REQUEST FOR PROPOSALS

Server Room Relocation

Issued: April 14, 2025
Due: May 9, 2025

TAYLORSVILLE-BENNION IMPROVEMENT DISTRICT

TAYLORSVILLE-BENNION IMPROVEMENT DISTRICT REQUEST FOR PROPOSALS (RFP)

Server Room Relocation

GENERAL

Taylorsville-Bennion Improvement District (the District) is a political subdivision of the State of Utah organized in April 1957, for the purpose of providing sewer and water services. The District operates as an Enterprise Fund. The District serves a population of approximately 70,000 people.

The District employs 34 people and operates and maintains approximately 229 miles of water lines, 12 wells, 1 sewer lift station, 1 sewer siphon, and approximately 189 miles of sewer collection lines. The principal place of business and offices of the District are located at 1800 West 4700 South, in Taylorsville, Utah.

RFP CONTACT

This Request for Proposals (RFP) has been prepared by the District and the District is the issuing entity of this RFP. The District's representative for this RFP is Bruce Hicken, Director of Finance.

PRE-BID MEETING / WALK THROUGH

An **optional** pre-bid meeting will be held at 10:00 a.m. on Monday, April 21, 2025 at 1800 West 4700 South, Taylorsville. This meeting is designed to clarify the requirements outlined in this Request for Bids and provide an opportunity for potential bidders to ask questions.

SCOPE OF WORK

The selected respondent shall relocate the District server to a different location within the District offices; including all wiring, HVAC, electrical modifications, and removal of replaced wiring. The Scope of work has been divided into the following tasks (each task is further described below):

1. Task 1 – Run All Necessary Communications Wiring As Shown in the Engineering Documents
2. Task 2 – Relocate District Server
3. Task 3 – Provide HVAC for new server room location as specified in the Engineering Documents
4. Task 4 – Provide sanitary sewer connection for condensate from new HVAC equipment
5. Task 5 – Complete Electrical modifications as specified in the Engineering Documents

Task 1 – Run all necessary communications wiring as shown in the Engineering Documents. The district will provide new rack and patch panels. All new home-runs from office wall plates, access points, and cameras will terminate into the supplied patch panels. All connections need to be clearly identified and labeled. All connections shall be tested for quality and report provided to the District. Use different color CAT6 cabling for, offices / rooms, access points, and cameras.

Effective dust and debris control and removal measures should be implemented and maintained in construction areas for the entirety of the project. All work areas are to be returned to preconstruction conditions before owner acceptance including replacement of any damaged or stained ceiling tiles and patch/paint of damaged areas.

Task 2 – The new server room must be prepared including the following tasks; 1. Remove carpet, chair rail, wallpaper, and carpet glue, 2. Patch and paint walls, window frames, and door frame, and 3. Stain / seal cement floor.

Relocate existing Xfinity coaxial line from old server room to new server room.

After all new CAT6 wires have been installed and terminated, servers, switches, and UPS's will be moved by District staff from the basement rack to new rack. The rack for the SCADA server and network will be moved by District staff, as is, from the adjacent room. Remove all existing Communications cabling from each wall plate, access point, and camera to the basement server location.

Task 3 – Provide equipment, installation, and testing of the specified HVAC system as shown in the Engineering Documents.

Task 4 – Complete plumbing modifications as specified in the Engineering Documents by providing a condensate receptor for the HVAC equipment and connecting to the building sanitary sewer system.

Task 5 – Complete electrical modifications as specified in the Engineering Documents by relocating electrical panel from the basement of the District offices to the main level of the District offices including necessary framing, patching and painting of the wall for the new panel. Provide power for the new server room as shown in the Engineering Documents.

The following tasks and / or purchases will be completed by District staff or outside of the Server Room Relocation project:

- Access control system for the new server room
- Moving of the actual server, switches, and UPSs
- Purchase of one new rack and patch panels for new server room
- Moving of the SCADA system rack and server
- Modification of phone communication line to new server room

TIMELINE

The following timeline will be followed with respect to this RFP:

1. Beginning date: Monday, April 14, 2025
2. Optional Pre-Bid / Walkthrough: Monday, April 21, 2025 at 10:00 a.m.
3. Response submission deadline: Friday, May 9, 2025 at 4:00 p.m.
4. Evaluation committee review period: Monday, May 12, 2025 – Friday, May 16, 2025
5. Anticipated award of contract: Wednesday, May 21, 2025

CONTENTS OF PROPOSAL

Proposals should be submitted following these guidelines:

A. Submission Time, Place and Manner

Printed copies (5 copies) **or** one electronic copy (in PDF format), of the Proposal Documents must be received on or before Friday, May 9, 2025 at 4:00 p.m. (MDT). Mail to Taylorsville-Bennion Improvement District, PO Box 18579, Taylorsville, UT 84118, or e-mail as follows:

Proposal Documents: Attention: Bruce Hicken
E-Mail: bruce@tbid.gov

Late Submission: Proposals received after May 9, 2025 at 4:00 p.m. (MDT) will not be considered. Any mailed proposal received after that date and time will not be considered, irrespective of the date of mailing or any other factor.

B. Responder Information

The first page of the proposal should include:

Title: "Server Room Relocation"

Responder information: Company Name / RFP Contact Person
Address
Telephone
E-Mail

C. Response Criteria

The proposal should address the following:

1. Qualifications and ability to provide services required:

   Qualifications and expertise:
   - Provide a brief description of your company including ownership, volume of business, number of employees, and number of years in business
   - Describe your overall business philosophy
   - Describe your company's strength in the marketplace
   - What distinguishes your company and the services you offer from other companies

   Support team:
   - Describe the team that would service the District relationship, specifying the individual who will be the lead person
   - Describe the responsibilities, expertise, experience, and education of each team member

Services provided:

- Provide a list of services provided by your company, and indicate those services that will be included in your Cost Proposal

2. Work plan:

   Include a complete narrative of your assessment of the work to be performed, your company's ability and approach, and the resources necessary to fulfill the requirements. Include discussion of the following:

   - How would you minimize downtime resulting from the cutover from the old server room to the new one?
   - We would like the project completed in a timely manner after selecting a contractor. Please provide a timeframe of work to be completed with estimated completion date.

3. Past performance:

   - List references (including a contact person and that person's contact information and title) of entities for which similar services have been provided, and who can render an opinion regarding the ability of the responder to provide those services
   - Describe any work performed for water and/or sewer districts, or other similar special service districts

4. Standard Agreement:

   Provide a standard contract, including terms and conditions, which your company uses. This is necessary to satisfy Utah Code Ann. § 63G-6a-703(2) (e).

5. Conflicts of interest:

   Indicate whether there are any potential conflicts of interest that would affect the ability of your company to fairly represent the District. For each potential conflict of interest state:

   - The names of the individuals and entities involved;
   - The nature of the conflict, and
   - The steps that responder will take to mitigate the impact of the conflict

D. Cost Proposal

In cost section of the proposal, include all information on cost for the Server Room Relocation and any related items for which the responder may charge. Please include the following:

1. Total cost for all equipment and labor described in the Scope of Work section (not including equipment provided by the District).
2. List other anticipated costs that will require reimbursement, either on an actual cost basis or any other basis, if any.
3. Any other information relevant to cost

EVALUATION AND CONTRACT

Evaluation Criteria

An evaluation and selection committee will meet to consider all responsive proposals submitted and rank the proposals based on the criteria stated below.

Evaluation categories are assigned a maximum number of points for evaluation purposes, with a maximum cumulative total of 100 points. The proposals will be evaluated based on the following factors:

	Criteria	Score (0 - 5) *	Weight	Maximum Points
1	Demonstrated qualifications and ability to provide specified services:			
	Qualifications and expertise	5	x 2	10
	Support team	5	x 2	10
2	Work Plan			
	Clearly written proposal which indicates an understanding of the key issues, clearly defines deliverables, and the responders ability to meet the requirements and specifications listed.	5	x 5	25
3	Past Performance			
	Demonstrated experience (i.e. proven track record). Positive references indicating successful past performance for districts or other similar local or special service districts.	5	x 5	25
4	Standard Contract Provided			
	The provided contract should be suitable for the services being sought and the relationship between TBID and the company responding to the RFP. The contract should be fair and balanced and should adequately protect TBID's interests. TBID reserves the right to discuss proposed contract terms and negotiate appropriate changes with the successful company.	5	x 1	5
5	Conflicts of Interest	P/F		
5	Cost Proposal - based on formula described under cost section	5	x 5	25
	Total Maximum Score Available			100

Score (0 – Unacceptable, 5 – Superior)

Evaluation Process

Phase 1: The evaluation committee will review all proposals that are timely received. Proposals that are not responsible, responsive, or do not comply with the requirements of this RFP and the requested submission format will be eliminated from consideration.

Phase 2: The evaluation committee will evaluate proposals that are not eliminated in Phase 1 in accordance with criteria 1 – 5 listed above.

The proposal with the lowest cost will receive the maximum points available. All other proposals will receive points determined by the ratio for the lowest proposal's cost to each other proposal's cost with the points being rounded down to the nearest whole number. The ratio is calculated as follows: the maximum points available for the cost category, multiplied by lowest proposed price/proposal price.

Utah Procurement Code

All proposals will be evaluated in accordance with the requirements of the Utah Procurement Code, Title 63G, Chapter 6a of the Utah Code.

E-Verify Compliance

The company that is awarded the bid must certify that they are in compliance with Utah Code Ann. § 63G-12-302(3) (including amendments and substitutions to the law) relative to the verification of the work eligibility status of employees and, in particular, that Company is registered and participates in a Status Verification system as required by law. Please see attached certification form.

Accuracy of Proposal

All proposals will be relied upon to be true and accurate. The District will rely on this information when evaluating each submission by the criteria listed in the Evaluation and Contract section.

Best and Final Offers

In accordance with Utah Code Ann. § 63G-6a-707.5, the evaluation committee may request best and final offers from responsible offerors who have submitted responsive proposals that meet the minimum qualifications, evaluation criteria, or applicable score thresholds identified in this RFP, if:

1. no single proposal addresses all the specifications stated in the request for proposals;
2. all or a significant number of the proposals are ambiguous on a material point and the evaluation committee requires further clarification in order to conduct a fair evaluation of proposals;

3. the evaluation committee needs additional information from all offerors to complete the evaluation of proposals;
4. the differences between proposals in one or more material aspects are too slight to allow the evaluation committee to distinguish between proposals;
5. all cost proposals are too high or over budget; or
6. another reason exists supporting a request for best and final offers, as provided in established rules.

Best and final offers will then be evaluated and scored by the evaluation committee in accordance with the evaluation criteria and procedures stated in this RFP.

Contract

A contract may be awarded (pending successful contract negotiations) to the responder whose proposal is the most advantageous to the District, taking into consideration price and the other evaluation factors described in this RFP.

In accordance with Utah Procurement Code, the District reserves the right to award the contract to a technically lower-cost responder that scored lower than the highest scoring responder if, based on a cost benefit analysis required by the Utah Procurement Code, the highest scoring responder will not provide the best value to the District.

The contract may be for a period of up to five (5) years, and may be canceled at any time with or without cause upon 30 days written notice from either the District or the company.

The District reserves the right to reject any and all proposals.

Addenda

In the event that it becomes necessary to revise any part of this RFP, respondents that are invited to submit in response to the RFP, and any other person requesting such information, will be notified by e-mail that a copy of the addenda is available. It is the responsibility of each respondent to ensure that its contact information given to the District is correct. The final date for the issuance and notification of addenda will be five (5) days prior to the due date of the proposal.

Protected Information

As a governmental entity, the District is subject to the Government Records Access and Management Act, Title 63G, Chapter 2 of the Utah Code ("GRAMA"), and cannot guarantee that information provided in a proposal will not be subject to disclosure under GRAMA.

Cost of Responding to RFP and Contract Negotiations

All expenses relating to responding to this RFP, including, but not limited to, preparing, submitting, and presenting a proposal, attending meetings in relation to this RFP, discussions, and all travel, dining, lodging, and communication expenses will be borne by the responder. The District assumes no liability for any costs incurred by a responder in responding to this RFP.

All expenses of the successful responder relating to conducting contract negotiations, including, but not limited to, drafting, research, legal review, preparation, attending meetings, site visits, travel, dining, lodging, and communication expenses will be borne by the responder. The District assumes no liability for any costs incurred by a responder relating to contract negotiations.

Responder will not bill for any expense that was incurred before the contract is signed.

CERTIFICATION OF COMPLIANCE
WITH E-VERIFY PROGRAM OR EQUIVALENT

This is to certify that _____ ("Company") covenants, represents and warrants to Taylorsville-Bennion Improvement District ("the District") that Company is and at all times during the performance of any contract with the District will be in full compliance with the requirements of Utah Code Ann. § 63G-12-302(3) (including amendments and substitutions to the law) relative to the verification of the work eligibility status of employees and, in particular, that Company is registered and participates in a Status Verification system as required by law.

Dated this ____ day of _____, 2025.

_____
Name of Company

By: _____
Title: _____
Printed Name: _____

MECHANICAL SYMBOLS

NOTES:
1. ALL SYMBOLS MAY NOT BE USED.
2. DOTTED SYMBOLS INDICATE EXISTING EQUIPMENT, ETC

SYMBOL	EXPLANATION
ø	ROUND MEASUREMENT
	RETURN AIR GRILLE/DUCT
	SUPPLY AIR DIFFUSER/DUCT
	EXHAUST AIR INTAKE GRILLE
	EXHAUST FAN
T X–X	THERMOSTAT/SENSOR
S X–X	SENSOR
	MECHANICAL EQUIPMENT SYMBOL
	KEYED NOTE REFERENCE
NECK CFM / SIZE CFM TAG	NECK: NECK AND BRANCH DUCT SIZE. CFM: CFM OF DIFFUSER OR GRILLE. TAG: DIFFUSER OR GRILLE CALL–OUT.
	SUPPLY AIR DUCTWORK
	RETURN AIR DUCTWORK
	EXHAUST AIR DUCTWORK
	OUTSIDE AIR DUCTWORK
R/D	RADIATION DAMPER
F/S	FIRE/SMOKE DAMPER
	BALANCING DAMPER

SUBMITTALS:

1. CONTRACTOR TO ALLOW 10 WORKING DAYS FOR SUBMITTAL TURNAROUND.

2. CONTRACTOR TO PROVIDE SUBMITTALS FOR ALL EQUIPMENT AND MATERIALS IN A SINGLE PACKAGE. PIECEMEAL SUBMITTALS WILL BE RETURNED WITH A NOTE TO REVISE AND RESUBMIT.

3. SUBMITTALS WILL BE CHECKED FOR COMPLIANCE WITH CAPACITY REQUIREMENTS AND ELECTRICAL REQUIREMENTS. CONTRACTOR TO VERIFY THAT WEIGHTS, DIMENSIONS, AND DUCT CONNECTIONS ON SUBMITTED EQUIPMENT IS CONSISTENT WITH SCHEDULED EQUIPMENT PRIOR TO SUBMITTAL. CHANGES IN SCOPE BROUGHT ABOUT BY SUBMITTED EQUIPMENT THAT DOES NOT COMPLY WITH THE WEIGHTS, DIMENSIONS, OR CONNECTION LOCATIONS ON SCHEDULED EQUIPMENT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

COMMISSIONING NOTES:

MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE ALL DOCUMENTATION TO THE OWNER AS PER THE LISTED 2021 IECC CODE REFERENCES BELOW:

C408.2.1 A COMMISSIONING PLAN SHALL BE DEVELOPED BY A REGISTERED DESIGN PROFESSIONAL OR APPROVED AGENCY AND SHALL INCLUDE THE FOLLOWING ITEMS:

1. A NARRATIVE DESCRIPTION OF THE ACTIVITIES THAT WILL BE ACCOMPLISHED DURING EACH PHASE OF COMMISSIONING, INCLUDING THE PERSONNEL INTENDED TO ACCOMPLISH EACH OF THE ACTIVITIES.

2. A LISTING OF THE SPECIFIC EQUIPMENT, APPLIANCES OR SYSTEMS TO BE TESTED AND A DESCRIPTION OF THE TESTS TO BE PERFORMED.

3. FUNCTIONS TO BE TESTED, INCLUDING, BUT NOT LIMITED TO CALIBRATIONS AND ECONOMIZER CONTROLS.

4. CONDITIONS UNDER WHICH THE TESTS WILL BE PERFORMED. AT A MINIMUM, TESTING SHALL AFFIRM WINTER AND SUMMER DESIGN CONDITIONS AND FULL OUTSIDE AIR CONDITIONS.

5. MEASURABLE CRITERIA FOR PERFORMANCE.

C408.2.4 PRELIMINARY COMMISSIONING REPORT. A PRELIMINARY REPORT OF COMMISSIONING TEST PROCEDURES AND RESULTS SHALL BE COMPLETED AND CERTIFIED BY THE REGISTERED DESIGN PROFESSIONAL OR APPROVED AGENCY AND PROVIDED TO THE BUILDING OWNER OR OWNER'S AUTHORIZED AGENT. THE REPORT SHALL BE ORGANIZED WITH MECHANICAL AND SERVICE HOT WATER FINDINGS IN SEPARATE SECTIONS TO ALLOW INDEPENDENT REVIEW. THE REPORT SHALL BE IDENTIFIED AS "PRELIMINARY COMMISSIONING REPORT," SHALL INCLUDE THE COMPLETED COMMISSIONING COMPLIANCE CHECKLIST, FIGURE C408.2.4, AND SHALL IDENTIFY:

1. ITEMIZATION OF DEFICIENCIES FOUND DURING TESTING REQUIRED BY THIS SECTION THAT HAVE NOT BEEN CORRECTED AT THE TIME OF REPORT PREPARATION.

2. DEFERRED TESTS THAT CANNOT BE PERFORMED AT THE TIME OF REPORT PREPARATION BECAUSE OF CLIMATIC CONDITIONS.

3. CLIMATIC CONDITIONS REQUIRED FOR PERFORMANCE OF THE DEFERRED TESTS.

4. RESULTS OF FUNCTIONAL PERFORMANCE TESTS.

5. FUNCTIONAL PERFORMANCE TEST PROCEDURES USED DURING THE COMMISSIONING PROCESS, INCLUDING MEASURABLE CRITERIA FOR TEST ACCEPTANCE.

C408.2.4.1 ACCEPTANCE OF REPORT. BUILDINGS, OR PORTIONS THEREOF, SHALL NOT BE CONSIDERED AS ACCEPTABLE FOR A FINAL INSPECTION PURSUANT TO SECTION C105.2.6 UNTIL THE CODE OFFICIAL HAS RECEIVED THE PRELIMINARY COMMISSIONING REPORT FROM THE BUILDING OWNER OR OWNER'S AUTHORIZED AGENT.

C408.2.4.2 THE CODE OFFICIAL SHALL BE PERMITTED TO REQUIRE THAT A COPY OF THE PRELIMINARY COMMISSIONING REPORT BE MADE AVAILABLE FOR REVIEW BY THE CODE OFFICIAL.

C408.2.5 DOCUMENTATION REQUIREMENTS. THE CONSTRUCTION DOCUMENTS SHALL SPECIFY THAT THE DOCUMENTS DESCRIBED IN THIS SECTION BE PROVIDED TO THE BUILDING OWNER WITHIN 90 DAYS OF THE RECEIPT OF THE CERTIFICATE OF OCCUPANCY.

DOCUMENTS SHALL INCLUDED BUT ARE NOT LIMITED TO: DRAWINGS, MANUALS, SYSTEM BALANCING REPORT, AND FINAL COMMISSIONING REPORT.

PROJECT MECHANICAL NOTES:

1. MECHANICAL CONTRACTOR TO PROVIDE AND INSTALL A 7–DAY PROGRAMMABLE THERMOSTAT FOR THE SPLIT SYSTEM. VERIFY THERMOSTAT LOCATION WITH OWNER REPRESENTATIVE IN FIELD.

2. FIELD VERIFY LOCATION OF ALL EXISTING MECHANICAL UNITS WITH GENERAL CONTRACTOR/OWNER REPRESENTATIVE.

3. COORDINATE EXACT LOCATION IN FIELD OF ALL NEW MECHANICAL UNITS WITH GENERAL CONTRACTOR/OWNER REPRESENTATIVE

4. HEATING LOADS COMPLETED USING CHVAC OR OTHER APPROVED CALCULATION METHODS.

5. REFRIGERANT PIPING INSULATION.

   5.1. INSULATE ALL REFRIGERANT SUCTION PIPING WITH 1/2" THICK FLEXIBLE FOAMED PLASTIC CLOSED CELL PIPE INSULATION.

   5.2. INSULATION SHALL HAVE A "K" FACTOR OF NOT MORE THAN .26 AT 70°F AND A WATER VAPOR TRANSMISSION RATE OF 0.1 PERM–INCH OR LESS IN CONFORMANCE WITH ASTM C–177 & ASTM C–355 WATER METHOD.

   5.3. WHEN INSULATION IS EXPOSED TO SUNLIGHT WRAP WITH POLYTAPE WITH ONE THIRD OVERLAP.

   5.4. INSTALL INSULATION BY SLITTING TUBULAR SECTIONS AND APPLYING OVER PIPING.

   5.5. PAINT ALL INSULATION AND/OR TAPE EXPOSED TO THE EXTERIOR WITH ULTRAVIOLET RESISTING PAINT.

6. MECHANICAL CONTRACTOR SHALL VISIT THE PROJECT SITE DURING THE BIDDING PROCESS.

DESIGN CONTACTS

PROJECT MANAGER	GARRETT SORENSEN
MECHANICAL ENGINEER:	MARK MAKIN
MECHANICAL DESIGNER:	CADEN HERBERT

MECHANICAL SHEET INDEX

SITE CONDITIONS

SITE:

CITY: TAYLORSVILLE, UT
ELEVATION: 4,295'

OUTDOOR CONDITIONS:

WINTER: HTG: 3° F
SUMMER: CLG: 98° F

INDOOR CONDITIONS

WINTER: HTG: 75° F
SUMMER: CLG: 72° F

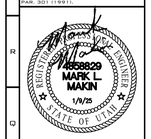
IF TEMPERATURES SHOWN DO NOT MATCH CONDITIONS DESIRED FOR THIS PROJECT CONTACT THE ENGINEER OF RECORD.

APPLICABLE CODES

- 2021 INTERNATIONAL MECHANICAL CODE (IMC)
- 2021 INTERNATIONAL BUILDING CODE (IBC)
- 2021 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)
- 2021 INTERNATIONAL PLUMBING CODE (IPC)
- 2021 INTERNATIONAL FUEL GAS CODE (IFGC)
- ASHRAE 90.1 – 2022

NOTE: CURRENT CODES ADOPTED BY THE RESPECTIVE JURISDICTION WILL SUPERCEDE THIS LIST OF CODES.

ROYAL ENGINEERING
MECHANICAL
PROVO, UTAH 84606
FAX: 801.375.2676
ELECTRICAL
1851 S. EAST BAY BLVD.
PHONE: 801.375.2228



REVISIONS:

1800 W 4700 S
TAYLORSVILLE,
UT 84129

TBID SERVER ROOM RELOCATION

DRAWING TITLE: MECHANICAL NOTES & LEGENDS

DRAWN BY: CH | CHECKED BY: MLM

DATE PLOTTED: 1/9/2025

PROJECT #: J24277.00

M0.1

MECHANICAL KEYED NOTES:

1. FIELD VERIFY 7-DAY PROGRAMMABLE THERMOSTAT LOCATION WITH OWNERS REPRESENTATIVE. INSTALL THERMOSTAT AT 48" A.F.F..
2. ANTICIPATED LOCATION OF WALL MOUNTED COOLING UNIT. VERIFY FINAL LOCATION WITH STRUCTURE AND OWNERS REPRESENTATIVE.
3. ANTICIPATED LOCATION OF ROOF MOUNTED CONDENSING UNIT. VERIFY FINAL LOCATION WITH STRUCTURE AND OWNERS REPRESENTATIVE.
4. CONTRACTOR TO TERMINATE AND SEAL EXISTING FLOOR RETURN AND CEILING SUPPLY DUCT.

MECHANICAL PLAN

SCALE: 1/8" = 1'-0"

ROYAL ENGINEERING
ELECTRICAL
MECHANICAL
1837 S. EAST BAY BLVD.
PROVO, UTAH 84606
PHONE: 801.375.2228
FAX: 801.375.2676

REGISTERED PROFESSIONAL ENGINEER
4858829
MARK L. MAKIN
1/9/25
STATE OF UTAH

REVISIONS:

1800 W 4700 S
TAYLORSVILLE, UT 84129

TBID SERVER ROOM RELOCATION

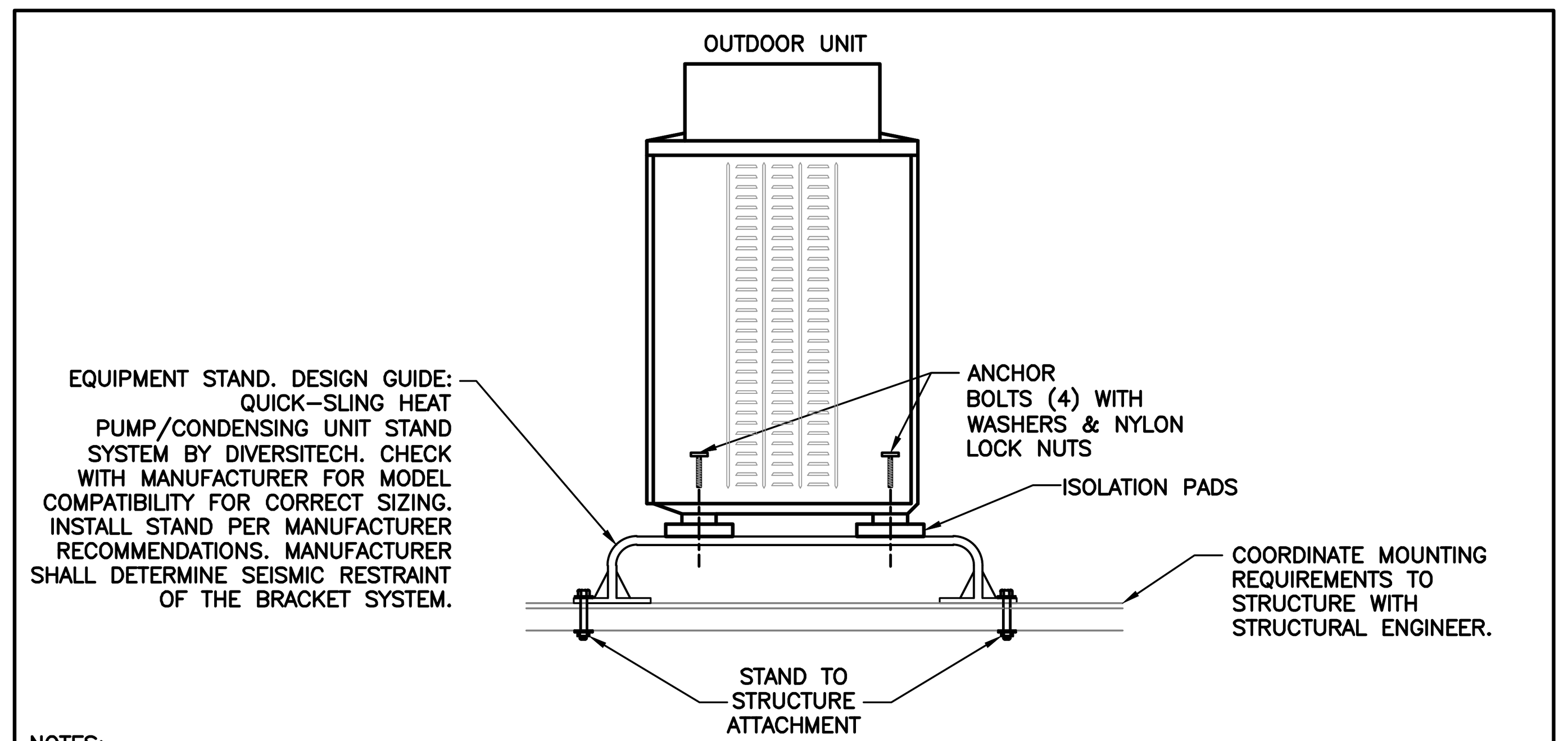
DRAWING TITLE:
MECHANICAL PLAN

DRAWN BY:	CHECKED BY:
CH	MLM

DATE PLOTTED: 1/9/2025

PROJECT #: J24277.00

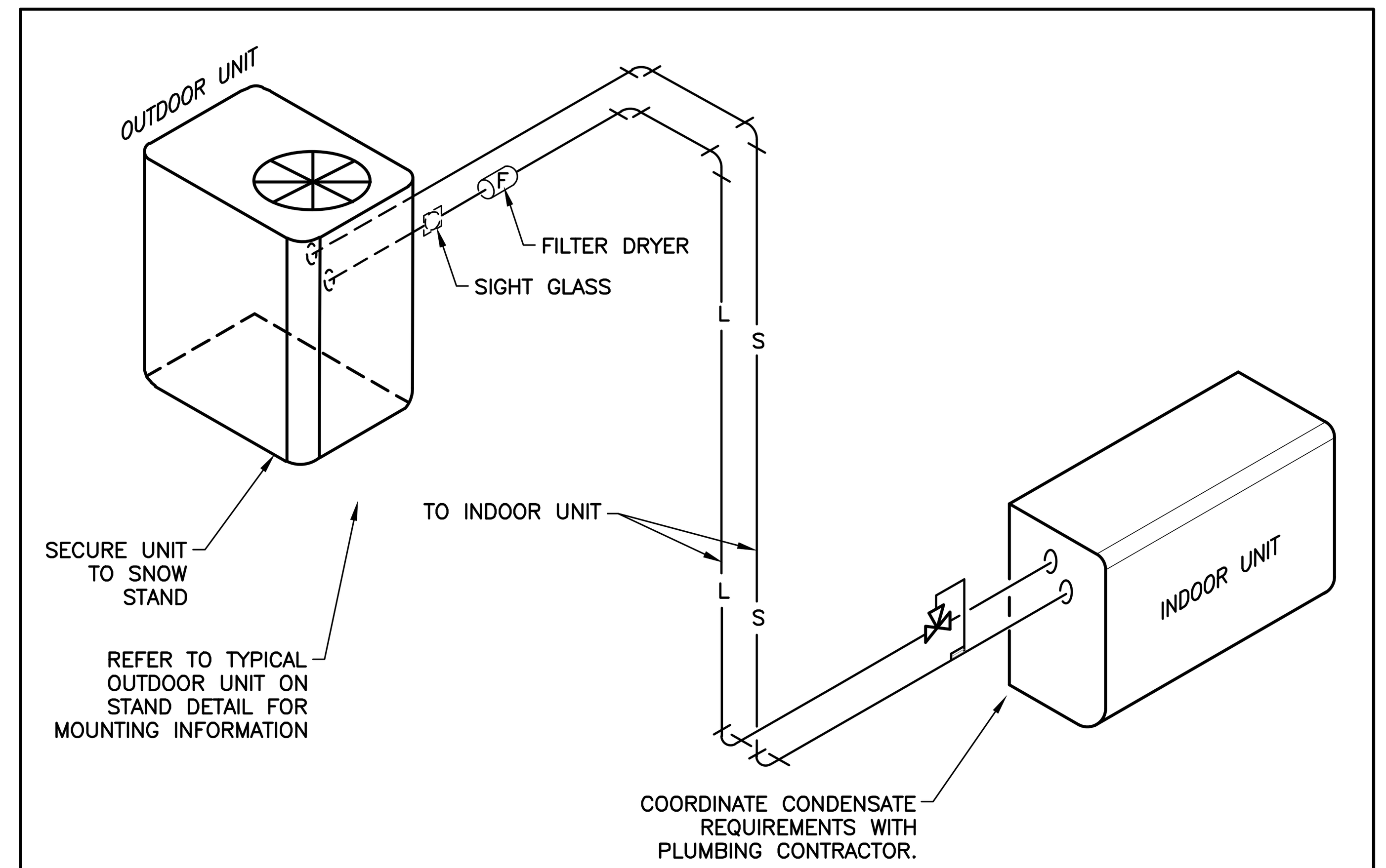
M1.1



NOTES:
1. INSTALL UNIT LEVEL OR, IF ON A SLOPE, MAINTAIN SLOPE TOLERANCE OF 2 DEGREES (OR 2 INCHES PER 5 FEET).
2. COORDINATE WITH ARCHITECTURAL FOR MOUNTING HEIGHT REQUIREMENTS
3. PROTECT ADJACENT SURFACE(S) TO AVOID EXPOSURE OF ADJACENT SURFACE TO UNIT REFRIGERANT AND OIL DURING INSTALLATION.
4. FOLLOW ALL MANUFACTURER RECOMMENDATIONS.
5. VERIFY STAND LOCATION(S) WITH STRUCTURAL AND ARCHITECTURAL PLANS.
6. INSTALL UNIT WITH MANUFACTURER RECOMMENDED CLEARANCES AROUND ALL SIDES OF THE UNIT. SEE UNIT MANUFACTURER INSTALLATION MANUAL FOR RECOMMENDED DISTANCES.
7. SECURE STAND TO STRUCTURE UNDER THE DIRECTION OF THE STRUCTURAL ENGINEER AND PER MANUFACTURER RECOMMENDATIONS.

TYPICAL OUTDOOR UNIT ON STAND DETAIL

SCALE: NONE



TYPICAL ROOF MOUNTED COOLING ONLY REFRIGERANT SCHEME

SCALE: NONE

SPLIT SYSTEM COOLING ONLY INDOOR & OUTDOOR UNITS

INDOOR UNIT							OUTDOOR/HEAT PUMP UNIT								REMARKS
MARK	DESIGN GUIDE	NOMINAL SUPPLY CFM	NOMINAL COOLING BTU/H	NOMINAL HEATING BTU/H	ELECTRICAL VOLTAGE (DC VOLTS)	ELECTRICAL UNIT MCA	DESIGN GUIDE	ELECTRICAL VOLT/PH/HZ	ELECTRICAL UNIT MCA	ELECTRICAL UNIT MOCP	REFRIGERANT	SEER	HSPF	MARK	
SAC 1	MITSUBISHI PKA–SERIES	705	24,000	N/A	24	1	PUY–SERIES	230/1/60	18	30	R32	17	N/A	SCU 1	1 – 9

1. SITE CONDITIONS ARE 97/62 DEG. DB/WB SUMMER, 3 DEG. F DB WINTER, AND AN ELEVATION OF 4,295 FEET ABOVE SEA LEVEL.
2. APPROVED MANUFACTURERS: DAIKIN, MITSUBISHI, FRIEDRICH, FUJITSU, SANYO. (SUBJECT TO DOCUMENT CONFORMANCE).
3. WITH R32 REFRIGERANT.
4. PROVIDE AND INSTALL ALL REQUIRED MOUNTING HARDWARE.
5. PROVIDE AND INSTALL CONDENSATE PIPING TO NEAREST PLUMBING DRAIN.
6. WITH LOW AMBIENT KIT TO ALLOW OPERATION TO 0 DEG. F.
7. FACTORY THERMOSTAT CONTROLS HARD WIRED AND SECURED TO THE WALL. DESIGN STANDARD PAC–YT53CRAU–J.
8. PROVIDE SNOW STAND AND WIND BAFFLES AS REQUIRED FOR YEAR ROUND OPERATION.
9. ELECTRICAL CONTRACTOR SHALL PROVIDE CONNECTION BETWEEN INDOOR AND OUTDOOR UNIT.

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REGISTERED PROFESSIONAL ENGINEER
4858829
MARK L. MAKIN
1/9/25
STATE OF UTAH

REVISIONS:

TBID SERVER ROOM RELOCATION

1800 W 4700 S
TAYLORSVILLE, UT 84129

DRAWING TITLE:
MECHANICAL SCHEDULE & DETAILS

DRAWN BY: CH
CHECKED BY: MLM
DATE PLOTTED: 1/9/2025
PROJECT #: J24277.00

M5.1

SECTION 23 Mechanical – GENERAL PROVISIONS
Not all specification items are used in every project.

PART 1 – GENERAL

– **Scope:**

A. Provisions of this section apply to all work specified in all sections under Division 23.

B. In addition, work in Division 23 is governed by the provisions of the Bidding Requirements, Contract Forms, General Conditions and all sections under Division 1, General Requirements.

C. Contractor is responsible for results deviating from the plans.

– **Examination of Premises:** Visit the site, verify all measurements and job conditions, and pay all costs necessary to perform the work. Coordinate division of fee responsibilities with the General Contractor.

– **The Mechanical Contractor** shall be licensed and hold a current contracting license that has been valid for a minimum of two years as a Mechanical Contractor in the State where the project is located.

– **The Mechanical Contractor** shall have a minimum of five years experience installing commercial cooling and heating systems similar to those described in these specifications and provide a list of previous projects, including name of project and contact person names and phone numbers as a separate document in addition to the mechanical bid submitted if required by the General Contractor.

– **The Mechanical Contractor** shall be able to bond work he is bidding to perform and shall provide a written statement from the bonding agency proposed to be used for this project as a separate document in addition to the mechanical bid submitted if required by the General Contractor. The bonding agency shall be one having a Best's insurance rating of A or A+.

– **Regulations, Permits, Fees, Charges, Inspections:**

A. Regulations: Comply with all applicable codes, rules and regulations. All materials and work must comply with local construction, mechanical, plumbing, electrical and fire codes. As a minimum, comply with the following: IBC, IMC, IPC, NEC, NFPA codes and all City codes.

B. In addition to the requirements of all governing codes, ordinances and agencies, conform to the requirements of the following codes and standards.

1. 2021 International Mechanical Code
2. 2021 International Building Code
3. 2021 International Energy Conservation Code
4. 2021 International Plumbing Code
5. 2021 International Fuel Gas Code
6. ASHRAE 90.1 – 2022

***Current codes adopted by the respective jurisdiction will supercede this list of codes.

C. Fees and Permits: Pay all connection, installation, use, development, etc., fees and/or charges. Obtain and pay for all required permits and licenses. Coordinate division of fee responsibilities with the General Contractor.

D. Inspections: All work must be inspected and approved by local authorities. Prior to final approval, furnish the Architect with certificates of inspections and approvals by the local authorities in accordance with Division 1.

1. Preheat and interpass temperature shall be determined by temperature indicating stick (crayon), contact pyrometers or other equally suitable means.

– **Drawings and Specifications:**

A. Refer to Division 1 for information on submittals and shop drawings.

B. If a conflict exists between the drawings and specifications, promptly notify the Architect and Engineer.

– **Record Drawings:**

A. Provide record drawings for all work under sections in Division 22 & 23. See Division 1 for detailed requirements covering preparation of record drawings.

– **Work and Materials:**

A. Unless otherwise specified, all materials must be new and of the quality specified. The workmanship shall be of a quality that is acceptable to the Architect and is equal to the standards of the trades. Contractor must staff the project with sufficient skilled workmen, including a fully qualified construction Superintendent, to complete the work in the time allotted. The Superintendent must be qualified to supervise all of the work in his work category.

– **Approvals of Materials and Equipment:**

A. Refer to Division 1 for description of material and equipment for prior approvals and substitutions. Submittals Must be received by Engineer 10 days prior to due date/bid opening.

– **Maintenance Manual:**

A. Prior to completion of the project, compile a complete equipment and maintenance manual for all equipment supplied under sections of Division 23, as described in Division 1.

B. Manuals shall be bound in a three–ring binder. A preliminary submittal of the manual shall be made to the Architect 90 days after receiving approved submittals. Final submittal of the manual shall be made four weeks prior to substantial completion of the project.

– **Equipment Purchases:**

A. Arrange for purchase and delivery of all materials and equipment within 15 days after approval of submittals. Coordinate with General Contractor.

– **Cooperative Work:**

A. Correct without charge any work requiring alteration due to lack of proper supervision or failure to make proper provision in time. Correct without charge any damage to adjacent work caused by the alteration. See Division 1 for additional requirements.

B. Cooperative Work Includes:

1. General supervision and responsibility for proper location, rough–in and size of work related to Division 22 & 23 but provided under other divisions of these specifications.

2. Installation of sleeves, inserts and anchors bolts for work under sections in Division 23.

3. Electrical work as specified herein. Refer to Division 26 for requirements.

– **Construction Facilities:**

A. General: Under this division of the specifications execute all work in a manner to provide safe and lawful ingress and egress to the Owner's establishment and such facilities shall be kept clear of materials or equipment as directed by the Architect. Refer to Division 1 for additional requirements.

B. Furnish and maintain from the beginning to the completion of all work all lawful and necessary guards, railings, fences, canopies, lights, and warning signs. Take all necessary precautions required by city and state laws to avoid injury or damage to any and all persons and property.

– **Guarantee:**

A. Guarantee all material, equipment, and workmanship for all sections under Division 23 in writing to be free from defects of material and workmanship for one year from date of final acceptance as outlined in Division 1.

B. Replace without charge any material or equipment proving defective during this period.

C. The guarantee shall include performance of the equipment under all conditions of load, installing any additional items of control and/or protective devices as required and the replacing of any refrigerant lost.

– **Mechanical Wiring:**

A. Provide all temperature control wiring, all interlock wiring, and equipment control wiring for the equipment that is to be provided under this Division unless specifically shown on electrical drawings. All wiring shall be not less than No. 14 insulated, color coded wire in electrical metallic tubing. Installation shall comply with Division 26.

B. Before ordering motors, equipment, etc., verify the available voltage and phase with the electrical trades.

– **Electrical Work:**

A. Electrical wiring, including power wiring and control wiring (except as otherwise specified under Automatic Temperature Controls), all raceways, wiring, outlet and junction boxes, and labor for installation of the wiring and equipment shall be included in Electrical Division 26 of the specifications.

B. All starters in motor control centers are to be furnished and installed under the Electrical Division of the specifications.

C. Under the Automatic Temperature Control section of these specifications, furnish and install all wiring, conduit, electric automatic temperature control devices, thermostats, relays, pneumatic electric switches, automatic control switches and pilot lights. See the Automatic Temperature Control Section, for additional detailed information.

D. All loose starters and control devices for equipment furnished under Division 23 (except as otherwise specified under Automatic Temperature Control Section) are to be furnished under that particular section of Division 23 and installed under the electrical division.

E. Contractor shall be responsible for the checking and testing of all controls and the interlocks for a complete and satisfactory operating system.

F. Before ordering any motors and equipment. Verify the available voltage and phase for all motors with the Electrical Contractor.

G. Submit a complete list of all motors prior to final closeout of job indicating the location, horsepower, voltage, phase specified in Table 132 of ANSI B.1.

– **Welding Codes and Standards:**

A. All welding and other criteria covered by this specification shall be in accordance with the following code:

1. ASME Boiler and Pressure Vessel Code
2. Section IX ANSI Code for Power Piping: B31.1

– **Product Handling**

A. Protection: Take all precautions necessary to protect the materials of this section, before, during and after installation.

B. Replacements: In the event of damage immediately repair all damaged and defective work to the approval of the Engineer, at no additional cost to the Owner.

– **Job Conditions**

A. Examination of site: Examine the site and include in bid proposal all conditions under which work is to be performed.

– **Miscellaneous**

A. Permit and Fees: Apply and pay for all necessary permits, inspections, examinations and fees or charges required by Public Authorities having jurisdiction.

B. Locations and Accessibility: Contractor shall fully inform their self regarding peculiarities and limitations of space available for installation of work under this section for valves, motors, controls and other devices requiring service. Maintenance and adjustments shall be placed in fully accessible positions and locations, provide access doors and/or panels where required in ductwork and/or construction whether specifically detailed or not, and render all such devices accessible.

C. Scaffolding: Furnish all scaffolding, rigging and hoisting as required for the proper execution of the work.

D. All HVAC equipment shall be labeled. Information on labels shall include: Identification number and name same as the drawings, flow and static pressure and the area to which the unit serves. Labels shall be black faced laminate with white engraved lettering at least 3/16 inch high.

E. All gas fired equipment shall include a label indication that the appliance has been adjusted, modified or re–calibrated for the altitude wherein the project is to be located. The appliance shall also include a compliance statement indicating that the appliance has been adjusted, modified or re–calibrated for the proper operation at the altitude of the project and shall be listed capable for use with natural gas or propane gas if propane is listed on the drawings.

– **Submittals**

A. Shop Drawings: Within 15 days after award of contract, and before any of the materials of this section are fabricated and delivered to the jobsite, submit complete shop drawings and equipment submittals for the Engineer to review in accordance with these specifications. Show all details of all ductwork and equipments pads.

B. Product Data:

1. Submit six (6) copies of all manufacturer's product data simultaneously with all shop drawings submittals.
2. Product data to include, all air conditioning equipment, hangers, fans and other standard items as required to complement shop drawings for a submittal indications products to be used on this work.

C. Record Drawings: Maintain throughout the progress of the work project record drawings and submit to the Owner.

D. Operating Manuals and Maintenance Manuals:

1. Submit four (4) copies of all operating instructions, control diagrams and maintenance manuals to owner representative.
2. Fully instruct Owner's operating personnel and demonstrate performance, operation and maintenance of equipment. Amount of allocated for said instruction and demonstration of equipment and systems shall be part of these obligations. Submit to Engineer a letter signed by Owner's representative who will operate system stating that he has been fully instructed by contractor about operation and maintenance of equipment and system.

E. Guarantees: In addition to equipment warranties, furnish a written guarantee against defects in materials and workmanship for one year. Guarantee shall include repair of damage to, or replacement of any part of equipment or premises caused by leaks or breaks in pipe or equipment provided under this section.

– **Equipment Identification**

A. Except for individual room heating units and items furnished under temperature control all items of mechanical equipment, including fans, pumps, boilers, electrical switches, starters for mechanical equipment and gauges shall be labeled.

B. Information on labels shall include the following:

1. Identification number and name. Generally this number and name shall be the same as that shown on the drawings or in the specifications.
2. If the item is a fan provide/show cfm.
3. If the item is a pump, provide/show, show gpm flow and feet of head.
4. If the item is part of a unit, the label shall have in addition to its item number, the number of the main item it is serving.
5. Valves shall be tagged with the area/rooms served and their normal operating positions shall be indicated.
6. Where the main unit is served by the valve is apparent, only the valve function needs to be included on the nameplate.

C. The types of Nameplates shall be as follows:

1. The valve tags shall be 1/2 inch embossed aluminum tapes with identification on one side for valves. Tags for magnetic starters shall be screwed to the metal starter cover. Gauge tags shall be 1 inch x 2 inch embossed aluminum with identification on one side listing area/system served with a stainless steel tag wire.
2. Equipment nameplates shall be black faced laminate with white engraved lettering at least 3/16 inches high.

D. Valve tags shall be connected to valve stems by steel rings or chains. Screws shall be used for equipment labels prior to installation. The contractor shall submit to the Engineer a complete list of all valves and each item of equipment to be identified with the proper identification.

– **Fire Stopping**

A. Only tested and approved fire stop systems shall be used.

B. Fire stop system installation must meet requirements of ASTM E–814, UL 1479 or UL 2079 tested assemblies that provide a fire rating equal to that of construction being penetrated.

C. Proposed fire stop materials and methods shall conform to applicable having codes having local jurisdiction.

D. Fire stop systems are not to reestablish the structural integrity of the load bearing partitions/assemblies, or support live loads and traffic. Installer shall consult the Structural Engineer prior to penetrating any load bearing assembly.

E. For those fire stop applications that exist for which no UL tested system is available through a manufacturer, and engineering judgment derived from similar UL system design or other test, will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineer judgment drawings must follow requirements set forth by the International Fire stop Council.

F. The work of this section shall be accomplished by a single source contractor or by those contractors who, by their contract, are penetrating rated construction with their work. Regardless of responsibility the General Contractor shall be responsible to assure and verify that all products, systems, etc. used under this section are appropriate and meet the intent of this specification and is accomplished by factory trained workmen.

G. Acceptable manufacturers are subject to compliance with through penetration firestop systems listed in the UL fire resistance directory. Provide products from the following manufacturers as identified:

1. Hilti Inc.
2. 3M Corporation
3. STI/Specified Technologies Inc.
4. Metacaulk/Rectorseal Corporation
5. Tremco
6. Cafco/Isolatek International
7. Nelson Firestop Product.

H. Use only firestop products that have been UL 1479, ASTM E–814, or UL 2079 listed for specific fire–rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements and fire–rating involved for each separate instance.

I. Cast–in–place firestop devices for use with non–combustible and combustible plastic pipe (closed and open piping systems) penetrating concrete floors, the following products are acceptable:

1. HILTI CP 680 cast–in–place firestop device.
2. HILTI CP 681 tub box kit for use with tub installations.

K. Sealants, caulking materials, or foams for use with non–combustible items including steal pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT). The following products are acceptable:

1. HILTI FS–One Intumescent Firestop Sealant
2. HILTI CP 604 Self–leveling Firestop Sealant
3. HILTI CP 620 Fire Foam
4. HILTI CP 606 Flexible Firestop Sealant
5. HILTI CP 601S Elastomeric Firestop Sealant

L. Sealants or caulking materials for use with sheet metal ducts. The following products are acceptable:

1. HILTI CP 601S Elastomeric Firestop Sealant
2. HILTI CP 606 Flexible Firestop Sealant
3. HILTI FS–One Intumescent Firestop Sealant

M. Intumescent sealants, caulking materials for use with combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe. The following products are acceptable:

1. HILTI FS–One Intumescent Firestop Sealant

N. Firestop collar or wrap devices attached to assembly around combustible plastic pipe (closed or open piping systems). The following products are acceptable.

1. HILTI CP 642 Firestop Collar
2. HILTI CP 643 Firestop Collar
3. HILTI CP 645 Firestop Sleeve

O. Materials used for complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways. The following products are acceptable.

1. HILTI CP 637 Trowelable Firestop Mortar/Compound
2. HILTI FS 657 Fire Block
3. HILTI CP 620 fire Foam

P. Non curing, re–penetrable materials used for large size/complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways. The following products are acceptable:

1. HILTI FS 657 Fire Block

PART 2 – PRODUCTS

– **Machinery Belt Drives:**

A. Use V–belts designed for 150% of capacity for all belt drives. For multiple belt drives, use matched sets, so marked at the factory.

B. On drives with not more than two belts, provide adjustable pitch motor sheaves with the midpoint of the adjustment range equal to that required to achieve the specified fan capacity.

C. On motors with drives with more than two belts, furnish nonadjustable sheaves, providing the specified fan capacity.

– **Machinery Accessories:**

A. Lubricating Devices: Provide all oil level gauges, oil pressure gauges, grease cups, grease gun fittings, as required by the equipment. Extend all lubricating fittings to readily accessible locations.

B. Guards: Provide totally–enclosed OSHA type belt guards for all rotating equipment. Design guards to be readily removable for access to belt drives.

– **Equipment Design and Installation:**

A. Uniformity: Unless otherwise specified, provide all equipment of same type or classification by the same manufacturer.

B. Design: Design all equipment in accordance with ASME, AGA, UL and other applicable technical standards as follows:

C. Pressure vessels – ASME Code constructed and stamped

D. Electric appliances – UL labeled

E. Fire protection equipment – UL approved and labeled

F. Fans – AMCA rated and stamped

G. Cooling equipment – ARI certified

H. Fire dampers, smoke dampers, combination fire and smoke dampers – UL listed

I. Concrete Inserts:

1. The work under this section includes furnishing and installing all concrete inserts required for all materials and equipment specified herein or in other sections of Division 23.
2. Provide concrete inserts equal to Unistrut 'P' Series with standard, plain, oiled finish. Provide exposed Unistrut pipe supports with electrogalvanized factory finish.

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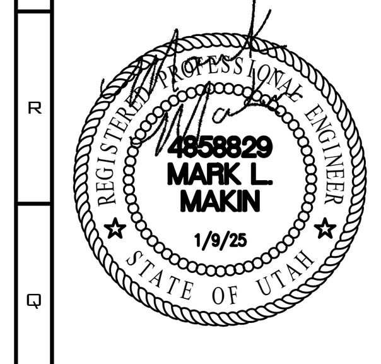

REVISIONS:

TBID SERVER ROOM RELOCATION
1800 W 4700 S
TAYLORSVILLE,
UT 84129

DRAWING TITLE: MECHANICAL SPECIFICATIONS

DRAWN BY:	CHECKED BY:
CH	MLM

DATE PLOTTED: 1/9/2025

PROJECT #: J24277.00

M7.1

– Diffusers, Registers and Grilles

A. Air distribution equipment shall be of the sizes, types, and capacities indicated on the drawings, herein or approved equals.

B. Registers, grilles, and diffusers of the sizes shown on the drawings and described here in shall be furnished and installed. All grilles, diffusers and registers shall be complete with frames with rubber gaskets suitable for the area and wall construction where shown on the drawings.

C. Finish for all registers, diffusers, grilles, etc. shall be off–white unless otherwise selected by the Owner. Approved manufacturers for all air distribution products shall be Price Industries, Titus, Nailor, Metal Air/Greenheck, Tuttle & Bailey, Carnes, Hart and Cooley, or Anemostat.

D. Supply air shall be introduced into conditioned space in such a manner that conditioned air and room air is rapidly and evenly mixed, resulting in equalization of temperature and draftless air distribution through zone of occupancy with temperature differentials up to 25 degrees F for both cooling and heating air. Quantities and throws shall be as indicated on drawings.

E. Velocity of moving air below 5 foot level, during cooling cycle, shall not exceed limits of either 50 fpm at 1.5 degrees F below average room temperature or 70 fpm at 1 degree F below average room temperature. Velocity of moving air at the 1 foot level, during heating cycle shall not be less than 10 fpm. Temperature difference at or below the 5 foot level shall not exceed the following:

1. 2 degrees F below average room temperature at 30 fpm
2. 1.5 degrees F below average room temperature at 50 fpm
3. 1 degree F below average room temperature at 70 fpm
4. Sound pressure level in all octave bands for each diffuser shall not exceed 'NC' noise criteria as noted on the drawings, at task level when HVAC units operate at designed capacities.

F. Ceiling diffusers, grilles and registers shall be independently supported from the structure so that they are not dependant on the ceiling for support.

G. Ceiling diffusers may be round necked or of equivalent size square neck. Provide square to round neck adapter as necessary. Flex duct shall typically connect directly to the diffuser using a 1–1/2 inch centerline radius flexible duct elbow. If space does not allow for a full 1–1/2 inch centerline radius to be provided, then a lined sheet metal boot shall be provided. The flexible duct shall be connected to the side of the sheet metal boot. The flexible duct shall not be connected to the top of the sheet metal boot.

H. Ceiling supply air diffusers shall be louvered faced directional diffuser with border for lay in ceiling or border type for surface mounting in other than lay in ceilings, baked enamel finish, blow and pattern shown on the drawings.

I. Provide and install the following grilles, diffusers, louvers, or approved equals or as shown on the drawings.

J. Supply, exhaust, transfer and return air grilles mounted on walls 6 feet above the floor shall be Price Industries model 635, with 45–degree deflection, 1/2" blade spacing, horizontal extruded aluminum blades, baked enamel finish.

K. Supply, exhaust, transfer and return air grilles mounted on walls lower than 6 feet above the floor shall be sight–proof, heavy duty gymnasium type with horizontal 45–degree deflection blades, 3/8 inch blade spacing, baked enamel finish.

L. Ceiling supply air diffusers shall be louvered faced directional diffuser model SMD manufactured by Price Industries with border type 36 for lay in ceiling or border type 1 for surface mounting in other than lay in ceilings, baked enamel finish, blow and pattern shown on the drawings.

M. Supply, exhaust, transfer and return air grilles mounted on walls 6 feet above the floor shall be Price Industries model 635, with 45–degree deflection, 1/2" blade spacing, horizontal extruded aluminum blades, baked enamel finish.

N. Supply, exhaust, transfer and return air grilles mounted on walls lower than 6 feet above the floor shall be sight–proof, heavy duty gymnasium type equal to Price Industries model 91 with horizontal 45–degree deflection blades, 3/8" blade spacing, baked enamel finish.

O. Drum louvers shall be Price Industries model HCD, High Capacity Drum louver with opposed blade damper.

P. Exposed duct round diffuser shall be Price Industries model RCD, Round Cone Diffuser, 3–position adjustment, 4 cone style, baked enamel finish.

Q. Linear slot supply diffusers shall be Price Industries model SDS75, extruded aluminum frame construction with fully adjustable air pattern.

R. Make up air supply diffusers shall be Price Industries model PDC perforated face ceiling diffusers, fixed 1–way air pattern, hinged removable perforated face screen, baked enamel finish.

S. Ceiling filter return air grilles in lay in ceiling shall be Price Industries model 10F, with hinged, perforated faceplate and 1" filter for lay in T–bar application, baked enamel finish. Mechanical contractor shall provide the 1" filter.

T. Ceiling return grilles and transfer air grilles shall be Price Industries model PDR or PDDR perforated diffuser with removable perforated faceplate in lay in T–bar application, bake enamel finish.

U. Ceiling return, exhaust and transfer air grilles for surface mounting in other than lay in ceilings shall be Price industries series 10, with perforated removable faceplate, baked enamel finish.

– Ducts and Sheet Metal Work

A. Provide ducts, plenums, access doors, fresh air intakes, and exhaust as indicated and required. All ductwork shall be constructed, erected and tested in accordance with the most restrictive of local regulations, procedures and detailed in the ASHRAE Handbook of Fundamentals or the applicable standards adopted by the Sheet Metal and Air Conditioning Contractors National Association (SMACNA). Provide prefabricated spiral lockseam ducts and fittings and rectangular ducts of galvanized steel. Aluminum flexible ductwork or gypsum board ductwork is not acceptable.

B. All connections to main ducts shall be made with low loss fittings.

C. Flat duct surfaces shall be crimped diagonally regardless of size. Longitudinal joints in all duct sizes may be flat lock joints. Transverse joints and intermediate bracing shall be constructed of galvanized sheet metal or galvanized structural angles in accordance with requirements of SMACNA Guide and public authorities having jurisdiction.

D. Transverse joints on all ducts shall be sealed with mastic sealant or metal aluminum foil tape.

E.

E. Longitudinal joints on ducts with internal static pressures in excess of 0.75 inches of water pressure shall be sealed with mastic or tape.

F. Lock joints shall be hammered to make them airtight. Inside of duct shall present a smooth surface to flow air.

G. Changes in size of ducts shall increase gradually with a slope of not more than 12 inches in 5 feet where possible, but not more than 12 inches in 3 feet in any event.

H. Turns shall be made with throat radius of not less then the duct width.

I. Plenums shall be made of 18 gauge galvanized sheet steel reinforced horizontally on a maximum of 48" centers by 1–1/2"x1–1/4"x 1/8" galvanized angles reinforced vertically by 1–1/2" standing seams.

– Volume Dampers

A. Dampers used in low velocity branch ducts to control the volume of air flow shall be Young 5020 series volume damper or equal. Operating head shall be placed on the side of the duct and shall locked in position by a set key where the damper is accessible. Where the damper is not accessible, provide a remote volume control damper with an end bearing or miter gear, coupling, 3/8 inch square shaft, and regulator for operating the unit remotely from the ceiling.

– Temperature Controls

A. Thermostats shall be provided with the air conditioning units. They shall be installed and wired by the HVAC contractor. Thermostats for roof top units shall be programmable with night setback and override control.

– Insulation

A. Thermal/Acoustical duct insulation: Line the first 10 feet of supply air and return air ducts from the mechanical unit, unless otherwise specified with Knauf duct insulation or equal. Duct Liner shall be mat–faced to provide a smooth air stream surface, mold resistant, 1–1/2 inches thick insulation wrapped entirely around duct with joints lapped at least 2 inches and secured with 16 gauge galvanized wire on 12 inch centers. Insulation shall cover all surfaces including standing seams.

B. Rectangular supply ducts and return air ducts located on unconditioned spaces shall be lined with Knauf EPA registered anti–microbial duct liner or equal with a thermal resistive value of duct liner as noted on the plans. Rectangular supply ducts and return air ducts located outside the building envelope shall be lined with Knauf EPA registered anti–microbial duct liner or equal, with a thermal resistive value of duct liner as noted on the plans. Density coated fiberglass duct liner complying with friction correction factor not greater than 1.1 at a velocity of 3000 fpm. Apply insulation to inside of ducts with an approved fire retardant adhesive to provide 100% coverage and a smooth surface. In ducts with one side more than 12 inches secure insulation with mechanical fasteners in addition to adhesive, spaced at 14 inch centers in both directions. Mechanical fasteners shall be flush with the liner surface and shall start within 2 inches of the leading edge of each section and within 3 inches of the leading edge of all cross joints of the liner and shall be heavily coated with an approved fire resistant adhesive. The duct liner shall shall be cut to assure snug closing corner joints. The black surface of the liner shall face the air stream. Transverse joints shall be neatly butted and all damaged areas shall be heavily coated with a approved adhesive.

C. All duct insulation shall have an NRC rating of not less than 0.60 and a K factor of not more than 0.27. Duct dimensions shall be increased on each side from those shown on drawings to accommodated insulation thickness

– Duct Penetrations

A. All ducts penetrating through the fire rated walls and floors shall be properly sealed with fire chalking/sealant as note in the Fire Stop section and specified herein. Install all materials per manufacturers directions.

– Turning Vanes

A. Turning vanes shall be furnished and installed in all 90–degree turns in rectangular low velocity supply, return, mixed air and fresh air ducts, and elsewhere as shown on the drawings. Material of turning vanes shall match ductwork. Vanes are to be single blade, of size, gauge, and fabrication in accordance with SMACNA recommendations.

– Equal Materials and Substitutions

A. In addition to manufacturers specified, the following shall also be considered equal. Provided corresponding models meet specified requirements. Equivalent substituted equipment named herein shall be submitted to Architect for approval. Submit alternate selections at time of bid, listing major equipment:

Insulation:	Certaineed, Johns Manville, Ownes Corning, Knuaf
Air Filters:	AAF (American Filter), Farr, Camfil
Split System:	From manufacturers listed as approved in the schedule.
Diffusers and Grilles:	Titus, Nailor, Price, Krueger, Hart and Cooley, Carnes, Greenheck, Anemostat, Tuttle and Bailey, or Engineer approved equivalent.
Ceiling Exhaust Fan:	Broan, Fantech, ACME, Carnes, Cook, Breidert, Coolair, Captiveaire, S&P, Greenheck, Twin City Fan, Delta Breez, Air King. (subject to project document conformance)
Roof Top Unit:	From manufacturers listed as approved in the schedule.

– Refrigerant Lines

A. Refrigerant lines are to be sized as per manufacturer's requirements. Lines to be fully insulated with 1 inch foam flex or equal. Insulation exposed to the sun shall be painted with two coats of protective paint. The system is to be evacuated to 200 microns, hold vacuum 24 hours. Each heat pump/condensing unit is to be provided with a refrigerant line kit. Follow manufacturers installation instructions if more stringent than noted.

– Aluminum Louvers

A. Louvers are to be furnished and all connections made by the Mechanical contractor. Louvers shall be type as noted on the drawings. Louvers shall be AMCA certified with free area velocities less than 100 fpm. In no case shall free area be less than 50% of the face area. Frames shall be approved by Architect for mounting at location shown on the drawing with insect or bird screens as noted in the schedules and on the drawings. Louvers to be Airolite, Venco, Ruskin, AWV/American Warming and Ventilating, Air Balance or Louvers and Dampers.

– High Wall Fan Coil Unit

A. Furnish and install indoor, wall–mounted, direct expansion, fan coil unit to be used without ductwork. Unit shall consist of tangential, direct–drive fan. Fan motor, cooling coil, piping connections, electrical controls, microprocessor control system, integral temperature sensing, and factory–supplied mounting bracket. Unit shall be capable of being used in a refrigerant circuit with a matching air–cooled outdoor condensing/heat pump unit. Fan shall be tangential direct–drive blower type with air intake at the upper front face of the unit and discharge at the bottom front. Automatic, motor–driven vertical air sweep shall be provided standard. Air sweep operation shall be user selectable. Horizontal direction may be manually adjusted and vertical air sweep may be manually set. Coil shall be copper tube with aluminum fins and galvanized steel pan under the coil shall have a drain connection for hose attachment to remove condensate. Condensate pan shall have internal trap and auxiliary drip pan under coil header. Provide the following functions as a minimum: automatic restart, a timer function, temperature–sensing controls, evaporative coil, freeze protection, wireless infrared remote control, auto stop features, automatic air sweep control, dehumidification mode, fan–only operation, diagnostics, user–selectable fan speed control, and compressor restart time delay. Unit shall be rated per ARI standards and shall be listed in the ARI directory matched system. Units shall be UL listed. Provide equipment from manufacturers listed in the equipment schedule..

– Pipe Identification

A. Identification of piping color and style coding shall comply with OSHA ANSI Safety Color Coding Regulations.

B. The identifying color coded bands, legends, and directional arrows on piping and duct systems shall be located adjacent to each valve, at every point of entry and exit where piping passes through a wall or ceiling, on each riser and junction, every 50 feet on long continuous lines and adjacent to all special fittings (regulating valves, etc.)

C. Legends shall be applied on the color band on the perimeter of the pipe in a location that will be readily visible to operating personnel from the floor in the area.

D. Color coding shall follow ANSI standards:

MATERIAL	BACKGROUND COLOR	IDENTIFYING LEGEND	LETTERING
Chiller Water	Green	Chilled Water Supply	White
Chilled Water Return	Green	Chiller Water Return	White
Domestic Cold Water	Green	Domestic Cold Water	White
Domestic Hot Water	Yellow	Domestic Hot Water	Black
Domestic Hot Water Return	White	Domestic Hot Water Return	Black
Fire Protection	Red	Fire Protection Water	White
Heating Water Supply	Yellow	Heating Water Supply	Black
Heating Water Return	Yellow	Heating Water Return	Black
Roof Drain	Green	Roof Drain	White
Waste	Yellow	Waste Water	Black
Natural Gas	Yellow	Natural Gas	Black

– Pipe Hangers

A. All necessary structural members, hangers, and supports of approved design shall be provided to keep piping in proper alignment and to prevent transmission of injurious thrusts and vibrations. Pipe hangers shall generally be of the clevis pipe–clamp type with suspension bolts. All bolts shall have provision for vertical adjustment and shall be equipped with locknuts.

B. No hanger shall be welded directly to steel joists. Where joist occur, clips shall be installed and hanger rod attached to clips. All piping hung from joists shall be hung from joists panel points. Protective saddles shall be provided on all insulated piping at point of hanger. Hangers shall not penetrate insulation.

C. For 1–1/4" diameter and smaller piping use 1/2" diameter rod with a maximum spacing of 6 feet. An additional hanger shall be provided 1 foot from each pipe drop, rise, or turn.

D. Pipe hangers shall not be welded to metal pan floor.

E. When pipe hangers are to be installed in concrete, inserts shall be in holes drilled in concrete.

F. All hangers, supports, and anchors shall be assembled with heavy pattern, hexagon carbon steel nuts.

G. Perforated metal strap shall shall only be permitted when approved by local code official.

H. All pipe hangers, inserts, trapezes, etc., and all necessary accessories required to support the piping shall be provided by contractor.

I. All pipe hangers shall be installed outside of insulation on the insulated lines.

PART 3 – EXECUTION

– Verification of Dimensions:

A. Scaled and figured dimensions are approximate only. Before proceeding with work, carefully check and verify dimensions at site, and be responsible for properly fitting equipment and materials together and to the structure in spaces provided.

B. Drawings are essentially diagrammatic and many offsets, bends, special fittings and exact locations are not indicated. Carefully study drawings and premises in order to determine best methods, exact locations, routes, building obstructions, and install apparatus and equipment in available locations. Install apparatus and equipment in manner and in locations to avoid obstructions, preserve headroom, and keep openings and passageways clear.

– Cutting and Patching:

A. Cut work and patch per Division 1 as necessary to properly install the new work. As the work progresses, coordinate necessary openings, holes, chases, etc., in their correct location. If the required openings, holes and chases are not in their correct locations, make the necessary corrections at no cost to the Owner. Avoid excessive cutting and do not cut structural members without the consent of the Architect and structural engineer. Patching by General Contractor at Mechanical, Plumbing or Fire Protection Contractor's expense. Include as a part of the work under this contract all structural framing required by penetrations through the roof and necessary steel to support ducts and pipes between structural steel unless shown on the structural drawings.

– Closing–in of Unfinished Work:

A. Cover no work until inspected, tested and approved by local code official and general contractor. Where work is covered before inspection and test, uncover it, and when inspected, tested and approved, restore all work to original proper condition.

– Excavation and Backfill:

A. Perform all necessary excavation, shoring and backfilling required for the proper laying of all pipes and conduits inside the building and premises, and outside as may be necessary. Conform to Division 2 requirements. Remove all excess excavated materials from the site or dispose of on site as directed by General Contractor.

B. Excavate all trenches open cut, keep trench banks as nearly vertical as practicable, and sheet and brace trenches where required for stability and safety. Excavate trenches true to line and make bottoms not less than 18" wide but no wider than necessary to provide ample work room. Grade trench bottoms accurately to provide uniform bearing and support for each section of pipe on undisturbed soil along its entire length. Dig "bell" holes after the trench bottom has been graded. Machine grade only to the top line of the pipes, doing the balance by hand. Do not cut any trench near or under footings without first consulting the Architect and structural engineer. Comply with all OSHA requirements.

C. Provide backfilling and compaction in accordance with requirement of Division 2 and under the direction of the Architect and/or general contractor and the testing firm to the required density. Make the first 2 feet of fill in 6" layers, each thoroughly compacted as directed, and free from rocks, large clods of earth, leaves, branches, and debris. Compact the rest of the backfill to prevent settlement as directed, using in the backfill no rocks larger than 4" in diameter, and using no rocks at all in the top 12".

– Accessibility:

A. Install valves, dampers, thermometers, gauges, traps, cleanouts, control devices or other specialties requiring reading, adjustment, inspection, repairs, removal or replacement conveniently and accessibly throughout the finished building. Where any of these devices are shown on the contract drawings to be installed above any inaccessible ceiling, the Mechanical Contractor shall furnish access doors or panels as required.

B. All access doors or panels in walls and ceilings required for access to control devices, traps, valves and similar devices are to be furnished and installed as part of the work under this section. Provide type as specified under Division 8.

C. Provide ducts which pierce a fire separation with fire dampers of same fire rating as the separation.

D. Refer to drawings and "Finish Schedule" for type of wall and ceiling in each area and for rated construction.

E. Coordinate work of various sections to locate valves, traps, and dampers with others to avoid unnecessary duplication of access doors.

– Roof Flashings:

A. Flash and counterflash all piping, conduits and ductwork penetrating roofing membrane with flashing per roofing manufacturer's recommendations. Refer to architectural drawings for detailing of duct and pipe penetrations through roof.

– Equipment Rough–in:

A. Rough in all equipment and fixtures as designated on the drawings and in the specifications. The drawings indicate only the approximate location of rough–ins. The exact rough–in locations must be determined from large–scale certified drawings. The Contractor shall obtain all certified/approved rough–in information before progressing with any work for rough–in final connections.

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TBID SERVER ROOM RELOCATION

DRAWING TITLE: MECHANICAL SPECIFICATIONS

DRAWN BY:	CHECKED BY:
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DATE PLOTTED: 1/9/2025

PROJECT #: J24277.00

M7.2

B. Be responsible for providing all outlets and services of proper size at the required locations.

C. Minor changes in the contract drawings shall be anticipated and provided for under this division of the specifications.

D. Rough–in only (unless otherwise designated on the drawings) shall include the following:

1. Mechanical: Provide all services as indicated and required, including all ductwork, piping and valves. Valve and cap all piping stub–outs. Cap all ductwork stub–outs in a manner suitable for future extension.

E. Mechanical equipment installed on the roof shall not be installed any closer than 10'–0" to the edge of the roof unless there is a 42" high parapet or equipment guardrail.

– **Owner–Furnished and Other Equipment:**

A. Rough–in only for all Owner–furnished equipment (see Division 1) and all equipment furnished under other sections of the specifications, except as otherwise specified and/or noted on the drawings.

– **Equipment identification**

A. All major equipment shall bear firmly attached metal nameplates which state name of manufacturer, model number and electrical data.

– **Discrepancies**

A. In the event of discrepancy, immediately notify the General Contractor and/or Owner.

B. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

– **Initial Lubrication, Adjusting, and Filling Systems**

A. Before operating any mechanical system, equipment bearings shall be lubricated and bolts, pulleys, and other moving parts checked for alignment and tolerances in accordance with manufacturer's operating instructions. Vibrations and noise shall be suppressed.

– **Cleaning of Equipment, Materials and Premises**

A. Clean entire premises of unused materials, rubbish, debris, grease spots and dirt left by mechanical systems installation.

– **Equipment and Material**

A. Install all equipment and material per manufacturer's recommendations.

– **Accessibility**

A. Install work readily accessible for normal operation, reading of instruments, adjustment, service inspection and repair, provide access panels where indicated and required. Access panels shall be the responsibility of respective subcontractors.

B. Provide all services designated, valve and cap all piping, cap all waste piping and ductwork and leave in a clean and orderly manner.

C. Rough–in requirements shall be as outlined in the preceding paragraph titled "Equipment Rough–In."

– **Equipment Final Connections:**

A. Provide all piping and duct final connections for all equipment under Division 22 & 23 as required herein specified and indicated on the drawings.

B. Air Conditioning, Heating, and Ventilating: Provide final connections complete with necessary valves, drains, unions, flanges and duct connections for equipment furnished and installed under other sections of the specifications, except as otherwise designated. Included under the HVAC sections of the specifications are the final connections to the following:

1. Condensate and evaporative cooler drain piping from air conditioning equipment.

2. Supply, return, relief, outside air and exhaust duct connections for all equipment including exhaust fans.

3. Piping connections for all equipment.

4. Duct connections for all hoods.

– **Machinery Drives:**

A. After tests have been performed on the air conditioning and air handling systems, make without cost not more than two changes in the size of the nonadjustable sheaves to obtain the required air quantities.

– **Machinery Accessories:**

A. Application: Do not install any equipment in an application not recommended by the manufacturer.

B. Installation: Align, level and adjust all equipment for proper operation. Install so connecting and disconnecting of piping and accessories can readily be done and so all parts are readily accessible for inspection, service and repair. Install equipment in accordance with manufacturer's recommendations.

– **Pipe and Equipment Supports:**

A. Where supports, foundations, stands, suspended platforms for machinery, tanks, or other equipment are indicated or specified, perform the following:

1. Locate support members to avoid equipment strains and interference with piping connections, tube pulling or other maintenance operations.

2. Where saddles are required, use cast iron or welded steel saddles with curvature to fit the tank shell.

3. Mount power–driven equipment on common base with driver.

B. Concrete Inserts: Furnish and install all concrete inserts required for all materials and equipment specified and/or shown on the drawings for Division 22.

C. Concrete Foundations: Work under this section includes coordination of construction of all concrete foundations indicated or required for equipment specified herein or in other sections under Division 22. Materials and workmanship shall be described under Division 3.

D. Grout under all equipment after leveling, filling completely the space between machinery bed plate and foundation surface as specified in Division 3. Finish exposed surface of grout for a neat appearance.

E. Floor Stands: Where equipment is mounted standard or on legs, construct of structural steel or steel pipe and fittings, cross–brace and fasten with flanges or plates bolted to floor.

F. Ceiling or Wall Supports: Use suspended platform, strap hangers, bracket or shelf, whichever is most suitable for equipment and location. Construct of structural steel members, steel plates, rods or pipe as required. Cross–brace and fasten to building structure or inserts in an approved manner.

G. Steel Work: Neatly fabricate and erect steel work with burrs and welding spatter ground off. Paint after fabrication with a rust–inhibitive primer.

H. Roof Mounted Equipment (Steel Supported): Provide curbs and flashings for metal support structures as shown in the latest SMACNA manual for roof supports.

– **Cleanup:**

A. In addition to cleanup specified under Division 1, thoroughly clean all parts of the equipment. Where exposed parts are to be painted, thoroughly clean off any splattered construction materials and remove all oil and grease spots. Wipe the surface carefully and scrape out all cracks and corners.

B. Thoroughly flush and clean out all water circulating systems. Remove, clean and replace all strainer elements.

C. During the progress of the work, keep the premises clean and free of debris.

– **Painting:**

A. Except as otherwise specified or indicated in the architectural drawings and/or specifications, paint all exposed unfinished metal with one coat of rust–inhibiting primer. (Galvanized ductwork and factory painted equipment shall be considered as having primed surface.)

B. Finished painting is specified under Division 9.

– **Objectionable Noise and Vibration:**

A. Construct and brace the metal partitions, ducts and sheet metal housings to prevent vibration or rattling when systems are in operation. Install connections to equipment so noise and vibration will not reach the conditioned area through ducts, piping, conduit, sheet metal work, or the building structure. Provide power–driven equipment suspended from the structure with spring type isolation.

– **Welding:**

A. Procedures:

1. All procedures and welders must be qualified in accordance with the requirements of Section IX, ASME Boiler and Pressure Vessel Code and ANSI code for power piping B31.1. Procedure qualification test records and acceptance shall be submitted with the welding procedure prior to the start of fabrication.
2. Architect's inspector or authorized representative will review performance qualification records of individual welders.

B. Welding Processes: The following welding processes are permitted, provided that the procedure is qualified in accordance with Section IX, ASME Boiler and Pressure Vessel Code.

1. Manual shielded metal–arc.
2. Gas tungsten–arc.
3. Other welding processes may be used providing they are qualified in accordance with Section IX, ASME Boiler and Pressure Vessel Code.

C. Restrictions: Weld bevel preparations shall be provided on all welding fittings and shall be machined or ground to remove all discoloration if flame or arc cut.

D. Welding Filler Material:

1. A filler material control procedure shall be submitted to General Contractor for review and acceptance prior to performing any welding.
2. All shielded metal–arc welding shall be performed using low–hydrogen type electrodes such as E 7018.

E. Preheat and Interpass Temperature:

F. Preheat for pressure components shall be as specified in Table 132 of ANSI B.1.

– **Operation**

D. Place system in operation and regulate and adjust to Owner's satisfaction. System shall operate quietly and without vibration or noise.

E. Contractor shall make necessary field adjustments for even temperatures throughout the project.

– **Certification**

A. Upon completion, the contractor shall inspect work of this section and deliver to Owner a written certification that installed materials and workmanship conform to specifications.

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TBID SERVER ROOM RELOCATION

DRAWING TITLE:
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CH	MLM

DATE PLOTTED: 1/9/2025

PROJECT #: J24277.00

M7.3

PLUMBING SYMBOLS

NOTES:
1. ALL SYMBOLS MAY NOT BE USED.
2. DOTTED SYMBOLS INDICATE EXISTING EQUIPMENT, ETC

SS	SANITARY OR WASTE PIPING
— — — — —	VENT PIPING
CW	COLD WATER PIPING
HW	HOT WATER PIPING
GAS	GAS PIPING
SD	STORM DRAIN PIPING
RD	ROOF DRAIN PIPING
ORD	OVERFLOW ROOF DRAIN PIPING
GR	GREASE PIPING
RW	RECIRCULATION WATER PIPING
—	PIPE RISER OR FIXTURE CONNECTION
—	WALL HYDRANT/HOSE BIB
—	FLOOR DRAIN
—	AREA DRAIN
—	ROOF DRAIN
ø	ROUND MEASUREMENT.
P-#	PLUMBING FIXTURE SYMBOL
M	MECHANICAL EQUIPMENT SYMBOL
#	KEYED NOTE REFERENCE
PRV	PRESSURE REDUCING VALVE STATION
—	GATE VALVE & BACKFLOW PREVENTOR

PIPING SEISMIC SUPPORT NOTES:

1. PER ASCE STANDARD 7–22 SEISMIC SUPPORTS ARE NOT REQUIRED FOR THE FOLLOWING CONDITION:
   1.1. PIPING IS SUPPORTED BY ROD HANGERS 12" OR LESS IN LENGTH FROM THE TOP OF THE PIPE TO THE SUPPORTING STRUCTURE.
   1.2. HIGH–DEFORMABILITY PIPING IS USED.
2. IF INSTANCES OCCUR WHERE PIPING IS SUSPENDED BY HANGERS GREATER THAN 12" IN LENGTH. SYSTEM CONNECTORS AND COMPONENTS SHALL BE COMPATIBLE AND DESIGNED FOR THE APPLICATION THAT THEY ARE USED FOR. SHALL HAVE A MINIMUM OF TWO TRANSVERSE BRACES PER STRAIGHT PIPING RUN. THE MAXIMUM DISTANCE BETWEEN TRANSVERSE BRACES WILL BE DETERMINED BY PIPE SIZE AND PIPING COMPOSITION. SHALL HAVE A MINIMUM OF ONE LONGITUDINAL BRACE PER STRAIGHT DUCT RUN. IF LENGTH OF PIPING EXCEEDS LONGITUDINAL BRACE SPACING, ADDITIONAL LONGITUDINAL BRACES WILL BE REQUIRED.
3. FOR SEISMIC BRACING OF PLUMBING EQUIPMENT AND PIPING AN INDEPENDENT SEISMIC AND VIBRATION CONTROL SUBCONTRACTOR WITH EXPERIENCE, COMPUTING CAPABILITIES, AND MANUFACTURED PRODUCTS SHALL BE FURNISHED BY PLUMBING CONTRACTOR. INDEPENDENT SEISMIC CONSULTANT SHALL PROVIDE REQUIRED COMPUTATIONS, SHOP DRAWINGS, AND MANUFACTURED PRODUCTS TO MEET THE MINIMUM REQUIREMENTS OF ASCE 7–22 AND INTERNATIONAL BUILDING CODES (LATEST ADOPTED EDITION) FOR THE RESPECTIVE SEISMIC DESIGN FOR SEISMIC ZONE WITH IMPORTANCE FACTOR 1.5. SEISMIC SUBCONTRACTOR SHALL EXERCISE THE QUALITY CONTROL FOR THIS WORK AND SHALL NOT BE LIMITED TO INSTRUCTIONS DIRECTED TO THE PLUMBING CONTRACTOR. THE SEISMIC SUBCONTRACTOR SHALL CERTIFY IN WRITING THAT THEY HAVE INSPECTED THE INSTALLATION AND THAT ALL ISOLATION ANCHORS AND SEISMIC RESTRAINT MATERIALS ARE INSTALLED CORRECTLY AND FUNCTIONING PROPERLY. CERTIFICATION SHALL BE PROVIDED AFTER ALL CORRECTIVE WORK HAS BEEN COMPLETED

SUBMITTAL NOTES:

1. CONTRACTOR TO ALLOW 10 WORKING DAYS FOR SUBMITTAL TURNAROUND.
2. CONTRACTOR TO PROVIDE SUBMITTALS FOR ALL EQUIPMENT AND MATERIALS IN A SINGLE PACKAGE. PIECEMEAL SUBMITTALS WILL BE RETURNED WITH A NOTE TO REVISE AND RESUBMIT.
3. SUBMITTALS WILL BE CHECKED FOR COMPLIANCE WITH CAPACITY REQUIREMENTS AND ELECTRICAL REQUIREMENTS. CONTRACTOR TO VERIFY THAT WEIGHTS, DIMENSIONS, AND DUCT CONNECTIONS ON SUBMITTED EQUIPMENT IS CONSISTENT WITH SCHEDULED EQUIPMENT PRIOR TO SUBMITTAL. CHANGES IN SCOPE BROUGHT ABOUT BY SUBMITTED EQUIPMENT THAT DOES NOT COMPLY WITH THE WEIGHTS, DIMENSIONS, OR CONNECTION LOCATIONS ON SCHEDULED EQUIPMENT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

PROJECT PLUMBING NOTES:

1. PIPING SCHEMATIC(S) FOR ADDITIONAL INFORMATION ON WASTE & VENT PIPING DIAMETERS.
2. COORDINATE ALL WORK WITH OTHER TRADES AS REQUIRED. CONCEAL ALL PIPING IN FINISHED AREAS.
3. PROVIDE AND INSTALL ALL REQUIRED FITTINGS IN PIPING SYSTEM. REMOVE OR RELOCATE ANY EXISTING PLUMBING FIXTURES & ASSOCIATED PIPING IN CONFLICT WITH THIS PLUMBING PLAN. COORDINATE ALL REQUIREMENTS WITH OWNER REPRESENTATIVE. EXTEND OR REMOVE & TERMINATE ANY PIPING AS REQUIRED. MAINTAIN FUNCTIONALITY OF ALL UPSTREAM FIXTURES. DISPOSE OF PIPING.
4. MAKE CONNECTION TO EXISTING SEWER LINE. MODIFY SEWER LINE TO ACCOMMODATE NEW PLUMBING FIXTURES. PROVIDE AND INSTALL ALL REQUIRED CLEANOUTS.
5. COORDINATE ALL REQUIRED SAW CUTTING OF EXISTING FLOOR OR SLAB FOR DRAIN PIPING, ETC. WITH GENERAL CONTRACTOR. REPAIR FLOOR OR SLAB AS DIRECTED BY OWNER REPRESENTATIVE. PROVIDE AND INSTALL EPOXY DOWELS AT SLAB TO SLAB JOINTS.
6. MAKE PROVISIONS FOR A BARRIER–TYPE TRAP SEAL PROTECTION (I.E. TRAP GUARD) WHERE NOTED AND/OR CALLED FOR.
7. PIPING LOCATIONS ARE GRAPHICALLY SHOWN. PLUMBING CONTRACTOR SHALL DETERMINE ACTUAL PIPE ROUTING IN FIELD PER AVAILABLE SPACE AND BUILDING CONSTRUCTION.
8. NOT ALL CLEANOUTS ARE SHOWN. PROVIDE AND INSTALL ALL REQUIRED CLEANOUTS. CLEANOUTS FOR HORIZONTAL DRAINS SHALL BE INSTALLED NO MORE THAN 100' APART. CLEANOUTS SHALL BE INSTALLED AT EACH CHANGE OF DIRECTION GREATER THAN 45°. A CLEAN–OUT SHALL BE PROVIDED AT THE BASE OF EACH WASTE OR SOIL STACK. CLEANOUTS SHALL BE ACCESSIBLE AND THE SAME SIZE AS THE WASTE LINES ON WHICH THEY ARE INSTALLED.
9. COORDINATE WITH OTHER TRADES TO ENSURE AND ALL PLUMBING VENTS ARE A MINIMUM OF 10–FEET FROM ALL FRESH AIR INTAKES.
10. SANITARY WASTE AND VENT PIPING MATERIAL SHALL MEET THE STANDARDS SET FORTH IN 2021 IPC TABLES 702.1, 702.2 AND 702.3 & 702.4.
11. PLUMBING CONTRACTOR SHALL INCLUDE PRICING TO INVESTIGATE EXISTING SEWER LINE LOCATIONS AND INVERT ELEVATIONS. GIVE RECOMMENDATIONS TO OWNER FOR MOST ECONOMICAL AND LEAST INTRUSIVE WAY TO CONNECT NEW DRAIN PIPING IN ADDITION TO EXISTING DRAIN PIPING.
12. PLUMBING CONTRACTOR SHALL VISIT THE PROJECT SITE DURING THE BIDDING PROCESS.
13. CONTRACTOR SHALL VERIFY LOCATION, SIZE, AND ELEVATION OF ALL UTILITIES PRIOR TO BEGINNING OF CONSTRUCTION.
14. EXISTING PLUMBING FIXTURES AND ASSOCIATED SYSTEMS TO REMAIN. PLUMBING CONTRACTOR SHALL INCLUDE PRICING TO VERIFY PROPER FUNCTION OF ALL PLUMBING FIXTURES UPSTREAM FROM THE CONNECTION TO THE EXISTING SEWER LINE.

DESIGN CONTACTS

PROJECT MANAGER	GARRETT SORENSEN
MECHANICAL ENGINEER:	MARK MAKIN
PLUMBING DESIGNER:	CADEN HERBERT

PLUMBING SHEET INDEX

SHEET NUMBER	SHEET TITLE
P0.1	PLUMBING NOTES & LEGENDS
P1.1	PLUMBING PLANS
P5.1	PLUMBING SCHEDULE, DETAILS, & SCHEMATIC
P7.1	PLUMBING SPECIFICATIONS
P7.2	PLUMBING SPECIFICATIONS

APPLICABLE CODES

- 2021 INTERNATIONAL MECHANICAL CODE (IMC)
- 2021 INTERNATIONAL BUILDING CODE (IBC)
- 2021 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)
- 2021 INTERNATIONAL PLUMBING CODE (IPC)
- 2021 INTERNATIONAL FUEL GAS CODE (IFGC)
- ASHRAE 90.1 – 2022

NOTE: CURRENT CODES ADOPTED BY THE RESPECTIVE JURISDICTION WILL SUPERCEDE THIS LIST OF CODES.

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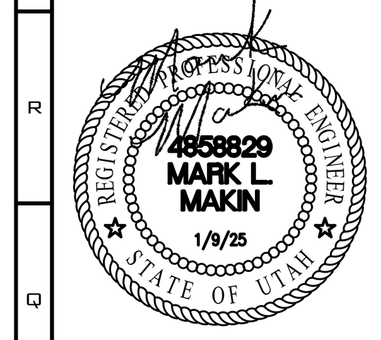

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DRAWING TITLE:
PLUMBING NOTES & LEGENDS

DRAWN BY:	CHECKED BY:
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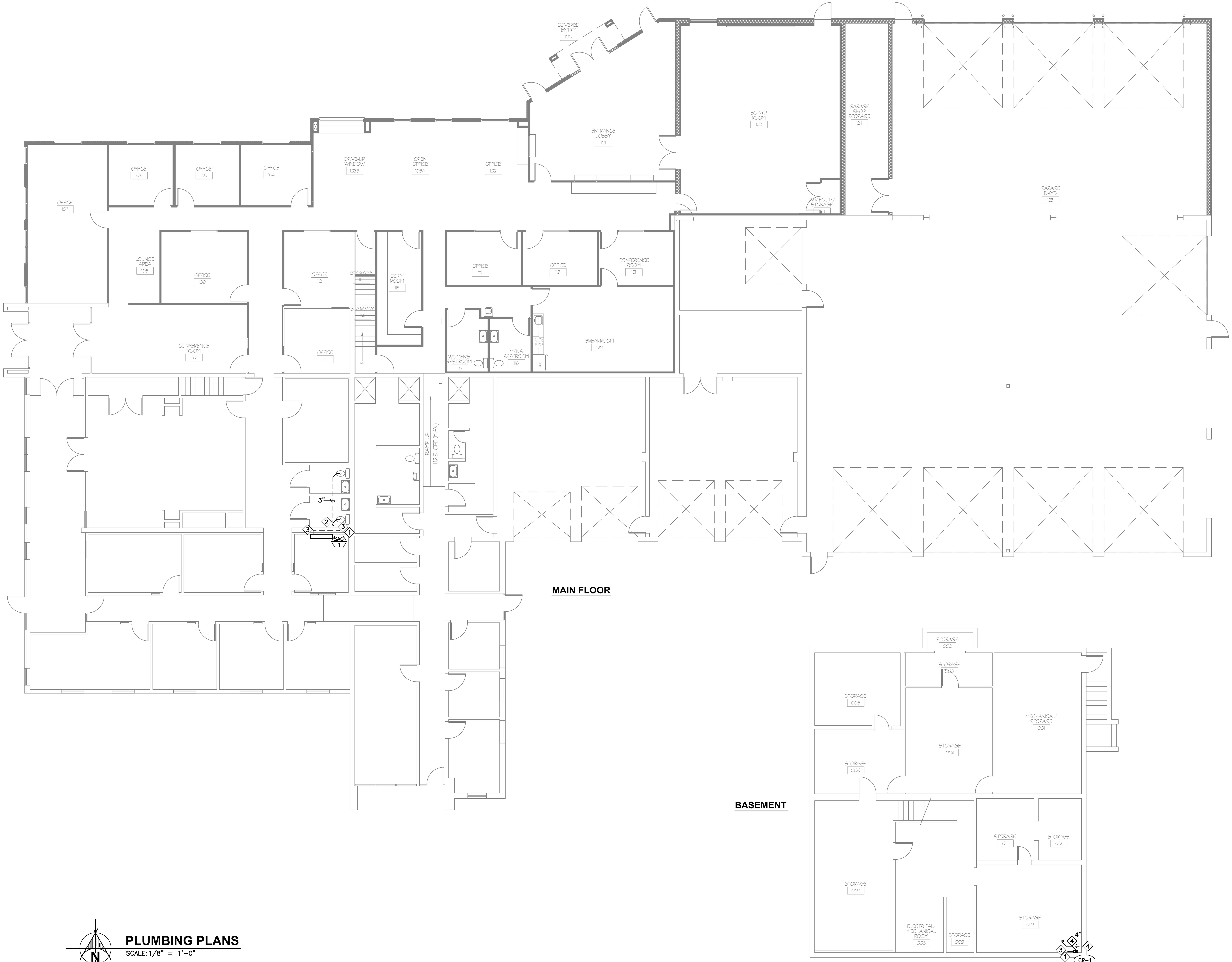
PROJECT #: J24277.00

P0.1



PLUMBING PLANS
SCALE: 1/8" = 1'-0"

PLUMBING KEYED NOTES:

1. SEE PLUMBING SCHEMATICS FOR ADDITIONAL INFORMATION.
2. ANTICIPATED LOCATION OF EXISTING 3" DROP FROM MAIN LEVEL WATER CLOSETS TO BASEMENT LEVEL PIPING.
3. ROUTE CONDENSATE FROM WALL MOUNTED COOLING UNIT TO CONDENSATE RECEPTOR. CONDENSATE RECEPTOR TO MOUNT HIGH ON WALL OF BASEMENT LEVEL. ROUTE CONDENSATE PIPING IN FURRED OUT WALL BETWEEN RESTROOM AND NEW SERVER ROOM. PROVIDE AND INSTALL A PERMANENT LABEL INDICATING THAT THE CONDENSATE LINE SERVES THE AC UNIT IN THE SERVER ROOM.
4. ANTICIPATED LOCATION OF EXISTING 4" DRAIN PIPE. CONNECT CONDENSATE RECEPTOR TO EXISTING PIPE IN THIS AREA.

GENERAL SHEET NOTES:

1. PLUMBING LINES ARE SHOWN SCHEMATICALLY FOR CLARITY AND SHALL BE ROUTED WITHIN CONCEALED SPACES (I.E. WALLS, DROPS, CHASES, ETC.)

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DRAWN BY: CH	CHECKED BY: MLM
DATE PLOTTED:	1/9/2025
PROJECT #:	J24277.00

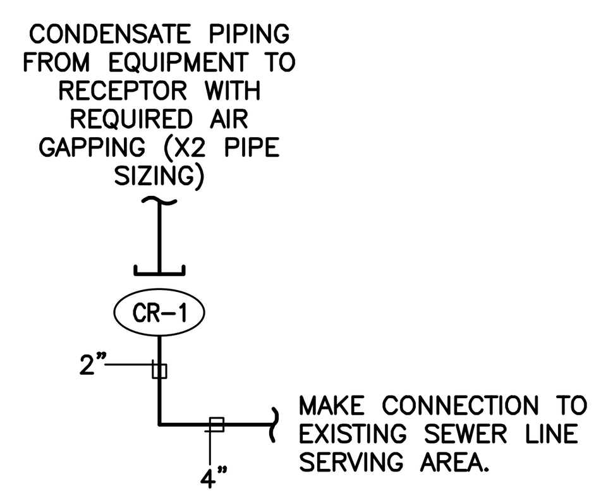
P1.1

PLUMBING FIXTURE SCHEDULE

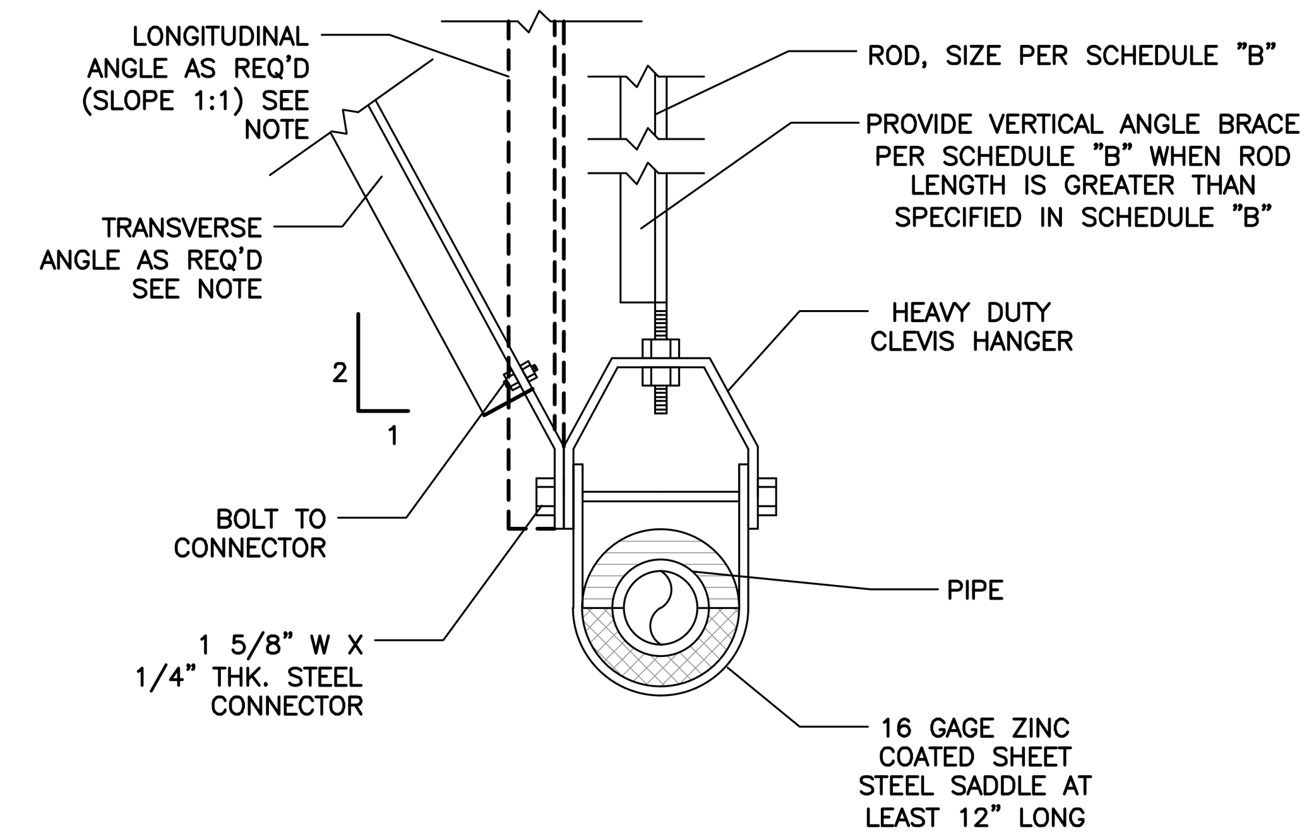
MARK	FIXTURE	PIPE SIZE					REMARKS
		TRAP	WASTE	VENT	C.W.	H.W.	
CR-1	CONDENSATE RECEPTOR	2"	2"	1 1/2"	——	——	CONDENSATE RECEPTOR WITH HUB FUNNEL FOR CONDENSATE FROM HIGH EFFICIENCY EQUIPMENT. PROVIDE AND INSTALL TRAP BARRIER–TYPE SEAL PROTECTION (I.E. TRAP GUARD).

NOTES:
1. VERIFY ALL MANUFACTURERS, FINISHES, AND OPTIONS WITH OWNER BEFORE ORDERING ANY PLUMBING FIXTURES.

2. MINIMUM UNDERGROUND SANITARY SEWER PIPING SIZE SHALL BE 2 INCHES.



CONDENSATE RECEPTOR



PIPING BRACING NOTES:
1. DESIGN SUPPORT SYSTEM FOR SEISMIC ZONE 4.
2. REFERENCE SMACNA SEISMIC RESTRAINT MANUAL.
3. SEISMIC BRACING IS REQUIRED FOR ALL PIPING 2 1/2" AND LARGER UNLESS INSTALLED PER SEISMIC NOTES ON SHEET P301.
4. DO NOT USE BRANCH SECTIONS TO BRACE PIPING MAINS.
5. PROVIDE FLEXIBLE COUPLINGS AT PENETRATIONS THROUGH BUILDING SEISMIC AND EXPANSION JOINTS AND WHERE PIPING IS RIGIDLY CONNECTED TO EQUIPMENT.
6. FOR EQUIPMENT REQUIRING SEISMIC BRACING INSTALL BRACES AS FOLLOWS:

a. DO NOT USE JOIST BRIDGING FOR SUPPORT OF ANY LOAD.

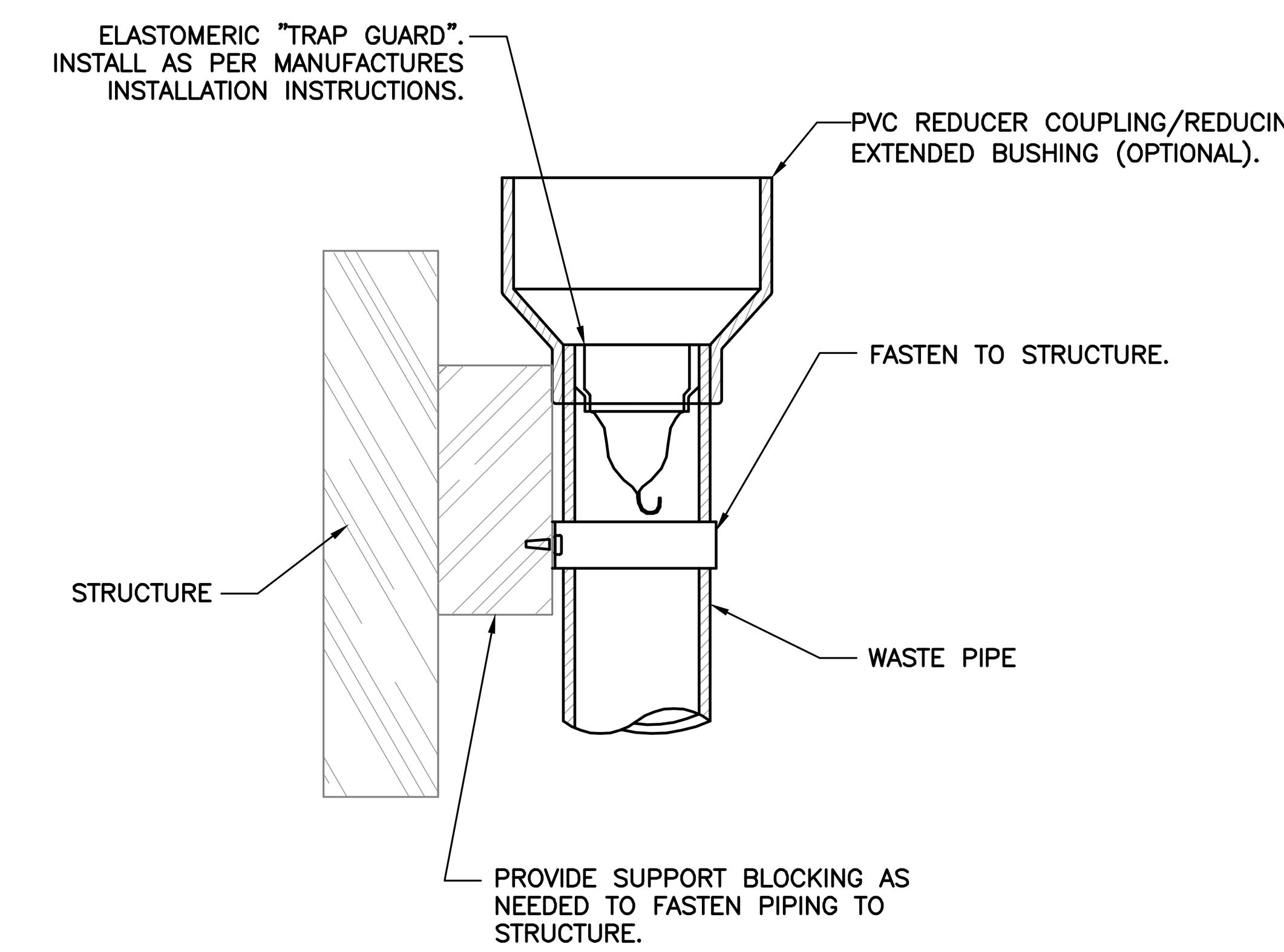
b. IF SUPPORTING LOADS ABOVE 30 LBS. BETWEEN JOIST PANEL POINTS REINFORCE BOTTOM CHORD OF JOIST AS PER STRUCTURAL ENGINEERS REQUIREMENTS. REFER TO SUPPORT DETAILS ON STRUCTURAL DRAWINGS.

SCHEDULE "B" TRANSVERSE BRACING FOR PIPE

PIPE SIZE INCHES	BOLTS TO ANGLES	LONGITUDAL TRANSVERSE & VERTICAL ANGLES	ROD DIAMETER INCHES	MAXIMUM ROD LENGTH	MAXIMUM INTERVAL OF BRACES IN FEET	
					40–S STEEL OR CAST IRON	COPPER TUBE
1	3/8"	1 1/2" X 1 1/2" X 3/16"	3/8"	19"	24.2	12.1
1 1/4"	3/8"	1 1/2" X 1 1/2" X 3/16"	3/8"	19"	24.2	12.1
1 1/2"	3/8"	1 1/2" X 1 1/2" X 3/16"	3/8"	19"	27.5	13.2
2	3/8"	1 1/2" X 1 1/2" X 3/16"	1/2"	19"	31.9	15.4
2 1/2"	3/8"	2" X 2" X 5/16"	1/2"	19"	35.2	16.5
3	3/8"	2" X 2" X 5/16"	1/2"	19"	37.4	18.7
3 1/2"	3/8"	2" X 2" X 5/16"	1/2"	19"	39.6	19.8
4	3/8"	2" X 2" X 5/16"	5/8"	19"	42.9	20.9
5	1/2"	2" X 2" X 5/16"	5/8"	19"	45.1	22.0
6	1/2"	2" X 2" X 5/16"	3/4"	19"	49.5	24.2
8	1/2"	2 1/2" X 2 1/2" X 1/4"	7/8"	19"	53.9	28.6
10	1/2"	3" X 3" X 1/4"	7/8"	19"	59.4	30.8

PIPE HANGERS DETAIL

SCALE: NONE



CONDENSATE HUB/FUNNEL DRAIN

SCALE: NONE

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MECHANICAL
PROVO, UTAH 84606
FAX: 801.375.2676
ELECTRICAL
1837 S. EAST BAY BLVD.
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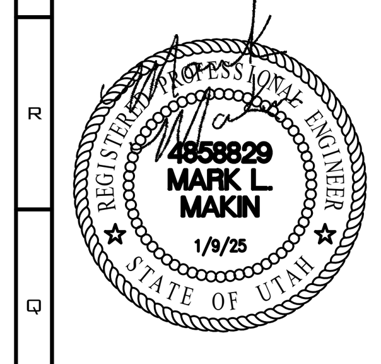

REVISIONS:

1800 W 4700 S
TAYLORSVILLE, UT 84129

TBID SERVER ROOM RELOCATION

DRAWING TITLE:
PLUMBING SCHEDULE, DETAILS, & SCHEMATIC

DRAWN BY:	CHECKED BY:
CH	MLM

DATE PLOTTED: 1/9/2025

PROJECT #: J24277.00

P5.1

SECTION 22 PLUMBING – GENERAL PROVISIONS

Not all specification items are used in every project.

PART 1 – GENERAL

– Scope:

A. Furnish all labor, materials, equipment, appliances and necessary incidentals for the complete installation of all plumbing shown on the drawings and as specified.

B. Work specified in this section:

1. Sanitary soil, waste and vent systems.
2. Domestic hot and cold water systems.
3. Domestic water heaters.
4. Furnish and set all sleeves for pipes passing through walls and floors.
5. Pipe covering, insulation and wrapping.
6. Excavation and backfill.
7. Rough–in and final connections to air conditioning equipment of condensate drains.
8. All plumbing fixtures, water heaters, valves, and other miscellaneous items or equipment required for a complete installation.
9. Collars at fire rated penetrations.

C. Provisions of this section apply to all work specified in all sections under Division 22. All items indicated on site, Architectural, Mechanical, or Plumbing drawings are to be provided complete from point of connection to finished fixture in conformance with all governing authority requirements. Nothing in these drawings or specifications shall be construed to permit work in violation of governing codes.

D. In addition, work in Division 22 is governed by the provisions of the Bidding Requirements, Contract Forms, General Conditions and all sections under Division 1, General Requirements.

1. Examination of Premises: Visit the site (as required), verify all measurements and job conditions, and pay all costs necessary to perform the work. Coordinate division of fee responsibilities with the General Contractor.
2. The Plumbing Contractor shall be licensed and hold a current contracting license as a Plumbing Contractor that has been valid for a minimum of two (2) years in the State where the project is located.
3. The Plumbing Contractor shall have a minimum of five (5) years experience installing commercial plumbing systems similar to those described in these specifications and provide a list of previous projects, including name of project and contact person names and phone numbers if required by the General Contractor.
4. The Plumbing Contractor shall be able to bond the work being bid to perform and shall provide a written statement from the bonding agency proposed to be used for this project as a separate document in addition to the plumbing bid submitted if required by the General Contractor. The bonding agency shall be one having a Best's insurance rating of A or A+.

E. Contractor is responsible for results caused by deviating from the plans.

– Regulations, Permits, Fees, Charges, Inspections:

A. Regulations: Comply with all applicable codes, rules and regulations. All materials and work must comply with local construction, mechanical, plumbing, electrical and fire codes. As a minimum, comply with the following: IMC, IPC, IECC, NEC, NFPA codes and all City codes.

B. In addition to the requirements of all governing codes, ordinances and agencies, conform to the requirements of the following codes and standards:

1. 2021 International Plumbing Code
2. 2021 International Building Code
3. 2021 International Mechanical Code
4. 2021 International Energy Conservation Code.

C. Current codes adopted by the respective jurisdiction will supercede the listed codes.

D. Fees and Permits: Pay all connection, installation, use, development, etc., fees and/or charges. Obtain and pay for all required permits and licenses. Coordinate division of fee responsibilities with the General Contractor.

E. Inspections: All work must be inspected and approved by local authorities. Prior to final approval, furnish the Architect with certificates of inspections and approvals by the local authorities in accordance with Division 1.

1. Preheat and interpass temperature shall be determined by temperature indicating crayons, contact pyrometers or other equally suitable means.

F. Postweld Heat Treatment: Postweld heat treatment for pressure components shall be as specified in Table 131 of ANSI B31.1.

– Drawings and Specifications:

A. Refer to Division 1 for information on submittals and shop drawings.

B. If a conflict exists between the drawings and specifications, promptly notify the Architect and Engineer.

– Record Drawings:

A. Provide record drawings for all work under sections in Division 22. See Division 1 for detailed requirements covering preparation of record drawings.

– Work and Materials:

A. Unless otherwise specified, all materials must be new and of the quality specified. The workmanship shall be of a quality that is acceptable to the Architect and is equal to the standards of the trades. Contractor must staff the project with sufficient skilled workmen, including a fully qualified construction Superintendent, to complete the work in the time allotted. The Superintendent must be qualified to supervise all of the work in his work category.

– Approvals of Materials and Equipment:

A. Refer to Division 1 for description of material and equipment for prior approvals and substitutions. Must be received by Engineer 10 days prior to due date/bid opening.

– Maintenance Manual:

A. Prior to completion of the project, compile a complete equipment and maintenance manual for all equipment supplied under sections of Division 22 as described in Division 1.

B. Manuals shall be bound in a three–ring binder. A preliminary submittal of the manual shall be made to the Architect 90 days after receiving approved submittals. Final submittal of the manual shall be made four weeks prior to substantial completion of the project.

– Equipment Purchases:

A. Arrange for purchase and delivery of all materials and equipment within 15 days after approval of submittals. Coordinate with General Contractor.

– Cooperative Work:

A. Correct without charge any work requiring alteration due to lack of proper supervision or failure to make proper provision in time. Correct without charge any damage to adjacent work caused by the alteration. See Division 1 for additional requirements.

B. Cooperative Work Includes:

1. General supervision and responsibility for proper location, rough–in and size of work related to Division 22 but provided under other divisions of these specifications.
2. Installation of sleeves, inserts and anchors bolts for work under sections in Division 22.
3. Electrical work as specified herein. Refer to Division 26 for requirements.

– Construction Facilities:

A. General: Under this division of the specifications execute all work in a manner to provide safe and lawful ingress and egress to the Owner's establishment and such facilities shall be kept clear of materials or equipment as directed by the Architect. Refer to Division 1 for additional requirements.

B. Furnish and maintain from the beginning to the completion of all work all lawful and necessary guards, railings, fences, canopies, lights, and warning signs. Take all necessary precautions required by city and state laws to avoid injury or damage to any and all persons and property.

– Guarantee:

A. Guarantee all material, equipment, and workmanship for all sections under Division 22 in writing to be free from defects of material and workmanship for one year from date of final acceptance as outlined in Division.

1. Replace without charge any material or equipment proving defective during this period.
2. The guarantee shall include performance of the equipment under all conditions of load, installing any additional items of control and/or protective devices as required and the replacing of any refrigerant lost.

– Electrical Work:

A. Electrical wiring, including power wiring and control wiring (except as otherwise specified under Automatic Temperature Controls), all raceways, wiring, outlet and junction boxes, and labor for installation of the wiring and equipment shall be included in Electrical Division 26 of the specifications.

B. All starters in motor control centers are to be furnished and installed under the Electrical Division of the specifications.

C. Before ordering any motors and equipment. Verify the available voltage and phase for all motors with the Electrical Contractor.

D. Submit a complete list of all motors prior to final closeout of job indicating the locations, horsepower, voltage, phase specified in Table 132 of ANSI B.1.

E. All field wiring and equipment must conform to the applicable sections of the Electrical specifications, Division 26.

– Welding Codes and Standards: All welding and other criteria covered by this specification shall be in accordance with the following code:

A. ASME Boiler and Pressure Vessel Code

B. Section IX ANSI Code for Power Piping: B31.1

C. AWS D10.12.D10.12M Welded joints for gas piping.

– Product Handling

A. Protection: Take all precautions necessary to protect the materials of this section before, during, and after installation.

B. Replacements: In the event of damage, immediately repair all damaged and defective work to the approval of the Engineer, at no additional cost to the Owner.

– Submittals:

A. Manufacturer's Literature: Within 35 days after award of contract and before any of the materials of this section are delivered to the job site submit seven complete brochures of all materials and equipment, per Division 1 of the specifications.

B. Other Submittals:

1. Shop Drawings.
2. Sterilization Test Report
3. Test Data.

C. Sets in bound booklet form of written operating and maintenance instructions and brochures for equipment specified in this section. Fully instruct Owners Operating Personnel.

D. Record Drawings: Keep an accurate dimensioned record of As–Built locations and elevations, as referred to approved base datum, of buried concealed.

E. Operation and Maintenance Instructions: Deliver to Architect complete as built locations or line work of manholes, cleanouts, valves, plugged tees, capped ends, and of work which is installed different from shown in the plans.

– Miscellaneous:

A. Examination of the site: Exercise care in examining the site and coordinate all work indicated on the drawings with existing conditions. Report to Architect in writing conditions that will prevent proper provisions of this work. Verify depth and location of all service lines with servicing companies having jurisdiction before excavating, by submission of the bid. The contractor warrants that he has familiarized himself with the existing conditions and will perform all work as required for hookup and as required by the contract documents at no additional cost.

B. Permits and fees: Arrange and pay for all permits, inspections and fee required by all governing agencies.

C. Service connections: Make all necessary arrangements with applicable utility company for connection to existing service lines. Pay all fees associated with work including meters, hookup charge and utility assessments fees.

D. Drawings: Coordinate all space requirements with other trades, drawings indicate desired location and arrangement of piping, equipment, and other items and are to be followed as closely as possible.

PART 2 – PRODUCTS

– General

A. Pipe sleeves and wrapping:

1. Provide polished chromium plated and brass set screw flanges where plumbing piping pass through walls, floors, ceilings, and partitions in finished portions of building including flanges on pipes at fixtures.
2. All sleeves in concrete and exterior walls shall be 20 GA. galvanized iron one inch O.D. larger than the pipe, caulked if below grade in a moisture proof manner.
3. All pipes penetrating through fire walls and floors shall be properly safed with Dow Corning 3–6548 silicone RTV foam or equal. Install per manufacturer's directions.

B. Pipe Identification:

1. Piping identification per ANSI and OSHA Standards: Each individual pipeline shall be marked for quick and easy identification as to contents and character of material carried in the pipes by set on SNA or STR Marker.
2. Markers shall be installed and spaced at not more than 20 foot intervals and so located that markers shall be visible where piping is exposed.
3. Color scheme shall be as follows:

	Background or Color Band	Identification Marker
Domestic Hot Water –	Yellow	Black on Yellow
Domestic Hot Water Return –	Yellow	Black on Yellow
Domestic Cold Water –	Green	White on Green
Sanitary Sewer –	Green	White on Green
Sanitary Vent –	Green	White on Green
Fire Protection (Sprinkler) –	Red	White on Red
Natural Gas –	Yellow	Black on Yellow
Storm Water –	Green	White on Green
Steam –	Orange	White on Orange
Chiller Water Supply & Return –	Blue	White on Blue
Condenser Water Supply & Return –	Blue	White on Blue
Glycol Solution –	Purple	White on Purple
Secondary Heating Water Supply –	Brown	White on Brown
Secondary Heating Water Return –	Brown	White on Brown

C. One marker shall installed at each side of valves, special fittings and at branch take–offs. In furred spaces install one band 2 feet above floor and 19 inches below ceiling line.

D. Materials: Materials when not otherwise definitely specified shall conform to the applicable ASTM, ASME, AGA and ASA standards.

E. All gas fired equipment shall include a label indicating that the appliance has been adjusted, modified or re–calibrated for the altitude where in the project is to be located (Green Sticker). The appliance shall also include a compliance statement indicating that the appliance has been adjusted, modified or re–calibrated for the proper operation at the altitude of the project and shall be listed capable for use with natural gas or propane gas if propane is listed on the drawings.

– Pipe and Fittings:

A. All piping, fittings, flanges, etc. shall be free from defects and shall comply with the appropriate ASTM specifications.

B. Black steel pipe: ASTM A53 ERW Grade B, standard weight (schedule 40) or extra strong (schedule 80) as specified.

C. Copper tubing: ASTM B88, Type L or K as specified.

D. PVC pipe and fittings: ASTM D1785 Class 150 with ASTM D 2564 solvent cement joints unless otherwise specified. Schedule 40. PVC plastic pipe fittings: ASTM F 628, schedule 40.

E. PEX–AL–HPDE distribution system: ASTM F 1986 tubing and metal–insert type with copper or stainless–steel crimp ring and matching PEX–AL–HDPE tube dimensions. Manifold: Multiple–outlet, plastic or corrosion–resistant–metal assembly complying with ASTM F 877: with plastic or corrosion–resistant–metal valve for each outlet.

F. PP piping and fittings: ASTM F 2389; CSA B137.11

G. Acrylonitrile Butadiene Styrene (ABS) plastic pipe: ASTM D 2661, schedule 40, ASTM F 628 schedule 40. ABS plastic pipe fittings: ASTM F 409, accessible and replaceable, solvent cement and threaded types, drain pattern.

H. Cast iron soil pipe and fittings: ASTM A74

I. Welded black steel fittings: ASTM A234 grade B, 150–Pound for standard weight piping, 300–Pound for extra strong piping, or of weight or schedule of matching piping.

J. Threaded malleable iron fittings: ANSI B16.3, 150–Pound for standard weight piping, 300–Pound for extra strong piping, or weight or schedule of matching piping either black or galvanized to match piping.

K. Welded flanges: ASTM A181 grade B, 150–Pound for standard weight piping, 300–Pound for extra strong piping or of equal weight of connected equipment.

L. Copper fittings: Wrought copper, ANSI specification B16.22.

M. Ball valves domestic water: Bronze, fullport, class 150, threaded. NIBCO T–585 or equal.

N. Partition stop valves: Loose key type with wall flange. T&S B–0415 oe equal.

O. Balancing cocks 2 inches and smaller shall be by Armstrong, NIBCO, Taco or Watts.

P. Solder: Joints in copper piping above grade shall be stay safe 50 solder or 95–5 solder.

Q. Condensate drains shall be Type L hard copper tubing with wrought–copper fittings (can't be used for condensing gas–fired applications) or PVC pipe and fittings where allowed. A P–trap shall be provided at drains.

R. Gas piping in the building and not buried shall be standard weight black steel pipe and shall have welded fittings. Any alternate above ground material must be approved by the stamping engineer. Gas piping buried shall be polyethylene pipe with continuous 18 gauge tracing wire with schedule 40 black steel epoxy coated transition risers and/or transition fittings per ASTM D2513 and installed in accordance with local utility company regulations. Paint all exterior exposed gas piping.

S. Chilled water and heating system lines shall be standard weight black steel. Pipe 2–1/2 inch and smaller shall either have welded fittings, mechanical grooved fittings or malleable iron screwed fittings.

T. Domestic hot water, hot water return, and cold water piping shall be Type L or K hard tempered copper pipe with wrought–copper fittings using 95–5 solder. Any alternate piping for lines over 2 inches must be approved by the stamping engineer. Pex tube piping may be used in lieu of copper on sizes 2–inches and smaller. Where piping is exposed outside partitions, use Type L or K hard copper tubing and wrought copper fittings.

U. Domestic hot water and cold water piping buried below grade shall be Type K soft tempered (annealed) copper without fittings or joints and covered with unicellular insulation. Polypropylene Heat fused may be used underground when approved by the stamping engineer. PEX tube piping may be used in lieu of copper on sizes 2" and smaller.

V. Chilled water and heating system lines shall be standard weight black steel pipe. Pipe 2–1/2" and smaller shall either have welded fittings, mechanical grooved fittings or malleable iron screwed fittings.

W. All soil, waste, vent, roof drain and roof drain overflow piping below ground shall be ABS or PVC plastic pipe, rated for domestic waste and vent, with ABS or PVC plastic socket type drain, waste vent pattern fittings, solvent cemented joints. Install ABS drainage pipe and fittings according to ASTM D661. Install PVC drainage pipe and fittings according to ASTM F891.

X. All soil, waste, vent, roof drain and overflow piping above ground shall be standard weight cast iron with no hub coupling, ABS, PVC or approved material meeting the standards set forth in IPC acceptable materials tables 702.1, 702.2, and 702.3 & 702.4..

Y. Kitchen waste and vent serving fixtures capable of discharging or receiving waste liquids with temperatures in excess of 120°F shall be piped using No–Hub standard weight cast iron pipe for a minimum of 20 feet before changing to ABS pipe or CPVC for a minimum of 20 feet before transitioning to PVC/ABS.

– Roof Flashing:

A. Sanitary Vent Flashings shall be one–piece lead with counterflashing sleeve.

– Pipe Sleeves:

A. Wall sleeves shall be flush with finished surface.

B. Sleeves shall be sized to allow 1/2 inch clearance around pipe insulation.

C. Insulation and covering shall be continuous through wall and floor sleeves.

D. Floor sleeves shall extend to top of concrete curbs for piping rising through floors.

E. Acceptable sleeves: adjust–to–crete, paramount, hole–out, Cretesleeve or equal.

– Cleanouts:

A. Full size cleanouts shall be installed at the base of each soil waste stack. All other cleanouts shall be installed where shown on the drawings and where required by State, Local or National Plumbing Codes.

B. All cleanouts shall be installed in locations easily accessible for rodding. Cleanouts shall be JR Smith, Wade, Josam or equal.

– Pipe Hangers:

A. Hangers shall be supplied with factory installed isolation and DI–Chromate finish or as noted on the drawings and details.

B. Use adjustable swivel ring hangers sized to match installed piping.

C. Use plastic coated riser clamps for copper piping.

D. Hanger rod diameters shall conform to the following:

1. Pipe size 2 inch and smaller: 3/8 inch rods.
2. Pipe size 2–1/2 inch and 3 inch: 1/2 inch rods.
3. Pipe size 3 inch and larger: 5/8 inch rods.

– Plumbing Fixtures:

A. Fixtures shall be the water saving type with maximum usage of 1.6 gallons per flush for water closets, 2.5 gallons per minute for showers, 3.0 gallons per minute for service sinks, 1.0 gallon per flush for urinals, 0.5 gallons per minute for public lavatories, 2.2 gallons per minute for private lavatories and 2.2 gallons per minute for sinks.

B. All fixtures shall be caulked to the floor or wall with water resistant white butyl rubber caulking compound. Trim for shall match in design. Faucets shall have renewable seats.

PLUMBING EQUIPMENT	MANUFACTURER
Floor Drains & Floor Sinks:	Zurn, JR Smith, Wade, Josam, Ancon, Mifab, Watts, or Equal
Trench Drains:	Zurn, JR Smith, Watts, Josam or approved equal
Roof Drains and Overflow:	Zurn, JR Smith, Wade, Watts, Josam, Ancon, Mifab
Cleanouts:	Zurn, JR Smith, Wade, Josam, Mikro, Mifab, Watts, or Equal
Valves:	Watts, Milwaukee, Crane, Kennedy, Stockham, Misson, Grinnell, Keystone, American Valve, or

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REGISTERED PROFESSIONAL ENGINEER
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STATE OF UTAH

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TBID SERVER ROOM RELOCATION

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DRAWING TITLE: PLUMBING SPECIFICATIONS

DRAWN BY: CH | CHECKED BY: MLM

DATE PLOTTED: 1/9/2025

PROJECT #: J24277.00

P7.1

	NIBCO
Shower Valves:	Powers, Symmons, Delta, Leonard, Moen, Bradley, Zurn, Acorn
Pipe Hangers & Supports:	Grinnell, Elcen, Kin–Line, Unistrut, F&S, B–Line, Michigan, Wesanco, or Piping Technology & Products
Insulation:	CertainTeed, Manville, Pittsburgh, Armstrong, LSP Products, or Owens–Corning
Plumbing Faucets:	American Standard, Chicago, Delta, Moen, Kohler, Symmons, T&S, Gerber, Zurn
Plumbing Fixtures:	American Standard, Kohler, Toto, Gerber, Watts, Zurn, Sterling, Sloan, Lasco
Plumbing Supply Stops:	Eastman, Crane, Kohler, Wolverine, McGuire, Brasscraft, EBC, Zurn, Chicago
Water Closets:	American Standard, Gerber, Kohler, Toto, Sterling, Sloan
Flush Valves:	Sloan. Delany, Zurn, Moen, American Standard, Gerber
Toilet Seats:	American Standard, Bemis, Kohler, Sperzel, Olsonite, Beneke, Gerber or Church
Pressure Reducing Valves:	Watts, Zurn or Wilkins
Hose Bibs:	Chicago, Acorn, Wolverine, Woodford, McGuire, Watts, Mifab, Josam, Zurn, Sioux Chief, Prier, Smith
Electric Water Coolers:	Elkay, Sunroc, Halsey Taylor, Haws Corporation, Westinghouse, Murdock, Sloan
Stainless Steel Sinks:	Elkay, Just, Moen, Franke Commercial or approved equal
Disposals:	Insinkerator, Evergrind, Kenmore, or appoved equal
Gas Pressure Regulator:	Fisher, Equimeter, Pietro Fiorentini
Thermostatic Tempered Water Valves:	Symmons, Powers, Leonard, Bradley, Watts, Caleffi, Lawler, Acorn
P–Traps:	American Standard, Kohler, McGuire, Brasscraft, Dearborn, EBC
Shock Absorbers:	Zurn, Smith, Wade, Josam, PPP, Sioux Chief, Watts, Mifab
Sewer Ejectors:	Peabody–Barnes, Weil, Hydromatic, Gorman–Rupp, Swaby, Weinman, Zoeller, Liberty
Gas Water Heaters:	AO Smith, American, Bradford White, Rheem, State, Rinnai, Ruud, National, PVI, or approved equal
Electric Water Heaters:	Lochnivar, AO Smith, American, Rheem, State, Ruud, PVI, National, EEMAX, Chronomite, Vaughn, or approved equal

PART 3 – EXECUTION

– Surface Conditions:

A. Inspection: All plumbing shall be installed in accordance with the requirements of all governing authorities, The original design, and referenced standards.

B. Discrepancies:

1. In the event of discrepancy, immediately notify the Architect.
2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.
3. Interferences between installed work of various trades due to lack of coordination shall be resolved by the Architect whose decision is final.
4. Relocate or offset any work as required to accommodate work of other trades at no extra cost to the Owner when so directed by the Architect.

– Verification of Dimensions:

A. Scaled and figured dimensions are approximate only. Before proceeding with work, carefully check and verify dimensions at site, and be responsible for properly fitting equipment and materials together and to the structure in spaces provided.

B. Drawings are essentially diagrammatic and many offsets, bends, special fittings and exact locations are not indicated. Carefully study drawings and premises in order to determine best methods, exact locations, routes, building obstructions, and install apparatus and equipment in available locations. Install apparatus and equipment in manner and in locations to avoid obstructions, preserve headroom, and keep openings and passageways clear.

– Locations and Space Requirements:

A. Contractor shall fully inform self regarding peculiarities and limitation of spaces available for installation of work under this division. Drawings indicate desired location and arrangement of piping, equipment and other items and are to be followed as closely as possible. Work specified and not clearly defined by drawings shall be installed and arranged in a satisfactory manner. In any case and at any time a change in location required by obstacles or the installation of other trades not shown on the plumbing plans shall be made by contractor without additional charge provided the change is ordered before work is installed and no extra materials are required.

B. Verify all spaces, dimensions for all fixtures, equipment, or owner–furnished equipment and equipment furnished under other sections.

C. Obtain all necessary rough in data and dimensions for all fixtures, equipment, or owner–furnished equipment and equipment furnished under other sections.

D. Maintain ample headroom clearances and accessibility. Maintain ceiling heights.

E. Constantly check work of other trades to prevent interference with this installation.

– Cutting and Patching:

A. Cut work and patch per Division 1 as necessary to properly install the new work. As the work progresses, coordinate necessary openings, holes, chases, etc., in their correct location. If the required openings, holes and chases are not in their correct locations, make the necessary corrections at no cost to the Owner. Avoid excessive cutting and do not cut structural members without the consent of the Architect. Patching by General Contractor at Mechanical, Plumbing or Fire Protection Contractor's expense. Include as a part of the work under this contract all structural framing required by penetrations through the roof and necessary steel to support ducts and pipes between structural steel unless shown on the structural drawings.

– Closing–in of Unfinished Work:

A. Cover no work until inspected, tested and approved. Where work is covered before inspection and test,uncover it, and when inspected, tested and approved, restore all work to original proper condition.

– Excavation and Backfill:

A. Perform all necessary excavation, shoring and backfilling required for the proper laying of all pipes and conduits inside the building and premises, and outside as may be necessary. Conform to Division 2 requirements. Remove all excess excavated materials from the site or dispose of on site as directed by General Contractor.

B. Excavate all trenches open cut, keep trench banks as nearly vertical as practicable, and sheet and brace trenches where required for stability and safety. Excavate trenches true to line and make bottoms not less than 18 inches wide but no wider than necessary to provide ample work room. Grade trench bottoms accurately to provide uniform bearing and support for each section of pipe on undisturbed soil along its entire length. Dig "bell" holes after the trench bottom has been graded. Machine grade only to the top line of the pipes, doing the balance by hand. Do not cut any trench near or under footings without first consulting the Architect. Comply with OSHA requirements.

C. Provide backfilling and compaction in accordance with requirement of Division 2 and under the direction of the Architect and the Owner's testing firm to the required density. Make the first 2 feet of fill in 6 inch layers, each thoroughly compacted as directed, and free from rocks, large clods of earth, leaves, branches, and debris. Compact the rest of the backfill to prevent settlement as directed, using in the backfill no rocks larger than 4" in diameter, and using no rocks at all in the top 12".

– Accessibility:

A. Install valves, dampers, thermometers, gauges, traps, cleanouts, control devices or other specialties requiring reading, adjustment, inspection, repairs, removal or replacement conveniently and accessibly throughout the finished building.

B. Where any of these devices are shown on the contract drawings to be installed above any inaccessible ceiling, the Plumbing Contractor shall furnish access doors or panels as required. All access doors or panels in walls and ceilings required for access to control devices, traps, valves and similar devices are to be furnished and installed as part of the work under this section.

C. Provide type as specified under Division 8. Refer to drawings and "Finish Schedule" for type of wall and ceiling in each area and for rated construction.

D. Coordinate work of various sections to locate valves, traps, and dampers with others to avoid unnecessary duplication of access doors.

– Roof Flashings:

A. Flash and counterflash all piping, conduits and ductwork penetrating roofing membrane with flashing per roofing manufacturer's recommendations, architectural drawings and plumbing details.

– Equipment Rough–in:

A. Rough in all equipment and fixtures as designated on the drawings and in the specifications. The drawings indicate only the approximate location of rough–ins. The exact rough–in locations must be determined from large–scale certified drawings. The Contractor shall obtain all certified rough–in information before progressing with any work for rough–in final connections.

B. Minor changes in the contract drawings shall be anticipated and provided for under this division of the specifications.

C. Rough–in only (unless otherwise designated on the drawings) shall include the following:

1. Plumbing: Provide all services designated and required, including waste and water. Valve and cap all stub–outs for water and gas. Cap all waste and vent outlets.
2. Mechanical: Provide all services as indicated and required, including all ductwork, piping and valves. Valve and cap all piping stub–outs. Cap all ductwork stub–outs in a manner suitable for future extension.

– Owner–Furnished and Other Equipment:

A. Rough–in only for all Owner–furnished equipment (see Division 1) and all equipment furnished under other sections of the specifications, except as otherwise specified and/or noted on the drawings.

B. Provide all services designated, valve and cap all piping, cap all waste piping and ductwork and leave in a clean and orderly manner.

C. Rough–in requirements shall be as outlined in the preceding paragraph titled "Equipment Rough–In."

– Equipment Final Connections:

A. Provide all piping final connections for all equipment under Division 22 as required herein specified and indicated on the drawings.

B. Plumbing: Provide final plumbing connections complete with shutoff valves, risers, traps, vacuum breakers and indirect wastes for all equipment furnished and installed under other sections of these specifications, except as otherwise designated. Included under the Plumbing section of the specifications are the final connections to the following:

1. Miscellaneous equipment specified to be furnished and installed under other divisions of the specifications.
2. Cold water make–up connections to air conditioning equipment.
3. Kitchen equipment, furnished under other sections of the specifications.

– Sterilization:

A. Sterilize each unit of water supply and distribution system with liquid chloride or hydrochloride before acceptance of operation in accordance with AWWA C601, "Standard for Disinfection Water Mains" work shall be done by contractor and unless otherwise required by Public Authorities having Jurisdiction, shall conform to the following:

B. Material: Liquid Chlorine, Hydrochloride.

C. Method:

1. The pipe system shall be flushed with clean, potable water until dirty water does not appear at the points of outlet.
2. The system or part thereof shall be filled with a water/chlorine solution containing not less than 50 parts per million (50 mg/L) of chlorine, and the system or part thereof shall be valved off and allowed to stand for 24 hours; or the system or part thereof shall be filled with a water/chlorine solution containing not less than 200 parts per million (200 mg/L) of chlorine and allowed to stand for 3 hours.
3. Following the required standing time, the system shall be flushed with clean potable water until the chlorine is purged from the system.
4. The procedure shall be repeated where shown by a bacteriological examination that contamination remains present in the system.

D. Sterilization report shall be turned into the Engineer for review prior to requesting a substantial completion inspection.

– Machinery Accessories:

A. Application: Do not install any equipment in an application not recommended by the manufacturer.

B. Installation: Align, level and adjust all equipment for proper operation. Install so connecting and disconnecting of piping and accessories can readily be done and so all parts are readily accessible for inspection, service and repair. Install equipment in accordance with manufacturer's recommendations.

– Pipe and Equipment Supports:

A. Where supports, foundations, stands, suspended platforms for machinery, tanks, or other equipment are indicated or specified, perform the following:
1. Locate support members to avoid equipment strains and interference with piping connections, tube pulling or other maintenance operations.
2. Where saddles are required, use cast iron or welded steel saddles with curvature to fit the tank shell.
3. Mount power–driven equipment on common base with driver.

B. Concrete Inserts: Furnish and install all concrete inserts required for all materials and equipment specified and/or shown on the drawings for Division 22.

C. Concrete Foundations: Work under this section includes coordination of construction of all concrete foundations indicated or required for equipment specified herein or in other sections under Division 22. Materials and workmanship shall be described under Division 3.

D. Grout under all equipment after leveling, filling completely the space between machinery bed plate and foundation surface as specified in Division 3. Finish exposed surface of grout for a neat appearance.

E. Floor Stands: Where equipment is mounted standard or on legs, construct of structural steel or steel pipe and fittings, cross–brace and fasten with flanges or plates bolted to floor.

F. Ceiling or Wall Supports: Use suspended platform, strap hangers, bracket or shelf, whichever is most suitable for equipment and location. Construct of structural steel members, steel plates, rods or pipe as required. Cross–brace and fasten to building structure or inserts in an approved manner.

G. Steel Work: Neatly fabricate and erect steel work with burrs and welding spatter ground off. Paint after fabrication with a rust–inhibitive primer.

– Hangers and Supports:

A. Hold horizontal pipe runs firmly in place using approved steel and iron hangers, supports, and/or pipe rest unless otherwise indicated. Suspend hanger rods from concrete inserts or from approved brackets, clamps or clips. Hang pipes individually or in groups if supporting structure is adequate to support weight of piping and fluid. Except for buried piping, hang or support pipe runs so that they may expand or contract freely without strain to pipe or equipment.

1. Horizontal steel piping: Provide hangers or supports every 10 ft. except every 8 ft. for piping 1–1/4 inch and smaller.
2. Horizontal copper tubing: For 2 inch diameter and over, provide hangers every 10 feet, for 1–1/2 inch diameter and smaller every 6 feet.
3. Horizontal cast–iron no–hub piping: Provide hangers or supports at each side of no–hub fittings. Provide anti–separation bracing at each 90 degree change in direction.
4. Horizontal cast–iron hub and spigot piping: Provide hangers or supports at each hub.
5. Vertical piping: Support at floor with iron pipe clamps.

– Test:

A. Perform test to Architect's satisfaction. Make test in presence of Owner's Representative and at the time suitable to him if requested. Furnish necessary labor and equipment and bear cost for testing. Cost of replacing and/or repairing damage resulting therefor shall be borne by this contractor, should the contractor refuse or neglect to make test necessary to satisfy the Architect that requirement of specifications and drawings are met, such tests may be made by an independent testing company and the contractor charged for all expenses.

B. Hydrostatic test: Make by completely filling piping system with water and eliminating accumulations of air so that leakage, no matter how small, will be apparent on testing gauge immediately. Maintain pressure until pipe under test has been examined, but in no case less than 24 hours. Test system at the following pressure:

SYSTEM	TEST PRESSURE
Domestic Cold Water	150 PSIG
Domestic Hot Water	150 PSIG

C. Sanitary soil, waste, bent systems test: Before installation of fixtures, cap end of system and fill lines with water to 10 feet above the section being tested (including bends) and allow to stand for at least fifteen (15) minutes before inspection starts. Make test in sections if necessary or convenient. However, include interconnections between new sections and previously tested section in the new test.

D. Roof drainage system: Test as specified for sanitary system.

E. Gas systems: Test with compressed air at 10 PSI for six hours or longer as directed to provide a tight seal without leaks. Use pressure recorder to record pressure of all lines for duration of test.

F. Repair all leaks and retest as required.

– Cleanouts:

A. Provide cleanouts where indicated and required. Unless otherwise indicated, cleanouts shall be accessible with extensions to grade to outside of buildings, or to floors above as indicated or required. Do not locate cleanouts in public lobbies and public corridors unless approved by Architect.

B. Membranes: Where waterproofing membrane occurs under floor, bring membrane to cleanout without puncturing and permanently anchor to integral anchoring flange with heavy cast–iron clamping collar and rustproof bolts.

C. Covers: Set cleanout covers with all finished wall, floor or grade. In all cases securely anchor by means of integral lugs and bolts. Where surfacing material such as resilient coverings is specified, ascertain thickness being used and set cleanout top so finished floor is smooth.

D. Use thread compound on all threaded inspection/cleanout caps.

– Pipe Installation:

A. Make pipe runs straight and true. Springing or forcing piping into place is not permitted. Install in manner to prevent any undue strain on equipment. Make joints smooth and unobstructed inside and out, and ream pipe ends thoroughly to remove burrs. Conceal piping in finished portions of the building except as otherwise directed or indicated. Cap or plug ends and openings in pipe and fittings immediately to exclude dirt until equipment is installed or final connections are made.

B. Install piping to clear beams unless sleeving is indicated. Constantly check work of other trades to prevent interference with this installation. Obtain approval from Architect if coring or cutting of concrete work is necessary due to failure to install required sleeves prior to the time of concrete pour. Cost of coring and cutting work shall be borne by the plumbing or mechanical subcontractor.

C. Exposed plated or enameled pipe: Make connections to equipment with special care. Show no tool marks or threads.

D. Dielectric Unions: Make connections between two dissimilar metal pipes with dielectric unions.

E. Unions: Provide a unions on one side of each shutoff valve, at both sides of automatic valves, equipment connections and elsewhere indicated or required, unless flanges are indicated.

F. Floor, wall ceiling plates: Provide where pipes pierce finished surfaces.

G. Noise: Install soil, waste, and water piping in a manner that prevents any unusual noise from flow of water under normal conditions.

H. Shutoff Valves: Provide where indicated and required for adequate control of system and for isolation of fixture groups and equipment.

I. Buried Pipe: Install with minimum 36 inches coverage unless otherwise indicated. Lay piping accurately to grade where invert elevations are indicated. When required provide thrust blocks per manufacturer's recommendations.

J. Equipment and Materials: Install per manufacturer's recommendations.

K. Accessibility: Install work readily accessible for normal operation, reading of instruments, adjustments, service, inspections and repair. Provide access panels where indicated and required.

L. Pipe Joints: Make screwed joints with a minimum amount of compound applied to the male thread only. All joints shall be made per code requirements and manufacturer's recommendations.

M. Provide pipe isolation at all hangers for non–insulated materials.

N. Piping Rough–in for Fixtures: Support or secure to building construction of firmly anchored waste piping so that pipes cannot be displaced. Do not secure to walls. Use of makeshift devices, such as rope, wire, tape, etc. is prohibited.

O. Horizontal drainage piping shall be installed in uniform alignment at uniform slopes.

P. The minimum slopes for horizontal pipes:

1. 4 inches or larger in diameter, not less than 1% (1/8 inch per foot).
2. Less than 4 inches in diameter, not less than 2% (1/4 inch per foot).

– Cleanup:

A. In addition to cleanup specified under Division 1, thoroughly clean all parts of the equipment. Where exposed parts are to be painted, thoroughly clean off any splattered construction materials and remove all oil and grease spots. Wipe the surface carefully and scrape out all cracks and corners.

B. Thoroughly flush and clean out all water circulating systems. Remove, clean and replace all strainer elements.

C. During the progress of the work, keep the premises clean and free of debris.

– Painting:

A. Except as otherwise specified or indicated in the architectural drawings and/or specifications, paint all exposed unfinished metal with one coat of rust–inhibiting primer.

B. Finished painting is specified under Division 9.

– Connections to Services:

A. Provide all connections to sanitary sewer lines, storm sewer, gas lines, water lines, electrical services furnished under other contracts, except as otherwise specifically designated. Provide all necessary tees, taps and connections required to properly connect to all mains. Verify all required City requirements before making any piping connections to sanitary sewer, storm sewer, water or gas piping and conform to them during installation.

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TBID SERVER ROOM RELOCATION

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DRAWING TITLE: PLUMBING SPECIFICATIONS

DRAWN BY:	CHECKED BY:
CH	MLM

DATE PLOTTED: 1/9/2025

PROJECT #: J24277.00

P7.2

ELECTRICAL SYMBOLS

SYMBOL	EXPLANATION	SYMBOL	EXPLANATION	SYMBOL	EXPLANATION
	BRANCH CIRCUIT CONCEALED IN CEILING OR WALL	F1	FIXTURE TYPE SYMBOL		TAMPER AND FLOW
	BRANCH CIRCUIT CONCEALED IN GROUND OR FLOOR		LINEAR FIXTURE (TYPICAL)	FACP	FIRE ALARM CONTROL PANEL
A-1,3	BRANCH CIRCUIT HOMERUNS TO PANEL		EMERGENCY LIGHTING UNIT	RFAA	REMOTE FIRE ALARM ANNUNCIATOR PANEL
135	ROOM NUMBER		SURFACE OR PENDANT MOUNTED FIXTURE	NAC	FIRE ALARM NAC PANEL
CH	MECHANICAL EQUIPMENT SYMBOL		RECESSED FIXTURE	VOICE	FIRE ALARM VOICE PANEL
1	KEYED NOTE REFERENCE		WALL MOUNTED FIXTURE	D/H	DOOR HOLDER
42X	FEEDER TAG (SEE FEEDER SCHEDULE)		WALL PACK	F/S	FIRE/SMOKE DAMPER
FLUSH SURFACE	LIGHTING AND POWER PANELBOARD		STRIP FIXTURE	F	FIRE ALARM PULL STATION
NON-FUSED FUSED	DISCONNECT SWITCH		TRACK LIGHTING		FIRE ALARM STROBE
NON-FUSED FUSED	DISCONNECT SWITCH WITH MOTOR STARTER	BUGEYE EGRESS	EMERGENCY LIGHTING UNIT		FIRE ALARM HORN/STROBE
	MOTOR STARTER		WALL MOUNTED EXIT LIGHT (SINGLE FACE)	LF	FIRE ALARM HORN/STROBE (LF = LOW FREQUENCY)
VFD	VARIABLE FREQUENCY DRIVE		WALL MOUNTED EXIT LIGHT (DOUBLE FACE)		FIRE ALARM HORN/STROBE WITH PROTECTIVE COVER
C	CONDUIT STUB		CEILING MOUNTED EXIT LIGHT (SINGLE FACE)		FIRE ALARM SPEAKER/STROBE
J	JUNCTION BOX		CEILING MOUNTED EXIT LIGHT (DOUBLE FACE)	LF	FIRE ALARM SPEAKER/STROBE (LF = LOW FREQUENCY)
	ELECTRIC VEHICLE CHARGING STATION (EVSE)		EXIT LIGHT WITH PROTECTIVE COVER		FIRE ALARM SPEAKER
WP A-3 REF	MODIFIER PANEL SPACE ASSIGNMENT EQUIPMENT DESIGNATION	$	SINGLE POLE SWITCH (SUBSCRIPT AS INDICATED BELOW)	LF	FIRE ALARM SPEAKER (LF = LOW FREQUENCY)
+44	MOUNTING HEIGHT ABOVE FLOOR OR GRADE GIVEN IN INCHES.	2	TWO POLE SWITCH		FIRE ALARM HORN
GFCI	PROTECTED BY FAULT CIRCUIT INTERRUPTER	3	3-WAY SWITCH		
TR	TAMPER RESISTANT	4	4-WAY SWITCH	LF	FIRE ALARM HORN (LF = LOW FREQUENCY)
WP	WEATHERPROOF COVER & LISTED WEATHER RESISTANT DEVICE	D	DIMMER SWITCH		
DISP	DISPOSAL	K	KEYED SWITCH		FIRE ALARM STROBE CEILING MOUNTED
DW	DISHWASHER	T	TIMER SWITCH		
EWC	ELECTRIC WATER COOLER	M	MANUAL STARTER WITH THERMAL OVERLOAD		FIRE ALARM HORN/STROBE CEILING MOUNTED
REF	REFRIGERATOR	F	PADDLE FAN SPEED CONTROL. (CANARM "CN" SERIES)		
USB	HUBBELL USB15AC5W OR EQUAL DUPLEX PLUS USB CHARGER	OC	OCCUPANCY SENSOR SWITCH	LF	FIRE ALARM HORN/STROBE CEILING MOUNTED (LF = LOW FREQUENCY)
WASH	WASHING MACHINE	LV	LOW VOLTAGE CONTROL SWITCH		
		LV/D	LOW VOLTAGE CONTROL SWITCH WITH DIMMER		FIRE ALARM HORN CEILING MOUNTED
		OC/D	OCCUPANCY SENSOR CONTROL SWITCH WITH DIMMER		
	SIMPLEX RECEPTACLE OUTLET	OC/2	DUAL RELAY OCCUPANCY SENSOR CONTROL SWITCH	LF	FIRE ALARM HORN CEILING MOUNTED (LF = LOW FREQUENCY)
	DUPLEX RECEPTACLE OUTLET	$$	DOUBLE GANG SWITCH		SMOKE DETECTOR (SUBSCRIPT AS INDICATED BELOW)
	QUAD RECEPTACLE OUTLET	$a,b,c LV / S a,b	LOW VOLTAGE MULTI BUTTON CONTROL SWITCH (LETTER INDICATES CONTROL OF CORRESPONDING FIXTURES)	B C	SMOKE ALARM BATTERY-BACKED SMOKE/CARBON MONOXIDE ALARM COMBO BATTERY-BACKED
	SPLIT WIRED DUPLEX RECEPTACLE OUTLET	ab	CONTROLLING SWITCH (LETTER INDICATES CONTROL OF CORRESPONDING FIXTURES)	CS/LF D	SMOKE/CARBON MONOXIDE DETECTOR WITH LOW FREQUENCY SOUNDER BASE DUCT SMOKE DETECTOR
	220V RECEPTACLE OUTLET	S	OCCUPANCY SENSOR (CEILING MOUNTED)	R S/LF	SMOKE DETECTOR WITH ADDRESSABLE RELAY SMOKE DETECTOR WITH LOW FREQUENCY SOUNDER BASE
	ISOLATED GROUND RECEPTACLE OUTLET	DT PIR	DUAL TECHNOLOGY OCCUPANCY SENSOR (CEILING MOUNTED) PASSIVE INFRARED OCCUPANCY SENSOR (CEILING MOUNTED)		HEAT DETECTOR
	SPECIAL RECEPTACLE OUTLET	RC	ROOM CONTROLLER		GAS DETECTOR
T	THERMOSTAT OUTLET	LS	DAYLIGHT SENSOR	CO CO/NO2	CARBON MONOXIDE DETECTOR CARBON MONOXIDE/NITROGEN DIOXIDE SENSOR (GARAGE)
S	REMOTE SENSOR OUTLET	P	PHOTOCELL		ADA TWO-WAY COMMUNICATIONS SYSTEM
▽(#)	COMPUTER DATA OUTLET (#) INDICATES JACK QUANTITIES	V	VOLUME CONTROL	KP	ACCESS CONTROL KEY PAD
	NETWORK AND VOICE OUTLET		WALL SPEAKER	CR	ACCESS CONTROL CARD READER
	WIRELESS ACCESS POINT CEILING MOUNTED		CEILING SPEAKER	Sos	ACCESS CONTROL DOOR STRIKE
TV	TELEVISION OUTLET		SURVEILLANCE CAMERA	ML	ACCESS CONTROL MAG LOCK
	MOTOR OUTLET	DVR	SURVEILLANCE DIGITAL VIDEO RECORDER	DS	ACCESS CONTROL DOOR SENSOR
	EXHAUST FAN	NURSE	NURSE CALL ANNUNCIATOR PANEL		ACCESS CONTROL REQUEST TO EXIT
	FLOOR MOUNTED DEVICE	N	NURSE CALL EMERGENCY CALL DEVICE		PUSHBUTTON
	CEILING MOUNTED DEVICE	N	NURSE CALL EMERGENCY CALL LIGHT	B	BELL

NOTE: ALL SYMBOLS MAY NOT BE USED.

ABBREVIATIONS INDEX

#	NUMBER	DC	DIRECT CURRENT	KW	KILOWATT	PT	POTENTIAL TRANSFORMER
ϕ	PHASE	DISP	DISPOSAL	LRA	LOCKED ROTOR AMPS	PV	PHOTOVOLTAIC
1ϕ	SINGLE PHASE	DRY	DRYER	LTG	LIGHTING	PVC	POLYVINYL CHLORIDE
2P	TWO-POLE	DW	DISHWASHER	MATV	MASTER ANTENNA TELEVISION	(R)	RELOCATE
3ϕ	THREE PHASE	DWG	DRAWING	MAX	MAXIMUM	RECP	RECEPTACLE
4P	FOUR-POLE	EC	EMPTY CONDUIT	MB	MAIN BUS	REF	REFRIGERATOR
AC	ALTERNATING CURRENT	EM	EMERGENCY	MCB	MAIN CIRCUIT BREAKER	REQ	REQUIRED
AFF	ABOVE FINISHED FLOOR	EMG	EMERGENCY GENERATOR	MCC	MOTOR CONTROL CENTER	RLA	RATED LOAD AMPS
AFG	ABOVE FINISHED GRADE	EMT	ELECTRICAL METALLIC TUBING	MCM	1000 CIRCULAR MILLS	RMS	ROOT MEAN SQUARE
AFP	ARC FAULT PROTECTOR	EPO	EMERGENCY POWER OFF	MH	MANHOLE	SE	SERVICE ENTRANCE
AHJ	AUTHORITY HAVING JURISDICTION	EWC	ELECTRIC WATER COOLER	MIC	MICROPHONE	SPD	SURGE PROTECTION DEVICE
AIC	AMP INTERRUPTING CURRENT (SYMMETRICAL)	EWH	ELECTRIC WALL HEATER	MIN	MINIMUM	SPEC	SPECIFICATION
AL	ALUMINUM	(E)	EXISTING	MLO	MAIN LUGS ONLY	SPK	SPEAKER
AM	AMPS METER	(F)	FUTURE	MNF	MANUFACTURER	SS	SELECTOR SWITCH
AMP	AMPERE	FA	FIRE ALARM	MTG	MOUNTING	SW	SWITCH
ANN	ANNUNCIATOR	FACP	FIRE ALARM CONTROL PANEL	MTR	MOTOR	SWBD	SWITCHBOARD
ATS	AUTOMATIC TRANSFER SWITCH	FC	FOOT CANDLE	MW	MICROWAVE	SWGR	SWITCHGEAR
AUX	AUXILIARY	FLA	FULL LOAD AMPS	(N)	NEW	TTB	TELEPHONE TERMINAL BOARD
AWG	AMERICAN WIRE GAUGE	FT	FOOT	N/A	NOT APPLICABLE	TBC	TELEPHONE TERMINAL CABINET
BC	BARE COPPER	FRZ	FREEZER	NC	NORMALLY CLOSED	TV	TELEVISION
BFG	BELOW FINISH GRADE	FS	FUSED SWITCH	NEC	NATIONAL ELECTRICAL CODE	TYP	TYPICAL
C	CONDUIT	GFAF	DUAL FUNCTION GFCI/AFCI CIRCUIT BREAKER	NEMA	NATIONAL MANUFACTURING ASSOCIATION	UG	UNDERGROUND
CAB	CABINET	GFCI	GROUND FAULT CIRCUIT INTERRUPTER	NFC	NATIONAL FIRE CODE	UNO	UNLESS NOTED OTHERWISE
CATB	COMMUNITY ANTENNA TELEVISION	GFEP	GROUND-FAULT EQUIPMENT PROTECTION	NFPA	NATIONAL FIRE PROTECTION ASSOCIATION	UPS	UNINTERRUPTIBLE POWER SUPPLY
CATV	CABLE TELEVISION	GFP	GROUND FAULT PROTECTOR	NFS	NON FUSED SWITCH	V	VOLT (KV-KILOVOLT)
CFCI	CONTRACTOR FURNISHED CONTRACTOR INSTALLED	GRC	GALVANIZED RIGID CONDUIT	NIC	NOT IN CONTRACT	VA/R	VOLT-AMPS/REACTIVE
CKT	CIRCUIT	GRD	GROUND	NL	NIGHT LIGHT	VM	VOLT METER
CLG	CEILING	HP	HORSE POWER	NO	NORMALLY OPEN	W	WATTS
CNTR	CONTRACTOR	HZ	HERTZ	NTS	NOT TO SCALE	W/	WITH
CO	CONVENIENCE OUTLET	IG	ISOLATED GROUND	OFCI	OWNER FURNISHED CONTRACTOR INSTALLED	WASH	WASHER
CRT	COMPUTER TERMINAL	IMC	INTERMEDIATE METALLIC CONDUIT	OFOI	OWNER FURNISHED OWNER INSTALLED	WH	WATTHOUR
CT	CURRENT TRANSFORMER	IN	INCH	OS&Y	OUTSIDE SCREW AND YOKE	W/O	WITHOUT
CU	COPPER	J-BOX	JUNCTION BOX	PB	PUSH BUTTON	WP	WEATHER PROOF
C/W	CONDUIT WITH	KV	KILOVOLT	PF	POWER FACTOR	XFMR	TRANSFORMER
(D)	DEMOLISH/DELETE	KVA	KILOVOLT AMPERES	PFR	PHASE FAILURE RELAY	XFMR-SW	TRANSFORMER SWITCH
DB	DECIBEL	KVAR	KILOVARS	PNL	PANEL	XP	EXPLOSION PROOF

NOTE: THIS IS A TYPICAL ABBREVIATION LIST. NOT ALL ABBREVIATIONS MAY BE USED ON THIS PROJECT.

ELECTRICAL GENERAL NOTES:

1. WORK SHALL BE PERFORMED IN A WORKMANLIKE MANNER, PER INDUSTRY STANDARD, AND TO THE SATISFACTION OF THE ARCHITECT AND ENGINEER.
2. WORK, MATERIALS, AND EQUIPMENT SHALL CONFORM TO THE LATEST EDITIONS OF LOCAL, STATE AND NATIONAL CODES, STANDARDS AND ORDINANCES.
3. EVERY CIRCUIT AND CIRCUIT MODIFICATION SHALL BE LEGIBLY IDENTIFIED AS TO ITS CLEAR, EVIDENT, AND SPECIFIC PURPOSE OR USE PER NEC 408.4(A).
4. ALL MATERIALS USED IN THIS INSTALLATION SHALL BE U.L. APPROVED AND NEW.
5. DO NOT PENETRATE STRUCTURAL ELEMENTS OF FLOORS, WALLS, CEILINGS, ROOF, ETC.
6. DETAILS ARE SHOWN ON DIFFERENT SHEETS. THE CONTRACTOR SHALL REFER TO THOSE DETAILS WHETHER OR NOT CALLED IN REFERENCE NOTES.
7. ELECTRICAL CONTRACTOR SHALL NOTIFY AND COORDINATE WITH THE MECHANICAL CONTRACTOR SUCH THAT NO DUCTS, PIPING, OR EQUIPMENT FOREIGN TO THE OPERATION OF THE ELECTRICAL EQUIPMENT SHALL BE PERMITTED TO BE INSTALLED IN, ENTER, OR PASS THROUGH ELECTRICAL ROOMS OR SPACES, OR ABOVE OR BELOW ELECTRICAL EQUIPMENT IN OTHER AREAS.
8. NO WIRING SHALL RUN IN DUCT WORK.
9. THE MINIMUM SIZE OF THE CONDUCTORS ARE TO BE #12 AWG THHN COPPER, UNLESS INDICATED OTHERWISE ON THE DRAWINGS. STRANDED CONDUCTORS ARE NOT ALLOWED IN THE CONDUCTORS SMALLER THAN #10 AWG.
10. USE EPOXY ANCHORS TO SUPPORT THE ELECTRICAL EQUIPMENT. EXPANSION ANCHOR BOLTS ARE NOT ACCEPTED.
11. THE ELECTRICAL CONTRACTOR SHALL REVIEW AND COORDINATE WITH MECHANICAL, PLUMBING, AND OTHER DRAWINGS PRIOR TO BID.
12. ALL JUNCTION BOXES SHALL HAVE MINIMUM DEPTH OF 2-1/8" UNLESS OTHERWISE SPECIFIED. SECURE ALL JUNCTION BOXES AS SHOWN IN THE DETAILS. FURNISH AND INSTALL PROPER PLASTER RINGS.
13. MANY DEVICE MOUNTING LOCATIONS ARE DEPENDENT ON MILLWORK LOCATIONS. COORDINATE ALL APPLICABLE LOCATIONS WITH MILLWORK INSTALLER PRIOR TO BEGINNING WORK.
14. LIGHT SWITCHES INSTALLED ADJACENT TO EACH OTHER, SHALL BE GANGED TOGETHER WITH ONE PIECE COVER PLATE.
15. THE ELECTRICAL CONTRACTOR SHALL TERMINATE THE ELECTRICAL CONNECTIONS TO ALL THE EQUIPMENT BY PROVIDING THE NECESSARY MALE/FEMALE CONNECTOR, RECEPTACLE, PLUG, ETC.
16. FINAL CONNECTIONS TO EQUIPMENT SHALL BE MADE AS PER MANUFACTURERS WRITTEN INSTRUCTIONS AND APPROVED WIRING DIAGRAMS AND DETAILS. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO PROVIDE ALL MATERIALS AND EQUIPMENT COMPATIBLE WITH EQUIPMENT ACTUALLY SUPPLIED. THE ELECTRICAL CONTRACTOR SHALL VERIFY ALL ELECTRICAL LOADS (VOLTAGE, PHASE, CONNECTION REQUIREMENTS, ETC.) OF EQUIPMENT FURNISHED UNDER OTHER DIVISIONS WITH APPROVED SHOP DRAWINGS PRIOR TO BEGINNING ROUGH-IN.
17. VERIFY EXACT LOCATION(S) OF ALL EQUIPMENT TO BE FURNISHED BY OTHERS PRIOR TO ROUGH-IN.
18. AT THE END OF THE JOB, PROVIDE BLANK COVER PLATES TO MATCH THE OTHER COVER PLATES FOR ALL JUNCTION BOXES WHERE DEVICES HAVE NOT YET BEEN INSTALLED.
19. ALL SWITCHBOARDS, SWITCHGEAR, AND PANELBOARDS SHALL BE PERMANENTLY MARKED TO INDICATE EACH DEVICE OR EQUIPMENT WHERE THE POWER ORIGINATES. PER NEC 408.4(B).
20. SERVICE EQUIPMENT SHALL BE LEGIBLY MARKED IN THE FIELD WITH THE AVAILABLE FAULT CURRENT. THE FIELD MARKING(S) SHALL INCLUDE THE DATE THE FAULT-CURRENT CALCULATION WAS PERFORMED AND BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED. PER NEC 110.24(A)
21. EACH DISCONNECTING MEANS SHALL BE LEGIBLY MARKED TO INDICATE ITS PURPOSE UNLESS LOCATED AND ARRANGED SO THE PURPOSE IS EVIDENT. PER NEC 110.22
22. SEISMIC BRACING REQUIREMENTS SHALL FOLLOW ASCE 7-16.

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SHEET INDEX

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TBID SERVER ROOM RELOCATION

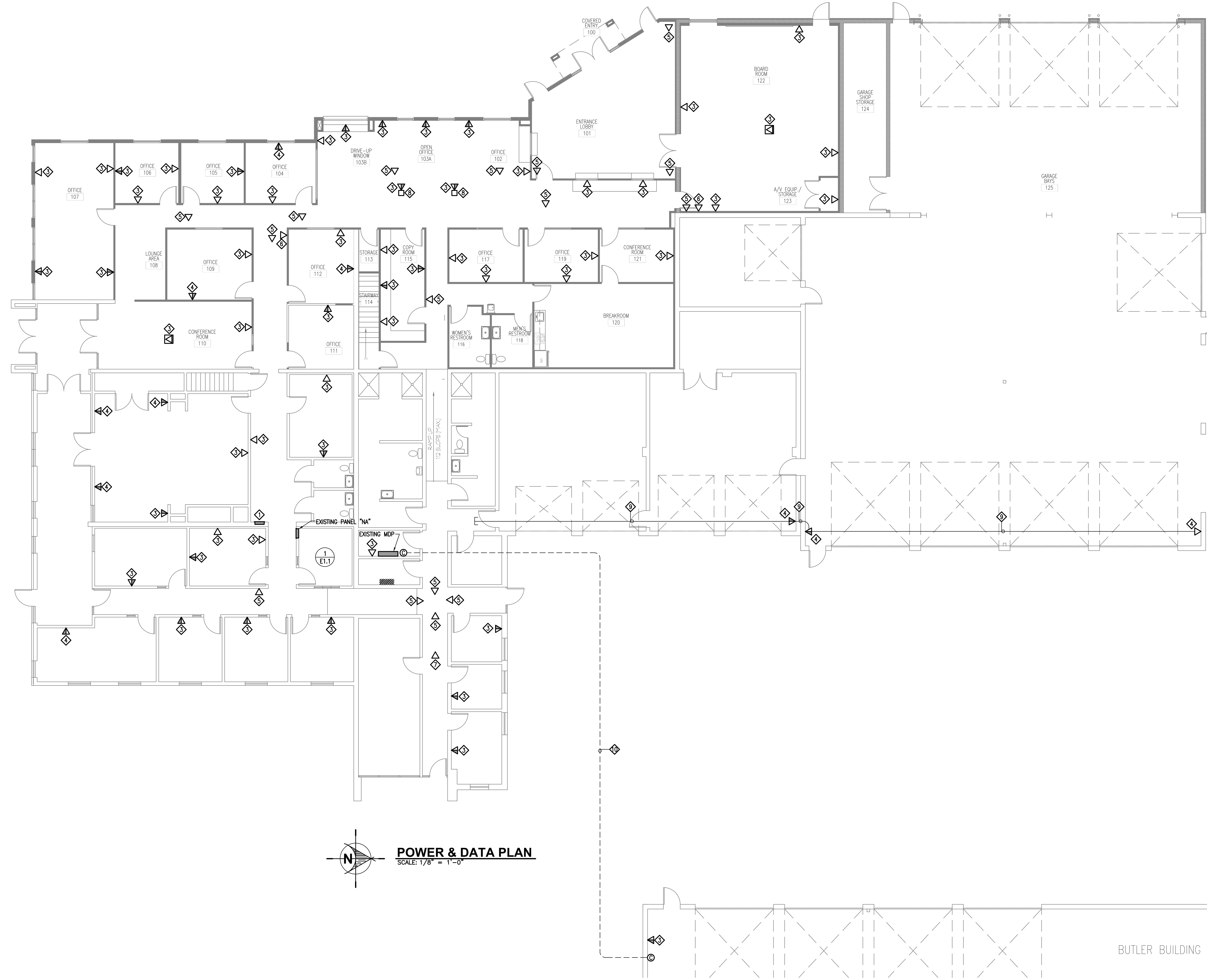
DRAWING TITLE:
ELECTRICAL COVER SHEET

DRAWN BY:	CHECKED BY:
MRB	JCB

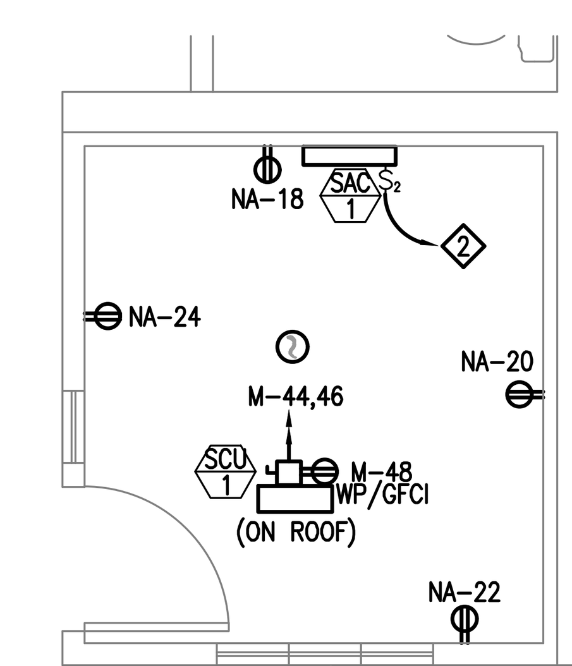
DATE PLOTTED: 3/6/2025

PROJECT #: J24277.00

E0.1



POWER & DATA PLAN
SCALE: 1/8" = 1'-0"



SERVER ROOM
1/E1.1 SCALE: 1/4" = 1'-0"

ELECTRICAL KEYED NOTES:

1. REMOVE TWO SECTION PANEL FROM BASEMENT. INSTALL NEW SINGLE SECTION PANEL ON THE FIRST FLOOR. FRAME OUT WALL ON FIRST FLOOR TO ACCOMMODATE PANEL. INSTALL NEMA 3R GUTTER AT THE LOCATION OF EXISTING PANELS TO CAPTURE EXISTING CONDUIT AND MC CABLE. EXTEND ALL CIRCUITS FROM OLD LOCATION TO THE NEW LOCATION. PROVIDE NEW 60 SPACE RECESSED PANEL UTILIZING THE EXISTING BREAKERS. SEE PANEL SCHEDULE.
2. PROVIDE CONNECTION TO OUTDOOR UNIT. INDOOR UNIT IS POWERED FROM THE OUTDOOR UNIT.
3. EXISTING JACK LOCATION. REPLACE CABLE, JACK AND FACEPLATE. TERMINATE AND TEST. PROVIDE TEST RESULTS TO OWNER. TELEPHONE/DATA SYMBOL PROVIDE (2) CAT6 CABLES, DATA SYMBOL ONLY PROVIDE (1) CAT6 CABLE.
4. NEW JACK LOCATION. PROVIDE CABLE, JACK AND FACEPLATE. TERMINATE AND TEST. PROVIDE TEST RESULTS TO OWNER. TELEPHONE/DATA SYMBOL PROVIDE (2) CAT6 CABLES, DATA SYMBOL ONLY PROVIDE (1) CAT6 CABLE.
5. EXISTING CAMERA LOCATION. PROVIDE (1) CAT6 CABLE.
6. EXISTING WIRELESS ACCESS POINT LOCATION. PROVIDE (1) CAT6 CABLE.
7. NEW WIRELESS ACCESS POINT LOCATION. PROVIDE (1) CAT6 CABLE.
8. REPLACE EXISTING PHONE/DATA IN POWER POLE.
9. DATA RUNS IN GARAGE REQUIRE ¾" CONDUIT.
10. EXISTING UNDERGROUND CONDUIT WITH CAT5 CABLE TO BE REPLACED WITH CAT6.

PERFORMANCE NOTES:

1. ALL EXISTING CAT5 DATA CABLE TO BE REMOVED OUT OF CEILING AND REPLACED WITH CAT6 FROM EACH DATA POINT TO THE SERVER ROOM.

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REGISTERED PROFESSIONAL ENGINEER
1138139
M. RYAN BEAGLES
3/6/25
STATE OF UTAH

REVISIONS:

TBID SERVER ROOM RELOCATION

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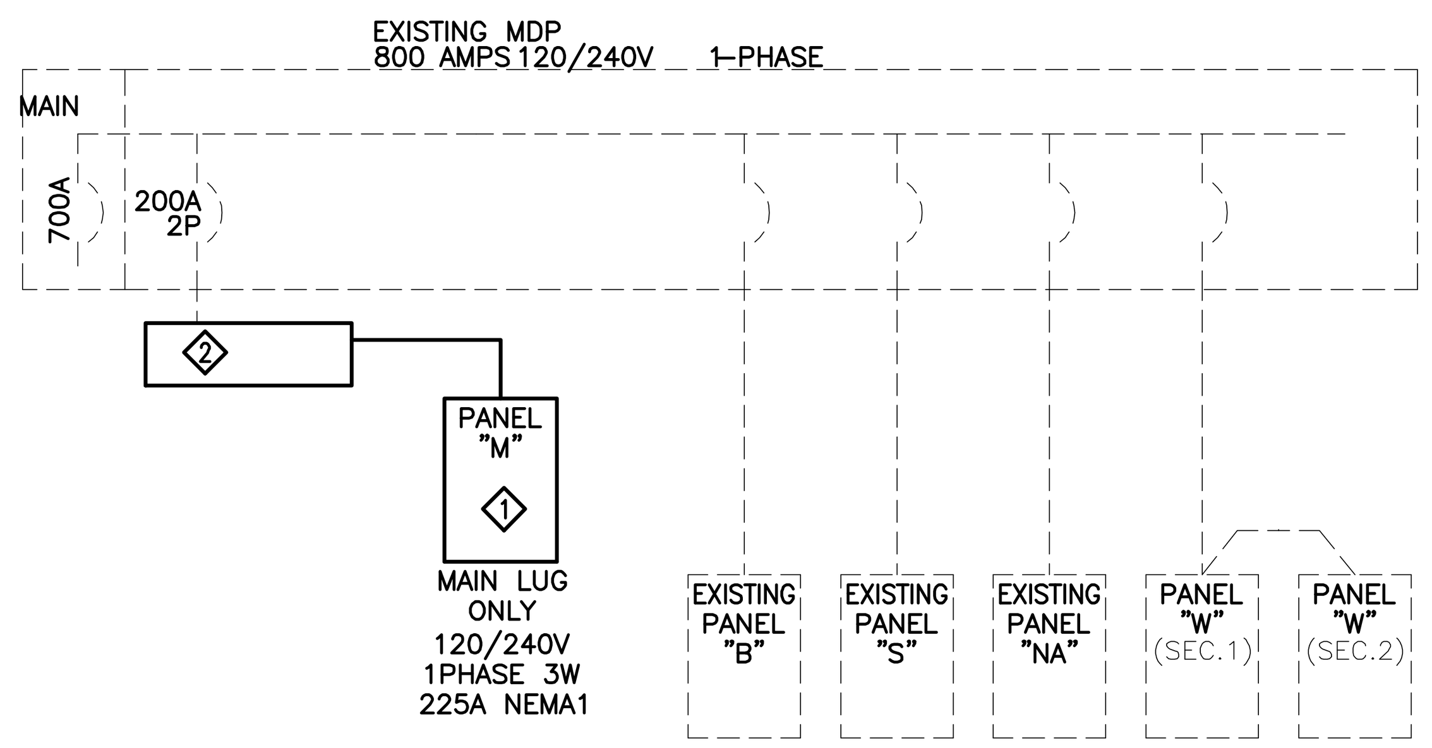
DRAWING TITLE:	POWER PLAN
DRAWN BY: MRB	CHECKED BY: JCB
DATE PLOTTED:	3/6/2025
PROJECT #:	J24277.00

E1.1

ELECTRICAL KEYED NOTES:

1. RELOCATE TWO SECTION PANEL FROM BASEMENT TO FIRST FLOOR.
2. INSTALL NEMA 3R GUTTER AT THE LOCATION OF EXISTING PANELS TO CAPTURE EXISTING CONDUIT AND MC CABLE. EXTEND ALL CIRCUITS FROM OLD LOCATION TO THE NEW LOCATION.



1 POWER ONE-LINE DIAGRAM

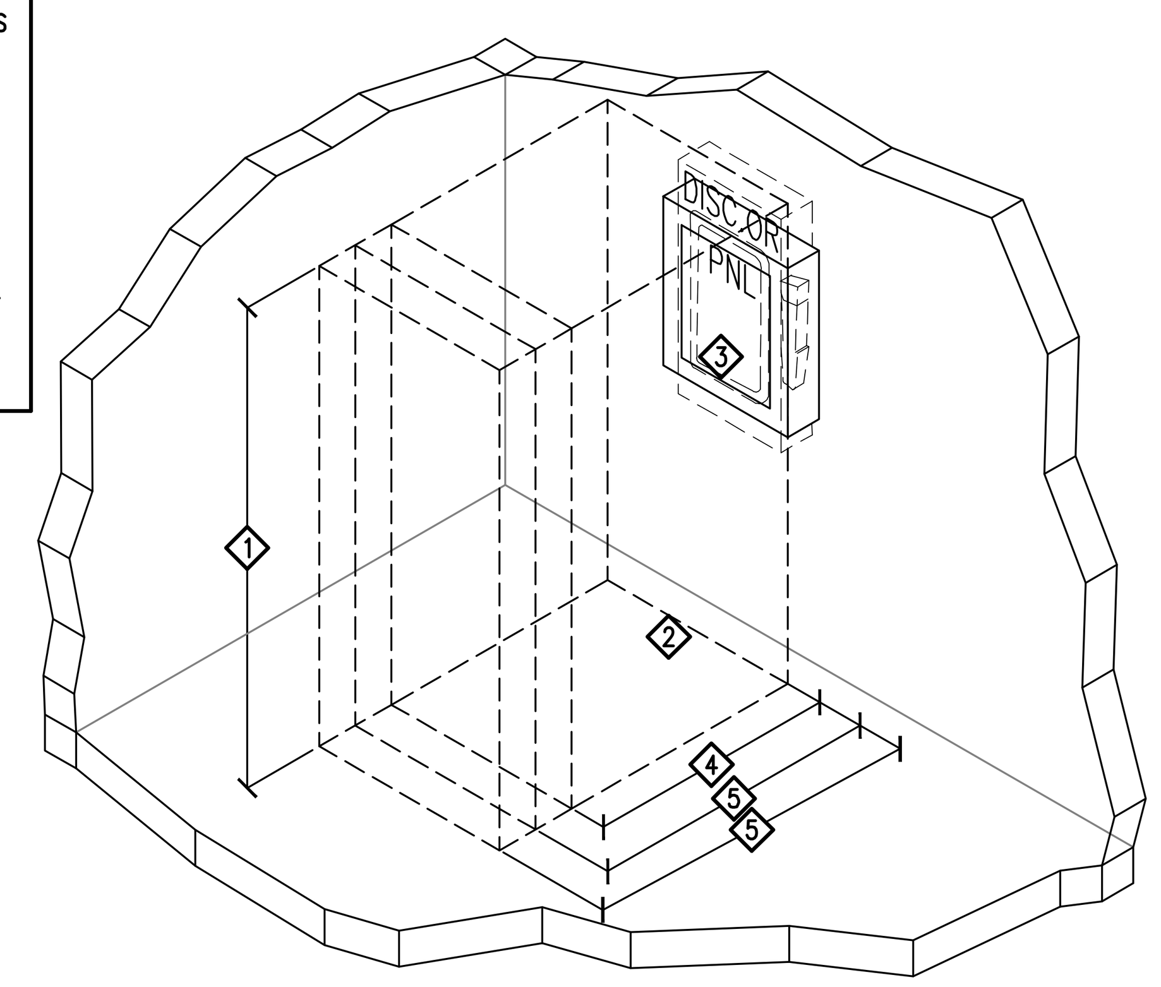
SCALE: NONE

KEYED NOTES:

1. THE MINIMUM HEADROOM OF WORKING SPACE SHALL BE 6½ FT.
2. THE WIDTH OF THE WORKING SPACE SHALL BE THE WIDTH OF THE EQUIPMENT OR 30 IN., WHICHEVER IS GREATER. THE PANEL DOOR SHALL OPEN AT LEAST 90 DEGREES.
3. ALL CIRCUIT BREAKERS OR DISCONNECT HANDLES SHALL BE NOT MORE THAN 6 FT 7 IN. ABOVE THE FLOOR WHEN IN THEIR HIGHEST POSITION.
4. 3 FT CLEARANCE IF 0–150V TO GROUND
5. 3.5FT CLEARANCE IF 151–600V TO GROUND. 4FT IF EXPOSED LIVE PARTS ON BOTH SIDES OF THE WORKING SPACE.

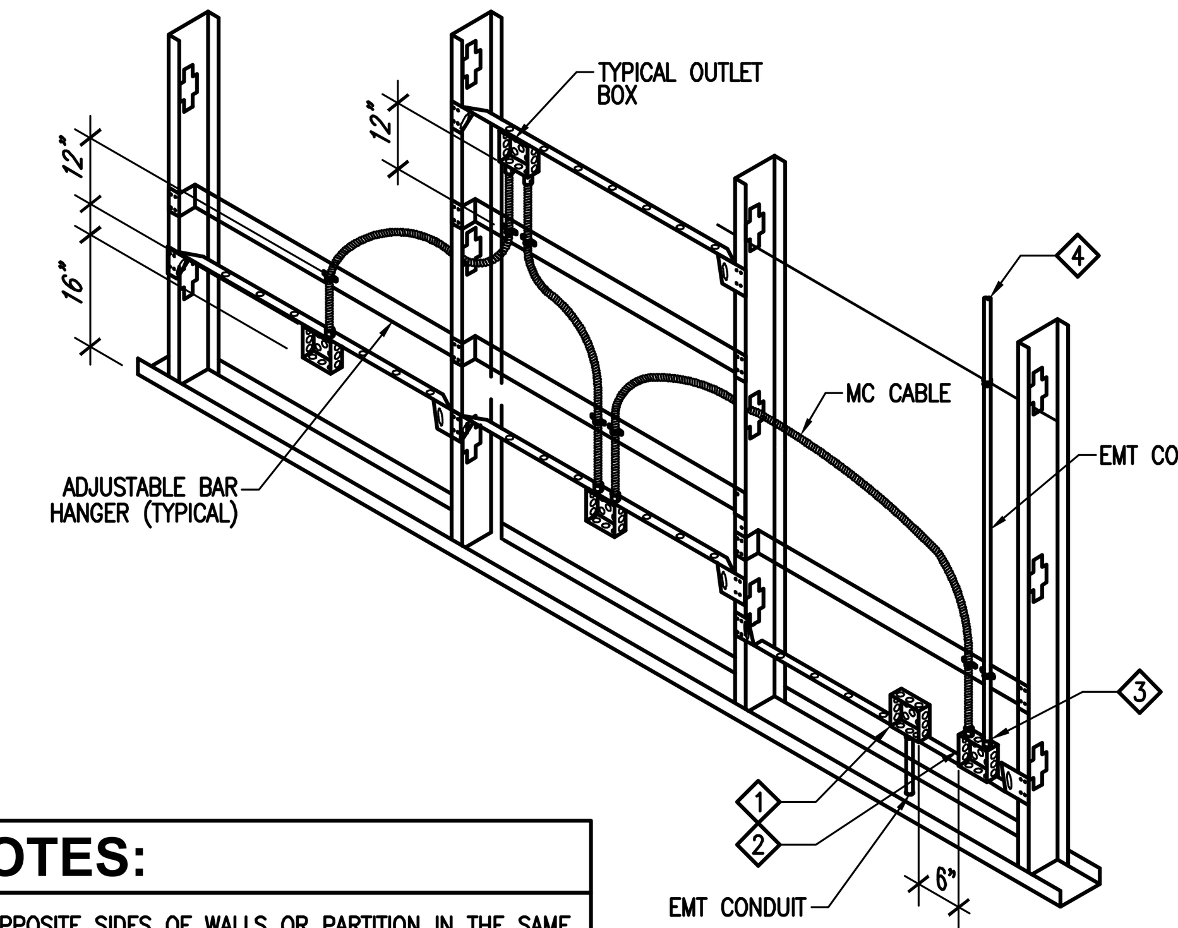
GENERAL NOTE:

1. ALL WORKING SPACE CLEARANCE FROM FACE OF PANEL.



2 ELECTRICAL EQUIPMENT WORK SPACE CLEARANCES

SCALE: NTS



KEYED NOTES:

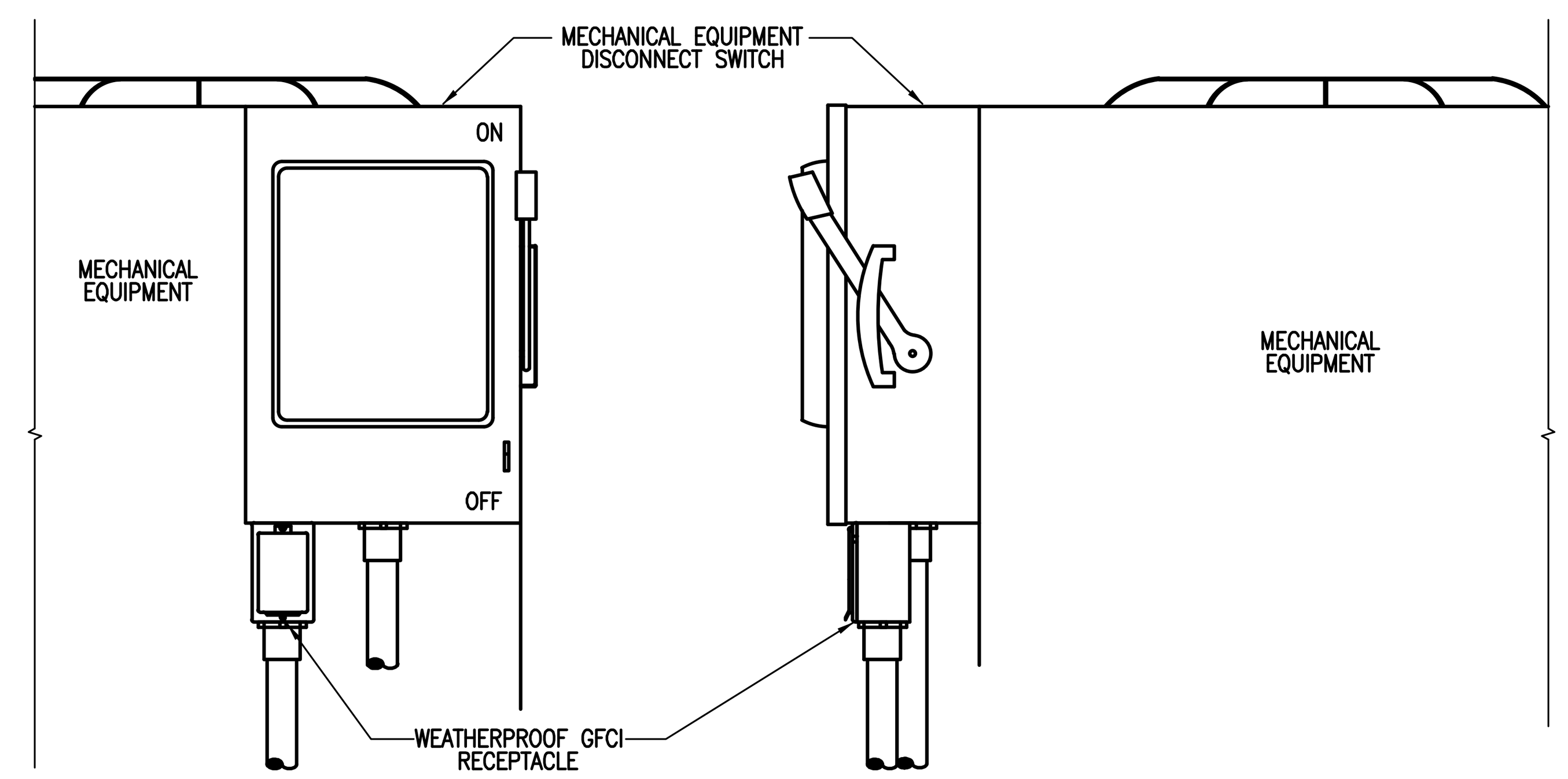
1. OUTLET BOXES ON OPPOSITE SIDES OF WALLS OR PARTITION IN THE SAME STUD SPACE MUST BE SEPARATED BY A MIN. OF 6" HORIZONTAL DISTANCE.
2. ELECTRICAL BOXES INSTALLED IN FIRE RESISTANT WALLS OR PARTITIONS SHALL COMPLY WITH IBC 714.4.2 (24" SEPARATION ON OPPOSITE SIDES.)
3. INSULATED THROAT EMT CONNECTOR.
4. HOME RUN TO PANEL MUST BE IN RACEWAY.

GENERAL NOTES:

1. TYPICAL FOR WOOD AND METAL STUD ROUGH IN.
2. PLASTER RINGS NOT SHOWN. COORDINATE RING DEPTH TO BE FLUSH WITH FINAL FINISH SURFACE.
3. LOCATE ALL OUTLET BOXES IN ACCORDANCE WITH ARCHITECTURAL AND MECHANICAL DRAWINGS, AND WITH ALL APPLICABLE SHOP DRAWINGS.

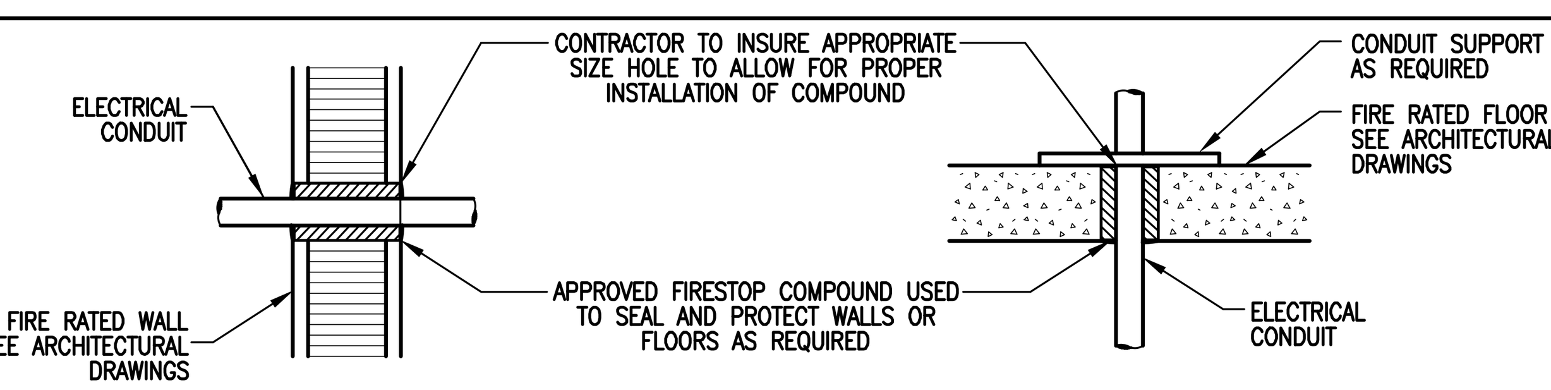
3 ROUGH-IN DETAIL FOR MC CABLE

SCALE: NTS



4 WEATHERPROOF RECEPTACLE INSTALLATION DETAIL

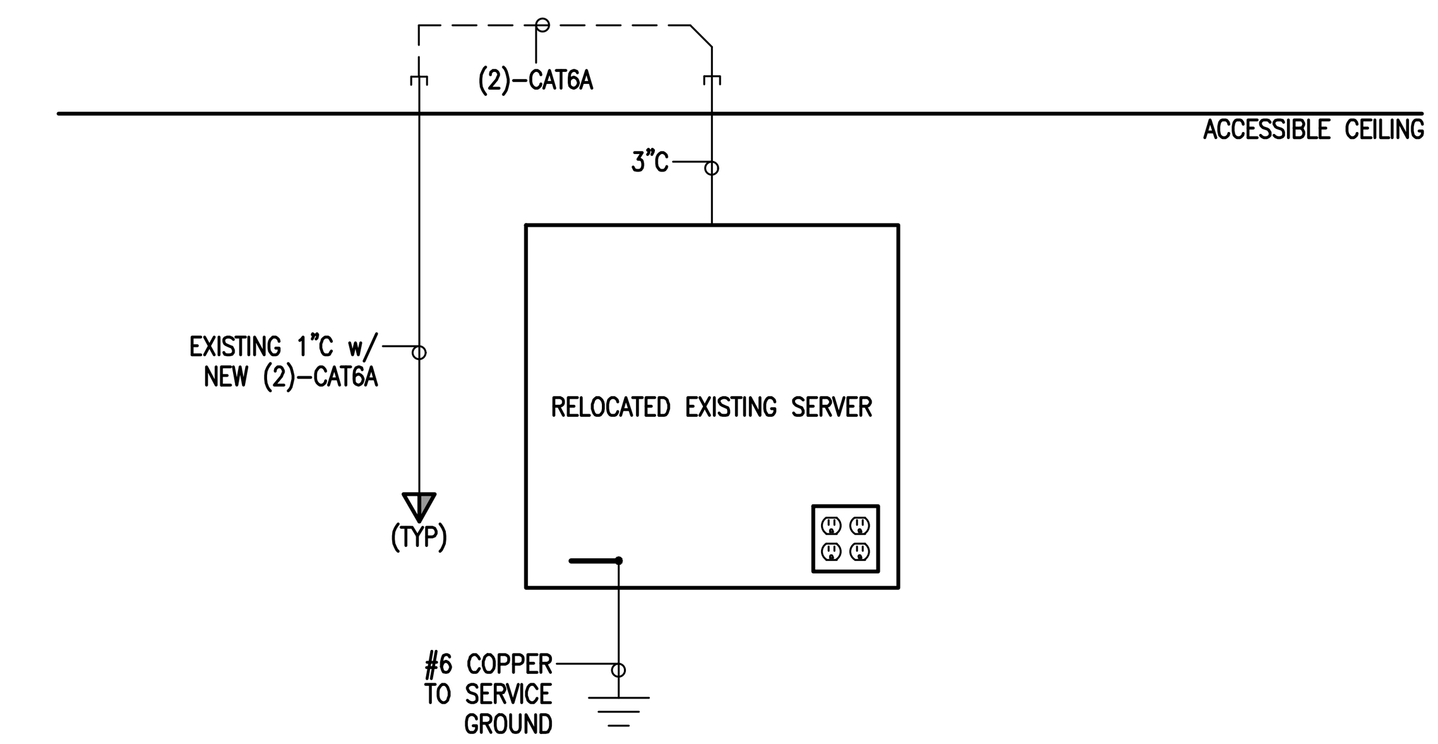
SCALE: NTS



NOTE:
1. ALL FIRE STOPPING COMPOUND TO BE INSTALLED UNDER STRICT ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.

5 FIRE RATED PENETRATION DETAIL

SCALE: NTS



6 COMMUNICATIONS RISER DIAGRAM

SCALE: NTS

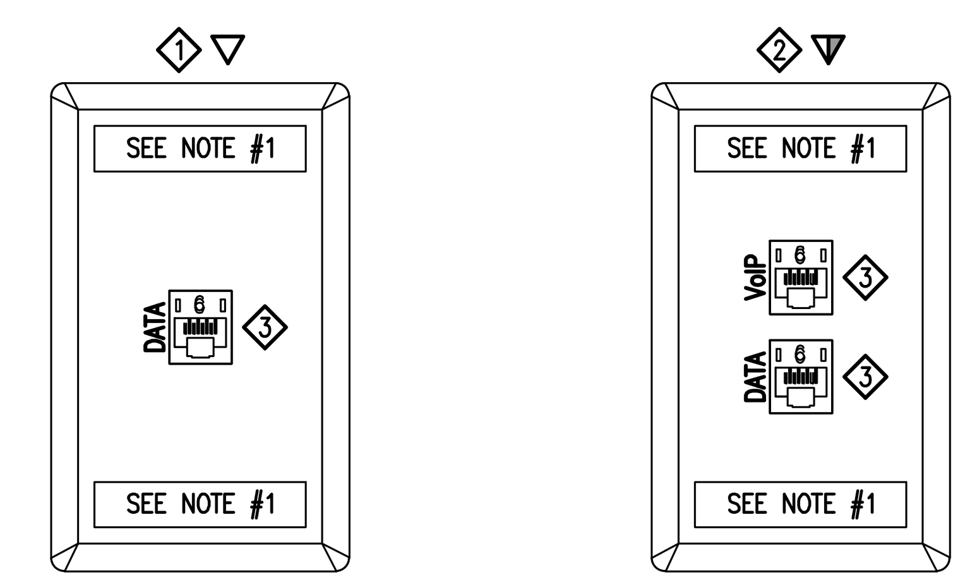
KEYED NOTES:

1. 1-PORT SINGLE GANG FACEPLATE (HUBBELL #IFP11*)
2. 2-PORT SINGLE GANG FACEPLATE (HUBBELL #IFP12*)
3. CAT 6 8-POSITION JACK (HUBBELL #HXJ6*)

GENERAL NOTES:

1. COORDINATE STATION AND PORT LABELING WITH OWNER.
2. ALL PATCH CABLES AND STATION CABLES SHALL BE PROVIDED AND INSTALLED BY EC.
3. ALL PATCHING AND/OR CROSS CONNECTION SHALL BE PERFORMED BY THE EC.

* MATCH FACEPLATE COLOR TO RECEPTACLES.



7 DATA/VOICE JACK INSTALLATION DETAIL

SCALE: NTS

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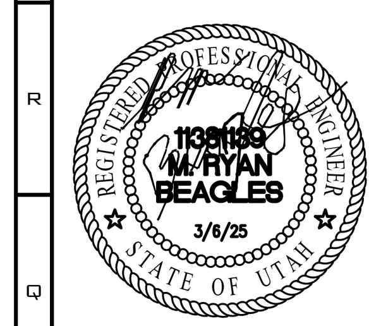

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DRAWING TITLE:	ELECTRICAL DETAILS
DRAWN BY: MRB	CHECKED BY: JCB
DATE PLOTTED:	3/6/2025
PROJECT #:	J24277.00

E5.1

FAULT CURRENT CALCULATION TABLE

MAIN UTILITY COMPANY TRANSFORMER (ROCKY MOUNTAIN POWER)	TRANSFORMER KVA	AFC AT UTILITY	%Z
1Ø 120/240V -400A	75	20,973 A	1.49%

CONFIGURATION						FEEDER			SYSTEM								
FROM		TO		LENGTH	SOURCE FAULT CURRENT	FEEDER SIZE	FEEDERS PER PHASE	WIRE CONSTANT	LINE TO LINE VOLTS	XFMR SECONDARY VOLTS	PHASE	KVA	%Z	MOTOR LOAD	FAULT CURRENT AT EQUIPMENT	FULL OR SERIES RATED	MINIMUM SYMMETRICAL EQUIPMENT AIC RATING
TRANSFORMER	UTILITY	SWITCHBOARD	METER	100'-0"	20,973 AIC	350 AL	2	16,813	240 V		1Ø		-		16,647 AIC	FULL	22,000 AIC
SWITCHBOARD	METER	SWITCHBOARD	MDP	60'-0"	16,647 AIC	350 AL	2	16,813	240 V		1Ø		-		14,814 AIC	FULL	22,000 AIC
SWITCHBOARD	MDP	PANELBOARD	M	40'-0"	14,814 AIC	3/0 CU	1	13,923	240 V		1Ø		-		12,582 AIC	FULL	22,000 AIC

NOTE: DISTANCES INDICATED ARE FOR FAULT-CURRENT ANALYSIS ONLY. CONTRACTOR SHALL USE FIELD MEASUREMENTS ESTABLISH CONDUCTOR LENGTHS FOR ORDERING PURPOSES.

EQUIPMENT SCHEDULE

SYMBOL	DESCRIPTION	SERVICE		DISCONNECT		STARTER	LOAD			REMARKS
		VOLTS	PHASE	SIZE	FUSE		HP/TON	VA	AMPS	
SAC 1	SPLIT AIR CONDITIONER	240 V	1Ø	2 POLE SWITCH	-	INTEGRAL	-	240	1.0A	POWERED FROM OUTDOOR UNIT
SCU 1	SPLIT CONDENSING UNIT	240 V	1Ø	30A NEMA 3R	-	INTEGRAL		4,320	18.0A	MOCP 30A

NOTES:

1. VERIFY ALL EQUIPMENT LOCATIONS AND CONNECTION REQUIREMENTS (i.e. VOLTAGE, PHASE, FLA, ETC.) WITH MECHANICAL DRAWINGS/SUBMITTALS BEFORE FOR ACTUAL EQUIPMENT INSTALLED.
2. ALL FUSES SHALL BE DUAL ELEMENT TIME DELAY. FINAL BREAKER/FUSE & DISCONNECT SIZE SHALL BE DETERMINED BY MANUFACTURER'S RECOMMENDATION FOR ACTUAL EQUIPMENT INSTALLED.
3. MAXIMUM VALUES INDICATED.
4. DISCONNECTING MEANS NOT REQUIRED FOR EQUIPMENT WITHIN SIGHT (AS DEFINED IN NEC) OF BRANCH PANEL SERVING EQUIPMENT. SEE NEC 422.31 (B).
5. DISCONNECTING MEANS NOT REQUIRED FOR APPLIANCES NOT OVER 300 VA. SEE NEC 422.31 (A).

PANEL SCHEDULE "M"

VOLTAGE: 240 / 120 VOLTS — **BUS RATING (AMPS):** 200 — **REMARKS:** NEW 60 CIRCUIT PANELBOARD USING BREAKERS FROM OLD TWO SECTION PANELBOARD.

MOUNTING: FLUSH — **PHASE:** 1 — **MAIN LUGS ONLY**

ENCLOSURE: NEMA 1 — **WIRE:** 3 — **SHORT CIRCUIT RATING:** SEE FAULT CURRENT TABLE

CIRCUIT BREAKER					CIRCUIT NAME	FEEDER			CKT. LOAD		LOAD/PHASE (VA)		CKT. LOAD		FEEDER			CIRCUIT NAME	CIRCUIT BREAKER				
No.	AMPS	POLE	ENERGY USE [6]	MOD.		C	WIRE	GRD	DEMAND FACTOR	WATTS	ØA	ØB	WATTS	DEMAND FACTOR	GRD	WIRE	C		MOD.	ENERGY USE [6]	POLE	AMPS	No.
1	20	1	-	EX	REPAIR SHOP				1.00		0			1.00				A/C NEW	EX	-	1	20	2
3	20	1	-	EX	SIMPLEX UPSTAIRS				1.00			0		1.00				A/C NEW	EX	-	1	20	4
5	20	1	-	EX	LIGHTS UPSTAIRS				1.00		0			1.00				A/C EXISTING	EX	-	1	20	6
7	20	1	-	EX	SYSTEM CONTROL LIGHTS				1.00			0		1.00				A/C EXISTING	EX	-	1	20	8
9	20	1	-	EX					1.00		0			1.00				LIGHTS DOWNSTAIRS	EX	-	1	20	10
11	20	1	-	EX	OUTLETS UPSTAIRS				1.00			0		1.00				OUTLETS UPSTAIRS	EX	-	1	20	12
13	20	1	-	EX	BOARD ROOM				1.00		0			1.00				BASEMENT LIGHTS	EX	-	1	20	14
15	20	1	-	EX	SPACE				1.00			0		1.00				TC OUTSIDE LIGHTS	EX	-	1	20	16
17	20	1	-	EX	OLD FURNACE				1.00		0			1.00				OUTLETS DOWNSTAIRS	EX	-	1	20	18
19	20	1	-	EX	SPACE				1.00			0		1.00				OUTLETS UPSTAIRS	EX	-	1	20	20
21	20	1	-	EX	SPACE				1.00		0			1.00				OUTLETS UPSTAIRS	EX	-	1	20	22
23	20	1	-	EX	COMPUTER				1.00			0		1.00				OUTLETS SW CORNER	EX	-	1	20	24
25	20	1	-	EX	COMPUTER				1.00		0			1.00				NEW FURNACE/SO BASEMENT	EX	-	1	20	26
27	20	1	-	EX	SOUTHWEST LIGHTS				1.00			0		1.00				SPACE	EX	-	1	20	28
29	20	1	-	EX	SPACE				1.00		0			1.00				TERMINAL OUTLET	EX	-	1	20	30
31	20	1	-	EX	SPACE				1.00			0		1.00				NORTH-WEST TERMINAL OUTLET	EX	-	1	20	32
33	20	1	-	EX	TERMINAL OUTLET				1.00		0			1.00				LIGHT DOWNSTAIRS	EX	-	1	20	34
35	20	1	-	EX	TERMINAL ROOM				1.00			0		1.00				COMPUTER TERMINAL	EX	-	1	20	36
37	20	1	-	EX	SPACE				1.00		0			1.00				SOUTHEAST OFFICE	EX	-	1	20	38
39	20	1	-	EX	LIGHTS KITCHEN-TERMINAL RM				1.00			0		1.00				CENTER SOUTH OFFICE LIGHTS	EX	-	1	20	40
41	20	1	-	EX	OUTLETS SOUTH OF KITCHEN				1.00		0			1.00				FIRE SPRINKLER	EX	-	1	20	42
43	50	2	-	EX	RANGE				1.00			2,160	2,160	1.00	#10	#10	¾"	SPLIT AIR CONDITIONER	NEW	-	2	30	44
45	-	-	-	EX	-	-		-	1.00		2,160		2,160	1.00	-	#10	-	-	NEW	-	-	.	46
47	20	1	-	EX	WATER HEATER				1.00			180	180	1.00	#12	#12	¾"	ROOFTOP RECEPTACLE	EX	-	1	20	48
49	20	1	-	EX	SPARE				1.00		0			1.00				SPARE	EX	-	1	20	50
51	20	1	-	EX	SPARE				1.00			0		1.00				SPARE	EX	-	1	20	52
53	20	1	-	EX	SPARE				1.00		0			1.00				SPARE	EX	-	1	20	54
55	20	1	-	EX	SPARE				1.00			0		1.00				SPARE	EX	-	1	20	56
57	20	1	-	EX	SPARE				1.00		0			1.00				SPARE	EX	-	1	20	58
59	20	1	-	EX	SPARE				1.00			0		1.00				SPARE	EX	-	1	20	60

NOTES :

1. ALL INSULATION ON CONDUCTORS TO BE THHN UNLESS NOTED OTHERWISE. INSULATION ON ALL UNDERGROUND EXTERIOR CONDUCTORS SHALL BE THHW.
2. LOAD DEMANDS CALCULATED AS PER SECTIONS 210 & 220 OF THE NATIONAL ELECTRICAL CODE.
3. PANEL COVER SHALL BE FIELD MARKED FOR FLASH PROTECTION WITH A PERMANENT LABEL AS REQUIRED BY THE NATIONAL ELECTRICAL CODE SECTION 110. LABEL SHALL READ: "DANGER: POTENTIAL ARC FLASH HAZARD"
4. PANELBOARD SHALL BE FIELD MARKED WITH THE AVAILABLE FAULT CURRENT PER NEC 408.6.
5. FIRE ALARM SYSTEMS SHALL HAVE BRANCH CIRCUITS IDENTIFIED BY RED LABELS STATING "FIRE ALARM CIRCUIT" AS REQUIRED BY THE NATIONAL ELECTRICAL CODE ARTICLE 760.41B
6. END-USE METERING CATEGORIES - TOTAL (HVAC) SYSTEM, (INLTG) INTERIOR LIGHTING, (EXLTG) EXTERIOR LIGHTING, (PLUG) LOADS, (PROC)ESS LOAD, BUILDING OPERATIONS AND OTHER (MISC)ELLANEOUS LOADS.

ØA	ØB	TOTALS	
2,160	2,340	4,500	CONNECTED LOAD (VA)
		19	CONNECTED LOAD (A)
0	0	0	DEMAND FACTOR ADJUSTMENTS (VA)
2,160	2,340	4,500	TOTAL LOAD (VA)
18	20	20	TOTAL LOAD (A)
48%	52%		PHASE BALANCE

PANEL SCHEDULE "NA"

VOLTAGE: 240 / 120 VOLTS — **BUS RATING (AMPS):** 225 — **REMARKS:** EXISTING CUTLER-HAMMER PANEL

MOUNTING: FLUSH — **PHASE:** 1 — **MAIN LUGS ONLY**

ENCLOSURE: NEMA 1 — **WIRE:** 3 — **SHORT CIRCUIT RATING:** EXISTING

CIRCUIT BREAKER					CIRCUIT NAME	FEEDER			CKT. LOAD		LOAD/PHASE (VA)		CKT. LOAD		FEEDER			CIRCUIT NAME	CIRCUIT BREAKER				
No.	AMPS	POLE	ENERGY USE [6]	MOD.		C	WIRE	GRD	DEMAND FACTOR	WATTS	ØA	ØB	WATTS	DEMAND FACTOR	GRD	WIRE	C		MOD.	ENERGY USE [6]	POLE	AMPS	No.
1	20	1	-	EX	SIGN POWER VIA T-C				1.25		0			1.00				SMALL CONFERENCE RECEPT.	EX	-	1	20	2
3	20	1	-	EX	FLAG POLE LIGHTING VIA T-C				1.25			0		1.00				OFFICE RECEPT.	EX	-	1	20	4
5	20	1	-	EX	PARKING LIGHTING VIA T-C				1.25		0			1.00				OFFICE RECEPT.	EX	-	1	20	6
7	20	1	-	EX	PARKING LIGHTING VIA T-C				1.25			0		1.00				OFFICE RECEPT.	EX	-	1	20	8
9	20	1	-	EX	CORRIDORE LIGHTING				1.25		0			1.00				OFFICE RECEPT.	EX	-	1	20	10
11	20	1	-	EX	OFFICE LIGHTING				1.25			0		1.00				MAP ROOM RECEPT.	EX	-	1	20	12
13	20	1	-	EX	OFFICE LIGHTING (SCADA)				1.25		0			1.00				OFFICE RECEPT.	EX	-	1	20	14
15	20	1	-	EX	BOARDROOM LIGHTING				1.25			0		1.25				EMERGENCY LIGHTING	EX	-	1	20	16
17	20	1	-	EX	ENTRY LIGHTING				1.25		360		360	1.00	#12	#12	¾"	SERVER ROOM RECP.	EX	-	1	20	18
19	20	1	-	EX	SPARE				1.00			360	360	1.00	#12	#12	¾"	SERVER ROOM RECP.	EX	-	1	20	20
21	20	1	-	EX	SPARE				1.00		360		360	1.00	#12	#12	¾"	SERVER ROOM RECP.	EX	-	1	20	22
23	20	1	-	EX	SPARE				1.00			360	360	1.00	#12	#12	¾"	SERVER ROOM RECP.	EX	-	1	20	24
25	20	1	-	EX	SPARE				1.00		0			1.00				SPARE	EX	-	1	20	26
27	20	1	-	EX	SPARE				1.00			0		1.00				SPARE	EX	-	1	20	28
29	20	1	-	EX	SPARE				1.00		0			1.00				EAST GATE	EX	-	1	20	30
31	20	2	-	EX	SPARE				1.00			0		1.00				SPARE	EX	-	2	20	32
33	-	-	-	EX	-				1.00		0			1.00				-	EX	-	-	-	34
35			-	-	SPACE				1.00			0		1.00				CONDENSER UNIT-1	EX	-	2	50	36
37			-	-	SPACE				1.00		0			1.00	-		-	-	EX	-	-	-	38
39	20	1	-	EX	FURNACE-1				1.00			0		1.00				CONDENSER UNIT-2	EX	-	2	50	40
41	20	1	-	EX	WEST GATE				1.00		0			1.00	-		-	-	EX	-	-	-	42

NOTES :

1. ALL INSULATION ON CONDUCTORS TO BE THHN UNLESS NOTED OTHERWISE. INSULATION ON ALL UNDERGROUND EXTERIOR CONDUCTORS SHALL BE THHW.
2. LOAD DEMANDS CALCULATED AS PER SECTIONS 210 & 220 OF THE NATIONAL ELECTRICAL CODE.
3. PANEL COVER SHALL BE FIELD MARKED FOR FLASH PROTECTION WITH A PERMANENT LABEL AS REQUIRED BY THE NATIONAL ELECTRICAL CODE SECTION 110. LABEL SHALL READ: "DANGER: POTENTIAL ARC FLASH HAZARD"
4. PANELBOARD SHALL BE FIELD MARKED WITH THE AVAILABLE FAULT CURRENT PER NEC 408.6.
5. FIRE ALARM SYSTEMS SHALL HAVE BRANCH CIRCUITS IDENTIFIED BY RED LABELS STATING "FIRE ALARM CIRCUIT" AS REQUIRED BY THE NATIONAL ELECTRICAL CODE ARTICLE 760.41B
6. END-USE METERING CATEGORIES - TOTAL (HVAC) SYSTEM, (INLTG) INTERIOR LIGHTING, (EXLTG) EXTERIOR LIGHTING, (PLUG) LOADS, (PROC)ESS LOAD, BUILDING OPERATIONS AND OTHER (MISC)ELLANEOUS LOADS.

ØA	ØB	TOTALS	
720	720	1,440	CONNECTED LOAD (VA)
		6	CONNECTED LOAD (A)
0	0	0	DEMAND FACTOR ADJUSTMENTS (VA)
720	720	1,440	TOTAL LOAD (VA)
6	6	6	TOTAL LOAD (A)
50%	50%		PHASE BALANCE

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DRAWING TITLE: ELECTRICAL SCHEDULES

DRAWN BY:	CHECKED BY:
MRB	JCB

DATE PLOTTED: 3/6/2025

PROJECT #: J24277.00

E6.1

ELECTRICAL SPECIFICATIONS

GENERAL PROVISION

A. REFERENCE
   1. THE GENERAL CONDITIONS AND OTHER CONTRACT DRAWINGS AS SET FORTH IN THE FOREGOING PAGES ARE HEREBY INCORPORATED INTO AND BECOME A PART OF THE SPECIFICATIONS FOR WORK UNDER THIS TITLE, INSOFAR AS THEY APPLY HERETO.
   2. ALL SPECIFICATIONS UNDER THIS DIVISION TITLE ARE DIRECTED TO AND ARE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR, UNLESS OTHER TRADES OR PERSONS ARE SPECIFICALLY MENTIONED, "ELECTRICAL CONTRACTOR" IS INFERRED AND INTENDED.

B. CONTRACT DRAWINGS
   1. THE DRAWINGS ACCOMPANYING THESE SPECIFICATIONS ARE COMPLEMENTARY EACH TO THE OTHER AND WHAT IS CALLED FOR BY ONE SHALL BE AS IF CALLED FOR BY BOTH.
   2. CONSULT ALL CONTRACT DRAWINGS WHICH MAY AFFECT THE LOCATION OF EQUIPMENT, CONDUIT AND WIRING AND MAKE MINOR ADJUSTMENTS IN LOCATION TO SECURE COORDINATION.
   3. WIRING LAYOUT IS SCHEMATIC AND EXACT LOCATIONS SHALL BE DETERMINED BY FIELD CONDITIONS.
   4. OTHER THAN MINOR ADJUSTMENTS SHALL BE SUBMITTED TO THE OWNER'S REPRESENTATIVE FOR APPROVAL BEFORE PROCEEDING WITH THE WORK.

C. JOB-SITE COPY OF DOCUMENTS
   1. MAINTAIN AT THE SITE, ONE COPY OF ALL DRAWINGS, SPECIFICATIONS, ADDENDA APPROVED SHOP DRAWINGS, CHANGE ORDERS AND OTHER MODIFICATIONS, IN GOOD ORDER AND MARKED TO RECORD ALL CHANGES MADE DURING CONSTRUCTION. THESE SHALL BE AVAILABLE TO THE OWNER'S REPRESENTATIVE. THE DRAWINGS MARKED TO RECORD ALL CHANGES MADE DURING CONSTRUCTION SHALL BE DELIVERED TO THE OWNER'S REPRESENTATIVE FOR THE OWNER UPON COMPLETION OF THE WORK. AN ADDITIONAL SET OF DRAWINGS WILL BE FURNISHED BY THE OWNER'S REPRESENTATIVE FOR THIS PURPOSE UPON REQUEST.

D. GUARANTEES
   1. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEFECTS, REPAIRS AND REPLACEMENTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR AFTER DATE OF SUBSTANTIAL COMPLETION AS DETERMINED BY THE OWNER'S REPRESENTATIVE. PRODUCT GUARANTEES GREATER THAN ONE (1) YEAR SHALL BE PASSED ALONG TO THE OWNER FOR FULL BENEFIT OF THE MANUFACTURER'S WARRANTY.

DEMOLITION

E. DESCRIPTION OF WORK
   1. ALL RELOCATIONS, RECONNECTIONS AND REMOVALS ARE NOT NECESSARILY INDICATED ON DRAWINGS. ALL SUCH REQUIRED WORK SHALL BE INCLUDED WITHOUT ADDITIONAL COST TO OWNER. OTHER DEMOLITION WORK SHALL BE PERFORMED AS REQUIRED TO MAINTAIN SYSTEM OPERATION.
   2. THE INTENT OF THE DRAWINGS IS NOT TO SHOW EVERY DEVICE, OUTLET, FIXTURE, CONDUIT, ETC. AFFECTED BY DEMOLITION WORK.
   3. THE DRAWINGS DO NOT NECESSARILY REFLECT AS-BUILT CONDITIONS. THE CONTRACTOR SHALL VISIT THE JOBSITE PRIOR TO BIDDING TO DETERMINE THE OVERALL SCOPE OF DEMOLITION WORK.
   4. REFER TO SECTIONS OF OTHER DIVISIONS FOR APPLICABLE REQUIREMENTS AFFECTING DEMOLITION WORK.

B. GENERAL
   1. DEMOLITION WORK SHALL BE LAID OUT IN ADVANCE TO ELIMINATE UNNECESSARY CUTTING, DRILLING, CHANNELING, ETC. WHERE SUCH CUTTING, DRILLING, OR CHANNELING BECOMES NECESSARY, PERFORM WITH CARE, USE SKILLED MECHANICS OF THE TRADES INVOLVED. REPAIR DAMAGE TO BUILDING AND EQUIPMENT. CUTTING WORK OF OTHER CONTRACTORS SHALL BE DONE ONLY WITH THE CONSENT OF THAT CONTRACTOR. CUTTING OF STRUCTURAL MEMBERS SHALL NOT BE PERMITTED.

C. PATCHING AND REPAIR
   1. THE CONTRACTOR IS RESPONSIBLE FOR ALL DEMOLITION, PATCHING AND REPAIR OF ALL FINISHED INTERIOR SURFACES PERTAINING TO THE INSTALLATION OF THIS PARTICULAR PHASE OF WORK. ALL SURFACES SHALL BE FINISHED (PAINTED, ETC.) TO MATCH THE ADJACENT MATERIALS, FINISHES AND COLORS.
   2. HARD SURFACES: WHENEVER DEMOLITION OR EXCAVATION IS REQUIRED FOR THE INSTALLATION OF THE ELECTRICAL SYSTEM, IT SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR TO MAKE REPAIRS AND/OR REPLACEMENTS OF HARD FINISH SURFACES SUCH AS CONCRETE, ASPHALT, ETC.
   3. THE METHOD OF PATCHING AND REPAIR SHALL FOLLOW GOOD CONSTRUCTION PRACTICES AND ALL FINISHED SURFACES SHALL MATCH MATERIALS AND FINISH WHEREIN THE DEMOLITION OCCURRED.

D. EXISTING EQUIPMENT:
   1. THE NEW ELECTRICAL EQUIPMENT AND APPARATUS SHALL BE COORDINATED AND CONNECTED INTO THE EXISTING SYSTEM AS REQUIRED. AUXILIARY SYSTEMS SHALL COMPLY, UNLESS OTHERWISE SPECIFIED.
   2. THE EXISTING ELECTRICAL DEVICES, CONDUIT AND/OR EQUIPMENT THAT FOR ANY REASON OBSTRUCTS CONSTRUCTION SHALL BE RELOCATED. PROVIDE CONDUIT, WIRING, JUNCTION BOXES, ETC. AS REQUIRED TO EXTEND EXISTING CIRCUITS AND SYSTEMS TO RELOCATED DEVICES OR EQUIPMENT.
   3. THE NEW FIXTURES INDICATED FOR EXISTING OUTLETS SHALL BE INSTALLED IN ACCORDANCE WITH THE FIXTURE SPECIFICATIONS.
   4. WHEN INSTALLING EQUIPMENT IN THE EXISTING BUILDING, IT SHALL BE CONCEALED.
   5. EXISTING RACEWAYS SHALL BE USED WHERE POSSIBLE, EXCEPT AS NOTED. ALL CIRCUITS, CONDUIT AND WIRE THAT ARE NOT USED IN THE REMODELED AREA SHALL BE CAREFULLY REMOVED, AND TURNED OVER TO THE OWNER. THOSE FIXTURES INDICATED FOR RE-USE SHALL BE THOROUGHLY CLEANED, REPAIRED AS REQUIRED, RELAMPED AND INSTALLED AS INDICATED.
   6. OBTAIN PERMISSION FROM THE ARCHITECT AND OWNER'S REPRESENTATIVE BEFORE PENETRATING ANY CEILING, FLOOR, AND WALL SURFACES.

WORK INCLUDED

A. INSTALLATION, MATERIALS, AND WORKMANSHIP
   1. FURNISH AND INSTALL ALL NECESSARY ANCHORS, SUPPORTS, STRAPS, BOXES, FITTINGS AND OTHER SIMILAR APPURTENANCES NOT INDICATED ON THE DRAWINGS BUT WHICH ARE REQUIRED FOR A COMPLETE AND PROPERLY INSTALLED SYSTEM CONSISTENT WITH THE ARCHITECTURAL TREATMENT OF THE BUILDING.
   2. THE ELECTRICAL CONTRACTOR, INSOFAR AS THE WORK IS CONCERNED, SHALL AT ALL TIMES KEEP THE PREMISES IN A NEAT AND ORDERLY CONDITION. AND AT THE COMPLETION OF THE WORK, SHALL PROPERLY CLEAN UP AND CART AWAY DEBRIS AND EXCESS MATERIALS. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST OF DUMPSTER & REFUSED DISPOSAL AS REQUIRED FOR ELECTRICAL WORK.
   3. ALL MATERIALS SHALL BE NEW AND UNDETERIORATED AND OF A QUALITY NOT LESS THAN THE MINIMUM SPECIFIED.

B. COORDINATION OF PLANS AND SPECIFICATIONS
   1. CONTACT THE OWNER'S REPRESENTATIVE IMMEDIATELY IF THERE IS ANY QUESTIONS REGARDING THE MEANING OR INTENT OF EITHER PLANS OR SPECIFICATIONS, OR UPON NOTICING ANY DISCREPANCIES OR OMISSIONS IN EITHER PLANS OR SPECIFICATIONS.

C. CUTTING AND PATCHING
   1. ALL ELECTRICAL EQUIPMENT SHALL BE KEPT DRY AND CLEAN DURING THE CONSTRUCTION PERIOD. INTERIOR OF ALL ENCLOSURES SHALL BE CLEANED OF DIRT AND DEBRIS BEFORE INSTALLING TRIM OR COVERS.
   2. ALL FINISHED SURFACES OF EQUIPMENT FURNISHED UNDER THIS CONTRACT SHALL BE THOROUGHLY CLEANED OF DIRT AND ALL SCRATCHED OR DAMAGED SURFACES SHALL BE TOUCHED UP WITH MATCHING MATERIALS BEFORE FINAL ACCEPTANCE OF THE WORK.
   3. WHEN ALL WORK IS COMPLETED AND ALL WORK HAS BEEN SATISFACTORILY TESTED AND ACCEPTED BY THE OWNER'S REPRESENTATIVE, ALL CONDUIT AND OTHER EXPOSED SURFACES SHALL BE THOROUGHLY CLEANED.

CODES AND FEES

A. CODES:
   1. ALL WORK PERFORMED UNDER THIS SPECIFICATION SHALL BE DONE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE AS PREPARED AND PUBLISHED BY THE NATIONAL FIRE PROTECTION ASSOCIATION AND ANY APPLICABLE STATE OR LOCAL CODES.

B. FEES:
   1. OBTAIN AND PAY FOR ANY AND ALL PERMITS REQUIRED BY ALL LAWS AND REGULATIONS AND PUBLIC AUTHORITY HAVING SUCH JURISDICTION.

TESTS AND INSPECTIONS

A. OBTAIN ALL INSPECTIONS REQUIRED BY ALL LAWS, ORDINANCES, RULES, REGULATIONS OR PUBLIC AUTHORITY HAVING JURISDICTION AND OBTAIN CERTIFICATES OF SUCH INSPECTIONS AND SUBMIT SAME TO THE OWNER'S REPRESENTATIVE. PAY ALL FEES, CHARGES AND OTHER EXPENSES IN CONNECTION THEREIN. OBTAIN OCCUPANCY PERMIT AS REQUIRED BY OWNER. FINAL PAYMENT SHALL NOT BE MADE UNTIL OCCUPANCY PERMIT IS OBTAINED.

B. WORK SHALL BE UNACCEPTABLE WHEN FOUND TO BE DEFECTIVE OR CONTRARY TO THE PLANS SPECIFICATIONS, CODES SPECIFIED OR ACCEPTED STANDARDS OF GOOD WORKMANSHIP.

C. THE CONTRACTOR SHALL PROMPTLY CORRECT ALL WORK FOUND UNACCEPTABLE BY THE OWNER'S REPRESENTATIVE WHETHER OBSERVED BEFORE OR AFTER SUBSTANTIAL COMPLETION AND WHETHER OR NOT FABRICATED, INSTALLED OR COMPLETED. THE CONTRACTOR SHALL BEAR ALL COSTS OF CORRECTING SUCH UNACCEPTABLE WORK, INCLUDING COMPENSATION FOR THE OWNERS REPRESENTATIVE ADDITIONAL SERVICES MADE NECESSARY THEREBY.

CONDUIT

A. FURNISH AND INSTALL ALL CONDUITS, BOXES, FITTINGS, ETC., FOR A COMPLETE RACEWAY SYSTEM.

B. ALL WIRING SHALL BE RUN IN EMT CONDUIT OR MC CABLE WITH GROUND CONDUCTOR UNLESS OTHERWISE NOTED.

C. ALL CONDUIT SIZES STATED HEREIN OR MARKED ON THE DRAWINGS ARE MINIMUM SIZE AND SHALL BE NO LESS THAN ½" UNLESS OTHERWISE NOTED.

D. ALL CONDUIT SHALL BE SUBSTANTIALLY SUPPORTED BY PIPE STRAPS OR SUITABLE CLAMPS OR HANGERS ATTACHED TO THE ELEMENTS OF THE BUILDING STRUCTURE TO PROVIDE RIGID INSTALLATION; IN NO CASE SHALL CONDUIT BE ATTACHED OR SUPPORTED FROM ADJOINING PIPE OR INSTALLED IN SUCH A MANNER AS TO PREVENT THE READY REMOVAL OF OTHER PIPE FOR REPAIRS.

WIRE AND CABLE

A. ALL CONDUCTORS SHALL BE COPPER AND OF THE AWG SIZE AND TYPE SHOWN ON THE DRAWINGS. WHERE NO SIZE OR TYPE IS SHOWN. CONDUCTORS SHALL NOT BE LESS THAN #12 TYPE XHHW, THHN, OR THWN. CONDUCTORS #8 AWG AND LARGER SHALL BE STRANDED COPPER AND HAVE 600 VOLT INSULATION; BE UL LABELED AND OF AMERICAN MANUFACTURER.

B. ALL BRANCH CIRCUITS SHALL BE TYPE MC CABLE.

C. ALL CONNECTIONS ARE TO BE MADE USING PRESSURE TYPE TERMINALS.

D. THE FOLLOWING COLOR CODE SHALL BE USED:

	120/240 VOLT
PHASE A	BLACK
PHASE B	RED
NEUTRAL	WHITE
GROUND	GREEN

E. CONDUCTORS NO. 10 AWG OR SMALLER SHALL HAVE INSULATION COLORED AS NOTED ABOVE.

F. CONDUCTORS NO. 8 AWG OR LARGER SHALL HAVE INSULATION COLORED AS NOTED ABOVE OR COLORED TAPE, MINIMUM SIZE ½", WRAPPED TWICE AROUND AT THE FOLLOWING POINTS:
   1. AT EACH TERMINAL.
   2. AT EACH CONDUIT ENTRANCE.
   3. AT INTERVALS NOT MORE THAN 12 INCHES APART IN ALL BOXES, PANEL TUBS, SWITCHBOARDS, ETC.

G. ALL BRANCH CIRCUITS SHALL BE MARKED IN THE PANEL BOARD GUTTERS. MARKERS SHALL INDICATE CORRESPONDING BRANCH--CIRCUIT NUMBERS.

H. EACH BRANCH CIRCUIT REQUIRING A NEUTRAL SHALL BE FURNISHED WITH A SEPARATE INDIVIDUAL NEUTRAL CONDUCTOR.

BOXES AND PLATES

A. FURNISH AND INSTALL ALL OUTLET, JUNCTION, AND PULL BOXES AS INDICATED ON THE DRAWINGS AND AS NECESSARY TO INSTALL THE REQUIRED CONDUIT AND WIRING IN A NEAT AND PROFESSIONAL AND SKILLFUL MANNER MANNER.

B. PULL BOXES AND JUNCTION BOXES SHALL BE GALVANIZED AND OF THE CORRECT SIZE AND GAUGE, SIZED IN ACCORDANCE WITH CODE REQUIREMENTS AND SHALL BE U.L. LABELED.

C. ALL BOXES FOR EXPOSED WORK IN FINISHED SPACES SHALL BE "FS" TYPE WITH THREADED HUBS WITH RIGID CONDUIT RISER (DEEP WIRE MOLD BOXES).

D. ALL BOXES SHALL BE RIGIDLY SUPPORTED INDEPENDENT OF THE CONDUIT SYSTEM. BOXES CAST INTO MASONRY OR CONCRETE ARE CONSIDERED TO BE RIGIDLY SUPPORTED.

WIRING DEVICES

A. WIRING DEVICES SHALL BE SIMILAR TO THOSE LISTED BELOW AND OF SPECIFIED AMPERAGE. OTHER SPECIAL PURPOSE DEVICES SHALL BE AS SPECIFIED ON THE DRAWINGS.

B. DUPLEX GROUNDING TYPE RECEPTACLE - 20 AMP, 125 VOLT
   1. HUBBELL 5352
   2. ARROW HART 5352

C. SINGLE POLE SWITCHES - 20 AMP, 120 VOLT

D. WEATHERPROOF RECEPTACLES - 20 AMP, 125 VOLT - NEMA 5-20R
   1. HUBBELL 5352 WITH 5205 COVER INTERMATIC GUARDIAN
   2. I SERIES, NEMA 3R COVER
   3. ARROW HART 5352 WITH 4500 COVER

E. G.F.C.I. RECEPTACLE - 20 AMP, 125 VOLT - NEMA 5-20 R
   1. HUBBELL GF 5262 WITH MATCHING NYLON COVER PLATE OR WO-26 W.P. COVER

F. GROUND ALL RECEPTACLES IN ACCORDANCE WITH ARTICLE 250.146 OF NEC AND AS INDICATED IN THE GROUNDING SECTION OF THIS SPECIFICATION.

IDENTIFICATION

A. EACH PIECE OF SERVICE EQUIPMENT AND INDIVIDUAL SWITCHES, ALL DISCONNECTS, STARTERS, ALL EXHAUST FAN MANUAL STARTING SWITCHES.

B. IDENTIFICATION SHALL BE IN THE FORM OF LAMINATED PLASTIC NAMEPLATES, BLACK RACE, WITH THE LETTERS ENGRAVED INTO THE WHITE BACKGROUND, MINIMUM ¼" HIGH. PLATES SHALL BE DRILLED ON EACH END FOR SHEET METAL SCREW ATTACHMENT. NO "DYMO" OR SIMILAR TYPE LABELS WILL BE ALLOWED.

C. PANEL BOARD DIRECTORY: A TYPED CIRCUIT DIRECTORY SHALL BE PROVIDED INDICATING LOCAL AREA SERVED AND LOCATION FOR EACH BRANCH CIRCUIT.

GROUNDING

A. ALL FEEDERS AND BRANCH CIRCUITS OVER 100 VOLTS SHALL INCLUDE A GROUNDING CONDUCTOR SIZED IN ACCORDANCE WITH NEC TABLE 250-122, EXCEPT NOT BE SMALLER THAN #12 FOR POWER AND LIGHTING CIRCUITS AND #14 FOR CONTROL CIRCUITS. ALL GROUND CONDUCTORS SHALL BE GREEN, OR AS SPECIFIED UNDER THE WIRE AND CABLE SECTION OF THIS SPECIFICATION.

B. ALL GROUND CLAMPS SHALL BE PENN-UNION "GPL" TYPE OR SIMILAR BY O.Z. OR BURNDY.

C. CONDUIT FOR SOLITARY GROUND CONDUCTORS SHALL BE RIGID SCHEDULE 40 PVC NON- METALLIC ELECTRICAL CONDUIT WITH U.L. LABEL SOLITARY GROUND CONDUCTORS SHALL NOT BE PLACED THROUGH METALLIC SLEEVES OR CONDUITS AND SHALL NOT BE COMPLETELY ENCIRCLED BY METALLIC HANGERS OR SUPPORTS.

D. THE GROUND CONDUCTOR SHALL BE CONNECTED TO THE NEUTRAL IN ONLY TWO LOCATIONS -ON THE SUPPLY SIDE OF THE SERVICE DISCONNECT MEANS PER NEC--250--24 AND ON SEPARATELY DERIVED SYSTEMS PER NEC 250-30.

E. AT EACH RECEPTACLE BOX, THE GROUND CONDUCTOR SHALL ENTER AND CONNECT, WITH NORMAL WIRING CONNECTOR, TO: 1) THE GROUND PIGTAIL TO RECEPTACLE: 2) THE GROUND PIGTAIL TO THE BOX GROUND SCREW; AND 3) THE OUTGOING GROUND CONDUCTOR TO NEXT DEVICE, IF NOT AT END OF RUN. METAL TO METAL CONTACT BETWEEN THE DEVICE YOKE AND THE OUTLET BOX IS NOT ACCEPTABLE AS A BOND FOR EITHER SURFACE. MOUNTED BOXES OR FLUSH TYPE BOXES.

F. CONDUIT SYSTEM SHALL BE ELECTRICALLY CONTINUOUS. ALL LOCK NUTS SHALL CUT THROUGH ENAMELED OR PAINTED SURFACES ON ENCLOSURES. WHERE ENCLOSURES AND NON-CURRENT CARRYING METALS ARE ISOLATED FROM THE CONDUIT SYSTEM, USE BONDING JUMPERS WITH APPROVED CLAMPS. WHERE REDUCING WASHERS ARE USED AND WHERE CONCENTRIC OR ECCENTRIC KNOCKOUTS ARE NOT COMPLETELY REMOVED BONDING BUSHINGS SHALL BE REQUIRED.

INTERRUPTION OF SERVICE AND OWNER'S OPERATION

A. THE ELECTRICAL CONTRACTOR SHALL ORGANIZE HIS WORK SO THAT THESE ALTERATIONS AND ADDITIONS SHALL CAUSE A MINIMUM OF INTERFERENCE AND DISTURBANCE TO THE OWNER. ARRANGEMENTS SHALL BE MADE WITH THE OWNER AND ENGINEER BEFORE INTERRUPTING SERVICE IN ANY AREA. A WRITTEN DETAILED METHOD OF INTERRUPTION PROCEDURE INDICATING ELAPSED TIME REQUIRED AND TIME OF INTERRUPTION SHALL BE PREPARED BY THE ELECTRICAL CONTRACTOR AND SUBMITTED TO THE OWNER FOR APPROVAL.

B. ALL INTERRUPTIONS OF SERVICE SHALL BE MADE WHEN THE LOAD IS AT A MINIMUM AND SHALL BE SCHEDULED AT THE OWNER'S CONVENIENCE. (SERVICE INTERRUPTIONS WILL BE SCHEDULED FOR OTHER THAN NORMAL DAYTIME WORKING HOURS. THE ELECTRICAL CONTRACTOR SHALL INCLUDE NECESSARY COST FOR OVERTIME LABOR IN ALL BIDS.)

C. AT NO TIME SHALL THE ELECTRICAL CONTRACTOR OR HIS EMPLOYEES NORMALLY WORKING ON THE PROJECT LEAVE THE FACILITY DURING A TIME WHEN ANY NORMALLY LIVE CIRCUITS OR FEEDERS ARE DISCONNECTED, WITHOUT PERMISSION OF THE ENGINEER.

D. ALL MATERIALS, CONNECTIONS AND EQUIPMENT FOR TEMPORARY CONTROL OR POWER WIRING TO MAINTAIN CONTINUITY OF SERVICE DURING CONSTRUCTION SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR.

POWER AND LIGHTING PANELS

A. FURNISH AND INSTALL, AS SCHEDULED AND SHOWN ON THE DRAWINGS, POWER PANELS FOR OPERATION ON VOLTAGES INDICATED.

B. ALL TERMINATIONS SHALL BE MARKED "75°C ONLY", "60/75° C" OR LISTED FOR USE OF 75° C INSULATED CONDUCTORS AT FULL 75° C AMPACITY.

C. ALL BUS BARS SHALL BE SILVER, TIN PLATED COPPER OR TIN PLATED ALUMINUM.

D. CABINETS SHALL BE OF COMMERCIAL GALVANIZED SHEET STEEL, CODE GAUGE AND SIZE, SURFACE OR RECESSED MOUNTED AS CALLED FOR IN THE DRAWINGS.

E. NEUTRAL ASSEMBLY SHALL HAVE INDIVIDUAL ANTI-TURN SOLDERLESS TERMINALS, SIMILAR TO SQUARE D TYPE PK, FOR CONNECTION OF ULTIMATE NUMBER OF NEUTRAL WIRES. SHEET METAL TERMINAL STRIPS AND CONNECTIONS WILL BE REJECTED.

F. PANEL SHALL HAVE A COPPER GROUND BAR SIMILAR TO NEUTRAL BAR IN NUMBER, SIZE, AND TYPE OF ANTI-TURN SOLDERLESS LUGS. THIS GROUND BAR SHALL BE FACTORY BONDED TO THE PANEL TUB IN THE GUTTER SPACE OPPOSITE THE MAINS AND THE NEUTRAL ASSEMBLY AND SHALL HAVE THE SCREWDRIVER SLOTS FACING THE FRONT OF THE PANEL.

G. QUALITY STANDARD: SQUARE D TYPE QO AND NQ.

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TBID SERVER ROOM RELOCATION

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