

# Ruffalo CODY

## 1025 KIRKWOOD PARKWAY SW

## CEDAR RAPIDS, IOWA

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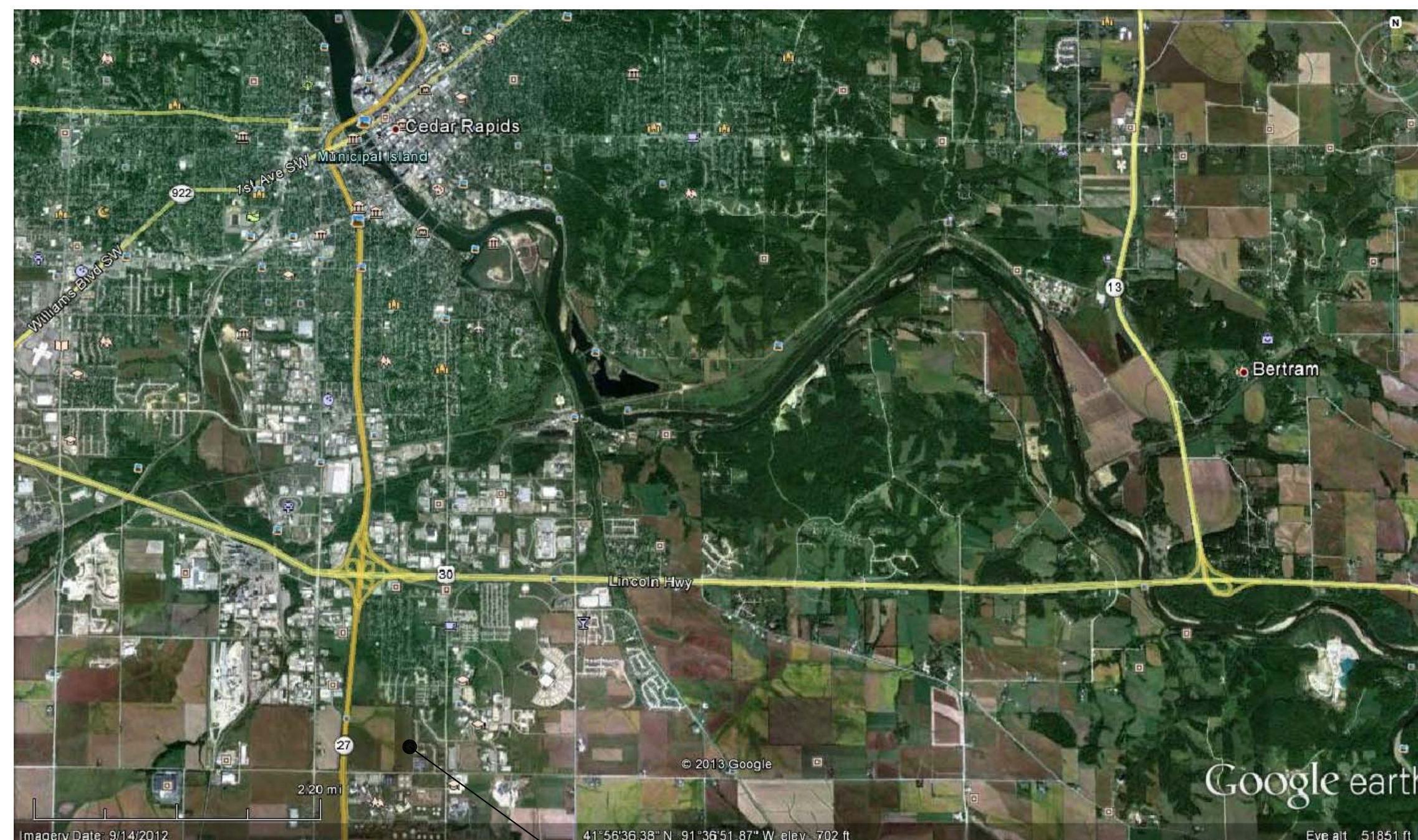
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### PROJECT LOCATION



PROJECT LOCATION

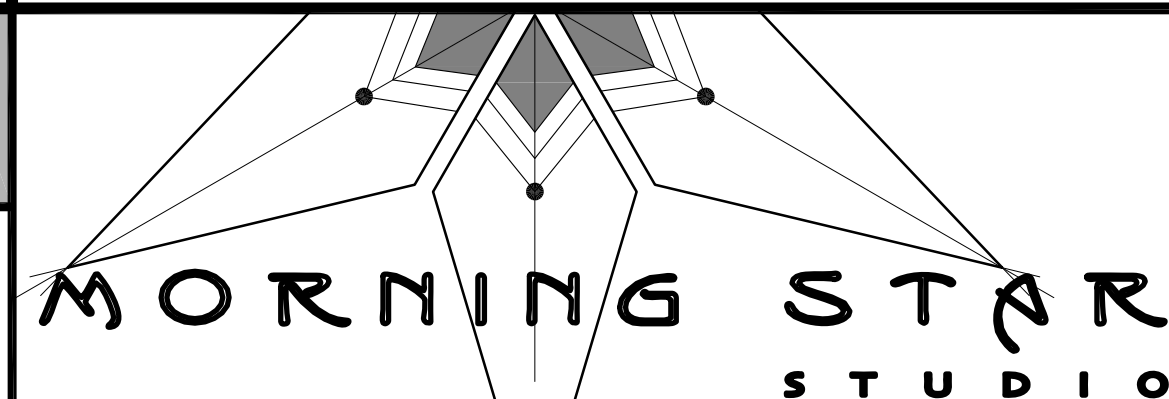
### CODE DATA

2012 IBC

CODE INFORMATION IS ON THE CODE SHEET

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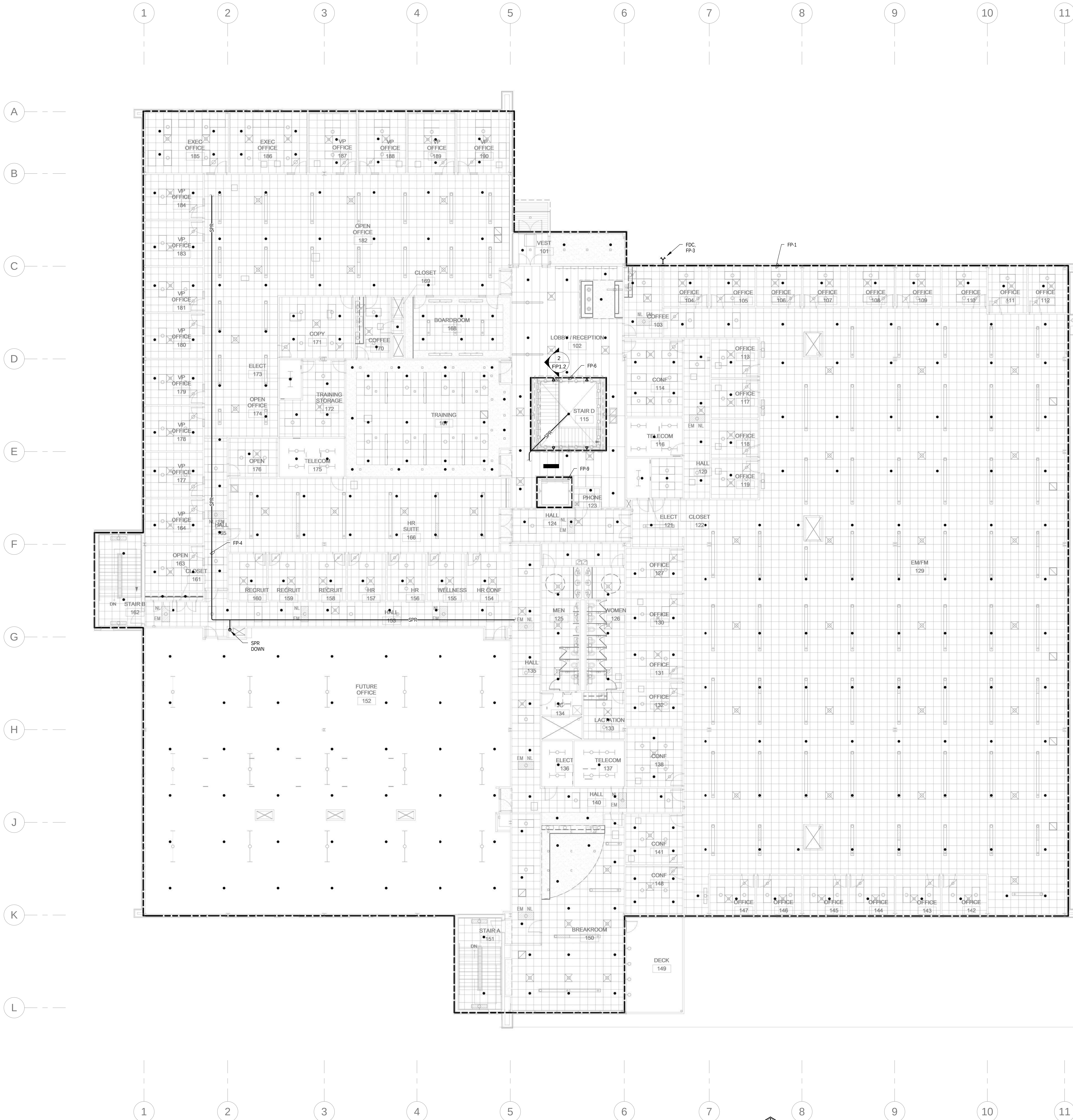
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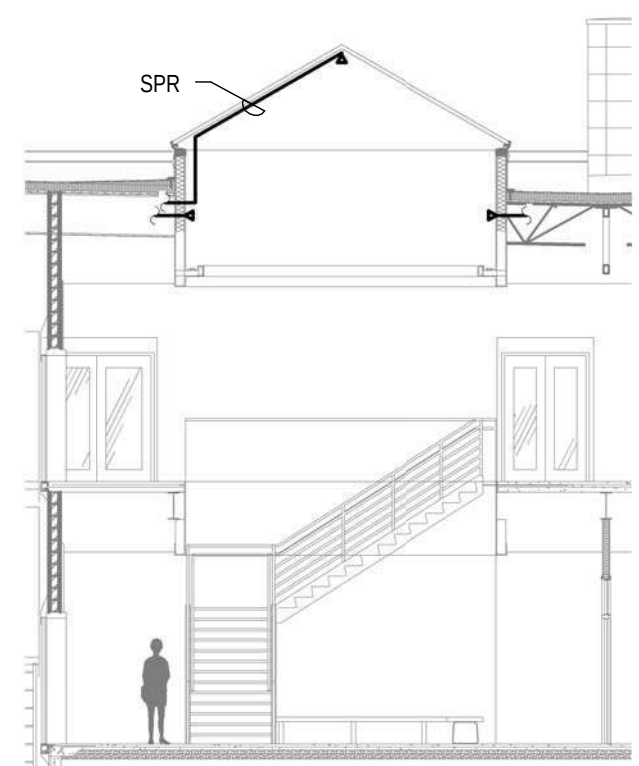
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FIRST FLOOR PLAN  
3/32" = 1'-0"

- FIRE PROTECTION SYMBOLS**  
(NOTE: ALL SYMBOLS SHOWN MAY NOT BE REQUIRED FOR THIS PROJECT)
- \*\*\* FIRE PROTECTION SYSTEM \*\*\*
  - SPR — SPRINKLER LINE
  - WSP — WET STANDPIPE
  - DSP — DRY STANDPIPE
  - SPRINKLER HEAD
  - SIDEWALL SPRINKLER HEAD
  - FLOW SWITCH
  - FIRE DEPARTMENT CONNECTION (FDC)
  - FIRE HOSE CABINET (FHC)
  - RECESSED FIRE HOSE CABINET (FHC)



2 SKYLIGHT SECTION  
3/32" = 1'-0"

- GENERAL FIRE PROTECTION NOTES**
- Provide new sprinkler system for entire building in accordance with NFPA 13.
  - Coordinate final sprinkler head placement with ceiling, exposed structure, lights, ductwork, and piping. Refer to architectural reflected ceiling plan. Unless noted otherwise, all sprinkler heads are to be centered in ceiling tiles.
  - Provide sprinkler inspector's test stations as required by code. Field coordinate locations with general contractor and architect. Drain to nearest janitor's sink or floor drain.
  - Occupancy shall be Light Hazard, except for mechanical rooms and storage rooms which shall be Ordinary Hazard, Group 2.
  - Provide coverage above and below ductwork in mechanical rooms as required. See mechanical plans for ductwork sizes and locations.
  - Drawings are in part diagrammatic, intended to convey the scope of work, and to indicate the general locations of equipment, piping. Contractor shall field verify all dimensions and layout his own work according to the following guidelines:
    - Contractor shall be responsible for determining the exact locations for equipment and rough ins and the exact routing of piping prior to construction so as to best fit the layout of the work. Coordinate final layout with all trades.
    - Where offsets in piping are required to coordinate the work of other trades, with structure, piping, conduit, ductwork etc. or to maintain required ceiling heights, they shall be provided at no additional cost to the Owner.
    - Unless otherwise noted, all piping to be routed concealed in walls or chases or above suspended ceiling. Water piping shall not be routed in exterior walls. Coordinate layout with existing conditions and all other trades. Route all piping as high as possible and along walls to maximize space available for other trades.
    - Coordinate routing of piping to maintain access to filters, motors, electrical equipment, and controls. In no case, shall piping pass directly over electrical panels or disconnects or restrict access to any electrical equipment including junction boxes.
  - All elements of the construction shall be performed by workmen skilled in the particular craft involved, and regularly employed in that particular craft. All work shall be performed in a neat, workmanlike manner in keeping with the highest standards of the craft.
  - Coordinate locations and sizes of openings in new structure with General Contractor. When additional cutting and patching is required due to Fire Protection Contractor's failure to coordinate this work, it shall be the Fire Protection Contractor's responsibility to provide the additional cutting and patching. Seal and/or fire stop all penetrations as required.
  - Provide all required support steel for piping and equipment.
  - Where there is no ceiling indicated new piping will be routed exposed within room. All exposed piping shall be painted to match adjacent wall/ceiling color.
  - Contractor shall note that in nearly all areas the space above ceilings is extremely limited, and coordination of work is mandatory.

- FIRE PROTECTION NOTES**
- FP-1 Suggested sprinkler head location. Contractor to verify exact location and quantity of heads as required per NFPA 13 and field conditions. Unless otherwise noted, all areas with suspended ceilings to be provided with concealed pendant heads with flat cover plates, areas with no ceiling to be provided with upright heads and/or sidewall heads. Refer to architectural plans and sections for obstructions. Sprinkler heads shall be quick response type heads. Coordinate sprinkler head locations with lights and other ceiling mounted devices.
  - FP-2 Provide and install double check valve at sprinkler service entrance with flow and tamper switches.
  - FP-3 Provide and install flush chrome 4 x 2 1/2 x 2 1/2 fire department connection at building entrance with check valve. Also, provide 120V horn / strobe, to be installed by electrical contractor.
  - FP-4 Suggested routing for sprinkler piping. Route piping as high as possible and coordinate exact routing with all other trades.
  - FP-5 Provide zone control valves, one for lower floor and one for first floor.
  - FP-6 Provide coverage for skylight in this area. Piping for sidewall heads shall be concealed in the walls and the heads shall be fully concealed flush sidewall heads with flat cover plate. The head at the peak of the skylight shall be fed by exposed piping as shown.
  - FP-7 Provide Novoc 1230 fluid system for server room. All equipment and controls for this system shall be located in Storage 022. Enclosure of Room 023 shall be tested in accordance with NFPA.
  - FP-8 Provide Novoc control panel in this location. Coordinate panel connection to fire alarm system with fire alarm contractor.
  - FP-9 Sprinkler heads are not required for elevator machine room or hoist way. Provide protection within the elevator pit only. Elevator pit to have sprinkler coverage provided by a side wall head mounted at an elevation of no greater than 24 inches above the elevator pit floor. Provide isolation valve and tamper switch in piping to elevator pit sprinkler. Coordinate tamper switch location with fire alarm contractor.
  - FP-10 Provide heads above and below the garage door as required by code.
  - FP-11 Provide heads below the stair landings.

REFER TO SHEET FP1.2 FOR  
FIRE PROTECTION NOTES

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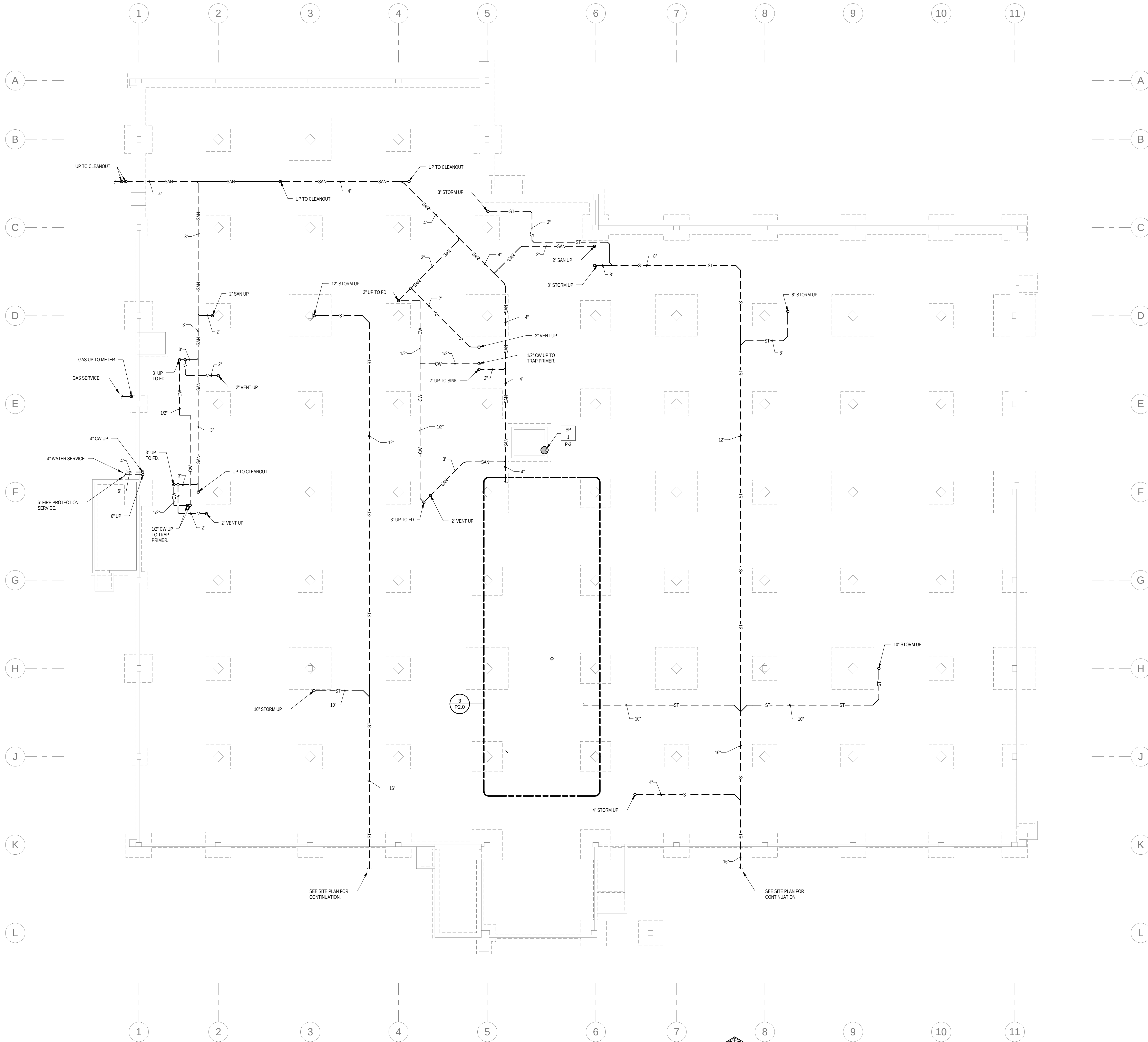
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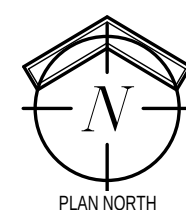
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FIRST FLOOR FIRE PROTECTION PLAN  
SHEET  
FP1.2

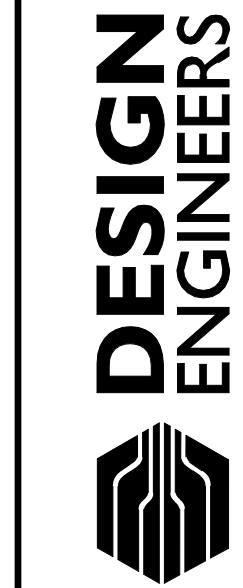


UNDERSLAB FLOOR PLAN

3/32" = 1'-0"



REFER TO SHEET P1.1 FOR PLUMBING NOTES



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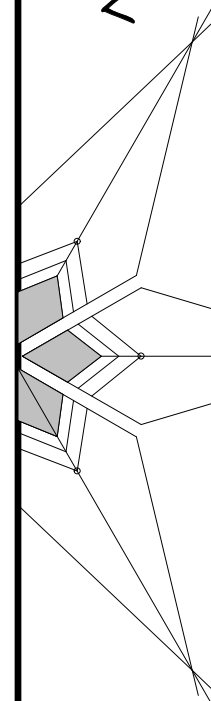
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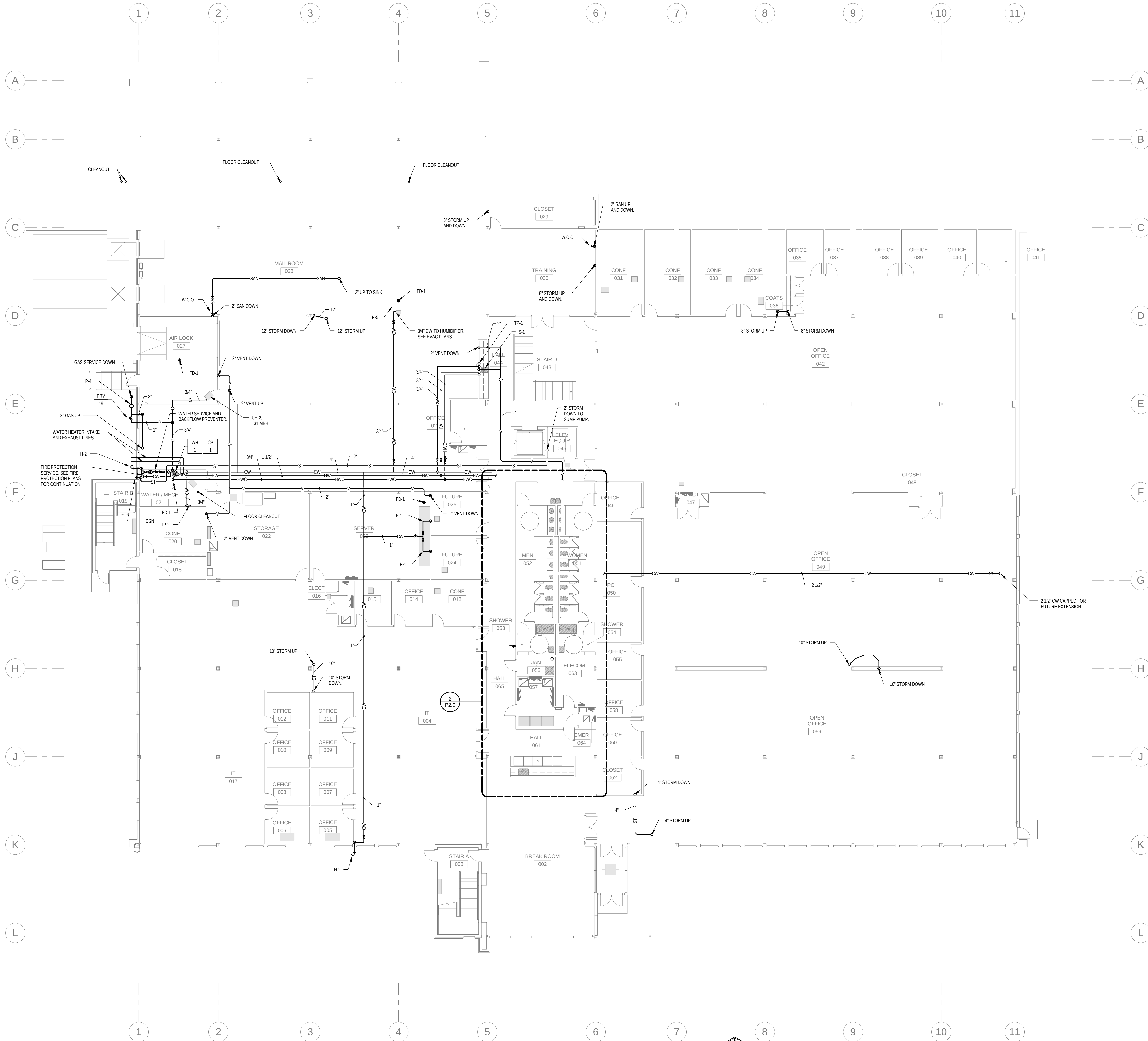
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SHEET  
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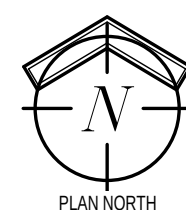
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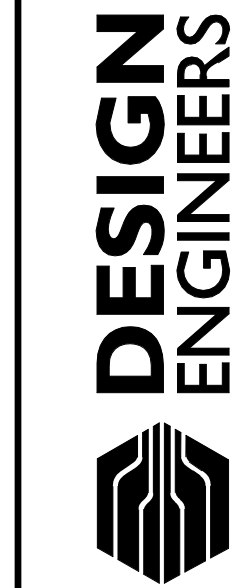
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LOWER FLOOR PLAN  
3/32" = 1'-0"



REFER TO SHEET P5.1 FOR  
PLUMBING NOTES



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SHEET  
**P1.2**

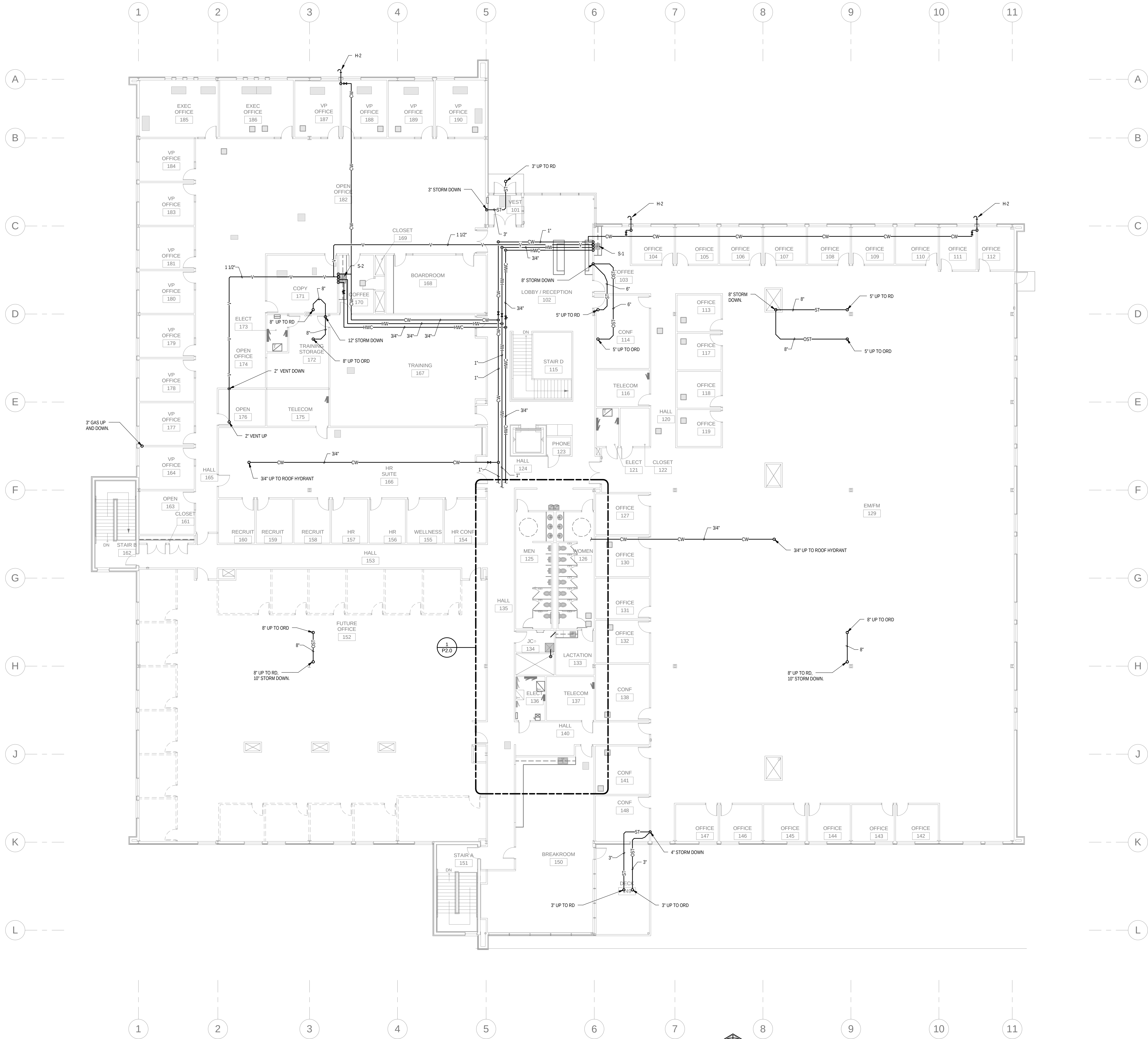
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FIRST FLOOR PLAN  
3/32" = 1'-0"



REFER TO SHEET P5.1 FOR  
PLUMBING NOTES



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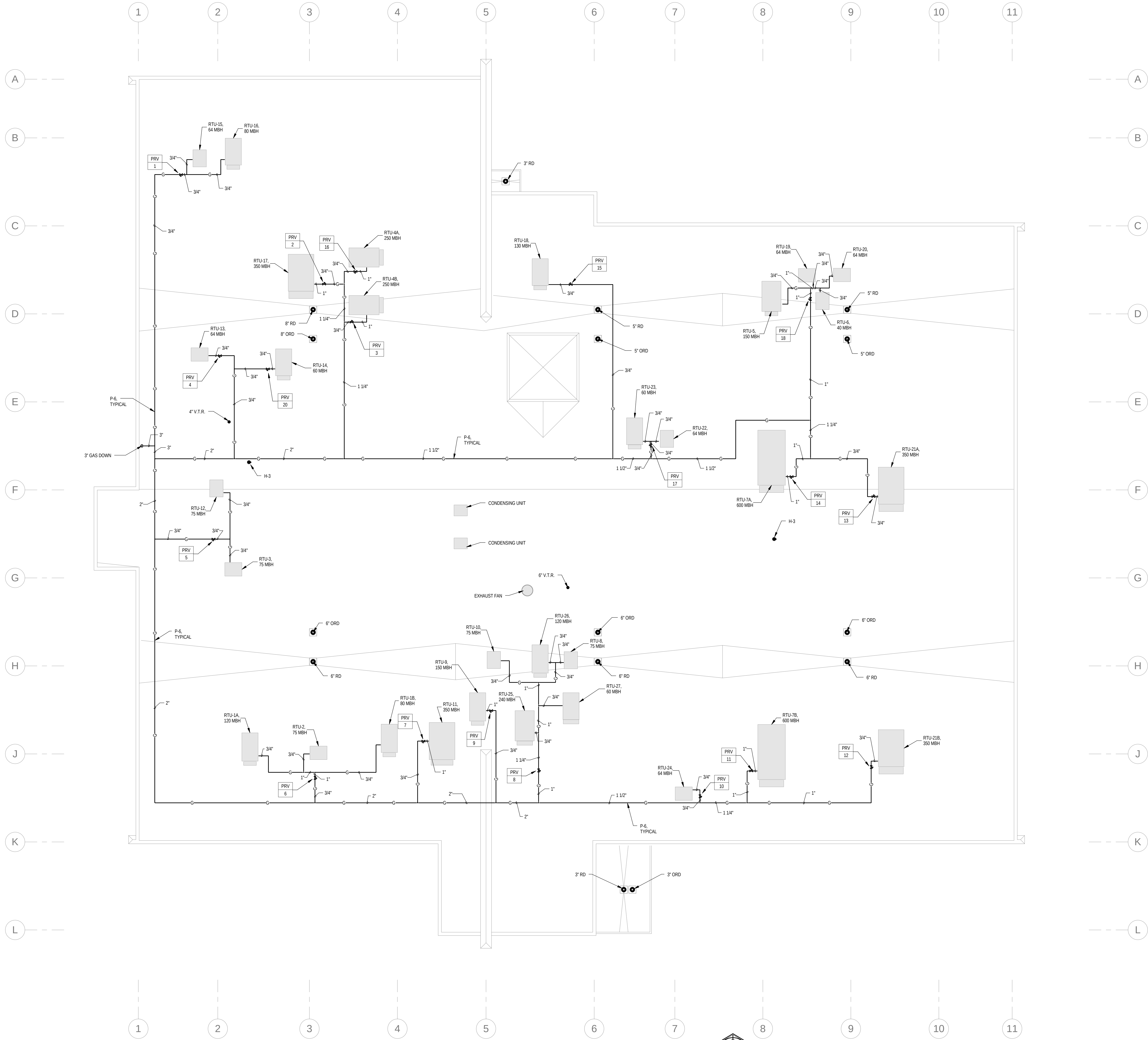
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DRAWING NAME  
FIRST FLOOR  
PLUMBING PLAN

SHEET  
**P1.3**

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ROOF FLOOR PLAN

3/32" = 1'-0"



REFER TO SHEET P5.1 FOR PLUMBING NOTES



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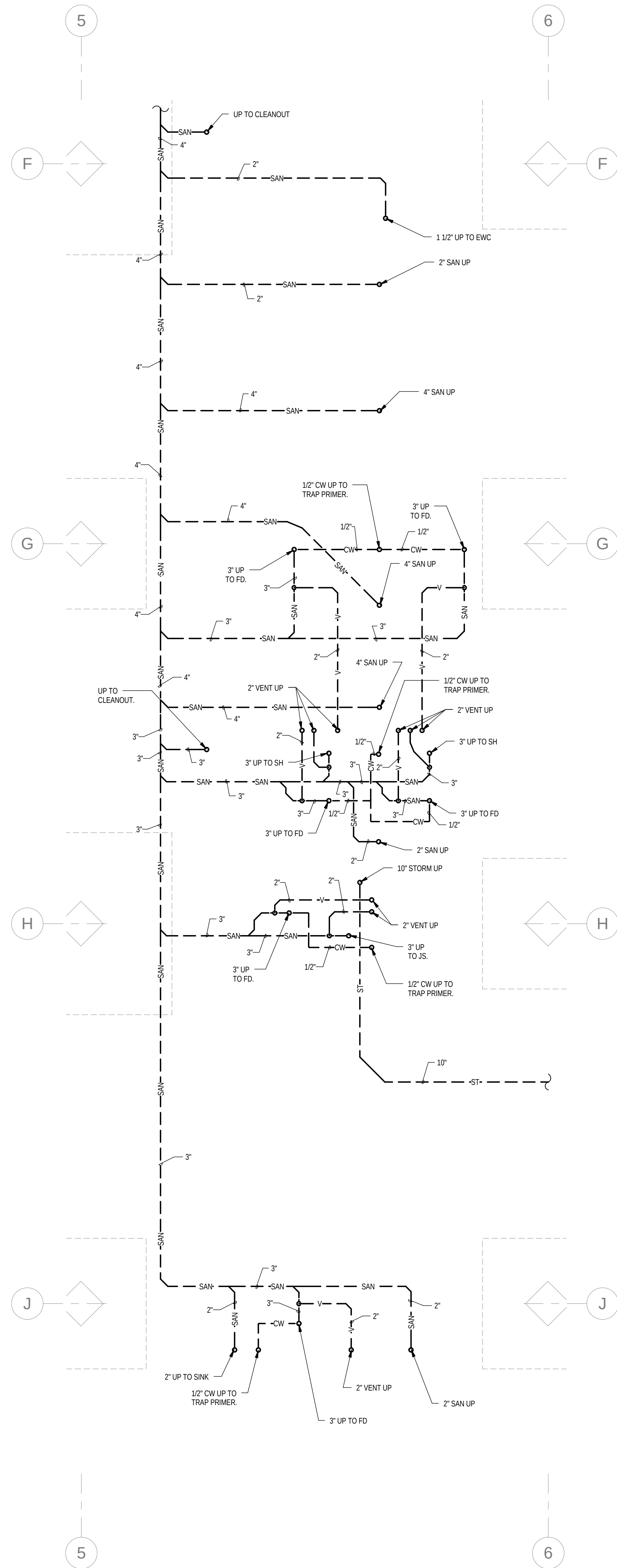
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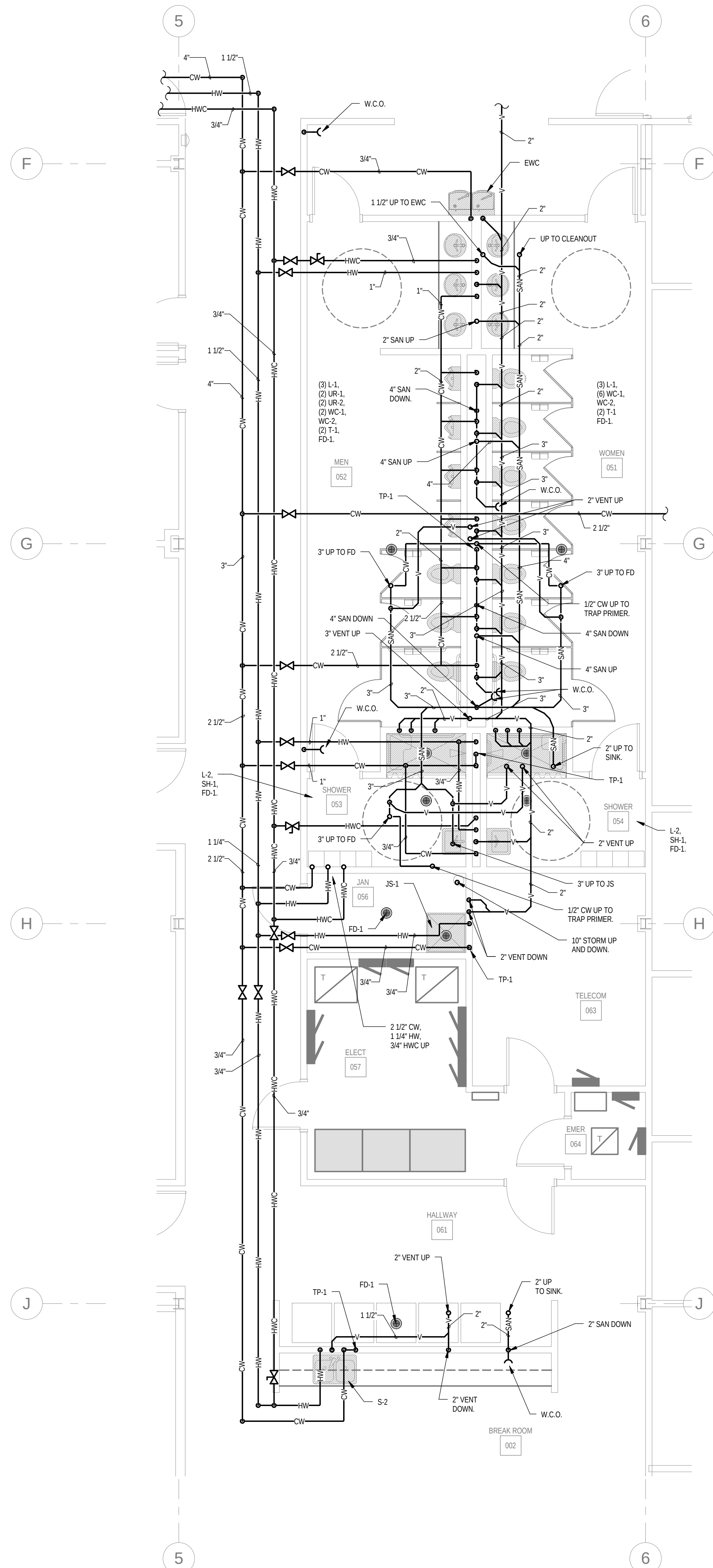
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**P1.4**

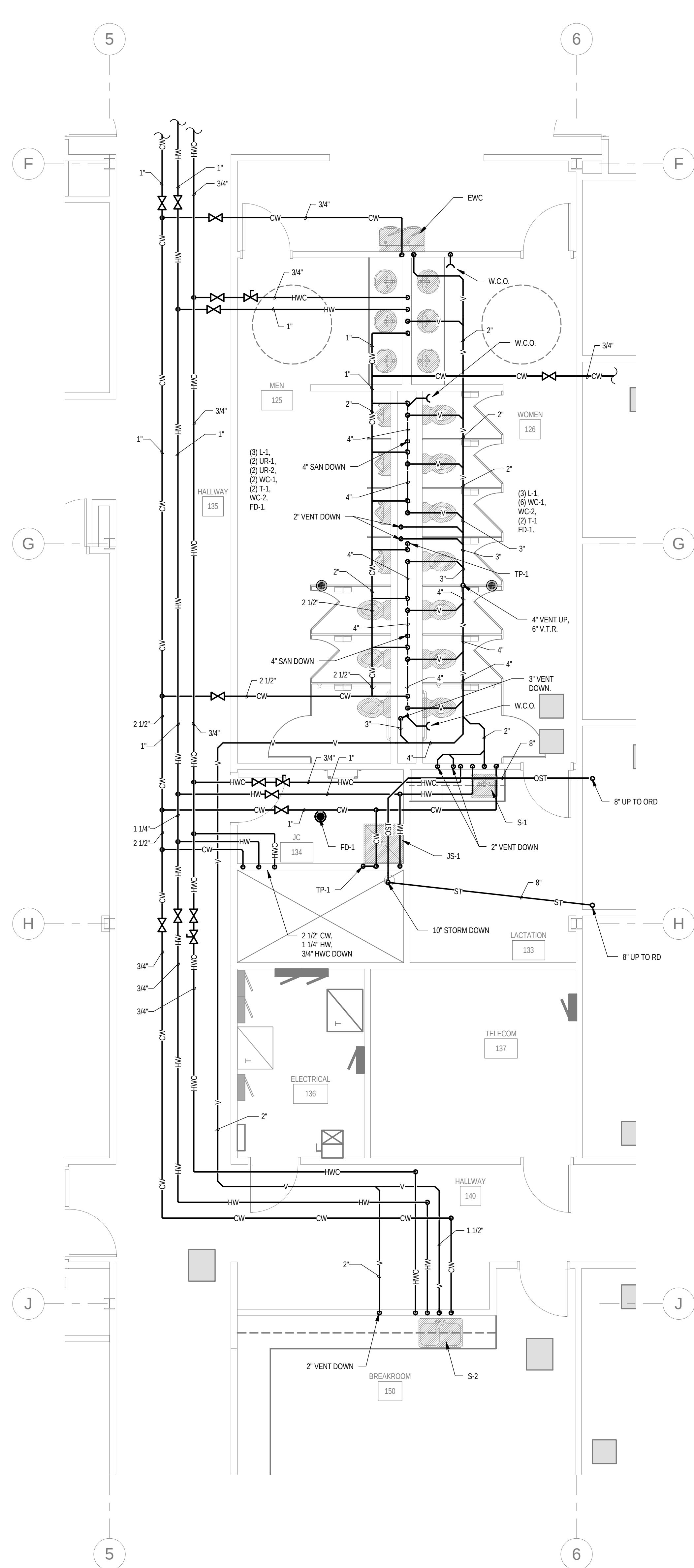
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PARTIAL ENLARGED UNDERSLAB FLOOR PLAN  
1/4" = 1'-0"



PARTIAL ENLARGED LOWER FLOOR PLAN  
1/4" = 1'-0"



PARTIAL ENLARGED FIRST FLOOR PLAN  
1/4" = 1'-0"

REFER TO SHEET P5.1 FOR  
PLUMBING NOTES



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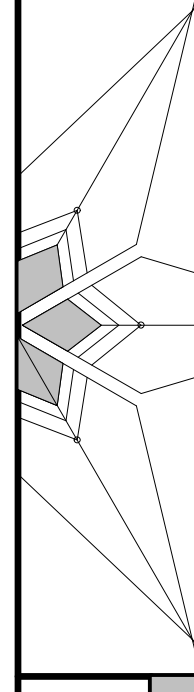
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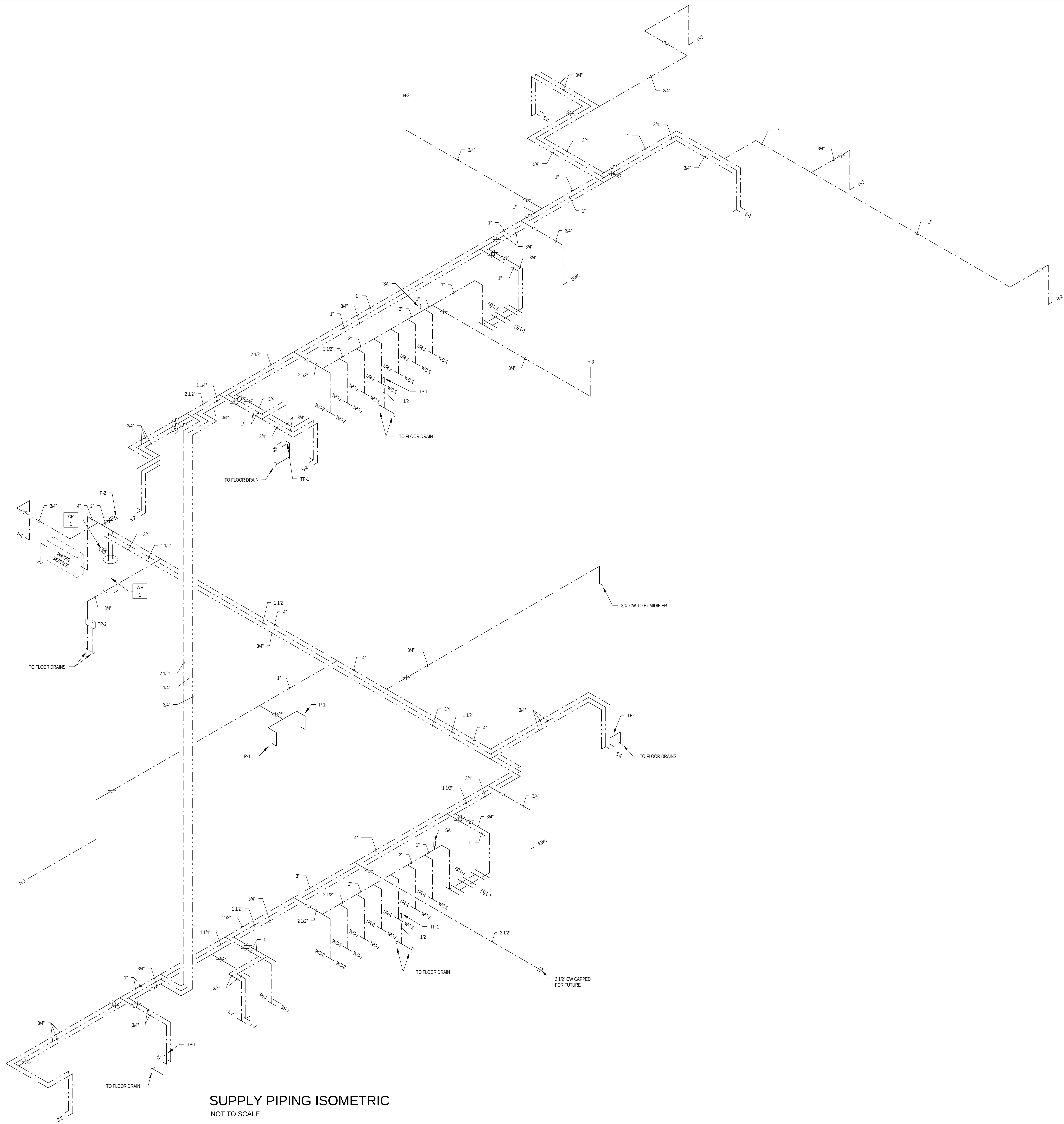
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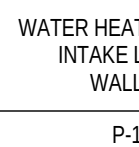
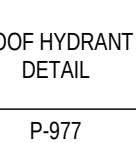
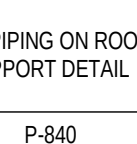
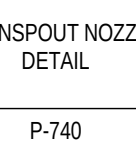
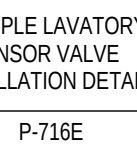
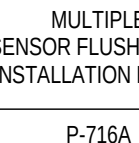
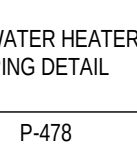
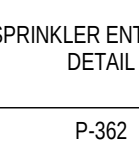
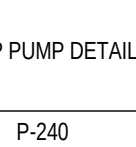
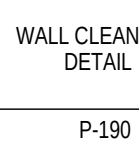
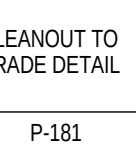
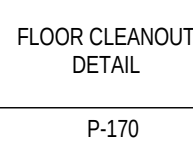
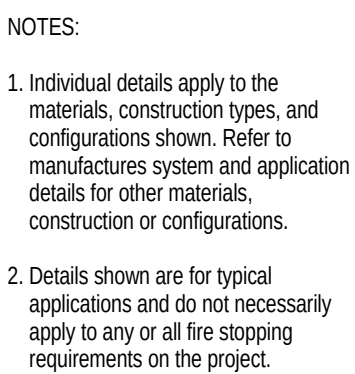
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MORNING STAR  
STUDIO



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ARCHITECTURE ■ INTERIOR DESIGN  
■ STRUCTURAL ENGINEERING





| PLUMBING FIXTURE SCHEDULE                                                                                                                                                                                                                                             |                                                                                 |                                                                                                   |                                                                                                                                                          |             |                                                                                                                                |                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------------------------------------------------------------------------------------------------------------------------|------------------------|
|                                                                                                                                                                                                                                                                       | Base Fixture                                                                    | Details                                                                                           | Trim                                                                                                                                                     | Water Usage | Accessories / Notes                                                                                                            | Color                  |
| DSN                                                                                                                                                                                                                                                                   | Watts RD-940 downspout nozzle                                                   | nickel bronze with anchor flange                                                                  |                                                                                                                                                          |             |                                                                                                                                |                        |
| EWC                                                                                                                                                                                                                                                                   | Elkay EZSTL8WSLK EZH2O system electric water cooler with bottle filling station | Self-contained, wall mounted, bi-level water electric refrigerated cooler                         | 8 GPH, 2.5 FLA, 370 Watts                                                                                                                                |             | P-trap, angle supply with stop<br>See architectural drawings for mounting heights.<br>Provide with receptacle adaptor plug.    | stainless steel finish |
| FD-1                                                                                                                                                                                                                                                                  | Watts Series FD-200-A-7 floor drain                                             | round 6" nickel bronze strainer                                                                   | with trap primer tapping                                                                                                                                 |             |                                                                                                                                |                        |
| H-1                                                                                                                                                                                                                                                                   | Woodford Model 101 wall faucet                                                  | anti-siphon                                                                                       |                                                                                                                                                          |             |                                                                                                                                |                        |
| H-2                                                                                                                                                                                                                                                                   | Woodford Model B67 wall hydrant                                                 | automatic draining, freezeless                                                                    | with locking door with vacuum breaker                                                                                                                    |             |                                                                                                                                |                        |
| H-3                                                                                                                                                                                                                                                                   | Woodford Model SRH-MS freezeless roof hydrant                                   | includes mounting system                                                                          |                                                                                                                                                          |             |                                                                                                                                |                        |
| JS-1                                                                                                                                                                                                                                                                  | Fiat MSB-2424 24 x 4 x 10" molded-stone                                         | With factory installed drain                                                                      | Chicago Faucet 897-RCF faucet with vacuum breaker, 3/4" hose thread, pall hook, and wall brace.                                                          | 2.2 gpm     | Provide Fiat MSG-2424 stainless steel wall guard, Fiat 832AA hose and bracket.                                                 |                        |
| L-1                                                                                                                                                                                                                                                                   | Integral bowl                                                                   |                                                                                                   | Sloan Optima ETF-80-4-LT-BDT sensor faucet less transformer, below deck thermostatic mixing valve, 0.5 gpm vandal resistant spray head                   | 0.5 gpm     | Open grid strainer<br>P-trap, angle supplies with stops<br>Insulate all exposed piping                                         | white                  |
| L-2                                                                                                                                                                                                                                                                   | Kohler K-2032 Greenwich vitreous china lavatory                                 | wall hung, 4" faucet centers drilled for concealed arm carrier.                                   | Sloan Optima ETF-80-4-LT-BDT sensor faucet less transformer, ETF-312-A Trim Plate for 4" Centerset in sink. Leonard Model 170 thermostatic mixing valve. | 0.5 gpm     | P-trap<br>Concealed arm carrier<br>Angle supplies with stops<br>Insulate all exposed piping.                                   | white                  |
| ORD                                                                                                                                                                                                                                                                   | Zurn ZC100-DR-GD-W2                                                             | Dura coated cast iron body<br>Cast iron dome with 2" dam                                          | with underdeck clamp                                                                                                                                     |             |                                                                                                                                |                        |
| RD                                                                                                                                                                                                                                                                    | Zurn ZC100-DR-GD                                                                | Dura coated cast iron body<br>Cast iron dome                                                      | with underdeck clamp                                                                                                                                     |             |                                                                                                                                |                        |
| S-1                                                                                                                                                                                                                                                                   | Elkay LR-1918 19" x 18" x 7-1/2" deep stainless steel sink                      | Single compartment<br>Two hole punched                                                            | Chicago Faucet 2302-CP deck mounted faucet with gooseneck spout and single lever handle.                                                                 | 2.2 gpm     | LK-35 Basket strainer<br>P-trap<br>Angle supplies with stops                                                                   |                        |
| S-2                                                                                                                                                                                                                                                                   | Elkay LR-3321 33" x 21" x 7-7/8" deep stainless steel sink                      | Double compartment<br>Four hole punched                                                           | Chicago Faucet 2301-8CP single handle faucet with 10" swing spout with side hose and spray                                                               | 2.2 gpm     | LK-35 Basket strainer<br>P-trap<br>Angle supplies with stops                                                                   |                        |
| SH-1                                                                                                                                                                                                                                                                  | shower base and surround systems specified in architectural divisions.          |                                                                                                   | Symmons Temptrol S-96-1 2.0 shower valve with stops, and showerhead                                                                                      | 2.0 gpm     | shower drain with strainer, P-trap                                                                                             |                        |
| SA                                                                                                                                                                                                                                                                    | Sloux Chief Hydra-Restor 653-B                                                  | 3/4" size                                                                                         |                                                                                                                                                          |             |                                                                                                                                |                        |
| T-1                                                                                                                                                                                                                                                                   | Sloan EL-154 box mount transformer                                              | 120 VAC/24 VAC, 50 VA                                                                             |                                                                                                                                                          |             | for water closet and urinal flush valves and lavatories                                                                        |                        |
| TP-1                                                                                                                                                                                                                                                                  | Zurn Z1022 automatic trap primer                                                |                                                                                                   |                                                                                                                                                          |             |                                                                                                                                |                        |
| TP-2                                                                                                                                                                                                                                                                  | Zurn Z1020 electronic trap primer                                               | with box and cover                                                                                |                                                                                                                                                          |             |                                                                                                                                |                        |
| UR-1                                                                                                                                                                                                                                                                  | Sloan WEUS-1002.1301-0.25 ES-S Urinal                                           | Wall hung vitreous china, washdown flush, 3/4" top spud.<br>Handicapped height.                   | Includes Sloan Royal Optima HEU sensor activated flushometer, 0.25 gpf                                                                                   | 0.25 gpf    | Wall carrier<br>See architectural elevations for mounting height.                                                              | White                  |
| UR-2                                                                                                                                                                                                                                                                  | Sloan WEUS-1002.1301-0.25 ES-S Urinal                                           | Wall hung vitreous china, washdown flush, 3/4" top spud.<br>Standard height                       | Includes Sloan Royal Optima HEU sensor activated flushometer, 0.25 gpf                                                                                   | 0.25 gpf    | Wall carrier<br>See architectural elevations for mounting height.                                                              | White                  |
| WC-1                                                                                                                                                                                                                                                                  | Sloan WETS 2050.1303-1.28 ES-S TMO Wall hung water closet                       | Wall hung vitreous china, elongated bowl, siphon jet flush, 1-1/2" top spud<br>Standard height    | Includes Sloan Royal Optima sensor activated flushometer, 1.28 gpf<br>flush valve has true mechanical override                                           | 1.28 gpf    | Open front seat, less cover, with check hinges.<br>Heavy duty wall carrier<br>See architectural elevations for mounting height | white seat and fixture |
| WC-2                                                                                                                                                                                                                                                                  | Sloan WETS 2050.1303-1.28 ES-S TMO Wall hung water closet                       | Wall hung vitreous china, elongated bowl, siphon jet flush, 1-1/2" top spud<br>Handicapped height | Includes Sloan Royal Optima sensor activated flushometer, 1.28 gpf<br>flush valve has true mechanical override                                           | 1.28 gpf    | Open front seat, less cover, with check hinges.<br>Heavy duty wall carrier<br>See architectural elevations for mounting height | white seat and fixture |
| NOTES:<br>1. In general, refer to Architectural elevations for mounting heights of all fixtures. Contractor to confirm which fixtures are to comply with the requirements of ADA prior to rough-in of piping and install all piping and fixtures as required per ADA. |                                                                                 |                                                                                                   |                                                                                                                                                          |             |                                                                                                                                |                        |

| GAS PRESSURE REDUCING VALVE SCHEDULE                                                                       |                   |              |                    |                       |            |      |                       |
|------------------------------------------------------------------------------------------------------------|-------------------|--------------|--------------------|-----------------------|------------|------|-----------------------|
| PLAN MARK                                                                                                  | SERVICE           | CAPACITY CFH | INLET PRESSURE PSI | OUTLET PRESSURE in WC | VALVE SIZE | CV   | MODEL NUMBER (NOTE 1) |
| PRV-1                                                                                                      | RTU-15, 16        | 144          | 2                  | 11                    | 3/4        | 9.83 | CS404                 |
| PRV-2                                                                                                      | RTU-17            | 350          | 2                  | 11                    | 3/4        | 9.83 | CS404                 |
| PRV-3                                                                                                      | RTU-14B           | 250          | 2                  | 11                    | 3/4        | 9.83 | CS404                 |
| PRV-4                                                                                                      | RTU-13            | 64           | 2                  | 11                    | 3/4        | 9.83 | CS404                 |
| PRV-5                                                                                                      | RTU-3, 12         | 150          | 2                  | 11                    | 3/4        | 9.83 | CS404                 |
| PRV-6                                                                                                      | RTU-1A, 1B, 2     | 304          | 2                  | 11                    | 3/4        | 9.83 | CS404                 |
| PRV-7                                                                                                      | RTU-11            | 350          | 2                  | 11                    | 3/4        | 9.83 | CS404                 |
| PRV-8                                                                                                      | RTU-8,10,25,26,27 | 510          | 2                  | 11                    | 3/4        | 9.83 | CS404                 |
| PRV-9                                                                                                      | RTU-9             | 150          | 2                  | 11                    | 3/4        | 9.83 | CS404                 |
| PRV-10                                                                                                     | RTU-24            | 64           | 2                  | 11                    | 3/4        | 9.83 | CS404                 |
| PRV-11                                                                                                     | RTU-7B            | 600          | 2                  | 11                    | 3/4        | 9.83 | CS404                 |
| PRV-12                                                                                                     | RTU-21B           | 350          | 2                  | 11                    | 3/4        | 9.83 | CS404                 |
| PRV-13                                                                                                     | RTU-21A           | 350          | 2                  | 11                    | 3/4        | 9.83 | CS404                 |
| PRV-14                                                                                                     | RTU-7A            | 600          | 2                  | 11                    | 3/4        | 9.83 | CS404                 |
| PRV-15                                                                                                     | RTU-19            | 130          | 2                  | 11                    | 3/4        | 9.83 | CS404                 |
| PRV-16                                                                                                     | RTU-4A            | 250          | 2                  | 11                    | 3/4        | 9.83 | CS404                 |
| PRV-17                                                                                                     | RTU-22,23         | 124          | 2                  | 11                    | 3/4        | 9.83 | CS404                 |
| PRV-18                                                                                                     | RTU-5,6,19,20     | 318          | 2                  | 11                    | 3/4        | 9.83 | CS404                 |
| PRV-19                                                                                                     | WH-1, WH-2        | 171          | 2                  | 11                    | 3/4        | 9.83 | CS404                 |
| PRV-20                                                                                                     | RTU-14            | 60           | 2                  | 11                    | 3/4        | 9.83 | CS404                 |
| NOTES:<br>1. Valves performance based on Fischer refer to specifications for other approved manufacturers. |                   |              |                    |                       |            |      |                       |

| PLUMBING FIXTURE CONNECTION SCHEDULE |                                 |             |      |        |        |  |
|--------------------------------------|---------------------------------|-------------|------|--------|--------|--|
| ITEM NO.                             | DESCRIPTION OF PLUMBING FIXTURE | CONNECTIONS |      |        |        |  |
|                                      |                                 | CW          | HW   | WASTE  | VENT   |  |
| EWC                                  | Electric Water Cooler           | 1/2"        | -    | 1-1/4" | 1-1/4" |  |
| FD-1                                 | Floor Drain                     | -           | -    | 3"     | 2"     |  |
| H-1,2,3                              | Hose Bib/Wall Hydrant           | 3/4"        | -    | -      | -      |  |
| JS-1                                 | Janitor Sink                    | 3/4"        | 3/4" | 3"     | 2"     |  |
| L-1,2                                | Lavatory                        | 1/2"        | 1/2" | 1-1/2" | 1-1/2" |  |
| S-1,2                                | Sink                            | 1/2"        | 1/2" | 2"     | 1-1/2" |  |
| SH-1                                 | Shower                          | 3/4"        | 3/4" | 2"     | 1-1/2" |  |
| TP                                   | Electronic Trap Primer          | 1/2"        | -    | -      | -      |  |
| UR-1,2                               | Urinal                          | 1"          | -    | 2"     | 1-1/2" |  |
| WC-1,2                               | Water Closet                    | 1"          | -    | 4"     | 2"     |  |

| SUMP PUMP SCHEDULE                                                                                                                                                                                                    |     |           |             |             |               |       |    |                    |              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----------|-------------|-------------|---------------|-------|----|--------------------|--------------|
| PLAN MARK                                                                                                                                                                                                             | GPM | HEAD (FT) | PUMP TYPE   | SYSTEM TYPE | ELECTRICAL HP | VOLTS | PH | MODEL NO. (NOTE 1) | USAGE        |
| SP-1                                                                                                                                                                                                                  | 50  | 30        | Submersible | Simplex     | 1/2           | 120   | 1  | SPD 50H            | Elevator Pit |
| NOTES:<br>1. Selection based on Hydromatic. See specifications for other approved manufacturers.<br>2. Provide with 24" diameter x 30" deep pump basin with perforated cover. Pump to be controlled by manual switch. |     |           |             |             |               |       |    |                    |              |

| CIRCULATING PUMP SCHEDULE |     |          |             |                   |      |          |       |    |                                   |                   |  |
|---------------------------|-----|----------|-------------|-------------------|------|----------|-------|----|-----------------------------------|-------------------|--|
| PLAN MARK                 | GPM | HEAD FT. | WATER TEMP. | SIZE SUCT X DISCH | RPM  | MOTOR HP | VOLTS | PH | MANUFACTURER & MODEL NO.          | SERVICE           |  |
| CP-1                      | 12  | 26       | 140         | 3/4" x 3/4"       | 3300 | 1/6      | 120   | 1  | Bell & Gossett Series PL - Bronze | DHW Recirculating |  |

| GAS WATER HEATER SCHEDULE                                                                                                                                    |                 |              |                  |          |        |              |       |            |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------|------------------|----------|--------|--------------|-------|------------|--|
| PLAN MARK                                                                                                                                                    | STORAGE GALLONS | RECOVERY GPH | DEG. F TEMP RISE | FUEL     | BTU/HR | MANUFACTURER | MODEL | REMARKS    |  |
| WH-1                                                                                                                                                         | 48              | 48.5         | 90               | Nat. Gas | 40,000 | Rheem        | RHE50 | Notes 1, 2 |  |
| Notes:<br>1. Provide expansion tank.<br>2. Provide 3" PVC intake and 3" PVC exhaust pipe for a total equivalent distance of 60 feet each. See Detail P-1136. |                 |              |                  |          |        |              |       |            |  |

## PLUMBING SYMBOLS

(NOTE: ALL SYMBOLS SHOWN MAY NOT BE REQUIRED FOR THIS PROJECT)

### \*\*\* PLUMBING SYMBOLS \*\*\*

|             |                                                         |
|-------------|---------------------------------------------------------|
| -- SAN --   | SANITARY WASTE BELOW GRADE. AW=ACID WASTE               |
| --- SAN --- | SANITARY SEWER ABOVE GRADE. AW = ACID WASTE.            |
| -- ST --    | STORM SEWER BELOW GRADE.                                |
| --- ST ---  | STORM SEWER ABOVE GRADE.                                |
| CO          | CLEANOUT - CO, WALL CLEANOUT - WCO YARD CLEANOUT - YCO  |
| --- V ---   | PLUMBING VENT, V=VENT, VTR=VENT THRU ROOF, AV=ACID VENT |
| --- CW ---  | COLD WATER - CW                                         |
| --- HW ---  | HOT WATER - HW (20 DEG. UNLESS NOTED OTHERWISE)         |
| --- HWC --- | HOT WATER CIRCULATING - HWC                             |
| --- G ---   | GAS - NATURAL OR MANUFACTURED                           |
| ⊗           | FLOOR DRAIN - FD                                        |
| ⊙           | ROOF DRAIN - RD, DOWNSPOUT - DS                         |
| ⊕           | WALL HYDRANT - WH                                       |
| ⊕           | HOSE BIBB - HB                                          |
| ⊕           | SHOWER - SH                                             |
| ⊕           | UNION                                                   |
| ⊕           | DIELECTRIC UNION                                        |
| ⊕           | SHUT-OFF VALVE                                          |
| ⊕           | ANGLE SHUT-OFF VALVE                                    |
| ⊕           | BALANCING OR SHUT-OFF COCK                              |
| ⊕           | FLOW CONTROL VALVE                                      |
| ⊕           | AUTOMATIC CONTROL VALVE                                 |
| ⊕           | RELIEF OR SAFETY VALVE                                  |
| ⊕           | PRESSURE REDUCING VALVE                                 |
| ⊕           | CHECK VALVE                                             |
| ⊕           | BACKFLOW PREVENTER                                      |
| ⊕           | VALVE IN RISER                                          |
| ⊕           | 3-WAY AUTOMATIC CONTROL VALVE                           |
| ⊕           | PRESSURE-TEMPERATURE RELIEF VALVE                       |
| ⊕           | WATER METER                                             |
| ⊕           | GAS METER                                               |

### \*\*\* PIPING SPECIALTIES \*\*\*

|   |                                           |
|---|-------------------------------------------|
| ⊕ | ELBOW TURNED UP OR TOWARDS                |
| ⊕ | ELBOW TURNED DOWN OR AWAY                 |
| ⊕ | TEE TURNED UP OR TOWARDS                  |
| ⊕ | TEE TURNED DOWN OR AWAY                   |
| ⊕ | DROP OR RISE                              |
| ⊕ | ARROW IN LINE INDICATES DIRECTION OF FLOW |
| ⊕ | PITCH DOWN IN DIRECTION OF ARROW          |
| ⊕ | CAP OR PLUG                               |
| ⊕ | STRAINER                                  |
| ⊕ | CONNECTION - NEW TO EXISTING              |

### GENERAL PLUMBING NOTES

- Drawings are in part diagrammatic, intended to convey the scope of work, and to indicate the general locations of equipment, piping and ductwork. Contractor shall field verify all dimensions and layout his own work according to the following guidelines:
  - Contractor shall be responsible for determining the exact locations for equipment and rough ins and the exact routing of piping prior to construction so as to best fit the layout of the work. Space above ceilings is extremely limited; coordinate final layout with all trades.
  - Where offsets in piping are required to coordinate the work of other trades, with existing structure, piping, conduit, ductwork etc. or to maintain required ceiling heights, they shall be provided at no additional cost to the Owner.
  - All existing piping routing shown is intended to indicate approximate size, number and location of piping branches for bidding purposes only. Contractor to verify exact size and configuration prior to construction.
  - Unless otherwise noted, all piping to be routed concealed in walls, chases or above suspended ceiling. Water piping shall not be routed in exterior walls. Coordinate layout with existing conditions and all other trades. Route all piping as high as possible and along walls to maximize space available for other trades.
  - Coordinate routing of piping to maintain access to filters, motors, electrical equipment, and controls. In no case shall piping pass directly over electrical panels or disconnects or restrict access to any electrical equipment including junction boxes.
  - Verify exact size and location of all existing systems requiring connection to new piping prior to commencing work.
- Because of the scale of the drawings, certain piping or items such as unions, fittings, or valves, or cleanouts may not be shown, but where such items are required by code, the specifications, or where they are required by the nature of the work, they shall be furnished and installed.

Unless specifically shown otherwise, cleanouts shall be located in walls. Cleanouts shall not be located above ceilings. For cleanouts that are required, but not shown on plans, coordinate exact locations with Architect and Engineer prior to installation.
- All elements of the construction shall be performed by workmen skilled in the particular craft involved, and regularly employed in that particular craft. All work shall be performed in a neat, workmanlike manner in keeping with the highest standards of the craft.
- Coordinate installation vents, and all other items penetrating the exterior building envelope with General Contractor. All items penetrating the roof are to be installed as per roofing manufacturer requirements.
- Coordinate locations and sizes of openings in new structure with General Contractor. When additional cutting and patching is required due to Plumbing Contractor's failure to coordinate this work, it shall be the Plumbing Contractor's responsibility to provide the additional cutting and patching. Seal and/or fire stop all penetrations as required.
- For all work required above existing ceilings to remain, Contractor is responsible for removal and replacement of all ceiling tile as required to accomplish the work.
- Plumbing Contractor shall provide all required support steel for piping.
- Provide isolation valves for all equipment and all branch lines serving two or more fixtures.
- Where there is no ceiling indicated new piping will be routed exposed within room. All exposed piping shall be painted to match adjacent wall/ceiling color.
- Contractor shall note that in nearly all areas the space above ceilings is extremely limited, and coordination of work is mandatory.

### PLUMBING NOTES

- P-1 Provide connection to the computer room humidifiers in this location. Provide RPZ and shutoff valves. Provide 1 RPZ as shown.
- P-2 Provide 2" valved capped cold water line for future irrigation.
- P-3 Coordinate the location of the elevator sump pit with the general contractor and the elevator supplier.
- P-4 Provide 2 psi building gas pressure.
- P-5 Provide RPZ in supply line to humidifier.
- P-6 All gas supply piping upstream of the PRV for rooftops shall be 2 psi.

MORNING STAR STUDIO

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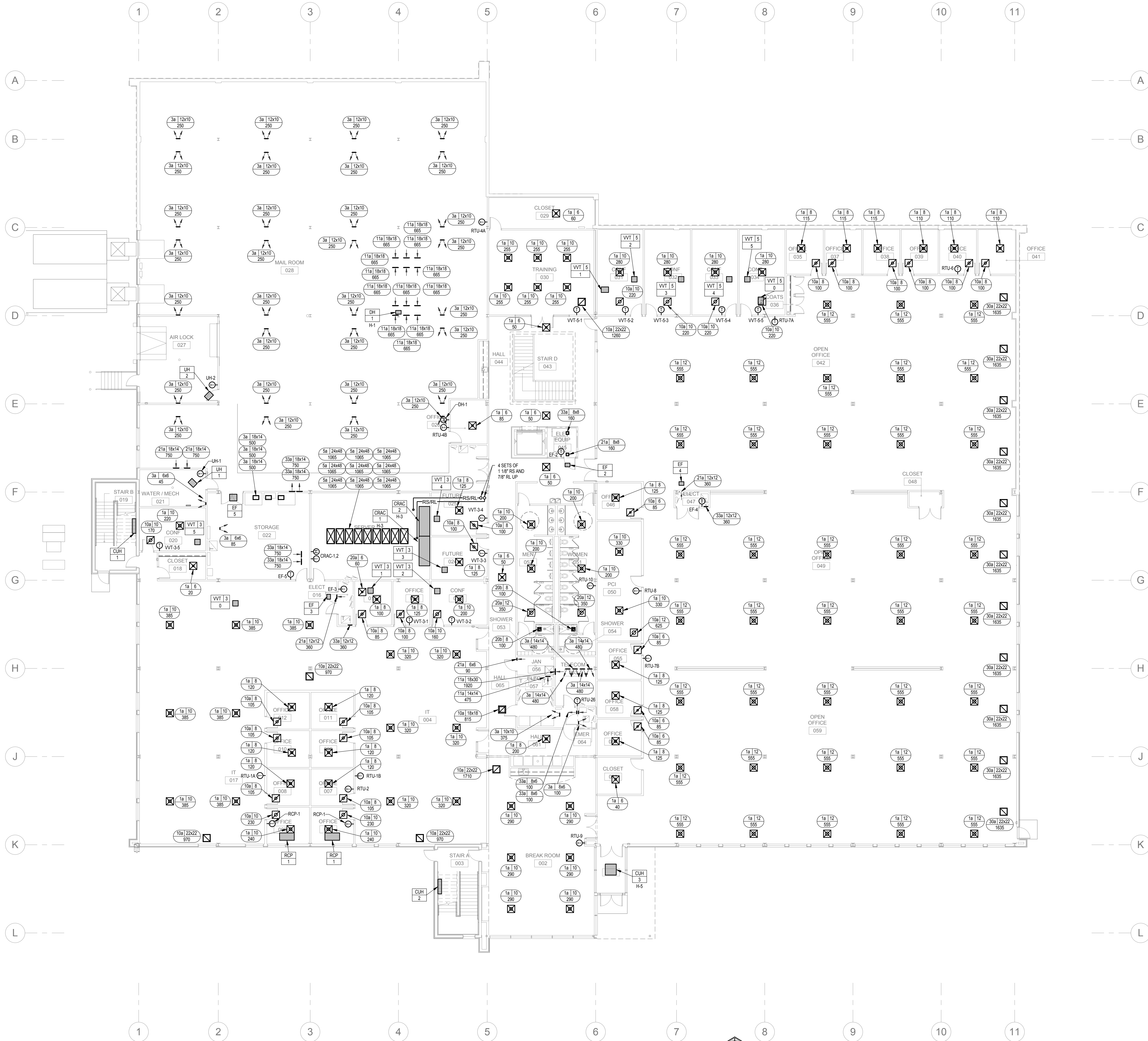
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AND SCHEDULES

SHEET

P5.1

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LOWER FLOOR PLAN  
3/32" = 1'-0"



| GRILLE AND DIFFUSER KEY                                                |                    |
|------------------------------------------------------------------------|--------------------|
| GRILLE OR DIFFUSER PLAN MARK                                           | DIFFUSER NECK SIZE |
|                                                                        | CFM                |
| COORDINATE CEILING DIFFUSERS WITH ARCHITECTURAL REFLECTED CEILING PLAN |                    |

REFER TO SHEET HS.2 FOR HVAC NOTES



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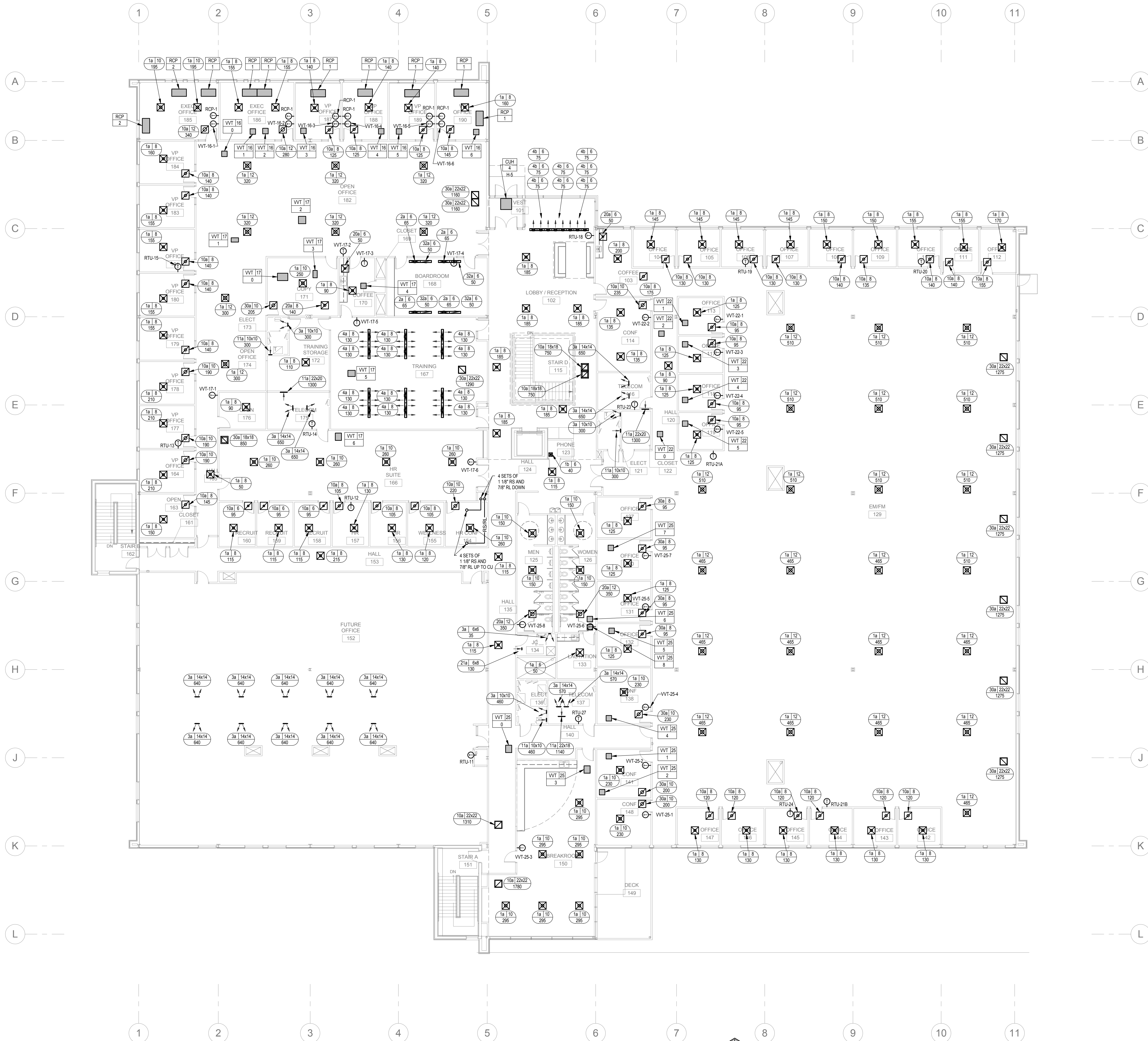
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| JOB NO.      | 12008      |
| DRAWING NAME |            |

LOWER FLOOR  
HVAC DIFFUSER  
PLAN

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FIRST FLOOR PLAN  
3/32" = 1'-0"



| GRILLE AND DIFFUSER KEY                                                |                    |
|------------------------------------------------------------------------|--------------------|
| GRILLE OR DIFFUSER PLAN MARK                                           | DIFFUSER NECK SIZE |
|                                                                        | CFM                |
| COORDINATE CEILING DIFFUSERS WITH ARCHITECTURAL REFLECTED CEILING PLAN |                    |

REFER TO SHEET HS.2 FOR HVAC NOTES



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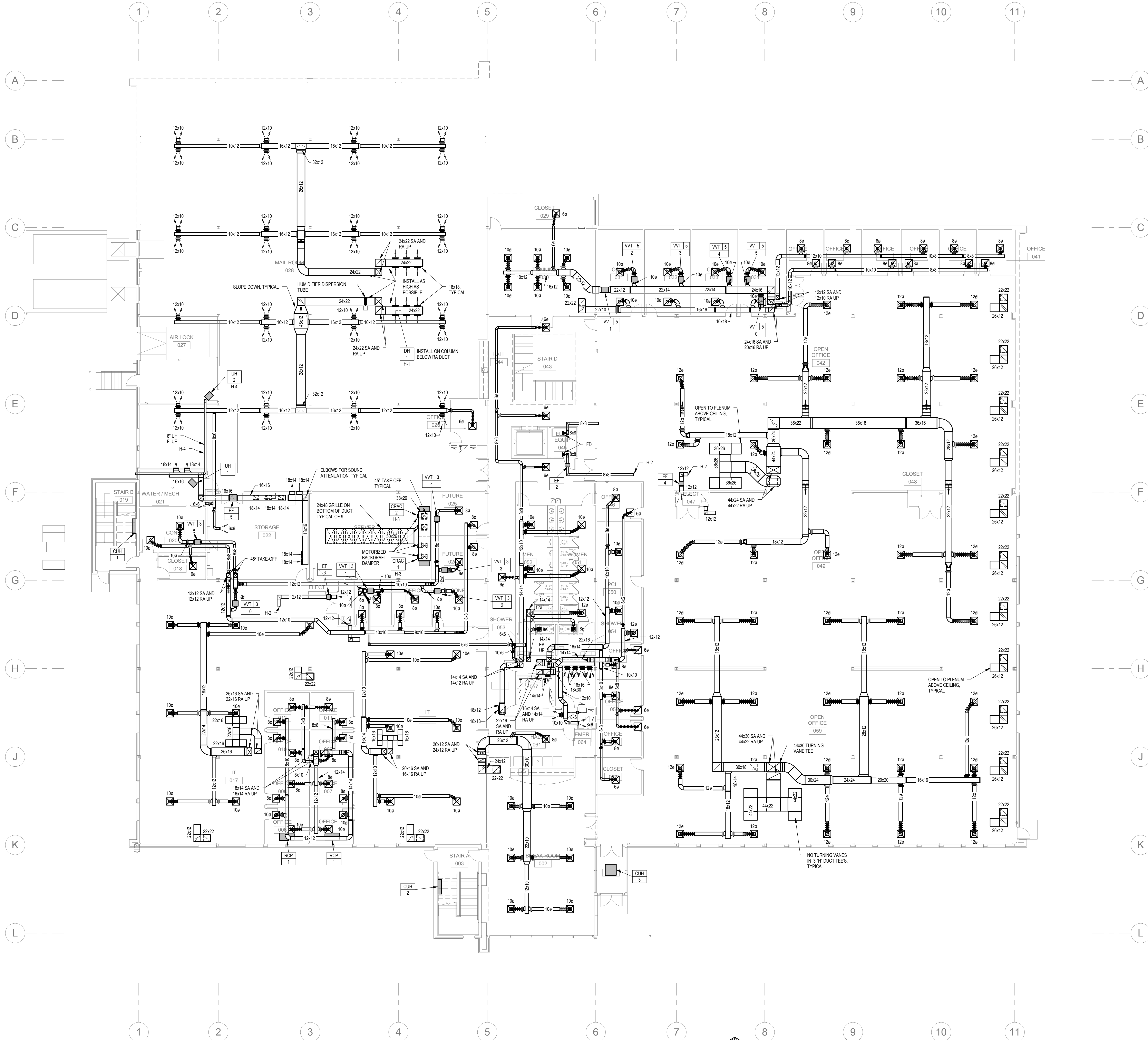
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| CHECKED      | KPH                            |
| DATE         | 09-06-2013                     |
| JOB NO.      | 12008                          |
| DRAWING NAME | FIRST FLOOR HVAC DIFFUSER PLAN |

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LOWER FLOOR PLAN  
3/32" = 1'-0"



REFER TO SHEET HS-2 FOR  
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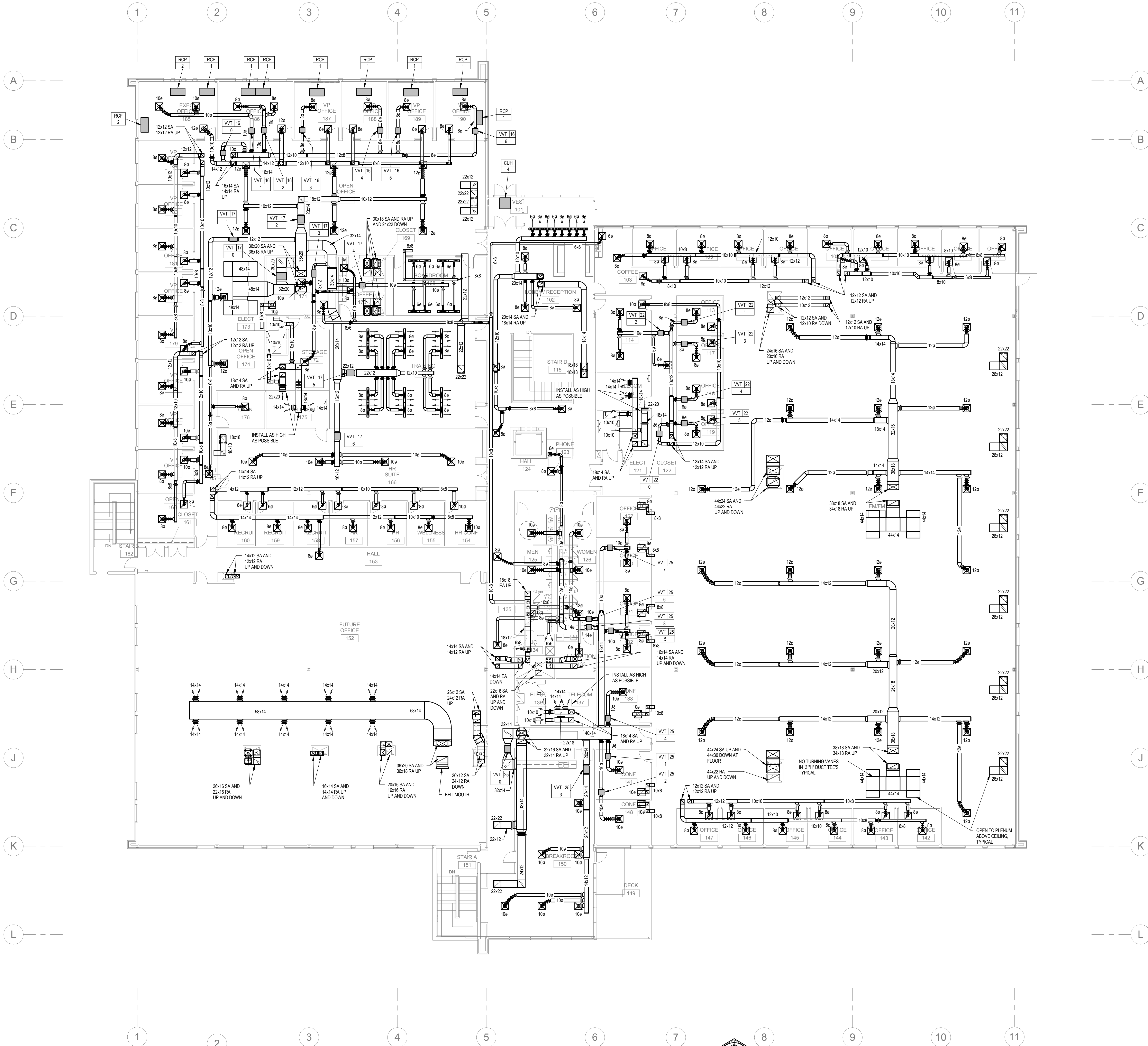
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| CHECKED | KPH        |
| DATE    | 09-06-2013 |
| JOB NO. | 12008      |

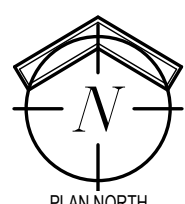
DRAWING NAME  
LOWER FLOOR  
HVAC DUCTWORK  
PLAN

SHEET  
**H2.1**

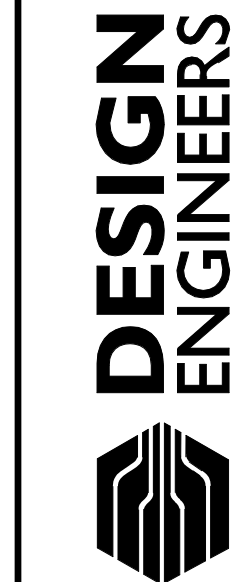
MORNING STAR  
STUDIO  
000380 STREET SE ■ STUDIO 201  
CEDAR RAPIDS, IOWA ■ 52401  
ARCHITECTURE ■ INTERIOR DESIGN  
■ STRUCTURAL ENGINEERING  
PHONE ■ 319.362.5464  
FAX ■ 319.362.5520



FIRST FLOOR PLAN  
3/32" = 1'-0"



REFER TO SHEET HS.2 FOR  
HVAC NOTES



MECHANICAL AND ELECTRICAL CONSULTANTS  
CEDAR RAPIDS, IOWA 52404 - 4850  
TEL: 319.841.1944 FAX: 319.841.1949

**RuffaloCODY**  
1025 KIRKWOOD PARKWAY SW  
CEDAR RAPIDS, IOWA

| DATE | REVISIONS |
|------|-----------|
|      |           |
|      |           |
|      |           |

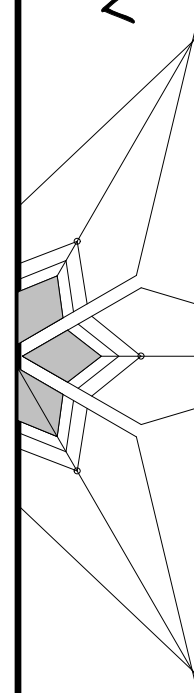
PERMIT / BID

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| DRAWN   | AAA        |
| CHECKED | KPH        |
| DATE    | 09-06-2013 |
| JOB NO. | 12008      |

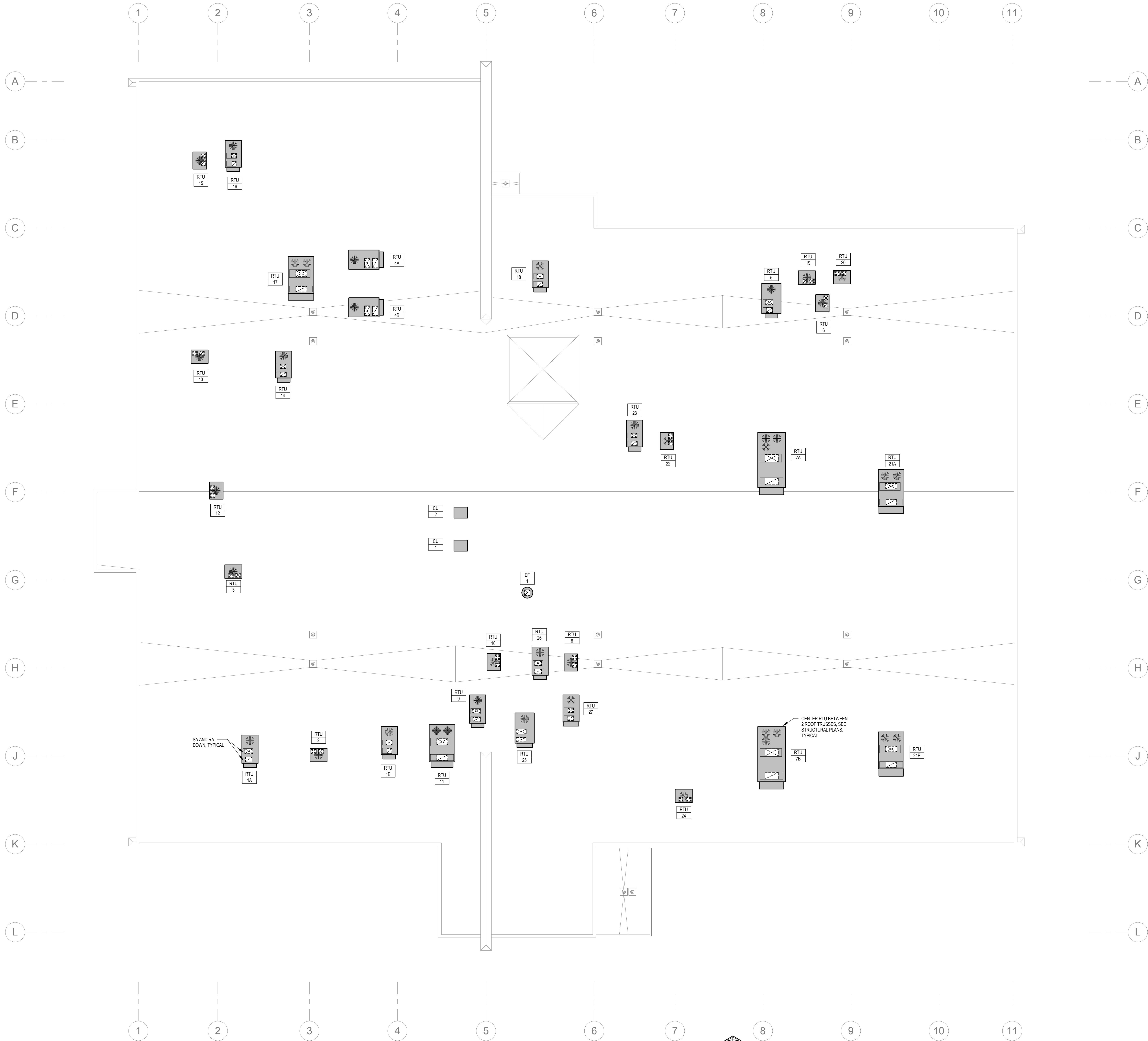
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FIRST FLOOR  
HVAC DUCTWORK  
PLAN

SHEET  
**H2.2**

MORNING STAR  
STUDIO

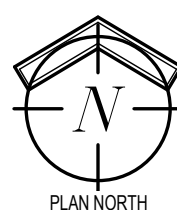


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ROOF FLOOR PLAN

3/32" = 1'-0"



REFER TO SHEET HS-2 FOR  
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CEDAR RAPIDS, IOWA

| DATE | REVISIONS |
|------|-----------|
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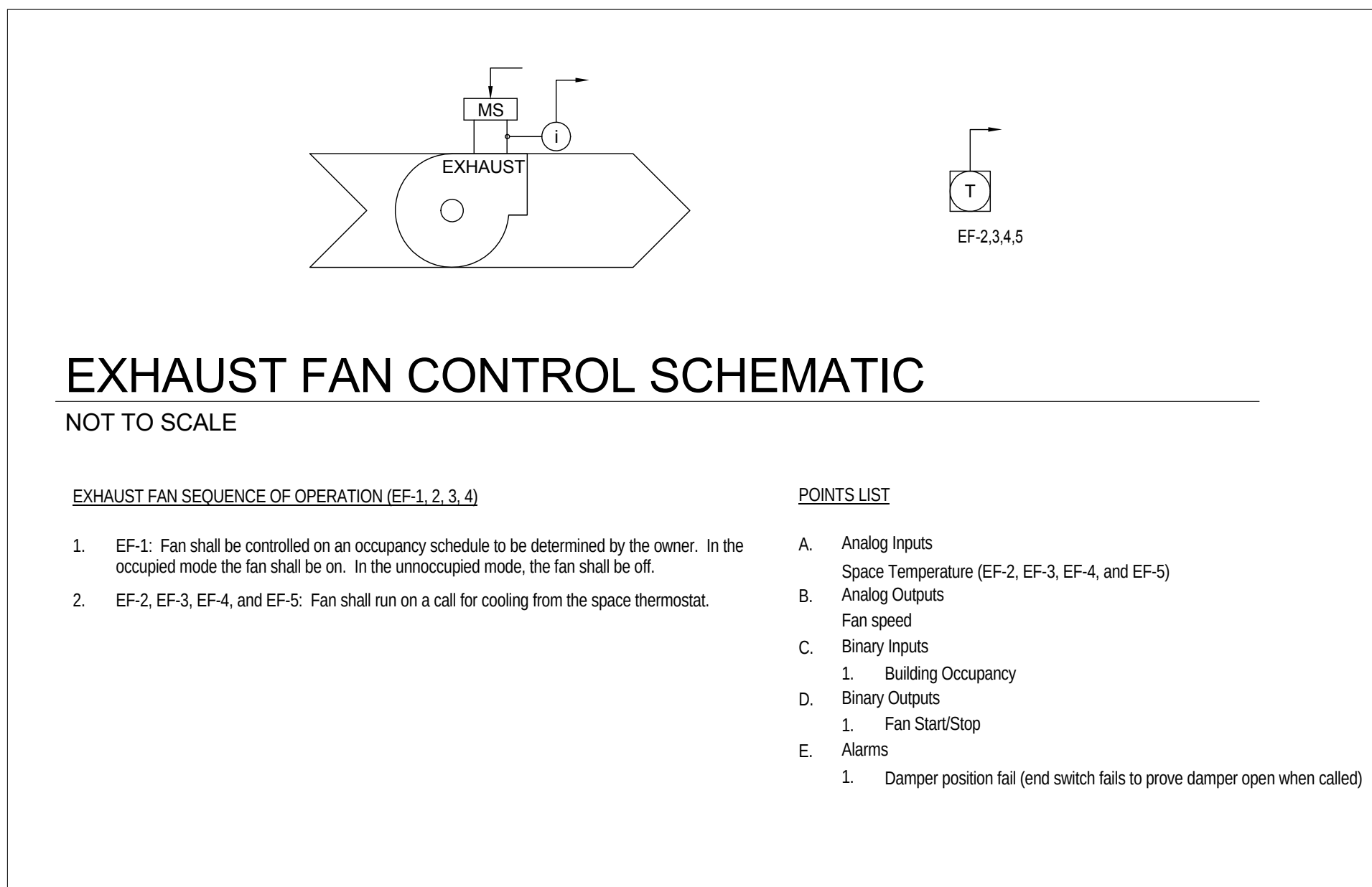
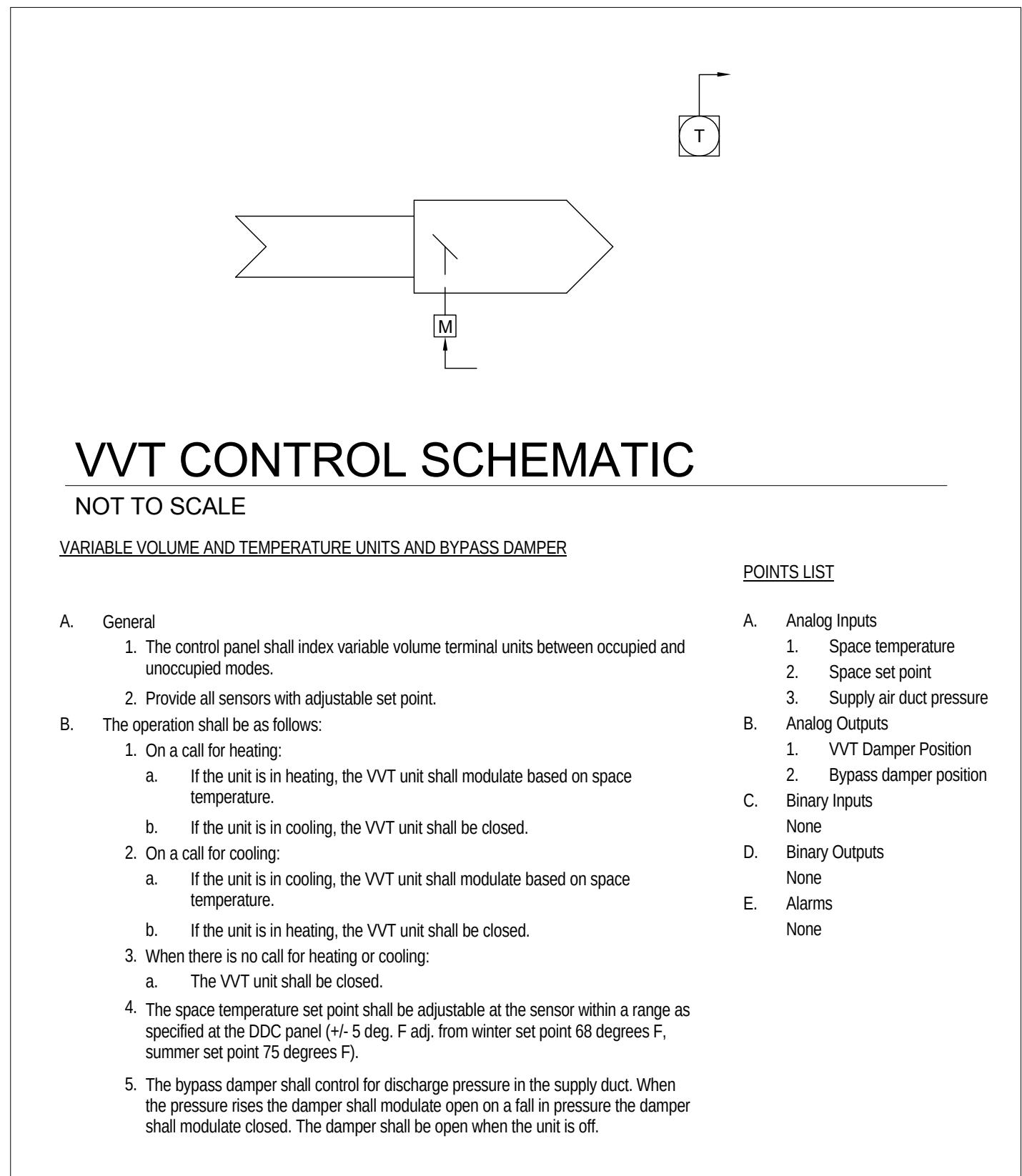
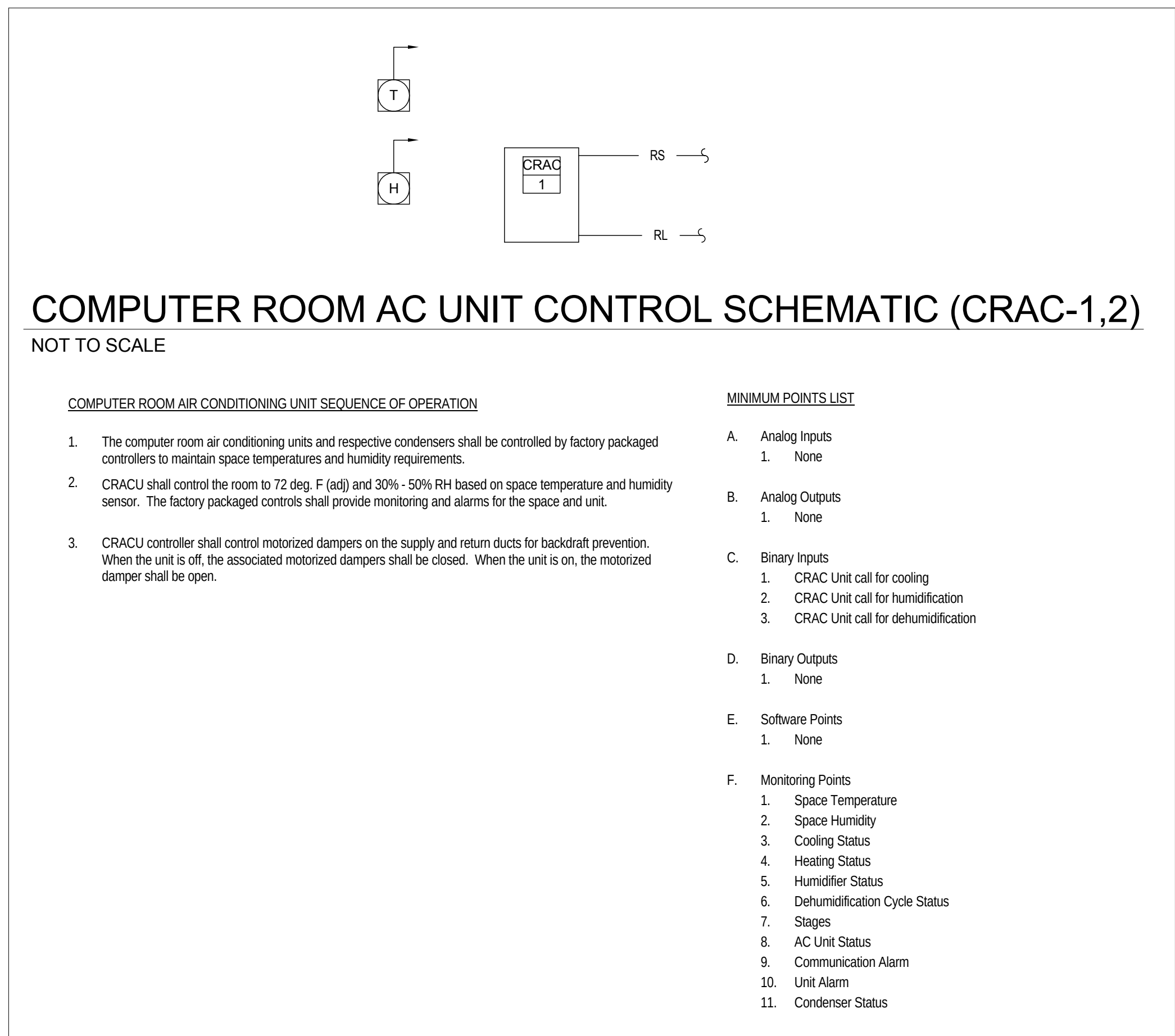
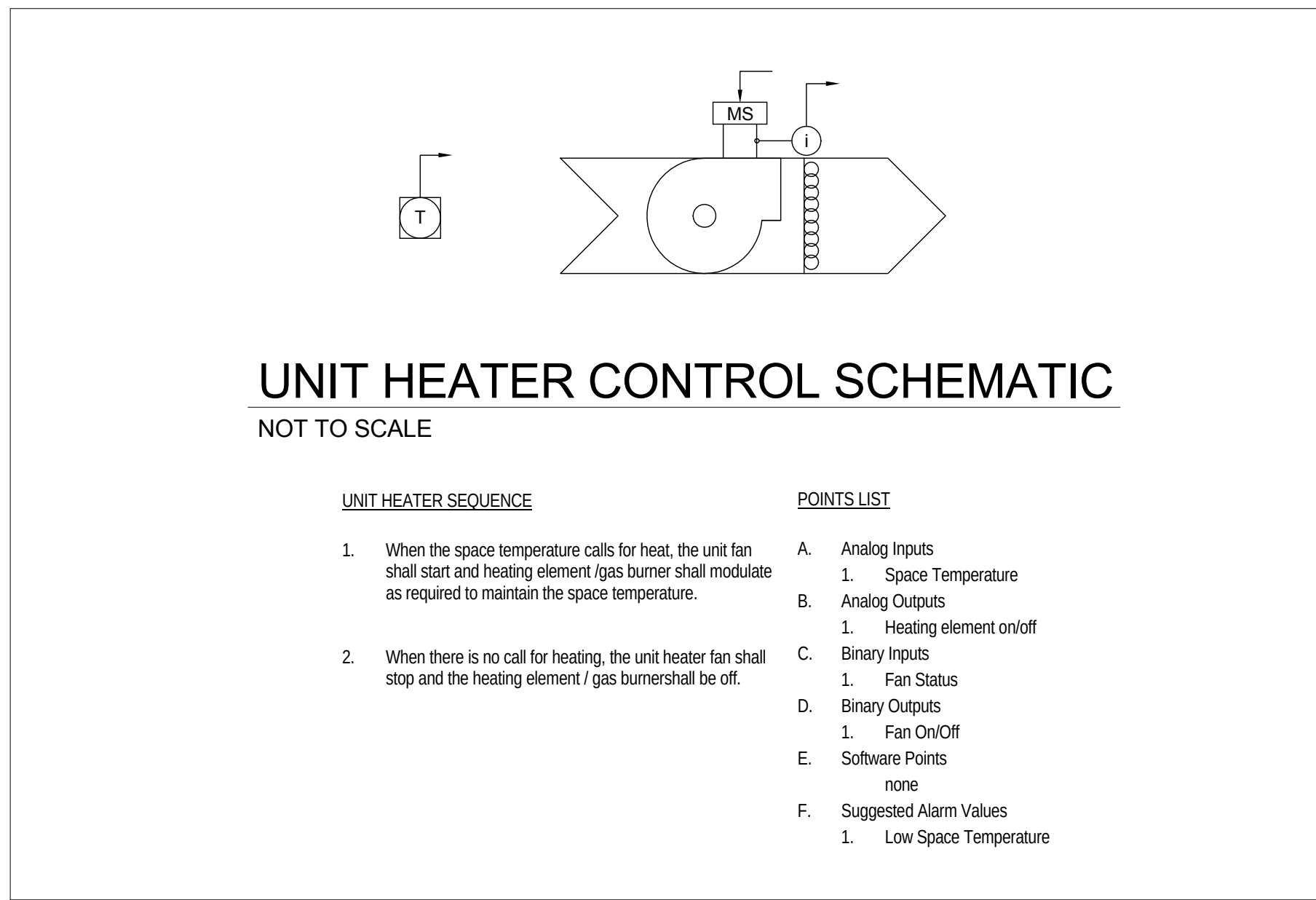
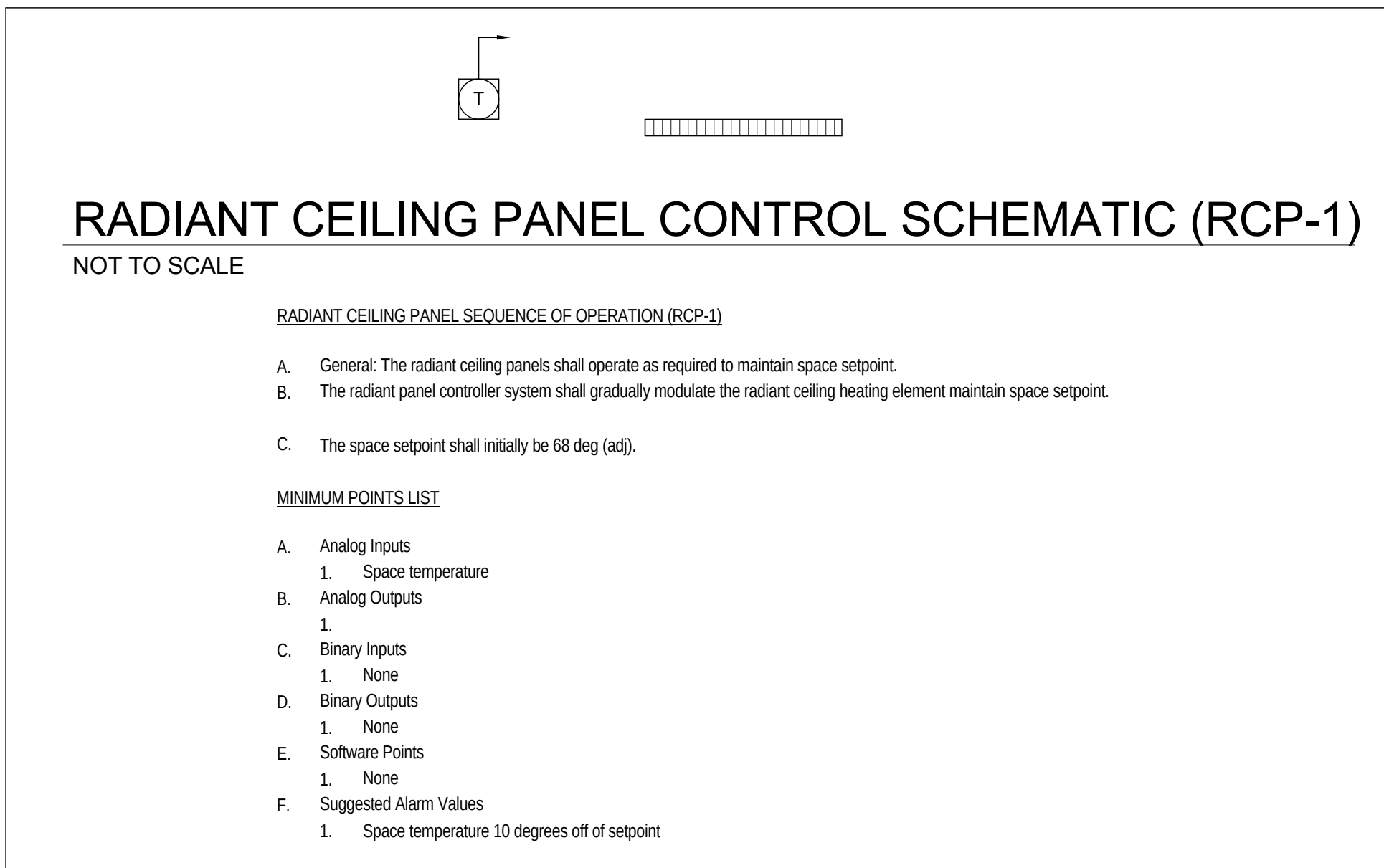
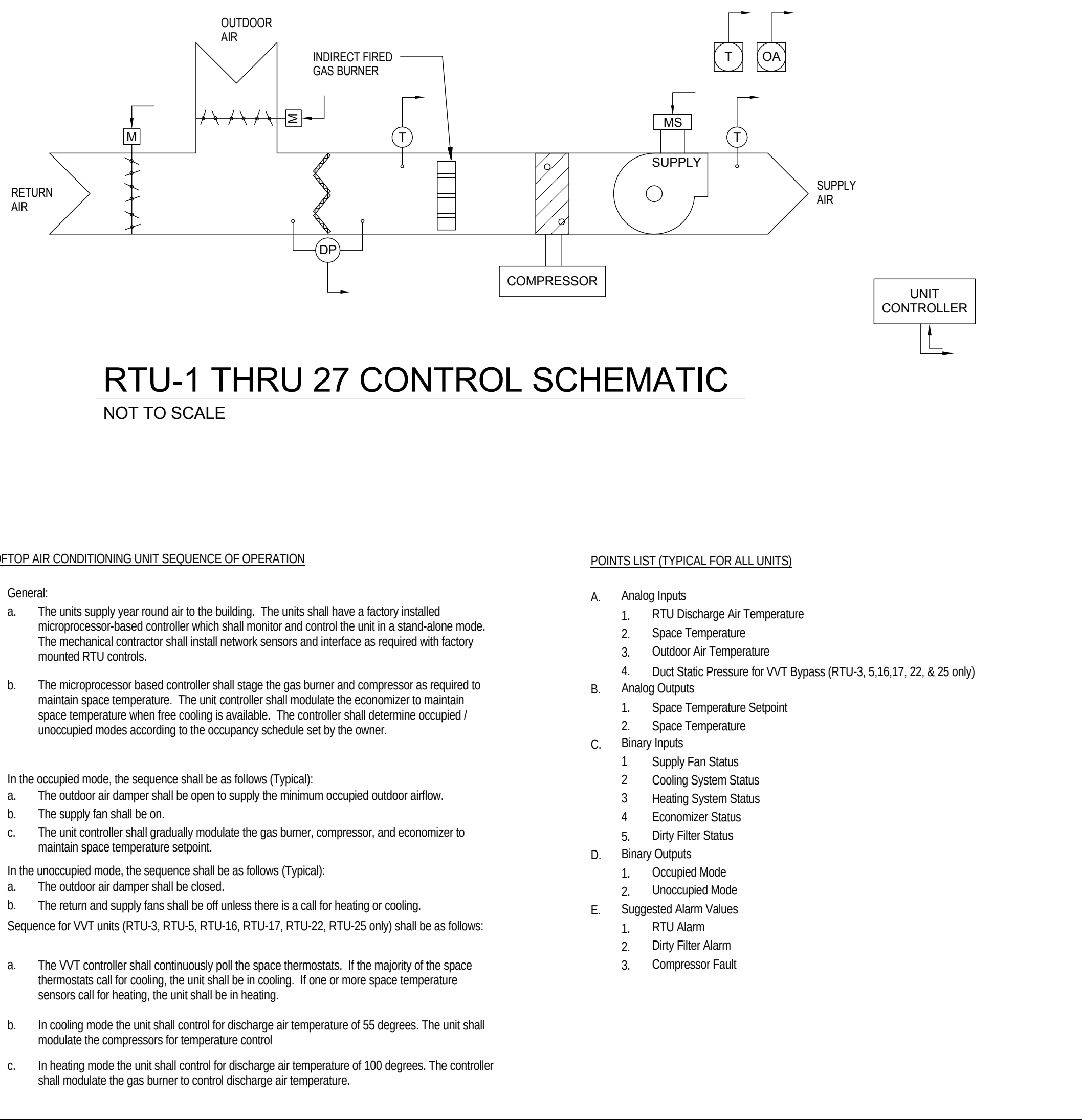
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| DRAWN<br>AAA       |
| CHECKED<br>KPH     |
| DATE<br>09-06-2013 |
| JOB NO.<br>12008   |

DRAWING NAME  
ROOF HVAC  
DUCTWORK PLAN

SHEET  
**H2.3**

MORNING STAR  
STUDIO  
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CEDAR RAPIDS, IOWA ■ 52401  
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■ STRUCTURAL ENGINEERING  
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**CONTROLS SCHEMATIC SYMBOLS**

(NOTE: ALL SYMBOLS SHOWN MAY NOT BE REQUIRED FOR THIS PROJECT.)

|  |                                                                                                                                                                                                                                |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | SPACE SENSOR<br>T = TEMPERATURE<br>OCC = OCCUPANCY<br>H = HUMIDITY<br>CO2 = CARBON DIOXIDE<br>CO = CARBON MONOXIDE<br>S = GAS DETECTOR<br>NOX = NITROGEN DIOXIDE<br>VO = VENTILATION OVERRIDE<br>NOX = NITROGEN OXIDE (NOXNO2) |
|  | AVERAGING/LOW POINT SENSORS<br>T = TEMPERATURE (AVERAGING)<br>F = FREEZE STAT. (LOW POINT)                                                                                                                                     |
|  | SENSOR<br>P = PRESSURE<br>T = TEMPERATURE<br>H = HUMIDITY<br>I = CURRENT                                                                                                                                                       |
|  | MOTORIZED DAMPER                                                                                                                                                                                                               |
|  | SMOKE DAMPER                                                                                                                                                                                                                   |
|  | DIFFERENTIAL PRESSURE SENSOR                                                                                                                                                                                                   |
|  | ELECTRICALLY COMMUTATED MOTOR                                                                                                                                                                                                  |
|  | VARIABLE FREQUENCY DRIVE                                                                                                                                                                                                       |
|  | MOTOR STARTER                                                                                                                                                                                                                  |
|  | LINE VOLTAGE RELAY                                                                                                                                                                                                             |
|  | FAN<br>EXHAUST<br>RETURN<br>SUPPLY                                                                                                                                                                                             |
|  | OUTPUT FROM DDC CONTROLLER                                                                                                                                                                                                     |
|  | INPUT TO DDC CONTROLLER                                                                                                                                                                                                        |
|  | NORMALLY CLOSED                                                                                                                                                                                                                |
|  | NORMALLY OPEN                                                                                                                                                                                                                  |
|  | TWO WAY CONTROL VALVE                                                                                                                                                                                                          |
|  | THREE WAY CONTROL VALVE                                                                                                                                                                                                        |
|  | PUMP                                                                                                                                                                                                                           |
|  | FILTER<br>AFMS = AIR FLOW MEASURING STATION<br>WFMS = WATER FLOW MEASURING STATION                                                                                                                                             |
|  | COMPRESSOR                                                                                                                                                                                                                     |
|  | THRD PARTY CONTROLLER                                                                                                                                                                                                          |
|  | HUMIDIFIER DISPERSION TUBE                                                                                                                                                                                                     |
|  | COIL ENERGY RECOVERY WHEEL ETC.                                                                                                                                                                                                |
|  | DUCTWORK                                                                                                                                                                                                                       |
|  | FACE AND BYPASS COIL                                                                                                                                                                                                           |

MORNING STAR  
STUDIO

000340 STREET SE ■ STUDIO 201  
CEDAR RAPIDS ■ IOWA ■ 52401  
PHONE ■ 319.362.5464  
FAX ■ 319.362.5520

DESIGN  
ENGINEERS

MECHANICAL AND ELECTRICAL CONSULTANTS  
CEDAR RAPIDS, IOWA 52404 • 4850  
TEL: 319.841.1944 FAX: 319.841.1949

RuffaloCODY

1025 KIRKWOOD PARKWAY SW  
CEDAR RAPIDS, IOWA

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DRAWN  
Author

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Checker

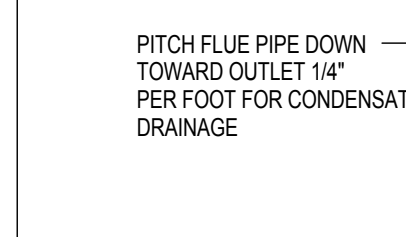
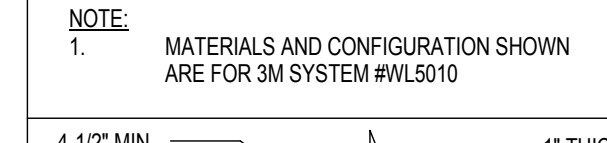
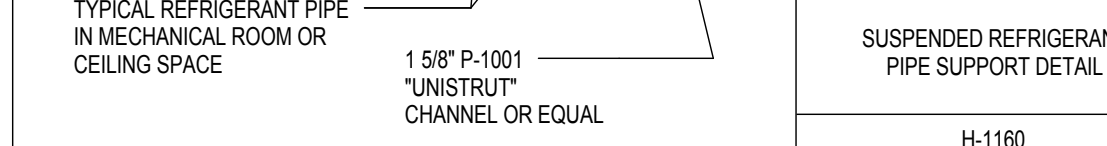
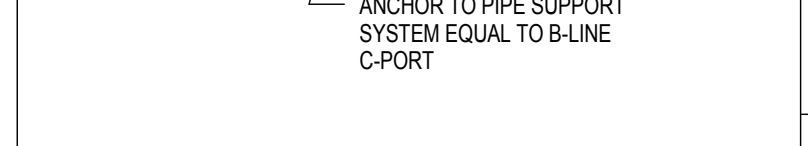
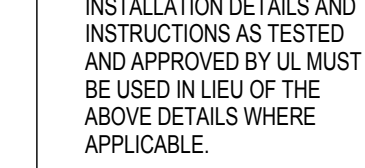
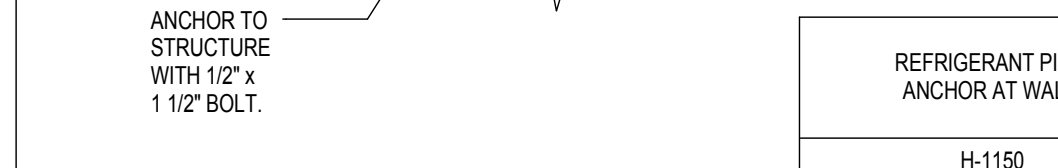
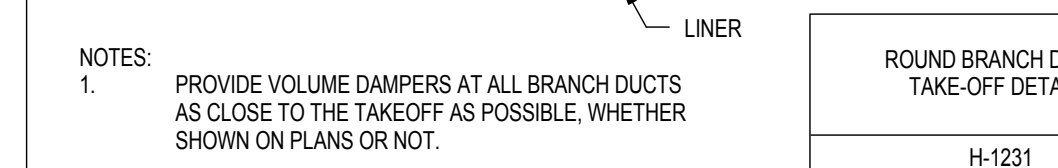
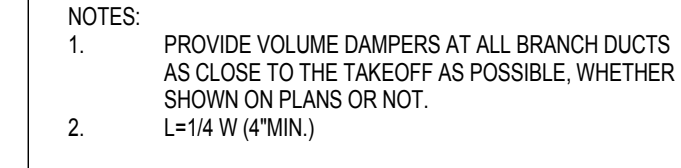
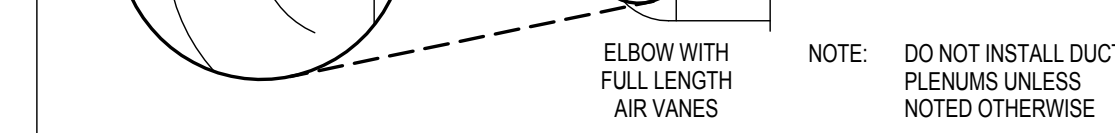
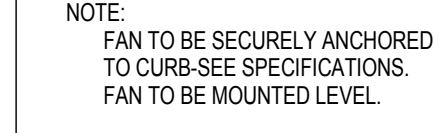
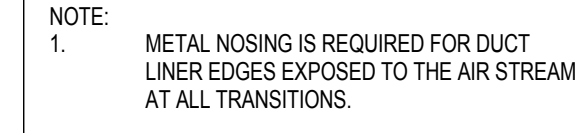
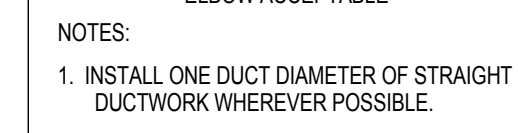
DATE  
09-06-2013

JOB NO.  
12008

DRAWING NAME  
HVAC CONTROLS  
AND DETAILS

SHEET

H5.0



| ROOF TOP UNIT AIR CONDITIONER SCHEDULE |       |                |                        |           |                        |     |    |     |         |               |            |             |              |                  |               |
|----------------------------------------|-------|----------------|------------------------|-----------|------------------------|-----|----|-----|---------|---------------|------------|-------------|--------------|------------------|---------------|
| PLAN MARK                              | FAN   |                |                        |           | SELF CONTAINED COOLING |     |    |     | HEATING |               |            |             | ELECTRICAL   |                  |               |
|                                        | CFM   | MIN O.A. (CFM) | EXTERNAL STATIC PRESS. | CAP (MBH) | NET TOT                | EER | DB | WB  | DB      | INLET AIR (F) | AMB. (MBH) | INPUT (MBH) | OUTPUT (MBH) | GAS PRESS. (PSI) | AIR TEMP. (F) |
| PLAN MARK                              | CFM   | MIN O.A. (CFM) | EXTERNAL STATIC PRESS. | CAP (MBH) | NET TOT                | EER | DB | WB  | DB      | INLET AIR (F) | AMB. (MBH) | INPUT (MBH) | OUTPUT (MBH) | GAS PRESS. (PSI) | AIR TEMP. (F) |
| RTU-1A                                 | 2720  | 420            | 1.25                   | 84.1      | 11.2                   | 80  | 67 | 115 | 120     | 97.2          | 7          | 14          | 70           | 103.4            | 480           |
| RTU-1B                                 | 1920  | 300            | 1.25                   | 57.0      | 12.6                   | 80  | 67 | 115 | 80      | 64.0          | 7          | 14          | 70           | 101.2            | 480           |
| RTU-2                                  | 1200  | 110            | 1.25                   | 35.0      | 11.0                   | 80  | 67 | 95  | 75      | 50.8          | 7          | 14          | 70           | 115              | 208           |
| RTU-3                                  | 900   | 180            | 1.25                   | 29.2      | 11.0                   | 80  | 67 | 95  | 75      | 70.2          | 7          | 14          | 70           | 115              | 208           |
| RTU-4A                                 | 4000  | 710            | 1.25                   | 94.8      | 12.5                   | 80  | 67 | 115 | 250     | 160           | 7          | 14          | 70           | 107.3            | 480           |
| RTU-4B                                 | 4000  | 0              | 1.25                   | 94.8      | 12.5                   | 80  | 67 | 115 | 250     | 160           | 7          | 14          | 70           | 107.3            | 480           |
| RTU-5                                  | 2720  | 580            | 1.25                   | 84.8      | 13.0                   | 80  | 67 | 115 | 150     | 120           | 7          | 14          | 70           | 103.0            | 480           |
| RTU-6                                  | 675   | 80             | 1.25                   | 18.0      | 11.0                   | 80  | 67 | 95  | 40      | 32            | 7          | 14          | 70           | 115              | 208           |
| RTU-7A                                 | 10500 | 1480           | 1.25                   | 322.8     | 10.3                   | 80  | 67 | 115 | 600     | 486           | 7          | 14          | 70           | 95.3             | 480           |
| RTU-7B                                 | 10500 | 1480           | 1.25                   | 322.8     | 10.3                   | 80  | 67 | 115 | 600     | 486           | 7          | 14          | 70           | 95.3             | 480           |
| RTU-8                                  | 1200  | 210            | 1.25                   | 35.0      | 11.0                   | 80  | 67 | 95  | 75      | 70.2          | 7          | 14          | 70           | 115              | 208           |
| RTU-9                                  | 1950  | 295            | 1.25                   | 57.5      | 12.6                   | 80  | 67 | 115 | 150     | 120           | 7          | 14          | 70           | 99.9             | 480           |
| RTU-10                                 | 1040  | 255            | 1.25                   | 29.2      | 11.0                   | 80  | 67 | 95  | 75      | 70.2          | 7          | 14          | 70           | 115              | 208           |
| RTU-11                                 | 6400  | 910            | 1.0                    | 191.5     | 11.0                   | 80  | 67 | 115 | 350     | 284           | 7          | 14          | 70           | 99.2             | 480           |
| RTU-12                                 | 1200  | 200            | 1.0                    | 35.0      | 11.0                   | 80  | 67 | 95  | 75      | 70.2          | 7          | 14          | 70           | 115              | 208           |
| RTU-13                                 | 780   | 65             | 1.0                    | 23.0      | 11.0                   | 80  | 67 | 95  | 64      | 50.8          | 7          | 14          | 70           | 115              | 208           |
| RTU-14                                 | 1600  | 0              | 1.0                    | 48.8      | 15.0                   | 80  | 67 | 115 | 60      | 48            | 7          | 14          | 70           | 98.1             | 480           |
| RTU-15                                 | 780   | 80             | 1.0                    | 23.0      | 11.0                   | 80  | 67 | 95  | 64      | 50.8          | 7          | 14          | 70           | 115              | 208           |
| RTU-16                                 | 1280  | 140            | 1.0                    | 38.9      | 15.0                   | 80  | 67 | 115 | 80      | 64            | 7          | 14          | 70           | 116.5            | 480           |
| RTU-17                                 | 6400  | 1115           | 1.0                    | 191.5     | 11.8                   | 80  | 67 | 115 | 350     | 284           | 7          | 14          | 70           | 103.4            | 480           |
| RTU-18                                 | 1700  | 185            | 1.0                    | 49.6      | 15.0                   | 80  | 67 | 115 | 130     | 103           | 7          | 14          | 70           | 119.9            | 480           |
| RTU-19                                 | 780   | 90             | 1.0                    | 23.0      | 11.0                   | 80  | 67 | 95  | 64      | 50.8          | 7          | 14          | 70           | 115              | 208           |
| RTU-20                                 | 780   | 70             | 1.0                    | 23.0      | 11.0                   | 80  | 67 | 95  | 64      | 50.8          | 7          | 14          | 70           | 115              | 208           |
| RTU-21A                                | 5600  | 790            | 1.0                    | 166.7     | 11.8                   | 80  | 67 | 115 | 350     | 284           | 7          | 14          | 70           | 103.4            | 480           |
| RTU-21B                                | 5600  | 790            | 1.0                    | 166.7     | 11.8                   | 80  | 67 | 115 | 350     | 284           | 7          | 14          | 70           | 103.4            | 480           |
| RTU-22                                 | 860   | 105            | 1.0                    | 23.0      | 11.0                   | 80  | 67 | 95  | 64      | 50.8          | 7          | 14          | 70           | 115              | 208           |
| RTU-23                                 | 1600  | 0              | 1.0                    | 48.8      | 15.0                   | 80  | 67 | 115 | 60      | 48            | 7          | 14          | 70           | 98.1             | 480           |
| RTU-24                                 | 780   | 65             | 1.0                    | 23.0      | 11.0                   | 80  | 67 | 95  | 64      | 50.8          | 7          | 14          | 70           | 115              | 208           |
| RTU-25                                 | 4000  | 850            | 1.0                    | 137.6     | 11.0                   | 80  | 67 | 115 | 240     | 203           | 7          | 14          | 70           | 103.2            | 480           |
| RTU-26                                 | 2400  | 0              | 1.0                    | 74.1      | 12.6                   | 80  | 67 | 115 | 120     | 96            | 7          | 14          | 70           | 107.3            | 480           |
| RTU-27                                 | 1600  | 0              | 1.0                    | 48.8      | 13.8                   | 80  | 67 | 115 | 60      | 48            | 7          | 14          | 70           | 98.1             | 480           |

NOTES:

1. Selections based on Trane. See specifications for other approved manufacturers.
2. Provide with the following options:
  - a. DB Economizer with barometric relief.
  - b. Vibration isolation roof curb.
  - c. Condenser coil hail guards.
  - d. Disconnect.
3. Provide with the following options:
  - a. DB Economizer with power relief fan (coordinate power wiring with electrical contractor).
  - b. Vibration isolation roof curb.
  - c. Condenser coil hail guards.
  - d. Disconnect.
4. Capacity based on data from Trane at nominal unit airflow, 80 deg DB, 67 deg WB, and 95 deg ambient temperature.

| VARI TRAC VARIABLE AIR VOLUME DAMPER SCHEDULE |                |             |      |                     |               |  |  |  |  |
|-----------------------------------------------|----------------|-------------|------|---------------------|---------------|--|--|--|--|
| PLAN MARK                                     | AIR VALVE SIZE | DAMPER TYPE | CFM  | UNIT IDENTIFICATION | AREA SERVED   |  |  |  |  |
| VVT-3-0                                       | 8"             | Round       | 650  | Bypass              | RTU-3         |  |  |  |  |
| VVT-3-1                                       | 6"             | Round       | 230  | Zone                | 014, 015      |  |  |  |  |
| VVT-3-2                                       | 6"             | Round       | 200  | Zone                | 013           |  |  |  |  |
| VVT-3-3                                       | 6"             | Round       | 125  | Zone                | 024           |  |  |  |  |
| VVT-3-4                                       | 6"             | Round       | 125  | Zone                | 025           |  |  |  |  |
| VVT-3-5                                       | 6"             | Round       | 220  | Zone                | 020           |  |  |  |  |
| VVT-5-0                                       | 14" x 12"      | Rectangular | 2160 | Bypass              | RTU-5         |  |  |  |  |
| VVT-5-1                                       | 10" x 16"      | Rectangular | 1600 | Zone                | 028, 030      |  |  |  |  |
| VVT-5-2                                       | 6"             | Round       | 280  | Zone                | 031           |  |  |  |  |
| VVT-5-3                                       | 6"             | Round       | 280  | Zone                | 032           |  |  |  |  |
| VVT-5-4                                       | 6"             | Round       | 280  | Zone                | 033           |  |  |  |  |
| VVT-5-5                                       | 6"             | Round       | 280  | Zone                | 034           |  |  |  |  |
| VVT-6-0                                       | 10"            | Round       | 1000 | Bypass              | RTU-6         |  |  |  |  |
| VVT-6-1                                       | 8"             | Round       | 385  | Zone                | 185           |  |  |  |  |
| VVT-6-2                                       | 6"             | Round       | 315  | Zone                | 186           |  |  |  |  |
| VVT-6-3                                       | 6"             | Round       | 140  | Zone                | 187           |  |  |  |  |
| VVT-6-4                                       | 6"             | Round       | 140  | Zone                | 188           |  |  |  |  |
| VVT-6-5                                       | 6"             | Round       | 140  | Zone                | 189           |  |  |  |  |
| VVT-6-6                                       | 6"             | Round       | 160  | Zone                | 190           |  |  |  |  |
| VVT-17-0                                      | 30" x 20"      | Rectangular | 5570 | Bypass              | RTU-17        |  |  |  |  |
| VVT-17-1                                      | 8" x 12"       | Rectangular | 845  | Zone                | 174, 176      |  |  |  |  |
| VVT-17-2                                      | 20" x 10"      | Rectangular | 2065 | Zone                | 182           |  |  |  |  |
| VVT-17-3                                      | 8" x 12"       | Rectangular | 475  | Zone                | 170, 171, 172 |  |  |  |  |
| VVT-17-4                                      | 8"             | Round       | 355  | Zone                | 168           |  |  |  |  |
| VVT-17-5                                      | 16" x 10"      | Rectangular | 1535 | Zone                | 167           |  |  |  |  |
| VVT-17-6                                      | 16" x 8"       | Rectangular | 1125 | Zone                | 168           |  |  |  |  |
| VVT-22-0                                      | 6"             | Round       | 610  | Bypass              | RTU-22        |  |  |  |  |
| VVT-22-1                                      | 6"             | Round       | 125  | Zone                | 113           |  |  |  |  |
| VVT-22-2                                      | 6"             | Round       | 360  | Zone                | 114           |  |  |  |  |
| VVT-22-3                                      | 6"             | Round       | 125  | Zone                | 117           |  |  |  |  |
| VVT-22-4                                      | 6"             | Round       | 125  | Zone                | 118           |  |  |  |  |
| VVT-22-5                                      | 6"             | Round       | 125  | Zone                | 119           |  |  |  |  |
| VVT-25-0                                      | 18" x 14"      | Rectangular | 3205 | Bypass              | RTU-25        |  |  |  |  |
| VVT-25-1                                      | 6"             | Round       | 148  | Zone                | 148           |  |  |  |  |
| VVT-25-2                                      | 6"             | Round       | 230  | Zone                | 141           |  |  |  |  |
| VVT-25-3                                      | 10" x 16"      | Rectangular | 1780 | Zone                | 150           |  |  |  |  |
| VVT-25-4                                      | 6"             | Round       | 230  | Zone                | 138           |  |  |  |  |
| VVT-25-5                                      | 6"             | Round       | 250  | Zone                | 132           |  |  |  |  |
| VVT-25-6                                      | 8"             | Round       | 350  | Zone                | 126, 133      |  |  |  |  |
| VVT-25-7                                      | 6"             | Round       | 250  | Zone                | 127, 130      |  |  |  |  |
| VVT-25-8                                      | 8"             | Round       | 680  | Zone                | 124, 125, 135 |  |  |  |  |

| COMPUTER ROOM AC UNIT SCHEDULE |            |     |    |            |           |     |      |         |    |               |            |     |            |                    |       |       |       |               |
|--------------------------------|------------|-----|----|------------|-----------|-----|------|---------|----|---------------|------------|-----|------------|--------------------|-------|-------|-------|---------------|
| PLAN MARK                      | SUPPLY FAN |     |    | DX COOLING |           |     |      | HEATING |    |               | ELECTRICAL |     |            | MODEL NO. (NOTE 1) | NOTES |       |       |               |
|                                | CFM        | ESP | HP | EAT        | CAP (MBH) | TOT | SHC  | REFRIG  | KW | AIR TEMP. (F) | ENT        | LVG | Humidifier |                    |       | VOLTS | PH    | FLA           |
| CRAC-1                         | 9,600      | 0.5 | 5  | 75         | 229       | 197 | 407C | 25.0    | 55 | 63            | 22         | 460 | 3          | 59.5               | 72.5  | 80    | VS070 | 1,2,3,4,5,6,7 |
| CRAC-2                         | 9,600      | 0.5 | 5  | 75         | 229       | 197 | 407C | 25.0    | 55 | 63            | 22         | 460 | 3          | 59.5               | 72.5  | 80    | VS070 | 1,2,3,4,5,6,7 |

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Selections based on Liebert. See specifications for other approved manufacturers.

Provide unit with ICOM controller. Non-locking disconnect switch, and dual refrigeration circuits with variable digital scroll compressors for capacity control, infrared humidifier, electric reheat, 2" MERV 8 filters, liquidated detector and condensate pump.

Provide unit with upflow air configuration with front return.

Provide unit with BMS and SNMP interface cards (wiring to BMS by Contractor).

Provide unit with factory startup and 5 year compressor warranty.

Unit to be controlled to maintain space condition at 72 DB/50% RH. (+/- 1 F, +/- 2%), provide return air unit mounted temperature and humidity sensors.

| DUCT INSULATION SCHEDULE (Note 1)   |                      |                    |                             |                     |                        |                       |                         |             |             |             |
|-------------------------------------|----------------------|--------------------|-----------------------------|---------------------|------------------------|-----------------------|-------------------------|-------------|-------------|-------------|
| Space Type                          | Service (Note 7)     | Construction       | Type                        | Duct Liner (Note 4) | Duct Covering (Note 5) | Preinsulated (Note 6) | Rigid Covering (Note 5) | Uninsulated |             |             |
| Conditioned or Tempered (Note 2, 3) | Supply Air           | Round              | General                     | -                   | 1-1/2"                 | -                     | -                       | -           |             |             |
|                                     |                      | Rectangular        | Double wall, between layers | -                   | -                      | 1-1/2"                | -                       | -           |             |             |
|                                     |                      |                    | General                     | 1"                  | -                      | -                     | -                       | -           |             |             |
|                                     |                      |                    | Upstream of VVTs            | -                   | -                      | 1-1/2"                | -                       | -           |             |             |
|                                     |                      | Downstream of VVTs | 1"                          | -                   | -                      | -                     | -                       | -           |             |             |
|                                     |                      | Flex Duct          | -                           | -                   | -                      | -                     | 1-1/2"                  | -           | -           |             |
|                                     | Return Air           | Flex Connector     | Round                       | General             | -                      | 1-1/2"                | -                       | -           | -           |             |
|                                     |                      | Rectangular        | General                     | General             | -                      | -                     | -                       | -           | -           | Uninsulated |
|                                     |                      | Rectangular        | General                     | General             | 1"                     | -                     | -                       | -           | -           |             |
|                                     |                      | Flex Duct          | -                           | -                   | -                      | -                     | 1-1/2"                  | -           | -           |             |
|                                     |                      | Flex Connector     | Round                       | General             | -                      | -                     | -                       | -           | -           | Uninsulated |
|                                     |                      | Rectangular        | General                     | General             | 1"                     | -                     | -                       | -           | -           | Uninsulated |
|                                     | Exhaust / Relief Air | Flex Duct          | -                           | -                   | -                      | -                     | 1-1/2"                  | -           | -           |             |
|                                     |                      | Flex Connector     | Round                       | General             | -                      | -                     | -                       | -           | -           | Uninsulated |
|                                     |                      | Rectangular        | General                     | General             | 1"                     | -                     | -                       | -           | -           |             |
|                                     |                      | Flex Duct          | -                           | -                   | -                      | -                     | 1-1/2"                  | -           | -           |             |
| Flex Connector                      |                      | Round              | General                     | -                   | -                      | -                     | -                       | -           | Uninsulated |             |
| Downstream of ERU, AHU or EF        |                      | General            | General                     | -                   | 1-1/2"                 | -                     | -                       | -           |             |             |
| Outdoor Air                         | Round                | General            | General                     | -                   | 1-1/2"                 | -                     | -                       | -           |             |             |
|                                     | Rectangular          | General            | General                     | -                   | 1-1/2"                 | -                     | -                       | -           |             |             |
|                                     | Flex Connector       | Round              | General                     | -                   | -                      | -                     | -                       | -           |             |             |
|                                     | Flex Connector       | Round              | General                     | -                   | -                      | -                     | -                       | -           |             |             |
| Transfer Air                        | Rectangular          | General            | General                     | 1"                  | -                      | -                     | -                       | -           | Uninsulated |             |
|                                     | Flex Duct            | -                  | -                           | -                   | -                      | -                     | -                       | -           |             |             |
|                                     | Flex Duct            | -                  | -                           | -                   | -                      | -                     | 1-1/2"                  | -           |             |             |
|                                     | Flex Duct            | -                  | -                           | -                   | -                      | -                     | -                       | -           |             |             |
| Combustion Air                      | Round                | General            | General                     | -                   | 1-1/2"                 | -                     | -                       | -           |             |             |
|                                     | Rectangular          | General            | General                     | -                   | 1-1/2"                 | -                     | -                       | -           |             |             |

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Unless listed above as "None," all ductwork and accessories shall be either lined or covered.

If type or thickness is not indicated, it shall be 1-1/2" covering.

Conditioned Space: an area inside the building which is heated and/or cooled.

Tempered Space: an area inside the building which is not directly heated or cooled, but is adjacent to a heated or cooled space with no insulation separating the two spaces (e.g., ceiling plenums).

See Specification Section 23 313 - HVAC Metal Ducts.

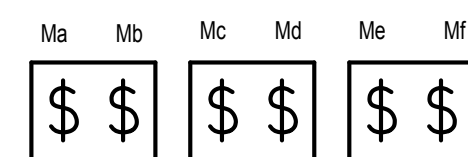
See Specification Section 23 070 - HVAC Insulation.

See Specification Section 23 330 - Air Duct Accessories and/or 23 313 - HVAC Metal Ducts.

Refer to plans for ductwork designations.

2

| DUCT INSULATION SCHEDULE (Note 1)   |                  |                      |                              |                     |                        |                       |                         |             |             |
|-------------------------------------|------------------|----------------------|------------------------------|---------------------|------------------------|-----------------------|-------------------------|-------------|-------------|
| Space Type                          | Service (Note 7) | Construction         | Type                         | Duct Liner (Note 4) | Duct Covering (Note 5) | Preinsulated (Note 6) | Rigid Covering (Note 5) | Uninsulated |             |
| Conditioned or Tempered (Note 2, 3) | Supply Air       | Round                | General                      | -                   | 1-1/2"                 | -                     | -                       | -           |             |
|                                     |                  |                      | Double wall, between layers  | -                   | -                      | 1-1/2"                | -                       | -           |             |
|                                     |                  | Rectangular          | General                      | 1*                  | -                      | -                     | -                       | -           |             |
|                                     |                  |                      | Upstream of VVTs             | -                   | 1-1/2"                 | -                     | -                       | -           |             |
|                                     |                  | Downstream of VVTs   | 1*                           | -                   | -                      | -                     | -                       |             |             |
|                                     |                  | Flex Duct            | -                            | -                   | 1-1/2"                 | -                     | -                       |             |             |
|                                     | Return Air       | Flex Connector       | -                            | -                   | 1-1/2"                 | -                     | -                       | -           |             |
|                                     |                  | Round                | General                      | -                   | -                      | -                     | -                       | -           | Uninsulated |
|                                     |                  |                      | Rectangular                  | General             | 1*                     | -                     | -                       | -           | -           |
|                                     |                  | Flex Duct            | -                            | -                   | 1-1/2"                 | -                     | -                       | -           |             |
|                                     |                  |                      | Flex Connector               | -                   | -                      | -                     | -                       | -           | -           |
|                                     |                  | Exhaust / Relief Air | Round                        | General             | -                      | -                     | -                       | -           | -           |
|                                     | Rectangular      |                      |                              | General             | 1*                     | -                     | -                       | -           | -           |
|                                     | Flex Duct        |                      | -                            | -                   | 1-1/2"                 | -                     | -                       | -           |             |
|                                     |                  |                      | Flex Connector               | -                   | -                      | -                     | -                       | -           | -           |
|                                     | Outdoor Air      |                      | Downstream of ERU, AHU or EF | General             | -                      | 1-1/2"                | -                       | -           | -           |
| Round                               |                  |                      |                              | General             | -                      | 1-1/2"                | -                       | -           | -           |
| Rectangular                         |                  | General              | -                            | 1-1/2"              | -                      | -                     | -                       | -           |             |
|                                     |                  | Flex Connector       | -                            | 1-1/2"              | -                      | -                     | -                       | -           |             |
| Transfer Air                        |                  | Round                | General                      | -                   | -                      | -                     | -                       | -           | Uninsulated |
|                                     |                  | Rectangular          | General                      | 1*                  | -                      | -                     | -                       | -           | -           |
|                                     | Flex Duct        | -                    | -                            | 1-1/2"              | -                      | -                     | -                       | -           |             |
| Combustion Air                      | Round            | General              | -                            | 1-1/2"              | -                      | -                     | -                       | -           |             |
|                                     | Rectangular      | General              | -                            | 1-1/2"              | -                      | -                     | -                       | -           |             |



## OPEN OFFICE SWITCH DETAIL

REFER TO SHEET E5.8 FOR  
ELECTRICAL NOTES

## Lighting/Switching Key

LIGHTING

FIXTURE TYPE  
PER SCHEDULE

QUANTITY OF  
FIXTURES

4FC/3LINE

SWITCHING  
SCHEME (LOWER CASE /  
LOP RELAY (UPPER CASE))

ELECTRICAL NOTE

PANEL CIRCUIT  
NUMBER

EM: EMERGENCY FIXTURE

NL: NIGHT LIGHT

Coordinate ceiling mounted devices  
with  
Reflected Ceiling Plan

SWITCHING

(Blank) - Indicates standard switch

2 - Indicates 2 pole switch

3 - Indicates 3 way switch

4 - Indicates 4 way switch

P.L. - Indicates pilot light

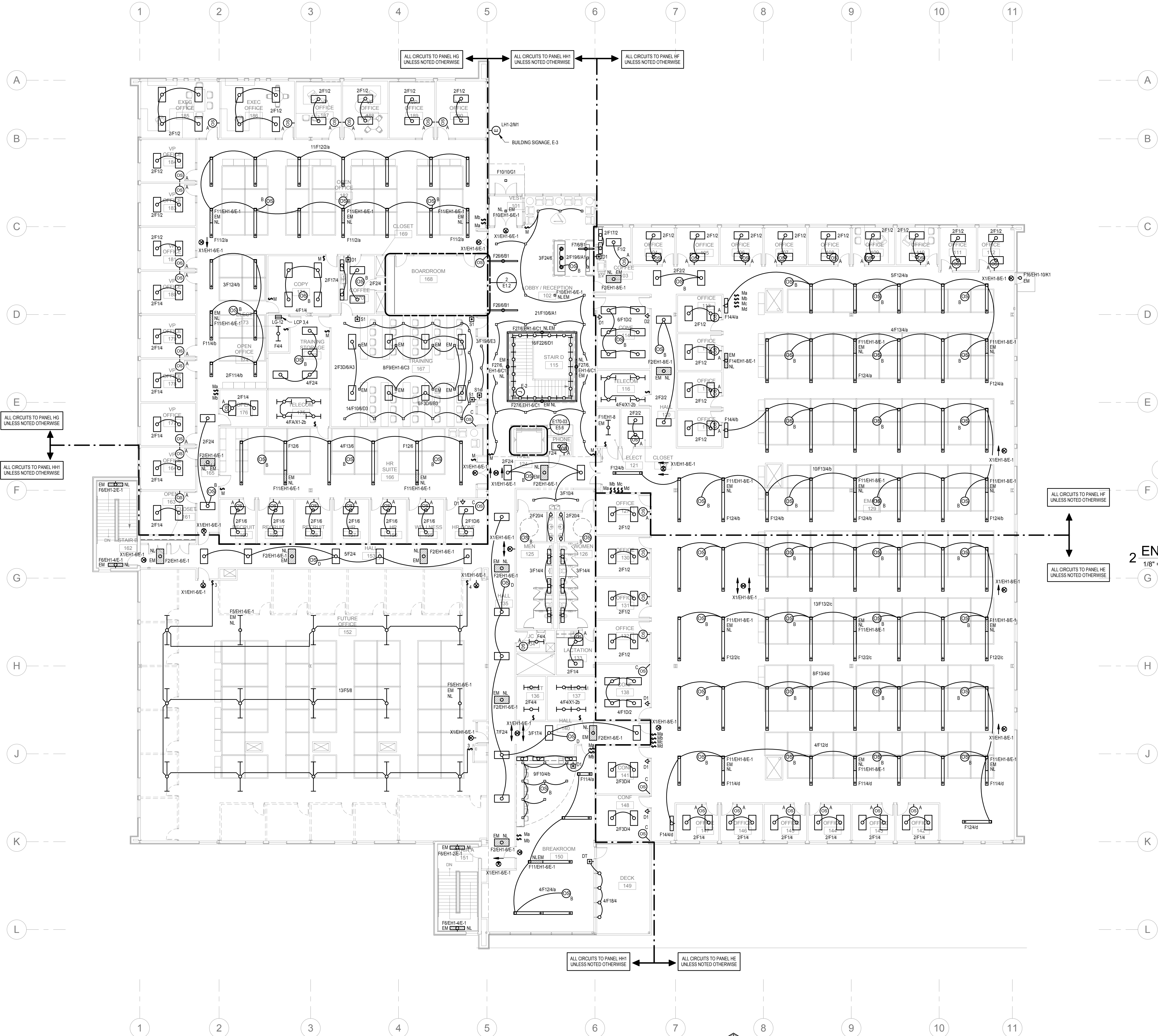
K - Indicates keyed switch

WP - Indicates reciprocate with weatherproof box/cover

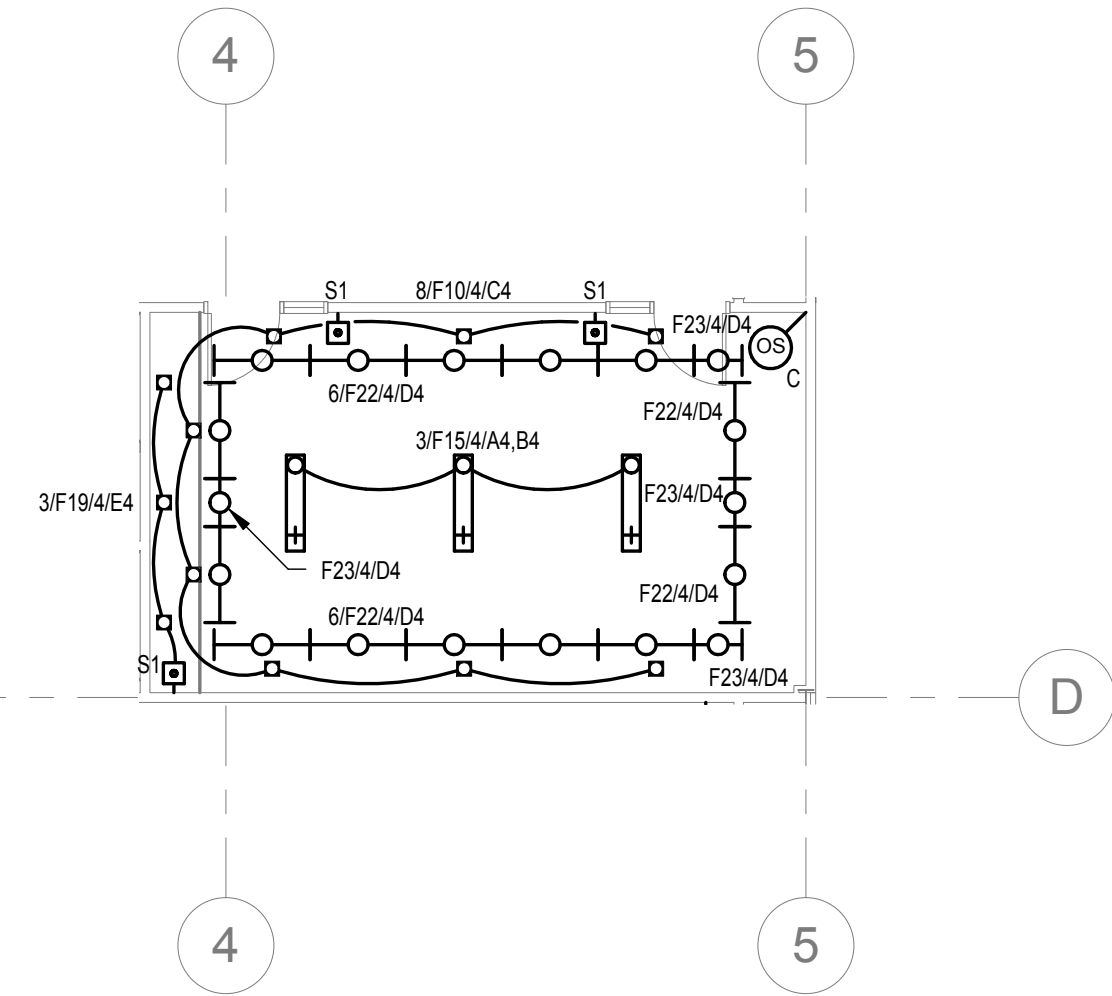
+H - Dimension indicates height to center of switch  
above finish floor (+46" if not shown)

N - Lowercase letter indicates switching scheme

M - Indicates momentary switch



FIRST FLOOR PLAN  
3/32" = 1'-0"



REFER TO SHEET E5.8 FOR ELECTRICAL NOTES

| Lighting/Switching Key                                                                   |                                                        |
|------------------------------------------------------------------------------------------|--------------------------------------------------------|
| LIGHTING                                                                                 |                                                        |
| FIXTURE TYPE PER SCHEDULE                                                                | SWITCHING SCHEME (LOWER CASE) / LOP RELAY (UPPER CASE) |
| QUANTITY OF FIXTURES                                                                     | ELECTRICAL NOTE                                        |
|                                                                                          | PANEL CIRCUIT NUMBER                                   |
| EM EMERGENCY FIXTURE                                                                     |                                                        |
| NL NIGHT LIGHT                                                                           |                                                        |
| Coordinate ceiling mounted devices with Reflected Ceiling Plan                           |                                                        |
| SWITCHING                                                                                |                                                        |
| (Blank) - Indicates standard switch                                                      |                                                        |
| 2 - Indicates 2 pole switch                                                              |                                                        |
| 3 - Indicates 3 way switch                                                               |                                                        |
| 4 - Indicates 4 way switch                                                               |                                                        |
| P.L. - Indicates pilot light                                                             |                                                        |
| K - Indicates keypad switch                                                              |                                                        |
| WP - Indicates receptacle with weatherproof box/flopper                                  |                                                        |
| +N - Dimension indicates height to center of switch above finish floor (+4F) (not shown) |                                                        |
| * - Lowercase letter indicates switching scheme                                          |                                                        |
| M - Indicates momentary switch                                                           |                                                        |

MORNING STAR STUDIO

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RuffaloCODY

1025 KIRKWOOD PARKWAY SW  
CEDAR RAPIDS, IOWA

| DATE | REVISIONS |
|------|-----------|
|      |           |
|      |           |
|      |           |

PERMIT / BID

DRAWN  
DRH, JMC

CHECKED  
EBB

DATE  
09-06-2013

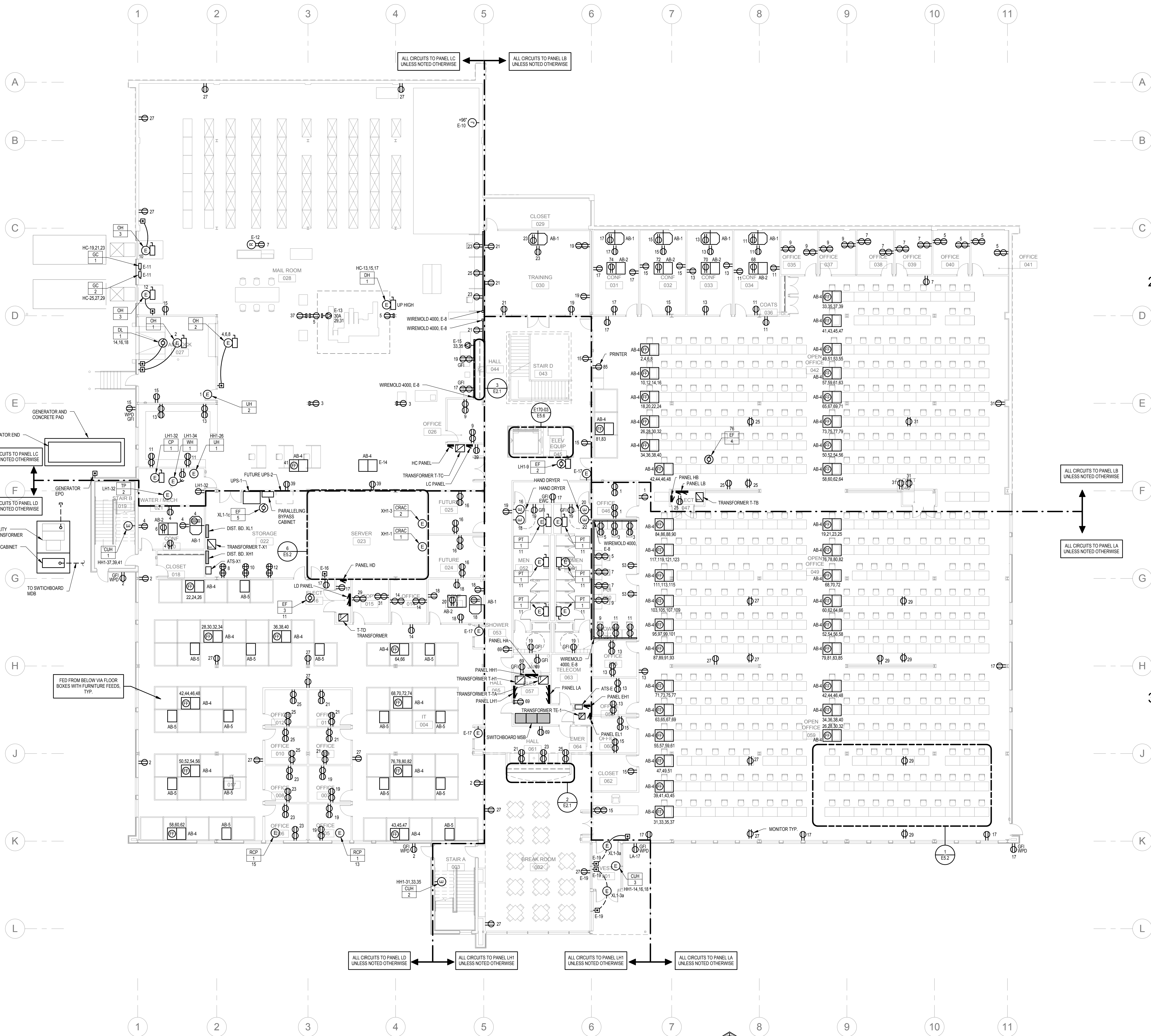
JOB NO.  
12008

DRAWING NAME  
FIRST FLOOR LIGHTING PLAN

SHEET

E1.2

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LOWER FLOOR PLAN  
3/32" = 1'-0"

2 ENLARGED BREAK ROOM POWER PLAN  
1/4" = 1'-0"

3 ENLARGED COFFEE BAR  
1/4" = 1'-0"

REFER TO  
TELECOMMUNICATION  
DRAWINGS FOR ANY  
ADDITIONAL ELECTRICAL  
WORK

REFER TO SHEET ES.8 FOR  
ELECTRICAL NOTES

Receptacle Key

- S - Indicates safety type receptacle
- GFI - Indicates ground fault interrupter receptacle
- TVSS - Indicates transient voltage surge suppressor receptacle
- IG - Indicates isolated ground receptacle
- WP - Indicates receptacle with weatherproof box/cap and plug cover
- # - Number indicates panel circuit number
- \*\*\* - Dimension indicates height to center of receptacle above finish floor (+18" if not shown)
- USB - Indicates USB type receptacle
- TR - Indicates tamper resistant type receptacle

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09-06-2013

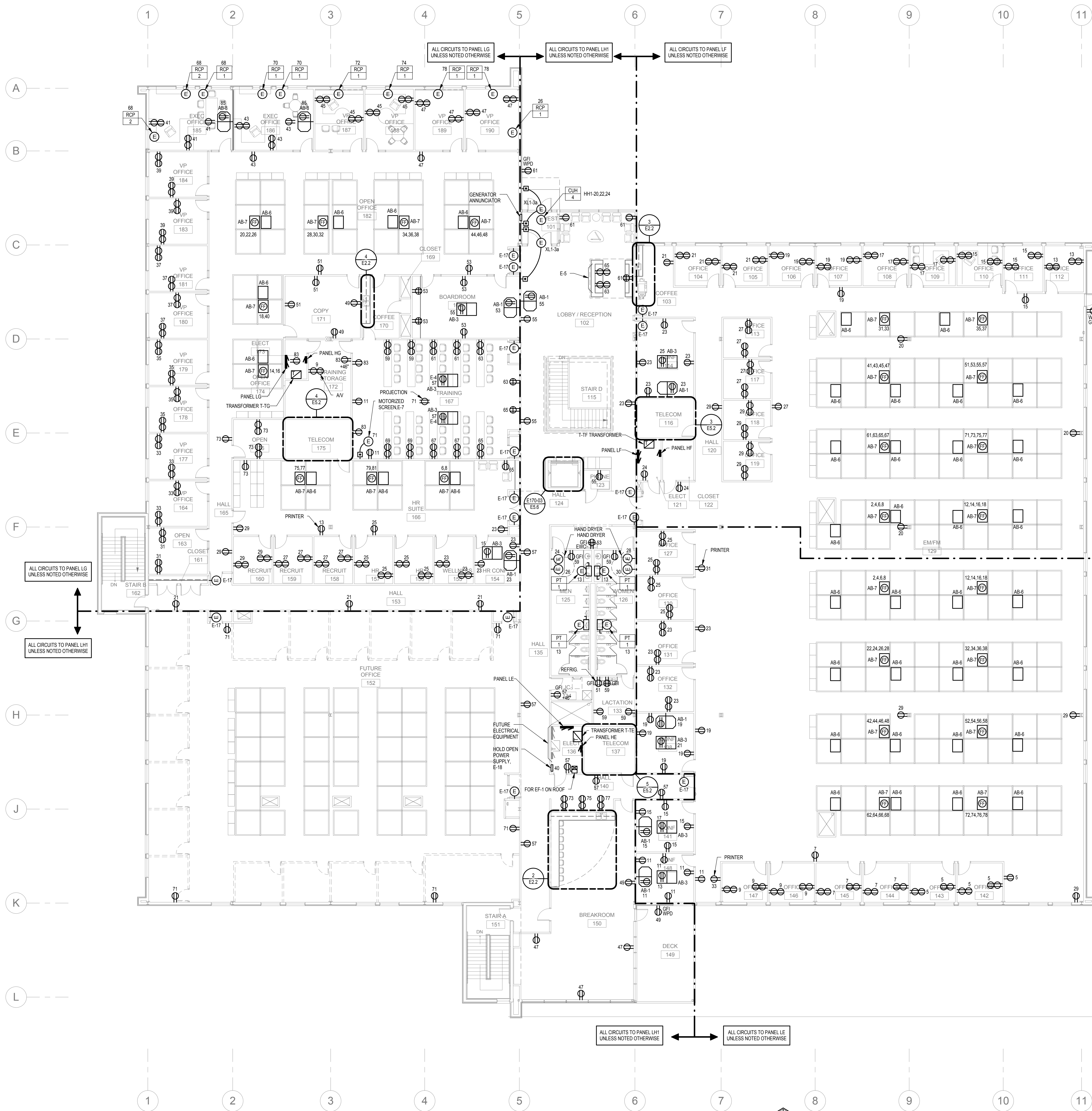
JOB NO.  
12008

DRAWING NAME  
LOWER FLOOR  
POWER PLAN

SHEET

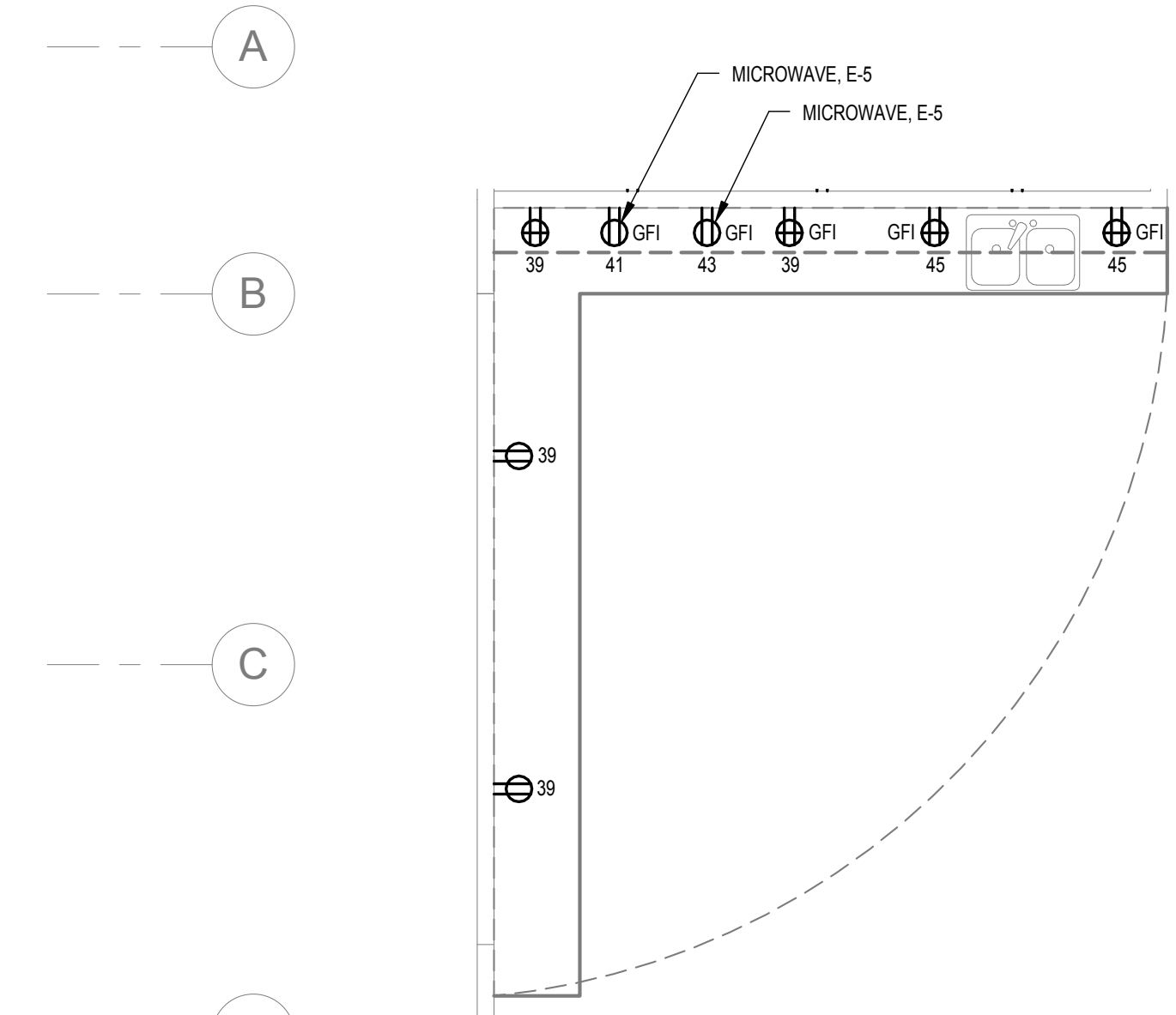
E2.1

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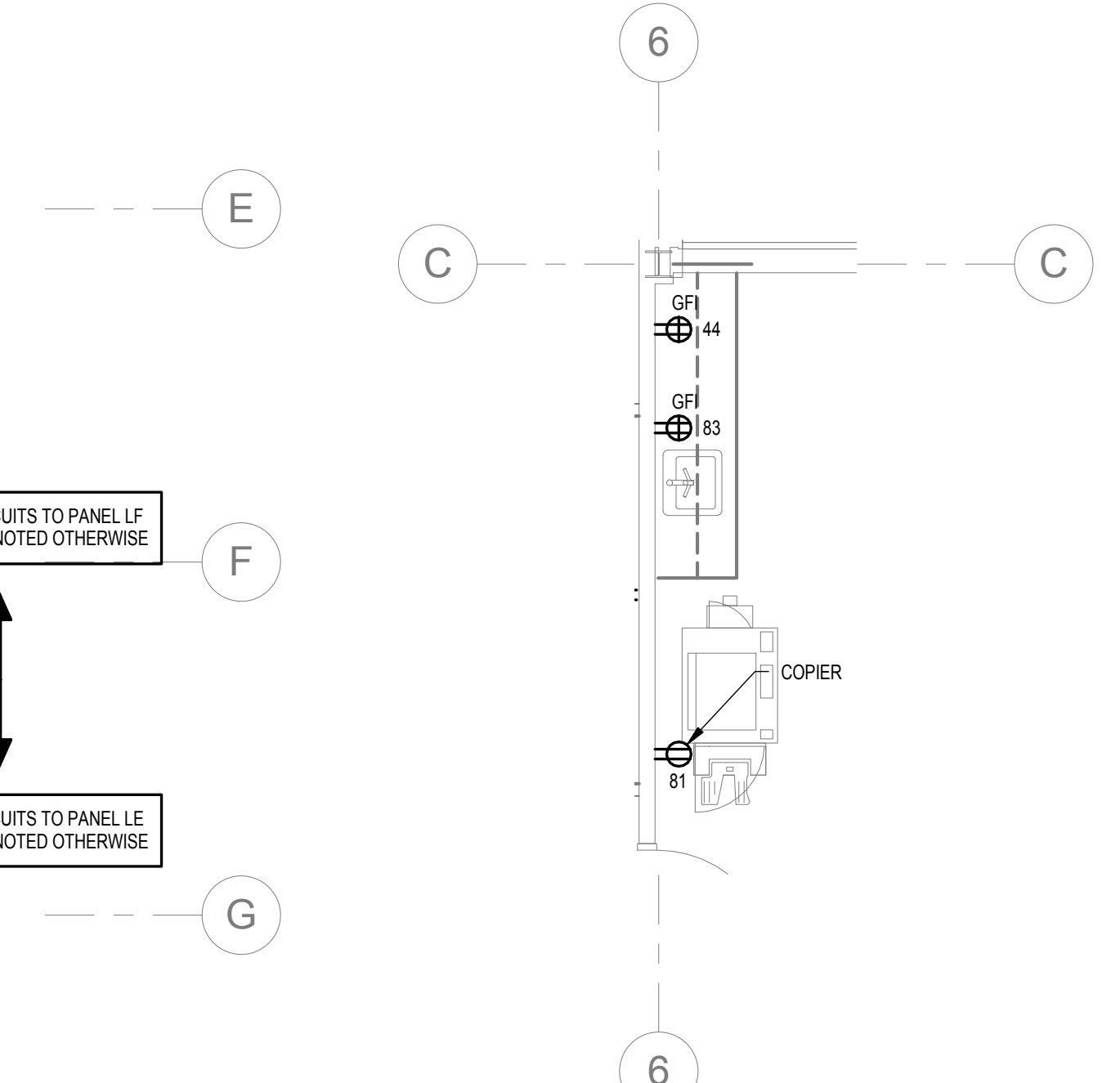
FIRST FLOOR PLAN

3/32" = 1'-0"



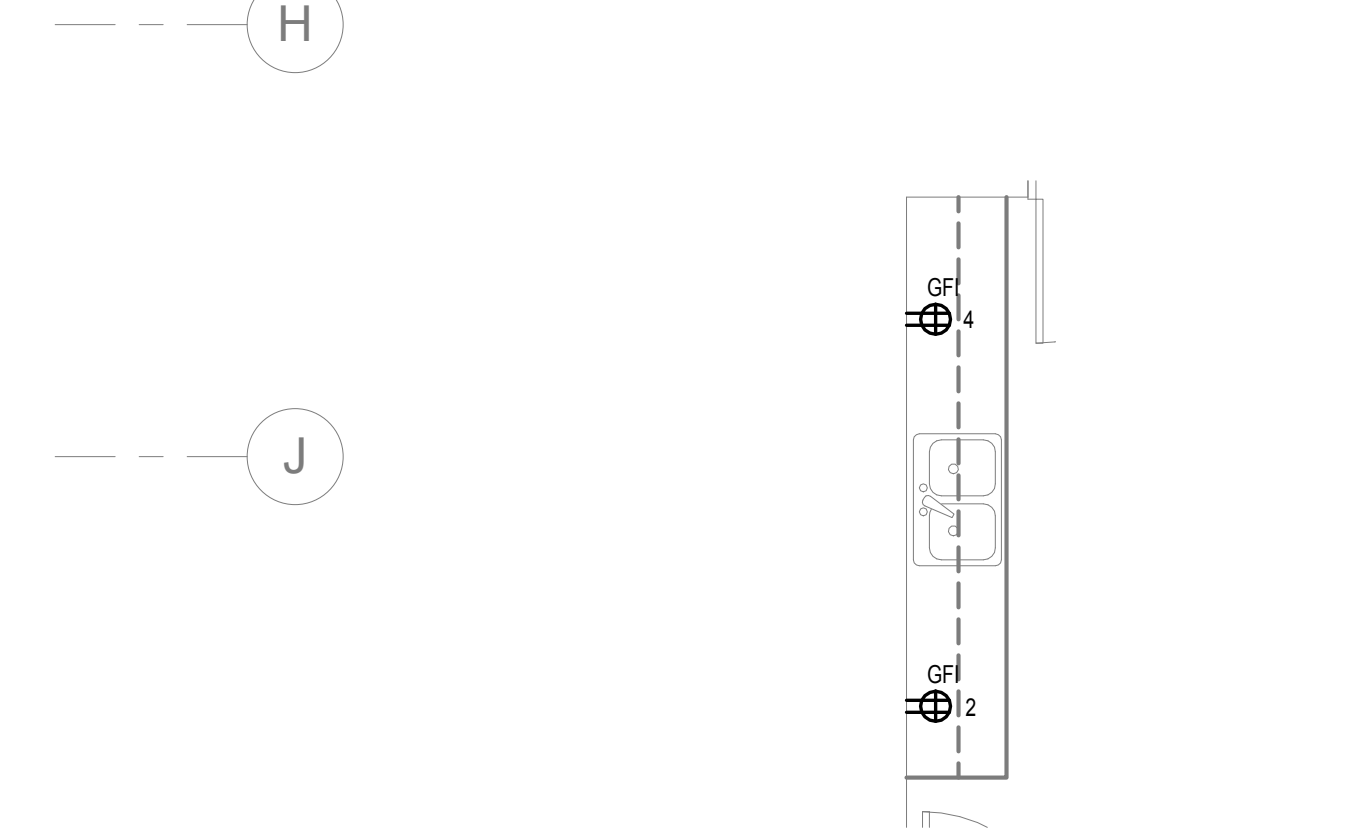
2 ENLARGED BREAK ROOM FIRST FLOOR

1/4" = 1'-0"



3 ENLARGED COFFEE FIRST FLOOR

1/4" = 1'-0"



4 ENLARGED COFFEE BAR FIRST FLOOR

1/4" = 1'-0"

REFER TO TELECOMMUNICATION DRAWINGS FOR ANY ADDITIONAL ELECTRICAL WORK

REFER TO SHEET ES.8 FOR ELECTRICAL NOTES

Receptacle Key

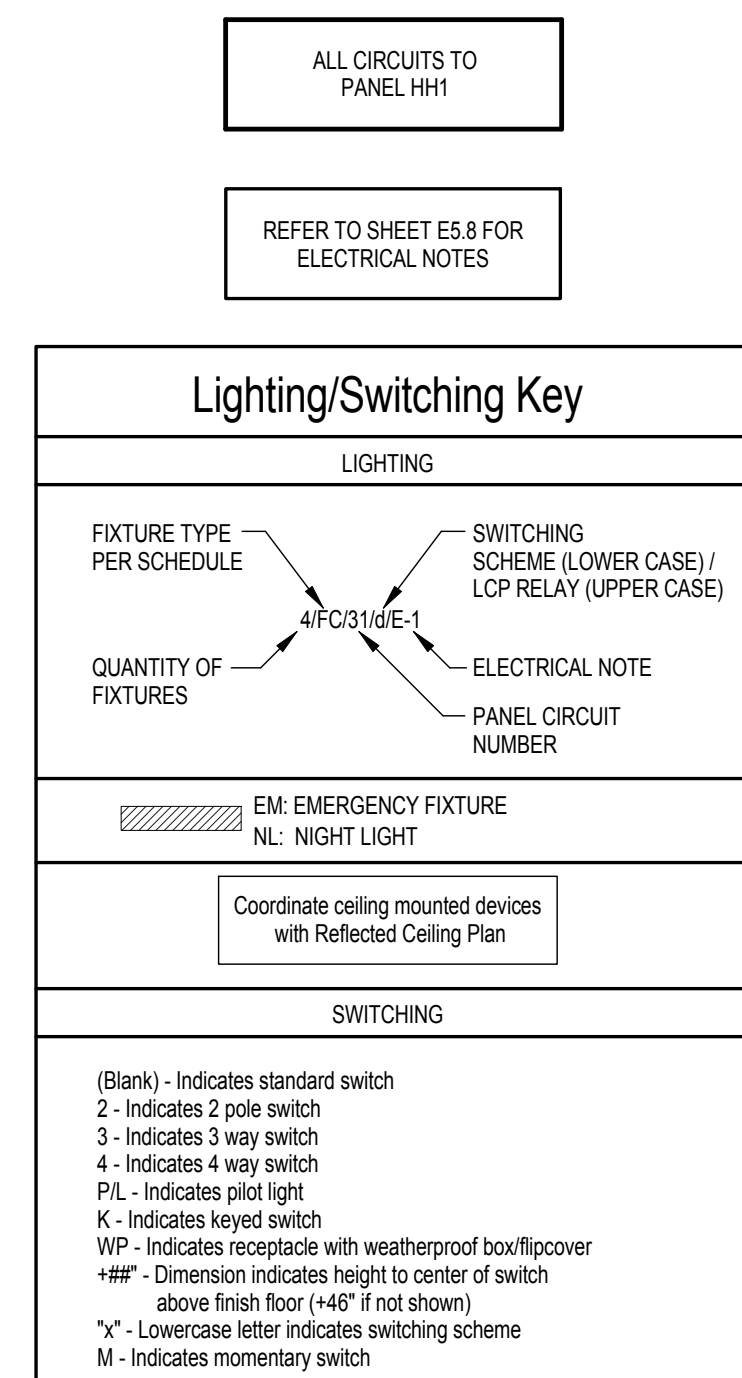
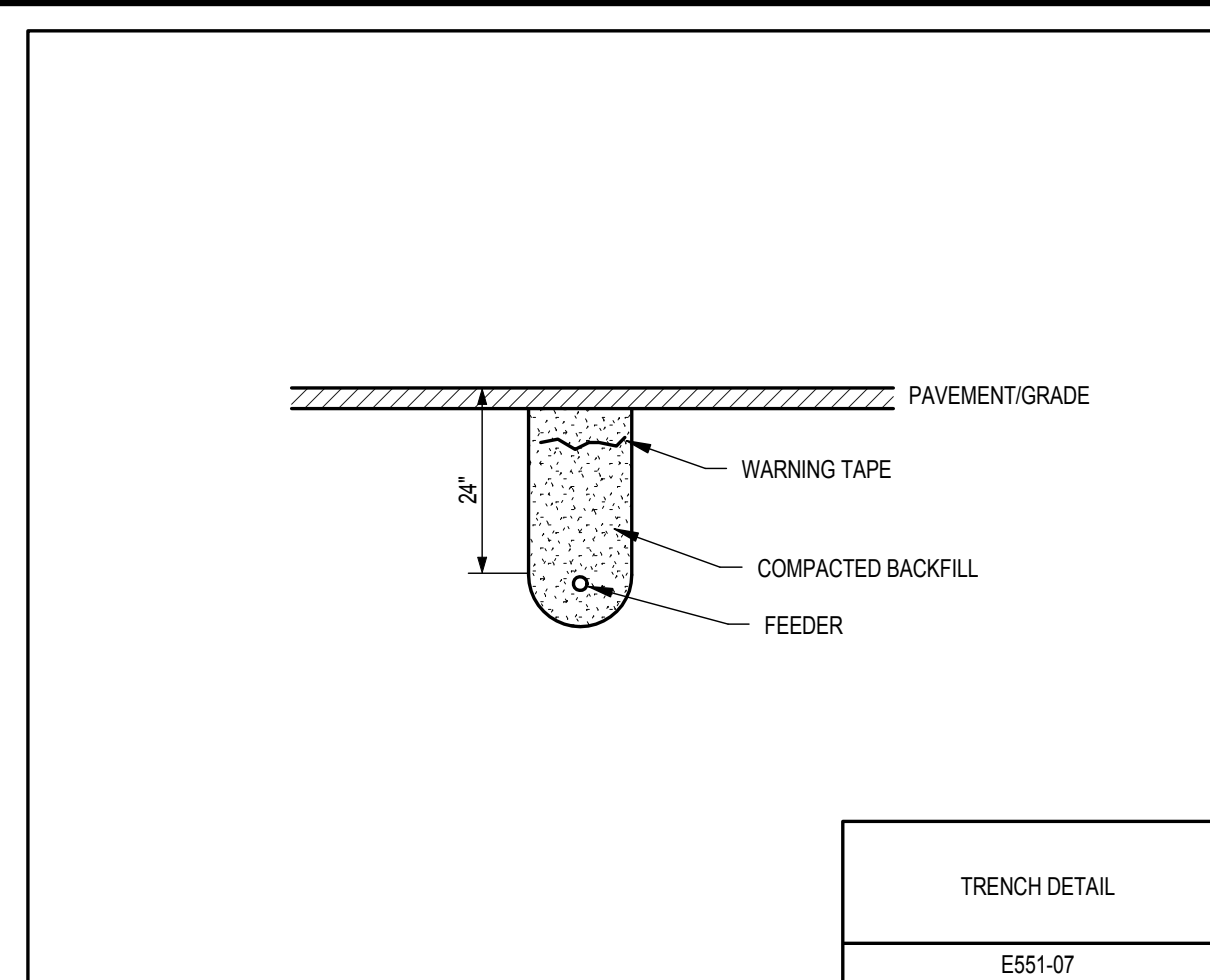
- S - Indicates safety type receptacle
- GFI - Indicates ground fault interrupter receptacle
- TVSS - Indicates transient voltage surge suppressor receptacle
- IG - Indicates isolated ground receptacle
- WP - Indicates receptacle with weatherproof box/cover and plug cover
- # - Number indicates panel circuit number
- \*\*\* - Dimension indicates height to center of receptacle above finish floor (+18" if not shown)
- USB - Indicates USB type receptacle
- TR - Indicates tamper resistant type receptacle

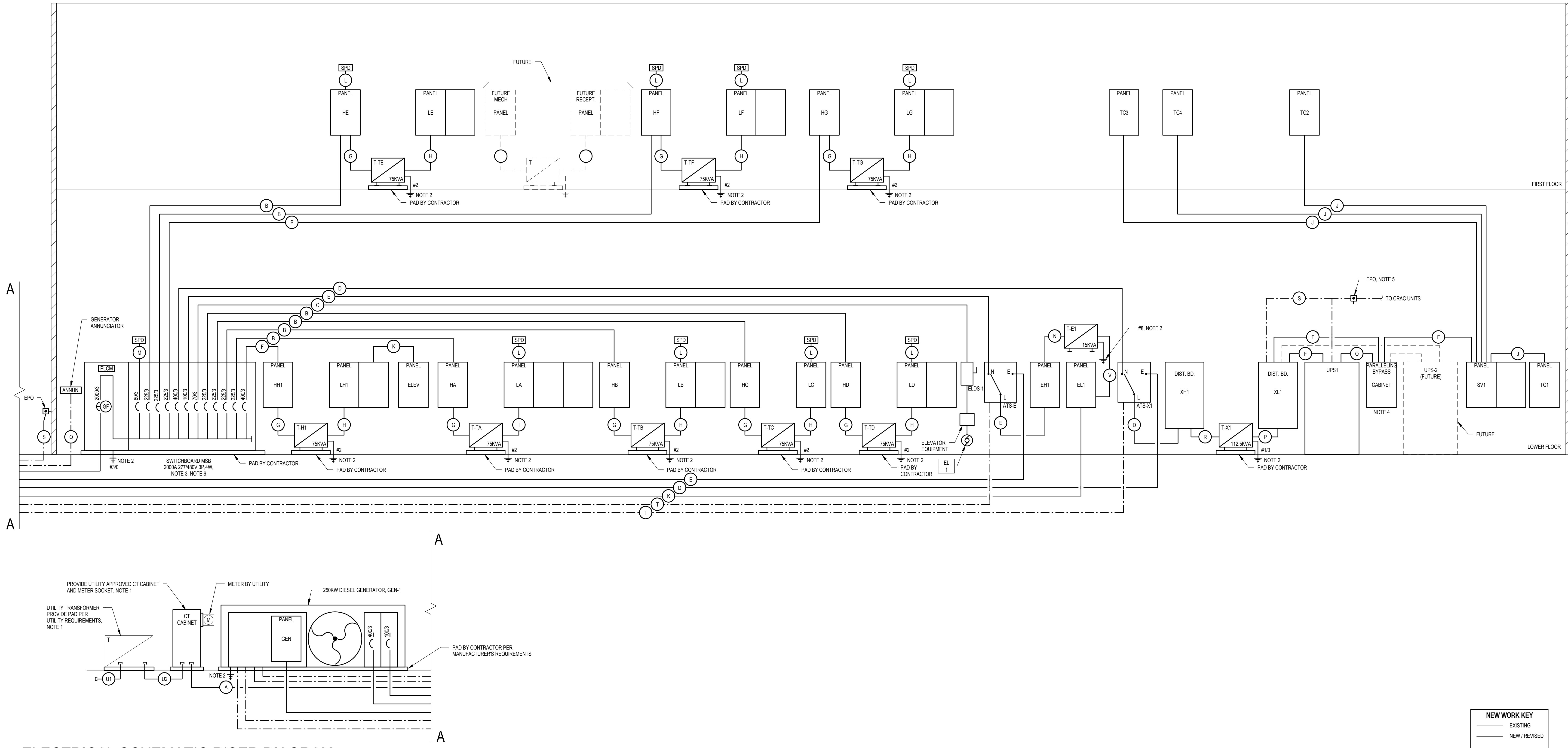
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|--------------|------------------------|
| DRAWN        | DRH, JMC               |
| CHECKED      | EBB                    |
| DATE         | 09-06-2013             |
| JOB NO.      | 12008                  |
| DRAWING NAME | FIRST FLOOR POWER PLAN |

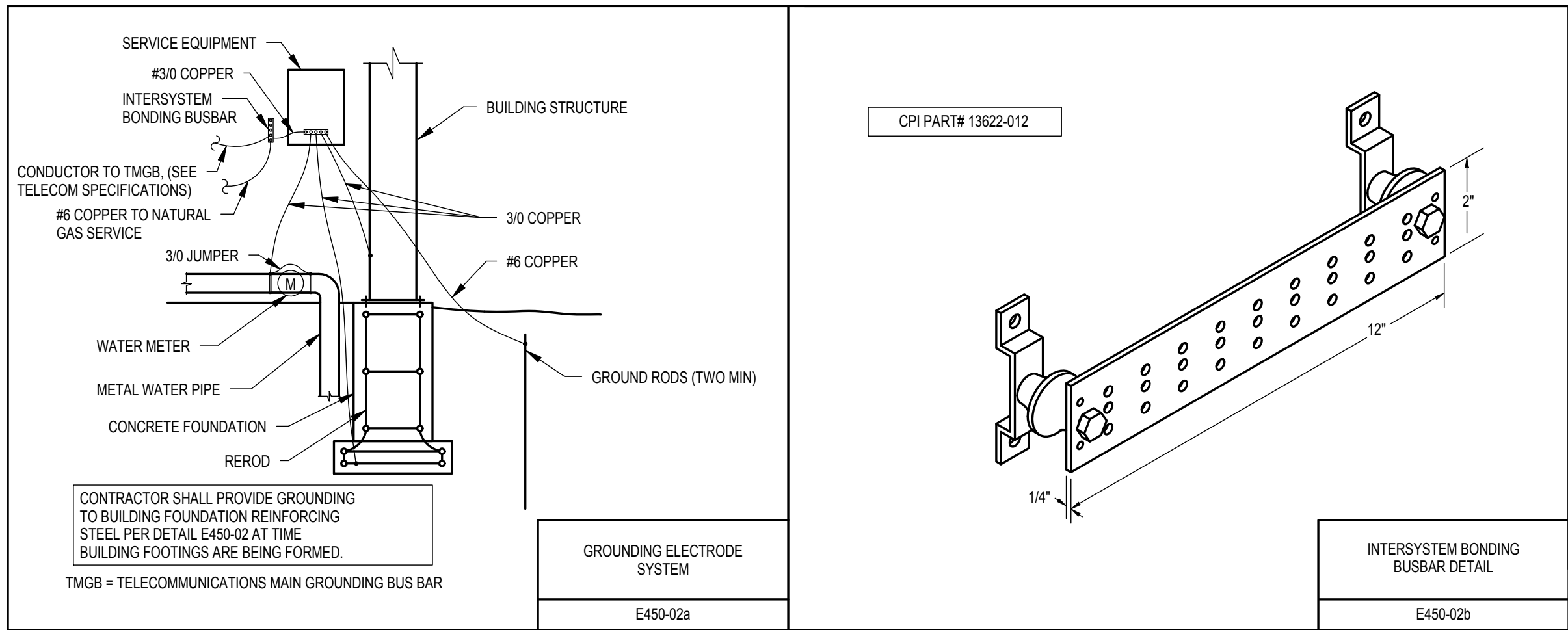






# 1 ELECTRICAL SCHEMATIC RISER DIAGRAM NOT TO SCALE

- ELECTRICAL RISER DIAGRAM NOTES
- Coordinate all utility requirements with Alliant Energy representative Jill Roulier (319.786.2024).
  - Ground per NEC 250 and Details E450-01, E450-02, E450-06 and E450-07.
  - Provide Switchboard MSB shall be 65,000 AIC with fully rated 2000A/3P main breaker. Provide with 400A/3P, 225A/3P and 100A/3P spare, 400A/3P and 225A/3P prepared space.
  - Provide 400A/3P paralleling/bypass cabinet. Provide cabinet with 350A/3P input circuit breaker for UPS1, 400A/3P output circuit breaker and prepared space for future 200A/3P input circuit breaker from future UPS2. Provide with keyed interlock system.
  - Provide Emergency Power Off (EPO) signal to shunt trip circuit breakers in Dist. Bd. XL1, UPS1 and both CRAC units.
  - Provide alternate source signage per NEC 700.7 (A).



| FEEDER SCHEDULE |                                  |                                |      |                      |
|-----------------|----------------------------------|--------------------------------|------|----------------------|
| FEEDER          | LOAD SERVED                      | CONDUIT AND WIRE SIZE          | AMPS | COMMENTS             |
| A               | SWBD, MSB                        | 5 SETS - 4" C, 600MCM          | 2000 |                      |
| B               | PNLS HA, HB, HC, HD, HE, HF, HG  | 2-1/2" C, 4#4/0, 1#4 GRND.     | 225  |                      |
| C               | ELEVATOR (EL-1)                  | 1" C, 3#6, 1#10 GRND.          | 45   |                      |
| D               | ATS-X1, XH1                      | 3-1/2" C, 4#500MCM, 1#5 GRND.  | 400  | NOTE 2               |
| E               | ATS-E, EH1                       | 1-2" C, 4#3, 1#8               | 100  |                      |
| F               | HH1, PARAL. CAB., SV1, UPS1      | 3-1/2" C, 4#600MCM, 1#5 GRND.  | 400  | NOTE 2               |
| G               | 79KVA XFMR                       | 1-1/4" C, 3#2, 1#6 GRND.       | 110  |                      |
| H               | PNLS LB, LC, LD, LE, LF, LG, LH1 | 3" C, 5#250MCM, 1#2 GRND.      | 225  | 200% NEUTRAL, NOTE 2 |
| I               | PANEL LA                         | 3" C, 5#300MCM, 1#2 GRND.      | 250  | 200% NEUTRAL, NOTE 2 |
| J               | PNLS TC1, TC2, TC3, TC4          | 1" C, 4#6, 1#10 GRND.          | 60   |                      |
| K               | PNLS GEN, ELEV                   | 1" C, 4#6, 1#10 GRND.          | 60   |                      |
| L               | 200V SPD'S                       | 3/4" C, 4#10                   | 30   |                      |
| M               | 480V SPD                         | 1" C, 3#6, 1#8 GRND.           | 60   |                      |
| N               | XFMR T-E1                        | 3/4" C, 3#10                   | 30   |                      |
| O               | PARAL. CAB. (FROM UPS1)          | 3-1/2" C, 4#500MCM, 1#5 GRND.  | 350  |                      |
| P               | XL1                              | 2 SETS - 2-1/2" C, 4#4/0, 1#10 | 400  | NOTE 2               |
| Q               | GEN. ANNUNC.                     | 1" C                           | NA   | NOTE 3               |
| R               | XFMR T-X1                        | 2" C, 3#3/0, 1#6 GRND.         | 175  | NOTE 2               |
| S               | EPO/SHUNT TRIP                   | 3/4" C                         | NA   | NOTE 3               |
| T               | ATS/GENERATOR                    | 3/4" C                         | NA   | NOTE 3               |
| U1              | UTILITY PADMOUNT. XFMR           | CONDUIT AS REQUIRED BY ALLIANT | NA   | NOTE 1               |
| U2              | METERING CABINET                 | CONDUIT AS REQUIRED BY ALLIANT | NA   | NOTE 1               |
| V               | PNL EL1                          | 1" C, 4#6, 1#8 GRND.           | 60   |                      |

NOTES:

- Provide conduit and sleeves as required for primary conductors by Utility. Coordinate all requirements.
- Confirm feeder size requirements with associated circuit breaker and equipment termination lugs.
- Provide cabling per manufacturer's requirements.

| TRANSFER SWITCH SCHEDULE |           |         |                       |                   |                     |                      |       |                       |
|--------------------------|-----------|---------|-----------------------|-------------------|---------------------|----------------------|-------|-----------------------|
| PLAN MARK                | MIN. SIZE | VOLTS   | SYSTEM                | TRANSFER TYPE     | ENCLOSURE NEMA TYPE | MOUNTING             | POLES | REMARKS               |
| ATS-E                    | 100       | 277/480 | EPSS                  | Closed-transition | NEMA 1              | Wall or Freestanding | 4     | ASCO 7000 Series      |
| ATS-X1                   | 400       | 277/480 | Building Distribution | Closed-transition | NEMA 1              | Freestanding         | 4     | 42KA ASCO 7000 Series |

Notes:

- Refer to notes and specifications for special identification requirements for EPSS system. ATS to meet all NFPA 110, Level 1 requirements.
- Provide signal to CRAC units that system is on stand-by power. CRAC units will be programmed to only allow one unit to run when system is powered by generator.

| UNINTERRUPTIBLE POWER SUPPLY (UPS) SCHEDULE |         |       |                               |                   |                 |              |                               |         |  |
|---------------------------------------------|---------|-------|-------------------------------|-------------------|-----------------|--------------|-------------------------------|---------|--|
| PLAN MARK                                   | VOLTS   | PHASE | MODULAR CAPACITY              | TYPE              | EXTERNAL BYPASS | MOUNTING     | MANUFACTURER AND MODEL NUMBER | NOTES   |  |
| UPS1                                        | 120/208 | 3     | INSTALLED 3 4 - 15KW 6 - 15KW | On-line, scalable | Note 3          | Freestanding | Liabert APM/BDC               | 1, 2, 4 |  |

Notes:

- Battery Warranty to be 3- years full replacement, 7 years, pro-rated.
- UPS shall be expandable to 90KW with no additional cabinets.
- Provide unit with 400A/3P paralleling and bypass cabinet to allow for a second UPS unit in the future.
- Provide shut-down capabilities upon EPO signal.

| DRY TYPE TRANSFORMER SCHEDULE |            |               |               |    |      |                 |    |      |        |              |         |                          |       |
|-------------------------------|------------|---------------|---------------|----|------|-----------------|----|------|--------|--------------|---------|--------------------------|-------|
| PLAN MARK                     | KVA RATING | OC TEMP. RISE | PRIMARY VOLTS | PH | WIRE | SECONDARY VOLTS | PH | WIRE | % REG. | TAPS NO. (±) | NO. (L) | MANUFACTURER CATALOG NO. | NOTES |
| T-E1                          | 15         | 115           | 480           | 3  | 3    | 120/208         | 3  | 4    | 2.5    | 2            | 4       | EE75T3HFISNLP            | 1, 2  |
| T-TA                          | 75         | 115           | 480           | 3  | 3    | 120/208         | 3  | 4    | 2.5    | 2            | 4       | EE75T3HFISNLP            | 1     |
| T-TB                          | 75         | 115           | 480           | 3  | 3    | 120/208         | 3  | 4    | 2.5    | 2            | 4       | EE75T3HFISNLP            | 1     |
| T-TC                          | 75         | 115           | 480           | 3  | 3    | 120/208         | 3  | 4    | 2.5    | 2            | 4       | EE75T3HFISNLP            | 1     |
| T-TD                          | 75         | 115           | 480           | 3  | 3    | 120/208         | 3  | 4    | 2.5    | 2            | 4       | EE75T3HFISNLP            | 1     |
| T-TF                          | 75         | 115           | 480           | 3  | 3    | 120/208         | 3  | 4    | 2.5    | 2            | 4       | EE75T3HFISNLP            | 1     |
| T-TG                          | 75         | 115           | 480           | 3  | 3    | 120/208         | 3  | 4    | 2.5    | 2            | 4       | EE75T3HFISNLP            | 1     |
| T-H1                          | 75         | 115           | 480           | 3  | 3    | 120/208         | 3  | 4    | 2.5    | 2            | 4       | EE75T3HFISNLP            | 1     |
| T-X1                          | 112.5      | 115           | 480           | 3  | 3    | 120/208         | 3  | 4    | 2.5    | 2            | 4       | EE112T3HFISNLP           | 1     |

NOTES:

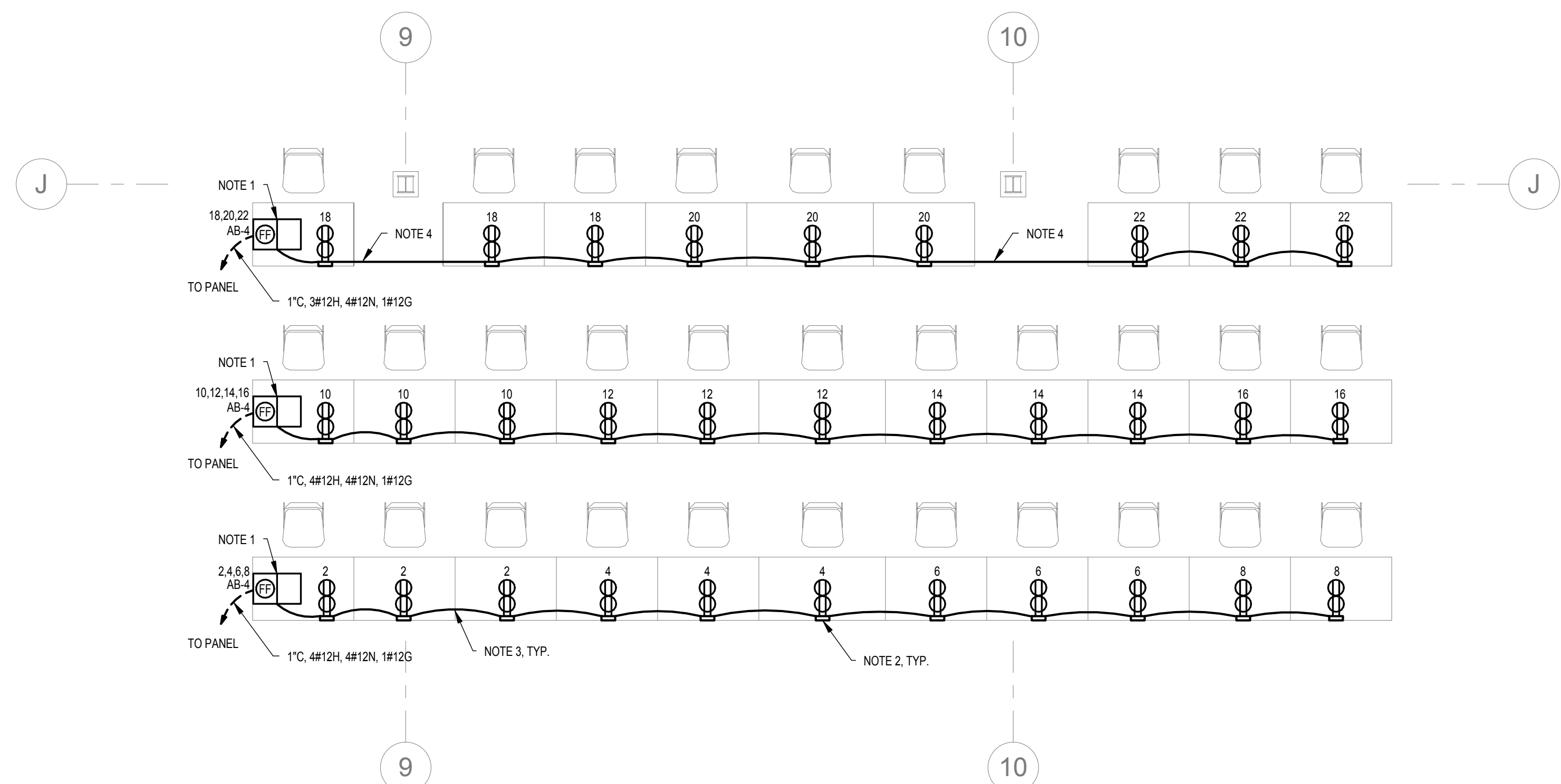
- Provide K-13 rated transformer.
- Wall mounted. Provide mounting brackets. Coordinate wall blocking with General Contractor.

| ENGINE-GENERATOR SCHEDULE |     |     |                 |    |      |                 |           |
|---------------------------|-----|-----|-----------------|----|------|-----------------|-----------|
| PLAN MARK                 | KW  | KVA | GENERATOR VOLTS | PH | WIRE | CIRCUIT BREAKER | ENCLOSURE |
| GEN-1                     | 250 | 300 | 277/480         | 3  | 4    | Note 1          | Level 1   |

NOTES:

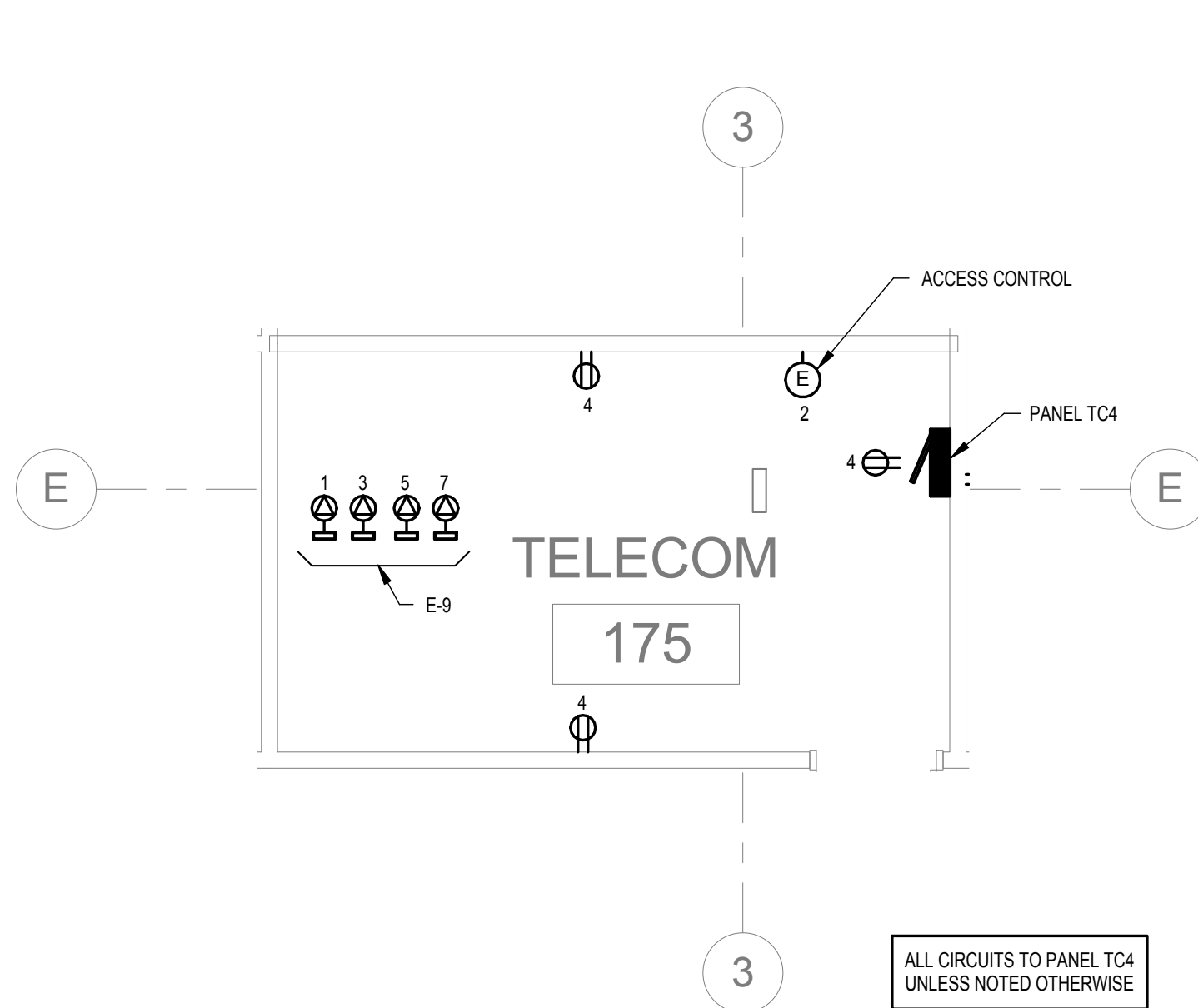
- Provide with 100A/3P breaker for EPSS branch and 400A/3P breaker for Optional Standby branch. Breakers shall be physically separated per NEC.
- Engine-generator circuit breakers to be electrically operated to allow synchronization control.
- Refer to 263213 for base fuel tank requirements.

REFER TO TELECOMMUNICATION DRAWINGS FOR ANY ADDITIONAL ELECTRICAL WORK

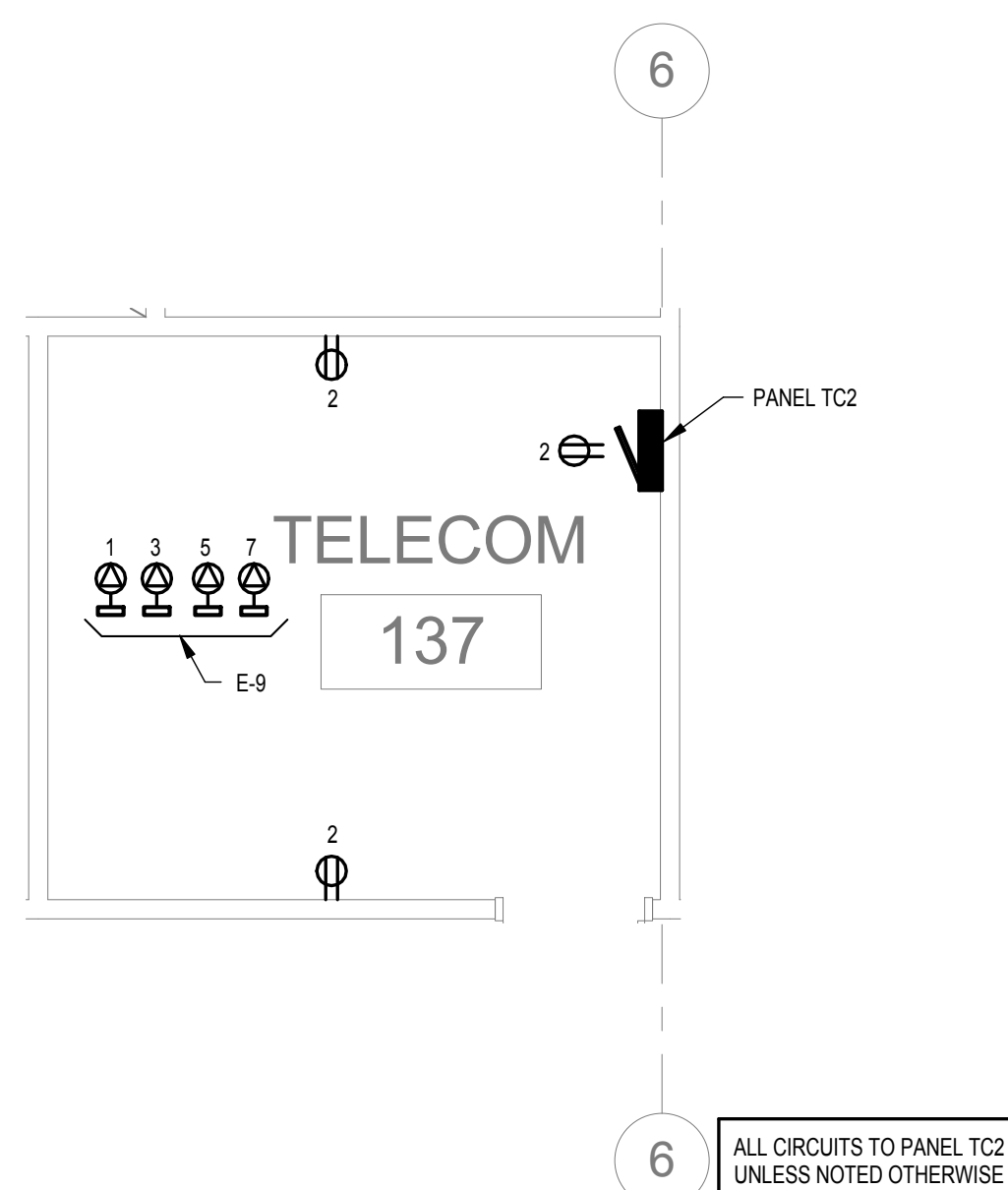


1 TYPICAL ENLARGED OPEN OFFICE 042, 049, 059 POWER PLAN  
1/4" = 1'-0"

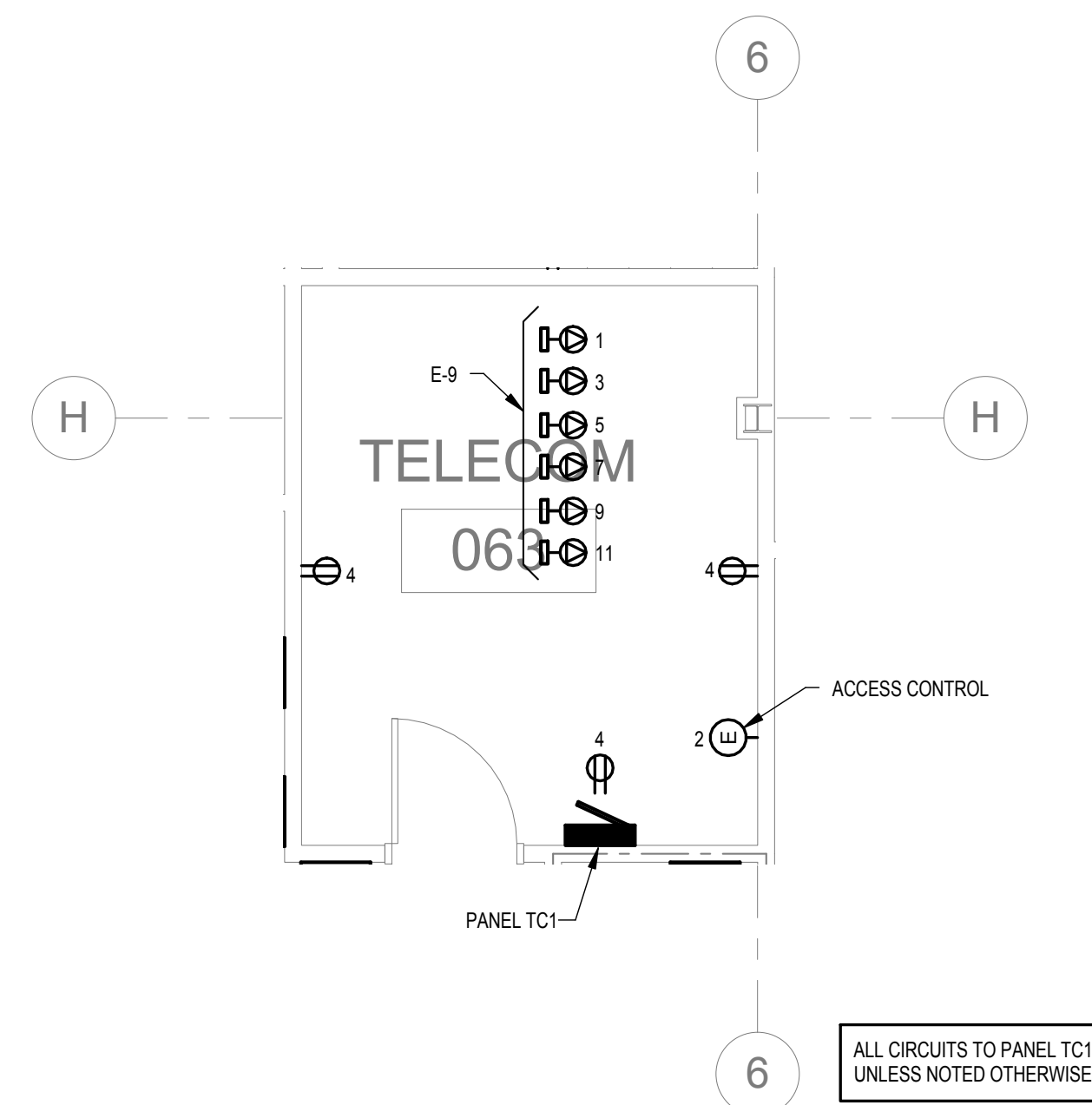
- OPEN OFFICE ELECTRICAL NOTES:
1. PROVIDE FLEXIBLE CONDUIT CONNECTION FROM FURNITURE FEED FLOOR BOX TO FIRST DOUBLE DUPLEX RECEPTACLE. PROVIDE 2" THREADED 90 WITH INSULATED BUSHING ON COVER FOR TELECOM. SEE ACTIVATION BOX SCHEDULE FOR ADDITIONAL INFORMATION.
  2. PROVIDE SURFACE MOUNTED DOUBLE DUPLEX RECEPTACLE MOUNTED TO BACK PANEL OF DESK. THIS IS TYPICAL FOR ALL DESKS SHOWN IN OPEN OFFICES 042, 049 AND 059. CIRCUITS SHOWN ARE FOR GENERALIZED CONCEPT FOR EACH ROW OF DESKS. SEE PLANS AND SCHEDULES FOR DETAILED CIRCUITING REQUIREMENTS.
  3. PROVIDE FLEXIBLE CONDUIT CONNECTION BETWEEN ADJACENT DEVICES. ROUTE NEATLY AND CLEANLY ALONG BACK PANEL OF DESK. SUPPORT PER NEC.
  4. PROVIDE EMT CONDUIT TO EXTEND ELECTRICAL AND TELECOM BETWEEN DESKS THAT ARE SEPARATED DUE TO COLUMN INTERFERENCE. EMT TO BE SECURED TO FLOOR.
  5. REFER TO SPECIFICATIONS FOR ADDITIONAL WIRING REQUIREMENTS, INCLUDING UPSIZING OF WIRES FOR VOLTAGE DROP AND SHARED NEUTRALS.



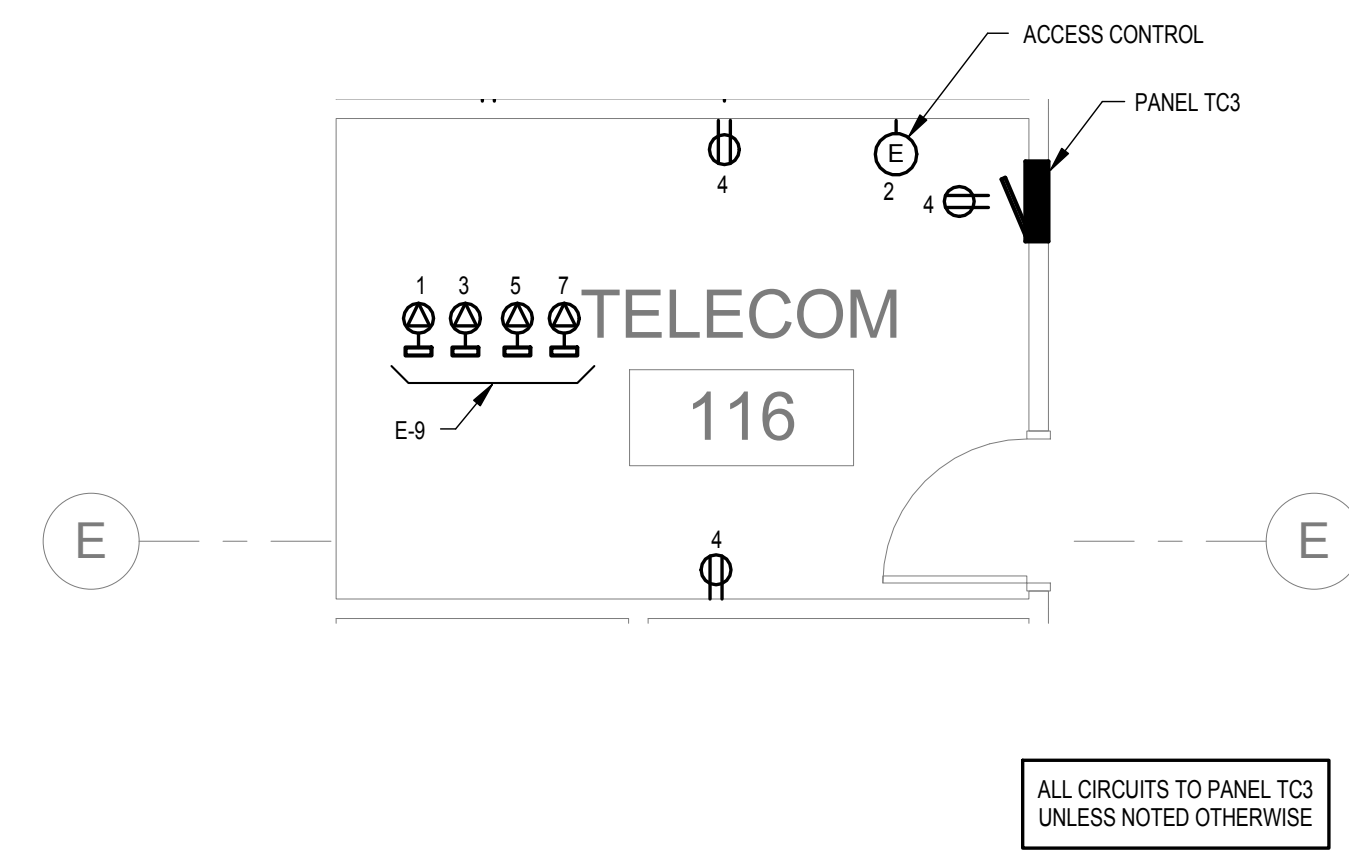
4 ENLARGED TELECOM 175  
1/4" = 1'-0"



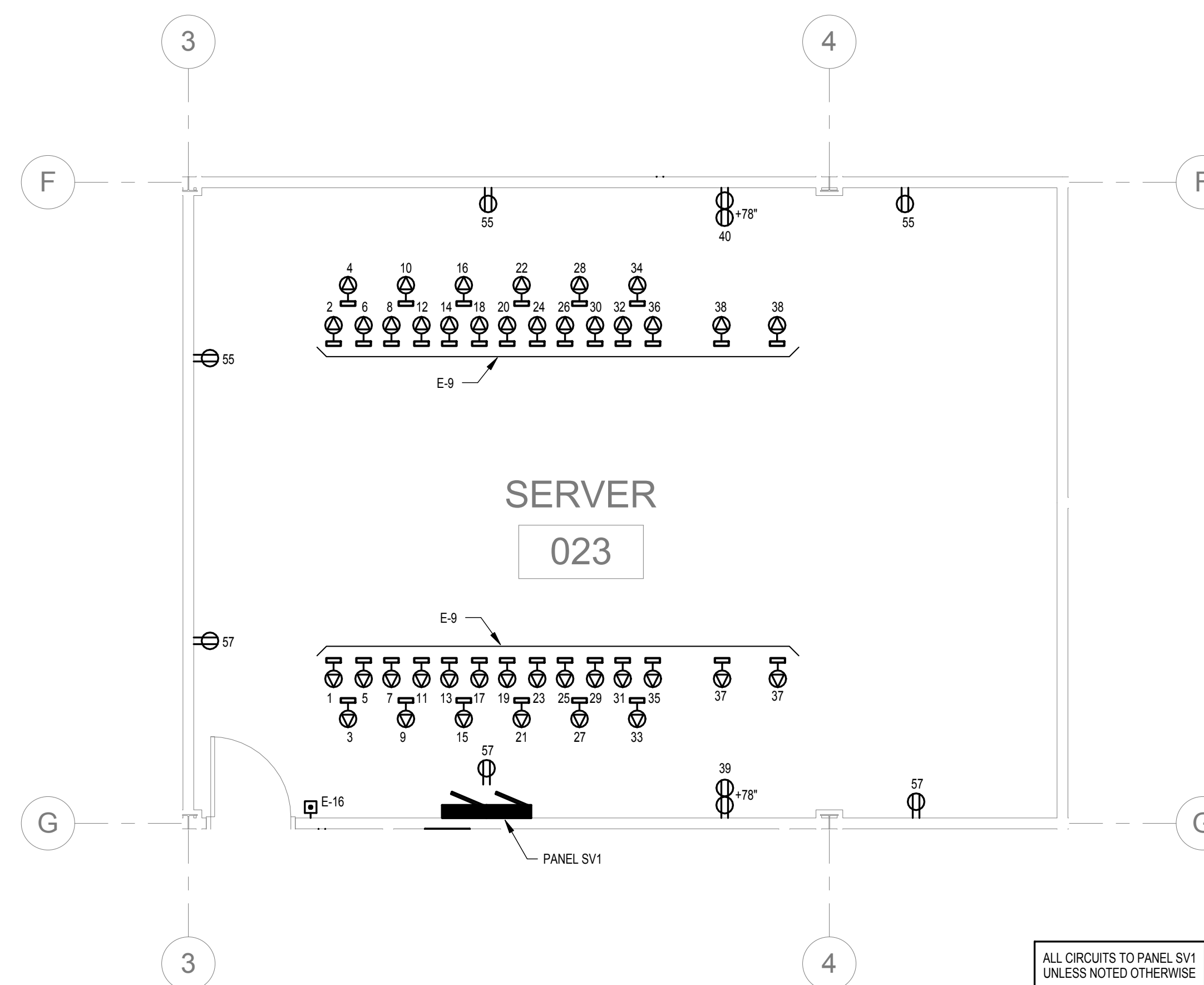
5 ENLARGED TELECOM 137  
1/4" = 1'-0"



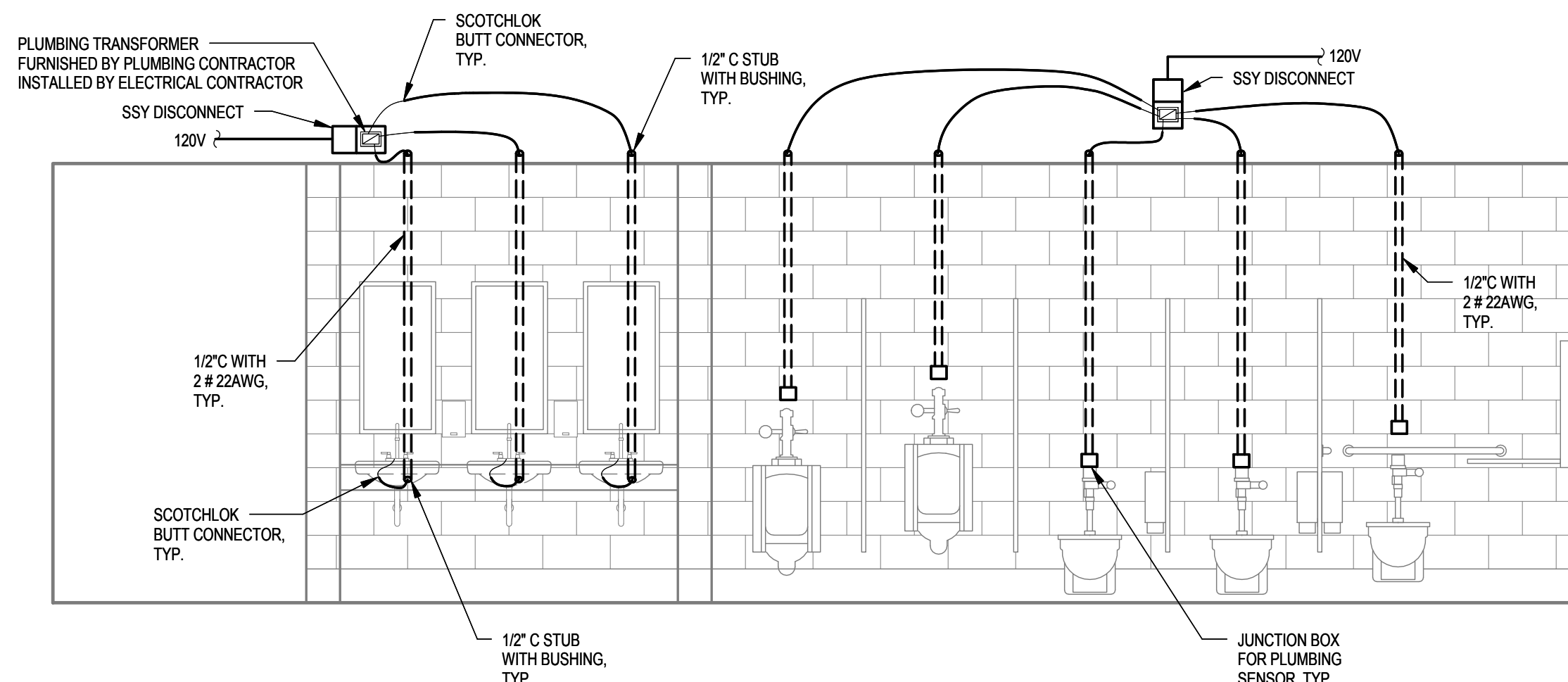
2 ENLARGED TELECOM 063  
1/4" = 1'-0"



3 ENLARGED TELECOM 116 FIRST FLOOR  
1/4" = 1'-0"

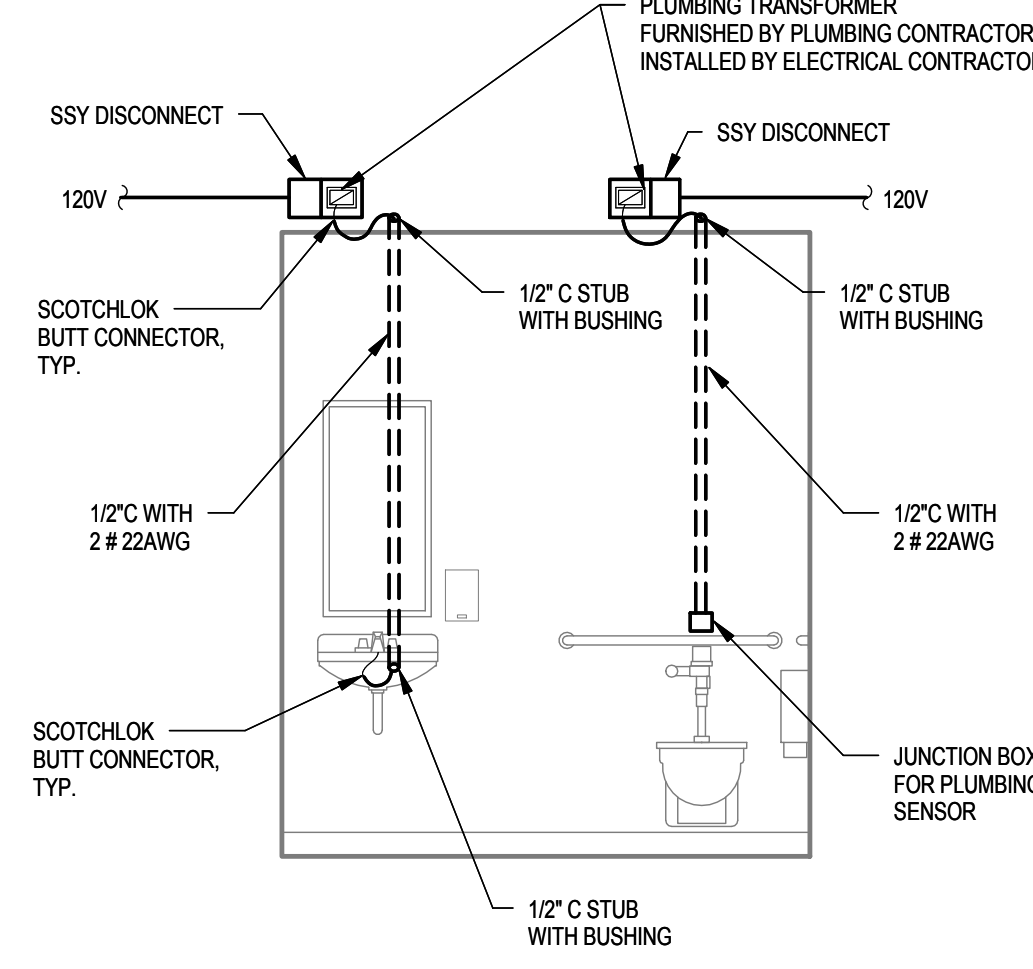


6 ENLARGED SERVER ROOM 023  
1/4" = 1'-0"

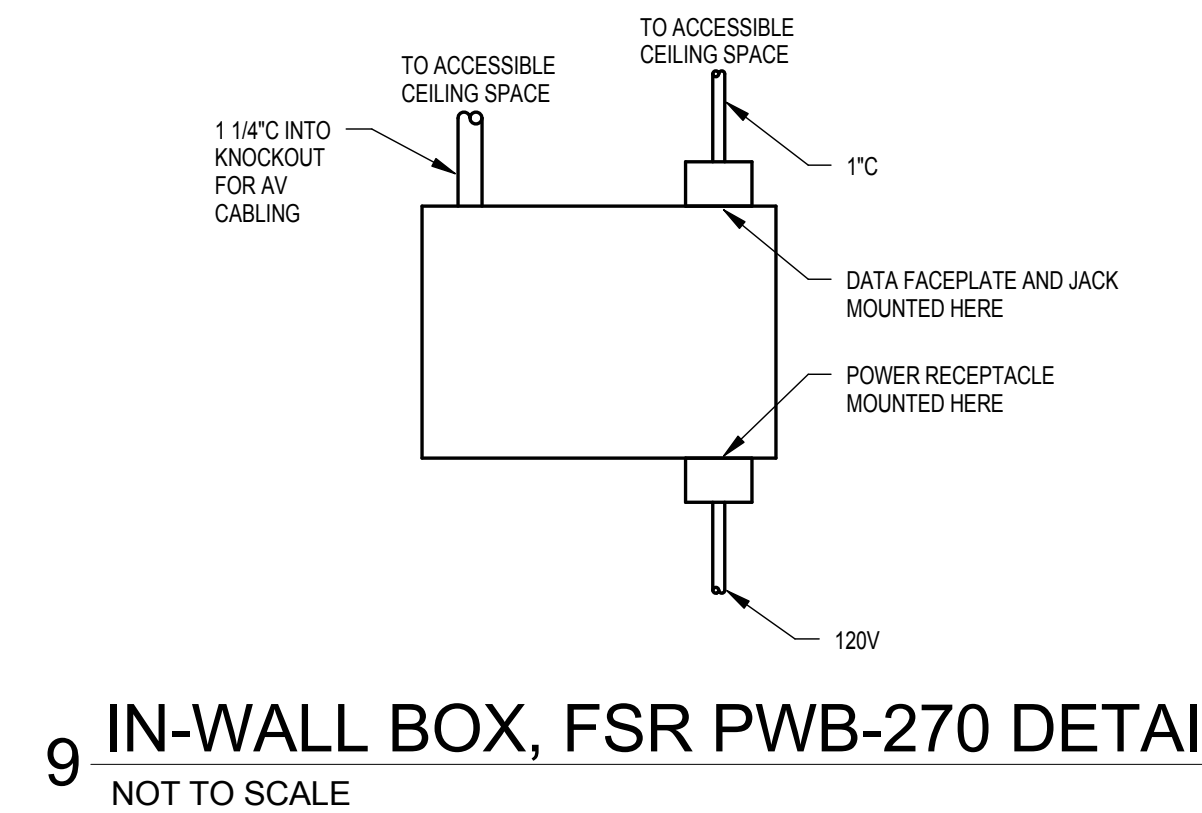


7 TYPICAL LOW VOLTAGE PLUMBING CONNECTION DETAIL  
NOT TO SCALE

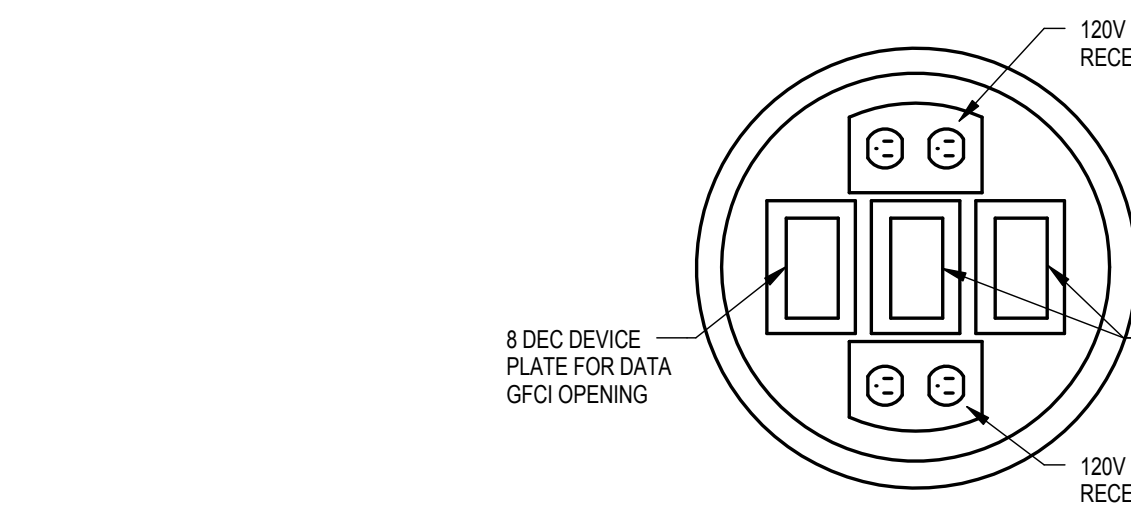
- LOW VOLTAGE PLUMBING CONNECTION NOTES:
1. DRAWING IS DIAGRAMATIC TO SHOW INTENT OF SCOPE OF WORK. SEE PLANS FOR ACTUAL FIXTURE COUNTS.
  2. ELECTRICAL CONTRACTOR SHALL MAKE ALL TERMINATIONS TO PLUMBING TRANSFORMER AND SENSORS.
  3. COORDINATE ROUGH-IN LOCATIONS OF ALL ELECTRICAL BOXES WITH PLUMBING CONTRACTOR.
  4. COORDINATE LOCATION OF 12" C STUB FOR SINK/FAUCET TO ENSURE CLEAN INSTALLATION. ALL WIRES SHALL BE CONCEALED BEHIND SINK.



8 FSR FL-500P-6 FLOOR BOX DETAIL  
NOT TO SCALE



9 IN-WALL BOX, FSR PWB-270 DETAIL  
NOT TO SCALE



10 WIREMOLD EVOLUTION 8AT POKE-THRU DETAIL  
NOT TO SCALE

REFER TO TELECOMMUNICATION DRAWINGS FOR ANY ADDITIONAL ELECTRICAL WORK

REFER TO SHEET ES.8 FOR ELECTRICAL NOTES

Receptacle Key

- S - Indicates safety type receptacle  
GFI - Indicates ground fault interrupter receptacle  
TVSS - Indicates transient voltage surge suppressor receptacle  
IG - Indicates isolated ground receptacle  
WIP - Indicates receptacle with weatherproof box/cover and plug cover  
# - Number indicates panel circuit number  
+H - Dimension indicates height to center of receptacle above finish floor (+18" if not shown)  
USB - Indicates USB type receptacle  
TR - Indicates tamper resistant type receptacle

| DATE | REVISIONS |
|------|-----------|
|      |           |
|      |           |
|      |           |

#### PERMIT / BID

|              |            |
|--------------|------------|
| DRAWN        | DRH, JMC   |
| CHECKED      | EBB        |
| DATE         | 09-06-2013 |
| JOB NO.      | 12008      |
| DRAWING NAME |            |

#### ELECTRICAL SCHEDULES AND DETAILS

| DIST. BOARD SCHEDULE: XL1                                                             |         |   |                   |             |           |                     |    |         |                   |    |  |
|---------------------------------------------------------------------------------------|---------|---|-------------------|-------------|-----------|---------------------|----|---------|-------------------|----|--|
| VOLTAGE                                                                               |         |   | 120/208V, 3PH, 4W |             |           | 400A MB :MAIN       |    |         |                   |    |  |
| GRND BUS                                                                              |         |   | YES               |             |           | CONN. AMPS 259      |    |         | SURFACE :MOUNTING |    |  |
| LOCATION                                                                              |         |   | STORAGE           |             |           | 10,000              |    |         | IESCR             |    |  |
| A=A/C E=EQUIP H=HEAT K=KITCH L=LIGHTS M=MOTOR R=RECEPT S=SPARE SP=SPACE               |         |   |                   |             |           |                     |    |         |                   |    |  |
| CKT NO.                                                                               | BKR AMP | P | DESCRIPTION       | LOAD AMPS   | LOAD AMPS | DESCRIPTION         | P  | BKR AMP | CKT NO.           |    |  |
| 1a                                                                                    | 20      | 1 | E                 | CU-1-Heater | 3         | UPS1                | E  | 3       | 400               | 2  |  |
| b                                                                                     | 20      | 1 | E                 | CU-2-Heater | 3         |                     |    |         |                   |    |  |
| c                                                                                     | 20      | 1 | E                 | EF-5        | 3         | 'ST                 |    |         |                   |    |  |
| 3a                                                                                    | 20      | 1 | S                 |             |           | Paralleling Cabinet | E  | 3       | 400               | 4  |  |
| b                                                                                     | 20      | 1 | S                 |             |           |                     |    |         |                   |    |  |
| c                                                                                     | 20      | 1 | S                 |             |           |                     |    |         |                   |    |  |
| 5                                                                                     | 100     | 3 | SP                |             |           | Future UPS2         | SP | 3       | 400               | 6  |  |
|                                                                                       |         |   |                   |             |           |                     |    |         |                   |    |  |
| 7                                                                                     | 100     | 3 | SP                |             |           | 'ST                 | SP | 3       | 100               | 8  |  |
|                                                                                       |         |   |                   |             |           |                     |    |         |                   |    |  |
| 9                                                                                     | 100     | 3 | SP                |             |           |                     | SP | 3       | 100               | 10 |  |
|                                                                                       |         |   |                   |             |           |                     |    |         |                   |    |  |
| 11                                                                                    | 100     | 3 | SP                |             |           |                     | SP | 3       | 100               | 12 |  |
|                                                                                       |         |   |                   |             |           |                     |    |         |                   |    |  |
| 'HL' = HANDLE LOCK<br>IESCR = INTEGRATED ELECTRICAL SHORT CIRCUIT RATING<br>P = POLES |         |   |                   |             |           |                     |    |         |                   |    |  |

| PANEL SCHEDULE:                                                                                   |         |                   |             |                          | EL1           |                        |        |         |                   |    |    |
|---------------------------------------------------------------------------------------------------|---------|-------------------|-------------|--------------------------|---------------|------------------------|--------|---------|-------------------|----|----|
| VOLTAGE                                                                                           |         | 120/208V, 3PH, 4W |             |                          |               |                        | 60A MB |         | :MAIN             |    |    |
| GRND BUS                                                                                          |         | YES               |             |                          | CONN.VA: 7499 |                        |        |         | SURFACE :MOUNTING |    |    |
| LOCATION:                                                                                         |         | EMER 064          |             |                          |               |                        | 10,000 |         | :IESCR            |    |    |
| A=A/C E=EQUIP H=HEAT K=KITCH L=LIGHTS M=MOTOR R=RECEPT S=SPARE SP=SPACE                           |         |                   |             |                          |               |                        |        |         |                   |    |    |
| CKT NO.                                                                                           | BKR AMP | P                 | DESCRIPTION | LOAD V.A.                | LOAD V.A.     | DESCRIPTION            | P      | BKR AMP | CKT NO.           |    |    |
| 1                                                                                                 | 20      | 1                 | E           | FACP Panel               | 500           | MAIN BREAKER           | E      | 3       | 60                | 2  |    |
| 3                                                                                                 | 20      | 1                 | E           | FACP NAC Panel           | 500           | MAIN BREAKER           | E      |         |                   | 4  |    |
| 5                                                                                                 | 20      | 1                 | E           | LCP1 (Rm 057)            | 500           | MAIN BREAKER           | E      |         |                   | 6  |    |
| 7                                                                                                 | 20      | 1                 | E           | Server Clean Agent Panel | 500           |                        |        |         |                   | 8  |    |
| 9                                                                                                 | 20      | 1                 | S           |                          |               |                        |        |         |                   | SP |    |
| 11                                                                                                | 20      | 1                 | S           |                          |               |                        |        |         |                   | SP | 10 |
| 13                                                                                                | 20      | 1                 | S           |                          |               |                        |        |         |                   | SP | 14 |
| 15                                                                                                | 20      | 1                 | S           |                          |               |                        |        |         |                   | SP | 16 |
| 17                                                                                                | 20      | 1                 | S           |                          |               |                        |        |         |                   | SP | 18 |
| 19                                                                                                |         |                   | SP          |                          |               |                        |        |         |                   | SP | 20 |
| 21                                                                                                |         |                   | SP          |                          |               |                        |        |         |                   | SP | 22 |
| 23                                                                                                |         |                   | SP          |                          |               |                        |        |         |                   | SP | 24 |
|                                                                                                   |         |                   |             |                          |               | 1833 Feed-Through Lugs |        |         |                   |    |    |
|                                                                                                   |         |                   |             |                          |               | 1833 to Panel Gen      |        |         |                   |    |    |
|                                                                                                   |         |                   |             |                          |               | 1833                   |        |         |                   |    |    |
| *HL = HANDLE LOCK *GFI = GROUND FAULT INTERRUPTER *AFI = ARC FAULT INTERRUPTER                    |         |                   |             |                          |               |                        |        |         |                   |    |    |
| NOTES:                                                                                            |         |                   |             |                          |               |                        |        |         |                   |    |    |
| 1. All overcurrent devices shall be selectively coordinated with supply side overcurrent devices. |         |                   |             |                          |               |                        |        |         |                   |    |    |
| 2. Provide feed-through lugs to serve Panel GEN.                                                  |         |                   |             |                          |               |                        |        |         |                   |    |    |

| PANEL SCHEDULE:                                                                |         |                   |             |           |           | HC                                 |   |          |         |          |  |  |  |
|--------------------------------------------------------------------------------|---------|-------------------|-------------|-----------|-----------|------------------------------------|---|----------|---------|----------|--|--|--|
| VOLTAGE                                                                        |         | 277/480V, 3PH, 4W |             |           |           |                                    |   | 225A MLO |         | MAIN     |  |  |  |
| GRND BUS                                                                       |         | YES               |             |           |           | CONN VA: 151273                    |   | SURFACE  |         | MOUNTING |  |  |  |
| LOCATION:                                                                      |         | MAILROOM 028      |             |           |           |                                    |   | 35,000   |         | IESCR    |  |  |  |
| A=A/C E=EQUIP H=HEAT K=KITCH L=LIGHTS M=MOTOR R=RECEPT S=SPARE SP=SPACE        |         |                   |             |           |           |                                    |   |          |         |          |  |  |  |
| CKT NO.                                                                        | BKR AMP | P                 | DESCRIPTION | LOAD V.A. | LOAD V.A. | DESCRIPTION                        | P | BKR AMP  | CKT NO. |          |  |  |  |
| 1                                                                              | 35      | 3                 | M RTU-4A    | 6892      | 3300      | Lts-Mailroom No., Airlock, Counter | L | 1        | 20      | 2        |  |  |  |
| 3                                                                              |         |                   | M           | 6892      | 3520      | Lts-Mailroom So.                   | L | 1        | 20      | 4        |  |  |  |
| 5                                                                              |         |                   | M           | 6892      |           |                                    | S | 1        | 20      | 6        |  |  |  |
| 7                                                                              | 35      | 3                 | M RTU-4B    | 6892      |           |                                    | S | 1        | 20      | 8        |  |  |  |
| 9                                                                              |         |                   | M           | 6892      |           |                                    | S | 1        | 20      | 10       |  |  |  |
| 11                                                                             |         |                   | M           | 6892      |           |                                    | S | 1        | 20      | 12       |  |  |  |
| 13                                                                             | 20      | 3                 | M DH-1      | 3367      |           |                                    | S | 1        | 20      | 14       |  |  |  |
| 15                                                                             |         |                   | M           | 3367      |           |                                    | S | 1        | 20      | 16       |  |  |  |
| 17                                                                             |         |                   | M           | 3367      |           |                                    | S | 1        | 20      | 18       |  |  |  |
| 19                                                                             | 60      | 3                 | M GC-1      | 11000     |           |                                    | S | 1        | 20      | 20       |  |  |  |
| 21                                                                             |         |                   | M           | 11000     |           |                                    | S | 1        | 20      | 22       |  |  |  |
| 23                                                                             |         |                   | M           | 11000     |           |                                    | S | 1        | 20      | 24       |  |  |  |
| 25                                                                             | 60      | 3                 | M GC-2      | 11000     | 9000      | Transformer T-TC, *HL              | E | 3        | 110     | 26       |  |  |  |
| 27                                                                             |         |                   | M           | 11000     | 9000      |                                    | E |          |         | 28       |  |  |  |
| 29                                                                             |         |                   | M           | 11000     | 9000      |                                    | E |          |         | 30       |  |  |  |
| *HL = HANDLE LOCK *GFI = GROUND FAULT INTERRUPTER *AFI = ARC FAULT INTERRUPTER |         |                   |             |           |           |                                    |   |          |         |          |  |  |  |

PANEL SCHEDULE:

HF

VOLTAGE

277/480V, 3PH, 4W

225A MLO :MAIN

GRND BUS

YES

CONN.VA: 83220

SURFACE :MOUNTING

LOCATION:

ELECT 121

35,000 :IESCR

A=A/C E=EQUIP H=HEAT K=KITCH L=LIGHTS M=MOTOR R=RECEPT S=SPARE SP=SPACE

| CKT NO. | BKR AMP | P | DESCRIPTION | LOAD V.A. | LOAD V.A. | DESCRIPTION                      | P | BKR AMP | CKT NO. |
|---------|---------|---|-------------|-----------|-----------|----------------------------------|---|---------|---------|
| 1       | 60      | 3 | M           | RTU-21A   | 11626     | 2122 Lts-Rms 103-114,117-120,122 | L | 1       | 20      |
| 3       |         |   | M           |           | 11626     | 3740 Lts-Rm 129 North End        | L | 1       | 20      |
| 5       |         |   | M           |           | 11626     |                                  | S | 1       | 20      |
| 7       |         |   | SP          |           |           |                                  | S | 1       | 20      |
| 9       |         |   | SP          |           |           |                                  | S | 1       | 20      |
| 11      |         |   | SP          |           |           |                                  | S | 1       | 20      |
| 13      |         |   | SP          |           |           |                                  | S | 1       | 20      |
| 15      |         |   | SP          |           |           |                                  | S | 1       | 20      |
| 17      |         |   | SP          |           |           |                                  | S | 1       | 20      |
| 19      |         |   | SP          |           |           |                                  | S | 1       | 20      |
| 21      |         |   | SP          |           |           |                                  | S | 1       | 20      |
| 23      |         |   | SP          |           |           |                                  | S | 1       | 20      |
| 25      |         |   | SP          |           |           | 14160 Transformer T-TF, *HL      | E | 3       | 110     |
| 27      |         |   | SP          |           |           | 14160                            | E |         | 28      |
| 29      |         |   | SP          |           |           | 14160                            | E |         | 30      |

'HL' = HANDLE LOCK

\*GFI = GROUND FAULT INTERRUPTER

\*AFI = ARC FAULT INTERRUPTER

DIST. BOARD SCHEDULE: XH1

VOLTAGE277/480V, 3PH, 4W

400A MLO :MAIN

GRND BUSYES

CONN. AMPS303

LOCATIONSTORAGE 022

35,000 :IESCR

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PANEL SCHEDULE:

HA

VOLTAGE

277/480V, 3PH, 4W

225A MLO :MAIN

GRND BUS

YES

CONN.VA:

134271

SURFACE :MOUNTING

LOCATION:

ELEC 057

65,000 :IESCR

A=A/C E=EQUIP H=HEAT K=KITCH L=LIGHTS M=MOTOR R=RECEPT S=SPARE SP=SPACE

| CKT NO. | BKR AMP | P | DESCRIPTION | LOAD V.A. | LOAD V.A. | DESCRIPTION                  | P | BKR AMP | CKT NO. |
|---------|---------|---|-------------|-----------|-----------|------------------------------|---|---------|---------|
| 1       | 110     | 3 | M           | RTU-7B    | 21397     | 2695 Lts- Rms 46,49,50       | L | 1       | 20      |
| 3       |         |   | M           |           | 21397     | 2585 Lts- Rms 55,58,59,60,62 | L | 1       | 20      |
| 5       |         |   | M           |           | 21397     |                              | S | 1       | 20      |
| 7       |         |   | SP          |           |           |                              | S | 1       | 20      |
| 9       |         |   | SP          |           |           |                              | S | 1       | 20      |
| 11      |         |   | SP          |           |           |                              | S | 1       | 20      |
| 13      |         |   | SP          |           |           |                              | S | 1       | 20      |
| 15      |         |   | SP          |           |           |                              | S | 1       | 20      |
| 17      |         |   | SP          |           |           |                              | S | 1       | 20      |
| 19      |         |   | SP          |           |           |                              | S | 1       | 20      |
| 21      |         |   | SP          |           |           |                              | S | 1       | 20      |
| 23      |         |   | SP          |           |           |                              | S | 1       | 20      |
| 25      |         |   | SP          |           | 21600     | Transformer T-TA, *HL        | E | 3       | 110     |
| 27      |         |   | SP          |           | 21600     |                              | E |         | 28      |
| 29      |         |   | SP          |           | 21600     |                              | E |         | 30      |

'HL' = HANDLE LOCK

\*GFI = GROUND FAULT INTERRUPTER

\*AFI = ARC FAULT INTERRUPTER

|                    |  |  |                   |  |  |                |  |  |                   |  |  |
|--------------------|--|--|-------------------|--|--|----------------|--|--|-------------------|--|--|
| PANEL SCHEDULE: HD |  |  |                   |  |  |                |  |  |                   |  |  |
| VOLTAGE            |  |  | 277/480V, 3PH, 4W |  |  | 225A MLO :MAIN |  |  |                   |  |  |
| GRND BUS           |  |  | YES               |  |  | CONN.VA: 75748 |  |  | SURFACE :MOUNTING |  |  |
| LOCATION:          |  |  | ELECTRICAL 016    |  |  | 35,000 :IESCR  |  |  |                   |  |  |

**PANEL SCHEDULE: LA**

VOLTAGE 120/208V, 3PH, 4W  
 GRND BUS YES  
 LOCATION: ELEC 057  
 CONN.VA: 115624  
 250A MB :MAIN  
 SURFACE :MOUNTING  
 10,000 :IESCR

| A/A/C | E=  | HEAT | K=          | KITCH     | L=        | LIGHTS      | M= | MOTOR | R=  | RECEPT | S= | SPARE | SP= | SPACE | BKR | CKT |
|-------|-----|------|-------------|-----------|-----------|-------------|----|-------|-----|--------|----|-------|-----|-------|-----|-----|
| NO.   | AMP | P    | DESCRIPTION | LOAD V.A. | LOAD V.A. | DESCRIPTION | P  | AMP   | NO. |        |    |       |     |       |     |     |
| 1     | 20  | 1    | R 046       | 900       | 1200      | Furn Feed   | R  | 1     | 20  | 2      |    |       |     |       |     |     |
| 3     | 20  | 1    | R 050       | 360       | 1200      | Furn Feed   | R  | 1     | 20  | 4      |    |       |     |       |     |     |
| 5     | 20  | 1    | R 050       | 360       | 1200      | Furn Feed   | R  | 1     | 20  | 6      |    |       |     |       |     |     |
| 7     | 20  | 1    | R 050       | 360       | 800       | Furn Feed   | R  | 1     | 20  | 8      |    |       |     |       |     |     |
| 9     | 20  | 1    | R 050       | 360       | 1200      | Furn Feed   | R  | 1     | 20  | 10     |    |       |     |       |     |     |
| 11    | 20  | 1    | R 050       | 360       | 1200      | Furn Feed   | R  | 1     | 20  | 12     |    |       |     |       |     |     |
| 13    | 20  | 1    | R 055, 058  | 1620      | 1200      | Furn Feed   | R  | 1     | 20  | 14     |    |       |     |       |     |     |
| 15    | 20  | 1    | R 060, 062  | 1260      | 1200      | Furn Feed   | R  | 1     | 20  | 16     |    |       |     |       |     |     |
| 17    | 20  | 1    | R South     | 900       | 1200      | Furn Feed   | R  | 1     | 20  | 18     |    |       |     |       |     |     |
| 19    | 20  | 1    | R Furn Feed | 1200      | 1200      | Furn Feed   | R  | 1     | 20  | 20     |    |       |     |       |     |     |
| 21    | 20  | 1    | R Furn Feed | 1200      | 1200      | Furn Feed   | R  | 1     | 20  | 22     |    |       |     |       |     |     |
| 23    | 20  | 1    | R Furn Feed | 1200      |           |             | S  | 1     | 20  | 24     |    |       |     |       |     |     |
| 25    | 20  | 1    | R Furn Feed | 800       | 1200      | Furn Feed   | R  | 1     | 20  | 26     |    |       |     |       |     |     |
| 27    | 20  | 1    | R Ceiling R | 720       | 1200      | Furn Feed   | R  | 1     | 20  | 28     |    |       |     |       |     |     |
| 29    | 20  | 1    | R Ceiling R | 720       | 1200      | Furn Feed   | R  | 1     | 20  | 30     |    |       |     |       |     |     |
| 31    | 20  | 1    | R Furn Feed | 1200      | 800       | Furn Feed   | R  | 1     | 20  | 32     |    |       |     |       |     |     |
| 33    | 20  | 1    | R Furn Feed | 1200      | 1200      | Furn Feed   | R  | 1     | 20  | 34     |    |       |     |       |     |     |
| 35    | 20  | 1    | R Furn Feed | 1200      | 1200      | Furn Feed   | R  | 1     | 20  | 36     |    |       |     |       |     |     |
| 37    | 20  | 1    | R Furn Feed | 800       | 1200      | Furn Feed   | R  | 1     | 20  | 38     |    |       |     |       |     |     |
| 39    | 20  | 1    | R Furn Feed | 1200      | 800       | Furn Feed   | R  | 1     | 20  | 40     |    |       |     |       |     |     |
| 41    | 20  | 1    | R Furn Feed | 1200      | 1200      | Furn Feed   | R  | 1     | 20  | 42     |    |       |     |       |     |     |
| 43    | 20  | 1    | R Furn Feed | 1200      | 1200      | Furn Feed   | R  | 1     | 20  | 44     |    |       |     |       |     |     |
| 45    | 20  | 1    | R Furn Feed | 800       | 1200      | Furn Feed   | R  | 1     | 20  | 46     |    |       |     |       |     |     |
| 47    | 20  | 1    | R Furn Feed | 1200      | 800       | Furn Feed   | R  | 1     | 20  | 48     |    |       |     |       |     |     |
| 49    | 20  | 1    | R Furn Feed | 1200      |           |             | S  | 1     | 20  | 50     |    |       |     |       |     |     |
| 51    | 20  | 1    | R Furn Feed | 1200      | 1200      | Furn Feed   | R  | 1     | 20  | 52     |    |       |     |       |     |     |
| 53    | 20  | 1    | S           |           | 1200      | Furn Feed   | R  | 1     | 20  | 54     |    |       |     |       |     |     |
| 55    | 20  | 1    | R Furn Feed | 1200      | 1200      | Furn Feed   | R  | 1     | 20  | 56     |    |       |     |       |     |     |
| 57    | 20  | 1    | R Furn Feed | 1200      | 800       | Furn Feed   | R  | 1     | 20  | 58     |    |       |     |       |     |     |
| 59    | 20  | 1    | R Furn Feed | 1200      | 1200      | Furn Feed   | R  | 1     | 20  | 60     |    |       |     |       |     |     |
| 61    | 20  | 1    | R Furn Feed | 800       | 1200      | Furn Feed   | R  | 1     | 20  | 62     |    |       |     |       |     |     |
| 63    | 20  | 1    | R Furn Feed | 1200      | 1200      | Furn Feed   | R  | 1     | 20  | 64     |    |       |     |       |     |     |
| 65    | 20  | 1    | R Furn Feed | 1200      | 800       | Furn Feed   | R  | 1     | 20  | 66     |    |       |     |       |     |     |
| 67    | 20  | 1    | R Furn Feed | 1200      | 1200      | Furn Feed   | R  | 1     | 20  | 68     |    |       |     |       |     |     |
| 69    | 20  | 1    | R Furn Feed | 800       | 1200      | Furn Feed   | R  | 1     | 20  | 70     |    |       |     |       |     |     |
| 71    | 20  | 1    | R Furn Feed | 1200      | 1200      | Furn Feed   | R  | 1     | 20  | 72     |    |       |     |       |     |     |
| 73    | 20  | 1    | R Furn Feed | 1200      |           |             | S  | 1     | 20  | 74     |    |       |     |       |     |     |
| 75    | 20  | 1    | R Furn Feed | 1200      | 1200      | Furn Feed   | R  | 1     | 20  | 76     |    |       |     |       |     |     |
| 77    | 20  | 1    | R Furn Feed | 800       | 1200      | Furn Feed   | R  | 1     | 20  | 78     |    |       |     |       |     |     |
| 79    | 20  | 1    | R Furn Feed | 1200      | 1200      | Furn Feed   | R  | 1     | 20  | 80     |    |       |     |       |     |     |
| 81    | 20  | 1    | R Furn Feed | 1200      | 800       | Furn Feed   | R  | 1     | 20  | 82     |    |       |     |       |     |     |
| 83    | 20  | 1    | R Furn Feed | 1200      | 800       | Furn Feed   | R  | 1     | 20  | 84     |    |       |     |       |     |     |
| 85    | 20  | 1    | R Furn Feed | 800       | 1200      | Furn Feed   | R  | 1     | 20  | 86     |    |       |     |       |     |     |
| 87    | 20  | 1    | R Furn Feed | 1200      | 1200      | Furn Feed   | R  | 1     | 20  | 88     |    |       |     |       |     |     |
| 89    | 20  | 1    | R Furn Feed | 1200      | 800       | Furn Feed   | R  | 1     | 20  | 90     |    |       |     |       |     |     |
| 91    | 20  | 1    | R Furn Feed | 1200      | 2652      | RTU-4       | M  | 2     | 35  | 92     |    |       |     |       |     |     |
| 93    | 20  | 1    | R Furn Feed | 800       | 2652      |             | M  |       |     | 94     |    |       |     |       |     |     |
| 95    | 20  | 1    | R Furn Feed | 1200      |           |             | S  | 1     | 20  | 96     |    |       |     |       |     |     |
| 97    | 20  | 1    | R Furn Feed | 1200      |           |             | S  | 1     | 20  | 98     |    |       |     |       |     |     |
| 99    | 20  | 1    | R Furn Feed | 1200      |           |             | S  | 1     | 20  | 100    |    |       |     |       |     |     |
| 101   | 20  | 1    | R Furn Feed | 800       |           |             | S  | 1     | 20  | 102    |    |       |     |       |     |     |
| 103   | 20  | 1    | R Furn Feed | 1200      |           |             | S  | 1     | 20  | 104    |    |       |     |       |     |     |
| 105   | 20  | 1    | R Furn Feed | 1200      |           |             | S  | 1     | 20  | 106    |    |       |     |       |     |     |
| 107   | 20  | 1    | R Furn Feed | 1200      |           |             | S  | 1     | 20  | 108    |    |       |     |       |     |     |
| 109   | 20  | 1    | R Furn Feed | 800       |           |             | S  | 1     | 20  | 110    |    |       |     |       |     |     |
| 111   | 20  | 1    | R Furn Feed | 1200      |           |             | S  | 1     | 20  | 112    |    |       |     |       |     |     |
| 113   | 20  | 1    | R Furn Feed | 1200      |           |             | S  | 1     | 20  | 114    |    |       |     |       |     |     |
| 115   | 20  | 1    | R Furn Feed | 1200      |           |             | S  | 1     | 20  | 116    |    |       |     |       |     |     |
| 117   | 20  | 1    | R Furn Feed | 1200      |           |             | S  | 1     | 20  | 118    |    |       |     |       |     |     |
| 119   | 20  | 1    | R Furn Feed | 1200      |           |             | S  | 1     | 20  | 120    |    |       |     |       |     |     |
| 121   | 20  | 1    | R Furn Feed | 1200      |           | SPD         | E  | 3     | 30  | 122    |    |       |     |       |     |     |
| 123   | 20  | 1    | R Furn Feed | 800       |           |             | E  |       |     | 124    |    |       |     |       |     |     |
| 125   | 20  | 1    | S           |           |           |             | E  |       |     | 126    |    |       |     |       |     |     |

\*HL = HANDLE LOCK \*GFI = GROUND FAULT INTERRUPTER \*AFI = ARC FAULT INTERRUPTER

- NOTES:
1. Provide 200 percent rated neutral.
  2. Provide feed-through lugs. Layout based on three 42 circuit panelboards.
  3. Coordinate circuit installation with furniture installer. If internal furniture utilizes shared neutrals, provide circuit breaker handle ties as required.

**PANEL SCHEDULE: LC**

VOLTAGE 120/208V, 3PH, 4W  
 GRND BUS YES  
 LOCATION: MAILROOM 028  
 CONN.VA: 30346  
 225A MB :MAIN  
 SURFACE :MOUNTING  
 10,000 :IESCR

| A/A/C | E=  | HEAT | K=                   | KITCH     | L=        | LIGHTS                  | M= | MOTOR | R=  | RECEPT | S= | SPARE | SP= | SPACE | BKR | CKT |
|-------|-----|------|----------------------|-----------|-----------|-------------------------|----|-------|-----|--------|----|-------|-----|-------|-----|-----|
| NO.   | AMP | P    | DESCRIPTION          | LOAD V.A. | LOAD V.A. | DESCRIPTION             | P  | AMP   | NO. |        |    |       |     |       |     |     |
| 1     | 20  | 1    | M UH-2               | 720       | 1656      | OH-1 (Dock)             | E  | 1     | 20  | 2      |    |       |     |       |     |     |
| 3     | 20  | 1    | R 028 South Column   | 600       | 1800      | OH-2 (Air Lock)         | E  | 3     | 20  | 4      |    |       |     |       |     |     |
| 5     | 20  | 1    | R 028 Center Columns | 360       | 1800      |                         | E  |       |     | 6      |    |       |     |       |     |     |
| 7     | 20  | 1    | R 028 Cord Reel      | 360       | 1800      |                         | E  |       |     | 8      |    |       |     |       |     |     |
| 9     | 20  | 1    | R 026                | 1176      | 1176      | OH-3 (N Compactor Door) | E  | 1     | 20  | 10     |    |       |     |       |     |     |
| 11    | 20  | 1    | R 028 Counter Area   | 720       | 1176      | OH-3 (S Compactor Door) | E  | 1     | 20  | 12     |    |       |     |       |     |     |
| 13    | 20  | 1    | R 028 Counter Area   | 720       | 1440      | Dock Leveler            | E  | 3     | 20  | 14     |    |       |     |       |     |     |
| 15    | 20  | 1    | R 027                | 540       | 1440      |                         | E  |       |     | 16     |    |       |     |       |     |     |
| 17    | 20  | 1    | R 028 Wiremold       | 650       | 1440      |                         | E  |       |     | 18     |    |       |     |       |     |     |
| 19    | 20  | 1    | R 028 Wiremold       | 360       |           |                         | S  | 2     | 20  | 20     |    |       |     |       |     |     |
| 21    | 20  | 1    | R 028 Wiremold       | 500       |           |                         | S  |       |     | 22     |    |       |     |       |     |     |
| 23    | 20  | 1    | R 028 Wiremold       | 360       |           |                         | S  | 2     | 30  | 24     |    |       |     |       |     |     |
| 25    | 20  | 1    | R 028 Wiremold       | 180       |           |                         | S  |       |     | 26     |    |       |     |       |     |     |
| 27    | 20  | 1    | R 028 N and W Walls  | 720       |           |                         | S  | 1     | 20  | 28     |    |       |     |       |     |     |
| 29    | 30  | 2    | R 028 Center Column  | 2080      |           |                         | S  | 1     | 20  | 30     |    |       |     |       |     |     |
| 31    | 20  | 1    | R                    | 2080      |           |                         | S  | 1     | 20  | 32     |    |       |     |       |     |     |
| 33    | 20  | 2    | R 028 Wiremold       | 1664      |           |                         | S  | 1     | 20  | 34     |    |       |     |       |     |     |
| 35    | 20  | 1    | S                    | 1664      |           |                         | S  | 1     | 20  | 36     |    |       |     |       |     |     |
| 37    | 20  | 1    | R 028 Center Columns | 360       |           |                         | S  | 1     | 20  | 38     |    |       |     |       |     |     |
| 39    | 20  | 1    | R 028 South Wall     | 540       |           |                         | S  | 1     | 20  | 40     |    |       |     |       |     |     |
| 41    | 20  | 1    | R 028 Furn Feed      | 540       |           |                         | S  | 1     | 20  | 42     |    |       |     |       |     |     |
| 43    | 20  | 1    | S                    |           |           |                         | S  | 1     | 20  | 44     |    |       |     |       |     |     |
| 45    | 20  | 1    | S                    |           |           |                         | S  | 1     | 20  | 46     |    |       |     |       |     |     |
| 47    | 20  | 1    | S                    |           |           |                         | S  | 1     | 20  | 48     |    |       |     |       |     |     |
| 49    | 20  | 1    | S                    |           |           | SPD                     | E  | 3     | 30  | 50     |    |       |     |       |     |     |
| 51    | 20  | 1    | S                    |           |           |                         | E  |       |     | 52     |    |       |     |       |     |     |
| 53    | 20  | 1    | S                    |           |           |                         | E  |       |     | 54     |    |       |     |       |     |     |

\*HL = HANDLE LOCK \*GFI = GROUND FAULT INTERRUPTER \*AFI = ARC FAULT INTERRUPTER

- NOTES:
1. Provide 200 percent rated neutral.
  2. Provide feed-through lugs. Layout based on one 54 circuit panelboards.
  3. Coordinate circuit installation with furniture installer. If internal furniture utilizes shared neutrals, provide circuit breaker handle ties as required.

**PANEL SCHEDULE: LB**

VOLTAGE 120/208V, 3PH, 4W  
 GRND BUS YES  
 LOCATION: ELECTRIC 047  
 CONN.VA: 100676  
 225A MB :MAIN  
 SURFACE :MOUNTING  
 10,000 :IESCR

| CKT | NO | BKR | AMP | P           | DESCRIPTION | LOAD<br>V.A. | LOAD<br>V.A.  | DESCRIPTION | R | P | BKR | AMP | NO  |
|-----|----|-----|-----|-------------|-------------|--------------|---------------|-------------|---|---|-----|-----|-----|
| 1   | 20 | 2   | M   | RTU-6       | 1414        | 1200         | Furn Feed     |             | R | 1 | 20  | 2   |     |
| 3   |    |     | M   |             | 1414        | 1200         | Furn Feed     |             | R | 1 | 20  | 4   |     |
| 5   | 20 | 1   | R   | 041, 040    | 1440        | 1200         | Furn Feed     |             | R | 1 | 20  | 6   |     |
| 7   | 20 | 1   | R   | 039, 038    | 1620        | 800          | Furn Feed     |             | R | 1 | 20  | 8   |     |
| 9   | 20 | 1   | R   | 037, 035    | 1440        | 1200         | Furn Feed     |             | R | 1 | 20  | 10  |     |
| 11  | 20 | 1   | R   | 034         | 1080        | 1200         | Furn Feed     |             | R | 1 | 20  | 12  |     |
| 13  | 20 | 1   | R   | 033         | 900         | 1200         | Furn Feed     |             | R | 1 | 20  | 14  |     |
| 15  | 20 | 1   | R   | 032         | 900         | 800          | Furn Feed     |             | R | 1 | 20  | 16  |     |
| 17  | 20 | 1   | R   | 031         | 1080        | 1200         | Furn Feed     |             | R | 1 | 20  | 18  |     |
| 19  | 20 | 1   | R   | 030         | 540         | 1200         | Furn Feed     |             | R | 1 | 20  | 20  |     |
| 21  | 20 | 1   | R   | 030         | 540         | 1200         | Furn Feed     |             | R | 1 | 20  | 22  |     |
| 23  | 20 | 1   | R   | 030         | 360         | 800          | Furn Feed     |             | R | 1 | 20  | 24  |     |
| 25  | 20 | 1   | R   | Ceiling R   | 540         | 1200         | Furn Feed     |             | R | 1 | 20  | 26  |     |
| 27  | 20 | 1   | S   |             |             | 1200         | Furn Feed     |             | R | 1 | 20  | 28  |     |
| 29  | 20 | 1   | S   |             |             | 1200         | Furn Feed     |             | R | 1 | 20  | 30  |     |
| 31  | 20 | 1   | R   | Ceiling R   | 540         | 800          | Furn Feed     |             | R | 1 | 20  | 32  |     |
| 33  | 20 | 1   | R   | Furn Feed   | 1200        | 1200         | Furn Feed     |             | R | 1 | 20  | 34  |     |
| 35  | 20 | 1   | R   | Furn Feed   | 1200        | 1200         | Furn Feed     |             | R | 1 | 20  | 36  |     |
| 37  | 20 | 1   | R   | Furn Feed   | 1200        | 1200         | Furn Feed     |             | R | 1 | 20  | 38  |     |
| 39  | 20 | 1   | R   | Furn Feed   | 800         | 800          | Furn Feed     |             | R | 1 | 20  | 40  |     |
| 41  | 20 | 1   | R   | Furn Feed   | 1200        | 1200         | Furn Feed     |             | R | 1 | 20  | 42  |     |
| 43  | 20 | 1   | R   | Furn Feed   | 1200        | 800          | Furn Feed     |             | R | 1 | 20  | 44  |     |
| 45  | 20 | 1   | R   | Furn Feed   | 1200        | 800          | Furn Feed     |             | R | 1 | 20  | 46  |     |
| 47  | 20 | 1   | R   | Furn Feed   | 800         | 800          | Furn Feed     |             | R | 1 | 20  | 48  |     |
| 49  | 20 | 1   | R   | Furn Feed   | 1200        | 1200         | Furn Feed     |             | R | 1 | 20  | 50  |     |
| 51  | 20 | 1   | R   | Furn Feed   | 1200        | 1200         | Furn Feed     |             | R | 1 | 20  | 52  |     |
| 53  | 20 | 1   | R   | Furn Feed   | 1200        | 1200         | Furn Feed     |             | R | 1 | 20  | 54  |     |
| 55  | 20 | 1   | R   | Furn Feed   | 800         | 800          | Furn Feed     |             | R | 1 | 20  | 56  |     |
| 57  | 20 | 1   | R   | Furn Feed   | 1200        | 1200         | Furn Feed     |             | R | 1 | 20  | 58  |     |
| 59  | 20 | 1   | R   | Furn Feed   | 1200        | 1200         | Furn Feed     |             | R | 1 | 20  | 60  |     |
| 61  | 20 | 1   | R   | Furn Feed   | 1200        | 1200         | Furn Feed     |             | R | 1 | 20  | 62  |     |
| 63  | 20 | 1   | R   | Furn Feed   | 800         | 800          | Furn Feed     |             | R | 1 | 20  | 64  |     |
| 65  | 20 | 1   | R   | Furn Feed   | 1200        | 500          | CP2 (Rm. 029) |             | E | 1 | 20  | 66  |     |
| 67  | 20 | 1   | R   | Furn Feed   | 1200        | 360          | 031 Floor Box |             | R | 1 | 20  | 68  |     |
| 69  | 20 | 1   | R   | Furn Feed   | 1200        | 360          | 031 Floor Box |             | R | 1 | 20  | 70  |     |
| 71  | 20 | 1   | R   | Furn Feed   | 800         | 360          | 031 Floor Box |             | R | 1 | 20  | 72  |     |
| 73  | 20 | 1   | R   | Furn Feed   | 1200        | 360          | 031 Floor Box |             | R | 1 | 20  | 74  |     |
| 75  | 20 | 1   | R   | Furn Feed   | 1200        | 528          | EF-4          |             | E | 1 | 20  | 76  |     |
| 77  | 20 | 1   | R   | Furn Feed   | 1200        |              |               |             | S | 1 | 20  | 78  |     |
| 79  | 20 | 1   | R   | Furn Feed   | 800         |              |               |             | S | 1 | 20  | 80  |     |
| 81  | 20 | 1   | R   | 042         | 1000        |              |               |             | S | 1 | 20  | 82  |     |
| 83  | 20 | 1   | R   | 042         | 500         |              |               |             | S | 1 | 20  | 84  |     |
| 85  | 20 | 1   | R   | 042 Printer | 500         |              |               |             | S | 1 | 20  | 86  |     |
| 87  | 20 | 1   | S   |             |             |              |               |             | S | 1 | 20  | 88  |     |
| 89  | 20 | 1   | S   |             |             |              |               |             | S | 1 | 20  | 90  |     |
| 91  | 20 | 1   | S   |             |             |              |               |             | S | 1 | 20  | 92  |     |
| 93  | 20 | 1   | S   |             |             |              |               |             | S | 1 | 20  | 94  |     |
| 95  | 20 | 1   | S   |             |             |              |               |             | S | 1 | 20  | 96  |     |
| 97  | 20 | 1   | S   |             |             |              |               |             | S | 1 | 20  | 98  |     |
| 99  | 20 | 1   | S   |             |             |              |               |             | S | 1 | 20  | 100 |     |
| 101 | 20 | 1   | S   |             |             |              |               |             | S | 1 | 20  | 102 |     |
| 103 | 20 | 1   | S   |             |             | SPD          |               |             | E | 3 | 30  | 104 |     |
| 105 | 20 | 1   | S   |             |             |              |               |             | E |   |     |     | 106 |
| 107 | 20 | 1   | S   |             |             |              |               |             | E |   |     |     | 108 |

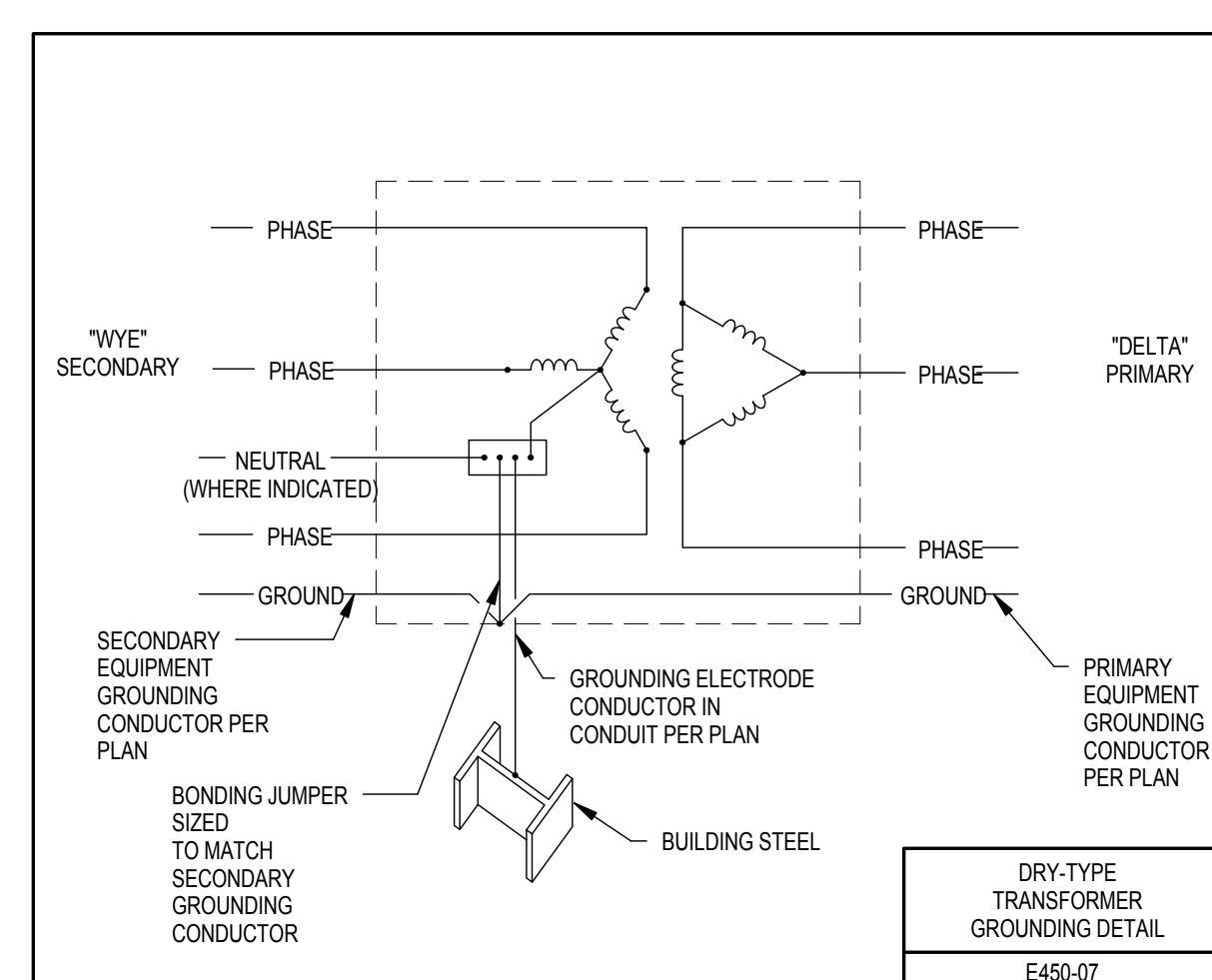
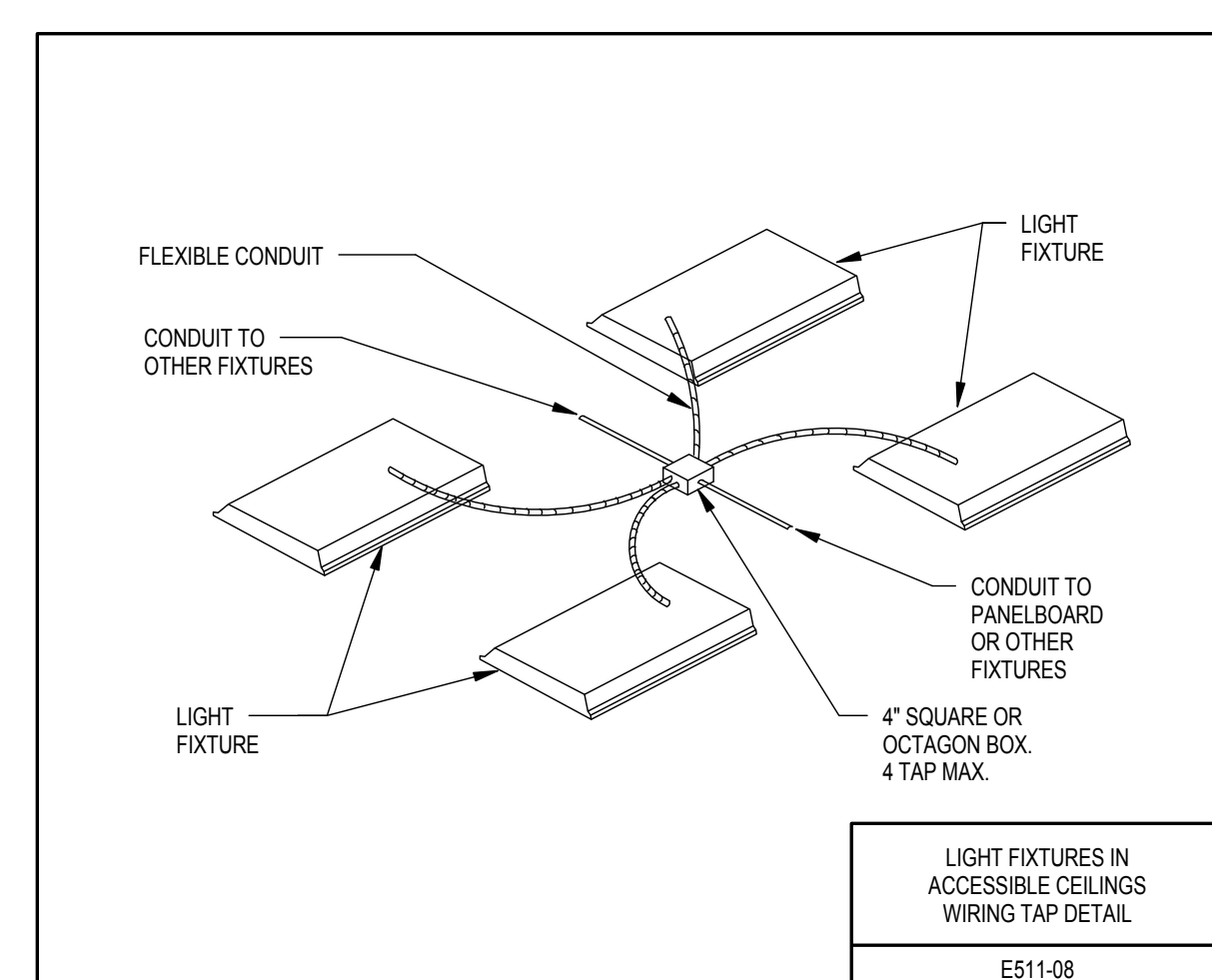
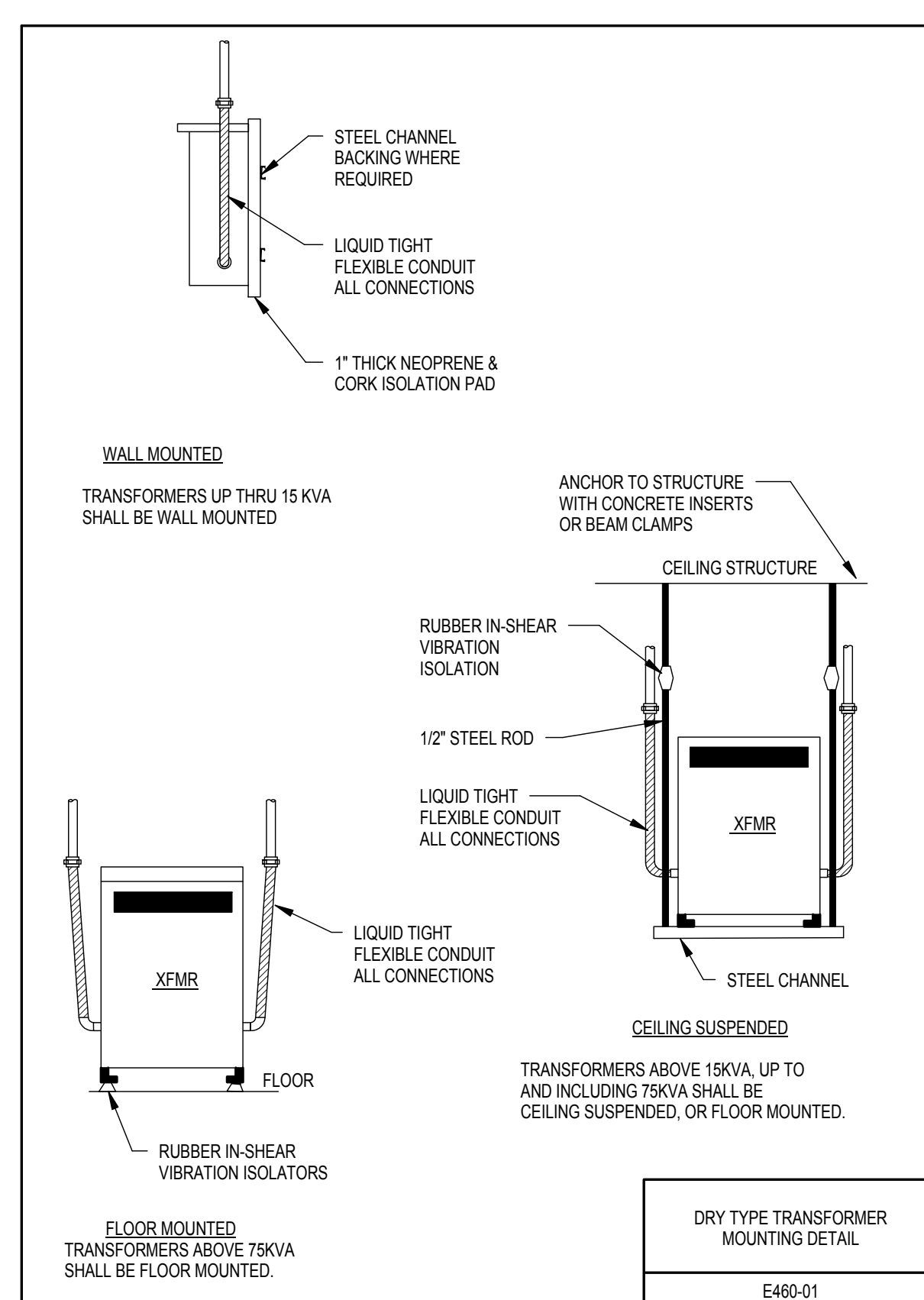
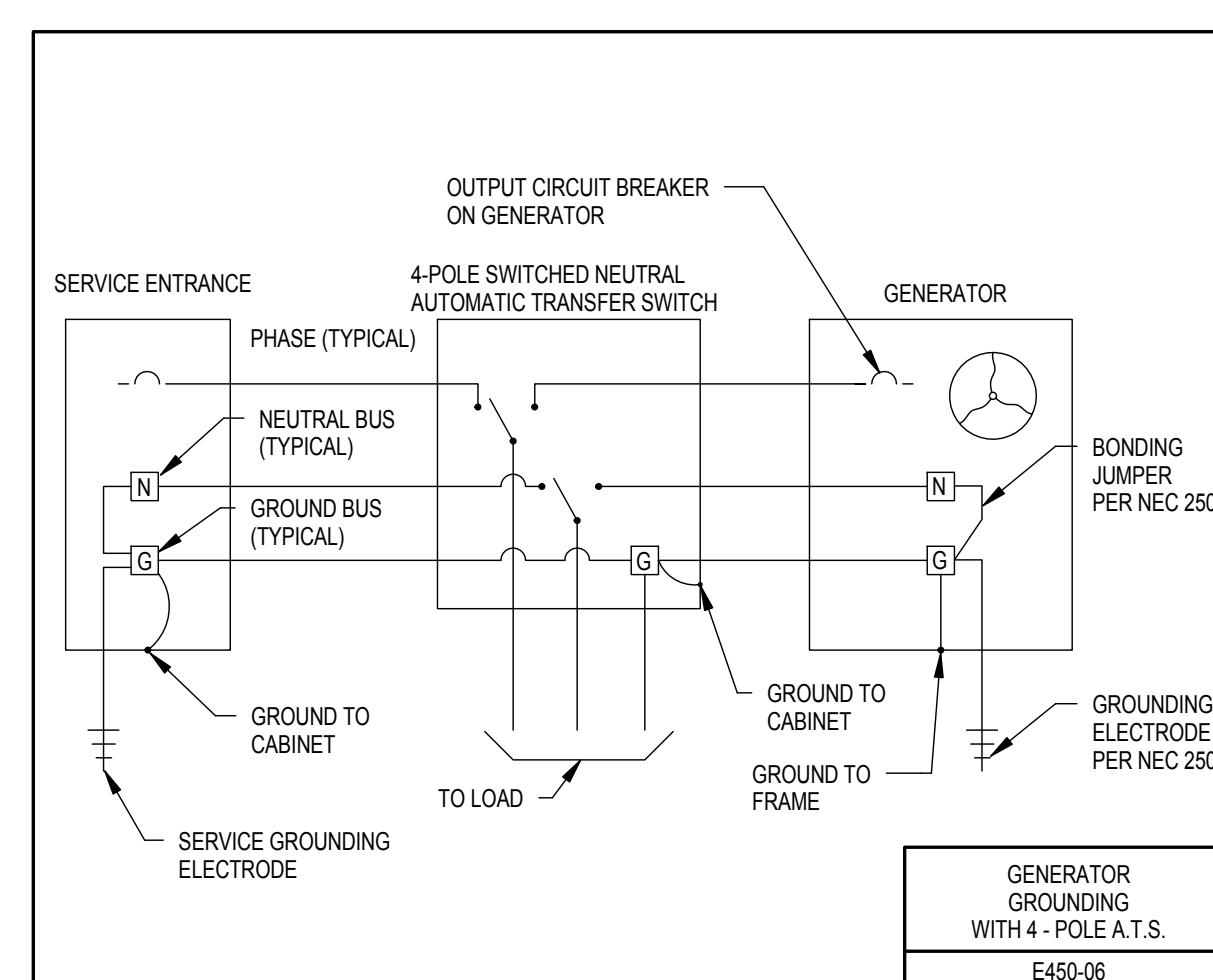
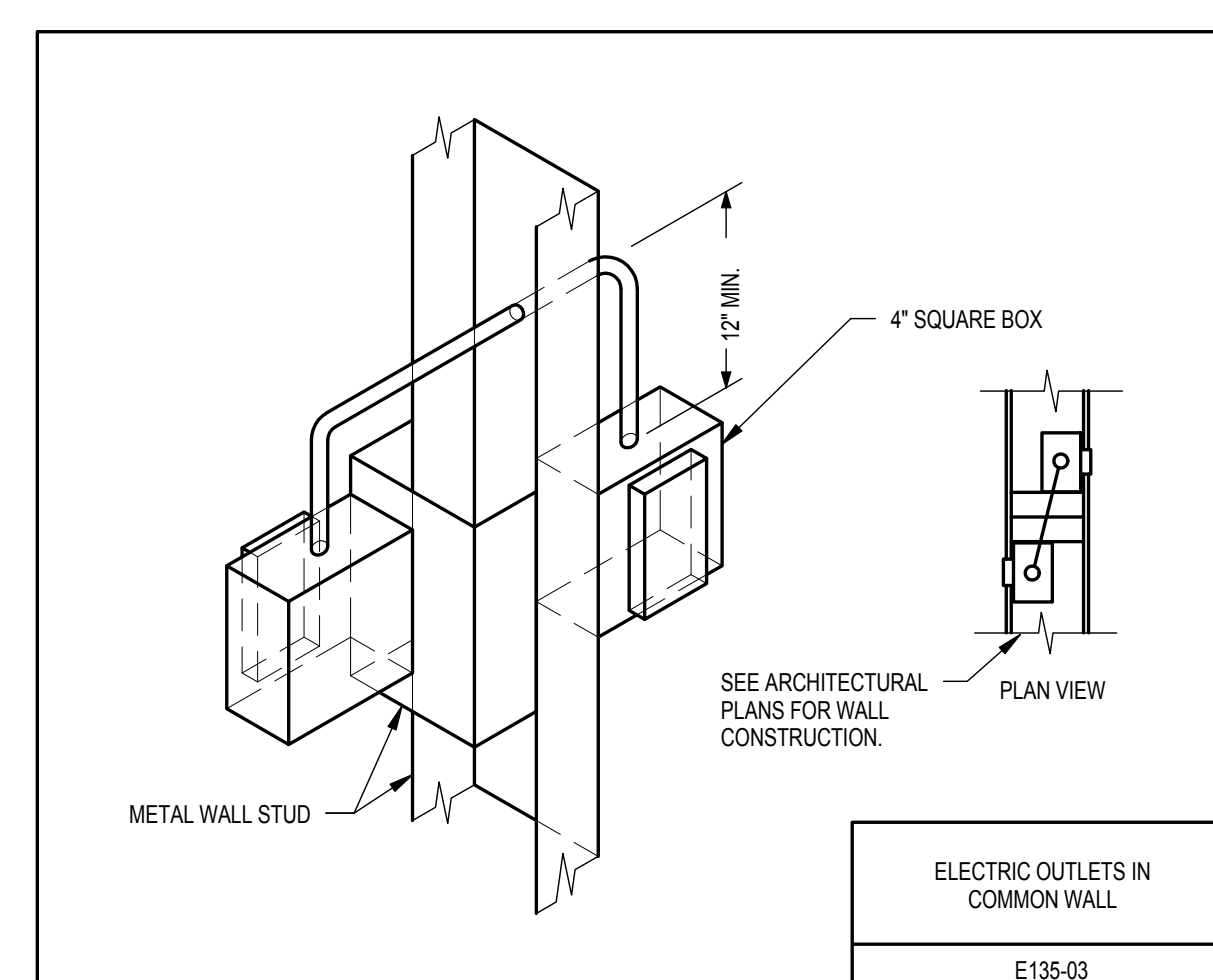
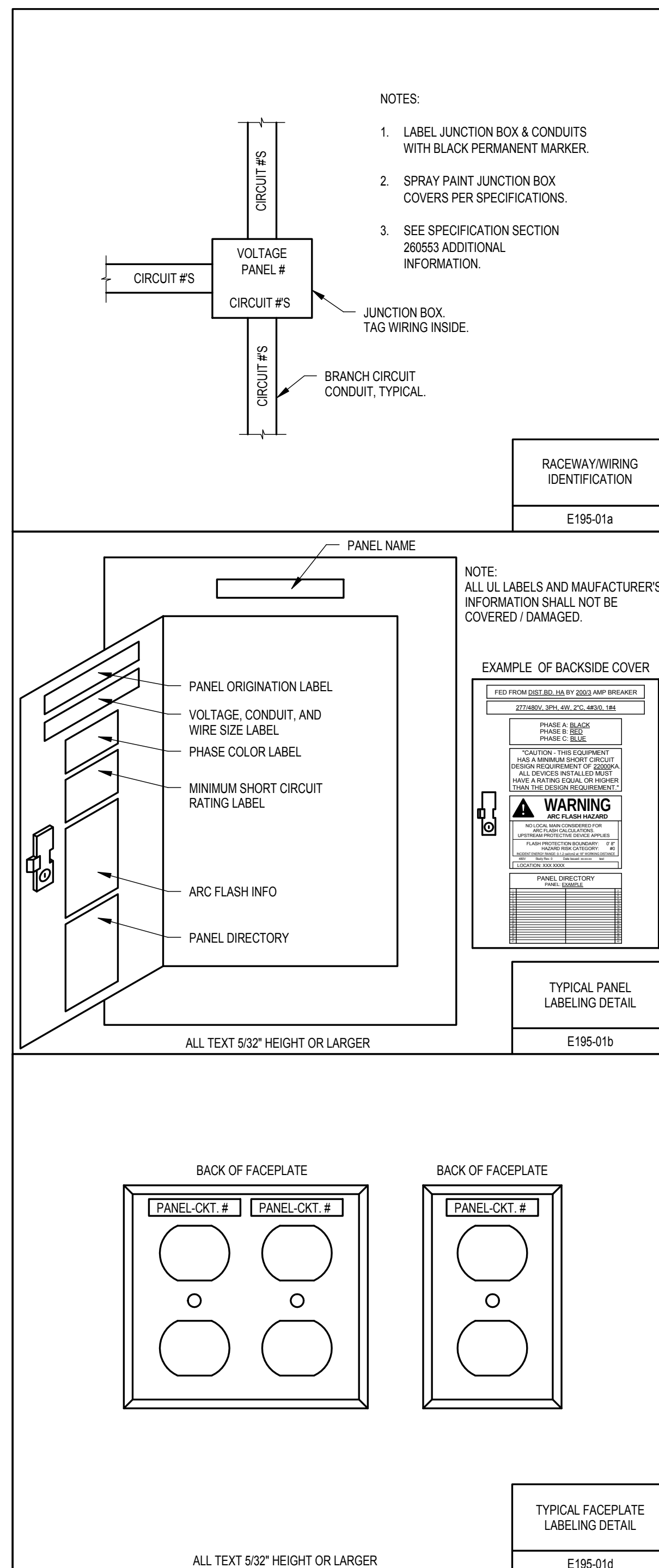
| PANEL SCHEDULE:                                                                |         |   |                                 | SV1             |           |                               |   |                  |     |    |  |
|--------------------------------------------------------------------------------|---------|---|---------------------------------|-----------------|-----------|-------------------------------|---|------------------|-----|----|--|
| VOLTAGE 120/208V, 3PH, 4W                                                      |         |   |                                 | 400A MB MAIN    |           |                               |   |                  |     |    |  |
| GRND BUS YES                                                                   |         |   |                                 | CONN VA: 107055 |           |                               |   | SURFACE MOUNTING |     |    |  |
| LOCATION: SERVER 023                                                           |         |   |                                 | 10,000 IESCR    |           |                               |   |                  |     |    |  |
| A=A/C E=EQUIP H=HEAT K=KITCH L=LIGHTS M=MOTOR R=RECEPT S=SPARE SP=SPACE        |         |   |                                 |                 |           |                               |   |                  |     |    |  |
| CKT NO.                                                                        | BKR AMP | P | DESCRIPTION                     | LOAD V.A.       | LOAD V.A. | DESCRIPTION                   | P | BKR AMP          | NO. |    |  |
| 1                                                                              | 20      | 1 | R South Rack #1 Twist Lock      | 1920            | 1920      | North Rack #1 Twist Lock      | R | 1                | 20  | 2  |  |
| 3                                                                              | 20      | 1 | R South Rack #1 Twist Lock      | 1920            | 1920      | North Rack #1 Twist Lock      | R | 1                | 20  | 4  |  |
| 5                                                                              | 20      | 1 | R South Rack #1 Twist Lock      | 1920            | 1920      | North Rack #1 Twist Lock      | R | 1                | 20  | 6  |  |
| 7                                                                              | 20      | 1 | R South Rack #2 Twist Lock      | 1920            | 1920      | North Rack #2 Twist Lock      | R | 1                | 20  | 8  |  |
| 9                                                                              | 20      | 1 | R South Rack #2 Twist Lock      | 1920            | 1920      | North Rack #2 Twist Lock      | R | 1                | 20  | 10 |  |
| 11                                                                             | 20      | 1 | R South Rack #2 Twist Lock      | 1920            | 1920      | North Rack #2 Twist Lock      | R | 1                | 20  | 12 |  |
| 13                                                                             | 20      | 1 | R South Rack #3 Twist Lock      | 1920            | 1920      | North Rack #3 Twist Lock      | R | 1                | 20  | 14 |  |
| 15                                                                             | 20      | 1 | R South Rack #3 Twist Lock      | 1920            | 1920      | North Rack #3 Twist Lock      | R | 1                | 20  | 16 |  |
| 17                                                                             | 20      | 1 | R South Rack #3 Twist Lock      | 1920            | 1920      | North Rack #3 Twist Lock      | R | 1                | 20  | 18 |  |
| 19                                                                             | 20      | 1 | R South Rack #4 Twist Lock      | 1920            | 1920      | North Rack #4 Twist Lock      | R | 1                | 20  | 20 |  |
| 21                                                                             | 20      | 1 | R South Rack #4 Twist Lock      | 1920            | 1920      | North Rack #4 Twist Lock      | R | 1                | 20  | 22 |  |
| 23                                                                             | 20      | 1 | R South Rack #4 Twist Lock      | 1920            | 1920      | North Rack #4 Twist Lock      | R | 1                | 20  | 24 |  |
| 25                                                                             | 20      | 1 | R South Rack #5 Twist Lock      | 1920            | 1920      | North Rack #5 Twist Lock      | R | 1                | 20  | 26 |  |
| 27                                                                             | 20      | 1 | R South Rack #5 Twist Lock      | 1920            | 1920      | North Rack #5 Twist Lock      | R | 1                | 20  | 28 |  |
| 29                                                                             | 20      | 1 | R South Rack #5 Twist Lock      | 1920            | 1920      | North Rack #5 Twist Lock      | R | 1                | 20  | 30 |  |
| 31                                                                             | 20      | 1 | R South Rack #6 Twist Lock      | 1920            | 1920      | North Rack #6 Twist Lock      | R | 1                | 20  | 32 |  |
| 33                                                                             | 20      | 1 | R South Rack #6 Twist Lock      | 1920            | 1920      | North Rack #6 Twist Lock      | R | 1                | 20  | 34 |  |
| 35                                                                             | 20      | 1 | R South Rack #6 Twist Lock      | 1920            | 1920      | North Rack #6 Twist Lock      | R | 1                | 20  | 36 |  |
| 37                                                                             | 20      | 1 | R South Demarc/Future Demarc TL | 1920            | 1920      | North Demarc/Future Demarc TL | R | 1                | 20  | 38 |  |
| 39                                                                             | 20      | 1 | R South Wall +75" Recept        | 1920            | 1920      | North Wall +75" Recept.       | R | 1                | 20  | 40 |  |
| 41                                                                             | 20      | 1 | S                               |                 |           | S                             | 1 | 20               | 42  |    |  |
| 43                                                                             | 60      | 3 | E Panel TC1                     | 3180            | 2515      | Panel TC3                     | E | 3                | 60  | 44 |  |
| 45                                                                             |         |   | E                               | 3180            | 2515      |                               | E |                  |     | 46 |  |
| 47                                                                             |         |   | E                               | 3180            | 2515      |                               | E |                  |     | 48 |  |
| 49                                                                             | 60      | 3 | E Panel TC2                     | 2015            | 2015      | Panel TC4                     | E | 3                | 60  | 50 |  |
| 51                                                                             |         |   | E                               | 2015            | 2015      |                               | E |                  |     | 52 |  |
| 53                                                                             |         |   | E                               | 2015            | 2015      |                               | E |                  |     | 54 |  |
| 55                                                                             | 20      | 1 | R N Convenience Recept.         | 540             |           |                               | S | 1                | 20  | 56 |  |
| 57                                                                             | 20      | 1 | R S Convenience Recept.         | 540             |           |                               | S | 1                | 20  | 58 |  |
| 59                                                                             | 20      | 1 | S                               |                 |           |                               | S | 1                | 20  | 60 |  |
| 61                                                                             | 20      | 1 | S                               |                 |           |                               | S | 1                | 20  | 62 |  |
| 63                                                                             | 20      | 1 | S                               |                 |           |                               | S | 1                | 20  | 64 |  |
| 65                                                                             | 20      | 1 | S                               |                 |           |                               | S | 1                | 20  | 66 |  |
| 67                                                                             | 20      | 1 | S                               |                 |           |                               | S | 1                | 20  | 68 |  |
| 69                                                                             | 20      | 1 | S                               |                 |           |                               | S | 1                | 20  | 70 |  |
| 71                                                                             | 20      | 1 | S                               |                 |           |                               | S | 1                | 20  | 72 |  |
| 73                                                                             | 20      | 1 | S                               |                 |           |                               | S | 1                | 20  | 74 |  |
| 75                                                                             | 20      | 1 | S                               |                 |           |                               | S | 1                | 20  | 76 |  |
| 77                                                                             | 20      | 1 | S                               |                 |           |                               | S | 1                | 20  | 78 |  |
| 79                                                                             | 20      | 1 | S                               |                 |           |                               | S | 1                | 20  | 80 |  |
| 81                                                                             | 20      | 1 | S                               |                 |           |                               | S | 1                | 20  | 82 |  |
| 83                                                                             | 20      | 1 | S                               |                 |           |                               | S | 1                | 20  | 84 |  |
| *HL = HANDLE LOCK *GFI = GROUND FAULT INTERRUPTER *AFI = ARC FAULT INTERRUPTER |         |   |                                 |                 |           |                               |   |                  |     |    |  |

| PANEL SCHEDULE:                                                                |     |     |   | TC1                |           |           |                         |                  |     |     |         |
|--------------------------------------------------------------------------------|-----|-----|---|--------------------|-----------|-----------|-------------------------|------------------|-----|-----|---------|
| VOLTAGE 120/208V, 3PH, 4W                                                      |     |     |   | 60A MLO MAIN       |           |           |                         |                  |     |     |         |
| GRND BUS YES                                                                   |     |     |   | CONN VA: 9540      |           |           |                         | SURFACE MOUNTING |     |     |         |
| LOCATION: TELECOM 063                                                          |     |     |   | 10,000 IESCR       |           |           |                         |                  |     |     |         |
| A=A/C E=EQUIP H=HEAT K=KITCH L=LIGHTS M=MOTOR R=RECEPT S=SPARE SP=SPACE        |     |     |   |                    |           |           |                         |                  |     |     |         |
| CKT NO.                                                                        | BKR | AMP | P | DESCRIPTION        | LOAD V.A. | LOAD V.A. | DESCRIPTION             | P                | BKR | AMP | CKT NO. |
| 1                                                                              | 20  | 1   | R | Rack #1 Twist Lock | 1500      | 1500      | Access Control          | E                | 1   | 20  | 2       |
| 3                                                                              | 20  | 1   | R | Rack #1 Twist Lock | 1500      | 540       | Convenience Receptacles | R                | 1   | 20  | 4       |
| 5                                                                              | 20  | 1   | R | Rack #2 Twist Lock | 1500      |           |                         | S                | 1   | 20  | 6       |
| 7                                                                              | 20  | 1   | R | Rack #2 Twist Lock | 1500      |           |                         | S                | 1   | 20  | 8       |
| 9                                                                              | 20  | 1   | R | Rack #3 Twist Lock | 1500      |           |                         | S                | 1   | 20  | 10      |
| 11                                                                             | 20  | 1   | S |                    |           |           |                         | S                | 1   | 20  | 12      |
| 13                                                                             | 20  | 1   | S |                    |           |           |                         | SP               |     |     | 14      |
| 15                                                                             | 20  | 1   | S |                    |           |           |                         | SP               |     |     | 16      |
| 17                                                                             | 20  | 1   | S |                    |           |           |                         | SP               |     |     | 18      |
| 19                                                                             |     |     |   | SP                 |           |           |                         | SP               |     |     | 20      |
| 21                                                                             |     |     |   | SP                 |           |           |                         | SP               |     |     | 22      |
| 23                                                                             |     |     |   | SP                 |           |           |                         | SP               |     |     | 24      |
| 25                                                                             |     |     |   | SP                 |           |           |                         | SP               |     |     | 26      |
| 27                                                                             |     |     |   | SP                 |           |           |                         | SP               |     |     | 28      |
| 29                                                                             |     |     |   | SP                 |           |           |                         | SP               |     |     | 30      |
| *HL = HANDLE LOCK *GFI = GROUND FAULT INTERRUPTER *AFI = ARC FAULT INTERRUPTER |     |     |   |                    |           |           |                         |                  |     |     |         |

| PANEL SCHEDULE:                                                                |         |   |                      | TC2           |           |                         |    |         |         |  |  |
|--------------------------------------------------------------------------------|---------|---|----------------------|---------------|-----------|-------------------------|----|---------|---------|--|--|
| VOLTAGE 120/208V, 3PH, 4W                                                      |         |   |                      | 60A MLO MAIN  |           |                         |    |         |         |  |  |
| GRND BUS YES                                                                   |         |   |                      | CONN VA: 6040 |           | SURFACE MOUNTING        |    |         |         |  |  |
| LOCATION: TELECOM 137                                                          |         |   |                      |               |           | 10,000 IESCR            |    |         |         |  |  |
| A=A/C E=EQUIP H=HEAT K=KITCH L=LIGHTS M=MOTOR R=RECEPT S=SPARE SP=SPACE        |         |   |                      |               |           |                         |    |         |         |  |  |
| CKT NO.                                                                        | BKR AMP | P | DESCRIPTION          | LOAD V.A.     | LOAD V.A. | DESCRIPTION             | P  | BKR AMP | CKT NO. |  |  |
| 1                                                                              | 20      | 1 | R Rack #1 Twist Lock | 1375          | 540       | Convenience Receptacles | R  | 1 20    | 2       |  |  |
| 3                                                                              | 20      | 1 | R Rack #1 Twist Lock | 1375          |           |                         | S  | 1 20    | 4       |  |  |
| 5                                                                              | 20      | 1 | R Rack #1 Twist Lock | 1375          |           |                         | S  | 1 20    | 6       |  |  |
| 7                                                                              | 20      | 1 | R Rack #1 Twist Lock | 1375          |           |                         | S  | 1 20    | 8       |  |  |
| 9                                                                              | 20      | 1 | S                    |               |           |                         | S  | 1 20    | 10      |  |  |
| 11                                                                             | 20      | 1 | S                    |               |           |                         | S  | 1 20    | 12      |  |  |
| 13                                                                             |         |   | SP                   |               |           |                         | SP |         | 14      |  |  |
| 15                                                                             |         |   | SP                   |               |           |                         | SP |         | 16      |  |  |
| 17                                                                             |         |   | SP                   |               |           |                         | SP |         | 18      |  |  |
| 19                                                                             |         |   | SP                   |               |           |                         | SP |         | 20      |  |  |
| 21                                                                             |         |   | SP                   |               |           |                         | SP |         | 22      |  |  |
| 23                                                                             |         |   | SP                   |               |           |                         | SP |         | 24      |  |  |
| 25                                                                             |         |   | SP                   |               |           |                         | SP |         | 26      |  |  |
| 27                                                                             |         |   | SP                   |               |           |                         | SP |         | 28      |  |  |
| 29                                                                             |         |   | SP                   |               |           |                         | SP |         | 30      |  |  |
| *HL = HANDLE LOCK *GFI = GROUND FAULT INTERRUPTER *AFI = ARC FAULT INTERRUPTER |         |   |                      |               |           |                         |    |         |         |  |  |

| PANEL SCHEDULE:                                                                |     |                   |    | TC3                |           |           |                         |          |     |         |
|--------------------------------------------------------------------------------|-----|-------------------|----|--------------------|-----------|-----------|-------------------------|----------|-----|---------|
| VOLTAGE                                                                        |     | 120/208V, 3PH, 4W |    |                    |           | 60A MLO   |                         | MAIN     |     |         |
| GRND BUS                                                                       |     | YES               |    | CONN VA: 7540      |           | SURFACE   |                         | MOUNTING |     |         |
| LOCATION:                                                                      |     | TELECOM 116       |    |                    |           | 10,000    |                         | IESCR    |     |         |
| A=A/C E=EQUIP H=HEAT K=KITCH L=LIGHTS M=MOTOR R=RECEPT S=SPARE SP=SPACE        |     |                   |    |                    |           |           |                         |          |     |         |
| CKT NO.                                                                        | BKR | AMP               | P  | DESCRIPTION        | LOAD V.A. | LOAD V.A. | DESCRIPTION             | P        | BKR | CKT NO. |
| 1                                                                              | 20  | 1                 | R  | Rack #1 Twist Lock | 1375      | 1500      | Access Control          | E        | 1   | 20 2    |
| 3                                                                              | 20  | 1                 | R  | Rack #1 Twist Lock | 1375      | 540       | Convenience Receptacles | R        | 1   | 20 4    |
| 5                                                                              | 20  | 1                 | R  | Rack #2 Twist Lock | 1375      |           |                         | S        | 1   | 20 6    |
| 7                                                                              | 20  | 1                 | R  | Rack #3 Twist Lock | 1375      |           |                         | S        | 1   | 20 8    |
| 9                                                                              | 20  | 1                 | S  |                    |           |           |                         | S        | 1   | 20 10   |
| 11                                                                             | 20  | 1                 | S  |                    |           |           |                         | S        | 1   | 20 12   |
| 13                                                                             |     |                   | SP |                    |           |           |                         | SP       |     | 14      |
| 15                                                                             |     |                   | SP |                    |           |           |                         | SP       |     | 16      |
| 17                                                                             |     |                   | SP |                    |           |           |                         | SP       |     | 18      |
| 19                                                                             |     |                   | SP |                    |           |           |                         | SP       |     | 20      |
| 21                                                                             |     |                   | SP |                    |           |           |                         | SP       |     | 22      |
| 23                                                                             |     |                   | SP |                    |           |           |                         | SP       |     | 24      |
| 25                                                                             |     |                   | SP |                    |           |           |                         | SP       |     | 26      |
| 27                                                                             |     |                   | SP |                    |           |           |                         | SP       |     | 28      |
| 29                                                                             |     |                   | SP |                    |           |           |                         | SP       |     | 30      |
| *HL = HANDLE LOCK *GFI = GROUND FAULT INTERRUPTER *AFI = ARC FAULT INTERRUPTER |     |                   |    |                    |           |           |                         |          |     |         |

| PANEL SCHEDULE:                                                                |     |     |   | TC4                |           |           |                         |    |     |     |     |
|--------------------------------------------------------------------------------|-----|-----|---|--------------------|-----------|-----------|-------------------------|----|-----|-----|-----|
| VOLTAGE 120/208V, 3PH, 4W                                                      |     |     |   | 60A MLO MAIN       |           |           |                         |    |     |     |     |
| GRND BUS YES                                                                   |     |     |   | CONN VA: 6040      |           |           |                         |    |     |     |     |
| LOCATION: TELECOM 175                                                          |     |     |   | 10,000 IESCR       |           |           |                         |    |     |     |     |
| A=A/C E=EQUIP H=HEAT K=KITCH L=LIGHTS M=MOTOR R=RECEPT S=SPARE SP=SPACE        |     |     |   |                    |           |           |                         |    |     |     |     |
| CKT                                                                            | BKR | AMP | P | DESCRIPTION        | LOAD V.A. | LOAD V.A. | DESCRIPTION             | P  | BKR | AMP | CKT |
| 1                                                                              | 20  | 1   | R | Rack #1 Twist Lock | 1000      | 1500      | Access Control          | E  | 1   | 20  | 2   |
| 3                                                                              | 20  | 1   | R | Rack #1 Twist Lock | 1000      | 540       | Convenience Receptacles | R  | 1   | 20  | 4   |
| 5                                                                              | 20  | 1   | R | Rack #2 Twist Lock | 1000      |           |                         | S  | 1   | 20  | 6   |
| 7                                                                              | 20  | 1   | R | Rack #3 Twist Lock | 1000      |           |                         | S  | 1   | 20  | 8   |
| 9                                                                              | 20  | 1   | S |                    |           |           |                         | S  | 1   | 20  | 10  |
| 11                                                                             | 20  | 1   | S |                    |           |           |                         | S  | 1   | 20  | 12  |
| 13                                                                             | 20  | 1   | S |                    |           |           |                         | SP |     |     | 14  |
| 15                                                                             |     |     |   | SP                 |           |           |                         | SP |     |     | 16  |
| 17                                                                             |     |     |   | SP                 |           |           |                         | SP |     |     | 18  |
| 19                                                                             |     |     |   | SP                 |           |           |                         | SP |     |     | 20  |
| 21                                                                             |     |     |   | SP                 |           |           |                         | SP |     |     | 22  |
| 23                                                                             |     |     |   | SP                 |           |           |                         | SP |     |     | 24  |
| 25                                                                             |     |     |   | SP                 |           |           |                         | SP |     |     | 26  |
| 27                                                                             |     |     |   | SP                 |           |           |                         | SP |     |     | 28  |
| 29                                                                             |     |     |   | SP                 |           |           |                         | SP |     |     | 30  |
| *HL = HANDLE LOCK *GFI = GROUND FAULT INTERRUPTER *AFI = ARC FAULT INTERRUPTER |     |     |   |                    |           |           |                         |    |     |     |     |



| LIGHTING SEQUENCE OF OPERATION SCHEDULE |             |                        |             |             |                           |                 |             |                           |               |             |                        |  |  |  |
|-----------------------------------------|-------------|------------------------|-------------|-------------|---------------------------|-----------------|-------------|---------------------------|---------------|-------------|------------------------|--|--|--|
| ROOM NAME                               | ROOM NUMBER | CONTROL SEQUENCE GROUP | ROOM NAME   | ROOM NUMBER | CONTROL SEQUENCE GROUP    | ROOM NAME       | ROOM NUMBER | CONTROL SEQUENCE GROUP    | ROOM NAME     | ROOM NUMBER | CONTROL SEQUENCE GROUP |  |  |  |
| VEST                                    | 001         | 9                      | OFFICE      | 046         | 1                         | VEST            | 101         | 9                         | STAIR A       | 151         | 6                      |  |  |  |
| BREAK ROOM                              | 002         | 11                     | ELECTRIC    | 047         | 5                         | LOBBY/RECEPTION | 102         | 13                        | FUTURE OFFICE | 152         | 5                      |  |  |  |
| - BREAK ROOM UNDERCABINET               |             | 10                     | CLOSET      | 048         | 1                         | COFFEE BAR/WORK | 103         | 10                        | HALLWAY       | 153         | 2                      |  |  |  |
| STAIR A                                 | 003         | 6                      | OPEN OFFICE | 049         | 12                        | OFFICE          | 104         | 1                         | HR CONF       | 154         | 3                      |  |  |  |
| IT                                      | 004         | 4                      | PCI         | 050         | 11                        | OFFICE          | 105         | 1                         | WELLNESS      | 155         | 1                      |  |  |  |
| OFFICE                                  | 005         | 1                      | WOMEN       | 051         | 2                         | OFFICE          | 106         | 1                         | HR            | 156         | 1                      |  |  |  |
| OFFICE                                  | 006         | 1                      | MEN         | 052         | 2                         | OFFICE          | 107         | 1                         | HR            | 157         | 1                      |  |  |  |
| OFFICE                                  | 007         | 1                      | SHOWER      | 053         | 1                         | OFFICE          | 108         | 1                         | RECRUIT       | 158         | 1                      |  |  |  |
| OFFICE                                  | 008         | 1                      | SHOWER      | 054         | 1                         | OFFICE          | 109         | 1                         | RECRUIT       | 159         | 1                      |  |  |  |
| OFFICE                                  | 009         | 1                      | OFFICE      | 055         | 1                         | OFFICE          | 110         | 1                         | RECRUIT       | 160         | 1                      |  |  |  |
| OFFICE                                  | 010         | 1                      | JAN         | 056         | 1                         | OFFICE          | 111         | 1                         | CLOSET        | 161         | N/A                    |  |  |  |
| OFFICE                                  | 011         | 1                      | ELEC        | 057         | 5                         | OFFICE          | 112         | 1                         | STAIR B       | 162         | 6                      |  |  |  |
| OFFICE                                  | 012         | 1                      | OFFICE      | 058         | 1                         | OFFICE          | 113         | 1                         | OPEN          | 163         | 1                      |  |  |  |
| CONF                                    | 013         | 3                      | OPEN OFFICE | 059         | 12                        | CONF            | 114         | 14                        | VP OFFICE     | 163         | 1                      |  |  |  |
| OFFICE                                  | 014         | 1                      | OFFICE      | 060         | 1                         | STAIR D         | 115         | 13                        | VP OFFICE     | 164         | 1                      |  |  |  |
| COPY                                    | 015         | 1                      | HALLWAY     | 061         | 2                         | TELECOM         | 116         | 5                         | HALLWAY       | 165         | 2                      |  |  |  |
| ELECTRICAL                              | 016         | 5                      | CLOSET      | 062         | 1                         | OFFICE          | 117         | 1                         | HR SUITE      | 166         | 12                     |  |  |  |
| IT                                      | 017         | 4                      | TELECOM     | 063         | 5                         | OFFICE          | 118         | 1                         | TRAINING      | 167         | 15                     |  |  |  |
| CLOSET                                  | 018         | 1                      | EMER        | 064         | 5                         | OFFICE          | 119         | 1                         | BOARDROOM     | 168         | 15                     |  |  |  |
| STAIR B                                 | 019         | 6                      |             |             | HALLWAY                   | 120             | 2           | CLOSET                    | 169           | N/A         |                        |  |  |  |
| CONF                                    | 020         | 3                      |             |             | ELECT                     | 121             | 5           | COFFEE BAR                | 170           | 2           |                        |  |  |  |
| WATER/MECH                              | 021         | 5                      |             |             | CLOSET                    | 122             | 1           | - COFFEE BAR UNDERCABINET |               | 10          |                        |  |  |  |
| STORAGE                                 | 022         | 11                     |             |             | PHONE                     | 123             | 1           | COPY                      | 171           | 11          |                        |  |  |  |
| SERVER                                  | 023         | 5                      |             |             | HALLWAY                   | 124             | 2           | TRAINING STORAGE          | 172           | 11          |                        |  |  |  |
| FUTURE                                  | 024         | 7                      |             |             | MEN                       | 125             | 2           | ELECT                     | 173           | 5           |                        |  |  |  |
| FUTURE                                  | 025         | 7                      |             |             | WOMEN                     | 126             | 2           | OPEN OFFICE               | 174           | 12          |                        |  |  |  |
| OFFICE                                  | 026         | 1                      |             |             | OFFICE                    | 127             | 1           | TELECOM                   | 175           | 5           |                        |  |  |  |
| AIR LOCK                                | 027         | 11                     |             |             | EM/FM                     | 129             | 12          | OPEN                      | 176           | 1           |                        |  |  |  |
| MAIL ROOM                               | 028         | 4                      |             |             | OFFICE                    | 130             | 1           | VP OFFICE                 | 177           | 1           |                        |  |  |  |
| - MAIL ROOM DESK                        |             | 11                     |             |             | OFFICE                    | 131             | 1           | VP OFFICE                 | 178           | 1           |                        |  |  |  |
| TRAINING CLOSET                         | 029         | 1                      |             |             | OFFICE                    | 132             | 1           | VP OFFICE                 | 179           | 1           |                        |  |  |  |
| TRAINING                                | 030         | 8                      |             |             | JC                        | 134             | 1           | VP OFFICE                 | 180           | 1           |                        |  |  |  |
| CONF                                    | 031         | 3                      |             |             | HALLWAY                   | 135             | 2           | VP OFFICE                 | 181           | 1           |                        |  |  |  |
| CONF                                    | 032         | 3                      |             |             | ELECTRICAL                | 136             | 5           | VP OFFICE                 | 182           | 1           |                        |  |  |  |
| CONF                                    | 033         | 3                      |             |             | TELECOM                   | 137             | 5           | VP OFFICE                 | 183           | 1           |                        |  |  |  |
| CONF                                    | 034         | 3                      |             |             | CONF                      | 138             | 3           | VP OFFICE                 | 184           | 1           |                        |  |  |  |
| OFFICE                                  | 035         | 1                      |             |             | LACTATION                 | 139             | 1           | EXEC OFFICE               | 185           | 1           |                        |  |  |  |
| COATS                                   | 036         | N/A                    |             |             | HALLWAY                   | 140             | 2           | EXEC OFFICE               | 186           | 1           |                        |  |  |  |
| OFFICE                                  | 037         | 1                      |             |             | CONF                      | 141             | 3           | VP OFFICE                 | 187           | 1           |                        |  |  |  |
| OFFICE                                  | 038         | 1                      |             |             | OFFICE                    | 142             | 1           | VP OFFICE                 | 188           | 1           |                        |  |  |  |
| OFFICE                                  | 039         | 1                      |             |             | OFFICE                    | 143             | 1           | VP OFFICE                 | 189           | 1           |                        |  |  |  |
| OFFICE                                  | 040         | 1                      |             |             | OFFICE                    | 144             | 1           | VP OFFICE                 | 190           | 1           |                        |  |  |  |
| OFFICE                                  | 041         | 1                      |             |             | OFFICE                    | 145             | 1           |                           |               |             |                        |  |  |  |
| OPEN OFFICE                             | 042         | 12                     |             |             | OFFICE                    | 146             | 1           |                           |               |             |                        |  |  |  |
| STAIR D                                 | 043         | 2                      |             |             | OFFICE                    | 147             | 1           |                           |               |             |                        |  |  |  |
| COFFEE BAR/HALLWAY                      | 044         | 10                     |             |             | CONF                      | 148             | 3           |                           |               |             |                        |  |  |  |
| ELEV EQUIP                              | 045         | 5                      |             |             | DECK                      | 149             | 10          |                           |               |             |                        |  |  |  |
|                                         |             |                        |             |             | BREAKROOM                 | 150             | 4           |                           |               |             |                        |  |  |  |
|                                         |             |                        |             |             | - BREAK ROOM UNDERCABINET |                 | 10          |                           |               |             |                        |  |  |  |

GENERAL NOTE: UNLESS NOTED OTHERWISE, SENSOR TIME DELAY TO BE 15 MINUTES.

N/A : NOT APPLICABLE

REFER TO SHEETS EXXX FOR ADDITIONAL INFORMATION.

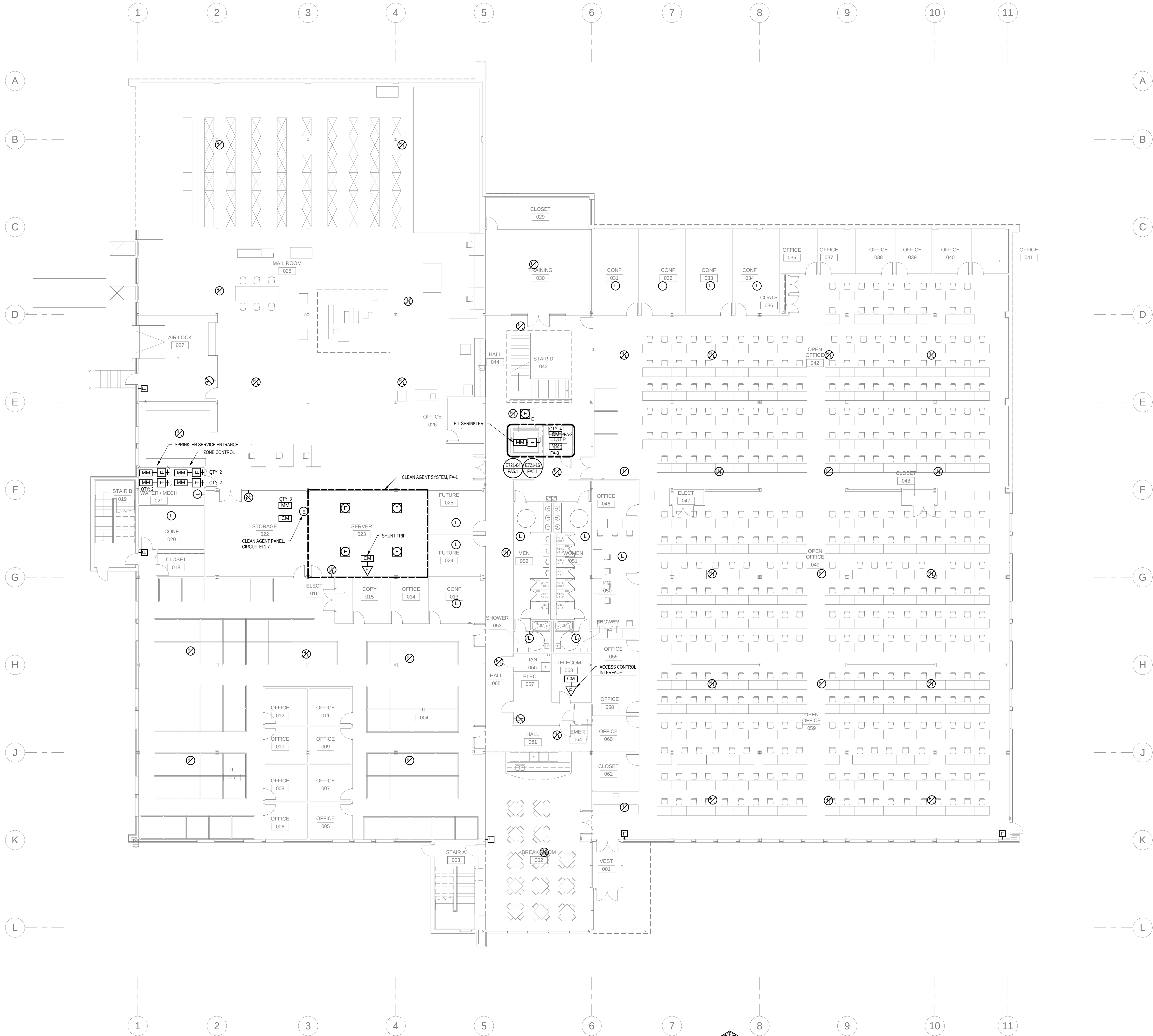
|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sequence 1 - Wall Switch Sensor:                                 | Light fixtures shall be controlled by a wall mounted occupancy sensor with integral manual switch. Fixtures shall be controlled manual ON with the switch on the sensor. Fixtures shall be switched OFF by either the manual switch on the sensor or following a 15 minute period of no occupancy detected.                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Sequence 2 - Ceiling Sensor Only:                                | Space shall be controlled by an Occupancy Sensor with Auto ON/OFF function. Sensor shall turn lights on when occupancy is detected. Sensor shall keep lights ON as long as occupancy is detected and for 15 minutes following not detection.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Sequence 3 - Single Zone Dimming                                 | Room controlled by a combination of manual dimmer and occupancy sensors. Fixtures in the space shall be switched/dimmed ON manually with the dimmer at the door and adjusted to a desired light level. Fixtures in the space shall be switched OFF by either the dimmers in the room or following a 15 minute period of no occupancy detected.                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Sequence 4 - Multi-Zone Switched with Sensor                     | Room controlled by a combination of manual momentary switches and occupancy sensors. Multiple zoned fixtures in the space shall be switched ON manually with the switches at the door. The multiple zoned fixtures in the space shall be switched OFF by either the switches in the room or following a 15 minute period of no occupancy detected.                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Sequence 5 - Standard Switching:                                 | Light fixtures in the spaces shall be controlled by a standard switching as shown on the drawings. Contractor shall refer to drawings for single pole, 3-way and 4-way switching in each specific space.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Sequence 6 - Stairs:                                             | Stairwells shall be controlled by an occupancy sensor integral to the light fixture. One lamp shall remain one 24/7. After 10 min of no occupancy is detected by the sensor, the fixture shall automatically turn off the other lamp. Once occupancy is detected, the second lamp shall turn on.                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Sequence 7 - Dual Level Switching with Sensor                    | The light fixtures in the space shall be controlled by a combination of manual momentary switches and occupancy sensors. Fixtures shall be manually switched ON by the switch(es). Inboard lamps shall be separately switched from outboard lamps. Fixtures shall be switched OFF by either toggling the switch(es) or following a 15 minute period of no detection by the occupancy sensor.                                                                                                                                                                                                                                                                                                                                                                               |
| Sequence 8 - Multi-zone Dimming with Sensor                      | Room controlled by a combination of manual keypad/dimmers and occupancy sensors via lighting control panel. Top button of keypad at door (S1) to turn ON all fluorescent fixtures. The bottom button of keypad at door (S1) to turn OFF all zones/channels. 8-button keypad at podium (S3) to control/select 4 zones, master ON/OFF, and Raiser/Lower. 4-button keypad at podium (S2) to provide selected scenes. The multiple zoned fixtures in the space shall be switched/dimmed OFF by either the digital switches/dimmers in the room or following a 15 minute period of no occupancy detected.                                                                                                                                                                       |
| Sequence 9 - Night Lights                                        | Fixtures shall be on 24/7 to serve emergency and night light functions.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Sequence 10 - Digital Timer                                      | Fixtures shall be manually switched ON with integral switch. Fixtures shall be switched OFF by integral switch or 15 minute time out.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Sequence 11 - Single Zone Switching with Sensor                  | The light fixtures in the space shall be controlled by a combination of manual momentary switches and occupancy sensors. Fixtures shall be manually switched ON by the switch(es). Fixtures shall be switched OFF by either toggling the switch(es) or following a 15 minute period of no detection by the occupancy sensor.                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Sequence 12 - Open Offices with Sensor                           | Room controlled by a combination of manual momentary switches and occupancy sensors. Fixtures shall be Auto ON/OFF by sensor or override manual ON/OFF by associated switches. The fixtures in the space shall be switched OFF by either the switches in the room or following a 15 minute period of no occupancy detected.                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Sequence 13 - Lighting Control Panel                             | Areas are controlled via Lighting Control Panels. See schedule for LCP serving area for sequence of operation information.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Sequence 14 - 3-way Dimming with Sensor                          | The light fixtures in the space shall be controlled by a combination of manual momentary switch, dimmer and occupancy sensors. Fixtures shall be manually switched ON by the switch or momentary button integral to dimmer. Fixtures shall be switched OFF by either toggling the switch or dimmer or following a 15 minute period of no detection by the occupancy sensor.                                                                                                                                                                                                                                                                                                                                                                                                |
| Sequence 15 - Multi-zone Dimming with Sensor, Crestron Interface | Room controlled by a combination of manual switches/dimmers and occupancy sensors via lighting control panel. Top button of keypads at doors (S1) to turn ON all fluorescent fixtures. The bottom buttons of keypads at doors (S1) to turn OFF all zones/channels. Separate keypad at coffee bar (S1) to control only coffee bar downlights. Lighting controls shall be integrated with Crestron A/V system serving room. A/V touchscreen, provided by A/C Contractor, to allow for control of individual loads and scene selections. The multiple zoned fixtures in the space shall be switched/dimmed OFF by either the keypads, touchscreen or following a 15 minute period of no occupancy detected. Provide all necessary components for integration with A/V system. |

| LCP1                                                                                                                                                                                                                                                                                                                                    |                |                   |                                          |                 |         |                    |           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------------|------------------------------------------|-----------------|---------|--------------------|-----------|
| OUTPUT RELAY NO.                                                                                                                                                                                                                                                                                                                        | SWITCHING ZONE | PANEL CIRCUIT NO. | DESCRIPTION                              | CONNECTED WATTS | VOLTAGE | OPERATION SEQUENCE | REMARKS   |
| 1                                                                                                                                                                                                                                                                                                                                       | A1             | HH1-6             | LOBBY/RECEPTION DOWNLIGHTS.DISPLAY       | 415             | 277     | 1                  |           |
| 2                                                                                                                                                                                                                                                                                                                                       | B1             | HH1-6             | LOBBY/RECEPTION WALL TO CEILING FIXTURES | 705             | 277     | 2                  |           |
| 3                                                                                                                                                                                                                                                                                                                                       | C1             | HH1-6             | STAIR D 4" RING FIXTURE                  | 840             | 277     | 2                  |           |
| 4                                                                                                                                                                                                                                                                                                                                       | D1             | HH1-6             | STAIR D COVE UPLIGHT                     | 512             | 277     | 3                  |           |
| 5                                                                                                                                                                                                                                                                                                                                       | E1             | SPARE             | FUTURE PENDANT                           |                 |         |                    |           |
| 6                                                                                                                                                                                                                                                                                                                                       | F1             | SPARE             |                                          |                 |         |                    |           |
| 7                                                                                                                                                                                                                                                                                                                                       | G1             | HH1-10            | NORTH AND SOUTH CANOPIES, NORTH BOLLARDS | 225             | 277     | 4                  |           |
| 8                                                                                                                                                                                                                                                                                                                                       | H1             | HH1-10            | NORTH AND WEST PARKING LOT FIXTURES      | 1950            | 277     | 4                  |           |
| 9                                                                                                                                                                                                                                                                                                                                       | J1             | HH1-12            | SOUTH PARKING LOT FIXTURES               | 2700            | 277     | 4                  |           |
| 10                                                                                                                                                                                                                                                                                                                                      | K1             | EH1-10            | BUILDING MOUNTED WALLPACKS               | 150             | 277     | 4                  | EMERGENCY |
| 11                                                                                                                                                                                                                                                                                                                                      | L1             | EH1-10            | EMERGENCY PARKING LOT FIXTURES           | 750             | 277     | 4                  | EMERGENCY |
| 12                                                                                                                                                                                                                                                                                                                                      | M1             | LH1-2             | BUILDING SIGNAGE AND MONUMENT            | 1500            | 120     | 4                  |           |
| 13                                                                                                                                                                                                                                                                                                                                      | N1             | SPARE             |                                          |                 |         |                    |           |
| 14                                                                                                                                                                                                                                                                                                                                      | P1             | SPARE             |                                          |                 |         |                    |           |
| 15                                                                                                                                                                                                                                                                                                                                      | Q1             | SPARE             |                                          |                 |         |                    |           |
| 16                                                                                                                                                                                                                                                                                                                                      | R1             | SPARE             |                                          |                 |         |                    |           |
| 17                                                                                                                                                                                                                                                                                                                                      | S1             | SPACE             |                                          |                 |         |                    |           |
| 18                                                                                                                                                                                                                                                                                                                                      | T1             | SPACE             |                                          |                 |         |                    |           |
| 19                                                                                                                                                                                                                                                                                                                                      | U1             | SPACE             |                                          |                 |         |                    |           |
| 20                                                                                                                                                                                                                                                                                                                                      | V1             | SPACE             |                                          |                 |         |                    |           |
| 21                                                                                                                                                                                                                                                                                                                                      | W1             | SPACE             |                                          |                 |         |                    |           |
| 22                                                                                                                                                                                                                                                                                                                                      | X1             | SPACE             |                                          |                 |         |                    |           |
| 23                                                                                                                                                                                                                                                                                                                                      | Y1             | SPACE             |                                          |                 |         |                    |           |
| 24                                                                                                                                                                                                                                                                                                                                      | Z1             | SPACE             |                                          |                 |         |                    |           |
| GENERAL NOTES:                                                                                                                                                                                                                                                                                                                          |                |                   |                                          |                 |         |                    |           |
| 1. Panel is based on Wattstopper Lighting LIA lighting control panel and components.                                                                                                                                                                                                                                                    |                |                   |                                          |                 |         |                    |           |
| 2. Provide the following field components for programming and control of lighting relay panel components: Panel LENC248S (Enclosure); LIA24 (Interior); Timeslock and Astronomical Timeslock (See Schedule for more information). Equipment Supplier shall provide all additional components as required for complete operating system. |                |                   |                                          |                 |         |                    |           |
| 3. Equipment manufacturer shall provide onsite commissioning and programming of system as well as Owner training. This shall also include a scheduled face to face meeting with user group to determine button labeling and Owner/User system changes based on how space will be used.                                                  |                |                   |                                          |                 |         |                    |           |
| 4. Table above indicates which circuits shall be controlled by this panel along with panel of which circuits originate.                                                                                                                                                                                                                 |                |                   |                                          |                 |         |                    |           |
| 6. Provide ELCU-100 or emergency contacts for automatic switch over of all emergency lighting loads.                                                                                                                                                                                                                                    |                |                   |                                          |                 |         |                    |           |
| OPERATION SEQUENCES:                                                                                                                                                                                                                                                                                                                    |                |                   |                                          |                 |         |                    |           |
| 1. Light fixtures shall operate based on time of day schedule. Fixtures shall be ON from 7a-6p Monday-Friday. Momentary switches shall provide 1 hour override during all "Off" hours.                                                                                                                                                  |                |                   |                                          |                 |         |                    |           |
| 2. Light fixtures shall operate based on time of day schedule. Fixtures shall be ON from 7a-6p Monday-Friday.                                                                                                                                                                                                                           |                |                   |                                          |                 |         |                    |           |
| 3. Light fixtures shall operate from dusk until 12:00 am.                                                                                                                                                                                                                                                                               |                |                   |                                          |                 |         |                    |           |
| 4. Light fixtures shall operate from dusk until dawn.                                                                                                                                                                                                                                                                                   |                |                   |                                          |                 |         |                    |           |

| LCP2                                                                                                                                                                                                                                                                                                               |                |                   |                                |                 |         |                    |                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------------|--------------------------------|-----------------|---------|--------------------|-----------------|
| OUTPUT RELAY NO.                                                                                                                                                                                                                                                                                                   | SWITCHING ZONE | PANEL CIRCUIT NO. | DESCRIPTION                    | CONNECTED WATTS | VOLTAGE | OPERATION SEQUENCE | REMARKS         |
| 1                                                                                                                                                                                                                                                                                                                  | A2             | HB-2              | TRAINING 030 NORTH FLUORESCENT | 204             | 277     | 1                  | 0-10VDC DIMMING |
| 2                                                                                                                                                                                                                                                                                                                  | B2             | HB-2              | TRAINING 030 SOUTH FLUORESCENT | 408             | 277     | 1                  | 0-10VDC DIMMING |
| 3                                                                                                                                                                                                                                                                                                                  | C2             | HB-2              | TRAINING 030 CENTER DOWNLIGHTS | 150             | 277     | 1                  | 0-10VDC DIMMING |
| 4                                                                                                                                                                                                                                                                                                                  | D2             | HB-2              | TRAINING 030 SOFFIT DOWNLIGHTS | 180             | 277     | 1                  | 0-10VDC DIMMING |
| 5                                                                                                                                                                                                                                                                                                                  | E2             | SPARE             |                                |                 |         |                    |                 |
| 6                                                                                                                                                                                                                                                                                                                  | F2             | SPARE             |                                |                 |         |                    |                 |
| 7                                                                                                                                                                                                                                                                                                                  | G2             | SPARE             |                                |                 |         |                    |                 |
| 8                                                                                                                                                                                                                                                                                                                  | H2             | SPARE             |                                |                 |         |                    |                 |
| GENERAL NOTES:                                                                                                                                                                                                                                                                                                     |                |                   |                                |                 |         |                    |                 |
| 1. Panel is based on Crestron GLPAC-DIMFLV control panel and components.                                                                                                                                                                                                                                           |                |                   |                                |                 |         |                    |                 |
| 2. Equipment Supplier shall provide all additional components as required for complete operating system.                                                                                                                                                                                                           |                |                   |                                |                 |         |                    |                 |
| 3. Equipment manufacturer shall provide onsite commissioning and programming of system as well as Owner training. This shall also include a scheduled face to face meeting with user group to determine button labeling and Owner/User system changes based on how space will be used, including scene selections. |                |                   |                                |                 |         |                    |                 |
| 4. Table above indicates which circuits shall be controlled by this panel along with panel of which circuits originate.                                                                                                                                                                                            |                |                   |                                |                 |         |                    |                 |
| 5. Provide module to allow input from 3rd party low voltage occupancy sensor.                                                                                                                                                                                                                                      |                |                   |                                |                 |         |                    |                 |
| 6. See Occupancy Sensor Schedule for additional information.                                                                                                                                                                                                                                                       |                |                   |                                |                 |         |                    |                 |
| OPERATION SEQUENCES:                                                                                                                                                                                                                                                                                               |                |                   |                                |                 |         |                    |                 |
| 1. See Lighting Sequence of Operation Schedule                                                                                                                                                                                                                                                                     |                |                   |                                |                 |         |                    |                 |

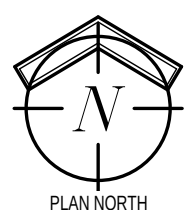
| LCP3                 |                                                                                                                                                                                                                                                                                                                 |                   |                                |                 |         |                    |                        |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------------------|-----------------|---------|--------------------|------------------------|
| OUTPUT RELAY NO.     | SWITCHING ZONE                                                                                                                                                                                                                                                                                                  | PANEL CIRCUIT NO. | DESCRIPTION                    | CONNECTED WATTS | VOLTAGE | OPERATION SEQUENCE | REMARKS                |
| 1                    | A3                                                                                                                                                                                                                                                                                                              | HG-6              | TRAINING 167 WEST FLUORESCENT  | 204             | 277     | 1                  | 0-10VDC DIMMING        |
| 2                    | B3                                                                                                                                                                                                                                                                                                              | HG-6              | TRAINING 167 SOUTH FLUORESCENT | 408             | 277     | 1                  | 0-10VDC DIMMING        |
| 3                    | C3                                                                                                                                                                                                                                                                                                              | EH1-6             | TRAINING 167 CENTER DOWNLIGHTS | 200             | 277     | 1                  | 0-10VDC DIM. EMERGENCY |
| 4                    | D3                                                                                                                                                                                                                                                                                                              | HG-6              | TRAINING 167 SOFFIT DOWNLIGHTS | 252             | 277     | 1                  | 0-10VDC DIMMING        |
| 5                    | E3                                                                                                                                                                                                                                                                                                              | HG-6              | TRAINING 167 COFFEE BAR        | 24              | 277     | 1                  |                        |
| 6                    | F3                                                                                                                                                                                                                                                                                                              | SPARE             |                                |                 |         |                    |                        |
| 7                    | G3                                                                                                                                                                                                                                                                                                              | SPARE             |                                |                 |         |                    |                        |
| 8                    | H3                                                                                                                                                                                                                                                                                                              | SPARE             |                                |                 |         |                    |                        |
| GENERAL NOTES:       |                                                                                                                                                                                                                                                                                                                 |                   |                                |                 |         |                    |                        |
| 1.                   | Panel is based on Crestron GLPAC-DIMFLV control panel and components.                                                                                                                                                                                                                                           |                   |                                |                 |         |                    |                        |
| 2.                   | Equipment Supplier shall provide all additional components as required for complete operating system.                                                                                                                                                                                                           |                   |                                |                 |         |                    |                        |
| 3.                   | Equipment manufacturer shall provide onsite commissioning and programming of system as well as Owner training. This shall also include a scheduled face to face meeting with user group to determine button labeling and Owner/User system changes based on how space will be used, including scene selections. |                   |                                |                 |         |                    |                        |
| 4.                   | Table above indicates which circuits shall be controlled by this panel along with panel of which circuits originate.                                                                                                                                                                                            |                   |                                |                 |         |                    |                        |
| 5.                   | Provide module to allow input from 3rd party low voltage occupancy sensor.                                                                                                                                                                                                                                      |                   |                                |                 |         |                    |                        |
| 6.                   | Provide ELCU-100 or emergency contacts for automatic switch over of all emergency lighting loads.                                                                                                                                                                                                               |                   |                                |                 |         |                    |                        |
| 7.                   | Panel to be integrated and controlled by Crestron A/V system and touchpad, provided by others.                                                                                                                                                                                                                  |                   |                                |                 |         |                    |                        |
| 8.                   | See Occupancy Sensor Schedule for additional information.                                                                                                                                                                                                                                                       |                   |                                |                 |         |                    |                        |
| OPERATION SEQUENCES: |                                                                                                                                                                                                                                                                                                                 |                   |                                |                 |         |                    |                        |
| 1.                   | See Lighting Sequence of Operation Schedule                                                                                                                                                                                                                                                                     |                   |                                |                 |         |                    |                        |





LOWER FLOOR PLAN

3/32" = 1'-0"



REFER TO SHEET FA1.1 FOR  
FIRE ALARM NOTES



**RuffaloCODY**  
1025 KIRKWOOD PARKWAY SW  
CEDAR RAPIDS, IOWA

| DATE | REVISIONS |
|------|-----------|
|      |           |
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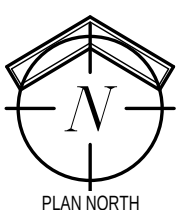
PERMIT / BID

|         |            |
|---------|------------|
| DRAWN   | DRH, JMC   |
| CHECKED | EBB        |
| DATE    | 09-06-2013 |
| JOB NO. | 12008      |

DRAWING NAME  
LOWER FLOOR  
FIRE ALARM PLAN

SHEET  
**FA1.1**

MORNING STAR  
STUDIO  
00080 STREET SE ■ STUDIO 201  
CEDAR RAPIDS, IOWA ■ 52404  
ARCHITECTURE ■ INTERIOR DESIGN  
STRUCTURAL ENGINEERING  
PHONE ■ 319.362.5464  
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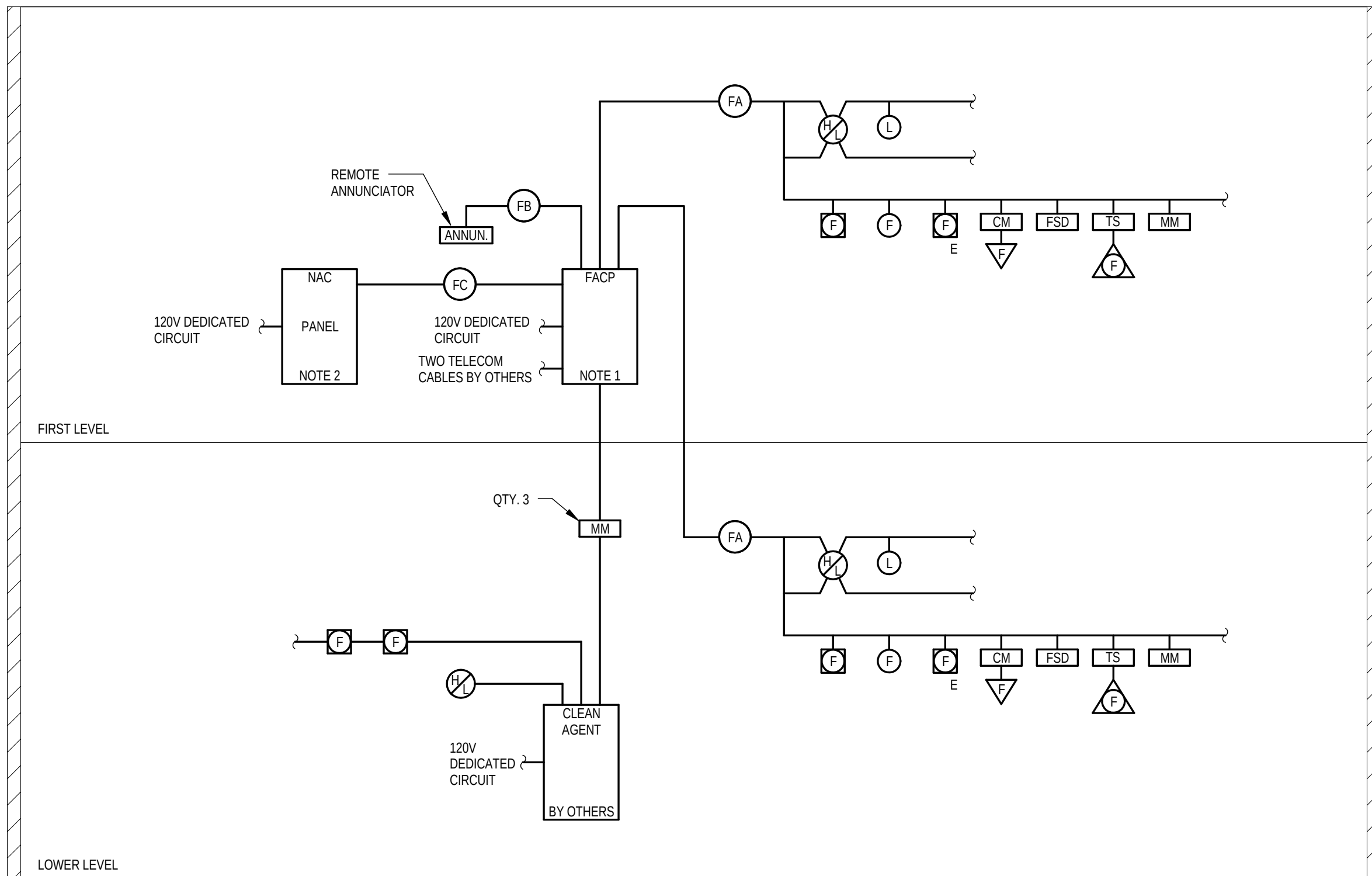


### FIRE ALARM SYMBOLS

(NOTE: ALL SYMBOLS SHOWN MAY NOT BE REQUIRED FOR THIS PROJECT)

#### \*\*\* FIRE ALARM SYSTEM \*\*\*

- MANUAL PULL STATION 46" ABOVE FLOOR
- AUDIO NOTIFICATION DEVICE - CEILING MOUNTED
  - B - BELL
  - C - CHIME
  - H - HORN
  - S - SPEAKER
- AUDIO NOTIFICATION DEVICE - WALL MOUNTED 80" ABOVE FLOOR OR AS NOTED
  - B - BELL
  - C - CHIME
  - H - HORN
  - S - SPEAKER
- VISUAL NOTIFICATION LIGHT - CEILING MOUNTED
- VISUAL NOTIFICATION LIGHT - WALL MOUNTED 80" ABOVE FLOOR OR AS NOTED
- VISUAL / AUDIO NOTIFICATION DEVICE
  - B - BELL
  - C - CHIME
  - H - HORN
  - S - SPEAKER
- VISUAL / AUDIO NOTIFICATION DEVICE - WALL MOUNTED 80" ABOVE FLOOR OR AS NOTED
  - B - BELL
  - C - CHIME
  - H - HORN
  - S - SPEAKER
- THERMAL DETECTOR, RATE OF RISE TYPE 200-200 DEGREE TYPE
- THERMAL DETECTOR, RATE OF RISE TYPE - WALL MOUNTED 200-200 DEGREE TYPE
- SMOKE DETECTOR - CEILING MOUNTED
  - E - ELEVATOR
  - I - TRANSMITTER/RECEIVER
- SMOKE DETECTOR - WALL MOUNTED
  - E - ELEVATOR
  - I - TRANSMITTER/RECEIVER
- ELECTROMAGNETIC DOOR HOLDER - CEILING OR FLOOR MOUNTED
- ELECTROMAGNETIC DOOR HOLDER - WALL MOUNTED
- REMOTE LED FOR DETECTOR ANNUNCIATION - CEILING MOUNTED
- REMOTE LED FOR DETECTOR ANNUNCIATION - WALL MOUNTED
- SMOKE DETECTOR IN DUCT
- TEST SWITCH
- FAN SHUT-DOWN OR CONTROL RELAY
- FIRE ALARM VOICE PHONE JACK
- SPRINKLER ALARM FLOW SWITCH
- SPRINKLER ALARM TAMPER SWITCH
- MONITOR MODULE
- CONTROL MODULE
- BEAM SMOKE DETECTOR - CEILING MOUNTED
  - T - TRANSMITTER/RECEIVER
  - R - REFLECTOR
- BEAM SMOKE DETECTOR - WALL MOUNTED
  - T - TRANSMITTER/RECEIVER
  - R - REFLECTOR
- SMOKE OR FIRE/SMOKE DAMPER CONNECTION
- DAMPER INDICATING LIGHT - CEILING MOUNTED
- DAMPER INDICATING LIGHT - WALL MOUNTED



### FIRE ALARM SCHEMATIC RISER DIAGRAM

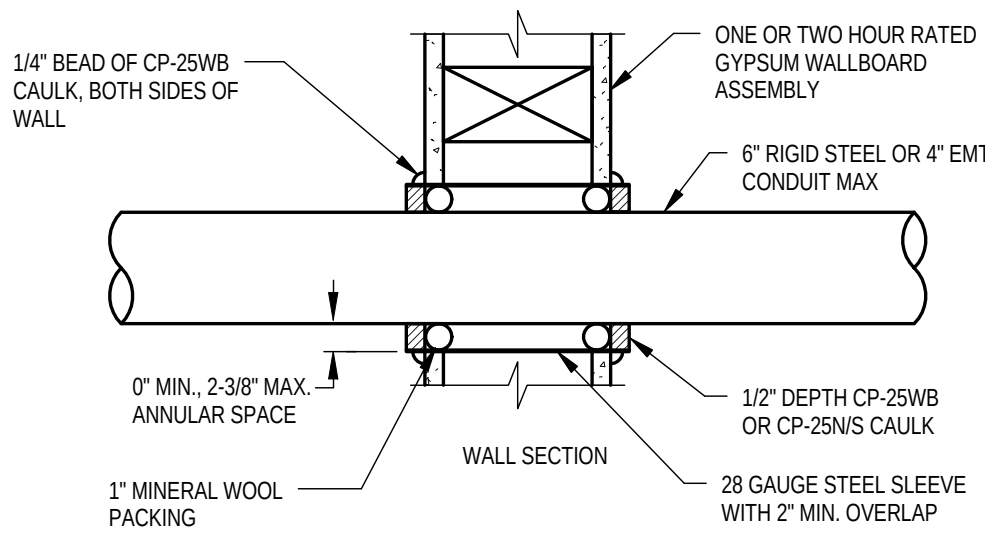
NOT TO SCALE

- FIRE ALARM RISER DIAGRAM NOTES**
- The fire alarm control panel is based on the Notifier addressable control panel with initiation devices, notification devices, control devices, and monitoring devices. Panel shall be sized and capable of handling devices shown on plans plus all auxiliary equipment for complete working system. Plus have a 30% spare capacity to add additional devices without adding additional hardware to panel.
  - Quantity of NAC Extender Panels shall be determined by Equipment Supplier. Provide all components as required for a complete system.

#### FIRE ALARM WIRING SCHEDULE

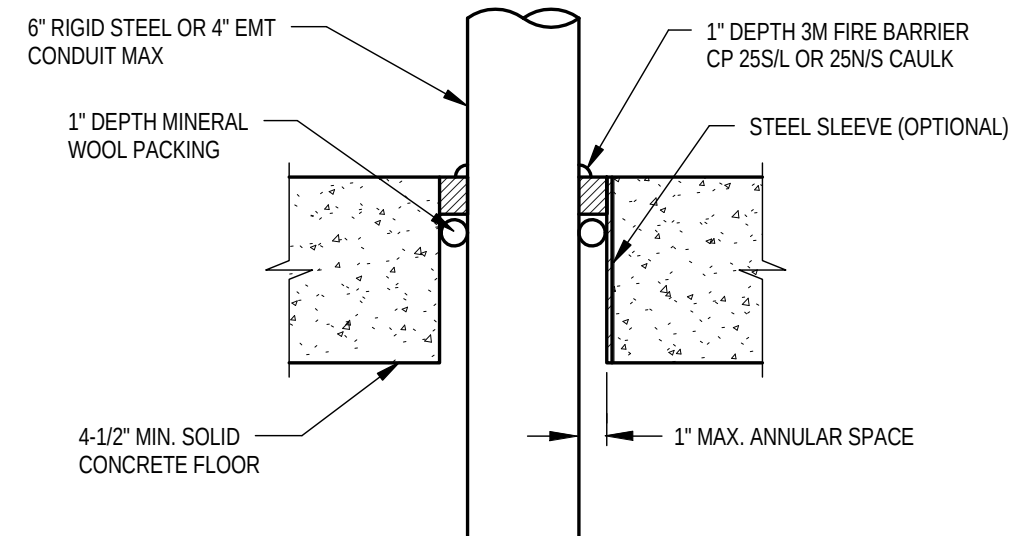
| FEEDER | LOAD SERVED        | WIRE SIZE                                                                                                                                                                 | NOTES          |
|--------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| FA     | Fire Alarm Wiring  | 1" Conduit<br>#16/2 tw. Pair - Signal line circuit (SLC)<br>#16/2 tw. Pair Shielded - Speaker<br>2#14 THHN - Scribe<br>2#14 THHN - Module Power<br>2#14 THHN - Door Power | Class B Wiring |
| FB     | Annunciator Wiring | 3/4" Conduit<br>#18/2 tw. Pair Shielded<br>2#14 THHN - Power                                                                                                              |                |
| FC     | NAC Extender Panel | Two 2#14 THHN                                                                                                                                                             |                |

NOTES:  
1. All wiring shall meet fire alarm manufacturer's requirements.



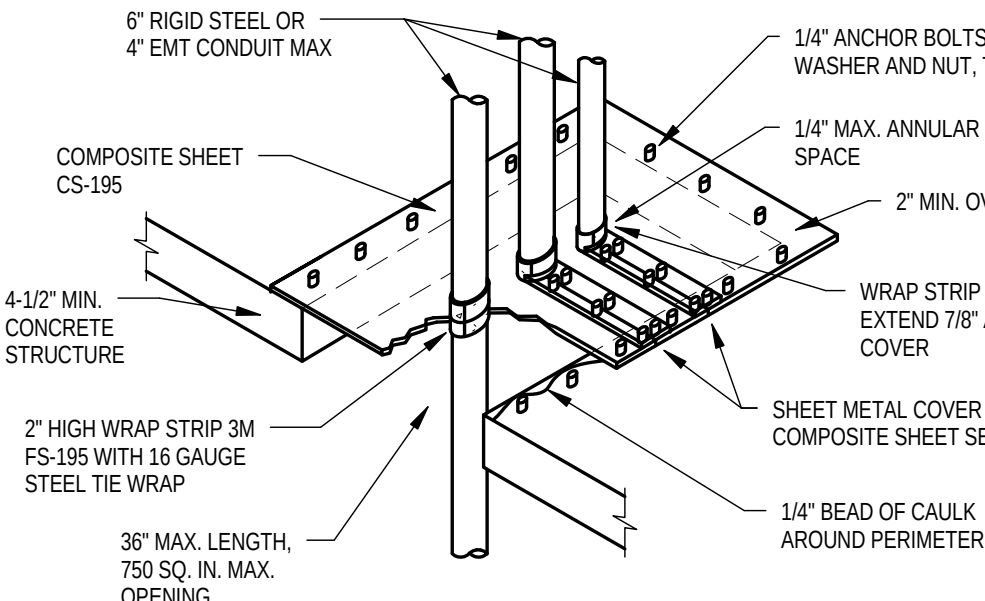
NOTE:  
1. MATERIALS AND CONFIGURATION SHOWN ARE FOR 3M SYSTEM #WL1003

BREACH SEALING DETAIL  
ONE AND TWO HOUR FIRE-STOP



NOTE:  
1. MATERIALS AND CONFIGURATION SHOWN ARE FOR 3M SYSTEM #CAJ1001

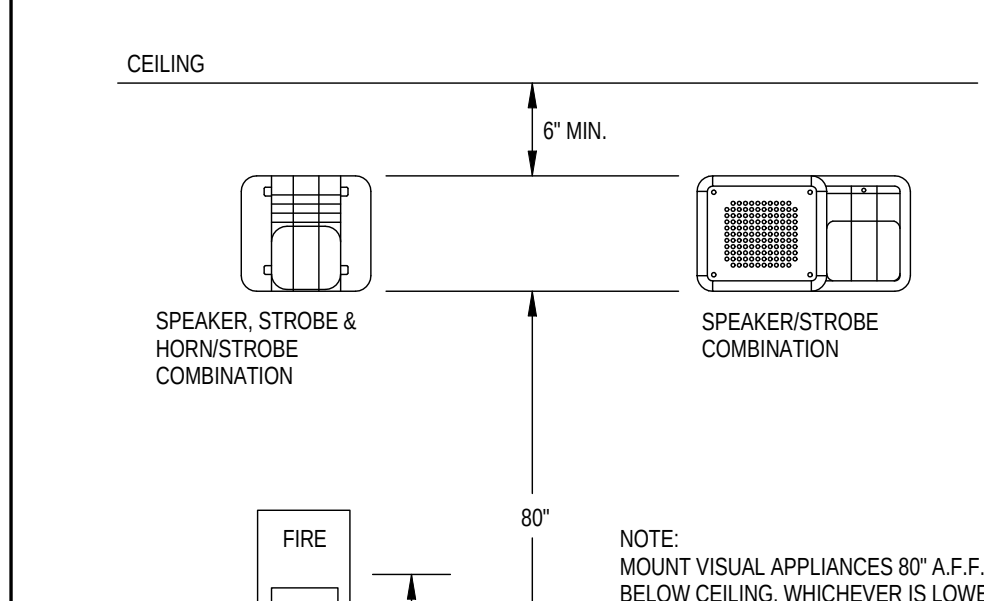
FLOOR SEALING DETAIL  
TWO HOUR FIRE-STOP



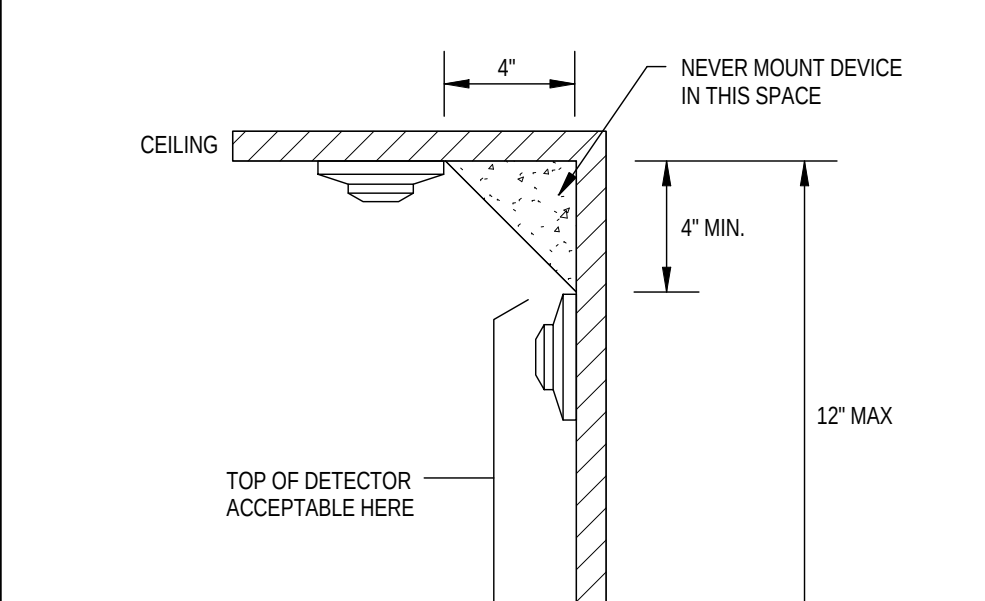
NOTE:  
1. MATERIALS AND CONFIGURATION SHOWN ARE FOR 3M SYSTEM #WL1003

PENETRATION FOR LARGE  
OPENINGS THREE HOUR  
FIRE-STOP

- NOTES:
- INDIVIDUAL DETAILS APPLY ONLY TO THE MATERIALS, CONSTRUCTION TYPES, AND CONFIGURATIONS SHOWN. REFER TO MANUFACTURER'S SYSTEM AND APPLICATION DETAILS FOR OTHER MATERIALS, CONSTRUCTION OR CONFIGURATIONS.
  - DETAILS SHOWN ARE FOR TYPICAL APPLICATIONS AND DO NOT NECESSARILY APPLY TO ANY OR ALL FIRE STOPPING REQUIREMENTS ON THE PROJECT.
  - IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSTALL ALL FIRE STOPPING IN STRICT ACCORDANCE TO THE MANUFACTURER'S INSTRUCTIONS TO COMPLY WITH THE APPROPRIATE 3M SYSTEM ASSEMBLY REQUIREMENTS.
  - MODEL NUMBERS AND MATERIALS ARE BASED ON 3M PRODUCTS.

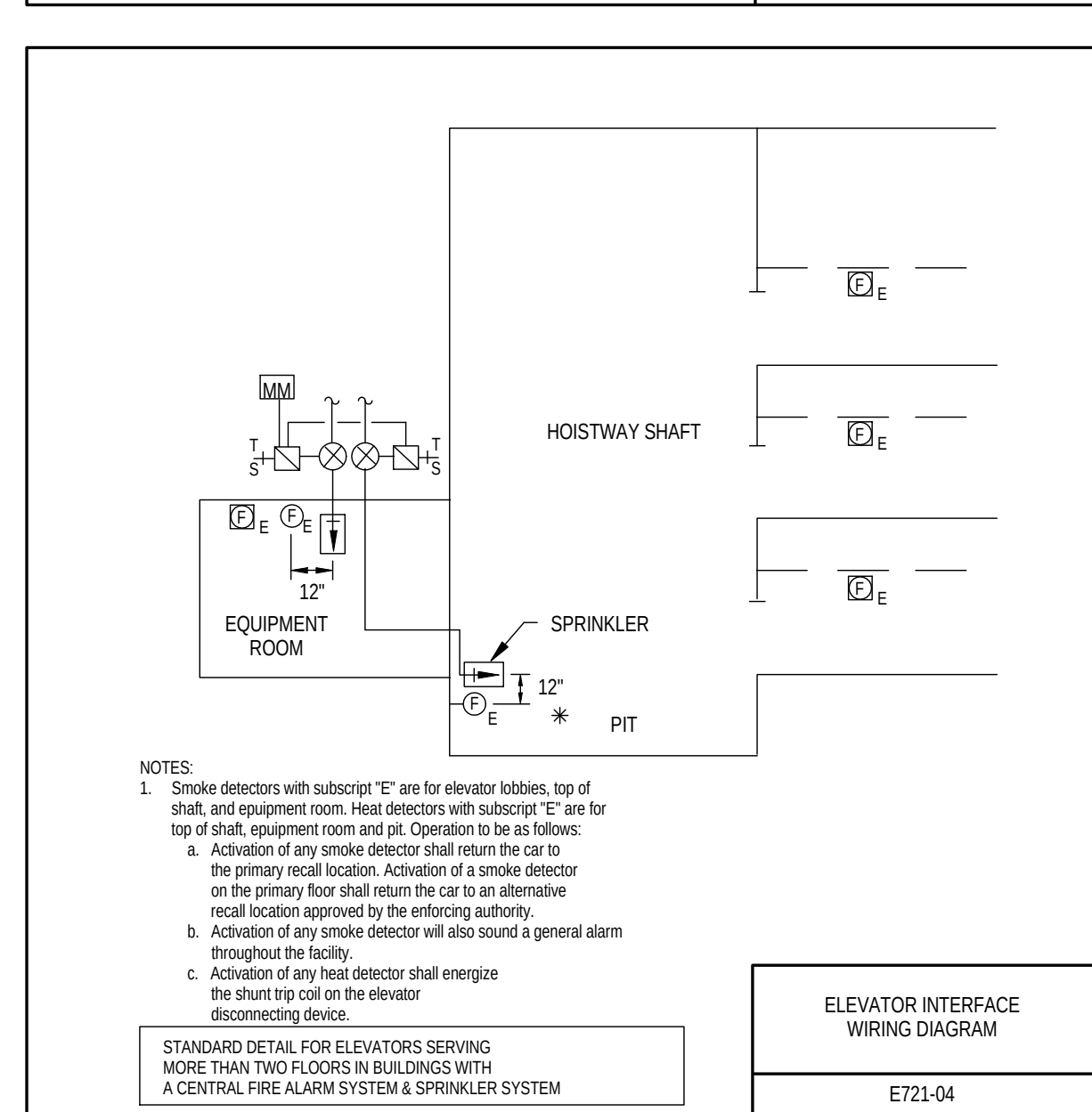
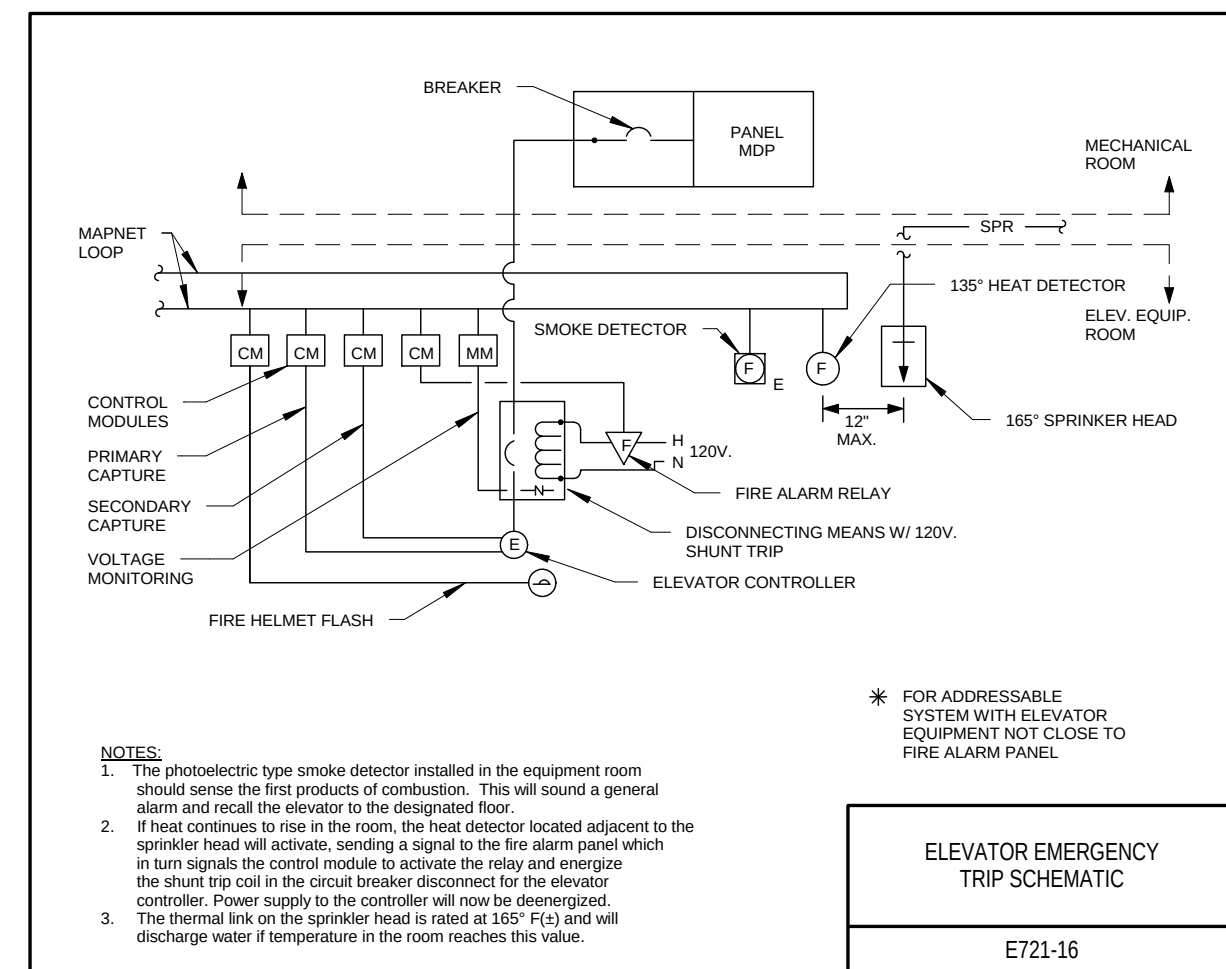


FIRE ALARM DEVICE  
TYPICAL MOUNTING HEIGHTS

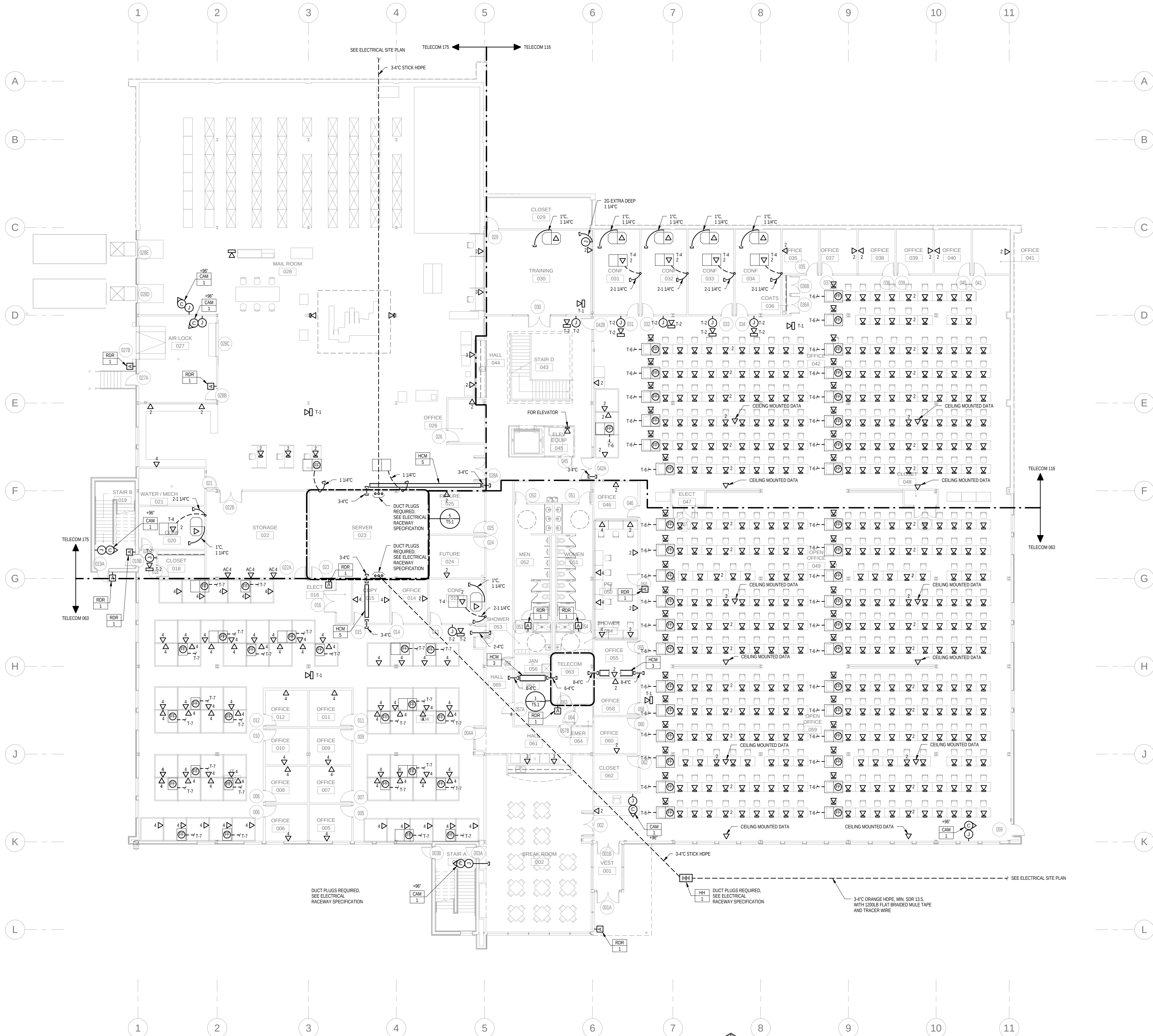


SMOKE DETECTOR MOUNTING

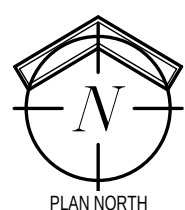
REFERENCE: NFPA72-1999 A-2.2.2.1



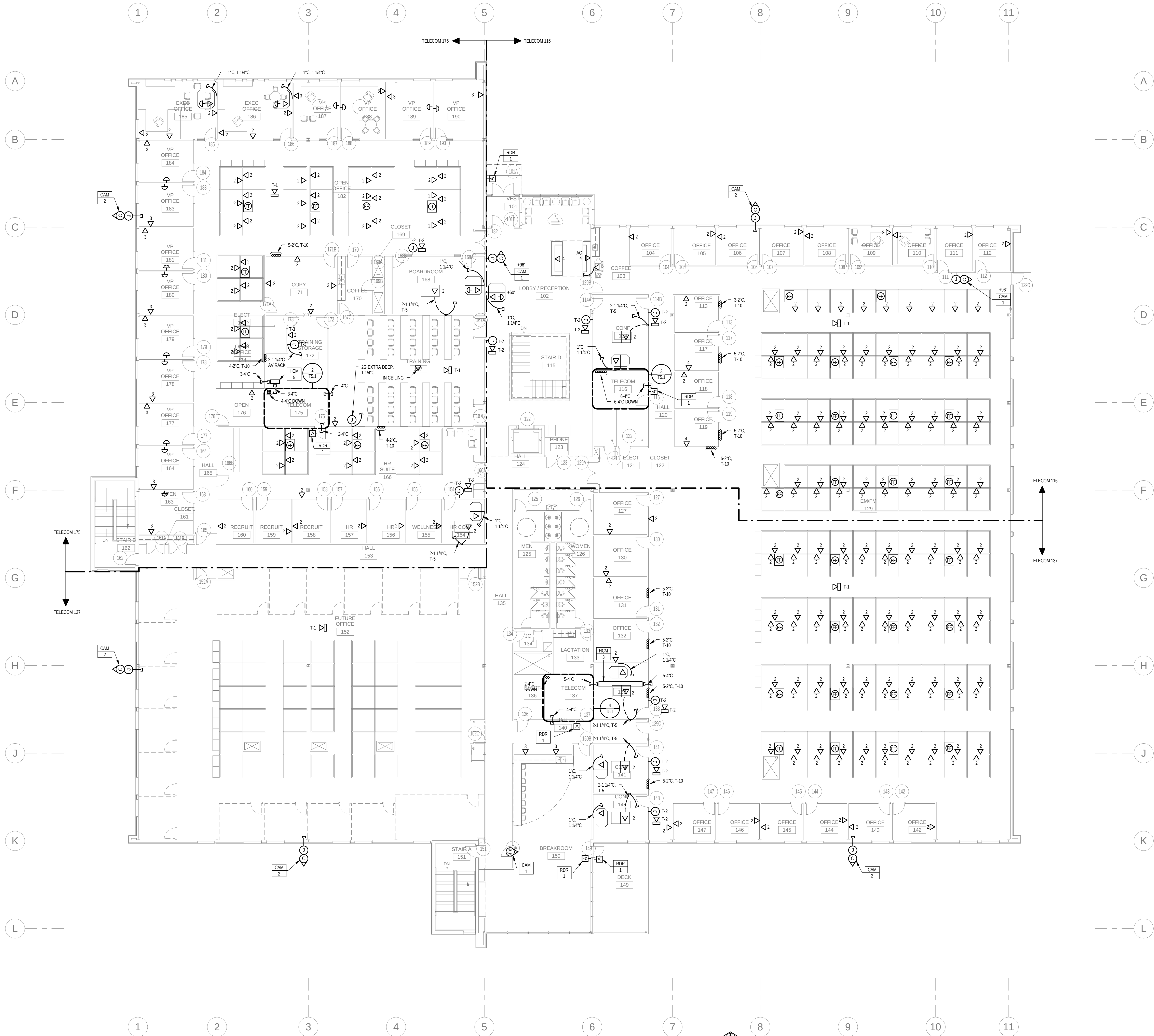
STANDARD DETAIL FOR ELEVATORS SERVING MORE THAN TWO FLOORS IN BUILDINGS WITH A CENTRAL FIRE ALARM SYSTEM & SPRINKLER SYSTEM



LOWER FLOOR PLAN  
3/32" = 1'-0"



REFER TO SHEET T5.3 FOR  
TELECOM NOTES



FIRST FLOOR PLAN  
3/32" = 1'-0"



REFER TO SHEET TS.3 FOR  
TELECOM NOTES



**RuffaloCODY**  
1025 KIRKWOOD PARKWAY SW  
CEDAR RAPIDS, IOWA

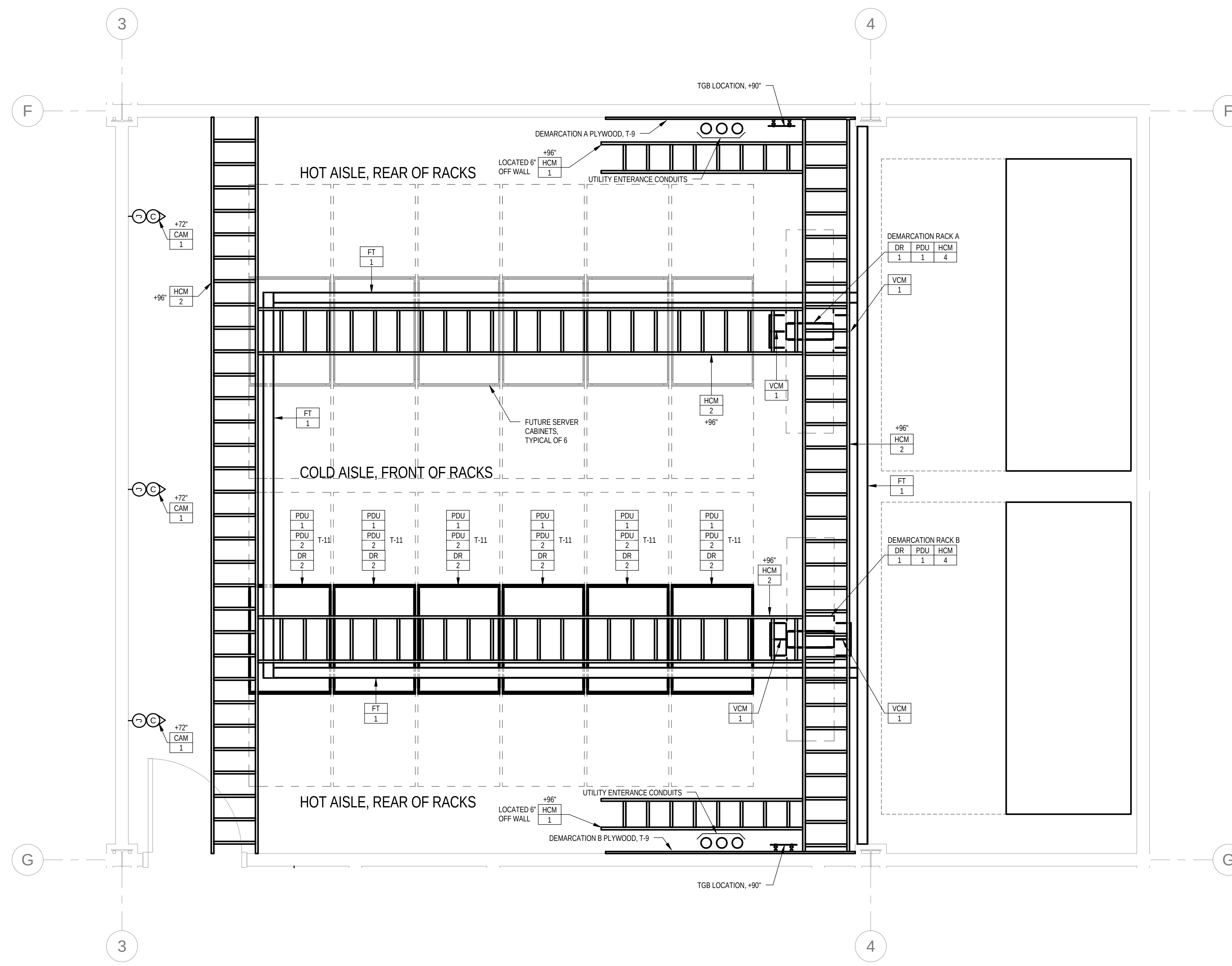
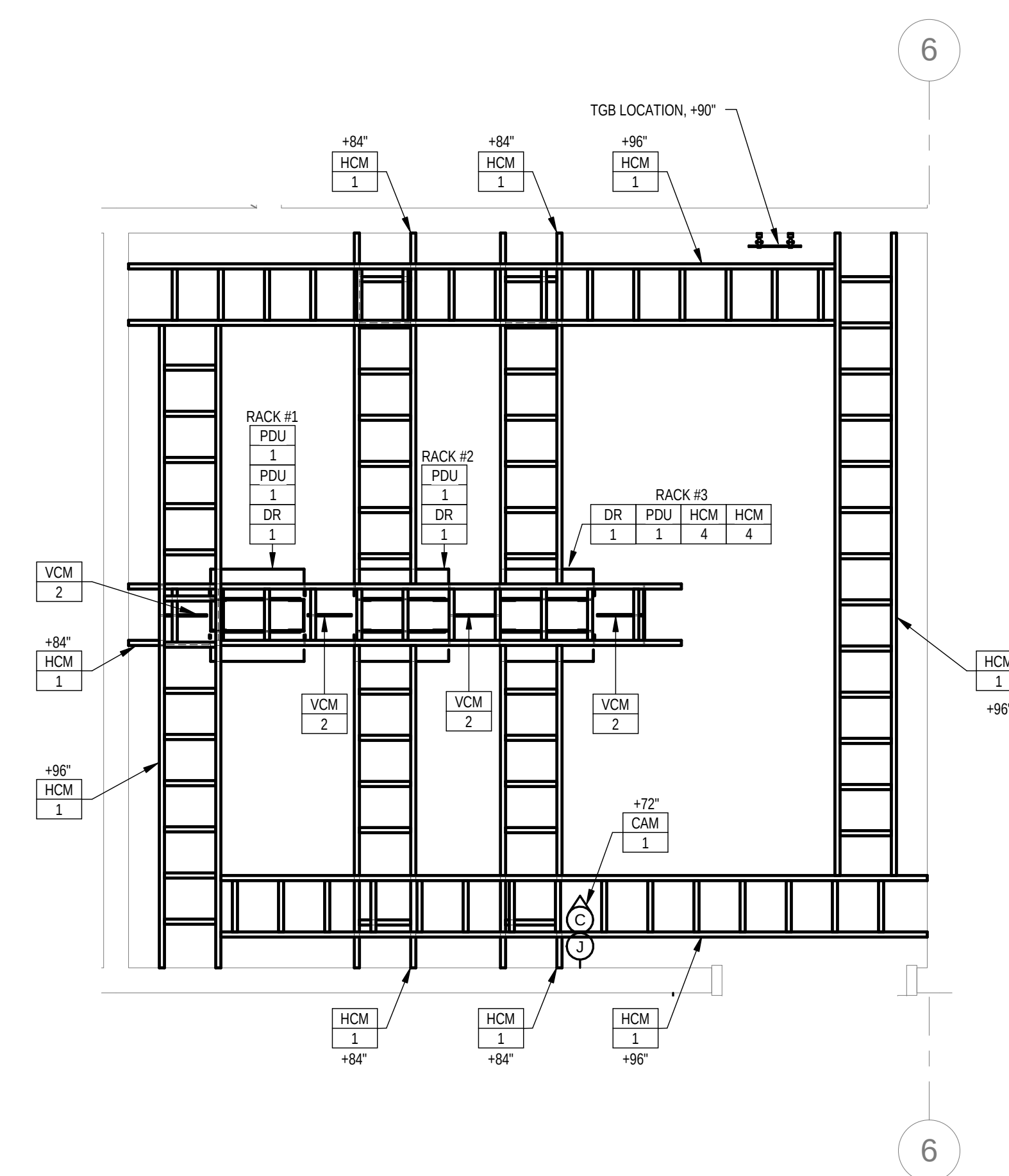
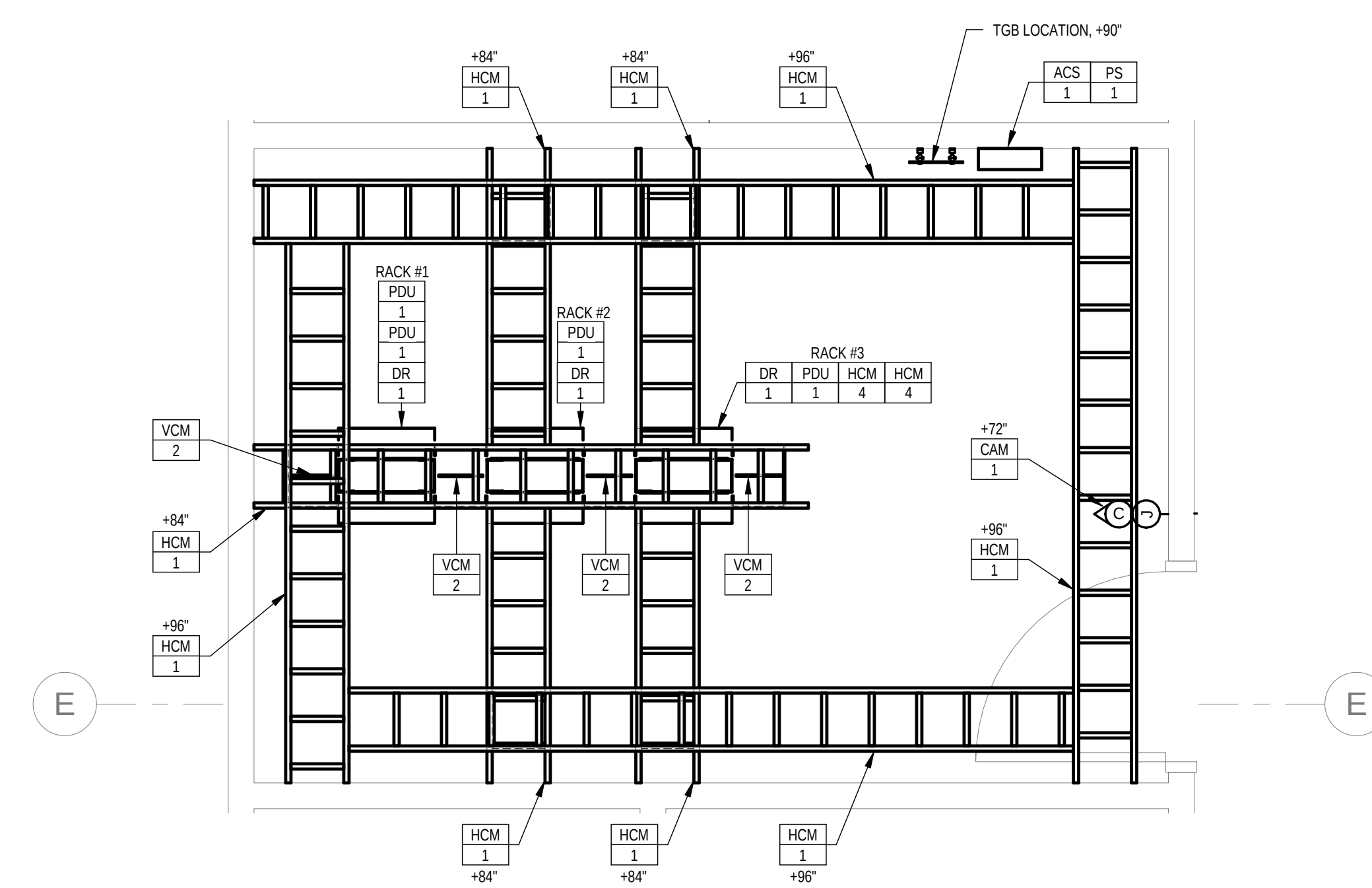
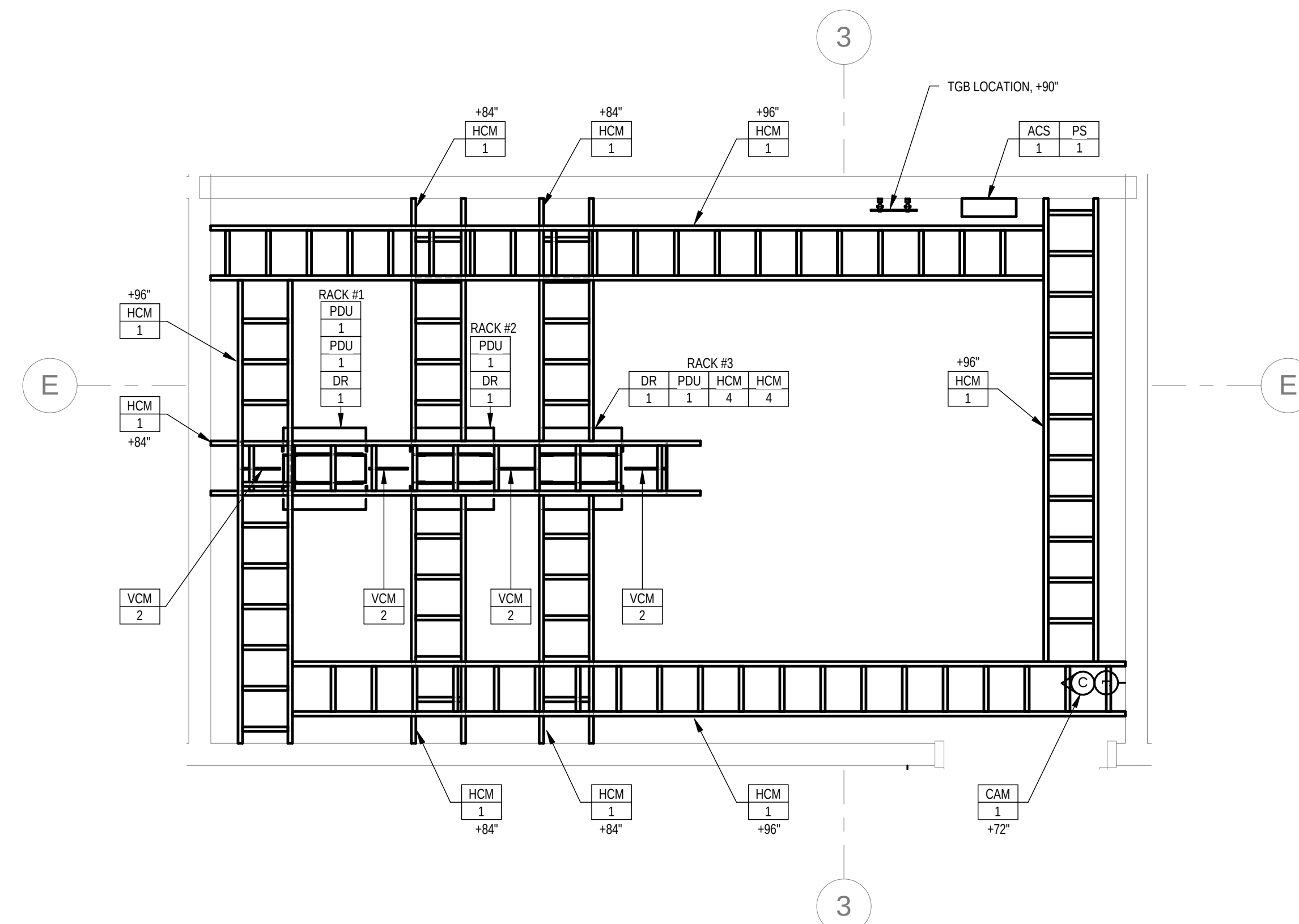
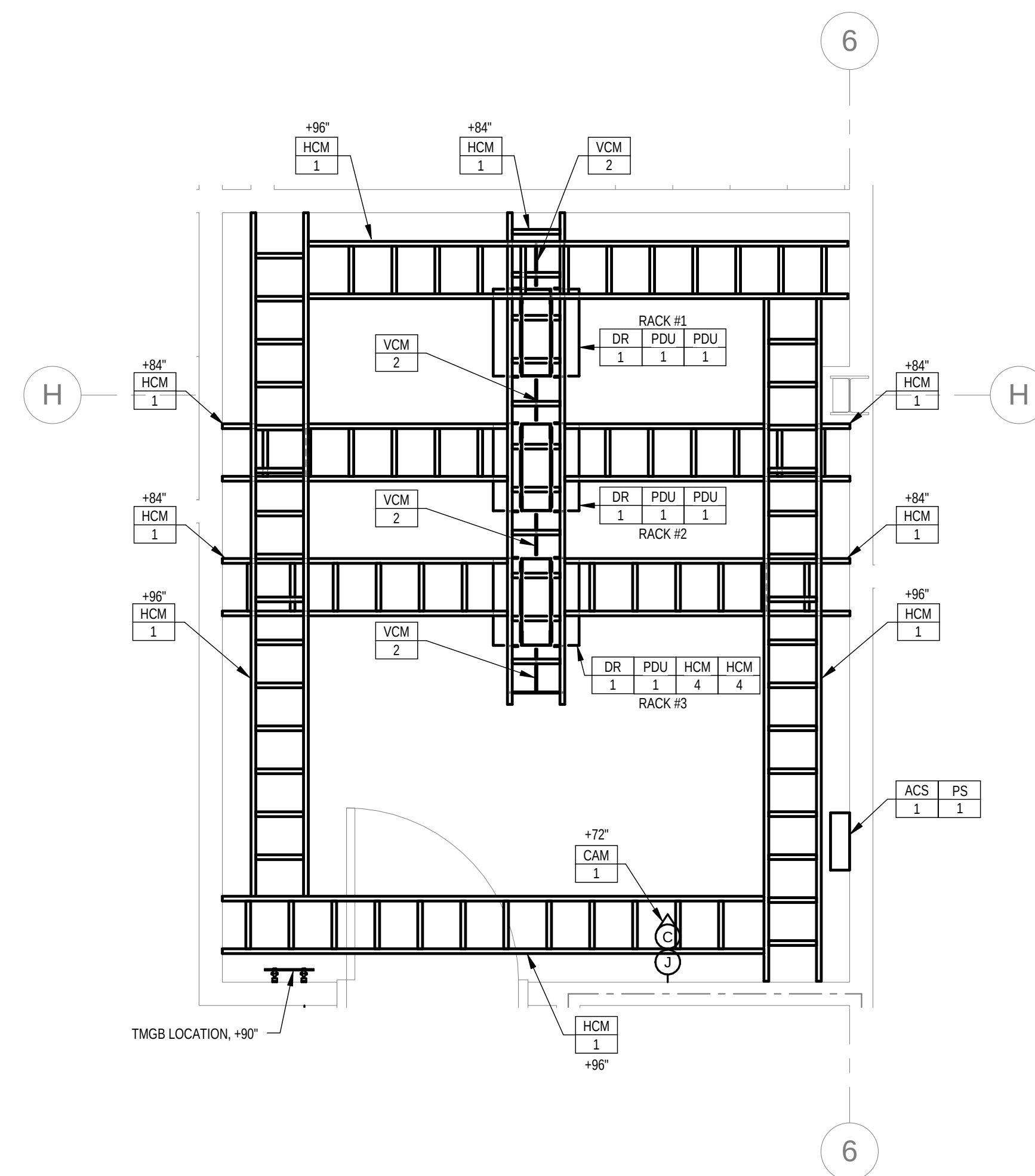
| DATE | REVISIONS |
|------|-----------|
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|      |           |

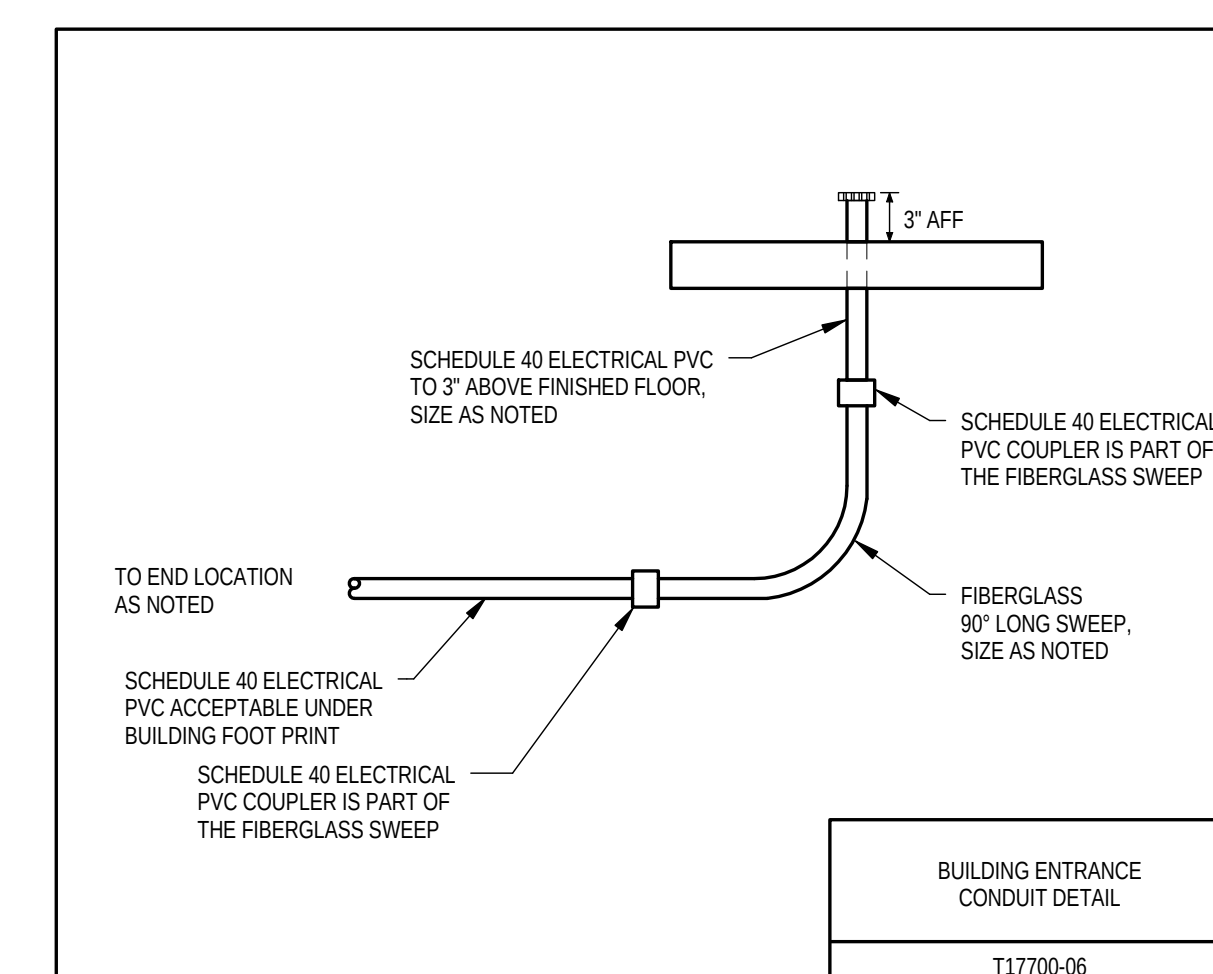
PERMIT / BID

|              |                             |
|--------------|-----------------------------|
| DRAWN        | DRH, JMC                    |
| CHECKED      | RSG                         |
| DATE         | 09-06-2013                  |
| JOB NO.      | 12008                       |
| DRAWING NAME | FIRST FLOOR<br>TELECOM PLAN |

SHEET  
**T1.2**

MORNING STAR  
STUDIO  
000380 STREET SE ■ STUDIO 201  
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## TELECOMMUNICATIONS SYMBOLS

(NOTE: ALL SYMBOLS SHOWN MAY NOT BE REQUIRED FOR THIS PROJECT)

\*\*\* TELECOM \*\*\*

INFORMATION JACK FOR VOICE OR DATA USE.  
MATCH RECEPTACLE HEIGHT UNLESS OTHERWISE NOTED.  
Y - INDICATES NUMBER OF RJ-45 JACKS/CABLES.  
THE NUMBER ONE IS IMPLIED.  
XZ - INDICATES ADDITIONAL DETAIL PER THE FOLLOWING:  
AC - INDICATES 8" ABOVE COUNTERTOP OR 4" ABOVE BACKSPASH  
W - INDICATES WALL PHONE PLATE AT 48" UNLESS OTHERWISE NOTED  
W - INDICATES WALL PHONE PLATE AT 48" UNLESS OTHERWISE NOTED, PLUS ONE JACK AT STANDARD OUTLET HEIGHT

XX  
#

EQUIPMENT DESIGNATION  
PER EQUIPMENT SCHEDULE

CATV SYSTEM OUTLET

SPEAKER OUTLET - CEILING MOUNTED

S - INDICATES SURFACE TYPE  
R - INDICATES RECESSED TYPE

SPEAKER OUTLET - WALL MOUNTED

S - INDICATES SURFACE TYPE  
R - INDICATES RECESSED TYPE

CLOCK - CEILING MOUNTED

CLOCK - WALL MOUNTED

BELL OR BUZZER

BELL OR BUZZER - WALL MOUNTED

MICROPHONE OUTLET (XLR ONLY) - IN FLOOR

BOX OR CEILING MOUNTED

MICROPHONE OUTLET (XLR ONLY) - WALL MOUNTED

VOLUME CONTROL - WALL MOUNTED

SECURITY DEVICE

SECURITY DEVICE - WALL MOUNTED

INTERCOM DEVICE

INTERCOM DEVICE - WALL MOUNTED

ACCESS CONTROL SYSTEM DEVICE - WALL MOUNTED

PROJECTOR - CEILING MOUNTED

PROJECTOR - WALL MOUNTED

CAMERA - CEILING MOUNTED

CAMERA - WALL MOUNTED

MOTION DETECTOR

MOTION DETECTOR - WALL MOUNTED

PUSH BUTTON

WIRE BASKET

LADDER RACK

ANY WIRING DEVICE WITH THIS SYMBOL  
INDICATES SURFACE MOUNTED OUTLET BOX

SPLICE CONNECTION FROM  
EXISTING TO NEW

CONDUIT SUB

CONDUIT CONTINUATION

CONDUIT TURNING UP

CONDUIT TURNING DOWN

FURNITURE FEED

FURNITURE FEED - WALL MOUNTED

FLOOR BOX / POKE THRU  
WITH SERVICES AS NOTED

WALL BOX WITH SERVICES AS NOTED

JUNCTION BOX - IN FLOOR BOX OR CEILING

JUNCTION BOX - WALL MOUNTED

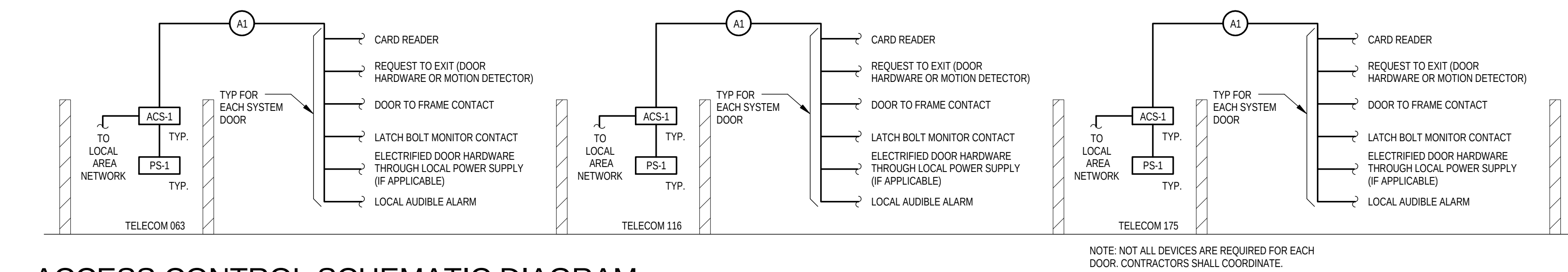
PULL BOX

PROJECTION SCREEN - CEILING MOUNTED

PROJECTION SCREEN - WALL MOUNTED

ELECTRONIC DISPLAY - CEILING MOUNTED

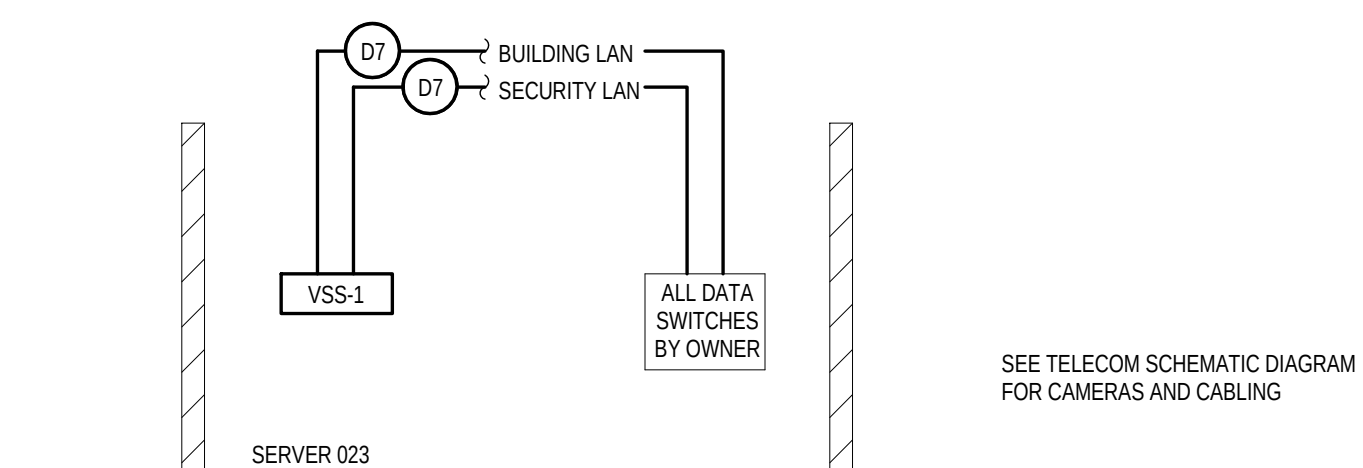
ELECTRONIC DISPLAY - WALL MOUNTED



## 1 ACCESS CONTROL SCHEMATIC DIAGRAM

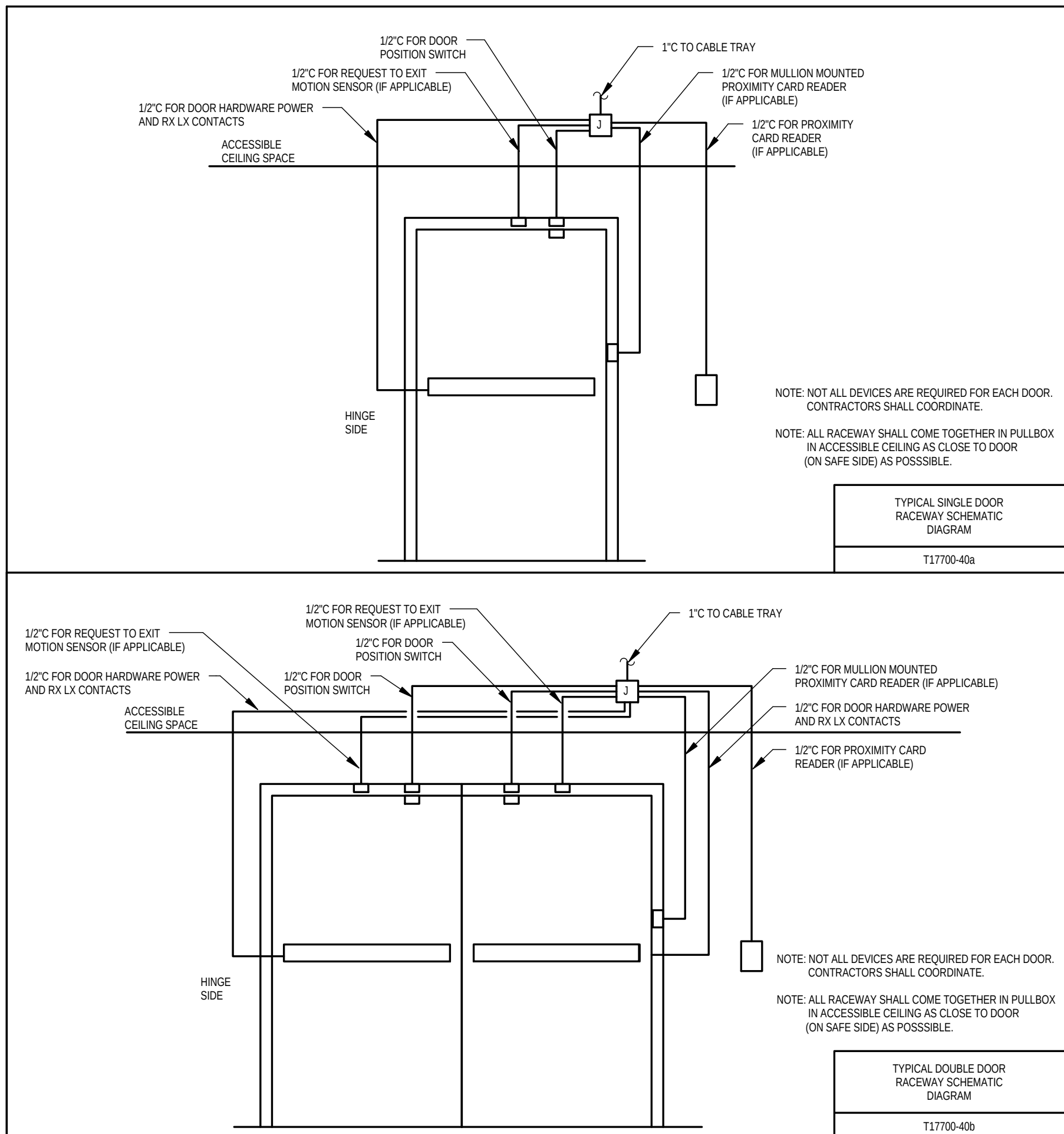
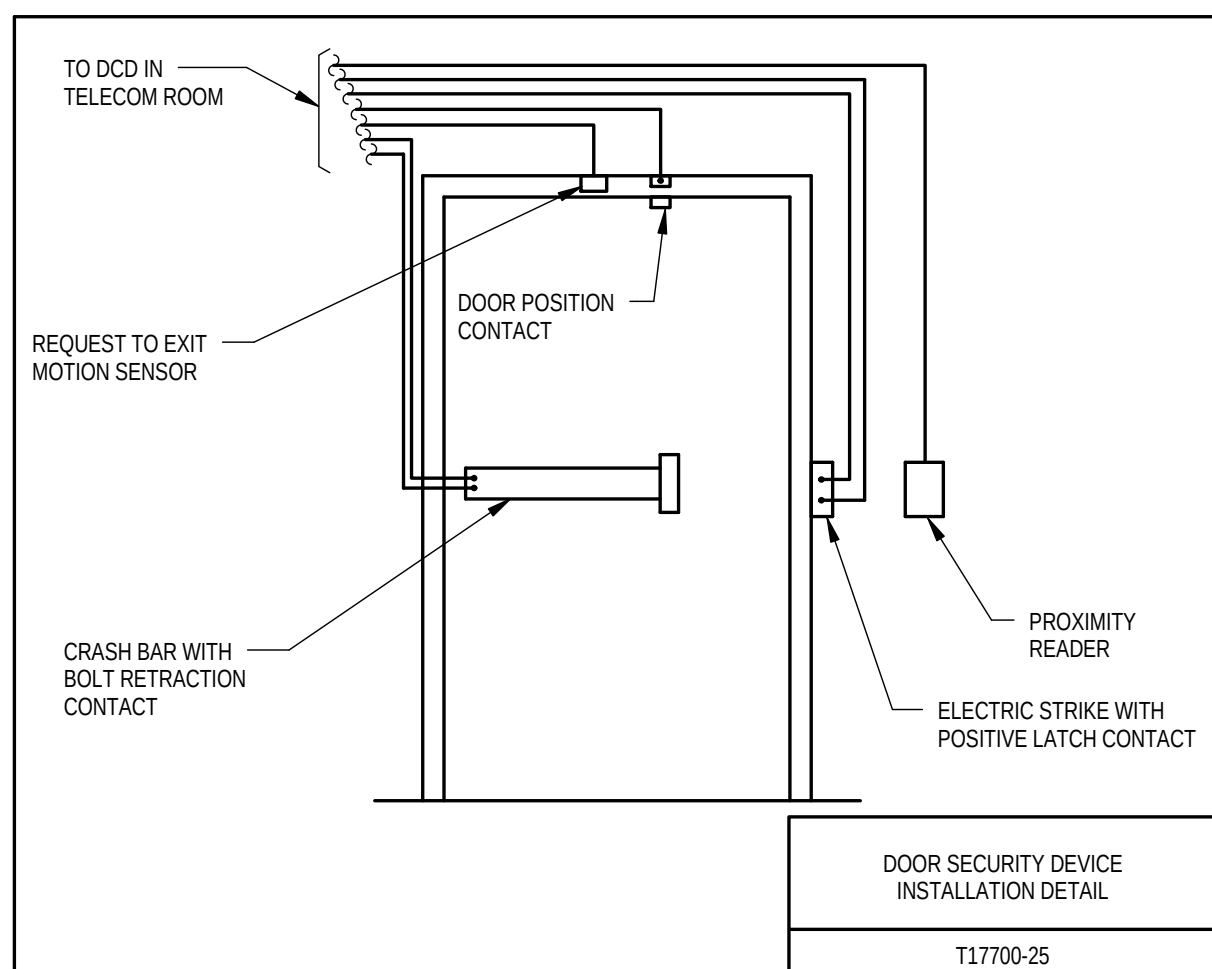
NOT TO SCALE

NOTE: IF AMAG IS USED, ONE ETHERNET DAUGHTER BOARD IN TELECOM 063 IS ACCEPTABLE WITH 20 MA INTERCONNECTS TO OTHER TELECOM ROOMS.



## 2 VIDEO SURVEILLANCE SCHEMATIC DIAGRAM

NOT TO SCALE



## 3 CABLE TELEVISION SCHEMATIC DIAGRAM

NOT TO SCALE

| ACCESS CONTROL DOOR SCHEDULE |           |                   |                       |
|------------------------------|-----------|-------------------|-----------------------|
| DOOR #                       | DOOR TYPE | HEAD END LOCATION | NOTES                 |
| 001A                         | RDR       | Telecom 063       |                       |
| 003B                         | AEO       | Telecom 063       |                       |
| 019A                         | RDR       | Telecom 175       |                       |
| 019B                         | RDR       | Telecom 175       |                       |
| 023                          | RDR       | Telecom 175       | Server Room           |
| 027A                         | RDR       | Telecom 175       |                       |
| 027B                         | DCO       | Telecom 175       | Garage Door           |
| 028B                         | RDR       | Telecom 175       |                       |
| 028D                         | DCO       | Telecom 175       | Trash Compactor Door  |
| 028E                         | DCO       | Telecom 175       | Trash Compactor Door  |
| 050                          | RDR       | Telecom 175       | PCI Room              |
| 053                          | RDR       | Telecom 063       | Limited Access Shower |
| 054                          | RDR       | Telecom 063       | Limited Access Shower |
| 059                          | EES       | Telecom 063       |                       |
| 063                          | RDR       | Telecom 063       | Telecom Room          |
| 101A                         | RDR       | Telecom 116       |                       |
| 116                          | RDR       | Telecom 116       | Telecom Room          |
| 129D                         | EES       | Telecom 116       |                       |
| 137                          | RDR       | Telecom 116       | Telecom Room          |
| 149                          | DBL RDR   | Telecom 063       | Deck                  |
| 175                          | RDR       | Telecom 175       | Telecom Room          |

Contractor Shall Check Specifications For Possible Further Details

### DOOR TYPE:

|                                                              |                                                                                                                                                                                                                       |
|--------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>RDR: Card Reader Entrance, Acceptable Exit</b>            | Equipped with card reader for access via electrically unlocking door hardware, request to exit functionality, latch bolt monitoring, and door position contacts.                                                      |
| <b>DBL RDR: Double Card Reader Entrance, Acceptable Exit</b> | Equipped with two card readers, one on each side, for access via electrically unlocking door hardware, latch bolt monitoring, and door position contacts. Request to exit not needed due to card reader on each side. |
| <b>PEAE: Programmable Entrance, Acceptable Exit</b>          | Equipped with electrically unlocking door hardware (but no card reader), request to exit functionality, latch bolt monitoring, and door position contacts. May be programmed/unlocked as an acceptable entrance.      |
| <b>AEO: Acceptable Exit Only</b>                             | Request to exit functionality, latch bolt monitoring, and door position contacts. Cannot be electrically unlocked.                                                                                                    |
| <b>EEO: Emergency Exit Only</b>                              | Door position contacts and latch bolt monitoring.                                                                                                                                                                     |
| <b>EES: Emergency Exit w/ Sounder</b>                        | Door position contacts, latch bolt monitoring, and a local audible alarm (sounder) tied into access control system.                                                                                                   |
| <b>DCO: Door Contacts Only</b>                               | Door position contacts only. Typically used for garage doors or specialty situations.                                                                                                                                 |

### NOTES:

- Contractor shall coordinate with Owner and program door locking and unlocking schedule per Owner request.
- Contractor shall provide and install Bosch DS160 PIR REX on door types that require request to exit function and have an electric strike.
- Contractor shall provide and install Bosch DS160 PIR REX on door types that require request to exit, and it is not provided integral to the door hardware (coordinate with architectural drawings and specifications).
- See specifications for connection requirements between electrified door openers (ADA) and access control system.

| TELECOMMUNICATIONS SCHEDULE |                                                                                     |                               |                               |                                                                                                                     |       |
|-----------------------------|-------------------------------------------------------------------------------------|-------------------------------|-------------------------------|---------------------------------------------------------------------------------------------------------------------|-------|
| PLAN MARK                   | DESCRIPTION                                                                         | FURNISHED BY                  | INSTALLED BY                  | REMARKS                                                                                                             | NOTES |
| A1                          | Cable, Access Control Composite                                                     | Access Control Contractor     | Access Control Contractor     | CSC 112115 Plenum                                                                                                   |       |
| D2                          | Cable, Data Branch, 4PR UTP                                                         | Telecom Contractor            | Telecom Contractor            | Plenum. See spec.                                                                                                   |       |
| D3                          | Cable, Copper Back Bone, Misc. Circuits                                             | Telecom Contractor            | Telecom Contractor            | 50PR Cat 5e Plenum, Match D2 Manufacturer                                                                           |       |
| D4                          | Cable, RJ-45 To RJ-45 Patch Cord, Cat 6, 1'                                         | Telecom Contractor            | Telecom Contractor            | Short For Patch Panel To Switch Directly (Vertically). Blue, Provide Qty 1650, Match UTP (Same Manufacturer)        | T-8   |
| D5                          | Cable, RJ-45 To RJ-45 Patch Cord, Cat 6, 10'                                        | Telecom Contractor            | Telecom Contractor            | Flat Work Area Outlets. Blue, Provide Qty 1650, Match UTP (Same Manufacturer)                                       | T-8   |
| D7                          | Cable, RJ-45 To RJ-45 Patch Cord, Cat 6, 7', For Cameras                            | Telecom Contractor            | Telecom Contractor            | Match UTP (Same Manufacturer). Connect to UTP Drop For Camera Installation By Vid. Surv. Contractor                 |       |
| F1                          | Cable, Optical Fiber, Armored Indoor Application, 24MM OM4                          | Telecom Contractor            | Telecom Contractor            | Corning Cable Systems MIC DX Non-conductive, Plenum                                                                 |       |
| R2                          | Cable, Coaxial, Series 6, Plenum Rated                                              | Telecom Contractor            | Telecom Contractor            | CommScope 2275V White                                                                                               |       |
| Intentional Blank Row       |                                                                                     |                               |                               |                                                                                                                     |       |
| ACS-1                       | Access Control System Head End                                                      | Access Control Contractor     | Access Control Contractor     | Axis P3384-V                                                                                                        |       |
| CAM-1                       | Camera, Video Surveillance                                                          | Video Surveillance Contractor | Video Surveillance Contractor | Axis P3384-VE                                                                                                       |       |
| CAM-2                       | Camera, Video Surveillance                                                          | Video Surveillance Contractor | Video Surveillance Contractor | Axis P3346-VE                                                                                                       |       |
| DR-1                        | Data Rack, 7x19" Two Post                                                           | Telecom Contractor            | Telecom Contractor            |                                                                                                                     |       |
| DR-2                        | Server Cabinet For Server Room                                                      | Telecom Contractor            | Telecom Contractor            |                                                                                                                     |       |
| FHL-1                       | Fiber Housing, Loaded For All Incoming Fiber                                        | Telecom Contractor            | Telecom Contractor            | Corning Cable Systems CCH-04U New Style                                                                             |       |
| FHL-2                       | Fiber Housing, Loaded For All Incoming Fiber                                        | Telecom Contractor            | Telecom Contractor            | Corning Cable Systems CCH-02U New Style                                                                             |       |
| FT-1                        | Fiber Trough, 4" x 4" w/ All Necessary Junctions And Accessories For System Install | Telecom Contractor            | Telecom Contractor            | Tyco Electronics Fiber Trough, Formerly ADC-Fiber Trough                                                            |       |
| HCM-1                       | Horizontal Cable Management, 12" Ladder Rack                                        | Telecom Contractor            | Telecom Contractor            | w/ 6" Vertical Stands Every 12" Min. and L Brackets For Grounding and Power Underneath Facing Inward Every 12" Min. |       |
| HCM-2                       | Horizontal Cable Management, 18" Ladder Rack                                        | Telecom Contractor            | Telecom Contractor            | w/ 6" Vertical Stands Every 12" Min. and L Brackets For Grounding and Power Underneath Facing Inward Every 12" Min. |       |
| HCM-3                       | Horizontal Cable Management, 18" x 4" Wire Basket                                   | Telecom Contractor            | Telecom Contractor            |                                                                                                                     |       |
| HCM-4                       | Horizontal Cable Management, 19" Rack Mounted 2RU                                   | Telecom Contractor            | Telecom Contractor            |                                                                                                                     |       |
| HCM-5                       | Horizontal Cable Management, 12" x 4" Wire Basket                                   | Telecom Contractor            | Telecom Contractor            |                                                                                                                     |       |
| HH-1                        | Hand Hole, 30" Wide x 48" Long x 36" Deep                                           | Electrical Contractor         | Electrical Contractor         | Furnish And Install Per Multiple Details Found On Telecom Sheets                                                    |       |
| IDC-1                       | Insulation Displacement Connector, 110 Style w/ Legs                                | Telecom Contractor            | Telecom Contractor            | Same Manufacturer As Connectivity                                                                                   |       |
| PDU-1                       | Power Distribution Unit, 19" Rack Mounted                                           | Telecom Contractor            | Telecom Contractor            | Tripp Lite PDUIM420 w/ Min. 10' Cord and L5-20P Plug                                                                |       |
| PDU-2                       | Power Distribution Unit, Vertical, Dual Input, For Server Cabinet                   | Telecom Contractor            | Telecom Contractor            | Tripp Lite PDUIMV40 w/ Min. 10' Cord and L5-20P Plug                                                                |       |
| PP-1                        | Patch Panels, Rack Mounted, Modular, 24 Port 1RU and 48 Port 2RU (see detail)       | Telecom Contractor            | Telecom Contractor            | Each Provided Shall Be Full Of Black Cat6 Jacks                                                                     |       |
| PP-2                        | Patch Panels, Rack Mounted, Modular, 48 Port 2RU                                    | Telecom Contractor            | Telecom Contractor            | Each Provided Shall Be Full Of Black Cat6 Jacks. Terminate 1PR Per Port                                             |       |
| PS-1                        | Power Supply, Access Control System                                                 | Access Control Contractor     | Access Control Contractor     |                                                                                                                     |       |
| RDR-1                       | Reader, Card, Proximity                                                             | Access Control Contractor     | Access Control Contractor     | HID, Standard Wall Mount Or Door Frame Mount Models As Required, Coordinate w/ Architectural                        |       |
| VCM-1                       | Vertical Cable Management, 7" Tall x 6" Wide x 12" Deep                             | Telecom Contractor            | Telecom Contractor            |                                                                                                                     |       |
| VCM-2                       | Vertical Cable Management, 7" Tall x 10" Wide x 12" Deep                            | Telecom Contractor            | Telecom Contractor            |                                                                                                                     |       |
| VSS-1                       | Video Surveillance Server, Mount in Server Room Server Cabinet                      | Video Surveillance Contractor | Video Surveillance Contractor | Dual NIC Card. See Spec. Coordinate Which Cabinet w/ Owner                                                          |       |

Contractor Shall Check Specifications For Possible Further Details

### GENERAL TELECOM NOTES

- The Electrical Contractor shall study all Telecom plans including reading all Telecom general and specific notes for instructions that will affect or pertain to the Electrical Contractor.
- Electrical Contractor shall provide and install all telecom conduits to accessible ceiling space (they shall not be terminated above hand lifts or in exposed areas). Unless instructed otherwise, stub all telecom conduits to the accessible ceiling space in the same room as the opening.
- The Electrical Contractor shall not daisy chain any voice/data cabling or AV cabling conduits when routing from boxes to accessible ceiling spaces, etc.
- The Electrical Contractor shall provide and install bushings on all telecom conduits at the time of conduit installation.
- Coordinate routing of raceway and equipment to maintain access to filters, motors, electrical equipment, and controls. In no case shall raceway, cabling bundles, or equipment pass directly over electrical panels or disconnects or restrict access to any electrical equipment including junction boxes.
- Conduit minimum sizes shall be per the electrical raceway specifications unless noted otherwise.
- Contractor shall verify all quantities.
- Contractor shall fasten all equipment to structure so everything is completely solid.
- Contractor shall use hook and loop fasteners on cabling exclusively, no tie wraps. Exception: tie wraps may be used loosely for dressing cables during installation, but shall be removed and replaced with hook and loop fasteners before job is complete.
- The maximum distance between all J hooks shall be five feet. All J hooks shall be sized to have at least 50% capacity available for future growth. Contractor shall not fasten cabling to piping, ductwork, conduits, or anything other than Contractor installed J hooks or cable tray supported from structure. Contractor shall not tie cable over piping, ductwork, conduits, ceiling grilles, and any other building structure element or building support system device. Use low voltage pathway only.
- All telecom cabling in finished spaces is to be routed concealed in walls, unless specifically noted otherwise. All exposed cabling and cabling behind inaccessible construction (such as in walls and above drywall ceilings) shall be routed in conduit which is provided and installed by the Electrical Contractor. All wall penetrations shall be sleeved with conduit.
- The Contractor shall not pull any telecom cabling through conduits that do not have the required bushings installed. Cabling pulled through conduits with no bushings that receive cable jacket damage shall be replaced by the contractor at no charge to the Owner.
- The Contractor shall review the architectural plans for areas that are base bid and areas that are alternate bids and work accordingly (if alternates exist).
- The Contractor shall review the architectural plans for fire wall locations, then provide and install fire stopping in all telecom conduits including those with cabling in them and those telecom sleeves or conduits without cabling in them for those fire wall locations.
- The telecom structured cabling shall not have paint or paint overspray on the cabling jacket which may degrade the performance of the cabling and void the warranty. Cabling which has paint on it shall be replaced at the Contractor's expense (it cannot be cleaned mechanically or with solvents, it shall be replaced).

### TELECOM NOTES

- Telecom Contractor shall furnish and install a connectivity manufacturer thermoplastic surface box (biscuit) in accessible ceiling space with 10' slack coil of UTP for the purpose of wireless data access. Actual active device shall be furnished by the Owner but installed by the Contractor. Contractor shall coordinate with Owner regarding mounting style (model that has antenna protruding through ceiling tile versus unit that fully resides in plenum, etc.). Contractor shall provide simple but sturdy L bracket shelf secured to structure for each installation if required. Active device shall be at least minimally secured to shelf with tie downs or equivalent.
- Electrical Contractor shall furnish and install an extra deep box (minimum 2.5' clear inside) with double gang minding. Box shall receive 1" EMT conduit to accessible ceiling space directly above. Telecom Contractor shall furnish and install information jack (data drop) in connectivity manufacturer thermoplastic surface box (biscuit) in accessible ceiling space (with 10' slack coil) immediately at the end of the EMT conduit run. The purpose of this installation is for the Owner provided laptops which will be electronic scheduling devices for reserving the room. The Telecom Contractor shall also furnish and install a Cat 6 patch cord (same manufacturer as the UTP data cable) from the biscuit jack above, down the conduit and into the junction box. The Owner will place a USB power brick in the junction box space and connect the patch cord which will provide PoE power to the laptop. The Owner will then connect the power brick to the laptop and install the laptop and laptop support frame to the wall.
- Electrical Contractor shall coordinate location of AV raceway and information jack (data) raceway with Owner and Owners direct AV Contractor such that these openings are behind the AV rack in a suitable location for the type rack being provided and intended mounting height/location.
- Information jacks shall be terminated on manufacturer standard faceplate with labeling windows inside this floor box. Eventhough some AV cabling will pass through this floorbox, this is not a furniture feed application for voice/data.
- Data cabling is segregated by area and in some locations by floor. In locations with this note, the data cabling shall be brought directly back up to the floor with the faceplate or furniture feed for consistent structured cabling plant management. While it is not necessary that the conduit tie directly to the poke through in continuous fashion, it is mandatory that the cable remain clearly segregated therefore the Electrical Contractor shall provide all conduits associated with the poke through from ceiling space on the floor above to the poke through location, terminating the conduit within 24" of the bottom edge of the poke through device, no farther away. Add pull box in conduit run if over 180 degrees of bend radius.
- Electrical Contractor shall furnish and install 2" schedule 40 electrical PVC conduit from the floor box directly plan west as much as possible to the nearest wall on that azimuth and then up to accessible ceiling space in the same room. In this conduit run, transition to 2" EMT within 9' of rising above the concrete floor. The direction of the conduit is critical for cable length and deviation from this plan to other walls which takes the conduit in a direction away from the associated telecom room is not acceptable.
- Electrical Contractor shall furnish and install 2" schedule 40 electrical PVC conduit from the floor box directly plan east as much as possible to the nearest wall on that azimuth and then up to accessible ceiling space in the same room. In this conduit run, transition to 2" EMT within 9' of rising above the concrete floor. The direction of the conduit is critical for cable length and deviation from this plan to other walls which takes the conduit in a direction away from the associated telecom room is not acceptable.
- That is no typo in the schedule, that is a LOT of patch cords since there is a LOT of UTP. The Telecom Contractor shall be responsible for furnishing and installing all those patch cords that are specified in the schedule so don't miss them! Coordinate with the Owner regarding installation since data switches are Owner furnished. Telecom Contractor shall also install the Owner provided data switches using new rack screws. To bid the labor, plan to install all data switches shown on the rack elevations and up to 6 more data switches if required. Installation includes mounting in the racks using new rack screws and routing and connecting power cords to the PDUs. Backplane or GBC trunk connections will be by the Owner.
- The Electrical Contractor shall furnish and install a 4'x8' sheet of plywood in this location in the horizontal (landscape) orientation, secured to the wall securely enough to handle up to 250 pounds of load attached to the plywood. The bottom of the plywood should be 36" AFF placing the center at 60" AFF. It shall be 3/4" AC plywood, A side visible, fire rated, painted with three separate coats of fire retardant bright white paint (with one of the fire rating stamps on the A side neatly masked off so it remains visible for the AHJ (authority having jurisdiction)).
- The Electrical Contractor shall furnish and install conduits in the quantity and size shown from the lower level accessible ceiling space to the upper level accessible ceiling space in the shortest and most direct option possible (only kick out below if a lower level wall is encountered). This is primary pathway to get voice/data cabling back up to the proper level which it terminates on at both ends.
- Coordinate exact location of vertical power distribution unit in each server cabinet with Owner. They have to determine which side it mounts on in relation to the folding cord manager on their servers.
- Rack front elevations are shown to outline the desired installation pattern of power distribution units, patch panels and data switches. These elevations shall not override the schematic diagrams, meaning that if more cabling is added at any time than the elevations show patch panels for, the Contractor remains responsible (per the schematic diagrams) for furnishing and installing patch panels per the pattern for all cabling.