

# Orange County Barnett Park Air Handling Units Replacement

## PERMIT DOCUMENTATION

September 29, 2016

## Orange County Government

### Capital Projects Division

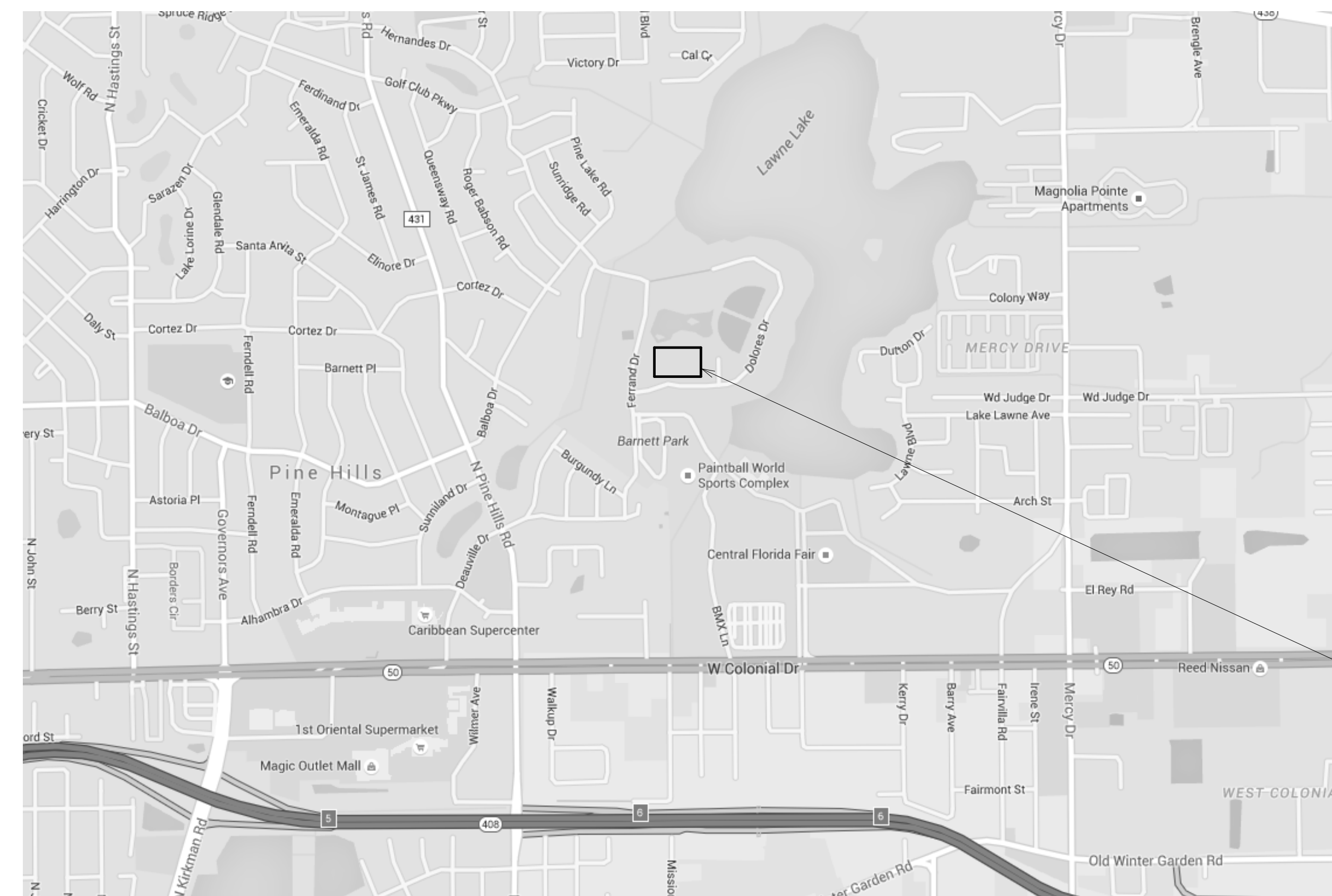
400 East South Street, Suite 500  
Orlando, FL 32801

### GENERAL SCOPE OF WORK

1. INSTALL A 500 CFM SINGLE DUCT VAV INTO THE MAIN SUPPLY OF AHU-1R IN MECHANICAL ROOM 112.
2. PERMANENT REPLACEMENT OF EXISTING AHU-1R WITH SIMILAR LIKE-KIND UNIT.
3. PERMANENT REPLACEMENT OF EXISTING AHU-2R WITH SIMILAR LIKE-KIND UNIT.
4. INSTALL AND CONNECT NEW VFDs TO AHU-1R/AHU-2R.
5. INSTALL CROSSOVER DUCTWORK CONNECTING TO MAIN SUPPLY DUCTWORK OF AHU-1R AND RUNNING THROUGH THE 2ND FLR AND INTO AHU-2R MAIN SUPPLY DUCT.
6. INSTALL TEMPORARY 4000CFM AIR HANDLING UNIT IN STORAGE ROOM 111.
7. THE NEW HVAC UNITS SHALL BE CONNECTED TO THE EXISTING MAIN BUILDING AUTOMATION SYSTEM.
8. ELECTRICAL - CONNECT NEW OR RECONNECT EXISTING CIRCUITS TO NEW HVAC EQUIPMENT.
9. FLUSH ALL CHILLED WATER PIPING SERVING BARNETT PARK AFTER AHU-1R/AHU-2R HAVE BEEN INSTALLED. BYPASS CHILLED WATER COILS IN AIR HANDLERS WITH TEMPORARY PIPING DURING THE FLUSHING OF THE CHILLED WATER PIPING. CLEAN ALL INTERNAL COMPONENTS OF CHILLER. EDDY CURRENT TESTING SHALL BE PERFORMED ON CHILLER, EVAPORATOR TUBES SHALL ALSO BE BRUSHED. PROVIDE WATER QUALITY ANALYSIS WITH TRANE ON CHILLED WATER SYSTEM ONCE NEW SYSTEMS HAVE BEEN BROUGHT ONLINE. A REPORT SHALL BE PROVIDED TO ORANGE COUNTY FACILITIES AFTER COMPLETION OF CHILLER FLUSHING.

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E001	ELECTRICAL GENERAL INFORMATION
E101	ELECTRICAL DEMOLITION PLANS
E102	ELECTRICAL NEW PLANS



KEY PLAN

PROJECT LOCATION

### BOARD OF COUNTY COMMISSIONERS

- COUNTY MAYOR - TERESA JACOBS
- DISTRICT 1 COMMISSIONER - S. SCOTT BOYD
- DISTRICT 2 COMMISSIONER - BRYAN NELSON
- DISTRICT 3 COMMISSIONER - PETE CLARKE
- DISTRICT 4 COMMISSIONER - JENNIFER THOMPSON
- DISTRICT 5 COMMISSIONER - TED B. EDWARDS
- DISTRICT 6 COMMISSIONER - VICTORIA P. SIPLIN

### PROJECT TEAM

electrical	mechanical
RTM Engineering 952 S Semoran Blvd Suite 100 Winter Park, FL 32792 ph. (407) 678-2055 fax (407) 678-2088 contact: Mitesh Smart	RTM Engineering 952 S Semoran Blvd Suite 100 Winter Park, FL 32792 ph. (407) 678-2055 fax (407) 678-2088 contact: Mitesh Smart

### PROFESSIONAL SEALS

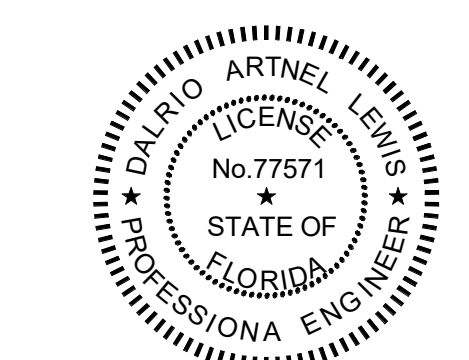
Maen Jauhary, P.E. P.E. Lic. No. 76232	Dalrio A Lewis, P.E. P.E. Lic. No. 77571

Client:



Consultants:

EOR Stamp:



09/29/2016

Dalrio A. Lewis, PE 77571 (FL)

Project:

Barnett Park AHU Replacement

Location:

4801 W Colonial Dr, Orlando, FL, 32808

Issuance:

PERMIT DOCUMENTS

Revisions:

#	Date	Description

Date:

09/29/2016

Project Number:  
16.OC.027

Drawn By:

SE

Checked By:

DL

MECHANICAL GENERAL INFORMATION

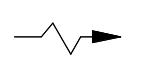
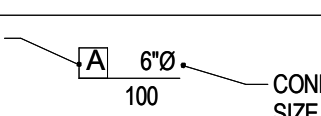






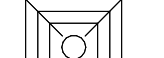
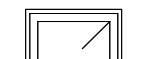


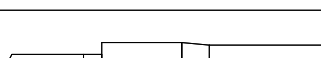

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M001


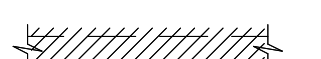
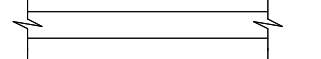
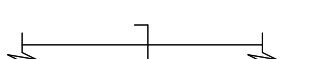


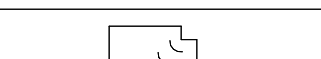
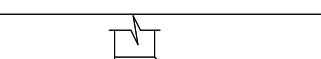

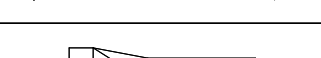
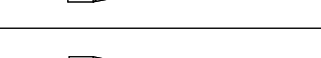
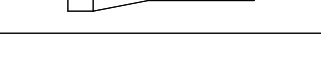
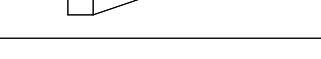

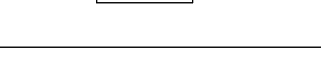
### MECHANICAL GENERAL NOTES

- 1 APPLICABLE CODES: FLORIDA BUILDING CODE FIFTH EDITION (2014) INCLUDING MECHANICAL, PLUMBING, FUEL GAS, NEC 2011, SMACNA, ASHRAE, NFPA
- 2 THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY FOR THE INSTALLATION OF A COMPLETE SYSTEM IN ACCORDANCE WITH THESE DRAWINGS. THE APPLICABLE BUILDING CODE AND ALL OTHER APPLICABLE STATE, COUNTY, AND LOCAL ORDINANCES AND THE LATEST EDITION OF THE FOLLOWING PUBLICATIONS, SMACNA, ASHRAE, NFPA 90A, 90B, 91, AND ANSI B-1 MECHANICAL REFRIGERATION.
- 3 THE CONTRACTOR SHALL VISIT THE SITE AND COORDINATE WITH ALL OTHER TRADES.
- 4 A TRAINING SHALL BE PROVIDED BY THE CONTRACTOR FOR ALL EQUIPMENT AND CONTROLS WITH NECESSARY TIME TO ENSURE THE OWNER HAS UNDERSTOOD SYSTEM. MINIMUM TRAINING HOURS SHALL BE SCHEDULED AT 4 HOURS. ALL COSTS AND TIME OF TRAINING SHALL BE INCLUDED IN THE BID.
- 5 ALL EQUIPMENT SHALL BE UL OR ETL LISTED.
- 6 DUCT SIZES SHOWN ARE INSIDE AIRFLOW DIMENSIONS. WHERE INTERNAL LINERS ARE USED, INSIDE DIAMETER OF DUCT SHALL COMPENSATE FOR INSULATION THICKNESS.
- 7 ALL SUPPLY AND RETURN BRANCH TAKE-OFFS TO BE PROVIDED WITH MANUAL VOLUME DAMPERS. ALL ELBOWS AND TEES MUST BE FURNISHED IN TURNING VANES. PROVIDE MANUAL VOLUME DAMPERS AND EXTRACTOR AT ALL FLEX TAKE OFFS.
- 8 PROVIDE NEW FILTERS FOR ALL AIR CONDITIONING EQUIPMENT BEFORE START-UP. REPLACE ALL FILTERS PRIOR TO FINAL ACCEPTANCE BY OWNER. SUBMIT A NOTICE TO THE OWNER OF HOW MANY FILTERS, SIZES AND LOCATIONS OF ALL FILTERS CHANGED.
- 9 THERMOSTAT LOCATION SHALL BE APPROVED BY THE OWNER AND ENGINEERS BEFORE INSTALLATION. INSTALL 48" A.F.F. PER A.D.A. REQUIREMENTS.
- 10 ALL INSULATION SHALL HAVE RATING LESS THAN 25 FLAME SPREAD AND 50 SMOKE DEVELOPMENT.
- 11 PROVIDE MINIMUM OF 3' CLEARANCE IN FRONT OF ALL 120-240 VOLT PANELS AND 4' CLEARANCE IN FRONT OF ANY 480 VOLT PANEL. PROVIDE ADEQUATE SIDE CLEARANCE PER NEC.
- 12 MECHANICAL PLANS IN GENERAL ARE DIAGRAMMATIC IN NATURE, AND ARE TO BE READ IN CONJUNCTION WITH ELECTRICAL PLANS AND SHALL BE CONSIDERED AS ONE SET OF DOCUMENTS. DUCT AND PIPING OFFSETS, BLENDS AND TRANSITIONS WILL BE REQUIRED TO PROVIDE AND INSTALL A COMPLETE FUNCTIONAL SYSTEM AND SHALL BE PROVIDED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
- 13 THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO BIDDING, ORDERING, FABRICATING OR INSTALLATION OF MATERIALS OR EQUIPMENT.
- 14 ROUTE ALL DUCTWORK, PIPING AND ACCESSORIES IN A MANNER TO AVOID BUILDING COMPONENTS STRUCTURE, AND LIGHTING. COORDINATE TRANSITIONS MADE TO MAXIMUM PRESSURE DROPS PER FAN AND PUMP MANUFACTURERS CURVES.
- 15 ALL DEBRIS SHALL BE PROPERLY DISPOSED OF OFF SITE. CLEAN UP SITE DAILY AFTER WORK IS COMPLETE. IF CLEAN UP PERFORMED BY OWNERS REPRESENTATIVE AS A RESULT OF SUBCONTRACTOR NOT PERFORMING CLEAN UP OPERATIONS, OWNER WILL HAVE THE RIGHT TO CHARGE SUBCONTRACTOR FOR CLEAN UP LABOR.
- 16 CONTRACTOR SHALL BE RESPONSIBLE FOR ALL NECESSARY SUPPORTING DEVICES FOR ALL ACCESSORIES INCLUDED WITHIN THIS CONTRACT.
- 17 THE CONTRACTOR SHALL SUPPLY THE ENGINEER WITH "AS-BUILT" DRAWINGS. IF FIELD CHANGES ARE MADE, CONTRACTOR NEEDING DRAWINGS CHANGES FOR INSPECTION SHALL SUBMIT CHANGES WITH SUFFICIENT TIME TO MAKE DRAWINGS CHANGES. THE CONTRACTOR WILL BE BILLED HOURLY FOR CADD CHANGES IF THE CHANGES WERE NOT PRE-APPROVED BY THE ENGINEER AND OWNER.
- 18 PROVIDE TYPE "B" STATIC FIRE DAMPERS WITH CURTAIN TOTALLY OUT OF AIR STREAM IN ALL DUCTS OR OPENINGS PENETRATING RATED WALLS AND FLOORS PER MECHANICAL PLANS. PROVIDE TYPE "A" STATIC FIRE DAMPERS WITH CURTAIN IN AIR STREAM FOR ALL FIRE DAMPERS USED IN CONJUNCTION WITH GRILLES/REGISTERS PENETRATING RATED WALLS AND FLOORS PER MECHANICAL PLANS.

### LEGEND

SYMBOL	DESCRIPTION
	INDICATES DIRECTION OF AIRFLOW
TYPE 	USE TO IDENTIFY SUPPLY, RETURN OR EXHAUST GRILLE VALUES AND TYPE
	TEMPERATURE SENSOR X-ZONE CONTROLLED
	HUMIDISTAT (DIGITAL)
	SMOKE DETECTOR
	OCCUPANCY SENSOR (DUAL TECHNOLOGY - IR/MOTION) CEILING MOUNTED
	GREENHECK STATIC FIRE DAMPER WITH ACCESS DOOR SEE ARCHITECTURAL LIFE SAFETY PLANS FOR FIRE RATED WALL LOCATIONS
	GREENHECK FIRE SMOKE DAMPER WITH ACCESS DOOR (W/ACTUATOR) SEE ARCHITECTURAL LIFE SAFETY PLANS FOR FIRE RATED WALL LOCATIONS
	CEILING SUPPLY DIFFUSER
	RETURN GRILLE OR DUCT DOWNUP
	EXHAUST GRILLE OR DUCT DOWNUP
	SIDEWALL SUPPLY DIFFUSER
	TERMINAL UNIT VARIABLE/CONSTANT AIR VOLUME
	TERMINAL UNIT VARIABLE/CONSTANT AIR VOLUME WITH HOT WATER HEAT
THIS IS A GENERAL LIST OF SYMBOLS. ALL SYMBOLS MAY NOT BE USED ON A SPECIFIC PROJECT	

### DUCTWORK LEGEND

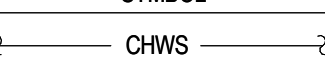
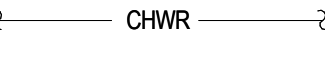



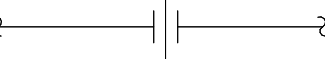
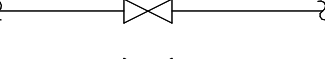
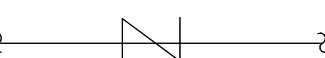
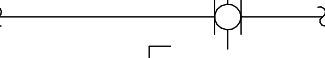
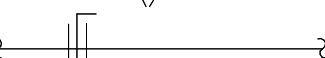
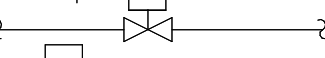

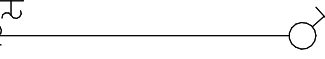

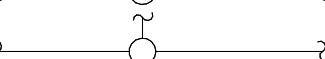


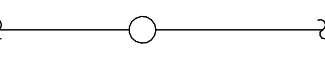


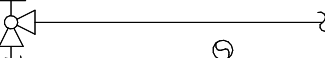
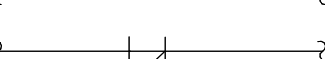
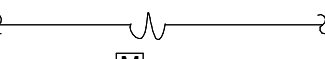










SYMBOL DOUBLE LINE	DESCRIPTION
	FLEXIBLE DUCTWORK
	EXISTING EQUIPMENT OR DUCTWORK TO BE REMOVED.
	EXISTING DUCTWORK TO REMAIN NEW DUCTWORK
	MANUAL VOLUME DAMPER (MVD) MOTOR OPERATED DAMPER (MOD)
	ACCESS DOOR
	RADIUS ELBOW (R=1.5)
	VANED ELBOW
	BRANCH DUCT TAKE-OFF
	RISE OR DROP DIRECTION OF AIR FLOW
	CHANGE FROM RECTANGULAR TO ROUND DUCT OR SINGLE LINE DUCT
	CHANGE IN SIZE OF DUCTWORK (CONCENTRIC)
	CHANGE IN SIZE OF DUCTWORK (ECCENTRIC)
	SPIN IN FITTING WITH MANUAL VOLUME DAMPER
	OPPOSED BLADE CONTROL DAMPER WITH ACTUATOR
	PARALLEL BLADE CONTROL DAMPER WITH ACTUATOR
THIS IS A GENERAL LIST OF SYMBOLS. ALL SYMBOLS MAY NOT BE USED ON A SPECIFIC PROJECT	

### ABBREVIATIONS

AC	AIR CONDITIONING	F	FAHRENHEIT	PRESS	PRESSURE
ACH	AIR CHANGES PER HOUR	FA	FILTER ACCESS	PVC	POLYVINYL CHLORIDE
AD	ACCESS DOOR	FACP	FIRE ALARM CONTROL PANEL	RA	RETURN AIR
AFF	ABOVE FINISHED FLOOR	FCD	FLOW CONTROL DAMPER	RD	ROOF DRAIN
AG	ABOVE GRADE	FCDU	FAN COIL UNIT	REF	REFRIGERANT
AHU	AIR HANDLING UNIT	FD	FIRE DAMPER	RG	RETURN GRILLE
AI	ANALOG INPUT	FSD	FIRE SMOKE DAMPER	RL	RAIN LEADER
AO	ANALOG OUTPUT	FL	FLOOR	RLA	RUNNING LOAD AMPS
AP	ACCESS PANEL	FLA	FULL LOAD AMPACITY	RPM	REVOLUTIONS PER MINUTE
APPROX	APPROXIMATELY	FPF	FINS PER FOOT	RS	REFRIGERANT SENSOR
BDD	BACK DRAFT DAMPER	FPI	FINS PER INCH	RTU	ROOFTOP A/C UNIT
BFF	BELOW FINISHED FLOOR	FPM	FEET PER MINUTE	RTU	ROOF TOP UNIT
BHP	BRAKE HORSE POWER	FPM	FINS PER MINUTE	SA	SUPPLY AIR
BDD	BOTTOM OF DUCT	FSD	FIRE SMOKE DAMPER	SD	SUPPLY DIFFUSER
BOT	BOTTOM	GPH	GALLONS PER HOUR	SD	FIRE STAT
BTU	BRITISH THERMAL UNIT	GPM	GALLONS PER MINUTE	SD	SMOKE DETECTOR
CAP	CAPACITY	H	HUMIDITY	SEN	SENSIBLE
CC	COOLING COIL	HC	HEATING COIL	SG	SUPPLY GRILLE
CD	CONDENSATE DRAIN	HP	HORSEPOWER	SP	STATIC PRESSURE
CFM	CUBIC FEET PER MINUTE	HHWR	HEATING HOT WATER RETURN	STRUCT	STRUCTURAL
CHWR	CHILLED WATER RETURN	HHWS	HEATING HOT WATER SUPPLY	SYS	SYSTEM
CHWS	CHILLED WATER SUPPLY	HZ	HERTZ	T	TEMPERATURE
CLG	CEILING	IBHD0	INCHES OF WATER	TSP	TOTAL STATIC PRESSURE
CMU	CONCRETE MASONRY UNIT	KW	KILOWATT	TYP	TYPICAL
CONN	CONNECTION	LAT	LEAVING AIR TEMPERATURE	UC	UNDERCUT
CT	COOLING TOWER	LAT	LATENT	UG	UNDERGROUND
CJ	CONDENSING UNIT	LD	LOCKED DOOR	UL	UNDERWRITERS LABORATORY
DB	DRY BULB	LPC	LOW PRESSURE CONDENSATE	UON	UNLESS OTHERWISE NOTED
DDC	DIRECT DIGITAL CONTROL	LPS	LOW PRESSURE STEAM	UV	UNIT VENTILATOR
DG	DOOR GRILLE	LPA	LOCKED ROTOR AMPS	VAV	VARIABLE AIR VOLUME
DI	DIGITAL INPUT	LVG	LEAVING	VD	VOLUME DAMPER
DN	DOWN	LWT	LEAVING WATER TEMPERATURE	VFD	VARIABLE FREQUENCY DRIVE
DO	DIGITAL OUTPUT	MAX	MAXIMUM	WB	WET BULB
DP	DEW POINT	MBH	1000BTU		
DX	DIRECT EXPANSION	MCA	MINIMUM CIRCUIT AMPACITY		
EA	EXHAUST AIR	MD	MOTORIZED DAMPER		
EAT	ENTERING AIR TEMPERATURE	MEZZ	MEZZANINE		
EA	EXHAUST AIR	MIN	MINIMUM		
EER	ENERGY EFFICIENCY RATIO	MISC	MISCELLANEOUS		
EF	EXHAUST FAN	NC	NORMALLY CLOSED		
EG	EXHAUST GRILLE	NIC	NOT IN CONTRACT		
EL	ELEVATION	NO	NORMALLY OPEN		
ELEC	ELECTRICAL	NTS	NOT TO SCALE		
ENT	ENTERING	OA	OUTSIDE AIR		
EQUIP	EQUIPMENT	OAI	OUTSIDE AIR INTAKE		
ESP	EXTERNAL STATIC PRESSURE	OAL	OUTSIDE AIR LOUVER		
ET	EXPANSION TANK	OC	OUTCENTER		
EXH	EXHAUST	PD	PRESSURE DROP		
EXIST	EXISTING	PH	PHASE		

THIS IS A GENERAL LIST OF ABBREVIATIONS AND MAY NOT BE USED ON A SPECIFIC PROJECT. IF AN ABBREVIATION IS USED ON A PROJECT AND IS NOT REPRESENTED IN THIS LIST, CONTRACTOR SHALL SUBMIT A REQUEST FOR INFORMATION.

### PIPING LEGEND

SYMBOL	DESCRIPTION
	CHWS CHILLED WATER SUPPLY
	CHWR CHILLED WATER RETURN
	CD CONDENSATE LINE
	REFRIGERANT PIPING
	HHWS HEATING HOT WATER SUPPLY
	HHWR HEATING HOT WATER RETURN
	PR PIPE REDUCER
	PU PIPE UNION
	GV GATE VALVE
	GLV GLOBE VALVE
	CV CHECK VALVE
	BV BALL VALVE
	PV PLUG VALVE
	BV BUTTERFLY VALVE
	2-WAY CONTROL VALVE
	3-WAY CONTROL VALVE
	SRV SAFETY OR PRESSURE RELIEF VALVE
	VRV VALVE IN RISER
	DFD DIRECTION OF FLOW
	TC 45 OR 90 DEGREES
	BC 45 OR 90 DEGREES
	SC SIDE CONNECTION
	CO CAPPED OUTLET
	DI DROP IN PIPING
	RI RISE IN PIPING
	SV SOLENOID VALVE
	OSY OUTSIDE SCREW AND YOKE
	WFM WATER FLOW MEASURING DEVICE
	AGV ANGLE GLOBE VALVE
	PG PRESSURE GAUGE
	SBV STRAINER WITH BALL VALVE
	EJ EXPANSION JOINT
	BTU BTU FLOW METER

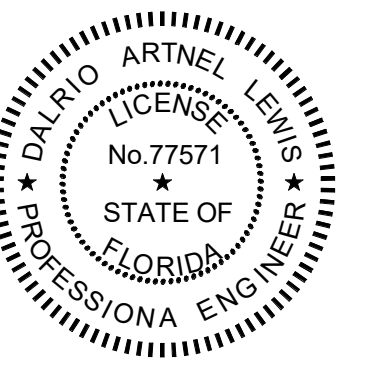
- GENERAL PLAN NOTES:**
1. ALL AIR DISTRIBUTION COMPONENTS AS SHOWN IN PLANS SHALL REMAIN IN PLACE UNLESS OTHERWISE NOTED.
  2. REBALANCE EXISTING EXHAUST SYSTEM AND EXHAUST GRILLES TO NEW CFMS AS INDICATED ON FLOOR PLANS.

Client:



Consultants:

EOR Stamp:



09/29/2016  
Dalrio A. Lewis, PE 77571 (FL)

Project:  
Barnett Park AHU Replacement

Location:  
4801 W Colonial Dr,  
Orlando, FL, 32808

Issuance:  
**PERMIT DOCUMENTS**

Revisions:

#	Date	Description

Date:  
09/29/2016

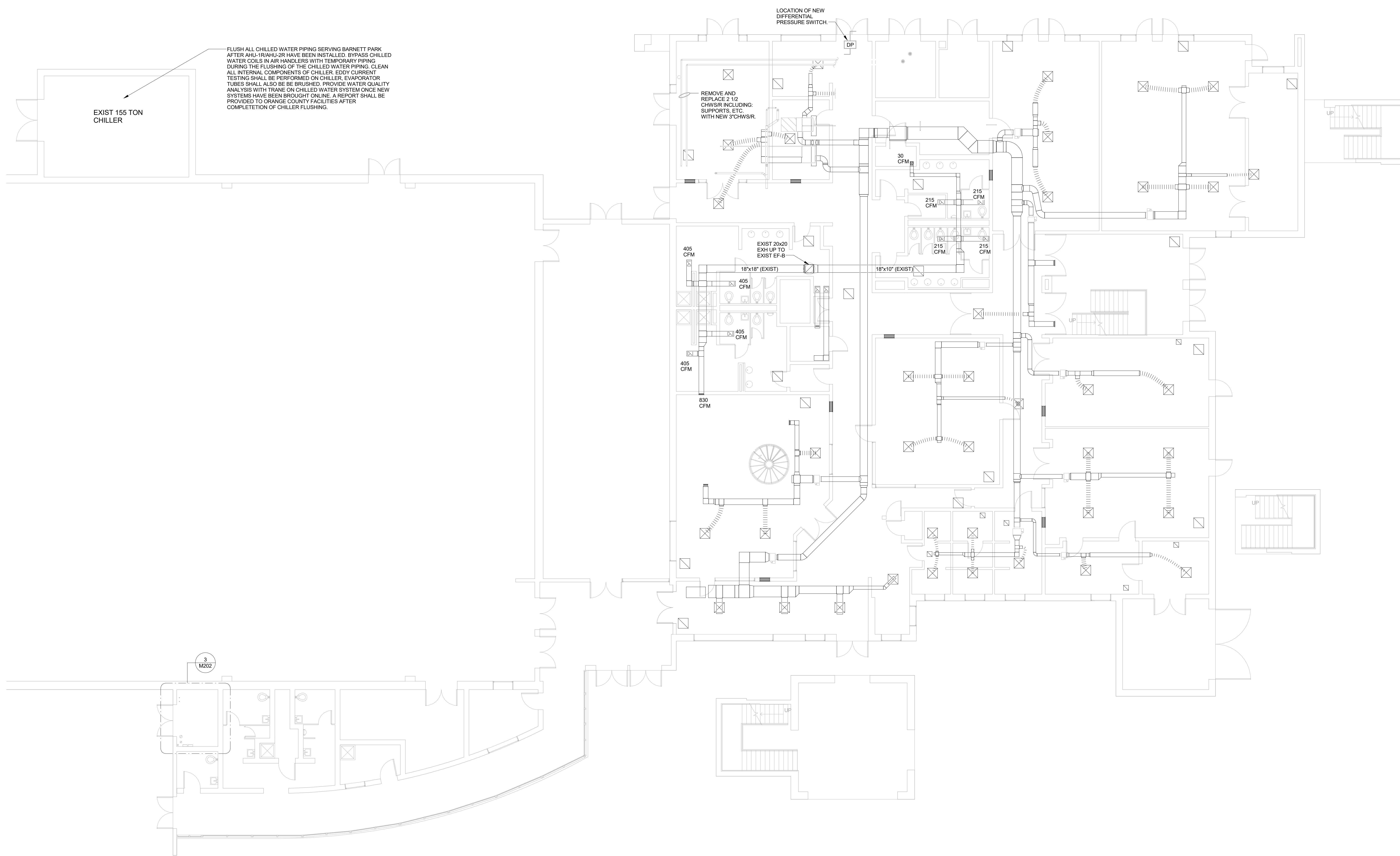
Project Number:  
16.OC.027

Drawn By: SE  
Checked By: DL

**FIRST FLOOR OVERALL MECHANICAL PLAN**

Sheet No.:

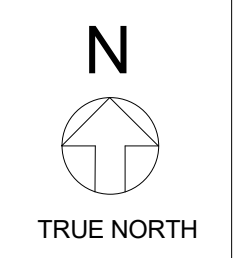
**M101**



FLUSH ALL CHILLED WATER PIPING SERVING BARNETT PARK AFTER AHU-1R/AHU-2R HAVE BEEN INSTALLED. BYPASS CHILLED WATER COILS IN AIR HANDLERS WITH TEMPORARY PIPING DURING THE FLUSHING OF THE CHILLED WATER PIPING. CLEAN ALL INTERNAL COMPONENTS OF CHILLER. EDDY CURRENT TESTING SHALL BE PERFORMED ON CHILLER EVAPORATOR TUBES SHALL ALSO BE BRUSHED. PROVIDE WATER QUALITY ANALYSIS WITH TRANE ON CHILLED WATER SYSTEM ONCE NEW SYSTEMS HAVE BEEN BROUGHT ONLINE. A REPORT SHALL BE PROVIDED TO ORANGE COUNTY FACILITIES AFTER COMPLETION OF CHILLER FLUSHING.

EXIST 155 TON CHILLER

1 First Floor Overall Mechanical Plan  
1/8" = 1'-0"



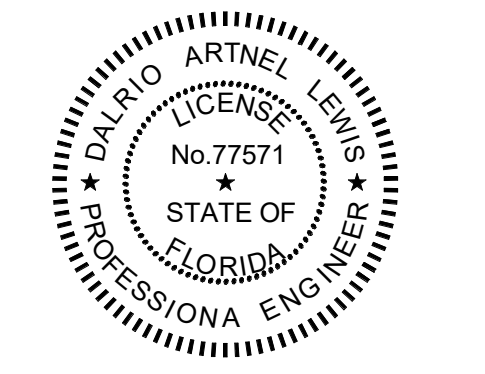
- GENERAL PLAN NOTES:**
1. ALL AIR DISTRIBUTION COMPONENTS AS SHOWN IN PLANS SHALL REMAIN IN PLACE UNLESS OTHERWISE NOTED.
  2. REBALANCE EXISTING EXHAUST SYSTEM AND EXHAUST GRILLES TO NEW CFMS AS INDICATED ON FLOOR PLANS.

Client:



Consultants:

EOR Stamp:



09/29/2016  
Dalrio A. Lewis, PE 77571 (FL)

Project:  
Barnett Park AHU Replacement

Location:  
4801 W Colonial Dr,  
Orlando, FL, 32808

Issuance:  
**PERMIT DOCUMENTS**

Revisions:

#	Date	Description

Date:  
09/29/2016

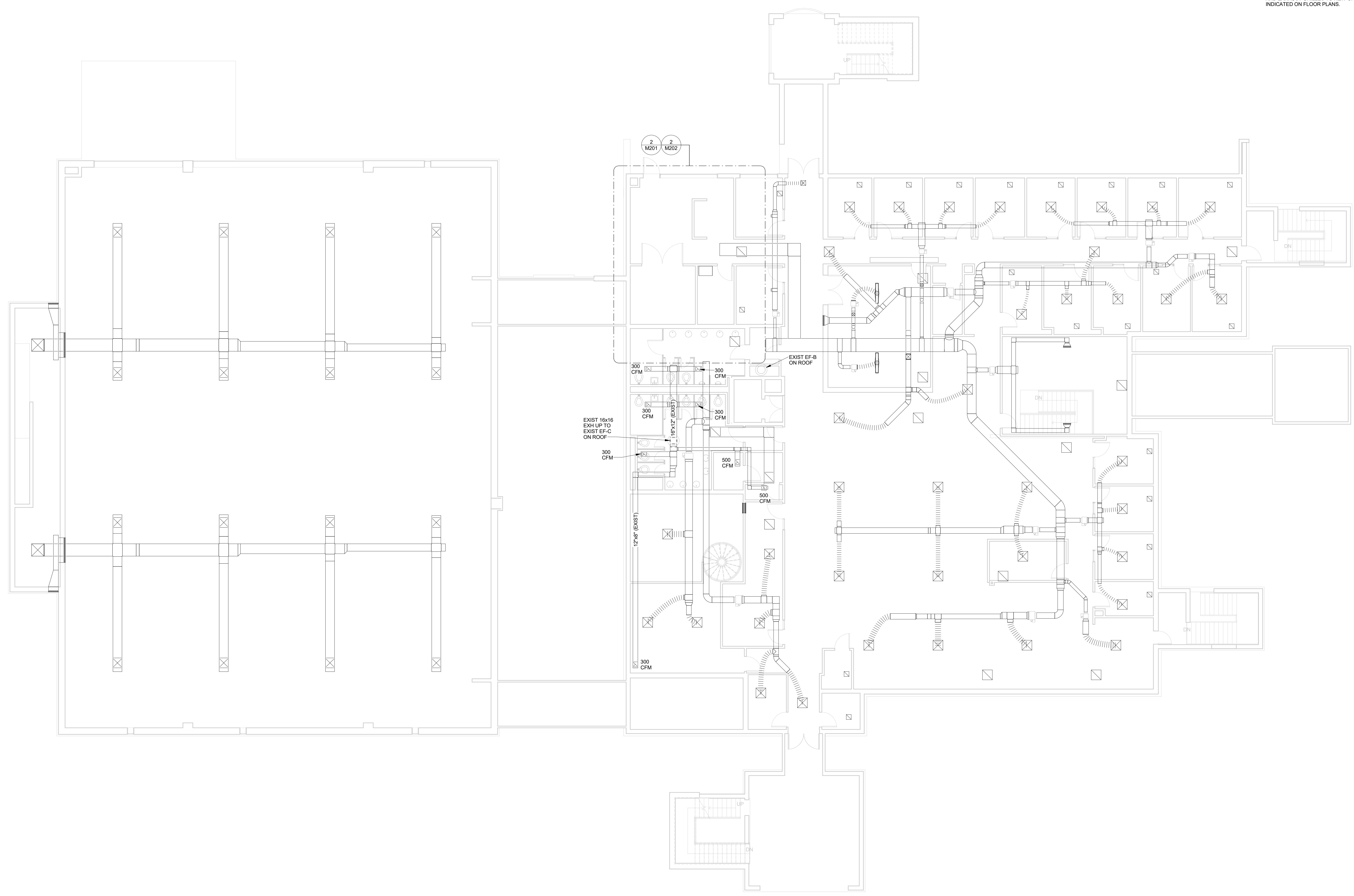
Project Number:  
16.OC.027

Drawn By: SE  
Checked By: DL

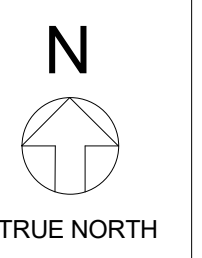
**SECOND FLOOR OVERALL MECHANICAL PLAN**

Sheet No.:

**M102**



① Second Floor Overall Mechanical Plan  
1/8" = 1'-0"



Client:



Consultants:

EOR Stamp:



09/29/2016  
Dairio A. Lewis, PE 77571 (FL)

Project:  
Barnett Park AHU Replacement

Location:  
4801 W Colonial Dr,  
Orlando, FL, 32808

Issuance:  
**PERMIT DOCUMENTS**

Revisions:

#	Date	Description

Date:  
09/29/2016

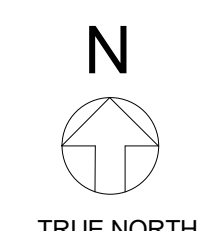
Project Number:  
16.OC.027

Drawn By: SE  
Checked By: DL

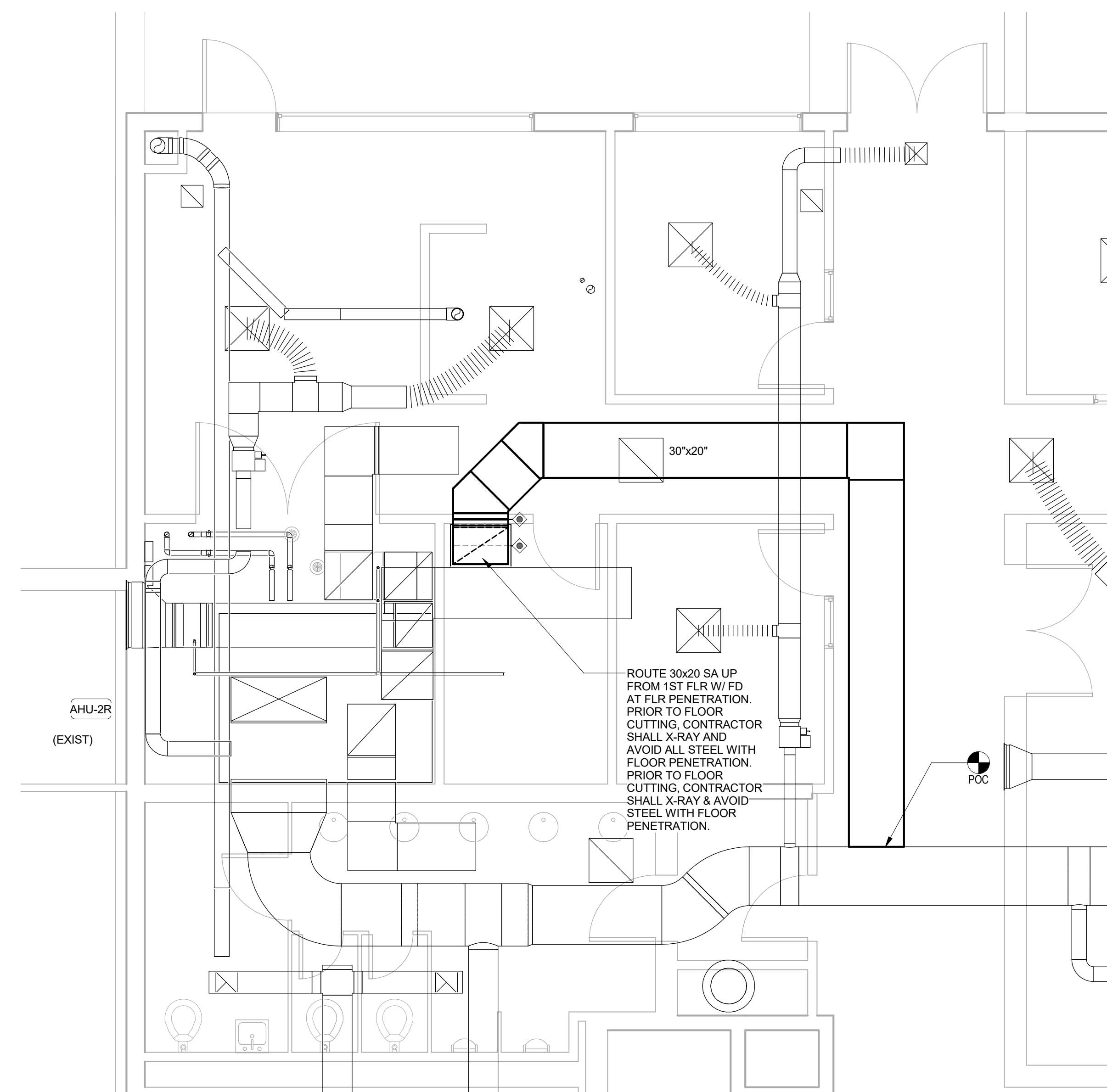
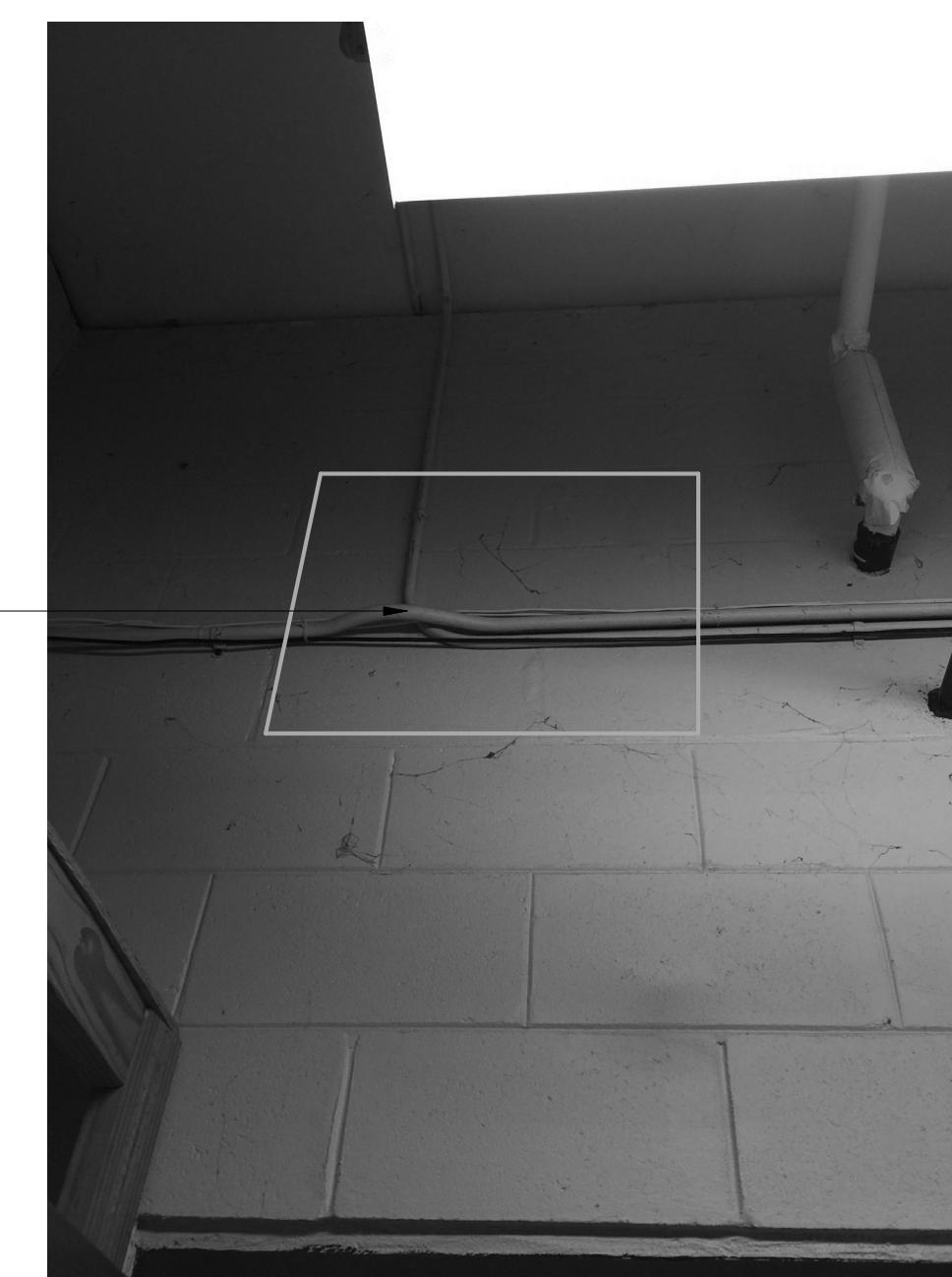
**MECHANICAL PHASING PLAN**

Sheet No.:

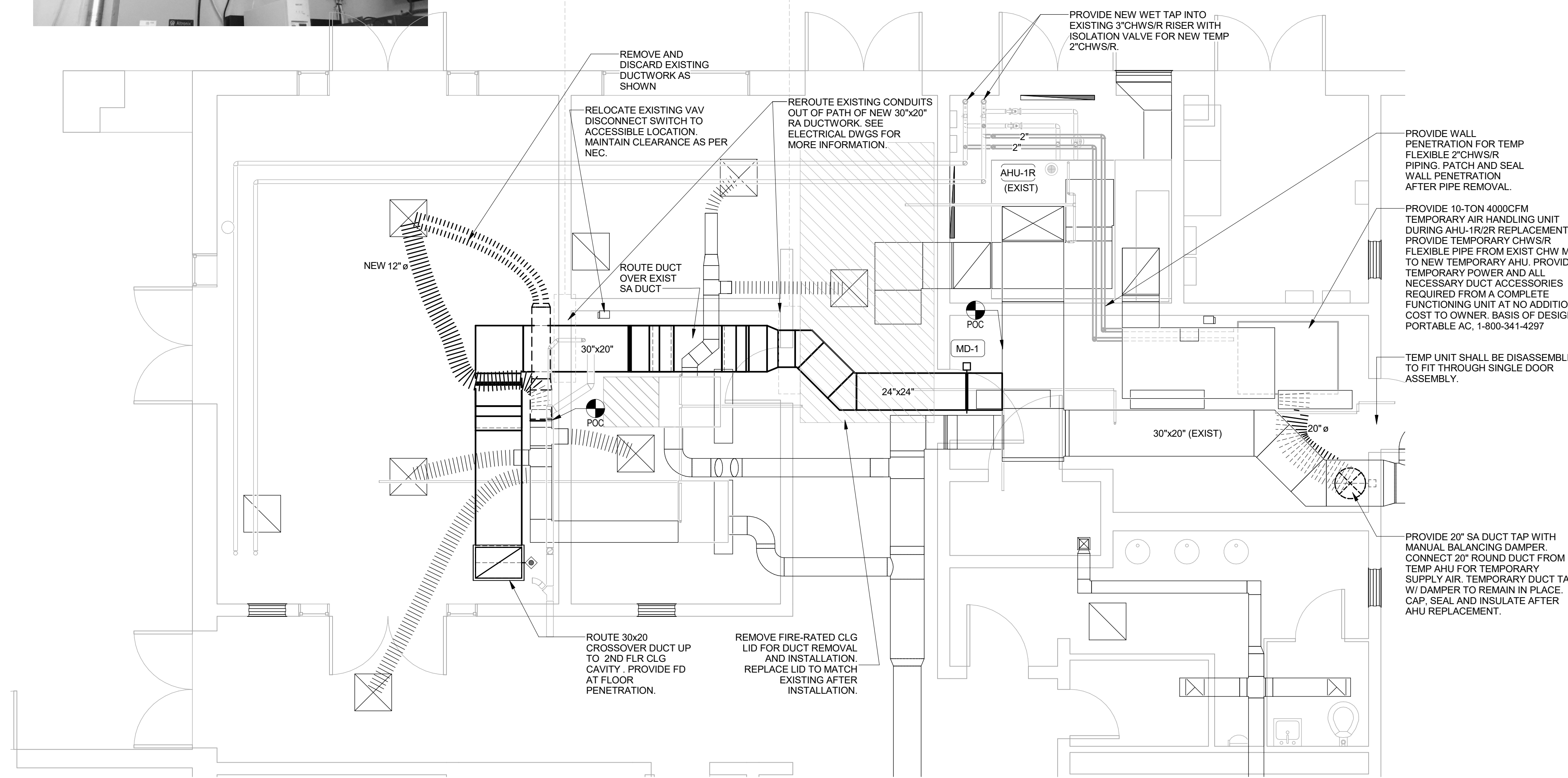
**M103**



RELOCATE EXISTING CONDUIT TO ACCOMMODATE NEW DUCT



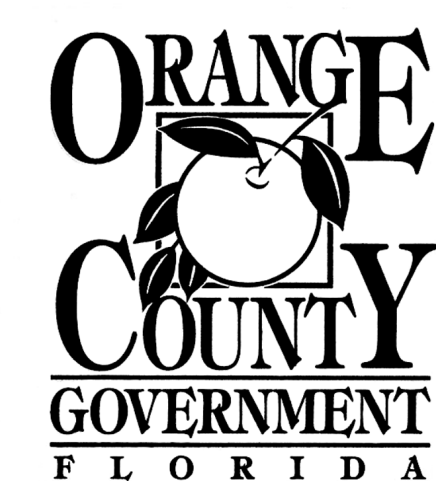
② Second Floor Mechanical Phasing Plan  
1/4" = 1'-0"



① First Floor Mechanical Phasing Plan  
1/4" = 1'-0"

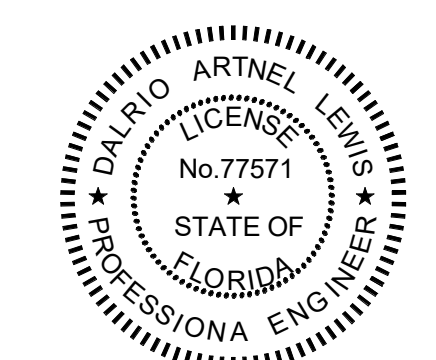


Client:



Consultants:

EOR Stamp:



09/29/2016  
Dairio A. Lewis, PE 77571 (FL)

Project:  
Barnett Park AHU Replacement

Location:  
4801 W Colonial Dr,  
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Issuance:  
**PERMIT DOCUMENTS**

Revisions:

#	Date	Description

Date:  
09/29/2016

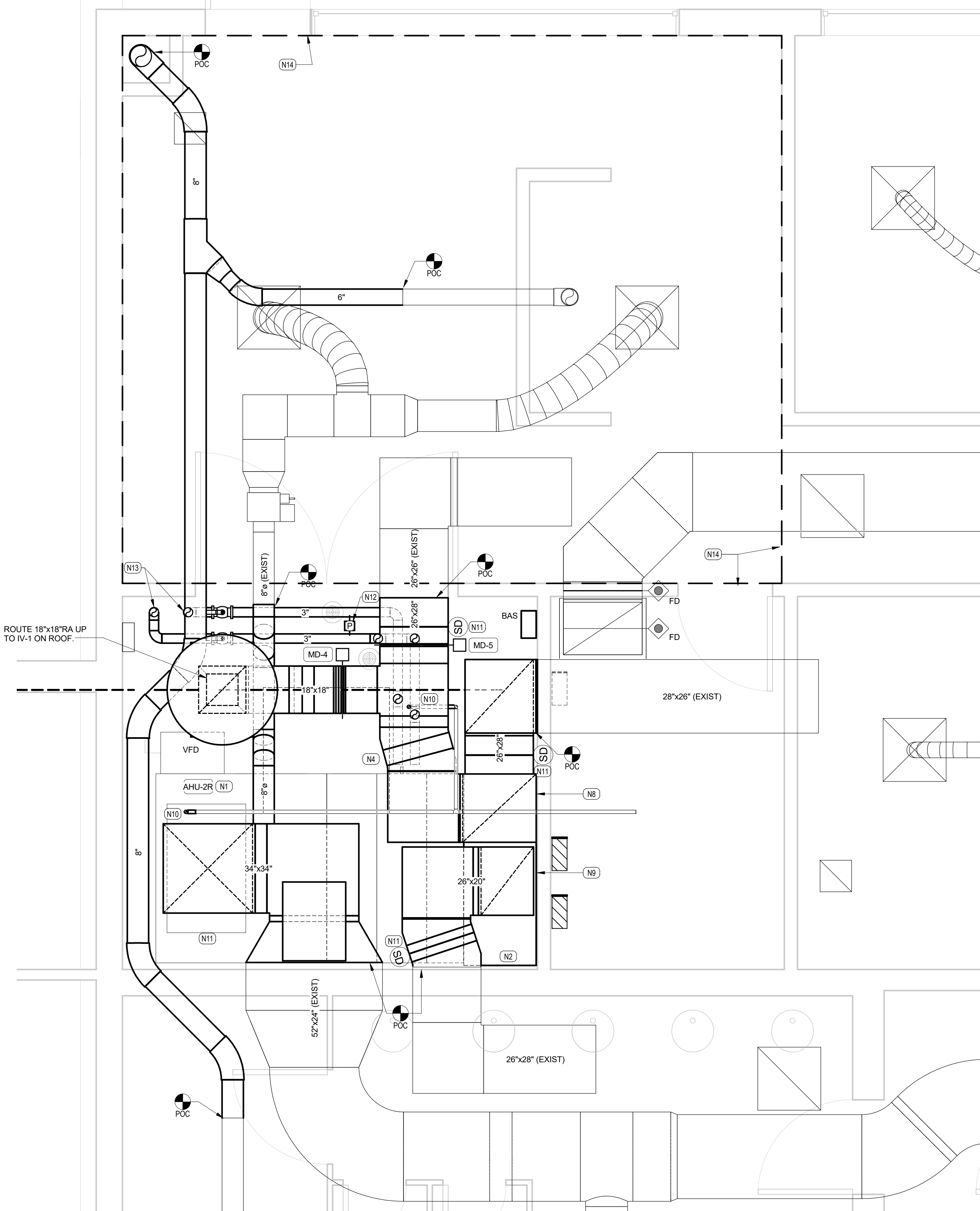
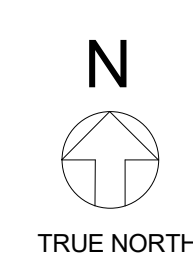
Project Number:  
16.OC.027

Drawn By: SE  
Checked By: DL

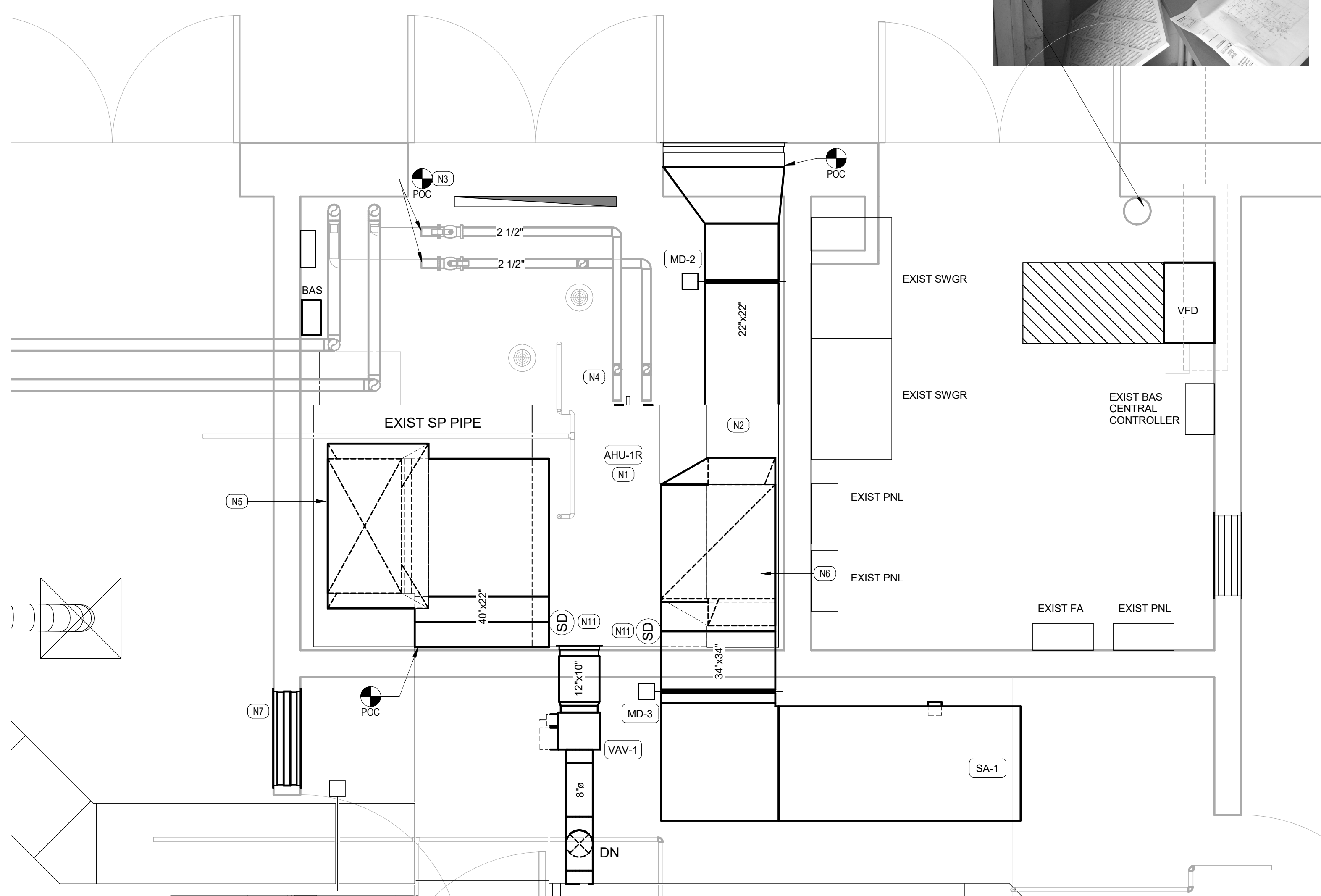
**MECHANICAL NEW PLANS**

Sheet No.:

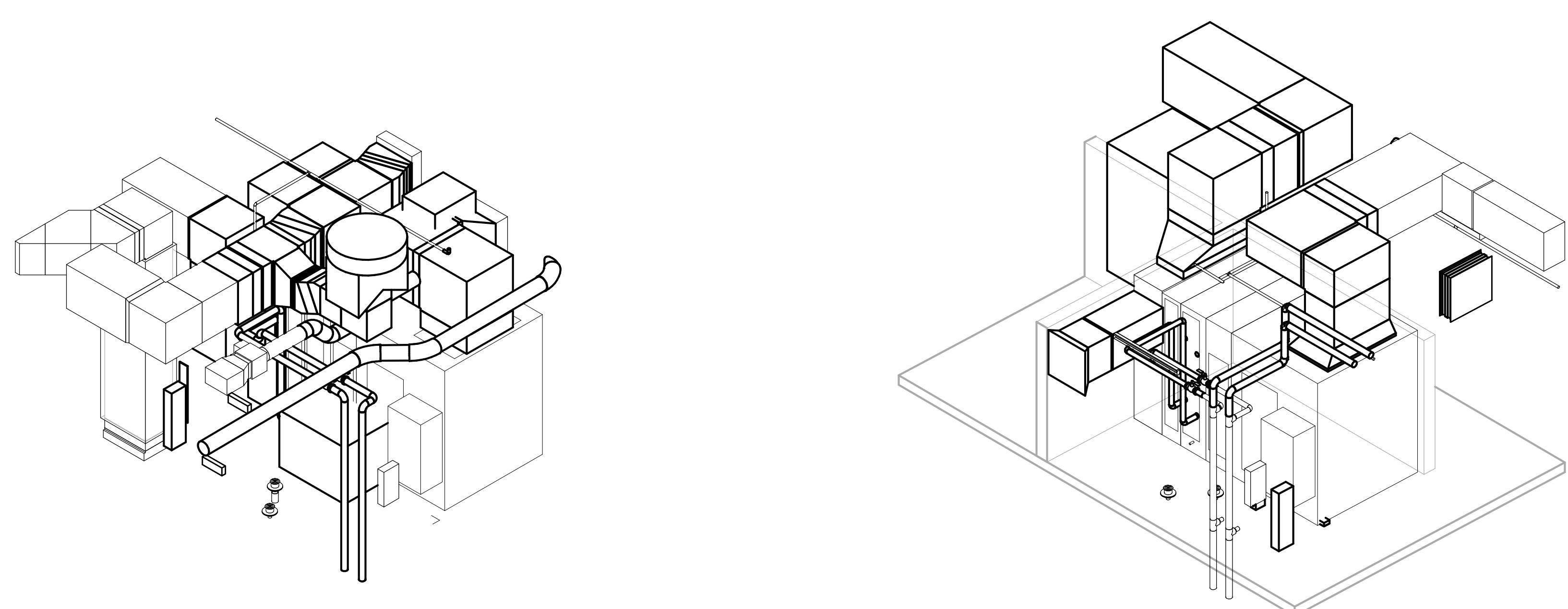
**M202**



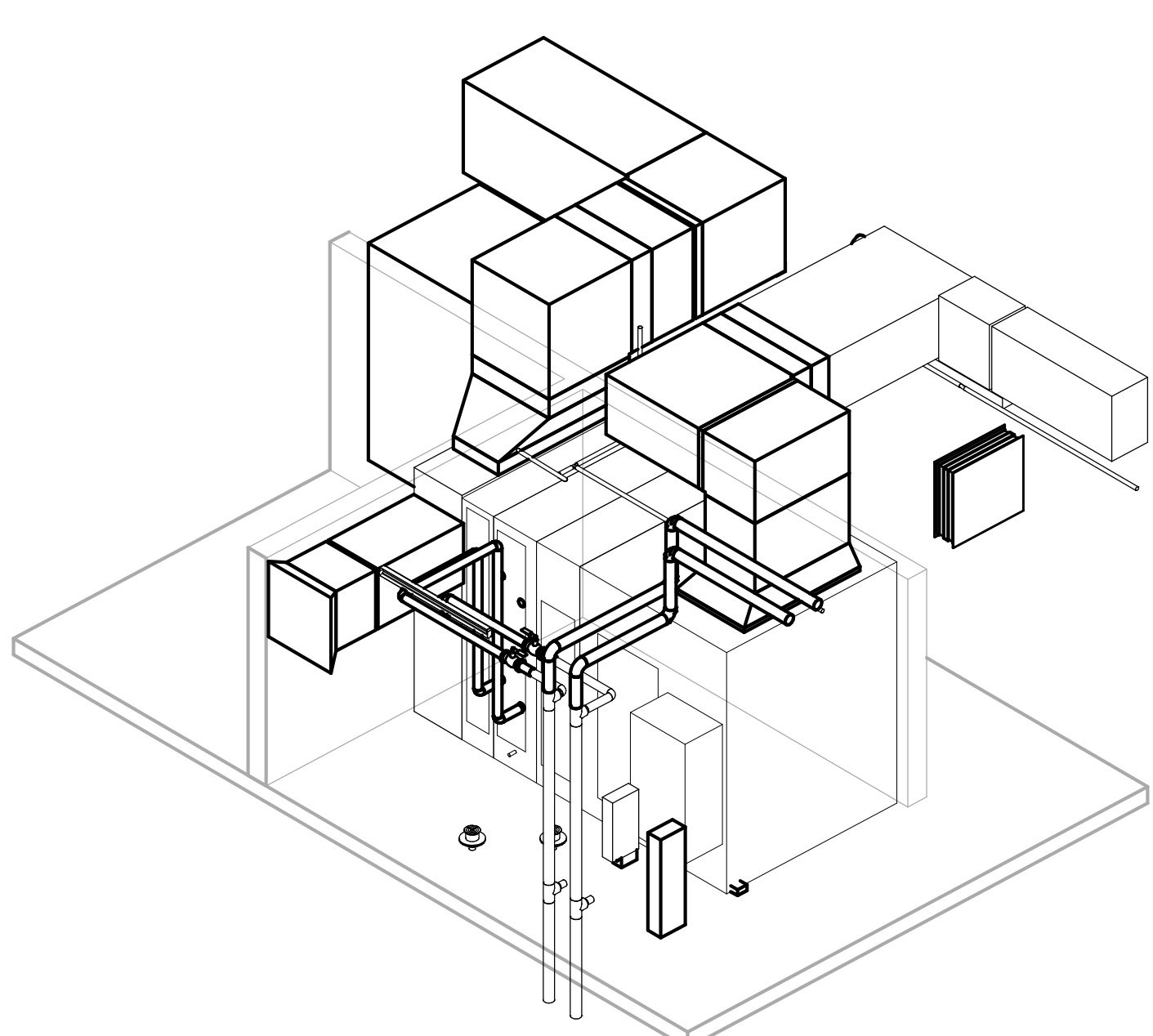
2 Second Floor New Partial Mechanical Plan (ADMIN)  
1/2" = 1'-0"



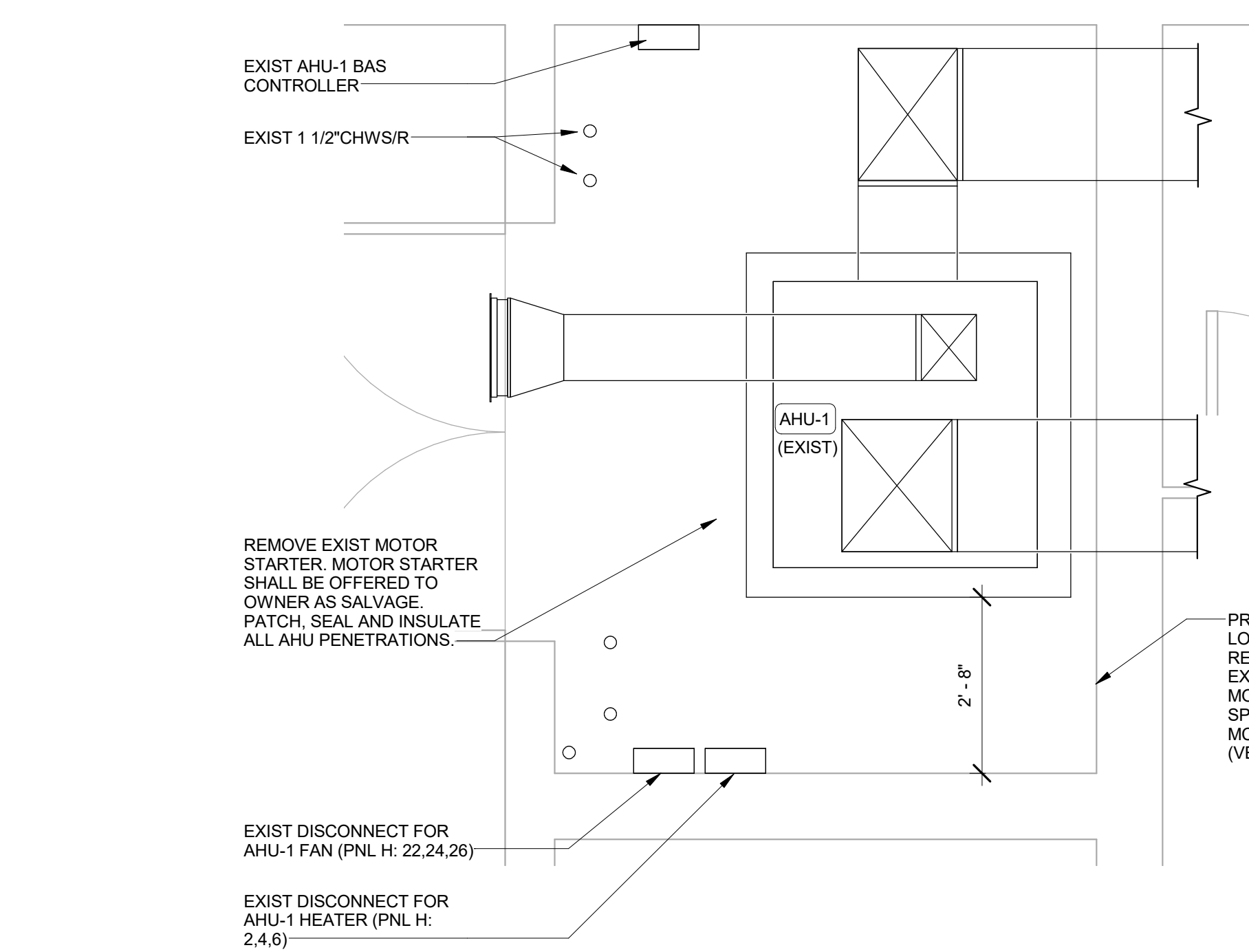
1 First Floor Partial Mechanical Plan New (ADMIN)  
1/2" = 1'-0"



5 Second Floor Mechanical Room Isometric



4 First Floor Mechanical Room Isometric



3 First Floor Partial Mechanical Plan - (GMY)  
1/2" = 1'-0"

**GENERAL NOTES:**

- BUILDING SHALL REMAIN OPERATIONAL DURING AHU INSTALLATION.
- ALL CHW PIPING (NEW/EXISTING) SHALL BE PROVIDED WITH ALUMINUM JACKETING IN MECHANICAL ROOMS.
- CONTRACTOR SHALL FIELD VERIFY ALL EXISTING DUCT AND PIPE SIZES FOR POINTS OF CONNECTION PRIOR TO START OF WORK. PROVIDE ALL DUCT/PIPE TRANSITIONS AS REQUIRED FOR CONNECTION OF NEW DUCT/PIPING TO EXISTING. FIELD VERIFY FINAL LOCATIONS OF DDC AND VFD WITH FIELD CONDITIONS PRIOR TO INSTALLATION. VFD/DC SHALL NOT BE INSTALLED UNDER ANY EXISTING WATER PIPES. PROVIDE NEW CONTROLS PER CONTROLS SHEETS. CONNECT TO EXISTING BAS.

**NEW PLAN NOTES**

- MOUNT NEW AHU ON EQUIPMENT BASE RAILS AND VIBRATION ISOLATION PADS. ROUTE 2 1/2" CHWS/R DN TO AHU. ROUTE 1 1/4" CD TO EXIST CD.
- PROVIDE BUILT UP RA PLENUM SECTION AT BACK OF AHU.
- CONNECT NEW PIPING TO EXISTING. PROVIDE NEW ISOLATION VALVES.
- ROUTE 2 1/2" CHWS/R DN TO AHU-1R. ROUTE 3" CHWS/R DN TO AHU-2R.
- ROUTE 40x22 SA UP FROM AHU-1R.
- ROUTE 50x20 RA DN TO RA PLENUM.
- PROVIDE 36x36 TRANSFER OPENING ABOVE FIRE RATED CEILING.
- ROUTE 26x28 RA/CA DN TO RA PLENUM.
- ROUTE 26x20 RA DN TO RA PLENUM.
- PROVIDE NEW UPRIGHT SPRINKLER HEAD AND GUARD. REROUTE SPRINKLER TO AVOID DUCTWORK.
- CONNECT SD TO EXIST FIRE ALARM SYSTEM.
- PROVIDE DIFFERENTIAL PRESSURE SWITCH IN CHW PIPING. CONNECT TO BAS FOR SECONDARY PUMP SPEED CONTROL.
- ROUTE 1" CHWS/R FROM FIRST FLR MECH UP TO 2ND FLR MECH RM. PROVIDE MANUAL AIR VENT AT THE TOP OF THE CHW RISER. PROVIDE NEW ISOLATION VALVES.
- AREA SHALL BE DEMISED OFF FROM VIEWING OF PUBLIC. PROVIDE VISQUEEN WALLS AROUND MECHANICAL ROOM FOR DUST CONTROL. PROTECT ALL EXISTING EQUIPMENT FROM DAMAGE. AREA SHALL BE RESTORED TO PRECONSTRUCTION CONDITION.

RELOCATE EXISTING J-BOX FOR VFD INSTALLATION.

RELOCATE FIRE HYDRANT AS SHOWN



SPACE	ZONES	GROSS AREA (SF)	NET AREA (SF)	VENTILATION SCHEDULE													
				Table 403.3		Table 403.3.1		Table 403.3.1.2		Table 403.3.1.2		Table 403.3.1.2		Table 403.3.1.2		Table 403.3.1.2	
				Default Occupant Density (People/1000SF)	No. of People (Rounded)	OUTDOOR AIR RATE PEOPLE	AREA	Outdoor Airflow Rate (n Occupied Space)	Zone Air Distrib. Effectiveness	Zone Outdoor Airflow	Zone Design Primary Airflow Rate (No VAV)	Minimum Supply Air Zone Airflow Rate	Primary Outdoor Air Fraction	Uncorrected Outdoor Air Intake	Min. Outdoor Air Intake Flow Rate (Rounded)	Approx. Outdoor Air Intake Flow Rate	
Pz	Rp (CFM/Person)	Ra (CFM/SF)	Vbz (CFM)	Ez	Voz (CFM)	Vpz (CFM)	Vpzm (CFM)	Zp	Vou (CFM)	Vot(m) (CFM)	Vot (CFM)						
<b>AHU - 01</b>																	
BUILDING OCCUPANCY LOAD = 80																	
OCCUPANT DIVERSITY = 0.4211																	
MAX Zp ==> 1.95 0.30 <== [Ev] Table 403.3.2.3.2																	
<b>FB - A - 1 (EXISTING)</b>																	
107 CORRIDOR	1	282	282	0	0	0	0.06	17	0.8	21	390	240	Zp	17	57	80	
133 OFFICE	1	125	125	5	1	5	0.06	13	0.8	16	170	240	e	10	33	35	
SUBTOTAL																	
407																	
<b>FB - A - 2 (EXISTING)</b>																	
122 OFFICE	1	158	158	5	1	5	0.06	14	0.8	18	200	60		11	39	40	
123 OFFICE	1	186	186	5	1	5	0.06	16	0.8	20	300	60		13	45	45	
124 COPY	1	47	47	4	1	4	0.06	8	0.8	10	70	60		5	17	20	
SUBTOTAL																	
389																	
<b>FB - A - 3 (EXISTING)</b>																	
119 PANTRY	1	140	140	0	0	0	0.12	17	0.8	21	115	60		17	56	60	
120 KITCHEN	1	192	192	0	0	0	0.06	12	0.8	14	315	60		12	39	40	
SUBTOTAL																	
332																	
<b>FB - B - 1 (EXISTING)</b>																	
104 CORRIDOR	1	315	315	0	0	0	0.06	19	0.8	24	115	105	Zp	19	63	65	
121 GAME ROOM	1	720	432	20	9	7.5	0.18	145	0.8	182	660	105	e	106	354	365	
SUBTOTAL																	
747																	
<b>FB - C - 1 (EXISTING)</b>																	
117 AEROBICS MEETING ROOM	1	557	334.2	50	17	5	0.06	105	0.8	131	950	165	Zp	56	187	190	
SUBTOTAL																	
334.2																	
<b>FB - C - 2 (EXISTING)</b>																	
118 MEETING ROOM	1	697	697	50	35	5	0.06	217	0.8	271	1160	165	1.64	116	386	390	
SUBTOTAL																	
697																	
<b>FB - D - 1 (EXISTING)</b>																	
108 MEETING ROOM 2	1	797	797	50	40	5	0.06	248	0.8	310	1350	240	e	132	441	445	
SUBTOTAL																	
797																	
<b>FB - E - 1 (EXISTING)</b>																	
107 CORRIDOR (B)	1	722	722	0	0	0	0.06	43	0.8	54	115	240		43	145	145	
132 SR. DAY ROOM	1	499	499	10	5	5	0.06	55	0.8	69	1110	240		40	135	135	
134 TELE ROOM	1	179	179	0	0	0	0.12	21	0.8	27	250	240		21	72	75	
SUBTOTAL																	
1400																	
<b>FB - E - 2 (EXISTING)</b>																	
100 LOBBY	1	548	548	10	6	5	0.06	63	0.8	79	800	165	Zp	46	152	155	
102 CORRIDOR	1	226	226	0	0	0	0.06	14	0.8	17	80	165	e	14	46	50	
SUBTOTAL																	
774																	
<b>FB - E - 3 (EXISTING)</b>																	
127 WEIGHT ROOM	1	1024	1024	10	11	20	0.06	281	0.8	352	1575	240	1.47	154	514	515	
SUBTOTAL																	
1024																	
<b>FB - F - 1 (EXISTING)</b>																	
109 MEETING ROOM 1	1	1076	1076	50	54	5	0.06	335	0.8	418	1680	320	Zp	178	595	595	
110 STORAGE	1	305	305	0	0	0	0.12	37	0.8	46	60	320	e	37	122	125	
SUBTOTAL																	
1381																	
<b>FB - G - 1 (EXISTING)</b>																	
128 CONTROL DESK	1	165	165	30	5	5	0.06	35	0.8	44	200	320		20	69	70	
104 CORRIDOR	1	125	125	0	0	0	0.06	8	0.8	9	25	320		8	25	25	
105 LOBBY	1	365	365	10	4	0	0.06	22	0.8	27	320	320	Zp	22	73	75	
136 ENCLOSED CORRIDOR TO GYM	1	254	254	0	0	0	0.06	15	0.8	19	680	320	e	15	51	55	
SUBTOTAL																	
909																	
TOTAL NO. OF PEOPLE = 190																	
TOTAL OA FOR AHU - 01 = 3716 3765																	
NOTES: 1. BASED ON VENTILATION REQUIREMENTS FROM FLORIDA BUILDING CODE MECHANICAL 5TH EDITION																	

SPACE	ZONES	GROSS AREA (SF)	NET AREA (SF)	VENTILATION SCHEDULE												
				Table 403.3		Table 403.3.1		Table 403.3.1.2		Table 403.3.1.2		Table 403.3.1.2		Table 403.3.1.2		
				Default Occupant Density (People/1000 SF)	No. of People (Rounded)	OUTDOOR AIR RATE PEOPLE	AREA	Outdoor Airflow Rate (n Occupied Space)	Zone Air Distrib. Effectiveness	Zone Outdoor Airflow	Zone Design Primary Airflow Rate (No VAV)	Minimum Supply Air Zone Airflow Rate	Primary Outdoor Air Fraction	Uncorrected Outdoor Air Intake	Min. Outdoor Air Intake Flow Rate (Rounded)	Approx. Outdoor Air Intake Flow Rate
Pz	Rp (CFM/Person)	Ra (CFM/SF)	Vbz (CFM)	Ez	Voz (CFM)	Vpz (CFM)	Vpzm (CFM)	Zp	Vou (CFM)	Vot(m) (CFM)	Vot (CFM)					
<b>AHU - 02</b>																
BUILDING OCCUPANCY LOAD = 45																
OCCUPANT DIVERSITY = 0.6923																
MAX Zp ==> 0.65 0.50 <== [Ev] Table 403.3.2.3.2																
<b>FB - A - 1 (EXISTING)</b>																
217 ADMIN #9	1	111	111	5	1	5	0.06	12	0.8	15	115	80	Zp	10	21	25
221 ADMIN #8	1	114	114	5	1	5	0.06	12	0.8	15	115	80	e	10	21	25
238 CORRIDOR (A)	1	98	98	0	0	0	0.06	6	0.8	7	200	80	e	6	12	15
SUBTOTAL																
323																
<b>FB - B - 1 (EXISTING)</b>																
220 BREAK ROOM	1	255	255	5	2	2	0.06	25	0.8	32	890	105		22	45	45
SUBTOTAL																
255																
<b>FB - B - 2 (EXISTING)</b>																
232 FISCAL #1	1	128	128	5	1	5	0.06	13	0.8	16	130	125		11	23	25
233 FISCAL #2	1	131	131	5	1	5	0.06	13	0.8	16	130	125		11	23	25
234 COPY	1	114	114	4	1	4	0.06	12	0.8	15	110	125		10	21	25
238 CORRIDOR (B)	1	448	448	0	0	0	0.06	27	0.8	34	350	125		27	54	55
SUBTOTAL																
821																
<b>FB - B - 3 (EXISTING)</b>																
230 ASST. MAN.	1	133	133	5	1	5	0.06	13	0.8	16	420	165		11	23	25
231 ADMIN #7	1	129	129	5	1	5	0.06	13	0.8	16	335	165		11	23	25
SUBTOTAL																
262																
<b>FB - B - 4 (EXISTING)</b>																
210 OPEN OFFICE (B)	1	1712	1027.2	5	6	5	0.06	92	0.8	115	1330	225		82	165	165
243 COPY	1	132	132	5	2	2	0.12	16	0.8	20	350	225		16	32	35
SUBTOTAL																
1027.2																
<b>FB - B - 5 (EXISTING)</b>																
201 SUPERVISOR	1	107	107	5	1	5	0.06	11	0.8	14	270	165		10	20	20
202 SUPERVISOR	1	110	110	5	1	5	0.06	12	0.8	15	270	165		10	21	25
203 SUPERVISOR	1	110	110	5	1	5	0.06	12	0.8	15	100	165	Zp	10	21	25
204 PRINT	1	79	79	4	1	4	0.06	10	0.8	12	145	165	e	8	17	20
SUBTOTAL																
498																
<b>FB - B - 6 (EXISTING)</b>																
210 OPEN OFFICE	1	158	158	5	1	5	0.06	14	0.8	18	720	105		13	26	30
SUBTOTAL																
158																
<b>FB - C - 1 (EXISTING)</b>																
223 ADMIN #1	1	109	109	5	1	5	0.06	12	0.8	14	230	165		10	21	25
223 ADMIN #2	1	118	118	5	1	5	0.06	12	0.8	15	230	165		11	22	25
224 ADMIN #3	1	117	117	5	1	5	0.06	12	0.8	15	230	165		10	21	25
225 ADMIN #4	1	119	119	5	1	5	0.06	12	0.8	15	230	165		11	22	25
SUBTOTAL																
463																
<b>FB - C - 2 (EXISTING)</b>																
226 ADMIN #5	1	117	117	5	1	5	0.06	12	0.8	15	230	165		10	21	25
227 ADMIN #6	1	117	117	5	1	5	0.06	12	0.8	15	230	165		10	21	25
228 EXEC. SEC.	1	117	117	5	1	5	0.06	12	0.8	15	230	165		10	21	25
229 MANAGER	1	154	154	5	1	5	0.06	14	0.8	19	300	165		13	26	30
SUBTOTAL																
505																
<b>FB - C - 3 (EXISTING)</b>																
STAIRS	1	500	500	0	0	0	0.06	30	0.8	38	1300	165		30	60	60
SUBTOTAL																
500																
<b>FB - D (EXISTING)</b>																
206 OFFICE + UNNAMED PASSAGEWAY	1	430	430	5	3	5	0.06	41	0.8	51	1500	320	Zp	36	73	75
207 STORAGE	1	58	58	0	0	0	0.12	7	0.8	9	100	320	e	7	14	15
208 STORAGE	1	305	305	0	0	0	0.12	37	0.8	46	100	320	e	37	74	75
SUBTOTAL																
793																
<b>FB - F - 2 (EXISTING)</b>																
240 WEIGHT ROOM	1	354	354	10	4	20	0.06	101	0.8	127	1200	320		77	154	155
241 UNNAMED	1	411	411	0	0	0	0.06	25	0.8	31	600	320		25	50	50
SUBTOTAL																
765																
<b>FB - F - 1 (EXISTING)</b>																
239 CORRIDOR	1	603	603	0	0	0	0.06	36	0.8	45	1000	320		36	73	75
238 CORRIDOR	1	278	278	0	0	0	0.06	17	0.8	21	500	320		17	34	35
200 WAITING	1	275	275	10	3	5	0.06	32	0.8	39	230	320		27	54	55
SUBTOTAL																
1158																
<b>FB - G (EXISTING)</b>																
205 STORAGE	1	42	42	0	0	0	0.12	5	0.8	6	0	320	Zp	5	11	15
210 OPEN OFFICE	1	986	986	5	5	5	0.06	84	0.8	105	2160					



Client:



Consultants:

EOR Stamp:



09/29/2016  
Dalrio A. Lewis, PE 77571 (FL)

Project:

Barnett Park AHU Replacement

Location:

4801 W Colonial Dr, Orlando, FL, 32808

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Revisions:

#	Date	Description

Date:

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Project Number:  
16.OC.027

Drawn By:

SE

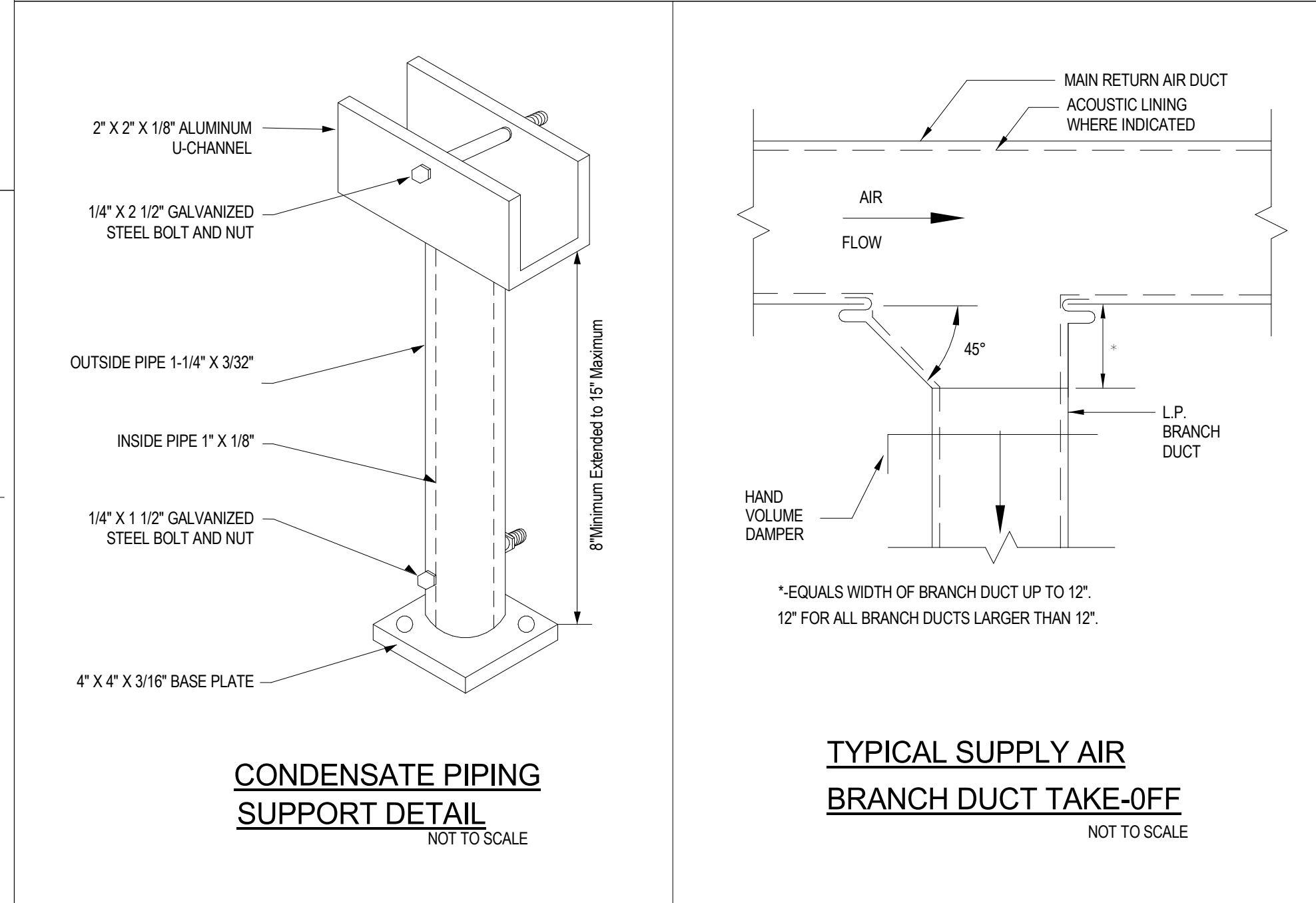
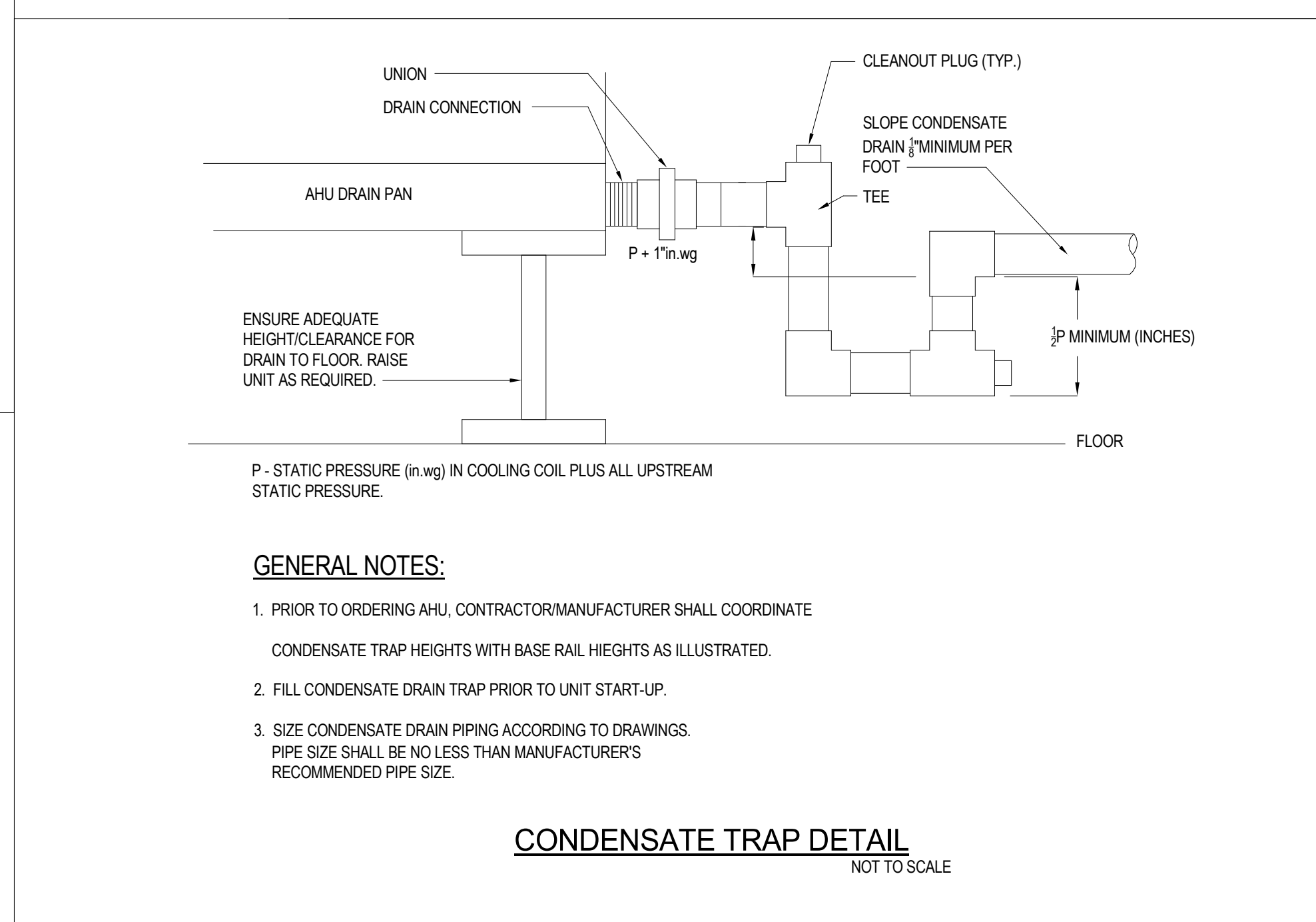
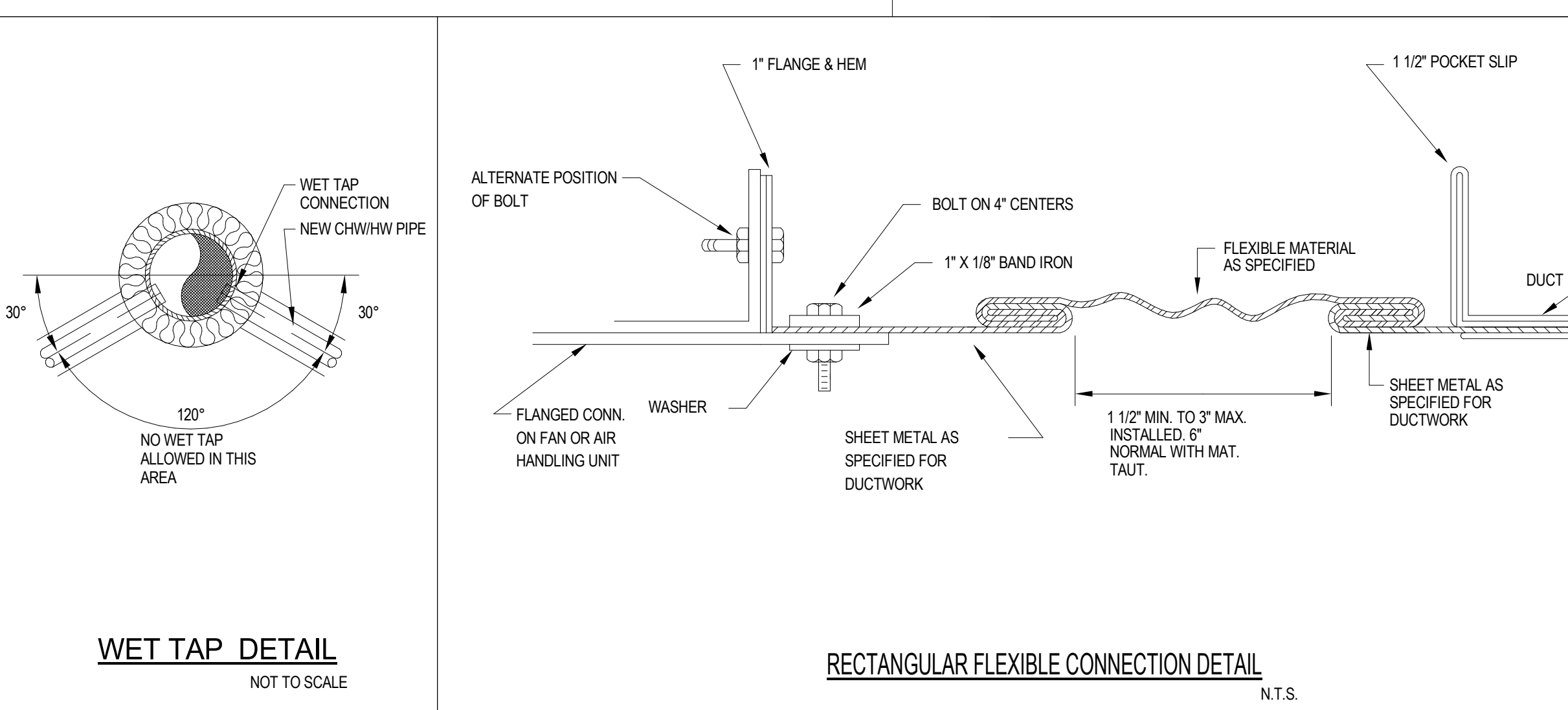
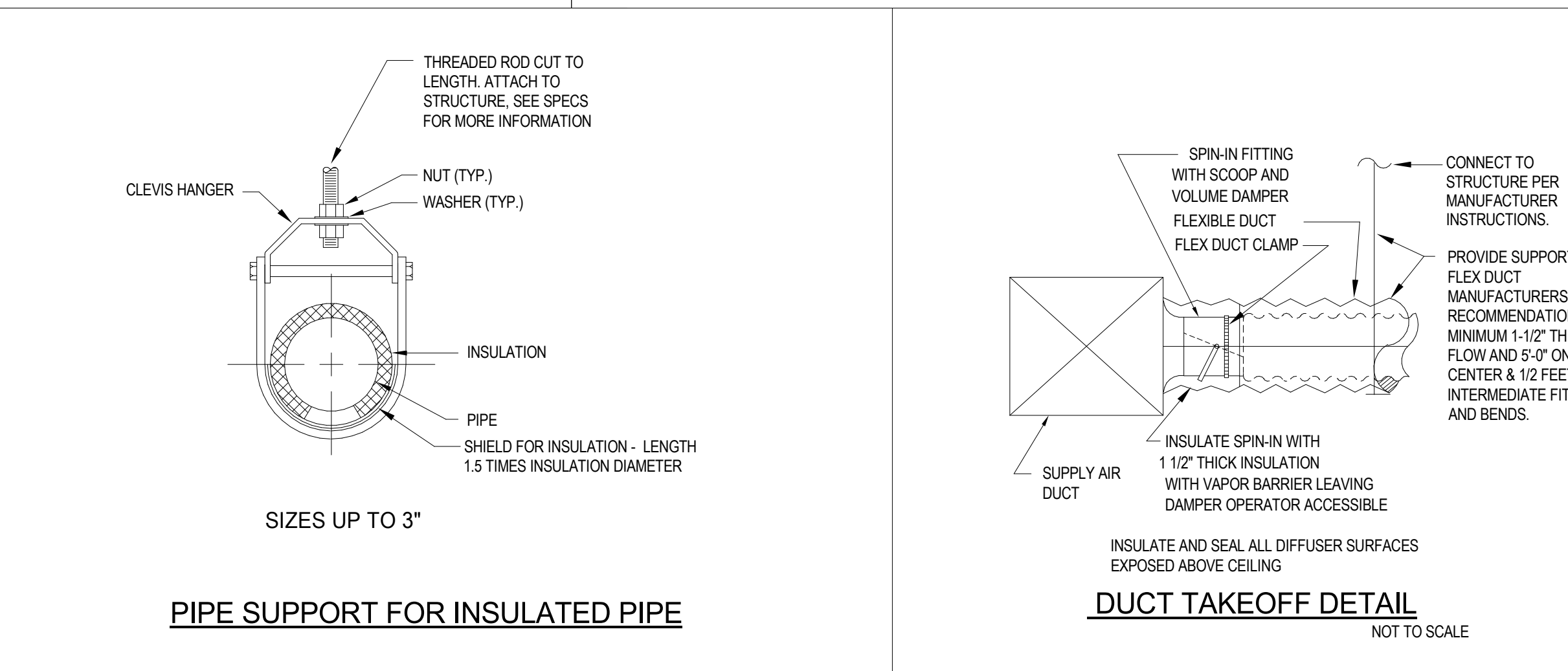
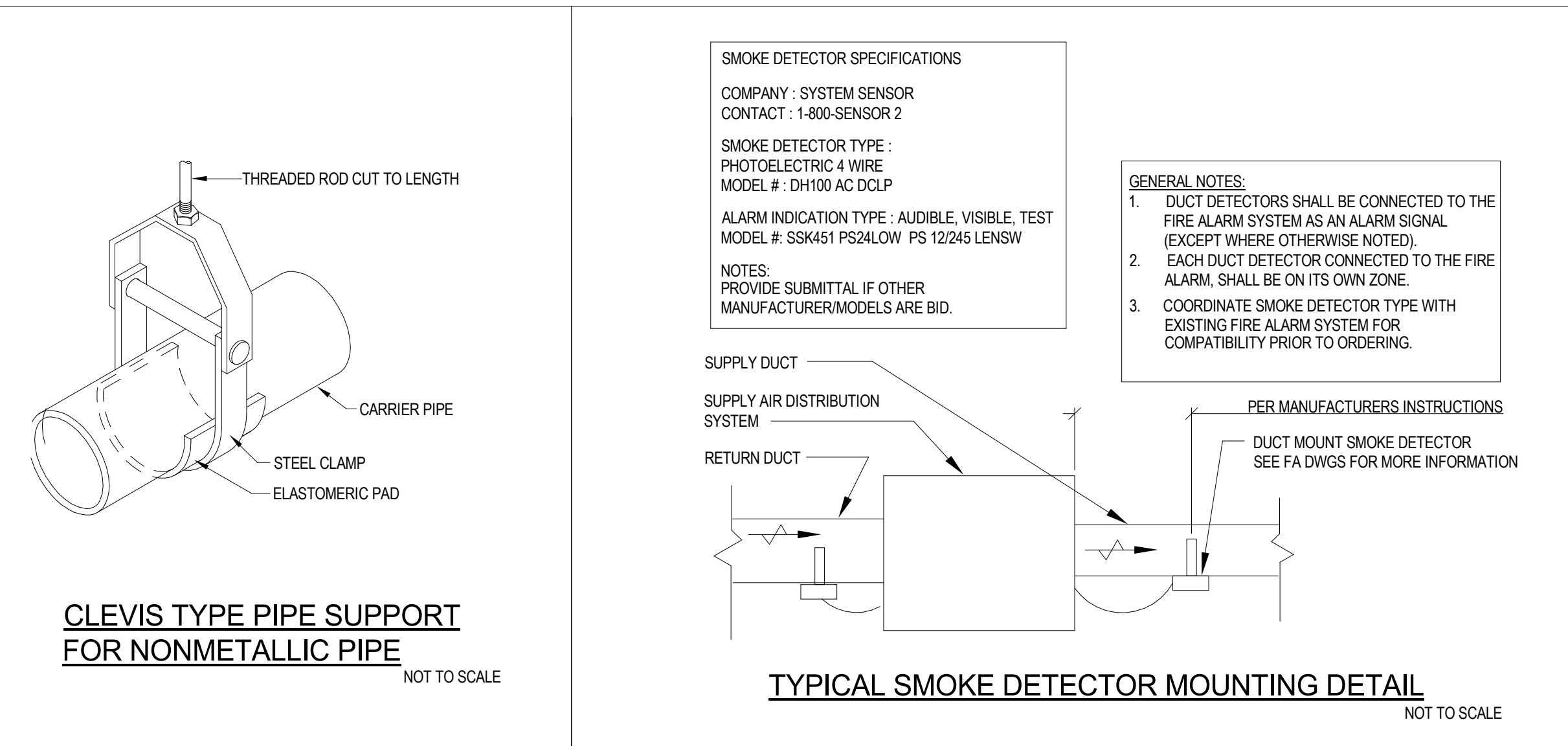
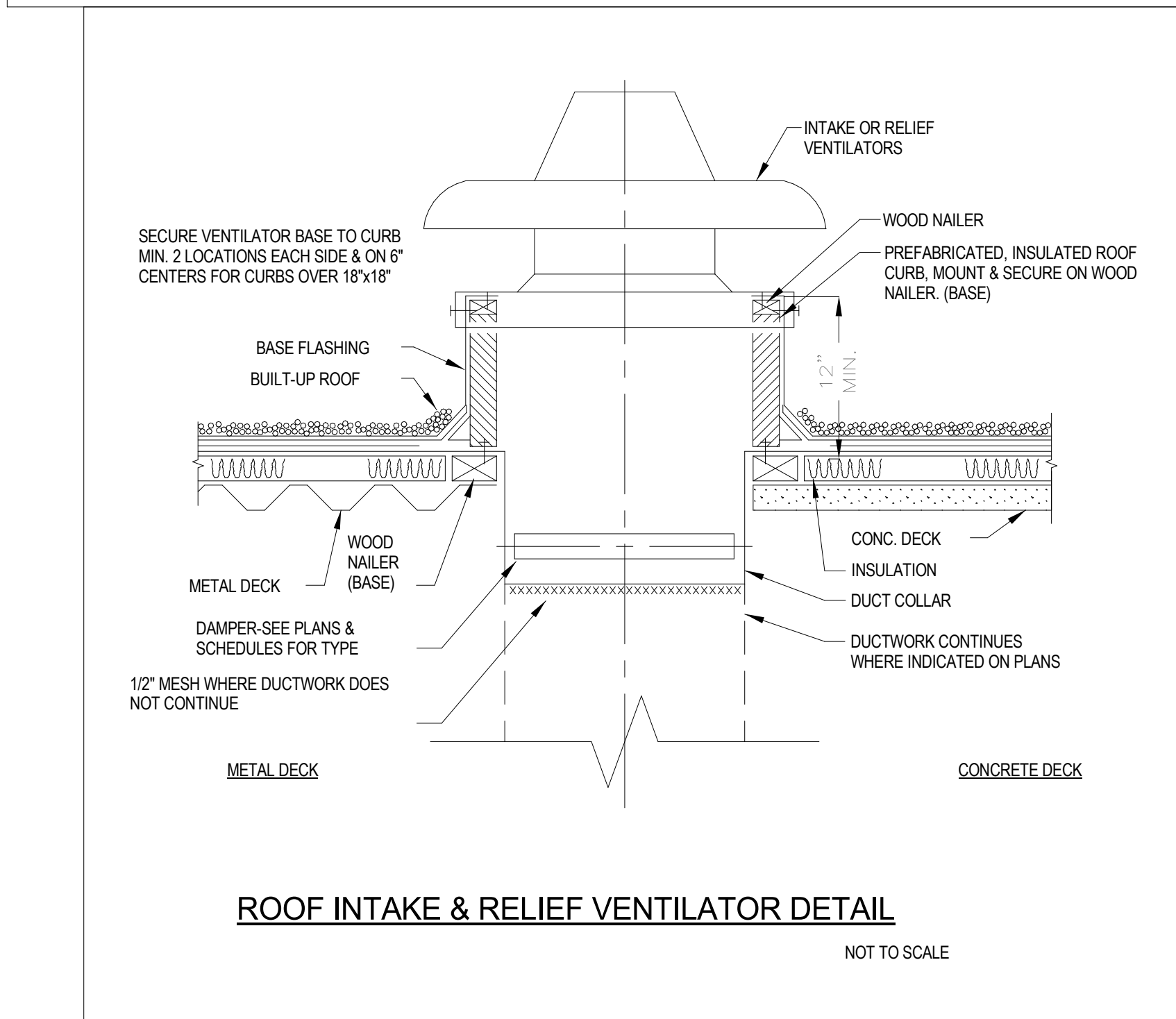
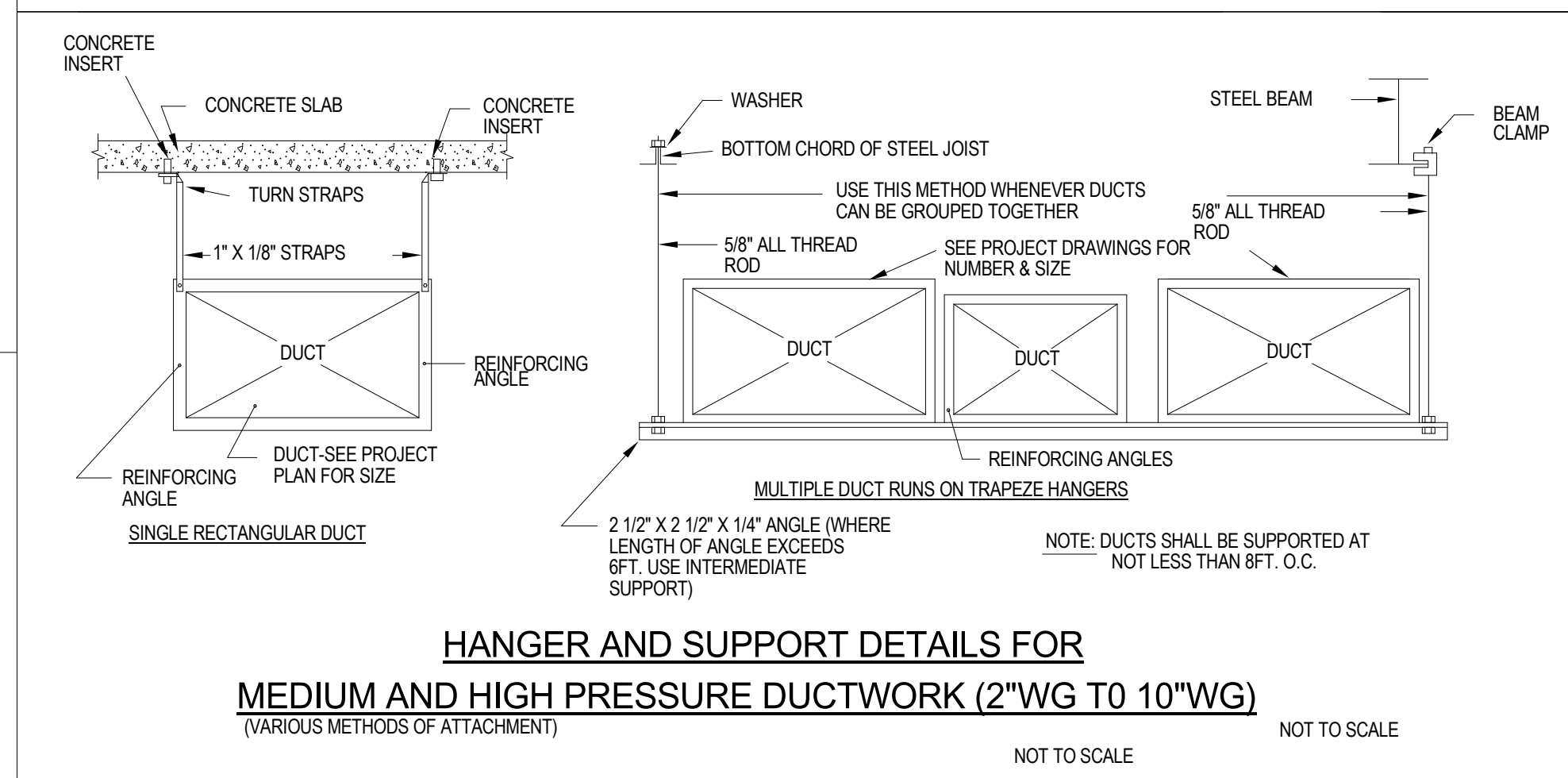
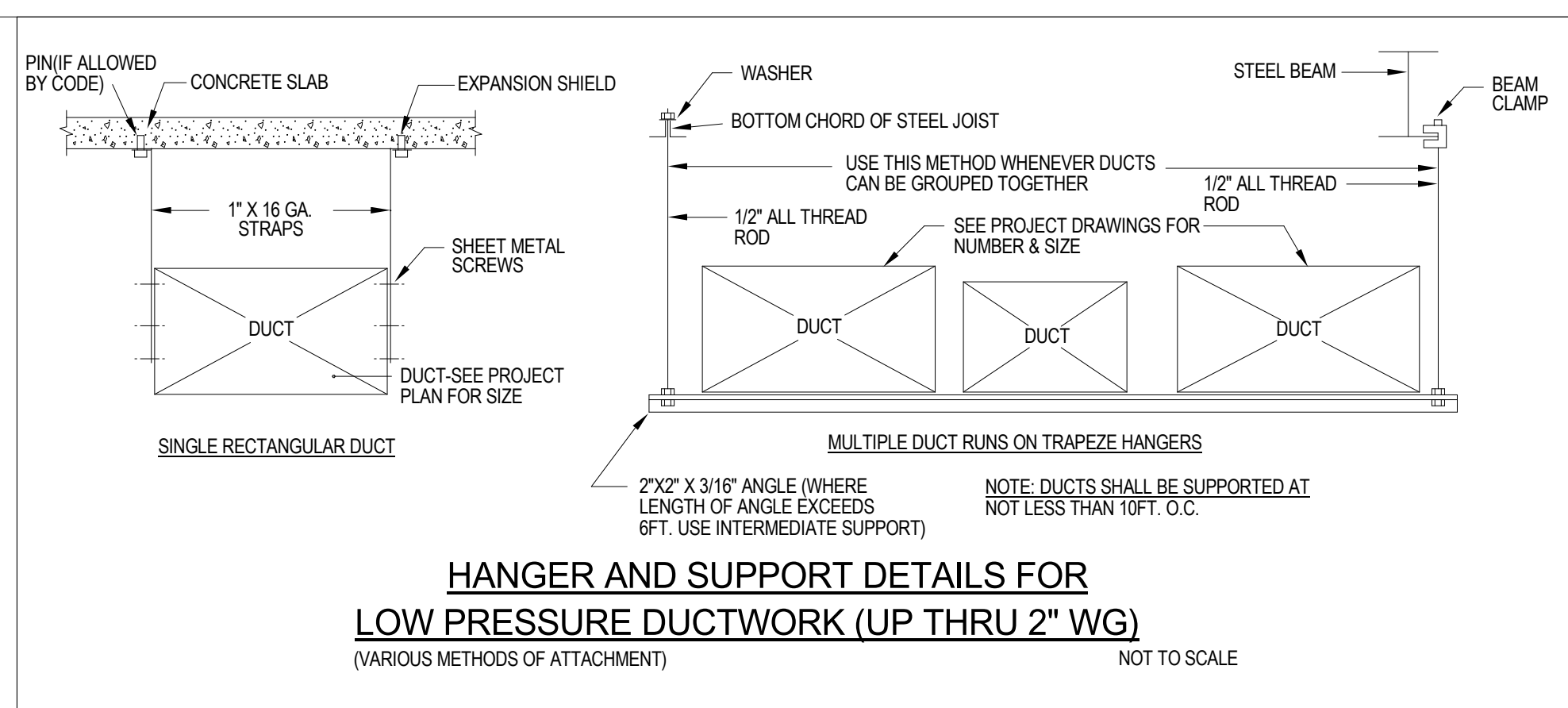
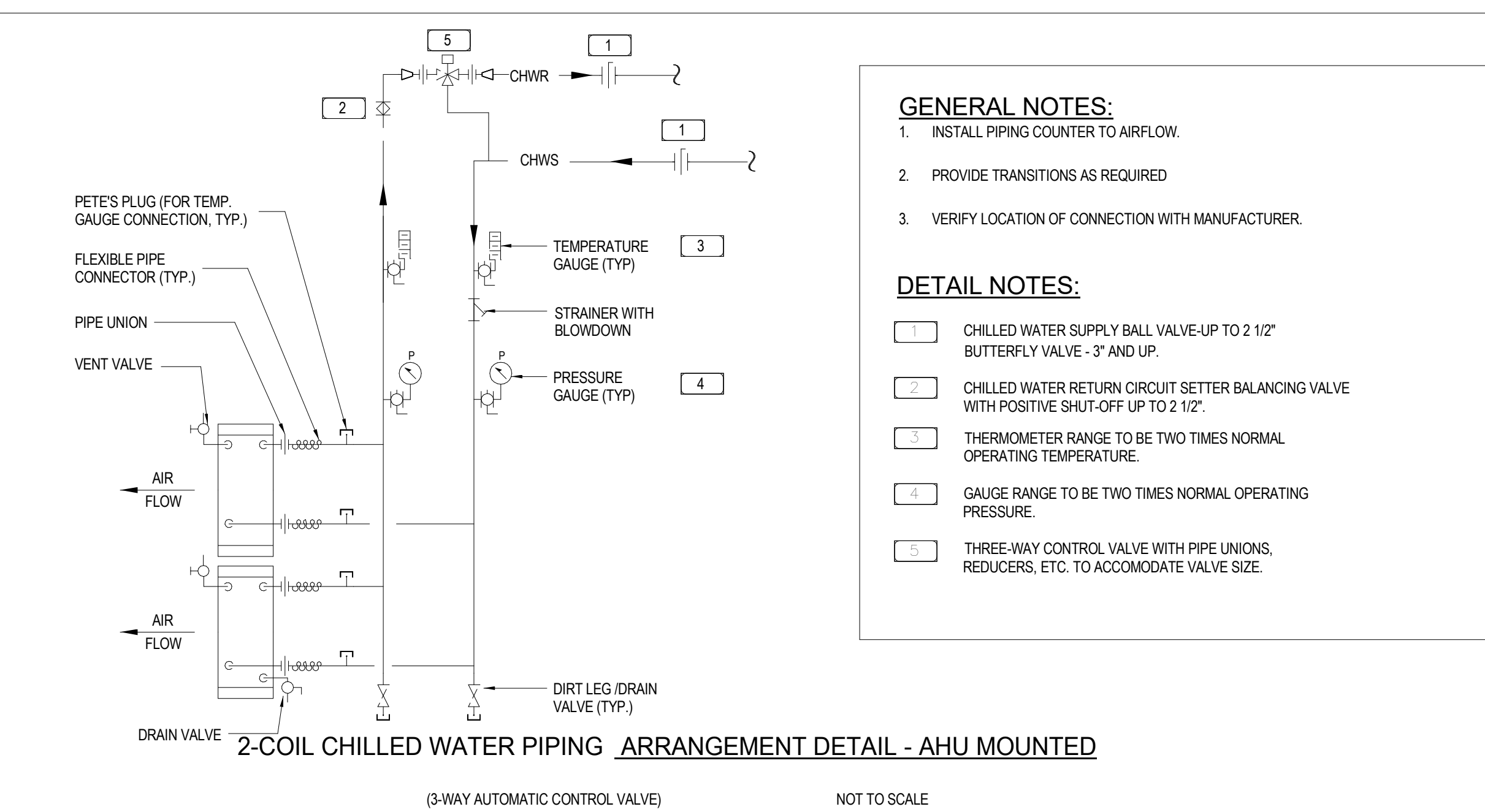
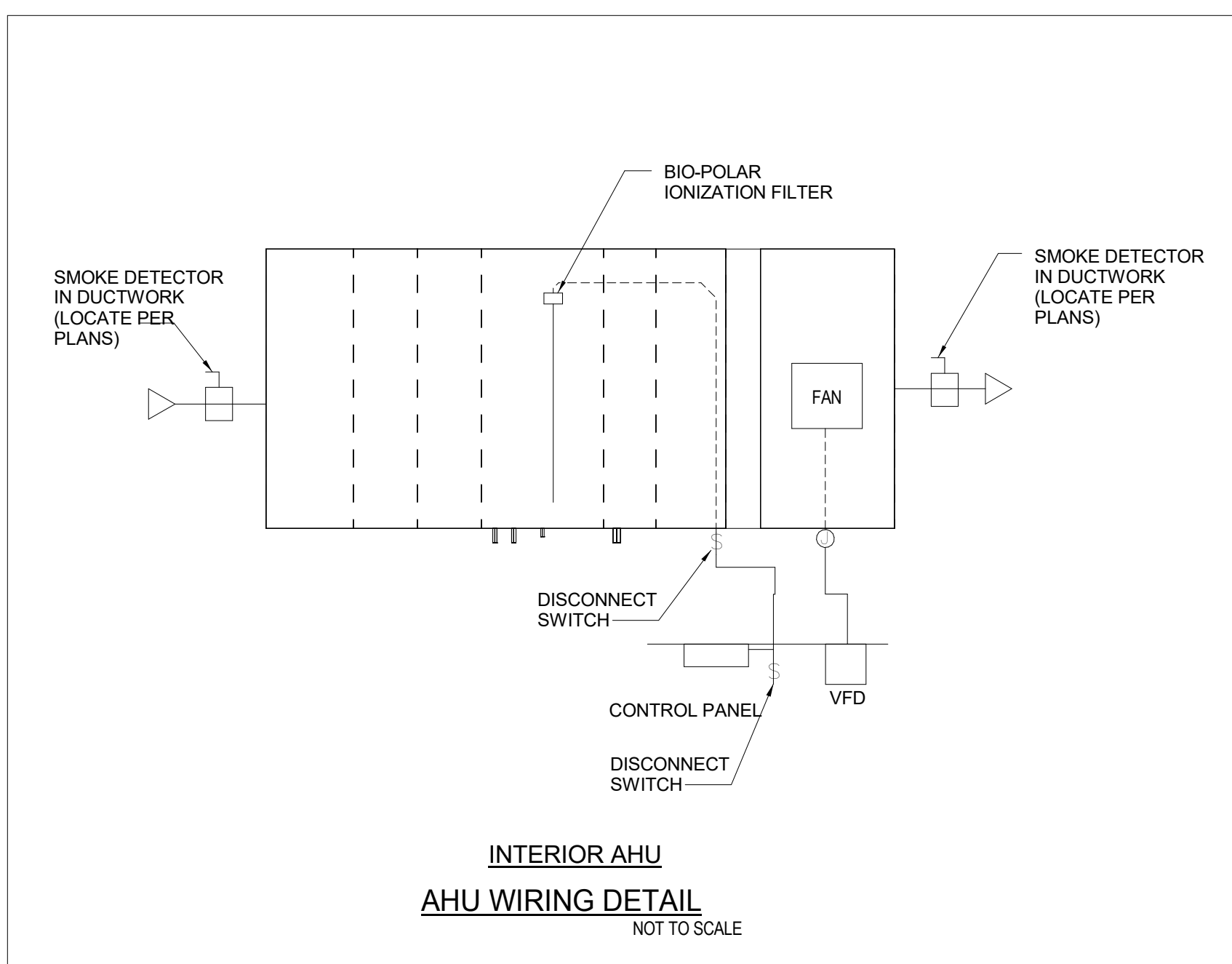
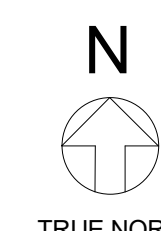
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DL

MECHANICAL DETAILS

Sheet No.:

M401



SYSTEM NO. W-J-5045  
XHEZ.W-J-5045  
Through-penetration Firestop Systems

Page Bottom:

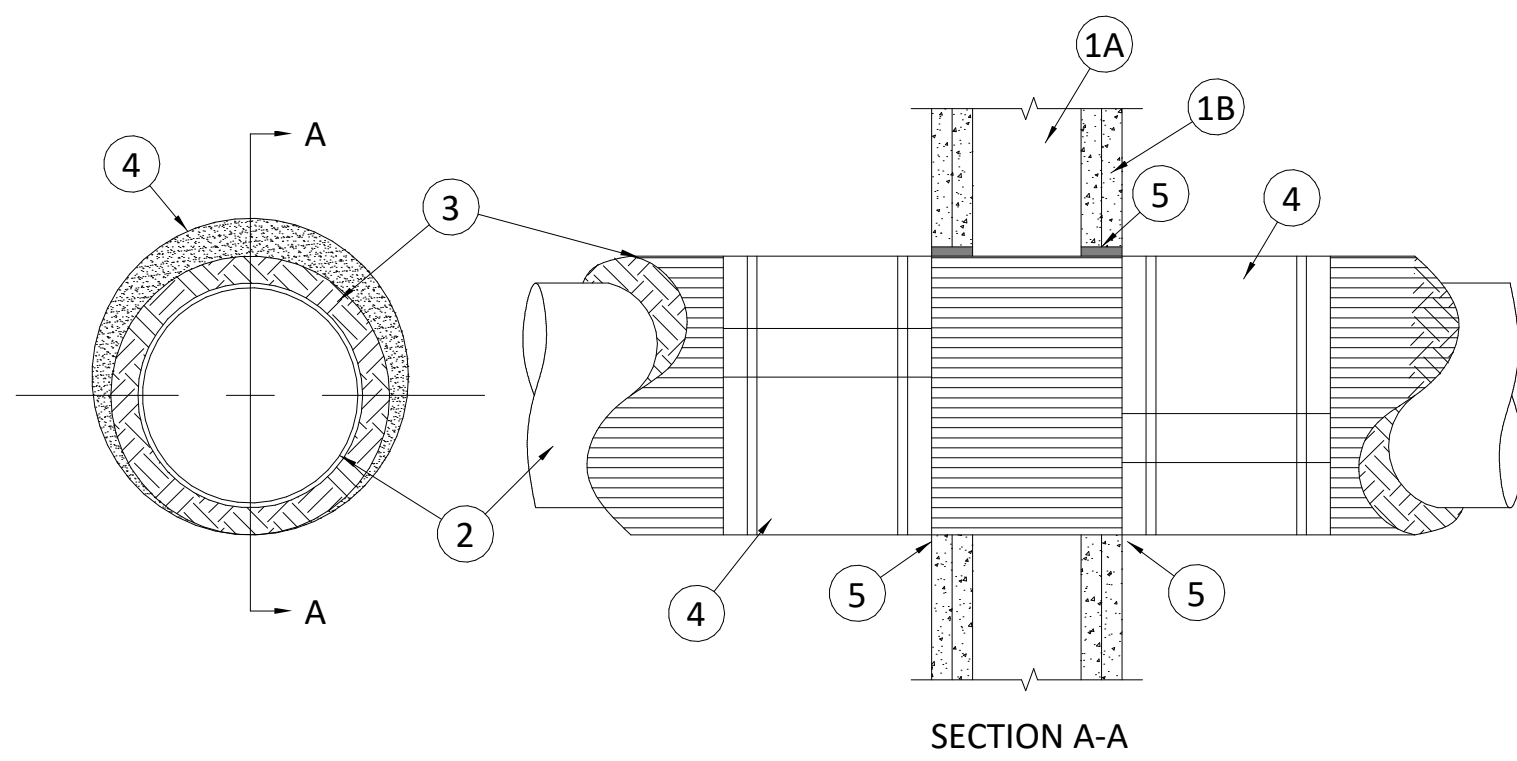
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- Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
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- Only products which bear UL's Mark are considered Certified.

XHEZ - Through-penetration Firestop Systems

SYSTEM NO. W-J-5045

May 19, 2005  
F Ratings – 1 and 2 Hr (See Item 1)  
T Ratings – 1/2, 1 and 1-1/2 Hr (See Item 3)



1. Wall Assembly – The 1 or 2 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400 or V400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:

- A. Studs – Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 3.58 in. (92 mm) wide and spaced max 24 in. (610 mm) OC.
- B. Gypsum Board – Nom 5/8 in. (16 mm) thick gypsum board, as specified in the individual Wall and Partition Design. Max diam of opening is 14-1/2 in. (368 mm) for wood stud walls and 20 in. (508 mm) for steel stud walls.

1A. Steel Sleeve – (Optional, Not Shown) – Cylindrical sleeve fabricated from min 0.019 in. (0.48 mm) thick (No. 28 gauge) galv sheet steel and having a min 2 in. (51 mm) lap along the longitudinal seam. Length of steel sleeve to be equal to thickness of wall plus 1 in. (25 mm) such that, when installed, the ends of the sleeve will project approx 1/2 in. (13 mm) beyond the surface of the wall on both sides of the wall assembly. Sleeve installed by coiling the sheet steel to a diam smaller than the through opening, inserting the coil through the openings and releasing the coil to let it uncoil against the circular cutouts in the gypsum board layers.

2. Through Penetrants – One metallic pipe or tubing to be positioned within the firestop system. Pipe or tubing to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes or tubing may be used:  
A. Steel Pipe – Nom 12 in. (305 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.  
B. Copper Tubing – Nom 6 in. (152 mm) diam (or smaller) Type L (or heavier) copper tubing.  
C. Copper Pipe – Nom 6 in. (152 mm) diam (or smaller) Regular (or heavier) copper pipe.

3. Pipe Covering Materials – Cellular Glass Insulation – Nom 1-1/2 to 3 in. (38 to 76 mm) thick cellular glass units sized to the outside diam of the steel pipe and supplied in nom 24 in. (610 mm) long half sections or nom 18 in. (457 mm) long segments. Pipe insulation installed on pipe in accordance with the manufacturer's instructions. The annular space between insulation and sleeve or edge of opening shall be min 0 in. (0 mm, point contact) to max 1-1/4 in. (32 mm) T Rating is 1/2 hr when nom 1-1/2 in. (38 mm) thick pipe insulation is used in 1 hr and 2 hr fire rated wall assembly. T Rating is 1 hr when nom 3 in. (76 mm) thick pipe insulation is used in 1 hr fire rated wall assembly. T Rating is 1-1/2 hr when nom 3 in. (76 mm) thick pipe insulation is used in 2 hr fire rated wall assembly.

4. Metal Jacket – Min 12 in. (305 mm) long jacket formed of min 0.010 in. (25 mm) thick steel or aluminum sheet cut to wrap tightly around the pipe insulation with a min 2 in. (51 mm) lap. Jacket secured with min 1/2 in. (13 mm) wide stainless steel hose clamps or bands located within 2 in. (51 mm) of each end of the jacket and spaced a max of 10 in. (254 mm) O.C. Jacket to be installed with edges abutting surface of caulk fill material (Item 5) on both surfaces of wall. Metal jacket to be used in addition to any other jacking material which may be required or desired on the pipe insulation.

5. Fill, Void or Cavity Materials – Caulk or Sealant – Installed to fill annular space to a min depth of the gypsum board, flush with both surfaces of wall. A min 1/2 in. (13 mm) diam bead of caulk shall be applied to the pipe insulation/gypsum board interface at the point contact location on both sides of wall.

3M COMPANY – CP 25WB+ IC 15WB+ caulk or FB-3000 WT sealant  
\* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

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Example:  
A 12 in. x 12 in. (305mm x 305mm) damper would require a minimum clearance of 1/4 in. (6mm) on width and 1/4 in. (6mm) on height.  
A 48 in. x 12 in. (1219mm x 305mm) damper would require a minimum clearance of 1/2 in. (13mm) on width and 1/4 in. (6mm) on height.

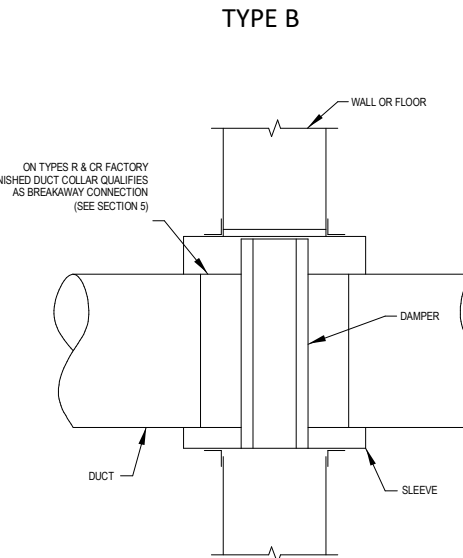
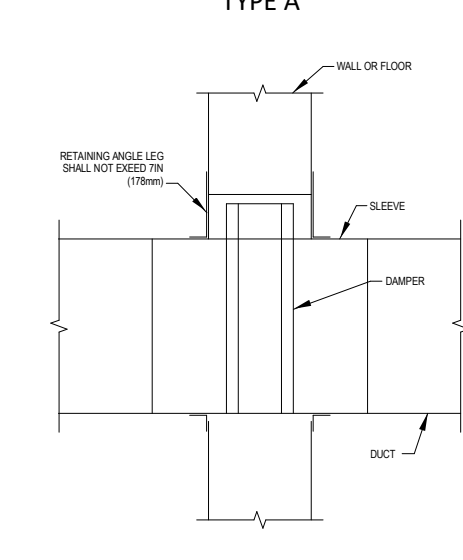
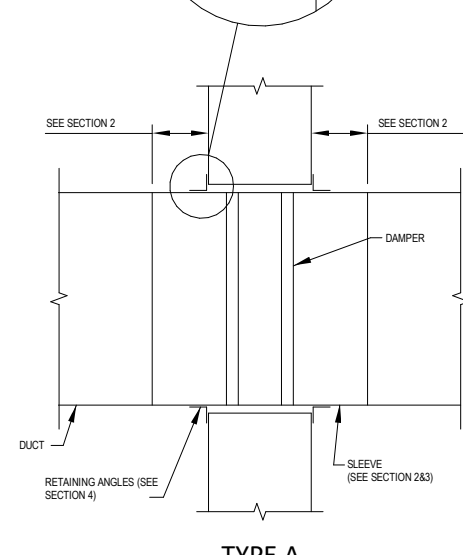
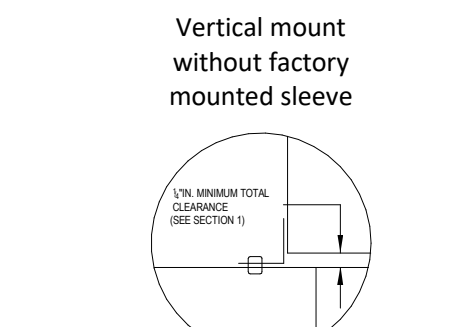
2. GAUGES AND LENGTHS OF FIRE DAMPER SLEEVES  
All the dampers must be installed in a steel sleeve of the required gauge and length. See Table 1 for required minimum sleeve gauges. Maximum sleeve thickness is 10 gauge (3.5mm). Sleeve inside dimensions must equal damper outside dimensions.

Sleeves shall extend a maximum of 6 in. (152mm) beyond the wall or floor opening on each side (see Figure 1). When an access door is incorporated as a part of sleeve, the sleeve may extend a maximum of 16 in. (406mm) beyond the wall or floor opening on the access door side.

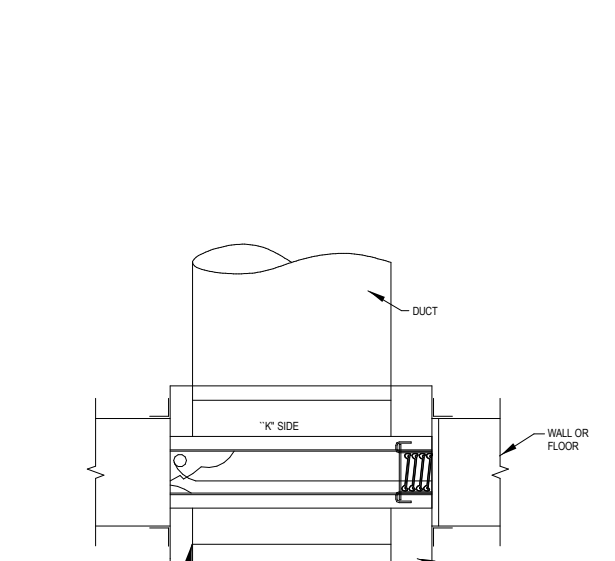
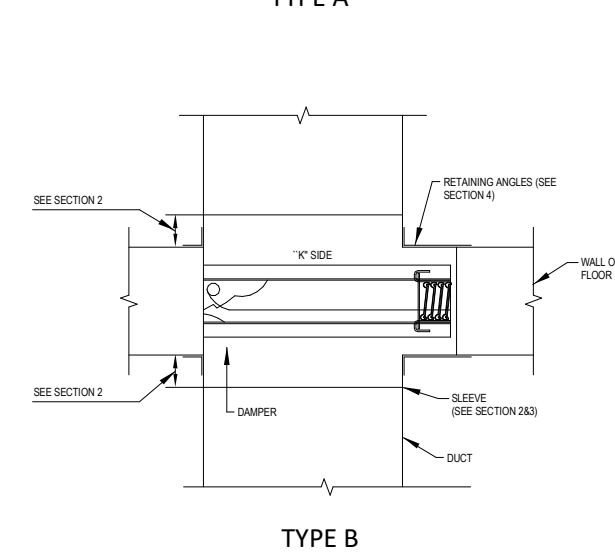
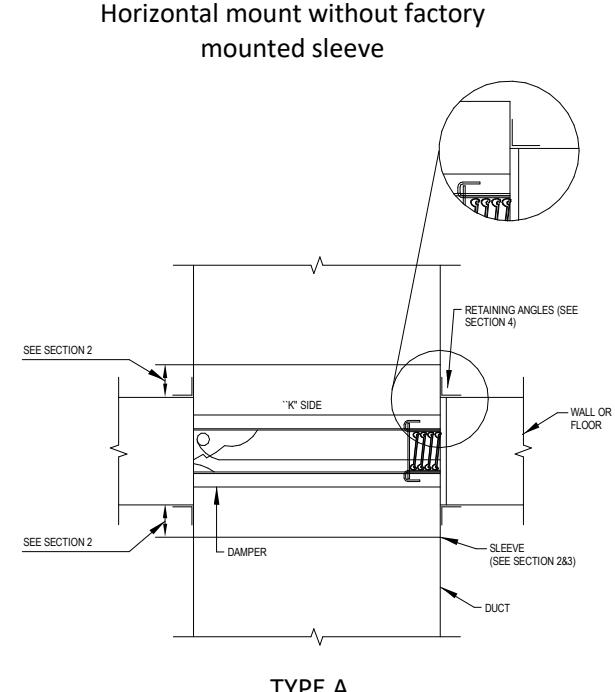
Sleeve Gauge	Duct Dimension	Type of Duct to Sleeve Connection Permitted
14 ga. (0.075 in.) - 10 ga. (0.138 in.) [2mm - 3.5mm]	All Duct Sizes	Rigid or Breakway
16 ga. (0.060 in.) [1.5mm]	36 in. (914mm) max. width/24 in. (610mm) max. width/24 in. (610mm) diameter	Rigid or Breakway
16 ga. (0.060 in.) [1.5mm]	All Duct Sizes	Breakway only
18 ga. (0.048 in.) [1.2mm]	85 in. (2159mm) wide and over	
20 ga. (0.036 in.) [0.9mm]	55 in. - 84 in. wide (1397mm - 2134mm)	
22 ga. (0.030 in.) [0.76mm]	31 in. - 54 in. wide (787mm - 1372mm)	
24 ga. (0.024 in.) [0.6mm]	13 in. - 30 in. wide (330mm - 762mm)	
26 ga. (0.018 in.) [0.46mm]	12 in. wide and under (305mm)	

Sleeve thickness must not be less than the gauge of the connecting duct. UL Standard 555 requires all ducts to terminate at fire damper sleeves.

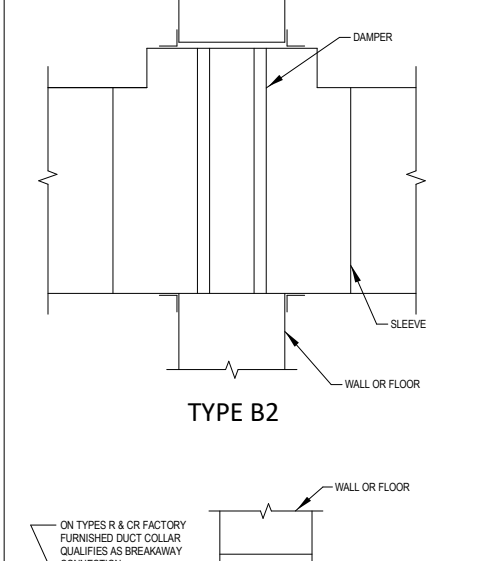
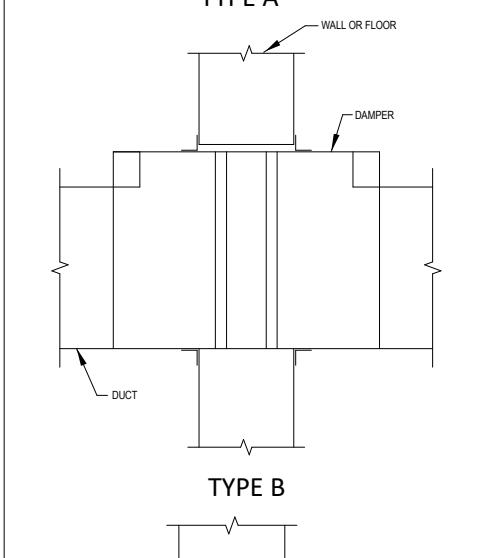
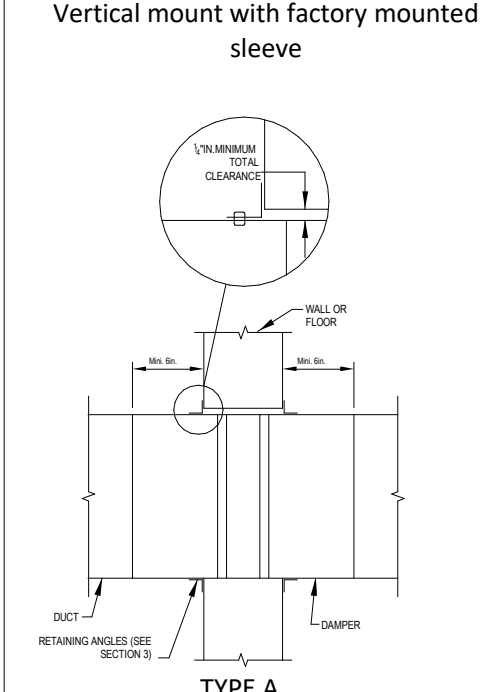
Table 1: Minimum sleeve thickness for fire dampers.



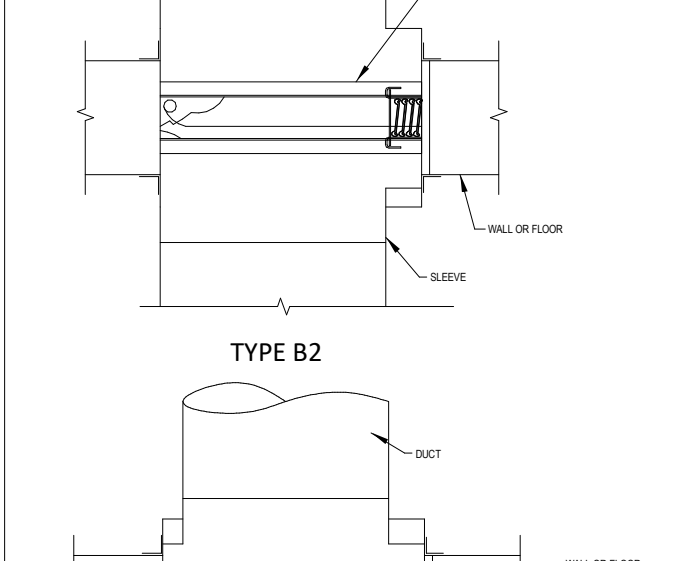
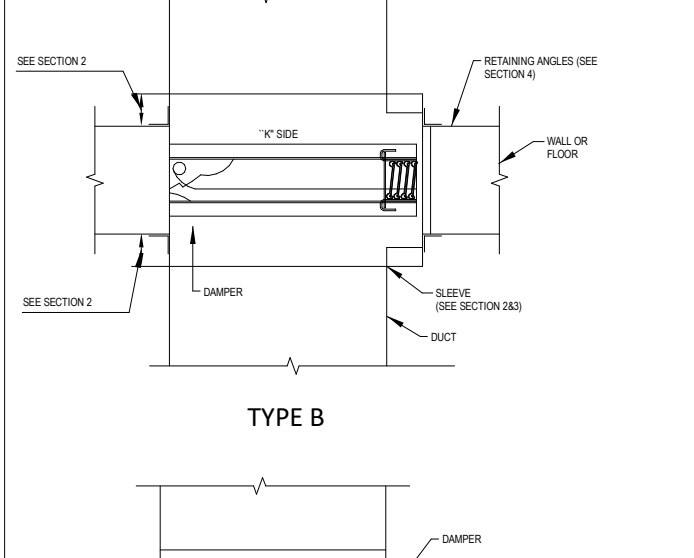
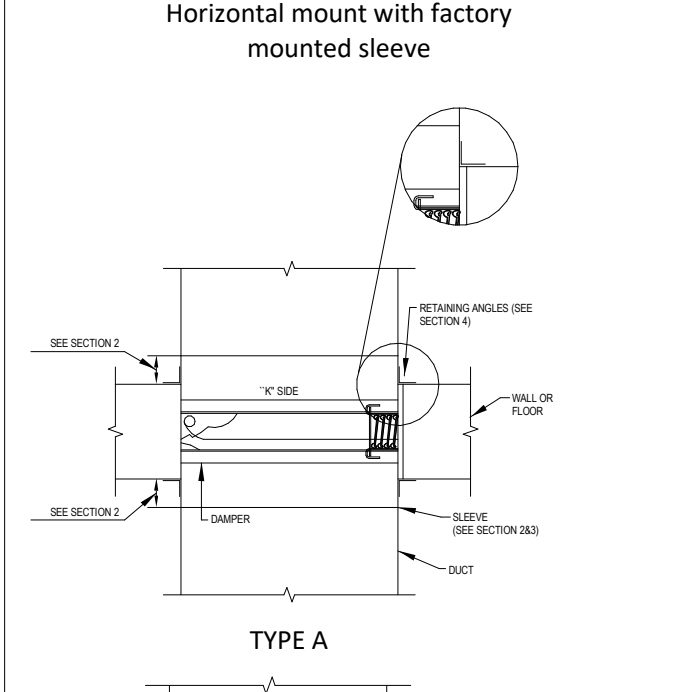
When damper installed vertically, the blade stack must be on the top.



When dampers installed horizontally, the ramp must be positioned up as shown in above drawings.



When dampers installed vertically, the blade stack must be on the top.



When dampers installed horizontally, the ramp must be positioned up as shown in above drawings.

SYSTEM NO. W-J-5011  
XHEZ.W-J-5011  
Through-penetration Firestop Systems

Page Bottom:

Design/System/Construction/Assembly Usage Disclaimer

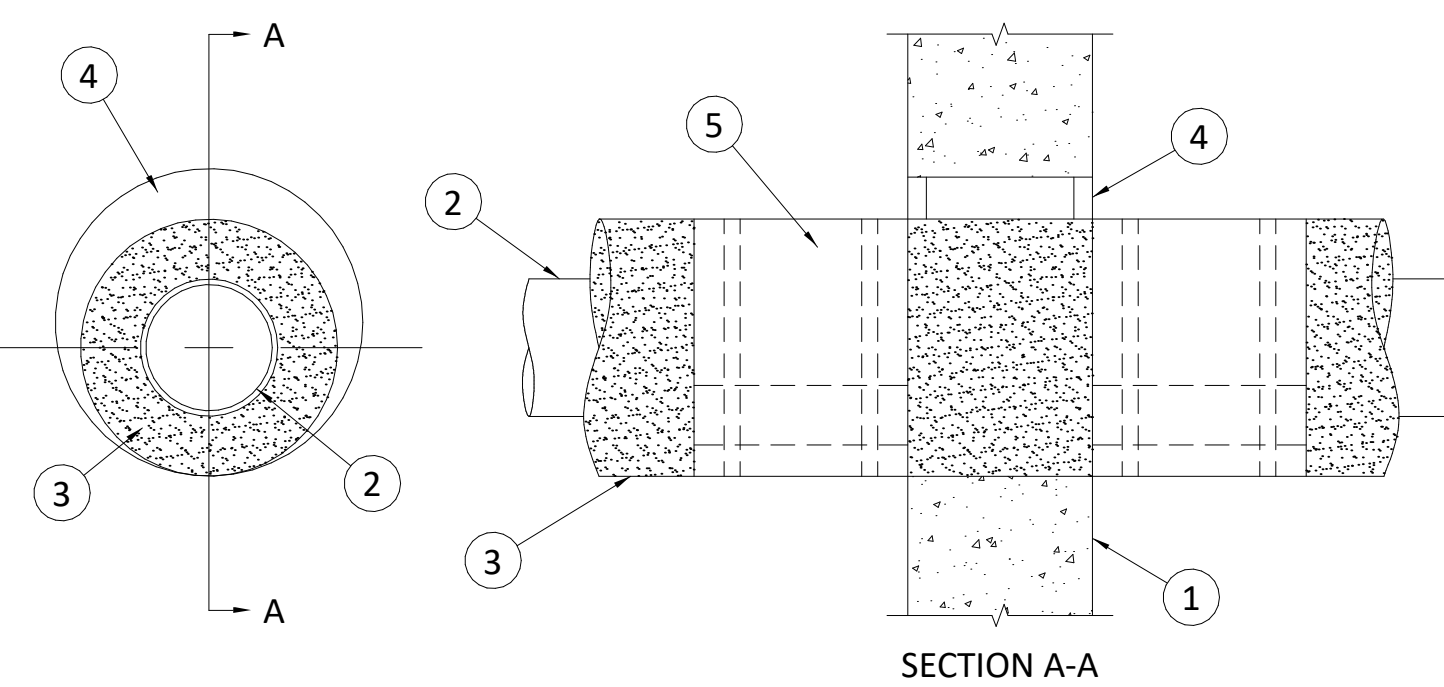
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XHEZ - Through-penetration Firestop Systems

SYSTEM NO. W-J-5011

December 09, 2008  
F Rating – 2 Hr  
T Ratings – 3/4, 1, 1-1/2 and 2 Hr (See Item 3)

L Rating At Ambient – Less Than 1 CFM/sq ft  
L Rating At 400 F – Less Than 1 CFM/sq ft



1. Wall Assembly – Min 6 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified Concrete Blocks\*. Max diam of opening is 20 in.

See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. Through Penetrant – One metallic pipe or tubing to be installed either concentrically or eccentrically within the firestop system. Pipe or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes or tubing may be used:

- A. Steel Pipe – Nom 16 in. diam (or smaller) Schedule 10 (or heavier) steel pipe.
- B. Iron Pipe – Nom 16 in. diam (or smaller) cast or ductile iron pipe.
- C. Copper Tubing – Nom 6 in. diam (or smaller) Type L (or heavier) copper tubing.
- D. Copper Pipe – Nom 6 in. diam (or smaller) Regular (or heavier) copper pipe.

3. Pipe Covering Materials – Cellular Glass Insulation – Nom 1 to 3 in. thick cellular glass units sized to the outside diam of the through-penetrant and supplied in nom 24 in. long half sections or nom 18 in. long segments. Pipe insulation installed on pipe in accordance with the manufacturer's instructions. The annular space between insulated pipe or tubing and periphery of opening shall be min 0 in. (point contact) to max 1-1/2 in. When nom 1 in. thick insulation is used, T Rating is 3/4 hr. When nom 1-1/2 in. thick insulation is used, T Rating is 1 hr. When nom 2 in. thick insulation is used, T Rating is 1-1/2 hr. When nom 3 in. thick insulation is used, T Rating is 2 hr.

PITTSBURGH CORNING CORP – FOAMGLAS

4. Fill, Void or Cavity Materials – Sealant – Min 5/8 in. thickness of fill material applied within the annular flush with both surfaces of wall. At point contact location, min 3/8 in. diam bead of fill material to be applied at insulated metal pipe/concrete interface on both sides of wall.

SPECIFIED TECHNOLOGIES INC – SpecSeal Series SSS Sealant or SpecSeal LCI Sealant

5. Metal Jacket – Min 12 in. long jacket formed of min 0.010 in. thick aluminum sheet cut to wrap tightly around the pipe insulation with a min 2 in. lap and secured using bands and seals of similar material. Bands to be located within 2 in. of each end of the jacket and spaced max 10 in. OC. Jacket to be installed with edge abutting surface of fill material (Item 4) on each side of wall. Metal jacket may be used in addition to any other jacking material which may be required or desired on the pipe insulation.

\* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

Last Updated on 2008-12-09

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Client:



Consultants:

EOR Stamp:



09/29/2016  
Dalrio A. Lewis, PE 77571 (FL)

Project:  
Barnett Park AHU Replacement

Location:  
4801 W Colonial Dr, Orlando, FL, 32808

Issuance:  
PERMIT DOCUMENTS

Revisions:

#	Date	Description

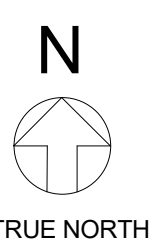
Date:  
09/29/2016  
Project Number:  
16.OC.027

Drawn By: SE  
Checked By: DL

MECHANICAL DETAILS

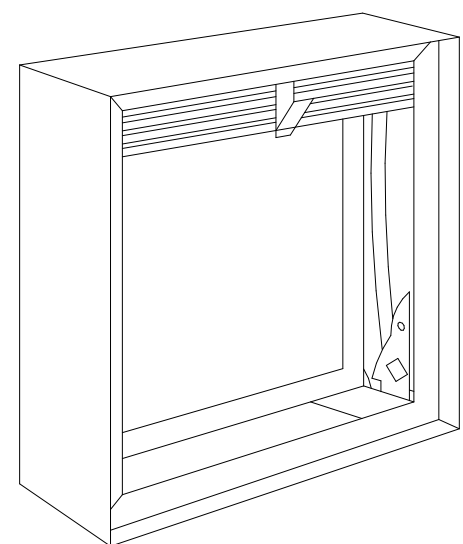
Sheet No.:

M402



Document Number 452763  
FD, DFD, SSFD, SSDFD, & KFD Models  
\*11/2 and 3 Hour Curtain Fire Dampers  
Vertical and Horizontal Mount

Installation, Operation and Maintenance Instructions



FD, DFD, SSFD, & KFD models are intended for installation in accordance with fire damper requirements established by:  
National Fire Protection Association  
NFPA Standard 90, 90A, & 101  
IBC International Building Code  
CSFM California State Fire Marshal  
Fire Damper Listing (#3225-0861-102)  
New York City (BSA/MEA listing #260-91-M)

\*UL CLASSIFIED (see complete marking on product)  
\*UL CLASSIFIED to Canadian safety standards (see complete marking on product)  
UL Standard 555 (Listing #R13317)

**SAFETY WARNING:**  
Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating, and maintenance instructions thoroughly before installing or servicing this equipment.

**WARRANTY:**  
Greenheck warrants this equipment to be free from defects in material and workmanship for a period of one year from the shipment date. Any units or parts which prove to be defective during the warranty period will be repaired or replaced at our option. Greenheck shall not be liable for damages resulting from misapplication or misuse of its products. Greenheck will not be responsible for any installation or removal costs. Greenheck will not be responsible for any service work or backcharges without prior written authorization.

**RECEIVING AND HANDLING:**  
Upon receiving dampers, check for both obvious and hidden damage. If damage is found, record all necessary information on the bill of lading and file a claim with the final carrier. Check to be sure that all parts of the shipment, including accessories, are accounted for. Dampers must be kept dry and clean. Indoor storage and protection from dirt, dust and the weather is highly recommended. Do not store at temperatures in excess of 100°F (38°C).

Due to continuing research, Greenheck reserves the right to change specifications without notice.

This manual is the property of the owner, and is required for future maintenance. Please leave it with the owner when the job is complete.

Client:



THE  
**SCOTT**  
PARTNERSHIP  
ARCHITECTURE  
INC.

1900  
Summit  
Tower  
Blvd  
Suite  
260  
Orlando  
FL  
32810  
407 660 2766  
Fax 407 875 3276  
SL@AACC01155

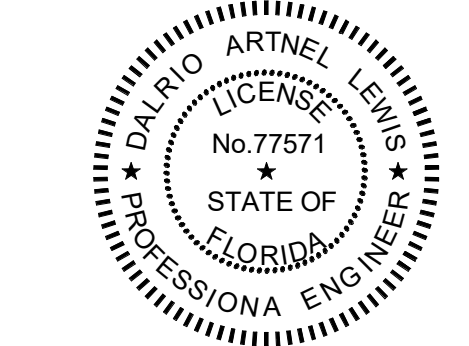
PROJECT

■ SIGN / SEAL  
■ CONSULTANT

PROJECT  
**BARNETT PARK  
RECREATION FACILITY**  
**ORANGE COUNTY**  
PARKS AND RECREATION DEPARTMENT

Consultants:

EOR Stamp:



09/29/2016  
Dalrio A. Lewis, PE 77571 (FL)

Project:  
Barnett Park AHU  
Replacement

Location:  
4801 W Colonial Dr,  
Orlando, FL, 32808

Issuance:  
**PERMIT  
DOCUMENTS**

SHEET INFO.

DATE: 13 MAY 1994  
DRAWN BY: SBC  
CHECKED BY: SBC  
PROJECT NO: 92033TSPA

REVISIONS

▲ PERMIT SET : 8 AUGUST 1994  
○ OGD PERMIT REVIEW : 22 DEC 1994  
▲ REV 3 (OGD REV) : 28 APR 95  
▲ FINAL PERMIT : 25 MAY 1995

SHEET TITLE

09/29/2016  
Project Number:  
16.OC.027

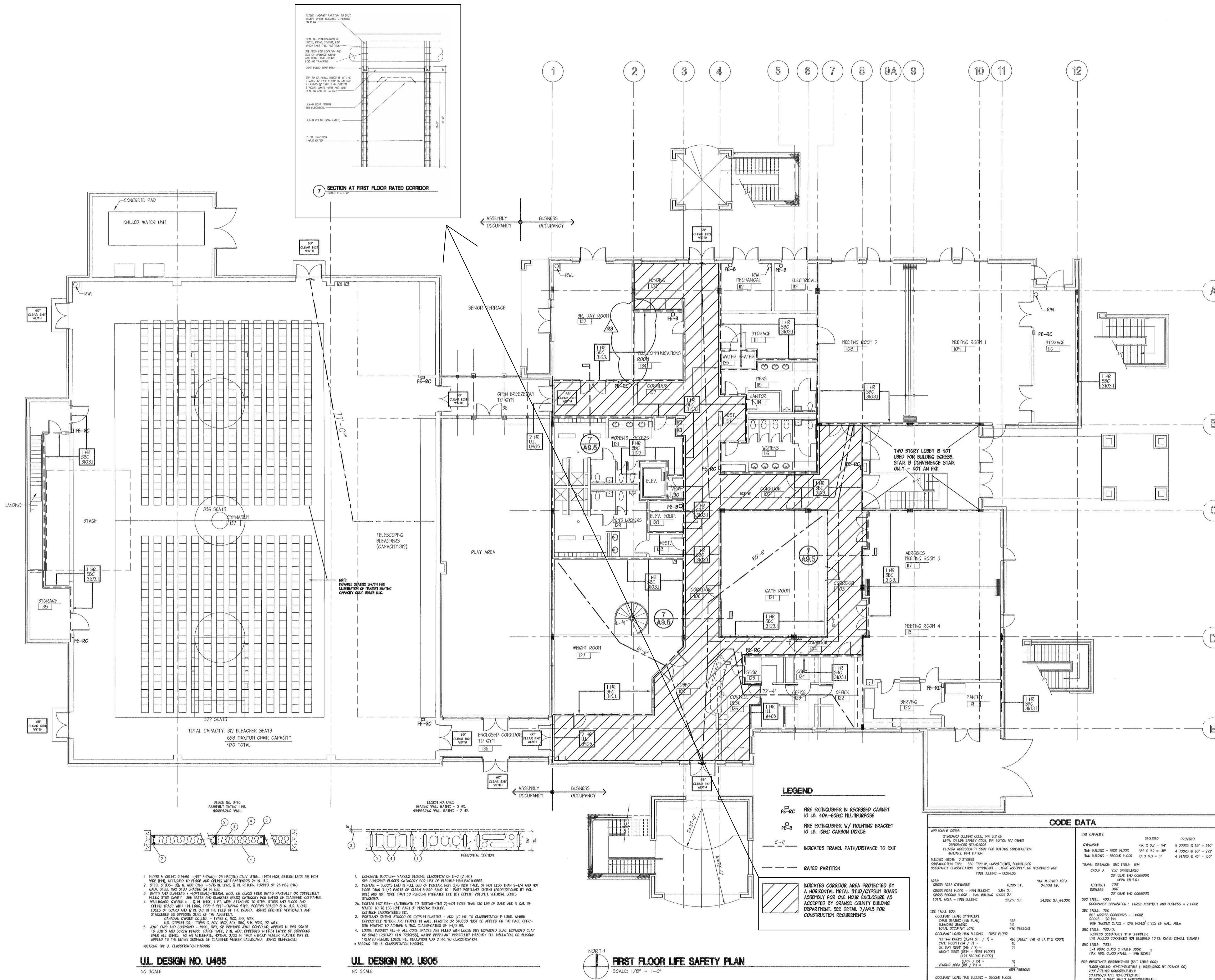
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Checked By: DL

**A2.1**

**MECHANICAL  
DETAILS**

Sheet No.:

**M403**



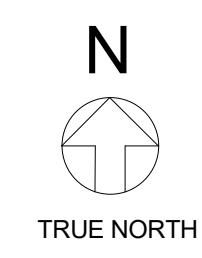
**U.L. DESIGN NO. U465**  
NO SCALE

**U.L. DESIGN NO. U805**  
NO SCALE

**FIRST FLOOR LIFE SAFETY PLAN**  
SCALE: 1/8" = 1'-0"

THIS SHEET IS FOR REFERENCE  
PURPOSES ONLY FOR CONSTRUCTION  
OF FIRE RATED LID.

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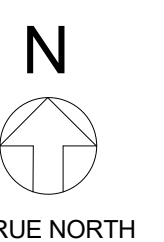
Project Number:  
16.OC.027

Drawn By: SE	Checked By: DL
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**MECHANICAL CONTROLS**

Sheet No.:

**M501**



CONTROLS LEGEND					
SYMBOL	ABB.	DESCRIPTION	SYMBOL	ABB.	DESCRIPTION
	AHU	AIR HANDLING UNIT		DTS	DUCT TEMPERATURE SENSOR
	CO2	CARBON DIOXIDE SENSOR - WALL MOUNTED		EDH	ELECTRIC DUCT HEATER
	OC	OCCUPANCY SENSOR (DUAL TECHNOLOGY - IR/MOTION), CEILING MOUNTED.		FLT	FILTER
	CC	COOLING COIL		FRT	FREEZE STAT
	CCP	CENTRAL CONTROL PANEL		CP	PROGRAMMABLE CONTROLLER
	CHWV	CHILLED WATER VALVE		OTS	OUTSIDE TEMPERATURE SENSOR
	CSS	CURRENT SENSING SWITCH		SP	SURGE PROTECTION
	CSSR	CURRENT SENSING SWITCH WITH RELAY		STHS	SPACE TEMPERATURE HUMIDITY SENSOR
	CT	CURRENT TRANSMITTER		VFD	VARIABLE FREQUENCY DRIVE
	MD	MOTORIZED DAMPER		DSD	DUCT SMOKE DETECTOR
	DPS	DIFFERENTIAL PRESSURE SWITCH		DHS	DUCT HUMIDITY SENSOR
	DPT	DIFFERENTIAL PRESSURE TRANSMITTER		FAN	FAN
	DCO	DUCT CARBON DIOXIDE SENSOR		TS	AVERAGING TEMPERATURE SENSOR
	SCO	SPACE CARBON DIOXIDE SENSOR		-	DIGITAL INPUT POINT TO CONTROL PANEL
	FM	AIR FLOW MONITORING STATION		-	DIGITAL OUTPUT POINT TO CONTROL PANEL
	TSO	OUTSIDE TEMP SENSOR		-	ANALOG INPUT POINT TO CONTROL PANEL
	HSO	OUTSIDE HUMIDITY SENSOR		-	ANALOG OUTPUT POINT TO CONTROL PANEL

**BAS CONTROL DIAGRAM AND SYSTEM DESCRIPTION**

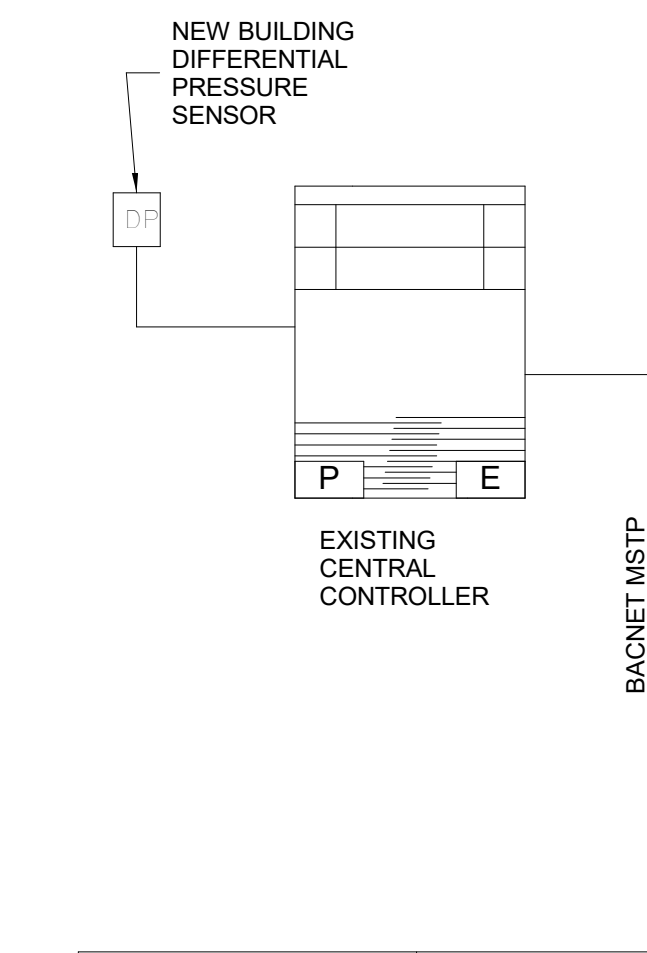
THE BUILDING AUTOMATION SYSTEM (BAS) WILL BE A WEB-BASED BASIS OF DESIGN. AUTOMATED LOGIC, SUPERVISORY CONTROLLER WILL BE CAPABLE OF COMMUNICATION VIA BACNET MSTP AND ARJNET PROTOCOL SIMULTANEOUSLY AT THE SYSTEM LEVEL, TO ALLOW FOR SEAMLESS INTEGRATION WITH FUTURE EQUIPMENT EXPANSIONS. USER INTERFACE WILL BE WEB BASED WITH ACCESS AVAILABLE VIA ANY STANDARD INTERNET BROWSER. SYSTEMS EMPLOYING LOCAL WORKSTATIONS OR PROPRIETARY PC SOFTWARE TO FACILITATE REMOTE ACCESS WILL NOT BE ACCEPTABLE.

AIR HANDLING UNIT CONTROLLERS SHALL BE CAPABLE OF INTERFACING WITH EXISTING BUILDING AUTOMATION SYSTEM. AIR HANDLING UNIT CONTROLLERS SHALL BE DASHY CHAINED PER MANUFACTURERS INSTALLATION INSTRUCTIONS. CONNECT NEW AHU CONTROLLERS TO EXISTING DASHY CHAINED SYSTEM.

EXHAUST FANS SHALL BE CONNECTED TO THE CLOSEST PROGRAMMABLE CONTROLLER.

IF THE BUILDING DIFFERENTIAL PRESSURE FALLS BELOW 0.00" IN H2O, INCREASE OUTSIDE AIR DAMPER POSITION ON ALL AHUS BY 10% UNTIL BOTH CO2 AND BUILDING DIFFERENTIAL PRESSURE ARE SATISFIED.

CONTROLS SHALL BE TIED INTO EXISTING TRANE TRACER CONTROLS AND NO OTHER CONTROLS SYSTEM SHALL BE IMPLEMENTED.



**EXHAUST FAN (NON LAB)**

**SEQUENCE OF OPERATIONS: EXISTING RESTROOM EXHAUST FANS (EF-B, EF-C)**

**OCCUPIED:**  
WHEN THE BUILDING IS SCHEDULED FOR OCCUPIED OPERATION, IF THE UNIT IS NOT ALREADY RUNNING, THE FAN SHALL BE STARTED.

**UNOCCUPIED:**  
WHEN THE BUILDING IS SCHEDULED FOR UNOCCUPIED OPERATION, THE FAN SHALL REMAIN OFF. CONTACT BACK TO BAS.

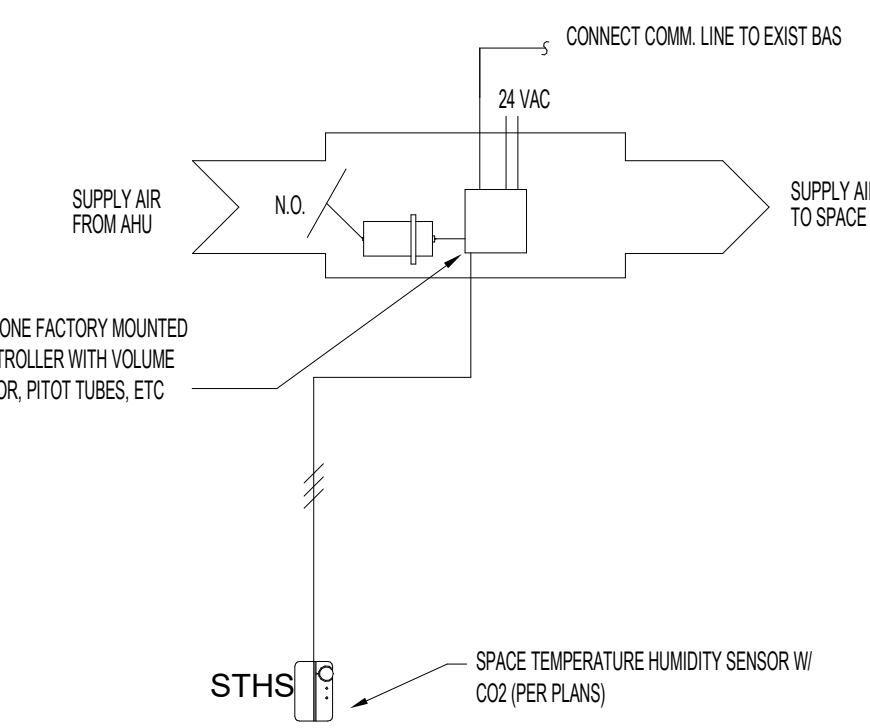
**FAN STATUS:**  
A CURRENT SENSOR SHALL BE USED TO VERIFY FAN OPERATION. IF CURRENT FALLS BELOW A PRESCRIBED LEVEL, AN ALARM SIGNAL SHALL BE SENT TO THE BAS.

EF - B - 3310 CFM  
EF - C - 1900 CFM

**CROSSOVER MOTORIZED DAMPER**

BUILDING AUTOMATION SYSTEM (BAS):  
THE BUILDING AUTOMATION SYSTEM SHALL SEND THE CROSSOVER MOTORIZED DAMPER OPEN/CLOSE BASED ON FAN FAILURE STATUS OF AHU-1R/AHU-2R.

CONNECT CROSSOVER MOTORIZED DAMPER TO AHU-1R BAS CONTROLLER.



**VARIABLE VOLUME TERMINAL (COOLING ONLY)**

**SEQUENCE OF OPERATION FOR SINGLE ZONE VARIABLE AIR VOLUME TERMINAL UNITS (VAV'S)**

GENERAL:  
ALL VAV TERMINAL UNITS SHALL HAVE STANDALONE D.D.C. ELECTRONIC CONTROL AND ELECTRICAL ACTUATED DAMPER MOTOR.

**BUILDING AUTOMATION SYSTEM INTERFACE:**  
THE BUILDING AUTOMATION SYSTEM (BAS) WILL SEND THE CONTROLLER OCCUPIED AND UNOCCUPIED COMMANDS. THE BAS MAY ALSO SEND PRIORITY SHUTDOWN, SPACE TEMPERATURE, AND SPACE TEMPERATURE SET POINT COMMANDS. IF COMMUNICATION IS LOST WITH THE BAS, THE VAV WILL OPERATE USING ITS LOCAL SET POINTS.

**COOL SET POINT:**  
THE SPACE TEMPERATURE SET POINT WILL BE DETERMINED EITHER BY A LOCAL SPACE SENSOR INPUT OR A COMMUNICATED VALUE. THE VAV SHALL USE THE STORED DEFAULT SET POINTS WHEN NEITHER A LOCAL SET POINT NOR COMMUNICATED SET POINT IS PRESENT.

**OCCUPANCY MODE:**  
THE OCCUPANCY MODE SHALL BE COMMUNICATED VIA THE BAS. VALID OCCUPANCY MODES FOR THE VAV WILL BE:

**OCCUPIED:**  
NORMAL OPERATING MODE FOR OCCUPIED SPACES OR DAYTIME OPERATION. WHEN THE UNIT IS IN THE OCCUPIED MODE THE VAV WILL MAINTAIN THE SPACE TEMPERATURE AT THE ACTIVE OCCUPIED COOLING SET POINT. APPLICABLE VENTILATION AND AIRFLOW SET POINTS WILL BE ENFORCED. THE OCCUPIED MODE WILL BE THE DEFAULT MODE.

**UNOCCUPIED:**  
NORMAL OPERATING MODE FOR UNOCCUPIED SPACES OR NIGHTTIME OPERATION. WHEN THE UNIT IS IN UNOCCUPIED MODE THE VAV WILL MAINTAIN THE SPACE TEMPERATURE AT THE STORED UNOCCUPIED COOLING SET POINT REGARDLESS OF THE PRESENCE OF A HARDWIRED OR COMMUNICATED SET POINT. WHEN THE SPACE TEMPERATURE EXCEEDS THE ACTIVE UNOCCUPIED SET POINT THE VAV WILL MODULATE FULLY CLOSED.

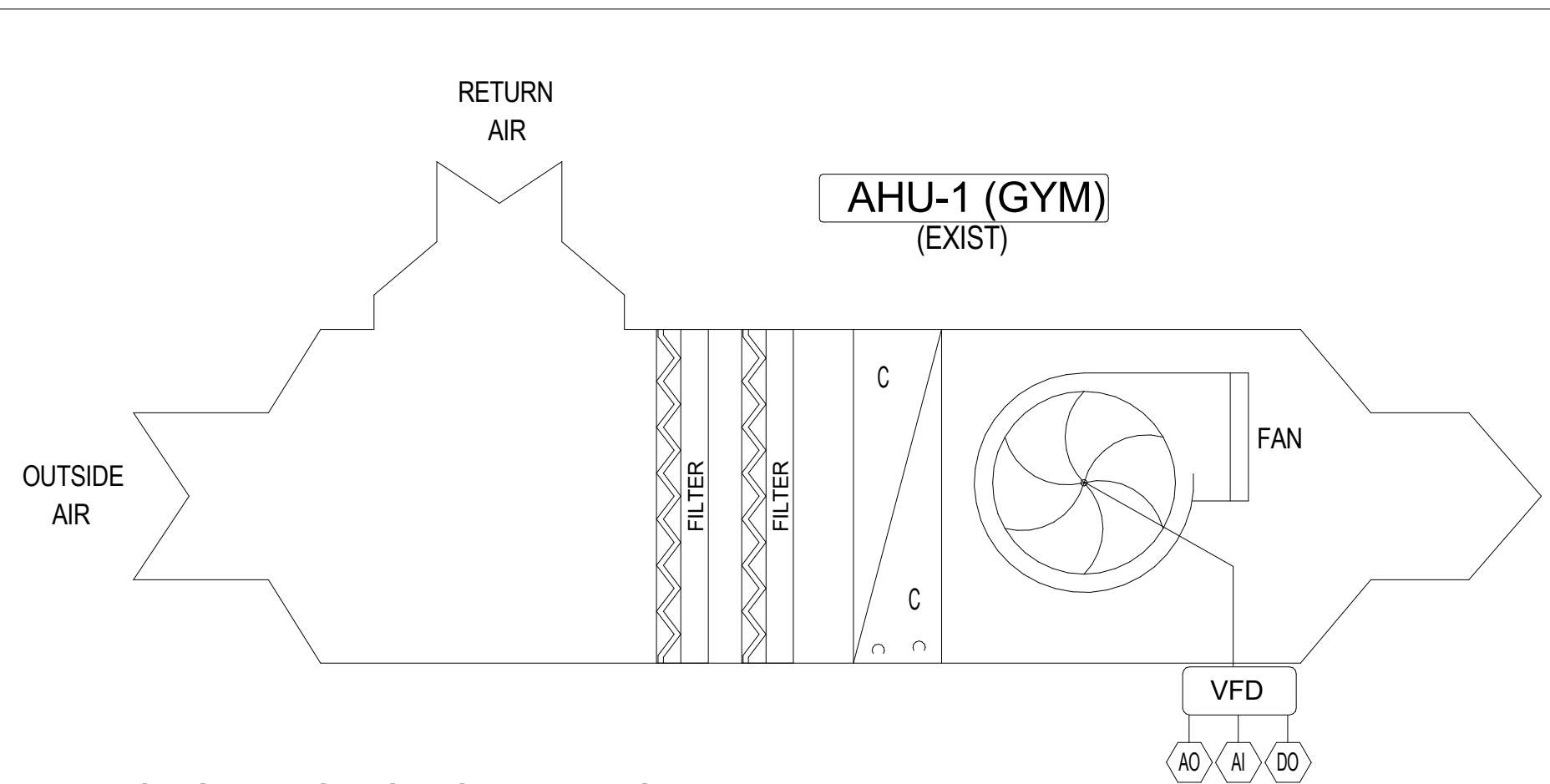
**OCCUPIED OVERRIDE:**  
MODE USED TO TEMPORARILY PLACE THE UNIT INTO THE OCCUPIED OPERATION. OVERRIDE OF THE UNOCCUPIED MODE SHALL BE POSSIBLE VIA THE SPACE SENSOR. THE OVERRIDE WILL LAST FOR A MAXIMUM OF FOUR HOURS. THE OVERRIDE SHALL BE CANCELABLE FROM THE SPACE SENSOR AT ANY TIME. DURING THE OVERRIDE THE ASSOCIATED AHU WILL RUN IN OCCUPIED MODE.

**COOLING MODE:**  
WHEN THE UNIT IS IN COOLING MODE, THE VAV WILL MAINTAIN THE SPACE TEMPERATURE AT THE ACTIVE COOLING SET POINT BY MODULATING THE AIRFLOW BETWEEN THE ACTIVE COOLING MINIMUM AIRFLOW SET POINT TO THE MAXIMUM COOLING AIRFLOW SET POINT. BASED ON THE VAV OCCUPANCY MODE, THE ACTIVE COOLING SET POINT WILL BE ONE OF THE FOLLOWING:

SET POINT DEFAULT VALUE  
OCCUPIED COOLING SET POINT 75°F (ADJUSTABLE)  
OCCUPIED MIN COOLING FLOW SET POINT SEE VAV SCHEDULE  
OCCUPIED MAX COOLING FLOW SET POINT SEE VAV SCHEDULE

THE MEASURED SPACE TEMPERATURE AND THE ACTIVE COOLING SET POINT WILL BE USED TO DETERMINE THE REQUESTED COOLING CAPACITY OF THE ASSOCIATED AHU. THE OUTPUTS WILL BE CONTROLLED BASED ON THE UNIT CONFIGURATION AND THE REQUESTED COOLING CAPACITY.

**SPACE SENSOR FAILURE:**  
IF THERE IS A FAULT WITH THE OPERATION OF THE ZONE SENSOR, IT WILL BE FED BACK TO THE BAS. SPACE SENSOR FAILURE WILL CAUSE THE VAV TO DRIVE THE DAMPER TO MINIMUM AIR FLOW IF THE VAV IS IN THE OCCUPIED MODE, OR DRIVE IT CLOSED IF THE VAV IS IN THE UNOCCUPIED MODE.

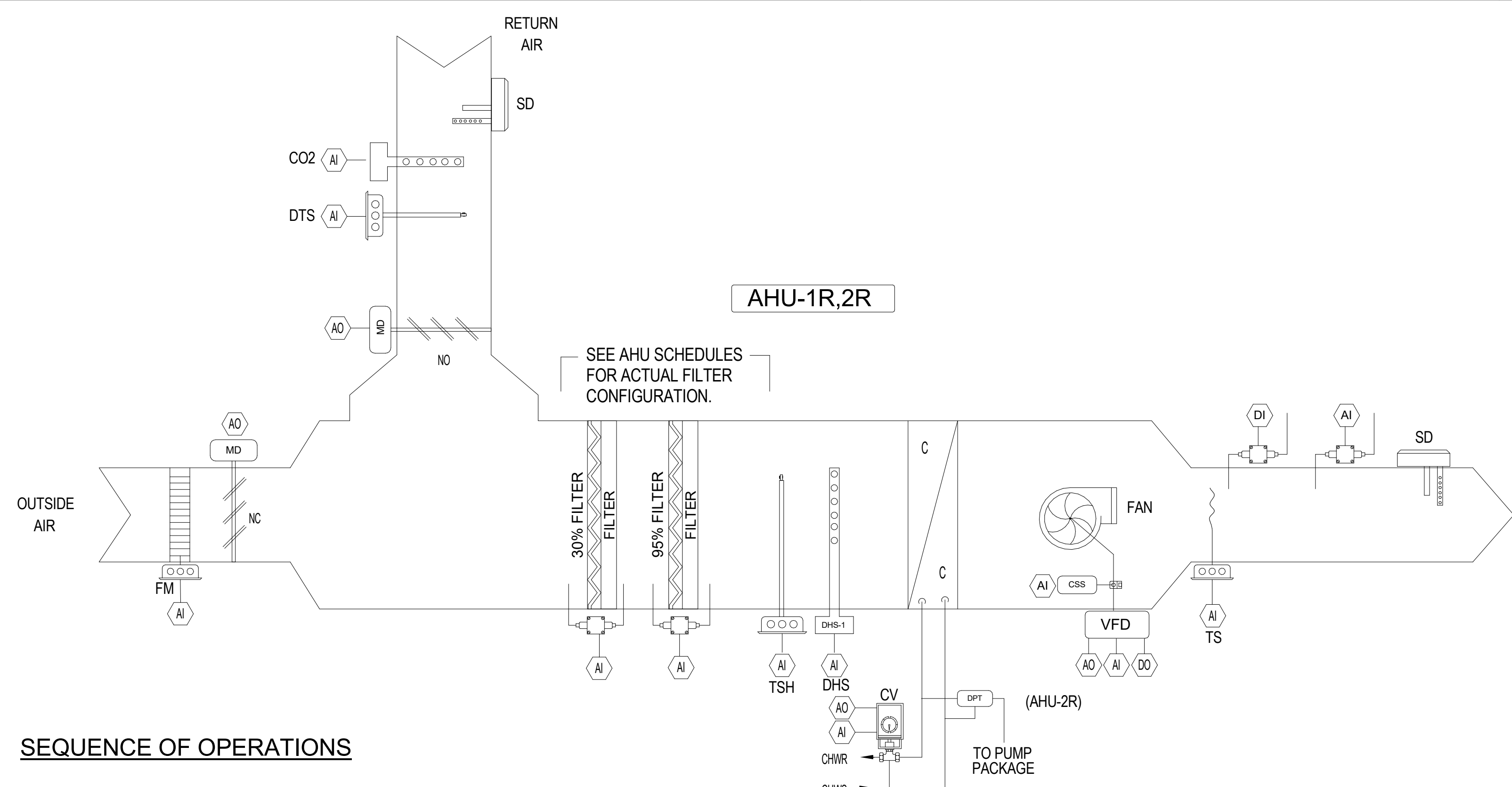
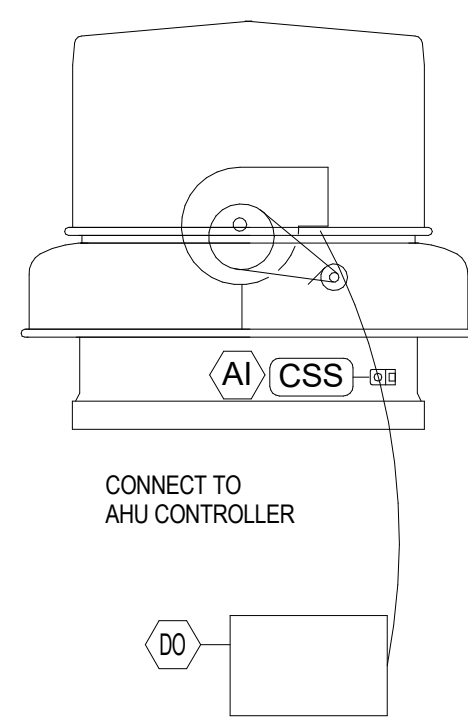


**SEQUENCE OF OPERATION**

BUILDING AUTOMATION SYSTEM (BAS):  
THE AHU SHALL MAINTAIN ALL PRESET CONTROL FUNCTIONS AS DETERMINED FOR AHU-1.

**COOLING MODE:**  
STARTING WITH SUPPLY FAN VFD SPEED AT MINIMUM AS SET BY T&B. ON RISE IN SA TEMPERATURE ABOVE SETPOINT, MODULATE THE COOLING CONTROL VALVE OPEN TO MAINTAIN SPACE COOLING SETPOINT. WHEN THE COOLING CONTROL VALVE REACHES 100%, MODULATE SA FAN VFD IN PARALLEL UPWARD FROM MINIMUM TO MAXIMUM TO MAINTAIN COOLING SET POINT. ON DECREASE IN SA TEMPERATURES THE SA FAN VFD SHALL BE MODULATED DOWNWARD TOWARDS MINIMUM. ON A CONTINUE DECREASE, MODULATE THE COOLING VALVE CLOSED.

**HEATING MODE:**  
THE CHILLED WATER VALVE WILL BE COMPLETELY CLOSED BEFORE THE ELECTRIC HEATER IS ACTIVATED. THE AHU SHALL OPERATE AT MINIMUM SPEED IN THE HEATING MODE. THE ELECTRIC HEATER SHALL BE ACTIVATED IN 3 STAGES TO MAINTAIN SPACE HEATING SETPOINT.



**SEQUENCE OF OPERATIONS**

BUILDING AUTOMATION SYSTEM (BAS):  
THE BUILDING AUTOMATION SYSTEM SHALL SEND THE AIR HANDLING UNIT SYSTEM OCCUPIED, UNOCCUPIED, OPTIMAL START/STOP, COOL-DOWN/WARM-UP MODES, OCCUPIED OVERRIDE, DUCT STATIC PRESSURE AND DISCHARGE AIR TEMPERATURE SETPOINTS. IF COMMUNICATION IS LOST WITH THE BAS, THE AHU CONTROLLER SHALL OPERATE USING ITS DEFAULT MODES AND SETPOINTS.

THE CONTROLS FOR THE VAV AIR HANDLING UNIT SYSTEMS (AHU-XX) WILL EACH FUNCTION AS FOLLOWS:

THESE AHUS CIRCULATE A MIXTURE OF RETURN AIR AND OUTSIDE AIR TO THE CONDITIONED SPACES THROUGH A DISTRIBUTION SYSTEM OF DUCTWORK AND AIR DISTRIBUTION DEVICES.

THESE SYSTEMS WILL BE AUTOMATICALLY STARTED AND STOPPED BY THE BAS WHENEVER THE HAND-OFF-AUTOMATIC SEARCH IS IN THE AUTOMATIC POSITION AND MANUALLY STARTED AND STOPPED BY THE HAND POSITION.

- COOL-DOWN AND WARM-UP MODES:**
- COOL-DOWN PRIOR TO SCHEDULED OCCUPANCY TIME: THE BAS SHALL CALCULATE AN OPTIMAL START TIME FOR COOL-DOWN OPERATION SO THAT THE SPACE HAS REACHED THE SET-POINT TEMPERATURE AT THE SCHEDULED OCCUPANCY TIME. THE DISCHARGE TEMPERATURE SHALL BE CONTROLLED TO GRADUALLY REDUCE THE SPACE TEMPERATURE TO PREVENT CONDENSATION FROM FORMING ON INTERIOR ARCHITECTURAL SURFACES, OR THE SURFACES OF AIR DISTRIBUTION DEVICES, BASED ON THE CALCULATED DEW POINT FROM THE SPACE TEMPERATURE AND HUMIDITY SENSORS.
  - WARM-UP PRIOR TO SCHEDULED OCCUPANCY TIME: THE BAS SHALL CALCULATE AN OPTIMAL START TIME FOR WARM-UP OPERATION SO THAT THE SPACE HAS REACHED THE SET-POINT TEMPERATURE AT THE SCHEDULED OCCUPANCY TIME. THE AHU SHALL OPERATE AT MINIMUM SPEED IN THE HEATING MODE.
  - DURING COOL-DOWN OR WARM-UP MODES, THE OUTSIDE AIR DAMPERS SHALL BE CLOSED.
  - AFTER THE COOL-DOWN OR WARM-UP MODES, THE OUTSIDE AIR AND RETURN AIR DAMPERS SHALL GO TO PRESET POSITIONS.

**B. OCCUPIED:** WHEN THE BUILDING IS SCHEDULED FOR OCCUPIED OPERATION, IF THE UNIT IS NOT ALREADY RUNNING, THE UNIT SHALL BE STARTED. THE TIME SCHEDULED FOR OCCUPIED OPERATION SHALL BE ONE HOUR PRIOR TO THE NORMAL OCCUPANCY TIME TO PROVIDE FOR A TEMPERATURE EQUALIZATION AND IAQ PRE-OPERATION PERIOD.

**C. UNOCCUPIED:** WHEN THE BUILDING IS SCHEDULED FOR UNOCCUPIED OPERATION, THE UNIT SUPPLY FAN SHALL BE STOPPED, THE CHILLED VALVES SHALL BE CLOSED AND THE OUTSIDE AIR DAMPERS SHALL CLOSE.

- NIGHT SET-BACK: THE AHU SHALL NORMALLY REMAIN OFF. IF THE SPACE REACHES 80° F (ADJUSTABLE), THE BAS SHALL START THE AHU TO CIRCULATE THE AIR WITHIN THE ZONE AND THE VAV'S SHALL MODULATE THEIR ELECTRIC HEATING COILS UNTIL THE SPACE HEATING TEMPERATURE REACHES 65° F (ADJUSTABLE), AT WHICH TIME THE AHU SHALL BE SHUTDOWN.
- NIGHT SET-UP: IF THE SPACE TEMPERATURE REACHES 85° F (ADJUSTABLE), THE BAS SHALL START THE AHU AND OPERATE IT UNDER NORMAL COOLING CONTROL WITH 100% RE-CIRCULATED AIR. THE UNIT SHALL BE SHUT DOWN BY THE BAS WHEN THE TEMPERATURE DROPS TO 80° F (ADJUSTABLE).

**D. SPACE TEMPERATURE CONTROL:**

- MODULATE THE 2-WAY CHILLED WATER VALVES TO MAINTAIN SYSTEM DISCHARGE TEMPERATURE SETPOINT. (SEE SCHEDULE)
- MODULATE ALL SUPPLY FAN VARIABLE SPEED DRIVES TO MAINTAIN SPACE AIR TEMPERATURE SETPOINT.

**E. HUMIDITY CONTROL:**

- PRIMARY HUMIDITY CONTROL SHALL BE ACCOMPLISHED BY THE BAS VARYING THE DISCHARGE AIR TEMPERATURE OF THE COOLING COIL. THE TARGET RANGE OF RH SHALL BE 45-55% DURING SCHEDULED OCCUPIED TIMES, AND 40-60% DURING UNOCCUPIED TIMES.

- OCCUPIED:**
  - IF THE RH RISES ABOVE THE MAXIMUM SETPOINT, THE BAS SHALL GRADUALLY REDUCE (4° F PER HOUR) THE LEAVING AIR TEMPERATURE SETPOINT OF THE COOLING COIL TO A MAXIMUM REDUCTION OF 4° F BELOW SETPOINT. WHEN THE RH FALLS TO 3% BELOW THE MAXIMUM SETPOINT, THE BAS SHALL RETURN TO NORMAL OPERATION BY GRADUALLY INCREASING (1° F PER HOUR) THE LEAVING AIR TEMPERATURE SETPOINT OF THE COOLING COIL BACK TO ITS NORMAL SETPOINT.
  - IF THE RH FALLS BELOW THE MINIMUM SETPOINT, THE BAS SHALL GRADUALLY INCREASE (4° F PER HOUR) THE LEAVING AIR TEMPERATURE SETPOINT OF THE COOLING COIL TO A MAXIMUM INCREASE OF 8° F ABOVE SETPOINT. WHEN THE RH RISES TO 6% ABOVE THE MINIMUM SETPOINT, THE BAS SHALL GRADUALLY REDUCE (1° F PER HOUR) THE LEAVING AIR TEMPERATURE SETPOINT OF THE COOLING COIL BACK TO ITS NORMAL SETPOINT.
- UNOCCUPIED:**
  - IF THE RH RISES ABOVE THE MAXIMUM SETPOINT, THE BAS SHALL LOG THE EVENT AND START THE AHU. THE BAS SHALL FULLY OPEN THE CHILLED WATER VALVES. WHEN THE RH FALLS TO 3% BELOW THE MAXIMUM SETPOINT, THE BAS SHALL STOP THE AHU AND CLOSE THE VALVES.
  - IF THE RH FALLS BELOW THE MINIMUM SETPOINT, THE BAS SHALL LOG THE EVENT. THERE IS NO CONTROL ACTION TO BE TAKEN BY THE BAS FOR THIS CONDITION.

**F. OUTDOOR AIR CONTROL:**  
WHEN RETURN AIR CO2 CONCENTRATION RISES ABOVE SET POINT AS MEASURED BY THE DUCT CO2 SENSOR, THE OUTSIDE AIR DAMPER SHALL MODULATE OPEN. UNTIL THE CO2 LEVEL FALL BELOW SET POINT OR IT REACHES THE MAXIMUM OPEN POSITION, DAMPER POSITION AND OPENING RATE SHALL ADJUST TO ACCOUNT FOR CHANGES IN SUPPLY FAN SPEED. ONCE THE CONCENTRATION FALLS BELOW SET POINT, THE DAMPER SHALL RETURN TO MINIMUM POSITION.

THE BAS SHALL MODULATE THE RETURN AIR DAMPER TO CREATE SUFFICIENT RESISTANCE TO MAINTAIN THE SCHEDULED QUANTITY OF OUTSIDE AIR TO THE AHU, AS MEASURED BY THE AIRFLOW MEASURING STATION IN THE OUTSIDE AIR DUCT.

**G. FILTER STATUS:**

- IF THE PRE-FILTER PRESSURE DROP EXCEEDS 0.75" W.G., A FILTER CHANGE ALARM SHALL BE GENERATED AT THE BAS.
- IF THE FINAL FILTER PRESSURE DROP EXCEEDS 1.0" W.G., A FILTER CHANGE ALARM SHALL BE GENERATED AT THE BAS.

**H. FIRE ALARM SHUTDOWN:**  
ON A SIGNAL FROM THE FIRE ALARM SYSTEM, THE AIR HANDLING UNIT WILL SHUT DOWN AND THE ASSOCIATED DUCT SMOKE DAMPERS WILL CLOSE. WHEN THE FIRE ALARM SYSTEM IS RESET, THE DUCT SMOKE DAMPERS SHALL OPEN PRIOR TO THE AIR HANDLING UNIT FAN STARTING.

**I. POWER INTERRUPTION OR FAN SHUTDOWN:**

- THE OUTSIDE AIR, DUCT SMOKE DAMPERS AND HOT WATER VALVES WILL CLOSE.

- LOW LIMIT SAFETY:**
  - A SEPARATE LOW LIMIT SAFETY SENSING AIR ENTERING THE COOLING COIL, SET AT 36° F (ADJUSTABLE) WILL STOP THE FAN AND OPEN THE CHW VALVE FULL OPEN AND RAMP CHW PUMPS TO XXX SPEED.
- HIGH STATIC PRESSURE SWITCH:**  
A HIGH STATIC PRESSURE SWITCH WITH MANUAL RESET SHALL SENSE THE SUPPLY AIR PRESSURE AND STOP THE FAN IF ITS LIMIT IS EXCEEDED. HARD WIRE TO VFD AUXILIARY CONTACT AND PROVIDE DRY CONTACT BACK TO BAS.
- DISCHARGE DUCT STATIC PRESSURE SETPOINT OPTIMIZATION:**  
THE SUPPLY FAN SHALL OPERATE CONTINUOUSLY IN THE OCCUPIED MODE AND ITS SPEED SHALL BE MODULATED VIA PID CONTROL AT 1 SEC INTERVALS TO MAINTAIN THE DUCT STATIC PRESSURE SETPOINT. THE DUCT STATIC PRESSURE SETPOINT IS SENT BY THE BAS AND IS RESET BETWEEN THE MINIMUM AND MAXIMUM STATIC PRESSURE LIMITS TO MAINTAIN THE "CRITICAL ZONE" VAV AIR DAMPER IN A POSITION BETWEEN 75% AND 90% OPEN (ADJUSTABLE).

- THE BAS SHALL CONTINUOUSLY MONITOR THE DAMPER POSITION OF ALL VAV TERMINAL UNITS. THE DISCHARGE DUCT STATIC PRESSURE TRANSDUCER SHALL BE SENSED 23 RODS DOWN THE LENGTH OF THE PRIMARY SUPPLY TRUNK (AWAY FROM ANY BRANCH DUCTS). THE SENSOR MUST BE MOUNTED IN A NON-TURBULENT LOCATION.
- WHEN ANY VAV DAMPER IS MORE THAN 90% (ADJ.) OPEN, THE SUPPLY FAN DISCHARGE DUCT STATIC PRESSURE SETPOINT SHALL BE RESET UPWARD BY 0.1 IN W.C. (ADJ.) AT A FREQUENCY OF 15 MINUTES (ADJ.) UNTIL NO DAMPER IS MORE THAN 90% OPEN OR THE STATIC PRESSURE SETPOINT HAS RESET UPWARD TO THE SYSTEM MAXIMUM DUCT STATIC PRESSURE SETPOINT OR THE AHU VARIABLE-FREQUENCY DRIVE IS AT THE MAXIMUM SPEED SETTING.
- WHEN ALL VAV DAMPERS ARE LESS THAN 75% (ADJ.) OPEN, THE SUPPLY FAN DISCHARGE DUCT STATIC PRESSURE SETPOINT SHALL BE RESET DOWNWARD BY 0.1 IN W.C. (ADJ.) AT A FREQUENCY OF 15 MINUTES (ADJ.) UNTIL AT LEAST ONE DAMPER IS MORE THAN 75% OPEN OR THE STATIC PRESSURE SETPOINT HAS RESET DOWNWARD TO THE SYSTEM MINIMUM DUCT STATIC PRESSURE SETPOINT OR THE AHU VARIABLE-FREQUENCY DRIVE IS AT THE MINIMUM SPEED SETTING.
- THE CONTROL BANDS, SETPOINT INCREMENT VALUES, SETPOINT DECREMENT VALUES AND ADJUSTMENT FREQUENCIES SHALL BE ADJUSTED TO MAINTAIN MAXIMUM STATIC PRESSURE OPTIMIZATION WITH STABLE SYSTEM CONTROL AND MAXIMUM COMFORT CONTROL.
- THE BAS SHALL HAVE THE CAPABILITY TO ALLOW THE OPERATOR TO EXCLUDE "PROBLEM" ZONES THAT SHOULD NOT BE CONSIDERED WHEN DETERMINING THE OPTIMIZED SETPOINT FROM THE EQUIPMENT GRAPH SCREEN.
- THE BAS SHALL ALSO READ THE STATUS OF THE SUPPLY AIR STATIC PRESSURE SENSOR AND DISPLAY THE ACTIVE DUCT STATIC PRESSURE READING ON THE EQUIPMENT GRAPHICS.
- THE BAS SHALL HAVE THE ABILITY TO IDENTIFY AND DISPLAY TO THE USER, THE VAV BOX THAT SERVES THE CRITICAL ZONE (THAT IS, THE ZONE WITH THE MOST WIDE-OPEN VAV DAMPERS). THIS INFORMATION SHALL UPDATE DYNAMICALLY AS THE LOCATION OF THE CRITICAL ZONE CHANGES BASED ON BUILDING LOAD, AND DUCT STATIC PRESSURE SETPOINT OPTIMIZATION CONTROL SHOW ALL VAV DAMPER POSITIONS ON AHU GRAPHIC AND ACTIVE REQUESTS PER ZONE.
- DURING THE COMMISSIONING PROCESS, THE CONTROLS CONTRACTOR SHALL DEMONSTRATE THE PERFORMANCE OF FAN PRESSURE OPTIMIZATION.

**M. SMOKE DETECTION:**  
SMOKE DETECTORS IN THE RETURN AIR DUCT AND DOWN STREAM OF THE FILTERS IN THE SUPPLY DUCT WILL AUTOMATICALLY SHUT DOWN THE FAN AND WILL SEND A SIGNAL TO THE FIRE ALARM SYSTEM.

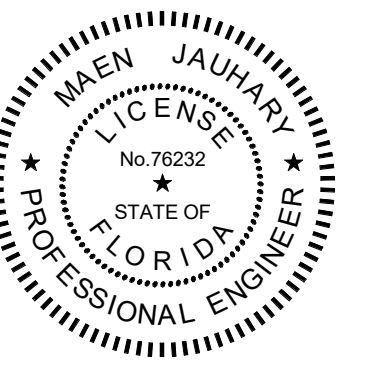
GENERAL ELECTRICAL NOTES		ABBREVIATIONS		RENOVATION/DEMOLITION LEGEND	
<p>1. THE ELECTRICAL WORK IS SUBJECT TO ALL OF THE PURCHASER'S TERMS, CONDITIONS AND SPECIFICATIONS, INCLUDING WORKMANSHIP.</p> <p>2. GENERAL WORK PRACTICES FOR ELECTRICAL CONSTRUCTION SHALL BE IN ACCORDANCE WITH NECA 1 "STANDARD FOR GOOD WORKMANSHIP IN ELECTRICAL CONSTRUCTION" (ANSI).</p> <p>3. IT IS THE INTENT OF THESE ELECTRICAL DRAWING SHEETS TO CALL FOR FINISHED WORK, TESTED, AND READY FOR OPERATION. FOR THE ELECTRICAL WORK, "PROVIDE" IS AN ALL-INCLUSIVE TERM REQUIRING CONTRACTOR TO PROCURE, FABRICATE, FURNISH, INSTALL, MOUNT, WIRE, CONNECT AND SUPPLY ALL MATERIAL AND LABOR NECESSARY TO COMPLETE THE WORK TO THE ACCEPTANCE OF THE OWNER AND THE AUTHORITY HAVING JURISDICTION (AHJ).</p> <p>4. ALL MATERIAL PROVIDED BY THE CONTRACTOR SHALL BE NEW AND FREE OF DEFECTS, LISTED/LABELLED FOR THE INTENDED PURPOSE BY UNDERWRITERS LABORATORY (UL) OR OTHER ORGANIZATION THAT IS ACCEPTABLE TO THE AHJ.</p> <p>5. ALL MATERIAL SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS, UNLESS OTHERWISE NOTED.</p> <p>6. CONTRACTOR SHALL INSPECT SITE FOR FIELD VERIFICATION OF ALL ASPECTS OF THE WORK PRIOR TO BIDDING.</p> <p>7. ALL DISCREPANCIES ON DRAWING SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT IN WRITING PRIOR TO SUBMISSION OF BIDS. CONTRACTORS SUBMISSION OF A BID CONSTITUTES ACCEPTANCE OF ALL CONDITIONS INCLUDING FIELD CONDITIONS.</p> <p>8. THE CONTRACTOR SHALL OBTAIN AND FURNISH ALL REQUIRED PERMITS AND ARRANGE FOR ALL REQUIRED INSPECTIONS. THE CONTRACTORS BID SHALL INCLUDE COST OF ALL REQUIRED PERMITS AND FEES, INCLUDING UTILITY FEES.</p> <p>9. THE ELECTRICAL SHEETS ARE DIAGRAMMATICAL IN NATURE AND INDICATE THE GENERAL LOCATION OF OUTLETS, EQUIPMENT, AND THE CIRCUIT ARRANGEMENT OF THE REQUIRED WIRING. ALTHOUGH THE DRAWINGS DO NOT NECESSARILY INDICATE THE ACTUAL ROUTES OF CONDUITS, WHERE INDICATED, THEY SHALL BE FOLLOWED AS CLOSELY AS PROPER COORDINATION WITH THE WORK OF OTHER TRADES AND SPACE WILL PERMIT. WHERE CONDUIT RUNS ARE NOT SHOWN ON THE DRAWINGS, COORDINATE CONDUIT RUNS WITH THE WORK OF OTHER TRADES AND STRUCTURE. SIMPLIFY INSTALLATION WHEREVER POSSIBLE, BUT SUBJECT TO APPROVAL BY THE ARCHITECT FOR VISUAL AND STRUCTURAL REASONS. IT IS NOT WITHIN THE SCOPE OF THE DRAWINGS TO SHOW ALL NECESSARY OFFSETS, BENDS, PULL BOXES, AND OBSTRUCTIONS. THE DRAWINGS ARE NOT INTENDED TO BE SCALED. REFER TO THE ARCHITECTURAL DRAWINGS FOR DIMENSIONS. IN CASE OF DISCREPANCY BETWEEN ELECTRICAL AND ARCHITECT SHEET SET FOR MOUNTING ELEVATIONS OR REFLECTED CEILING, FOLLOW ARCHITECT SHEETS.</p> <p>10. MAINTAIN ON THE JOB SITE, IN GOOD CONDITION, ONE SET OF UP-TO-DATE ELECTRICAL DRAWINGS, PROGRESSIVELY NEATLY, LEGIBLY, AND EXACTLY RECORD ON THESE DRAWINGS THE LOCATION OF ALL CONCEALED CONDUIT RUNS AND ALL WORK WHICH IS INSTALLED DIFFERENTLY THAN IN THE LOCATION AND MANNER INDICATED ON THE DRAWINGS. UPON COMPLETION OF THE WORK, THE DRAWINGS SHALL BE TURNED OVER TO THE ARCHITECT FOR APPROVAL AND POSSESSION AS A PERMANENT AND COMPLETE RECORD DOCUMENT OF THE ELECTRICAL WORK.</p> <p>11. WHEN FOLLOWED BY THE PHRASE "OR EQUAL", SPECIFIC MANUFACTURER'S PRODUCTS ARE USED AS AS A BASIS OF DESIGN. ALTERNATE PRODUCT MAY BE PROVIDED IF APPROVED "AS EQUAL" BY THE ENGINEER OF RECORD AND THE AHJ.</p> <p>12. FOR ALL ELECTRICAL &amp; COMMUNICATIONS DEVICES AND CIRCUITS, CONTRACTOR SHALL FIELD VERIFY WITH OWNER AND COORDINATE WITH ALL OTHER TRADES FINAL LOCATION(S) PRIOR TO ROUGH IN.</p> <p>13. PRIOR TO FINAL ACCEPTANCE, CLEAN ALL SWITCHES, CABINETS, DEVICE PLATES, FIXTURES, AND OTHER ITEMS FURNISHED UNDER THIS CONTRACT AND ENSURE THAT ALL PANEL BOARD DIRECTORIES ARE IN PLACE AND COMPLETED OR REVISED AS REQUIRED BY THE WORK, AND THAT ALL MARKING AND IDENTIFICATION OF ALL EQUIPMENT, JUNCTION BOXES, AND OTHER ITEMS IS COMPLETED. REPAIR OR REPLACE, AS DIRECTED BY THE OWNER, ANY ITEMS DAMAGED DUE TO INSTALLATION OR RELOCATION OF EQUIPMENT OR DEVICES AT NO ADDITIONAL COST TO THE OWNER.</p> <p>14. UPON THE COMPLETION OF THE WORK, THE ENTIRE ELECTRICAL SYSTEM SHALL BE TESTED AND SHALL BE SHOWN TO BE IN PROPER WORKING CONDITION IN ACCORDANCE WITH THE INTENT OF THE SPECIFICATIONS AND DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE ALL SYSTEMS READY FOR OPERATION AND TO HAVE AN ELECTRICIAN AVAILABLE TO OPERATE SAME IN ACCORDANCE WITH OR UNDER THE SUPERVISION OF THE ARCHITECT/ENGINEER AND OR AHJ. THE CONTRACTOR SHALL BE AVAILABLE TO ASSIST IN REMOVAL OF PANEL FRONTS, ETC. TO PERMIT INSPECTION AS REQUIRED.</p> <p>15. ALL WORK SHALL MEET OR EXCEED THE REQUIREMENTS OF THE FLORIDA BUILDING CODE, NATIONAL ELECTRIC CODE (NFPA 70), LOCAL ORDINANCES AND THE AUTHORITY HAVING JURISDICTION.</p> <p>16. FLEXIBLE CONDUIT INSTALLED OUTDOORS, IN ANY MECHANICAL EQUIPMENT ROOM, OR IN NORMALLY WET AREAS SHALL BE LIQUID TIGHT FLEX WITH SUITABLE FITTINGS.</p> <p>17. COORDINATE WITH ALL MECHANICAL TRADES FOR SPACE REQUIREMENTS IN MECHANICAL ROOMS, CORRIDORS, SHAFTS, ABOVE CEILING, ETC. THIS INCLUDES SPACE ABOVE PANELS WHERE DUCTS AND PIPING ARE PROHIBITED.</p> <p>FOR EXACT LOCATIONS OF MECHANICAL EQUIPMENT, SEE MECHANICAL PLANS.</p> <p>18. PROVIDE CONDUIT EXPANSION FITTINGS WITH BONDING JUMPERS FAR ALL CONDUITS PASSING THROUGH EXPANSION JOINTS.</p> <p>19. AS PER FLORIDA BUILDING CODE, FEEDER AND CUSTOMER OWNED SERVICE CONDUCTORS SHALL BE SIZED FOR A MAXIMUM VOLTAGE DROP OF 2 PERCENT AT DESIGN LOAD, BRANCH CIRCUIT CONDUCTORS SHALL BE SIZED FOR A MAXIMUM VOLTAGE DROP OF 3 PERCENT AT DESIGN LOAD.</p>		<p>A AMPERE</p> <p>AF AVAILABLE FRAME</p> <p>AFC AVAILABLE FAULT CURRENT</p> <p>AFCI ARC FAULT CIRCUIT INTERRUPTER</p> <p>AFIF ABOVE FINISHED FLOOR</p> <p>AFG ABOVE FINISHED GRADE</p> <p>AHU AIR HANDLER UNIT (HVAC)</p> <p>AHJ AUTHORITY HAVING JURISDICTION</p> <p>AIC AMPERE INTERRUPTING CAPACITY</p> <p>AWG AMERICAN WIRE GAUGE</p> <p>BKR BREAKER</p> <p>C CONDUIT OR CONDUCTOR</p> <p>CB CIRCUIT BREAKER</p> <p>CLG CEILING</p> <p>CO CONDUIT ONLY</p> <p>CPT CONTROL POWER TRANSFORMER</p> <p>CU CONDENSING UNIT (HVAC), COPPER</p> <p>DS DISCONNECT (SAFETY) SWITCH</p> <p>EC EMPTY CONDUIT</p> <p>EF EXHAUST FAN</p> <p>EL EMERGENCY LIGHT (UNSWITCHED)</p> <p>ELE ELECTRICAL, ELECTRIC</p> <p>EM EMERGENCY</p> <p>EMT ELECTRICAL METALLIC TUBING</p> <p>ENT ELECTRICAL NONMETALLIC TUBING</p> <p>ENH ELECTRIC WATER HEATER</p> <p>EX EXISTING</p> <p>FBC FLORIDA BUILDING CODE</p> <p>FDS FUSED DISCONNECT (SAFETY) SWITCH</p> <p>FLOUR FLUORESCENT</p> <p>FMC FLEXIBLE METAL CONDUIT</p> <p>FMT FLEXIBLE METAL TUBING</p> <p>GND GROUND (ELECTRICAL)</p> <p>GEN GENERATOR</p> <p>GFI GROUND FAULT INTERRUPTER</p> <p>GWH GAS WATER HEATER</p> <p>HH HAND HOLE</p> <p>HID HIGH INTENSITY DISCHARGE LIGHT</p> <p>HP HORSE POWER</p> <p>HPS HIGH PRESSURE SODIUM LIGHT</p> <p>HZ HERTZ (ELECTRICAL)</p> <p>ICCB INSULATED CASE CIRCUIT BREAKER</p> <p>IG ISOLATED GROUND</p> <p>IMC INTERMEDIATE METAL CONDUIT</p> <p>JB JUNCTION BOX</p> <p>KMIL THOUSAND CIRCULAR MILS</p> <p>KVA KILOVOLT-AMPERE</p> <p>KW KILOWATT</p> <p>KWH KILOWATT-HOUR</p> <p>LTG LIGHT, LIGHTING</p> <p>LFMC LIQUIDTIGHT FLEXIBLE METAL CONDUIT</p> <p>LQNC LIQUIDTIGHT FLEXIBLE NONMETALLIC CONDUIT</p> <p>MCC MAIN CIRCUIT BREAKER</p> <p>MCC NOT CONTROL CENTER</p> <p>MCCB MOLDED CASE CIRCUIT BREAKER</p> <p>MDP MAIN DISTRIBUTION PANEL</p> <p>MH METAL HALIDE LIGHT, MAN HOLE</p> <p>MLO MAIN LUGS ONLY</p> <p>N, NEUTR (ELECTRICAL)</p> <p>NEC NATIONAL ELECTRICAL CODE)</p> <p>NEMA NATIONAL ELECTRICAL MANUFACTURERS ASSN.</p> <p>NFPA NATIONAL FIRE PROTECTION ASSOCIATION</p> <p>NL NIGHT LIGHT</p> <p>P POLE</p> <p>PB PULL BOX</p> <p>PCB POWER CIRCUIT BREAKER</p> <p>PH PHASE (ELECTRICAL)</p> <p>PNL PANEL</p> <p>PNLB PANELBOARD</p> <p>PVC PLASTIC CONDUIT</p> <p>PWR POWER (ELECTRICAL)</p> <p>RCPT RECEPTACLE</p> <p>RMC RIGID METAL CONDUIT</p> <p>RNC RIGID NONMETALLIC CONDUIT</p> <p>RTU ROOF TOP UNIT (HVAC)</p> <p>SD SMOKE DETECTOR</p> <p>SF SUPPLY FAN</p> <p>SH SHIELDED</p> <p>SW SWITCH</p> <p>SWBD SWITCHBOARD</p> <p>TEL TELEPHONE</p> <p>TTB TELEPHONE TERMINAL BOARD</p> <p>UG UNDERGROUND</p> <p>UL UNDERWRITERS LABORATORY</p> <p>UPS UNINTERRUPTIBLE POWER SUPPLY</p> <p>UGN UNLESS OTHERWISE NOTED</p> <p>V, VAC VOLT, VOLT AC</p> <p>W WATT</p> <p>WP WEATHERPROOF</p> <p>XFMR POWER TRANSFORMER</p>		<p><b>SYMBOL:</b> <b>DESCRIPTION:</b> EXISTING TO REMAIN.</p> <p> <b>DESCRIPTION:</b> EXISTING TO BE REMOVED.</p> <p> <b>DESCRIPTION:</b> EXISTING TO BE RELOCATED.</p>	
SUBMITTAL/ SHOP DRAWING DATA		CODE DISCLAIMER		CONDUIT RACEWAY & WIRING LEGEND	
<p>PROVIDE 6-SETS (EACH) OF MANUFACTURER'S DATA, O&amp;M MANUALS, ELECTRICAL DATA, DIMENSIONAL DATA AND CLEARANCES, CONNECTION DATA, COLOR SAMPLES (IF REQUIRED), AND TEST DATA FOR THE FOLLOWING:</p> <p>DISCONNECT SWITCHES, CIRCUIT BREAKERS.</p> <p>SHOP DRAWINGS MUST BE SUBMITTED AND APPROVED PRIOR TO ORDERING OF EQUIPMENT. ENGINEER WILL REQUIRE 7 WORKING DAYS TO REVIEW DRAWINGS. ANY ITEM FURNISHED AND/OR INSTALLED WITHOUT THE BENEFIT OF REVIEW AND ACCEPTANCE FOUND TO BE DEFICIENT SHALL BE SUBJECT TO REPLACEMENT AT THE DIRECTION OF THE ENGINEER AND AT THE CONTRACTOR'S SOLE EXPENSE. ENGINEER WILL REQUIRE DETAILED, COMPLETED SUBMITTALS.</p>		<p>NOT ALL ABBREVIATIONS ARE USED IN EVERY DESIGN</p> <p><b>ELECTRICAL DESIGN IN ACCORDANCE WITH 2011 NATIONAL ELECTRIC CODE (NFPA-70), AS INCORPORATED BY THE 2014 FLORIDA BUILDING CODE AND 2014 EDITION OF THE FLORIDA FIRE PREVENTION CODE.</b></p> <p><b>ALL MAIN FEEDERS HAVE BEEN SIZED FOR A MAXIMUM OF 2% VOLTAGE DROP AND ALL BRANCH CIRCUIT FEEDERS HAVE BEEN SIZED FOR A MAXIMUM OF 3% VOLTAGE DROP PER FBC-5TH EDITION.</b></p>		<p><b>SYMBOL:</b> <b>DESCRIPTION:</b> RACEWAY CONDUIT CONCEALED ABOVE CEILING OR WITHIN WALL UNLESS OTHERWISE NOTED. EACH CIRCUIT SHALL CONSIST OF PHASE, NEUTRAL AND GROUND CONDUCTORS. EVERY CIRCUIT SHALL HAVE ITS OWN INDIVIDUAL NEUTRAL. FOR LIGHTING CIRCUITS PROVIDE REQUIRED SWITCH LEGS TO ACHIEVE SWITCHING INDICATED ON PLANS.</p> <p> <b>DESCRIPTION:</b> HOME RUN TO PANEL ALL HOMERUNS SHALL BE #10 AWG, 3/4" MINIMUM. WIRING HOME RUN: LETTER INDICATES PANEL NUMBER IS BRANCH CIRCUIT(S)</p> <p> <b>DESCRIPTION:</b> GROUNDING CONDUCTOR.</p> <p> <b>DESCRIPTION:</b> CONDUIT IN/UNDER SLAB OR UNDERGROUND.</p> <p> <b>DESCRIPTION:</b> CONDUIT CAP.</p> <p> <b>DESCRIPTION:</b> CONDUIT FOR POWER.</p> <p> <b>DESCRIPTION:</b> CONDUIT STUB-DOWN.</p> <p> <b>DESCRIPTION:</b> CONDUIT STUB-UP.</p> <p> <b>DESCRIPTION:</b> GROUNDING ELECTRODE CONDUCTOR</p>	
POWER PLAN LEGEND		CODE DISCLAIMER		POWER PLAN LEGEND	
<p>NOT ALL ABBREVIATIONS ARE USED IN EVERY DESIGN</p>		<p><b>ELECTRICAL DESIGN IN ACCORDANCE WITH 2011 NATIONAL ELECTRIC CODE (NFPA-70), AS INCORPORATED BY THE 2014 FLORIDA BUILDING CODE AND 2014 EDITION OF THE FLORIDA FIRE PREVENTION CODE.</b></p> <p><b>ALL MAIN FEEDERS HAVE BEEN SIZED FOR A MAXIMUM OF 2% VOLTAGE DROP AND ALL BRANCH CIRCUIT FEEDERS HAVE BEEN SIZED FOR A MAXIMUM OF 3% VOLTAGE DROP PER FBC-5TH EDITION.</b></p>		<p><b>SYMBOL:</b> <b>DESCRIPTION:</b> DUPLEX RECEPTACLE, NEMA 5-20R, MOUNT 18" AFF UON.</p> <p> <b>DESCRIPTION:</b> DUPLEX RECEPTACLE, NEMA 5-20R, MOUNT 42" AFF OR ABOVE COUNTER.</p> <p> <b>DESCRIPTION:</b> DUPLEX RECEPTACLE, NEMA 5-20R, MOUNT 18" AFF UON (GROUND FAULT CIRCUIT INTERRUPTED) JUNCTION BOX WITH BLANK PLATE; BRACKET INDICATES WALL MOUNTED.</p> <p> <b>DESCRIPTION:</b> PANELBOARD (RECESSED FLUSH-MOUNTED UON).</p> <p> <b>DESCRIPTION:</b> ELECTRICAL MAIN DISTRIBUTION PANELBOARD OR SWITCHBOARD</p> <p> <b>DESCRIPTION:</b> TRANSFORMER (NON-UTILITY) NUMBER INDICATES KVA, EX. 45= 45KVA</p> <p> <b>DESCRIPTION:</b> TRANSFORMER (UTILITY)</p> <p> <b>DESCRIPTION:</b> PULL BOX</p> <p> <b>DESCRIPTION:</b> ELECTRICAL MOTOR</p> <p> <b>DESCRIPTION:</b> NON-FUSED DISCONNECT SWITCH</p> <p> <b>DESCRIPTION:</b> ELECTRICAL METER</p> <p> <b>DESCRIPTION:</b> SMOKE DETECTOR, DUCT MOUNT</p> <p> <b>DESCRIPTION:</b> SHUT DOWN RELAY</p>	
				<p>NOT ALL SYMBOLS ARE USED IN EVERY DESIGN</p>	

Client:



Consultants:

EOR Stamp:



Project:

Barnett Park AHU Replacement

Location:  
4801 W Colonial Dr,  
Orlando, FL, 32808

Issuance:  
**PERMIT DOCUMENTS**

Revisions:

#	Date	Description

Date:  
09/29/2016

Project Number:  
16.OC.027

Drawn By: ME  
Checked By: MJ

**ELECTRICAL GENERAL INFORMATION**

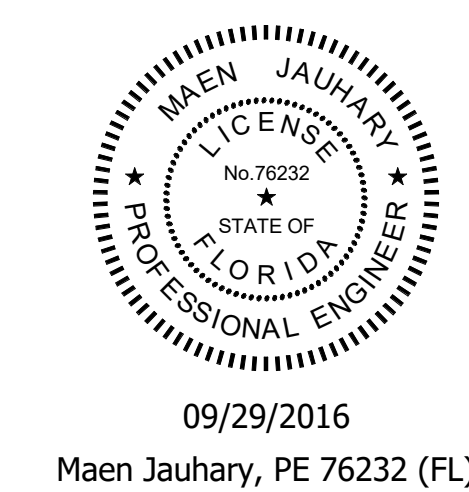
Sheet No.:

Client:



Consultants:

EOR Stamp:



Project:  
**Barnett Park AHU Replacement**

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 4801 W Colonial Dr,  
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ME	MJ

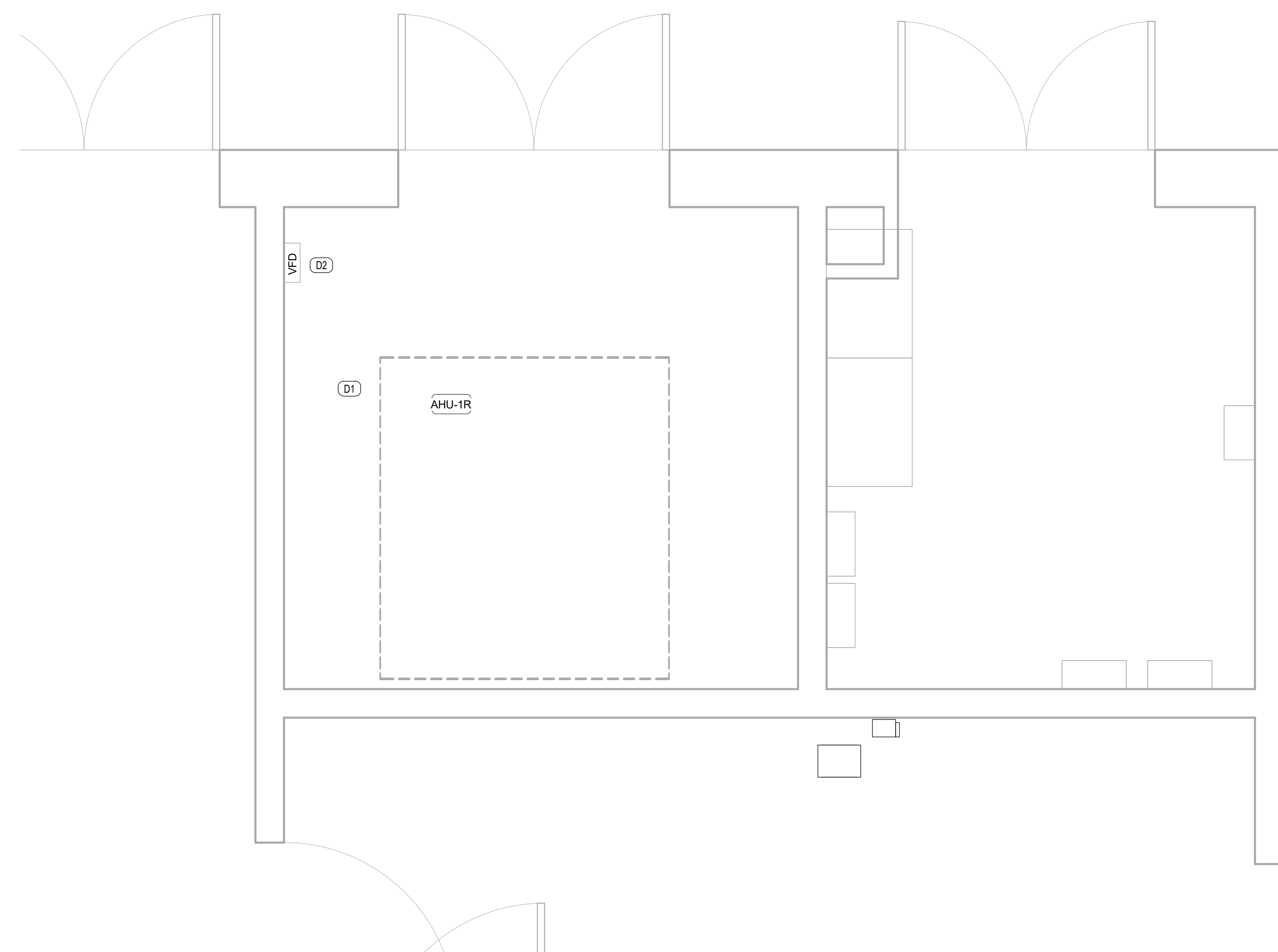
**ELECTRICAL DEMOLITION PLANS**

Sheet No.:

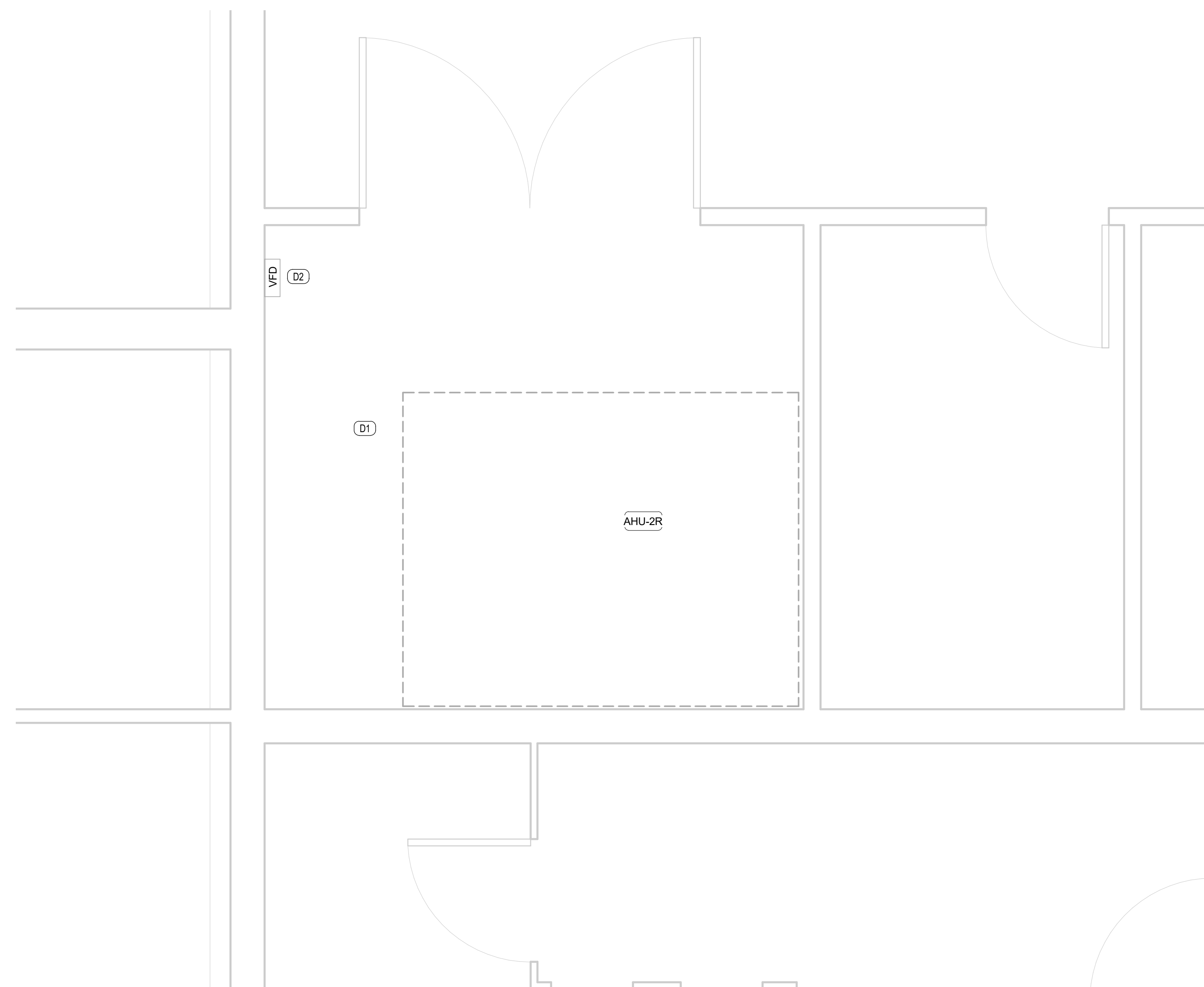
**E101**

**DEMOLITION NOTES**

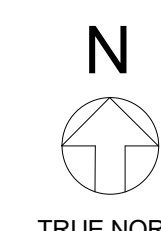
- 01 EXISTING AHU TO BE REMOVED. REMOVE WIRING & CONDUIT BACK TO VFD.
- 02 EXISTING VFD TO BE REMOVED. REMOVE WIRING AND CONDUIT BACK TO PANEL SOURCE.



1 First Floor Electrical Demo Plan  
 1/2" = 1'-0"



2 Second Floor Electrical Demo Plan  
 1/2" = 1'-0"

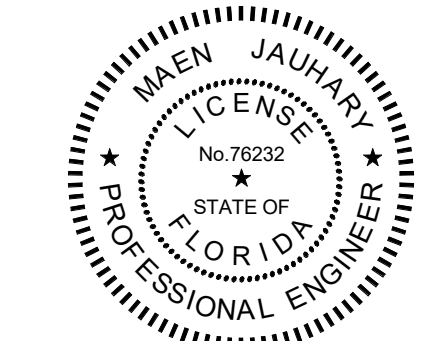


Client:



Consultants:

EOR Stamp:



09/29/2016  
Maen Jauhari, PE 76232 (FL)

Project:

Barnett Park AHU Replacement

Location:

4801 W Colonial Dr,  
Orlando, FL, 32808

Issuance:

PERMIT  
DOCUMENTS

Revisions:

#	Date	Description

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09/29/2016

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16.OC.027

Drawn By:

ME

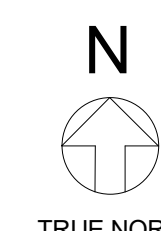
Checked By:

MJ

ELECTRICAL  
NEW PLANS

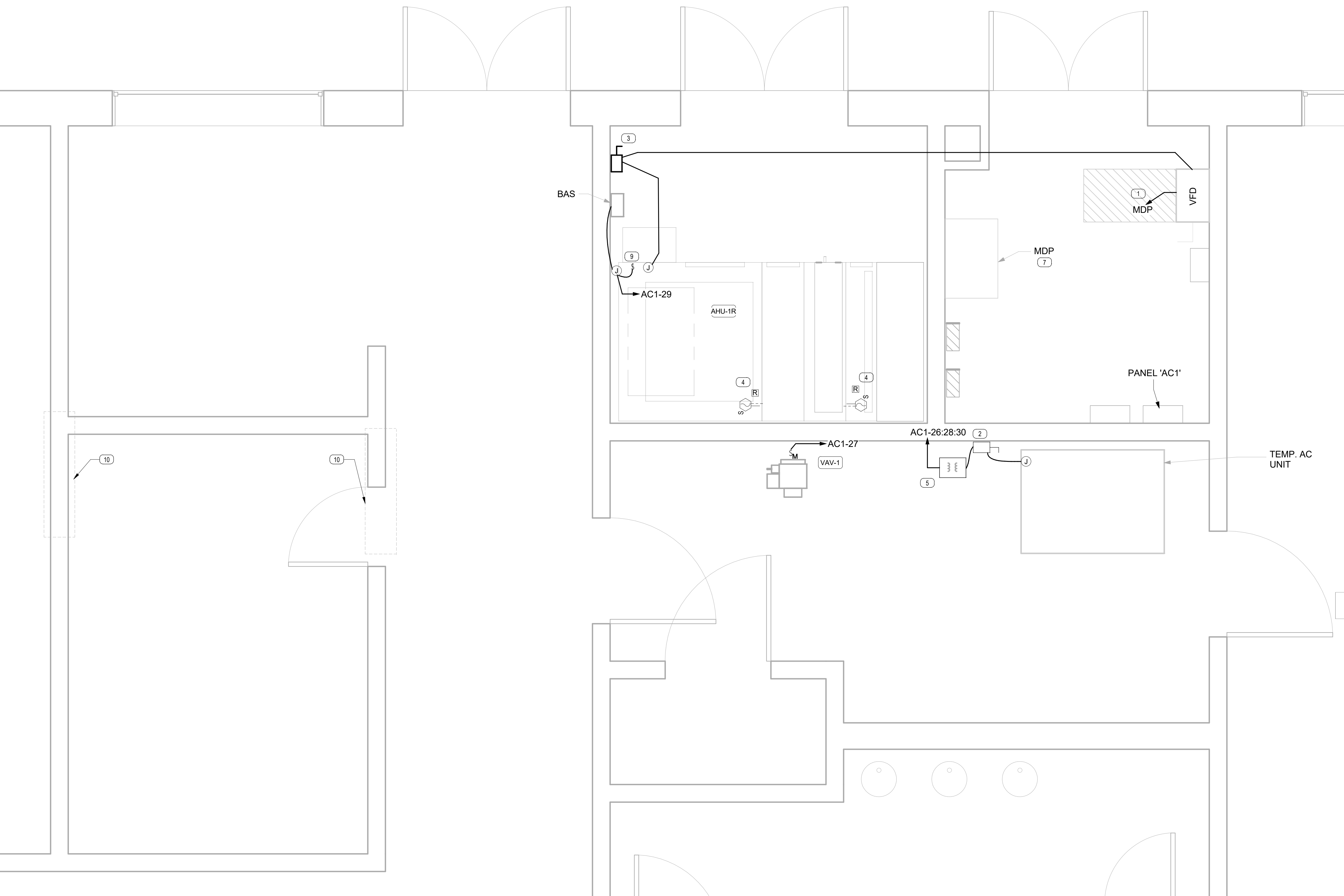
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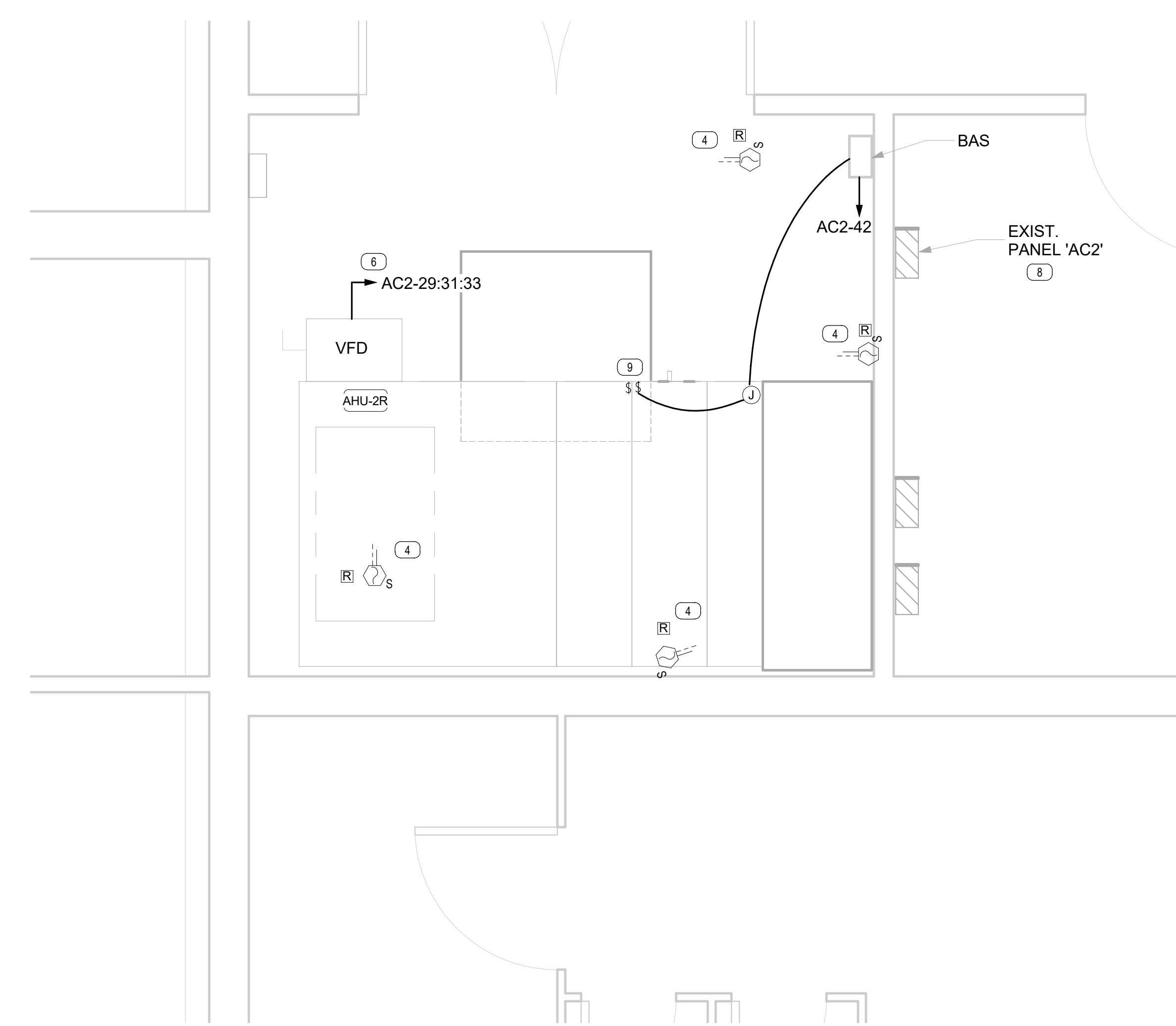


KEY NOTES

- 1 3 #1, 1 #6G, 1 1/2" TO A NEW 3P-125A IN MDP.  
TEMP 3P-60A, DISCONNECT SWITCH.
- 2 3P-200A DISCONNECT SWITCH, LOCK OUT TAG OUT.  
"DON'T OPERATE SWITCH UNDER LOAD. FOR  
MAINTENANCE SHUT DOWN VFD BEFORE OPERATING  
THE SWITCH."
- 3 CONNECT DUCT SMOKE DETECTOR TO NEAREST FIRE  
ALARM INITIATING DEVICE. WIRE RELAY TO SHUT DOWN  
FAN UPON A FIRE ALARM SIGNAL.
- 4 TEMPORARY 3 PH, 208 V-480V, 25 KVA STEP UP  
TRANSFORMER FOR TEMP. AC UNIT. RUN 3 #3, 1 #6G, 1  
1/4" FROM NEW 3P-90A C.B. IN PANEL AC1 TO  
TRANSFORMER'S 208 V SECTION, AND RUN 3 #10, 1 #8  
SUPPLY SIDE BONDING JUMPER, 2 1/4" FROM  
TRANSFORMER'S 480V SECTION TO TEMP AC UNIT  
DISCONNECT. CONNECT TRANSFORMER GROUND TO  
EXISTING BUILDING GROUND USING #4 CU GROUNDING  
ELECTRODE CONDUCTOR. PROVIDE NEW C.B. IN PANEL  
AC1 WITH A LOCKING DEVICE & FIELD MARK ITS  
LOCATION ON THE TRANSFORMER.
- 5 3 #1, 1 #6G, 1 1/2" TO A NEW 3P-125A IN PANEL AC2.  
REPLACE EXISTING 3P-60A C.B. FEEDING EXISTING  
AHU-1 WITH A NEW 3P-125A TO FEED NEW UNIT.  
REPLACE EXISTING 3P-80A C.B. FEEDING EXISTING  
AHU-2 WITH A NEW 3P-125A TO FEED NEW UNIT.
- 6 DISCONNECT SWITCH FOR BIPOLAR IONIZATION UNITS  
RELOCATE EXISTING CONDUIT TO ACCOMMODATE NEW  
DUCT INSTALLATION. TRACE CIRCUIT BACK TO SOURCE  
PANEL BEFORE STARTING WORK. REFER TO SHEET  
M103, EXISTING CONDUITS LPA1 - 7, 9; LPA1 - 35, 37, 39;  
LPA1 - 49
- 7
- 8
- 9
- 10



1 First Floor Electrical New Plan  
1/2" = 1'-0"



2 Second Floor Electrical New Plan  
1/2" = 1'-0"

UPDATED: 10/3/2016 10:13 am  
ISSUED FOR: APPROVAL

LOCATION: 113 ELEC ROOM  
VOLTAGE: 120V/208V  
TRIM: SURFACE

MAIN: 400A MLO  
SYSTEM: 3A, 4W  
BUS RATING: 400A

CONN. LOAD: 116 KVA  
FEED: TOP  
GROUND: BUS: YES COPPER

CKT	LOAD SERVED	CNO	PHASE	NEUT	DIS	BKR	DMD	L1	L2	L3	DMD	BKR	CNO	PHASE	NEUT	DIS	LOAD SERVED
1	FAN BOX FB-D					55/2	N	4000			55/2	N	40/2				FAN BOX FB-E
3							N	4000				N	40/2				FAN BOX FB-B
5	FAN BOX FB-F					55/2	N	4000			55/2	N	40/2				FAN BOX FB-C
7							N	4000				N	40/2				FAN BOX FB-C
9	FAN BOX FB-C					55/2	N	4000			55/2	N	40/2				FAN BOX FB-C
11							N	4000				N	40/2				FAN BOX FB-A
13	FAN BOX FB-A					55/2	N	4000			55/2	N	40/2				FAN BOX FB-E
15							N	4000				N	40/2				FAN BOX FB-E
17	FAN BOX FB-G					55/2	N	4000			55/2	N	40/2				FAN BOX FB-E
19							N	4000				N	40/2				FAN BOX FB-A
21	FAN BOX FB-E					55/2	N	4000			55/2	N	40/2				FAN BOX FB-F
23							N	4000				N	40/2				FAN BOX FB-B
25	EXISTING CONDUIT					55/2	N	4000			55/2	N	40/2				FAN BOX FB-B
27	VAV-1	3/4"	#10	#10	20/1	A		1200			28	27					TEMP. AC UNIT
29	JBOX - BAS CONTROL	3/4"	#10	#10	20/1	R		1200			30	29					AHU-2R
31	SPACE										32	31					SPACE
33	SPACE										34	33					SPACE
35	SPACE										36	35					SPACE
37	SPACE										38	37					SPACE
39	SPACE										40	39					SPACE
41	SPACE										42	41					SPACE

39403 36251 39403

UPDATED: 10/3/2016 10:07 am  
ISSUED FOR: APPROVAL

LOCATION: 218 ELEC ROOM  
VOLTAGE: 120V/208V  
TRIM: SURFACE

MAIN: 400A MLO  
SYSTEM: 3A, 4W  
BUS RATING: 400A

CONN. LOAD: 142.6 KVA  
FEED: TOP  
GROUND: BUS: YES COPPER

CKT	LOAD SERVED	CNO	PHASE	NEUT	DIS	BKR	DMD	L1	L2	L3	DMD	BKR	CNO	PHASE	NEUT	DIS	LOAD SERVED
2	FAN BOX FB-D					55/2	N	4000			55/2	N	40/2				FAN BOX FB-C
4							N	4000				N	40/2				FAN BOX FB-B
6	FAN BOX FB-F					55/2	N	4000			55/2	N	40/2				FAN BOX FB-C
8							N	4000				N	40/2				FAN BOX FB-C
10	FAN BOX FB-C					55/2	N	4000			55/2	N	40/2				FAN BOX FB-C
12							N	4000				N	40/2				FAN BOX FB-A
14	FAN BOX FB-A					55/2	N	4000			55/2	N	40/2				FAN BOX FB-E
16							N	4000				N	40/2				FAN BOX FB-E
18	FAN BOX FB-G					55/2	N	4000			55/2	N	40/2				FAN BOX FB-D
20							N	4000				N	40/2				FAN BOX FB-A
22	FAN BOX FB-E					55/2	N	4000			55/2	N	40/2				FAN BOX FB-F
24							N	4000				N	40/2				FAN BOX FB-B
26	TEMP. AC UNIT					55/2	N	4000			55/2	N	40/2				FAN BOX FB-B
28							N	4000				N	40/2				FAN BOX FB-B
30	AHU-2R	1-1/2"	#1	#6	125/3	A	5148	5148			30	29					AHU-2
32	SPACE										32	31					SPACE
34	SPACE										34	33					SPACE
36	SPACE										36	35					SPACE
38	SPACE										38	37					SPACE
40	SPACE										40	39					SPACE
42	EXISTING LOAD					20/1	R	1200			42	41					JBOX - BAS CONTROL AHU-2R

68295 53557 40703

UPDATED: 10/3/2016 10:40 am  
ISSUED FOR: APPROVAL

LOCATION: ELEC RM  
VOLTAGE: 120V/208V  
TRIM: SURFACE

MAIN: 1600A MLO  
SYSTEM: 3A, 4W  
BUS RATING: 1600A

CONN. LOAD: 565.4 KVA  
FEED: TOP  
GROUND: BUS: YES COPPER

CKT	LOAD SERVED	CNO	PHASE	NEUT	DIS	BKR	DMD	L1	L2	L3	DMD	BKR	CNO	PHASE	NEUT	DIS	LOAD SERVED
2	SURGE SUPPRESSOR					40/3	N	1333			40/3	N					SPARE
4							N	1333				N					SPARE
6							N	1333				N					SPARE
8	CHILLER PUMP P-1					20/3	N	2333			20/3	N					CHILLER PUMP P-1
10							N	2333				N					CHILLER PUMP P-2
12							N	2333				N					CHILLER PUMP P-2
14	AHU-1R	1-1/2"	#1	#6	125/3	A	5148	5148			14	13					AHU-1
16							N	5148			16	15					PANEL-LP/A3
18							N	5148			18	17					PANEL-A IRRIGATION PUMP
20							N	5148			20	19					PANEL-A IRRIGATION PUMP
22							N	5148			22	21					PANEL-LP/A1
24							N	5148			24	23					PANEL-LP/A2
26	EMV-1					175/3	N	1266			26	25					EMV-1
28							N	1266			28	27					ELEVATOR
30							N	1266			30	29					ELEVATOR
32	PANEL LP/A1					30/3	N	1666			32	31					PANEL LP/A1
34							N	1666			34	33					PANEL LP/A2
36							N	1666			36	35					PANEL LP/A2
38	PANEL AC-2					400/3	N	1100			38	37					PANEL AC-2
40							N	1100			40	39					PANEL AC-1
42							N	1100			42	41					PANEL AC-1
44	CHILLER					400/3	N	1111			44	43					CHILLER
46							N	1111			46	45					CHILLER
48							N	1111			48	47					CHILLER

16840 16840 16840

LOADS (IN VA)	CONNECTED	DEMAND FACTOR	MINIMUM FEEDER	LOADS	CONNECTED	DEMAND FACTOR	MINIMUM FEEDER	LOADS	CONNECTED	DEMAND FACTOR	MINIMUM FEEDER	LOADS	CONNECTED	DEMAND FACTOR	MINIMUM FEEDER	LOADS	CONNECTED	DEMAND FACTOR	MINIMUM FEEDER
REMAINING CONTINUOUS LOADS	0	1.25	0	REMAINING CONTINUOUS LOADS	0	1.25	0	REMAINING CONTINUOUS LOADS	111012	1.0	111012	REMAINING CONTINUOUS LOADS	0	1.25	0	REMAINING CONTINUOUS LOADS	549996	1.0	549996
REMAINING NON-CONTINUOUS LOADS	113637	1.0	113637	REMAINING NON-CONTINUOUS LOADS	0	1.0	0	REMAINING NON-CONTINUOUS LOADS	0	1.0	0	REMAINING NON-CONTINUOUS LOADS	0	1.0	0	REMAINING NON-CONTINUOUS LOADS	0	1.0	0
DEMAND LOADS	0	1.0	0	DEMAND LOADS	0	1.0	0	DEMAND LOADS	0	1.0	0	DEMAND LOADS	0	1.0	0	DEMAND LOADS	0	1.0	0
TOTAL CONNECTED LOAD	116	KVA	322.3	AMPS	TOTAL CONNECTED LOAD	142.6	KVA	396	AMPS	TOTAL CONNECTED LOAD	142.6	KVA	396	AMPS	TOTAL CONNECTED LOAD	565.4	KVA	1570.2	AMPS
MIN. FEEDER/PANEL CAP.	116	KVA	322.3	AMPS	MIN. FEEDER/PANEL CAP.	142.6	KVA	396	AMPS	MIN. FEEDER/PANEL CAP.	142.6	KVA	396	AMPS	MIN. FEEDER/PANEL CAP.	565.4	KVA	1570.2	AMPS
OVERALL DEMAND FACTOR	1.00			OVERALL DEMAND FACTOR	1.00			OVERALL DEMAND FACTOR	1.00			OVERALL DEMAND FACTOR	1.00			OVERALL DEMAND FACTOR	1.00		