

# ORANGE COUNTY, FLORIDA

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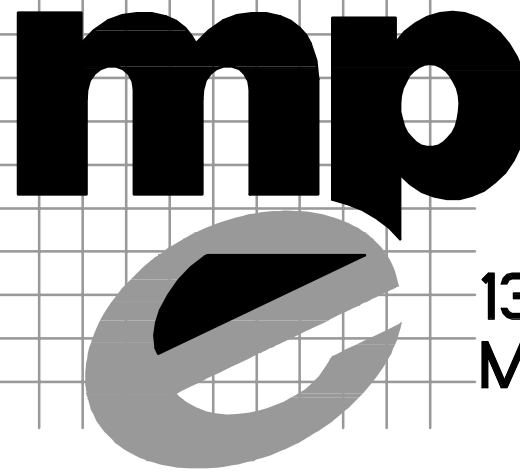
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## FIRE STATION #54 HVAC REPLACEMENT

06-17-14  
BID DOCUMENTS

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PROFESSIONAL  
ENGINEERING, INC.**  
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### HVAC

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**ORANGE COUNTY  
 FIRE STATION 54  
 HVAC  
 REPLACEMENT**

**Revisions**

No.	Date	Description

Key Plan

MPE PROJ#: 2013-173
Designed By: RR
Drawn By: RR
Checked By: ABjr
Issue Date: 06/17/14
Drawing Scale: 1/8" = 1'-0"
Drawing Title:

**HVAC  
 PHASING PLAN**

BID DOCUMENTS

Drawing No.

**PH-1.1**

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 FLORIDA STATE P.E. NUMBER: 5131

**PHASING NOTES**

THE CONTRACTOR SHALL PERFORM WORK ON DAYS, NIGHTS AND WEEKENDS SO AS TO MINIMIZE THE IMPACT AND DOWNTIME OF THE FACILITY. THE FACILITY SHALL REMAIN FULLY OPERATIONAL THROUGHOUT CONSTRUCTION. THE PROJECT WILL BE BROKEN UP INTO PHASES AS FOLLOWS:

**PHASE 1**  
 REPLACE EXISTING AIR CONDITIONING EQUIPMENT, RESTROOM EXHAUST FAN, SUPPLY AIR, RETURN AIR AND EXHAUST AIR DUCTWORK AND CONTROLS SERVING THIS PORTION OF THE BUILDING. LOCATE NEW AIR HANDLING UNIT IN EXISTING MEZZANINE MECHANICAL ROOM. LOCATE NEW INLINE EXHAUST FAN ABOVE THE CEILING AND PROVIDE NEW ROOF VENT IN SAME LOCATION AS REMOVED EXHAUST FAN. PERFORM TEST AND BALANCE OF NEW AIR HANDLING UNIT AND EXHAUST SYSTEM.

**PHASE 2**  
 REPLACE EXISTING AIR CONDITIONING EQUIPMENT, SUPPLY AND RETURN AIR DUCTWORK AND CONTROLS SERVING THIS PORTION OF THE BUILDING. LOCATE NEW AIR HANDLING UNIT IN EXISTING MEZZANINE MECHANICAL ROOM. EXISTING HOOD EXHAUST FAN AND SUPPLY AIR FAN TO REMAIN, PROVIDE NEW INTAKE DUCTWORK ON ROOF FOR THE EXISTING SUPPLY FAN. PERFORM TEST AND BALANCE OF THE NEW AIR HANDLING UNIT.

**PHASE 3**  
 REPLACE EXISTING AIR CONDITIONING EQUIPMENT, EXHAUST SYSTEMS, SUPPLY AIR, RETURN AIR AND EXHAUST AIR DUCTWORK, AND CONTROLS SERVING THIS PORTION OF THE BUILDING. LOCATE NEW AIR HANDLING UNIT IN EXISTING MEZZANINE MECHANICAL ROOM.

REPLACE EXISTING ROOF MOUNTED RESTROOM EXHAUST FAN WITH NEW INLINE FAN DUCTED NEW ROOF VENT LOCATED AT REMOVED EXHAUST FAN LOCATION.

REPLACE EXISTING ROOF MOUNTED CASCADE ROOM EXHAUST FAN WITH NEW INLINE FAN DUCTED NEW ROOF VENT LOCATED AT REMOVED EXHAUST FAN LOCATION. PROVIDE NEW OUTDOOR AIR INTAKE DUCTWORK TO CASCADE ROOM.

REPLACE EXISTING ROOF MOUNTED TOILET ROOM R100C EXHAUST FAN WITH NEW INLINE FAN DUCTED NEW ROOF VENT LOCATED AT REMOVED EXHAUST FAN LOCATION.

REPLACE EXISTING (2) ROOF MOUNTED APPARATUS BAY EXHAUST FANS AND DUCTWORK WITH (2) NEW INLINE FANS DUCTED TO NEW WALL LOUVERS IN THE APPARATUS BAY. PROVIDE (2) NEW AIR INTAKE WALL LOUVERS WITH MOTORIZED DAMPERS FOR EXHAUST FAN MAKE-UP AIR.

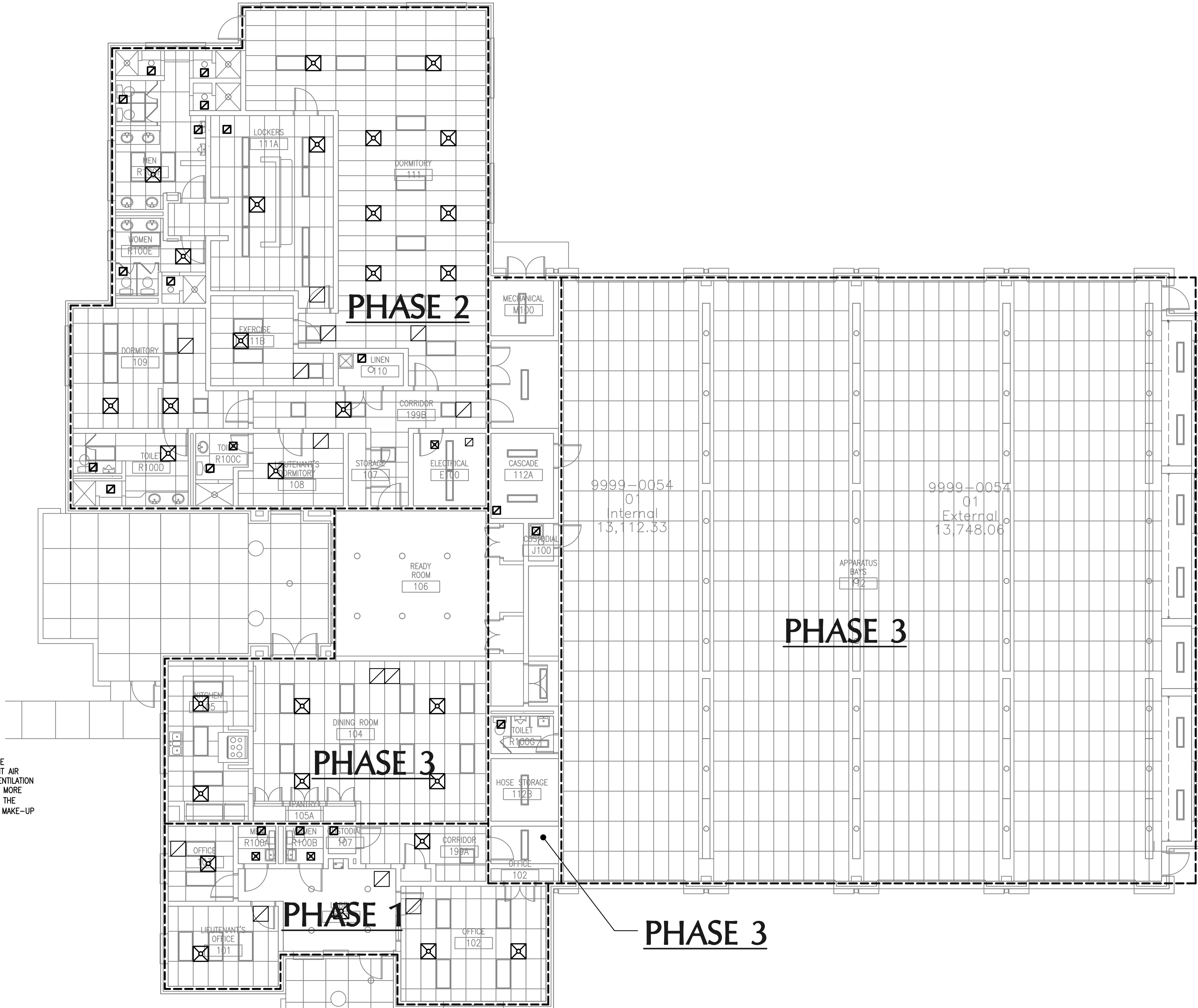
INSTALL NEW 100% OUTDOOR AIR SPLIT SYSTEM DUCTED TO EACH NEW AIR HANDLING RETURN AIR DUCTWORK. CONNECT INTAKE DUCTWORK FOR OUTDOOR AIR UNIT TO NEW ROOF VENT LOCATED AT EXISTING REMOVED OUTDOOR AIR INTAKE AT ROOF.

- UPON CONTRACT AWARD THE CONTRACTOR SHALL MEET WITH THE OWNER AND SHALL CONFIRM THE ORDER AND SCOPE OF THE PHASING AND SHALL MODIFY THE PROJECT PHASING PLAN AS PER OWNER REQUIREMENTS AT THE COMMENCEMENT OF CONSTRUCTION.
- SEE ARCHITECTURAL, STRUCTURAL AND MECHANICAL/ELECTRICAL PLANS FOR A MORE COMPLETE AND DETAILED SCOPE DEFINITION.
- CONTRACTOR SHALL NOT COMMENCE WORK ON PHASE 2 UNTIL THE PHASE 1 CONSTRUCTION IS COMPLETE AND THE SPACE IS TURNED OVER TO THE OWNER FOR THEIR USE. SAME FOR PHASE 3.

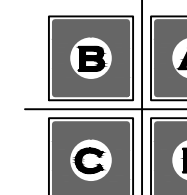
**SCOPE OF WORK**

THE SCOPE OF WORK FOR THIS PROJECT INCLUDES BUT IS NOT LIMITED TO ALL LABOR AND MATERIALS NECESSARY FOR THE FOLLOWING ITEMS:

- CONTRACTOR SHALL REPLACE THE (3) EXISTING DX HEAT PUMP SPLIT SYSTEMS IN THE MEZZANINE OF THE APPARATUS BAY OF THE BUILDING WITH NEW DX HEAT PUMP SPLIT AIR CONDITIONING SYSTEMS. PROVIDE NEW 100% OUTDOOR SPLIT SYSTEM TO PROVIDE VENTILATION TO EACH SPLIT SYSTEM AIR HANDLING UNIT. SEE FLOOR PLANS AND SCHEDULES FOR MORE INFORMATION. ALL EXISTING EXHAUST FANS IN THE BUILDING (EXCEPT THOSE SERVING THE KITCHEN HOOD) SHALL BE REMOVED AND REPLACED WITH NEW FANS. EXISTING HOOD MAKE-UP AIR FAN SHALL REMAIN AND HAVE ITS INTAKE DUCTWORK REPLACED WITH NEW DUCTWORK.
- PROVIDE NEW (3) NEW SPLIT SYSTEM AIR HANDLING UNITS ON THE EXISTING MEZZANINE OF THE APPARATUS BAY WITH NEW REFRIGERANT PIPING RUN TO ASSOCIATED HEAT PUMP UNITS AT GRADE. REPLACE ALL CONDENSATE DRAIN PIPING RUN TO EXISTING FLOOR DRAINS AT THE MEZZANINE LEVEL.
- CONTRACTOR SHALL REPLACE ALL EXISTING SUPPLY AIR, RETURN AIR, OUTSIDE AIR AND EXHAUST AIR DUCTWORK WITH NEW DUCTWORK.
- CONTRACTOR SHALL REPLACE ALL EXISTING VT ZONE DAMPERS FROM AHU-1.3 WITH NEW VARIABLE AIR VOLUME BOXES (VAV).
- CONTRACTOR SHALL FURNISH AND INSTALL NEW ELECTRICAL PROVISIONS AS REQUIRED FOR ALL NEW AND REPLACED HVAC EQUIPMENT.
- CONTRACTOR SHALL REMOVE AND REPLACE ALL HARD CEILING IN THE BUILDING AS NECESSARY TO ACCOMPLISH THE WORK.
- ALL EXISTING LAY-IN CEILING TILES AND GRID SHALL BE REMOVED AND REINSTALLED AS REQUIRED TO INSTALL NEW DUCTWORK ABOVE THE CEILING.
- CONTRACTOR SHALL DISCONNECT, REMOVE, STORE AND REINSTALL ALL ELECTRICAL EQUIPMENT MOUNTED IN THE CEILING OR ON WALLS FOR AREAS TO BE RENOVATED AS NECESSARY TO ACCOMPLISH THE WORK. THIS INCLUDES LIGHTING FIXTURES, SPEAKERS, SMOKE DETECTORS, ETC. TEMPORARILY TERMINATE WIRES AND SUPPORT ALL CONDUIT FROM STRUCTURE THAT MAY BE RESTING ON THE CEILING.
- CONTRACTOR SHALL PROTECT OR TEMPORARILY RELOCATE ALL FIXTURES, EQUIPMENT AND FURNITURE IN THE BUILDING THROUGHOUT CONSTRUCTION AS NECESSARY TO ACCOMMODATE THE WORK.
- CONTRACTOR SHALL TEST AND BALANCE ALL OF THE NEW HVAC SYSTEMS AND AIR DISTRIBUTION SYSTEMS. THIS WORK ALSO INCLUDES THE TEST AND BALANCE OF THE NEW EXHAUST SYSTEMS. TEST & BALANCE HVAC SYSTEMS AFTER EACH PHASE IS COMPLETED AND PERFORM A FINAL TEST & BALANCE ON THE ENTIRE BUILDING INCLUDING HVAC AND EXHAUST SYSTEMS AFTER LAST PHASE IS COMPLETED.
- THE FACILITY SHALL REMAIN FULLY OCCUPIED AND FUNCTIONAL THROUGHOUT THE PROJECT CONSTRUCTION. CONTRACTOR SHALL WORK DURING NON-OCCUPIED HOURS, EVENINGS, WEEKENDS AND HOLIDAYS TO PERFORM THE WORK.
- CONTRACTOR SHALL REPLACE/REPAIR SECTIONS OF THE EXISTING DRYWALL/PLASTER CEILING OR WALL AS NECESSARY TO ACCOMPLISH THE WORK. THIS IS DIRECTED TO THE CEILINGS AND WALLS SURROUNDING EXHAUST FANS TO BE REPLACED.
- CONTRACTOR SHALL REPLACE THE EXISTING TRANE CONTROLS SYSTEM AND ALL THERMOSTATS AND TEMPERATURE SENSORS WITH A NEW DDC CONTROLS SYSTEM.
- CONTRACTOR SHALL PROVIDE TEMPORARY COOLING OR HEATING TO THE SPACES SERVED AS EACH HVAC SYSTEM IS BEING REPLACED, AS REQUIRED BY THE OWNER OR THEIR REPRESENTATIVE.
- THE CONTRACTOR SHALL REPAIR OR REPLACE ANY EXISTING INTERIOR OR EXTERIOR FINISHES (WALL/FLOORS) DAMAGED DURING CONSTRUCTION AS DETERMINED BY THE OWNER, AT THE CONTRACTORS COST.



**FLOOR PLAN - HVAC**  
 SCALE: 1/8"=1'-0"

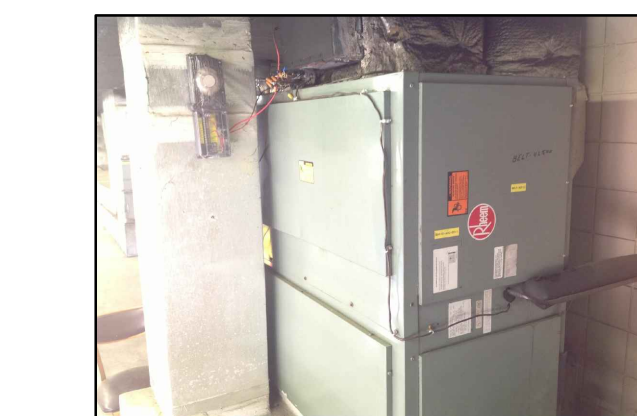
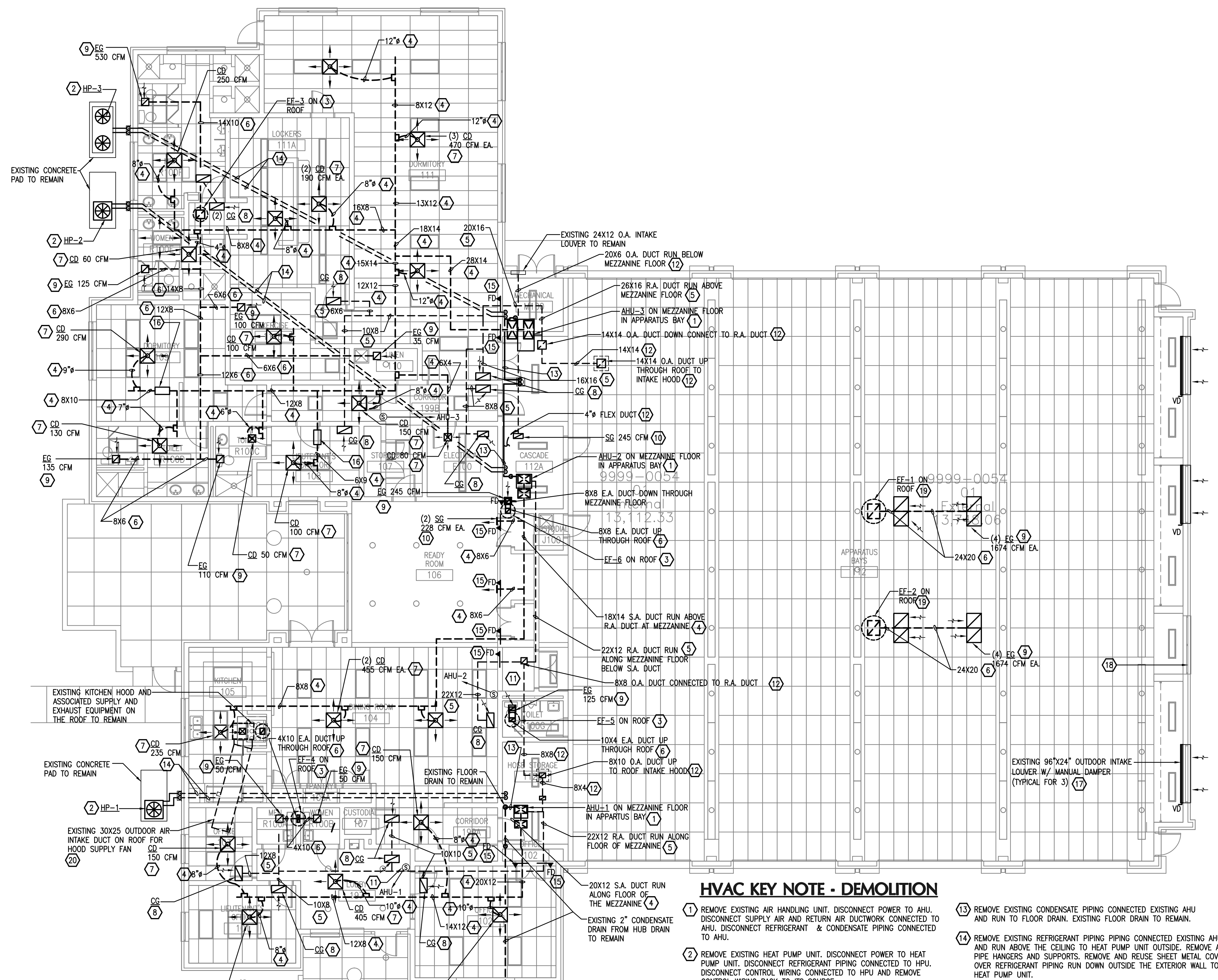


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PLOT DATE: 6/17/2014 4:19:04 PM MATERN PROFESSIONAL ENGINEERING

**ORANGE COUNTY  
 FIRE STATION 54  
 HVAC  
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**AIR HANDLING UNIT AHU-3**



**HEAT PUMP UNIT HP-3**



**AIR HANDLING UNIT AHU-2**



**HEAT PUMP UNIT HP-2**



**AIR HANDLING UNIT AHU-1**



**HEAT PUMP UNIT HP-1**



**EXHAUST FAN EF-4**



**KITCHEN HOOD SUPPLY & EXHAUST FAN**



**EXHAUST FAN EF-3**



**EXHAUST FAN EF-5 & O.A. INTAKE AHU-1 & 2**



**APPARATUS BAY EXHAUST FAN EF-1 & EF-2**



**APPARATUS BAY O.A. INTAKE LOUVERS**

**HVAC GENERAL NOTES**

- CONTRACTOR TO REMOVE SECTIONS OF CEILING TILES AND CEILING GRID AS REQUIRED TO REMOVE EXISTING DUCTWORK ABOVE THE CEILING AND RE-INSTALL NEW DUCTWORK. CONTRACTOR TO REPLACE ANY DAMAGED CEILING TILES OR GRID DURING CONSTRUCTION.
- CONTRACTOR TO REMOVE SECTION OF HARD GYPSUM CEILING AS REQUIRED TO REMOVE EXISTING DUCTWORK ABOVE THE CEILING AND RE-INSTALL NEW DUCTWORK. CONTRACTOR TO REPAIR/REPLACE HARD GYPSUM CEILING REMOVED DURING CONSTRUCTION.
- CONTRACTOR TO REMOVE EXISTING CEILING LIGHTS AS REQUIRED TO REMOVE EXISTING DUCTWORK AND RE-INSTALL NEW DUCTWORK. REPAIR/REPLACE ANY CEILING LIGHT DAMAGED DURING CONSTRUCTION. DISCONNECT & RECONNECT POWER TO THE LIGHTS AS REQUIRED.
- PRIOR TO DEMOLITION OF ANY PORTION OF THE EXISTING HVAC EQUIPMENT AND ASSOCIATED DUCTWORK, CONTRACTOR SHALL TEST THE EXISTING SPLIT SYSTEMS AND DUCTWORK FOR PERFORMANCE (COOLING & HEATING CAPACITIES), AIR FLOWS (CFM) AT AIR HANDLING EQUIPMENT AND EXHAUST FANS, AIR FLOWS AT ALL DIFFUSERS AND GRILLES AND ELECTRICAL CONSUMPTION (AMPS) OF HVAC EQUIPMENT. CONTRACTOR TO PREPARE AND SUBMIT A TEST REPORT OF THE TEST RESULTS TO THE OWNER OR THEIR REPRESENTATIVE.

**FLOOR PLAN - HVAC - DEMOLITION**

SCALE: 1/8"=1'-0"

**HVAC KEY NOTE - DEMOLITION**

- REMOVE EXISTING AIR HANDLING UNIT. DISCONNECT POWER TO AHU. DISCONNECT SUPPLY AIR AND RETURN AIR DUCTWORK CONNECTED TO AHU. DISCONNECT REFRIGERANT & CONDENSATE PIPING CONNECTED TO AHU.
- REMOVE EXISTING HEAT PUMP UNIT. DISCONNECT POWER TO HEAT PUMP UNIT. DISCONNECT REFRIGERANT PIPING CONNECTED TO HPU. DISCONNECT CONTROL WIRING CONNECTED TO HPU AND REMOVE CONTROL WIRING BACK TO ITS SOURCE.
- REMOVE EXISTING ROOF EXHAUST FAN. DISCONNECT POWER TO EXHAUST FAN. DISCONNECT EXHAUST DUCTWORK CONNECTED TO FAN. EXISTING ROOF CURB TO REMAIN. PROVIDE TEMPORARY CURB CAP OVER EXISTING ROOF OPENING.
- REMOVE EXISTING SUPPLY AIR DUCTWORK RUN ABOVE THE CEILING AND EXPOSED IN APPARATUS BAY. REMOVE DUCT HANGERS AND SUPPORTS.
- REMOVE EXISTING RETURN AIR DUCTWORK RUN ABOVE THE CEILING OR EXPOSED IN APPARATUS BAY. REMOVE ALL DUCT HANGERS AND SUPPORTS.
- REMOVE EXISTING EXHAUST DUCT RUN ABOVE THE CEILING. REMOVE EXISTING DUCT HANGERS AND SUPPORTS.
- REMOVE EXISTING CEILING SUPPLY AIR DIFFUSERS (CD). REMOVE CONNECTING FLEXIBLE DUCT BACK TO BRANCH DUCT CONNECTION.
- REMOVE EXISTING CEILING RETURN AIR GRILLE (CG). REMOVE EXISTING DUCTWORK CONNECT TO GRILLE.
- REMOVE EXISTING CEILING EXHAUST AIR GRILLE (EG). REMOVE CONNECTING DUCTWORK CONNECTED TO GRILLE.
- REMOVE EXISTING SIDEWALL SUPPLY AIR GRILLE (SG). REMOVE CONNECTING DUCTWORK CONNECTED TO GRILLE.
- REMOVE EXISTING WALL TEMPERATURE SENSOR. REMOVE ALL CONTROL WIRING AND SUPPORTS.
- REMOVE EXISTING OUTDOOR AIR DUCTWORK CONNECTED TO AHU RETURN AIR DUCT. REMOVE EXISTING DUCT HANGERS AND SUPPORTS. EXISTING ROOF INTAKE HOOD AND ROOF CURB TO REMAIN.
- REMOVE EXISTING CONDENSATE PIPING CONNECTED EXISTING AHU AND RUN TO FLOOR DRAIN. EXISTING FLOOR DRAIN TO REMAIN.
- REMOVE EXISTING REFRIGERANT PIPING CONNECTED EXISTING AHU AND RUN ABOVE THE CEILING TO HEAT PUMP UNIT OUTSIDE. REMOVE ALL PIPE HANGERS AND SUPPORTS. REMOVE AND REUSE SHEET METAL COVER OVER REFRIGERANT PIPING RUN DOWN OUTSIDE THE EXTERIOR WALL TO HEAT PUMP UNIT.
- REMOVE EXISTING FIRE DAMPER AT DUCTWORK WALL PENETRATION OF APPARATUS BAY.
- REMOVE EXISTING VAV BOX ABOVE THE CEILING. REMOVE CONNECTING DUCTWORK. REMOVE EXISTING TEMPERATURE CONTROLS.
- REMOVE EXISTING WALL LOUVER AND MANUAL VOLUME DAMPER. REPLACE LOUVER WITH NEW FLORIDA PRODUCT APPROVED LOUVER AT SAME SIZE AS EXISTING WALL OPENING.
- REMOVE EXISTING WINDOW AND WINDOW FRAME. REPLACE WITH NEW FLORIDA PRODUCT APPROVED LOUVER AT SAME SIZE AS EXISTING WALL OPENING.
- REMOVE EXISTING APPARATUS BAY ROOF EXHAUST FAN. DISCONNECT POWER TO EXHAUST FAN. DISCONNECT EXHAUST DUCTWORK CONNECTED TO FAN. EXISTING ROOF CURB TO REMAIN. PROVIDE INSULATED SHEET METAL CURB CAP OVER EXISTING ROOF OPENING AND SEAL WEATHERTIGHT.
- REMOVE EXISTING 30X25 OUTDOOR AIR INTAKE SHEET METAL DUCT CONNECTED TO EXISTING HOOD SUPPLY FAN ON ROOF. EXISTING DUCT ROOF SUPPORTS TO REMAIN.

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 FLORIDA STATE P.E. NUMBER: 5131

**Revisions**

No.	Date	Description

Key Plan

MPE PROJ#: 2013-173

Designed By: RR

Drawn By: RR

Checked By: ABJR

Issue Date: 06/17/14

Drawing Scale: 1/8" = 1'-0"

Drawing Title:

**FLOOR PLAN  
 HVAC  
 DEMOLITION**

BID DOCUMENTS

Drawing No.

**MD-1.1**

# ORANGE COUNTY FIRE STATION 54 HVAC REPLACEMENT

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ENG. BUS. No. EB-0005096 CERT. OF AUTH. No. 5096

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## FLOOR PLAN HVAC

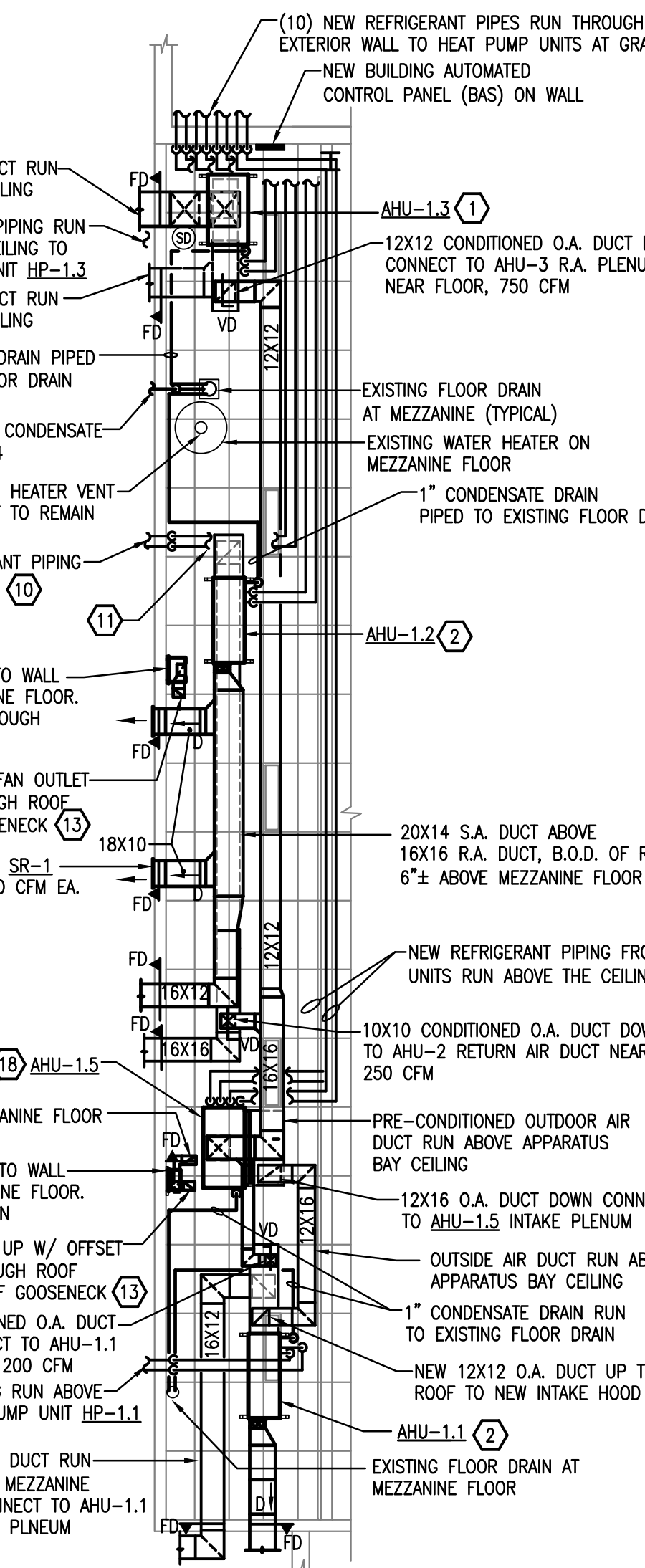
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AREA SERVED	UNIT	SUPPLY AIR	RETURN AIR	OUTSIDE AIR	EXHAUST AIR	NET EFFECT
LOBBY, OFFICE AREA	AHU-1.1	1400	1200	200*	---	+200*
DINING, KITCHEN & READY ROOM	AHU-1.2	1950	1700	250*	---	+250*
DORMS, EXERCISE & RESTROOM AREA	AHU-1.3	4000	3250	750*	---	+750*
EXISTING KITCHEN HOOD MAKE-UP AIR	SF-1	---	---	900	---	+900
SUB TOTAL	---	7550	6150	2100	---	+2100
RESTROOMS 100C-100F	EF-1.3	---	---	---	725	-725
RESTROOMS 100 AB/ CUSTODIAL 107	EF-1.4	---	---	---	150	-150
EXISTING KITCHEN HOOD EXHAUST AIR	EF-7	---	---	---	1000	-1000
SUB TOTAL	---	---	---	---	-1875	-1875
BUILDING PRESSURIZATION	---	---	---	---	---	+225
* 100% OUTSIDE AIR UNIT AHU-1.5 PROVIDES THE VENTILATION AIR TO AHU-1.1, AHU-1.2 & AHU-1.3						

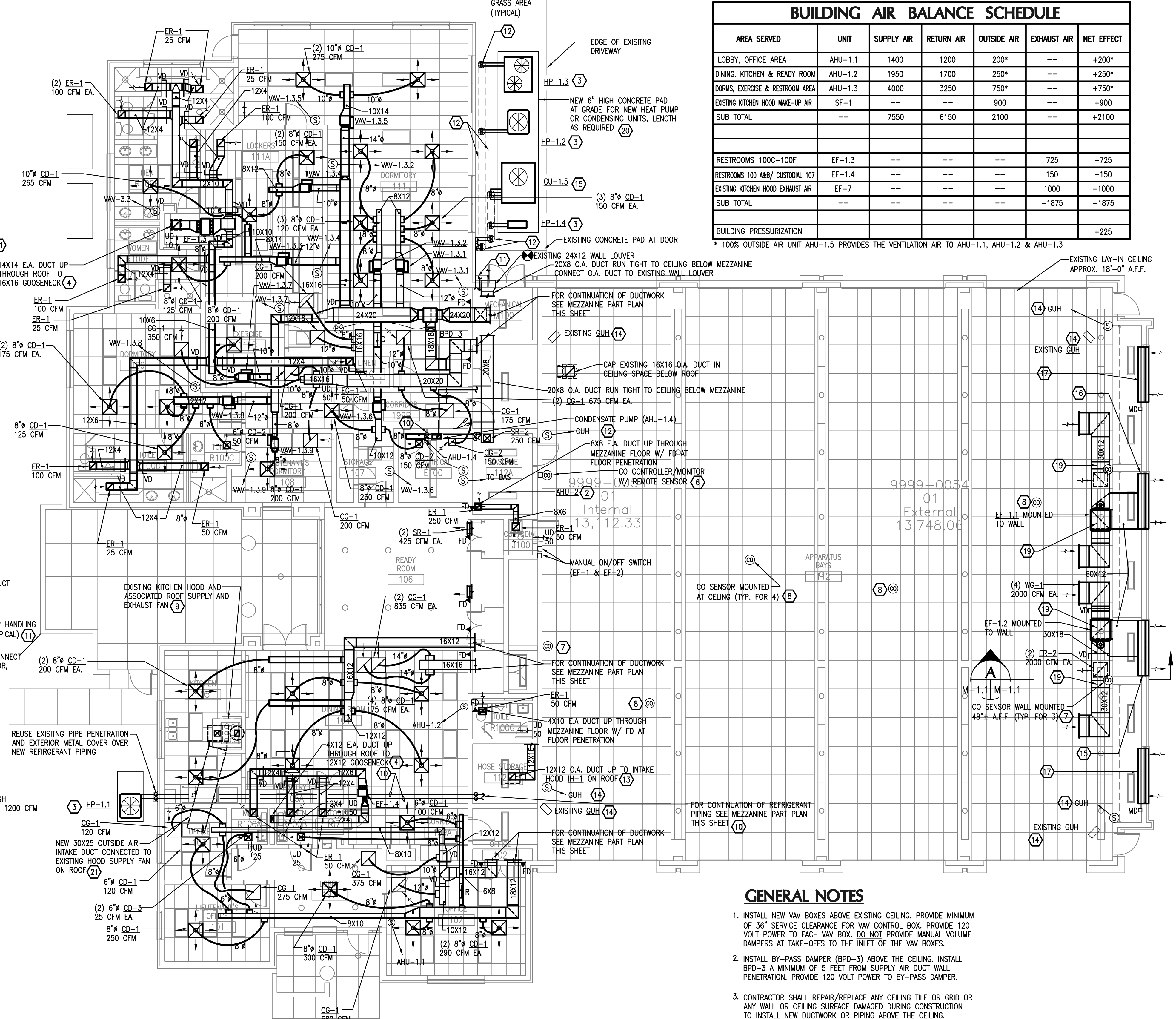
### HVAC KEY NOTES

- NEW VERTICAL AIR HANDLING UNIT AHU-1 INSTALLED ON 24" HIGH SUPPORT STAND. COORDINATE AHU LOCATION WITH THE EXISTING WALL OPENINGS FOR DUCTWORK. PROVIDE DRAIN PAN OVERFLOW DETECTION DEVICE TO SHUT-DOWN AHU IF ANY CONDENSATE OVERFLOW WATER IS DETECTED FROM THE DRAIN PAN.
- NEW HORIZONTAL AIR HANDLING UNIT AHU-2 OR AHU-3 INSTALLED ON 36" HIGH SUPPORT STAND. PROVIDE DRAIN PAN OVERFLOW DETECTION DEVICE TO SHUT-DOWN AHU IF ANY CONDENSATE OVERFLOW WATER IS DETECTED FROM THE DRAIN PAN.
- NEW AIR COOLED HEAT PUMP CONDENSING UNIT INSTALLED ON EXISTING CONCRETE PAD. EXTEND EXISTING CONCRETE PAD AS REQUIRED TO ACCOMMODATE NEW HEAT PUMP UNIT DIMENSIONS. SECURE HEAT PUMP UNIT TO CONCRETE PAD TO MEET 2010 FLORIDA BUILDING CODE HIGH VELOCITY WIND LOAD REQUIREMENTS.
- NEW ROOF GOOSENECK INSTALLED ON EXISTING ROOF CURB. SECURE EXHAUST GOOSENECK TO EXISTING ROOF CURB TO MEET 2010 FLORIDA BUILDING CODE HIGH VELOCITY WIND LOAD REQUIREMENTS. CONTRACTOR TO VERIFY EXISTING ROOF CURB SIZE.



### HVAC KEY NOTES

- NEW AIR HANDLING UNIT INSTALLED ON WALL ABOVE THE DOOR. PROVIDE CONDENSATE PUMP MOUNTED ON WALL NEXT TO AIR HANDLING UNIT. PROVIDE AUXILIARY DRAIN PAN UNDER CONDENSATE PUMP W/ FLOAT SWITCH TO SHUT DOWN AHU-1.4 SHOULD ANY WATER ACCUMULATE IN DRAIN PAN.
- NEW CARBON MONOXIDE (CO) MONITORING PANEL WITH CO SENSOR MOUNTED ON WALL 48"± A.F.F. CONNECT ALL REMOTE CARBON MONOXIDE (CO) SENSORS TO MONITORING PANEL. SET INTERNAL CO SENSOR TO 50 PPM.
- NEW CARBON MONOXIDE (CO) SENSOR MOUNTED ON WALL 48"± A.F.F. SET SENSOR TO 50 PPM. CONNECT SENSOR TO CO MONITORING PANEL.
- EXISTING KITCHEN HOOD AND ASSOCIATED SUPPLY FAN SF-1 AND EXHAUST FAN EF-7 TO REMAIN. EXISTING HOOD FIRE SUPPRESSION SYSTEM TO REMAIN.
- NEW REFRIGERANT PIPING RUN ABOVE THE CEILING. SEAL PIPE PENETRATIONS OF APPARATUS BAY WALL WITH APPROVED FIRE CAULK.
- NEW REFRIGERANT PIPING RUN ABOVE THE APPARATUS BAY CEILING. SEAL REFRIGERANT PIPE PENETRATION OF THE EXTERIOR WALL. PROVIDE NEW 20 GAUGE SHEET METAL COVER OVER (12) EXPOSED REFRIGERANT PIPES RUN ALONG THE OUTSIDE OF THE EXTERIOR WALL. PIPE COVER SHALL EXTEND FROM WALL PENETRATION TO WITH-IN 2' ± OF FINISHED GRADE. REFRIGERANT PIPING WITH INSULATION RUN OUTSIDE METAL COVER TO UNDERGROUND PVC CONDUIT SHALL HAVE ALUMINUM JACKET OVER EXPOSED PIPING AND INSULATION.

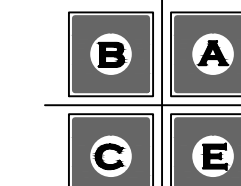


### HVAC KEY NOTES

- NEW REFRIGERANT PIPING AND HVAC CONTROL WIRING RUN UNDERGROUND IN PVC CONDUIT AND CONNECT TO EACH HEAT PUMP OR CONDENSING UNIT. SEE DETAIL. COORDINATE UNDERGROUND PVC CONDUIT WITH EXISTING 2" CONDENSATE DRAIN UNDERGROUND TO EXISTING DRY WELL FROM MEZZANINE FLOOR DRAIN.
- NEW OUTSIDE AIR INTAKE HOOD #1-1 INSTALLED ON EXISTING ROOF CURB. PROVIDE CURB ADAPTER AS REQUIRED. INTAKE HOOD SHALL BE LOREN COOK MODEL G1 28X36 HOOD SIZE WITH 16X16 THROAT SIZE OR APPROVED EQUAL. SECURE HOOD TO ROOF CURB TO MEET 2010 FLORIDA BUILDING CODE HIGH VELOCITY WIND REQUIREMENTS.
- EXISTING GAS UNIT HEATER GUH-1 BELOW THE CEILING TO REMAIN. PROVIDE NEW REMOTE TEMPERATURE SENSORS WITH FAN ON/OFF SWITCH, MOUNT SENSOR 48" A.F.F. TO CONTROL EACH ELECTRIC UNIT HEATER. CONNECT SENSOR TO NEW BAS CONTROL PANEL TO MONITOR ELECTRIC UNIT HEATER ON/OFF OPERATION.
- PROVIDE NEW 96"x24" WALL EXHAUST AIR LOUVER W/ 1 FOOT DEEP SHEET METAL PLENUM. INSTALL LOUVER IN REMOVED WINDOW OPENING. CONTRACTOR TO CONFIRM OPENING SIZE. CONNECT 60X12 DISCHARGE DUCT FROM EF-1.2 TO PLENUM.
- PROVIDE NEW 96"x24" WALL EXHAUST LOUVER W/ 1 FOOT DEEP SHEET METAL PLENUM IN REMOVED LOUVER OPENING. CONTRACTOR TO CONFIRM OPENING SIZE. CONNECT NEW 60X12 DISCHARGE DUCT FROM EF-1.1 TO PLENUM.

### GENERAL NOTES

- INSTALL NEW VAV BOXES ABOVE EXISTING CEILING. PROVIDE MINIMUM OF 36" SERVICE CLEARANCE FOR VAV CONTROL BOX. PROVIDE 120 VOLT POWER TO EACH VAV BOX. DO NOT PROVIDE MANUAL VOLUME DAMPERS AT TAKE-OFFS TO THE INLET OF THE VAV BOXES.
- INSTALL BY-PASS DAMPER (BPD-3) ABOVE THE CEILING. INSTALL BPD-3 A MINIMUM OF 5 FEET FROM SUPPLY AIR DUCT WALL PENETRATION. PROVIDE 120 VOLT POWER TO BY-PASS DAMPER.
- CONTRACTOR SHALL REPAIR/REPLACE ANY CEILING TILE OR GRID OR ANY WALL OR CEILING SURFACE DAMAGED DURING CONSTRUCTION TO INSTALL NEW DUCTWORK OR PIPING ABOVE THE CEILING.
- CONTRACTOR SHALL FIRE CAULK ALL NEW PIPE PENETRATIONS OF THE WALL SEPARATING APPARATUS BAY FROM REST OF THE BUILDING. REPAIR ANY WALL OPENING NOT BEING REUSED.
- CONDENSATE PIPING RUN ABOVE MEZZANINE FLOOR FROM AHU'S SHALL SLOPE A MINIMUM OF 1/4" PER FOOT OVER ITS ENTIRE RUN. CONDENSATE PIPING SHALL BE INSULATED WITH 3/4" CLOSED CELLULAR (ARMAFLEX) INSULATION AND ALL INSULATION JOINTS SHALL BE SEALED WITH APPROVED MASTIC. FIRE CAULK PIPE PENETRATION OF APPARATUS BAY WALL.
- PUMPED CONDENSATE PIPING RUN ABOVE THE CEILING TO THE MEZZANINE SHALL BE INSULATED WITH 3/4" CLOSED CELLULAR (ARMAFLEX) INSULATION AND ALL INSULATION JOINTS SHALL BE SEALED WITH APPROVED MASTIC. FIRE CAULK PIPE PENETRATION OF APPARATUS BAY WALL.
- PROVIDE PLASTER FRAME FOR ALL DIFFUSER AND GRILLES LOCATED IN HARD GYMNASIUM CEILINGS.
- EXISTING GAS PIPING RUN IN APPARATUS BAY FOR THE GAS FIRED UNIT HEATERS GUH TO REMAIN. PROTECT THIS GAS PIPING THROUGH-OUT CONSTRUCTION.



### SECTION



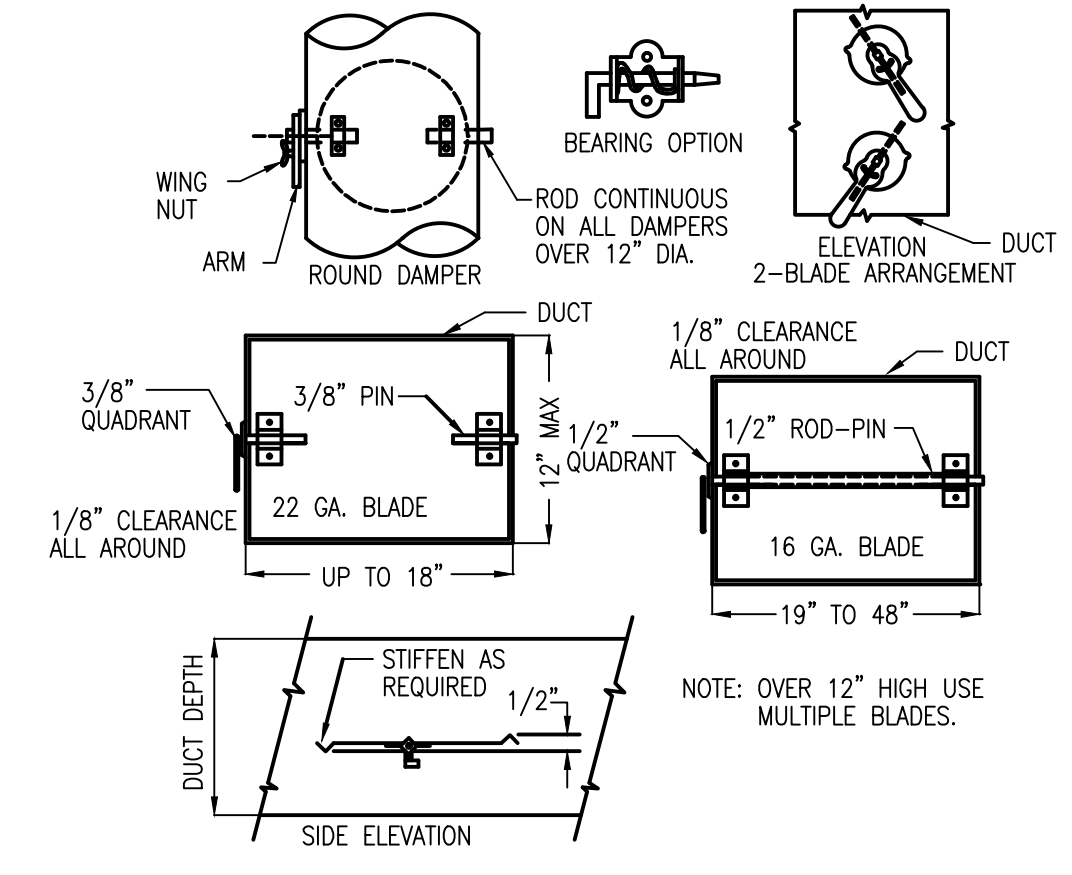
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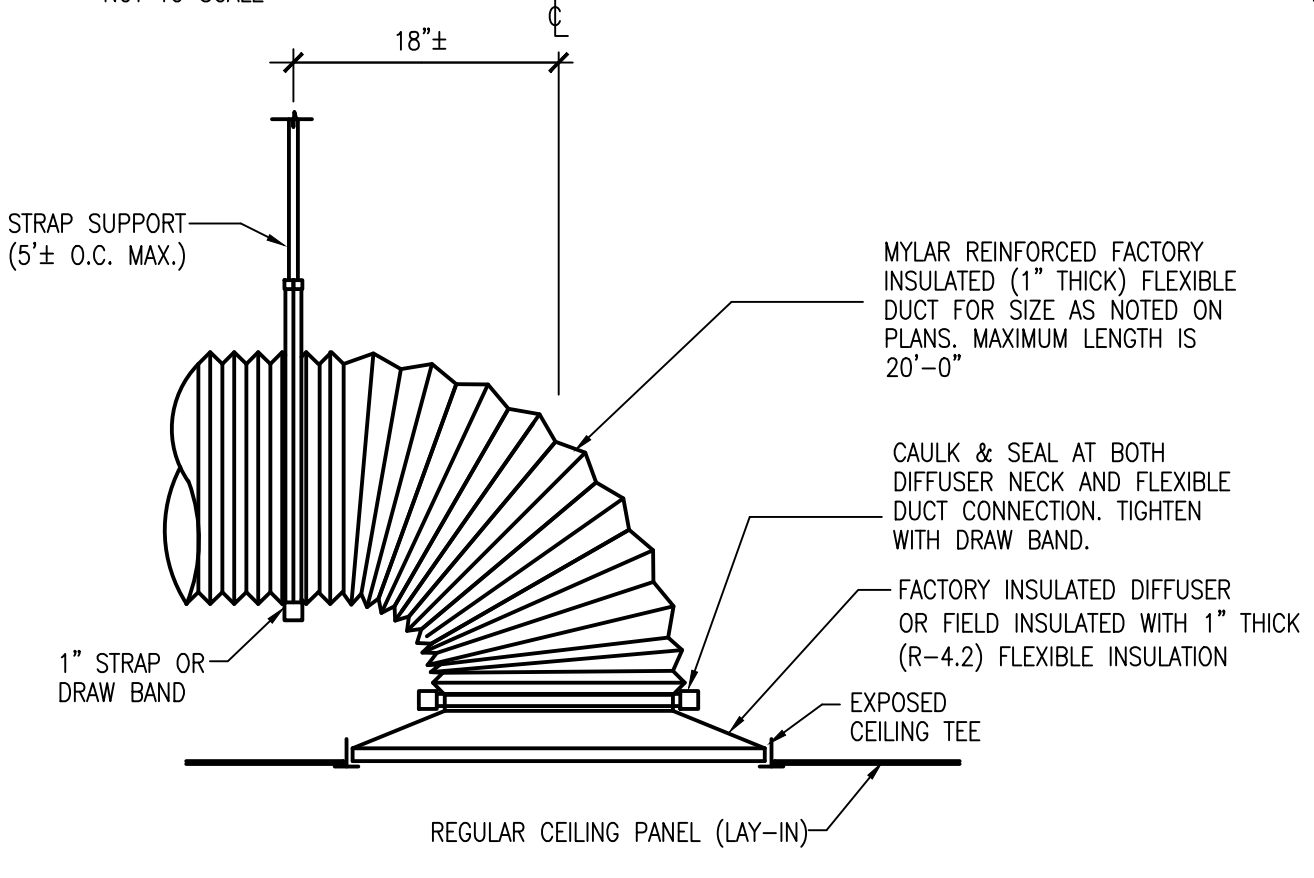




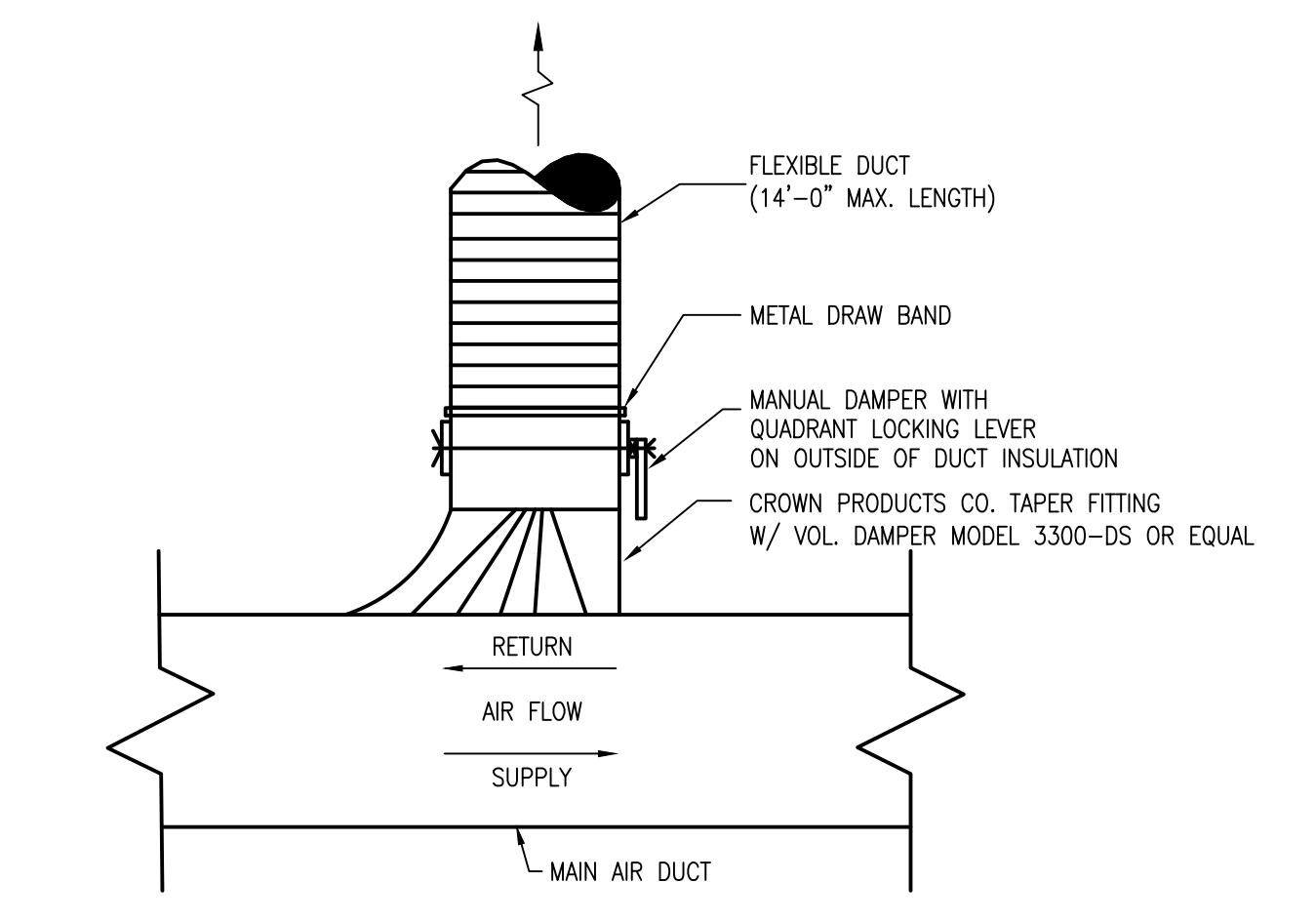
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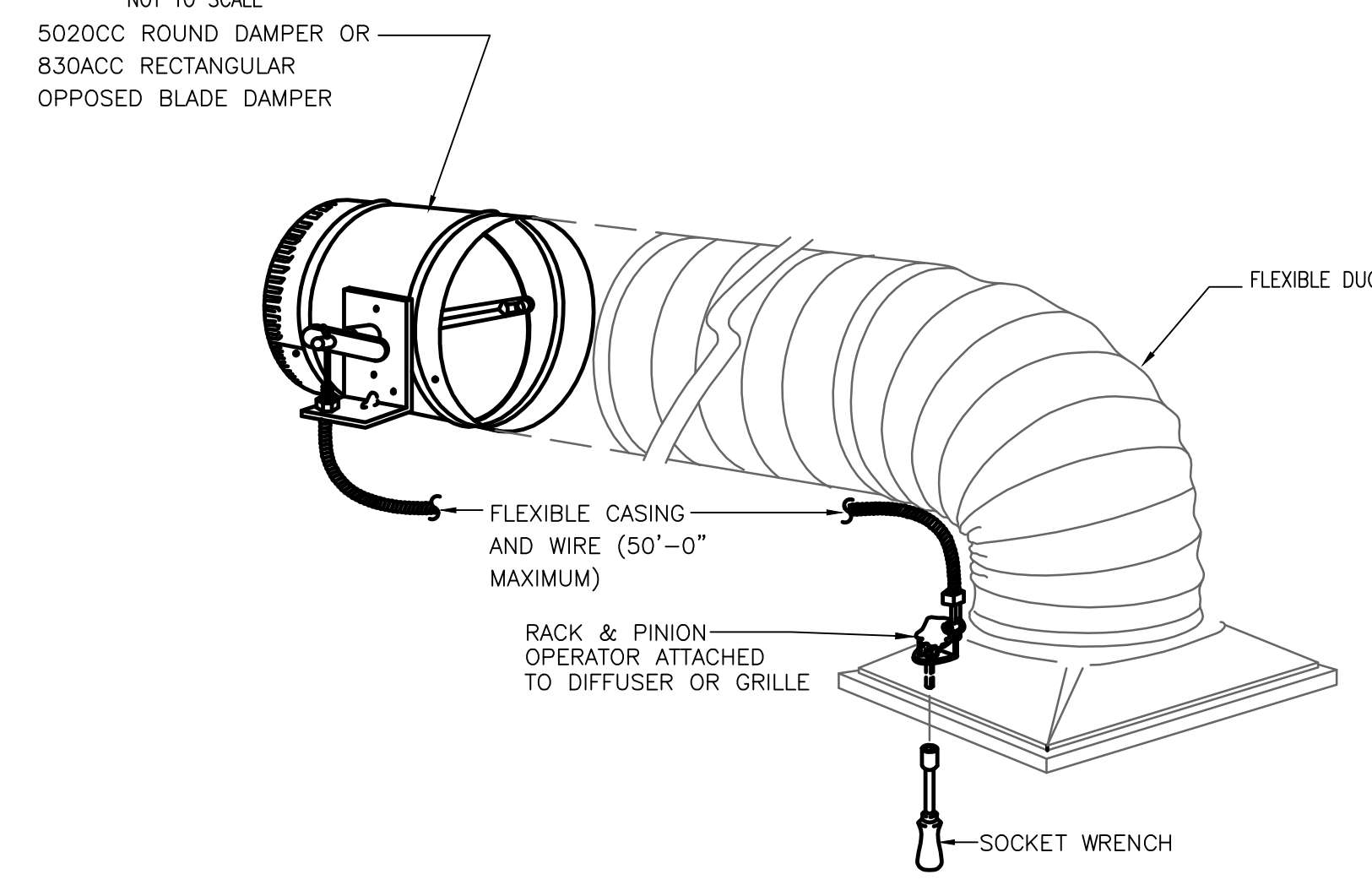
**VOLUME DAMPERS-SINGLE BLADE TYPE**  
NOT TO SCALE



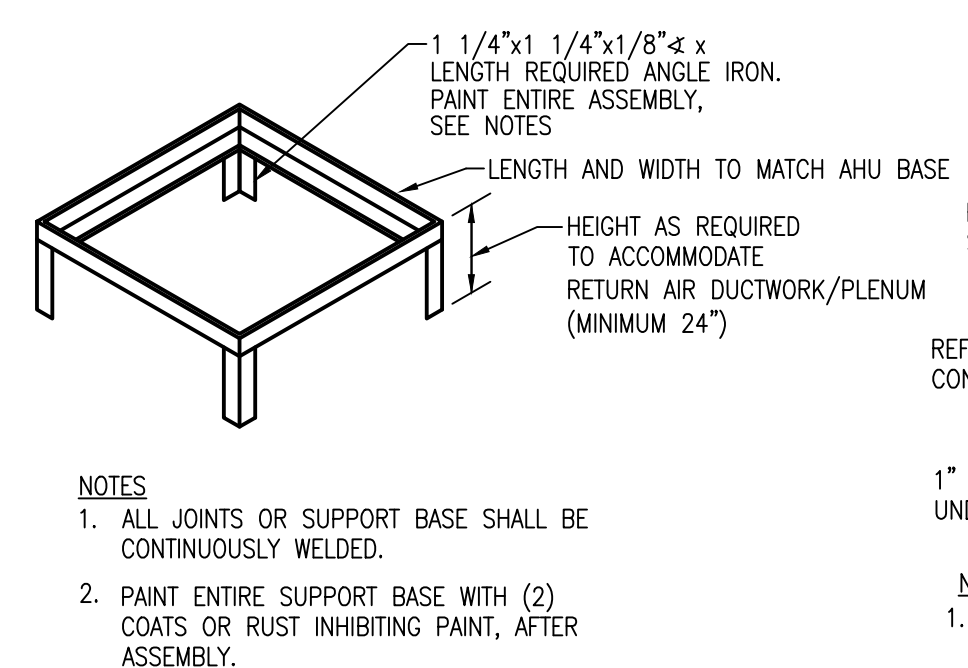
**DIFFUSER CONNECTION DETAIL**  
NOT TO SCALE



**TYPICAL FLEXIBLE DUCT CONNECTION DETAIL - SUPPLY & RETURN**  
NOT TO SCALE

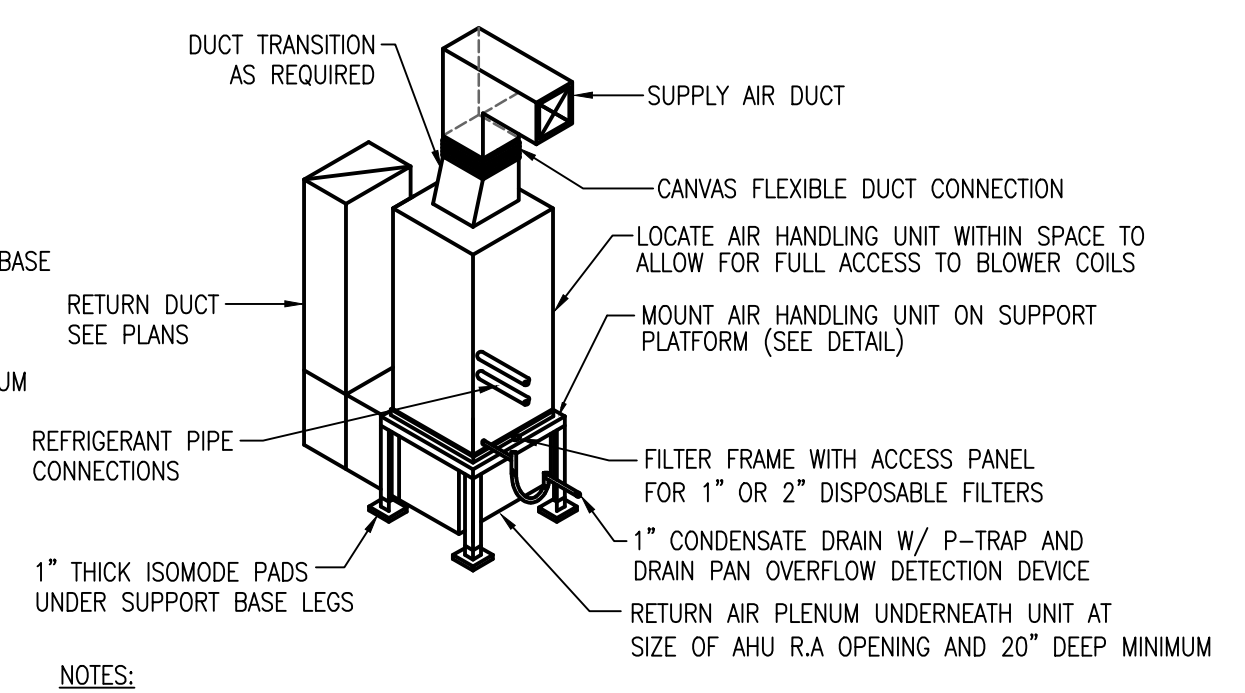


**REMOTE VOLUME DAMPER DETAIL**  
NOT TO SCALE



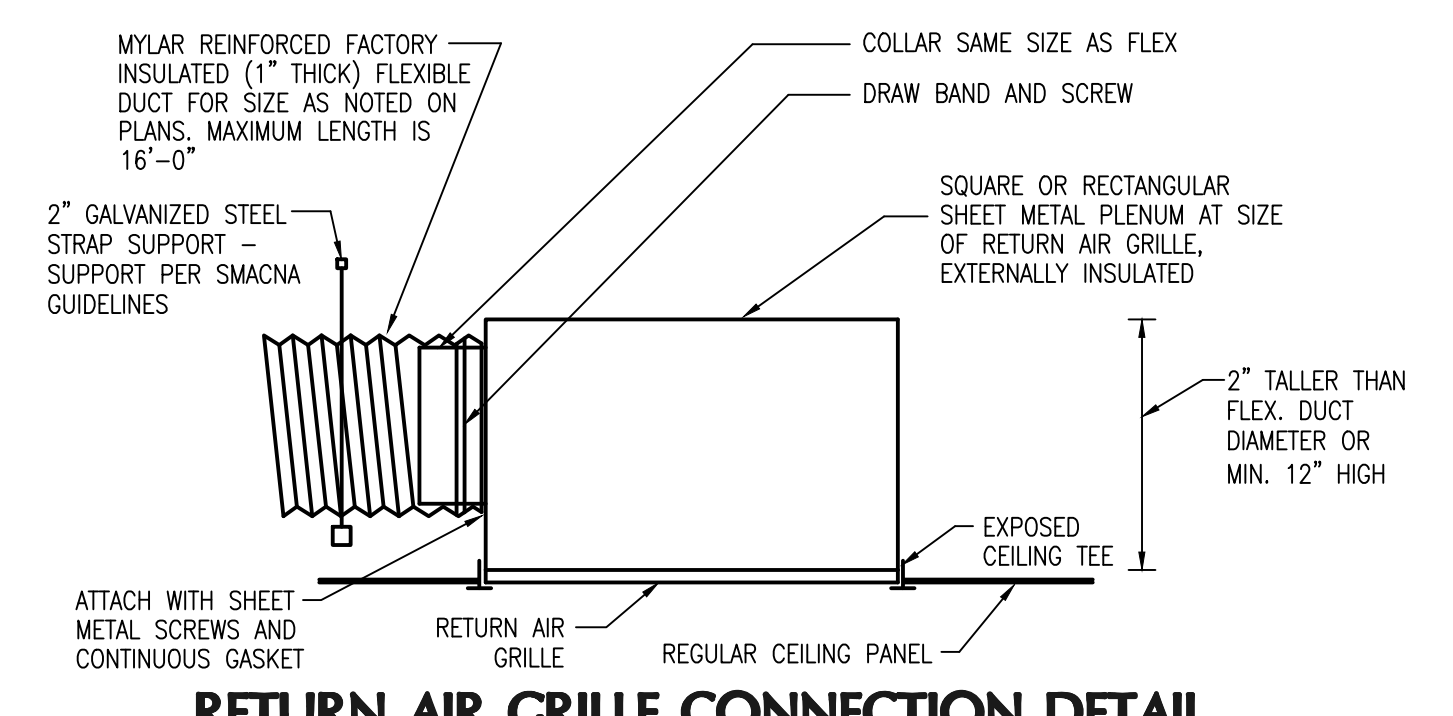
- NOTES:
1. ALL JOINTS OR SUPPORT BASE SHALL BE CONTINUOUSLY WELDED.
  2. PAINT ENTIRE SUPPORT BASE WITH (2) COATS OF RUST INHIBITING PAINT, AFTER ASSEMBLY.

**A.H.U. SUPPORT BASE**  
NOT TO SCALE

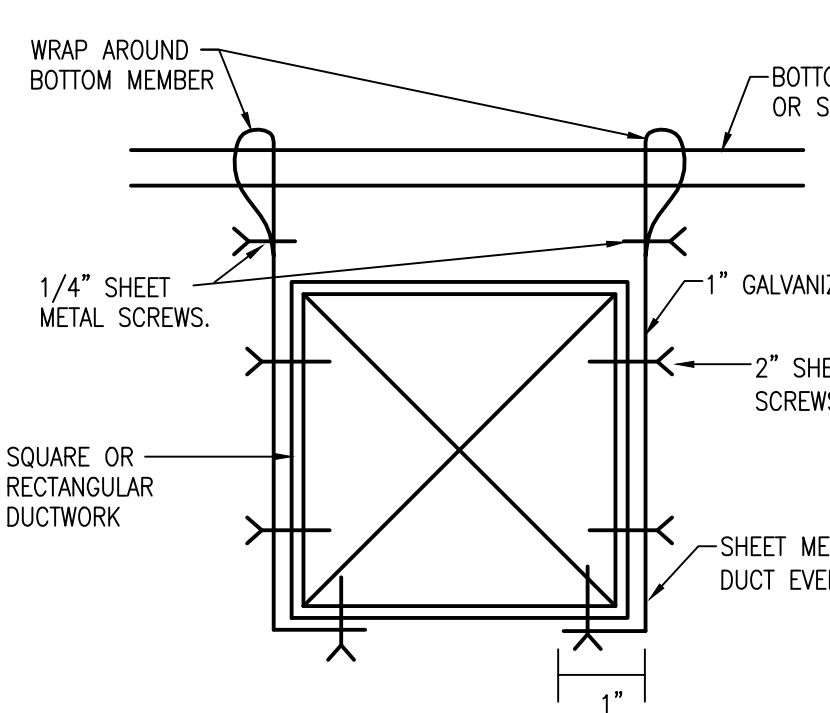


- NOTES:
1. SEE MANUFACTURERS RESIDENTIAL PIPING AND LONG LINE GUIDELINE FOR SIZING REFRIGERANT PIPING. FOR LONG LINE APPLICATIONS, TOTAL LENGTH OF PIPE RUN EXCEEDING 80, PROVIDE MANUFACTURERS RECOMMEND REFRIGERANT ACCESSORIES AND THE LONG LINE RUN MAY CAUSE UP TO A 4 PERCENT CAPACITY REDUCTION DEPENDING ON THE LIQUID AND SUCTION LINE SIZES.
  2. PROVIDE MINIMUM OF 3 FEET SIDE ACCESS CLEARANCE TO ACCESS AHU BLOWER FAN, ELECTRIC HEATER AND REFRIGERANT COOLING COIL.

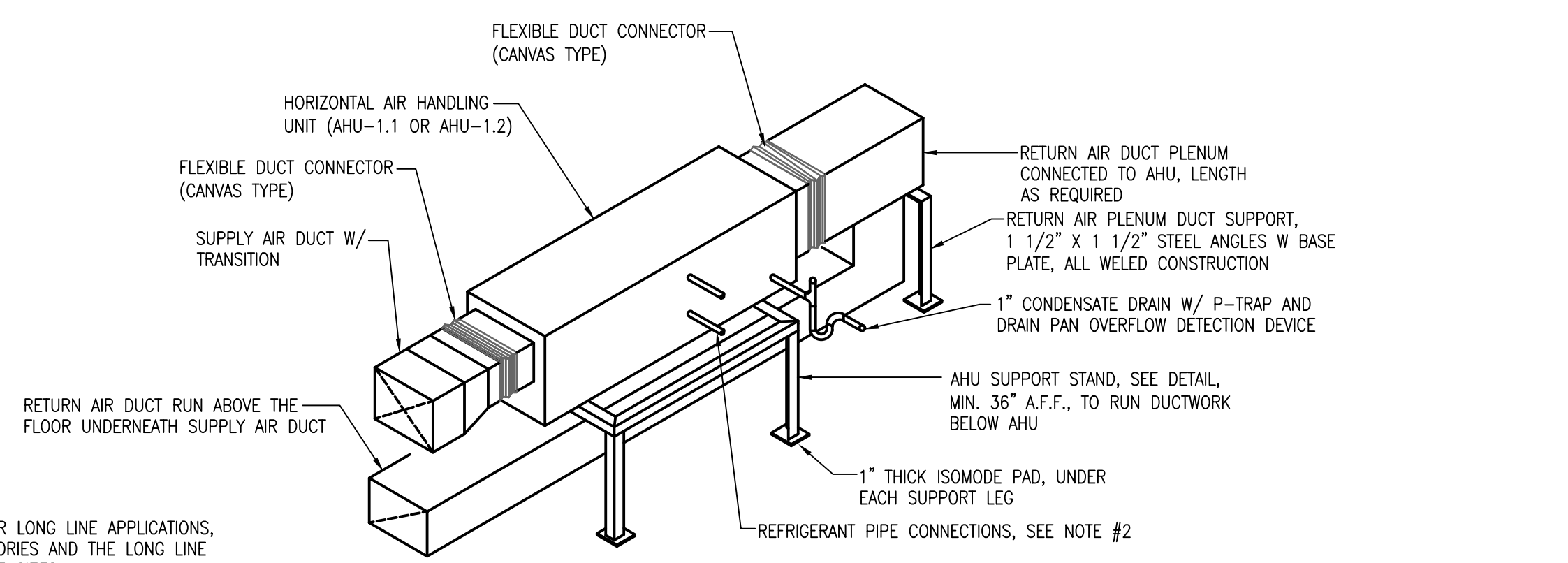
**VERTICAL AIR HANDLING UNIT MOUNTING DETAIL**  
NOT TO SCALE



**RETURN AIR GRILLE CONNECTION DETAIL**  
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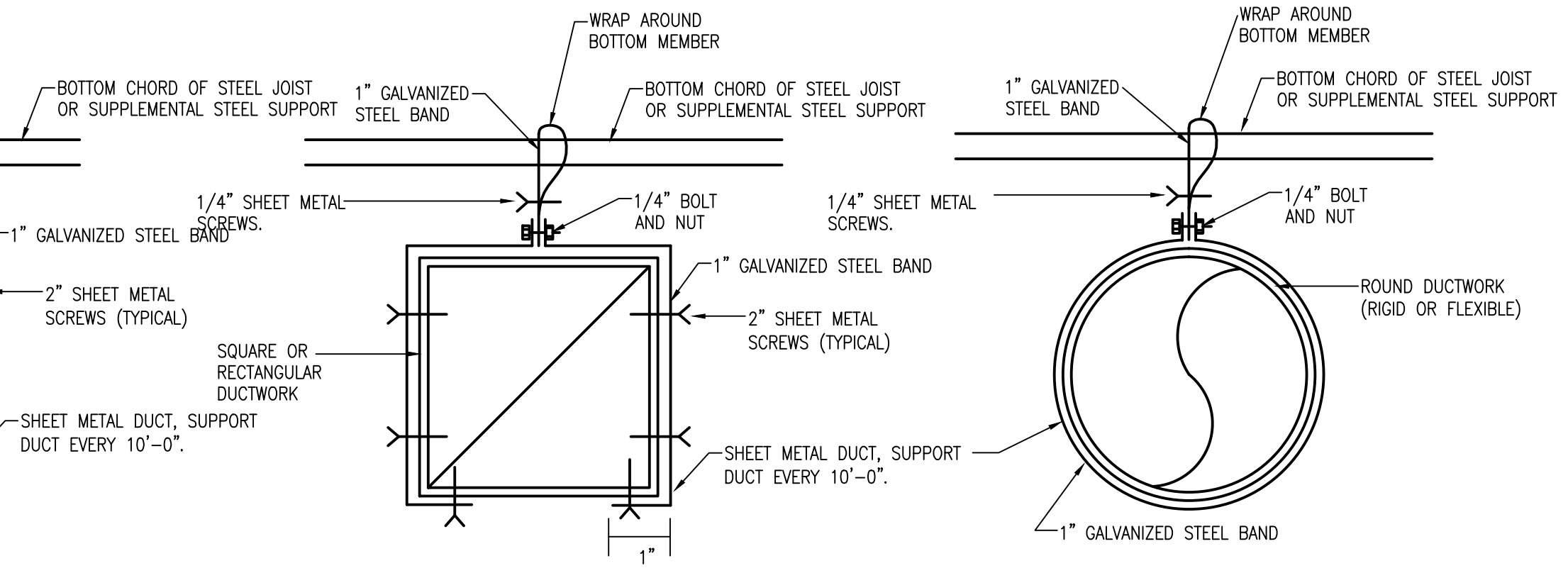


**SHEET METAL DUCT HANGING DETAIL**  
NOT TO SCALE



- NOTES:
1. RETURN AIR DUCTWORK FOR AHU-1.1 SHALL RUN BESIDE THE AHU AT SIMILAR HEIGHT AS SUPPLY AIR DUCT.
  2. SEE MANUFACTURERS RESIDENTIAL PIPING AND LONG LINE GUIDELINE FOR SIZING REFRIGERANT PIPING. FOR LONG LINE APPLICATIONS, TOTAL LENGTH OF PIPE RUN EXCEEDING 80, PROVIDE MANUFACTURERS RECOMMEND REFRIGERANT ACCESSORIES AND THE LONG LINE RUN MAY CAUSE UP TO A 4 PERCENT CAPACITY REDUCTION DEPENDING ON THE LIQUID AND SUCTION LINE SIZES.
  3. PROVIDE MINIMUM OF 3 FEET SIDE ACCESS CLEARANCE TO ACCESS AHU BLOWER FAN, ELECTRIC HEATER AND REFRIGERANT COOLING COIL.

**HORIZONTAL AIR HANDLING UNIT DETAIL**  
NOT TO SCALE



**DUCTWORK FLOOR SUPPORT DETAIL**  
NOT TO SCALE

- NOTES:
1. 1 1/2" x 1 1/2" STEEL ANGLES WITH 4"x4" STEEL BASE PLATE. ALL WELDED CONSTRUCTION CAN BE USED IN PLACE OR INDICATED DUCT SUPPORT.
  2. PROVIDE DUCT SUPPORT EVERY 10 FEET FOR DUCTWORK RUN ALONG MEZZANINE FLOOR. DUCTS RUN ALONG MEZZANINE FLOOR CAN BE SUPPORTED FROM STRUCTURE ABOVE.

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**ORANGE COUNTY FIRE STATION 54 HVAC REPLACEMENT**

Revisions

No.	Date	Description

Key Plan  
MPE PROJ#: 2013-173  
Designed By: RR  
Drawn By: RR  
Checked By: ABJR  
Issue Date: 06/17/14  
Drawing Scale: NO SCALE  
Drawing Title:

**DETAILS HVAC**  
BID DOCUMENTS  
Drawing No. **M-4.1**

**AUGUSTO E. BOBES JR. P.E.**  
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 MATERN PROFESSIONAL ENGINEERING

# ORANGE COUNTY FIRE STATION 54 HVAC REPLACEMENT

Revisions

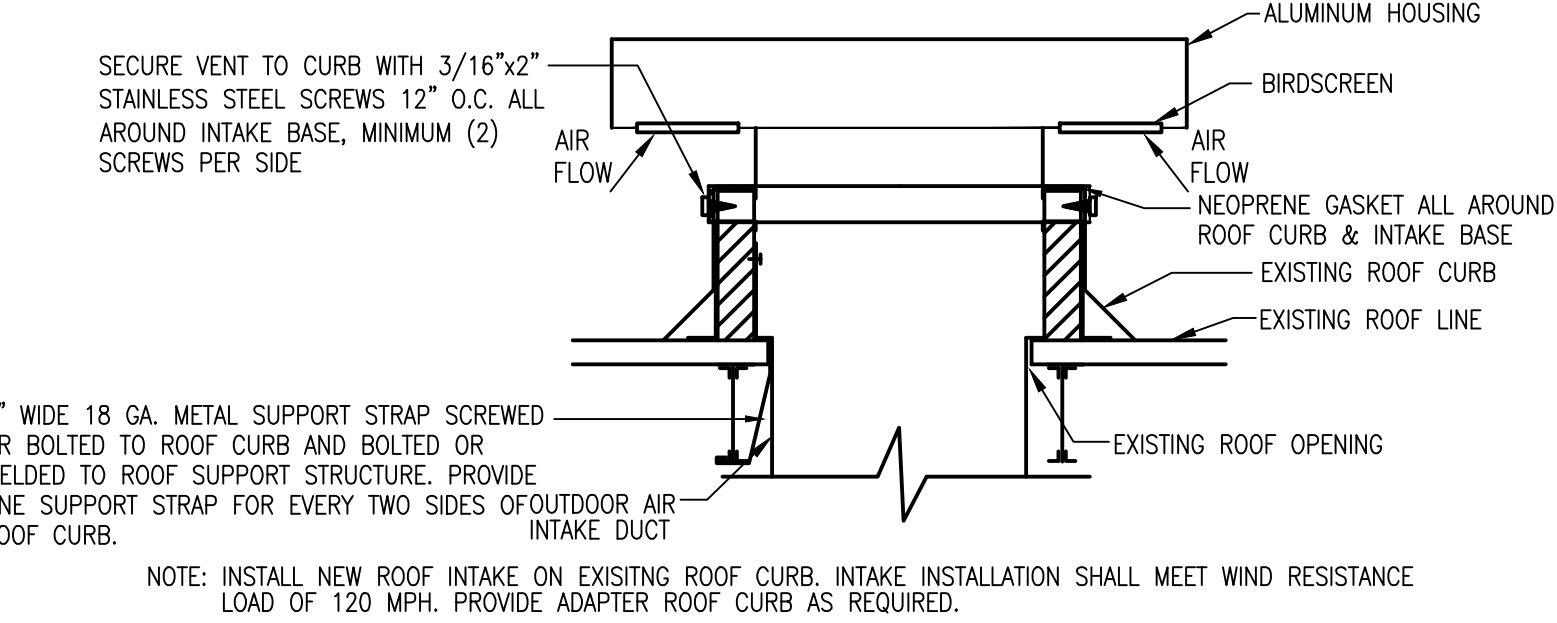
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Key Plan

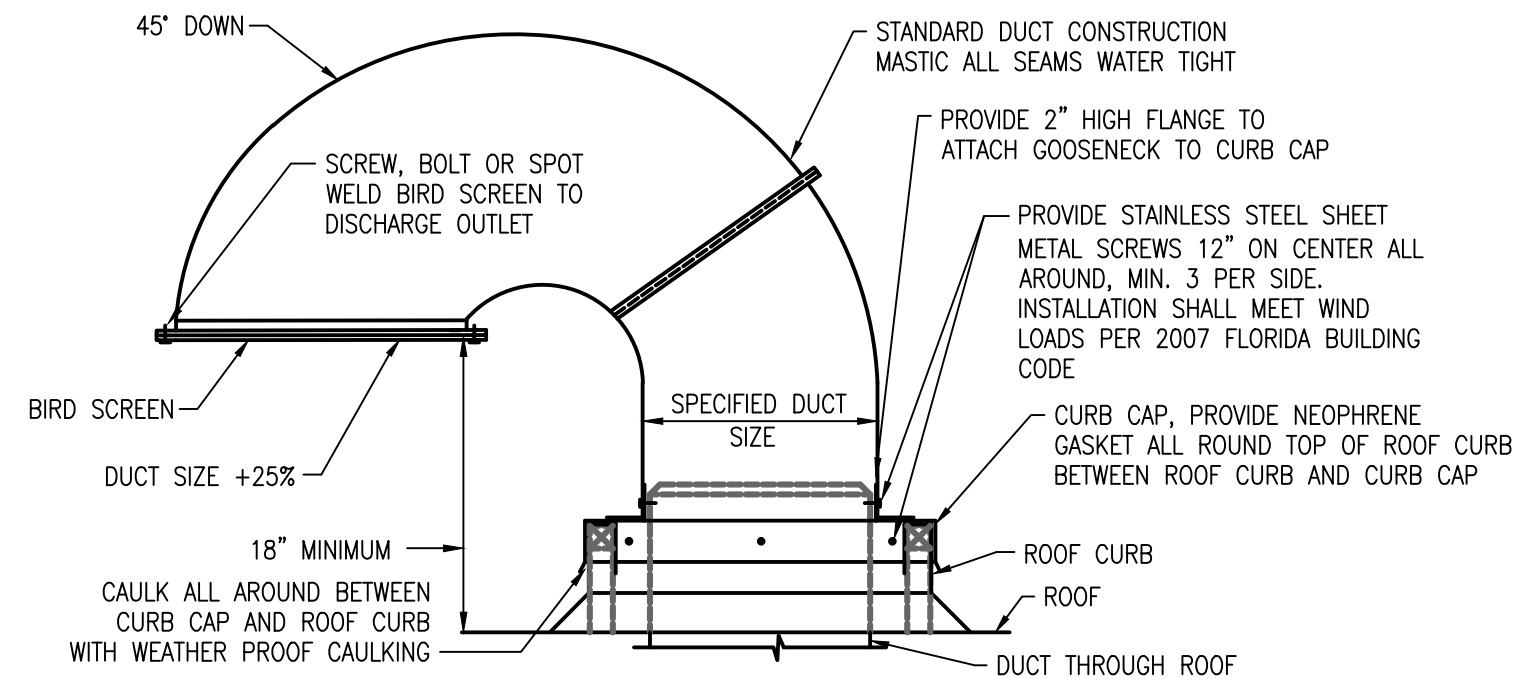
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 Checked By: ABJR  
 Issue Date: 06/17/14  
 Drawing Scale: NO SCALE  
 Drawing Title:  
**DETAILS II HVAC**  
 BID DOCUMENTS  
 Drawing No.  
**M-4.2**

**AUGUSTO E. BOBES JR. P.E.**  
**FLORIDA P.E. # 39410**

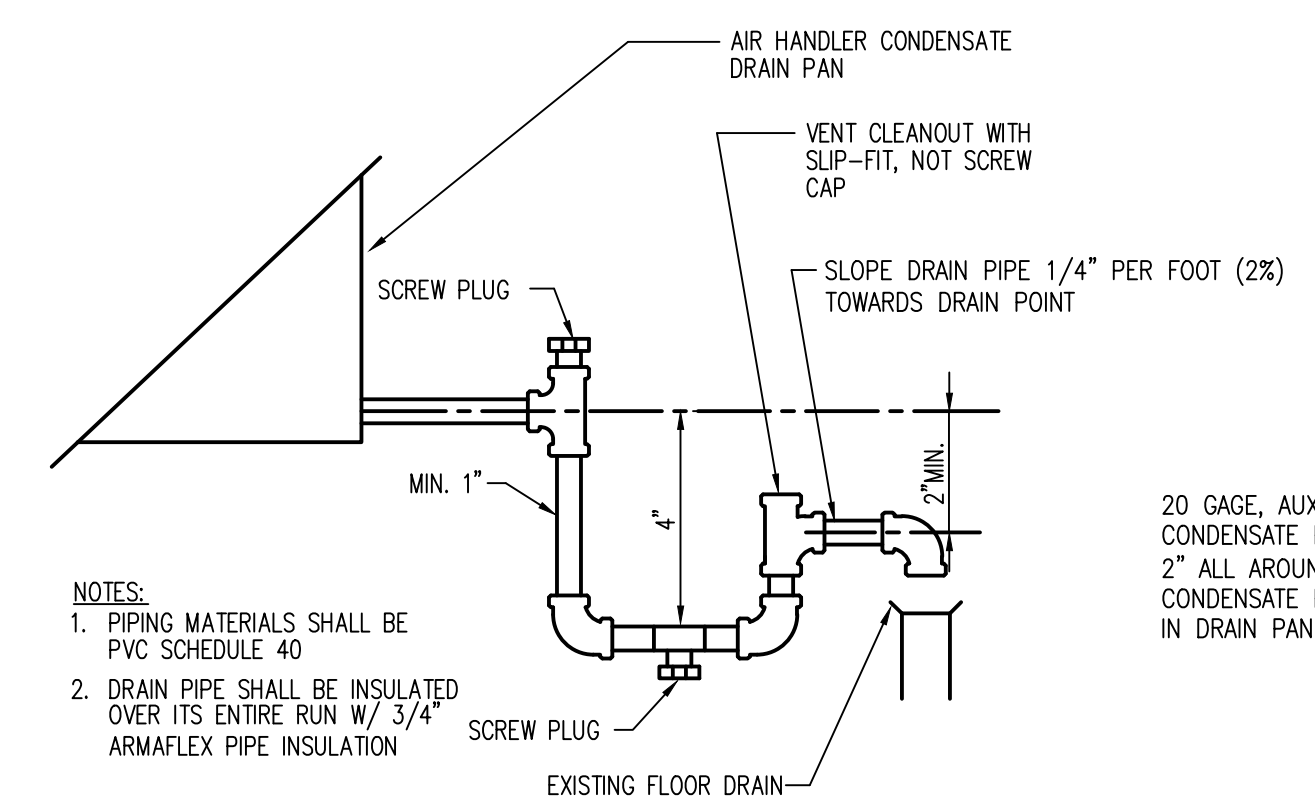
**BOBES ASSOCIATES CONSULTING ENGINEERS**  
 150 CIRCLE DRIVE, MAITLAND, FL 32751  
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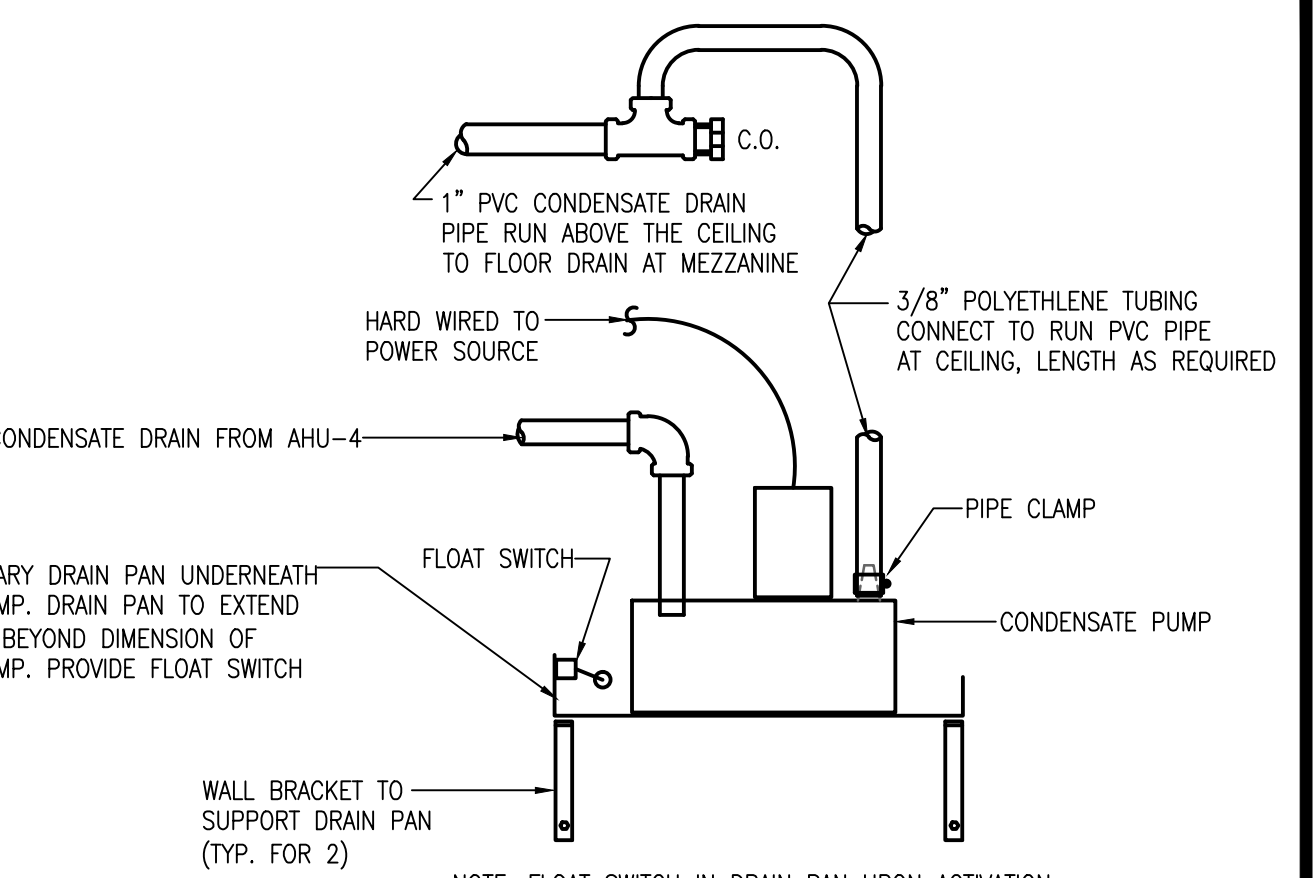
**ROOF MOUNTED INTAKE VENT DETAIL**  
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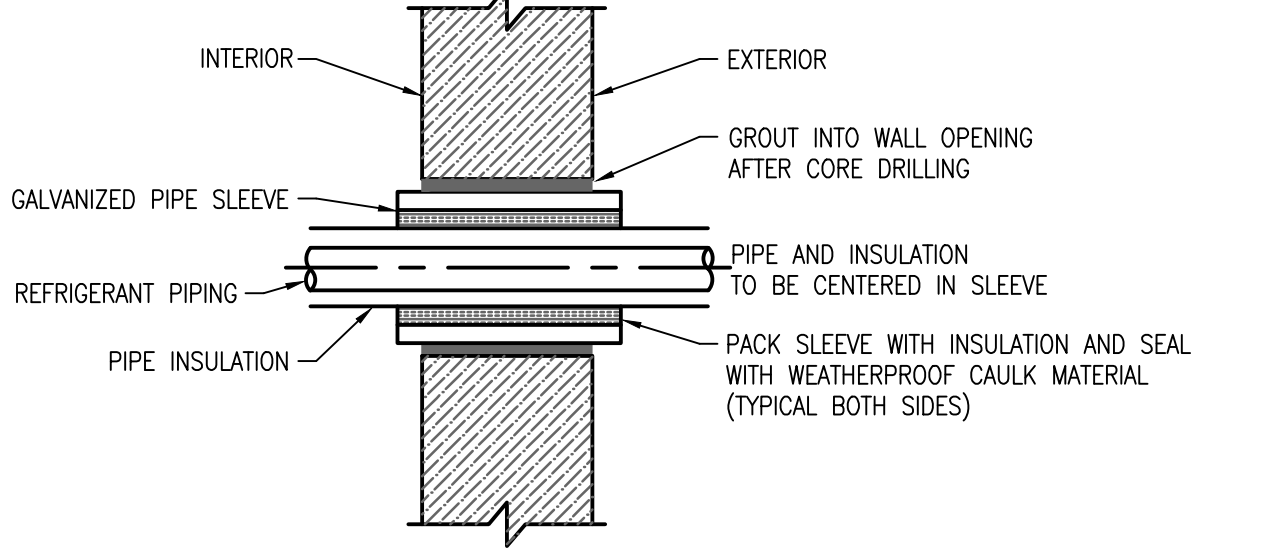
**GOOSENECK DETAIL**  
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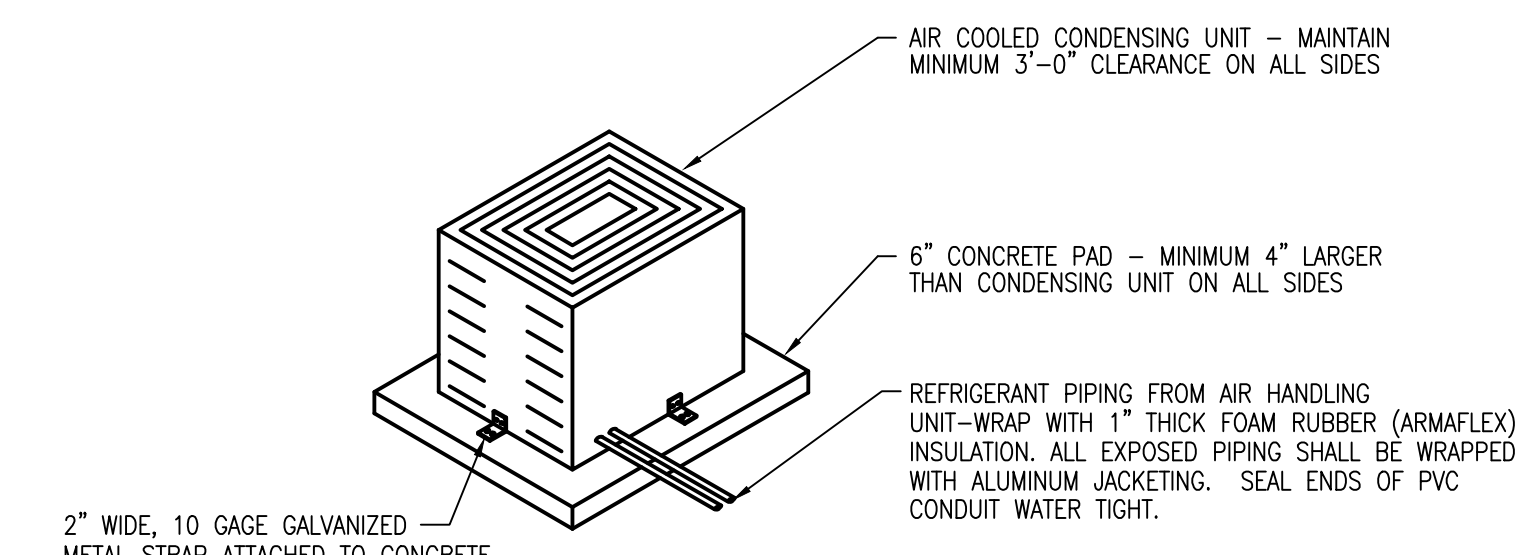
**AIR HANDLING UNIT CONDENSATE TRAP DETAIL**  
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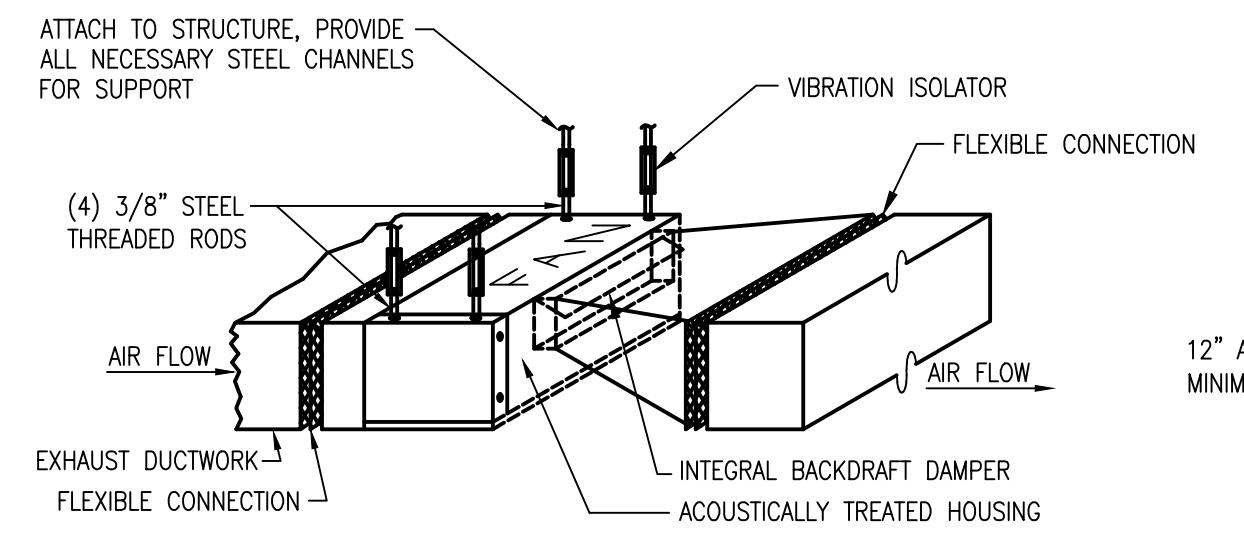
**CONDENSATE PUMP DETAIL**  
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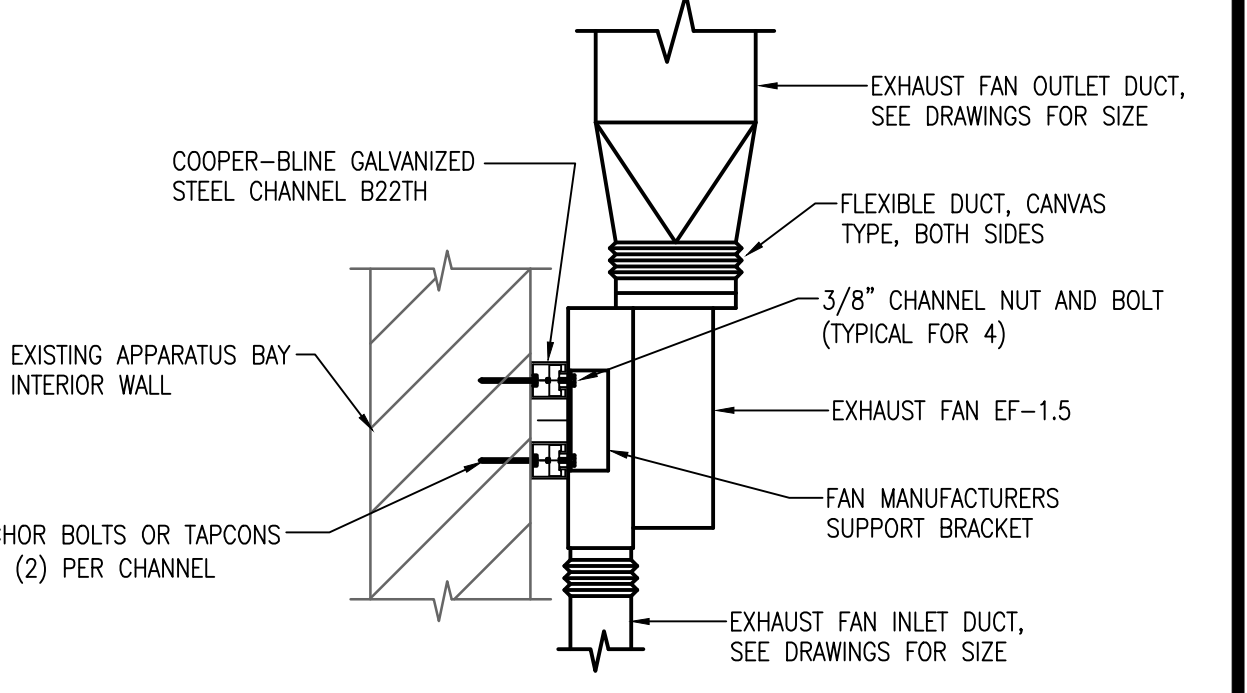
**REFRIGERANT PIPING EXTERIOR WALL PENETRATION DETAIL**  
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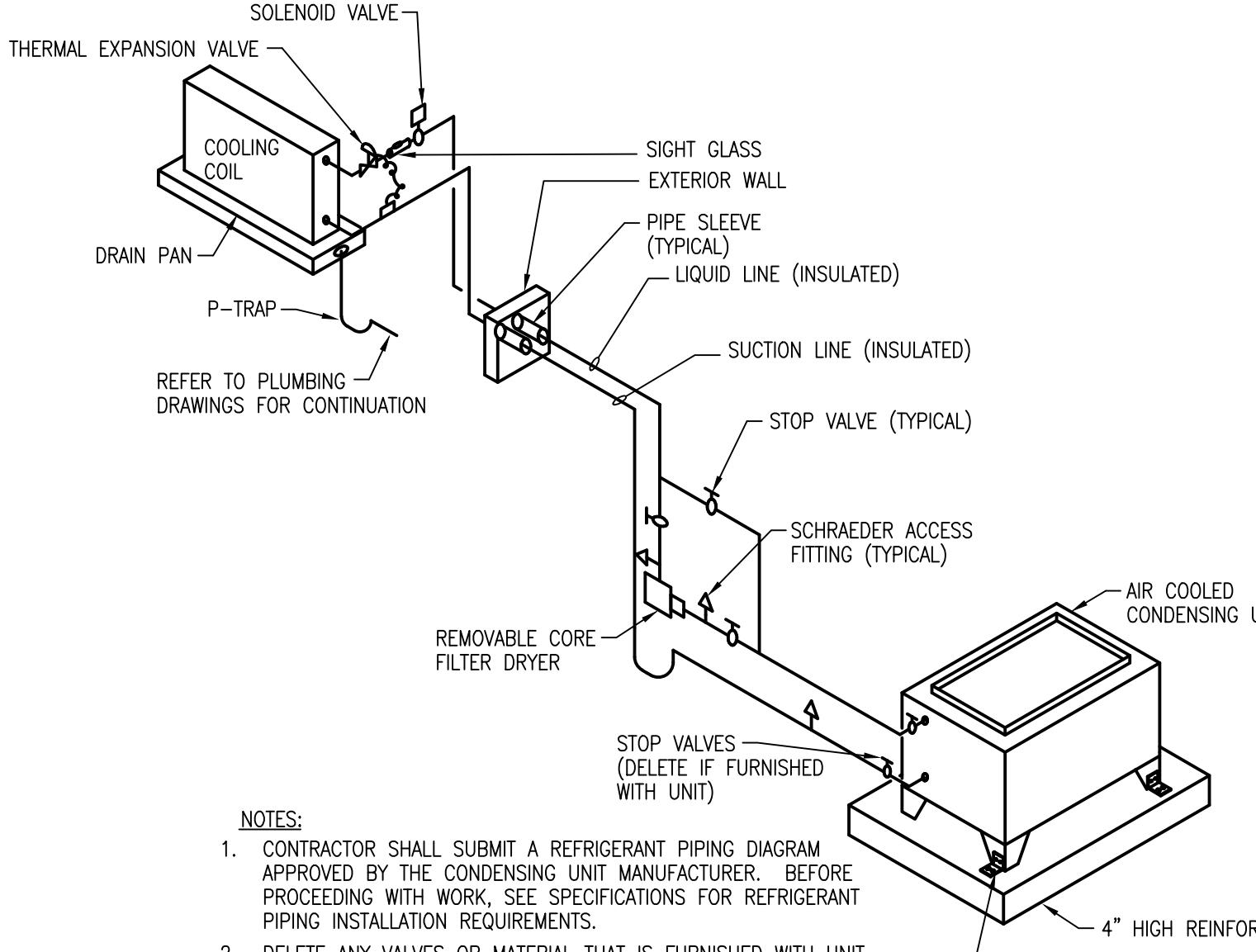
**PAD MOUNTED CONDENSING UNIT/HEAT PUMP UNIT DETAIL**  
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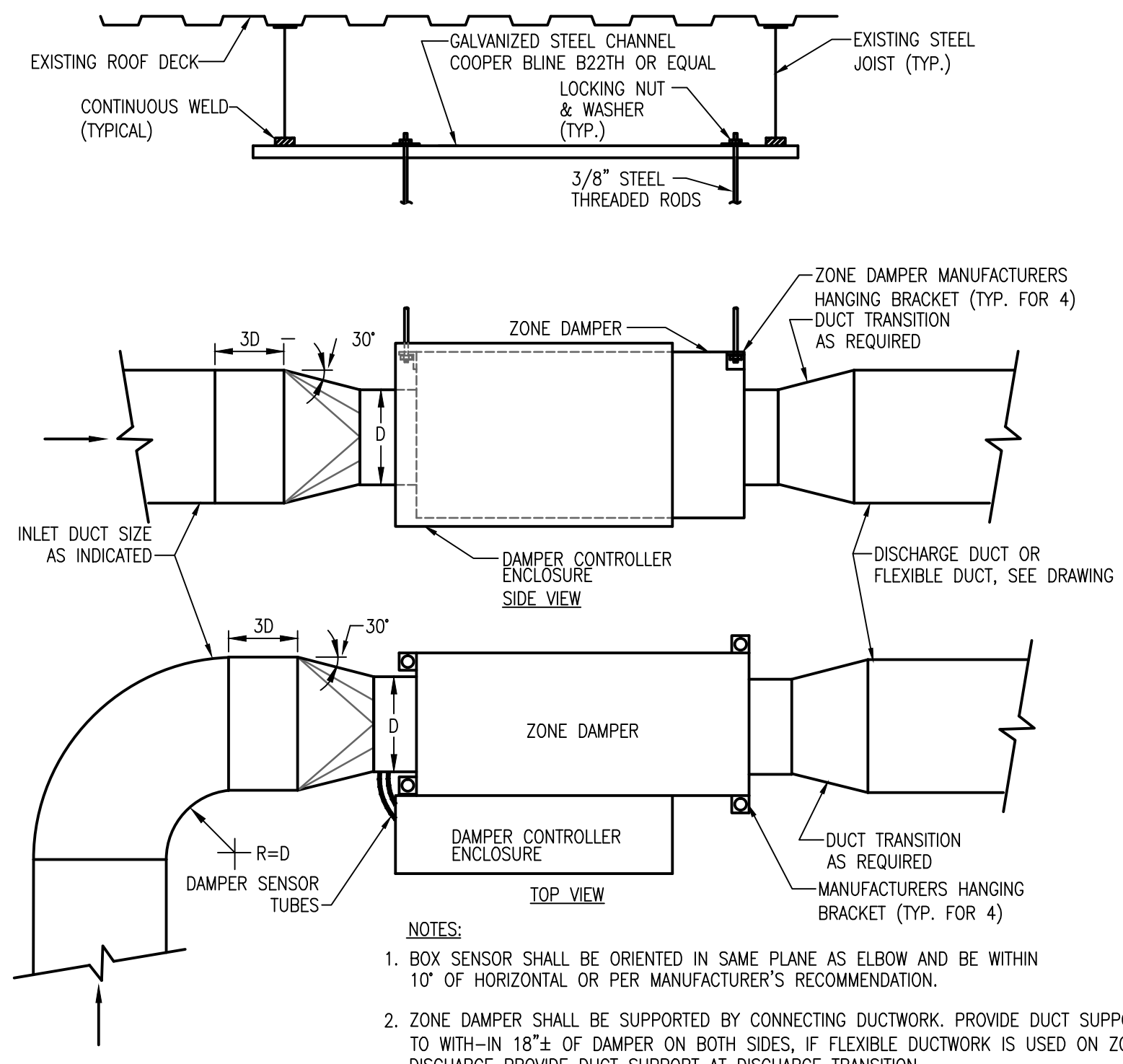
**INLINE EXHAUST FAN DETAIL**  
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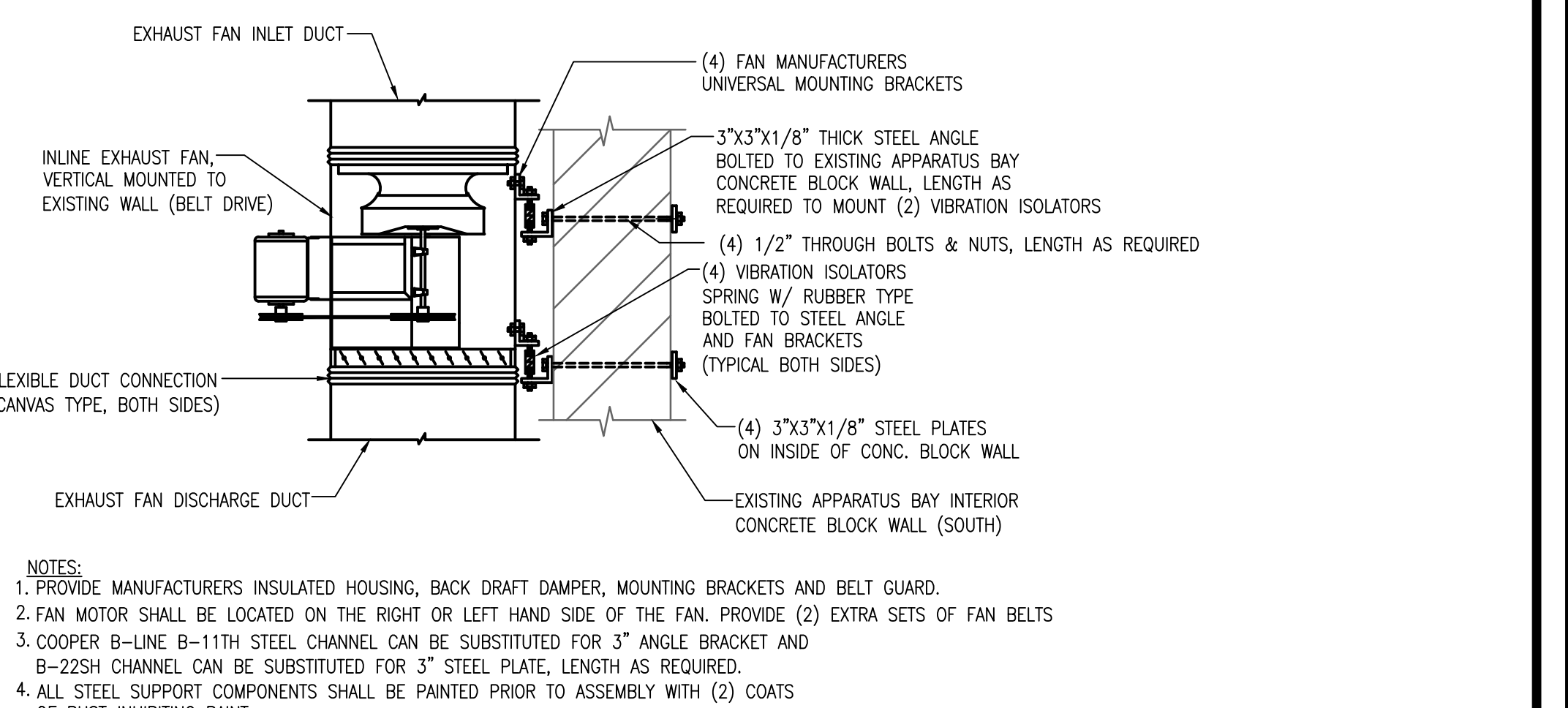
**WALL MOUNTED EXHAUST FAN DETAIL**  
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**REFRIGERANT PIPING DETAIL**  
NOT TO SCALE



**ZONE DAMPER CONNECTIONS (HARD DUCTED) DETAIL**  
NOT TO SCALE



**APPARATUS BAY INLINE FAN HANGING DETAIL**  
NOT TO SCALE

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 MATERN PROFESSIONAL ENGINEERING

**ORANGE COUNTY FIRE STATION 54 HVAC REPLACEMENT**

LOAD DESCRIPTION	WATTS PER PHASE			BKR	POLE	CKT	POLE	BKR	WATTS PER PHASE			LOAD DESCRIPTION	
	PH A	PH B	PH C						PH A	PH B	PH C		
PANEL "LPA" (EXISTING)	13800			150	3	1	2	3	150	12533		PANEL "LPB" (EXISTING)	
		13800				5	6			12533			
SURGE PROTECTOR (EXISTING)	X	X		30	3	7	8	3	40	2639		LIFT STATION (EXISTING)	
			X			9	10			2639			
						11	12			2639			
CASCADE SYSTEM (EXISTING)	3033			80	3	13	14	3	70	5000		TRANSFORMER T4 (EXISTING)	
		3033				15	16			5000			
						17	18			5000			
HP-1.3	3359			50	3	19	20	3	80	8601		AHU-1.3	
		3359				21	22			8601			
						23	24			8601			
HP-1.1	2995			50	2	25	26	2	60	3245		HP-1.2	
		2995				27	28			3245			
AHU-1.1	3839			35	3	29	30	3	35	3839		AHU-1.2	
		3839				31	32			3839			
						33	34			3839			
EF-1.1	1248			35	2	35	36	3	70	4990		CU-1.5	
		1248				37	38			4990			
EF-1.2	1248			35	2	39	40			4990			
		1248				41	42	1	15	309		EF-1.3	
PANELBOARD SUB-TOTALS	28274	28274	26527							40847	40847	37911	PANELBOARD SUB-TOTALS
PANELBOARD TOTALS:			202680W (563A)										

**SYMBOL LIST**

- 2X2 FLUORESCENT FIXTURE
- 2X4 FLUORESCENT FIXTURE
- RECESSED DOWNLIGHT
- DISCONNECT SWITCH, "F" INDICATES FUSED
- MANUAL MOTOR STARTER
- CONNECTION TO EQUIPMENT
- DISTRIBUTION PANEL
- CEILING MOUNTED SPEAKER
- CEILING MOUNTED SMOKE DETECTOR
- DUCT MOUNTED SMOKE DETECTOR
- MOTOR RATED DISCONNECT SWITCH
- FIRE ALARM SHUTDOWN RELAY
- CEILING MOUNTED FIRE ALARM DEVICE
- CEILING FAN

**GENERAL NOTES**

- PROVIDE PROPER NUMBER OF WIRES IN EACH CONDUIT AS REQUIRED BY INDICATED CIRCUITRY AND SWITCHING.
- ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT (ADA) AND 2008 NATIONAL ELECTRICAL CODE (NEC).
- COORDINATE ALL WORK DONE UNDER THIS DIVISION WITH WORK TO BE PERFORMED UNDER DIVISION 15.
- COORDINATE WITH OTHER TRADES FOR EXACT LOCATIONS OF ALL MOTORS AND OTHER EQUIPMENT TO BE INSTALLED AND/OR WIRED UNDER THIS DIVISION BUT FURNISHED UNDER ANOTHER DIVISION.
- TYPE AC CABLE AND ELECTRICAL NON-METALLIC TUBING SHALL NOT BE PERMITTED. TYPE MC CABLE IS PERMITTED AS LONG AS IT IS ACCEPTABLE TO THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ).
- ALL CONDUITS ABOVE SLAB, WHETHER EXPOSED OR CONCEALED, SHALL BE EMT, IMC, OR RIGID GALVANIZED STEEL.
- ALL BOXES, PLASTER RINGS, EXTENSION RINGS AND BOX COVERS SHALL BE METAL.
- ALL CONDUITS SHALL BE PARALLEL AND PERPENDICULAR TO STRUCTURAL MEMBERS.
- ALL BENDS SHALL BE MADE IN CONDUIT USING PROPER EQUIPMENT AND MEET NATIONAL ELECTRICAL CODE (NEC) REQUIREMENTS.
- ALL WIRE, INCLUDING BUT NOT LIMITED TO FEEDERS AND BRANCH CIRCUIT WIRING, SHALL BE COPPER - #12 AWG THIN MINIMUM.
- ALL DEVICES SHALL BE COMMERCIAL OR SPECIFICATION GRADE.
- ALL ELECTRICAL EQUIPMENT SHALL BE UL LISTED.
- A GREEN INSULATED COPPER GROUND CONDUCTOR SHALL BE INSTALLED IN ALL RACEWAYS, SIZED PER REQUIREMENTS OF N.E.C..
- GROUNDING SYSTEM SHALL BE IN ACCORDANCE WITH NEC ARTICLE 250 AND APPLICABLE REQUIREMENTS OF IEEE STANDARDS 142 AND 241.
- CONDUCTORS ARE SIZED FOR VOLTAGE DROP PER N.E.C. ARTICLE 210.19(A)(1) FPN No. 4 AND F.B.C. 505.7.3.1&2. ELECTRICAL CONTRACTOR SHALL PERFORM VOLTAGE DROP CALCULATIONS IN ACCORDANCE WITH N.E.C. ARTICLE 210.19 (A)(1) FPN No. 4 AND F.B.C. 505.7.3.1&2 ON ANY CIRCUITS THAT ARE INSTALLED THAT DIFFER FROM THE DESIGN SHOWN IN THESE PLANS. FEEDER CONDUCTORS SHALL BE SIZED FOR A MAXIMUM VOLTAGE DROP OF 2% AND BRANCH CIRCUIT CONDUCTORS 3% AT DESIGN LOAD.
- LIGHT FIXTURES SUPPORTED BY CEILING GRID SHALL BE SUPPORTED AS PER FIELD TECHNICAL INFORMATION NO.40. LIGHT FIXTURES WEIGHING LESS THAN 10 POUNDS SHALL HAVE ONE 12 GAGE HANGER WIRE CONNECTED FROM THE FIXTURE TO THE STRUCTURE ABOVE. LIGHT FIXTURES WEIGHING MORE THAN 10 POUNDS SHALL HAVE TWO 12 GAGE WIRES ATTACHED AT OPPOSING CORNERS OF EACH LIGHT FIXTURE.

**EXISTING CONDITIONS NOTES**

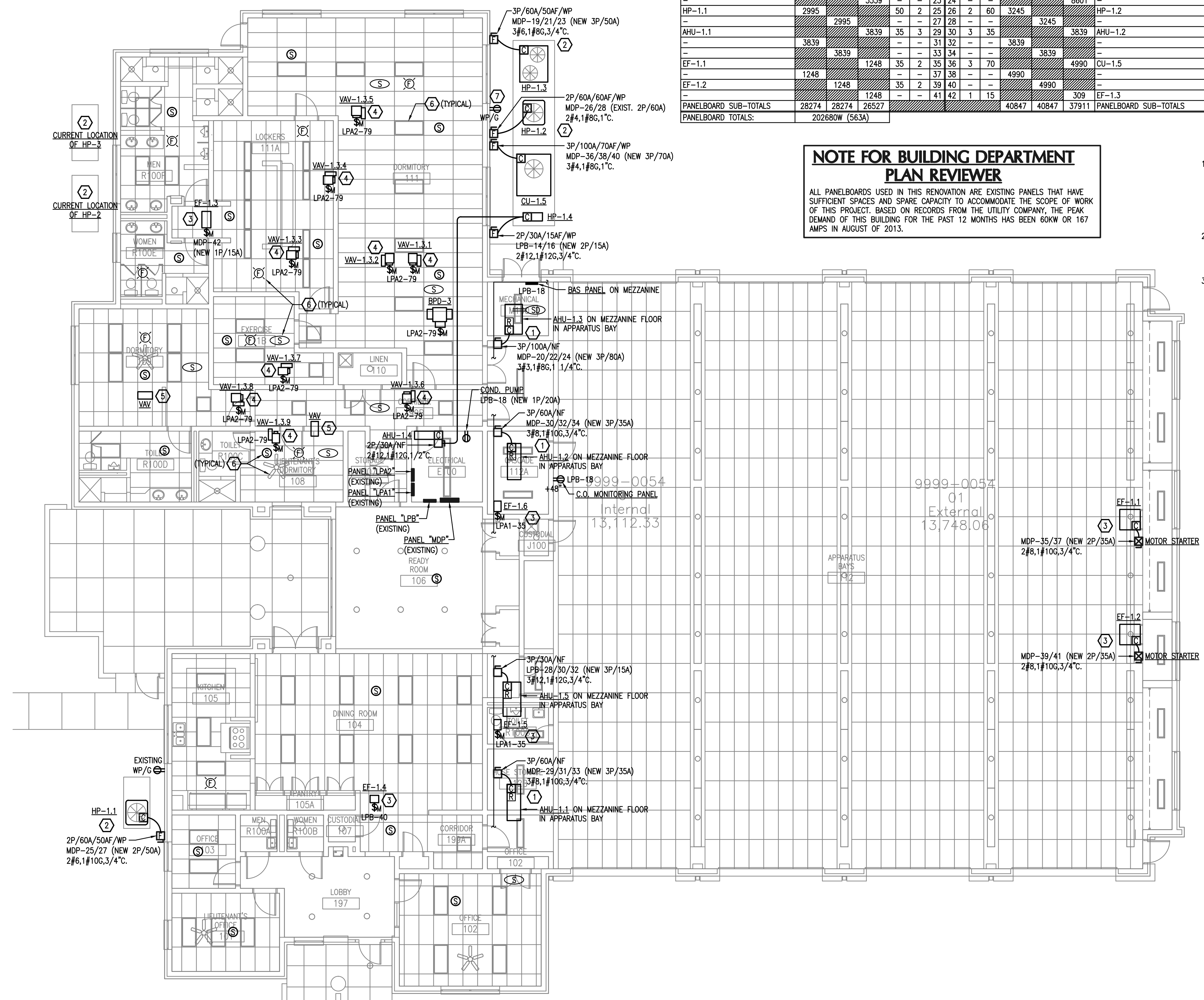
- THIS DRAWING HAS BEEN PREPARED FROM FIELD INVESTIGATIONS AND BUILDING RECORD DRAWINGS. CONTRACTOR SHALL VISIT THE BUILDING AND TAKE SUCH OTHER STEPS AS MAY BE REASONABLY NECESSARY TO ASCERTAIN THE NATURE AND LOCATION OF WORK, AND THE GENERAL AND LOCAL CONDITIONS WHICH CAN AFFECT THE WORK OR THE COST THEREOF.
- EVERY EFFORT HAS BEEN MADE TO DETAIL EACH CONDITION. THE DRAWING MAY NOT DETAIL EVERY CONDITION OR LOCATION ENCOUNTERED. MANY CONDITIONS ARE TYPICAL OR SIMILAR TO THE DRAWING SHOWN.
- CONFLICTS AND / OR PROBLEMS SHALL BE REPORTED PRIOR TO BIDDING FOR RESOLUTION. FAILURE TO REPORT THESE CONFLICTS PLACES THE RESPONSIBILITY ON THE CONTRACTOR TO COMPLETE THE WORK IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS AT NO ADDITIONAL COST TO THE OWNER.

**NOTE FOR BUILDING DEPARTMENT PLAN REVIEWER**

ALL PANELBOARDS USED IN THIS RENOVATION ARE EXISTING PANELS THAT HAVE SUFFICIENT SPACES AND SPARE CAPACITY TO ACCOMMODATE THE SCOPE OF WORK OF THIS PROJECT. BASED ON RECORDS FROM THE UTILITY COMPANY, THE PEAK DEMAND OF THIS BUILDING FOR THE PAST 12 MONTHS HAS BEEN 60KW OR 167 AMPS IN AUGUST OF 2013.

**DEMOLITION AND RENOVATION KEY NOTES**

- AIR HANDLING UNIT IS TO BE REPLACED. DISCONNECT POWER FROM EXISTING AHU AND REMOVE DISCONNECT SWITCH, CONDUIT, WIRING AND ASSOCIATED EQUIPMENT (CONDUIT MAY BE REUSED IF CORRECT SIZE AND IN GOOD CONDITION). PROVIDE POWER FOR NEW AHU AS SHOWN ON PLAN AND PER INFORMATION ON NAMEPLATE OF NEW AHU. MAKE ALL CONNECTIONS TO AHU ACCORDING TO MANUFACTURER'S INSTRUCTIONS. PANEL AND CIRCUIT NUMBER WERE OBTAINED FROM FIELD INVESTIGATION AND MUST BE VERIFIED FOR ACCURACY BY CONTRACTOR AND ADJUSTED FOR ACTUAL FIELD CONDITION IF NECESSARY. PROVIDE NEW TYPED PANEL DIRECTORY INDICATING ALL LOADS.
- HEAT PUMP UNIT IS TO BE REPLACED. DISCONNECT POWER FROM EXISTING HEAT PUMP AND REMOVE DISCONNECT SWITCH, CONDUIT, WIRING AND ASSOCIATED EQUIPMENT (CONDUIT MAY BE REUSED IF CORRECT SIZE AND IN GOOD CONDITION). PROVIDE POWER FOR NEW HEAT PUMP AS SHOWN ON PLAN AND PER INFORMATION ON NAMEPLATE OF UNIT. MAKE ALL CONNECTIONS TO HEAT PUMP ACCORDING TO MANUFACTURER'S INSTRUCTIONS. PANEL AND CIRCUIT NUMBER WERE OBTAINED FROM FIELD INVESTIGATION AND MUST BE VERIFIED FOR ACCURACY BY CONTRACTOR AND ADJUSTED FOR ACTUAL FIELD CONDITION IF NECESSARY. PROVIDE NEW TYPED PANEL DIRECTORY INDICATING ALL LOADS.
- EXHAUST FAN IS TO BE REPLACED. DISCONNECT POWER FROM EXISTING FAN AND REMOVE DISCONNECT SWITCH, CONDUIT, WIRING AND ASSOCIATED EQUIPMENT (CONDUIT MAY BE REUSED IF CORRECT SIZE AND IN GOOD CONDITION). PROVIDE POWER FOR NEW EXHAUST FAN AS SHOWN ON PLAN AND PER INFORMATION ON NAMEPLATE OF FAN AND INSTALL NEW FEEDER TO A NEW DISCONNECT SWITCH TO BE INSTALLED NEAR EXHAUST FAN. MAKE ALL CONNECTIONS TO EXHAUST FAN ACCORDING TO MANUFACTURER'S INSTRUCTIONS. PANEL AND CIRCUIT NUMBER WERE OBTAINED FROM FIELD INVESTIGATION AND MUST BE VERIFIED FOR ACCURACY BY CONTRACTOR AND ADJUSTED FOR ACTUAL FIELD CONDITION IF NECESSARY. PROVIDE NEW TYPED PANEL DIRECTORY INDICATING ALL LOADS.
- INSTALL A 1P, 20A CIRCUIT BREAKER AT SPACE INDICATED AND PROVIDE 120V TO NEW VAV BOXES FOR CONTROL POWER. UPDATE PANEL DIRECTORY WITH A LEGIBLE DESCRIPTION OF NEW LOAD.
- DISCONNECT AND REMOVE ANY POWER FROM EXISTING VAV BOXES TO BE DELETED.
- CONTRACTOR SHALL REMOVE AND REINSTALL ANY LIGHTING FIXTURES, SPEAKERS, FIRE ALARM DEVICES, CEILING FANS, ETC. THAT MAY INTERFERE WITH THE INSTALLATION OF NEW MECHANICAL EQUIPMENT AND DUCT WORK. COORDINATE WITH MECHANICAL CONTRACTOR. CONTRACTOR SHALL REPLACE ANY EQUIPMENT DAMAGED DURING CONSTRUCTION.
- INSTALL A WEATHERPROOF GFCI RECEPTACLE FOR HVAC EQUIPMENT MAINTENANCE AND CONNECT TO NEAREST RECEPTACLE CIRCUIT IN THE BUILDING.



**FLOOR PLAN - ELECTRICAL**  
 SCALE: 1/8"=1'-0"

**AUGUSTO E. BOBES JR., P.E.**  
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 FLORIDA STATE P.E. NUMBER: 5131

Revisions

No.	Date	Description

Key Plan  
 MPE PROJ#: 2013-173  
 Designed By: WMC  
 Drawn By: WMC  
 Checked By: ABJr  
 Issue Date: 06/17/14  
 Drawing Scale: 1/8" = 1'-0"  
 Drawing Title:

**FLOOR PLAN ELECTRICAL**

BID DOCUMENTS  
 Drawing No. **E-1.1**