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FASCIMILE TRANSMITTAL COVER SHEET

DATE: February 10, 2026
TO: Doris Furr
FROM: Planholder
PROJECT: TRUCK DRIVING SCHOOL
For BISHOP STATE COMMUNITY COLLEGE
GMC PROJECT NO. AMOB250055
RE: ADDENDUM NO. 2 AND ACKNOWLEDGEMENT OF RECEIPT OF ADDENDUM NO. 2

ACKNOWLEDGEMENT OF RECEIPT:

PLEASE PRINT RECIPIENT'S NAME, FIRM, AND DATE RECEIVED.

**THEN FAX BACK TO (251) 460-4423 or EMAIL doris.furr@gmcnetwork.com
FOR OUR RECORDS AND TO ACKNOWLEDGE YOUR RECEIPT OF THIS ADDENDUM.**

NAME *(PLEASE PRINT)*

FIRM *(PLEASE PRINT)*

DATE RECEIVED *(PLEASE PRINT)*

ADDENDUM NUMBER 2

February 10, 2026

PROJECT:
TRUCK DRIVING SCHOOL
BISHOP STATE COMMUNITY COLLEGE
GMC PROJECT NO. AMOB250055

AD2-1 CLARIFICATIONS / RFI RESPONSES / ADDITIONS / ETC.:

- A. Bidders shall acknowledge receipt of the Addendum in writing, as provided on the Acknowledgment Receipt.
- B. **Clarification:** Sheet A1.01 - OG2 6" stud walls at IT Closet 110 shall extend to roof deck with 5/8" gyp bd. each side. All penetrations shall be sealed.
- C. **Clarification:** Sheet G1.21 and A1.01 – Wall Type OG1 – Wall type shall extend to the bottom of the roof purlins to provide continuous insulation around the perimeter of the building. Gypsum board shall be taped and floated. No paint is required above the ceiling.
- D. **Clarification:** Sheet A2.01. Delete the hard ceiling in Electrical Room 112. Provide and install (1) LSF fixture and (1) LS4E fixture. Coordinate location of fixtures with mechanical ductwork. Provide and install hangers as required for installation of light fixtures.
- E. **Clarification:** Sheet E1.00. See clouded note, "The Electrical Contractor shall distinctly label all services for each building on the property such that they correspond with the respective building they serve. For example, if there are two buildings and services, they shall be labeled as "Building 1 of 2," "Building 2 of 2."
- F. **Clarification:** Sheets M1.01 and M2.01. See added fire dampers to fire wall and fire damper detail clouded on M1.01 and M2.01.
- G. Interior wall framing OG2 6".... on sheet G1.21 show framing full height to deck... wall sections show framing to above ceiling (and I assume braced). Both have sheetrock stopping above ceiling. How are walls to be framed? (I know electrical room walls are to deck WITH sheetrock to deck both sides).
RESPONSE: OG2 6" non-rated wall type shall extend a minimum of 6" above the ceiling and braced to the structure above @ 48" O.C. OG2 walls shall be insulated with unfaced sound batt insulation, full stud depth.

- H. I would like to request that Resuflor DecoFlake SB be approved as an equal alternate to the Standard Stontech ERF product that is specified for the resinous floor on Finish Schedule on page A8.01.

RESPONSE: Sherwin Williams Resuflor DecoFlake SB in color Mackerel is approved as an equal alternate contingent upon meeting all the requirements of the plans and specifications.

- I. We would like to seek approval for Pinnacle Structures active be an approved manufacturer for the BSCC Truck Driving School project.

RESPONSE: Pinnacle Structures is an approved manufacturer contingent upon meeting all the requirements of the plans and specifications.

- J. On the unit price sheet, it calls the sidewalk out to be 5" thick. However, on the detail from page C-901, the sidewalk is called out at 4" thick. Please advise which thickness is correct.

RESPONSE: The thickness of the sidewalk shall be 5 inches.

- K. C-102 – Skills Pad Are all of the Joints shown construction joints or are they control joints with the option to make them construction joints if a pour stop is needed?

RESPONSE: All joints shown are control joints. The construction joint at 30 feet is illustrative and not required. However, if construction joints are used no slab

- L. C102 – Detail is given for a construction Joint. #5 Tie Bars are in each direction. If this detail is correct and what they intend each 15' x 15' section would have to be poured separately.

RESPONSE: The concrete pad does not require any tie bars unless there are construction joints. See above.

- M. C102 - #5 Rebar tie bars – Is this the intent? Seems like smooth dowels with dowels baskets would make more sense? Allow for expansion and contraction of the paving.

RESPONSE: Deformed # 5 bars are required per the detail if construction joints are used for short term / long term separation of slabs. Load transfer dowels are not required based on the use.

- N. C901 – Skills pad “construction control” joint details don’t seem to match joint details on C102. No Tie bars are shown.

RESPONSE: The detail is for a control joint fill. Construction joint rebar detail is per sheet C-102.

- O. I see that the specs are calling for a 22ga Snap-lock roof panel and that the addendum has said that a Super-lock (mechanically seamed) panel would be acceptable. My question is do we still need to maintain the 22ga or will they be okay with a 24ga since it's a mechanically seamed panel in lieu of the snap down? We would never use a snap down panel in a wind zone over 130MPH so just trying to get clarification on that.

RESPONSE: Metal Roof Panels shall be 22 gauge and mechanically seamed. See Specification Section 13 1220 Pre-Engineered Metal Building System.

- P. A2.01 RCP Note 1 calls for insulation above the ceilings in the classrooms, offices, rest rooms, and break rooms. Do you want me to include insulation at the corridor and lobby as well?

RESPONSE: No. Provide unfaced sound batt insulation above ceilings as noted

- Q. G1.21 Partition Types calls for wall type OG1 which is installed at the inside of the exterior wall around the perimeter of the building to go 6" above the room ceiling height. The typical ceiling height is 9' however, there is no ceiling in Mechanical Room 113. Do you want those exterior walls to the deck above or should I stay with the height of the other walls?

RESPONSE: Perimeter walls in Mechanical Room 113 shall extend to the roof deck.

- R. The windows in the exterior walls, do they have gyp board returns around the window?

RESPONSE: Yes, per the details on sheet A6.01

- S. Is the water storage in the shelter specs to be provided by the contractor or owner? If contractor provided can we get additional specs?

RESPONSE: Water storage is provided by the Owner.

- T. The drawings call for 2 - 1000 person first aid kits. Is this correct? Occupancy of the shelter is 42 persons.

RESPONSE: Provide (1) 100 Person First Aid Kit.

- U. I don't see any wall details or elevations that call out insulation only the building insulation. Do any of the interior walls receive insulation?

RESPONSE: Yes. All interior walls shall receive un-faced sound batt insulation, full stud depth.

- V. On page A5.01 Detail B8 it appears that the Lobby west wall is full height. Is this the only wall that is? What is the construction of the interior mechanical and electrical walls?

RESPONSE: The west wall of the Lobby shall extend 6" above the ceiling. The interior of the mechanical and electrical walls is painted 5/8" gyp bd. over metal studs.

W. On sheet A2.01 this note is shown. Is the building sprinklered?

KEY NOTES - RCP	
KEY	KEYNOTE
R1	PROVIDE AND INSTALL NEW CEILING GRID AND CEILING TILES. COORDINATE WITH SPECS.
R2	PROVIDE AND INSTALL NEW LIGHTS. COORDINATE WITH ELECTRICAL.
R3	PROVIDE AND INSTALL NEW HVAC DIFFUSERS. COORDINATE WITH MECHANICAL.
R4	PROVIDE AND INSTALL NEW EXIT LIGHTS. COORDINATE WITH ELECTRICAL.
R5	PROVIDE AND INSTALL NEW DOWNSPOUTS AND GUTTERS. COORDINATE WITH EXTERIOR ELEVATIONS AND SPECS.
R6	PROVIDE AND INSTALL NEW CANOPIES. COORDINATE WITH SPECS.
R7	PROVIDE AND INSTALL NEW SPRINKLERS. COORDINATE WITH PLUMBING AND FIRE SUPPRESSION.
R8	PROVIDE AND INSTALL NEW EXTERIOR LIGHTING. COORDINATE WITH ELECTRICAL.
R9	PROVIDE AND INSTALL NEW SECURITY CAMERAS. COORDINATE WITH ELECTRICAL AND SECURITY CONSULTANT.
R10	PROVIDE AND INSTALL NEW DUCTLESS MINISPLIT. COORDINATE WITH MECHANICAL.
R11	PROVIDE AND INSTALL NEW GYP BD CEILING. COORDINATE WITH SPECS.

RESPONSE: No. Building is not sprinklered.

X. Also, where is the main disconnect? It is not shown on sheet E2.01

RESPONSE: Main disconnect is shown on Sheet E0.01

Y. Backflow and tamper switch shown on utility plans. Is this applicable?

RESPONSE: No. Backflow and tamper switch are not applicable.

Z. Is the General Contractor responsible for purchasing a building permit?

RESPONSE: Yes. General Contractor is responsible for all required permits and fees.

AA. Is the Owner Allowance covering any and all utility fees?

RESPONSE: No. General Contractor is responsible for all required permits and fees and shall be included in the Base Bid.

BB. There is a note on the reflected ceiling plan (R9) that states we are to provide security cameras. This is not shown on electrical. Is this our responsibility?

RESPONSE: Provide an allowance of \$8,500.00 for J-boxes and conduit for camera locations. Include the allowance amount in the Base Bid.

CC. Can we find out if Lobby Desk is Owner provided. If not, can you provide details for clarification?

RESPONSE: The lobby desk will be plastic laminate millwork with solid surface countertops and will be contractor provided and installed.

DD. Can Pinnacle Structures be added as acceptable manufacturer for the PEMB? Please see their email below and attachment.

RESPONSE: Pinnacle Structures is an approved manufacturer contingent upon meeting all the requirements of the plans and specifications.

AD2-2 ISSUED SPECIFICATIONS:

- A. Section 07 2116 Pre-Engineered Building Blanket Insulation
- B. Section 13 1220 Pre-Engineered Metal Building Systems

AD2-3 ISSUED DRAWINGS:

- A. C-102 Site Plan
- B. C-201 Grading Plan
- C. C-902 Water and Sewer Details
- D. E1.00 Legend, Schedules & Riser Diagram
- E. M1.01 HVAC New Work Plan
- F. M2.01 HVAC Schedules and Details



AD2-4 ATTACHMENTS:

- A. Addendum No. 2 Received Response form

END OF ADDENDUM

PREPARED BY

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SECTION 07 21 16

PRE-ENGINEERED BUILDING BLANKET INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Provide 2-layer insulation system for pre-engineered metal buildings with a minimum of R-30 for Roof system– new construction.
- B. Related Sections:
 - 1. Section 13 12 20 - Metal Building Systems.

1.2 REFERENCES

- A. Materials shall meet the property requirements of one or more of the following specifications as applicable to the specific product or end use:
 - 1. American Society for Testing of Materials (ASTM):
 - a. ASTM C991 - Standard Specification for Flexible Fibrous Glass Insulation for Metal Buildings.
 - b. ASTM C1136 - Standard Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation.
 - c. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 - d. ASTM E 96 - Standard Test Method for Water Vapor Transmission of Materials in Sheet Form (Procedure A).
 - 2. North American Insulation Manufacturers Association (NAIMA):
 - a. NAIMA 202-96(R) (Rev. 2000) STANDARD For Flexible Fiberglass Insulation to be Laminated for Use in Metal Buildings
 - 3. National Fire Protection Association (NFPA):
 - a. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials.
 - 4. Underwriters Laboratories (UL):
 - a. UL 723 - Test for Surface Burning Characteristics of Building Materials.

1.3 DESIGN REQUIREMENTS

- A. Minimum insulation R-Value of 30 for installed roof system.
- B. Minimum Insulation R-Value of 19 for installed wall system.
- C. The installed roof and wall systems shall provide a continuous vapor barrier.

1.4 SUBMITTALS

- A. Product Data: Provide manufacturer's data for each of the following including:
 - 1. Roof installation instructions
 - 2. Wall installation instructions
 - 3. Product data sheet
 - 4. Design considerations guide
 - 5. Recycle content certification for fiberglass insulation products – minimum 50% recycled content for all fiberglass insulation materials.
- B. Shop Drawings: Provide shop drawings that indicate the following:
 - 1. Liner fabric layout
 - 2. Insulation Layout and cut list
 - 3. Customer and project information

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Companies shall be familiar with the installation practices associated with banded liner systems.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products indoors or in a dry, covered area.
- B. Do not open products until ready to use.
- C. Protect products from potential construction site damage.
- D. Use care when opening products as pallets may shift during shipment.
- E. Banding has sharp edges. Wear cut proof gloves when handling.
- F. Wear safety glasses when unpacking materials.

1.7 PROJECT CONDITIONS

- A. For best results, do not install this system outside of the temperature, humidity, ventilation and environmental limits recommended by the manufacturer. Products should be kept covered and dry at temperatures less than 100°F prior to installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Owens Corning Insulating Systems, LLC, Toledo, OH 43659; www.owenscorning.com or equal.

2.2 MATERIALS

- A. The OptiLiner® System (BOD) consists of the following materials:
1. (2) Layers unfaced light density fiberglass metal building insulation in the following product categories:
 - a. Owens Corning Certified R Metal Building Insulation
 - 1) Complies with ASTM C991 Type 1.
 - 2) Complies with NAIMA 202-96-REV 2000.
 - 3) Flame Spread Index <25 and Smoke Developed Index <50 when tested in accordance with ASTM E84, NFPA 255 and UL 723.
 - 4) Certified by SCS Global Services to contain a minimum of 65% recycled glass content, 18% pre-consumer and 47% post-consumer.
 - 5) Thermal Resistance: Available R-Values = R25
 - 6) Unfaced.
 - 7) GREENGUARD Indoor Air Quality Certified®.
 - 8) GREENGUARD Gold Certified.
 - b. Owens Corning Metal Building Utility Blanket
 - 1) Flame Spread Index <25 and Smoke Developed Index <50 when tested in accordance with ASTM E 84, NFPA 255 and UL 723.
 - 2) Certified by SCS Global Services to contain a minimum of 65% recycled glass content, 18% pre-consumer and 47% post-consumer.
 - 3) Thermal Resistance: Available R-Values = R7.
 - 4) Unfaced.
 - 5) GREENGUARD Indoor Air Quality Certified®.
 - 6) GREENGUARD Gold Certified.
 2. Fabric liner facing/vapor barrier composed of woven high-density polyethylene coated on both sides with polyethylene. Complies with the following:
 - a. ASTM C1136, Types I through Type VI
 - 1) Type I-IV exception for dimensional stability (value is < 2.0%)
 - b. Perm rating: ≤ 0.02 when tested in accordance with ASTM E 96 Procedure A.
 - c. Flame Spread Index < 25 and Smoke Developed Index < 50 when tested in accordance with ASTM E 84.
 - d. Color:
 - 1) White
 3. Vapor barrier adhesive. Complies with the following:
 - a. Application temperature 10°F to 110° F
 4. Double sided vapor barrier tape. Complies with the following:
 - a. Width 0.75"
 - b. Rubber based and free film
 5. Patch tape. Complies with the following:

- a. Adhesive added to one side
- b. Installation temperature from 10°F to 110°F
- c. 3" width
6. Metal Banding/Straps. Complies with the following:
 - a. Coated steel
 - b. 1.0" wide
 - c. Structural Steel Grade 50 per ASTM C 653
 - d. Exposed color to match vapor barrier
 - 1) White
 - 2) Black
 - e. Backing – gray
7. Thermal breaks
 - a. Closed cell polyethylene foam tape for wall applications. Complies with the following:
 - 1) 0.125" thick to 0.375" thick
 - 2) 3.0" wide
 - b. Thermal spacer blocks. Complies with the following:
 - 1) Extruded or expanded polystyrene
 - 2) Minimum width 3.0"
 - 3) Thickness 0.5" – 1.0"
8. Light gage steel fasteners
 - a. Zinc plated cold forged steel
 - b. Head color to match vapor barrier
 - 1) White
 - 2) Black
 - c. Contain rubber sealing washer
9. Heavy gage steel fasteners
 - a. Zinc plated cold forged steel
 - b. Head color to match vapor barrier
 - 1) White
 - 2) Black
 - c. Contain rubber sealing washer
10. Insulation Hangars
 - a. Insul-hold insulation hangars

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine the areas and conditions under which work of this section will be installed. Verify that adjacent materials are dry and ready to receive insulation. Verify structure, bracing, and concealed building systems have been tested and inspected.
- B. Provide written report listing conditions detrimental to performance of work in this section. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install liner system in accordance with manufacturer's installation instructions and approved Shop Drawings.
- B. Purlin and girt attachment surfaces should be clean and dry prior to attaching two-faced tape or sealing adhesive.
- C. Installed fiberglass insulation should fit snugly against purlin and girt walls in the cavity space. Avoid gaps, voids and any excess compression.

3.3 CLEANING

- A. Clean dirt from vapor barrier fabric using a soft cloth with soap and water or non-abrasive household cleaner. Solvent-based cleaners and abrasive pads should be avoided.

3.4 SAFETY PRECAUTIONS

- A. Installation contractor must have a site-specific safety plan and comply with all OSHA applicable local rules and regulations when installing this system.
- B. Workers must use OSHA required fall protection when installing the banded liner system at heights (see OSHA regulations at 29 CFR 1926, Subpart M).
- C. Banding has sharp edges and cut proof gloves should be worn when handling.

3.5 APPENDIX

- A. Refer to the Owens Corning publications listed below for product information, including uses, descriptions, physical properties, performance, specification compliance and application recommendations. Copies of these documents can be found at www.owenscorning.com.
 - 1. OptiLiner® Banded Liner System Product Data Sheet – Owens Corning Publication 10011681
 - 2. OptiLiner® Wall Installation Instructions – Owens Corning Publication 10011266
 - 3. OptiLiner® Roof Installation Instructions – Owens Corning Publication 10011267
 - 4. OptiLiner® Bi-Directional Banding Option – Owens Corning Publication 10011602

END OF SECTION

SECTION 13 1220

PRE-ENGINEERED METAL BUILDING SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes metal building systems that consist of integrated sets of mutually dependent components including structural framing roof panels, wall panels, doors, windows and accessories.
- B. Related Sections include the following:
 - 1. Division 3 Section "Cast-in-Place Concrete" for concrete foundations, slabs, and anchor-bolt installation.
 - 2. Division 7 Section "Building Insulation" for insulation.
 - 3. Division 8 Section "Glazing" for glass and glazing not standard.
 - 4. Division 9 Section "Painting" for field applied primer over shop primer not standard with metal building system manufacturer.

1.3 DEFINITIONS

- A. Bay: Dimension between main frames measured normal to frame (at centerline of frame) for interior bays, and dimension from centerline of first interior main frame measured normal to end wall (outside face of end-wall girt) for end bays.
- B. Building Length: Dimension of the building measured perpendicular to main framing from end wall to end wall (outside face of girt to outside face of girt).
- C. Building Width: Dimension of the building measured parallel to main framing from sidewall to sidewall (outside face of girt to outside face of girt).
- D. Clear Span: Distance between supports of beams, girders, or trusses (measured from lowest level of connecting area of a column and a rafter frame or knee).

- E. Eave Height: Vertical dimension from finished floor to eave (the line along the sidewall formed by intersection of the planes of the roof and wall).
- F. Clear Height under Structure: Vertical dimension from finished floor to lowest point of any part of primary or secondary structure, not including crane supports, located within clear span.
- G. Terminology Standard: Refer to MBMA's "Metal Building Systems Manual" for definitions of terms for metal building system construction not otherwise defined in this Section or in referenced standards.

1.4 SYSTEM DESCRIPTION

- A. General: Provide a complete, integrated set of mutually dependent components and assemblies that form a metal building system capable of withstanding structural and other loads, thermally induced movement, and exposure to weather without failure or infiltration of water into building interior. Include primary and secondary framing, metal roof panels, metal wall panels, and accessories complying with requirements indicated.
 - 1. Provide metal building system of size and with spacings, slopes, and spans indicated.
- B. Primary Frame Type:
 - 1. Rigid Clear Span: Solid-member, structural-framing system without interior columns.
 - 2. Braced Spans: See plan for location and type of bracing anticipated in the axis of the building parallel to the roof ridge. Where unrestricted by doors and windows solid rod bracing may be provided (use of stranded wire bracing is not acceptable.) Rod bracing to be located at the centerline of the column and shall be provided with adequate allowance for take-up after installation.
 - 3. Rigid Portal Frames: Fabricated from shop-welded, built-up steel plates or structural-steel shapes to match primary framing; of size required to withstand design loads. See plan for location and type of bracing anticipated in the axis of the building parallel to the roof ridge.
- C. End-Wall Framing: Manufacturer's standard, for buildings not required to be expandable, consisting of load-bearing end-wall and corner columns, and rafters.
- D. Secondary Frame Type: Manufacturer's standard purlins and flush-framed **or** by-pass girts as indicated on architectural drawings and elevations.
 - E. Eave Height: As Indicated
 - F. Bay Spacing: As Indicated

- G. Roof Slope: 4:12
- H. Roof System: Manufacturer's standard snap lock standing seam, minimum 1 1/2" high roof panels, stand-off thermal-break between deck and purlins with vinyl faced insulation.
- I. Exterior Wall System: Manufacturer's standard field-assembled, insulated metal wall panels.

1.5 SYSTEM PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide metal building systems capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - 1. Design Loads: As required by 2021 International Building Code and ASCE 7-16, "Minimum Design Loads for Buildings and Other Structures."
 - 2. Live Loads: Include vertical loads induced by the building occupancy indicated on Drawings. Include loads induced during erection and by maintenance workers, materials, and equipment for roof live loads.
 - 3. Wind Loads: Include horizontal and uplift loads induced by a 3 second gust wind speed of 151 mph; Exposure C; enclosed building.
 - 4. Collateral Loads: In addition to dead weight of metal building system building design to include additional loads for permanent items such as sprinklers, mechanical systems, ductwork, suspended space heaters, electrical systems, lights, et cetera. Minimum collateral load shall be 5 PSF. Collateral loads shall not be used to reduce net wind uplift.
 - 5. Load Combinations: Design metal building systems to withstand the most critical effects of load factors and load combinations as required by 2021 International Building Code and ASCE 7-16, "Minimum Design Loads for Buildings and Other Structures."
 - 6. Deflection Limits: Engineer assemblies to withstand design loads with deflections no greater than the following:
 - a. Wind Columns: Horizontal deflection of 1/240
 - b. Purlins and Rafters: Vertical deflection of 1/240 of the span in inches.
 - c. Girts: Horizontal deflection of 1/240 of the span in inches.
 - d. Metal Roof Panels: Vertical deflection of 1/240 of the span in inches.
 - e. Metal Wall Panels: Horizontal deflection of 1/240 of the span in inches.

7. Drift Limits: Limit horizontal deflection of the primary building frame in either direction to a maximum of $H/200$. Drift and deflection limits specified for wind loads shall be based on a 25-year mean recurrence interval (97 MPH).
 8. Design secondary framing system to accommodate deflection of primary building structure and construction tolerances, and to maintain clearances at openings.
 9. Provide metal panel assemblies capable of withstanding the effects of loads and stresses indicated, based on testing according to ASTM E 1592.
- B. Thermal Movements: Provide metal panel systems that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change: 70 deg F ambient and 100 deg F at material surface.
- C. Thermal Performance: Provide insulated metal panel assemblies with the following maximum U-factors and minimum R-values for opaque elements when tested according to ASTM C 1363 or ASTM C 518:
1. Metal Roof Panel Assemblies:
 - a. R-Value: R-19 + R11 LS
 2. Metal Wall Panel Assemblies:
 - a. R-Value: R-13 + R-6.5ci
- D. Air Infiltration for Metal Roof Panels: Air leakage through assembly of not more than 0.09 cfm/sq. ft. of roof area when tested according to ASTM E 1680 at negative test-pressure difference of 4 lbf/sq. ft.
- E. Air Infiltration for Metal Wall Panels: Air leakage through assembly of not more than 0.09 cfm/sq. ft. of wall area when tested according to ASTM E 283 at static-air-pressure difference of 4 lbf/sq. ft.
- F. Water Penetration for Metal Roof Panels: No water penetration when tested according to ASTM E 1646 at a minimum differential pressure of 20 percent of inward-acting, wind-load design pressure of not less than 6.24 lbf/sq. ft. and not more than 12 lbf/sq. ft.
- G. Water Penetration for Metal Wall Panels: No water penetration when tested according to ASTM E 331 at a minimum differential pressure of 20 percent of inward-acting, wind-load design pressure of not less than 6.24 lbf/sq. ft. and not more than 12 lbf/sq. ft.

- H. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for Class 90.

1.6 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of the following metal building system components:
 - 1. Structural-framing system.
 - 2. Metal roof panels.
 - 3. Metal wall panels.
 - 4. Insulation and vapor retarders.
 - 5. Flashing and trim.
 - 6. Accessories.
- B. Shop Drawings: For the following metal building system components. Include plans, elevations, sections, details, and attachments to other work.
 - 1. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by professional engineer registered in the State of Alabama responsible for their preparation.
 - 2. Anchor-Bolt Plans: Submit anchor-bolt plans before foundation work begins. Include location, diameter, and projection of anchor bolts required to attach metal building to foundation. Indicate column reactions at each location. Upon review of the Anchor-Bolt plan and column reactions the SEOR will review the A-Bolt detail on the Construction Documents for development length requirements and make revisions where required.
 - 3. Structural-Framing Drawings: Show complete fabrication of primary and secondary framing; include provisions for openings. Indicate welds and bolted connections, distinguishing between shop and field applications. Include transverse cross-sections.
 - 4. Metal Roof and Wall Panel Layout Drawings: Show layouts of metal panels including methods of support. Include details of edge conditions, joints, panel profiles, corners, anchorages, trim, flashings, closures, and special details. Distinguish between factory- and field-assembled work; show locations of exposed fasteners.

- a. Show wall-mounted items including doors, windows, louvers, and lighting fixtures.
 - b. Show roof-mounted items including basketball goal supports, penetrations and lighting fixtures.
- C. Samples for Initial Selection: For each type of building component with factory-applied color finish.
- D. Samples for Verification: For each type of exposed finish required, prepared on Samples of sizes indicated below.
 1. Metal Roof and Wall Panels: Nominal 12 inches long by actual panel width. Include fasteners, closures, and other exposed panel accessories.
 2. Flashing and Trim: Nominal 12 inches long. Include fasteners and other exposed accessories.
 3. Vapor Retarders: Nominal 6-inch square Samples.
- E. Product Certificates: For each type of metal building system, signed by product manufacturer.
 1. Letter of Design Certification: Signed and sealed by a qualified professional engineer. Include the following:
 - a. Name and location of Project.
 - b. Order number.
 - c. Name of manufacturer.
 - d. Name of Contractor.
 - e. Building dimensions including width, length, height, and roof slope.
 - f. Indicate compliance with AISC standards for hot-rolled steel and AISI standards for cold-rolled steel, including edition dates of each standard.
 - g. Indicate compliance with identified building code and year of edition.
 - h. Design Loads: Include dead load, roof live load, collateral loads, deflection, drift, wind loads/speeds and exposure.
 - i. Load Combinations: Indicate that loads were applied acting simultaneously with concentrated loads, according to governing building code.
 - j. Building-Use Category: Indicate category of building use and its effect on load importance factors.
 - k. IAS Certification : Include statement that metal building system and components were designed and produced in an IAS-AC472 Certified Facility .

- F. Welding certificates.
- G. Erector Certificate: Signed by manufacturer certifying that erector complies with requirements.
- H. Manufacturer Certificate: Signed by manufacturer certifying that products comply with requirements.
- I. Qualification Data: For erector, manufacturer, and professional engineer.
- J. Material Test Reports: Signed by manufacturers certifying that the following products comply with requirements:
 - 1. Structural steel including chemical and physical properties.
 - 2. Bolts, nuts, and washers including mechanical properties and chemical analysis.
 - 3. Tension-control, high-strength, bolt-nut-washer assemblies.
 - 4. Coating system including shop primers and top coat.
 - 5. Nonshrink grout.
- K. Source quality-control test reports.
- L. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for insulation and vapor retarders. Include reports for thermal resistance, fire-test-response characteristics, water-vapor transmission, and water absorption.
- M. Maintenance Data: Include requirements for metal panel finishes in maintenance manuals.
- N. Warranties: Special warranties specified in this Section.

1.7 QUALITY ASSURANCE

- A. Erector Qualifications: An experienced erector who has specialized in erecting and installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer.
- B. Manufacturer Qualifications: A qualified manufacturer and member of MBMA.
 - 1. IAS Certification: An IAS-AC472 Certified Manufacturer that designs and produces metal building systems and components in an IAS-Certified Facility.

2. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.
- C. Source Limitations: Obtain primary metal building system components, including structural framing and metal panel assemblies, through one source from a single manufacturer.
- D. Product Options: Drawings indicate size, profiles, and dimensional requirements of metal building system and are based on the specific system indicated. Refer to Division 1 Section "Product Requirements."
 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
- E. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel," and AWS D1.3, "Structural Welding Code--Sheet Steel."
- F. Structural Steel: Comply with AISC's "Specification for Structural Steel Buildings-- Allowable Stress Design, Plastic Design," or AISC's "Load and Resistance Factor Design Specification for Structural Steel Buildings," for design requirements and allowable stresses.
- G. Cold-Formed Steel: Comply with AISI's "Specification for the Design of Cold-Formed Steel Structural Members," or AISI's "Load and Resistance Factor Design Specification for Steel Structural Members," for design requirements and allowable stresses.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, sheets, panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.
- B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness and with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

1.9 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when weather conditions permit metal panels to be installed according to manufacturers' written instructions and warranty requirements.

1.10 COORDINATION

- A. Coordinate size and location of concrete foundations and casting of anchor-bolt inserts into foundation walls and footings. Concrete, reinforcement, and formwork requirements are specified in Division 3 Section "Cast-in-Place Concrete."
- B. Coordinate installation of roof penetrations, which are specified in Division 7 Section "Roof Accessories."
- C. Coordinate metal panel assemblies with rain drainage work, flashing, trim, and construction of supports and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.11 WARRANTY

- A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Special Project Warranty: Roofing Installer's warranty, on warranty form at end of General Conditions, signed by roofing Installer, covering Work of this Section, in which roofing Installer agrees to repair or replace components of metal roofing system that fail in materials or workmanship within the following warranty period:
- C. Warranty Period: Five years from date of Substantial Completion.
- D. Special Warranty on Metal Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No.8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period for Roof and Wall Panels: 20 years from date of Substantial Completion.
- E. Special Weathertightness Warranty for Standing-Seam Metal Roof Panels: Manufacturer's standard form in which manufacturer agrees to repair or replace standing-seam, metal roof panel assemblies that fail to remain weathertight, including leaks, within specified warranty period.

1. Warranty Period: 20 years from date of Substantial Completion.
- F. Guarantee: Standard manufacturer's roofing guarantees which contain language regarding the governing of the guarantee by any state other than the State of Alabama, must be amended to exclude such language, and substituting the requirement that the Laws of the State of Alabama shall govern all such guarantees.

1.12 Pre-Roofing Conference

- A. A pre-roofing conference is required before any roofing materials are installed. This conference shall be conducted by a representative of the Architect and attended by representatives of the Owner, Building Commission Inspector, General Contractor, Roofing Contractor, Sheet Metal Contractor and the Roofing Materials Manufacturer (if warranty is required of this manufacturer). If equipment of substantial size is to be placed on the roof, the Mechanical Contractor must also attend this meeting.
- B. The pre-roofing conference is intended to clarify application requirements for the work to be completed before roofing operations can begin. This would include a detailed review of the specifications, roof plans, roof deck information, flashing details, and approved shop drawings, submittal data, and samples. If conflict exists between the specifications and the Manufacturer's requirements, this shall be resolved. If this pre-roofing conference cannot be satisfactorily concluded without further inspection and investigation by any of the parties present, it shall be reconvened at the earliest possible time to avoid delay of the work. In no case should the work proceed without inspection of all areas and substantial agreement on all points.
- C. The following are to be accomplished during the conference:
1. Review all Factory Mutual and Underwriters Laboratories requirements listed in the specifications and resolve any questions or conflicts that may arise.
 2. Establish trade-related job schedules, including the installation of roof-mounted mechanical equipment.
 3. Establish roofing schedule and work methods that will prevent roof damage.
 4. Require that all roof penetrations and walls be in place prior to installing the roof.
 5. Establish those areas on the job site that will be designated as work and storage areas for roofing operations.
 6. Establish weather and working temperature conditions to which all parties must agree.
 7. Establish acceptable methods of protecting the finished roof if any trades must travel across or work on or above any areas of the finished roof.

- D. The Architect shall prepare a written report indicating actions taken and decisions made at this pre-roofing conference. This report shall be made a part of the project records and copies furnished to the General Contractor, the Owner, the Building Commission, and the Building Commission Inspector.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. American Steel Buildings.
 2. Gulf States Manufacturers, Inc.
 3. Mesco Metal Buildings; Division of NCI Building Systems, LLP.
 4. Inland Building Systems Alliance Steel, Inc.
 5. Nucor Building Systems
 6. Pinnacle Structures
 7. Varco – Pruden Buildings

2.2 STRUCTURAL-FRAMING MATERIALS

- A. W-Shapes: ASTM A 992.
- B. Channels, Angles, M-Shapes, and S-Shapes: ASTM A 36; ASTM A 572, Grade 50 or 55; or ASTM A 529 Grade 50 or 55.
- C. Plate and Bar: ASTM A 36; ASTM A 572, Grade 50 or 55; or ASTM A 529, Grade 50 or 55.
- D. Non-High-Strength Bolts, Nuts, and Washers: ASTM A 307, Grade A, carbon-steel, hex-head bolts; ASTM A 563 carbon-steel hex nuts; and ASTM F 844 plain (flat) steel washers.
1. Finish: Plain, exposed portions to be coated after installation to match structural steel.

- E. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy hex steel structural bolts; ASTM A 563 heavy hex carbon-steel nuts; and ASTM F 436 hardened carbon-steel washers.
 - 1. Finish: Plain, exposed portions to be coated after installation to match structural steel.
- F. Threaded Rods: ASTM A 36.
 - 1. Nuts: ASTM A 563 heavy hex carbon steel.
 - 2. Washers: ASTM F 436 hardened carbon steel.
 - 3. Finish: Plain, exposed portions to be coated after installation to match structural steel.
- G. Primer: As selected by manufacturer for resistance to normal atmospheric corrosion, compatibility with finish paint systems, capability to provide sound foundation for field-applied topcoats despite prolonged exposure, and as follows:
 - 1. SSPC-Paint 25, red iron oxide, zinc oxide, raw linseed oil and alkyd primer.

2.3 PANEL MATERIALS

- A. Metallic-Coated Steel Sheet Prepainted with Coil Coating: Steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755 and the following requirements:
 - 1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653, G90 coating designation; structural quality.
- B. Panel Sealants: Provide the following:
 - 1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape ½ inch wide and 1/8 inch thick.
 - 2. Joint Sealant: ASTM C920; one-part elastomeric polyurethane, polysulfide, or silicone-rubber sealant; of type, grade, class, and use classifications required to seal joints in panels and remain weathertight; and as recommended by metal building system manufacturer.

2.4 THERMAL INSULATION FOR FIELD-ASSEMBLED METAL PANELS

- A. Metal Building Insulation: See Specification Section 07 2116 Pre-Engineered Blanket Insulation.

2.5 MISCELLANEOUS MATERIALS

- A. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide fasteners with heads matching color of materials being fastened by means of plastic caps or factory-applied coating.
 - 1. Fasteners for Metal Roof and Wall Panels: Self-drilling Type 410 stainless-steel or self-tapping Type 304 stainless-steel or zinc-alloy-steel hex washer head, with EPDM or PVC washer under heads of fasteners bearing on weather side of metal panels.
 - 2. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws with hex washer head.
 - 3. Blind Fasteners: High-strength aluminum or stainless-steel rivets.
- B. Nonmetallic, Shrinkage-Resistant Grout: Premixed, non-metallic, non-corrosive, non-staining grout containing selected silica sands, Portland cement, shrinkage compensating agents, plasticizing and water-reducing agents, complying with ASTM C 1107, of consistency suitable for application, and with a 30-minute working time.
- C. Metal Panel Sealants:
 - 1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape of manufacturer's standard size.
 - 2. Joint Sealant: ASTM C 920; one-part elastomeric polyurethane, polysulfide, or silicone-rubber sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended by metal building system manufacturer.

2.6 FABRICATION, GENERAL

- A. General: Design components and field connections required for erection to permit easy assembly.
 - 1. Mark each piece and part of the assembly to correspond with previously prepared erection drawings, diagrams, and instruction manuals.
 - 2. Fabricate structural framing to produce clean, smooth cuts and bends. Punch holes of proper size, shape, and location. Members shall be free of cracks, tears, and ruptures.

- B. Tolerances: Comply with MBMA's "Metal Building Systems Manual": Chapter IV, Section 9, "Fabrication and Erection Tolerances."
- C. Metal Panels: Fabricate and finish metal panels at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.
 - 1. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of metal panel.

2.7 STRUCTURAL FRAMING

- A. General:
 - 1. Primary Framing: Shop fabricate framing components to indicated size and section with baseplates, bearing plates, stiffeners, and other items required for erection welded into place. Cut, form, punch, drill, and weld framing for bolted field assembly.
 - a. Make shop connections by welding or by using high-strength bolts.
 - b. Join flanges to webs of built-up members by a continuous submerged arc-welding process.
 - c. Brace compression flange of primary framing with steel angles or cold-formed structural tubing between frame web and purlin or girt web, so flange compressive strength is within allowable limits for any combination of loadings.
 - d. Weld clips to frames for attaching secondary framing members.
 - e. Shop Priming: Prepare surfaces for shop priming according to SSPC-SP 2. Shop prime primary structural members with specified primer after fabrication.
 - 2. Secondary Framing: Shop fabricate framing components to indicated size and section by roll-forming or break-forming, with baseplates, bearing plates, stiffeners, and other plates required for erection welded into place. Cut, form, punch, drill, and weld secondary framing for bolted field connections to primary framing.
 - a. Make shop connections by welding or by using non-high-strength bolts.
 - b. Secondary Framing Material: Metallic-Coated Steel Sheet: ASTM A 653/A 653M, SS, Grades 33 through 80 , or HSLAS or HSLAS-F, Grades 50 through 80; with G60 coating designation; mill phosphatized.
- B. Primary Framing: Manufacturer's standard structural primary framing system, designed to withstand required loads and specified requirements. Primary framing includes transverse frames; rafter beams, end-wall, and corner columns; and wind bracing.

1. General: Provide frames with attachment plates, bearing plates, and splice members. Factory drill for field-bolted assembly. Provide frame span and spacing indicated.
 2. Rigid Clear-Span Frames: I-shaped frame sections fabricated from shop-welded, built-up steel plates or structural-steel shapes. Interior columns are not permitted.
- C. Secondary Framing: Manufacturer's standard secondary framing members, including purlins, girts, eave struts, flange bracing, base members, gable angles, clips, headers, jamps, and other miscellaneous structural members. Fabricate framing from cold-formed, structural-steel sheet or roll-formed, metallic-coated steel sheet prepainted with coil coating, unless otherwise indicated, to comply with the following:
1. Purlins: C- or Z-shaped sections; fabricated from minimum 0.0598-inch-thick steel sheet, built-up steel plates, or structural-steel shapes; minimum 2-1/2-inch-wide flanges.
 2. Girts: C- or Z-shaped sections; fabricated from minimum 0.0598-inch-thick steel sheet, built-up steel plates, or structural-steel shapes. Form ends of Z-sections with stiffening lips angled 40 to 50 degrees to flange and with minimum 2-1/2-inch-wide flanges. Where required by specified loading conditions, by-pass girt members with depth greater than 8" are to be provided with notched condition at sidewall columns.
 3. Eave Struts: Unequal-flange, C-shaped sections; fabricated from 0.0598-inch-thick steel sheet, built-up steel plates, or structural-steel shapes; to provide adequate backup for metal panels.
 4. Flange Bracing: Minimum 2-by-2-by-1/8-inch structural-steel angles or 1-inch diameter, cold-formed structural tubing to stiffen primary frame flanges.
 5. Sag Bracing: Minimum 1-by-1-by-1/8-inch structural-steel angles.
 6. Base or Sill Angles: Minimum 3-by-2-by-0.0598-inch zinc-coated (galvanized) steel sheet.
 7. Purlin and Girt Clips: Minimum 0.0598-inch-thick, steel sheet. Provide galvanized clips where clips are connected to galvanized framing members.
 8. Framing for Openings: Channel shapes; fabricated from minimum 0.0598-inch-thick, cold-formed, structural-steel sheet or structural-steel shapes. Frame head and jamb of door openings, and head, jamb, and sill of other openings.
 9. Miscellaneous Structural Members: Manufacturer's standard sections fabricated from cold-formed, structural-steel sheet; built-up steel plates; or zinc-coated (galvanized) steel sheet; designed to withstand required loads.

- D. Bracing: Provide adjustable wind bracing as follows:
1. Rigid Portal Frames: Fabricate from shop-welded, built-up steel plates or structural steel shapes to match primary framing; of size required to withstand design loads in the longitudinal direction. Portal Frame bracing shall only be located in those bays indicated on the structural drawings.
 2. Braced Sidewall Frames: Solid rod "X" bracing (stranded wire not acceptable) with adequate means of take-up after full erection. Sidewall bracing shall only be located in those bays indicated on the structural drawings.
- E. Factory-Primed Finish: Apply specified primer immediately after cleaning and pretreating.
1. Prime primary structural-framing members to a minimum dry film thickness of 1 mil.

2.8 METAL ROOF PANELS

- A. Vertical-Rib, Standing-Seam Metal Roof Panels: Formed with 1 1/2" vertical ribs at panel edges and intermediate stiffening ribs symmetrically spaced between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels and engaging opposite edge of adjacent panels. Factory apply sealant at each interlocking joint.
1. Material: Zinc-coated (galvanized) steel sheet, minimum 22 gage.
 - a. Exterior Finish: Fluoropolymer Two-coat system.
 - b. Color: As selected by Architect from manufacturer's full range.
 2. Clips: Manufacturer's standard, floating type to accommodate thermal movement; fabricated from [zinc-coated (galvanized) steel sheet.
 3. Joint Type: Mechanically Seamed
 4. Panel Coverage: 16 inches .
 5. Panel Height: 1 1/2 inches .
 6. Uplift Rating: UL 90.
- B. Exterior Finish: Apply the following coil coating to roof panels and accessories:

1. Fluoropolymer Two-Coat System: Manufacturer's standard two-coat, thermocured system consisting of specially formulated inhibitive primer and flouropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight, with a total minimum dry film thickness of 1 mil and 30 percent reflective gloss when tested according to ASTM D 523.
 - a. Durability: Provide coating field tested under normal range of weather conditions for a minimum of 20 years without significant peel, blister, flake, chip, crack, or check in finish; without chalking in excess of a chalk rating of 8 according to ASTM D 4214; and without fading in excess of five Hunter units.
 2. Colors, Textures and Glosses: As selected by Architect from manufacturer's full range for these characteristics.
- C. Concealed Finish: Apply pretreatment and manufacturer's standard white or light colored backer finish, consisting of prime coat and wash coat with a total minimum dry film thickness of 0.5 mil.

2.9 WALL PANELS

- A. Uninsulated Wall Panels: Provide manufacturer's standard panels complying with the following:
1. Reverse-Ribbed Panels: Fabricate from metallic-coated steel sheets prepainted with coil coating, factory formed to provide 36-inch coverage, with recessed trapezoidal major valleys at 12 inches o.c., and intermediate valleys symmetrically spaced between major valleys full length of panel. Design panels for mechanical attachment to structure using exposed fasteners, lapping major valleys at panel edges. Comply with the following:
 - a. Material: Zinc-coated (galvanized steel.)
 - b. Yield Strength: 80 ksi.
 - c. Metal Thickness: 0.0239 inch.
 - d. Panel Thickness: 1.250 inch.
- B. Exposed Finish for Exterior Panels: Apply the following coil coating:
1. Fluoropolymer Two-Coat System: Manufacturer's standard two-coat, thermocured system consisting of specially formulated inhibitive primer and flouropolymer color topcoat containing not less than 70 percent polyvinylidene

fluoride resin by weight, with a total minimum dry film thickness of 1 mil and 30 percent reflective gloss when tested according to ASTM D 523.

- a. Durability: Provide coating field tested under normal range of weather conditions for a minimum of 20 years without significant peel, blister, flake, chip, crack, or check in finish; without chalking in excess of a chalk rating of 8 according to ASTM D 4214; and without fading in excess of five Hunter units.
2. Colors, Textures and Glosses: As selected by Architect from manufacturer's full range for these characteristics.
- C. Concealed Finish: Apply pretreatment and manufacturer's standard white or light colored backer finish, consisting of prime coat and wash coat with a total minimum dry film thickness of 0.5 mil.

2.10 METAL SOFFIT PANELS

- A. General: Provide factory-formed metal soffit panels designed to be installed by lapping and interconnecting side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps. Include accessories required for weathertight installation.
- B. Metal Soffit Panels: Match profile and material of metal roof panels.
 1. Finish: Match finish and color of metal wall panels.
- C. Exposed-Fastener, Tapered-Rib-Profile, Metal Soffit Panels: Formed with raised, trapezoidal major ribs and intermediate stiffening ribs symmetrically spaced between major ribs; designed to be installed by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps.
 1. Material: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.024-inch nominal uncoated steel thickness. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
 - a. Exterior Finish: Three-coat fluoropolymer.
 - b. Color: As selected by Architect from manufacturer's full range.
 2. Major-Rib Spacing: 12 inches o.c.
 3. Panel Coverage: 36 inches.
 4. Panel Height: 1.25 inches.

2.11 ACCESSORIES

- A. General: Provide accessories as standard with metal building system manufacturer and as specified. Fabricate and finish accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes. Comply with indicated profiles and with dimensional and structural requirements.
1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
- B. Roof Panel Accessories: Provide components required for a complete metal roof panel assembly including copings, fasciae, corner units, ridge closures, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels, unless otherwise indicated.
1. Closures: Provide closures at eaves and ridges, fabricated of same material as metal roof panels.
 2. Clips: Manufacturer's standard, formed from steel sheet, designed to withstand negative-load requirements.
 3. Cleats: Manufacturer's standard, mechanically seamed cleats formed from steel sheet.
 4. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
 5. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch thick, flexible closure strips; cut or premolded to match metal roof panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
- C. Wall Panel Accessories: Provide components required for a complete metal wall panel assembly including copings, fasciae, mullions, sills, corner units, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal wall panels, unless otherwise indicated.
1. Closures: Provide closures at eaves and rakes, fabricated of same material as metal wall panels.
 2. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch thick, flexible closure strips; cut or premolded to match metal wall panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

- D. Gutters: Formed from 0.022-inch nominal-thickness, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating with 70% resin Kynar 500 or Hylar 5000 fluoropolymer finish; finished to match roof fascia and rake trim. Match profile of gable trim, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch long sections, sized according to SMACNA's "Architectural Sheet Metal Manual."
1. Trim colors to be selected by Architect from manufacturer's full range of colors.
 2. Gutter Supports: Fabricated from same material and finish as gutters.
 3. Strainers: Bronze, copper, or aluminum wire ball type at outlets.
- E. Downspouts: Formed from 0.022-inch nominal-thickness, zinc-coated (galvanized) steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished to match metal wall panels. Fabricate in minimum 10-foot long sections, complete with formed elbows and offsets.
1. Mounting Straps: Fabricated from same material and finish as gutters.
- F. Flashing and Trim: Formed from minimum 0.0239-inch thick, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished to match adjacent metal panels.
1. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers.
- G. Roof Curbs: Fabricate curbs from 0.0478-inch thick, zinc coated (galvanized) steel sheet with welded top box and bottom skirt, and integral full-length cricket. Fabricate curb subframing of minimum 0.0598-inch thick, angle, C or Z-shaped steel sheet. Fabricate curb and subframing to withstand indicated loads, of size and height indicated. Finish roof curbs to match roof panels.
1. Insulate roof curb with 1-inch thick rigid insulation.
- H. Pipe Flashing: Premolded, EPDM pipe collar with flexible aluminum ring bonded to base.

2.12 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.13 SOURCE QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing and inspecting agency, approved by Owner, to perform the following tests and inspections and to submit reports.
 - 1. Special inspections will not be required if fabrication is performed by a manufacturer registered and approved by authorities having jurisdiction to perform such Work without special inspection.
 - a. After fabrication, submit certificate of compliance with copy to authorities having jurisdiction certifying that Work was performed according to Contract requirements.
- B. Tests and Inspections:
 - 1. Bolted Connections: Shop-bolted connections shall be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
 - 2. Welded Connections: In addition to visual inspection, shop welded connections shall be tested and inspected according to AWS D1.1 and the following inspection procedures, at inspector's option:
 - a. Liquid Penetrant Inspection: ASTM E 165.
 - b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
 - c. Ultrasonic Inspection: ASTM E 164.
 - d. Radiographic Inspection: ASTM E 94.
- C. Correct deficiencies in Work that test reports and inspections indicate do not comply with the Contract Documents.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Erector present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Before erection proceeds, survey elevations and locations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments to receive structural framing, with Erector present, for compliance with requirements and metal building system manufacturer's tolerances.

1. Engage land surveyor to perform surveying.
- C. Proceed with erection only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition.
- B. Provide temporary shores, guys, braces, and other supports during erection to keep structural framing secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Temporary work to be in accordance with manufacturer's recommendations. Remove temporary supports when permanent structural framing, connections, and bracing are in place, unless otherwise indicated.

3.3 ERECTION OF STRUCTURAL FRAMING

- A. Erect metal building system according to manufacturer's written erection instructions and erection drawings.
- B. Do not field cut, drill, or alter structural members without written approval from metal building system manufacturer's professional engineer.
- C. Set structural framing accurately in locations and to elevations indicated and according to AISC specifications referenced in this Section. Maintain structural stability of frame during erection.
- D. Base Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
1. Set plates for structural members on setting nuts.
 2. Tighten anchor rods after supported members have been positioned and plumbed.
 3. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- E. Align and adjust structural framing before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with framing. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
1. Level and plumb individual members of structure.

- F. Primary Framing and End Walls: Erect framing true to line, level, plumb, rigid, and secure. Level baseplates to a true even plane with full bearing to supporting structures, set with double-nutted anchor bolts. Use grout to obtain uniform bearing and to maintain a level base-line elevation. Moist cure grout for not less than seven days after placement.
 - 1. Make field connections using high-strength bolts installed according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
 - a. Joint Type: Snug tightened or pretensioned.
- G. Secondary Framing: Erect framing true to line, level, plumb, rigid, and secure. Fasten secondary framing to primary framing using clips with field connections using non-high-strength bolts.
 - 1. Provide rake or gable purlins with tight-fitting closure channels and fasciae.
 - 2. Locate and space wall girts to suit openings such as doors and windows.
 - 3. Provide supplemental framing at entire perimeter of openings, including doors, windows, louvers, ventilators, and other penetrations of roof and walls.
- H. Bracing: Install bracing in roof and sidewalls where indicated on erection drawings.
 - 1. Tighten rod and cable bracing to avoid sag.
 - 2. Locate interior end-bay bracing only where indicated.
- I. Framing for Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical and electrical work. Securely attach to structural framing.
- J. Erection Tolerances: Maintain erection tolerances of structural framing within AISC's "Code of Standard Practice for Steel Buildings and Bridges."

3.4 METAL PANEL INSTALLATION, GENERAL

- A. Examination: Examine primary and secondary framing to verify that structural panel support members and anchorages have been installed within alignment tolerances required by manufacturer.
 - 1. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before metal panel installation.
- B. General: Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Field cut metal panels as required for openings. Cut openings as small as possible, neatly to size required, and without damage to adjacent metal panel finishes.
 - a. Field cutting of metal panels by torch is not permitted unless approved in writing by manufacturer.
 2. Install metal panels perpendicular to structural supports, unless otherwise indicated.
 3. Flash and seal metal panels with weather closures at perimeter of openings and similar elements. Fasten with self-tapping screws.
 4. Locate and space fastenings in uniform vertical and horizontal alignment.
 5. Locate metal panel splices over, but not attached to, structural supports with end laps in alignment. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
 6. Lap metal flashing over metal panels to allow moisture to run over and off the material.
- C. Lap-Seam Metal Panels: Install screw fasteners with power tools having controlled torque adjusted to compress neoprene washer tightly without damage to washer, screw threads, or metal panels. Install screws in predrilled holes.
1. Arrange and nest side-lap joints so prevailing winds blow over, not into, lapped joints. Lap ribbed or fluted sheets one full rib corrugation. Apply metal panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.
- D. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal roof panel manufacturer.
- E. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal panel assemblies. Provide types of gaskets, fillers, and sealants indicated or, if not indicated, types recommended by metal panel manufacturer.
1. Seal metal panel end laps with double beads of tape or sealant, full width of panel. Seal side joints where recommended by metal panel manufacturer.
 2. Prepare joints and apply sealants to comply with requirements in Division 7 Section "Joint Sealants."

3.5 METAL ROOF PANEL INSTALLATION

- A. General: Provide metal roof panels of full length from eave to ridge, unless otherwise indicated or restricted by shipping limitations.
 - 1. Install ridge caps as metal roof panel work proceeds.
 - 2. Flash and seal metal roof panels with weather closures at eaves and rakes. Fasten with self-tapping screws.
- B. Field-Assembled, Standing-Seam Metal Roof Panels: Fasten metal roof panels to supports with concealed clips at each standing-seam joint at location, spacing, and with fasteners recommended by manufacturer.
 - 1. Install clips to supports with self-tapping fasteners.
 - 2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
 - 3. Snap Joint: Nest standing seams and fasten together by interlocking and completely engaging factory-applied sealant.
 - 4. Rigidly fasten eave end of metal roof panels and allow ridge end free movement due to thermal expansion and contraction. Pre-drill panels for fasteners.
 - 5. Provide metal closures at ridge caps.
- C. Metal Fascia Panels: Align bottom of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Flash and seal metal panels with weather closures where fasciae meet soffits, along lower panel edges, and at perimeter of all openings.

3.6 METAL WALL PANEL INSTALLATION

- A. General: Install metal wall panels in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to girts, extending full height of building, unless otherwise indicated. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement.
 - 1. Unless otherwise indicated, begin metal panel installation at corners with center of rib lined up with line of framing.
 - 2. Shim or otherwise plumb substrates receiving metal wall panels.
 - 3. When two rows of metal panels are required, lap panels 4 inches minimum.

4. When building height requires two rows of metal panels at gable ends, align lap of gable panels over metal wall panels at eave height.
 5. Rigidly fasten base end of metal wall panels and allow eave end free movement due to thermal expansion and contraction. Pre-drill panels.
 6. Flash and seal metal wall panels with weather closures at eaves, rakes, and at perimeter of all openings. Fasten with self-tapping screws.
 7. Install screw fasteners in pre-drilled holes.
 8. Install flashing and trim as metal wall panel work proceeds.
 9. Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete, and elsewhere as indicated, or if not indicated, as necessary for waterproofing.
 10. Align bottom of metal wall panels and fasten with blind rivets, bolts, or self-tapping screws.
 11. Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.
- B. Field-Assembled, Metal Wall Panels: Install metal wall panels on exterior side of girts. Attach metal wall panels to supports with fasteners as recommended by manufacturer.
1. Field-Insulated Assemblies: Install thermal insulation as specified. Install metal liner panels over insulation on interior side of girts at locations indicated. Fasten with exposed fasteners as recommended by manufacturer.

3.7 METAL SOFFIT PANEL INSTALLATION

- A. Provide metal soffit panels the full width of soffits. Install panels perpendicular to support framing.
- B. Flash and seal metal soffit panels with weather closures where panels meet walls and at perimeter of all openings.

3.8 THERMAL INSULATION INSTALLATION FOR FIELD-ASSEMBLED METAL PANELS

- A. General: Install insulation concurrently with metal wall panel installation, in thickness indicated to cover entire wall, according to manufacturer's written instructions.
 1. Set vapor-retarder-faced units with vapor retarder to warm side of construction, unless otherwise indicated. Do not obstruct ventilation spaces, except for firestopping.

2. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to surrounding construction to ensure airtight installation. Tape to match color and finish of vapor retarder.
 3. Install factory-laminated, vapor-retarder-faced blankets straight and true in one-piece lengths with both sets of facing tabs sealed to provide a complete vapor retarder.
- B. Blanket Roof Insulation: Comply with the following installation method:
1. Over-Purlin-with-Spacer-Block Installation: Extend insulation and vapor retarder over and perpendicular to top flange of secondary framing members. Install layer of filler insulation over first layer to fill space formed by metal roof panel standoffs. Hold in place by panels fastened to standoffs.
 2. Retainer Strips: Install retainer strips at each longitudinal insulation joint, straight and taut, nesting with secondary framing to hold insulation in place.
 3. Thermal Spacer Blocks: Where metal roof panels attach directly to purlins, install thermal spacer blocks.
- C. Blanket Wall Insulation: Extend insulation and vapor retarder over and perpendicular to top flange of secondary framing members. Hold in place by metal wall panels fastened to secondary framing.
1. Retainer Strips: Install retainer strips at each longitudinal insulation joint, straight and taut, nesting with secondary framing to hold insulation in place.
 2. Sound-Absorption Insulation: Where sound-absorption requirement is indicated for metal liner panels, cover insulation with polyethylene film and provide inserts of wire mesh to form acoustical spacer grid.

3.9 ACCESSORY INSTALLATION

- A. General: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
1. Install components required for a complete metal roof panel assembly including trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
 2. Install components for a complete metal wall panel assembly including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.

3. Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by manufacturer.
- B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
1. Install exposed flashing and trim that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
 2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).
 3. Separations: Separate metal from incompatible metal or corrosive substrates by coating concealed surfaces, at locations of contact, with asphalt mastic or other permanent separation as recommended by manufacturer.
- C. Pipe Flashing: Form flashing around pipe penetration and metal roof panels. Fasten and seal to panel as recommended by manufacturer.

3.10 FIELD QUALITY CONTROL

- A. Testing Agency: Contractor to engage a qualified testing and inspecting agency acceptable to and approved by architect to perform the following tests and inspections and to submit reports.
- B. Tests and Inspections:
1. High-Strength, Field-Bolted Connections: Connections shall be tested and inspected during installation according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

2. Welded Connections: In addition to visual inspection, field-welded connections shall be tested and inspected according to AWS D1.1 and the following inspection procedures, at inspector's option:
 - a. Liquid Penetrant Inspection: ASTM E 165.
 - b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
 - c. Ultrasonic Inspection: ASTM E 164.
 - d. Radiographic Inspection: ASTM E 94.
- C. Correct deficiencies in Work that test reports and inspections indicate do not comply with the Contract Documents.

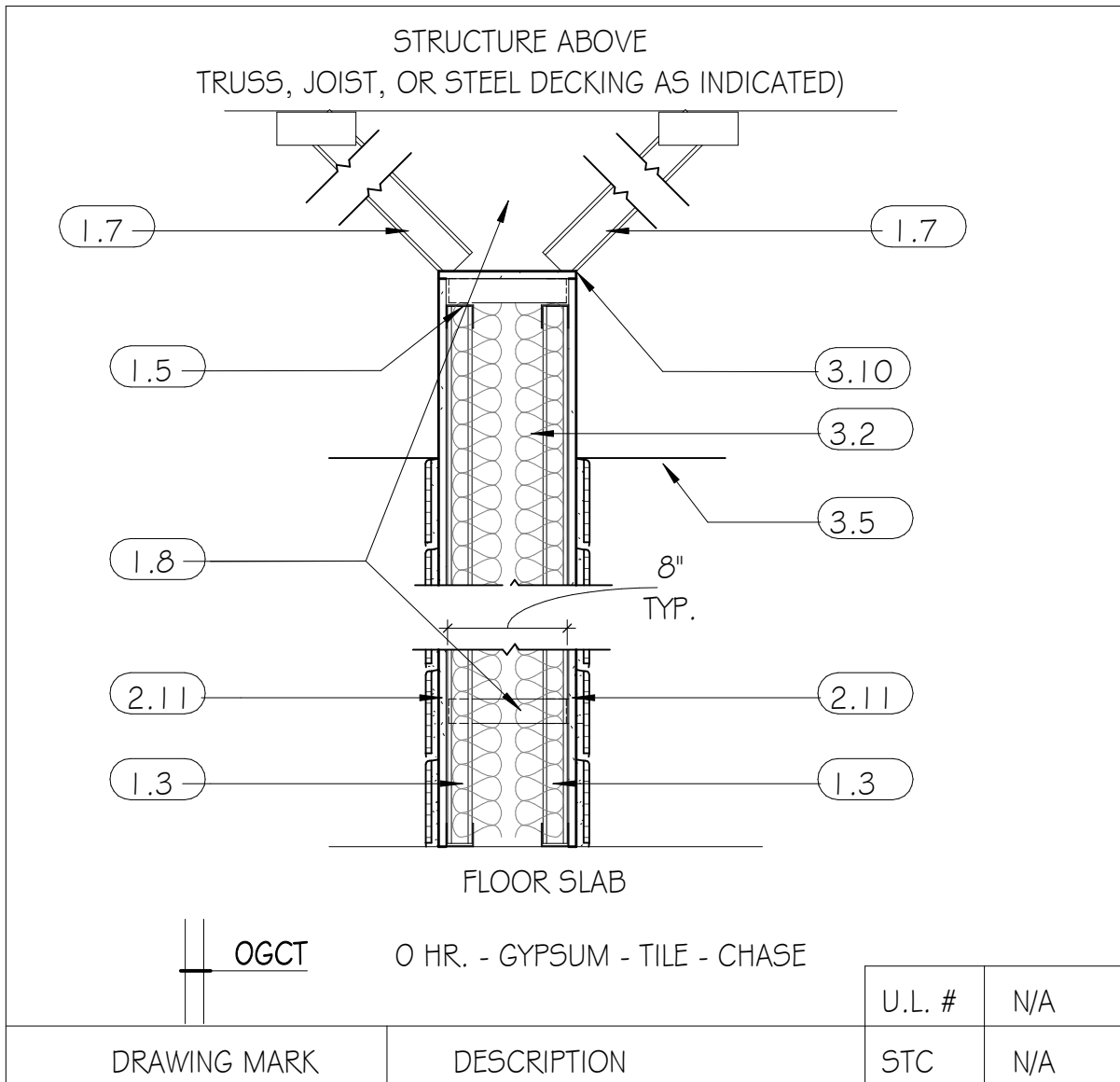
3.11 CLEANING AND PROTECTION

- A. Touchup Painting: After erection, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted structural framing, base plates, and accessories.
 1. Clean and prepare surfaces by SSPC-SP 2, "Hand Tool Cleaning," or SSPC-SP 3, "Power Tool Cleaning."
 2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.
- B. Repair damaged galvanized coatings on exposed surfaces with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- C. Metal Panels: Remove temporary protective coverings and strippable films, if any, as metal panels are installed. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.
 1. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF PRE-ENGINEERED METAL BUILDING SYSTEM

NUMBERED NOTES

- 1.3 PLUMBING CHASE. 1-5/8" METAL STUDS 16" OC IN TWO ROWS.
- 1.5 CONTINUOUS TOP TRACK (0.0329" METAL THICKNESS)
- 1.7 STUD BRACING MIN. 48 IN. OC (24" OC AT WALL-HUNG CABINETS)
- 1.8 STEEL STUD OR RUNNER BRACING, FULL WIDTH OF CAVITY, @ 48" O.C. VERT. MAX
- 2.11 ONE LAYER 1/2" TYPE 'X' GLASS-MAT BACKER BOARD WITH THIN-SET TILE UP TO CEILING. TRANSITION TO 1/2" TYPE 'X' MR GYP BOARD FROM ABOVE CEILING TO STRUCTURE ABOVE. SEE FINISH SCHEDULE FOR COLORS AND INTERIOR ELEVATIONS FOR PATTERN.
- 3.2 SOUND ATTENUATION BATT INSULATION BOTH SIDES OF STUD CAVITY. 3.5" THICK
- 3.5 ACOUSTICAL CEILING PANELS. WHERE PANELS W/ COMBINED NRC/CAC RATINGS OF .70/35 (OR BETTER) ARE USED, DRAPED INSULATION MAY BE OMITTED
- 3.10 EXTEND GYP BOARD TO TOP OF TRACK TO ESTABLISH A DRAFT STOP ASSEMBLY. CONDUIT TURNOUTS AND ELECTRICAL BOXES MUST STAND CLEAR OF MET. STUDS TO ALLOW FOR APPLICATION OF UNINTERRUPTED GYPSUM MEMBRANE



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4551 HALLS MILL RD.
MOBILE, AL 36693

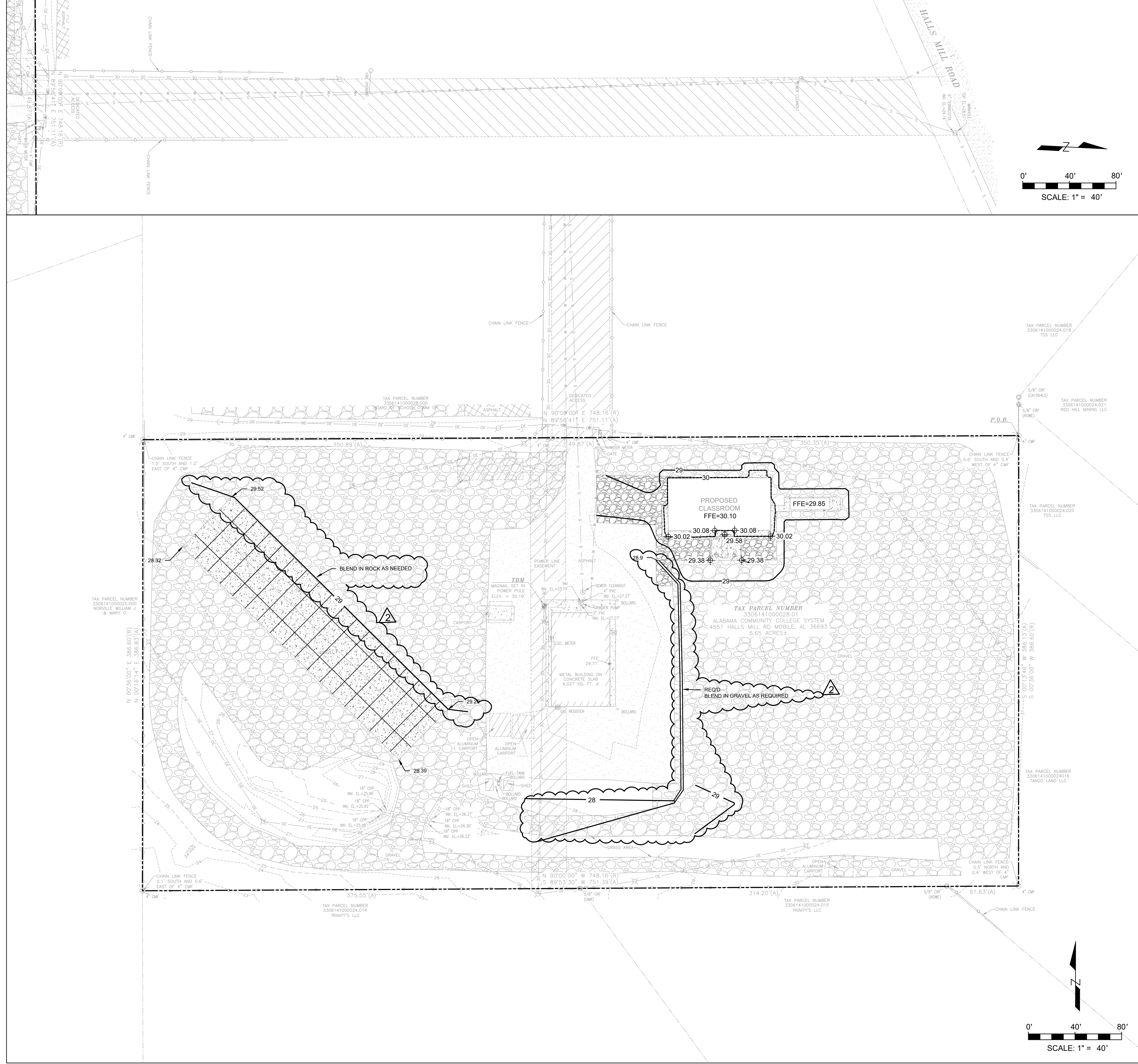
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CHASE WALL DETAIL
GMC # #AMOB250055
02/10/26
DRAWN BY: H.S.

11 North Water Street, Suite 19290
Mobile, AL 36602
T 251.460.4006
GMCNETWORK.COM

GMC

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LEGEND

	PROPOSED SWALE
	EXISTING 5' CONTOUR
	EXISTING 1' CONTOUR
	PROPOSED 5' CONTOUR
	PROPOSED 1' CONTOUR
	PROPOSED SPOT ELEVATION

GMC
 2039 Main Street
 Daphne, AL 36526
 T 251.626.2626

**BISHOP STATE
 COMMUNITY COLLEGE**

ISSUE	DATE
FINAL DESIGN REVIEW	12-18-2024
ISSUE FOR BID	01-09-2025
APPENDIX 2	02-10-2025
DESIGNER:	CS
DRAWN BY:	BS

**BISHOP STATE COMMUNITY
 COLLEGE DRIVER TRAINING
 CAMPUS**
 4551 HALLS MILL RD MOBILE, AL
 CMOB250088



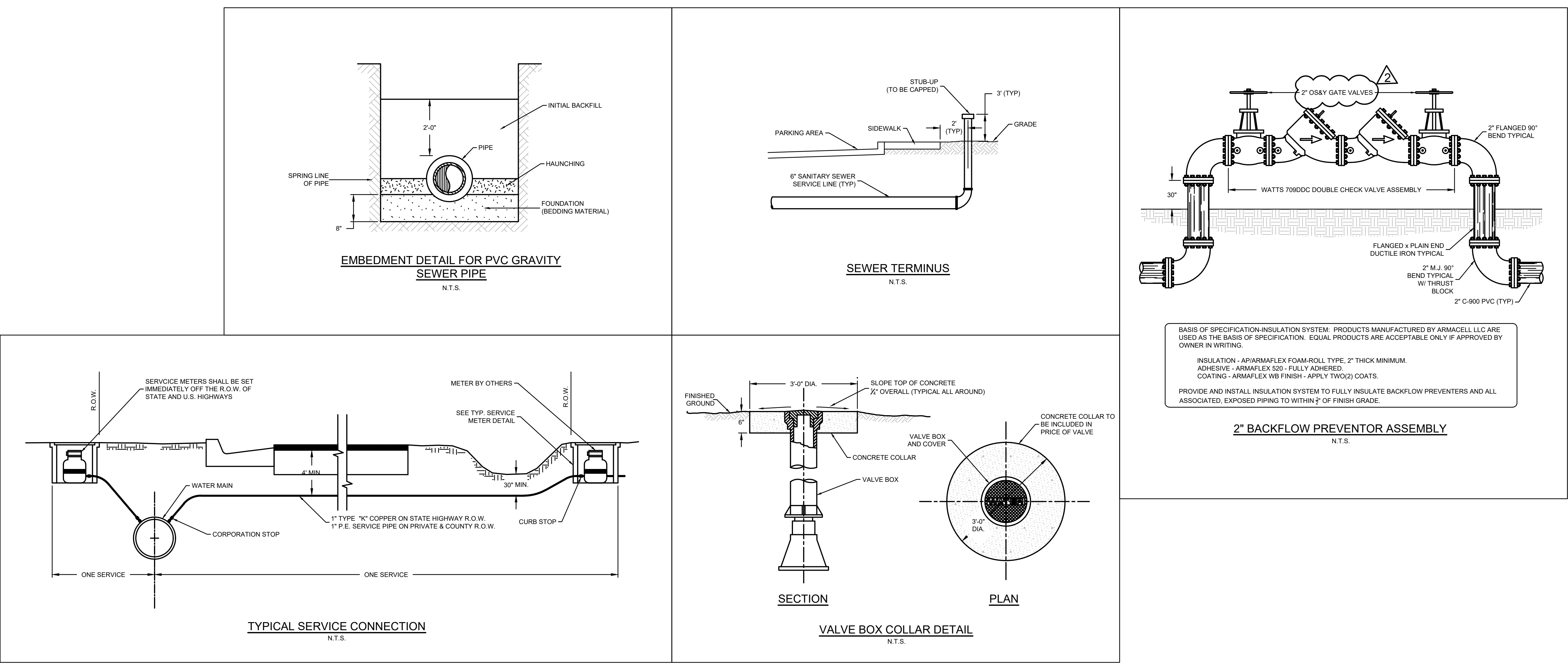
GRADING PLAN
C-201

ISSUE	DATE
FINAL DESIGN REVIEW	12-18-2025
ISSUE FOR BID	01-09-2026
ADDENDUM-2	02-10-2026
DESIGNER:	CS
DRAWN BY:	BS

BISHOP STATE COMMUNITY
 COLLEGE DRIVER TRAINING
 CAMPUS
 4651 HALLS MILL RD MOBILE, AL
 CMOB250088



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LIGHTING FIXTURE SCHEDULE						
EX	LUMENS	WATTS	LAMP TYPE	MOUNTING	MANUFACTURER AND CATALOG NUMBER	NOTES
EX1	N/A	3.0	LED RED	UNIVERSAL	H.E. WILLIAMS # EXIT-R-EM-WHT-COPY/SF-D	
EX2	N/A	3.0	LED RED	UNIVERSAL	H.E. WILLIAMS # EXIT-R-EM-WHT-COPY/DF-D	
EX3	N/A	N/A	LED RED	UNIVERSAL	LITHONIA # D-S-W-1-R-20	
LSA LSAE	2916	19.7	LED 35K	SUSPENDED	H.E. WILLIAMS # 75R-4-130-835-FF-DM-UNV H.E. WILLIAMS # 75R-4-130-835-EM/10W-FF-DM-UNV	E - FOR FIXTURES WITH AN "E" ONLY. PROVIDE INTEGRAL LOW BATTERY BACKUP. REMOTE TEST SWITCH SHALL NOT BE ACCEPTED.
LT24A LT24AE	3972	32.0	LED 35K	GRID CEILING	H.E. WILLIAMS # LT-24-140-835-AF-DM-UNV H.E. WILLIAMS # LT-24-140-835-AF-EM/10W-DM-UNV	E - FOR FIXTURES WITH AN "E" ONLY. PROVIDE INTEGRAL LOW BATTERY BACKUP. REMOTE TEST SWITCH SHALL NOT BE ACCEPTED.
LT24B LT24BE	5202	37.2	LED 35K	GRID CEILING	H.E. WILLIAMS # LT-24-152-835-AF-DM-UNV H.E. WILLIAMS # LT-24-152-835-AF-EM/10W-DM-UNV	E - FOR FIXTURES WITH AN "E" ONLY. PROVIDE INTEGRAL LOW BATTERY BACKUP. REMOTE TEST SWITCH SHALL NOT BE ACCEPTED.
LT24C LT24CE	6396	48.5	LED 35K	GRID CEILING	H.E. WILLIAMS # LT-24-164-835-AF-DM-UNV H.E. WILLIAMS # LT-24-164-835-AF-EM/10W-DM-UNV	E - FOR FIXTURES WITH AN "E" ONLY. PROVIDE INTEGRAL LOW BATTERY BACKUP. REMOTE TEST SWITCH SHALL NOT BE ACCEPTED.
WP WPE	3400	44.0	LED 50K	SURFACE WALL	H.E. WILLIAMS # W6R-15-130-835-GRAY-DM-UNV-W-WM H.E. WILLIAMS # W6R-15-130-835-EM/7W-GRAY-DM-UNV-W-WM	E - FOR FIXTURES WITH AN "E" ONLY. PROVIDE INTEGRAL LOW BATTERY BACKUP. REMOTE TEST SWITCH SHALL NOT BE ACCEPTED.

MECHANICAL EQUIPMENT ELECTRICAL SCHEDULE						
MARK	ITEM	VOLTAGE/#	DISCONNECT SWITCH	CONDUCTORS	FEEDER GROUND	CONDUIT
AHU#1	AIR HANDLING UNIT	240/1	60 N1	2#6	#10	1.00" C
AHU#2	AIR HANDLING UNIT	240/1	60 N1	2#6	#10	1.00" C
AHU#3	AIR HANDLING UNIT	240/1	60 N1	2#6	#10	1.00" C
HPU#1	HEAT PUMP UNIT	240/1	30 N3R	2#10	#10	0.75" C
HPU#2	HEAT PUMP UNIT	240/1	60 N3R	2#8	#10	0.75" C
HPU#3	HEAT PUMP UNIT	240/1	60 N3R	2#8	#10	0.75" C
DAHU#1	DUCTLESS AIR HANDLING UNIT	240/1	INTEGRAL	2#12	#12	0.75" C
DCDU#1	DUCTLESS CONDENSING UNIT	240/1	30 N3R	2#12	#12	0.75" C
EF#1	EXHAUST FAN	120/1	LIGHT SWITCH	2#12	#12	0.75" C
EF#2	EXHAUST FAN	120/1	LIGHT SWITCH	2#12	#12	0.75" C
EF#3	EXHAUST FAN	120/1	LIGHT SWITCH	2#12	#12	0.75" C
EF#4	EXHAUST FAN	120/1	LIGHT SWITCH	2#12	#12	0.75" C
WH#1	WATER HEATER	240/1	60 N1	2#8	#10	0.75" C

ELECTRICAL SYMBOL LEGEND	
SYMBOL	DESCRIPTION
	PANELBOARD - SEE RESPECTIVE PANELBOARD SCHEDULE.
	BRANCH CIRCUIT CONDUIT RUN CONCEALED IN WALL OR ABOVE CEILING. ARROW INDICATES CIRCUIT HORIZONTAL, HASHMARKS INDICATE NUMBER OF CONDUCTORS. ABSENCE OF HASHMARKS INDICATES TWO CONDUCTORS PLUS GROUND. "1" INDICATES CIRCUIT BREAKER SPACE IN PANELBOARD. SEE RESPECTIVE PANEL CIRCUIT SCHEDULE. MINIMUM CIRCUIT SIZE = 2#12, #125, 1/2" UNLESS NOTED OTHERWISE ON PANEL SCHEDULES OR DRAWINGS. PROVIDE DEDICATED NEUTRAL. SHARING OF THE NEUTRAL CONDUCTOR BETWEEN CIRCUITS IS PROHIBITED.
	INDICATES ELECTRICAL CONDUIT ROUTED UNDERGROUND/SLAB.
	ELECTRIC MOTOR - SEE RESPECTIVE EQUIPMENT SCHEDULE.
	NON-FUSED DISCONNECT, HEAVY DUTY (SAFETY) SWITCH - SIZE AND TYPE AS NOTED. TOP OF SWITCH 6"-6" A.F.F. PROVIDE PHENOLIC LABEL MOUNTED ABOVE DISCONNECT.
	20 AMP, 120 VAC, 2-POLE, 3-WIRE, GROUNDING TYPE, DUPLEX RECEPTACLE. FLUSH WALL MOUNTED 18" A.F.F. UNLESS NOTED OTHERWISE.
	20 AMP, 125 VAC, 2-POLE, 3-WIRE, GROUNDING TYPE, DOUBLE DUPLEX RECEPTACLE. FLUSH WALL 18" A.F.F. UNLESS NOTED OTHERWISE.
	20 AMP, 120 VAC, 2-POLE, 3-WIRE, GROUND FAULT CIRCUIT INTERRUPTED TYPE DUPLEX RECEPTACLE. FLUSH WALL-MOUNTED 18" A.F.F. UNLESS NOTED OTHERWISE.
	INDICATES GFCI WIRING DEVICE WITH WEATHER-PROOF IN-USE COVER PLATE.
	INDICATES DEVICE FLUSH MOUNTED HORIZONTALLY 6" ABOVE COUNTERTOP OR IN BACKSPASH.
	INDICATES RECEPTACLE FOR ELECTRIC WATER COOLER. MOUNT OUTLET SO THAT IT WILL BE ACCESSIBLE AND CONCEALED AFTER INSTALLATION OF WATER COOLER.
	INDICATES RECEPTACLE FOR MICROWAVE OVEN. COORDINATE MOUNTING LOCATION WITH CASE WORK.
	INDICATES RECEPTACLE FOR REFRIGERATOR. FLUSH WALL MOUNT 60" A.F.F. UNLESS NOTED OTHERWISE.
	(2) 20A, 125 VAC 2P, 3W, GROUNDING TYPE, DUPLEX RECEPTABLES FLUSH MOUNTED IN FLOOR BOX WITH FLUSH FACEPLATE AND (2) DATA OUTLETS AS INDICATED ON TELECOM LEGEND. PROVIDE DEVICE MOUNTING BRACKETS FOR EACH DEVICE. FLOOR BOX EQUAL TO LEGRAND WIREMOLD RACKET-PRO. COORDINATE ALL FLOORBOX REQUIREMENTS WITH OWNER PRIOR TO ROUGH-IN.
	VOICE/DATA OUTLET IN A 4" SQUARE BOX WITH 1 GANG EXTENSION RING. DEVICE MOUNTED 18" AFF UNLESS NOTED OTHERWISE. STUB 3/4" FROM BACKBOX TO 6" ABOVE ACCESSIBLE CEILING. PROVIDE CONDUIT BUSHINGS.
	ADDRESSABLE INTELLIGENT FIRE ALARM SYSTEM CONTROL PANEL/FIRE COMMAND CENTER, FLUSH MOUNTED. FIELD VERIFY EXACT MOUNTING LOCATION.
	FLUSH MOUNT, ADDRESSABLE, FIRE ALARM REMOTE ANNUNCIATOR PANEL.
	FLUSH MOUNT, ADDRESSABLE, REMOTE FIRE FIGHTERS MICROPHONE.
	ADDRESSABLE INTELLIGENT FIRE ALARM VOICE COMMAND CENTER.
	FIRE ALARM SYSTEM ADDRESSABLE PULL STATION - SEMI FLUSH MOUNTED 48" A.F.F. TO TOP UNLESS NOTED OTHERWISE. DEVICES MARKED WITH A "WP" SHALL BE PROVIDED WITH A WEATHERPROOF COVER.
	FIRE ALARM SYSTEM SPEAKER / STROBE DEVICE SEMI FLUSH WALL MOUNTED AT 80" A.F.F. OR 6" BELOW THE FINISHED CEILING WHICHEVER IS LOWER, UNLESS NOTED OTHERWISE. CANDELA RATING AS NOTED. ALL STROBES IN COMMON SPACES OR CORRIDORS SHALL BE SYNCHRONIZED. "WP" INDICATES WEATHERPROOF DEVICE MOUNTED TO WEATHERPROOF ENCLOSURE.
	FIRE ALARM SYSTEM VISUAL DEVICE SEMI FLUSH WALL MOUNTED AT 80" A.F.F. OR 6" BELOW THE FINISHED CEILING WHICHEVER IS LOWER, UNLESS NOTED OTHERWISE. CANDELA RATING AS NOTED. ALL STROBES IN COMMON SPACES OR CORRIDORS SHALL BE SYNCHRONIZED. "WP" INDICATES WEATHERPROOF DEVICE MOUNTED TO WEATHERPROOF ENCLOSURE.
	FIRE ALARM SYSTEM SPEAKER / STROBE DEVICE CEILING MOUNTED, UNLESS NOTED OTHERWISE. ALL STROBES IN COMMON SPACES OR CORRIDORS SHALL BE SYNCHRONIZED. STROBE SHALL BE 75 CANDELLA MINIMUM UNLESS NOTED OTHERWISE.
	FIRE ALARM SYSTEM VISUAL DEVICE CEILING MOUNTED, UNLESS NOTED OTHERWISE. ALL STROBES IN COMMON SPACES OR CORRIDORS SHALL BE SYNCHRONIZED. STROBE SHALL BE 75 CANDELLA MINIMUM UNLESS NOTED OTHERWISE.
	ADDRESSABLE INTELLIGENT CEILING MOUNTED FIRE ALARM SYSTEM PHOTOELECTRIC TYPE SMOKE DETECTOR WITH BASE.
	ADDRESSABLE INTELLIGENT FIRE ALARM SYSTEM DUCT MOUNTED PHOTOELECTRIC SMOKE DETECTOR COMPLETE WITH HOUSING AND AIR SAMPLING TUBES. "S" DENOTES DETECTOR IN SUPPLY DUCT, "R" DENOTES DETECTOR IN RETURN DUCT.
	FIRE ALARM SYSTEM INTERFACE MODULE - MOUNTED AT EQUIPMENT.
	ADDRESSABLE INTELLIGENT FIRE ALARM SYSTEM HEAT DETECTOR RATE OF RISE TYPE.
	ELECTROMAGNETIC DOOR HOLDER INTERLOCKED WITH FIRE ALARM SYSTEM. COORDINATE LOCATION WITH THE ARCHITECT PRIOR TO ROUGH-IN.
	ADDRESSABLE MONITOR MODULE.
	SPRINKLER SYSTEM FLOW SWITCH, FURNISHED AND INSTALLED BY FIRE PROTECTION (SPRINKLER) SYSTEM CONTRACTOR, AND CONNECTED TO FIRE ALARM SYSTEM CONTROL PANEL VIA AN ADDRESSABLE MONITOR MODULE BY FIRE ALARM SYSTEM CONTRACTOR.
	SPRINKLER SYSTEM TAMPER SWITCH, FURNISHED AND INSTALLED BY FIRE PROTECTION (SPRINKLER) SYSTEM CONTRACTOR, AND CONNECTED TO FIRE ALARM SYSTEM CONTROL PANEL VIA AN ADDRESSABLE MONITOR MODULE BY FIRE ALARM SYSTEM CONTRACTOR.
	GROUNDING ELECTRODE SYSTEM MW NEC ART. 250 - 50 REBAR IN FOOTINGS AND 2 - GROUND RODS AT SERVICE.

SYMBOLS NOTES:
 1. ALL OUTLETS ARE TO BE FLUSH MOUNTED.
 2. MOUNTING HEIGHTS ARE FROM THE CENTER LINE OF THE DEVICE.
 3. ALL SINGLE GANG AND TWO GANG DEVICES SHALL USE A 4" SQ. BOX WITH EXTENSION RING.
 4. ALL MULTI - GANG DEVICES SHALL USE A COMMON COVER PLATE.
 5. ALL DEVICES (i.e. SWITCHES, RECEPTABLES, TELEPHONE OUTLETS, ETC.) AND THEIR COVER PLATES SHALL BE COLOR AS DETERMINED BY THE ARCHITECT UNLESS NOTED OTHERWISE.
 6. A.F.F. INDICATES MOUNTING HEIGHT ABOVE FINISHED GRADE.
 7. A.F.F. INDICATES MOUNTING HEIGHT ABOVE FINISHED FLOOR.

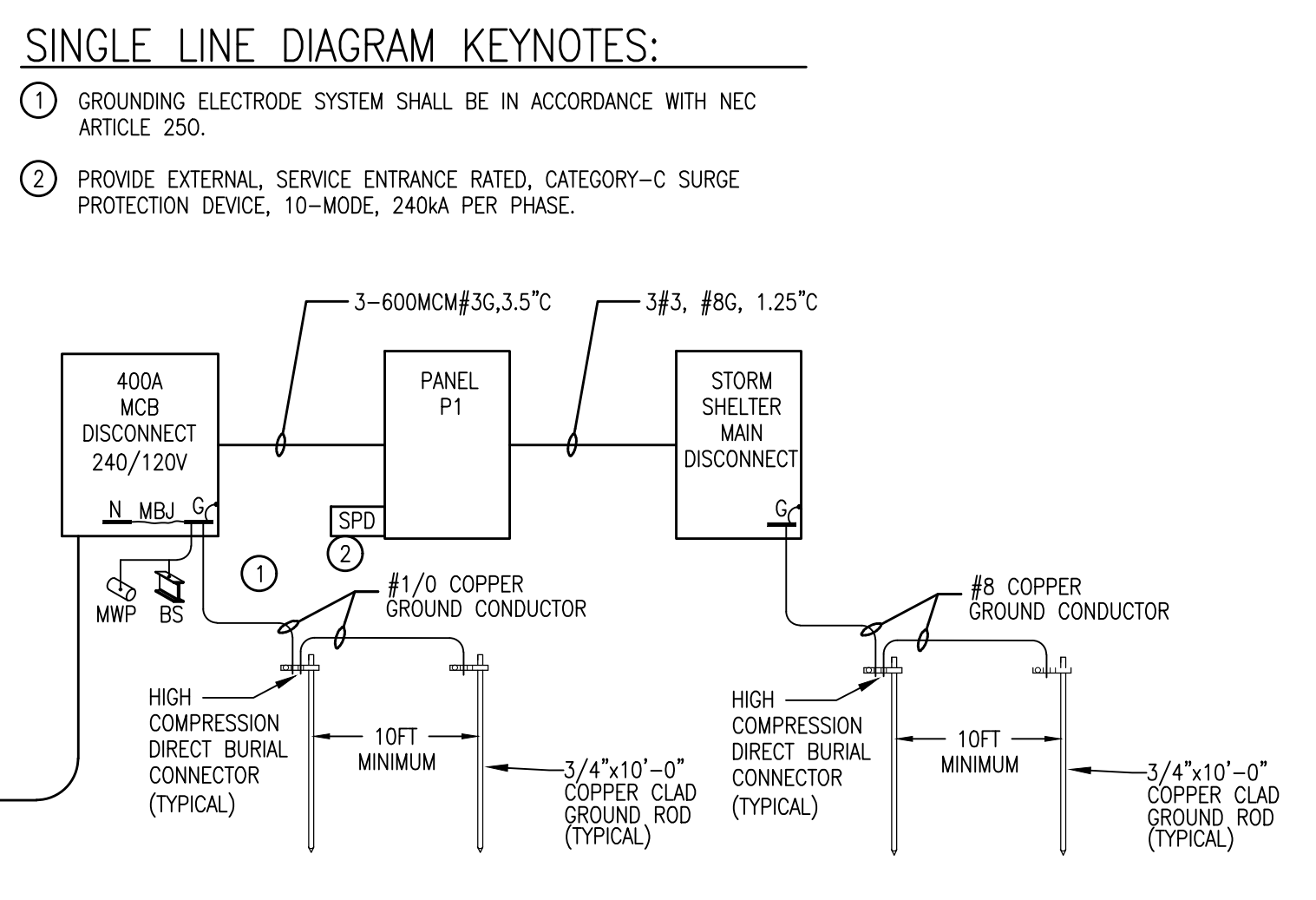
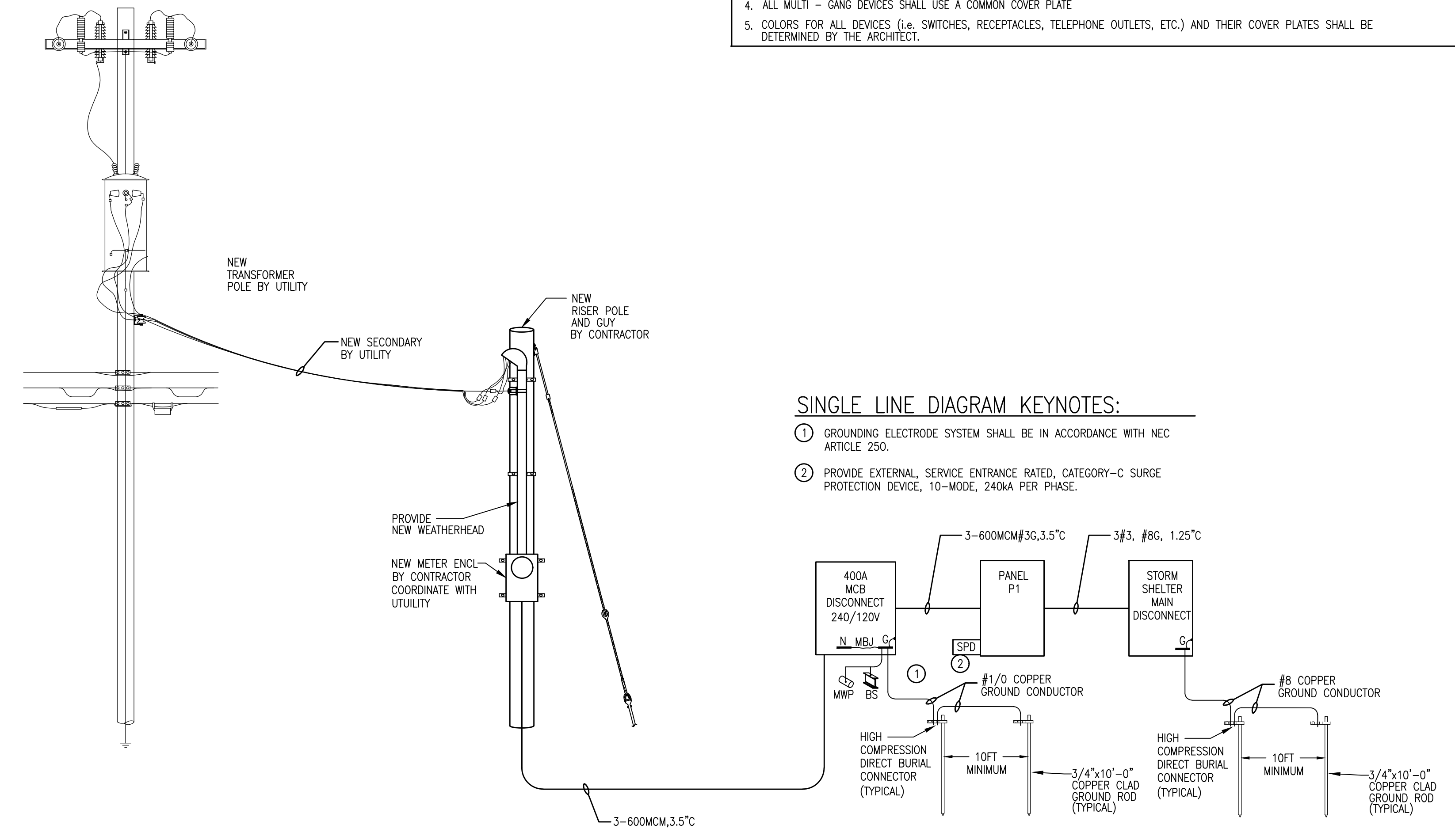
LIGHTING SYMBOL LEGEND	
SYMBOL	DESCRIPTION
	"LED" LIGHTING FIXTURE. LETTER(S) DENOTE TYPE - SEE LIGHTING FIXTURE SCHEDULE.
	"LED" LIGHTING FIXTURE WITH INTEGRAL BATTERY BACKUP.
	20 AMP, 120/277 VAC SINGLE POLE TOGGLE SWITCH - FLUSH WALL MOUNTED 48" A.F.F. UNLESS NOTED OTHERWISE. SUBSCRIPT INDICATES AS FOLLOWS: 3 - 20 AMP, 120/277 VAC THREE WAY TOGGLE SWITCH 4 - 20 AMP, 120/277 VAC FOUR WAY TOGGLE SWITCH D - 0-10V ON/OFF/DIMMING WALL SWITCH. SEE LIGHTING PLANS AND DETAILS FOR ADDITIONAL REQUIREMENTS. DT - DUAL TECHNOLOGY MOTION SENSOR WALL SWITCH. WATSTOPPER DT-100. TIME DELAY DURATION SHALL BE 20 MINUTES MAXIMUM. PROGRAM FOR "MANUAL ON". MOLD - LOW VOLTAGE MANUAL ON AND DIMMING WALL SWITCH EQUAL TO WATSTOPPER DCLV2. SEE LIGHTING PLANS AND DETAILS FOR ADDITIONAL REQUIREMENTS. PROGRAM FOR "MANUAL ON". PROVIDE ALL 0-10V WIRING AS REQUIRED.
	"LED" EXIT LIGHT WITH BATTERY. DARKENED QUADRANTS INDICATE ILLUMINATED FACES, ARROWS AS INDICATED. LETTER(S) DENOTE TYPE - SEE LIGHTING FIXTURE SCHEDULE.
	POWER PACK RELAY FOR CONTROL OF LIGHTING CONTROLS, EQUAL TO WATSTOPPER CAT# BZ-50. MOUNT DEVICE IN AN ACCESSIBLE LOCATION.
	DUAL TECHNOLOGY CEILING-MOUNTED 360° OCCUPANCY SENSOR, WATSTOPPER DT-300. SEE LIGHTING CONTROL WIRING DIAGRAM FOR ADDITIONAL INFORMATION. MOUNT AT LOCATION AS INDICATED ON PLANS. DEVICE SHALL BE PROGRAMMED FOR "AUTOMATIC ON" (UNLESS INDICATED OTHERWISE ON PLANS). PROGRAM SUCH THAT BOTH TECHNOLOGIES ARE REQUIRED TO TRIGGER LIGHTS "ON" AND EITHER TECHNOLOGY SHALL "HOLD" LIGHTS "ON". SEE PLANS FOR SENSOR LOCATIONS THAT ARE "MANUAL ON" ONLY 8M. TIME DELAY DURATION SHALL BE 20 MINUTES MAXIMUM. SEE MANUFACTURERS INSTRUCTIONS FOR APPROPRIATE DIP SWITCH SETTINGS.

SYMBOLS NOTES:
 1. ALL DEVICES ARE TO BE FLUSH MOUNTED.
 2. MOUNTING HEIGHTS ARE FROM THE CENTER LINE OF THE DEVICE.
 3. ALL SINGLE GANG AND TWO GANG DEVICES SHALL USE A 4" SQ. BOX WITH EXTENSION RING.
 4. ALL MULTI - GANG DEVICES SHALL USE A COMMON COVER PLATE.
 5. COLORS FOR ALL DEVICES (i.e. SWITCHES, RECEPTABLES, TELEPHONE OUTLETS, ETC.) AND THEIR COVER PLATES SHALL BE DETERMINED BY THE ARCHITECT.

NEMA 1, SURFACE MOUNT PANEL P1 SCHEDULE						
400A M.L.O. 240Y/120V 1ø 3W 10,000 AIC RATING						
CKT NO.	LOAD DESCRIPTION	BREAKER POLE/AMP	KVA	BREAKER AMP/POLE	LOAD DESCRIPTION	CKT NO.
1	LIGHTING 104, 105, 106, 107	1 20 1.1 0.4	20 1	1	LIGHTING 103, 108, 109, 110, 111	2
3	LIGHTING 100, 102, 103, 112, 113	1 20 0.8 0.4	20 1	1	OUTSIDE LIGHTING	4
5	MICROWAVE	1 20 1.0 1.0	20 1	1	COUNTER EQUIPMENT	6
7	REFRIGERATOR	(G) 1 20 1.0 0.8	20 1	1	RECEPT 104	8
9	RECEPT 104	1 20 0.8 1.0	20 1	1	RECEPT 104	10
11	RECEPT 105	1 20 1.0 0.8	20 1	1	RECEPT 105	12
13	RECEPT 105	1 20 0.8 0.4	20 1	1	RECEPT 106	14
15	RECEPT 107	1 20 0.4 1.0	20 1	1	RECEPT 107	16
17	WATER FOUNTAIN	(G) 1 20 0.5 0.8	20 1	1	RECEPT 103	18
19	RECEPT 101, 102	1 20 0.4 1.2	20 1	1	RECEPT 100	20
21	RECEPT 113	1 20 1.0 1.0	20 1	1	RECEPT 113	22
23	RECEPT 112	1 20 1.0 0.4	20 1	1	TBB 111	24
25	RECEPT 110	1 20 0.4 0.4	20 1	1	RECEPT 108	26
27	AHU#1	2 60 10.8 3.6	30 2	2	HPU#1	28
29						30
31	AHU#2	2 60 10.8 5.1	40 2	2	HPU#2	32
33						34
35	AHU#3	2 60 10.8 6.1	50 2	2	HPU#3	36
37						38
39	DCDU#1/DAHU#1	2 15 2.9 6.0	25 2	2	WH#1	40
41						42
43	RECEPT 107	1 20 0.6 0.2	20 1	1	RECEPT EXTERIOR/FRONT DOOR	44
45	RECEPT EXTERIOR/HPU	1 20 0.2 0.6	20 1	1	ICE MACHINE RM 107	(G) 46
47	SPARE	1 20 - -	20 1	1	SPARE	48
49	SPARE	1 20 - -	20 1	1	SPARE	50
51	SPARE	1 20 - -	20 1	1	SPARE	52
53	STORM SHELTER PANEL	2 100 - -	30 2	2	SPD	54
55						56

CONNECTED LOAD 77.5 KVA

(G) INDICATES GFCI TYPE BREAKER.
 (S) INDICATES SHUNT TRIP BREAKER.



ELECTRICAL SINGLE LINE
 SCALE: NOT TO SCALE

THE ELECTRICAL CONTRACTOR SHALL DISTINCTLY LABEL ALL SERVICES FOR EACH BUILDING ON THE PROPERTY SUCH THAT THEY CORRESPOND WITH THE RESPECTIVE BUILDING THEY SERVE. FOR EXAMPLE, IF THERE ARE TWO BUILDINGS AND SERVICES, THEY SHALL BE LABELED AS "BUILDING 1 OF 2", "BUILDING 2 OF 2".

GMC
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 11 North Water Street, Suite 19290
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ISSUE DATE
 01/09/2026
 ISSUE FOR BID 02/10/2026
 CITY COMMENT RESPONSE 02/10/2026

DRAWN BY: M. TITUS
 CHECKED BY: A. VARGHESE

BSSC TRUCK DRIVING SCHOOL
 4551 HALLS MILL RD.
 MOBILE, AL 36683

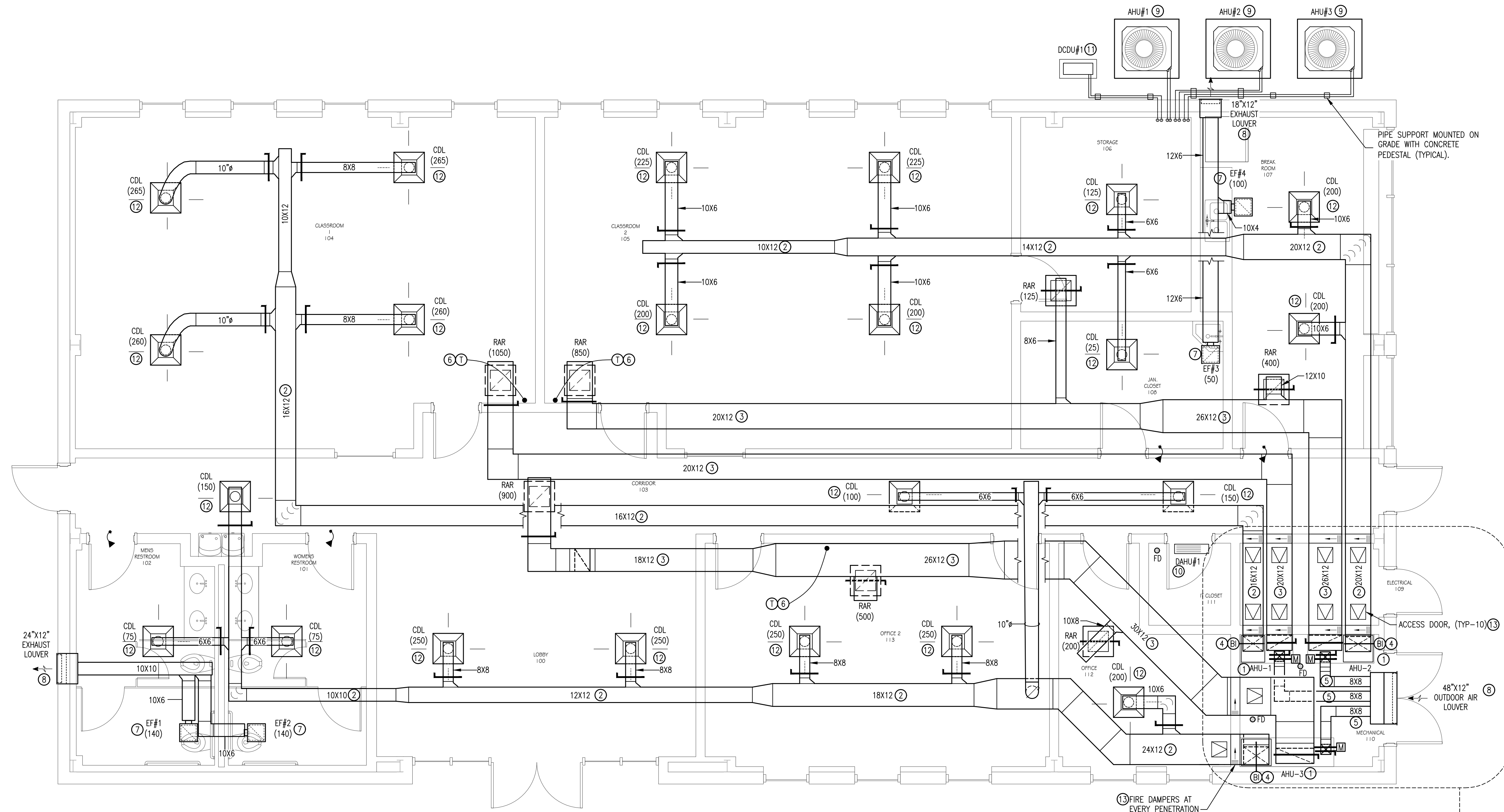


LEGEND, SCHEDULES & RISER DIAGRAM

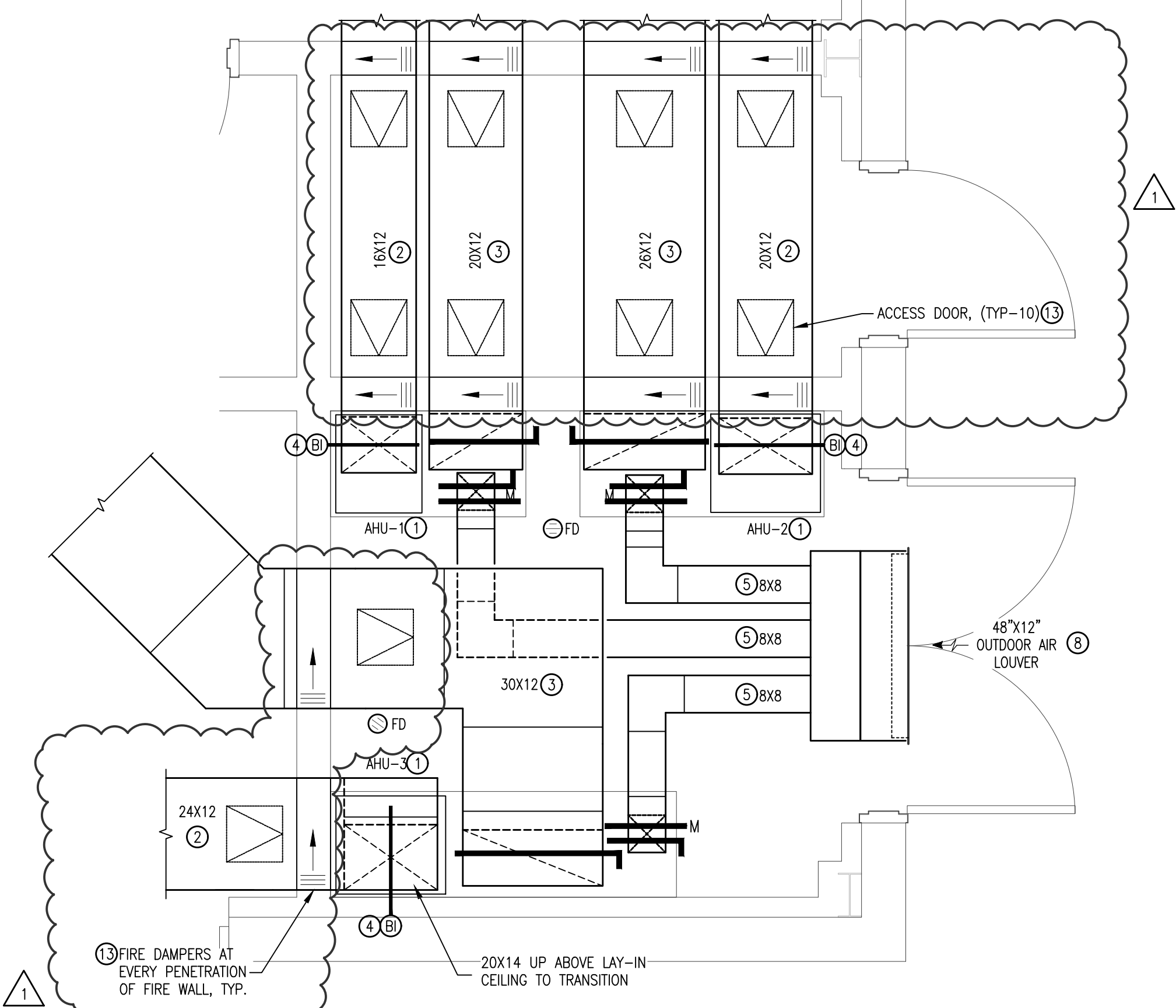
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H.M. YONGE & ASSOCIATES, INC.
 CONSULTING ENGINEERS // EST. 1988

51 EAST GREGORY STREET 253 ST. ANTHONY STREET
 PENSACOLA, FLORIDA 32502 MOBILE ALABAMA 36603
 PHONE: (850)434-2661 PHONE: (251)690-7446



1 HVAC NEW WORK PLAN
SCALE: 1/4" = 1'-0"
TRUE NORTH



2 ENLARGED MECHANICAL ROOM PLAN
SCALE: 1/2" = 1'-0"
TRUE NORTH

- HVAC NEW WORK KEY NOTES:**
- AIR HANDLING UNIT OF SPLIT SYSTEM HEAT PUMP MOUNTED ON RETURN AIR PLENUM CONSTRUCTED OF NON-COMBUSTIBLE MATERIALS. A METAL FRAME SHALL BE OF GALVANIZED SHEET METAL SIDES AND TOP. INSULATE INTERIOR OF PLENUM WITH 1-1/2 INCH THICK FIBROUS DUCT BOARD. APPLY INSULATION TO TOP AND BOTTOM TO COVER ALL INTERIOR EXPOSED METAL. EXTEND FROM UNIT. FULL SIZE OF UNIT OPENING A CONDENSATE DRAIN ROUTED TO SPILL ONTO FLOOR DRAIN. COMPLETELY INSULATE CONDENSATE DRAIN LINE FROM UNIT TO FLOOR DRAIN. INCLUDE IN P-TRAP OF DRAIN LINE A FLOAT SWITCH TO AUTOMATICALLY SHUT DOWN UNIT AS DRAINAGE SYSTEM FLOODS. SUPPORT DRAIN PIPING EVERY 48 INCHES WITH UNISTRUT TYPE PIPE SUPPORT SYSTEM.
 - SUPPLY AIR DUCTWORK SHALL EXTEND UP FROM UNIT FULL SIZE OF OPENING WITH TRANSITION TO INDICATED DUCT SIZE. ROUTE DUCT TIGHT TO UNDERSIDE OF ROOF JOISTS GENERALLY AS INDICATED WITH OFFSETS TO AVOID OBSTRUCTIONS. EXTEND BRANCH DUCTS FOR CONNECTION OF DESIGNATED AIR DEVICES. INCLUDE A MANUAL VOLUME DAMPER IN EACH BRANCH DUCT AND BALANCE AIR DEVICE TO INDICATED AIR FLOW. BRANCH DUCTS SHALL BE ROUTED ABOVE MAIN DUCTS BETWEEN ROOF JOISTS TO ACCOMMODATE FIELD CONDITIONS.
 - RETURN AIR DUCTWORK SHALL BE EXTENDED UP FROM RETURN AIR PLENUM AND ELBOW TO HORIZONTAL POSITION AT SAME ELEVATION AS SUPPLY AIR DUCT. EXTEND BRANCH DUCTS FROM TRUNK DUCT FOR CONNECTION TO DESIGNATED AIR DEVICES. INCLUDE A MANUAL VOLUME DAMPER IN EACH BRANCH DUCT AND BALANCE AIR DEVICE TO INDICATED AIR FLOW. ADDITIONALLY, A MANUAL VOLUME DAMPER SHALL BE INSTALLED IN RETURN AIR DUCT WITHIN 36 INCHES OF PLENUM.
 - DUCT MOUNTED BI-POLAR IONIZATION DEVICE IN SUPPLY AIR DUCT. INTERLOCK BI-POLAR IONIZATION DEVICE WITH AIR HANDLING UNIT SUCH THAT AS UNIT IS OPERATING SO SHALL THE BI-POLAR IONIZATION DEVICE BE OPERATING AND OTHERWISE BOTH SHALL NOT BE OPERATING.
 - OUTDOOR AIR INTAKE DUCTWORK SHALL BE EXTENDED UP FROM RETURN AIR PLENUM AND OVER FOR CONNECTION TO WALL MOUNTED OUTDOOR AIR INTAKE LOUVER ABOVE MECHANICAL ROOM DOORS. INSTALL A MANUAL VOLUME DAMPER AND MOTORIZED DAMPER IN OUTDOOR AIR DUCTWORK WITHIN 36 INCHES OF PLENUM. BALANCE MANUAL VOLUME DAMPER TO INDICATED AIR FLOW. INTERLOCK MOTORIZED DAMPER WITH RESPECTIVE TEMPERATURE CONTROLLER SUCH THAT DAMPER SHALL BE OPEN DURING OCCUPIED HOURS. OTHERWISE THE MOTORIZED DAMPER SHALL BE CLOSED.
 - WALL MOUNTED ELECTRIC/ELECTRONIC TEMPERATURE CONTROLLER WITH DIGITAL DISPLAY, SEVEN DAY PROGRAMMING, MODE SELECTION, AUTOMATIC CHANGE OVER AND BATTERY BACK-UP. INCLUDE AUXILIARY CONTACTS WITH CONTROLLER FOR CONTROL OF OUTDOOR AIR INTAKE MOTORIZED DAMPER. MOTORIZED DAMPER SHALL BE OPEN DURING OCCUPIED HOURS AND CLOSED OTHERWISE.
 - CEILING MOUNTED EXHAUST FAN WITH EXHAUST AIR DISCHARGE DUCTWORK ROUTED FOR CONNECTION TO DESIGNATED PLENUM OF DISCHARGE AIR LOUVER. INTERLOCK CONTROL OF EXHAUST FAN AS SCHEDULED.
 - WALL MOUNTED LOUVER THAT IS WEATHERPROOF AND HURRICANE RATED PER MIAMI-DADE STANDARDS. PROVIDE LOUVER WITH FULL SIZE PLENUM EXTENDING A MINIMUM OF 12 INCHES FROM BACK OF LOUVER FOR CONNECTION OF DESIGNATED DUCTWORK. ADJUST FINAL LOCATION OF LOUVER SUBJECT TO ARCHITECTURAL PLANS.
 - OUTDOOR CONDENSING UNIT MOUNTED ON 4 INCH THICK CONCRETE PAD. PAD SHALL BE 4 INCHES LARGER THAN UNIT IN ALL DIRECTIONS. SECURE UNIT TO PAD AT EACH SUPPORT. EXTEND REFRIGERANT PIPING FROM CONDENSING UNIT ABOVE GRADE OVER TO EXTERIOR WALL UNTIL ALIGNED WITH STORAGE ROOM. PIPING TO PENETRATE WALL AND TURN UP ON INSIDE SURFACE OF WALL TO ABOVE CEILING ELEVATION. OVER INTO MECHANICAL ROOM TO ABOVE RESPECTIVE AIR HANDLING UNIT AND DOWN FOR CONNECTION. SUPPORT REFRIGERANT PIPING EVERY 48 INCHES IN HORIZONTAL AND VERTICAL POSITIONS WITH UNISTRUT TYPE PIPE SUPPORT SYSTEM.
 - DUCTLESS MINI-SPLIT SYSTEM INSTALLED IN ELECTRICAL ROOM. UNIT SHALL BE WALL MOUNTED ABOVE DOOR. CONDENSATE DRAIN PIPING SHALL BE ROUTED TO DESIGNATED FLOOR DRAIN. PLUMBING TO COORDINATE FLOOR DRAIN LOCATION WITH MECHANICAL CONTRACTOR. COMPLETELY INSULATE CONDENSATE DRAIN AND SUPPORT EVERY 48 INCHES.
 - OUTDOOR CONDENSING UNIT FOR DUCTLESS MINI-SPLIT SYSTEM MOUNTED ON 4 INCH CONCRETE PAD. SECURE UNIT AT CORNER TO PAD. EXTEND REFRIGERANT PIPING FROM CONDENSING UNIT ABOVE GRADE OVER TO EXTERIOR WALL ALIGNED WITH STORAGE ROOM. PIPING TO PENETRATE WALL AND TURN UP ON INSIDE SURFACE OF WALL TO ABOVE CEILING ELEVATION. OVER TO ABOVE DUCTLESS MINI-SPLIT SYSTEM FOR CONNECTION. SUPPORT PIPING IN HORIZONTAL AND VERTICAL POSITIONS EVERY 48 INCHES WITH UNISTRUT TYPE PIPE SUPPORT SYSTEM.
 - NEW AIR DEVICE INSTALLED IN LAY-IN CEILING. PROVIDE BRANCH DUCT WITH AIR DAMPENING DEVICE TO BALANCE AIR DEVICE TO DESIGN AIR FLOW.
 - STATIC FIRE DAMPER INSTALLED IN DUCT AT FIRE WALL PENETRATIONS. INCLUDE PANEL IN DUCTWORK TO ALLOW ACCESS TO FIRE DAMPER. WHERE GYPSUM BOARD CEILINGS ARE PRESENT, AN ACCESS PANEL SHALL BE INSTALLED IN COORDINATION WITH DUCT WORK ACCESS PANEL.

H.M. YONGE & ASSOCIATES, INC.
CONSULTING ENGINEERS // EST. 1988

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4551 HALLS MILL RD.
MOBILE, AL 36693

HVAC NEW WORK PLAN

M1.01
sheet of

ISSUE DATE: 01/09/2026
ISSUE FOR BID: 02/10/2026
CITY COMMENT RESPONSE: 02/10/2026

DRAWN BY: _____
CHECKED BY: _____

GMC AMOB250055

02/10/2026

OUTSIDE AIR VENTILATION RATES IAQ PROCEDURE - 2021 IMC											
ZONE TAG	FACILITY TYPE	ZONE USE	ZONE FLOOR AREA (SF) Az	ZONE MAX OCCUPANCY Rp	TABLE 6.1 OA/person (Rp)	TABLE 6.1 cfm/H2 (R0)	Pz*Rp	Az*Ra	TABLE 6.2 VENTILATION EFF. (Ez)	ZONE OA (CFM)	
CORNER CLASSROOM	EDUCATIONAL	CLASSROOMS	653	25	10.0	0.12	250	78	1.0	328	
ZONE HEIGHT (FT)			10	AIR CHANGES/HOUR							9.6
DESIRED OA (V0) IAQ			130	OA PER VFP							328 CFM
MAX/MIN SA (V0)			1050	OA PER IAQ							13.1
RETURN AIR (Vv)			920	OA SAVINGS							198 CFM
RECIRC. FLOW FACTOR(R)			0.88	OA DRY BULB							95 °F
VENT. EFF. (Ez)			1.0	OA WET BULB							80 °F
PHYSICAL ACTIVITY			SEDEINARY	COIL LVG. DRY BULB							55 °F
FILTER LOCATION			B	COIL LVG. WET BULB							54 °F
HVAC FLOW TYPE			CONSTANT								
OA FLOW TYPE			CONSTANT								
CONTAMINANT OF CONCERN	CONTAMINANT SOURCE	MAXIMUM THRESHOLD VALUE (PPM)	STEADY STATE USING VFP	STEADY STATE USING IAQ	STEADY STATE LEVEL OK @ REDUCED OAT						
ACETALDEHYDE	PEOPLE	100	0.01112	0.00015	YES						
ACETONE	PEOPLE	250	0.00167	0.00013	YES						
AMMONIA	PEOPLE	25	0.01523	0.00373	YES						
BENZENE	PEOPLE	1	0.00252	0.00004	YES						
2-BUTANONE (MEK)	PEOPLE	200	0.00019	0.00002	YES						
CARBON DIOXIDE	PEOPLE	5000	990	1034	YES						
CHLOROFORM	PEOPLE	2	0.00011	0.00002	YES						
DIOXANE	PEOPLE	100	0	0	YES						
HYDROGEN SULFIDE	PEOPLE	10	0	0	YES						
METHANE	PEOPLE	N/A	1.68094	1.68094	YES						
METHANOL	PEOPLE	200	0	0	YES						
METHYLENE CHLORIDE	PEOPLE	25	0.00077	0.00003	YES						
PROPANE	PEOPLE	1000	0.00998	0.00998	YES						
TETRACHLOROETHANE	PEOPLE	5	0	0	YES						
TETRACHLOROETHYLENE	PEOPLE	100	0.00037	0.00001	YES						
TOLUENE	PEOPLE	100	0.00533	0.00007	YES						
TRICHLOROETHANE	PEOPLE	350	0.00077	0.02	YES						
XYLENE	PEOPLE	100	0.00230	0.00003	YES						
IS IAQ ACCEPTABLE AT REDUCED OA LEVELS?			YES								

NOTE: OWNER HAS BEEN ADVISED REGARDING THE USE OF BI-POLAR AIR PURIFICATION DEVICES.
NOTE: AIR PURIFICATION DEVICES SHALL BE INTERLOCKED WITH EVAPORATOR SECTION TO BE OPERATION ONLY AS EVAPORATOR SECTION IS OPERATING.

OUTSIDE AIR VENTILATION RATES IAQ PROCEDURE - 2021 IMC											
ZONE TAG	FACILITY TYPE	ZONE USE	ZONE FLOOR AREA (SF) Az	ZONE MAX OCCUPANCY Rp	TABLE 6.1 OA/person (Rp)	TABLE 6.1 cfm/H2 (R0)	Pz*Rp	Az*Ra	TABLE 6.2 VENTILATION EFF. (Ez)	ZONE OA (CFM)	
CLASSROOM AND BREAKROOM	EDUCATIONAL	CLASSROOMS	1175	30	10.0	0.12	300	141	1.0	441	
ZONE HEIGHT (FT)			10	AIR CHANGES/HOUR							7.1
DESIRED OA (V0) IAQ			175	OA PER VFP							441 CFM
MAX/MIN SA (V0)			1400	OA PER IAQ							14.7
RETURN AIR (Vv)			1225	OA SAVINGS							266 CFM
RECIRC. FLOW FACTOR(R)			0.88	OA DRY BULB							95 °F
VENT. EFF. (Ez)			1.0	OA WET BULB							80 °F
PHYSICAL ACTIVITY			SEDEINARY	COIL LVG. DRY BULB							55 °F
FILTER LOCATION			B	COIL LVG. WET BULB							54 °F
HVAC FLOW TYPE			CONSTANT								
OA FLOW TYPE			CONSTANT								
CONTAMINANT OF CONCERN	CONTAMINANT SOURCE	MAXIMUM THRESHOLD VALUE (PPM)	STEADY STATE USING VFP	STEADY STATE USING IAQ	STEADY STATE LEVEL OK @ REDUCED OAT						
ACETALDEHYDE	PEOPLE	100	0.01112	0.00015	YES						
ACETONE	PEOPLE	250	0.00167	0.00013	YES						
AMMONIA	PEOPLE	25	0.01523	0.00373	YES						
BENZENE	PEOPLE	1	0.00252	0.00004	YES						
2-BUTANONE (MEK)	PEOPLE	200	0.00019	0.00002	YES						
CARBON DIOXIDE	PEOPLE	5000	990	1034	YES						
CHLOROFORM	PEOPLE	2	0.00011	0.00002	YES						
DIOXANE	PEOPLE	100	0	0	YES						
HYDROGEN SULFIDE	PEOPLE	10	0	0	YES						
METHANE	PEOPLE	N/A	1.68094	1.68094	YES						
METHANOL	PEOPLE	200	0	0	YES						
METHYLENE CHLORIDE	PEOPLE	25	0.00077	0.00003	YES						
PROPANE	PEOPLE	1000	0.00998	0.00998	YES						
TETRACHLOROETHANE	PEOPLE	5	0	0	YES						
TETRACHLOROETHYLENE	PEOPLE	100	0.00037	0.00001	YES						
TOLUENE	PEOPLE	100	0.00533	0.00007	YES						
TRICHLOROETHANE	PEOPLE	350	0.00077	0.02	YES						
XYLENE	PEOPLE	100	0.00230	0.00003	YES						
IS IAQ ACCEPTABLE AT REDUCED OA LEVELS?			YES								

NOTE: OWNER HAS BEEN ADVISED REGARDING THE USE OF BI-POLAR AIR PURIFICATION DEVICES.
NOTE: AIR PURIFICATION DEVICES SHALL BE INTERLOCKED WITH EVAPORATOR SECTION TO BE OPERATION ONLY AS EVAPORATOR SECTION IS OPERATING.

OUTSIDE AIR VENTILATION RATES IAQ PROCEDURE - 2021 IMC											
ZONE TAG	FACILITY TYPE	ZONE USE	ZONE FLOOR AREA (SF) Az	ZONE MAX OCCUPANCY Rp	TABLE 6.1 OA/person (Rp)	TABLE 6.1 cfm/H2 (R0)	Pz*Rp	Az*Ra	TABLE 6.2 VENTILATION EFF. (Ez)	ZONE OA (CFM)	
CORRIDOR AND BREAKROOM	CORRIDOR	CORRIDOR	1627	56	0.0	0.06	0	98	1.0	98	
ZONE HEIGHT (FT)			10	AIR CHANGES/HOUR							6.5
DESIRED OA (V0) IAQ			200	OA PER VFP							98 CFM
MAX/MIN SA (V0)			1750	OA PER IAQ							1.7
RETURN AIR (Vv)			1550	OA SAVINGS							-102 CFM
RECIRC. FLOW FACTOR(R)			0.89	OA DRY BULB							95 °F
VENT. EFF. (Ez)			1.0	OA WET BULB							80 °F
PHYSICAL ACTIVITY			STANDING	COIL LVG. DRY BULB							55 °F
FILTER LOCATION			B	COIL LVG. WET BULB							54 °F
HVAC FLOW TYPE			CONSTANT								
OA FLOW TYPE			CONSTANT								
CONTAMINANT OF CONCERN	CONTAMINANT SOURCE	MAXIMUM THRESHOLD VALUE (PPM)	STEADY STATE USING VFP	STEADY STATE USING IAQ	STEADY STATE LEVEL OK @ REDUCED OAT						
ACETALDEHYDE	PEOPLE	100	0.01112	0.00015	YES						
ACETONE	PEOPLE	250	0.00167	0.00013	YES						
AMMONIA	PEOPLE	25	0.01523	0.00373	YES						
BENZENE	PEOPLE	1	0.00252	0.00004	YES						
2-BUTANONE (MEK)	PEOPLE	200	0.00019	0.00002	YES						
CARBON DIOXIDE	PEOPLE	5000	990	1034	YES						
CHLOROFORM	PEOPLE	2	0.00011	0.00002	YES						
DIOXANE	PEOPLE	100	0	0	YES						
HYDROGEN SULFIDE	PEOPLE	10	0	0	YES						
METHANE	PEOPLE	N/A	1.68094	1.68094	YES						
METHANOL	PEOPLE	200	0	0	YES						
METHYLENE CHLORIDE	PEOPLE	25	0.00077	0.00003	YES						
PROPANE	PEOPLE	1000	0.00998	0.00998	YES						
TETRACHLOROETHANE	PEOPLE	5	0	0	YES						
TETRACHLOROETHYLENE	PEOPLE	100	0.00037	0.00001	YES						
TOLUENE	PEOPLE	100	0.00533	0.00007	YES						
TRICHLOROETHANE	PEOPLE	350	0.00077	0.02	YES						
XYLENE	PEOPLE	100	0.00230	0.00003	YES						
IS IAQ ACCEPTABLE AT REDUCED OA LEVELS?			YES								

NOTE: OWNER HAS BEEN ADVISED REGARDING THE USE OF BI-POLAR AIR PURIFICATION DEVICES.
NOTE: AIR PURIFICATION DEVICES SHALL BE INTERLOCKED WITH EVAPORATOR SECTION TO BE OPERATION ONLY AS EVAPORATOR SECTION IS OPERATING.

MECHANICAL LEGEND	
AHU	AIR HANDLING UNIT
DAHU	DUCTLESS AIR HANDLING UNIT
CDL	CEILING DIFFUSER LAY-IN
CDG	CEILING DIFFUSER GYPSUM BOARD
CFM	CUBIC FEET PER MINUTE
EF	EXHAUST FAN
HPU	HEAT PUMP UNIT
DCDU	DUCTLESS CONDENSING UNIT
MVD	MANUAL VOLUME DAMPER
OA	OUTSIDE AIR
RA	RETURN AIR
RAR	RETURN AIR REGISTER
SA	SUPPLY AIR
TYP	TYPICAL
	CEILING DIFFUSER WITH THROW INDICATION
	EXHAUST/RETURN AIR DEVICE
	FLEXIBLE DUCT
	DUCTWORK (DIMENSIONS: WIDTH X HEIGHT)
	FLEX DUCT TAKE-OFF WITH AIR-SCOOP, SPIN-IN TAP AND BALANCING DAMPER
	ELBOW WITH TURNING VANES
	45° SHOE-FITTING TAKE-OFF
	DUCT CONNECTION OVER AIR DEVICE
	RETURN AIR DUCT IN SECTION
	SUPPLY AIR DUCT IN SECTION
	BI-POLAR IONIZATION
	MOTORIZED DAMPER
	THERMOSTAT WITH EQUIPMENT # SERVED MOUNT 48" A.F.F.
	5/8" DOOR UNDERCUT
	MANUAL VOLUME DAMPER

AIR DEVICE SCHEDULE					
MARK	CFM	MAX. NC	AIR DEVICE SIZE	DUCT CONNECTION SIZE	REMARKS (TYPE)
0-75	0-75	25	6"6"		SEE PLANS CD
76-150	76-150	25	9"6"		SEE PLANS CD
151-200	151-200	25	9"9"		SEE PLANS CD
201-300	201-300	25	9"9"		SEE PLANS CD
---	---	---	---	---	---
0-150	0-150	25	8"8"		SEE PLANS RAR
151-450	151-450	25	12"12"		SEE PLANS RAR
451-600	451-600	25	14"14"		SEE PLANS RAR
601-1000	601-1000	25	18"18"		SEE PLANS RAR
1001-2000	1001-2000	25	24"24"		SEE PLANS RAR

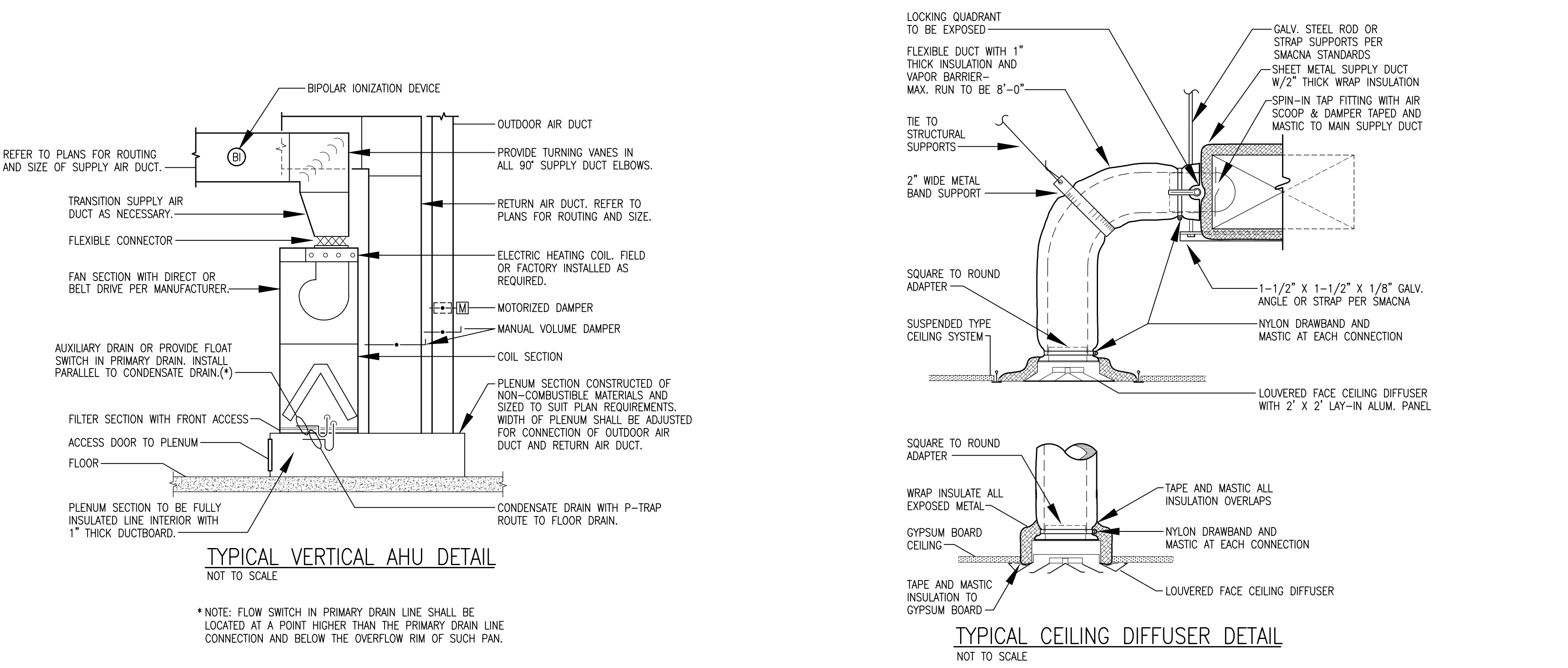
NOTE: PROVIDE 24"x24" PANEL FOR ALL AIR DEVICES IN LAY-IN CEILING.
PROVIDE DUCT CONNECTION SIZE SHOWN UNLESS OTHERWISE NOTED ON PLANS.
AIR DEVICE SIZES SHOWN ON PLANS TAKE PRECEDENCE OVER THIS SCHEDULE.

SPLIT SYSTEM HEAT PUMP UNIT SCHEDULE																														
MARK	AHU	AREA SERVED	NOMINAL TONNAGE	AHU DATA				AHU ELECTRICAL DATA				AHU COOLING CAPACITY @ ARI STANDARD CONDITIONS				HPU HEATING CAPACITY @ ARI STANDARD CONDITIONS				REMARKS										
				TOTAL CFM	OA CFM	ESP	MOTOR HP	HEAT KW	VOLTS	Hz	PHASE	MCA	MOCP	EDB °F	EWB °F	AMBIENT °F	TOTAL BTU/HR	SENSIBLE BTU/HR	EDB °F		AWB °F	TOTAL BTU/HR	C.O.P.	MIN. SEER/EEER	COMPR. RLA	OUTDOOR FAN FLA	VOLTS	Hz	PHASE	MCA
AHU#1	CORNER CLASS ROOM	3 TONS	1050	130	0.5"	1/2	9.6	240	60	1	55	60	80	67	95	31,953	22,513	70	47	32,000	3.9	14.3	1 @ 14.1	0.64	240	60	1	19	30	12330
AHU#2	CLASSROOM/BREAKROOM	4 TONS	1400	175	0.5"	1/2	9.6	240	60	1	55	60	80	67	95	43,000	30,600	70	47	43,500	4.0	14.3	1 @ 18.1	2.80	240	60	1	25	40	12334
AHU#3	CORRIDOR/OFFICES/BATHROOMS	5 TONS	1750	200	0.5"	1/2	9.6	240	60	1	59	60	80	67	95	54,846	39,562	70	47	52,500	4.0	14.3	1 @ 22.3	2.80	240	60	1	33	50	12334

NOTE: THE HEAT PUMP SHALL OPERATE AS STAGE 1 HEATING. THE ELECTRIC STRIP HEAT SHALL OPERATE AS STAGE 2 HEATING AND DEFROST CYCLE. DURING STAGE 2 HEATING, THE COMPRESSOR AND THE ELECTRIC STRIP HEAT SHALL OPERATE SIMULTANEOUSLY.
PROVIDE SINGLE POINT CONNECTION FOR AIR HANDLING UNIT BLOWER AND STRIP HEAT.
AIR HANDLING UNIT IS TO OPERATE CONTINUOUSLY DURING OCCUPIED HOURS WITH CONDENSING UNIT CYCLING SUBJECT TO THERMOSTATIC SETTING. DURING UNOCCUPIED HOURS, AIR HANDLING UNIT AND CONDENSING UNIT TO CYCLE SIMULTANEOUSLY SUBJECT TO THERMOSTATIC SETTING.
BASIS OF DESIGN - TRANE SPLIT SYSTEM AIR HANDLER 2-5 TON (240V, 60Hz, 1ø) & TRANE HEAT PUMP 3-5 TON (240V, 60Hz, 1ø).

DUCTLESS SPLIT AIR CONDITIONING UNIT SCHEDULE																
MARK	AHU DATA	COOLING CAPACITY @ ARI STANDARD CONDITIONS			REFR. TYPE	MIN. SEER	COMPR. RLA	OUTDOOR FAN FLA	INDOOR MCA	OUTDOOR MCA	OUTDOOR MOC	ELEC. DATA (V/Hz/PH)	SERVES	REMARKS		
	TOTAL CFM	MOTOR	EDB	EWB	AMBIENT	COOLING BTU/HR										
DAHU#1	250	0.5 FLA	80F	67F	95F/75F	9,000	R-410	14.0	6.72 A	0.5 A	1.0 A	10 A	15 A	240/60/1	IT	123456789

NOTE: PROVIDE WALL-MOUNTED INDOOR UNIT COMPLETE WITH A WALL MOUNTED THERMOSTAT.
COMPRESSOR SHALL BE INVERTER DRIVEN TYPE.
INDOOR UNIT RECEIVES POWER FROM OUTDOOR UNIT THRU FIELD SUPPLIED INTERCONNECTED WIRING. COORDINATE WIRING REQUIREMENTS WITH ELECTRICAL CONTRACTOR. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR HAVING ELECTRICAL CONTRACTOR PROVIDING POWER TO INDOOR UNIT.
ROUTE FULLY INSULATED CONDENSATE DRAIN LINE TO FLOOR DRAIN IN SAME SPACE.
PROVIDE WITH DRAIN PAN LEVEL SENSOR TO SHUT DOWN UNIT PRIOR TO PAN OVERFLOW. SENSOR SHALL BE PROVIDED BY UNIT MANUFACTURER.
AREFLOW SHOWN IS FOR 'HIGH' CFM SETTING WITH DRY COIL CONDITION.
PROVIDE WITH 7 YEAR COMPRESSOR AND 5 YEAR PARTS MANUFACTURER WARRANTY.
BASIS OF DESIGN: MITSUBISHI



FAN SCHEDULE												
MARK	TOTAL CFM (DIA)	TSP	RPM	TYPE DRIVE	TYPE FAN	INTERLOCK WITH	MOTOR HP/WATTS	ELECTRICAL DATA			REMARKS	
								MAX. SONES	VOLTS	Hz		PHASE
EF#1	140	0.25	915	DIRECT	CEILING MOUNTED	LIGHT SWITCH	17 W	2.0	120	60	1	12330
EF#2	140	0.25	915	DIRECT	CEILING MOUNTED	LIGHT SWITCH	17 W	2.0	120	60	1	12330
EF#3	50	0.25	797	DIRECT	CEILING MOUNTED	LIGHT SWITCH	80 W	2.5	120	60	1	12334
EF#4	100	0.30	797	DIRECT	CEILING MOUNTED	LIGHT SWITCH	80 W	2.5	120	60	1	12330

NOTE: PROVIDE WITH FAN SPEED CONTROLLER, CONTROLLER SHALL BE MOUNTED TO FAN.
PROVIDE WITH