

CITY OF GRAND HAVEN REQUEST FOR PROPOSALS (RFP)

Architectural & Engineering Services Public Safety Building Expansion and Renovation

Issue Date: October 23, 2026

Proposal Due: December 1, 2026

Estimated Construction Budget: \$11,000,000

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1. Invitation to Submit Proposals

The City of Grand Haven invites qualified architectural and engineering firms to submit proposals for comprehensive professional services to evaluate, program, design, bid, and administer the expansion and renovation of the City's Public Safety building. The City seeks an experienced municipal public safety design team capable of delivering a resilient, efficient, and future-ready facility.

2. Project Schedule

Issue Date: October 23, 2026

Pre-Proposal Meeting: November 3, 2026

Questions Due: November 10, 2026

Proposal Due: December 1, 2026

Interviews: December 8–9, 2026 (If necessary)

Selection: December 21, 2026

3. Statement of Purpose

The project will evaluate the existing facility, identify operational deficiencies, and develop a phased renovation and expansion plan to support Police, Fire, Emergency Operations, and community needs over the next 30-50 years.

4. About the City

The City of Grand Haven is a full-service municipal corporation located in western Michigan along the eastern shoreline of Lake Michigan at the mouth of the Grand River. As the county seat of Ottawa County, Grand Haven serves as the governmental, commercial, recreational, and cultural center for the surrounding region.

Known nationally as "Coast Guard City, USA," Grand Haven combines a vibrant waterfront, historic downtown, nationally recognized beaches, extensive park system, and strong neighborhoods with a growing economy centered on manufacturing, tourism, healthcare, and professional services. The City experiences significant seasonal population increases due to tourism, festivals, recreational boating, and special events, creating public safety demands that far exceed its resident population.

Governance

The City operates under the Council-Manager form of government. The elected City Council establishes policy and strategic direction while appointing the City Manager, who serves as the City's chief administrative officer responsible for daily municipal operations and implementation of Council policy.

The City provides a comprehensive range of municipal services including:

- Police, Fire, and EMS
- Public Works (water and wastewater distribution lines, streets, infrastructure, parks, facilities)
- Water and Wastewater Utilities Operations
- Planning and Community Development
- Harbor Operations
- Building Inspections and Code Enforcement
- Economic Development
- Central Park Place (Community Center)
- Airport Operations

The City's commitment to fiscal responsibility, high-quality public services, and strategic investment has resulted in significant public and private investment throughout the community over the past decade.

Community Demographics

The City has a permanent population of approximately 11,000 residents, while serving a substantially larger daytime and seasonal population.

Key demographic characteristics include:

- Population: approximately 11,000
- Land Area: approximately 5.8 square miles
- Total Service Area: approximately 7.4 square miles, including waterways
- County Seat of Ottawa County
- Median age higher than state averages
- Highly educated workforce
- Strong owner-occupied residential neighborhoods
- Diverse employment base including manufacturing, healthcare, tourism, retail, and professional services

During the summer months, visitor populations increase dramatically due to beaches, marinas, boating, festivals, and waterfront events, significantly increasing service demands placed upon municipal infrastructure and emergency response systems.

Community Growth and Development

Grand Haven has experienced sustained investment and redevelopment while maintaining its historic character and quality of life.

Major community trends include:

- Continued downtown mixed-use redevelopment
- Expansion of waterfront commercial activity
- Increased residential development
- Growth in tourism and visitor activity
- Redevelopment and clean-up of former industrial properties
- Housing investment and neighborhood revitalization
- Expansion of recreational amenities
- Continued investment in public infrastructure
- Increased regional employment opportunities

The City continues to implement its Master Plan through strategic infrastructure improvements, economic development initiatives, housing investments, and redevelopment projects designed to strengthen both the local economy and quality of life.

Grand Haven Department of Public Safety

The City operates one of Michigan's longstanding integrated Public Safety Departments, utilizing a cross-trained public safety model adopted in 1994.

Unlike traditional municipal departments where police, fire, and EMS function independently, Grand Haven Public Safety Officers are trained and certified to provide:

- Law Enforcement
- Fire Suppression
- Emergency Medical Response
- Rescue Operations
- Community Risk Reduction
- Emergency Management

This integrated approach enables efficient deployment of personnel and equipment while providing comprehensive emergency services through a unified organizational structure.

Public Safety Service Area

The Department provides primary emergency services throughout the City of Grand Haven, including:

- Residential neighborhoods
- Historic Downtown
- Commercial corridors
- Industrial areas
- Municipal facilities
- Waterfront districts
- Grand River shoreline
- Lake Michigan shoreline
- Marinas

- Harbor facilities
- Public beaches
- Parks and recreation areas
- Airport facilities

The department also responds to:

- Marine emergencies
- Hazardous materials incidents
- Water rescue operations
- Mutual aid requests
- Regional emergency incidents

Seasonal population fluctuations substantially increase emergency call volumes, requiring flexible staffing and operational readiness throughout the year.

Public Safety Mission

Mission: To protect the community through professional police, fire, and emergency medical services while enhancing the quality of life for everyone who lives, works, and visits the City of Grand Haven.

Vision: To be recognized as a trusted, innovative, community-driven public safety organization that ensures safety, fosters resilience, and strengthens partnerships for future generations.

Public Safety Facility Needs

The existing Public Safety facility has served the community for many years; however, shifting service demands, evolving emergency response standards, safety standards, technology requirements, and workforce needs have underscored the need for expansion and modernization.

Key planning considerations include:

- Expanded administrative space; private, open offices and conference rooms.
- New modernized office furniture in office spaces.
- Modern emergency operations capabilities and flow.
- Enhanced training facilities that allow space for hands-on training.
 - Provide an upgraded training room with modern audiovisual technology to support staff training, meetings, presentations, and community engagement. The space should comfortably accommodate a minimum of 75 people.
- Updated and expanded apparatus bays and equipment storage
 - Current Apparatus Bay Measurements
 - Interior (from wall to wall) 60'x62' = 3720 sq. ft.
 - Indents 2(46'x3') = 276 sq. ft.
 - Total= 3996 sq. ft.

- **Note:** Each individual truck bay is 50'x14' (700 sq. ft.) with 5' of overhang beneath the roof onto the apron, and 1' spacing between bays.
- Preferred Measurements for an Expanded Apparatus Bay
 - Increase the length of each apparatus bay by extending the building footprint and eliminating the existing front overhang.
 - Add one additional apparatus bay stall to increase overall capacity.
 - Target a total apparatus bay area exceeding 4,500 square feet.
- Dedicated Firefighter Decontamination Area: Provide a designated decontamination area specifically designed for firefighters and emergency personnel exposed to smoke, soot, carcinogens, and other hazardous contaminants.
 - Negative Pressure Environment: Incorporate a negative-pressure system to help prevent contaminated air from migrating into clean areas of the Public Safety facility.
 - Separation of Clean and Contaminated Areas: Establish a clearly defined separation between “dirty” and “clean” areas to minimize cross-contamination and protect the health and safety of building occupants.
 - Contaminated PPE and Equipment Management: Provide a controlled space for personnel to remove, handle, and manage contaminated personal protective equipment (PPE) and firefighting equipment following emergency operations.
 - On-Site Decontamination Amenities: Evaluate the inclusion of a steam shower or other appropriate decontamination systems to allow personnel to begin the decontamination process immediately upon returning from an incident.
 - Dedicated Fire Gear Storage: Provide designated storage for firefighting gear, incorporating modern locker systems designed to support proper equipment organization, separation, and contamination control.
- Evidence and Records Management: Provide expanded and improved evidence and records storage and management areas to accommodate current and future operational needs.
 - Interior Evidence Storage: Provide a dedicated interior evidence storage room with minimum dimensions of 40 feet by 40 feet (1,600 square feet).
 - Functional Design: Ensure the layout supports secure storage, efficient organization, controlled access, and appropriate evidence handling procedures.
- Expanded Employee Wellness and Support Facilities: Provide enhanced employee wellness amenities, including a fitness room, dedicated mental health/wellness room and outdoor seating area.
- Improved Locker Rooms and Support Spaces: Expand and modernize locker rooms, restroom facilities, and bunk rooms (2) to accommodate current staffing levels and anticipated future agency growth.
 - Facility Layout and Circulation: Improve the flow and accessibility between locker rooms, the fitness room, and the apparatus bay to support efficient daily operations and emergency response readiness.
 - Private Shower Facilities: Provide individual shower stalls designed to ensure privacy and accommodate personnel needs.
 - Restroom Facilities: Provide adequate restroom capacity, including multiple sinks and toilet stalls, to support current and projected staffing levels.
 - Ventilation and Indoor Air Quality: Incorporate appropriate ventilation systems to maintain air quality, control moisture, and promote occupant comfort.

- Individual Storage and Seating: Provide larger individual lockers with integrated or adjacent seating and sufficient space to securely store uniforms, personal belongings, and required personnel equipment.
 - Incorporate the facility paging and alerting system into each bunk room to ensure personnel receive emergency notifications promptly.
- Modern Dispatch and Technology Infrastructure: Upgrade dispatch systems and technology infrastructure to support reliable communications, efficient operations, and current and future public safety needs.
- Commercial-Grade Kitchen and Dining Facilities: Provide a commercial-grade kitchen designed for continuous, 24/7 public safety operations, featuring a large central island, adequate counter space, storage and refrigeration, and durable, commercial-grade appliances and finishes. The layout should support safe, efficient meal preparation by multiple personnel simultaneously and include a dining and break area with seating for a minimum of 15 personnel.
- Shooting Range Improvements: Upgrade the shooting range backstop, ventilation system, and associated equipment to improve safety, functionality, and overall performance.
- Building Security, Infrastructure, and Resiliency: Improve facility security through enhanced access control, including key card entry systems, and address necessary remediation and ventilation improvements.
- Incorporate energy-efficient, low-maintenance building systems and resilient design features to support long-term performance and operational continuity.
- New Garage Construction: Design a new, approximately 3,300-square-foot, temperature-controlled garage utilizing high-quality, durable, low-maintenance building materials, including steel, brick, or brick veneer, to ensure long-term functionality and aesthetic appeal. The proposed structure shall accommodate a minimum of ten (10) interior vehicle parking spaces and include two (2) overhead garage doors, one (1) personnel entry door, and one (1) interior restroom. The scope shall include all necessary site preparation, foundations, utilities, mechanical, electrical, plumbing, HVAC, and associated improvements required to deliver a fully operational facility in compliance with applicable building codes and regulations.

The City's goal is to develop a facility that supports integrated police, fire, and EMS operations while providing efficient, resilient, and adaptable space that will serve the community for decades to come.

5. Existing Public Safety Facility

Existing Building is as described in **Exhibit A**.

It is expected that the facility will remain operational throughout design and construction; phasing is expected to minimize disruption.

6. Project Goals and Objectives

The City of Grand Haven seeks to create a modern, resilient, and highly functional Public Safety facility that supports the evolving operational needs of its Police and Fire divisions while enhancing service delivery to the community. Through this project, the City intends to:

- Improve operational efficiency
- Strengthen emergency preparedness

- Enhance employee wellness and safety
- Modernize evidence, investigations, training, and emergency operations
- Improve resiliency, security, sustainability, accessibility, and long-term flexibility
- Provide flexible spaces that accommodate future staffing growth

The selected architectural and engineering team will be expected to work collaboratively with City staff to develop innovative, cost-effective solutions that balance functionality, sustainability, security, and long-term stewardship of public resources. These goals and objectives are intended to guide the planning, design, and implementation of the project and establish the framework for a facility that will serve the City and its residents for decades to come.

7. Project Scope

The selected consultant shall prepare a complete assessment and master plan for expansion and renovation of the existing Public Safety building, associated site improvements, parking, utilities, circulation, ventilation, dispatch and technology equipment, and future expansion opportunities.

8. Scope of Professional Services

The City of Grand Haven anticipates completing this project through a phased approach to ensure thoughtful planning, informed decision-making, and successful implementation. Each phase is intended to build upon the previous phase, allowing the City to validate project goals, refine facility programming, confirm project costs, and maintain flexibility as the project advances. Respondents should clearly identify how they will execute each phase, the anticipated deliverables, and the approach they will use to maintain schedule, budget, and effective communication throughout the duration of the project. The City reserves the right to modify the scope, sequencing, or timing of future phases based on project needs, available funding, and City Council direction.

Phase 1 – Existing Conditions & Programming

- Building assessment
- Staff interviews/workshops
- Space programming
- Operational workflow analysis
- Existing systems evaluation
- Site analysis
- Concept alternatives
- Renderings
- Opinion of probable construction cost

Phase 2 – Schematic Design

- Preferred concept
- Floor plans
- Site plan
- Exterior concepts

- Updated cost estimate

Phase 3 – Design Development

- Architectural
- Civil
- Structural
- Mechanical
- Electrical
- Plumbing
- Fire Protection
- Security
- AV/IT
- Furniture and fixtures coordination

Phase 4 – Construction Documents

Complete permit-ready drawings and specifications.

Phase 5 – Bidding

Respond to RFIs, prepare addenda, evaluate bids, recommendation of award.

Phase 6 – Construction Administration

Submittals, site visits, pay applications, change orders, punch list, closeout.

9. Deliverables

The City of Grand Haven expects the selected consultant to provide comprehensive, high-quality deliverables that support informed decision-making throughout each phase of the project. Deliverables should clearly communicate project progress, design intent, technical recommendations, and cost implications while serving as effective tools for City staff, elected officials, stakeholders, and the public. Unless otherwise approved by the City, all deliverables shall be provided in both electronic and editable formats and shall meet all applicable professional standards. The consultant should identify any additional deliverables that they believe would enhance the project's overall success.

Anticipated deliverables include a programming report, schematic plans, renderings, cost estimates for each design phase, permit drawings, bid documents, construction administration reports, and record drawings.

10. Sustainability & Resiliency

The City of Grand Haven is committed to investing in public facilities that are durable, efficient, and fiscally responsible throughout their entire lifecycle. The Public Safety building expansion and renovation should incorporate sustainable design principles that reduce long-term operating and

maintenance costs, improve occupant health and wellness, enhance environmental performance, and increase the facility's resilience to future challenges.

The City encourages innovative, practical, and cost-effective solutions that balance initial construction costs with long-term value, recognizing that sustainability encompasses not only environmental stewardship but also operational efficiency, adaptability, and responsible management of public resources. Respondents should describe how sustainability principles will be integrated into the project's planning, design, material selection, and building systems.

11. Public Engagement

The City of Grand Haven recognizes that the Public Safety building is a critical community asset and that meaningful public engagement is an important component of the planning and design process. The selected consultant will be expected to support the City in communicating the project's purpose, goals, progress, and design concepts to City Council, staff, stakeholders, and the public in a clear, transparent, and accessible manner. Public engagement activities should foster understanding, encourage constructive feedback, and build community confidence in the project while respecting the operational and security requirements of a public safety facility.

The consultant should demonstrate experience facilitating public meetings, preparing high-quality visual materials, and effectively communicating complex technical information to diverse audiences. The City anticipates a collaborative engagement process that informs decision-making while maintaining the project schedule and budget.

The selected consultant is expected to participate in stakeholder meetings, City Council presentations, and public open houses, and to provide graphics suitable for public communication.

12. Proposal Requirements

To facilitate a thorough and equitable evaluation, firms shall submit a complete Statement of Qualifications and Proposal that addresses each item outlined below. Proposals should be organized in the order presented and clearly identify each section. The City reserves the right to request additional information or clarification from any respondent during the evaluation process.

A. Cover Letter

Provide a cover letter signed by an individual authorized to bind the firm contractually. The letter should include:

- Name and address of the firm
- Primary contact person and contact information
- Statement of the firm's understanding of the project
- Confirmation of the firm's ability to perform the requested services
- Statement committing the firm's key personnel to the project
- Acknowledgment of any addenda issued
- Signature of an authorized representative

B. Firm Qualifications

Provide a general overview of the firm including:

- Years in business
- Office locations
- Size of the firm
- Areas of professional expertise
- Michigan licensing and registrations
- Description of in-house disciplines
- Experience providing services to municipalities
- Experience with occupied public safety facilities

C. Project Team

Identify the proposed project team members, including (if relevant):

- Project Manager
- Principal-in-Charge
- Lead Architect
- Civil Engineer
- Structural Engineer
- Mechanical Engineer
- Electrical Engineer
- Fire Protection Engineer
- Technology/Security Consultant
- Interior Designer
- Landscape Architect
- Cost Estimator
- Construction Administrator

For each team member provide:

- Resume
- Years of experience
- Professional registrations
- Relevant project experience
- Anticipated project responsibilities
- Estimated level of involvement

Identify any subconsultants and clearly define their role.

D. Relevant Project Experience

Provide descriptions of at least five (5) projects completed within the past ten years that are similar in size, complexity, and scope.

Preference will be given to projects involving:

- Combined police and fire facilities
- Public safety renovations
- Occupied building renovations
- Municipal facilities
- Public safety campus planning
- Facility expansions
- Emergency Operations Centers
- Public engagement processes

For each project, include:

- Owner
- Project location
- Construction cost
- Completion date
- Building size
- Services provided
- Reference information
- Photographs or renderings
- Description of unique challenges and solutions

E. Project Understanding

Provide a narrative demonstrating the firm's understanding of the City's objectives including:

- Existing facility challenges
- Operational considerations
- Maintaining operations during construction
- Opportunities for expansion
- Long-term flexibility
- Public safety best practices
- Security considerations
- Community expectations

Respondents are encouraged to identify opportunities and challenges to consider during planning and design.

F. Project Approach and Methodology

Describe the firm's approach to completing the project including:

Phase 1

- Existing conditions assessment
- Facility evaluation
- Stakeholder interviews
- Programming

- Space needs analysis
- Concept alternatives
- Public engagement
- Preliminary cost estimating

Phase 2

- Schematic Design
- Design Development
- Construction Documents
- Permitting

Phase 3

- Bidding assistance
- Construction Administration
- Project closeout

Include quality control procedures, internal review processes, and methods for managing scope, schedule, and budget.

G. Schedule

Provide a proposed project schedule that includes:

- Major milestones
- Design phases
- Public meetings
- Cost estimate updates
- Council presentations
- Bid period
- Construction administration

Discuss the firm's ability to meet the City's anticipated timeline.

H. Public Engagement Strategy

Describe the firm's experience facilitating public engagement, including:

- Community meetings
- City Council presentations
- Stakeholder workshops
- Interactive design sessions
- Public open houses

Describe the tools and graphics used to communicate complex design concepts to non-technical audiences.

I. Sustainability and Resiliency

Describe how the firm incorporates sustainable and resilient design principles, including:

- Energy efficiency
- Low-maintenance materials
- Renewable energy readiness

- Water conservation
- Stormwater management
- Emergency preparedness
- Climate resiliency
- Healthy building design

J. Technology and Innovation

Describe how technology will be incorporated into the project, including:

- Building Information Modeling (BIM)
- 3D visualization
- Digital collaboration platforms
- Building automation
- Security systems integration
- Future technology adaptability

K. Cost Control and Value Engineering

Describe the firm's process for:

- Developing project budgets
- Cost estimating
- Value engineering
- Life-cycle cost analysis
- Identifying cost-saving opportunities
- Managing project scope

Include examples of how the firm has successfully maintained project budgets on comparable projects.

L. References

Provide a minimum of five (5) client references from similar projects completed within the last ten years. Include:

- Organization
- Contact person
- Title
- Phone
- Email
- Project description

M. Fee Proposal

Provide a detailed fee proposal that includes:

- Lump sum fee by project phase
- Hourly billing rates
- Reimbursable expenses
- Subconsultant costs
- Additional services
- Optional services
- Assumptions
- Exclusions

Fees should clearly identify costs associated with each phase of work.

N. Additional Value-Added Services

Identify any additional services or expertise the firm believes would benefit the City, such as:

- Facility master planning
- Asset management planning
- Space utilization studies
- Capital improvement planning
- Grant assistance
- Commissioning
- LEED or sustainable design consulting
- Public communications support
- Drone mapping
- Building performance modeling

O. Required Certifications

Include the following:

- Proof of Professional Licensure
- Any additional information required by the City

13. Evaluation Criteria

The City of Grand Haven will evaluate proposals using a qualifications-based selection process designed to identify the firm best suited to successfully deliver the project. Proposals will be reviewed by an evaluation committee based on demonstrated experience, technical expertise, project understanding, proposed approach, and overall ability to meet the City's objectives. While cost is an important consideration, the City places significant value on relevant public safety facility experience, the qualifications of the proposed project team, and the firm's ability to provide innovative, collaborative, and cost-effective solutions. The City reserves the right to request interviews, seek clarification of proposals, negotiate with the highest-ranked respondent, and consider any other factors determined to be in the best interest of the City.

14. Selection Process

The City of Grand Haven intends to conduct a fair, transparent, and competitive selection process to identify the firm best qualified to provide architectural and engineering services for the Public Safety Building Expansion and Renovation Project. The selection process is intended to evaluate each respondent's experience, technical expertise, understanding of the project, and ability to partner successfully with the City to deliver a high-quality project.

The City reserves the right to modify the selection process as it deems it to be in its best interest and may waive informalities, request additional information, conduct interviews, or negotiate with one or more respondents at any stage of the process.

The anticipated selection process is as follows:

Proposal Submission: All proposals shall be submitted in accordance with the requirements and deadlines identified in this RFP. Late submissions may not be considered.

Administrative Review: City staff will review each proposal to determine whether it is complete and responsive to the requirements of this solicitation. The City may request clarification or additional information from respondents if necessary. Failure to provide requested information within the timeframe established by the City may result in disqualification.

Evaluation Committee Review: A selection committee consisting of City staff and other individuals designated by the City will independently evaluate each proposal using the evaluation criteria identified in this RFP. Committee members will assess each firm's qualifications, relevant experience, project team, project approach, and overall ability to successfully complete the project.

Interviews and Presentations: The City may invite shortlisted firms to participate in interviews and project presentations. Interviews are intended to provide the selection committee with an opportunity to better understand each firm's project approach, communication style, technical expertise, team dynamics, and understanding of the City's objectives.

Reference Checks: The City reserves the right to contact references provided by respondents, as well as other clients familiar with the firm's work, to verify project experience, technical performance, communication, responsiveness, and ability to deliver projects on time and within budget.

Fee Evaluation and Scope Review: Fee proposals will be reviewed in conjunction with the overall qualifications of each respondent. The City may request clarification of proposed fees, assumptions, staffing levels, or scope of services. Selection will not necessarily be based on the lowest fee proposal but rather on the proposal determined to provide the greatest overall value to the City.

Negotiation: Following completion of the evaluation process, the City intends to enter into negotiations with the highest-ranked respondent to finalize the project scope, schedule, fee, and contract terms.

If negotiations are unsuccessful, the City reserves the right to terminate negotiations and begin negotiations with the next highest-ranked respondent without reissuing the RFP.

Recommendation and Award: Following successful negotiations, City staff will prepare a recommendation for award to the appropriate approving authority. The contract award is subject to all required approvals and execution of a Professional Services Agreement acceptable to the City.

Selection Timeline: The anticipated project schedule included in this RFP represents the City's best estimate at the time of issuance. The City reserves the right to modify the schedule as necessary to accommodate the evaluation process, project needs, or other circumstances.

15. General Conditions

The City reserves the right to reject any or all proposals, waive irregularities, request clarification, negotiate scope and fees, cancel or reissue the solicitation at any time, award a contract in whole or in part, or decline to award a contract if it is determined to be in the City's best interest.

16. Insurance & Contract Requirements

Consultant shall maintain professional liability, general liability, workers compensation, and automobile insurance meeting City requirements and execute the City's Professional Services Agreement.

17. Appendices

Appendix A Existing Plans

Appendix B Post Selection Intended Timeline

CONTACT / QUESTIONS

Questions may be directed to:

Ms. Ashley Latsch

City Manager

616-847-4888

alatsch@grandhaven.org

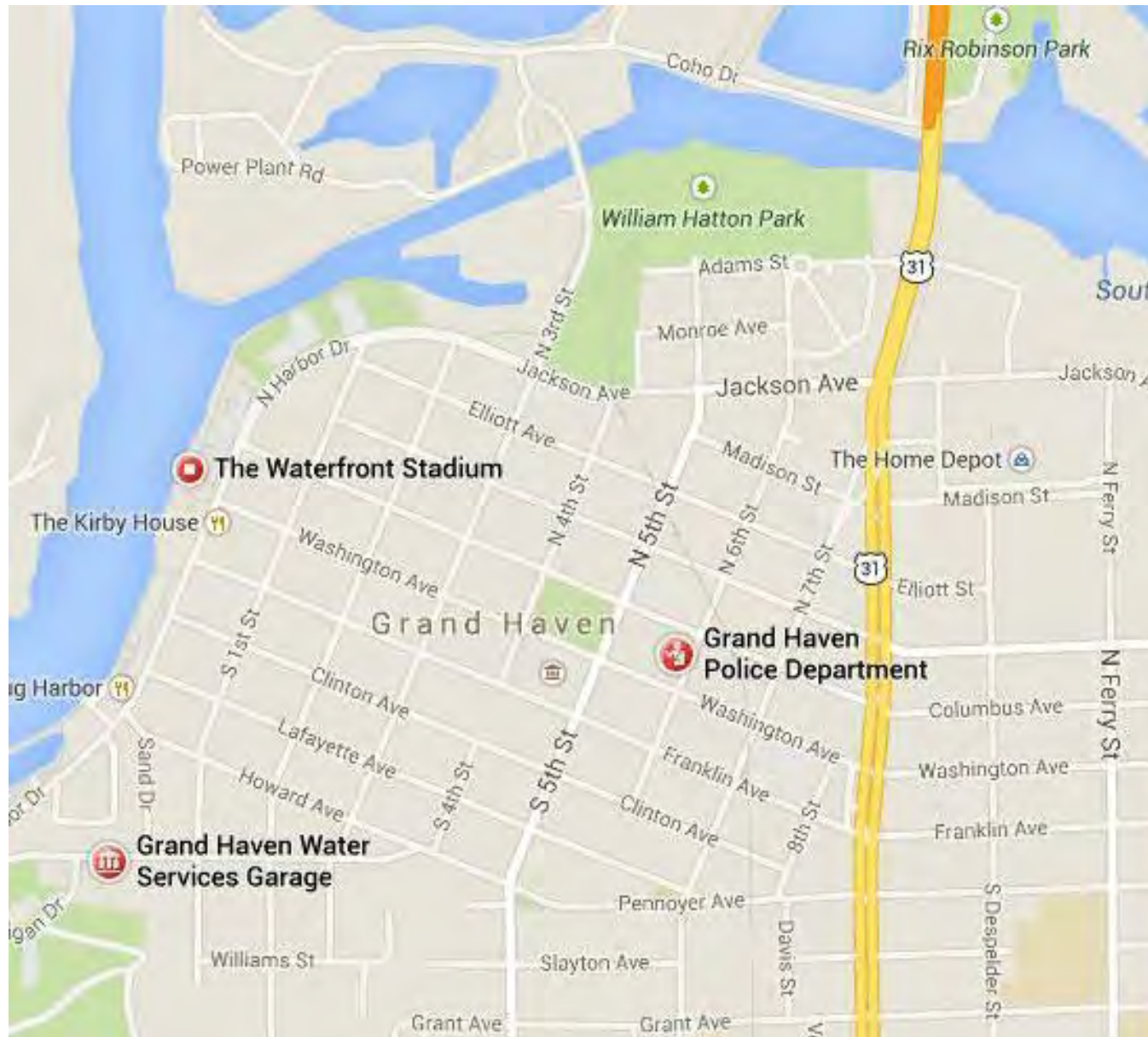
DEPARTMENT OF PUBLIC SAFETY RENOVATIONS AND CAMPUS MECHANICAL SYSTEMS UPGRADE



CITY OF GRAND HAVEN

GRAND HAVEN, MICHIGAN

BIDS & CONSTRUCTION
03.30.2015
GMB Project # 5-3175

<div>DEPARTMENT OF PUBLIC SAFETY</div> <div><div>CIVIL</div><div>C1.01 SITE DEMOLITION LAYOUT & GRADING PLAN</div><div>C8.01 SITE DETAILS</div></div> <div><div>STRUCTURAL</div><div>S1.01 STRUCTURAL GENERAL INFORMATION AND DETAILS</div><div>S2.01 PARTIAL FOUNDATION PLAN</div><div>S4.01 MAIN LEVEL FLOOR FRAMING PLAN</div><div>S4.02 ROOF FRAMING PLAN</div><div>S6.01 STRUCTURAL SECTIONS AND ELEVATIONS</div></div> <div><div>ARCHITECTURAL</div><div>A0.01 ARCHITECTURAL GENERAL INFORMATION</div><div>A1.01 LOWER LEVEL DEMOLITION PLAN</div><div>A1.02 MAIN LEVEL DEMOLITION PLAN</div><div>A2.01 LOWER LEVEL FLOOR PLAN</div><div>A2.02 MAIN LEVEL FLOOR PLAN</div><div>A2.03 ROOF PLAN</div><div>A3.01 LOWER LEVEL REFLECTED CEILING PLAN</div><div>A3.02 MAIN LEVEL REFLECTED CEILING PLAN</div><div>A4.01 EXTERIOR ELEVATION</div><div>A5.01 DOOR FRAME SCHEDULE</div><div>A6.01 BUILDING SECTIONS</div><div>A6.10 WALL SECTIONS</div><div>A7.01 DETAILS</div><div>A7.02 DETAILS</div><div>A8.01 INTERIOR ELEVATIONS</div><div>A9.01 LOWER LEVEL FINISHES PLAN</div><div>A9.02 MAIN LEVEL FINISHES PLAN</div></div> <div><div>PLUMBING</div><div>P2.01 LOWER LEVEL PLUMBING PLAN</div><div>P2.02 MAIN LEVEL PLUMBING PLAN</div></div> <div><div>MECHANICAL</div><div>M0.01 LOWER LEVEL MECHANICAL DEMOLITION PLAN</div><div>M0.02 MAIN LEVEL MECHANICAL DEMOLITION PLAN</div><div>M2.01 LOWER LEVEL HVAC PLAN</div><div>M2.02 MAIN LEVEL HVAC PLAN</div><div>M3.01 LOWER LEVEL HYDRONIC PLAN</div><div>M3.02 MAIN LEVEL HYDRONIC PLAN</div><div>M4.01 HOT WATER HEATING SCHEMATIC</div><div>M9.01 MECHANICAL EQUIPMENT SCHEDULES, SYMBOLS, AND LEGENDS</div></div> <div><div>ELECTRICAL</div><div>E0.01 ELECTRICAL DEMOLITION PLANS</div><div>E2.01 LOWER LEVEL POWER & COMMUNICATIONS PLAN</div><div>E2.02 MAIN LEVEL POWER & COMMUNICATIONS PLAN</div><div>E3.01 LOWER LEVEL LIGHTING PLAN</div><div>E3.02 MAIN LEVEL LIGHTING PLAN</div><div>E4.01 ELECTRICAL ONE-LINE DIAGRAM</div><div>E5.01 ELECTRICAL SCHEDULES</div><div>E7.01 ELECTRICAL SYMBOL LEGENDS</div><div>E7.02 ELECTRICAL DETAILS</div></div>	<div>CITY HALL</div> <div><div>CITY HALL ARCHITECTURAL</div><div>CA2.01 PLANS AND DETAILS</div></div> <div><div>CITY HALL MECHANICAL</div><div>CM0.01 CITY HALL MECHANICAL DEMOLITION PLANS</div><div>CM2.01 CITY HALL MECHANICAL PLANS</div><div>CM9.01 MECHANICAL SCHEMATICS, SCHEDULES, ABBREVIATIONS AND DETAILS</div></div>	<div>ANNEX BUILDING</div> <div><div>ANNEX ARCHITECTURAL</div><div>AA2.01 PLANS AND DETAILS</div></div> <div><div>ANNEX PLUMBING</div><div>AP2.01 ANNEX PLUMBING PLANS</div></div> <div><div>ANNEX MECHANICAL</div><div>AM0.01 ANNEX MECHANICAL DEMOLITION PLANS</div><div>AM2.01 ANNEX HVAC PLANS</div><div>AM3.01 ANNEX HYDRONIC PLANS</div><div>AM9.01 MECHANICAL SCHEDULES, ABBREVIATIONS AND DETAILS</div></div> <div><div>ANNEX ELECTRICAL</div><div>AE2.01 ELECTRICAL PLANS AND DETAILS</div></div>	<div>VICINITY MAP</div> <div></div>
			<div>ALTERNATES</div> <div><div>A-1. ADD ADA/BFD PARKING ON EAST SIDE OF BUILDING</div><div>A-2. ADD ACCESS CONTROL SYSTEM</div><div>A-3. DELETE EXISTING WEST STAIR TO GARAGE</div><div>A-4. ADD METAL PANELS AT PARAPET WALLS OF APPARATUS BAY</div><div>A-5. USE WINDOW GLASS FILM TO ACHIEVE BALLISTIC RATING OF LEVEL 3, IN LIEU OF BALLISTIC LEVEL 3 GLASS.</div><div>A-6. 2" THICK CUSHION FLOORING FOR THE FITNESS ROOM</div><div>A-7. ADD PASS-THRU EVIDENCE ROOM LOCKERS</div><div>E-1: ANNEX BUILDING ELECTRICAL SERVICE</div></div>





03.30.15	BIDS & CONSTRUCTION
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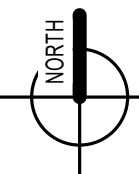
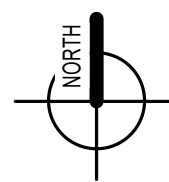
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ARCHITECTURAL GENERAL INFORMATION

504

ADD



1. APPLICABLE CODES:

[illegible]

- [illegible]



GRAND HAVEN, MICHIGAN

03.30.15	BIDS & CONSTRUCTION
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Site / Civil	
Architecture	
Interior	
Structure	
Mechanical	
Electrical	

PROJECT NO. 5-3175



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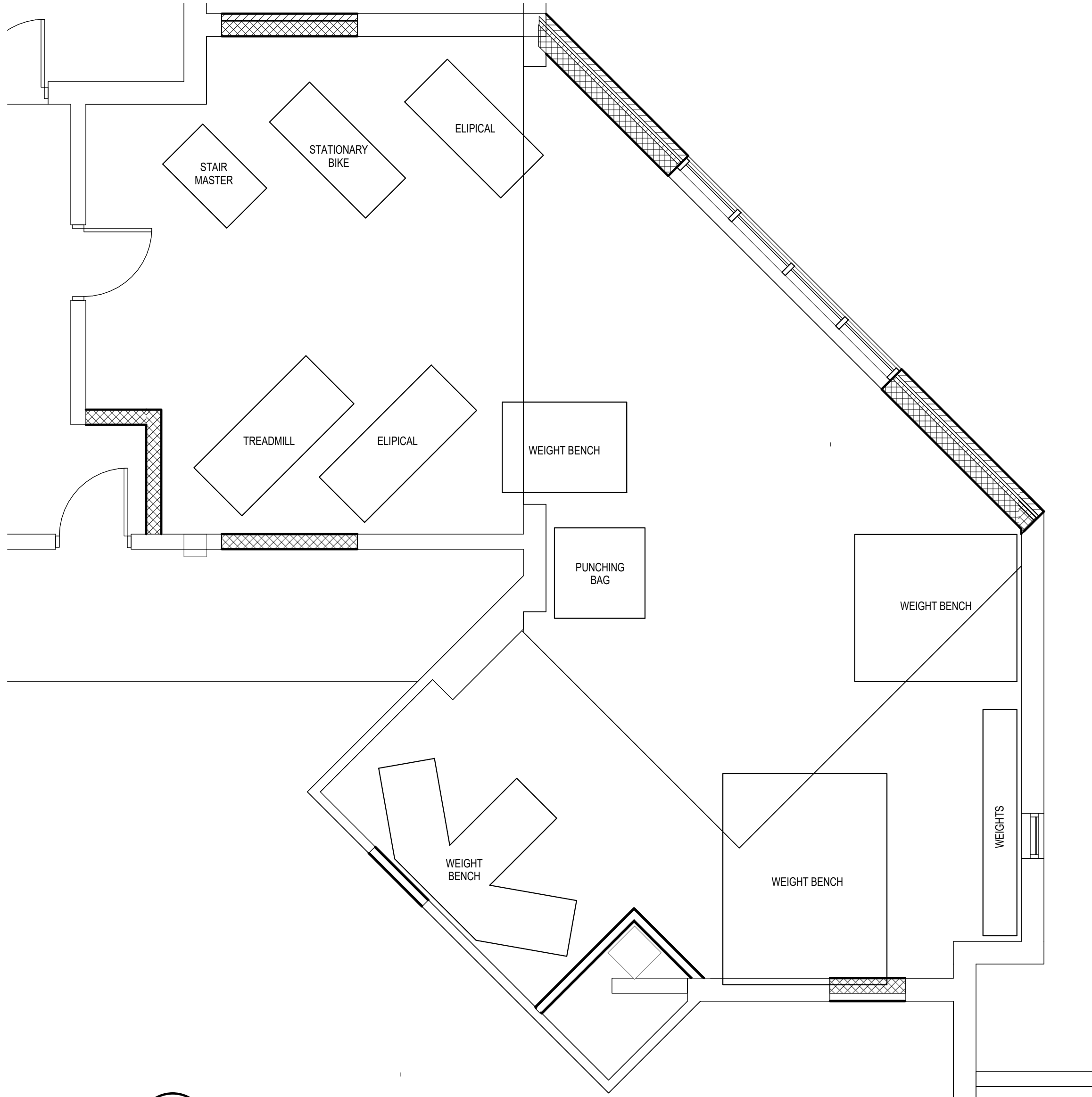
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LOWER LEVEL DEMOLITION
PLAN

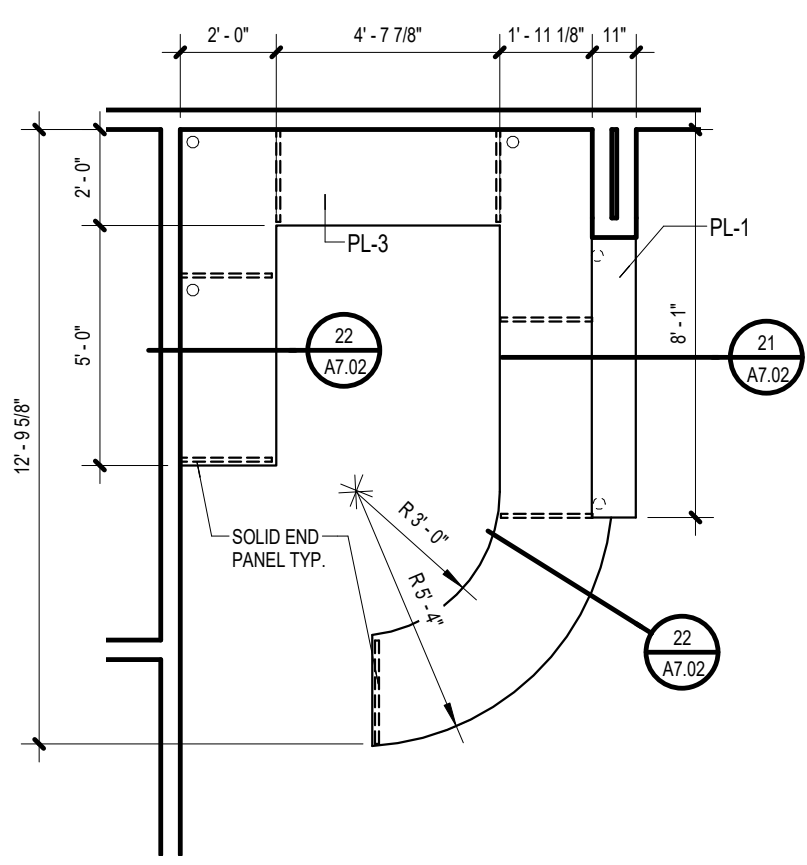
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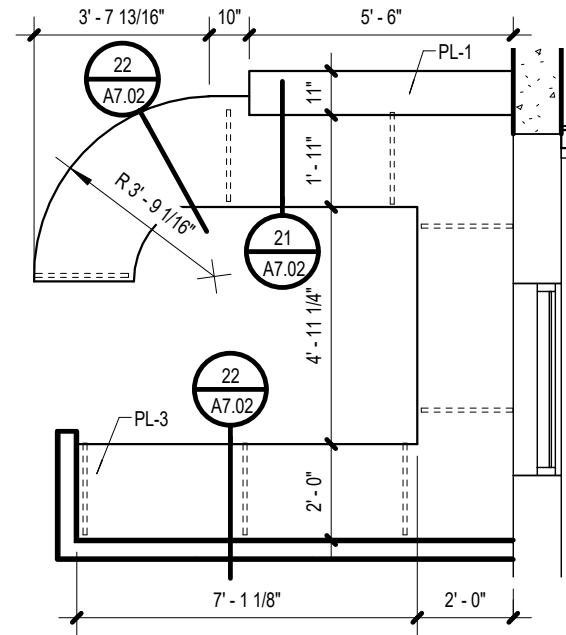
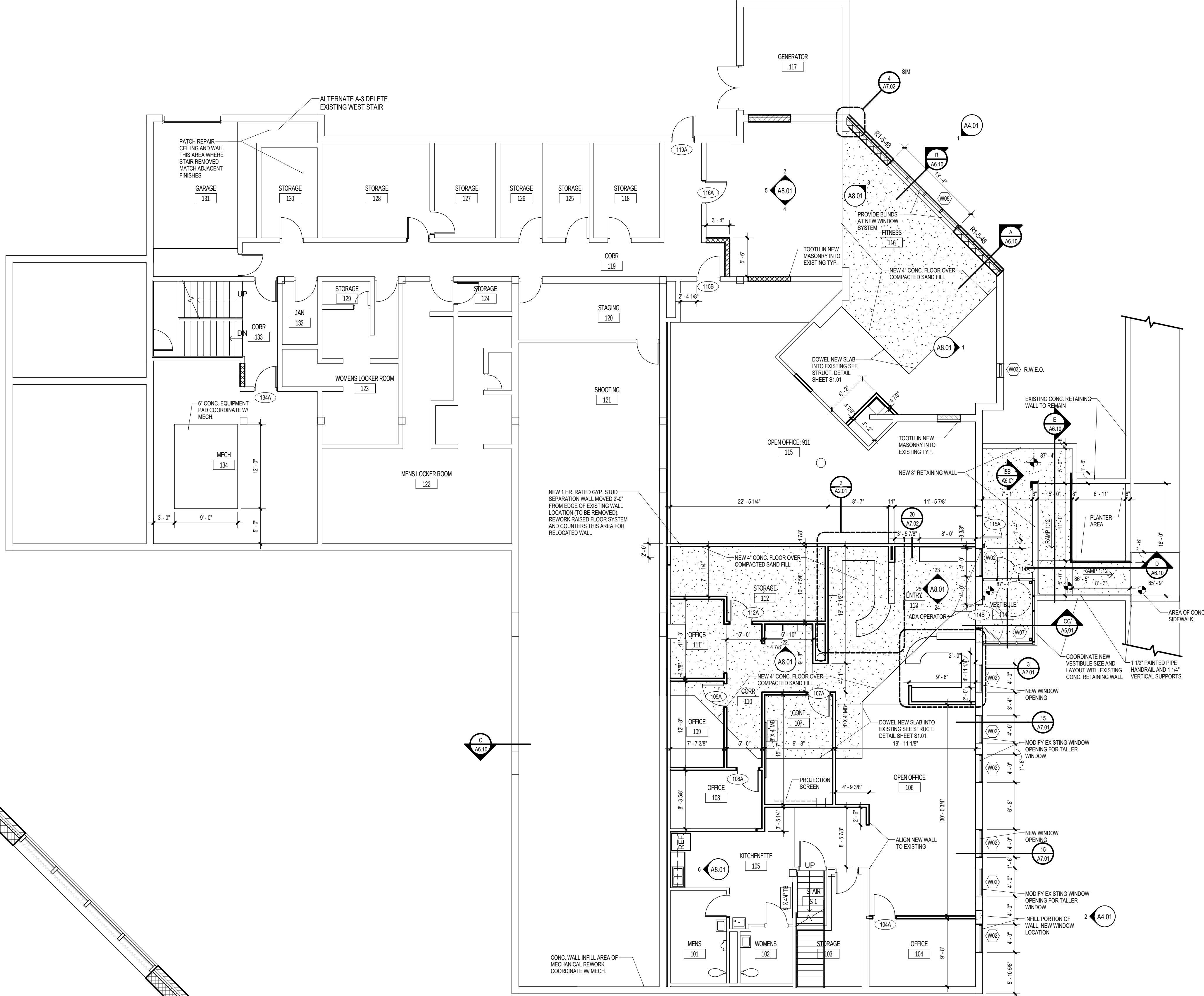
1 ENLARGED FITNESS EQUIPMENT LAYOUT
1/4" = 1'-0"



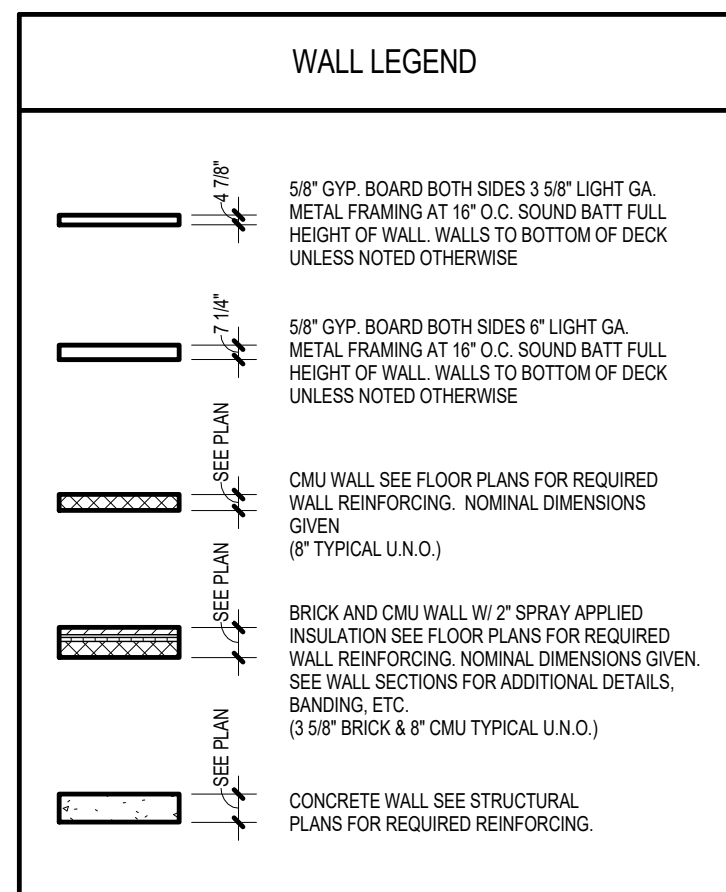
2 LOWER LEVEL MILLWORK
1/4" = 1'-0"



3 LOWER LEVEL SOUTH DESK
1/4" = 1'-0"



- GENERAL NOTES:
- FINISH FLOOR MAN LEVEL = 619.09 ± 100.0"
 - FINISH FLOOR LOWER LEVEL = 607.39 ± 17.4"
 - REFERENCE STRUCTURAL DRAWINGS FOR CONCRETE SLAB SIZES AND SLAB RELATED INFORMATION.
 - CONSTRUCTION AND/OR CONTROL JOINTS SHALL BE ON A 20'-0" SQUARE GRID (MAX) UNLESS OTHERWISE NOTED. ALL CONSTRUCTION JOINTS SHALL BE DOWNED 18" 12" SMOOTH DOWNES AT 18" ON. SEE DETAILS.
 - TURN UP VAPOR RETARDER MATERIAL AT JOINTS BETWEEN FLOOR SLAB AND FOUNDATION WALL UNLESS NOTED OTHERWISE.
 - SEE FOUNDATION PLANS FOR FLOOR SLAB RECESSES FOR TILE, WOOD FLOOR, ETC. (VERIFY RECESS REQUIRED BY MFG.)
 - EXTEND ALL NEW INTERIOR WALL PARTITIONS (MASONRY OR STUDS) TO BOTTOM OF DECK ABOVE UNLESS NOTED OTHERWISE. EXISTING WALLS TO RECEIVE NEW FINISH BLOCKING SEE DETAIL 17A7.02.
 - PROVIDE CONTINUOUS 1x6 BLOCK END BEAMS AT THE LOCATIONS INDICATED ON WALL SECTIONS OR DETAILS. FILL U-BLOCKS WITH CONCRETE AND REINFORCE WITH (2) #5 BARS CONTINUOUS FOR 6" AND (3) #5 BARS CONTINUOUS FOR 12" UNLESS NOTED OTHERWISE ON DRAWINGS.
 - SEE SPECIFICATIONS FOR STEEL LINTEL SIZES FOR WALL OPENINGS NOT DETAILED (e.g. HVAC DUCTS, ETC.).
 - FIRE STOP ALL INTERCONNECTIONS BETWEEN VERTICAL AND HORIZONTAL SPACES AND CONCEALED WALL SPACES AT THE CEILING, FLOOR, AND ROOF LEVELS.
 - CONTRACTOR SHALL COORDINATE THE INSTALLATION OF OWNER FURNISHED EQUIPMENT, INCLUDING DIMENSIONS OF SUCH AS THEY RELATE TO HISHER OWN WORK.
 - DIMENSIONS GIVEN ARE TO THE FACE OF MASONRY UNITS OR TO THE FACE OF METAL STUD PARTITION WALLS.
 - REFER TO INTERIOR ELEVATIONS SHEET A8.01 FOR TYPICAL BARRIER FREE DIMENSIONS.
 - INSTALL SOLID BLOCK BEHIND ALL RECESSED WALL UNITS AS REQUIRED TO MAINTAIN FIRE RATINGS.
 - SEE FLOOR PLANS FOR WALL REINFORCING REQUIRED. (SEE WALL REINFORCING SCHEDULE)
 - INTERIOR STUD WALLS ARE TO USE 3/8" METAL STUD FRAMING UNLESS OTHERWISE NOTED.
 - ALL FIRE WALLS, FIRE BARRIERS, FIRE PARTITIONS, SMOKE BARRIERS, AND SMOKE PARTITIONS SHALL BE IDENTIFIED WITH STENCILING AT INTERVALS NOT TO EXCEED 50'. REFER TO CODE PLAN FOR WALLS REQUIRED TO BE PROTECTED.
 - ALL EXTERIOR BLOCK CORNERS ARE TO BE BULLNOSE BLOCK EXCEPT CONCRETE BLOCK COLUMNS, PIERS AND WALLS TO RECEIVE TILE - UNLESS NOTED OTHERWISE.
 - REFER TO PLUMBING DRAWINGS FOR FLOOR DRAINS.
 - REFER TO REFLECTED CEILING PLANS FOR SOFFITS AND BULKHEADS.
 - REFER TO FLOOR PLANS AND EXTERIOR ELEVATIONS FOR WINDOW FRAME TYPES.
 - REFER TO REFLECTED CEILING PLANS FOR BORROWED LIGHT FRAME TYPES.
 - FURNISH & INSTALL 2x12 HORIZONTAL WOOD BLOCKING BETWEEN STUDS WHERE REQUIRED FOR MOUNTING OF UPPER CABINETS OR OTHER EQUIPMENT SHOWN ON INTERIOR ELEVATIONS OR AS SPECIFIED IN CASEWORK, SCIENCE OR BUILDING SPECIALTIES SECTIONS.
 - LIST OF STANDARD ABBREVIATIONS:
 - "B.F." = BARRIER FREE
 - "F.D." = FLOOR DRAIN
 - "F.E." = FIRE EXTINGUISHER
 - "F.E.C." = RECESSED FIRE EXTINGUISHER CABINET
 - "H.O." = HAND DRYER
 - "M.B.D." = MARKER BOARD
 - "R.W.E.O." = REPLACEMENT WINDOW EXISTING OPENING
 - "T.B.O." = TACK BOARD
 - "T.P.D." = TOILET PAPER DISPENSER
 - "U.N.O." = UNLESS NOTED OTHERWISE

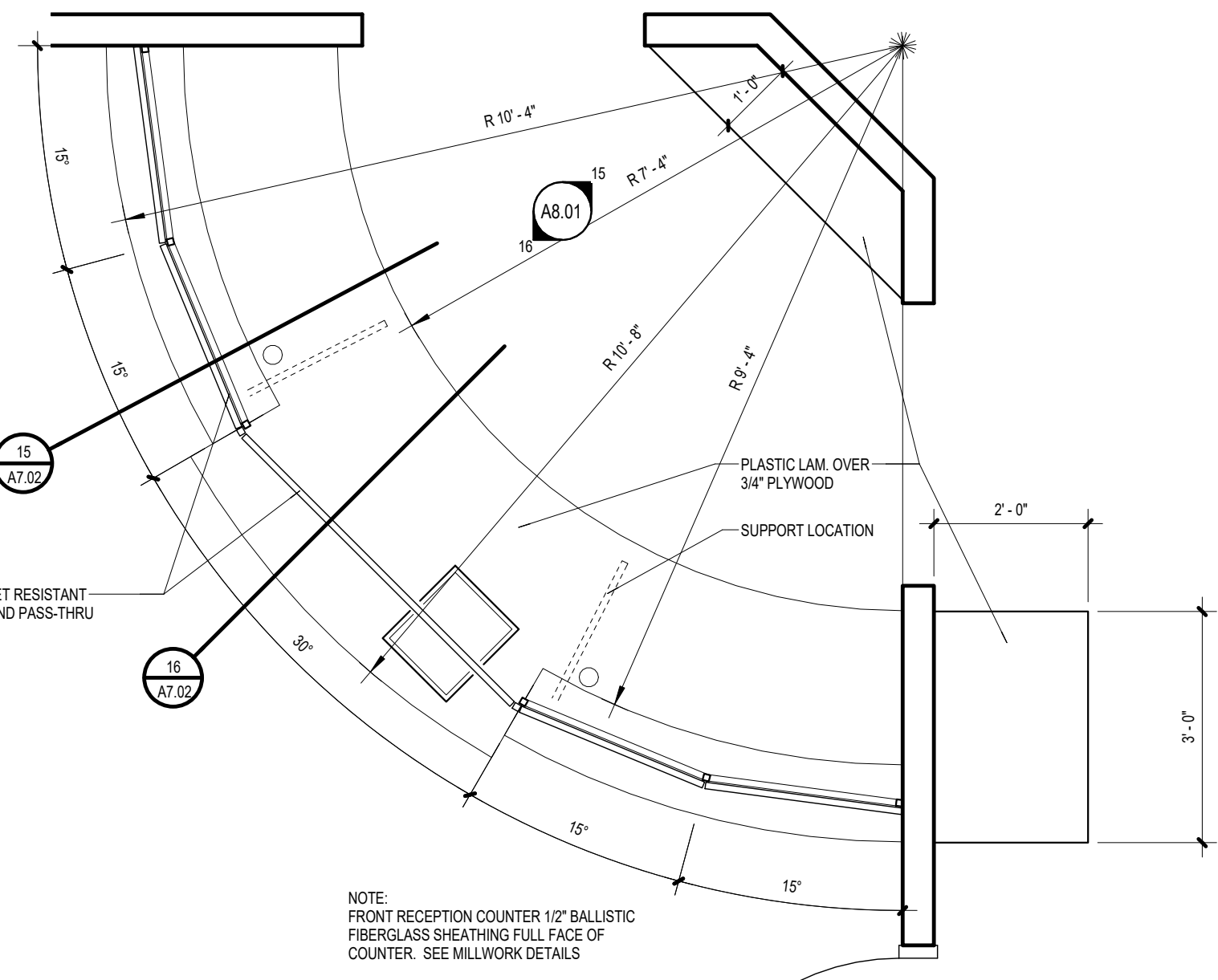


-FIRE RATINGS AS CALLED FOR ON CODE COMPLIANCE PLAN
-DIMENSIONS GIVEN ARE TO THE FINISHED FACE OF CMU OR GYPSUM WALL BOARD UNLESS NOTED OTHERWISE
-ALL EXISTING WALLS THAT RUN TO BOTTOM OF EXISTING CEILING TO RECEIVE CONT. 2x TOP BLOCKING (PAINTED) SEE DETAIL 17A7.02

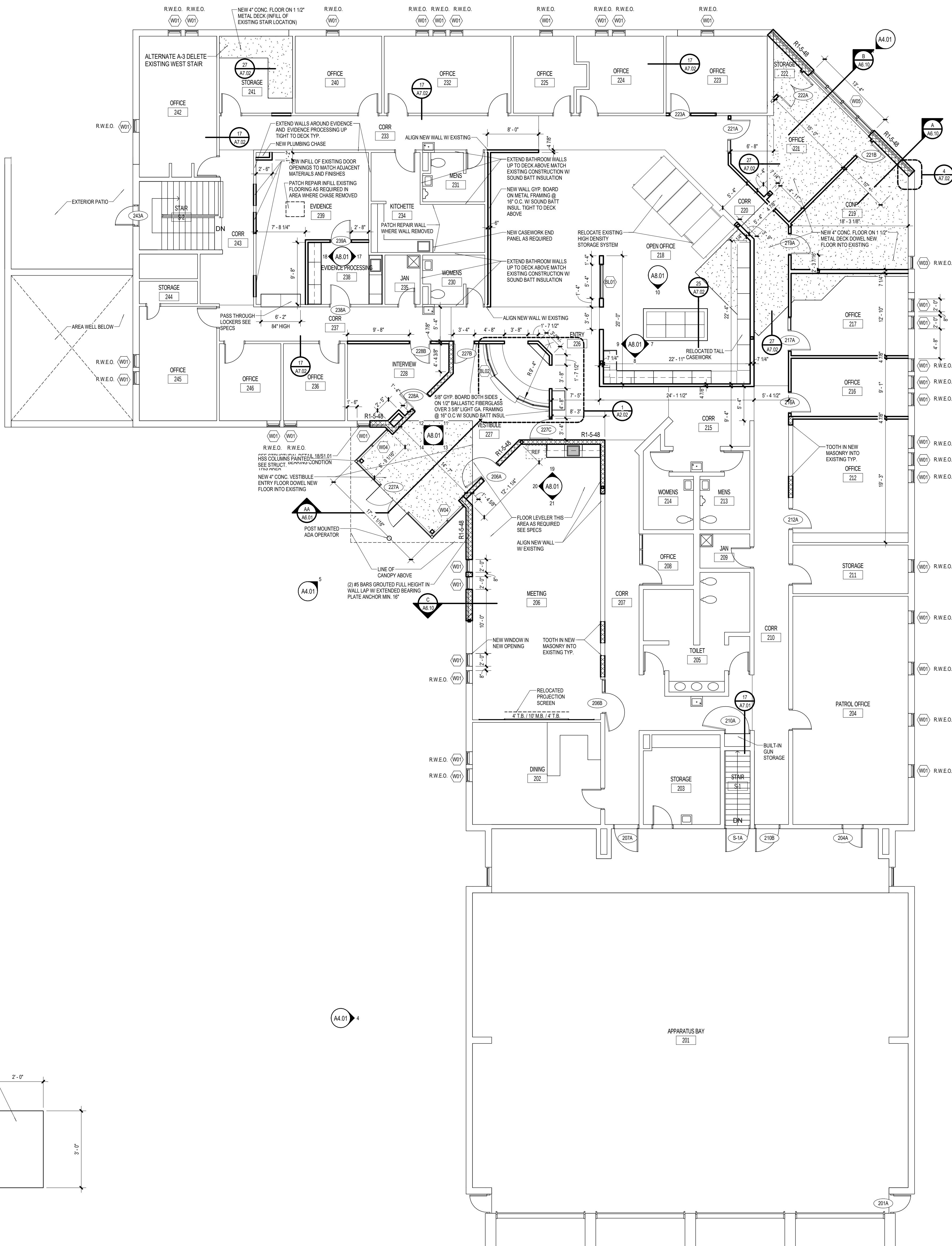
WALL REINFORCING SCHEDULE				
MARK	NUMBER OF BARS	BAR SIZE (GRADE 60)	BAR SPACING	REMARKS
R1-5-48	ONE	#5	48" o.c.	CENTER IN CORE
R1-7-48	ONE	#7	48" o.c.	CENTER IN CORE
R2-7-32	TWO	#7	32" o.c.	CENTER IN CORE

NOTE:
MINIMUM REINFORCING (FOR ALL WALLS NOT OTHERWISE NOTED):
ALL BEARING WALLS SHALL RECEIVE A MINIMUM REINFORCING OF R1-5-48.
ALL EXTERIOR WALLS SHALL RECEIVE A MINIMUM REINFORCING OF R1-5-48.
ALL INTERIOR NON-BEARING WALLS OVER 16'-0" HIGH SHALL RECEIVE A MINIMUM REINFORCING OF R1-5-48.
ALL MASONRY PIERS SHALL RECEIVE A MINIMUM REINFORCING OF (4) #5 BARS FULL HEIGHT IN GROUTED CORES.
ALL BAR LAPS ARE TO BE 30" MINIMUM.
BLOCK CORES WITH VERTICAL REINFORCING SHALL BE GROUTED SOLID FOR FULL HEIGHT OF WALL.
18" CMU MASONRY WALL MUST BE 18" CMU (NOT 20#87).
VERTICAL REINFORCING SHALL BE REQUIRED ON BOTH SIDES OF ALL WALL OPENINGS.
ALL BEARING AND EXTERIOR WALLS NOT OTHERWISE NOTED SHALL RECEIVE A MINIMUM WALL REINFORCING OF R1-5-48. (SEE PLANS).
WHEN A FOUNDATION DOWEL DOES NOT LINE UP WITH A VERTICAL BLOCK CORE, IT SHALL NOT BE SUPPORTED MORE THAN ONE HORIZONTAL IN VERTICAL. DOWELS MAY BE GROUTED INTO A CELL ADJACENT TO THE VERTICAL WALL REINFORCING.
SAND FILL ALL BLOCK WALLS AT TOILET ROOMS DIRECTLY ADJACENT TO CLASSROOMS.
ONE BAR DIA. MIN. CLEARANCE 3/4" MIN. CLEAR FROM MASONRY (TYP. ALL SIDES).
TWO BAR PLAN
ONE BAR PLAN
WALL REINFORCING DETAIL

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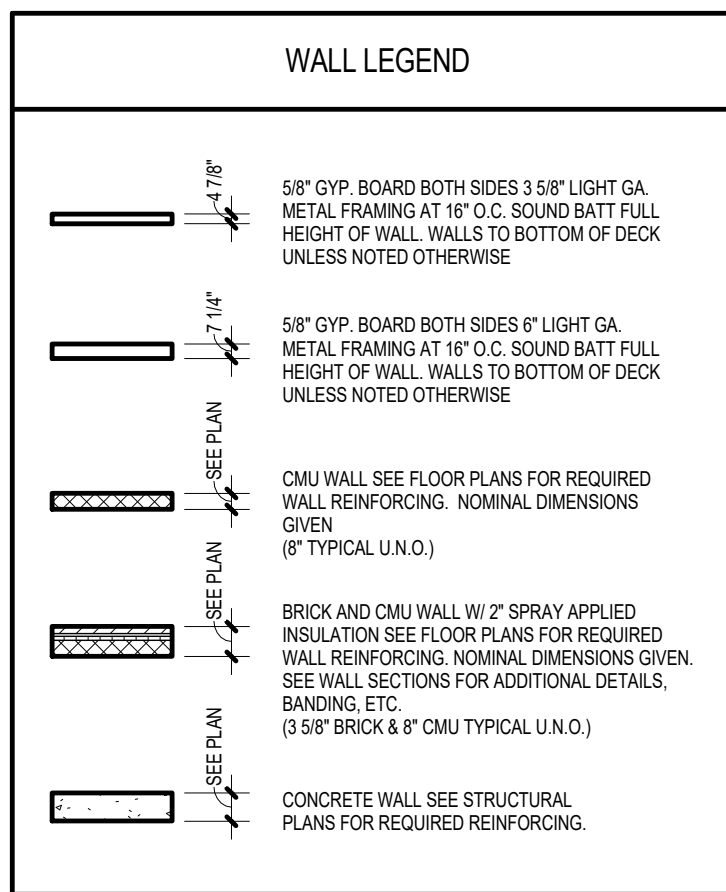
1
A2.02 ENLARGED MILLWORK PLAN
1/2" = 1'-0"



MAIN LEVEL
1/8" = 1'-0"

- GENERAL NOTES:
1. FINISH FLOOR MAIN LEVEL = 1710.00 ± 1710.00'
FINISH FLOOR LOWER LEVEL = 607.30 ± 607.30'
 2. REFERENCE STRUCTURAL DRAWINGS FOR CONCRETE SLAB SIZES AND SLAB RELATED INFORMATION.
 3. CONSTRUCTION AND/OR CONTROL JOINTS SHALL BE ON A 20' 0" SQUARE GRID (MAX) UNLESS OTHERWISE NOTED. ALL CONSTRUCTION JOINTS SHALL BE DOVELED W/ 12" SMOOTH DOVELS AT 18" ON. SEE DETAILS.
 4. TURN UP VAPOR RETARDER MATERIAL AT JOINTS BETWEEN FLOOR SLAB AND FOUNDATION WALL UNLESS NOTED OTHERWISE.
 5. SEE FOUNDATION PLANS FOR FLOOR SLAB RECESSES FOR TILE, WOOD FLOOR, ETC. (VERIFY RECESS REQUIRED BY MFG.)
 6. EXTEND ALL NEW INTERIOR WALL PARTITIONS (MASONRY OR STUDS) TO BOTTOM OF DECK ABOVE UNLESS NOTED OTHERWISE. EXISTING WALLS TO RESEAL NEW FINISH BLOCKING SEE DETAIL 17A.02.
 7. PROVIDE CONTINUOUS U-BLOCK BOND BEAMS AT THE LOCATIONS INDICATED ON WALL SECTIONS OR DETAILS. FILL U-BLOCKS WITH CONCRETE AND REINFORCE WITH (2) #5 BARS CONTINUOUS FOR 8" AND (3) #5 BARS CONTINUOUS FOR 12" UNLESS NOTED OTHERWISE ON DRAWINGS.
 8. SEE SPECIFICATIONS FOR STEEL LATEL SIZES FOR OPENINGS NOT DETAILED: 1/8" HVAC DUCTS, ETC.).
 9. FIRE STOP ALL INTERCONNECTIONS BETWEEN VERTICAL AND HORIZONTAL SPACES AND CONCEALED WALL SPACES AT THE CEILING, FLOOR, AND ROOF LEVELS.
 10. CONTRACTOR SHALL COORDINATE THE INSTALLATION OF OWNER FURNISHED EQUIPMENT, INCLUDING DIMENSIONS OF SUCH AS THEY RELATE TO HISHER OWN WORK.
 11. DIMENSIONS GIVEN ARE TO THE FACE OF MASONRY UNITS OR TO THE FACE OF METAL STUD PARTITION WALLS.
 12. REFER TO INTERIOR ELEVATIONS SHEET A8.01 FOR TYPICAL BARRIER FREE DIMENSIONS.
 13. INSTALL SOLID BLOCK BEHIND ALL RECESSED WALL UNITS AS REQUIRED TO MAINTAIN FIRE RATINGS.
 14. (SEE FLOOR PLANS FOR WALL REINFORCING REQUIRED) (SEE WALL REINFORCING SCHEDULE).
 15. INTERIOR STUD WALLS ARE TO USE 3.5" METAL STUD FRAMING UNLESS OTHERWISE NOTED.
 16. ALL FIRE WALLS, FIRE BARRIERS, FIRE PARTITIONS, SMOKE BARRIERS, AND SMOKE PARTITIONS SHALL BE IDENTIFIED WITH STENCILING AT INTERVALS NOT TO EXCEED 30'. REFER TO CODE PLAN FOR WALLS REQUIRED TO BE PROTECTED.
 17. ALL EXTERIOR BLOCK CORNERS ARE TO BE BULNOSE BLOCK EXCEPT CONCRETE BLOCK COLUMNS, PIERS AND WALLS TO RECEIVE TILE - UNLESS NOTED OTHERWISE.
 18. REFER TO PLUMBING DRAWINGS FOR FLOOR DRAINS.
 19. REFER TO REFLECTED CEILING PLANS FOR SOFFITS AND BULKHEADS.
 20. REFER TO FLOOR PLANS AND EXTERIOR ELEVATIONS FOR WINDOW FRAME TYPES.
 21. REFER TO FLOOR PLANS & INTERIOR ELEVATIONS FOR BORROWED LITE FRAME TYPES.
 22. FURNISH & INSTALL 5/12 HORIZONTAL WOOD BLOCKING BETWEEN STUDS WHERE REQUIRED FOR MOUNTING OF UPPER CABINETS OR OTHER EQUIPMENT SHOWN ON INTERIOR ELEVATIONS OR AS SPECIFIED IN CASEWORK, SCHEDULE, OR BUILDING SPECIALTIES SECTIONS.
 23. LIST OF STANDARD ABBREVIATIONS:

- 1/8" F. = BARRIER FREE
1/4" D. = FLOOR DRAIN
1" E. = FIRE EXTINGUISHER
1" E.C. = RECESSED FIRE EXTINGUISHER CABINET
1" D. = HAND DRYER
1" B.D. = MARKER BOARD
1" W.E.O. = REPLACEMENT WINDOW EXISTING OPENING
1" B.D. = TACK BOARD
1" P.D. = TOILET PAPER DISPENSER
1" U.N.O. = UNLESS NOTED OTHERWISE



FIRE RATINGS AS CALLED FOR ON CODE COMPLIANCE PLAN
DIMENSIONS GIVEN ARE TO THE FINISHED FACE OF CMU OR GYPSUM WALL BOARD UNLESS NOTED OTHERWISE
ALL EXISTING WALLS THAT RUN TO BOTTOM OF EXISTING CEILING TO RECEIVE CONT. 3/4" TOP BLOCKING (PAINTED) SEE DETAIL 17A.02

WALL REINFORCING SCHEDULE				
MARK	NUMBER OF BARS	BAR SIZE (GRADE 60)	BAR SPACING	REMARKS
R1-S-48	ONE	#5	48" o.c.	CENTER IN CORE
R1-T-48	ONE	#7	48" o.c.	CENTER IN CORE
R2-T-32	TWO	#7	32" o.c.	CENTER IN CORE

NOTE:

MINIMUM REINFORCING (FOR ALL WALLS NOT OTHERWISE NOTED):

- ALL BEARING WALLS SHALL RECEIVE A MINIMUM REINFORCING OF R1-S-48.
- ALL EXTERIOR WALLS SHALL RECEIVE A MINIMUM REINFORCING OF R1-S-48.
- ALL INTERIOR NON-BEARING WALLS OVER 10'-0" HIGH SHALL RECEIVE A MINIMUM REINFORCING OF R1-S-48.
- ALL MASONRY PIERS SHALL RECEIVE A MINIMUM REINFORCING OF (4) #5 BARS FULL HEIGHT IN GROUDED CORES.
- ALL BAR LAPS ARE TO BE 30" MINIMUM.
- BLOCK CORES WITH VERTICAL REINFORCING SHALL BE GROUDED SOLID FOR FULL HEIGHT OF WALL.
- 18" CMU MASONRY WALL MUST BE 18" CMU (NOT 20")

VERTICAL REINFORCING SHALL BE REQUIRED ON BOTH SIDES OF ALL WALL OPENINGS.

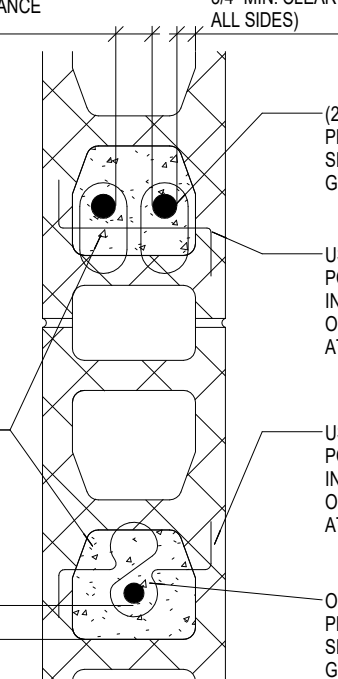
ALL BEARING AND EXTERIOR WALLS NOT OTHERWISE NOTED SHALL RECEIVE A MINIMUM WALL REINFORCING OF R1-S-48. (SEE PLANS)

WHEN A FOUNDATION DOWEL DOES NOT LINE UP WITH A VERTICAL BLOCK CORE, IT SHALL NOT BE SLOPED MORE THAN ONE HORIZONTAL IN VERTICAL. DOWELS MAY BE GROUDED INTO A CELL ADJACENT TO THE VERTICAL WALL REINFORCING.

SAND FILL ALL BLOCK WALLS AT TOILET ROOMS DIRECTLY ADJACENT TO CLASSROOMS.

ONE BAR DIA.
MIN. CLEARANCE

3/4" MIN. CLEAR FROM MASONRY (TYP.
ALL SIDES)



(2) VERTICAL REBAR - SEE PLANS FOR SIZE & SPACING - SECURE IN PLACE BEFORE GROUTING

TWO BAR PLAN

ALIGN CORES VERTICALLY TO MAINTAIN A CONTINUOUS UNRESTRICTED 17" x 17" CELL AREA - GROUT SOLID FOR FULL HEIGHT OF WALL

USE MIN. 9/4 DIA. WIRE REBAR PORTFORMERS TO HOLD BARS IN PLACE AT TOP & BOTTOM OF WALL AND IN BETWEEN AT MAXIMUM 6" INTERVALS

USE MIN. 9/4 DIA. WIRE REBAR PORTFORMERS TO HOLD BARS IN PLACE AT TOP & BOTTOM OF WALL AND IN BETWEEN AT MAXIMUM 6" INTERVALS

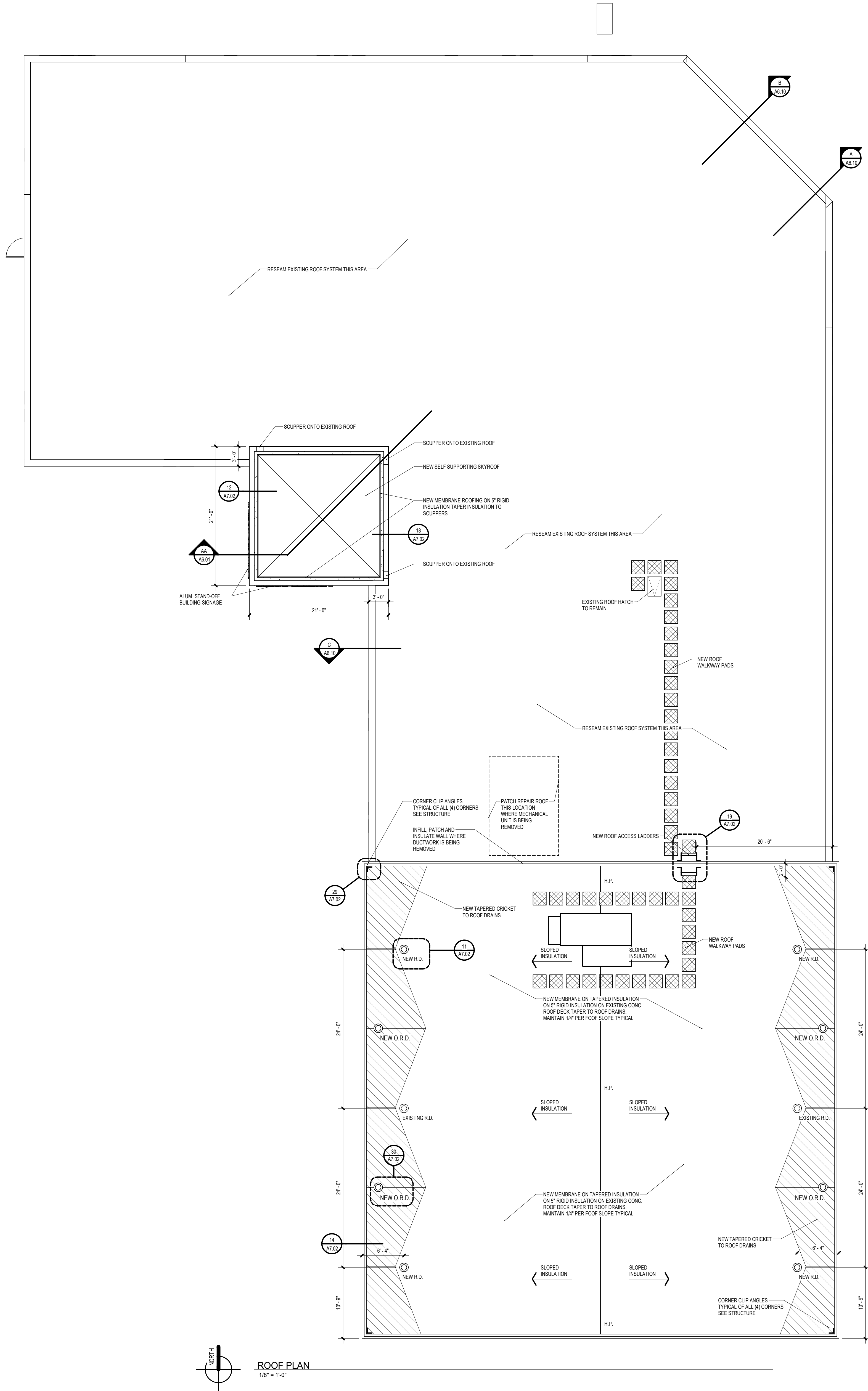
ONE VERTICAL REBAR - SEE PLANS FOR SIZE & SPACING - SECURE IN PLACE BEFORE GROUTING

COR. MASONRY UNITS

3/4" MIN. CLEARANCE (TYP. ALL SIDES)

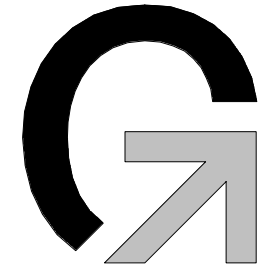
WALL REINFORCING DETAIL

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- GENERAL NOTES
1. ROOF DETAILS -
SEE TYPICAL ROOF DRAIN DETAIL 11/07/02
SEE TYPICAL LADDER DETAIL 10/07/02
 2. REFER TO PLUMBING DRAWINGS FOR LOCATION AND NUMBER OF PLUMBING VENTS THRU ROOF.
 3. REFER TO MECHANICAL DRAWINGS TO COORDINATE ALL ROOF PENETRATIONS & LOCATIONS.
 4. PROVIDE 1/2" PER FOOT TAPERED CRICKETS AT ALL ROOF HATCHES AND MECHANICAL ROOF PENETRATIONS. TAPER SHALL PROVIDE DRAINAGE AROUND HATCH AND EQUIPMENT.
 5. SEE SPECIFICATION FOR ROOFING SYSTEM TO BE USED AND ROOF PLAN FOR LOCATIONS OF TAPERED INSULATION AND OR SLOPE CHANGES OF ROOF.
 6. STANDARD ROOF ABBREVIATIONS -
"RD" - ROOF DRAIN
"ORD" - OVERFLOW ROOF DRAIN
"EF" - EXHAUST FAN
"IV" - INTAKE VENT
"RTU" - ROOF TOP UNIT
"RV" - RELIEF VENT

- LEGEND
- TAPERED RIGID INSULATION
SLOPE TO ROOF DRAINS.
 - DIRECTION OF ROOF SLOPE
(SEE STRUCTURAL FOR ALL
ROOF FRAMING SLOPES)
 - STANDARD ROOF DRAIN
 - ROOF HATCH
 - ROOF WALKWAY PAD
(SEE SPEC. FOR MATERIAL)



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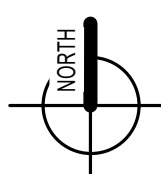
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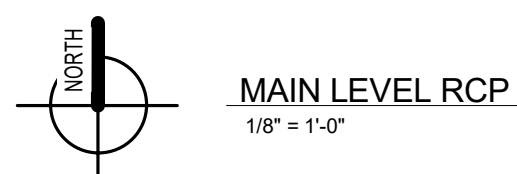
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ROOF PLAN

A2.03



LOWER
1/8" = 1' 0"


$$1/8'' = 1/16''$$

CEILING LEGEND

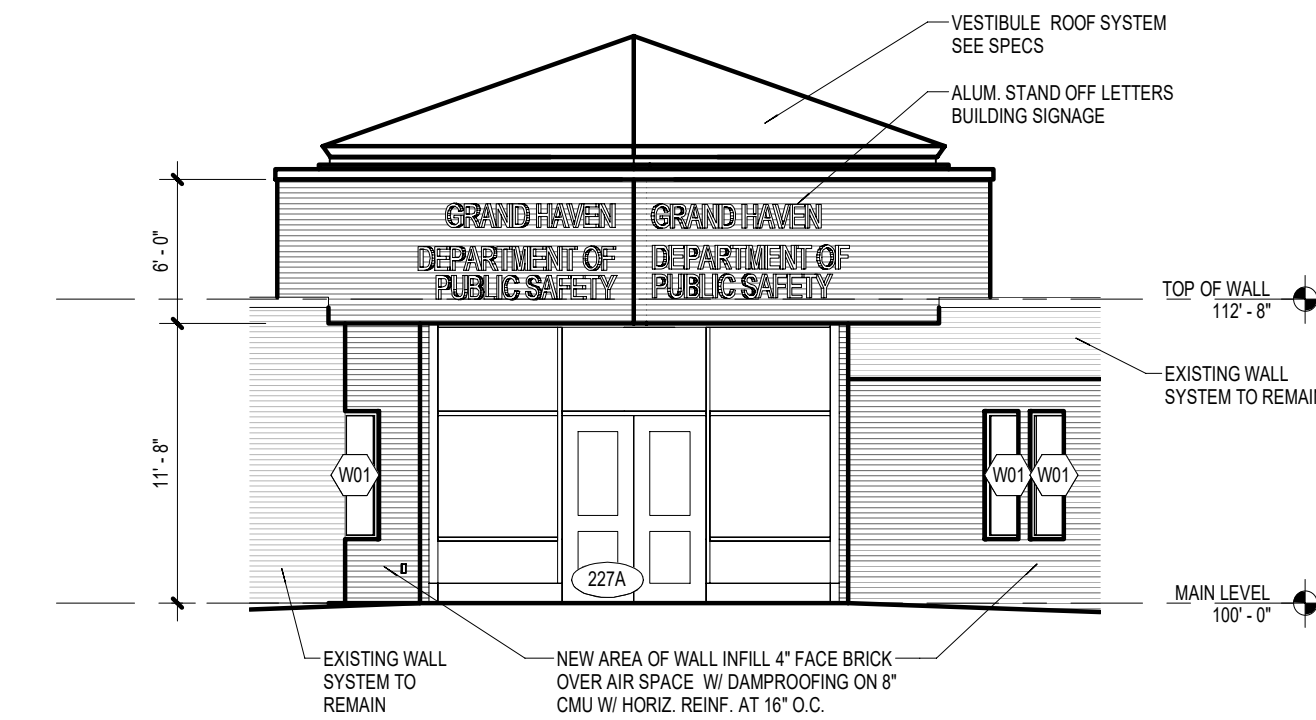
GENERAL CEILING NOTES:

1. CONTRACTOR SHALL FOLLOW GRID PATTERN ESTABLISHED ON THE REFLECTED CEILING PLAN ESTABLISHED ON THE REFLECTED CEILING PLAN AND SHALL BE RESPONSIBLE FOR APPROVAL BY THE ARCHITECT.
2. CEILING TYPE AS SPECIFIED. CEILING HEIGHTS NOTED ON CONTRACT DOCUMENTS.
3. WIRE CEILING FROM STRUCTURE ABOVE AND WIRE FOR ADDITIONAL LOAD AT EACH LIGHT AND CEILING DIFFUSERS.
4. UNLESS OTHERWISE NOTED, CEILING TO BE SUSPENDED METAL TEAL PLATE HANGERS WITH THE EXCEPT 2" HANGERS. SEE SPECIFICATIONS FOR MANUFACTURER AND STYLE.
5. PENDANT MOUNTED FIXTURES CENTERED ON GRID REQUIRE GRID TO BE CUT TO ACCOMMODATE LIGHT FIXTURES.
6. MOUNT SPEAKERS AND SURFACE AIR DIFFUSERS IN THE CENTER OF WHOLE CELL HANGERS. ADJUST A RIGID PANEL BACKER TO PANELS AT LOCATIONS WHICH INDICATE SPEAKERS, DIFFUSERS, LIGHTS, OR EXIST. LIGHTS, EXIST. LIGHTS, EXIST. LIGHTS, EXIST.
7. PROVIDE 2" ANCEILING GRID CROSS-TEAL AT EACH SLOUT AND GRILLE.
8. PROVIDE AN ADDITIONAL CROSS-TEAL AT EACH SLOUT DIFFUSER.
9. REFER TO THE MECHANICAL DRAWINGS FOR BULKHEADS REQUIRED TO BE FRAMED IN OPTICAL BOARD BULKHEADS.
10. ALL CEILING HEIGHTS ARE SUBJECT TO ADJUSTMENT TO ACCOMMODATE UNFORESEEN FIELD CONDITIONS. COORDINATE CHANGES WITH ARCHITECT AND TESTED CONDITIONS.
11. SOME CORRIDOR CEILING PANEL LAYOUTS HAVE BEEN ADJUSTED LATER TO CHANGE IN CORRIDOR DIRECTION TO ACCOMMODATE LAYOUT.

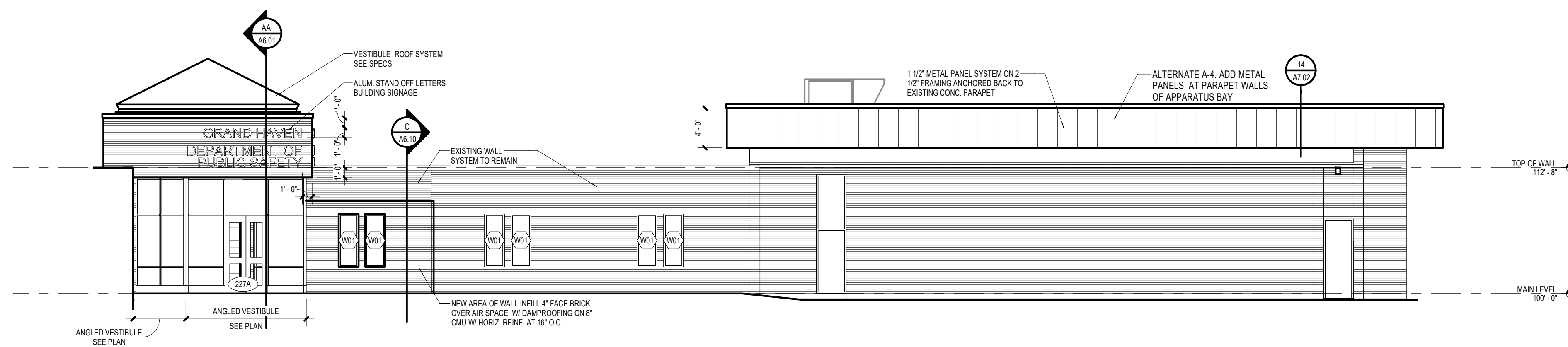
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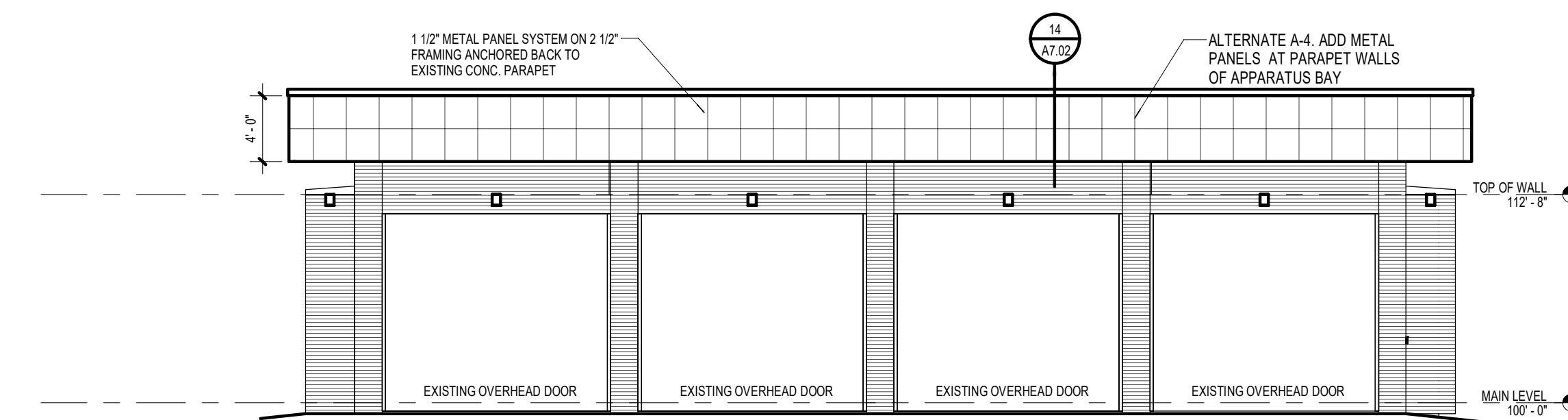
6 ENTRY VESTIBULE PERSPECTIVE



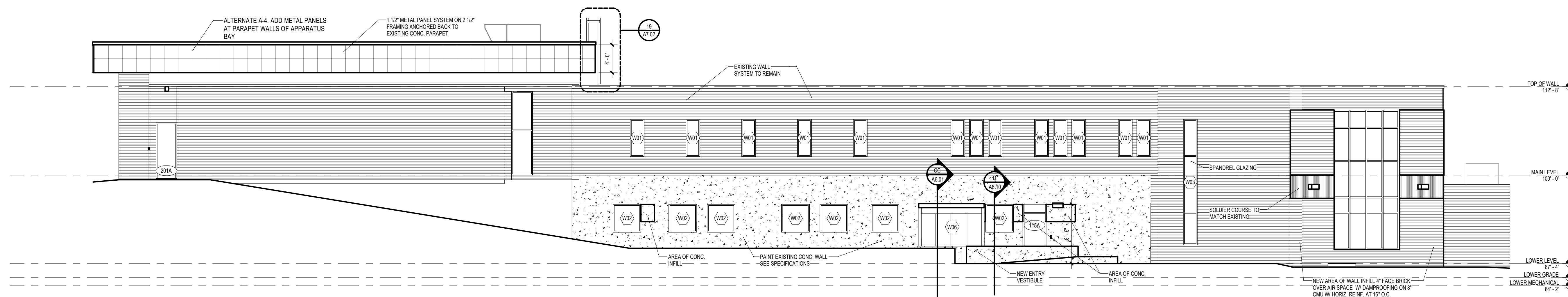
5 SOUTH WEST ENTRY ELEVATION
1/8" = 1'-0"



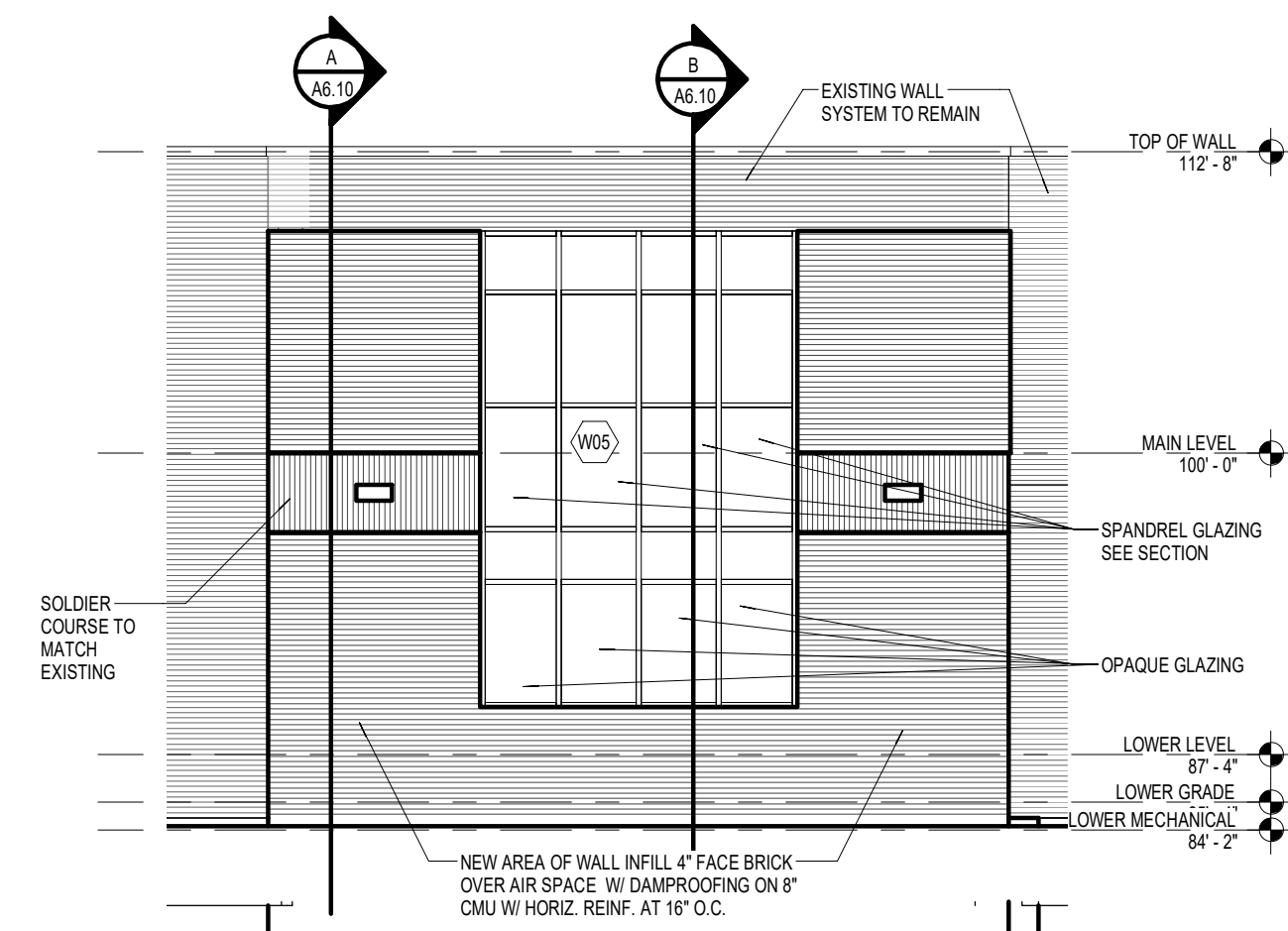
4 WEST ELEVATION
1/8" = 1'-0"



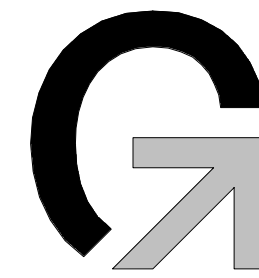
3 SOUTH ELEVATION
1/8" = 1'-0"



2 EAST ELEVATION
1/8" = 1'-0"



1 NORTHEAST ELEVATION
1/8" = 1'-0"



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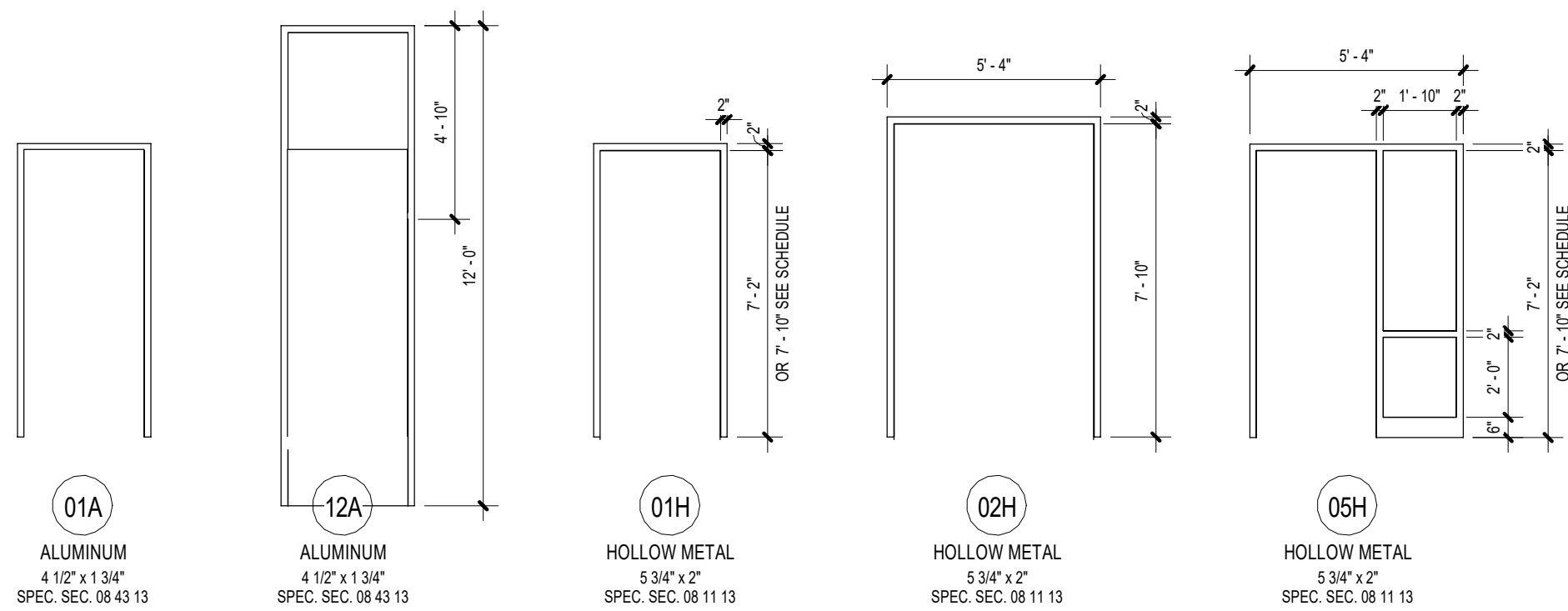
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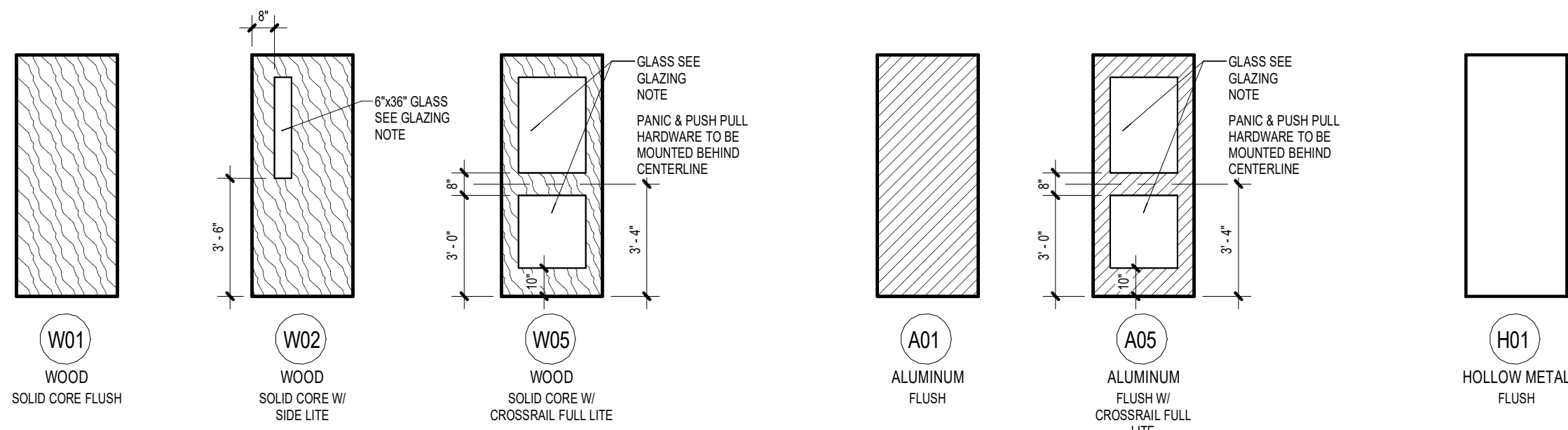
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EXTERIOR ELEVATION

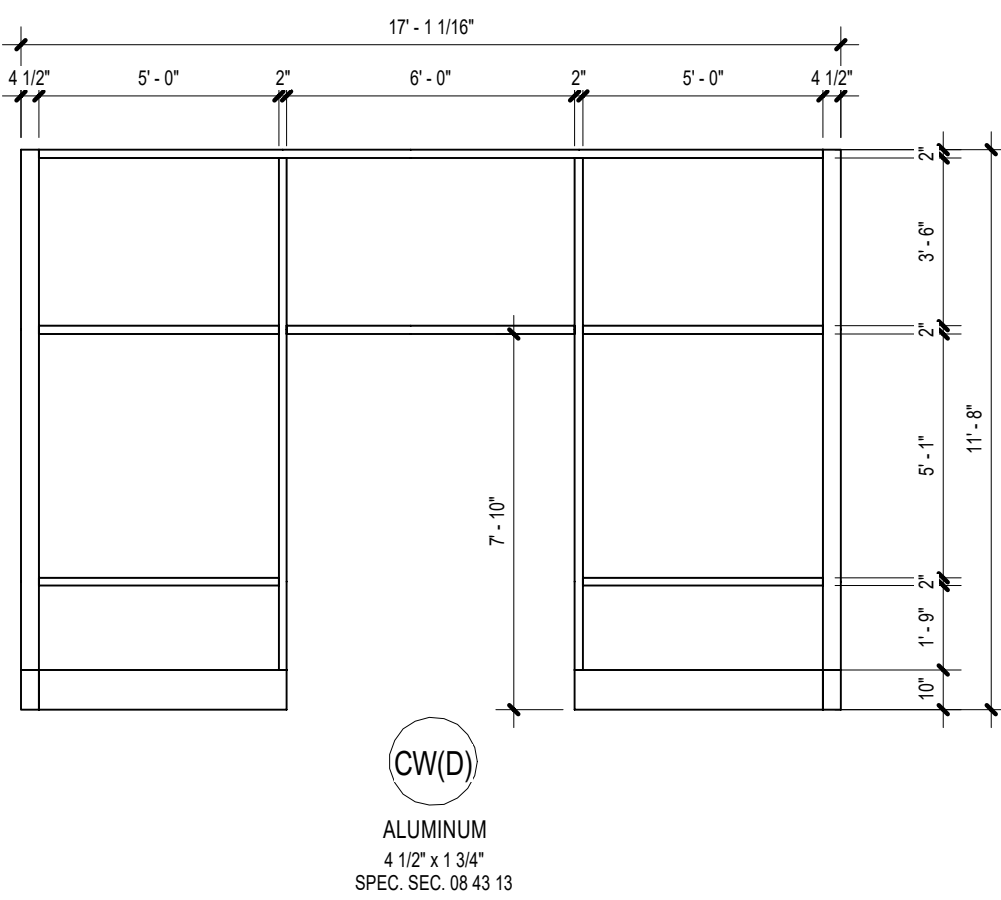
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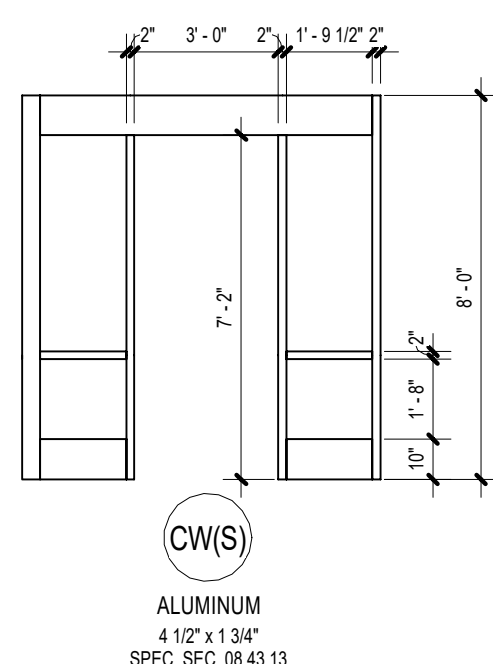
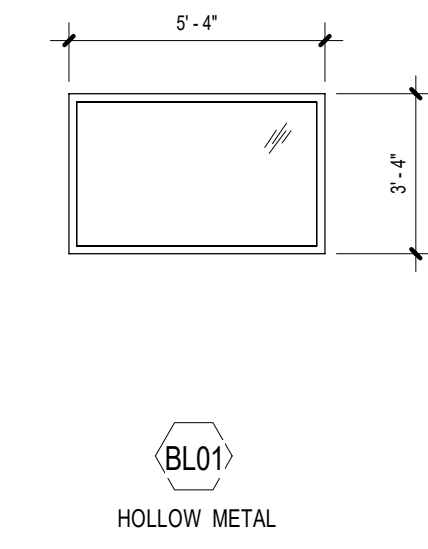
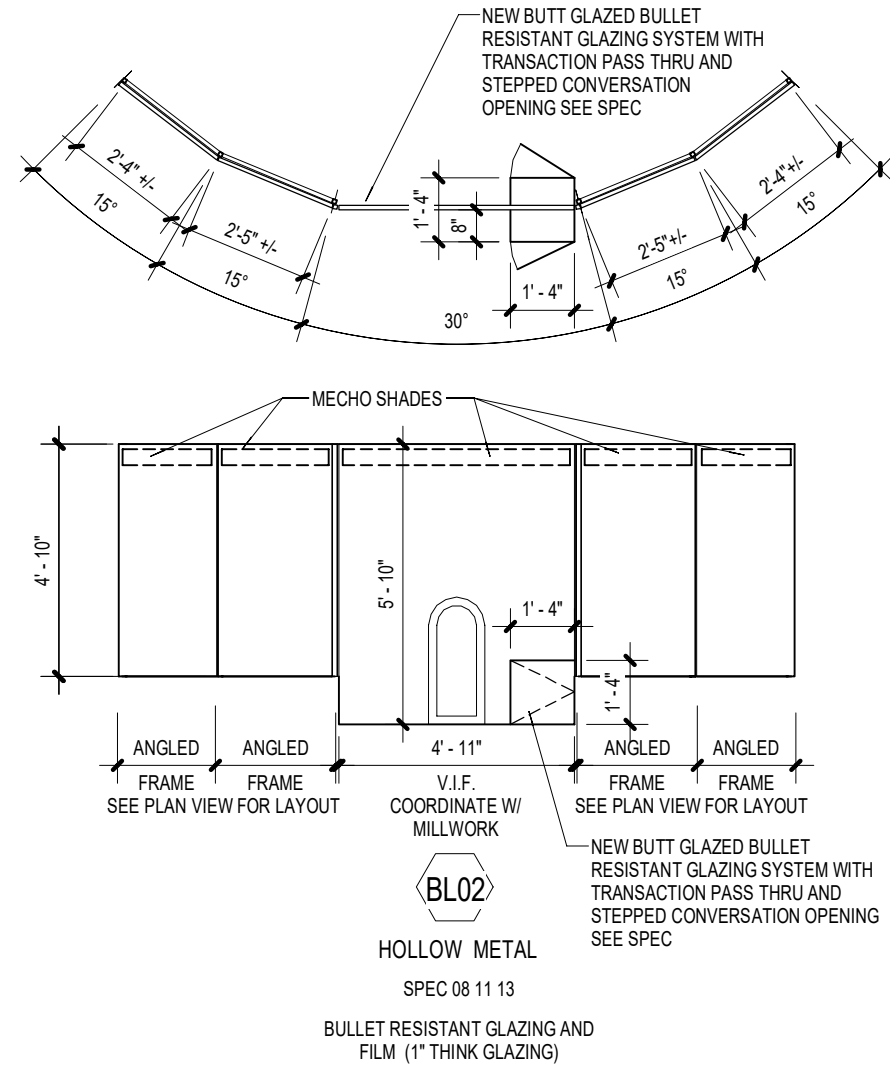
DOOR FRAME LEGEND



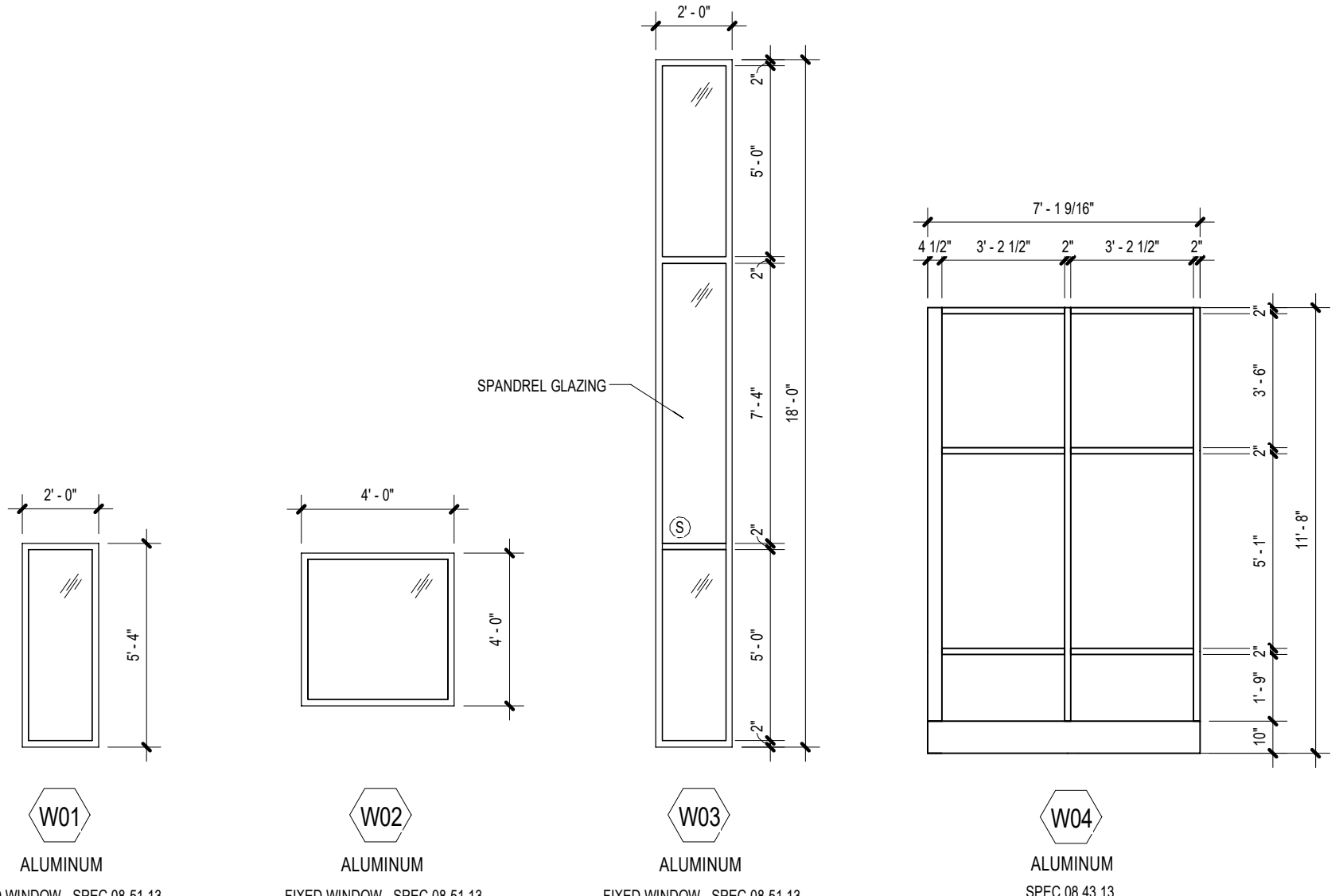
DOOR TYPE LEGEND



STOREFRONT ENTRY FRAMES



BORROWED LITE FRAME TYPES



NOTE:
AREAS OF REPLACEMENT WINDOW EXISTING OPENING (R.W.E.O.)
HAVE BEEN LABELED ON PLANS. ROUGH OPENINGS TO BE FIELD
VERIFIED

WINDOW LEGEND

DOOR NUMBER	DOOR & FRAME SCHEDULE										REMARKS
	DOOR SIZE	DOOR TYPE	FRAME TYPE	FIRE RATING	HDMR SET NO.	DETAILS					
						HEAD	JAMB	SILL			
104A	3' 0" x 7' 2" x 1 3/4"	W02	01H			9/A7.01	9/A7.01				
107A	3' 0" x 7' 2" x 1 3/4"	W02	01H			9/A7.01	9/A7.01				
108A	3' 0" x 7' 2" x 1 3/4"	W02	01H			9/A7.01	9/A7.01				
109A	3' 0" x 7' 2" x 1 3/4"	W02	01H			9/A7.01	9/A7.01				
112A	3' 0" x 7' 2" x 1 3/4"	W01	01H			9/A7.01	9/A7.01				
114A	3' 0" x 7' 2" x 1 3/4"	A05	CW (B)								
114B	3' 0" x 7' 2" x 1 3/4"	A05	CW (B)			3/A7.01	3/A7.01	SIM TO: 1/A7.01		CARD READER	
115A	3' 0" x 7' 2" x 1 3/4"	A01	12A			3/A7.01	3/A7.01	SIM TO: 1/A7.01		CARD READER	
115B	3' 0" x 7' 2" x 1 3/4"	H01	01H			10/A7.01	10/A7.01	10/A7.01			
116A	3' 0" x 7' 2" x 1 3/4"	H01	01H							EXISTING DOOR, NEW PAINT & HARDWARE	
119A	3' 0" x 7' 2" x 1 3/4"	H01	01H							EXISTING DOOR / NEW CARD READER	
13AA	3' 0" x 7' 2" x 1 3/4"	H01	01H			10/A7.01	10/A7.01	10/A7.01			
201A	2' 8" x 7' 10" x 1 3/4"	H01	01H							EXISTING DOOR / NEW CARD READER	
204A	3' 0" x 7' 10" x 1 3/4"	W01	01H			9/A7.01	9/A7.01			EXISTING DOOR / NEW CARD READER	
206A	3' 0" x 7' 10" x 1 3/4"	W02	01H			9/A7.01	9/A7.01			ELECTRIC STRIKE	
206B	3' 0" x 7' 10" x 1 3/4" (5'-4")	W01	06H			10/A7.01	10/A7.01			EXISTING DOOR / NEW CARD READER	
207A	3' 0" x 7' 10" x 1 3/4"	W01	01H			9/A7.01	9/A7.01			CARD READER	
210A	3' 0" x 7' 10" x 1 3/4"	W01	01H			9/A7.01	9/A7.01			EXISTING DOOR / NEW CARD READER	
210B	3' 0" x 7' 10" x 1 3/4"	W01	01H			10/A7.01	10/A7.01			EXISTING DOOR / NEW CARD READER	
212A	3' 0" x 7' 10" x 1 3/4"	W03	01H			9/A7.01	9/A7.01				
216A	3' 0" x 7' 10" x 1 3/4"	W02	01H			9/A7.01	9/A7.01				
217A	3' 0" x 7' 10" x 1 3/4" (5'-4")	W01	06H			9/A7.01	9/A7.01				
218A	3' 0" x 7' 10" x 1 3/4"	W02	01H			9/A7.01	9/A7.01				
221A	3' 0" x 7' 10" x 1 3/4" (5'-4")	W01	06H			9/A7.01	9/A7.01				
221B	3' 0" x 7' 10" x 1 3/4"	W01	01H			9/A7.01	9/A7.01				
222A	PRR 2' 6" x 7' 10" x 1 3/4"	W01	02H			9/A7.01	9/A7.01				
223A	3' 0" x 7' 10" x 1 3/4"	W02	01H			9/A7.01	9/A7.01				
227A	(PRI) 3' 0" x 7' 10" x 1 3/4"	A05	CW (D)			4/A7.01	16/A7.01	SIM TO: 1/A7.01		ELECTRIC STRIKE	
227B	3' 0" x 7' 2" x 1 3/4"	W01	01H			9/A7.01	9/A7.01			CARD READER	
227C	3' 0" x 7' 2" x 1 3/4"	W01	01H			9/A7.01	9/A7.01			ELECTRIC STRIKE	
228A	3' 0" x 7' 10" x 1 3/4"	W01	01H			9/A7.01	9/A7.01			CARD READER	
228B	3' 0" x 7' 10" x 1 3/4"	W02	01H			9/A7.01	9/A7.01			CARD READER	
238A	3' 0" x 7' 10" x 1 3/4"	W01	01H			9/A7.01	9/A7.01			CARD READER	
238B	3' 0" x 7' 10" x 1 3/4"	W01	01H			9/A7.01	9/A7.01			CARD READER	
243B	3' 0" x 7' 10" x 1 3/4"	W01	01H							EXISTING DOOR / NEW CARD READER	
5-1A	3' 0" x 7' 2" x 1 3/4"	H01	01H							EXISTING DOOR / NEW CARD READER	
S-1A	3' 0" x 7' 10" x 1 3/4"	W01	01H							EXISTING DOOR / NEW CARD READER	

GLAZING NOTES:

ALL EXTERIOR WINDOWS
AND DOOR LITES:
1" INSULATED PER SPECIFICATIONS.

INTERIOR DOOR &
BORROWED LITES:

1/4" CLEAR TYPICAL EXCEPT FIRE-RATED
- SEE SPECIFICATIONS.

GLASS:

GLASS TO BE TEMPERED AS REQUIRED
BY SPECIFICATIONS AND APPLICABLE
CODES.

MAXIMUM GLASS AREA PER FIRE RATING:
180 MIN. LABEL = NO GLASS
90 MIN. LABEL = 100 SQ. IN.
45 MIN. LABEL = 120 SQ. IN.
20 MIN. LABEL = AS TESTED

VERIFY COMPLIANCE TO ALL
APPLICABLE CODES.

ADJUST LITE SIZE BASED ON SCHEDULED
FIRE RATING AS NECESSARY.

ISSUANCES

03.30.15 BIDS & CONSTRUCTION

Site / Civil
Architecture
Interior
Structure
Mechanical
Electrical

PROJECT NO. 5-3175

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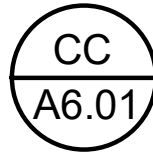
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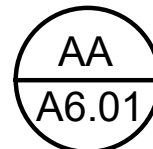
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Architecture	
Interior	
Structure	
Mechanical	
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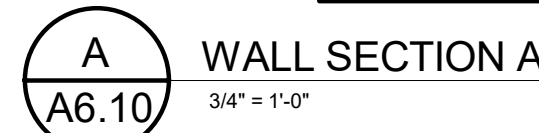
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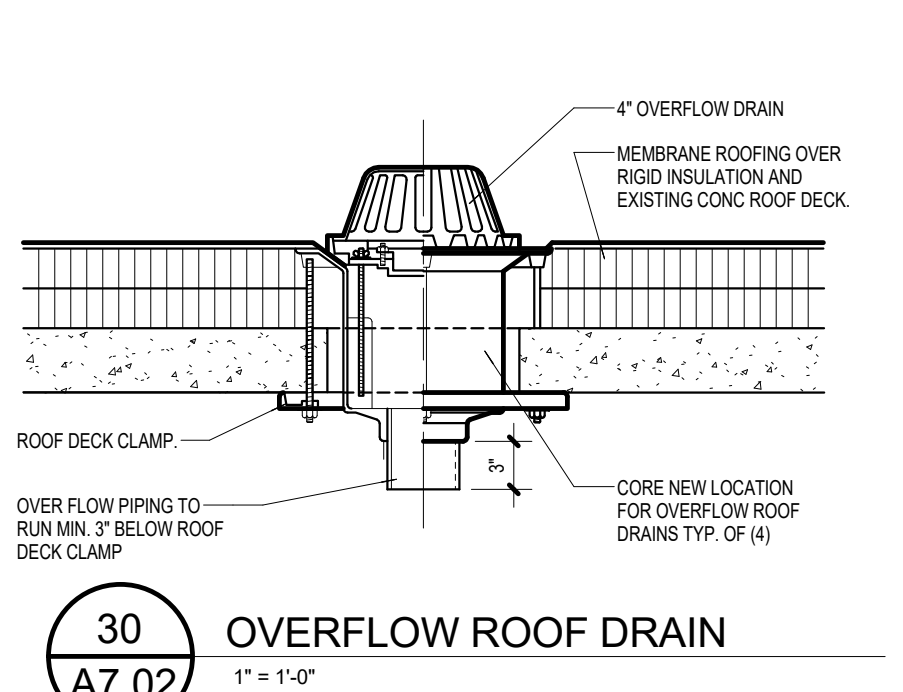
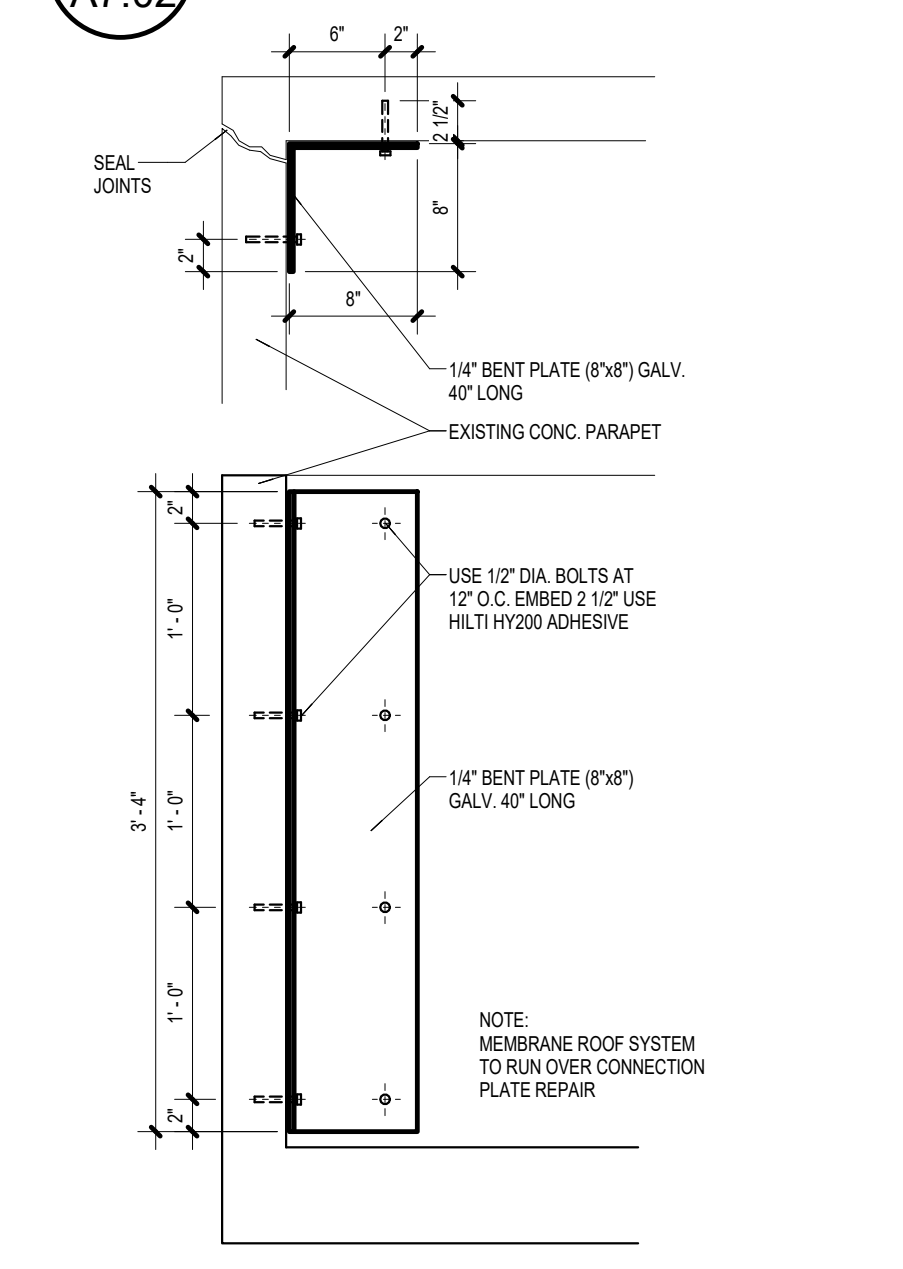
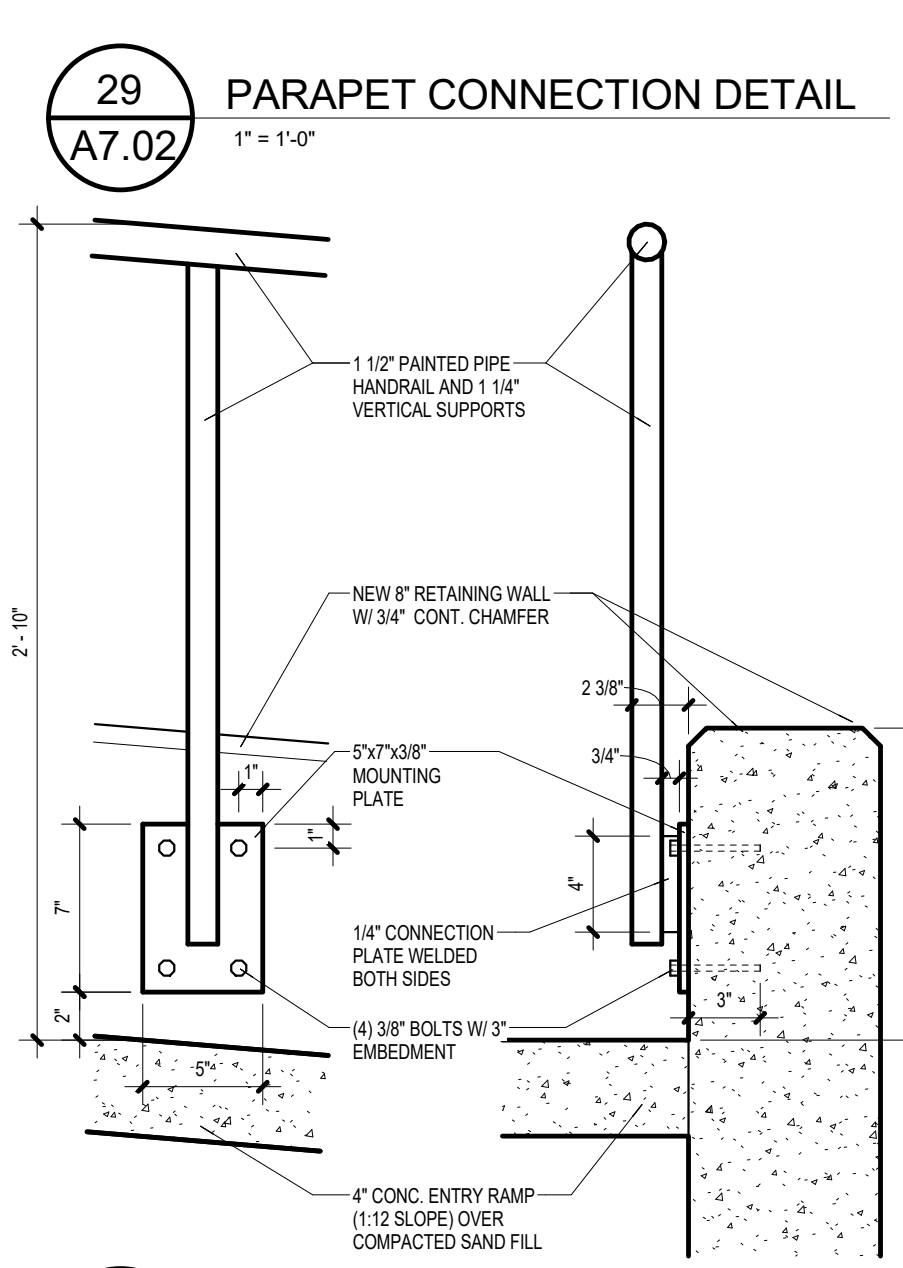
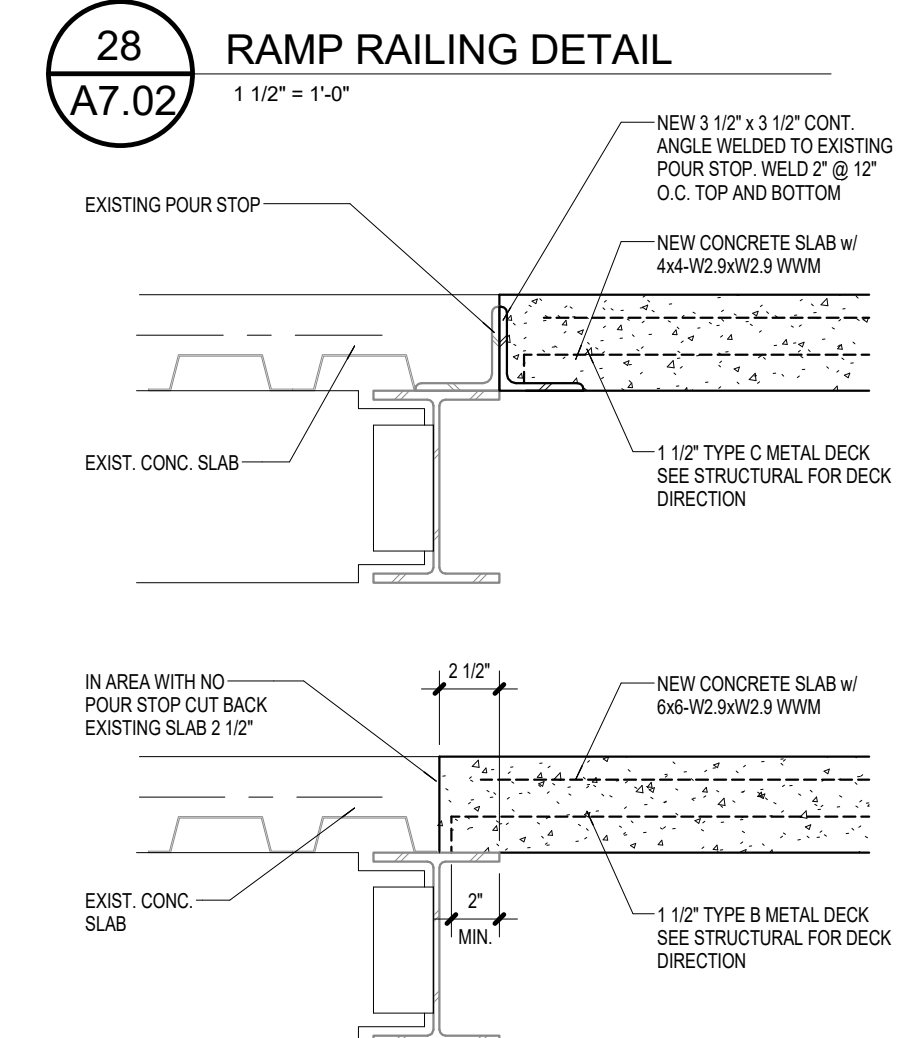
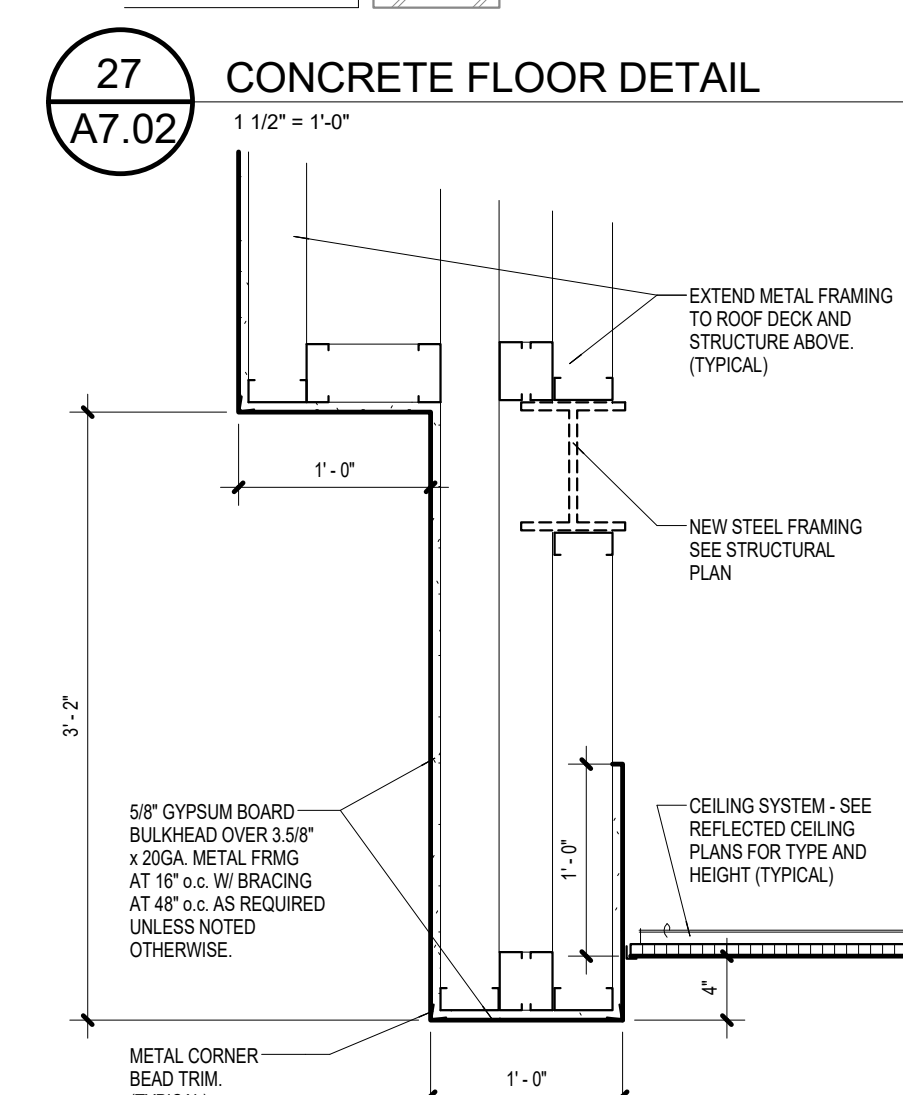
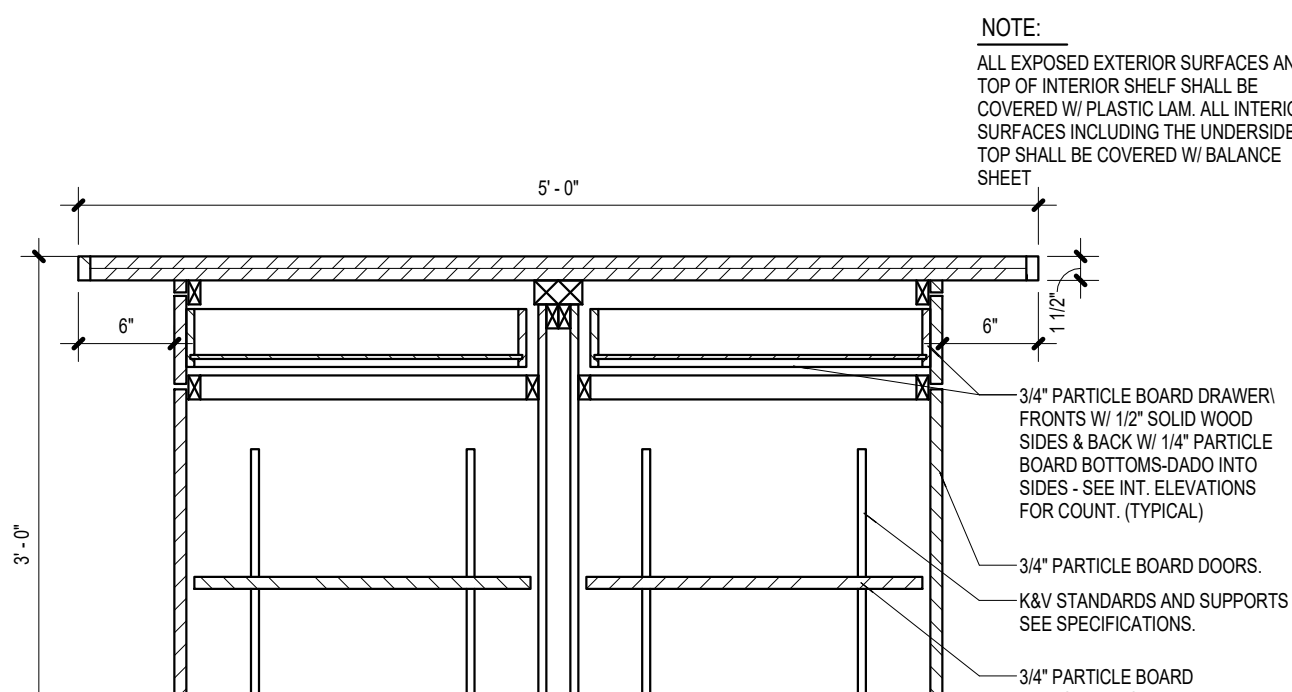
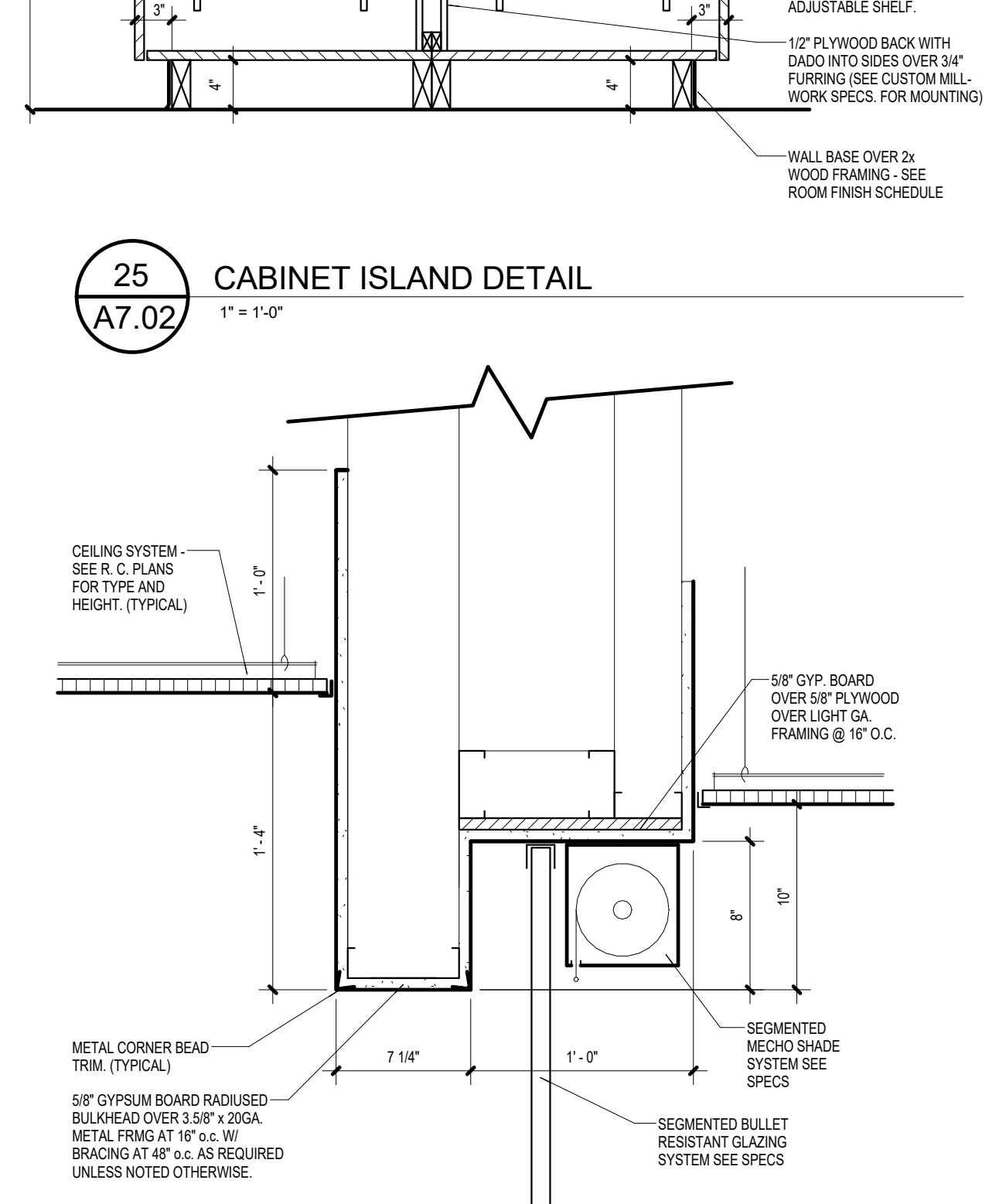
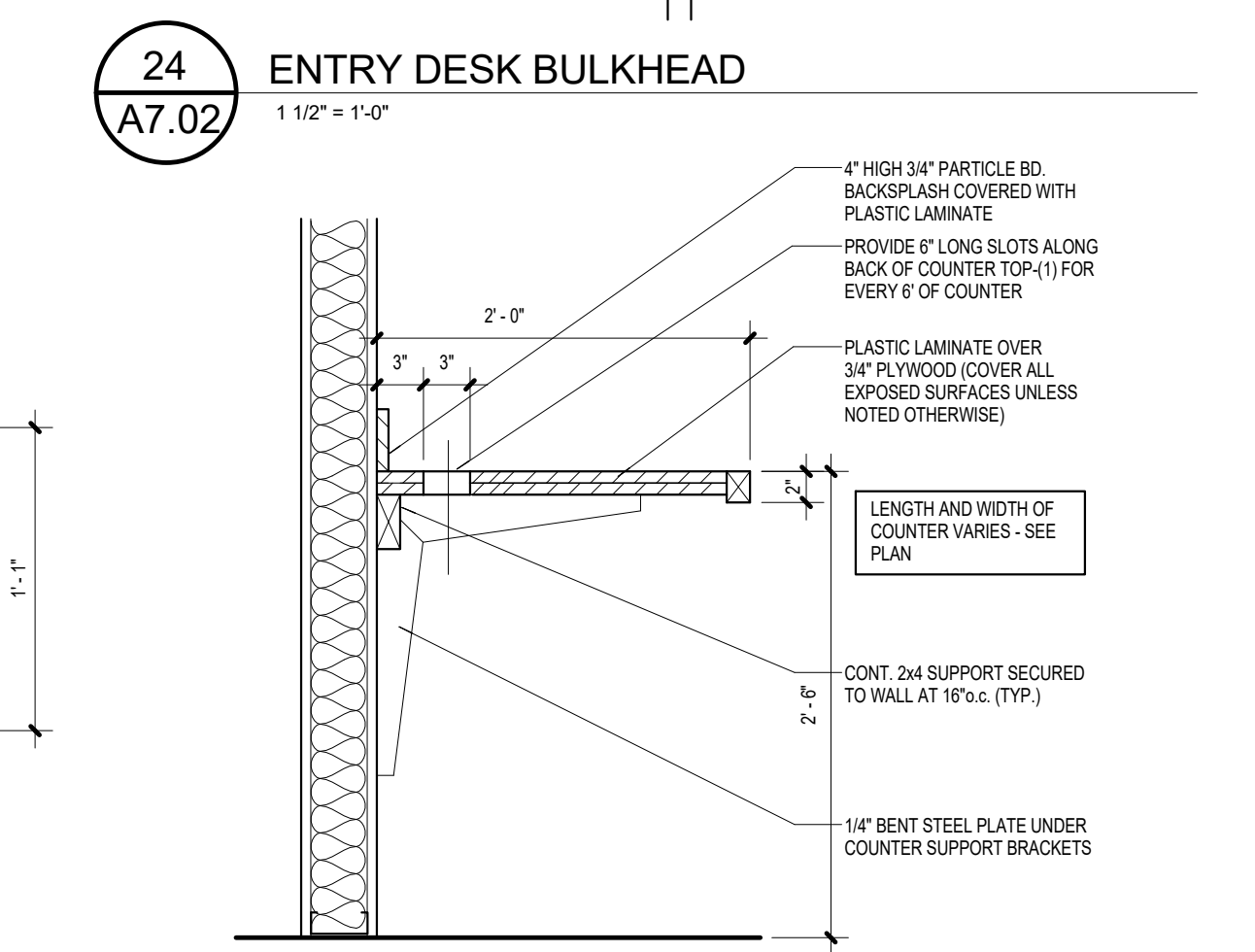
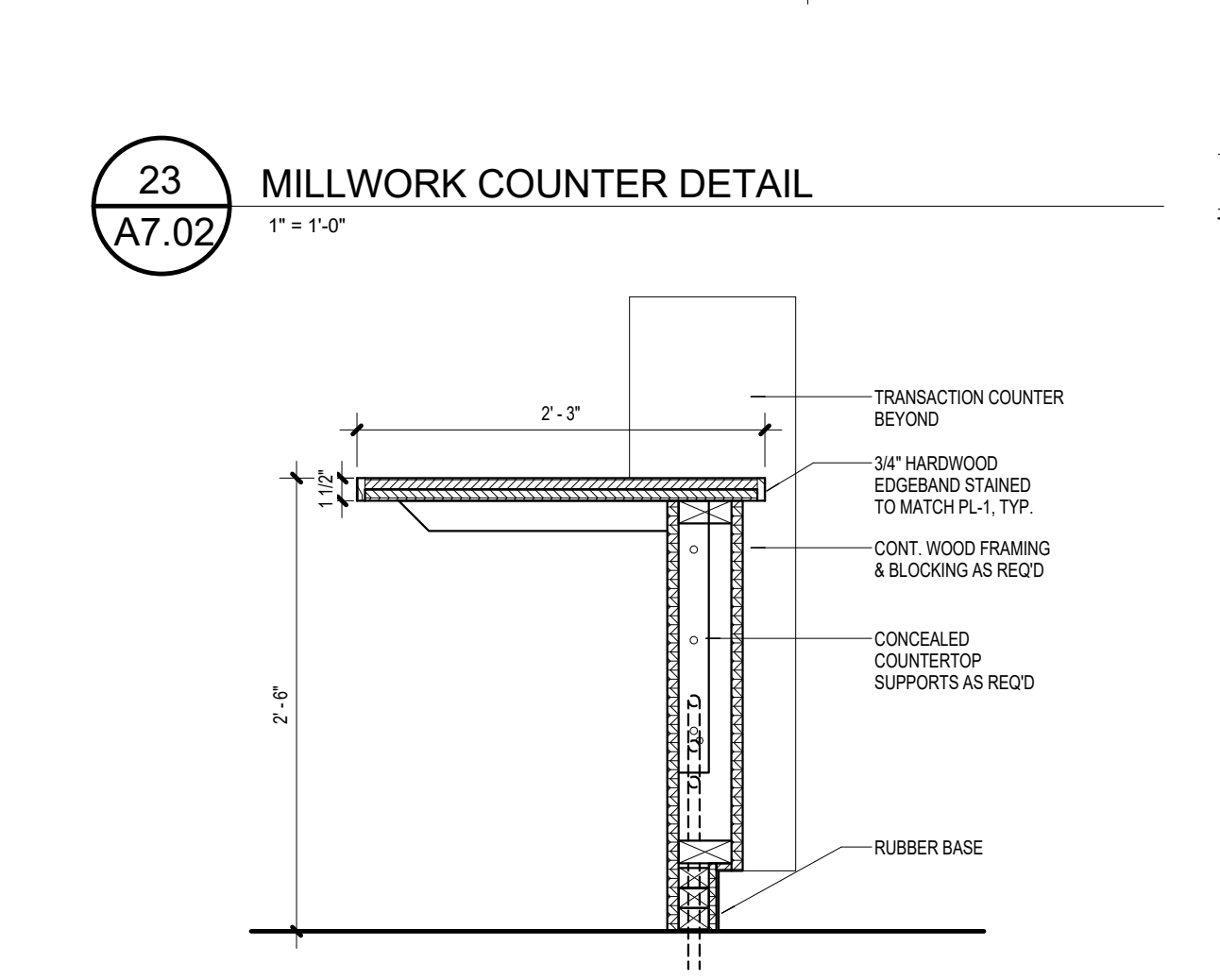
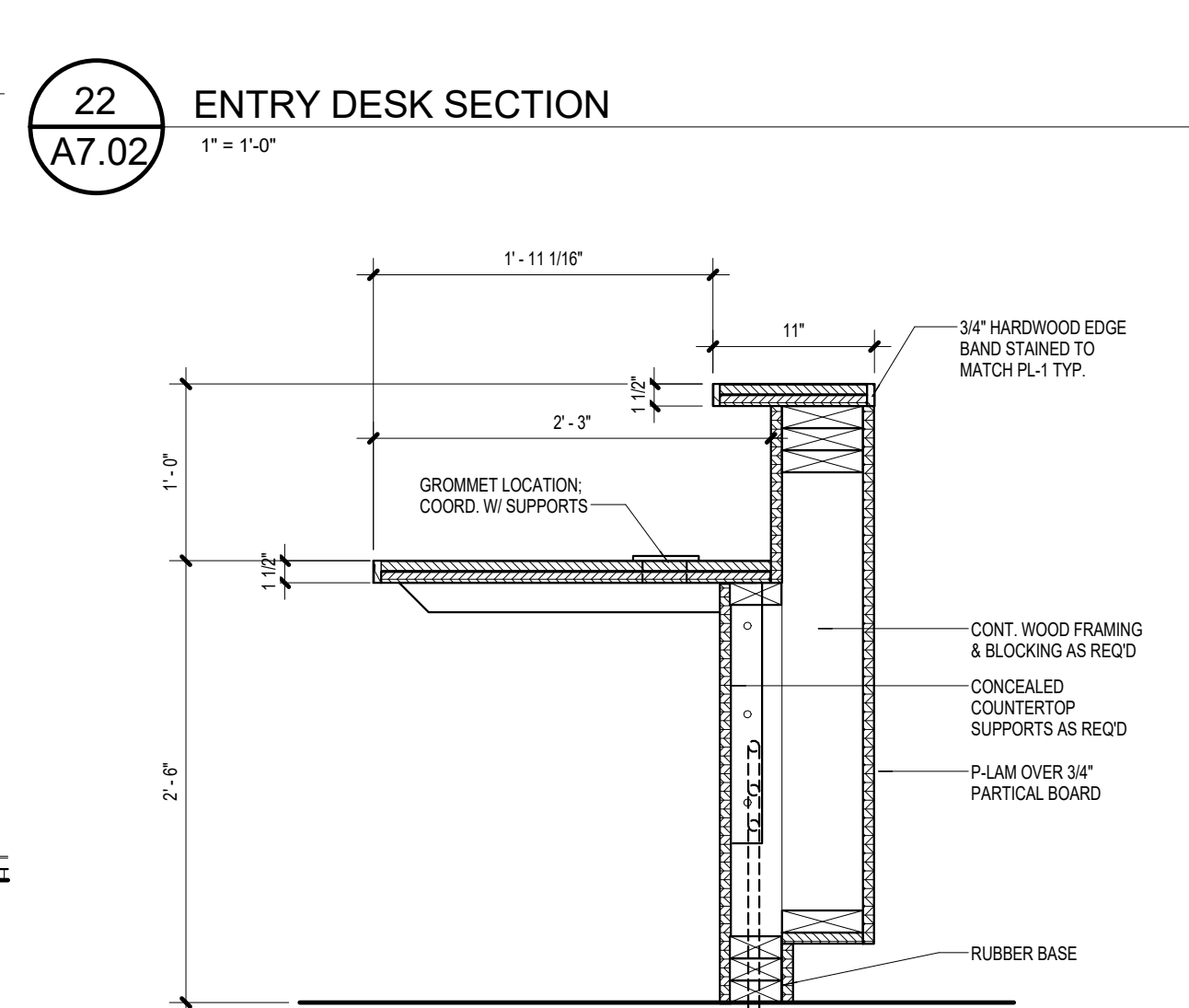
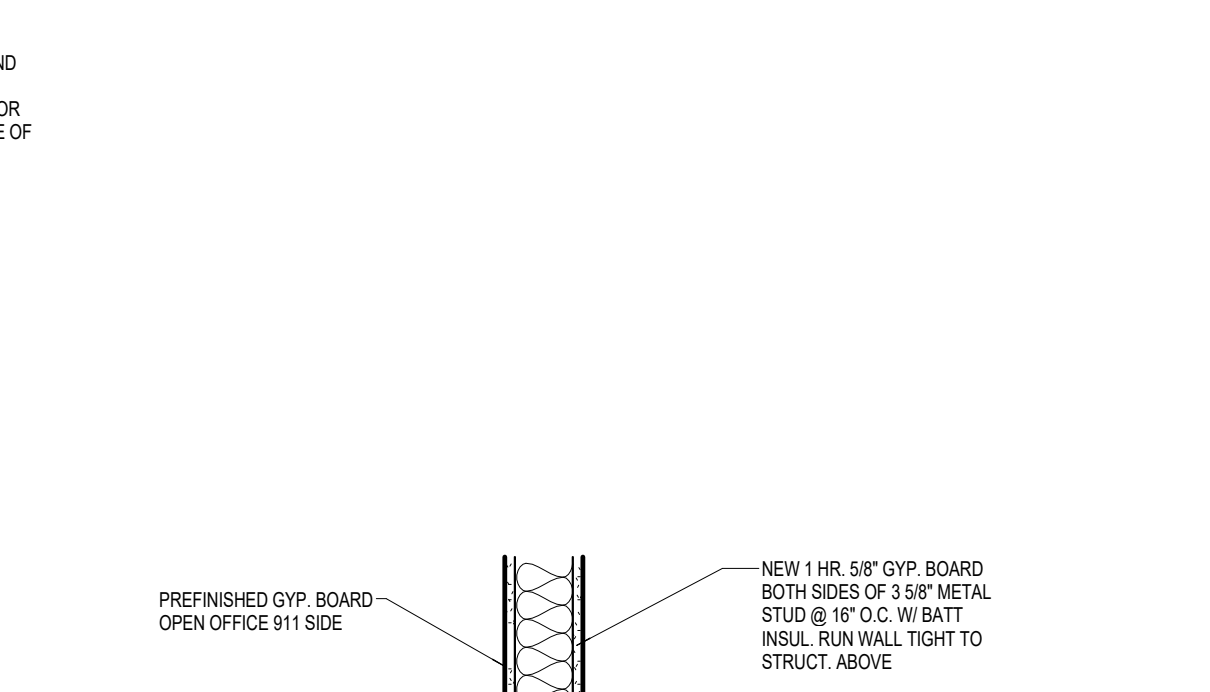
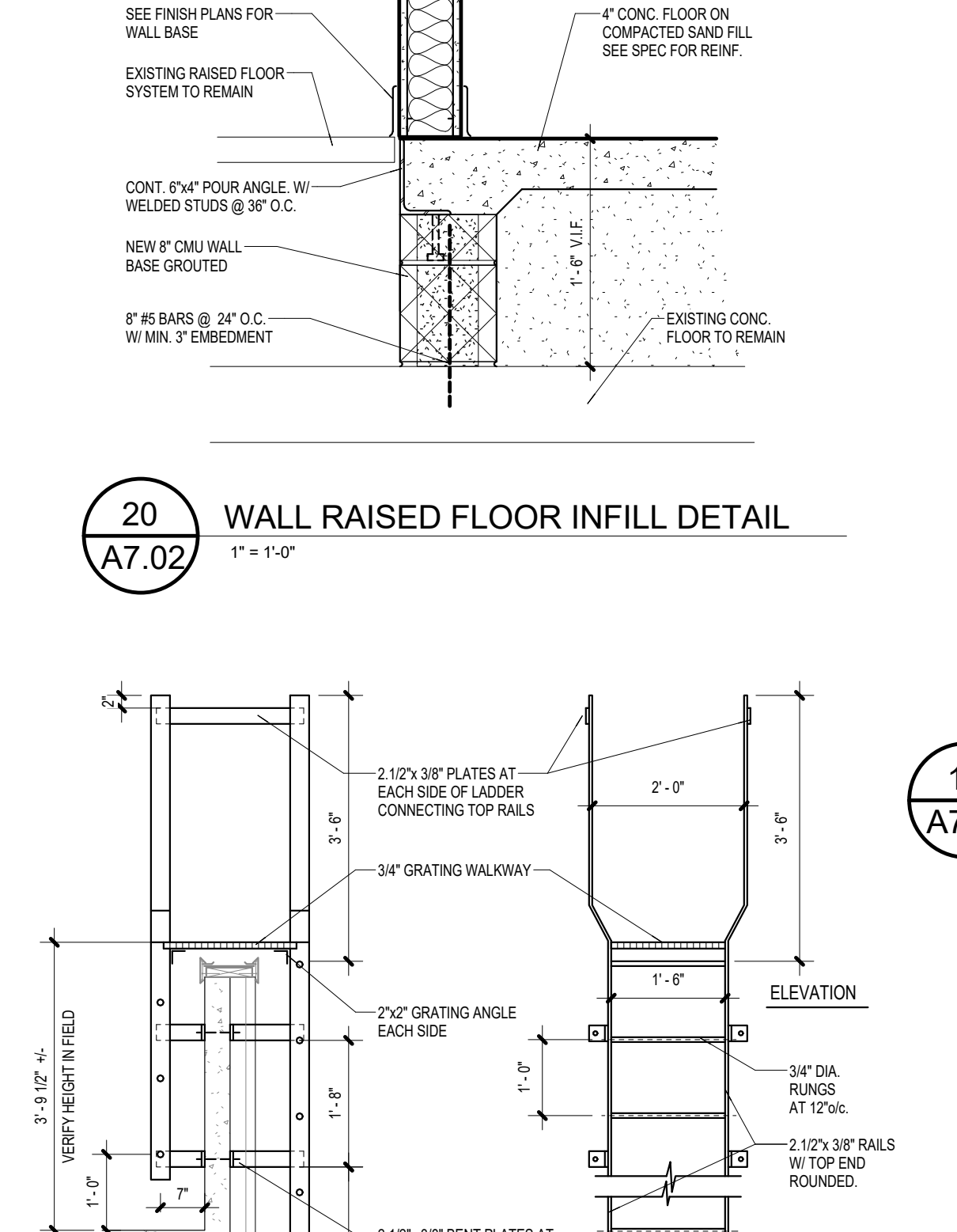
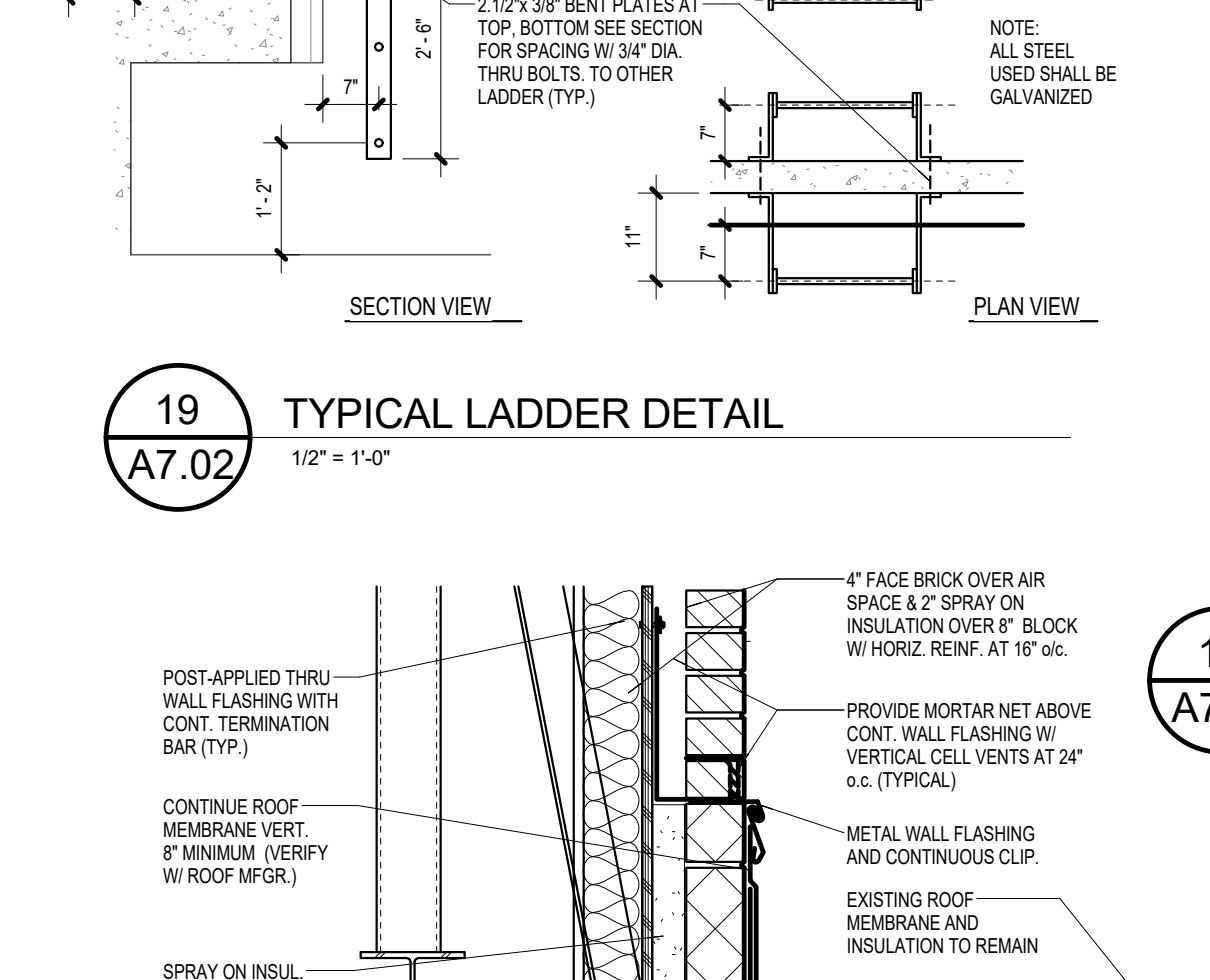
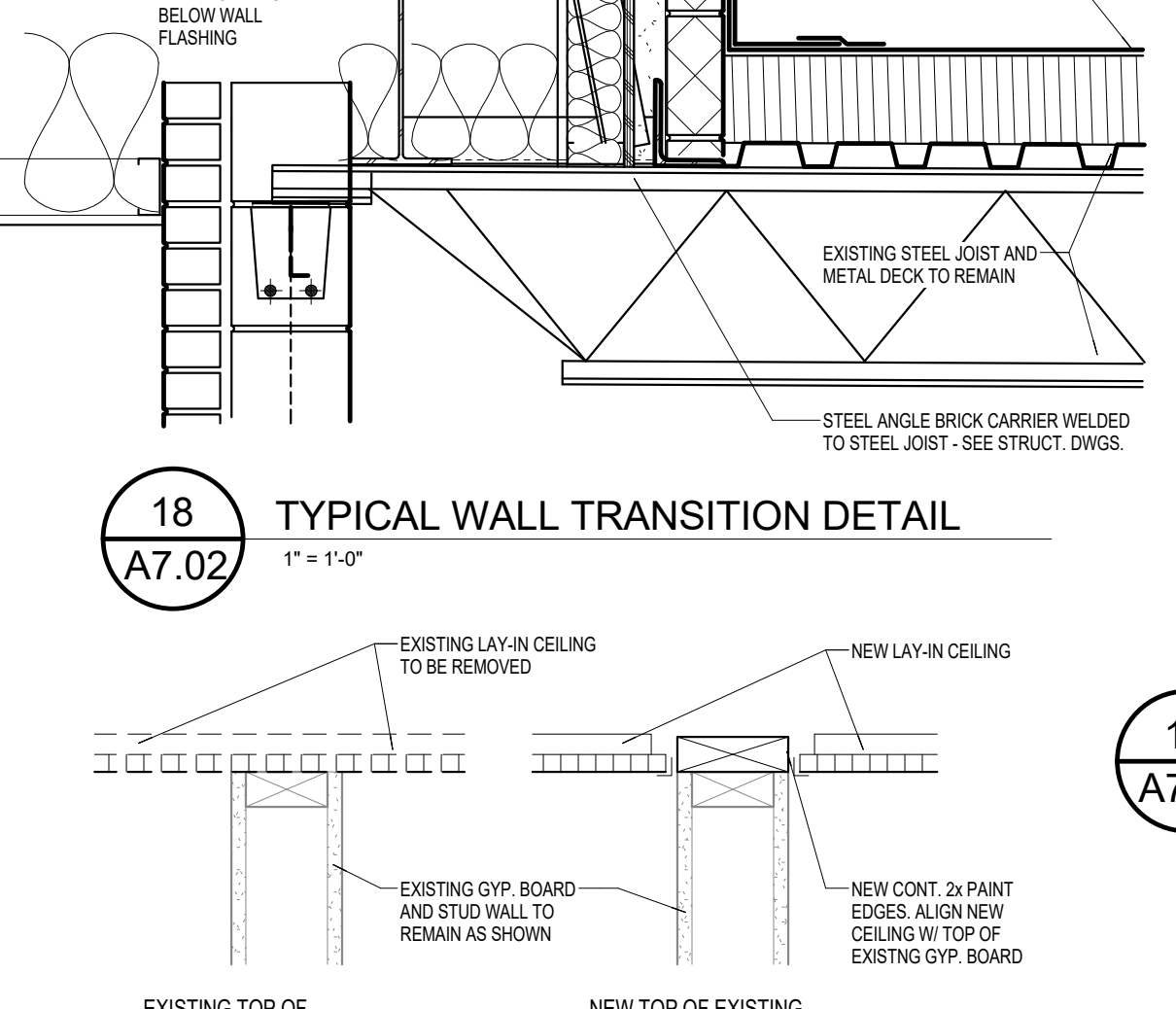
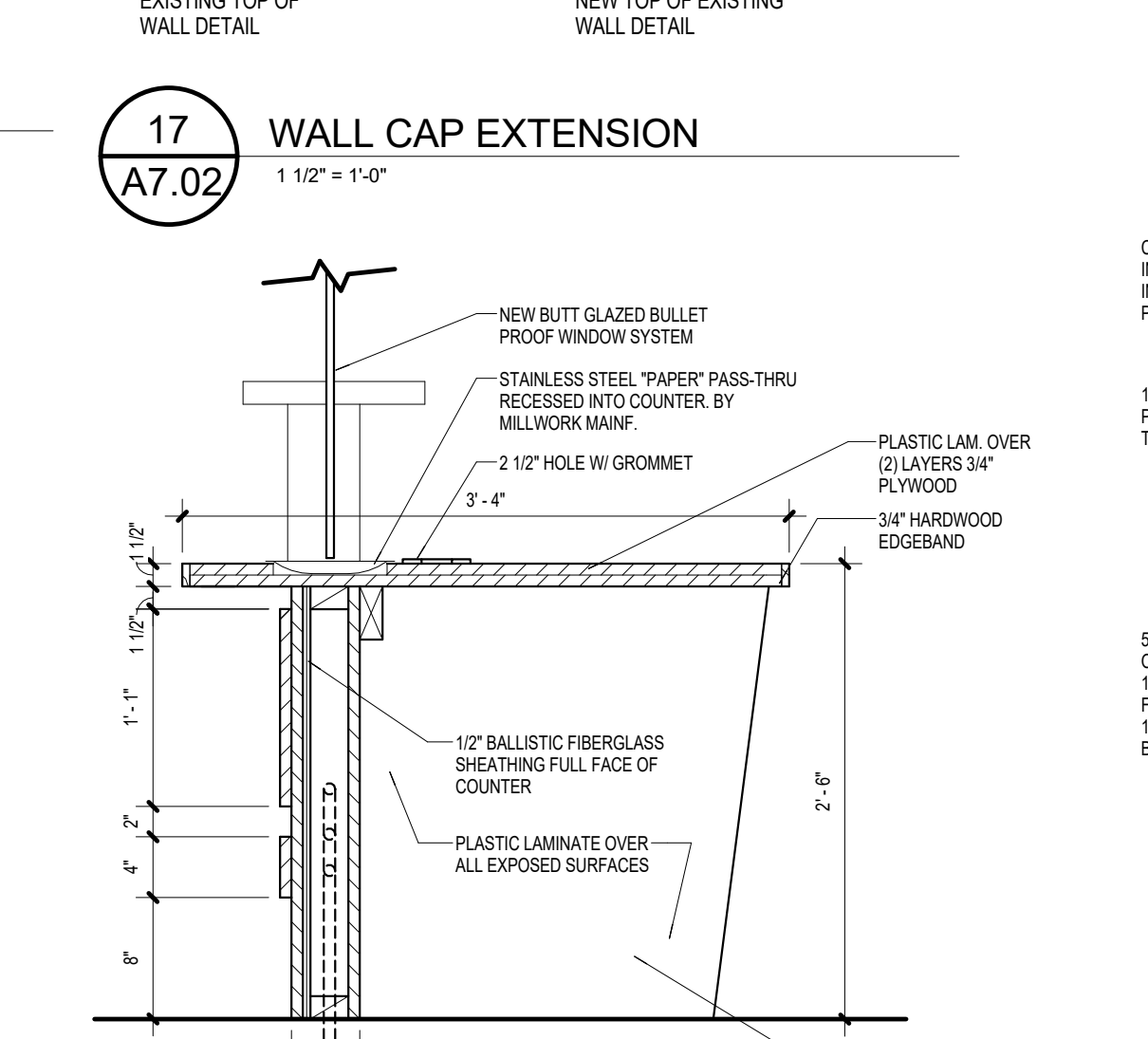
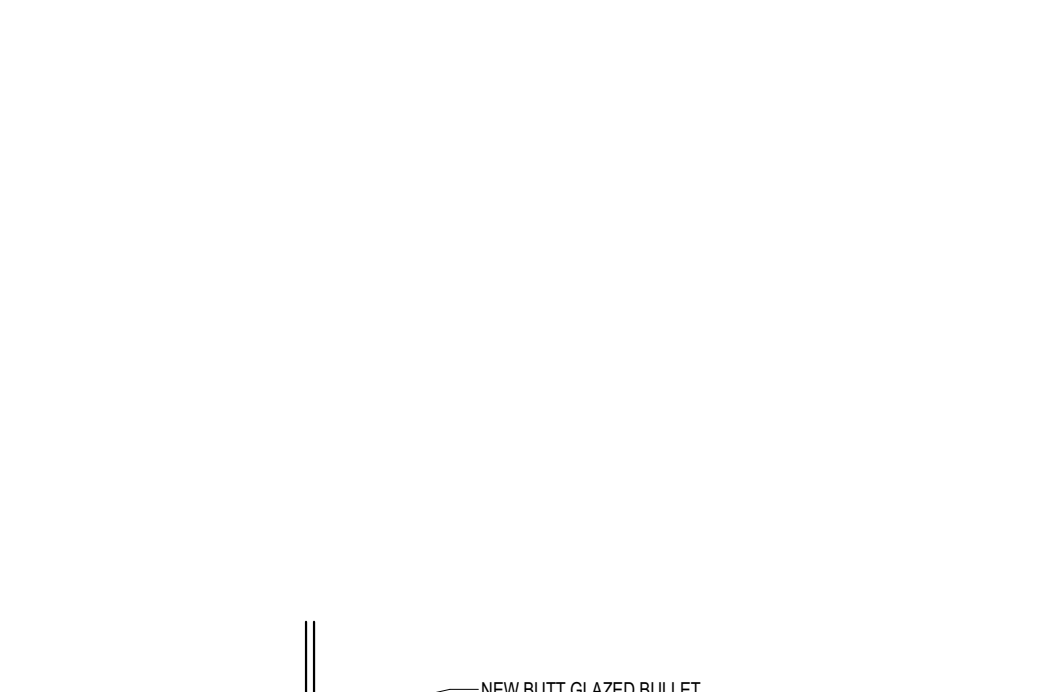
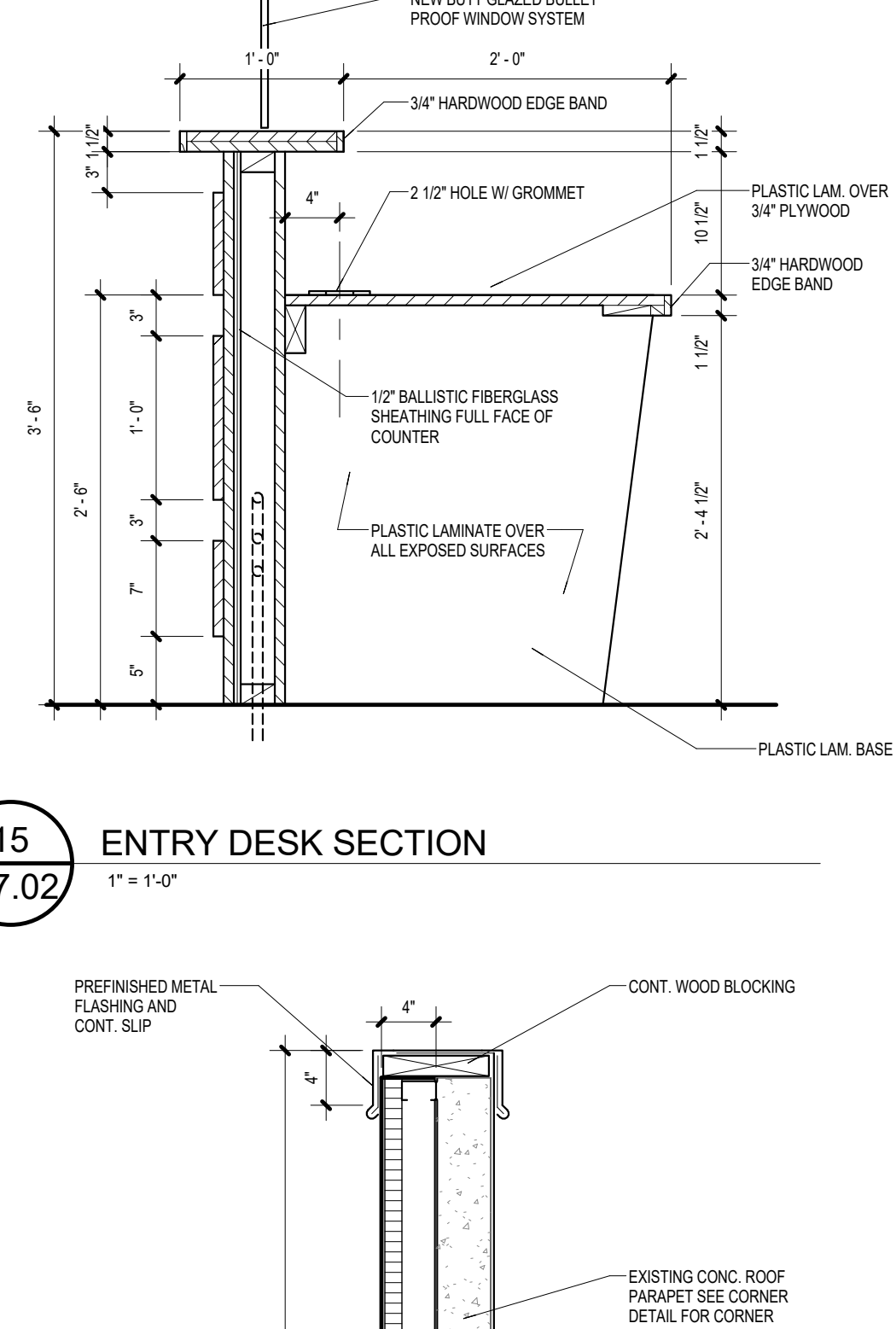
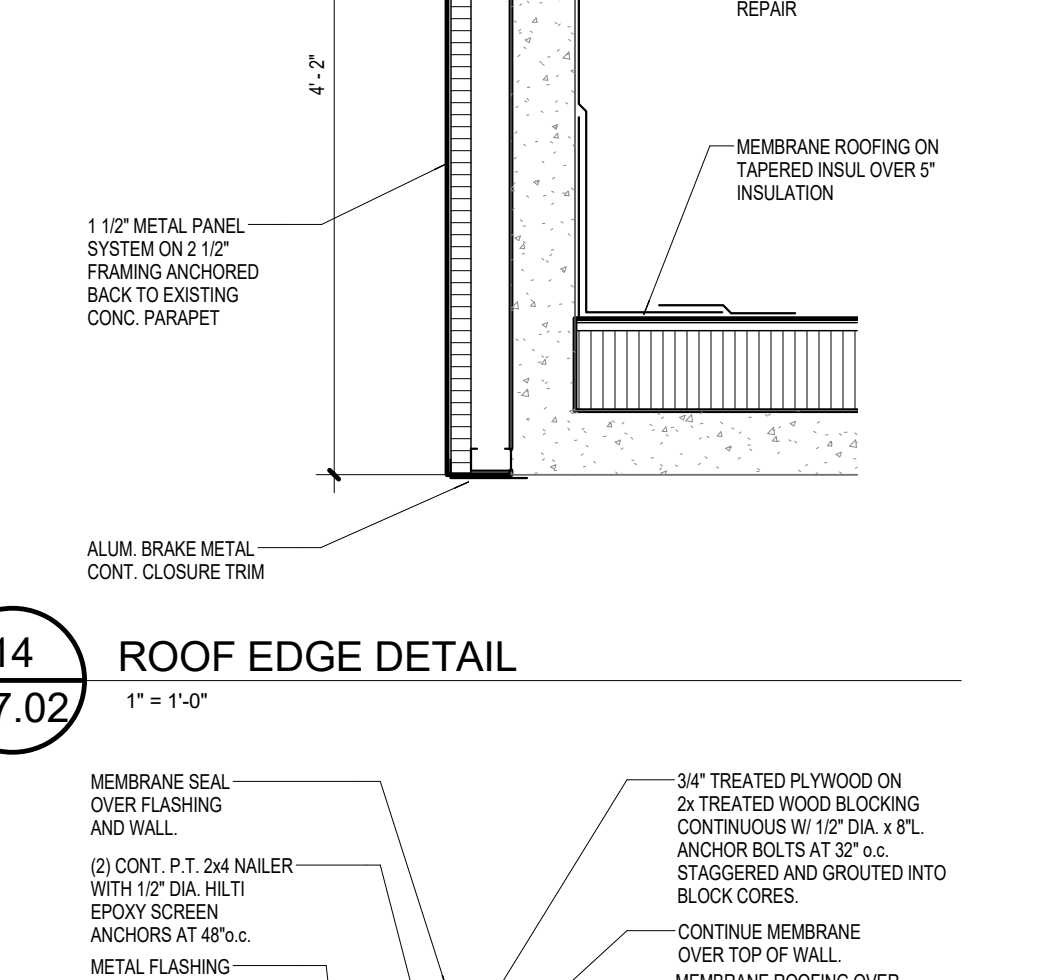
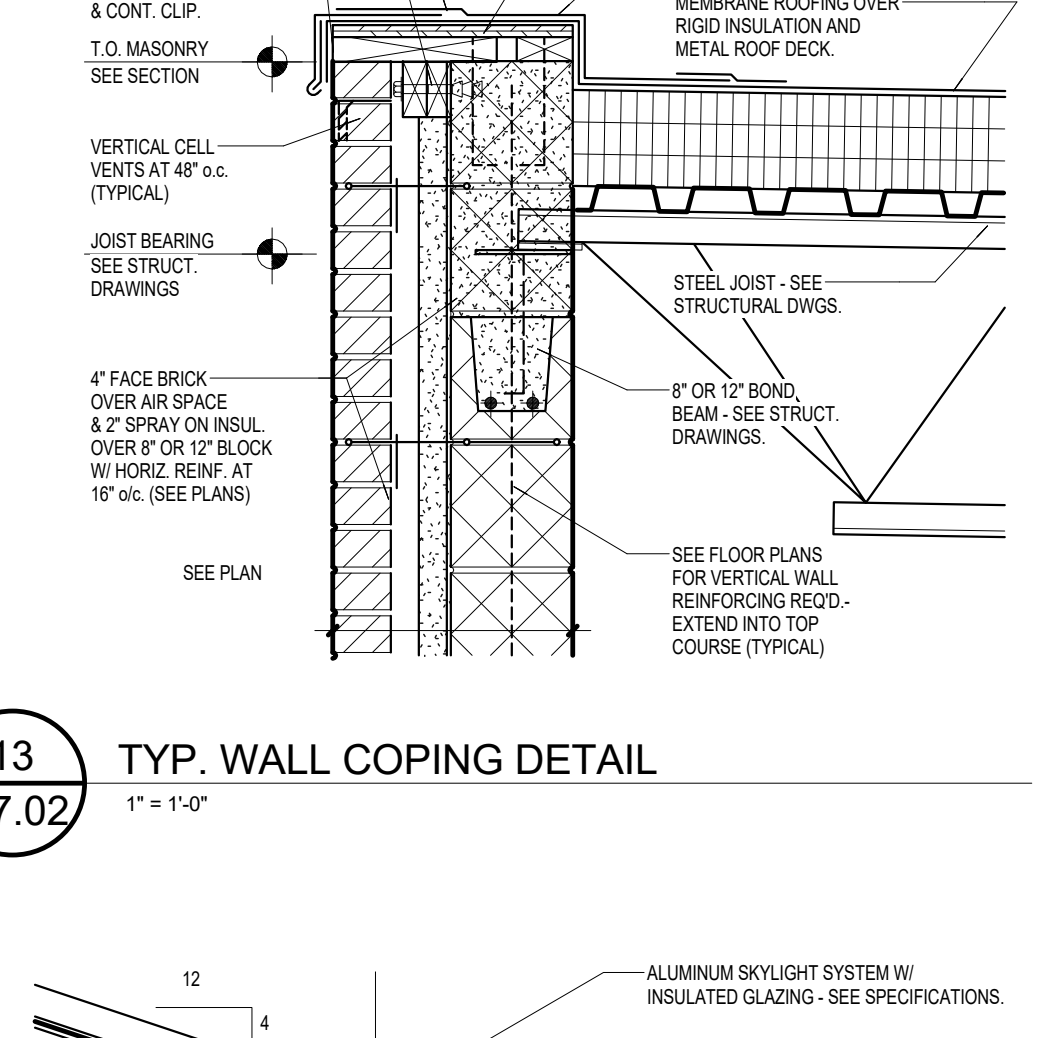
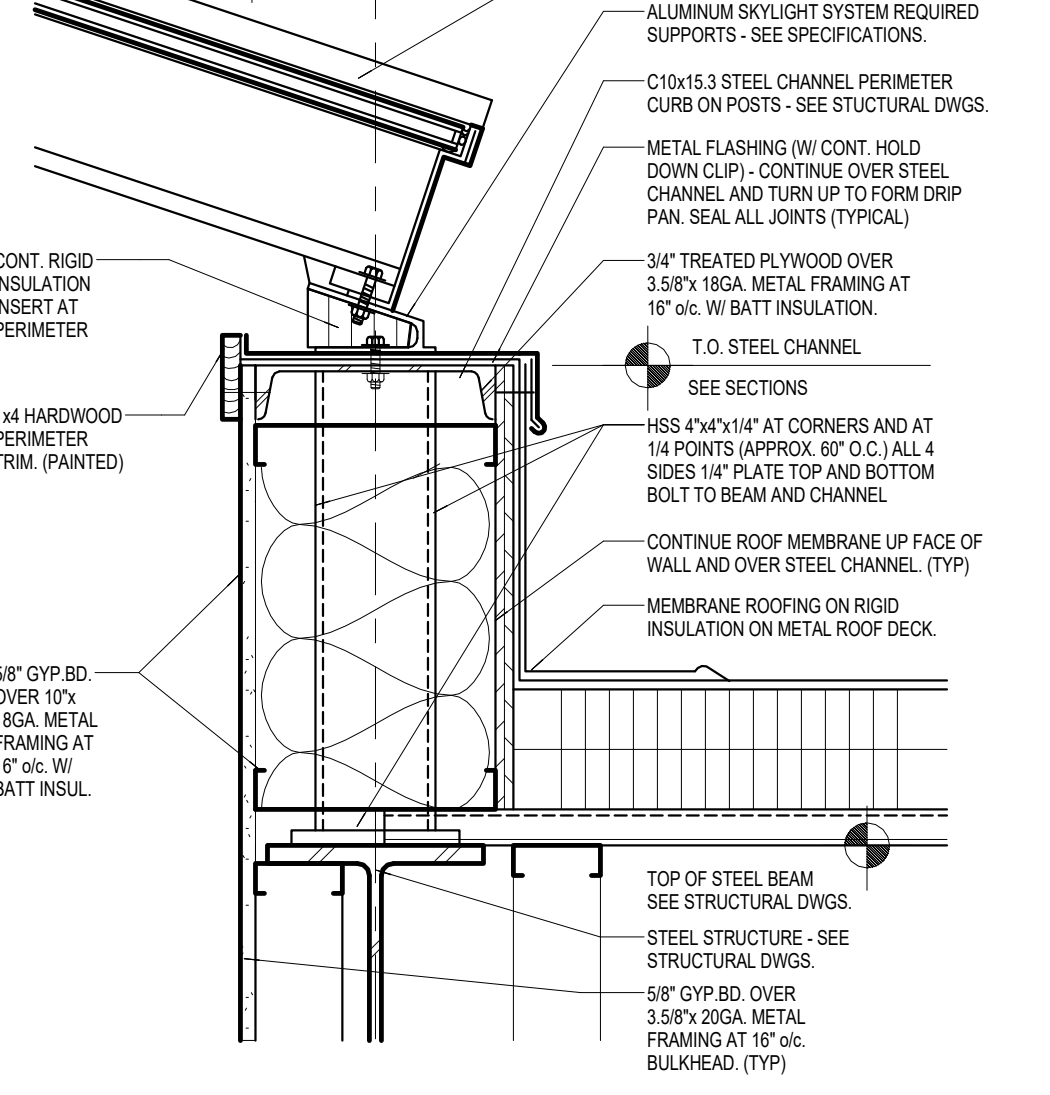
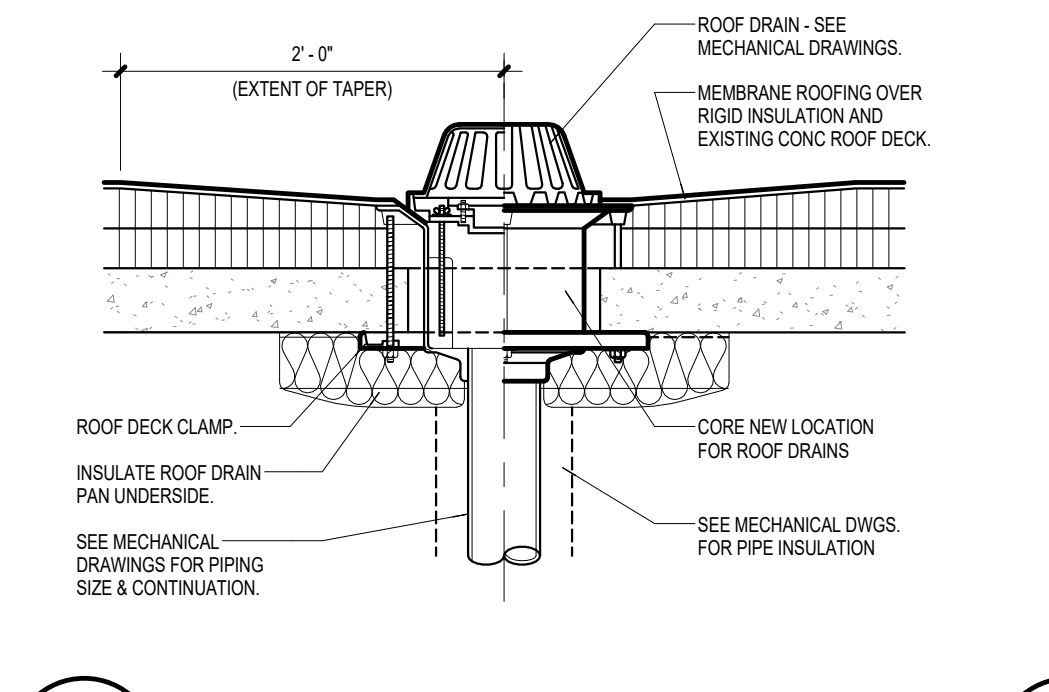
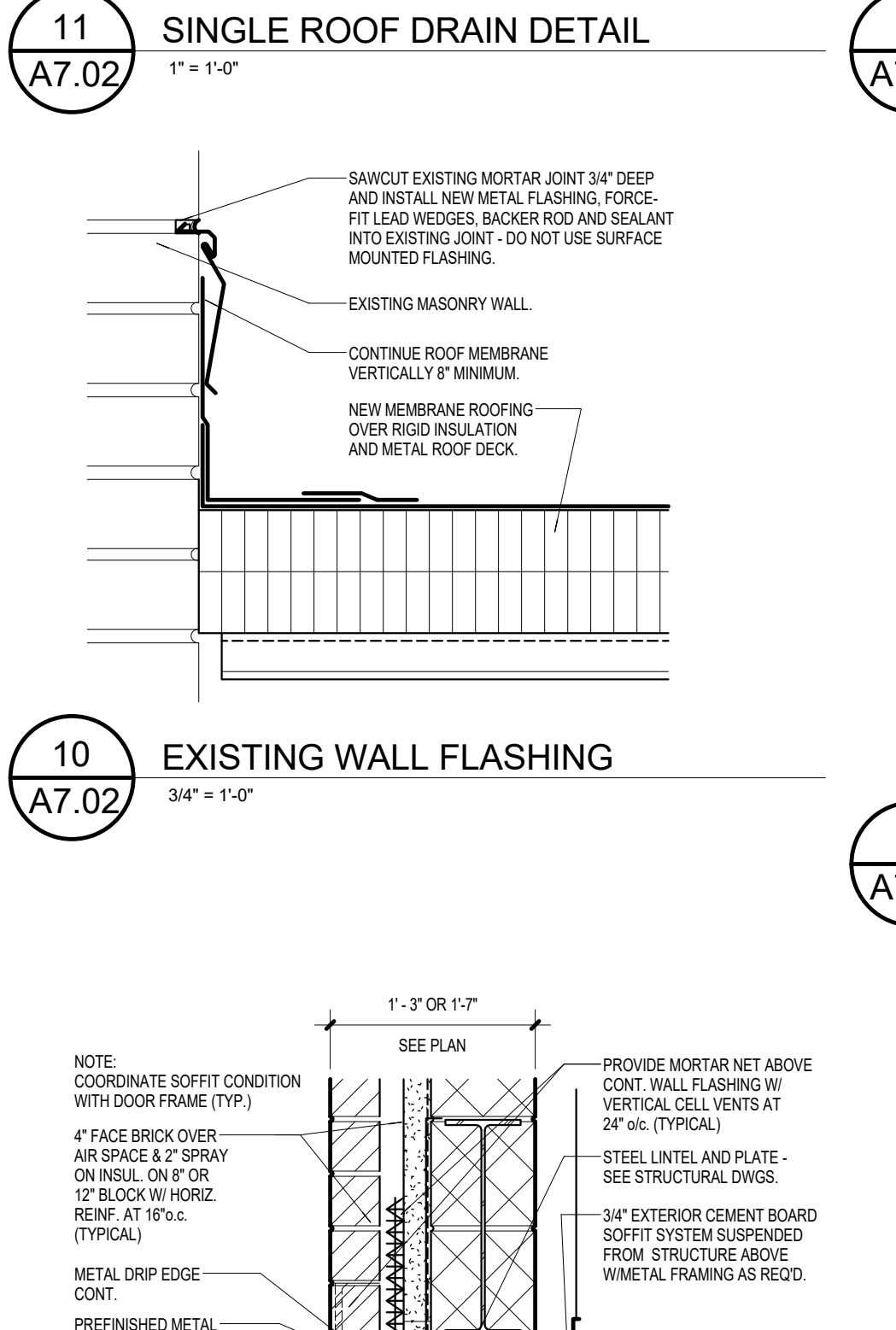
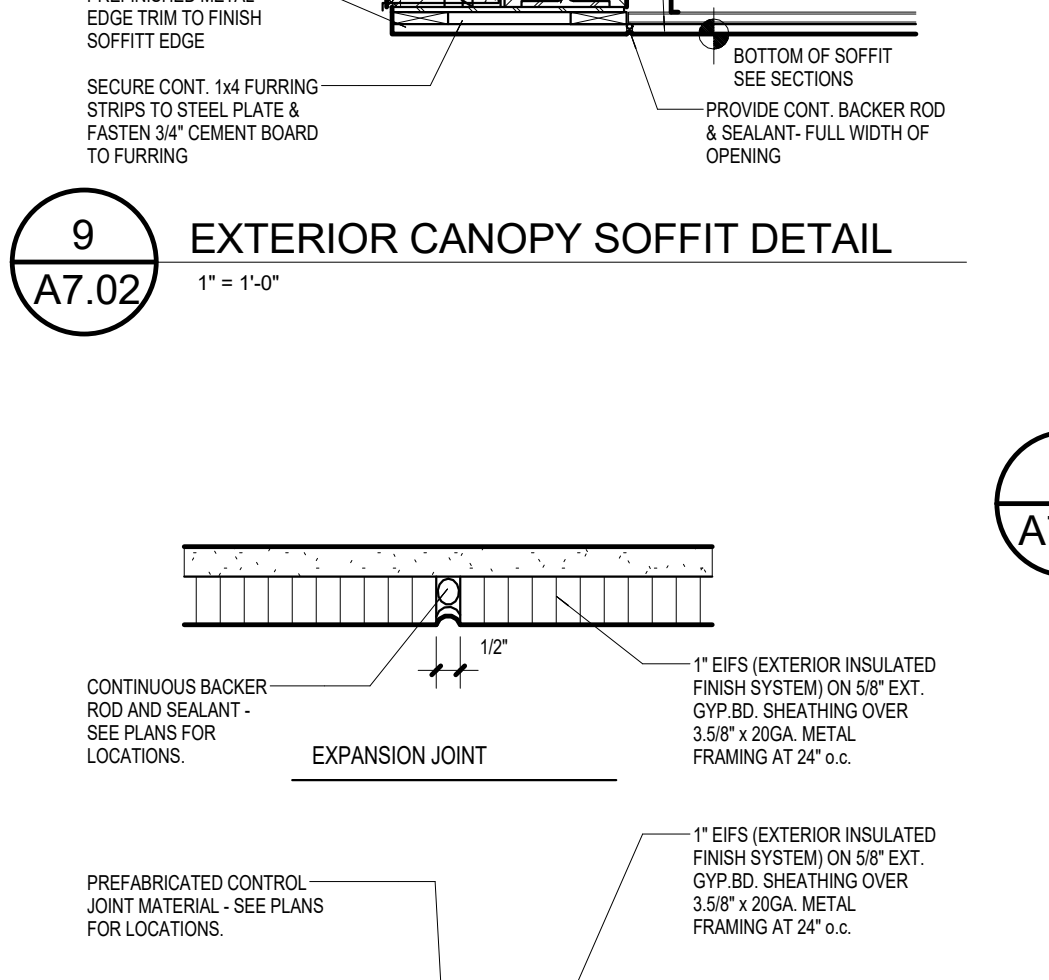
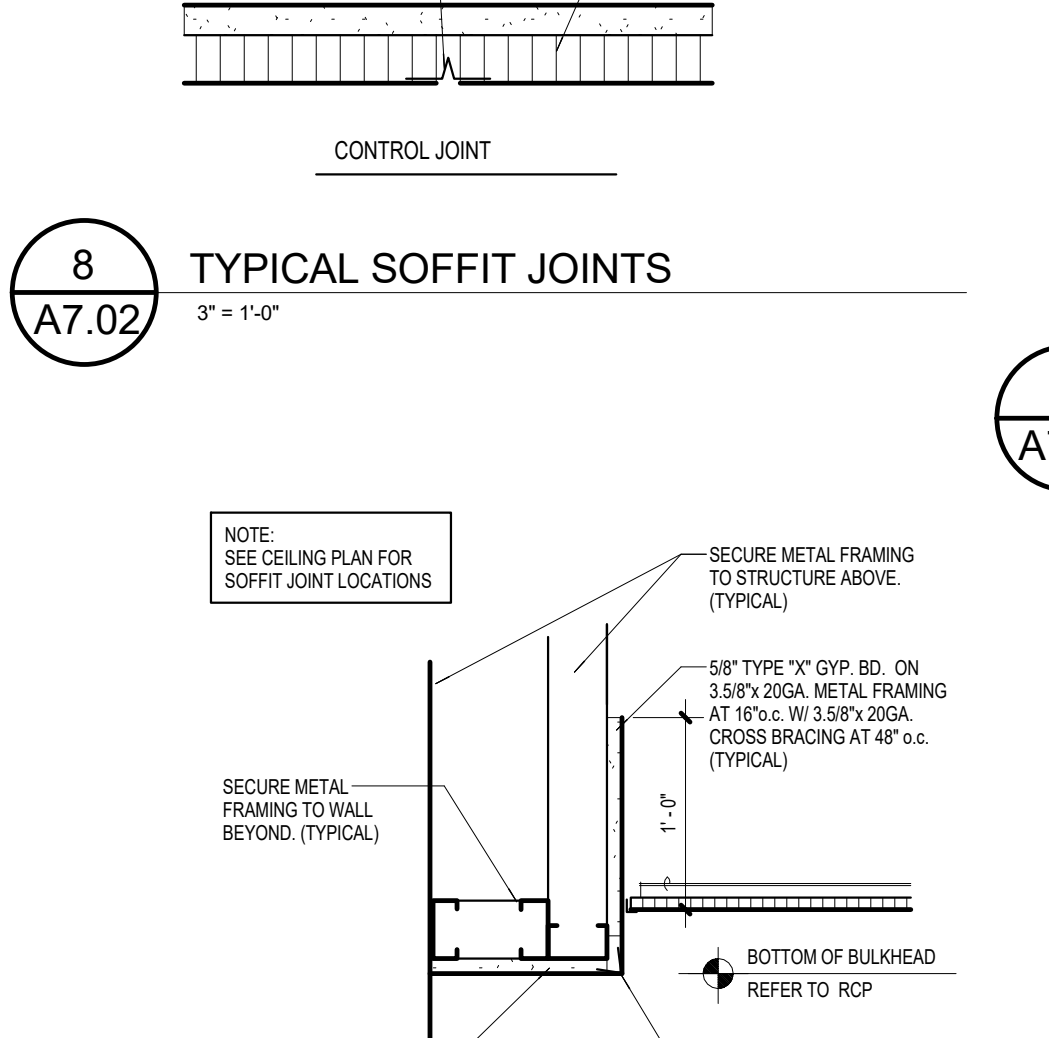
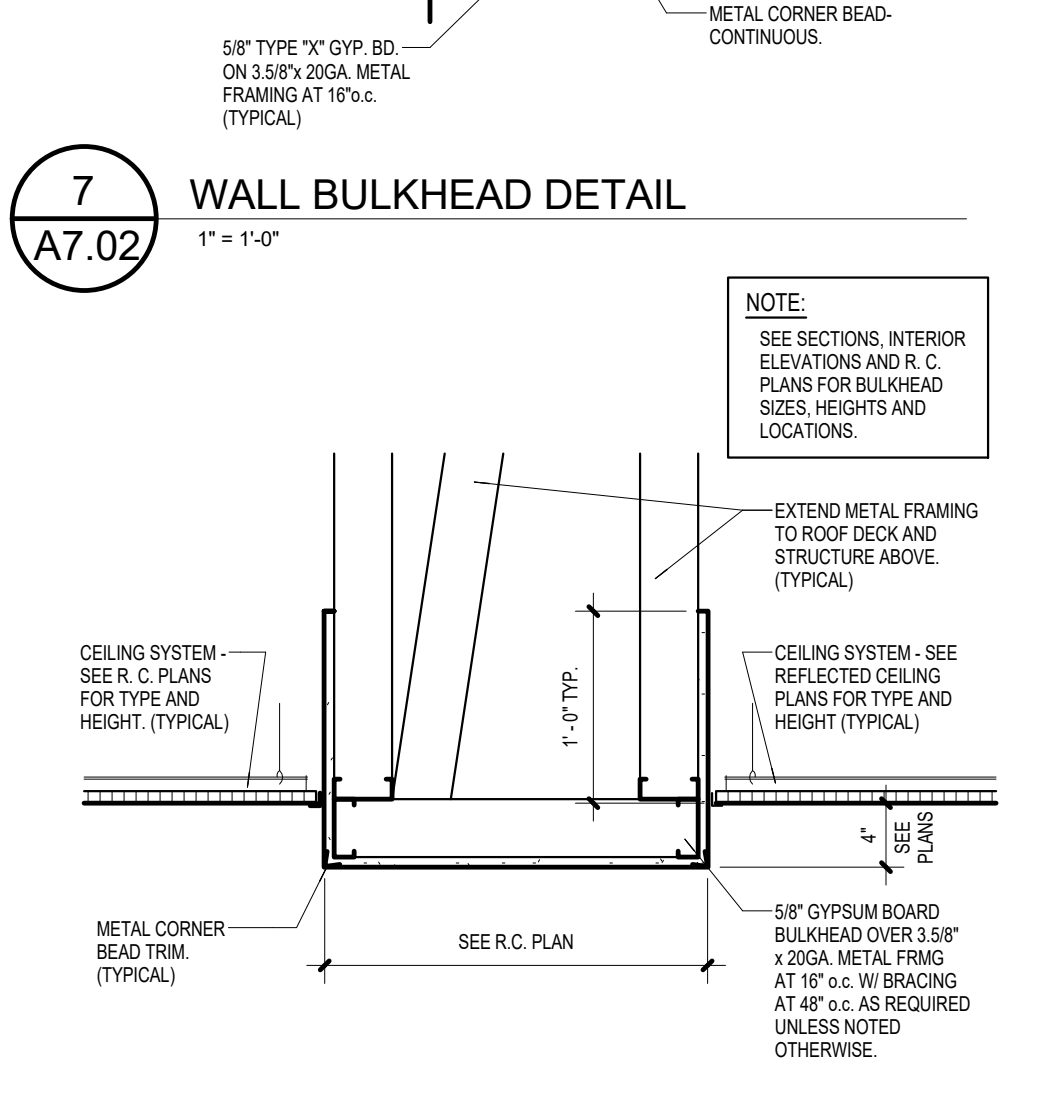
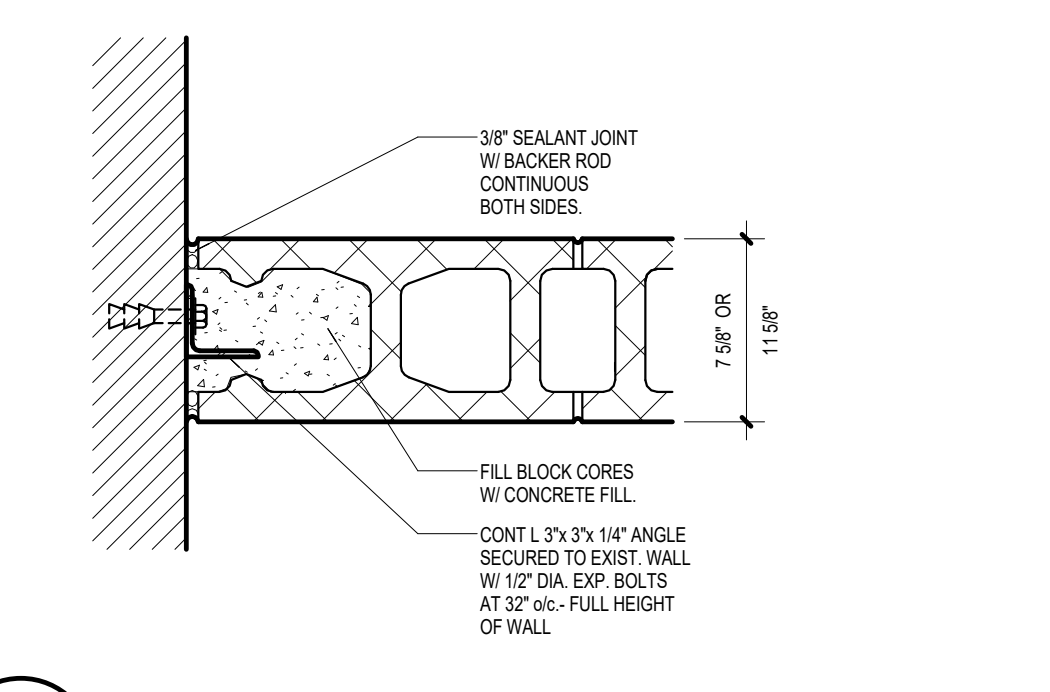
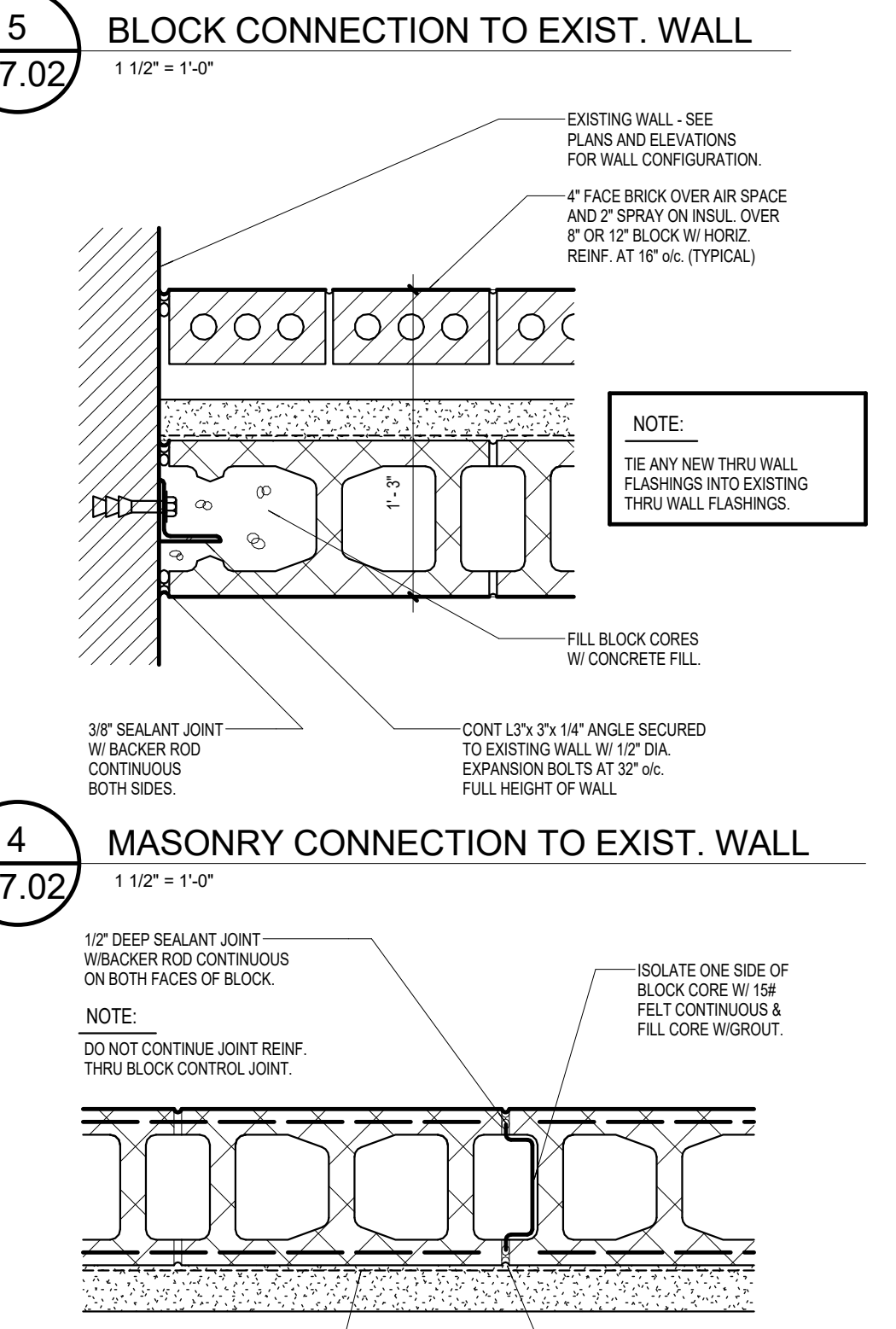
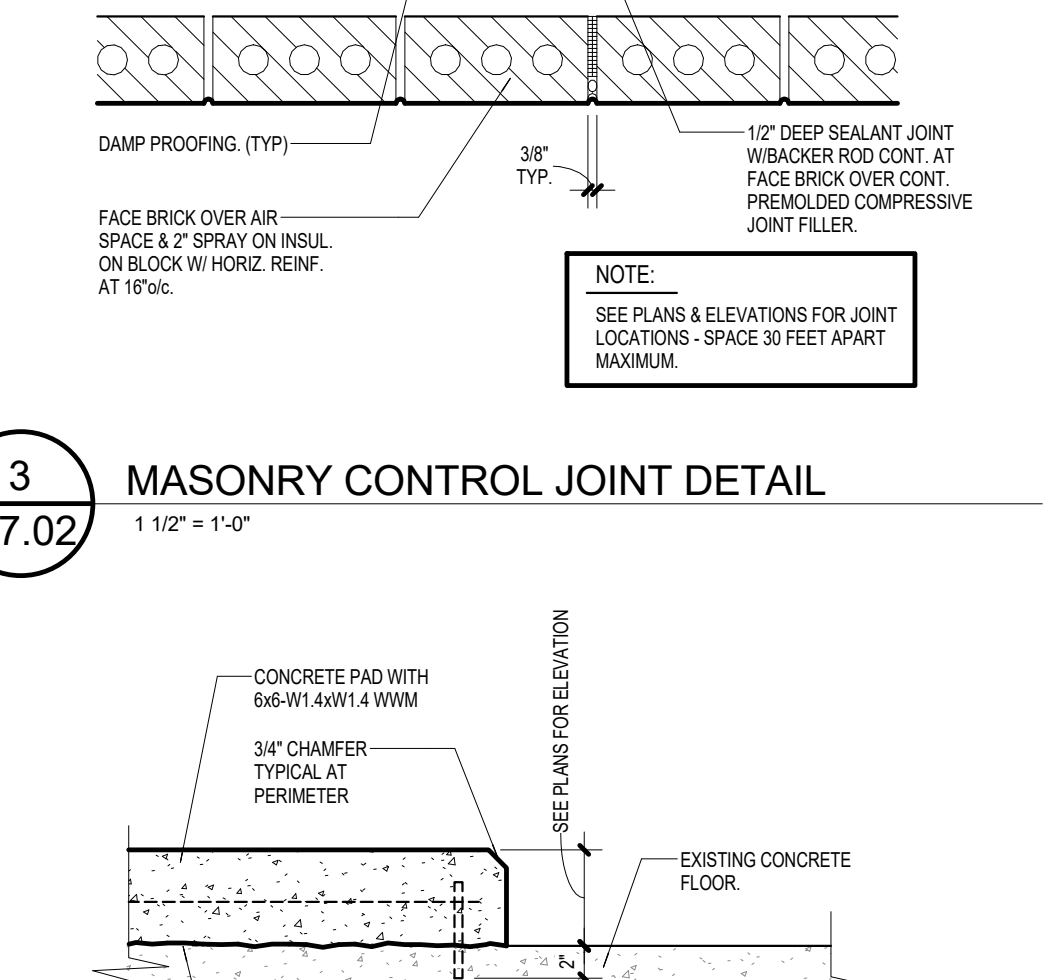
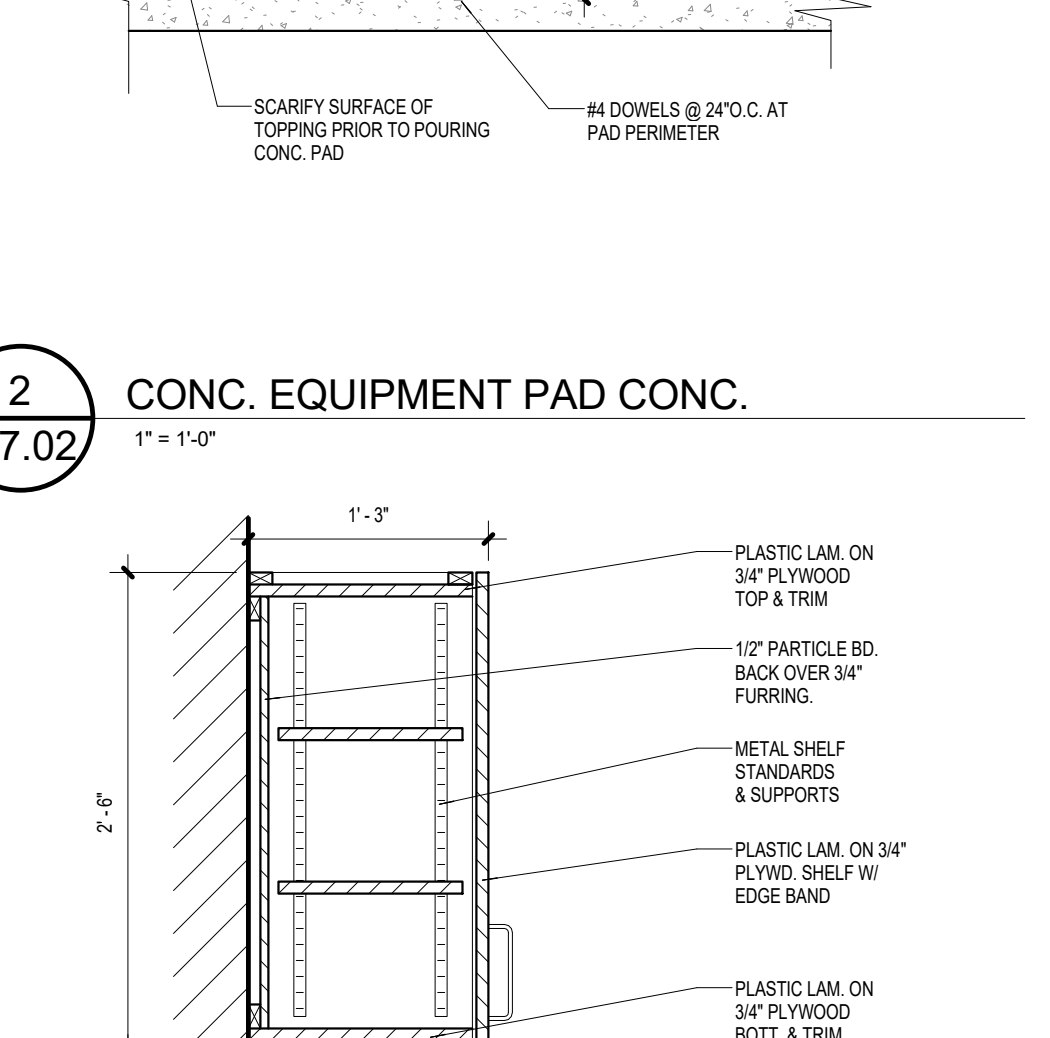
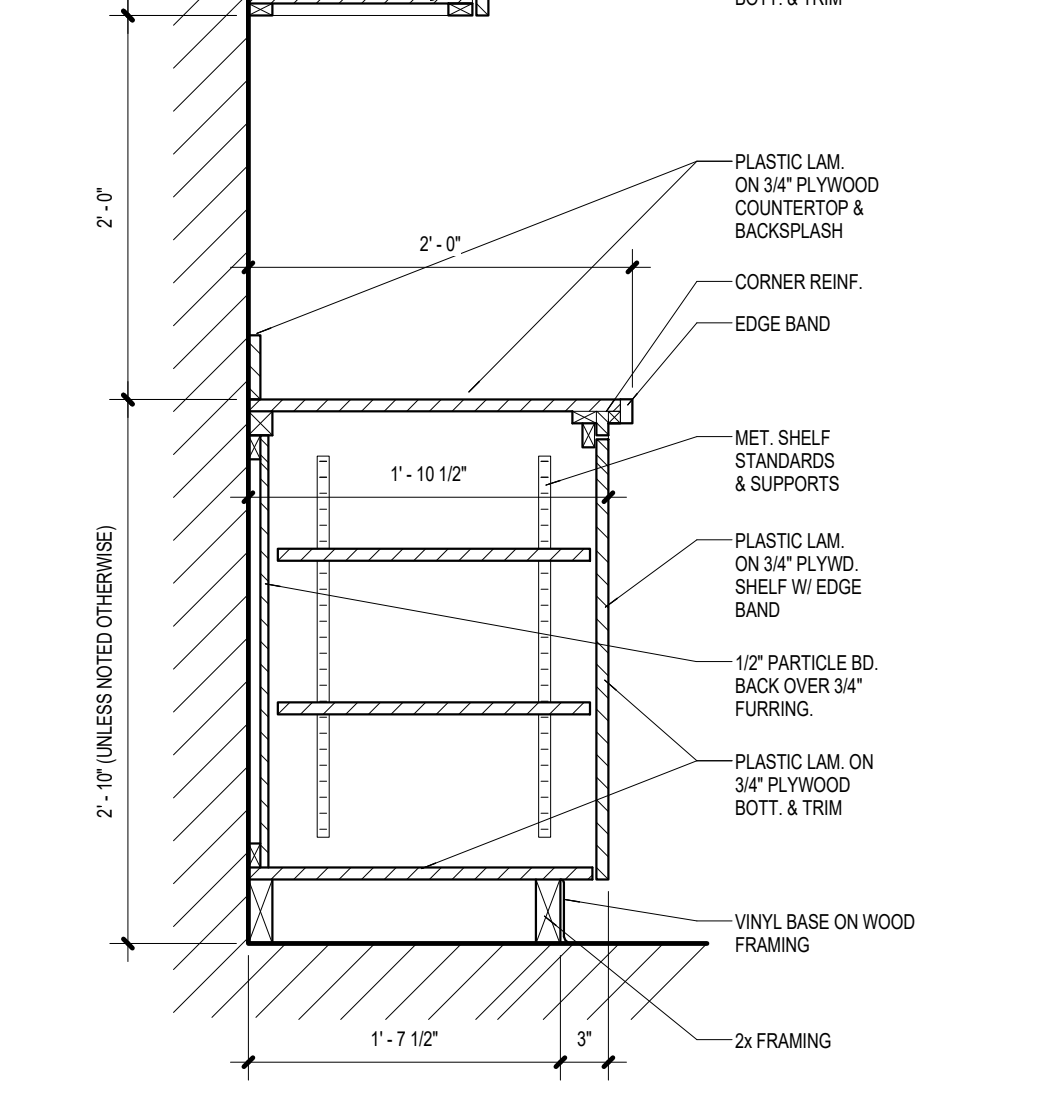
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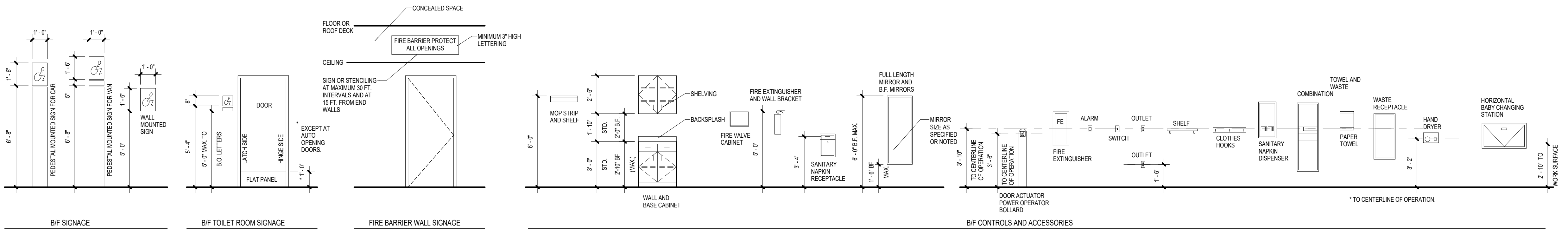
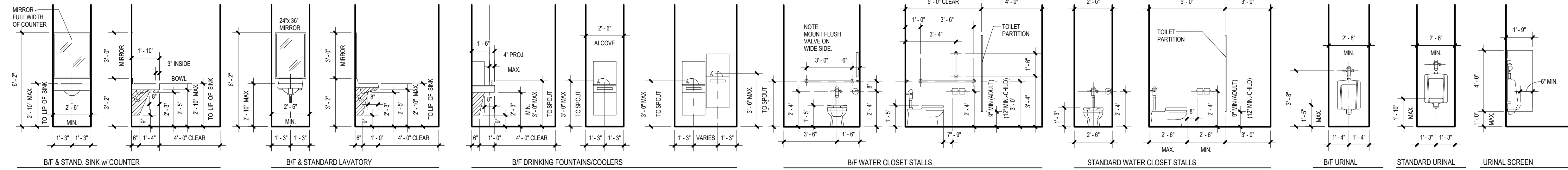
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$$1/2^* = 1'-0^*$$

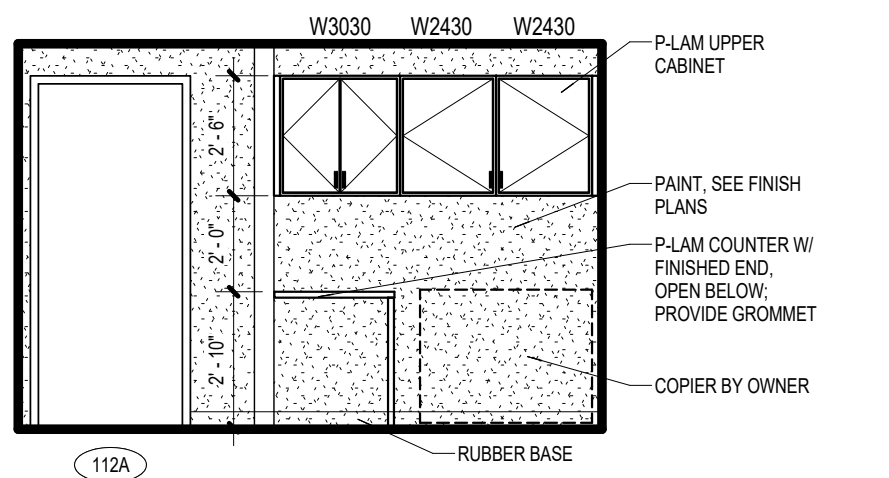
$$1/2^* = 1'-0^*$$

$$1/2^{\circ} = 1^{\circ} - 0^{\circ}$$



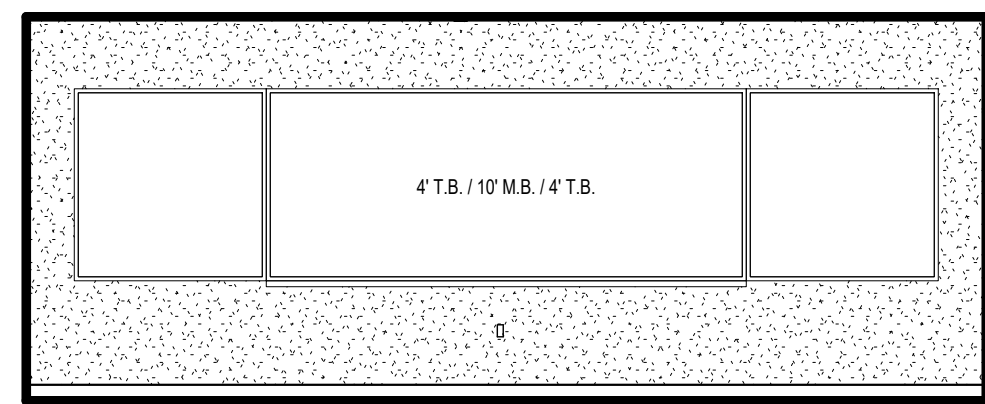




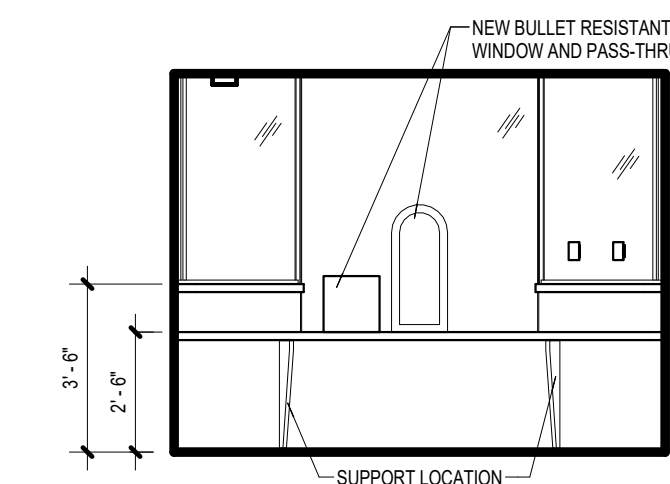
BARRIER FREE DIMENSIONS



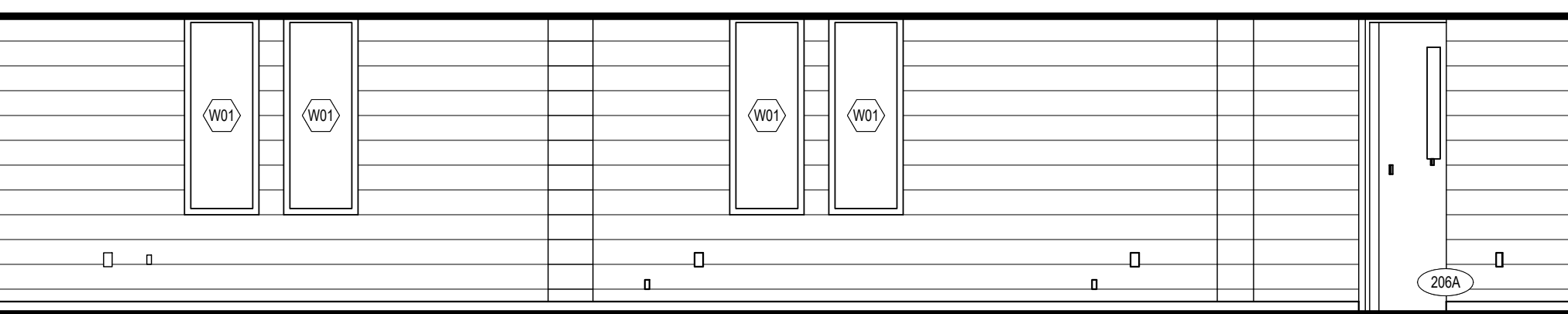
22
A8.01 110 CORRIDOR NORTH WALL
1/4" = 1'-0"



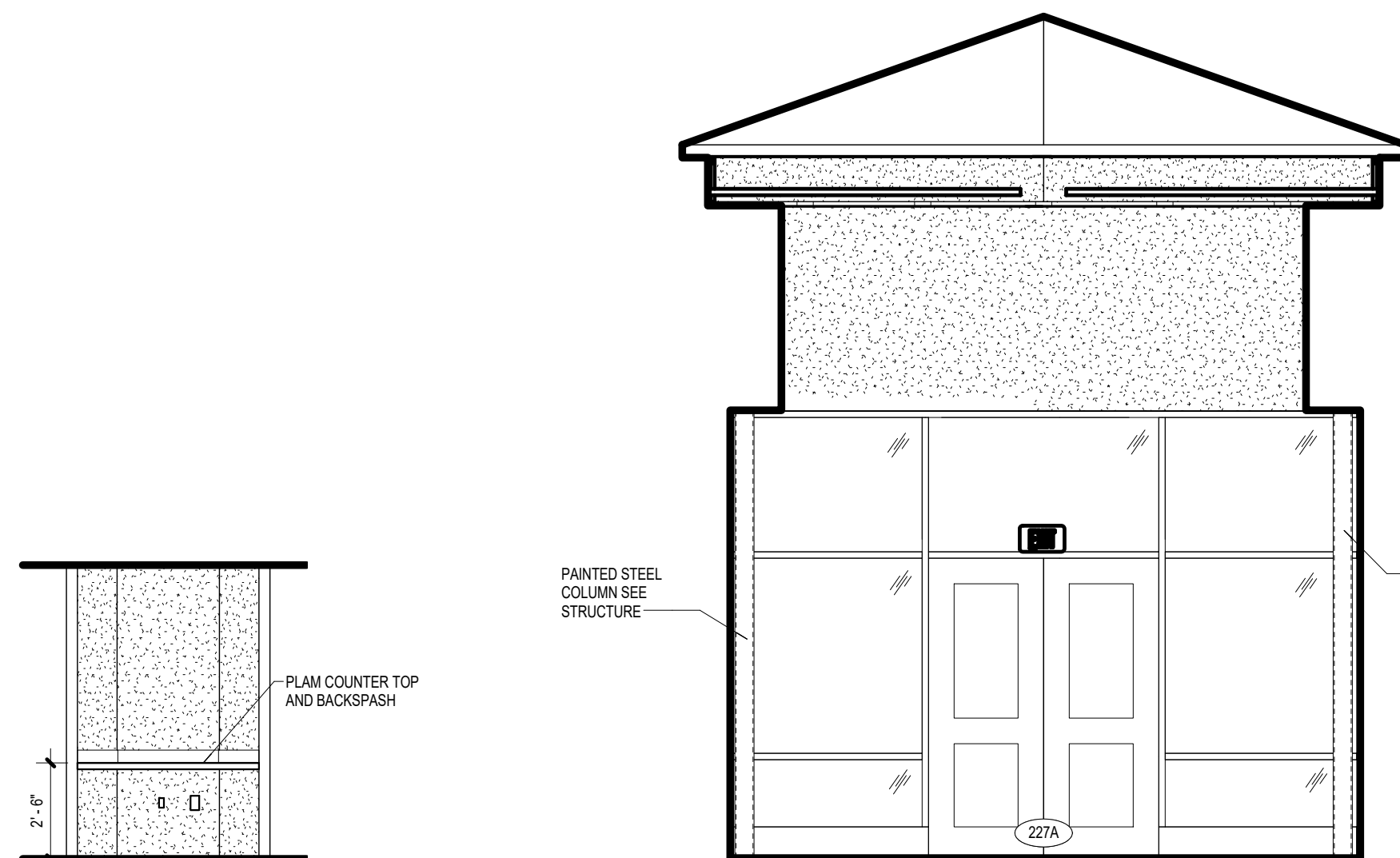
21
A8.01 206 MEETING SOUTH
1/4" = 1'-0"



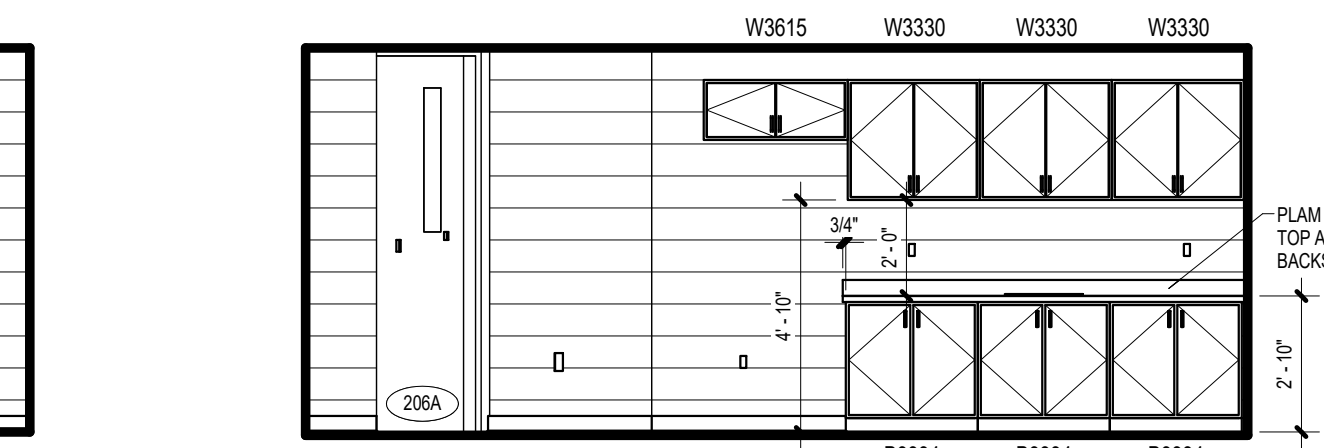
16
A8.01 227 VEST. (RECEPTION) SOUTHWEST
1/4" = 1'-0"



20
A8.01 206 MEETING WEST
1/4" = 1'-0"



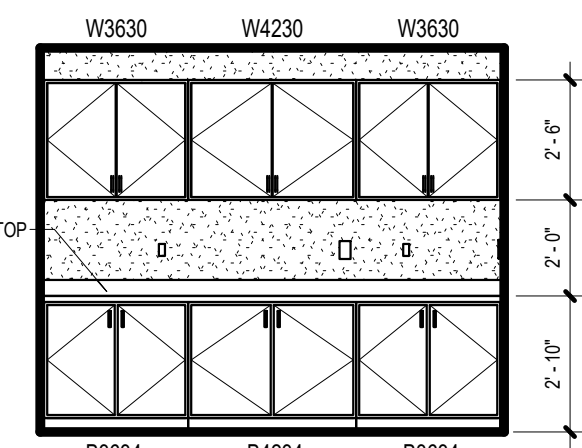
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A8.01 230 VESTIBULE SOUTHWEST
1/4" = 1'-0"



19
A8.01 206 MEETING NORTH
1/4" = 1'-0"



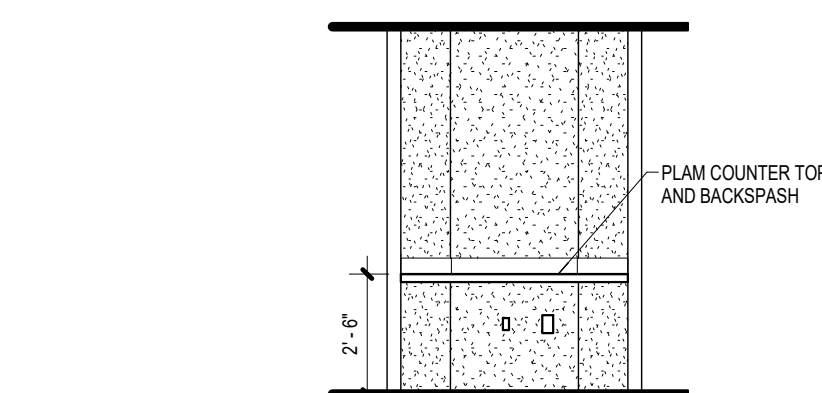
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A8.01 230 VESTIBULE SOUTHEAST
1/4" = 1'-0"



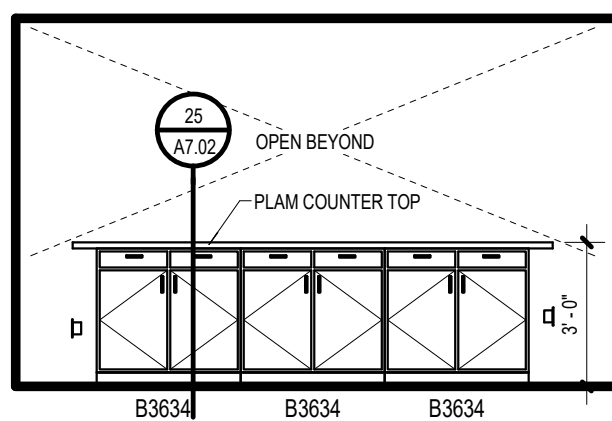
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A8.01 241 EVIDENCE PRO. WEST
1/4" = 1'-0"



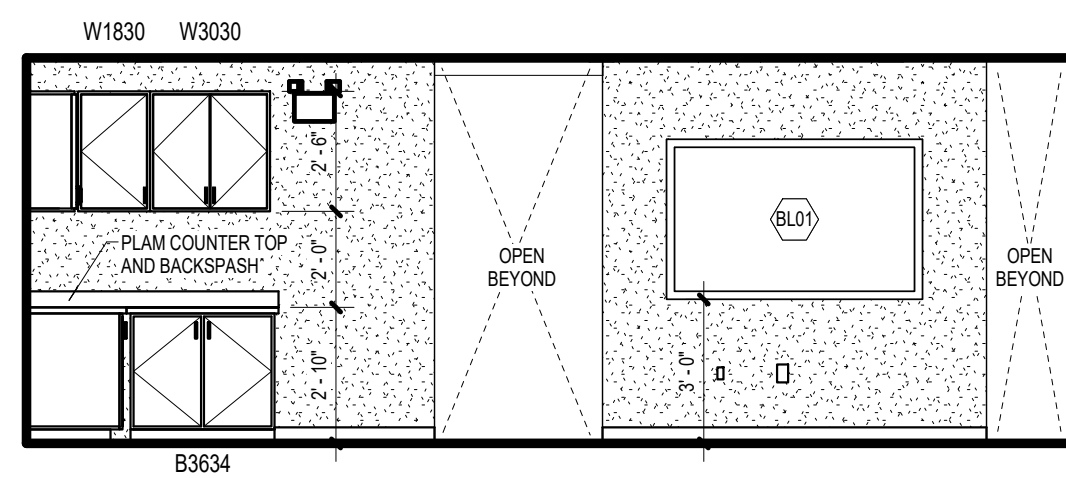
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A8.01 241 EVIDENCE PRO. EAST
1/4" = 1'-0"



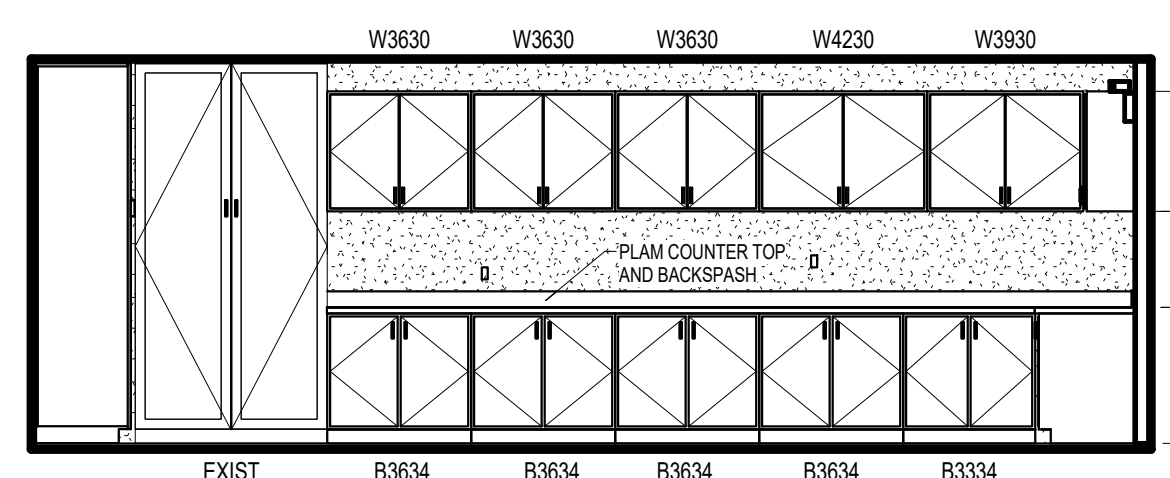
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A8.01 227 VEST. (RECEPTION) NORTHEAST
1/4" = 1'-0"



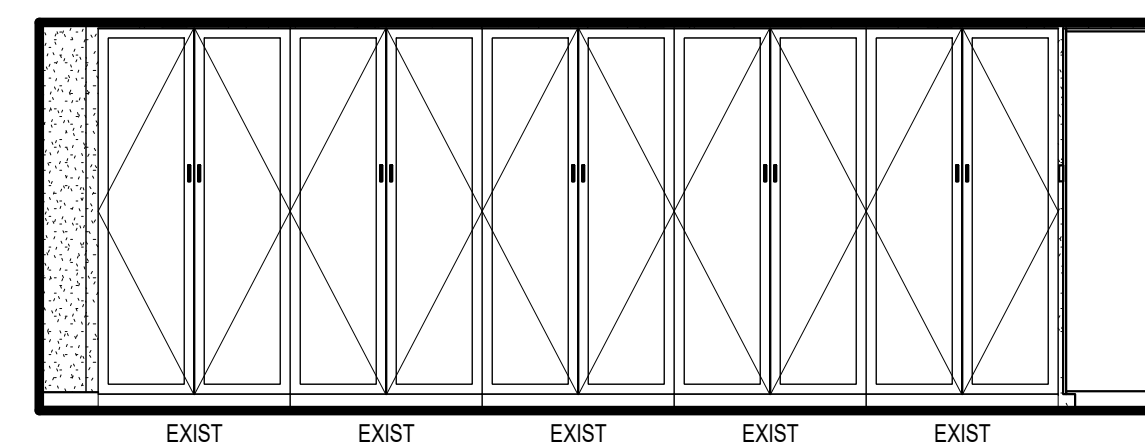
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A8.01 218 OPEN OFFICE ISLAND
1/4" = 1'-0"



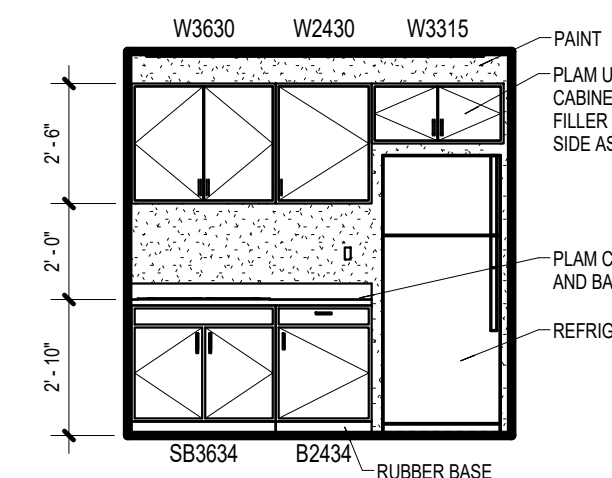
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A8.01 218 OPEN OFFICE WEST
1/4" = 1'-0"



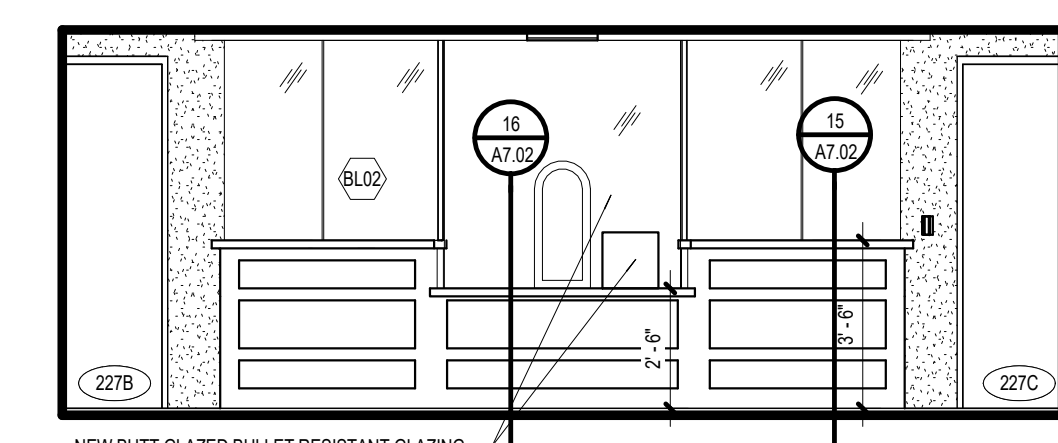
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A8.01 218 OPEN OFFICE SOUTH
1/4" = 1'-0"



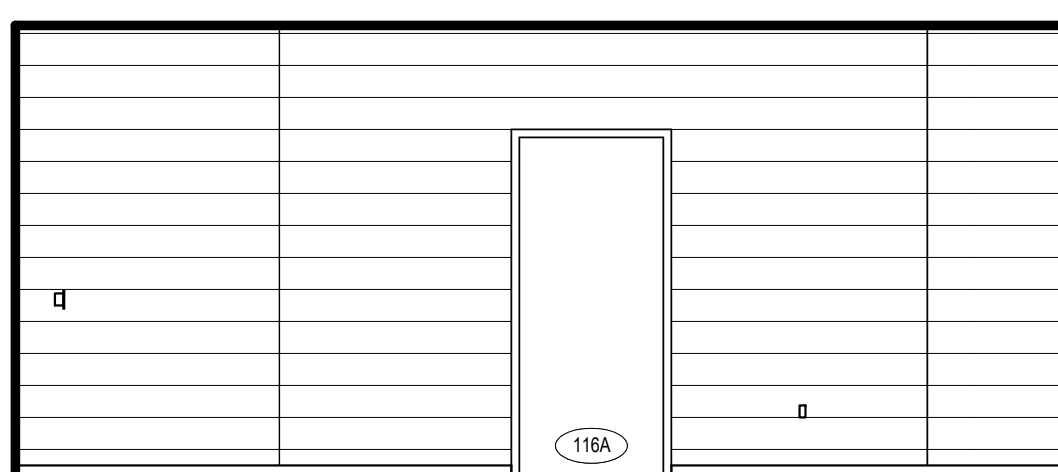
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A8.01 218 OPEN OFFICE EAST
1/4" = 1'-0"



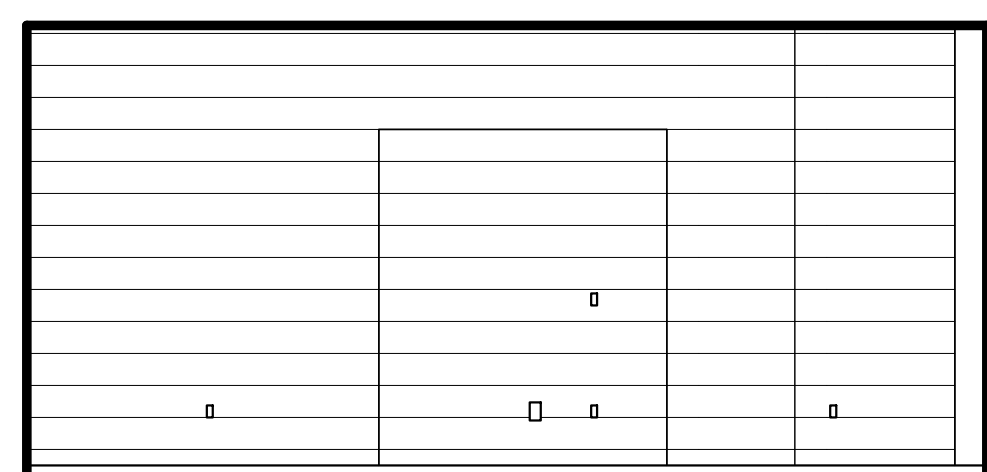
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A8.01 105 KITCHENETTE WEST
1/4" = 1'-0"



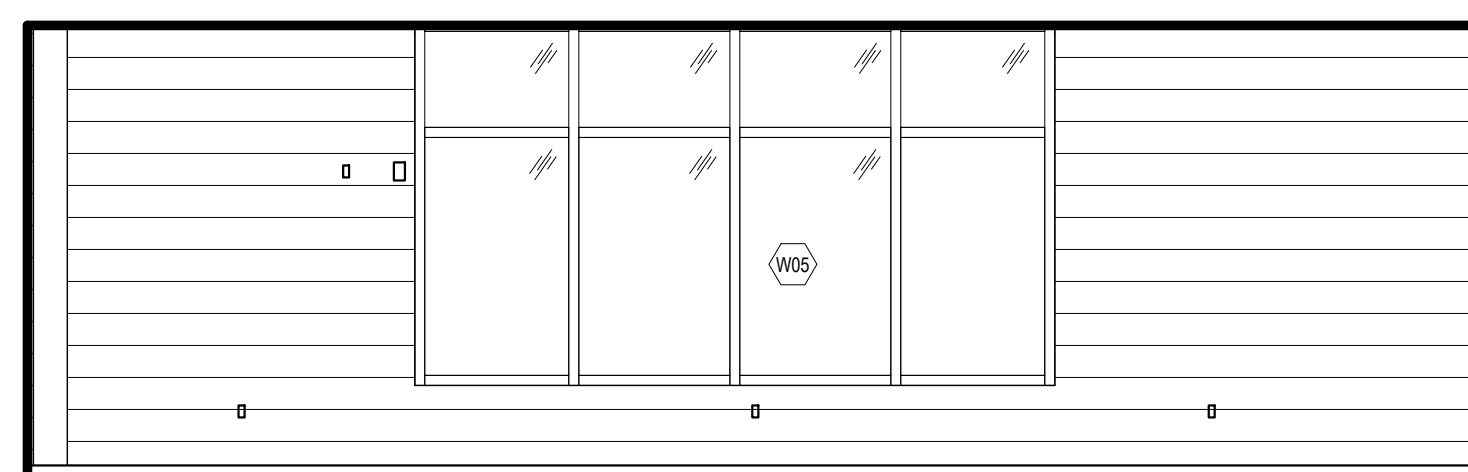
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A8.01 230 VESTIBULE NORTHEAST
1/4" = 1'-0"



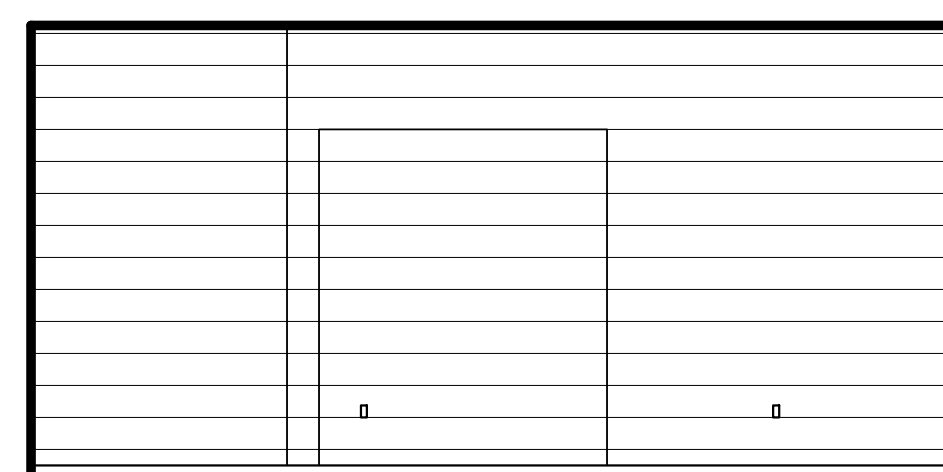
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A8.01 116 FITNESS WEST
1/4" = 1'-0"



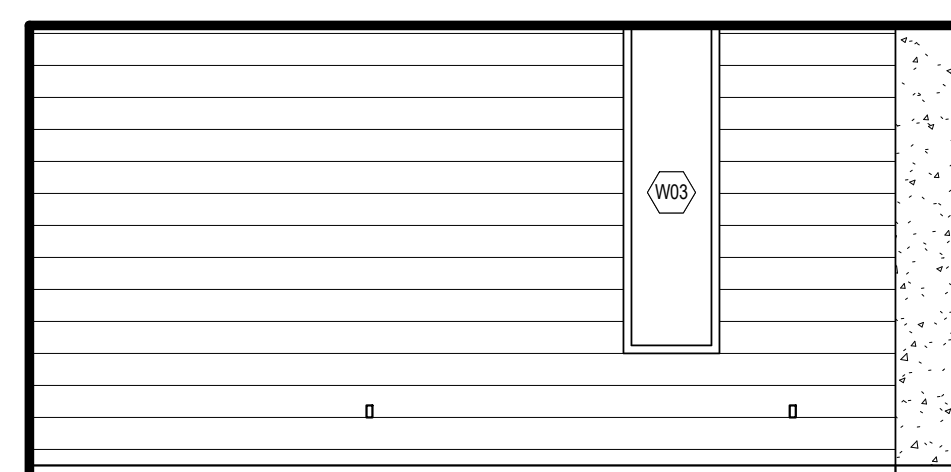
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A8.01 116 FITNESS SOUTH
1/4" = 1'-0"



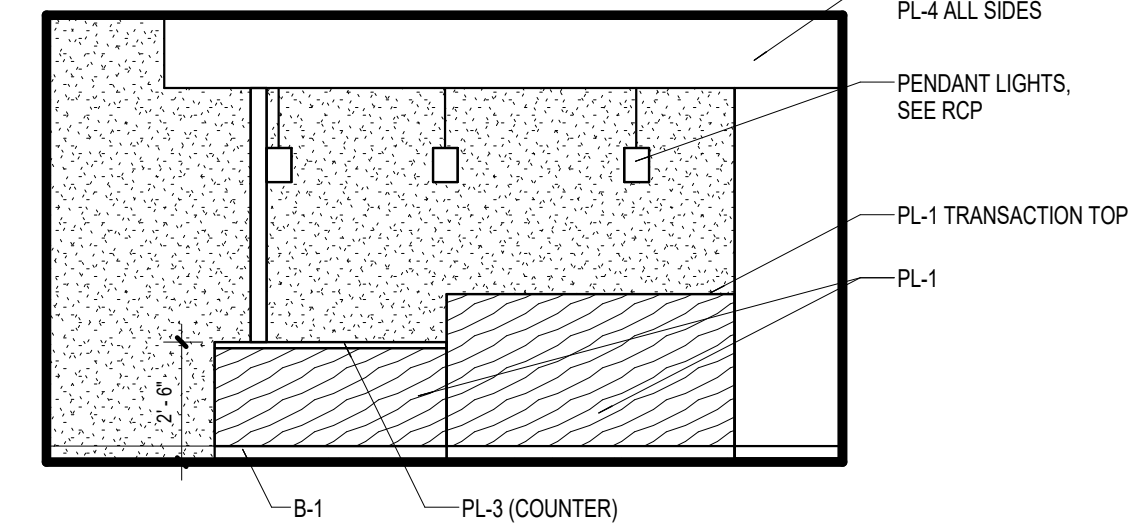
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A8.01 116 FITNESS NORTHEAST
1/4" = 1'-0"



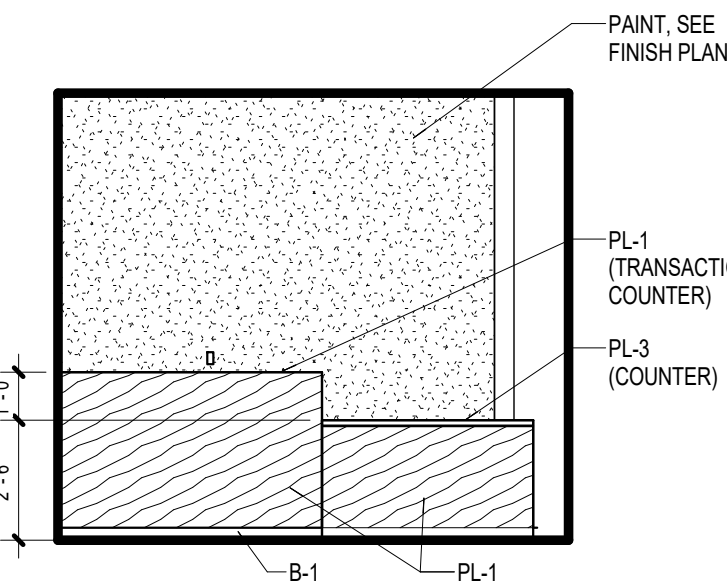
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A8.01 116 FITNESS NORTH
1/4" = 1'-0"



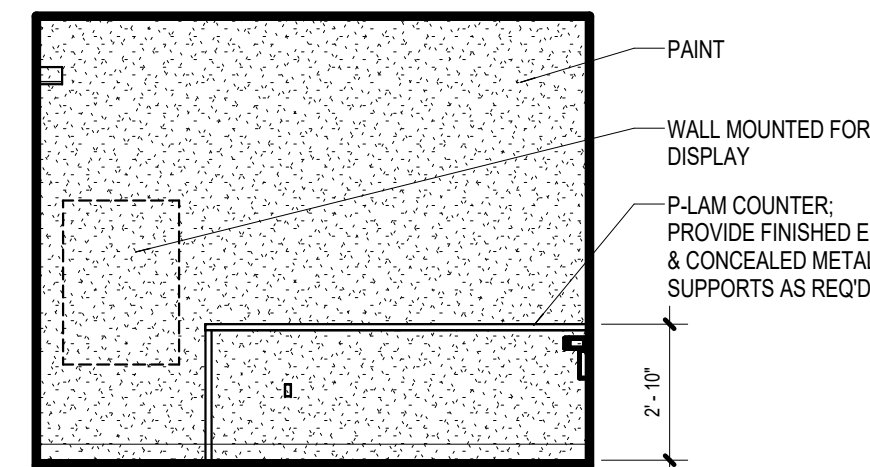
1
A8.01 114 FITNESS EAST
1/4" = 1'-0"



25
A8.01 113 ENTRY WEST WALL
1/4" = 1'-0"



24
A8.01 113 ENTRY SOUTH WALL
1/4" = 1'-0"



23
A8.01 113 ENTRY NORTH WALL
1/4" = 1'-0"



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03.30.15 BIDS & CONSTRUCTION

Site / Civil
Architecture
Interior
Structure
Mechanical
Electrical

PROJECT NO. 5-3175

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ARCHITECTURE + ENGINEERING

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INTERIOR ELEVATIONS

A8.01



03.30.15	BIDS & CONSTRUCTION
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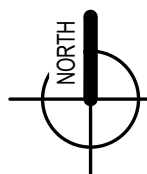
03.30.15	BIDS & CONSTRUCTION
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Site / Civil	
Architecture	
Interior	
Structure	
Mechanical	
Electrical	

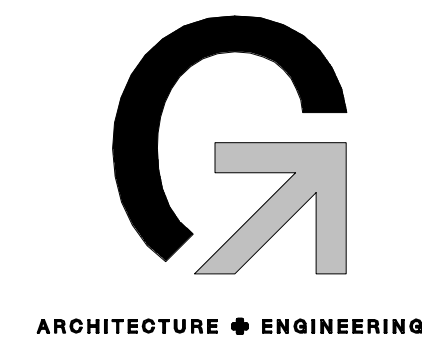
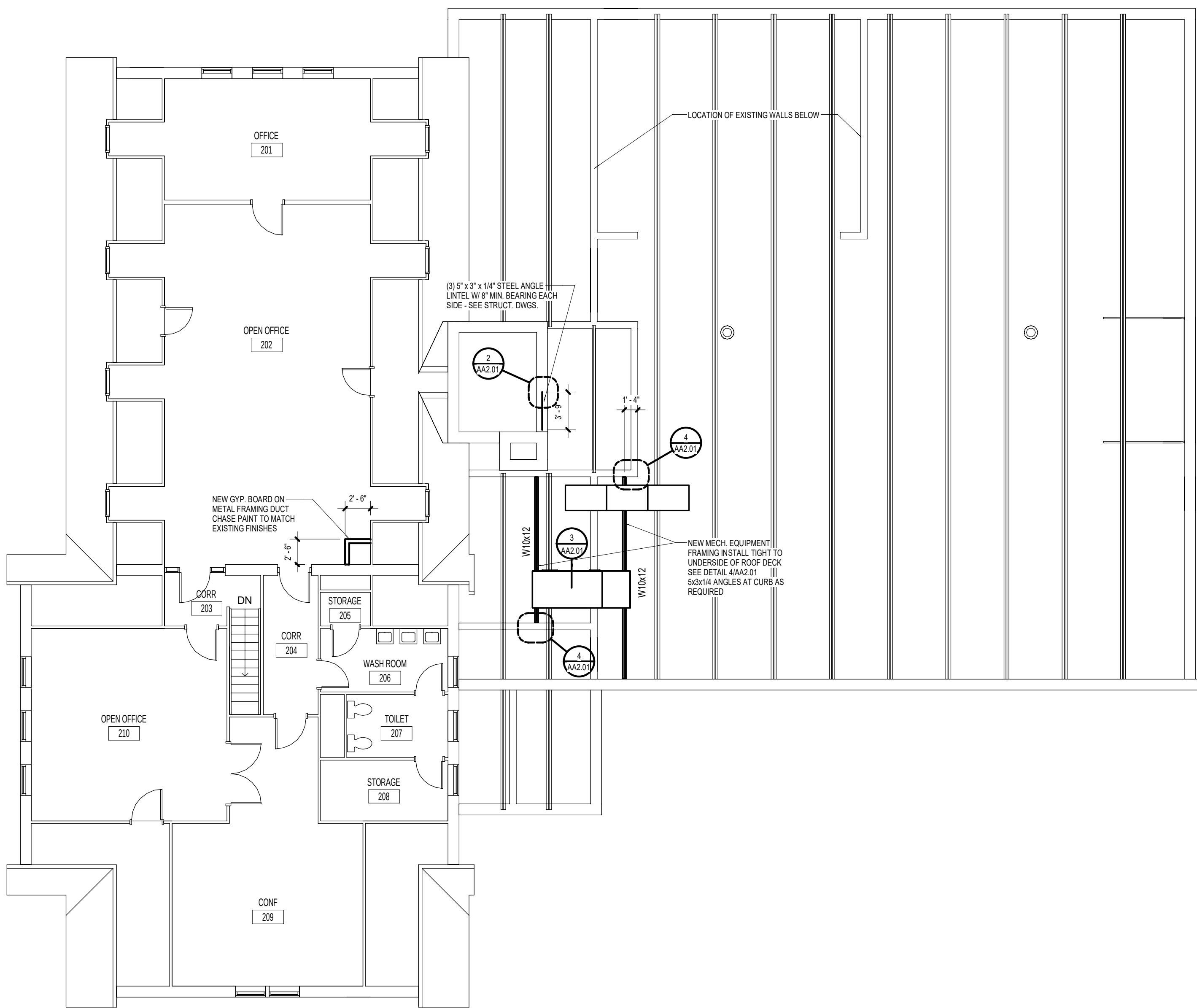
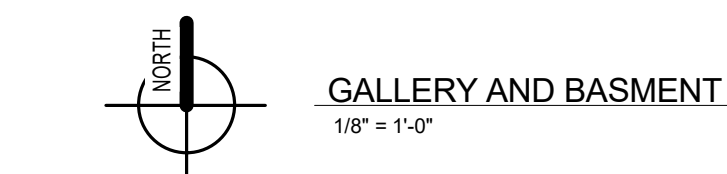
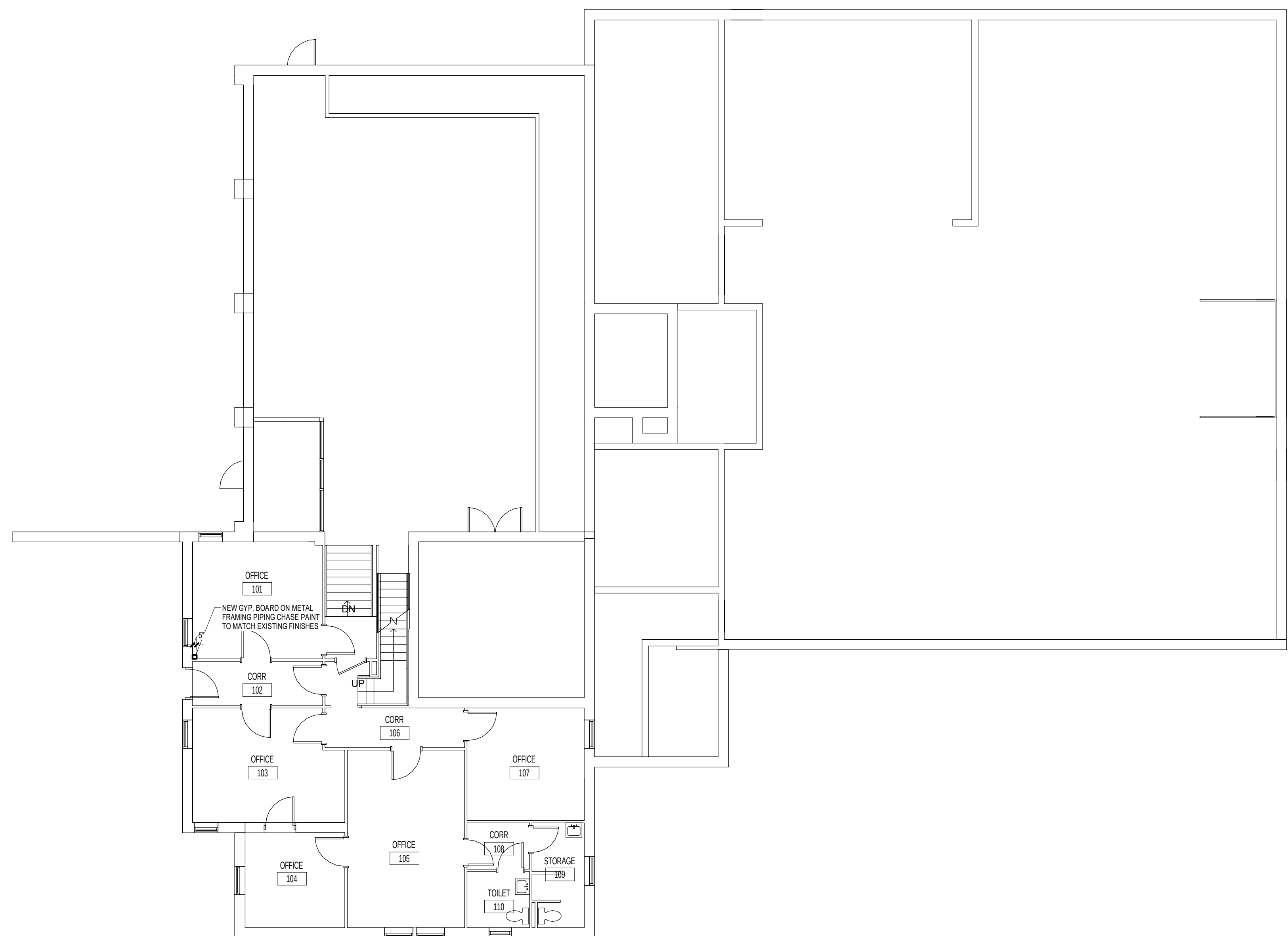
PROJECT NO. 5-3175



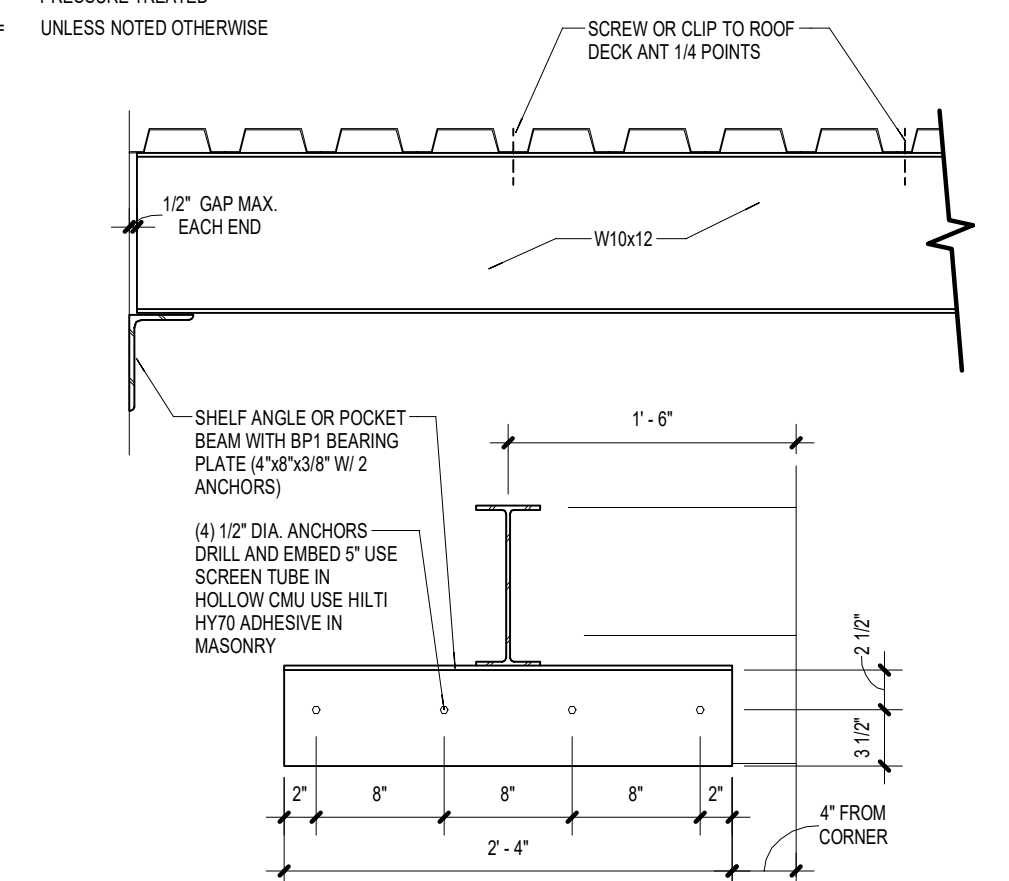
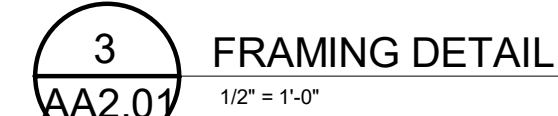
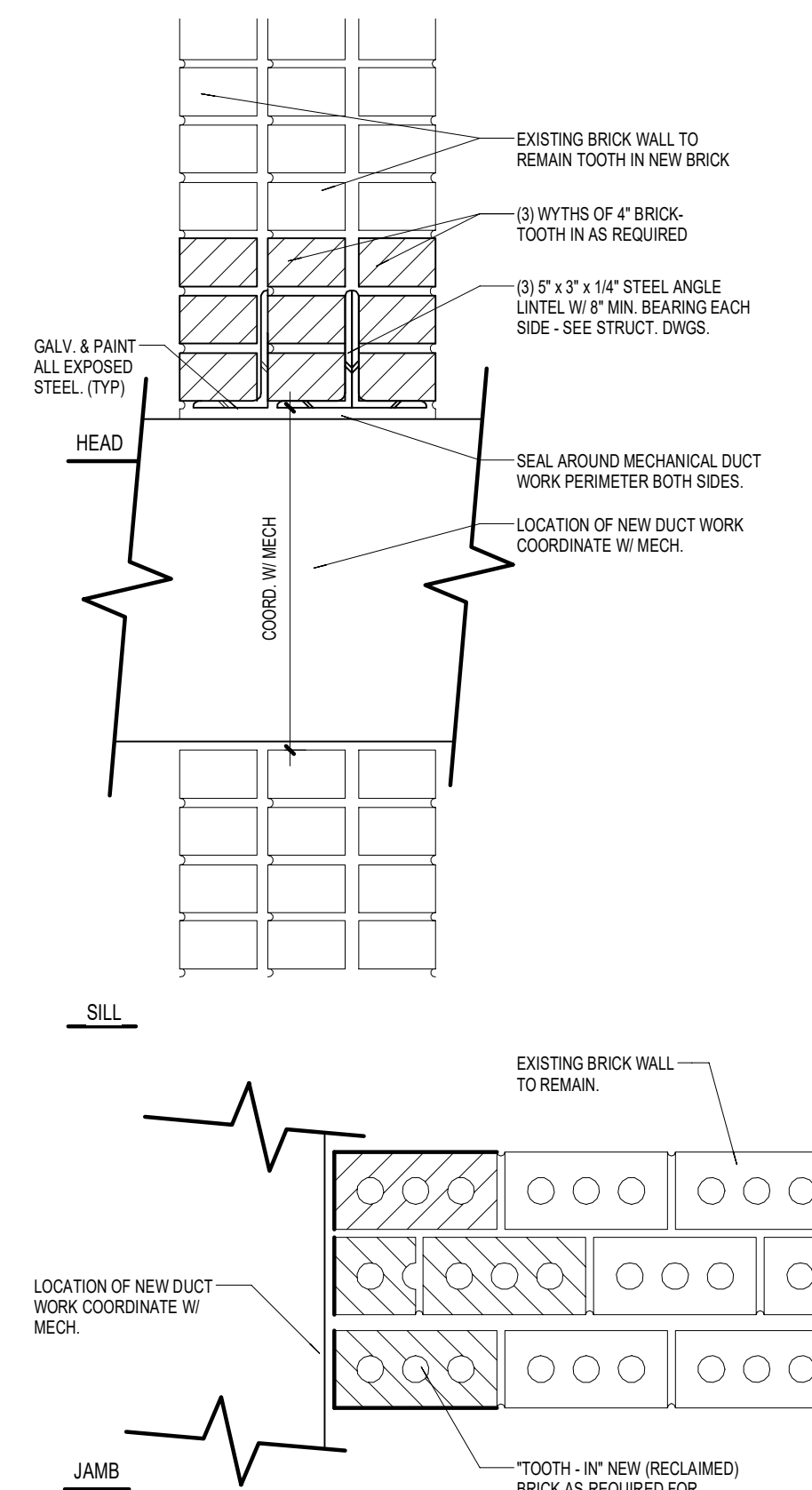
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GENERAL FINISH NOTES	
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1. FINISH FLOOR ELEVATION = FIRST FLOOR + 10'-0"
2. REFERENCE STRUCTURAL DRAWINGS FOR CONCRETE SLAB SIZES AND SLAB RELATED INFORMATION.
3. CONSTRUCTION AND/OR CONTROL JOINTS SHALL BE ON A 20'-0" SQUARE GRID MAX. UNLESS OTHERWISE NOTED. ALL CONSTRUCTION JOINTS SHALL BE REINFORCED BY 10'S FOOT COWELS AT 18" max. SEE DETAILS.
4. SEE SPECIFICATIONS FOR STEEL LINTS, SIZES FOR WALL OPENINGS NOT DETAILLED (e.g. HVAC DUCTS, ETC.)
5. CONTRACTOR SHALL COORDINATE THE INSTALLATION OF OWNER FURNISHED EQUIPMENT. INCLUDING DIMENSIONS OF SUCH AS THEY RELATED TO RISER WORK AREA.
6. DIMENSIONS GIVEN ARE FOR THE FACE OF MASONRY UNITS OR TO THE FACE OF CONCRETE WALL.
7. INTERIOR STUD WALLS TO BE 5.56" METAL STUD FRAMING UNLESS OTHERWISE NOTED.
8. PROVIDE TO REFLECTED CEILING PLANS FOR SOFFITS AND BULKHEADS.
9. LIST OF STANDARD ABBREVIATIONS -



GRAND HAVEN, MICHIGAN

03.30.15	BIDS & CONSTRUCTION
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Site / Civil	
Architecture	
Interior	
Structure	
Mechanical	
Electrical	

PROJECT NO. 5-3175 C.H.



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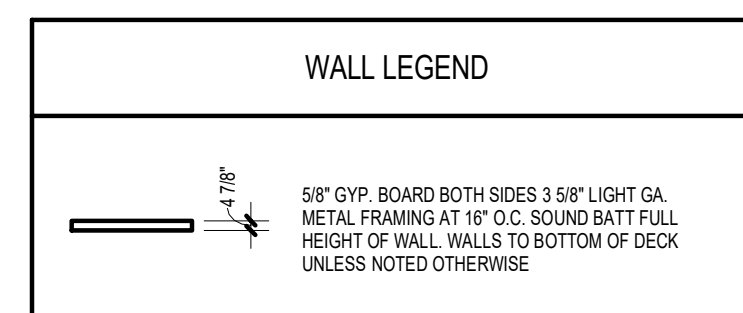
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PLANS AND DETAILS

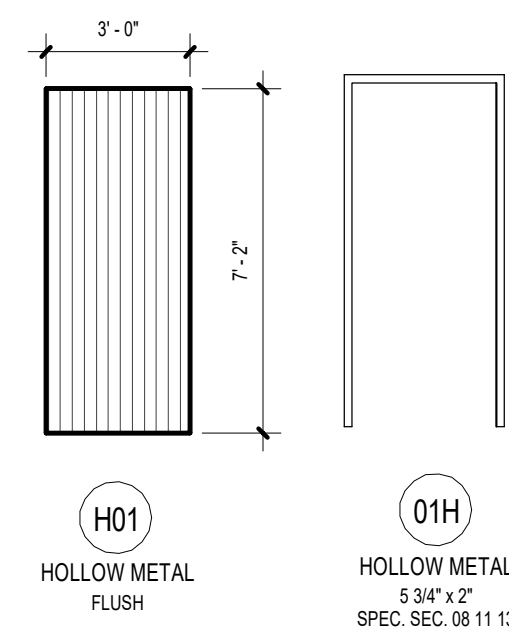
CA2.01

GENERAL NOTES:

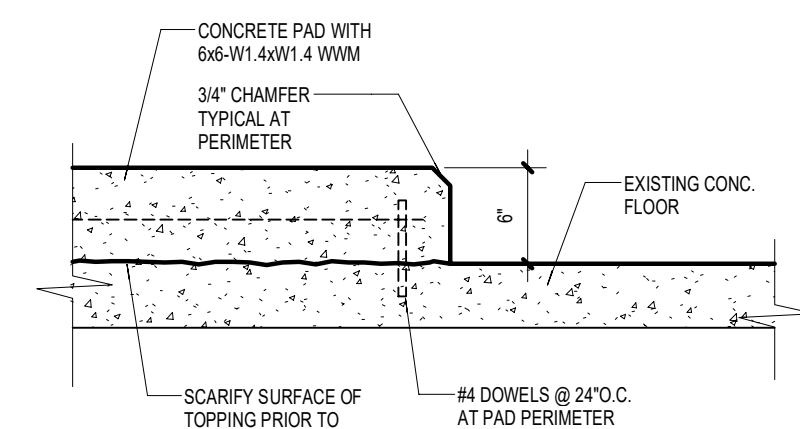
2. BASEMENT FINISH FLOOR ELEVATION = 100'-0"
 3. SEE SPECIFICATIONS FOR STEEL LIMIT SIZES FOR WALL OPENINGS NOT DETAILED (e.g. HVAC DUCTS, ETC.)
 4. SEE FIRE STOP INTERLOCATIONS BETWEEN VERTICAL AND HORIZONTAL SPACES AND CONCEALED WALL SPACES AT THE CEILING FLOOR, AND ROOF LEVELS.
 5. CONTRACTOR SHALL COORDINATE THE INSTALLATION OF CURVED FINISHED PIPING, INCLUDING DIMENSIONS AND LOCATIONS, WITH THE RELATED CIVIL WORK.
 6. DIMENSIONS GIVEN ARE TO THE FINISHED FACE OF WALLS
 7. INTERIOR STUDO WALLS ARE TO USE 3/8" METAL STUD FRAMING UNLESS OTHERWISE NOTED
 8. ALL FIRE BARRIERS, FIRE BARRIERS, FIRE STOP PARTITIONS, SHOCK BARRIERS, AND SHOCK PARTITIONS SHALL BE IDENTIFIED WITH INTERLOCKING "I" INTERVALS NOT TO EXCEED 30". REFER TO CODE FOR AN ALLOWANCE REQUIRED TO BE PROTECTED.
 9. LIST OF STANDARD ABBREVIATIONS -
- | | | |
|-------|---|---------------------------|
| "B" | = | BARRIER FREE |
| "FD" | = | FLOOR DRAIN |
| "F" | = | FIRE EXTINGUISHER |
| "FE" | = | FIRE EXTINGUISHER CABINET |
| "F" | = | FINISH FLOOR |
| "MB" | = | MARKER BOARD |
| "UNO" | = | UNLESS NOTED OTHERWISE |



-DIMENSIONS GIVEN ARE TO THE FINISHED FACE OF CMU OR GYPSUM WALL BOARD UNLESS NOTED OTHERWISE

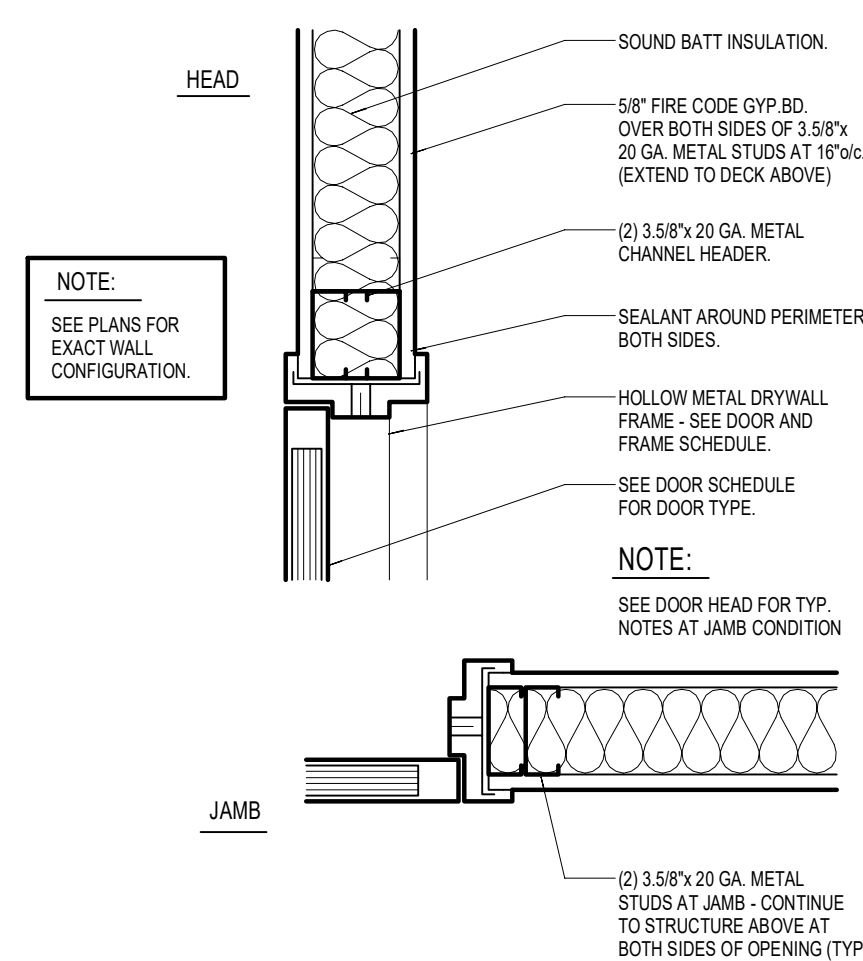


DOOR & DOOR FRAME LEGEND

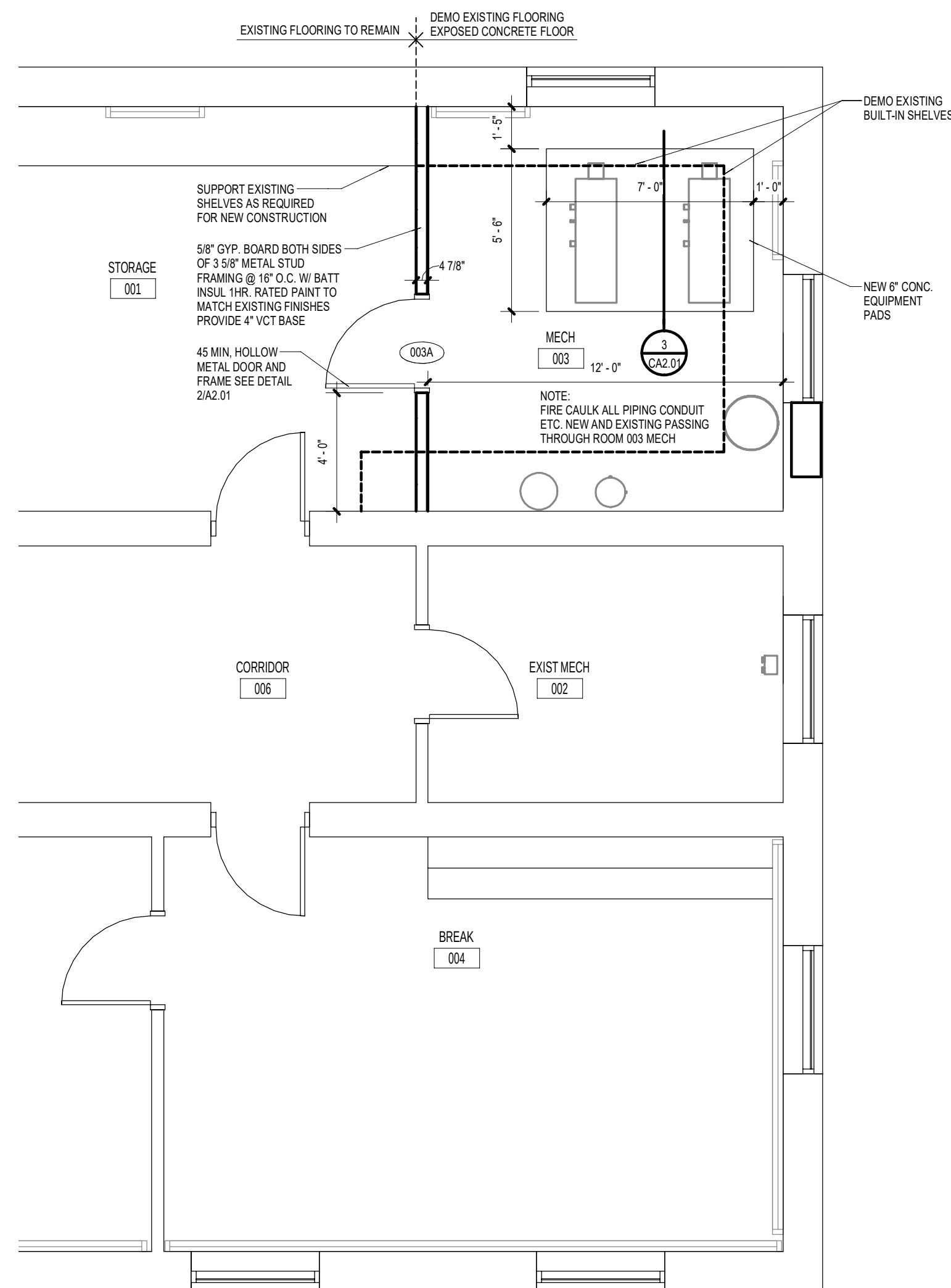


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CA2.01

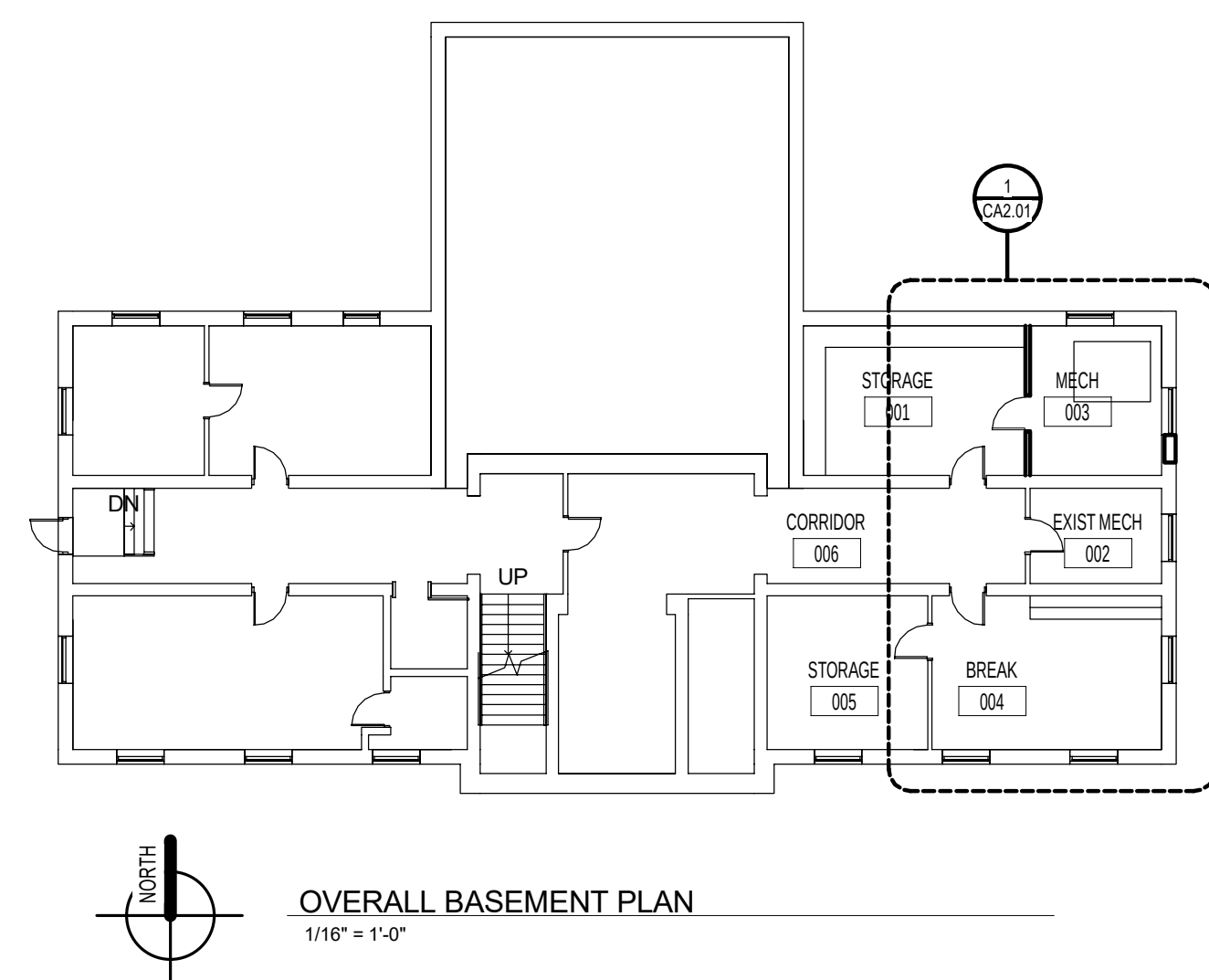
CONC. EQUIPMENT PAD ON PRECAST
1" = 1'-0"



2 INTERIOR STUD WALL DOOR DETAIL
CA2.01 1 1/2" = 1'-0"

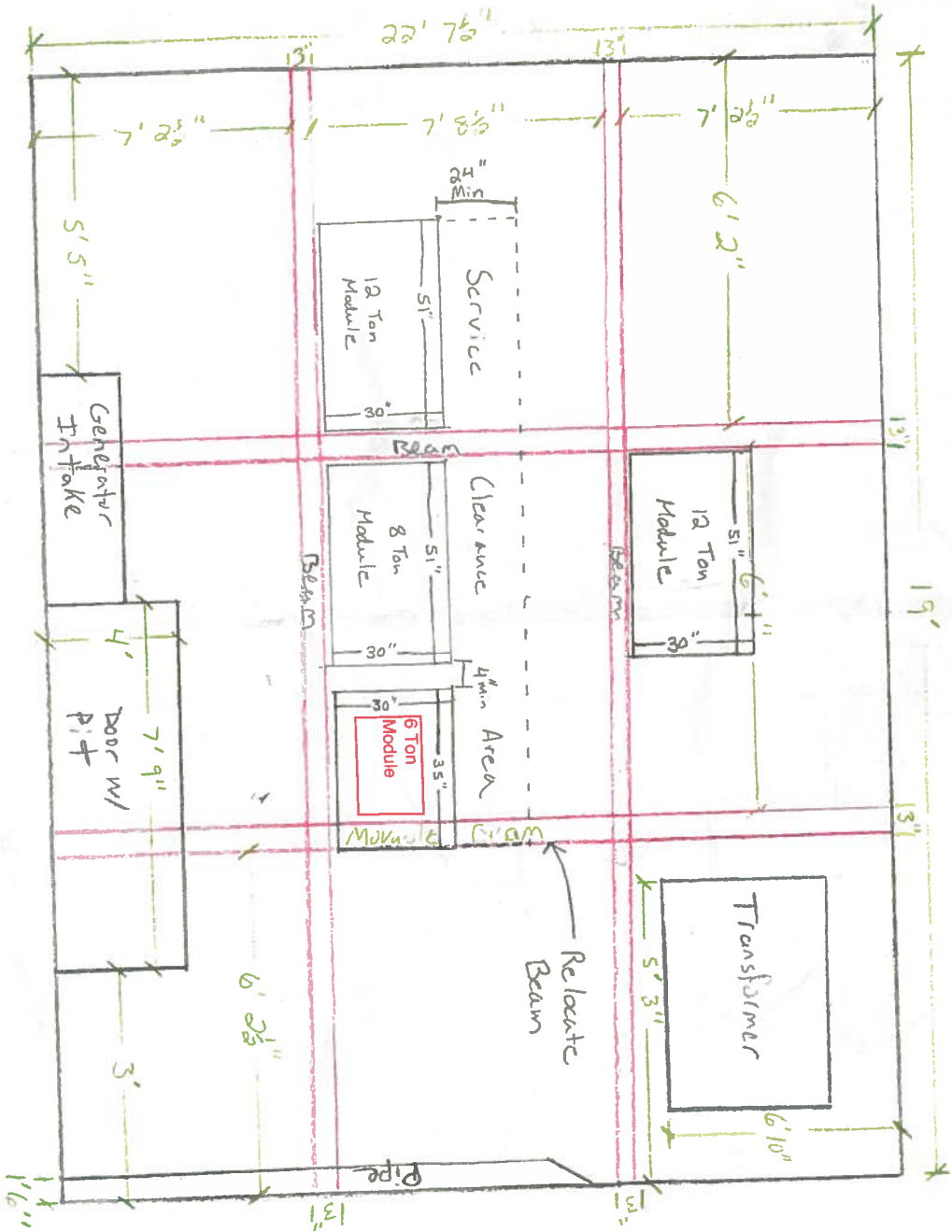


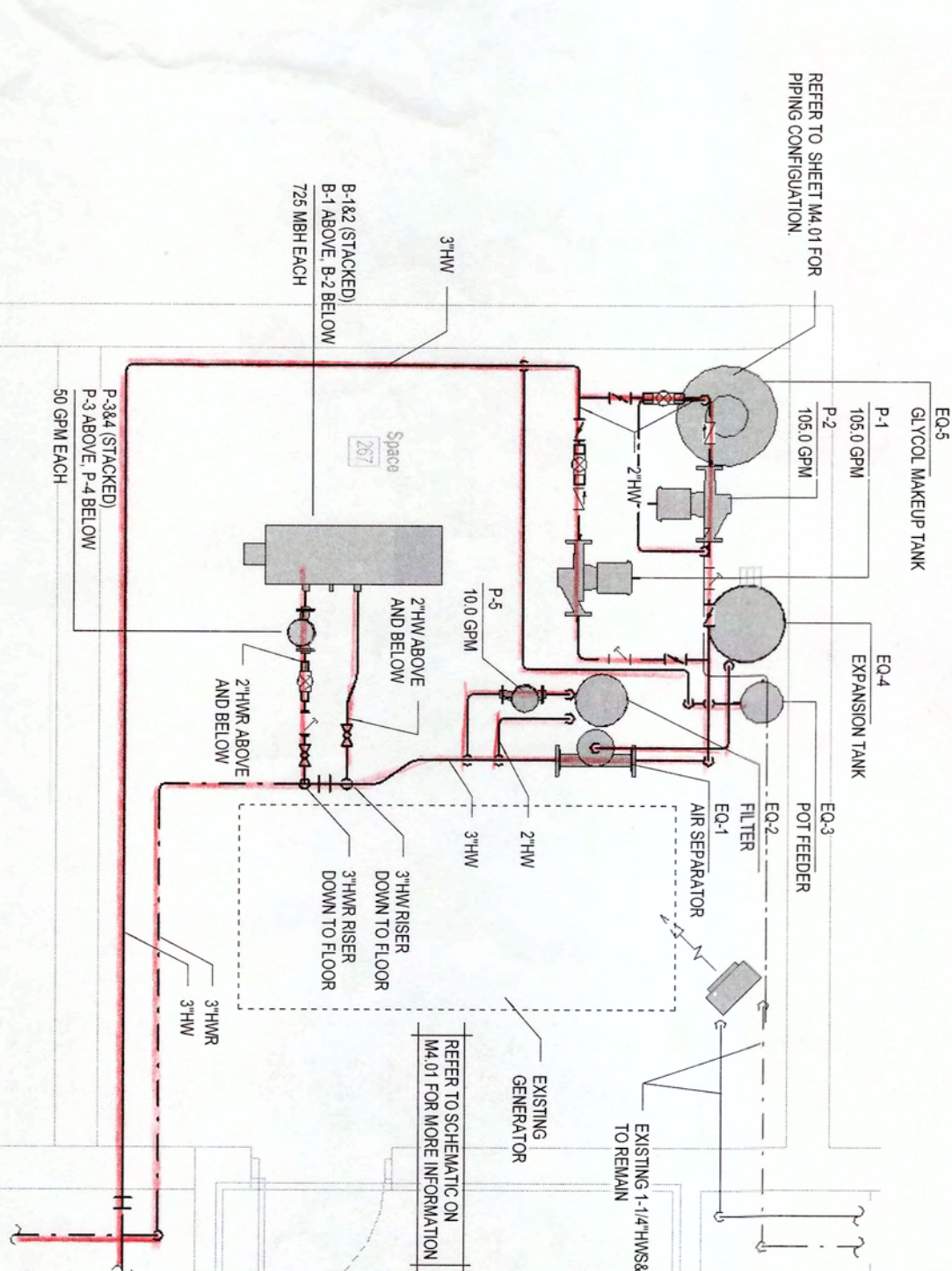
1 ENLARGED BASEMENT PLAN
CA2.01 1/4" = 1'-0"



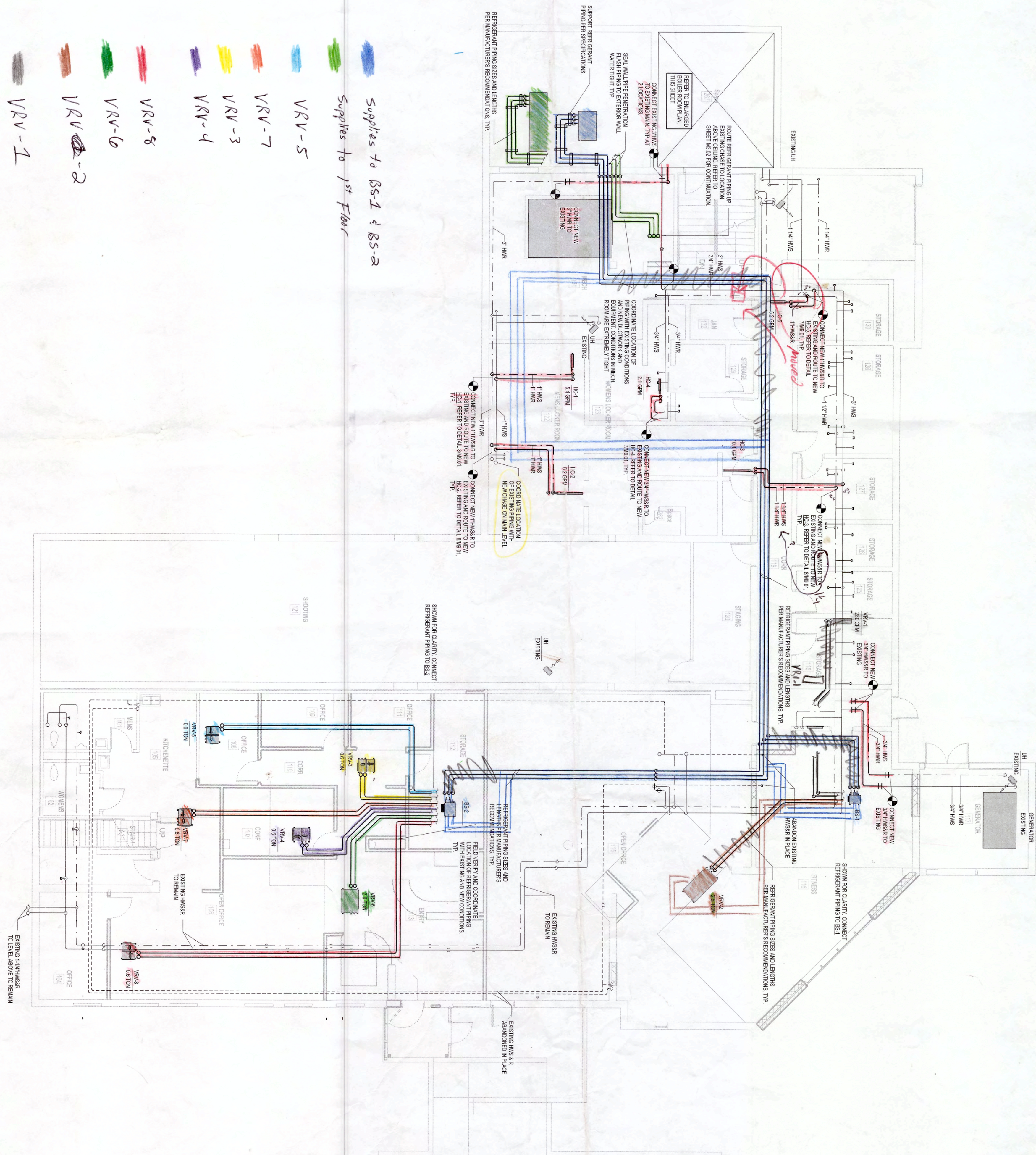
OVERALL BASEMENT PLAN
1/16" = 1'-0"

Public Safety O.D.'s





2
ENLARGED BOILER AND MECHANICAL ROOM HYDRONIC
PLAN
1/8" = 1'-0"



LOWER LEVEL HYDRONIC PLAN
1/8" = 1'-0"

- Supplies to BS-1 & BS-2
Supplies to 1st Floor
- VRV-1
 - VRV-2
 - VRV-3
 - VRV-4
 - VRV-5
 - VRV-6
 - VRV-7
 - VRV-8

- GENERAL HYDRONIC PIPING NOTES:
- CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING PIPE ROUTING WITH ELECTRICAL AND MECHANICAL TRADES.
 - ALL PIPING SHALL BE INSTALLED AT A MINIMUM OF 18" FROM ANY OBSTACLE, UNLESS OTHERWISE NOTED.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING PIPE ROUTING WITH ELECTRICAL AND MECHANICAL TRADES.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING PIPE ROUTING WITH ELECTRICAL AND MECHANICAL TRADES.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING PIPE ROUTING WITH ELECTRICAL AND MECHANICAL TRADES.
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 - CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING PIPE ROUTING WITH ELECTRICAL AND MECHANICAL TRADES.

Site / Civil	
Architecture	
Interior	
Structure	
Mechanical	
Electrical	

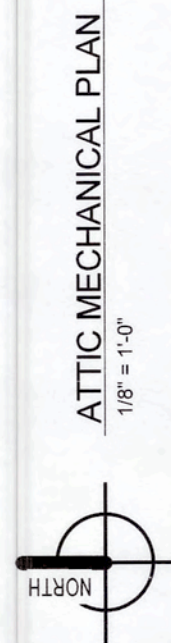
1. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING PIPE ROUTING WITH DUCTWORK AND ELECTRICAL TRADES.
2. INSTALL THERMOSTATS/SENSORS AT 48" A.F.F. TO TOP OF THERMOSTATS/SENSORS, UNLESS NOTED OTHERWISE. ALL THERMOSTATS/SENSORS INSTALLED ON OUTSIDE WALLS SHALL HAVE INSULATED BACKPLATES.

- [illegible]

01	REPLACE EXISTING FIN TUBE PNEUMATIC CONTROL VALVE WITH NEW 2-WAY DDC CONTROL VALVE CONTROLING EXISTING GUARANTOR DO TEMPERATURE SENSOR. REFER TO SPECIFICATION FOR SEQUENCES OF OPERATIONS. CONTRACTOR TO FIELD VERIFY CONDITIONS AND QUANTITIES.
02	MAINTAIN EXISTING LOCAL CONTROL.
03	REPLACE EXISTING AIR HANDLER HOT WATER AND CHILLED WATER PNEUMATICALLY ACTUATED 3-WAY CONTROL VALVES WITH 3-WAY DDC CONTROL VALVES.
04	REPLACE EXISTING AIR HANDLER OUTDOOR AIR AND RETURN AIR PNEUMATICALLY ACTUATED DAMPERS WITH NEW DDC MOTORIZED DAMPERS.



FIRST FLOOR MECHANICAL PLAN



ATTIC MECHANICAL PLAN



POWER LEVEL MECHANICAL PLAN

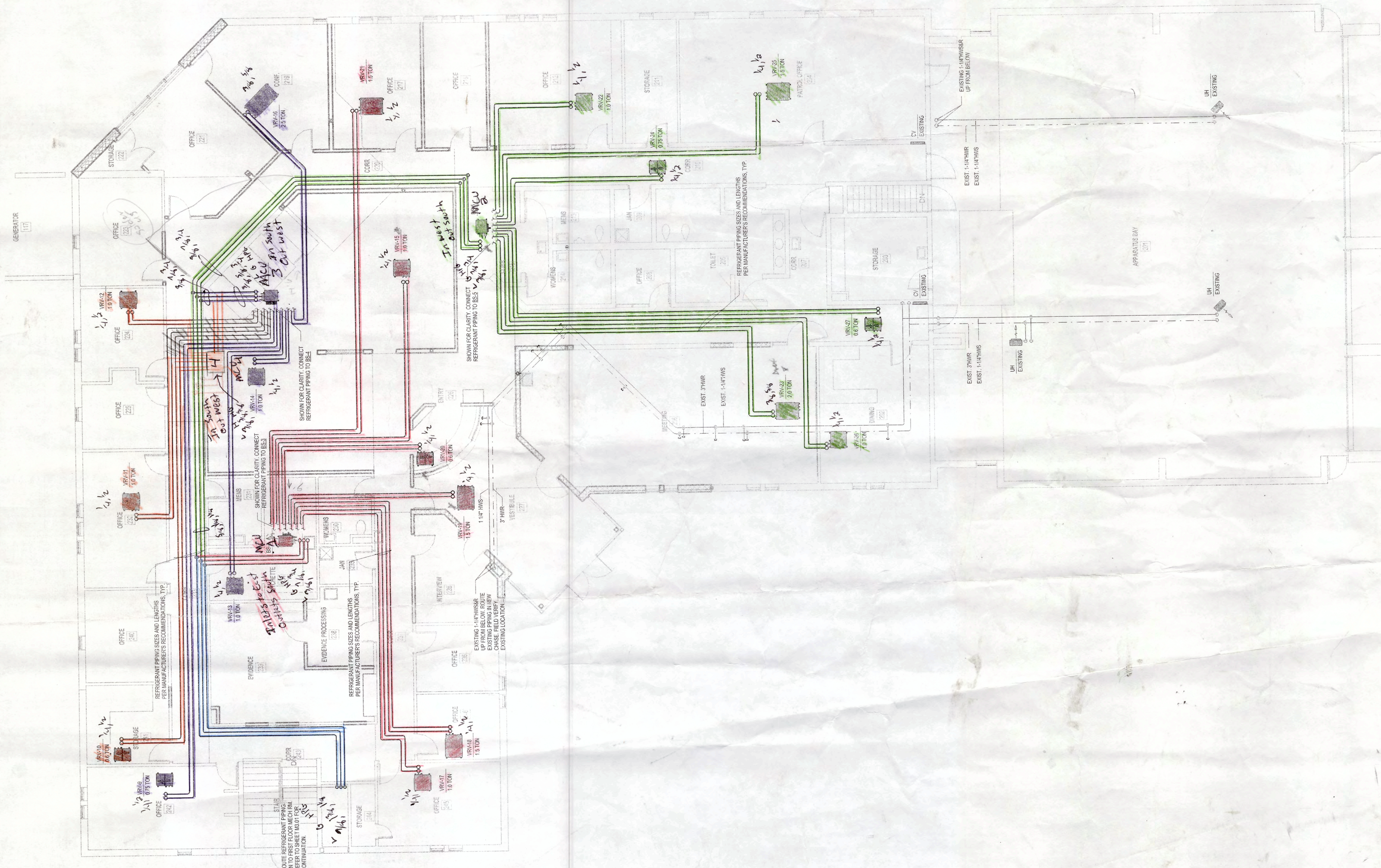


SECOND FLOOR MECHANICAL RIAN



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MAIN LEVEL HYDRONIC PLAN

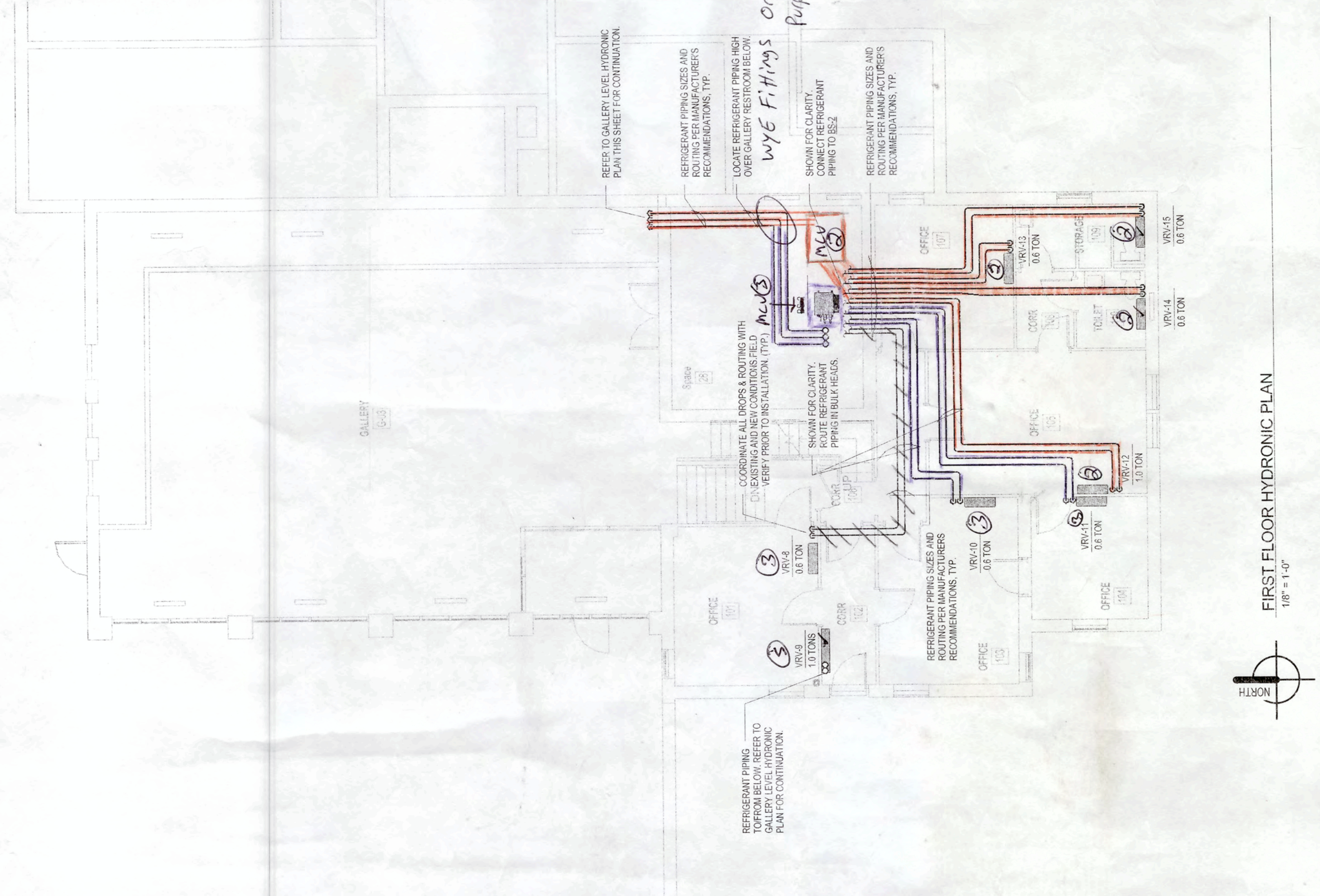
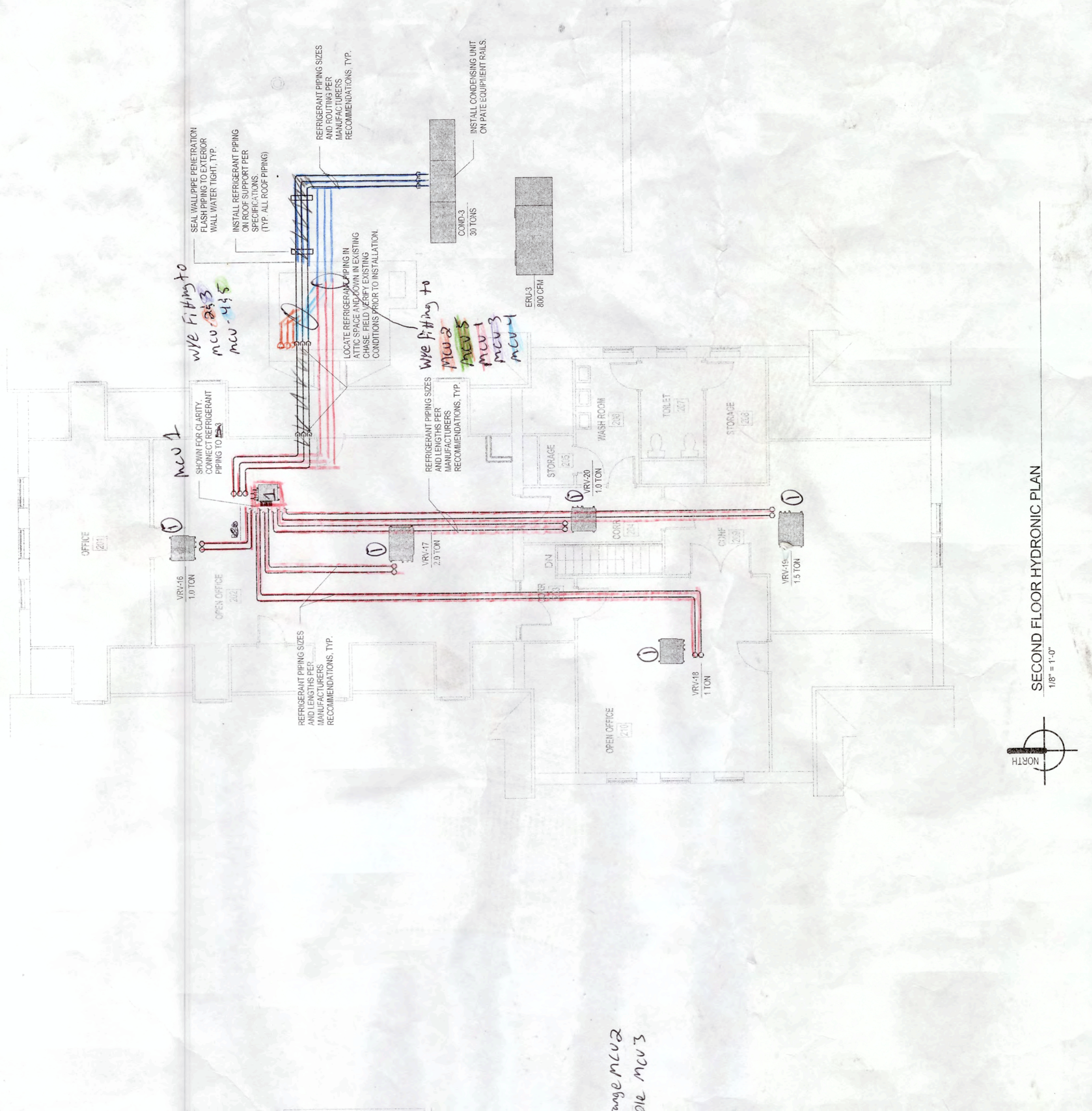
1/8" = 1'-0"

GENERAL HYDRONIC PIPING NOTES:

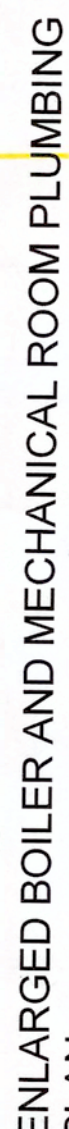
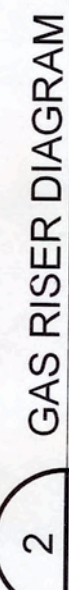
- [illegible]

GENERAL HYDRONIC PIPING NOTES:

1. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING PIPE ROUTING WITH DUCTWORK AND ELECTRICAL TRUNKS.
2. INSTALL THERMOSTATS IN ROOMS AT 4' AFF. TO TOP OF THERMOSTAT. THERMOSTATS SHALL BE RESPONSIBLE FOR THE COORDINATION OF THE ROOMS WITH DUCTWORK AND ELECTRICAL TRUNKS. THERMOSTATS SHALL BE RESPONSIBLE FOR THE COORDINATION OF THE ROOMS WITH DUCTWORK AND ELECTRICAL TRUNKS.
3. CONTRACTOR SHALL FIELD VERIFY MECHANICAL EQUIPMENT CONDITIONS PER TO THE CONTRACT. CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF THE ROOMS WITH DUCTWORK AND ELECTRICAL TRUNKS. THERMOSTATS SHALL BE RESPONSIBLE FOR THE COORDINATION OF THE ROOMS WITH DUCTWORK AND ELECTRICAL TRUNKS.
4. COORDINATE PIPING AND THERMOSTATS WITH APPROVED TIMING TO AVOID INTERFERENCE.



Site	Civil
Architecture	Architecture
Interior	Interior
Structure	Structure
Mechanical	Mechanical
Electrical	Electrical
PROJECT NO.	53175

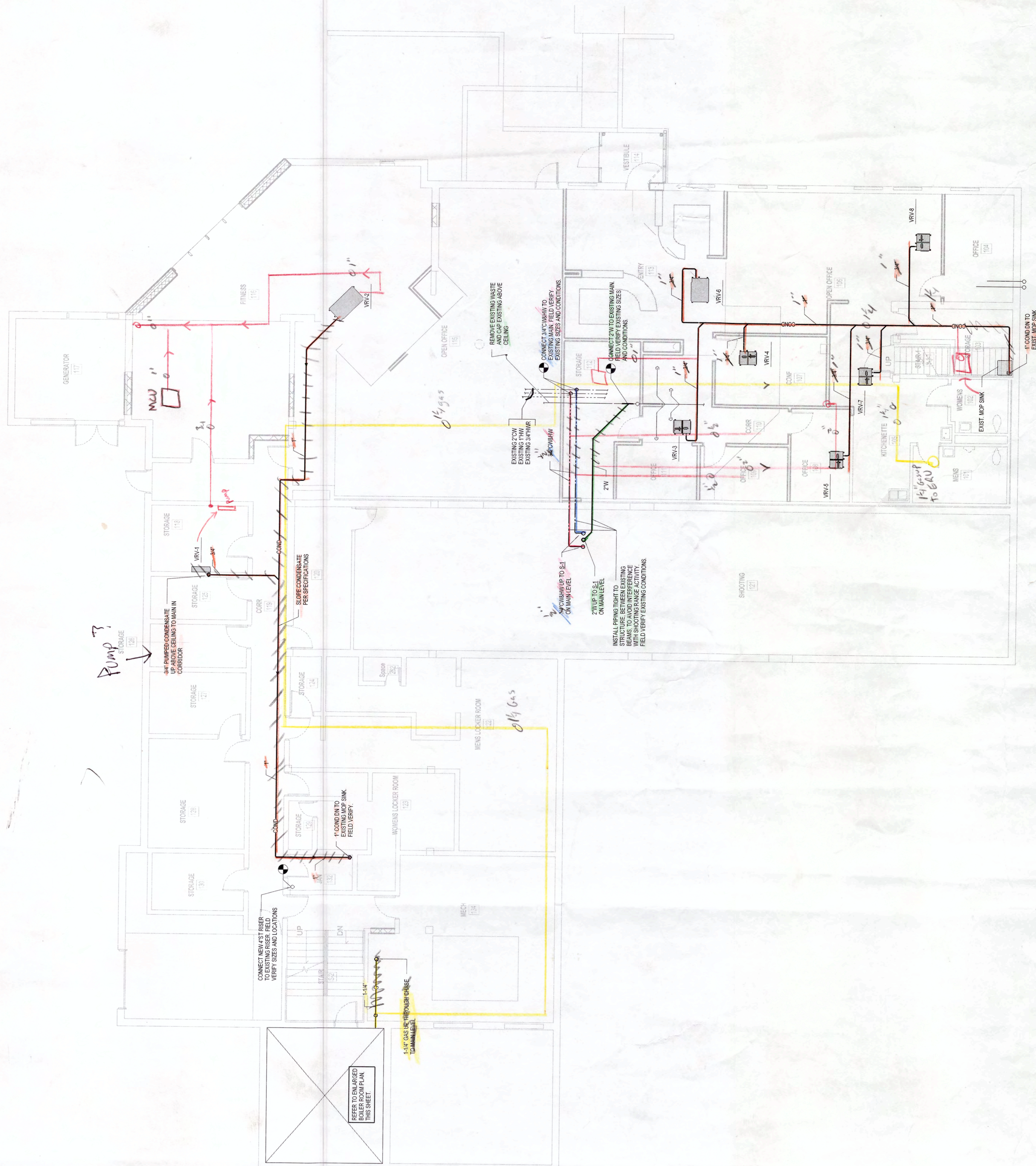
[illegible]

MINIMUM SIZE CONNECTION					
	FIXTURE	CW	HW	SAN	VENT
	SINK	1/2"	1/2"	1-1/2"	1-1/2"
	DRINKING FOUNTAIN	1/2"	—	1-1/4"	1-1/4"

WATER HAMMER ARRESTOR LEGEND		
SYMBOL	FDI RATING	FIXTURE UNIT CAP
	A	1-11

GENERAL PLUMBING NEW WORK NOTES:

- [illegible]



OBJECT NO. 5-3175

CMB **ac**

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POWER & COMMUNICATION GENERAL NOTES

[illegible]

ELECTRICAL KEYNOTES	
P01	RE-INSTALL MOTORIZED PROJECTION SCREEN, PROJECTOR MOUNT AND ASSOCIATED CABELING AND CONTROLS
P07	FURNISH AND INSTALL A MILLION MOUNTED DEVICE
P08	INSTALL RECEIPTS IN CASEWORK / MILL WORK WITH IN/ OF COUNTER TOP.
P09	RE-INSTALL EXISTING SPEAKER, EXTEND WIRING AS REQUIRED.
P10	RE-INSTALL EXISTING 911 EMERGENCY PHONE. RE-ROUTE WIRING AS REQUIRED.
P11	RE-INSTALL CIRCUIT FOR MOVEABLE STORAGE



MAIN LEVEL POWER & COMMUNICATIONS PLAN



Site / Cntrl	
Architecture	
Interior	
Structure	
Mechanical	
Electrical	

[illegible]

01	REPLACE EXISTING NEW LINE PNEUMATIC CONTROL VALVE WITH NEW 3WAY TCC CONTROL VALVE. VENTING DOWNSTREAM OF TCC. TEMPERATURE SENSOR. REFER TO SPECIFICATIONS FOR SEQUENCES OF OPERATIONS. CONTRACTOR TO FIELD VERIFY LOCATIONS AND QUANTITIES.
02	MAINTAIN EXISTING LOCAL CONTROL
03	REPLACE EXISTING AIR HANDLER HOT WATER AND CHILLED WATER PNEUMATICALLY ACTUATED 3-WAY CONTROL VALVES WITH 3WAY TCC CONTROL VALVES.
04	REPLACE EXISTING AIR HANDLER OUTDOOR AIR AND RETURN AIR PNEUMATICALLY ACTUATED DAMPERS WITH NEW TCC MOTORISED DAMPERS.



Tender
 Breaker
 →

6-top Pump 5
 6-bottom Pump Control panel + EF-1

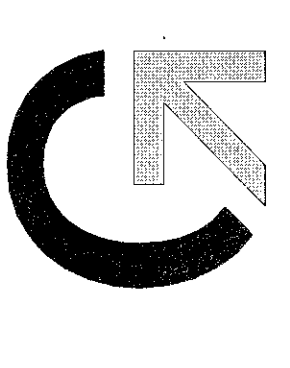
11 - Pump 4

3 pole
 Breaker

36 } pumps
 38 }
 40 }

41 - Boiler 1
 47 - Boiler 2

REFER TO PUMPED TANK
 IN ORDER TO OBTAIN INFORMATION.



LIGHTING GENERAL NOTES

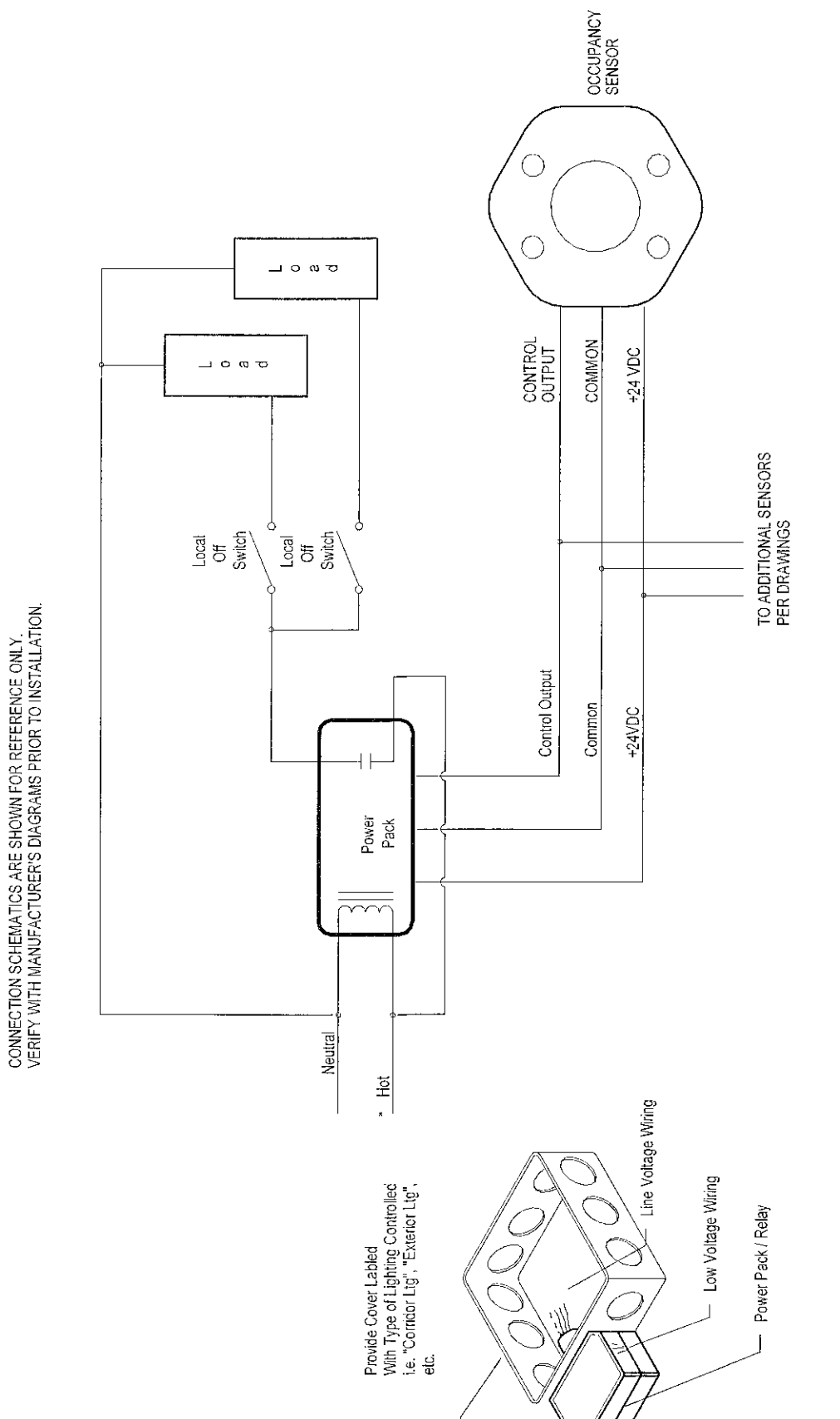
1. THE INTENT OF THIS PROJECT IS TO REPLACE THE EXISTING INCANDESCENT AND FLUORESCENT LIGHT FIXTURES WITH NEW LED LIGHTING. (SEE E.D. FOR DETAILS AND SPECIFICATIONS.)
2. ALL NEW LED LIGHTING SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
3. ALL NEW LED LIGHTING SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
4. ALL NEW LED LIGHTING SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
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9. ALL NEW LED LIGHTING SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
10. ALL NEW LED LIGHTING SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.

1.01	LED LIGHTING	LED LIGHTING SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
1.02	LED LIGHTING	LED LIGHTING SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
1.03	LED LIGHTING	LED LIGHTING SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
1.04	LED LIGHTING	LED LIGHTING SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
1.05	LED LIGHTING	LED LIGHTING SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
1.06	LED LIGHTING	LED LIGHTING SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
1.07	LED LIGHTING	LED LIGHTING SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
1.08	LED LIGHTING	LED LIGHTING SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
1.09	LED LIGHTING	LED LIGHTING SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
1.10	LED LIGHTING	LED LIGHTING SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.

DPB-1
EM3-9
EM3-1
OS - Relay

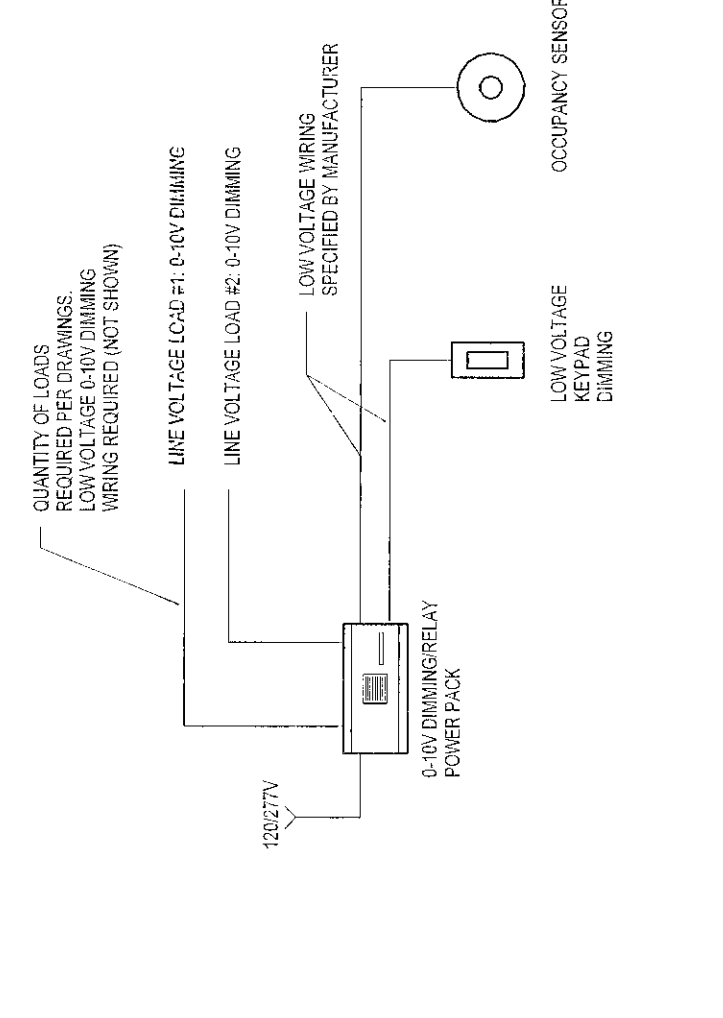
TYPICAL OCCUPANCY SENSOR CONTROL DETAIL

1" = 1'-0"



TYPICAL OFFICE SPACE LIGHTING CONTROL DETAIL

1" = 1'-0"



MAIN LEVEL LIGHTING PLAN

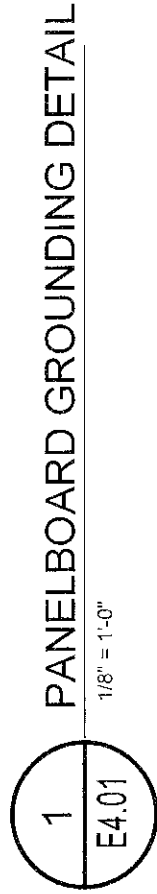
1" = 1'-0"



[illegible]

CONCRETE-ENCASED ELECTRODE.
EAST 20'-0" OF 44 (12" DIA.) STEEL,
FORMING BARS (ELECTRICALLY-
CONTINUOUS) WITH ANCHORING.

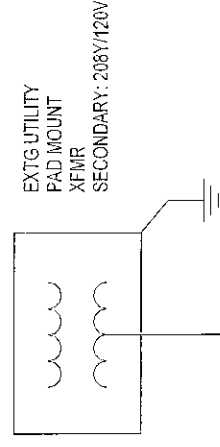
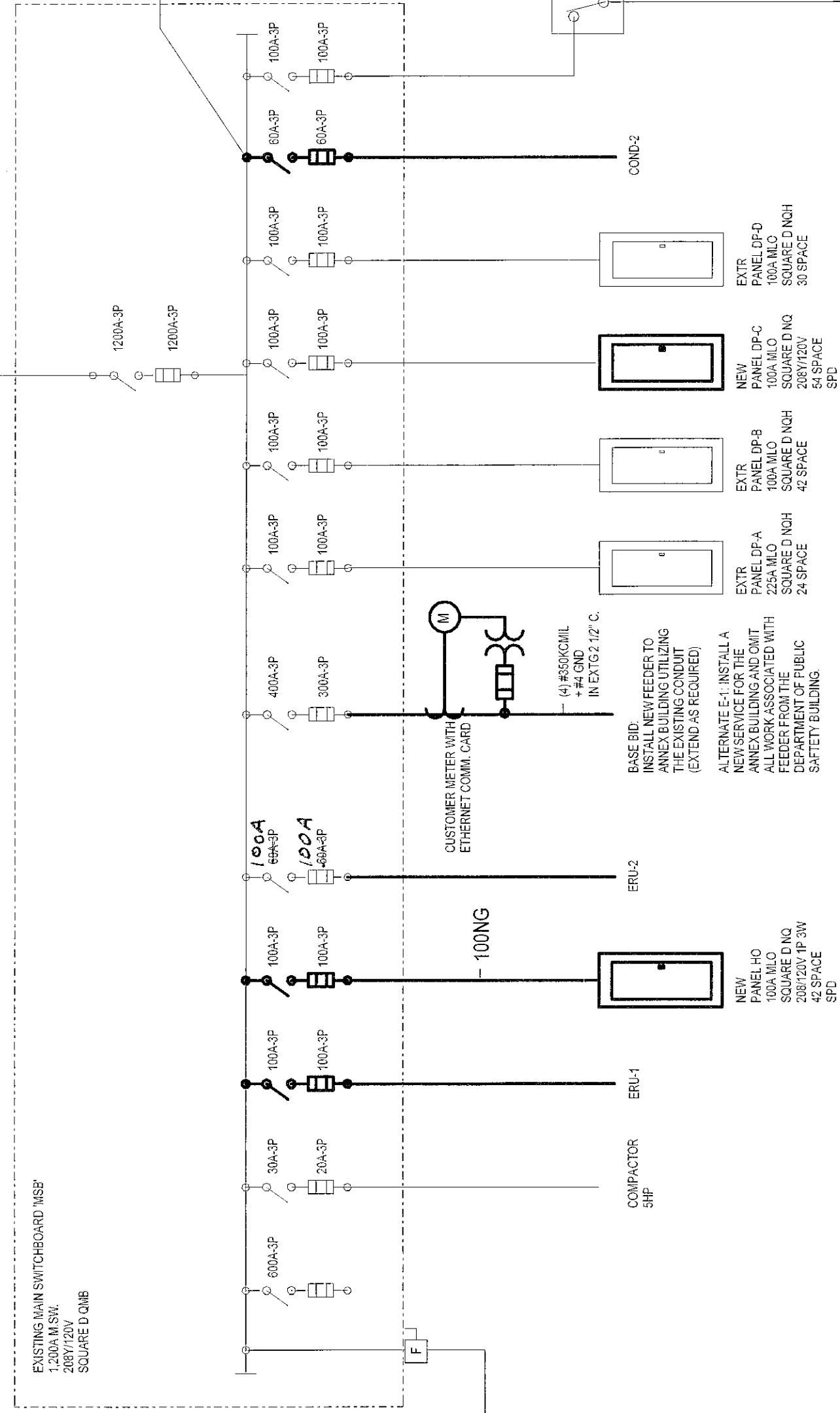
KEYNOTES



1) PANELBOARD GROUNDING DETAIL

5

1. REFER TO EQUIPMENT CONNECTION SCHEDULE FOR FUSE / CIRCUIT BREAKER AND FEEDER SITES TO UTILIZATION EQUIPMENT.
2. ALL ITEMS SHOWN INFADED PRINT REPRESENT EXISTING EQUIPMENT TO REMAIN. ALL ITEMS SHOWN IN BOLD PRINT REPRESENT NEW EQUIPMENT FURNISHED AND INSTALLED BY THE CONTRACTOR. ITEMS SHOWN IN BOLD DASHED PRINT REPRESENT ITEMS TO BE DEMOLISHED AND REMOVED BY THE CONTRACTOR.



EXISTING HISTORIC DEMAND: 135.6 KW/(63.1 KVA @ .8 PF)
DEMOLISHED CONNECTED LOAD (MECH. EQ.): 160.1 KVA
PANEL D9-C NEW: 3.6 KVA
PANEL H0-NEW: 17.4 KVA
MECH. EQUIPMENT CITY HALL, ANNEX & DPS: 173.4 KVA
TOTAL NEW CONNECTED LOAD: 194.3 KVA
125%: 163.1 - 160.1 = 3.1 KVA
125%: 163.1 - 160.1 = 238.1 KVA (650.834 @ .208/120V)
EXISTING DEMAND: 135.6 KW/(63.1 KVA @ .8 PF)

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Interior	
Structure	
Mechanical	
Electrical	ND

PROJECT NO. 5-3175

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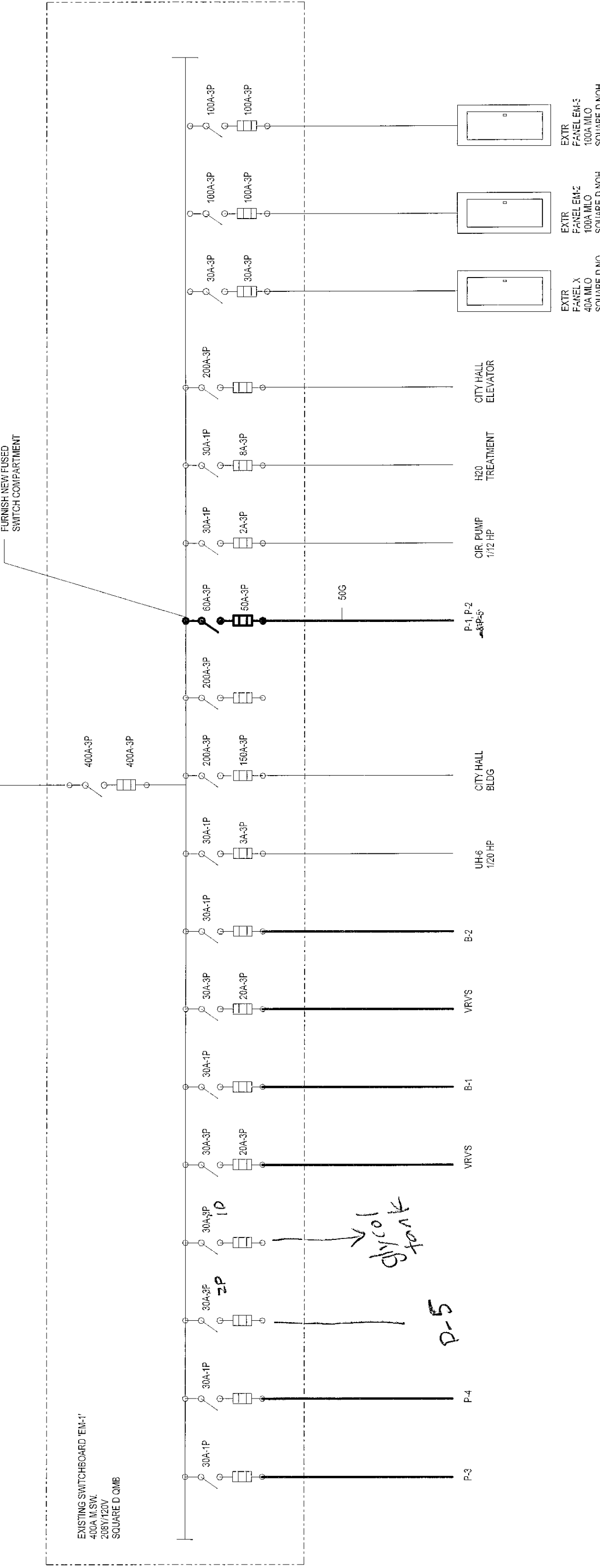
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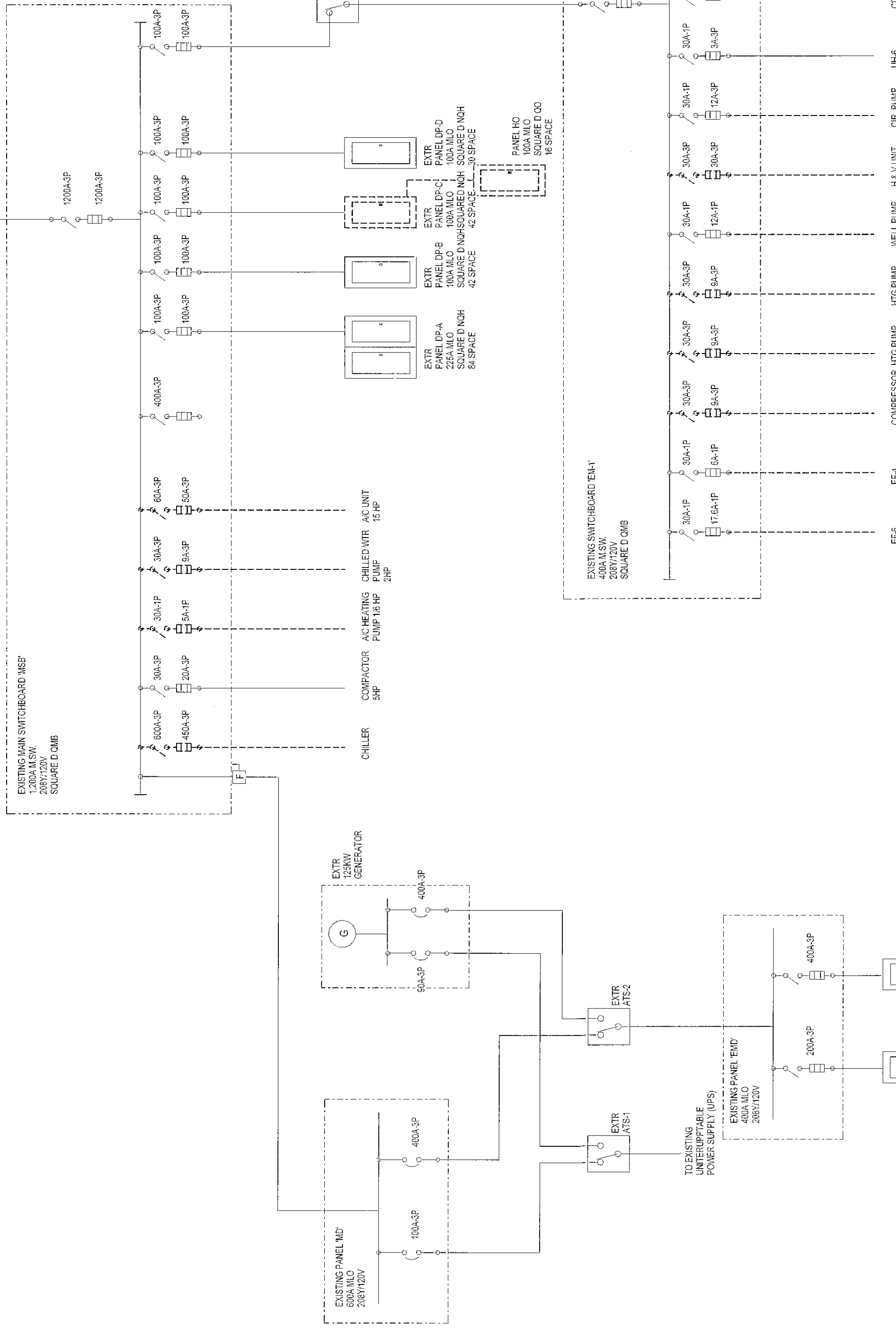
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ELECTRICAL ONE-LINE
DIAGRAM

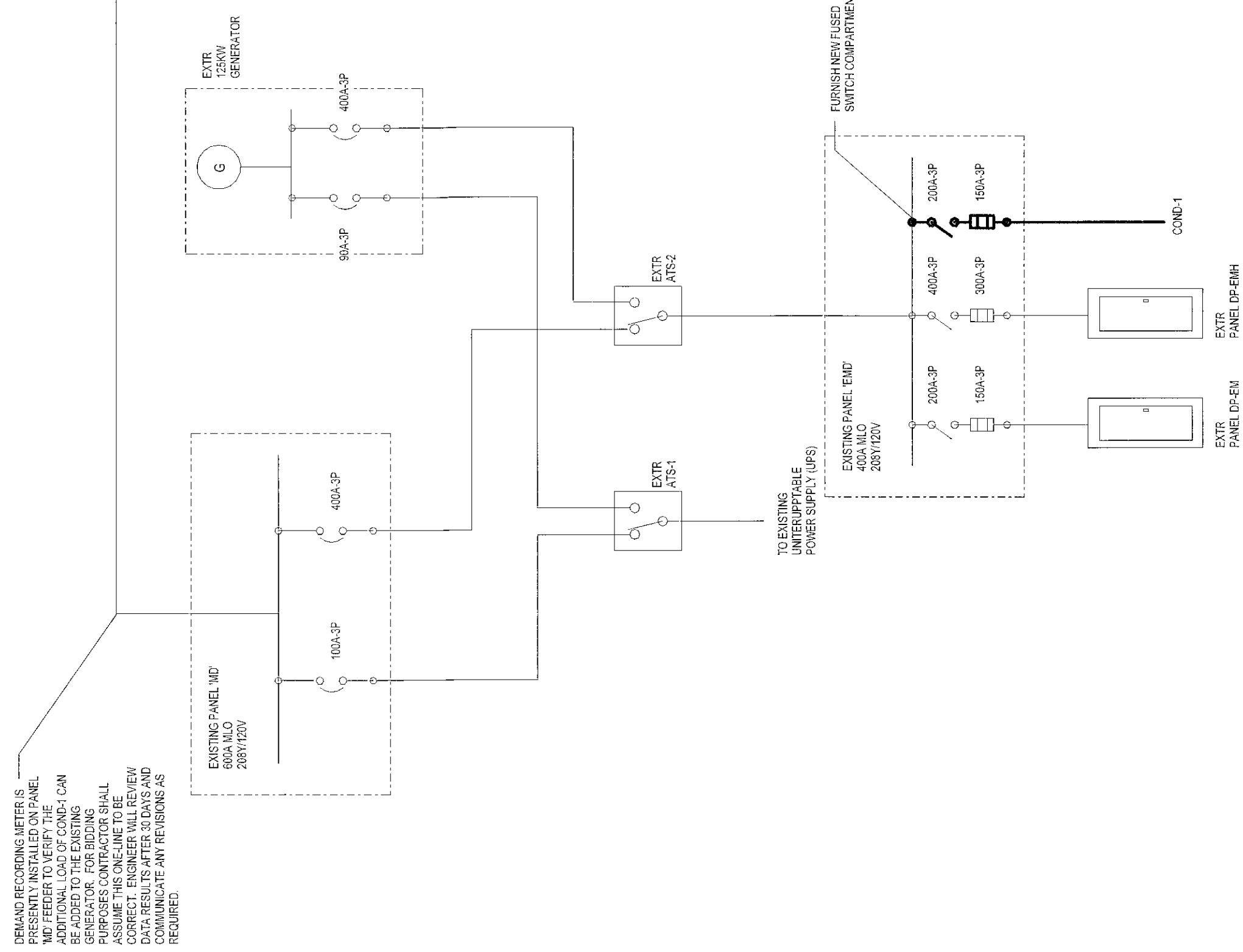
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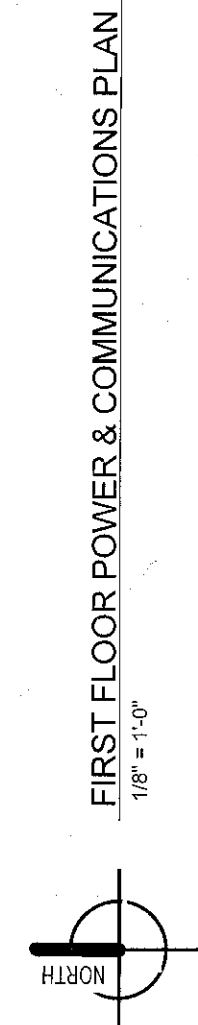
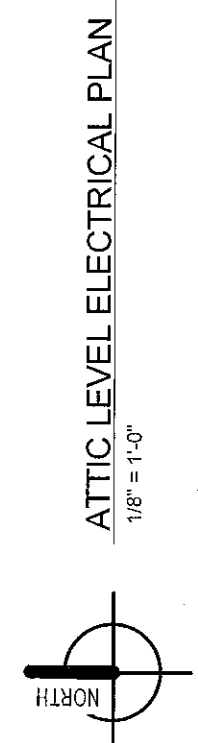


ONE-LINE DIAGRAM (SHOWING FINAL CONFIGURATION)

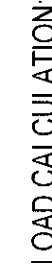
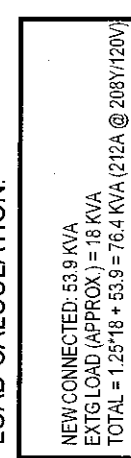
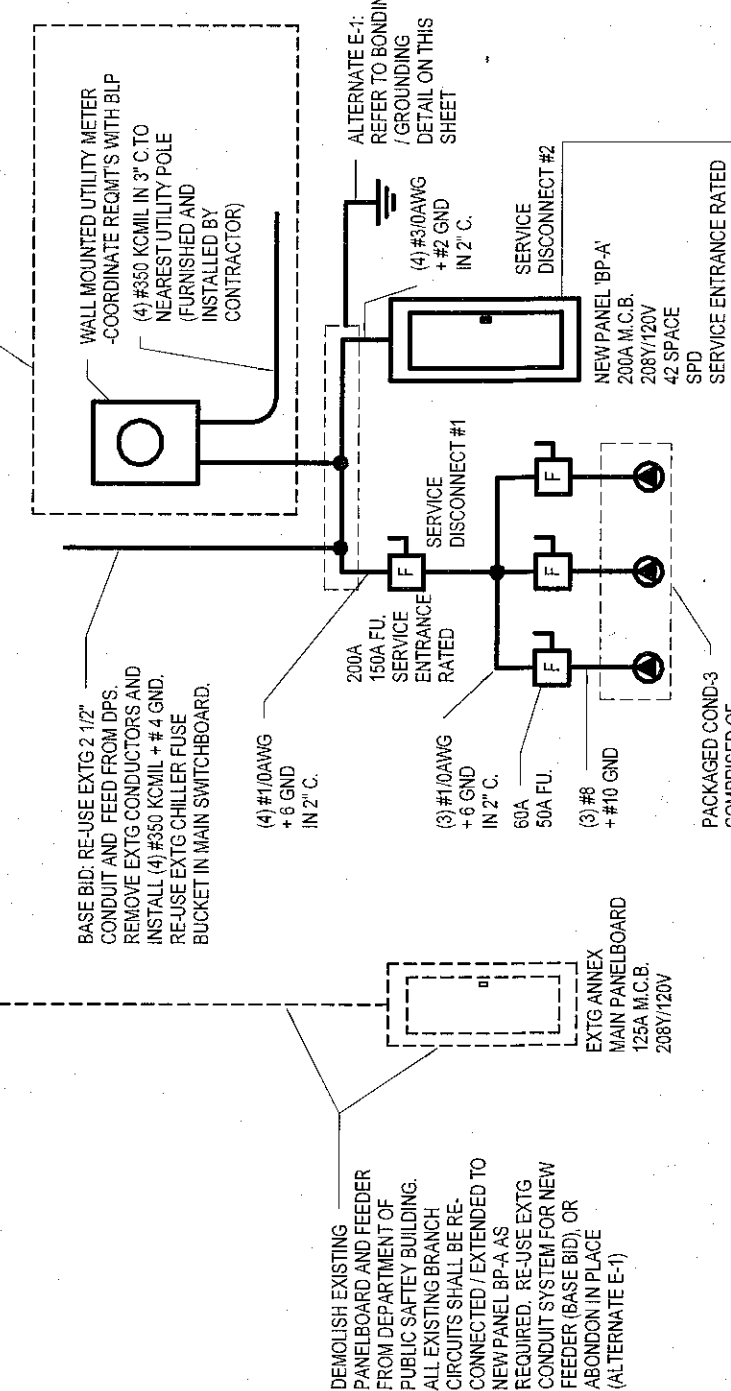
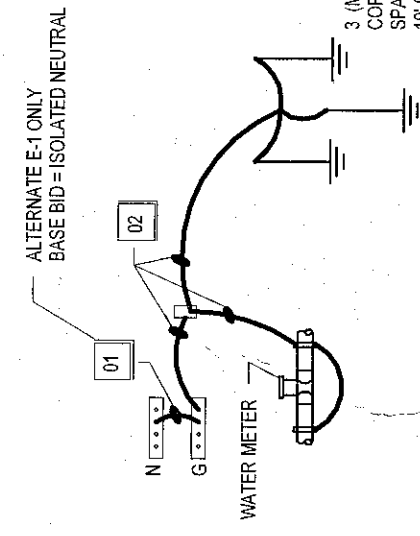


EXISTING ONE-LINE DIAGRAM (SHOWING DEMOLITION)



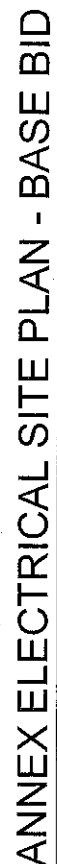


- REFER TO ELECTRICAL GENERAL NOTES ON SHEET E7-21.
REFER TO MECHANICAL DRAWINGS FOR LOCATIONS OF SMOKE DAMPERS AND COMBINATION
FIRE-ALARM DAMPERS. E-5 SHALL PROVIDE 120VAC POWER (DECATAG 20 AMP 1-PHASE)
TO EACH DAMPER. E-5 SHALL PROVIDE 24VDC POWER (DECATAG 10 AMP 1-PHASE) TO EACH
FIRE-ALARM DAMPER. ALSO PROVIDE ONE ALARM DIAL SMOKE DETECTOR FEEDLINE FROM EACH
DAMPER. UNDER NO CIRCUMSTANCES SHALL A FIRE-ALARM DIAL SMOKE DETECTOR FEEDLINE
BE USED AS A FEEDLINE FOR ANOTHER DIAL DETECTOR FEEDLINE. FEEDLINE SHALL BE
Labeled FOR INTERCOMING DAMPER IN CORRESPONDING PANEL UNIT PER THE
REQUIREMENTS.
REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL ELECTRICAL DETECTOR SCOPE
AND DETECTOR LOCATIONS. ALL ELECTRICAL CONNECTIONS TO EQUIPMENT SHALL BE
FOR SIGNALING, NOT FOR POWER. ALL ELECTRICAL CONNECTIONS TO EQUIPMENT SHALL
BE BACK TO SOURCE.



- | KEYNOTES | |
|----------|---|
| 01 | SYSTEM BONDING JUMPER
(SIZED PER NEC TABLE 250-96) |
| 02 | GROUNDING ELECTRODE CONDUCTOR
(SIZED PER NEC ARTICLE 250-66) |

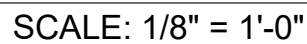
PANELBOARD BONDING AND GROUNDING DETAIL

[illegible]

PROVIDE WITH SPD, CONTRACTOR TO FIELD VERIFY EXISTING CIRCUIT BREAKER SIZES AND QUANTITIES

TOTAL LOADS:	21884 VA
TOTAL AMPERAGE:	61 A

TOTAL LOADS:



Scale: 1/8"=1'0"	Design File:
Date: 7/9/15	CGH-EPSF1A15
Drawn By:	City of Grand Haven
Drawing Size: 24"x36"	Drawing Number:
	FLA15



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

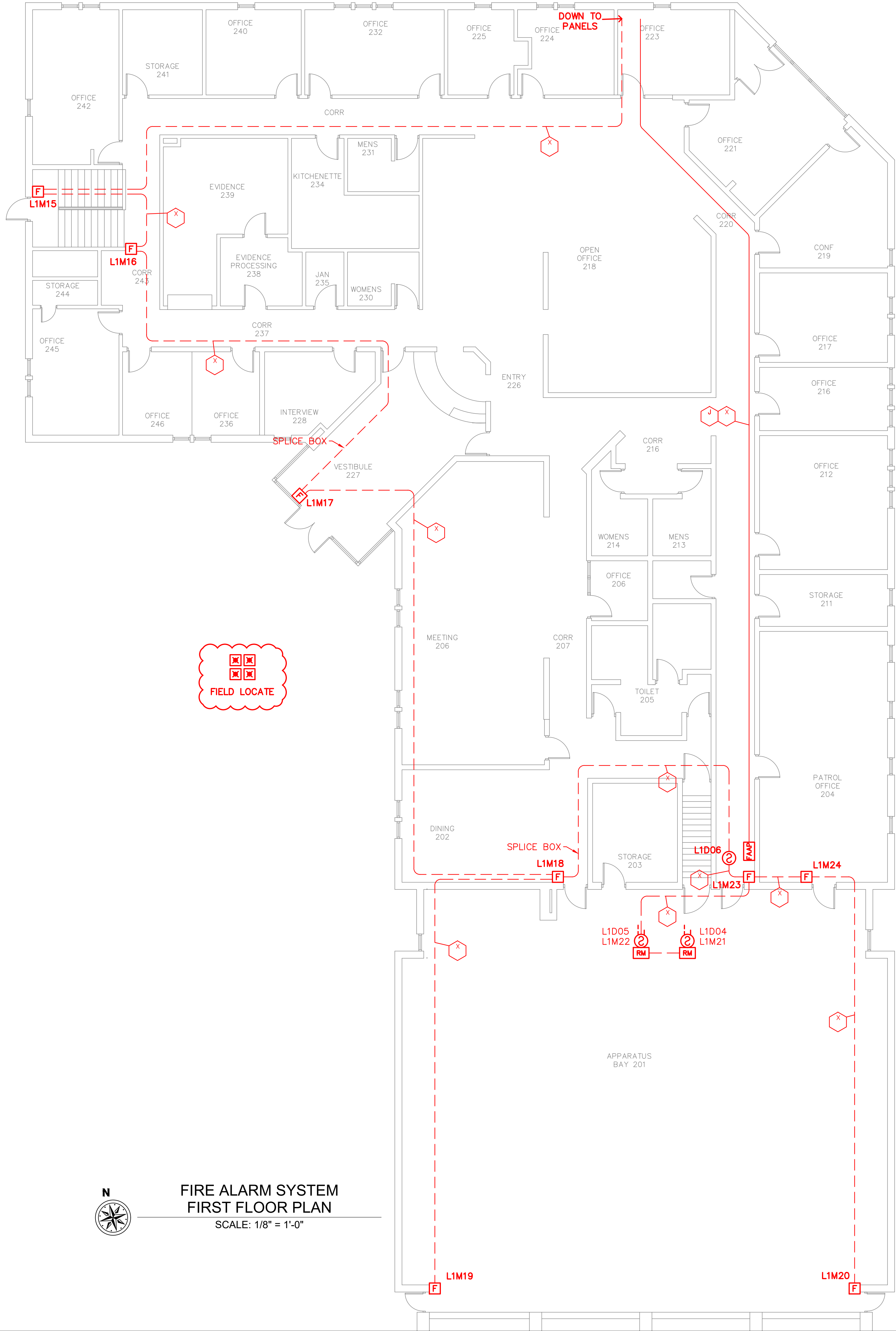
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Drawing Size:	24"x36"
Design File: CGH-EPSF1A15	
City of Grand Haven	
Drawing Number: NLA15	

525 WASHINGTON AVE.
GRAND HAVEN, MI 49417

Date	Revisions
6/1/16	AS BUILT

ENGINEERED PROTECTION SYSTEMS, INC.
Suite 200 750 Front N.W. Grand Rapids, MI 49504

Phone: (616) 459-0281
Fax: (616) 459-0553
E-mail: cad@epssecurity.com
Contact:



SYMBOL	DESCRIPTION	MOUNTING REQUIREMENT	MOUNTING HEIGHT
	FIRE ALARM CONTROL PANEL	IN SUPPLIED CABINET	TOP OF CABINET NOT HIGHER THAN 7'
	FIRE ALARM ANNUNCIATOR PANEL	ON SUPPLIED BACK BOX	TOP OF CABINET NOT HIGHER THAN 7'
	ADDRESSABLE MONITOR MODULE	ON A 4X4 SQUARE BOX	ADJACENT TO DEVICE OR AT EYE LEVEL
	RELAY MODULE	ON A 4X4 SQUARE BOX	ADJACENT TO DEVICE OR AT EYE LEVEL
	SMOKE DETECTOR	ON A 4" OCTAGON BOX	ON CEILING
	DUCT SMOKE DETECTOR	ON RETURN AIR DUCT UNLESS NOTED OTHERWISE	PER INSTRUCTIONS
	MANUAL FIRE PULL STATION	ON A 2X4 SINGLE GANG OR SUPPLIED BACK BOX	48" A.F.F. TO BOTTOM
	REMOTE TEST SWITCH	ON A 2X4 SINGLE GANG BOX	TOP OF BOX NOT HIGHER THAN 7' AND EASILY ACCESSIBLE
	HORN/STROBE POWER SUPPLY	IN SUPPLIED CABINET	TOP OF CABINET NOT HIGHER THAN 7'
	HORN/STROBE (WALL-MOUNTED)	ON A 4X4 SQUARE BOX OR SUPPLIED WEATHERPROOF (P2WG) BACK BOX SET CANDELA AS INDICATED ON PLAN	80" TO 96" A.F.F. TO LENS, IF CEILING IS LESS THAN 80" MOUNT WITHIN 6" OF CEILING
	STROBE (WALL-MOUNTED)	ON A 4X4 SQUARE BOX OR SUPPLIED WEATHERPROOF (SWK) BACK BOX SET CANDELA AS INDICATED ON PLAN	80" TO 96" A.F.F. TO LENS, IF CEILING IS LESS THAN 80" MOUNT WITHIN 6" OF CEILING
	HORN/STROBE (CEILING-MOUNTED)	ON A 4X4 SQUARE BOX OR SUPPLIED WEATHERPROOF (P2WG) BACK BOX SET CANDELA AS INDICATED ON PLAN	ON CEILING OR ON BOTTOM OF BUILDING STEEL
	HORN/STROBE (CEILING-MOUNTED)	ON A 4X4 SQUARE BOX OR SUPPLIED WEATHERPROOF (SCWG) BACK BOX SET CANDELA AS INDICATED ON PLAN	ON CEILING OR ON BOTTOM OF BUILDING STEEL
	END OF LINE RESISTOR	AT LAST DEVICE ON CIRCUIT/LOOP	AT LAST DEVICE ON CIRCUIT/LOOP
	20 140 FFLP	----	----
	40 180 FFLP, SHIELDED	----	----
	20 180 FFLP	----	----

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ENGINEERED PROTECTION SYSTEMS, INC.
Suite 200 750 Front N.W. Grand Rapids, MI 49504

Date: 6/1/16

Revisions: AS BUILT

525 WASHINGTON AVE.
GRAND HAVEN, MI 49417

City of Grand Haven

Grand Haven Public Safety

FIRE ALARM SYSTEM

FIRST FLOOR

Scale: 1/8"=1'0"

Date: 7/9/15

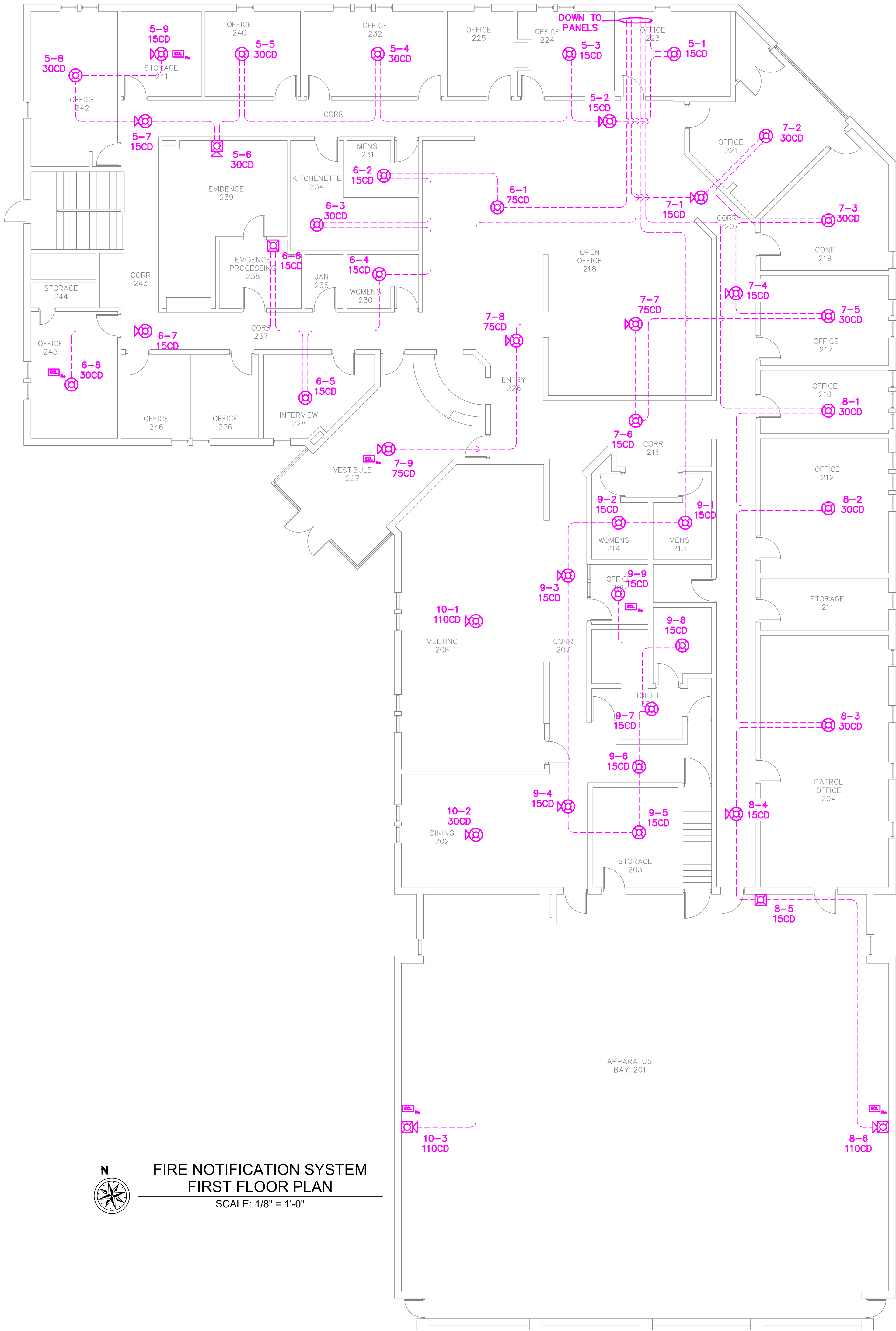
Drawn By:

Drawing Size: 24"x36"

Design File: CGH-EPSF1A15

City of Grand Haven

Drawing Number: F1A15



FIRE NOTIFICATION SYSTEM
FIRST FLOOR PLAN
SCALE: 1/8" = 1'-0"

SYMBOL	DESCRIPTION	MOUNTING REQUIREMENT	MOUNTING HEIGHT
	FIRE ALARM CONTROL PANEL	IN SUPPLIED CABINET	TOP OF CABINET NOT HIGHER THAN 7'
	FIRE ALARM ANNUNCIATOR PANEL	ON SUPPLIED BACK BOX	TOP OF CABINET NOT HIGHER THAN 7'
	ADDRESSABLE MONITOR MODULE	ON A 4X4 SQUARE BOX	ADJACENT TO DEVICE OR AT EYE LEVEL
	RELAY MODULE	ON A 4X4 SQUARE BOX	ADJACENT TO DEVICE OR AT EYE LEVEL
	SMOKE DETECTOR	ON A 4" OCTAGON BOX	ON CEILING
	DUCT SMOKE DETECTOR	ON RETURN AIR DUCT UNLESS NOTED OTHERWISE	PER INSTRUCTIONS
	MANUAL FIRE PULL STATION	ON A 2X4 SINGLE GANG OR SUPPLIED BACK BOX	48" A.F.F. TO BOTTOM
	REMOTE TEST SWITCH	ON A 2X4 SINGLE GANG BOX	TOP OF BOX NOT HIGHER THAN 7' AND EASILY ACCESSIBLE
	HORN/STROBE POWER SUPPLY	IN SUPPLIED CABINET	TOP OF CABINET NOT HIGHER THAN 7'
	HORN/STROBE (WALL-MOUNTED)	ON A 4X4 SQUARE BOX OR SUPPLIED WEATHERPROOF (P2WK) BACK BOX SET CANDELA AS INDICATED ON PLAN	80" TO 96" A.F.F. TO LENS IF CEILING IS LESS THAN 80" MOUNT WITHIN 6" OF CEILING
	STROBE (WALL-MOUNTED)	ON A 4X4 SQUARE BOX OR SUPPLIED WEATHERPROOF (SWK) BACK BOX SET CANDELA AS INDICATED ON PLAN	80" TO 96" A.F.F. TO LENS IF CEILING IS LESS THAN 80" MOUNT WITHIN 6" OF CEILING
	HORN/STROBE (CEILING-MOUNTED)	ON A 4X4 SQUARE BOX OR SUPPLIED WEATHERPROOF (P2WK) BACK BOX SET CANDELA AS INDICATED ON PLAN	ON CEILING OR ON BOTTOM OF BUILDING STEEL
	HORN/STROBE (CEILING-MOUNTED)	ON A 4X4 SQUARE BOX OR SUPPLIED WEATHERPROOF (SWK) BACK BOX SET CANDELA AS INDICATED ON PLAN	ON CEILING OR ON BOTTOM OF BUILDING STEEL
	END OF LINE RESISTOR	AT LAST DEVICE ON CIRCUIT/LOOP	AT LAST DEVICE ON CIRCUIT/LOOP
	2C 14G FFLP	---	---
	4C 18G FFLP, SHIELDED	---	---
	2C 18G FFLP	---	---

Phone: (616) 459-0281

Fax: (616) 459-0553

E-mail: cad@epssecurity.com

Contact:



ENGINEERED PROTECTION SYSTEMS, INC.
Suite 200 750 Front N.W. Grand Rapids, MI 49504

Date: 6/1/16

Revisions: AS BUILT

525 WASHINGTON AVE.,
GRAND HAVEN, MI 49417

City of Grand Haven

Grand Haven Public Safety

FIRE NOTIFICATION SYSTEM

FIRST FLOOR

Scale: 1/8"=1'0"

Date: 7/9/15

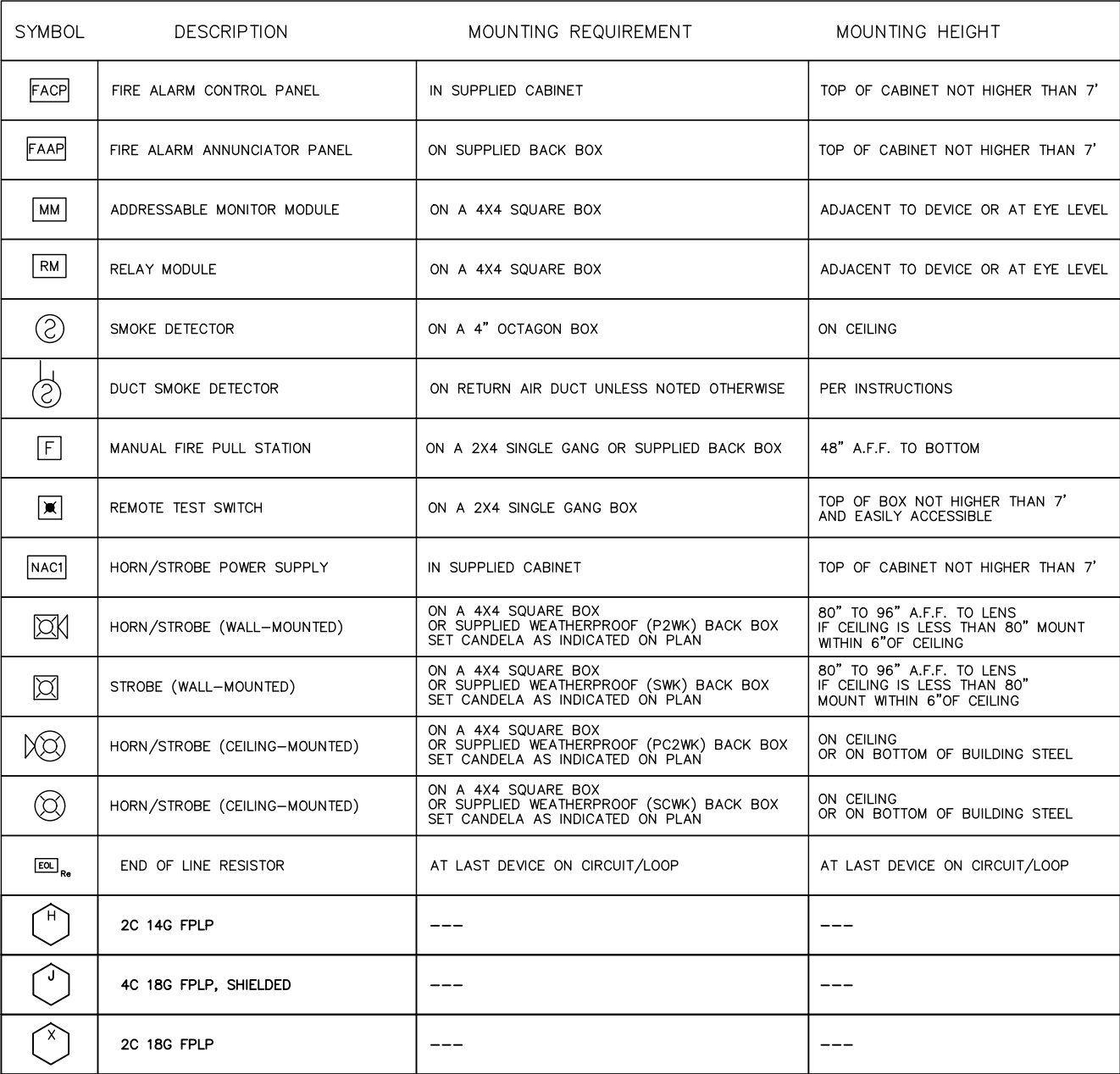
Drawn By:

Drawing Size: 24"x36"

Design File:
CGH-EPSF1A15

City of
Grand Haven

Drawing Number:
N1A15





SUMMIT
SURVEYING

SURVEYORS GENERAL NOTES:

SURVEYORS SYMBOLOGY:

Symbol Legend	
Symbol	Denotes
	Deciduous Tree
	Light Pole
	Mailbox
	Shrub
	Sign
	Sign
	Square CB
	Storm MH
	Concrete
	Asphalt

1. DO NOT WORK ANY DEBRIS, ROOTS, TOPSOIL, OR OTHER MATERIALS.
2. DO BURY SHAL, COMPLY WITH APPLICABLE REQUIREMENTS OR THE LOCAL CODE, ORDINANCES AND ADJACENT PREVENTION REGULATIONS.
3. PROTECT THE SITE, ADJACENT PROPERTY AND UTILITY SERVICES FROM DAMAGE OR DISRUPTION OF SERVICE CAUSED BY THE CONSTRUCTION OF THE STRUCTURE. SITE OR UTILITIES SHALL BE REPAIRED AT THE CONTRACTORS EXPENSE.
4. ALL TREES TO REMAIN SHALL BE CAREFULLY PROTECTED. DO NOT DRIVE HEAVY EQUIPMENT WITHIN 12 FT OF TREE TRUNKS. BRANCHES WHICH ARE DAMAGED DURING CONSTRUCTION OF THE STRUCTURE OR SURFACES SHALL BE CUT OUT BY THE ARCHITECT/ENGINEER. ANY ROOTS OF TREES BEING SAVED WHICH ARE EXPOSED DUE TO THE CONSTRUCTION OF THE STRUCTURE SHALL BE CUT OUT. DAMAGED TREES MAY BE REPLACED AT THE DISCRETION OF THE ARCHITECT/ENGINEER AT THE EXPENSE OF THE CONTRACTOR RESPONSIBLE FOR THE DAMAGE.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING NECESSARY PERMITS FOR WORK IN ROAD AND ON UTILITY CONNECTIONS OR ADJACENT PROPERTY PRIOR TO START OF CONSTRUCTION.
6. CONTRACTORS TO REVIEW ALL SHEETS FOR RELATED INFORMATION.
7. LIST OF STANDARD ABREVIATIONS.

"A.F.F." = ABOVE FINISHED FLOOR
 "C/L" = CENTER LINE
 "F.F.E" = FINISH FLOOR ELEVATION
 "U.N.O" = UNLESS NOTED OTHERWISE

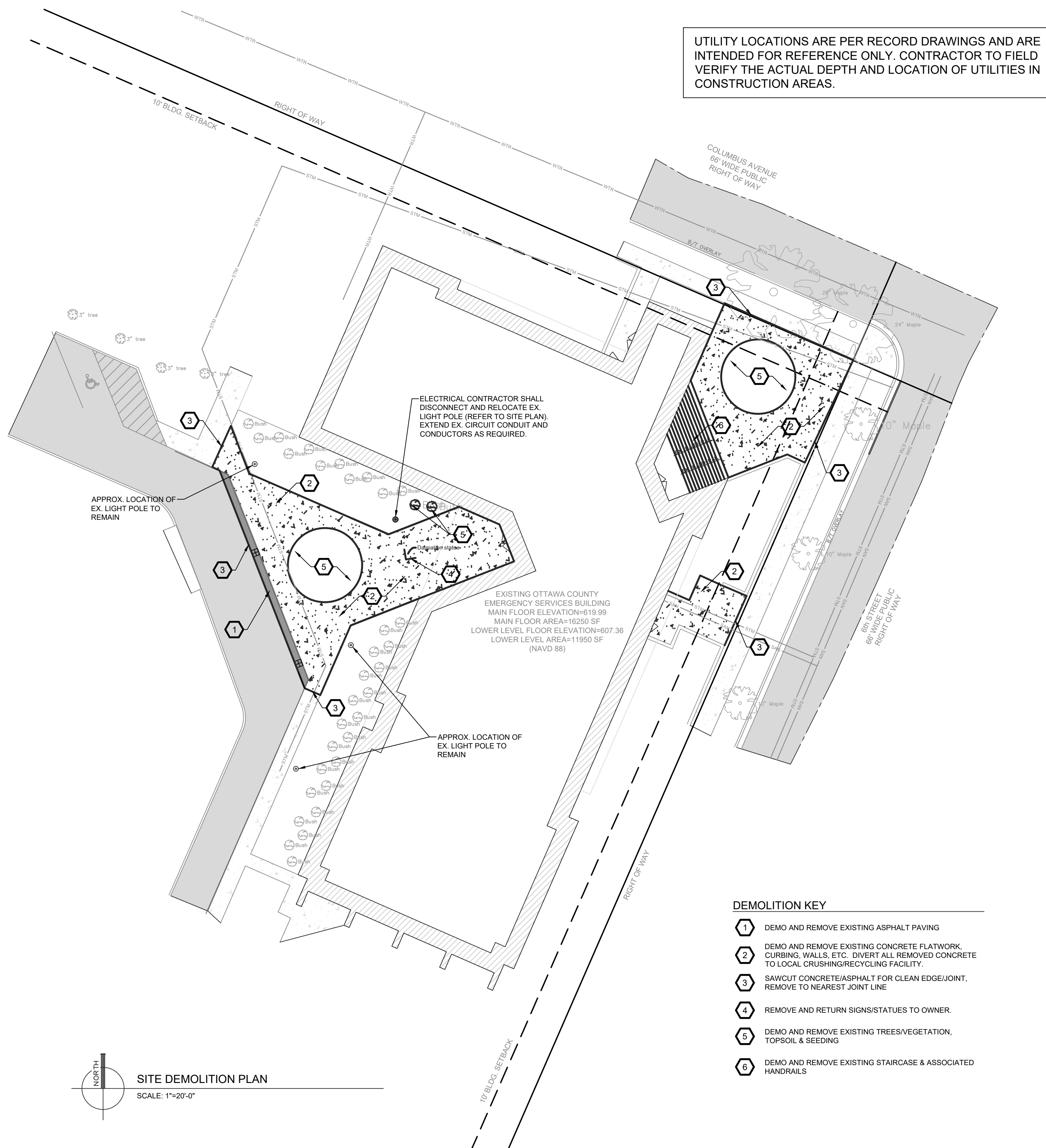
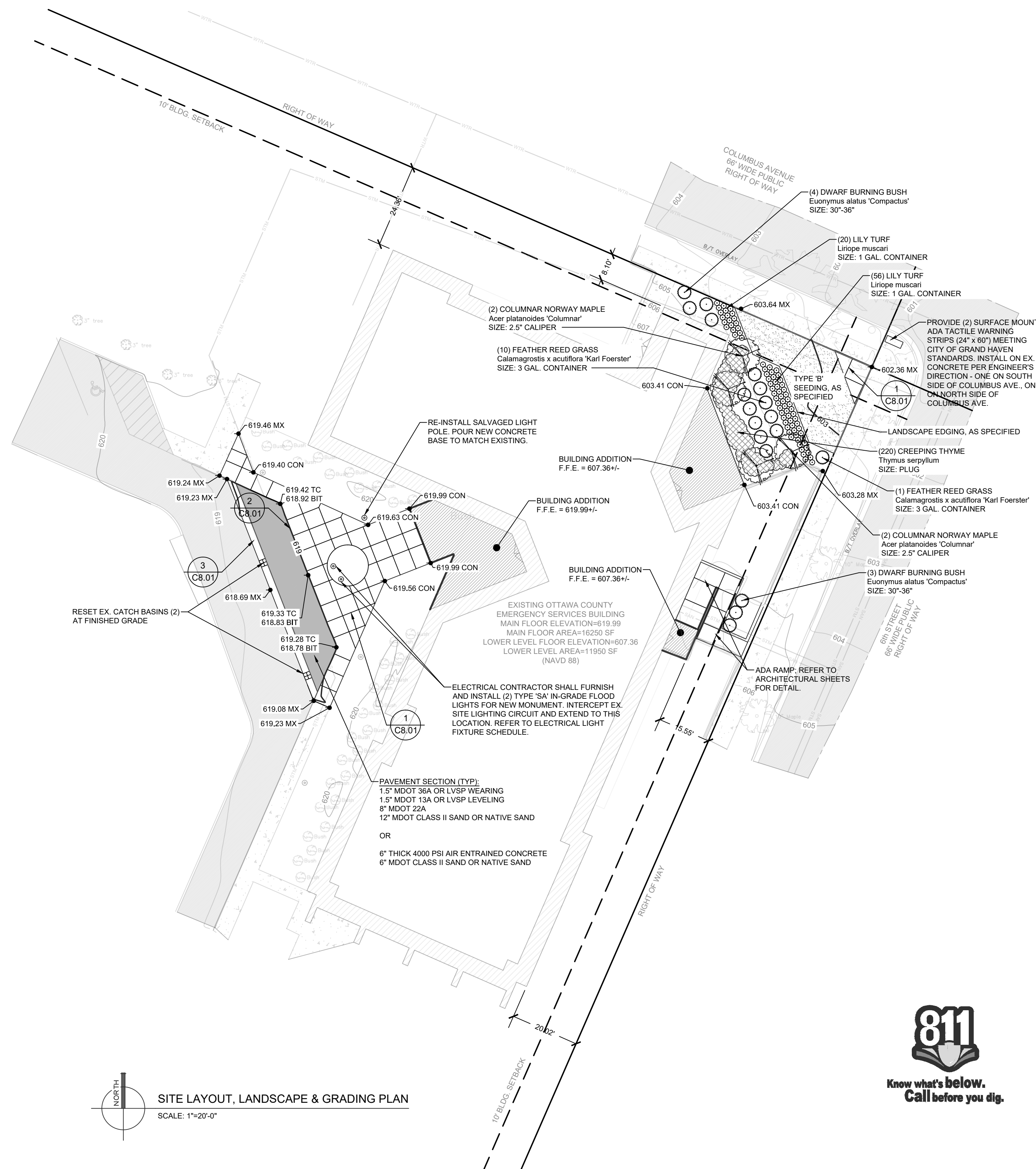
LAYOUT LEGEND		
SYMBOL	DESCRIPTION	DETAIL/SPEC
	STANDARD CURB & GUTTER	DETAIL #/C8.01 SPEC 32 13 13
	ROLLED CURB & GUTTER	DETAIL #/C8.01 SPEC 32 13 13
	CONCRETE SIDEWALK	DETAIL #/C8.01 SPEC 32 13 13
	CONCRETE PAVEMENT	DETAIL #/C8.01 SPEC 32 13 13
	HEAVY DUTY PAVEMENT	DETAIL #/C8.01 SPEC 32 12 16
	STANDARD DUTY PAVEMENT	DETAIL #/C8.01 SPEC 32 12 16
	SIGN & POST	DETAIL #/C8.01
	CHAINLINK FENCE	DETAIL #/C8.01 SPEC 32 31 13
	ORNAMENTAL FENCE	DETAIL #/C8.01 SPEC 32 31 19

1. ALL WORK SHALL COMPLY WITH APPLICABLE REGULATIONS OR THE LOCAL CODE, ORDINANCES AND ANY APPLICABLE ENVIRONMENTAL REGULATIONS.
2. PROTECT THE SITE, ADJACENT PROPERTY AND UTILITY SERVICES FROM DAMAGE OR DISRUPTION OF SERVICE/ACCESS. DAMAGE TO EXISTING STRUCTURES, SITE OR UTILITIES SHALL BE REPAIRED AT THE CONTRACTORS EXPENSE.
3. ALL TREES TO REMAIN SHALL BE CAREFULLY PROTECTED. REFER TO GENERAL LANDSCAPE MAINTENANCE SCHEDULE, TREE PROTECTION REQUIREMENTS.
4. CONTRACTOR SHALL OBTAIN SOIL EROSION PERMITS INCLUDING SUBMITTING NOTICE OF COVERAGE TO MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY (IF REQUIRED). PRIOR TO DISTURBING ANY SOIL, CONTRACTOR SHALL HAVE TEMPORARY EROSION CONTROL S IN PLACE AND MAINTAINED THROUGHOUT CONSTRUCTION.
5. REFER TO PROJECT SPECIFICATIONS FOR REQUIREMENTS AND RECOMMENDATION RELATED TO SOIL PLACEMENT.
6. CONTRACTOR SHALL BE REQUIRED TO CHECK LINES AND GRADES AGAINST PLANS AND NOTIFY ARCHITECT OF ANY DISCREPANCIES.
7. DO NOT BURY ANY DEBRIS, ROOTS, TPOPS OR OTHER DELETERIOUS/UNSATISFABLE FILL MATERIALS.
8. LIST OF STANDARD ABBREVIATIONS.

"BIT"	=	PROPOSED BITUMINOUS GRADE
"BOW"	=	BOTTOM OF WALL GRADE
"BOS"	=	BOTTOM OF STAIR
"BW"	=	BACK OF WALK GRADE
"CON"	=	PROPOSED CONCRETE GRADE
"F.F./FFE"	=	FINISHED FLOOR ELEVATION
"FG"	=	FINISHED GRADE
"FW"	=	FRONT OF WALK GRADE
"G"	=	GUTTER GRADE
"MX"	=	MATCH EXISTING
"TC"	=	TOP OF CURB GRADE
"TOS"	=	TOP OF STAIR GRADE
"TOW"	=	TOP OF WALL GRADE

GRADING LEGEND		
SYMBOL	DESCRIPTION	DETAIL/SPEC
	PROPOSED SPOT ELEVATION	SPEC 31 20 00
	SURFACE FLOW DIRECTION	
	PROPOSED CONTOUR	
	EX. CONTOUR	
	GRADING LIMITS	

1. ALL PLANTING BEDS SHALL BE HARDWOOD BARK MULCH 2" DEEP.
2. ALL TREES OUTSIDE PLANTING BEDS SHALL HAVE 5'-6" DIAMETER OF SHREDED HARDWOOD BARK MULCH 4" DEEP.
3. ALL PLANT HOLE PREPARATION FOR TREES SHALL BE AS FOLLOWS: ONE-HALF TOPSOIL, AND ONE-HALF APPROVED COMMERCIAL HORTICULTURAL PEAT MOSS.
4. ALL AREAS DISTURBED DURING CONSTRUCTION SHALL BE REPAIRED AND SEEDED AS PER SPECIFICATIONS. REMOVE ALL STONES AND OTHER DEBRIS OVER 1" BEFORE SEEDING.
5. REFER TO DETAILS XCXXXX AND XCXX.XX FOR PLANTING INFORMATION.
6. ALL TREE LOCATIONS TO BE STAKED AND APPROVED BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
7. COORDINATE LOCATION OF ALL DRAIN RELOCATION PLANTING AND BOULDERS WITH LANDSCAPE ARCHITECT.
8. CONTRACTOR SHALL PLACE IRRIGATION FLAGS TO DELINEATE BETWEEN ALL AREAS PLANTED WITH NATIVE SEEDS AND TURF GRASS SEED. FLAGS SHALL BE PLACED AT THE END OF EACH ROW OF PLANTING.



DEPARTMENT OF PUBLIC SAFETY

CITY OF GRAND HAVEN

GRAND HAVEN, MICHIGAN

ISSUANCES	
03.30.15	BIDS & CONSTRUCTION
Site / Civil	MRF
Architecture	
Interior	
Structure	
Mechanical	
Electrical	

PROJECT NO. 5-3175

GMB ae

85 East Eighth Street, Suite 200
Holland, Michigan 49423

P. 616.796.0200 F. 616-796-0201
www.gmb.com

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SITE DEMOLITION,
LAYOUT &
GRADING PLANS

C1.01



**Know what's below.
Call before you dig.**

30"x42"

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GRAND HAVEN, MICHIGAN

ISSUANCES	
03.30.15	BIDS & CONSTRUCTION
Site / Civil	MRF
Architecture	
Interior	
Structure	
Mechanical	
Electrical	

PROJECT NO. 5-3175

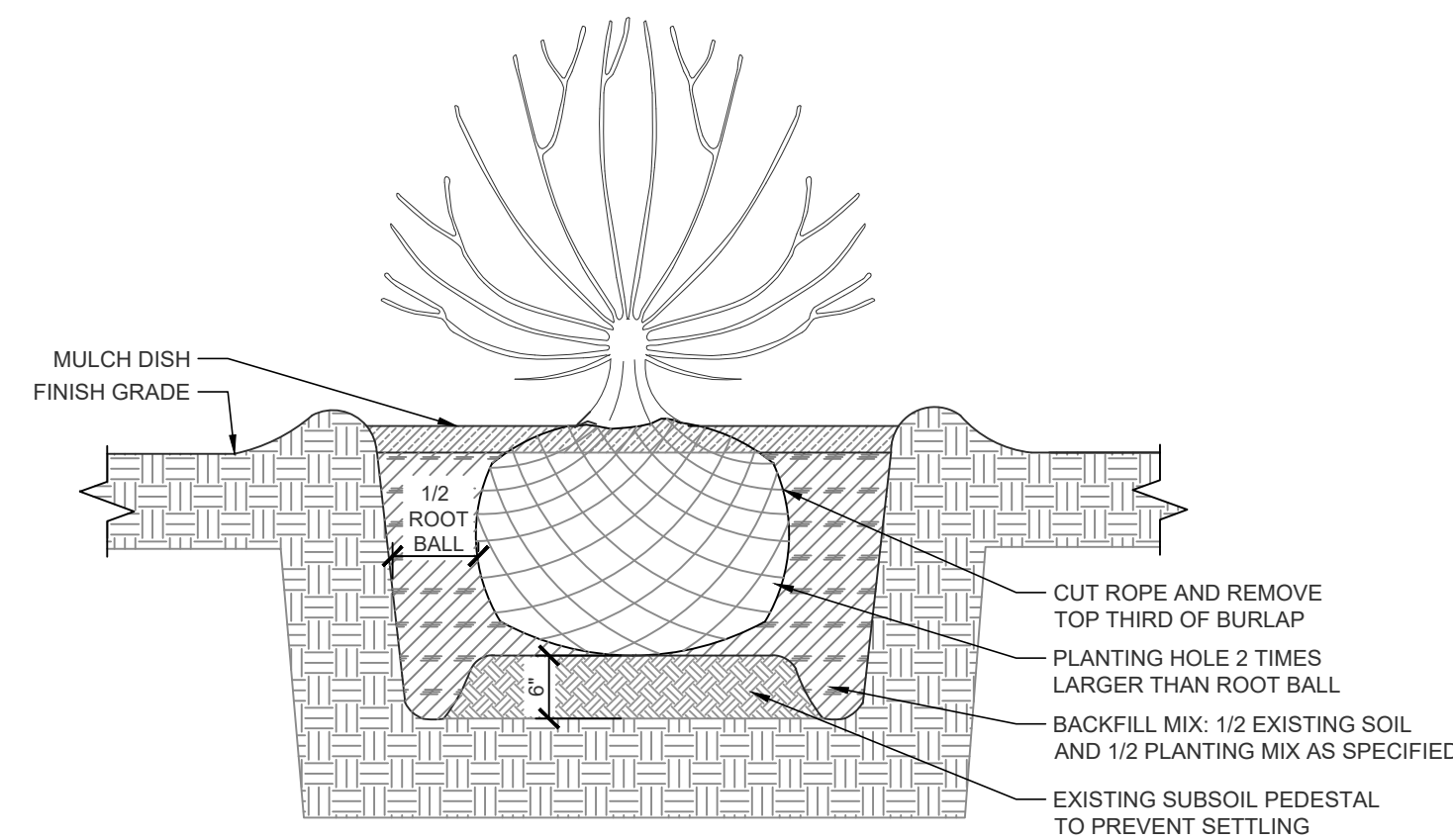
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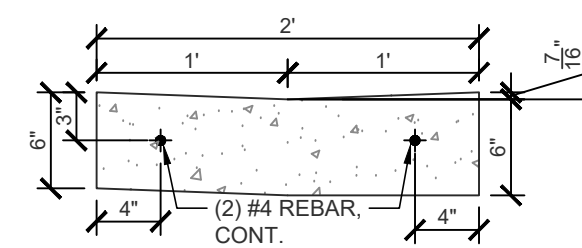
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SITE DETAILS

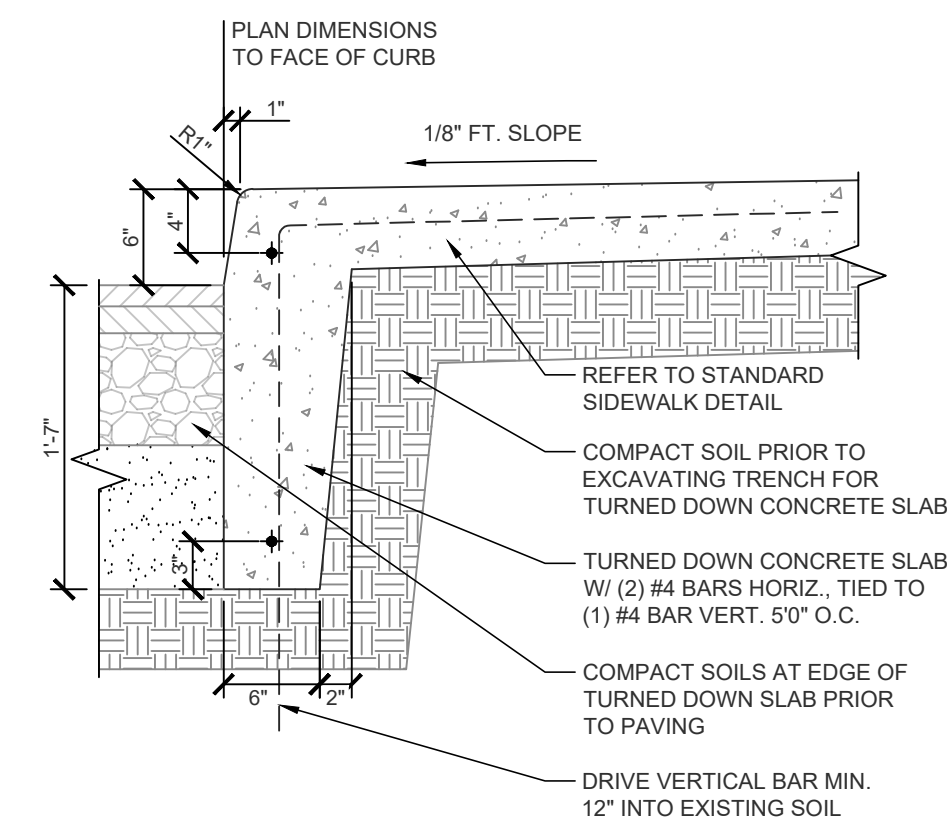
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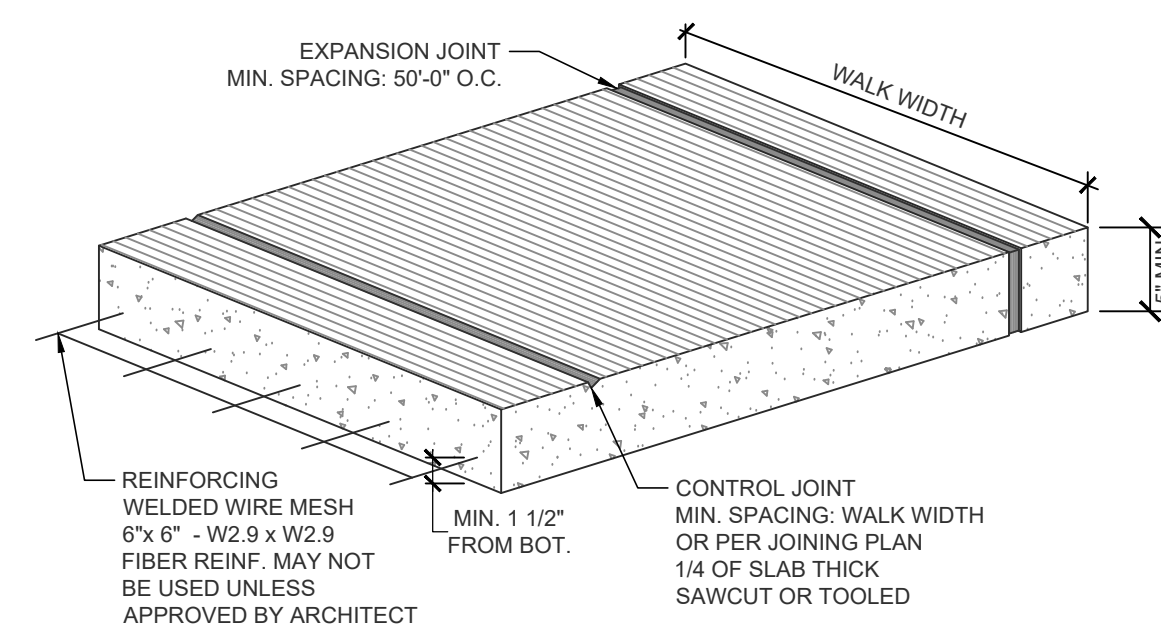
4 SHRUB PLANTING
C8.01 NOT TO SCALE



3 24" GUTTER PAN
C8.01 NOT TO SCALE

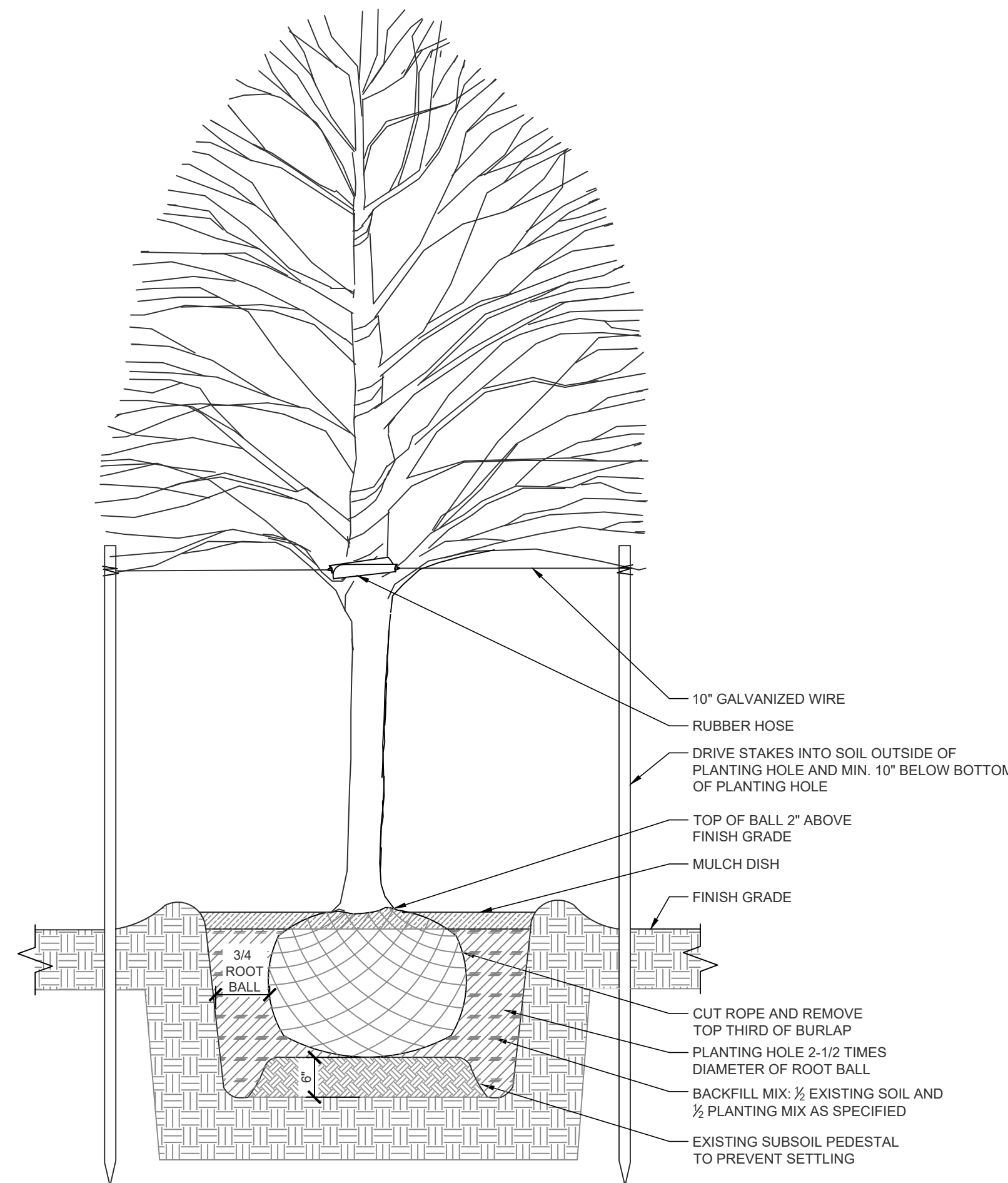


2 SIDEWALK EDGE
C8.01 NOT TO SCALE



GENERAL SIDEWALK NOTES	
1.	ALL SIDEWALK IS 9" THICK UNLESS OTHERWISE NOTED
2.	ALL SIDEWALK SHALL HAVE A MIN. 8" GRANULAR BASE
3.	ALL EDGES MUST BE FINISHED WITH A 1/2" FILLET
4.	REFER TO SPEC. 32 13 13 FOR CONCRETE SPECS.
5.	BROOM FINISH ALL SIDEWALK PERPENDICULAR TO WIDTH. REFER ALSO TO SPEC. 32 13 13.
6.	WHERE A PERMANENT STRUCTURE IS LOCATED IN SIDEWALK, PLACE EXPANSION MATERIAL AROUND STRUCTURE AND ADJUST JOINT PATTERN TO INTERSECT STRUCTURE
7.	COLD JOINTS - PLACE EXPANSION JOINT AT ALL COLD JOINTS

1 TYPICAL SIDEWALK
C8.01 NOT TO SCALE



5 TREE PLANTING
C8.01 NOT TO SCALE

30"x42"

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ANNEX ELECTRICAL SITE PLAN - ALTERNATE E-1



ANNEX ELECTRICAL SITE PLAN - BASE BID

Branch Panel: PANEL 'BP-A'													
Location: BASEMENT 003						Volts: 208Y/120V 3PH 4W			A.I.C. Rating: 10KA				
Supply From:						Phases: 3			Main Type: MAIN CIRCUIT BREAKER				
Mounting: SURFACE						Wires: 4			Mains Rating: 225 A				
Enclosure: TYPE 1									MCB Rating: 225 A				
Provide with the following:													
CKT	Circuit Description	Trip	Poles	A		B		C		Poles	Trip	Circuit Description	CKT
BPA-1	EXISTING PANEL 'BP-2'	100 A	2	0	1,009					2	20 A	BS-1 / VRV-1 THRU 3	BPA-2
BPA-3						0	1,009						BPA-4
BPA-5	BS-2 / VRV-4 THRU 6, 8	20 A	2					364	468	2	20 A	VRV-7, 10 THRU 15	BPA-6
BPA-7				364	468								BPA-8
BPA-9						5,637	645						BPA-10
BPA-11	ERU-3	60 A	3					5,637	645	2	100 A	EXISTING PANEL 'BP-3'	BPA-12
BPA-13				5,637	0								BPA-14
BPA-15						0	0			2	40 A	EXISTING RANGE	BPA-16
BPA-17	EXISTING PANEL 'BP-1'	60 A	3					0	0	1	20 A	EXTG CKT	BPA-18
BPA-19				0	0					1	20 A	EXTG CKT	BPA-20
BPA-21	EXTG CKT	20 A	1			0	0			1	20 A	EXTG CKT	BPA-22
BPA-23	EXTG CKT	20 A	1					0	0	1	20 A	EXTG CKT	BPA-24
BPA-25	EXTG CKT	20 A	1	0	0					1	20 A	EXTG CKT	BPA-26
BPA-27	EXTG CKT	20 A	1			0	0			1	20 A	EXTG CKT	BPA-28
BPA-29	EXTG CKT	20 A	1					0	0	1	20 A	EXTG CKT	BPA-30
BPA-31	EXTG CKT	20 A	1	0	0					1	20 A	EXTG CKT	BPA-32
BPA-33	EXTG CKT	20 A	1			0	0			1	20 A	EXTG CKT	BPA-34
BPA-35	EXTG CKT	20 A	1					0	0	1	20 A	EXTG CKT	BPA-36
BPA-37	EXTG CKT	20 A	1	0	0					1	20 A	EXTG CKT	BPA-38
BPA-39	EXTG CKT	20 A	1					0	0	1	20 A	EXTG CKT	BPA-40
BPA-41	EXTG CKT	20 A	1					0	0	1	20 A	EXTG CKT	BPA-42
PHASE LOAD:				7,478 VA		7,291 VA		7,114 VA					



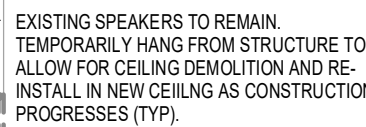
03.30.15	BIDS & CONSTRUCTION
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Mechanical	
Electrical	ND

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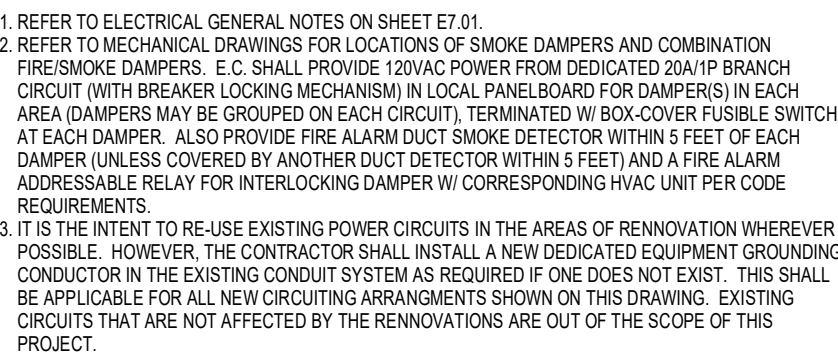
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1/8" = 1'-0"

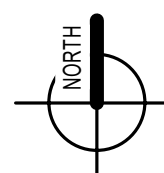
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03.30.15	BIDS & CONSTRUCTION
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ELECTRICAL KEYNOTES	
P03	ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A COMBINATION FUSED MOTOR STARTER FOR EQUIPMENT - REFER TO SPECS.
P04	BOILER EMERGENCY SHUTDOWN SWITCH. REFER TO DETAIL ON SHEET 02
P05	ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A SINGLE PHASE MANUAL STARTER FOR EQUIPMENT - REFER TO SPECS.
P06	EQUIPMENT SHALL BE PROVIDED WITH A VARIABLE FREQUENCY DRIVE, INSTALLED BY THE ELECTRICAL CONTRACTOR.
P07	FURNISH AND INSTALL A MULLION MOUNTED DEVICE.



 $1/8" = 1'-0"$

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET 01-1.

2. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS OF SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS. E.C. SHALL PROVIDE 120VAC POWER FROM DEDICATED 20AMP/1PH BRANCH CIRCUIT (WITH BREAKER LOCKING MECHANISM) IN LOCAL PANELBOARD FOR DAMPERS IN EACH AREA. DAMPERS SHALL BE OPERATED BY 24VDC OR 120VAC REMOTE CONTROLLED SWITCH AT EACH DAMPER. ALSO PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET) AND A FIRE ALARM ADDRESSABLE RELAY FOR INTERLOGGING DAMPER WITH CORRESPONDING HVAC UNIT PER CODE REQUIREMENTS.

3. IT IS THE INTENT TO RE-USE EXISTING POWER CIRCUITS IN THE AREAS OF RENOVATION WHEREVER POSSIBLE. HOWEVER, THE CONTRACTOR SHALL INSTALL A NEW DEDICATED EQUIPMENT GROUNDING CONDUCTOR IN THE EXISTING DUCT SYSTEM AS REQUIRED IF ONE DOES NOT EXIST. THIS SHALL BE APPLICABLE FOR ALL NEW CIRCUITING AREAS SHOWN ON THIS DRAWING. EXISTING CIRCUITS THAT ARE NOT AFFECTED BY THE RENOVATIONS ARE OUT OF THE SCOPE OF THIS PROJECT.

ELECTRICAL KEYNOTES	
P01	RE-INSTALL MOTORIZED PROJECTION SCREEN, PROJECTOR MOUNT AND ASSOCIATED CABLING AND CONTROLS.
P07	FURNISH AND INSTALL A MILLION MOUNTED DEVICE
P08	INSTALL RECEPTS IN CASEWORK / MILLWORK WITH IN 6" OF COUNTER TOP.
P09	RE-INSTALL EXISTING SPEAKER. EXTEND WIRING AS REQUIRED.
P10	RE-INSTALL EXISTING 911 EMERGENCY PHONE. RE-ROUTE WIRING AS REQUIRED.
P11	RE-INSTALL CIRCUIT FOR MOVEABLE STORAGE

GRAND HAVEN, MICHIGAN

03.30.15	BIDS & CONSTRUCTION
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[illegible]

Site / Civil	
Architecture	
Interior	
Structure	
Mechanical	
Electrical	ND

PROJECT NO. 5-3175



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MAIN LEVEL POWER & COMMUNICATIONS PLAN

E2.02

ISSUANCES

03.30.15	BIDS & CONSTRUCTION

Site / Civil	
Architecture	
Interior	
Structure	
Mechanical	
Electrical	ND

PROJECT NO. 5-3175

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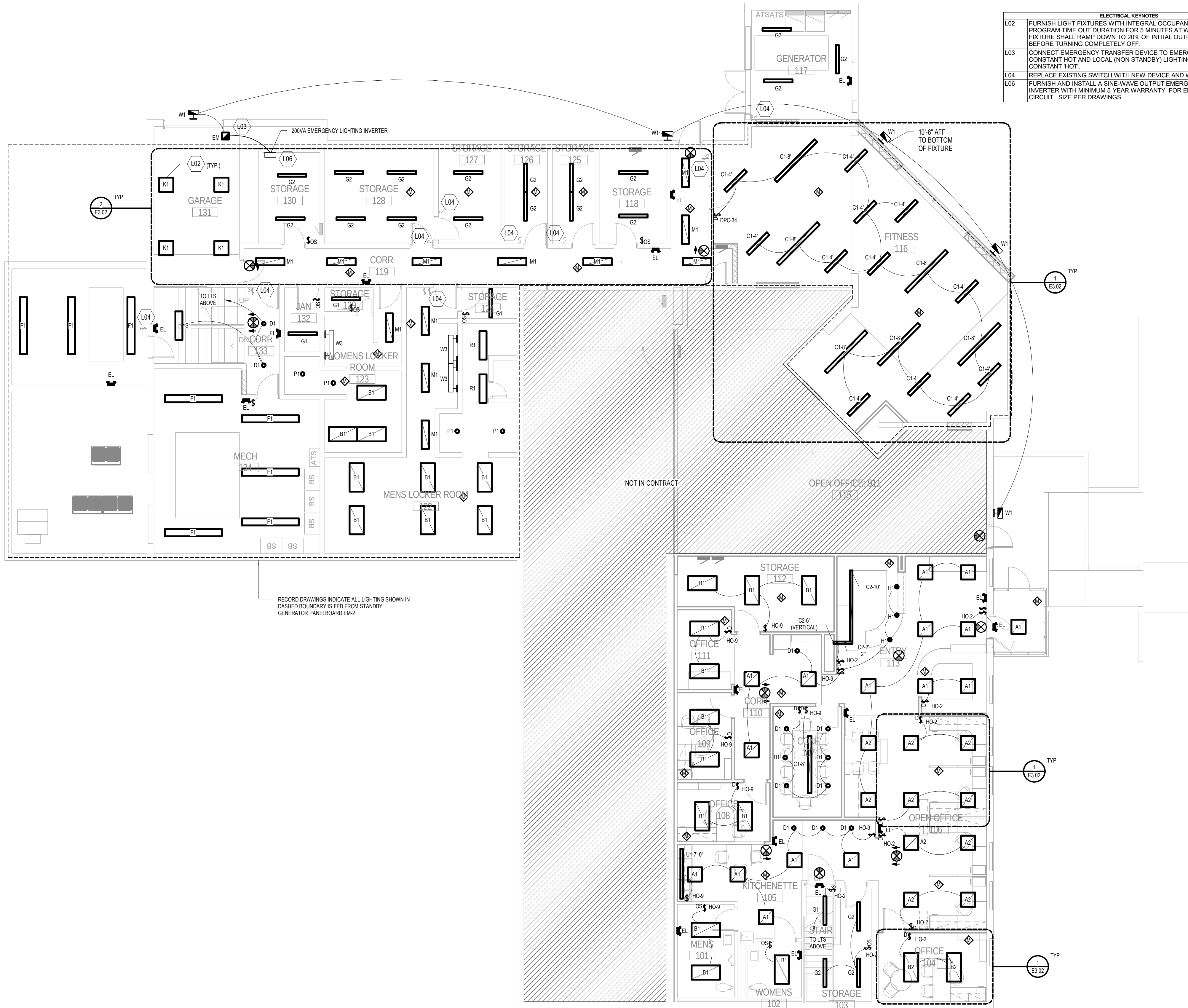
LOWER LEVEL LIGHTING PLAN

LIGHTING GENERAL NOTES

- IT IS THE INTENT OF THIS PROJECT TO REPLACE ALL THE EXISTING INCANDESCENT AND FLOURESCENT LIGHT FIXTURES WITH NEW LIGHT EMITTING DIODE (LED) FIXTURES AND UPDATE THE CONTROLS IN EACH SPACE TO HAVE AUTOMATIC OFF FUNCTIONALITY BY THE INSTALLATION OF OCCUPANCY SENSORS.
- ALL EXISTING LIGHTING CIRCUITS SHALL BE RE-USED AND CONNECTED TO NEW LIGHT FIXTURES. HOWEVER, UPON SPOT CHECK, NO EQUIPMENT GROUNDING CONDUCTOR WAS FOUND TO BE INSTALLED IN THE EXISTING CONDUIT SYSTEM. THE CONTRACTOR SHALL FURNISH AND INSTALL A NEW INSULATED GROUNDING CONDUCTOR FOR EACH EXISTING LIGHTING CIRCUIT FROM THE POINT OF SUPPLY TO THE END DEVICE AND BOND ELECTRICAL RACEWAYS, BOXES, FITTINGS, ETC. TO ENSURE ALL NEW LIGHT FIXTURES ARE PROPERLY GROUNDING.
- CONTRACTOR SHALL REPLACE ALL EXISTING SWITCH DEVICES WITH A NEW DEVICE - REFER TO SPEC.
- LIGHTING CONTROL INTENT BY SPACE:
OFFICE SPACES: INSTALL MODULAR DIMMING CONTROLLER (SEE SPEC); OCCUPANCY SENSOR - AND LOW VOLTAGE DIMMING SWITCH AS SHOWN. CONTROLLER SHALL BE PROGRAMMED FOR: MANUAL ON, AUTO-OFF WITH A 5-MINUTE TIME OUT DURATION. OCCUPANCY SENSOR OR CONTROLLER SHALL HAVE A DRY CONTACT OUTPUT TO INDICATE OCCUPIED STATUS TO THE BMS SYSTEM. LOW VOLTAGE 0-10V WIRING IS REQUIRED BETWEEN THE DIMMING CONTROLLER AND EACH NEW LIGHT FIXTURE IN THE SPACE (NOT SHOWN).
CORRIDORS, BATHROOMS, STORAGE ROOMS, AND SIMILAR COMMON SPACES: INSTALL NEW OCCUPANCY SENSORS ON THE LINE. SIDE OF THE CONTROLS SWITCHES IN EACH SPACE AS INDICATED ON THE DRAWING. LIGHTS SHALL BE AUTO-ON, AUTO-OFF WITH A TIME OUT DURATION OF 5 MINUTES. CONTROL SWITCHES SHALL FUNCTION AS A MANUAL OFF ONLY.
EXTERIOR: EXTERIOR LIGHTS SHALL FUNCTION ON A TIME-OF-DAY SCHEDULE. UTILIZE THE EXISTING LIGHTING CONTROLS AND TIME CLOCK CONTROLS AND EXTERIOR CIRCUITS AS REQUIRED. ALL NEW EXTERIOR EXPRESS FIXTURES SHALL BE FURNISHED WITH A SMALL SINE WAVE INVERTER TIED TO THE LOCAL HOT LEG TO PROVIDE 90 MINUTES OF EMERGENCY ILLUMINATION AT FULL OUTPUT OF THE LIGHT FIXTURE.

ELECTRICAL KEYNOTES

- L02 FURNISH LIGHT FIXTURES WITH INTEGRAL OCCUPANCY SENSOR. PROGRAM TIME OUT DURATION FOR 5 MINUTES AT WHICH POINT THE FIXTURE SHALL RAMP DOWN TO 20% OF INITIAL OUTPUT FOR 30 MINUTES BEFORE TURNING COMPLETELY OFF.
- L03 CONNECT EMERGENCY TRANSFER DEVICE TO EMERGENCY INVERTER. CONSTANT HOT AND LOCAL (NON STANDBY) LIGHTING CIRCUIT. CONSTANT HOT.
- L04 REPLACE EXISTING SWITCH WITH NEW DEVICE AND WALL PLATE.
- L06 FURNISH AND INSTALL A SINE-WAVE OUTPUT EMERGENCY LIGHTING INVERTER WITH MINIMUM 5-YEAR WARRANTY FOR EMERGENCY LIGHTING CIRCUIT. SIZE PER DRAWINGS.



RECORD DRAWINGS INDICATE ALL LIGHTING SHOWN IN
DASHED BOUNDARY IS FED FROM STANDBY
GENERATOR PANEL/BOARD (BMS)



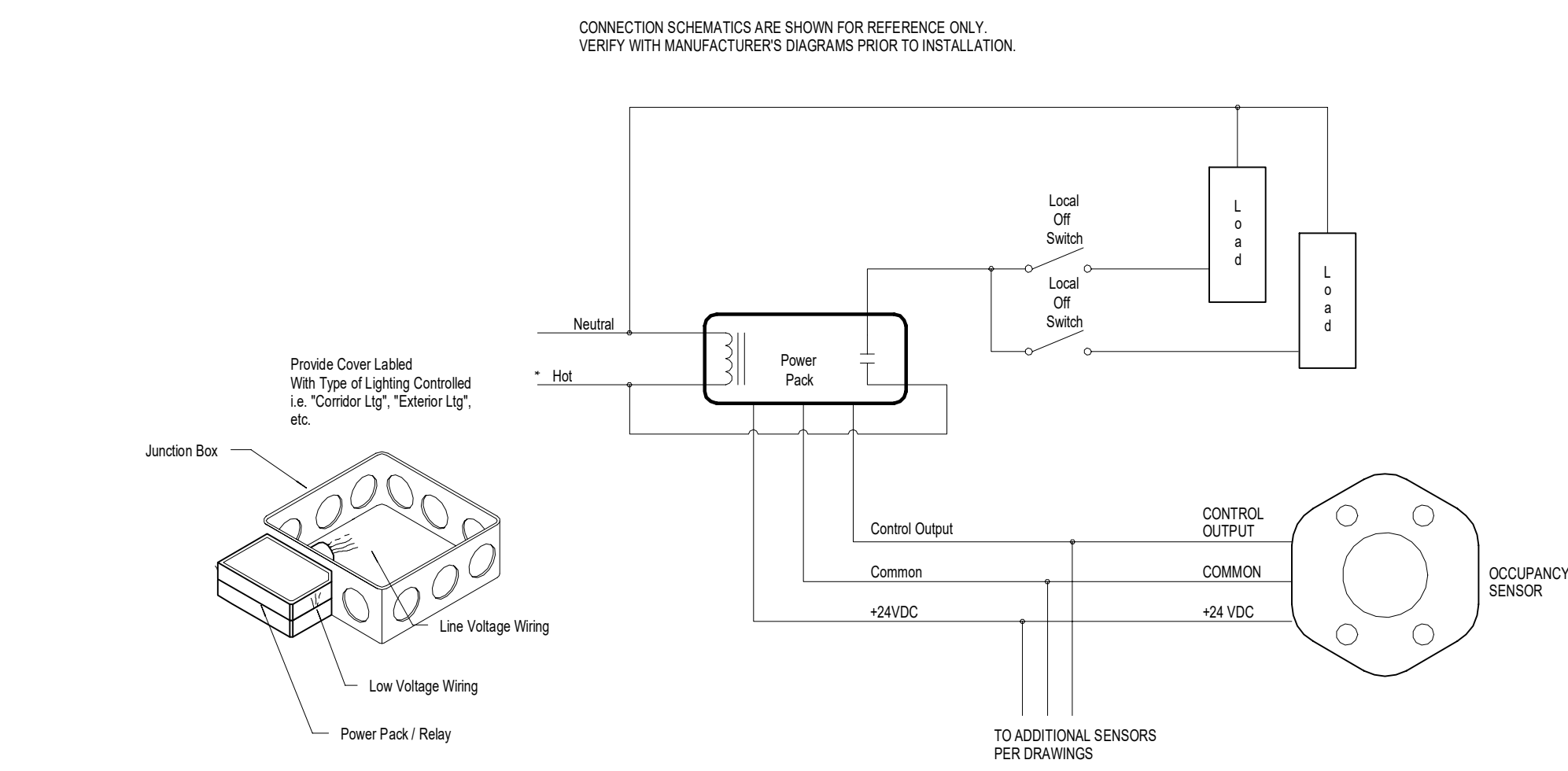
LOWER LEVEL LIGHTING PLAN

1/8" = 1'-0"

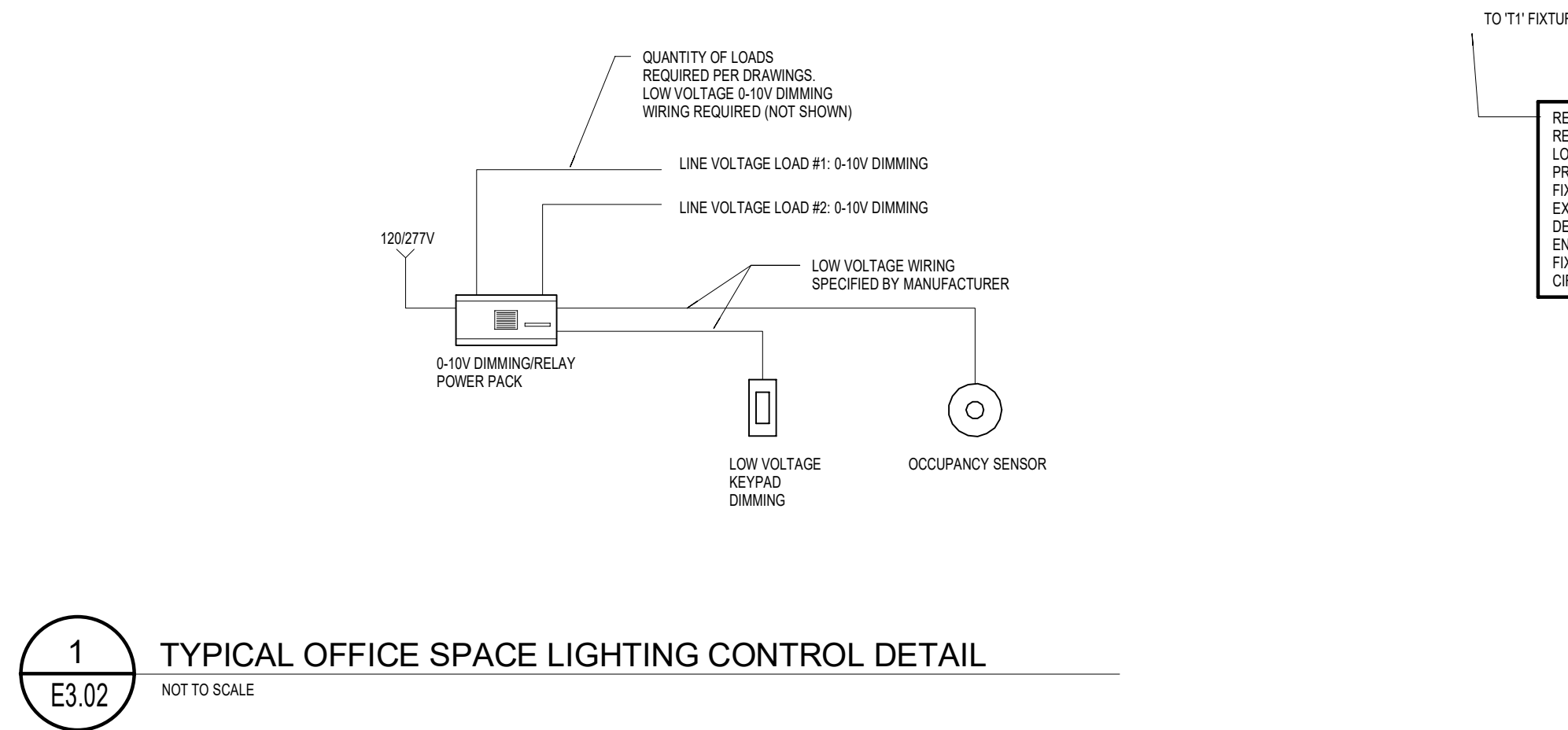
- LIGHTING GENERAL NOTES**
- IT IS THE INTENT OF THIS PROJECT TO REPLACE ALL THE EXISTING INCANDESCENT AND FLUORESCENT T12 LIGHT FIXTURES WITH NEW LIGHT EMITTING DIODE (LED) FIXTURES AND UPDATE THE CONTROLS IN EACH SPACE TO HAVE AUTOMATIC OFF FUNCTIONALITY BY THE INSTALLATION OF OCCUPANCY SENSORS.
 - ALL EXISTING LIGHTING CIRCUITS SHALL BE RE-USED AND CONNECTED TO NEW LIGHT FIXTURES. HOWEVER, UPON SPOT CHECK, NO EQUIPMENT GROUNDING CONDUCTOR WAS FOUND TO BE INSTALLED IN THE EXISTING CONDUIT SYSTEM. THE CONTRACTOR SHALL FURNISH AND INSTALL A NEW INSULATED GROUNDING CONDUCTOR FOR EACH EXISTING LIGHTING CIRCUIT FROM THE POINT OF SUPPLY TO THE END DEVICE AND BOND ELECTRICAL RACKWAYS, BOXES, FITTINGS, ETC. TO ENSURE ALL NEW LIGHT FIXTURES ARE PROPERLY GROUNDED.
 - CONTRACTOR SHALL REPLACE ALL EXISTING SWITCH DEVICES WITH A NEW DEVICE - REFER TO SPECS.
 - LIGHTING CONTROL INTENT BY SPACE:
OFFICE SPACES: INSTALL MODULAR DIMMING CONTROLLER (SEE SPECS), OCCUPANCY SENSOR, AND LOW VOLTAGE DIMMING SWITCH AS SHOWN. CONTROLLER SHALL BE PROGRAMMED FOR: MANUAL ON, AUTO OFF WITH A 5-MINUTE TIME OUT DURATION. OCCUPANCY SENSOR OR CONTROLLER SHALL HAVE A DRY CONTACT OUTPUT TO INDICATE OCCUPIED STATUS TO THE BMS SYSTEM. LOW VOLTAGE 0-10V WIRING IS REQUIRED BETWEEN THE DIMMING CONTROLLER AND EACH NEW LIGHT FIXTURE IN THE SPACE (NOT SHOWN).
CORRIDORS, BATHROOMS, STORAGE ROOMS, AND SIMILAR COMMON SPACES: INSTALL NEW OCCUPANCY SENSORS ON THE LINE. USE OF THE CONTROL SWITCHES IN EACH SPACE AS INDICATED ON THE DRAWING. LIGHTS SHALL BE AUTOMATIC AUTO OFF WITH A TIME OUT DURATION OF 15 MINUTES. CONTROL SWITCHES SHALL FUNCTION AS A MANUAL OFF ONLY.
EXTERIOR: EXTERIOR LIGHTS SHALL FUNCTION ON A TIME-OF-DAY SCHEDULE. UTILIZE THE EXISTING LIGHTING CONTRACTORS AND TIME CLOCK CONTROLS AND EXTEND CIRCUITS AS REQUIRED. ALL NEW EXTERIOR EXPRESS FIXTURES SHALL BE FURNISHED WITH A SMALL SINE WAVE INVERTER, TIED TO THE LOCAL HOT LINES, TO PROVIDE 60 MINUTES OF EMERGENCY ILLUMINATION AT FULL OUTPUT OF THE LIGHT FIXTURE.

ELECTRICAL KEYNOTES	
L01	FURNISH AND INSTALL A DMX CONTROL STATION FOR VESTIBULE COVE LIGHTS (TYPE J1) WITH INTEGRAL TIME CLOCK AND PRESET SCENE CAPABILITIES. REFER TO MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR PROPER WIRING AND COMPONENT LAYOUT. REFER TO LIGHTING CONTROLS SPECIFICATION.
L03	CONNECT EMERGENCY TRANSFER DEVICE TO EMERGENCY INVERTER CONSTANT HOT AND LOCAL (NON-STANDBY) LIGHTING CIRCUIT CONSTANT "HOT".
L04	REPLACE EXISTING SWITCH WITH NEW DEVICE AND WALL PLATE.
L05	FIXTURE SHALL OPERATE AS A NIGHT LIGHT (ON 24 HOURS A DAY). CONNECT TO LOCAL EMERGENCY LIGHTING CIRCUIT.
L06	FURNISH AND INSTALL A SINE-WAVE OUTPUT EMERGENCY LIGHTING INVERTER WITH MINIMUM 5-YEAR WARRANTY FOR EMERGENCY LIGHTING CIRCUIT. SIZE PER DRAWINGS.

1
E3.02
TYPICAL OFFICE SPACE LIGHTING CONTROL DETAIL
NOT TO SCALE



2
E3.02
TYPICAL OCCUPANCY SENSOR CONTROL DETAIL
1" = 1'-0"



MAIN LEVEL LIGHTING PLAN
1/8" = 1'-0"

EQUIPMENT CONNECTION SCHEDULE																			
FED FROM	TAG	DESCRIPTION	LOAD		VOLT	Ø	X DISCONNECT / CONTROLLER	Amperacy		WIRING				RACEWAY				X NOTES	
			VALUE	UNITS				SIZE	POLE	TYPE	NO	SIZE	GND	TYPE 1	SIZE	TYPE 2	SIZE		
DEPARTMENT OF PUBLIC SAFETY BUILDING																			
REFER TO DRAWINGS	COMB-1	CONDENSING UNIT	80.6	A	208	3	FUSED DISCONNECT FOR EACH MODULE (3) BY E.C.	160	3	THWN-2	3	10	6	EMT	1 1/2	LFMC	1 1/4	2	
	COMB-2	CONDENSING UNIT	38.8	A	208	3	FUSED DISCONNECT BY E.C.	80	3	THWN-2	3	6	10	EMT	3/4	LFMC	3/4	1	
	BS-1	BRANCH SELECTOR MODULE	0.4	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	BS-2	BRANCH SELECTOR MODULE	0.4	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	BS-3	BRANCH SELECTOR MODULE	0.4	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	BS-4	BRANCH SELECTOR MODULE	0.4	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	BS-5	BRANCH SELECTOR MODULE	0.4	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	B-1	BOILER	8	A	115	1	DISCONNECT: BOILER E-STOP AND CONTACTOR BY E.C.	20	1	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	B-2	BOILER	8	A	115	1	DISCONNECT: BOILER E-STOP AND CONTACTOR BY E.C.	20	1	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	CH-1	CABINET HEATER	4	KW	208	1	LINE VOLTAGE T-STATE BY MECH. CONTRACTOR	30	2	THWN-2	2	10	10	EMT	1/2	FMC	1/2	1	
	ERU-1	ENERGY RECOVERY UNIT	82	A	208	3	CONTROLS / DISCONNECT BY EQUIPMENT MANUFACTURER	160	3	THWN-2	3	3	8	EMT	1	LFMC	1		
	ERU-2	ENERGY RECOVERY UNIT	46	A	208	3	CONTROLS / DISCONNECT BY EQUIPMENT MANUFACTURER	60	3	THWN-2	3	6	10	EMT	1	LFMC	1		
	EQ-5	GLYCOL FEED TANK	0.3	HP	115	1	DISCONNECT BY E.C. - FIELD VERIFY REQUIREMENTS WITH INSTALLER	20	1	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	P-1	HOT WATER CIRC. PUMP	5	HP	208	3	VFD PROVIDED BY TEMP. CONTROLS CONTRACTOR	25	3	THWN-2	3	10	10	EMT	1/2	FMC	1/2	1	
	P-2	HOT WATER CIRC. PUMP (STANDBY)	5	HP	208	3	VFD PROVIDED BY TEMP. CONTROLS CONTRACTOR	25	3	THWN-2	3	10	10	EMT	1/2	FMC	1/2	1	
	P-3	BOILER CIRC. PUMP	0.5	HP	115	1	SINGLE PHASE MOTOR SWITCH BY E.C.	20	1	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	P-4	BOILER CIRC. PUMP	0.5	HP	115	1	SINGLE PHASE MOTOR SWITCH BY E.C.	20	1	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	P-5	FILTER PUMP	1.5	HP	208	3	COMBINATION FUSED DISCONNECT / MOTOR STARTER BY E.C.	10	3	THWN-2	3	12	12	EMT	1/2	FMC	1/2	1	
	VRV-1	VARIABLE REFRIGERANT VOLUME DEVICE	0.3	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-2	VARIABLE REFRIGERANT VOLUME DEVICE	2.8	A	208	1	FUSED DISCONNECT BY E.C.	6	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-3	VARIABLE REFRIGERANT VOLUME DEVICE	0.6	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-4	VARIABLE REFRIGERANT VOLUME DEVICE	0.6	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-5	VARIABLE REFRIGERANT VOLUME DEVICE	0.6	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-6	VARIABLE REFRIGERANT VOLUME DEVICE	1.8	A	208	1	FUSED DISCONNECT BY E.C.	3	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-7	VARIABLE REFRIGERANT VOLUME DEVICE	0.6	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-8	VARIABLE REFRIGERANT VOLUME DEVICE	1.6	A	208	1	FUSED DISCONNECT BY E.C.	3	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-9	VARIABLE REFRIGERANT VOLUME DEVICE	0.6	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-10	VARIABLE REFRIGERANT VOLUME DEVICE	0.6	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-11	VARIABLE REFRIGERANT VOLUME DEVICE	0.6	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-12	VARIABLE REFRIGERANT VOLUME DEVICE	0.6	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-13	VARIABLE REFRIGERANT VOLUME DEVICE	0.6	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-14	VARIABLE REFRIGERANT VOLUME DEVICE	0.6	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-15	VARIABLE REFRIGERANT VOLUME DEVICE	2.8	A	208	1	FUSED DISCONNECT BY E.C.	6	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-16	VARIABLE REFRIGERANT VOLUME DEVICE	0.6	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-17	VARIABLE REFRIGERANT VOLUME DEVICE	0.6	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-18	VARIABLE REFRIGERANT VOLUME DEVICE	1.5	A	208	1	FUSED DISCONNECT BY E.C.	3	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-19	VARIABLE REFRIGERANT VOLUME DEVICE	1.5	A	208	1	FUSED DISCONNECT BY E.C.	3	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-20	VARIABLE REFRIGERANT VOLUME DEVICE	0.6	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-21	VARIABLE REFRIGERANT VOLUME DEVICE	1.4	A	208	1	FUSED DISCONNECT BY E.C.	3	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-22	VARIABLE REFRIGERANT VOLUME DEVICE	0.6	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-23	VARIABLE REFRIGERANT VOLUME DEVICE	1.8	A	208	1	FUSED DISCONNECT BY E.C.	3	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-24	VARIABLE REFRIGERANT VOLUME DEVICE	0.6	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-25	VARIABLE REFRIGERANT VOLUME DEVICE	0.6	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-26	VARIABLE REFRIGERANT VOLUME DEVICE	1.8	A	208	1	FUSED DISCONNECT BY E.C.	3	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-27	VARIABLE REFRIGERANT VOLUME DEVICE	0.6	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-28	VARIABLE REFRIGERANT VOLUME DEVICE	0.6	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
ANNEX BUILDING																			
REFER TO DRAWINGS	COMB-3	CONDENSING UNIT	90	A	208	3	FUSED DISCONNECT FOR EACH MODULE (3) BY E.C.	160	3	THWN-2	3	10	6	EMT	2	LFMC	2	2	
	BS-1	BRANCH SELECTOR MODULE	0.4	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	BS-2	BRANCH SELECTOR MODULE	0.4	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	BS-3	BRANCH SELECTOR MODULE	0.4	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	ERU-3	ENERGY RECOVERY UNIT	47	A	208	3	CONTROLS / DISCONNECT BY EQUIPMENT MANUFACTURER	60	3	THWN-2	3	6	10	EMT	1	LFMC	1	1	
	VRV-1	VARIABLE REFRIGERANT VOLUME DEVICE	2.9	A	208	1	FUSED DISCONNECT BY E.C.	6	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-2	VARIABLE REFRIGERANT VOLUME DEVICE	2.9	A	208	1	FUSED DISCONNECT BY E.C.	6	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-3	VARIABLE REFRIGERANT VOLUME DEVICE	2.9	A	208	1	FUSED DISCONNECT BY E.C.	6	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-4	VARIABLE REFRIGERANT VOLUME DEVICE	0.6	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-5	VARIABLE REFRIGERANT VOLUME DEVICE	0.6	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-6	VARIABLE REFRIGERANT VOLUME DEVICE	0.4	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-7	VARIABLE REFRIGERANT VOLUME DEVICE	1.5	A	208	1	FUSED DISCONNECT BY E.C.	3	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-8	VARIABLE REFRIGERANT VOLUME DEVICE	0.4	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-9	VARIABLE REFRIGERANT VOLUME DEVICE	0.5	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-10	VARIABLE REFRIGERANT VOLUME DEVICE	0.4	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-11	VARIABLE REFRIGERANT VOLUME DEVICE	0.4	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-12	VARIABLE REFRIGERANT VOLUME DEVICE	0.4	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-13	VARIABLE REFRIGERANT VOLUME DEVICE	0.4	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-14	VARIABLE REFRIGERANT VOLUME DEVICE	0.4	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-15	VARIABLE REFRIGERANT VOLUME DEVICE	0.4	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-16	VARIABLE REFRIGERANT VOLUME DEVICE	0.4	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-17	VARIABLE REFRIGERANT VOLUME DEVICE	1.8	A	208	1	FUSED DISCONNECT BY E.C.	3	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-18	VARIABLE REFRIGERANT VOLUME DEVICE	0.6	A	208	1	FUSED DISCONNECT BY E.C.	1	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-19	VARIABLE REFRIGERANT VOLUME DEVICE	1.5	A	208	1	FUSED DISCONNECT BY E.C.	3	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	VRV-20	VARIABLE REFRIGERANT VOLUME DEVICE	1.5	A	208	1	FUSED DISCONNECT BY E.C.	3	2	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
CITY HALL BUILDING																			
REFER TO DRAWINGS	B-1	BOILER	8	A	115	1	DISCONNECT: BOILER E-STOP AND CONTACTOR BY E.C.	20	1	THWN-2	2	12	12	EMT	1/2	LFMC	1/2	1	
	B-2	BOILER	8	A	115	1	DISCONNECT: BOILER E-STOP AND CONTACTOR BY E.C.	20	1	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	EF-1	EX. FAN	0.16	HP	115	1	PLUG-IN FUSE DISCONNECT BY E.C.	6	1	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
	P-1	HOT WATER CIRC. PUMP	2	HP	208	3	VFD PROVIDED BY TEMP. CONTROLS CONTRACTOR	10	3	THWN-2	3	12	12	EMT	1/2	FMC	1/2	1	
	P-2	HOT WATER CIRC. PUMP	2	HP	208	3	VFD PROVIDED BY TEMP. CONTROLS CONTRACTOR	10	3	THWN-2	3	12	12	EMT	1/2	FMC	1/2	1	
	P-3	BOILER CIRC. PUMP	0.5	HP	115	1	SINGLE PHASE MOTOR SWITCH BY E.C.	20	1	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1	
P-4	BOILER CIRC. PUMP	0.5	HP	115	1	SINGLE PHASE MOTOR SWITCH BY E.C.	20	1	THWN-2	2	12	12	EMT	1/2	FMC	1/2	1		
P-5	FILTER PUMP	1.5	HP	208	3	COMBINATION FUSED DISCONNECT / MOTOR STARTER BY E.C.	10	3	THWN-2	3	12	12	EMT	1/2	FMC	1/2	1		
NOTES:																			
1. AMPACITY COLUMN REFERS TO INDIVIDUAL EQUIPMENT FUSED AT UNIT (I.E. IN COMBO STARTER, DISCONNECT OR VFD). REFER TO PANELBOARD SCHEDULES FOR BRANCH CIRCUIT SIZING.																			
2. AMPACITY COLUMN REFERS TO BRANCH CIRCUIT SUPPLYING MULTIPLE UTILIZATION EQUIPMENT. CONTRACTOR SHALL PROVIDE DISCONNECTS AND FUSES SIZED PER THE NAME PLATE RATINGS OF EACH MODULE																			
3.																			
4.																			
CONTROL CIRC. WIRING: MCC VFD's - VFD's IN ELECTRICAL MISC. S/N K, STARTER - FULL VOLTAGE NON-REVERSING STARTER IN MCC, BY EGM-SUPPLIED BY EQUIPMENT MANUFACTURER, BY EGM-PROVIDED AND INSTALLED BY THE ELECTRICAL CONTRACTOR CONDUIT: RMC, RIGID STEEL CONDUIT; EMT: ELECTRICAL METAL TUBING; SS: STAINLESS STEEL TUBING; LFMC: HIGH TENSILE METALLIC CONDUIT; FMC: FLEXIBLE METALLIC CONDUIT																			

AFB	ABOVE FINISHED FLOOR	HP	HEAT PUMP
ARCH	ARCHITECT	INTLK	INTERLOCK
BKR	BREAKER	JCT	JUNCTION
BOB	BOTTOM OF BOX	JB	JUNCTION BOX
BOS	BOTTOM OF STEEL	KW	KILOWATT
BP	BREAKER PANEL	KWH	KILOWATT HOUR
BLDG	BUILDING	KO	KNOCK OUT
CAP	CAPACITY	LBL	LABEL
OKT	CIRCUIT	LT	LIGHT
CB	CIRCUIT BREAKER	LC	LIGHT CONTROL
C	CONDUIT	LTG	LIGHTING
COMM	COMMUNICATIONS	LTP	LIGHT POLE
CONN	CONNECTION	LP	LIGHTING PENCIL
CONST	CONSTRUCTION	NEC	NATIONAL ELECTRICAL CODE
CONTR	CONTRACT (GR)	NEG	NEGATIVE (-)
CLL	CURRENT LIMIT LINE	NC	NORMALLY CLOSED
CT	CURRENT TRANSFORMER	NO	NORMALLY OPEN
EHD	ELECTRIC HAND DRYER	N/A	NOT APPLICABLE
ELEC	ELECTRIC (AL)	NIC	NOT IN CONTRACT
EWG	ELECTRIC WATER COOLER	NL	NIGHT LIGHT
EMERGEN	EMERGENCY	PC	PHOTO CELL
ENGR	ENGINEER	POS	POSITIVE (+)
ENT	ENTRANCE	PWR	POWER
EQ	EQUIVALENT EQUIPMENT	P & L	POWER & LIGHTING
EQUIP	EQUIPMENT	PP	POWER PANEL
EST	ESTIMATE	PP	POWER POLE
EF	EXHAUST FAN	S	SURFACE
ETR	EXISTING TO REMAIN	S.B.O.	SUPPLIED BY OTHERS
EX(IST)	EXISTING	SP	SINGLE POLE
EXTR	EXTINGUISHER	SPK	SURGE PROTECTION DEVICE
F	FLUSH	SPE	SPEAKER
FASTN	FASTEN (ER)	SPEC	SPECIFICATION
FA	FIRE ALARM	SUB	SUBSTITUTE
FE	FIRE EXTINGUISHER	TEL	TELEPHONE
FP	FIRE PROOF / FIRE PROTECTION	TEL	TELEVISION
FLUOR	FLUORESCENT	TSTAT	THERMOSTAT
FBO	FURNISHED BY OTHERS	TRMR	TRANSFORMER
GEN	GENERATOR	UG	UNDERGROUND
GRD	GROUND	UL	UNDERWRITERS LABORATORIES
HORIZ	HORIZONTAL	UH	UNIT HEATER
HTR	HEATER	UN	UNLESS OTHERWISE NOTED
HV	HEATING / VENTILATING	VERT	VERTICAL
HVG	HEATING	W	WITH
HVAC	HEATING, VENTILATING, AIR CONDITIONING	WO	WITHOUT
HAC	HAND-OFF - AUTOMATIC	WL	WET LOCATION
		WPR	WEATHER PROOF

	THREE PHASE MOTOR CONNECTION, 3 HORSE POWER
	SINGLE PHASE MOTOR CONNECTION, 10 HORSE POWER
	(IN)LING. SAFETY SWITCH DISCONNECTING MEANS
	(IN)LING. SAFETY SWITCH DISCONNECTING MEANS
	(IN)LING. COMBINATION MOTOR STARTER & FUSED DISCONNECTING MEANS
	VARIABLE FREQUENCY DRIVE
	(2) #12 THIN WITH GROUND IN A 1/2" CONDUIT TYPICAL
	DIRECT ELECTRICAL CONNECTION
	DUPLEX RECEPTACLE MOUNTED VERTICALLY AT 1' AFF. TO THE BOTTOM OF THE DEVICE BOX (TYPICAL, UNLESS OTHERWISE NOTED)
	QUADRUPLUX RECEPTACLE MOUNTED VERTICALLY AT 1' AFF. TO THE BOTTOM OF THE DEVICE BOX (TYPICAL, UNLESS OTHERWISE NOTED)
	DUPLEX GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLE MOUNTED VERTICALLY AT 1' AFF. TO THE BOTTOM OF THE DEVICE BOX (TYPICAL, UNLESS OTHERWISE NOTED)
	WEATHER-RESISTANT DUPLEX RECEPTACLE WITH WEATHERPROOF COVER PLATE MOUNTED VERTICALLY AT 1' AFF. TO THE BOTTOM OF THE DEVICE BOX (TYPICAL, UNLESS OTHERWISE NOTED)
	WEATHER-RESISTANT DUPLEX RECEPTACLE WITH RIT LOCATION WHILE-USE COVER PLATE MOUNTED VERTICALLY AT 1' AFF. TO THE BOTTOM OF THE DEVICE BOX (TYPICAL, UNLESS OTHERWISE NOTED)
	SINGLE RECEPTACLE MOUNTED VERTICALLY AT 1' AFF. TO THE BOTTOM OF THE DEVICE BOX (TYPICAL, UNLESS OTHERWISE NOTED)
	MULTIPHASE RECEPTACLE, SEE PLAN FOR TYPE
	STANDBY OR EMERGENCY POWER RECEPTACLE
	PANELBOARD
	TRANSFORMER
	EMERGENCY STOP STATION, REFER TO DETAIL FOR REQUIREMENTS
	ADA DOOR OPERATOR PUSH BUTTON MOUNTED AT 40" AFF. TO BOTTOM OF BOX. COORDINATE REQUISITE DOOR SIZE WITH DOOR HARDWARE PROVIDER. CONFORMED BY ARCH. TRADES, INSTALLED AND WIRED BY E.C.
	PUSHBUTTON STATION FOR EQUIPMENT CONTROL, FURNISHED BY OTHERS.
	ON/OFF PUSH BUTTON
	THREE-FUNCTION PUSH BUTTON (UP/DOWN/STOP) OR (OPEN/CLOSE/STOP) ETC.

NOTE: NOT ALL SYMBOLS ARE NECESSARILY USED

\$	SINGLE POLE LIGHT SWITCH MOUNTED 44" AFF TO THE BOTTOM OF THE DEVICE BOX
\$3	THREE WAY LIGHT SWITCH MOUNTED AT 44" AFF TO THE BOTTOM OF THE DEVICE BOX
\$4	FOUR WAY LIGHT SWITCH MOUNTED AT 44" AFF TO THE BOTTOM OF THE DEVICE BOX
\$4	LOOKING LIGHT SWITCH MOUNTED AT 44" AFF TO THE BOTTOM OF THE DEVICE BOX
\$OS	SINGLE POLE LIGHT SWITCH WITH INTEGRAL OCCUPANCY SENSOR MOUNTED 44" AFF TO THE BOTTOM OF THE DEVICE BOX
\$D	WALL BOX DIMMER SWITCH MOUNTED AT 44" AFF TO THE BOTTOM OF THE DEVICE BOX
\$T	ELECTRONIC TIMER SWITCH MOUNTED AT 44" AFF TO THE BOTTOM OF THE DEVICE BOX
\$P	LIGHT SWITCH WITH PILOT LIGHT MOUNTED AT 44" AFF TO THE BOTTOM OF THE DEVICE BOX
\$LV	LOW VOLTAGE NETWORKED LIGHTING CONTROL SWITCH MOUNTED AT 44" AFF TO THE BOTTOM OF THE DEVICE BOX. SEE SPECS
\$2	DOUBLE POLE
\$DT	DOUBLE THROW (MAINTAINED)
	IN GROUND (IN FLOOR)
	2' X 4' LUMINAIRE TYPE "X"
	2' X 2' LUMINAIRE TYPE "X"
	NOMINAL 1' X 4' LUMINAIRE TYPE "X"
	ROUND LUMINAIRE TYPE "X" REFER TO LUMINAIRE SCHEDULE FOR SIZE
	WALL MOUNTED LUMINAIRE TYPE "X"
	SINGLE FACE EXIT SIGN, TYPE "X" IN SCHEDULE. CONNECT TO LOCAL EMERGENCY LIGHTING CIRCUIT AHEAD OF ANY CONTROLS. SHADING INDICATES FACE ORIENTATION.
	DOUBLE FACE EXIT SIGN, TYPE "X" IN SCHEDULE. CONNECT TO LOCAL EMERGENCY LIGHTING CIRCUIT AHEAD OF ANY CONTROLS. SHADING INDICATES FACE ORIENTATION.
	MAINTAINED EXIT SIGN. SIMILAR TO ABOVE
K3	AUOUST-RESISTANT EXIT SIGN, TYPE "X" IN SCHEDULE. TO CONNECT TO LOCAL EMERGENCY LIGHTING CIRCUIT AHEAD OF ANY CONTROLS.
	FIXTURE IS DESIGNATED FOR EMERGENCY OPERATION UPON LOSS OF NORMAL UTILITY POWER.
	EMERGENCY UNIT EQUIPMENT. CONNECT TO LOCAL EMERGENCY LIGHTING CIRCUIT AHEAD OF BATTERING.
	OCCUPANCY SENSOR, CEILING-MOUNTED ORIENTATION SHOWN. SEE SPECIFICATIONS FOR TYPE.
	OCCUPANCY SENSOR, WALL-MOUNTED AT 8'-0" AFF TO BOB U.O.N. ORIENTATION SHOWN. SEE SPECIFICATIONS FOR TYPE.
	PHOTO CELL. SEE SPECIFICATIONS
	DENOTATION CONTROL INPUT DISCONNECT ON LIGHTING CONTROL RELAY PANEL SYSTEM. REFER TO INPUT SCHEDULE.
	POLE MOUNTED STEERABLE FIXTURE.
EM	SELF-CONTAINED EMERGENCY LIGHTING UNIT

NOTE: NOT ALL SYMBOLS ARE NECESSARILY USED

COMMUNICATIONS DEVICE ROUTING - SQUARE BOX WITH SINGLE GANG DEVICE RING STUB (11" CONDUITS FROM DEVICE TO REACH ACCESSIBLE CEILING, UNLESS OTHERWISE NOTED) MOUNT DEVICE BOX AT SAME HEIGHT AS NEAREST FLOOR RECEPTACLE BOX U.O.N.

AV
W.A.P.
CAM

ROUTING FOR AUDIO VISUAL OUTLET 4 11/16" SQUARE BOX WITH TWO-GANG DEVICE RING STUB (11" 1-1/4" CONDUITS FROM DEVICE TO REACH ACCESSIBLE CEILING) MOUNT DEVICE BOX AT 46" AFF TO 7'00" AS NEAREST OVERHEAD ACCESSIBLE CEILING COMMUNICATIONS DEVICE ROUTING - SURFACE MOUNT SURFACE MOUNT ABOVE END-OF-CABLE LEAVE 21/2" SERVICE CORD HANG FROM STRUCTURE ABOVE DEVICE NOT TO LAY ON CEILING, OUTLET USED FOR FUTURE WIRELESS ACCESSPOINT (W.A.P.) OR SURVEILLANCE CAMERA (CAM).

ⓔ

PAGING SYSTEM OR AUDIO SYSTEM LOUSPACKER: REFER TO SPECS FOR TYPE. CONNECT TO APPROPRIATE PAGING ZONE AT HEAD-END EQUIPMENT. U.O.N.

ⓁⓂⓈ

VOLUME CONTROL, FOR PAGING SYSTEM LOUSPACKERS IN ROOM. MOUNT AT 46" AFF TO BOTTOM OF BOX. REFER TO SPECIFICATIONS FOR TYPE.

Ⓢ

SLAVE CLOTH, WALL MOUNTED AT 46" AFF TO CENTER, U.O.N.

→

CONDUIT SEVERE FOR COMMUNICATIONS CABLES 2" TYPE. UNLESS OTHERWISE NOTED, USE FOR VIDEO/AUDIO/AV/NETWORK/RS-485, ETC. 2" CONDUIT. PREPARE ALL PENETRATIONS IN RATED WALLS OR FLOOR WITH THROUGH-WALL CLOTH FITTINGS AS SPECIFIED. REFER TO CONDUIT CLAMP PLAN FOR LOCATION. E.C. SHALL PROVIDE ADDITIONAL SLEEVES FOR OTHER CABLES AS REQUIRED.

	PULL STATION
	PULL STATION WITH POLY CARBONATE PROTECTIVE COVER, STI-1 STOPPER IF OR EQUIV.
	VISUAL NOTIFICATION APPLIANCE, WALL-MOUNTED, 15-CADELLA STROKE RATING UNLESS OTHERWISE NOTED
	VISUAL NOTIFICATION APPLIANCE, CEILING-MOUNTED, 15-CADELLA STROKE RATING UNLESS OTHERWISE NOTED
	VISUAL NOTIFICATION APPLIANCE, CEILING-MOUNTED, 15-CADELLA STROKE RATING UNLESS OTHERWISE NOTED
	WHERE'S THE "WUMP?" IS NOTED, PROVIDE LISTED WIRE GUARD OR PROTECTIVE POLY CARBONATE COVER FOR NOTIFICATION DEVICE, CEILING-MOUNTED, 15-CADELLA STROKE RATING PER MECH. TRADES AND ADJUST DEVICE CEILING LAYOUT AS NECESSARY.
	WHERE "W4" IS NOTED, PROVIDE LISTED WET-LOCATION NOTIFICATION DEVICE, SUITABLE FOR INDOOR OR OUTDOOR USE.
	SMOKE DETECTOR
	HEAT DETECTOR
	DUCT SMOKE DETECTOR
	MECH. DAMPER OPERATOR MOTOR FURNISHED AND INSTALLED BY MECH. TRADES, E.C. SHALL PROVIDE 120VAC POWER CIRCUIT AND INTERMEDIATE FIRE ALARM CONTROL RELAYS PER CODE REQUIREMENTS.
	FIRE PROTECTION TAPER SWITCH FURNISHED AND INSTALLED BY MECH. TRADES, E.C. SHALL PROVIDE SUPERVISED ADDRESSABLE INPUT TO FIRE ALARM SYSTEM AND ALARM INTERFACING.
	FIRE PROTECTION TAPER SWITCH FURNISHED AND INSTALLED BY MECH. TRADES, E.C. SHALL PROVIDE SUPERVISED ADDRESSABLE INPUT TO FIRE ALARM SYSTEM AND ALARM INTERFACING.
	ELECTROMAGNETIC DOOR HOLD-OPEN DEVICE
	ADDRESSABLE RELAY FOR FIRE ALARM CONTROL OF DEVICE INDICATED ON DRAWING, FOR LINE-VOLTAGE DEVICES, PROVIDE INTERPOSING RELAY WITH CURRENT RATINGS AS REQ'D.
	FIRE ALARM REMOTE ANNUNCIATE
	FIRE ALARM CONTROL PANEL
	KEYED TEST SWITCH AND REMOTE INDICATOR FOR DOOR SMOKE DETECTOR
	FIRE PROTECTION OR ALARM BELL
	FIRE HORN
	ENTRY ARMISTEAM CONTROL KEYPAD, MOUNTED AT 60" AFF TO BOB
	INTERCOM STATION, MOUNTED AT 56" AFF TO BOB
	SECURITY CAMERA, WALL OR CEILING MOUNTED
	INFRARED MOTION DETECTOR, WALL OR CEILING MOUNTED
	ULTRASONIC MOTION SENSOR, WALL OR CEILING MOUNTED
	CARD READER, WALL MOUNTED SINGLE-GANG BOX AT 40" AFF TO BOB, STUB OUT 3/4" CONDUIT FROM BOX ABOVE NEAREST ACCESSIBLE CEILING SPACE.
	RACEWAY FOR DOOR ELECTRIC STRIKE, STUB OUT 1/2" ENT OR RMC FROM DOOR FRAME AT SYMBOL, LOCATION TO ABOVE NEAREST ACCESSIBLE CEILING SPACE, COORDINATE WITH DOOR INSTALLER AND HARDWARE SUPPLIER.
	RACEWAY FOR DOOR ELECTRIC PANIC BAR, STUB OUT 1/2" ENT OR RMC FROM DOOR FRAME AT SYMBOL, LOCATION TO ABOVE NEAREST ACCESSIBLE CEILING SPACE, COORDINATE WITH DOOR INSTALLER AND HARDWARE SUPPLIER.
	PRESSURE SWITCH
	DOOR CONTACTS

NOTE 1:
ROUGH-INS SHALL BE SINGLE-GANG WITH 1/2" CONDUIT STUBBED OUT ABOVE NEAREST ACCESSIBLE CEILING SPACE, UNLESS OTHERWISE REQUIRED BY EQUIPMENT OR NOTED.

NOTE 2:
COORDINATE ALL INSTALLATION AND ROUGH-INS W/ RELEVANT INSTALLERS.

ITEM 1
ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR REVERSING AND PROVIDING TIES AS SPECIFICALLY LISTED AND ASSIGNED IN MECHANICAL EQUIPMENT SCHEDULES SUCH AS DISCONNECTS, STARTERS, TRIPPERS, SWITCHES, VARIABLE FREQUENCY DRIVES, ETC.

ITEM 2
ELECTRICAL CONTRACTOR IS REQUIRED TO REPAIR TO ARCHITECTURAL, REFLECTED CEILING PLANS FOR ADDITIONAL LUMINAIRE INFORMATION AND MOUNTING LOCATIONS.

ITEM 3
ELECTRICAL CONTRACTOR SHALL VERIFY CUL OR OR DEVICES, SURFACE RACEWAY, AND/OR MOUNTOUT ASSEMBLIES WITH ARCHITECT/ENGINEER.

ITEM 4
ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR LOCATION OF THE EXHAUST FANS LISTED IN THE MECHANICAL EQUIPMENT LIST BY REFERRING TO MECHANICAL/AC PLANS.

ITEM 5
FEEDERS ON DRAWINGS ARE SCHEMATIC ONLY. CONDUIT RUNS SHALL, SOPLY WITH CONDUIT SPECIFICATIONS AND CONTAINANCES THAT IS NO GREATER THAN 10% OVER SIZES. CONDUIT MUST BE COORDINATE WITH THE CONDUIT TYPE OR PERPENDICULAR WITH BUILDING STEEL, AND/OR ARCHITECTURAL LINES.

ITEM 6
ADJUST LUMINAIRE LOCATIONS IN MECHANICAL ROOMS TO ACCOMMODATE MECHANICAL EQUIPMENT AND FIELD CONDITIONS.

ITEM 7
ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO REVERSE INVERTER ELEVATION SHEETS FOR PLACEMENT OF DEVICE BOXES. COORDINATE LOCATIONS SO THAT NO DEVICES ARE BEING INSTALLED BEHIND MARKED BARRIERS, IMPHONS, TACK BOARDS, ETC.

ITEM 8
ELECTRICAL CONTRACTOR IS RESPONSIBLE TO THROUGH SINGLE GANG BOXES FOR WARMUP/TEMPERATURE CONTROLS SENSORS IN WALL COUPLED ROOMS. IN ADDITION TO THE BOXES, INSTALL 1/2" CONDUIT FROM BOX TO THE DEVICE OR TO THE DEVICE AS REQUIRED. COORDINATE WITH LINE VOLTAGE AND MECH. DRAWINGS.

ITEM 9
CABINET HEATERS MAY HAVE LINE VOLTAGE THERMOSTATS SUPPLIED BY MECHANICAL CONTRACTOR AND INSTALLED BY THE ELECTRICAL CONTRACTOR. REFER TO MECHANICAL EQUIPMENT SCHEDULE.

ITEM 10
SEE MECHANICAL EQUIPMENT LIST FOR DETAILED INFORMATION ON EQUIPMENT AND CONTROL. ELECTRICAL CONTRACTOR SHALL PROVIDE ITEMS AS NOTED IN MECHANICAL EQUIPMENT LIST.

ITEM 11
SEE ROOF PLANS FOR EXACT LOCATIONS OF ROOF-TO-ROOF MECHANICAL EQUIPMENT.

ITEM 12
FOR ALL MECHANICAL CABLE SLEEVES INTO ROOMS FOR WHICH SIZES ARE NOT CALLED OUT, E.G. CABLE SUPPLY 2" CONDUIT SLEEVES WITH APPROPRIATE BUSHINGS.

ITEM 13
ELECTRICAL CONTRACTOR SHALL COORDINATE WITH PLUMBING CONTRACTOR AND THE ELECTRIC WATER COOLER SHOP DRAWINGS FOR MONTHLY HEATING OF EWC POWER CONNECTIONS.

ITEM 14
ELECTRICAL CONTRACTOR SHALL REVEAL TIEOUT EQUIPMENT SHOP DRAWINGS FOR CORRECT DEVICE BOX POSITION IN LOCATION OF HAND DRIPS.

ITEM 15
ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR INSTALLING ANY LOOSE VARIABLE FREQUENCY DRIVES PROVIDED BY THE MECHANICAL CONTRACTOR.

ITEM 16
METAL CABLE GAGE MAY BE USED FOR FUTURE WIRING SLENGTHS OF 6 FEET OR MORE. METAL CABLE SHALL BE USED FOR ALL WIRING SLENGTHS OF 6 FEET OR MORE. CABLE OR OTHER CABLE TYPES SHALL NOT BE USED UNLESS SPECIFICALLY AUTHORIZED BY THE ENGINEER. IT IS THE INTENT OF THESE CONSTRUCTION REQUIREMENTS THAT ALL INSTALLED BRANCH CIRCUITS BE PROTECTED BY CABLE RACKS AND CONDUITS ALLOWING REMOVAL AND REPLACEMENT OF WIRING IN THE FUTURE. CONDUITS ARE REQUIRED UNLESS OTHERWISE NOTED IN THE SPECIFICATIONS.

ITEM 17
CONDUIT BUNDLING FOR THE EMERGENCY SYSTEM SHALL BE INSTALLED IN SEPARATE CONDUIT RACKWAY AND BE KEPT ENTIRELY OUTSIDE OF ALL OTHER WIRING AND CONDUIT PERMITS E.E.C.

ITEM 18
ALL FEEDER AND BRANCH TO PANELS, MOTORS, LIGHTS, RECEPTABLES, TRANSFORMERS, DISTRIBUTION TRAYS, AND CONTROL WIRING SHALL BE INSTALLED IN SEPARATE CONDUIT SYSTEMS TO THE N.E.C. OF THE CONDUIT SYSTEM SHALL NOT BE CONSIDERED AN ACCEPTABLE CONNECTION.

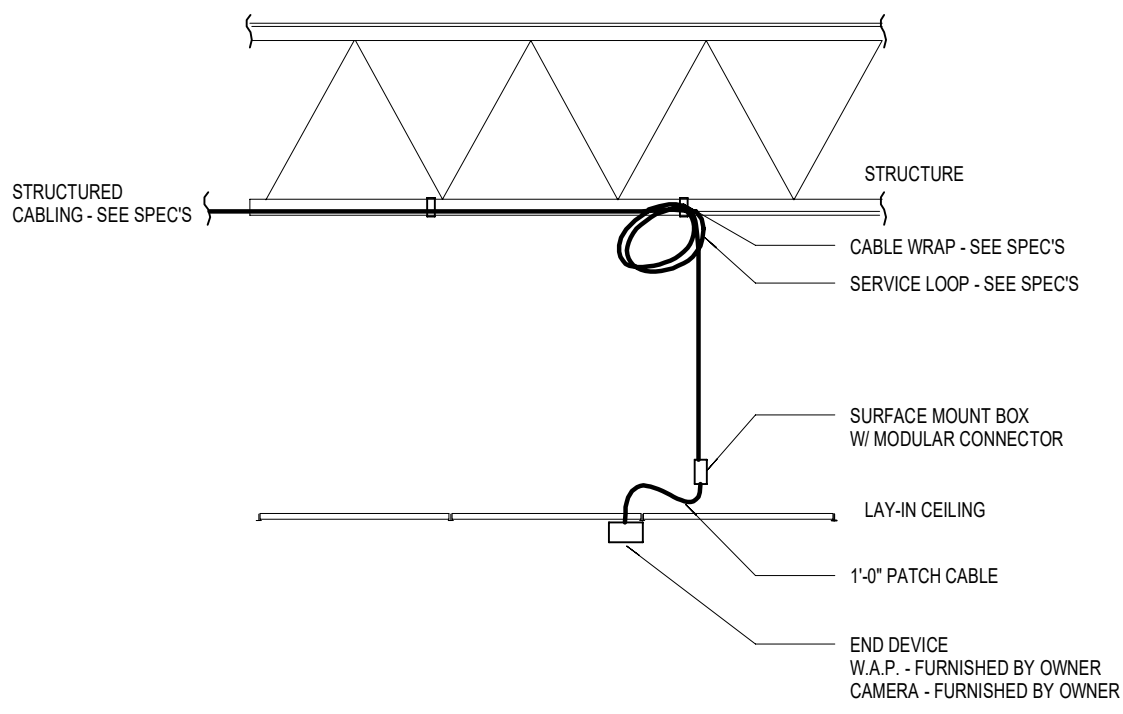
ITEM 19
ALL "LOW VOLTAGE" COMMUNICATIONS, SAFETY/SECURITY AND CONTROL CABLEING MAY BE INSTALLED WITHOUT CONDUIT, OR CABLE TRAY, ONLY WHEN THE FOLLOWING ARE ALL IN COMPLIANCE WITH THE NATIONAL ELECTRICAL CODE FOR MAINTENANCE. OTHERWISE, ALL CABLEING ASSOCIATED WITH BATTERY, CORDLESS, OR REMOTE CONTROLLING DEVICES, FIRE ALARM SYSTEM, VOICEDATA/VIDEO SYSTEMS, INTERCOM SYSTEM, CLOCK SYSTEM, AUTO SYSTEMS, ETC. MUST BE INSTALLED IN APPROVED CONDUIT OR SURFACE RACEWAY UNLESS OTHERWISE NOTED IN THE SPECIFICATIONS.

ITEM 20
CONDUITS AND CABLEING SHALL NOT BE INSTALLED WITHIN 4" OF ROOF DECK, EXCEPT AS NECESSARY TO SERVICE ROOF MOUNTED ITEMS AND ONLY WHEN THE CONDUIT OR CABLE IS ROUTED VERTICALLY TO EQUIP EQUIPMENT FROM BELOW.

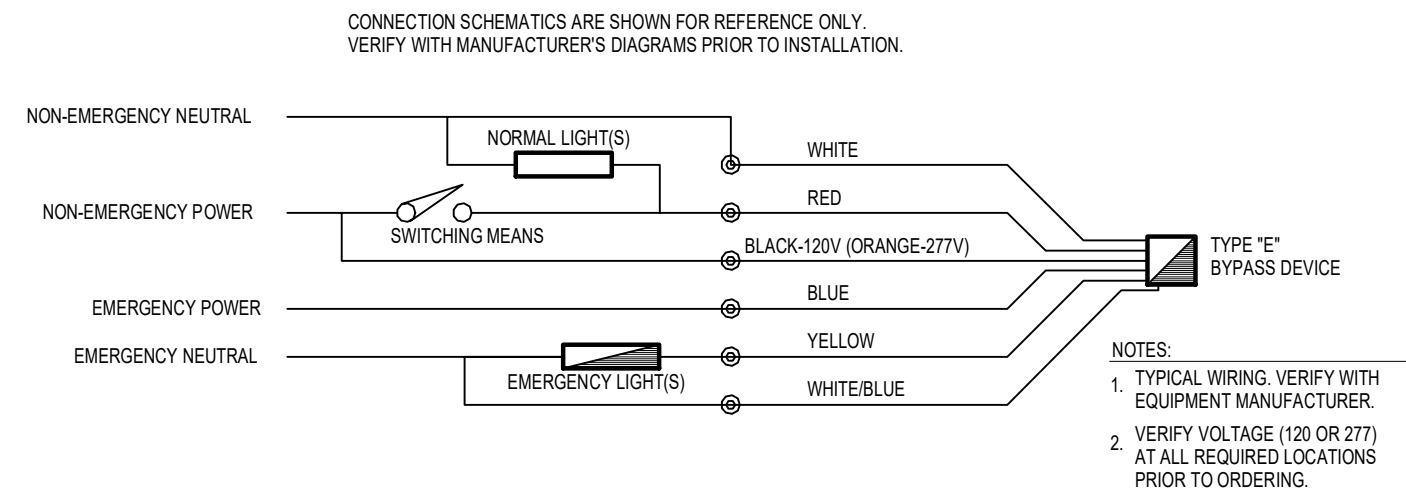
ITEM 21
CONDUIT INSTALLED IN HORIZONTAL TRAYS SHALL BE 3/4" MINIMUM SIZE.

ITEM 22
PROVIDE DIRECT CONNECTIONS FROM PANEL, RECEPTABLE, OR CORD TO APPROXIMATE CENTER OF THE HARDWARE. POWER SUPPLY CORDS ARE REQUIRED FOR CORD LOCK DEVICES, COUNTERS, ETC. REFER TO HARDWARE MANUFACTURER'S INSTRUCTIONS FOR CORDS. SYSTEM SCHEDULES IN RESPECTIVE SPECIFICATIONS FOR QUANTITIES AND LOCATIONS.

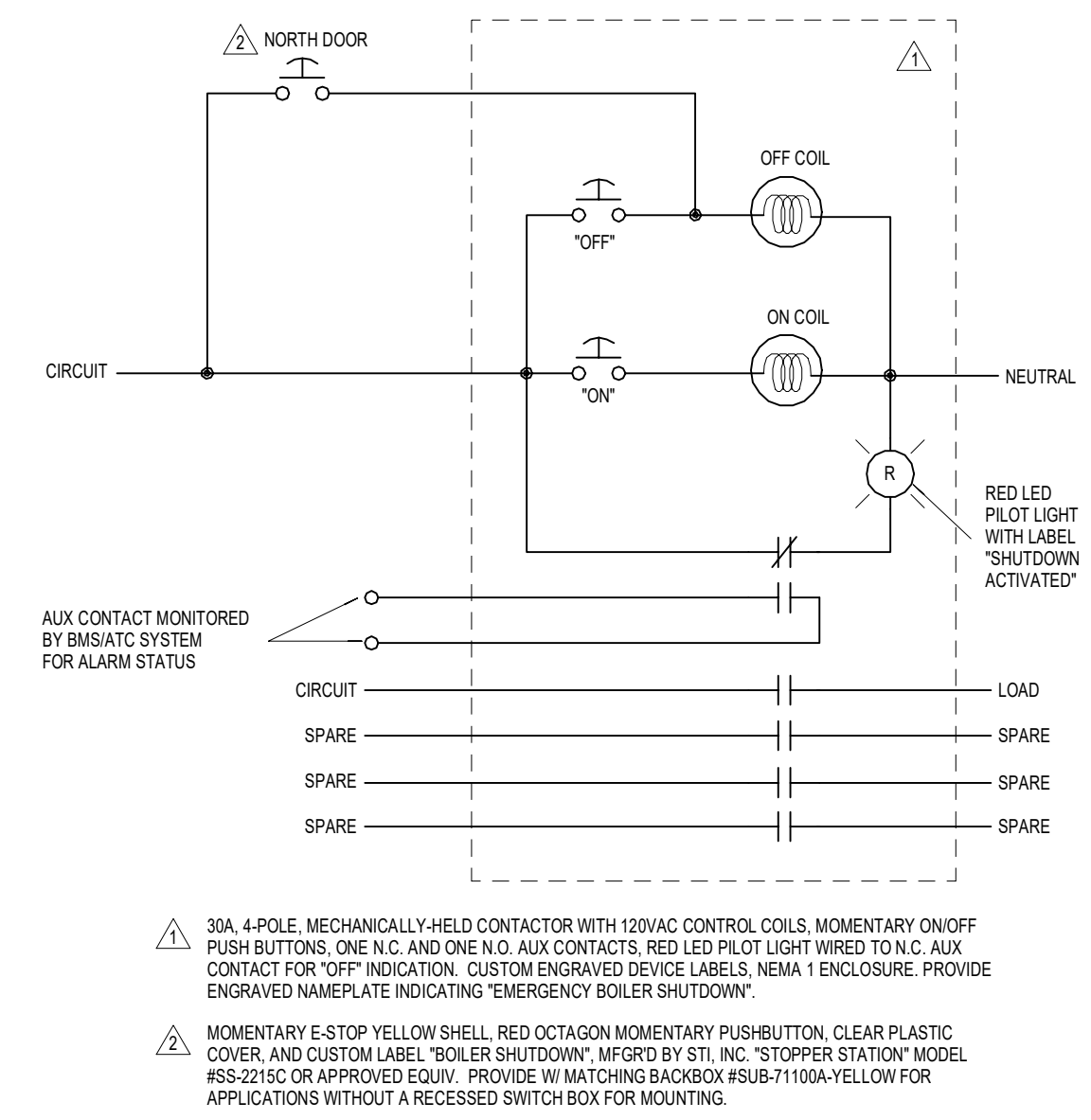




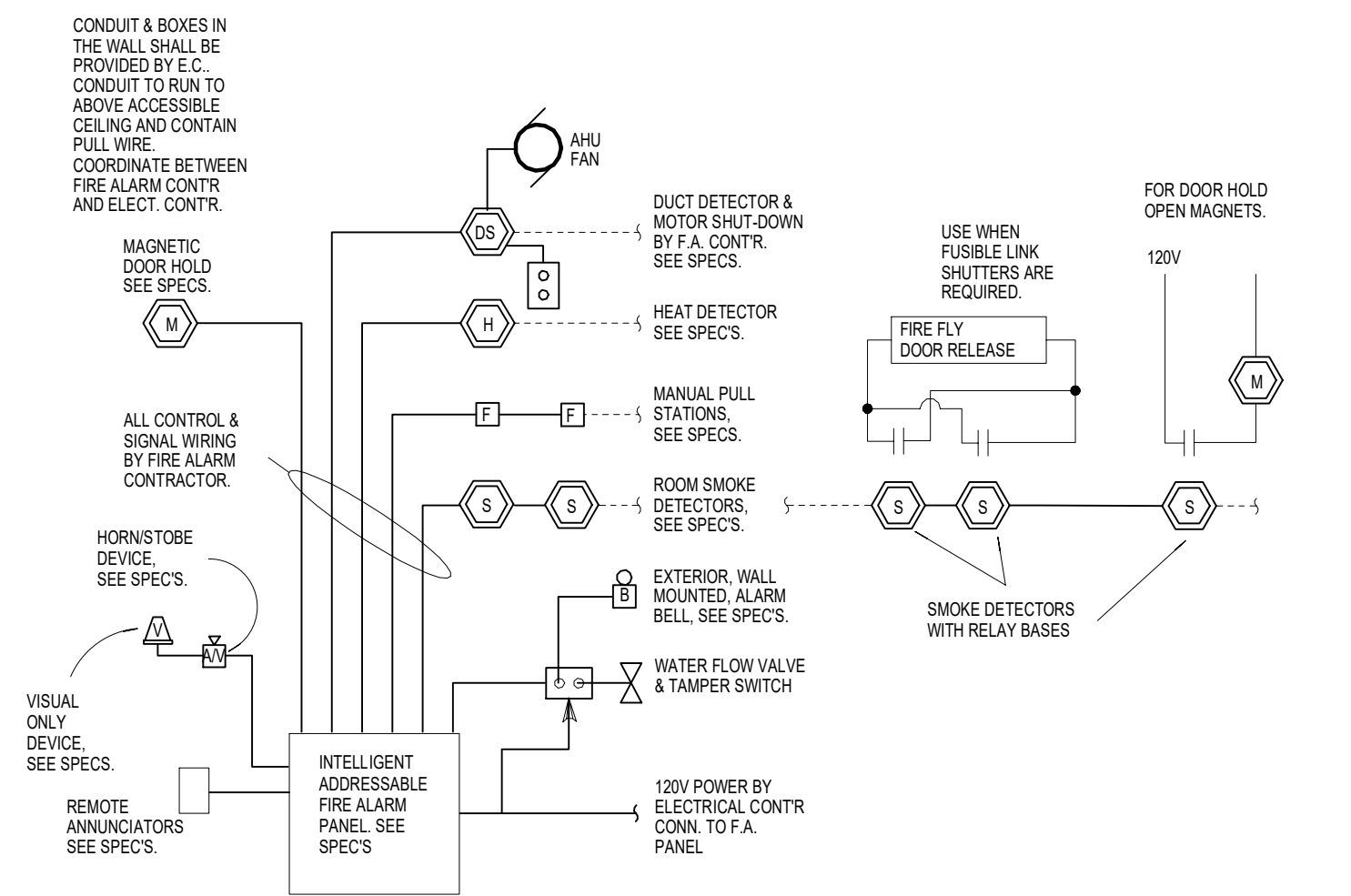
7
E7.02
WIRELESS ACCESS POINT, CAMERA CABLING
INSTALLATION DETAIL
1/8" = 1'-0"



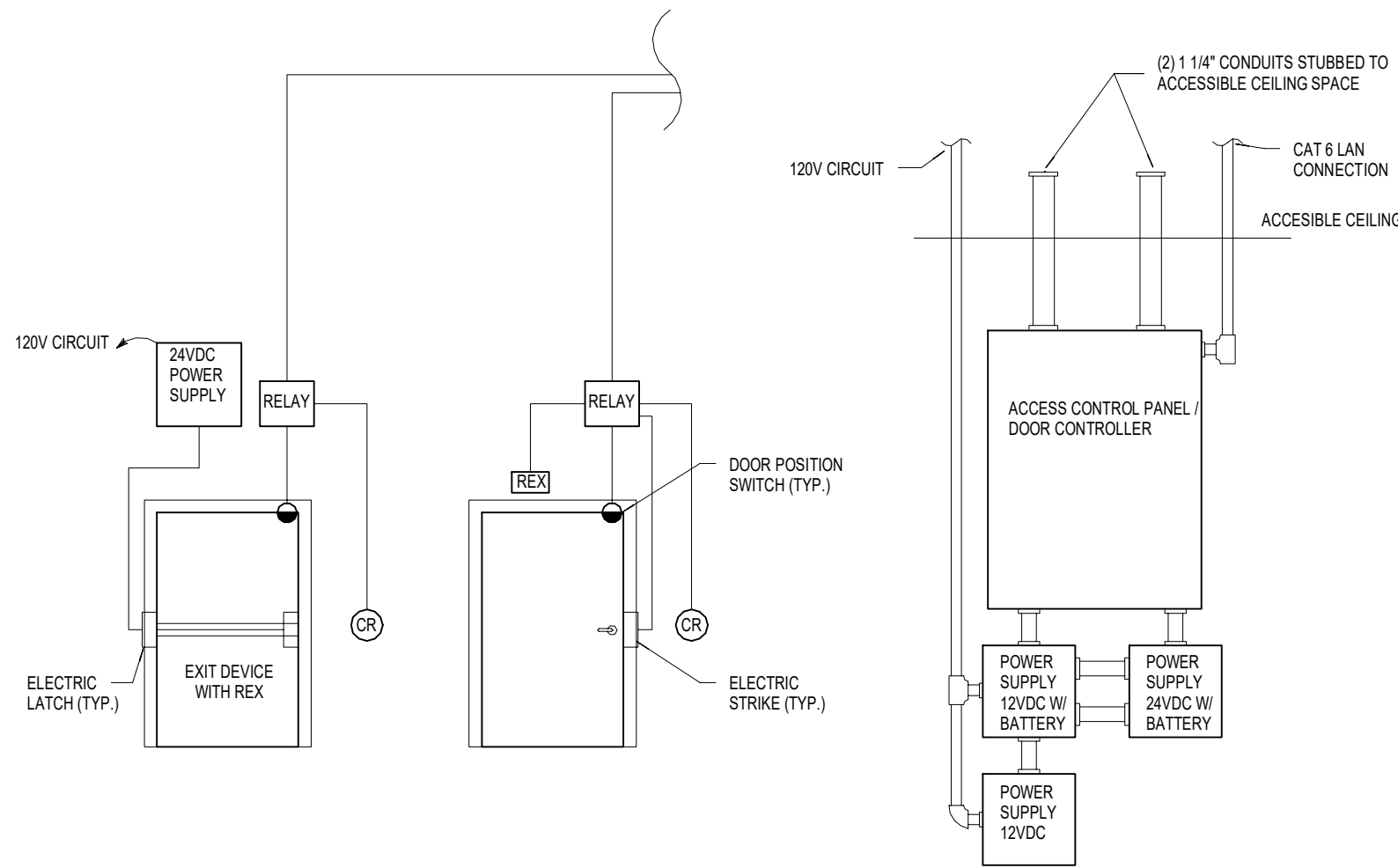
5
E7.02
EMERGENCY LIGHTING BYPASS DEVICES
1" = 1'-0"



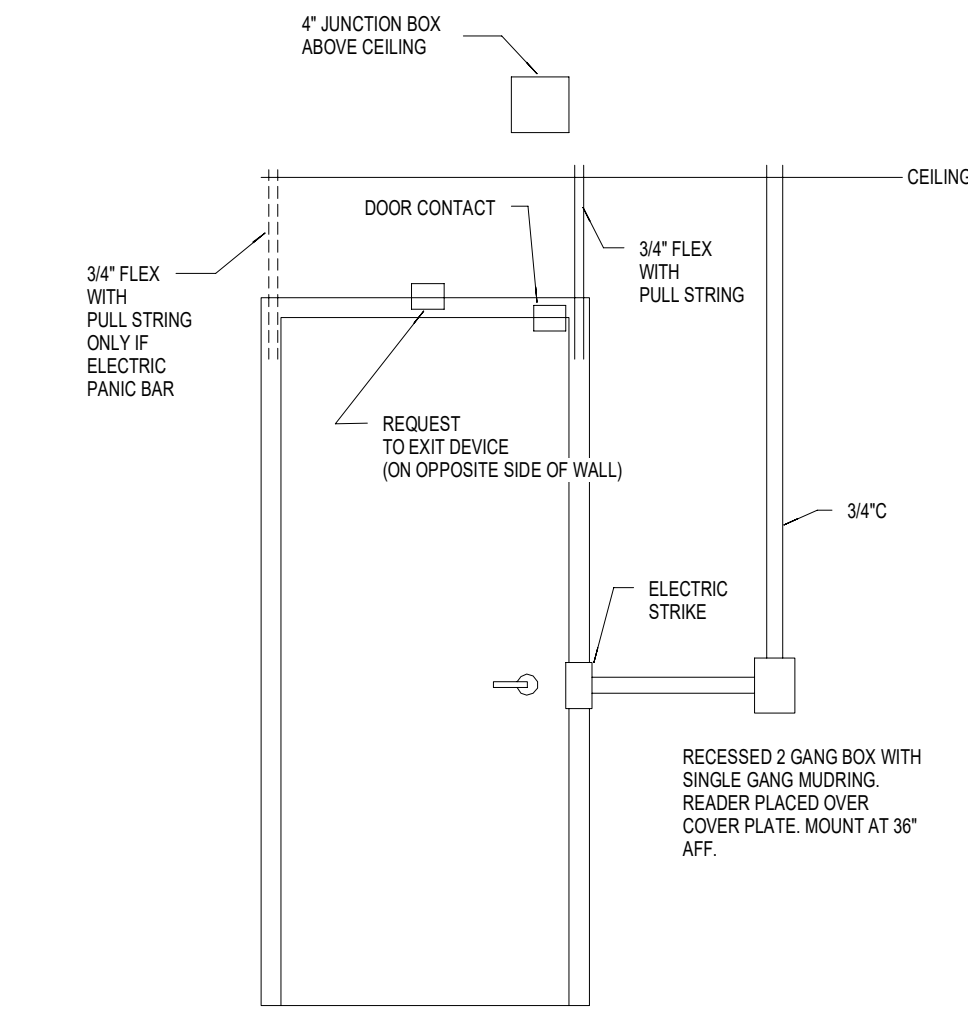
1
E7.02
EMERGENCY BOILER SHUTDOWN DETAIL & WIRING
DETAIL
1/8" = 1'-0"



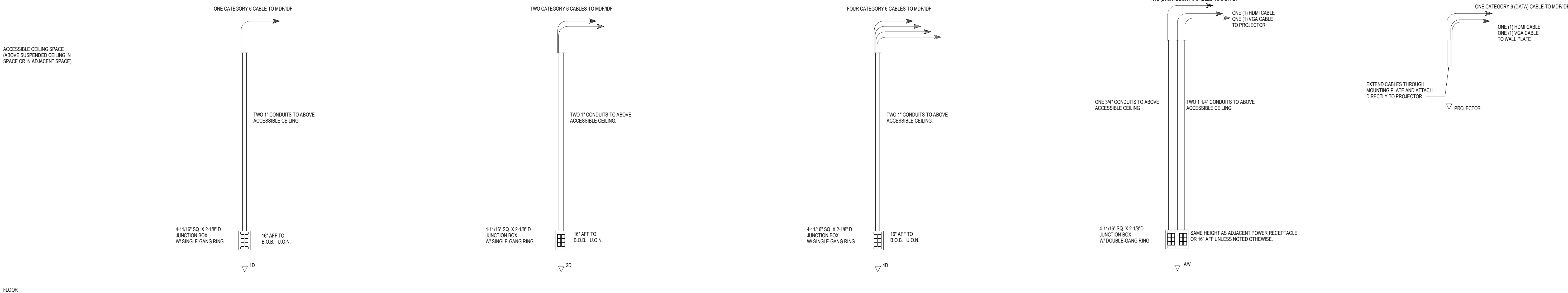
6
E7.02
FIRE ALARM RISER
1" = 1'-0"



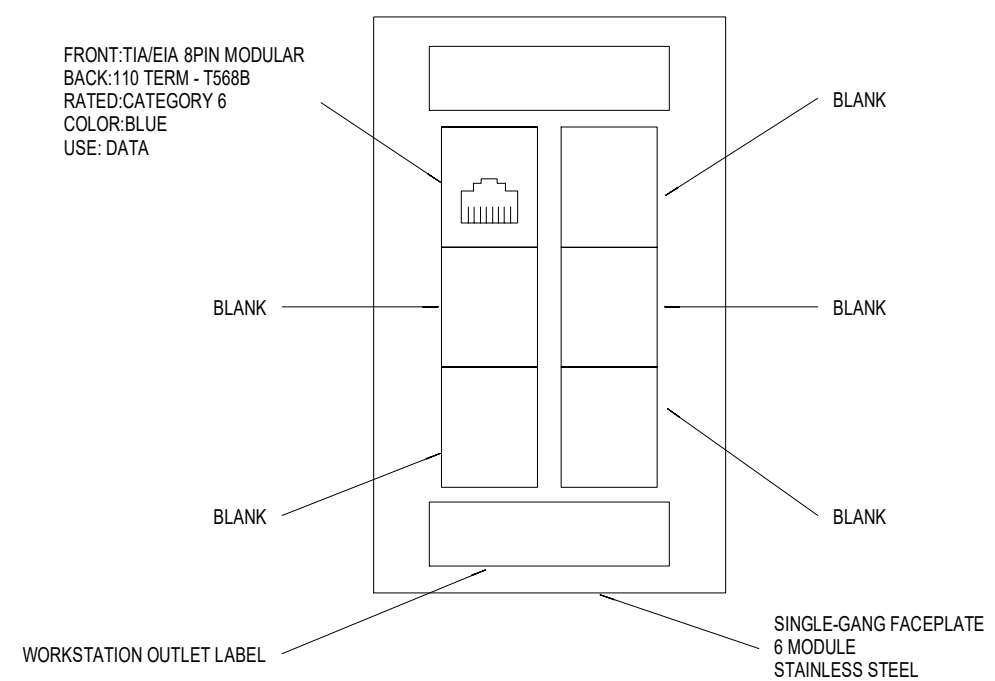
4
E7.02
TYPICAL ACCESS CONTROL PANEL LAYOUT
1/8" = 1'-0"



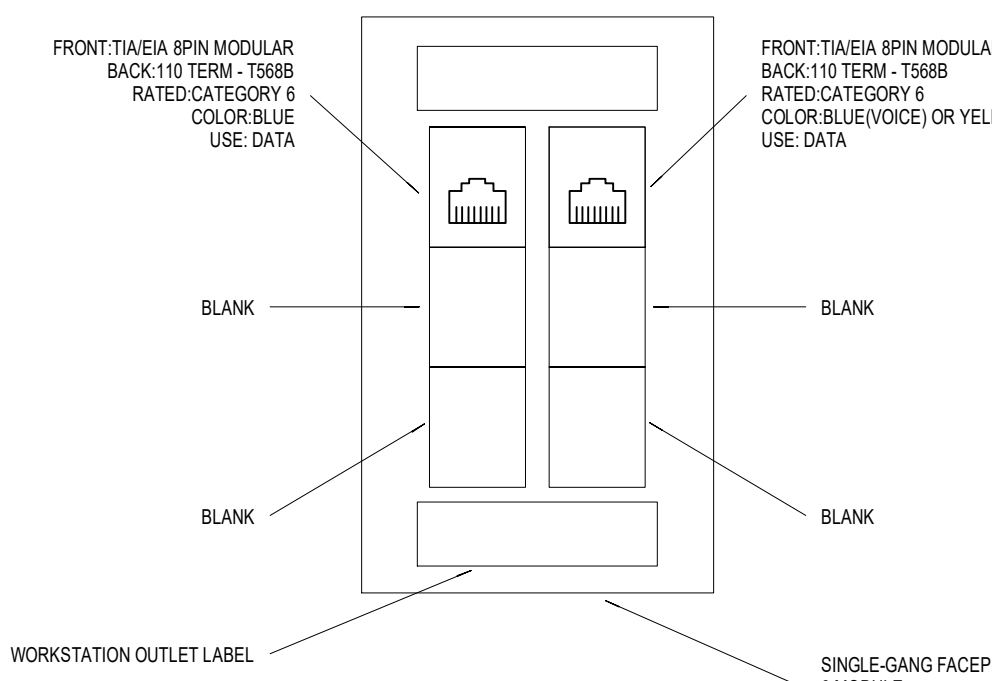
2
E7.02
SINGLE SECURED DOOR ROUGH-IN
1/8" = 1'-0"



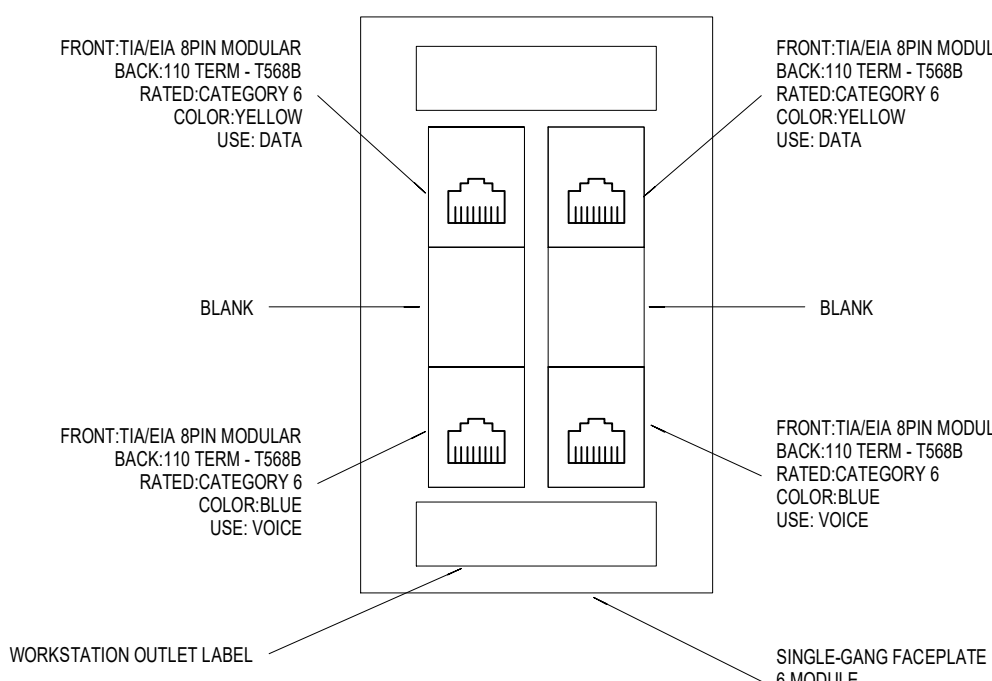
PROJECTOR COMMUNICATION OUTLET



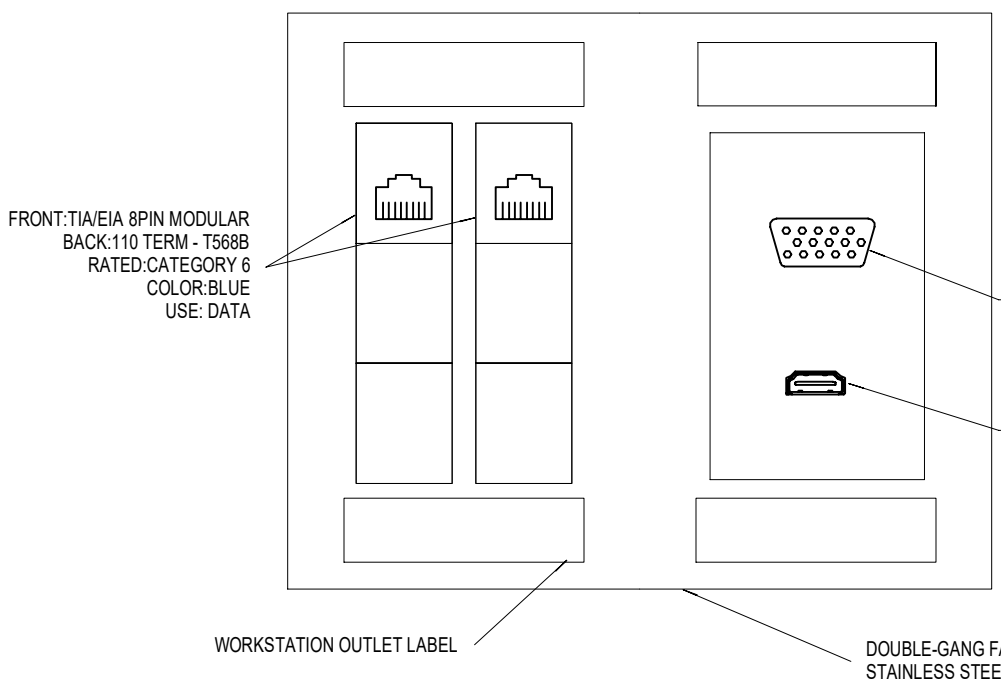
COMMUNICATION OUTLET TYPE "1D"



COMMUNICATION OUTLET TYPE "2D or 1D, 1V"



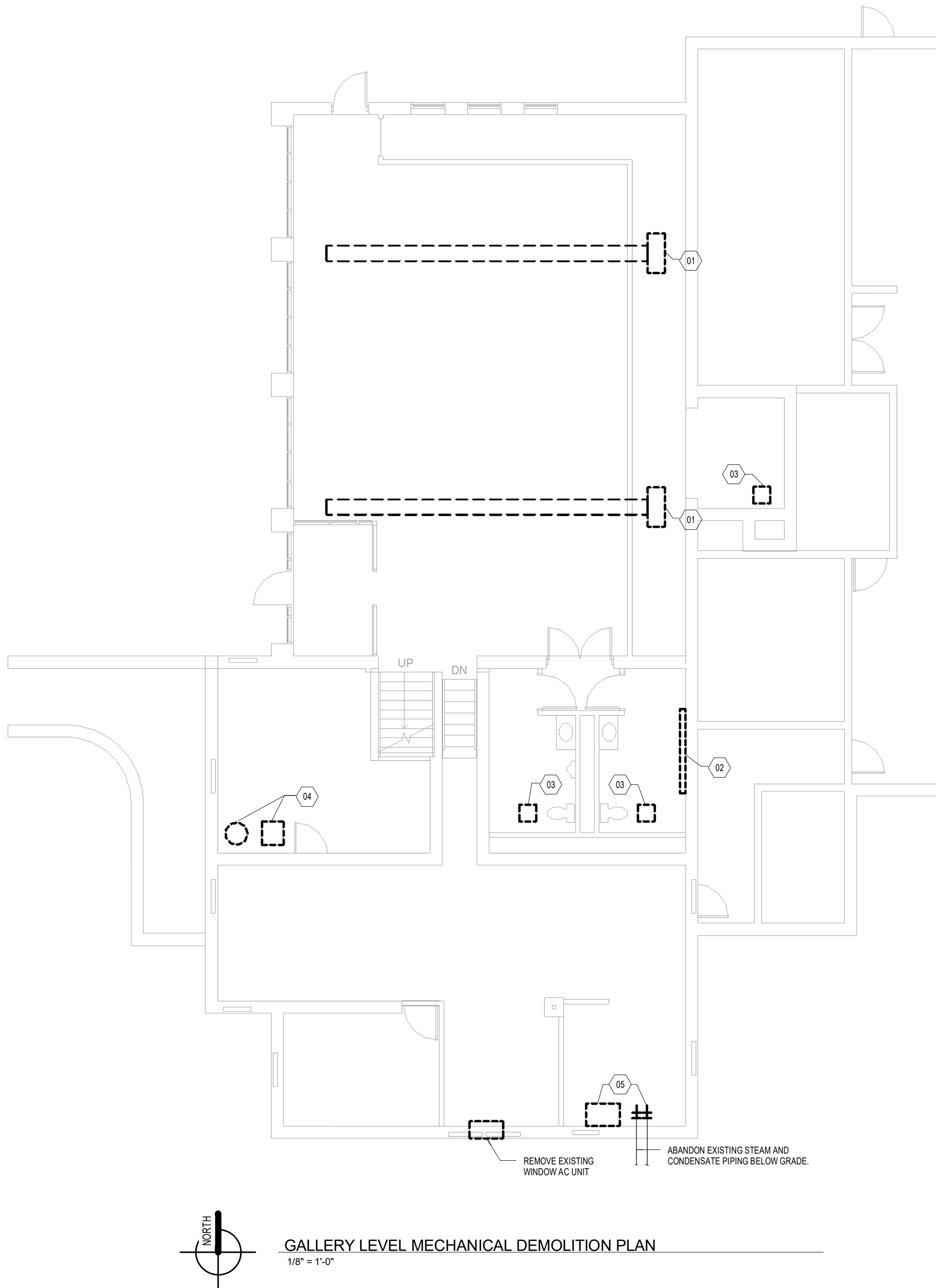
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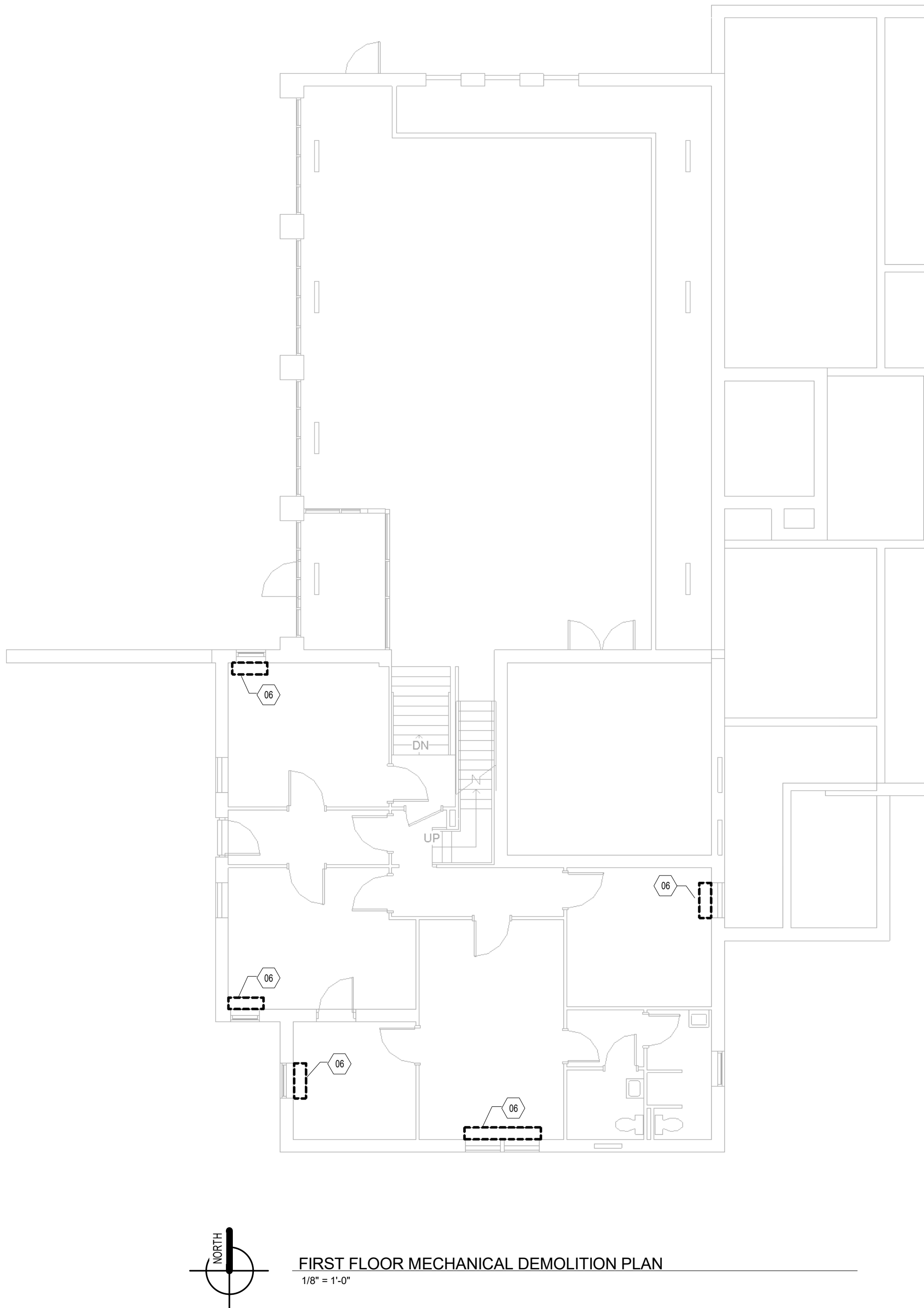
COMMUNICATION OUTLET TYPE "2D, A/V"

3
E7.02
COMMUNICATION ACTIVATION DETAILS
1" = 1'-0"

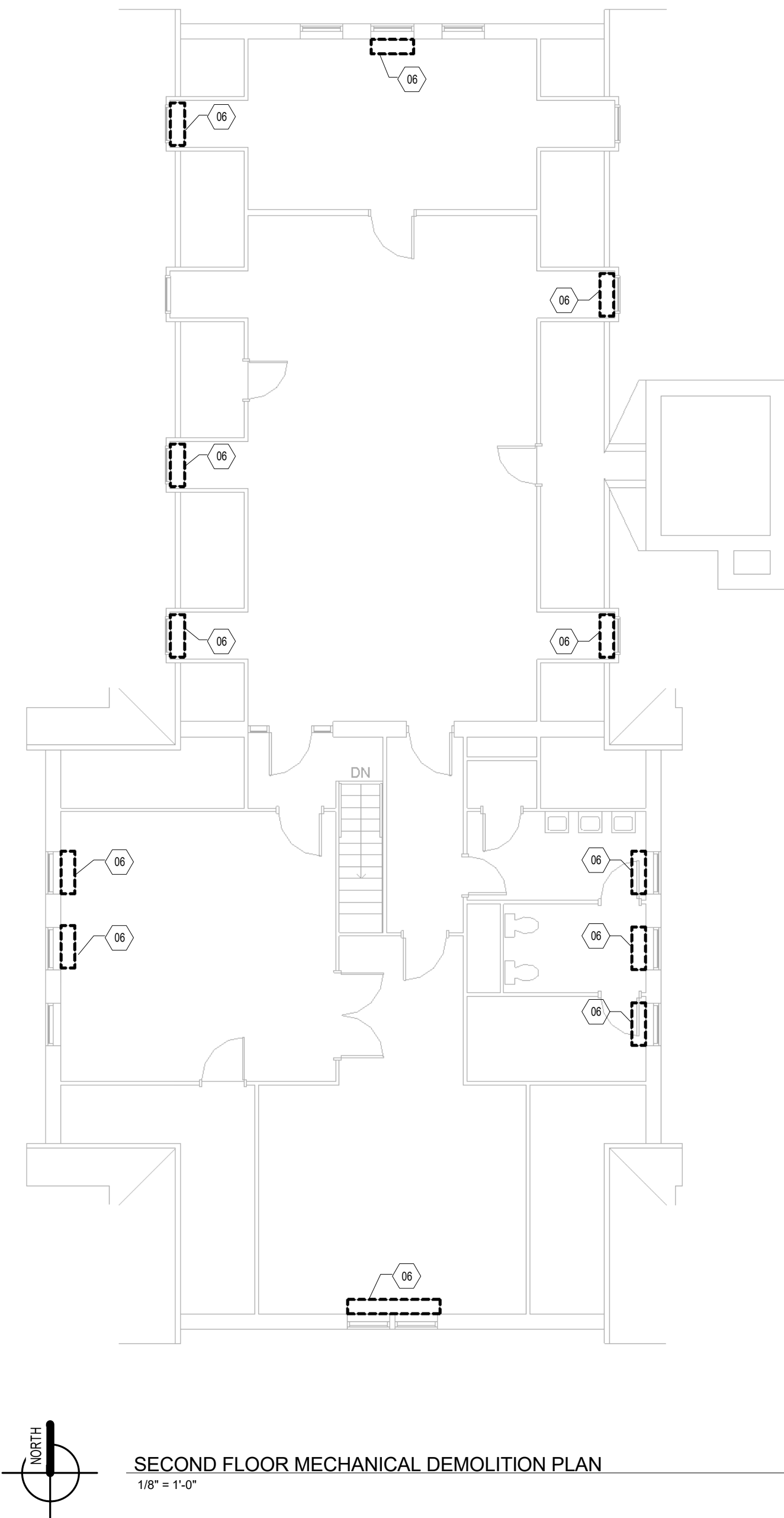
C:\local_projects\5-175M ANNEX_CENTRAL_bellamy6.rvt



GALLERY LEVEL MECHANICAL DEMOLITION PLAN
1/8" = 1'-0"



FIRST FLOOR MECHANICAL DEMOLITION PLAN
1/8" = 1'-0"



SECOND FLOOR MECHANICAL DEMOLITION PLAN
1/8" = 1'-0"

MECHANICAL DEMOLITION NOTES

- 01 REMOVE EXISTING STEAM UNIT HEATER INCLUDING ALL STEAM AND CONDENSATE PIPING, INSULATION, DUCTWORK, GRILLES, CONTROLS, PNEUMATIC TUBING, AND ALL SUPPORTS. PATCH AND REPAIR WALL.
- 02 REMOVE EXISTING FINED TUBE INCLUDING ALL STEAM AND CONDENSATE PIPING, INSULATION, AND SUPPORTS. PATCH AND REPAIR WALL.
- 03 REMOVE EXISTING EXHAUST FAN INCLUDING GRILLES, DUCTWORK, SUPPORTS, CONTROLS, AND PNEUMATIC TUBING. PATCH AND REPAIR CEILING AND PATCH AND REPAIR DUCT WALL PENETRATIONS. SEAL WATER TIGHT.
- 04 REMOVE EXISTING AIR COMPRESSOR AND DRYER. REMOVE ALL EXPOSED PNEUMATIC TUBING THROUGHOUT BUILDING AND ALL PNEUMATIC CONTROL DEVICES, THERMOSTATS, AND SENSORS. PATCH AND REPAIR WALLS WHERE NECESSARY.
- 05 REMOVE EXISTING CONDENSATE PUMP AND ALL EXPOSED STEAM AND CONDENSATE PIPING THROUGHOUT BUILDING. REMOVE ALL ACCESSORIES, CONTROLS, SUPPORTS, ETC. CAP ABANDONED STEAM AND CONDENSATE PIPING AT ENTRY TO BUILDING.
- 06 REMOVE EXISTING STEAM RADIATOR AND ALL CONTROLS AND ACCESSORIES. CUT BACK PIPING AND CAP BELOW FLOOR. PATCH AND REPAIR FLOOR OR WALL PENETRATIONS.

GENERAL MECHANICAL DEMOLITION NOTES:

1. THE CITY OF GRAND HAVEN RESERVES THE RIGHT OF FIRST REFUSAL IN OWNERSHIP OF ANY EQUIPMENT ITEMS AND MATERIAL TO BE REMOVED FROM THE BUILDING AND SITE.
2. INVESTIGATION OF EXISTING HEATING, PLUMBING AND VENTILATION SYSTEMS WILL BE REQUIRED BY THE CONTRACTOR AS PART OF HIS BID PRICE, SO THAT THE EXACT EXTENT OF DEMOLITION CAN BE ACCURATELY DETERMINED. THE CONTRACTOR'S BID PRICE SHALL ALSO COVER REMOVAL OF SOME PORTIONS OF HEATING, PLUMBING AND VENTILATION SYSTEMS NOT SPECIFICALLY SHOWN ON THIS DRAWING, BUT DISCOVERED DURING THE INVESTIGATION PROCESS. THE CONTRACTOR SHALL WORK WITH THE A/E AND THE OWNER TO DETERMINE WHICH PORTIONS OF EXISTING SYSTEM MUST REMAIN ACTIVE AND WHICH PORTIONS MUST BE DEMOLISHED. REMOVE ALL INACTIVE DUCTWORK AND PIPING TO THE NEAREST ACTIVE MANS. DUCTWORK SHALL BE CAPPED AND SEALED AIRTIGHT AT TERMINATION POINTS. PIPING SHALL BE CAPPED AT TERMINATION POINTS.
3. ALL PIPING AND EQUIPMENT SHOWN DASHED SHALL BE REMOVED OR RELOCATED UNLESS OTHERWISE NOTED. PROTECT EXISTING WORK WHICH IS TO REMAIN IN PLACE FOR REUSE WITH TEMPORARY COVERS, SHORING, BRACING, AND SUPPORTS. VERIFY LOCATIONS OF AND PROTECT EXISTING INTERIOR ELECTRICAL AND MECHANICAL UTILITIES AND SERVICES. EXCEPT WHERE INDICATED OTHERWISE, ALL MATERIALS AND EQUIPMENT REMOVED, AND NOT REUSED SHALL BECOME PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE OWNER'S PROPERTY. THE OWNER RESERVES THE RIGHT TO SALVAGE PARTS FROM ALL MECHANICAL EQUIPMENT BEFORE REMOVAL FROM THE SITE. ALL MATERIALS AND EQUIPMENT REQUIRING REMOVAL AND RELOCATION FOR REUSE SHALL BE CAREFULLY REMOVED AND STORED TO PREVENT DAMAGE AND REINSTALLED AS THE WORK PROGRESSES.
4. CONTRACTOR TO FIELD VERIFY ACTUAL LOCATION AND SIZES OF EXISTING PIPING, DUCTWORK, EQUIPMENT AND SUPPORTS.
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6. CONTRACTOR SHALL DRAIN EXISTING SYSTEMS AS REQUIRED FOR DEMOLITION, AND SHALL BE RESPONSIBLE FOR FILING, TESTING AND STARTUP OF SYSTEMS UPON COMPLETION. CONTRACTOR SHALL MAINTAIN OWNER'S CHEMICAL TREATMENT PROGRAM.
7. IF ASBESTOS MATERIAL IS ENCOUNTERED IT WILL BE REMOVED BY OWNER.
8. MODIFICATIONS TO ROOFING SYSTEM FOR DEMOLITION OR INSTALLATION OF EQUIPMENT SHALL BE DONE BY THIS CONTRACTOR. WORK SHALL MAINTAIN OWNER'S ROOFING WARRANTY.
9. REFER TO SPECIFICATION SECTION 02 41 19 SELECTIVE DEMOLITION FOR A LIST OF ITEMS TO BE REMOVED AND RETURNED TO THE OWNER.

ISSUANCES

03.30.15 BIDS & CONSTRUCTION

Site / Civil	
Architecture	
Interior	
Structure	
Mechanical	
Electrical	

PROJECT NO. 5-3175

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CITY OF GRAND HAVEN

GRAND HAVEN, MICHIGAN

03.30.15	BIDS & CONSTRUCTION
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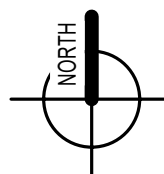
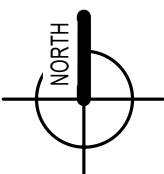
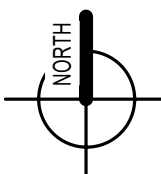
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Structure	
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Electrical	



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AM2.01

10. SEAL ALL JOINTS AIRTIGHT WHERE NEW DUCTWORK CONNECTS TO EXISTING, TYPICAL.


$$1/8'' = 1'-0''$$

$$1/8'' = 1'-0''$$

$$1/8'' = 1'-0''$$



GRAND HAVEN, MICHIGAN

03.30.15	BIDS & CONSTRUCTION
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ANNEX HYDRONIC PLANS

AM3.01



- ### GENERAL HYDRONIC PIPING NOTES:
1. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING PIPE ROUTING WITH ELECTRIC AND ELECTRICAL TRADES.
 2. INSTALL THERMOSTAT WALLS AT 4" AFF. TO TOP OF THERMOSTATS SENSORS. UNLESS NOTED OTHERWISE, ALL THERMOSTAT SENSORS INSTALLED ON OUTSIDE WALLS SHALL BE INSULATED BACKPLATES.
 3. CONTRACTOR SHALL FIELD VERIFY MECHANICAL EQUIPMENT CONDITIONS PRIOR TO START OF WORK. IF MECHANICAL EQUIPMENT CONDITIONS ARE NOT SATISFACTORY, CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF PIPE ROUTING WITH ELECTRIC AND ELECTRICAL TRADES. REPAIRS TO MECHANICAL EQUIPMENT SHALL BE FOR TYPICAL COL, EQUIPMENT, VALVE AND PIPING INFORMATION.
 4. CORE HOLES FOR WALLS AND FLOORS FOR PIPES, PROVIDE SLEEVES, AND PIPE STOP TO TOP OF FLOOR. SET OUT AND MARK PLANS FOR ALL PIPING.
 5. ALL PIPING BRANCHES SHALL HAVE ISOLATION VALVES LOCATED ABOVE THE CEILING/ CORRIDORS/ OR MECHANICAL ROOMS AND/ OR CLOSETS AT AN ACCESSIBLE LOCATION AND BE CAPABLE OF SHUTTING DOWN THE ENTIRE SYSTEM. ISOLATION VALVES SHALL BE LOCATED ON PIPEWORK CROSS OR INHABIT SPACE LOCATIONS. ALL PIPING SHALL BE LOCATED TO INSURE INDOOR WORK. COORDINATE INSTALLATION WITH MECHANICAL/HVAC CONTRACTOR.
 6. PATCH AND REPAIR ALL EXISTING PIPE INSTALLATION WHERE NEW HOT WATER HEATING SUPPLY AND RETURN PIPING CONNECTS TO EXISTING PIPING. TYPICAL.
 7. COORDINATE PIPING AND THERMOSTATS WITH APPROPRIATE TRADES TO AVOID INTERFERENCES.

GRILLE AND DIFFUSER SCHEDULE										
Mark	Manufacturer	Model	Description	Module Size	Border Type	Material	Neck Size	Front Blade Spacing	Rear Blade Spacing	Accessories
T-1	Titus	35ORS	Return Grille with 35 Degree Deflection		Surface Mount	Steel - Titus - 26 White	12"x8"			
S-1	Titus	TMSA-06-12x12-3-26	High Performance Square Cone Diffuser	12 x 12	Lay-In	Steel - Titus - 26 White	6"ø			
S-2	Titus	TMSA-08-24x24-1-26	High Performance Square Cone Diffuser	24 x 24	Surface Mount	Steel - Titus - 26 White	8"ø			
S-3	Titus	TMSA-08-24x24-3-26	High Performance Square Cone Diffuser	24 x 24	Lay-In	Steel - Titus - 26 White	8"ø			
S-4	Titus	300RL	Adjustable Supply Grille with Double Deflection		Surface Mount	Steel - Titus - 26 White	6"x4"	1"	1"	(1)
S-5	Titus	300RL	Adjustable Supply Grille with Double Deflection		Surface Mount	Steel - Titus - 26 White	10"x8"	1"	1"	(2)
S-6	Titus	300FS	Spiral Duct Mounted Adjustable Double Deflection Grille		Surface Mount	Aluminum - Titus - 26 White	10"x6"	1"	1"	(3)
R-1	Titus	PAR-8x8-24x24-1-26	Perforated Square Ceiling Diffuser	24 x 24	Lay-In	Steel - Titus - 26 White	8"x8"			(3)
R-2	Titus	PAR-10x10-24x24-1-26	Perforated Square Ceiling Diffuser	24 x 24	Lay-In	Steel - Titus - 26 White	10"x10"			(3)
R-3	Titus	PAR-12x12-24x24-1-26	Perforated Square Ceiling Diffuser	24 x 24	Lay-In	Steel - Titus - 26 White	12"x12"			(1)
E-1	Titus	35ORS	Return Grille with 35 Degree Deflection		Surface Mount	Steel - Titus - 26 White	6"x6"			(1)
E-2	Titus	35ORS	Return Grille with 35 Degree Deflection		Surface Mount	Steel - Titus - 26 White	8"x6"			(1)
E-3	Titus	35ORS	Return Grille with 35 Degree Deflection		Surface Mount	Steel - Titus - 26 White	10"x10"			(1)
E-4	Titus	350RL	Return Grille with 35 Degree Deflection		Surface Mount	Steel - Titus - 26 White	12"x12"			
T-1	Titus	35ORS	Return Grille with 35 Degree Deflection		Surface Mount	Steel - Titus - 26 White	12"x8"			(3)
T-2	Titus	PAR-10x10-24x24-1-26	Perforated Square Ceiling Diffuser	24 x 24	Lay-In	Steel - Titus - 26 White	10"x10"			

NOTES:

- DIFFUSERS AND GRILLES BASED ON TITUS.
- CONTRACTOR SHALL VERIFY SIZE, LOCATION AND CEILING PRIOR TO ORDERING DIFFUSERS AND GRILLES. COORDINATE LOCATION OF DIFFUSERS AND GRILLES WITH ALL TRADES.
- ALL LAY-IN DIFFUSERS SHALL BE 4-WAY THROW, UNLESS NOTED OTHERWISE.
- ALL DIFFUSERS LOCATED IN HARD CEILINGS SHALL HAVE PLASTER TRIM MOUNTING FRAME FOR CEILING ACCESS.
- ALL SUPPLY DIFFUSERS IN HARD CEILINGS SHALL HAVE FLEXIBLE DUCT WORK CONNECTED TO DIFFUSER INLET.

ACCESSORIES:

- OPPOSED BLADE DAMPER
- MODEL ASD AIR SCOOP DAMPER EXTRACTOR
- PAINT DUCTWORK BEHIND DIFFUSER, FLAT BLACK

DEPARTMENT OF PUBLIC SAFETY CONDENSING UNIT SCHEDULE						
TAG NO.	MODEL	NOMINAL CAP. (TONS)	VOLTAGE / PHASE	MCA (A)	MOP (A)	FLA (A)
COND-1	REYQ20T1AU	30		43	50	15+15
	REYQ120T1AU			43	50	15+15
	REYQ120T1AU			43	50	15+15

BASED ON DAKIN

BRANCH SELECTOR SCHEDULE					
TAG NO.	MODEL	NO. OF VRV'S	VOLTAGE / PHASE	MCA (A)	FUSE (A)
BS-1	BS8Q64TV	7	208-1	0.4	15
BS-2	BS8Q64TV	8	208-1	0.4	15
BS-3	BS8Q64TV	8	208-1	0.4	15

BASED ON DAKIN

ANNEX VRV UNIT SCHEDULE													
TAG NO.	ROOM(S) SERVED	UNIT TYPE	NOMINAL CAP. (TONS)	TOTAL CLG. CAP. (TONS)	SENSE CLG. CAP. (BTU/H)	HEATING CAP. (BTU/H)	AIRFLOW (CFM)	FAN SPEED (RPM)	SOUND (DBA)	VOLTAGE / PHASE	MCA	FUSE (A)	COMMENTS
VRV-1	G-03	CONCEALED DUCTED	3.0	36875	27133	40740	1130	MED	39-43	208-1	2.9	15	1.
VRV-2	G-03	CONCEALED DUCTED	3.0	36875	27133	40740	1130	MED	39-43	208-1	2.9	15	1.
VRV-3	G-03	CONCEALED DUCTED	3.0	36875	27133	40740	1130	MED	39-43	208-1	2.9	15	1.
VRV-4	G-04	WALL MOUNTED	1.0	12767	8725	13750	410	LOW	42	208-1	0.8	15	1,2
VRV-5	G-05	WALL MOUNTED	0.6	8034	5984	8600	260	HIGH	29-35	208-1	0.3	15	1,2
VRV-6	G-06	WALL MOUNTED	0.6	8034	5984	8600	260	HIGH	29-35	208-1	0.3	15	1,2
VRV-7	003	CONCEALED DUCTED	1.5	18438	13574	20370	635	MED	38-42	208-1	1.5	15	1.
VRV-8	101	WALL MOUNTED	0.6	8034	5984	8600	260	HIGH	29-35	208-1	0.3	15	1,2
VRV-9	102	FLOOR STANDING	1.0	12767	7783	13750	280	HIGH	29-35	208-1	0.6	15	1,2
VRV-10	103	WALL MOUNTED	0.6	8034	5984	8600	260	HIGH	29-35	208-1	0.3	15	1,2
VRV-11	104	WALL MOUNTED	0.6	8034	5984	8600	260	HIGH	29-35	208-1	0.3	15	1,2
VRV-12	105	WALL MOUNTED	1.0	12767	8725	13750	410	HIGH	42	208-1	0.8	15	1,2
VRV-13	106	WALL MOUNTED	0.6	8034	5984	8600	260	HIGH	29-35	208-1	0.3	15	1,2
VRV-14	107	WALL MOUNTED	0.6	8034	5984	8600	260	HIGH	29-35	208-1	0.3	15	1,2
VRV-15	108	WALL MOUNTED	0.6	8034	5984	8600	260	HIGH	29-35	208-1	0.3	15	1,2
VRV-16	201	CONCEALED DUCTED	1.0	12295	9046	13751	450	HIGH	29-39	208-1	1.4	15	1,2
VRV-17	202	CONCEALED DUCTED	2.0	24568	18084	27501	688	HIGH	38-42	208-1	1.8	15	1.
VRV-18	210	CONCEALED DUCTED	1.0	12295	9046	13751	450	HIGH	35-39	208-1	1.4	15	1.
VRV-19	209	CONCEALED DUCTED	1.5	18438	13574	20370	635	MED	38-42	208-1	1.5	15	1.
VRV-20	206, 207, 208	CONCEALED DUCTED	1.0	12295	9046	13751	388	LOW	35-39	208-1	1.4	15	1.

COMMENTS:
1. BASED ON DAKIN
2. INCLUDE CONDENSATE PUMP

MECHANICAL EQUIPMENT SCHEDULE
GRAND HAVEN PUBLIC SAFETY
ANNEX BUILDING
GMB PROJECT #5-3175

Energy recovery Unit

Annex Packaged Rooftop Energy Recovery Unit: Aeon model RQ-003-2-4H-E06E-11A, 6 tons nominal cooling capacity.

Heat pump configuration - Heating Performance: 51.2 EAT, 78.7 LAT, 25.1 MBH. Cooling Performance: 82.3 / 67.8 EDB / EWB, 52.27 / 51.16 LDB/LWB (unit), 37.26 total MBH, 25.16 sensible MBH, R-104A refrigerant.

Hot gas bypass: 16 MBH hot-gas bypass re-heat coil

Back-up Electric Heat: 34.1 MBH, 10.0 kW, 24.1 FLA,

Supply Fan: 750 CFM at 0.75" ESP, Exhaust Fan: 750 CFM at 0.75" ESP

Electrical Performance: 208/3/60, 47 FLA, 56 MCA, 60 MOP.

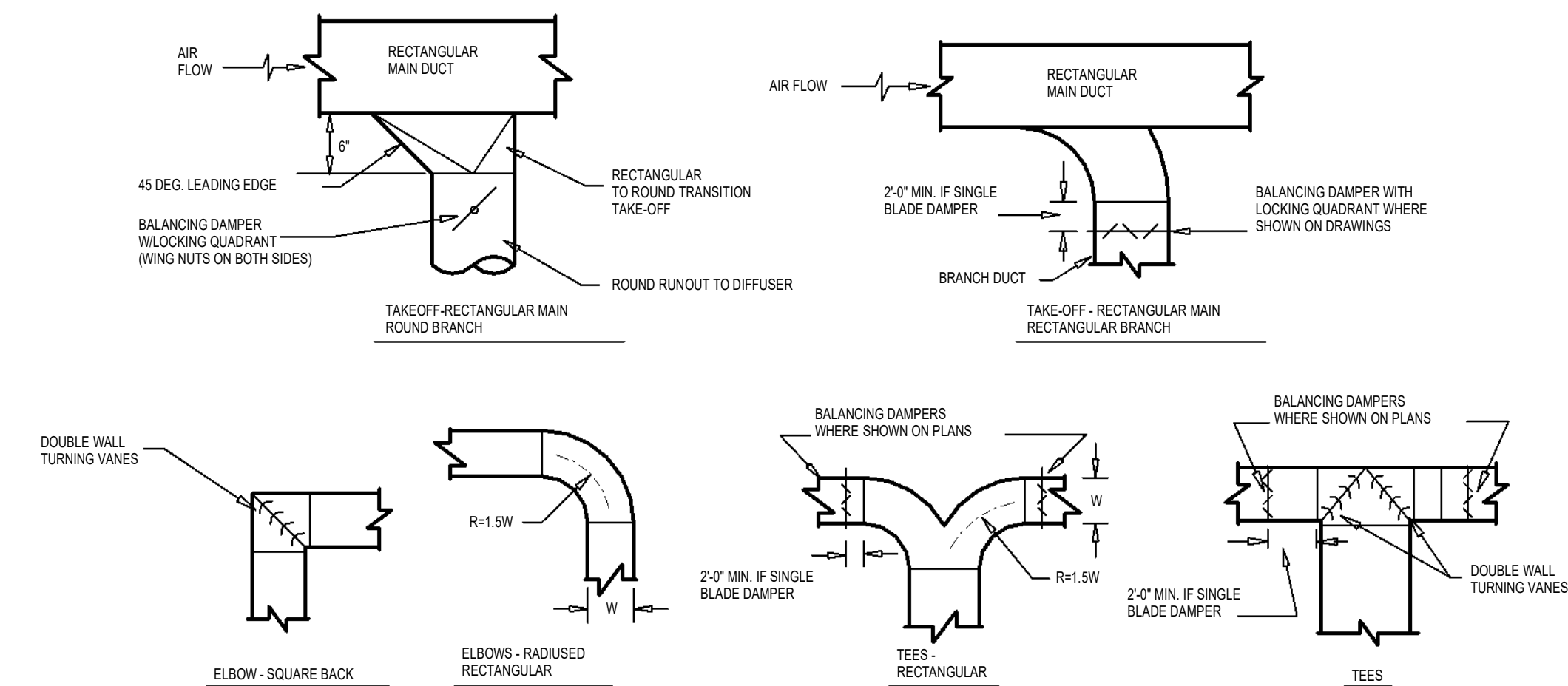
General Requirements: 100% outdoor air, horizontal discharge arrangement and (3) sets of 2 inch FARR 3000 throwaway filters. Provide factory installed and wired non-fused disconnect switch and powered convenience outlet hinged access doors, through the base electrical connections. Provide prefabricated, insulated acoustical plenum roof curb under unit with integral spring isolation. Provide factory-installed dry bulb changeover controlled 0-100% modulating economizer with power exhaust relief and motorized outside air damper. Factory mounted controls shall have Bachel communication interface capable of sequences and control points listed in the specifications. Unit to be controlled by BMS/ATC System.

Wheel Performance:
Design Cooling Data: Outside Air (Cooling); 95/75 EDB/EWB, Return/Exhaust Air (Cooling); 75/82 EDB/EWB.

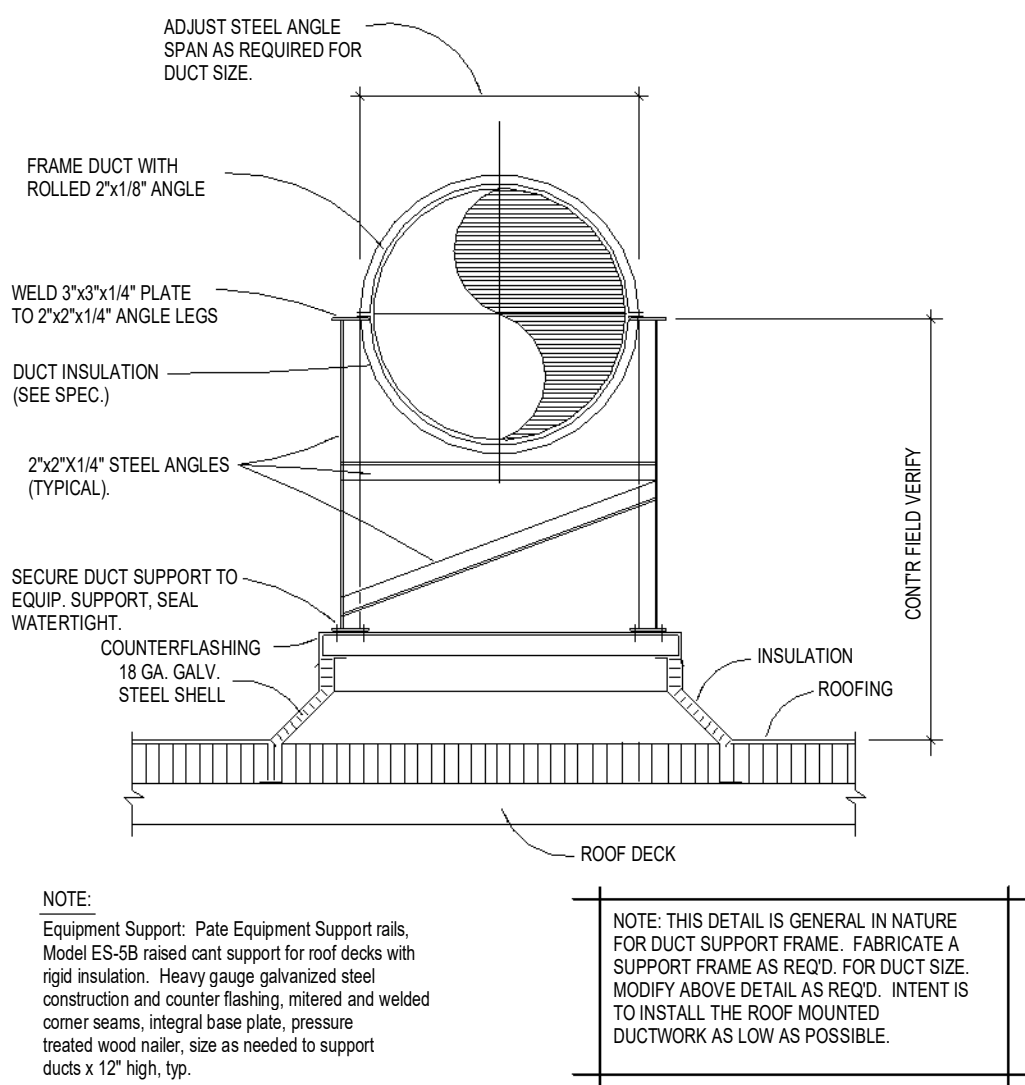
Delivered Cooling Conditions: Heat Recovery Wheel; 82.3/48.7 86 LDB/LWB.

Design Heating Data: Outside Air (Heating); 10.0/9.0 EDB/EWB, Return/Exhaust Air (Heating); 70/60 EDB/EWB.

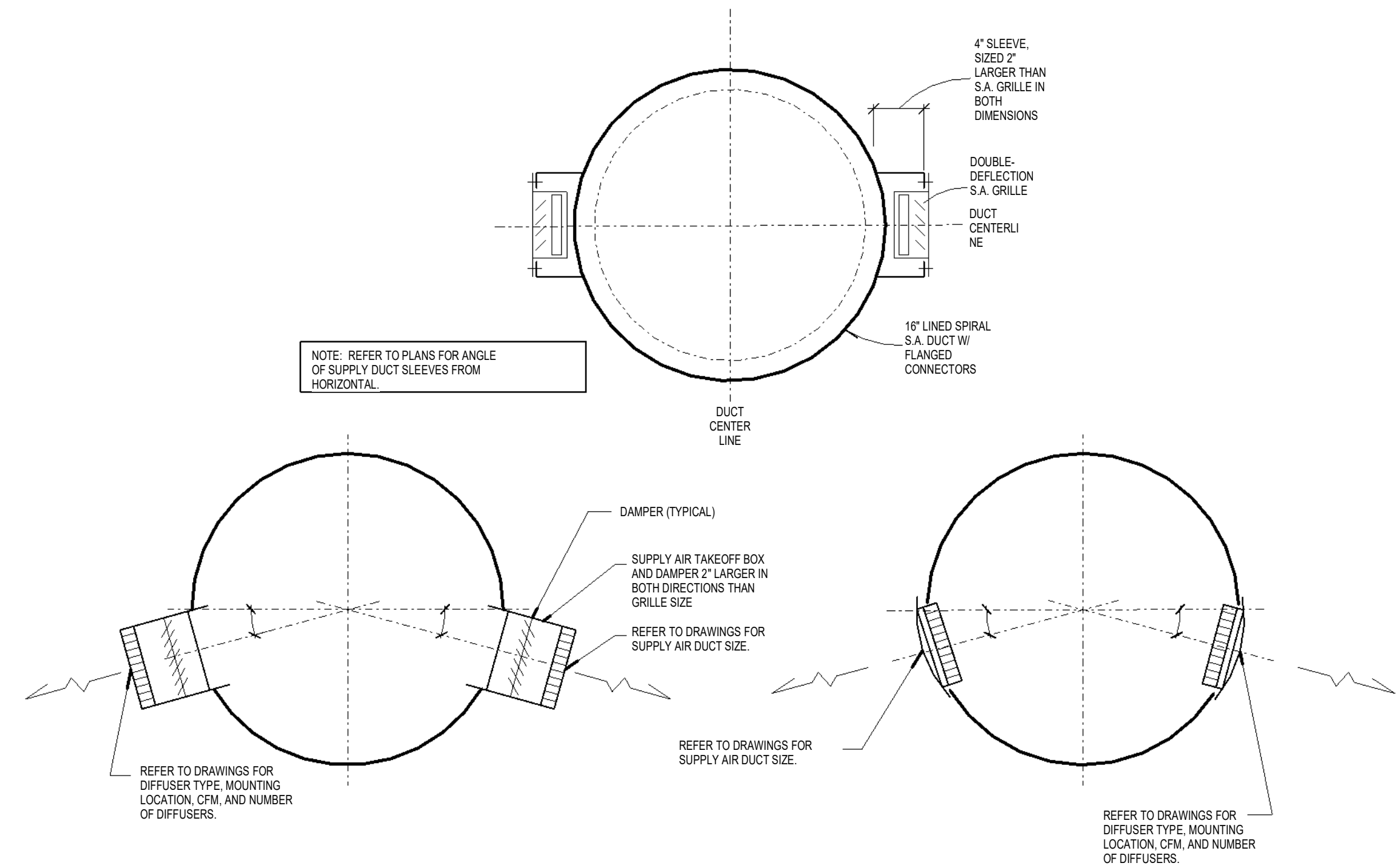
Delivered Heating Conditions: Heat Recovery Wheel; 51.15/45.76 LDB/LWB.



2
AM9.07
Typical Low Pressure Rectangular Duct Fittings
1" = 1'-0"



3
AM9.07
ROOF DUCT SUPPORT DETAIL
3/8\"/>



1
AM9.07
Duct Mounted Supply Air Diffuser Detail
1" = 1'-0"

ISSUANCES

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Architecture	
Interior	
Structure	
Mechanical	
Electrical	

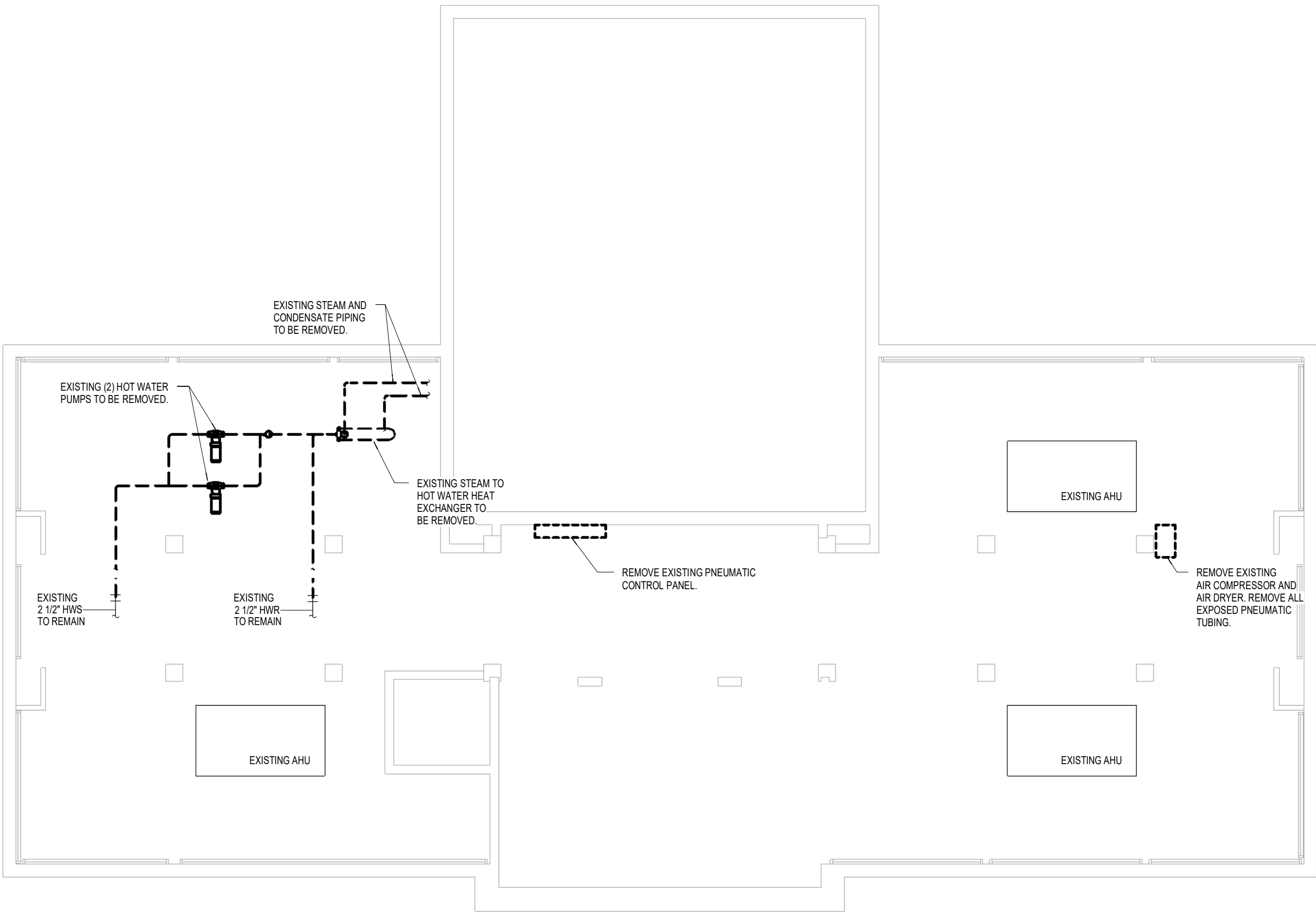
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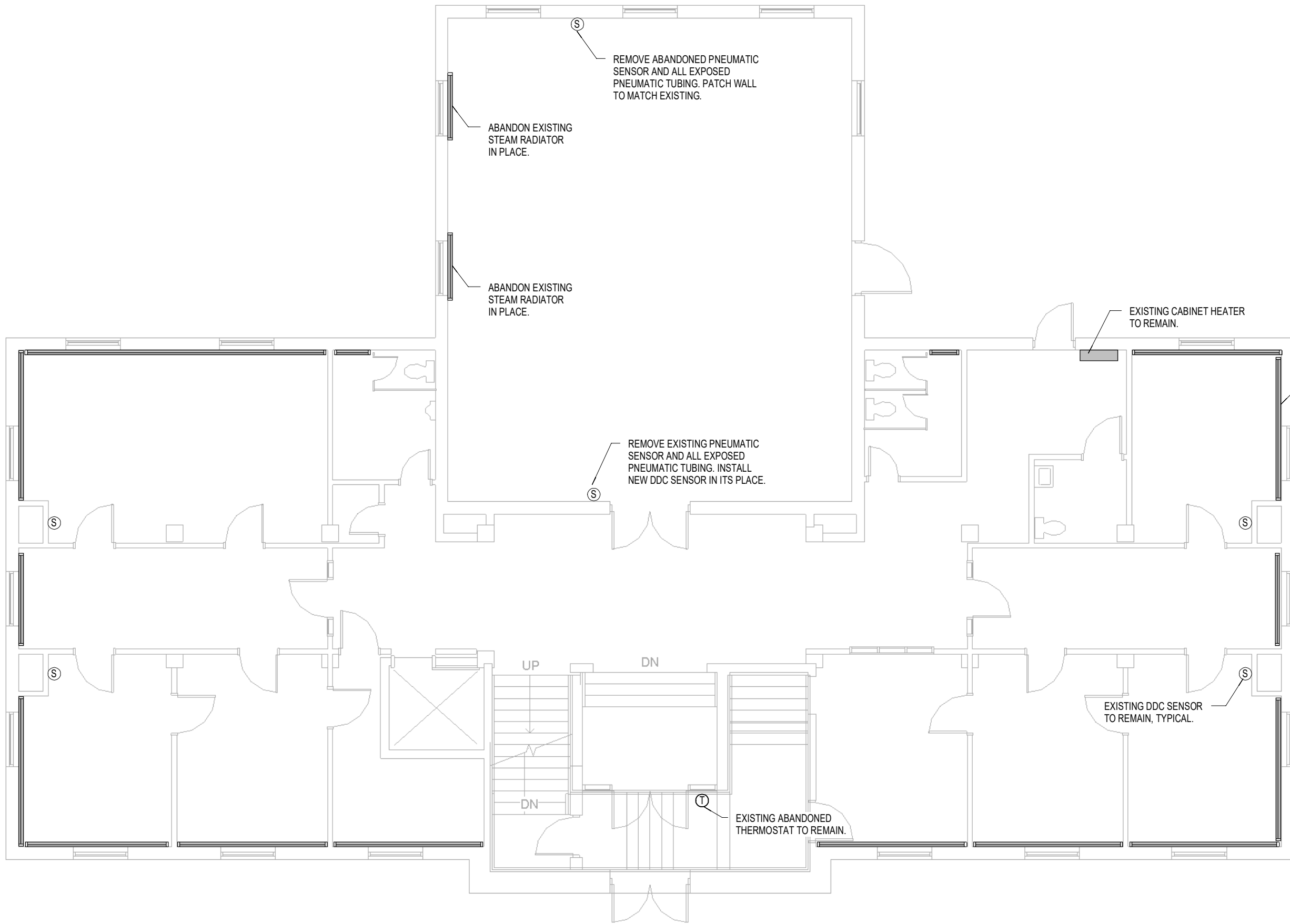
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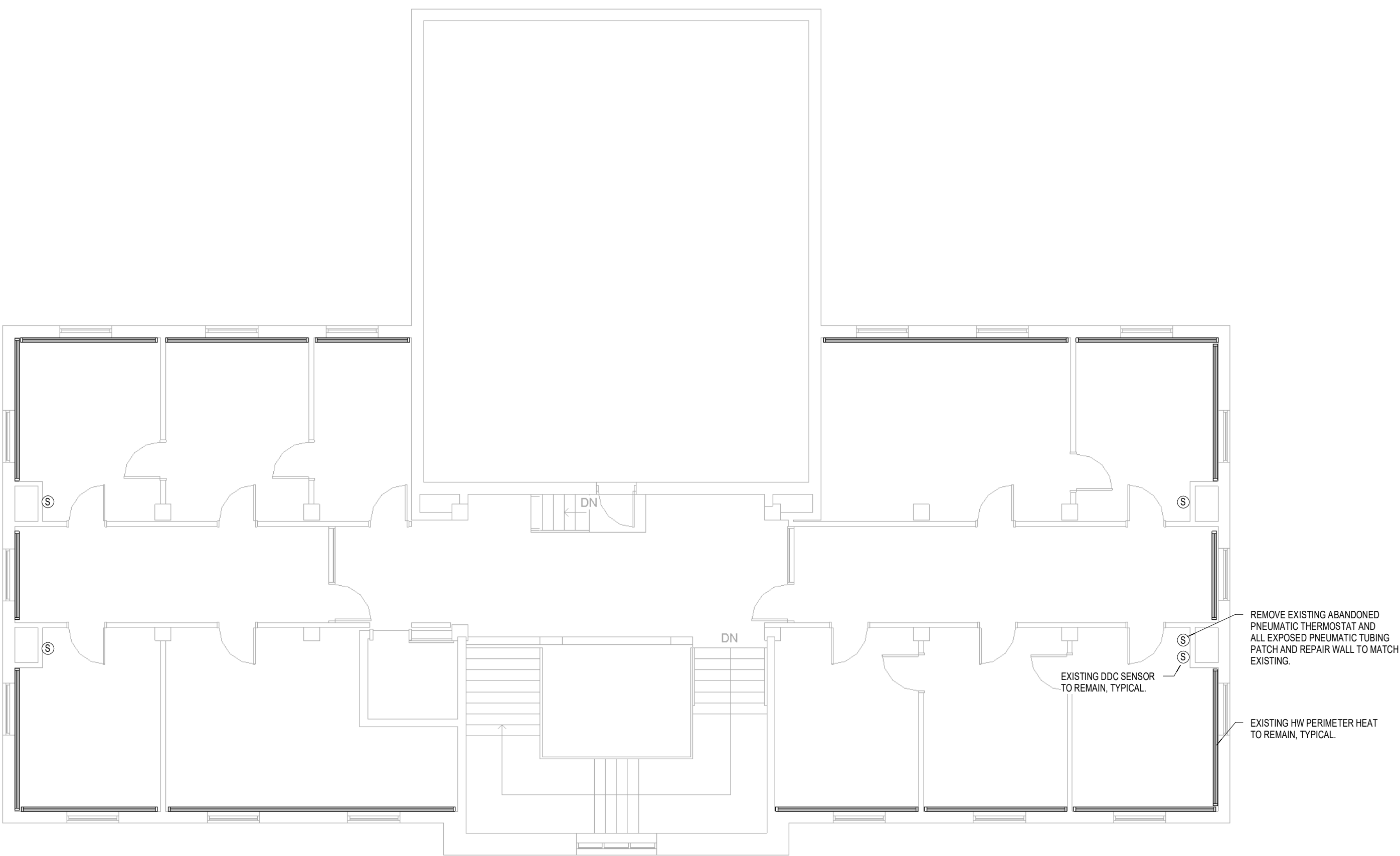
MECHANICAL SCHEDULES,
ABBREVIATIONS AND DETAILS



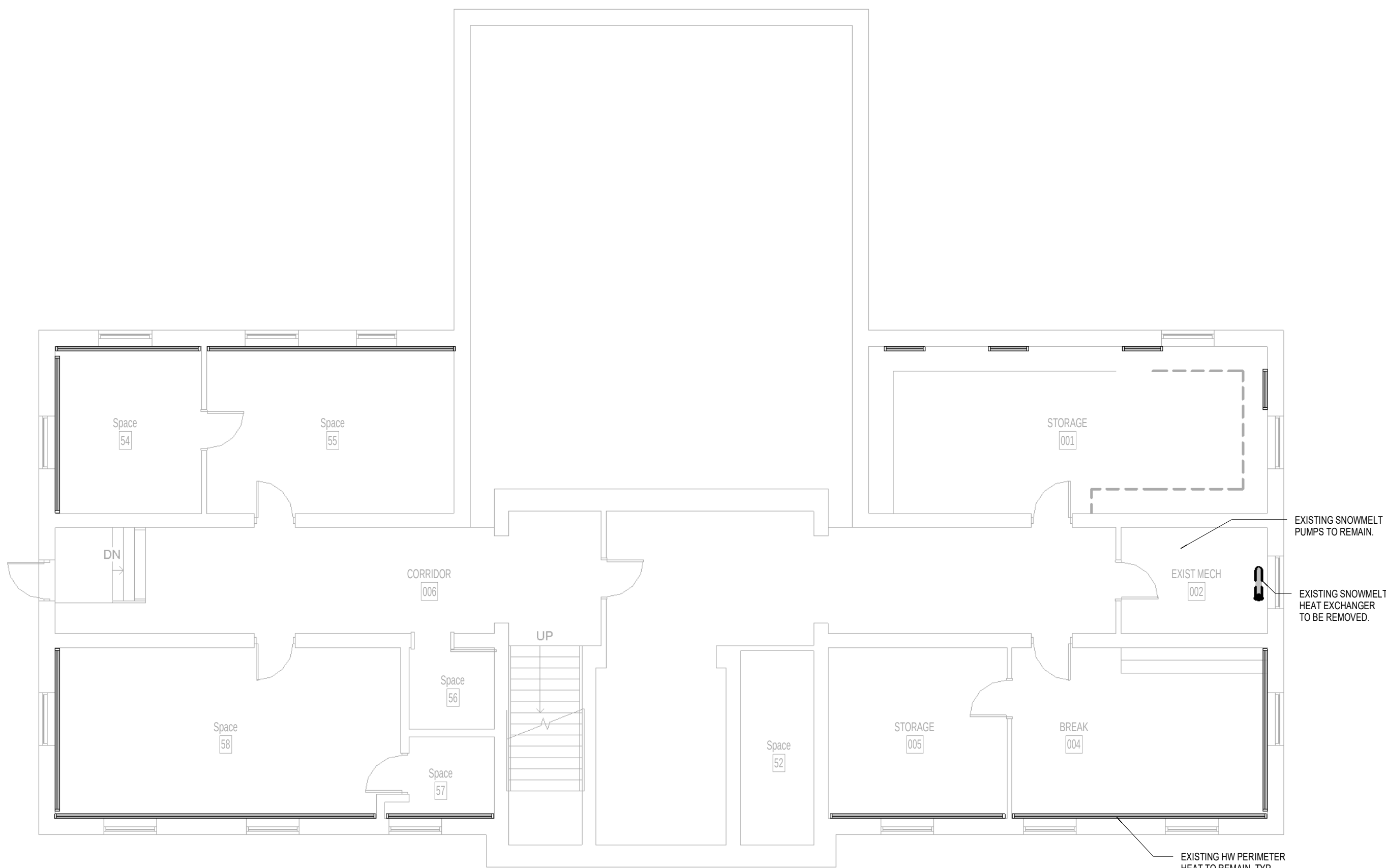
ATTIC MECHANICAL DEMOLITION PLAN
1/8" = 1'-0"



FIRST FLOOR MECHANICAL DEMOLITION PLAN
1/8" = 1'-0"



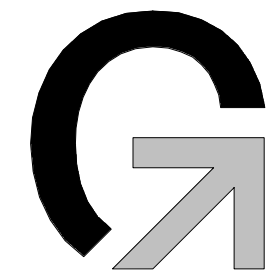
SECOND FLOOR MECHANICAL DEMOLITION PLAN
1/8" = 1'-0"



LOWER LEVEL MECHANICAL DEMOLITION PLAN
1/8" = 1'-0"

GENERAL DEMOLITION NOTES:

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6. CONTRACTOR SHALL DRAIN EXISTING SYSTEMS AS REQUIRED FOR DEMOLITION, AND SHALL BE RESPONSIBLE FOR FILLING, TESTING AND STARTUP OF SYSTEMS UPON COMPLETION. CONTRACTOR SHALL MAINTAIN OWNER'S CHEMICAL TREATMENT PROGRAM.
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8. MODIFICATIONS TO ROOFING SYSTEM FOR DEMOLITION OR INSTALLATION OF EQUIPMENT SHALL BE DONE BY THIS CONTRACTOR. WORK SHALL MAINTAIN OWNER'S ROOFING WARRANTY.
9. REFER TO SPECIFICATION SECTION 02 41 19 SELECTIVE DEMOLITION FOR A LIST OF ITEMS TO BE REMOVED AND RETURNED TO THE OWNER.



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CITY OF GRAND HAVEN
GRAND HAVEN, MICHIGAN

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Electrical

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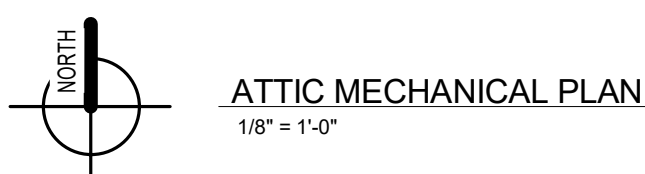
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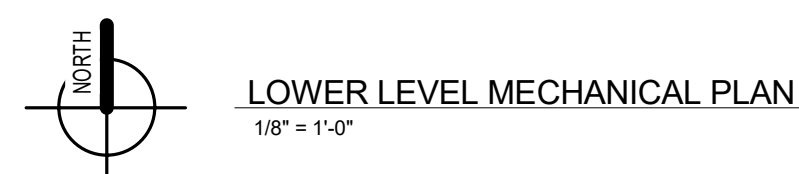
CITY HALLMECHANICAL
DEMOLITION PLANS

CM0.01



1. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING PIPE ROUTING WITH DUCTWORK AND ELECTRICAL TRADES.
2. INSTALL THERMISTAT SENSORS AT A FIVE (5) FOOT TOP OF THERMISTAT SENSORS, UNLESS NOTED OTHERWISE. ALL THERMISTAT SENSORS INSTALLED ON DOWNSTAIRS WALLS SHALL BE INSULATED BASKETPLATES.
3. CONTRACTOR SHALL FIELD VERIFY MECHANICAL EQUIPMENT CONDITIONS PRIOR TO INSTALLATION. CONNECTION OF HIGH VOLTAGE AND DUCTWORK COMPONENTS. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH ELECTRICAL TRADES. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING TIE SHEETS M71 AND M72 FOR TYPICAL COIL, COILS, COILS, AND PIPEWORK.
4. CORE HOLES IN WALLS AND FLOORS FOR PIPES, PROVIDE SLEEVES, AND FREE STEP TO MAINTAIN WALL/LOOR RATING. SEE CODE COMPLIANCE PLANS FOR RATINGS.
5. ALL PIPING BRANCHES SHALL HAVE ISOLATION VALVE LOCATED ABOVE THE CEILING/CORRIDOR OR MECHANICAL ROOMS AND/OR CLOSETS AT AN ACCESSIBLE LOCATION. PIPING SHALL BE DESIGNED FOR 150 PSI. PIPING SHALL BE INSTALLED IN THE MOST CONCEALABLE PIPING OR DUCTWORK ROOMS OR INHABITABLE SPACE LOCATIONS. ALL HYDROVIC PIPING SHALL BE INSTALLED UNDER DUCTWORK. COORDINATE INSTALLATION WITH MECHANICAL HVAC CONTRACTOR.
6. PATCH AND REPAIR ALL EXISTING PIPE INSULATION WHENEVER NEW HOT WATER HEATING SUPPLY AND RETURN PIPING CONNECTIONS TO EXISTING PIPING. TYPICAL.
7. COORDINATE PIPING AND THERMISTATS WITH APPROPRIATE TRADES TO AVOID INTERFERENCE.

01	REPLACE EXISTING FIN TUBE PNEUMATIC CONTROL VALVE WITH NEW 2-WAY DDC CONTROL VALVE CAPABLE OF EXISTING CONTRACTOR DDC TEMPERATURE SENSOR. REFER TO SPECIFICATION FOR SEQUENCES OF OPERATIONS. CONTRACTOR TO FIELD VERIFY LOCATIONS AND QUANTITIES.
02	MAINTAIN EXISTING LOCAL CONTROL.
03	REPLACE EXISTING AIR HANDLER HOT WATER AND CHILLED WATER PNEUMATICALLY ACTUATED 3-WAY CONTROL VALVES WITH 3-WAY DDC CONTROL VALVES.
04	REPLACE EXISTING AIR HANDLER OUTDOOR AIR AND RETURN AIR PNEUMATICALLY ACTUATED DAMPERS WITH NEW DDC MOTORIZED DAMPERS.

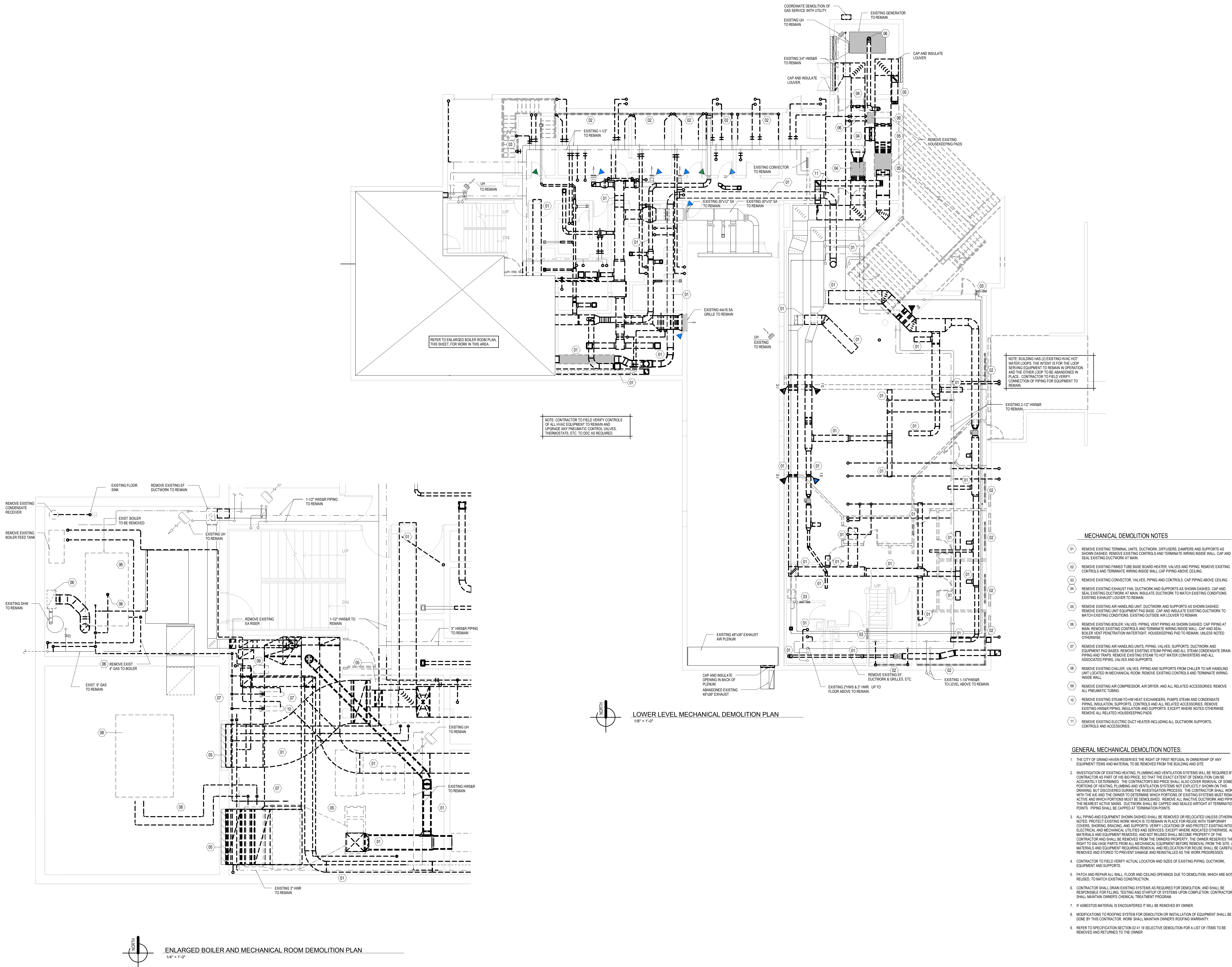


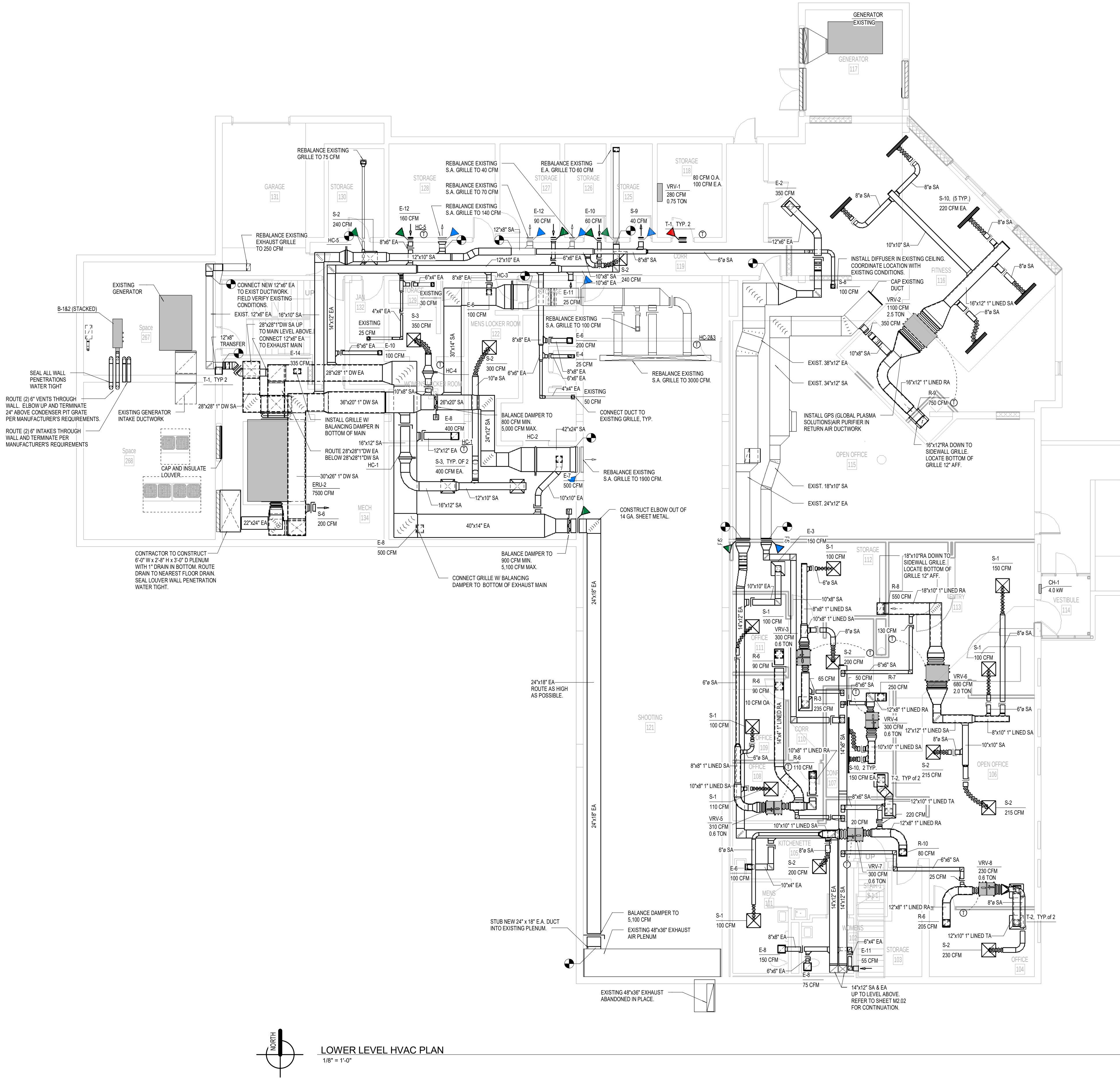
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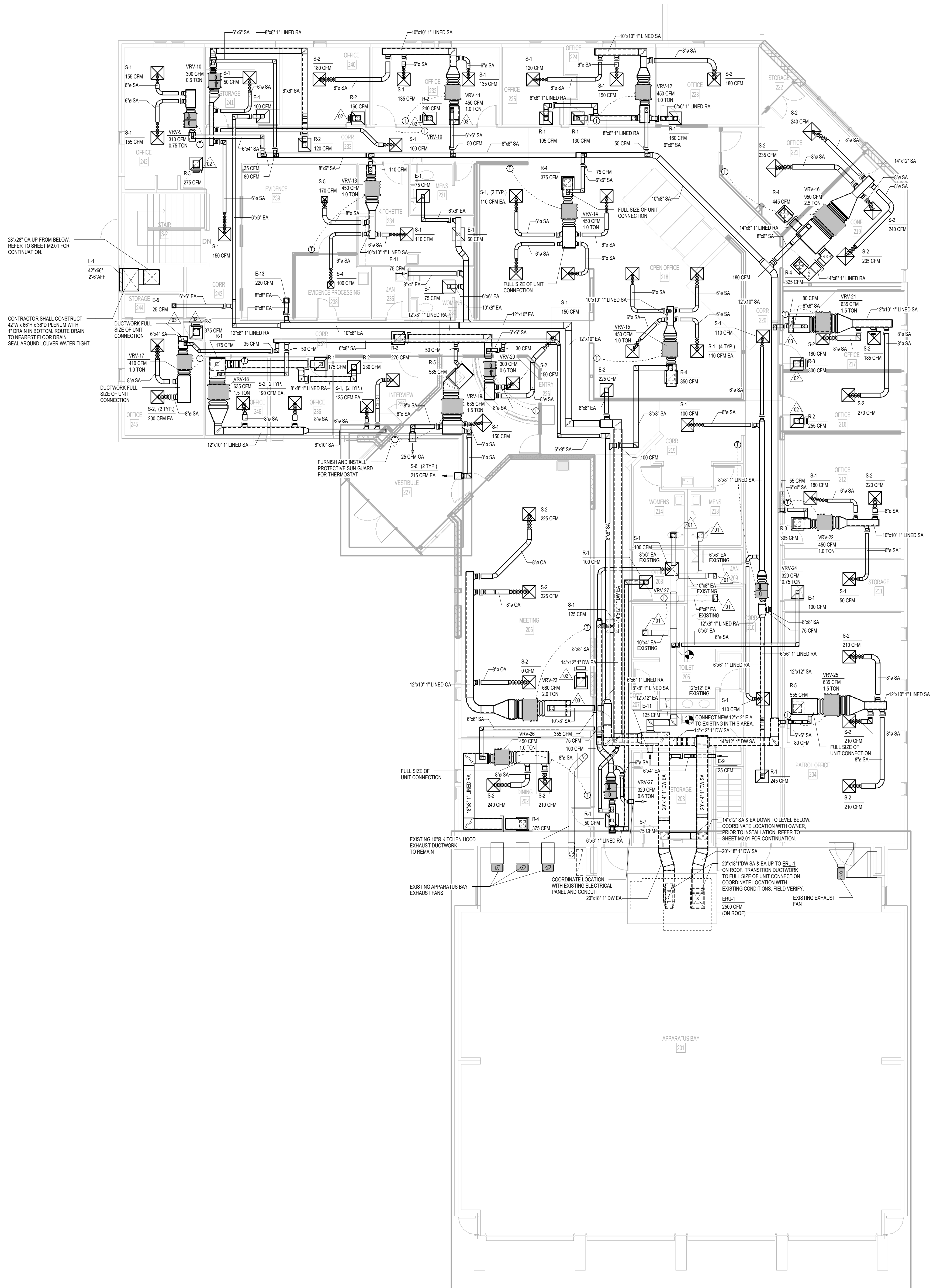
CM2.01





LOWER LEVEL HVAC PLAN
1/8" = 1'-0"

- GENERAL HVAC NOTES:
1. ACTUAL LOCATION OF GRILLES AND DIFFUSERS SHALL BE COORDINATED WITH REFLECTED CEILING PLAN. IF THERE ARE ANY DISCREPANCIES VERIFY FINAL LOCATION WITH ARCHITECT/ENGINEER.
 2. INSTALL ALL THERMOSTATS/SENSORS AT 48" A.F.F. TO TOP OF THERMOSTATS/SENSORS, UNLESS NOTED OTHERWISE. ALL THERMOSTATS/SENSORS INSTALLED SHALL HAVE INSULATED BACKPLATES.
 3. CONTRACTOR SHALL FIELD VERIFY MECHANICAL EQUIPMENT CONDITIONS PRIOR TO FABRICATION AND CONNECTION OF HYDRONIC AND DUCTWORK COMPONENTS.
 4. IN AREAS OF ACOUSTICALLY LINED AND DOUBLE WALL DUCTWORK, THE DIMENSIONS LISTED ARE THE FREE AREA WITHIN THE DUCT LINER.
 5. IN AREAS WHERE DUCTWORK IS EXPOSED, ROUTE DUCTWORK AS HIGH AS POSSIBLE UNLESS NOTED OTHERWISE ON DRAWINGS.
 6. CONTRACTOR SHALL REFER TO CODE COMPLIANCE DRAWING FOR INFORMATION ON RATINGS OF FIRE/SMOKE DAMPERS.
 7. PAINT INTERIOR OF DUCT AT RETURN AND EXHAUST DIFFUSERS/GRILLES FLAT BLACK.
 8. FLEXIBLE DUCTWORK CORE SHALL BE CLAMPED AND TAPED AT ALL CONNECTIONS AND JOINTS (i.e. AT CONNECTION TO BRANCH DUCTWORK, DIFFUSERS, ETC.). TAPE SHALL MEET REQUIREMENTS OF UL 181B-7X. IN ADDITION, FLEXIBLE DUCTWORK JACKET SHALL BE TAPED AT ALL CONNECTIONS AND JOINTS WITH TAPE MEETING THE ABOVE STATED REQUIREMENTS. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
 9. ALL SUPPLY AND RETURN AIR DUCTWORK SHOWN WITH DASHES SHALL BE INTERNALLY LINED DOUBLE WALL DUCTWORK WITH 1" THICK DUCT LINER FOR ROUND AND RECTANGULAR SUPPLY & RETURN. ALL EXHAUST DUCTWORK SHOWN WITH DASHES SHALL BE ACOUSTICALLY LINED SINGLE WALL DUCTWORK.
 10. SEAL ALL JOINTS AIRTIGHT WHERE NEW DUCTWORK CONNECTS TO EXISTING. TYPICAL.



MECHANICAL KEYED NOTES:

- RE-BALANCE EXISTING EXHAUST AIR GRILLE TO 75 CFM.
- INSTALL 1" LINED ELBOW FULL SIZE OF GRILLE CONNECTION. FACE RETURN OPENING IN THE OPPOSITE DIRECTION FROM UNIT INTAKE.
- INSTALL ELBOW AND FACE TOWARD ROOF.

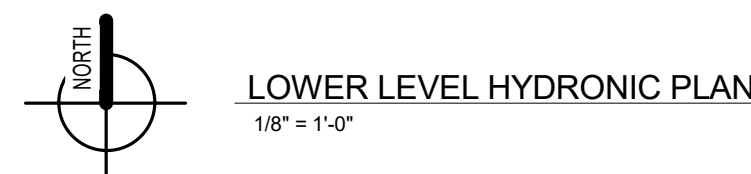
GENERAL HVAC NOTES:

- ACTUAL LOCATION OF GRILLES AND DIFFUSERS SHALL BE COORDINATED WITH REFLECTED CEILING PLAN. IF THERE ARE ANY DISCREPANCIES VERIFY FINAL LOCATION WITH ARCHITECT/ENGINEER.
- INSTALL ALL THERMOSTATS/SENSORS AT 4" AT F.T. TO TOP OF THERMOSTATS/SENSORS, UNLESS NOTED OTHERWISE. ALL THERMOSTATS/SENSORS INSTALLED SHALL HAVE INSULATED BACKPLATES.
- CONTRACTOR SHALL FIELD VERIFY MECHANICAL EQUIPMENT CONDITIONS PRIOR TO FABRICATION AND CONNECTION OF WORKING AND DUCTWORK COMPONENTS.
- IN AREAS OF ACOUSTICALLY LINED AND DOUBLE WALL DUCTWORK, THE DIMENSIONS LISTED ARE THE FREE AREA WITHIN THE DUCT LINER.
- IN AREAS WHERE DUCTWORK IS EXPOSED, ROUTE DUCTWORK AS HIGH AS POSSIBLE UNLESS NOTED OTHERWISE ON DRAWING.
- CONTRACTOR SHALL REFER TO CODE COMPLIANCE DRAWING FOR INFORMATION ON RATINGS OF FIRE/SMOKE DAMPERS.
- PAIN INTERIOR OF DUCT AT RETURN AND EXHAUST DIFFUSERS/GRILLES FLAT BLACK.
- FLEXIBLE DUCTWORK CORE SHALL BE CLAMPED AND TAPED AT ALL CONNECTIONS AND JOINTS (i.e. AT CONNECTION TO BRANCH DUCTWORK, DIFFUSERS, ETC.). TAPE SHALL MEET REQUIREMENTS OF UL 181B-FX. IN ADDITION, FLEXIBLE DUCTWORK JACKET SHALL BE TAPED AT ALL CONNECTIONS AND JOINTS WITH TAPE MEETING THE ABOVE STATED REQUIREMENTS. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
- ALL SUPPLY AND RETURN AIR DUCTWORK SHOWN WITH DASHES SHALL BE INTERNALLY LINED DOUBLE WALL DUCTWORK WITH 1" THICK DUCT LINER FOR ROUND AND RECTANGULAR SUPPLY & RETURN. ALL EXHAUST DUCTWORK SHOWN WITH DASHES SHALL BE ACOUSTICALLY LINED SINGLE WALL DUCTWORK.
- SEAL ALL JOINTS AIRTIGHT WHERE NEW DUCTWORK CONNECTS TO EXISTING, TYPICAL.

Issuances

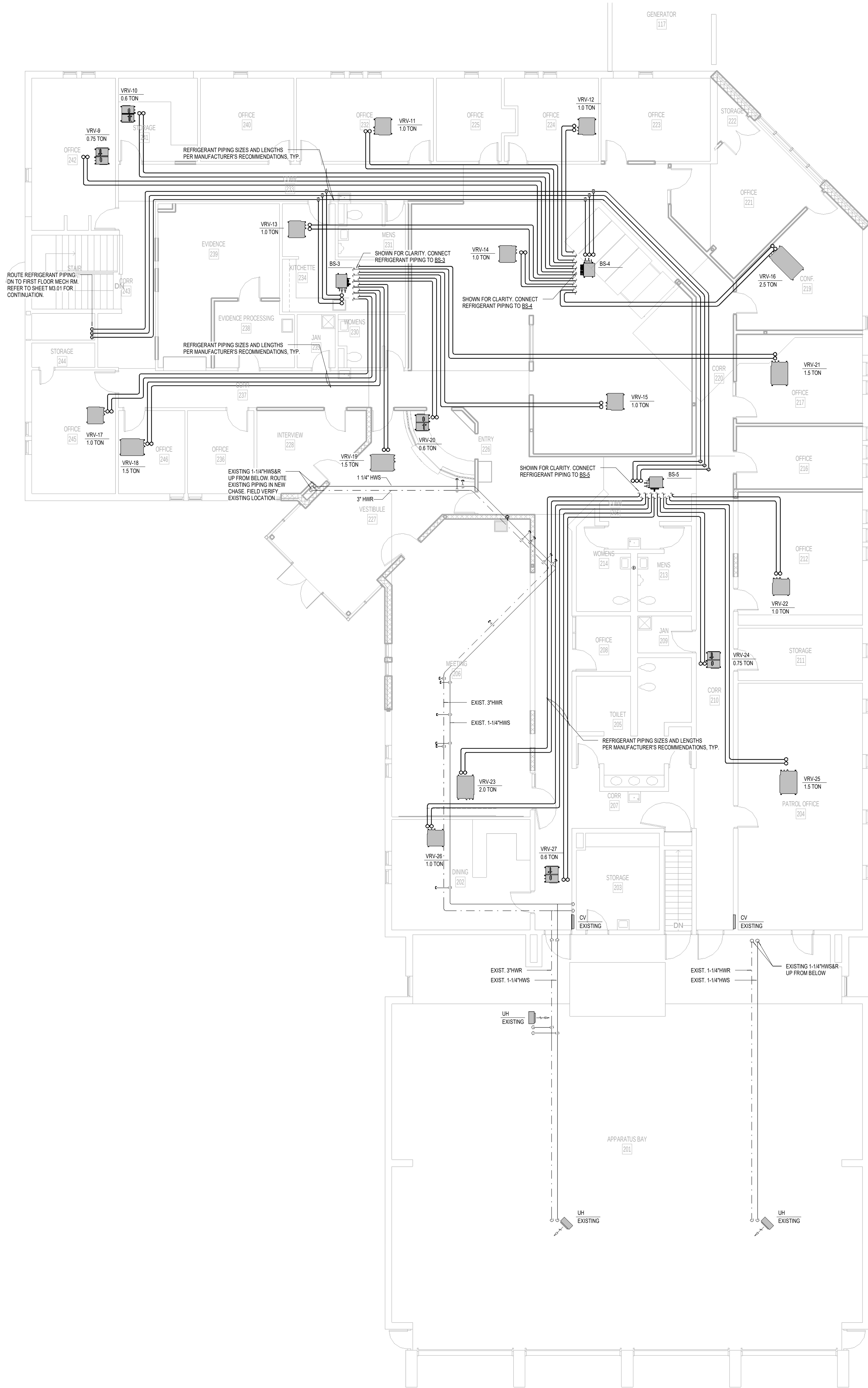
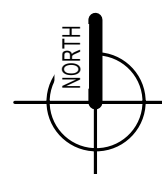
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GENERAL HYDRONIC PIPING NOTES

3. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING PERMITTING WITH OVERSIGHT AND ELECTRICAL TRADES.
4. INSTALL THERMISTORS/STADIUMS AT 48°F +/- 4°F OF TOP OF THERMISTOIDS STATIONS. UNLESS NOTED OTHERWISE, ALL THERMISTOIDS/STADIUMS TO BE INSTALLED ON OUTSIDE WALLS HAVE INSULATED BACKPACKETS.
5. CONTRACTOR SHALL FIELD VERIFY MECHANICAL EQUIPMENT CONDITIONS PRIOR TO FABRICATION AND CONNECTION OF HYDRAONIC AND DUCTWORK COMPONENTS. CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING PIPING, ELECTRICAL AND ELECTRICAL TRACES. REFER TO DETAIL SHEETS M7.1 AND M7.2 FOR TYPICAL COIL, PIPING AND ELECTRICAL CONNECTIONS.
6. CORROSION RESISTANT AND FLOORS PROVIDE SLOPES, SLOPES AND FRESH STOP TO MAINTAIN WALL/DOOR RATING. SEE CODE COMPLIANCE PLANS FOR RATINGS.
7. ALL PIPING BRANCHES SHALL HAVE ISOLATION VALVES LOCATED ABOVE THE GELULINUM CORRIDORS OR MECHANICAL ROOMS AND LOCATED AT AN ACCESSIBLE LOCATION AND HAVE A MINIMUM 1/2" OF SLOPE FOR DRAINAGE TO THE MECHANICAL ROOMS. WHERE PIPING AND DUCTWORK CROSS OR ABUT AT SAME ELEVATIONS, ALL HYDRAONIC PIPING SHALL BE ABOVE DUCTWORK. COORDINATE INSTALLATION WITH MECHANICAL/HVAC CONTRACTOR.
8. PATCH AND REPAIR ALL EXISTING PIPE JOINTS WHERE NEW HOT WATER HEATING SUPPLY AND RETURN PIPING CONNECTS TO EXISTING PIPING. TYPICAL.
9. COORDINATE PIPING AND THERMISTOIDS WITH APPROPRIATE TRADES TO AVOID INTERFERENCE.



MAIN LEVEL HYDRONIC PLAN
1/8" = 1'-0"

GENERAL HYDRONIC PIPING NOTES:

- CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING PIPE ROUTING WITH DUCTWORK AND ELECTRICAL TRADES.
- INSTALL THERMOSTATS/SENSORS AT 48" A.F.P. TO TOP OF THERMOSTATS/SENSORS. UNLESS NOTED OTHERWISE, ALL THERMOSTATS/SENSORS INSTALLED ON OUTSIDE WALLS SHALL HAVE INSULATED BACKPLATES.
- CONTRACTOR SHALL FIELD VERIFY MECHANICAL EQUIPMENT CONDITIONS PRIOR TO FABRICATION AND CONNECTION OF HYDRONIC AND DUCTWORK COMPONENTS. CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF PIPE ROUTING WITH DUCTWORK AND ELECTRICAL TRADES. REFER TO DETAIL SHEETS M3.01 AND M3.02 FOR TYPICAL COIL, EQUIPMENT, VALVE AND PIPING INFORMATION.
- CORE HOLES IN WALLS AND FLOORS FOR PIPES, PROVIDE SLEEVES, AND FIRE STOP TO MAINTAIN WALL/FLOOR RATING. SEE CODE COMPLIANCE PLANS FOR RATINGS.
- ALL PIPING BRANCHES SHALL HAVE ISOLATION VALVES LOCATED ABOVE THE CEILING (IN CORRIDORS) OR MECHANICAL ROOMS AND/OR CLOSETS AT AN ACCESSIBLE LOCATION AND HEIGHT. INTENT OF DESIGN IS FOR ALL DUCTWORK TO BE LOCATED HIGH AS POSSIBLE WHERE PIPING AND DUCTWORK CROSS OR INHABIT SAME LOCATIONS. ALL HYDRONIC PIPING SHALL BE LOCATED UNDER DUCTWORK. COORDINATE INSTALLATION WITH MECHANICAL/HVAC CONTRACTOR.
- PATCH AND REPAIR ALL EXISTING PIPE INSULATION WHERE NEW HOT WATER HEATING SUPPLY AND RETURN PIPING CONNECTS TO EXISTING PIPING, TYPICAL.
- COORDINATE PIPING AND THERMOSTATS WITH APPROPRIATE TRADES TO AVOID INTERFERENCES.



03.30.15	BIDS & CONSTRUCTION
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5-3175

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MECHANICAL EQUIPMENT SCHEDULE
GRAND HAVEN PUBLIC SAFETY
PUBLIC SAFETY BUILDING
GMB PROJECT #5-3175

BOILER
Hot Water Boiler: Thermal Solutions APX-725, 2" inlet and 2" outlet water connections, 1" natural gas connection, UL/FM/RCS-21 gas train, 725 MBH input, 680 MBH output @ 90% thermal efficiency, 5 inch dia. waste and vent size for vertical direct vented combustion with vent and air inlet caps, temperature gauge in air. TYP. relief valve shall be rated 34" x 120" LBS. With Backcheck Damper and Corrosion Resistant. Provide Condensate neutralization kit and P/T valve discharge to nearest floor drain. Note: Use CPVC schedule 40 for intake and AL24-4C for vent.

Hot Water Boiler: Same as B-1.

CABINET HEATER
On-Wall mounted electric wall heater, Model F1326T1, bottom discharge and steel grille, 4.0 kW capacity, 208V, surface mounting, 1.5 hour, disconnect switch, mounting bracket, and the voltage wall mounted thermostat provided by mechanical contractor and installed by electrical contractor.

Energy Recovery Unit
ERU-1
Packaged Rooftop Energy Recovery Unit: Aeon model RH-015-8, 13 tons nominal cooling capacity.

Heat pump configuration - Heating Performance: 46.3 EAT, 80.8 LAT, 106 MBH. Cooling Performance: 82.6 / 88.1 EDB / EDB, 47.53 / 48.21 LDB/LWB (cont), 157 total MBH, 98.48 sensible MBH, R-410A refrigerant.

Hot gas bypass: 58 MBH re-heat coil

Auxiliary Heating Coil: Natural Gas, 102.4 MBH

Supply Fan: 2,500 CFM at 1" ESP, Exhaust Fan: 2,500 CFM at 1" ESP

Electrical Requirements: 208/240, 82 FLA, 88 MCA, 110 MOP

General Requirements: 100% outdoor air, vertical discharge arrangement and (1) sets of 2 inch FARR 3030 broomway filter, Provide factory installed and vented non-leak disconnect switch and powered condensate unit, hinged access door, through the base electrical connections. Provide prefabricated, insulated acoustical plenum for each under unit with integral supply isolation. Provide factory-installed by dual shaver controlled 5-100% modulating economizer with power exhaust relief and motorized outside air damper. Factory mounted controls shall have factory communicate interface capable of sequences and control points listed in the specifications. Unit to be controlled by BMS/ATC System.

Wheel Performance:
Design Cooling Data: Outside Air (Cooling): 85/75 EDB/EWB, Return/Exhaust Air (Cooling): 75/62 EDB/EWB
Delivered Cooling Conditions: Heat Recovery Wheel: 81.7/67.2 LDB/LWB

Design Heating Data: Outside Air (Heating): 0.0/0.0 EDB/EWB, Return/Exhaust Air (Heating): 70/60 EDB/EWB
Delivered Heating Conditions: Heat Recovery Wheel: 49.5/46.06 LDB/LWB

ERU-2
Energy Recovery Unit: Aeon model M2-H-016-R-2-A-A-5-C-0
Supply Fan: 7500 CFM at 1.5" ESP, Exhaust Fan: 7500 CFM at 1.5" ESP

Electrical Requirements: 208/240, 46 FLA, 52 MCA, 70 MOP

General Requirements: 100% outdoor air, (3) sets of 2 inch FARR 3030 broomway filter, Provide factory installed and vented non-leak disconnect switch and hinged access door. Factory mounted controls shall have factory communicate interface capable of sequences and control points listed in the specifications. Unit to be controlled by BMS/ATC System. Include space for future HEPA filter in exhaust stream.

Wheel Performance:
Design Cooling Data: Outside Air (Cooling): 85/75 EDB/EWB, Return/Exhaust Air (Cooling): 75/62 EDB/EWB
Delivered Cooling Conditions: Heat Recovery Wheel: 81.7/67.2 LDB/LWB

Design Heating Data: Outside Air (Heating): 0.0/0.0 EDB/EWB, Return/Exhaust Air (Heating): 70/60 EDB/EWB
Delivered Heating Conditions: Heat Recovery Wheel: 46.7/44.43 LDB/LWB

HEATING COIL
HC-1
Hot Water Heating Coil, Mess Locker: Trane type ST hot water reheat coil, size 271" x 18", 1100 cfm, 1 row, 142 FPP, 15" EAT, 85" LAT, 130 EWT, 30 WTD, 30.71 MBH total capacity, 5.4 gpm, 0.147" APD, 16.6 B. WPD, without turndown. Provide with 3-way control valve.

HC-2
Hot Water Heating Coil, Shooting Range: Trane type TT hot water reheat coil, size 361" x 18", 1600 cfm, 2 row, 142 FPP, 45" EAT, 85" LAT, 130 EWT, 30 WTD, 30.71 MBH total capacity, 5.4 gpm, 0.147" APD, 16.6 B. WPD, without turndown. Provide with 3-way control valve.

HC-3
Hot Water Heating Coil, Shooting Range: Trane type TT hot water reheat coil, size 421" x 18", 3100 cfm, 2 row, 142 FPP, 45" EAT, 85" LAT, 130 EWT, 30 WTD, 30.71 MBH total capacity, 5.4 gpm, 0.147" APD, 16.6 B. WPD, without turndown. Provide with 3-way control valve.

HC-4
Hot Water Heating Coil, Women's Locker: Trane type ST hot water reheat coil, size 181" x 18", 550 cfm, 2 row, 142 FPP, 15" EAT, 85" LAT, 130 EWT, 30 WTD, 30.71 MBH total capacity, 5.4 gpm, 0.147" APD, 16.6 B. WPD, without turndown. Provide with 2-way control valve.

HC-5
Hot Water Heating Coil, Corridor / Storage: Trane type ST hot water reheat coil, size 241" x 18", 870 cfm, 2 row, 142 FPP, 15" EAT, 85" LAT, 130 EWT, 30 WTD, 30.71 MBH total capacity, 5.4 gpm, 0.147" APD, 16.6 B. WPD, without turndown. Provide with 2-way control valve.

LOUVER
L-1
Ventilation Air Louver, ERU-2: Ruston extended aluminum drainable blade louver, 42" W x 66" H x 6" D, Model ELF63750 with 37-1/2 deg. blade angle, insect screen, standard frame with extended sill and custom Kyrus 500 finish to be selected by the Architect.

MECHANICAL EQUIPMENT
EQ-1
Air Separator: Hot Water Heating System: Ball & Gossett Rotameter, Model RL-3, 190 GPM capacity, 3" NPT tangential openings, without strainer.

EQ-2
Pool Heater: Hot Water Heating System: Two gallon pot feeder with funnel and fill & drain valves, Weesab or equal.

EQ-3
Size Stream Filter: Hot Water System: 10 GPM, 1.1/2" inlet and discharge, 1" NPT drain fitting, 3/4 stainless steel construction, factory base plate, 150 psi pressure rating, 5/8 inch ball element rated to at least 200 psi, F, 20 micron filter, maximum 1.5 psi clean pressure drop at 10 GPM flow, 100% or 50%.

EQ-4
Expansion tank, Hot Water System: Vertical expansion tank with bladder, 44 gallons, 34 gallons acceptance, ASME rated, packaged to 1/2 psi, 5/8" NPT NPT 200". Provide pressure relief valve.

EQ-5
Glycol Feed Tank: Weesab Model GMP 1050 Glycol Feeder, 50 gallon capacity, 1.8 GPM @ 80 PSI, level controls, attached injection pump rated at 10.1 HP, 120/160, based on 30% ethylene glycol.

EQ-6
Makeup Water Meter for Heating System: Badger or Carbon, installing disc water meter with electric control register, 3/4 inch size, 10 gallons per contact isolation.

PUMPS
P-1
Hot Water Circulation Pump: Ball & Gossett In-Line Pump, Series 80, size 2-1/2 x 2-1/2 x 8-1/2, 105 GPM @ 92' TDH, 1750 RPM, 5 hp, 208/240V, Variable Frequency drive furnished by Temperature Control Contractor, installed by Electrical Contractor.

P-2
Hot Water Circulation Pump: Same as P-1.

P-3
Boiler Circulation Pump: Ball & Gossett In-Line Pump, Series 80, size 2AAB, 10 GPM @ 10' TDH, 1750 RPM, 0.5 hp 120/160, disconnected provided and installed by Electrical Contractor.

P-4
Boiler Circulation Pump: Same as P-3.

P-5
Fill Pump, Hot Water Heating System: Ball & Gossett In-line pump, Series 80, Size 1AA, 10 GPM at 60' TDH, 1.5 HP, 3450 RPM, 120/160, Pressure Efficiency motor.

ABBREVIATIONS	
AFF	ABOVE FINISHED FLOOR
BFW	BOILER FEED WATER
BDP	BOTTOM OF DUCT
BOG	BOTTOM OF GRILLE
BOP	BOTTOM OF PIPE
CCP	COMPRESSED AIR
CCR	CHILLED GLYCOL RETURN
CCR	CHILLED GLYCOL SUPPLY
CH	CABINET HEATER
CONV	CONVECTOR
CO	CLEAN-OUT
COW	DOMESTIC COLD WATER
DN	DOMESTIC COLD WATER
DOW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
DWR	EXHAUST HOT WATER RETURN
EA	EXHAUST AIR
EF	EXHAUST FAN
FD	FLOOR CLEAN-OUT
FD	FLOOR DRAIN
FP	FIRE PROTECTION
G	NATURAL GAS
HWR	HOT WATER RETURN (HEATING)
HWS	HOT WATER SUPPLY (HEATING)
DA	OUTSIDE AIR
PV	POST INDICATOR VALVE
RECIRC	DOMESTIC HOT WATER RETURN
RWR	RADIANT WATER RETURN
RA	RADIANT WATER SUPPLY
SA	SAINTARY WASTE
ST	STORM WATER
SA	SUPPLY AIR
SA	SOFTWATER
TD	TOP OF DUCT
TD	TOP OF DUCT
TD	TOP OF GRILLE
TD	TOP OF PIPE
V	VENT
VD	VOLUME DAMPER
VIR	VENT THRU ROOF
UH	UNIT HEATER
W	WASTE
WCD	WALL CLEAN-OUT
WH	WALL HYDRANT

VALVE SYMBOLS	
	GATE VALVE
	BALL VALVE
	GLOBE VALVE
	BUTTERFLY VALVE
	CHECK VALVE
	SWING CHECK VALVE
	TRIPLE-OUTLET VALVE
	PLUG VALVE
	DIAPHRAGM VALVE
	NEEDLE VALVE
	ANGLE VALVE
	THREE-WAY VALVE
	SELF-CONTAINED PRESS. REDUC'G VALVE
	EXT. PRESSURE REDUC'G VALVE
	RELIEF / SAFETY VALVE
	HOSE BIBB
	SOLENOID VALVE
	CIRCUIT SETTER
	TEMPERATURE CONTROL VALVE
	3-WAY TEMPERATURE CONTROL
	SELF OPERATED VALVE
	BACKFLOW PREVENTER WITH ORIF. P/V
	INDICATES VALVE IS FLANGED (TYP)

GRILLE AND DIFFUSER SCHEDULE									
Mark	Model	Description	Module Size	Border Type	Material	Neck Size	Front Blade Spacing	Rear Blade Spacing	Accessories
S-1	TMSA-06-24x24-3-26	High Performance Square Cone Diffuser	24 x 24	Lay-In	Steel - Ti-Us - 26 White	8"			
S-2	TMSA-06-24x24-3-26	High Performance Square Cone Diffuser	24 x 24	Lay-In	Steel - Ti-Us - 26 White	8"			
S-3	TMSA-10-24x24-3-26	High Performance Square Cone Diffuser	24 x 24	Lay-In	Steel - Ti-Us - 26 White	10"			
S-4	TMSA-06-12x12-1-26	High Performance Square Cone Diffuser	12 x 12	Surface Mount	Steel - Ti-Us - 26 White	6"			
S-5	TMSA-06-12x12-1-26	High Performance Square Cone Diffuser	12 x 12	Surface Mount	Steel - Ti-Us - 26 White	8"			
S-6	300RS	Adjustable Supply Grille with Double Deflection		Surface Mount	Steel - Ti-Us - 26 White	12"x6"	1"	1"	
S-7	300RS	Adjustable Supply Grille with Double Deflection		Surface Mount	Steel - Ti-Us - 26 White	8"x4"	1"	1"	
S-8	300RS	Adjustable Supply Grille with Double Deflection		Surface Mount	Steel - Ti-Us - 26 White	6"x6"	1"	1"	
S-9	300RL	Adjustable Supply Grille with Double Deflection		Surface Mount	Steel - Ti-Us - 26 White	8"x8"	1"	1"	(1)
S-10	TBD-30-48-08	High Capacity Adjustable Plenum Slot Diffuser		Lay-In	Steel - Ti-Us - Flat Black	8"			
R-1	PAR-6x8-24x24-1-26	Perforated Square Ceiling Diffuser	24 x 24	Lay-In	Steel - Ti-Us - 26 White	6"x6"			(2)
R-2	PAR-6x8-24x24-1-26	Perforated Square Ceiling Diffuser	24 x 24	Lay-In	Steel - Ti-Us - 26 White	8"x8"			(2)
R-3	PAR-10x10-24x24-1-26	Perforated Square Ceiling Diffuser	24 x 24	Lay-In	Steel - Ti-Us - 26 White	10"x10"			(2)
R-4	PAR-12x12-24x24-1-26	Perforated Square Ceiling Diffuser	24 x 24	Lay-In	Steel - Ti-Us - 26 White	12"x12"			(2)
R-5	PAR-15x15-24x24-1-26	Perforated Square Ceiling Diffuser	24 x 24	Lay-In	Steel - Ti-Us - 26 White	15"x15"			(2)
R-6	350RS	Return Grille with 35 Degree Deflection		Surface Mount	Steel - Ti-Us - 26 White	12"x12"			
R-7	350RL	Return Grille with 35 Degree Deflection		Surface Mount	Steel - Ti-Us - 26 White	10"x10"			
R-8	33RL	Heavy Duty Bar Return Grille with 38 deg. Deflection		Surface Mount	Steel - Ti-Us - 26 White	18"x10"			
R-9	33RL	Heavy Duty Bar Return Grille with 38 deg. Deflection		Surface Mount	Steel - Ti-Us - 26 White	22"x10"			
R-10	350RL	Return Grille with 35 Degree Deflection		Surface Mount	Steel - Ti-Us - 26 White	12"x12"			
E-1	PAR-6x8-24x24-1-26	Perforated Square Ceiling Diffuser	24 x 24	Lay-In	Steel - Ti-Us - 26 White	6"x6"			
E-2	PAR-6x8-24x24-1-26	Perforated Square Ceiling Diffuser	24 x 24	Lay-In	Steel - Ti-Us - 26 White	8"x8"			
E-3	PAR-10x10-24x24-1-26	Perforated Square Ceiling Diffuser	24 x 24	Lay-In	Steel - Ti-Us - 26 White	10"x10"			
E-4	350RL	Return Grille with 35 Degree Deflection		Surface Mount	Steel - Ti-Us - 26 White	6"x4"			
E-5	350RS	Return Grille with 35 Degree Deflection		Surface Mount	Steel - Ti-Us - 26 White	6"x6"			
E-6	350RL	Return Grille with 35 Degree Deflection		Surface Mount	Steel - Ti-Us - 26 White	8"x8"			
E-7	350RL	Return Grille with 35 Degree Deflection		Surface Mount	Steel - Ti-Us - 26 White	10"x10"			
E-8	350RL	Return Grille with 35 Degree Deflection		Surface Mount	Steel - Ti-Us - 26 White	12"x12"			
E-9	350RS	Return Grille with 35 Degree Deflection		Surface Mount	Steel - Ti-Us - 26 White	6"x4"			
E-10	350RS	Return Grille with 35 Degree Deflection		Surface Mount	Steel - Ti-Us - 26 White	6"x6"			
E-11	350RS	Return Grille with 35 Degree Deflection		Surface Mount	Steel - Ti-Us - 26 White	8"x4"			
E-12	350RS	Return Grille with 35 Degree Deflection		Surface Mount	Steel - Ti-Us - 26 White	8"x6"			
E-13	350RS	Return Grille with 35 Degree Deflection		Surface Mount	Steel - Ti-Us - 26 White	8"x8"			
E-14	350RS	Return Grille with 35 Degree Deflection		Surface Mount	Steel - Ti-Us - 26 White	12"x8"			
T-1	350RS	Return Grille with 35 Degree Deflection		Surface Mount	Steel - Ti-Us - 26 White	12"x8"			
T-2	PAR-10x10-24x24-1-26	Perforated Square Ceiling Diffuser	24 x 24	Lay-In	Steel - Ti-Us - 26 White	10"x10"			(2)

- NOTES:**
- DIFFUSERS AND GRILLES BASED ON TITUS
 - CONTRACTOR SHALL VERIFY SIZE, LOCATION AND CEILING PRIOR TO ORDERING DIFFUSERS AND GRILLES
 - COORDINATE LOCATION OF DIFFUSERS AND GRILLES WITH ALL TRADES
 - ALL LAY-IN DIFFUSERS SHALL BE 4-WAY THROW, UNLESS NOTED OTHERWISE
 - ALL DIFFUSERS LOCATED IN HARD CEILINGS SHALL HAVE PLASTER TRIM MOUNTING FRAME FOR CEILING ACCESS
 - ALL SUPPLY DIFFUSERS IN HARD CEILINGS SHALL HAVE FLEXIBLE DUCT WORK CONNECTED TO DIFFUSER INLET
- ACCESSORIES:**
- OPPOSED BLADE DAMPER
 - PAINT DUTYWORK BEHIND DIFFUSER, FLAT BLACK

DEPARTMENT OF PUBLIC SAFETY CONDENSING UNIT SCHEDULE						
TAG NO.	MODEL	NOMINAL CAP. (TONS)	VOLTAGE / PHASE	MCA (A)	MOP (A)	RLA (A)
COND-1	REVQ127TJAJ	26	208-3			
	REVQ144TJAJ			55	70	16.2x22.6
	REVQ168TJAJ			62	70	17.4x22.6
COND-1	REVQ144TJAJ	12	208-3	55	70	16.2x22.6

BASED ON DASHN

BRANCH SELECTOR SCHEDULE					
TAG NO.	MODEL	NO. OF VRV	VOLTAGE / PHASE	MCA (A)	FUSE (A)
BS-1	BS80G5TJU	2	208-1	0.4	15
BS-2	BS80G5TJU	6	208-1	0.4	15
BS-3	BS80G5TJU	6	208-1	0.4	15
BS-4	BS80G5TJU	7	208-1	0.4	15
BS-5	BS80G5TJU	6	208-1	0.4	15

BASED ON DASHN

DEPARTMENT OF PUBLIC SAFETY VRV UNIT SCHEDULE													
TAG NO.	ROOM(S) SERVED	UNIT TYPE	NOMINAL CAP. (TONS)	TOTAL CLG. CAP. (BTU/H)	SENS. CLG. CAP. (BTU/H)	HEATING CAP. (BTU/H)	AIRFLOW (CFM)	SOUND (DBA)	VOLTAGE PHASE	MCA	FUSE (A)	PHASE	COMMENTS
VRV-1	118	WALL MOUNTED	0.75	10134	6886	10860	280	31-37	208-1	0.3	15	1, 2	
VRV-2	116	CONCEALED DUCTED	2.5	30710	23196	34616	1004	30-43	208-1	2.8	15	1	
VRV-3	112, 110	CONCEALED DUCTED	0.6	7700	6039	8650	317	29-33	208-1	0.6	15	1	
VRV-4	107	CONCEALED DUCTED	0.6	7700	6039	8650	317	29-33	208-1	0.6	15	1	
VRV-5	106, 109, 111	CONCEALED DUCTED	0.6	7700	6039	8650	317	29-33	208-1	0.6	15	1	
VRV-6	106, 113	CONCEALED DUCTED	2.0	24668	18624	27501	688	30-42	208-1	1.8	15	1	
VRV-7	101, 102, 103, 105	CONCEALED DUCTED	0.6	7700	6039	8650	317	29-33	208-1	0.6	15	1	
VRV-8	104	CONCEALED DUCTED	0.6	7700	6039	8650	229	29-33	208-1	0.6	15	1	
VRV-9	242	CONCEALED DUCTED	0.75	9738	7203	10697	317	29-33	208-1	0.6	15	1	
VRV-10	232, 241, 243	CONCEALED DUCTED	0.6	7700	6039	8650	317	29-33	208-1	0.6	15	1	
VRV-11	232, 240	CONCEALED DUCTED	1.0	12295	9646	13751	450	35-39	208-1	1.4	15	1	
VRV-12	223, 224, 225	CONCEALED DUCTED	1.0	12295	9646	13751	450	35-39	208-1	1.4	15	1	
VRV-13	234, 228, 229	CONCEALED DUCTED	1.0	12295	9646	13751	450	35-39	208-1	1.4	15	1	
VRV-14	218	CONCEALED DUCTED	1.0	12295	9646	13751	450	35-39	208-1	1.4	15	1	
VRV-15	218	CONCEALED DUCTED	1.0	12295	9646	13751	450	35-39	208-1	1.4	15	1	
VRV-16	218, 221	CONCEALED DUCTED	2.5	30710	23196	34616	1004	30-43	208-1	2.8	15	1	
VRV-17	244, 245	CONCEALED DUCTED	1.0	12295	9646	13751	450	35-39	208-1	1.4	15	1	
VRV-18	236, 238, 240	CONCEALED DUCTED	1.5	18438	13574	20701	635	30-42	208-1	1.5	15	1	
VRV-19	237	CONCEALED DUCTED	1.5	18438	13574	20701	635	30-42	208-1	1.5	15	1	
VRV-20	238	CONCEALED DUCTED	0.6	7700	6039	8650	317	29-33	208-1	0.6	15	1	
VRV-21	216, 217	CONCEALED DUCTED	1.5	18438	13574	20701	635	30-42	208-1	1.5	15	1	
VRV-22	211, 212	CONCEALED DUCTED	1.0	12295	9646	13751	450	35-39	208-1	1.4	15	1	
VRV-23	206	CONCEALED DUCTED	2.0	24668	18624	27501	688	30-42	208-1	1.8	15	1	
VRV-24	214, 215, 220	CONCEALED DUCTED	1.5	18438	13574	20701	635	30-42	208-1	1.5	15	1	
VRV-25	244	CONCEALED DUCTED	1.5	18438	13574	20701	635	30-42	208-1	1.5	15	1	
VRV-26	202	CONCEALED DUCTED	1.0	12295	9646	13751	450	35-39	208-1	1.4	15	1	
VRV-27	203, 207, 208	CONCEALED DUCTED	0.6	7700	6039	8650	317	29-33	208-1	0.6	15	1	

NOTES

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1" = 1'-0"



- ALL EXISTING PLUMBING FUTURES, EQUIPMENT AND ASSOCIATED PIPING SHALL BE REMOVED AND THE EXISTING SYSTEMS SHALL BE REINSTALLED TO REMAIN IN PLACE FOR REUSE WITH TEMPORARY COVERS, SHROUDS, BRACING, AND SUPPORTS.
- THE OWNER RESERVES THE RIGHT OF FIRST REFUSAL, IN OWNERSHIP OF ANY AND ALL MATERIALS AND EQUIPMENT, TO BE REMOVED AND REUSED.
- EQUIPMENT TO BE REMOVED AND NOT REUSED SHALL BECOME THE PROPERTY OF THE CONTRACTOR.
- INVESTIGATION OF EXISTING PLUMBING SYSTEMS WILL BE REQUIRED BY THE CONTRACTOR TO DETERMINE THE LOCATION OF ALL EXISTING PLUMBING SYSTEMS. IF NOT ACCURATELY DETERMINED, THE CONTRACTOR'S BID PRICE SHALL ALSO COVER THE COST OF INVESTIGATION OF EXISTING PLUMBING SYSTEMS. THE INVESTIGATION DRAWINGS, BUT DISCOVERED DURING THE INVESTIGATION PROCESS, THE CONTRACTOR SHALL NOT BE RESPONSIBLE FOR THE REMOVAL OF THE DETERMINED WHICH PORTIONS OF EXISTING SYSTEMS MUST REMAIN ACTIVE AND WHICH PORTIONS MUST BE DEMOLISHED. REMOVE ALL INACTIVE PIPING TO THE NEAREST ACTIVE MAINS AND CAP.
- DEMOLITION OF AN ITEM SHALL INCLUDE REMOVAL OF ALL RELATED HANGERS, SUPPORTS, AND BRACING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL INDICATED SURFACES.
- THE CONTRACTOR SHALL PROTECT ALL WALLS, CEILING FLOORS, LIGHTS AND OTHER FINISHED SURFACES WHICH ARE NOT SCHEDULED FOR IMMEDIATE REMOVAL. IF ANY WALLS OR CEILING ARE DAMAGED, CONTRACTOR SHALL REPAIR OR REPLACE TO MATCH ORIGINAL CONDITIONS.
- CONTRACTOR SHALL COORDINATE WITH OTHER TRADES FOR ALL FLOOR, WALL, AND ROOF

03.30.15	BIDS & CONSTRUCTION
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Site / Civil	
Architecture	
Interior	
Structure	
Mechanical	
Electrical	

PROJECT NO. 5-3175



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ANNEX PLUMBING PLANS

AP2.01

Site / Civil	
Architecture	
Interior	
Structure	
Mechanical	
Electrical	

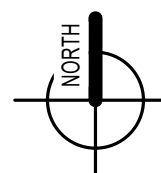
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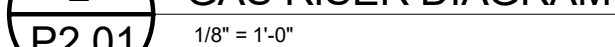
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LOWER LEVEL PLUMBING
PLAN

P2.01



1/8" = 1'-0"



PLUMBING ABBREVIATIONS

MINIMUM SIZE CONNECTION

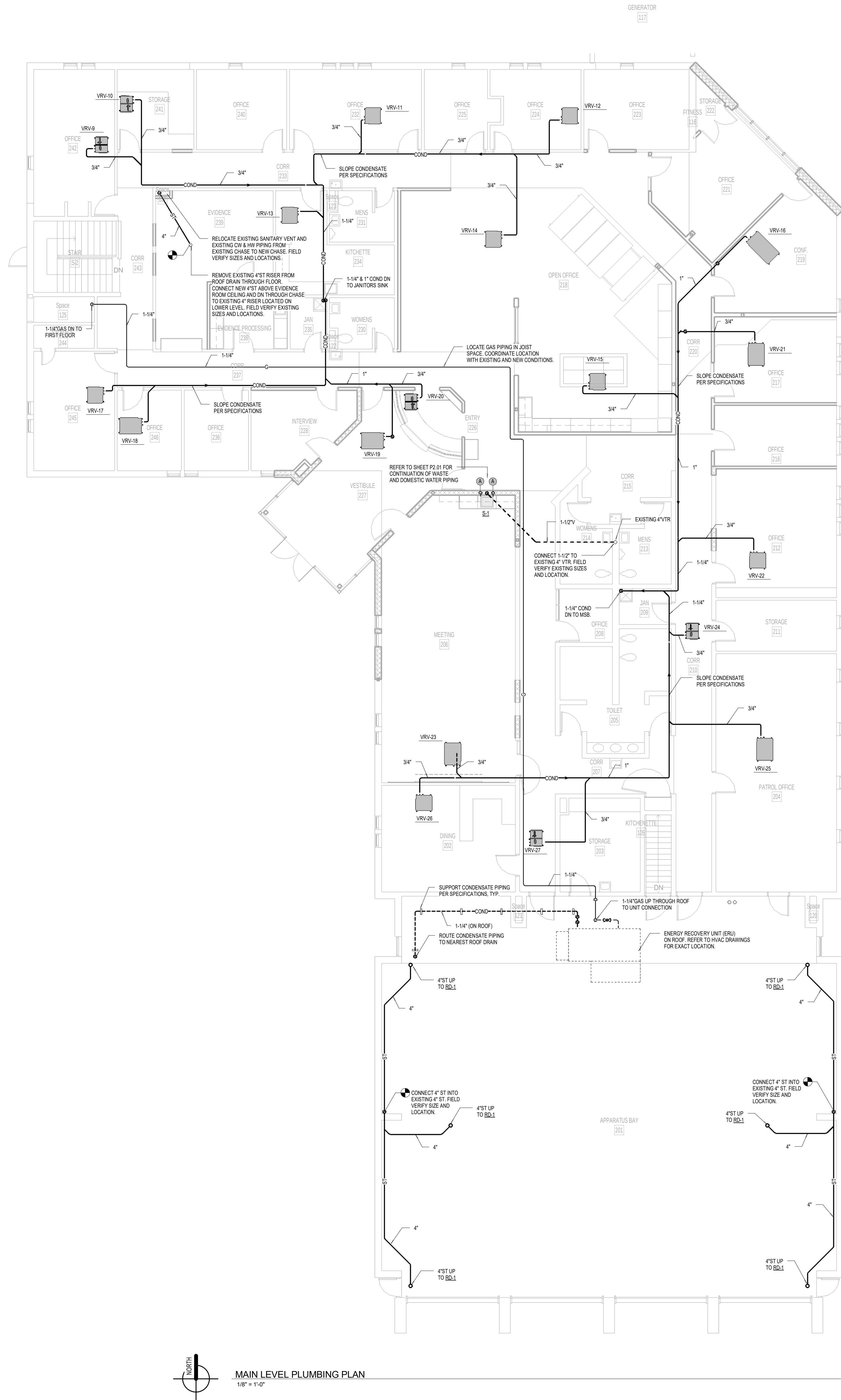
WATER HAMMER ARRESTOR LEGEND

NOTES:
1. PLUMBING CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER PLACEMENT OF WATER HAMMER ARRESTORS. REFER TO SPECIFICATION SECTION 221006 AND MANUFACTURERS RECOMMENDATIONS.

GENERAL PLUMBING NEW WORK NOTES:

4. ALL EXISTING PLUMBING FIXTURES, EQUIPMENT AND ASSOCIATED PIPING SHALL BE REMOVED FROM THE PROJECT SITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL TO REMAIN IN PLACE FOR REUSE WITH TEMPORARY COVERS, COVERING, BRACING, AND PROVISIONS TO PROTECT EXISTING STRUCTURES AND ADJACENT AREAS.
5. ALL EXISTING MATERIALS TO BE REMOVED SHALL BE REMOVED FROM THE BUILDING SITE AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE NECESSARY PERMITS OF THE CITY OF CHICAGO AND SHALL BE REMOVED FROM THE PROJECT SITE.
6. INVESTIGATION OF EXISTING PLUMBING SYSTEMS WILL BE REQUIRED BY THE CONTRACTOR AS PART OF THE INVESTIGATION. SUCH INVESTIGATION SHALL BE CONDUCTED BY A QUALIFIED INVESTIGATOR DETERMINED. THE CONTRACTOR'S BID PRICE SHALL ALSO COVER THE COST OF THE INVESTIGATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE REMOVAL DRAWINGS, BUT DISCOVERED DURING THE INVESTIGATION PROCESS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE CITY OF CHICAGO OF THE REMOVAL. WHICH PORTIONS OF EXISTING SYSTEMS MUST REMAIN ACTIVE AND WHICH PORTIONS MUST BE REMOVED. THE CONTRACTOR SHALL INACTIVE PIPING TO THE NEAREST MAINS AND CAP.
7. DEMOLITION OF AN ITEM SHALL INCLUDE REMOVAL OF ALL RELATED HANGERS, SUPPORTS, BRACES, AND ACCESSORIES.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL UNFINISHED SURFACES.
9. THE CONTRACTOR SHALL PROTECT ALL WALLS, CEILINGS, FLOORS, LIGHTS AND OTHER FINISHED SURFACES WHICH ARE NOT SCHEDULED FOR IMMEDIATE REMOVAL. IF REMOVAL OF SUCH SURFACES IS DETERMINED, CONTRACTOR SHALL REPAIR OR REPLACE TO MATCH ORIGINAL CONDITIONS.
10. CONTRACTOR SHALL COORDINATE WITH OTHER TRADES FOR ALL WALL, FLOOR, AND ROOF REMOVALS.

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MAIN LEVEL PLUMBING PLAN
1/8" = 1'-0"

PLUMBING ABBREVIATIONS			
AV	AIR ADMITTANCE VALVE	HWR	DOMESTIC HOT WATER RETURN
AFF	ABOVE FINISH FLOOR	IOB	ICE MAKER OUTLET BOX
AV	ACID VENT	RD	ROOF DRAIN
CGL	CEILING	SAN	SANITARY DRAIN
COND	CONDENSATE	ST	STORM DRAIN
CONN	CONNECTION	TYP	TYPICAL
CW	DOMESTIC COLD WATER	V	VENT
DN	DOWN	VTR	VENT THROUGH ROOF
EXIST	EXISTING	W	WASTE
FD	FLOOR DRAIN		
FLR	FLOOR		
HW	DOMESTIC HOT WATER		

MINIMUM SIZE CONNECTION				
FIXTURE	CW	HW	SAN	VENT
SNK	1/2"	1/2"	1-1/2"	1-1/2"
DRINKING FOUNTAIN	1/2"	—	1-1/4"	1-1/4"

WATER HAMMER ARRESTOR LEGEND		
SYMBOL	PSI RATING	FIXTURE UNIT CAP
	A	1-11

NOTES:
1. PLUMBING CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER PLACEMENT OF WATER HAMMER ARRESTORS. REFER TO SPECIFICATION SECTION 221006 AND MANUFACTURERS RECOMMENDATIONS.

GENERAL PLUMBING NEW WORK NOTES:

- ALL EXISTING PLUMBING FIXTURES, EQUIPMENT, AND ASSOCIATED PIPING SHOWN AS DASHED OR NOTED SHALL BE REMOVED. PROTECT EXISTING WORK WHICH IS TO REMAIN IN PLACE FOR REUSE WITH TEMPORARY COVERS, SHORING, BRACING, AND SUPPORTS.
- THE OWNER RESERVES THE RIGHT OF FIRST REFUSAL IN OWNERSHIP OF ANY EQUIPMENT AND MATERIALS TO BE REMOVED FROM THE BUILDING SITE. ALL EQUIPMENT TO BE REMOVED AND NOT REUSED SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE OWNERS PROPERTY.
- INVESTIGATION OF EXISTING PLUMBING SYSTEMS WILL BE REQUIRED BY THE CONTRACTOR AS PART OF HIS BID PRICE. SO THAT THE EXACT EXTENT OF DEMOLITION CAN BE ACCURATELY DETERMINED. THE CONTRACTORS BID PRICE SHALL ALSO COVER REMOVAL OF SOME PORTIONS OF PLUMBING SYSTEMS NOT EXPLICITLY SHOWN ON THE DEMOLITION DRAWINGS, BUT DISCOVERED DURING THE INVESTIGATION PROCESS. THE CONTRACTOR SHALL WORK WITH THE ARCHITECT/ENGINEER AND THE OWNER TO DETERMINE WHICH PORTIONS OF EXISTING SYSTEMS MUST REMAIN ACTIVE AND WHICH PORTIONS MUST BE DEMOLISHED. REMOVE ALL INACTIVE PIPING TO THE NEAREST ACTIVE MAINS AND CAP.
- DEMOLITION OF AN ITEM SHALL INCLUDE REMOVAL OF ALL RELATED HANGERS, SUPPORTS, PIPING, AND ACCESSORIES. REMOVAL OF POWER WIRING SHALL BE BY OTHERS UNLESS INDICATED OTHERWISE.
- CONTRACTOR SHALL PROTECT ALL WALLS, CEILINGS, FLOORS, LIGHTS AND OTHER FINISHED SURFACES WHICH ARE NOT SCHEDULED FOR IMMEDIATE REMOVAL. IF SURFACES OR LIGHTS ARE DAMAGED, CONTRACTOR SHALL REPAIR OR REPLACE TO MATCH ORIGINAL CONDITIONS.
- CONTRACTOR SHALL COORDINATE WITH OTHER TRADERS FOR ALL FLOOR, WALL, AND ROOF REPAIR WORK LEFT BY REMOVED ITEMS.

GENERAL FOUNDATION NOTES:

1. PLAN ELEVATION, MAIN LEVEL = 105'-0" ± SITE DATUM EL. 619.99
2. FOUNDATION DESIGN LOADS:
 - a. MAXIMUM SOIL BEARING CAPACITY
COLUMN FOOTINGS = 2000 psf
WALL FOOTINGS = 3000 psf
 - b. CONCRETE COMPRESSIVE STRENGTH (f'_c) = 2000 psi
 - c. REIN. STEEL YIELD STRENGTH (f_y) = 60,000 psi
3. FOUNDATIONS WILL BE PLACED IN BOTH THE NATIVE SOIL AND NEW SAND FILL. PRIOR TO PLACING CONCRETE THE BEARING SURFACE SHALL BE COMPACTED TO A DENSITY OF 95% PERCENT OF ITS MAXIMUM DENSITY AS DETERMINED BY ASTM D1557. REFERENCE THE SOIL REPORT FOUND IN THE SPECIFICATIONS FOR ADDITIONAL RECOMMENDATIONS.
4. ON SITE EXCAVATED SOILS MAY BE USED FOR BACKFILLING OF FOUNDATIONS EXCEPT AT RETAINING WALLS WHERE CLEAN SAND MEETING MOST CLASS 1 STANDARDS SHALL BE USED. THE WATER CONTENT OF ALL CLAY MATERIALS BEING PLACED SHALL BE 15.0 PERCENT OR LESS. FOLLOW THE RECOMMENDED INSTALLATION AND COMPACTION PROCEDURES FOR FILL AS OUTLINED IN THE SPECIFICATIONS AND SOILS REPORT.
5. INSTALL 2" RIGID INSULATION ON ALL PERIMETER FOUNDATION WALLS TO A MINIMUM DEPTH OF 2'-0" BELOW GRADE.
6. STEP FOOTINGS AT A MINIMUM 2 UNITS HORIZONTAL TO ONE (1) UNIT VERTICAL WITH MAXIMUM 24" VERTICAL STEP. SEE DETAIL S107.01.
7. LAP CONTINUOUS REINFORCING 24 BAR DIAMETERS UNLESS NOTED OTHERWISE. PROVIDE CORNER BARS FOR HORIZONTAL REINFORCING OF SAME SIZE.

GENERAL FLOOR SLAB NOTES:

1. FLOOR SLABS ON GRADE SHALL BE MINIMUM 4" THICK CONCRETE WITH SYNTHETIC FIBER REINFORCEMENT PER SPECIFICATIONS.
2. ALL FLOOR SLABS ON GRADE SHALL BE PLACED ON 10 MIL VAPOR BARRIER OVER MINIMUM 4" COMPACTED CLEAN SAND FILL MEETING MOST CLASS 1 STANDARDS PLACED ON COMPACTED SUITABLE SUB-GRADE.
3. INSTALL CONSTRUCTION AND/OR CONTROL JOINTS FOR SLABS ON GRADE ON A MAXIMUM 16'-0" SQUARE GRID OR AS SHOWN ON THE FLOOR FINISH PLANS. REFERENCE DETAIL S117.01 FOR JOINTS.
4. FLOOR SLAB DESIGN LOADS:
CONCRETE COMPRESSIVE STRENGTH = 4000 psi (SLAB ON GRADE)
5. SLAB EDGE DETAIL. PROVIDE BOND BREAKER AT ALL SLAB TO WALL LOCATIONS.

GENERAL STEEL FRAMING NOTES:

1. SEE ARCHITECTURAL DRAWINGS FOR MISCELLANEOUS STEEL REQUIRED NOT LIMITED TO ANGLES, PLATES, CHANNELS, RAILINGS, AND POSTS.
2. MASONRY CORES SHALL BE GROUTED FULL 3 COURSES DOWN MINIMUM BELOW ALL LINTEL, BEAM AND JOIST BEARING LOCATIONS. POCKET WALLS AS NECESSARY. GROUT AND PATCH WALL TO MATCH ADJACENT MATERIAL.
3. FURNISH & INSTALL 20 GA. FLAT PLATE FILLERS & COVERS AT DECK EDGES AND AT TRANSITION LINES OF ORIENTATION CHANGES AS REQ'D.
4. FURNISH & INSTALL ALL JOIST BRIDGING & BRACINGS AS NOTED OR AS REQUIRED BY THE STEEL JOIST INSTITUTE (SJI).
5. PROVIDE 1/8"x1/4" LVL FRAMES FOR ROOF SLUMPS AND FOR ALL OTHER ROOF OPENINGS REQUIRED ON PLANS UNLESS NOTED OTHERWISE.
6. PROVIDE BEARING PLATE "BP" AT ALL K-SERIES JOIST ENDS AND BEARING PLATE "BP" AT ALL L-SERIES JOIST ENDS BEARING ON MASONRY UNLESS NOTED OTHERWISE.

METAL DECK ATTACHMENT:

USE THE FOLLOWING GUIDELINES FOR SECURING THE METAL ROOF DECK TO ITS SUPPORTING STRUCTURE.

1. ALL 1.5 B DECK - USE 5/8" PUDLE WELDS ON 364 PATTERN WITH #10 SCREW SLOEAP FASTENERS MINIMUM 2 PER SPAN OR USE HLT 1/2"x6"x19.15 POWDER ACTUATED FASTENERS ON 364 PATTERN WITH #10 SCREW SLOEAP FASTENERS MIN. 2 PER SPAN
2. ALL 1.5 C FORM DECK - USE 3/8" PUDLE WELDS ON 363 PATTERN WITH #10 SCREW SLOEAP FASTENERS MINIMUM 2 PER SPAN OR USE HLT 1/2"x6"x19.15 POWDER ACTUATED FASTENERS ON 363 PATTERN WITH #10 SCREW SLOEAP FASTENERS MIN. 2 PER SPAN

LINTEL SCHEDULE		
MARK	MATERIAL	SHAPE
U8	8" MASONRY U-BLOCK w/ (2) #4 BARS & CONC. FILL	
U8	8" MASONRY U-BLOCK w/ (2) #5 BARS & CONC. FILL	
U10	10" MASONRY U-BLOCK w/ (2) #5 BARS & CONC. FILL	
U12	12" MASONRY U-BLOCK w/ (3) #5 BARS & CONC. FILL	
L3	L3 10x3 1/2 x 14"	
L5	L5 3 x 12 x 14" LVL	
L6	L6 6 x 8 x 51/8"	
PLATE THICKNESS: 3" = 3/8"		
BEAM SIZE PLATE WIDTH: 09" = 7/16" 09" = 9/16" 11" = 1 1/16" 14" = 1 1/4" 18" = 1 1/2" 21" = 1 3/4"		
INSTALL BEARING PLATE "BP2" FOR ALL LINTELS UNLESS NOTED OTHERWISE ON PLANS (NOT SHOWN FOR CLARITY). ALL STEEL LINTELS IN EXTERIOR WALLS AND AT POOL ENVIRONMENT SHALL BE GALVANIZED. SEE DETAIL BELOW FOR ADDITIONAL REQUIREMENTS.		

STRUCTURAL DESIGN LOADS:

1. OCCUPANCY CATEGORY = I-11
2. FLOOR LOAD:
 - CLASSROOMS & LABS = 40 psf
 - LOBBIES, STAIRS & EXITS = 100 psf
 - CORRIDORS = 100 psf
 - MECHANICAL & MAINTENANCE ROOMS = 125 psf
 - STORAGE ROOMS = 125 psf
 - PARTITION LOAD = 15 psf
3. ROOF LOAD:
 - GROUND SNOW LOAD (P_g) = 50 psf
 - FLAT ROOF SNOW LOAD (P_f) = 42 psf
 - SNOW EXPOSURE FACTOR (C_e) = 1.0
 - SNOW LOAD IMPORTANCE FACTOR (I_s) = 1.2
 - THERMAL FACTOR (C_t) = 1.0
 - ROOF DEAD LOAD = 20 psf
 - ADDITIONAL SNOW DRIFT LOAD:
 - ALL STRUCTURAL FRAMING HAVE BEEN DESIGNED FOR ADDITIONAL DRIFTING PROVIDED COMPLIANCE WITH THE BUILDING CODE AND ASCE 7-05
4. WIND LOAD:
 - ULTIMATE WIND SPEED (3 SEC. GUST) = 125 mph
 - WIND EXPOSURE = B
 - INTERNAL PRESSURE COEFFICIENTS (C_{pi}) = 0.18
 - COMPONENTS & CLADDING PRESSURE:
 - > FLAT ROOFS (BASED ON 20 PSF):
 - 50 psf UP/WT WITHIN 10' OF CORNER
 - 30 psf UP/WT WITHIN 10' OF EDGE
 - 20 psf UP/WT INTERIOR
 - > WALLS =
 - 25 psf POSITIVE
 - 25 psf NEGATIVE
5. SEISMIC DESIGN:
 - RISK CATEGORY = IV
 - SEISMIC IMPORTANCE FACTOR (I_s) = 1.50
 - MAPPED SPECTRAL RESPONSE ACCELERATIONS: $S_a = 0.08, S_1 = 0.045$
 - SITE CLASS = D
 - SPECTRAL RESPONSE COEFFICIENTS: $S_{ds} = 0.08, S_{d1} = 0.072$
 - SEISMIC DESIGN CATEGORY = C
 - SEISMIC FORCE RESISTING SYSTEM = ORDINARY STEEL BRACED FRAME/MASONRY SHEAR WALLS
 - DESIGN BASE SHEAR = 280 psf
 - SEISMIC RESPONSE COEFFICIENT (C_s) = 0.40
 - RESPONSE MODIFICATION FACTOR (R) = 3.25
 - ANALYSIS PROCEDURE = EQUIVALENT LATERAL FORCE PROCEDURE

FOUNDATION LEGEND:

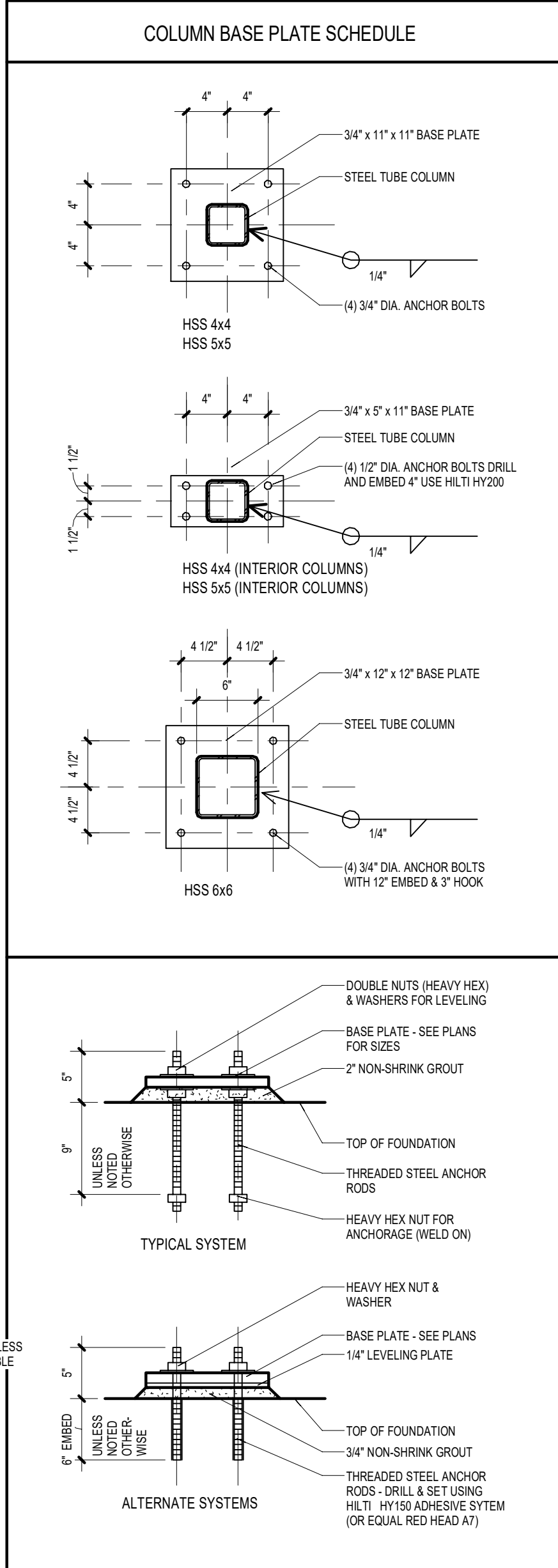
- TOW DENOTES TOP OF WALL ELEVATION
- TOW DENOTES TOP OF PIER ELEVATION
- TOL DENOTES TOP OF LEDGE ELEVATION
- TOL DENOTES TOP OF FOOTING ELEVATION
- TOS DENOTES TOP OF SLAB ELEVATION
- 15" WALL DENOTES CONCRETE WALL THICKNESS
- 8/34 WALL DENOTES 8" SPLIT FOUNDATION WALL, 4" CONCRETE, 4" INSULATION, 4" CMU (SEE DETAIL 1857.02)
- F18 FOOTING MARK - SEE SCHEDULE FOR SIZE & REINFORCING
- P2 PIER MARK - SEE SCHEDULE FOR SIZE & REINFORCING
- CONCRETE FOUNDATION WALL & FOOTING
- MASONRY WALL & CONCRETE FOOTING

FRAMING LEGEND:

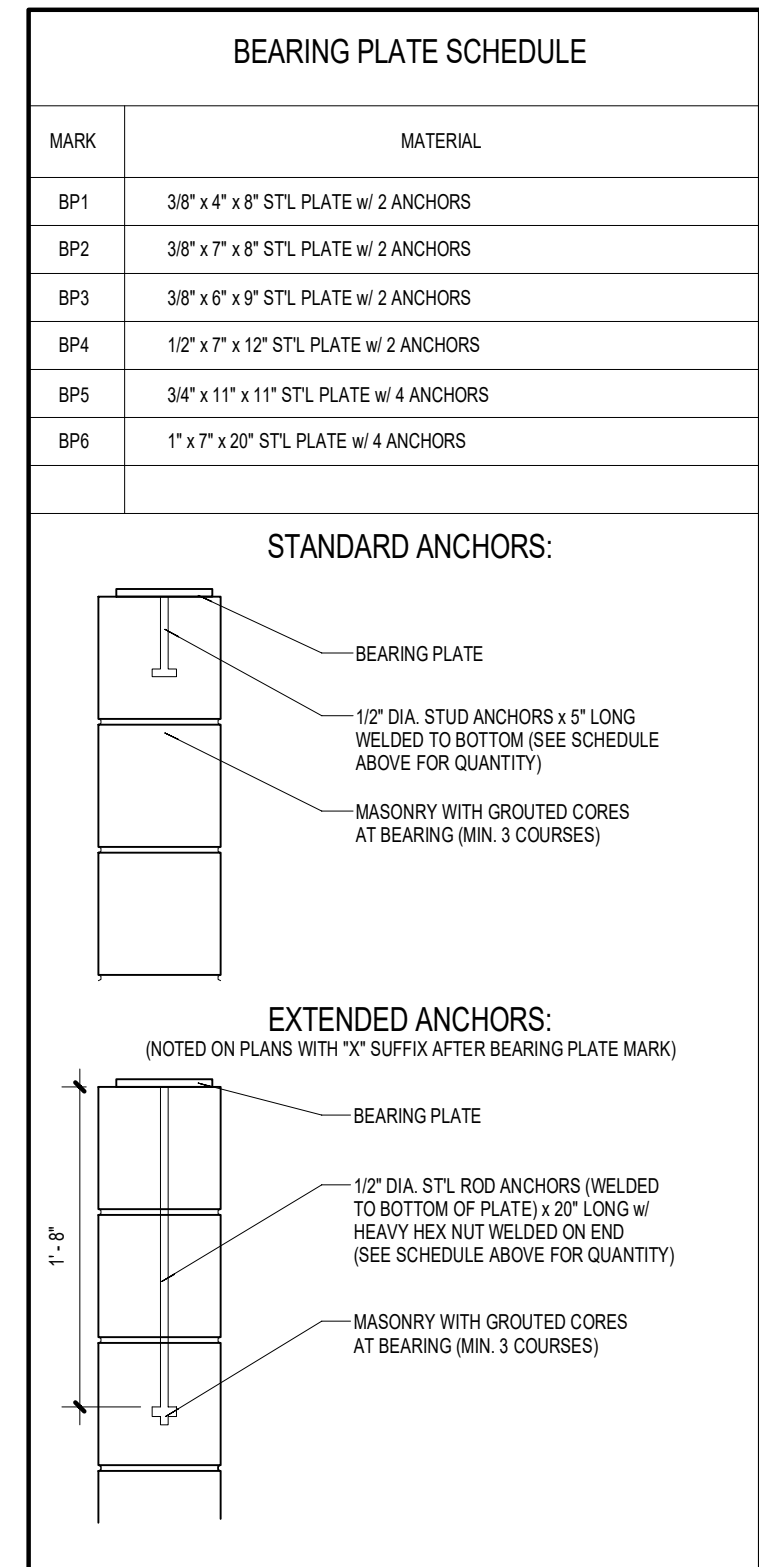
- U8 DENOTES LINTEL TYPE (SEE SCHEDULE ABOVE)
- BP1 DENOTES BEARING PLATE TYPE (SEE SCHEDULE ABOVE)
- W18x30-S DENOTES BEAM WITH STUDS ON TOP FLANGE (MINIMUM 12" DIA. x 4" LONG HEADED STUDS @ 32"OC)
- T100-0" DENOTES TOP OF STEEL (SEE PLANS)
- B100-0" DENOTES BOTTOM OF STEEL (SEE PLANS)
- MO MOMENT CONNECTION
- EOD EDGE OF DECK
- TCX TOP CHORD EXTENSION
- BCX BOTTOM CHORD EXTENSION
- 1/4 DENOTES STRUCTURE SLOPES DOWN & PITCH
- EX. W18x50 THE "EX" DENOTES EXISTING STEEL TO REMAIN (ALL OTHER MEMBERS NOT NOTED WITH AN "EX" SHALL BE NEW & FURNISHED AS PART OF THIS CLARITY).
- (FV) FIELD VERIFY
- BOD BOTTOM OF DECK
- ABV ABOVE
- BLW BELOW

NON LOAD BEARING LINTEL SCHEDULE		
MASONRY OPENING	WITH	LINTEL
0'-0" TO 6'-4"	4" BRCK	L3 10x3 1/2 x 14"
	6" CMU	U8
	12" CMU	U10
6'-0" TO 10'-0"	4" BRCK	L5 3 x 12 x 14" LVL
	6" CMU	W18X130
	12" CMU	W18X130
	12" CMU	W18X130
	12" CMU	W18X130
10'-0" TO 14'-0"	6" CMU	W18X130
	12" CMU	W18X130
	12" CMU	W18X130

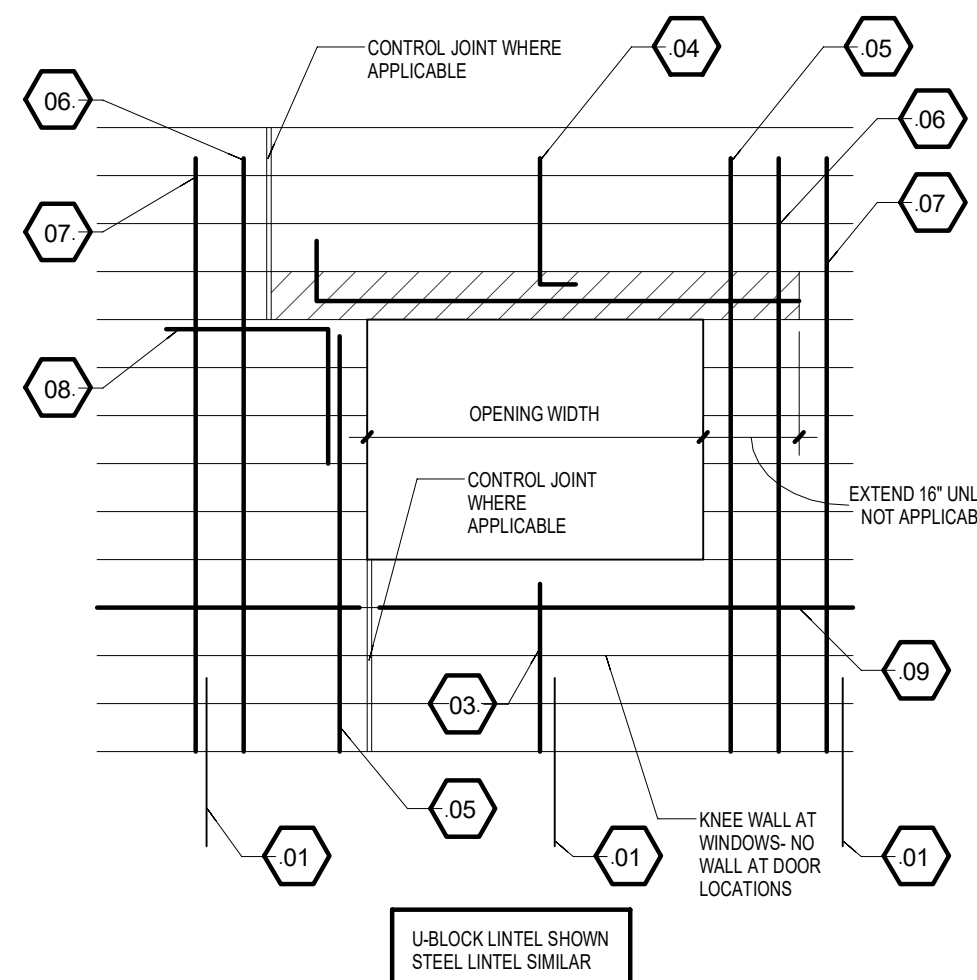
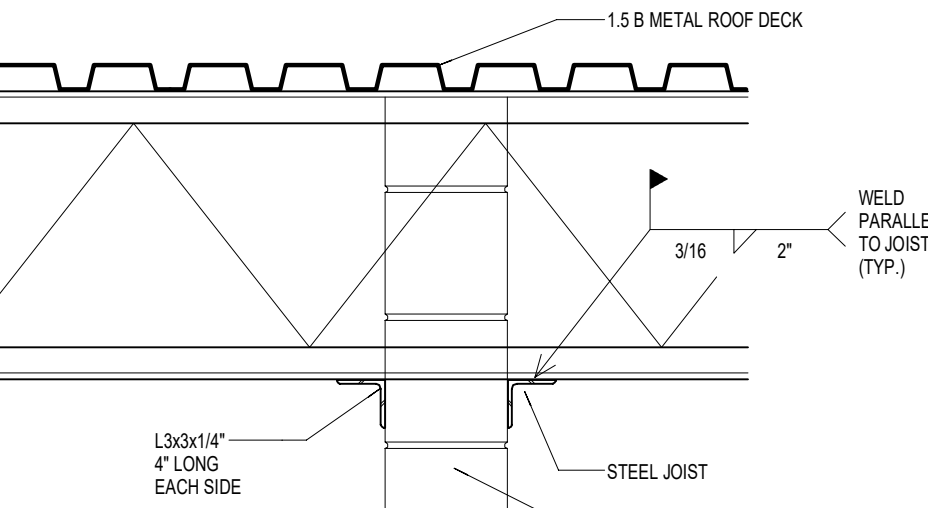
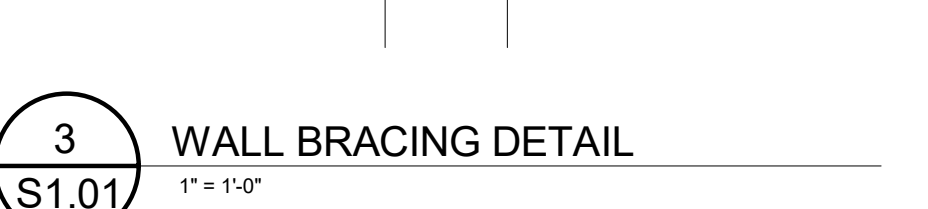
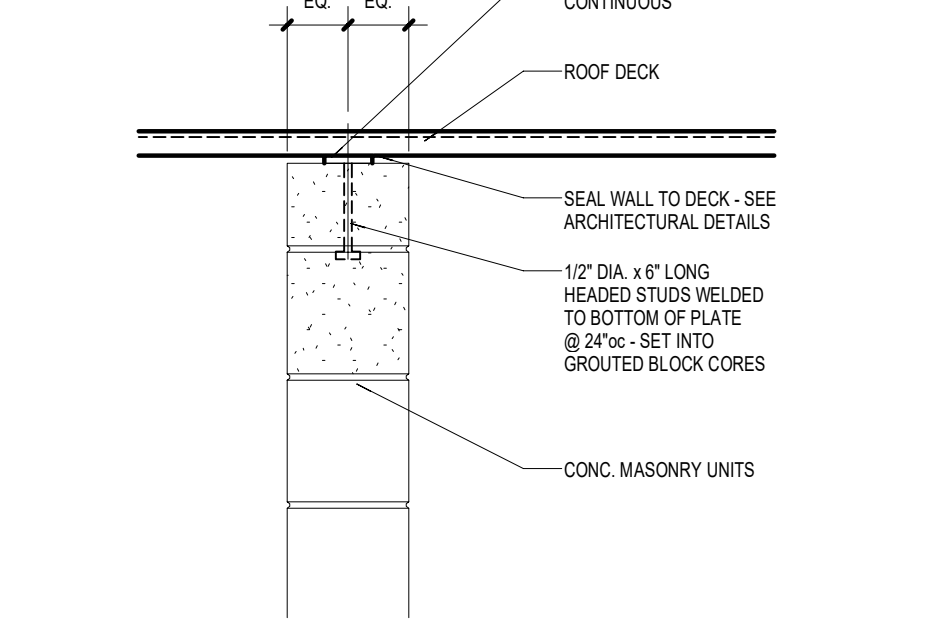
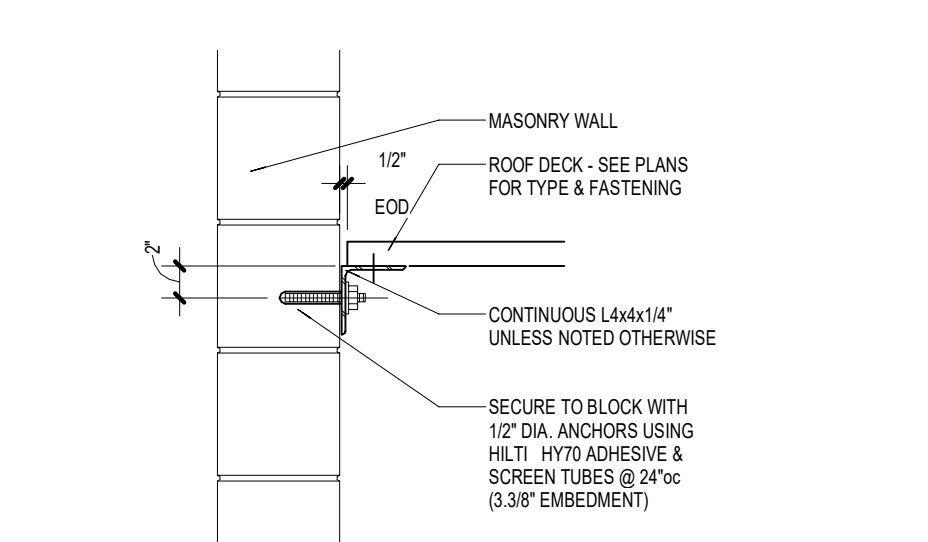
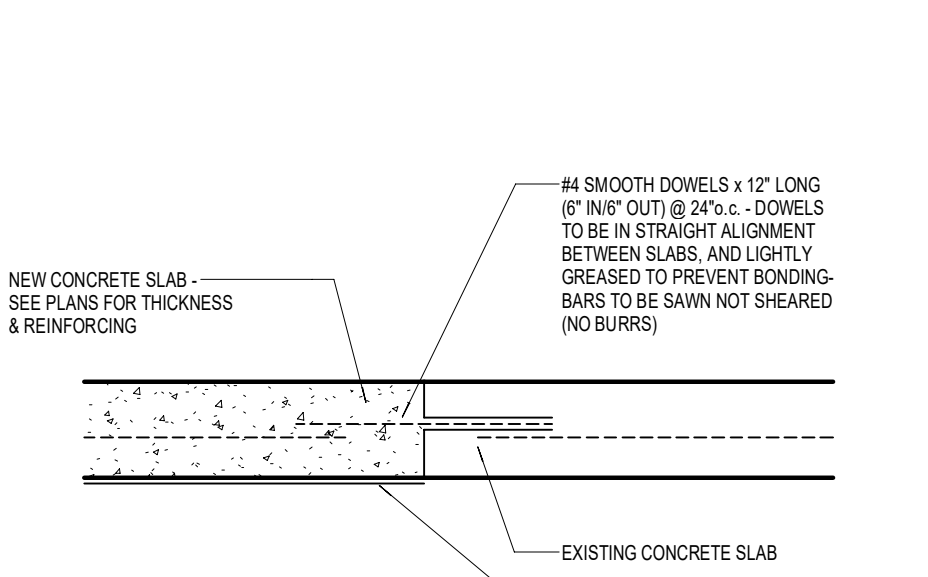
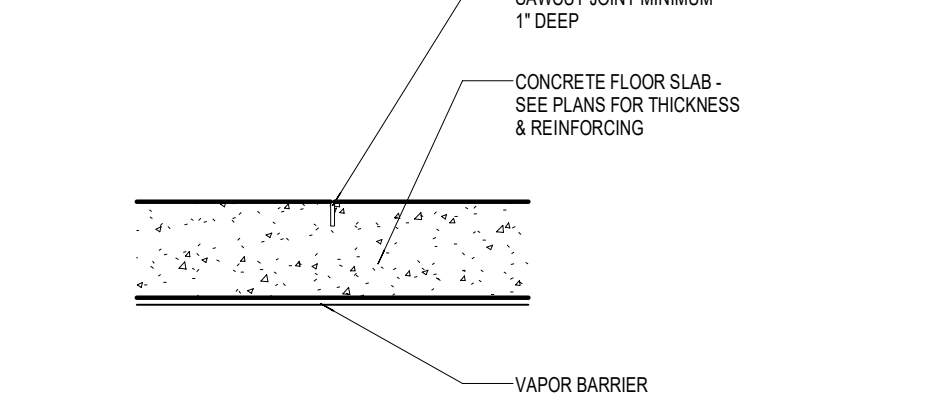
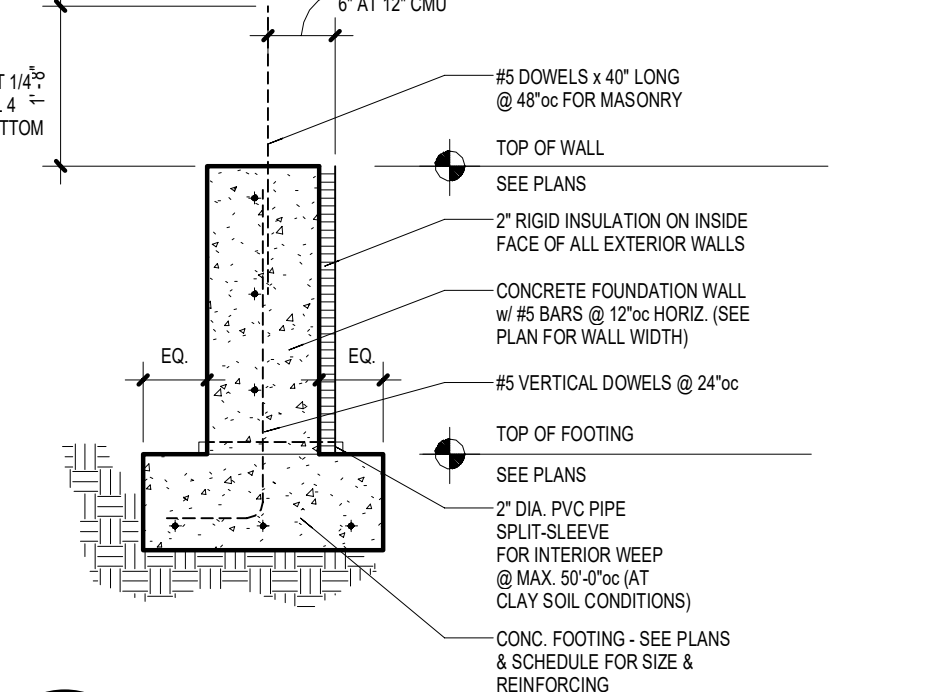
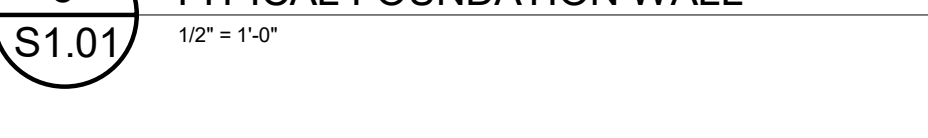
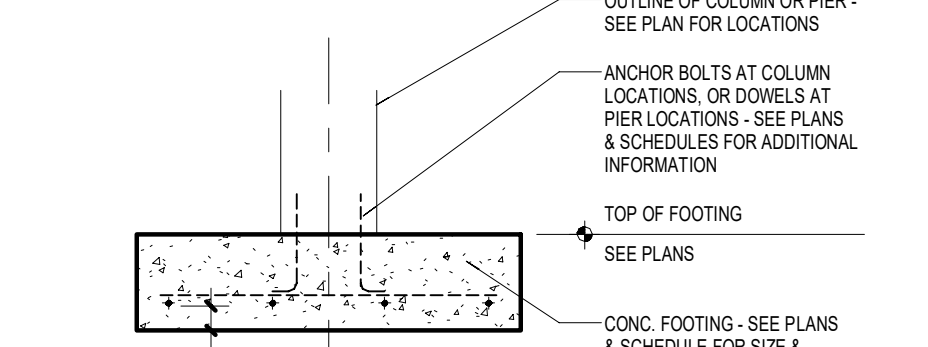
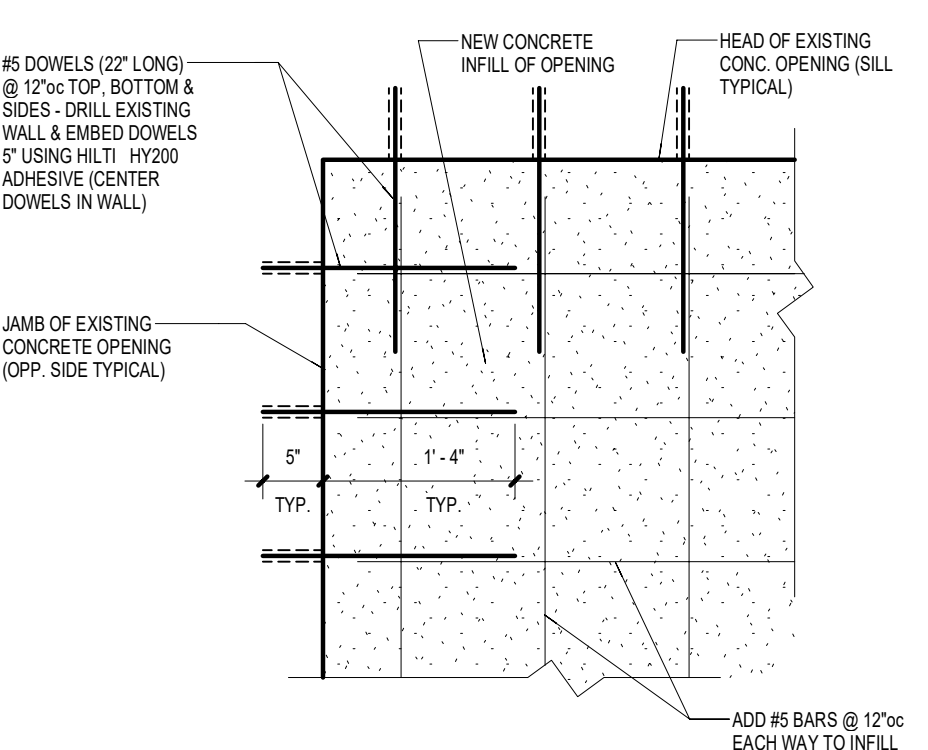
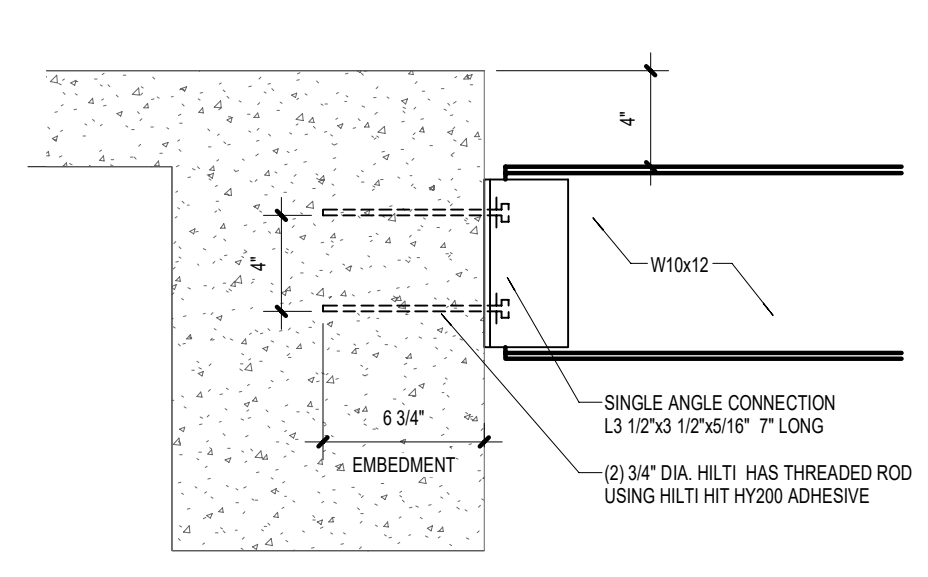
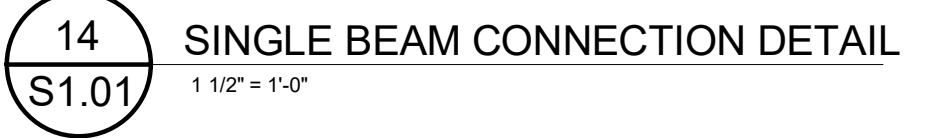
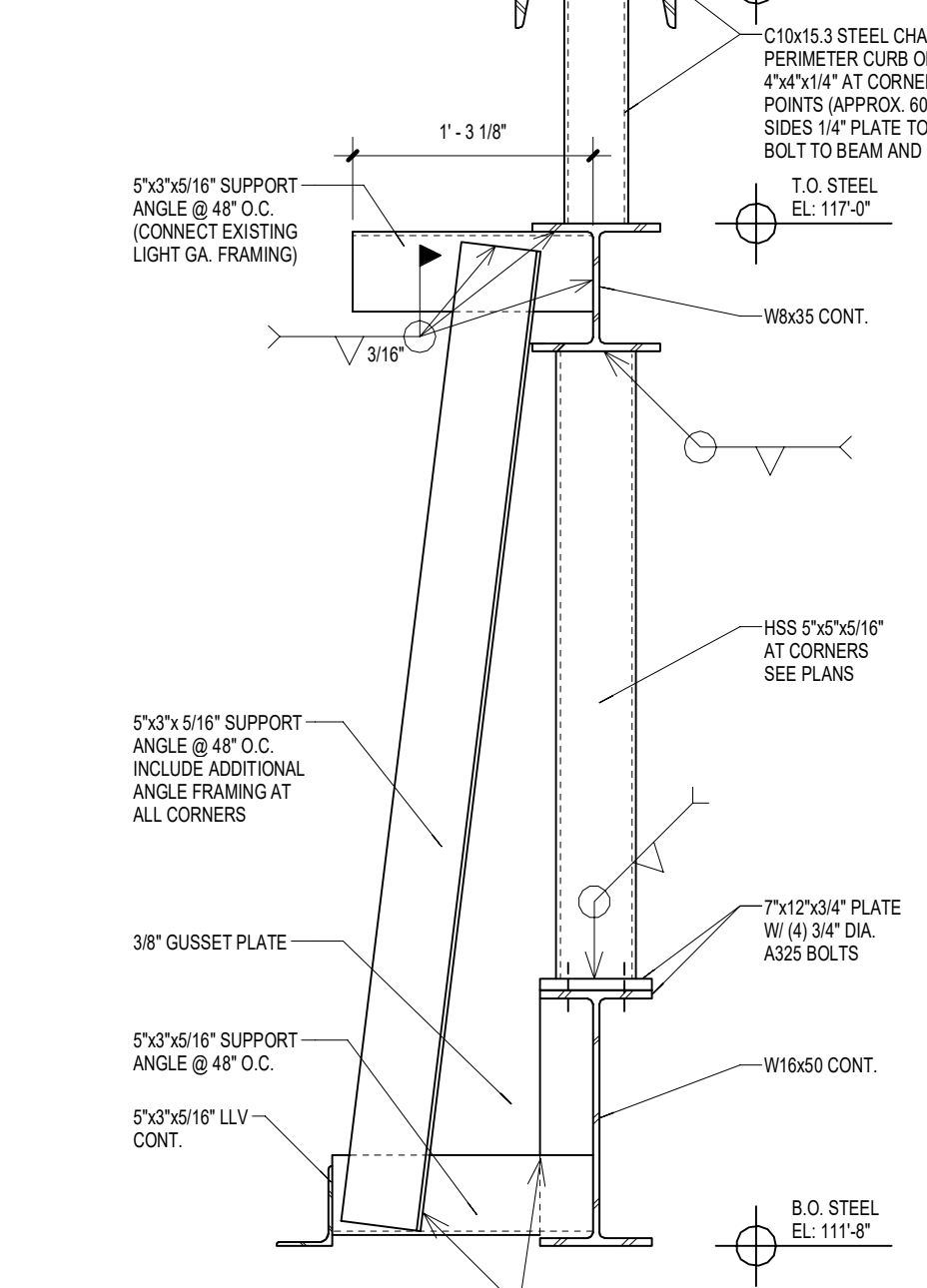
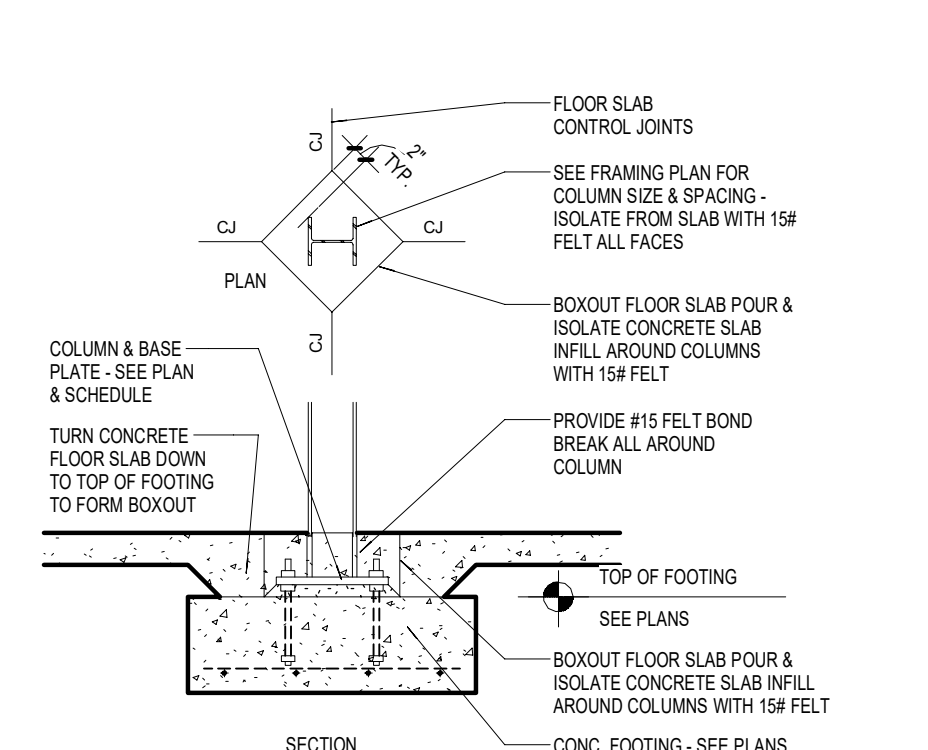
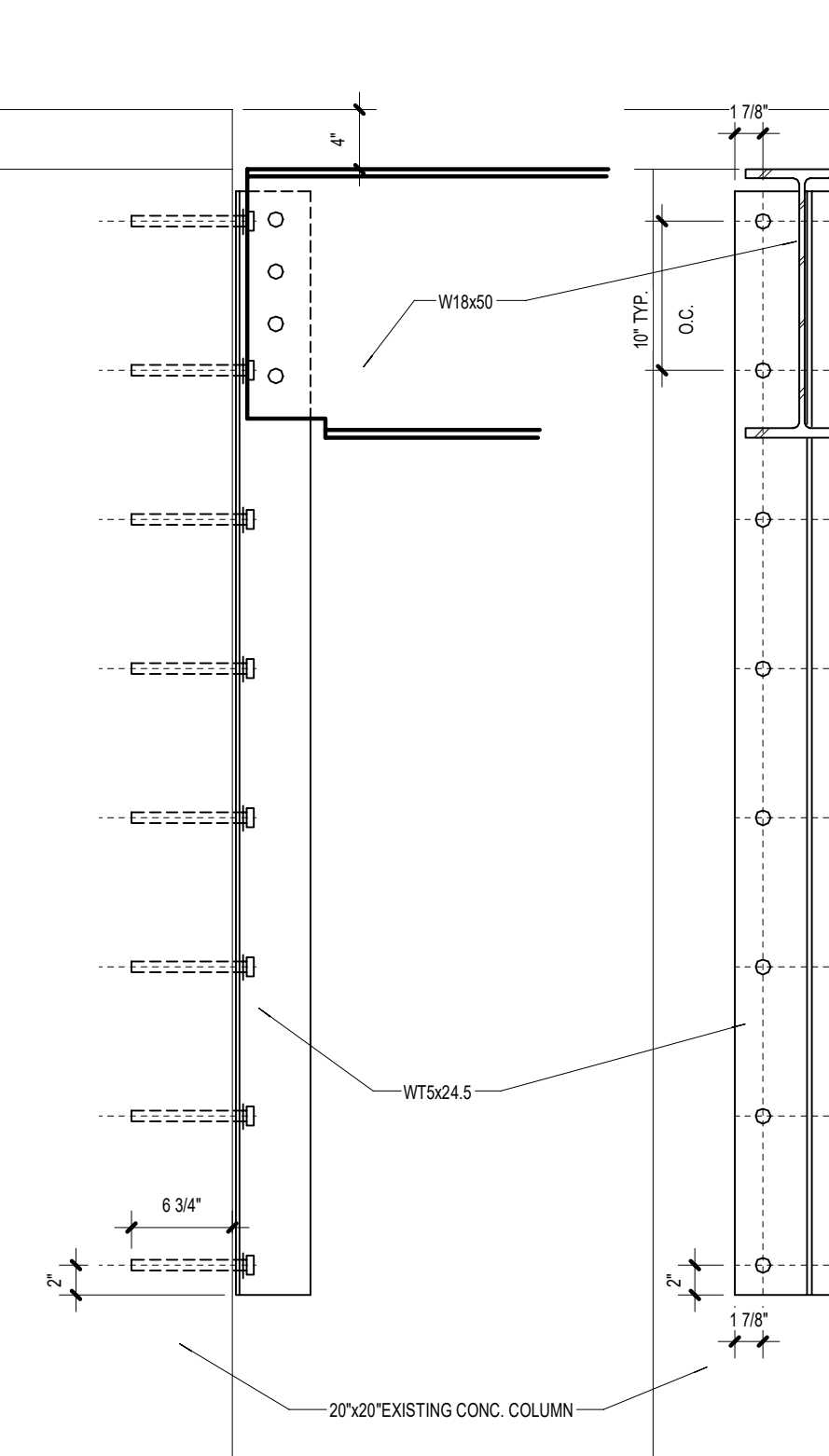
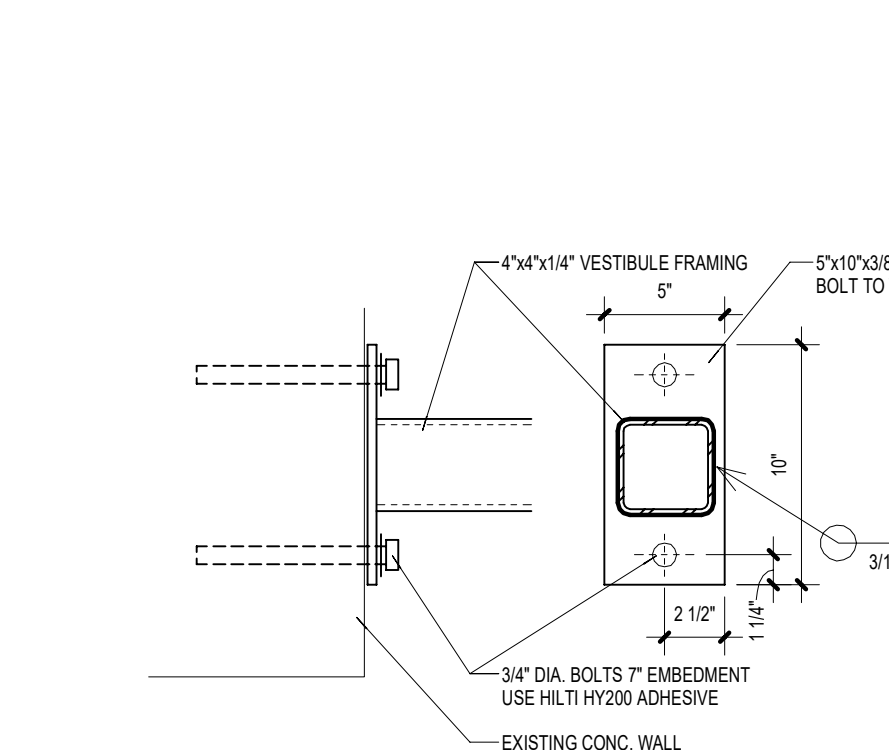
PIER DIAGRAM SCHEDULE		
MARK	WIDTH	LENGTH
P1	16"	VARIES
P2	22"	VARIES
P3	24"	VARIES
P4	32"	VARIES
P5	24"	48"
P6	32"	48"



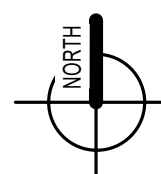
PIER SCHEDULE			
MARK	WIDTH	LENGTH	HEIGHT
P1	16"	10"	VARIES
P2	22"	22"	VARIES
P3	24"	24"	VARIES
P4	32"	32"	VARIES
P5	24"	48"	VARIES
P6	32"	48"	VARIES



- 01 FOUNDATION DOWELS PER DRAWINGS
- 02 U-BLOCK REINFORCING HEADER - EXTEND STRAIGHT OR AT CONTROL JOINT PROVIDE STD. 45 DEGREE HOOK ON REINFORCING AND GROUT SOLID INTO CORES ABOVE LINTEL
- 03 CONTINUE VERTICAL WALL REINFORCING IN KNEE WALL BELOW OPENING (WHERE APPLICABLE)
- 04 CONTINUE VERTICAL WALL REINFORCING OVER OPENING AND/OR INTO LINTEL BEAM WITH STD. 45 DEGREE HOOK
- 05 ADD (1) #5 VERT. BAR IN GROUTED FIRST CORE AT JAMBS - RUN FULL HEIGHT OF WALL IN ADDITION TO SCHEDULED REINFORCING
- 06 AT OPENING WIDTHS OF 4'-11" THRU 8'-0" ADD (1) #5 VERT. BAR IN GROUTED SECOND CORE AT JAMBS - RUN FULL HEIGHT OF WALL IN ADDITION TO SCHEDULED REINFORCING
- 07 AT OPENING WIDTHS OVER 8'-1" ADD (1) #5 VERT. BAR IN GROUTED THIRD CORE AT JAMBS - RUN FULL HEIGHT OF WALL IN ADDITION TO SCHEDULED REINFORCING
- 08 AT TERMINATED VERTICAL REINFORCING PROVIDE ACI 90 DEGREE HOOK OR #4 DOWELS (20"x20") GROUTED INTO ADJACENT CORES
- 09 PROVIDE LADDER JOINT REINFORCING IN BED JOINT OF FIRST COURSE BELOW THE SILL - RUN FROM CONTROL JOINT TO CONTROL JOINT



UNLESS NOTED OTHERWISE, SEE SHEET S1.01 FOR TYPICAL WALL FOOTING
DETAIL AND TYPICAL COLUMN FOOTING DETAIL



GRAND HAVEN, MICHIGAN

03.30.15	BIDS & CONSTRUCTION
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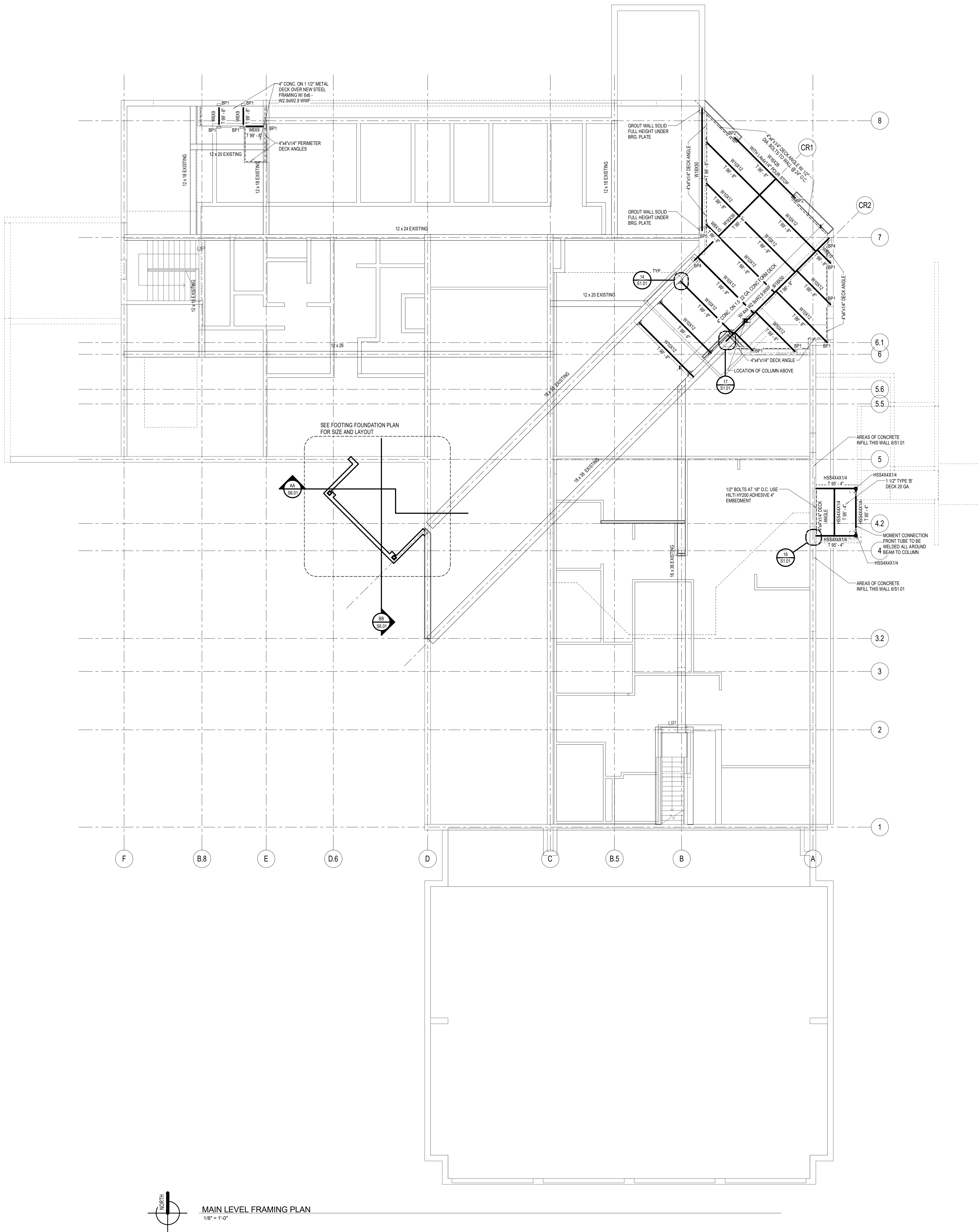
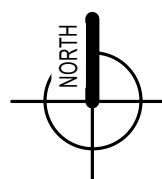


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MAIN LEVEL FRAMING PLAN

1/8" = 1'-0"

ISSUANCES

03.30.15 BIDS & CONSTRUCTION

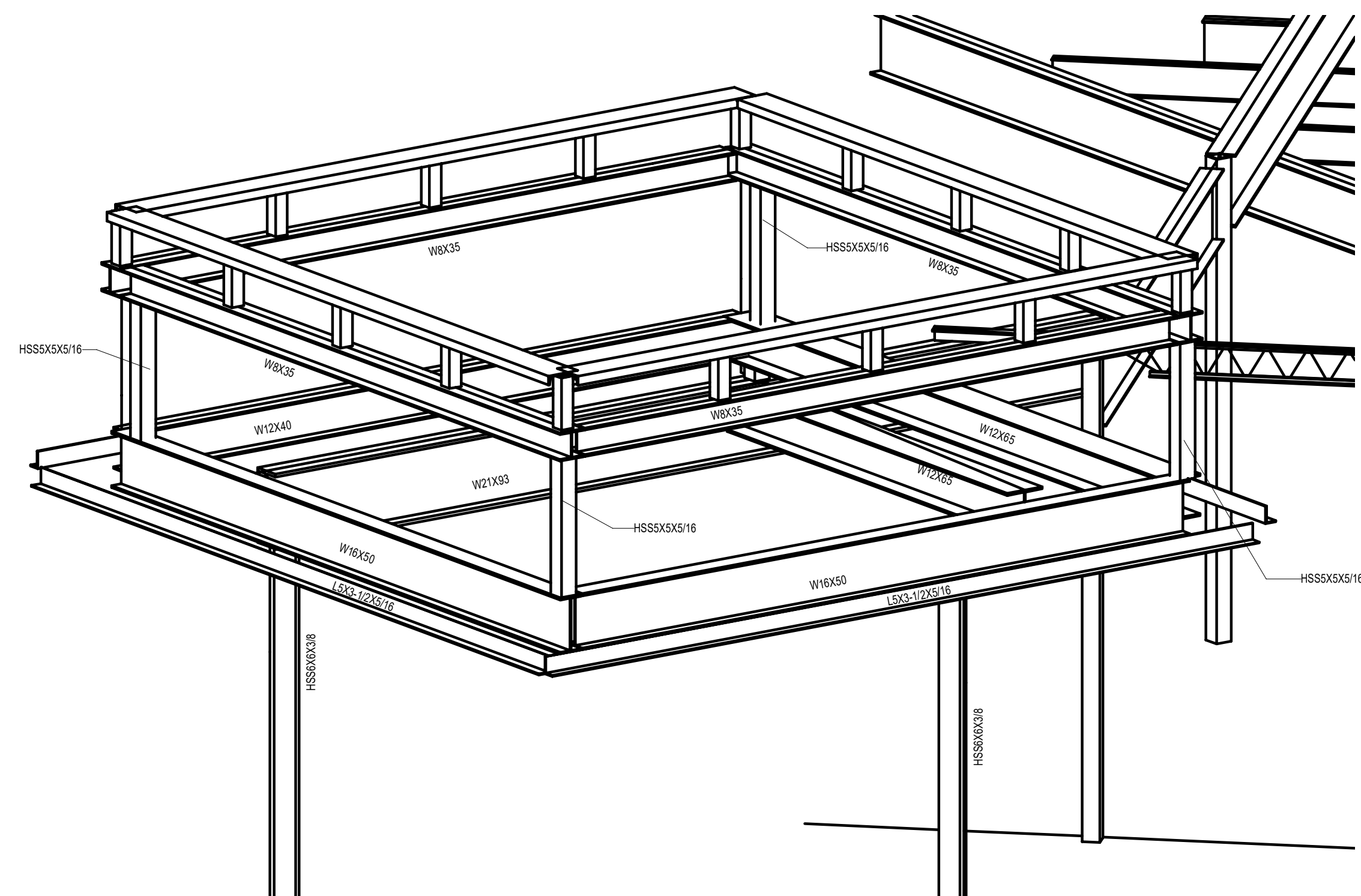
Site / Civil	
Architecture	
Interior	
Structure	
Mechanical	
Electrical	

PROJECT NO. 5-3175

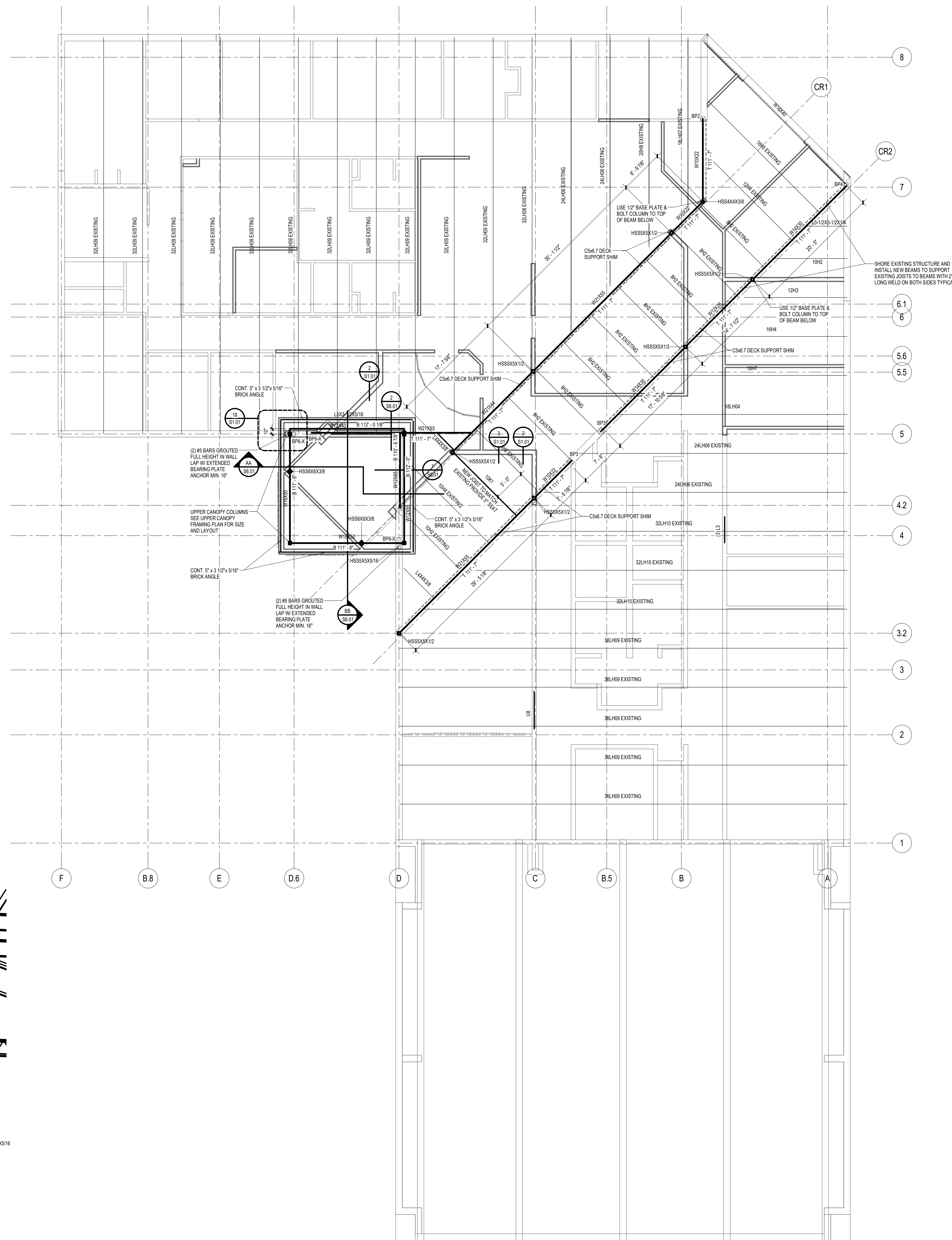
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1 CANOPY FRAMING ISOMETRIC



ROOF FRAMING PLAN
1/8" = 1'-0"



HVAC SYSTEM REPLACEMENT

GRAND HAVEN PUBLIC SAFETY

525 Washington Ave
Grand Haven, MI 49417

Engineer:

IGNYTE

MECHANICAL + ELECTRICAL DESIGN
123 devisser place
kalamazoo, mi 49007
269.207.9247

Architect:

In-Formarchitecture

architecture - interior design
123 devisser place
kalamazoo, mi 49007
269.270.3331

Applicable Codes:

- MICHIGAN BUILDING CODE (MBC) - 2015
- MICHIGAN MECHANICAL CODE (IMC) - 2021
- MICHIGAN PLUMBING CODE (IPC) - 2021
- MICHIGAN ELECTRICAL CODE (NFPA 70) - 2023
- MICHIGAN ENERGY CODE (IECC) - 2015
- MICHIGAN FIRE SPRINKLER CODE (NFPA 13) - 2013
- ASHRAE STANDARD 55 - 2023
- ASHRAE STANDARD 62.1-2016

Alternates:

- ALTERNATE #1: (ADD) LOCKER ROOM COOLING
ALTERNATE #2: (ADD) APARATUS BAY AND DIRECTOR PARKING GAS-FIRED RADIANT

Drawing Index:

SHEET NO.	SHEET NAME	SHEET NO.	SHEET NAME
G000	COVER SHEET	E000	ELECTRICAL SYMBOLS AND SPECIFICATION
M000	MECHANICAL SYMBOLS AND GENERAL NOTES	ED100	LOWER LEVEL ELECTRICAL DEMOLITION PLAN
MD100	LOWER LEVEL MECHANICAL DEMOLITION PLAN	ED110	MAIN LEVEL ELECTRICAL DEMOLITION PLAN
MD110	MAIN LEVEL MECHANICAL DEMOLITION PLAN	E100	LOWER LEVEL POWER PLAN
M010	MECHANICAL ZONE PLAN	E110	MAIN LEVEL POWER PLAN
M020	MECHANICAL ZONE PLANS	E401	ELECTRICAL ONE-LINE DIAGRAM
M300	LOWER LEVEL SHEET METAL PLAN	ED901	ALTERNATE - ELECTRICAL DEMOLITION PLANS
M310	MAIN LEVEL SHEET METAL PLAN	E901	ALTERNATE - ELECTRICAL PLANS
M400	LOWER LEVER HVAC PIPING PLAN		
M410	MAIN LEVEL HVAC PIPING PLAN		
M601	MECHANICAL SYSTEM DIAGRAMS		
M701	MECHANICAL SCHEDULES		
M710	MECHANICAL DETAILS		
M801	TEMPERATURE CONTROLS		
M900	ALTERNATE - MECHANICAL DEMOLITION PLAN		
M901	ALTERNATE - LOWER LEVEL MECHANICAL PLAN		
M902	ALTERNATE - MAIN LEVEL MECHANICAL PLAN		
M903	ALTERNATE - SCHEDULES & DETAILS		

Grand total: 26

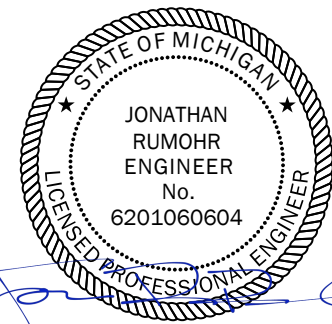


HVAC SYSTEM
REPLACEMENT

IGNYTE

MECHANICAL + ELECTRICAL DESIGN

BID DOCUMENTS 08.12.2024
Issued For: Date



STAMP
THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.
SCALE

Drawing Title:

COVER SHEET

Project No: 23.110

G000

ABBREVIATION	DESCRIPTION	ABBREVIATION	DESCRIPTION	ABBREVIATION	DESCRIPTION
A	COMPRESSED AIR	FD	FLOOR DRAIN	O	OXYGEN
A(____#)	COMPRESSED AIR (SPECIFIC PSIG)	FFD	FUNNEL FLOOR DRAIN	OA	OUTSIDE AIR
AAV	AUTOMATIC AIR VENT	FH	FIRE HYDRANT	OAT	OUTSIDE AIR TEMPERATURE
ACC	AIR COOLED CONDENSER	FHC	FIRE HOSE CABINET	OB	OPPOSITE BLADE DAMPER
ACCU	AIR COOLED CONDENSER UNIT	FHR	FIRE HOSE RACK	OCN	ON CENTER/CENTER TO CENTER
AD	ACCESS DOOR	FHV	FIRE HOSE VALVE	OD	OUTSIDE DIAMETER
AD	AREA DRAIN	FLA	FULL LOAD AMPS	OED	OPEN ENDED CUT
AE	AIR EXTRACTOR	FLD	FLOOR DRAIN	OFCI	OWNER FURNISHED, CONTRACTOR INSTALL
AFMS	ABOVE FINISHED FLOOR	FM	FLOW METER	OFOI	OWNER FURNISHED, OWNER INSTALLED
AFMS	AIRFLOW MEASURING STATION	FMS	FLOW MEASURING STATION	OVERLOAD	OVERLOAD
AGRAE	ABOVE GRADE	FPM	FOOT PER MINUTE	ORC	OVERFLOW RAIN CONDUCTOR
AHU	AIR HANDLING UNIT	FP	FIRE PUMP	ORD	OVERFLOW ROOF DRAIN
ALT	ALTERNATE	FPTU	FAN POWERED (AIR) TERMINAL UNIT	OS&Y	OUTSIDE SCREW AND YOKE
AMP	AMPERE	FS	FLOOR SINK	OV	OUTLET VELOCITY
APD	AIR PRESSURE DROP	FSE	FOOD SERVICE EQUIPMENT	OVS	OPERATOR WORKSTATION
AR	ARGON	FT	FEET		
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR-CONDITIONING ENGINEERS	FR	FINNED TUBE RADIATION	PACU	PACKAGED AIR CONDITIONING UNIT
ASR	AUTOMATIC SPRINKLER RISER	FW	FOOT WASH	PB	PARALLEL BLADE DAMPER
AUX	AUXILIARY	FV	FACE VELOCITY	PC	PUMPED CONDENSATE
AV	ACID VENT	G	NATURAL GAS	PCW	PROCESS COOLING WATER
AVTR	ACID VENT THROUGH ROOF	GA	GAUGE	PCWR	PROCESS COOLING WATER RETURN
AW	ACID WASTE	GAL	GALLON	PCWS	PROCESS COOLING WATER SUPPLY
		GAL	GALLON PER HOUR	PD	PRESSURE DROP (FEET OF WATER)
		GR	GROUND HYDRANT	PH	PERMETER HEAT
BAS	BUILDING AUTOMATION SYSTEM	GRH	GALLOWS RELIEF HOOD	PHR	PERMETER HEAT RETURN
BLOWER COIL UNIT		GPH	GALLONS PER HOUR	PHS	PERMETER HEAT SUPPLY
BDD	BACK DRAFT DAMPER	GPM	GALLONS PER MINUTE	PNL	PANEL
BFF	BELOW FINISHED FLOOR			PPM	PARTS PER MILLION
BFP	BACKFLOW PREVENTER	H	HYDROGEN	PRESS	PRESSURE
BRK	BRAKE HORSEPOWER	HBB	HOT BIBB	PRV	PRESSURE REDUCING VALVE
BOD	BOTTOM OF DUCT	HC	HEATING COIL	PSAN	PUMPED SANITARY
BP	BOTTOM OF PIPE	HD	HOT DECK	PSI	POUNDS PER SQUARE INCH
BTU	BRITISH THERMAL UNIT	HEPA	HIGH EFFICIENCY PARTICULATE ARRESTANCE	PSIA	POUNDS PER SQUARE INCH - ABSOLUTE
BTUH	BRITISH THERMAL UNIT PER HOUR	HGT	HIGH TIGHT	PSIG	POUNDS PER SQUARE INCH - GAUGE
BWV	BACKWATER VALVE	HQA	HAND-OFF/AUTO	PST	PUMPED STORM
		HO	HUB OUTLET	PW	PURIFIED WATER
		HP	HEAT PUMP	PWR	PURIFIED WATER RETURN
C	COMMON	HPW	HORSEPOWER	PWS	PURIFIED WATER SUPPLY
CAP	CAPACITY	HPCW	HIGH PRESSURE DOMESTIC COLD WATER		
CAV	CONSTANT AIR VOLUME	HPHW	HIGH PRESSURE DOMESTIC HOT WATER	(R)	RELOCATED
CB	CATCH BASIN	HPHWR	HIGH PRESSURE DOMESTIC HOT WATER RETURN		RETURN GRILLE OR REGISTER
CB	COOLING COIL	HPSWR	HIGH PRESSURE DOMESTIC HOT WATER RETURN	RA	RETURN AIR
CD	COLD DECK	HPL	HEAT PUMP LOOP	RAT	RETURN AIR TEMPERATURE
CD	CONDENSATE DRAIN	HPS	HIGH PRESSURE STEAM	RC	RAIN CONDUCTOR
CFI	CONTRACTOR FURNISHED, CONTRACTOR	HLR	HEAT PUMP LOOP RETURN	RCP	RAISED CEILING PANEL
CFI	INSTALLED	HPS	HEAT PUMP LOOP SUPPLY	R	ROOF DRAIN
CFM	CUBIC FEET PER MINUTE	HR	HOUR	REQ	REQUIRED
CFM	CUBIC FEET PER MINUTE	HTG	HEATING	REDF	RETURN EXHAUST FAN
CH	CHILLER	HW	HEATING VENTILATING, AIR CONDITIONING	RH	RETURN FAN
CH	CHILLED WATER	HVAC	HEATING VENTILATING, AIR CONDITIONING	RL	RELATIVE HUMIDITY
CHWR	CHILLED WATER RETURN	HHW	HEATING HOT WATER	RH	REFRIGERANT LIQUID
CHWS	CHILLED WATER SUPPLY	HHWR	HEATING HOT WATER RETURN	RLFA	RELIEF AIR
CID	CODING	HHWS	HEATING HOT WATER SUPPLY	RPM	REVOLUTIONS PER MINUTE
CIS	CONDENSATE	HW	HEATING HOT WATER	RS	REFRIGERANT SUCTION
CND(____#)	CONDENSATE (SPECIFIC PSIG)	HW(____)	DOMESTIC HOT WATER (SPECIFIC TEMP °F)	RTU	ROOFTOP UNIT
CO	CLEAN OUT	HWR	DOMESTIC HOT WATER RETURN		
CO	CARBON DIOXIDE	HX	HEAT EXCHANGER		
CONT	CONTINUATION OR CONTINUED	HZ	HERTZ	SA	SUPPLY AIR DIFFUSER OR GRILLE
CONTR	CONTRACTOR			SA	SOUND ATTENUATOR
CONV	CONVECTOR	IAQ	INDOOR AIR QUALITY	SA	SUPPLY AIR
CONV	COEFFICIENT OF PERFORMANCE	ID	INSIDE DIAMETER	SAN	SANITARY WASTE
CP	CIRCULATING PUMP	IE	INVERT ELEVATION	SAN (GREASE)	SANITARY WASTE - GREASE
CRU	CONDENSATE RETURN UNIT	INT	INTAKE HOOD	SAT	SUPPLY AIR TEMPERATURE
CSS	CLINICAL SERVICE SINK	IN	INCHES	SCW	SOFTENED DOMESTIC COLD WATER
CT	COOLING TOWER	INH	INCHES	SCWF	SOFTENED DOMESTIC COLD WATER FILTERED
CU	CABINET UNIT HEATER	INW	INDIRECT WASTE	SECT	SECTION
CW	DOMESTIC COLD WATER			SF	SUPPLY FAN
CW	DOMESTIC COLD WATER FILTERED	JC	JANITOR'S CLOSET	SH	SHOWER
CWR	CONDENSER WATER RETURN	JP	JOCKEY PUMP	SHW	SOFTENED DOMESTIC HOT WATER
CWS	CONDENSER WATER SUPPLY	KW	KILOWATT	SHW (140)	SOFTENED DOMESTIC HOT WATER (140)
		KWH	KILOWATT-HOUR	SHWR	SOFTENED DOMESTIC HOT WATER RETURN
				SHWR (140)	SOFTENED DOMESTIC HOT WATER RETURN
D&T	DRIP AND TRAP	KW	KILOWATT	SK	SINK
DA	DISCHARGE AIR	LAT	LEAVING AIR TEMPERATURE	SMR	SNOW MELT RETURN
DA	DISCHARGE AIR TEMPERATURE	LAT	LEAVING AIR TEMPERATURE	SMS	SNOW MELT SUPPLY
DB	DRY BULB	LAB	LABORATORY	SP	STATIC PRESSURE
DB	DIRECT DIGITAL CONTROL	LAV	LAVATORY	SPEC	SPECIFICATION
DEG	DEGREE	LBS	POUNDS	SPKLR	SPRINKLER

<u>SYMBOL</u>	<u>DESCRIPTION</u>	<u>SYMBOL</u>	<u>DESCRIPTION</u>
	CARBON DIOXIDE SENSOR		OCCUPANCY SENSOR
	CARBON MONOXIDE SENSOR		PRESSURE TRANSMITTER
	DIFFERENTIAL PRESSURE TRANSMITTER		STATIC PRESSURE SENSOR OR PROBE
	FLOW METER		VALVE - 2 WAY CONTROL VALVE
	GUARD FOR STAT OR SENSOR		VALVE - 3 WAY CONTROL VALVE
	HUMIDISTAT OR HUMIDITY SENSOR (AS DEFINED ON TC DRAWINGS)		THERMOSTAT OR TEMPERATURE SENSOR (AS DEFINED ON TC DRAWINGS)

SINGLE LINE SYMBOLS		DUCTWORK SYMBOLS	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	AIR VENT - AUTOMATIC		AIR TERMINAL UNIT
	AIR VENT - MANUAL		AIR TERMINAL UNIT WITH HEATING COIL
	BACKFLOW PREVENTER		VENTURI AIR TERMINAL UNIT
	CATCH BASIN		VENTURI AIR TERMINAL UNIT WITH HEATING COIL
	CIRCULATING PUMP		DAMPER - HORIZONTAL FIRE (EXISTING, NEW)
	CLEAN OUT - IN FLOOR		DAMPER - HORIZONTAL FIRE / SMOKE (EXISTING, NEW)
	CLEAN OUT - FLANGE		DAMPER - SMOKE (EXISTING, NEW)
	DIRECTION OF FLOW - DOWN		DAMPER - VERTICAL FIRE (EXISTING, NEW)
	DIRECTION OF PITCH - DOWN		DAMPER - VERTICAL FIRE / SMOKE (EXISTING, NEW)
	FINNED TUBE RADIATION		DAMPER - BACK DRAFT
	FIRE PROTECTION - SIAMESE CONNECTION - FREE STANDING		DAMPER - MOTORIZED
	FIRE PROTECTION - SIAMESE CONNECTION - WALL MOUNTED		DAMPER - VOLUME (MANUALLY ADJUSTABLE)
	FIRE PROTECTION - SPRINKLER HEAD, CONCEALED		DIFFUSER - BLANK OFF
	FIRE PROTECTION - SPRINKLER HEAD, PENDANT		DIFFUSER - LINEAR SLOT
	FIRE PROTECTION - SPRINKLER HEAD, UPRIGHT		DIFFUSER - SQUARE OR RECTANGULAR
	FIRE PROTECTION - SPRINKLER HEAD, SIDEWALL		DUCT CROSS SECTION - SUPPLY
	FLOOR DRAIN		DUCT CROSS SECTION - RETURN
	FLOOR DRAIN - ELEVATION		DUCT CROSS SECTION - EXHAUST
	FLOOR DRAIN - FUNNEL		DUCT - FLEXIBLE CONNECTION
	FLOOR DRAIN - FUNNEL, ELEVATION		DUCT - FLEXIBLE DUCT
	FLOW MEASURING DEVICE (FOR TEST AND BALANCING)		DUCT TAKE-OFF - ROUND CONICAL
	FLOW SWITCH		DUCT TAKE-OFF - RECTANGULAR WITH SHOE TAP
	FLOW METER		ELBOW - RECTANGULAR WITH TURNING VANES
	HOSE BIBB		ELBOW - RECTANGULAR / ROUND SMOOTH RADIUS
	MANHOLE		ELBOW DOWN - RECTANGULAR
	OPEN SITE DRAIN		ELBOW DOWN - ROUND
	PIPE - ANCHOR		ELBOW UP - RECTANGULAR
	PIPE - CAP OR PLUG		ELBOW UP - ROUND
	PIPE - ELBOW DOWN		FAN - AXIAL
	PIPE - ELBOW UP		FAN - CENTRIFUGAL (ELEVATION)
	PIPE - EXPANSION JOINT OR COMPENSATOR		HEATING COIL
	PIPE - FLANGE		INCLINED DROP IN DIRECTION OF AIRFLOW
	PIPE - HOSE AND BRAID FLEXIBLE CONNECTION		INCLINED RISE IN DIRECTION OF AIRFLOW
	PIPE - RUBBER FLEXIBLE CONNECTION		INTAKE OR RELIEF HOOD
	PIPE - GUIDE		REGISTER - RETURN OR EXHAUST
	PIPE - TEE DOWN		REGISTER - RETURN WITH BOOT
	PIPE - TEE UP		REGISTER - TRANSFER GRILLE
	PIPE - UNION		ROOF EXHAUST FAN
	PRESSURE AND TEMPERATURE TEST PLUG		TRANSITION - CONCENTRIC
	PRESSURE GAUGE AND COCK		TRANSITION - ECCENTRIC
	REDUCER - CONCENTRIC		UNIT HEATER - HORIZONTAL THROW
	REDUCER - ECCENTRIC		UNIT HEATER - VERTICAL THROW
	ROOF/OVERFLOW DRAIN		
	STEAM TRAP - FLOAT AND THERMOSTATIC		
	STRAINER		
	STRAINER WITH VALVE AND BLOW-OFF		
	THERMOMETER		
	TRAP		
	VALVE - ANGLE		
	VALVE - BALL		
	VALVE - BALANCE (I.E. BALANCE VALVE TO 0.5 GPM)		

S-1
10ø
350

SUPPLY DIFFUSER WITH SCHEDULE TAG "1",
10" DIAMETER NECK SIZE
350 CFM

R-1
22x22
640

RETURN REGISTER WITH SCHEDULE TAG "1",
22" X 22" NECK SIZE
640 CFM
EXHAUST REGISTER E DESIGNATION SIMILAR.

TL-101

AIR TERMINAL UNIT WITH HEATING COIL NO. 101
WITH SERVICE CLEARANCE SHOWN

VTU-101

VENTURI AIR TERMINAL WITH HEATING COIL
NO. 101 WITH SERVICE CLEARANCE SHOWN

8

PIPE DIAMETER NOTATION
ALL SIZES IN INCHES

8ø

DUCT SIZE NOTATION
ALL SIZES IN INCHES

22x10 **18x14ø**

OVAL DUCT
RECTANGULAR DUCT

1

CONSTRUCTION NOTE (NUMBER) OR
DEMOLITION NOTE (LETTER)

EF 1

EQUIPMENT DESIGNATION,
(i.e. EXHAUST FAN NUMBER 1)

HW-1

PIPING RISER DESIGNATION,
(i.e. HOT WATER RISER NUMBER 1)

NEW SYSTEM COMPONENT

EXISTING SYSTEM COMPONENT TO REMAIN

POINT OF NEW CONNECTION SYMBOL

1
M5.1

SECTION OR PLAN NUMBER

SHEET WHERE SECTION IS DRAWN

AREA OF ENLARGEMENT

1
M5.1

PLAN NUMBER

SHEET WHERE ENLARGED PLAN IS DRAWN

1
M5.1

SECTION OR PLAN NUMBER

SECTION OR ENLARGED PLAN
SCALE: 1/8" = 1' - 0"

SHEET M1.0
SHEET M1.1

MATCHLINE

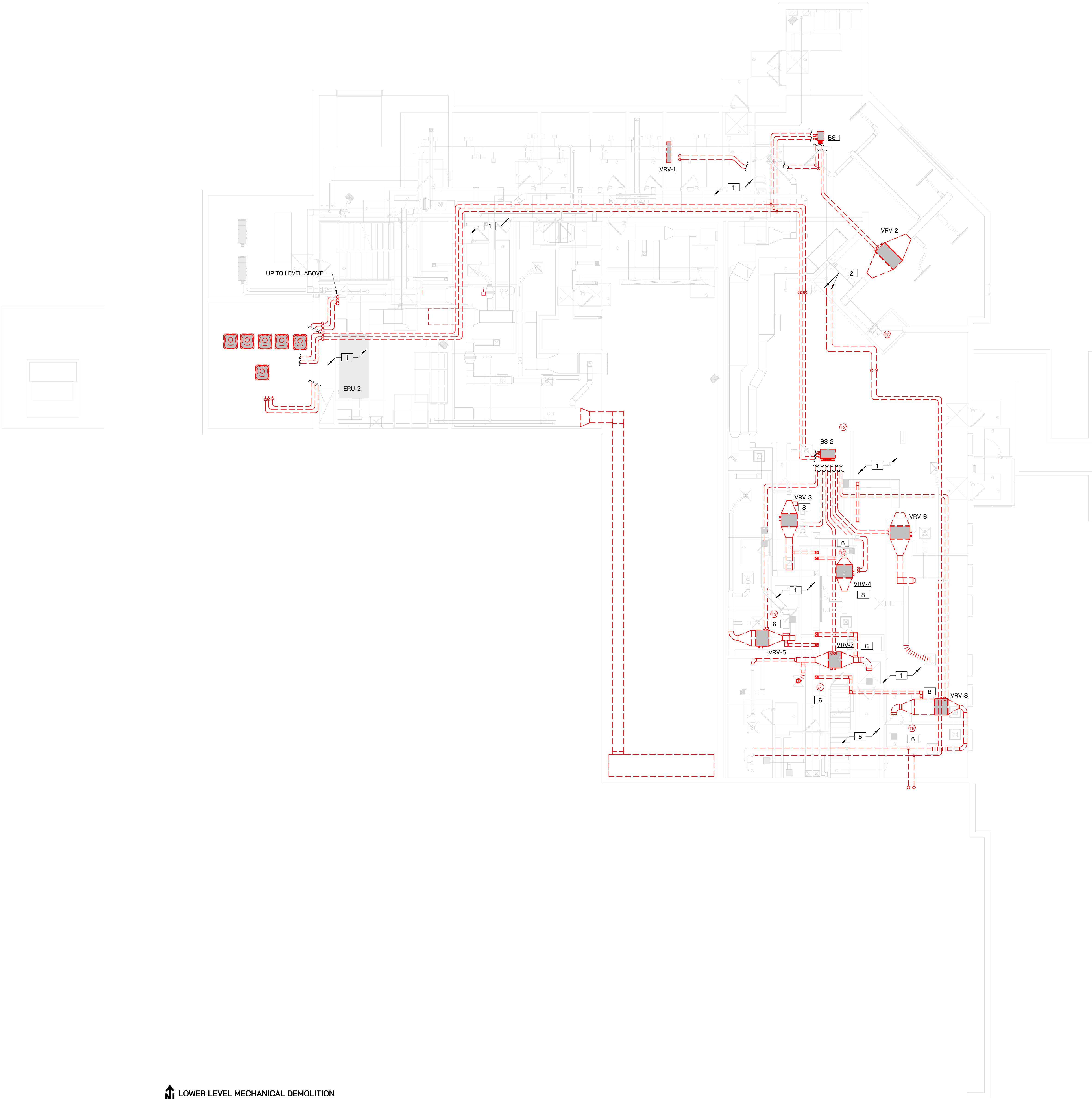
HEAVY LINE WEIGHT INDICATES NEW WORK

LIGHT LINE WEIGHT INDICATES EXISTING
EQUIPMENT OR REFERENCED
INFORMATION

GRAY LINE INDICATES BACKGROUND
INFORMATION

DASHED LINES INDICATE PIPING
ROUTED BELOW SLAB OR GRADE

HATCH MARKS INDICATE EQUIPMENT OR
MATERIALS TO BE DISCONNECTED AND
REMOVED.



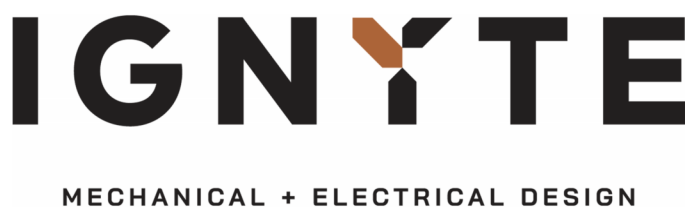
LOWER LEVEL MECHANICAL DEMOLITION
1/8" = 1'-0"

MECHANICAL DEMOLITION KEYED NOTES

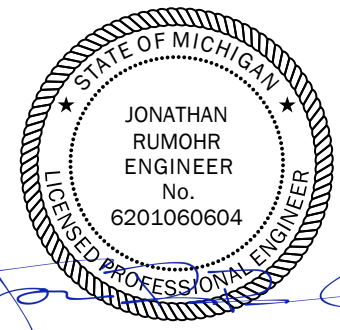
- 1 REMOVE EXISTING REFRIGERANT PIPING IN ENTIRETY.
- 2 DEMO BACK TO EXISTING 2.5" HHWS PIPE. VIF SIZE AND LOCATION OF CONNECTION POINT.
- 3 REMOVE EXISTING GRILLE. PREPARE FOR RELOCATION.
- 4 DEMO EXISTING DUCT BRANCH IN ENTIRETY. SEAL DUCT TAKEOFF.
- 5 REMOVE EXISTING CONDENSATE PIPING IN ENTIRETY.
- 6 REMOVE EXISTING THERMOSTAT. PATCH AND PAINT TO MATCH EXISTING CONDITIONS.
- 7 DEMO EXISTING HEATING COIL. PREPARE DUCTWORK FOR NEW CONNECTION.
- 8 DEMO EXISTING CONDENSATE LINE FROM VRV.



HVAC SYSTEM
REPLACEMENT



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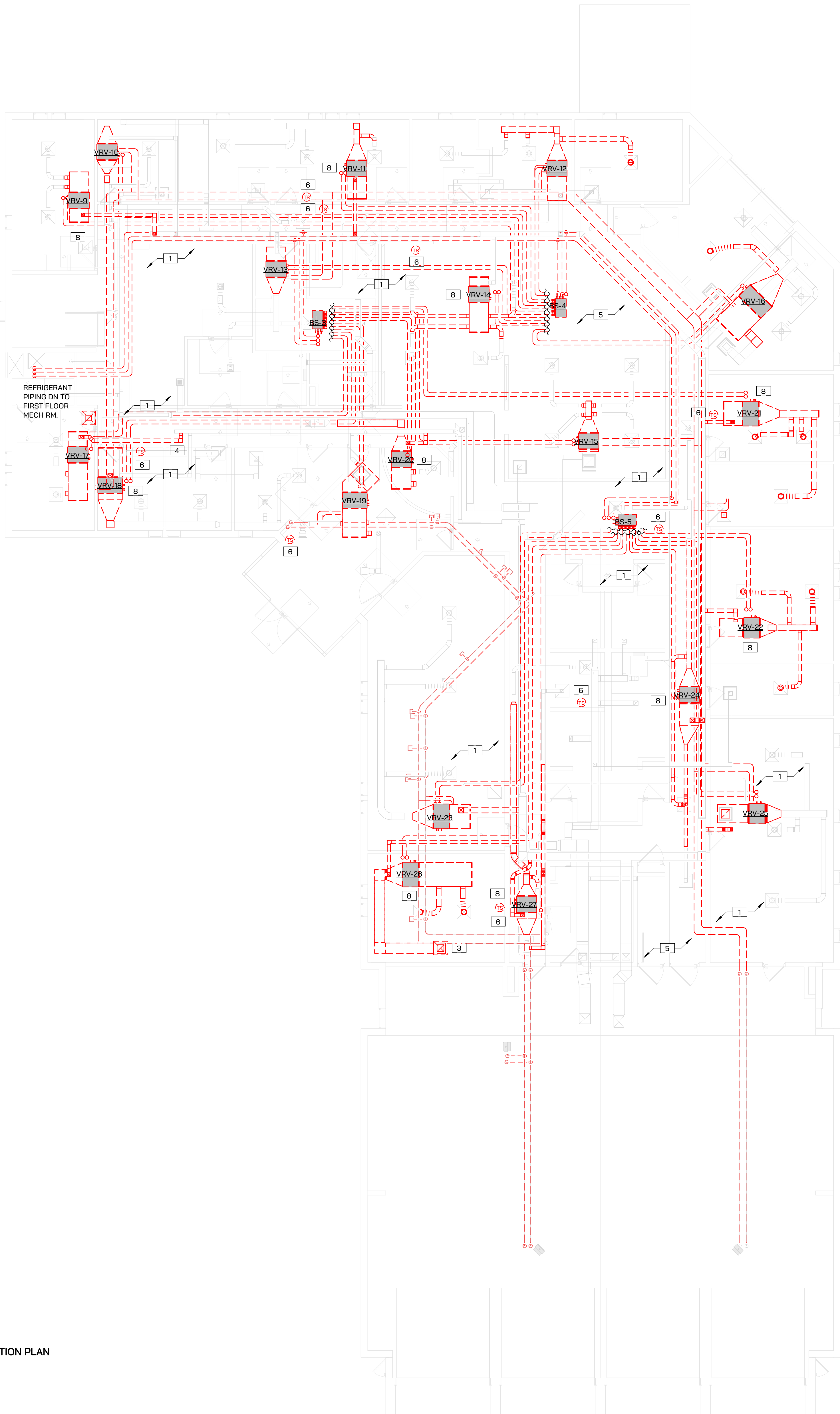
STAMP
THE FOLLOWING DIMENSION EQUALS
ONE INCH WHEN PRINTED TO SCALE.
SCALE

Drawing Title:

LOWER LEVEL
MECHANICAL DEMOLITION
PLAN

Project No: 23.110

MD100



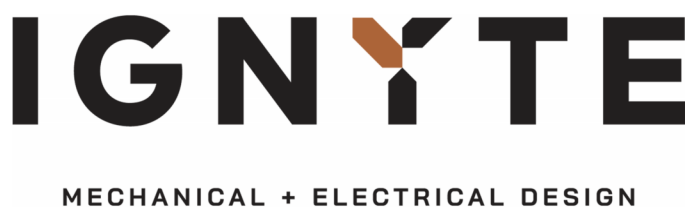
 MAIN LEVEL MECHANICAL DEMOLITION PLAN
1/8" = 1'-0"

MECHANICAL DEMOLITION KEYED NOTES

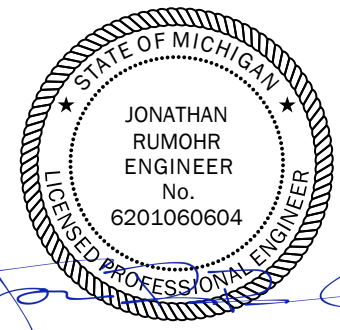
- 1 REMOVE EXISTING REFRIGERANT PIPING IN ENTIRETY.
- 2 DEMO BACK TO EXISTING 2.5" HHWS PIPE. VIF SIZE AND LOCATION OF CONNECTION POINT.
- 3 REMOVE EXISTING GRILLE. PREPARE FOR RELOCATION.
- 4 DEMO EXISTING DUCT BRANCH IN ENTIRETY. SEAL DUCT TAKEOFF.
- 5 REMOVE EXISTING CONDENSATE PIPING IN ENTIRETY.
- 6 REMOVE EXISTING THERMOSTAT. PATCH AND PAINT TO MATCH EXISTING CONDITIONS.
- 7 DEMO EXISTING HEATING COIL. PREPARE DUCTWORK FOR NEW CONNECTION.
- 8 DEMO EXISTING CONDENSATE LINE FROM VAV.



HVAC SYSTEM
REPLACEMENT



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SCALE

Drawing Title:

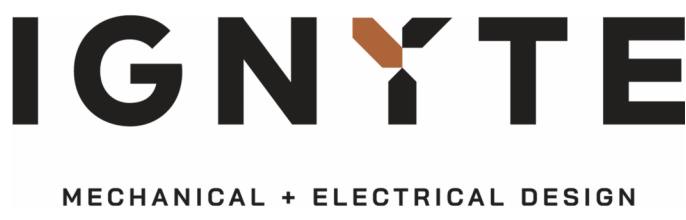
MAIN LEVEL MECHANICAL
DEMOLITION PLAN

Project No: 23.110

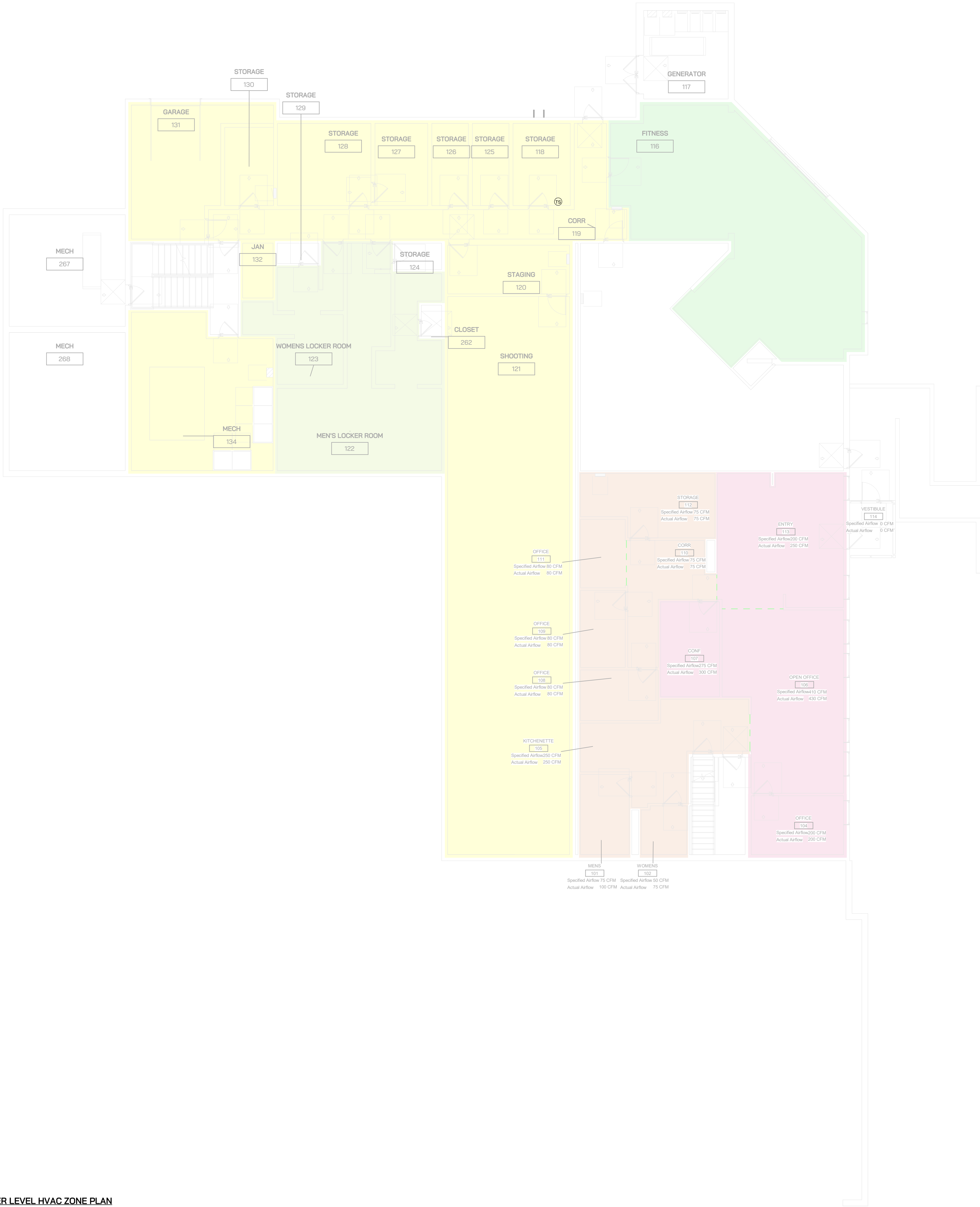
MD110



HVAC SYSTEM
REPLACEMENT

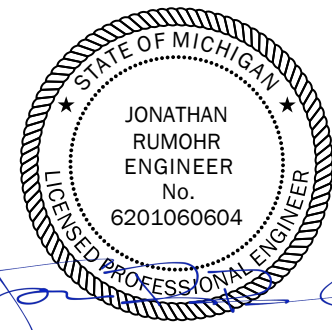


- BC-11
- BC-12
- BC-13
- BC-14 (ALTERNATE)
- ERU-2



LOWER LEVEL HVAC ZONE PLAN
1/8" = 1'-0"

BID DOCUMENTS	08.12.2024
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THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.
SCALE

Drawing Title:

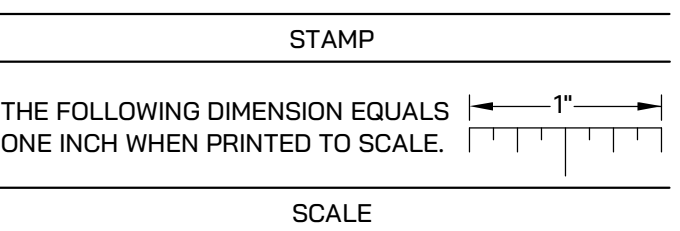
MECHANICAL ZONE PLAN

Project No: 23.110

M010



IGNYTE
MECHANICAL + ELECTRICAL DESIGN



Drawing Title:

MECHANICAL ZONE PLANS

Project No: 23.110

M020

 LOWER LEVEL SHEET METAL PLAN
1/8" = 1'-0"

SHEET METAL KEYED NOTES

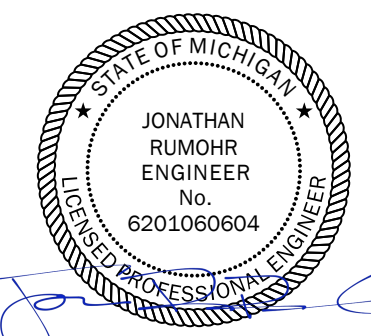
- 1 REINSTALL EXISTING GRILLE.
- 2 CONNECT NEW HVAC SHEET METAL TO EXISTING ABOVE CEILING.
- 3 REBALANCE EXISTING GRILLES TO INDICATED AIRFLOW.
- 4 EXTEND EXISTING DUCT. CONNECT TO NEW SIDEWALL GRILLE.
- 5 TENANT SPACE. CONTRACTORS SHALL COORDINATE ACCESS WITH TENANT.
- 6 SEE DETAIL ON SHEET M903 FOR VENTING.
- 7 PROVIDE WALL CAP WITH BIRD SCREEN AND BACKDRIFT DAMPER BASED ON SEIHO MODEL SFX 4. PAINT TO MATCH BUILDING. REFERENCE DETAIL ON M903.



HVAC SYSTEM REPLACEMENT

IGNYTE
MECHANICAL + ELECTRICAL DESIGN

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STAMP

THE FOLLOWING DIMENSION EQUALS
ONE INCH WHEN PRINTED TO SCALE.

SCALE

Drawing Title:

LOWER LEVEL SHEET
METAL PLAN

Project No: 23.110

M300



- 
- The seal of the Grand Haven Police Department is circular. It features a central shield with a blue background and a white border. The shield contains a white star at the top, a white banner with the text "POLICE DEPT GRAND HAVEN" in the middle, and a white banner with the text "WORLD SERVICE" at the bottom. The shield is surrounded by a blue ring with the text "GRAND HAVEN" at the top and "PUBLIC SAFETY" at the bottom. The entire seal is set against a black background.

IGNYTE
MECHANICAL + ELECTRICAL DESIGN

Drawing Title: _____

Project No: 23.110

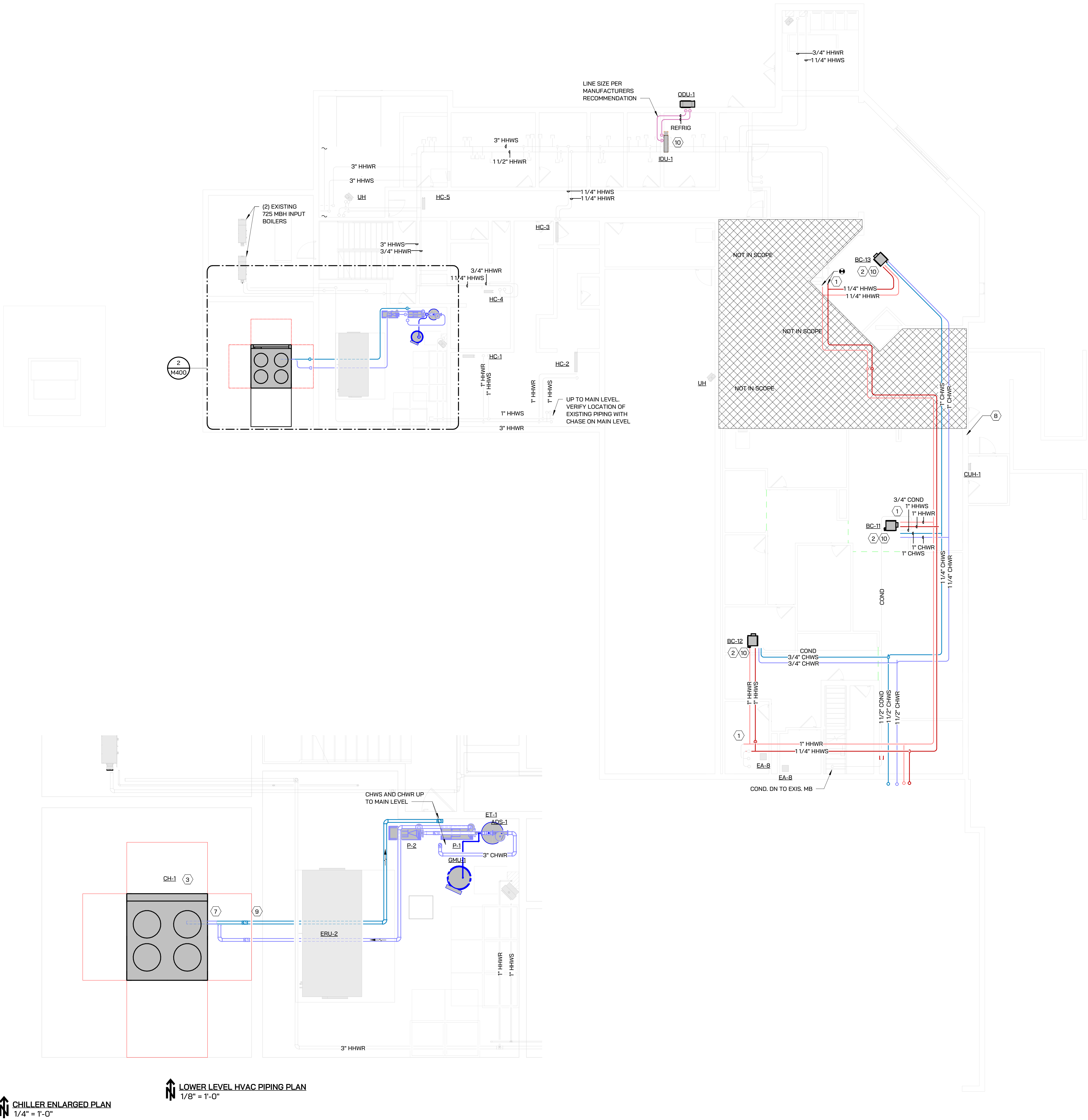
© 2024 ICNYTE DESIGN



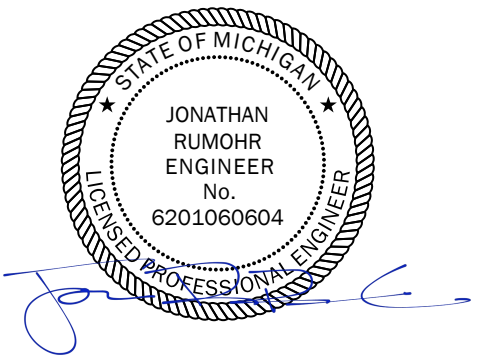
HVAC SYSTEM
REPLACEMENT

IGNYTE
MECHANICAL • ELECTRICAL DESIGN

- HVAC PIPING KEYED NOTES**
1. INSTALL NEW HHW BRANCH TO SERVE FAN COIL UNIT. CONNECTION SIZE PER MANUFACTURERS RECOMMENDATION.
 2. CONNECT NEW HHWS, HHWR, CHWS, AND CHWR. REFERENCE DETAIL ON SHEET M10.
 3. REFER TO DETAIL ON M601 FOR CHILLED WATER DIAGRAM.
 4. EXTEND EXISTING HHWS AND HHWR TO NEW FAN COIL UNIT.
 5. INSTALL 1" GAS PIPING LINE TO SERVE IR-2. VIF EXISTING GAS PIPING SIZE.
 6. INSTALL IR-1 ALIGNED WITH EXISTING CONCRETE BEAM. INSTALL AT HIGHER CEILING BOTTOM ELEVATION. INSTALL AT 45 DEGREE ANGLE.
 7. MATCH MANUFACTURERS CONNECTION SIZES.
 8. TENANT SPACE. CONTRACTORS SHALL COORDINATE ACCESS WITH TENANT.
 9. PIPES TO ENTER BUILDING THROUGH EXISTING WALL PENETRATION. PATCH AND SEAL TO MATCH EXISTING.
 10. CONNECT NEW UNIT TO EXISTING CONDENSATE LINE.



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ONE INCH WHEN PRINTED TO SCALE.
SCALE

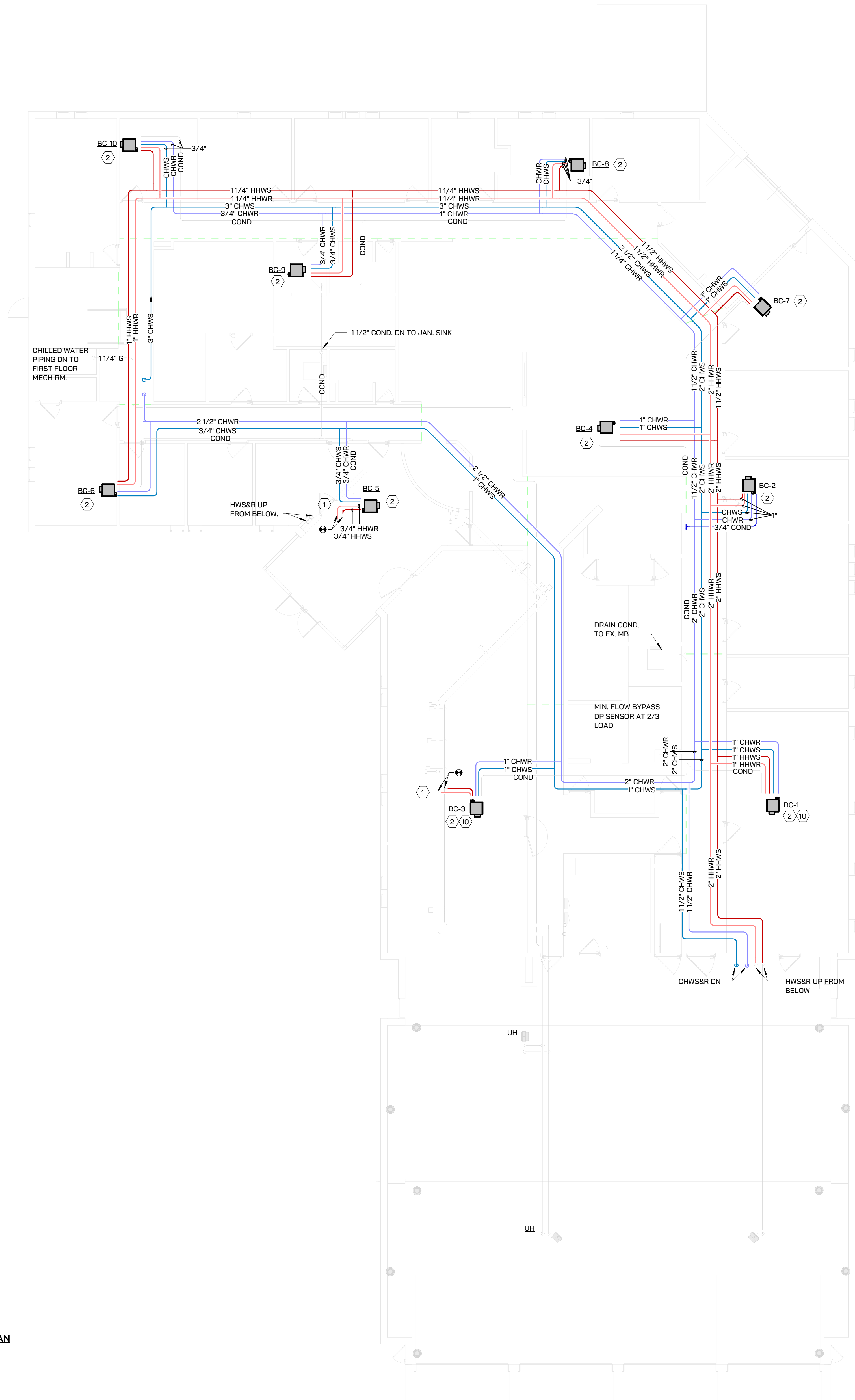
Drawing Title:

LOWER LEVER HVAC
PIPING PLAN

Project No: 23.110

M400

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MAIN LEVEL HVAC PIPING PLAN
1/8" = 1'-0"

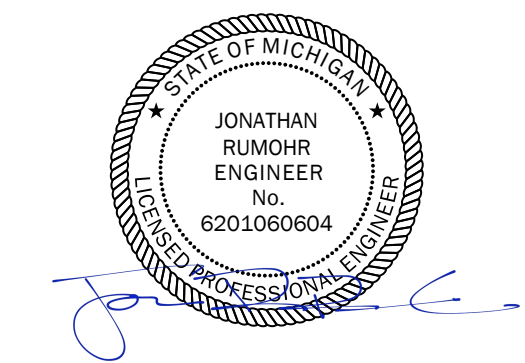
- HVAC PIPING KEYED NOTES**
1. INSTALL NEW HHW BRANCH TO SERVE FAN COIL UNIT. CONNECTION SIZE PER MANUFACTURERS RECOMMENDATION.
 2. CONNECT NEW HHWS, HHWR, CHWS, AND CHWR. REFERENCE DETAIL ON SHEET M10.
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 7. MATCH MANUFACTURERS CONNECTION SIZES.
 8. TENANT SPACE. CONTRACTORS SHALL COORDINATE ACCESS WITH TENANT.
 9. PIPES TO ENTER BUILDING THROUGH EXISTING WALL PENETRATION. PATCH AND SEAL TO MATCH EXISTING.
 10. CONNECT NEW UNIT TO EXISTING CONDENSATE LINE.



HVAC SYSTEM
REPLACEMENT

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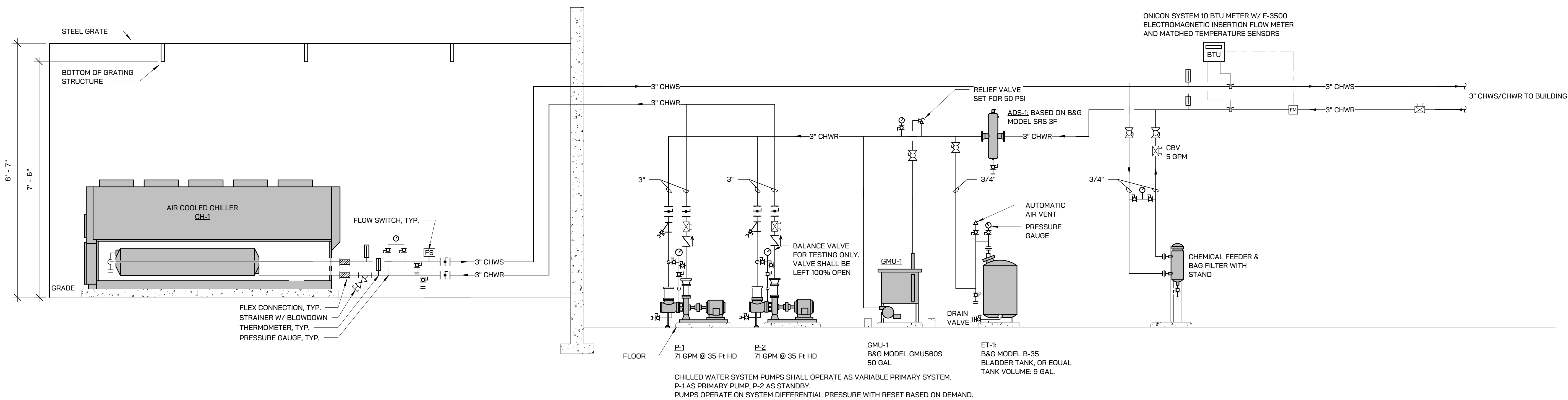


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SCALE

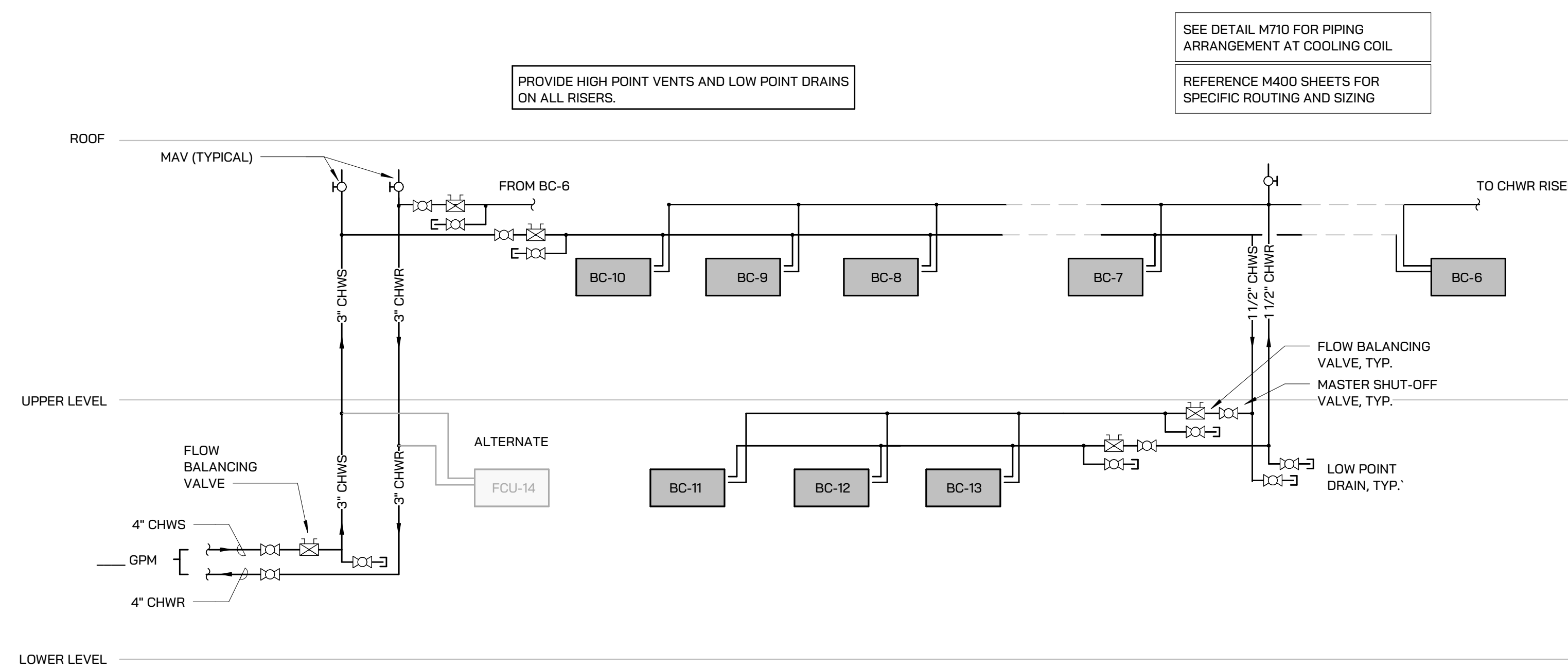
Drawing Title:
MAIN LEVEL HVAC PIPING PLAN

Project No: 23.110

M410



1 CHILLED WATER PLANT DIAGRAM
SCALE: NONE



CHWS & RETURN RISER

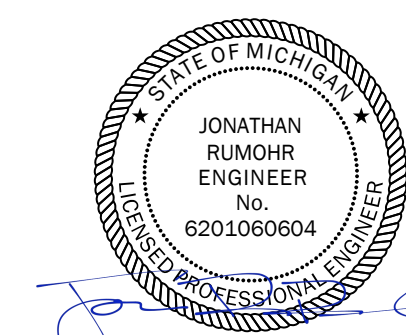
2 CHILLED WATER RISER DIAGRAM
SCALE: NONE



HVAC SYSTEM REPLACEMENT

IGNYTE
MECHANICAL • ELECTRICAL DESIGN

BID DOCUMENTS 08.12.2024
Issued For: Date



STAMP

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.
SCALE

Drawing Title:

MECHANICAL SYSTEM DIAGRAMS

Project No: 23.110

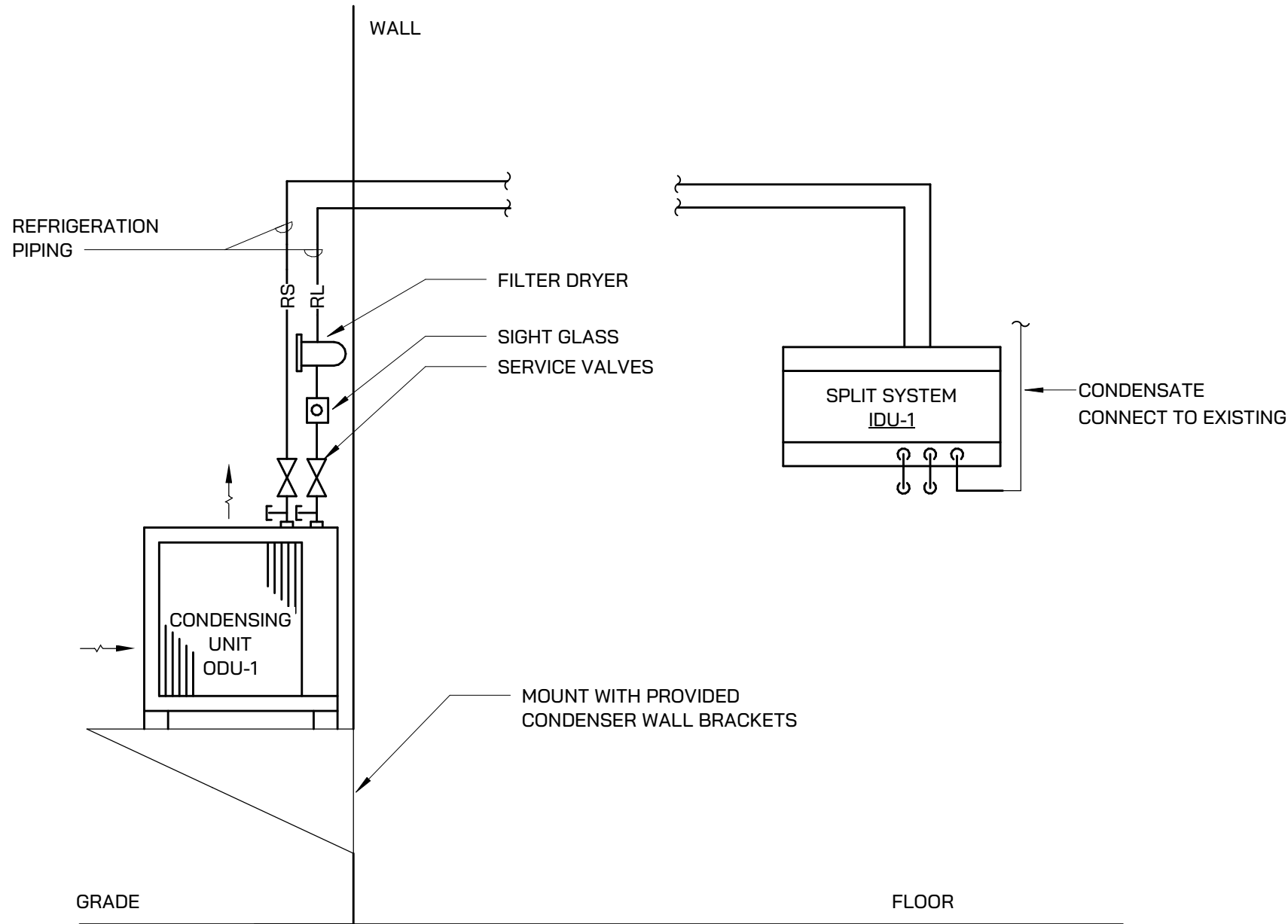
M601

FAN COIL UNIT SCHEDULE (CHILED-WATER & HOT-WATER)																																					
IDENTITY	MANUFACTURER	MODEL	PRODUCT TYPE	NOMINAL CAPACITY	INTAKE FLOW	DESIGN AIRFLOW RATE	SUPPLY FAN SYSTEM		SUPPLY FAN MOTOR		COOLING COIL					CHILLED-WATER DESIGN				HEATING AIRFLOW DESIGN				HEATING TEMP. RISE	HOT-WATER DESIGN				HEAT TRANSFER FLUID	AIR FILTER	RIGHT SIDE CONNECTION	ELECTRICAL				PRODUCT WEIGHT	NOTES
							CAPACITY	ESP	SIZE	RPM	TOTAL	SENSIBLE	EDB	EWB	LDB	LWB	FLOW RATE	SUPPLY	ΔT	HEAD LOSS	OUTPUT	EAT	LAT		FLOW RATE	SUPPLY	ΔT	HEAD LOSS				VOLTAGE	PHASE	MCA	MOCP		
FC-1	DAIKIN APPLIED	BCHD0101	HORIZONTAL CONCEALED BLOWER COIL	28193.0 Btu/h	260 CFM	1200 CFM	1200 CFM	1.72 in-wg	664 W	1553	28193.0 Btu/h	26898.0 Btu/h	77 °F	63 °F	56 °F	55 °F	4 GPM	40 °F	15 °F	4.28 Feet	53460.0 Btu/h	50 °F	90 °F	41 °F	5 GPM	130 °F	20 °F	9.42 Feet	WATER	MERV 8	Yes	208 V	1	10 A	15 A	408.00 lbf	
FC-2	DAIKIN APPLIED	BCHD0101	HORIZONTAL CONCEALED BLOWER COIL	28254.0 Btu/h	180 CFM	1260 CFM	1260 CFM	1.83 in-wg	761 W	1616	28254.0 Btu/h	27576.0 Btu/h	76 °F	63 °F	56 °F	55 °F	4 GPM	40 °F	15 °F	4.25 Feet	54827.0 Btu/h	50 °F	89 °F	40 °F	5 GPM	130 °F	20 °F	9.69 Feet	WATER	MERV 8	No	208 V	1	10 A	15 A	408.00 lbf	
FC-3	DAIKIN APPLIED	BCHD0101	HORIZONTAL CONCEALED BLOWER COIL	38097.0 Btu/h	410 CFM	1720 CFM	1720 CFM	1.28 in-wg	761 W	1250	38097.0 Btu/h	37403.0 Btu/h	77 °F	63 °F	57 °F	56 °F	5 GPM	40 °F	15 °F	1.82 Feet	84125.0 Btu/h	50 °F	94 °F	45 °F	8 GPM	130 °F	20 °F	5.63 Feet	WATER	MERV 8	No	208 V	1	9 A	15 A	652.00 lbf	
FC-4	DAIKIN APPLIED	BCHD0101	HORIZONTAL CONCEALED BLOWER COIL	28059.0 Btu/h	240 CFM	1200 CFM	1200 CFM	1.72 in-wg	664 W	1553	28059.0 Btu/h	26850.0 Btu/h	76 °F	63 °F	56 °F	55 °F	4 GPM	40 °F	15 °F	4.26 Feet	53460.0 Btu/h	50 °F	90 °F	41 °F	5 GPM	130 °F	20 °F	9.42 Feet	WATER	MERV 8	No	208 V	1	10 A	15 A	408.00 lbf	
FC-5	DAIKIN APPLIED	BCHD0101	HORIZONTAL CONCEALED BLOWER COIL	19673.0 Btu/h	50 CFM	880 CFM	880 CFM	1.50 in-wg	358 W	1333	19673.0 Btu/h	18638.0 Btu/h	75 °F	62 °F	56 °F	55 °F	3 GPM	40 °F	15 °F	1.76 Feet	37315.0 Btu/h	50 °F	88 °F	39 °F	4 GPM	130 °F	20 °F	4.95 Feet	WATER	MERV 8	No	208 V	1	5 A	15 A	325.00 lbf	
FC-6	DAIKIN APPLIED	BCHD0101	HORIZONTAL CONCEALED BLOWER COIL	22870.0 Btu/h	140 CFM	940 CFM	940 CFM	1.09 in-wg	336 W	1226	22870.0 Btu/h	21318.0 Btu/h	76 °F	63 °F	55 °F	55 °F	3 GPM	40 °F	15 °F	3.53 Feet	46001.0 Btu/h	50 °F	94 °F	45 °F	5 GPM	130 °F	20 °F	8.62 Feet	WATER	MERV 8	Yes	208 V	1	5 A	15 A	408.00 lbf	
FC-7	DAIKIN APPLIED	BCHD0101	HORIZONTAL CONCEALED BLOWER COIL	34111.0 Btu/h	180 CFM	1680 CFM	1680 CFM	1.61 in-wg	701 W	1362	34111.0 Btu/h	34111.0 Btu/h	76 °F	63 °F	57 °F	56 °F	5 GPM	40 °F	15 °F	2.82 Feet	74081.0 Btu/h	50 °F	90 °F	40 °F	7 GPM	130 °F	20 °F	4.59 Feet	WATER	MERV 8	Yes	208 V	1	9 A	15 A	552.00 lbf	
FC-8	DAIKIN APPLIED	BCHD0101	HORIZONTAL CONCEALED BLOWER COIL	23309.0 Btu/h	150 CFM	975 CFM	975 CFM	1.14 in-wg	373 W	1263	23309.0 Btu/h	21866.0 Btu/h	76 °F	63 °F	56 °F	55 °F	3 GPM	40 °F	15 °F	3.58 Feet	47085.0 Btu/h	50 °F	94 °F	44 °F	5 GPM	130 °F	20 °F	7.49 Feet	WATER	MERV 8	Yes	208 V	1	5 A	15 A	408.00 lbf	
FC-9	DAIKIN APPLIED	BCHD0101	HORIZONTAL CONCEALED BLOWER COIL	10034.0 Btu/h	70 CFM	450 CFM	450 CFM	0.91 in-wg	112 W	1034	10034.0 Btu/h	9575.0 Btu/h	76 °F	63 °F	57 °F	55 °F	1 GPM	40 °F	15 °F	1.48 Feet	21492.0 Btu/h	50 °F	93 °F	44 °F	2 GPM	130 °F	20 °F	1.68 Feet	WATER	MERV 8	No	208 V	1	5 A	15 A	224.00 lbf	
FC-10	DAIKIN APPLIED	BCHD0101	HORIZONTAL CONCEALED BLOWER COIL	18228.0 Btu/h	130 CFM	700 CFM	700 CFM	1.13 in-wg	209 W	1140	18228.0 Btu/h	16273.0 Btu/h	76 °F	63 °F	55 °F	54 °F	3 GPM	40 °F	15 °F	1.55 Feet	32682.0 Btu/h	50 °F	92 °F	43 °F	3 GPM	130 °F	20 °F	3.28 Feet	WATER	MERV 8	Yes	208 V	1	5 A	15 A	325.00 lbf	
FC-11	DAIKIN APPLIED	BCHD0101	HORIZONTAL CONCEALED BLOWER COIL	32502.0 Btu/h	250 CFM	1475 CFM	1475 CFM	1.40 in-wg	537 W	1266	32502.0 Btu/h	31995.0 Btu/h	76 °F	63 °F	56 °F	56 °F	5 GPM	40 °F	15 °F	2.75 Feet	66505.0 Btu/h	50 °F	92 °F	43 °F	4 GPM	130 °F	20 °F	3.52 Feet	WATER	MERV 8	No	208 V	1	9 A	15 A	552.00 lbf	
FC-13	DAIKIN APPLIED	BCHD0101	HORIZONTAL CONCEALED BLOWER COIL	27699.0 Btu/h	320 CFM	1120 CFM	1120 CFM	1.57 in-wg	552 W	1469	27699.0 Btu/h	25858.0 Btu/h	77 °F	64 °F	56 °F	55 °F	4 GPM	40 °F	15 °F	4.25 Feet	51334.0 Btu/h	50 °F	92 °F	42 °F	5 GPM	130 °F	20 °F	8.82 Feet	WATER	MERV 8	No	208 V	1	10 A	15 A	408.00 lbf	

AIR COOLED CHILLER SCHEDULE																											
IDENTITY	MANUFACTURER	MODEL	PRODUCT TYPE	INSTALLTION TYPE	NOMINAL CAPACITY	EVAPORATOR CHILLED WATER					GLYCOL CONCENTRATION	HEAT TRANSFER FLUID	OUTDOOR COIL SPEC	OUTDOOR FAN SPEC	COMPRESSOR SPEC	RATED EFFICIENCY	IPLV/IP (EER)	REFRIGERANT TYPE	ELECTRICAL				Dimensions			PRODUCT WEIGHT	NOTES
						FLOW RATE	SUPPLY	RETURN	TEMP. DROP	HEAD LOSS									VOLTAGE	PHASE	MCA	MOCP	Length	Width	Height		
CH-1	DAIKIN APPLIED	AG2004F	PATHFINDER PACKAGED AIR-COOLED SCROLL CHILLER	BASE SUPPORT	41.90 ton	71 GPM	55 °F	40 °F	15 °F	5.10 Feet	30.00%	WATER	COIL FINS: MICROCHANNEL GUARDS: CONDENSER COIL LOUVERS & BASE FRAME WIRE GRILLES	AC FAN MOTORS & DC (FIRST FANS DC/CIRCUIT)	4 SCROLL COMPRESSOR, JJNNHHNN PPA240HD78 EVAPORATOR	10.4 BTU/W·H	17.78	R32	208 V	3	204 A	250 A	86"	85"	99"	3909.00 lbf	

PUMP SCHEDULE																				
IDENTITY	MANUFACTURER	MODEL	PRODUCT TYPE	MATERIAL	SYSTEM FLUID	ARRANGEMENT	PUMP DESIGN				NPSH REQUIRED	INLET CONNECTION SIZE	OUTLET CONNECTION SIZE	MOTOR			ELECTRICAL		WEIGHT	NOTES
							FLOW	HEAD	BHP	EFFICIENCY				POWER	RPM	FLA	VOLTAGE	PHASE		
P-1	ARMSTRONG	4280 1203	DESIGN ENVELOPE CLOSE-COUPLED HORIZONTAL END SUCTION PUMP	CAST IRON	WATER, 30% PROPYLENE GLYCOL	PRIMARY/STANDBY	71 GPM	35.00 Feet	1 hp	75.90%	6.70 Feet	1 1/2"	11/4"	1.2 hp	3836	9.5 A	208 V	1	66.10 lbf	
P-2	ARMSTRONG	4280 1203	DESIGN ENVELOPE CLOSE-COUPLED HORIZONTAL END SUCTION PUMP	CAST IRON	WATER, 30% PROPYLENE GLYCOL	PRIMARY/STANDBY	71 GPM	35.00 Feet	1 hp	75.90%	6.70 Feet	1 1/2"	11/4"	1.2 hp	3836	9.5 A	208 V	1	66.10 lbf	

GRILLE, REGISTER, DIFFUSER SCHEDULE												
MARK	MANUFACTURER	MODEL	FACE SIZE	NECK SIZE	MIN FLOW	MAX FLOW	GRD.THROW	ACCESSORY	MATERIAL	COLOR	MOUNTING	REMARKS
EA-1	TITUS	XG-4500S	48"X18"	40"X14"	1738 CFM	4055 CFM		-	STEEL		SIDEWALL	
RA-2	TITUS	PAR-AA	24"X24"	24"X24"	0 CFM	500 CFM		-	ALUMINUM	PER ARCH	LAY-IN	
SA-1	TITUS	OMNI-AA	24"X24"	6"	78 CFM	274 CFM	2-4-7	NECK DAMPER	ALUMINUM	WHITE	LAY-IN	



SPLIT SYSTEM (IDU-L)
BASED ON SAMSUNG MODEL AC018BNA0CH/AA (CX18BACB), 1.5 TON WALL-MOUNTED MINI-SPLIT, 18,000 BTU/H·R
NOMINAL COOLING CAPACITY AT 90 DEG F OAT. CAPACITY RANGE 4,000 TO 20,000 BTU/H·R, 13.5 MCA, 15 FLA, 208V, 1 PHASE. REFRIGERANT TYPE R410A. INDOOR UNIT POWERED FROM OUTDOOR UNIT. SEER 20, EER 12, 25.8 LBS.

PROVIDE WITH THERMOSTAT INTERFACE, BLUE DIAMOND CONDENSATE PUMP, DRAIN PAN LEVEL SENSOR, FASCIA KIT FOR CONDENSATE PUMP AND LINSET. STAND-ALONE CONTROLS LOCATED IN IT ROOM, PROVIDE SEPARATE TEMPERATURE SENSOR CONNECTED TO BUILDING MANAGEMENT SYSTEM FOR MONITOR AND ALARM.

AIR COOLED CONDENSING UNIT (ODU-L)
BASED ON SAMSUNG MODEL AC018BXSCC/AA (CX18SCB), OUTDOOR CONDENSING UNIT, INVERTER-DRIVEN, TWIN BLDC ROTARY COMPRESSOR. BLDC WITH CROSSFLOW FAN EVAPORATOR FAN TYPE. 8.2 RLA, 208/1/60.

PROVIDE WITH CRANKCASE HEATER, CONDENSER WALL BRACKET, THERMAL EXPANSION VALVE, HAIL GUARD, AND WIND BAFFLES. PROVIDE ALL WIRING BETWEEN IDU AND ODU.

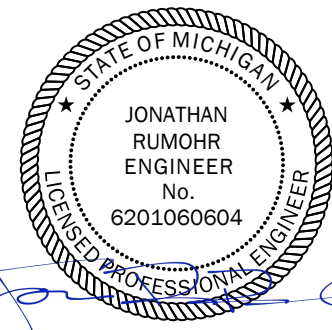
1
W701
SPLIT SYSTEM AND ROOF MOUNTED CONDENSING UNIT DETAIL
SCALE: NONE



HVAC SYSTEM
REPLACEMENT

IGNYTE
MECHANICAL • ELECTRICAL DESIGN

BID DOCUMENTS 08.12.2024
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SCALE

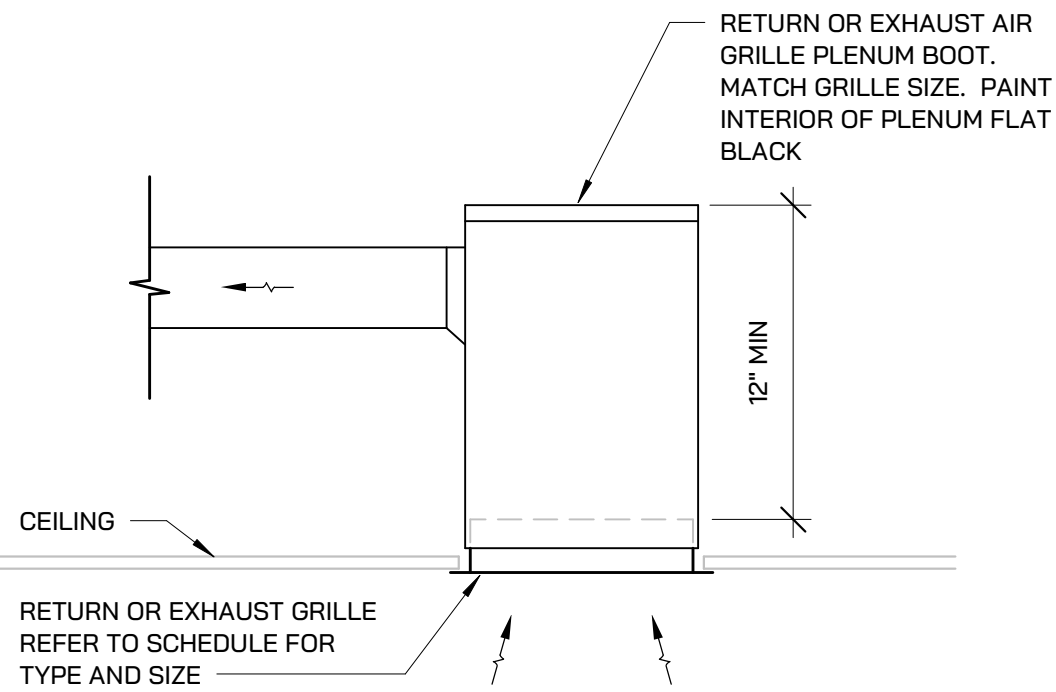
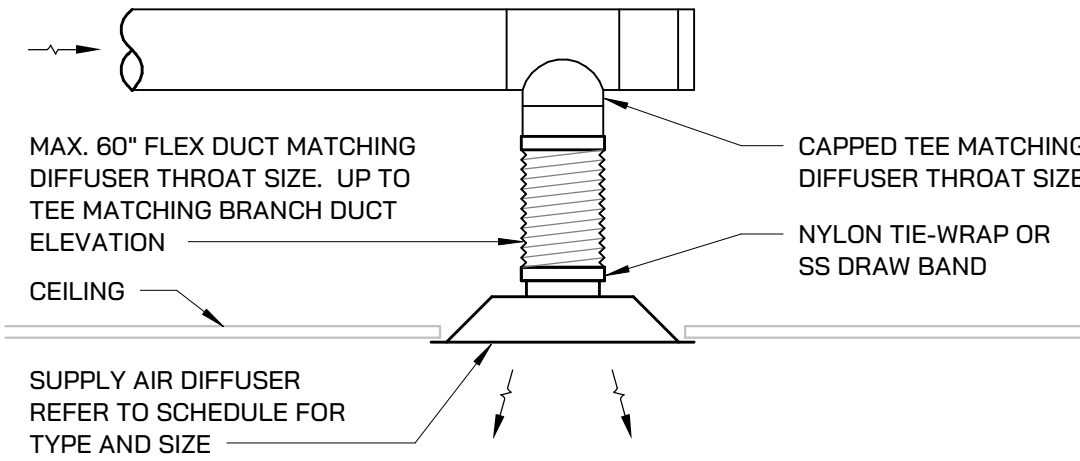
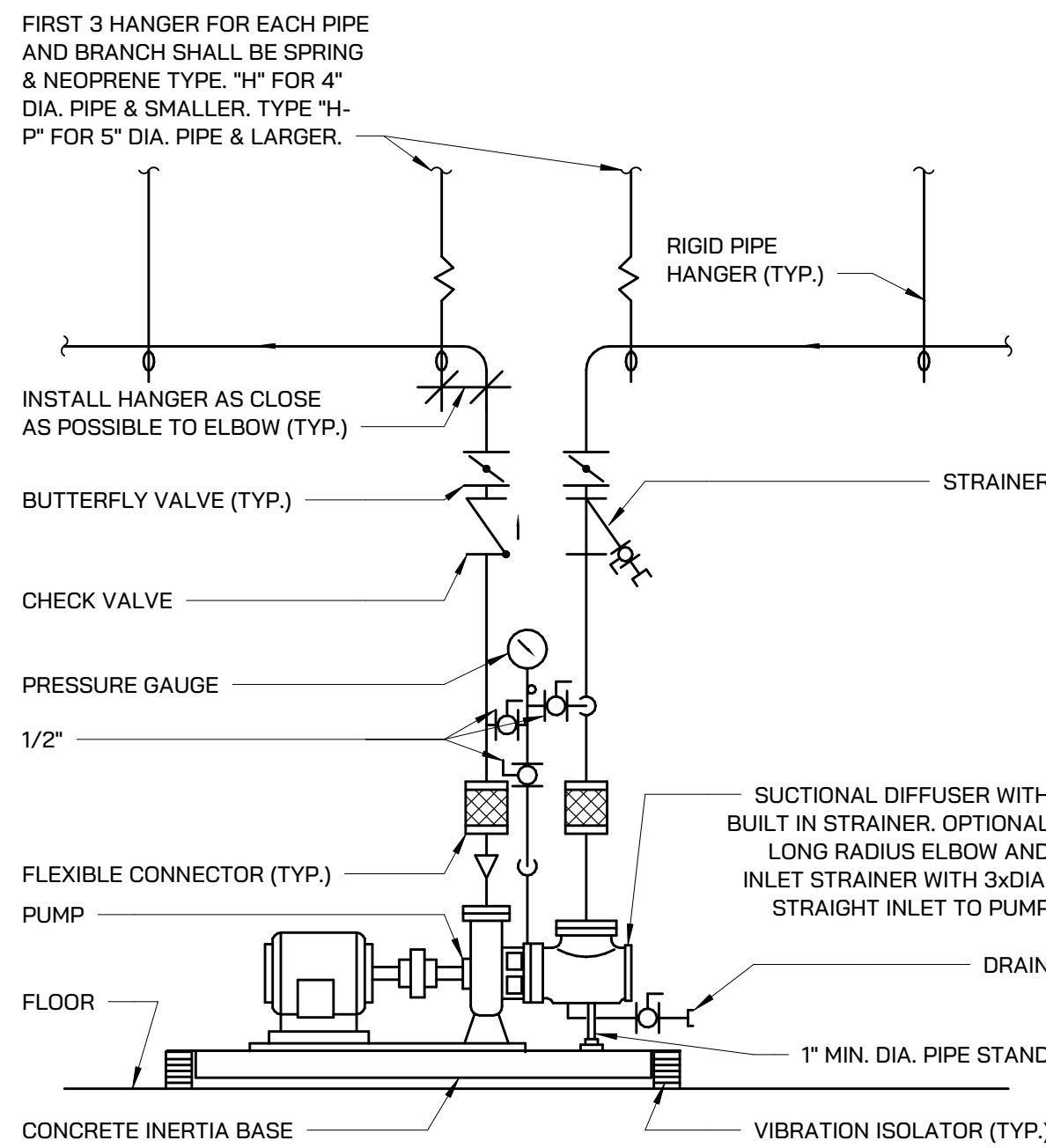
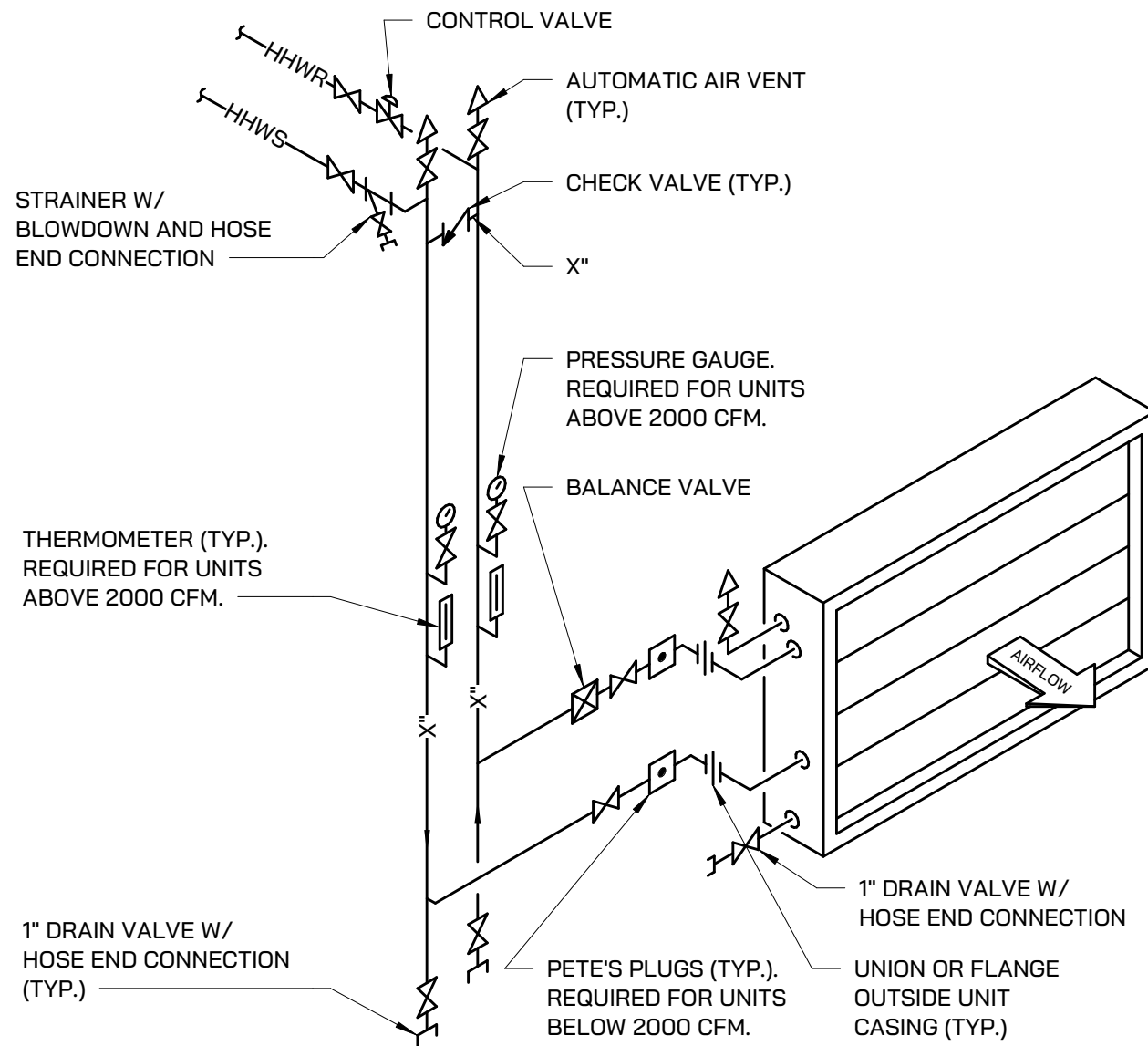
Drawing Title:

MECHANICAL SCHEDULES

Project No: 23.110

M701

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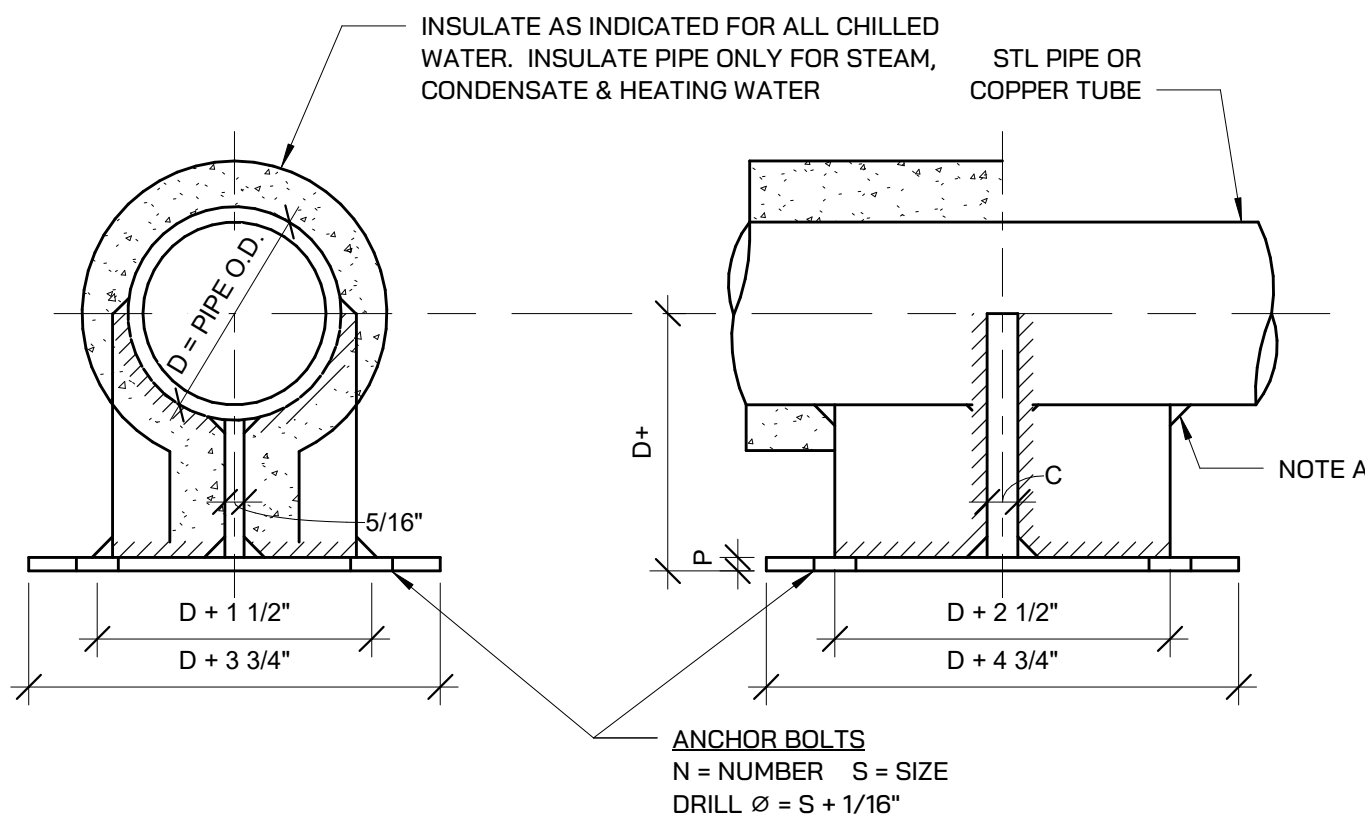


1 RETURN/EXHAUST AIR DETAIL
SCALE: NONE

2 SUPPLY AIR DIFFUSER DETAIL
SCALE: NONE

3 BASE MOUNTED PUMP
SCALE: NONE

4 CHILLED AND HEATING WATER COIL PIPING DETAIL
SCALE: NONE



PIPE ANCHOR SCHEDULE (in.)					
D	P	C	N	S	BOLT PATTERN
1 1/2	3/8	1/4	4	1/2	
2	3/8	3/8	4	5/8	
2 1/2	3/8	3/8	4	5/8	
3	1/2	1/2	4	5/8	
4	5/8	3/4	4	3/4	

NOTES:
1. WHERE USED FOR COPPER TUBE OR PIPE, BRAZE TO FABRICATED STEEL ANCHOR.

64"x64" - 8"x8" @ 1/8" SCALE

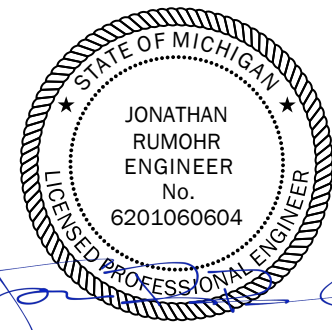
5 PIPE ANCHOR DETAIL
SCALE: NONE



HVAC SYSTEM REPLACEMENT

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Drawing Title:

MECHANICAL DETAILS

Project No: 23.110

M710

DIRECT DIGITAL CONTROLS - GENERAL REQUIREMENTS

1.

BMS CONTRACTOR TO SUBMIT DETAILED STEP BY STEP CONTROL SEQUENCES AND NOT JUST COPY THESE SEQUENCES INTO THE SUBMITTALS.

2.

ALL INITIAL ADJUSTABLE RANGES AND SETPOINT VALUES SHALL BE INDICATED. GRAPHIC CONTROL LOGIC FLOW CHARTS FOR EACH CONTROL SYSTEM SHALL BE INCLUDED TO SUPPORT SEQUENCES.

3.

ALL SETPOINTS AND PARAMETERS SHALL BE ADJUSTED OR MODIFIED AS REQUIRED DURING SUBMITTAL REVIEW, SETUP AND COMMISSIONING AT NO EXTRA COST.

4.

THE DIRECT DIGITAL CONTROLS (DDC) SHALL BE PROGRAMMED TO THE SEQUENCE OF OPERATION AS DESCRIBED WITHIN THE CONTRACT DOCUMENTS. PROVIDE AND INSTALL ALL NECESSARY COMPONENTS AND ACCESSORIES FOR A COMPLETE AND OPERATIONAL SYSTEM INCLUDING, BUT NOT LIMITED TO SENSORS, RELAYS, GATEWAYS, COMMUNICATION WIRING AND CONDUIT, AND ALL NECESSARY ELECTRICAL DEVICES, WIRING, AND CONDUIT.

5.

ALL SETPOINTS, DEAD BANDS, AND TIME DELAY INTERVALS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY SYSTEM OPERATORS. APPROPRIATE DEAD BANDS AND TIME DELAYS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS.

6.

ALL VARIABLE FREQUENCY CONTROLLERS AND STARTER HAND-OFF-AUTO SWITCHES NORMALLY REMAIN IN THE AUTO POSITION AND THE HAND AND OFF POSITIONS ARE USED FOR MAINTENANCE SITUATIONS.

7.

BUILDING MANAGEMENT SYSTEM WILL MONITOR, AND CONTROL SYSTEMS AS NOTED BELOW UNLESS OTHERWISE NOTED.

8.

PROVIDE FINAL CALIBRATION K-FACTORS FOR ALL DEVICES INCLUDING, BUT NOT LIMITED TO TERMINAL AIR UNITS, AIRFLOW STATIONS, FAN OFFSETS.

9.

PROVIDE NON-INTEGRAL CONTROL VOLTAGE TRANSFORMER FOR LOW VOLTAGE WIRING. TERMINAL UNITS SHALL BE GROUPED INTO A MAXIMUM OF FOUR (4) TERMINAL UNITS PER TRANSFORMER. TRANSFORMER SHALL BE SIZED PER TERMINAL UNIT REQUIREMENTS.

10.

REFER TO ELECTRICAL GENERAL NOTES AND COORDINATE WITH ELECTRICAL CONTRACTOR.

11.

DDC IS THE SAME AS BMS WHEN IT COMES TO PROVIDING GRAPHIC INTERFACE.

12.

SEQUENCES OUTLINED (UNLESS OTHERWISE SPECIFIED) SHALL BE PERFORMED BY DIRECT DIGITAL CONTROL FIELD PANELS (DDCFPS) OR LOCALLY MOUNTED DIRECT DIGITAL UNIT CONTROLLERS.

13.

UNLESS OTHERWISE SPECIFIED, ALL SETPOINTS AND TIME DELAYS SHALL BE ADJUSTABLE BY THE OPERATOR THROUGH THE BAS AND THROUGH MENU ACCESS AT ALL DDCFPS WITHOUT ANY HARDWARE OR SOFTWARE REVISIONS.

14.

ABILITY TO REVIEW ALL MEASURED DATA, CONTROL SETPOINTS AND FUNCTIONS SHALL BE PROVIDED AT BAS WORKSTATION AND DDCFPS.

15.

PROVIDE MENU DRIVEN CAPABILITY TO OVERRIDE AUTOMATED START/STOP OR OPERATING MODES FOR EACH PIECE OF EQUIPMENT (INCLUDING PUMPS, RTUS, VUVS, ETC...). IF A SEQUENCE IS DISABLED BY MANUAL INPUT AND THE BAS ATTEMPTS AN AUTOMATIC CHANGE IN OPERATING MODE, AN ALARM SHALL BE INITIATED AT THE BAS STATING THAT THE SYSTEM WAS UNABLE TO CHANGE THE MODE DUE TO USER INPUT. WHERE APPLICABLE A MANUAL INPUT COMMAND WILL THEN BE REQUIRED FROM THE USER INSTRUCTING THE BAS TO START THE NEXT SEQUENTIAL PIECE OF EQUIPMENT.

16.

THE DESIGN INTENT IS FOR THE BAS TO MONITOR PRESSURES, TEMPERATURES AND FLOWS AND TO CONTROL VALVES, VARIABLE FREQUENCY DRIVES (VFDs), AHUS, PUMPS, ETC... MONITORED DATA WILL BE USED TO ENERGIZE OR DE-ENERGIZE EQUIPMENT IN ACCORDANCE WITH THE SEQUENCES OUTLINED.

17.

ALL EQUIPMENT CONTROLLED BY THE BAS SHALL BE CAPABLE OF MANUAL OPERATION THROUGH HAND-OFF-AUTOMATIC (HOA) SWITCHES LOCATED IN THE MOTOR STARTERS. THE POSITIONING OF ALL VALVES CONTROLLED BY THE BAS SHALL BE CAPABLE OF MANUAL POSITIONING (OPEN, CLOSED, MODULATED, AUTO) VIA LABELED POTENTIOMETERS AND SWITCHES. SAFETY DEVICES SHALL FUNCTION AND SHUT DOWN THE ASSOCIATED EQUIPMENT WHEN THE MANUAL SWITCHES ARE IN BOTH THE HAND AND AUTO POSITIONS.

18.

COORDINATE ALL SENSOR INSTALLATION LOCATIONS AND SUBMIT PROPOSED POSITIONS ON APPLICABLE PIPING AND DUCTWORK COORDINATION SUBMITTALS. COORDINATE AND ENSURE MANUFACTURER'S RECOMMENDED UPSTREAM AND DOWNSTREAM PIPE OR DUCT DIAMETERS ARE PROVIDED. SPECIAL ATTENTION IS REQUIRED FOR FLOW ELEMENTS AND TRANSMITTERS. IN THE FOLLOWING SEQUENCES, THE SYMBOL FE REFERS TO FLOW ELEMENTS OF THE PILOT TUBE TYPE, THE SYMBOL FT, WHEN ATTACHED TO AN FE, REFERS TO A FLOW TRANSMITTER, THE SYMBOL FT ALONE, REFERS TO A COMBINATION FLOW ELEMENT AND TRANSMITTER.

19.

UNLESS OTHERWISE NOTED, THE SYMBOL TT, WHEN ATTACHED TO AN TE, REFERS TO A TEMPERATURE SENSOR CONNECTED TO A SEPARATE TEMPERATURE TRANSMITTER. THE SYMBOL TT ALONE, REFERS TO A COMBINATION TEMPERATURE SENSOR AND TRANSMITTER.

20.

PROVIDE COMMUNICATIONS INTERFACE (INCLUDING NECESSARY SOFTWARE) BETWEEN THE BAS AND EACH MANUFACTURER SUPPLIED CONTROL PANEL SPECIFIED. BAS SHALL BE CAPABLE OF READING AND DISPLAYING ALL DATA USED BY THE MANUFACTURER'S CONTROL PANEL. SOFTWARE INTERFACE SHALL BE THROUGH LONMARK/BACNET COMPLIANT PROTOCOL WHERE THE BAS IS REQUIRED TO CONTROL THE OPERATION OF THE EQUIPMENT, PROVIDE COMPLETE INPUT AND OUTPUT INTERFACE.

21.

FAIL SAFE POSITIONS INDICATED ARE POSITIONS THAT DEVICES WILL GO TO WHEN THE ASSOCIATED EQUIPMENT IS DE-ENERGIZED.

22.

PROVIDE ADEQUATE DAMPING OF ALL MODULATING CONTROL LOOPS TO PREVENT HUNTING. MAXIMUM RESPONSE TIME SHALL BE 30 SECONDS. ALL CONTROL PID LOOPS SHALL BE TUNED TO PROVIDE FOR STABLE OPERATION OF THE CONTROL DEVICE. THIS PID LOOP TUNING MAY BE REQUIRED TO BE PERFORMED MULTIPLE TIMES DURING MULTIPLE CONTROL SCENARIOS.

23.

WHenever a unit is shut down because of one of its safeties, the BAS shall retain in memory the reading and setpoint of each associated device to help the operator in isolating the cause of the shut down. BAS shall include an on screen manual restart button for each system and piece of equipment to allow remote restart at head end computer.

24.

WHenever an alarm is initiated, the BAS shall retain in memory the reading and setpoint of each associated device to help the operator in isolating the cause of the alarm.

25.

IF ANY DDCFP OR EQUIPMENT MANUFACTURER'S CONTROL PANEL LOSES COMMUNICATION WITH THE BAS NETWORK, AN ALARM SHALL BE INITIATED AT THE BAS INDICATING THE LOCATION OF THE FAULT.

26.

THE FOLLOWING DEFINITIONS APPLY TO THE SEQUENCES OF OPERATION:

1.

BAS: PERSONAL COMPUTER BASED WORKSTATION

2.

DDCFP: DIRECT DIGITAL CONTROL FIELD PANEL. DDCFPS ARE APPLICATION BASED LOCAL SYSTEM CONTROLLERS WITH INPUTS FROM MONITORED DEVICES, OUTPUTS TO CONTROLLED DEVICES, CONTROLLING LOGIC SOFTWARE, AND NETWORKING CAPABILITY FOR COMMUNICATION WITH THE BAS.

3.

END DEVICE: MONITORED SENSORS AND CONTROLLED OPERATORS FOR SPECIFIC EQUIPMENT ITEMS. END DEVICES WILL PROVIDE A VARIETY OF ANALOG OR BINARY INPUT SOURCES TO THE DDCFPS AS WELL AS RECEIVE OUTPUTS FROM LOCAL CONTROLLERS OR DDCFPS.

27.

WHenever a piece of equipment is taken offline for maintenance, alarms related to this piece of equipment shall be inhibited.

28.

WHERE CURRENT TRANSMITTERS ARE USED TO DETERMINE FAN OR EQUIPMENT STATUS, A BELT OFF TEST SHALL BE PERFORMED TO DETERMINE CURRENT LOW POINT TO VERIFY STATUS.

UNLESS NOTED OTHERWISE THE FOLLOWING SHALL BE INITIAL SPACE TEMPERATURE SETPOINTS (ADJUSTABLE):

(OFFICE, CONFERENCE AND CONDITIONED SUPPORT) INTERIOR CONDITIONS

A.

SUMMER INTERIOR TEMPERATURE: 76°F OCCUPIED/90°F MAX UNOCCUPIED

B.

SUMMER MAXIMUM DEWPOINT: 56.8°F (51.4% RH)

C.

WINTER INTERIOR TEMPERATURE: 71°F OCCUPIED/55°F MIN UNOCCUPIED

D.

WINTER MINIMUM RELATIVE HUMIDITY: NONE
- OCCUPANCY SCHEDULES:

A.

OCCUPANCY SCHEDULING SHALL BE CAPABLE OF SCHEDULING BY AREA, ZONE, GROUPS OF ZONES, INDIVIDUALLY CONTROLLED EQUIPMENT AND GROUPS OF INDIVIDUALLY CONTROLLED EQUIPMENT.

B.

EACH SCHEDULE SHALL PROVIDE BEGINNING AND ENDING DATES AND TIMES (HOURS-MINUTES).

C.

A WEEKLY REPEATING SCHEDULE (E.G. BETWEEN 8:00 A.M. AND 6:00 P.M., MONDAY THROUGH FRIDAY) SHALL CONSTITUTE ONE SCHEDULE, NOT FIVE.

D.

DATED SCHEDULES MAY BE ENTERED IN ONE-YEAR ADVANCE.

E.

DATED SCHEDULES SHALL BE SELF-DELETING WHEN EFFECTIVE DATES HAVE PASSED.

F.

WHEN A TEMPERATURE OF A ROOM, AREA OR ZONE, SCHEDULED OFF OR UNOCCUPIED, FALLS BELOW 55 F (ADJ.), THE SCHEDULE SHALL BE OVERRIDDEN AUTOMATICALLY AND THE ZONE SHALL BE OVERRIDDEN TO PROVIDE MINIMUM 55 F SPACE TEMPERATURE AND AN ALARM SHALL BE INITIATED THROUGH THE BAS.

G.

WHEN A TEMPERATURE OF A ROOM, AREA OR ZONE, AS DESCRIBED ABOVE REACHES 55 F (ADJ.) PLUS A DEADBAND (ADJ.), THE NORMAL SCHEDULE IS RESUMED.

H.

LEAP YEARS SHALL BE ADJUSTED AUTOMATICALLY WITHOUT OPERATOR INTERVENTION.

SCHEDULES:

I.

SPACES INITIAL SCHEDULES (ADJUSTABLE)

J.

OCCUPIED.....8:00 AM TO 6:00 PM MON. THRU FRI.

K.

UNOCCUPIED.....ALL OTHER TIME PERIODS

L.

REFER TO INDIVIDUAL SEQUENCES FOR ADDITIONAL VARIABLES

M.

CONTROL SYSTEM NOTES

N.

UNLESS OTHERWISE NOTED, ALL CONTROLS SHALL BE DIRECT DIGITAL TYPE (DDC).

O.

ALL SETPOINTS INDICATED IN THE SEQUENCES SHALL BE ADJUSTABLE VIA A LAPTOP COMPUTER OR ELECTRONIC SERVICE TOOL CONNECTED TO ANY DDCFP.

P.

EACH SEQUENCE WITH A DEFINED OCCUPIED PERIOD SHALL HAVE THE PERIOD ADJUSTABLE GLOBALLY (SO THAT ALL CAN BE ON THE SAME TIME FRAME) AND INDIVIDUALLY (SO THAT ANY ONE OPERATION CAN HAVE A DIFFERENT OCCUPIED PERIOD).

Q.

SOFTWARE COMMUNICATION SHALL BE REQUIRED BETWEEN THE BAS AND EQUIPMENT MANUFACTURERS PACKAGED CONTROL SYSTEMS.

R.

ALL DDC FIELD PANELS (DDCFPS) SHALL BE CAPABLE OF INDEPENDENT OPERATION REGARDLESS OF THE STATUS OF THE BUILDING AUTOMATION SYSTEM (BAS).

S.

REFER TO SPECIFIC NOTES ON VARIABLE FREQUENCY DRIVES (VFD).

T.

ALL COMMON INFORMATION (OUTSIDE AIR TEMP & HUMIDITY, ETC...) SHALL BE MEASURED AND COMMUNICATED IN AT LEAST (3) LOCATIONS.

U.

ALL SEQUENCES SHALL BE PERFORMED BY THE DDCFP AND MONITORED BY THE CENTRAL BAS. ALL WALL MOUNTED TEMPERATURE OR HUMIDITY TRANSMITTERS SHALL HAVE ALL PENETRATIONS SEALED.

V.

ALL INSTALLED CONTROL DEVICES SHALL BE INSTALLED IN SUCH A WAY TO BE ACCESSIBLE FOR MAINTENANCE AND REPAIR

SEQUENCE OF OPERATIONS

FAN COIL UNITS

OPERATION BASED ON THE FOLLOWING

1.

PROVIDE DIRECT DIGITAL CONTROLS FOR FAN COIL UNIT OPERATION. UNIT(S) ARE A COMBINATION OF AN INDOOR SINGLE ZONE VARIABLE VOLUME UNIT, SUPPLY FAN, ECM MOTOR, CHILLED WATER COIL, CONTROL VALVE (CV) AND ACTUATOR, HEATING HOT WATER COIL, CONTROL VALVE (CV), MERV 8 PRE-FILTERS, AND AIR TEMPERATURE/AIRFLOW/HUMIDITY SENSOR(S).

2.

FAN COIL UNIT ADJUSTABLE SCHEDULE BASED ON THE FOLLOWING:

A.

TIME OF DAY (TOD) SCHEDULE.

a.

TO BE DETERMINED BY OWNER (CONSULT WITH OWNER).

B.

TIME OF DAY (TOD) SCHEDULE.

C.

SYSTEM SHALL RUN CONTINUOUSLY (24/7) WITH NO UNOCCUPIED MODE.

D.

ENABLED AND DISABLED BASED ON MANUAL OVERRIDE FROM DDC.

3.

FAN COIL UNIT ADJUSTABLE SETPOINTS:

A.

OCCUPIED 74°F COOLING / 70°F HEATING

B.

STANDBY 76°F COOLING / 68°F HEATING (BASED ON LIGHTING OCCUPANCY SENSOR(S))

C.

UNOCCUPIED 85°F COOLING / 62°F HEATING

4.

START/STOP, CONTROLLED DEVICES SHALL RESPOND AS FOLLOWS:

A.

WHEN INDEXED TO STOP:

a.

DISABLE SUPPLY FAN.

b.

COOLING CV 100% CLOSED.

c.

HEATING CV SHALL MODULATE TO MAINTAIN MIXED/DISCHARGE AIR TEMPERATURE SENSOR AT 80°F (ADJ.), WHEN OUTDOOR AIR TEMPERATURE IS BELOW 45°F (ADJ.).

D.

WHEN INDEXED TO START:

a.

ENABLE SUPPLY FAN.

b.

OPERATION OF SYSTEM TO RESUME AFTER START-UP DELAY.

5.

SUPPLY FAN CONTROL - SYSTEM CONTROLLER SHALL MODULATE SUPPLY FAN MOTOR(S), HEATING AND COOLING SOURCES TO MAINTAIN AN ADJUSTABLE SPACE TEMPERATURE SETPOINT MEASURED BY A SPACE TEMPERATURE THERMOSTAT.

A.

HEATING - UPON A FALL IN SPACE TEMPERATURE BELOW SPACE TEMPERATURE SETPOINT, CONTROLLER SHALL RESPOND BASED ON THE FOLLOWING:

a.

MODULATE HEATING SOURCE (AS FIRST STAGE HEATING) TO MAINTAIN SPACE TEMPERATURE SETPOINT.

-

INCLUDE A MAXIMUM HEATING DISCHARGE TEMPERATURE OF 95°F (ADJ.).

b.

SUPPLY FAN(S) AT MINIMUM CFM/SPEED SETPOINT.

c.

MODULATE SUPPLY FAN SPEED (AS SECOND STAGE HEATING) TO MAINTAIN ACTIVE CFM/SPEED SETPOINT SPACE TEMPERATURE SETPOINT.

d.

MINIMUM (30% OF DESIGN CFM) AND MAXIMUM (80% OF DESIGN CFM) CFM SETPOINTS (ADJ.).

B.

UPON A CALL FOR ADDITIONAL HEAT BASED ON SUPPLY FAN(S) ARE DELIVERING MAXIMUM CFM/SPEED (AS THIRD STAGE OF HEATING) OVERRIDE MAXIMUM HEATING DISCHARGE TEMPERATURE.

-

ALLOW HEATING CV TO MODULATE TO MAINTAIN SPACE TEMPERATURE SETPOINT.

C.

COOLING - UPON A RISE IN SPACE TEMPERATURE ABOVE SPACE TEMPERATURE SETPOINT, CONTROLLER SHALL RESPOND BASED ON THE FOLLOWING:

a.

MODULATE SUPPLY FAN SPEED (AS FIRST STAGE COOLING) TO MAINTAIN ASPACE TEMPERATURE SETPOINT.

-

MINIMUM (30% OF DESIGN CFM) AND MAXIMUM (100% OF DESIGN CFM) CFM SETPOINTS (ADJ.).

b.

ECONOMIZER SHALL BE UTILIZED (AS FIRST STAGE COOLING) IF APPLICABLE AND NOT ALLOWING DISCHARGE AIR TEMPERATURE TO DROP BELOW 55°F, THEN SUPPLY FAN.

c.

MODULATE COOLING SOURCE (AS SECOND STAGE COOLING) TO MAINTAIN SPACE TEMPERATURE SETPOINT.

-

SUPPLY FAN(S) SHALL BE AT MAXIMUM CFM SETPOINT.

6.

DE-HUMIDIFICATION CONTROL - SYSTEM CONTROLLER SHALL ENABLE DE-HUMIDIFICATION MODE TO MAINTAIN A SPACE HUMIDITY/AVERAGE SPACE HUMIDITY/RETURN/EXHAUST HUMIDITY SETPOINT OF 55% RH (ADJ.) MEASURED BY A ROOM HUMIDISTAT/THE AVERAGE OF THE ROOM HUMIDISTATS/BY A DUCT HUMIDISTAT LOCATED UPSTREAM OF UNIT RETURN/RELIEF/EXHAUST FAN(S).

A.

TEMPERATURE CONTROL SHALL OVERRIDE DISCHARGE AIR TEMPERATURE FUNCTION AND RESET DOWN TO 45°F (ADJ.).

B.

DISCHARGE AIR TEMPERATURE SHALL BE RESET BACK UP TO ITS NORMAL (NON-DEHUMIDIFICATION) SETPOINT PRIOR TO ENABLING THE HUMIDIFIER.

7.

UNOCCUPIED CONTROL - SYSTEM CONTROLLER SHALL INITIATE THE FOLLOWING BASED ON A FALL OR RISE IN SPACE TEMPERATURE:

A.

HEATING - SYSTEM CONTROLLER SHALL CYCLE SYSTEM ON (UNOCCUPIED HEATING MODE) WHEN A CALL FOR HEAT IS INITIATED BY A SPACE TEMPERATURE SENSOR(S) DURING UNOCCUPIED MODE AND HEATING SYSTEM IS OR CAN BE ENABLED. SYSTEM SHALL RESPOND BASED ON THE FOLLOWING:

a.

ENABLE FAN(S) AND SYSTEM SHALL FUNCTION AS DESCRIBED IN TEMPERATURE CONTROL OPERATION TO PROVIDE HEATING TO ZONE WITH THE EXCEPTION TO THE FOLLOWING:

-

MIXED AIR DAMPERS SHALL REMAIN CLOSED WITH RETURN DAMPER 100% OPENED AND OUTDOOR AND RELIEF/EXHAUST 100% CLOSED.

b.

COOLING SHALL BE DISABLED.

B.

SYSTEM DISABLED UPON SATISFYING THE CALL FOR HEAT AND HEATING CV SHALL REMAIN UNDER CONTROL OF MIXED/DISCHARGE AIR TEMPERATURE CONTROL.

8.

INITIAL STARTUP CONTROL - SYSTEM CONTROLLER SHALL ENABLE UNIT PRIOR TO SCHEDULED OCCUPANCY UTILIZING OPTIMUM START LOGIC TO ADJUST STARTUP TIME FOR UNIT BASED ON OUTDOOR AIR TEMPERATURE, BUILDING TEMPERATURE AND HISTORIC ELAPSE TIME TO REACH SETPOINT.

A.

UNIT SHALL ENERGIZE AND PROVIDE HEATING AND COOLING BASED ON THE SPACE TEMPERATURE SENSOR(S) TO BRING SPACE TO OCCUPIED SETPOINT. THE OUTDOOR AND RELIEF/EXHAUST AIR DAMPERS SHALL BE CLOSED UNLESS ECONOMIZER IS ENABLED. ONCE OCCUPIED SETPOINT HAS BEEN REACHED, THE UNIT SHALL SWITCH TO OCCUPIED MODE.

9.

TIMED OVERRIDE CONTROL - SYSTEM CONTROLLER SHALL ENABLE UNIT WHEN ASSOCIATED TERMINAL UNIT TIMED OVERRIDE (2 HOURS (ADJ)) IS ENABLED, SYSTEM SHALL BE ENABLE AND FUNCTION AS IN OCCUPIED MODE.

CHILLER PLANT

OPERATION BASED ON THE FOLLOWING

SYSTEM GENERAL DESCRIPTION:

THE COOLING PLANT CONTROL SYSTEM SHALL MONITOR AND CONTROL THE SYSTEM'S CHILLER(S), PUMP(S), AND CONTROL VALVES AS SHOWN ON THE COOLING PLANT FLOW DIAGRAM, IN THE COOLING PLANT POINTS LIST AND AS DETAILED IN THE SEQUENCE OF OPERATION LISTED BELOW.

THE COOLING PLANT SYSTEM CONSISTS OF AIR-COOLED CHILLER(S) WITH ITS PIPING CONFIGURATION ARRANGED AS A VARIABLE PRIMARY LOOP SUPPLYING CHILLED WATER TO THE FACILITY. THE MANIFOLDED CHILLED WATER DISTRIBUTION PUMPS ARE CONFIGURED AS LEAD / LAG CONTROL.

COOLING PLANT SYSTEM ENABLE/DISABLE:

THE COOLING PLANT SYSTEM SHALL BE ENABLED/DISABLED BY THE COOLING PLANT CONTROLLER AS REQUESTED BY THE BUILDING AUTOMATION SYSTEM (BAS) OPERATOR INTERFACE PANEL OR THE BAS TIME OF DAY SCHEDULE OR BY OUTSIDE AIR TEMPERATURE OF 65.0 DEG F AND RISING (ADJ.). THE SYSTEM WILL START AND STOP THE CHILLER AND CHILLED WATER PUMPS BASED UPON SYSTEM LOAD.

WHEN THE COOLING PLANT SYSTEM IS ENABLED THE SYSTEM SHALL SEND AN ENABLE SIGNAL TO THE CHILLER. UPON RECEIVING THE ENABLE SIGNAL THE CHILLER SHALL SEND A CHILLED WATER PUMP REQUEST SIGNAL TO THE CONTROL SYSTEM TO ENABLE THE CHILLED WATER PUMPING SEQUENCE.

WHEN THE COOLING PLANT SYSTEM IS ENABLED, THE SYSTEM SHALL RESPOND TO A CHILLED WATER PUMP REQUEST FROM THE CHILLER. THE SYSTEM SHALL START THE LEAD CHILLED WATER PUMP.

THE COOLING PLANT IS DISABLED WHEN ALL CHILLERS ARE DISABLED AND THERE IS NOT AN ACTIVE CHILLED WATER PUMP REQUEST. WHEN THE PLANT IS DISABLED THE CHILLED WATER PUMP SHALL BE COMMANDED OFF.

CHILLED WATER PUMP COMMANDS:

WHEN THE COOLING PLANT SYSTEM IS ENABLED, THE SYSTEM SHALL RESPOND TO A CHILLED WATER PUMP REQUEST FROM A CHILLER, THE SYSTEM SHALL START A CHILLED WATER PUMP THROUGH A CONTACT CLOSURE OF THE PUMPS VARIABLE SPEED DRIVE RUN-ENABLE CONTACTS. THE SYSTEM SHALL DETECT THE CHILLED WATER PUMP RUN STATUS BY A VARIABLE SPEED DRIVE CURRENT SWITCH. THE MANIFOLDED CHILLED WATER PUMPS WILL OPERATE IN A LEAD/LAG SEQUENCE THAT SHALL BE ROTATED ON A WEEKLY SCHEDULE. THE ROTATION SEQUENCE SHALL BE BASED ON CALCULATED RUN TIME WITH THE PUMP HAVING THE LEAST RUN TIME DESIGNATED AS LEAD, THE PUMP WITH THE NEXT LOWEST RUN TIME WILL BE THE SECOND IN THE SEQUENCE (OR LAG PUMP) AND SO ON. FROM THE BAS OPERATOR INTERFACE, AN OPERATOR SHALL BE ABLE TO MANUALLY CHANGE THE LEAD/LAG SEQUENCE OR REQUEST ANY PUMP TO BE UNAVAILABLE WHICH WOULD REMOVE IT FROM THE ROTATION SEQUENCE.

IF THE CHILLED WATER SYSTEM DIFFERENTIAL PRESSURE FALLS 0.5 PSIG (ADJ.) BELOW SETPOINT AND THE LEAD PUMP IS AT 100% (ADJ.) FOR MORE THAN 5 MINUTES (ADJ.), THE NEXT PUMP IN THE SEQUENCE SHALL START. IF THE PUMP SPEED CONTROL OUTPUT IS BELOW 65% (ADJ.) FOR MORE THAN 5 MINUTES (ADJ.), THE LAST OPERATING PUMP IN THE SEQUENCE SHALL BE DISABLED.

CHILLED WATER PUMP SPEED:

THE SYSTEM SHALL MONITOR THE CHILLED WATER SYSTEM DIFFERENTIAL PRESSURE SENSOR. WHEN THE PUMP VARIABLE SPEED DRIVE SHALL CONTROL THE ANALOG SPEED SIGNAL THAT IS SENT TO THE PUMP VARIABLE SPEED DRIVE TO MAINTAIN THE CHILLED WATER DIFFERENTIAL PRESSURE TO ITS SETPOINT OF 15 PSIG (ADJ.).

CHILLED WATER PUMP FAILURE:

IF THE LEAD START/STOP RELAY IS ENABLED AND THE PUMP'S RUNNING STATUS IS OFF FOR MORE THAN 30 SECONDS (ADJ.), THE SYSTEM SHALL ANNUNCIATE A CHILLED WATER PUMP FAILURE ALARM TO THE BAS AND START THE NEXT PUMP IN THE SEQUENCE. ONCE THE PROBLEM HAS BEEN CORRECTED, THE OPERATOR SHALL BE ABLE TO CLEAR THE ALARM FAILURE FROM THE BAS OPERATOR INTERFACE OR BY MANUALLY OVERRIDING THE PUMP ON. THIS SHALL RE-ENABLE THE LEAD/STANDBY SEQUENCE.

CHILLED WATER MINIMUM FLOW:

THE SYSTEM SHALL MONITOR THE EVAPORATOR DIFFERENTIAL PRESSURE OF THE CHILLER. WHEN THE PRESSURE OF THE OPERATING CHILLER INDICATES A LOW PRESSURE (FLOW), THE SYSTEM SHALL CONTROL THE ANALOG SIGNAL THAT IS SENT TO THE COOLING COIL THREE-WAY VALVES TO MAINTAIN THE MINIMUM PRESSURE (FLOW) FOR ALL OPERATING CHILLERS.

OPTIMIZED DISTRIBUTION PUMP DIFFERENTIAL PRESSURE CONTROL:

THE SYSTEM SHALL MONITOR THE CHILLED WATER SYSTEM DIFFERENTIAL PRESSURE SENSOR. THE SYSTEM SHALL CONTROL THE CHILLED WATER PUMP(S) VARIABLE SPEED DRIVE TO MAINTAIN THE CHILLED WATER SYSTEM DIFFERENTIAL PRESSURE TO ITS SETPOINT. THE BAS SHALL MONITOR THE POSITION OF ALL CHILLED WATER CONTROL VALVES SERVED BY THE COOLING PLANT. AT CHILLED WATER SYSTEM STARTUP, THE CHILLED WATER SYSTEM PRESSURE SETPOINT WILL BE SET TO THE SYSTEM DESIGN VALUE OF XX PSI (ADJ.). IN ALL CASES THE DISTRIBUTION PUMPS DIFFERENTIAL PRESSURE SETPOINT SHALL BE BOUND BETWEEN A MINIMUM OF 30 PSI (ADJ.) AND A MAXIMUM OF THE SYSTEM DESIGN VALUE.

THE SETPOINT CONTROL SHALL BE BASED ON ASHRAE GUIDELINE 98 TRIM AND RESPOND LOGIC: AT A FREQUENCY OF ONCE EVERY 10 MINUTES (ADJ.), THE CONTROL SYSTEM SHALL CALCULATE REQUESTS FOR COOLING BASED ON THE CRITERIA SHOWN BELOW:

1) THE AIR HANDLING UNIT (AHU) OR FAN COIL SERVED BY THE COOLING PLANT HAS BEEN RUNNING IN A COOLING MODE FOR 15 MINUTES (ADJ.)

2) IF AN AHUS (OR OTHER EQUIPMENT) CHILLED WATER VALVE IS GREATER THAN 95%, SEND 1 REQUEST UNTIL THE CHILLED WATER VALVE IS LESS THAN 70%.

3) ELSE IF THE CHILLED WATER VALVE IS LESS THAN 95%, SEND 0 REQUESTS.

THE BAS SHALL DEFAULT TO IGNORING THE FIRST 2 REQUESTS (ADJ.).

(NOTE: AT STARTUP SET IGNORE VALUE TO AT LEAST 40% OF THE NUMBER OF AHUS SERVED). WHEN (REQUESTS > IGNORES) THE SYSTEM SHALL RESPOND BY ADJUSTING THE CHILLED WATER PUMP DIFFERENTIAL PRESSURE SETPOINT.

UPWARD BY (REQUESTS - IGNORES) * (3) PSI (ADJ.), BUT NO LARGER THAN 10 PSI (ADJ.) WHEN REQUESTS ARE EQUAL TO, OR LESS THAN IGNORES, THE SETPOINT SHALL BE RESET DOWNWARD BY 2 PSI (ADJ.).

MINI-SPLITS - IT CLOSET

OPERATION BASED ON THE FOLLOWING

1.

MANUFACTURER PACKAGED CONTROLLER(S) SHALL CONTROL SPLIT SYSTEM AIR CONDITIONER OPERATION BASED ON THE FOLLOWING:

A.

AUTOMATIC TEMPERATURE CONTROL: MANUFACTURER PROVIDED CONTROLLER(S), THERMOSTAT(S), INDOOR FAN, EVAPORATOR AND OUTDOOR CONDENSER SHALL MAINTAIN SYSTEM TEMPERATURE COOLING SETPOINT BASED ON AN ADJUSTABLE SETPOINT OF 76°F (ADJ.).

2.

PROVIDE DIRECT DIGITAL CONTROLS (DDC) FOR SPLIT SYSTEM AIR CONDITIONER OPERATION. SYSTEM IS A COMBINATION OF CEILING/WALL MOUNTED VARIABLE AIRFLOW INDOOR UNIT(S), AIR COOLED CONDENSERS), MANUFACTURER THERMOSTAT.

3.

MONITOR, ALARM AND ADJUST INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

A.

SPACE TEMPERATURE.

a.

SYSTEM DISABLED UPON SATISFYING THE CALL.

4.

INITIAL START-UP (OPTIMAL START) CONTROL - SYSTEM CONTROLLER SHALL ENABLE UNIT PRIOR TO SCHEDULED OCCUPANCY UTILIZING OPTIMUM START LOGIC TO ADJUST STARTUP TIME FOR SYSTEM.

A.

BASED ON SPACE TEMPERATURE AND HISTORIC ELAPSE TIME TO REACH SETPOINT.

B.

SYSTEM SHALL BE ENABLED AND PROVIDE HEATING AND COOLING BASED ON THE SPACE TEMPERATURE SENSOR TO BRING SPACE TO OCCUPIED SETPOINT.

a.

ENABLE FAN.

b.

OUTDOOR AND EXHAUST AIR DAMPERS 100% CLOSED, RETURN AIR DAMPER 100% OPENED.

c.

UNLESS ECONOMIZER IS ENABLED.

d.

SYSTEM SHALL SWITCH TO OCCUPIED MODE.

5.

TIMED OVERRIDE CONTROL - SYSTEM CONTROLLER SHALL ENABLE SYSTEM WHEN ASSOCIATED SPACE TIMED OVERRIDE (2 HOURS (ADJ.)) IS ENABLED, SYSTEM SHALL BE ENABLE AND FUNCTION AS IN OCCUPIED MODE.

6.

SAFETY SHUTDOWN:

HVAC SYSTEM REPLACEMENT

MECHANICAL • ELECTRICAL DESIGN

BID DOCUMENTS	08.12.2024
Issued For:	Date

Drawing Title:

TEMPERATURE CONTROLS

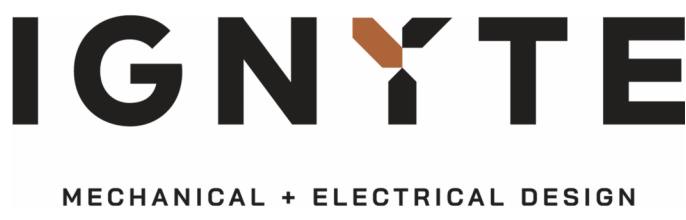
Project No: 23.110

M801

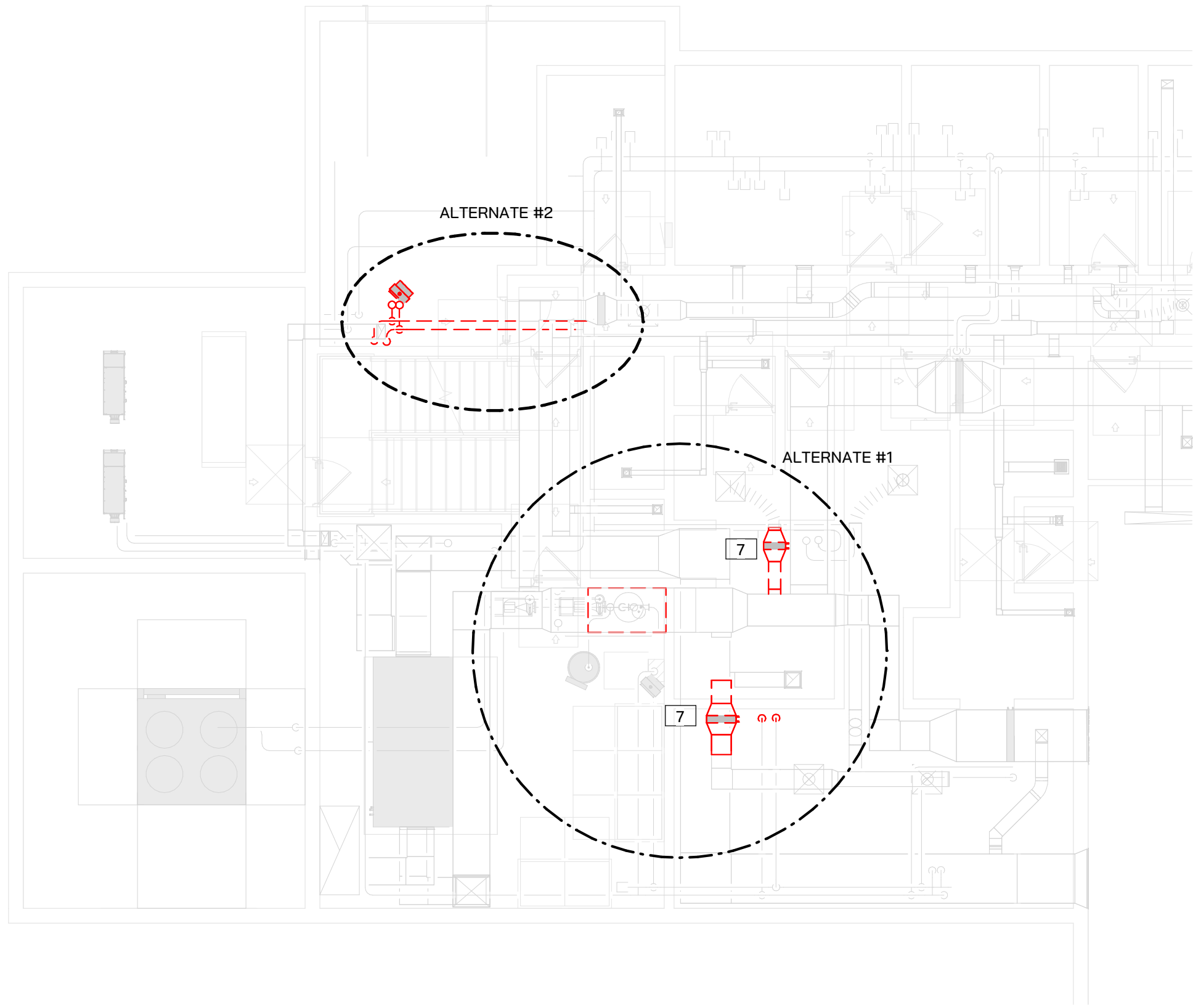
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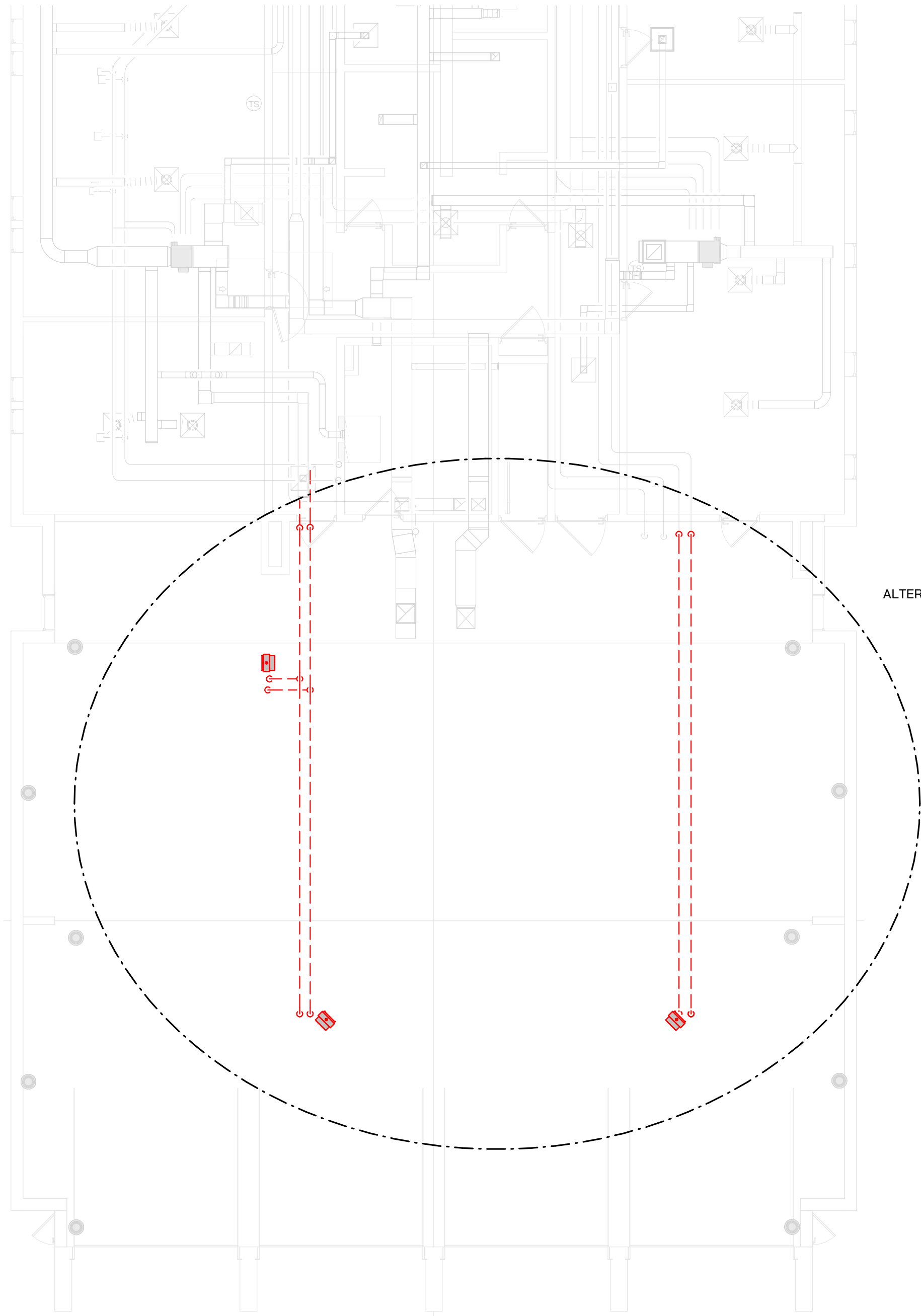
HVAC SYSTEM
REPLACEMENT



- MECHANICAL DEMOLITION KEYED NOTES
- 1 REMOVE EXISTING REFRIGERANT PIPING IN ENTIRETY.
 - 2 DEMO BACK TO EXISTING 2.5" HHWS PIPE. VIF SIZE AND LOCATION OF CONNECTION POINT.
 - 3 REMOVE EXISTING GRILLE. PREPARE FOR RELOCATION.
 - 4 DEMO EXISTING DUCT BRANCH IN ENTIRETY. SEAL DUCT TAKEOFF.
 - 5 REMOVE EXISTING CONDENSATE PIPING IN ENTIRETY.
 - 6 REMOVE EXISTING THERMOSTAT. PATCH AND PAINT TO MATCH EXISTING CONDITIONS.
 - 7 DEMO EXISTING HEATING COIL. PREPARE DUCTWORK FOR NEW CONNECTION.
 - 8 DEMO EXISTING CONDENSATE LINE FROM VRV.

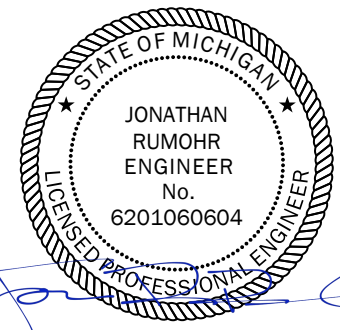


LOWER LEVEL MECHANICAL DEMOLITION PLAN - ALTERNATE
1/8" = 1'-0"



FIRST FLOOR MECHANICAL DEMOLITION PLAN
1/8" = 1'-0"

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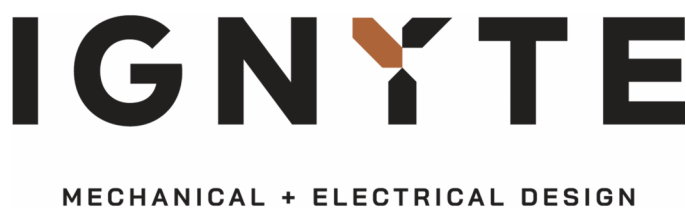
ALTERNATE -
MECHANICAL DEMOLITION
PLAN

Project No: 23.110

M900



HVAC SYSTEM
REPLACEMENT

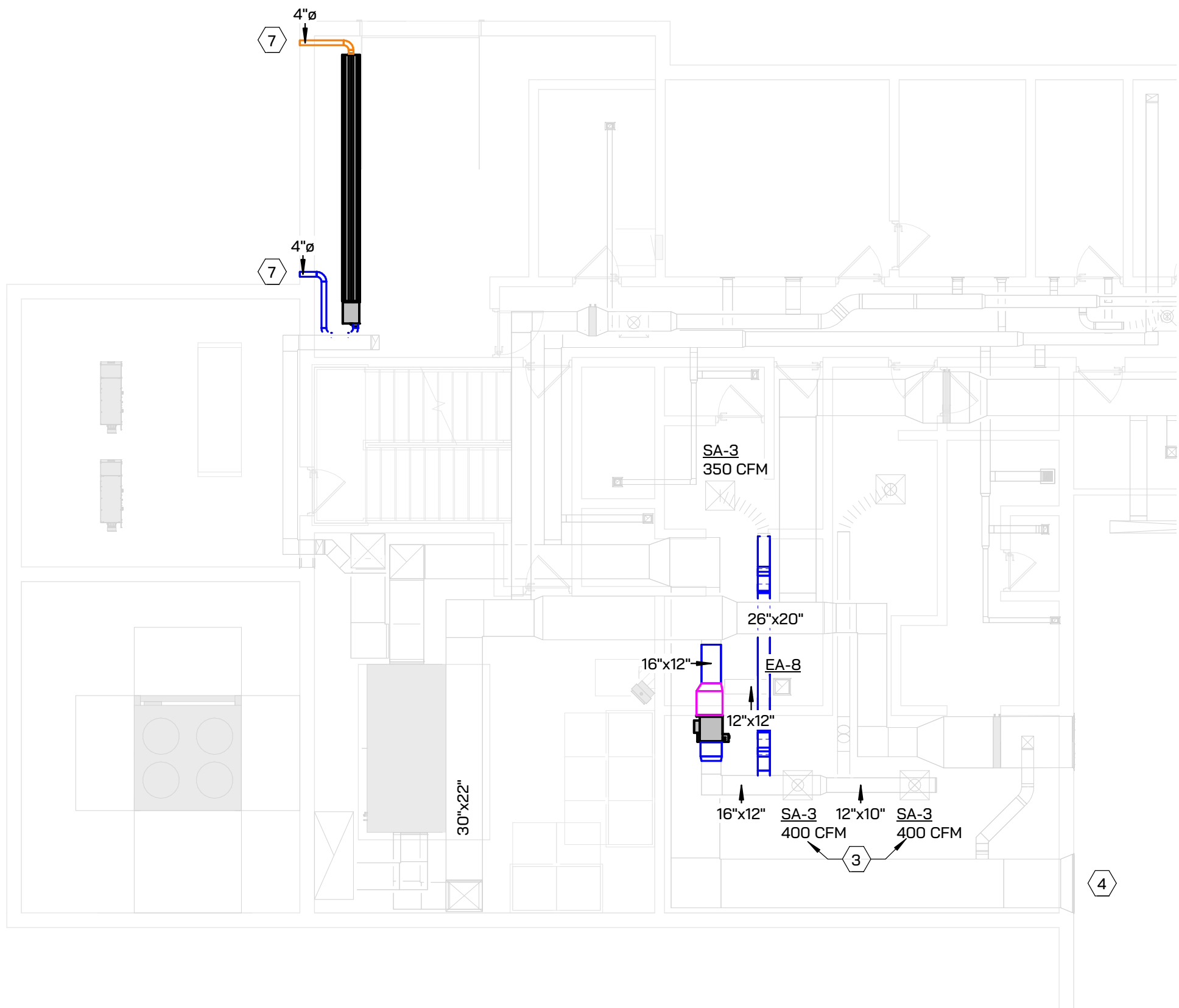


SHEET METAL KEYED NOTES

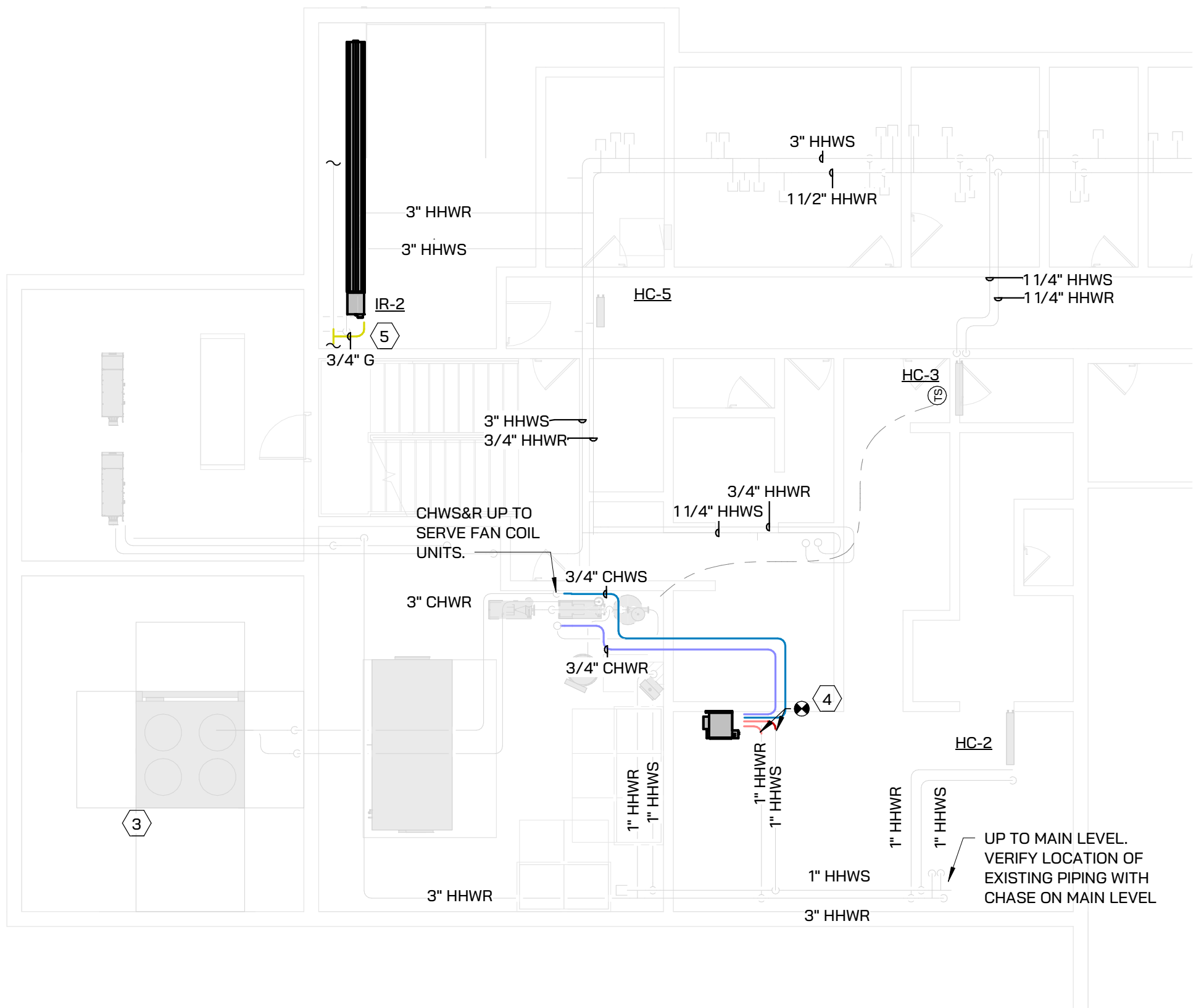
- 1 REINSTALL EXISTING GRILLE.
- 2 CONNECT NEW HVAC SHEET METAL TO EXISTING ABOVE CEILING.
- 3 REBALANCE EXISTING GRILLES TO INDICATED AIRFLOW.
- 4 EXTEND EXISTING DUCT. CONNECT TO NEW SIDEWALL GRILLE.
- 5 TENANT SPACE. CONTRACTORS SHALL COORDINATE ACCESS WITH TENANT.
- 6 SEE DETAIL ON SHEET M903 FOR VENTING.
- 7 PROVIDE WALL CAP WITH BIRD SCREEN AND BACKDRAFT DAMPER BASED ON SEIHO MODEL SFX 4, PAINT TO MATCH BUILDING, REFERENCE DETAIL ON M903.

HVAC PIPING KEYED NOTES

- 1 INSTALL NEW HHW BRANCH TO SERVE FAN COIL UNIT. CONNECTION SIZE PER MANUFACTURERS RECOMMENDATION.
- 2 CONNECT NEW HHWS, HHWR, CHWS, AND CHWR. REFERENCE DETAIL ON SHEET M10.
- 3 REFER TO DETAIL ON M801 FOR CHILLED WATER DIAGRAM.
- 4 EXTEND EXISTING HHWS AND HHWR TO NEW FAN COIL UNIT.
- 5 INSTALL 1" GAS PIPING LINE TO SERVE IR-2. VIF EXISTING GAS PIPING SIZE.
- 6 INSTALL IR-1 ALIGNED WITH EXISTING CONCRETE BEAM. INSTALL AT HIGHER CEILING BOTTOM ELEVATION. INSTALL AT 45 DEGREE ANGLE.
- 7 MATCH MANUFACTURERS CONNECTION SIZES.
- 8 TENANT SPACE. CONTRACTORS SHALL COORDINATE ACCESS WITH TENANT.
- 9 PIPES TO ENTER BUILDING THROUGH EXISTING WALL. PENETRATION. PATCH AND SEAL TO MATCH EXISTING.
- 10 CONNECT NEW UNIT TO EXISTING CONDENSATE LINE.

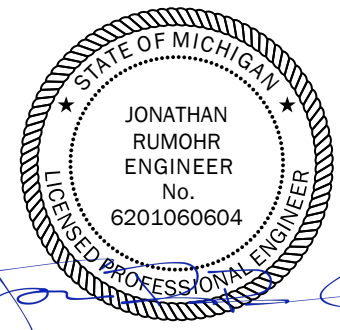


LOWER LEVEL SHEET METAL PLAN
1/8" = 1'-0"



LOWER LEVEL HVAC PIPING PLAN
1/8" = 1'-0"

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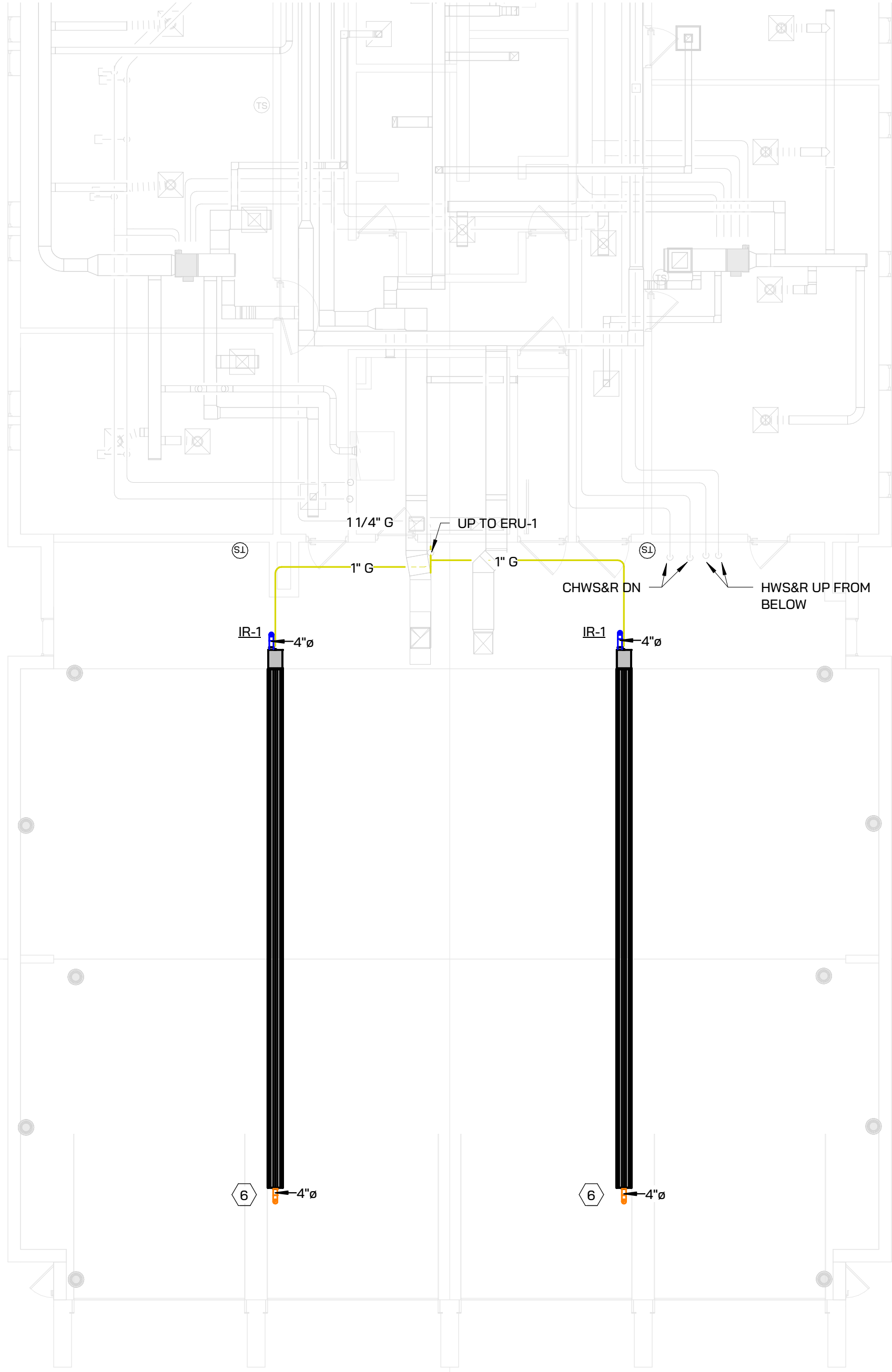
ALTERNATE - LOWER
LEVEL MECHANICAL PLAN

Project No: 23.110

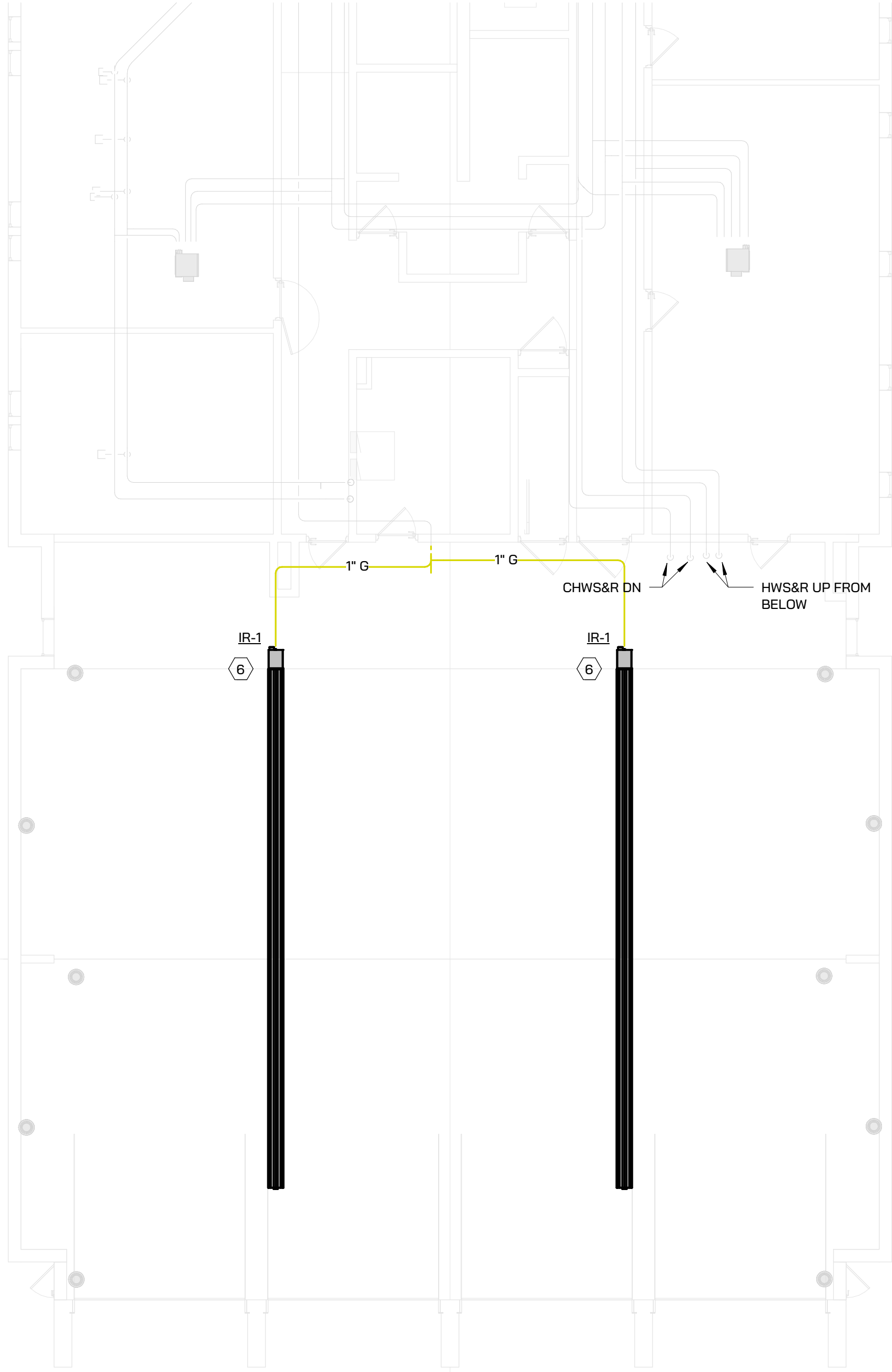
M901

- SHEET METAL KEYED NOTES
- 1 REINSTALL EXISTING GRILLE.
 - 2 CONNECT NEW HVAC SHEET METAL TO EXISTING ABOVE CEILING.
 - 3 REBALANCE EXISTING GRILLES TO INDICATED AIRFLOW.
 - 4 EXTEND EXISTING DUCT. CONNECT TO NEW SIDEWALL GRILLE.
 - 5 TENANT SPACE. CONTRACTORS SHALL COORDINATE ACCESS WITH TENANT.
 - 6 SEE DETAIL ON SHEET M903 FOR VENTING.
 - 7 PROVIDE WALL CAP WITH BIRD SCREEN AND BACKDRAFT DAMPER BASED ON SEIHO MODEL SFX 4. PAINT TO MATCH BUILDING. REFERENCE DETAIL ON M903.

- HVAC PIPING KEYED NOTES
- 1 INSTALL NEW HHW BRANCH TO SERVE FAN COIL UNIT. CONNECTION SIZE PER MANUFACTURERS RECOMMENDATION.
 - 2 CONNECT NEW HHWS, HHWR, CHWS, AND CHWR. REFERENCE DETAIL ON SHEET M10.
 - 3 REFER TO DETAIL ON M601 FOR CHILLED WATER DIAGRAM.
 - 4 EXTEND EXISTING HHWS AND HHWR TO NEW FAN COIL UNIT.
 - 5 INSTALL 1" GAS PIPING LINE TO SERVE IR-2. VIF EXISTING GAS PIPING SIZE.
 - 6 INSTALL IR-1 ALIGNED WITH EXISTING CONCRETE BEAM. INSTALL AT HIGHER CEILING BOTTOM ELEVATION. INSTALL AT 45 DEGREE ANGLE.
 - 7 MATCH MANUFACTURERS CONNECTION SIZES.
 - 8 TENANT SPACE. CONTRACTORS SHALL COORDINATE ACCESS WITH TENANT.
 - 9 PIPES TO ENTER BUILDING THROUGH EXISTING WALL PENETRATION. PATCH AND SEAL TO MATCH EXISTING.
 - 10 CONNECT NEW UNIT TO EXISTING CONDENSATE LINE.



MAIN LEVEL SHEET METAL PLAN
1/8" = 1'-0"



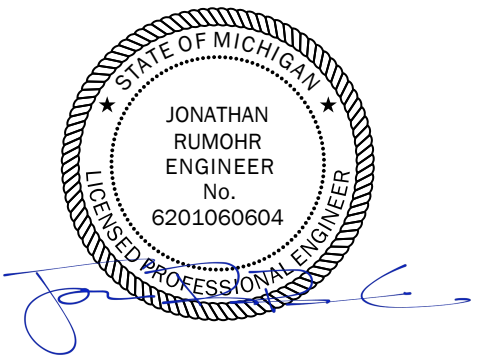
MAIN LEVEL HVAC PIPING PLAN
1/8" = 1'-0"



HVAC SYSTEM
REPLACEMENT

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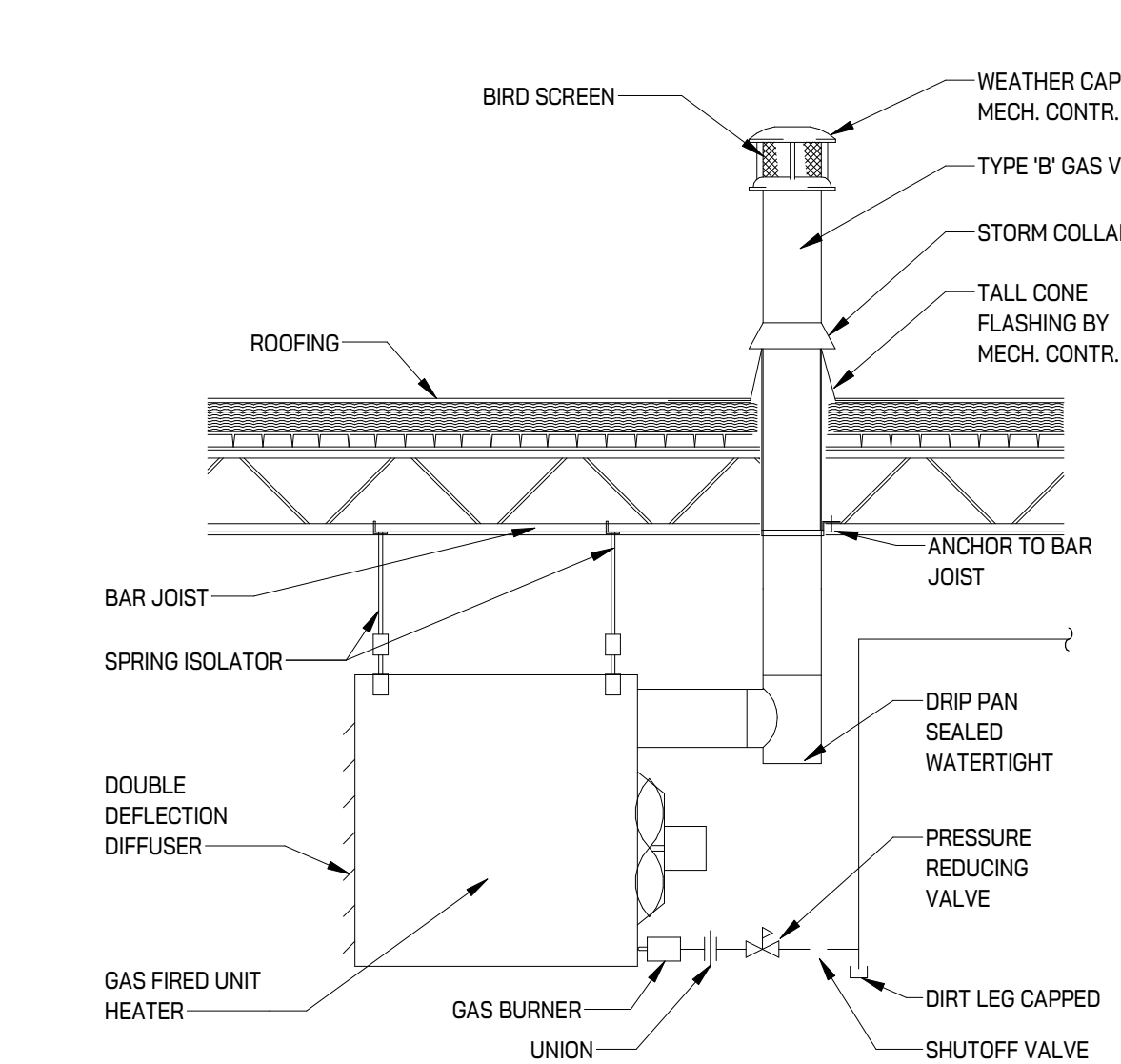
ALTERNATE - MAIN LEVEL
MECHANICAL PLAN

Project No: 23.110

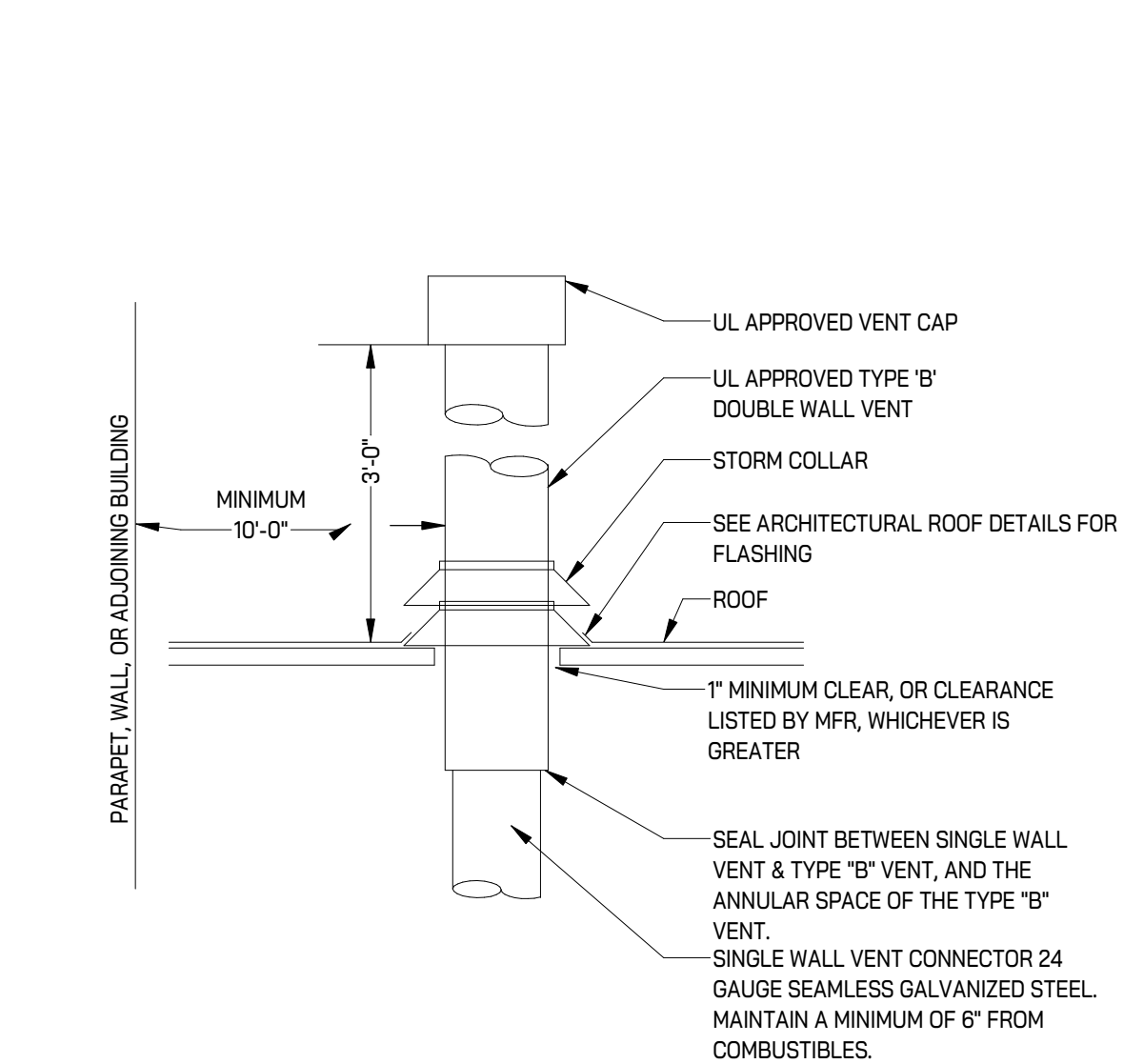
M902

FAN COIL UNIT SCHEDULE (CHILED-WATER & HOT-WATER) ALTERNATE																																							
IDENTITY	MANUFACTURER	MODEL	PRODUCT TYPE	NOMINAL CAPACITY	OUTDOOR AIR INTAKE FLOW	DESIGN AIRFLOW RATE	SUPPLY FAN SYSTEM		SUPPLY FAN MOTOR		COOLING COIL						CHILLED-WATER DESIGN				HEATING AIRFLOW DESIGN			HEATING TEMP. RISE	HOT-WATER DESIGN				HEAT TRANSFER FLUID	SOUND RATINGS	AIR FILTER	RIGHT SIDE CONNECTION	ELECTRICAL				PRODUCT WEIGHT	SPECIFICATION	NOTES
							CAPACITY	ESP	SIZE	RPM	TOTAL	SENSIBLE	EDB	EWB	LDB	LWB	FLOW RATE	SUPPLY	ΔT	HEAD LOSS	OUTPUT	EAT	LAT		FLOW RATE	SUPPLY	ΔT	HEAD LOSS					VOLTAGE	PHASE	MCA	MOCp			
FC-14	DAIKIN APPLIED	BCHD0101	HORIZONTAL CONCEALED BLOWER COIL	21473.0 Btu/h	100 CFM	850 CFM	850 CFM	0.97 in-wg	261 W	1137	21473.0 Btu/h	19740.0 Btu/h	76 °F	63 °F	55 °F	54 °F	3 GPM	40 °F	16 °F	3.36 Feet	43114.0 Btu/h	50 °F	96 °F	46 °F	4 GPM	130 °F	20 °F	7.73 Feet	WATER	72 dB	MERV 8	Yes	208 V	1	5 A	15 A	408.00 lbf		

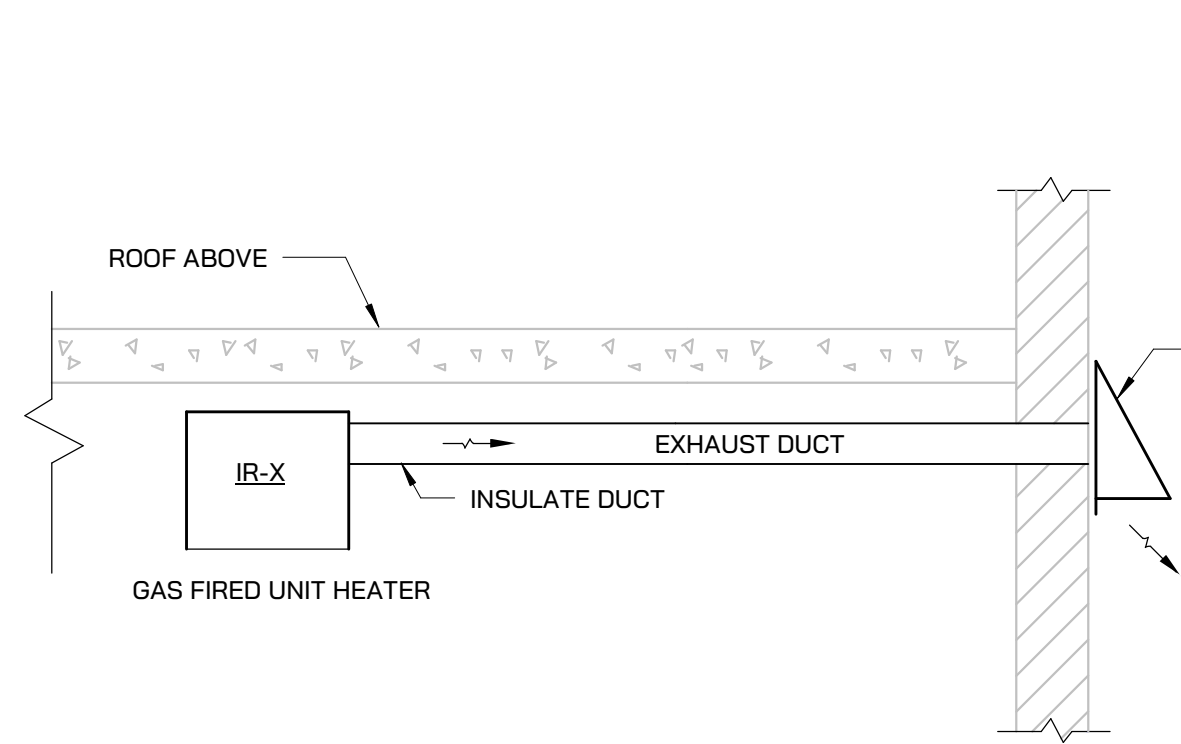
GAS-FIRED RADIANT HEATER SCHEDULE																					
IDENTITY	MANUFACTURER	MODEL	PRODUCT TYPE	INSTALLATION TYPE	BOTTOM ELEVATION	MATERIAL	HEAT EXCHANGER TYPE	GAS BURNER LENGTH	TYPE	GAS BURNER RATINGS				INSTAKE DUCT DIA.	EXHAUST DUCT DIA.	HEATING STAGES	ELECTRICAL		PRODUCT WEIGHT	SPECIFICATION	NOTES
										INPUT RATING	OUTPUT RATING	EFFICIENCY	MINIMUM RATE				VOLTAGE	PHASE			
IR-1	RE-VERBER-RAY HEATER	HL3-40-100	TWO STAGE, LOW INTENSITY, GAS-FIRED INFRARED TUBE HEATERS	Reflector Down	11' - 0"	ALUMINIZED COATED STEEL RADIANT EMITTER TUBES	AL/SS	41 ft	NG	100000.0 Btu/h	65000.0 Btu/h	65.00%	20000.0 Btu/h	4"	4"	2	120 V	1	190.00 lbf	24 V THERMOSTATIC CONTROL VOLTAGE	
IR-2	RE-VERBER-RAY HEATER	LD3-15-40	TWO STAGE, LOW INTENSITY, GAS-FIRED INFRARED TUBE HEATERS	Reflector Down	10' - 0"	HIGHLY POLISHED ALUMINUM	AL/SS	17 ft	NG	40000.0 Btu/h	28000.0 Btu/h	70.00%	8000.0 Btu/h	4"	4"	2	120 V	1	100.00 lbf	24 V THERMOSTATIC CONTROL VOLTAGE	



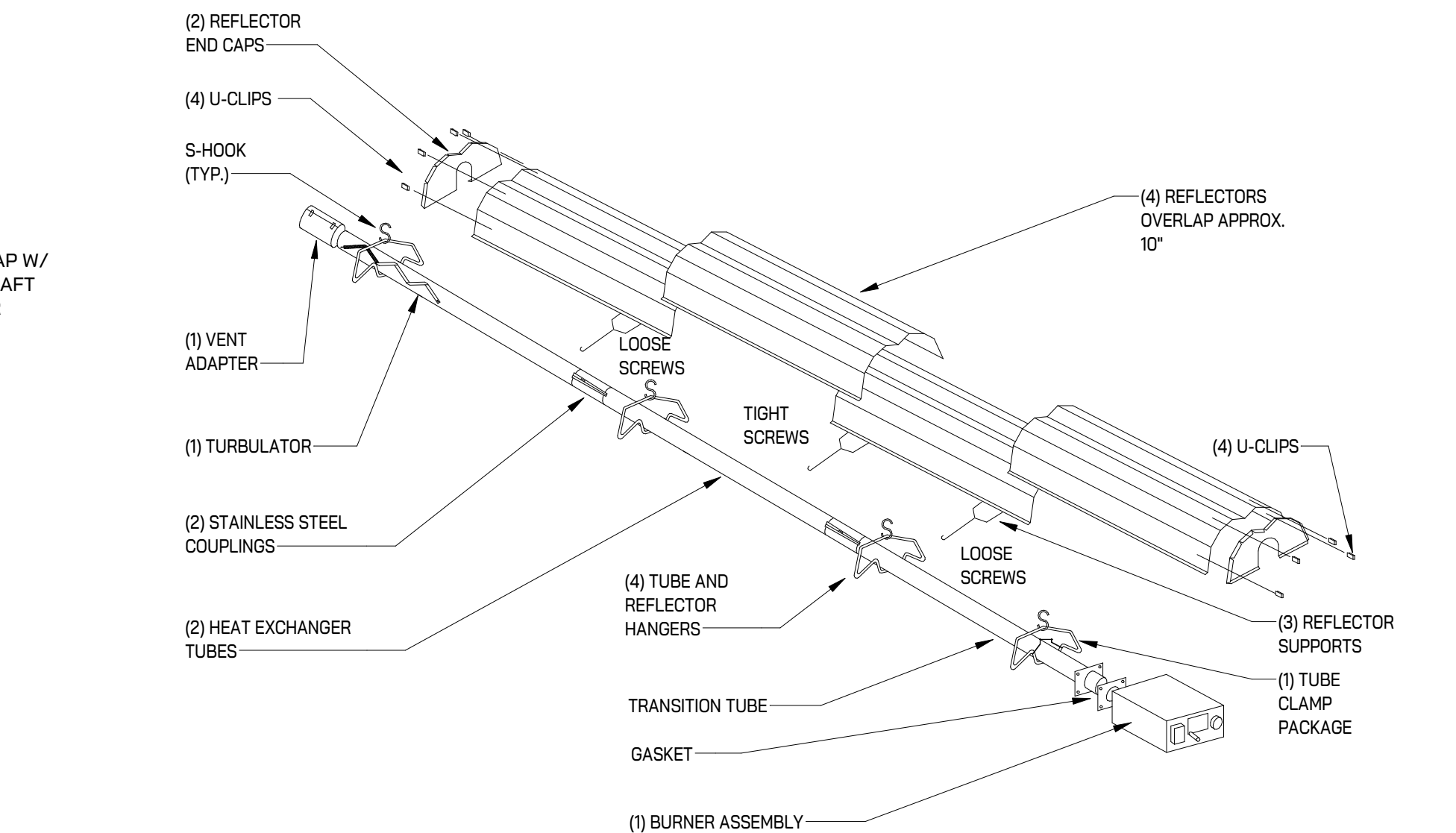
1 GAS FIRED UNIT HEATER DETAIL
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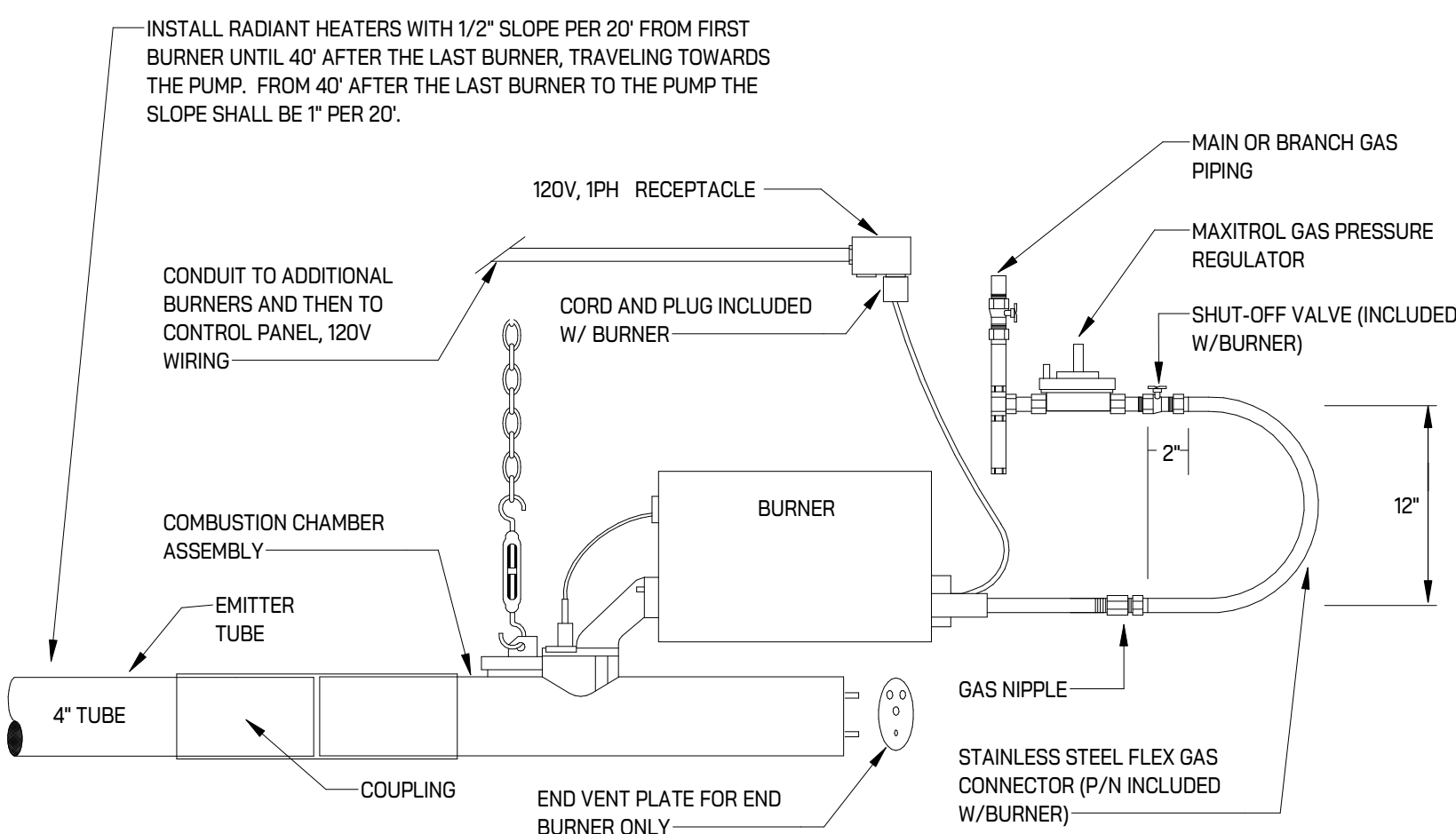
2 UNIT HEATER VENT
SCALE: NONE



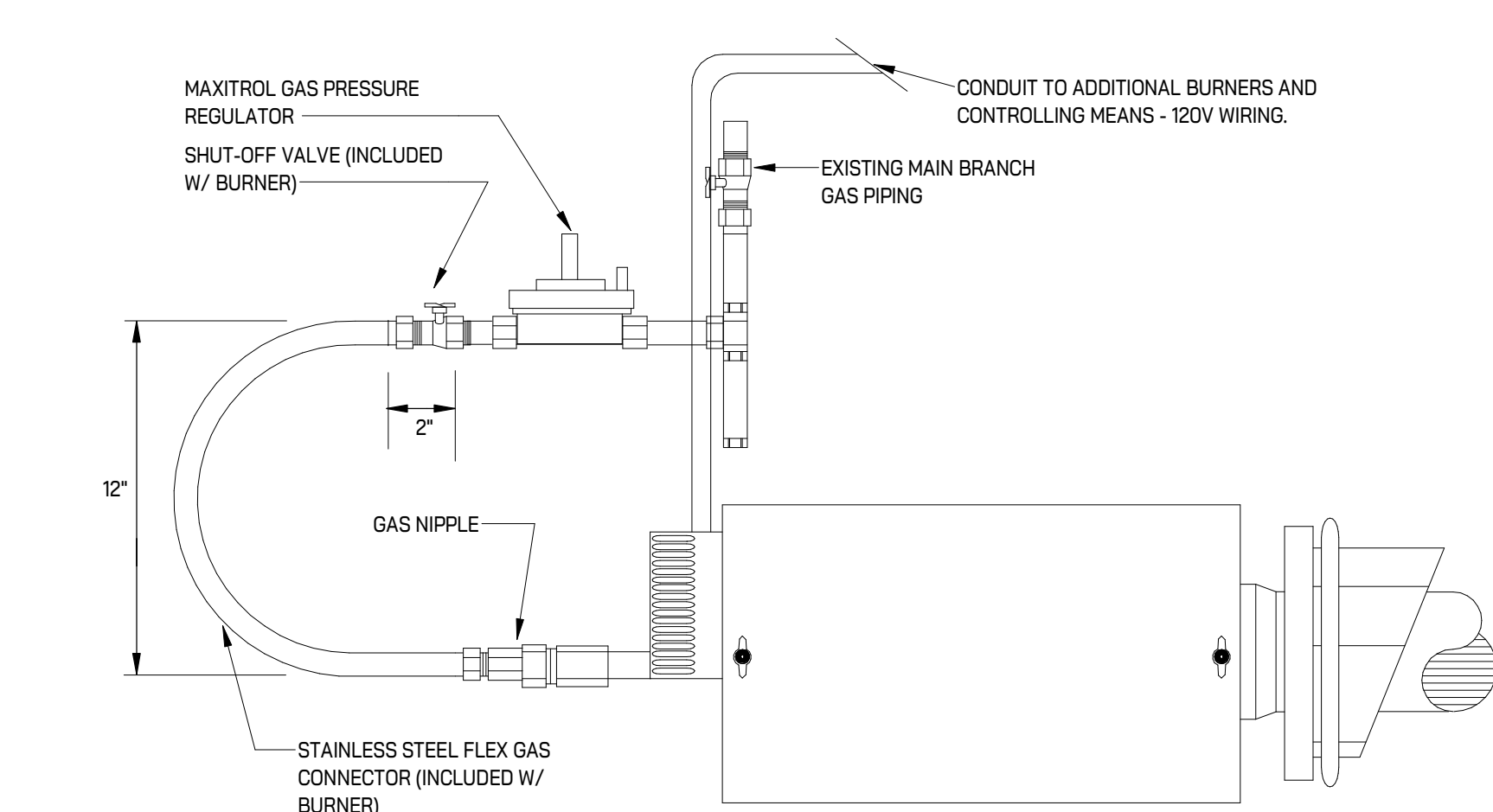
3 GAS FIRED UNIT HEATER SIDEWALL DISCHARGE
SCALE: NONE



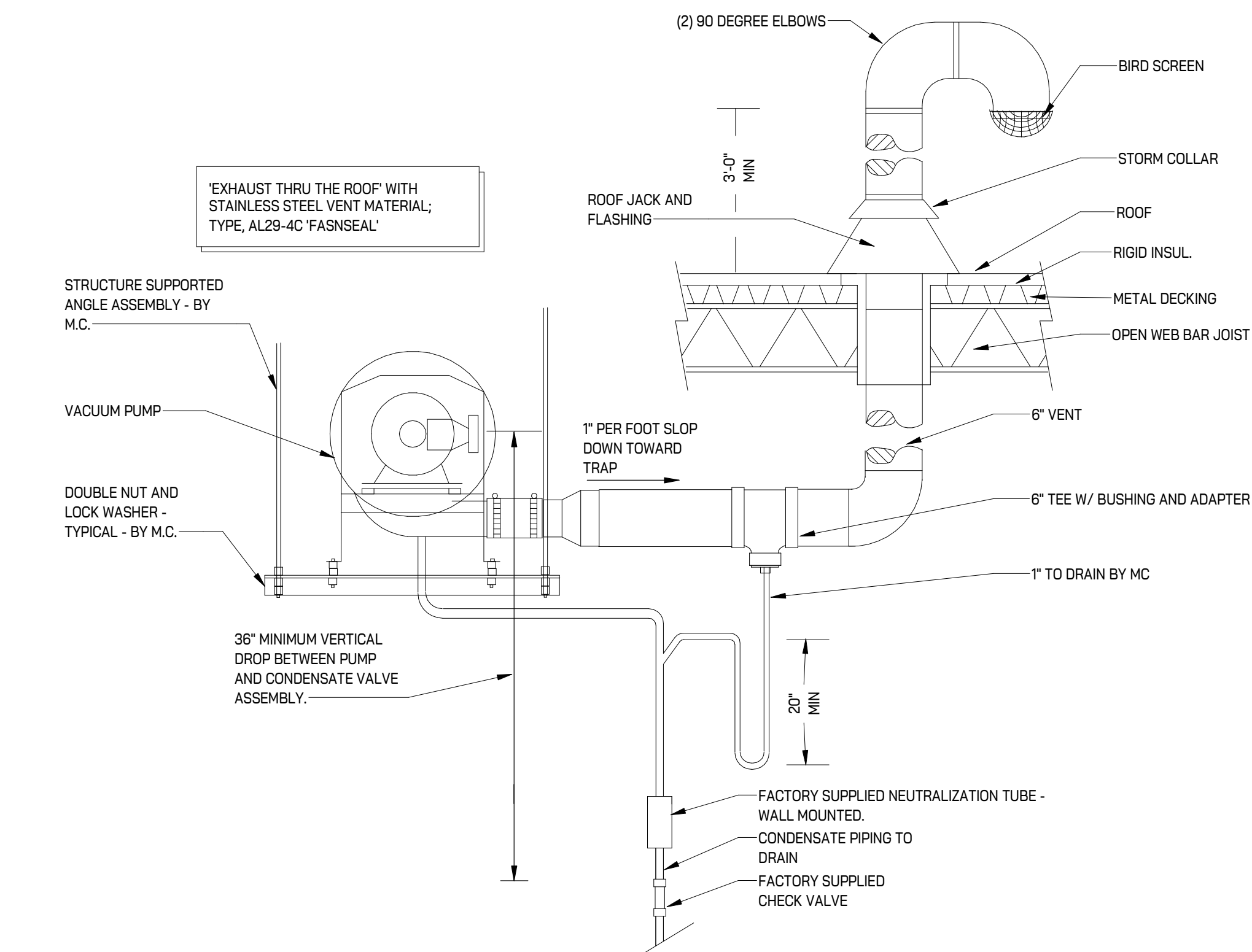
4 INFRARED DETAIL 1
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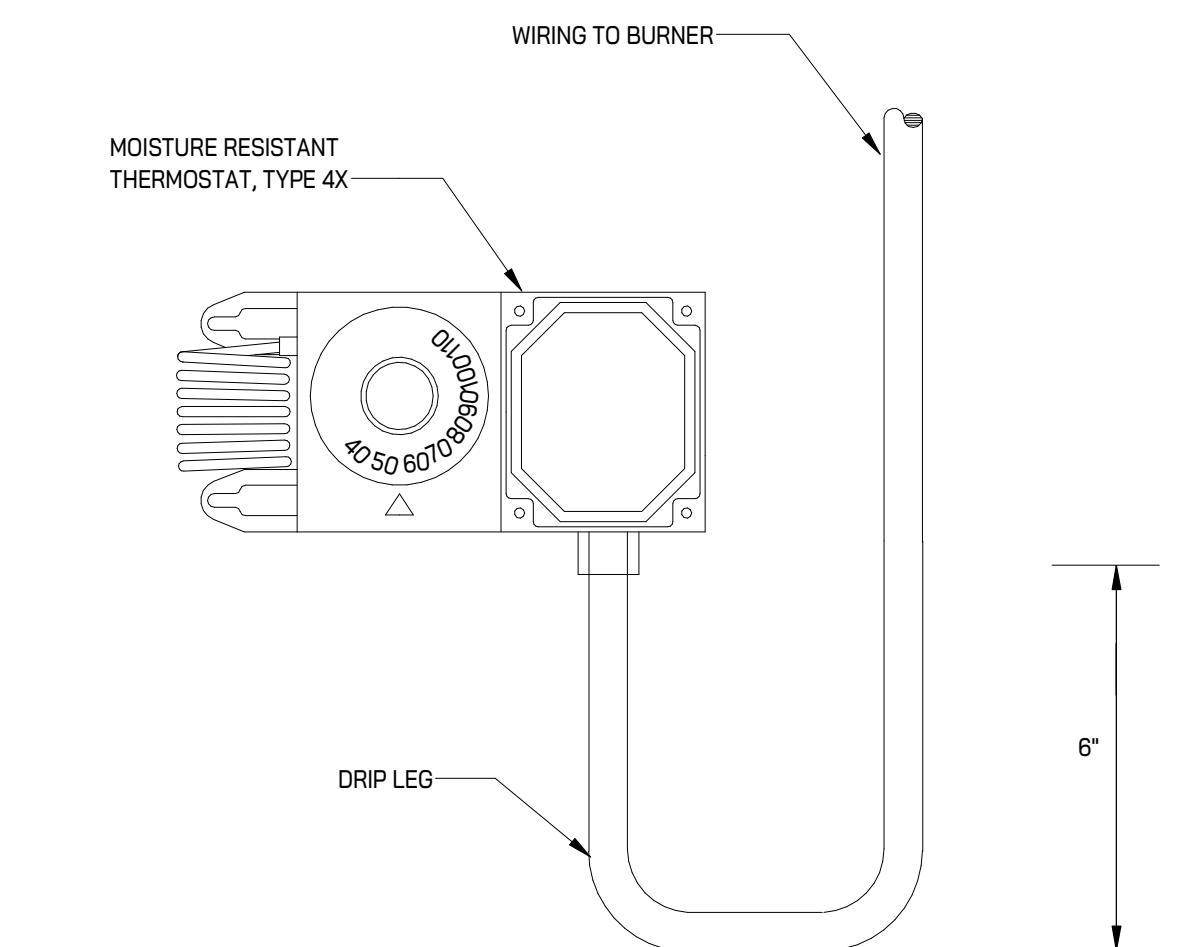
5 INFRARED DETAIL 4
SCALE: NONE



6 INFRARED GAS PIPING DETAIL
SCALE: NONE



7 INFRARED EXHAUST DETAIL
SCALE: NONE



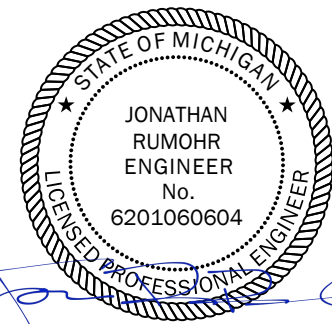
8 INFRARED THERMOSTAT DETAIL
SCALE: NONE



HVAC SYSTEM REPLACEMENT

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Drawing Title:
ALTERNATE - SCHEDULES & DETAILS

Project No: 23.110

M903

ABBREVIATION	DESCRIPTION
A	AMPERES
AF	AMPERES FRAME (BREAKER RATING)
AFCI	ARC FAULT CIRCUIT INTERRUPTER
A.F.F.	ABOVE FINISH FLOOR
AIC	AMPS INTERRUPTING CAPACITY
AL	AUDIENCE LEFT
AR	AUDIENCE RIGHT
AT	AMPSRIP TRIP (BREAKER SETTING)
ATS	AUTOMATIC TRANSFER SWITCH
AUX	AUXILIARY
BKR	BREAKER
BPS	BOLTED PRESSURE SWITCH
C	CONDUIT
CB	CIRCUIT BREAKER
CKT	CIRCUIT
CT	CURRENT TRANSFORMER
DEMO	DEMOLITION
DM	DIMENSION
DISC	DISCONNECT
DP	DISTRIBUTION PANEL
DS	DOWNSTAGE
DWG	DRAWING
EBU	EMERGENCY BATTERY UNIT
EC	ELECTRICAL CONTRACTOR
ELEC	ELECTRICAL
EM/ EMERG	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
EO	ELECTRICALLY OPERATED
EPD	EMERGENCY POWER OFF
EWC	ELECTRIC WATER COOLER
EXIST	EXISTING
EXT	EXTERIOR
FA	FIRE ALARM
FLA	FULL LOAD AMPS
FLR	FLOOR
FOH	FRONT OF HOUSE
FSEC	FOOD SERVICE EQUIPMENT
FU	FUSE
G/GRD/EG	GROUND
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFP	GROUND FAULT PROTECTION
HOA	HAND-OFF-AUTO
HP	HORSEPOWER
HV	HIGH VOLTAGE
HZ	HERTZ
IG	ISOLATED GROUND
JB	JUNCTION BOX
KV	KILOVOLT
KVA	KILOVOLT - AMPERES
KW	KILOWATT
KWH	KILOWATT - HOURS
LA	LIGHTING ARRESTOR
LP	LIGHTING PANEL
LDP	LIGHTING DISTRIBUTION PANEL
MAX	MAXIMUM
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MDP	MAIN DISTRIBUTION PANEL
MECH	MECHANICAL
MIN	MINIMUM
MISC.	MISCELLANEOUS
MLO	MAIN LOUIS ONLY
MTD	MOUNTED
MTG	MOUNTING
MTR	MOTOR
N	NEUTRAL
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NF	NON-FUSIBLE
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OC	ON CENTER
OFCI	OWNER FURNISHED,
	CONTRACTOR INSTALLED
OFCI	OWNER FURNISHED,
	OWNER INSTALLED
P	POLE
PB	PUSHBUTTON STATION
PH	PHASE
PT	POTENTIAL TRANSFORMER
PDP	POWER DISTRIBUTION PANEL
RECEPT.	RECEPTACLE
RCP	RECEPTACLE
RDP	RECEPTACLE DISTRIBUTION PANEL
RP	RECEPTACLE PANEL
RSC	RIGID STEEL CONDUIT
SCHED	SCHEDULE
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
TB	TERMINAL BOX
TELECOM	TELECOMMUNICATIONS
TR	TAMPER RESISTANT
TTP	TELEPHONE TERMINAL BACKBOARD
TYP	TYPICAL
UNO	UNLESS OTHERWISE NOTED
US	UPSTAGE
V	VOLTS
W	WIRE OR WATTS
WG	WIRE GUARD
WP	WEATHERPROOF
XFMR	TRANSFORMER
XP	EXPLOSION PROOF
(E)	EXISTING
(R)	RELOCATED

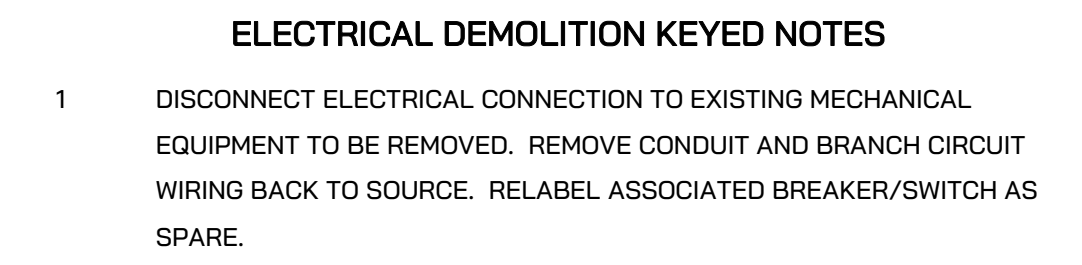
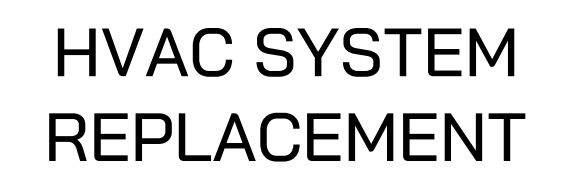
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	LIGHTING FIXTURE - ARCHITECTURAL TROFFER		CONTROL PANEL
	EMERGENCY LIGHTING FIXTURE		MOTOR
	LIGHTING FIXTURE - PENDANT		VARIABLE FREQUENCY DRIVE
	WALL MOUNTED LIGHTING FIXTURE		MANUAL CONTROLLER
	LIGHTING FIXTURE		MAGNETIC CONTROLLER
	TRACK LIGHTING FIXTURE		COMBINATION MAGNETIC CONTROLLER
	POLE MOUNTED LIGHTING FIXTURE		NON-FUSIBLE DISCONNECT SWITCH
	POLE MOUNTED LIGHTING FIXTURE - POST TOP		FUSIBLE DISCONNECT SWITCH
	BOLLARD LIGHTING FIXTURE		ENCLOSED CIRCUIT BREAKER
	EMERGENCY LIGHTING UNIT		PUSH BUTTON STATION
	EXIT LIGHTING FIXTURE WITH DIRECTIONAL ARROWS (SHADED AREA INDICATES FACE)		EMERGENCY POWER OFF BUTTON
	EXIT LIGHTING FIXTURE WITH DIRECTIONAL ARROWS (SHADED AREA INDICATES FACE)		AUTOMATIC DOOR CONTROLLER
	EXIT LIGHTING FIXTURE - WALL MOUNTED		AUTOMATIC DOOR PUSH PAD OPERATOR
	GENERATOR TRANSFER DEVICE		GROUND ROD
	LIGHTING CONTROL DEVICE - REFER TO LIGHTING CONTROL SCHEDULE		GROUND CONNECTION
	SINGLE POLE TOGGLE SWITCH		CONDUIT SLEEVE WITH BUSHINGS LENGTH AS REQUIRED "X" INDICATES CONDUIT SIZE
	TWO POLE TOGGLE SWITCH		CONDUIT STUB - UP/DOWN
	3 WAY TOGGLE SWITCH		EMPTY BOX FOR FUTURE TELECOMMUNICATION OUTLET
	4 WAY TOGGLE SWITCH		EMPTY BOX FOR FUTURE TELECOMMUNICATION OUTLET MOUNTED 4" ABOVE COUNTER TOP
	KEY OPERATED SWITCH		EMPTY BOX FOR FUTURE CEILING MOUNTED TELECOMMUNICATION OUTLET
	DIMMER SWITCH		TELECOMMUNICATION OUTLET "X" INDICATES TYPE
	DIMMER OCCUPANCY SENSOR SWITCH		SPEAKER
	LOW VOLTAGE DIMMER SWITCH		SPEAKER - WALL MOUNTED
	PILOT SWITCH		MICROPHONE
	TOUCH SCREEN SWITCH		VOLUME CONTROL
	OCCUPANCY SENSOR DEVICE - CEILING		SIGNALING BELL
	OCCUPANCY SENSOR DEVICE - WALL		SINGLE FACE CLOCK - CEILING MOUNTED
	PHOTOCELL DEVICE - REFER TO ZONES SHOWN ON PLANS		SINGLE FACE CLOCK - WALL MOUNTED
	REMOTE GENERATOR ANNUNCIATOR PANEL		DOUBLE FACE CLOCK - CEILING MOUNTED
	AUTOMATIC TRANSFER SWITCH		DOUBLE FACE CLOCK - WALL MOUNTED
	SIMPLEX / DUPLEX RECEPTACLE		MANUAL FIRE ALARM PULL STATION
	SIMPLEX / DUPLEX RECEPTACLE CONTROLLED BY AUTOMATIC CONTROL DEVICE / SYSTEM		SMOKE DETECTOR
	QUAD RECEPTACLE		DUCT SMOKE DETECTOR
	ABOVE COUNTER DUPLEX RECEPTACLE (SIMILAR FOR TAMPER RESISTANT, QUADS, EMERGENCY AND GFI RECEPTACLES)		CARBON MONOXIDE DETECTOR
	DUPLEX RECEPTACLE-GROUND FAULT CIRCUIT INTERRUPTER		REMOTE TEST STATION (FOR DUCT DETECTOR)
	DUPLEX EMERGENCY RECEPTACLE		THERMAL DETECTOR
	USB RECEPTACLE		FIRE ALARM BELL
	CEILING MOUNTED DUPLEX RECEPTACLE		FIRE ALARM AUDIBLE NOTIFICATION - WALL MOUNT SPEAKER/STROBE
	POWER POLE - WIREMOLD TYPE		FIRE ALARM VISUAL NOTIFICATION - WALL MOUNT SPEAKER/STROBE
	SPECIAL RECEPTACLE - REFER TO ELECTRICAL STANDARD SCHEDULES		FIRE ALARM AUDIBLE NOTIFICATION - CEILING MOUNT SPEAKER/STROBE
	MULTI-OUTLET RACEWAY - LEGRAND AL3300 OR EQUAL		FIRE ALARM VISUAL NOTIFICATION - CEILING MOUNT STROBE
	POKE-THROUGH ASSEMBLY - LEGRAND EVOLUTION SERIES OR EQUAL		FIREFIGHTERS PHONE JACK
	FLOOR BOX ASSEMBLY - LEGRAND EVOLUTION SERIES OR EQUAL		FIRE ALARM CONTROL PANEL
	EQUIPMENT CONNECTION - REFER TO ELECTRICAL FEEDER AND PANEL SCHEDULE FOR BREAKER AND CONDUCTOR SIZE/QUANTITY		FIRE ALARM ANNUNCIATOR PANEL
	JUNCTION BOX		NOTIFICATION APPLIANCE CIRCUIT EXTENDER PANEL
			TAMPER SWITCH
			FLOW SWITCH

REFER TO ELECTRICAL

SYMBOL	DESCRIPTION	NOTES
	SECURITY CAMERA	1. CONTRACTOR TO PROCURE ALL REQUIRED BUILDING PERMITS AND INSPECTIONS TO COMPLETE PROJECT.
	MOTION DETECTOR	2. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE MICHIGAN ELECTRICAL CODE.
	SECURITY KEY SWITCH	3. PROVIDE NEW ELECTRICAL SERVICES FROM CONSUMERS ENERGY AS INDICATED. COORDINATE SCOPE OF WORK AND PROVIDE ALL WORK TO PROVIDE A FULLY FUNCTIONAL ELECTRICAL SERVICE.
	DOOR CONTACT	4. REMOVE ALL ELECTRICAL EQUIPMENT, WIRE, CONDUIT, ETC ASSOCIATED WITH DEMOLISHED EQUIPMENT.
	KEY PAD	5. REMOVE ALL ABANDONED ELECTRICAL CONDUIT AND WIRE BACK TO SOURCE.
	CARD READER	6. PROVIDE SHOP DRAWINGS FOR THE FOLLOWING: A. CONDUIT, B. CONDUCTORS, C. WIRING DEVICES INCLUDING COVERPLATES, D. DISCONNECT SWITCHES, ENCLOSED CIRCUIT BREAKERS AND FUSED SWITCHES, E. PANELBOARDS, AND SWITCHBOARDS F. TRANSFORMERS, G. SURGE PROTECTION DEVICES H. POWER METERS, I. INTERIOR LIGHT FIXTURES, J. EXTERIOR LIGHT FIXTURES INCLUDING SITE POLES, K. LIGHTING CONTROL SYSTEM AND DEVICES, L. FIRE ALARM SYSTEM.
	DURESS PUSH BUTTON STATION	7. PATCH, REPAIR, AND PAINT ANY OPENINGS THROUGH ROOF, CEILINGS, WALLS, OR FLOORS TO MATCH EXISTING CONDITION.
	DELAYED EGRESS	8. THE OWNER SHALL HAVE FIRST RIGHT OF REFUSAL OF ALL DEMOLISHED EQUIPMENT.
	REQUEST TO EXIT STATION	9. PROVIDE LAMACOID LABELS FOR: A. PANELBOARDS AND SWITCHBOARDS, B. TRANSFORMERS, C. DISCONNECT SWITCHES, D. VARIABLE FREQUENCY DRIVES, E. LIGHTING CONTROL PANELS. LABEL SHALL INDICATE ROOMS CONTROLLED.
	CIRCUIT BREAKER	10. MINIMUM CONDUIT SIZE SHALL BE 1/2" TRADE SIZE.
	DRAWOUT CIRCUIT BREAKER MANUALLY OPERATED	11. USE THE CONDUIT TYPE SUITABLE FOR THE ENVIRONMENT IN WHICH IS IS LOCATED: A. INDOORS: EMT WITH SET SCREW FITTINGS. MC CABLE IS ACCEPTABLE FOR BRANCH CIRCUITS WHERE CONCEALED. B. OUTDOORS: RIGID GALVANIZED STEEL. C. UNDERGROUND: RIGID NON METALLIC SCHEDULE 80 PVC. D. CONDUIT EXITING FROM UNDERGROUND SHALL TRANSITION TO EMT/RGS PRIOR TO BEING EXPOSED.
	SWITCH	12. PROVIDE CONDUIT SLEEVES FOR LOW VOLTAGE DATA CABLING.
	AUTOMATIC OR MANUAL TRANSFER SWITCH	13. ALL CABLING SHALL BE IN CONDUIT UNLESS ABOVE AN ACCESSIBLE CEILING WHERE "J" HOOKS ARE ACCEPTABLE.
	FUSE	14. USE CONDUIT SWEEPS FOR ALL DATA CABLING CONDUITS.
	TRANSFORMER	15. DATA BOXES SHALL BE DOUBLE GANG, 3 1/2" DEEP WITH SINGLE GANG MUD RING WITH 1" CONDUIT TO ABOVE ACCESSIBLE CEILING.
	CURRENT TRANSFORMER	16. ALL BOXES SHALL BE RECESSED IN WALLS AND CONDUIT CONCEALED WHERE POSSIBLE.
	POTENTIAL TRANSFORMER	17. EMERGENCY CIRCUITS SHALL NOT BE IN CONDUIT WITH OTHER NON-EMERGENCY CIRCUITS.
	LIGHTNING ARRESTOR	18. MINIMUM CONDUCTOR SIZE FOR POWER SHALL BE #12 AWG. ANY BRANCH CIRCUITS OVER 100' IN LENGTH SHALL BE #10 AWG MINIMUM FOR VOLTAGE DROP.
	PANELBOARD	19. PROVIDE THIN-2 COPPER INDOORS AND THWN-2 COPPER OUTDOORS, UNLESS NOTED OTHERWISE OR DICTATED OTHERWISE BY THE NEC.
	"X" INDICATES PANELBOARD NAME	20. PROVIDE GROUNDING ELECTRODE SYSTEM AND EQUIPMENT GROUNDING PER THE NATIONAL ELECTRIC CODE.
	GROUND	21. PANELBOARDS SHALL BE FULLY RATED, SERIES RATED PANELS ARE NOT ACCEPTABLE. HAVE HINGED SWING DOOR-IN-DOOR. LOAD CENTERS ARE NOT ACCEPTABLE. SQUARE D NODD OR EQUAL FOR 208/120V BRANCH PANELBOARDS. SQUARE D NF OR EQUAL FOR 480/277V PANELBOARDS. PROVIDE TYPED PANELBOARD CIRCUIT LABEL CARDS. UPDATE ALL EXISTING LABEL CARDS AS REQUIRED.
	SECURITY KEY INTERLOCK	22. SURGE PROTECTION DEVICES SHALL BE MOUNTED AS CLOSE TO MAIN BUS AS POSSIBLE TO LIMIT FEEDER LENGTH.
	ENGINE GENERATOR	23. ALL FLOOR MOUNTED EQUIPMENT SHALL BE ON 4" HOUSEKEEPING PAD.
	UTILITY METER	24. RECEPTACLES SHALL BE TAMPER-RESISTANT EXTRA HEAVY DUTY GRADE, 20AMP MINIMUM, WHITE IN COLOR UNLESS NOTED OTHERWISE.
	AMMETER	25. ALL DEVICE COVERS SHALL MATCH DEVICE COLOR UNLESS STAINLESS STEEL COVERS ARE SPECIFIED.
	VOLTMETER	26. WEATHERPROOF RECEPTACLE COVERS SHALL BE METAL, WHILE-IN-USE TYPE.
	AMMETER SWITCH	27. SWITCHES SHALL BE HEAVY DUTY GRADE, 20 AMP, QUIET TYPE, WHITE UNLESS NOTED OTHERWISE.
	VOLTMETER SWITCH	28. LIGHTING CONTROL DEVICES SHALL BE MANUFACTURED BY N-LIGHT, UNLESS NOTED OTHERWISE.
	SURGE PROTECTIVE DEVICE	29. ALL LIGHTING CONTROLS SHALL BE MEET ASHRAE 90.1 - 2013 WITH MICHIGAN AMENDMENTS.
	TIME DELAY RELAY	30. IT IS UNDERSTAND AND AGREED BY THE INSTALLER THAT WORK HEREIN DESCRIBED SHALL BE COMPLETE IN EVERY DETAIL, EVEN THOUGH EVERY ITEM INVOLVED IS NOT PARTICULARLY MENTIONED. INSTALLER SHALL BE HELD TO PROVIDE ALL LABOR AND MATERIALS NECESSARY FOR THE WORK INTENDED AND DESCRIBED FOR A COMPLETE AND OPERATIONAL SYSTEM. SUCH MATERIALS SHALL INCLUDE, BUT ARE NOT LIMITED TO, CONDUIT, FITTINGS, COVERPLATES, WIRING, BREAKERS, CONTROL DEVICES, LIGHTING ACCESSORIES, ETC. THIS ALSO INCLUDES EQUIPMENT REQUIRED BY STATE AND LOCAL CODES.
	THERMAL OVERLOAD RELAY	
	NORMALLY OPEN CONTACTS	
	NORMALLY CLOSED CONTACTS	
	N.O. PUSH BUTTON SINGLE CIRCUIT	
	N.C. PUSH BUTTON SINGLE CIRCUIT	
	BRANCH CIRCUIT PANEL BOARD - 208/120V	
	DISTRIBUTION PANEL - 208/120V	
	BRANCH CIRCUIT PANEL BOARD - 480/277V	
	DISTRIBUTION PANEL - 480/277V	
	SWITCHBOARD	
	TRANSFORMER	
	GROUND BUS	

NOTE: SOME SYMBOLS AND ABBREVIATIONS SHOWN MAY NOT APPLY TO THIS PROJECT.





MECHANICAL + ELECTRICAL DESIGN

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Drawing Title: _____

PLAN

Project No: 23.110

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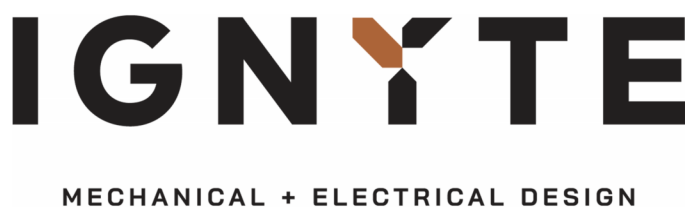
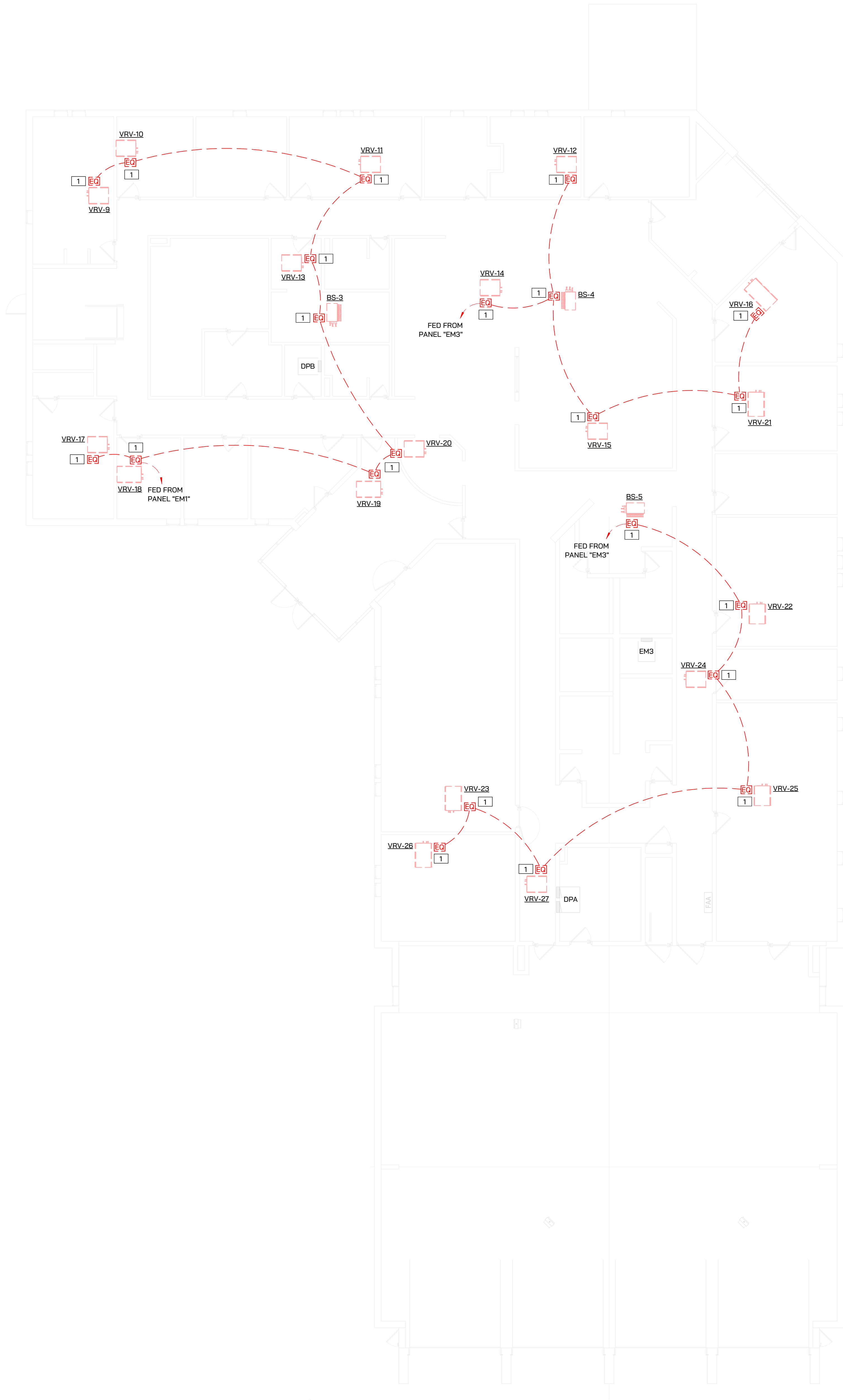
 LOWER LEVEL ELECTRICAL DEMOLITION PLAN
1/8" = 1'-0"

ELECTRICAL DEMOLITION KEYED NOTES

1 DISCONNECT ELECTRICAL CONNECTION TO EXISTING MECHANICAL EQUIPMENT TO BE REMOVED. REMOVE CONDUIT AND BRANCH CIRCUIT WIRING BACK TO SOURCE. RELABEL ASSOCIATED BREAKER/SWITCH AS SPARE.

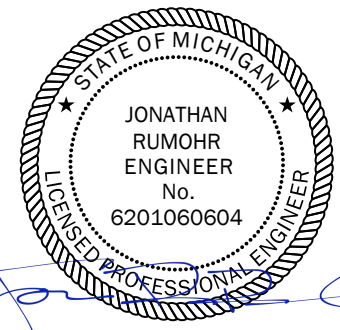


HVAC SYSTEM REPLACEMENT



MAIN LEVEL ELECTRICAL DEMOLITION PLAN
1/8" = 1'-0"

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THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.

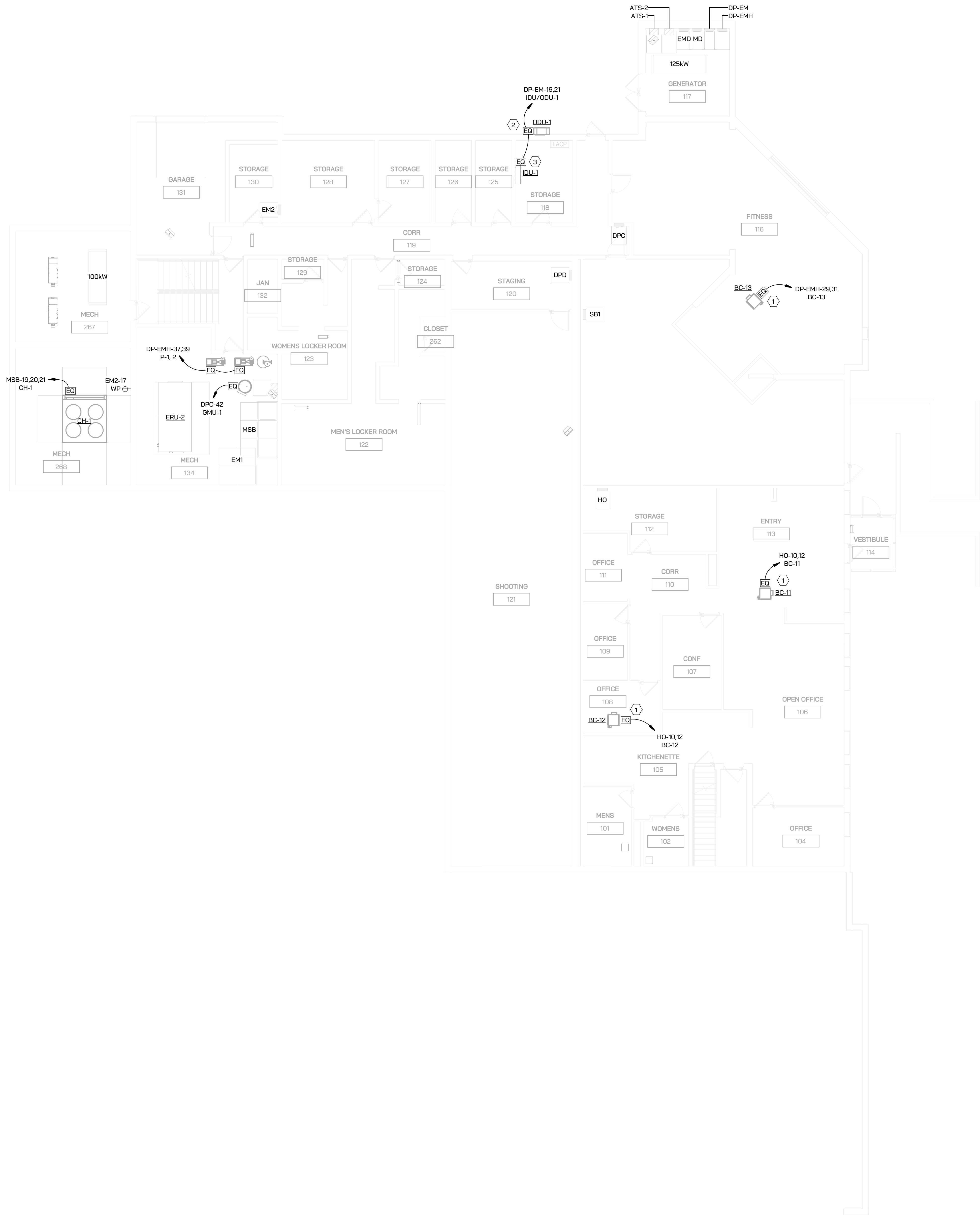
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Drawing Title:

MAIN LEVEL ELECTRICAL DEMOLITION PLAN

Project No: 23.110

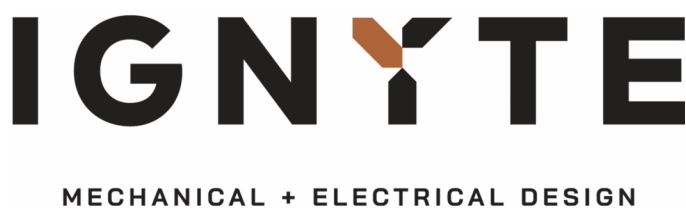
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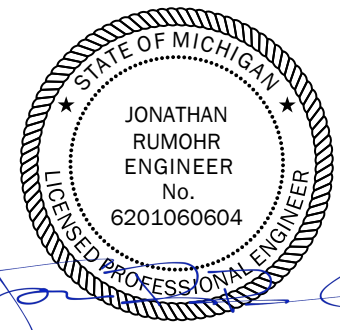
- ELECTRICAL POWER KEYED NOTES**
- 1 PROVIDE 30A, NEMA 1, NON-FUSED DISCONNECT AT NEW MECHANICAL EQUIPMENT TO DISCONNECT FROM ASSOCIATED BRANCH CIRCUIT.
 - 2 PROVIDE 30A, NEMA 3R, NON-FUSED DISCONNECT AT NEW MECHANICAL EQUIPMENT TO DISCONNECT FROM ASSOCIATED BRANCH CIRCUIT.
 - 3 INDOOR UNIT FED FROM ASSOCIATED OUTDOOR UNIT. COORDINATE WIRING REQUIREMENTS WITH MECHANICAL.



HVAC SYSTEM
REPLACEMENT



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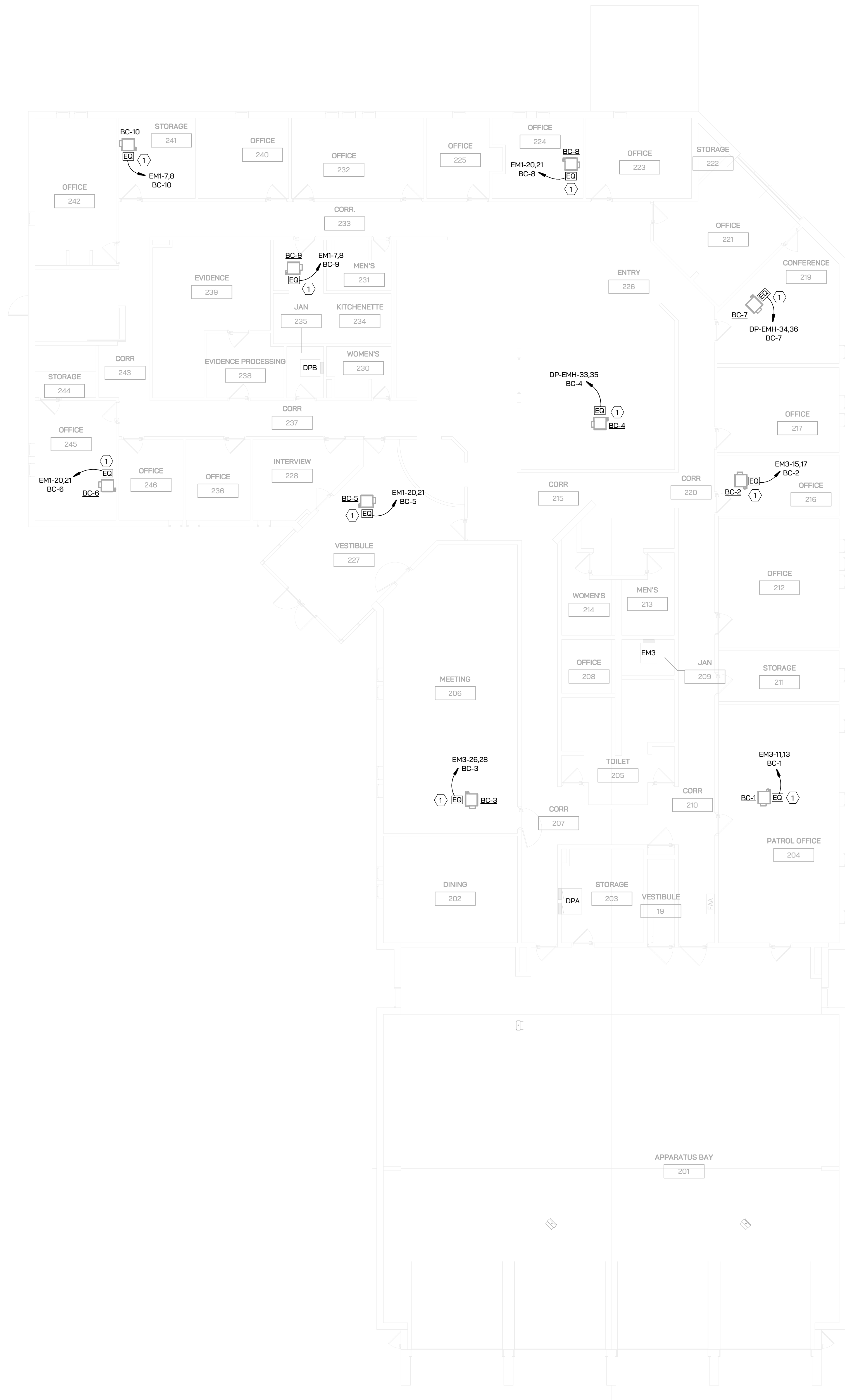
Drawing Title:

LOWER LEVEL POWER
PLAN

Project No: 23.110

E100

LOWER LEVEL POWER PLAN
1/8" = 1'-0"



MAIN LEVEL POWER PLAN
1/8" = 1'-0"

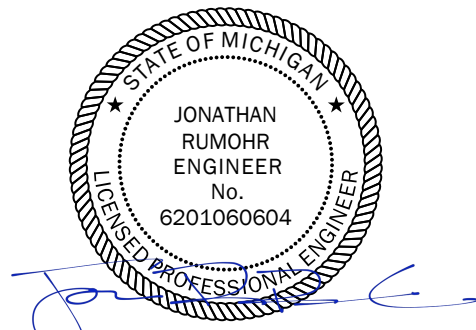
- ELECTRICAL POWER KEYED NOTES**
- 1 PROVIDE 30A, NEMA 1, NON-FUSED DISCONNECT AT NEW MECHANICAL EQUIPMENT TO DISCONNECT FROM ASSOCIATED BRANCH CIRCUIT.
 - 2 PROVIDE 30A, NEMA 3R, NON-FUSED DISCONNECT AT NEW MECHANICAL EQUIPMENT TO DISCONNECT FROM ASSOCIATED BRANCH CIRCUIT.
 - 3 INDOOR UNIT FED FROM ASSOCIATED OUTDOOR UNIT. COORDINATE WIRING REQUIREMENTS WITH MECHANICAL.



HVAC SYSTEM
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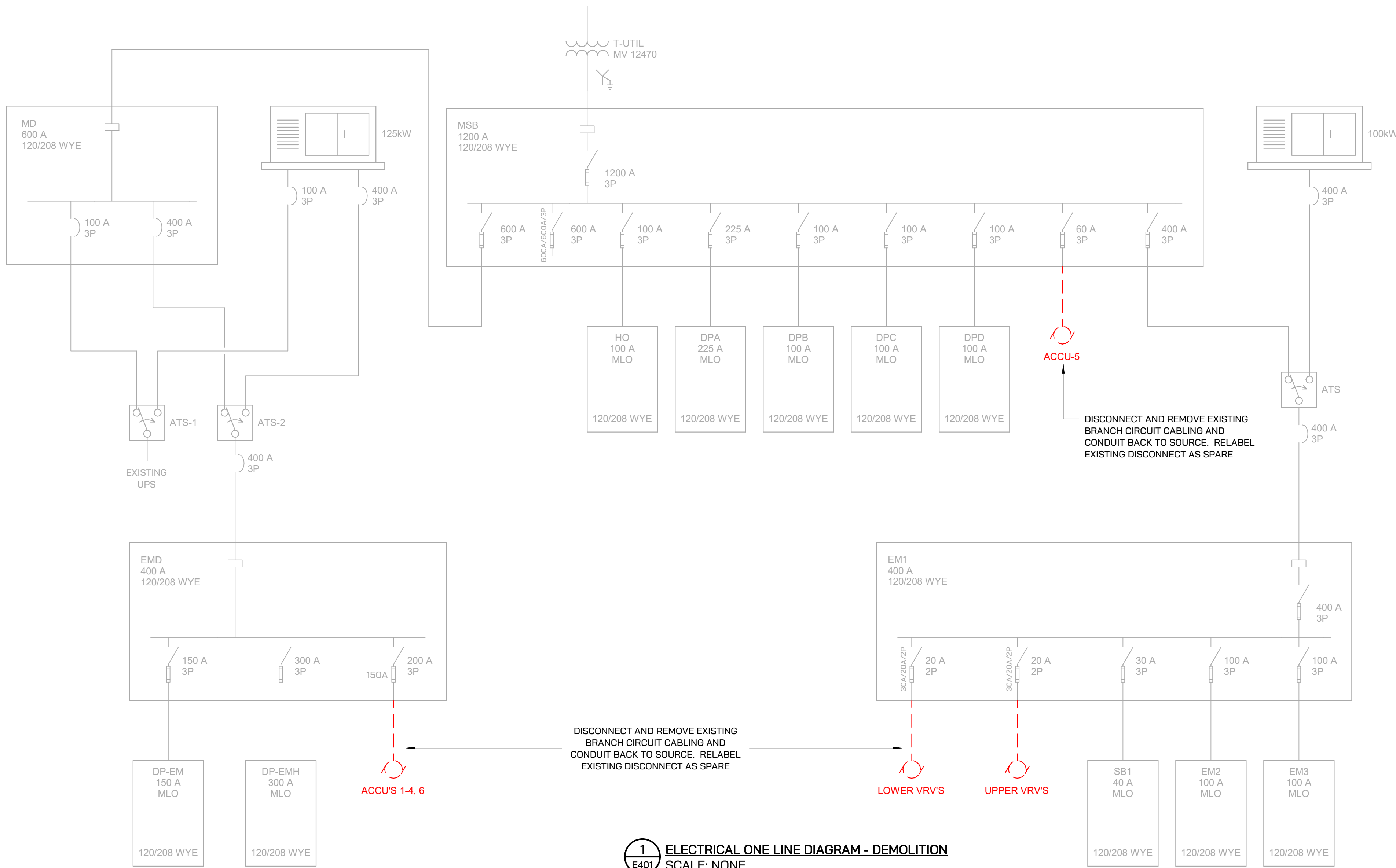
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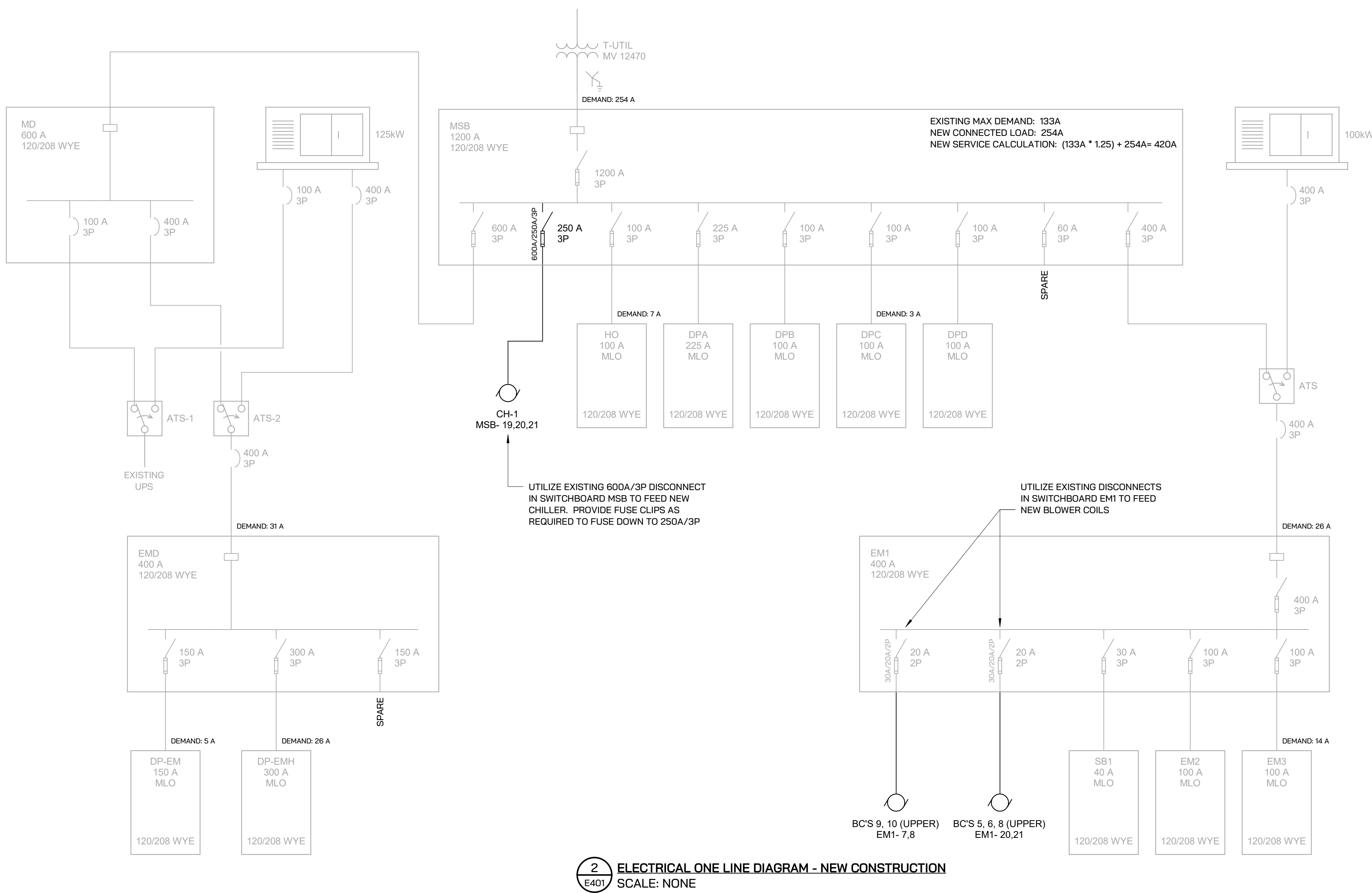
MAIN LEVEL POWER PLAN

Project No: 23.110

E110



1
E401 ELECTRICAL ONE LINE DIAGRAM - DEMOLITION
SCALE: NONE



2
E401 ELECTRICAL ONE LINE DIAGRAM - NEW CONSTRUCTION
SCALE: NONE

ELECTRICAL HVAC BRANCH CIRCUIT SCHEDULE

CIRCUIT DESCRIPTION	FED FROM	LOAD CURRENT	BRANCH CIRCUIT INFORMATION							
	PANEL - CIRCUIT		OCPD / POLES	# OF RUNS	WIRE	NEUTRAL	GROUND	CONDUIT	VOLTAGE DROP	
208 V										
HVAC CH-1	MSB - 19,20,21	185 A	250 A / 3	1	250kcmil	250kcmil	#4	2-1/2" C	0.55%	
HVAC BC'S 5, 6, 8	EM1 - 20,21	13 A	20 A / 2	1	#12	#12	#12	1/2" C	2.28%	
HVAC BC'S 9, 10	EM1 - 7,8	8 A	20 A / 2	1	#12	#12	#12	1/2" C	1.59%	
HVAC BC'S 11, 12	HO - 10,12	13 A	20 A / 2	1	#12	#12	#12	1/2" C	1.71%	
HVAC BC-1	EM3 - 11,13	8 A	20 A / 2	1	#12	#12	#12	1/2" C	1.05%	
HVAC BC-2	EM3 - 15,17	8 A	20 A / 2	1	#12	#12	#12	1/2" C	1.00%	
HVAC BC-3	EM3 - 26,28	8 A	20 A / 2	1	#12	#12	#12	1/2" C	1.30%	
HVAC BC-4	DP-EMH - 33,35	8 A	20 A / 2	1	#12	#12	#12	1/2" C	1.66%	
HVAC BC-7	DP-EMH - 34,36	8 A	20 A / 2	1	#12	#12	#12	1/2" C	1.53%	
HVAC BC-13, 14	DP-EMH - 29,31	12 A	20 A / 2	1	#12	#12	#12	1/2" C	1.16%	
HVAC IDU/ODU-1	DP-EM - 19,21	9 A	20 A / 2	1	#12	#12	#12	1/2" C	1.15%	
HVAC P-1, P-2	DP-EMH - 37,39	18 A	25 A / 2	1	#8	#8	#8	3/4" C	1.38%	
120 V										
HVAC GMU-1	DPC - 42	5 A	20 A / 1	1	#12	#12	#12	1/2" C	1.97%	

BRANCH CIRCUIT SIZING SCHEDULE - GENERAL PURPOSE

OVERCURRENT DEVICE RATING (AMPERES)	WIRE SIZE (AWG OR KCMIL)		CONDUIT SIZE			
	PHASE & NEUTRAL	GROUND	CONDUIT SIZE			
			SINGLE PHASE 2 WIRE+G (1PH, 1N, 1G)	SINGLE PHASE 3 WIRE+G (2PH, 1N, 1G)	THREE PHASE 3 WIRE+G (3PH, 1G)	THREE PHASE AND NEUTRAL 4 WIRE+G (3PH, 1N, 1G)
15-20	12	12	3/4"	3/4"	3/4"	3/4"
25-30	10	10	3/4"	3/4"	3/4"	3/4"
35-40	8	10	3/4"	3/4"	3/4"	3/4"
45-50	6	10	3/4"	3/4"	3/4"	3/4"
60	4	10	1"	1"	1"	1-1/4"

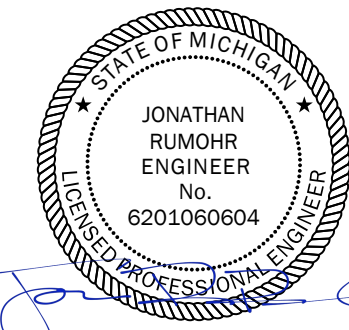
- NOTES:
- CONTRACTOR TO SIZE FEEDERS AND BRANCH CIRCUITS BASED ON THIS SCHEDULE AND OCPD SIZE, UNLESS NOTED OTHERWISE.
 - CONDUCTORS ARE BASED ON THHN/THWN.
 - CONDUCTORS ARE BASED ON 90°C, 600V INSULATED COPPER WIRE APPLIED AT 75°C FOR TERMINATION RATE 60/75°C OR 75°C. FOR TERMINATION RATED AT 60°C, USE CONDUCTORS AND CONDUIT SIZES INDICATED IN PARENTHESES.
 - CONDUIT SIZES ARE VALID FOR EMT OR RGS. CONDUIT SIZES SHALL BE ADJUSTED AS REQUIRED FOR THE OTHER TYPES OF CONDUIT.



HVAC SYSTEM REPLACEMENT

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Drawing Title:

ELECTRICAL ONE-LINE DIAGRAM

Project No: 23.110

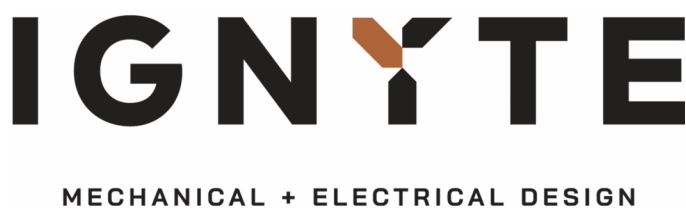
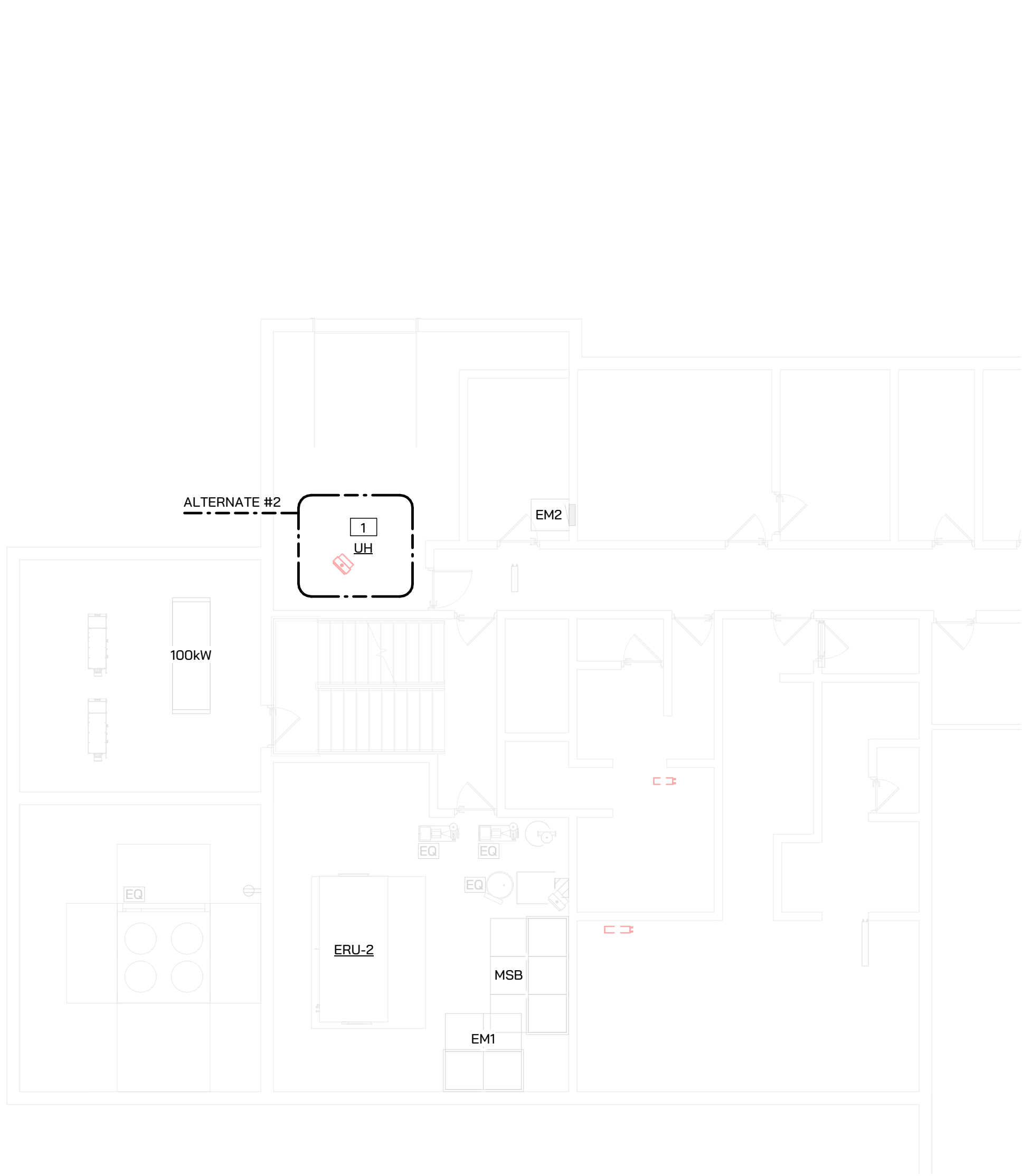
E401

ELECTRICAL DEMOLITION KEYED NOTES - ALTERNATE

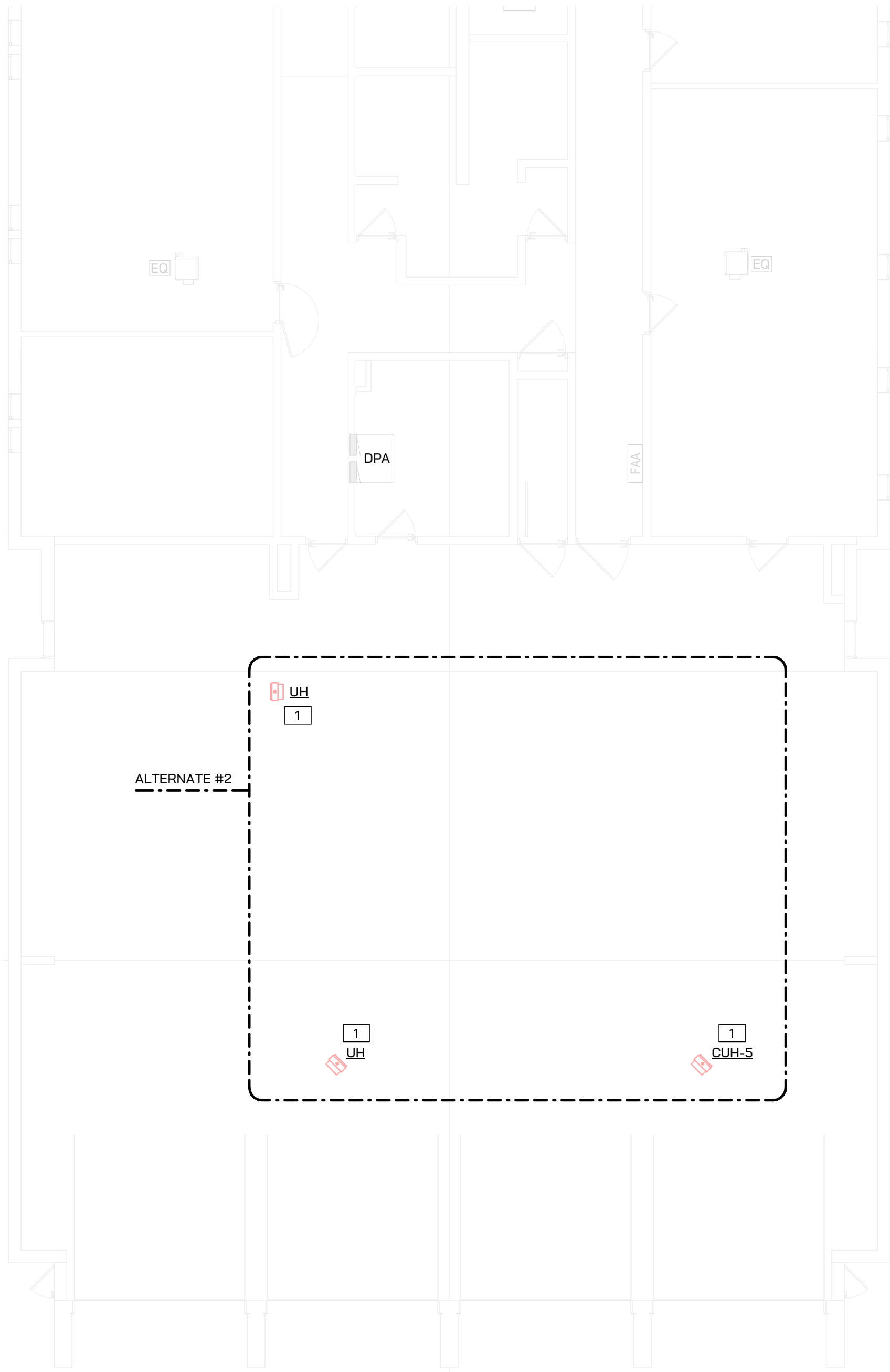
- 1
- DISCONNECT ELECTRICAL CONNECTION TO EXISTING MECHANICAL EQUIPMENT TO BE REMOVED. REMOVE CONDUIT AND BRANCH CIRCUIT WIRING BACK TO NEAREST ACTIVE JUNCTION BOX. RETAIN BRANCH CIRCUIT FOR REUSE IN NEW CONSTRUCTION.



HVAC SYSTEM REPLACEMENT

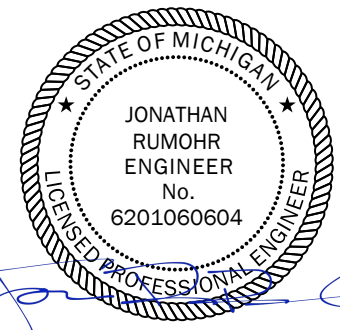


↑ LOWER LEVEL ELECTRICAL DEMOLITION PLAN
1/8" = 1'-0"



↑ MAIN LEVEL ELECTRICAL DEMOLITION PLAN
1/8" = 1'-0"

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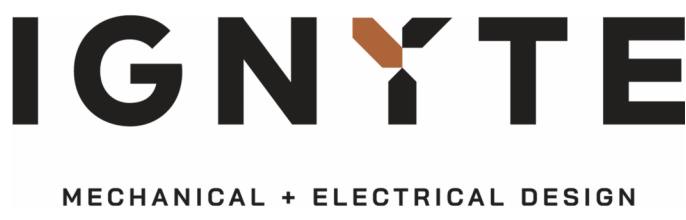
ALTERNATE - ELECTRICAL DEMOLITION PLANS

Project No: 23.110

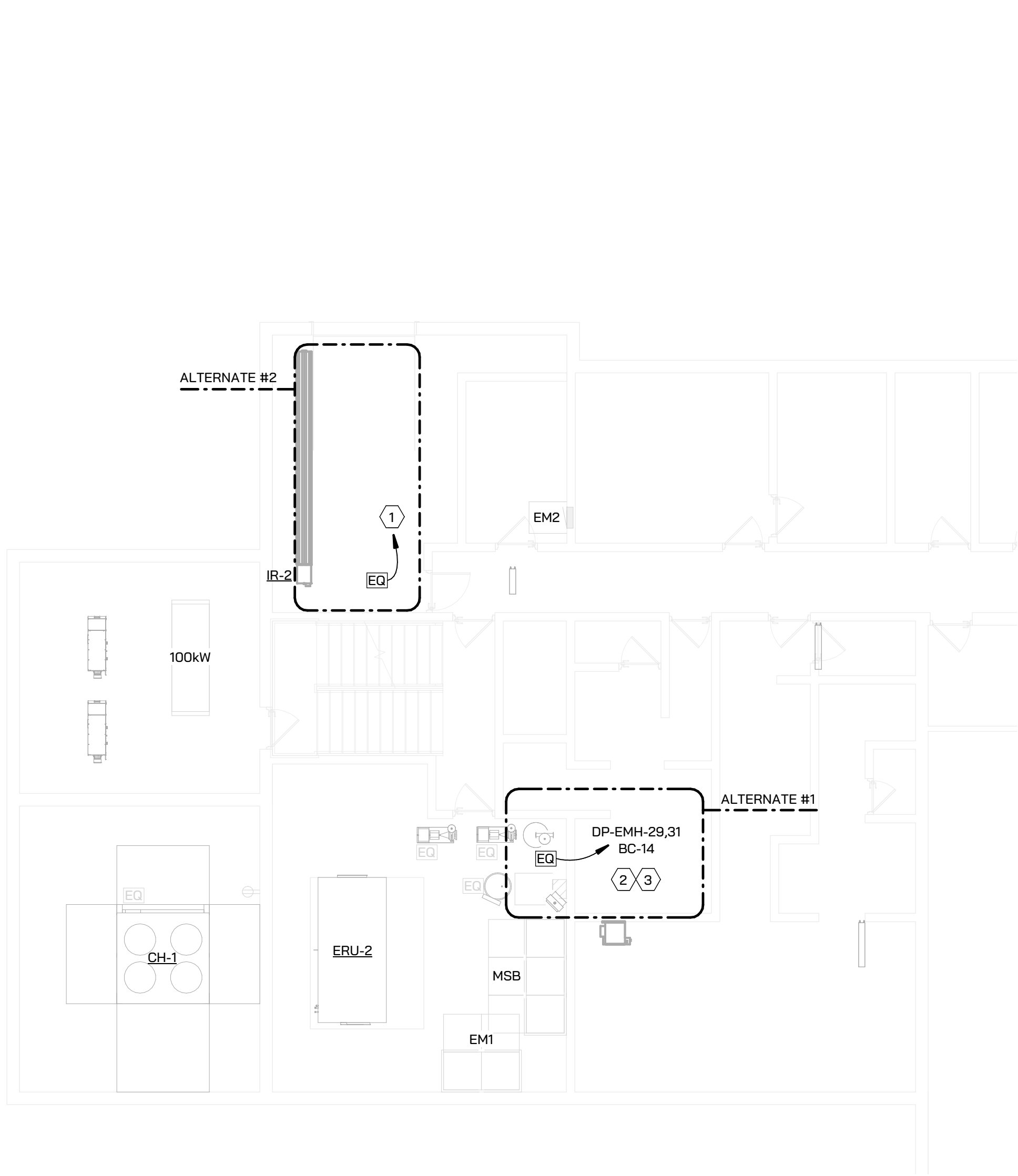
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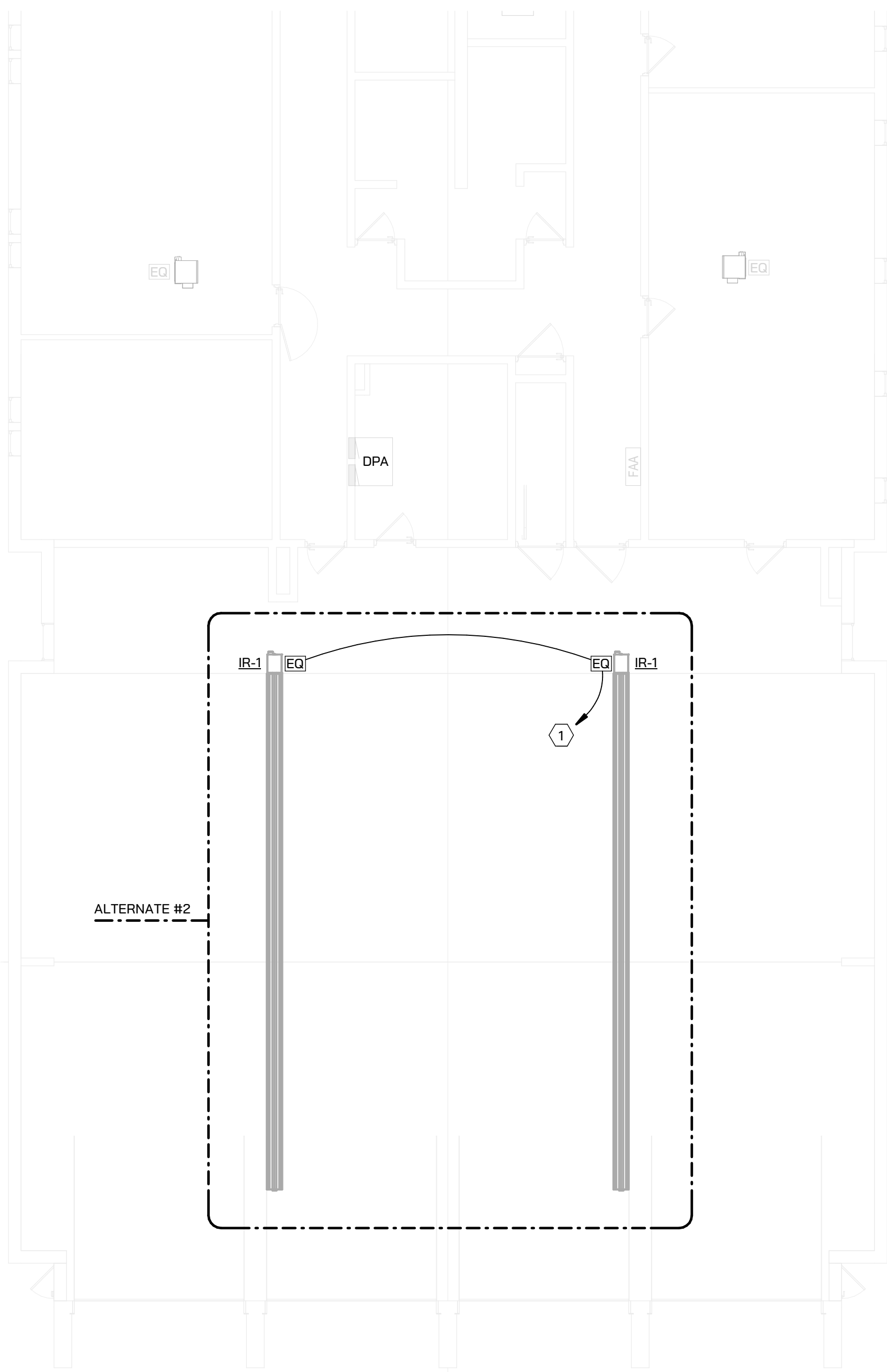
HVAC SYSTEM
REPLACEMENT



- ELECTRICAL POWER KEYED NOTES - ALTERNATE
1. EXTEND EXISTING BRANCH CIRCUIT MADE AVAILABLE THROUGH DEMOLITION AND CONNECT TO NEW INFRARED HEATER. RELABEL ASSOCIATED BRANCH CIRCUIT WITH EQUIPMENT NAME.
 2. PROVIDE 30A, NEMA 1, NON-FUSED DISCONNECT AT NEW MECHANICAL EQUIPMENT TO DISCONNECT FROM ASSOCIATED BRANCH CIRCUIT.
 3. EXTEND HVAC BRANCH CIRCUIT FROM BLOWER COIL "BC-13" TO NEW MECHANICAL EQUIPMENT "BC-14".

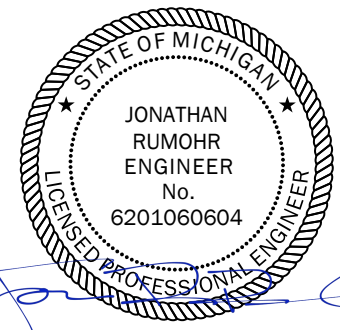


↑ LOWER LEVEL POWER PLAN
1/8" = 1'-0"



↑ MAIN LEVEL POWER PLAN
1/8" = 1'-0"

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Drawing Title:

ALTERNATE - ELECTRICAL
PLANS

Project No: 23.110

E901

Appendix B

- **Notice to Proceed / Project Kickoff:** January 2027
- **Preliminary Design Approval:** March 2027
- **Design Development Approval:** May 2027
- **Construction Documents Complete:** August 2027
- **Construction Bid Package Issued:** September 2027
- **Contractor Bids Received:** October 2027
- **Construction Award:** October–November 2027