

CANNON HEALTH BUILDING HVAC UPGRADES

288 North 1460 West Salt Lake City, Utah 84116

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E1.01	PENTHOUSE ELECTRICAL PLAN
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CONSULTANTS

PROJECT ENGINEER: VAN BOERUM & FRANK ASSOCIATES, INC.
330 SOUTH 300 EAST
SALT LAKE CITY, UT 84111
(801) 530-3148 (Steve Shepherd)

ELECTRICAL ENGINEER: VAN BOERUM & FRANK ASSOCIATES, INC.
330 SOUTH 300 EAST
SALT LAKE CITY, UT 84111
(801) 530-3148 (Stan Johns)



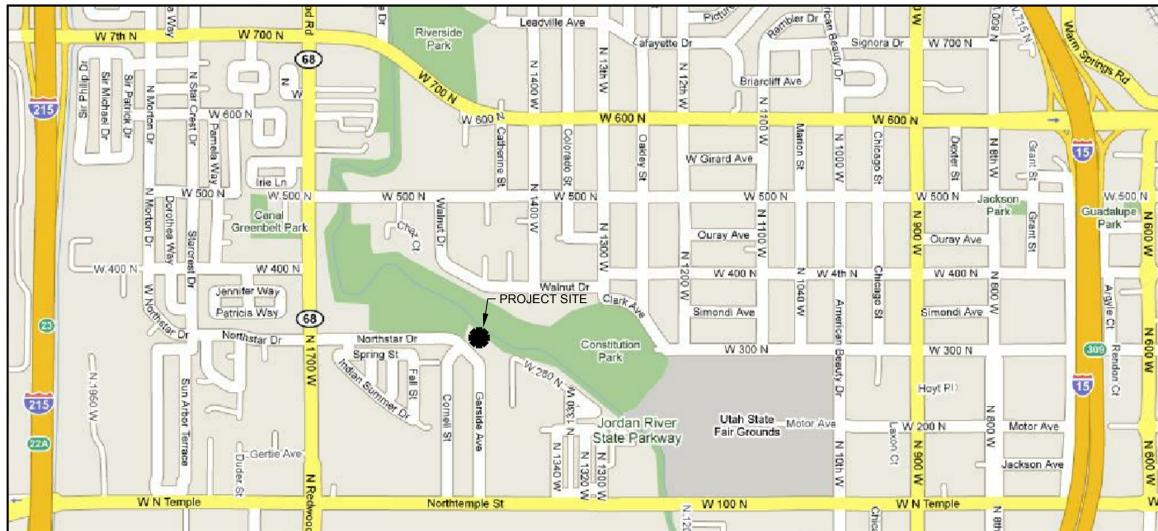
State of Utah—Department of Administrative Services

DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT

4110 State Office Building / Salt Lake City, Utah 84114 / 538-3018

DFCM Project No. 07177390 CONSTRUCTION DRAWINGS

SALT LAKE CITY, UTAH



Vicinity Map



CODE ANALYSIS

APPLICABLE CODES			
	Year		Year
International Building Code	2006	National Electrical Code	2005
International Mechanical Code	2006	Uniform Code for Building Conservation	N/A
International Fire Code	2006	ADA Accessibility Guidelines	
International Energy Conservation Code	2006		

A. Occupancy and Group: B
 Change in Use: Yes No Mixed Occupancy: Yes No
 Special Use and Occupancy (e.g. High Rise, Covered Mall): N/A

B. Seismic Design Category: N/A Design Wind Speed: N/A mph

C. Type of Construction (circle one):
 I A I B II A II B III A III B IV HT V A V B

D. Fire Resistance Rating Requirements for the Exterior Walls based on the fire separation distance (in hours):
 North: NR South: NR East: NR West: NR

E. Mixed Occupancies: NO Nonseparated Uses: NO

F. Sprinklers:
 Required: NO Provided: NO Type of Sprinkler System: N/A

G. Number of Stories: 4 Building Height: 62' 0"

H. Actual Area per Floor (square feet): 46325

I. Tabular Area: UL

J. Area Modifications:
 a) $A_a = A_1 + \left[\frac{A_1 I_f}{100} \right] + \left[\frac{A_1 I_s}{100} \right]$ $I_f = 100 \left[\frac{F}{P} - 0.25 \right] \frac{W}{30}$

b) Sum of the Ratio Calculations for Mixed Occupancies:
 $\frac{\text{Actual Area}}{\text{Allowable Area}} \leq 1$

c) Total Allowable Area for:
 1) One Story:
 2) Two Story: $A_a(2)$
 3) Three Story: $A_a(3)$

d) Unlimited Area Building: Yes No Code Section:

K. Fire Resistance Rating Requirements for Building Elements (hours).

Element	Hours	Assembly Listing	Element	Hours	Assembly Listing
Exterior Bearing Walls	N		Floors - Ceiling Floors	N	
Interior Bearing Walls	N		Roofs - Ceiling Roofs	N	
Exterior Non-Bearing Walls	N		Exterior Doors and Windows	NR	
Structural Frame	N		Shaft Enclosures	1 HR	
Partitions - Permanent	N		Fire Walls		
Fire Barriers			Fire Partitions		
			Smoke Partitions		

L. Design Occupant Load:
 Exit Width Required: N/A Exit Width Provided: N/A

M. Minimum Number of Required Plumbing Facilities:
 a) Water Closets - Required (m) (f) Provided (m) (f)
 b) Lavatories - Required (m) (f) Provided (m) (f)
 c) Bath Tubs or Showers:
 d) Drinking Fountains: Service Sinks:

FOOTNOTES:
 1) In case of conflict with the U.S. Department of Justice Federal Registers Parts 1 through 16 - ADA Guidelines and specific reference to the International Building Code Accessibility Chapters, the more restrictive requirement shall govern.
 2) Additional Code Information shall be provided at the discretion of the Building Official for Complex Buildings. Including, but not limited to:
 a) High Rise Requirements.
 b) Atriums.
 c) Performance Based Criteria.
 d) Means or Egress Analysis.
 e) Fire Assembly Locator Sheet.
 f) Exterior and Interior Accessibility Route.
 g) Fire Stopping, Including Tested Design Number.



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 Van Boerum & Frank Assoc., 2008

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REVISIONS

VBFA PROJECT #: 08249
 CHECKED BY: Sshepherd / Jbeck
 DRAWN BY: Ejarez / Cbetts
 CURRENT/REV DATE: 11/24/08

SHEET CONTENTS
COVER SHEET

C0.00



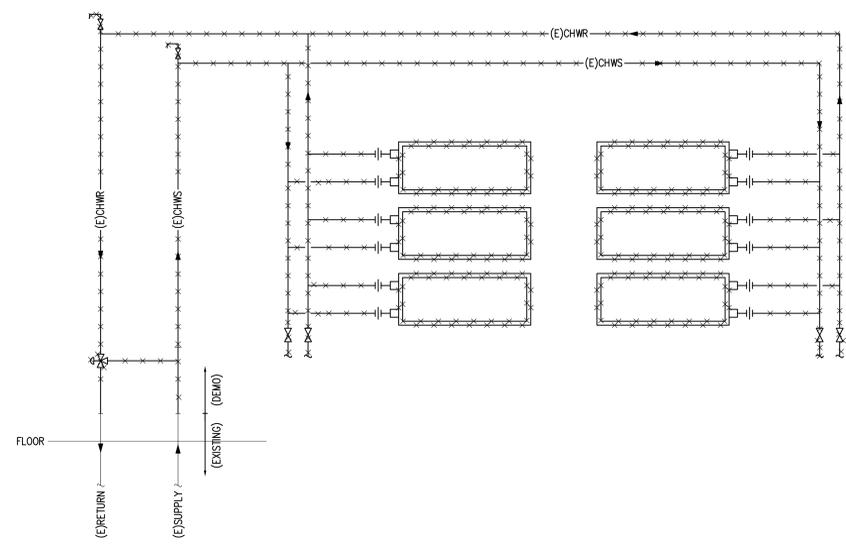
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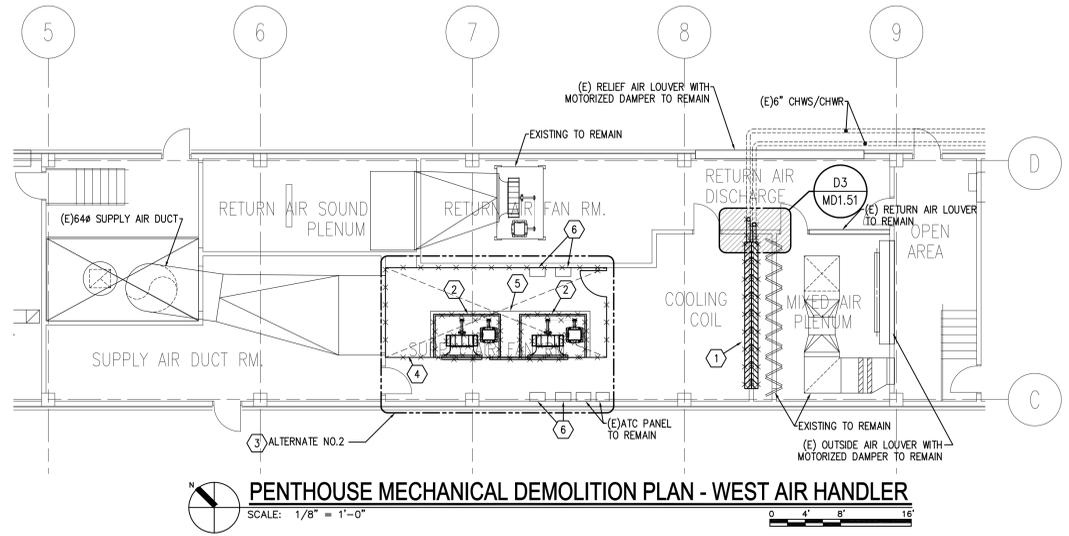


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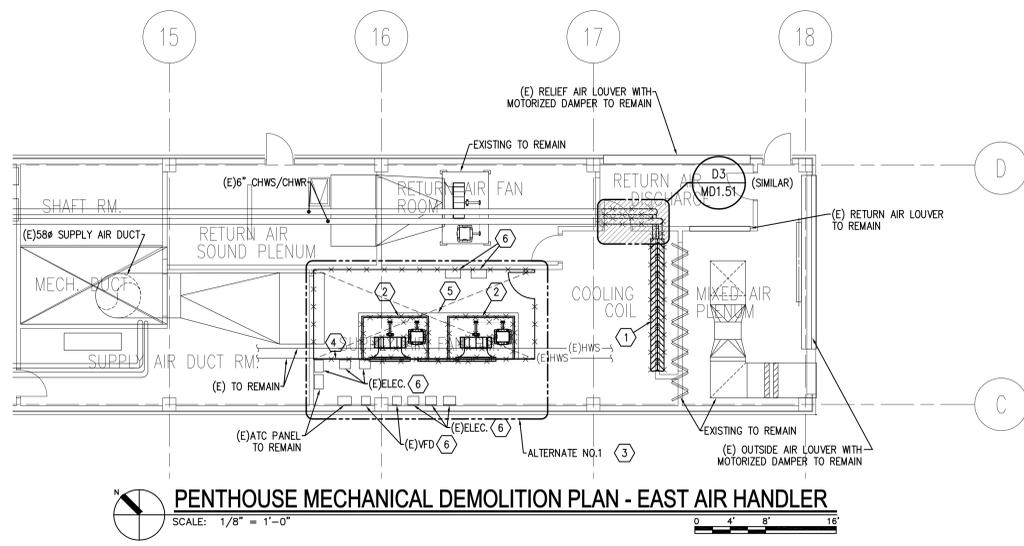
- 1. REMOVE EXISTING COOLING COIL, ASSOCIATED PIPING, SUPPORTS, ETC. TO ACCOMMODATE INSTALL OF NEW COIL. PATCH AND REPAIR EXISTING WALLS AS NECESSARY. CHILLED WATER SHUTOFF VALVES ARE LOCATED AT CHILLER AND CHILLED WATER PUMPS.
2. REMOVE EXISTING SUPPLY FANS TO ACCOMMODATE INSTALLATION OF NEW FAN ARRAY. REMOVAL OF FANS, MOTORS, SUPPORTS ETC. TO BE ACCOMPLISHED THROUGH EXISTING DOORS.
3. REMOVAL AND REPLACEMENT OF FANS AND ASSOCIATED WORK IS AN ALTERNATE.
4. REMOVE EXISTING SHEET METAL PLENUM WALL.
5. EXISTING CONCRETE HOUSEKEEPING PAD TO REMAIN.
6. SEE ELECTRICAL DRAWINGS FOR REMOVAL OF ELECTRICAL EQUIPMENT.



D3 COOLING COIL PIPING DEMOLITION SCHEMATIC NO SCALE



PENTHOUSE MECHANICAL DEMOLITION PLAN - WEST AIR HANDLER SCALE: 1/8" = 1'-0"



PENTHOUSE MECHANICAL DEMOLITION PLAN - EAST AIR HANDLER SCALE: 1/8" = 1'-0"

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Table with 2 columns: Field, Value. Includes Project #, Checked By, Drawn By, Current/Bid Date.

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MD1.51

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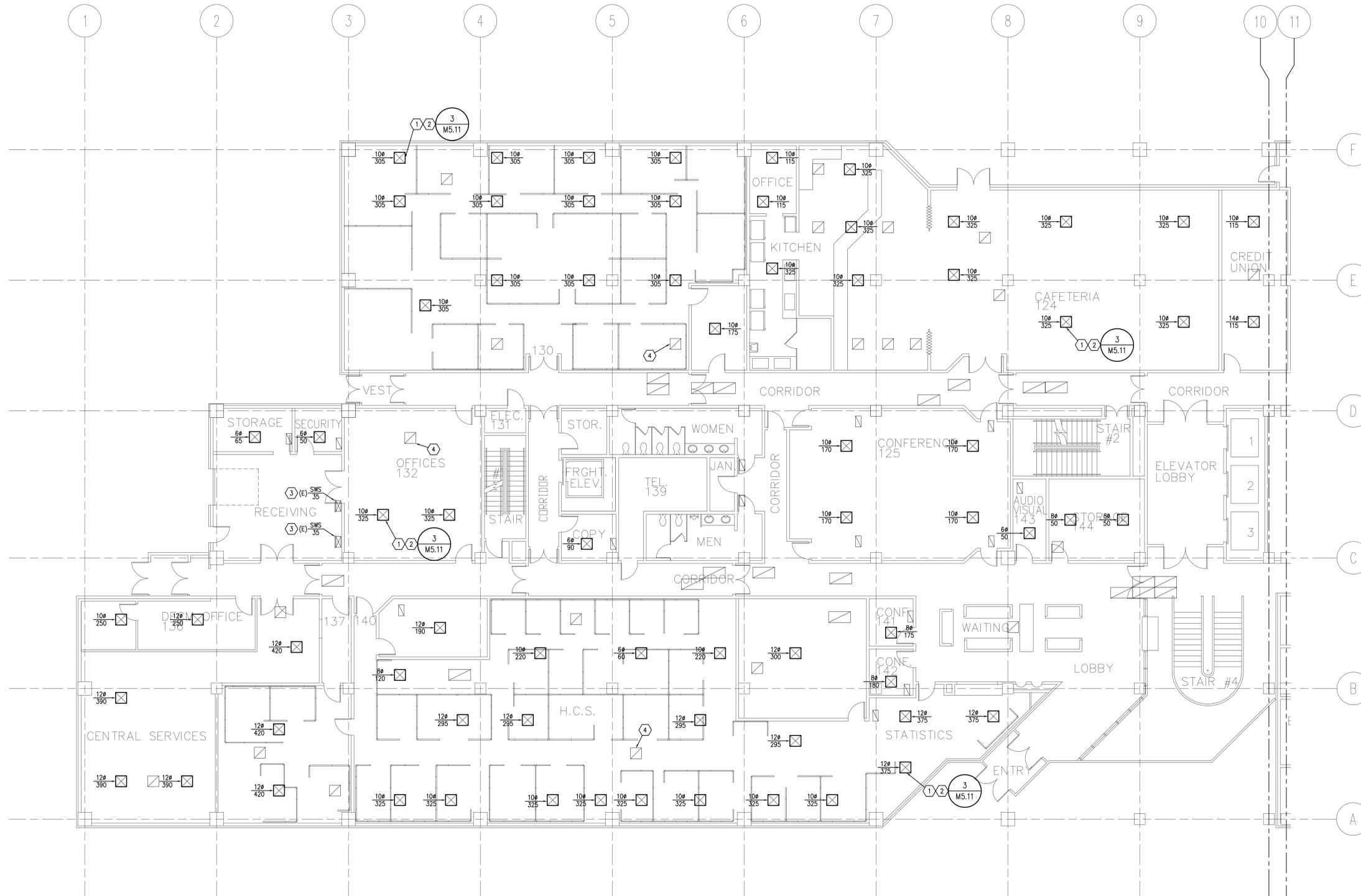
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FIRST FLOOR MECHANICAL PLAN
 SCALE: 1/8" = 1'-0"

KEYED NOTES

1. REMOVE EXISTING DIFFUSER AND REPLACE WITH NEW. EXTEND AND CONNECT EXISTING FLEXIBLE DUCT TO NEW DIFFUSER. FIELD VERIFY EXISTING DIFFUSER AND DUCT SIZE (TYPICAL OF ALL). SEE DETAIL 3/M5.11. REPLACE DAMAGED CEILING TILES AND FLEXIBLE DUCTWORK DUE TO CONSTRUCTION.
2. BALANCE DIFFUSER TO AIRFLOW AS SHOWN. (TYPICAL OF ALL).
3. EXISTING SIDE WALL SUPPLY GRILLE TO REMAIN. BALANCE TO CFM SHOWN.
4. EXISTING RETURN GRILLE TO REMAIN. FOR REFERENCE ONLY. (TYPICAL OF ALL).



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**FIRST FLOOR
 MECHANICAL
 PLAN**

M1.11

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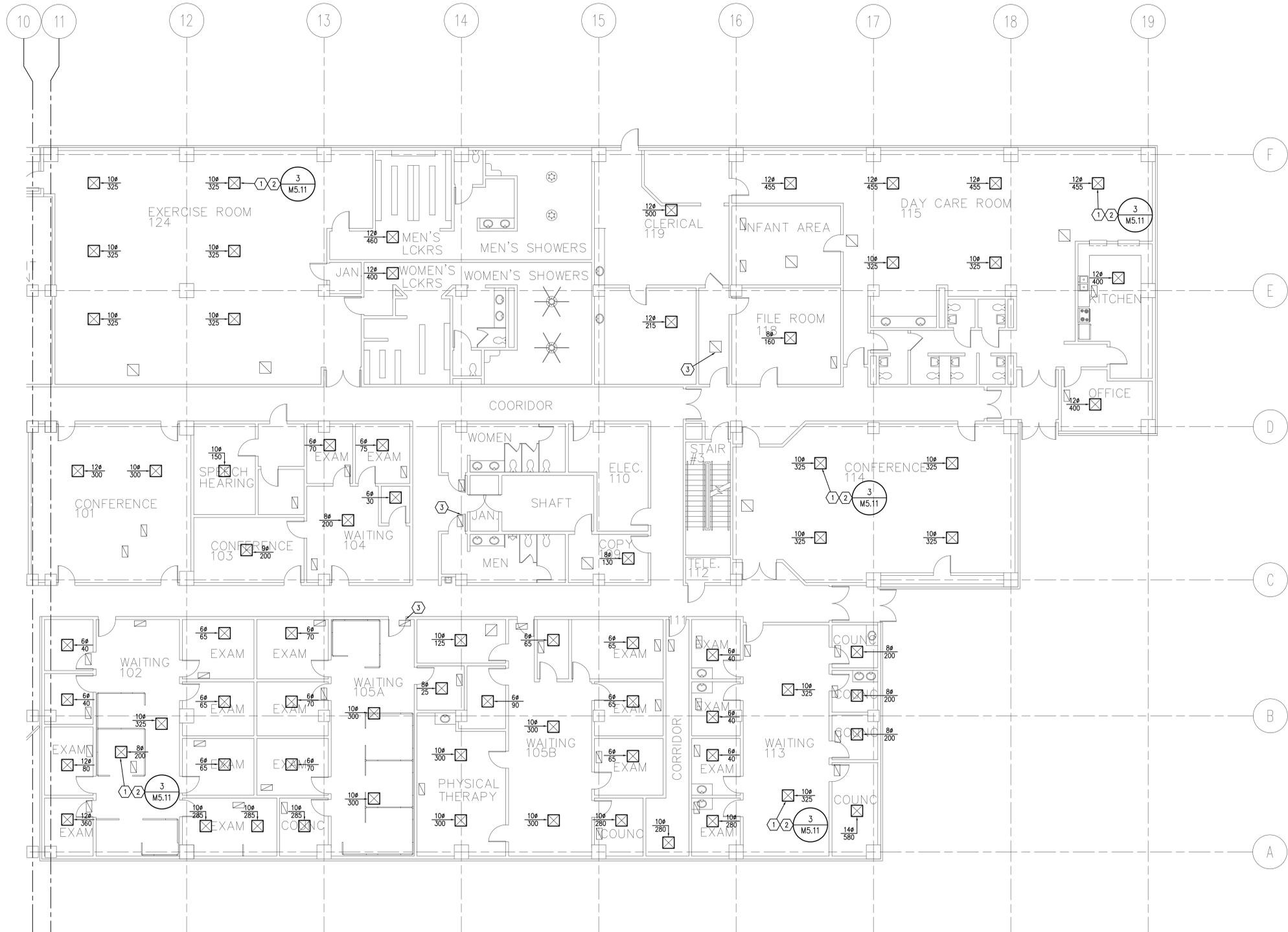
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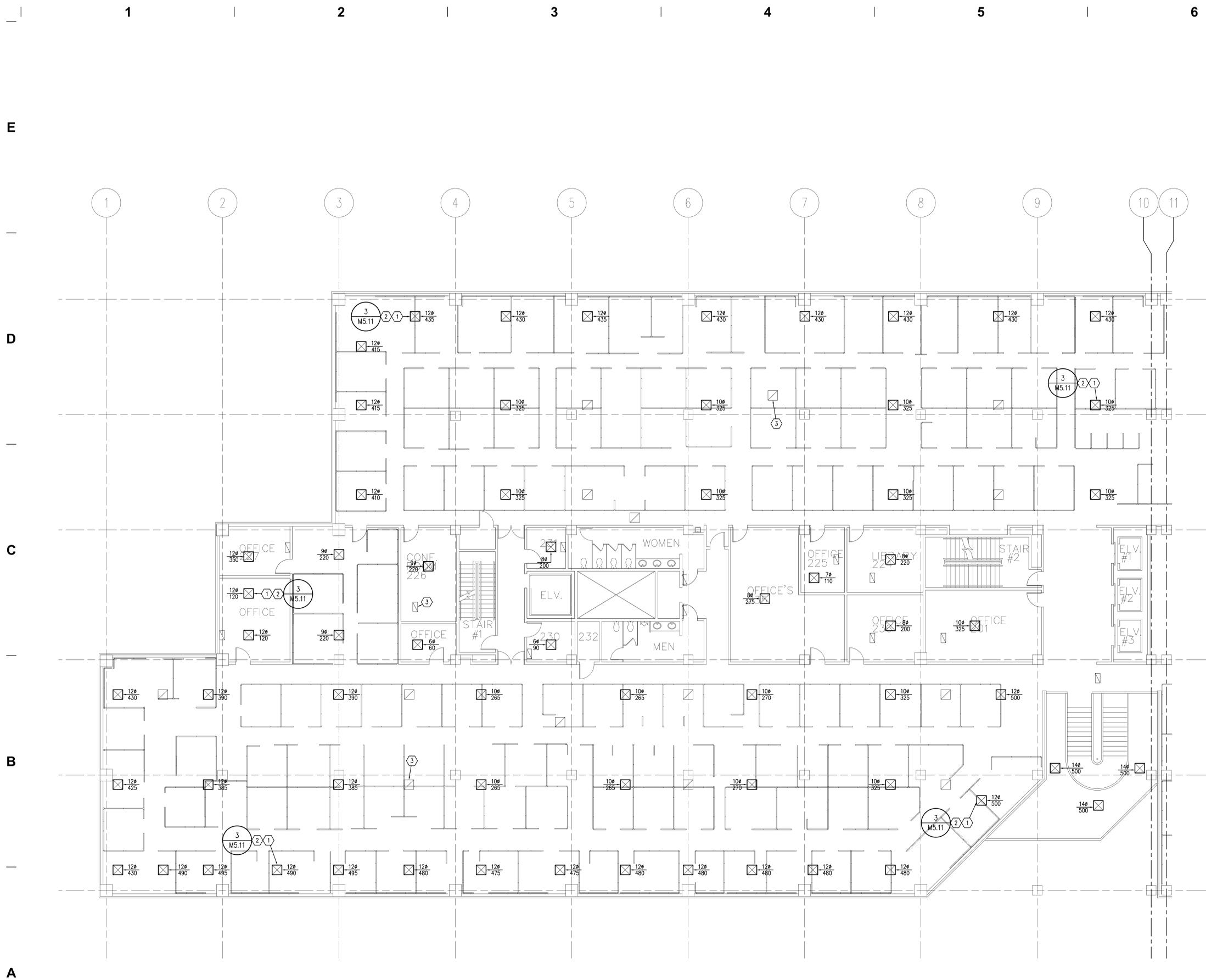
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**FIRST FLOOR
MECHANICAL
PLAN**

M1.12



FIRST FLOOR MECHANICAL PLAN
SCALE: 1/8" = 1'-0"
0 4 8 16



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

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**SECOND FLOOR
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 PLAN**

M1.21

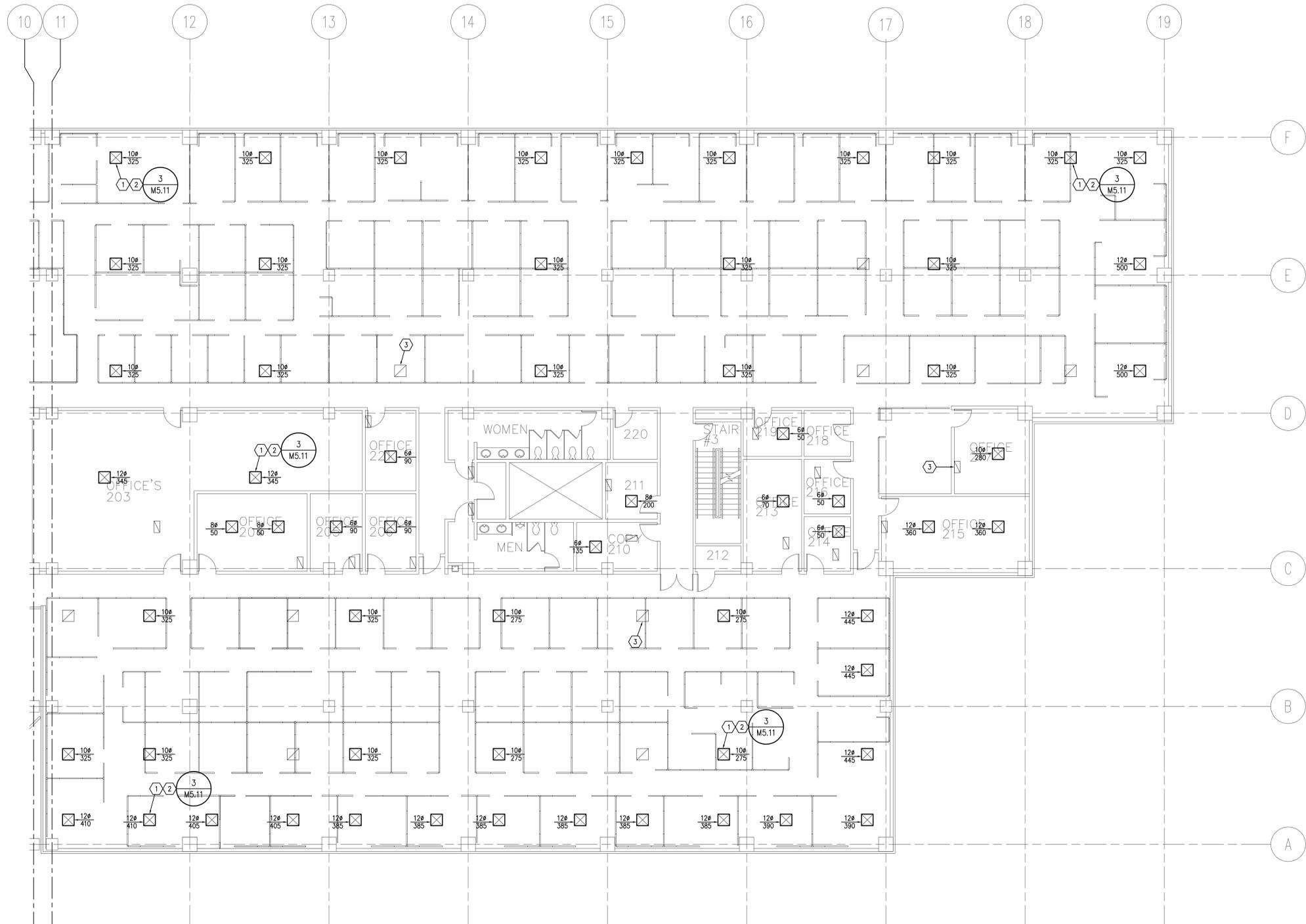
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SECOND FLOOR MECHANICAL PLAN
 SCALE: 1/8" = 1'-0"

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**SECOND FLOOR
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M1.22

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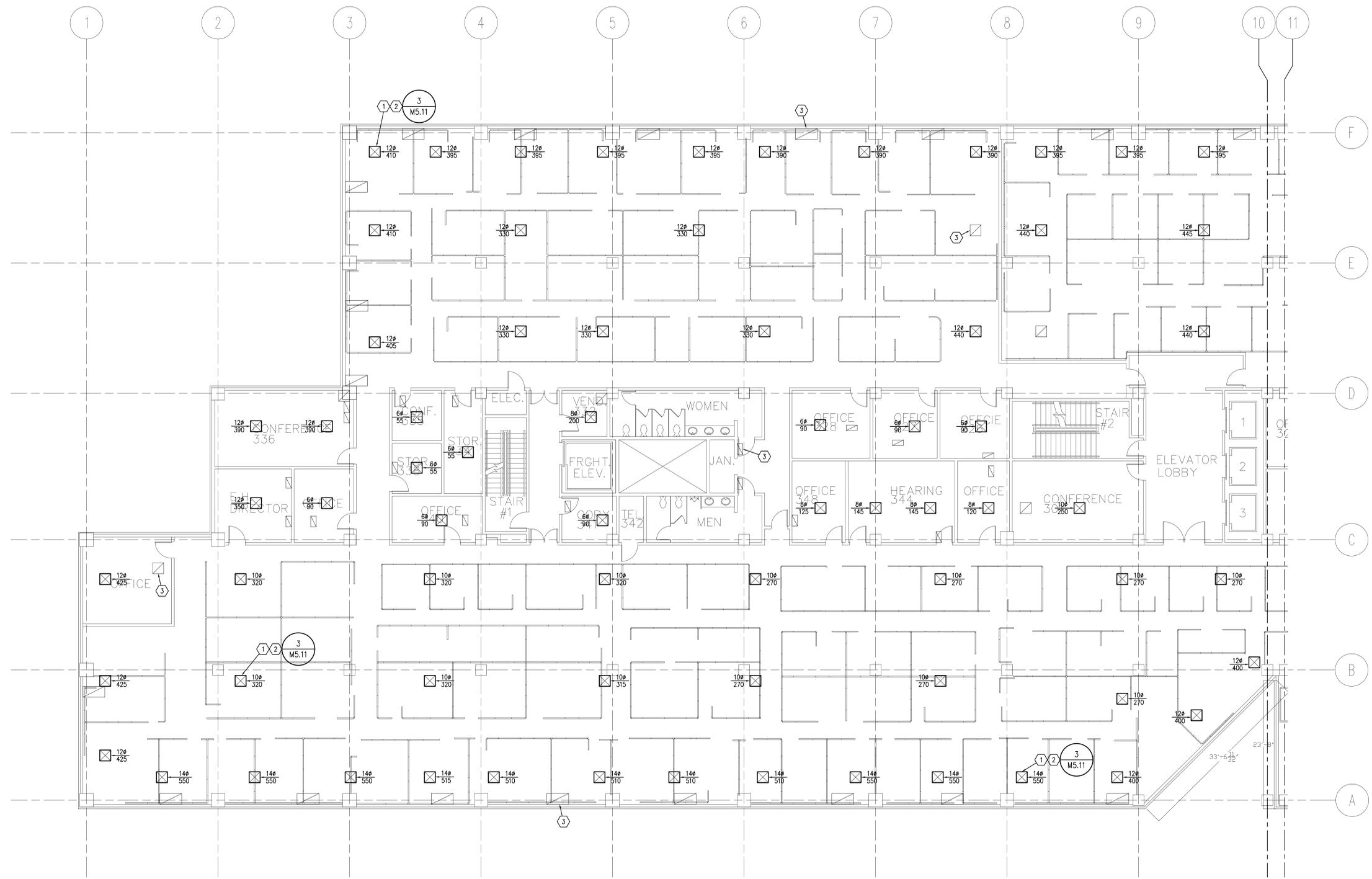
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**THIRD FLOOR
MECHANICAL
PLAN**

M1.31



THIRD FLOOR MECHANICAL PLAN
SCALE: 1/8" = 1'-0"

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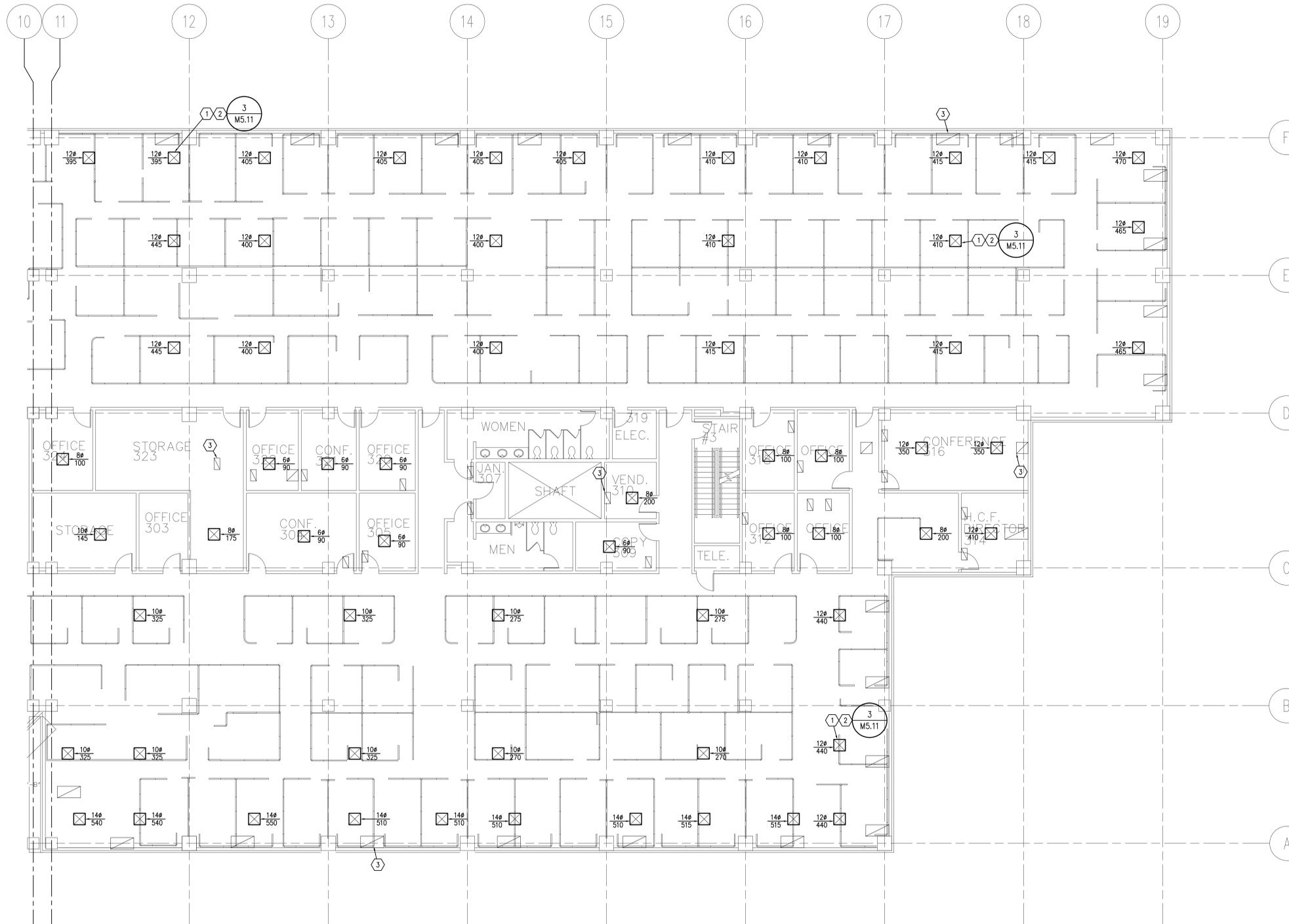
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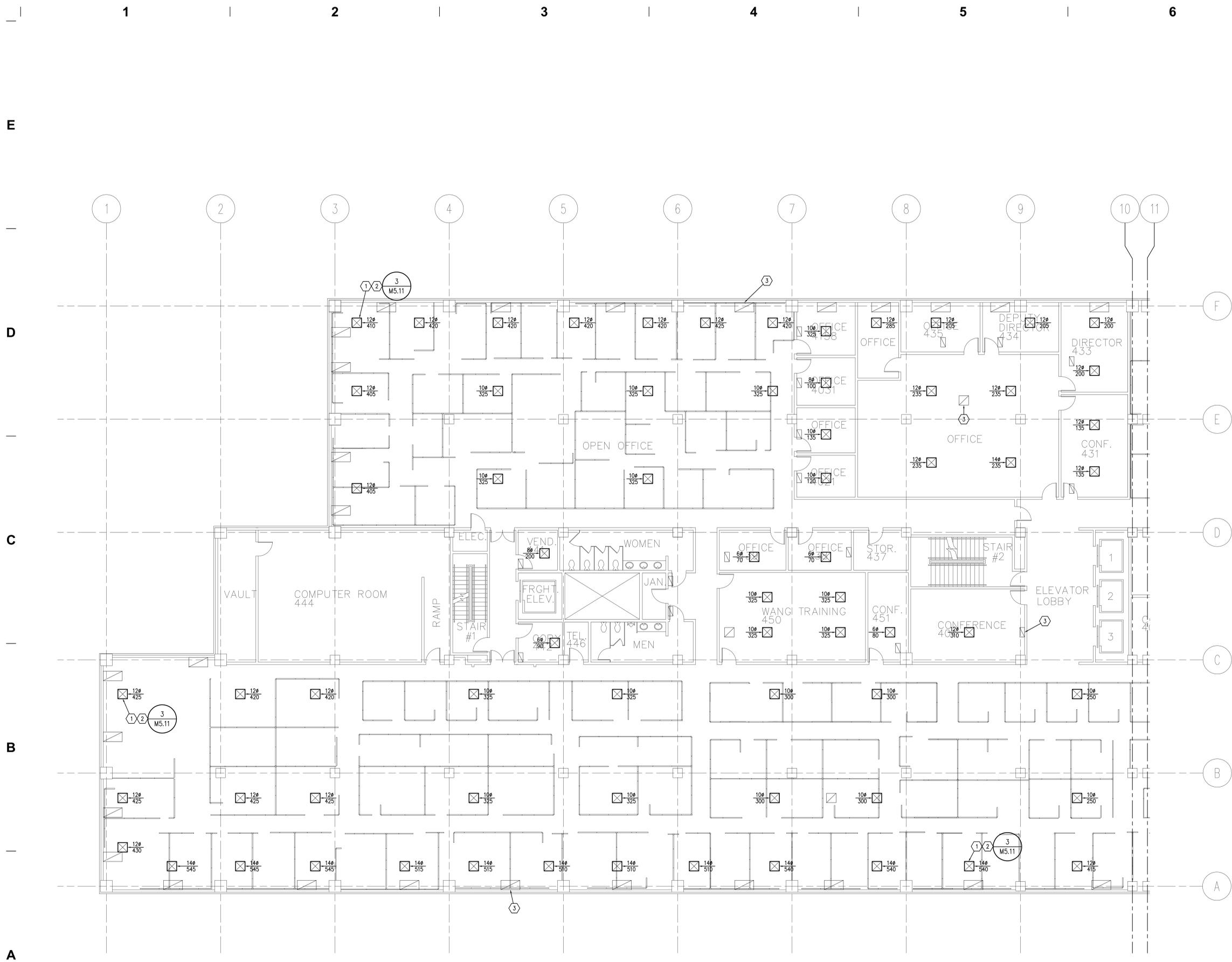
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**THIRD FLOOR
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PLAN**

M1.32



THIRD FLOOR MECHANICAL PLAN
SCALE: 1/8" = 1'-0"
0 4 8 16



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**FOURTH FLOOR
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PLAN**

M1.41

FOURTH FLOOR MECHANICAL PLAN
SCALE: 1/8" = 1'-0"
0 4' 8' 16'

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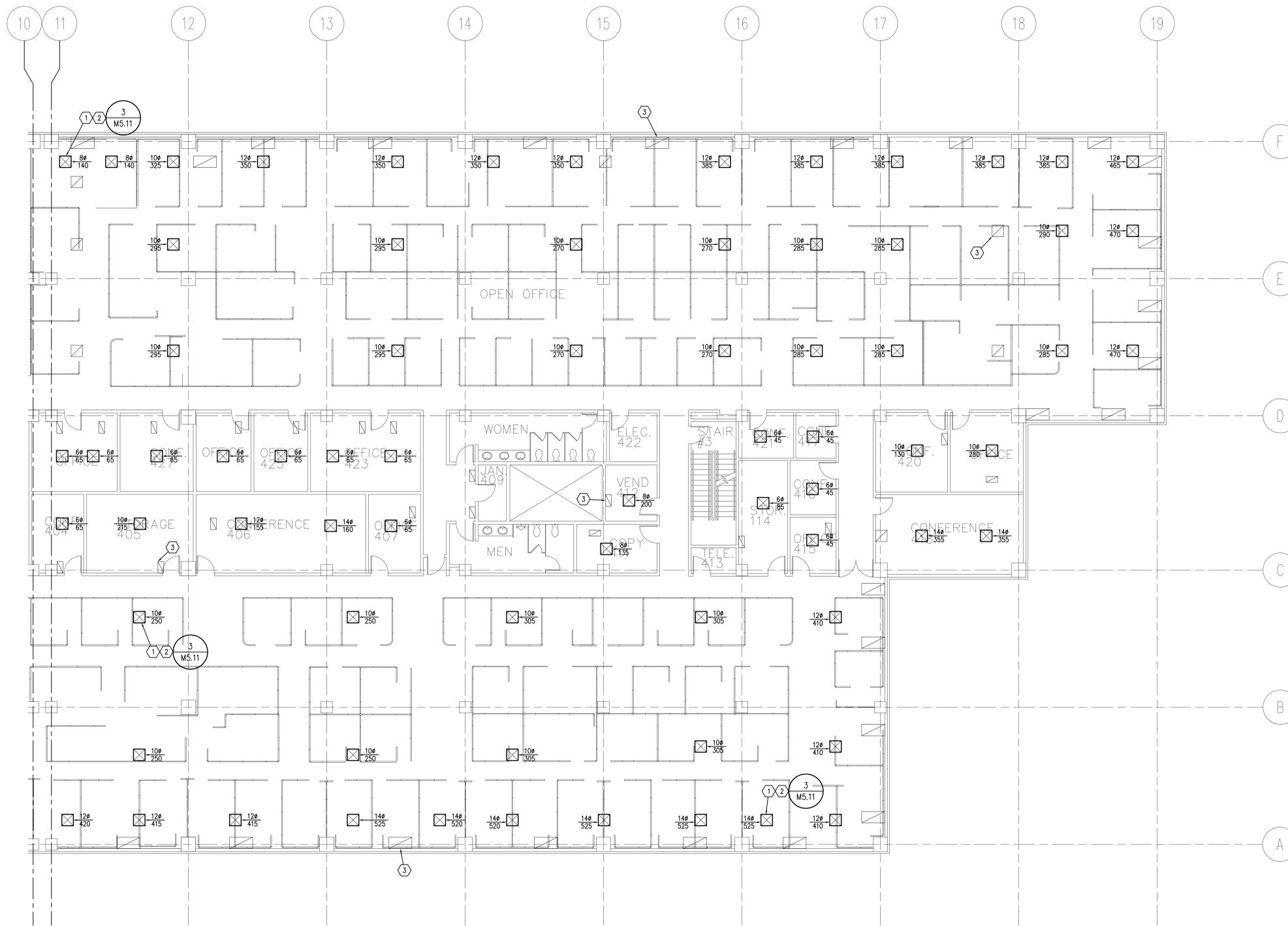
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**FOURTH FLOOR
MECHANICAL
PLAN**

M1.42

FOURTH FLOOR MECHANICAL PLAN
SCALE: 1/8" = 1'-0"
0 4 8 16

1

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KEYED NOTES

1. REPLACE EXISTING COOLING COIL WITH NEW.
2. EXTEND AND CONNECT NEW COIL PIPING TO EXISTING. SEE DETAIL 1/M5.11. NEAREST SHUT OFF VALVES ARE LOCATED BY CHILLERS AND CHILLED WATER PUMPS.
3. PAN IN WITH SHEET METAL AND SEAL TO FILTER BANK AS REQUIRED, INCLUDE SIDES AS WELL AS TOP.
4. REMOVAL AND REPLACEMENT OF FANS AND ASSOCIATED WORK IS AN ALTERNATE.
5. EXTEND AND CONNECT DOUBLE WALL INSULATED SHEET METAL PLENUM FROM DISCHARGE OF FANS TO EXISTING DUCT OPENING AT WALL. FIELD VERIFY EXISTING CONDITIONS.
6. PROVIDE AND FIELD INSTALL FAN ARRAY. EQUIPMENT SHALL BE BROUGHT THRU EXISTING DOORS AND OPENINGS. FIELD VERIFY EXISTING CONDITIONS INCLUDING DIMENSIONS, EQUIPMENT PIPING, ETC. BEFORE ORDERING EQUIPMENT.
7. TRANSITION SHEET METAL PLENUM TO EXISTING DUCT.
8. PROVIDE 7'-0" x 3'-0" PLENUM DOOR.
9. RELOCATE EXISTING ATC PANELS.
10. EXTEND CONTROL WIRING TO ATC PANELS. FIELD VERIFY EXACT CONDITIONS.



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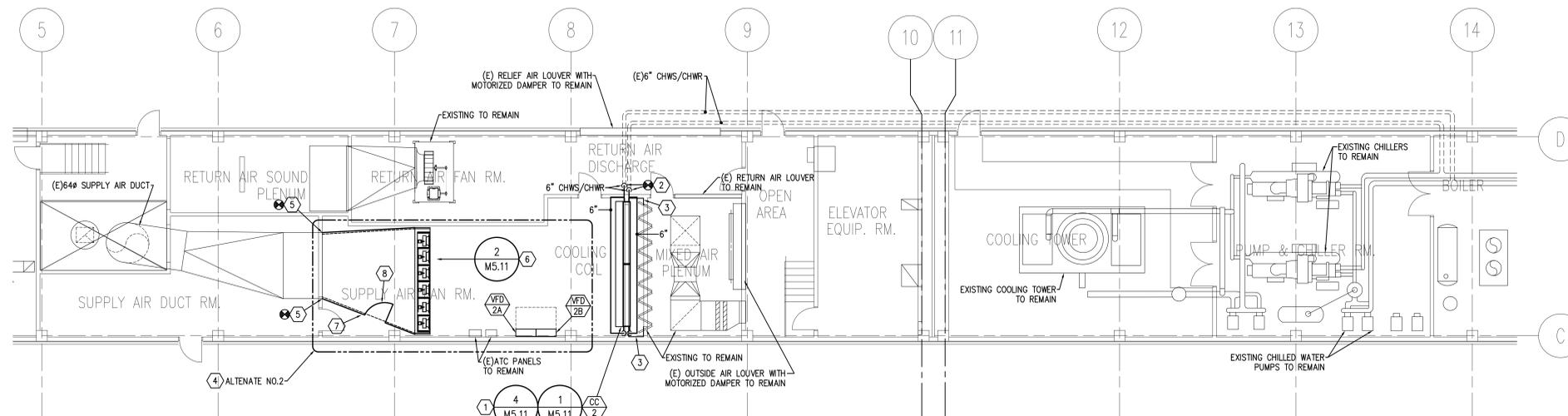
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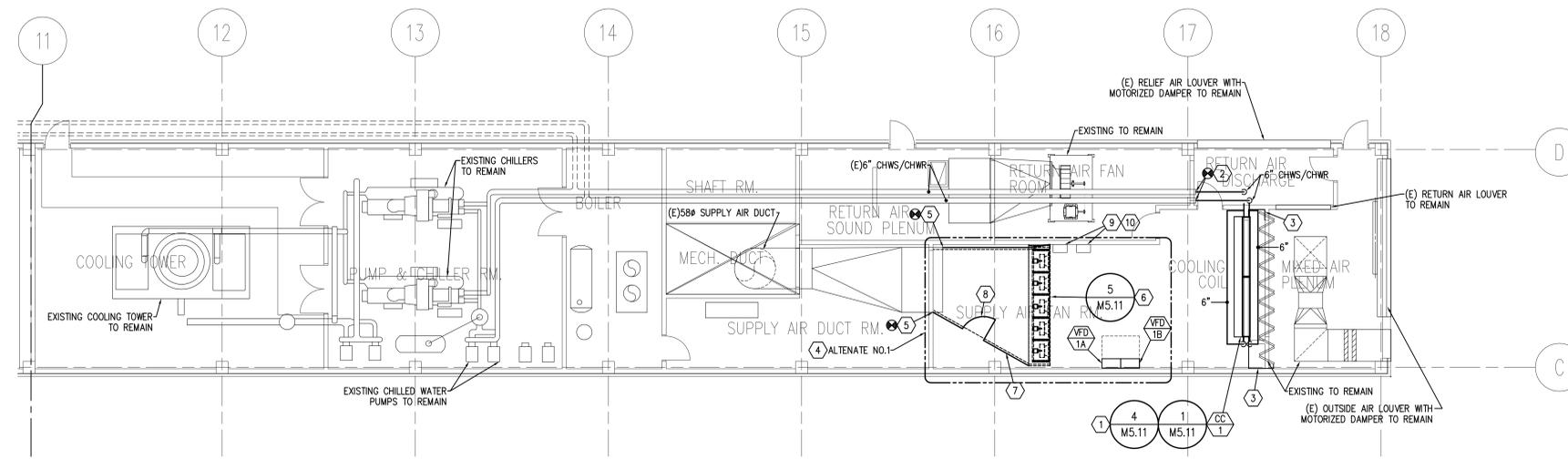


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PENTHOUSE MECHANICAL PLAN - WEST AIR HANDLER
SCALE: 1/8" = 1'-0"



PENTHOUSE MECHANICAL PLAN - EAST AIR HANDLER
SCALE: 1/8" = 1'-0"

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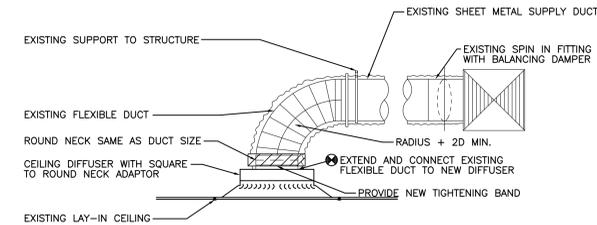


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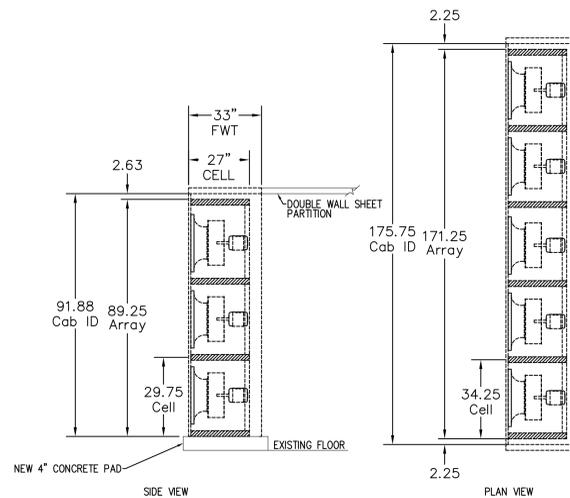
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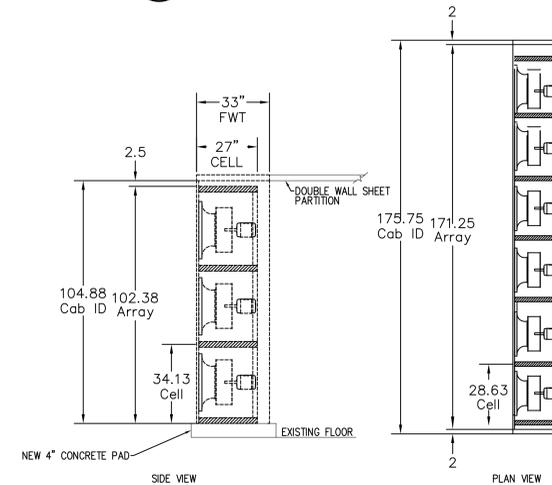
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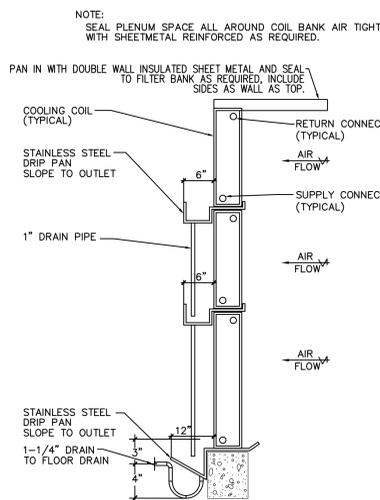
3 CEILING DIFFUSER DETAIL NO SCALE



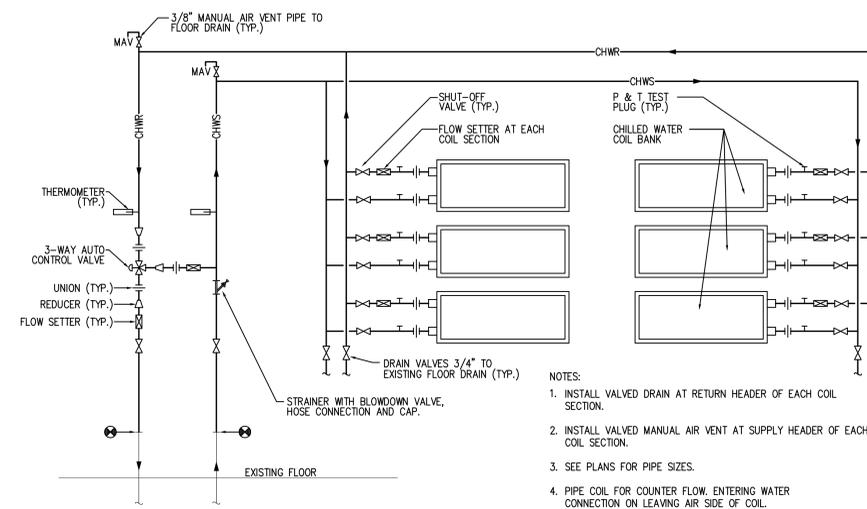
5 EAST AIR HANDLER FAN ARRAY DETAIL (ALT NO.1) NO SCALE



2 WEST AIR HANDLER FAN ARRAY DETAIL (ALT NO.2) NO SCALE



4 COOLING COIL AND DRIP PAN DETAIL NO SCALE



1 COOLING COIL PIPING SCHEMATIC NO SCALE

CANNON HEALTH BUILDING HVAC UPGRADES

288 NORTH 1460 WEST SALT LAKE CITY, 84116

Table with 2 columns: REVISIONS, and 2 rows for project details including project number, checker, drawer, and date.

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B

A

AIR HANDLER FAN SCHEDULE																		
ID	MANUFACTURER AND MODEL NUMBER	LOCATION	TYPE	AREA TYPE	AIR					ELECTRICAL					PHYSICAL			
					MAXIMUM AIRFLOW RATE (CFM)	STATIC PRESSURE (IN. WATER)	FAN SPEED (RPM)	NUMBER OF FANS	FAN WHEEL DIAMETER (IN)	TOTAL MOTOR SIZE (HP)	TOTAL MOTOR BHP	MOTOR SIZE PER FAN (HP)	MOTOR BHP PER FAN (HP)	MOTOR SPEED (RPM)	VOLT/PH/Hz	TOTAL ARRAY LENGTH/ WIDTH (IN)	NOTES	
SF-1	HUNTAIR	EAST AH-1	NOTE 1	SUPPLY	74,000	6.0	2656	15	20	112.5	96.6	7.5	6.44	1750	460/3	176/33/92	1 (ALT NO. 1)	
SF-2	HUNTAIR	WEST AH-2	NOTE 1	SUPPLY	89,000	6.0	2764	18	20	135.0	126.8	7.5	7.05	1750	460/3	176/33/105	1 (ALT NO. 2)	

- 1. FIELD-BUILT, MULTI-SUPPLY FAN ARRAY
- 2. PROVIDE A TERMINAL STRIP AND A CONTACTOR

COIL SCHEDULE																		
ID	MANUFACTURER AND MODEL NUMBER	LOCATION	USAGE	AIR					FLUID					PHYSICAL				
				AIRFLOW RATE (CFM)	LOAD (BTU/H)	SENSIBLE LOAD (BTU/H)	ENTERING TEMP. DBWB (°F)	LEAVING TEMP. DBWB (°F)	STATIC PRESSURE (IN. WATER)	FLOW RATE (GPM)	ENTERING/LEAVING TEMP. (°F)	FLUID	WORKING HEAD LOSS (FT)	NO. COILS	EACH COIL FIN HEIGHT/ LENGTH (IN)	MINIMUM FACE AREA (FT²)	MINIMUM ROWS/ FINS PER INCH	NOTES
CC-1	TEMTRON 5WC-8-36x90x8-8 AL	EAST AH	COOLING	74,000	2,838,313	2,174,011	85/66	52/51	0.84	442	45/58	WATER	12.11	6	36 / 90	135	8/8	1.2
CC-2	TEMTRON 5WC-8-36x106x8-8 AL	WEST AH	COOLING	89,000	3,504,772	2,650,243	85/66	52/51	0.85	612	45/56	WATER	14.34	6	36 / 106	162	8/8	1.2

- 1. CAPACITIES BASED ON 4500 FEET ELEVATION.
- 2. REPLACE EXISTING COIL WITH NEW. FIELD VERIFY EXACT DIMENSIONS AND CONDITIONS.

GRILLES, REGISTERS AND DIFFUSERS				
ID	MANUFACTURER	MODEL	MAX NC	DESCRIPTION
CD-1	EH PRICE	SPD	30	SQUARE PLAQUE FACE CEILING DIFFUSERS. REMOVABLE FACE, C.W./O.B.D. FRAME SHALL BE FOR SURFACE OR LAY-IN MOUNTING AS REQUIRED BY CEILING TYPE. LAY-IN FRAMES SHALL BE 24" x 24", 24" x 12" OR 12" x 12" AS REQUIRED TO FIT CEILING TILE SPACE AVAILABLE. UNLESS OTHERWISE NOTED, ALL SUPPLY DIFFUSERS SHALL BE OF THE CD-1 TYPE

VARIABLE FREQUENCY DRIVE SCHEDULE					
ID	MANUFACTURER AND MODEL NUMBER	LOCATION	MOTOR SIZE (HP)	VOLT/PH	NOTES
VFD-1A	ABB	EAST AH-1	60	460/3	(ALT NO. 1)
VFD-1B	ABB	EAST AH-1	60	460/3	(ALT NO. 1)
VFD-2A	ABB	WEST AH-2	75	460/3	(ALT NO. 2)
VFD-2B	ABB	WEST AH-2	75	460/3	(ALT NO. 2)



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CANNON HEALTH BUILDING
HVAC UPGRADES
288 NORTH 1460 WEST SALT LAKE CITY, 84116

REVISIONS	

VBFA PROJECT #: 08249
CHECKED BY: Sshepherd / jbeck
DRAWN BY: Ejuarez / Cbetts
CURRENT/BID DATE: 11/24/08

SHEET CONTENTS
MECHANICAL
SCHEDULES

M6.11

ELECTRICAL SYMBOL SCHEDULE

SYMBOL	DEVICE/FIXTURE DESCRIPTION	CATALOG NUMBER	MOUNTING	COMMENTS
O	CEILING LIGHT FIXTURE	SEE LIGHTING FIXTURE SCHEDULE	CEILING	(1) (2)
\$	SINGLE POLE SWITCH	HUBBELL BS120I	4' - 0"	(6)
\$ ₃	THREE WAY SWITCH	HUBBELL BS320I	4' - 0"	(6)

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
---	MIRING IN CND IN CEILING OR WALL	---	MIRING IN CND IN GROUND OR FLOOR
---	CONDUIT TURNED UP	---	CONDUIT TURNED DOWN
---	CIRCUIT HOME RUN TO PANEL. 3 CONDUCTORS INCLUDING THE EQUIPMENT GROUND CONDUCTOR.	---	
---	CIRCUIT HOME RUN TO PANEL. NUMBER OF ARROW HEADS INDICATE NUMBER OF CIRCUITS. SLASH MARKS INDICATE NUMBER OF CONDUCTORS. EX. TWO CIRCUITS, FOUR CONDUCTORS, COMMON NEUTRAL AND THREE CIRCUITS WITH 7 CONDUCTORS (SEPARATE NEUTRAL PER CIRCUIT). BOTH EX. INCLUDE AN EQUIP. GROUND.	---	

INSTALL CONDUIT AS DRAWN ON THE PLANS. THE ONLY EXCEPTIONS ARE THOSE AUTHORIZED IN WRITING BY THE ENGINEER. ALL CONDUITS SHALL INCLUDE AN EQUIPMENT GROUND CONDUCTOR SIZED PER NEC.

ABBREVIATIONS/NOTES

BC - BARE COPPER, AFG - ABOVE FINISHED GRADE, AIC - AMPS INTERRUPTING CAPACITY, AFF - ABOVE FINISHED FLOOR, BFC - BELOW FINISHED CEILING, BFG - BELOW FINISHED GRADE, CND. OR C - CONDUIT, CT - CURRENT TRANSFORMER, EC - ELECTRICAL CONTRACTOR, MC - MECHANICAL CONTRACTOR, GC - GENERAL CONTRACTOR, GND - GROUND, DPA - DROP FROM ABOVE, POS - POINT OF SALES, POC - POINT OF CONNECTION, P.C. - PLUMBING CONTRACTOR, MCA - MINIMUM CIRCUIT AMPS, VA - VOLT/AMPS, TC - TEMP. CONTROL CONTRACTOR, SCA - SHORT CIRCUIT AMPERES, RMC - RIGID METAL CONDUIT, VF - VERIFY IN FIELD, WP - WEATHER PROOF/NEMA 3R

- SEE LIGHTING FIXTURE SCHEDULE FOR TYPE AND SPECIFICS.
- SEE LIGHTING FIXTURE SCHEDULE FOR MOUNTING OF FIXTURE.
- WIRE FIXTURE FROM ADJACENT J-BOX.
- PROVIDE UN-SWITCHED CONDUCTOR TO EMERGENCY BALLAST
- PROVIDE DIRECTIONAL ARROWS AS SHOWN.
- ACCEPTABLE EQUALS ARE P&S, LEVITON, COOPER, HUBBELL
- ACCEPTABLE EQUALS ARE HUBBELL, WAIT STOPPER, SENSOR SWITCH
- ACCEPTABLE EQUALS ARE GENERAL ELECTRIC, ALLEN-BRADLEY, SQUARE D
- ACCEPTABLE EQUALS ARE LEVITON, P&S, HUBBELL, COOPER
- ACCEPTABLE EQUALS ARE INTERMATIC, PARAGON, EZ-CONTROL
- USE A 4" X 4" BOX WITH A MUD RING TO MATCH THE DEVICE AND INSTALLATION.
- PROVIDE MUD RING AND/OR BOX COVER APPROPRIATE FOR DEVICE/FIXTURE SERVED.
- USE HEAVY DUTY FOR 480 VOLT.
- SIZE TO THE EQUIPMENT BEING CONTROLLED
- PROVIDE A FLOOR BOX HUBBELL S1PFB/S1SP, TWO HBL5BK, ONE IM2K1BK, AND FIVE IMB1BK W/FLANGE TO MATCH FLOOR TYPE
- PROVIDE A FLOOR BOX HUBBELL S1PFB/S1SP WITH ONE IM2K1BK, TWO IMB1BK AND ONE HBL2162BK.
- ACCEPTABLE EQUALS ARE HUBBELL, ORTRONICS, SIEMON
- MATCH THE VOLTAGE OF THE RELAY WITH THAT OF THE CONTROLLING CIRCUIT.
- MOUNT SWITCH AT DOOR JAM PER MANUFACTURER'S INSTRUCTIONS.
- FEED THE STYLE LINE RECEPT FROM THE GFCI OUTLET SO BOTH ARE GFCI PROTECTED.
- PROVIDE HANDY BOX (RACO 663 OR EQUAL) MOUNT DIRECTLY TO FURNACE FUSE 15 AMP OR AS INDICATED ON PLANS.
- IF EXHAUST FAN, SWITCH WITH LIGHTS UNLESS INDICATED OTHERWISE.
- PROVIDE DEVICE UL LISTED TO BE USED WITH THE FIRE ALARM PANEL/SYSTEM.
- PROVIDE ONE IMF1I, TWO HBL5TI, ONE IM2K1TI AND TWO IMB1TI.
- PROVIDE ONE BR20I
- FOR F-TYPE USE ONE IMF1I, ONE SFFGW, ONE IMK1TI AND TWO IMB1TI.
- PROVIDE A FLOOR BOX HUBBELL B2431 WITH S3825 COVER.
- PROVIDE TIMER INTERVAL AS SHOWN ON DRAWINGS OR LISTED IN SPECIFICATIONS.

- ### # KEYED NOTES
- EC SHALL DISCONNECT AND REMOVE THE EXISTING VFD FOR THE EXISTING AIR HANDLER.
 - EC SHALL DISCONNECT AND REMOVE THE EXISTING VFD, BYPASS SWITCHES, WIREWAYS FOR THE EXISTING AIR HANDLER.
 - EC SHALL REMOVE EXISTING DISCONNECT AND ELECTRICAL FROM THE EXISTING AIR HANDLER.
 - EC SHALL REMOVE, AND STORE FOR REINSTALLATION, THE EXISTING LUMINAIRES INSIDE THE EXISTING AIR HANDLER UNIT. REMOVE THE ASSOCIATED SWITCH(ES) CONDUIT AND CONDUCTORS. REMOVE ALL ELECTRICAL CONDUIT ATTACHED TO THE INSIDE AND OUTSIDE OF THE DUCT SYSTEM TO BE REMOVED. COORDINATE AND CONFIRM WITH MC.

- ### GENERAL NOTES
- THE ELECTRICAL SYSTEMS DEFINED BY THESE PLANS AND SPECIFICATIONS ARE TO BE CONSTRUCTED AS COMPLETE AND OPERABLE SYSTEMS AND SHALL BE BID WITH THIS INTENT. THE CONTRACTOR SHALL VISIT THE SITE, READ ALL THE RELEVANT DOCUMENTS AND BECOME FAMILIAR WITH THE TYPE OF CONSTRUCTION AND WORK TO BE ACCOMPLISHED. SHOULD ANY ERROR, OMISSION OR CONFLICT EXIST IN EITHER THE PLANS OR SPECIFICATIONS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING BEFORE SUBMITTING HIS BID PRICE SO A CHANGE CAN BE ISSUED IN A PRE-BID ADDENDUM. OTHERWISE, THE CONTRACTOR AND/OR EQUIPMENT SUPPLIER SHALL SUPPLY THE PROPER MATERIALS AND LABOR TO INSTALL COMPLETE AND OPERABLE SYSTEMS AT THEIR OWN EXPENSE. WHEN EACH ELECTRICAL SYSTEM IS COMPLETE, THE CONTRACTOR SHALL TEST AND CONFIRM ITS PROPER OPERATION. ANY INCOMPLETE SYSTEM SHALL BE MADE COMPLETE AND OPERABLE.
 - THE ARCHITECTURAL AND MECHANICAL PLANS ARE CONSIDERED A PART OF THE ELECTRICAL DOCUMENTS SO FAR AS THEY APPLY. THE ELECTRICAL CONTRACTOR SHALL REFER TO AND COORDINATE WITH THEM. NO EXTRA COST SHALL BE ALLOWED FOR FAILURE TO COORDINATE THE CONTRACT DOCUMENTS WITH OTHER TRADES AND/OR IF EQUIPMENT DIMENSIONS ARE GREATER THAN SPECIFIED AND/OR DIMENSIONED ON THE PLANS.
 - NO ADDITIONS TO THE CONTRACTOR BID WILL BE ALLOWED FOR CHANGES MADE NECESSARY BY INTERFERENCE WITH OTHER WORK.
 - THE ELECTRICAL CONTRACTOR SHALL PROVIDE EQUIPMENT, MATERIALS AND LABOR FOR THE CONNECTIONS OF ALL EQUIPMENT SHOWN ON THE PLANS - ARCHITECTURAL, MECHANICAL, ETC.
 - THIS PROJECT IS TO BE INSTALLED IN STRICT ACCORDANCE WITH LOCAL AND STATE CODES AND THE NEC. IF AT ANY TIME DURING CONSTRUCTION, OR AFTER SOMETHING IS FOUND TO BE INSTALLED IN VIOLATION OF THE CODES LISTED ABOVE, IT SHALL BE CORRECTED AT THE CONTRACTORS EXPENSE.
 - ELECTRICAL CONTRACTOR SHALL CONFIRM MINIMUM CODE (NEC) WORKING CLEARANCE BEFORE INSTALLING ANY ELECTRICAL PANELS OR CABINETS AND SHALL MOVE THE PANELS AT HIS EXPENSE IF REJECTED BY AN INSPECTOR. IF CLEARANCE IS NOT POSSIBLE, THE DESIGNER SHALL BE NOTIFIED IMMEDIATELY IN WRITING.
 - THE CONTRACTOR SHALL ALLOW THE MOVEMENT, BEFORE ROUGH-IN, OF ANY ELECTRICAL PANEL, DEVICE, LUMINAIRE, ETC. A DISTANCE OF 10 FEET WITHOUT REQUIRING ADDITIONAL COST TO THE PROJECT.
 - THE ELECTRICAL CONTRACTOR SHALL SECURE ALL CONDUIT TO THE STRUCTURE AS IT IS SET IN PLACE USING INDUSTRY STANDARD METHODS AND PRACTICES.
 - TO ASSURE ALL DEVICES ARE RIGIDLY SET, THE ELECTRICAL CONTRACTOR SHALL SECURE ALL DEVICE BOXES WITH BRACKETS, HANGERS, ETC. DESIGNED FOR THE APPLICATION. ANY DEVICE BOXES NOT SECURED WILL BE MADE SECURE AT THE CONTRACTORS EXPENSE.
 - BEFORE ANY ELECTRICAL CONDUIT, BOXES, ETC. ARE COVERED (FLOOR, CEILING, WALLS, ETC.), THEY SHALL BE APPROVED BY THE INSPECTING OFFICER (INSPECTOR). THE UNCOVERING AND REPLACEMENT OF ELECTRICAL WORK FOR THE INSPECTION PURPOSES WILL BE AT THE COST OF THE ELECTRICAL CONTRACTOR.
 - LENGTHS OF FLEXIBLE CONDUIT GREATER THAN 48 INCHES SHALL NOT BE INSTALLED ON THIS PROJECT FLEXIBLE CONDUIT SHALL NOT BE CONCEALED.
 - LUMINAIRES INSTALLED IN THE MECHANICAL ROOM SHALL BE PLACED SO THAT ALL EQUIPMENT IS ADEQUATELY ILLUMINATED AFTER THE MECHANICAL EQUIPMENT IS IN PLACE.
 - ELECTRICAL CONTRACTOR SHALL PROVIDE CONDUIT WITH PULL CORD, FROM ALL HEATING/COOLING EQUIPMENT TO THE THERMOSTAT, FOR THE AUTOMATIC TEMPERATURE SYSTEM CONTROL. CONFIRM AND COORDINATE WITH THE MECHANICAL CONTRACTOR.
 - DURING CONSTRUCTION, THE ELECTRICAL CONTRACTOR SHALL REMOVE, REROUTE AND/OR RELOCATE ANY EXISTING ELECTRICAL EQUIPMENT THAT CONFLICTS WITH THE REMODEL OR ADDITION. ALL SYSTEMS SHALL BE OPERABLE AT THE COMPLETION OF THE PROJECT. EQUIPMENT THAT IS NOT REUSED, AND NOT WANTED BY THE OWNER IN WRITING, BECOMES THE PROPERTY OF THE ELECTRICAL CONTRACTOR AND SHALL BE REMOVED FROM THE PREMISES.
 - THE ELECTRICAL CONTRACTOR SHALL MAINTAIN ELECTRICAL CONTINUITY TO REMAINING EQUIPMENT WHEN ANY EXISTING ELECTRICAL EQUIPMENT IS REMOVED.
 - EXISTING LUMINAIRES THAT ARE TO REMAIN, OR BE REUSED, SHALL BE CLEANED AND RELAMPED.
 - ALL COSTS FROM THE USE OF THE EXISTING PANEL SHALL BE INCLUDED IN THE CONTRACTORS BASE BID, I.E. CHANGE IN BREAKER SIZE, ADDITIONAL BREAKERS, ETC.
 - ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE EQUIPMENT SUPPLIER ON THE EXACT LOCATIONS OF ALL EQUIPMENT AND ELECTRICAL CONNECTIONS PRIOR TO ROUGH-IN. THE EC SHALL MAKE THE FINAL CONNECTION TO ALL EQUIPMENT.

MECHANICAL EQUIPMENT SCHEDULE

MARK	DESCRIPTION	ELECTRICAL						REMARKS
		VPHz	MCA	MOCF	FLA	LMHP	DISCONNECT SIZE/POLE	
AH-1	EAST SUPPLY FAN	480/3	166.0	175.0				(1)
AH-2	WEST SUPPLY FAN	480/3	204.0	225.0				(1)

VPHz = VOLTAGE / PHASE / HERTZ
MCA = MINIMUM CIRCUIT AMPACITY
MOCF = MAXIMUM OVER CURRENT PROTECTION LISTED BY THE MANUFACTURER
LMHP = LARGEST MOTOR HORSE POWER

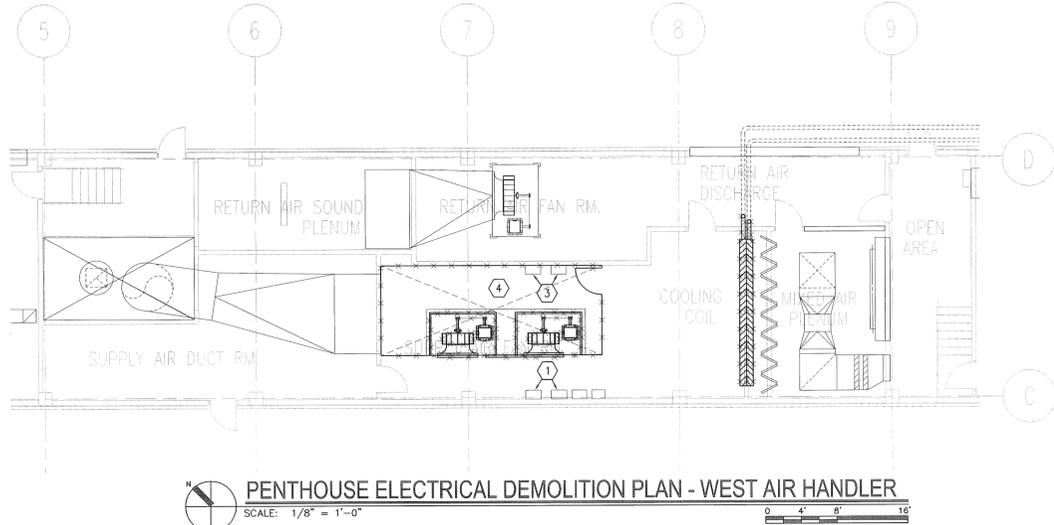
NOTES:
(1) MAKE CONNECTION TO VFD FURNISHED BY MC.

CONDUIT/CONDUCTOR SCHEDULE

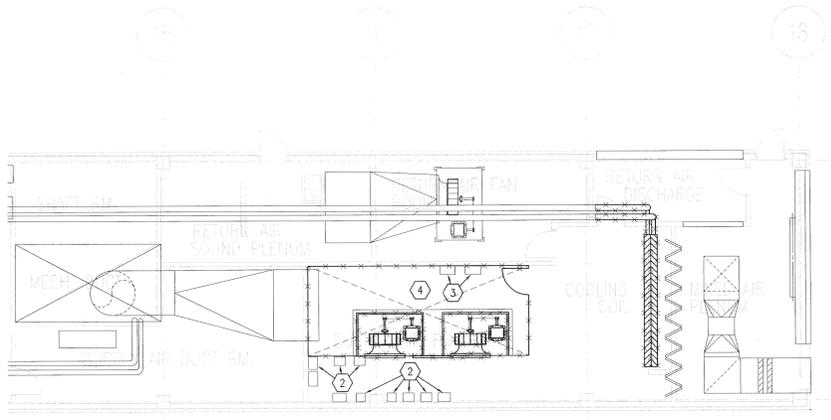
MARK	AMPS	CONDUIT				REMARKS
		CABLE	QTY	SIZE	INSUL	
C325	255	2 1/2"	3	250	(1) (2)	
C340	230	2 1/2"	3	4/0	(1) (2)	
C435	310	3"	4	350	(1) (2)	

NOTE:
(1) THHN/THWN-2
(2) ALL CONDUIT SHALL CONTAIN A SEPARATE EQUIPMENT GROUNDING CONDUCTOR SIZED IN ACCORDANCE WITH THE NEC. ACCOUNT FOR PARALLEL RUNS.

SUFFIX:
"A" INDICATES ALUMINUM CONDUCTORS
"Y" INDICATES YELLOW ISOLATED GROUND CONDUCTOR IN ADDITION TO THE GROUND CONDUCTOR IN NOTE ABOVE.



PENTHOUSE ELECTRICAL DEMOLITION PLAN - WEST AIR HANDLER
SCALE: 1/8" = 1'-0"



PENTHOUSE ELECTRICAL DEMOLITION PLAN - EAST AIR HANDLER
SCALE: 1/8" = 1'-0"



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REVISIONS

NO.	DATE	DESCRIPTION

VBFA PROJECT #: 08249
CHECKED BY: Sahepherd / Jback
DRAWN BY: Ejarez / Cbatts
CURRENT BID DATE: 11/24/08

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PENTHOUSE ELECTRICAL DEMOLITION PLAN

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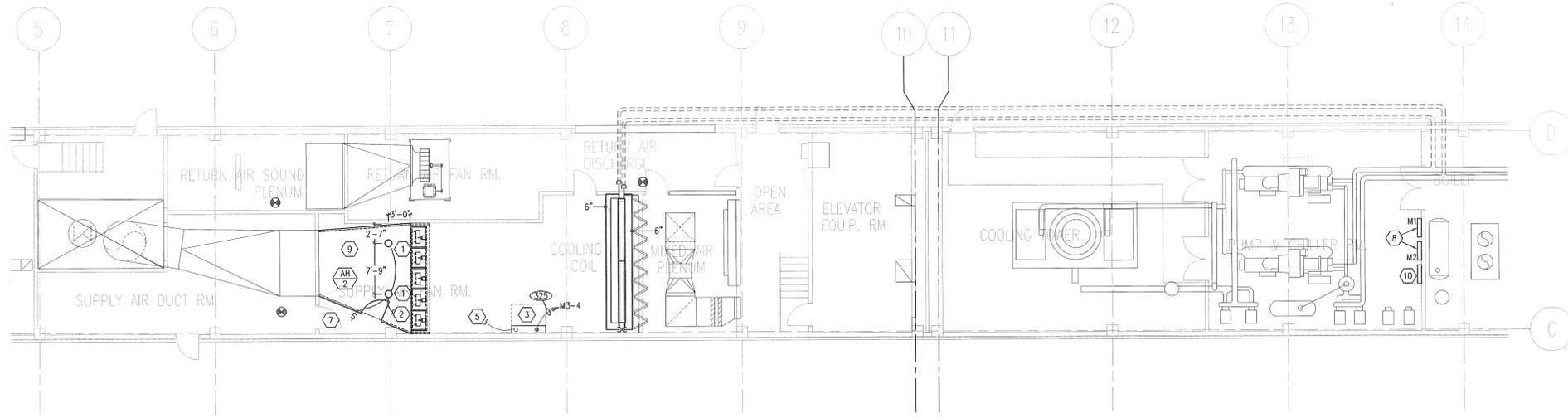
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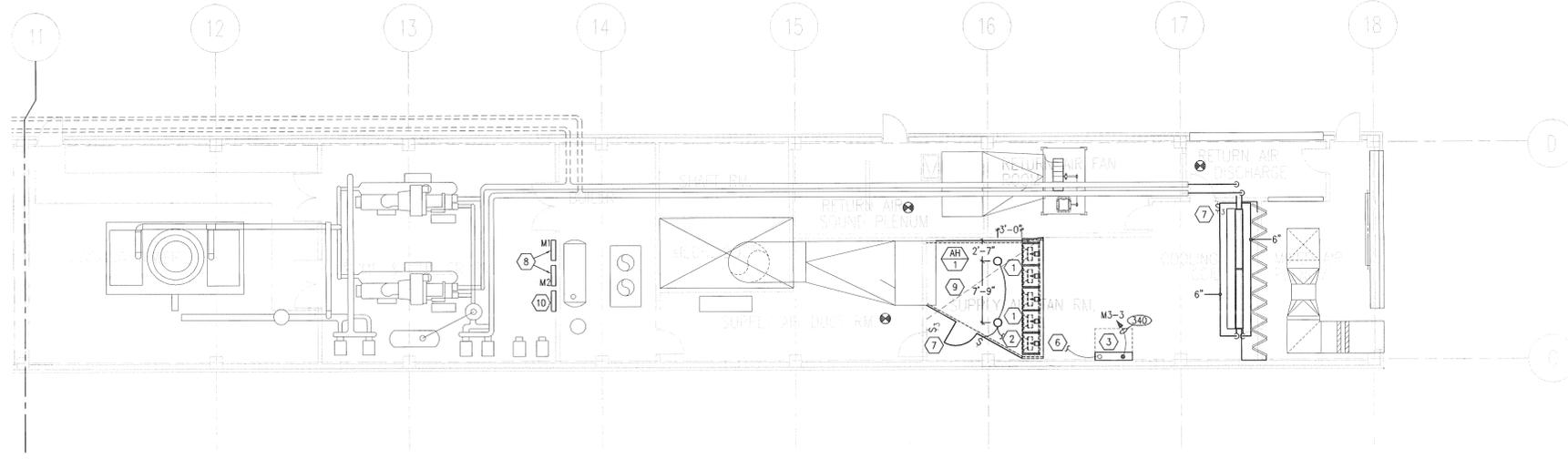
C

B

A



PENTHOUSE ELECTRICAL PLAN - WEST AIR HANDLER
 SCALE: 1/8" = 1'-0" 0 4' 8' 16'



PENTHOUSE ELECTRICAL PLAN - EAST AIR HANDLER
 SCALE: 1/8" = 1'-0" 0 4' 8' 16'

KEYED NOTES

1. INSTALL JAR LUMINAIRES, REMOVED FROM THE EXISTING DUCT, IN THE NEW DUCT AS SHOWN. COORDINATE EXACT LOCATION WITH MC.
2. EC SHALL CONNECT THE LIGHT FIXTURES TO THE EXISTING LIGHTING CIRCUIT THAT POWERED THEM BEFORE THIS RENOVATION.
3. VFD PACKAGE PROVIDED BY MC. EC SHALL MAKE ALL ELECTRICAL CONNECTIONS FROM THE VFD PACKAGE TO THE FAN-WALL MOTORS AND FROM THE VFD PACKAGE TO THE PANELBOARD.
4. FAN WALL.
5. EC SHALL PROVIDE FOUR 3/4" CONDUITS WITH 12#12-1#12GND CONDUCTORS FROM THE VFD PACKAGE TO THE FAN WALL AND MAKE CONNECTION TO EACH OF THE 16 FAN MOTORS AND TO THE MOTOR CONTROLLERS IN THE VFD PACKAGE. CONFIRM REQUIREMENTS AND COORDINATE WITH THE MC.
6. EC SHALL PROVIDE THREE 3/4" CONDUITS WITH 15#12-1#12GND CONDUCTORS FROM THE VFD PACKAGE TO THE FAN WALL AND MAKE CONNECTION TO EACH OF THE 15 FAN MOTORS AND TO THE MOTOR CONTROLLERS IN THE VFD PACKAGE. CONFIRM REQUIREMENTS AND COORDINATE WITH THE MC.
7. EC SHALL PROVIDE A THREE WAY LIGHT SWITCH AND TRAVELERS FROM THIS SWITCH TO THE OTHER THREE WAY SWITCH. CONNECT TO THE EXISTING 4" LUMINAIRES IN THE MECHANICAL AREA SO THEY CAN BE CONTROLLED FROM EITHER DOOR. FIELD CONFIRM EXISTING CONDITIONS.
8. EXISTING PANELBOARDS M1 AND M2. EC SHALL REMOVE THE CONDUCTORS FEEDING THE EXISTING AIR HANDLERS. FIELD CONFIRM EXISTING CONDITIONS.
9. EC SHALL RE-INSTALL ANY EXISTING FIRE ALARM DEVICES REMOVED FROM THE EXISTING DUCTS IN THE NEW AIR HANDLER AS REQUIRED BY CODE.
10. PANELBOARD M3. EC SHALL PROVIDE A PANELBOARD AS SHOWN ON SHEET E201 TO POWER THE NEW AIRHANDLERS AH-1 AND AH-2.
11. EC SHALL PROVIDE A 600 AMP BREAKER, TO FEED THE NEW PANEL M3, IN THE EXISTING MS80 SWITCHBOARD WITH THE SAME AIC RATING AS THE EXISTING BREAKERS. FIELD CONFIRM THE EXISTING CONDITIONS.

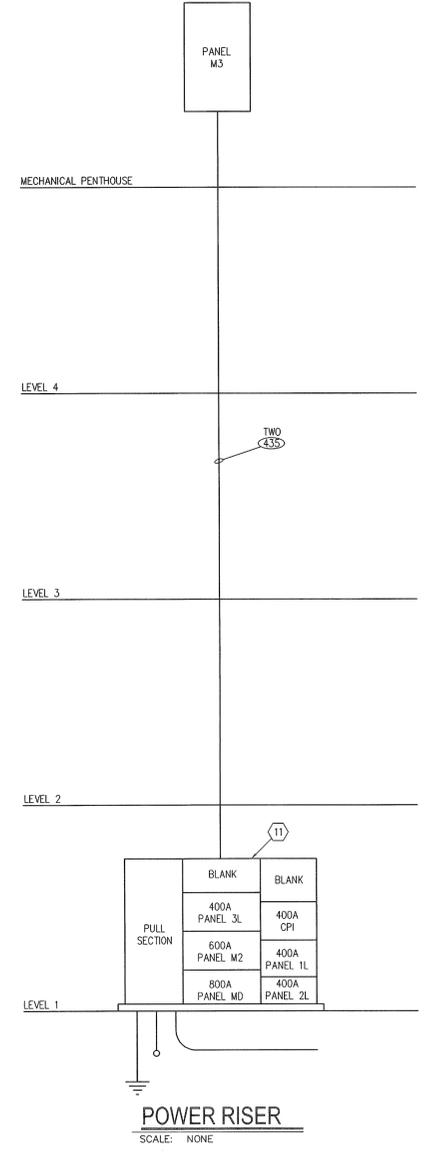


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HVAC UPGRADES**
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REVISIONS

NO.	DATE	DESCRIPTION

VBFA PROJECT #: 08249
 CHECKED BY: Stjepherd / Jbeck
 DRAWN BY: Ejuarez / Cbotts
 CURRENT/BD DATE: 11/24/08

SHEET CONTENTS
**PENTHOUSE
ELECTRICAL
PLAN**

E1.01

M3		VOLTAGE 480V/277		MOUNTING		FEED		MAINS		DIMS.		SPECIAL EQUIPMENT				
PANEL	LINE	PHASE	WIRES	4	FLUSH	X	TOP	600	AMP	32"	W	X	GROUND BUS			
TYPE	LOCATION	AIC	14,000	AMPS	X	SURFACE	BOTTOM	X	LUGS	8.25"	D	NEMA 3R	SURGE PROTECTOR			
OR	CIRCUIT	OUTLETS	BRKR	WIRE	CIRCUIT	COMBINED PHASES			CIRCUIT	WIRE	BRKR	OUTLETS	CIRCUIT			
NO.	DESCRIPTION	CODE/TS	NO	SIZE	LOAD	A	B	C	LOAD	SIZE	AMP	P	INS.	COLTS	DESCRIPTION	NO.
1					46003	102537			56534							2
3	AH-1	1	3	200	46003	102537			56534	250	3	1			AH-2	4
5	SPACE				46003				56534							6
7	SPACE															8
9	SPACE															10
11	SPACE															12
13	SPACE															14
15	SPACE															16
17	SPACE															18

NOTE: (A) CONFIRM THE AIC AVAILABLE AT THIS PANEL IS NOT MORE THEN THAT SHOWN ON THIS SCHEDULE. PROVIDE BREAKERS RATED FOR THE SHORT CIRCUIT CURRENT AVAILABLE AT THIS PANELBOARD.

PHASE TOTALS	CONV LOAD	CODES
VA 102537 102537 102537	308 KVA	1 = SEE DRAWINGS FOR CONDUIT & CONDUCTOR SIZE
DIV	AV. AMPS	2 = SHORT-TRIP BREAKER
AMPS 370 370 370	370 A	3 = SLOW-TRIP BREAKER
		4 = PROVIDE LOCK OFF DEVICE

THIS PANEL, ALL OF ITS LUGS, BREAKERS, ETC. SHALL BE RATED FOR 75°C

- I. INTERIOR AND EXTERIOR LUMINAIRES
1. PROVIDE LIGHTING SYSTEM COMPLETE WITH LAMPS AND ACCESSORIES, AS INDICATED IN THE CONTRACT DOCUMENTS.
 2. LUMINAIRES
 - a) PROVIDE COMPLETE LUMINAIRE ASSEMBLIES OF TYPE INDICATED ON THE DRAWINGS WITH FEATURES, OPTIONS AND ACCESSORIES AS SCHEDULED AND AS NEEDED FOR A COMPLETE ASSEMBLY AND INSTALLATION.

- PART 3 - EXECUTION
- A. GENERAL
1. ALL MATERIALS SHALL BE INSTALLED IN A PROFESSIONAL MANNER INDICATIVE OF THE TRADE. ALL PENETRATIONS OF THE OUTSIDE WALLS OR ROOF SHALL BE SEALED WITH APPROPRIATE SEALANT OR CAULK FOR THE PARTICULAR SURFACE INVOLVED.
- B. RACEWAYS
1. RACEWAYS SHALL RUN EXPOSED UNLESS OTHERWISE INDICATED. EXPOSED RACEWAY RUNS SHALL BE PARALLEL WITH SUPPORTING WALLS, BEAMS, AND CEILINGS AND WITH EACH OTHER AND SHALL NOT RUN CLOSER THAN 6 INCHES TO ANY WATER PIPE OR HEATER FLUME.
 2. RACEWAY ENDS SHALL BE REAMED AFTER THREADING AND AFTER CUTTING AND BE MADE TO BUTT IN THE CENTER OF THE COUPLING. THE USE OF RUNNING THREADS IS PROHIBITED.
 3. RACEWAYS SHALL BE INSTALLED AS A COMPLETE SYSTEM, CONTINUOUS FROM OUTLET TO OUTLET, CABINET, BOX OR FITTINGS, AND SHALL BE MECHANICALLY CONNECTED SO THAT ADEQUATE ELECTRICAL CONTINUITY FROM ONE TO ANOTHER IS OBTAINED. CONDUITS SHALL BE SUPPORTED WITH STAMPED STEEL OR MALLEABLE IRON STRAPS (SUCH AS MANUFACTURED BY RACO) DESIGNED FOR SUPPORTING CONDUIT. THE SIZE OF STRAP SHALL MATCH THE SIZE OF THE CONDUIT. NAILS, PERFORATED STRAP, OR PLUMBERS TAPE SHALL NOT BE USED FOR SUPPORT OF RACEWAY.
 4. PROVIDE 1/8" POLY PULL CORD IN RACEWAYS WITHOUT CONDUCTORS.
 5. FOUR 90 DEGREE BENDS MAXIMUM BETWEEN TERMINATIONS OR BOXES.

- C. CONDUCTORS
1. ALL CONDUCTORS SHALL BE INSTALLED IN CONDUIT AND COLOR CODED AS FOLLOWS:

PHASE	208/277	480/277
PHASE A	BLACK	BROWN
PHASE B	RED	ORANGE
PHASE C	BLUE	YELLOW
NEUTRAL	WHITE	GREY
GROUND	GREEN	GREEN
 2. MAKE JOINTS, SPLICES, TAPS AND CONNECTIONS IN CONDUCTORS WITH SOLDERLESS CONNECTORS.

- D. JUNCTION AND PULL BOXES
1. PULL BOXES SHALL BE PROVIDED WHERE INDICATED OR WHERE NECESSARY TO FACILITATE THE PULLING OF CONDUCTORS. TELEPHONE RACEWAYS SHALL HAVE A MAXIMUM OF TWO 90 DEGREE BENDS BETWEEN TERMINATIONS OR BOXES.

- E. GROUNDING
1. INSTALL A CODE SIZED GROUNDING CONDUCTOR IN ALL RACEWAYS. DO NOT USE THE RACEWAY FOR GROUNDING. MAKE GOOD CONTACT AT ALL PANEL BOARDS, OUTLET BOXES, AND JUNCTION OR PULL BOXES TO THE RACEWAY SYSTEM. USE APPROVED BONDING MATERIALS.

- F. LUMINAIRE INSTALLATION
3. LOCATE LUMINAIRES AS INDICATED ON THE DRAWINGS.
 4. INSTALL ACCESSORIES FURNISHED WITH AND REQUIRED FOR EACH LUMINAIRE.

- G. BONDING
1. BOND ALL PIPING (GAS WATER, ETC) AS REQUIRED BY THE NEC. CONFIRM SYSTEMS TO BE USED WITH IFC.

- H. CUTTING AND PATCHING
1. PERFORM DRILLING, CUTTING, AND PATCHING OF THE GENERAL CONSTRUCTION WORK WHETHER EXISTING OR NEW, AS REQUIRED FOR THE INSTALLATION OF ELECTRICAL WORK. PATCH WITH THE SAME MATERIALS, WORKMANSHIP, AND FINISH AS THE ORIGINAL WORK AND ACCURATELY MATCH ALL SURROUNDING WORK. SUCH WORK WILL BE DONE BY A CRAFTSMAN ACCREDITED IN THE APPLICABLE TRADE UNDER THE CONTRACTOR'S SUPERVISION AND BE ACCEPTABLE TO THE OWNER'S REPRESENTATIVE. COORDINATE WITH OTHER TRADES AND GENERAL CONTRACTOR PRIOR TO CUTTING, DRILLING, OR CORING.

- I. WIRING DEVICES
1. MOUNTING HEIGHTS TO THE CENTER OF THE DEVICE AND ORIENTATION SHALL BE AS FOLLOWS:

THERMOSTATS/MECHANICAL SWITCHES	60" AFF
LIGHT SWITCHES	48" AFF
CONVENIENCE & TELEPHONE OUTLETS	
ABOVE COUNTER	44" AFF
DATA, TELEPHONE, TV AND CONVENIENCE OUTLETS (TYPICAL)	18" AFF
 - ALL MOUNTING HEIGHTS ARE TYPICAL UNLESS NOTED OTHERWISE ON THE PLANS. ALL SWITCHES AND THERMOSTATS TO BE MOUNTED AS CLOSE TO DOOR JAMB AS POSSIBLE. COORDINATE ALL DEVICES WITH ARCHITECTURAL PLANS AND DETAILS. RECEPTACLES SHALL BE ORIENTED WITH THE GROUND TERMINAL UP WHEN INSTALLED VERTICAL AND WITH THE NEUTRAL TERMINAL(S) UP WHEN INSTALLED HORIZONTAL.

- J. TESTING
1. DEMONSTRATE THAT ALL COMPONENTS OF THE WORK OF THIS DIVISION HAVE BEEN PROVIDED AND THAT THEY OPERATE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
 2. TEST WIRING AND CONNECTORS FOR CONTINUITY, SHORT CIRCUITS AND IMPROPER GROUNDS. TEST EACH INDIVIDUAL POWER CIRCUIT WITH THE POWER EQUIPMENT CONNECTED FOR PROPER OPERATION.
 3. PROVIDE DETAILED DOCUMENTATION OF EACH TEST PERFORMED TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE, WITH THE NAMES AND THE SIGNATURES OF QUALIFIED INDIVIDUALS WHO CONDUCTED AND WITNESSED EACH TEST.

ELECTRICAL SPECIFICATIONS

PART 1 - GENERAL

- A. DESCRIPTION
1. FURNISH ALL LABOR, MATERIALS, EQUIPMENT AND TRANSPORTATION AS REQUIRED TO PROPERLY INSTALL A COMPLETE AND OPERABLE ELECTRICAL SYSTEM.
- B. RULES AND REGULATIONS
1. ALL WORK AND MATERIALS SHALL BE INSTALLED AS SHOWN AND HEREIN SPECIFIED.
 2. THE LATEST EDITIONS OF THE FOLLOWING SPECIFICATIONS, STANDARDS, AND AMENDMENTS, AS ADOPTED BY THE AUTHORITY HAVING JURISDICTION, SHALL FORM A PART OF THIS SPECIFICATION THE SAME AS IF HEREIN WRITTEN OUT IN FULL (ALL MATERIALS AND INSTALLATIONS SHALL CONFORM TO THE APPLICABLE REQUIREMENTS THEREOF):
 - a) NFPA (NATIONAL FIRE PROTECTION ASSOCIATION), PUBLICATION NUMBER 70, "NATIONAL ELECTRICAL CODE", PUB. NO. 72E, "AUTOMATIC FIRE DETECTORS".
 - b) UL (UNDERWRITERS LABORATORIES, INC.).
 - c) NEMA (NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION).
 - d) UBC (UNIFORM BUILDING CODE) AND STANDARD BUILDING CODE.
 - e) IBC (INTERNATIONAL BUILDING CODE)
 - f) IFC (INTERNATIONAL FIRE CODE)
 - g) IECC (INTERNATIONAL ENERGY CONSERVATION CODE)
 - h) NEC (INTERNATIONAL ELECTRICAL CODE)
 - i) STATE AND LOCAL BUILDING AUTHORITY AND CODES
 3. NO REQUIREMENT TO THESE DRAWINGS AND SPECIFICATIONS SHALL BE CONSTRUCTED TO VOID ANY OF THE PROVISIONS OF THE ABOVE SPECIFICATIONS AND STANDARDS.

- C. PERMITS AND INSPECTIONS UNLESS OTHERWISE SPECIFIED, THE CONTRACTOR SHALL APPLY, PAY FOR AND SCHEDULE ALL APPLICABLE PERMITS, FEES AND INSPECTIONS REQUIRED BY ANY AND ALL PUBLIC AUTHORITIES HAVING JURISDICTION AND REQUIRING INSPECTION.
1. EC SHALL INCLUDE ALL UTILITY COMPANY CHARGES IN THE BASE BID.
- D. WORKMANSHIP AND MATERIALS
1. WORKMANSHIP SHALL BE OF THE BEST QUALITY AND NONE BUT COMPETENT PERSONNEL SKILLED IN THEIR TRADE SHALL BE EMPLOYED. THE CONTRACTOR SHALL FURNISH THE SERVICES OF AN EXPERIENCED SUPERINTENDENT, WHO WILL BE IN CHARGE OF THE EXECUTION OF WORK, UNTIL COMPLETED AND ACCEPTED.
 2. UNLESS OTHERWISE HEREIN AFTER SPECIFIED, ALL MATERIALS AND EQUIPMENT UNDER THIS DIVISION OF THE SPECIFICATIONS SHALL BE NEW OF BEST GRADE AND AS LISTED IN PRINTED CATALOGS OF THE MANUFACTURER. EACH ARTICLE OF ITS KIND SHALL BE THE STANDARD PRODUCT OF A SINGLE MANUFACTURER.
 3. THE OWNER'S REPRESENTATIVE SHALL HAVE THE RIGHT TO ACCEPT OR REJECT MATERIAL EQUIPMENT AND/OR WORKMANSHIP AND DETERMINE WHEN THEY HAVE COMPLIED WITH THE REQUIREMENTS HEREIN SPECIFIED.
 4. ALL MANUFACTURED MATERIALS SHALL BE CLEARLY MARKED OR STAMPED WITH THE MANUFACTURER'S NAME AND RATING.
 5. REFERENCE TO STANDARDS ARE INTENDED TO BE THE LATEST REVISION OF THE STANDARD SPECIFIED, OR THAT ACCEPTED BY THE AUTHORITY HAVING JURISDICTION

- E. MANUFACTURER'S RECOMMENDATIONS
1. EQUIPMENT INSTALLED UNDER THIS DIVISION OF THE SPECIFICATIONS SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS, UNLESS OTHERWISE SHOWN ON THE DRAWINGS OR HEREIN SPECIFIED.
- F. GUARANTEE
- ALL MATERIALS AND EQUIPMENT PROVIDED AND INSTALLED UNDER THIS SECTION SHALL BE GUARANTEED FOR A MINIMUM OF ONE YEAR. SHOULD ANY TROUBLE OR MALFUNCTIONS OCCUR DURING THIS PERIOD DUE TO DEFECTIVE MATERIALS OR FAULTY WORKMANSHIP, THE CONTRACTOR WILL BE HELD LIABLE AND SHALL FURNISH LABOR, MATERIALS AND EQUIPMENT NECESSARY TO CORRECT THE TROUBLE OR MALFUNCTION WITHOUT ADDITIONAL COST TO THE OWNER. ALL DEFECTIVE MATERIAL OR INTERIOR WORKMANSHIP NOTICED DURING THE TIME OF INSTALLATION SHALL BE CORRECTED IMMEDIATELY TO THE ENTIRE SATISFACTION OF THE ARCHITECT AND OWNER, AT NO ADDITIONAL COST.
- G. DEFINITIONS
1. FURNISH: TO SUPPLY AND DELIVER, UNLOAD, INSPECT FOR DAMAGE.
 2. INSTALL: TO UNPACK, ASSEMBLE, ERECT, APPLY, PLACE, FINISH, CURE, PROTECT, CLEAN, AND MAKE READY FOR USE.
 3. PROVIDE: TO FURNISH AND INSTALL.
- H. SUBMITTALS
1. PROVIDE SHOP DRAWINGS AND MANUFACTURER'S LITERATURE OF MATERIALS AND EQUIPMENT AS REQUIRED IN THE GENERAL CONDITIONS, AS DIRECTED BY THE OWNER'S REPRESENTATIVE AND AS LISTED BELOW:
 2. CATALOG CUTS
 - a) TRIM AND COVER PLATES (EACH TYPE AND STYLE)
 - b) CIRCUIT BREAKERS (EACH SIZE AND TYPE)
 - c) SAFETY SWITCHES
 - d) FUSES (EACH SIZE AND TYPE)
 - e) LIGHTING FIXTURES

THE ABOVE IS A STANDARD SUBMITTAL REQUIREMENT LIST. ELECTRICAL CONTRACTOR SHALL SUBMIT ALL APPLICABLE ITEMS FOR REVIEW. MATERIAL NOT SUBMITTED AND APPROVED BY THE ARCHITECT OR OWNER'S REPRESENTATIVE SHALL BE SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTORS COST IF DIRECTED BY THE ARCHITECT OR THE OWNER'S REPRESENTATIVE.

PART 2 - MATERIALS

- A. GENERAL
- MATERIALS AND EQUIPMENT SHALL BE STANDARD CATALOGED PRODUCTS OF MANUFACTURERS REGULARLY ENGAGED IN THE MANUFACTURE OF THE PRODUCT. UL LISTED, AND SHALL BE THE LATEST STANDARD DESIGN THAT CONFORMS TO SPECIFIED MATERIALS AND EQUIPMENT.
- B. RACEWAY
1. ELECTRICAL METALLIC TUBING (EMT) SHALL BE USED IN INTERIOR DRY LOCATIONS GALVANIZED FLEXIBLE STEEL OR LIQUID TIGHT STEEL CONDUIT SHALL BE USED FOR CONNECTIONS TO MECHANICAL EQUIPMENT AND TRANSFORMERS OR AS INDICATED. LIQUID TIGHT CONDUIT SHALL BE USED IN EXTERIOR OR DAMP LOCATIONS.
 - 3/4" CONDUIT SHALL BE THE MINIMUM SIZE CONDUIT. OUTDOOR AND WET OR DAMP LOCATIONS: PROVIDE RIGID STEEL CONDUIT. PROVIDE CAST METAL OR PVC OUTLET, JUNCTION, AND PULL BOXES.
- C. FITTINGS
1. ALL FITTINGS SHALL BE STEEL/MALLEABLE IRON SET SCREW OR COMPRESSION WITH INSULATING BUSHINGS.
- D. OUTLET AND JUNCTION BOXES
1. BOXES IN INTERIOR DRY LOCATION SHALL BE GALVANIZED ONE-PIECE PRESSED STEEL, KNOCKOUT TYPE, NOT LESS THAN 4 INCHES SQUARE AND 2 1/8" DEEP, APPLETON, RACO, OR EQUAL.
 2. BOXES SHALL BE EQUIPPED WITH PLASTER RINGS, EXTENSION RINGS, AND FIXTURE STUDS AS REQUIRED FOR THE DEVICE OR APPLICATION.
 3. PROVIDE SURFACE MOUNTING OUTLET BOX IN NON-FINISHED AREAS, SURFACE MOUNTING FOR UNFINISHED AREAS.
 4. ALL BOXES IN FINISHED SPACES SHALL BE FLUSH MOUNTING AND PROVIDED WITH MUD RINGS AS REQUIRED FOR THE DEVICE AND WALL MATERIAL.

- E. CONDUCTORS
1. ALL CONDUCTORS SHALL BE SOFT DRAWN, ANNEALED COPPER IN RACEWAY SIZED AS SHOWN ON THE PLANS. ALL CONDUCTORS TO BE MINIMUM #12 AWG, #8 AWG AND LARGER SHALL BE STRANDED.
 2. CONDUCTORS SHALL BE COPPER, THIN OR THIN-2 COLOR CODED IN ACCORDANCE WITH PART 3, SECTION C. 1. OF THESE SPECIFICATIONS.

- F. WIRING CONNECTIONS
1. MAKE ALL ELECTRICAL CONNECTIONS.
 2. MAKE CONNECTION TO DEVICES USING "PIG-TAILS". DO NOT USE A DEVICE AS A CONNECTION OR A SPLICE UNIT.
 3. DO NOT PLACE STRANDED CONDUCTORS DIRECTLY UNDER SCREWS. INSTALL CRIMP-ON, INSULATED, FORK TERMINALS FOR CONDUCTOR TERMINATIONS, OR INSTALL SOLDER CONDUCTORS.

- G. WIRING DEVICES
1. PLATES - SHALL BE STEEL
 2. SWITCHES - SHALL BE AS SHOWN ON THE PLANS OR EQUAL OF P&S, LEVITON OR COOPER 20 AMP, SILENT TYPE. COLOR SHALL BE IVORY
 3. RECEPTACLES - SHALL BE AS SHOWN ON PLANS OR EQUAL OF P&S, LEVITON OR COOPER 20AMP. COLOR SHALL BE IVORY.
 4. SPECIAL PURPOSE OUTLETS SHALL BE AS INDICATED ON THE DRAWINGS.

- H. PANEL BOARDS
1. DEAD FRONT TYPE, EQUIPPED WITH BOLT - ON CIRCUIT BREAKERS AND PROVISIONS FOR FUTURE BREAKERS, AS INDICATED. SQUARE D, GENERAL ELECTRIC, SIEMENS, OR CUTLER HAMMER. THE NUMBER OF POLES, TYPE, VOLTAGE, AND AMP RATING SHALL BE AS INDICATED ON THE PLANS. PROVIDE FULL SIZE GROUND BUS. NEUTRAL WIRES SHALL BE CONNECTED TO A COMMON NEUTRAL BUS WITH BONDING SCREWS OR LUGS, THE NEUTRAL BUS SHALL BE INSULATED FROM THE CABINET.
 2. FURNISH COMPLETE WITH DOOR, KEYS LOCK AND TYPE WRITTEN, LAMINATED DIRECTORY. CABINETS SHALL BE RIGIDLY SUPPORTED INDEPENDENT OF CONDUITS. KEYING SHALL MATCH EXISTING PANEL BOARDS, IF ANY.
 3. PROVIDE FULLY RATED PANEL BOARDS WITH A MINIMUM AIC RATING AS INDICATED ON THE DRAWINGS.



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HVAC UPGRADES
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REVISIONS

NO.	DESCRIPTION

VBFA PROJECT #: 08249
CHECKED BY: Shephard / Jbeck
DRAWN BY: Ejuarez / Cbets
CURRENT BID DATE: 11/24/08

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SPECIFICATIONS
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