

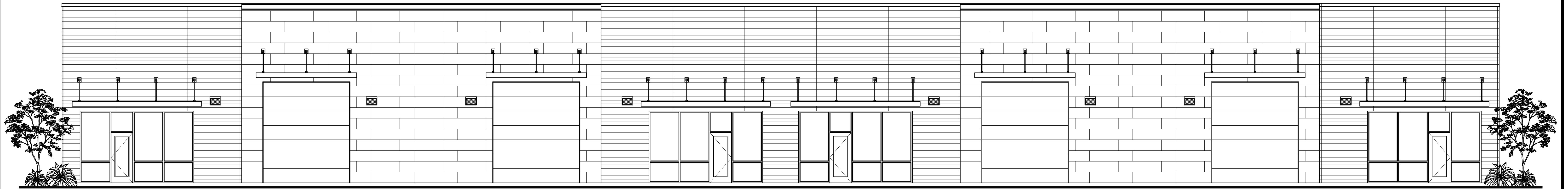
# A New Multi-Purpose Commercial Building for ASSOCIATED CONTRACT SERVICES

Jarco Drive, Fuquay Varina, North Carolina

Joint Venture: John P. Watkins, Architect . 56 Hillmark Drive . Columbia, South Carolina 29210 . Phone 803-779-7570

Craig A. Otto, Architect, Inc. . 105 W. Main St. Ste. C . Lexington, South Carolina 29072 . Phone 803-957-9004 . [craig@craigottoarchitect.com](mailto:craig@craigottoarchitect.com)

<p><b>ARCHITECT</b> MR. CRAIG OTTO CRAIG A. OTTO, ARCHITECT, INC. 5044 AUGUSTA ROAD LEXINGTON, SC. 29072 803-957-9004</p>	<p><b>CIVIL ENGINEER</b> VHB ENGINEERING NC, P.C. 940 MAIN CAMPUS DRIVE, SUITE 500 RALEIGH, NC 27606 919-829-0328</p>	<p><b>STRUCTURAL ENGINEER</b> MR. LUCAS YOUNG FULLER GROUP, INC. 1350 CLEVELAND STREET, SUITE C GREENVILLE, SC 29607 864-235-3580</p>	<p><b>PLUMBING ENGINEERING</b> MR. MICHAEL W. KILIAN KILIAN ENGINEERING, INC. PO BOX 3301 HENDERSON, NC 27536 252-438-8778</p>	<p><b>MECHANICAL ENGINEERING</b> MR. MICHAEL W. KILIAN KILIAN ENGINEERING, INC. PO BOX 3301 HENDERSON, NC 27536 252-438-8778</p>	<p><b>ELECTRICAL ENGINEER</b> MR. MICHAEL W. KILIAN KILIAN ENGINEERING, INC. PO BOX 3301 HENDERSON, NC 27536 252-438-8778</p>
---	---	---	--	--	---



## DRAWING INDEX

<p><u>ARCHITECTURAL</u></p> <p>A0.0 COVER SHEET LSO BUILDING CODE REVIEW A1.1 ARCHITECTURAL FLOOR PLAN, DETAILS AND DOOR SCHEDULE A1.2 REFLECTED CEILING PLAN A2.1 EXTERIOR ELEVATIONS A4.1 TOILET PLANS AND DETAILS A5.1 WALL SECTIONS A5.2 WALL SECTIONS</p>	<p><u>CIVIL PLANS</u></p> <p>... SEE CIVIL COVER SHEET FOR SHEET LIST TABLE</p>	<p><u>STRUCTURAL</u></p> <p>S0.1 GENERAL NOTES AND DESIGN CRITERIA S1.1 FOUNDATION PLAN S1.2 TRUCK DOCK FOUNDATION PLAN AND DETAILS S2.1 FOUNDATION DETAILS</p>	<p><u>PLUMBING</u></p> <p>P1 PLUMBING NOTES P2 PLUMBING SCHEDULES AND DETAILS P3 SANITARY PLAN P4 DOMESTIC SUPPLY PLAN</p>	<p><u>MECHANICAL</u></p> <p>M1 MECHANICAL NOTES M2 MECHANICAL PLAN M3 MECHANICAL SCHEDULES AND DETAILS</p>	<p><u>ELECTRICAL</u></p> <p>E1 ELECTRICAL NOTES E2 ELECTRICAL SHECDULES E3 LIGHTING PLAN E4 POWER PLAN E5 HOUSE PANEL, POWER RISER, AND ELECTRICAL DETAILS E6 BREAKER SCHEDULES AND POWER RISER</p>
--	---	---	--	--	---



April 11, 2025

# 2018 North Carolina Building Code

The following is a review of and synopsis of selected portions of the 2018 North Carolina State Building Code which apply to this project. Although all portions that apply have not been reprinted, the Code, in its entirety, shall be considered printed here in full.

The General Contractor, subcontractors, and suppliers shall be responsible for meeting all requirements of the 2018 North Carolina State Building Code, 2018 North Carolina State Fire Code, 2018 North Carolina State Mechanical Code, 2018 North Carolina State Plumbing Code and 2018 North Carolina State Fuel Gas Code, 2018 North Carolina State Energy Conservation Code (or ASHRAE 90.1 Standard / 2013), 2020 National Electric Code, 2009 ICC A117.1, 2010 Americans with Disabilities Act Standards for Accessible Design, NFPA 10 and all other NFPA codes that apply to this project. Should a discrepancy between the codes and the drawings exist, the General Contractor shall immediately inform the Architect and request a solution. Should the General Contractor, subcontractor, or supplier proceed with the work without notifying the Architect, the General Contractor shall assume responsibility for the work and shall be required to correct the work.

Scope of Work: New  
Occupancy Group: Mixed: B, F-1, F-2, S-1, S-2  
Construction Type: II-B  
Fire Protection Systems: None Required  
Height: 26 feet  
Stories: 1  
Area: 12,000 square feet  
Separation Distance: Greater than 10 feet all exterior walls  
Rated Assemblies: None required  
Total Occupant Load: 120

## Chapter 3

- 304.1 Business Group B. Business Group B occupancy includes, among others, the use of a building or structure, or a portion thereof, for office, professional or service type transactions, including storage of records and accounts. Business occupancies shall include, but not be limited to, the following: Professional Services.
- 306.2 Moderate hazard factory industrial, Group F-1. Factory industrial uses that are not classified as Factory Industrial F-2 Low Hazard shall be classified as F-1 Moderate Hazard.
- 306.3 Low hazard factory industrial, Group F-2. Factory industrial uses that involve the fabrication or manufacturing of noncombustible materials which during finishing, packing, or processing do not involve a significant fire hazard shall be classified as F-2 occupancies.
- 311.2 Moderate-hazard storage, Group S-1. Buildings occupied for storage uses that are not classified as Group S-2.
- 311.3 Low hazard storage, Group S-2. Includes, among others, buildings used for the storage of noncombustible materials such as products on wood pallets or in paper cartons with or without single thickness divisions or in paper wrappings. Such products are permitted to have a negligible amount of plastic trim.

## Chapter 5

- 504.1 General. The height, in feet, and the number of stories of a building shall be determined based on the type of construction, occupancy classification and whether there is an automatic sprinkler system installed throughout the building.
- 504.3 Height in feet. The maximum height, in feet, of a building shall not exceed the limits specified in Table 504.3.
- Table 504.3: Group B, F, S, Type II-B Construction, not equipped with an automatic sprinkler system: 35 feet.
- 504.3 Number of Stories. The maximum number of stories of a building shall not exceed the limits specified in Table 504.4.
- Table 504.3 Allowable building height in feet above grade plane:  
Group B, Type II-B Construction, not equipped with an automatic sprinkler system: 3 stories maximum.  
Group F-1, Type II-B Construction, not equipped with an automatic sprinkler system: 2 stories maximum.  
Group F-2, Type II-B Construction, not equipped with an automatic sprinkler system: 3 stories maximum.  
Group S-1, Type II-B Construction, not equipped with an automatic sprinkler system: 2 stories maximum.  
Group S-2 Type II-B Construction, not equipped with an automatic sprinkler system: 3 stories maximum.

6. 506.1 General. The floor area of a building shall be determined based on the type of construction, occupancy classification, whether there is an automatic sprinkler system installed throughout the building and the amount of building frontage on public way or open space.

7. 506.2 Allowable area determination. The allowable area of a building shall be determined in accordance with the applicable provisions of Sections 506.2.1 through 506.2.4 and Section 506.3.

8. Table 506.2 Allowable Area Factor:  
Group B, Non-sprinklered, Type II-B Construction: 23,000 square feet per story  
Group F-1, Non-sprinklered, Type II-B Construction: 15,500 square feet per story  
Group F-2, Non-sprinklered, Type II-B Construction: 23,000 square feet per story  
Group S-1, Non-sprinklered, Type II-B Construction: 17,500 square feet per story  
Group S-2, Non-sprinklered, Type II-B Construction: 26,000 square feet per story

9. The building height is 26 feet, it is 1 story and the area is 12,000 square feet, therefore, it complies with the height, stories and area requirements for all possible occupancy classifications.

10. 508.3 Nonseparated occupancies. Buildings or portions of buildings that comply with the provisions of this section shall be considered nonseparated occupancies.

11. 508.3.1 Occupancy classification. Nonseparated occupancies shall be individually classified in accordance with Section 302.1. The requirements of this code shall apply to each portion of the building based on the occupancy classification of that space. In addition, the most restrictive provisions of Chapter 9 that apply to the nonseparated occupancies shall apply to the total nonseparated occupancy area.

12. 508.3.2 Allowable building area and height. The allowable building area and height of the building or portion thereof shall be based on the most restrictive allowances for the occupancy groups under consideration for the type of construction of the building in accordance with Section 503.1.

13. 508.3.3 Separation. No separation is required between nonseparated occupancies.

14. Note: Groups B, F and S all have the same allowable building height (35 feet). The allowable stories for Groups B, F-2 and S-2 is 3 while Groups F-1 and S-1 is 2. The allowable area for Group B and F-2 is 23,000 sf, for F-1 it is 15,500 sf, for S-1 it is 17,500 sf and for S-2 it is 26,000 sf. Therefore, occupancies listed may be considered nonseparated occupancies and no separation is required.

## Chapter 6

- 602.2 Types I and II construction are those types of construction in which the building elements listed in Table 601 are of noncombustible materials, except as permitted in Section 603 and elsewhere in this code.
- Table 601 Using Type II-B construction, all structural elements require a 0 hour fire rating (no fire rating).
- Table 602 Fire resistance rating requirements for exterior walls based on fire separation distance:  
For Group B, F-2 and S-2, Type II-B construction, the following fire ratings must be provided:  
Less than 5 feet - 1 hour  
5 feet to less than 10 feet - 1 hour  
10 feet to over 30 feet - 0 hours  
For Group F-1 and S-1, Type II-B construction, the following fire ratings must be provided:  
Less than 5 feet - 2 hours  
5 feet to less than 10 feet - 1 hour  
10 feet to over 30 feet - 0 hours
- Note: All exterior walls have a fire separation of greater than 10 feet, therefore, the exterior walls are not required to be fire rated.

## Chapter 8

1. Table 803.1 Interior wall and ceiling finish requirements by occupancy:  
Group B, Nonsprinklered: Interior exit stairways, interior exit ramps and exit passageways (not applicable): Class A+ Corridors and enclosure for exit access stairways and exit access ramps (not applicable): Class B+ Rooms and enclosed spaces, Class C.  
Group F, Nonsprinklered: Interior exit stairways, interior exit ramps and exit passageways (not applicable): Class B+ Corridors and enclosure for exit access stairways and exit access ramps (not applicable): Class C+ Rooms and enclosed spaces, Class C.  
Group S, Nonsprinklered: Interior exit stairways, interior exit ramps and exit passageways (not applicable): Class B+ Corridors and enclosure for exit access stairways and exit access ramps (not applicable): Class B+ Rooms and enclosed spaces, Class C.

## Chapter 9

1. 906.1 General. Portable fire extinguishers shall be provided in the following locations: 1. In Group A, B, E, F, H, I, M, R-1, R-2, R-4 and S occupancies. 5. Where required by the International Fire Code sections indicated in Table 906.1.

2. 906.2 General requirements. Portable fire extinguishers shall be selected and installed in accordance with this section and NFPA 10.

## Chapter 10

1. Table 1004.1.2 Maximum floor area allowances per occupant. Industrial areas: 100 gross.

2. Occupant load per Table 1004.1.2: 12,000 sf / 100 sf / pp (Industrial areas ? worst case scenario) = 120 occupants. Or, 3,000 sf / 100 sf / pp (each tenant space) = 30 occupants per lease area (x 4 = 120 occupants)

3. Table 1005.3.2 Other egress components. The capacity, in inches, of means of egress components other than stairways shall be calculated by multiplying the occupant load served by such component by a means of egress capacity factor of 0.2 inch per occupant. Therefore, 30 occupants (each tenant space) x 0.2 inches per person equals a total egress width required is 6 inches. The total egress width provided throughout each tenant space is 12 inches at two (2) separate exits.

4. 1006.3.1 Egress based on occupant load. Each story and occupied roof shall have the minimum number of exits, or access to exits, as specified in Table 1006.3.1.

5. Table 1006.3.1 Minimum number of exits or access to exits per story: 1 ? 500 occupants: 2 exits.

6. 1008.2 Illumination required. The means of egress serving a room or space shall be illuminated at all times that the room or space is occupied.

7. 1010.1.5 Floor elevation. There shall be a floor or landing on each side of a door. Such floor or landing shall be at the same elevation on each side of the door. Landings shall be level except at exterior landings, which are permitted to have a slope not to exceed 0.25 unit vertical in 12 units horizontal (2 percent slope).

8. 1010.1.6 Landings at doors. Landings shall have a width not less than the width of the stairway or the door, whichever is greater. Landings shall have a length measured in the direction of travel of not less than 44 inches.

9. 1010.1.7 Thresholds. Thresholds at doorways shall not exceed 0.5 inches for doors.

10. 1010.1.9 Door operations. Except as specifically permitted by this section egress doors shall be readily operable from the egress side without the use of a key or special knowledge or effort.

11. 1010.1.9.1 Hardware. Door handles, pulls, latches, locks and other operating devices on doors required to be accessible by Chapter 11 shall not require tight grasping, tight pinching or twisting of the wrist to operate.

12. 1010.1.9.5 Unlatching. The unlatching of any door leaf shall not require more than one operation.

13. Table 1017.2 Exit access travel distance. Groups B, F-1 and S-1 without a sprinkler system: 200 feet. Groups F-2 and S-2 without a sprinkler system: 300 feet.

14. 1028.5 Access to a public way. The exit discharge shall provide a direct and unobstructed access to a public way.

## Chapter 11

1. 1103.1 Where required. Sites, buildings, structures, facilities, elements and spaces, temporary or permanent, shall be accessible to persons with physical disabilities.

2. 1109.2 Toilet and bathing facilities. Each toilet room and bathing room shall be accessible. Where a floor level is not required to be connected to an accessible route, the only toilet rooms or bathing rooms provided within the facility shall not be located on an inaccessible floor. At least one of each type of fixture, element, control, or dispenser in each accessible toilet room or bathing room shall be accessible.

## Chapter 12

1. 1210.1 Required fixtures. The number and type of plumbing fixtures provided in any occupancy shall comply with Chapter 29.

2. 1210.2.1 Floors and wall bases. In other than dwelling units, toilet, bathing, and shower room floor finish materials shall have a smooth, hard, nonabsorbent surface. The intersections of such floors with walls shall have a smooth, hard, nonabsorbent, vertical base that extends upward onto the walls not less than 4 inches.

3. 1210.2.2 Walls and partitions. Walls and partitions within 2 feet of service sinks, urinals and water closets shall have a smooth, hard, nonabsorbent surface, to a height of 4 feet above the floor, and except for structural elements, the materials used in such walls shall be a type that is not adversely affected by moisture.

## Miscellaneous

1. 1804.3 Site grading. The ground immediately adjacent to the foundation shall be sloped away from the building at a slope of not less than one unit vertical in 20 units horizontal (5-percent slope) for a minimum distance of 10 feet (3048 mm) measured perpendicular to the face of the wall or an approved alternate method of diverting water away from the foundation shall be used. The procedure used to establish the final ground level adjacent to the foundation shall account for additional settlement of the backfill.

JOHN P. WATKINS, ARCHITECT  
56 HILLMARK DRIVE  
COLUMBIA, SOUTH CAROLINA 29210

**Craig A. Otto**  
ARCHITECT, INC.

DESIGN • PLANNING • ARCHITECTURE

105 West Main Street, Suite C  
Lexington, South Carolina 29072  
Phone (803) 957-9004  
craig@raigottoarchitect.com


No.	Revisions	Date

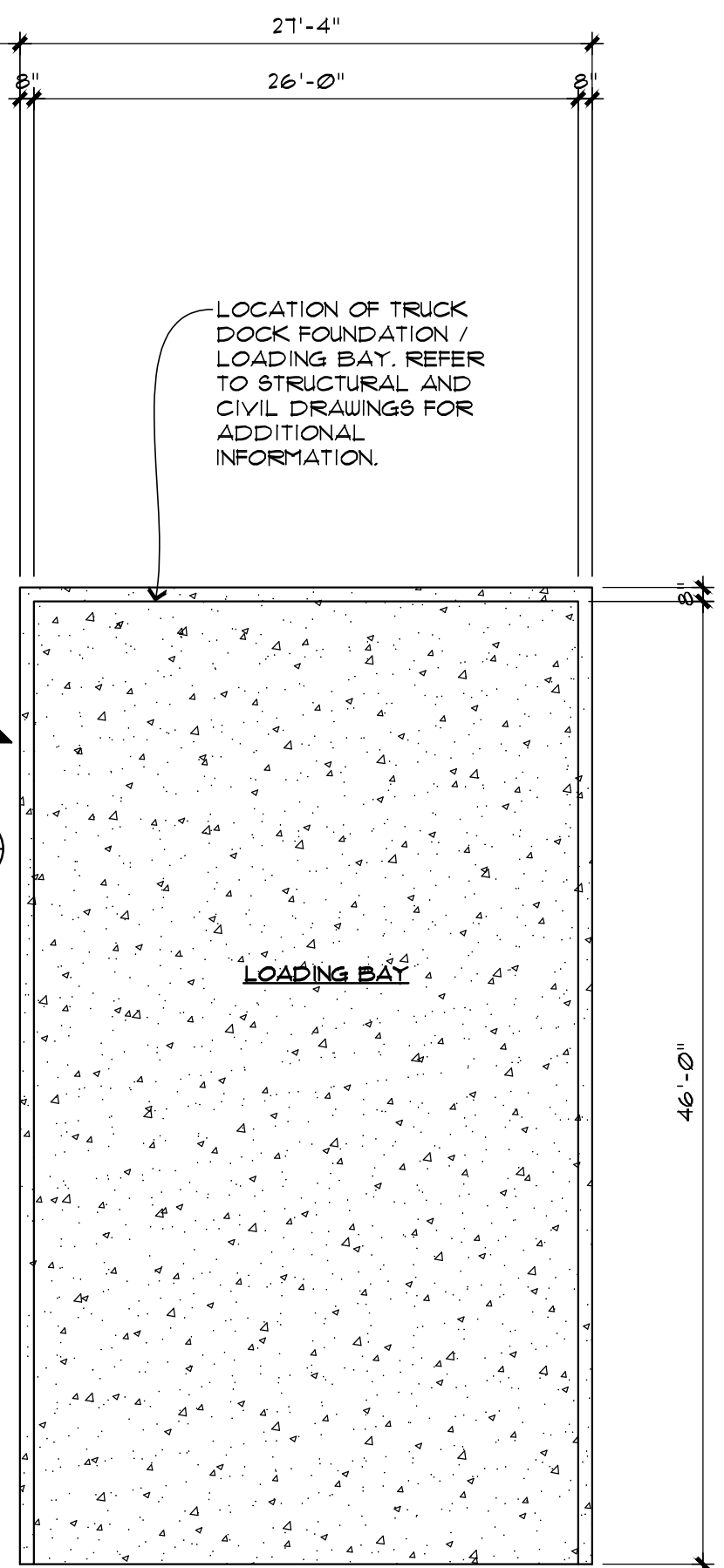
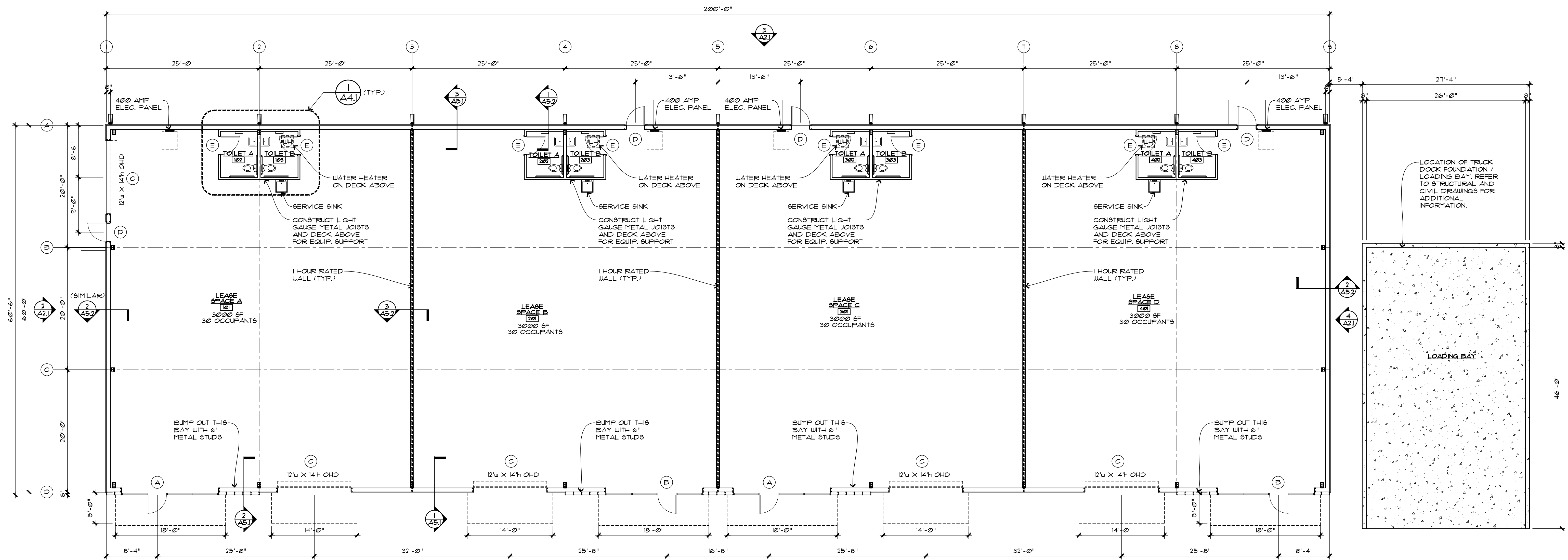
All rights reserved. This drawing and the design shown thereon are copyrighted as prescribed by the laws of the United States and are the sole property of Craig A. Otto, Architect, Inc. Anyone duplicating, reproducing, or causing to be reproduced these drawings or the design thereon without permission of the architect will be subject to legal action.

Project Title: **ASSOCIATED CONTRACT SERVICES**  
JARCO DR, FUQUAY VARINA, NC

Drawing Title: **BUILDING CODE REVIEW SUMMARY**

Consultant:

Seal:  Date: APRIL 11, 2025  
Drawn By: JCO  
Drawing No.: **LS0**



**DOOR NOTES:**

NOTE 1: ALL DOOR HANDLES, PULLS, LATCHES, LOCKS AND OTHER OPERATING DEVICES SHALL BE LEVER TYPE COMPLYING WITH IBC SECTION 1008.1.1 AND SHALL BE READILY OPENABLE FROM THE EGRESS SIDE WITHOUT THE USE OF A KEY OR SPECIAL KNOWLEDGE OR EFFORT PER IBC SECTION 1008.1.2.

NOTE 2: DOOR HANDLES, PULLS, LATCHES, LOCKS AND OTHER OPERATING DEVICES ON DOORS SHALL NOT REQUIRE TIGHT GRASPING, TIGHT FINCHING OR TWISTING OF THE WRIST TO OPERATE.

NOTE 3: THRESHOLDS SHALL BE A MAXIMUM OF 1/2" HIGH ABOVE THE ADJACENT FLOOR SURFACE.

NOTE 4: IN ADDITION TO THE HARDWARE NOTED ON THE DOOR SCHEDULE, ALL DOOR LEAVES SHALL RECEIVE 1 1/2 PAIR BUTTS, INCLUDING SPRING HINGES AT RATED DOORS WHERE REQUIRED, 1 1/2 PAIR SILENCERS, AND A FLOOR OR WALL STOP. ALL HARDWARE REQUIRED FOR A COMPLETE DOOR SET SHALL BE PROVIDED FOR EACH DOOR.

NOTE 5: ALL EXTERIOR DOORS SHALL RECEIVE WEATHERSTRIPPING, BOTTOM SWEEPS, AND THRESHOLDS. ALL HARDWARE REQUIRED FOR A COMPLETE DOOR SET SHALL BE PROVIDED FOR EACH DOOR.

NOTE 6: PROVIDE TEMPERED GLASS (T) IN ALL LOCATIONS REQUIRED BY THE BUILDING CODE. PROVIDE 1/4" WIRE GLASS IN ALL LOCATIONS REQUIRED BY THE BUILDING CODE IF APPLICABLE.

NOTE 7: CAULK EXTERIOR AND INTERIOR SIDES OF ALL DOOR FRAMES.

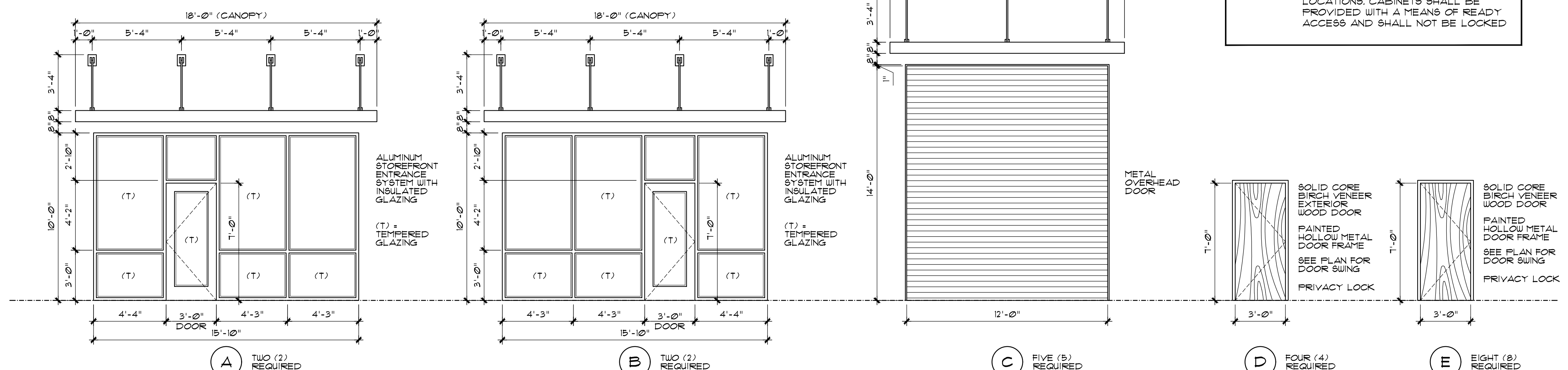
**1 ARCHITECTURAL FLOOR PLAN**  
SCALE: 1/8" = 1' - 0"  
12,000 SQUARE FEET

**WALL / CEILING LEGEND**

NON-RATED WALLS:  
ALL INTERIOR WALLS SHOWN THIS SHALL BE METAL STUDS WITH 5/8" GYPSUM BOARD EACH SIDE (PROVIDE R-11 INSULATION AROUND ALL TOILETS AND OFFICES.)

1 HOUR RATED WALLS:  
ALL INTERIOR WALLS SHOWN THIS SHALL BE METAL STUDS WITH 5/8" TYPE X GYPSUM BOARD EACH SIDE TO BOTTOM OF ROOF (PROVIDE R-13 BATT INSULATION)

NOTE: FIRE EXTINGUISHERS SHALL NOT BE OBSTRUCTED OR OBSCURED FROM VIEW AND MUST BE INSTALLED IN CONSPICUOUS LOCATIONS. CABINETS SHALL BE PROVIDED WITH A MEANS OF READY ACCESS AND SHALL NOT BE LOCKED



**1 DOOR SCHEDULE AND ELEVATIONS**  
SCALE: 1/4" = 1' - 0"

**JOHN P. WATKINS, ARCHITECT**  
56 HILLMARK DRIVE  
COLUMBIA, SOUTH CAROLINA 29210

**Craig A. Otto**  
ARCHITECT, INC.  
DESIGN • PLANNING • ARCHITECTURE

105 West Main Street, Suite C  
Lexington, South Carolina 29072  
Phone (803) 957-9004  
craig@craigottoarchitect.com

No.	Revisions	Date

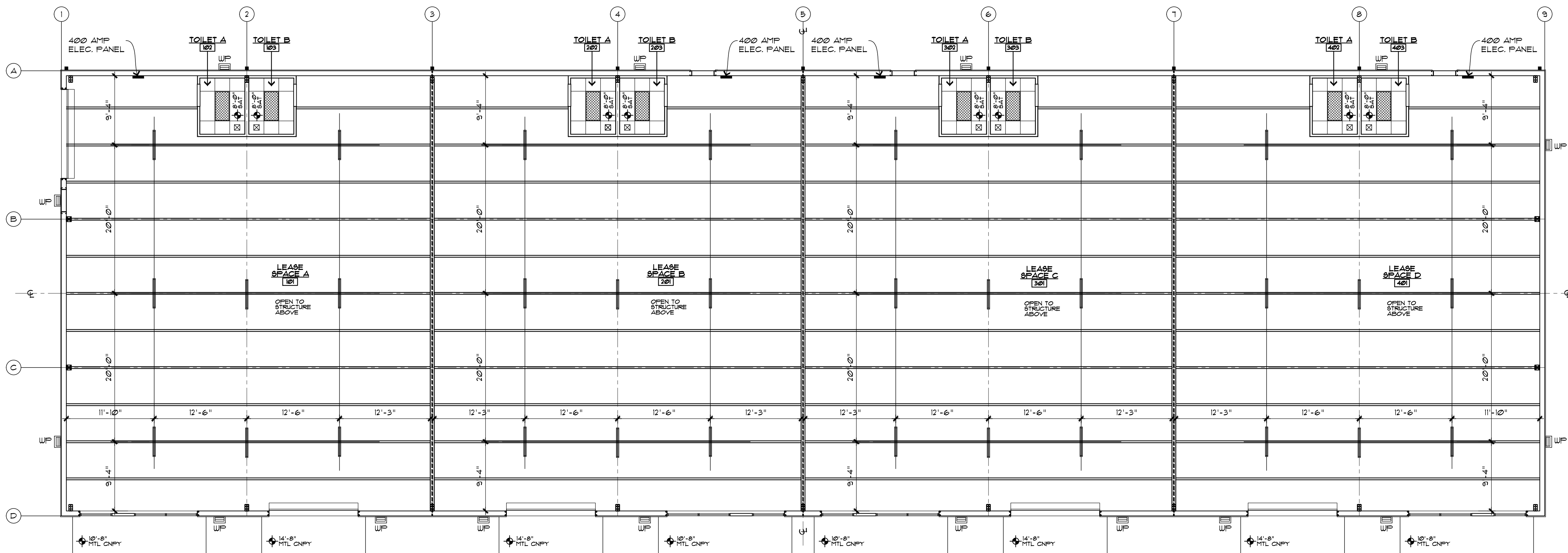
All rights reserved. This drawing and the design shown thereon are copyrighted as prescribed by the laws of the United States and are the sole property of Craig A. Otto, Architect, Inc. Anyone duplicating, reproducing, or causing to be reproduced these drawings or the design thereon without permission of the architect will be subject to legal action.

Project Title **DOLLAR GENERAL #3181**  
WHITE OAK ROAD, THOMSON, GA 30824

Drawing Title **FLOOR PLAN, DETAILS AND DOOR SCHEDULE**

Consultant











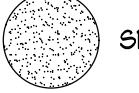
Seal  
  
 Date **APRIL 11, 2025**  
 Drawn By **JCO**  
 Drawing No. **A1.1**



**1**  
A1.2 REFLECTED CEILING PLAN  
SCALE: 1/8" = 1' - 0"

**GENERAL NOTES:**  
 NOTE 1: ALL BULKHEADS SHALL BE FRAMED USING 3 5/8" METAL STUDS AND SHALL BE SMOOTH PAINTED  
 NOTE 2: SEE FINISH SCHEDULE SHEET FOR ALL CEILING TYPES  
 NOTE 3: SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION  
 NOTE 4: IF A DISCREPANCY OCCURS BETWEEN THE ARCHITECTURAL DRAWINGS AND THE ENGINEERING DRAWINGS, CONSULT THE ARCHITECT PRIOR TO PROCEEDING

**SYMBOL LEGEND**

-  2 X 4 RECESSED LED LIGHT
-  EXTERIOR LED WALL PACK
-  RECESSED LED CAN LIGHT
-  8' LONG SUSPENDED LED STRIP LIGHT
-  WALL MOUNTED BRACKET LIGHT
-  EXHAUST FAN
-  HVAC SUPPLY GRILLE
-  HVAC RETURN GRILLE
-  GYPSUM BOARD CONTROL JOINT LOCATION
-  2 X 4 SUSPENDED ACOUSTICAL TILE CEILING
-  SMOOTH, PAINTED, GYPSUM BOARD CEILING

**JOHN P. WATKINS, ARCHITECT**  
 56 HILLMARK DRIVE  
 COLUMBIA, SOUTH CAROLINA 29210

**Craig A. Otto**  
 ARCHITECT, INC.  
 DESIGN • PLANNING • ARCHITECTURE

105 West Main Street, Suite C  
 Lexington, South Carolina 29072  
 Phone (803) 957-9004  
 craig@craigottoarchitect.com


No.	Revisions	Date

All rights reserved. This drawing and the design shown thereon are copyrighted as prescribed by the laws of the United States and are the sole property of Craig A. Otto, Architect, Inc. Anyone duplicating, reproducing, or causing to be reproduced these drawings or the design thereon without permission of the architect will be subject to legal action.

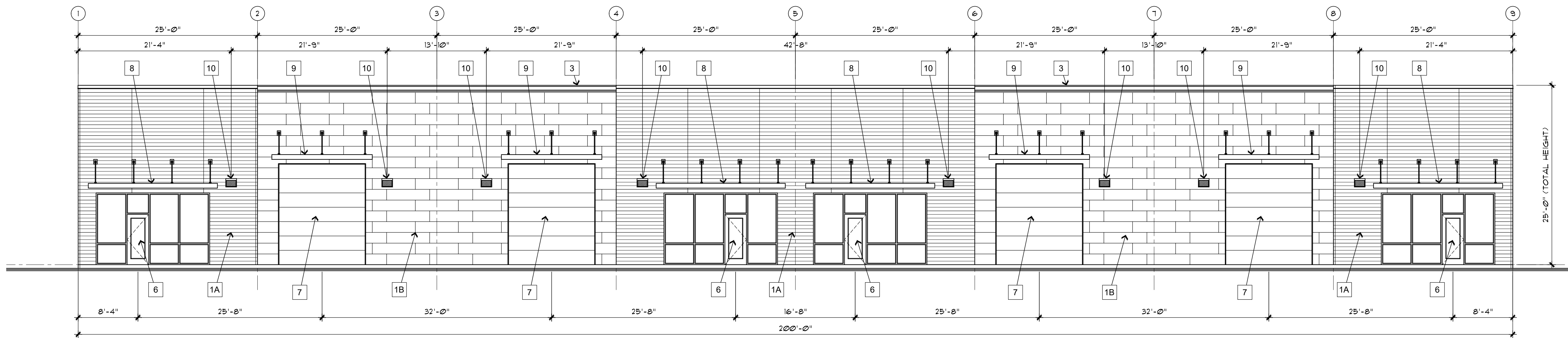
Project Title: **ASSOCIATED CONTRACT SERVICES**  
 JACRO DR, FUQUAY VARINA, NC

Drawing Title: **REFLECTED CEILING PLAN**

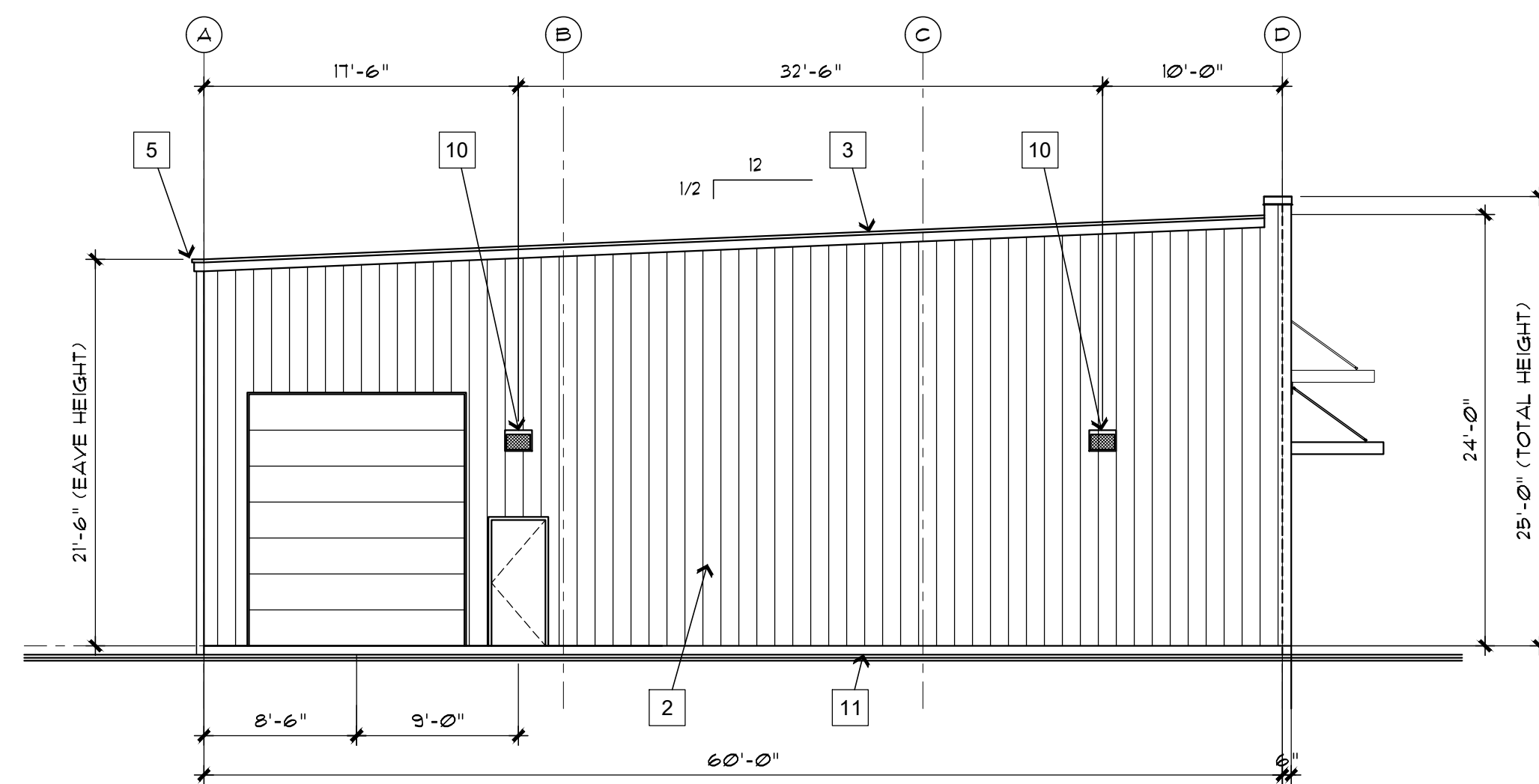
Consultant: **Craig A. Otto Architect, Inc.**

Seal: 

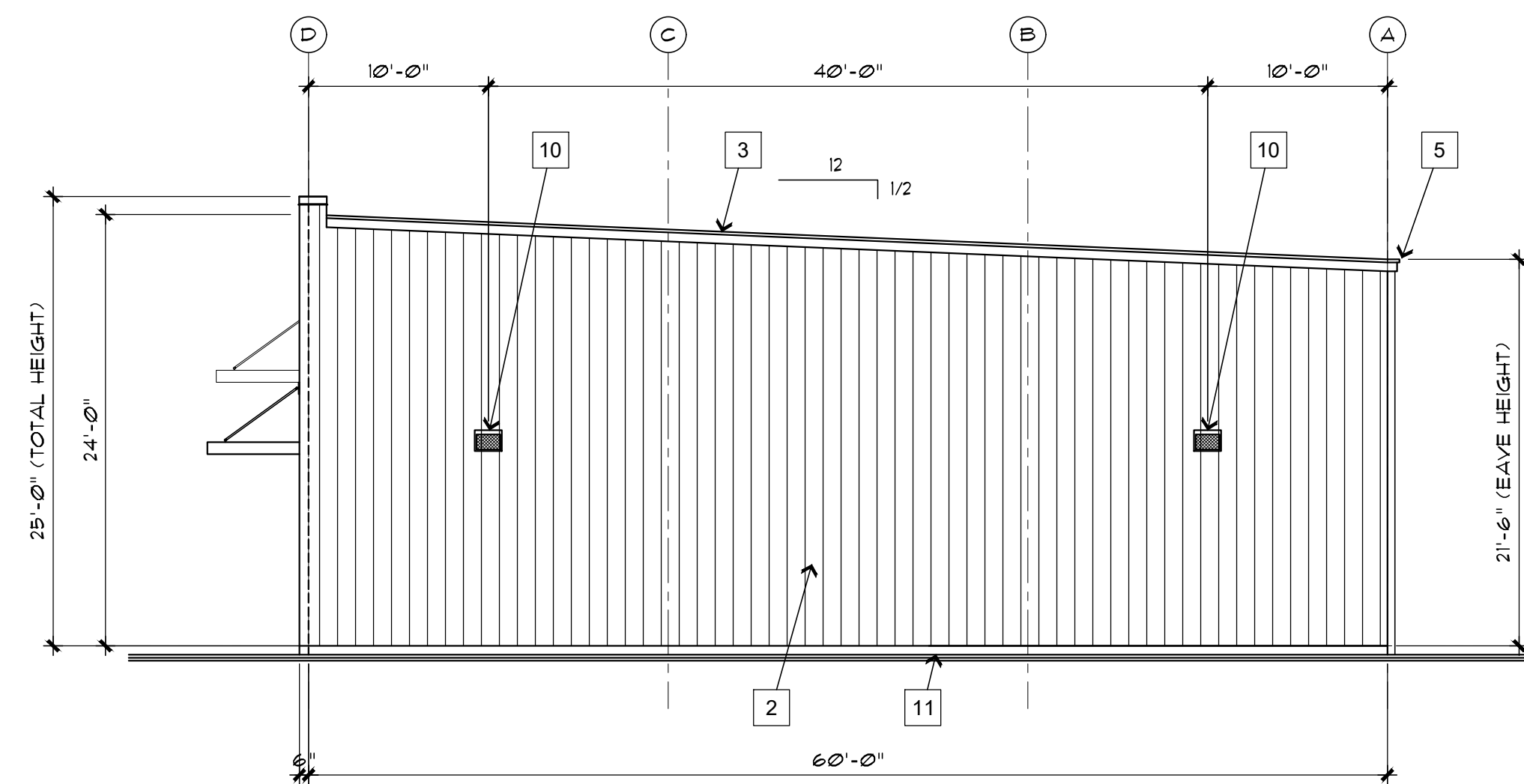
Date: **APRIL 11, 2025**  
 Drawn By: **JCO**  
 Drawing No.: **A1.2**



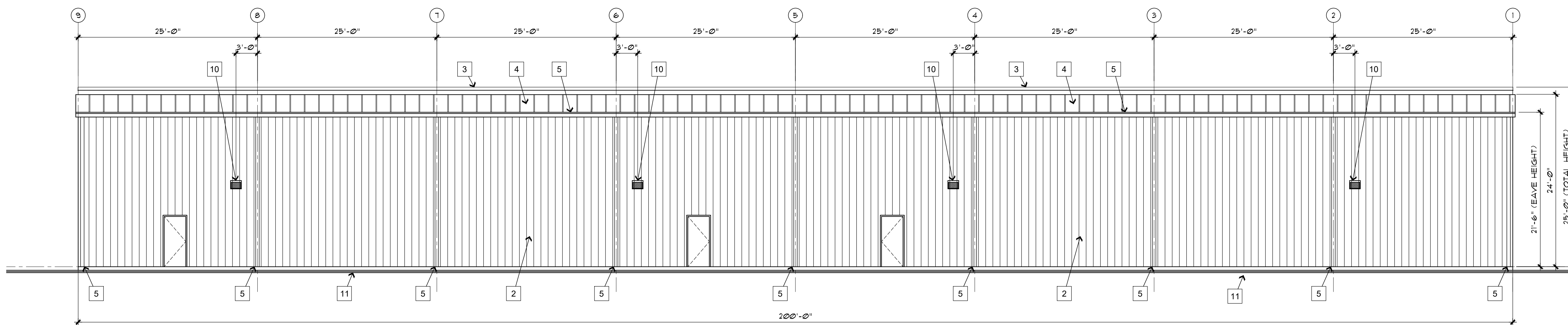
1 FRONT ELEVATION  
A2.1 SCALE: 1/8" = 1' - 0"



2 LEFT ELEVATION  
A2.1 SCALE: 1/8" = 1' - 0"



4 RIGHT ELEVATION  
A2.1 SCALE: 1/8" = 1' - 0"



3 REAR ELEVATION  
A2.1 SCALE: 1/8" = 1' - 0"

**EXTERIOR FINISH LEGEND**

- 1A NICHIIA ROUGHSAWN WOOD SERIES  
"ESPRESSO" FINISH. SECURE TO 1/2" PLYWOOD SHEATHING ON 6" METAL STUDS TO PROVIDE BUMP-OUTS WHERE INDICATED.
- 1B NICHIIA ARCHITECTURAL BLOCK MODERN SERIES  
"TUSCAN" FINISH. SECURE TO 1/2" PLYWOOD SHEATHING. CORNICE ABOVE IN "BONE" FINISH. REFER TO DETAIL SHEET A5.1. FINISH CORNICE TO SAME SIZE OF BUMP-OUT.
- 2 PREFINISHED METAL WALL PANELS:  
PREFINISHED METAL WALL PANELS AS SELECTED BY THE OWNER ON METAL BUILDING WALL GRIDS WHERE REQUIRED BY THE METAL BUILDING MANUFACTURER.
- 3 METAL TRIM:  
PREFINISHED METAL RAKE AND EAVE TRIM AS SELECTED BY THE OWNER AND PROVIDED BY THE METAL BUILDING MANUFACTURER.
- 4 METAL ROOF PANELS:  
GALVALUME STANDING SEAM METAL ROOF PANELS WITH CLIPS AS REQUIRED FOR R-19 INSULATION PROVIDED BY THE METAL BUILDING MANUFACTURER. ROOF INSULATION SHALL BE R-19 VINYL FACED INSULATION WITH R-5 THERMAL BLOCKS.
- 5 GUTTER AND DOWNSPOUTS:  
ALUMINUM GUTTER AND DOWNSPOUTS BY METAL BUILDING MANUFACTURER.
- 6 STOREFRONT DOOR SYSTEM:  
ALUMINUM CENTER SET STOREFRONT SYSTEM WITH INSULATED GLAZING. INSTALL ALL WINDOWS ACCORDING TO THE METAL BUILDING MANUFACTURER'S AND WINDOW MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- 7 OVERHEAD DOORS:  
METAL OVERHEAD DOORS AS SELECTED BY THE OWNER. INSTALL ALL OVERHEAD DOORS ACCORDING TO THE METAL BUILDING MANUFACTURER'S AND DOOR MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- 8 METAL CANOPY:  
18'-0" x 5'-0" ALUMINUM CANOPY BY METAL BUILDING MANUFACTURER.
- 9 METAL CANOPY:  
14'-0" x 5'-0" ALUMINUM CANOPY BY METAL BUILDING MANUFACTURER.
- 10 WALLPACK:  
LED WALLPACK AT 12'-0" AFF TO J-BOX. REFER TO ELECTRICAL PLANS.
- 11 GRADE:  
SLOPE GRADE AWAY FROM THE BUILDING.

JOHN P. WATKINS, ARCHITECT  
56 HILLMARK DRIVE  
COLUMBIA, SOUTH CAROLINA 29210

**Craig A. Otto**  
ARCHITECT, INC.

DESIGN • PLANNING • ARCHITECTURE

105 West Main Street, Suite C  
Lexington, South Carolina 29072  
Phone (803) 957-9004  
craig@craigottoarchitect.com


No.	Revisions	Date

All rights reserved. This drawing and the design shown thereon are copyrighted as prescribed by the laws of the United States and are the sole property of Craig A. Otto, Architect, Inc. Anyone duplicating, reproducing, or causing to be reproduced these drawings or the design thereon without permission of the architect will be subject to legal action.

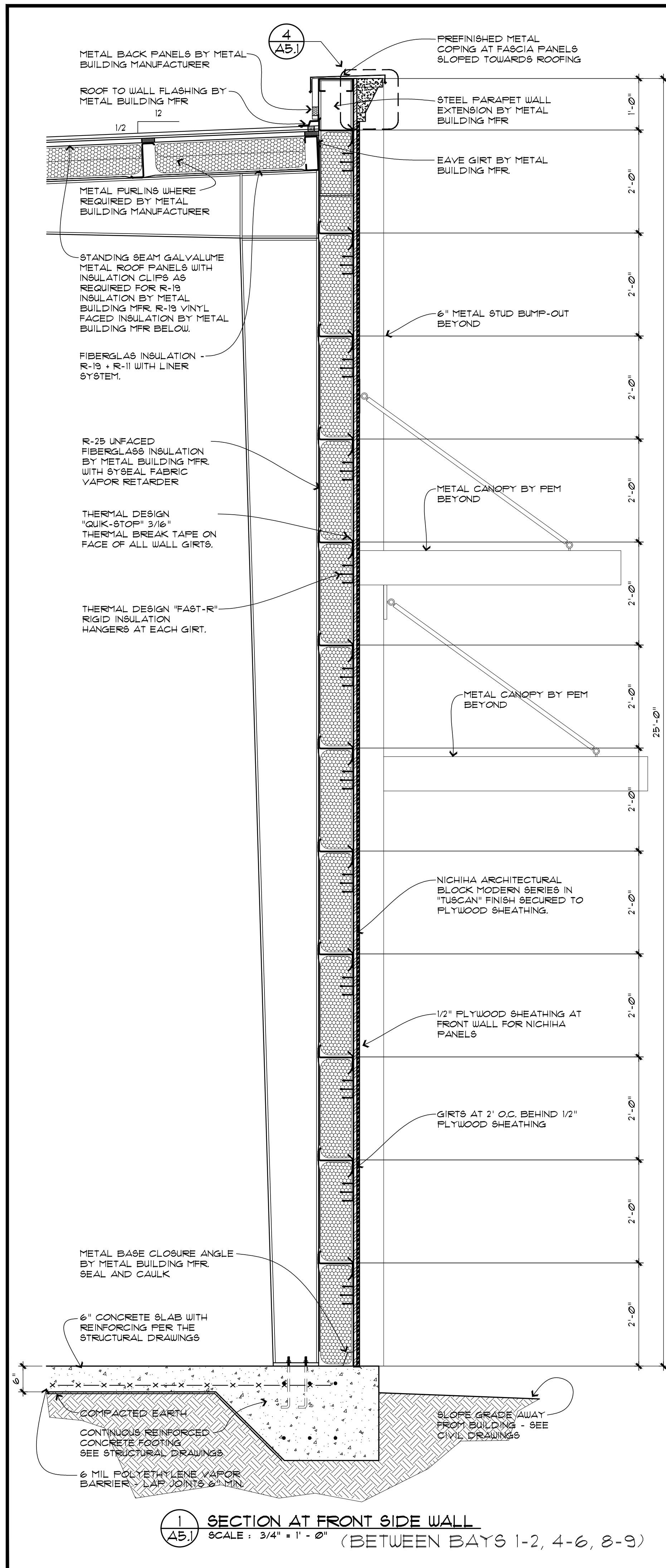
Project Title  
**THE ASSOCIATED CONTRACT SERVICES**  
JACRO DR, FUQUAY VARINA, NC

Drawing Title  
**EXTERIOR ELEVATIONS**

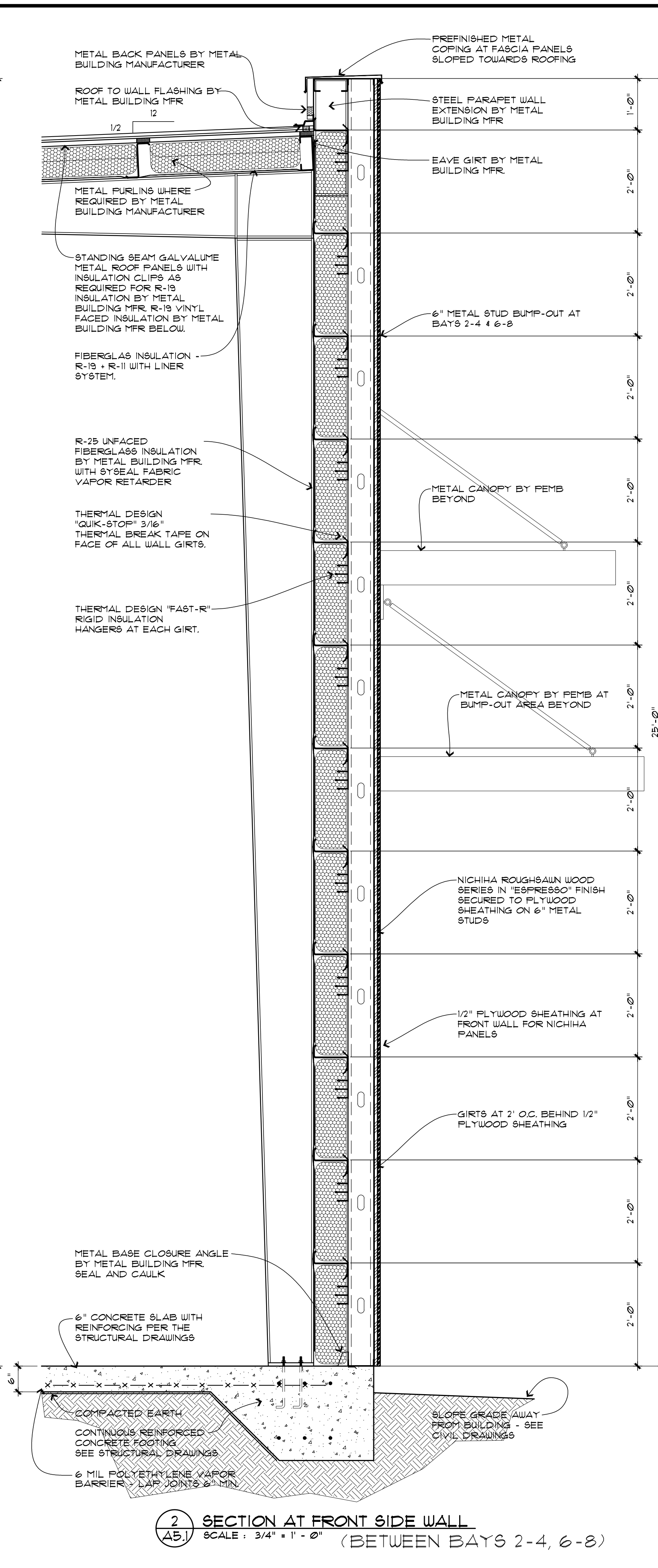
Consultant

Seal  
  
Date  
APRIL 11, 2025  
Drawn By  
JCO  
Drawing No.  
**A2.1**

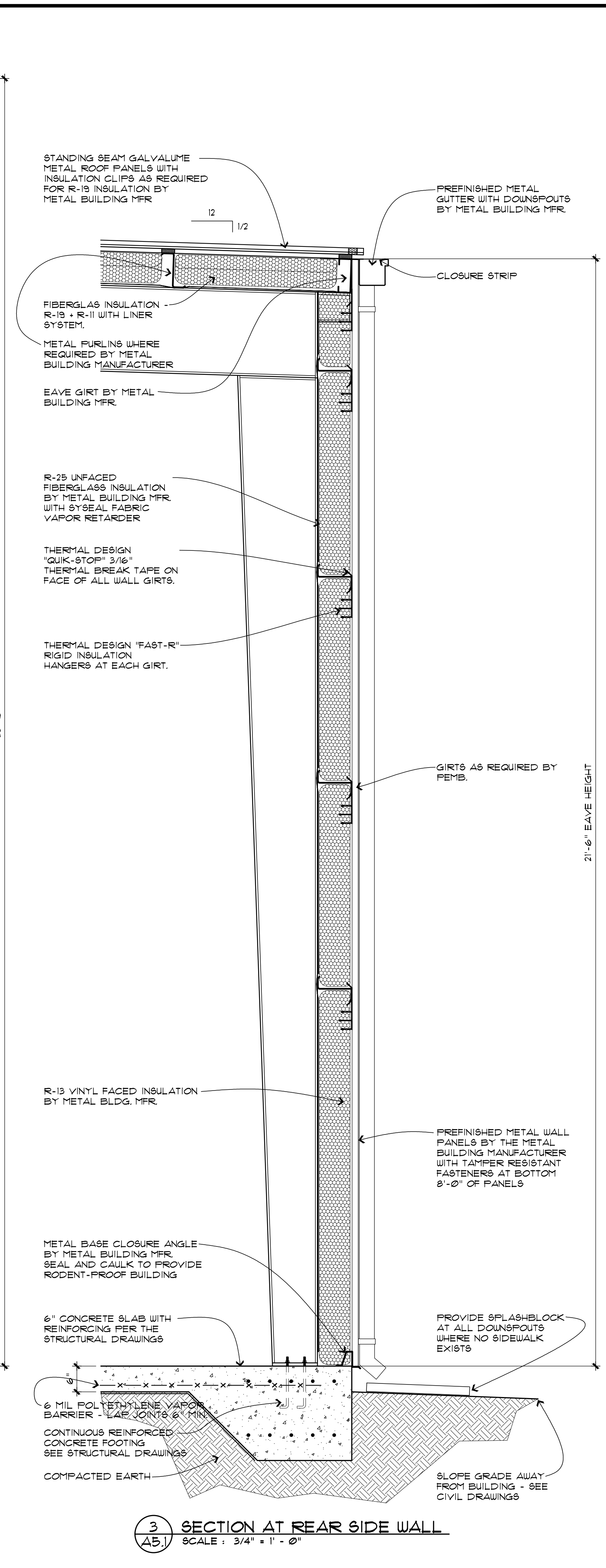




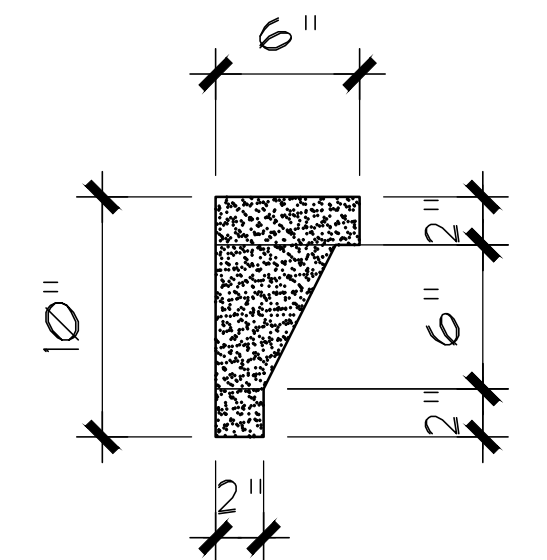
1 SECTION AT FRONT SIDE WALL  
 SCALE: 3/4" = 1' - 0" (BETWEEN BAYS 1-2, 4-6, 8-9)



2 SECTION AT FRONT SIDE WALL  
 SCALE: 3/4" = 1' - 0" (BETWEEN BAYS 2-4, 6-8)



3 SECTION AT REAR SIDE WALL  
 SCALE: 3/4" = 1' - 0"



4 CORNICE DETAIL  
 SCALE: 1-1/2" = 1' - 0"

JOHN P. WATKINS, ARCHITECT  
 56 HILLMARK DRIVE  
 COLUMBIA, SOUTH CAROLINA 29210

**Craig A. Otto**  
 ARCHITECT, INC.

DESIGN • PLANNING • ARCHITECTURE

105 West Main Street, Suite C  
 Lexington, South Carolina 29072  
 Phone (803) 957-9004  
 craig@craigottoarchitect.com

No.	Revisions	Date

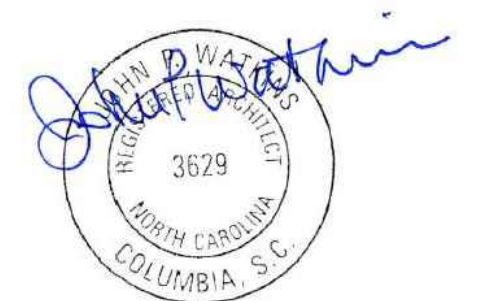
All rights reserved. This drawing and the design shown thereon are copyrighted as prescribed by the laws of the United States and are the sole property of Craig A. Otto, Architect, Inc. Anyone duplicating, reproducing, or causing to be reproduced these drawings or the design thereon without permission of the architect will be subject to legal action.

Project Title  
**ASSOCIATED CONTRACT SERVICES**  
 JARCO DR, FUQUAY VARINA, NC

Drawing Title  
 WALL SECTIONS

Consultant

Seal



Date

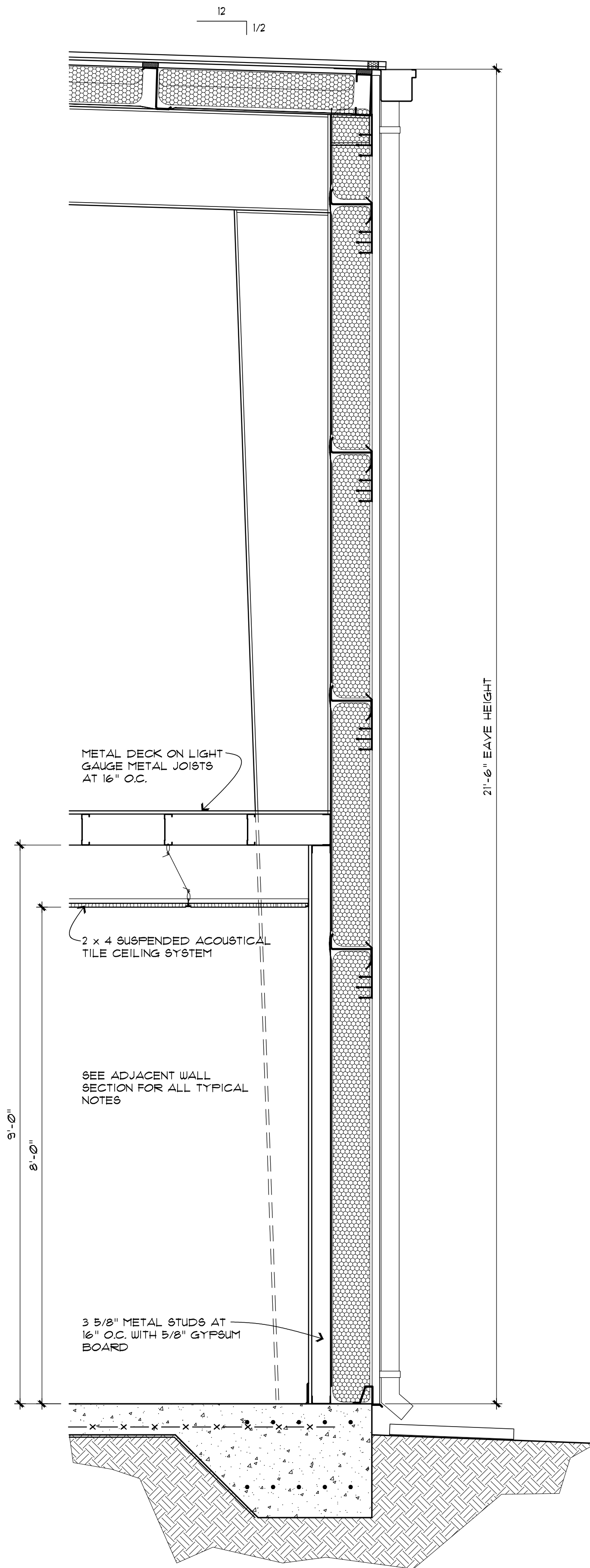
APRIL 11, 2025

Drawn By

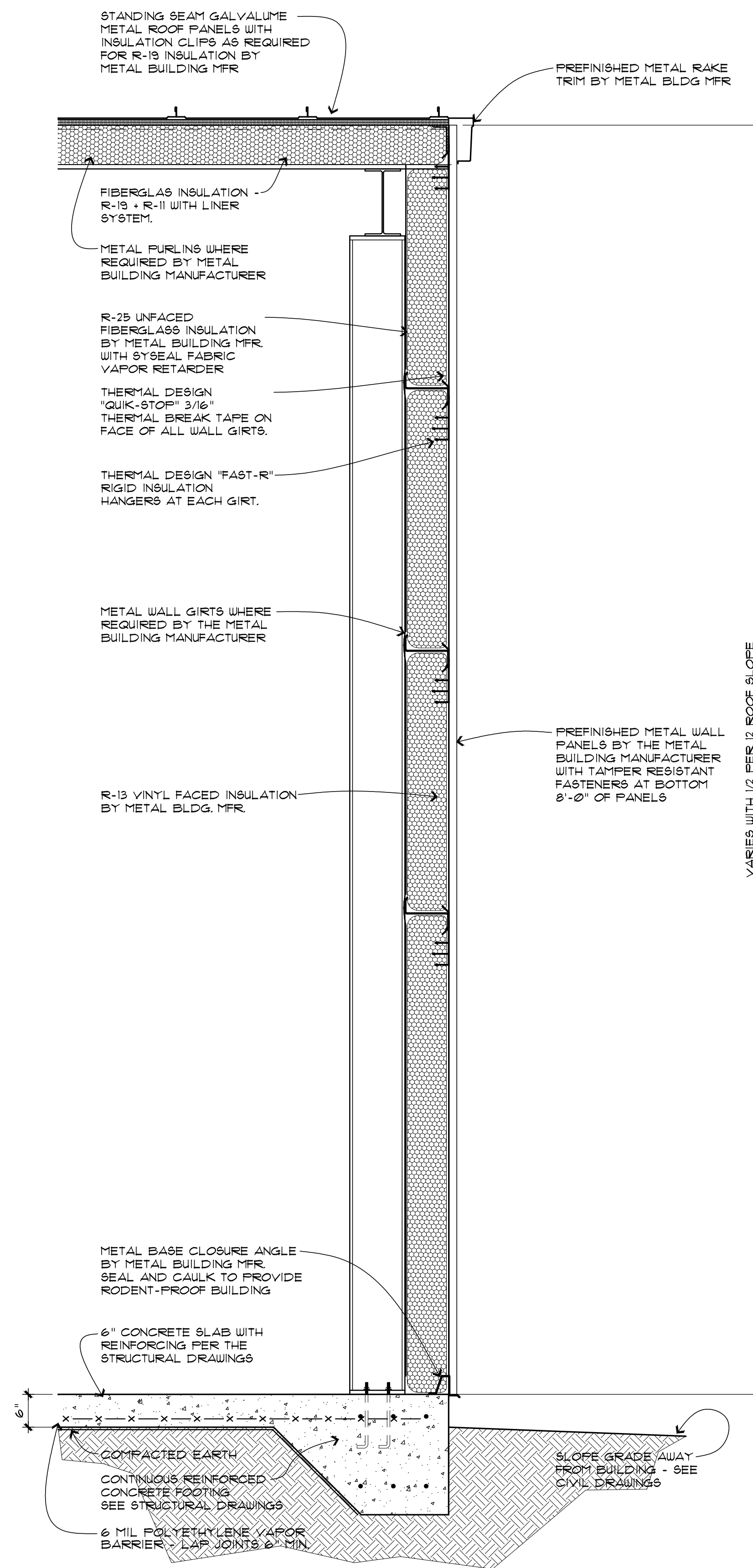
JCO

Drawing No.

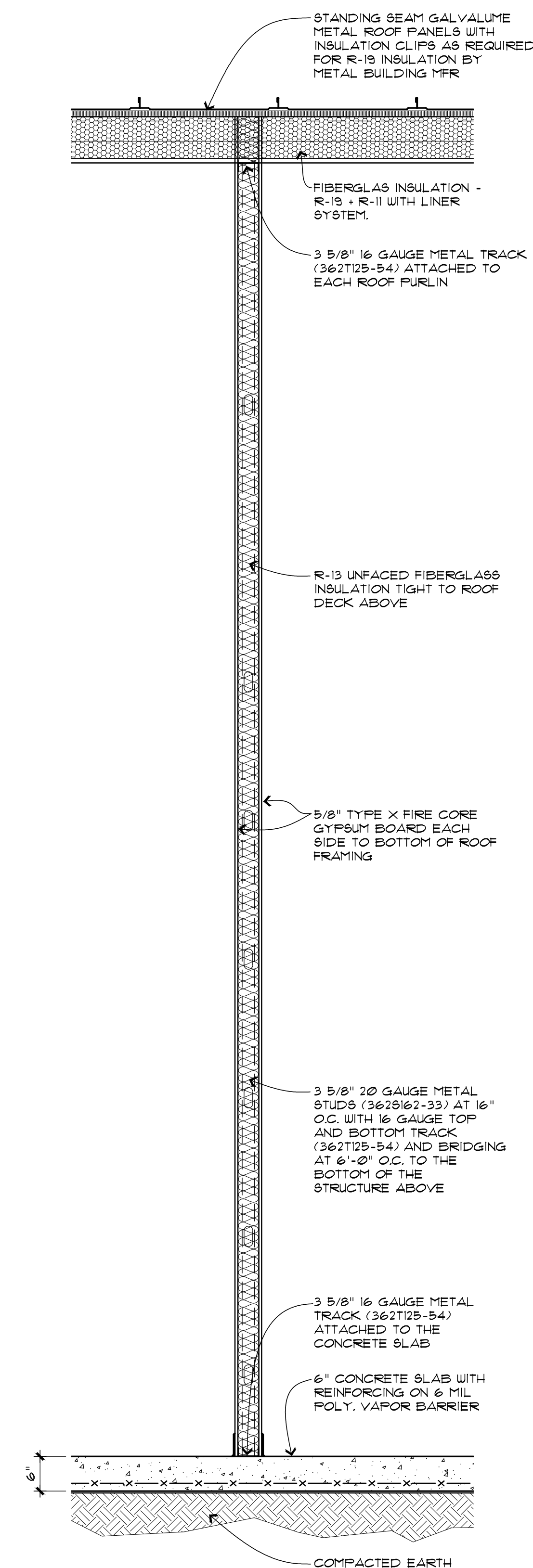
A5.1



1 SECTION AT TYPICAL TOILET  
 A5.2 SCALE: 3/4" = 1' - 0" (REAR SIDE WALL)



2 SECTION AT TYPICAL END WALL  
 A5.2 SCALE: 3/4" = 1' - 0"



3 SECTION AT 1 HOUR RATED SEPARATION WALL  
 A5.2 SCALE: 3/4" = 1' - 0"

JOHN P. WATKINS, ARCHITECT  
 56 HILLMARK DRIVE  
 COLUMBIA, SOUTH CAROLINA 29210

**Craig A. Otto**  
 ARCHITECT, INC.

DESIGN • PLANNING • ARCHITECTURE

105 West Main Street, Suite C  
 Lexington, South Carolina 29072  
 Phone (803) 957-9004  
 craig@craigottoarchitect.com

No.	Revisions	Date

All rights reserved. This drawing and the design shown thereon are copyrighted as prescribed by the laws of the United States and are the sole property of Craig A. Otto, Architect, Inc. Anyone duplicating, reproducing, or causing to be reproduced these drawings or the design thereon without permission of the architect will be subject to legal action.

Project Title  
**ASSOCIATED CONTRACT SERVICES**  
 JARCO DR, FUQUAY VARINA, NC

Drawing Title  
**WALL SECTIONS**

Consultant

Seal  
 APRIL 11, 2025  
 Drawn By  
 JCO  
 Drawing No.



**A5.2**

**GENERAL REQUIREMENTS**

- THE STRUCTURE DESCRIBED BY THESE DOCUMENTS IS INTENDED TO WORK AS A COMPLETED STRUCTURE. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES OF CONSTRUCTION INCLUDING TEMPORARY SHORING, BRACING, AND TEMPORARY SUPPORTS. THE CONTRACTOR IS ALSO RESPONSIBLE FOR COORDINATION OF HIS OR HER WORK WITH ALL OTHER TRADES, AND FOR PERFORMING ALL WORK IN A SAFE AND SATISFACTORY MANNER.
- ENGINEER/ARCHITECT'S APPROVAL MUST BE OBTAINED IN WRITING FOR ALL DEVIATIONS AND SUBSTITUTIONS. THE ENGINEER/ARCHITECT IS NOT RESPONSIBLE FOR THE FAILURE OF THE CONTRACTOR TO BUILD THE STRUCTURE ACCORDING TO THE DOCUMENTS.
- THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS AND DIMENSIONS PRIOR TO DETAILING, FABRICATION AND CONSTRUCTION; AND SHALL NOTIFY THE ENGINEER/ARCHITECT OF ANY DISCREPANCIES.
- OWNER SHALL EMPLOY AND PAY A QUALIFIED INDEPENDENT TESTING AGENCY TO PERFORM TESTS AND INSPECTIONS SPECIFIED IN OTHER SECTIONS, AND THOSE REQUIRED BY AUTHORITIES HAVING JURISDICTION, INCLUDING ALL SPECIAL INSPECTIONS. CONTRACTOR IS RESPONSIBLE FOR SCHEDULING INSPECTIONS AND TESTS. RETESTING: OWNER SHALL PAY FOR RETESTING WHERE RESULTS OF INSPECTIONS AND TESTS PROVE UNSATISFACTORY AND INDICATE NONCOMPLIANCE WITH REQUIREMENTS. THE OWNER RESERVES THE RIGHT TO DEDUCT COSTS OF RETESTING FROM CONSTRUCTION CONTRACT COSTS.
- SECTIONS SHOWN ON STRUCTURAL DRAWINGS PROVIDE TYPICAL DETAILING INFORMATION THAT SHALL BE APPLIED TO ALL SIMILAR AND LIKE CONDITIONS U.N.O. SHOP DRAWINGS SHALL DETAIL ALL CONDITIONS IN ACCORDANCE WITH PROJECT REQUIREMENTS.
- COORDINATE FLOOR, ROOF, AND WALL OPENING SIZES AND LOCATIONS WITH ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING, AND CIVIL PLANS. NOTIFY THE ENGINEER OF ANY DISCREPANCIES.

**EARTHWORK**

- AN INDEPENDENT TESTING AGENCY SHALL BE RETAINED BY THE OWNER TO PERFORM TESTING OF EARTHWORK. ALL FOOTING AND SLAB SUB-GRADES SHALL BE INSPECTED, AND TESTED IF REQUIRED, BY THE TESTING AGENCY. ALL FILL PLACEMENT AND COMPACTION SHALL BE MONITORED BY THE TESTING AGENCY. ALL BACKFILL MATERIALS SHALL BE APPROVED BY TESTING AGENCY PRIOR TO PLACEMENT. THE ENGINEER IS NOT RESPONSIBLE FOR SUBSURFACE CONDITIONS ENCOUNTERED IN THE FIELD CONTRARY TO THOSE ASSUMED FOR DESIGN.
- THE FOUNDATIONS ARE DESIGNED FOR 2000 PSF ALLOWABLE SOIL BEARING PRESSURE AND A SOIL SUBGRADE MODULUS (K) OF 100 PCL. CAPACITY SHALL BE APPROVED BY THE TESTING AGENCY PRIOR TO CONCRETE PLACEMENT.
- SUBGRADE PREPARATION FOR SLAB ON GRADE SHALL BE PERFORMED IN ACCORDANCE WITH GEOTECHNICAL ENGINEERING REPORT. IN THE ABSENCE OF A GEOTECHNICAL REPORT THE INSPECTOR SHALL VERIFY THE SUBGRADE MEETS THE MINIMUM DESIGN SOIL PROPERTIES SPECIFIED ON THE CONSTRUCTION DOCUMENTS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING ALL SERVICE AND UTILITY LINES ON THE SITE.
- REFER TO PROJECT GEOTECHNICAL REPORT FOR ADDITIONAL INFORMATION. IN CASE OF DISCREPANCY, THE GEOTECHNICAL REPORT SHALL GOVERN UNLESS APPROVED OTHERWISE IN WRITING BY THE ENGINEER.

**CAST-IN-PLACE CONCRETE**

- ALL WORK SHALL COMPLY WITH ACI 301, "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS"; ASTM C 94; AND CRSI'S "MANUAL OF STANDARD PRACTICE."
  - DESIGN OF ALL FORMWORK AND BRACING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
  - DEFORMED REINFORCING BARS: ASTM A615, GRADE 60.
  - WELDED STEEL WIRE FABRIC: ASTM A1064, FLAT SHEETS, NOT ROLLS. LAP A MINIMUM OF ONE CROSS WIRE SPACING PLUS 2 INCHES.
  - PORTLAND CEMENT: ASTM C 150, TYPE 1.
  - AGGREGATE: NORMAL WEIGHT CONCRETE, ASTM C33; LIGHT WEIGHT CONCRETE, ASTM C330.
  - FLY ASH: ASTM C 618, TYPE F.
  - PROPORTION MIX DESIGNS TO PROVIDE THE FOLLOWING PROPERTIES:
    - UNIT WEIGHT: NORMAL WEIGHT CONCRETE 145 PCF  
LIGHT WEIGHT CONCRETE 115 PCF
    - AIR CONTENT: EXPOSURE CLASS FO - 0% +2%  
EXPOSURE CLASS F1, F2, F3 - 6% ±1%
    - CEMENTITIOUS MATERIAL: LIMIT FLY ASH TO 15 PERCENT OF TOTAL CEMENT CONTENT
- | APPLICATION                       | EXPOSURE CLASS | 28 DAY STRENGTH | MAX W/C | MAX AGGREGATE |
|-----------------------------------|----------------|-----------------|---------|---------------|
| INTERIOR SLAB ON GRADE & FOOTINGS | FO             | 4000 PSI        | 0.53    | 1"            |

- DO NOT ADD WATER TO CONCRETE DURING DELIVERY, AT PROJECT SITE, OR DURING PLACEMENT, UNLESS APPROVED BY ENGINEER.
- PROTECT CONCRETE FROM PHYSICAL DAMAGE OR REDUCED STRENGTH DUE TO WEATHER EXTREMES DURING MIXING, PLACING, AND CURING. COMPLY WITH ACI 308R "GUIDE TO HOT WEATHER CONCRETING" AND ACI 308R "GUIDE TO COLD WEATHER CONCRETING"
- OWNER SHALL ENGAGE AN INDEPENDENT TESTING AGENCY TO PERFORM TESTS AND TO SUBMIT TEST REPORTS TO THE ENGINEER. OBTAIN ONE COMPOSITE SAMPLE FOR EACH DAY'S POUR OF EACH CONCRETE MIXTURE EXCEEDING 5 CU. YD., BUT LESS THAN 25 CU. YD. PLUS ONE SET FOR EACH ADDITIONAL 50 CU. YD. OR FRACTION THEREOF. WHEN FREQUENCY OF TESTING PROVIDES FEWER THAN FIVE COMPRESSIVE-STRENGTH TESTS FOR EACH CONCRETE MIXTURE, TESTING SHALL BE CONDUCTED FROM AT LEAST FIVE RANDOMLY SELECTED BATCHES OR FROM EACH BATCH IF FEWER THAN FIVE ARE USED. A COMPOSITE SAMPLE CONSISTS OF FIVE CYLINDERS: ONE CYLINDER TO BE TESTED AT 7 DAYS, THREE CYLINDERS TO BE TESTED AT 28 DAYS AND ONE CYLINDER TO BE RESERVED FOR 56 DAYS IF NEEDED. THE TESTING AGENCY SHALL ALSO RECORD SLUMP, AIR CONTENT, AND TEMPERATURE OF EACH CYLINDER.
- SLAB FINISHES: REFER TO THE ARCHITECT FOR FLOOR FINISHES. PROVIDE A TROWELED FINISH FOR FLOOR SURFACES TO RECEIVE FLOOR COVERINGS, PAINT, OR OTHER THIN FILM-FINISH COATINGS. SPECIFIED OVERALL VALUES OF FLATNESS, F(F) 35; AND LEVELNESS, F(L) 25; WITH MINIMUM LOCAL VALUES OF FLATNESS, F(f) 24; AND LEVELNESS, F(l) 17. NONSLIP BROOM FINISH TO EXTERIOR CONCRETE PLATFORMS, STEPS, AND RAMPS.
- PROVIDE A 3/4" CHAMFER ON ALL EXPOSED CONCRETE EDGES, U.N.O.
- FOR SLAB ON GRADE, FORM 1/8" WIDE CONTRACTION JOINTS WITH POWER SAWS WHEN CUTTING ACTION WILL NOT TEAR, ABRADE OR OTHERWISE DAMAGE SURFACE AND BEFORE CONCRETE DEVELOPS RANDOM CONTRACTION JOINTS. SEE DETAILS FOR ADDITIONAL INFO. UNLESS NOTED OTHERWISE, LOCATE CONTRACTION JOINTS AT COLUMN LINES WITH A MAX RATIO OF 1.5 LENGTH TO WIDTH AND NO FARTHER APART THAN 36 TIMES SLAB THICKNESS.
- BEGIN CURING UNFORMED CONCRETE AFTER FINISHING. KEEP CONCRETE CONTINUOUSLY MOIST FOR AT LEAST 7 DAYS OR APPLY MEMBRANE-FORMING CURING COMPOUND TO CONCRETE. CONTRACTOR SHALL VERIFY COMPOUND IS COMPATIBLE WITH FLOOR COVERING/COATINGS.
- PROTECT CONCRETE FROM DAMAGE. REPAIR SURFACE DEFECTS IN CONCRETE.

**FOUNDATIONS**

- ALL EXCAVATIONS SHALL BE PROPERLY BACKFILLED, BUT NOT BEFORE CONCRETE HAS ATTAINED FULL DESIGN STRENGTH. NO BACKFILL SHALL BE PLACED AGAINST CONCRETE WALLS UNTIL CONCRETE HAS ATTAINED FULL 28-DAY STRENGTH.
- BASEMENT WALLS (NON-CANTILEVER CAST-IN-PLACE WALLS) SHALL BE BRACED AGAINST LATERAL THRUST. SUCH BRACING SHALL REMAIN IN PLACE UNTIL SLAB ON EARTH (AND SUPPORTED SLAB, IF ANY) HAS BEEN PLACED AND GAINED 75% COMPRESSIVE STRENGTH.
- CANTILEVER WALLS SHALL BE BRACED AGAINST LATERAL THRUST DURING BACKFILLING UNLESS COMPACTION IS PERFORMED ONLY BY HAND OPERATED EQUIPMENT IN ZONE WITHIN 5 FEET OF BACK WALL. FOUNDATION WALLS, RETAINING WALLS, AND BASEMENT WALLS HAVE NOT BEEN DESIGNED TO RESIST LATERAL LOADS DUE TO CONSTRUCTION EQUIPMENT SURCHARGE.
- SLEEVE PLUMBING OPENINGS IN SLABS BEFORE PLACING CONCRETE AND BEND REINFORCING AROUND SLEEVES. CORING NOT PERMITTED IN FLOOR SLABS, UNLESS APPROVED BY STRUCTURAL ENGINEER. DO NOT PLACE PIPES OR DUCTS EXCEEDING ONE-THIRD THE SLAB OR WALL THICKNESS WITHIN THE SLAB OR WALL UNLESS SPECIFICALLY SHOWN AND DETAILED ON STRUCTURAL DRAWINGS. SEE MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS FOR LOCATION OF SLEEVES, ACCESSORIES, ETC.

**REINFORCING STEEL**

- PROVIDE REINFORCING STEEL CONFORMING TO ASTM A706 FOR ALL REINFORCING STEEL REQUIRED TO BE WELDED AND WHERE NOTED ON THESE DRAWINGS.
- PROVIDE DEFORMED REBAR EMBEDMENT, LAP SPLICES, AND HOOKS AS DETAILED ON DRAWINGS. IF NOT SPECIFIED, FOLLOW ACI 301 STANDARD DETAILING REQUIREMENTS FOR THE APPROPRIATE CONDITIONS WITH CLASS B LAPS.
- REINFORCING STEEL MARKED "CONTINUOUS" SHALL BE LAPPED WITH CLASS "B" LAP SPLICE UNLESS SPECIFICALLY DETAILED OTHERWISE. PROVIDE CONTINUOUS REINFORCEMENT WHERE EVER POSSIBLE; SPLICE ONLY AS SHOWN OR APPROVED; STAGGER SPLICES WHERE POSSIBLE; USE TENSION SPLICE (CLASS "B") UNLESS NOTED OTHERWISE. DOWELS SHALL MATCH THE SIZE AND SPACING OF THE WALL OR COLUMN SPECIFIED REINFORCEMENT AND SHALL BE LAPPED WITH TENSION SPLICES (CLASS "B"), UNLESS NOTED OTHERWISE.
- HORIZONTAL REINFORCEMENT IN FOOTINGS, TURNDOWN SLABS, AND WALLS SHALL BE CONTINUOUS AROUND CORNERS. HORIZONTAL REINFORCEMENT SHALL CONTINUE AT BENDS AND CORNERS WITH BEND TO FAR FACE OF INTERSECTING ELEMENT IN EACH DIRECTION. ADDITIONAL HORIZONTAL CORNER BARS OF SAME SIZE AND SPACING MAY BE PROVIDED. PROVIDE CORNER BARS AT ALL TURNDOWN SLAB CORNERS AND C.I.P. CONCRETE WALL CORNERS. PROVIDE LAP SPLICE 48 TIMES BAR DIAMETER. WHERE PERPENDICULAR WALLS ARE NOT POURED CONTINUOUS, PROVIDE A KEVED JOINT WITH CORNER BARS.
- PROVIDE SPACERS, CHAIRS, BOLTERS, ETC. AS REQUIRED TO ASSEMBLE, PLACE, AND SUPPORT ALL REINFORCING IN PLAN.

**METAL BUILDING SYSTEMS**

- THE METAL BUILDING SYSTEM, INCLUDING FRAMES, GIRTS AND PURLINS, SHALL BE DESIGNED BY A REGISTERED ENGINEER IN THE STATE OF BUILDING JURISDICTION TO COMPLY WITH THE APPLICABLE BUILDING CODES.
- THE METAL BUILDING MANUFACTURER SHALL PROVIDE COMPLETE SHOP DRAWINGS FOR REVIEW, AND STRUCTURAL CALCULATIONS SEALED BY THE ENGINEER.
- THE METAL BUILDING MANUFACTURER MUST BE A MEMBER COMPANY OF THE INTERNATIONAL ACCREDITATION SERVICE AC472 AND SHALL PROVIDE A CURRENT CERTIFICATE OF ACCREDITATION.
- THE METAL BUILDING AND ITS COMPONENTS SHALL BE DESIGNED FOR THE LOADS SHOWN IN THE STRUCTURAL DESIGN CRITERIA AND AS SPECIFIED IN THE APPLICABLE BUILDING CODES.
- FIXED COLUMN BASES ARE NOT PERMITTED UNLESS NOTED OTHERWISE ON THE STRUCTURAL DRAWINGS.
- THE METAL BUILDING SHALL BE DESIGNED FOR A MAXIMUM LATERAL DRIFT OF H/100 USING A 10 YEAR WIND LOAD OCCURRENCE.
- GIRTS SHALL BE DESIGNED FOR A MAXIMUM HORIZONTAL WIND DEFLECTION OF L/240 BASED ON A 10 YEAR OCCURRENCE.
- PURLINS SHALL BE DESIGNED FOR A MAXIMUM DEFLECTION OF L/240 UNDER TOTAL LOAD.
- FABRICATION TOLERANCES SHALL COMPLY WITH THE MBMA'S "METAL BUILDING SYSTEMS MANUAL" FOR FABRICATION AND ERECTION TOLERANCES.
- ERECT STRUCTURAL STEEL ACCORDING TO AISC SPECIFICATIONS AND WITHIN ERECTION TOLERANCES OF AISC'S "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES."
- COMPLY WITH AISC 360 "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS," RCSC'S "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A 325 OR A 490 BOLTS," AND AWS D1.1 "STRUCTURAL WELDING CODE--STEEL."
- STRUCTURAL-STEEL: COMPLY WITH AISC 360, "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS," FOR DESIGN REQUIREMENTS AND ALLOWABLE STRESSES.
- COLD-FORMED STEEL: COMPLY WITH AISI'S "NORTH AMERICAN SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS" FOR DESIGN REQUIREMENTS AND ALLOWABLE STRESSES.
- ANCHOR RODS, BOLTS, NUTS: ASTM F1554, GRADE 55, UNHEADED RODS (SUPPLIED BY GENERAL CONTRACTOR PER STRUCTURAL DRAWINGS). SEE METAL BUILDING DRAWINGS FOR BOLT DIAMETER AND QUANTITIES.

**SPECIAL INSPECTION NOTES**

- SPECIAL INSPECTION IS TO BE PROVIDED IN ADDITION TO THE INSPECTIONS CONDUCTED BY THE DEPARTMENT OF BUILDING SAFETY AND SHALL NOT BE CONSTRUED TO RELIEVE THE OWNER OR HIS AUTHORIZED AGENT FROM REQUESTING THE PERIODIC AND CALLED INSPECTIONS BY THE BUILDING CODE.
- OWNER, OR OWNER'S AGENT, SHALL EMPLOY AND PAY A QUALIFIED INDEPENDENT TESTING AGENCY TO PERFORM TESTS AND INSPECTIONS SPECIFIED IN INSPECTION TABLES ON THIS SHEET, AND THOSE REQUIRED BY AUTHORITIES HAVING JURISDICTION. CONTRACTOR IS RESPONSIBLE FOR SCHEDULING INSPECTIONS AND TESTS.
- THE INSPECTOR(S) SHALL HAVE THE RELEVANT TRAINING & EXPERIENCE REQUIRED TO PERFORM THE NECESSARY INSPECTIONS. THE INSPECTOR SHALL WORK UNDER THE SUPERVISION OF AN ENGINEER LICENSED IN THE STATE OF JURISDICTION.
- THE GENERAL CONTRACTOR SHALL ENSURE THE WORK REMAINS ACCESSIBLE FOR INSPECTION UNTIL THE WORK HAS BEEN INSPECTED AND APPROVED.
- THE INSPECTOR(S) SHALL MAINTAIN RECORDS OF INSPECTIONS. COPIES OF THE RECORDS SHALL BE PROVIDED TO THE BUILDING OFFICIAL AND OWNER. IF WORK DOES NOT PASS INITIAL INSPECTION, THE INSPECTOR SHALL PROVIDE A REPORT TO THE STRUCTURAL ENGINEER OF RECORD, ARCHITECT AND GENERAL CONTRACTOR WITHIN 24 HOURS. THE WORK SHALL BE CORRECTED BY THE CONTRACTOR AND RE-INSPECTED PRIOR TO COVERING UP THE WORK. A REPORT INDICATING THE DISCREPANCIES HAVE BEEN CORRECTED SHALL BE FURNISHED TO ALL PARTIES BY THE INSPECTOR.
- THE SPECIAL INSPECTOR SHALL NOTIFY THE ENGINEER OF RECORD AND GENERAL CONTRACTOR IN WRITING WHEN ALL INSPECTIONS HAVE BEEN COMPLETED AND ANY DEFICIENCIES HAVE BEEN CORRECTED AND APPROVED.

**SHOP DRAWING SUBMITTALS**

- SUBMIT NEWLY PREPARED INFORMATION DRAWN TO SCALE. INDICATE DEVIATIONS FROM CONTRACT DOCUMENTS. DO NOT REPRODUCE CONTRACT DOCUMENTS OR COPY STANDARD INFORMATION. DOCUMENTS REPRODUCED FROM FULLER GROUP, LLC DOCUMENTS WITHOUT WRITTEN PERMISSION, WILL BE REJECTED. COMPLIANCE WITH SPECIFIED REQUIREMENTS REMAINS CONTRACTOR'S RESPONSIBILITY.
- ALLOW A MINIMUM OF 10 WORKING DAYS FOR SUBMITTAL REVIEWS.
- ELECTRONIC COPIES WILL BE ACCEPTED BUT WILL INCUR PRINTING CHARGES BILLED TO THE CLIENT.
- SHOP DRAWINGS SHALL BE REVIEWED BY THE GENERAL CONTRACTOR PRIOR TO SUBMITTING TO ENGINEER. SHOP DRAWINGS NOT REVIEWED BY THE GENERAL CONTRACTOR MAY BE SUBJECT TO REJECTION.
- THE CONTRACT DOCUMENTS SHALL NOT BE SCALED FOR DETERMINING DIMENSIONS OR QUANTITIES. USE ONLY PRINTED DIMENSIONS. ANY SCALED DIMENSIONS SHALL ASK FOR VERIFICATION ON THE SHOP DRAWING REVIEW.
- SEE ARCHITECTURAL DRAWINGS FOR DIMENSIONS NOT SHOWN. THE DETAILER SHALL REFER TO ARCHITECTURAL DRAWINGS FOR WALL, DOOR, AND WINDOW LOCATIONS. DIMENSIONS ON THE ARCHITECTURAL DRAWINGS SUPERCEDE DIMENSIONS SHOWN ON STRUCTURAL PLANS. NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
- PROVIDE THE FOLLOWING SUBMITTALS:
  - CONCRETE
    - CONCRETE MIX DESIGNS WITH SAMPLE LABORATORY TEST REPORTS PER ACI 318
    - CONCRETE ADMIXTURE PRODUCT DATA
    - REBAR SHOP DRAWINGS
    - CONCRETE SAMPLE CYLINDER BREAK RESULTS (7 DAYS, 28 DAYS)
  - PRE-ENGINEERED METAL BUILDING
    - SHOP DRAWINGS
    - FOUNDATION REACTIONS AND CALCULATION PACKAGE STAMPED BY A REGISTERED PROFESSIONAL ENGINEER

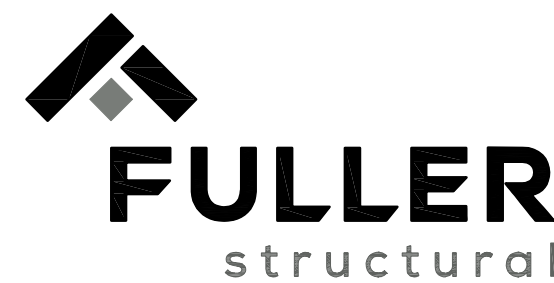
**DESIGN LOAD CRITERIA**

This analysis is made utilizing the 2018 North Carolina State Building Code, (2015 IBC).

ROOF DESIGN LOADS	
Dead Load	Per PEMB
Collateral Load	6 psf
Live Load	20 psf / Reducible
SNOW LOADS	
Ground Snow Load, P <sub>g</sub>	15 psf
Exposure Factor, C <sub>e</sub>	1.0
Thermal Factor, C <sub>t</sub>	1.1
Importance Factor, I <sub>s</sub>	1.0
Slope Factor, C <sub>s</sub>	1.0
Drift Surcharge Load, P <sub>d</sub>	5.5 psf
Width of Snow Drift, w	2.73 ft
Rain on Snow Surcharge	5 psf
Flat Roof Snow Load, P <sub>f</sub>	11.55 psf + Rain on Snow
RAIN INTENSITY, I	3.38 in/hr
WIND LOADS	
Basic Design Wind Speed, V	115 mph
Allowable Stress Design Wind Speed, V <sub>asd</sub>	90 mph
Wind Exposure	C
Internal Pressure Coefficient	+1.8, -1.8
Risk Category	II
Height & Exposure Adjustment, λ	1.0
Wind Directionality Factor, K <sub>d</sub>	0.85
Topographic Factor, K <sub>zt</sub>	1.0
SEISMIC LOADS	
Importance Factor, I <sub>s</sub>	1.0
Risk Category	II
Site Class	D
S <sub>s</sub> (Mapped)	0.173 g
S <sub>1</sub> (Mapped)	0.083 g
S <sub>0.1</sub>	0.184 g
S <sub>0.2</sub>	0.133 g
Design Category	B
Basic Seismic Force-Resisting System	Steel System Not Specifically Designed for Seismic
Response Coefficient, C <sub>s</sub>	0.062
Response Modification Factor, R	3.0
Design Base Shear	9.26K
Analysis Procedure	Equivalent Lateral Force

**ABBREVIATIONS**

ADD'L ARCH	ADDITIONAL ARCHITECT
B/XXX	BOTTOM OF XXX
BOH	BOTTOM OF HEADER
BOS	BOTTOM OF STEEL
BOI	BOTTOM BEARING
CL	CENTER LINE
CLR	CLEAR
CJ	CONTROL JOINT
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC.	CONCRETE
CONN.	CONNECTION
CONT.	CONTINUOUS
DIA	DIAMETER
DWG	DRAWING
(E)	EXISTING
EA	EACH
EF	EACH FACE
ELEV	ELEVATION
EMBED	EMBEDMENT
EOD	EDGE OF DECK
EOJ	END OF JOIST
EOR	ENGINEER OF RECORD
EOS	EDGE OF SLAB
EQ	EQUAL
E.W.	EACH WAY
(F)	FUTURE
FFE	FINISHED FLOOR ELEVATION
FLR.	FLOOR
FIN.	FINISHED
FOB	FACE OF BRICK
FOC	FACE OF CONCRETE
FOM	FACE OF MASONRY
FOS	FACE OF STUD
FS	FAR SIDE
FTG	FOOTING
GLV.	GALVANIZED
G.C.	GENERAL CONTRACTOR
(H)	HOOK
HOG	HOT-DIP GALVANIZED
HORIZ.	HORIZONTAL
HS	HIGH STRENGTH
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LONG	LONGITUDINAL
LSH	LONG SIDE HORIZONTAL
LSV	LONG SIDE VERTICAL
LT. GA.	LIGHT GAUGE
MANUF.	MANUFACTURER
MAX	MAXIMUM
MECH	MECHANICAL
MIN	MINIMUM
MSH	METAL STUD HEADER
NIC	NOT IN CONTRACT
NS	NEAR SIDE
O.C.	ON CENTER
O.H.	OPPOSITE HAND
P.A.F.	POWER-ACTUATED FASTENER
PL	PLATE
P.T.	PRESSURE TREATED
REINF.	REINFORCING
REF.	REFERENCE
REQ'D	REQUIRED
R.O.	ROUGH OPENING
RTU	ROOF TOP UNIT
SCHED.	SCHEDULE
SM	SIMILAR
SJ	SLAB JOINT
SOG	SLAB-ON-GRADE
STD	STANDARD
T&B	TOP AND BOTTOM
T/XXX	TOP OF XXX
TOS	TOP OF STEEL
TRANS	TRANSVERSE
TYP	TYPICAL
U.N.O.	UNLESS NOTED OTHERWISE
VERT.	VERTICAL
V.I.F.	VERIFY IN FIELD
W/	WITH
W.P.	WORK POINT
W/W	WELDED WIRE FABRIC



FULLER STRUCTURAL, INC.  
1350 C Cleveland St., Greenville, SC 29607  
O: 864.235.3580 · F: 864.235.3577  
info@fullergrp.com · fullergrp.com  
FULLER GROUP PROJECT # 24396  
NC FIRM CERT. NO: C-1903

JOHN P. WATKINS, ARCHITECT  
56 HILLMARK DRIVE  
COLUMBIA, SOUTH CAROLINA 29210

**Craig A. Otto**  
ARCHITECT, INC.

DESIGN • PLANNING • ARCHITECTURE

105 West Main Street, Suite C  
Lexington, South Carolina 29072  
Phone (803) 957-9004  
craig@craigottoarchitect.com

No.	Revisions	Date
0	Issued For Construction	02/07/2025

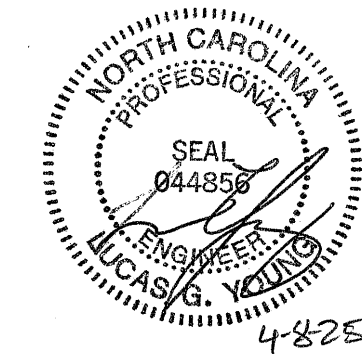
All rights reserved. This drawing and the design shown thereon are copyrighted as prescribed by the laws of the United States and are the sole property of Craig A. Otto, Architect, Inc. Anyone duplicating, reproducing, or causing to be reproduced these drawings or the design thereon without permission of the architect will be subject to legal action.

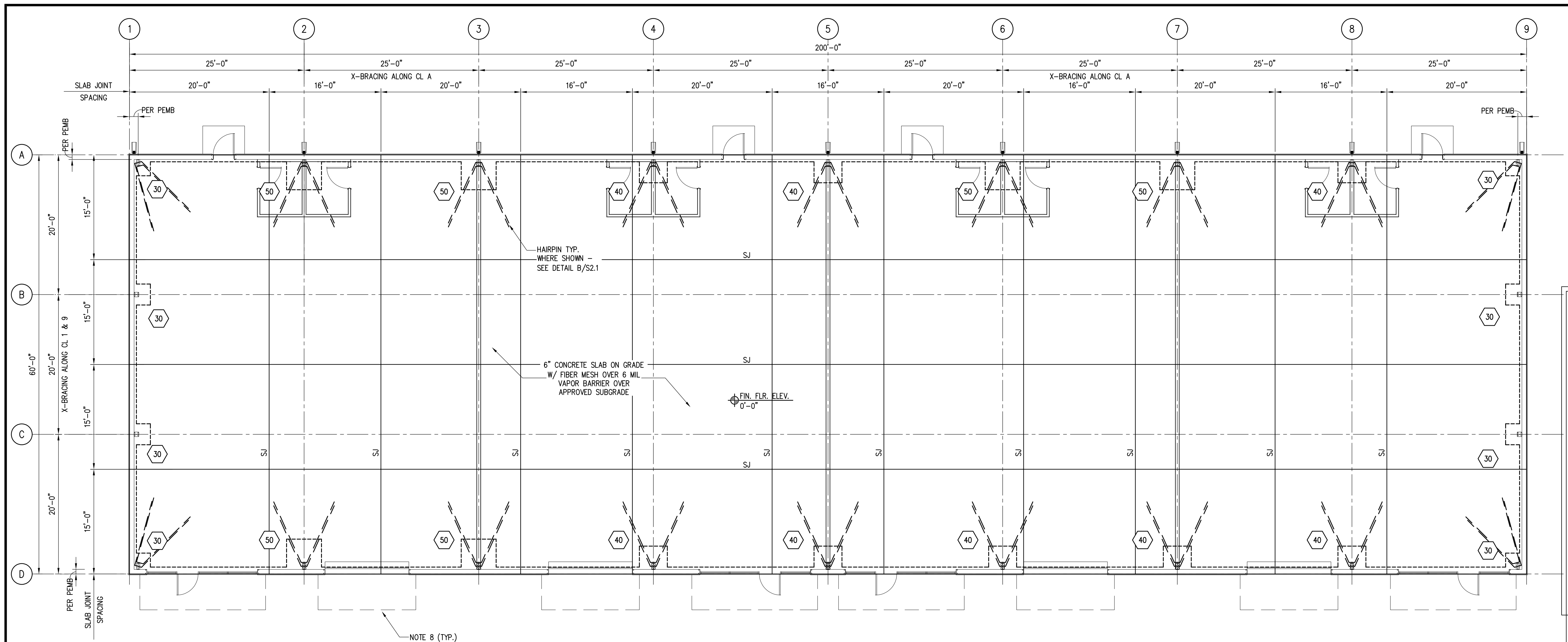
Project Title  
**ASSOCIATED CONTRACT SERVICES  
JARCO DR, FUQUAY VARINA, NC**

Drawing Title  
GENERAL NOTES AND  
DESIGN CRITERIA

Consultant

Seal	Date FEBRUARY 7, 2025
	Drawn By NLH
	Drawing No. 50.1





**1 FOUNDATION PLAN**  
 S1.1 SCALE : 1/8" = 1'-0"

- LEGEND**
- EOS EDGE OF SLAB
  - SJ SAWN JOINT - SEE A/S2.1
  - 30 FOOTING TYPE - SEE SCHEDULE

**NOTE:**  
 CIVIL DRAWINGS WERE NOT PROVIDED AT TIME OF DEVELOPMENT OF THESE CONSTRUCTION DOCUMENTS. DOCUMENTS HAVE BEEN DESIGNED AS IF THE SITE IS FLAT. CIVIL DRAWINGS SHALL BE SUBMITTED PRIOR TO BEGINNING CONSTRUCTION TO THE ENGINEER OF RECORD.

**NOTE:**  
 FINAL GEOTECHNICAL REPORT RECOMMENDATIONS WERE NOT PROVIDED AT TIME OF DEVELOPMENT OF THESE DOCUMENTS. ASSUMPTIONS REGARDING FROST DEPTH, BEARING CAPACITY AND SUBGRADE WILL NEED TO BE VERIFIED AND MAY IMPACT THE DESIGN SHOWN.

- NOTES TO METAL BUILDING MANUFACTURER**
1. METAL BUILDING DRAWINGS TO BE SEALED & SIGNED BY AN ENGINEER REGISTERED IN THE STATE OF SOUTH CAROLINA.
  2. ALL STEEL COLUMNS, GIRTS & ROOF FRAMING BY METAL BUILDING MANUFACTURER.
  3. NO FIXED BASES ALLOWED UNLESS SPECIFIED ON DWG.
  4. FOR ANCHOR BOLT & COLUMN SIZES & LOCATIONS SEE METAL BUILDING DRAWINGS. ANCHOR BOLTS SHALL BE FABRICATED AS PER DETAIL C/S2.1

FOOTING SCHEDULE			
TYPE	SIZE	THICKNESS	REINFORCING
30	3'-0"x3'-0"	1'-10"	(5) #5 EACH WAY
40	4'-0"x4'-0"	1'-10"	(7) #5 EACH WAY
50	5'-0"x5'-0"	1'-10"	(8) #5 EACH WAY

- FOUNDATION PLAN NOTES**
1. SEE SHEET S0.1 FOR GENERAL NOTES & DESIGN CRITERIA.
  2. ELEVATIONS GIVEN ARE SET FROM REFERENCE ELEVATION. REFERENCE ELEVATION (+0'-0") IS SET AT FINISHED FLOOR ELEV. SEE CIVIL DRAWINGS FOR ADDITIONAL INFORMATION.
  3. REFER TO ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING, AND DRAWINGS OF OTHER DISCIPLINES FOR LOCATIONS AND DIMENSIONS OF OPENINGS, DEPRESSIONS, AND OTHER NON-STRUCTURAL ITEMS.
  4. TYPICAL SLAB-ON-GRADE IS 6" NORMAL WEIGHT CONCRETE REINFORCED W/ 6x6 - W2.9xW2.9 WWF OVER 10 MIL VAPOR BARRIER, OVER APPROVED SUBBASE OVER APPROVED SUBGRADE PREPARED IN ACCORDANCE W/ GEOTECHNICAL REPORT. LOCATE REINFORCING 1 1/2" CLR. FROM T/SLAB.
  5. PROVIDE (2) #3x3'-0" IN TOP OF SLAB @ ALL RE-ENTRANT CORNERS NOT INTERSECTING A SLAB JOINT.
  6. LOCATE SLAB JOINTS @ 20'-0" O.C. MAX. SLAB JOINTS SHALL BE LOCATED TO MAINTAIN A MAXIMUM PANEL ASPECT RATIO OF 1.5 TO 1.0. SLAB JOINTS SHALL BE CONSTRUCTED PER DETAIL A/S2.1.
  7. SEE C/S2.1 FOR ANCHORAGE DETAILS.
  8. U.N.O. CANOPY FRAMING & ATTACHMENT IS BY OTHERS. SEE ARCHITECTURAL FOR ADDITIONAL INFORMATION.

**FULLER**  
 structural

FULLER STRUCTURAL, INC.  
 1350 C Cleveland St., Greenville, SC 29607  
 O: 864.235.3580 - F: 864.235.3577  
 info@fullergrp.com · fullergrp.com

FULLER GROUP PROJECT # 24396  
 NC FIRM CERT. NO: C-1903

**JOHN P. WATKINS, ARCHITECT**  
 56 HILLMARK DRIVE  
 COLUMBIA, SOUTH CAROLINA 29210

**Craig A. Otto**  
 ARCHITECT, INC.

DESIGN • PLANNING • ARCHITECTURE

105 West Main Street, Suite C  
 Lexington, South Carolina 29072  
 Phone (803) 957-9004  
 craig@craigottoarchitect.com

No.	Revisions	Date
0	Issued For Construction	02/07/2025

All rights reserved. This drawing and the design shown thereon are copyrighted as prescribed by the laws of the United States and are the sole property of Craig A. Otto, Architect, Inc. Anyone duplicating, reproducing, or causing to be reproduced these drawings or the design thereon without permission of the architect will be subject to legal action.

Project Title  
**ASSOCIATED CONTRACT SERVICES**  
**JARCO DR., FUQUAY VARINA, NC**

Drawing Title  
 FOUNDATION PLAN

Consultant

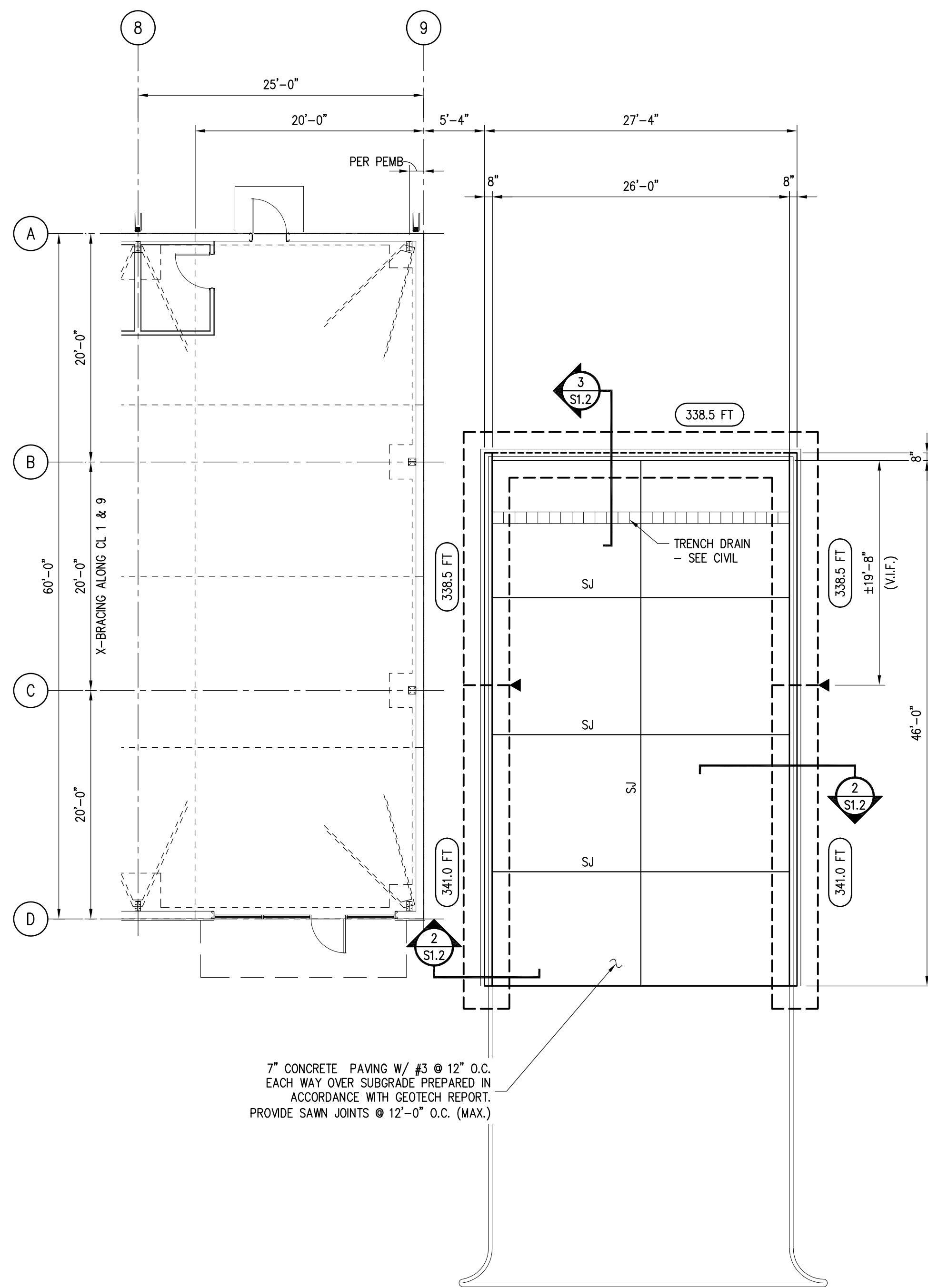
Seal

Date  
**FEBRUARY 7, 2025**

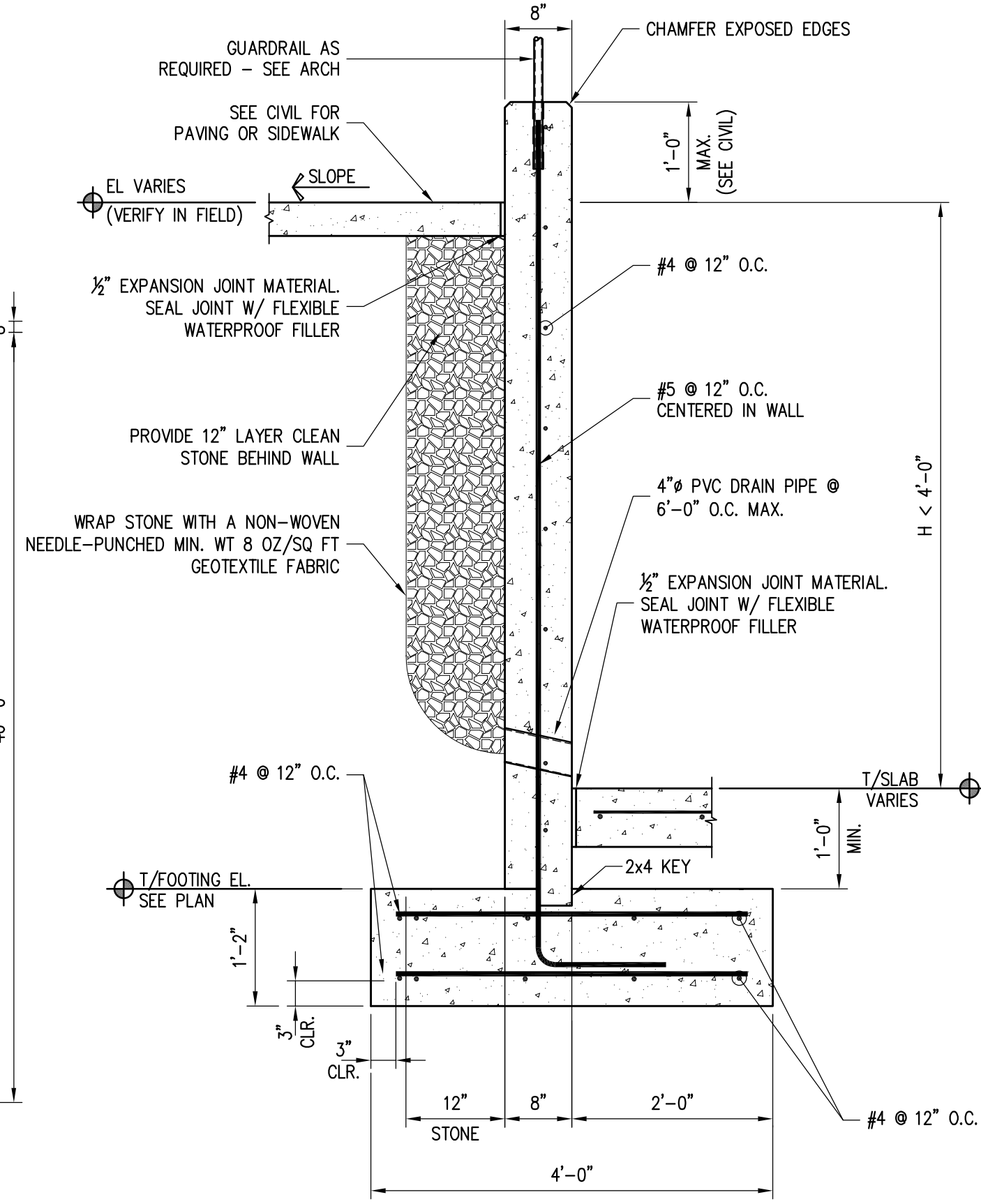
Drawn By  
 NLH

Drawing No.  
**S1.1**

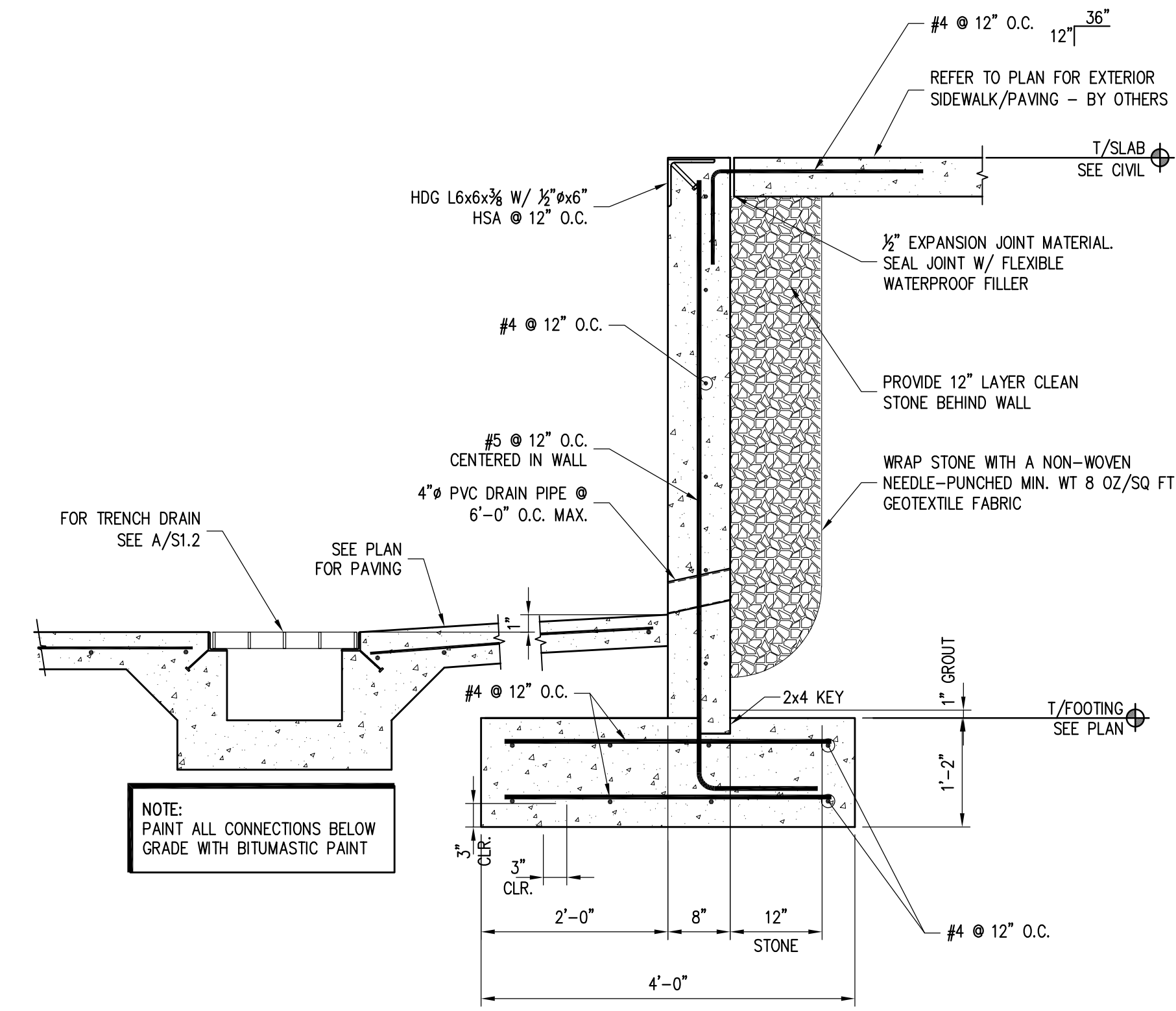
4-825



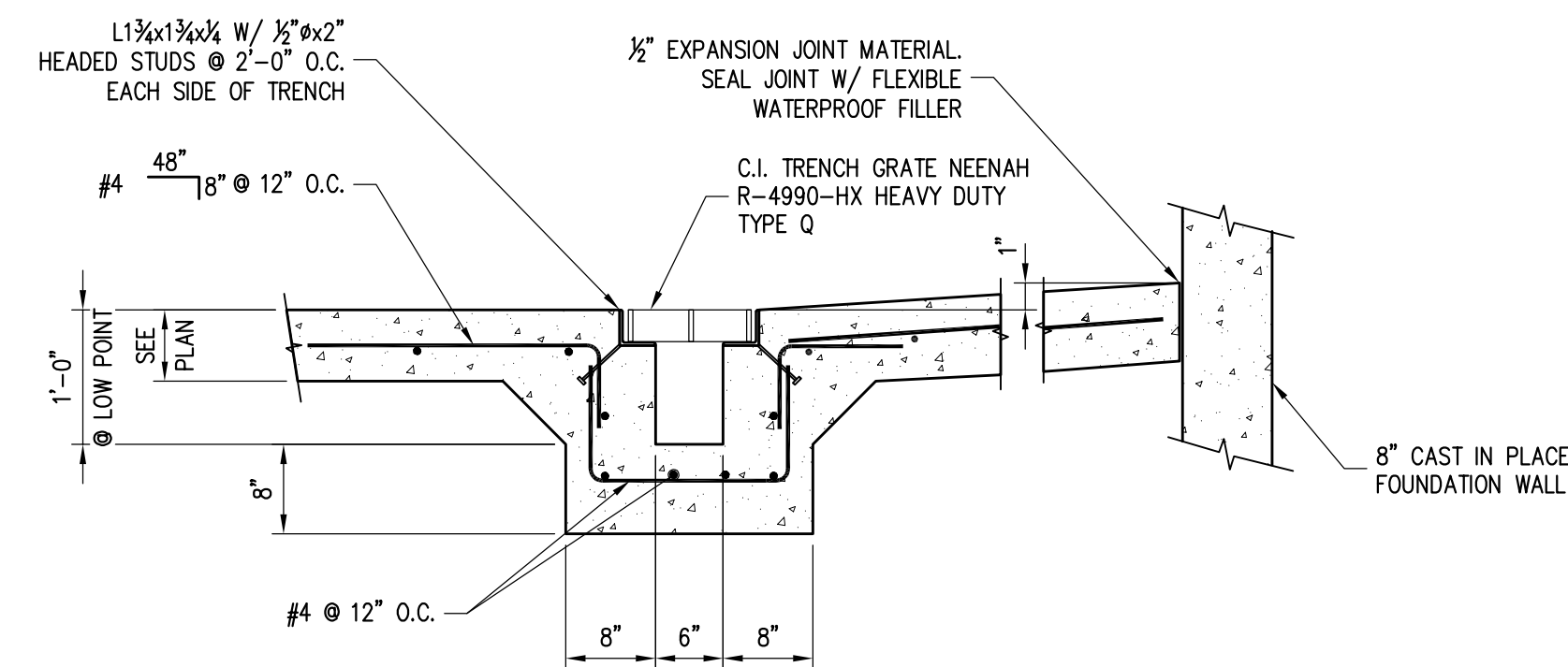
7" CONCRETE PAVING W/ #3 @ 12" O.C. EACH WAY OVER SUBGRADE PREPARED IN ACCORDANCE WITH GEOTECH REPORT. PROVIDE SAWN JOINTS @ 12'-0" O.C. (MAX.)



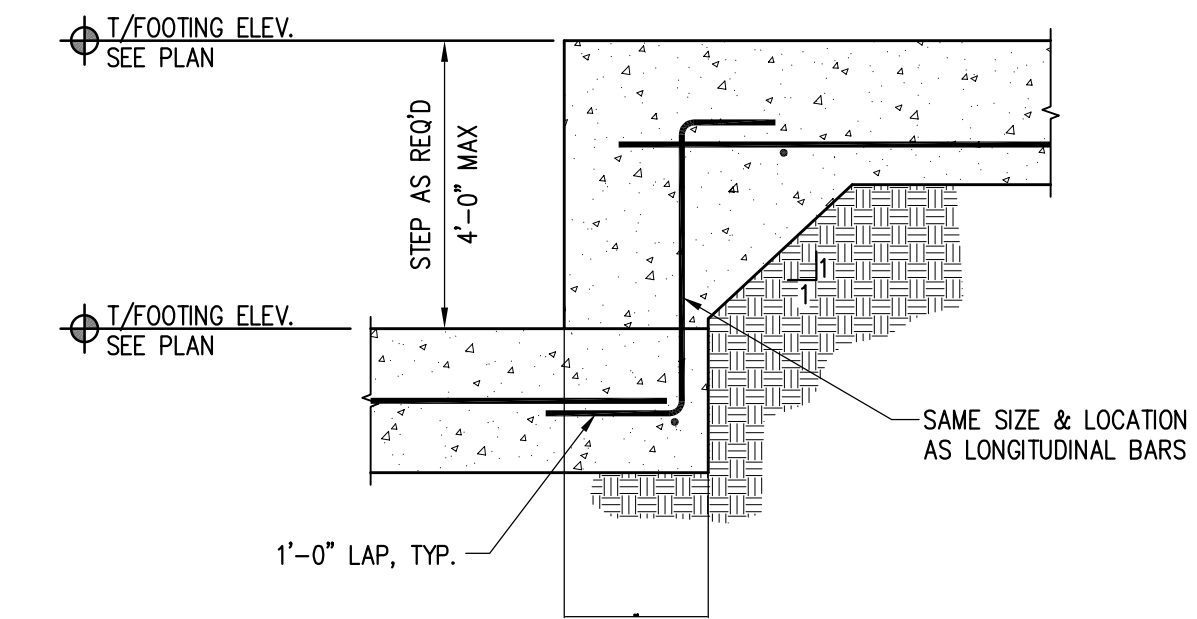
**SECTION 2**  
SCALE : 3/4" = 1'-0"



**SECTION 3**  
SCALE : 3/4" = 1'-0"



**DETAIL A**  
SCALE : 3/4" = 1'-0"



**DETAIL B**  
SCALE : 3/4" = 1'-0"

**1 TRUCK DOCK FOUNDATION PLAN**  
SCALE : 1/8" = 1'-0"

- LEGEND**
- SJ SAWN JOINT - SEE A/S3.1
  - EOS EDGE OF SLAB
  - STEP IN FOOTING - SEE DETAIL B/S1.2
  - ??? FT T/FOOTING ELEVATION

**NOTE:**  
FINAL GEOTECHNICAL REPORT RECOMMENDATIONS WERE NOT PROVIDED AT TIME OF DEVELOPMENT OF THESE DOCUMENTS. ASSUMPTIONS REGARDING FROST DEPTH, BEARING CAPACITY AND SUBGRADE WILL NEED TO BE VERIFIED AND MAY IMPACT THE DESIGN SHOWN.

**FULLER**  
structural  
FULLER STRUCTURAL, INC.  
1350 C Cleveland St., Greenville, SC 29607  
O: 864.235.3580 · F: 864.235.3577  
info@fullergrp.com · fullergrp.com  
FULLER GROUP PROJECT # 24396  
NC FIRM CERT. NO: C-1903

JOHN P. WATKINS, ARCHITECT  
56 HILLMARK DRIVE  
COLUMBIA, SOUTH CAROLINA 29210

**Craig A. Otto**  
ARCHITECT, INC.

DESIGN • PLANNING • ARCHITECTURE

105 West Main Street, Suite C  
Lexington, South Carolina 29072  
Phone (803) 957-9004  
craig@craigottoarchitect.com

No.	Revisions	Date
0	Issued For Construction	02/07/2025

All rights reserved. This drawing and the design shown thereon are copyrighted as prescribed by the laws of the United States and are the sole property of Craig A. Otto, Architect, Inc. Anyone duplicating, reproducing, or causing to be reproduced these drawings or the design thereon without permission of the architect will be subject to legal action.

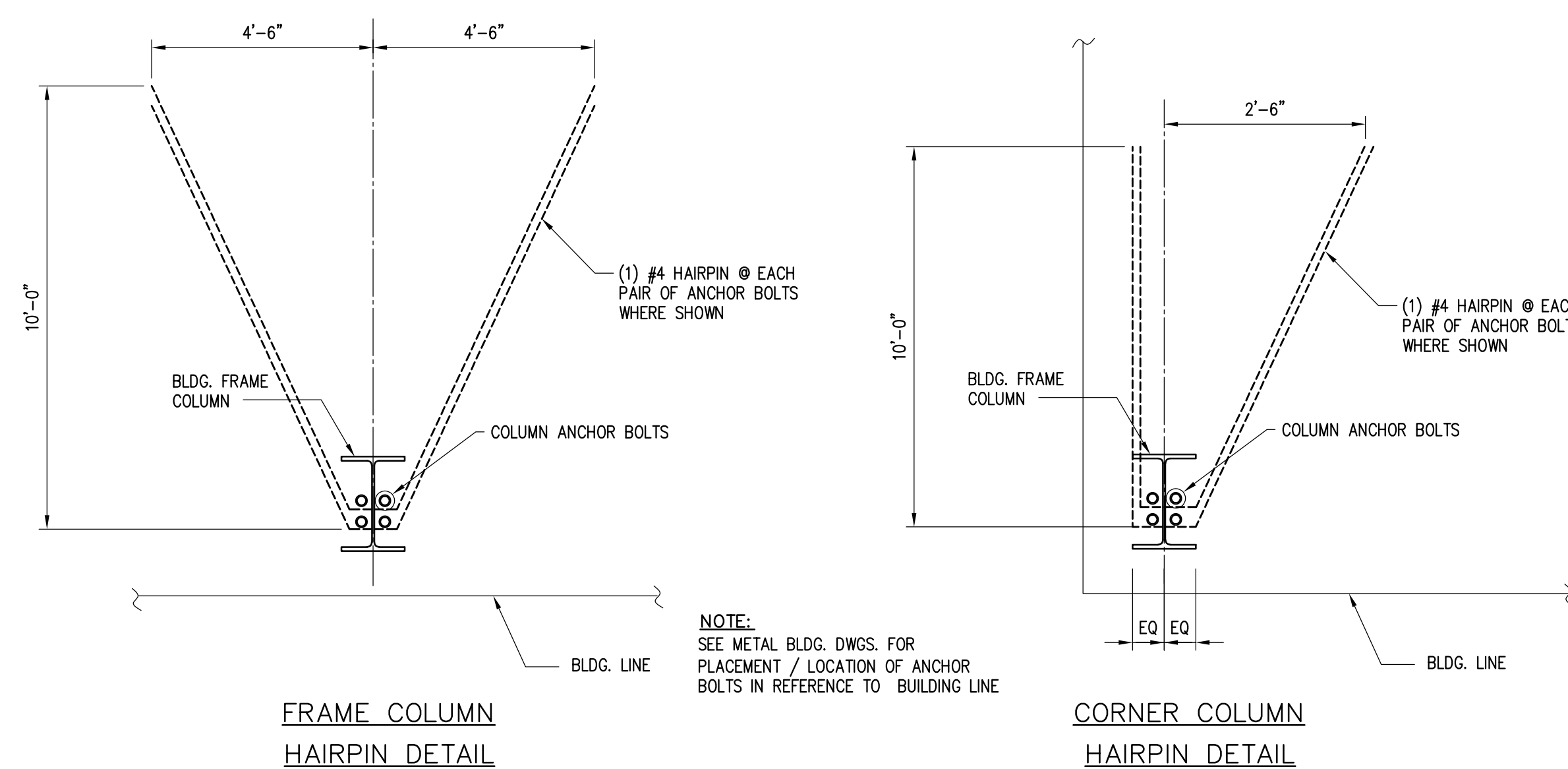
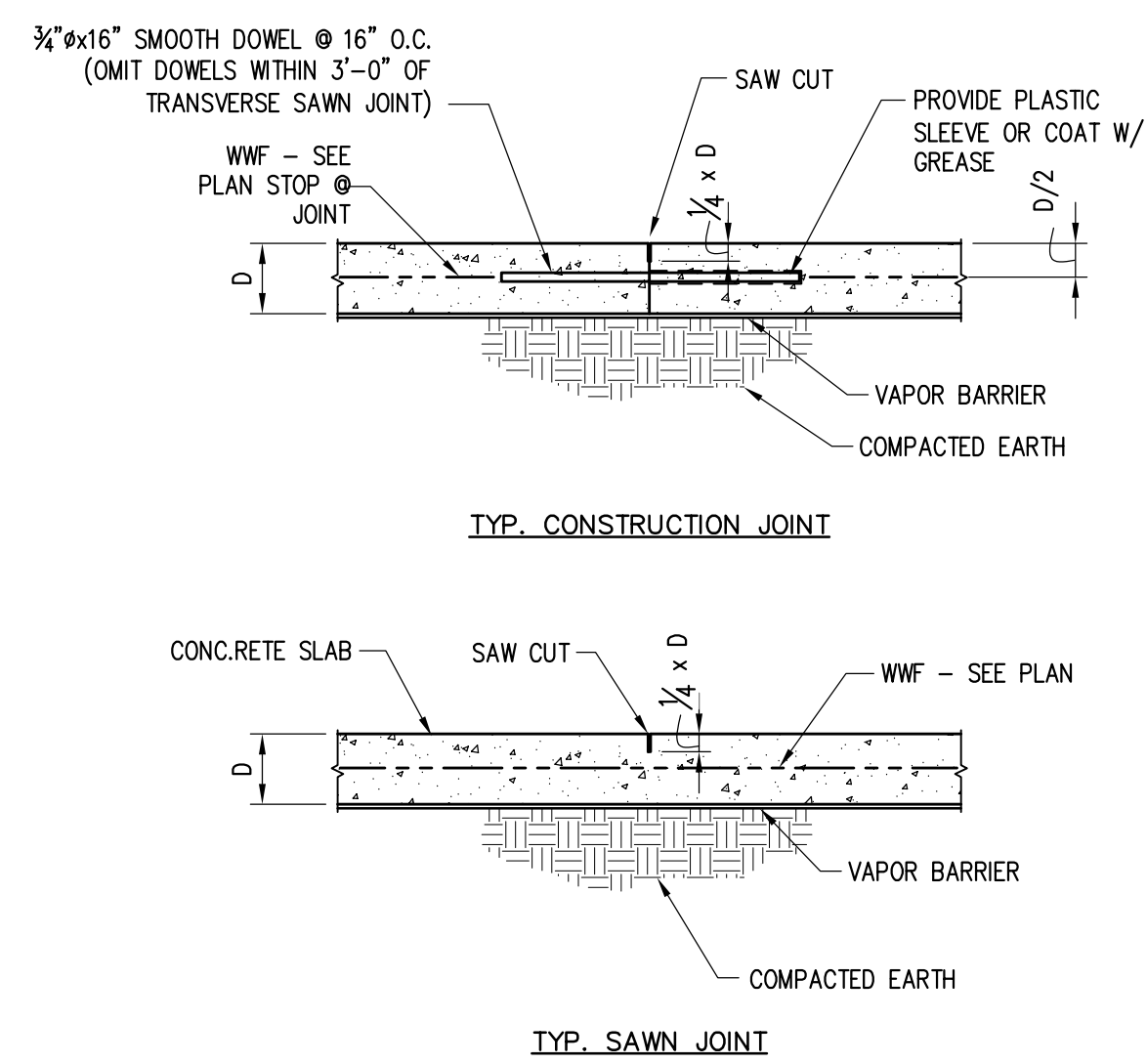
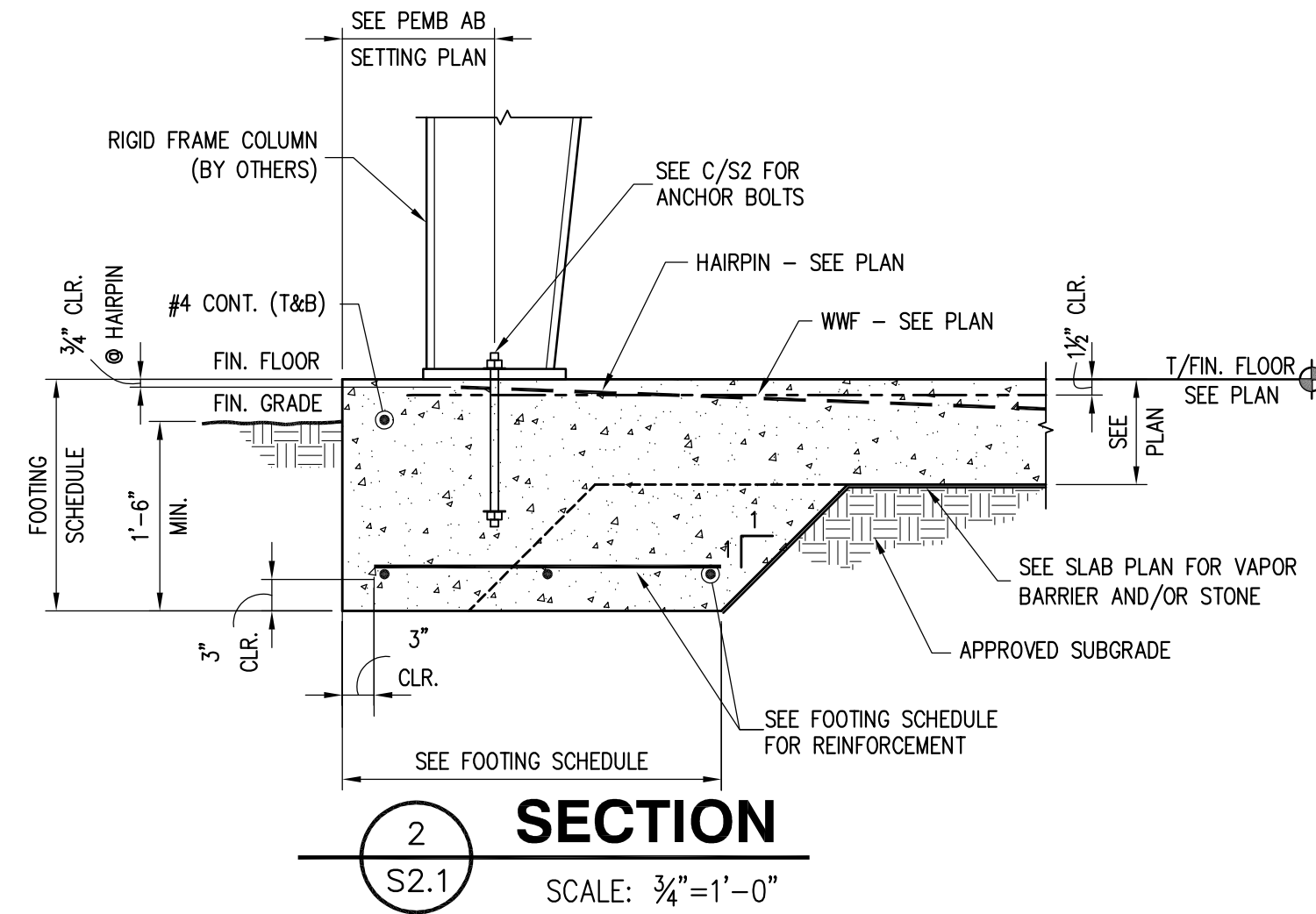
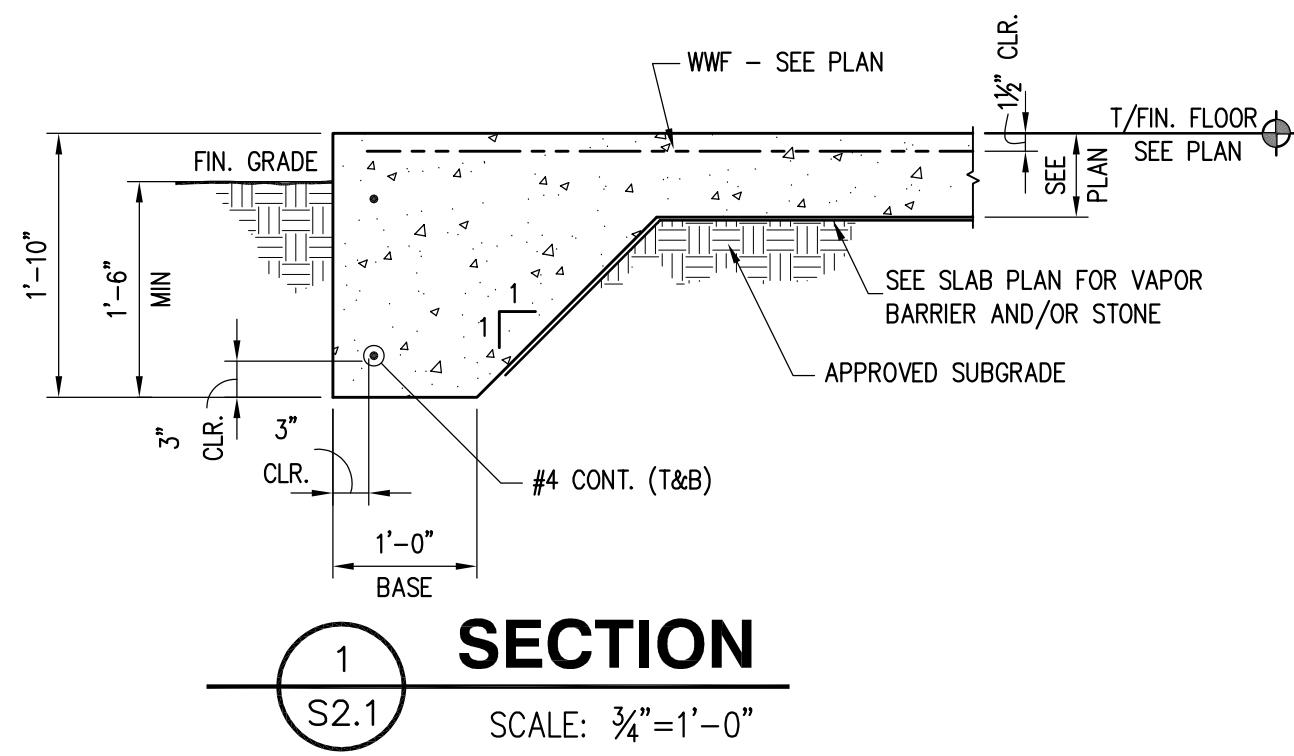
Project Title  
**ASSOCIATED CONTRACT SERVICES  
JARCO DR, FUGUAY VARINA, NC**

Drawing Title  
TRUCK DOCK FOUNDATION PLAN  
AND DETAILS

Consultant

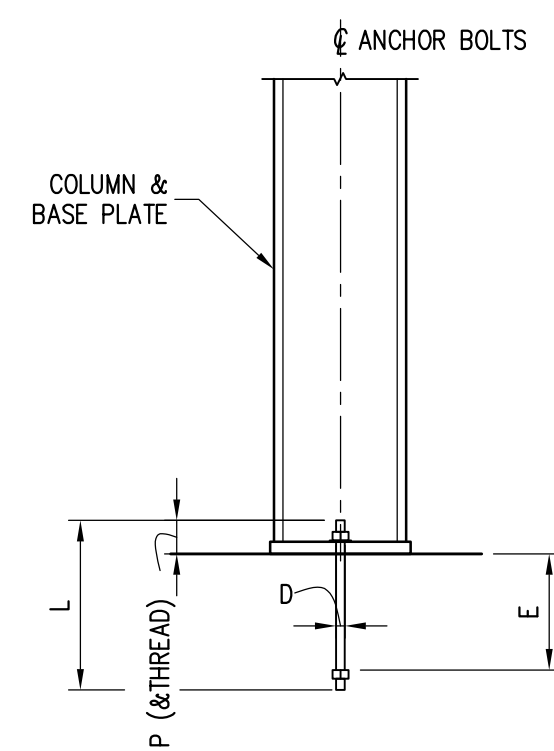
Seal 	Date FEBRUARY 7, 2025
	Drawn By NLH
	Drawing No. S1.2

4-825



**A** TYPICAL SLAB JOINT DETAILS  
SCALE: NTS

**B** DETAIL  
SCALE: NTS



ANCHOR BOLT SCHEDULE			
D	E	P	L
1/2"	6"	2"	10"
5/8"	7 1/2"	2"	11 1/2"
3/4"	9"	2 1/4"	13 1/4"
7/8"	10 1/2"	2 3/4"	15 1/4"
1"	12"	3"	17"
1 1/4"	15"	3 3/4"	20 3/4"
1 1/2"	18"	4 1/2"	24 1/2"
1 3/4"	21"	5 1/4"	28 1/4"
2"	25"	6"	33"

TYP. ANCHOR BOLT (F1334 GR. 50 STEEL)  
**C** DETAIL  
SCALE: NTS

**FULLER**  
structural  
FULLER STRUCTURAL, INC.  
1350 C Cleveland St., Greenville, SC 29607  
O: 864.235.3580 · F: 864.235.3577  
info@fullergrp.com · fullergrp.com  
FULLER GROUP PROJECT # 24396  
NC FIRM CERT. NO: C-1903

JOHN P. WATKINS, ARCHITECT  
56 HILLMARK DRIVE  
COLUMBIA, SOUTH CAROLINA 29210

**Craig A. Otto**  
ARCHITECT, INC.

DESIGN • PLANNING • ARCHITECTURE

105 West Main Street, Suite C  
Lexington, South Carolina 29072  
Phone (803) 957-9004  
craig@craigottoarchitect.com

No.	Revisions	Date
0	Issued For Construction	02/07/2025

All rights reserved. This drawing and the design shown thereon are copyrighted as prescribed by the laws of the United States and are the sole property of Craig A. Otto, Architect, Inc. Anyone duplicating, reproducing, or causing to be reproduced these drawings or the design thereon without permission of the architect will be subject to legal action.

Project Title  
**ASSOCIATED CONTRACT SERVICES  
JARCO DR, FUGUAY VARINA, NC**

Drawing Title  
FOUNDATION DETAILS

Consultant

Seal  
Date  
FEBRUARY 7, 2025  
Drawn By  
NLH  
Drawing No.  
S2.1

# GENERAL PLUMBING NOTES:

## ADMINISTRATIVE:

- THE FOLLOWING ABBREVIATIONS SHALL APPLY TO NOTES AND PLANS:  
PC - PLUMBING CONTRACTOR,  
EC - ELECTRICAL CONTRACTOR,  
MC - MECHANICAL CONTRACTOR,  
GC - GENERAL CONTRACTOR,  
FASC - FIRE ALARM SYSTEM CONTRACTOR.  
SPC- CURRENT STATE PLUMBING CODE (2018 NORTH CAROLINA STATE BUILDING CODE: PLUMBING CODE)
- "PROVIDE" MEANS TO FURNISH AND INSTALL. THE PLUMBING CONTRACTOR SHALL ALSO INSTALL MATERIALS FURNISHED BY OTHERS AND THE GENERAL CONTRACTOR.
- THE PC SHALL BE RESPONSIBLE FOR A COMPLETE AND OPERATIONAL SYSTEM AS DESCRIBED BY THESE PLANS AND SPECIFICATIONS.
- ALL MATERIALS AND EQUIPMENT SHALL BE DELIVERED TO THE SITE AND UNLOADED AT AN APPROVED LOCATION. PC SHALL PROTECT ALL MATERIALS AND EQUIPMENT FROM BREAKAGE, THEFT, AND THE ELEMENTS. ALL MATERIALS AND EQUIPMENT SHALL REMAIN THE PROPERTY OF THE PC UNTIL THE PROJECT HAS BEEN COMPLETED AND TURNED OVER TO THE OWNER.
- ALL MATERIALS USED SHALL BE NEW AND FREE OF DEFECTS. ANY MATERIALS FOUND TO BE DEFECTIVE SHALL BE REPLACED AT NO EXPENSE TO THE OWNER. ALL MATERIALS AND EQUIPMENT SHALL BEAR APPROVAL FROM UL OR AN APPROVED THIRD-PARTY AGENCY. WHERE A MANUFACTURER AND MODEL NUMBER IS GIVEN, IT IS TO ESTABLISH A STANDARD OF QUALITY AND NOT TO LIMIT PRODUCTS TO A PARTICULAR MANUFACTURER. PRODUCTS DETERMINED TO BE EQUAL BY THE ENGINEER WILL BE ACCEPTED.
- THE PLUMBING SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE SPC AND ANY APPLICABLE LOCAL CODES. WHERE A CONFLICT EXISTS BETWEEN THE ABOVE REQUIREMENTS, THE CONTRACTOR SHALL OBTAIN CLARIFICATION FROM THE ENGINEER OR IN THE EVENT ANY PART OF THESE PLANS CONFLICTS WITH THE ABOVE REQUIREMENTS.
- THE PC SHALL OBTAIN AND PAY FOR ALL PERMITS, FEES, AND INSPECTIONS NECESSARY FOR THE COMPLETION OF THE WORK UNDER THIS CONTRACT.
- DO NOT SCALE THESE DRAWINGS-REFER TO ARCHITECTURAL SHEETS FOR DIMENSIONS.
- THESE PLANS ARE DIAGRAMMATIC. THE PC SHALL ADJUST THE LOCATIONS OF EQUIPMENT, FIXTURES, PIPING, ETC. TO ACCOMMODATE PLANNED AND ENCOUNTERED INTERFERENCES. THE DRAWINGS DO NOT SHOW ALL BENDS, OFFSETS, AND FITTINGS THAT MAY BE REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM. THE PC SHALL MAKE ALLOWANCES FOR SUCH DEVIATIONS AND CONTINGENCIES IN BID TO IMPLEMENT THEM WITHOUT ADDITIONAL COST TO THE OWNER.
- THE PC SHALL VISIT THE SITE PRIOR TO BIDDING TO BECOME FAMILIAR WITH EXISTING CONDITIONS. CONTRACTOR SHALL CONTACT THE ENGINEER TO RESOLVE ANY DISCREPANCIES BETWEEN EXISTING CONDITIONS AND THESE PLANS. TO AVOID POTENTIAL CONFLICTS, COORDINATE WITH OTHER TRADES PRIOR TO THE START OF CONSTRUCTION.
- ALL UNDERGROUND UTILITIES SHALL BE LOCATED PRIOR TO ANY DIGGING.
- TRENCHING, COMPACTION, AND BACKFILL SHALL BE BY PC AND SHALL BE IN ACCORDANCE WITH SECTION 306 OF THE SPC. UNDERGROUND LINES SHALL BE LOCATED SUCH THAT THEY DO NOT ENDANGER FOOTINGS OR FOUNDATION WALLS.
- THE PC SHALL PROVIDE FIRESTOPPING AT ALL PENETRATIONS OF RATED FLOOR/CEILING ASSEMBLIES AND RATED WALL ASSEMBLIES TO PRESERVE OR RESTORE THE FIRE RESISTANCE RATING. SEAL ALL PENETRATIONS USING A UL LISTED SYSTEM FOUND IN THE UL DIRECTORY SPECIFIC TO THE UL LISTING OF THE ASSEMBLY BEING PENETRATED. SEE ARCHITECTURAL PLANS FOR UL RATED ASSEMBLIES SPECIFIC TO THE PROJECT.
- SYSTEM TESTING SHALL BE PERFORMED BY PLUMBING CONTRACTOR IN ACCORDANCE WITH SPC, SECTIONS 312.2, 312.3, AND 312.5.
- PC SHALL DISINFECT THE ENTIRE DOMESTIC WATER PIPING SYSTEM IN ACCORDANCE WITH THE AMERICAN WATER WORKS ASSOCIATION'S SPECIFICATIONS AND LOCAL HEALTH DEPARTMENT REGULATIONS.
- AT THE COMPLETION OF WORK AND PRIOR TO ACCEPTANCE BY OWNER, THE PC SHALL CLEAN ALL EXPOSED FIXTURES, MATERIALS, AND EQUIPMENT UNDER THIS CONTRACT.
- PC SHALL COORDINATE WITH THE GENERAL CONTRACTOR TO ENSURE ALL APPLICABLE CONSTRUCTION WASTE IS RECYCLED DURING THE CONSTRUCTION PHASE OF THE PROJECT.
- ALL PLUMBING SCOPE IS WITHIN FIVE (5) FEET OF EXTERIOR OF BUILDING OR AS SHOWN ON PLANS.

## METHODS:

- EXTEND DOMESTIC WATER PIPE AS INDICATED ON THE PLANS AND INSTALL DOMESTIC WATER DISTRIBUTION PIPING TO ALL FIXTURES AND EQUIPMENT REQUIRING THE SAME. WATER SERVICE PIPE AND THE BUILDING SEWER SHALL BE SEPARATED BY 5 FEET OF UNDISTURBED OR COMPACTED EARTH IN ACCORDANCE WITH 603.2 SPC. PROVIDE ALL FITTINGS, VALVES, AND OTHER ACCESSORIES AS NECESSARY FOR A COMPLETE INSTALLATION. ALL DOMESTIC WATER PIPING SHALL BE CONCEALED IN FINISHED AREAS. ANY OPEN ENDS SHALL BE PROTECTED UNTIL FINAL CONNECTIONS ARE MADE.
- ABOVE GRADE DOMESTIC WATER PIPING SHALL BE SLOPED AT A MINIMUM OF 1/32 INCH PER FOOT AND ARRANGED TO DRAIN AT LOW POINTS. INSTALL PIPING TO ALLOW FOR EXPANSION AND CONTRACTION WITHOUT STRESSING PIPE, JOINTS, OR CONNECTED

- EQUIPMENT. ROUTE PIPING IN AN ORDERLY MANNER-PARALLEL OR PERPENDICULAR TO WALLS WHEN POSSIBLE-AND MAINTAIN GRADIENT. EACH SUPPLY BRANCH LINE SERVING MORE THAN ONE FIXTURE SHALL HAVE A SHUTOFF VALVE INSTALLED TO ISOLATE ALL FIXTURES AND PIECES OF EQUIPMENT SUPPLIED BY THE BRANCH LINE. THE SHUTOFF VALVE SHALL BE LABELED AND LOCATED AS CLOSE TO THE CONNECTION TO THE SUPPLY MAIN AND RISER AS POSSIBLE. PROVIDE A FULL-OPEN VALVE ON THE BASE OF EVERY WATER RISER PIPE AND ON THE TOP OF EVERY WATER DOWN-FEED PIPE. PROVIDE VALVE HANDLE EXTENSIONS AS NECESSARY FOR INSULATION.
- IT SHALL BE THE RESPONSIBILITY OF THE PC TO SUSPEND AND SUPPORT ALL PIPING SYSTEMS FOLLOWING RECOGNIZED ENGINEERING PRACTICES AND USING STANDARD, COMMERCIALY ACCEPTED PIPE HANGERS AND SUSPENSION EQUIPMENT. ALL FIXTURES, DEVICES, AND EQUIPMENT SHALL BE SECURELY MOUNTED TO THE BUILDING STRUCTURE AND SHALL NOT RELY ON CEILING OR WALL SURFACES FOR SUPPORT. THE SUPPORT ATTACHMENT SHALL SUPPORT THE WEIGHT OF THE FIXTURE OR EQUIPMENT PLUS THE WEIGHT OF THE SUPPORT ATTACHMENT ITSELF. SUPPORT FROM THE TOP CHORD OF THE ROOF JOISTS, GIRDERS, AND BEAMS. THE BOTTOM CHORD IS NOT TO BE USED FOR EQUIPMENT AND PIPING SUPPORT. HANGERS SHALL NOT BE ATTACHED TO CORRUGATED STEEL DECKING. USE STEEL HANGERS FOR STEEL AND PLASTIC PIPE AND COPPER OR COPPER-PLATED HANGERS FOR COPPER PIPE. PROVIDE PROTECTION FOR COPPER PIPING IN CONTACT WITH DISSIMILAR METALS. WHERE COPPER PIPING IS SUPPORTED ON HANGERS WITH OTHER PIPING, PROVIDE A PERMANENT ELECTROLYTIC ISOLATION MATERIAL TO PREVENT CONTACT WITH OTHER METALS. IN GENERAL, HANGERS SHALL BE CLEVIS TYPE, STANDARD WEIGHT. FOR PIPING, HANGER SPACING SHALL BE IN ACCORDANCE WITH TABLE 308.5 OF THE SPC. HANGERS AND ACCESSORIES SHALL BE GRINNEL, MASON, OR B-LINE.
- SLEEVE ALL PIPES PASSING THROUGH PARTITIONS, WALLS, AND FLOORS. SLEEVES IN FLOORS AND INTERIOR WALLS OF POURED IN PLACE CONCRETE, BRICK, TILE, OR MASONRY SHALL BE SCHEDULE 40 STEEL PIPE, MACHINE CUT. SLEEVES IN GYPSUM BOARD WALLS SHALL BE 22 GAUGE, ROLLED GALVANIZED SHEET METAL. TACK WELD ON THE LONGITUDINAL SEAM. PROVIDE SLEEVES WHERE PIPES PASS THROUGH FLOORS AND WALLS ABOVE AND BELOW CEILINGS. PROVIDE SPLIT PIPE SLEEVES IN NEW WALLS BUILT UP AROUND EXISTING PIPES. TACK WELD SPLIT SLEEVES TOGETHER. SLEEVES IN WALLS SHALL BE INSTALLED FLUSH WITH THE WALL. SLEEVES IN FLOORS SHALL EXTEND 3/4 INCH ABOVE THE FLOOR-EXCEPT THEY SHALL BE FLUSH FOR 2 HOUR RATED FLOORS-AND SHALL BE FLUSH WITH THE STRUCTURE BELOW. EACH SLEEVE SHALL HAVE AN INSIDE DIAMETER 1 INCH LARGER THAN THE OUTSIDE DIAMETER OF THE COVERING OF EACH COVERED PIPE TO ALLOW CONTINUOUS INSULATION-BUT NOT LESS THAN TWO PIPE SIZES LARGER THAN EACH UNCOVERED. ANNULAR SPACES BETWEEN SLEEVES AND PIPES SHALL BE FILLED OR CAULKED IN AN APPROVED MANNER.
- THE TOP OF WATER PIPES INSTALLED BELOW GRADE OUTSIDE THE BUILDING SHALL BE BELOW THE FROST LINE OR A MINIMUM OF 12 INCHES BELOW FINISHED GRADE WHICHEVER IS GREATER. WATER PIPING INSTALLED IN A WALL EXPOSED TO THE EXTERIOR SHALL BE LOCATED ON THE HEATED SIDE OF THE WALL INSULATION. WATER PIPING INSTALLED IN AN UNCONDITIONED UTILITY ROOM OR UNCONDITIONED ATTIC SHALL BE INSULATED TO A MINIMUM OF R6.5 DETERMINED IN ACCORDANCE WITH ASTM C 177.
- HOT WATER PROVIDED TO PUBLIC HAND-WASHING FACILITIES/LAVATORIES SHALL BE TEMPERED WATER DELIVERED THROUGH AN APPROVED WATER-TEMPERATURE LIMITING DEVICE THAT CONFORMS TO ASSE 1070 OR CSA B125.3.
- INSULATE ALL EXPOSED WASTE AND SUPPLY PIPING UNDER LAVATORIES, SINKS, AND ELECTRIC WATER COOLERS WITH THE HAND-LAV GUARD INSULATION KIT BY TRUEBRO OR EQUAL.
- POTABLE WATER OUTLETS SHALL BE PROTECTED FROM BACKFLOW IN ACCORDANCE WITH 608.15 SPC. PRESSURE TYPE VACUUM BREAKERS SHALL CONFORM TO ASSE 1020 AND SPILPROOF VACUUM BREAKERS SHALL COMPLY WITH ASSE 1056. HOSE-CONNECTION VACUUM BREAKERS SHALL CONFORM TO ASSE 1011, ASSE 1019, ASSE 1035, OR ASSE 1052. CONNECTIONS TO BEVERAGE DISPENSERS, COFFEE MACHINES, AND NON-CARBONATED BEVERAGE DISPENSERS SHALL BE PROTECTED BY A BACKFLOW PREVENTER IN ACCORDANCE WITH ASSE 1022.
- THE PC SHALL INSTALL WATER HAMMER ARRESTORS ON BRANCH LINES WITH QUICK CLOSING VALVES PER MANUFACTURER'S INSTALLATION INSTRUCTIONS. WATER HAMMER ARRESTORS SHALL CONFORM TO ASSE 1010.
- THE PC SHALL PROVIDE CHECK VALVES AT ALL FIXTURES WITH THREADED OUTLETS AS REQUIRED BY CODE. TRAP PRIMERS SHALL BE PROVIDED AS SHOWN ON THE PLANS OR AS REQUIRED.
- ADJUST STOPS AND VALVES FOR INTENDED FLOW RATE TO FIXTURES WITHOUT SPLASHING, NOISE, OR OVERFLOW.
- BEFORE COMMENCING WORK, CHECK INVERT ELEVATIONS REQUIRED FOR SEWER CONNECTIONS, CONFIRM INVERTS, AND VERIFY THESE CAN BE PROPERLY CONNECTED TO WITH SLOPE FOR DRAINAGE AND COVER TO AVOID FREEZING. ONCE INVERTS AND FALL HAVE BEEN ESTABLISHED, EXTEND SANITARY SEWER AS SHOWN AND INSTALL ALL DRAINS, STACKS, VENTS, FLOOR DRAINS, AND CLEANOUTS NECESSARY FOR A COMPLETE INSTALLATION.
- ALL SANITARY SEWER PIPING IS BELOW GRADE OR WITHIN WALLS UNLESS OTHERWISE NOTED. ALL SANITARY VENT PIPING IS ABOVE THE CEILING OR WITHIN WALLS UNLESS OTHERWISE NOTED. SOIL AND WASTE PIPING SHALL BE INSTALLED TO PROVIDE PROTECTION AGAINST FREEZING PER 305.4.1 SPC. WASTE AND SOIL LINES LEAVING THE BUILDING MUST HAVE A MINIMUM COVER OF 3 INCHES.
- SOIL AND WASTE LINES 2-1/2 INCHES AND SMALLER SHALL BE SLOPED AT 1/4 INCH PER FOOT MINIMUM. SOIL AND WASTE LINES 3 INCHES TO 6 INCHES IN DIAMETER SHALL BE SLOPED AT 1/8 INCH PER FOOT MINIMUM.

- FOR WATER CLOSET WASTE CONNECTIONS, A 4 INCH BY 3 INCH CLOSET BEND SHALL BE ACCEPTABLE. WHERE A 3 INCH BEND IS UTILIZED ON WATER CLOSETS, A 4 INCH BY 3 INCH FLANGE SHALL BE INSTALLED TO RECEIVE THE FIXTURE HORN.
  - FOR PLASTIC PIPE SIZES GREATER THAN 6 INCHES, AND OTHER PIPE SIZES GREATER THAN 4 INCHES, RESTRAINTS SHALL BE PROVIDED FOR DRAINPIPES AT ALL CHANGES IN DIRECTION AND AT ALL CHANGES IN DIAMETER GREATER THAN TWO PIPE SIZES. BRACES, BLOCKS, RODDING, BACKFILL AND OTHER SUITABLE METHODS AS SPECIFIED BY THE COUPLING MANUFACTURER SHALL BE UTILIZED.
  - BASES OF STACKS SHALL BE SUPPORTED BY THE BUILDING STRUCTURE, VIRGIN OR COMPACTED EARTH, OR OTHER SUITABLE MATERIAL TO SUPPORT THE WEIGHT OF THE PIPING.
  - HORIZONTAL DRAINPIPES SHALL HAVE CLEANOUTS IN ACCORDANCE WITH 708.1 SPC. EXTEND CLEANOUTS TO FINISHED FLOOR OR WALL SURFACE. LUBRICATE THREADED CLEANOUT PLUGS WITH A MIXTURE OF GRAPHITE AND LINSEED OIL. ENSURE CLEARANCE AT ALL CLEANOUTS FOR RODDING OF DRAINAGE SYSTEM. INSTALL FLOOR CLEANOUTS AT AN ELEVATION TO ACCOMMODATE FINISHED FLOOR. EVERY CLEANOUT SHALL BE INSTALLED TO ALLOW CLEANING IN THE DIRECTION OF FLOW OF THE DRAINAGE PIPE OR AT RIGHT ANGLES THERETO. CLEANOUTS ON 6 INCH AND SMALLER PIPES SHALL BE PROVIDED WITH A CLEARANCE OF NOT LESS THAN 18 INCHES FOR RODDING.
  - DRAINAGE PIPING FOR FUTURE FIXTURES SHALL TERMINATE WITH AN APPROVED CAP OR PLUG.
  - AIR ADMITTANCE VALVES SHALL BE INSTALLED AFTER THE DWV TESTING REQUIRED BY SECTIONS 312.2 AND 312.3 OF THE SPC. PROVIDE ACCESS TO ALL AIR ADMITTANCE VALVES PER CODE. INSTALLATION OF ALL AIR ADMITTANCE VALVES SHALL CONFORM TO SECTION 918 OF THE SPC. AIR ADMITTANCE VALVES SHALL CONFORM TO ASSE 1050 OR 1051.
  - INDIRECT WASTE PIPING THAT EXCEEDS 2 FEET IN DEVELOPED LENGTH MEASURED HORIZONTALLY, OR 4 FEET IN TOTAL DEVELOPED LENGTH, SHALL BE TRAPPED. THE AIR GAP BETWEEN THE INDIRECT WASTE PIPE AND THE FLOOD LEVEL RIM OF THE WASTE RECEPTOR SHALL BE A MINIMUM OF TWICE THE EFFECTIVE OPENING OF THE INDIRECT WASTE PIPE.
  - THE PC SHALL PROVIDE UNIONS FOR DISASSEMBLY AND SERVICE OF ALL FIXTURES AND OTHER RELEVANT PLUMBING EQUIPMENT. UNIONS SHALL BE GROUND-JOINT WITH BRASS SEAT. PROVIDE INSULATING UNIONS AT EACH JUNCTION OF DISSIMILAR MATERIALS.
  - THE PC SHALL ACCURATELY ROUGH-IN ALL FIXTURES ACCORDING TO MANUFACTURER'S INSTALLATION DIMENSIONS AND INSTRUCTIONS. OFFSET ADAPTERS AND FLEXIBLE CONNECTORS ARE NOT ACCEPTABLE. FLUSH HANDLES SHALL BE MOUNTED ON THE WIDE SIDE OF TOILET AREAS FOR ADA COMPLIANCE. INSTALL EACH FIXTURE WITH TRAP EASILY REMOVABLE FOR SERVICING AND CLEANING. SEAL FIXTURES TO WALL AND FLOOR SURFACES WITH SEALANT. SOLIDLY ATTACH WATER CLOSETS TO FLOOR WITH LAG SCREWS. SEAL ALL SELF-RIMMING LAVATORIES AND SINKS (VITREOUS CHINA AND STAINLESS STEEL) WITH A COMMERCIAL GRADE PLUMBER'S PUTTY OR ACRYLIC LATEX CAULK APPLIED TO THE UNDERSIDE OF THE FIXTURE RIM IN A GENEROUS AMOUNT SO THAT WHEN FIXTURE IS SET, SEALANT SHALL OOOZE OUT.
  - ALL VENT THRU THE ROOF (VTR) PENETRATIONS SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR. PC SHALL PROVIDE FLASHING MATERIAL REQUIRED FOR VTRS. JOINTS AT THE ROOF AND AROUND VENT PIPES SHALL BE MADE WATERTIGHT BY THE USE OF LEAD, COPPER, GALVANIZED STEEL, ALUMINUM, OR OTHER APPROVED FLASHINGS OR FLASHING MATERIAL. MAINTAIN MINIMUM 10 FEET FROM ALL OUTSIDE AIR INTAKES.
  - INSTALL FULL OPEN VALVES PER SPC 606.1 ON THE MAIN WATER LINE INTO THE BUILDING. INSTALL SHUTOFF VALVES PER SPC 606.2.
- MATERIALS:**
- BALL VALVES SHALL HAVE BRASS BODY, FULL PORT, CHROME PLATED BALL, WITH TEFLON SEATS, 150 PSI WSP, AND COMPLY WITH MSS SP-110. GATE VALVES SHALL HAVE BRONZE BODY, CLASS 150, AND COMPLY WITH MSS SP-80, TYPE 2 STANDARD. VALVE BODY SHALL BE ASTM B 62. BRONZE WITH INTEGRAL SEAT AND UNION RING BONNET. ENDS SHALL BE THREADED OR SOLDER WITH COPPER-SILICON BRONZE STEM AND SOLID-WEDGE BRONZE DISC. INSTALL VALVES IN LOCATIONS THAT PERMIT EASY ACCESS WITHOUT DAMAGE TO BUILDING OR FINISHED MATERIALS; PROVIDE ACCESS DOORS IF REQUIRED. VALVES SHALL BE BY NIBCO, WATTS, OR STOCKHAM.
  - COLD WATER LINES SHALL BE INSULATED WITH 1/2 INCH THICK FIBROUS GLASS INSULATION WITH A FLAME DENSITY RATING LESS THAN 25 AND A SMOKE DENSITY RATING LESS THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM E 84. HOT WATER LINES UP TO 2 INCHES DIAMETER SHALL HAVE 1 INCH THICK INSULATION CONFORMING TO THE SAME STANDARD. PIPING LARGER THAN 2 INCHES SHALL RECEIVE 1-1/2 INCH THICK INSULATION. CLOSED CELL RUBBER INSULATION MEETING THE SMOKE AND FLAME RATINGS ABOVE MAY BE SUBSTITUTED FOR FIBROUS GLASS TYPE IF SO DESIRED. INSULATION INSTALLED ON PIPING OPERATING BELOW AMBIENT TEMPERATURES MUST HAVE A CONTINUOUS VAPOR RETARDER. ALL JOINTS, SEAMS AND FITTINGS MUST BE SEALED. ON SYSTEMS OPERATING ABOVE AMBIENT, THE BUTT JOINTS SHOULD NOT BE SEALED. ON COLD SURFACES WHERE A VAPOR SEAL MUST BE MAINTAINED, INSULATION SHALL BE APPLIED WITH A CONTINUOUS, UNBROKEN MOISTURE AND VAPOR RETARDER. ALL HANGERS, SUPPORTS, ANCHORS, OR OTHER PROJECTIONS SECURED TO COLD SURFACES SHALL BE INSULATED AND VAPOR SEALED TO PREVENT CONDENSATION. ALL PIPE INSULATION SHALL BE CONTINUOUS THROUGH WALLS, CEILING OR FLOOR OPENINGS, OR SLEEVES EXCEPT WHERE FIRESTOP OR FIRESAFING MATERIALS ARE REQUIRED. INSULATION SHALL HAVE A FACTORY APPLIED ALL-SERVICE JACKET WITH SELF-SEALING LAP. WHITE-KRAFT PAPER BONDED TO ALUMINUM FOIL AND REINFORCED WITH GLASS FIBERS; CONFORMING TO ASTM C 1136

- TYPE 1; VAPOR RETARDER; WITH A SELF-SEALING ADHESIVE. VERIFY THAT PIPING HAS BEEN TESTED. SURFACES ARE CLEAN AND DRY, AND ALL FOREIGN MATERIALS ARE REMOVED BEFORE APPLYING INSULATION MATERIALS. INSULATION SHALL BE BY KNAUF, ARMACELL, JOHNS-MANVILLE, OR OWENS-CORNING.
- ALL INSULATION CONTAINING FIBROUS MATERIALS EXPOSED TO AIRFLOW SHALL BE RATED FOR THAT EXPOSURE OR SHALL BE ENCAPSULATED. INSULATING PROPERTIES FOR ALL MATERIALS SHALL MEET OR EXCEED INDUSTRY STANDARDS. POLYSTYRENE PRODUCTS SHALL MEET ASTM C578 91. ALL INSULATION SHALL BE LOW-EMITTING WITH NOT GREATER THAN 0.05 PPM FORMALDEHYDE EMISSIONS. THE MAXIMUM FLAME SPREAD AND SMOKE DEVELOPED INDEX FOR INSULATION SHALL MEET THE REQUIREMENTS OF THE LOCAL CODES AND ORDINANCES ADOPTED BY THE JURISDICTION IN WHICH THE BUILDING IS LOCATED.
- FAUCETS AND FIXTURE FITTINGS SHALL CONFORM TO ASME A112.18.1. FAUCETS AND FIXTURE FITTINGS THAT SUPPLY DRINKING WATER FOR HUMAN CONSUMPTION SHALL CONFORM TO THE REQUIREMENTS OF NSF 61, SECTION 9. FIXTURE FITTINGS, FAUCETS, AND DIVERTERS SHALL BE INSTALLED AND ADJUSTED SO THAT THE FLOW OF HOT WATER FROM THE FITTINGS CORRESPONDS TO THE LEFT-HAND SIDE OF THE FIXTURE FITTING.
- BACKFLOW PREVENTION SHALL BE IN ACCORDANCE WITH SECTION 608.13 OF THE SPC AND THE LOCAL AUTHORITY HAVING JURISDICTION. REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTERS SHALL CONFORM TO ASSE 1013 OR AWWA C511. THE RELIEF OPENING SHALL DISCHARGE BY AIR GAP. AIR GAPS SHALL COMPLY WITH ASME A112.1.1 AND AIR GAP FITTINGS WITH ASME A112.1.3. DOUBLE CHECK VALVE ASSEMBLIES SHALL CONFORM TO ASSE 1015 OR AWWA C510. ACCESS TO BACKFLOW PREVENTERS SHALL BE PROVIDED AS SPECIFIED BY THE INSTALLATION INSTRUCTIONS OF THE APPROVED MANUFACTURER.
- FOR BELOW GRADE SANITARY WASTE PIPING, PC SHALL USE SERVICE WEIGHT CAST IRON PIPE WITH COMPRESSION JOINTS (ASTM A 74). USE MINIMUM 2" SIZE UNDERGROUND. SOLID WALL SCHEDULE 40 PVC (ASTM D 2665) WITH SCHEDULE 40 SOCKET TYPE PIPE FITTINGS (ASTM D 3311) MAY ALSO BE USED. DO NOT USE PVC PIPE FOR APPLICATIONS WHERE THE WASTEWATER TEMPERATURE EQUALS OR EXCEEDS 140°F OR IF THE BUILDING HEIGHT EXCEEDS 75 FEET.
- FOR ABOVE GRADE SANITARY WASTE AND VENT PIPING, USE SERVICE WEIGHT CAST IRON NO-HUB TYPE WITH COUPLINGS (CISPI 301). SOLID WALL SCHEDULE 40 PVC (ASTM D 2665) WITH SCHEDULE 40 SOCKET TYPE FITTINGS (ASTM D 3311) MAY BE USED IF PERMITTED BY LOCAL CODE, EXCEPT IN BUILDINGS EXCEEDING 75 FEET IN HEIGHT. DO NOT INSTALL PVC IN RETURN AIR PLENUMS. ALL VENT AND BRANCH VENT PIPES SHALL BE SO GRADED AND CONNECTED AS TO DRAIN BACK TO THE DRAINAGE PIPE BY GRAVITY. BRANCH VENTS EXCEEDING 40 FEET IN DEVELOPED LENGTH SHALL BE INCREASED BY ONE NOMINAL SIZE FOR THE ENTIRE DEVELOPED LENGTH OF THE PIPE.
- ALL OVERHEAD DOMESTIC WATER PIPING SHALL BE TYPE L COPPER WITH 95/5 LEAD FREE SOLDER, AND ALL BELOW GRADE WATER PIPING SHALL BE TYPE K COPPER WITH NO JOINTS. ALL PIPING SHALL HAVE MANUFACTURER'S NAME AND THE APPLICABLE STANDARD TO WHICH IT WAS MANUFACTURED CLEARLY MARKED ON EACH LENGTH. PIPING SHALL COMPLY WITH ASTM B-88. USE BRAZED JOINTS ON ALL COPPER PIPING 1-1/2 INCH AND LARGER. ALL PIPE AND PIPE FITTINGS, INCLUDING VALVES AND FAUCETS, USED IN THE WATER DISTRIBUTION SYSTEM SHALL HAVE A MAXIMUM LEAD CONTENT OF 0.25-PERCENT AND SHALL CONFORM TO NSF 61. HOT WATER DISTRIBUTION PIPE AND TUBING SHALL HAVE A MINIMUM PRESSURE RATING OF 100 PSI AT 180°F. COLD WATER DISTRIBUTION PIPE AND TUBING SHALL HAVE A MINIMUM PRESSURE RATING OF 160 PSI AT 73.4°F. DO NOT INSTALL PEX OR CPVC PIPING IN RETURN AIR PLENUMS.
- PC MAY USE PEX (ASTM F 877) WITH APPROVED FITTINGS (ASTM F 1807) WITH OWNER'S APPROVAL. CPVC PIPING (ASTM D 2846 OR ASTM F 441) WITH APPROVED FITTINGS (ASTM D 2846, ASTM F 438, OR ASTM F 439) MAY ALSO BE USED WHERE NOT LOCATED IN PLENUMS. ALL PLASTIC PIPE, FITTINGS, AND COMPONENTS SHALL BE THIRD-PARTY CERTIFIED AS CONFORMING TO NSF 14.
- PC SHALL PROVIDE ALL WATER HEATERS (WATTAGE/INPUT AND CAPACITY AS NOTED IN SCHEDULE). ALL WATER HEATERS SHALL BE THIRD PARTY CERTIFIED; PROVIDE PANS FOR WATER HEATERS IN ACCORDANCE WITH 504.7 OF THE SPC. ELECTRICAL CONNECTIONS SHALL BE BY ELECTRICAL CONTRACTOR, PC SHALL COORDINATE WITH EC ON ELECTRICAL CHARACTERISTICS OF THE EQUIPMENT PROVIDED.
- ALL PUMPS SHALL BE RATED FOR TRANSPORT OF POTABLE WATER. PUMPS IN AN INDIVIDUAL WATER SUPPLY SYSTEM SHALL BE CONSTRUCTED AND INSTALLED SO AS TO PREVENT CONTAMINATION FROM ENTERING THE WATER SUPPLY SYSTEM.



PO Box 3301, Henderson, NC 27536  
www.kilianengineering.com  
252.438.8778

**Craig A. Otto**  
**ARCHITECT, INC.**

DESIGN • PLANNING • ARCHITECTURE

105 West Main Street, Suite C  
Lexington, South Carolina 29072  
Phone (803) 957-9004  
craig@raigottoarchitect.com

All rights reserved. This drawing and the design shown thereon are copyrighted as prescribed by the laws of the United States and are the sole property of Craig A. Otto, Architect, Inc. Anyone duplicating, reproducing, or causing to be reproduced these drawings or the design thereon without permission of the architect will be subject to legal action.

Project Title  
**ASSOCIATED CONTRACT SERVICES**  
JARCO DR., FUQUAY VARINA, NC

Drawing Title  
**PLUMBING NOTES**

Project No. **25007Z**

Consultant

	Date 03/07/2025
	Drawn By REW/EMB
	Drawing No. <b>P-1</b>

PLUMBING FIXTURE SCHEDULE						
SYMBOL	FIXTURE	MANUFACTURER	FITTING	HW	CW	WASTE
P1H	TWO PIECE TANK TYPE ADA WATER CLOSET	TOTO CST744EL OR EQUAL BY AMERICAN STANDARD OR KOHLER	TWO-PIECE VITREOUS CHINA TOILET WITH HIGH-PROFILE TANK, ELONGATED FRONT BOWL AND CHROME TRIP LEVER. 1.28 GPF. PROVIDE SC534 OPEN FRONT SEAT LESS COVER. ASME 112.19.2 COMPLIANCE. TOP OF SEAT SHALL BE 17-19 INCHES AFF FOR ADA. LEVER MOUNTED ON WIDE SIDE FOR ADA.	-	1/2"	3"
P2	WALL MOUNT LAVATORY	TOTO LT307.4 OR EQUAL BY AMERICAN STANDARD OR KOHLER	VITREOUS CHINA LAVATORY WITH BACKSPASH COMPLYING WITH ASME 112.19.2. TOP OF RIM SHALL BE 34 INCHES AFF FOR ADA. PROVIDE WITH LAV-GUARD PROTECTORS FOR SUPPLY AND DRAIN LINES. PROVIDE JR SMITH 0700 (CONCEALED ARMS) WITH 19" ARMS 0800 (WALL SUPPORT PLATE). USE MOEN 8430 FAUCET.	1/2"	1/2"	2"
P3	SERVICE SINK	FIAT FL-1 OR APPROVED EQUAL	FLOOR MOUNTED SERV-A-SINK LAUNDRY TUB SUPPORTED WITH STEEL PAINTED ANGLE LEGS. SUPPLY WITH FIAT A1000 LAUNDRY DECK FAUCET. CONFIRM FAUCET SELECTION WITH OWNER BEFORE ORDERING.	1/2"	1/2"	2"
P4	EXPANSION TANK	AMTROL ST-5 OR EQUAL BY WATTS OR BELL & GOSSETT	INSTALL ON COLD WATER LINE BETWEEN WATER HEATER AND RPZ	-	3/4"	-
P5	THERMOSTATIC MIXING VALVE	WATTS LFMV OR EQUAL BY LAWLER OR LEONARD VALVE	ASSE STANDARD 1069 OR 1070 APPROVED WITH 1/2 INCH FEMALE NPT INLET AND OUTLET CONNECTIONS, BRASS BODY, AND INTEGRAL MOUNTING HOLES. TAMPER RESISTANT THERMOPLASTIC ENCLOSURE. SINGLE REPLACEABLE CARTRIDGE DESIGN.	1/2"	1/2"	-
P6	1" RPZ BACKFLOW PREVENTER	WATTS LF909 QT OR EQUAL BY CONBRACO OR WILKINS	RPZ ASSEMBLY CONSISTING OF A PRESSURE DIFFERENTIAL RELIEF VALVE LOCATED IN A ZONE BETWEEN TWO POSITIVE SEATING CHECK VALVES. THE ASSEMBLY SHALL INCLUDE TWO TIGHTLY CLOSING SHUTOFF VALVES BEFORE AND AFTER THE ASSEMBLY, TEST COCKS AND A PROTECTIVE STRAINER UPSTREAM OF THE FIRST SHUTOFF VALVE. THE ASSEMBLY SHALL MEET THE REQUIREMENTS OF ASSE 1013 AND AWWA C511	-	1"	-
P7	FREEZEPROOF HOSE BIBB	WOODFORD MODEL 68 OR EQUAL BY ZURN OR MIFAB	THE MODEL 68 IS A ASSE 1053 LISTED HYDRANT, WITH A ASSE 1052 DOUBLE CHECK BACKFLOW PREVENTER, COMES WITH A CHROME PLATED BRASS HEAD WITH STAINLESS STEEL COVER, IT DRAINS AUTOMATICALLY EVEN WITH A ATTACHED HOSE, HAS A ONE PIECE PLUNGER WHICH CONTROLS DRAIN AND FLOW FUNCTION, WORKS WITH PRESSURES UP TO 125 PSI, AND A MAX TEMPERATURE OF 120 DEGREES. TEE KEY FOR HYDRANT DOOR AND LOCK. EASIER TO INSTALL THAN STANDARD RECESSED BOX HYDRANT, WALL CLAMP IS INCLUDED, HEAD COVER FLIPS DOWN AND OUT OF THE WAY FOR UNOBSTRUCTED HYDRANT USE	-	3/4"	-
FCO	FLOOR CLEANOUT	ZURN, WATTS, JR SMITH	EPOXY COATED CAST IRON FLOOR CLEANOUT WITH ROUND ADJUSTABLE GASKETED NICKEL BRONZE TOP, REMOVABLE GAS TIGHT GASKETED BRASS CLEANOUT PLUG, AND NO HUB INLET.	-	-	-

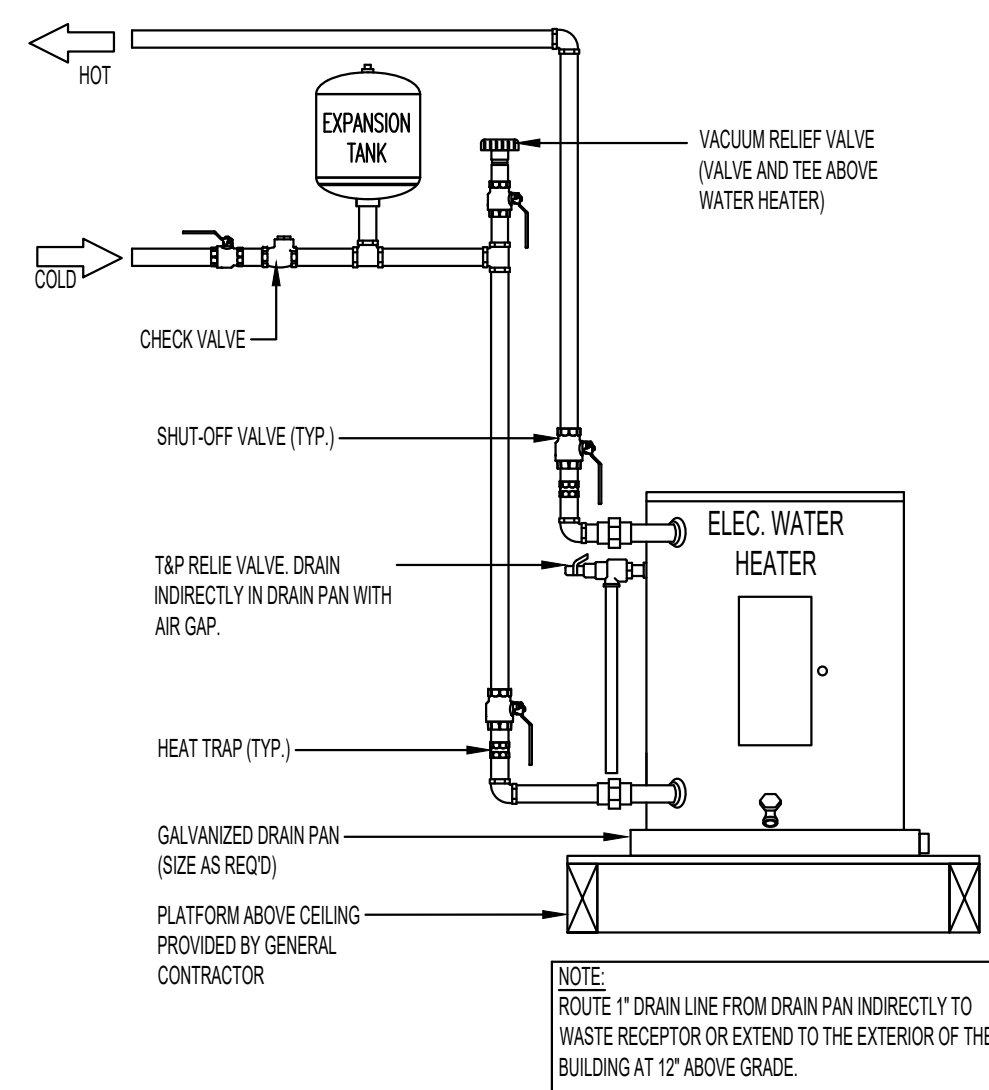
ELECTRIC WATER HEATER SCHEDULE												
MARK	MFG	MODEL	TANK VOL.	INPUT	RECOVERY	SET POINT	POWER		CONNECTIONS		OPTIONS	
			GALS	KW	GPH @ 60°F ΔT	°F	VOLTAGE	PHASE	HOT	COLD		
WH-1-4	RHEEM	EGSP10	10	1.5	10	110	120	1	3/4	3/4	1-5	

1. PROVIDE GALVANIZED STEEL SAFETY PAN
2. UL 174 LISTED
3. PROVIDE ASME LISTED TEMPERATURE AND PRESSURE RELIEF VALVE
4. MEET OR EXCEED ENERGY FACTOR REQUIREMENTS OF ASHRAE 90.1-2007
5. OR EQUAL BY A.O. SMITH, BRADFORD WHITE, OR STATE.

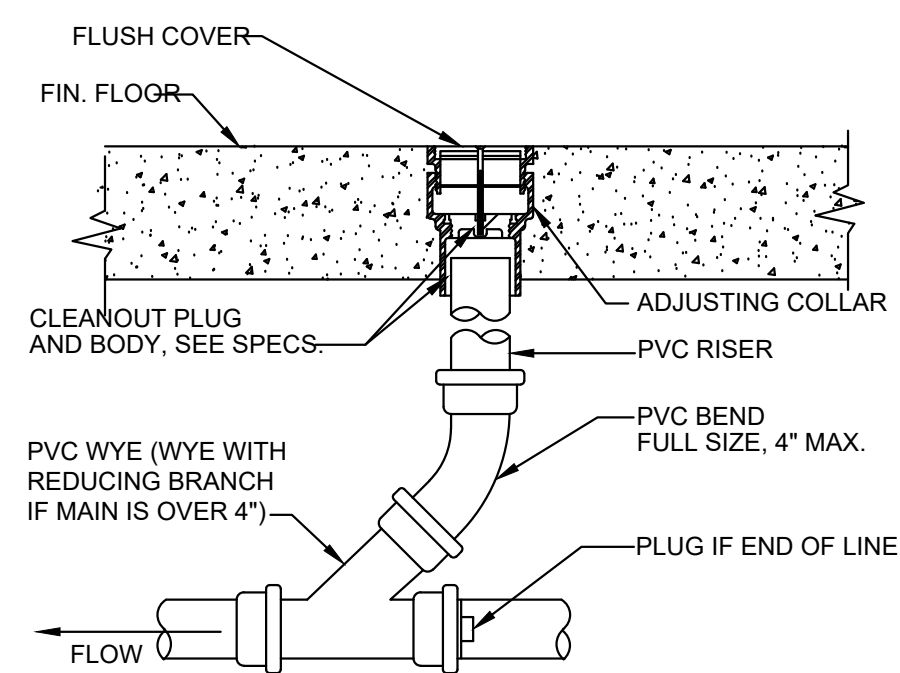
FIXTURE TYPE	QTY	DRAINAGE FIXTURE UNITS		WATER SUPPLY FIXTURE UNITS				
		EACH	TOTAL	CW	HW	CW & HW	HW TOTAL	TOTAL
WATER CLOSET, PUBLIC, FLUSH TANK	2	4.0	8.0	5.0	0.0	5.0	0.0	10.0
LAVATORY, PUBLIC	2	2.0	4.0	1.5	1.5	2.0	3.0	4.0
SERVICE SINK, OFFICES, ETC.	1	2.0	2.0	2.3	2.3	3.0	2.3	3.0
N/A	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
N/A	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
N/A	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
N/A	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
N/A	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DEMAND FIXTURE	GPM	QTY	TOTAL GPM	TOTAL DFU	14.0
HOSE BIB	5	2	5	TOTAL WSFU	5.3
				GPM	10.0
				OTHER FIXTURES' GPM	0
				TOTAL GPM	10.0

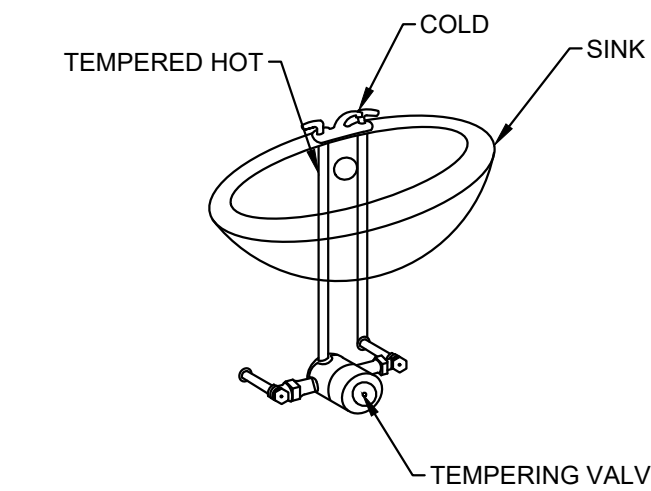
MINIMUM BUILDING DRAIN SIZE	4"	ONLY HALF OF HOSE BIBS USED IN CALCULATION
MINIMUM WATER LINE SIZE	1"	



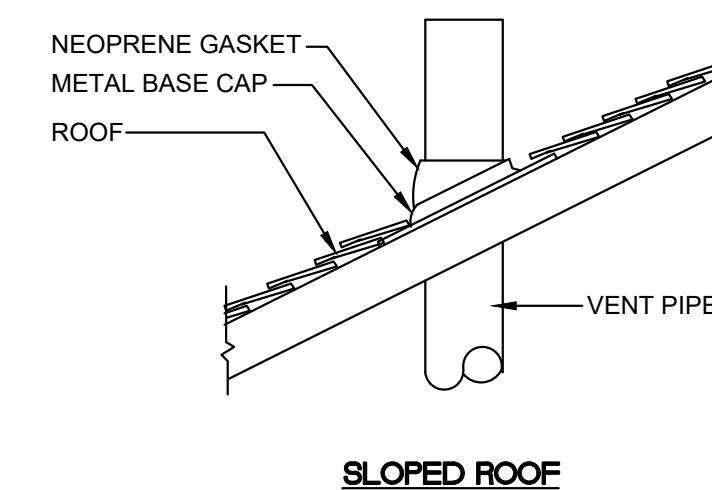
3 ELECTRIC WATER HEATER (ABOVE CEILING) DETAIL  
Scale: NONE



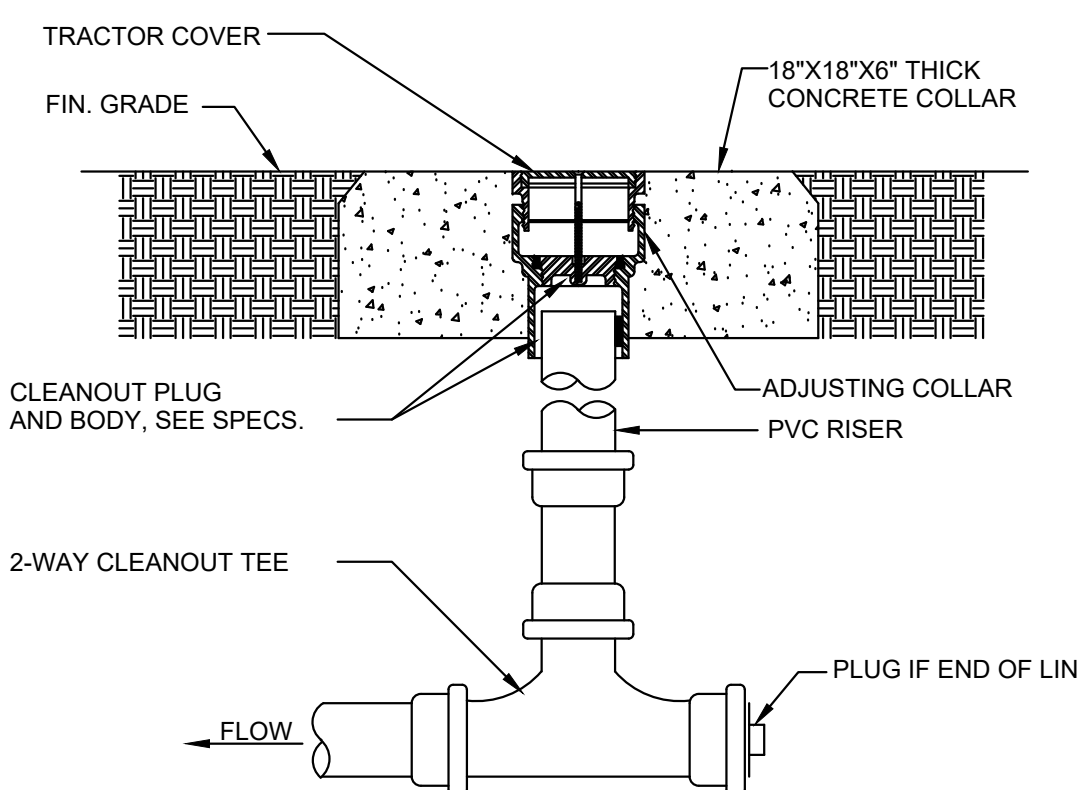
1 FLOOR CLEANOUT DETAIL  
Scale: NONE



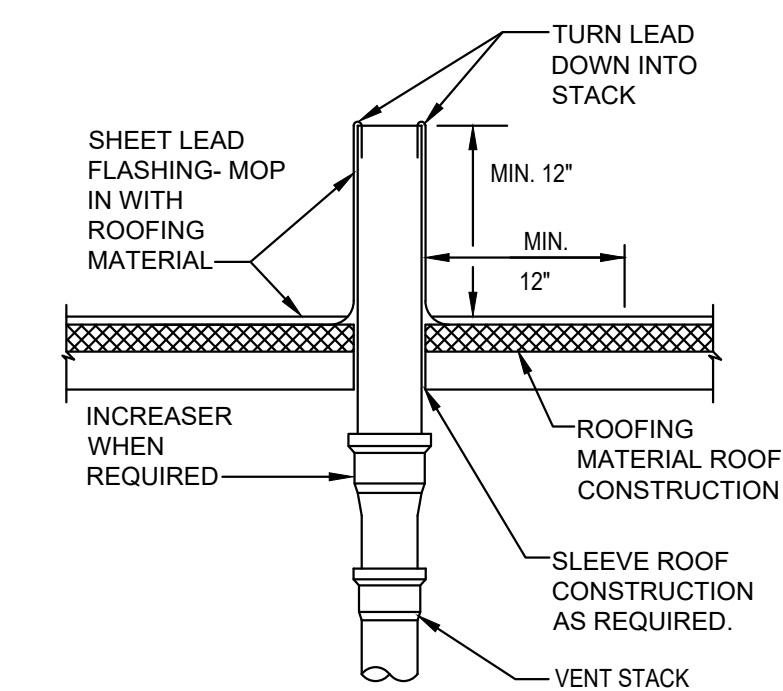
2 THERMOSTATIC MIXING VALVE DETAIL  
Scale: NONE



SLOPED ROOF



4 GRADE CLEANOUT DETAIL  
Scale: NONE



FLAT ROOF

5 VENT THRU ROOF DETAIL  
Scale: NONE

**Kilian Engineering, Inc.**  
PO Box 3301, Henderson, NC 27536  
www.kilianengineering.com  
252.438.8778

**Craig A. Otto ARCHITECT, INC.**

DESIGN • PLANNING • ARCHITECTURE

105 West Main Street, Suite C  
Lexington, South Carolina 29072  
Phone (803) 957-9004  
craig@craigottoarchitect.com

No.	Revisions	Date

All rights reserved. This drawing and the design shown thereon are copyrighted as prescribed by the laws of the United States and are the sole property of Craig A. Otto, Architect, Inc. Anyone duplicating, reproducing, or causing to be reproduced these drawings or the design thereon without permission of the architect will be subject to legal action.

Project Title  
**ASSOCIATED CONTRACT SERVICES**  
JARCO DR., FUQUAY VARINA, NC

Drawing Title  
**PLUMBING SCHEDULES AND DETAILS**

Project No. **250077**

Consultant

Seal: NORTH CAROLINA PROFESSIONAL ENGINEER  
SEAL 17304  
MICHAEL W. KILIAN  
Date: 03/07/2025  
Drawn By: REW/EMB  
Drawing No.: P-2

WALL / CEILING LEGEND

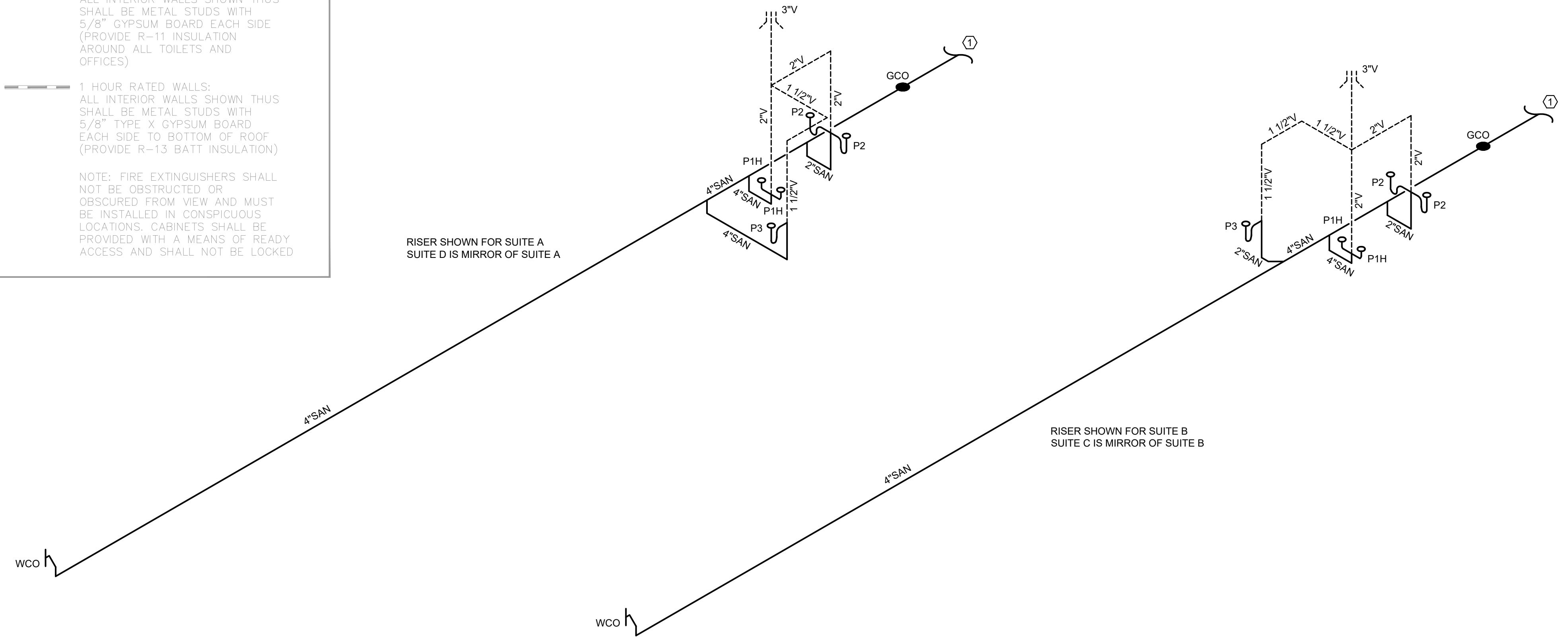
NON-RATED WALLS:  
ALL INTERIOR WALLS SHOWN THUS SHALL BE METAL STUDS WITH 5/8" GYPSUM BOARD EACH SIDE (PROVIDE R-11 INSULATION AROUND ALL TOILETS AND OFFICES)

1 HOUR RATED WALLS:  
ALL INTERIOR WALLS SHOWN THUS SHALL BE METAL STUDS WITH 5/8" TYPE X GYPSUM BOARD EACH SIDE TO BOTTOM OF ROOF (PROVIDE R-13 BATT INSULATION)

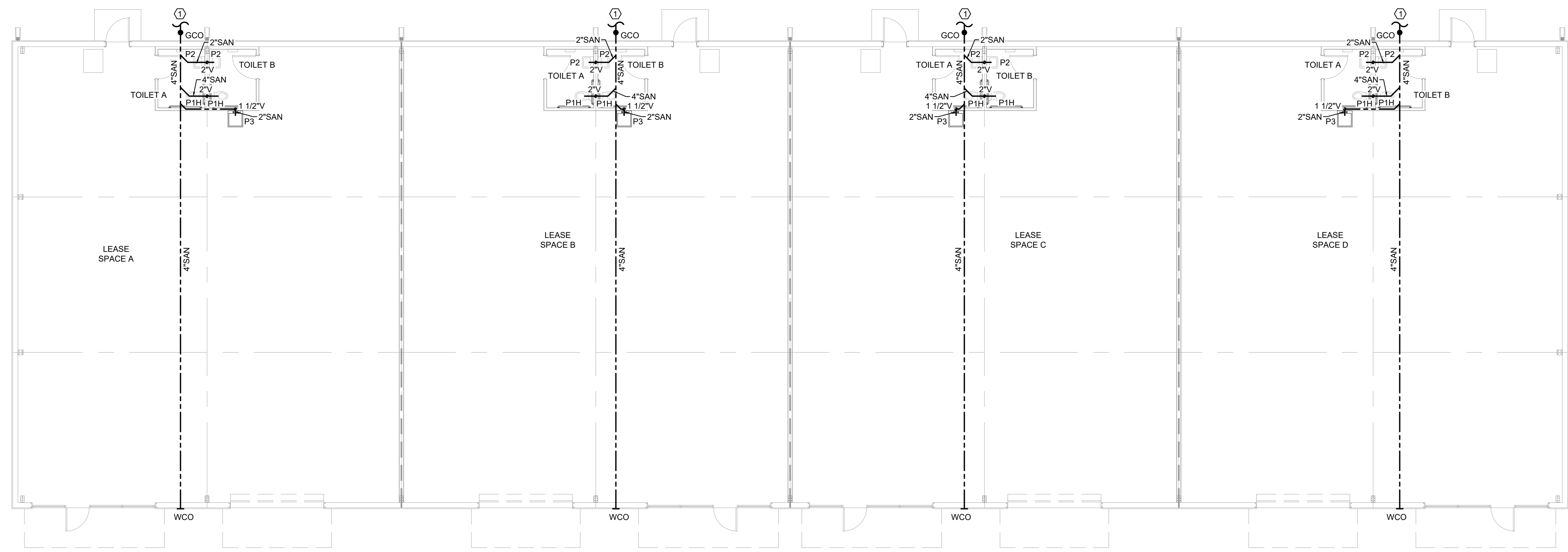
NOTE: FIRE EXTINGUISHERS SHALL NOT BE OBSTRUCTED OR OBSCURED FROM VIEW AND MUST BE INSTALLED IN CONSPICUOUS LOCATIONS. CABINETS SHALL BE PROVIDED WITH A MEANS OF READY ACCESS AND SHALL NOT BE LOCKED

**SANITARY HEX NOTES**

1. CONNECT TO SEWER. COORDINATE EXACT LOCATION ON SITE.



1 SANITARY RISER  
Scale: NONE



2 SANITARY PLAN  
Scale: 1/8" = 1'-0"

**Kilian Engineering, Inc.**  
PO Box 3301, Henderson, NC 27536  
www.kilianengineering.com  
252.438.8778

**Craig A. Otto ARCHITECT, INC.**  
DESIGN • PLANNING • ARCHITECTURE  
105 West Main Street, Suite C  
Lexington, South Carolina 29072  
Phone (803) 957-9004  
craig@craigottoarchitect.com

No.	Revisions	Date

All rights reserved. This drawing and the design shown thereon are copyrighted as prescribed by the laws of the United States and are the sole property of Craig A. Otto, Architect, Inc. Anyone duplicating, reproducing, or causing to be reproduced these drawings or the design thereon without permission of the architect will be subject to legal action.

Project Title  
**ASSOCIATED CONTRACT SERVICES**  
JARCO DR., FUQUAY VARINA, NC

Drawing Title  
SANITARY PLAN

Project No.  
250077

Consultant

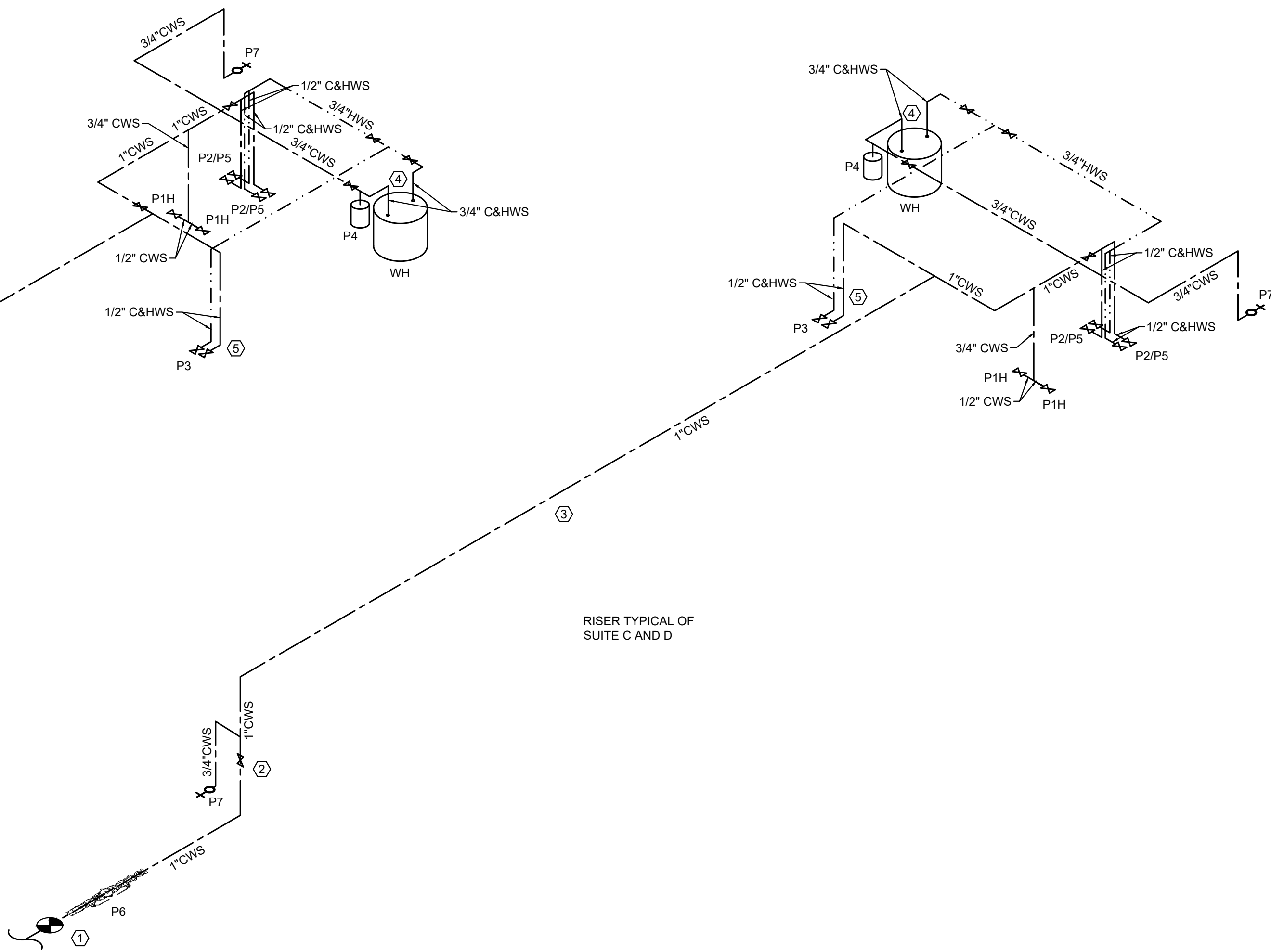
	Date 03/07/2025
	Drawn By REW/EMB Drawing No. P-3

**WALL / CEILING LEGEND**

NON-RATED WALLS:  
ALL INTERIOR WALLS SHOWN THUS SHALL BE METAL STUDS WITH 5/8" GYPSUM BOARD EACH SIDE (PROVIDE R-11 INSULATION AROUND ALL TOILETS AND OFFICES)

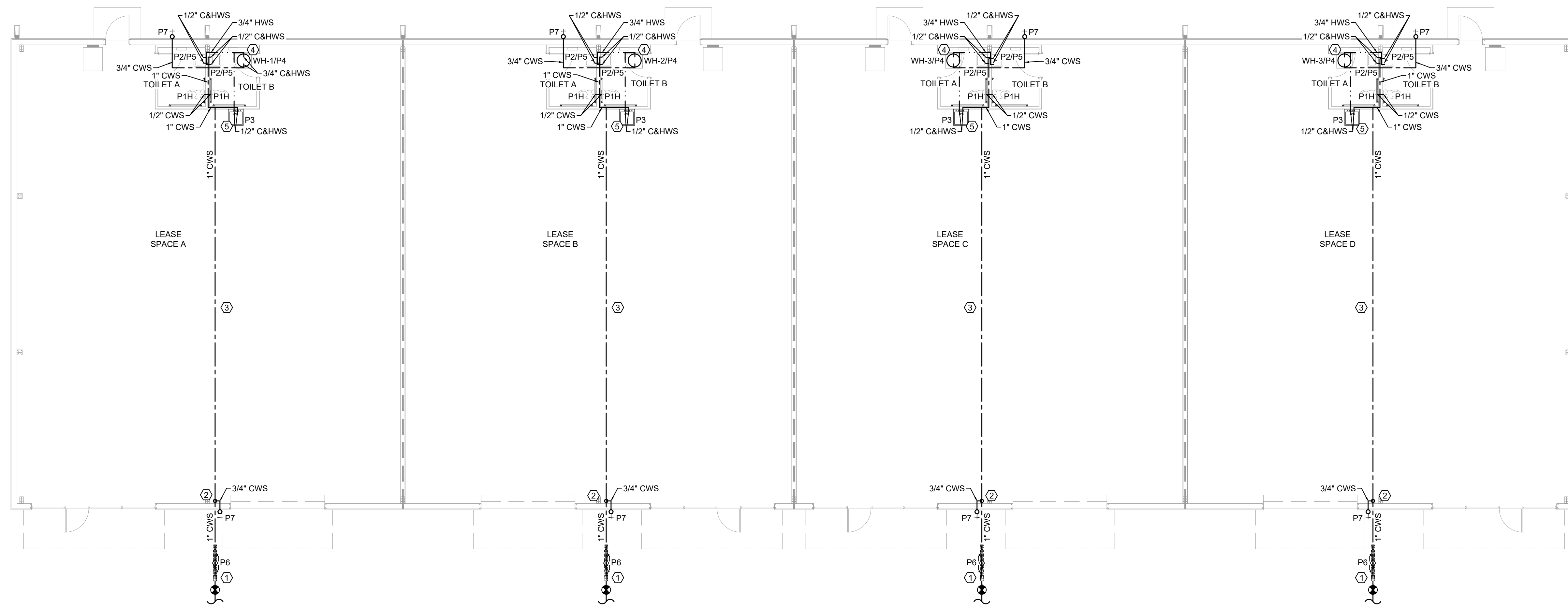
1 HOUR RATED WALLS:  
ALL INTERIOR WALLS SHOWN THUS SHALL BE METAL STUDS WITH 5/8" TYPE X GYPSUM BOARD EACH SIDE TO BOTTOM OF ROOF (PROVIDE R-13 BATT INSULATION)

NOTE: FIRE EXTINGUISHERS SHALL NOT BE OBSTRUCTED OR OBSCURED FROM VIEW AND MUST BE INSTALLED IN CONSPICUOUS LOCATIONS; CABINETS SHALL BE PROVIDED WITH A MEANS OF READY ACCESS AND SHALL NOT BE LOCKED



- DOMESTIC SUPPLY HEX NOTES**
- CONNECT TO WATER MAIN. COORDINATE EXACT LOCATION ON SITE. INSTALL RPZ IN HOT BOX AT METER.
  - ROUTE CWS UP THROUGH SLAB TO 20' A.F.F. CONFIRM HEIGHT WITH ARCHITECT. PC TO SUPPORT CWS AT HEIGHT. COORDINATE LOCATION WITH OWNER/GC. INSTALL ACCESSIBLE CUT OFF VALVE.
  - ANY WATER LINES THAT MUST BE INSTALLED IN UNCONDITIONED SPACES SHOULD BE INSULATED AND WHERE ACCESSIBLE PROTECTED BY THERMOSTATICALLY CONTROLLED HEAT TAPE.
  - WATER HEATER LOCATED ABOVE CEILING. SEE DETAIL FOR INSTALLATION. EXPANSION TANK CONNECTION AND DRAINAGE PAN TO BE INSTALLED ON WATER HEATER.
  - INSTALL INSULATION AND THERMOSTATICALLY CONTROLLED HEAT TAPE ON CONNECTIONS FOR SERVICE SINK.

**1 DOMESTIC SUPPLY RISER**  
Scale: NONE



**2 DOMESTIC SUPPLY PLAN**  
Scale: 1/8" = 1'-0"

**Kilian Engineering, Inc.**  
PO Box 3301, Henderson, NC 27536  
www.kilianengineering.com  
252.438.8778

**Craig A. Otto ARCHITECT, INC.**

DESIGN • PLANNING • ARCHITECTURE

105 West Main Street, Suite C  
Lexington, South Carolina 29072  
Phone (803) 957-9004  
craig@craigottoarchitect.com

No.	Revisions	Date

All rights reserved. This drawing and the design shown thereon are copyrighted as prescribed by the laws of the United States and are the sole property of Craig A. Otto, Architect, Inc. Anyone duplicating, reproducing, or causing to be reproduced these drawings or the design thereon without permission of the architect will be subject to legal action.

Project Title  
**ASSOCIATED CONTRACT SERVICES**  
JARCO DR., FUQUAY VARINA, NC

Drawing Title  
**DOMESTIC SUPPLY PLAN**

Project No.  
**250077**

Consultant

	Date 03/07/2025
	Drawn By REW/EMB Drawing No. <b>P-4</b>

## GENERAL MECHANICAL NOTES:

### ADMINISTRATIVE:

- THE FOLLOWING ABBREVIATIONS SHALL APPLY TO NOTES AND PLANS:  
PC - PLUMBING CONTRACTOR,  
EC - ELECTRICAL CONTRACTOR,  
MC - MECHANICAL CONTRACTOR,  
GC - GENERAL CONTRACTOR,  
FASC - FIRE ALARM SYSTEM CONTRACTOR,  
AHJ - AUTHORITY HAVING JURISDICTION,  
SMC - CURRENT STATE MECHANICAL CODE (2018 NORTH CAROLINA STATE BUILDING CODE: MECHANICAL CODE)  
SBC - CURRENT STATE BUILDING CODE (2018 NORTH CAROLINA STATE BUILDING CODE: BUILDING CODE)  
SECC- CURRENT STATE ENERGY CONSERVATION CODE (2018 NORTH CAROLINA STATE BUILDING CODE: ENERGY CONSERVATION CODE)  
NFPA - NATIONAL FIRE PROTECTION ASSOCIATION  
"PROVIDE" MEANS TO FURNISH AND INSTALL. MC SHALL ALSO INSTALL MATERIALS FURNISHED BY OTHERS AND GENERAL CONTRACTOR AS SHOWN ON THE PLANS OR NECESSARY FOR A COMPLETE INSTALLATION.
- THE MC SHALL BE RESPONSIBLE FOR A COMPLETE AND OPERATING SYSTEM AS DESCRIBED BY THESE PLANS AND SPECIFICATIONS.
- ALL MATERIALS AND EQUIPMENT SHALL BE DELIVERED TO THE SITE AND UNLOADED BY THE CONTRACTOR AT AN APPROVED LOCATION. THE MC SHALL PROTECT ALL MATERIALS AND EQUIPMENT FROM BREAKAGE, THEFT, AND THE ELEMENTS. ALL MATERIALS AND EQUIPMENT SHALL REMAIN THE PROPERTY OF THE MC UNTIL THE PROJECT HAS BEEN COMPLETED AND TURNED OVER TO THE OWNER.
- THE MC SHALL INSTALL ALL MATERIALS AND EQUIPMENT IN ACCORDANCE WITH THE SMC AND SBC AND ANY APPLICABLE LOCAL CODES. WHERE A CONFLICT EXISTS BETWEEN THE ABOVE REQUIREMENTS, THE MC SHALL OBTAIN CLARIFICATION FROM THE ENGINEER OR IN THE EVENT ANY PART OF THESE PLANS CONFLICTS WITH THE ABOVE REQUIREMENTS.
- THE MC SHALL OBTAIN AND PAY FOR ALL PERMITS, FEES, AND INSPECTIONS NECESSARY FOR THE COMPLETION OF THE WORK UNDER THIS CONTRACT.
- DO NOT SCALE THESE DRAWINGS-REFER TO ARCHITECTURAL SHEETS FOR DIMENSIONS.
- THE MC SHALL VISIT THE SITE PRIOR TO BIDDING TO BECOME FAMILIAR WITH EXISTING CONDITIONS. THE MC SHALL CONTACT THE ENGINEER TO RESOLVE ANY DISCREPANCIES BETWEEN EXISTING CONDITIONS AND THESE PLANS. THE MC SHALL COORDINATE WITH OTHER TRADES PRIOR TO THE START OF CONSTRUCTION.
- ALL MECHANICAL MATERIALS SHALL BE NEW AND FREE OF DEFECT AND LISTED AND LABELED BY UL OR AN APPROVED THIRD-PARTY AGENCY. ANY MATERIALS FOUND TO BE DEFECTIVE SHALL BE REPLACED BY THE MC WITHOUT ADDITIONAL COST TO THE OWNER. WHERE A MANUFACTURER AND MODEL NUMBER IS GIVEN, THE CITED EXAMPLE IS INTENDED TO ESTABLISH A STANDARD OF QUALITY AND NOT TO LIMIT PRODUCTS TO A PARTICULAR MANUFACTURER. SUCH EXAMPLES ARE USED TO CONVEY A GENERAL STYLE, TYPE, CHARACTER, AND QUALITY OF THE PRODUCT DESIRED; PRODUCTS DETERMINED TO BE EQUAL BY THE ENGINEER WILL BE ACCEPTED.
- THESE PLANS ARE DIAGRAMMATIC. THE MC SHALL ADJUST THE LOCATIONS OF EQUIPMENT, DUCTS, REGISTERS, GRILLES, ETC, TO ACCOMMODATE PLANNED AND ENCOUNTERED INTERFERENCES. THE DRAWINGS DO NOT SHOW ALL BENDS, OFFSETS, AND FITTINGS THAT MAY BE REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM. THE MC SHALL MAKE ALLOWANCES FOR SUCH DEVIATIONS AND CONTINGENCIES IN BID TO IMPLEMENT THEM WITHOUT ADDITIONAL COST TO THE OWNER.
- EC SHALL BE RESPONSIBLE FOR ALL POWER CONNECTIONS TO THE MECHANICAL EQUIPMENT. MC SHALL BE RESPONSIBLE FOR ALL CONTROL WIRING.
- IT IS THE MC'S RESPONSIBILITY TO VERIFY THAT ITEMS FURNISHED FOR THIS CONTRACT WILL FIT IN THE SPACE AVAILABLE. THE MC SHALL MAKE FIELD MEASUREMENTS AS NECESSARY TO DETERMINE SPACE REQUIREMENTS. IF THE MC MUST ALTER EQUIPMENT DUE TO SPACE CONSIDERATIONS, THE MC SHALL PROVIDE SIZES AND SHAPES THAT FIT THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS.
- MC SHALL COORDINATE WITH THE EC REGARDING THE ELECTRICAL REQUIREMENTS OF ALL EQUIPMENT BEING PROVIDED.
- MAINTAIN CLEARANCES FOR ALL EQUIPMENT ACCORDING TO MANUFACTURER'S RECOMMENDATIONS FOR SERVICEABILITY. ALL ROOFTOP EQUIPMENT MUST BE A MINIMUM OF 10 FEET FROM ROOF EDGE.
- MC SHALL FURNISH A BOUND SET OF OPERATING AND MAINTENANCE INSTRUCTIONS FOR ALL EQUIPMENT TO THE OWNER UPON COMPLETION OF THE PROJECT. MC SHALL PROVIDE ALL DOCUMENTATION TO THE OWNER AS NECESSARY TO SUBMIT FOR FACTORY WARRANTIES.
- CONTRACTOR SHALL PROTECT ALL HVAC EQUIPMENT FROM CONSTRUCTION AND SHEET ROCK DUST DURING CONSTRUCTION. ALL FILTERS SHALL BE REPLACED WITH NEW AT THE COMPLETION OF THE PROJECT.
- ALL EQUIPMENT INSTALLED ON ROOF MUST BE WITHIN THE ROOF SCREEN.
- IF A ROOF PENETRATION IS REQUIRED AND THE ROOF IS UNDER WARRANTY, USE THE AUTHORIZED ROOFER. PROVIDE DOCUMENTATION.

- ALL PIPING, WIRING, CONDUIT, INSULATION, EQUIPMENT, SUPPORTS, ETC. SHALL BE SUITABLE FOR INSTALLATION IN A RETURN PLENUM AS NECESSARY. COORDINATE WITH OTHER TRADES ON LOCATIONS OF ALL PLENUMS.
- MC SHALL COORDINATE WITH THE GENERAL CONTRACTOR TO ENSURE ALL APPLICABLE CONSTRUCTION WASTE IS RECYCLED DURING THE CONSTRUCTION PHASE OF THE PROJECT.

### METHODS:

- INSULATE DUCTWORK WITH FIBERGLASS DUCT WRAP; INSTALLED R-VALUE SHALL BE A MINIMUM R-6. COVERINGS AND LININGS, INCLUDING ADHESIVES WHEN USED, SHALL HAVE A FLAME SPREAD INDEX NOT MORE THAN 25 AND A SMOKE-DEVELOPED INDEX NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM E 84. ALL NEW DUCTWORK SHALL RECEIVE INSULATION ON THE OUTSIDE. INSTALL DUCT WRAP INSULATION WITH FACING OUTSIDE SO THAT TAPE FLAP OVERLAPS INSULATION AND FACING OF ADJACENT PIECE OF DUCT WRAP. INSULATION SHALL BE TIGHTLY BUTTED. FOR RECTANGULAR DUCTS, INSTALL SO INSULATION IS NOT EXCESSIVELY COMPRESSED AT DUCT CORNERS. STAPLE SEAMS APPROXIMATELY 6 INCHES ON CENTER WITH OUTWARD CLINCHING STAPLES. SEAL SEAMS WITH PRESSURE SENSITIVE TAPE MATCHING THE FACING. FOR RECTANGULAR DUCTS 24 INCHES IN WIDTH OR GREATER, SECURE DUCT WRAP TO THE BOTTOM OF THE DUCT WITH MECHANICAL FASTENERS SPACED 18 INCHES ON CENTER TO PREVENT SAGGING OF INSULATION. ADJACENT SECTIONS OF DUCT WRAP SHALL BE TIGHTLY BUTTED WITH THE 2 INCH TAPE FLAP OVERLAPPING. ALL TEARS, PUNCTURES, ETC. OF THE DUCT WRAP INSULATION SHALL BE SEALED WITH TAPE OR MASTIC TO PROVIDE A VAPOR TIGHT SYSTEM. INSULATION SHALL BE BY KNAUF INSULATION, OWENS CORNING CORP, OR CERTAINEED CORPORATION.
- VERIFY THAT DUCTS HAVE BEEN TESTED BEFORE APPLYING INSULATION MATERIALS. VERIFY THAT DUCT SURFACES ARE CLEAN, DRY AND FREE OF FOREIGN MATERIAL PRIOR TO INSULATING. DUCT COVERINGS SHALL NOT PENETRATE A WALL OR FLOOR REQUIRED TO HAVE A FIRE-RESISTANCE RATING OR REQUIRED TO BE FIRE BLOCKED.
- WHERE DUCTS ARE CONNECTED TO EXTERIOR WALL LOUVERS AND DUCT OUTLET IS SMALLER THAN LOUVER FRAME, PROVIDE BLANK-OUT PANELS SEALING LOUVER AREA AROUND DUCT. USE SAME MATERIAL AS DUCT, PAINTED BLACK ON EXTERIOR SIDE. SEAL TO LOUVER FRAME AND DUCT.
- PROVIDE DUCT ACCESS DOORS FOR INSPECTION AND CLEANING BEFORE AND AFTER FILTERS, COILS, FANS, AUTOMATIC DAMPERS, AT FIRE DAMPERS, COMBINATION FIRE AND SMOKE DAMPERS.
- CONSTRUCT T's, BENDS, AND ELBOWS WITH RADII OF NOT LESS THAN 1-1/2 TIMES THE WIDTH OF THE DUCT ON CENTERLINE. WHERE NOT POSSIBLE AND WHERE RECTANGULAR ELBOWS MUST BE USED, PROVIDE TURNING VANES.
- INCREASE DUCT SIZES GRADUALLY, NOT EXCEEDING 15 DEGREES DIVERGENCE; MAXIMUM OF 30 DEGREES DIVERGENCE UPSTREAM OF EQUIPMENT AND 45 DEGREES CONVERGENCE DOWNSTREAM.
- IT SHALL BE THE RESPONSIBILITY OF THE MC TO SUSPEND AND SUPPORT ALL EQUIPMENT, DUCTWORK, DIFFUSERS, AND OTHER MATERIALS FOLLOWING RECOGNIZED ENGINEERING PRACTICES AND USING STANDARD, COMMERCIALY ACCEPTED HANGERS AND SUSPENSION EQUIPMENT. ALL HVAC EQUIPMENT SHALL BE SECURELY MOUNTED TO THE BUILDING STRUCTURE AND SHALL NOT RELY ON CEILING OR WALL SURFACES FOR SUPPORT. THE SUPPORT ATTACHMENT SHALL SUPPORT THE WEIGHT OF THE EQUIPMENT PLUS THE WEIGHT OF THE SUPPORT ATTACHMENT ITSELF. SUPPORT FROM THE TOP CHORD OF THE ROOF JOISTS, GIRDERS, AND BEAMS. THE BOTTOM CHORD IS NOT TO BE USED FOR EQUIPMENT OR PIPING SUPPORT. HANGERS SHALL NOT BE ATTACHED TO CORRUGATED STEEL DECKING.
- DUCTS SHALL BE SUPPORTED IN ACCORDANCE WITH SMACNA AT INTERVALS NOT EXCEEDING 10 FEET. DUCTS 36 INCHES OR LARGER SHALL HAVE TRAPEZE TYPE HANGERS SUSPENDED WITH THREADED ROD. SUPPORT DUCTS FROM BAR JOISTS, GIRDERS, OR BEAMS.
- CHECK LOCATIONS OF AIR OUTLETS AND INLETS AND MAKE NECESSARY ADJUSTMENTS IN POSITION TO CONFORM WITH ARCHITECTURAL FEATURES, SYMMETRY, AND LIGHTING ARRANGEMENT. COORDINATE WITH SPRINKLER CONTRACTOR IF APPLICABLE.
- PROVIDE BALANCING DAMPERS AT POINTS ON SUPPLY WHERE BRANCHES ARE TAKEN FROM LARGER DUCTS AS REQUIRED FOR AIR BALANCING. INSTALL MINIMUM 2 DUCT WIDTHS FROM DUCT TAKE-OFF. PROVIDE BALANCING DAMPERS ON DUCT TAKE-OFFS TO DIFFUSERS AND REGISTERS, REGARDLESS OF WHETHER DAMPERS ARE SPECIFIED AS PART OF THE DIFFUSER OR REGISTER ASSEMBLY. ADJUST AIR HANDLING AND DISTRIBUTION SYSTEMS TO PROVIDE DESIGN SUPPLY, RETURN, AND EXHAUST AIR QUANTITIES AT SITE ALTITUDE.
- MC SHALL INSTALL ALL EXHAUST FANS AND VENT TO THE BUILDING'S EXTERIOR. EC SHALL SWITCH FANS WITH LIGHTS OR ON SEPARATE SWITCH AS SHOWN.
- INSTALL BACKDRAFT DAMPERS ON FRESH AIR AND EXHAUST DUCTS WHERE THEY PENETRATE THE THERMAL ENVELOPE PER SECC C402.5.5
- MC SHALL INSTALL FIRE DAMPERS AT EACH PENETRATION OF A RATED WALL AS INDICATED ON THE DRAWINGS OR AS REQUIRED BY THE AUTHORITY HAVING JURISDICTION. FIRE DAMPERS SHALL BE UL LABELED (UL 555), CURTAIN TYPE, WITH INTEGRAL FACTORY SLEEVE AND BLADES LOCATED OUTSIDE THE AIR STREAM. INSTALLATION OF ALL FIRE DAMPERS SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND SECTION 607 OF THE SMC. PROVIDE ACCESS PANELS FOR TESTING AND SERVICE AS NECESSARY. MC SHALL PROVIDE RADIATION DAMPERS AND THERMAL BLANKETS FOR ALL PENETRATIONS OF RATED

CEILING ASSEMBLIES. RADIATION DAMPERS SHALL BE UL LABELED (UL 555C) AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFIC INSTALLATION INSTRUCTIONS. FIRE DAMPERS, COMBINATION FIRE/SMOKE DAMPERS, AND CEILING RADIATION DAMPERS SHALL BE BY RUSKIN, NAILOR, OR LLOYD INDUSTRIES.

### MATERIALS:

- THE MC SHALL PROVIDE ALL HEATING AND COOLING EQUIPMENT AS SCHEDULED ON THE DRAWINGS. ALTERNATES SHALL BE FROM MANUFACTURERS LISTED IN SCHEDULES. THE MC SHALL PROVIDE FACTORY AND FIELD INSTALLED ACCESSORIES AS SCHEDULED OR AS NECESSARY FOR A COMPLETE AND OPERATIONAL HVAC SYSTEM.
- THE MC SHALL PROVIDE ALL EXHAUST AND SUPPLY FANS AS SCHEDULED OR BY EQUALS LISTED.
- DUCTWORK IS SHOWN WITH FREE AREA DIMENSIONS. ALL DUCTWORK SHALL BE FABRICATED AND INSTALLED IN ACCORDANCE WITH SMACNA LOW PRESSURE DUCT STANDARD, 2 INCH S.P.
- EXTERNAL DUCT INSULATION AND FACTORY-INSULATED FLEXIBLE DUCT SHALL BE LEGIBLY PRINTED OR IDENTIFIED AT INTERVALS NOT GREATER THAN 36 INCHES WITH THE NAME OF THE MANUFACTURER, THE THERMAL RESISTANCE R-VALUE AT THE SPECIFIED INSTALLED THICKNESS AND THE FLAME SPREAD AND SMOKE-DEVELOPED INDEXES OF THE COMPOSITE MATERIALS. ALL DUCT INSULATION PRODUCT R-VALUES SHALL BE BASED ON INSULATION ONLY, EXCLUDING AIR FILMS, VAPOR RETARDERS OR OTHER DUCT COMPONENTS, AND SHALL BE BASED ON TESTED C-VALUES AT 75°F MEAN TEMPERATURE AT THE INSTALLED THICKNESS, IN ACCORDANCE WITH RECOGNIZED INDUSTRY PROCEDURES. THE INSTALLED THICKNESS OF DUCT INSULATION USED TO DETERMINE ITS R-VALUES SHALL BE DETERMINED AS FOLLOWS:
  - FOR DUCT BOARD, DUCT LINER AND FACTORY-MADE RIGID DUCTS NOT NORMALLY SUBJECTED TO COMPRESSION, THE NOMINAL INSULATION THICKNESS SHALL BE USED.
  - FOR DUCT WRAP, THE INSTALLED THICKNESS SHALL BE ASSUMED TO BE 75 PERCENT (25-PERCENT COMPRESSION) OF NOMINAL THICKNESS.
  - FOR FACTORY-MADE FLEXIBLE AIR DUCTS, THE INSTALLED THICKNESS SHALL BE DETERMINED BY DIVIDING THE DIFFERENCE BETWEEN THE ACTUAL OUTSIDE DIAMETER AND NOMINAL INSIDE DIAMETER BY TWO.
- COMPRESS THE DUCT LINER SUFFICIENTLY TO HOLD IT FIRMLY IN PLACE. ADHESIVE BONDED PINS ARE NOT PERMITTED DUE TO LONG-TERM ADHESIVE AGING CHARACTERISTICS. LININGS SHALL BE INTERRUPTED AT THE AREA OF OPERATION OF A FIRE DAMPER AND AT A MINIMUM OF 6 INCHES UPSTREAM AND 6 INCHES DOWNSTREAM OF ELECTRIC RESISTANCE AND FUEL-BURNING HEATERS IN A DUCT SYSTEM. METAL NOSINGS OR SLEEVES SHALL BE INSTALLED OVER EXPOSED DUCT LINER THAT FACE OPPOSITE THE DIRECTION OF AIRFLOW. UPON COMPLETION OF INSTALLATION OF DUCT LINER AND BEFORE OPERATION IS TO COMMENCE, VISUALLY INSPECT SYSTEM AND VERIFY THAT THE DUCT LINER IS PROPERLY INSTALLED. OPEN ALL SYSTEM DAMPERS AND TURN ON FANS TO BLOW ALL SCRAPS AND OTHER LOOSE PIECES OF MATERIAL OUT OF THE DUCT SYSTEM. ALLOW FOR A MEANS OF REMOVAL OF SUCH MATERIAL.
- ALL INSULATION CONTAINING FIBROUS MATERIALS EXPOSED TO AIRFLOW SHALL BE RATED FOR THAT EXPOSURE OR SHALL BE ENCAPSULATED. INSULATING PROPERTIES FOR ALL MATERIALS SHALL MEET OR EXCEED INDUSTRY STANDARDS. POLYSTYRENE PRODUCTS SHALL MEET ASTM C578. ALL INSULATION SHALL HAVE FORMALDEHYDE EMISSIONS NOT GREATER THAN 0.05 PPM. THE MAXIMUM FLAME SPREAD AND SMOKE DEVELOPED INDEX FOR INSULATION SHALL MEET THE REQUIREMENTS OF THE LOCAL CODES AND ORDINANCES ADOPTED BY THE JURISDICTION IN WHICH THE BUILDING IS LOCATED.
- MASTIC USED TO SEAL DUCTWORK SHALL BE LISTED AND LABELED IN ACCORDANCE WITH UL 181A OR UL 181B MAINTAIN AMBIENT TEMPERATURES AND CONDITIONS REQUIRED BY MANUFACTURER OF ADHESIVES, MASTICS, AND INSULATION CEMENTS. DO NOT INSTALL DUCT SEALANT WHEN TEMPERATURES ARE LESS THAN THOSE RECOMMENDED BY THE SEALANT MANUFACTURER.
- ALL ADHESIVES AND SEALANTS SHALL HAVE VOC CONTENT BELOW 20 GRAMS PER LITER AND WHICH MEET THE REQUIREMENTS OF THE MANUFACTURER OF THE PRODUCTS BEING ADHERED OR INVOLVED. ADHESIVES AND SEALANTS SHALL CONTAIN NO HEAVY METALS OR FORMALDEHYDE.
- FACTORY-MADE AIR DUCTS AND CONNECTORS SHALL COMPLY WITH UL 181.
- FLEXIBLE DUCT SHALL BE UL LISTED CLASS 0 OR CLASS 1, INSULATED, AND COMPLY WITH UL 181. FLEXIBLE DUCT SHALL BE FACTORY FORMED, COMPOSED OF SPIRAL WOUND CORROSION RESISTANT WIRE BONDED TO AN INNER FABRIC LINER. DUCT SHALL BE FACTORY INSULATED WITH A FOIL VAPOR BARRIER JACKET. CONNECT TO RIGID DUCT WITH SPIN-IN FITTING AND DAMPER. FLEXIBLE DUCTS AND AIR CONNECTORS SHALL NOT PASS THROUGH ANY FIRE RESISTANCE RATED ASSEMBLY.
- THE MC SHALL PROVIDE ALL DIFFUSERS GRILLES, LOUVERS, AND OTHER AIR DISTRIBUTION OUTLETS AND INLETS. LOUVERS, GRILLES, AND DIFFUSERS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS. FOR LAY-IN CEILINGS, INSTALL SUPPORT FROM THE STRUCTURE FOR EACH DIFFUSER OR DAMPER. AIR DISTRIBUTION OUTLETS AND INLETS SHALL BE AS SCHEDULE OR ALTERNATES LISTED.

## RECTANGULAR/SQUARE TO ROUND DUCT EQUIVALENT

RECTANGULAR DUCT	ROUND DUCT
30"X26"	30"Ø
20"X26"	24"Ø
18"X18"	20"Ø
18"X20"	20"Ø
20"X16"	18"Ø
16"X16"	16"Ø
10"X16"	14"Ø
10"X20"	16"Ø
16"X14"	16"Ø
16"X12"	14"Ø



PO Box 3301, Henderson, NC 27536  
www.kilianengineering.com  
252.438.8778

## Craig A. Otto ARCHITECT, INC.

DESIGN • PLANNING • ARCHITECTURE

105 West Main Street, Suite C  
Lexington, South Carolina 29072  
Phone (803) 957-9004  
craig@craigottoarchitect.com

No.	Revisions	Date

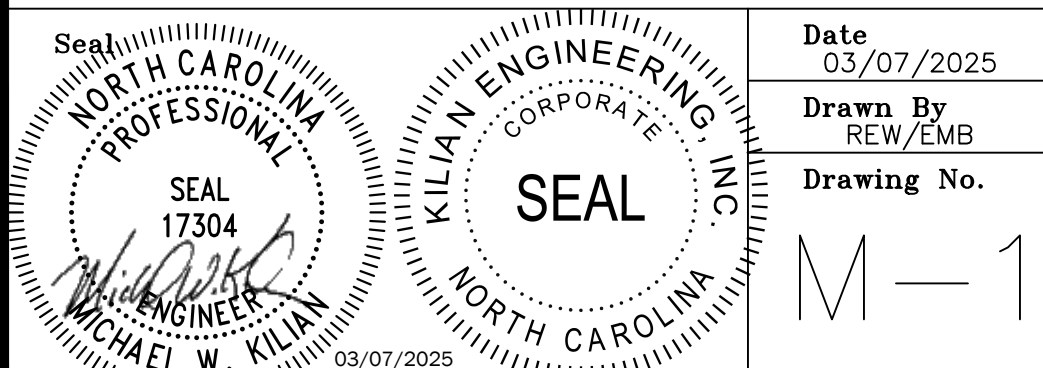
All rights reserved. This drawing and the design shown thereon are copyrighted as prescribed by the laws of the United States and are the sole property of Craig A. Otto, Architect, Inc. Anyone duplicating, reproducing, or causing to be reproduced these drawings or the design thereon without permission of the architect will be subject to legal action.

Project Title  
ASSOCIATED CONTRACT SERVICES  
JARCO DR., FUQUAY VARINA, NC

Drawing Title  
MECHANICAL NOTES

Project No. 250077

Consultant



Date  
03/07/2025

Drawn By  
REW/EMB

Drawing No.

M-1

**MECHANICAL  
PLAN HEX NOTES**

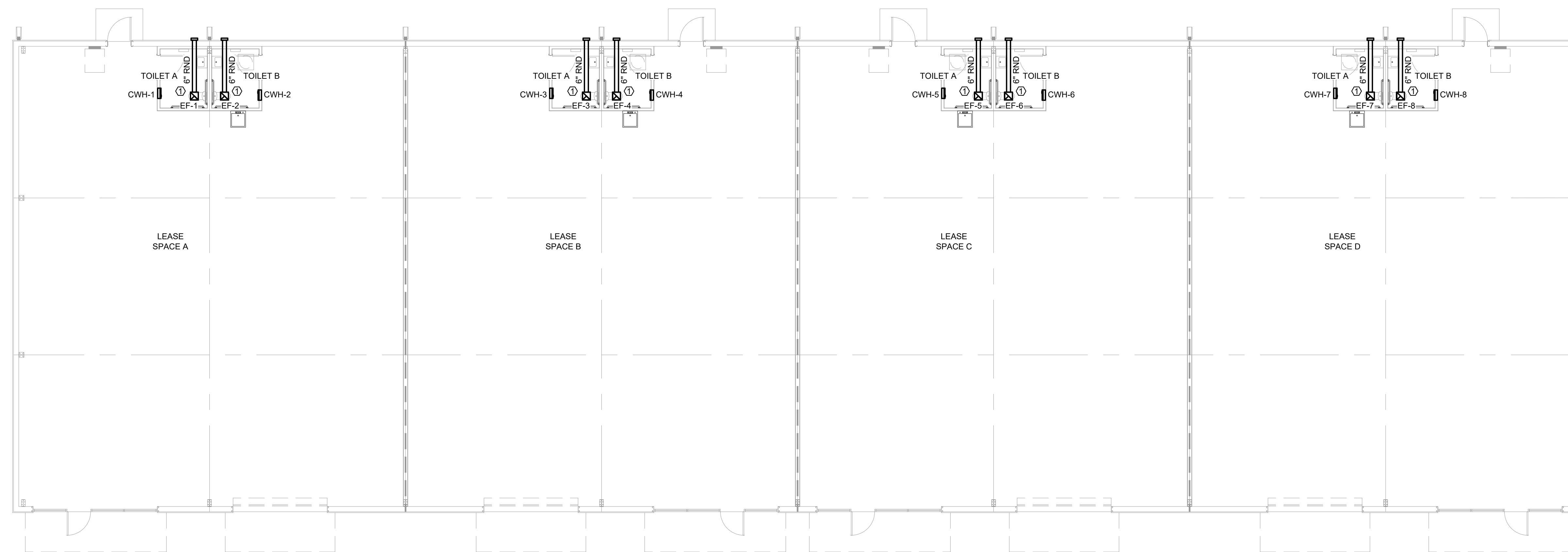
- ROUTE 6" Ø EXHAUST DUCT TO EXTERIOR. TERMINATE WITH APPROVED WALL CAP.

**WALL / CEILING LEGEND**

NON-RATED WALLS:  
ALL INTERIOR WALLS SHOWN THUS SHALL BE METAL STUDS WITH 5/8" GYPSUM BOARD EACH SIDE (PROVIDE R-11 INSULATION AROUND ALL TOILETS AND OFFICES)

1 HOUR RATED WALLS:  
ALL INTERIOR WALLS SHOWN THUS SHALL BE METAL STUDS WITH 5/8" TYPE X GYPSUM BOARD EACH SIDE TO BOTTOM OF ROOF (PROVIDE R-13 BATT INSULATION)

NOTE: FIRE EXTINGUISHERS SHALL NOT BE OBSTRUCTED OR OBSCURED FROM VIEW AND MUST BE INSTALLED IN CONSPICUOUS LOCATIONS. CABINETS SHALL BE PROVIDED WITH A MEANS OF READY ACCESS AND SHALL NOT BE LOCKED



**1 MECHANICAL PLAN**  
Scale: 1/8" = 1'-0"



PO Box 3301, Henderson, NC 27536  
www.kilianengineering.com  
252.438.8778

**Craig A. Otto  
ARCHITECT, INC.**

DESIGN • PLANNING • ARCHITECTURE

105 West Main Street, Suite C  
Lexington, South Carolina 29072  
Phone (803) 957-9004  
craig@craigottoarchitect.com

No.	Revisions	Date

All rights reserved. This drawing and the design shown thereon are copyrighted as prescribed by the laws of the United States and are the sole property of Craig A. Otto, Architect, Inc. Anyone duplicating, reproducing, or causing to be reproduced these drawings or the design thereon without permission of the architect will be subject to legal action.

Project Title  
**ASSOCIATED CONTRACT SERVICES  
JARCO DR., FUQUAY VARINA, NC**

Drawing Title  
**MECHANICAL PLAN**

Project No.  
**250077**

Consultant

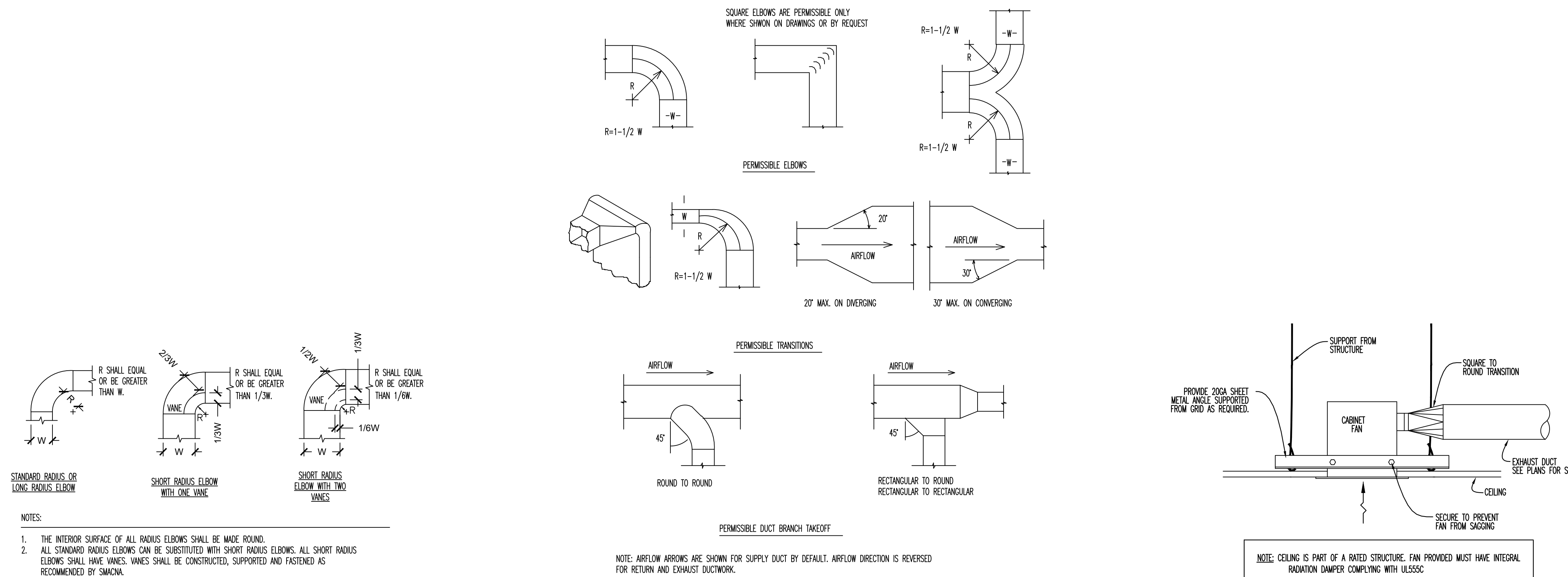
	Date 03/07/2025
	Drawn By REW/EMB Drawing No. <b>M-2</b>

ELECTRIC FAN-FORCED WALL HEATER SCHEDULE							
MARK	MFG/Model #	AIR FLOW	HEATER	VOLT/PH	FLA	MOCPP	NOTES
		CFM	KW		AMPS	AMPS	
CWH-1-8	QMARK CWH3404F	100	4	208/1	14.5	20	1-4

1. BUILT-IN THERMOSTAT
2. BUILT-IN DISCONNECT SWITCH
3. PROVIDE WITH SURFACE MOUNTING SLEEVE KIT
4. PROVIDE WITH 14-GAUGE SECURITY FRONT COVER, WHITE

EXHAUST FAN SCHEDULE								
MARK	MFG/MODEL #	TYPE	ESP (in WG)	CFM	VOLT/PH	FLA	SONES	NOTES
			0.40			96		
EF-1-8	GREENHECK SP-B110	CEILING						1-3

1. PROVIDE WITH PITCHED ROOF CURB & CAP FOR FLAT OR SLOPED ROOF, OR HOODED WALL WITH BACKDRAFT DAMPER CAP AS APPLICABLE
2. PROVIDE WITH SQUARE TO ROUND DUCT ADAPTER AS NECESSARY
3. OR EQUAL BY LOREN COOK OR PENNBARRY OR TWIN CITY



1 ACCEPTABLE ELBOWS

2 ACCEPTABLE DUCT TRANSITIONS

3 EXHAUST FAN DETAIL

- NOTES:
1. THE INTERIOR SURFACE OF ALL RADIUS ELBOWS SHALL BE MADE ROUND.
  2. ALL STANDARD RADIUS ELBOWS CAN BE SUBSTITUTED WITH SHORT RADIUS ELBOWS. ALL SHORT RADIUS ELBOWS SHALL HAVE VANES. VANES SHALL BE CONSTRUCTED, SUPPORTED AND FASTENED AS RECOMMENDED BY SMACNA.

**Kilian Engineering, Inc.**

105 West Main Street, Suite C  
Lexington, South Carolina 29072  
www.kilianengineering.com  
252.438.8778

**Craig A. Otto ARCHITECT, INC.**

DESIGN • PLANNING • ARCHITECTURE

105 West Main Street, Suite C  
Lexington, South Carolina 29072  
Phone (803) 957-9004  
craig@craigottoarchitect.com

No.	Revisions	Date

All rights reserved. This drawing and the design shown thereon are copyrighted as prescribed by the laws of the United States and are the sole property of Craig A. Otto, Architect, Inc. Anyone duplicating, reproducing, or causing to be reproduced these drawings or the design thereon without permission of the architect will be subject to legal action.

Project Title  
**ASSOCIATED CONTRACT SERVICES**  
JARCO DR., FUQUAY VARINA, NC

Drawing Title  
**MECHANICAL SCHEDULES AND DETAILS**

Project No. **250077**

Consultant

	Date	03/07/2025
	Drawn By	REW/EMB
	Drawing No.	M-3

## GENERAL ELECTRICAL NOTES:

### ADMINISTRATIVE:

1. THE FOLLOWING ABBREVIATIONS SHALL APPLY TO NOTES AND PLANS:

- PC - PLUMBING CONTRACTOR,
  - EC - ELECTRICAL CONTRACTOR,
  - MC - MECHANICAL CONTRACTOR,
  - GC - GENERAL CONTRACTOR,
  - FASC - FIRE ALARM SYSTEM CONTRACTOR,
  - AHJ - AUTHORITY HAVING JURISDICTION
  - NECA- NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION
  - NEC- NATIONAL ELECTRICAL CODE (2020)
  - SBC- CURRENT STATE BUILDING CODE (2018 NORTH CAROLINA STATE BUILDING CODE: BUILDING CODE)
  - SFC: CURRENT STATE BUILDING CODE: FIRE CODE (2018 NORTH CAROLINA STATE BUILDING CODE: FIRE PREVENTION CODE)
2. "PROVIDE" MEANS TO FURNISH AND INSTALL. THE EC SHALL ALSO INSTALL MATERIALS AND EQUIPMENT FURNISHED BY OTHERS AND THE GENERAL CONTRACTOR AS REQUIRED.
3. EC SHALL PROVIDE LABOR, MATERIALS, EQUIPMENT, AND SERVICES NECESSARY AND REASONABLY INCIDENTAL TO INSURE A COMPLETE AND OPERATIONAL ELECTRICAL SYSTEM IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS. MINOR ITEMS, ACCESSORIES, AND DEVICES REASONABLY INFERABLE AS NECESSARY FOR THE COMPLETION AND PROPER OPERATION OF ANY ELECTRICAL SYSTEM SHALL BE PROVIDED BY THE EC.
4. WORKMANSHIP SHALL BE IN ACCORDANCE WITH NECA 1 "STANDARD PRACTICE FOR GOOD WORKMANSHIP IN ELECTRICAL CONTRACTING."
5. ALL MATERIALS AND EQUIPMENT SHALL BE DELIVERED TO THE SITE AND UNLOADED BY THE EC AT AN APPROVED LOCATION. THE EC SHALL PROTECT ALL MATERIALS AND EQUIPMENT FROM BREAKAGE, THEFT, AND THE ELEMENTS. ALL MATERIALS AND EQUIPMENT SHALL REMAIN THE PROPERTY OF THE EC UNTIL THE PROJECT HAS BEEN COMPLETED AND TURNED OVER TO THE OWNER.
6. THE EC SHALL OBTAIN AND PAY FOR ALL PERMITS, FEES, AND INSPECTIONS NECESSARY FOR THE COMPLETION OF THE WORK UNDER THIS CONTRACT.
7. DO NOT SCALE THESE DRAWINGS-REFER TO ARCHITECTURAL SHEETS FOR DIMENSIONS.
8. TRADE NAMES AND MANUFACTURERS ARE SPECIFIED TO ESTABLISH A QUALITY STANDARD. SUBSTITUTIONS SHALL BE PERMITTED IF APPROVED BY THE ENGINEER PRIOR TO INSTALLATION. ALL LISTED MODEL NUMBERS SHALL BE VERIFIED WITH THE MANUFACTURER FOR PROPER APPLICATION OF EQUIPMENT.
9. THE EC SHALL VISIT THE SITE PRIOR TO BIDDING TO BECOME FAMILIAR WITH EXISTING CONDITIONS. THE EC SHALL CONTACT THE ENGINEER TO RESOLVE ANY DISCREPANCIES BETWEEN EXISTING CONDITIONS AND THESE PLANS. THE EC SHALL COORDINATE WITH OTHER TRADES PRIOR TO THE START OF CONSTRUCTION.
10. GROUNDING AND BONDING SHALL BE PER NEC ARTICLE 250. THE RACEWAY SYSTEM SHALL NOT BE RELIED UPON FOR GROUNDING CONTINUITY. A GREEN EQUIPMENT GROUNDING CONDUCTOR, SIZED PER NEC TABLE 250-122, SHALL BE RUN IN ALL POWER RACEWAYS. FOR NON-ISOLATED GROUND CIRCUITS PROVIDE ONE EQUIPMENT GROUNDING CONDUCTOR PER CONDUIT RUN. FOR ISOLATED GROUND CIRCUITS, PROVIDE ONE NEUTRAL AND ONE ISOLATED GROUND WIRE FOR EACH CIRCUIT; IN ADDITION, PROVIDE ONE EQUIPMENT GROUNDING CONDUCTOR PER CONDUIT RUN. MAIN BONDING JUMPERS AND SYSTEM BONDING JUMPERS SHALL BE INSTALLED IN ACCORDANCE WITH 250.28 OF THE NEC. FOR BUILDINGS OR STRUCTURES SUPPLIED BY FEEDERS OR BRANCH CIRCUITS, GROUNDING AND BONDING SHALL BE IN ACCORDANCE WITH NEC 250.32. SEPARATELY DERIVED AC SYSTEMS SHALL BE GROUNDED IN ACCORDANCE WITH NEC 250.30. RESISTANCE TO GROUND SHALL NOT EXCEED 25 OHMS; ADDITIONAL GROUNDING ELECTRODES SHALL BE INSTALLED PER 250.56 AS NECESSARY.
11. ALL MATERIALS AND EQUIPMENT SHALL COMPLY WITH THE UNDERWRITERS' LABORATORIES, INC. STANDARDS OR HAVE UL APPROVAL, OR BEAR UL RE-EXAMINATION LISTING WHERE SUCH APPROVAL HAS BEEN ESTABLISHED FOR THE TYPE OF DEVICE IN QUESTION.
12. CONDUCTORS, FUSES, CIRCUIT BREAKERS, AND DISCONNECT SWITCHES SHOWN ON THESE PLANS HAVE BEEN SIZED FOR THE SPECIFIED EQUIPMENT. BEFORE ORDERING ELECTRICAL EQUIPMENT, THE EC SHALL COORDINATE WITH OTHER CONTRACTORS ON THE SITE AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES SHOULD CONDUCTOR, CIRCUIT BREAKER, OR FUSE SIZES REQUIRE CHANGE.
13. THE EC SHALL COORDINATE WITH THE GC TO ENSURE THE FOLLOWING MATERIALS ARE RECYCLED DURING THE CONSTRUCTION PHASE OF THE PROJECT: LIGHT FIXTURES, INCLUDING PROPER DISPOSAL OF BALLASTS, FLUORESCENT LIGHT BULBS, AND TRANSFORMERS, WIRING AND ELECTRICAL EQUIPMENT, AND INSULATION. WASTE MATERIALS CONTAINING LEAD, ASBESTOS, PCBs (FLUORESCENT LAMP BALLASTS), OR OTHER HARMFUL SUBSTANCES SHALL BE HANDLED AND DISPOSED OF IN ACCORDANCE WITH FEDERAL AND STATE LAWS AND REQUIREMENTS CONCERNING HAZARDOUS WASTE.
14. ALL WORK SHALL CONFORM TO NEC, SBC, AND ALL APPLICABLE LOCAL CODES.
15. THE EC SHALL ALSO COORDINATE WITH THE GC REGARDING THE BONDING OF THE FOOTING REBAR, SO THAT IT WILL BE IN PLACE AND READY AT TIME OF FOOTING INSPECTION.

### METHODS:

1. EC SHALL REVIEW THE MECHANICAL PLANS TO ESTABLISH POINTS OF CONNECTION AND THE EXTENT OF THE ELECTRICAL WORK TO BE PROVIDED IN THE CONTRACT.
2. ALL CIRCUIT BREAKERS FEEDING HVAC EQUIPMENT SHALL BE HACR BREAKERS. ALL BRANCH CIRCUIT CONDUCTORS SHALL BE MINIMUM #12 AWG IN 3/4 in CONDUIT. EACH MULTI-WIRE BRANCH CIRCUIT SHALL BE PROVIDED WITH A MEANS TO SIMULTANEOUSLY DISCONNECT ALL UNGROUNDED CONDUCTORS AT THE SOURCE PER NEC 210.4(B). GROUP ALL CONDUCTORS OF EACH MULTI-WIRE BRANCH CIRCUIT PER 210.4(D) WITH WIRE TIES OR SIMILAR MEANS. DO NOT EXCEED THREE HOMERUNS PER CONDUIT. DO NOT INSTALL ISOLATED GROUND AND NON-ISOLATED GROUND CIRCUITS IN THE SAME CONDUIT. INSTALL CONDUCTORS OF DIFFERENT VOLTAGES IN SEPARATE CONDUITS.

3. ALL LIGHT FIXTURES SHALL BE SUPPORTED INDEPENDENTLY OF THE SUSPENDED CEILING. COORDINATE LIGHTING LAYOUT WITH CEILING GRID, MECHANICAL EQUIPMENT, DUCTWORK AND SPRINKLER HEADS AS NECESSARY. SEE REFLECTED CEILING PLAN FOR DETAILS. FLUORESCENT FIXTURES UTILIZING DOUBLE-ENDED LAMPS MUST HAVE A DISCONNECTING MEANS COMPLYING WITH NEC 410.130(G).
4. MOUNT LIGHT SWITCHES AT 48 in AFF. MULTIPLE SWITCHES AT SAME LOCATION SHALL BE UNDER ONE WALL PLATE. VERIFY WALL PLATE COLOR AND MATERIAL WITH THE ARCHITECT/OWNER. INSTALL SWITCHES WITH OFF POSITION DOWN. ALL SWITCHES SHALL BE HEAVY DUTY, IVORY PLASTIC WITH TOGGLE HANDLE, RATED 120-277V AC, AND COMPLYING WITH NEMA WD 6 AND WD 1. SWITCHES SHALL BE BY COOPER WIRING DEVICES, LEVITON MANUFACTURING, PASS & SEYMOUR, OR HUBBELL. PROVIDE BOX DEVICE PARTITION/DIVIDERS FOR MULTI-GANG BOXES FOR COMPLIANCE WITH NEC 404.8(B).
5. EC SHALL PROVIDE FIRE-STOPPING AT ALL ELECTRICAL PENETRATIONS OF RATED FLOORS AND WALLS TO PRESERVE OR RESTORE THE FIRE-RESISTANCE RATING. SEAL PENETRATIONS USING A UL LISTED SYSTEM FOUND IN THE UL DIRECTORY SPECIFIC TO THE UL LISTING OF THE ASSEMBLY BEING PENETRATED. SEE ARCHITECTURAL PLANS FOR UL RATED ASSEMBLIES SPECIFIC TO THIS PROJECT.
6. EC SHALL PROVIDE GFCI RECEPTACLES IN KITCHENS, RESTROOMS, OUTDOORS, AND IN SHOP AREAS AS REQUIRED BY NEC. REFRIGERATORS AND WATER COOLERS MUST HAVE A DEDICATED GFCI BREAKER. EACH OUTDOOR HVAC UNIT MUST HAVE A GFCI RECEPTACLE WITHIN 25 FEET FOR SERVICING. GFCI RECEPTACLES SHALL CONFORM TO UL 943 CLASS A AND UL 498 STANDARDS. SHOW WINDOW RECEPTACLES SHALL BE PROVIDED IN ACCORDANCE WITH 210.62 OF THE NEC. RECEPTACLES SHALL BE BY COOPER WIRING DEVICES, LEVITON MANUFACTURING, PASS & SEYMOUR, OR HUBBELL. ALL RECEPTACLES SHALL BE 125V RATED, HEAVY DUTY, AND COMPLY WITH NEMA WD 6 AND WD 1.
7. LOCATIONS AND HEIGHTS OF ALL WALL-MOUNTED DEVICES SHALL BE COORDINATED WITH THE ARCHITECT PRIOR TO INSTALLATION.
8. CONCEAL ALL CONDUIT EXCEPT IN MECHANICAL ROOMS OR UNFINISHED AREAS AS NOTED. USE EMT CONDUIT FOR ALL BRANCH CIRCUITS AND FEEDERS INSIDE THE BUILDING. TYPE MC CABLE AND TYPE AC CABLE MAY BE INSTALLED WITHIN WALLS IF ALL NEUTRAL WIRES, ISOLATED GROUND WIRES, AND EQUIPMENT GROUND WIRES AS LISTED ABOVE ARE CONTAINED IN THE CABLE. FLEXIBLE CONNECTIONS TO MOTORS AND OTHER EQUIPMENT SHALL BE MADE USING WEATHERPROOF FLEXIBLE CONDUIT. FOR LAY-IN LIGHT FIXTURES, USE MAXIMUM OF SIX (6) FEET OF FLEXIBLE MC CABLE (OR THE FLEXIBLE CONDUIT PROVIDED BY THE FIXTURE MANUFACTURER). SCHEDULE 40 PVC CONDUIT MAY BE USED FOR THE SECONDARY UNDERGROUND SERVICE, UNDERGROUND TELEPHONE SERVICE, AND BRANCH AND FEEDER CIRCUITS UNDER SLAB OR EXTERIOR TO THE BUILDING. EXPOSED EXTERIOR CONDUIT SHALL BE SCHEDULE 80 PVC. ALL UNDERGROUND RACEWAYS SHALL BE IDENTIFIED WITH UNDERGROUND LINE MARKING TAPE 6-8 in BELOW GRADE DIRECTLY ABOVE THE RACEWAY. PROVIDE PULL WIRE IN EMPTY CONDUITS. UPSIZE CONDUIT FROM MINIMUM SIZE AS NECESSARY FOR LONGER PULLS. UNDERGROUND RACEWAYS THAT STUB INTO THE BOTTOM OF SWITCHBOARDS, OUTDOOR TRANSFORMERS, GENERATORS, ETC., SHALL RISE AT LEAST 2 in ABOVE THE FINISHED SLAB TO PREVENT WATER FROM DRAINING INTO THE RACEWAYS. RACEWAYS THAT PENETRATE EXTERIOR WALLS OR INTERIOR PARTITIONS SEPARATING SPACES THAT WILL BE AT SIGNIFICANTLY DIFFERENT TEMPERATURES SHALL BE SEALED IN ACCORDANCE WITH ARTICLES 300.5(G), 300.7(A), AND 300.50(F) OF THE NEC. ROUTE CONDUIT IN AND UNDER SLAB FROM POINT-TO-POINT. ROUTE EXPOSED CONDUIT AND CONDUIT INSTALLED ABOVE ACCESSIBLE CEILINGS PARALLEL AND PERPENDICULAR TO WALLS. COMPLETELY AND THOROUGHLY SWAB ALL RACEWAYS BEFORE INSTALLING WIRE. PULL ALL CONDUCTORS INTO EACH RACEWAY AT ONE TIME. USE A SUITABLE WIRE PULLING LUBRICANT FOR BUILDING WIRE #4 AWG AND LARGER.
9. CABLES, RACEWAYS, OR BOXES, INSTALLED IN EXPOSED OR CONCEALED LOCATIONS UNDER METAL-CORRUGATED SHEET ROOF DECKING, SHALL BE INSTALLED AND SUPPORTED SO THERE IS NOT LESS THAN 1-1/2 in MEASURED FROM THE LOWEST SURFACE OF THE ROOF DECKING TO THE TOP OF THE CABLE, RACEWAY, OR BOX. A CABLE, RACEWAY, OR BOX SHALL NOT BE INSTALLED IN CONCEALED LOCATIONS IN METAL-CORRUGATED, SHEET DECKING-TYPE ROOF. SEE NEC 300.4(E)
10. THE EC SHALL PROVIDE ALL OUTLET, JUNCTION, PULL BOXES, FITTINGS, AND SUPPORTS. ALL OUTLET AND JUNCTION BOXES SHALL BE GALVANIZED STEEL TYPE BY APPLETON, STEEL CITY, OR RACO. EXTERIOR BOXES SHALL BE TYPE FS. VAPORTITE BOXES SHALL BE TYPE GS. WHERE SURFACE MOUNTED BOXES ARE USED, THOSE BOXES AND THEIR FACEPLATES SHALL HAVE ROUNDED CORNERS. BOXES INSTALLED IN FLOORS SHALL BE RATED FOR THE APPLICATION. MOUNT JUNCTION AND OUTLET BOXES FLUSH WITH FINISH SURFACES UNLESS OTHERWISE NOTED. WHERE MOUNTING HEIGHTS ARE GIVEN, THEY SHALL BE MEASURED FROM THE FINISHED FLOOR TO THE CENTER OF THE BOX. ALL BOXES SHALL BE SIZED PER NEC ARTICLE 314. ALL OUTLET AND JUNCTION BOXES SHALL HAVE A COVER PLATE, PROVIDED BY THE EC. OUTLET BOXES IN RATED WALLS SHALL BE INSTALLED IN ACCORDANCE WITH SBC 714.3.2 (MAXIMUM BOX SIZE IS 16 SQUARE in AND MAXIMUM OF SIX (6) BOXES PER 100 SQUARE FEET). INSTALL OUTLET BOXES IN RATED WALLS SUCH THAT OPENINGS OCCUR IN ONE SIDE ONLY WITHIN ANY GIVEN STUD SPACE. ALL CLEARANCES BETWEEN THE OUTLET BOX AND THE GYPSUM BOARD SHALL BE FILLED WITH JOINT COMPOUND OR OTHER APPROVED FIRE STOP MATERIAL. FLUSH MOUNTED JUNCTION BOXES IN ADJACENT ROOMS SHALL NOT BE MOUNTED BACK-TO-BACK. SURFACE MOUNTED FIXTURES SHALL BE FED THROUGH FLUSH MOUNTED 4X4 OCTAGONAL OR SQUARE BOXES.
11. ALL CONDUIT, BOXES, AND ELECTRICAL EQUIPMENT SHALL BE FIRMLY AND SECURELY FASTENED TO OR SUPPORTED FROM THE BUILDING STRUCTURAL MEMBERS OR EMBEDDED IN CONCRETE OR MASONRY.

- ELECTRICAL SUPPORTS SHALL NOT BE ATTACHED TO DUCTWORK, PIPING, OR THEIR SUPPORTS. HANGERS SHALL BE CATALOG ITEMS COMPATIBLE WITH AND SUITABLE FOR THE INTENDED USE. FOR METAL ROOF DECK INSTALLATIONS, 1 in EMT CONDUIT MAXIMUM AND 4 in JUNCTION BOXES MAXIMUM MAY BE SUPPORTED BY DECKING. THE SUSPENDED CEILING SYSTEM SHALL NOT BE USED FOR THE SUPPORT OF ELECTRICAL RACEWAY SYSTEMS OR SUPPORT OF COMMUNICATIONS OR DATA SYSTEMS WIRING. CONTRACTOR SHALL COMPLY WITH 1613 OF THE SBC.
12. ALL TELEPHONE AND COMMUNICATIONS OUTLETS AND RACEWAYS ARE ROUGH-INS ONLY. EACH TELEPHONE AND COMMUNICATIONS OUTLET SHALL BE A 4 in SQUARE BY 2-1/8 in DEEP BOX WITH 3/4 in KNOCK-OUTS AND A 3/4 in CONDUIT STUBBED FROM THE OUTLET BOX TO ABOVE THE CEILING. PROVIDE A NON-METALLIC INSULATING BUSHING ON ALL CONDUITS STUBBED ABOVE THE CEILING. PROVIDE A BLANK COVER PLATE ON ALL OUTLET BOXES.
13. EC SHALL INSTALL DISCONNECT SWITCHES IN SIGHT OF ALL HARDWIRED EQUIPMENT AND APPLIANCES OR PROVIDE BREAKERS CAPABLE OF BEING LOCKED IN THE OPEN POSITION PER NEC 422.31. FOR MOTOR DRIVEN APPLIANCES, PROVIDE A DISCONNECTING MEANS PER NEC 422.31 AND 430 PART IX. WHERE AN INDIVIDUAL DISCONNECT SWITCH, CIRCUIT BREAKER, STARTER, ETC, IS SHOWN ON THE PLANS ADJACENT TO ITS LOAD AND NOT LOCATED ON A WALL, PROVIDE NECESSARY MATERIALS AND LABOR TO SUPPORT THE DEVICE.
14. EC SHALL FIELD IDENTIFY ALL SWITCH BOARD, PANEL BOARDS, CONTROL PANELS, METER SOCKETS, ETC., TO WARN QUALIFIED PERSONS OF POTENTIAL ELECTRICAL ARC FLASH HAZARDS PER 110.16 OF NEC.
15. EC SHALL PROVIDE NAMEPLATES FOR IDENTIFICATION OF ALL EQUIPMENT, SWITCHES, PANELS, ETC. THE NAMEPLATES SHALL BE LAMINATED PHENOLIC PLASTIC, BLACK FRONT, AND BACK WITH WHITE CORE. WHITE ENGRAVED LETTERS (1/4 in MINIMUM) ETCHED INTO THE WHITE CORE. EC SHALL PROVIDE A TYPE WRITTEN DIRECTORY CARD THAT ACCURATELY IDENTIFIES CIRCUITS INSIDE EACH PANEL.
16. IN ACCORDANCE WITH SECTION 510 OF THE SFC, TESTING WILL BE REQUIRED TO DETERMINE SATISFACTORY FIRST RESPONDER RADIO SIGNAL STRENGTH INSIDE EACH BUILDINGS ON SITE. TESTING WILL NEED TO EITHER BE COMPLETED BY A COUNTY FIRE INSPECTOR (OBTAIN BY REQUESTING A COURTESY INSPECTION) OR A CERTIFIED 3RD PARTY. TESTING SHALL TAKE PLACE AT BOTH 80% PROJECT COMPLETION AND AGAIN AT 100% COMPLETION. IF UNACCEPTABLE SIGNAL DEGRADATION IS PRESENT AT EITHER 80% OR 100% INSPECTION, THEN AN ACCEPTABLE BOOSTER SYSTEM SHALL BE ADDED TO THE BUILDING DESIGN AT THAT TIME.
17. COLOR CODE CONDUCTORS PER NEC. FEEDERS SHALL BE IDENTIFIED IN ACCORDANCE WITH NEC 215.12. USE BLACK, RED, AND BLUE FOR PHASES A, B, AND C RESPECTIVELY ON 208Y/120 VOLT THREE-PHASE Y SYSTEMS AND WHITE FOR THE NEUTRAL. THIS IDENTIFICATION SHALL BE MADE AT EACH POINT WHERE A CONNECTION IS MADE. COLORS SHALL BE FACTORY APPLIED FOR CONDUCTORS #6 AWG AND SMALLER. ALL EQUIPMENT GROUNDING CONDUCTORS SHALL BE GREEN IN COLOR AND MINIMUM #12 AWG. THE EC SHALL PROVIDE PLENUM RATED CABLE FOR ANY ELECTRICAL, TELEPHONE, COMMUNICATION, OR OTHER CABLE THAT ENTERS CEILING RETURN PLENUMS.
18. WHERE CONDUCTORS ARE RUN IN PARALLEL, THE EC SHALL COMPLY WITH NEC 310.10(G).
19. PROVIDE AN UNDERGROUND PVC CONDUIT SYSTEM FOR TELEPHONE SERVICE WITH PULL WIRES. EC SHALL COORDINATE WITH TELEPHONE UTILITY REGARDING ADDITIONAL FACILITIES REQUIRED FOR THE SERVICE INSTALLATION.
20. INSTALL ONE (1) 3/4 in FIRE RETARDANT TREATED PLYWOOD BACKBOARD WHERE INDICATED ON THE DRAWINGS FOR THE USE BY THE TELEPHONE SYSTEM. PROVIDE A 120 VOLT RECEPTACLE ADJACENT TO THE TELEPHONE BOARD. GROUND ALL TELEPHONE AND COMMUNICATIONS CIRCUITS PER NEC 800.

### MATERIALS:

1. THE EC SHALL PROVIDE ALL NECESSARY DISCONNECTS, SWITCHES, RECEPTACLES, TERMINALS, ETC, UNDER THE ELECTRICAL BID AND SHALL INCLUDE ALL NECESSARY CIRCUITS AND CONNECTIONS TO THE EQUIPMENT PROVIDED BY ALL SUPPLIERS, UNLESS NOTED OTHERWISE BY OTHER DISCIPLINES.
2. EC SHALL PROVIDE ALL SERVICE ENTRANCE EQUIPMENT, SUB PANELS, AND OTHER ELECTRICAL DISTRIBUTION EQUIPMENT AS NECESSARY FOR A COMPLETE INSTALLATION. EC SHALL COORDINATE WITH UTILITY REGARDING SERVICE AND METERING DETAILS. \*PRIOR TO ORDERING EQUIPMENT, THE EC SHALL OBTAIN THE AVAILABLE FAULT CURRENT OR TRANSFORMER SIZE AND IMPEDANCE FROM THE UTILITY AND CONTACT THE ENGINEER IF THE VALUE EXCEEDS THE EQUIPMENT SPECIFIED.\* PANEL BOARDS AND SWITCH BOARDS SHALL BE SQUARE D, CUTLER-HAMMER, SIEMENS, OR GE. BUSES SHALL BE COPPER UNLESS OTHERWISE APPROVED BY THE ENGINEER. RECESSED PANEL BOARDS SHALL BE INSTALLED FLUSH WITH THE WALL FINISH. METER BASES SHALL COMPLY WITH THE UTILITY'S SPECIFICATIONS AND SHALL BE MOUNTED AT A HEIGHT APPROVED BY THE UTILITY. ALL EQUIPMENT IDENTIFIED FOR SERVICE ENTRANCE USE SHALL BE SO LABELED AND UL LISTED FOR SUCH USE. EC SHALL INSTALL ALL ELECTRICAL EQUIPMENT WITH CLEARANCES PER NEC 110.26. EC SHALL PERMANENTLY LABEL EQUIPMENT PER NEC 110.24.
3. ENCLOSED SAFETY SWITCHES SHALL BE HEAVY DUTY TYPE BY SQUARE D, EATON, OR GE. ENCLOSED SWITCHES SHALL HAVE A HANDLE LOCKABLE IN THE OFF POSITION AND SHALL HAVE A HANDLE INTERLOCKED TO PREVENT OPENING THE FRONT COVER WHILE IN THE ON POSITION. ENCLOSED SWITCHES OF THE FUSIBLE TYPE SHALL BE FUSED IN ACCORDANCE WITH NAMEPLATE DATA WITH DUAL ELEMENT TYPE FUSES BY BUSSMAN, LITTELFUSE, OR MERSEN.
4. OCCUPANCY SENSORS SHALL BE BY WATTSTOPPER, LUTRON, LEVITON, SENSOR SWITCH, HUBBELL, OR APPROVED EQUAL.
5. CIRCUIT BREAKERS SHALL BE MOLDED-CASE, THERMAL MAGNETIC TYPE WITH QUICK-MAKE, QUICK-BREAK MECHANISM, COMMON TRIP ON MULTI-POLE BREAKERS, AND UL LISTED FOR BOTH COPPER AND ALUMINUM CONDUCTORS. CIRCUIT BREAKERS IN PANELS SHALL BE SERIES RATED WITH THE MAIN BREAKER, FULLY RATED FOR THE

- SYSTEM, OR SERIES RATED WITH THE BREAKER FEEDING THE PANEL FROM THE FACTORY.
6. ALL WIRE, CONNECTORS, TERMINALS, AND LUGS SHALL BE PROVIDED BY THE EC. WHERE CONDUCTORS ARE RUN IN PARALLEL, LUGS SHALL BE LISTED FOR PARALLEL CONDUCTORS. PUSH WIRE CONNECTORS ARE NOT ALLOWED FOR BUILDING WIRE. PUSH CONNECTORS ARE ONLY ALLOWED, WHEN APPROVED, AS PART OF MANUFACTURED LISTED PRODUCTS. ALL WIRE SHALL BE INSTALLED IN CONDUIT UNLESS SPECIFICALLY NOTED OTHERWISE.
7. THE INSULATION TYPE FOR INTERIOR WIRING SHALL BE DUAL RATED THHN/THWN OR XHHW; ALL WIRING INSTALLED BELOW GRADE OR IN MOIST OR WET LOCATIONS SHALL HAVE TYPE THWN OR XHHW INSULATION. INSULATION VOLTAGE RATING SHALL BE 600 VOLTS AND A MINIMUM TEMPERATURE RATING OF 75°C. CONDUCTORS SHALL BE SOLID OR STRANDED COPPER FOR #10 AWG AND #12 AWG, AND STRANDED COPPER FOR #8 AWG AND LARGER SIZES. ALL WIRING AND CABLE SHALL BE UL LISTED. ALL TERMINATIONS AND DEVICES SHALL BE RATED FOR USE WITH 75°C CONDUCTORS. FINAL CONNECTIONS TO ALL MOTORS AND EQUIPMENT SUBJECT TO VIBRATION OR MOVEMENT SHALL BE MADE WITH STRANDED COPPER CONDUCTORS. CONDUCTORS SHALL BE BY CERRO WIRE, INC, INDUSTRIAL WIRE & CABLE, INC, ENCORE WIRE CORPORATION, OR SOUTHWIRE COMPANY.
8. JOINTS IN SOLID CONDUCTORS SHALL BE SPLICED USING IDEAL "WIRE NUTS", 3M "SCOTCH LOCK", OR T&B "PIGGY" CONNECTORS IN JUNCTION BOXES, OUTLET BOXES, AND LIGHTING FIXTURES. JOINTS IN STRANDED CONDUCTORS SHALL BE SPLICED BY APPROVED MECHANICAL CONNECTORS AND GUM RUBBER TAPE OR FRICTION TAPE. SOLDERLESS MECHANICAL CONNECTORS FOR SPLICES AND TAPS, PROVIDED WITH UL APPROVED INSULATING COVERS, MAY BE USED INSTEAD OF MECHANICAL CONNECTORS PLUS TAPE. IN ALL CASES, CONDUCTORS SHALL BE CONTINUOUS FROM OUTLET TO OUTLET AND NO SPLICING SHALL BE MADE EXCEPT WITHIN OUTLET OR JUNCTION BOXES, TROUGHS, OR GUTTERS. WHERE CONCENTRIC, ECCENTRIC, OR OVERSIZED KNOCKOUTS ARE ENCOUNTERED, A GROUNDING TYPE INSULATED BUSHING SHALL BE PROVIDED.
9. ALL LUMINAIRES SHALL BE LISTED. LUMINAIRES IN WET OR DAMP LOCATIONS SHALL BE MARKED AS SUITABLE FOR THE RESPECTIVE USE. EMERGENCY LIGHTING SHALL BE INSTALLED AS SHOWN. FINAL LOCATIONS OF ALL EXIT AND EMERGENCY LIGHTS SHALL BE VERIFIED WITH THE BUILDING INSPECTOR PRIOR TO INSTALLATION. ALL FLUORESCENT FIXTURES SHALL HAVE ELECTRONIC BALLASTS MEETING ANSI C82.11 FOR ELECTRONIC BALLAST PERFORMANCE. ALL BALLASTS SHALL BE UL LISTED AND MEET FEDERAL AND STATE EFFICIENCY REQUIREMENTS.
10. ALL CONDUIT, FITTINGS, COUPLINGS, AND SUPPORTS SHALL BE PROVIDED BY THE EC. CONDUIT FITTINGS AND COUPLINGS SHALL BE BY APPLETON, RACO, OR O-Z/GEDNEY. COUPLINGS SHALL BE THREADED, SET-SCREW, OR COMPRESSION TYPE. INDENTER OR CRIMP TYPE ARE NOT PERMITTED. CONDUIT FITTINGS AT ALL ELECTRICAL BOXES INCLUDING PULL, JUNCTION, AND OUTLET BOXES, SHALL HAVE INSULATED THROATS TO PREVENT INSULATION SCORING. DIE CAST FITTINGS ARE NOT PERMITTED
- EMT SHALL BE MANUFACTURED IN ACCORDANCE WITH AMERICAN NATIONAL STANDARDS INSTITUTE-AMERICAN NATIONAL STANDARD FOR STEEL ELECTRICAL METALLIC TUBING (EMT), ANSI C80.3 AND UL 797. RIGID METAL CONDUIT SHALL BE MANUFACTURED IN ACCORDANCE WITH ANSI-AMERICAN NATIONAL STANDARD FOR ELECTRICAL RIGID STEEL CONDUIT (ERSC), ANSI C80.1 AND UL 6. INTERMEDIATE METAL CONDUIT SHALL BE MANUFACTURED IN ACCORDANCE WITH ANSI-AMERICAN NATIONAL STANDARD FOR INTERMEDIATE METAL CONDUIT ANSI C80.6 AND UL 1242.
12. METAL CONDUIT SHALL BE BY ALLIED TUBING & CONDUIT, BECK MANUFACTURING, INC, OR WHEATLAND TUBE COMPANY. FLEXIBLE METAL CONDUIT, LIQUID-TIGHT FLEXIBLE METAL CONDUIT, AND NONMETALLIC CONDUIT SHALL BE BY AFC CABLE SYSTEMS, INC, ELECTRI-FLEX COMPANY, OR INTERNATIONAL METAL HOSE.

**Kilian Engineering, Inc.**

PO Box 3301, Henderson, NC 27536  
www.kilianengineering.com  
252.438.8778

**Craig A. Otto ARCHITECT, INC.**

DESIGN • PLANNING • ARCHITECTURE

105 West Main Street, Suite C  
Lexington, South Carolina 29072  
Phone (803) 957-9004  
craig@craigottoarchitect.com

No.	Revisions	Date

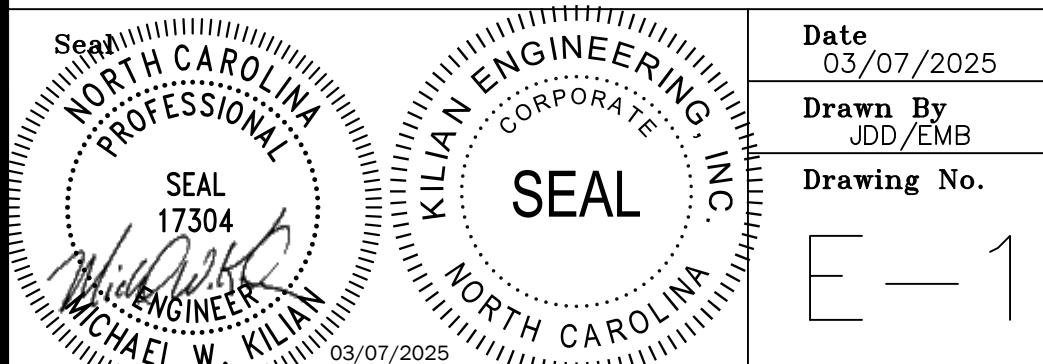
All rights reserved. This drawing and the design shown thereon are copyrighted as prescribed by the laws of the United States and are the sole property of Craig A. Otto, Architect, Inc. Anyone duplicating, reproducing, or causing to be reproduced these drawings or the design thereon without permission of the architect will be subject to legal action.

Project Title  
**ASSOCIATED CONTRACT SERVICES**  
JARCO DR., FUQUAY VARINA, NC

Drawing Title  
ELECTRICAL NOTES

Project No. 250077

Consultant



LIGHTING DEVICE LEGEND		
SYMBOL	DESCRIPTION	REMARKS
\$	SINGLE POLE WALL SWITCH	HEAVY DUTY, AC ONLY, COMMERCIAL GRADE GENERAL USE SNAP SWITCH COMPLYING WITH NEMA WD 6 AND WD 1. IVORY PLASTIC BODY WITH TOGGLE HANDLE. 120-277V, 20A. MEET FEDERAL SPECIFICATION W-S-896.
\$D	DIMMER SWITCH	COMMERCIAL GRADE, 120V, 1500W
\$W	WALL MOUNTED OCCUPANCY SENSOR	WATTSTOPPER DSW-301-W LINE VOLTAGE OCCUPANCY SENSOR. ULTRA SONIC AND INFRARED.
\$LV	LOW VOLTAGE SWITCH	WATTSTOPPER LVSW-101-B LOW VOLTAGE MOMENTARY CONTROL SWITCH.
\$3	3 WAY SWITCH	3-WAY TYPE SWITCH WITH SAME CHARACTERISTICS AS SINGLE POLE SWITCH ABOVE.
Ⓣ	CEILING OCCUPANCY SENSOR	WATTSTOPPER, HBL7 LOW VOLTAGE OCCUPANCY SENSOR. 360° ULTRA SONIC AND INFRARED.
P	POWER PACK	WATTSTOPPER, BZ-150 LOW VOLTAGE POWER PACK FOR CEILING PACK SENSORS.
J	JUNCTION BOX	GALVANIZED METAL BOX CONSTRUCTED IN ACCORDANCE WITH 314.40 OF THE NEC.
⊠	EXHAUST FAN	VENT FAN, 120V, CFM AS NOTED MC TO PROVIDE AND VENT, EC TO WIRE.

POWER DEVICE LEGEND		
SYMBOL	DESCRIPTION	REMARKS
▶	DATA AND TELEPHONE JACK	PHONE/DATA OUTLET. EC TO INSTALL 3/4" C WITH PULL-STRING FROM OUTLET BOX TO ABOVE CEILING FOR FUTURE USE. JACKS AND COMMUNICATION CABLING BY OTHERS.
Ⓢ	DUPLEX RECEPTACLE	NEMA 5-20R, HEAVY DUTY, COMMERCIAL GRADE, 125V, 20A COMPLYING WITH NEMA WD 6 AND WD 1. GFCI OR AFCI IF NOTED. 'WP' DENOTES WEATHERPROOF COVER. 'CH' DENOTES COUNTER HEIGHT. LISTED TAMPERPROOF IF NOTED. MEET FEDERAL SPECIFICATION W-C-596.
Ⓢ	QUAD RECEPTACLE	QUAD RECEPTACLE OF SAME CHARACTERISTICS AS DUPLEX TYPE ABOVE.
Ⓢ	DEDICATED RECEPTACLE	NEMA 5-20R, HEAVY DUTY, COMMERCIAL GRADE, 125V, 20A COMPLYING WITH NEMA WD 6 AND WD 1 UNLESS OTHERWISE NOTED ON PLANS. VERIFY PLUG TYPE PRIOR TO PURCHASE & INSTALLATION. GFCI OR AFCI IF NOTED. 'WP' DENOTES WEATHERPROOF COVER. 'CH' DENOTES COUNTER HEIGHT. LISTED TAMPERPROOF IF NOTED. MEET FEDERAL SPECIFICATION W-C-596. MAY BE EITHER SIMPLEX, DUPLEX, OR QUAD.
Ⓢ	240V RECEPTACLE	240V RECEPTACLE WITH SAME CHARACTERISTICS AS DUPLEX TYPE ABOVE. VERIFY NEMA PLUG CONFIGURATION.
Ⓢ	DUPLEX FLOOR RECEPTACLE	DUPLEX RECEPTACLE OF SAME CHARACTERISTICS AS ABOVE WITH BRASS COVER. MOUNT IN FLOOR. ALL FLOOR BOXES MUST BE LISTED FOR FLOOR APPLICATION.
Ⓢ	QUAD FLOOR RECEPTACLE	QUAD RECEPTACLE OF SAME CHARACTERISTICS AS ABOVE WITH BRASS COVER. MOUNT IN FLOOR. ALL FLOOR BOXES MUST BE LISTED FOR FLOOR APPLICATION.
⊠	FUSIBLE DISCONNECT SWITCH	HEAVY DUTY TYPE. TYPE 1 ENCLOSURE IN INTERIOR APPLICATIONS, TYPE 3R ENCLOSURE IN EXTERIOR APPLICATIONS, FUSE ACCORDING TO NAMEPLATE DATA.
⊠	DISCONNECT SWITCH	HEAVY DUTY TYPE. TYPE 1 ENCLOSURE IN INTERIOR APPLICATIONS, TYPE 3R ENCLOSURE IN EXTERIOR APPLICATIONS.
J	JUNCTION BOX	GALVANIZED METAL BOX CONSTRUCTED IN ACCORDANCE WITH 314.40 OF THE NEC.

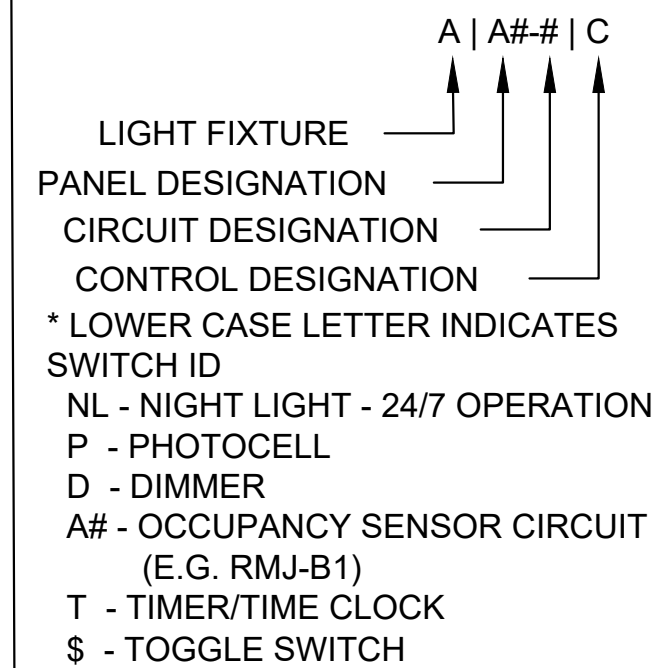
### OCCUPANCY SENSORS SEQUENCE OF OPERATION WITH LOW-VOLTAGE MOMENTARY SWITCH

- OCCUPANCY SENSOR DETECTS MOTION AND TURNS THE LIGHTS ON. SENSOR HOLDS LIGHTS ON AS LONG AS MOTION IS DETECTED. IF AFTER THE SET TIME DELAY, NO MOTION IS DETECTED, LIGHTS TURN OFF. CONSULT OWNER FOR DESIRED TIME DELAY SETTING.
- THE LOAD CAN BE TURNED ON USING THE MANUAL SWITCH AND IT STAYS ON ACCORDING TO THE OCCUPANCY LOGIC SETTING. THE TIME DELAY OPERATES AS PROGRAMMED. WHEN THE LOAD TURNS OFF DUE TO LACK OF OCCUPANCY DETECTION, IT CAN BE TURNED ON AGAIN BY OCCUPANCY DETECTION OR THE SWITCH.
- ACTIVATING THE MANUAL SWITCH WHILE THE LOAD IS ON TURNS THE LOAD OFF.
  - WHEN THE LOAD IS TURNED OFF MANUALLY, AS LONG AS THE SENSOR CONTINUES TO DETECT OCCUPANCY THE LOAD STAYS OFF. FIVE MINUTES AFTER THE LAST OCCUPANCY DETECTION, THE LIGHTS STAY OFF AND THE SENSOR REVERTS TO THE AUTOMATIC-ON MODE.
  - WHEN THE LOAD IS TURNED OFF MANUALLY, PRESSING THE SWITCH AGAIN TURNS THE LOAD ON AND THE SENSOR REVERTS TO THE AUTOMATIC-ON MODE.
  - ONCE RETURNING TO AUTOMATIC-ON MODE, EITHER THE SWITCH OR OCCUPANCY DETECTION CAN TURN THE LOAD ON.
- LOW-VOLTAGE INPUT SIGNAL FROM TIME CLOCK HOLDS LIGHTS ON DURING RETAIL HOURS REGARDLESS OF OCCUPANCY DETECTION.

### NOTES FOR EMERGENCY FIXTURES

- FOR INTERIOR FIXTURES WITH EMERGENCY BATTERIES, WIRE THE BATTERY CHARGER ON THE SAME CIRCUIT AS THE FIXTURE BALLAST AHEAD OF ALL SWITCHES, SENSORS, ETC.
- FOR EXTERIOR FIXTURES WITH EMERGENCY BATTERIES, WIRE THE BATTERY CHARGER ON THE SAME CIRCUIT AS THE NORMAL EXTERIOR LIGHTS OR AS SHOWN ON PLANS AHEAD OF ALL CONTACTORS, PHOTOCELLS, ETC.
- IN BOTH CASES, EMERGENCY POWER SHOULD INITIATE ONLY IN THE EVENT OF THE LOSS OF NORMAL POWER. ALL BATTERIES SHALL BE RATED TO POWER EMERGENCY ILLUMINATION FOR 90 MINUTES MINIMUM.

### LIGHTING CIRCUIT DESIGNATIONS



### POWER CIRCUIT DESIGNATIONS

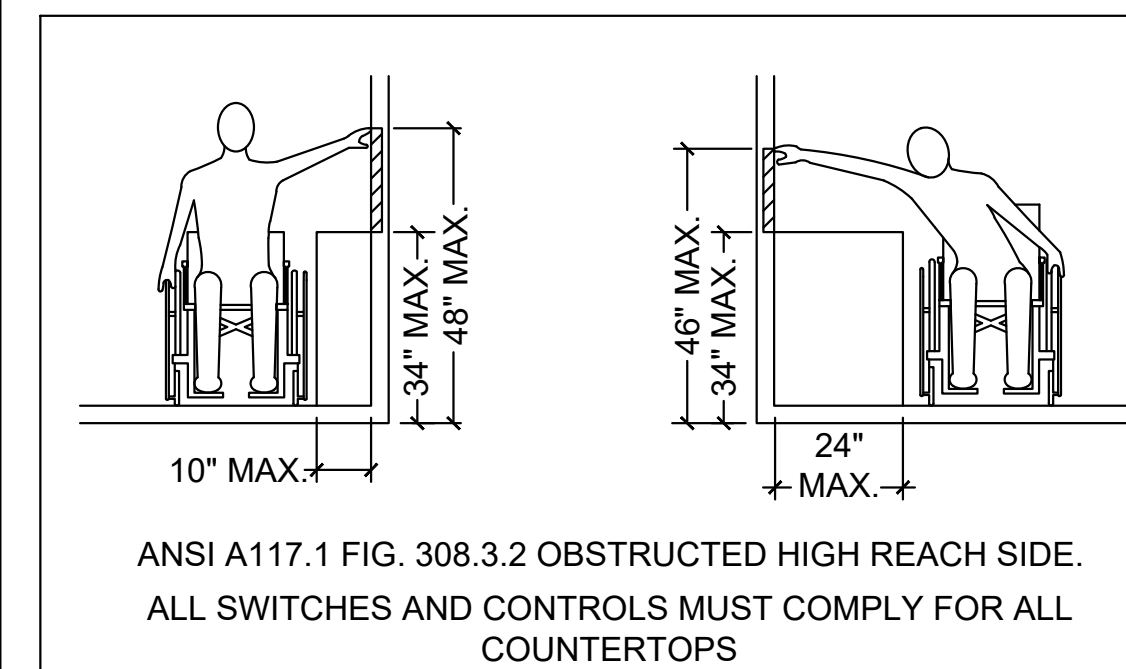


### OCCUPANCY SENSORS SEQUENCE OF OPERATIONS WITH LINE-VOLTAGE SWITCH

- LINE VOLTAGE SWITCH MUST BE TURNED ON OR IN ON POSITION.
- OCCUPANCY SENSOR DETECTS MOTION AND TURNS THE LIGHTS ON. SENSOR HOLDS LIGHTS ON AS LONG AS MOTION IS DETECTED. IF AFTER THE SET TIME DELAY, NO MOTION IS DETECTED, LIGHTS TURN OFF. CONSULT OWNER FOR DESIRED TIME DELAY SETTING.
- THE LOAD CAN BE TURNED OFF USING THE MANUAL LINE VOLTAGE SWITCH AND IT STAYS OFF UNTIL THE SWITCH IS TURNED TO ON POSITION AND THE OCCUPANCY SENSOR DETECTS OCCUPANCY.

### LEGEND

- T REFER TO TRANSFORMER SCHEDULE ABOVE
- B REFER TO BREAKER FEEDER SCHEDULE ABOVE
- # REFER TO GENERAL FEEDER SCHEDULE ABOVE



MARK	DESCRIPTION	LOUVER/LENS	LAMPS		VOLTAGE	INPUT WATTAGE	MOUNTING	REMARKS	MFG	MODEL
			TYPE	CCT						
A	4' LED STRIP LIGHT	VERIFY	LED	4000K	120	35.3	SUSPENDED	2	LITHONIA	CSS L48-4000LM MVOLT 40K 80CRI
B	2X4 LED PANEL	VERIFY	LED	4000K	120	35	RECESSED	2	LITHONIA	CPANL 2X4 AL06 SSW7 M2
C	EXTERIOR WALL PACK	VERIFY	LED	4000K	120	36	SURFACE	2	LITHONIA	TWR1 LED ALO SSW2 UVOLT PE DDBTXD
EXH	LED EXT/EMERGENCY COMBO	ACRYLIC	LED	N/A	-	-	VARIABLE	1.2	EELP	XC-LED-2-R-W-SD
EM	DUAL HEAD EMERGENCY FIXTURE	ACRYLIC	LED	N/A	-	2	VARIABLE	1.2	LITHONIA	ELM2L-SDRT
OE	EXTERIOR LIGHT	ACRYLIC	LED	N/A	-	2	VARIABLE	1.2	LITHONIA	AFO-DB-MVOLT-N-SD

- FIXTURE SHALL HAVE BATTERY BACKUP FOR 90 MINUTE ILLUMINATION.
- OR EQUAL BY COOPER, MOBERN, OR CURRENT BY GE LIGHTING.

ELECTRICAL DESIGNER'S STATEMENT			
ELECTRICAL SYSTEM AND EQUIPMENT METHOD OF COMPLIANCE			
PREScriptive	<input checked="" type="checkbox"/>	PERFORMANCE	<input type="checkbox"/>
ENERGY COST BUDGET	<input type="checkbox"/>		
LIGHTING SCHEDULE:			
LAMP TYPE REQUIRED IN FIXTURE:			SEE LIGHTING LEGEND
NUMBER OF LAMPS PER FIXTURE:			SEE LIGHTING LEGEND
BALLAST TYPE USED IN FIXTURE:			SEE LIGHTING LEGEND
NUMBER OF BALLASTS IN FIXTURE:			SEE LIGHTING LEGEND
TOTAL WATTAGE PER FIXTURE:			SEE LIGHTING LEGEND
TOTAL INTERIOR WATTAGE SPECIFIED VS ALLOWED:	WATTS SPECIFIED	WATTS ALLOWED	
	1409.6	14685.3	
OCCUPANCY	AREA (sf)	ALLOWANCE (W/sf)	WATTAGE ALLOWED
RETAIL	11655	1.26	14685.3
TOTAL	11655		14685.3
EQUIPMENT SCHEDULES WITH MOTORS (NOT USED FOR MECHANICAL SYSTEMS)			
MOTOR HORSEPOWER: N/A			
NUMBER OF PHASES: N/A			
MINIMUM EFFICIENCY: N/A			
MOTOR TYPE: N/A			
DESIGNER STATEMENT: TO THE BEST OF MY KNOWLEDGE AND BELIEF, THE DESIGN OF THIS BUILDING COMPLIES WITH THE 2018 NORTH CAROLINA ENERGY CONSERVATION CODE.			
FOR THE ADDITIONAL PRESCRIPTIVE REQUIREMENT REQUIRED BY C406 OF 2018 NORTH CAROLINA ENERGY CONSERVATION CODE, WE ARE CHOOSING C406.3 - REDUCED LIGHTING POWER DENSITY.			
1409.6W SPECIFIED	<=	13216.77W	14685.3W ALLOWED X90%

**Kilian Engineering, Inc.**  
 PO Box 3301, Henderson, NC 27536  
 www.kilianengineering.com  
 252.438.8778

**Craig A. Otto ARCHITECT, INC.**  
 DESIGN • PLANNING • ARCHITECTURE

105 West Main Street, Suite C  
 Lexington, South Carolina 29072  
 Phone (803) 957-9004  
 craig@craigottoarchitect.com

No.	Revisions	Date

All rights reserved. This drawing and the design shown thereon are copyrighted as prescribed by the laws of the United States and are the sole property of Craig A. Otto, Architect, Inc. Anyone duplicating, reproducing, or causing to be reproduced these drawings or the design thereon without permission of the architect will be subject to legal action.

Project Title  
**ASSOCIATED CONTRACT SERVICES**  
 JARCO DR., FUQUAY VARINA, NC

Drawing Title  
 ELECTRICAL SCHEDULES

Project No.  
 250077

Consultant

Seal: NORTH CAROLINA PROFESSIONAL ENGINEER, MICHAEL W. KILIAN, 03/07/2025  
 Seal: KILIAN ENGINEERING INC., SEAL, 03/07/2025  
 Date: 03/07/2025  
 Drawn By: JDD/EMB  
 Drawing No.: E-2

### LIGHTING PLAN HEX NOTES

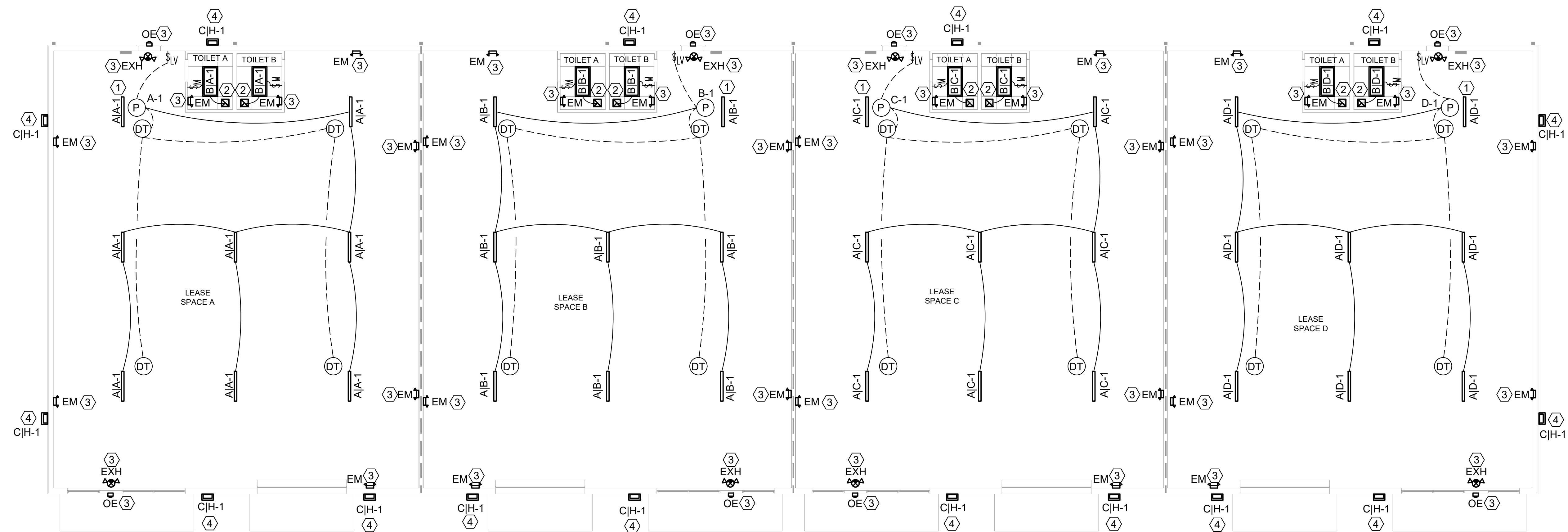
1. LIGHT TO BE 24/7
2. EXHAUST FAN TO BE POWERED THROUGH ROOM LIGHTING
3. EMERGENCY LIGHTING TO BE WIRED INTO NEAREST AREA LIGHTING CIRCUIT AHEAD OF ALL LIGHTING CONTROLS.
4. EXTERIOR LIGHTING TO BE CONTROLLED VIA PHOTOCCELL

### WALL / CEILING LEGEND

NON-RATED WALLS:  
ALL INTERIOR WALLS SHOWN THUS SHALL BE METAL STUDS WITH 5/8" GYPSUM BOARD EACH SIDE (PROVIDE R-11 INSULATION AROUND ALL TOILETS AND OFFICES)

1 HOUR RATED WALLS:  
ALL INTERIOR WALLS SHOWN THUS SHALL BE METAL STUDS WITH 5/8" TYPE X GYPSUM BOARD EACH SIDE TO BOTTOM OF ROOF (PROVIDE R-13 BATT INSULATION)

NOTE: FIRE EXTINGUISHERS SHALL NOT BE OBSTRUCTED OR OBSCURED FROM VIEW AND MUST BE INSTALLED IN CONSPICUOUS LOCATIONS. CABINETS SHALL BE PROVIDED WITH A MEANS OF READY ACCESS AND SHALL NOT BE LOCKED



1 LIGHTING PLAN  
Scale: 1/8" = 1'-0"



PO Box 3301, Henderson, NC 27536  
www.kilianengineering.com  
252.438.8778

**Craig A. Otto**  
ARCHITECT, INC.

DESIGN • PLANNING • ARCHITECTURE

105 West Main Street, Suite C  
Lexington, South Carolina 29072  
Phone (803) 957-9004  
craig@craigottoarchitect.com

No.	Revisions	Date

All rights reserved. This drawing and the design shown thereon are copyrighted as prescribed by the laws of the United States and are the sole property of Craig A. Otto, Architect, Inc. Anyone duplicating, reproducing, or causing to be reproduced these drawings or the design thereon without permission of the architect will be subject to legal action.

Project Title  
**ASSOCIATED CONTRACT SERVICES**  
JARCO DR., FUQUAY VARINA, NC

Drawing Title  
LIGHTING PLAN

Project No.  
250077

Consultant

	Date 03/07/2025
	Drawn By JDD/EMB Drawing No. E-3

## POWER PLAN HEX NOTES

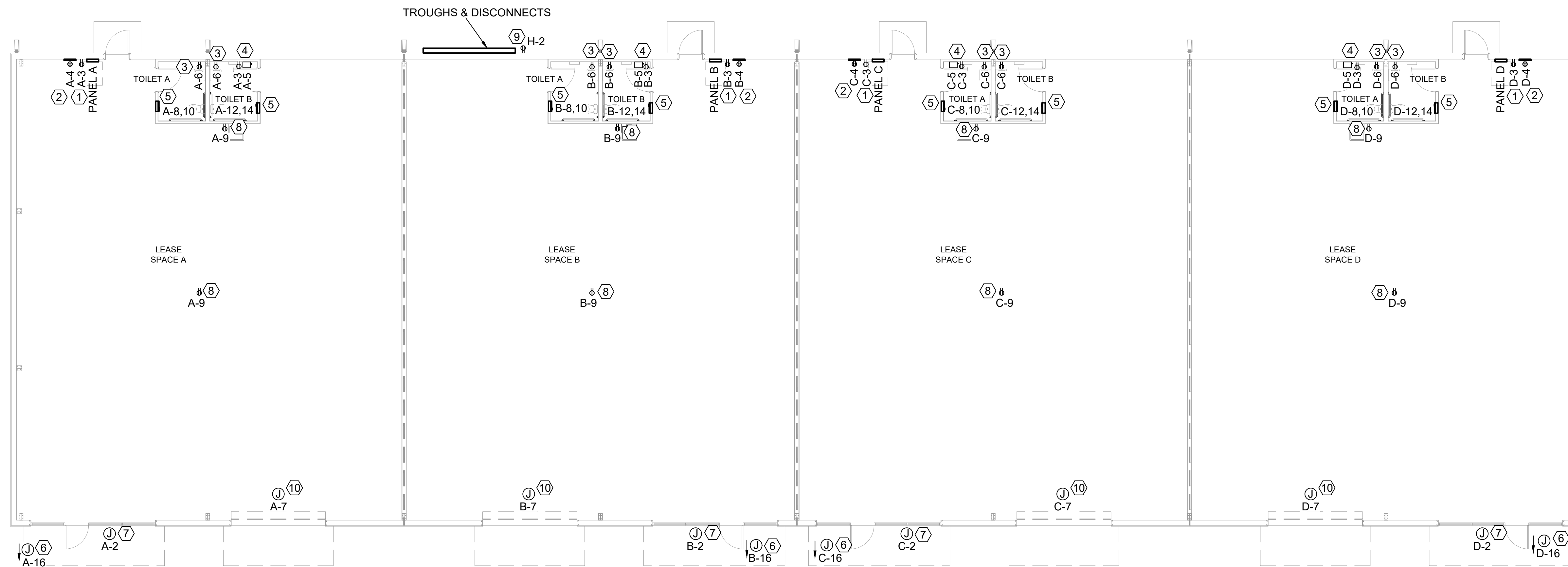
1. SERVICE RECEPTACLE, GFCI RATED, MOUNTED AT 18" AFF.
2. GFCI RECEPTACLE FOR PHONE BOARD
3. GFCI RECEPTACLE, MOUNTED AT COUNTER HEIGHT
4. DISCONNECT & GFCI RECEPTACLE FOR WATER HEATER LOCATED ABOVE CEILING
5. UNIT HEATER TO HAVE BUILT IN MEANS OF DISCONNECT. EC TO VERIFY WITH MC. EC TO PROVIDE DISCONNECT IF REQUIRED.
6. POWER FOR HOTBOX, SEE SITE PLAN FOR LOCATION
7. J-BOX FOR EXTERIOR SIGN, CONFIRM LOCATION WITH OWNER PRIOR TO INSTALLATION
8. POWER FOR HEAT TAPE ON CWS NEAR CEILING, COORDINATE EXACT LOCATION AND ELECTRICAL NEEDS WITH PC.
9. GFCI-WP RECEPTACLE MOUNTED AT 18" A.F.F.
10. POWER FOR GARAGE DOOR. VERIFY LOCATION AND EXACT REQUIREMENTS WITH MANUFACTURER.

## WALL / CEILING LEGEND

NON-RATED WALLS:  
ALL INTERIOR WALLS SHOWN THUS SHALL BE METAL STUDS WITH 5/8" GYPSUM BOARD EACH SIDE (PROVIDE R-11 INSULATION AROUND ALL TOILETS AND OFFICES)

1 HOUR RATED WALLS:  
ALL INTERIOR WALLS SHOWN THUS SHALL BE METAL STUDS WITH 5/8" TYPE X GYPSUM BOARD EACH SIDE TO BOTTOM OF ROOF (PROVIDE R-13 BATT INSULATION)

NOTE: FIRE EXTINGUISHERS SHALL NOT BE OBSTRUCTED OR OBSCURED FROM VIEW AND MUST BE INSTALLED IN CONSPICUOUS LOCATIONS. CABINETS SHALL BE PROVIDED WITH A MEANS OF READY ACCESS AND SHALL NOT BE LOCKED



1 POWER PLAN  
Scale: 1/8" = 1'-0"



PO Box 3301, Henderson, NC 27536  
www.kilianengineering.com  
252.438.8778

**Craig A. Otto**  
ARCHITECT, INC.

DESIGN • PLANNING • ARCHITECTURE

105 West Main Street, Suite C  
Lexington, South Carolina 29072  
Phone (803) 957-9004  
craig@craigottoarchitect.com

No.	Revisions	Date

All rights reserved. This drawing and the design shown thereon are copyrighted as prescribed by the laws of the United States and are the sole property of Craig A. Otto, Architect, Inc. Anyone duplicating, reproducing, or causing to be reproduced these drawings or the design thereon without permission of the architect will be subject to legal action.

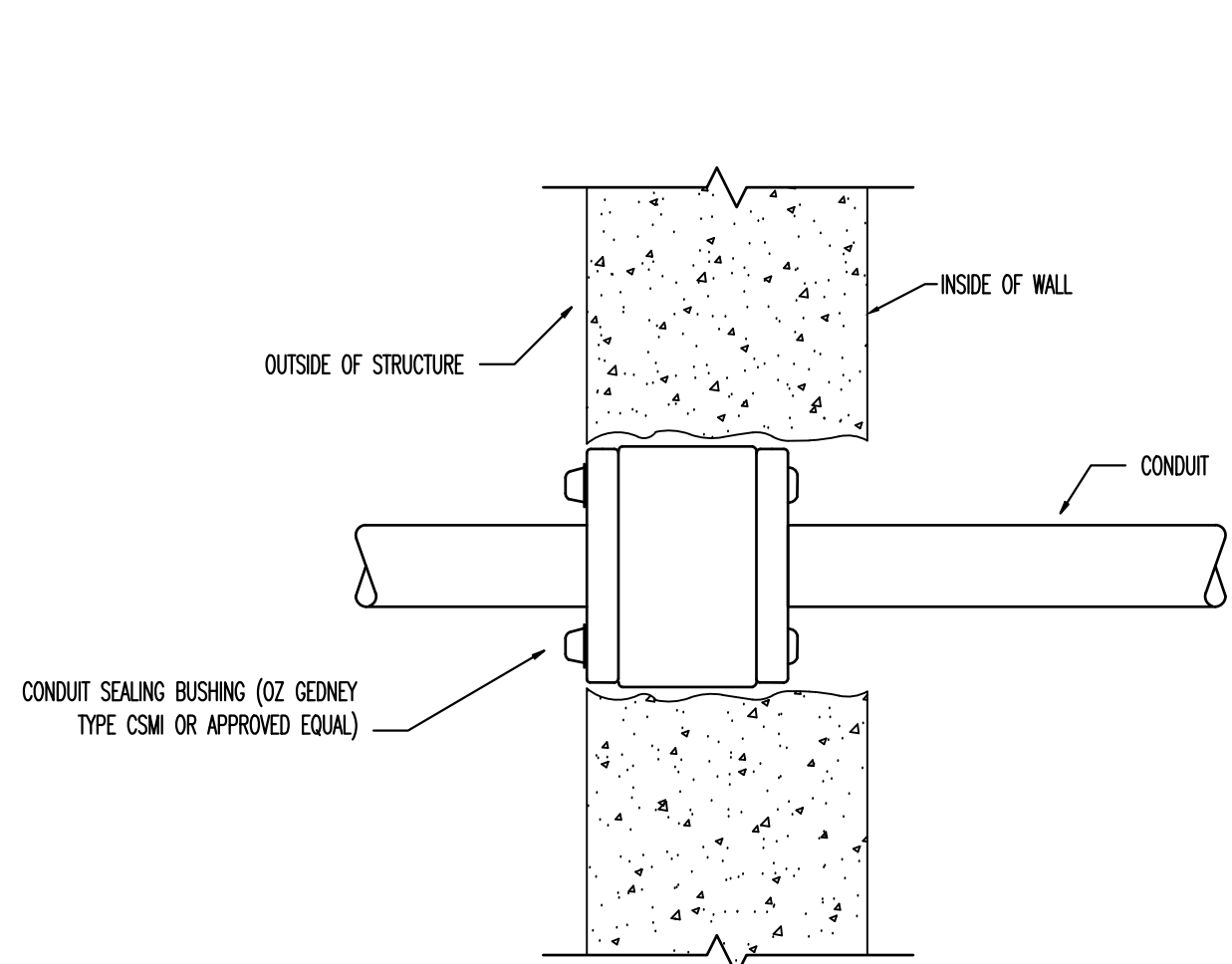
Project Title  
ASSOCIATED CONTRACT SERVICES  
JARCO DR., FUQUAY VARINA, NC

Drawing Title  
POWER PLAN

Project No.  
250077

Consultant

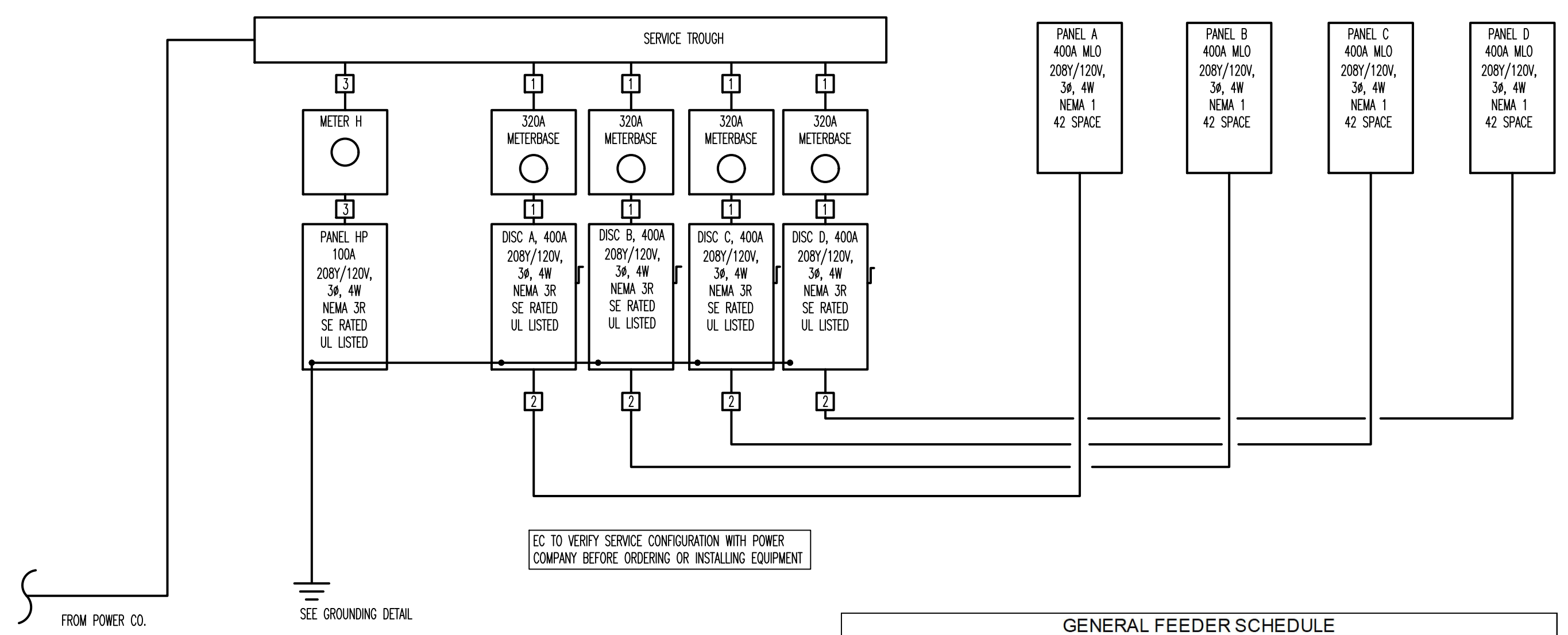
	Date	03/07/2025
	Drawn By	JDD/EMB
	Drawing No.	E-4



BREAKER FEEDER SCHEDULE			
AMPS	Wire Size	Ground Size	Conduit Size
15A	#12	#12	1/2"
20A	#12	#12	1/2"
25A	#10	#10	3/4"
30A	#10	#10	3/4"
35A	#8	#10	1"
40A	#8	#10	1"
50A	#8	#10	1"
60A	#6	#10	1 1/4"
70A	#4	#8	1 1/4"
80A	#4	#8	1 1/4"
90A	#3	#8	1 1/2"
100A	#3	#8	1 1/2"
110A	#2	#6	2"
125A	#1	#6	2"
150A	1/0	#6	2 1/2"
175A	2/0	#6	2 1/2"
200A	3/0	#6	2 1/2"
225A	4/0	#4	2 1/2"
250A	250 MCM	#4	3"
300A	350 MCM	#4	3 1/2"
350A	500 MCM	#3	4"
400A	2 Sets- 3/0	#3	2 1/2"
500A	2 Sets - 250 MCM	#2	3"
600A	2 Sets - 350 MCM	#1	3 1/2"
700A	3 Sets - 250 MCM	1/0	3"
800A	3 Sets - 300 MCM	1/0	3 1/2"
1000A	3 Sets - 400 MCM	2/0	3 1/2"

1. CONDUCTOR PER POLE PLUS NEUTRAL PER SET. E.C. TO VERIFY NECESSITY OF NEUTRAL FOR EACH CIRCUIT. NEUTRAL MAY BE DELETED IF NOT REQUIRED FOR INDIVIDUAL PIECES.

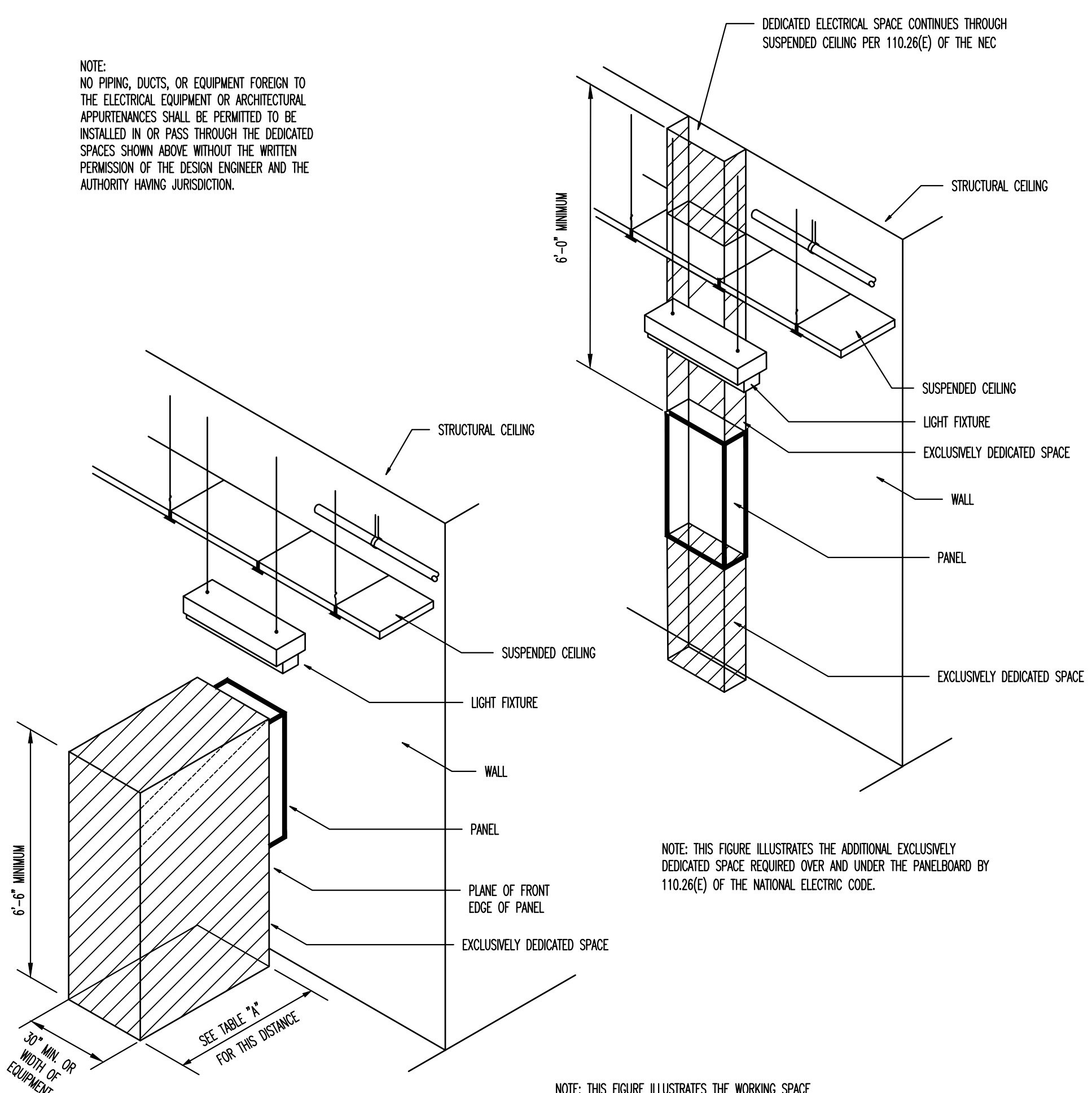
### 1 EXTERIOR WALL PENETRATION



GENERAL FEEDER SCHEDULE		
MARK	WIRE AND CONDUIT	AMPS
1	2 SETS-3-3/0 CU, 1-3/0 CU NEU., 2-1/2" CO.	400A
2	2 SETS-3-3/0 CU, 1-3/0 CU NEU., 1-#3 CU GRD., 2-1/2" CO.	400A
3	3-#3 CU, 1-#3 CU NEU., 1-1/2" CO.	100A

### 2 ELECTRICAL RISER

NOTE: NO PIPING, DUCTS, OR EQUIPMENT FOREIGN TO THE ELECTRICAL EQUIPMENT OR ARCHITECTURAL APURTAINANCES SHALL BE PERMITTED TO BE INSTALLED IN OR PASS THROUGH THE DEDICATED SPACES SHOWN ABOVE WITHOUT THE WRITTEN PERMISSION OF THE DESIGN ENGINEER AND THE AUTHORITY HAVING JURISDICTION.



NOTE: THIS FIGURE ILLUSTRATES THE ADDITIONAL EXCLUSIVELY DEDICATED SPACE REQUIRED OVER AND UNDER THE PANELBOARD BY 110.26(E) OF THE NATIONAL ELECTRIC CODE.

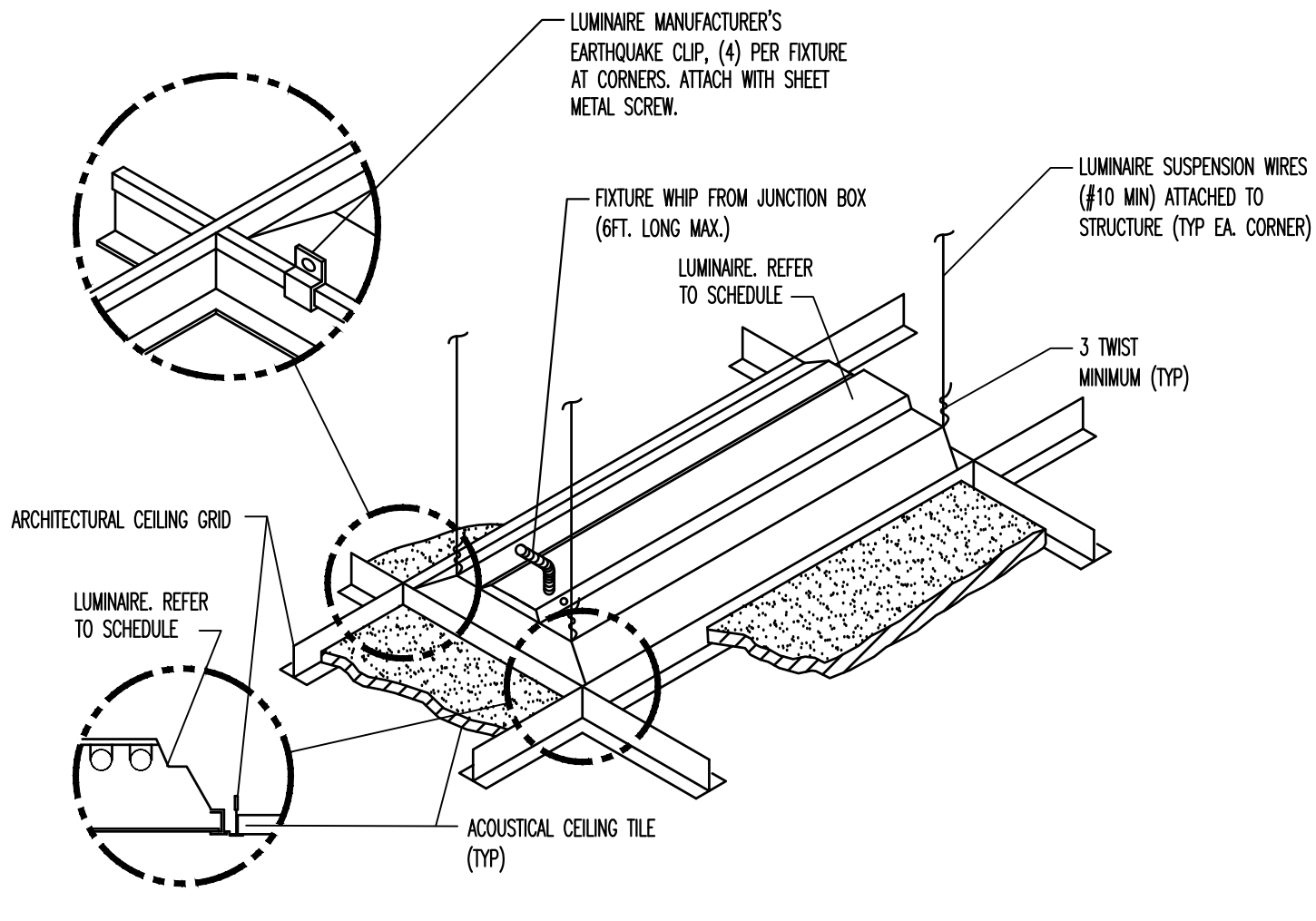
NOTE: THIS FIGURE ILLUSTRATES THE WORKING SPACE IN FRONT OF THE PANELBOARD REQUIRED BY 110.26 OF THE NATIONAL ELECTRIC CODE.

NOTE: WHERE THE CONDITIONS ARE AS FOLLOWS:

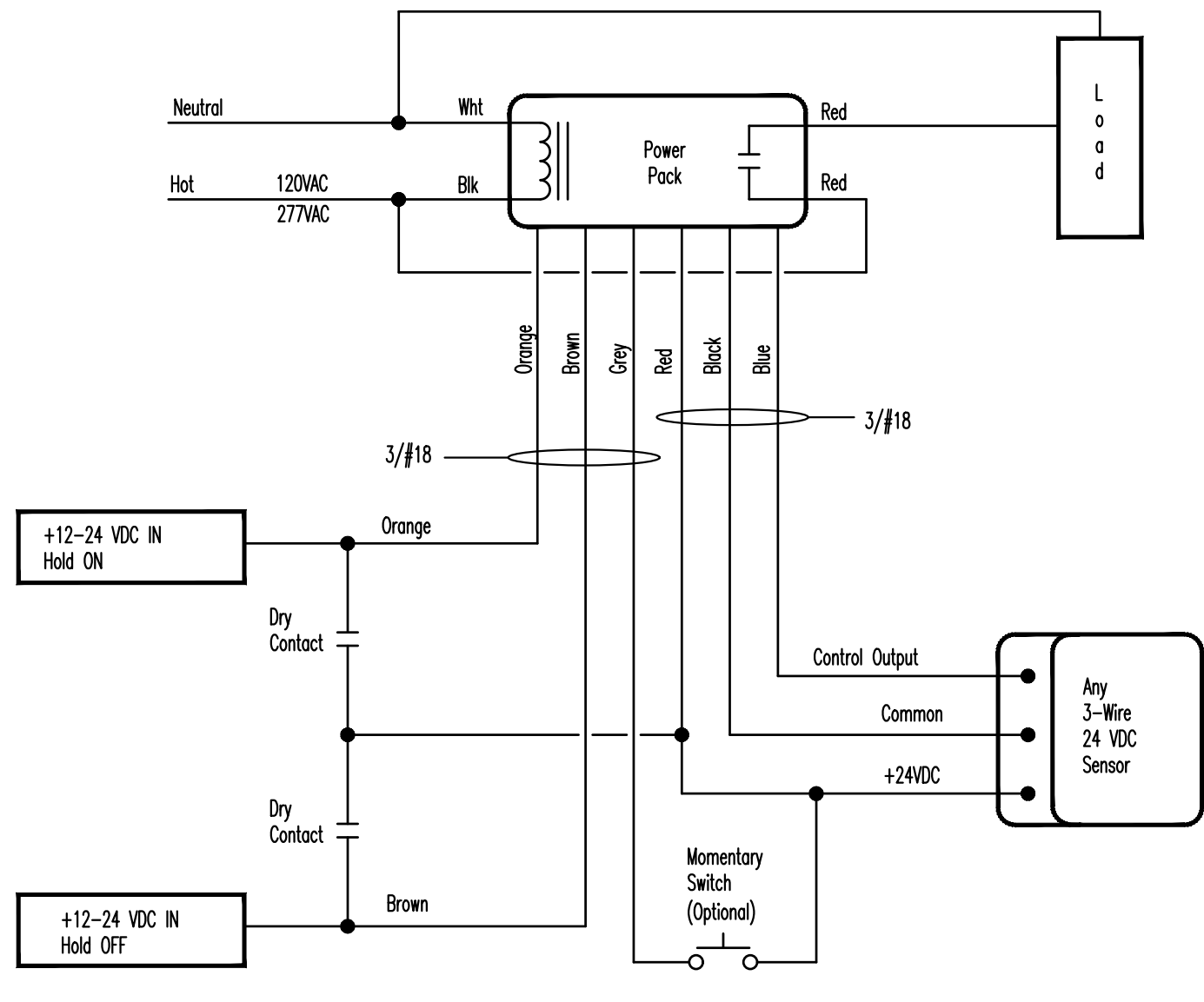
- CONDITION 1 - EXPOSED LIVE PARTS ON ONE SIDE OF THE WORKING SPACE AND NO LIVE OR GROUNDED PARTS ON THE OTHER SIDE OF THE WORKING SPACE, OR EXPOSED LIVE PARTS ON BOTH SIDES OF THE WORKING SPACE THAT ARE EFFECTIVELY GUARDED BY INSULATING MATERIALS.
- CONDITION 2 - EXPOSED LIVE PARTS ON ONE SIDE OF THE WORKING SPACE AND GROUNDED PARTS ON THE OTHER SIDE OF THE WORKING SPACE. CONCRETE, BRICK, OR TILE WALLS SHALL BE CONSIDERED AS GROUNDED.
- CONDITION 3 - EXPOSED LIVE PARTS ON BOTH SIDES OF THE WORKING SPACE.

TABLE 110.26(A)(1) WORKING SPACE			
VOLTAGE TO GROUND, NOMINAL	MINIMUM CLEAR DISTANCE (FEET)		
	CONDI TION 1	2	3
0-150	3	3	3
151-600	3	3-1/2	4

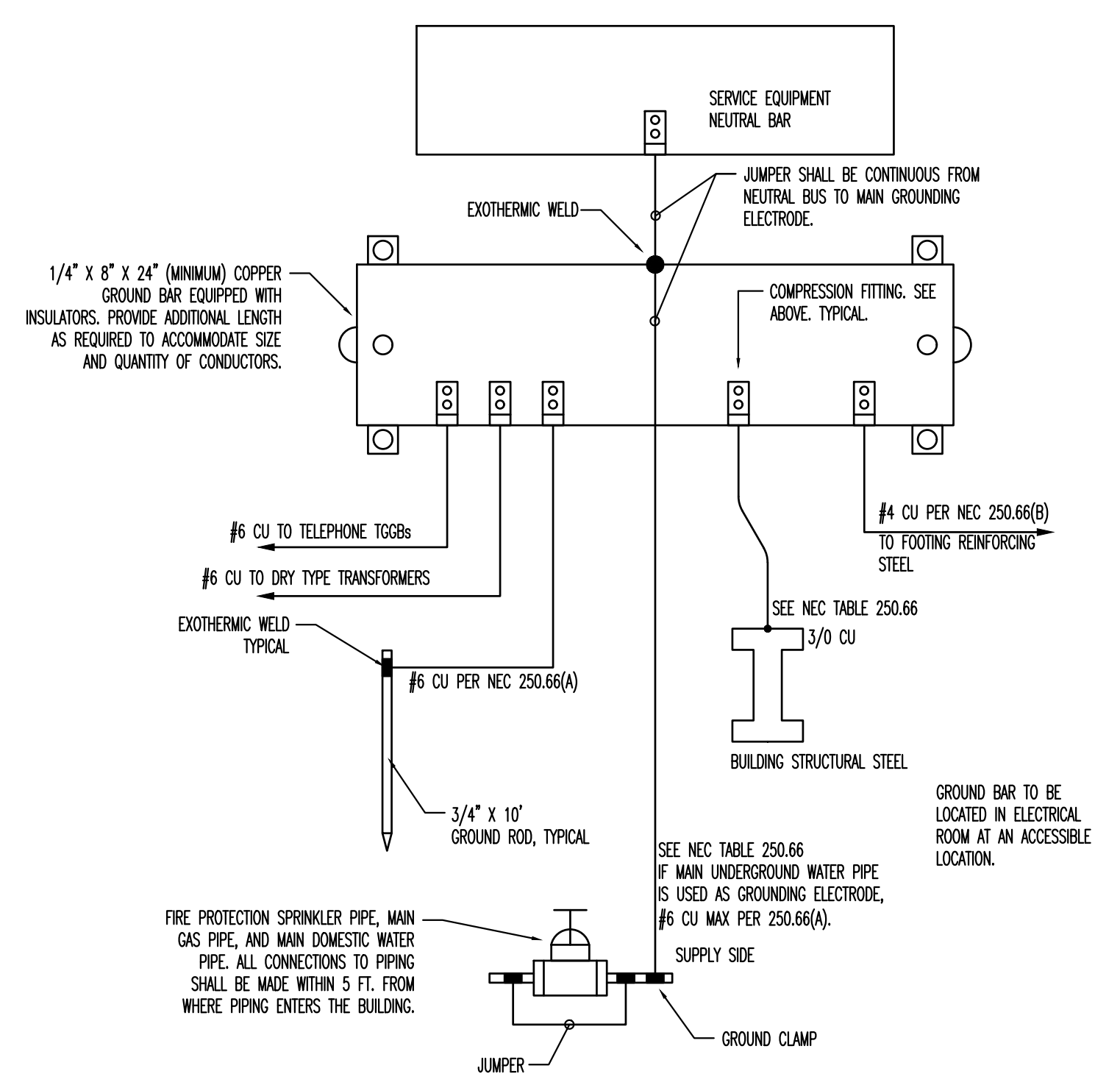
### 3 REQUIRED CLEARANCES



### 4 LAY IN FIXTURE SUPPORT



### 5 CEILING OCCUPANCY SENSOR WIRING



### 6 GROUNDING DETAIL

**Kilian Engineering, Inc.**  
 PO Box 3301, Henderson, NC 27536  
 www.kilianengineering.com  
 252.438.8778

**Craig A. Otto ARCHITECT, INC.**

DESIGN • PLANNING • ARCHITECTURE

105 West Main Street, Suite C  
 Lexington, South Carolina 29072  
 Phone (803) 957-9004  
 craig@raigottoarchitect.com

No.	Revisions	Date

All rights reserved. This drawing and the design shown thereon are copyrighted as prescribed by the laws of the United States and are the sole property of Craig A. Otto, Architect, Inc. Anyone duplicating, reproducing, or causing to be reproduced these drawings or the design thereon without permission of the architect will be subject to legal action.

Project Title  
**ASSOCIATED CONTRACT SERVICES**  
 JARCO DR., FUQUAY VARINA, NC

Drawing Title  
 HOUSE PANEL, POWER RISER & ELECTRICAL DETAILS

Project No.  
 250077

Consultant

Seal  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 MICHAEL W. KILLIAN  
 17304  
 03/07/2025

Seal  
 KILIAN ENGINEERING, INC. CORPORATE  
 SEAL  
 NORTH CAROLINA  
 03/07/2025

Date  
 03/07/2025

Drawn By  
 JDD/EMB

Drawing No.  
 E-5

PANEL A								
CKT	LOAD	BKR	LOAD kVA	PH	LOAD kVA	BKR	LOAD	CKT
1	INTERIOR LIGHTS	20/1	0.44	A	1.00	20/1	BUILDING SIGN	2
3	SERVICE RECEPPTS	20/1	0.36	B	0.36	20/1	PHONE BOARD	4
5	WATER HEATER	20/1	1.50	C	0.36	20/1	BATHROOM RECEPPTS	6
7	GARAGE DOOR	20/1	1.20	A	1.51	20/2	BATHROOM HEATER 1	8
9	HEAT TAPE RECEPPTS	20/1	0.90	B	1.51			10
11	SPARE	20/1	0.00	C	1.51	20/2	BATHROOM HEATER 2	12
13	SPACE		0.00	A	1.51			14
15	SPACE		0.00	B	0.50	20/1	HOT BOX	16
17	SPACE		0.00	C	0.00			18
19	SPACE		0.00	A	0.00			20
21	SPACE		0.00	B	0.00			22
23	SPACE		0.00	C	0.00			24
25	SPACE		0.00	A	0.00			26
27	SPACE		0.00	B	0.00			28
29	SPACE		0.00	C	0.00			30
31	SPACE		0.00	A	0.00			32
33	SPACE		0.00	B	0.00			34
35	SPACE		0.00	C	0.00			36
37	SPACE		0.00	A	0.00			38
39	SPACE		0.00	B	0.00			40
41	SPACE		0.00	C	0.00			42
			PH	kVA	AMPS			
			A	5.66	47.167			
			B	3.63	30.25			
			C	3.37	28.083			
VOLTAGE/PHASE			208Y/120V, 3P, 4W					
BUS RATING			400A					
MAIN CIRCUIT BREAKER RATING			MLO					
AIC RATING			22K					
SERVICE ENTRANCE RATED			NO					
ENCLOSURE			NEMA 1					
MOUNTING			SURFACE					

PANEL B								
CKT	LOAD	BKR	LOAD kVA	PH	LOAD kVA	BKR	LOAD	CKT
1	INTERIOR LIGHTS	20/1	0.44	A	1.00	20/1	BUILDING SIGN	2
3	SERVICE RECEPPTS	20/1	0.36	B	0.36	20/1	PHONE BOARD	4
5	WATER HEATER	20/1	1.50	C	0.36	20/1	BATHROOM RECEPPTS	6
7	GARAGE DOOR	20/1	1.20	A	1.51	20/2	BATHROOM HEATER 1	8
9	HEAT TAPE RECEPPTS	20/1	0.90	B	1.51			10
11	SPARE	20/1	0.00	C	1.51	20/2	BATHROOM HEATER 2	12
13	SPACE	20/1	0.00	A	1.51			14
15	SPACE		0.00	B	0.50	20/1	HOT BOX	16
17	SPACE		0.00	C	0.00			18
19	SPACE		0.00	A	0.00			20
21	SPACE		0.00	B	0.00			22
23	SPACE		0.00	C	0.00			24
25	SPACE		0.00	A	0.00			26
27	SPACE		0.00	B	0.00			28
29	SPACE		0.00	C	0.00			30
31	SPACE		0.00	A	0.00			32
33	SPACE		0.00	B	0.00			34
35	SPACE		0.00	C	0.00			36
37	SPACE		0.00	A	0.00			38
39	SPACE		0.00	B	0.00			40
41	SPACE		0.00	C	0.00			42
			PH	kVA	AMPS			
			A	5.66	47.167			
			B	3.63	30.25			
			C	3.37	28.083			
VOLTAGE/PHASE			208Y/120V, 3P, 4W					
BUS RATING			400A					
MAIN CIRCUIT BREAKER RATING			MLO					
AIC RATING			22K					
SERVICE ENTRANCE RATED			NO					
ENCLOSURE			NEMA 1					
MOUNTING			SURFACE					

PANEL C								
CKT	LOAD	BKR	LOAD kVA	PH	LOAD kVA	BKR	LOAD	CKT
1	INTERIOR LIGHTS	20/1	0.44	A	1.00	20/1	BUILDING SIGN	2
3	SERVICE RECEPPTS	20/1	0.36	B	0.36	20/1	PHONE BOARD	4
5	WATER HEATER	20/1	1.50	C	0.36	20/1	BATHROOM RECEPPTS	6
7	GARAGE DOOR	20/1	1.20	A	1.51	20/2	BATHROOM HEATER 1	8
9	HEAT TAPE RECEPPTS	20/1	0.90	B	1.51			10
11	SPARE	20/1	0.00	C	1.51	20/2	BATHROOM HEATER 2	12
13	SPACE	20/1	0.00	A	1.51			14
15	SPACE		0.00	B	0.50	20/1	HOT BOX	16
17	SPACE		0.00	C	0.00			18
19	SPACE		0.00	A	0.00			20
21	SPACE		0.00	B	0.00			22
23	SPACE		0.00	C	0.00			24
25	SPACE		0.00	A	0.00			26
27	SPACE		0.00	B	0.00			28
29	SPACE		0.00	C	0.00			30
31	SPACE		0.00	A	0.00			32
33	SPACE		0.00	B	0.00			34
35	SPACE		0.00	C	0.00			36
37	SPACE		0.00	A	0.00			38
39	SPACE		0.00	B	0.00			40
41	SPACE		0.00	C	0.00			42
			PH	kVA	AMPS			
			A	5.66	47.167			
			B	3.63	30.25			
			C	3.37	28.083			
VOLTAGE/PHASE			208Y/120V, 3P, 4W					
BUS RATING			400A					
MAIN CIRCUIT BREAKER RATING			MLO					
AIC RATING			22K					
SERVICE ENTRANCE RATED			NO					
ENCLOSURE			NEMA 1					
MOUNTING			SURFACE					

PANEL D								
CKT	LOAD	BKR	LOAD kVA	PH	LOAD kVA	BKR	LOAD	CKT
1	INTERIOR LIGHTS	20/1	0.44	A	1.00	20/1	BUILDING SIGN	2
3	SERVICE RECEPPTS	20/1	0.36	B	0.36	20/1	PHONE BOARD	4
5	WATER HEATER	20/1	1.50	C	0.36	20/1	BATHROOM RECEPPTS	6
7	GARAGE DOOR	20/1	1.20	A	1.51	20/2	BATHROOM HEATER 1	8
9	HEAT TAPE RECEPPTS	20/1	0.90	B	1.51			10
11	SPARE	20/1	0.00	C	1.51	20/2	BATHROOM HEATER 2	12
13	SPACE	20/1	0.00	A	1.51			14
15	SPACE		0.00	B	0.50	20/1	HOT BOX	16
17	SPACE		0.00	C	0.00			18
19	SPACE		0.00	A	0.00			20
21	SPACE		0.00	B	0.00			22
23	SPACE		0.00	C	0.00			24
25	SPACE		0.00	A	0.00			26
27	SPACE		0.00	B	0.00			28
29	SPACE		0.00	C	0.00			30
31	SPACE		0.00	A	0.00			32
33	SPACE		0.00	B	0.00			34
35	SPACE		0.00	C	0.00			36
37	SPACE		0.00	A	0.00			38
39	SPACE		0.00	B	0.00			40
41	SPACE		0.00	C	0.00			42
			PH	kVA	AMPS			
			A	5.66	47.167			
			B	3.63	30.25			
			C	3.37	28.083			
VOLTAGE/PHASE			208Y/120V, 3P, 4W					
BUS RATING			400A					
MAIN CIRCUIT BREAKER RATING			MLO					
AIC RATING			22K					
SERVICE ENTRANCE RATED			NO					
ENCLOSURE			NEMA 1					
MOUNTING			SURFACE					

PANEL H								
CKT	LOAD	BKR	LOAD kVA	PH	LOAD kVA	BKR	LOAD	CKT
1	EXTERIOR LIGHTS	20/1	0.72	A	0.18	20/1	SERVICE RECEPTACLE	2
3	SPARE	20/1	0.00	B	0.00	20/1	SPARE	4
5	SPARE	20/1	0.00	C	0.00	20/1	SPARE	6
7	SPARE		0.00	A	0.00		SPARE	8
9	SPACE		0.00	B	0.00		SPACE	10
11	SPACE		0.00	C	0.00		SPACE	12
13	SPACE		0.00	A	0.00		SPACE	14
15	SPACE		0.00	B	0.00		SPACE	16
17	SPACE		0.00	C	0.00		SPACE	18
19	SPACE		0.00	A	0.00		SPACE	20
21	SPACE		0.00	B	0.00		SPACE	22
23	SPACE		0.00	C	0.00		SPACE	24
25	SPACE		0.00	A	0.00		SPACE	26
27	SPACE		0.00	B	0.00		SPACE	28
29	SPACE		0.00	C	0.00		SPACE	30
			PH	kVA	AMPS			
			A	0.90	7.5			
			B	0.00	0			
			C	0.00	0			
VOLTAGE/PHASE			208Y/120V, 3P, 4W					
BUS RATING			100A					
MAIN CIRCUIT BREAKER RATING			100A					
AIC RATING			22K					
SERVICE ENTRANCE RATED			YES					
ENCLOSURE			NEMA 3R					
MOUNTING			SURFACE					

PANEL H - NEC ELECTRIC DEMAND SUMMARY 208Y/120V, 3P, 4W							
EQUIPMENT	DEMAND FACTOR	kVA			LOAD kVA	NEC REFERENCE	NOTES/CALCULATIONS
EXTERIOR LIGHTING	100%	0.72	0.00	0.00	0.72	220.12	
RECEPTACLES < 10 kVA	100%	0.18	0.00	0.00	0.18	220.44	
DEMAND kVA PER PHASE		0.90	0.00	0.00			
DEMAND AMPS PER PHASE		7.50	0.00	0.00			

\*THE CALCULATED LIGHTING LOAD EXCEEDS THE CONNECTED LIGHTING LOAD.

PANEL C - NEC ELECTRIC DEMAND SUMMARY 208Y/120V, 3P, 4W							
EQUIPMENT	DEMAND FACTOR	kVA			LOAD kVA	NEC REFERENCE	NOTES/CALCULATIONS
LIGHTING	100%	1.82	1.82	1.82	5.46	220.12	2880 SF X 1.9 VA/SF
RECEPTACLES < 10 kVA	100%	0.00	0.72	0.36	1.08	220.44	
HVAC	100%	3.02	1.51	1.51	6.04		BASED ON MCA
SIGN	100%	1.00	0.00	0.00	1.00	220.14(F)	
EQUIPMENT	100%	1.20	1.40	0.00	2.60		
WATER HEATER	125%	0.00	0.00	1.50	1.50	422.13	STORAGE TANK < 120 GAL @ 125%
DEMAND kVA PER PHASE		7.04	5.45	5.19			
DEMAND AMPS PER PHASE		58.64	45.40	43.23			

\*THE CALCULATED LIGHTING LOAD EXCEEDS THE CONNECTED LIGHTING LOAD.

PANEL D - NEC ELECTRIC DEMAND SUMMARY 208Y/120V, 3P, 4W							
EQUIPMENT	DEMAND FACTOR	kVA			LOAD kVA	NEC REFERENCE	NOTES/CALCULATIONS
LIGHTING	100%	1.82	1.82	1.82	5.46	220.12	2880 SF X 1.9 VA/SF
RECEPTACLES < 10 kVA	100%	0.00	0.72	0.36	1.08	220.44	
HVAC	100%	3.02	1.51	1.51	6.04		BASED ON MCA
SIGN	100%	1.00	0.00	0.00	1.00	220.14(F)	
EQUIPMENT	100%	1.20	1.40	0.00	2.60		
WATER HEATER	125%	0.00	0.00	1.50	1.50	422.13	STORAGE TANK < 120 GAL @ 125%
DEMAND kVA PER PHASE		7.04	5.45	5.19			
DEMAND AMPS PER PHASE		58.64	45.40	43.23			

\*THE CALCULATED LIGHTING LOAD EXCEEDS THE CONNECTED LIGHTING LOAD.

PANEL A - NEC ELECTRIC DEMAND SUMMARY 208Y/120V, 3P, 4W							
EQUIPMENT	DEMAND FACTOR	kVA			LOAD kVA	NEC REFERENCE	NOTES/CALCULATIONS
LIGHTING	100%	1.82	1.82	1.82	5.46	220.12	2880 SF X 1.9 VA/SF
RECEPTACLES < 10 kVA	100%	0.00	0.72	0.36	1.08	220.44	
HVAC	100%	3.02	1.51	1.51	6.04		BASED ON MCA
SIGN	100%	1.00					