

**REGAN YOUNG ENGLAND BUTERA**

REFERENDUMS • ENGINEERING • ARCHITECTURE • DESIGN



**ADDENDUM - 01**

DATE: .....23 February 2024

FROM: ..... Scott England, AIA

VIA: ..... ShareFile

456 HIGH ST. • MT. HOLLY, NJ 08060 USA  
(609) 265-2652 • 21AI00912100 • www.RYEBREAD.com

**SUBJECT:**  
**ADDENDUM - 01**  
LINDENWOLD HIGH SCHOOL CULINARY ARTS  
ALTERATION  
RYEBREAD Project #5713G

This addendum is issued to clarify, correct, or supplement the Documents as originally issued and will become a part of the Contract. Receipt thereof shall be acknowledged by Bidders in space provided in the Form of Bid. Failure to acknowledge this Addendum may be cause for rejection of Bid.

**BID DATE EXTENSION: 20 MARCH 2024 at 3:00 PM.**

1.01. **AMENDMENT:** (Reference to Grease Interceptor-GI-1): Delete the grease interceptor system (GI-1) as shown on drawing sheet P102 and other drawings where shown.

In lieu of the original design, install two (2) floor-mounted grease interceptors underneath each three-compartment pot sinks (FSE Item #11). Eliminate the grease interceptor control panel in Storage Room/A110.1.

1.02 **AMENDMENT:** (Reference to Food Service Equipment (FSE) Item #11): Amend all references to FSE item 11, to now read as:

**ITEM 11 (2) POT SINKS**

MFTR: ADVANCE TABCO (or Equal)  
Model: 93-3-54-18RL-12-inch-deep sinks with K-6 basket drain.  
Complete with the following:

- 2 Mixing faucets 1/2" H.W. 1/2" C.W.
- A) Each compartment with lever waste and overflow.
- B) Drainboards to have side splash at walls as shown on plan.

1.03 **BIDDER QUESTION:** (Reference to Existing Fire Sprinklers):

**Question:** Are you able to provide record drawings of the existing fire sprinkler system? From the information provided, we are not able to determine the quantity of branch piping that would need to be cut and relocated.

**Response:** Existing record delegated-design documents related to the existing fire sprinkler plans are not available. See attached drawings FP-1 and FP-2 from the original High School bid set for reference purposes. Please be advised that the A/E team has not reviewed, nor confirmed any data shown on the FP-1 and FP-2. All existing conditions and data shown must be field verified by the Contractor and their delegated-design fire protection team.

The required new sprinkler modifications required must be designed by a NJ-licensed Professional Engineer based on the new room layout and ceiling obstructions created by the new exhaust hoods. The work includes the investigation of the existing sprinkler system and conditions in their entirety.

- 1.04 **AMENDMENT** (Reference to ITB, Section 001000): Amend Section 001000, page 11, line 24 to now read as:

“The contractor may submit billing for equipment purchased and stored in FY **2024**”.

- 1.05 **ADDITION:** (Reference to District’s Fire Alarm Vendor): The District’s Fire Alarm Vendor is:

Jim Minick  
MFS Fire Protection  
648 Berlin-Crosskeys Toad  
Sicklerville, New Jersey 08081  
856-318-9637 (Office)  
856-725-6092 (Cell)  
mfrsystems@gmail.com

- 1.06 **CLARIFICATION:** (Reference to Extended School Year): The extended school year for students and staff is 08 July through 01 August, Mondays through Thursdays. No students will be in the school on Fridays.

- 1.07 **CLARIFICATION:** (Reference to Staging Location & Debris Container Location): Contractor parking, staging, and entrance area, is at the front of the High School. All construction team members must sign in at the front desk each day.

Debris containers and material delivery and removal entrances will be coordinated with the District at the Pre-Construction Conference. All perimeter access drives around the high school are slated to be milled and paved during the summer break, and all debris containers/storage boxes must be removed while the milling and paving operations are taking place.

Contractor may only remove demolition materials and debris from the classroom into the hallways or conduct any work in the hallways before or after school, when students are not present in the building.

- 1.08 **BIDDER QUESTION:** (Reference to Food Service Equipment (FSE))

**Question:** Food Service vendor is requesting voltage, phasing, etc. on the new food service equipment. Manufacturer needs the information to provide accurate pricing.

**Response:** Electrical requirements for the FSE equipment are specified in section 114000, FOOD SERVICE EQUIPMENT SCHEDULE, starting on page 14. However, the GC is required to coordinate with the Electrical Contractor to fully-coordinate the actual electrical requirements from the approved FSE shop drawings.

- 1.09 **CLARIFICATION:** (Resinous Flooring System): Contractor is to completely remove all existing flooring system and mastic and prepare the existing concrete slab as required by the flooring system manufacturer to provide an acceptable substrate for the installation of the new flooring system.

As part of the scope, the Contractor is required to have the resinous flooring manufacturer’s representative to attend the following, at a minimum. This is in addition to the requirements specified in section 096723, RESINOUS FLOORING.

1. Attend a pre-demolition kickoff meeting.
2. Inspect the existing concrete slab and preparation work prior to installation of the new flooring system. Manufacturer must determine if the preparation work is acceptable to the manufacturer's standards.
3. Attend at least one site visit during the process of the installation of the resinous flooring to ensure proper application.

1.10 **AMENDMENT:** (Reference to Drawing Sets): Delete all originally issued drawings and replace with a complete new set of attached bid drawings, referenced as "Confirmed Bid Set".

1.11 **BIDDER QUESTIONS** (Specifications Sections Noted Below)

**Questions:**

1. In section 221116 of the project specifications, it is noted that domestic water piping shall be Type L copper tube with soldered joints. Would press seal joints by Viega be found as acceptable for this project for both valves and fittings; please advise.
2. In section 221316, there is a material specification for both standard and extra heavy on the cast iron no hub piping. Please advise if in the piping application section of the specifications, the coupling referenced is standard or extra heavy; please advise.
3. In section 231123, it is noted for the natural gas piping to be welded at 2 1/2" and larger and threaded on 2" and smaller. Would the use of Viega Megapress be permissible on the gas piping for this project; inside and or outside?

**Response:**

1. All three questions have been addressed in the amended specification sections attached and reference in addendum item 1.12.

1.12 **AMENDMENT** (Reference to Amended Specification Sections) Delete originally-issues specification sections noted below and replace with the attached specifications that are part of this Addendum:

- 221116 - Domestic Water Piping; 8 pages
- 221316 – Sanitary Waste and Vent Piping; 7 pages
- 231123 – Natural Gas Piping; 14 pages
- 237432 – Range Hood Exhaust Systems; 6 pages
- 237433 – Rooftop DOAS Units; 9 pages
- 237434 – Sequence of Operations for the Culinary Arts Classroom HVAC & Range Hood Exhaust Systems; 5 pages

1.13 **AMENDMENT** (Reference to Bid Opening): The bid opening has been extended to now be on 20 March at 3:00 PM.

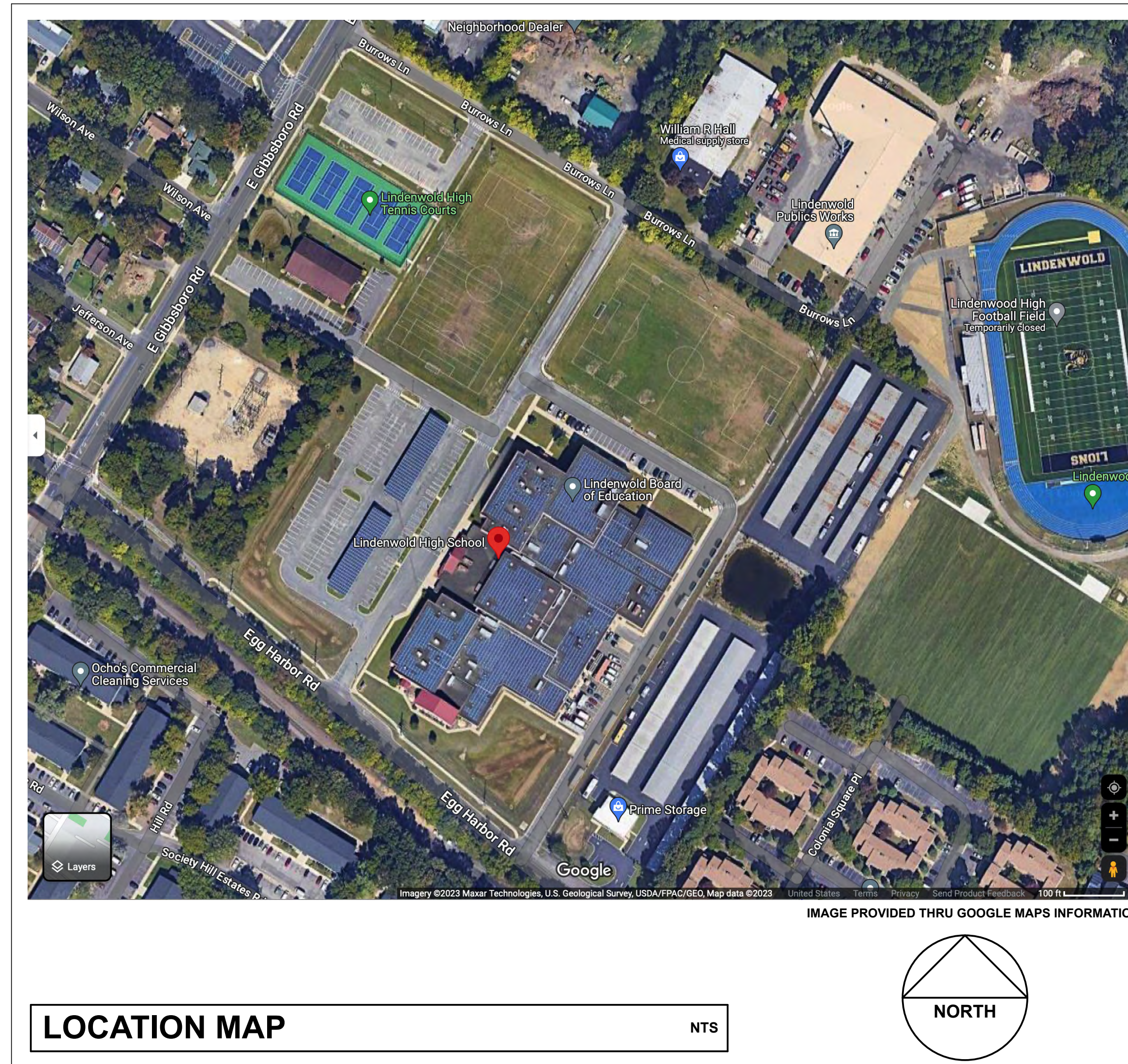
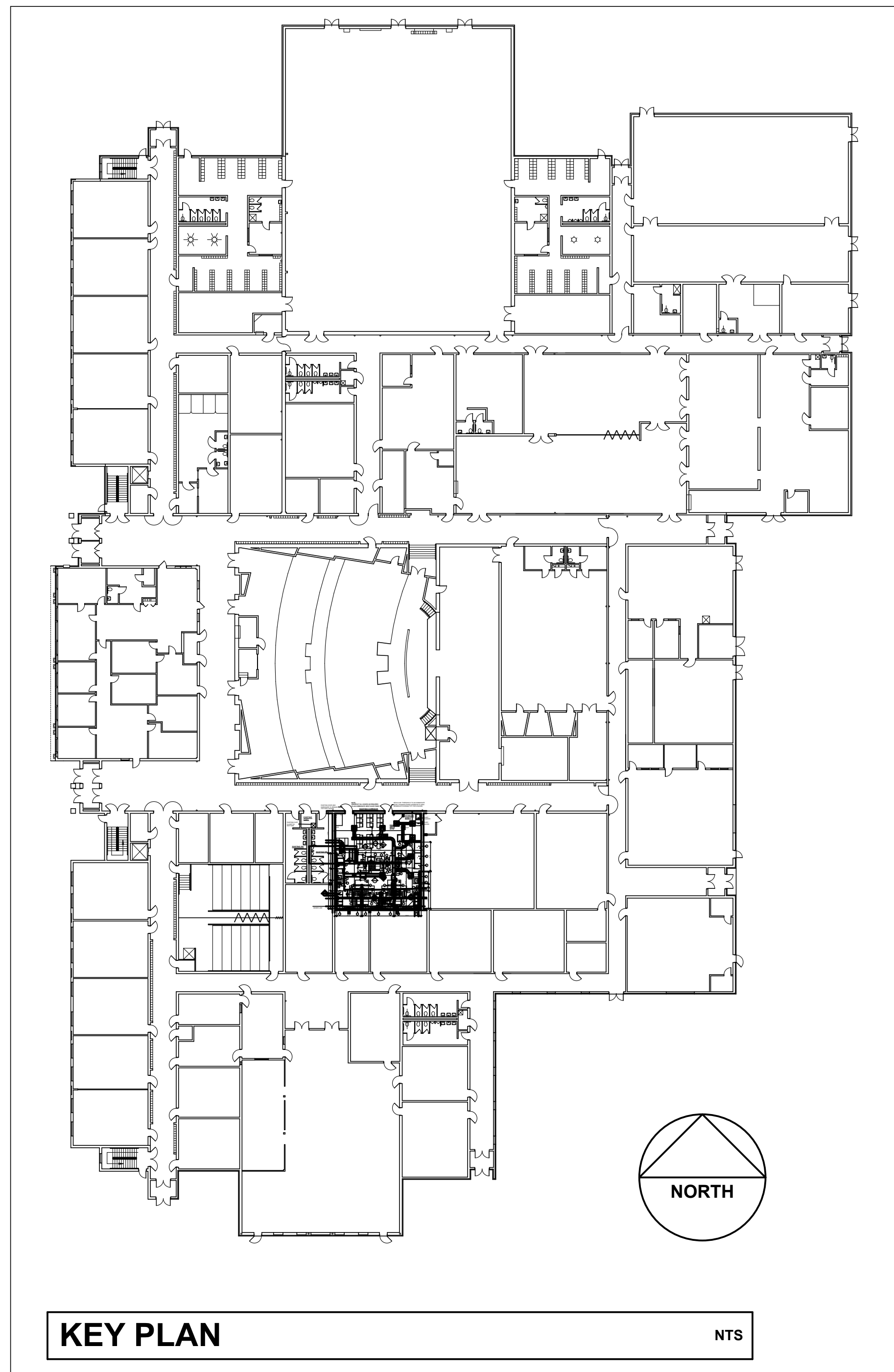
Attachments:

1. Amended Drawings Conformed Set, consisting of 31 sheets total.
2. Existing High School Fire Suppression Design Drawings FP-1 and FP-2, consisting of 2 sheets total.
3. Amended specification sections referenced in 1.13, consisting of 49 pages total.

**END OF ADDENDUM 01**

# CULINARY ARTS CLASSROOM ALTERATION LINDENWOLD HIGH SCHOOL

**BLOCK 244, LOT 3  
801 EGG HARBOR ROAD  
LINDENWOLD, NJ 08021**



## DRAWING LIST

- CS COVER SHEET
- A100 CODE ANALYSIS
- A101 EXISTING CONDITION PHOTOS
- A102 EXISTING CONDITION PHOTOS
- A103 DEMOLITION PLAN- REFLECTED CEILING PLAN
- A104 NEW- WORK PLANS AND ROOM FINISH SCHEDULE
- A104.1 MISC. PLANS
- A105 ROOF PLAN AND DETAILS
- A106 INTERIOR ELEVATIONS
- A107 INTERIOR ELEVATIONS AND SECTION DETAILS
  
- S1 STRUCTURAL GENERAL NOTES AND PARTIAL ROOF PLAN
- S2 PARTIAL ROOF/ HOOD SUPPORT PLAN
- S3 CONSTRUCTION DETAILS
  
- HD100 PARTIAL DEMOLITION PLAN- HVAC
- H-100 PARTIAL FLOOR PLAN- HVAC
- H-200 ABBREVIATIONS, SYMBOLS AND SCHEDULES- HVAC
- H-300 DETAILS- HVAC
  
- FP-100 PARTIAL FIRST FLOOR PLAN, NOTES AND DETAILS- FIRE PROTECTION
  
- P-100 PARTIAL FIRST FLOOR DEMOLITION PLAN- PLUMBING
- P-101 PARTIAL FIRST FLOOR PLAN DOMESTIC WATER AND NATURAL GAS
- P-102 PARTIAL FIRST FLOOR PLAN SANITARY AND VENTING- PLUMBING
- P-103 PARTIAL FIRST FLOOR PLAN NATURAL GAS- PLUMBING
- P-104 PARTIAL ROOF PLAN-PLUMBING
- P-200 SCHEDULES AND ABBREVIATIONS- PLUMBING
- P-300 RISER DIAGRAMS- PLUMBING
- P-400 DETAILS- PLUMBING
  
- ED-100 PARTIAL FIRST FLOOR PLAN- ELECTRICAL DEMOLITION
- E-100 PARTIAL FIRST FLOOR PLAN- LIGHTING
- E-101 PARTIAL FIRST FLOOR PLAN- POWER
- E-102 PARTIAL ROOF PLAN- ELECTRICAL
- E-103 OVERALL FIRST FLOOR PLAN- ELECTRICAL

REGAN YOUNG, AIA  
21A100912100

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NJDOE SP #07-2670-005-21-1000

PROJECT TITLE:  
**CULINARY ARTS CLASSROOM ALTERATION**

ADDRESS:  
**LINDENWOLD HIGH SCHOOL  
BLOCK 244, LOT 3  
801 EGG HARBOR ROAD  
LINDENWOLD, NJ 08021**

PROJECT NO.: **5713G**

REVISION DATE:	
1	ADD #1 23 FEB 24

DRAWING DATE:	15 JAN 2024
PRINT DATE:	2/23/24
DRAWN BY:	RR
SHEET TITLE:	COVER SHEET

**CONFORMED BID SET**

**CS**

**0100.0 Administration**  
(Not Applicable)

**0200.0 NJUCC Excerpts**

**5:23-2.21(c)** *New Jersey Uniform Construction Code (NJUCC)* shall control all matters concerning construction, alteration, addition, repair, removal, demolition, use, location, and occupancy of all buildings and structures and their service equipment, and shall apply to existing or proposed buildings and structures in the State of New Jersey.

**5:23-2.4(a)** As the building is being Reconstructed, work within the existing structure shall conform with the *NJUCC 5:23-6, Rehabilitation Subcode*.

**5:23-2.8(a)** When the installation, extension or alteration of mechanical equipment, refrigeration, air conditioning or ventilating apparatus, plumbing, gas piping, electric wiring, heating system or other equipment is specifically controlled by the provisions of the *NJUCC*, it shall be unlawful to use such equipment until a certificate of occupancy or certificate of approval, as the case may be, has been issued therefor by the construction official having jurisdiction.

**5:23-2.15** Application for a Construction Permit shall be submitted by the Contractor(s) per *NJUCC* Section 5:23-2.15.

**5:23-2.16(b)** A true copy of the construction permit shall be kept on the site of operations open to inspection during the entire time of prosecution of the Work and until the completion of the same.

**5:23-2.16(f)** The Contractor shall give at least 24 hours notice to the Construction Official of start of work under a construction permit.

**5:23-2.16(j)** The issuance of the construction permit shall be conditioned upon payment of appropriate fees, the Contractor's & Owner's assurance that the Work will conform to the requirements of the Code applicable to the Work for which the permit has been issued, including prior approvals and any approved amendments thereto, that the permit is a license to proceed with the Work and shall not be construed as authority to violate, cancel, or set aside any of the provisions of the regulations, that the Owner & Contractor will assist the Enforcing Agency in its inspection work, if requested, that all escrows required to be paid by the applicant in connection with the Work have been paid, and that any change of ownership is reported through a permit update and that any replacement performance guarantee has been furnished.

**5:23-2.18(b)** The Construction Official and appropriate Subcode Officials shall carry out periodic inspections during the progress of the Work to ensure that Work inspected conforms to the requirements of the Code.

**5:23-2.18(b)2** Inspections for all subcodes of construction shall be limited to those required for the following: fire suppression systems; heat producing devices; and any special inspections required by any subcode of the regulations. The mid-point inspection shall include a review for compliance with *IBC/NJ* Chapter 11.

**5:23-2.18(e)1** The Contractor shall notify the enforcing agency when the Work is ready for any required inspection specified by the *NJUCC* or required by the Construction Official or appropriate Subcode Official. This notice shall be given at least 24 hours prior to the time the inspection is desired. This notice shall represent an attestation on the part of the Contractor that the Work has been completed in conformance with the *NJUCC* and is ready for inspection.

**5:23-2.18(e)2** The Contractor shall allow for Code Inspections to be performed within three business days of the time for which they are requested. The Work shall not proceed in a manner that will preclude the inspection until it has been made.

**5:23-2.18(d)** Upon completion of the building or structure, and before the issuance of a Certificate of Use and Occupancy required by the *NJUCC*, a final inspection shall be made, and any violations of the code shall be noted and the holder of the permit shall be notified of any discrepancies by the construction official. The final inspection shall include: Installation of all interior and exterior finish materials, sealing of exterior joints, mechanical system and any other required equipment; Electrical wiring, devices, & fixtures; Plumbing piping, trim & fixtures, Tests required by any provision of the adopted subcodes; a review for compliance with N.J.A.C. 5:23-7, the Barrier Free Subcode, for all buildings required by N.J.A.C. 5:23-7.1 to be accessible; and verification of compliance with N.J.A.C. 5:23-3.5, Posting Structures.

**5:23-2.21(e)4** The Contractor shall perform the necessary services and be present on the construction site on a regular and periodic basis to determine that the Work is proceeding in accordance with the *NJUCC* and any conditions of the construction permit.

**5:23-2.21(d)** Upon completion of the construction, the Contractor shall submit to the Construction Official a report as to the satisfactory completion and the readiness of the project for occupancy and shall certify that, to the best of the Contractor's knowledge and belief, such has been done substantially in accordance with the *NJUCC* and with the plans and specifications, with any substantial deviations noted.

**5:23-2.21(e)** The actual construction of the Work shall be the responsibility of the Contractor(s) as identified on the approved construction permit, and shall involve execution of the Work in accordance with the regulations, execution & control of all methods of construction in a safe & satisfactory manner, and execution all Work in accordance with the *NJUCC* and those portions of the plans and specifications controlled by the *NJUCC*. The Contractor(s) shall render all such construction services as required to effect a safe & satisfactory installation of the project.

**5:23-2.21(e)5** Upon completion of the construction, the Contractor(s) shall certify to the best of their knowledge & belief that such has been done substantially in accordance with the *NJUCC* and with those portions of the plans & specifications controlled by the *NJUCC*, with any substantial deviations specifically noted.

**5:23-2.23(c)** A building or structure, or portion thereof, Reconstructed shall not be occupied or used until the Certificate of Occupancy shall have been issued for the entire building or structure or the portion being Reconstructed by the Construction Official, certifying that the Work has been completed in accordance with the provisions of the *NJUCC*, except as is otherwise provided in the regulations.

**5:23-2.29(a)** The Owner of any premises upon which a building or structure is to be constructed shall be deemed to have consented to inspection, by the Enforcing Agency, of the entire premises and of any and all construction being performed on it until a Certificate of Occupancy has been issued.

**5:23-2.34** The Contractor shall take measures protecting adjoining properties and public rights of way per *NJUCC* Section 5:23-2.34.

**5:23-3.5(b)** (b) Posted occupancy load: Every building and structure and part thereof designed for use as a place of public assembly or as an institutional building for harboring people for penal, correctional, educational, medical or other care or treatment (use groups A, E and I) shall be posted with an approved placard designating the maximum occupancy load.

**5:23-3.5(i)** All posting signs shall be furnished by the Owner and shall be of permanent design; they shall not be removed, or defaced and, if lost, removed or defaced, shall be immediately replaced.

**5:23-6.3(a)** Because this is a project where the extent and nature of the work is such that the work area cannot be occupied while the work is in progress and where a new Certificate of Occupancy is required before the work can be reoccupied, it shall be considered a "Reconstruction" per the parameters of the *NJUCC Rehab Code*. Reconstruction may include Repair, Renovation, Alteration, or any combination thereof.

**5:23-6.7(c)** The Work shall not cause any diminution of existing structural strength, system capacity, or mechanical ventilation below that which exists at the time of application for a permit, or that which is required by the applicable subcodes of the *NJUCC*, whichever is lower. The replacement or addition of fixtures, equipment, or appliances shall not increase loads on these systems unless the system is upgraded in

**5:23-6.7(e)1** Newly introduced fixed loads shall not exceed the uniformly distributed live loads or concentrated live load criteria of *IBC/NJ* Table 1607.1, and shall not create deflection that exceeds the standards set forth in *NJUCC* Section 5:23-6.7(c)1.

**5:23-6.7(e)1.ii** For steel frame construction, deflection shall not exceed L/240 for roofs with a slope of 3 in 12 or less or L/180 for roofs with a slope of greater than 3 in 12 and for floors.

**5:23-6.7(e)2** Any fire protection system providing partial or redundant protection originally installed to protect a special hazard that no longer exists and that is not required in accordance with the current *NJUCC* is allowed to be removed with the written approval of the Fire Subcode Official and Fire Official. All disconnected equipment and devices, such as pull stations, nozzles, detectors, sprinklers, sensors, panels, and hose connections, shall be removed so as not to give a false indication that the structure, area or space is protected.

**5:23-6.7(e)3** No work shall be undertaken that diminishes accessibility below that which is required by the *IBC/NJ Chapter 11, Accessibility*.

**5:23-6.7(e)4** Construction materials used as part of a Reconstruction project shall be consistent with the existing construction type or the allowable construction type, whichever is less restrictive.

**5:23-6.7(e)3** When a space is reconfigured, the altered space shall comply with the *IBC/NJ Chapter 11, Accessibility*.

**5:23-6.7(e)8** If a fireproofing material is removed that is integral to the rating of an existing fire-rated assembly, the material shall be replaced so that the rating is preserved.

**5:23-6.7(e)10** Any replacement to the electrical service equipment shall require that the grounding electrode system be updated to the requirements of Article 250 Part III of the *Electrical Subcode*.

**5:23-6.7(e)13** When a new refrigerant is introduced, the requirements of the Mechanical Subcode applicable to that refrigerant shall be met. This shall apply to the installation of new equipment, the replacement of existing equipment with equipment using a different refrigerant, or the replacement of the refrigerant in existing equipment with a different refrigerant.

**5:23-6.7(e)15** When the Work being performed creates or exposes the roof decking/sheathing or the framing of any wall, floor, ceiling, or roof assembly that is part of the building thermal envelope (enclosed conditioned space), any accessible voids in insulation shall be filled using insulation meeting the R-values of Table 5.5-4 or 5.5-5 of the *Commercial Energy Code*, as applicable.

**5:23-6.7(e)17** Ducts that are newly installed or replaced shall be installed with insulation meeting the R-values of Section 6.4.4.1.2 of the *Commercial Energy Code*, as applicable.

**5:23-6.7(e)18** The total replacement of a building lighting system or newly installed lighting system shall meet Section 9.1.2 of the commercial energy code, as applicable.

**5:23-6.7(e)19** When the work being performed results in an indoor or outdoor gas meter, related regulator, or piping becoming subject to vehicle impact, which work includes, but is not limited to, new installation, relocation, or other construction, the gas meter, related regulator or piping shall be protected by barriers meeting the requirements of Section 312 of the *International Fire Code*. For this purpose of applying this provision, "subject to vehicle impact" shall mean located within 3' of any garage door opening, driveway, or designated parking area, and not separated by a building wall from the space where the vehicle may be operated.

**5:23-6.7(f)** In buildings containing a fuel burning appliance or having an attached garage, carbon monoxide detection equipment shall be installed in accordance with *IBC/NJ* Section 915. (Battery-powered or plug-in devices shall be accepted for purposes of meeting the requirements of this section.)

**5:23-6.7(g)** All materials and methods used shall comply with requirements specified in *NJUCC* 5:23-6.8, Materials & Methods.

**5:23-6.7(g)1** For Repair work undertaken as part of a Reconstruction project, materials like those existing may be used. There is no limit to the amount of Repair work which may be undertaken.

**5:23-6.9(a)** When the rehabilitation of an existing building creates or includes any building element of a type listed in *NJUCC* Section 5:23-6.9, then the new element shall comply with the requirements for such an element established by that Section.

**5:23-6.9(c)1** Newly installed (not replacing an existing device) electrical service equipment, switchboards, panelboards, motor control centers and other electrical equipment containing overcurrent, switching or control devices likely to require examination, adjustment, servicing, or maintenance while energized shall conform with the requirements specified at *NJUCC* 5:23-6.8, Materials and methods, and, in addition, shall conform with Sections 110.26 (Space About Electrical Equipment—1,000 Volts, Nominal or Less), 110.32 (Workspace About Equipment—Over 1,000 Volts, Nominal), 110.33 (Entrance and Access to Workspace), 404.8 (Accessibility and Grouping) and 408.18 (Clearances), as applicable, of the *Electrical Subcode*.

**5:23-6.9(c)2** Newly installed (not replacing an existing device) heating, air conditioning or refrigeration equipment likely to require examination, adjustment, servicing or maintenance shall conform with the requirements of *NJUCC* 5:23-6.8, Materials and methods, and, in addition, shall conform with Section 210.63 Heating, Air Conditioning, and Refrigeration Equipment Outlet and, if newly installed in an attic, underfloor space, utility room or basement, 210.70 Lighting Outlets Required, as applicable, of the *Electrical Subcode*.

**5:23-6.9(c)3** As specified in Section 210.12 of the *Electrical Subcode*, Arc-Fault Circuit-Interrupter (AFCI) Protection shall be required for all newly installed (not replacement) branch circuits in dwelling units provided a listed combination type arc fault circuit interrupter breaker is available.

**5:23-6.9(c)3** Newly installed heating, cooling and ventilation systems shall have controls meeting Sections 6.4.3, 6.5, 7.4.4, and 7.4.6 of the commercial energy code and *IBC/NJ* Section 2111.14.

**5:23-6.9(e)4** Newly installed systems that include piping carrying fluids shall meet Sections 6.4.4.1.3 or Section 7.4.3 of the *Commercial Energy Code* and Section 1204 of the *Mechanical Subcode*.

**5:23-6.9(e)5** Newly installed heating and cooling equipment shall be sized in accordance with Section 6.4.2.1 and 7.4.1 of the *Commercial Energy Code*.

**5:23-6.11(b)** The capacity of the Means of Egress in each work area shall be sufficient for the maximum permitted occupant load of the work area and any adjacent spaces served by that means of egress as calculated on a per floor basis. Means of egress shall be measured in units of exit width of 22 inches.

**5:23-6.11(b)1** The maximum permitted Occupant Load of a space shall be determined by the capacity of the means of egress serving the space as calculated in accordance with Table 1. Building owners shall have the option of establishing a reasonable restriction on the occupant load of the space based on the existing capacity of the means of egress or of providing additional egress capacity.

**5:23-6.11 Table 1** Capacity per Unit Egress Width (in sprinklered building)  
• Use Group E: Doors, Ramps, & Corridors ..... 100  
(Unit of Egress width = 22")

**5:23-6.11(c)1** Existing interior finishes of walls and ceilings shall have a flame spread rating not greater than the class prescribed by Table 2 below. All existing interior finish materials which do not comply with the requirements of this section shall be removed or shall be treated with an approved fire retardant coating in accordance with the manufacturer's instructions to secure compliance with the requirements of this section. Exceptions are allowed as follows:  
2. Interior trim which does not exceed 10 percent of the aggregate wall and ceiling area of any room or space shall not be regulated by this section

**5:23-6.11 Table 2** Existing Interior Finish Requirements  
• Use Group E: Spaces ..... Class III

The classification of interior finishes referred to herein corresponds to flame spread ratings determined by ASTM E84 as follows: Class I flame spread, 0-25; Class II flame spread, 26-75; Class III flame spread, 76-200. In all cases, the smoke developed rating determined by ASTM E84 shall not exceed 450.

**5:23-6.11(d)** An automatic fire extinguishing system shall be required for newly installed commercial cooking equipment producing grease-laden vapors.

**5:23-6.18(b)** A minimum of two egress doorways shall be required for all rooms and spaces with an occupant load greater than 50 or in which the travel distance exceeds 75 feet. All egress doors serving an occupant load greater than 50 shall swing in the direction of exit travel.

**5:23-6.18(c)** The capacity of the means of egress in each work area shall be determined in accordance with *NJUCC* 5:23-6.11(b).

**5:23-6.18(e)** Artificial lighting with an intensity of not less than one foot candle at floor level shall be required during all times that the conditions of occupancy of the building require that the exits be available. Lighting shall also be required to illuminate the exit discharge.

**5:23-6.18(e)** Illuminated exit signs shall be provided for all required means of egress in all buildings, rooms or spaces required to have more than one exit or exit access. Exit signs shall be visible from the exit access and supplemented by directional signs when necessary. Exit signs shall meet the following criteria:

1. Red or green letters at least six inches high; minimum width of each stroke 3/4 inch on a white background or in other approved distinguishable colors. Arrows, if provided, shall be such that the direction cannot readily be changed. The word "Exit" shall be clearly discernible when the sign is not energized.
2. Exit signs shall be illuminated at all times when the building is occupied by a source providing at least five foot candles at the illuminated surface or shall be approved self-luminous signs which provide evenly illuminated letters with a minimum luminance of 0.06 foot lamberts. Exit signs shall be connected to an emergency electrical system conforming to NFPA 70 (NEC) except that continued illumination shall be required to be provided for not less than one hour in the case of primary power loss. No emergency power shall be required for approved self-luminous signs.

**5:23-6.18(j)** Structural elements which are uncovered during the course of the rehabilitation and which are found to be unsound or otherwise structurally deficient, shall be reinforced, supported or replaced in accordance with the applicable structural design criteria of the building subcode. Where structural elements are sound, there is no excessive deflection (defined as deflection in excess of the standards set forth in *NJUCC* 5:23-6.7(c)1), and fixed loads are not changing in a way that will increase the stresses on Page 121 of 252 *NJUCC* 5:23-6.17 existing structures beyond that which is permitted by *NJUCC* 5:23-6.7(c), existing structural elements shall be permitted to remain.

**5:23-6.18(i)2.i** All public school buildings shall be provided with mechanical ventilation. Newly-installed HVAC systems shall comply with the requirements of the Mechanical subcode.

**5:23-6.17(m)** Interior finishes shall comply with *NJUCC* 5:23-6.11(c).

**0300.0 Use & Occupancy Classification**

**0302.1** The following Use Classifications apply to this project:

**0305.2** Because these buildings are used by six or more persons for educational purposes through the 12<sup>th</sup> grade, they shall be classified per the *International Building Code/New Jersey 2018 (IBC/NJ)* as Use Group E, Education.

**0500.0 General Building Heights & Areas**

**Table 504.6.2**  
• Use Group B, Construction Type III-B, Sprinklered, 2-Story

! Proposed Reconstruction Area  
E ..... 1,491 SF

**0600.0 Types of Construction**

**0602.5** Because the building construction is that type in which the exterior walls are of noncombustible materials and the interior building elements are of any materials permitted by the *IBC/NJ*, it would be classified per the *IBC/NJ* as Construction Type II-B.

**Table 0601** Fire-Resistance Rating Requirements for Building Elements (hours)

• Primary Structural frame.....	0
• Exterior Bearing walls.....	0
• Exterior Nonbearing walls (Table 602).....	0
• Interior Bearing walls.....	0
• Nonbearing walls.....	0
• Floor construction.....	0
• Roof construction.....	0

**0900.0 Fire Protection Systems**

**0906.1** Portable fire extinguishers shall be provided in occupancies and locations as required by *IBC/NJ* Section 906.

**1000.0 Means of Egress**

**Table 1004.5** - Maximum Floor Area Allowances per Occupant:  
• Shops & other Vocational Room areas ..... 50 SF (net)/Occupant

! Proposed Egress Occupancy  
• Education ..... 1,491 SF ÷ 50 SF/Occupant = 30 Occupants

**1100.0 Accessibility**

**1104.4.2** Large buildings, defined as those with a total gross enclosed floor area of 10,000 SF or more, shall provide the accessible building features required of small buildings in *IBC/NJ* Section 1104.4.1. In addition, large be required to have elevator(s) to provide a vertical accessible route between floors.

**1110.3** Where sinks are provided, at least 5%, but note less than one provided id accessible spaces shall be accessible. Mop or services sinks are not required to be accessible.

**1110.10** Where fixed or built-in storage elements such as cabinets, coat hooks, shelves, medicine cabinets, lockers, closets and drawers are provided in required accessible spaces, at least 5%, but not less than one of each type shall be accessible.

**1110.15** Controls, operating mechanisms and hardware intended for operation by the occupant, including switches that control lighting and ventilation and electrical convenience outlets, in accessible spaces, along accessible routes or as parts of accessible elements shall be accessible. Exceptions: 1) Operable parts that are intended for use only by service or maintenance personnel shall not be required to be accessible. 3) Operable parts exempted in accordance with *JCC A117.1* are not required to be accessible.

**1112.1** Accessible signage shall be provided per *IBC/NJ* Sections 1112.2, 1112.3 and 1112.4

**Plumbing Systems**

**5:23-3.15(a)1** Plumbing supply, drainage, venting, fixtures, devices, trim, & appliances shall be designed, installed, & tested in accordance with the requirements of the *National Standard Plumbing Code/2021 (NPC)*, as adopted by *NJUCC*.

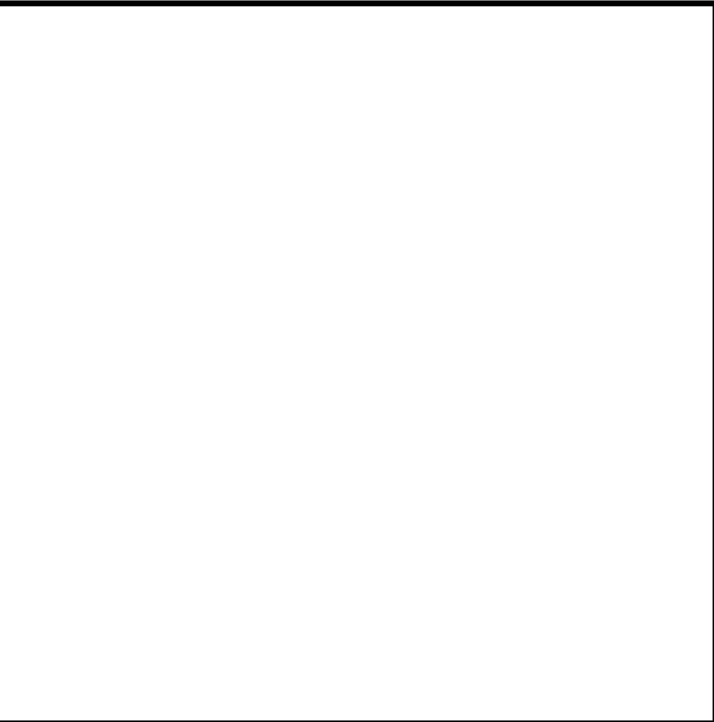
**Electrical Systems**

**5:23-3.16(a)1** Electrical Power & Lighting panels, circuiting, grounding, receptacles, fixtures, devices, & appliances shall be designed, installed, & tested in accordance with the requirements of the *National Electrical Code/2020 (NEC)*, as adopted by *NJUCC*.

**Mechanical Systems**

**M07.3** Heating, Ventilation, & Air Conditioning equipment, supply, exhaust, combustion air, & controls shall be designed, installed, & tested in accordance with the requirements of the *International Mechanical Code/2021* and the manufacturer's instructions and recommendations.

This code analysis is based upon NJAC 5:23, the *New Jersey Uniform Construction Code*. This Code adopts and amends the *International Building Code 2021 (New Jersey edition)*.




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<b>NJDOE SP #07-2670-005-21-1000</b>	
PROJECT TITLE: <b>CULINARY ARTS CLASSROOM ALTERATION</b>	
ADDRESS: <b>LINDENWOLD HIGH SCHOOL BLOCK 244, LOT 3 801 EGG HARBOR ROAD LINDENWOLD, NJ 08021</b>	
PROJECT NO.:	<b>5713G</b>

REVISION DATE:	
	<b>ADD #1 23 FEB 24</b>

DRAWING DATE:	<b>15 JAN 2024</b>
PRINT DATE:	<b>2/23/24</b>
DRAWN BY:	<b>RR</b>
SHEET TITLE:	<b>CODE ANALYSIS</b>

**A100**



PHOTO: 01



PHOTO: 06

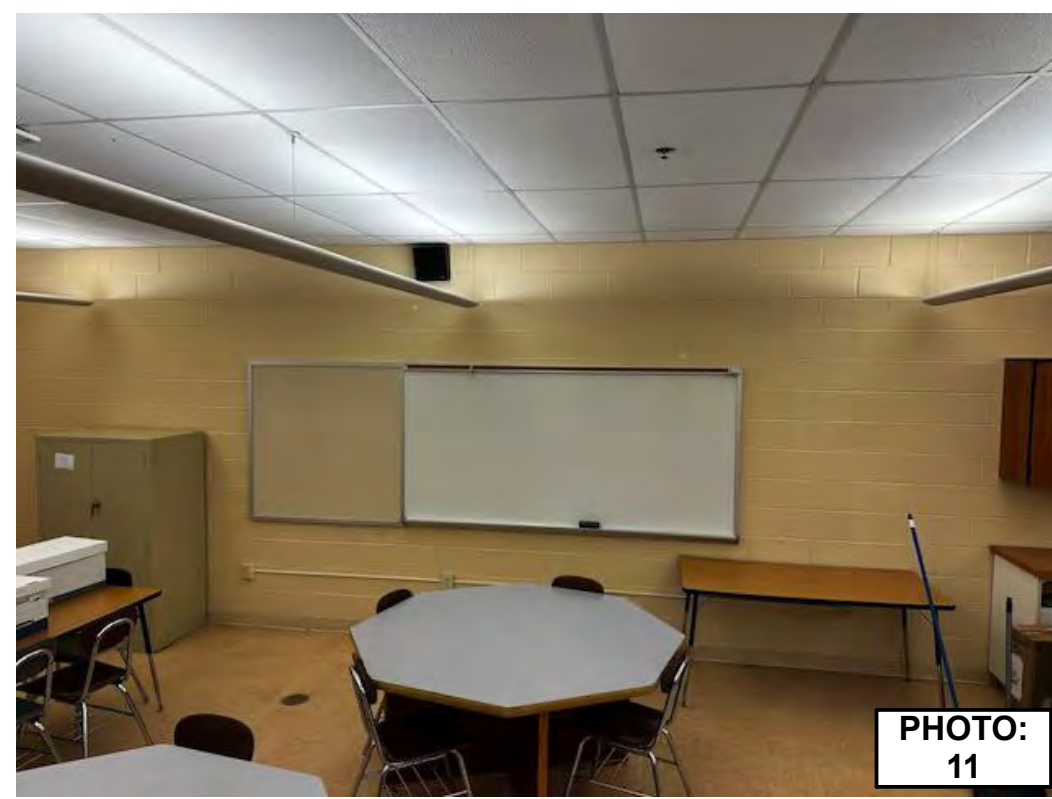


PHOTO: 11



PHOTO: 16



PHOTO: 21



PHOTO: 02



PHOTO: 07

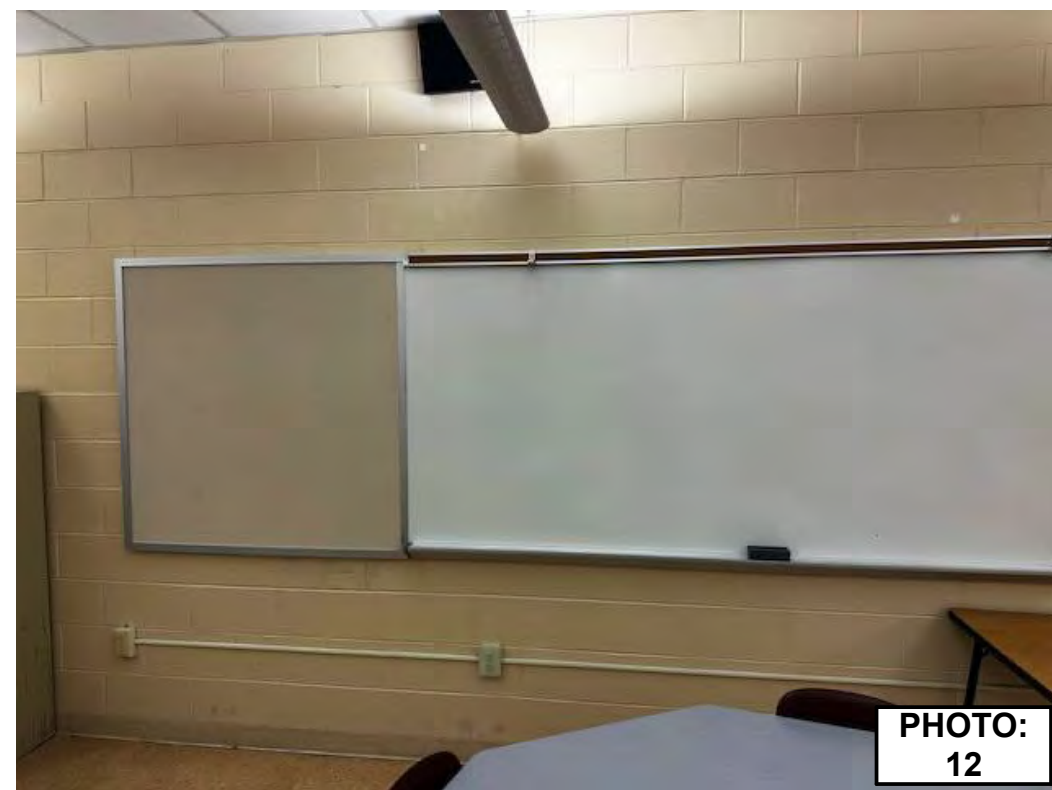


PHOTO: 12



PHOTO: 17

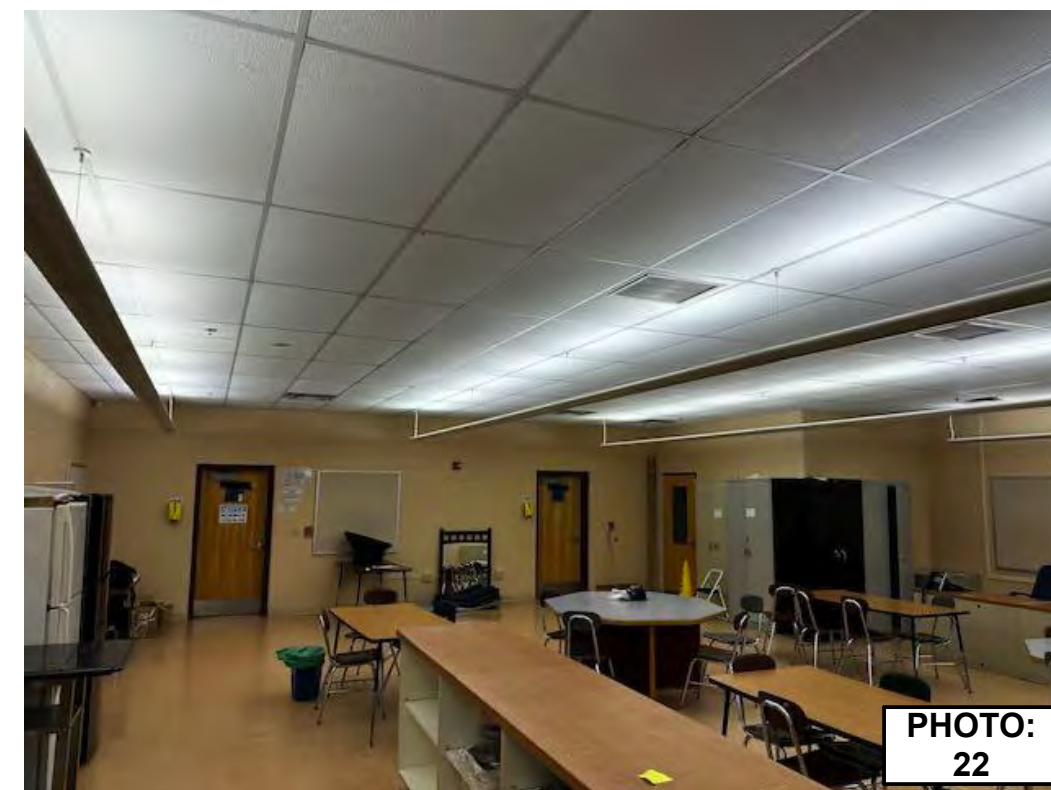


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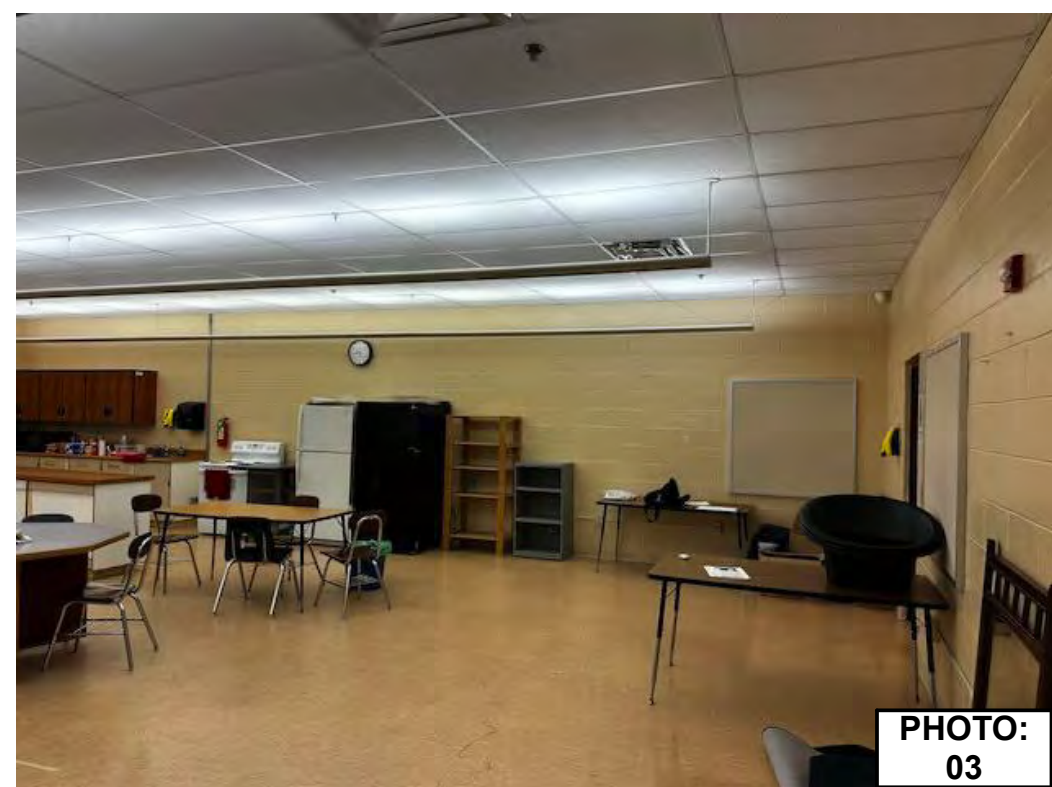


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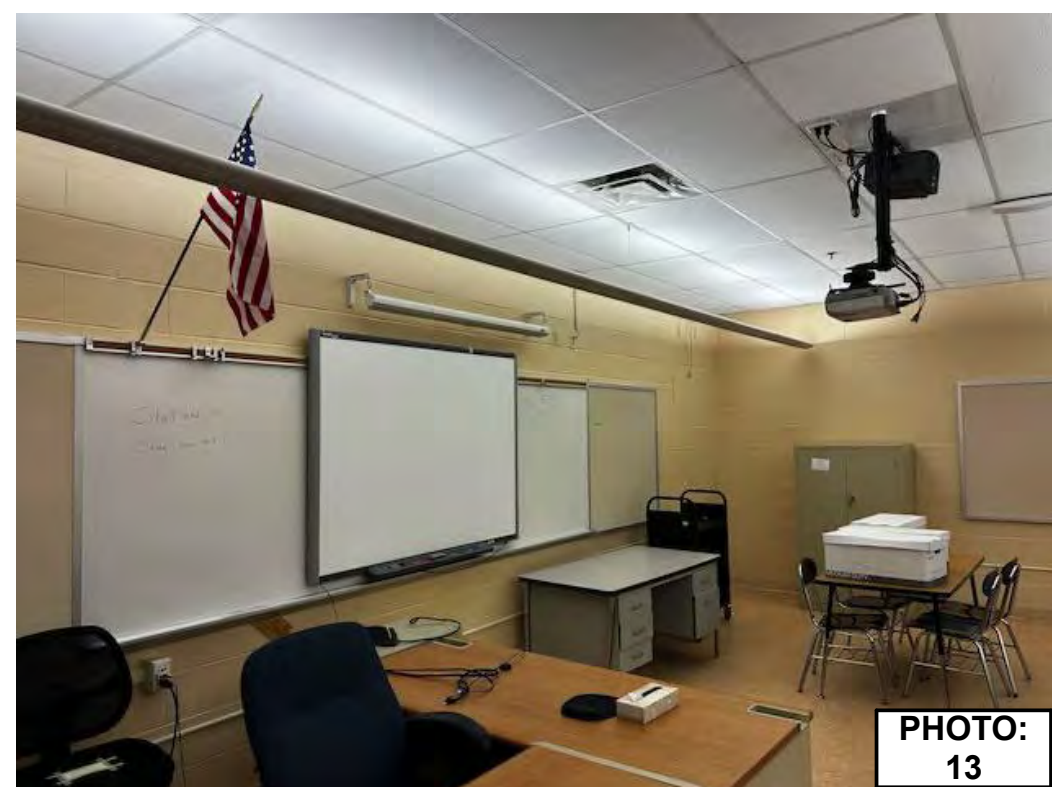


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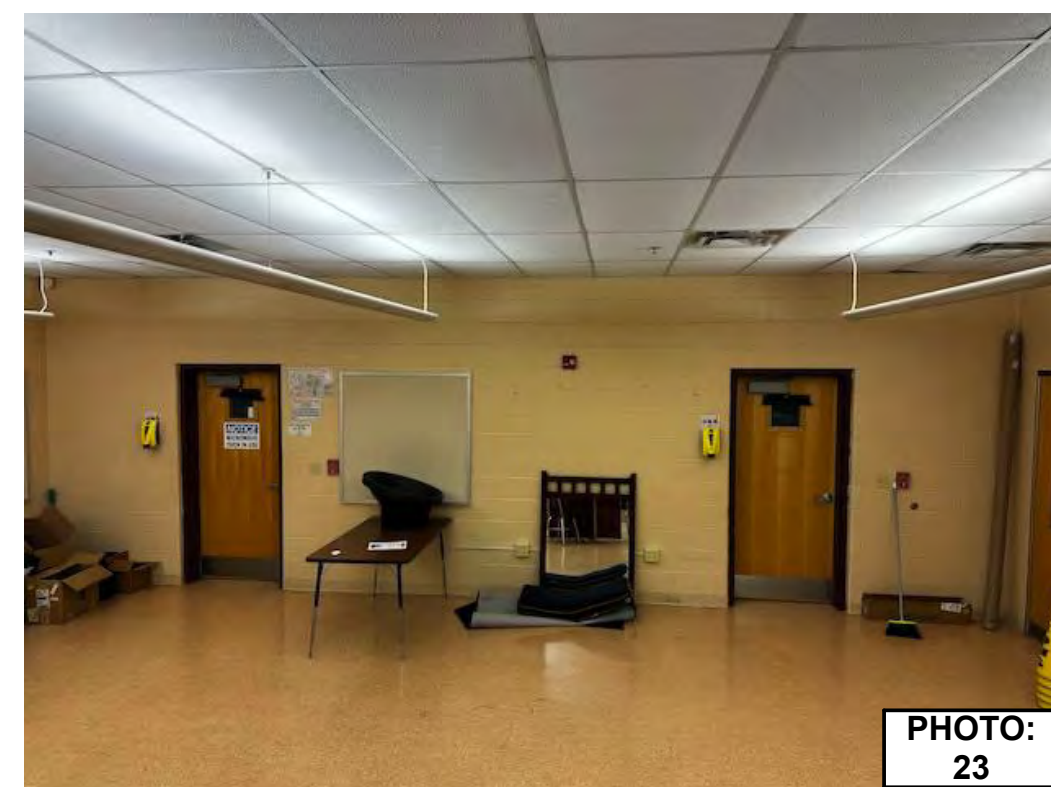


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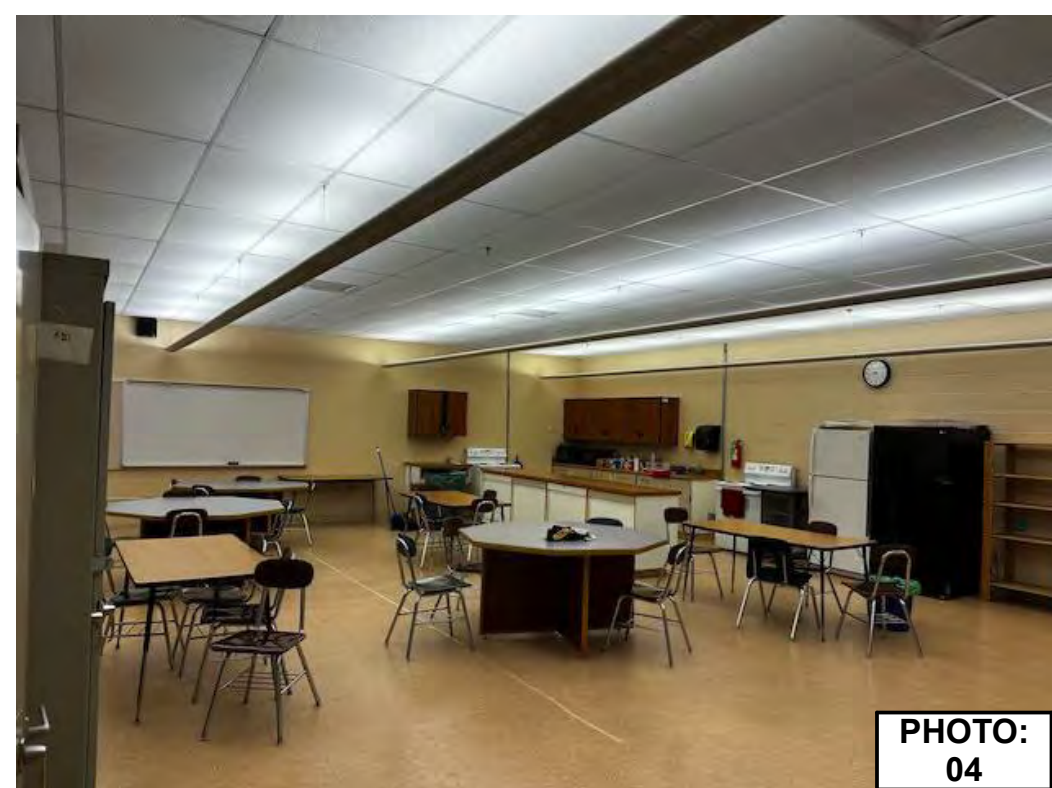


PHOTO: 04



PHOTO: 09



PHOTO: 14

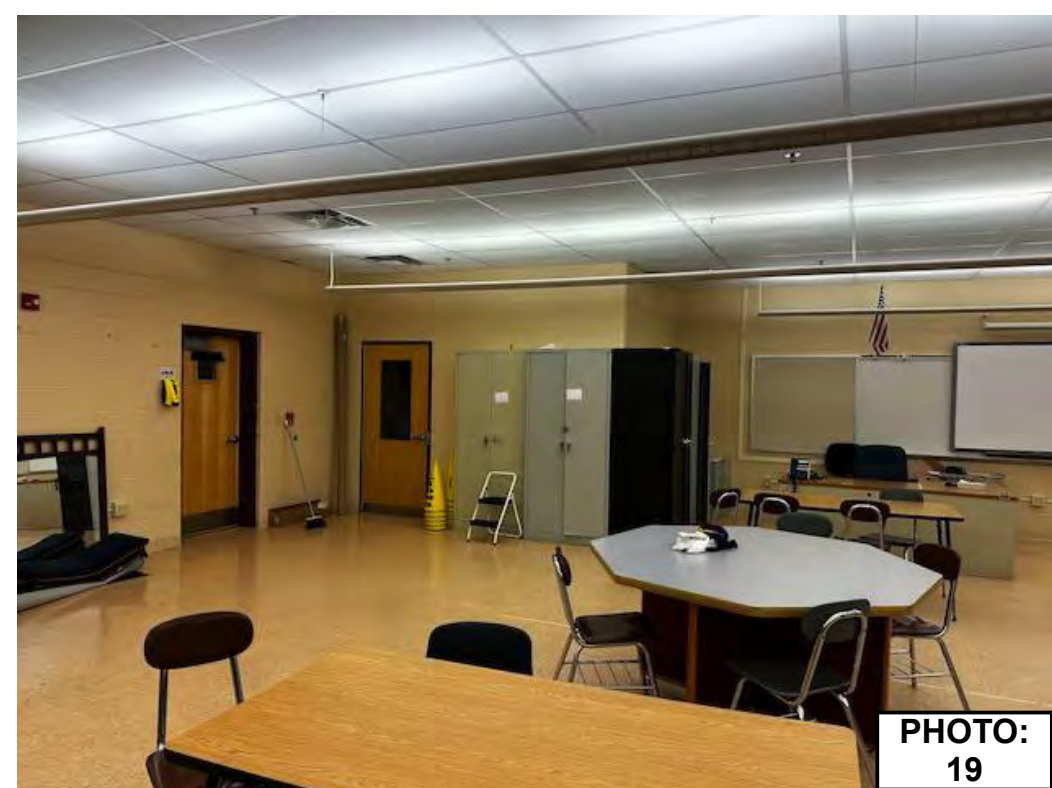


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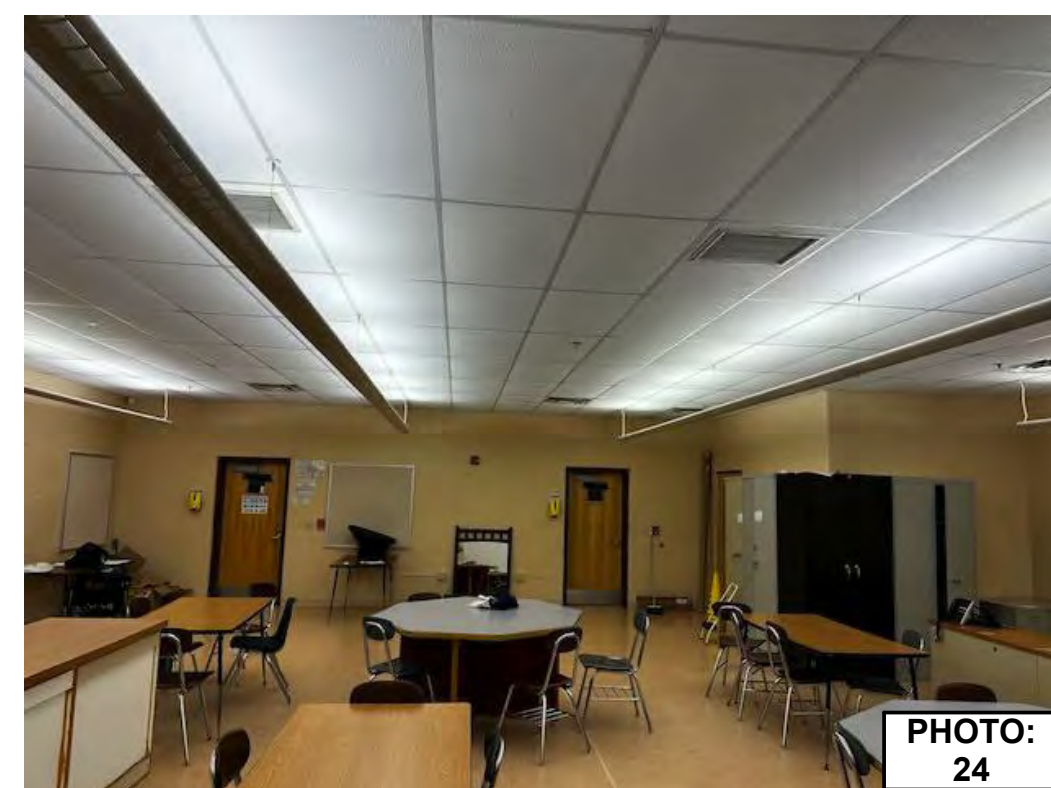


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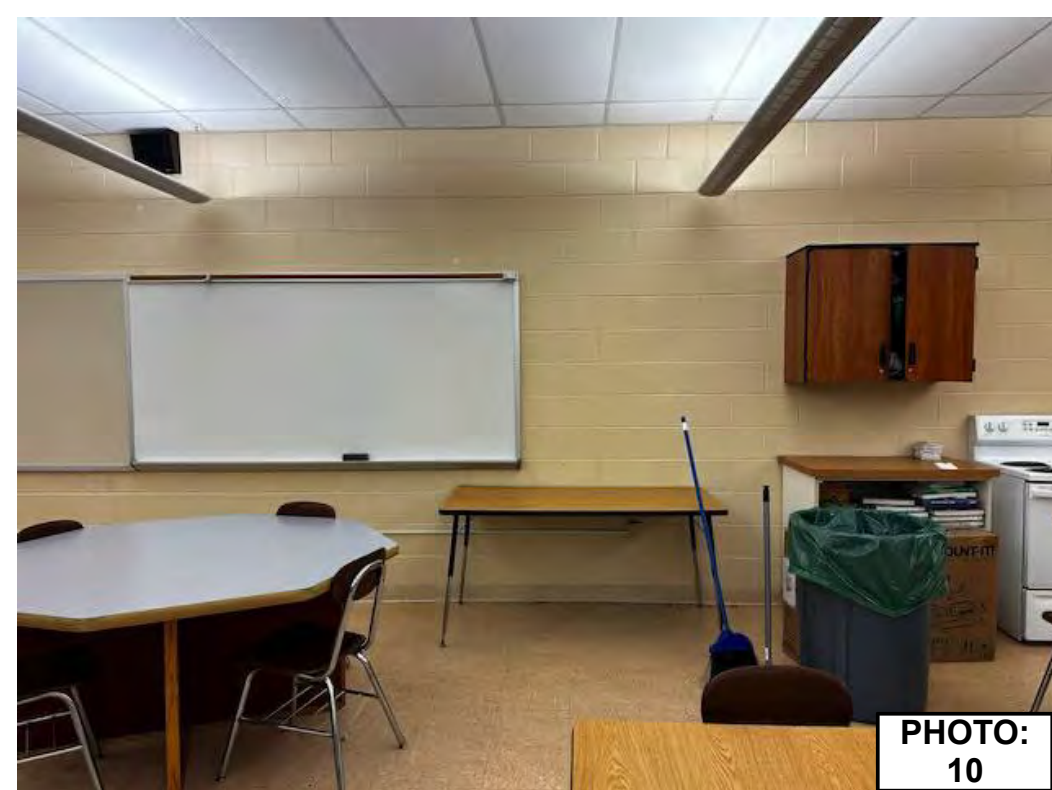


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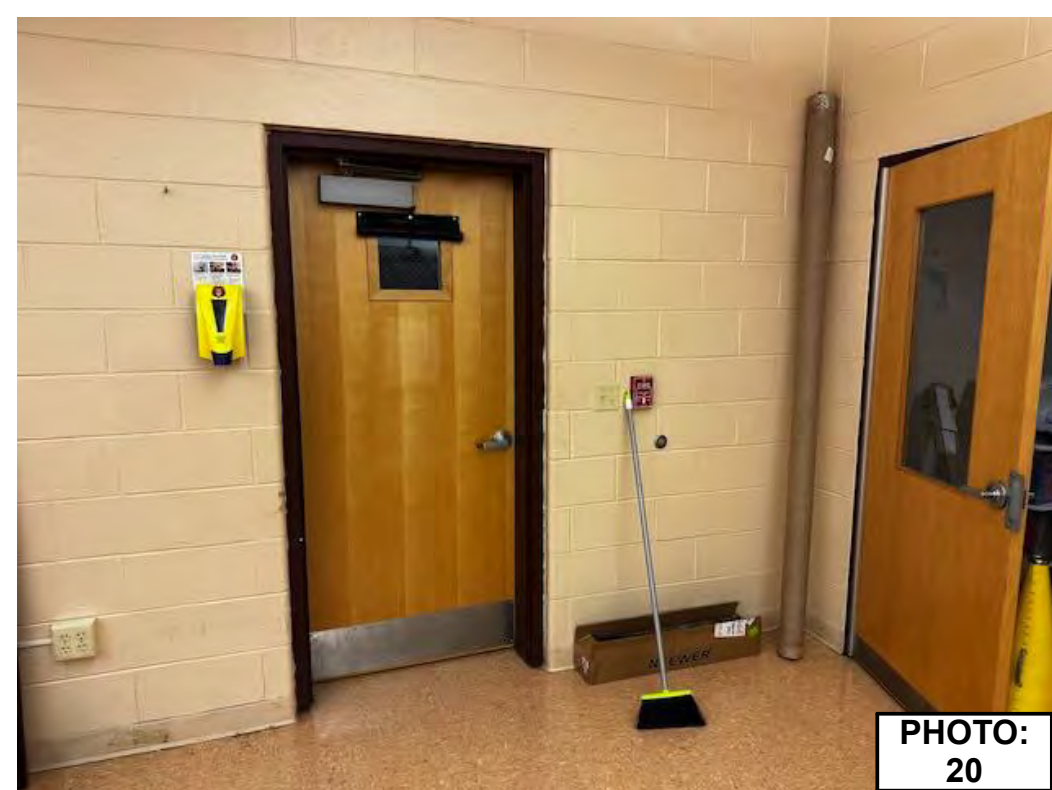


PHOTO: 20



PHOTO: 25

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**NJDOE SP #07-2670-005-21-1000**

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CLASSROOM ALTERATION**

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BLOCK 244, LOT 3  
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REVISION DATE:  
**1 ADD #1 23 FEB 24**

DRAWING DATE: **15 JAN 2024**

PRINT DATE: **2/23/24**

DRAWN BY: **RR**

SHEET TITLE: **EXISTING  
CONDITION  
PHOTOS**

**A101**



PHOTO: 26

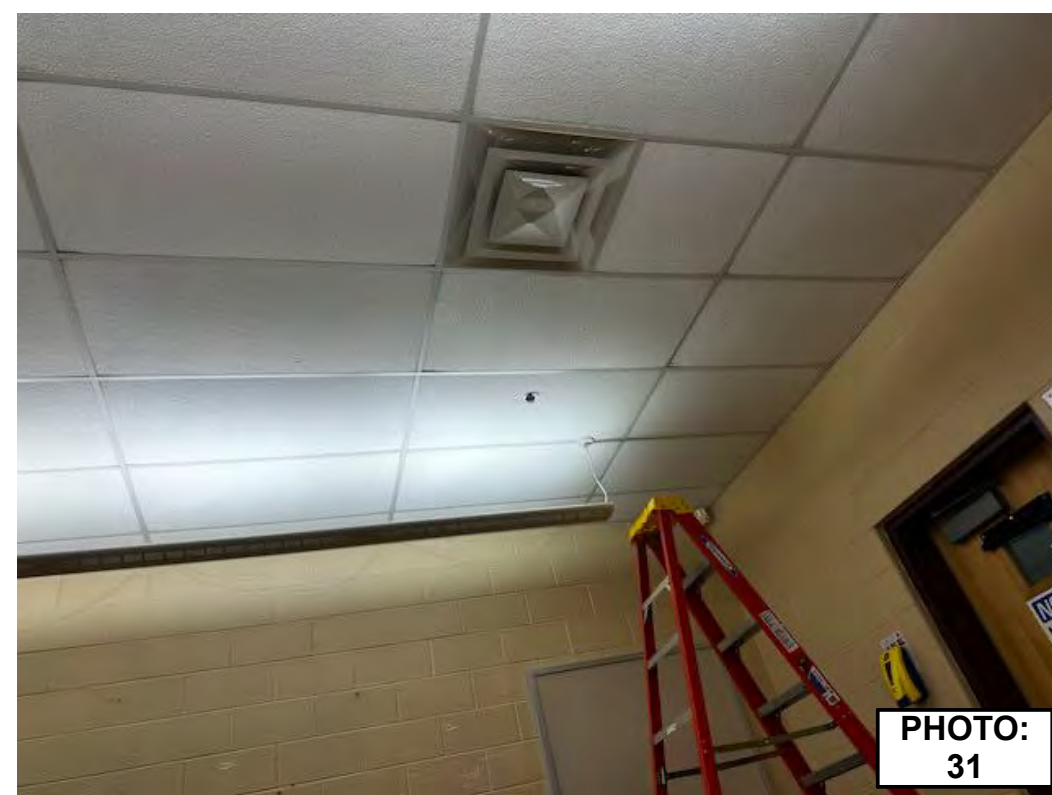


PHOTO: 31



PHOTO: 36



PHOTO: 41



PHOTO: 46



PHOTO: 27



PHOTO: 32



PHOTO: 37



PHOTO: 42



PHOTO: 47

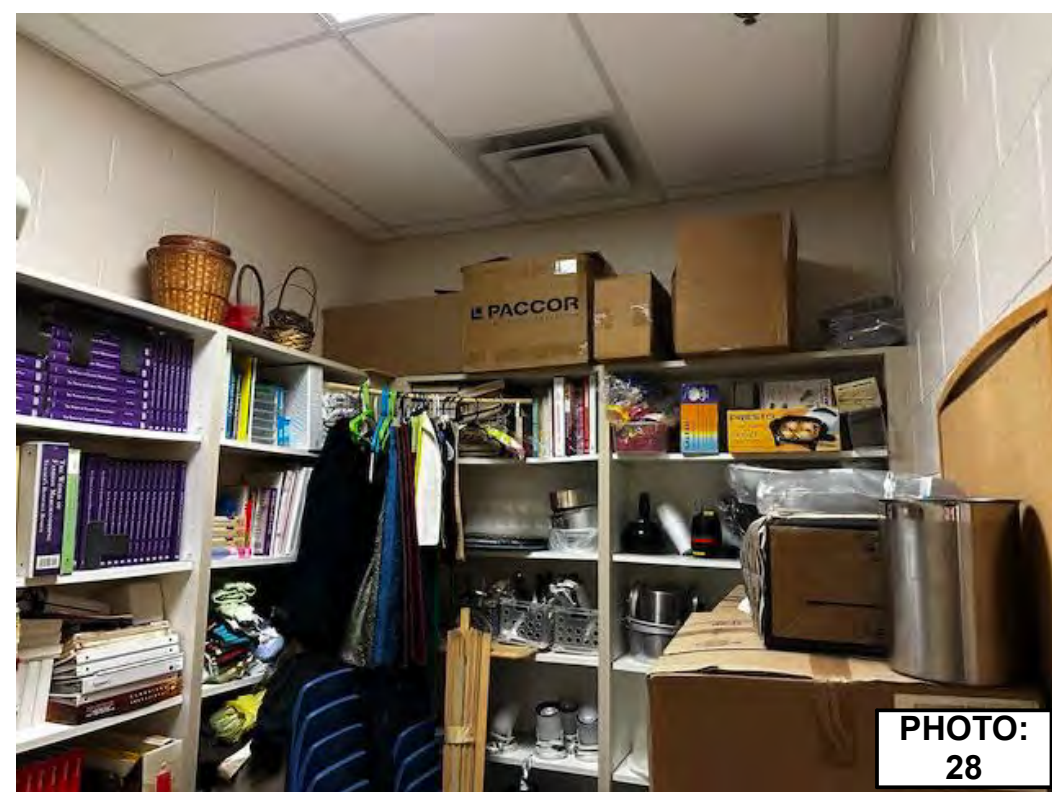


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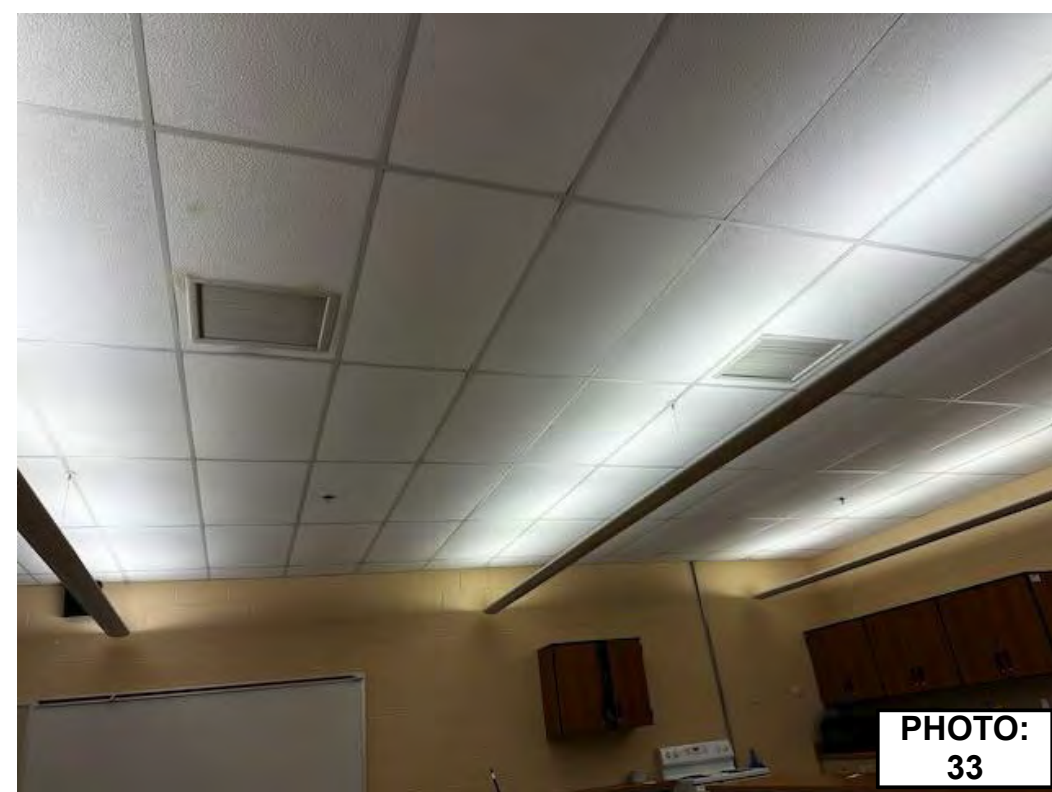


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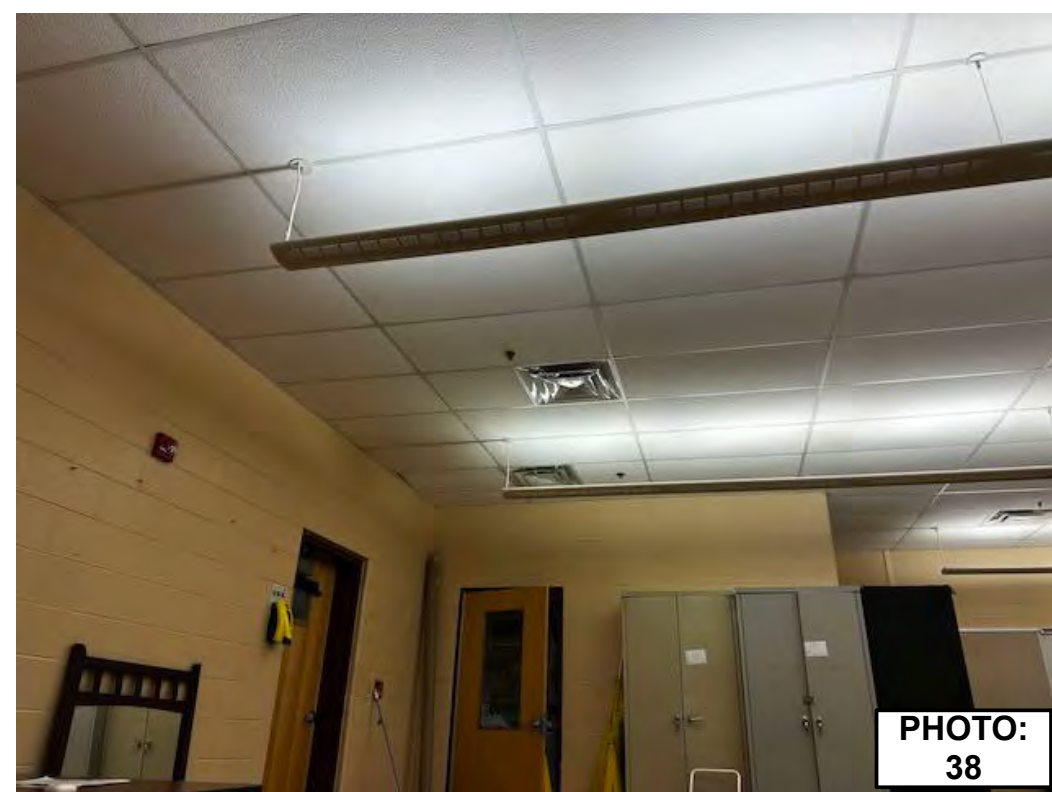


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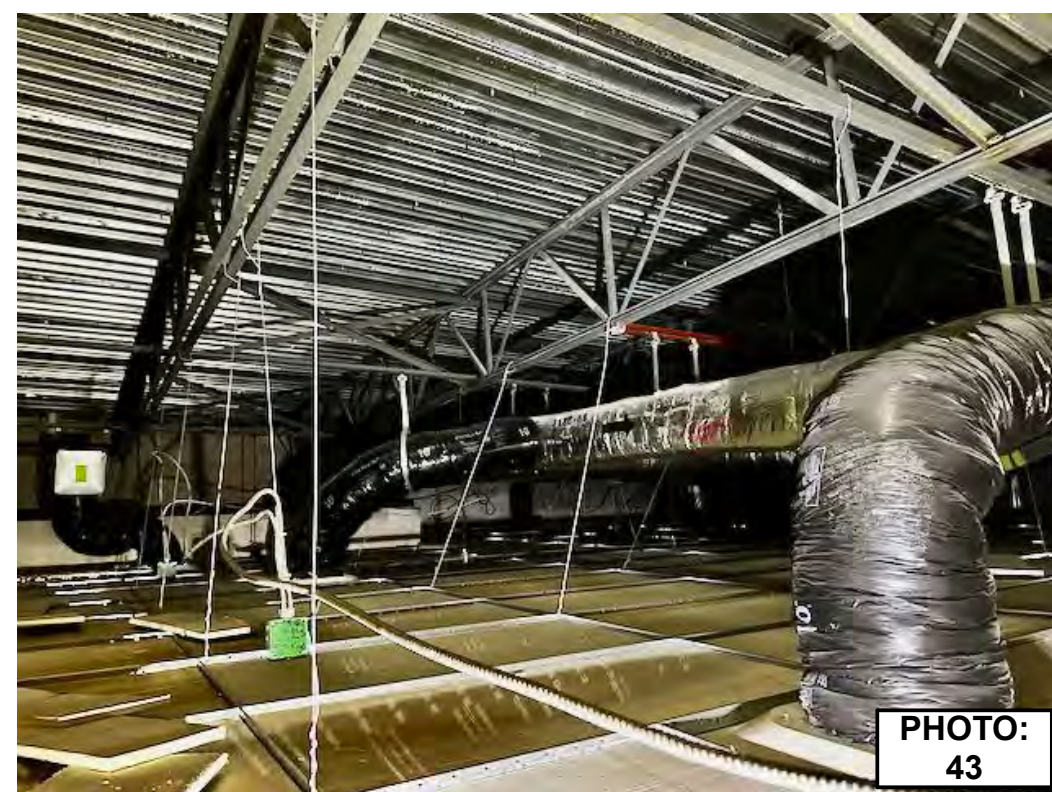


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PHOTO: 48

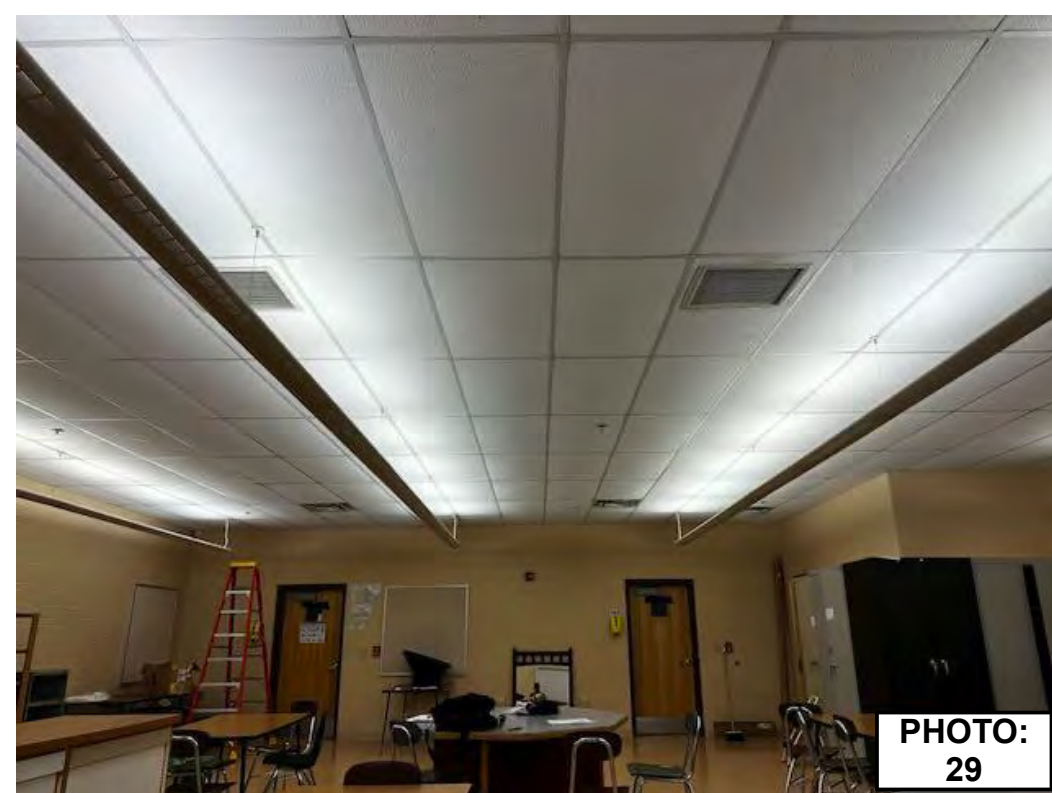


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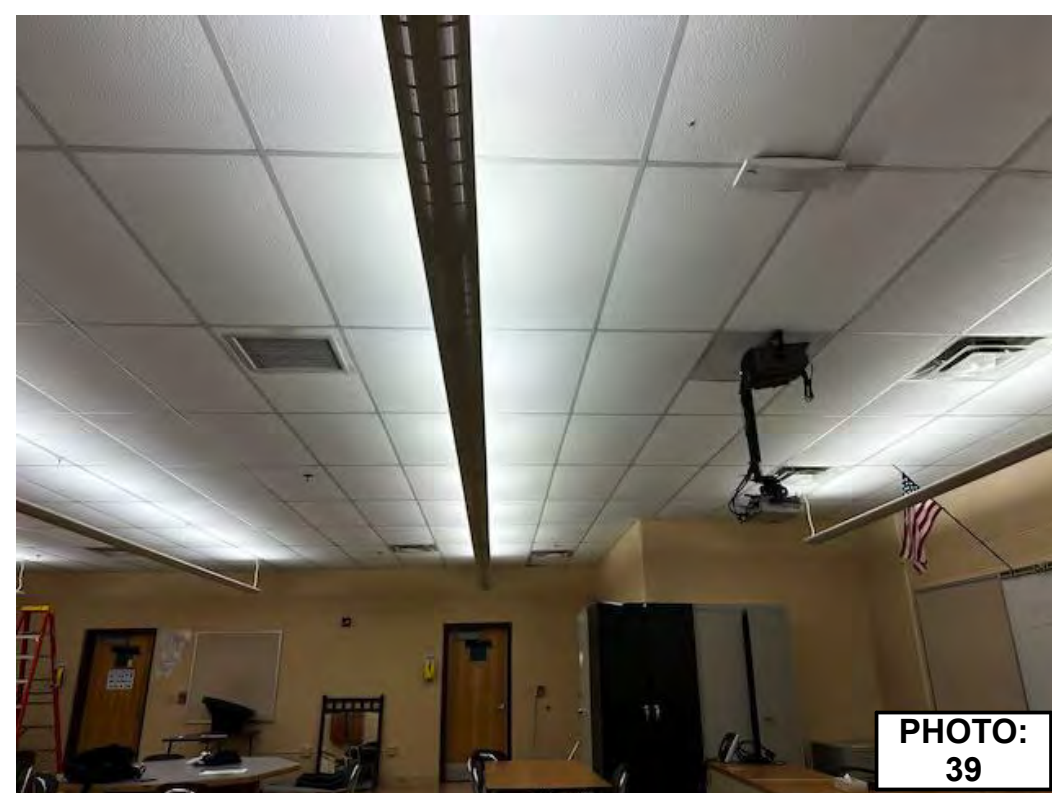


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PHOTO: 44



PHOTO: 49

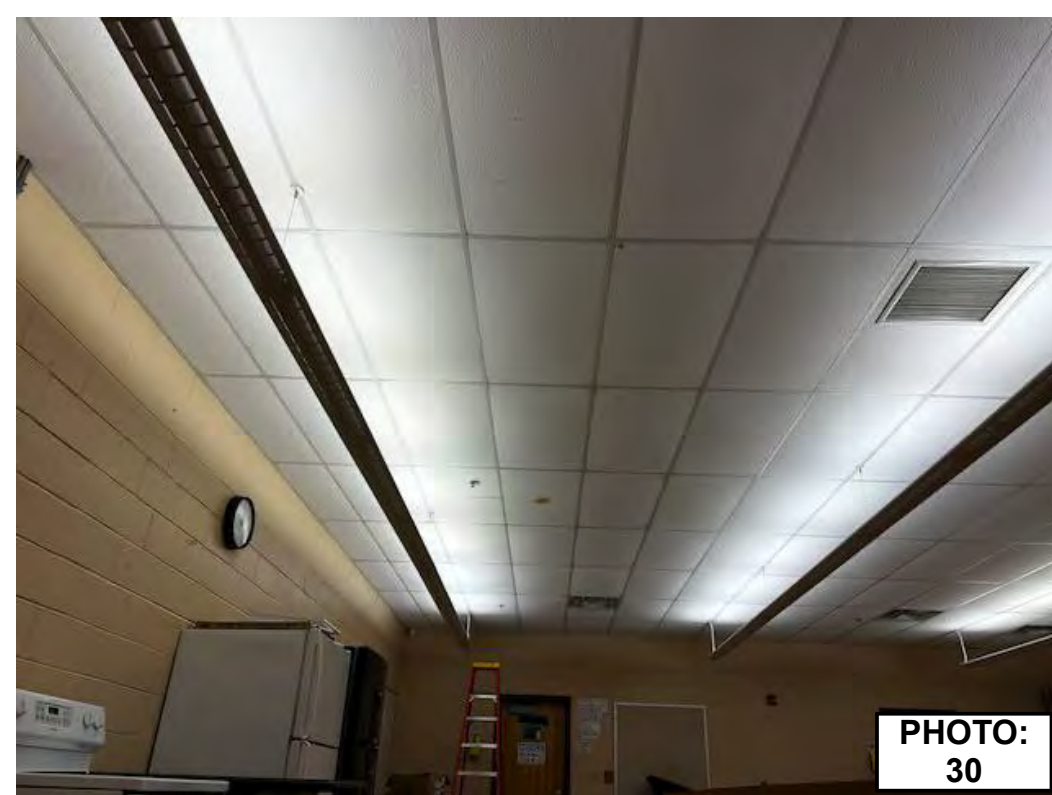


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PHOTO: 35



PHOTO: 40



PHOTO: 45

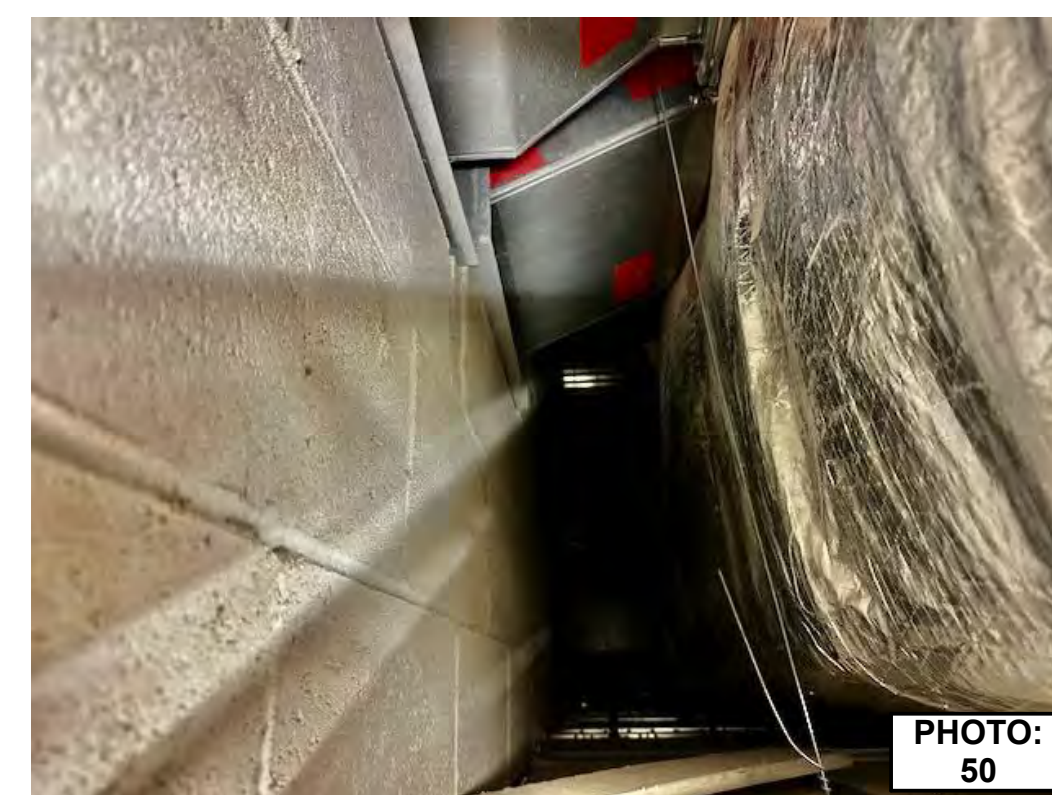


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SHEET TITLE:	<b>EXISTING CONDITION PHOTOS</b>

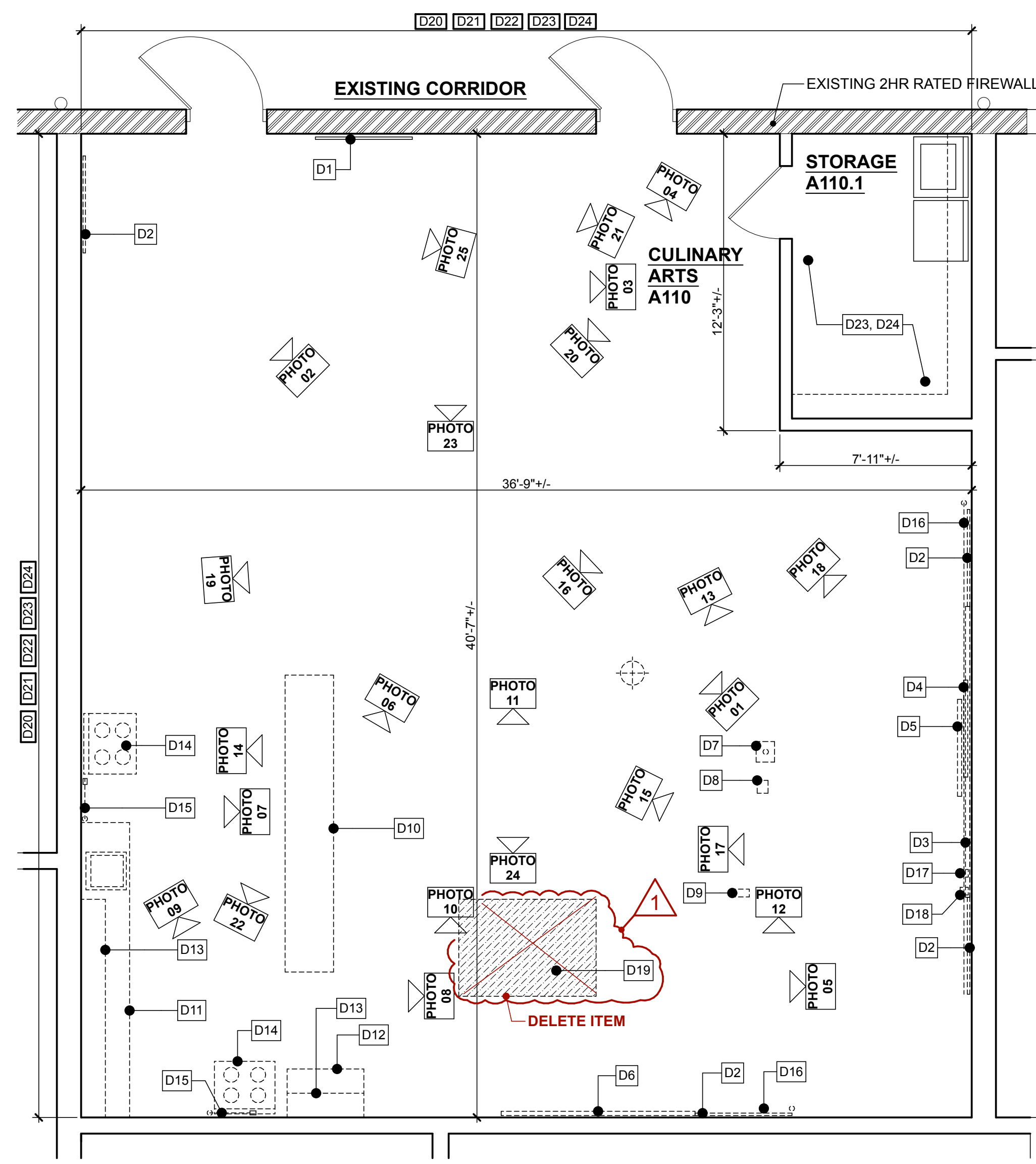
**A102**



**GENERAL DEMOLITION NOTES:**

NOTE: REMOVE ALSO MEANS TO DEMOLISH-UNO

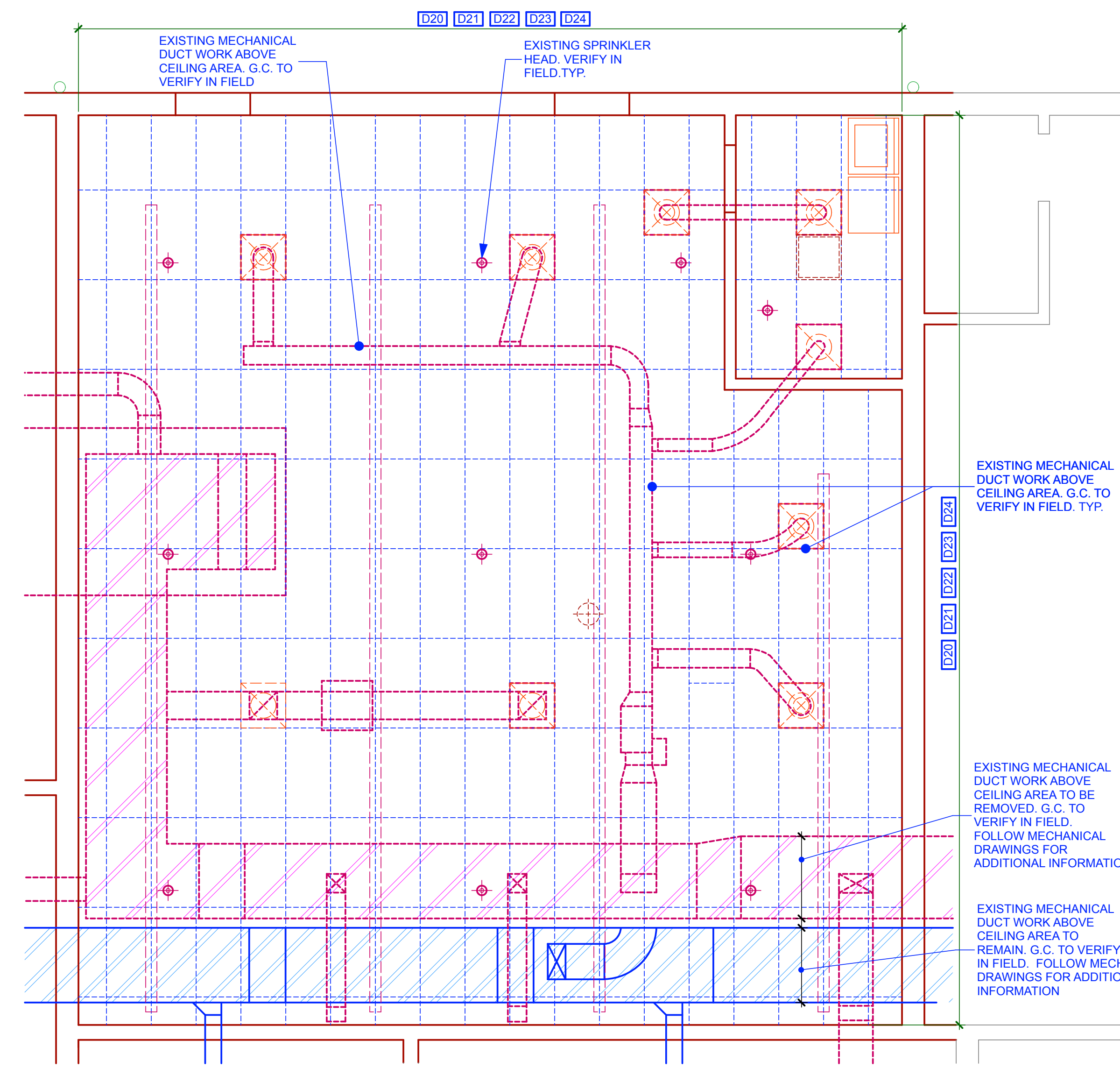
- D1 EXISTING TACK BOARD TO REMAIN.
- D2 EXISTING TACK BOARD TO BE REMOVED.
- D3 EXISTING MARKER BOARD TO BE REMOVED.
- D4 EXISTING ROLLING MARKER BOARD ASSEMBLY TO BE REMOVED AND RETURNED TO OWNER.
- D5 EXISTING WALL-MOUNTED PROJECT SCREEN AND BRACKETS TO BE REMOVED AND RETURNED TO OWNER.
- D6 EXISTING MARKER BOARD TO BE REMOVED.
- D7 EXISTING CEILING MOUNTED PROJECTOR, ALL WIRING AND BRACKET TO BE REMOVED AND REINSTALLED BY OWNER.
- D8 EXISTING CEILING MOUNTED SPEAKER, ALL WIRING AND BRACKET TO BE REMOVED AND REINSTALLED BY OWNER.
- D9 EXISTING WIFI MODULE TO BE REMOVED AND RETURNED TO OWNER
- D10 EXISTING ISLAND BASE CABINETS/ COUNTERTOP TO BE REMOVED.
- D11 EXISTING BASE CABINETS/ COUNTERTOP AND SINK TO BE REMOVED.
- D12 EXISTING BASE CABINET/ COUNTERTOP TO BE REMOVED.
- D13 EXISTING WALL CABINETS TO BE REMOVED.
- D14 EXISTING ELECTRIC STOVE TO BE REMOVED.
- D15 EXISTING ELECTRIC STOVE POWER OUTLET AND ELECTRICAL CONDUIT TO BE REMOVED IN THEIR ENTIRETY.
- D16 EXISTING ELECTRICAL RACEWAY AND OUTLETS TO BE REMOVED IN THEIR ENTIRETY.
- D17 EXISTING ELECTRICAL DUPLEX OUTLET ABOVE MARKER BOARD TO BE TERMINATED.
- D18 EXISTING WALL MOUNTED AUDIO SPEAKER BOX AND WIRING TO BE REMOVED IN THEIR ENTIRETY.
- 1 D19 NOT USED — DELETE ITEM
- D20 EXISTING ACOUSTICAL PANEL CEILING AND GRID TO BE REMOVED IN THEIR ENTIRETY.
- D21 EXISTING LIGHT FIXTURES TO BE REMOVED. FOLLOW ELECTRICAL DRAWINGS.
- D22 EXISTING MECHANICAL SUPPLY AND RETURN DUCTS TO BE REMOVED. FOLLOW MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION.
- D23 REMOVE EXISTING FLOORING AND WALL BASE. MECHANICALLY REMOVE ALL ADHESIVES AND PREP EXISTING CONCRETE SURFACE TO RECEIVE NEW FLOORING.
- D24 REMOVE EXISTING WALL-MOUNTED MISC. DISPENSERS AND FIRE EXTINGUISHERS AND RETURN TO OWNER.



**DEMOLITION PLAN**

1/4" = 1'-0" **01**

**EXISTING PHOTO LOCATOR:**



**EXISTING REFLECTED CLG. PLAN**

1/4" = 1'-0" **02**

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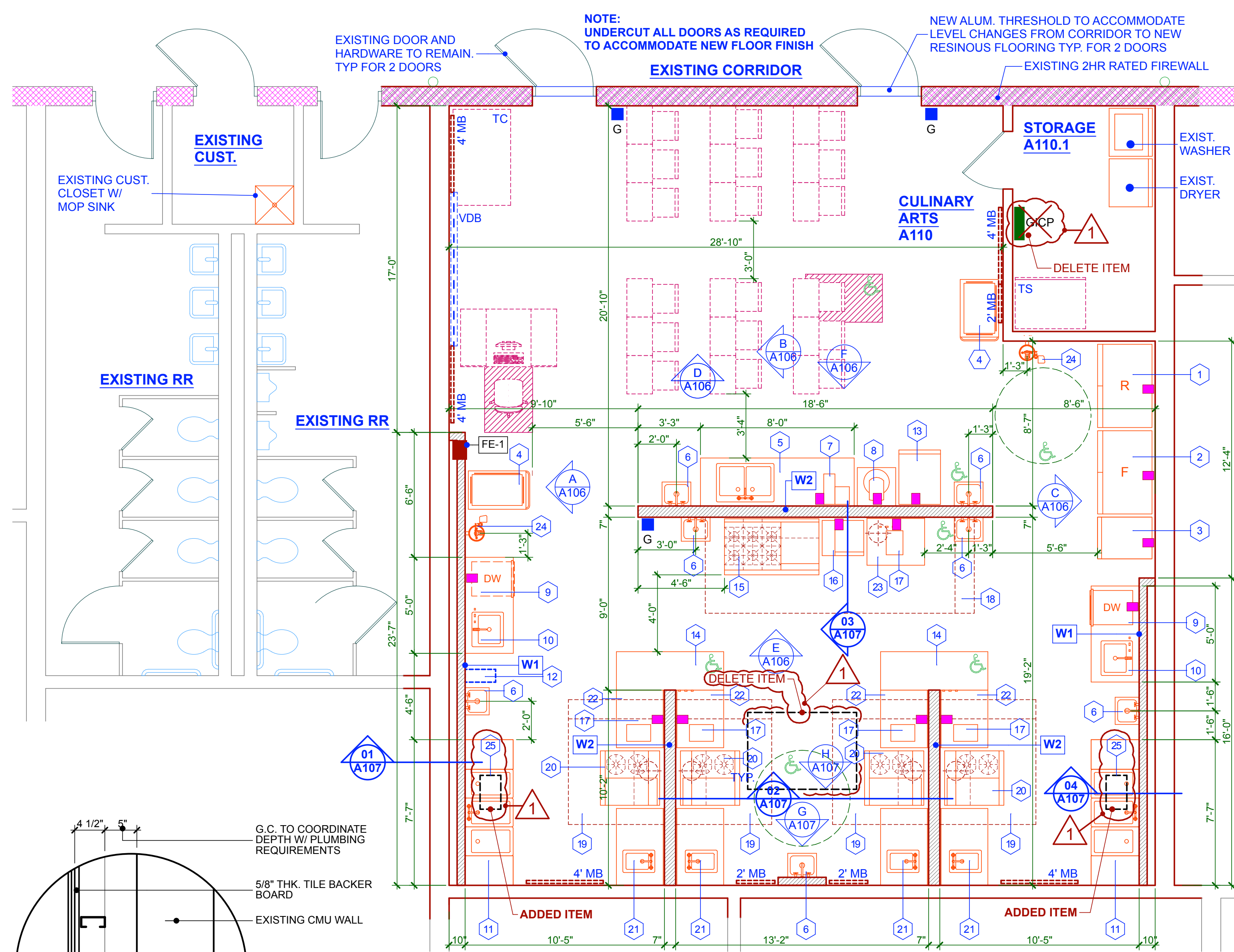
DRAWING DATE: **15 JAN 2024**

PRINT DATE: **2/23/24**

DRAWN BY: **RR**

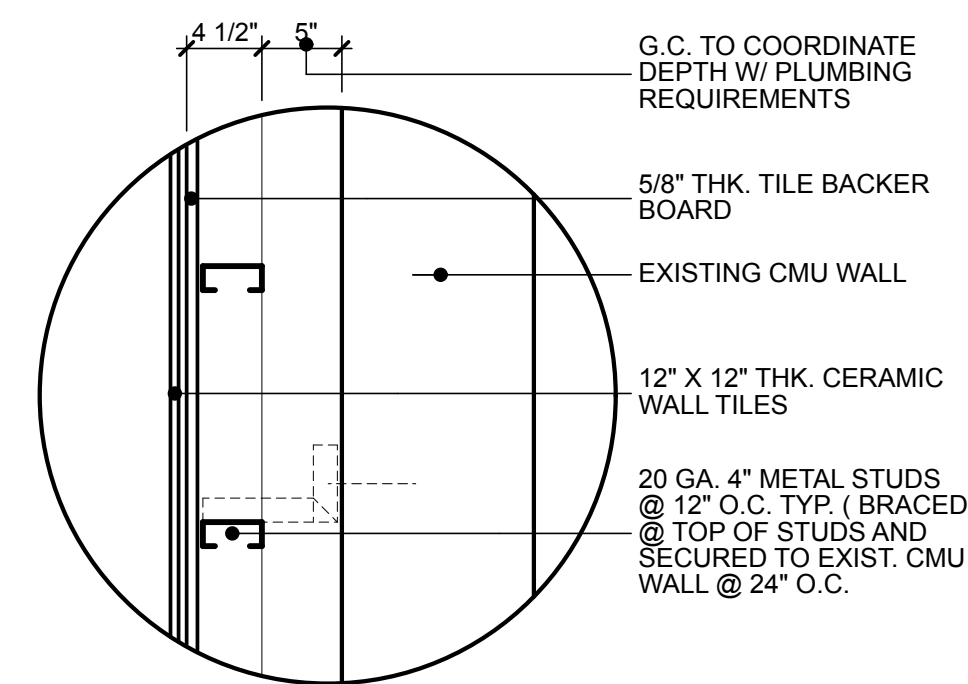
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REFLECTED CLG.  
PLAN**

**A103**

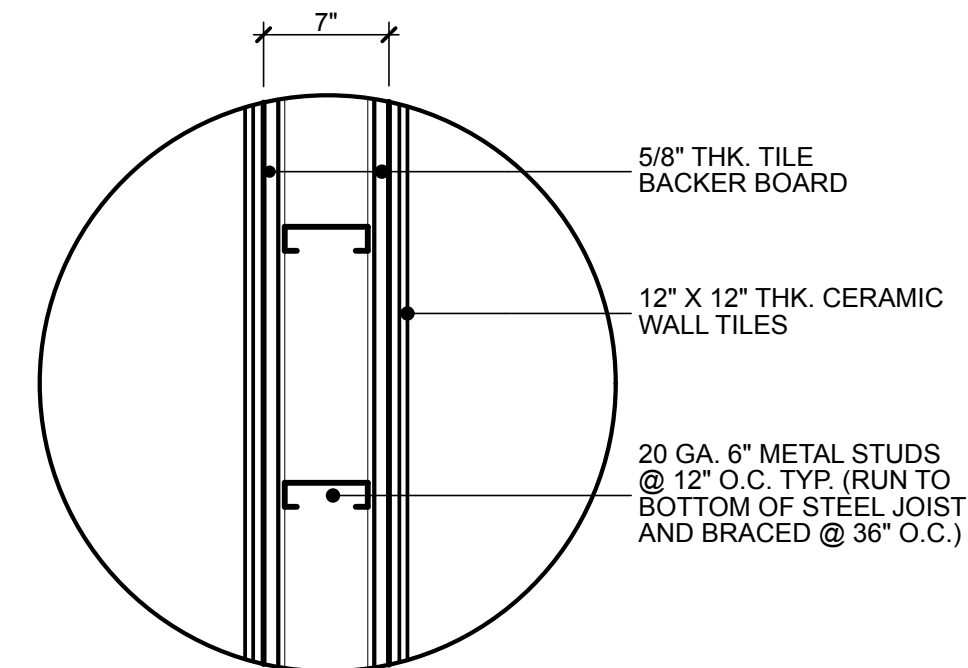


**FLOOR PLAN-NEW WORK** 1/4" = 1'-0" 01

AREA: 1,491 SF

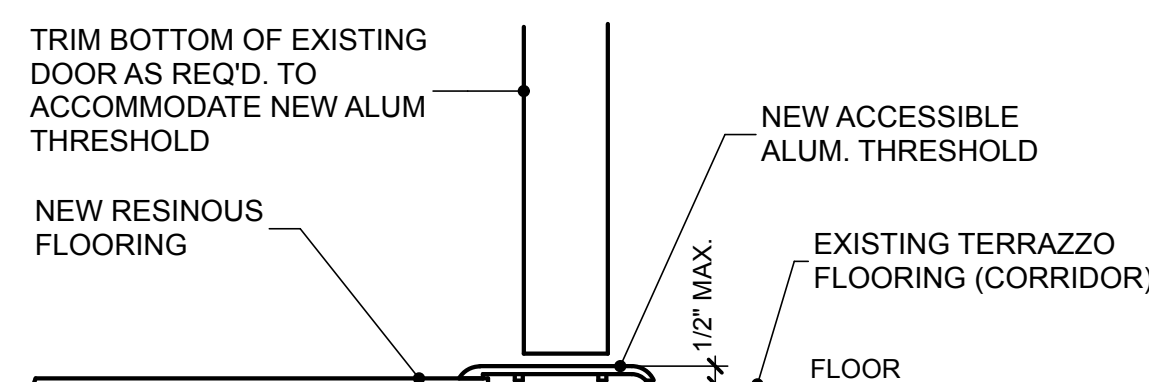


**WALL TYPE W1**

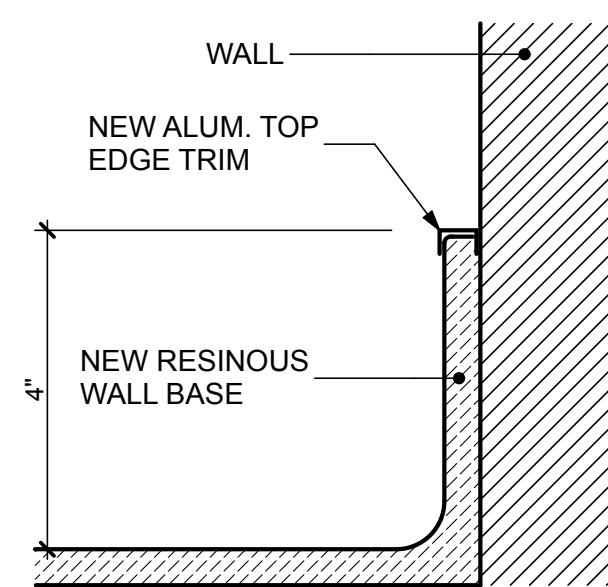


**WALL TYPE W2**

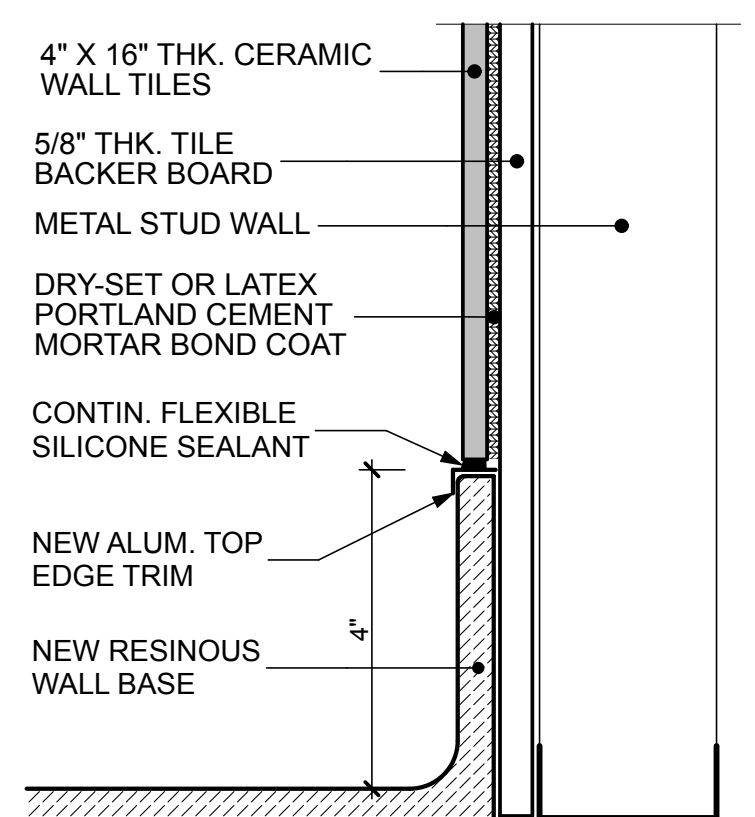
**WALL TYPES** NTS 03



**THRESHOLD DETAIL** NTS 04



**RESINOUS WALL BASE DETAIL** NTS 05

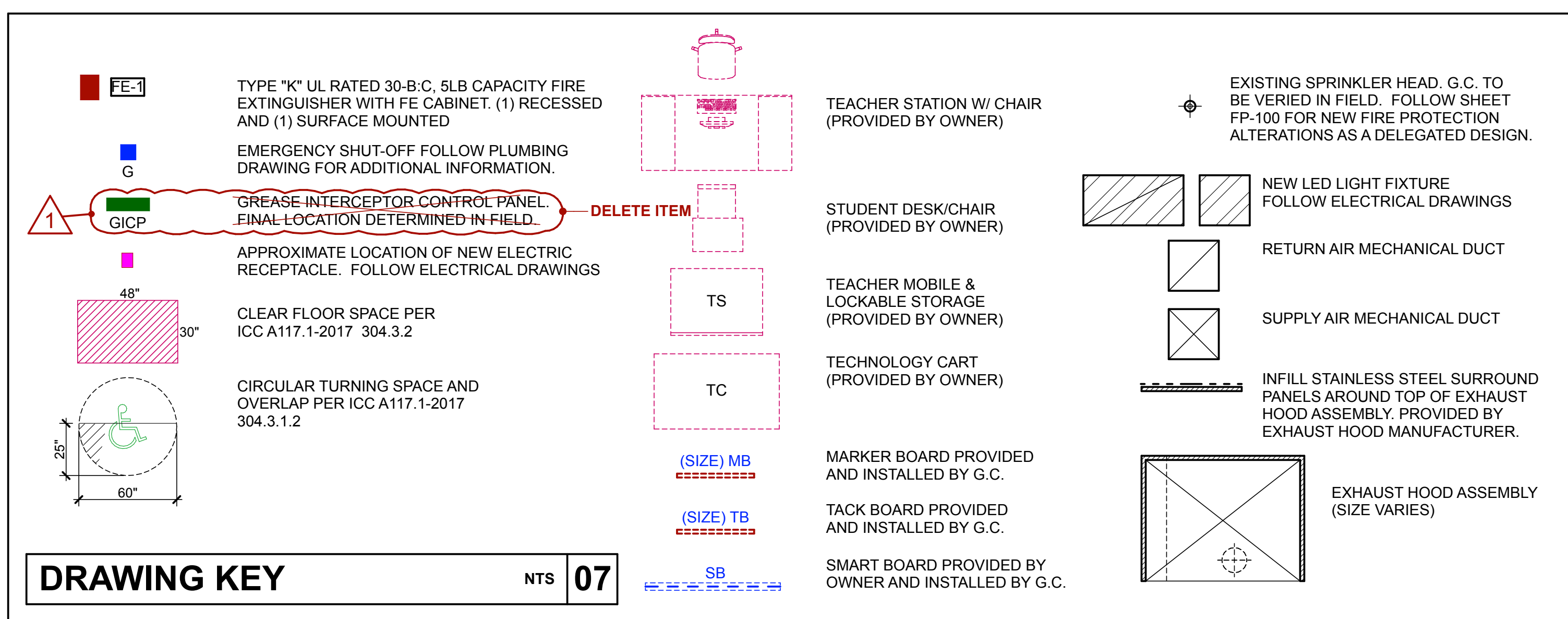


**RESINOUS WALL BASE & TILE DETAIL** NTS 06

**FOOD SERVICE EQUIPMENT KEY**

- 1 MOBILE 2 DR. REACH-IN REFRIGERATOR
- 2 MOBILE 2 DR. REACH-IN FREEZER
- 3 MOBILE FOOD WARMER
- 4 MOBILE UTILITY CARTS
- 5 WORK TABLE 96"W X 30"D W/ (2) COMPARTMENT SINK
- 6 HAND SINKS
- 7 SLICER
- 8 MIXER ON MOBILE STAND
- 9 UNDER COUNTER DISHWASHER
- 10 DISH TABLE WITH SINK
- 11 (3) COMPARTMENT POT SINK
- 12 WALL MOUNTED HOSE REEL
- 13 REACH-IN REFRIGERATOR
- 14 WORK COUNTER 67"W X 30"D (ADJUSTABLE HEIGHT)
- 15 RESTAURANT RANGE
- 16 COMBI OVEN W/ STAND
- 17 PORTABLE INDUCTION RANGE
- 18 EXHAUST HOOD W/ FIRE SUPPRESSION
- 19 EXHAUST HOOD W/ FIRE SUPPRESSION
- 20 RANGES WITH COMBINATION COOK TOPS
- 21 WORK COUNTER W/ SINK (48"W X 30"D)
- 22 WORK COUNTER 36"W X 30"D
- 23 MOBILE STATION 36" X 30"D
- 24 EYE WASH STATION
- 25 UNDER SINK GREASE INTERCEPTOR FOLLOW PLUMBING DRAWINGS FOR ADDITIONAL INFO.

**REFLECTED CEILING PLAN** 1/4" = 1'-0" 02



**DRAWING KEY** NTS 07

**ROOM FINISH SCHEDULE**

ROOM NO.	ROOM NAME	FLOOR	BASE	CEILING/ CLG HT.	WALLS				REMARKS
					NORTH	EAST	SOUTH	WEST	
A110	CULINARY ARTS	RESIN.	RESIN.	APC- 9'-6" A.F.F.	*	*	*	*	* FOLLOW WALL FINISHES PLAN FOR LOCATION OF C.T. AND HPC WALL FINISHES ON SHEET A105.1
A110.1	STORAGE	RESIN.	RESIN.	APC- 9'-6" A.F.F.	HPC	HPC	HPC	HPC	

**KEY:**  
 HPC HIGH PERFORMANCE COATING  
 PTD CERAMIC TILE WALL (FOLLOW WALL TYPES) FOR LOCATION  
 C.T. CERAMIC TILE WALL- FOLLOW WALL TYPES FOR LOCATION

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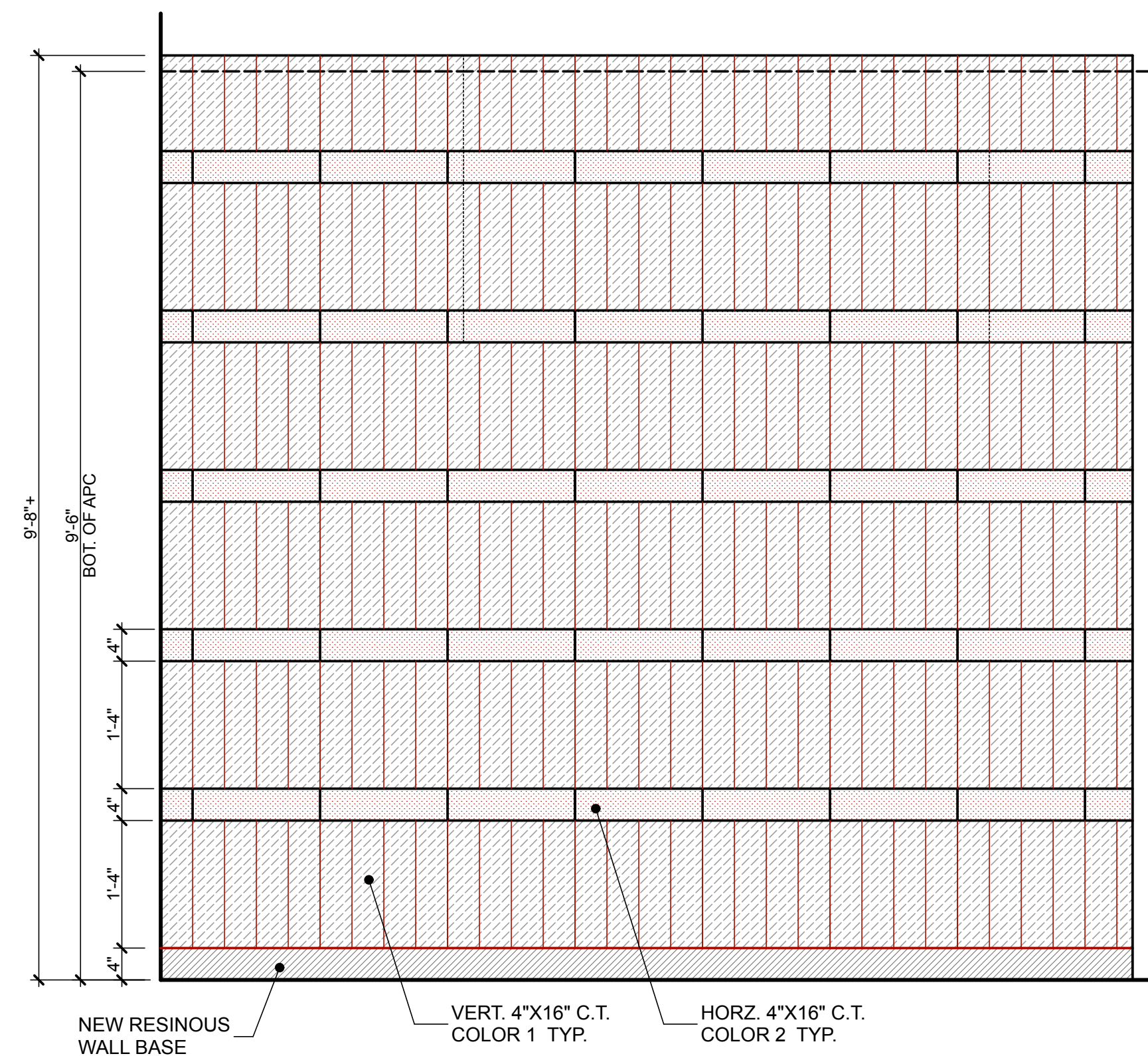
DRAWING DATE: **15 JAN 2024**

PRINT DATE: **2/23/24**

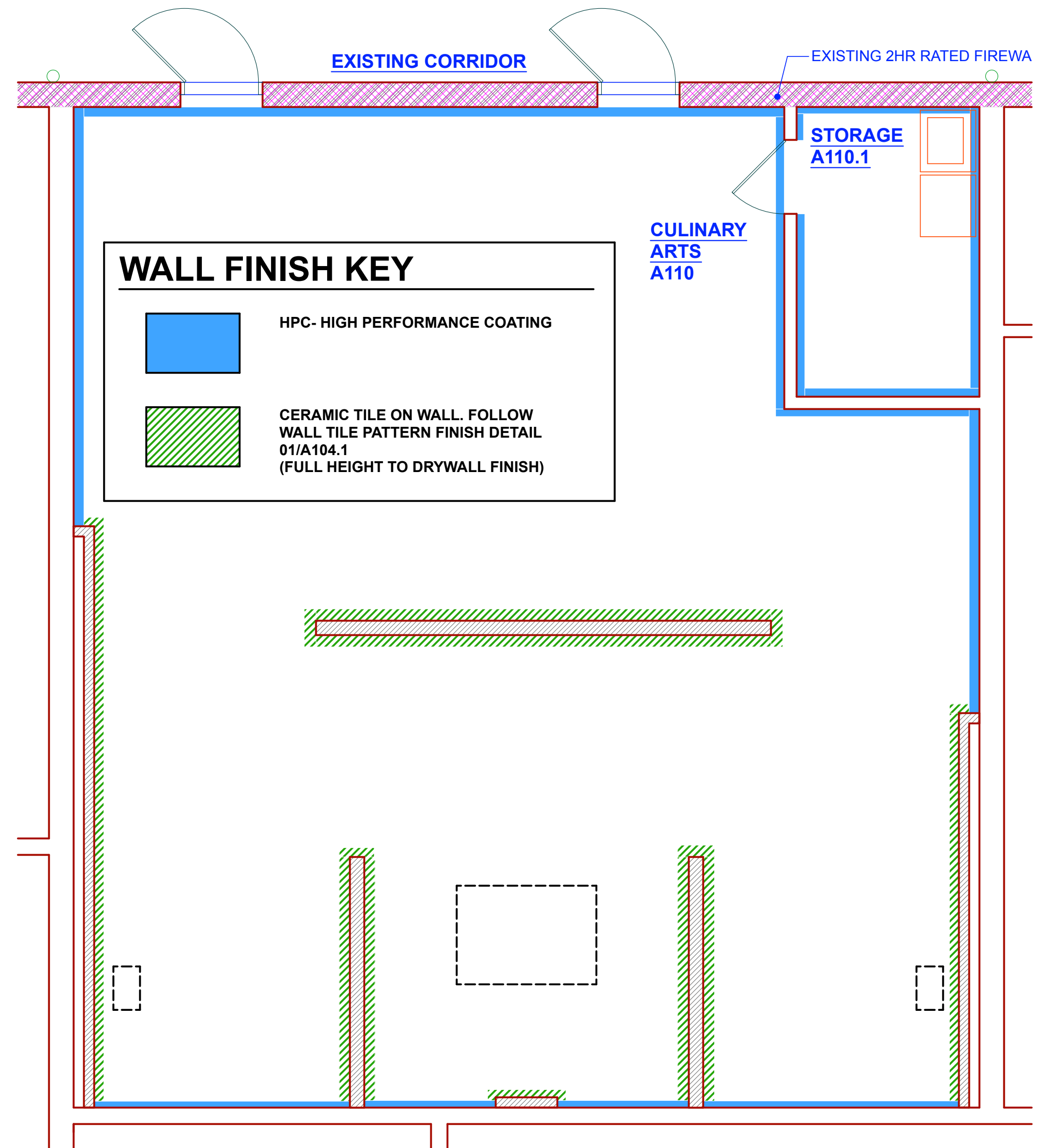
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SHEET TITLE: **NEW- WORK PLANS ROOM FINISH SCHEDULE**

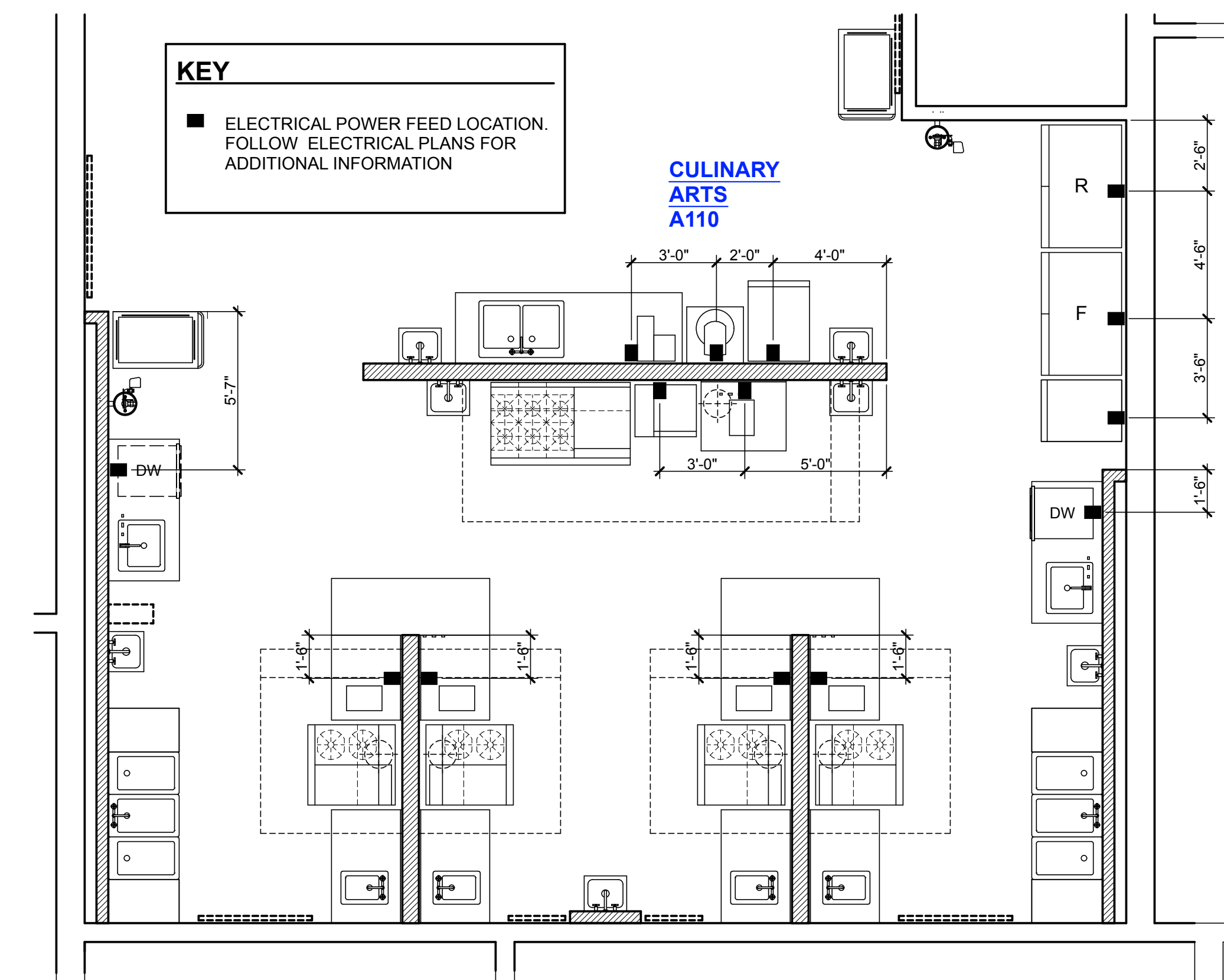
**A104**



**TYP. WALL TILE PATTERN** 3/4" = 1'-0" **01**



**WALL FINISH PLAN** 1/4" = 1'-0" **02**



**ELECTRICAL POWER FEED PLAN** 1/4" = 1'-0" **03**

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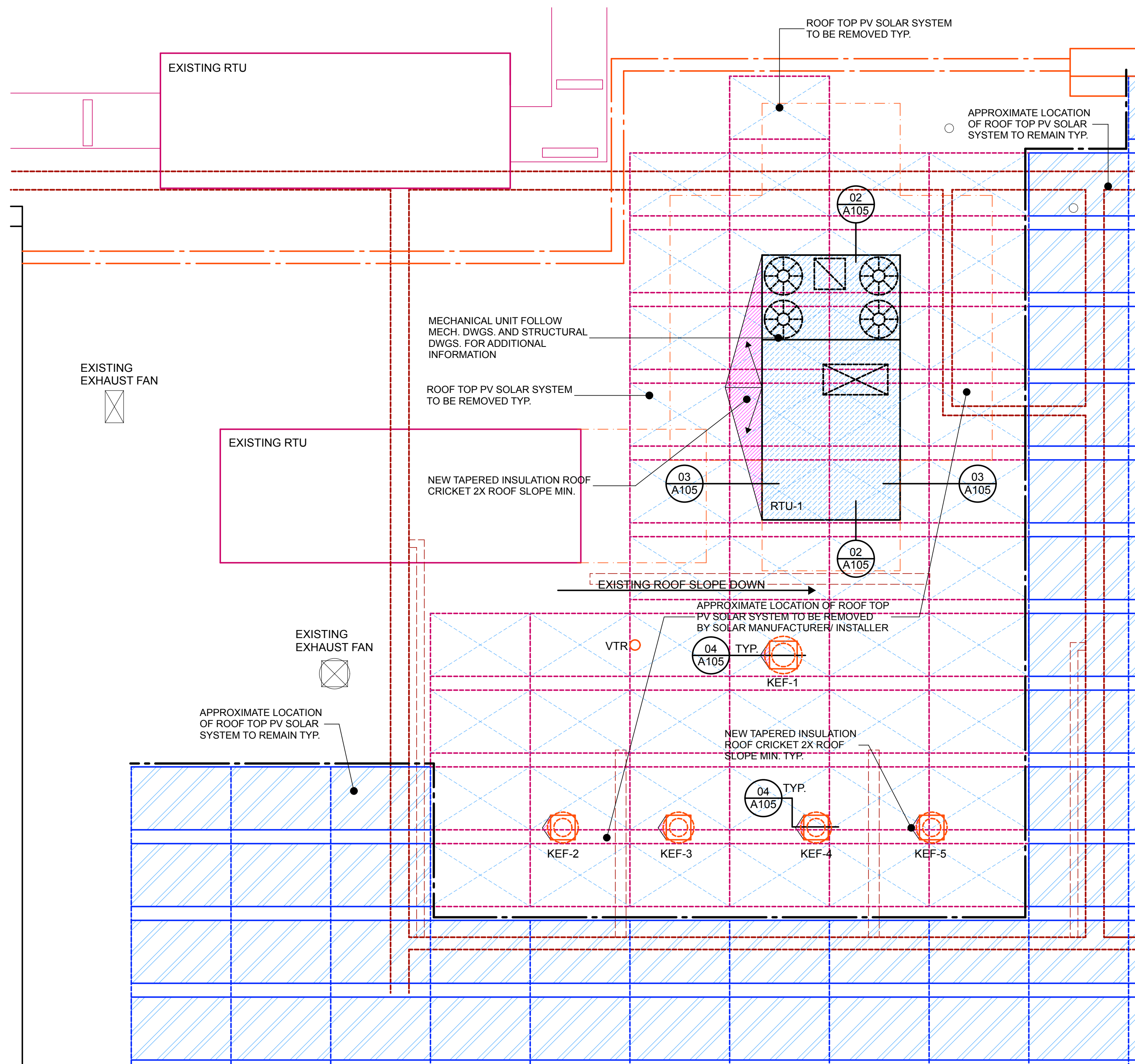
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PRINT DATE:	<b>2/23/24</b>
DRAWN BY:	<b>RR</b>
SHEET TITLE:	<b>MISC. PLANS</b>

PROJECT NO.:	<b>5713G</b>
REVISION DATE:	
<b>1</b>	<b>ADD #1 23 FEB 24</b>
DRAWING DATE:	<b>15 JAN 2024</b>
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SHEET TITLE:	<b>MISC. PLANS</b>

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DRAWN BY:	<b>RR</b>
SHEET TITLE:	<b>MISC. PLANS</b>

**A104.1**



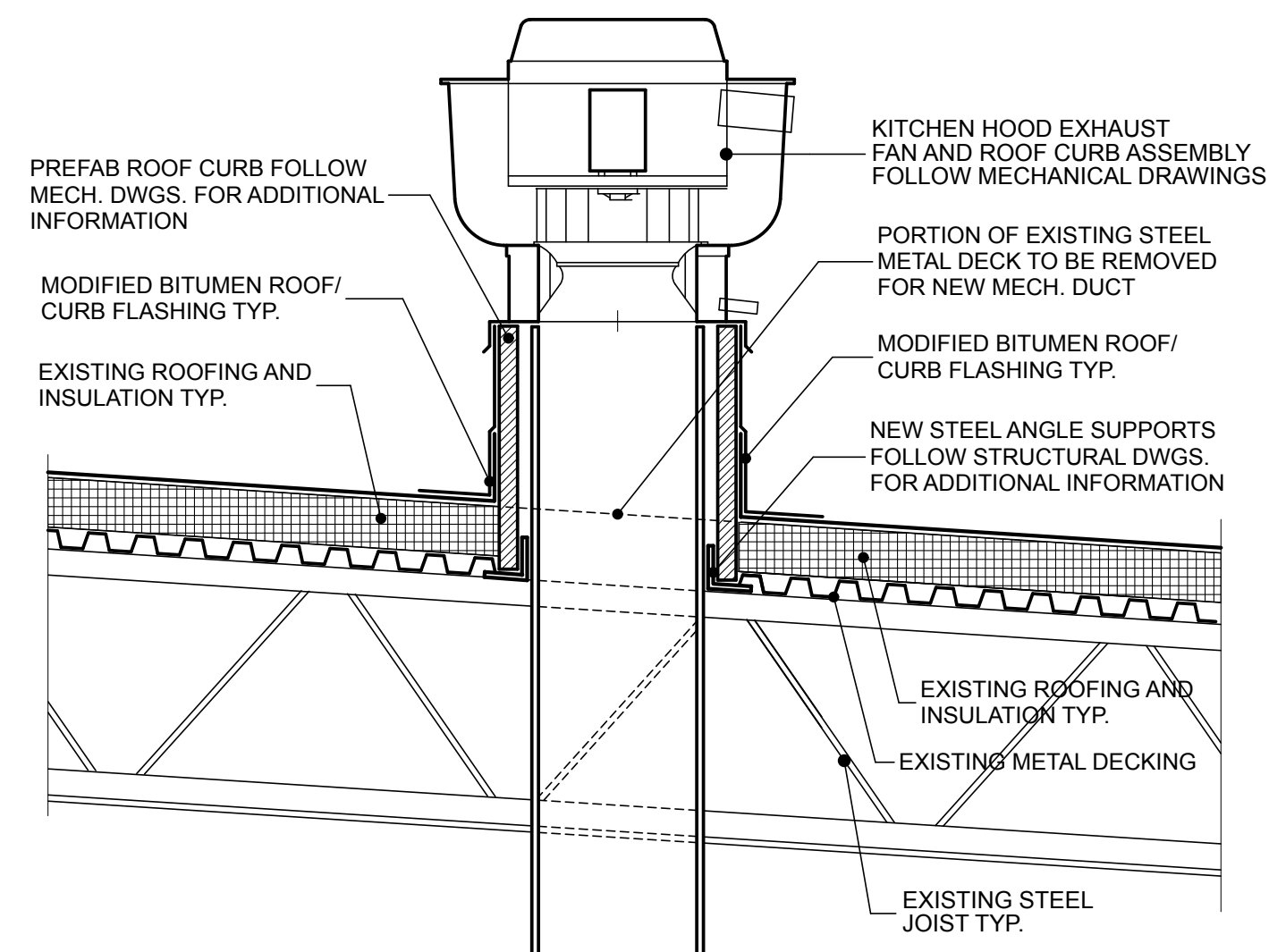
**ROOF PLAN** 1/4" = 1'-0" **01**

**GENERAL ROOF NOTES:**

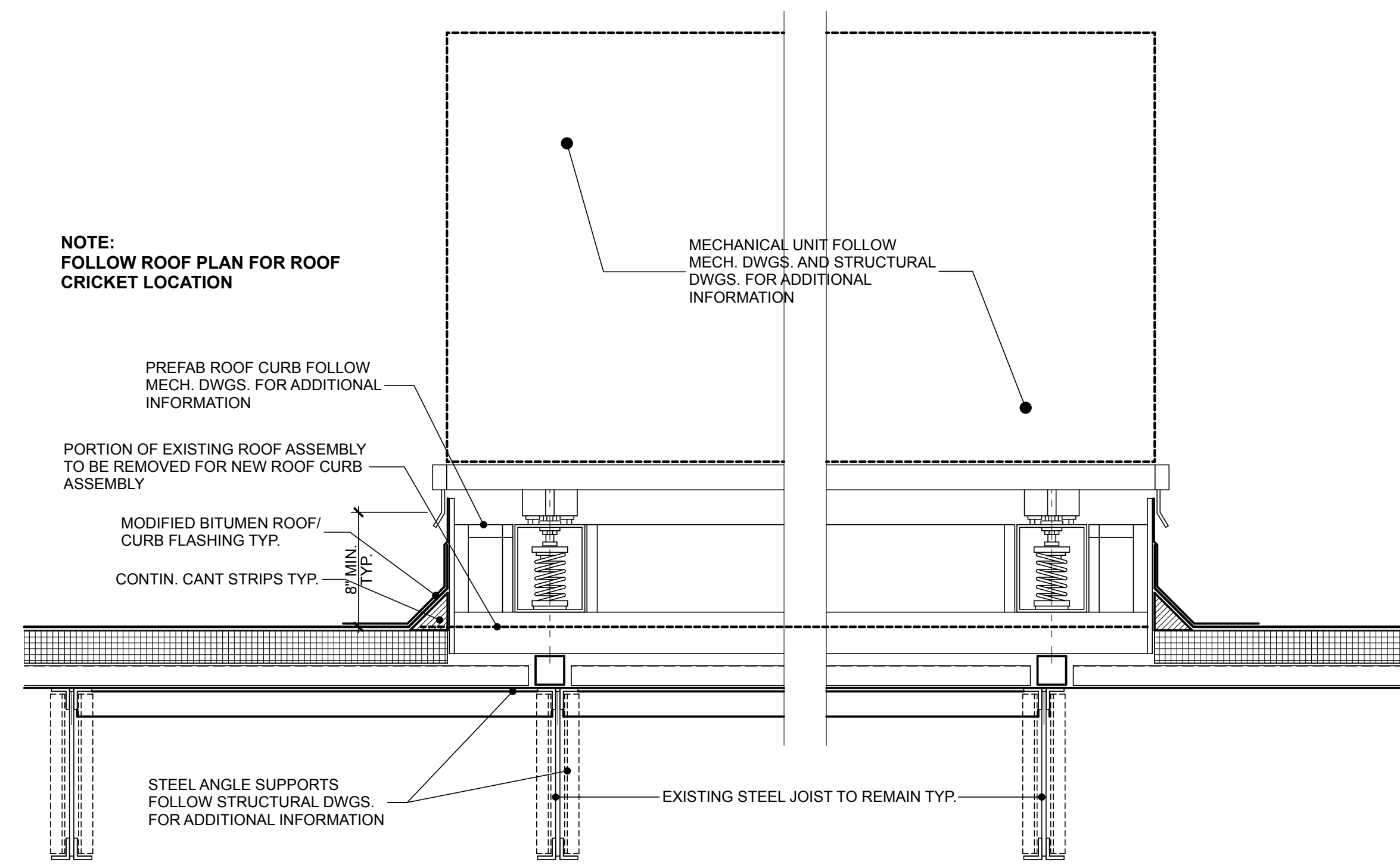
- GC TO FOLLOW SPEC SECTION 075000.13 FOR ADDITIONAL INFORMATION
- GC TO KEEP WEATHERPROOF INTEGRITY. CUTTING AND PATCHING OF MEMBRANE ROOFING FOR NEW CURBS AND OTHER ROOF PENETRATIONS SHALL MAINTAIN THE WEATHER INTEGRITY OF THE EXISTING ROOFS AND SHALL NOT PERMIT CONCEALED OR VISIBLE LEAKS INTO THE BUILDING INTERIOR. COMPLY WITH THE CURRENT PUBLISHED REQUIREMENTS OF THE OEM FOR ROOF PENETRATIONS OF THE TYPE NECESSARY FOR THE WORK
- EXISTING ROOFING SYSTEM IS A 4-PLY PREMIUM PLY (G) ASPHALT BUILT-UP ROOF SYSTEM WITH GRAVEL SURFACE AS MANUFACTURED BY W.P. HICKMAN SYSTEMS, INC.
- ALL PATCHING MATERIALS MUST BE COMPATIBLE WITH EXISTING ROOFING SYSTEM.
- FOLLOW ROOF PLAN FOR NEW ROOF CRICKET FOR POSITIVE ROOF DRAINAGE AROUND NEW RTU AND NEW EXHAUST FANS.

**GENERAL PV NOTES:**

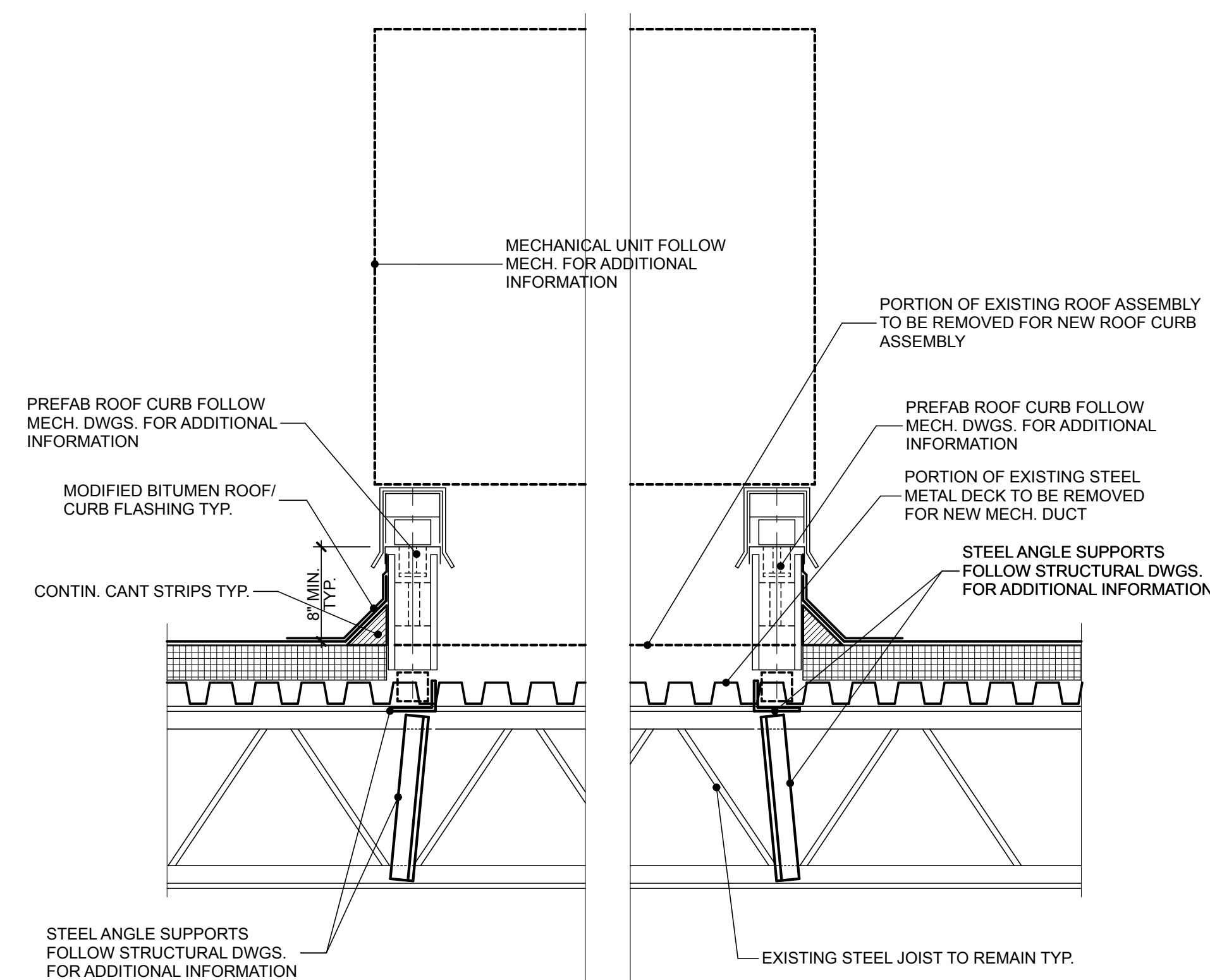
- EXISTING PV AND SUPPORT RAILS TO BE REMOVED BY DISTRICT'S SOLAR VENDOR PRIOR TO START OF PROJECT
- EXISTING PV AND SUPPORT RAILS TO REMAIN. VERIFY IN FIELD.



**ROOF CURB DETAIL** 3/4" = 1'-0" **04**



**ROOF CURB DETAIL** 3/4" = 1'-0" **02**



**ROOF CURB DETAIL** 3/4" = 1'-0" **03**

REGAN YOUNG, AIA  
21A100912100

**REGAN YOUNG ENGLAND BUTERA**  
REFERENDUMS • ENGINEERING • ARCHITECTURE • DESIGN

456 HIGH STREET • MT. HOLLY, NEW JERSEY 08060 USA  
+1(609)265-2652 • 0333FAX • 21A100912100 • RYEBREAD.COM

**NJDOE SP #07-2670-005-21-1000**

PROJECT TITLE:  
**CULINARY ARTS  
CLASSROOM ALTERATION**

ADDRESS:  
**LINDENWOLD HIGH SCHOOL  
BLOCK 244, LOT 3  
801 EGG HARBOR ROAD  
LINDENWOLD, NJ 08021**

PROJECT NO.: **5713G**

REVISION DATE:  
**1** **ADD #1** **23 FEB 24**

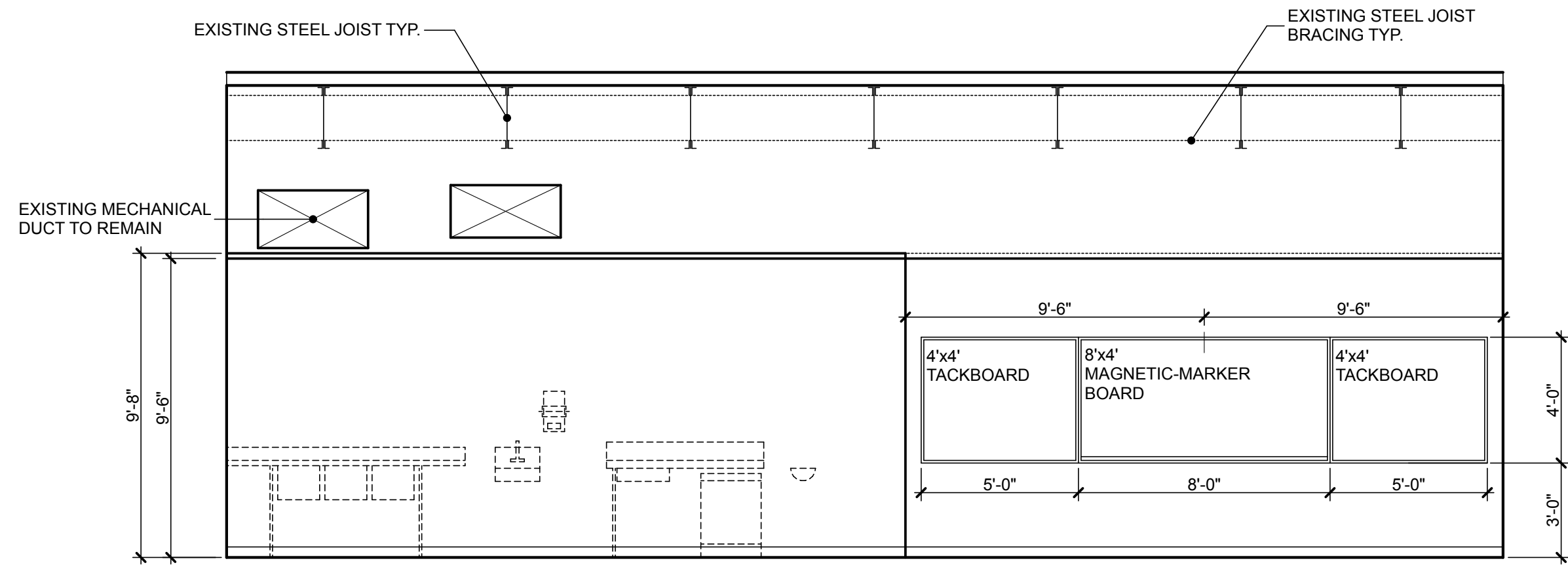
DRAWING DATE: **15 JAN 2024**

PRINT DATE: **2/23/24**

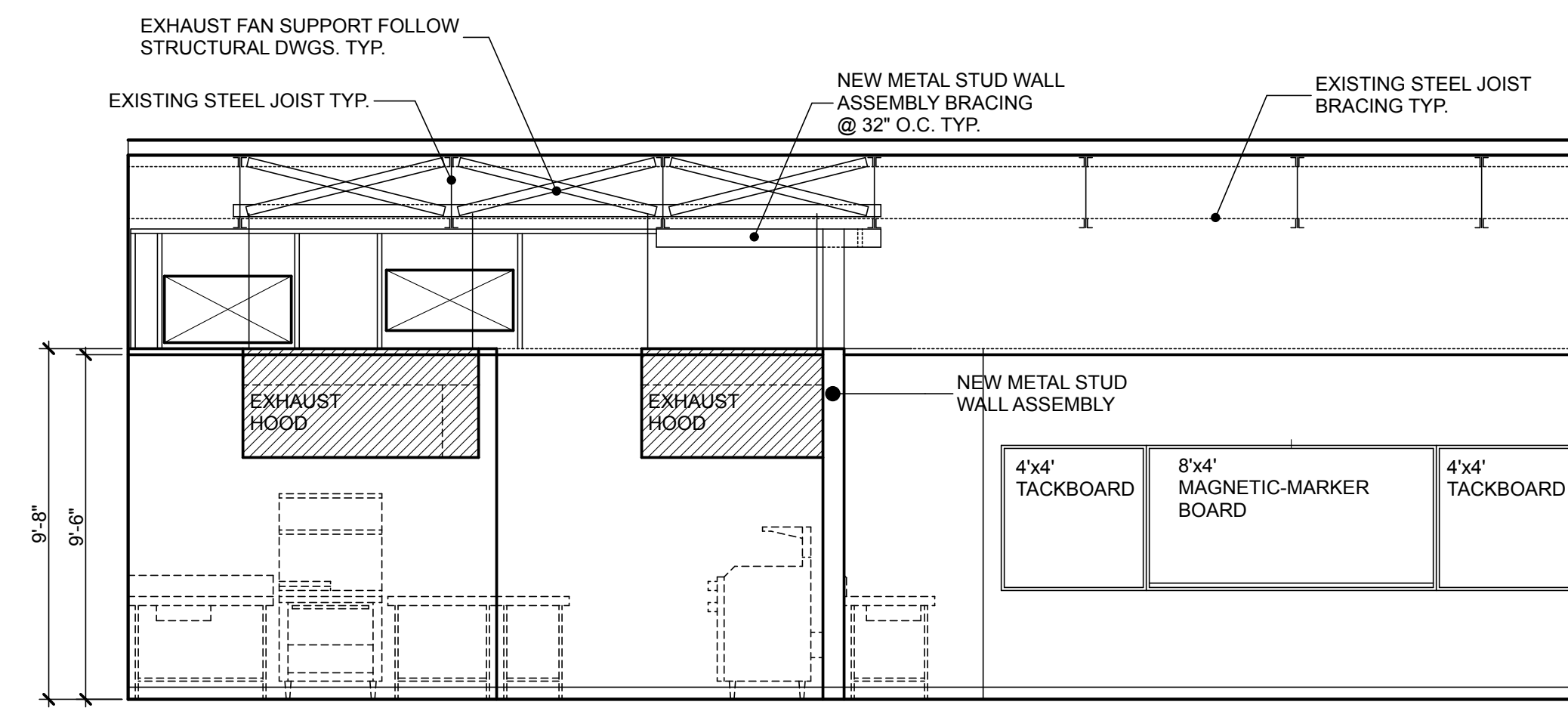
DRAWN BY: **RR**

SHEET TITLE: **ROOF PLAN AND  
DETAILS**

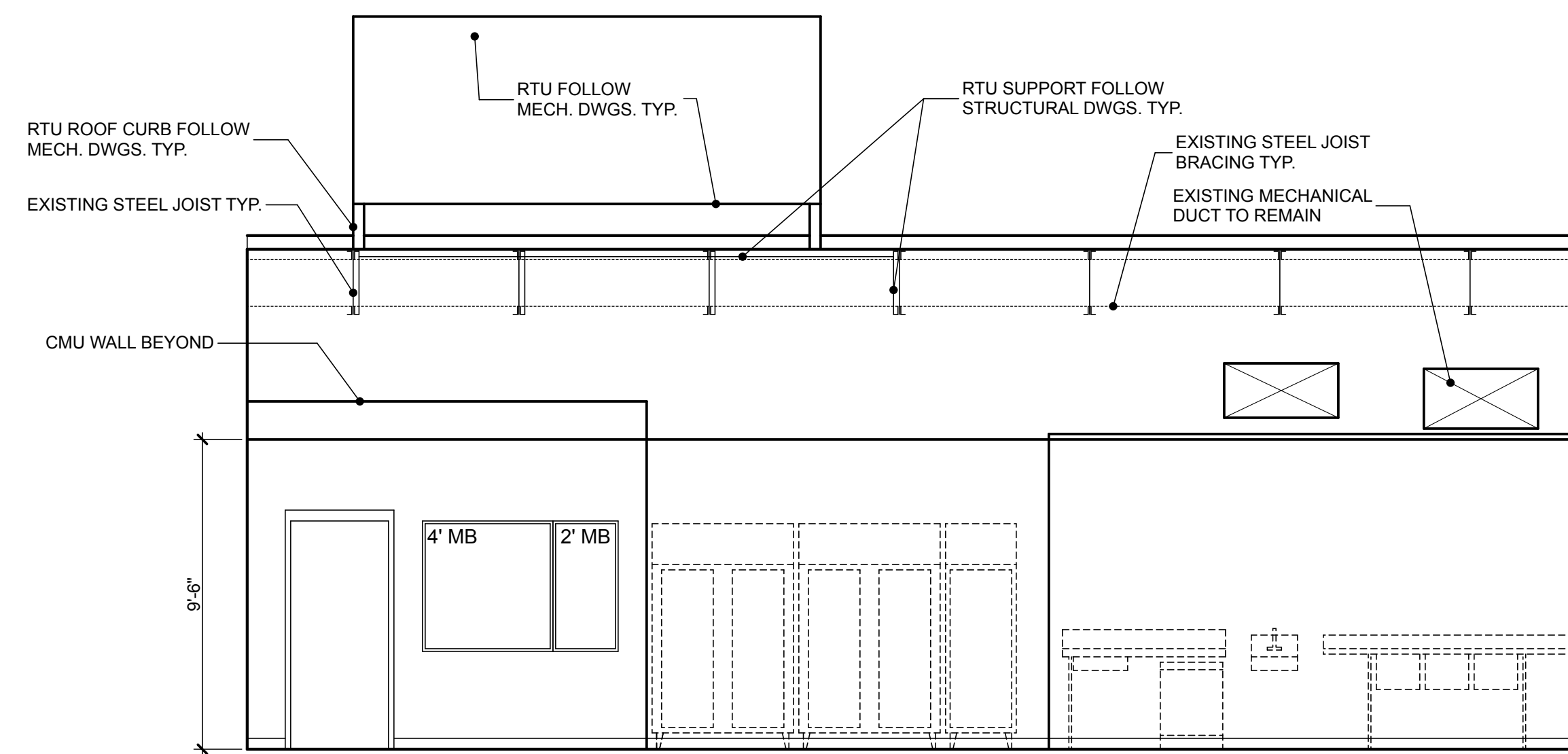
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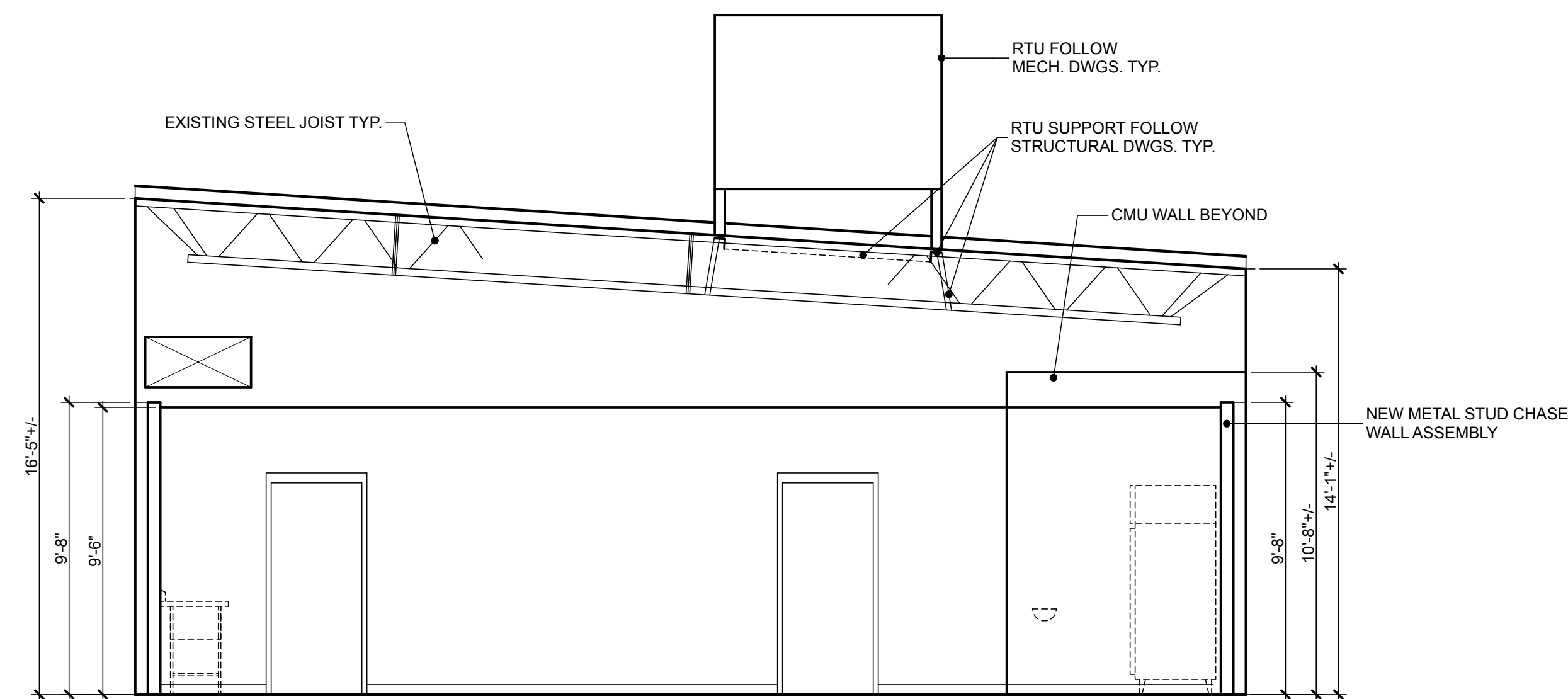
**INTERIOR ELEVATION** 1/4" = 1'-0" **A**



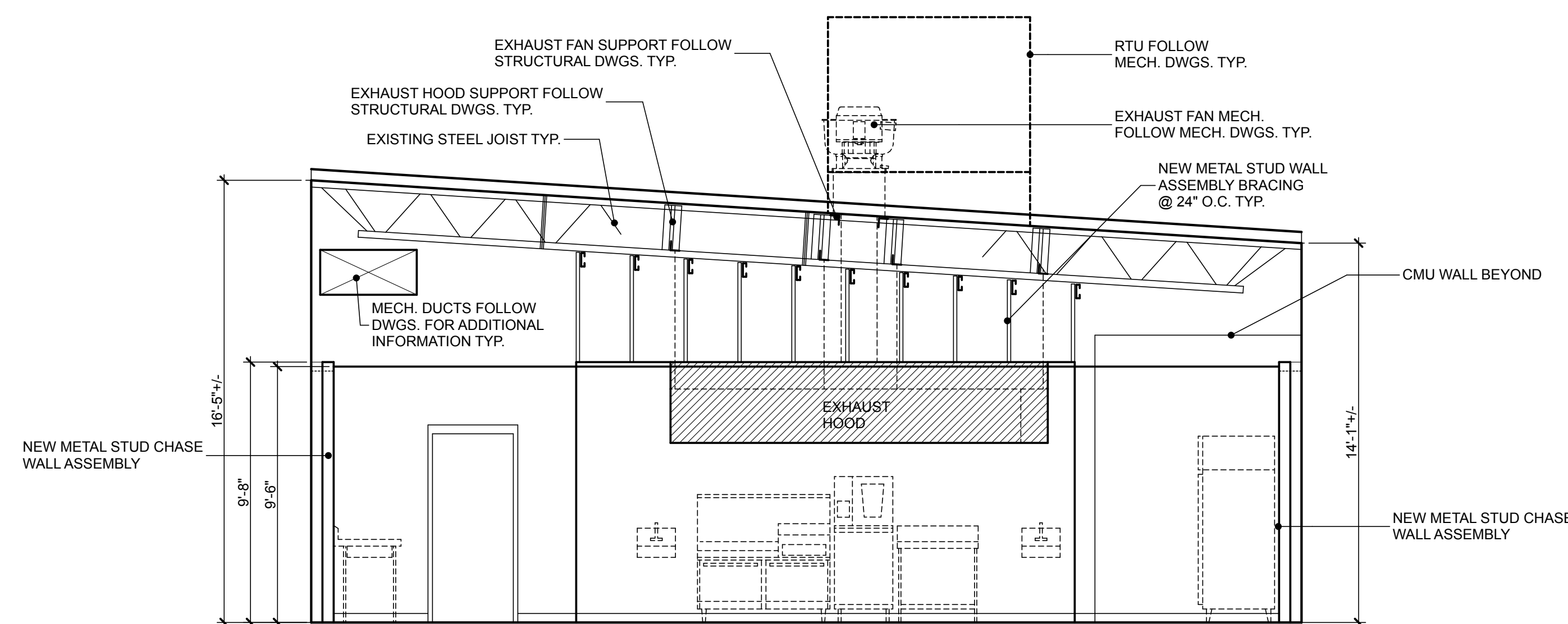
**INTERIOR ELEVATION** 1/4" = 1'-0" **B**



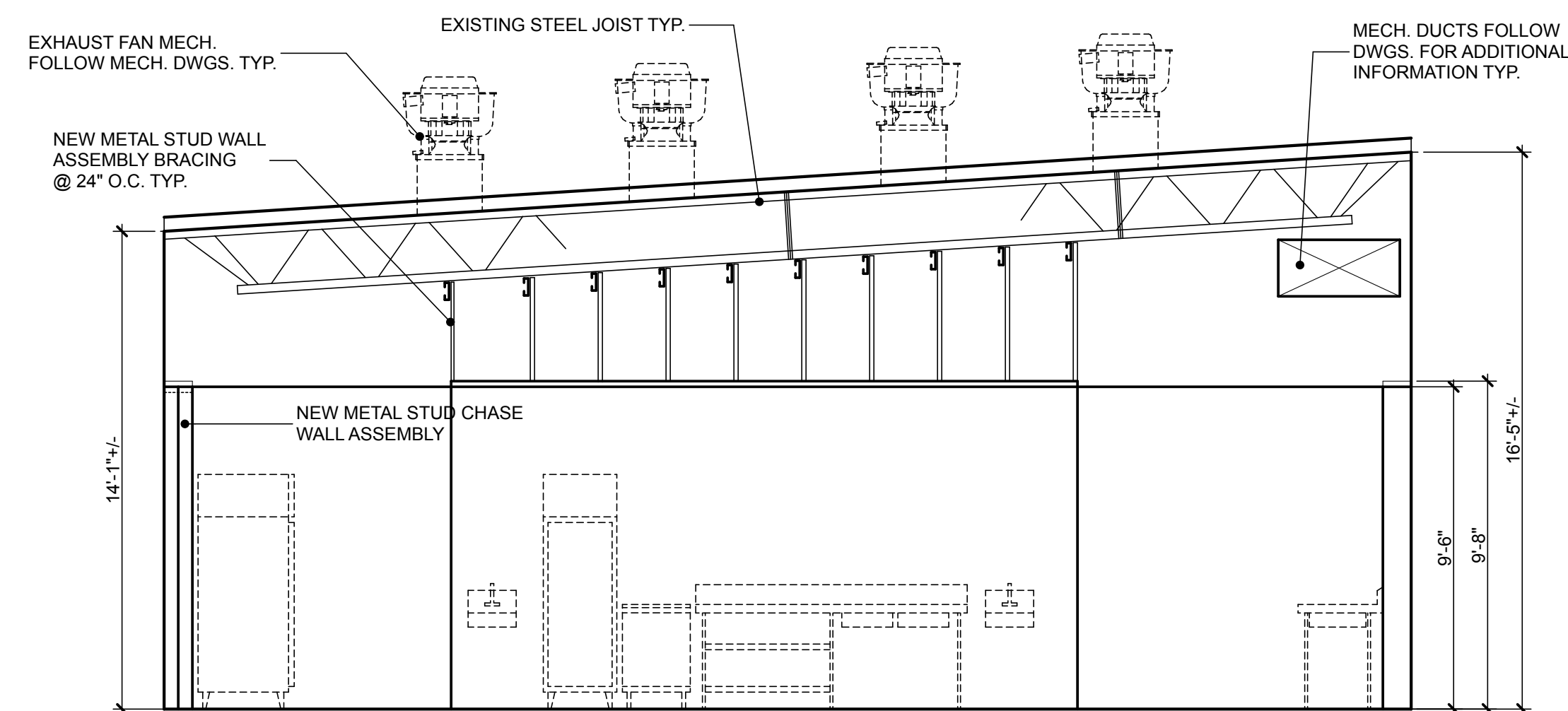
**INTERIOR ELEVATION** 1/4" = 1'-0" **C**



**INTERIOR ELEVATION** 1/4" = 1'-0" **D**



**INTERIOR ELEVATION** 1/4" = 1'-0" **E**



**INTERIOR ELEVATION** 1/4" = 1'-0" **F**

REGAN YOUNG, AIA  
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**NJDOE SP #07-2670-005-21-1000**

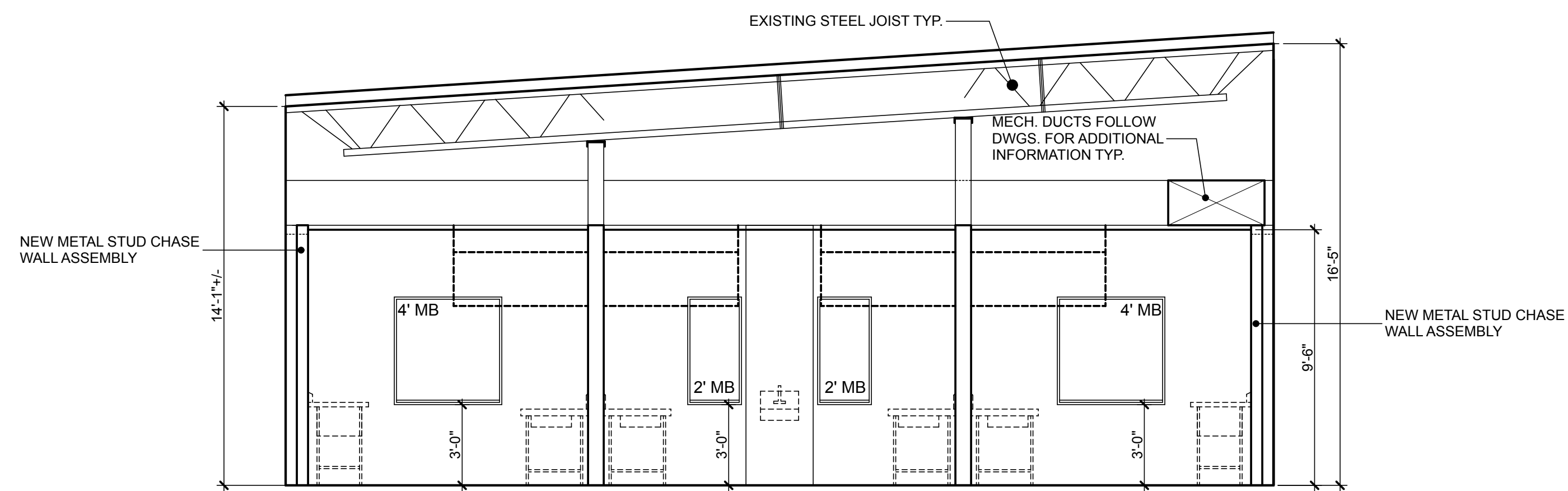
PROJECT TITLE:  
**CULINARY ARTS CLASSROOM ALTERATION**  
ADDRESS:  
**LINDENWOLD HIGH SCHOOL  
BLOCK 244, LOT 3  
801 EGG HARBOR ROAD  
LINDENWOLD, NJ 08021**

PROJECT NO.: **5713G**

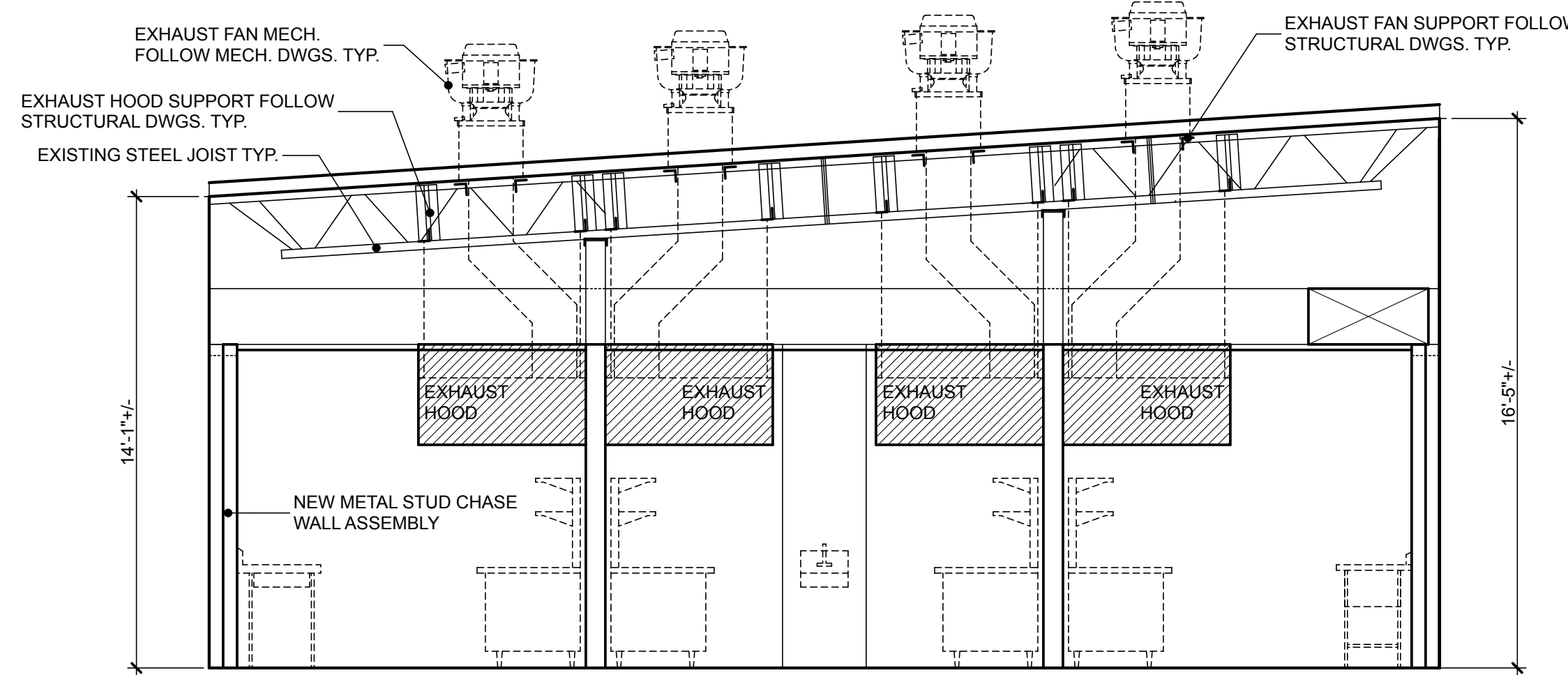
REVISION DATE:	
1	ADD #1 23 FEB 24

DRAWING DATE:	15 JAN 2024
PRINT DATE:	2/23/24
DRAWN BY:	RR
SHEET TITLE:	<b>INTERIOR ELEVATIONS</b>

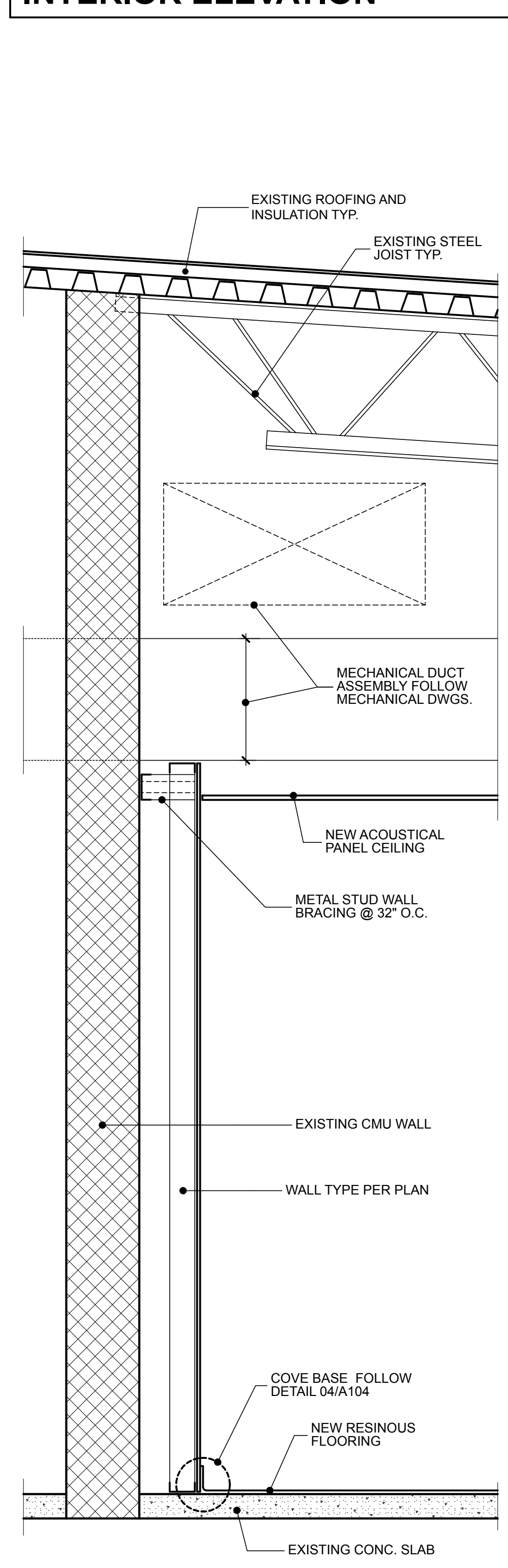
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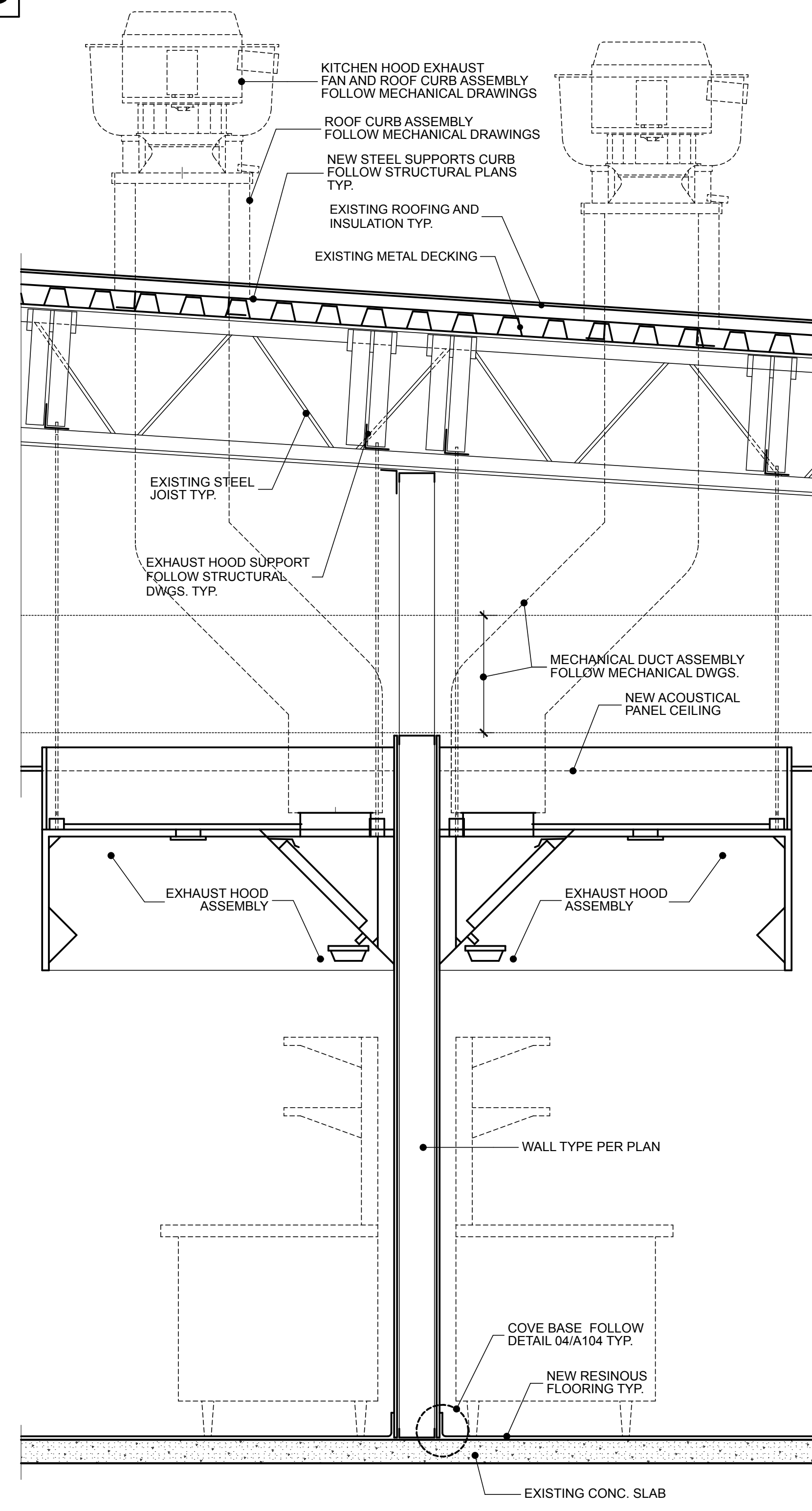
**INTERIOR ELEVATION** 1/4" = 1'-0" **G**



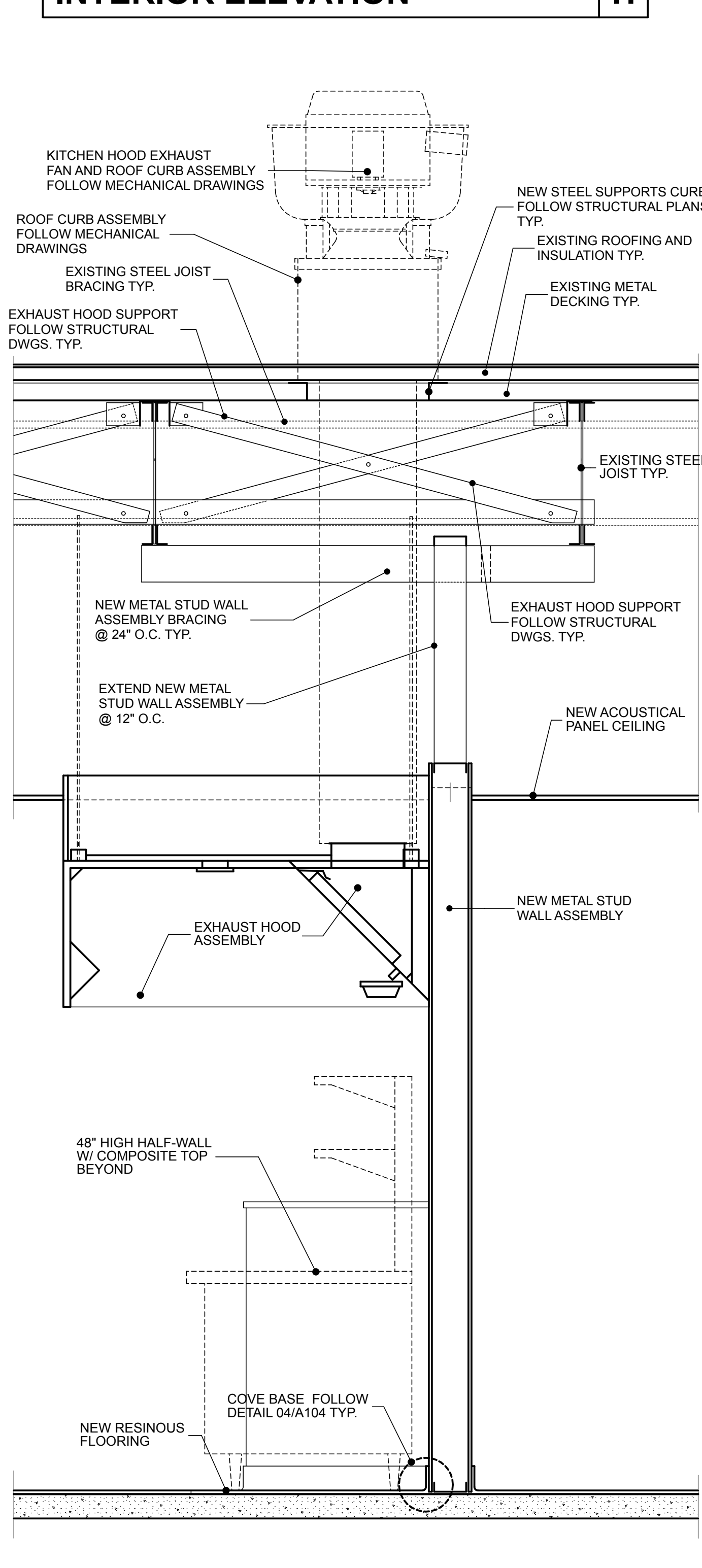
**INTERIOR ELEVATION** 1/4" = 1'-0" **H**



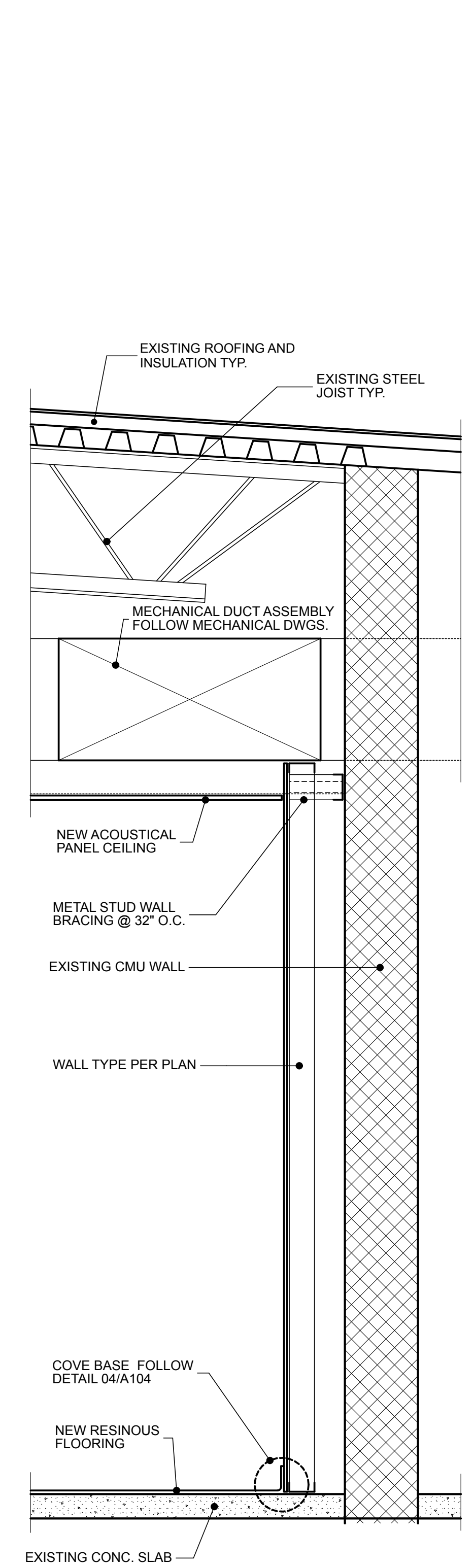
**SECTION DETAIL** 3/4" = 1'-0" **01**



**SECTION DETAIL** 3/4" = 1'-0" **02**



**SECTION DETAIL** 3/4" = 1'-0" **03**



**SECTION DETAIL** 3/4" = 1'-0" **04**

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**NJDOE SP #07-2670-005-21-1000**

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DRAWING DATE:	<b>15 JAN 2024</b>
PRINT DATE:	<b>2/23/24</b>
DRAWN BY:	<b>RR</b>
SHEET TITLE:	<b>INTERIOR ELEV. SECTION DETAILS</b>

**A107**

# GENERAL NOTES

## GENERAL NOTES

- BUILDING CODE - 2018 INTERNATIONAL BUILDING CODE - NJ EDITION
- 30 P.S.F GROUND SNOW
- WIND - 115 MPH EXPOSURE B, I=1.0
- SEISMIC - SDS=0.32 USE GROUP 1 DESIGN CAT B SD1=0.08 SITE CLASS D
- USE PROPERLY DESIGNED SHORING, BRACING, UNDERPINNING, ETC. AS NECESSITATED BY CONDITIONS OR AS REQUIRED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE TO ENSURE THE SAFETY OF THE BUILDING AND ITS COMPONENT PARTS DURING ERECTION.
- NO FIELD REVISIONS TO ANY STRUCTURAL COMPONENTS SHALL BE MADE WITHOUT PRIOR APPROVAL BY THE ARCHITECT/ENGINEER. THIS INCLUDES (BUT IS NOT LIMITED TO) REVISIONS DUE TO MISLOCATION, MISFIT OR ANY OTHER CONSTRUCTION ERROR.
- BRACE ALL WALLS DURING CONSTRUCTION TO PREVENT DAMAGE FROM WIND, WATER, EARTH PRESSURE AND CONSTRUCTION LOADS UNTIL ALL SUPPORTING ELEMENTS ARE IN PLACE AND ARE OF SUFFICIENT STRENGTH.
- NO OPENINGS SHALL BE PLACED IN ANY STRUCTURAL MEMBER (OTHER THAN AS INDICATED ON APPROVED SHOP DRAWINGS) UNTIL THE LOCATION HAS BEEN APPROVED BY THE ARCHITECT/ENGINEER.
- PROVIDE SLEEVE LAYOUTS FOR ALL PIPES AND ELECTRICAL PENETRATIONS THROUGH STRUCTURAL MEMBERS (ALL TRADES ARE INCLUDED). LAYOUTS ARE TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL, PRIOR TO CONSTRUCTION.
- STRUCTURAL DRAWINGS ARE TO BE COORDINATED AND USED IN CONJUNCTION WITH THE ARCHITECTURAL, MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS. SEE MECHANICAL DRAWINGS FOR EQUIPMENT PADS, BASES, SUPPORTS AND DUCT PENETRATIONS.
- SUPPORT AIR CONDITIONING UNITS, COMPRESSORS, HOODS AND OTHER ROOF MOUNTED OR SUSPENDED EQUIPMENT ONLY ON JOISTS, TRUSSES OR BEAMS DESIGNATED FOR THAT PURPOSE. IF NO SUPPORT HAS BEEN DESIGNED (OR IF QUESTION ARISES) NOTIFY THE ARCHITECT/ENGINEER PRIOR TO THE ERECTION OF EQUIPMENT AND BEFORE STRUCTURAL ERECTION IS COMPLETE.
- ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE GOVERNING CODE AND ALL OTHER APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS.
- WORK NOT INDICATED ON A PART OF THE DRAWINGS BUT REASONABLY IMPLIED TO BE SIMILAR TO THAT SHOWN AT CORRESPONDING PLACES, SHALL BE REPEATED.
- CONTRACTOR SHALL VERIFY AND/OR ESTABLISH ALL EXISTING CONDITIONS AND DIMENSIONS AT THE SITE.
- IF THE EXISTING FIELD CONDITIONS DO NOT PERMIT THE INSTALLATION OF THE WORK IN ACCORDANCE WITH THE DETAILS SHOWN, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER IMMEDIATELY AND PROVIDE A SKETCH OF THE CONDITION WITH HIS PROPOSED MODIFICATION OF THE DETAILS GIVEN ON THE CONTRACT DOCUMENTS.
- CONTRACTOR SHALL PROVIDE FOR DEWATERING AS REQUIRED DURING EXCAVATION AND CONSTRUCTION.
- WHERE ALTERATIONS INVOLVE THE EXISTING SUPPORTING STRUCTURE, THE CONTRACTOR SHALL PROVIDE SHORING AND PROTECTION REQUIRED TO INSURE THE STRUCTURAL INTEGRITY OF THE EXISTING STRUCTURE.
- BRACING, SHEETING, SHORING, ETC. REQUIRED TO SUPPORT UTILITIES, STRUCTURE, ETC. SHALL BE DESIGNED BY A NJ LICENSED ENGINEER ENGAGED BY THE CONTRACTOR; DETAILED SHOP DRAWINGS SHALL BE PREPARED INDICATING ALL WORK TO BE PERFORMED.
- IN NO CASE SHALL HEAVY EQUIPMENT BE PERMITTED CLOSER THAN 8 FEET FROM ANY PILE SUPPORTED STRUCTURE. IF THIS OCCURS, THE CONTRACTOR SHALL BE THE SOLELY RESPONSIBLE AND, AT HIS OWN EXPENSE, PROVIDE ADEQUATE SUPPORTS OR BRACE THE PILE SUPPORTED STRUCTURE TO WITHSTAND THE ADDITIONAL LOADS IMPOSED.
- NO BLASTING SHALL BE PERMITTED.
- SPECIAL INSPECTION IS REQUIRED OF ALL STRUCTURAL CONSTRUCTION. THE CONTRACTOR SHALL EMPLOY A QUALIFIED TESTING/INSPECTING AGENCY THAT SHALL PROVIDE PERIODIC REPORTS TO ARCHITECT/ENGINEER DURING CONSTRUCTION. SUBMIT FINAL INSPECTION REPORT SUMMARY FOR EACH DIVISION OF WORK, CERTIFIED BY A NJ LICENSED PROFESSIONAL ENGINEER THAT SPECIAL INSPECTIONS WERE PERFORMED AND THAT WORK WAS PERFORMED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
- THE NOTES ON THESE DRAWINGS DO NOT REPLACE THE SPECIFICATIONS. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS. SHOULD A CONFLICT ARISE BETWEEN THESE NOTES AND SPECIFICATIONS, WRITTEN CLARIFICATIONS SHOULD BE REQUESTED BY THE CONTRACTOR TO THE ARCHITECT/ENGINEER. INCONSISTENCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER PRIOR TO PROCEEDING WITH THE WORK.
- IF DURING THE PROGRESS OF THE WORK, THE CONTRACTOR MAY DISCOVER ANY INCONSISTENCY IN THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL REPORT THIS INCONSISTENCY TO THE ARCHITECT/ENGINEER. EXTRAS WILL NOT BE PERMITTED FOR CORRECTION OF DISCREPANCIES THAT COULD HAVE BEEN AVOIDED BY CAREFUL REVIEW AND THE MINOR ADJUSTMENT OF SIZE AND/OR LOCATION OF VARIOUS ITEMS.
- SHOULD THE CONTRACTOR SEEK APPROVAL OF A PRODUCT OTHER THAN SHOWN OR WITHIN THE SPECIFICATIONS, THE CONTRACTOR SHALL FURNISH WRITTEN EVIDENCE THAT THE PROPOSED PRODUCT CONFORMS IN ALL RESPECTS TO THE SPECIFIED PRODUCT.
- THE ARCHITECT/ENGINEER ARE NOT AND SHALL NOT BE HELD LIABLE FOR SITE SAFETY ISSUES, THESE ARE THE RESPONSIBILITY OF THE CONTRACTOR AND THEIR SUBCONTRACTORS.

## STRUCTURAL STEEL:

- STEEL SHALL CONFORM TO THE FOLLOWING GRADES:
 

ALL WF CHANNELS, ANGLES, PLATES, ETC. (UNO)	A992 (Fy=50 KSI)
STRUCTURAL TUBE	A36 (Fy=36 KSI)
STEEL PIPE	A500 (Fy=46 KSI)
ANCHOR BOLTS	A33 (Fy=35 KSI)
BOLTS	A307
WELDING ELECTRODES	A325 E70XX
- ALL STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE AISI CODE OF STANDARD PRACTICE (1988), EXCEPT AS MODIFIED IN THESE NOTES AND THE PROJECT SPECIFICATIONS.
- THE STEEL STRUCTURE IS A NON-Self-SUPPORTING STEEL FRAME AND IS DEPENDENT UPON DIAPHRAGM ACTION OF THE METAL ROOF DECK AND ATTACHMENT TO THE MASONRY WALLS FOR STABILITY AND FOR RESISTANCE TO WIND AND SEISMIC FORCES. PROVIDE ALL TEMPORARY SUPPORTS REQUIRED FOR STABILITY AND FOR RESISTANCE TO WIND AND SEISMIC FORCES UNTIL THESE ELEMENTS ARE COMPLETE AND ARE CAPABLE OF PROVIDING THIS SUPPORT.
- THE FABRICATOR IS RESPONSIBLE FOR THE DESIGN OF ALL CONNECTIONS. CONNECTIONS SHOWN ON THE STRUCTURAL DRAWINGS ARE SCHEMATIC AND ARE ONLY INTENDED TO SHOW THE RELATIONSHIP OF MEMBERS CONNECTED. CONNECTION DETAILS INDICATED ON THE DRAWINGS SHALL BE INCORPORATED INTO FABRICATOR'S CONNECTION DESIGN. SEE SPECIFICATIONS. ALL SHOP DRAWINGS SHALL BE SIGNED AND SEALED BY THE FABRICATOR'S ENGINEER WITH THE ENGINEER'S SEAL FOR THE STATE WHERE THE STRUCTURE IS LOCATED. ENGINEER'S SEAL MAY BE QUALIFIED FOR DESIGN OF CONNECTIONS ONLY.
- SPLICING OF STEEL MEMBERS, UNLESS SHOWN ON THE DRAWINGS, IS PROHIBITED WITHOUT WRITTEN APPROVAL OF THE ARCHITECT/ENGINEER.
- UNLESS NOTED OTHERWISE, BEAMS SHALL BEAR 8" MINIMUM ON CONCRETE OR MASONRY. UNLESS NOTED OTHERWISE, ANCHOR BEAMS TO MASONRY WITH TWO (2) 3/4" DIAMETER ANCHOR BOLTS WITH 4" HOOK AND 1'-4" EMBEDMENT.
- STRUCTURAL STEEL WORK SHALL BE SUBJECT TO QUALITY ASSURANCE TESTING AND INSPECTIONS. SEE QUALITY ASSURANCE GENERAL NOTES AND PROJECT SPECIFICATIONS.

- BOLTED CONNECTIONS SHALL USE A MINIMUM OF (2) 3/4 INCH DIAMETER HSB UNLESS NOTED OTHERWISE.
- WELDING SHALL BE PERFORMED WITH E70XX ELECTRODES. ALL WELDING SHALL BE PERFORMED BY QUALIFIED WELDERS AND SHALL CONFORM TO THE AWS D1.1 STRUCTURAL WELDING CODE.
- AFTER FABRICATIONS, ALL STEEL SHALL BE CLEANED OF ALL RUST, LOOSE MILL SCALE AND OTHER FOREIGN MATERIALS PRIOR TO THE APPLICATION OF TWO COATS OF SHOP PRIMER.
- STEEL ANGLES AND PLATES ALONG WITH BOLTS AND WASHERS, IN DIRECT AND PERMANENT CONTACT WITH EXTERIOR FINISH MASONRY, AND ALL EXPOSED STRUCTURAL STEEL, SHALL BE HOT-DIPPED GALVANIZED.
- STEEL BEAMS AND COLUMNS ADJACENT TO MASONRY SHALL HAVE ADJUSTABLE MASONRY TIES.
- STEEL SURFACES WITHIN 4 INCHES OF FIELD WELDS SHALL BE CLEANED AND GROUND SMOOTH. AFTER WELDING COAT SURFACE WITH PRIMER/PAINT.
- FULL DEPTH DOUBLE ANGLE END CONNECTIONS ARE TO BE USED ON ALL GIRDER AND BEAM CONNECTIONS.
- PROVIDE A MINIMUM OF 3/8 INCH THICK FULL DEPTH THRU-PLATE FOR ALL PIPE AND TUBE COLUMN CONNECTIONS.
- ALL CONNECTIONS SHALL BE DESIGNED FOR THE GREATER OF THE REACTIONS GIVEN ON THE FRAMING PLANS OR 1/2 THE AISI UNIFORM LOAD CAPACITY OF THE BEAM UNLESS A MORE STRINGENT CRITERIA IS GIVEN ON THE CONTRACT DOCUMENTS.
- ALL STEEL TO OTHER METAL CONNECTIONS ARE TO BE TREATED OR PROPERLY SEPARATED TO PREVENT GALVANIC AND CORROSIVE EFFECTS.
- FABRICATE BEAMS WITH THE NATURAL CAMBER UP.
- ALL STEEL NOT RECEIVING FIREPROOFING SHALL BE PAINTED WITH THE FABRICATOR'S RUST INHIBITIVE PRIMER. OMIT PAINT AT SLIP CRITICAL CONNECTIONS.
- NON-SHRINK GROUT FOR COLUMN BASE PLATES SHALL BE PREMIXED, NONMETALLIC GROUT COMPLYING WITH ASTM C-1107.
- ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED.

## MISCELLANEOUS:

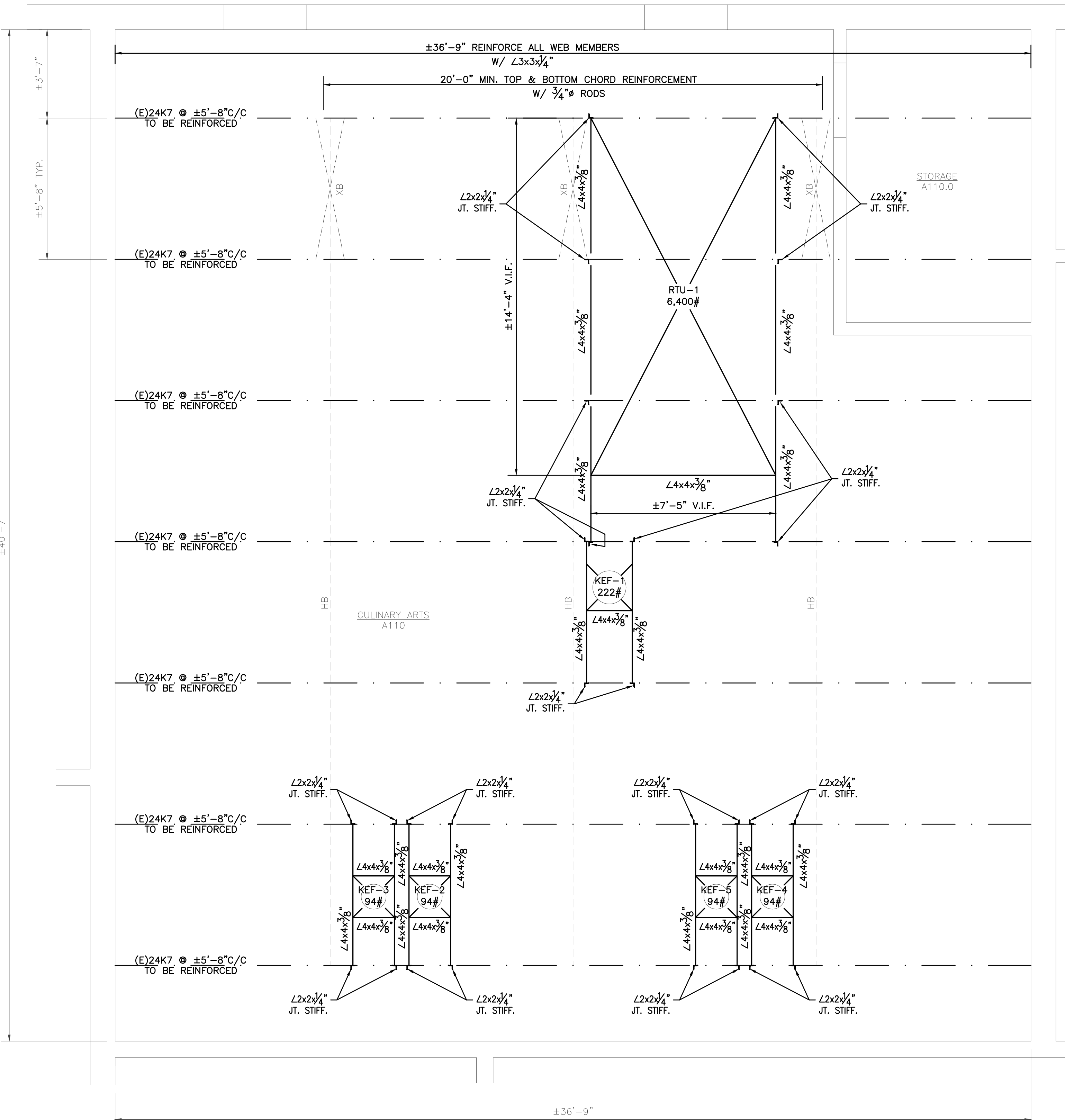
- THESE GENERAL NOTES SUPPLEMENT THE PROJECT SPECIFICATIONS. REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- STRUCTURAL DRAWINGS ARE INTENDED TO BE USED WITH ARCHITECTURAL AND MECHANICAL DRAWINGS. CONTRACTOR IS RESPONSIBLE FOR COORDINATING SUCH REQUIREMENTS INTO THEIR SHOP DRAWINGS AND WORK.
- NO OPENINGS SHALL BE MADE IN ANY STRUCTURAL MEMBER WITHOUT THE WRITTEN APPROVAL OF THE ARCHITECT/ENGINEER.
- NO CHANGE IN SIZE OR DIMENSION OF STRUCTURAL MEMBERS SHALL BE MADE WITHOUT THE WRITTEN APPROVAL OF THE ARCHITECT/ENGINEER.
- OPENINGS 1'-4" AND LESS ON A SIDE ARE GENERALLY NOT SHOWN ON THE STRUCTURAL DRAWINGS. REFER TO ARCHITECTURAL AND MECHANICAL DRAWINGS FOR SUCH OPENINGS.
- THE CONTRACTOR IS RESPONSIBLE FOR LIMITING THE AMOUNT OF CONSTRUCTION LOAD IMPOSED UPON STRUCTURAL FRAMING. CONSTRUCTION LOADS SHALL NOT EXCEED THE DESIGN CAPACITY OF THE FRAMING AT THE TIME THE LOADS ARE IMPOSED.
- THE STRUCTURE IS DESIGNED TO FUNCTION AS A UNIT UPON COMPLETION. THE CONTRACTOR IS RESPONSIBLE FOR FURNISHING ALL TEMPORARY BRACING AND/OR SUPPORT THAT MAY BE REQUIRED AS THE RESULT OF THE CONTRACTOR'S CONSTRUCTION METHODS AND/OR SEQUENCES.
- DO NOT SCALE THESE DRAWINGS, USE DIMENSIONS.
- CONTRACTOR'S CONSTRUCTION AND/OR ERECTION SEQUENCES SHALL RECOGNIZE AND CONSIDER THE EFFECTS OF THERMAL MOVEMENTS OF STRUCTURAL ELEMENTS DURING THE CONSTRUCTION PERIOD.
- THE CONTRACTOR SHALL INFORM THE ARCHITECT/ENGINEER IN WRITING OF ANY DEVIATION FROM THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL NOT BE RELIEVED OF THE RESPONSIBILITY OF SUCH DEVIATION BY THE ARCHITECT/ENGINEER REVIEW OF SHOP DRAWINGS, PRODUCT DATA, ETC. UNLESS THE CONTRACTOR HAS SPECIFICALLY INFORMED THE ARCHITECT/ENGINEER OF SUCH DEVIATION AT THE TIME OF SUBMISSION, AND THE ARCHITECT/ENGINEER HAS GIVEN WRITTEN APPROVAL TO THE SPECIFIC DEVIATION.

## QUALITY ASSURANCE:

- THE OWNER WILL EMPLOY AND PAY FOR THE SERVICES OF AN INDEPENDENT TESTING AGENCY TO PROVIDE QUALITY ASSURANCE TESTING AND INSPECTIONS FOR WORK SPECIFIED IN THESE NOTES. THE CONTRACTOR WILL EMPLOY AND PAY FOR THE SERVICES OF AN INDEPENDENT TESTING AGENCY ACCEPTABLE TO THE OWNER TO PROVIDE QUALITY ASSURANCE TESTING AND INSPECTIONS FOR WORK IF REQUIRED BY OWNER. THE TESTING AGENCY SHALL BE LICENSED WHERE THE STRUCTURE IS LOCATED AND ALL TESTING AND INSPECTIONS SHALL BE PERFORMED UNDER THE SUPERVISION OF AN ENGINEER REGISTERED WHERE THE STRUCTURE IS LOCATED.
- FAILURE OF QUALITY ASSURANCE TESTING AND INSPECTIONS TO DETECT ANY DEFECTIVE WORK OR MATERIAL SHALL NOT IN ANY WAY PREVENT LATER REJECTION WHEN SUCH DEFECT IS NOTED NOR SHALL IT OBLIGATE THE OWNER'S REPRESENTATIVE FOR FINAL ACCEPTANCE.
- THE TESTING AGENCY AND ITS REPRESENTATIVES ARE NOT AUTHORIZED TO REVOKO, ALTER, RELAX, ENLARGE OR RELEASE ANY PORTION OF THE WORK, PERFORM ANY DUTIES OF THE CONTRACTOR, OR BE A PARTY TO SCHEDULING OF WORK.
- THE CONTRACTOR SHALL NOTIFY THE TESTING AGENCY AND THE OWNER'S REPRESENTATIVE A MINIMUM OF 24 HOURS IN ADVANCE OF ALL WORK REQUIRING QUALITY ASSURANCE TESTING AND INSPECTIONS AND ALL REASONABLE FACILITIES SHALL BE MADE AVAILABLE FOR TECHNICIANS.
- RECORDS OF INSPECTIONS SHALL BE KEPT AVAILABLE TO THE BUILDING OFFICIAL DURING PROGRESS OF THE WORK AND FOR TWO YEARS AFTER COMPLETION OF THE PROJECT. RECORDS SHALL BE PRESERVED BY THE INDEPENDENT TESTING AGENCY.

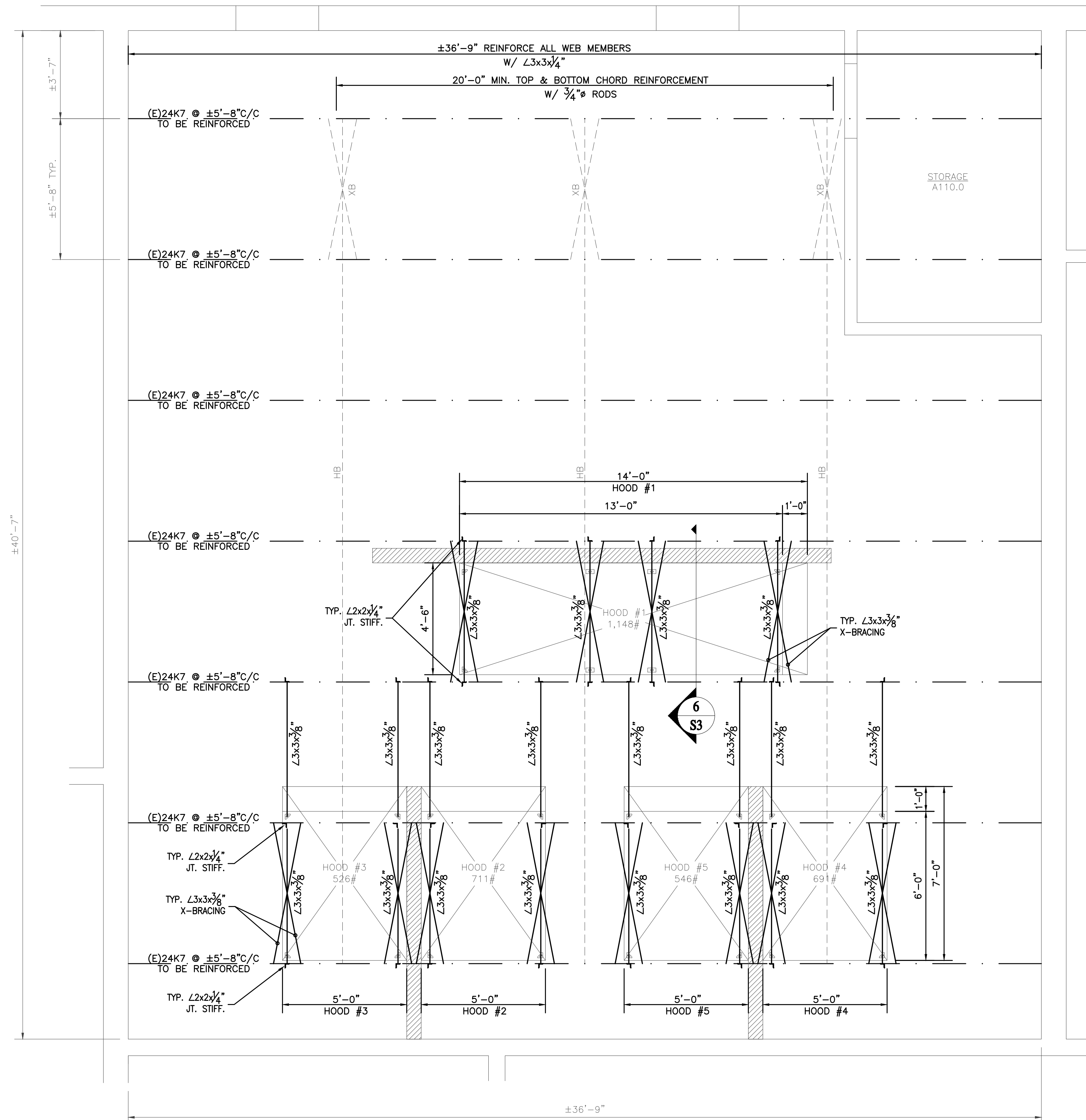
## NOTE:

ALL SUB-CONTRACTORS SHALL BE RESPONSIBLE FOR REVIEWING ALL DRAWINGS AND ALL SECTIONS OF THE SPECIFICATIONS FOR THE COORDINATION OF THEIR WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE ARCHITECT/ENGINEER BEFORE FINALIZING THEIR BIDS. CONTRACTOR SHOULD FIELD VERIFY ALL DIMENSIONS.



**1** PARTIAL ROOF PLAN  
**S1** SCALE: 3/8" = 1'-0"

REGAN YOUNG, AIA 21A100912100	
<b>REGAN YOUNG ENGLAND BUTERA</b> REFERENDUMS · ENGINEERING · ARCHITECTURE · DESIGN 456 HIGH STREET · MT. HOLLY, NEW JERSEY 08060 USA +1(609)265-2852/0333FAX · 21A100912100 · RYEBREAD.COM	
<b>SE2 ENGINEERING, LLC.</b> - PROFESSIONAL ENGINEERS - 1705 BUTLER PIKE; CONSHOHOCKEN, PA. 19428 TEL. (610) 828-1550 OFFICE@SE2ENG.NET	
<b>NJDOE SP #07-2670-005-21-1000</b> PROJECT TITLE: <b>CULINARY ARTS CLASSROOM ALTERATION</b>	
ADDRESS: <b>LINDENWOLD HIGH SCHOOL                  BLOCK 244, LOT 3                  801 EGG HARBOR ROAD                  LINDENWOLD, NJ 08021</b>	
PROJECT NO.:	5713G
REVISION DATE:	
DRAWING DATE:	15 JAN 2024
PRINT DATE:	
DRAWN BY:	SLD
SHEET TITLE:	STRUCTURAL GENERAL NOTES & PARTIAL ROOF PLAN
<h1>S1</h1>	
01	OF 03



**1**  
**S2** PARTIAL ROOF / HOOD SUPPORT PLAN  
SCALE: 3/8" = 1'-0"

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21AI00912100

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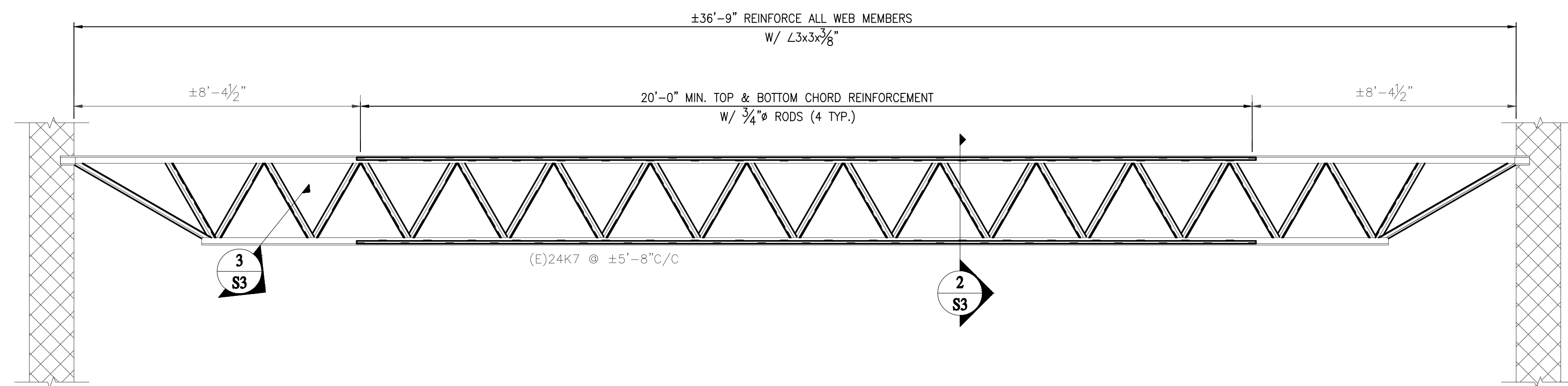
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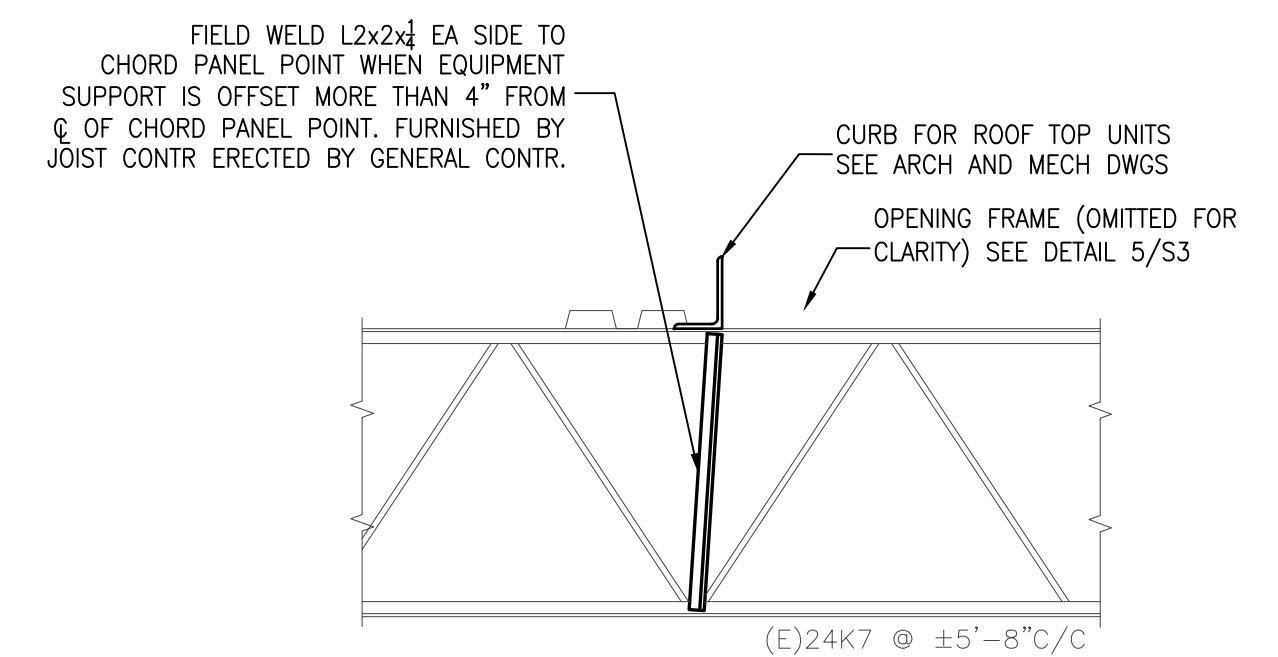
SHEET TITLE: PARTIAL ROOF / HOOD SUPPORT PLAN

**S2**

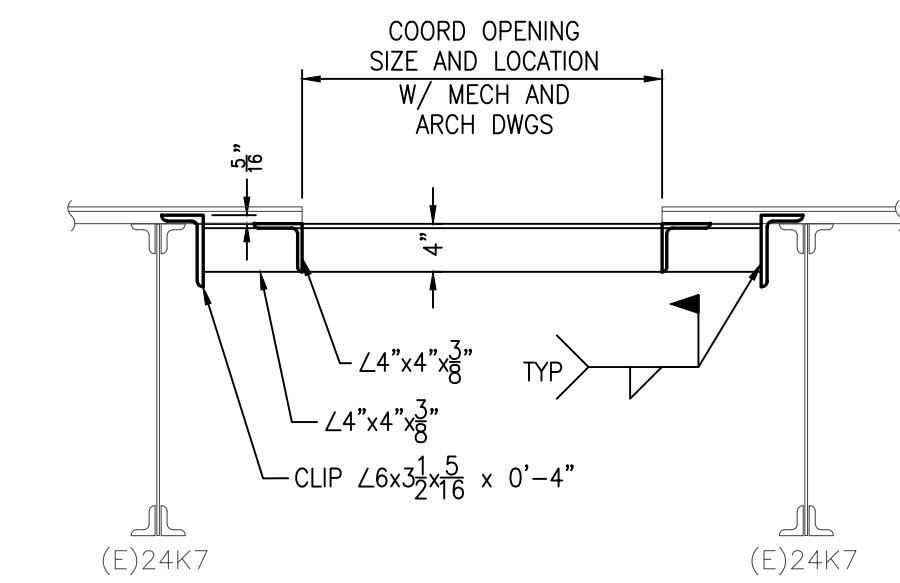




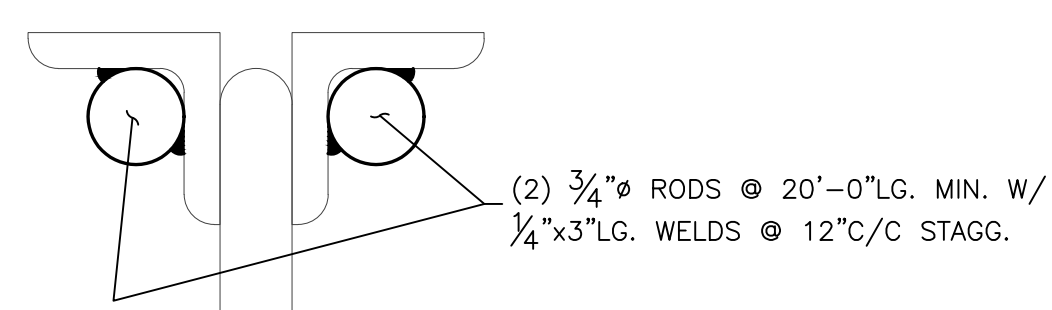
**1 JOIST REINFORCEMENT ELEVATION**  
 SCALE: 1/2" = 1'-0" (4) EXIST. 24K JOISTS TYP.



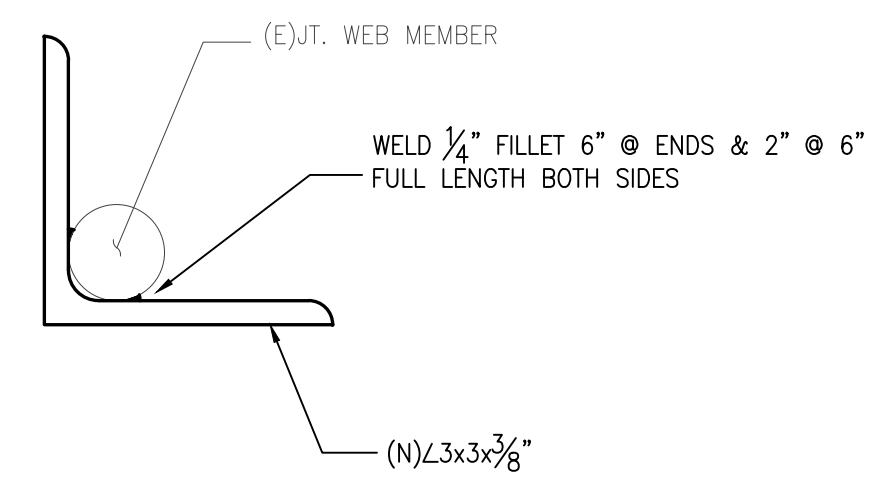
**4 JOIST STIFFENER DETAIL @ HVAC**  
 SCALE: 3/4" = 1'-0"



**TYP OPENING FRAME IN JOIST & METAL DECK**  
 SCALE: 3/4" = 1'-0"

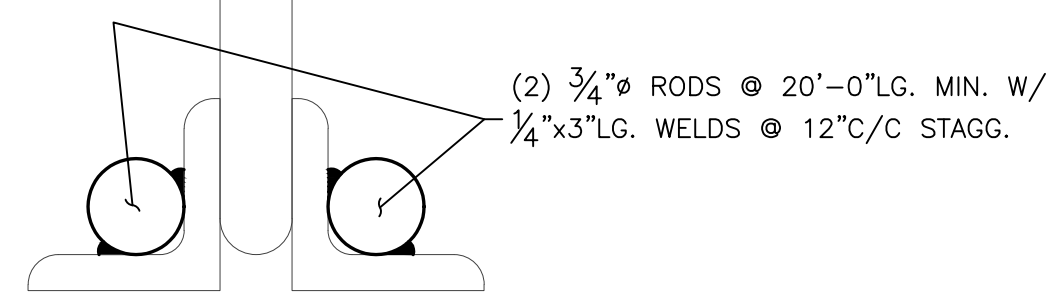


(2) 3/4" Ø RODS @ 20'-0" LG. MIN. W/  
 1/4" x 3" LG. WELDS @ 12" C/C STAGG.



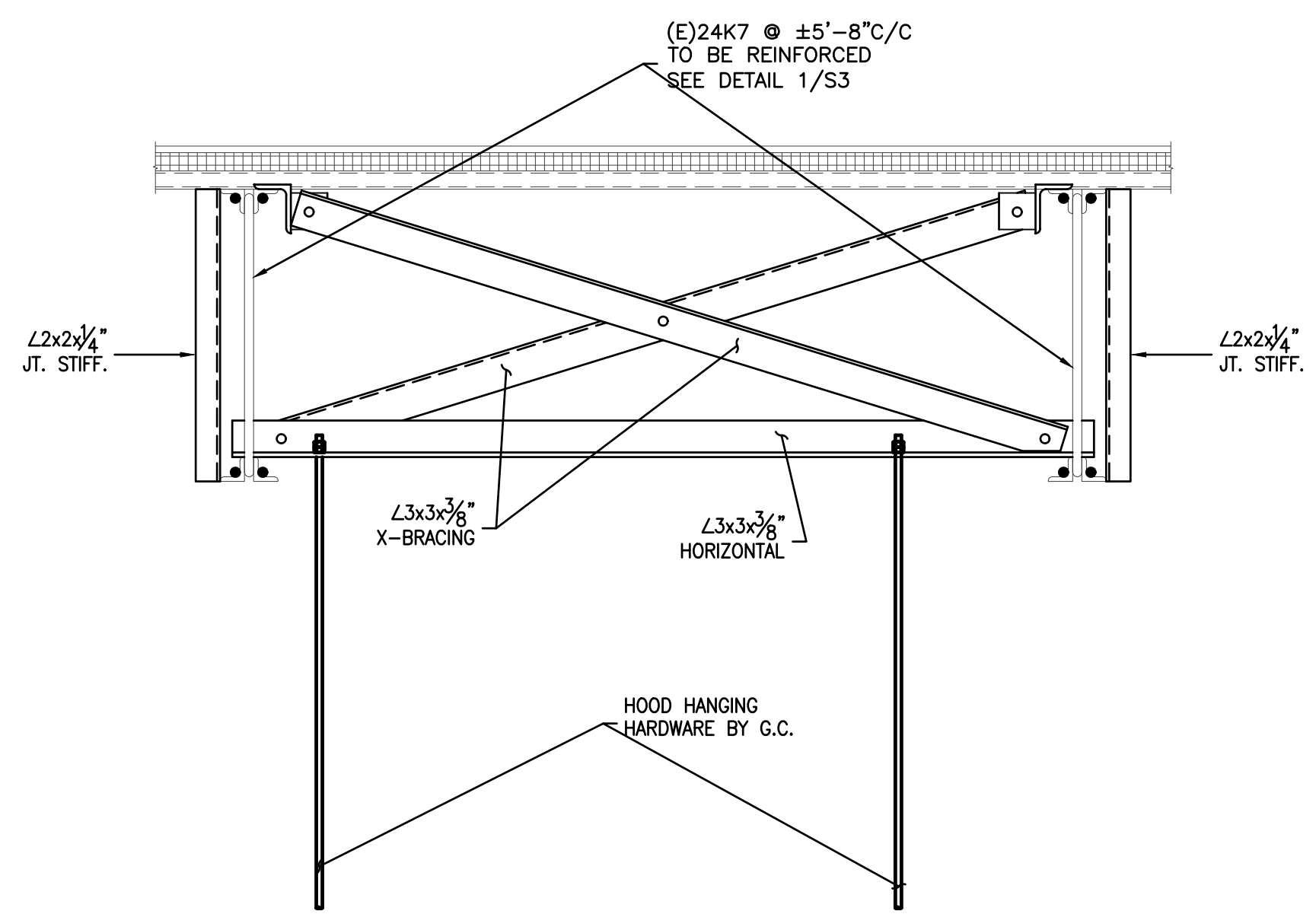
**3 TRUSS WEB REINFORCEMENT**  
 SCALE: 6" = 1'-0"

(E)24K7 @ ±5'-8" C/C



(2) 3/4" Ø RODS @ 20'-0" LG. MIN. W/  
 1/4" x 3" LG. WELDS @ 12" C/C STAGG.

**2 TRUSS TOP & BOTTOM CHORD REINFORCEMENT**  
 SCALE: 6" = 1'-0"



**6 HOOD SUPPORT SECTION**  
 SCALE: 1" = 1'-0"

REGAN YOUNG, AIA  
 21AI00912100

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**SE2 ENGINEERING, LLC.**  
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 1705 BUTLER PIKE, CONSHOHOCKEN, PA. 19428  
 TEL: (610) 828-1550 OFFICE@SE2ENG.NET

**NJDOE SP #07-2670-005-21-1000**

PROJECT TITLE:  
**CULINARY ARTS CLASSROOM ALTERATION**

ADDRESS:  
**LINDENWOLD HIGH SCHOOL  
 BLOCK 244, LOT 3  
 801 EGG HARBOR ROAD  
 LINDENWOLD, NJ 08021**

PROJECT NO.: 5713G

REVISION DATE:	

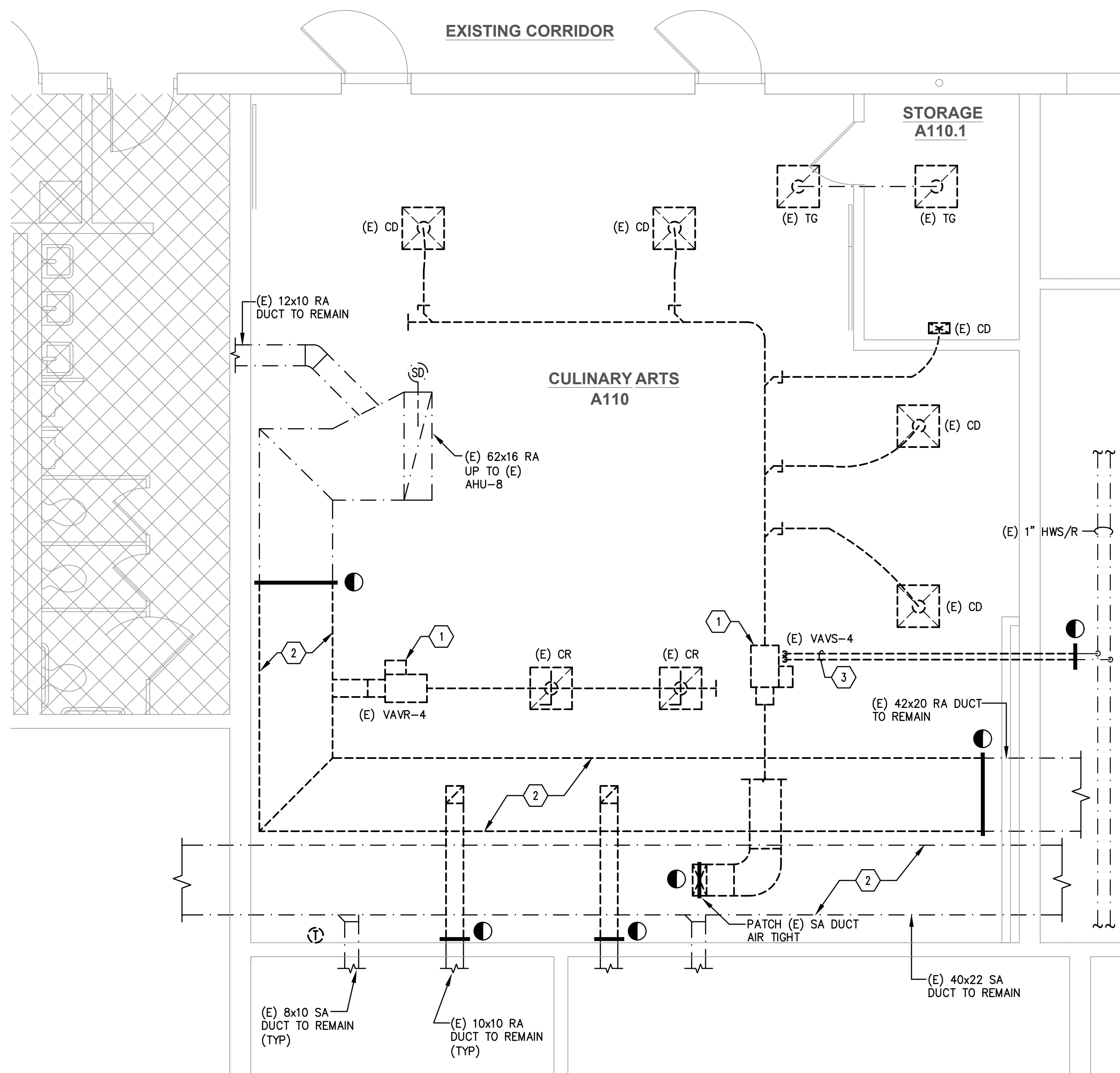
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PRINT DATE:

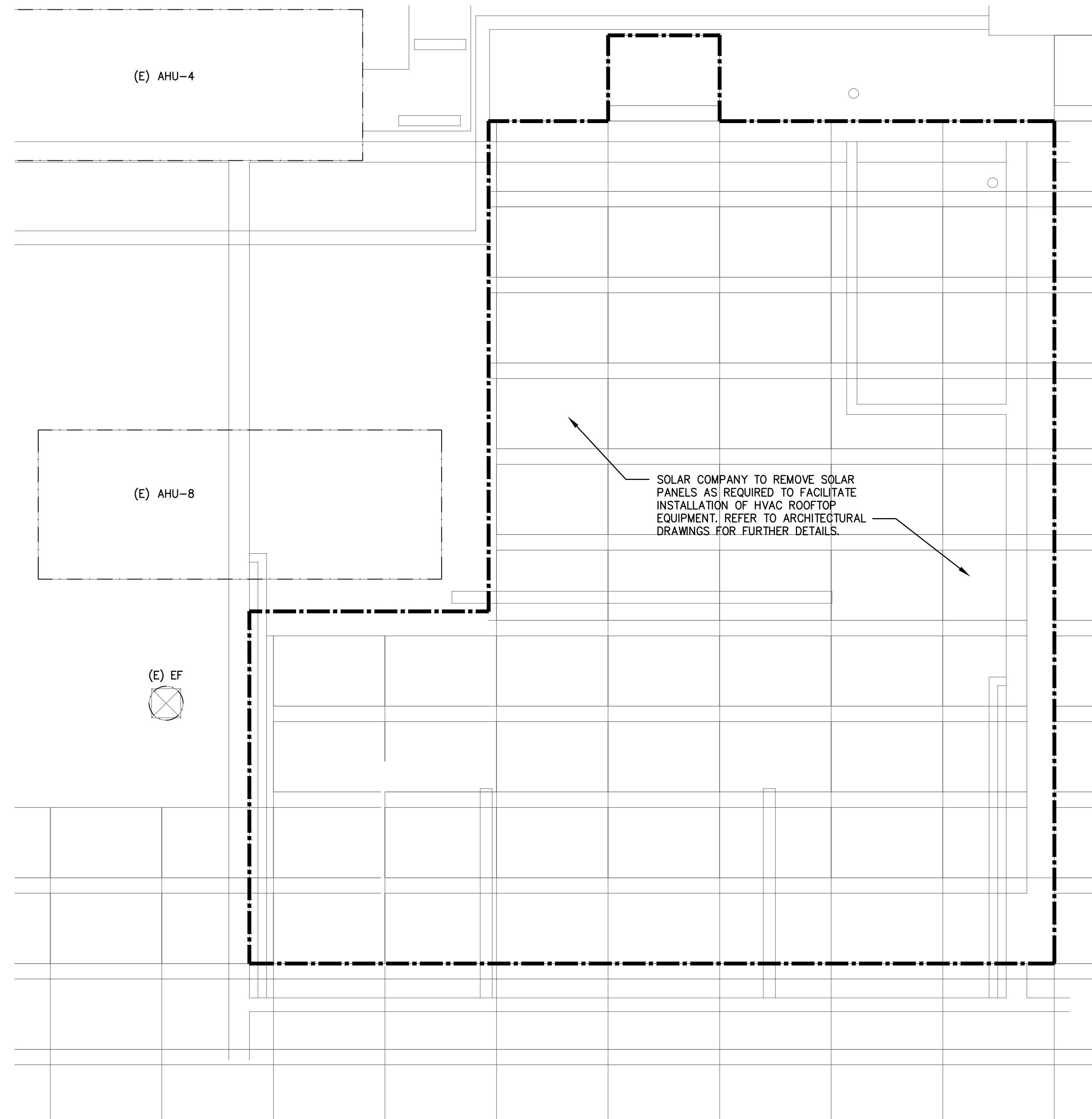
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SHEET TITLE: CONSTRUCTION DETAILS

**S3**



**1** PARTIAL FIRST FLOOR PLAN - HVAC DEMOLITION  
 HD100 SCALE 1/4" = 1'-0"



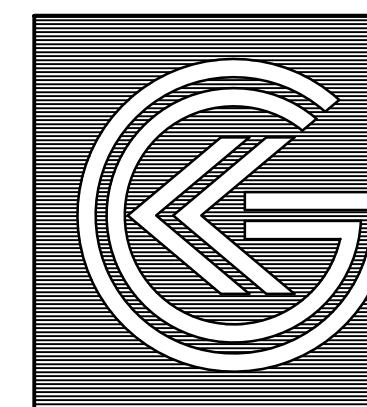
**2** PARTIAL ROOF PLAN - HVAC DEMOLITION  
 HD100 SCALE 1/4" = 1'-0"

**DEMOLITION GENERAL NOTES**

- CONTRACTOR SHALL FIELD VERIFY THE EXISTING CONDITIONS PRIOR TO DEMOLITION.
- EXECUTE DEMOLITION IN CAREFUL AND ORDERLY MANNER WITH THE LEAST POSSIBLE DISTURBANCE TO THE PUBLIC, EGRESS OR THE FUNCTIONING OF THE EXISTING BUILDING. PROVIDE OWNER 2 WEEKS OF ADVANCE NOTICES PRIOR TO SCHEDULING OF SHUT DOWN.
- PRIOR TO DEMOLITION, CONTRACTOR SHALL REVIEW WITH OWNER ALL MATERIALS TO BE REMOVED, SHOULD THE OWNER WANT TO KEEP ANY MATERIALS THE CONTRACTOR SHALL REMOVE AND DELIVER THE PARTS TO THE OWNER ON THE SITE WHERE SO DIRECTED. OTHERWISE ALL DEMOLISHED OR REMOVED MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE AND BE DISPOSED OF IN A LEGAL MANNER.
- DEMOLITION SHALL INCLUDE REMOVAL OF ALL PARTS AND PIECES IN THEIR ENTIRETY BACK TO POINTS INDICATED OR IF NOT INDICATED BACK TO THEIR POINT OF SOURCE.
- WHERE CONDITIONS PROHIBIT TOTAL REMOVAL OF THE WORK, THE REMAINING PORTION SHALL BE CUT FLUSH WITH THE SURROUNDING SURFACE AND BE CAPPED, PLUGGED OR SEALED AND THE SURROUNDING SURFACE SHALL BE REFINISHED IN AN APPROVED MANNER.
- ALL UNUSED FLOOR & WALL OPENINGS SHALL BE PATCHED & FINISHED TO MATCH ADJACENT SURFACES.

**KEY NOTES**

- DEMOLITION OF EXISTING SUPPLY AND RETURN VAV TERMINALS SHALL INCLUDE REMOVAL OF EXISTING CONTROLS.
- DEMOLITION OF EXISTING & INSTALLATION OF NEW RETURN DUCTWORK FOR AHU-8 SHALL BE PERFORMED ON CONTINUOUS 24 HR/DAY BASIS. STARTING ON 1ST FRIDAY MORNING OF SCHOOL DISTRICT'S SUMMER BREAKING, WITH COMPLETION BY END OF THAT WEEKEND, SO THAT AHU-8 IS OPERATING MONDAY MORNING.
- DEMOLISH AN EXISTING 1/2" HOT WATER SUPPLY/RETURN PIPING UP TO THE POINT INDICATED AND CAP AIRTIGHT.



**KELTER & GILLIGO**  
 consulting engineers

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 Suite 9, West Windsor, NJ 08550

Frank Tindall, P.E.  
 Professional Engineer  
 NJ 38656

February 23, 2024 - 8:49:21 am  
 Drawing: 3107-110-100.dwg



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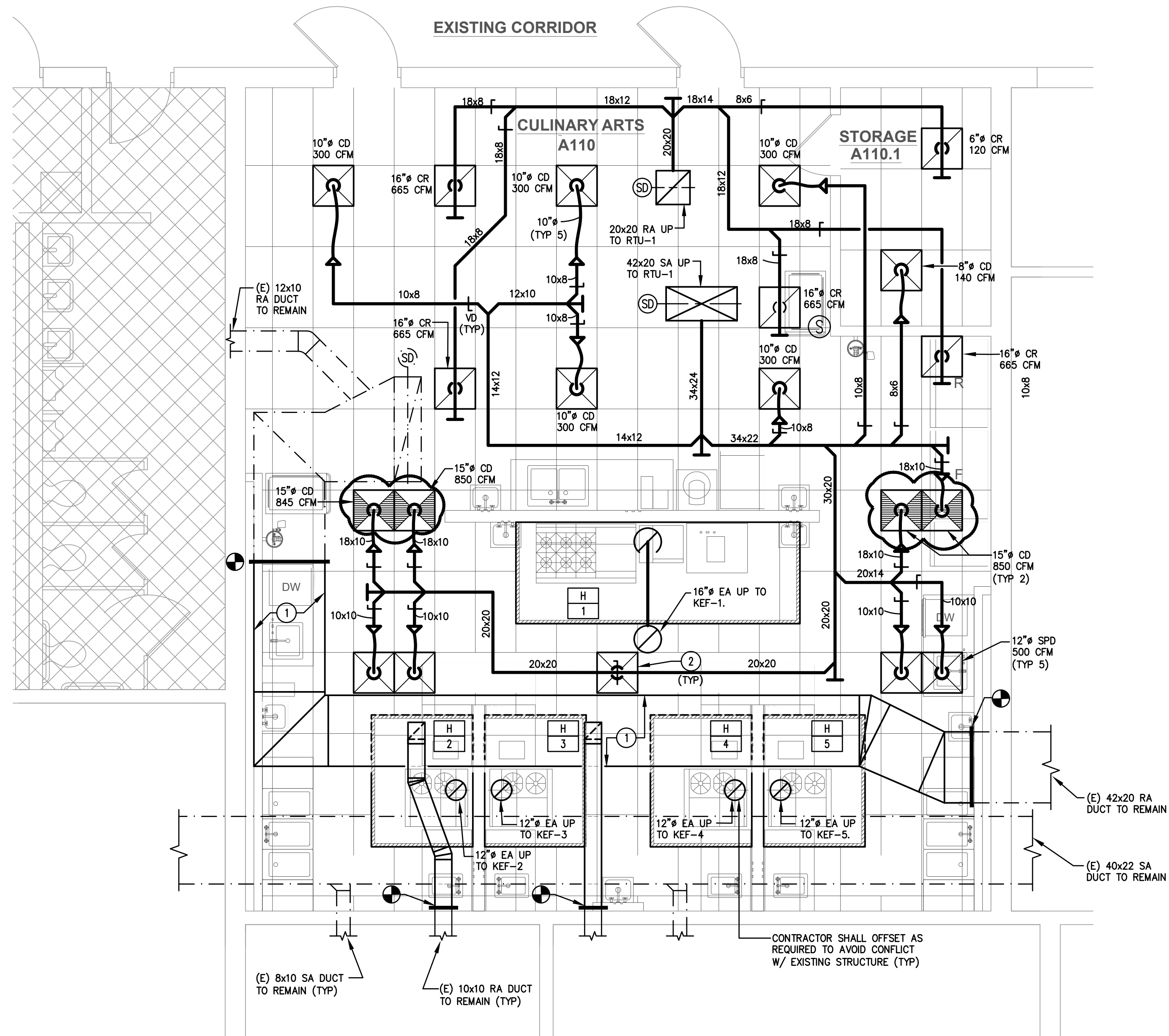
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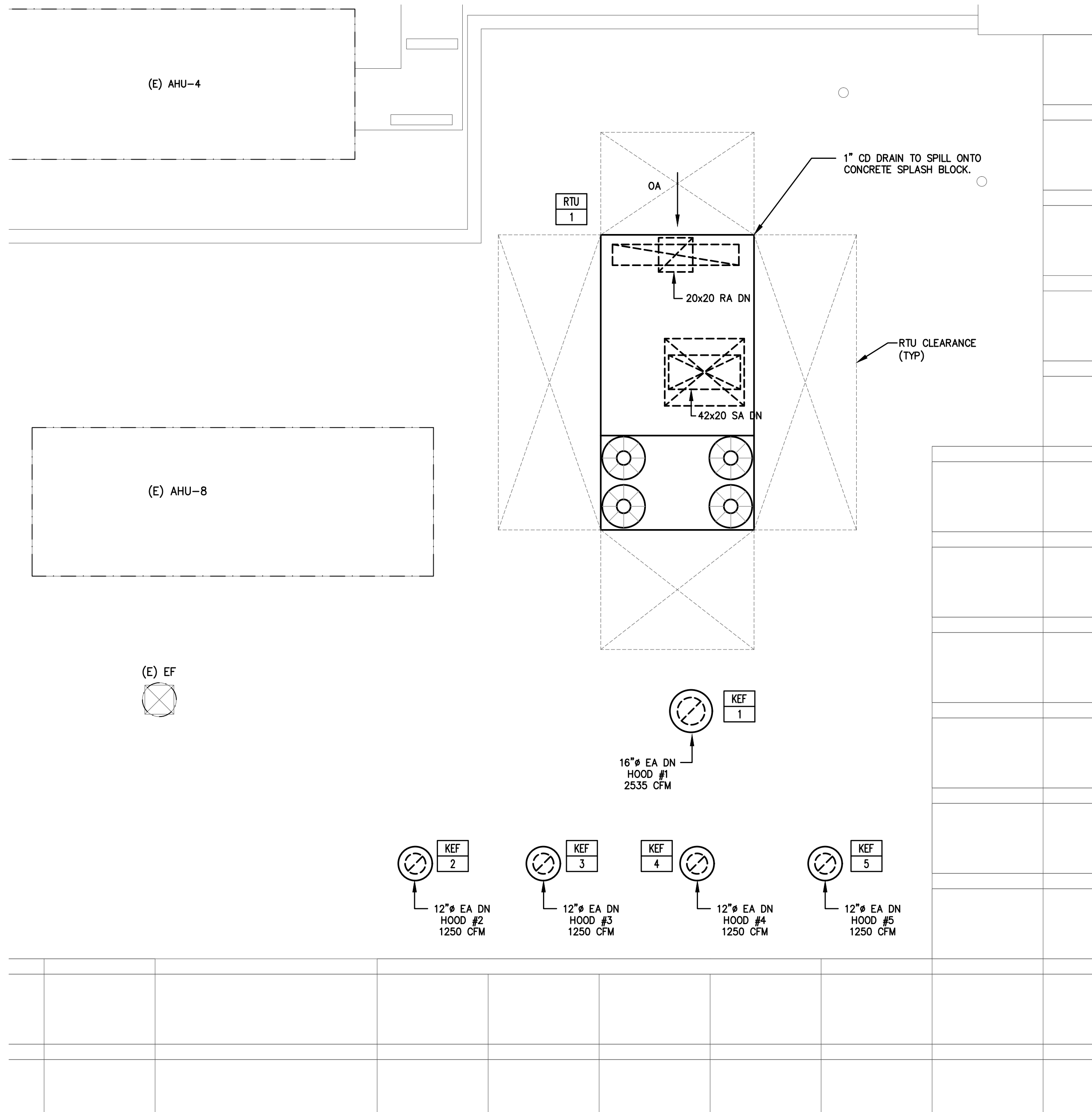
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SHEET TITLE: PARTIAL DEMOLITION PLAN - HVAC

**HD100**



**1** PARTIAL FIRST FLOOR PLAN – HVAC NEW WORK  
 H100 SCALE 1/4" = 1'-0"



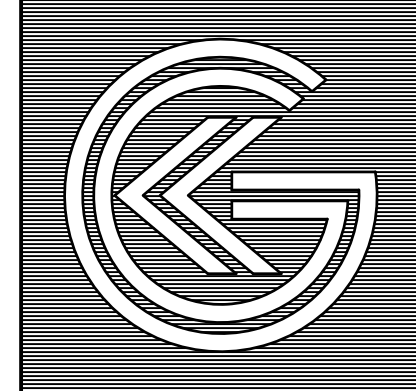
**2** PARTIAL ROOF PLAN – HVAC NEW WORK  
 H100 SCALE 1/4" = 1'-0"

**PLAN NOTES**

- CONTRACTOR TO FIELD VERIFY ALL MEASUREMENTS AND LOCATION OF EQUIPMENTS PRIOR STARTING NEW WORK.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING AND PATCHING OF CEILINGS, ROOFS AND FLOOR FLOORS REQUIRED AS A RESULT OF THEIR WORK.
- ALL OFFSETS AND TRANSITIONS NECESSARY TO SUCCESSFULLY CONSTRUCT THE DUCT DISTRIBUTION SYSTEM ARE NOT SHOWN ON THESE PLANS, BUT ARE STILL INCLUDED IN THE SCOPE OF WORK.
- DUCT SIZES SHOWN ARE CLEAR INSIDE DIMENSIONS. INTERNALLY LINED DUCTS SHALL BE INCREASED IN SIZE TO MAINTAIN THE SAME INTERNAL DIMENSION.
- ALL SUPPLY AIR AND RETURN AIR DUCTWORK FOR A DISTANCE OF 15'-0" DOWNSTREAM OF AIR HANDLING UNITS SHALL BE ACOUSTICALLY LINED PER SPECIFICATIONS.
- COORDINATE OPENINGS IN WALL WITH ARCHITECT TO MAINTAIN RATING AND ADJACENT SURFACE FINISHES.
- ALL DUCTWORK AND PIPING INSTALLATION SHALL BE COORDINATED WITH OTHER TRADES.
- ALL OPEN ENDED DUCTS SHALL BE TERMINATED WITH 1/4" x 1/4" ALUMINUM WOVEN WIRE MESH SCREEN UNLESS NOTED OTHERWISE.
- DUCTWORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH SMACNA LOW & MEDIUM PRESSURE "HVAC DUCT CONSTRUCTION STANDARD METAL AND FLEXIBLE".
- MOUNT THERMOSTAT/SENSOR AS INDICATED ON PLANS 48" AFF FOR ADA COMPLIANCE UNLESS OTHERWISE REQUIRED BY OWNER, ARCHITECT OR EQUIPMENT MANUFACTURER. COORDINATE LOCATION IN THE FIELD AND DO NOT MOUNT THEM ABOVE ELECTRICAL DEVICES. PROVIDE AN INSULATED SUB-BASE FOR ONLY OF THEM MOUNTED ON A WALL ADJACENT TO AN UNCONDITIONED SPACE.

**KEY NOTES**

- INSTALLATION OF NEW RETURN DUCTWORK FOR AHU-8 SHALL BE PERFORMED ON CONTINUOUS 24 HR/DAY BASIS. STARTING ON 1ST FRIDAY MORNING OF SCHOOL DISTRICT'S SUMMER BREAKING, WITH COMPLETION BY END OF THAT WEEKEND, SO THAT AHU-8 IS OPERATING MONDAY MORNING.
- PROVIDE A VOLUME DAMPER AT THE NECK OF THE SUPPLY AND RETURN DUCT.



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February 22, 2024 - 11:12:22 am  
 Drawing: 3107 - H-100.dwg

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**NJDOE SP #07-2670-005-21-1000**

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 BLOCK 244, LOT 3  
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PROJECT NO.: 5713G

REVISION DATE:	23 FEB 2024

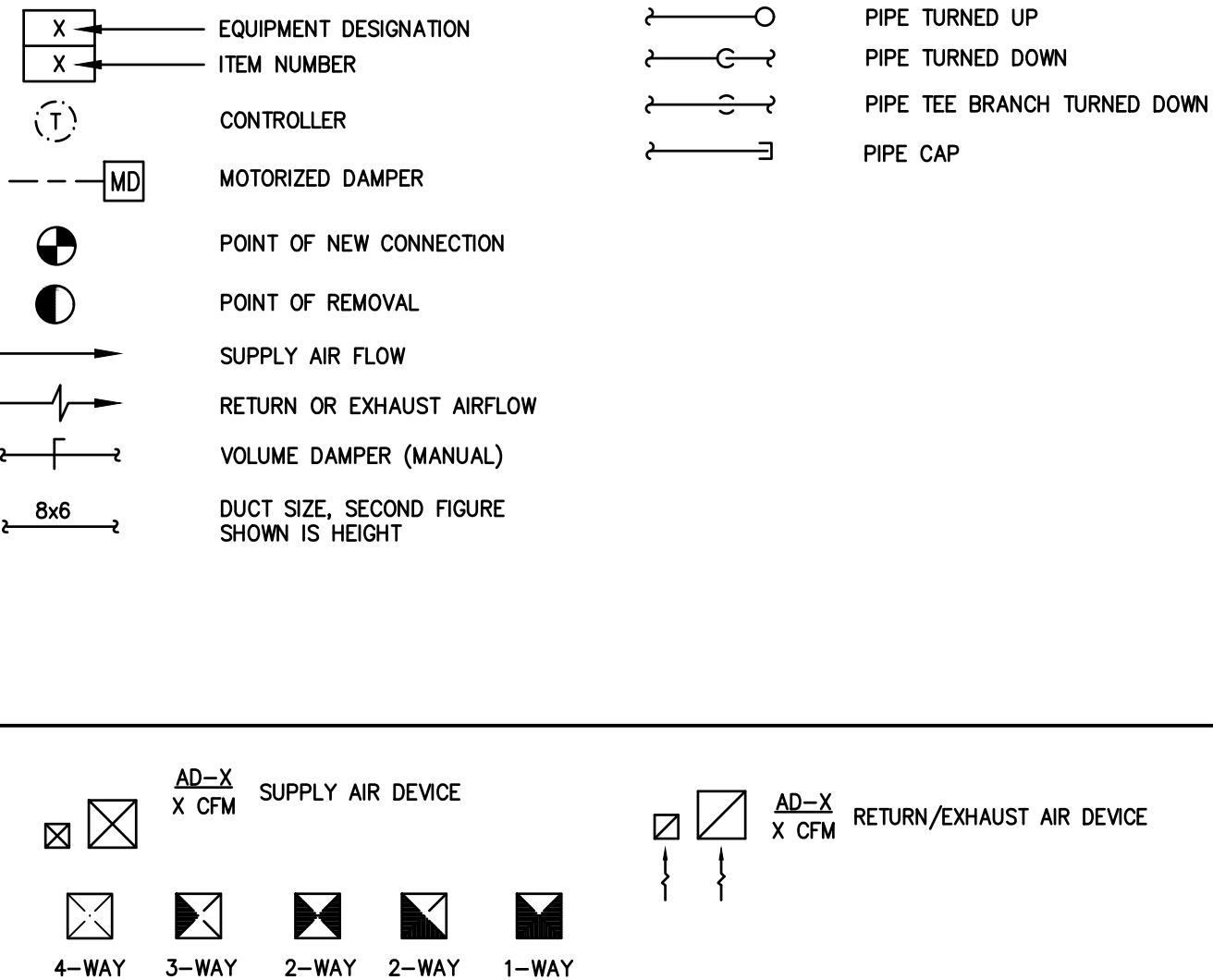
DRAWING DATE:	15 JAN 2024
PRINT DATE:	01/08/24
DRAWN BY:	AK
SHEET TITLE:	PARTIAL FLOOR PLANS - HVAC

**H100**

**ABBREVIATIONS**

- & CAL AND CAPTURE AREA LENGTH
- CD CEILING DIFFUSER
- CD CONDENSATE DRAIN
- CFM CUBIC FEET PER MINUTE
- CG CEILING GRILL
- CO CLEAN OUT
- CR CEILING REGISTER
- CR # DIAMETER
- DN DOWN
- DOAS DEDICATED OUTDOOR AIR SYSTEM
- DP DROP
- EF EXHAUST FAN
- EXIST/(E) EXISTING
- ER EXHAUST REGISTER
- ESP EXTERNAL STATIC PRESSURE
- GA GAUGE
- HP HORSE POWER
- HZ HERTZ (FREQUENCY)
- IWC INCHES OF WATER COLUMN
- IWG INCHES OF WATER GAUGE
- KEF KITCHEN EXHAUST FAN
- MD MOTORIZED DAMPER
- OAL OVERALL AREA LENGTH
- PH PHASE
- RG RETURN GRILL
- RPM REVOLUTIONS PER MINUTE
- RR RETURN REGISTER
- RTU ROOFTOP UNIT
- SA SUPPLY AIR
- SP STATIC PRESSURE
- SPD SUPPLY PLENUM DIFFUSER
- SR SUPPLY REGISTER
- T THERMOSTAT
- TEMP TEMPERATURE
- TYP TYPICAL
- V/PH/HZ VOLTS/PHASE/HERTZ
- VOLUME DAMPER
- W/ WITH
- WMS WIRE MESH SCREEN
- WT WEIGHT

**SYMBOLS LIST**



**DIFFUSER & REGISTER SCHEDULE**

NO.	MARK	REMARKS
1.	CD SHALL BE TITUS MODEL TMSA-AA OR APPROVED "EQUAL".	①②③④
2.	CR SHALL BE TITUS MODEL PAR-AA OR APPROVED "EQUAL".	②④
3.	SPD SHALL CAPTIVEAIRE MODEL DI-PSP.	④⑤⑥

- REMARKS:**
- LOUVERED FACE, HIGH CAPACITY, ALUMINUM DIFFUSER WITH ROUND NECK AND ADJUSTABLE DISCHARGE PATTERN.
  - PROVIDE OPPOSED BLADE VOLUME DAMPER.
  - PROVIDE EQUALIZING GRID.
  - PROVIDE STANDARD WHITE FINISH UNLESS OTHERWISE NOTED ON DRAWINGS.
  - STAINLESS STEEL PERFORATION AND TRIM REMOVABLE PERFORATION FOR PLENUM CLEANING.
  - CAPTIVEAIRE IS BASIS OF DESIGN.

**EXHAUST FAN SCHEDULE**

TAG	MFR	MODEL	TYPE	DRIVE	CFM	SP IN WC	HP	BHP	RPM	V/Ph/Hz	SONES	SERVICE	LOCATION	L/W/H (IN)	WEIGHT (LBS)
KEF-1	CAPTIVEAIRE	DU200HFA	UPBLAST	DIRECT	2535	1.2	2.0	1.125	1006	115/1/60	12.7	HOOD-1	ROOF	-	225
KEF-2	CAPTIVEAIRE	DUBSHFA	UPBLAST	DIRECT	1250	1.3	0.75	0.420	1287	115/1/60	10.3	HOOD-2	ROOF	-	100
KEF-3	CAPTIVEAIRE	DUBSHFA	UPBLAST	DIRECT	1250	1.3	0.75	0.420	1287	115/1/60	10.3	HOOD-3	ROOF	-	100
KEF-4	CAPTIVEAIRE	DUBSHFA	UPBLAST	DIRECT	1250	1.3	0.75	0.420	1287	115/1/60	10.3	HOOD-4	ROOF	-	100
KEF-5	CAPTIVEAIRE	DUBSHFA	UPBLAST	DIRECT	1250	1.3	0.75	0.420	1287	115/1/60	10.3	HOOD-5	ROOF	-	100

- PROVIDE THE FOLLOWING:**
- MOTOR WITH THERMAL OVERLOAD PROTECTION, DISCONNECT SWITCH & ISOLATION KIT.
  - PROVIDE UL LABELED/VENTED ROOF CURBS WITH GREASE BOX COVER FOR ROOF EXHAUST FANS.

**RANGE HOOD SCHEDULE**

TAG	MFR	MODEL	APPLIANCE DUTY	CAL/OAL (FT)	MAX COOKING TEMP, °F	TYPE	DESIGN CFM/FT	TOTAL CFM	SP IN WC	VEL	LOCATION	FILTER SIZE (QTY   H" x L")	WEIGHT (LBS)
H-1	CAPTIVEAIRE	5424 ND-2	HEAVY	13/14	600	1	195	2535	0.864	1816	CLASSROOM	9   20 x 16	1,175
H-2	CAPTIVEAIRE	6024 ND-2	HEAVY	6/7	600	1	208	1250	0.548	1592	CLASSROOM	4   20 x 16	725
H-3	CAPTIVEAIRE	6024 ND-2	HEAVY	6/7	600	1	208	1250	0.548	1592	CLASSROOM	4   20 x 16	540
H-4	CAPTIVEAIRE	6024 ND-2	HEAVY	6/7	600	1	208	1250	0.548	1592	CLASSROOM	4   20 x 16	700
H-5	CAPTIVEAIRE	6024 ND-2	HEAVY	6/7	600	1	208	1250	0.548	1592	CLASSROOM	4   20 x 16	560

- REMARKS:**
- PROVIDE ON/OFF SWITCH TO KEF'S.
  - PROVIDE SWITCHED LIGHTING SYSTEM.
  - PROVIDE FULL COVERAGE, SELF CONTAINED FIRE SUPPRESSION SYSTEM WITH HOOD MOUNTED UTILITY CABINET.

**VENTILATION SCHEDULE**

ROOM NAME	ROOM NUMBER	AREA SQ. FT.	No. OF PEOPLE	REQUIRED OUTSIDE AIR CFM PER CODE			PROVIDED VENTILATION AIR (CFM) PER DESIGN				EQUIPMENT TAG No.
				OA PER PERSON	OA PER SQ. FT.	OA TOTAL (MINIMUM)	SUPPLY	RETURN	OUTSIDE AIR	EXHAUST	
CULINARY ARTS CLASSROOM	A110	648	24	7.5	0.12	258	1,500	1,100	400	-	RTU-1
CULINARY ARTS COOKING	A110	745	-	7.5	0.12	90	1,360	1,210	150	-	RTU-1
STORAGE	A110.1	87	-	-	0.12	11	140	115	25	-	RTU-1

- VENTILATION SCHEDULE NOTES:**
- VENTILATION REQUIREMENTS ARE BASED ON THE INTERNATIONAL MECHANICAL CODE (IMC) 2021, NJ EDITION.
  - VENTILATION REQUIREMENTS ARE BASED ON THE NORMAL OPERATING CONDITIONS WHERE NO KITCHEN HOODS ARE IN OPERATION.

**ROOFTOP UNIT SCHEDULE**

MARK No.	MANUFACTURER	MODEL & SIZE	TYPE	SERVICE	RTU-1 CAPTIVEAIRE CASRTU4-1700-30-50T-2 DOWNFLOW CULINARY ARTS CLASSROOM & KITCHEN
SUPPLY FAN DATA:					
TOTAL AIRFLOW	CFM	7,535			
TOTAL OUTSIDE AIR	CFM	7,535			
MIN. AIRFLOW	CFM	3,000			
MIN. OUTSIDE AIR	CFM	575			
ESP	IWG	1.0			
MOTOR HORSEPOWER	HP	10.0			

EXHAUST/RETURN FAN DATA:				
TOTAL AIRFLOW	CFM	3,000		
ESP	IWG	0.5		
FAN SPEED	RPM	2,187		
BRAKE HORSEPOWER	BHP	0.89		
MOTOR HORSEPOWER	QTY/HP	1.0/2.3		

DX COOLING COIL DATA:				
TOTAL GROSS CAPACITY	MBH	639.0		
SENSIBLE GROSS CAPACITY	MBH	310.0		
EAT DB/WB	°F	93/76		
LAT DB/WB	°F	53.9/48.5		

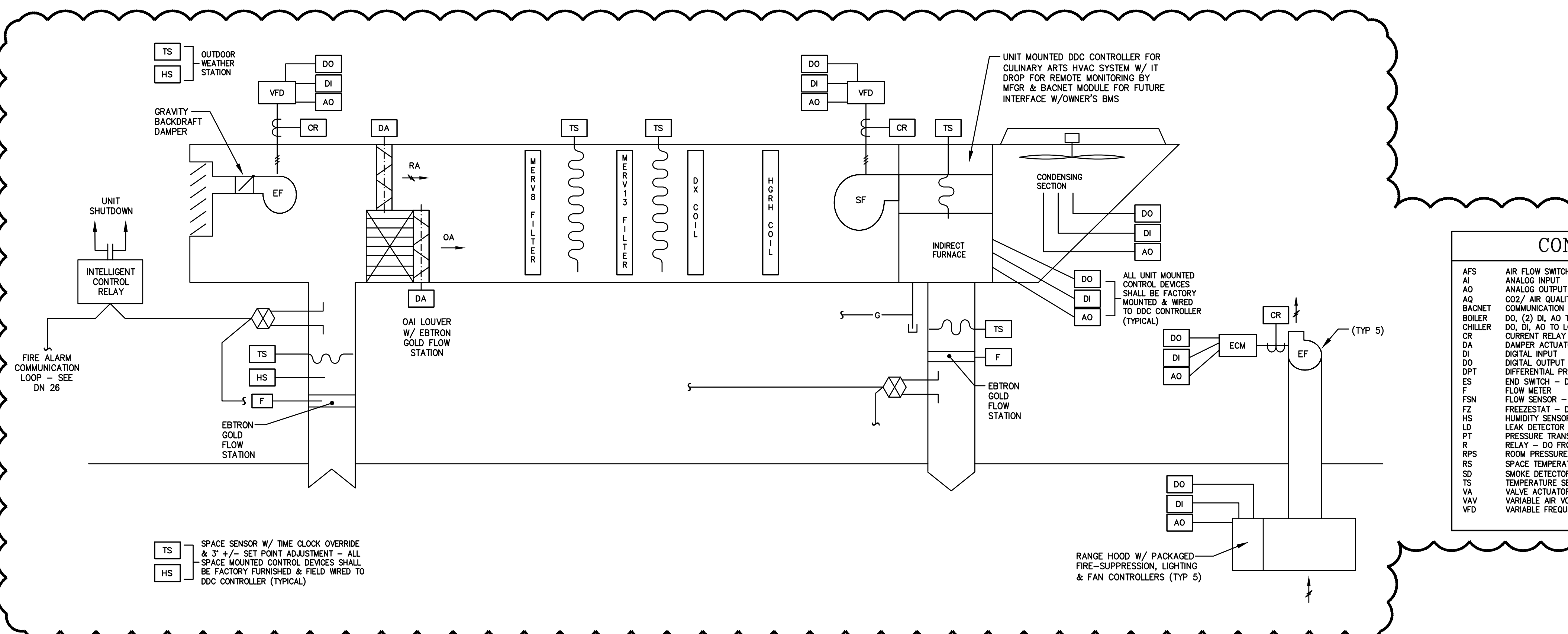
GAS HEATING DATA:				
INPUT/OUTPUT	MBH	79.6/64.4		
EAT/LAT DB	°F	0/-		
TEMP RISE	°F	69.0		
AIRFLOW	CFM	7,535		
MIN/MAX PRESSURE	IN WG	7/14		

HOT GAS REHEAT DATA:				
CAPACITY (MIN/MAX)	MBH	135.6/260		
LAT DB/WB	°F	70.0/57.3		
MOISTURE REMOVAL	LBS/HR	298.4		

ELECTRICAL DATA:				
POWER	V-PH-HZ	480/3/60		
MCA	AMPS	115.3		
MOCP	AMPS	130		

DIMENSIONS RTU (L x W x H)				
IN	117	89	69	(ADD 55" FOR HOOD)
UNIT WEIGHT	LBS	6,100		

- UNIT SOUND DATA:**
- | INLET FREQUENCY (HZ)  | 63   | 125  | 250 | 500  | 1000 | 2000 | 4000 | 8000 |
|-----------------------|------|------|-----|------|------|------|------|------|
| DISCHARGE OCTAVE BAND | 82.9 | 84.9 | 81  | 80.8 | 78.8 | 76.9 | 73.3 | 68.1 |
- NOTES:**
- IRI (INDUSTRIAL RISK INSURERS) COMPLIANCE REQUIRES MECHANICAL EXHAUST (POWER VENT) PRODUCTS OF COMBUSTION AND 100% SHUT-OFF TYPE (LOCKOUT) IGNITION SYSTEM.
  - BURNER, HEAT EXCHANGER, VENTING SYSTEM, AND DRIP PAN SHALL BE 409 STAINLESS STEEL.
  - DIRECT DRIVE PLENUM BLOWER MOTOR SHALL BE HIGH EFFICIENCY TYPE.
  - PROVIDE FREQUENCY DRIVE WITH THERMAL OVERLOAD PROTECTION.
  - CONTRACTOR SHALL COORDINATE MANUFACTURER'S AND A/C CONTROLS.
  - CLOGGED FILTER PRESSURE SWITCH. PROVISION FOR REMOTE INDICATION SHALL BE PROVIDED BY TERMINAL BLOCK CONNECTION POINT.
  - PROVIDE INSULATED DOUBLE WALL CONSTRUCTION.
  - THE MECHANICAL CONTRACTOR SHALL VERIFY THE EXACT SLOPE OF THE ROOF IN ORDER TO PROVIDE A LEVEL SURFACE FOR THE MECHANICAL EQUIPMENT. CURBS/RAILS SHALL BE FABRICATED WITH HEIGHT TAPERED TO MATCH SLOPE TO LEVEL TOPS OF UNITS.
  - SMOKE DETECTORS FURNISHED UNDER DIVISION 26 AND TO BE MOUNTED SUPPLY AND RETURN AIR STREAM WITH AUXILIARY CONTACTS OR INTELLIGENT CONTROL MODULE HARDWIRED TO SHUT UNIT DOWN WHEN SMOKE IS DETECTED.
  - PROVIDE SCROLL COMPRESSOR WITH INTEGRATED OIL SENSOR.
  - PROVIDE REFRIGERATION PRESSURE MONITORING ON HIGH AND LOW PRESSURE SIDE OF SYSTEM, INCLUDING THROUGH DIGITAL INTERFACE.
  - PROVIDE EC MOTOR CONDENSING FAN.
  - PROVIDE ELECTRONIC EXPANSION VALVE.
  - PROVIDE STATIC PRESSURE CONTROLLED BLOWER.
  - PROVIDE FULLY MODULATED HOT GAS REHEAT.
  - PROVIDE HAIL GUARD FOR CONDENSING COIL.
  - PROVIDE UNIT WITH DOWN DISCHARGE RETURN.
  - PROVIDE ROOF CURB WITH INTEGRAL SPRING TYPE VIBRATION ISOLATORS & WIND RESTRAINTS.
  - PROVIDE 2" THICK MERV 8 & MERV 13 THROW AWAY FILTERS IN OUTDOOR AIR AND MIXED AIR STREAM.



**CONTROL ABBREVIATIONS**

- AFS AIR FLOW SWITCH - DI TO LOCAL CONTROLLER
- AI ANALOG INPUT
- AO ANALOG OUTPUT
- AO CO2 / AIR QUALITY SENSOR - AI TO LOCAL CONTROLLER
- BACNET COMMUNICATION TO BACNET NETWORK FOR CONTROL AND MONITORING WHERE AVAILABLE
- BOILER DO, (2) DI, AO TO LOCAL CONTROLLER
- CHILLER DO, DI, AO TO LOCAL CONTROLLER
- CR CURRENT RELAY - DI TO LOCAL CONTROLLER
- DA DAMPER ACTUATOR - AO FROM LOCAL CONTROLLER
- DI DIGITAL INPUT
- DO DIGITAL OUTPUT
- DPT DIFFERENTIAL PRESSURE TRANSMITTER - AI TO LOCAL CONTROLLER
- ES END SWITCH - DI TO LOCAL CONTROLLER / HARD WIRED
- F FLOW METER
- FSN FLOW SENSOR - AI TO LOCAL CONTROLLER
- FZ FREEZE/STAT - DI TO LOCAL CONTROLLER / HARD WIRED
- HS HUMIDITY SENSOR - AI TO LOCAL CONTROLLER
- LD LEAK DETECTOR - DI TO LOCAL CONTROLLER
- PT PRESSURE TRANSMITTER - AI TO LOCAL CONTROLLER
- R RELAY - DO FROM LOCAL CONTROLLER
- RPS ROOM PRESSURE SENSOR - AI LOCAL CONTROLLER
- RS SPACE TEMPERATURE SENSOR - (2) AI, DI TO LOCAL CONTROLLER
- SD SMOKE DETECTOR - DI TO LOCAL CONTROLLER / HARD WIRED
- TS TEMPERATURE SENSOR - AI TO LOCAL CONTROLLER
- VA VALVE ACTUATOR - AO FROM LOCAL CONTROLLER
- VAV VARIABLE AIR VOLUME - AO, AI TO LOCAL CONTROLLER
- VFD VARIABLE FREQUENCY DRIVE - DO, DI, AO TO LOCAL CONTROLLER

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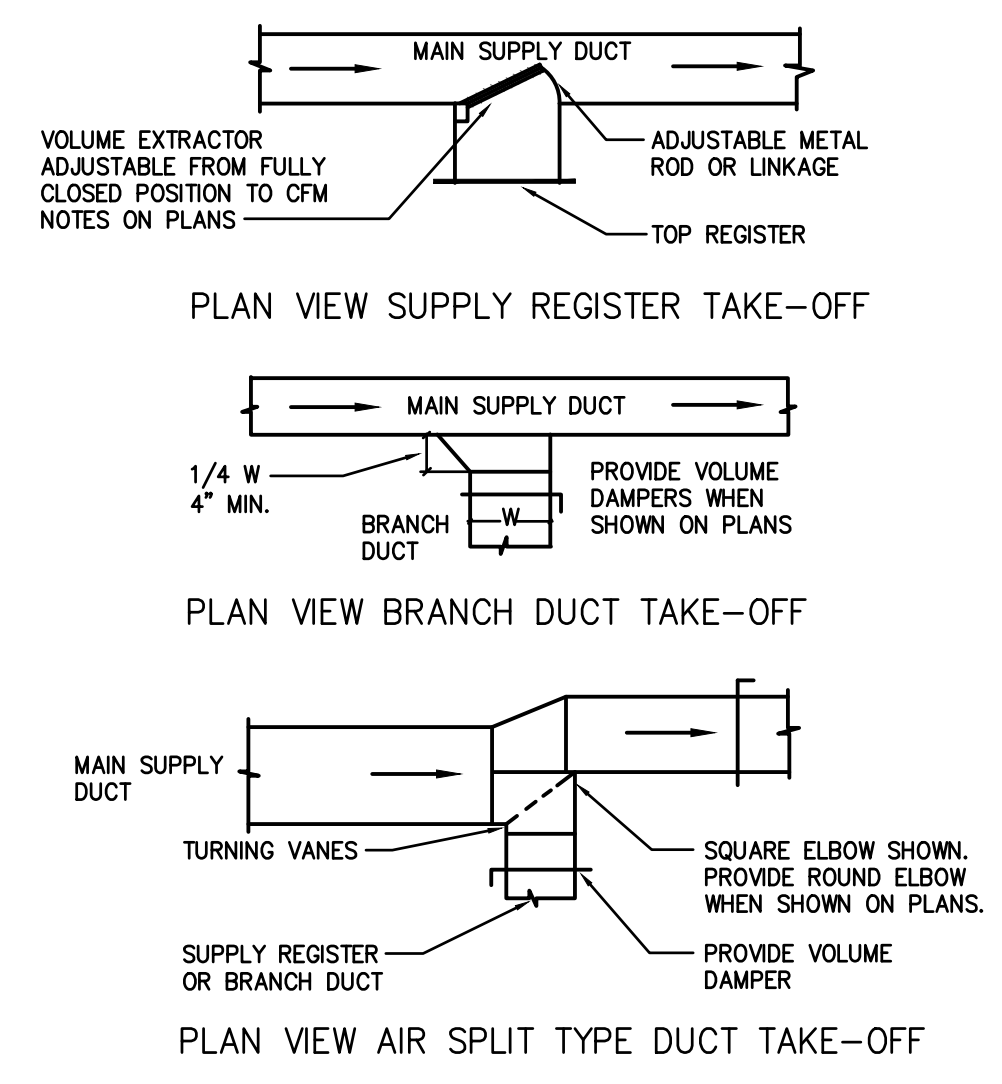
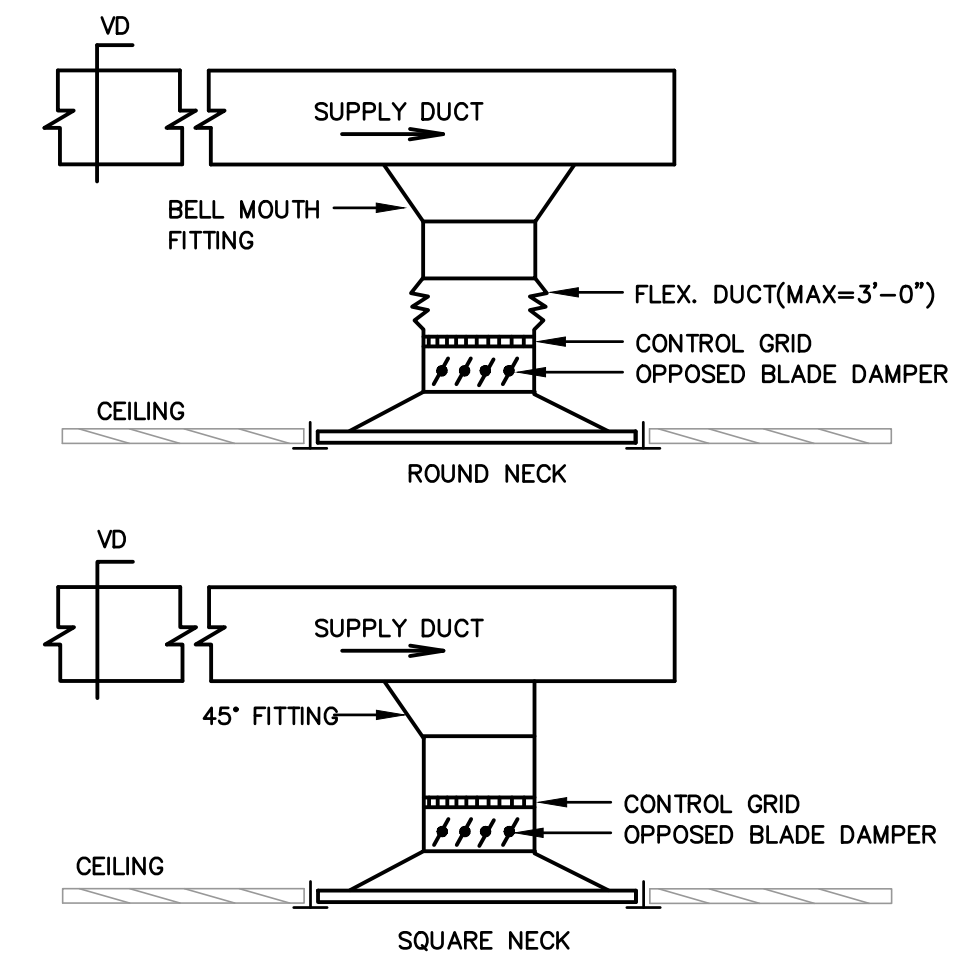
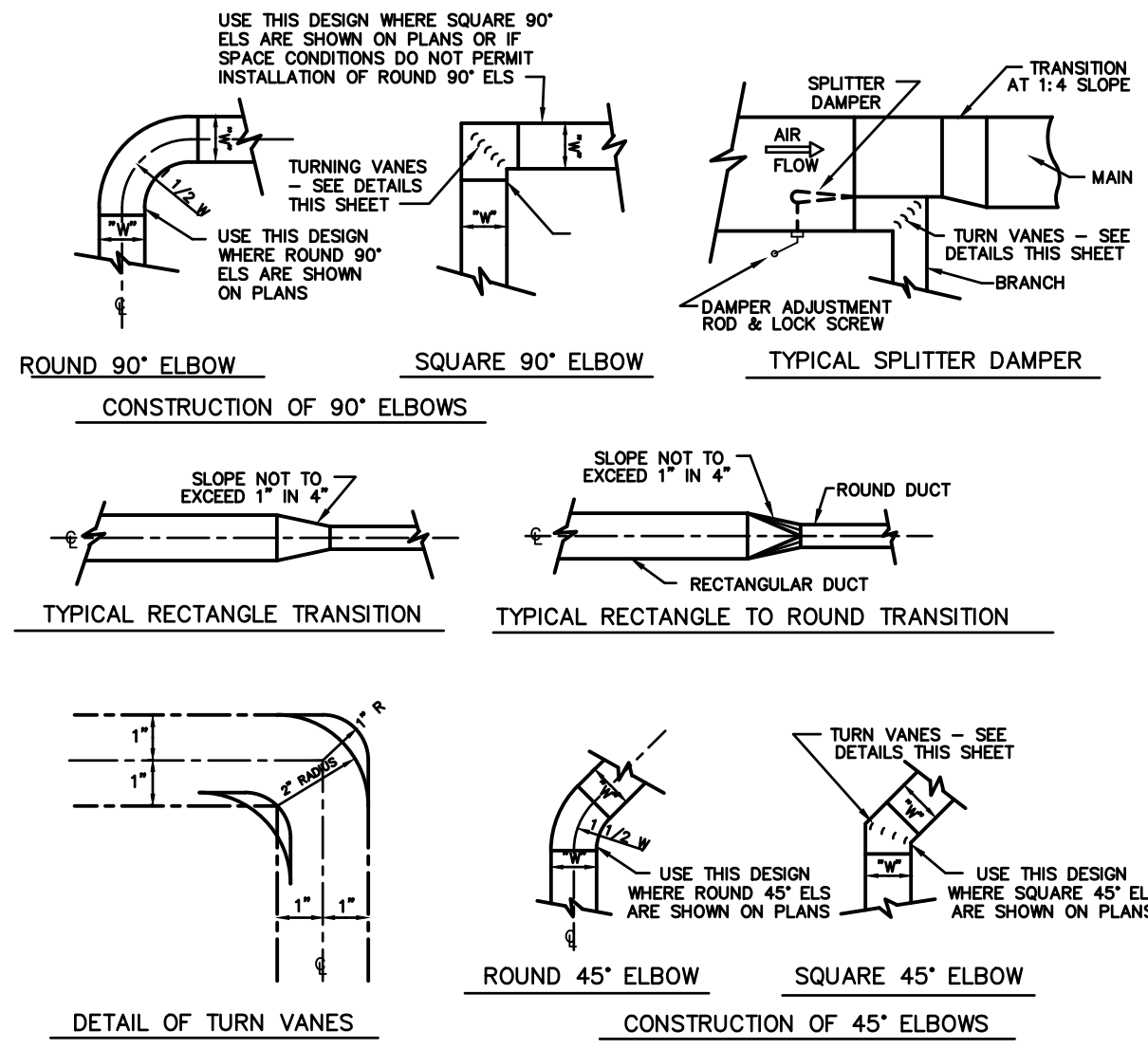
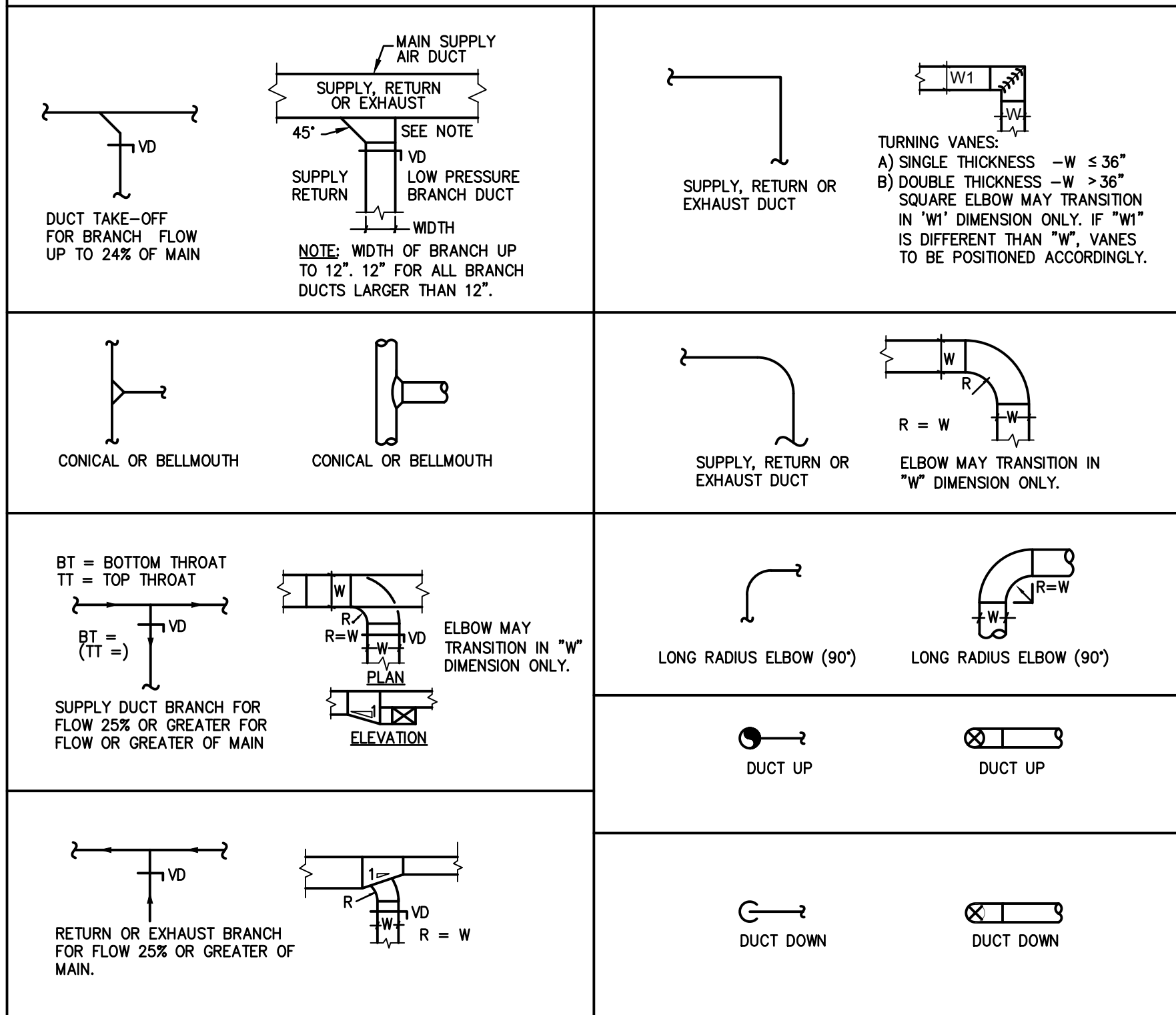
SHEET TITLE: **ABBREVIATIONS, SYMBOLS, CONTROLS AND SCHEDULES- HVAC**

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**H200**

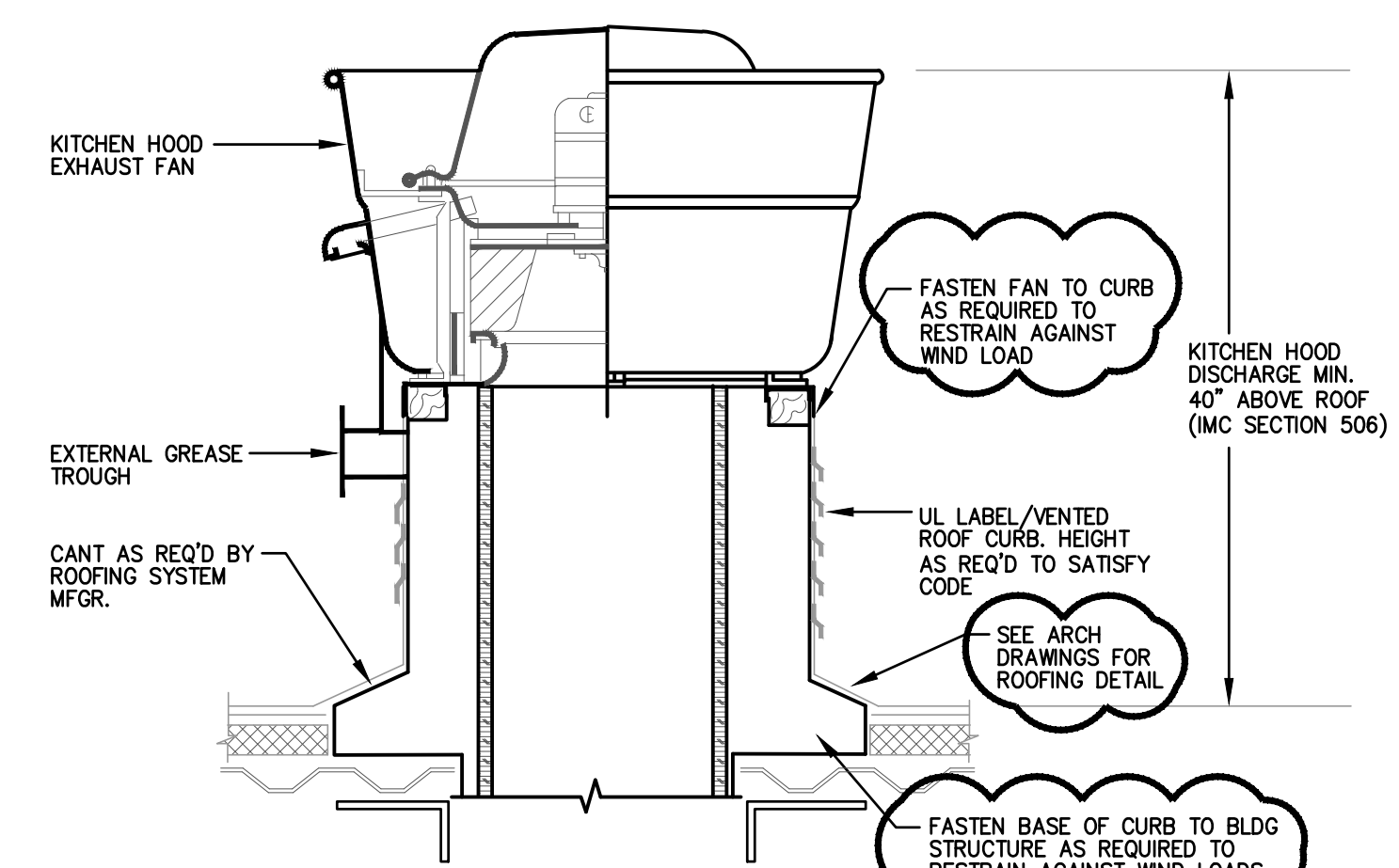
**TYPICAL DUCTWORK DETAILS**



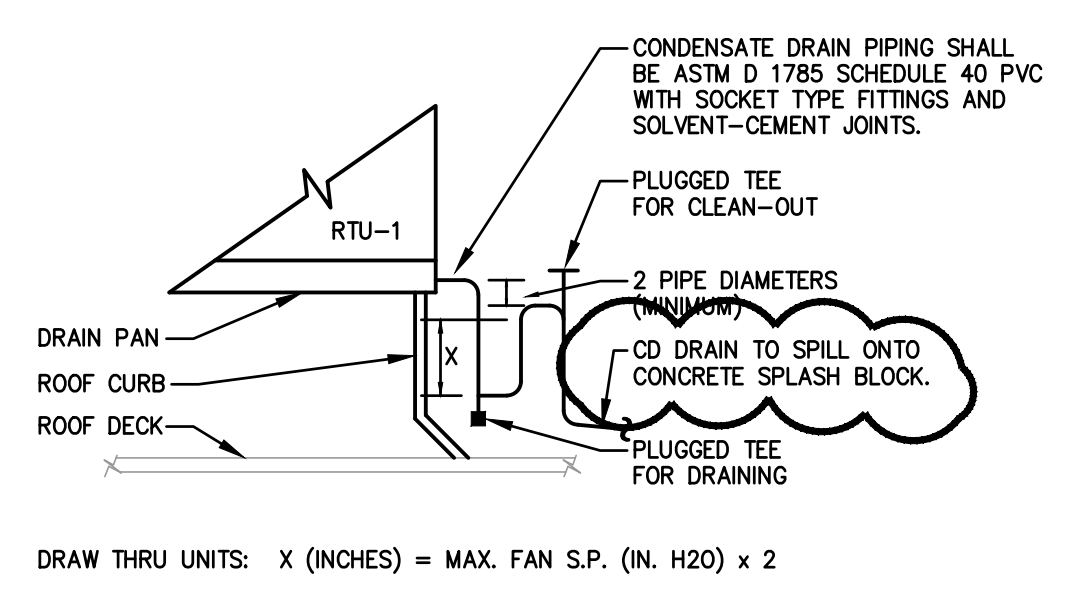
**1 DUCTWORK DETAILS**  
H300 NOT TO SCALE

**2 CEILING DIFFUSER TAKE-OFF**  
H300 NOT TO SCALE

**3 SUPPLY DUCT TAKE-OFF DETAIL**  
H400 NOT TO SCALE

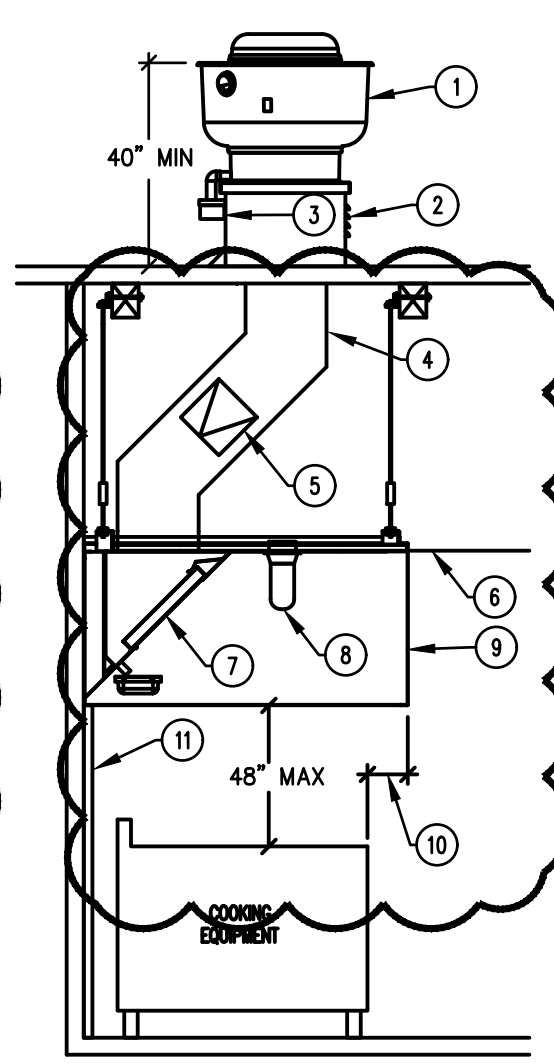


**4 KITCHEN HOOD EXHAUST FAN DETAIL**  
H300 NOT TO SCALE

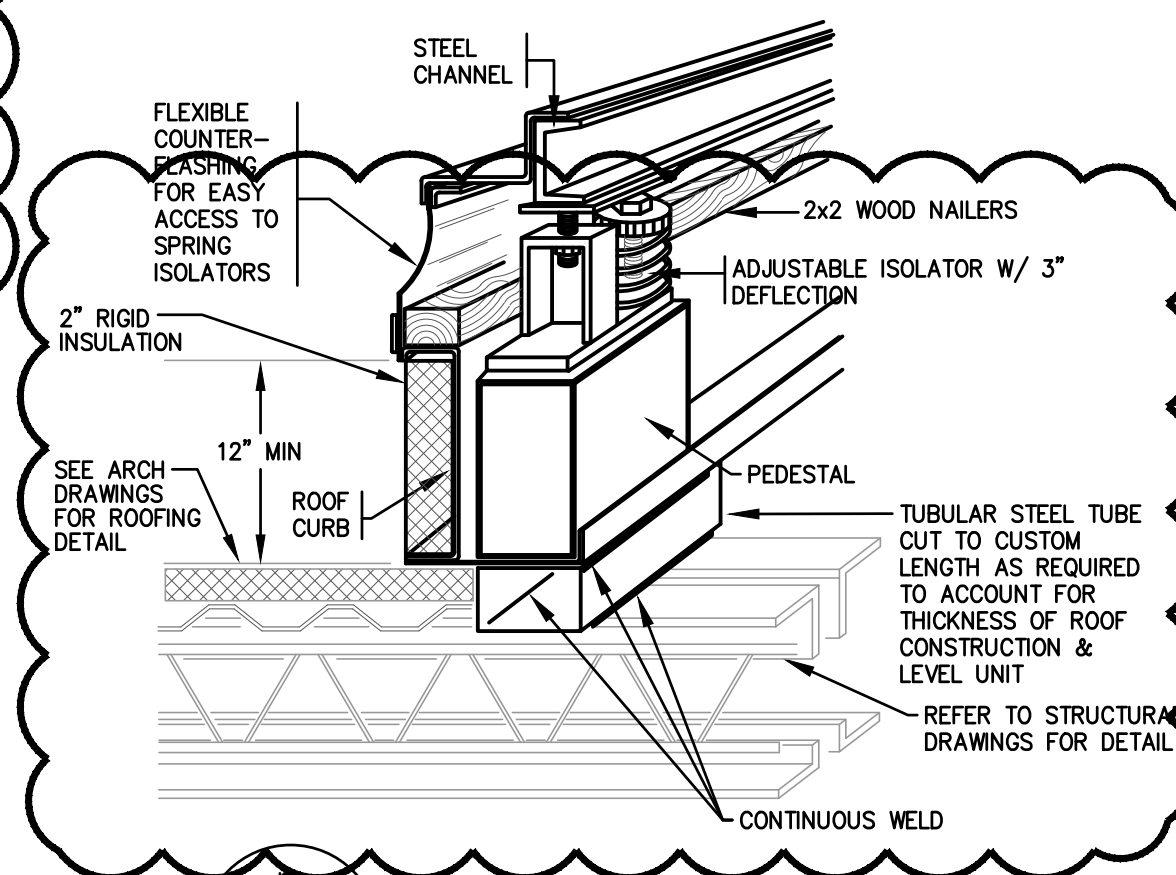


**5 DRAIN CONNECTION AT RTU COOLING COIL DETAIL**  
H300 NOT TO SCALE

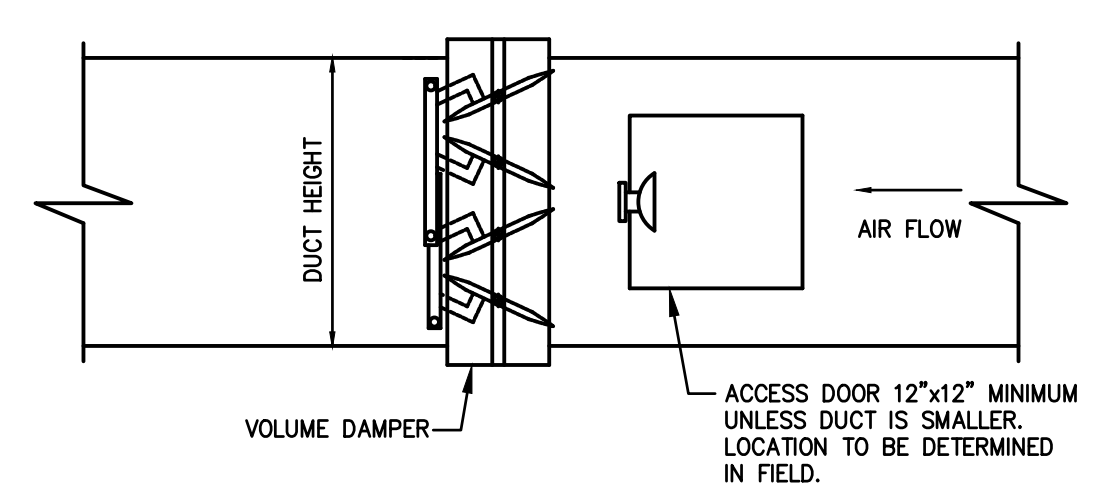
- KEYED NOTES:**
- KITCHEN EXHAUST FAN, TERMINATE MIN. 10'-0" FROM ADJACENT BUILDING, PROPERTY LINE, AIR INTAKES AND 10'-0" ABOVE ADJOINING GRADE.
  - VENTED DUCT EXTENSION.
  - GREASE TROUGH
  - GREASE DUCT UP TO EXHAUST FAN, SLOPE MIN. 1/4" PER LINEAR FOOT TO HOOD.
  - CLEANOUT DOOR IN DUCT SHALL BE SLIDING OR HINGED.
  - CEILING, SEE ARCHITECTURAL PLANS.
  - GREASE FILTERS WITH DRAIN.
  - HOOD LIGHTING.
  - STAINLESS STEEL TYPE 1 HOOD, MAINTAIN MIN. 18" CLEARANCE FROM COMBUSTIBLE, MIN. 3" CLEARANCE FROM 1-HR FIRE PROTECTED COMBUSTIBLES.
  - HOOD SHALL OVERHANG COOKING SURFACE MIN. 6" ON ALL OPEN SIDES. SEE ARCH DWGS FOR PROPOSED APPLIANCE LAYOUT
  - FULL HEIGHT 22 GA. STAINLESS STEEL BACKSPLASH BENEATH FULL LENGTH OF HOOD FINISH TO MATCH HOOD.



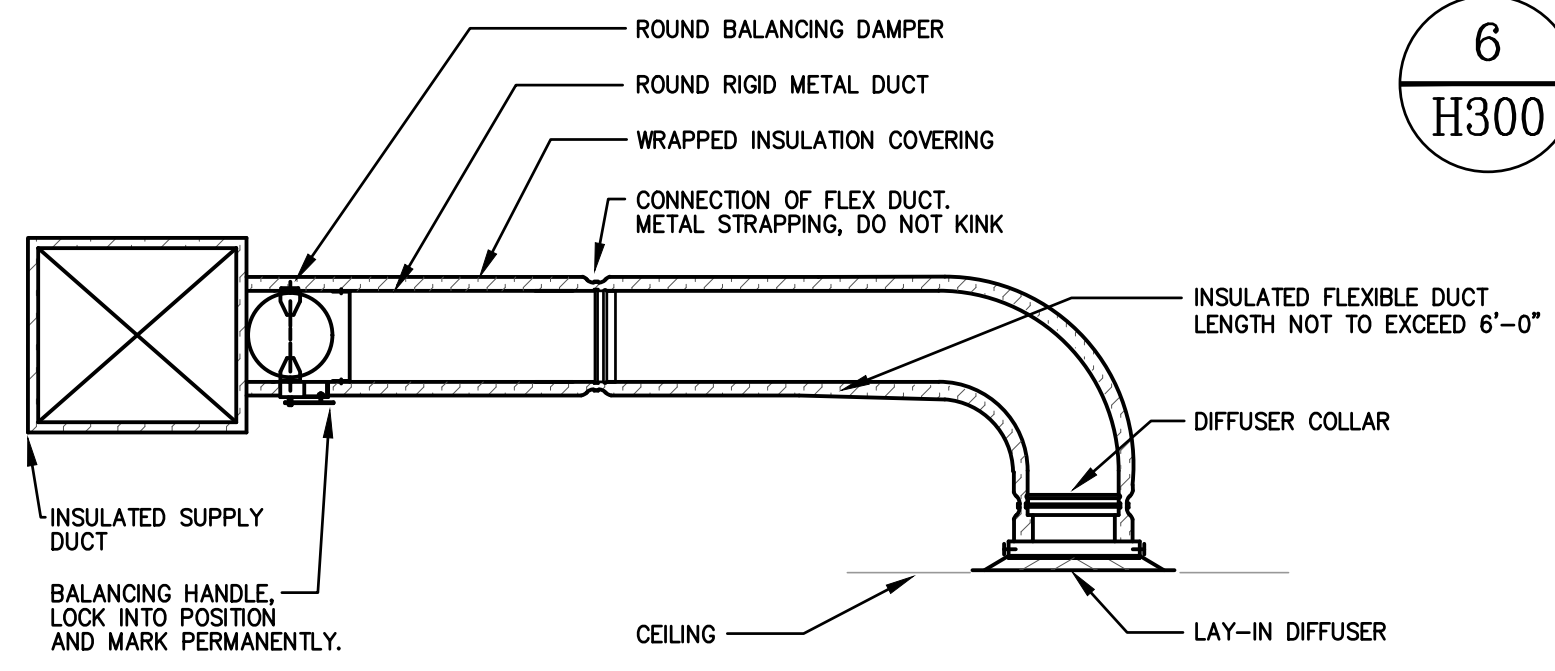
**6 KITCHEN HOOD DETAIL**  
H300 NOT TO SCALE



**7 ROOF CURB DETAIL**  
H300 NOT TO SCALE

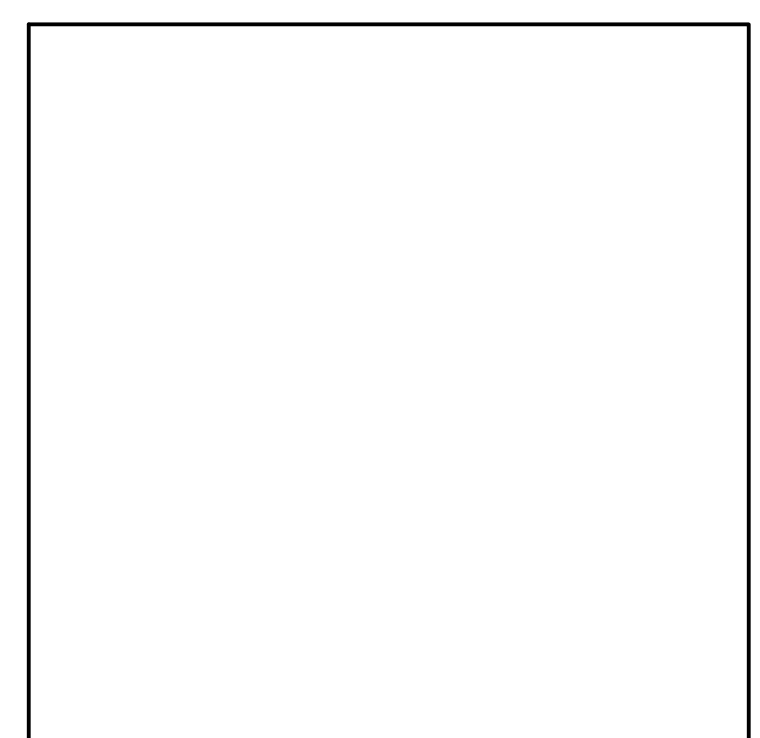


**8 VOLUME DAMPER DETAIL**  
H300 NOT TO SCALE



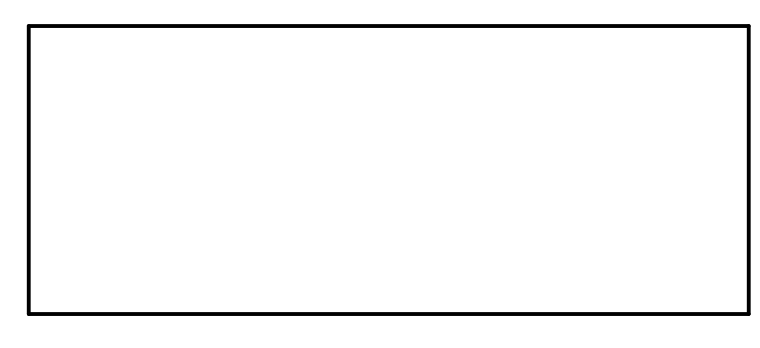
- NOTES:**
- PROVIDE AT FLEXIBLE DUCT CONNECTION METAL OR "PANDUIT" DRAWBAND ON THE INTERIOR FLEXIBLE DUCT HELIX. SECURE THE INSULATION OVER THE DRAW BAND WITH AN ADDITIONAL DRAWBAND.
  - PROVIDE BEADING ON ROUND METAL DUCT 12" OR LARGER IN DIAMETER.
  - PROVIDE MINIMUM 2" COLLARS FOR ATTACHMENT OF THE FLEX DUCT TO ROUND DUCT, DAMPERS AND DIFFUSERS.
  - BAND RIGID ROUND DUCT INSULATION TO DUCT AND PROVIDE TAPE FOR INSULATION OVERLAP.

**9 DIFFUSER DUCT CONNECTION**  
H300 NOT TO SCALE



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**NJDOE SP #07-2670-005-21-1000**

PROJECT TITLE:  
**CULINARY ARTS CLASSROOM ALTERATION**

ADDRESS:  
**LINDENWOLD HIGH SCHOOL  
BLOCK 244, LOT 3  
801 EGG HARBOR ROAD  
LINDENWOLD, NJ 08021**

PROJECT NO.: 5713G

REVISION DATE: 23 FEB 2024

DRAWING DATE: 15 JAN 2024

PRINT DATE: 01/08/24

DRAWN BY: AK

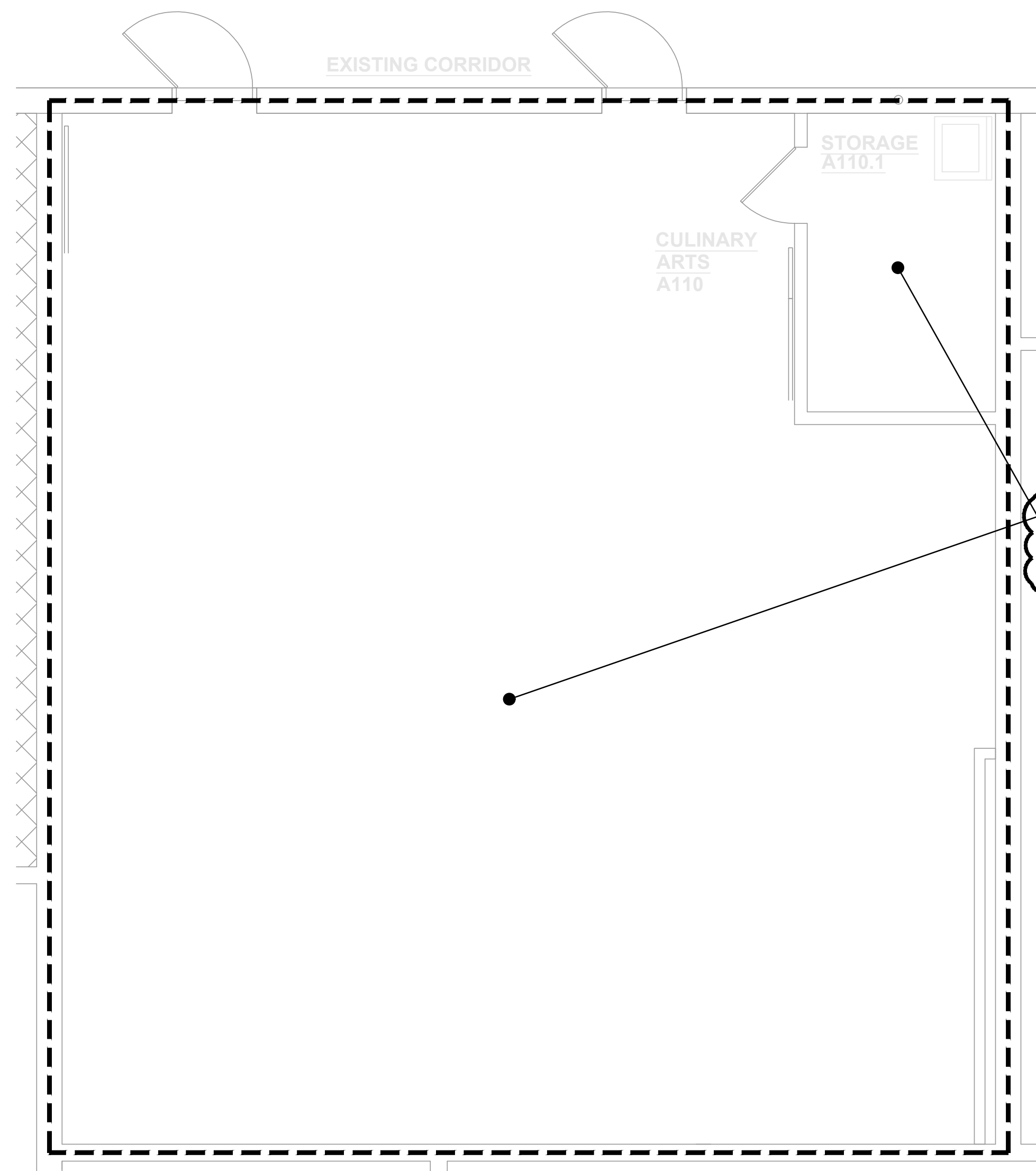
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February 22, 2024, 11:12:30 am  
Drawing: 3107-11-300.dwg

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**H300**

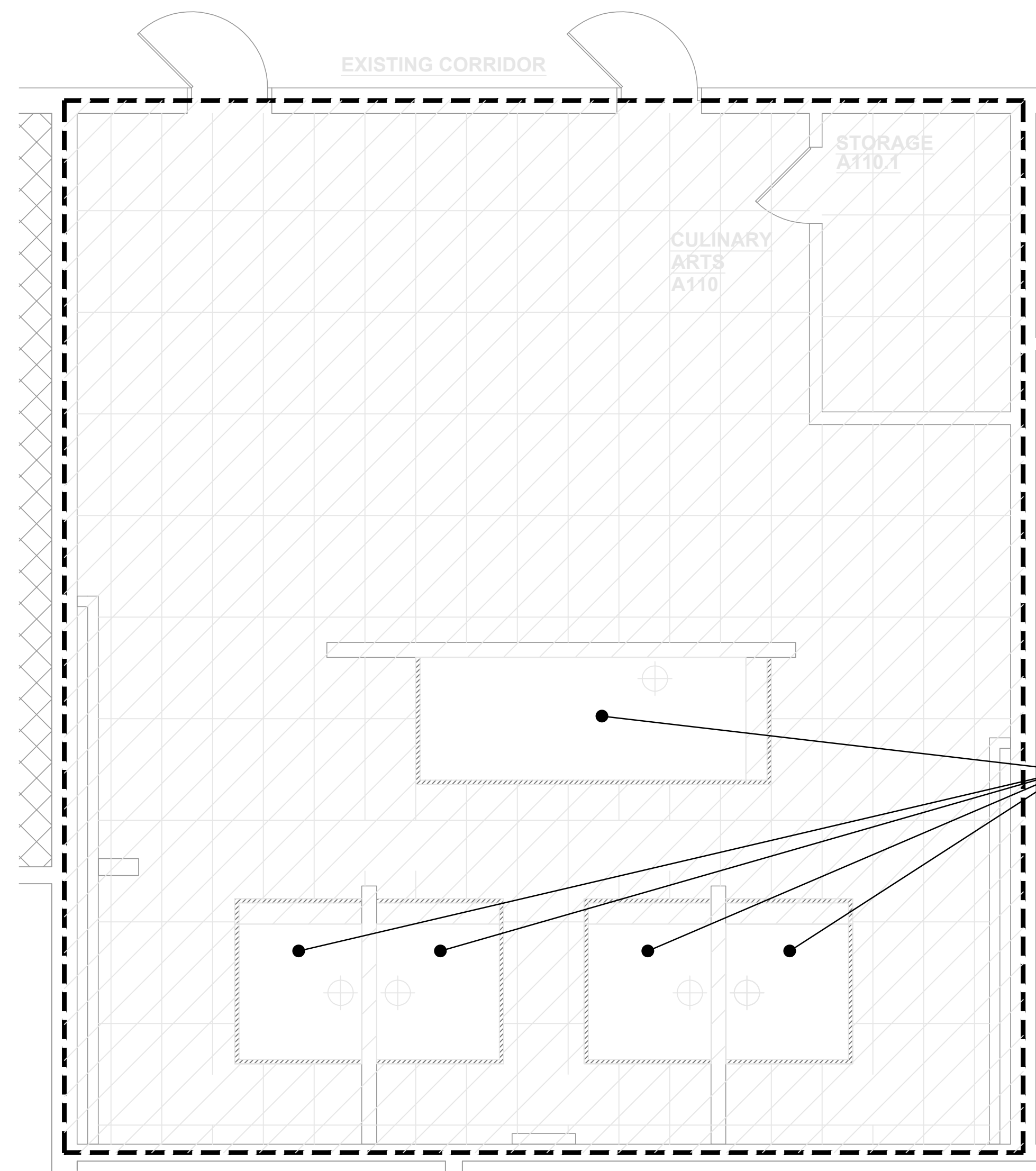


**1 PARTIAL FIRST FLOOR DEMOLITION PLAN - FIRE PROTECTION**

FP100 SCALE 1/4" = 1'-0"

**NOTES:**

1. CONTRACTOR SHALL SCHEDULE AND COORDINATE SPRINKLER DEMOLITION AND INSTALLATION TO MINIMIZE SHUT-DOWN TIME.
2. CONTRACTOR SHALL NOT INTERRUPT ANY OF THE SERVICES OF THE EXISTING BUILDING, NOR INTERFERE WITH THE SERVICES IN ANY WAY WITHOUT WRITTEN PERMISSION OF THE OWNER. SUCH INTERRUPTIONS AND INTERFERENCES SHALL BE MADE AS BRIEF AS POSSIBLE AND ONLY AT THE DESIGNATED TIMES. CONTRACTOR SHALL PROVIDE FIRE WATCH AT ALL TIMES FIRE PROTECTION SYSTEM IS OFFLINE.
3. NO EXISTING REMOVED PIPING AND SPRINKLER HEADS SHALL BE REUSED. ALL REMOVED PIPING, SPRINKLER HEADS, ETC., SHALL BE TURNED OVER TO OWNER OR DISPOSED OF AS DIRECTED. NO REMOVED MATERIALS SHALL BE REMOVED FROM THE PREMISES WITHOUT WRITTEN APPROVAL.



**2 PARTIAL FIRST FLOOR PLAN - FIRE PROTECTION**

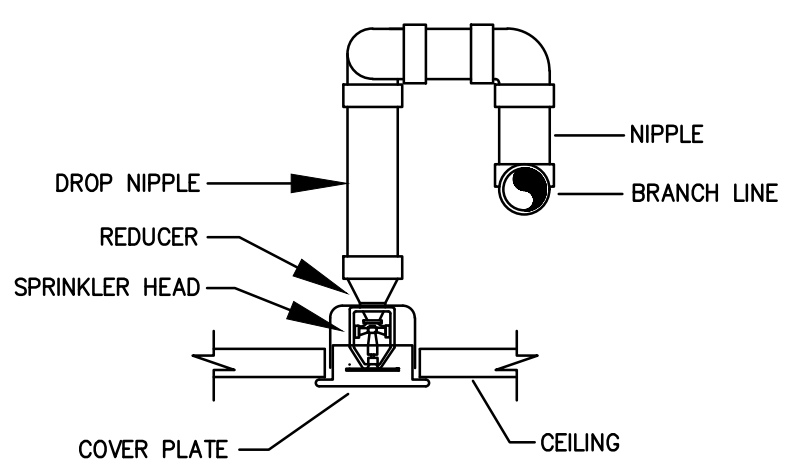
FP100 SCALE 1/4" = 1'-0"

**NOTES:**

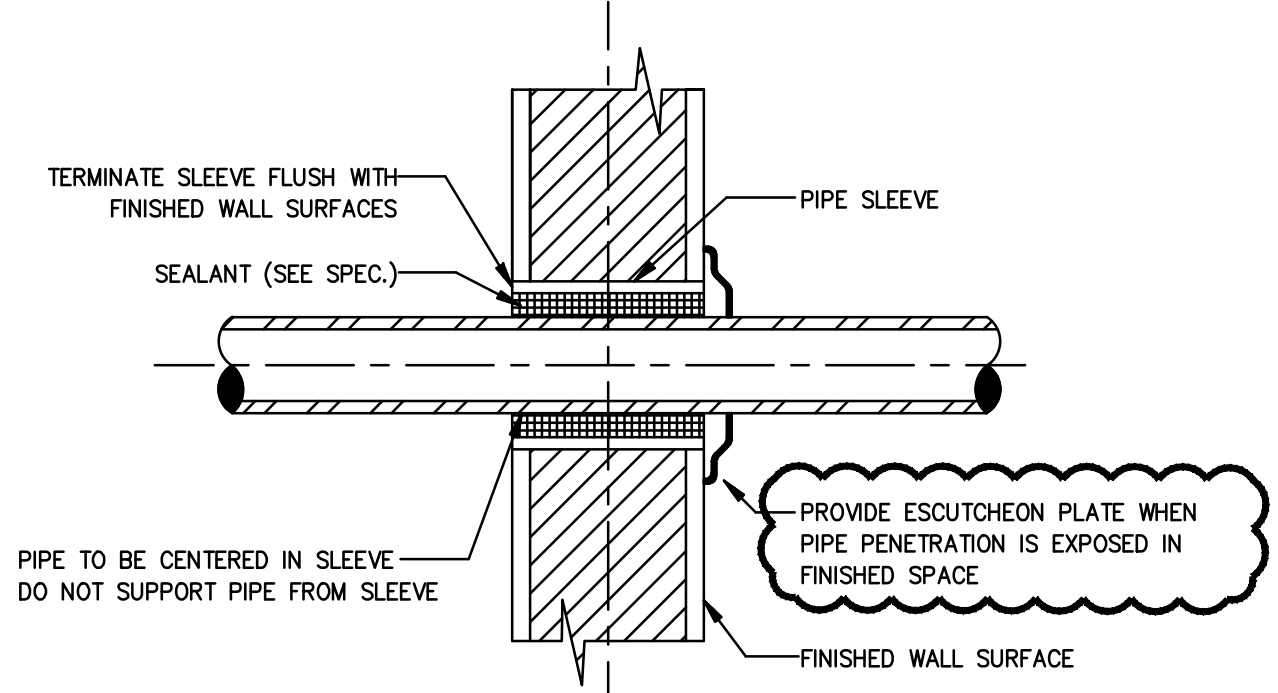
1. PROVIDE NEW CONCEALED TYPE SPRINKLER HEADS AS REQUIRED TO PROVIDE FULL SPRINKLER COVERAGE THROUGHOUT THE RENOVATED SPACE PER NFPA-13 (2019). SPRINKLER COVERAGE SHALL BE SUPPLIED FROM (E) MAIN WITH NEW BRANCH PIPING.
2. NEW SPRINKLER HEADS SHALL BE INSTALLED IN CENTER OF CEILING TILES.
3. ANSUL SYSTEMS SHALL BE INTERLOCKED WITH SOLENOID VALVE ON NATURAL GAS SUPPLY LOCATED ABOVE CEILING. ACTIVATION OF ANY ANSUL SYSTEM IN THE CLASSROOM SHALL CAUSE SOLENOID VALVE TO CLOSE, SHUTTING OFF NATURAL GAS SUPPLY TO ALL APPLIANCES IN THE CLASSROOM. REFER TO HVAC AND ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION.

**AREA OF SPRINKLER CALCULATION:**  
 LOCATION: AS INDICATED  
 SQUARE FEET PER SPRINKLER HEAD = 130  
 DENSITY = 0.15 OVER 1,500 SQ. FT.  
 ORDINARY HAZARD GROUP 1  
 K - FACTOR = 5.6  
 TOTAL COMBINED HOSE STREAM ALLOWANCE = 250 G.P.M.  
 DESIGN BASED ON NFPA 13  
 SPRINKLER TYPE: ORDINARY OR INTERMEDIATE TEMPERATURE AS REQUIRED BY DISTANCE FROM HEAT SOURCE, RESPONSE TIME INDEX SHALL MATCH EXISTING SYSTEM  
 FIRE PROTECTION CONTRACTOR IS RESPONSIBLE FOR OBTAINING ACCURATE FLOW DATA

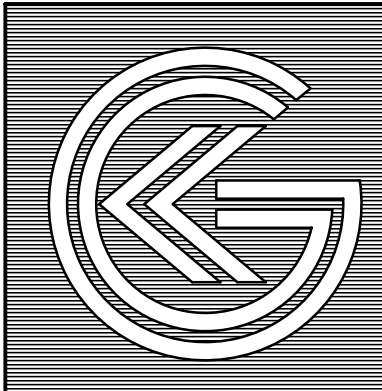
ANSUL SYSTEMS SHALL BE PROVIDED AS PART OF THE RANGE HOOD PACKAGE; REFER TO HVAC DRAWINGS/SPECIFICATIONS FOR ADDITIONAL INFORMATION



**3 CONCEALED TYPE SPRINKLER HEAD**  
 FP100 NOT TO SCALE



**4 PIPE SLEEVE THRU INTERIOR WALL**  
 FP100 NOT TO SCALE



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September 05, 2024, 8:05:13 AM  
 Drawing: J107 - 12-100.dwg

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**NJDOE SP #07-2670-005-21-1000**  
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 LINDENWOLD, NJ 08021

PROJECT NO.: 5713G

REVISION DATE: 23 FEB 2024

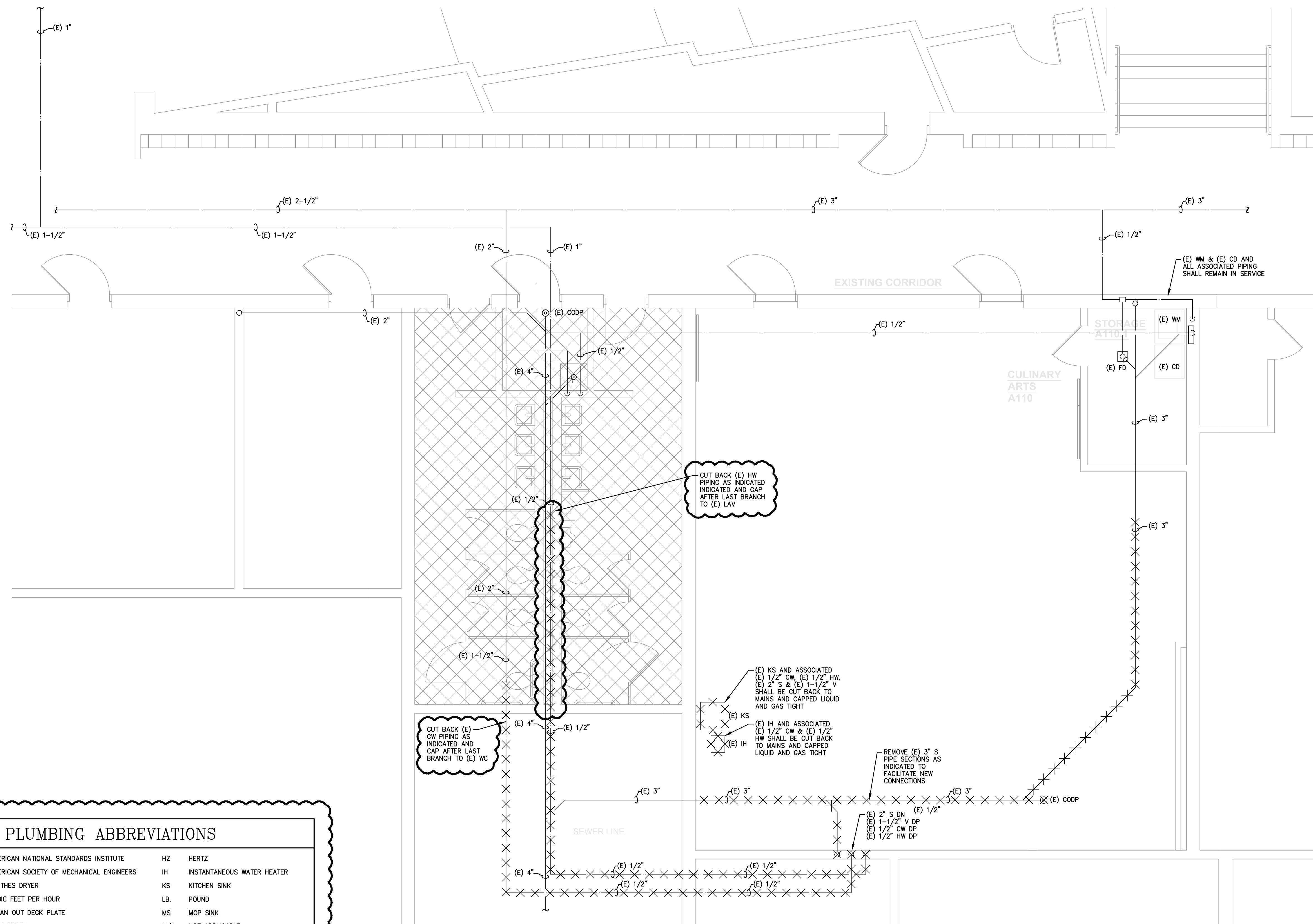
DRAWING DATE: 15 JAN 2024

PRINT DATE: 01/08/24

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SHEET TITLE: **PARTIAL FIRST FLOOR PLAN, NOTES & DETAILS - FIRE PROTECTION**

**FP100**



PLUMBING ABBREVIATIONS			
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	HZ	HERTZ
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS	IH	INSTANTANEOUS WATER HEATER
CD	CLOTHES DRYER	KS	KITCHEN SINK
CFH	CUBIC FEET PER HOUR	LB.	POUND
CODP	CLEAN OUT DECK PLATE	MS	MOP SINK
CW	COLD WATER	N/A	NOT APPLICABLE
DIA.	DIAMETER	PH	PHASE
DN	DOWN	PSI	POUNDS PER SQUARE INCH
DP	DROP	RPM	REVOLUTIONS PER MINUTE
(E)	EXISTING	S	SANITARY
FD	FLOOR DRAIN	SAN	SANITARY
FS	FLOOR SINK	SP	STANDPIPE
G	NATURAL GAS	UR	URINAL
GI	GREASE INTERCEPTOR	V	VENT
HP	HORSEPOWER	W.C.	INCHES OF WATER COLUMN
HW	HOT WATER	WM	CLOTHES WASHING MACHINE
HWR	HOT WATER RETURN		

**1 PARTIAL FIRST FLOOR DEMOLITION PLAN - PLUMBING**  
**P100** SCALE 1/4" = 1'-0"

- NOTES:
- SEE ARCHITECTURAL DRAWINGS FOR AREAS OF THAT REQUIRE OUTRIGHT REMOVAL AND REPLACEMENT OF SUSPENDED CEILINGS. CONTRACTOR SHALL BE RESPONSIBLE TO REMOVE AND REPLACE EXISTING CEILING TILES AND/OR CEILING GRID IN ALL OTHER AREAS, AS REQUIRED TO ACCESS WORK.
  - ALL EXISTING PIPE LOCATIONS ARE APPROXIMATE; CONTRACTOR SHALL FIELD VERIFY ALL PIPE LOCATIONS PRIOR TO COMMENCING WORK.
  - CUT AND PATCH ALL CONCRETE FLOORS, CMU, WALLS, AND FRAMED PARTITIONS AS REQUIRED AND FINISH TO MATCH ADJACENT SURFACES.

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 LINDENWOLD, NJ 08021

PROJECT NO.: 5713G

REVISION DATE: 23 FEB 2024

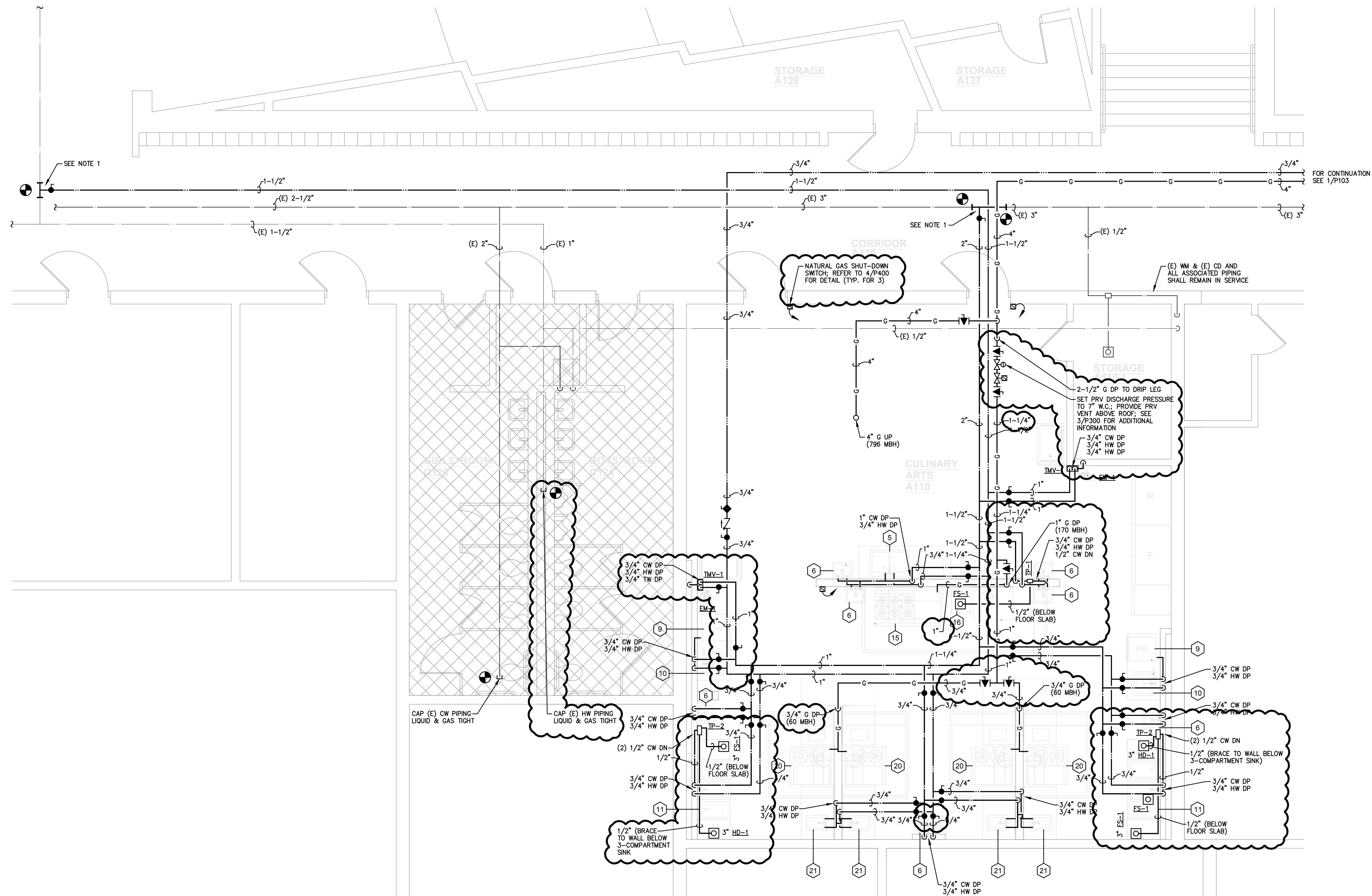
DRAWING DATE: 15 JAN 2024

PRINT DATE: 01/08/24

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SHEET TITLE: **PARTIAL FIRST FLOOR DEMOLITION PLAN - PLUMBING**

**P100**



**1** PARTIAL FIRST FLOOR NEW WORK PLAN - DOMESTIC WATER & NATURAL GAS - PLUMBING  
 P101 SCALE 1/4" = 1'-0"

- NOTES:**
- SHUT DOWN EXISTING DOMESTIC WATER SYSTEM, DRAIN, MAKE TIE-INS, FLUSH AND SANITIZE. PERFORM WORK CONTINUOUSLY WITHOUT INTERRUPTION, STARTING ON A FRIDAY MORNING AND COMPLETING BY SATURDAY NIGHT SO INSTALLATION IS READY FOR SERVICE MONDAY MORNING.
  - FOR CLARITY, NOT ALL PIPE SIZES ARE NECESSARILLY SHOWN; REFER TO RISER DIAGRAMS FOR ADDITIONAL INFORMATION.
  - ALL EXISTING PIPE LOCATIONS ARE APPROXIMATE; CONTRACTOR SHALL FIELD VERIFY ALL PIPE LOCATIONS PRIOR TO COMMENCING WORK.
  - CAREFULLY REMOVE, CLEAN, AND STORE SECTIONS OF CEILING FROM THE AREA OF WORK IN CORRIDOR SUFFICIENT TO ACCOMPLISH THE INSTALLATION OF NEW WORK. WHERE CEILING COMPONENTS ARE DAMAGED CONTRACTOR SHALL REPLACE IN KIND TO PROVIDE A UNIFORM APPEARANCE FULLY INTEGRATED WITH AND INDISTINGUISHABLE FROM THE EXISTING CEILING SYSTEM UPON COMPLETION.

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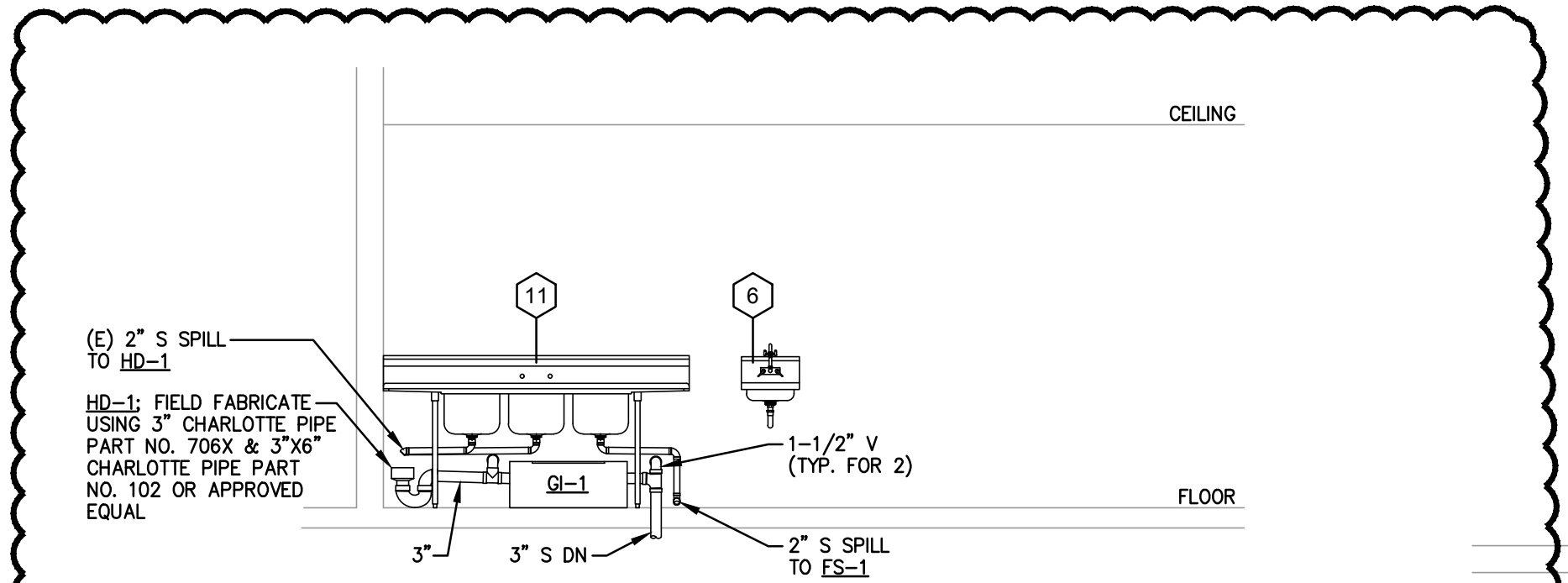
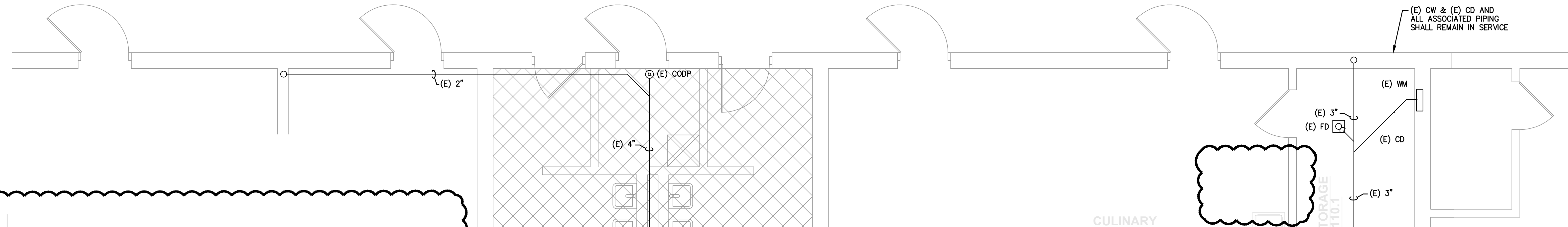
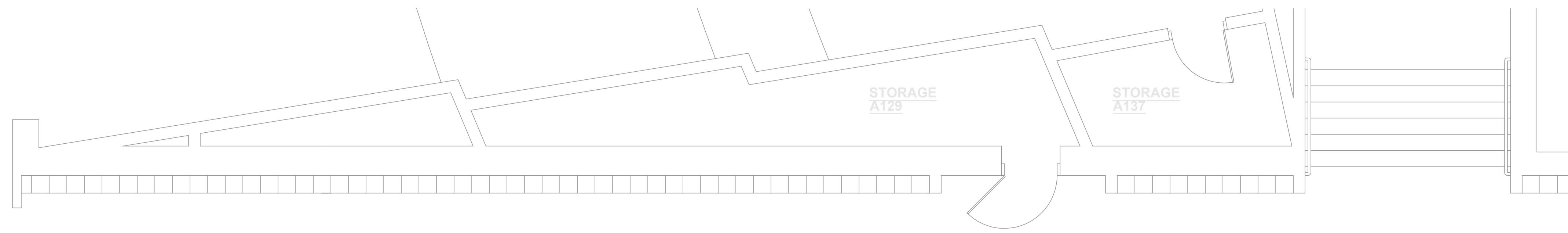
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 PRINT DATE: 01/08/24  
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 SHEET TITLE: PARTIAL FIRST FLOOR PLAN - DOMESTIC WATER & NATURAL GAS

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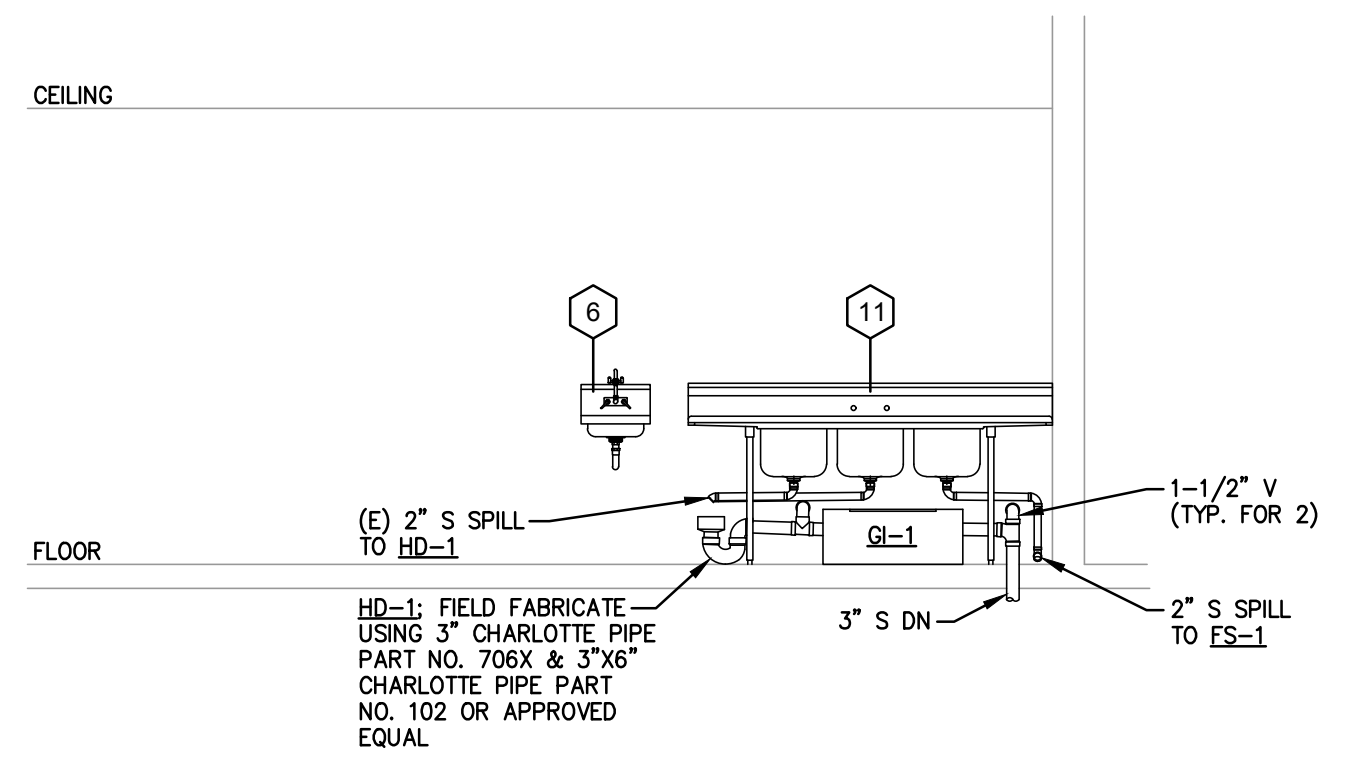
**P101**





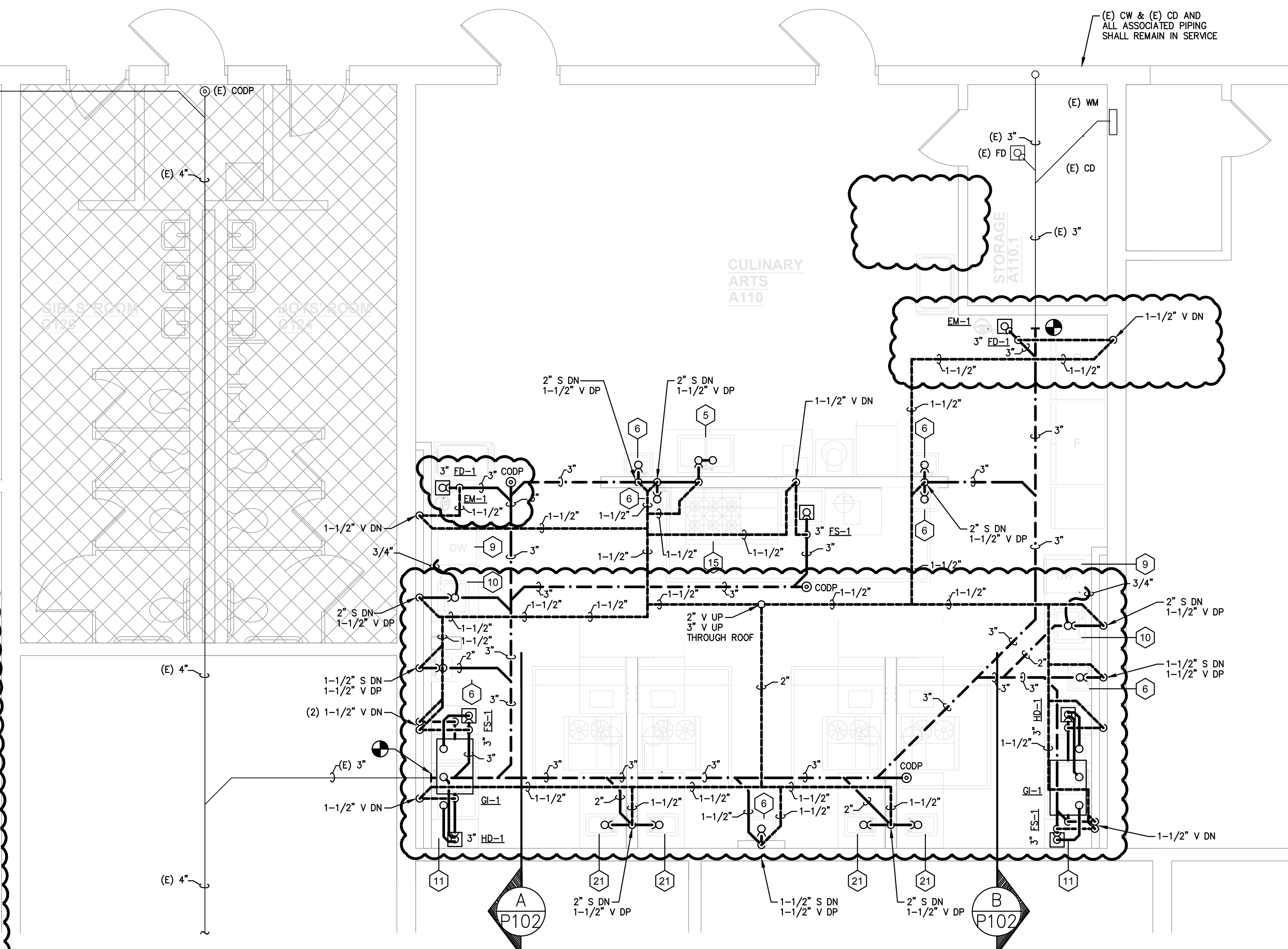
**A SECTION A - SANITARY & VENTING - PLUMBING**  
**P102** SCALE 1/4" = 1'-0"

NOTES:  
 1. ABOVE FLOOR DRAINAGE PIPING FOR GREASE INTERCEPTOR SHALL BE SOLID-WALL SCHEDULE 40 PVC WITH SOLVENT-WELDED JOINTS.



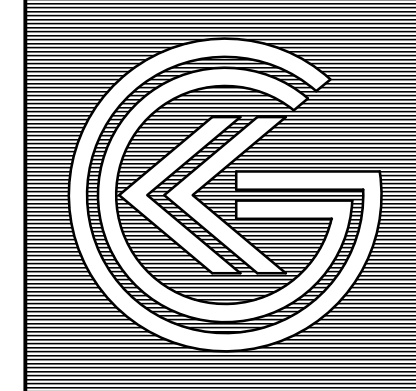
**B SECTION A - SANITARY & VENTING - PLUMBING**  
**P102** SCALE 1/4" = 1'-0"

NOTES:  
 1. ABOVE FLOOR DRAINAGE PIPING FOR GREASE INTERCEPTOR SHALL BE SOLID-WALL SCHEDULE 40 PVC WITH SOLVENT-WELDED JOINTS.



**1 PARTIAL FIRST FLOOR NEW WORK PLAN - SANITARY & VENTING - PLUMBING**  
**P102** SCALE 1/4" = 1'-0"

NOTES:  
 1. SHUT DOWN EXISTING DOMESTIC WATER SYSTEM, DRAIN, MAKE TIE-INS, FLUSH AND SANITIZE. PERFORM WORK CONTINUOUSLY WITHOUT INTERRUPTION, STARTING ON A FRIDAY MORNING AND COMPLETING BY SATURDAY NIGHT SO INSTALLATION IS READY FOR SERVICE MONDAY MORNING.  
 2. FOR CLARITY, NOT ALL PIPE SIZES ARE NECESSARILLY SHOWN; REFER TO RISER DIAGRAMS FOR ADDITIONAL INFORMATION.  
 3. ALL EXISTING PIPE LOCATIONS ARE APPROXIMATE; CONTRACTOR SHALL FIELD VERIFY ALL PIPE LOCATIONS PRIOR TO COMMENCING WORK.



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**NJDOE SP #07-2670-005-21-1000**  
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**CULINARY ARTS CLASSROOM ALTERATION**

ADDRESS:  
**LINDENWOLD HIGH SCHOOL**  
**BLOCK 244, LOT 3**  
 801 EGG HARBOR ROAD  
 LINDENWOLD, NJ 08021

PROJECT NO.: 5713G

REVISION DATE: 23 FEB 2024

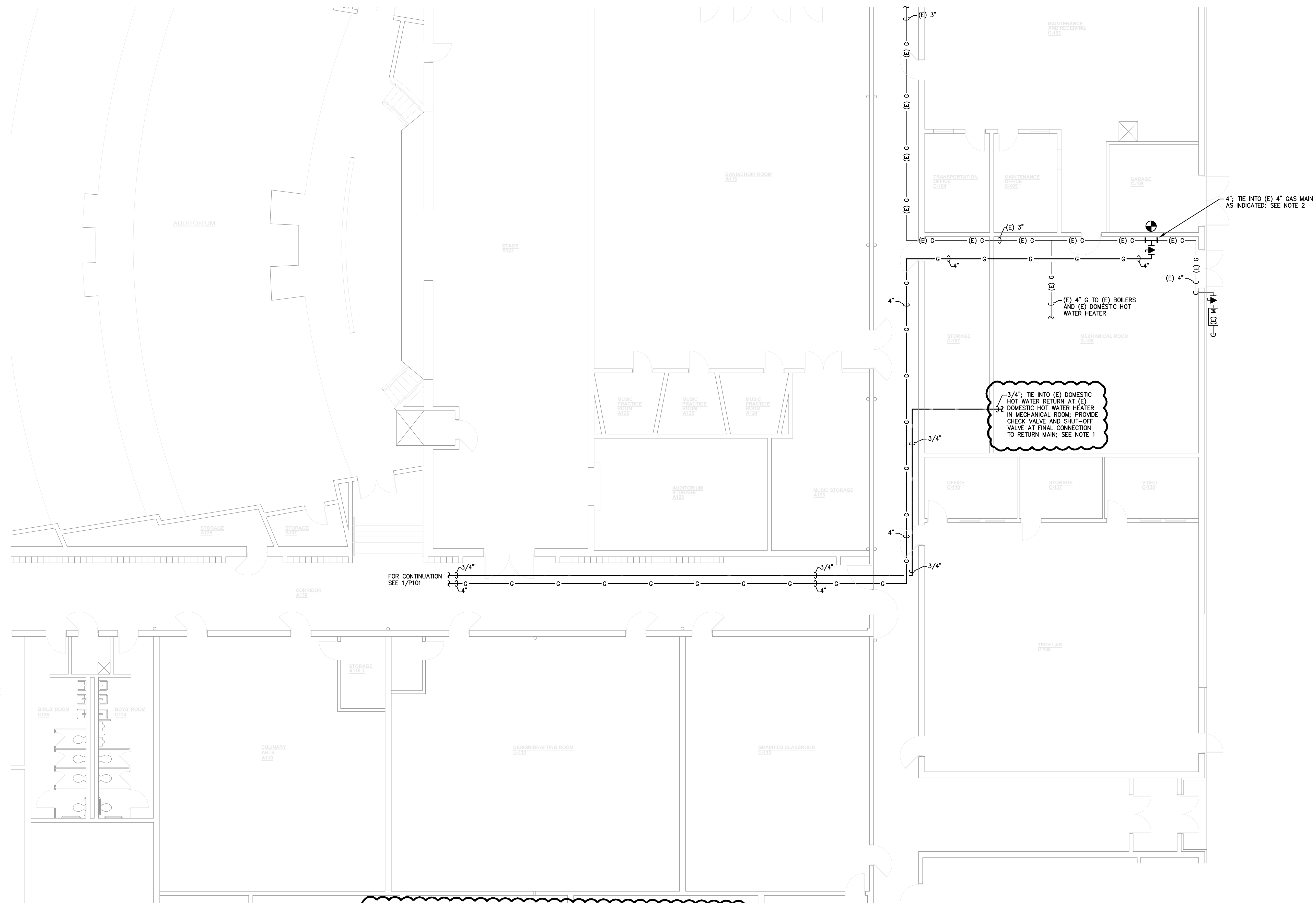
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SHEET TITLE: **PARTIAL FIRST FLOOR PLAN - SANITARY AND VENTING - PLUMBING**

**P102**



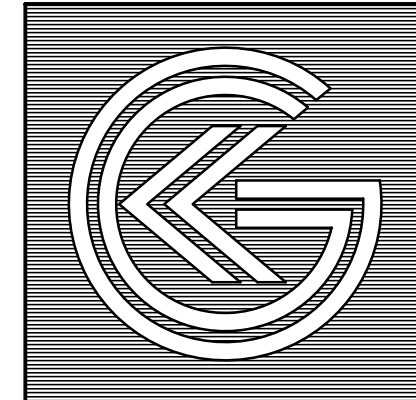
**1**  
**P103 PARTIAL FIRST FLOOR PLAN - PLUMBING**  
 SCALE 1/8" = 1'-0"  
 NOTES:  
 1. SHUT DOWN EXISTING DOMESTIC WATER SYSTEM, DRAIN, MAKE TIE-INS, FLUSH AND SANITIZE. PERFORM WORK CONTINUOUSLY WITHOUT INTERRUPTION, STARTING ON A FRIDAY MORNING AND COMPLETING BY SATURDAY NIGHT SO INSTALLATION IS READY FOR SERVICE MONDAY MORNING.  
 2. SHUT DOWN EXISTING NATURAL GAS SYSTEM, PURGE, AND MAKE TIE-INS. PERFORM WORK CONTINUOUSLY WITHOUT INTERRUPTION, STARTING ON A FRIDAY MORNING AND COMPLETING BY SATURDAY NIGHT SO INSTALLATION IS READY FOR SERVICE MONDAY MORNING.  
 3. CAREFULLY REMOVE, CLEAN, AND STORE SECTIONS OF CEILING FROM THE AREA OF WORK IN CORRIDOR SUFFICIENT TO ACCOMPLISH THE INSTALLATION OF NEW WORK. WHERE CEILING COMPONENTS ARE DAMAGED CONTRACTOR SHALL REPLACE IN KIND TO PROVIDE A UNIFORM APPEARANCE FULLY INTEGRATED WITH AND INDISTINGUISHABLE FROM THE EXISTING CEILING SYSTEM UPON COMPLETION.

3/4" TIE INTO (E) DOMESTIC HOT WATER RETURN AT (E) DOMESTIC HOT WATER HEATER IN MECHANICAL ROOM; PROVIDE CHECK VALVE AND SHUT-OFF VALVE AT FINAL CONNECTION TO RETURN MAIN; SEE NOTE 1

4" TIE INTO (E) 4" GAS MAIN AS INDICATED; SEE NOTE 2

FOR CONTINUATION SEE 1/P101

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 DRAWING: 3/107 - 12-102024



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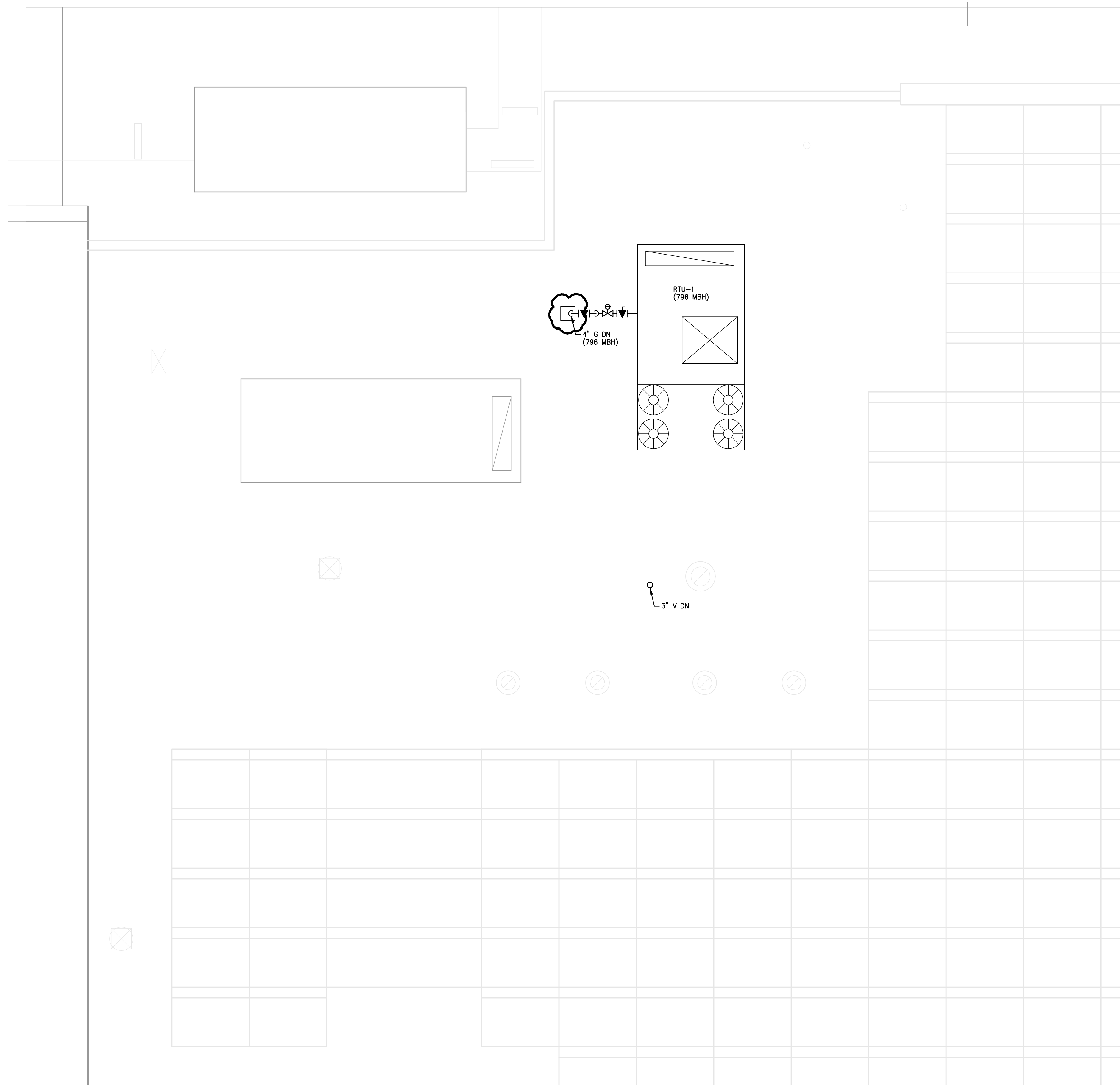
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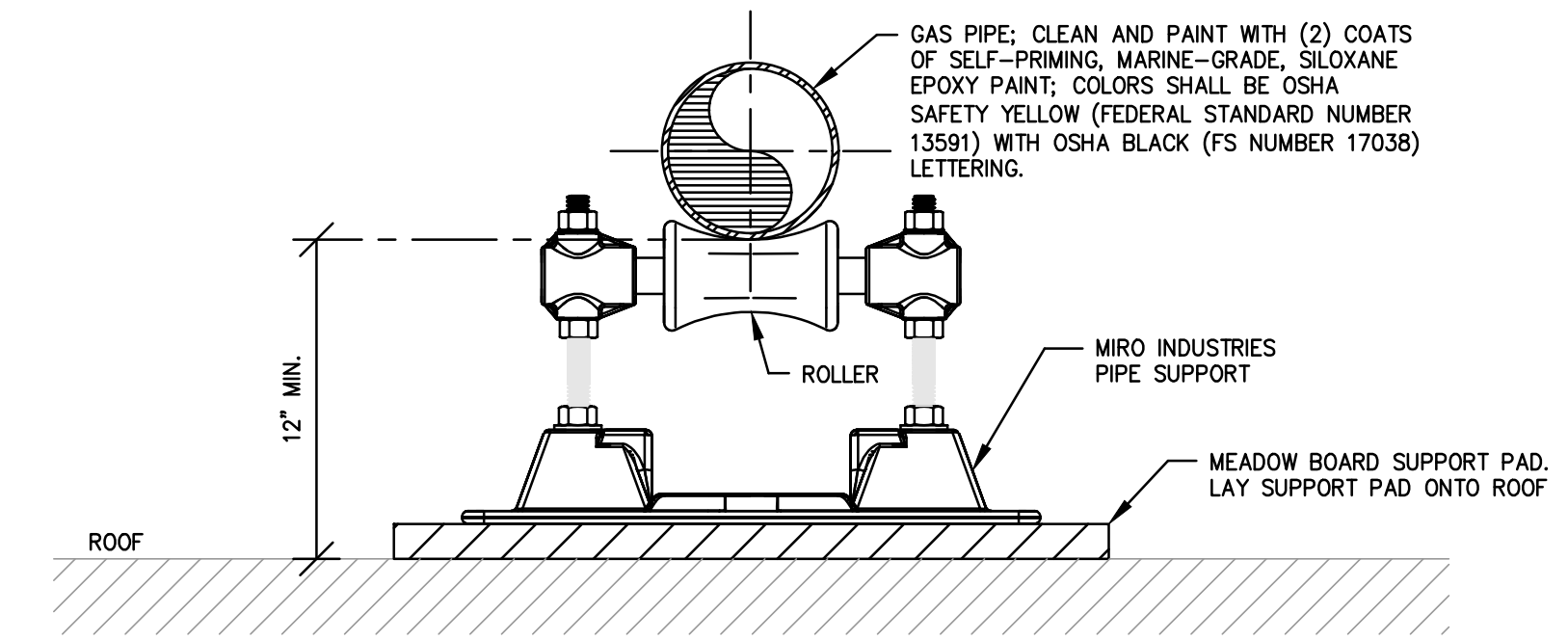
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SHEET TITLE: PARTIAL FIRST FLOOR PLAN - PLUMBING

**P103**

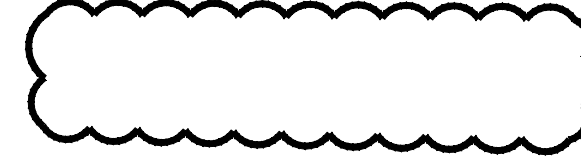


**1** PARTIAL ROOF NEW WORK PLAN – NATURAL GAS – PLUMBING  
 P104 SCALE 1/4" = 1'-0"

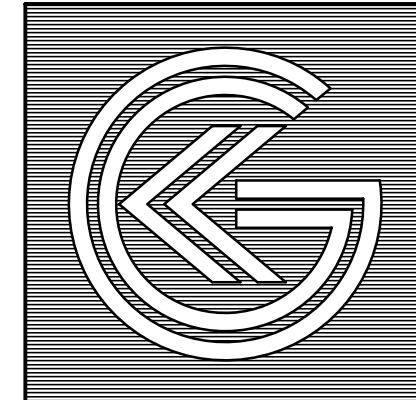


**2** ROOF-TOP GAS PIPE SUPPORT DETAIL  
 P104 NOT TO SCALE

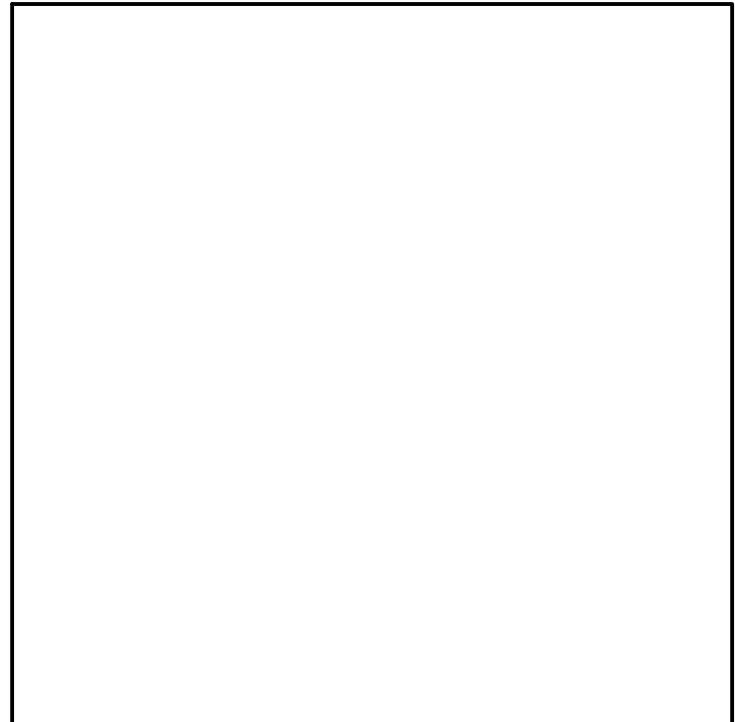
NOTES:  
 1. EVEN LOADING REQUIRED – LOAD SHALL NOT EXCEED 186 LBS.



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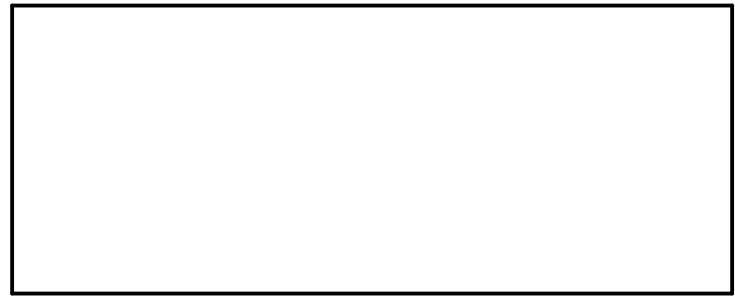


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SHEET TITLE: PARTIAL ROOF PLAN - PLUMBING

**P104**

PLUMBING SYMBOL LIST

ABBREVIATION	SYMBOL	DESCRIPTION	ABBREVIATION	SYMBOL	DESCRIPTION
CW		COLD WATER PIPING	GV		GATE VALVE
HW		HOT WATER PIPING	CV		CHECK VALVE
HWR		HOT WATER RETURN PIPING			BRANCH - TOP CONNECTION
T		TEMPERED WATER			BRANCH - BOTTOM CONNECTION
(E) CW		(E) COLD WATER PIPING			THERMOMETER
(E) HW		(E) HOT WATER PIPING	PS		PRESSURE SWITCH
V		VENT			NEW CONNECTION TO EXISTING
(E) V		(E) VENT	WHA		WATER HAMMER ARRESTOR
SAN		SOIL, WASTE, OR SANITARY SEWER	TV		HOT WATER TEMPERING VALVE
SAN		UNDERGROUND/BELOW SLAB SOIL, WASTE, OR SANITARY SEWER			TRAP
(E) SAN		(E) SOIL, WASTE OR SANITARY SEWER	CO		CLEANOUT
G		NATURAL GAS	FD		FLOOR/ROOF DRAIN
(E) G		(E) NATURAL GAS	COOP		CLEAN OUT DECK PLATE
		CAPPED OUTLET	PV		GAS PLUG VALVE
		VALVED & CAPPED OUTLET			GAS PRESSURE REGULATOR
BV		BALL VALVE	SV		SOLENOID VALVE AND REMOTE SHUT-OFF SWITCH
		BREAK OR CONTINUATION	EX		EXISTING PIPING TO BE REMOVED
DN, DP		PIPING DOWN, PIPING DROP			
		PIPING UP			
		VALVE ON VERTICAL			
		UNION			
FC		FLEXIBLE CONNECTION			
		HOT WATER RETURN BALANCING VALVE ASSEMBLY			

PLUMBING FLOOR DRAIN SCHEDULE

MARK	DESCRIPTION	MANUFACTURER MODEL	LOCATION	REMARKS
FD-1	GENERAL DRAIN	ZURN INDUSTRIES, INC. ZN-415-Y	TOILET ROOMS	C.I. BODY, SEDIMENT BUCKET, 3" OUTLET SIZE, 6" SQUARE TYPE S POLISHED NICKEL BRONZE STRAINER, PROVIDE TO ELASTOMETRIC WATERLESS TRAP GUARD SYSTEM (SEE PLUMBING SPECIALTIES SCHEDULE)
FS-1	FLOOR SINK	ZURN INDUSTRIES, INC. ZN-1910-P-8	TOOLS ROOM & GROUND'S ROOM	CAST IRON BODY WITH ACID RESISTANT PORCELAIN INTERIOR, SEDIMENT BUCKET, 3" OUTLET SIZE, 8" SQUARE TOP GRATE WITH HIGH OVAL FUNNEL, BOTTOM DOME STRAINER, 1/2" TRAP PRIMER CONNECTION

PLUMBING SPECIALTIES SCHEDULE

MARK	DESCRIPTION	MANUFACTURER MODEL	REMARKS
TG	WATERLESS TRAP GUARD	PROVENT TRAP GUARD	ELASTOMERIC, NORMALLY CLOSED TRAP GUARD DEVICE WHICH OPENS WHEN IN CONTACT WITH LIQUID, COMPLIES WITH WITH ANSI/ASME A112.6.3
TP-1	AUTOMATIC TRAP PRIMER	ZURN Z1022-XL	ALL BRONZE BODY WITH INTEGRAL VACUUM BREAKER, NON-LIMING INTERNAL OPERATING PISTON, STAINLESS STEEL SPRING, ANSI 1018 COMPLIANT
TP-2	ELECTRONIC TRAP PRIMER	ZURN Z1020-XL	FACTORY PROGRAMMED, 5-PORT, LEAD FREE, 1/2" COPPER INLET, BRASS BALL VALVE, 120V, BRASS VACUUM BREAKER
TV	POINT-OF-USE TEMPERING VALVE	LEONARD 270LF	CERTIFIED LEAD-FREE POINT-OF-USE HOT WATER TEMPERING VALVE; INSTALL BELOW SINK; SET OUTLET TEMPERATURE TO 105° (F).

PLUMBING FIXTURE & CONNECTION SCHEDULE

MARK	FIXTURE	MOUNTING	MANUFACTURER	MODEL NO.	TRIM NO.	SUPPORT NO.	TRAP	WASTE	VENT MIN.	CW	HW	TW	POWER	REMARKS
EM-1	EMERGENCY EYEWASH	FLOOR MOUNTED	GUARDIAN	G1704BC	SEE JMY-1 UNDER PLUMBING EQUIPMENT SCHEDULE	N/A	N/A	1-1/4"	N/A	N/A	N/A	1/2"	N/A	ORANGE POLYETHYLENE COVERED SCHED. 40 GALVANIZED STEEL PIPE, 4 EYEWASH SPRAY HEADS IN STEEL BOWL, 1/2" IPS STAY-OPEN VALVE, WASTE SPILLS TO FLOOR DRAIN

NOTE:

- PER ANSI Z358.1 EYEWASH TEMPERATURE SHALL BE SET TO 90(F).
- MOUNTING HEIGHTS FOR ALL FIXTURES SHALL BE AS INDICATED AND DIRECTED BY ARCHITECT.
- ALL EXPOSED TRAP ASSEMBLIES AND WATER SUPPLIES TO BE INSULATED.
- EYEWASH SHALL PROVIDE MINIMUM FLOW OF 3 GPM FOR 15 MINUTES.
- PROVIDE OSHA APPROVED SIGNAGE.

KITCHEN PLUMBING EQUIPMENT SCHEDULE

ITEM	QTY.	DESCRIPTION	WASTE	L.W.	VENT	CW	HW	TW	GAS	CFH	REMARKS
1	1	MOBILE 2 DR. REACH-IN REFRIGERATOR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-
2	1	MOBILE 2 DR. REACH-IN FREEZER	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-
3	1	MOBILE FOOD WARMER	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-
4	2	MOBILE UTILITY CARTS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-
5	1	WORK TABLE WITH 2-COMPARTMENT SINK	N/A	1-1/2"	N/A	1/2"	1/2"	N/A	N/A	N/A	16 GA STAINLESS STEEL
6	7	HAND SINK	1-1/2"	N/A	1-1/2"	1/2"	1/2"	N/A	N/A	N/A	SEAMLESS TYPE 304 STAINLESS STEEL
7	1	SLICER	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-
8	1	MIXER ON MOBILE STAND	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-
9	2	UNDERCOUNTER DISHWASHER	1-1/2"	N/A	N/A	N/A	3/4"	N/A	N/A	N/A	23 GAL PER HOUR; WITH DRAIN WATER TEMPERATURE KIT
10	2	DISH TABLE WITH SINK	1-1/2"	N/A	1-1/2"	1/2"	1/2"	N/A	N/A	N/A	16 GA TYPE 304 STAINLESS STEEL
11	2	3-COMPARTMENT POT SINK	N/A	1-1/2"	N/A	1/2"	1/2"	N/A	N/A	N/A	14 GA TYPE 304 STAINLESS STEEL; 16"x 20" x 14" BOWL
12	1	HOSE REEL ASSEMBLY	N/A	N/A	N/A	1/2"	1/2"	N/A	N/A	N/A	-
13	1	REACH-IN REFRIGERATOR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-
14	2	ADA WORK COUNTER	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-
15	1	RESTURANT RANGE WITH OVEN BASE	N/A	N/A	N/A	N/A	N/A	1"	1"	170	10" W.C. OPERATING PRESSURE
16	1	COMBI OVEN ON STAND	N/A	1"	N/A	1/2"	N/A	N/A	N/A	N/A	-
17	5	INDUCTION RANGES	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-
18	1	EXHAUST HOOD WITH ANSUL SYSTEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-
19	4	EXHAUST HOODS WITH ANSUL SYSTEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-
20	4	RANGES WITH COMBINATION TOP	N/A	N/A	N/A	N/A	N/A	1"	1"	30	-
21	4	COUNTERS WITH SINK	1-1/2"	N/A	N/A	1/2"	1/2"	N/A	N/A	N/A	-
22	1	EXHAUST HOOD WITH ANSUL SYSTEM	N/A	-	N/A	-	-	N/A	N/A	N/A	-
23	1	MOBILE TABLE	N/A	-	N/A	-	-	N/A	N/A	N/A	-

NOTE:

- INFORMATION PRESENTED HERE IS FOR REFERENCE ONLY; WHERE THIS INFORMATION IS IN CONFLICT WITH THE KITCHEN CONSULTANT'S DESIGN PACKAGE, THE KITCHEN CONSULTANT'S DOCUMENTS SHALL TAKE PRECEDENCE.
- KITCHEN EQUIPMENT, FIXTURES, AND TRIMS LISTED ABOVE SHALL BE FURNISHED UNDER DIVISION 11 AND INSTALLED UNDER DIVISION 22.

PLUMBING EQUIPMENT SCHEDULE

MARK	GENERAL			DESIGN DATA		ELECTRICAL						GAS	REMARKS	
	DESCRIPTION	MANUFACTURER	MODEL NUMBER	LOCATION	CAPACITY	PUMP HEAD	HP	RPM	VOLTS	PH	HZ			W
GI-1	AUTOMATIC GREASE INTERCEPTOR	SCHIER	GB-2	CULINARY ARTS A110	50 GPM 20 GAL (LIQUID) 127 LBS (GREASE)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	SEAMLESS ROTARY-MOLDED POLYETHYLENE SHELL WITH MIN. 5/16" UNIFORM THICKNESS AND BUILT-IN FLOW CONTROL, CERTIFIED TO ASME A112.14.3 (TYPE C), PROVIDE FIELD CUT RISER SYSTEM
JMY-1	THERMOSTATIC MIXING VALVE	GUARDIAN	G3602	SEE PLANS (WALL HUNG ABOVE CEILING)	20 GPM AT 30 PSI	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	LEAD-FREE BRASS BODY WITH COLD WATER BYPASS, INTERNAL PTFE VALVE SEATS, 1/2" CW & HW INLETS, 1/2" TW OUTLET, FACTORY ASSEMBLED & TESTED, CERTIFIED UNDER ANSI/ASSE 1071

GREASE INTERCEPTOR CALCULATION

3-COMPARTMENT SINK (ADVANCE TABCO 93-3-54-18RL)

DIMENSIONS (EACH BASIN) 16" x 20" x 12"

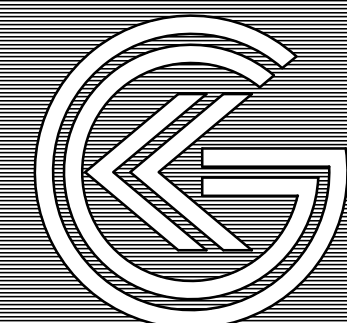
CAPACITY IN GALLONS (16 X 20 X 12 = 3840 CU IN / 231 = 16.62 GAL X 3 = 49.9 GAL)

DRAINAGE LOAD 49.9 GAL X 75% = 37.4 GAL 38 GALLONS

DRAINAGE RATE (FOR 1 MINUTE) 38/1 38 GPM

INTERCEPTOR (FROM PDI TABLE 1) PDI SIZE 50

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NJDOE SP #07-2670-005-21-1000

PROJECT TITLE:  
**CULINARY ARTS CLASSROOM ALTERATION**

ADDRESS:  
**LINDENWOLD HIGH SCHOOL BLOCK 244, LOT 3**  
801 EGG HARBOR ROAD  
LINDENWOLD, NJ 08021

PROJECT NO.: 5713G

REVISION DATE: 23 FEB 2024

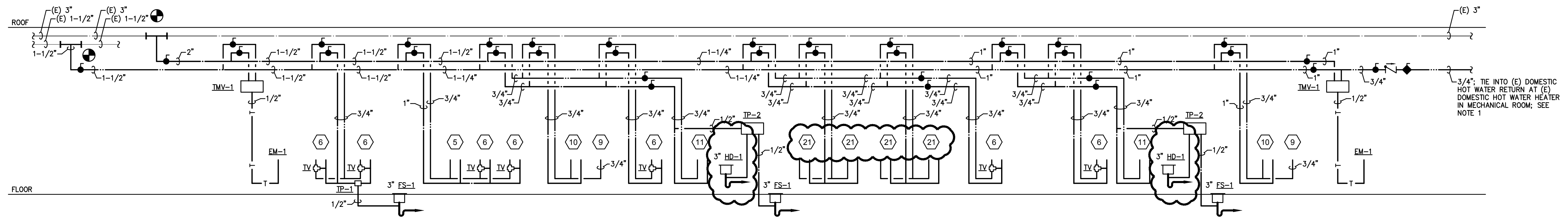
DRAWING DATE: 15 JAN 2024

PRINT DATE: 01/08/24

DRAWN BY: ACL

SHEET TITLE: SCHEDULES AND ABBREVIATIONS - PLUMBING

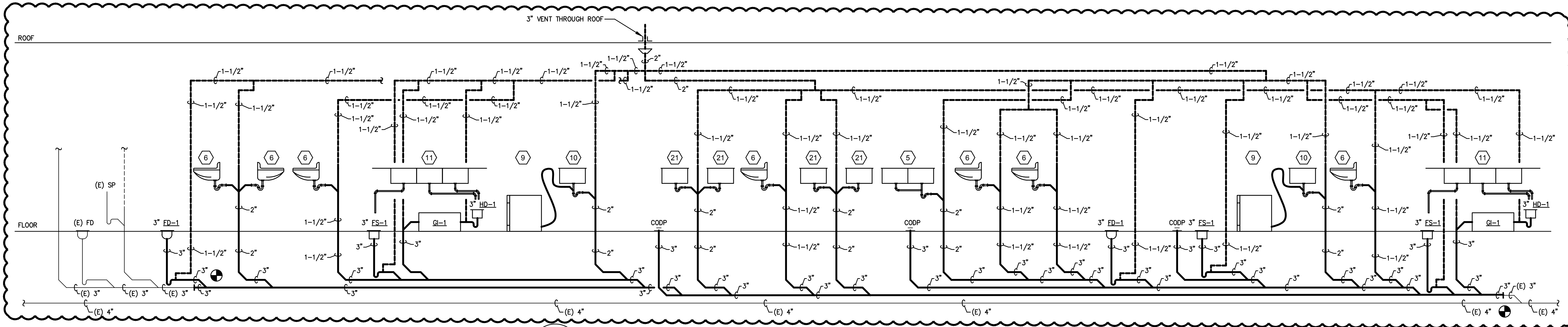
**P200**



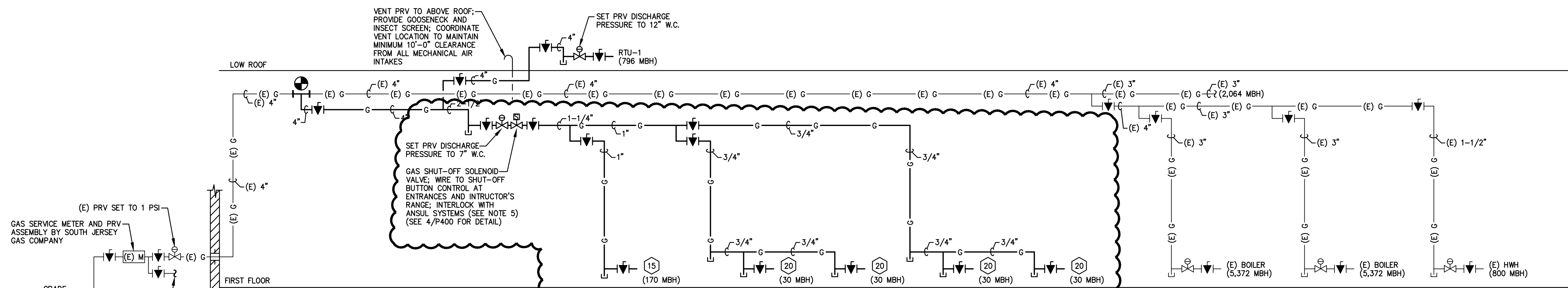
**1 DOMESTIC WATER RISER DIAGRAM - PLUMBING**  
**P300** NOT TO SCALE

NOTES:

1. SHUT DOWN EXISTING DOMESTIC WATER SYSTEM, DRAIN, MAKE TIE-INS, FLUSH AND SANITIZE. PERFORM WORK CONTINUOUSLY WITHOUT INTERRUPTION, STARTING ON A FRIDAY MORNING AND COMPLETING BY SATURDAY NIGHT SO INSTALLATION IS READY FOR SERVICE MONDAY MORNING.
2. SHUT DOWN EXISTING NATURAL GAS SYSTEM, PURGE, AND MAKE TIE-INS. PERFORM WORK CONTINUOUSLY WITHOUT INTERRUPTION, STARTING ON A FRIDAY MORNING AND COMPLETING BY SATURDAY NIGHT SO INSTALLATION IS READY FOR SERVICE MONDAY MORNING.



**2 SANITARY AND VENT RISER DIAGRAM - PLUMBING**  
**P300** NOT TO SCALE



**3 NATURAL GAS RISER DIAGRAM - PLUMBING**  
**P300** NOT TO SCALE

NOTES:

1. TOTAL DEVELOPED LENGTH OF GAS PIPING = 900'-0"
2. ALL GAS PRV'S SHALL BE EQUIMETER LOCK-UP TYPE APPROVED BY SOUTH JERSEY GAS.
3. ALL INTERIOR GAS PRV'S SHALL BE VENTED TO EXTERIOR OF BUILDING PER INTERNATIONAL FUEL GAS CODE (2021); USE OF VENT LIMITERS IS SPECIFICALLY PROHIBITED.
4. ALL GAS PIPING SHALL BE SIZED PER INTERNATIONAL FUEL GAS CODE (2021) TABLE 402.4(1) EXCEPT AS OTHERWISE NOTED.
5. INTERLOCK NORMALLY CLOSED GAS SOLENOID VALVE WITH ALL ANSUL SYSTEMS SO ACTIVATION OF ANY SINGLE SYSTEM WILL CAUSE VALVE TO CLOSE.

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 801 EGG HARBOR ROAD  
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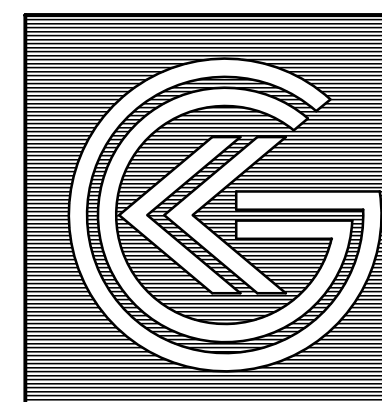
REVISION DATE: 23 FEB 2024

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SHEET TITLE: RISER DIAGRAMS - PLUMBING

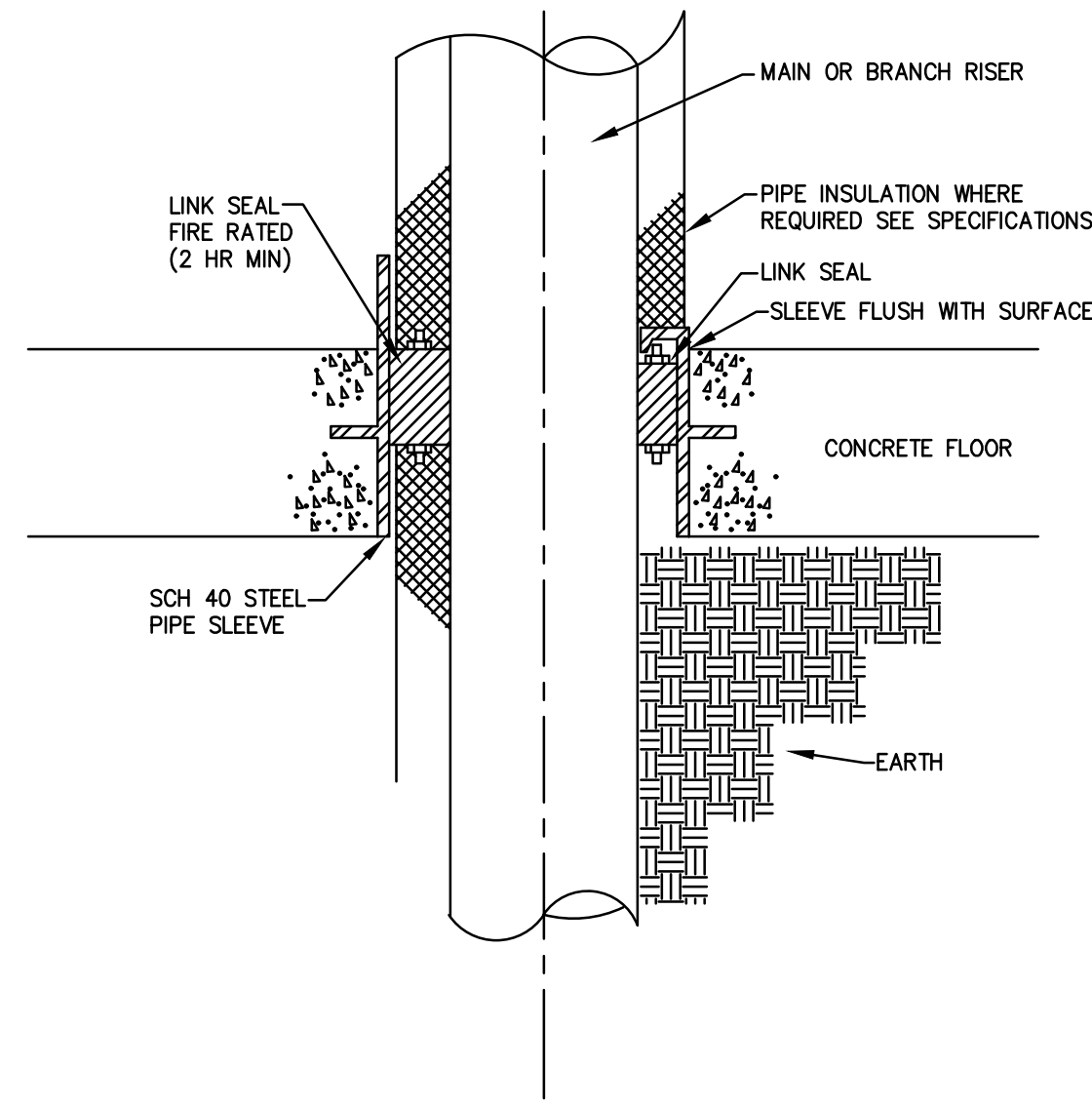


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 consulting engineers

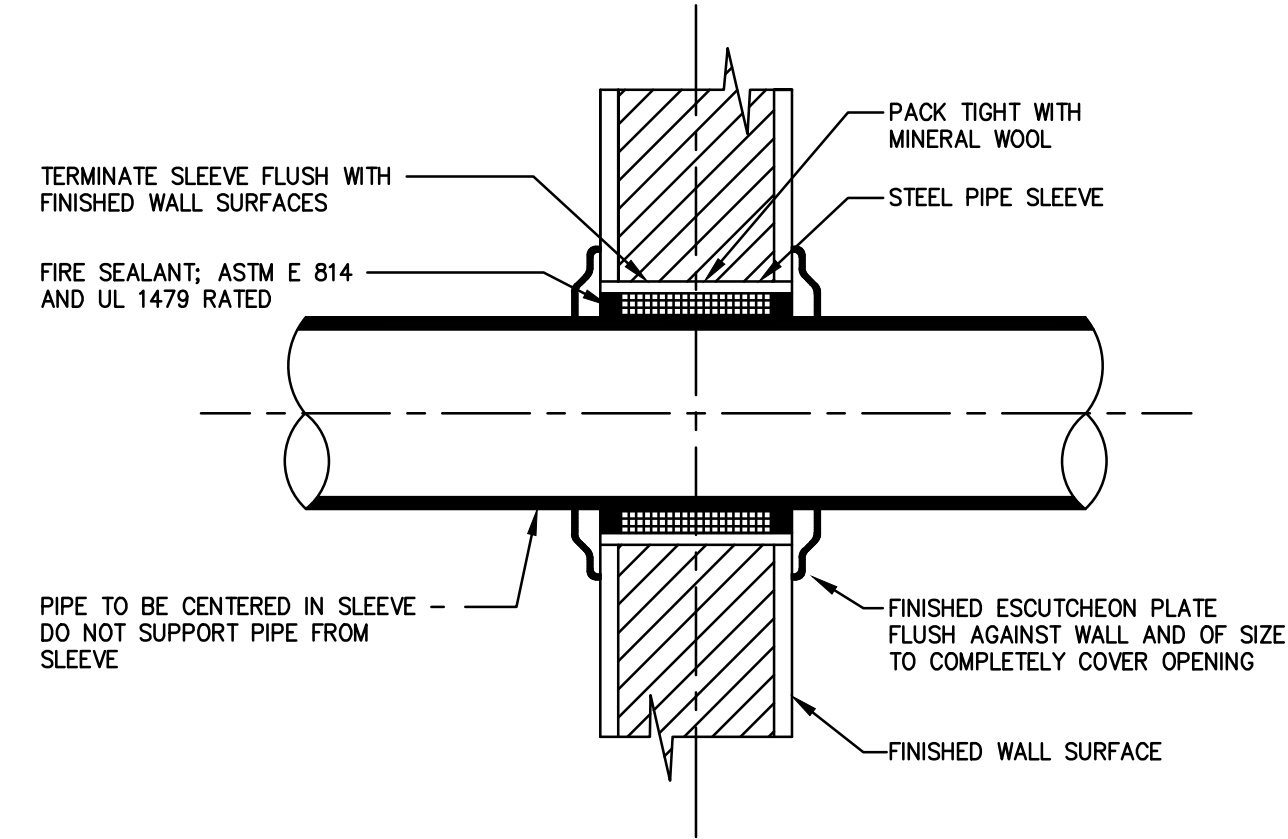
196 Princeton-Hightstown Road Bldg. 1A,  
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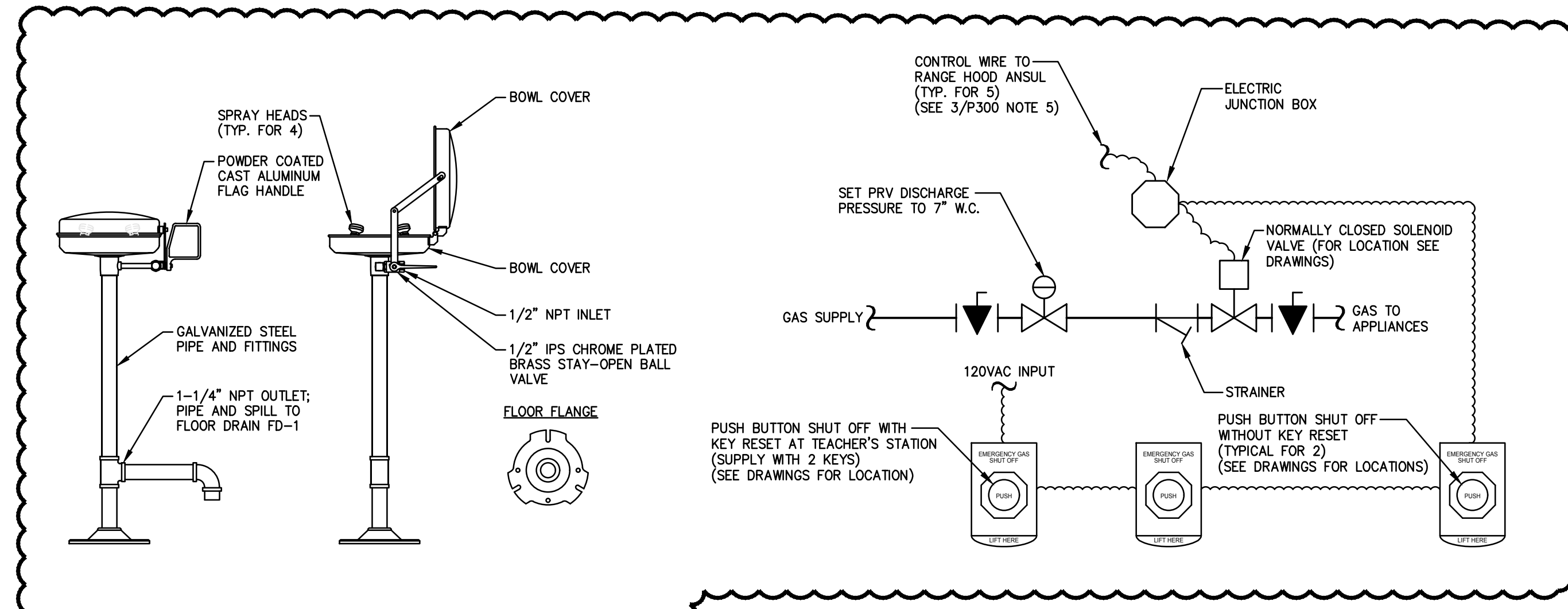
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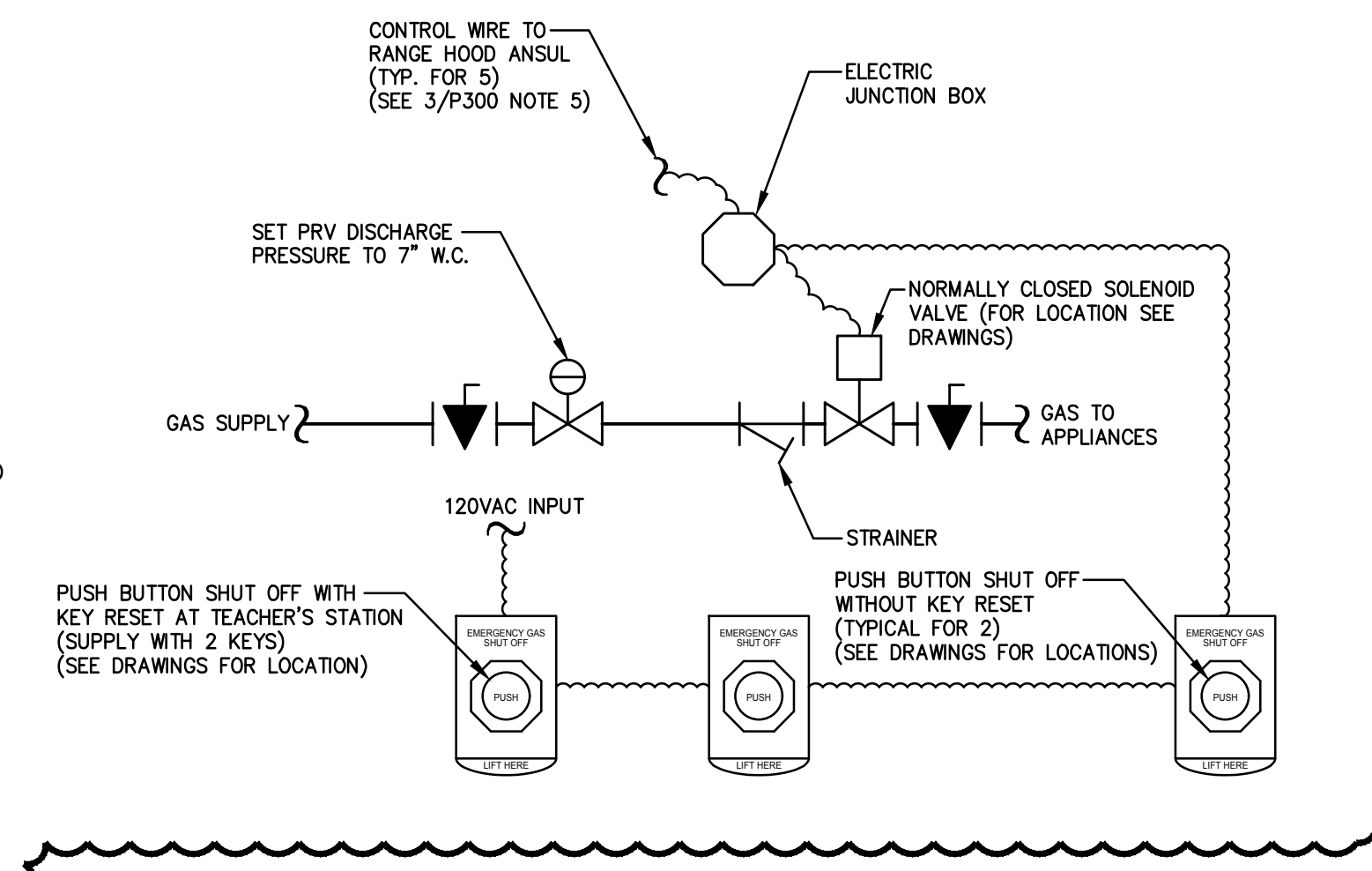
1 PIPE SLEEVE THROUGH FLOOR SLAB  
P400 NOT TO SCALE



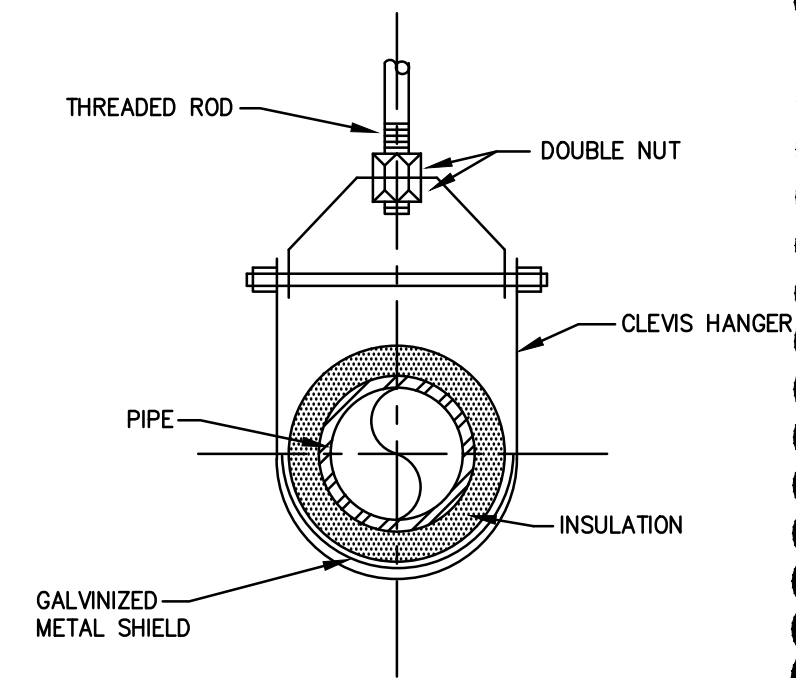
2 PIPE SLEEVE THROUGH INTERIOR WALL  
P400 NOT TO SCALE



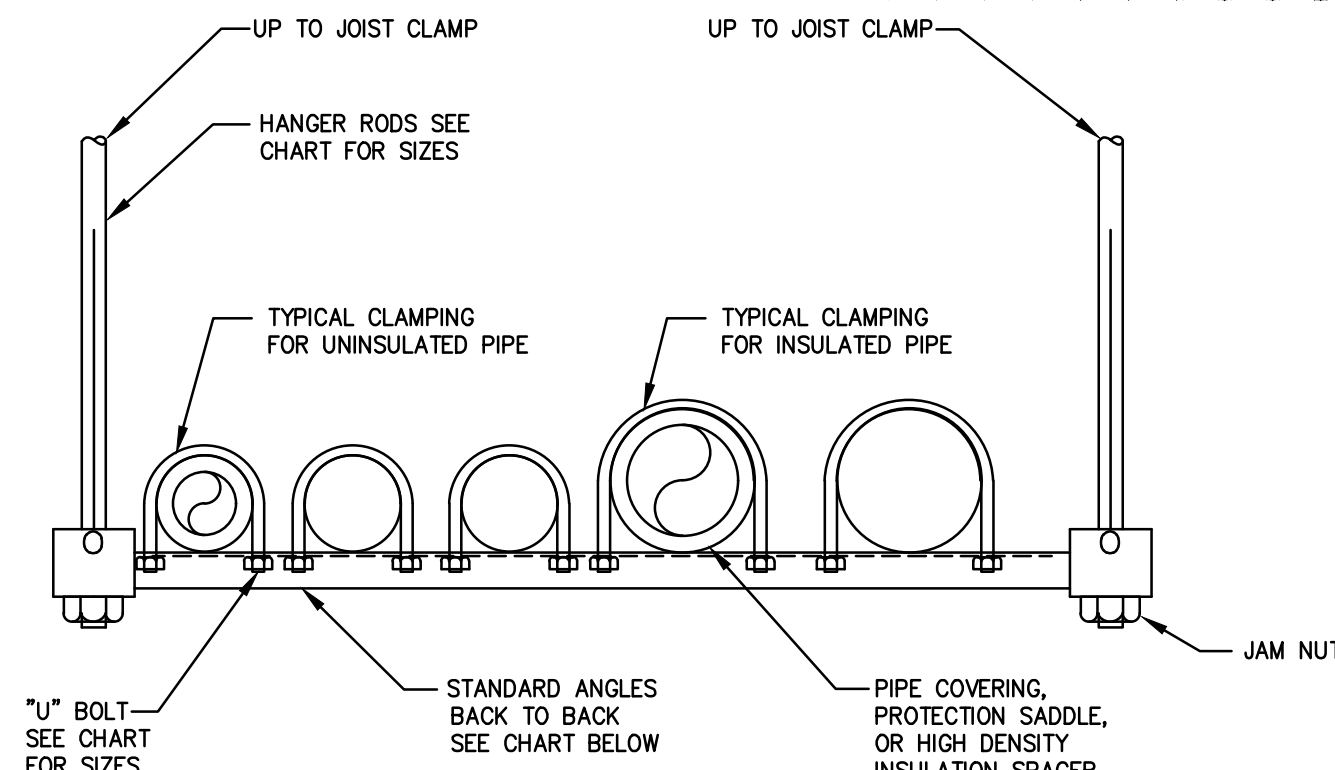
3 EYEWASH STATION DETAIL  
P400 NOT TO SCALE



4 NATURAL GAS SOLENOID SHUT-OFF VALVE  
P400 NOT TO SCALE

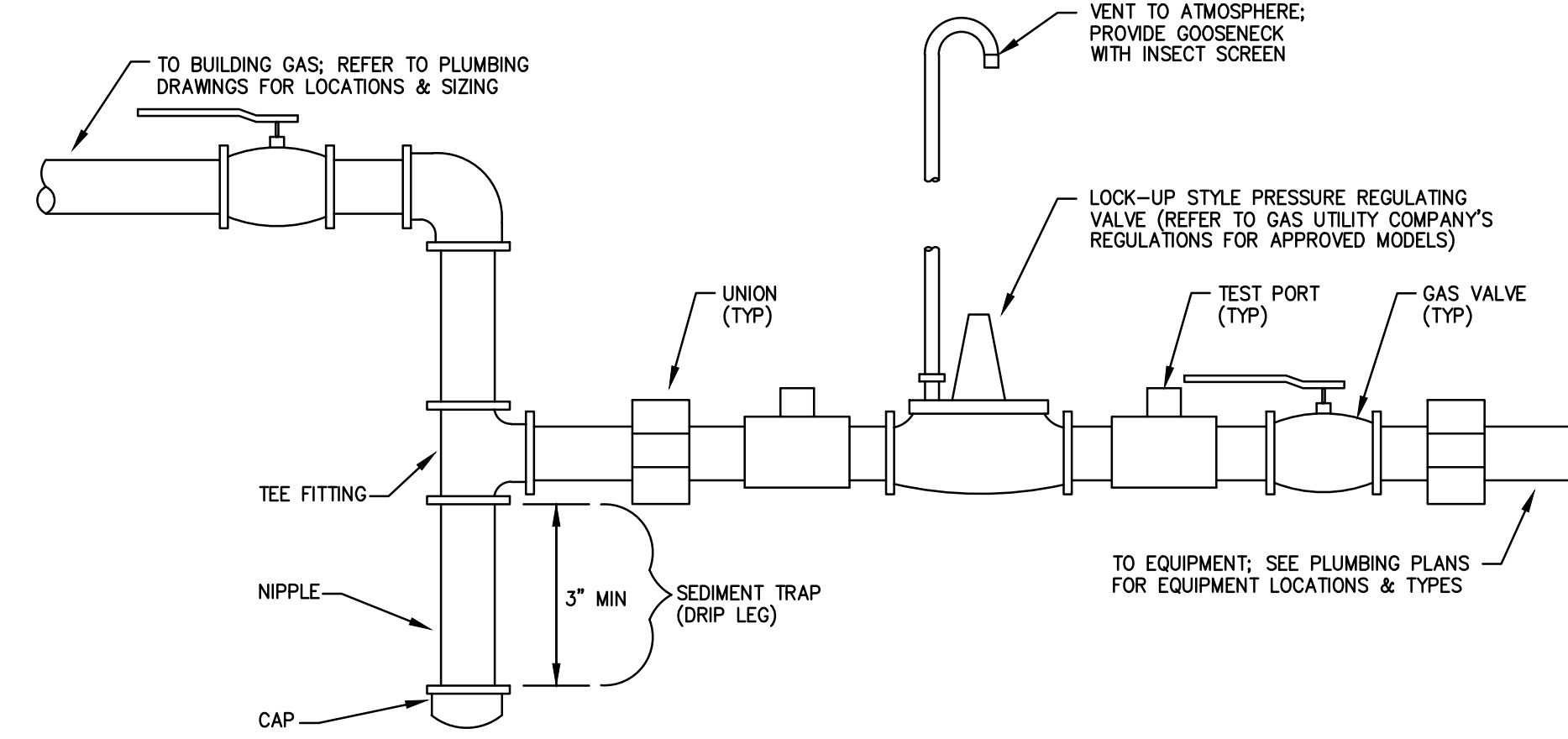


5 CLEVIS HANGER DETAIL  
P400 NOT TO SCALE

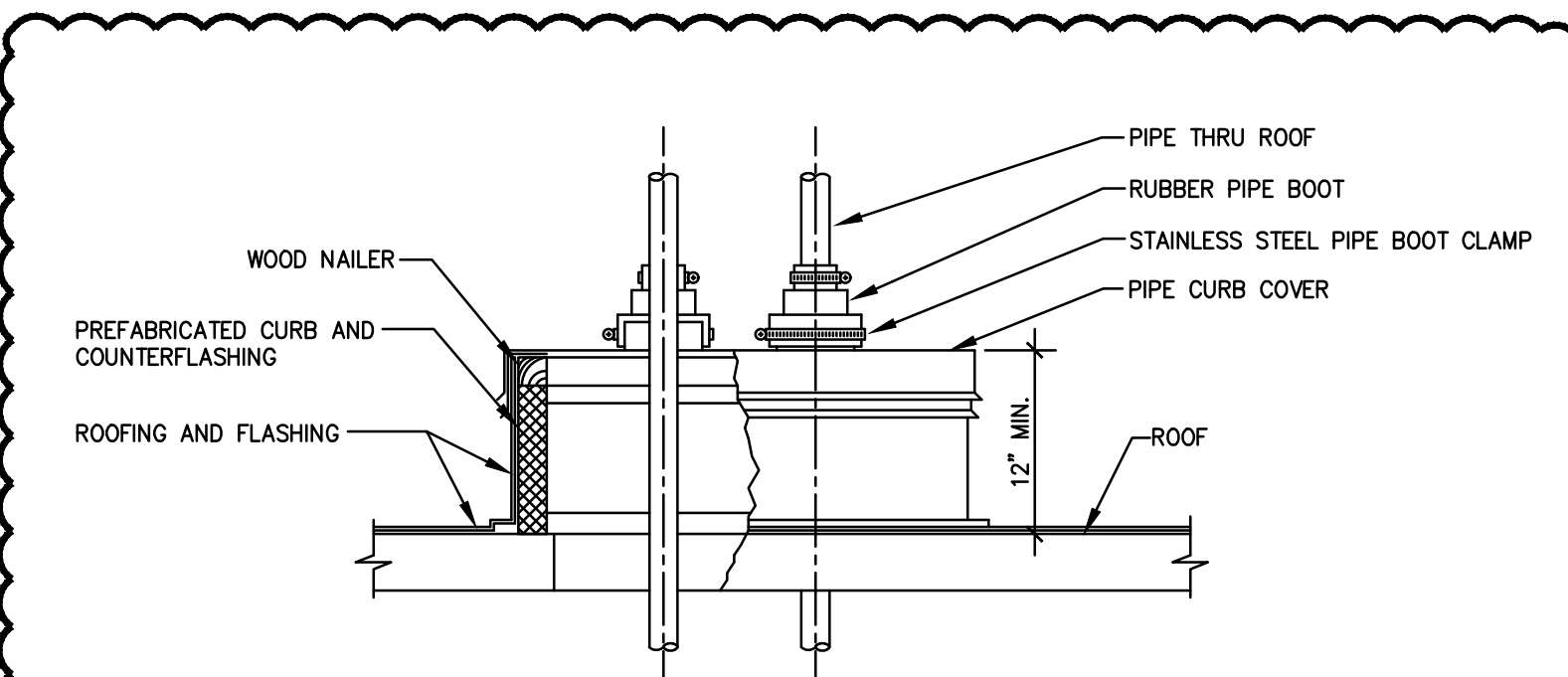


ANGLE SIZING FOR SPANS UP TO 10' (LOAD EQUALLY DISTRIBUTED)			PIPE SIZE	"U" BOLT SIZE
LOAD ON TRAPEZE LB.	ANGLE SIZE BACK TO BACK	HANGER ROD SIZE		
0 - 500	1-1/2" x 1-1/2" x 1/4"	3/8"	UP TO 1"	1/4"
600 - 1200	2" x 2" x 1/4"	1/2"	1-1/4" TO 4"	3/8"
1300 - 2000	2-1/2" x 2-1/2" x 1/4"	5/8"		

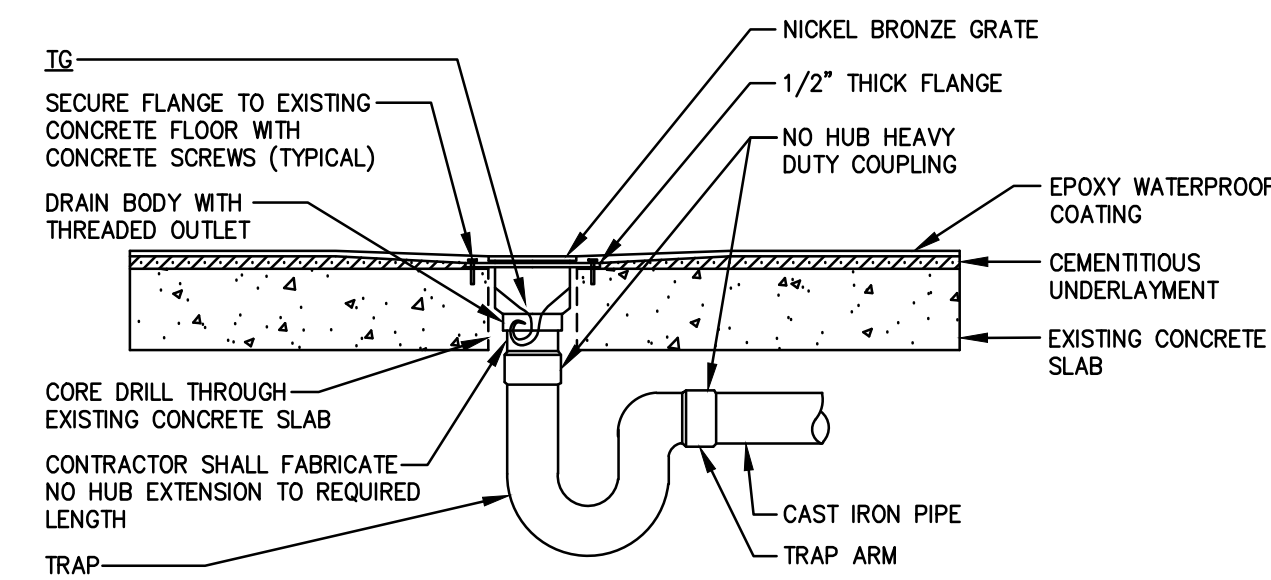
6 TRAPEZE HANGER DETAIL  
P400 NOT TO SCALE



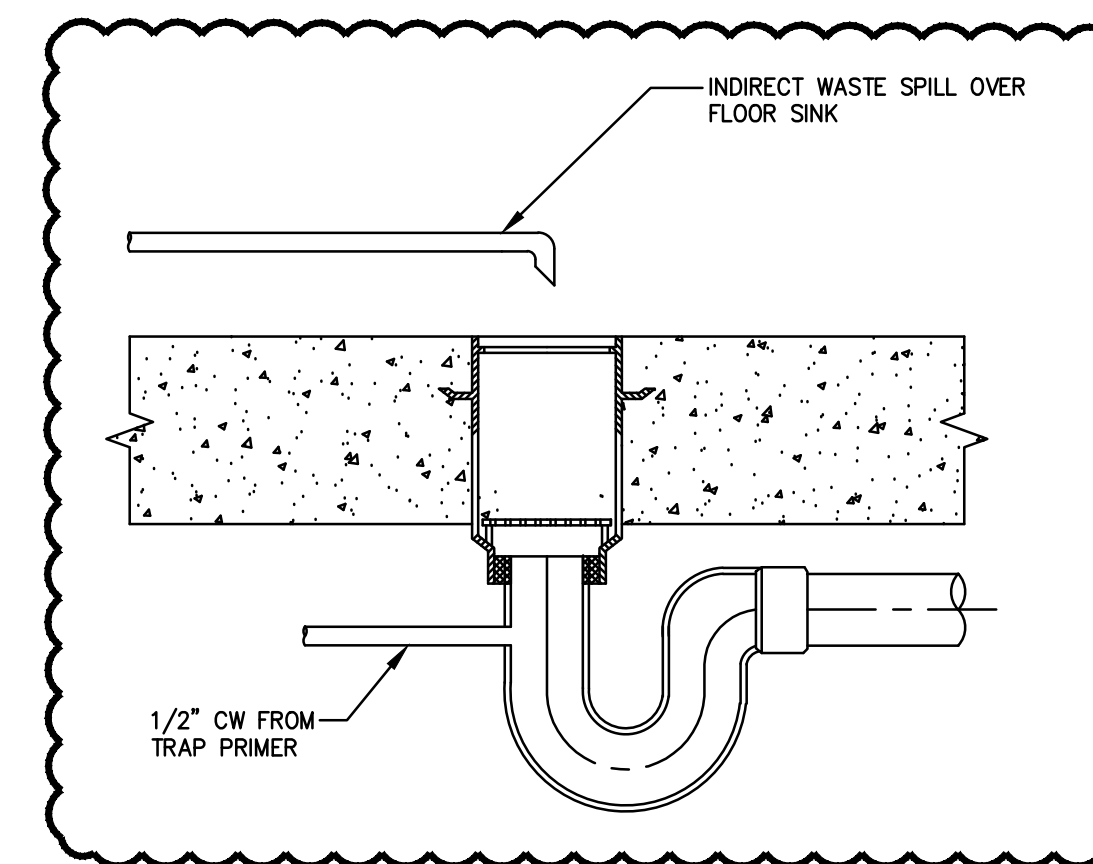
7 TYPICAL GAS EQUIPMENT CONNECTION  
P400 NOT TO SCALE



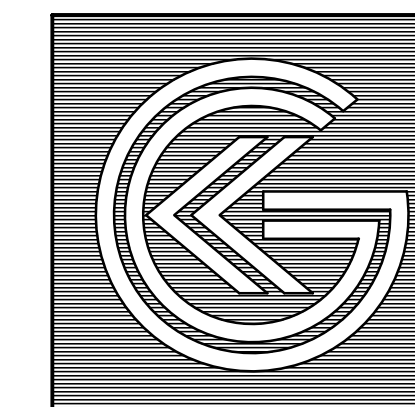
8 TYPICAL PIPE PENETRATION THROUGH ROOF  
P400 NOT TO SCALE



9 FLOOR DRAIN DETAIL WITH ELASTOMERIC TRAP SYSTEM  
P400 NOT TO SCALE



10 FLOOR SINK FOR INDIRECT WASTE DETAIL  
P400 NOT TO SCALE



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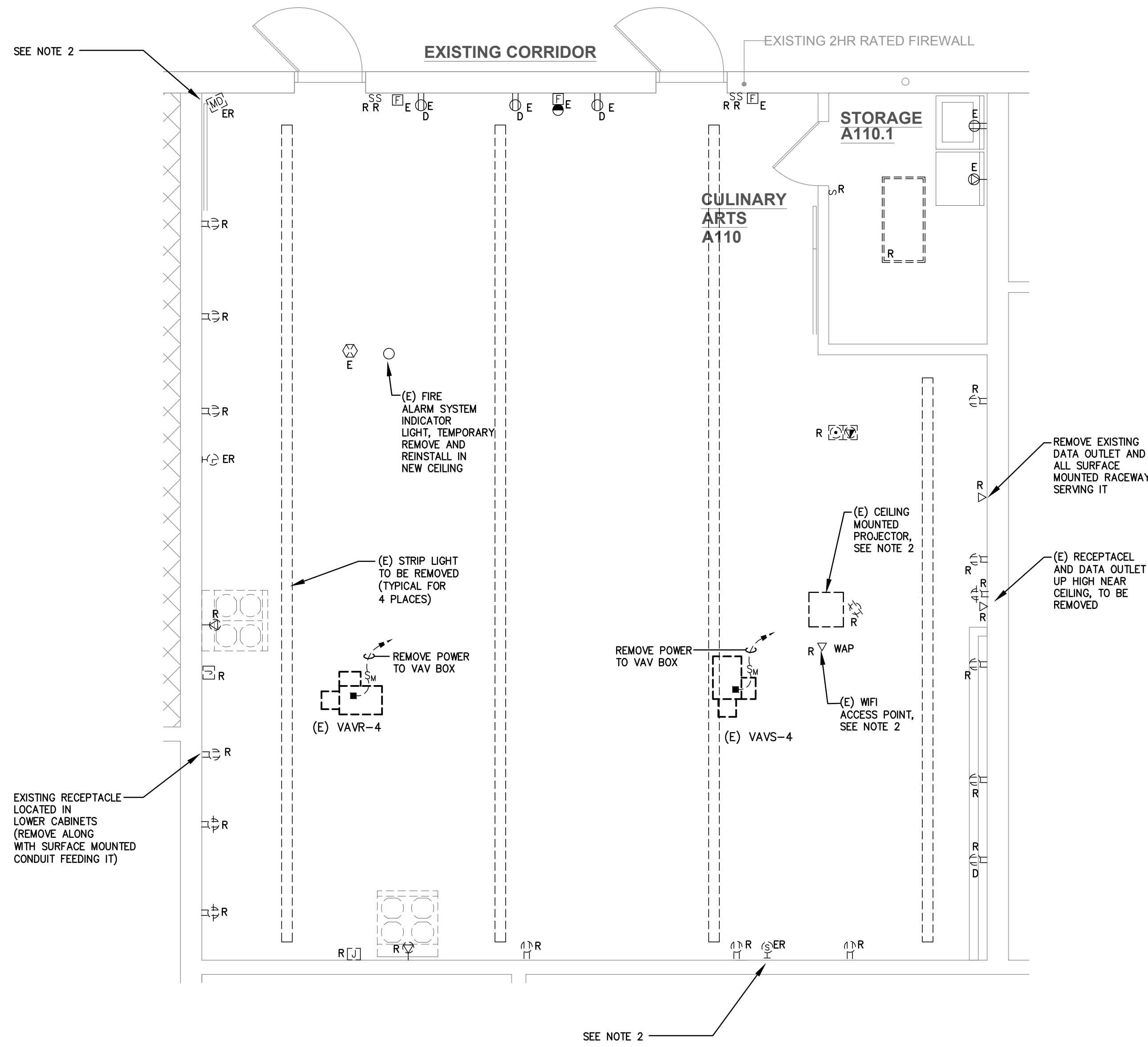
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PRINT DATE: 01/08/24

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SHEET TITLE: DETAILS - PLUMBING

**P400**



**DEMOLITION NOTES:**

1. THESE DEMOLITION PLANS ARE INTENDED TO BE USED AS A GUIDE TO THE CONTRACTOR. ALL DEMOLITION WORK REQUIRED, OR NECESSARY FOR THE INSTALLATION OF NEW WORK OR THE REMOVAL OF EXISTING EQUIPMENT, IS HEREBY INCLUDED, WHETHER SHOWN ON THESE PLANS OR NOT. REFER TO DRAWINGS OF ALL TRADES FOR ADDITIONAL WORK, AND COORDINATE IN THE FIELD.
2. THE CONTRACTOR SHALL VERIFY ACTUAL SITE CONDITIONS PRIOR TO SUBMITTING HIS BID. THE CONTRACTOR SHALL INCLUDE ALL DEMOLITION WORK NECESSARY FOR THE EFFECTIVE INSTALLATION AND PERFORMANCE OF NEW SYSTEMS. THE CONTRACTOR SHALL ALSO INCLUDE TEMPORARY REMOVAL AND REINSTALLATION OF EXISTING WORK WHEREVER NECESSARY. THE OWNER SHALL NOT ACCEPT EXTRA COSTS ASSOCIATED WITH THE DEMOLITION AND/OR TEMPORARY REMOVAL/REINSTALLATION WORK FROM THE CONTRACTOR.
3. THIS CONTRACTOR SHALL REMOVE ALL LIGHTING FIXTURES AND ELECTRICAL DEVICES AS INDICATED ON THE DEMOLITION PLANS, OR THAT ARE NO LONGER NEEDED BY THE OWNER. ALL EXISTING WIRING AND CONDUIT WHERE NO LONGER REQUIRED SHALL BE REMOVED BACK TO EXISTING PANEL. ALL EXISTING DISCONNECTED CIRCUITS NOT BEING REUSED SHALL BE TURNED OFF AND LABELED "SPARE". WHERE CONDUITS ARE INACCESSIBLE, REMOVE WIRE AND ABANDON CONDUITS.
4. IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY POWER IS BEING PROVIDED TO ALL EXISTING EQUIPMENT REQUIRED TO REMAIN IN SERVICE. RECONNECT ALL DISTURBED FACILITIES WHICH ARE EXISTING TO REMAIN AND PLACE THEM IN OPERATIONAL CONDITION.
5. REMOVE ALL WIRING DEVICES FROM WALLS TO BE DEMOLISHED. REMOVE EXISTING LIGHT SWITCHES WHERE NO LONGER REQUIRED. REUSE ALL EXISTING CONCEALED CONDUIT AND RECESSED DEVICE BOXES WHERE POSSIBLE. ABANDON BOXES IF THEY ARE IN EXISTING WALLS TO REMAIN. PATCH WALLS OVER ABANDONED BOXES TO MATCH ADJACENT SURFACES.
6. REMOVE ABANDONED OUTLET BOXES, SURFACE METAL RACEWAY AND CONDUIT THAT WOULD BE EXPOSED, AND REPAIR DISTURBED SURFACES TO MATCH ADJACENT AREAS.
7. MAJOR PIECES OF EQUIPMENT ARE TO BE TURNED OVER TO THE OWNER FOR HIS USE, OR AT THE OWNER'S DISCRETION, REMOVED FROM THE SITE AND DISPOSED OF, IF NO LONGER REQUIRED.
8. PATCH ALL WALLS TIGHT AT REMOVALS. MAINTAIN FIRE RATINGS AS REQUIRED.
9. THE CONTRACTOR SHALL REFER TO THE ARCHITECTURAL DRAWINGS FOR THE EXTENT OF WALL FINISHES AND CEILINGS TO BE REPLACED. ALL EXISTING DEVICES TO REMAIN SHALL BE TEMPORARILY DISCONNECTED AND REINSTALLED. WHERE TEMPORARY REMOVAL IS NOT POSSIBLE THE CONTRACTOR SHALL PROVIDE TEMPORARY SUPPORT OF EXISTING EQUIPMENT IN PLACE.
10. THE EXISTING FIRE ALARM SYSTEM SHALL BE MAINTAINED THROUGHOUT DEMOLITION AND CONSTRUCTION. PROVIDE TEMPORARY SUPPORT OF EXISTING DEVICES AS REQUIRED. THE CONTRACTOR SHALL NOTIFY THE FIRE MARSHAL UPON ANY MODIFICATIONS TO OR ANY NECESSARY INTERRUPTION IN SYSTEM OPERATION. NOTE THAT COVERING DEVICES DURING CONSTRUCTION IS AN INTERRUPTION TO COVERAGE.

**SYMBOL LIST & ABBREVIATIONS**

	LIGHT FIXTURE - SEE SCHEDULE
	LIGHT FIXTURE WITH INTEGRAL BATTERY BACKUP - SEE SCHEDULE
	EXIT SIGN - SEE SCHEDULE
	OCCUPANCY SENSOR - LETTER DENOTES TYPE OF SENSOR TO BE INSTALLED CI = CI-300 PASSIVE INFRARED SENSOR
	POWER PACK TRANSFORMER AND RELAY, OUTPUT RELAYS RATED 20A BALLAST OR INCANDESCENT, PROVIDE QUANTITY OF RELAYS AS REQUIRED, REFER TO AUTOMATIC LIGHTING CONTROL NOTES.
	DUPLEX RECEPTACLE, 20A, 125V, 2 POLE, U-GROUND SLOT, COMMERCIAL GRADE, TAMPER-RESISTANT, COORDINATE ALL DEVICE LOCATIONS WITH ARCHITECT PRIOR TO ROUGH-IN. GFI - INDICATES GROUND FAULT INTERRUPTION D - INDICATES DOUBLE DUPLEX (QUAD) RECEPTACLE
	DUPLEX RECEPTACLE MOUNTED ABOVE COUNTER HEIGHT
	SPECIAL PURPOSE RECEPTACLE, TYPE AS NOTED
	VOICE/DATA/VIDEO OUTLET - 4" X 4" OUTLET BOX WITH 1-1/4" C STUBBED UP ABOVE NEAREST ACCESSIBLE CEILING VERIFY LOCATION IN FIELD
	FLOOR BOX
	LIGHT SWITCH
	LOW VOLTAGE MOMENTARY SWITCH
	MANUAL MOTOR STARTER
	UNFUSED DISCONNECT SWITCH
	FUSED DISCONNECT SWITCH
	COMBINATION MAGNETIC MOTOR STARTER AND THERMAL OVERLOAD RELAY
	208/120V PANELBOARD
	480/277V PANELBOARD
	FIRE ALARM, SMOKE DETECTOR PHOTOELECTRIC
	FIRE ALARM, HEAT DETECTOR
	FIRE ALARM, HEAT DETECTOR (LOCATED ABOVE CEILING)
	FIRE ALARM, DUCT MOUNTED SMOKE DETECTOR WITH REMOTE INDICATING LIGHT
	FIRE ALARM, AUDIO/VISUAL DEVICE
	FIRE ALARM MANUAL PULL STATION
	FIRE ALARM, VISUAL DEVICE
	FIRE ALARM, CARBON MONOXIDE DETECTOR
	EMERGENCY PUSH BUTTON WITH KEY RESET, ASCO 216C89 OR APPROVED EQUAL
	CLOCK
	SPEAKER
	SECURITY MOTION DETECTOR
	JUNCTION BOX
	WIRE & CONDUIT, CONCEALED IN CEILING OR WALL
	HOMERUN TO PANEL, NUMERAL INDICATES CIRCUIT NUMBER
	CONNECTION TO EQUIPMENT
	ABOVE FINISHED FLOOR
	EXISTING
	EXISTING TO BE RELOCATED, CAREFULLY REMOVE AND STORE ON SITE. DISCONNECT AND SAFE-OFF ALL WIRING FOR FUTURE EXTENSION TO NEW LOCATION
	EXISTING TO BE REMOVED
	RELOCATE EXISTING TO THIS LOCATION, COORDINATE EXACT LOCATION IN FIELD, PROVIDE NEW WIRING TO EXTEND EXISTING WIRING AS REQUIRED, MATCH EXISTING WIRING TYPE AND SIZE
	WEATHERPROOF

**1 PARTIAL FIRST FLOOR DEMOLITION PLAN - ELECTRICAL**

ED100 SCALE 1/4" = 1'-0"

- NOTE:
1. ALL ELECTRICAL DEVICES TO BE REMOVED IN THEIR ENTIRETY.
  2. EXISTING LOW VOLTAGE ELECTRICAL DEVICE, COORDINATE WITH OWNER, REMOVAL AND REINSTALLATION WILL BE BY OWNER.

February 23, 2024 - 8:43:35 am  
Drawing: 3107 - E-100.dwg

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**NJDOE SP #07-2670-005-21-1000**

PROJECT TITLE:  
**CULINARY ARTS CLASSROOM ALTERATION**

ADDRESS:  
**LINDENWOLD HIGH SCHOOL  
BLOCK 244, LOT 3  
801 EGG HARBOR ROAD  
LINDENWOLD, NJ 08021**

PROJECT NO.: 5713G

REVISION DATE: 23 FEB 2024

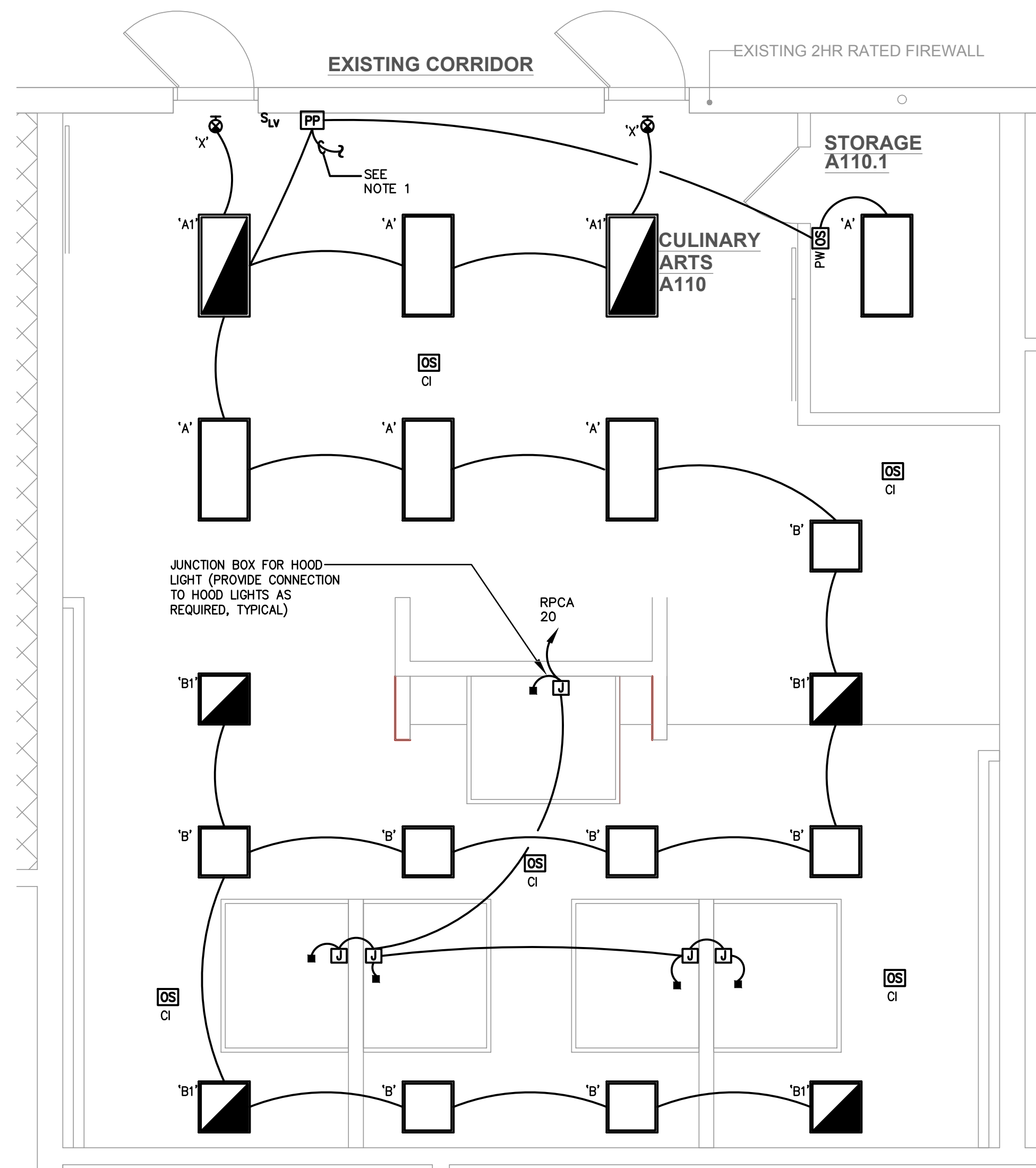
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PRINT DATE: 01/08/24

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SHEET TITLE: PARTIAL FIRST FLOOR PLAN - ELECTRICAL DEMOLITION

**ED-100**



**1** PARTIAL FIRST FLOOR PLAN - LIGHTING  
**E100** SCALE 1/4" = 1'-0"

**NOTES:**

- CONNECT TO EXISTING LIGHTING CIRCUIT IN AREA, VIA 2 #12 & 1 #12 GRD - 3/4".

LIGHTING FIXTURE SCHEDULE					
ID	LAMPS	MANUFACTURER	CATALOG NUMBER	MOUNTING	DESCRIPTION
A	60.3W LED 6400 LUMENS SPX 35	COOPER	FSP-2X4-4735-CA080	RECESSED	2' X 4' SEALED PANEL WITH CLEAR OUTER LENS - SUITABLE FOR KITCHEN USE, UNIVERSAL 120-277V DRIVER WITH 0-10V DIMMING
A1	60.3W LED 6400 LUMENS SPX 35	COOPER	FSP-2X4-3135-CA080-EL7W	RECESSED	2' X 4' SEALED PANEL WITH CLEAR OUTER LENS - SUITABLE FOR KITCHEN USE, 90 MINUTE BATTERY BACKUP, UNIVERSAL 120V -277V DRIVER WITH 0-10V DIMMING
B	38.8W LED 4200 LUMENS SPX 35	COOPER	FSP-2X2-3235-CA080	RECESSED	2' X 2' SEALED PANEL WITH CLEAR OUTER LENS - SUITABLE FOR KITCHEN USE, UNIVERSAL 120-277V DRIVER WITH 0-10V DIMMING
B1	38.8W LED 4200 LUMENS SPX 35	COOPER	FSP-2X2-3235-CA080-EL7W	RECESSED	2' X 2' SEALED PANEL WITH CLEAR OUTER LENS - SUITABLE FOR KITCHEN USE, 90 MINUTE BATTERY BACKUP, UNIVERSAL 120-277V DRIVER WITH 0-10V DIMMING
R	17W LED 900 LUMENS SPX 40	SAYLITE COOPER, FME OR APPROVED EQUAL	VPW-17W-900L-MV-50K-SN	SURFACE	VAPOR PROOF FIXTURE, UL LISTED FOR WET LOCATIONS, RIGHT ANGLE/BOX, CLEAR GLOBE, CAST GUARD, 120V INPUT
X	LED	SURE-LITES	APXH7R4	WALL/ CEILING	EXIT SIGN, POLYCARBONATE HOUSING, FACES WITH 6" x 3/4" RED LETTERS, SINGLE OR DOUBLE FACE AS REQUIRED, ARROWS AS REQUIRED, 120/277V INPUT, INTEGRAL 90 MINUTE EMERGENCY BATTERY BACKUP

**LIGHTING FIXTURE NOTES:**

- ALL FIXTURES SHALL COMPLY WITH ASHRAE/IESNA 90.1 2016 LIGHTING EFFICACY STANDARDS FOR NEW COMMERCIAL BUILDINGS.
- CONNECT ALL EXIT SIGNS AHEAD OF ALL SWITCHING AND CONTROLS.
- PROVIDE ALL EMERGENCY LIGHTING CONTROL RELAYS AND LIGHT FIXTURES SPECIFIED WITH EMERGENCY BATTERY BACKUP WITH AN UNSWITCHED PHASE LEG TO MONITOR FOR NORMAL POWER FAILURE.
- VERIFY EXACT LOCATION OF FIXTURES IN FIELD WITH ARCHITECT AND OWNER PRIOR TO ROUGH-IN.

**AUTOMATIC LIGHTING CONTROL NOTES:**

- FURNISH AND INSTALL ALL WIRING AND DEVICES AS RECOMMENDED BY THE MANUFACTURER'S WRITTEN INSTRUCTION FOR THE INSTALLATION OF OCCUPANCY SENSORS.
- PROVIDE ALL RELAYS, POWER PACKS AND LOW VOLTAGE WIRING AS REQUIRED.
- VERIFY ALL OCCUPANCY SENSORS TO BE FURNISHED AND INSTALLED WITH LOW VOLTAGE OR LINE VOLTAGE INPUTS.
- THE CONTRACTOR SHALL SET ALL PROGRAMMABLE TIME DELAYS TO A MINIMUM OF 15 MINUTES UNLESS OTHERWISE NOTED.

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**NJDOE SP #07-2670-005-21-1000**

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**CULINARY ARTS  
CLASSROOM ALTERATION**

ADDRESS:  
**LINDENWOLD HIGH SCHOOL  
BLOCK 244, LOT 3  
801 EGG HARBOR ROAD  
LINDENWOLD, NJ 08021**

PROJECT NO.: 5713G

REVISION DATE: 23 FEB 2024

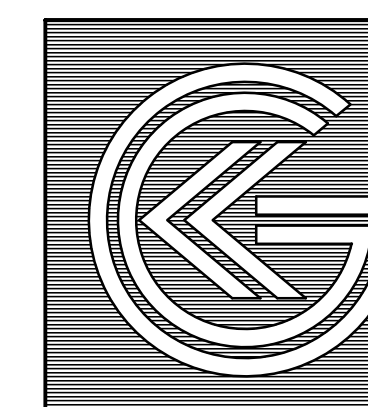
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SHEET TITLE: PARTIAL FIRST FLOOR PLAN - LIGHTING

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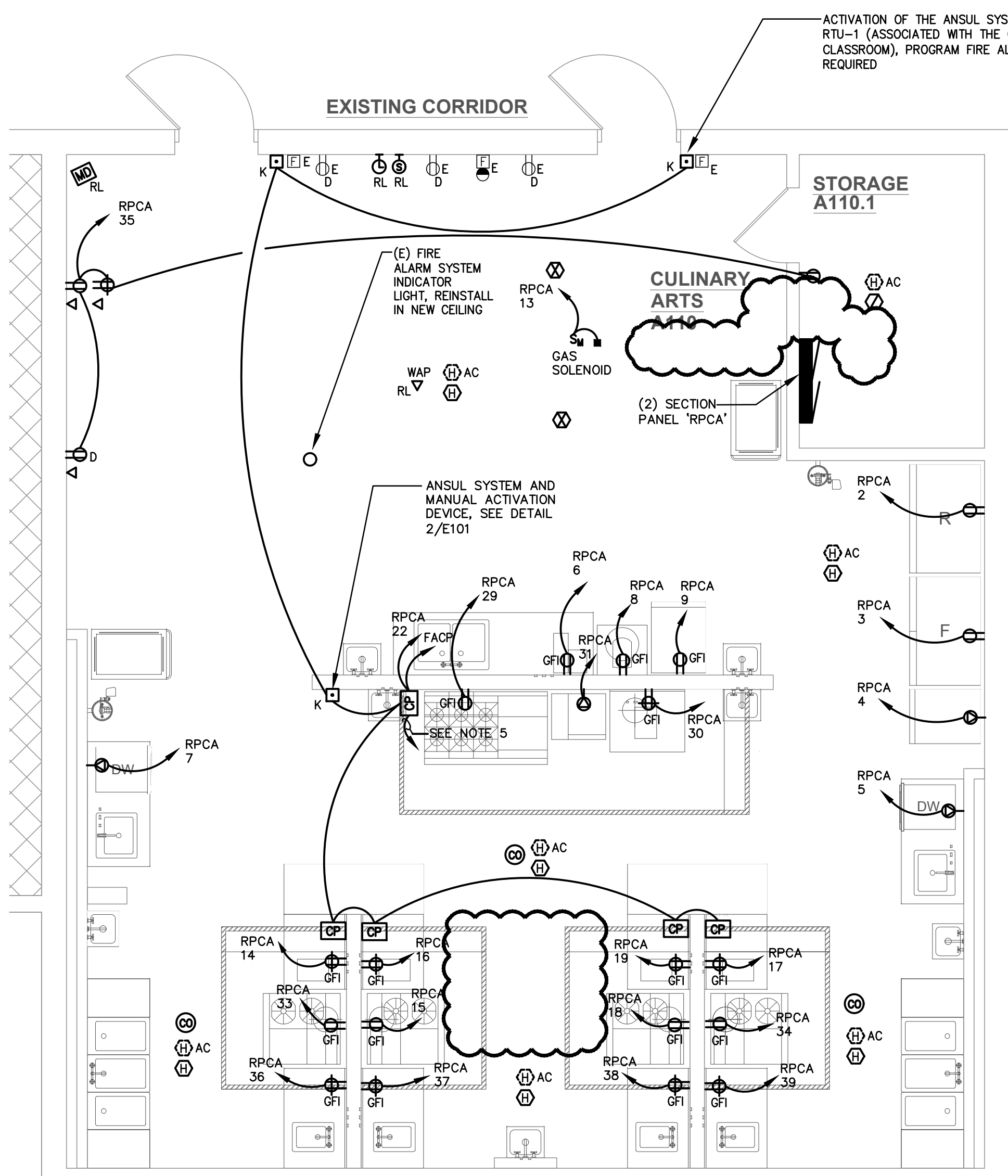
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Suite 9, West Windsor, NJ 08550

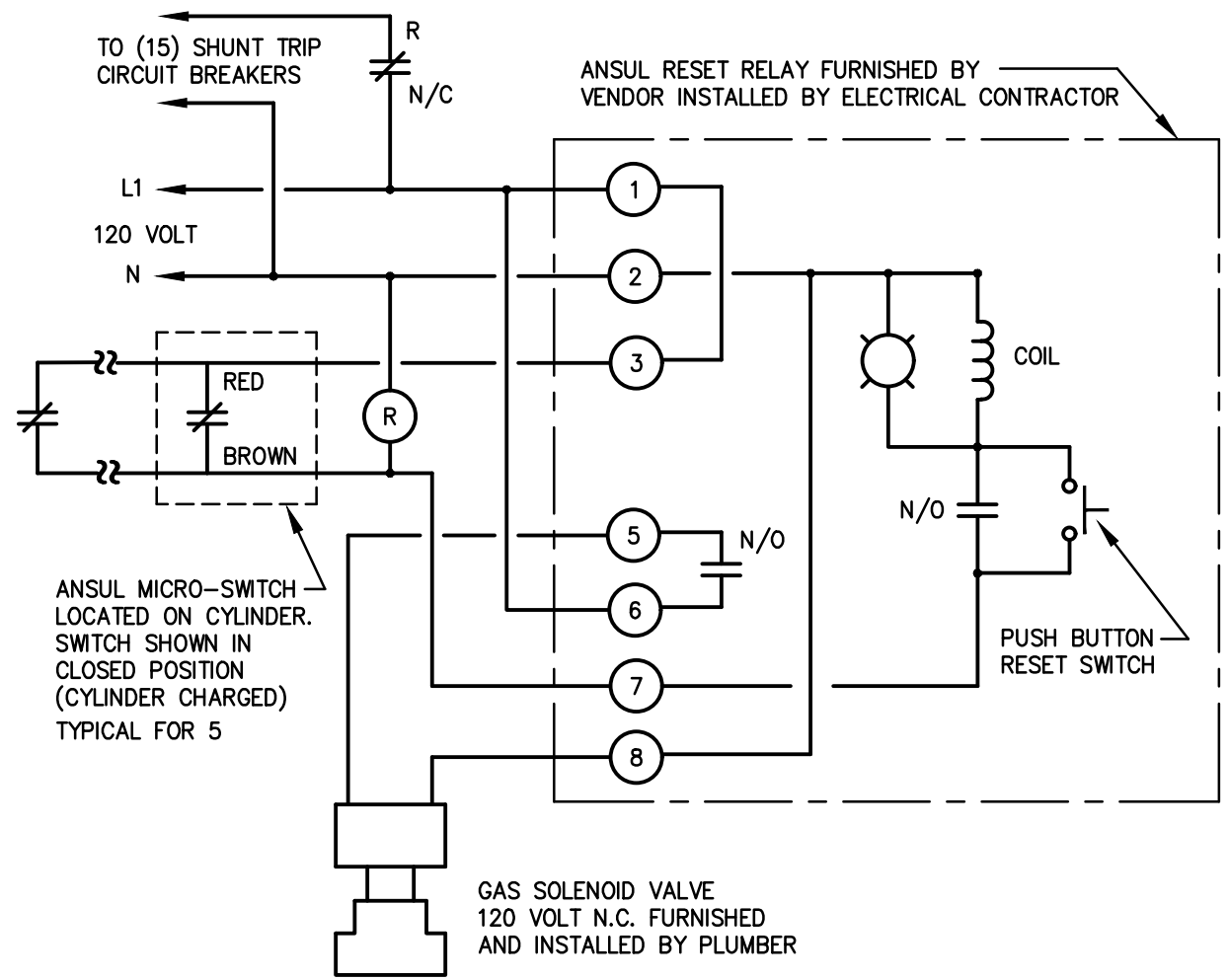
Frank Tindall, P.E.  
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NJ 38656

**E-100**





- 1 MOBILE 2 DR. REACH-IN REFRIGERATOR
- 2 MOBILE 2 DR. REACH-IN FREEZER
- 3 MOBILE FOOD WARMER
- 4 MOBILE UTILITY CARTS
- 5 WORK TABLE 96"W X 30"D W/ (2) COMPARTMENT SINK
- 6 HAND SINKS
- 7 SLICER
- 8 MIXER ON MOBILE STAND
- 9 UNDERCOUNTER DISHWASHER
- 10 DISH TABLE WITH SINK
- 11 3-COMPARTMENT POT SINK
- 12 WALL MOUNTED HOSE REEL
- 13 REACH-IN REFRIGERATOR
- 14 WORK COUNTER 67"W X 30"D (ADJUSTABLE HEIGHT)
- 15 RESTAURANT RANGE
- 16 COMBI OVEN W/STAND
- 17 PORTABLE INDUCTION RANGE
- 18 EXHAUST HOOD W/FIRE SUPPRESSION (14'W X 60"D)
- 19 EXHAUST HOOD W/FIRE SUPPRESSION (78"W X 60"D)
- 20 RANGES WITH COMBINATION COOK TOPS
- 21 WORK COUNTER W/SINK (48"W X 30"D)
- 22 WORK COUNTER 36"W X 30"D
- 23 MOBILE STATION 36"W X 30"D
- 24 EMERGENCY EYE WASH STATION



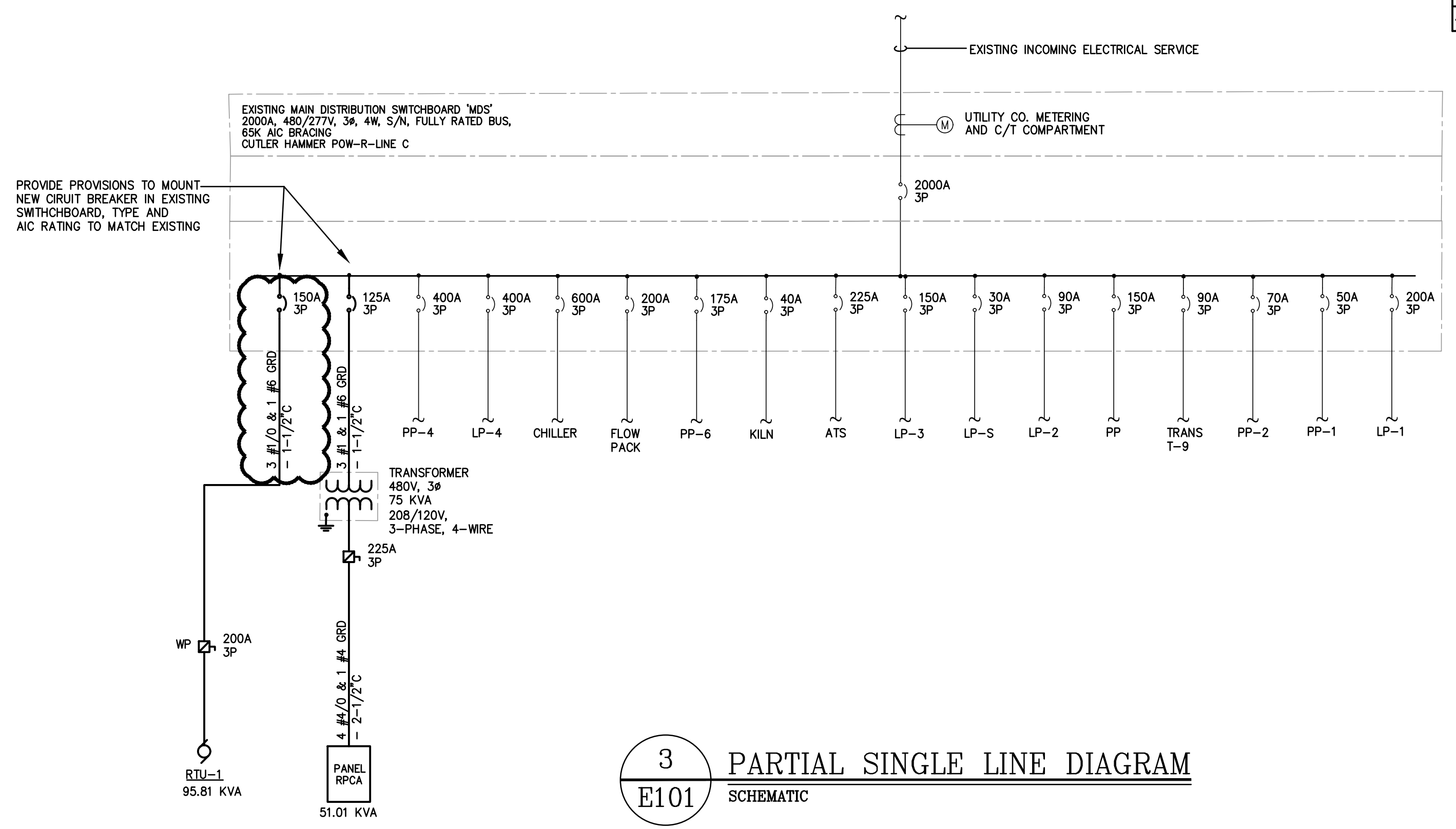
2 WIRING DIAGRAM FOR ANSUL FIRE PROTECTION SYSTEM GAS SHUT-OFF SCHEMATIC

(2 SECTION) PANELBOARD 'RPCA'						
208/120V, 3Ø, 4W, S/N, SURFACE, 225A/3P MAIN CIRCUIT BREAKER, 22 KAIC						
CKT. NO.	CIRCUIT BREAKER		LOAD		CIRCUIT DESCRIPTION	WIRE & CONDUIT
	AMPS	POLES	KVA	HP		
1	20	1	-	-	SPARE	-
SEE NOTE 2	2	20	1	0.8	ITEM 1 - REFRIGERATOR	2 #12 & 1 #12 GRD - 3/4" C
SEE NOTE 2	3	20	1	1.2	ITEM 2 - FREEZER	2 #12 & 1 #12 GRD - 3/4" C
SEE NOTE 2	4	20	2	1.5	ITEM 3 - FOOD WARMER	2 #12 & 1 #12 GRD - 3/4" C
SEE NOTE 2	5	30	3	8.6	ITEM 9 - UNDERC. DISHWASHER	3 #10 & 1 #10 GRD - 3/4" C
	6	20	1	0.7	ITEM 7 - SLICER	2 #12 & 1 #12 GRD - 3/4" C
SEE NOTE 2	7	30	3	8.6	ITEM 9 - UNDERC. DISHWASHER	3 #10 & 1 #10 GRD - 3/4" C
	8	20	1	1.0	ITEM 8 - MIXER	2 #12 & 1 #12 GRD - 3/4" C
	9	20	1	0.6	ITEM 13 - REACH-IN FRIDGE	2 #12 & 1 #12 GRD - 3/4" C
	10	20	1	-	SPARE	-
	11	20	1	-	SPARE	-
	12	20	1	-	SPARE	-
	13	20	1	0.20	GAS SOLENOID	2 #12 & 1 #12 GRD - 3/4" C
SEE NOTE 1	14	20	1	1.44	ITEM 17 - PORTABLE INDUCTION RANGE	2 #12 & 1 #12 GRD - 3/4" C
SEE NOTE 1	15	20	1	0.36	ITEM 20 - RANGE W/COMB. COOK TOPS	2 #12 & 1 #12 GRD - 3/4" C
SEE NOTE 1	16	20	1	1.44	ITEM 17 - PORTABLE INDUCTION RANGE	2 #12 & 1 #12 GRD - 3/4" C
SEE NOTE 1	17	20	1	1.44	ITEM 17 - PORTABLE INDUCTION RANGE	2 #12 & 1 #12 GRD - 3/4" C
SEE NOTE 1	18	20	1	0.36	ITEM 20 - RANGE W/COMB. COOK TOPS	2 #12 & 1 #12 GRD - 3/4" C
SEE NOTE 1	19	20	1	1.44	ITEM 17 - PORTABLE INDUCTION RANGE	2 #12 & 1 #12 GRD - 3/4" C
	20	20	1	0.63	HOOD LIGHTS	2 #12 & 1 #12 GRD - 3/4" C
	21	20	1	-	SPARE	-
	22	20	1	0.4	KITCHEN HOOD	2 #12 & 1 #12 GRD - 3/4" C
	23	50	1	2.9	2 KEF-1	2 #8 & 1 #10 GRD - 1" C
	24	25	1	1.6	3/4 KEF-2	2 #10 & 1 #10 GRD - 3/4" C
	25	25	1	1.6	3/4 KEF-3	2 #10 & 1 #10 GRD - 3/4" C
	26	25	1	1.6	3/4 KEF-4	2 #10 & 1 #10 GRD - 3/4" C
	27	25	1	1.6	3/4 KEF-5	2 #10 & 1 #10 GRD - 3/4" C
	28	20	1	0.3	RTU LTC/RECEP	2 #12 & 1 #12 GRD - 3/4" C
SEE NOTE 1	29	20	1	0.2	ITEM 15 - RESTAURANT RANGE	2 #12 & 1 #12 GRD - 3/4" C
SEE NOTE 1	30	20	1	1.4	ITEM 17 - INDUCTION RANGE	2 #12 & 1 #12 GRD - 3/4" C
SEE NOTES 1 & 2	31	30	2	5.7	ITEM 16 - COMBI RPO OVEN	2 #10 & 1 #10 GRD - 3/4" C
	32	20	1	-	SPARE	-
SEE NOTE 1	33	20	1	0.2	ITEM 20 - RANGE W/COMB. COOK TOPS	2 #12 & 1 #12 GRD - 3/4" C
SEE NOTE 1	34	20	1	0.2	ITEM 20 - RANGE W/COMB. COOK TOPS	2 #12 & 1 #12 GRD - 3/4" C
	35	20	1	0.7	RECEPS. DESK/SMARTBOARD	2 #12 & 1 #12 GRD - 3/4" C
SEE NOTE 1	36	20	1	0.2	WORKSTATION RECEP.	2 #12 & 1 #12 GRD - 3/4" C
SEE NOTE 1	37	20	1	0.2	WORKSTATION RECEP.	2 #12 & 1 #12 GRD - 3/4" C
SEE NOTE 1	38	20	1	0.2	WORKSTATION RECEP.	2 #12 & 1 #12 GRD - 3/4" C
SEE NOTE 1	39	20	1	0.2	WORKSTATION RECEP.	2 #12 & 1 #12 GRD - 3/4" C
	40	20	2	-	SPARE	-
	41	20	2	-	SPARE	-
	42	20	1	-	SPARE	-
	43	20	1	-	SPARE	-
	44	20	1	-	SPARE	-
	45	20	1	-	SPARE	-
	46	20	1	-	SPARE	-
	47-61	-	1	-	SPACE	-
				51.01	TOTAL CONNECTED LOAD	

- NOTES:
1. PROVIDE SHUNT TRIP BREAKER.
  2. PROVIDE GFI BREAKER.
  3. PROVIDE PANEL WITH ARC-FLASH HAZARD WARNING LABEL AS DESCRIBED PER NEC 110.21 (B).

1 PARTIAL FIRST FLOOR PLAN - ELECTRICAL  
E101 SCALE 1/4" = 1'-0"

- NOTES:
1. THE CONTRACTOR SHALL COORDINATE WITH THE KITCHEN VENDOR AND PROVIDE ALL NECESSARY POWER REQUIREMENTS TO FULLY CONNECT AND PLACE IN OPERATION ALL SPECIFIED KITCHEN EQUIPMENT.
  2. VERIFY NEMA CONFIGURATIONS OF ALL CORDS FURNISHED WITH EQUIPMENT AND PROVIDE CORRESPONDING DEVICE TYPE.
  3. PROVIDE CORD AND PLUG SET OF APPROPRIATE NEMA CONFIGURATION AS REQUIRED FOR EQUIPMENT FURNISHED WITHOUT CORD, WHETHER INDICATED ON PLANS OR NOT.
  4. ALL CONDUIT ENDS AT JUNCTION BOXES SHALL BE SEALED INTERNALLY AFTER INSTALLATION OF WIRES.
  5. TO GAS SOLENOID VALVE AND SHUNT-TRIP CIRCUIT BREAKER FOR EMERGENCY SHUT DOWN.



3 PARTIAL SINGLE LINE DIAGRAM  
E101 SCHEMATIC

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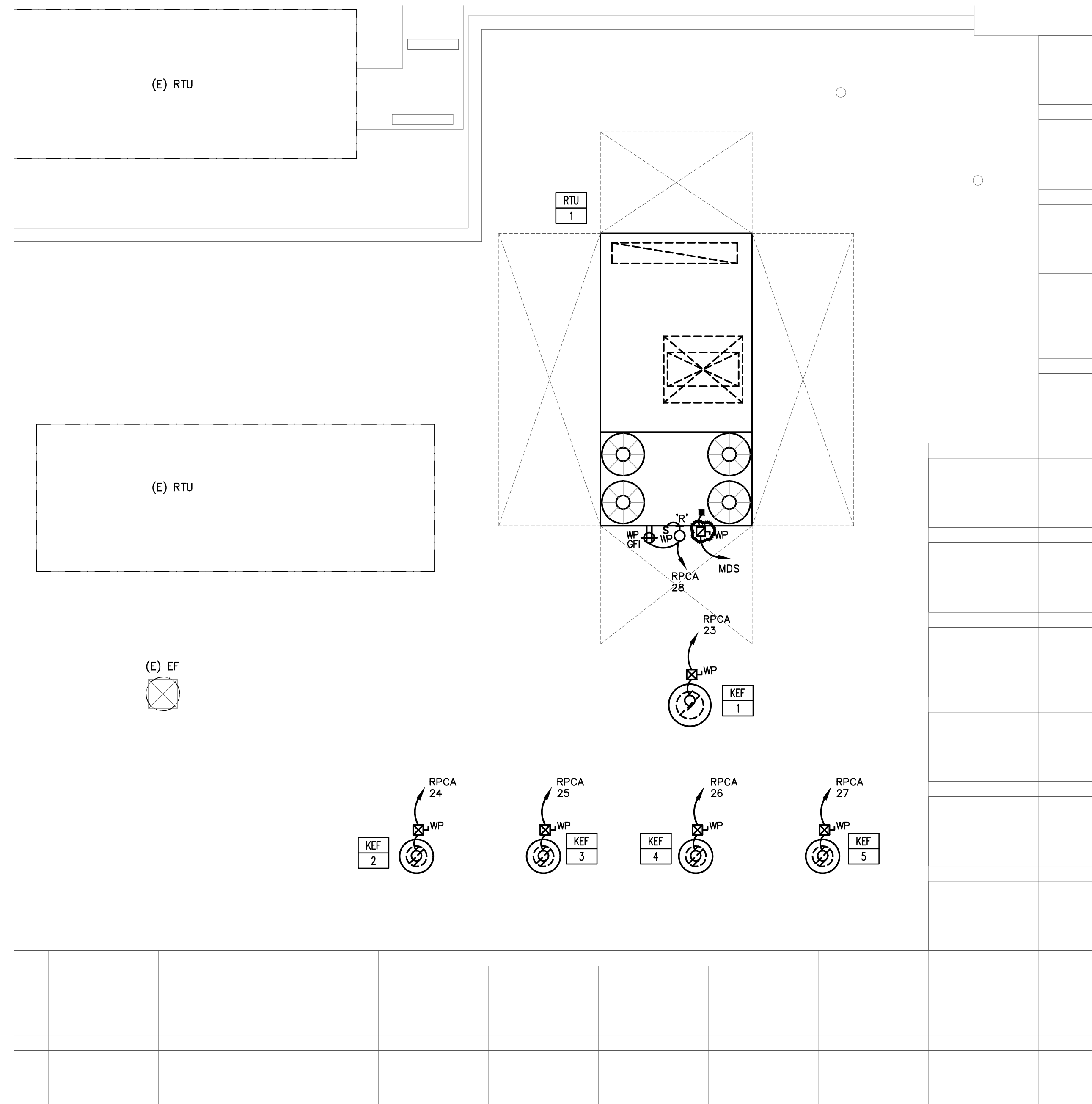
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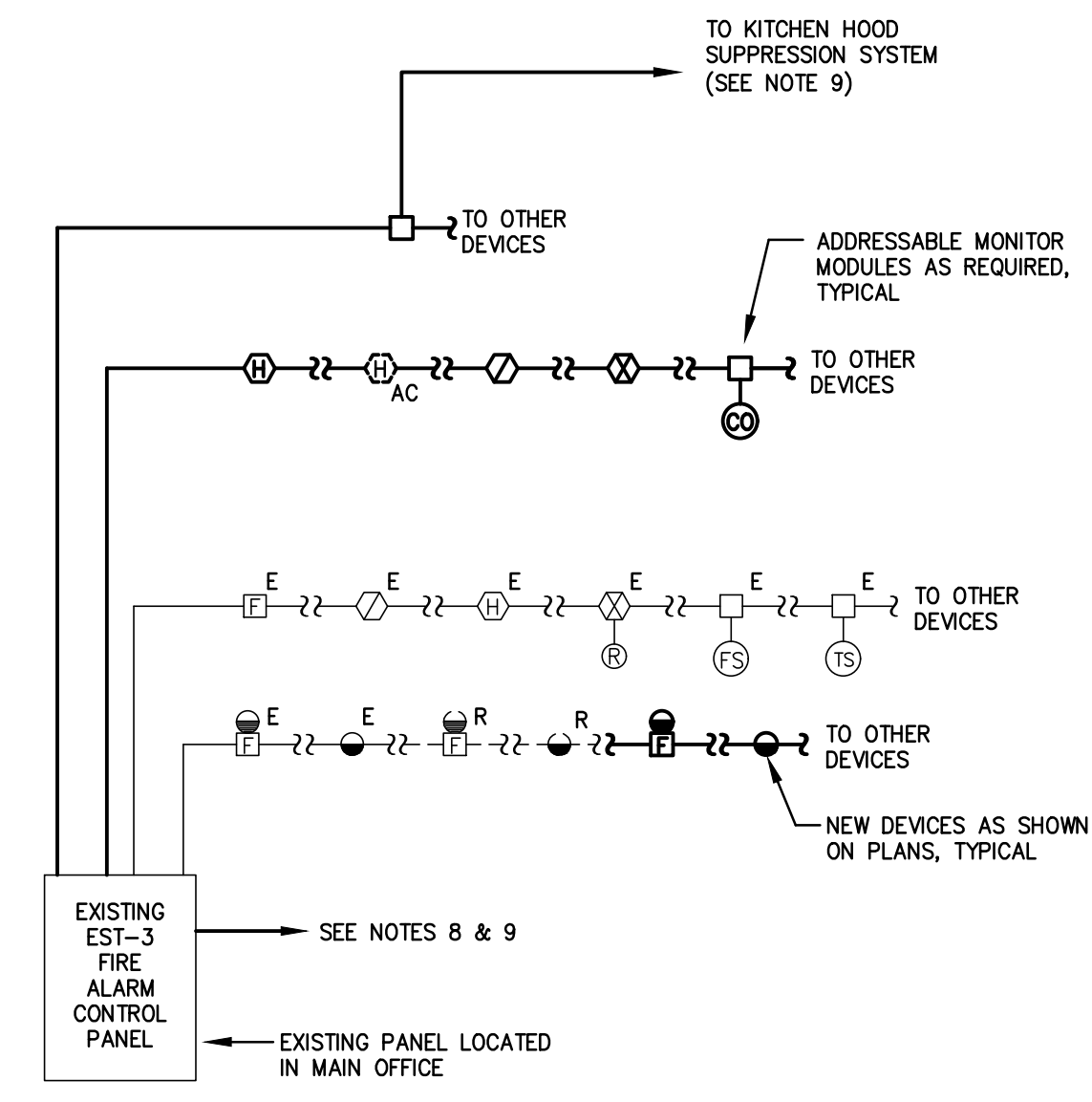
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**E-101**



**1** PARTIAL ROOF PLAN - ELECTRICAL  
 E102 SCALE 1/4" = 1'-0"



**2** FIRE ALARM SYSTEM RISER DIAGRAM  
 E102 SCHEMATIC

**FIRE ALARM SYSTEM NOTES:**

1. PROVIDE ALL WIRING AS RECOMMENDED BY MANUFACTURER. ALL WIRING SHALL BE IN CONDUIT. FIRE ALARM LABELED MC CABLE MAY BE USED IN CONCEALED LOCATIONS WHERE PERMITTED BY CODE.
2. CONTRACTOR IS RESPONSIBLE FOR INSURING THAT FIRE ALARM SYSTEM MODIFICATIONS MEET ALL APPLICABLE CODES AND FOR OBTAINING FINAL APPROVAL FROM LOCAL FIRE INSPECTOR(S).
3. PRIOR TO STARTING WORK, PREPARE SHOP DRAWINGS INCLUDING ALL INFORMATION REQUIRED UNDER NFPA 72 SECTION 14.2. SUBMIT SHOP DRAWINGS TO ENGINEER FOR REVIEW AND APPROVAL. ONCE APPROVED, SUBMIT SHOP DRAWINGS TO CODE REVIEWER/INSPECTOR(S) FOR APPROVAL. SHOP DRAWINGS TO BE SIGNED AND SEALED AND BY A NEW JERSEY PROFESSIONAL ENGINEER.
4. EXPAND EXISTING FIRE ALARM SYSTEM AS REQUIRED TO CONNECT NEW DEVICES. PROVIDE ALL NEW HARDWARE, RELAYS, MODULES, WIRING, BATTERIES, ECT., AS NECESSARY FOR COMPLETE INSTALLATION.
5. PROVIDE ALL PROGRAMMING BY A FACTORY CERTIFIED VENDOR AS REQUIRED TO MAKE THE NECESSARY MODIFICATION TO THE SYSTEM. INCLUDE ANY HARDWARE, WIRING, OF COMPONENTS NECESSARY FOR CONTINUED REUSE.
6. CONTRACTOR IS RESPONSIBLE TO COORDINATE QUANTITY AND LOCATION OF SPRINKLER FLOW AND TAMPER SWITCHES AND DUCT MOUNTED SMOKE DETECTORS. REFER TO FIRE PROTECTION AND HVAC DRAWINGS.
7. FURNISH AND INSTALL DUCT MOUNTED SMOKE DETECTORS WITH REMOTE INDICATING LIGHT AND TEST SWITCH. CONTRACTOR SHALL VERIFY AND CLEARLY LABEL REMOTE TEST SWITCH AS TO THE HVAC EQUIPMENT ASSOCIATED WITH EACH DETECTOR.
8. PROVIDE INTERCONNECTION WIRING BETWEEN HVAC EQUIPMENT AND FIRE ALARM CONTROL PANEL AS REQUIRED FOR FAN SHUTDOWN. ALL UNITS SHALL HAVE SEPARATE UNIT SHUTDOWN.
9. ACTIVATION OF THE ANSUL SYSTEM, SHALL SHUTDOWN RTU-1 (ASSOCIATED WITH CULINARY ARTS CLASSROOM).
10. PROVIDE AN ENABLE/DISABLED SIGNAL TO THE BUILDING AUTOMATION HVAC CONTROL SYSTEM TO INDICATE THE STATUS OF THE HVAC EQUIPMENT.
11. PROVIDE AT EACH LOCATION SHOWN, AUDIO/VISUAL DEVICES WITH OUTPUT LEVELS AS RECOMMENDED BY MANUFACTURER FOR THE SPACE, TO COMPLY WITH ADA & CODE REQUIREMENTS. PROVIDE ADDITIONAL DEVICES TO THOSE SHOWN IF/AS REQUIRED TO MEET LEVELS AT NO ADDITIONAL COST.
12. PROVIDE CARBON MONOXIDE DETECTORS AT ALL MECHANICAL EQUIPMENT UTILIZING NATURAL GAS. PROVIDE CARBON MONOXIDE DETECTORS WITHIN THE SPACES SERVED BY GAS FIRED MECHANICAL EQUIPMENT.
13. ALL FIRE ALARM CONTROL PANELS, REMOTE ANNUNCIATORS, AND BOOSTER PANELS SHALL HAVE SMOKE DETECTORS COVERAGE ABOVE. PROVIDE DEVICES WHETHER SHOWN ON PLANS OR NOT.
14. UPON COMPLETION OF FIRE ALARM WORK, PROVIDE A RE-ACCEPTANCE TEST OF THE ENTIRE SYSTEM PER NFPA 72.

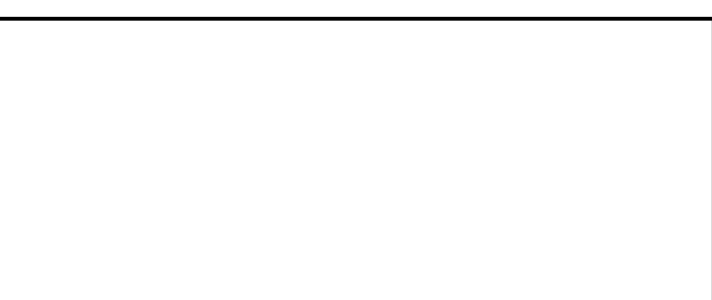
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ADDRESS:  
**LINDENWOLD HIGH SCHOOL  
 BLOCK 244, LOT 3  
 801 EGG HARBOR ROAD  
 LINDENWOLD, NJ 08021**

PROJECT NO.: 5713G

REVISION DATE: 23 FEB 2024

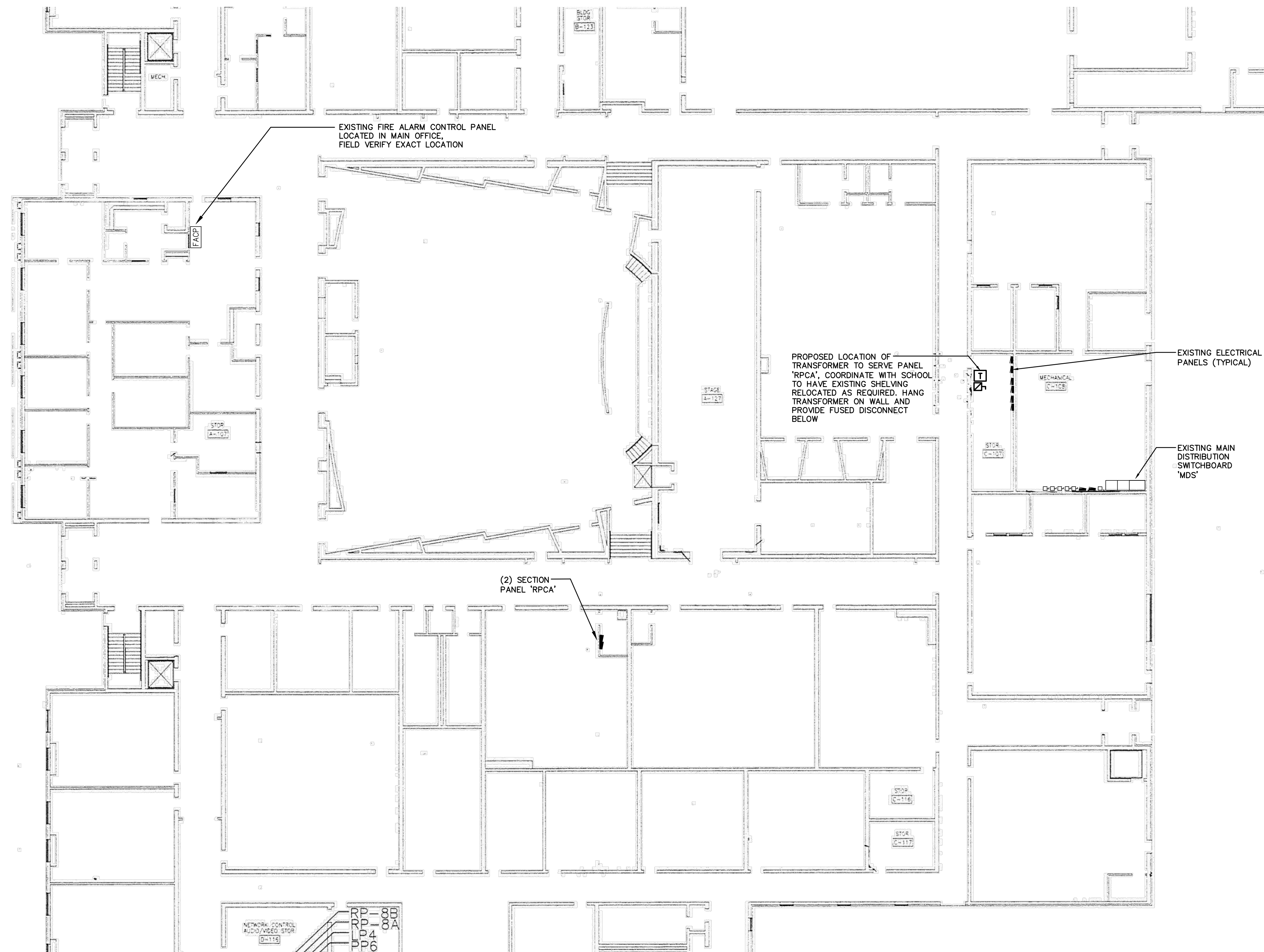

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SHEET TITLE: PARTIAL ROOF PLAN - ELECTRICAL

**E-102**



**1** OVERALL FIRST FLOOR PLAN - ELECTRICAL  
**E103** SCALE 1/16" = 1'-0"

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SHEET TITLE:	OVERALL FIRST FLOOR PLAN - ELECTRICAL

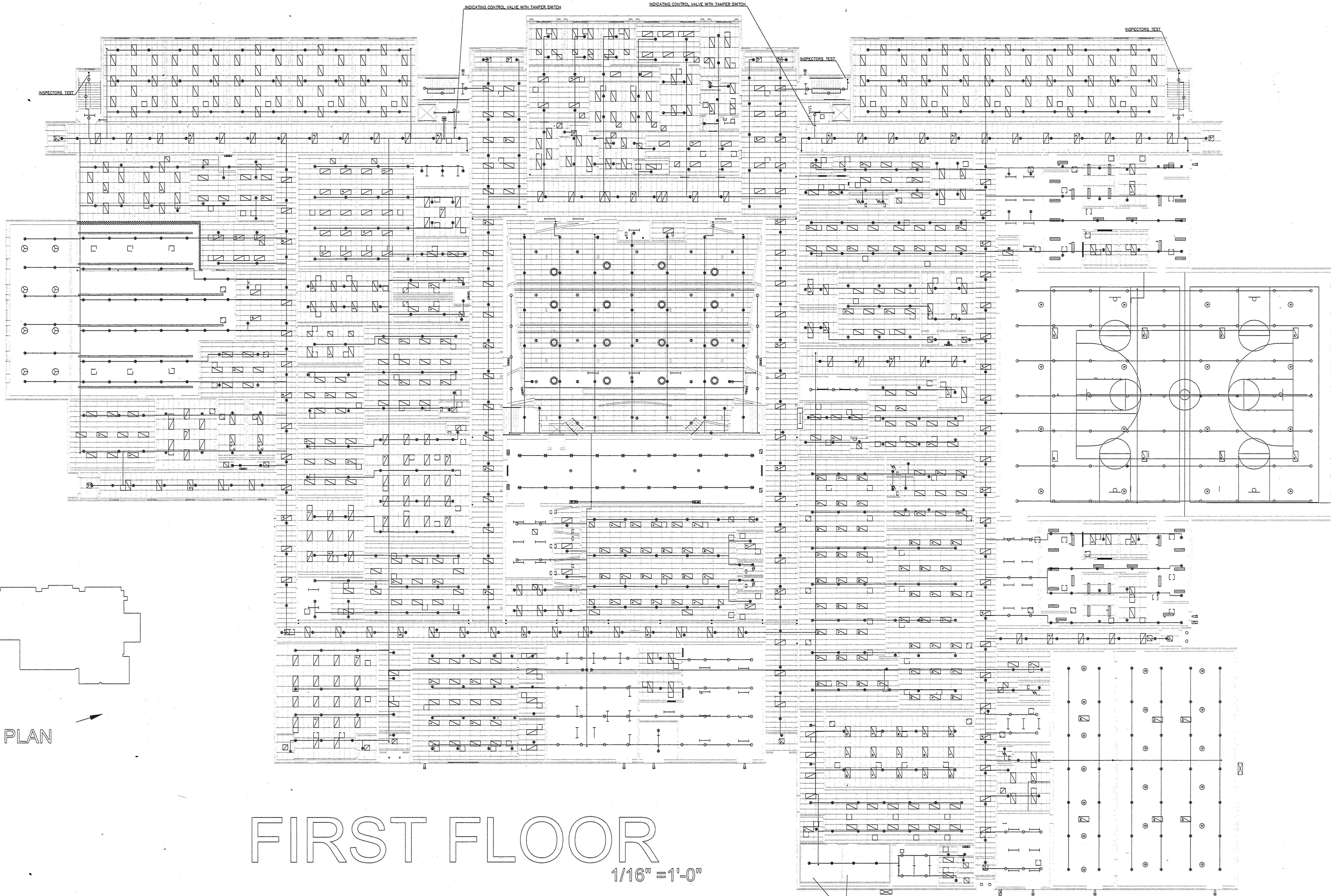
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**E-103**

February 23, 2024 - 8:47:10 am  
Drawing: 3107 - E-103.dwg



# FIRST FLOOR

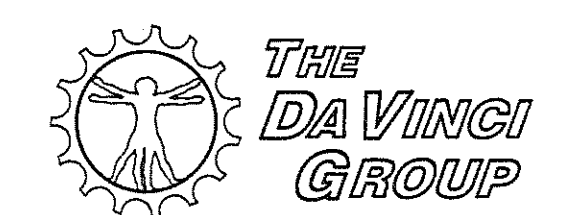
1/16" = 1'-0"

**GENERAL NOTES**

1. SPRINKLER PLANS PROVIDED FOR BID ARE SCHEMATIC AND ARE NOT MEANT TO CONVEY OR ALLOW DISCREPANCY BETWEEN THE WORK ILLUSTRATED HEREIN AND ALL APPLICABLE CODES, STANDARDS OR ORDINANCES. IT SHALL BE THE RESPONSIBILITY OF THE INSTALLING CONTRACTOR TO VERIFY ACTUAL CONDITIONS OF CONSTRUCTION AND TO MAINTAIN CONFORMANCE TO THE REQUIREMENTS OF ALL AUTHORITIES HAVING JURISDICTION. DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT OR OWNERS REPRESENTATIVE.
2. ALL SPRINKLER HEADS SHALL BE QUICK RESPONSE. (NO REDUCTION IN CALCULATION AREA WITHOUT A.H.J. AND OWNERS REPRESENTATIVE APPROVAL)
3. ALL SWITCHES AND BELLS TO BE PROVIDED BY SPRINKLER CONTRACTOR SHALL BE AT THE CORRECT VOLTAGE TO MATCH THE ALARM SYSTEM WIRING BY E.C.
4. DESIGN, MATERIALS AND INSTALLATION SHALL CONFORM TO BOCA, NFPA-13 CODES, CURRENT N.J. FIRE CODE
5. SPRINKLER PIPING SHALL BE THREADED, WELDED, OR GROOVED STEEL WITH A MINIMUM WALL THICKNESS SHALL BE SCH-10 (PLAIN END PIPE AND FITTINGS ARE NOT TO BE USED)
6. BIDDING CONTRACTORS MUST REVIEW ALL DRAWINGS, CONSTRUCTION DOCUMENTS AND SPECIFICATIONS PRIOR TO BID
7. WATER FLOW INFORMATION: DATE OF TEST 9/28/99 LOCATION OF TEST OLD EGGHARBOR RD. ADJACENT TO SITE. RESULTS: STATIC PRESSURE: 42 PSI RESIDUAL PRESSURE: 30 PSI AT A FLOW OF 1540 GPM SOURCE OF INFORMATION: NEW JERSEY AMERICAN WATER CO.
8. CONFIGURATION OF FIRE SERVICE PIT VALVING SHALL BE CONFIRMED WITH N.J. AMERICAN WATER AND LOCAL AUTHORITIES.
9. FIRE PROTECTION CONTRACTOR IS RESPONSIBLE TO COORDINATE HIS WORK WITH OTHER TRADES BEFORE INSTALLATION

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DIVISION 4

SPRINKLER PLAN

DRAWN BY: JH

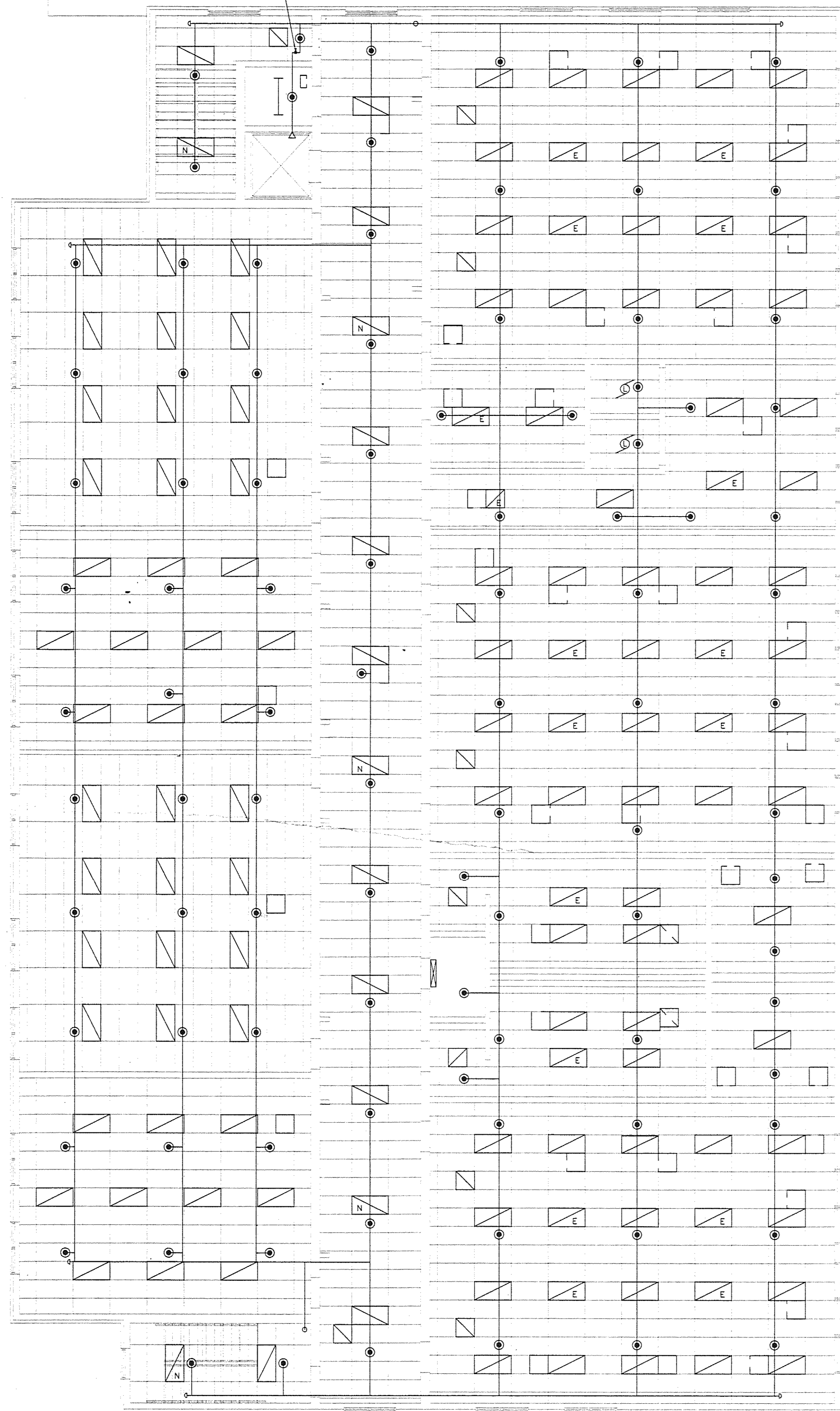
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DATE: 11/0/99

SCALE: AS NOTED

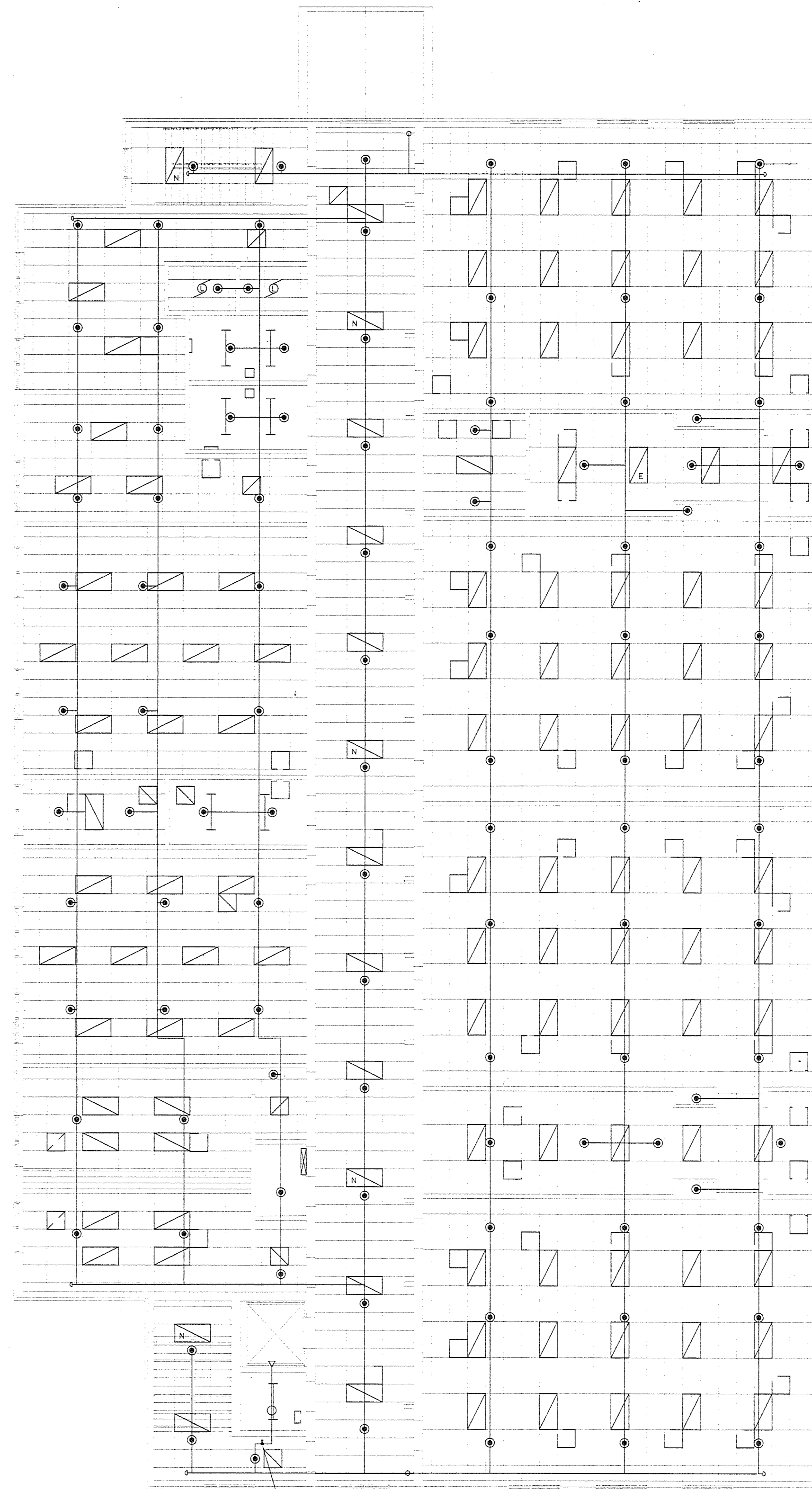
REVISED: COMM. NO. 9913  
 OF 137

INDICATING CONTROL VALVE WITH TAMPER SWITCH



SECOND FLOOR SOUTH

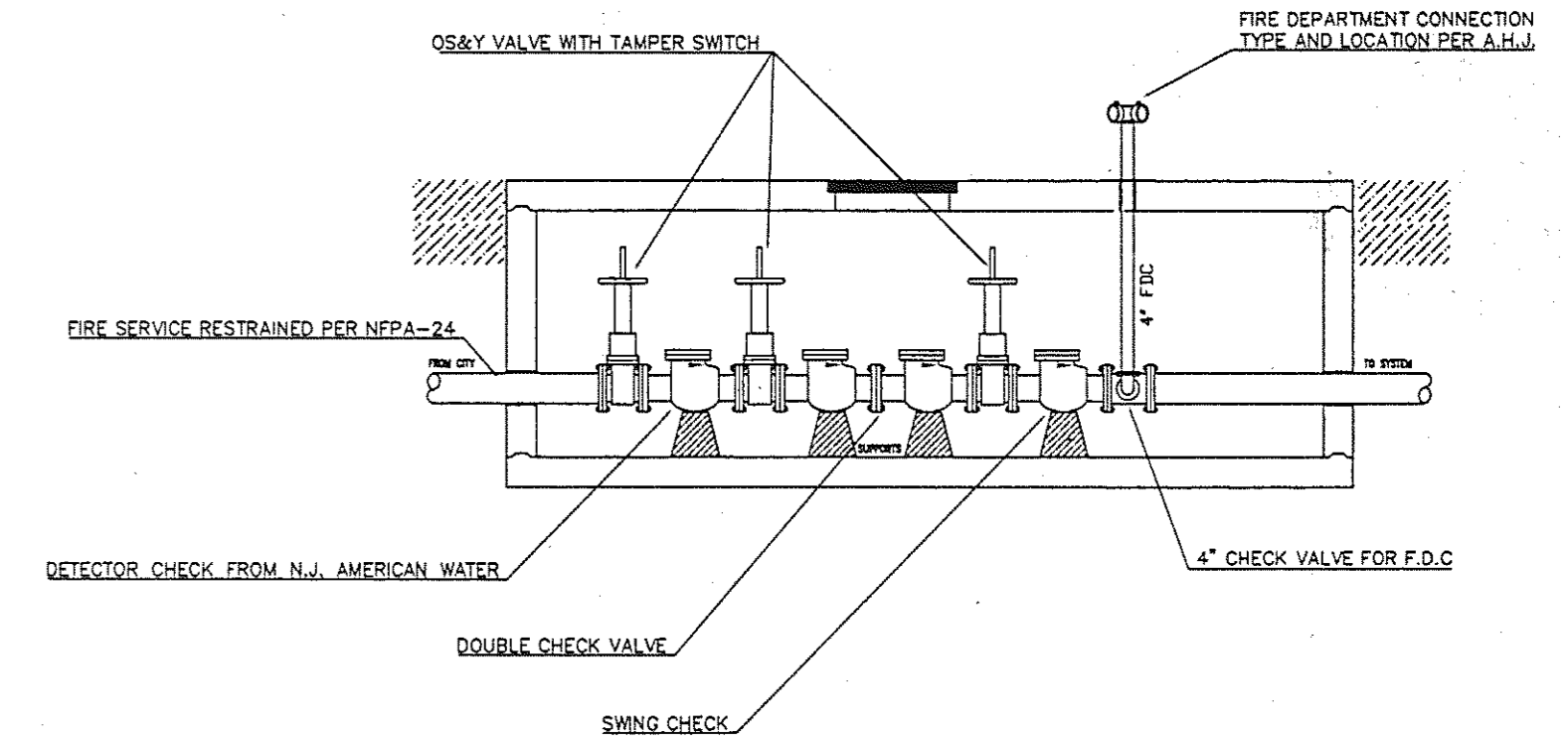
1/8" = 1'-0"



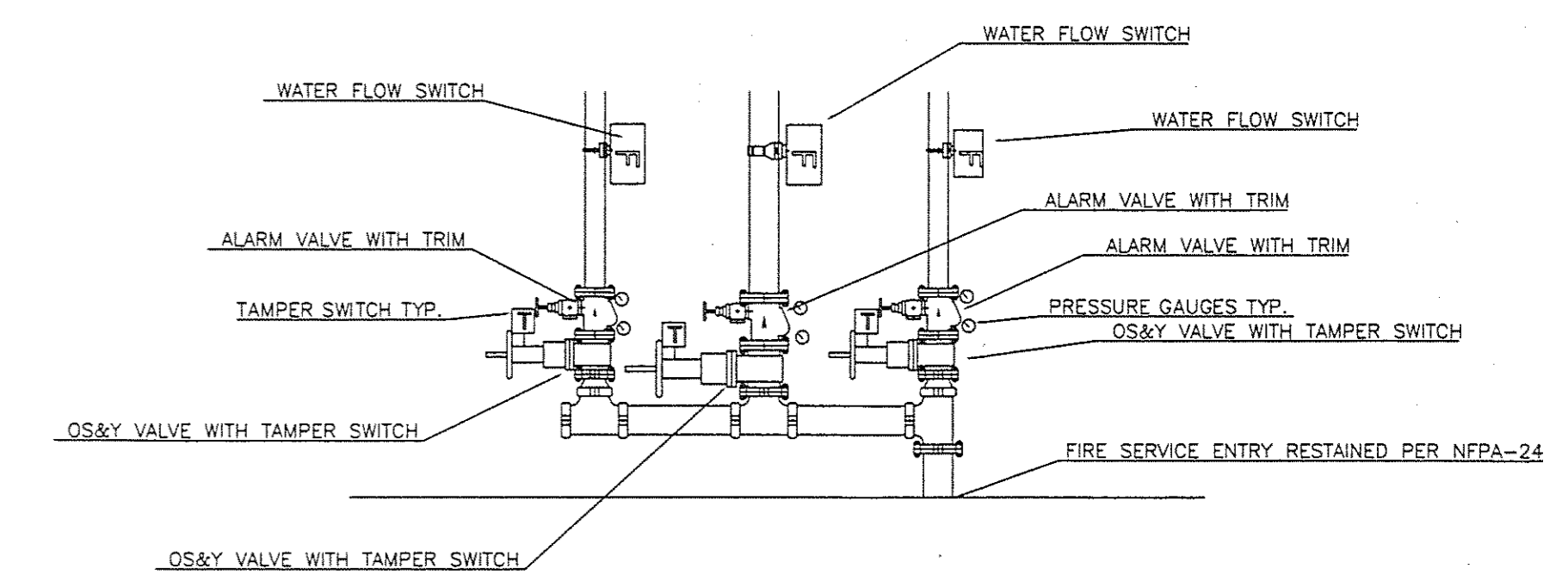
INDICATING CONTROL VALVE WITH TAMPER SWITCH

SECOND FLOOR NORTH

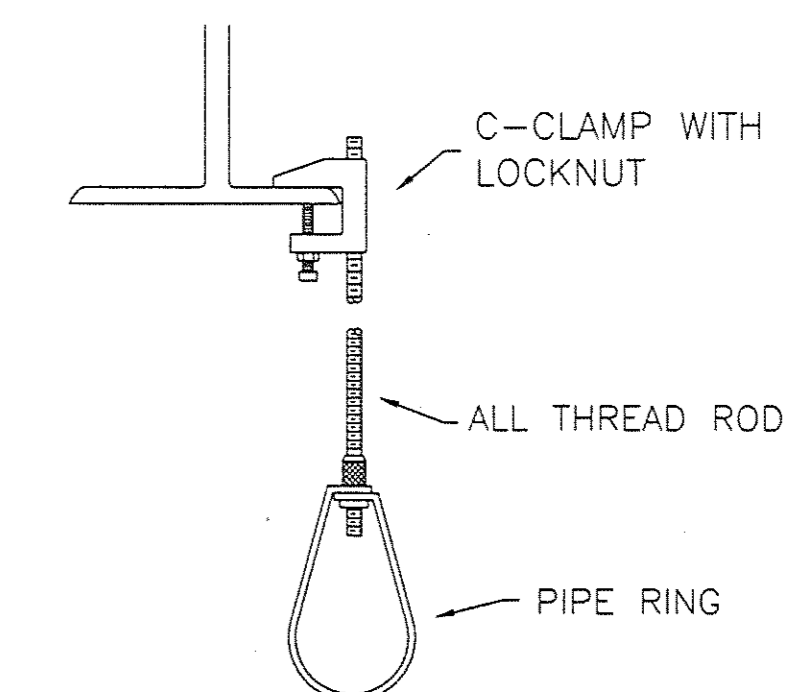
1/8" = 1'-0"



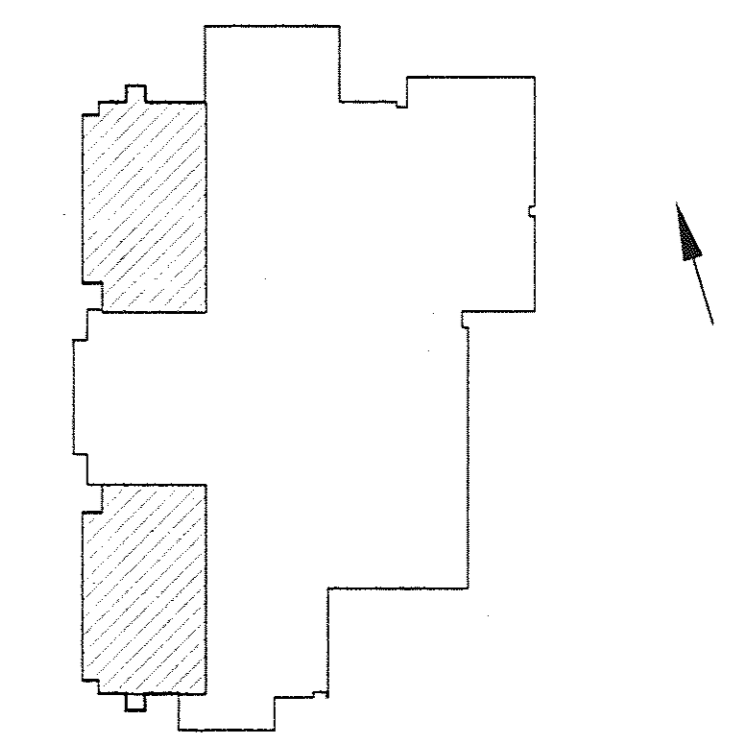
FIRE SERVICE PIT DETAIL  
SEE SITE PLAN FOR LOCATION



RISER DETAIL



C-CLAMP HANGER  
HANGER DETAIL



KEY PLAN

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DIVISION 4	
SPRINKLER PLAN	
DRAWN BY: JH	CHKD. BY: JH
DATE: 11/8/99	SCALE: AS NOTED
REVISED: COMM. NO. 9913	FP2 OF 137

## SECTION 221116 - DOMESTIC WATER PIPING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Where items of the General Conditions are repeated in this Section of the Specifications, it is intended to qualify or to call particular attention to them; it is not intended that any other parts of the General Conditions shall be assumed to be omitted if not repeated herein.
- C. Section 018100 – Special Requirements for Mechanical and Electrical Work shall apply to this Section.
- D. Section 220000 – General Provisions for Plumbing Work shall apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Domestic water pipes, tubes, and fittings.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For transition fittings and dielectric fittings.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. System purging and disinfecting activities report.
- B. Field quality-control reports.

#### 1.5 WARRANTY

- A. Provide full 2 year warranty as specified under Section 018100 “Special Requirements for Mechanical and Electrical Work”.

## PART 2 - PRODUCTS

### 2.1 PIPING MATERIALS

- A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.
- B. Potable-water piping and components shall comply with NSF 14 and NSF 61.

### 2.2 COPPER TUBE AND FITTINGS

- A. Hard Copper Tube: ASTM B 88, Type L water tube, drawn temper.
- B. Soft Copper Tube: ASTM B88, Type K water tube, annealed temper.
- C. Wrought-Copper, Solder-Joint Fittings: ASME B16.22, wrought-copper pressure fittings.
- D. Bronze Flanges: ASME B16.24, Class 150, with solder-joint ends.
- E. Copper Unions:
  - 1. MSS SP-123.
  - 2. Cast-copper-alloy, hexagonal-stock body.
  - 3. Ball-and-socket, metal-to-metal seating surfaces.
  - 4. Solder-joint or threaded ends.
- F. Copper Pressure-Seal-Joint Fittings:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Elkhart Products Corporation.
    - b. NIBCO Inc.
    - c. Viega.
  - 2. Fittings for NPS 2 and Smaller: Wrought-copper fitting with EPDM-rubber, O-ring seal in each end.
  - 3. Fittings for NPS 2-1/2 to NPS 4: Cast-bronze or wrought-copper fitting with EPDM-rubber, O-ring seal in each end.

### 2.3 PIPING JOINING MATERIALS

- A. Solder Filler Metals: ASTM B 32, lead-free alloys.
- B. Flux: ASTM B 813, water flushable.

- C. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for general-duty brazing unless otherwise indicated.

## 2.4 TRANSITION FITTINGS

- A. General Requirements:
  - 1. Same size as pipes to be joined.
  - 2. Pressure rating at least equal to pipes to be joined.
  - 3. End connections compatible with pipes to be joined.
- B. Fitting-Type Transition Couplings: Manufactured piping coupling or specified piping system fitting.

## 2.5 DIELECTRIC FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Elster Perfection Corporation.
  - 2. Grinnell Mechanical Products; Tyco Fire Products LP.
  - 3. Matco-Norca.
  - 4. Precision Plumbing Products, Inc.
  - 5. Victaulic Company.
  - 6. Or approved equal.
- B. Standard: IAPMO PS 66.
- C. Electroplated steel nipple complying with ASTM F 1545.
- D. Pressure Rating and Temperature: 300 psig at 225 deg F.
- E. End Connections: Male threaded or grooved.
- F. Lining: Inert and noncorrosive, propylene.

## PART 2 - EXECUTION

### 2.1 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of domestic water piping. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on coordination drawings.



- B. Install shutoff valve immediately upstream of each dielectric fitting.
- C. Install domestic water piping level without pitch and plumb.
- D. Install piping concealed from view and protected from physical contact by building occupants unless otherwise indicated and except in equipment rooms and service areas.
- E. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- F. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal, and coordinate with other services occupying that space.
- G. Install piping to permit valve servicing.
- H. Install nipples, unions, special fittings, and valves with pressure ratings the same as or higher than the system pressure rating used in applications below unless otherwise indicated.
- I. Install piping free of sags and bends.
- J. Install fittings for changes in direction and branch connections.
- K. Install unions in copper tubing at final connection to each piece of equipment, machine, and specialty.

## 2.2 JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.
- C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
  - 1. Apply appropriate tape or thread compound to external pipe threads.
  - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.
- D. Brazed Joints for Copper Tubing: Comply with CDA's "Copper Tube Handbook," "Brazed Joints" chapter.
- E. Soldered Joints for Copper Tubing: Apply ASTM B 813, water-flushable flux to end of tube. Join copper tube and fittings according to ASTM B 828 or CDA's "Copper Tube Handbook."
- F. Pressure-Sealed Joints for Copper Tubing: Join copper tube and pressure-seal fittings with tools recommended by fitting manufacturer.

### 2.3 DIELECTRIC FITTING INSTALLATION

- A. Install dielectric nipples in piping at connections of dissimilar metal piping and tubing.

### 2.4 HANGER AND SUPPORT INSTALLATION

- A. Comply with requirements for pipe hanger, support products, and installation in Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment."
  - 1. Vertical Piping: MSS Type 8 or 42, clamps.
  - 2. Individual, Straight, Horizontal Piping Runs:
    - a) 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
    - b) Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
  - 3. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
  - 4. Base of Vertical Piping: MSS Type 52, spring hangers.
- B. Support vertical piping and tubing at base and at each floor.
- C. Rod diameter may be reduced one size for double-rod hangers, to a minimum of 3/8 inch.
- D. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
  - 1. NPS 3/4 and Smaller: 60 inches with 3/8-inch rod.
  - 2. NPS 1 and NPS 1-1/4: 72 inches with 3/8-inch rod.
  - 3. NPS 1-1/2 and NPS 2: 96 inches with 3/8-inch rod.
- E. Install supports for vertical copper tubing every 10 feet.
- F. Support piping and tubing not listed in this article according to MSS SP-69 and manufacturer's written instructions.

### 2.5 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. When installing piping adjacent to equipment and machines, allow space for service and maintenance.

### 2.6 IDENTIFICATION

- A. Identify system components. Comply with requirements for identification materials and installation in Division 22 Section "Identification for Plumbing Piping and Equipment."
- B. Label pressure piping with system operating pressure.

2.7 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
- B. Piping Inspections:
  - 1. Do not enclose, cover, or put piping into operation until it has been inspected and approved by authorities having jurisdiction.
  - 2. During installation, notify authorities having jurisdiction at least one day before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction:
    - a) Roughing-in Inspection: Arrange for inspection of piping before concealing or closing in after roughing in and before setting fixtures.
    - b) Final Inspection: Arrange for authorities having jurisdiction to observe tests specified in "Piping Tests" Subparagraph below and to ensure compliance with requirements.
  - 3. Reinspection: If authorities having jurisdiction find that piping will not pass tests or inspections, make required corrections and arrange for reinspection.
  - 4. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
- C. Piping Tests:
  - 1. Fill domestic water piping. Check components to determine that they are not air bound and that piping is full of water.
  - 2. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit a separate report for each test, complete with diagram of portion of piping tested.
  - 3. Leave new, altered, extended, or replaced domestic water piping uncovered and unconcealed until it has been tested and approved. Expose work that was covered or concealed before it was tested.
  - 4. Cap and subject piping to static water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow it to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.
  - 5. Repair leaks and defects with new materials, and retest piping or portion thereof until satisfactory results are obtained.
  - 6. Prepare reports for tests and for corrective action required.
- D. Domestic water piping will be considered defective if it does not pass tests and inspections.
- E. Prepare test and inspection reports.

## 2.8 ADJUSTING

- A. Perform the following adjustments before operation:
  - 1. Open shutoff valves to fully open position.
  - 2. Remove plugs used during testing of piping and for temporary sealing of piping during installation.
  - 3. Remove and clean strainer screens. Close drain valves and replace drain plugs.
  - 4. Check plumbing specialties and verify proper settings, adjustments, and operation.

## 2.9 CLEANING

- A. Clean and disinfect potable domestic water piping as follows:
  - 1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
  - 2. Use purging and disinfecting procedures prescribed by authorities having jurisdiction; if methods are not prescribed, use procedures described in either AWWA C651 or AWWA C652 or follow procedures described below:
    - a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
    - b. Fill and isolate system according to either of the following:
      - 1) Fill system or part thereof with water/chlorine solution with at least 50 ppm of chlorine. Isolate with valves and allow to stand for 24 hours.
      - 2) Fill system or part thereof with water/chlorine solution with at least 200 ppm of chlorine. Isolate and allow to stand for three hours.
    - c. Flush system with clean, potable water until no chlorine is in water coming from system after the standing time.
    - d. Repeat procedures if biological examination shows contamination.
    - e. Submit water samples in sterile bottles to authorities having jurisdiction.
- B. Prepare and submit reports of purging and disinfecting activities. Include copies of water-sample approvals from authorities having jurisdiction.
- C. Clean interior of domestic water piping system. Remove dirt and debris as work progresses.

## 2.10 PIPING SCHEDULE

- A. Transition and special fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.
- B. Flanges and unions may be used for aboveground piping joints unless otherwise indicated.
- C. Under-building-slab, domestic cold water piping shall be the following:

1. Soft copper tube, ASTM B88, Type K; wrought copper, solder-joint fittings; and brazed joints.
- D. Aboveground domestic cold, hot and hot water recirculation water piping, shall be the following:
1. Hard copper tube, ASTM B 88, Type L; wrought-copper, solder-joint fittings; and soldered joints.

## 2.11 VALVE SCHEDULE

- A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
1. Shutoff Duty: Use ball valves.
  2. Drain Duty: Hose-end ball valves with bronze cap and chain.
- B. Use check valves to maintain correct direction of domestic water flow to and from equipment.

END OF SECTION 221116

SECTION 221316 - SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Section 018100 – Special Requirements for Mechanical and Electrical Work shall apply to this Section.
- C. Section 220000 – General Provisions for Plumbing Work shall apply to this Section.

1.2 SUMMARY

- A. Section Includes:
  - 1. Pipe, tube, and fittings.
  - 2. Specialty pipe fittings.

1.3 PERFORMANCE REQUIREMENTS

- A. Components and installation shall be capable of withstanding the following minimum working pressure unless otherwise indicated:
  - 1. Soil, Waste, and Vent Piping: 10-foot head of water.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
  - 1. Product Data for Credit IEQ 4.1: For solvent cements and adhesive primers, documentation including printed statement of VOC content.
  - 2. Laboratory Test Reports for Credit IEQ 4: For solvent cements and adhesive primers, documentation indicating that products comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

1.5 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.6 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- B. All cast iron soil pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute (CISPI) and be listed by NSF International.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

- A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.

2.2 HUBLESS, CAST-IRON SOIL PIPE AND FITTINGS

- A. Pipe and Fittings: ASTM A 888 or CISPI 301.
- B. CISPI, Hubless-Piping Couplings:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. ANACO-Husky.
    - b. Fernco Inc.
    - c. MIFAB, Inc.
    - d. Tyler Pipe.
    - e. Approved equal.
  - 2. Standards: ASTM C 1277 and CISPI 310.
  - 3. Description: Stainless-steel corrugated shield with stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve with integral, center pipe stop.
- C. Cast-Iron, Hubless-Piping Couplings:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. MG Piping Products Company.
    - b. Approved equal.
  - 2. Standard: ASTM C 1277.
  - 3. Description: Two-piece ASTM A 48/A 48M, cast-iron housing; stainless-steel bolts and nuts; and ASTM C 564, rubber sleeve with integral, center pipe stop.

### 2.3 HUB AND SPIGOT, CAST IRON SOIL PIPE AND FITTINGS

- A. Pipe and Fittings: ASTM A 74, Extra Heavy Class.
- B. Gaskets: ASTM C584 Rubber.

## PART 3 - EXECUTION

### 3.1 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on coordination drawings.
- B. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
- C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- D. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- E. Install piping to permit valve servicing.
- F. Install piping at indicated slopes.
- G. Install piping free of sags and bends.
- H. Install fittings for changes in direction and branch connections.
- I. Install piping to allow application of insulation.
- J. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if two fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.
- K. Lay buried building drainage piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.



- L. Install soil and waste drainage and vent piping at the following minimum slopes unless otherwise indicated:
    - 1. Horizontal Sanitary Drainage Piping: 2 percent downward in direction of flow for 2-1/2" and smaller and 1 percent for larger piping.
    - 2. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.
  - M. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."
  - N. Install force mains at elevations indicated.
  - O. Plumbing Specialties:
    - 1. Install cleanouts at grade and extend to where building sanitary drains connect to building sanitary sewers in sanitary drainage gravity-flow piping. Install cleanout fitting with closure plug inside the building in sanitary drainage force-main piping. Comply with requirements for cleanouts specified in Division 22 Section "Sanitary Waste Piping Specialties."
    - 2. Install drains in sanitary drainage gravity-flow piping. Comply with requirements for drains specified in Division 22 Section "Sanitary Waste Piping Specialties."
  - P. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.
  - Q. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Division 22 Section "Sleeves and Sleeve Seals for Plumbing Piping."
  - R. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Division 22 Section "Sleeves and Sleeve Seals for Plumbing Piping."
  - S. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Division 22 Section "Escutcheons for Plumbing Piping."
- 3.2 JOINT CONSTRUCTION
- A. Join hub-and-spigot, cast-iron soil piping with gasket joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for compression joints.
  - B. Join hubless, cast-iron soil piping according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-piping coupling joints.
  - C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

### 3.3 HANGER AND SUPPORT INSTALLATION

- A. Comply with requirements for pipe hanger and support devices and installation specified in Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment."
  1. Install carbon-steel pipe hangers for horizontal piping in noncorrosive environments.
  2. Install carbon-steel pipe support clamps for vertical piping in noncorrosive environments.
  3. Vertical Piping: MSS Type 8 or Type 42, clamps.
  4. Install individual, straight, horizontal piping runs:
    - a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
    - b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
    - c. Longer Than 100 Feet if Indicated: MSS Type 49, spring cushion rolls.
  5. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
  6. Base of Vertical Piping: MSS Type 52, spring hangers.
- B. Support horizontal piping and tubing within 12 inches of each fitting, valve, and coupling.
- C. Support vertical piping and tubing at base and at each floor.
- D. Rod diameter may be reduced one size for double-rod hangers, with 3/8-inch minimum rods.
- E. Install hangers for cast-iron soil piping with the following maximum horizontal spacing and minimum rod diameters:
  1. NPS 1-1/2 and NPS 2: 60 inches with 3/8-inch rod.
  2. NPS 3: 60 inches with 1/2-inch rod.
  3. NPS 4 and NPS 5: 60 inches with 5/8-inch rod.
- F. Install supports for vertical cast-iron soil piping every 15 feet (4.5 m).
- G. Install hangers for steel piping with the following maximum horizontal spacing and minimum rod diameters:
  1. NPS 1-1/4: 84 inches with 3/8-inch rod.
  2. NPS 1-1/2: 108 inches with 3/8-inch rod.
  3. NPS 2: 10 feet with 3/8-inch rod.
- H. Install supports for vertical steel piping every 15 feet.
- I. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

### 3.4 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect drainage and vent piping to the following:
  - 1. Plumbing Fixtures: Connect drainage piping in sizes indicated, but not smaller than required by plumbing code.
  - 2. Plumbing Fixtures and Equipment: Connect atmospheric vent piping in sizes indicated, but not smaller than required by authorities having jurisdiction.
  - 3. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by plumbing code.
  - 4. Install test tees (wall cleanouts) in conductors near floor and floor cleanouts with cover flush with floor.
  - 5. Comply with requirements for cleanouts and drains specified in Division 22 Section "Sanitary Waste Piping Specialties."
  - 6. Equipment: Connect drainage piping as indicated. Provide shutoff valve if indicated and union for each connection. Use flanges instead of unions for connections NPS 2-1/2 and larger.
- C. Where installing piping adjacent to equipment, allow space for service and maintenance of equipment.

### 3.5 IDENTIFICATION

- A. Identify exposed sanitary waste and vent piping. Comply with requirements for identification specified in Division 22 Section "Identification for Plumbing Piping and Equipment."

### 3.6 FIELD QUALITY CONTROL

- A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.
  - 1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
  - 2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
- B. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.
- C. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
- D. Test sanitary drainage and vent piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:

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1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
2. Leave uncovered and unconcealed new, altered, extended, or replaced drainage and vent piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.
3. Roughing-in Plumbing Test Procedure: Test drainage and vent piping except outside leaders on completion of roughing-in. Close openings in piping system and fill with water to point of overflow, but not less than 10-foot head of water. From 15 minutes before inspection starts to completion of inspection, water level must not drop. Inspect joints for leaks.
4. Finished Plumbing Test Procedure: After plumbing fixtures have been set and traps filled with water, test connections and prove they are gastight and watertight. Plug vent-stack openings on roof and building drains where they leave building. Introduce air into piping system equal to pressure of 1-inch wg. Use U-tube or manometer inserted in trap of water closet to measure this pressure. Air pressure must remain constant without introducing additional air throughout period of inspection. Inspect plumbing fixture connections for gas and water leaks.
5. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
6. Prepare reports for tests and required corrective action.

3.7 CLEANING AND PROTECTION

- A. Clean interior of piping. Remove dirt and debris as work progresses.
- B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- C. Place plugs in ends of uncompleted piping at end of day and when work stops.

3.8 PIPING SCHEDULE

- A. Aboveground, soil, waste and vent piping shall be the following:
  1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
  2. Hubless, cast-iron soil pipe and fittings hubless-piping couplings; and coupled joints.
- B. Underground, soil, waste, and vent piping shall be the following:
  1. Service class, hub and spigot cast-iron soil piping; gaskets; and gasketed joints.

END OF SECTION 221316

## SECTION 231123 - NATURAL-GAS PIPING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Where items of the General Conditions are repeated in this Section of the Specifications, it is intended to qualify or to call particular attention to them; it is not intended that any other parts of the General Conditions shall be assumed to be omitted if not repeated herein.
- C. This Section applies equally and specifically to all HVAC Sections of the Specifications.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Pipes, tubes, and fittings.
  - 2. Piping specialties.
  - 3. Piping and tubing joining materials.
  - 4. Valves.
  - 5. Pressure regulators.
  - 6. Service meters.
  - 7. Concrete bases.

#### 1.3 DEFINITIONS

- A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct shafts, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.
- B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.
- C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

#### 1.4 PERFORMANCE REQUIREMENTS

- A. Minimum Operating-Pressure Ratings:
  - 1. Piping and Valves: 100 psig minimum unless otherwise indicated.
  - 2. Service Regulators: 100 psig minimum unless otherwise indicated.

3. Minimum Operating Pressure of Service Meter 65 psig.

- B. Natural-Gas System Pressure within and outside Buildings: More than 0.5 psig but not more than 2 psig.
- C. Delegated Design: Design restraints and anchors for natural-gas piping and equipment, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

#### 1.5 ACTION SUBMITTALS

A. Product Data: For each type of the following:

- 1. Piping specialties.
- 2. Corrugated, stainless-steel tubing with associated components.
- 3. Valves. Include pressure rating, capacity, settings, and electrical connection data of selected models.
- 4. Pressure regulators. Indicate pressure ratings and capacities.
- 5. Service meters. Indicate pressure ratings and capacities.
- 6. Dielectric fittings.

B. Shop Drawings: For facility natural-gas piping layout. Include plans, piping layout and elevations, sections, and details for fabrication of pipe anchors, hangers, supports for multiple pipes, alignment guides, expansion joints and loops, and attachments of the same to building structure. Detail location of anchors, alignment guides, and expansion joints and loops.

- 1. Shop Drawing Scale: 1/4 inch per foot.
- 2. Detail mounting, supports, and valve arrangements for service meter assembly and pressure regulator assembly.

C. Delegated-Design Submittal: For natural-gas piping and equipment indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

#### 1.6 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Plans and details, drawn to scale, on which natural-gas piping is shown and coordinated with other installations, using input from installers of the items involved.

B. Site Survey: Plans, drawn to scale, on which natural-gas piping is shown and coordinated with other services and utilities.

C. Qualification Data: For qualified professional engineer.

D. Welding certificates.

E. Field quality-control reports.

#### 1.7 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For motorized gas valves, pressure regulators and service meters to include in emergency, operation, and maintenance manuals.

#### 1.8 QUALITY ASSURANCE

- A. Steel Support Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

#### 1.9 DELIVERY, STORAGE, AND HANDLING

- A. Handling Flammable Liquids: Remove and dispose of liquids from existing natural-gas piping according to requirements of authorities having jurisdiction.
- B. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.
- C. Store and handle pipes and tubes having factory-applied protective coatings to avoid damaging coating, and protect from direct sunlight.

#### 1.10 PROJECT CONDITIONS

- A. Perform site survey, research public utility records, and verify existing utility locations. Contact utility-locating service for area where Project is located.
- B. Interruption of Existing Natural-Gas Service: Do not interrupt natural-gas service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide purging and startup of natural-gas supply according to requirements indicated:
  - 1. Notify Owner no fewer than two (2) weeks in advance of proposed interruption of natural-gas service, and two (2) days in advance of reactivation of natural gas service.
  - 2. Do not proceed with interruption or reactivation of natural-gas service without Owner's written permission.

#### 1.11 WARRANTY

- A. From the date of substantial completion, warranties shall be for a minimum of two (2) years or as indicated in the individual sections of the project manual, whichever is greater.

## PART 2 - PRODUCTS

### 2.1 PIPES, TUBES, AND FITTINGS

- A. Steel Pipe: ASTM A 53/A 53M, black steel, Schedule 40, Type E or S, Grade B.
1. Malleable-Iron Threaded Fittings: ASME B16.3, Class 150, standard pattern.
  2. Carbon Steel Pressure-Seal-Joint Fittings: ASTM F3226 for metallic press-connect fittings.
  3. Wrought-Steel Welding Fittings: ASTM A 234/A 234M for butt welding and socket welding.
  4. Unions: ASME B16.39, Class 150, malleable iron with brass-to-iron seat, ground joint, and threaded ends.
  5. Forged-Steel Flanges and Flanged Fittings: ASME B16.5, minimum Class 150, including bolts, nuts, and gaskets of the following material group, end connections, and facings:
    - a. Material Group: 1.1.
    - b. End Connections: Threaded or butt welding to match pipe.
    - c. Lapped Face: Not permitted underground.
    - d. Gasket Materials: ASME B16.20, metallic, flat, asbestos free, aluminum o-rings, and spiral-wound metal gaskets.
    - e. Bolts and Nuts: ASME B18.2.1, carbon steel aboveground and stainless steel underground.
- B. Drawn-Temper Copper Tube: Comply with ASTM B 88, Type K.
1. Copper Fittings: ASME B16.22, wrought copper, and streamlined pattern.
  2. Bronze Flanges and Flanged Fittings: ASME B16.24, Class 150.
    - a. Gasket Material: ASME B16.20, metallic, flat, asbestos free, aluminum o-rings, and spiral-wound metal gaskets.
    - b. Bolts and Nuts: ASME B18.2.1, carbon steel or stainless steel.

### 2.2 PIPING SPECIALTIES

- A. Y-Pattern Strainers:
1. Body: ASTM A 126, Class B, cast iron with bolted cover and bottom drain connection.
  2. End Connections: Threaded ends for NPS 2 and smaller; flanged ends for NPS 2-1/2 and larger.
  3. Strainer Screen: 40-mesh startup strainer, and perforated stainless-steel basket with 50 percent free area.
  4. CWP Rating: 125 psig.
- B. Weatherproof Vent Cap: Cast- or malleable-iron increaser fitting with corrosion-resistant wire screen, with free area at least equal to cross-sectional area of connecting pipe and threaded-end connection.



## 2.3 JOINING MATERIALS

- A. Joint Compound and Tape: Suitable for natural gas.
- B. Welding Filler Metals: Comply with AWS D10.12/D10.12M for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.
- C. Brazing Filler Metals: Alloy with melting point greater than 1000 deg F complying with AWS A5.8/A5.8M. Brazing alloys containing more than 0.05 percent phosphorus are prohibited.

## 2.4 MANUAL GAS SHUTOFF VALVES

- A. General Requirements for Metallic Valves, NPS 2 and Smaller: Comply with ASME B16.33.
  - 1. CWP Rating: 125 psig .
  - 2. Threaded Ends: Comply with ASME B1.20.1.
  - 3. Dryseal Threads on Flare Ends: Comply with ASME B1.20.3.
  - 4. Tamperproof Feature: Locking feature.
  - 5. Listing: Listed and labeled by an NRTL acceptable to authorities having jurisdiction for valves 1 inch and smaller.
  - 6. Service Mark: Valves 1-1/4 inches to NPS 2 shall have initials "WOG" permanently marked on valve body.
- B. General Requirements for Metallic Valves, NPS 2-1/2 and Larger: Comply with ASME B16.38.
  - 1. CWP Rating: 125 psig.
  - 2. Flanged Ends: Comply with ASME B16.5 for steel flanges.
  - 3. Tamperproof Feature: Locking feature.
  - 4. Service Mark: Initials "WOG" shall be permanently marked on valve body.
- C. Two-Piece, Full-Port, Bronze Ball Valves with Bronze Trim: MSS SP-110.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. BrassCraft Manufacturing Company; a Masco company.
    - b. Conbraco Industries, Inc.; Apollo Div.
    - c. Lyall, R. W. & Company, Inc.
    - d. McDonald, A. Y. Mfg. Co.
    - e. Perfection Corporation; a subsidiary of American Meter Company.
    - f. Or approved equal.
  - 2. Body: Bronze, complying with ASTM B 584.
  - 3. Ball: Chrome-plated bronze.
  - 4. Stem: Bronze; blowout proof.
  - 5. Seats: Reinforced TFE; blowout proof.
  - 6. Packing: Threaded-body packnut design with adjustable-stem packing.

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7. Ends: Threaded, flared, or socket as indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
8. CWP Rating: 600 psig.
9. Listing: Valves NPS 1 and smaller shall be listed and labeled by an NRTL acceptable to authorities having jurisdiction.
10. Service: Suitable for natural-gas service with "WOG" indicated on valve body.

D. Cast-Iron, Nonlubricated Plug Valves: MSS SP-78.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. McDonald, A. Y. Mfg. Co.
  - b. Mueller Co.; Gas Products Div.
  - c. Xomox Corporation; a Crane company.
  - d. Or approved equal.
2. Body: Cast iron, complying with ASTM A 126, Class B.
3. Plug: Bronze or nickel-plated cast iron.
4. Seat: Coated with thermoplastic.
5. Stem Seal: Compatible with natural gas.
6. Ends: Threaded or flanged.
7. Operator: Square head or lug type with tamperproof feature where indicated.
8. Pressure Class: 125 psig.
9. Listing: Valves NPS 1 and smaller shall be listed and labeled by an NRTL acceptable to authorities having jurisdiction.
10. Service: Suitable for natural-gas service with "WOG" indicated on valve body.

E. Cast-Iron, Lubricated Plug Valves: MSS SP-78.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Flowserve.
  - b. Homestead Valve; a division of Olson Technologies, Inc.
  - c. McDonald, A. Y. Mfg. Co.
  - d. Milliken Valve Company.
  - e. Mueller Co.; Gas Products Div.
  - f. R&M Energy Systems, A Unit of Robbins & Myers, Inc.
  - g. Or approved equal.
2. Body: Cast iron, complying with ASTM A 126, Class B.
3. Plug: Bronze or nickel-plated cast iron.
4. Seat: Coated with thermoplastic.
5. Stem Seal: Compatible with natural gas.
6. Ends: Threaded or flanged.
7. Operator: Square head or lug type with tamperproof feature where indicated.
8. Pressure Class: 125 psig.
9. Listing: Valves NPS 1 and smaller shall be listed and labeled by an NRTL acceptable to authorities having jurisdiction.

10. Service: Suitable for natural-gas service with "WOG" indicated on valve body.

## 2.5 PRESSURE REGULATORS

### A. General Requirements:

1. Single stage, lock-up style, and suitable for natural gas.
2. Steel jacket and corrosion-resistant components.
3. Elevation compensator.
4. End Connections: Threaded for regulators NPS 2 and smaller; flanged for regulators NPS 2-1/2 and larger.

### B. Service Pressure Regulators: Comply with ANSI Z21.80.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Actaris.
  - b. American Meter Company.
  - c. Fisher Control Valves and Regulators; Division of Emerson Process Management.
  - d. Invensys.
  - e. Richards Industries; Jordan Valve Div.
  - f. Or approved equal.
2. Body and Diaphragm Case: Cast iron or die-cast aluminum.
3. Springs: Zinc-plated steel; interchangeable.
4. Diaphragm Plate: Zinc-plated steel.
5. Seat Disc: Nitrile rubber resistant to gas impurities, abrasion, and deformation at the valve port.
6. Orifice: Aluminum; interchangeable.
7. Seal Plug: Ultraviolet-stabilized, mineral-filled nylon.
8. Single-port, self-contained regulator with orifice no larger than required at maximum pressure inlet, and no pressure sensing piping external to the regulator.
9. Pressure regulator shall maintain discharge pressure setting downstream, and not exceed 150 percent of design discharge pressure at shutoff.
10. Overpressure Protection Device: Factory mounted, lock-up style, integral with pressure regulator.
11. Atmospheric Vent: Factory- or field-installed, stainless-steel screen in opening if not connected to vent piping.
12. Maximum Inlet Pressure: 100 psig.

## 2.6 DIELECTRIC FITTINGS

### A. General Requirements: Assembly of copper alloy and ferrous materials with separating nonconductive insulating material. Include end connections compatible with pipes to be joined.

### B. Dielectric Unions:

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1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Capitol Manufacturing Company.
  - b. Central Plastics Company.
  - c. Hart Industries International, Inc.
  - d. Jomar International Ltd.
  - e. Matco-Norca, Inc.
  - f. McDonald, A. Y. Mfg. Co.
  - g. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
  - h. Wilkins; a Zurn company.
  - i. Or approved equal.
2. Description:
  - a. Standard: ASSE 1079.
  - b. Pressure Rating: 125 psig minimum at 180 deg F.
  - c. End Connections: Solder-joint copper alloy and threaded ferrous.

C. Dielectric Flanges:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Capitol Manufacturing Company.
  - b. Central Plastics Company.
  - c. Matco-Norca, Inc.
  - d. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
  - e. Wilkins; a Zurn company.
  - f. Or approved equal.
2. Description:
  - a. Standard: ASSE 1079.
  - b. Factory-fabricated, bolted, companion-flange assembly.
  - c. Pressure Rating: 125 psig minimum at 180 deg F.
  - d. End Connections: Solder-joint copper alloy and threaded ferrous; threaded solder-joint copper alloy and threaded ferrous.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in for natural-gas piping system to verify actual locations of piping connections before equipment installation.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Close equipment shutoff valves before turning off natural gas to premises or piping section.
- B. Inspect natural-gas piping according to NFPA 54 and the International Fuel Gas Code to determine that natural-gas utilization devices are turned off in piping section affected.
- C. Comply with NFPA 54 and the International Fuel Gas Code requirements for prevention of accidental ignition.

### 3.3 OUTDOOR PIPING INSTALLATION

- A. Comply with NFPA 54 and the International Fuel Gas Code for installation and purging of natural-gas piping.
- B. Steel Piping with Protective Coating:
  - 1. Apply joint cover kits to pipe after joining to cover, seal, and protect joints.
  - 2. Repair damage to PE coating on pipe as recommended in writing by protective coating manufacturer.
  - 3. Replace pipe having damaged PE coating with new pipe.
- C. Copper Tubing with Protective Coating:
  - 1. Apply joint cover kits over tubing to cover, seal, and protect joints.
  - 2. Repair damage to PE coating on pipe as recommended in writing by protective coating manufacturer.
- D. Install fittings for changes in direction and branch connections.
- E. Install pressure gage upstream and downstream from each service regulator. Pressure gages are specified in Division 23 Section "Meters and Gages for HVAC Piping."

### 3.4 INDOOR PIPING INSTALLATION

- A. Comply with NFPA 54 and the International Fuel Gas Code for installation and purging of natural-gas piping.
- B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- C. Arrange for pipe spaces, chases, slots, sleeves, and openings in building structure during progress of construction, to allow for mechanical installations.
- D. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.

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- E. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- F. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- G. Locate valves for easy access.
- H. Install natural-gas piping at uniform grade of 2 percent down toward drip and sediment traps.
- I. Install piping free of sags and bends.
- J. Install fittings for changes in direction and branch connections.
- K. Verify final equipment locations for roughing-in.
- L. Comply with requirements in Sections specifying gas-fired appliances and equipment for roughing-in requirements.
- M. Drips and Sediment Traps: Install drips at points where condensate may collect, including service-meter outlets. Locate where accessible to permit cleaning and emptying. Do not install where condensate is subject to freezing.
  - 1. Construct drips and sediment traps using tee fitting with bottom outlet plugged or capped. Use nipple a minimum length of 3 pipe diameters, but not less than 3 inches long and same size as connected pipe. Install with space below bottom of drip to remove plug or cap.
- N. Extend relief vent connections for service regulators, line regulators, and overpressure protection devices to outdoors and terminate with weatherproof vent cap.
- O. Conceal pipe installations in walls, pipe spaces, utility spaces, above ceilings, below grade or floors, and in floor channels unless indicated to be exposed to view.
- P. Concealed Location Installations: Except as specified below, install concealed natural-gas piping and piping installed under the building in containment conduit constructed of steel pipe with welded joints as described in Part 2. Install a vent pipe from containment conduit to outdoors and terminate with weatherproof vent cap.
  - 1. Above Accessible Ceilings: Natural-gas piping, fittings, valves, and regulators may be installed in accessible spaces without containment conduit.
  - 2. In Walls or Partitions: Protect tubing installed inside partitions or hollow walls from physical damage using steel striker barriers at rigid supports.
    - a. Exception: Tubing passing through partitions or walls does not require striker barriers.
  - 3. Prohibited Locations:

- a. Do not install natural-gas piping in or through circulating air ducts, clothes or trash chutes, chimneys or gas vents (flues), ventilating ducts, or dumbwaiter or elevator shafts.
  - b. Do not install natural-gas piping in solid walls or partitions.
- Q. Use eccentric reducer fittings to make reductions in pipe sizes. Install fittings with level side down.
- R. Connect branch piping from top or side of horizontal piping.
- S. Install unions in pipes NPS 2 and smaller, adjacent to each valve, at final connection to each piece of equipment. Unions are not required at flanged connections.
- T. Do not use natural-gas piping as grounding electrode.
- U. Install strainer on inlet of each line-pressure regulator and automatic or electrically operated valve.
- V. Install pressure gage upstream and downstream from each line regulator. Pressure gages are specified in Division 23 Section "Meters and Gages for HVAC Piping."
- W. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Division 23 Section "Sleeves and Sleeve Seals for HVAC Piping."
- X. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Division 23 Section "Sleeves and Sleeve Seals for HVAC Piping."
- Y. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Division 23 Section "Escutcheons for HVAC Piping."

### 3.5 VALVE INSTALLATION

- A. Install manual gas shutoff valve for each gas appliance ahead of corrugated stainless-steel tubing, aluminum, or copper connector.
- B. Install underground valves with valve boxes.
- C. Install regulators and overpressure protection devices with maintenance access space adequate for servicing and testing.

### 3.6 PIPING JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- C. Threaded Joints:

1. Thread pipe with tapered pipe threads complying with ASME B1.20.1.
2. Cut threads full and clean using sharp dies.
3. Ream threaded pipe ends to remove burrs and restore full inside diameter of pipe.
4. Apply appropriate tape or thread compound to external pipe threads unless dryseal threading is specified.
5. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

D. Welded Joints:

1. Construct joints according to AWS D10.12/D10.12M, using qualified processes and welding operators.
2. Bevel plain ends of steel pipe.
3. Patch factory-applied protective coating as recommended by manufacturer at field welds and where damage to coating occurs during construction.

E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter.

F. Flanged Joints: Install gasket material, size, type, and thickness appropriate for natural-gas service. Install gasket concentrically positioned.

G. Flared Joints: Cut tubing with roll cutting tool. Flare tube end with tool to result in flare dimensions complying with SAE J513. Tighten finger tight, then use wrench. Do not overtighten.

### 3.7 HANGER AND SUPPORT INSTALLATION

A. Comply with requirements for pipe hangers and supports specified in Division 23 Section "Hangers and Supports for HVAC Piping and Equipment."

B. Install hangers for horizontal steel piping with the following maximum spacing and minimum rod sizes:

1. NPS 1 and Smaller: Maximum span, 96 inches; minimum rod size, 3/8 inch.
2. NPS 1-1/4: Maximum span, 108 inches; minimum rod size, 3/8 inch.
3. NPS 1-1/2 and NPS 2: Maximum span, 108 inches; minimum rod size, 3/8 inch.
4. NPS 2-1/2 to NPS 3-1/2: Maximum span, 10 feet; minimum rod size, 1/2 inch.
5. NPS 4 and Larger: Maximum span, 10 feet; minimum rod size, 5/8 inch.

C. Install hangers for horizontal drawn-temper copper tubing with the following maximum spacing and minimum rod sizes:

1. NPS 3/8: Maximum span, 48 inches; minimum rod size, 3/8 inch.
2. NPS 1/2 and NPS 5/8: Maximum span, 72 inches; minimum rod size, 3/8 inch.
3. NPS 3/4 and NPS 7/8: Maximum span, 84 inches; minimum rod size, 3/8 inch.
4. NPS 1: Maximum span, 96 inches; minimum rod size, 3/8 inch.



- D. Install hangers for horizontal, corrugated stainless-steel tubing with the following maximum spacing and minimum rod sizes:
  - 1. NPS 3/8: Maximum span, 48 inches; minimum rod size, 3/8 inch.
  - 2. NPS 1/2: Maximum span, 72 inches; minimum rod size, 3/8 inch.
  - 3. NPS 3/4 and Larger: Maximum span, 96 inches; minimum rod size, 3/8 inch.

### 3.8 CONNECTIONS

- A. Install natural-gas piping electrically continuous, and bonded to gas appliance equipment grounding conductor of the circuit powering the appliance according to NFPA 70.
- B. Install piping adjacent to appliances to allow service and maintenance of appliances.
- C. Connect piping to appliances using manual gas shutoff valves and unions. Install valve within 72 inches of each gas-fired appliance and equipment. Install union between valve and appliances or equipment.
- D. Sediment Traps: Install tee fitting with capped nipple in bottom to form drip, as close as practical to inlet of each appliance.
- E. Provide dielectric fitting at all connection points where dissimilar piping materials are joined.

### 3.9 LABELING AND IDENTIFYING

- A. Comply with requirements in Division 23 Section "Identification for HVAC Piping and Equipment" for piping and valve identification.
- B. Install detectable warning tape directly above gas piping, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

### 3.10 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Tests and Inspections:
  - 1. Test, inspect, and purge natural gas according to NFPA 54 and the International Fuel Gas Code and authorities having jurisdiction.
- C. Natural-gas piping will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

### 3.11 PIPING SCHEDULE

- A. Aboveground, branch piping NPS 1 and smaller shall be the following:

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1. Steel pipe with malleable-iron fittings and threaded joints.

B. Aboveground, distribution piping shall be the following:

1. Steel pipe with malleable-iron fittings and threaded joints for piping 2" & smaller.
2. Steel pipe with wrought-steel fittings and welded joints for piping 2-1/2" & larger.

3.12 ABOVEGROUND MANUAL GAS SHUTOFF VALVE SCHEDULE

A. Valves for pipe sizes NPS 2 and smaller at service meter shall be the following:

1. Two-piece, full-port, bronze ball valves with bronze trim.

B. Valves for pipe sizes NPS 2-1/2 and larger at service meter shall be the following:

1. Cast-iron, nonlubricated plug valve.

END OF SECTION 231123

SECTION 237432 – RANGE HOOD EXHAUST SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. A. Section 018100 – Special Requirements for Mechanical and Electrical Work shall apply to this Section.
- C. Section 230000 – Special Requirements for HVAC Work.

1.2 WORK SPECIFIED IN OTHER SECTIONS

- A. Section 237433 – Rooftop DOAS Units.

1.3 SUMMARY

- A. Provide complete range hood exhaust system consisting of UL labeled, pre-engineered, double-wall ductwork; UL labeled, spun aluminum, upblast roof fans; and UL labeled range hoods with self-contained ansul systems, lighting, grease filters, and controls. The range hood exhaust system, rooftop DOAS unit and associated network of local controls shall be the product of one manufacturer: CaptiveAire or approved equal.

1.4 QUALITY ASSURANCE

- A. ETL Listed and complies with UL705 (electrical) Standards and CSA Std C22.2, No 113.
- B. Fans shall bear the AMCA certified rating seal for air performance.
- C. Fan wheels shall be balanced in two planes and done in accordance with AMCA standard 204-96, Balance Quality and Vibration Levels for Fans.

1.5 WARRANTY

- A. From the date of substantial completion, warranties shall be for a minimum of two (2) years or as indicated in the individual sections of the project manual, whichever is greater.

1.6 SUBMITTALS

- A. Shop Drawings: Indicate assembly, unit dimensions, weight loading, required clearances, construction details, field connection details, electrical characteristics and connection requirements.
- B. Product Data:
  - 1. Provide literature that indicates dimensions, weights, capacities, ratings, fan performance, and electrical characteristics and connection requirements.
  - 2. Provide computer generated fan curves with specified operating point clearly plotted.
  - 3. Manufacturer's Installation Instructions.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.8 COORDINATION

- A. Coordinate clearance requirements with duct and equipment installers. Before preparing layout Shop Drawings, establish and maintain clearance requirements for access and service.

PART 2 - PRODUCTS

2.1 ROOF FANS - GENERAL

- A. The fan shall be factory assembled, tested, and shipped as a complete unit, complete with UL label for grease extraction.
- B. The following specifications, delivering all capacities scheduled and conforming to the design indicated herein.
- C. The fan wind band shall be constructed of heavy gauge aluminum or G90 Galvanized and shall be spun on an automatic lathe to provide consistent dimensions.
- D. Horizontal and vertical internal supports shall be used to fasten the wind band to the discharge apron securely. This provides rigidity for hinging and added strength to reduce shipping damage.
- E. The discharge apron shall have a rolled bead for added strength.
- F. Base corners shall be welded to provide strength and support for hinging and cleaning and prevent leakage into the building.
- G. The fan shall bear a permanently attached nameplate displaying model and serial number of unit for future identification.

- H. Nylon washers provide a tight seal. All fasteners in the fan housing shall be backed with nylon washers.
- I. The unit shall be factory tested after assembly.
- J. Roof Curb
  - 1. The curb shall be of ventilated design, constructed of galvanized steel, with UL label for grease extraction.
  - 2. The heavy duty G90 galvanized curb cap shall have fully welded corners for added strength and leak protection. Height of curb shall be governed by code required clearance between fan discharge and building construction.
  - 3. Hinged Base: Loose
  - 4. Grease Drain Box
- K. Fan Wheel
  - 1. The fan wheel shall be centrifugal backward inclined and non-overloading, with AMCA C spark-proof construction.
  - 2. The wheel blades shall be aerodynamically designed to minimize turbulence, increase efficiency and reduce noise.
  - 3. The wheel blades shall be welded to the wheel inlet cone.
  - 4. If balancing weights are required, they shall be riveted to the blades or wheel.
  - 5. The wheel inlet shall overlap the fan base inlet for maximum performance and efficiency.
  - 6. The wheel shall be firmly attached to the motor shaft with two set screws.
- L. Fan Motor
  - 1. Motor Type: Totally Enclosed Air Over Electronically Commutated Motor (TEAO-ECM).
  - 2. Motor shall be permanently lubricated and rated for continuous duty.
  - 3. Furnished at the specified voltage, phase, and enclosure. Motor speed shall be variable, controlled using an integrated speed controller.
  - 4. Motors shall be mounted out of the airstream and furnished at the specified voltage, phase, and enclosure.
  - 5. Motor mounting plate shall be constructed of heavy gauge galvanized steel.
  - 6. The motor compartment shall be cooled by outside air drawn through an extruded aluminum conduit tube.
  - 7. An integral electrical conduit running from the fan base to the motor compartment is provided for ease of installation.
  - 8. The conduit tube passage shall be sealed to prevent noise. Silicone rubber grommets shall isolate the conduit tube from the fan housing.
  - 9. The motor compartment shall be a two-piece construction. The cap has quick-release clips to provide fast and easy access to the motor compartment.

- M. Grease Storage
  - 1. The grease spout shall be made of aluminum tubing, welded to the fan housing. The weld shall be factory tested to ensure no leaks.
  - 2. Grease Box.
- N. ECM Exhaust Wiring Packages for Fans
  - 1. ECM Wiring Package - PWM Signal from ECPM03 Prewire (TELCO Motor), CCW Rotation
- O. Fan Accessories
  - 1. Grease Box
  - 2. Hinge Kit – Ships Loose for curb supplied by others.

## 2.2 RANGE HOOD EXHAUST DUCTWORK

- A. Products shall be designed for use with Type I kitchen hoods, which conform to the requirements of NFPA-96.
- B. Products shall be listed and compliant with safety standards UL1978, UL2221, CAN/ULC-S144 and testing has been extended to recognize ASTM E2336 and AC101 due to similar testing criteria.
- C. Products shall be installed in accordance with these instructions and National Fire Protection Association "NFPA 96"; Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.
- D. UL 2221: Standard for Fire Resistive Grease Duct Enclosure Assemblies. Chapter 7 of this standard references a test labeled Internal Fire Test. Section 7.1.1 references two installation conditions, Condition A and Condition B. Condition A represents all installation condition except for installation within non-ventilated combustible enclosures. Condition B represents installation within a non-ventilated combustible enclosure.
- E. Range hood exhaust ductwork shall be Model DW-3Z, classified under UL2221 (Test of Fire Resistive Duct Enclosure Assemblies) as an alternate to 2-Hr. fire resistive shaft enclosures with a minimum zero clearance to combustibles (sizes 5" to 36" diameter). Model 3Z is listed in accordance with the requirements for duct enclosure Condition A and B.
- F. Construction
  - 1. Inner duct section wall shall be constructed of .036" thick, 430 type stainless steel and be available in diameters 5" through 36".
  - 2. Outer Duct section wall shall be constructed of 430 stainless steel at a minimum of .024" thickness.
  - 3. Duct shall include 2 layers of Super Wool 607 Plus or Insulfrax Elite Blanket between the inner and outer wall insulation between the inner and outer wall.
  - 4. Duct sections shall be held together by the means of a formed V clamp. V clamps shall be

of the hex-head type with flanged stops and tapered "lead in" threads.

5. Duct joints shall be sealed with 3M Fire Barrier 2000+.
6. Duct wall assembly shall be tested and listed at 3/4" or zero inch clearance, according to classifications.

### 2.3 COMMERCIAL KITCHEN VENTILATION HOODS, UL LISTED COMMERCIAL KITCHEN HOODS

- A. Range hoods shall be the ND2 series, Type I, wall canopy hood for use over 450°F/600°F/700°F cooking surface temperatures. The aerodynamic design includes a mechanical baffle and performance enhancing lip for exceptional capture and containment.
- B. The hood shall have the size, shape, and performance specified on drawings.
- C. Construction shall be dependent on the structural application to minimize distortion and other defects. All seams, joints, and penetrations of the hood enclosure to the lower outermost perimeter, which directs and captures grease-laden vapor and exhaust gases, shall have a liquid-tight continuous external weld in accordance with NFPA 96.
- D. Duct sizes, CFM, and static pressure requirements shall be as shown on drawings. Static pressure requirements shall be precise and accurate; air velocity and volume information shall be accurate within 1-ft increments along the length of the ventilator.
- K. Construction
  1. Construction shall be type 430 stainless steel.
  2. Double wall insulated front to eliminate condensation and increase rigidity on wide sizes. The insulation shall have a flexural modulus of 475 EI, meet UL 181 requirements and be in accordance with NFPA 90A and 90B.
  3. Hood shall be equipped with a minimum of four connections for hanger rods. Hood lengths greater than 12' will have added hangers.
  4. Exhaust duct collar to be 3" or 4" high with flange.
  5. The grease drain system shall be an enclosed integral part of the hood back and have slopes with an exposed, removable 1/2 grease cup to facilitate cleaning.
  6. Removable grease cup for easy cleaning.
  7. An integral baffle to direct grease laden vapors toward the exhaust filter bank (ND2).
  8. Hood shall be furnished with UL classified filters, supplied in size and quantity as required by ventilator.
  9. All seams shall be welded and have stainless steel on exposed surfaces.
- L. Lighting
  1. Screw-in compact LED (100W equivalent) bulb. High temperature assembly includes clear and shock resistant globe.
  2. Wire Guards

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M. Filters

1. Stainless Steel Captrate Combo Filter (redesigned for low static pressure) with hook, ETL Listed. Particulate capture efficiency: 85% efficient at 9 microns, 76% efficient at 5 microns.

N. Accessories

1. Fire Suppression System: UL 300 fire suppression system. «FIRESYSTEM»
2. Hood Mounted Utility Cabinet – The cabinet can store listed fire suppression system, listed components, and pre-wired electrical controls.
3. Splash panel(s) selected:
  - Backsplash
4. Standoffs:
  - Back Standoff Bolt Together
5. Miscellaneous:
  - a. Ground/Polished Corners – Corners of hood welded along seams. Grind and polished corners for final finish.
  - b. Full Dimension Hanging Bracket – Unistrut added to allow for various hood mounting locations.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine all areas and conditions under which package(s) are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

3.2 INSTALLATION

- A. Install the range hood exhaust systems in accordance with manufacturer's instructions, drawings, written specifications, manufacturer's installation manual, and all applicable building codes.

3.3 CONNECTIONS

- A. Electrical connections conform to applicable requirements in Division 26 Sections.

3.4 SYSTEM START-UP & OWNER TRAINING

- A. System start-up and owner training shall be performed by a factory-trained Service Technician.

END SECTION 237432



SECTION 237433 – ROOFTOP DOAS UNITS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 GENERAL DESCRIPTION

- A. This section includes the rooftop DOAS unit; and all necessary factory and field mounted controls, programming, and installation requirements for packaged, rooftop, DOAS units and the range hood exhaust systems.
- B. Where items of the General Conditions are repeated in this Section of the Specifications, it is intended to qualify or to call particular attention to them; it is not intended that any other parts of the General Conditions shall be assumed to be omitted if not repeated herein.
- C. This Section applies equally and specifically to all HVAC Sections of the Specifications.

1.3 SUMMARY

- A. This section includes packaged heating and cooling units capable of supplying up to 100 percent outdoor air.
- B. The range hood exhaust system, rooftop DOAS unit and associated network of local controls shall be the product of one manufacturer: CaptiveAire or approved equal.

1.4 SUBMITTALS

- A. The manufacturer assumes no liability for the use or results of use of this document. This specification is to be reviewed by the engineer to confirm requirements of the project and building codes are met.
- B. As the manufacturer continues product development, it reserves the right to change design and specifications without notice.

1.5 WIND LOAD DESIGN

- A. Refer to 230548 Vibration and Wind Controls for HVAC Piping and Equipment.

1.6 QUALITY ASSURANCE

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- A. All models shall be ETL listed and comply to safety standards UL 1995, the Standard for Safety for Heating and Cooling Equipment. The Engineer of Record shall take responsibility for the approval of any modifications or additions to the unit, including aftermarket UV or ionization filtration devices.
- B. All models shall be ETL listed and comply to safety standards CSA Std. C22.2, No. 236-11.
- C. Indirect fired heaters shall comply with ANSI Z83.8-2013, and CSA 2.6-2013.
- D. This unit shall be tested in accordance to the following standards:
  - ANSI/AHRI Standard 340/360
  - ANSI/ASHRAE Standard 37
  - AHRI Standard 270/370

1.8 WARRANTY

- A. From the date of substantial completion, warranties shall be for a minimum of two (2) years or as indicated in the individual sections of the project manual, whichever is greater.
- B. Provide extended warranty coverage for the following:
  - 1. The direct expansion cooling system shall have 5-year full coverage warranty, including necessary preventative maintenance.
  - 2. The furnace shall have 10-year full coverage warranty.
- C. Throughout warranty period, provide continuous remote monitoring service contract via cellular uplink, with owner notification when in-person maintenance is required.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Supply one piece packaged units that are complete as per the following specification, deliver all capacities scheduled, and conform to design indicated herein.

2.2 CABINET

- A. Size 1 unit(s) cabinets shall be constructed of minimum 24-gauge. Sizes 2, 3, or 4 cabinets shall be 20-gauge G-90 galvanized steel riveted together via structural pop-rivets. All metal shall be CNC bent for precise assembly.
  - 1. Rigging Provisions: The unit shall have a structural base constructed of minimum 18-gauge in cabinet size 1 and 14-gauge in cabinet sizes 2, 3 & 4 G-90 galvanized steel, and include full sized fork pockets and lifting points on all four sides.

2. Roof Construction: The lids shall be fabricated by forming a double-standing, self-locking seam that requires no additional support. Roof shall be pitched to allow for proper drainage.
  3. Exterior Wall Construction: All exterior walls shall consist of a double wall, G-90 galvanized steel construction. Cabinet size 1 shall be insulated with 1-inch thick, R4.3 fiber glass duct board insulation. Cabinet sizes 2, 3 & 4 shall be insulated with 2-inch thick, R13 closed cell foam.
  4. Service Access Doors: All door jambs shall be gasketed around their perimeter, and allow for doors to be mounted via removable, spring actuated, stainless steel hinges with stainless steel rivets, and self-compressing latches. Each compartment shall have removable access panels to allow for ease of service and maintainability. Electrical cabinet access doors shall have a door hold installed to prop doors open. All doors shall have stainless steel latches which are pad lockable. Electrical cabinet doors shall be outfitted with schematic/manual pouches formed into the door, along with wiring diagram attached to the indoor of the door from the factory.
- B. Entire interior and exterior casing shall be constructed of minimum G90 galvanized steel. Unit shall have undergone a salt spray corrosion test as per ASTM B 117.
- C. Entire unit shall be wind rated up to  $\pm 150$ psf per TAS 201, 202 & 203 on any units utilizing a 20" or shorter factory provided roof curb.

### 2.3 AIRFLOW CONFIGURATIONS

- A. Discharge: Unit shall be configured for Down (vertical) discharge through the unit's base.
- B. Return: Unit shall also be configured for Down (vertical) Return through the unit's base.
- C. Intake Airflow: Unit configuration shall be through use of a fresh/outdoor and return air damper.
1. Damper: Shall exceed AMCA Class 1A standard for low leakage. Damper assembly shall be a single assembly, and outfitted with an integral bird screen and louver/gutter system to divert any drainage through the base of the unit – intake air hood not required.
  2. Actuator: A single direct drive damper actuator shall be used with spring return to ensure that the outdoor air section closes when not powered.

### 2.4 SUPPLY AND EXHAUST AIR BLOWER AND MOTOR

- A. All supply fans shall be direct drive (belt-drive not acceptable) variable speed plenum fans.
- B. Blower Motor: Motor shall be a premium efficiency motor available as:
1. Totally enclosed fan-cooled (TEFC) motor driven by a Variable Frequency Drive, or;
  2. Electronically Commutated Motor (ECM) modulated using a Pulse Width Modulating (PWM) signal.
- C. Fans to be selected at or near efficiency peak.

- D. Blower and motor assembly shall be dynamically balanced. The entire blower and motor assembly shall be mounted on rubber vibration isolators. Wheels balanced as per AMCA 204-96, Balance Quality and Vibration Levels for fans.
- E. Unit shall be equipped with total supply, return, and outside air intake CFM monitoring to measure and control airflows as specified under Section 237434 – Sequence of Operations for the Culinary Arts Classroom HVAC & Range Hood Exhaust Systems; and monitor/log data via cellular uplink.

## 2.5 REFRIGERATION SYSTEM

- A. Unit shall utilize a variable speed inverter duty scroll compressor with the following features:
  - 1. Modulation: Compressor shall be capable of compressor speed modulation from 15%-100% on 5, 6, 7.5, 8, 10, & 12.5 Ton units. Compressor shall be capable of compressor speed modulation from 25%-100% on 15, 20, 22, 25, 30, 40, and 50 Ton units.
  - 2. Refrigerant: Unit shall be factory charged with R410A refrigerant.
  - 3. Vibration Isolation: Compressor as well as blower assembly shall each be mounted on rubber vibration isolators to reduce transmission of vibration to the building structure.
  - 4. Internal Overload Protection: Compressor shall include internal thermal overload protection to protect against excessive motor temperatures.
  - 5. Crankcase Heater: Compressor shall include a crankcase heater to protect against liquid flood-back and elimination of oil foaming on startup. The crankcase heater must remain powered when the compressor is not in operation.
  - 6. Oil Management: Unit shall utilize both passive and active oil return management using Oil Level Sensor and scheduled oil boosts.
  - 7. Monitored Envelope: Unit shall monitor all critical refrigeration points to ensure compressor does not operate outside of safe operating envelope.
  - 8. Throttling Logic: Unit shall allow for high head pressure monitoring throttle mode for high ambient operation, and low suction pressure throttle mode for low capacity operation or any conditions resulting in low suction pressure.
  - 9. Pump-Down: Active pump-down mode with discharge line check valve to protect against liquid migration into compressor during idle times.
- B. The unit shall be outfitted with the following:
  - 1. Indoor Coil: Indoor evaporator coil shall be a high efficiency coil, copper tube with aluminum fins mechanically bonded to copper tubes. Coil is staggered to increase turbulence, reduce the coil bypass factor, and ultimately increase the time the air stays within the coil. Includes two probe sensors to read average coil face temperature.
  - 2. Electronic Expansion Valve: Each refrigeration circuit will be outfitted with an electronic expansion valve metering device which can be throttled from 0-100% open to allow for precise superheat control.
  - 3. Indoor Coil Drain Pan: The indoor coil shall be outfitted with a sloped stainless steel drain pan. This pan shall be insulated along the entire base to prevent condensation, and outfitted with a safety overflow switch which will automatically shut down cooling operation prior to

water overflowing the drain pan in the event of a drain clog. The entire drain pan shall be 20 GA Stainless Steel construction and wrap beneath the entire coil with flashing on entering side of coil to ensure capture of all condensate. Drain pan discharge pipe shall also be stainless steel construction. Drain pan shall be pitched to exceed ASHRAE 62.1 standard.

4. Base of the condensing coil cabinet shall be pitched away from the unit as a safety to ensure all draining exits away from the curb.
  5. Hot Gas Reheat Coil: The unit shall include copper tube and aluminum fin hot gas reheat coil mounted downstream of the indoor coil. This coil shall be controlled via fully modulating hot gas reheat valve to provide precise reheat temperature control. This coil shall include the addition of an evaporative coil leaving condition sensor to maintain a coil dew point. This also prevents operation of a dehumidification call when intake dew point conditions are found to be below space dew point conditions, preventing wasted energy.
  6. Outdoor (Condenser) Coil: Outdoor coil shall be a high efficiency coil design with aluminum fins mechanically bonded to copper tubes. The coil shall be downward sloped to protect coil from hail damage. Optional hail guards may also be outfitted to the outdoor coil for added protection from hail bouncing off the unit's roof up the coil.
  7. Outdoor Fans: The outdoor coil shall have a vertical discharge outfitted with quiet, efficient, fully modulating Electronically Commutated Motor (ECM) condensing fans. These fans shall modulate to maintain a temperature differential between outside air and the outdoor coil.
- C. To help mitigate any long-term potential for leaks or hardware failures, the unit shall be outfitted with the following protection measures:
1. Suction line accumulator for added protection against liquid entering suction line of compressor.
  2. Bi-flow, low pressure drop, filter drier.
  3. Electronic Expansion Valve (EEV) for precise superheat control. EEV shall open partially allowing system pressure equalization prior to activation of the compressor.
  4. Protective rubber sleeves installed on all distribution lines of indoor coil to prevent wear from rubbing.
  5. All refrigeration ports shall be short-stub assembly and any access port with a transducer or switch is mounted vertically to mitigate risk of bent/cracked stub joints.
  6. Refrigeration circuit shall be mechanically CNC pre-bent tubing wherever possible with minimal brazed joints to minimize points for potential refrigeration leaks.
  7. Factory tested for leaks via high pressure nitrogen decay and helium tracer gas testing.
  8. Suction line temperature sensor failure detection.
  9. Preventative failure alerts through a manufacturer provided, cloud based, cellular remote monitoring system.

## 2.6 HEATING SYSTEM

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- A. The gas burner shall be an indirect-fired, push-through type, using natural gas or liquid propane gas. The inlet-supply pressure to the unit for natural gas must be 7" w.c. minimum and 14" w.c. maximum.
- B. Burner shall be a tubular in-shot fired design capable of using natural gas. Each burner ignition shall be of the direct-spark design with remote flame sensing at inlet of the last firing tube of the gas manifold.
- C. Direct-sparking sequence shall last through the complete duration of the trial for ignition period for guaranteed light-off. Burner shall always be lit at maximum gas flow and combustion airflow for guaranteed light-off. Each burner ignition module shall have LED indicators for troubleshooting and a set of exposed prongs for testing flame indication signal.
- D. All furnaces shall be controlled by an electronic Vernier-type fully modulating control system capable of achieving 81% combustion efficiency over the entire gas firing range of the unit.
- E. Each furnace shall have fully modulating burner with:
  - 1. A minimum turndown ratio of 6:1 for natural gas and 5:1 for LP gas while maintaining a constant 81% efficiency. No cold air bypass of the heat exchanger.
  - 2. Each furnace heat exchanger shall be a bent-tube style design made entirely of stainless steel.
  - 3. Stainless steel Quick Seal Connection for gas connection.
  - 4. Manifold and Input gas pressure gauges.
  - 5. Factory piped condensate drain to exterior of cabinet.
  - 6. A combustion flue to be installed on adjacent side as combustion intake with integrated high velocity wind cap.
  - 7. A blocked vent safety airflow switch with high temperature silicone tubing operating off of absolute pressure measured inside of the power-vent blower housing.
  - 8. A high temperature auto-recycling limit with a maximum non-adjustable set point.
  - 9. A manual reset high temperature flame roll out switch with a non-adjustable set point.
  - 10. Each furnace compartment shall have a removable post and panel that allows the furnace to be easily removed for service and maintainability.
  - 11. A power-vent assembly for exhausting flue gases with a PSC or ECM type motor that is securely mounted and easily accessible/removable for service.
  - 12. A 0-10" w.c. gas pressure gauge installed on the gas manifold.

2.7 FILTERS

- A. All filters shall be installed on tracks for easy removal from the unit.
- B. Unit shall include 2" thick MERV 8 throw away filters in outdoor air stream. Mixed air shall have 2" MERV 13 throw away filters.

- C. Unit shall have adjustable pressure differential sensor for the filter bank to alert in the event of a clogged filter. Alert will be visible on HMIs located in space.

## 2.8 ELECTRICAL

- A. All controls shall be factory pre-wired or factory furnished and field-wired as required to meet Section 237434 – Sequence of Operations for the Culinary Arts Classroom HVAC & Range Hood Exhaust Systems. All controls shall be housed in an insulated electrical cabinet within the unit to protect against risk of condensation.
- B. Units shall be provided with single point electrical connection or separate electrical heat connection.
- C. Unit shall be provided with a door safety switch that de-energizes the supply fan when the door is opened.
- D. Unit shall be provided with a factory mounted averaging air temperature sensors to allow for accurate temperature readings within unit.
- E. The electrical cabinet shall be outfitted with the following:
  - 1. LED electrical cabinet service light with automatic activation upon door switch.
  - 2. Color wiring schematics, laminated to the interior wall of the cabinet doors.
  - 3. Factory mounted disconnect with unit bottom knockouts.
  - 4. A LED backlit, LCD Human-Machine Interface (HMI) shall be mounted within the unit's control cabinet to allow for all set points configuration and refrigeration system monitoring at the unit.
  - 5. 2 space mounted HMIs provided. HMIs shall allow for full programming capabilities and are outfitted with integral temperature and humidity sensors. HMIs shall be wired using standard CAT5/6 cables by contractor.
  - 6. 120V, 15A unit unpowered convenience outlet for separate power feed.
- F. All sensors shall be wired back to the main control board that continuously monitors all critical components and makes decisions based on pre-determined logic to accurately control the following:
  - 1. PID logic to control heater modulation ensuring precise discharge/space temperature control.
  - 2. PID logic to control compressor speed to provide precise control over evaporative coil temperatures, leaving dew point, and discharge/space temperatures.
  - 3. PID logic for Outdoor fan modulation to maintain an optimal outdoor coil temperature.
  - 4. PID logic for Electronic Expansion Valve (EEV) position to maintain a precise superheat temperature
  - 5. PID logic for Modulating Reheat valve to limit supply air temperature and relative humidity based off of space or discharge conditions.

## 2.9 CONTROLS

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- A. Unit shall be outfitted with a control board to allow for full control of the entire unit.
- B. Provide air flow or current switch on the supply and exhaust fans to sense air flow with available set of contacts for connection to BMS for airflow alerts.
- C. Unit shall include BACnet communications module to allow for seamless interface with existing BMS, by owner, under separate contract.
- D. All units shall be outfitted with CASLink cloud based monitoring, which monitors every point of operation. Provides configurable automated fault alert e-mails, and remote control capabilities.
- E. Integrated cellular module to provide remote connection to monitoring services to view both real time and historical unit operation. Data shall be stored a minimum of 3 years on the cloud. Data sample rate shall be a maximum of 60 seconds.
- F. Temperature Control System – Refer to Section 237434 – Sequence of Operations for the Culinary Arts Classroom HVAC & Range Hood Exhaust Systems.

2.10 ROOF CURB

- A. Refer to Section 230548 Vibration and Wind Controls for HVAC Piping and Equipment.

2.11 VARIABLE FREQUENCY DRIVES

- A. Provide Variable Frequency Drive for the compressor as part of the AC unit. VFD shall be furnished and installed to meet the performance set forth in the schedule and as specified under another section of this work.
  - 1. Accessories to be furnished and mounted by the drive manufacturer and contained in a single enclosure. (The use of more than one enclosure is not acceptable).
- B. Provide Variable Frequency Drive for speed control on all non-ECM direct drive supply and return fans.
- C. All VFDs shall provide the following inherent protections:
  - 1. Phase protection.
  - 2. Brownout protection.
  - 3. Overload/Overheat protection.
  - 4. Soft starts to protect bearings/hardware.
  - 5. Low & High voltage & over-torque protections.

PART 3 - EXECUTION

3.1 EXAMINATION



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- A. Examine areas and conditions under which packaged units are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions, drawings, written specifications, manufacturer's installation manual and all applicable building codes.

3.3 CONNECTIONS

- A. Piping installation requirements are specified in other Division 23 Sections. Drawings indicate the general arrangement of piping, fittings, and specialties. Install piping to allow service and maintenance.
- B. Duct installation requirements are specified in other Division 23 Sections. Drawings indicate the general arrangement of ducts.
- C. Electrical: Conform to applicable requirements in Division 26 Sections.

3.4 SYSTEM START-UP AND OWNER TRAINING

- A. System start-up and owner training shall be performed by a factory trained Service Technician, and commissioning report will be provided to Architect.

END OF SECTION 237433

SECTION 237434 - SEQUENCE OF OPERATIONS FOR THE CULINARY ARTS CLASSROOM  
HVAC & RANGE HOOD EXHAUST SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Where items of the General Conditions are repeated in this Section of the Specifications, it is intended to qualify or to call particular attention to them; it is not intended that any other parts of the General Conditions shall be assumed to be omitted if not repeated herein.
- C. This Section applies equally and specifically to all HVAC Sections of the Specifications.
- D. Section 018100 – Special Requirements for Mechanical and Electrical Work shall apply to this Section.
- E. Section 230000 – Special Requirements for HVAC Work.
- F. Section 237432 – Range Hood Exhaust Systems shall apply to this Section.
- G. Section 237433 – Rooftop DOAS Units shall apply to this Section.

1.2 SUMMARY

- A. This Section includes control sequences for HVAC systems, subsystems, and equipment.

1.3 DEFINITIONS

- A. CV: Constant Volume.
- B. DDC: Direct Digital Control.
- C. VAV: Variable Air Volume.
- D. RH: Relative Humidity.

1.4 GENERAL

- A. All setpoints specified are intended as initial values and shall be adjusted and optimized by the control system contractor throughout the warranty period.
- B. All setpoints shall user adjustable, whether indicated as adjustable or not.

1.5 SUMMARY

- A. The control package shall be configured as a Demand Control Ventilation (DCV) System, that regulates DOAS unit airflow rates (supply, return, outside air and relief) based on occupancy schedule and quantity of range hood exhaust that is in operation.
- B. The scope shall include all necessary sensors, controllers, wiring, hardware, software, firmware, programming, interlocks and servicing for a complete and functional system that satisfies the specified sequence of operations.
- C. The range hood exhaust system, rooftop DOAS unit and associated controls shall be the product of one manufacturer: CaptiveAire or approved equal.

1.6 SUBMITTALS

- A. The manufacturer shall supply complete computer-generated submittal drawings, including hood section view(s) and hood plan view(s). These drawings must be available to the engineer, architect, and owner for their use in construction, operation, and maintenance.

1.7 QUALITY ASSURANCE

- A. Control package shall be listed by ETL and complies with UL508A Standard and CAN/CSA C22.2, No. 14-05 Standards.
- B. ECPM03 Circuit Board shall be listed by ETL and complies with UL 61010-1 Standard and CAN/CSA C22.2, No. 61010-1 Standards.

1.8 WARRANTY

- A. Warrant all work in accordance with the general conditions for two (2) years from date of substantial completion. During the warranty period, the manufacturer shall be responsible for all necessary firmware/software revisions required to provide a complete and workable system consistent with the letter and intent of the Sequence of Operations section of the specifications. The manufacturer shall install operating system updates issued by the manufacturer(s) throughout the warranty period. Control system failures during the warranty period shall be adjusted, repaired, or replaced at no additional cost or reduction in service within 24 hours, during normal business hours.

1.9 CONTROL CABINET

- A. The control cabinet shall be unit mounted as an integral part of the Rooftop DOAS Unit.
- B. The system includes unit and space mounted HMI's for fan(s), gas valve reset, programmable schedule, control setpoints, Max Air Override function, Preparation Time mode, Cool Down mode, and diagnostics including VFD status.

- C. The LCD screen shows descriptive plain text explaining the functions or values.

#### 1.11 SYSTEM OPERATION

- A. The Rooftop DOAS Unit shall be sequenced through occupied and unoccupied modes of operation through a timeclock program. The timeclock program shall be overcalled to the occupied mode by a 0-2 hour (programmable) override button that is an integral part of the space mounted temperature/humidity sensor, or when any of the range hood exhaust fans are operating.
- B. The Rooftop DOAS Unit and Range Hood Exhaust Fans shall be interlocked to shut down through general alarm condition of building fire alarm system, and when any of the range hood ansul systems are activated.
- C. Rooftop Unit shall be furnished complete with controls for all unit functions, including cooling, heating, economizer control, liquid subcooling and hot gas reheat, variable air volume control of supply and relief fans, etc. The Unit Controls shall support industry standard open protocols including but not limited to MODBUS, BACNET and LON and shall be integrated into Building Automation System for complete control and monitoring capabilities.
- D. Unoccupied Mode:
  - 1. When the system is in the unoccupied mode, the supply and exhaust fans shall be off, the outdoor and exhaust air dampers shall be closed, the return air damper shall be open, and the refrigeration and gas fired furnace systems shall be inactive. If the unit senses the space conditions require operation during the unoccupied mode, the unit shall start and operate in the unoccupied heating/cooling mode as required.
  - 2. If space temperature drops below night heating setpoint, or rises above night cooling setpoint, the supply fan shall start and run at 3,000 CFM under recirculation cycle. During this operation the Dx cooling system or gas furnace shall be enabled to restore space temperature.
- E. Occupied Mode:
  - 1. When the system is in the occupied mode, the supply air fan and exhaust fan shall be energized and run continuously. The volume of the supply fan shall be monitored by an Ebtron Gold flow measuring station with a control algorithm that modulates fan speed from (3,000 CFM to 7,535 CFM) based on quantity of range hood exhaust, such that space is always 200 CFM negative. The volume of the exhaust fan shall be modulated from minimum to maximum under a control algorithm that maintains 0.02 w.c. of negative pressure in the Culinary Arts Classroom with respect to adjacent corridor.
  - 2. The outside and exhaust air dampers shall open to minimum airflow position. The return air damper shall open to maximum airflow position. The minimum position of the outside air intake damper shall be governed by an Ebtron Gold flow measuring station in the intake air stream through a demand control based ventilation system (DCV) that forms an integral part of the variable volume terminal unit control functions. If the DCV system senses a requirement for outside air in any space, it shall gradually open the RTU

outside air damper and call the VAV unit to modulate open to supply more air to the space.

3. The unit shall sequence the heating, cooling and dehumidification functions as required to maintain the unit leaving air temperature setpoint. The setpoint of the discharge temperature control loop shall be reset inversely with changes in space temperature, to maintain occupied heating and cooling setpoints.

F. Dehumidification Cycle:

1. When space RH is equal to or less than 50% (adj.) at all air terminals, the unit shall maintain its nominal leaving air temperature at the coiling coil. The cooling coil leaving air temperature setpoint shall be controlled based on space temperature.
2. When space exceeds 52% RH at any air terminal, the cooling coil outlet temperature shall be gradually reduced towards a full dehumidification setpoint of 55 deg F (adj.), and the space temperature shall be maintained by the hot gas reheat coil.

G. Discharge Temperature Control:

1. The unit shall modulate the hot gas reheat coil, gas fired furnace, or the mechanical refrigeration system, or engage the economizer cycle as required to maintain the unit discharge air temperature setpoint. The unit shall implement factory optimized heating, cooling and economizer control algorithms to maximize energy conservation based on deviation between space temperature and setpoint.

H. Economizer Mode:

1. When a call for cooling is placed, the unit shall compare outside enthalpy to space enthalpy. If outdoor conditions are the same or more suitable than indoor conditions, the unit shall enter economizer mode.
2. The outside air damper, return air damper and relief air damper shall modulate as required to maintain setpoints indicated.

I. Filter Monitoring: The system shall incorporate static pressure differential gauges and a run timer on the supply fan, indicating the number of hours the fan and filter and in use, and generate an alarm when replacement is necessary.

J. Fan Status Monitoring: The system shall monitor status of each supply, room fan and range hood exhaust fan; and compare against command state. When status does not agree with command state, an alarm shall be generated.

K. Heating and Cooling Equipment Monitoring: The system shall monitor status of heating and cooling equipment; and generate an alarm when status does not agree with command state.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions under which the system is installed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to installer.
- B. Install in accordance with the manufacturer's instructions, drawings, written specifications, manufacturer's installation manual, and all applicable building codes.

3.2 SYSTEM START-UP AND OWNER TRAINING

- A. System start-up and owner training shall be performed by a factory trained Service Technician, and commissioning report will be provided to Architect.

END OF SECTION 237434