ORANGE COUNTY, FLORIDA

ORANGE 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

FIRE STATION #31 HVAC REPLACEMENT

06/10/15
BID DOCUMENTS

MATERN PROFESSIONAL ENGINEERING, INC.
ENG. BUS. No. EB-0005096
CERT. OF AUTH. No. 5096
130 Candace Drive
Maitland, FL 32751-3331
PHONE (407) 740-5020
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PRIME CONSULTANT

MATERN PROFESSIONAL ENGINEERING, INC.

BOBES ASSOCIATES CONSULTING ENGINEERS, INC.
150 CIRCLE DRIVE
MAITLAND, FL 32751

MEP ENGINEER

BOBES ASSOCIATES CONSULTING ENGINEERS, INC. EB #5181
GUS BOBES JR. P.E. PRESIDENT PE #39410

BOWEN ENGINEERING CORPORATION
TELEPHONE: 407-423-7585
1528 VASSAR STREET
ORLANDO, FL 32804

SHEET NO.	STRUCTURAL SHEET INDEX FOR	SCALE
S-100	STRUCTURAL NOTES, PLAN SECTION & DETAILS	AS NOTED

SHEET NO.	MECHANICAL SHEET INDEX FOR	SCALE
M-0.1	LEGEND & NOTES - HVAC	NO SCALE
PH-1.1	HVAC PHASING PLAN AND SCOPE OF WORK	1/8"=1'-0"
MD-1.1	FIRST FLOOR PLAN - HVAC - DEMOLITION	1/8"=1'-0"
MD-1.2	SECOND FLOOR PLAN - HVAC - DEMOLITION	1/8"=1'-0"
M-1.1	FIRST FLOOR PLAN - HVAC - RENOVATION	1/8"=1'-0"
M-1.2	SECOND FLOOR PLAN - HVAC - RENOVATION	1/8"=1'-0"
M-1.3	ROOF PLAN - HVAC - RENOVATION	1/8"=1'-0"
M-2.1	BUILDING CONTROLS - HVAC	NO SCALE
M-3.1	SCHEDULES - HVAC	NO SCALE
M-4.1	DETAILS - HVAC	NO SCALE
M-4.2	DETAILS II - HVAC	NO SCALE
M-4.3	DETAILS III - HVAC	NO SCALE

SHEET NO.	ELECTRICAL SHEET INDEX FOR	SCALE
E-1.1	FIRST FLOOR PLAN - ELECTRICAL	3/16"=1'-0"
E-1.2	SECOND FLOOR PLAN - ELECTRICAL	3/16"=1'-0"
E-1.3	ROOF PLAN - ELECTRICAL	1/8"=1'-0"

STRUCTURAL NOTES

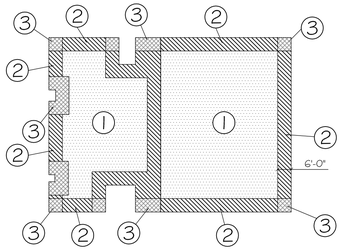
STRUCTURAL DESIGN CRITERIA

D-1 CODES: FLORIDA BUILDING CODE 2010

D-2 DESIGN LIVE LOADS:
ROOF: 20 PSF.

D-3 ULTIMATE DESIGN WIND SPEED V ult = 145 MPH, 3-SEC. GUST
NOMINAL DESIGN WIND SPEED V asd = 113 MPH, 3-SEC. GUST
RISK CATEGORY III - IV
EXPOSURE C
ENCLOSED BLDG, INTERNAL PRESSURE COEFFICIENT
(GCpi)= +/-0.18

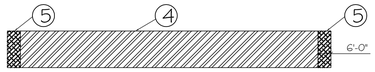
D-4 COMPONENTS AND CLADDING WIND PRESSURES



ROOF PRESSURES ULTIMATE PRESSURES IN PSF.

TRIBUTARY AREA	INTERIOR (1)	PERIMETER (2)	CORNER (3)
A<=20	-47.7	-80.0	-120.3
	+19.4	+19.4	+19.4
20<A<=50	-46.5	-71.5	-99.7
	+18.2	+18.2	+18.2
50<A<=100	-44.8	-60.2	-72.4
	+16.6	+16.6	+16.6
100<A	-43.6	-51.7	-51.7
	+15.4	+15.4	+15.4

NOTE: TO OBTAIN NOMINAL "ASD" WIND PRESSURES MULTIPLY VALUES SHOWN ON TABLE BY A FACTOR OF 0.6



WALL PRESSURES ULTIMATE PRESSURES IN PSF.

TRIBUTARY AREA	INTERIOR (4)	EXTERIOR (5)
A<=20	-46.5	-57.4
	+42.9	+42.9
20<A<=50	-44.6	-53.6
	+41.0	+41.0
50<A<=100	-42.1	-48.5
	+38.4	+38.4
100<A	-40.2	-44.6
	+36.5	+36.5

NOTE: TO OBTAIN NOMINAL "ASD" WIND PRESSURES MULTIPLY VALUES SHOWN ON TABLE BY A FACTOR OF 0.6

FIELD VERIFY CONDITIONS

FV-1 CONTRACTOR SHALL VERIFY CONDITIONS AND DIMENSIONS RELATIVE TO THE SAME. WHERE THERE ARE CONFLICTS BETWEEN ACTUAL FIELD CONDITIONS AND DATA PRESENTED IN THE DRAWINGS, SUCH CONDITIONS SHALL BE CALLED TO THE ARCHITECT'S ATTENTION AND THE NECESSARY ADJUSTMENTS SHALL BE MADE PER THEIR INSTRUCTIONS.

FV-2 GENERAL CONTRACTOR SHALL REVIEW AND APPROVE SHOP DRAWINGS BEFORE SUBMITTING THEM TO THE ENGINEER, OTHERWISE THEY WILL BE REJECTED.

FV-3 IF THERE ARE ANY DISCREPANCIES THE STRICTER SHALL GOVERN.

STRUCTURAL STEEL

S-1 FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AISC "MANUAL OF STRUCTURAL CONSTRUCTION" THIRTEENTH EDITION AND THE AISC "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS," 2005 EDITION.

S-2 STEEL DESIGNATIONS:
WIDE FLANGES.....ASTM A992 Fy=50k.s.i
ALL OTHER HOT-ROLLED
SHAPES AND PLATES.....ASTM A36 fy=36k.s.i
PIPE COLUMNS.....ASTM A53, GRADE B Fy=35k.s.i
STRUCTURAL TUBING.....ASTM A500, GRADE B Fy=46k.s.i

S-3 ALL HIGH-STRENGTH BOLTS SHALL MEET THE REQUIREMENTS OF THE "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS."

S-4 UNLESS NOTED OTHERWISE, ALL BOLTS SHALL BE 3/4" DIAMETER A-325 AND SHALL BE BEARING TYPE CONNECTIONS. IF A CERTAIN SITUATION IS NOT DETAILED USE A SIMIALAR DETAIL CONNECTIONS SHALL GENERALLY FOLLOW THE TYPES SHOWN IN AISC MANUAL OF STEEL CONSTRUCTION.

S-5 ALL BOLTS CAST IN CONCRETE SHALL CONFORM TO ASTM A-36 OR A-307.

S-6 ALL SHOP AND FIELD WELDING SHALL BE DONE BY CURRENTLY CERTIFIED WELDERS IN ACCORDANCE WITH AWS D1.1 "STRUCTURAL WELDING CODE," LATEST EDITION.

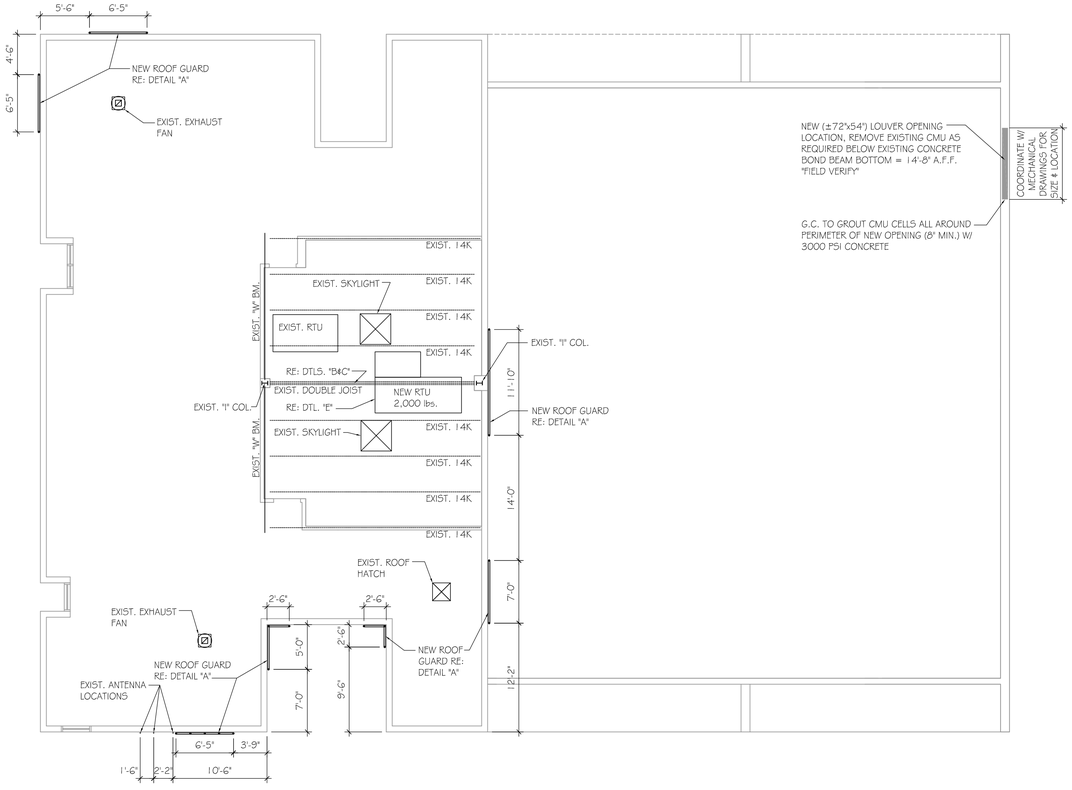
S-7 ALL WELDS ARE TO CONFORM TO AISC STANDARDS AND LOAD TABLES. USE E70XX ELECTRODES FOR ALL WELDING UNLESS NOTED OTHERWISE GRIND SMOOTH ALL EXPOSED WELDS.

S-8 SUBMIT STRUCTURAL STEEL SHOP DRAWINGS FOR REVIEW PRIOR TO FABRICATION. CLEARLY SHOW ALL PIECE MARKS, CONNECTIONS AND ERECTION DRAWINGS. ANY SPLICES NOT SHOWN ON CONTRACT DRAWINGS ARE TO BE CLEARLY NOTED FOR APPROVAL.

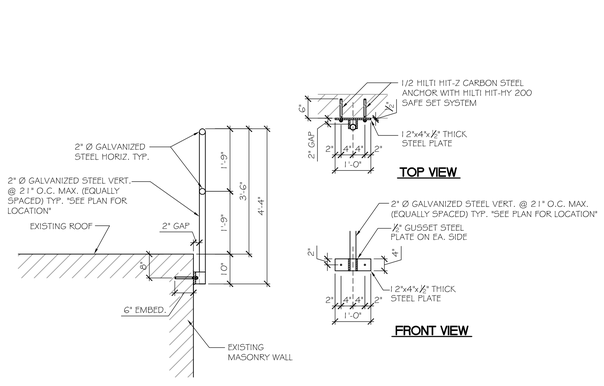
S-9 DO NOT WELD TO EMBEDS UNTIL CONCRETE HAS CURED AT LEAST 72 HOURS. USE APPROPRIATE WELDING PROCESSES TO LIMIT HEAT BUILDUP IN EMBED TO AVOID PLATE EXPANSION AND CRACKING OF CONCRETE.

S-10 WELDED CONNECTIONS SHALL DEVELOP THE FULL SHEAR AND/OR MOMENT CAPACITY OF THE MEMBERS CONNECTED. AS PER AISC

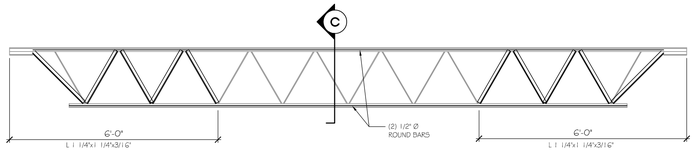
S-11 ALL BOLTED STEEL CONNECTIONS ARE TO BE STANDARD AISC BOLTED CONNECTIONS AS PER THE AISC MANUAL AND SHALL BE CAPABLE OF SUPPORTING MAXIMUM ALLOWABLE UNIFORM BEAM LOADS, AS DETERMINED FROM THE TABLES OF UNIFROM LOAD CONSTANTS OF THE AISC MANUAL. ALL BOLTS SHALL BE STRENGTH ASTM A325.



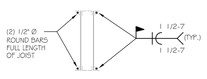
1 EXISTING PARTIAL ROOF FRAMING PLAN
1/8"=1'-0"
RE:



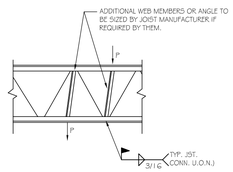
A GUARD RAIL CONNECTION
3/4"=1'-0"
RE:



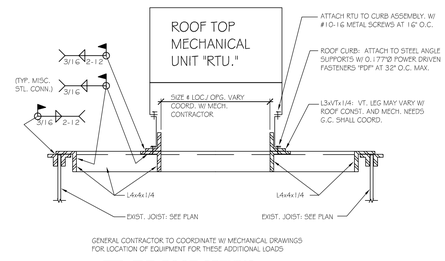
B DOUBLE JOIST REINFORCEMENT SECTION
N.T.S.
RE:



C SECTION
N.T.S.
RE:



D POINT LOAD SUPPORT
3/4"=1'-0"
RE:



E TYP. ROOF OPENING
N.T.S.
RE:

MATERN PROFESSIONAL ENGINEERING
MEP/FP Engineering Consultants - A Solutions Based Firm
ORLANDO I Fort Myers I Jacksonville I Tampa
Matern Professional Engineering, Inc
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ENG. BUS. No. EB-0005096 CERT. OF AUTH. No. 5096

ORANGE COUNTY FIRE STATION #31 HVAC REPLACEMENT

BOWEN ENGINEERING CORPORATION
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EB5026
FEDERICO J. BOWEN
P.E. # 38153

Revisions

No.	Date	Description

Key Plan

MPE PROJ#: 2013-177

Designed By: FB
Drawn By: JF
Checked By: FB
Issue Date: 06/10/15
Drawing Scale: AS NOTED

Drawing Title:

STRUCTURAL NOTES, PLAN SECTION & DETAILS

BID DOCUMENTS

Drawing No.

S-100

HVAC SYMBOL LEGEND

Symbol	Description	Symbol	Description
24x12	DUCT–FIRST DIM. IS WIDTH DUCT–SECOND DIM. IS HEIGHT		DUCT TAKE–OFF W/ VOLUME DAMPER
	DUCT ELBOW DOWN		POINT OF CONNECTION NEW TO EXISTING WORK
	DUCT ELBOW UP		POINT OF EXTENT OF REMOVAL OF EXISTING HVAC
R	DUCT RISE		THERMOMETER
D	DUCT DOWN		PRESSURE GAUGE
SA	DUCT UNDER POSITIVE PRESSURE		UNION OR FLANGE
RA EA OA	DUCT UNDER NEGATIVE PRESSURE		BALL OR BUTTERFLY VALVE
	ELBOW W/TURNING VANES		CHECK VALVE
	TAKE–OFF W/EXTRACTOR		MODULATING CONTROL VALVE
	FLEXIBLE DUCT		TWO POSITION CONTROL VALVE
	FLEXIBLE CONNECTION		PLUG VALVE W/ MEMORY
	SUPPLY AIR TERMINAL ARROW INDICATES THROW		FLEXIBLE PIPE
	RETURN OR EXHAUST AIR		STRAINER
	LINEAR DIFFUSERS		MANUAL AIR VENT
	SIDE MOUNTED EHD		AUTOMATIC AIR VENT
	BOTTOM MOUNTED EHD		3/4" HOSE END DRAIN PIPE
FS	FIRE DAMPER	CHWS	CHILLED WATER SUPPLY
SD	SMOKE DAMPER	CHWR	CHILLED WATER SUPPLY
S/F	SMOKE AND FIRE DAMPER	HWS	HOT WATER SUPPLY
VD	VOLUME DAMPER	HWR	HOT WATER RETURN
RVD	REMOTE VOLUME DAMPER	RHG	REFRIGERANT HOT GAS
MD	MOTORIZED DAMPER	RL	REFRIGERANT LIQUID
BDD	BACKDRAFT DAMPER	RS	REFRIGERANT SUCTION
S	SMOKE DETECTOR (DUCT MOUNTED)	D	CONDENSATE DRAIN
AD	CEILING ACCESS DOOR		PIPE ELBOW DOWN
AD	DUCT ACCESS DOOR		PIPE ELBOW UP
H	HUMIDITY SENSOR		PIPE ELBOW
S	ROOM SENSOR		PIPE TEE DOWN
T	THERMOSTAT		PIPE TEE UP
		Ø	ROUND

HVAC ABBREVIATIONS

AC	AIR CONDITIONING	HD	HUB DRAIN
AHU	AIR HANDLING UNIT	HOA	HAND/OFF/AUTOMATIC
AFF	ABOVE FINISHED FLOOR	HP	HORSEPOWER
BDD	BACKDRAFT DAMPER	HVAC	HEATING, VENTILATING & AIR CONDITIONING
BHP	BRAKE HORSEPOWER	H20	WATER
BMS	BUILDING MANAGEMENT SYSTEM	INIT	INITIAL
BTU	BRITISH THERMAL UNIT	KSU	KITCHEN AIR SUPPLY UNIT
CF	CHEMICAL FEEDER	LAT	LVG. AIR TEMPERATURE
CFM	CUBIC FEET PER MINUTE	LD	LINEAR DIFFUSER
CLG	CEILING	LR	LINEAR RETURN
CYC	CYCLES	LVG	LEAVING
COND	CONDENSATE	LWT	LVG. WATER TEMPERATURE
CC	COOLING COIL	MAU	MAKE UP AIR UNIT (KITCHEN HOOD)
CD	CEILING DIFFUSER	MBH	MEGA BTU PER HOUR
CG	CEILING GRILLE	MD	MOTORIZED DAMPER
DIM	DIMENSION	NC	NOISE CRITERIA
DB	DRY BULB	NIC	NOT IN CONTRACT
°F	DEGREES FARENHEIT	OA	OUTSIDE AIR
DWG	DRAWING	OPER	OPERATING
EA	EXHAUST AIR	OV	OUTLET VELOCITY
EAT	ENTERING AIR TEMPERATURE	PCF	PUMP, CHEMICAL FEED
EG	EXHAUST AIR GRILLE	PCH	PUMP, CHILLED WATER
EHC	ELECTRIC HEATING COIL	PD	PRESSURE DROP
EHD	ELECTRIC HEATER, DUCT	PH	PHASE
EHU	ELECTRIC UNIT HEATER	RG	RETURN AIR GRILLE
EHW	ELECTRIC HEATER, WALL	ROT	ROTATION
ENT	ENTERING	RPM	REVOLUTION PER MINUTE
ER	EXHAUST AIR REGISTER	RVD	REMOTE VOLUME DAMPER
EWT	ENT. WATER TEMPERATURE	SA	SUPPLY AIR
F	FILTER	SENS	SENSIBLE
FCU	FAN COIL UNIT	SD	SPLITTER DAMPER
EF	EXHAUST FAN	SP	STATIC PRESSURE
EFG	EXHAUST FAN, GREASE	SR	SUPPLY AIR REGISTER
FF	FLY FAN	TG	TRANSFER AIR GRILLE
FPI	FINS PER INCH	TEMP	TEMPERATURE
FPM	FEET PER MINUTE	UD	UNDERCUT DOOR
FR	FAN, RETURN	VG	VENT, GRAVITY
SF	SUPPLY FAN	W	WATTS
GPM	GALLONS PER MINUTE	WB	WET BULB
		W/	WITH

OUTSIDE AIR CALCULATIONS - FIRE STATION #31

STANDARD CASE: ASHRAE STD 62.1-2004 VERIFICATION RATE PROCEDURE/2010 FLORIDA BUILDING CODE (MECHANICAL) TABLE 403.3

ZONE	OCCUPANCY CATEGORY	Az ZONE FLOOR AREA (SF)	Rp PEOPLE OUTDOOR AIR RATE (CFM/PERSON)	Ra AREA OUTDOOR AIR RATE (CFM/SF)	Pz ZONE POPULATION	BREATHING ZONE OUTDOOR AIR FLOW (CFM)	TABLE 6–2 ZONE AIR DISTRIBUTION EFFECTIVENESS Ez	ZONE OUTDOOR AIR FLOW Voz/(CFM)	TABLE 6–3 SYSTEM VENTILATION EFFICENCY Ev	REQUIRED OUTDOOR AIR INTAKE FLOW Vot/(CFM)	ACTUAL OUTDOOR AIR INTAKE FLOW (CFM)	MEETS STANDARD	UNIT TAG
LT. OFFICE 101	OFFICE SPACE	165	5.0	.06	2	20	1.0	20	1.0	20	39	YES	AIIR HANDLING UNIT AHU–1.1
WOA READY ROOM 102	OFFICE SPACE	175	5.0	.06	2	21	1.0	21	1.0	20	65	YES	AIR HANDLING UNIT AHU–1.1
WOA BUNK ROOM	SLEEPING AREA	150	5.0	.06	1	14	1.0	14	1.0	14	35	YES	AIR HANDLING UNIT AHU–1.1
ELEC. ROOM E100B	GENERAL (STORAGE)	85	–	.12	–	11	1.0	11	1.0	11	13	YES	AIR HANDLING UNIT AHU–1.1
LOBBY 197B	OFFICE LOBBY	230	5.0	.06	1	19	1.0	19	1.0	19	32	YES	AIR HANDLING UNIT AHU–1.1
TOTAL										85	184		AHU–1.1 VENTILATION – 200 CFM
STUDY ROOM 104	OFFICE SPACE	145	5.0	.06	1	14	1.0	14	1.0	14	41	YES	AIR HANDLING UNIT AHU–1.2
FIRST AID 107	OFFICE SPACE	135	5.0	.06	2	19	1.0	19	1.0	19	34	YES	AIR HANDLING UNIT AHU–1.2
LOBBY 197A	OFFICE LOBBY	125	5.0	.06	1	13	1.0	13	1.0	13	60	YES	AIR HANDLING UNIT AHU–1.2
CORRIDOR 199	GENERAL CORRIDOR	269	–	.06	–	17	1.0	17	1.0	17	76	YES	AIR HANDLING UNIT AHU–1.2
TOTAL										195	331		AHU–1.2 VENTILATION – 250 CFM
KITCHEN 106	FOOD SERVICE	220	7.5	.18	1	47	1.0	47	1.0	47	68	YES	AIR HANDLING UNIT AHU–1.3
DINING 108	GENERAL (MEETING)	325	5.0	.06	10	70	1.0	70	1.0	70	127	YES	AIR HANDLING UNIT AHU–1.3
READY ROOM 109	GENERAL (MEETING)	455	5.0	.06	10	78	1.0	78	1.0	78	136	YES	AIR HANDLING UNIT AHU–1.3
TOTAL										125	150		AHU–1.3 VENTILATION – 150 CFM
DRYING ROOM R200C	GENERAL (STORAGE)	65	–	.12	–	8	1.0	8	1.0	8	30	YES	AIR HANDLING UNIT AHU–1.4
DORM 203	SLEEPING AREA	780	5.0	.06	5	72	1.0	72	1.0	72	280	YES	AIR HANDLING UNIT AHU–1.4
OFFICER DORM	SLEEPING AREA	220	5.0	.06	1	19	1.0	19	1.0	19	100	YES	AIR HANDLING UNIT AHU–1.4
CORRIDOR 299	CORRIDOR (GENERAL)	435	–	.06	–	27	1.0	27	1.0	27	100	YES	AIR HANDLING UNIT AHU–1.4
TOTAL										126	510		AHU–1.4 VENTILATION – 600 CFM

HVAC GENERAL NOTES

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE 2010 FLORIDA BUILDING CODE, THE 2010 FLORIDA MECHANICAL CODE, THE 2010 FLORIDA ENERGY EFFICIENCY CODE AND THE ORANGE COUNTY BUILDING DEPARTMENT REQUIREMENTS AND ALL OTHER APPLICABLE CODES AND STANDARDS.
2. CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS IN THE FIELD FOR EQUIPMENT, DUCTWORK AND WALL OR ROOF PENETRATIONS. COORDINATE DUCTWORK DISTRIBUTION SYSTEM WITH THE EXISTING VARYING HEIGHTS OF THE ROOF SUPPORT STRUCTURE,
3. REFER TO ARCHITECTURAL DRAWINGS FOR CLEARANCES WITHIN THE CEILING SPACE, MECHANICAL ROOMS, LOCATIONS AND SIZES OF BEAMS AND CEILING AND SOFFIT HEIGHTS. EXISTING ARCHITECTURAL DRAWINGS (PDF FORMAT) OF THE FIRE STATION #31 BUILDING CAN BE OBTAINED FROM ORANGE COUNTY FACILITIES DEPARTMENT.
4. DUCTWORK AND EQUIPMENT LOCATIONS AND CLEARANCES SHALL BE COORDINATED WITH GENERAL, PLUMBING, FIRE PROTECTION AND ELECTRICAL CONTRACTORS. REFER TO EXISTING ARCHITECTURAL PLANS FOR BUILDING SECTIONS AND DETAILS.
5. CONNECTION TO ALL EQUIPMENT SHALL BE VERIFIED WITH MANUFACTURERS CERTIFIED DRAWINGS. TRANSITIONS TO ALL EQUIPMENT SHALL BE VERIFIED AND PROVIDED FOR ALL EQUIPMENT FURNISHED.
6. COORDINATE DIFFUSER, REGISTER AND GRILLE LOCATION WITH LIGHTING, SPRINKLER AND ARCHITECTURAL CEILING PLANS. ALSO COORDINATE THE TYPE OF DIFFUSER FRAME WITH THE CEILING TYPE.
7. ALL EQUIPMENT SHALL BE PROPERLY SUPPORTED AND ISOLATED TO PREVENT NOISE AND VIBRATION TRANSMISSION. ALL AIR HANDLING EQUIPMENT SHALL BE SUPPORTED OR SUSPENDED WITH SPRING VIBRATION ISOLATORS PADS. ALL CONNECTIONS BETWEEN AIR HANDLING EQUIPMENT AND DUCTWORK SHALL BE CANVAS FLEXIBLE CONNECTORS.
8. ALL MECHANICAL EQUIPMENT SHALL BE LOCATED WITH RESPECT TO BUILDING CONSTRUCTION AND OTHER EQUIPMENT SO AS TO PERMIT ACCESS TO THE MECHANICAL EQUIPMENT IN CONFORMITY WITH ANY CLEARANCE WHICH MAY BE RECOMMENDED BY THE MANUFACTURER OF THE EQUIPMENT. SUFFICIENT CLEARANCE SHALL BE MAINTAINED FOR CLEANING COILS, MOTORS, BURNERS, AS WELL AS CHANGING FILTERS. ALL EQUIPMENT SHALL BE LOCATED WITHIN THE MECHANICAL ROOM AND CEILING SPACES WITH ADEQUATE CLEARANCES FOR REPAIR AND MAINTENANCE. ALL PIPING AND DUCTWORK SHALL BE INSTALLED TO PROVIDE ADEQUATE CLEARANCE FOR ACCESS TO ALL EQUIPMENT. INSTALLATION OF ALL MECHANICAL EQUIPMENT SHALL COMPLY WITH THE MANUFACTURERS SPECIFICATION AND CLEARANCE REQUIREMENT.
9. ALL DUCT DIMENSIONS SHOWN ARE CLEAR INSIDE DIMENSIONS.
10. THE INSIDE OF ALL DUCTS VISIBLE THRU THE FACE OF DIFFUSERS, REGISTERS, AND GRILLES SHALL BE PAINTED FLAT BLACK WITH NON TOXIC PAINT.
11. ALL SUPPLY AIR, RETURN AIR, OUTSIDE AIR AND EXHAUST AIR DUCTWORK SHALL BE GALVANIZED STEEL SHEETS. FABRICATION AND INSTALLATION SHALL BE IN ACCORDANCE WITH LATEST EDITION OF SMACNA DUCT CONSTRUCTION STANDARDS. SUPPLY AIR, RETURN AIR, OUTSIDE AIR AND EXHAUST DUCTWORK FOR EXHAUST FANS EF–1.3 SHALL BE RATED FOR A 2 INCH PRESSURE CLASSIFICATION. EXHAUST AIR DUCTWORK FOR ALL OTHER EXHAUST FANS SHALL BE RATED FOR 1" PRESSURE CLASSIFICATION.
12. ALL DUCTWORK TRANSVERSE AND LONGITUDINAL SEAMS AND JOINTS SHALL BE SEALED WITH APPROVED MASTIC.
13. ALL GREASE DUCT CONSTRUCTION SHALL BE STAINLESS STEEL, MIN 18 GAGE, OR CARBON STEEL, MIN 16 GAGE, ALL WELDED, LIQUID TIGHT CONSTRUCTION AS PER NFPA 96 LATEST EDITION AND 2010 FBCM SECTION 506.
14. ALL GREASE DUCT TO HOOD COLLAR CONNECTIONS SHALL BE MADE AS SHOWN IN FIGURE 7.5.2.2, NFPA 96 LATEST EDITION.
15. GREASE EXHAUST DUCT SHALL BE WRAPPED IN A FIRE RATED WRAP THROUGH IT'S ENTIRE LENGTH. MAINTAIN MINIMUM CLEARANCE AS PER NFPA 96, LATEST EDITION. DUCT ENCLOSURE SHALL COMPLY WITH 2010 FBCM SECTION 506.2.10 DUCT ENCLOSURE.
16. FLEXIBLE DUCTWORK SHALL BE INSULATED VINYL TYPE (R–6) WITH WIRE SPIRAL SUPPORT. FLEXIBLE DUCTWORK SHALL BE RUN IN MAXIMUM LENGTHS OF 20'–0". FLEXIBLE DUCTWORK SHALL BE PROPERLY SUPPORTED WITH GALVANIZED STEEL STRAPS 1" WIDE AND SHALL BE RUN AS STRAIGHT AS POSSIBLE WITH NO KINKS OR BENDS TO RESTRICT AIRFLOW.
17. ALL DUCTWORK, EXCEPT THE EXHAUST SYSTEM, SHALL BE EXTERNALLY INSULATED WITH 2.2" THICK (R–6) FIBERGLASS BLANKET INSULATION WITH FOIL JACKETING UNLESS OTHERWISE NOTED. INSULATION R VALUE IS WITH 25% COMPRESSION IN ACCORDANCE WITH FBCM 604.7 IDENTIFICATION.
18. ALL FIBROUS GLASS INSULATION JOINTS, SEAMS AND CONNECTIONS SHALL BE CONSTRUCTED WITH PRESSURE SENSITIVE TAPE, FAB, STAINLESS STEEL STAPLES AND THEN SEALED WITH MASTIC. HEAT AND PRESSURE SENSITIVE TAPE ARE NOT ACCEPTABLE AS A FINAL CLOSURE.
19. PROVIDE HANGER STRAPS FOR ALL DUCTS MADE OF 1" WIDE, 22 GAGE GALVANIZED STEEL– SPACED ACCORDING TO SMACNA STANDARDS AND ALL OTHER APPLICABLE GOVERNING CODES AND STANDARDS.
20. BEVELED TAKE OFFS WITH MANUAL VOLUME DAMPERS SHALL BE INSTALLED IN ALL BRANCH DUCTWORK LEADING FROM MAIN TRUNK LINES, EQUAL TO CROWN PRODUCTS MODEL 3300–DS. DO NOT INSTALL MANUAL DAMPERS ON TAKE–OFFS TO INLETS OF VAV BOXES.
21. ALL SPLITTER DAMPERS SHALL BE BALANCED AND SET PRIOR TO THE INSTALLATION OF THE CEILING.
22. ALL DUCT BRANCH TAKE OFFS FROM MAIN DUCT FOR INDIVIDUAL AIR OUTLETS AND INLETS SHALL HAVE MANUAL BALANCING DAMPERS WITH OPERATING HANDLE OUTSIDE THE DUCT INSULATION.
23. ALL DAMPERS AND EXTRACTORS SHALL HAVE LOCKING QUADRANTS AND SHALL BE ACCESSIBLE.
24. PROVIDE REMOTE VOLUME DAMPER (RVD) OPERATORS IN ALL NON–ACCESSIBLE CEILINGS. EQUAL TO YOUNG REGULATOR COMPANY MODEL 270–896C BOWDEN CABLE CONTROL UNIT OR METROPOLITAN AIR. CONTROL FOR EACH REMOTE VOLUME DAMPER SHALL BE LOCATED WITHIN THE DIFFUSER OR REGISTER BEING SERVED.
25. ALL DUCTWORK STORED ON SITE OR ALREADY INSTALLED SHALL HAVE ALL OPEN ENDS SEALED WITH VISQUINE TO PREVENT DUST AND DEBRIS FROM ACCUMULATING INSIDE OF THE DUCTWORK. INTERIORS OF ALL DUCTWORK SHALL BE THOROUGHLY CLEANED PRIOR TO INSTALLATION.
26. OUTSIDE AIR INTAKE HOODS ON ROOF SHALL BE LOCATED A MINIMUM OF 10'–0" FROM ANY EXHAUST AIR DISCHARGE, COMBUSTION AIR DISCHARGE OR ANY PLUMBING VENT TERMINATION.
27. PROVIDE ADJUSTABLE PULLEYS WITH CONSTANT VOLUME AIR HANDLING UNITS AND BELT DRIVE FANS. FURNISH (2) EXTRA SETS OF FAN BELTS.
28. EXHAUST FAN OUTLETS SHALL BE INSTALLED A MINIMUM OF 10'–0" FROM FRESH AIR INTAKES OF MECHANICAL EQUIPMENT AS WELL AS ALL OPERABLE WINDOWS AND DOORS.
29. ALL FANS AND AIR HANDLING UNITS SHALL BE PROPERLY SUPPORTED AND ISOLATED TO PREVENT NOISE AND VIBRATION TRANSMISSION. ALL AIR HANDLING EQUIPMENT SHALL BE SUPPORTED OR SUSPENDED WITH SPRING ISOLATORS. ALL CONNECTIONS BETWEEN FANS OR AIR HANDLING UNITS AND DUCTWORK SHALL BE CANVAS FLEXIBLE CONNECTORS.
30. ALL EQUIPMENT LOCATED WITHIN THE CEILING SPACES SHALL HAVE ADEQUATE CLEARANCES FOR REPAIR AND MAINTENANCE. ALL PIPING AND DUCTWORK SHALL BE INSTALLED TO PROVIDE ADEQUATE CLEARANCE FOR ACCESS TO ALL EQUIPMENT.
31. SET ALL CONDENSING UNITS ON 4" THICK CONCRETE SERVICE PAD. THE SERVICE PAD SHALL BE A MINIMUM OF 4" LARGER THEN CONDENSING UNIT ON ALL SIDES OF THE UNIT. PROVIDE 1" THICK NEOPRENE CORK VIBRATION ISOLATION PADS UNDERNEATH CONDENSING UNIT. SECURE CONDENSING UNITS TO CONCRETE PAD, SEE DETAIL.
32. ALL AIR HANDLING UNITS SHALL BE MOUNTED ON A MINIMUM 20" TALL STEEL SKIDS OR CUSTOM BUILT AHU SUPPORT STAND, SEE DETAIL. PROVIDE AUXILIARY DRAIN PAN WITH FLOAT SWITCH UNDER EACH AHU LOCATED IN ROOMS WITHOUT A FLOOR DRAIN IN THE ROOM. AUXILIARY DRAIN PAN SHALL COMPLY WITH 2010 FBCM SECTION 307.2.3.
33. REFER TO MECHANICAL AND ARCHITECTURAL DRAWINGS FOR LOCATIONS OF ALL FIRE AND SMOKE RATED PARTITIONS. ALL PENETRATIONS THROUGH FIRE RATED/SMOKE RATED PARTITIONS OR FLOORS AND CEILINGS SHALL HAVE FIRE/SMOKE DAMPERS. ALL FIRE WALL PENETRATIONS SHALL HAVE FIRE DAMPERS. PROVIDE ACCESS DOORS IN WALL OR HARD CEILING FOR THESE DAMPERS.
34. ALL FIRE/SMOKE DAMPERS ARE NORMALLY OPENED, 110 VOLTS. ALL DAMPERS SHALL CLOSE WHEN THE SMOKE DETECTOR IN THE AREA DETECTS SMOKE OR IF THE FIRE ALARM SYSTEM IS ACTIVATED. ONCE THE FIRE ALARM SYSTEM IS RESET, THE SMOKE DAMPERS SHALL RETURN TO THE NORMALLY OPENED POSITION.
35. PROVIDE ACCESS DOORS (24"x24") FOR ALL FIRE/SMOKE DAMPERS AND FIRE DAMPERS IN NON–ACCESSIBLE CEILINGS.
36. PROVIDE ACCESS PANELS IN DRYWALL CEILINGS AS REQUIRED FOR ACCESS TO MECHANICAL EQUIPMENT. COORDINATE WITH GENERAL CONTRACTOR TO PROVIDE WORK PLATFORMS AS REQUIRED FOR ALL EQUIPMENT LOCATED WITHIN THE CEILING SPACE.
37. FURNISH AND INSTALL INSULATED PVC CONDENSATE DRAINS WITH TRAPS FOR ALL COOLING COILS. MINIMUM DRAIN LINE SIZE SHALL MATCH THE OPENING OF THE AHU CONDENSATE DRAIN PAN. SLOPE CONDENSATE DRAIN PIPING 1/4" PER FOOT TOWARD DRAIN POINT OVER ITS ENERGIZE RUN.
38. ALL REFRIGERANT PIPING AND CONDENSATE PIPING SHALL BE FULLY SUPPORTED IT'S ENTIRE LENGTH AND SHALL BE ANCHORED TO PREVENT SWAY AND VIBRATION. PIPE SUPPORTS AND SUPPORT SPACING SHALL COMPLY WITH 2010 FBCM SECTION 305.
39. CONTRACTOR SHALL SUPPLY AND WIRE ALL SMOKE DETECTORS IN THE SUPPLY AIR DUCTWORK OF ALL AIR HANDLING UNITS 2000 CFM AND ABOVE TO SHUT DOWN THE FANS IN THE EVENT OF A FIRE. DUCT SMOKE DETECTOR SHALL BE OF PHOTOELECTRIC TYPE AND LOW VOLTAGE. DIVISION 15 CONTRACTOR SHALL INSTALL ALL SMOKE DETECTORS.
40. ALL WALL SENSORS, VARIABLE SPEED CONTROL SWITCHES, ON–OFF SWITCHES AND MOTOR STARTERS SHALL BE INDIVIDUALLY LABELED. LABELS SHALL INDICATED THE UNIT CONTROLLED, TYPE OF CONTROL AND AREA SERVED. THE LABELS SHALL BE PLASTIC LAMINATE, PERMANENT TYPE, WHITE WITH BLACK LETTERING, AND SHALL BE MOUNTED OUTSIDE OF THE COVER PLATE, OF THE CONTROL DEVICE.
41. FURNISH ALL DIRECT DRIVE EXHAUST FANS WITH SOLID STATE VARIABLE SPEED CONTROLLER. MOUNT CONTROLLER TO ROOF STRUCTURE IN CEILING SPACE NEAR FAN INTAKE DUCT. PROVIDE MOTOR STARTERS AND DISCONNECT SWITCHES FOR ALL NEW EXHAUST FANS.
42. FURNISH ALL EXHAUST FANS WITH BACK DRAFT DAMPERS.
43. COORDINATE ALL CONTROL DEVICES WITH THE ELECTRICAL CONTRACTOR.
44. ALL CONTROL WIRING, CONDUIT AND HARDWARE TO COMPLETE THE HVAC CONTROL SYSTEM SHALL BE FURNISHED AND INSTALLED UNDER DIVISION 15 – MECHANICAL.
45. ALL CONTROL WIRING AND INTERLOCK WIRING LOCATED IN MECHANICAL ROOMS, INSIDE OF WALLS AND IN NON ACCESSIBLE CEILINGS SHALL BE IN CONDUIT.
46. THERMOSTAT OR TEMPERATURE SENSOR LOCATIONS ARE TENTATIVE. FINAL THERMOSTAT OR SENSOR LOCATIONS SHALL BE APPROVED BY THE OWNER PRIOR TO INSTALLATION. THERMOSTATS OR SENSORS SHALL BE LOCATED 48"–54" ABOVE THE FINISHED FLOOR IN ACCORDANCE WITH ADA REQUIREMENTS AND THE 2010 FLORIDA ACCESSIBILITY CODE.
47. AIR FILTERS SHALL BE 1" OR 2" PLEATED, MERV 7 OR MERV 8, 30% EFFICIENT (MIN.) OR EQUAL IN AIR HANDLING EQUIPMENT. FILTERS SHALL BE INSTALLED PRIOR TO UNIT START UP, REPLACED A MINIMUM OF ONCE PER MONTH DURING THE CONSTRUCTION PERIOD, REPLACED PRIOR TO TEST AND BALANCE, AND REPLACED MONTHLY UNTIL FINAL COMPLETION.
48. ALL REFRIGERANT LINES FOR SPLIT SYSTEM DX UNITS SHALL HAVE FILTER DRYERS AND SIGHT GLASSES. ALL REFRIGERANT PIPING RUN ABOVE THE CEILING OR EXPOSED IN APPARATUS BAY MEZZANINE SHALL BE INSULATED WITH 1" THICK CLOSED CELLULAR (ARMAFLEX) INSULATION WITH ALL INSULATION JOINTS SEALED WITH APPROVED MASTIC.
49. ALL REFRIGERANT PIPING EXPOSED TO OUTDOORS SHALL BE INSULATED WITH 1" THICK CLOSED CELL FOAM INSULATION (ARMAFLEX). REFRIGERANT PIPING RUN DOWN THE BUILDING EXTERIOR WALL SHALL BE ENCLOSED IN 20 GAGE SHEET METAL COVER FROM WALL PENETRATION TO WITH–IN 2 FEET OF FINISHED GRADE. CONTRACTOR MAY REUSE EXISTING REFRIGERANT PIPING METAL COVERS. REFRIGERANT PIPING RUN OUTSIDE THE EXTERIOR METAL COVERS SHALL ALSO BE WRAPPED WITH ALUMINUM JACKETING TO PROTECT THE PIPE INSULATION.
50. ALL ROOF MOUNTED FANS AND ROOF MOUNTED INTAKES SHALL BE BOLTED DOWN TO THE ROOF CURB USING 1/4" STAINLESS STEEL BOLTS MAXIMUM SPACING OF EVERY 12" INCHES, MINIMUM OF 3 SCREWS PER EACH SIDE OF ROOF CURB. PROVIDE 1/4" THICK NEOPRENE GASKETS BETWEEN EQUIPMENT BASE AND ROOF CURBS. INSTALLATION SHALL MEET 2010 FLORIDA BUILDING CODE WIND LOAD REQUIREMENTS. ALL ROOF FANS OR INTAKES SHALL HAVE BIRD SCREEN ON INLET OPENINGS.
51. ALL HVAC SYSTEM'S AIRFLOW SHALL BE BALANCED BASED ON THE ACTUAL INSTALLED STATIC PRESSURE OF THE SYSTEM. CONTRACTOR SHALL PROVIDE POSITIVE MEANS FOR BALANCING EACH INDIVIDUAL AIR OUTLET AND INLET.
52. THE CONTRACTOR SHALL HIRE AN INDEPENDENT TEST AND BALANCE FIRM TO TEST AND BALANCE ALL AIR CONDITIONING SYSTEMS–SEE SPECIFICATIONS. THE TEST & BALANCE CONTRACTOR SHALL BE CERTIFIED BY NABA OR ABAA.
53. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR COORDINATING THEIR WORK WITH THE TEST AND BALANCE FIRM. PRIOR TO TEST AND BALANCE, THE CONTRACTOR SHALL START–UP, PRE–BALANCE THE SYSTEM, AND REPLACE ALL AIR FILTERS FOR EVERY AHU BEING TESTED. ALL DISCREPANCIES, DRIVE CHANGES, ETC. REPORTED BY ENGINEER OR THE TEST AND BALANCE FIRM SHALL BE CORRECTED BY THE CONTRACTOR WITHIN FIVE CALENDAR DAYS AT NO ADDITIONAL COST. PROVIDE (2) ADDITIONAL SEASONAL TEST AND BALANCE OF ALL HVAC SYSTEMS, COOLING & HEATING SEASON, AFTER FINAL ACCEPTANCE OF THE HVAC SYSTEM.
54. PROVIDE HAIL GUARDS OVER ALL GROUND MOUNTED CONDENSING UNITS CONDENSING COILS TO PROTECT CONDENSING COIL FROM EXTREME WEATHER.
55. PROVIDE VANDAL PROOF CAPS ON ALL GROUND MOUNTED CONDENSING UNIT REFRIGERANT SERVICE VALVES TO PREVENT UNAUTHORIZED RELEASE OF REFRIGERANT. PROVIDE VANDAL PROOF CAGE ATTACHED TO CONCRETE PAD OVER ALL GROUND MOUNTED CONDENSING UNITS 5 TONS AND SMALLER.
56. CONTRACTOR SHALL LABEL ALL EQUIPMENT (FANS, AIR HANDLING UNITS AND CONDENSING UNITS) WITH ENGRAVED TYPE PHENOLIC LABELS PERMANENTLY AFFIXED TO THE EQUIPMENT. CONTRACTOR SHALL AN INSTALL ADDITIONAL PHENOLIC LABEL TO THE CEILING GRID TEE BELOW ANY CEILING MOUNTED EQUIPMENT LOCATED ABOVE ACOUSTICAL LAY–IN CEILINGS. CONTRACTOR SHALL INSTALL AN ADDITIONAL PHENOLIC LABEL TO THE CEILING ACCESS PANEL LOCATED BELOW ANY CEILING MOUNTED EQUIPMENT LOCATED ABOVE GYPSUM BOARD CEILINGS.
57. CONTRACTOR TO PROVIDE TEMPORARY COOLING OR HEATING TO SPACES AS REQUIRED BY THE OWNER WHILE ITS HVAC SYSTEM IS DOWN DUE TO THE REPLACEMENT OF THE HVAC SYSTEM. TEMPORARY COOLING OR HEATING SYSTEM CAPACITY SHALL BE TO MAINTAIN A 78 F SPACE TEMPERATURE IN COOLING OR 68 F SPACE TEMPERATURE IN HEATING.
58. CONTRACTOR SHALL REMOVE LAY–IN CEILING TILES AND GRID TO PERFORM THE DEMOLITION AND RENOVATION WORK. CONTRACTOR SHALL REPLACE ANY CEILING TILES OR GRID DAMAGED DURING CONSTRUCTION AT THEIR OWN COST.
59. CONTRACTOR SHALL REMOVE SECTIONS OF HARD GYPSUM CEILINGS TO PERFORM THE DEMOLITION AND RENOVATION WORK. CONTRACTOR SHALL PACH/REPAIR REMOVED SECTIONS OF GYPSUM CEILINGS. THE ENTIRE CEILING THAT IS REPAIRED SHALL BE PAINTED WITH (2) COATS OF PAINT, TYPE AND COLOR AS SELECTED BY THE OWNER.
60. THE CONTRACTORS SHALL PROVIDE A WRITTEN GUARANTEE THAT SHALL WARRANT ALL WORKMANSHIP AND MATERIALS FOR ONE (1) YEAR DURING THE FIRST YEAR ALL SYSTEM MALFUNCTIONS SHALL BE REPAIRED AT NO EXPENSE TO THE OWNER. THE COMPRESSORS SHALL HAVE A 5 YEAR WARRANTY (LABOR & MATERIALS).
61. OPERATION AND MAINTENANCE MANUALS SHALL INCLUDE AS A SEPARATE SUBMITTAL ITEM, PREVENTATIVE MAINTENANCE REQUIREMENTS ALONG WITH TIME SCHEDULE(S) FOR EACH ITEM. THE SEQUENCE OF OPERATION SHALL ALSO INCLUDE A DEFINITIVE SEQUENCE OF OPERATION OF THE MECHANICAL SYSTEM AND COMPONENTS AS THEY FUNCTION INTEGRALLY AND INDEPENDENTLY WITH THE SYSTEM.
62. THE CONTRACTOR SHALL PREPARE REDLINED AS–BUILT DRAWINGS OF THE HVAC SYSTEMS AT THE COMPLETION OF THE PROJECT CONSTRUCTION AND SHALL INCLUDE THOSE AS–BUILT DRAWINGS AT PROJECT CLOSEOUT ALONG WITH THE O&M MANUAL.
63. THE CONTRACTOR SHALL PROVIDE ROOF GUARDS FOR ANY NEW ROOFTOP EQUIPMENT FOUND NOT IN COMPLIANCE WITH 2010 FBCM SECTION 304.11 GUARDS. GUARDS SHALL BE CONSTRUCTED IN COMPLIANCE WITH 2010 FLORIDA BUILDING CODE.

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ORANGE COUNTY FIRE STATION #31 HVAC REPLACEMENT

Revisions

No.	Date	Description

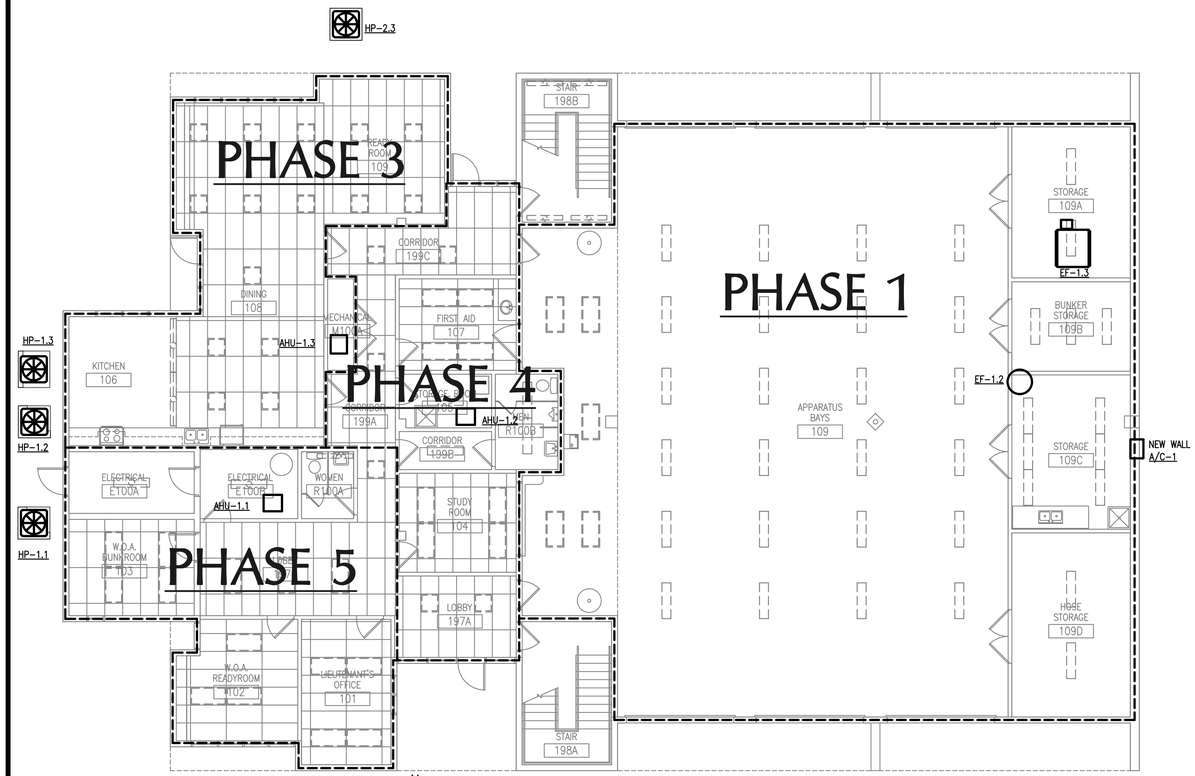
Key Plan

MPE PROJ#: 2013–177
Designed By: RR
Drawn By: RR
Checked By: ABJr
Issue Date: 06/10/15
Drawing Scale: NO SCALE

Drawing Title:
LEGEND & NOTES HVAC

BID DOCUMENTS

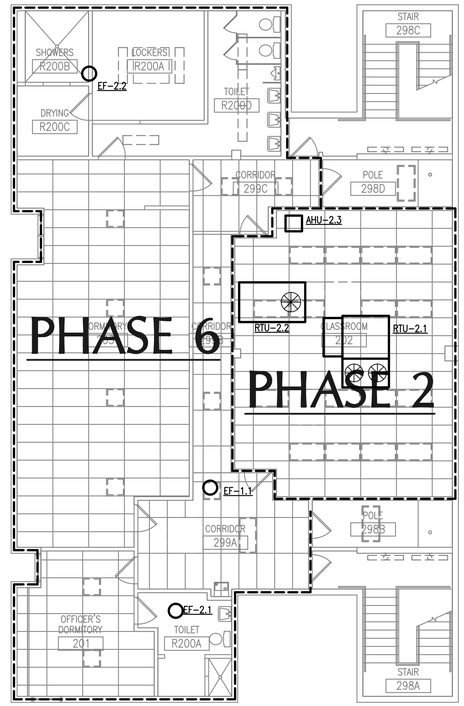
Drawing No.
M–0.1



N

FIRST FLOOR PLAN - HVAC - PHASING

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



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SECOND FLOOR PLAN - HVAC - PHASING

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

PHASING GENERAL NOTES

UPON CONTRACT AWARD THE CONTRACTOR SHALL MEET WITH THE OWNER AND SHALL CONFIRM THE ORDER AND SCOPE OF THE PHASING AND SHALL MODIFY THE PROJECT PHASING PLAN AS PER OWNER REQUIREMENTS AT THE COMMENCEMENT OF CONSTRUCTION.

CONTRACTOR SHALL NOT COMMENCE WORK ON NEXT PHASE UNTIL THE PREVIOUS PHASE CONSTRUCTION IS COMPLETE AND THE SPACE IS TURNED OVER TO THE OWNER FOR THEIR USE, UNTIL ALL PHASES ARE COMPLETE.

UPON COMPLETION OF THE FINAL PHASE THE CONTRACTOR SHALL HAVE THE ENTIRE HVAC SYSTEMS AND EXHAUST SYSTEMS TESTED AND BALANCED TO WITH-IN +/- 10% OF SCHEDULED AIR FLOWS.

CONTRACTOR TO PROVIDE TEMPORARY COOLING OR HEATING TO SPACES SERVED AT EACH PHASE AS REQUIRED BY THE OWNER.

CONTRACTOR SHALL REMOVE AND RE-INSTALL LAY-IN CEILINGS TO PERFORM THE WORK. CONTRACTOR TO REPLACE ANY CEILING TILES OR GRID DAMAGED DURING CONSTRUCTION AT THEIR OWN COST.

CONTRACTOR SHALL REMOVE SECTIONS AND REPAIR/PATCH HARD GYPSUM CEILINGS TO PERFORM THE WORK. SECTION OF HARD GYPSUM CEILINGS REMOVED AND REPLACED IN EACH ROOM SHALL HAVE THE ENTIRE CEILING IN THAT ROOM RE-PAINTED AS REQUIRED BY THE OWNER AFTER PATCH WORK IS COMPLETE, COLOR AS SELECTED BY OWNER.

CONTRACTOR SHALL PROTECT EXISTING WALL, FLOOR AND DOOR FINISHES THROUGHOUT CONSTRUCTION. CONTRACTOR SHALL REPAIR OR REPLACE FINISHES OR MATERIALS DAMAGED FROM THEIR WORK AS REQUIRED BY THE OWNER. CONTRACTOR SHALL RE-PAINT ENTIRE SECTIONS OF WALL FINISHES IN ROOMS/AREAS DAMAGED DURING CONSTRUCTION, COLOR AS SELECTED BY OWNER.

NEW EXHAUST DUCTWORK IN APPARATUS BAY SHALL HAVE THE EXTERIOR OF THE DUCTWORK PAINTED WITH (2) COATS OF RUST INHIBITING PAINT, COLOR AS SELECTED BY THE OWNER.

CONTRACTOR SHALL PROTECT EXISTING ROOF OF THE BUILDING THROUGHOUT CONSTRUCTION. CONTRACTOR SHALL PROTECT ROOF SURFACES WHERE ROOF WORK IS PERFORMED WITH PLYWOOD OR OTHER ACCEPTABLE MATERIALS. CONTRACTOR TO PATCH/REPAIR ANY ROOF LEAKS CAUSED BY THEIR ROOF WORK AS WELL ANY DAMAGED CEILING, WALL OR FLOORS BY THIS ROOF LEAK AT THEIR OWN EXPENSE. CONTRACTOR SHALL MAINTAIN ANY EXISTING ROOF WARRANTY.

PHASING NOTES

THE CONTRACTOR SHALL PERFORM WORK ON DAYS, NIGHTS AND WEEKENDS SO AS TO MINIMIZE THE IMPACT AND DOWNTIME OF THE FACILITY. THE FACILITY SHALL REMAIN FULLY OPERATIONAL THROUGHOUT CONSTRUCTION. REFER TO THE MECHANICAL DRAWINGS FOR HVAC EQUIPMENT AND AIR DISTRIBUTION SYSTEMS. THE PROJECT WILL BE BROKEN UP INTO PHASES AS FOLLOWS.

PHASE 1

PROVIDE APPARATUS BAY EXHAUST FAN EF-1.3 AND EXHAUST SYSTEM.

PROVIDE CARBON MONOXIDE (CO) MONITORING AND CONTROL SYSTEM FOR EXHAUST FAN EF-1.3.

REMOVE EXHAUST SYSTEM AND ROOF EXHAUST FAN EF-1. PROVIDE ROOF EXHAUST FAN EF-1.2 AND EXHAUST SYSTEM.

REMOVE AND REPLACE WALL AIR CONDITIONING UNIT A/C-1 IN STORAGE ROOM 109C.

TEST & BALANCE EXHAUST FAN EF-1.2 AND EXHAUST SYSTEM. TEST & BALANCE EXHAUST FAN EF-1.3 AND EXHAUST SYSTEM.

PHASE 2

PROVIDE NEW SPLIT SYSTEM AHU-2.3/HP-2.3 AND AIR DISTRIBUTION SYSTEM TO SERVE 2ND FLOOR CLASSROOM/EXERCISE ROOM 202.

REMOVE EXISTING ROOFTOP UNIT RTU-2 AND AIR DISTRIBUTION SYSTEM.

PROVIDE NEW 100% OUTDOOR AIR ROOFTOP UNIT RTU-2.2. PROVIDE OUTSIDE AIR DISTRIBUTION SYSTEM FOR 2ND FLOOR HVAC EQUIPMENT AND O.A. DUCTWORK RUN IN 1ST FLOOR CORRIDOR. PROVIDE TEMPORARY CONNECTION TO O.A. DUCTWORK SERVING (3) EXISTING AIR HANDLING UNITS.

REMOVE EXHAUST FAN EF-2 AND REPLACE WITH EF-1.1

REMOVE EXHAUST FAN EF-4 AND REPLACE WITH EF-2.1

TEST & BALANCE AHU-2.3/ HP-2.3 AND AIR DISTRIBUTION SYSTEM. TEST & BALANCE RTU-2.1 AND AIR DISTRIBUTION SYSTEM.

PHASE 3

REMOVE EXISTING SPLIT SYSTEM AHU-1/CU-1 AND AIR DISTRIBUTION SYSTEM.

PROVIDE NEW SPLIT SYSTEM AHU-1.1/HP-1.1 AND AIR DISTRIBUTION SYSTEM. PROVIDE NEW OUTSIDE AIR DUCTWORK TO O.A. DUCTWORK IN CORRIDOR.

REMOVE EXISTING DUCTWORK & GRILLES SERVING WOMENS RESTROOM R100A UP TO EXISTING DUCT RISER FOR EF-1.1

PROVIDE NEW EXHAUST SYSTEM FOR WOMENS RESTROOM AND CONNECT TO EXISTING EXHAUST DUCT RISER.

TEST AND BALANCE SPLIT SYSTEM AHU-1.1/HP-1.1 AND AIR DISTRIBUTION SYSTEM.

PHASE 4

REMOVE EXISTING SPLIT SYSTEM AHU-2/CU-2 AND AIR DISTRIBUTION SYSTEM.

PROVIDE SPLIT SYSTEM AHU-1.2/HP-1.2 AND AIR DISTRIBUTION SYSTEM. PROVIDE NEW OUTSIDE AIR DUCTWORK TO O.A. DUCTWORK IN CORRIDOR.

REMOVE EXISTING EXHAUST DUCTWORK SERVING RESTROOM R100B AND ROOM 199B AND DUCT RISER CONNECTION TO EF-1.1.

PROVIDE NEW EXHAUST SYSTEM SERVING RESTROOM R100B AND ROOM 199B AND EXHAUST DUCT RISER TO EF-1.1. CONNECT WOMENS RESTROOM EXHAUST TO DUCT RISER.

TEST & BALANCE SPLIT SYSTEM AHU-1.2/ HP-1.2 AND AIR DISTRIBUTION SYSTEM. TEST & BALANCE EXHAUST FAN EF-1.1 AND EXHAUST SYSTEM.

PHASE 5

REMOVE EXISTING SPLIT SYSTEM AHU-3/CU-3 AND AIR DISTRIBUTION SYSTEM.

PROVIDE NEW SPLIT SYSTEM AHU-1.3/HP-1.3 AND AIR DISTRIBUTION SYSTEM. PROVIDE NEW OUTSIDE AIR DUCTWORK TO O.A. DUCTWORK IN CORRIDOR.

REMOVE EXISTING KITCHEN HOOD KH-1 AND EXHAUST SYSTEM.

PROVIDE NEW KITCHEN HOOD KH-1 AND EXHAUST SYSTEM. PROVIDE WET CHEMICAL SYSTEM FOR KITCHEN HOOD.

TEST & BALANCE SPLIT SYSTEM AHU-1.3/HP-1.3 AND AIR DISTRIBUTION SYSTEM. TEST & BALANCE KITCHEN HOOD AND EXHAUST SYSTEM.

PHASE 6

REMOVE EXISTING ROOFTOP UNIT RTU-1 AND AIR DISTRIBUTION SYSTEM.

PROVIDE NEW ROOFTOP UNIT RTU-2.2 AND AIR DISTRIBUTION SYSTEM. PROVIDE OUTSIDE AIR DUCT CONNECTION TO 2ND FLOOR O.A. DUCTWORK.

REMOVE OF EXISTING ROOF EXHAUST FAN EF-3 AND EXHAUST SYSTEM.

PROVIDE NEW EXHAUST FAN EF-2.2 AND EXHAUST SYSTEM.

REMOVE OF EXISTING EXHAUST SYSTEM SERVING EF-2.1 AND PROVIDE NEW EXHAUST SYSTEM.

TEST & BALANCE ALL HVAC SYSTEMS AND EXHAUST SYSTEMS SERVING THE BUILDING.

SCOPE OF WORK

THE SCOPE OF WORK FOR THIS PROJECT INCLUDES BUT IS NOT LIMITED TO ALL LABOR AND MATERIALS NECESSARY FOR THE FOLLOWING ITEMS TO BE PERFORMED IN PHASES, SEE PHASING PLAN ON THIS SHEET:

1. CONTRACTOR SHALL REPLACE THE (3) EXISTING DX SPLIT SYSTEMS SERVING THE 1ST FLOOR WITH NEW DX HEAT PUMP SPLIT AIR CONDITIONING SYSTEMS.
2. CONTRACTOR SHALL PROVIDE NEW DX HEAT PUMP SPLIT SYSTEM SERVING 2ND FLOOR CLASSROOM/EXERCISE AREA TO REPLACE ROOFTOP UNIT SERVING THAT AREA.
3. CONTRACTOR SHALL PROVIDE NEW 100% OUTSIDE AIR ROOFTOP UNIT TO PROVIDE CONDITIONED OUTDOOR AIR TO EACH NEW HVAC SYSTEM SERVING THE FIRE STATION BUILDING.
4. CONTRACTOR SHALL REPLACE PACKAGED ROOFTOP UNIT SERVING 2ND FLOOR DORM AREA WITH NEW PACKAGED ROOFTOP HEAT PUMP UNIT.
5. CONTRACTOR SHALL PROVIDE NEW REFRIGERANT PIPING AND CONDENSATE DRAINAGE PIPING FOR THE DX HEAT PUMP SPLIT SYSTEMS AND NEW CONDENSATE DRAINAGE PIPING FOR ROOFTOP EQUIPMENT.
6. CONTRACTOR SHALL PROVIDE NEW APPARATUS BAY EXHAUST SYSTEM INCLUDING NEW CARBON MONOXIDE (CO) MONITIORING/CONTROL SYSTEM. PROVIDE NEW SHEET METAL EXHAUST DUCTWORK AND GRILLES FOR APPARATUS BAY EXHAUST SYSTEM.
7. CONTRACTOR SHALL REPLACE ROOF EXHAUST FAN SERVING APPARATUS BAY STORAGE ROOMS WITH NEW ROOF EXHAUST FAN.
8. CONTRACTOR SHALL REPLACE WALL MOUNTED A/C SERVING APPARATUS BAY STORAGE ROOM 109C WITH NEW WALL AIR CONDITIONING SYSTEM.
9. CONTRACTOR SHALL REPLACE (3) ROOF EXHAUST FANS SERVING RESTROOMS IN FIRE STATION WITH NEW ROOF EXHAUST FANS.
10. CONTRACTOR SHALL PATCH/REPAIR SECTIONS OF THE ROOF AS REQUIRED TO INSTALL NEW ROOFTOP EQUIPMENT. CONTRACTOR TO PROTECT THE EXISTING ROOF THROUGH OUT CONSTRUCTION. CONTRACTOR TO MAINTAIN ANY ROOF WARRANTY.
11. CONTRACTOR SHALL PROVIDE ROOF PROTECTION GUARDS AROUND ROOFTOP EQUIPMENT AS REQUIRED, SEE STRUCTURAL DRAWINGS.
12. CONTRACTOR SHALL REPLACE ALL EXISTING SUPPLY AIR, RETURN AIR, OUTSIDE AIR AND EXHAUST AIR DUCTWORK WITH NEW SHEET METAL DUCTWORK.
13. CONTRACTOR SHALL REPLACE ALL EXISTING CEILING DIFFUSERS AND GRILLES WITH NEW CEILING DIFFUSERS AND GRILLES.
14. CONTRACTOR SHALL REMOVE AND PATCH/REPAIR ALL HARD GYPSUM CEILINGS IN THE BUILDING AS NECESSARY TO ACCOMPLISH THE WORK. CONTRACTOR SHALL PAINT ENTIRE CEILING AREA WHERE GYPSUM CEILING REPAIR WORK IS PERFORMED WITH (2) COATS OF PAINT, TYPE AND COLOR AS SELECTED BY THE OWNER.
15. ALL EXISTING LAY-IN CEILING TILES AND GRID SHALL BE REMOVED AND REINSTALLED AS REQUIRED BY THE CONTRACTOR TO INSTALL NEW DUCTWORK ABOVE THE CEILING. CONTRACTOR SHALL REPLACE ANY CEILING TILES OR GRID DAMAGED DURING CONSTRUCTION AT THEIR OWN COST.
16. CONTRACTOR SHALL PAINT THE EXTERIOR OF ALL NEW EXHAUST DUCTWORK IN APPARATUS BAY WITH (2) COATS OF RUST INHIBITING PAINT, COLOR AS SELECTED BY THE OWNER.
17. CONTRACTOR SHALL REMOVE EXISTING TEMPERATURE CONTROL SYSTEM AND SHALL PROVIDE NEW DDC TEMPERATURE CONTROL SYSTEM FOR THE HVAC AND EXHAUST SYSTEMS SERVING THE BUILDING.
18. CONTRACTOR SHALL DISCONNECT, REMOVE, STORE AND REINSTALL ALL ELECTRICAL EQUIPMENT MOUNTED IN THE CEILING OR ON WALLS FOR AREAS TO BE RENOVATED AS NECESSARY TO ACCOMPLISH THE WORK. THIS INCLUDES LIGHTING FIXTURES, SPEAKERS, SMOKE DETECTORS, ETC. TEMPORARILY TERMINATE WIRES AND SUPPORT ALL CONDUIT FROM STRUCTURE THAT MAY BE RESTING ON THE CEILING.
19. CONTRACTOR SHALL PROTECT OR TEMPORARILY RELOCATE ALL FIXTURES, EQUIPMENT AND FURNITURE IN THE BUILDING THROUGHOUT CONSTRUCTION AS NECESSARY TO ACCOMMODATE THE WORK.
20. CONTRACTOR SHALL TEST AND BALANCE ALL OF THE NEW HVAC SYSTEMS AND AIR DISTRIBUTION SYSTEMS. THIS WORK ALSO INCLUDES THE TEST AND BALANCE OF THE NEW EXHAUST SYSTEMS. TEST & BALANCE HVAC SYSTEMS AFTER EACH PHASE IS COMPLETED AND PERFORM A FINAL TEST & BALANCE ON THE ENTIRE BUILDING INCLUDING HVAC AND EXHAUST SYSTEMS AFTER LAST PHASE IS COMPLETED.
21. THE FACILITY SHALL REMAIN FULLY OCCUPIED AND FUNCTIONAL THROUGHOUT THE PROJECT CONSTRUCTION. CONTRACTOR SHALL WORK DURING OCCUPIED HOURS, EVENINGS, WEEKENDS AND HOLIDAYS TO PERFORM THE WORK.
22. CONTRACTOR SHALL COORDINATE THE CONSTRUCTION PHASING OF THE PROJECT WITH THE OWNER OR THEIR REPRESENTATIVE. CHANGES IN PHASES OR WORK INCLUDED IN EACH PHASE SHALL BE CONFIRMED WITH THE OWNER PRIOR TO COMMENCEMENT OF THE WORK.
23. CONTRACTOR SHALL PROVIDE TEMPORARY COOLING OR HEATING TO THE SPACES SERVED IN EACH PHASE FOR EACH HVAC SYSTEM IS BEING REPLACED, AS REQUIRED BY THE OWNER OR THEIR REPRESENTATIVE.
24. THE CONTRACTOR SHALL REPAIR OR REPLACE ANY EXISTING INTERIOR OR EXTERIOR FINISHES (WALL/FLOORS) DAMAGED DURING CONSTRUCTION AS DETERMINED BY THE OWNER, AT THE CONTRACTORS COST. CONTRACTOR TO PAINT ENTIRE SECTIONS/AREAS OF INTERIOR WALLS DAMAGED DURING CONSTRUCTION WHERE REPAIR WORK IS PERFORMED.

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

ORANGE COUNTY FIRE STATION #31 HVAC REPLACEMENT

Revisions

No.	Date	Description

Key Plan

MPE PROJ#: 2013-177

Designed By: RR

Drawn By: RR

Checked By: ABJr

Issue Date: 06/10/15

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

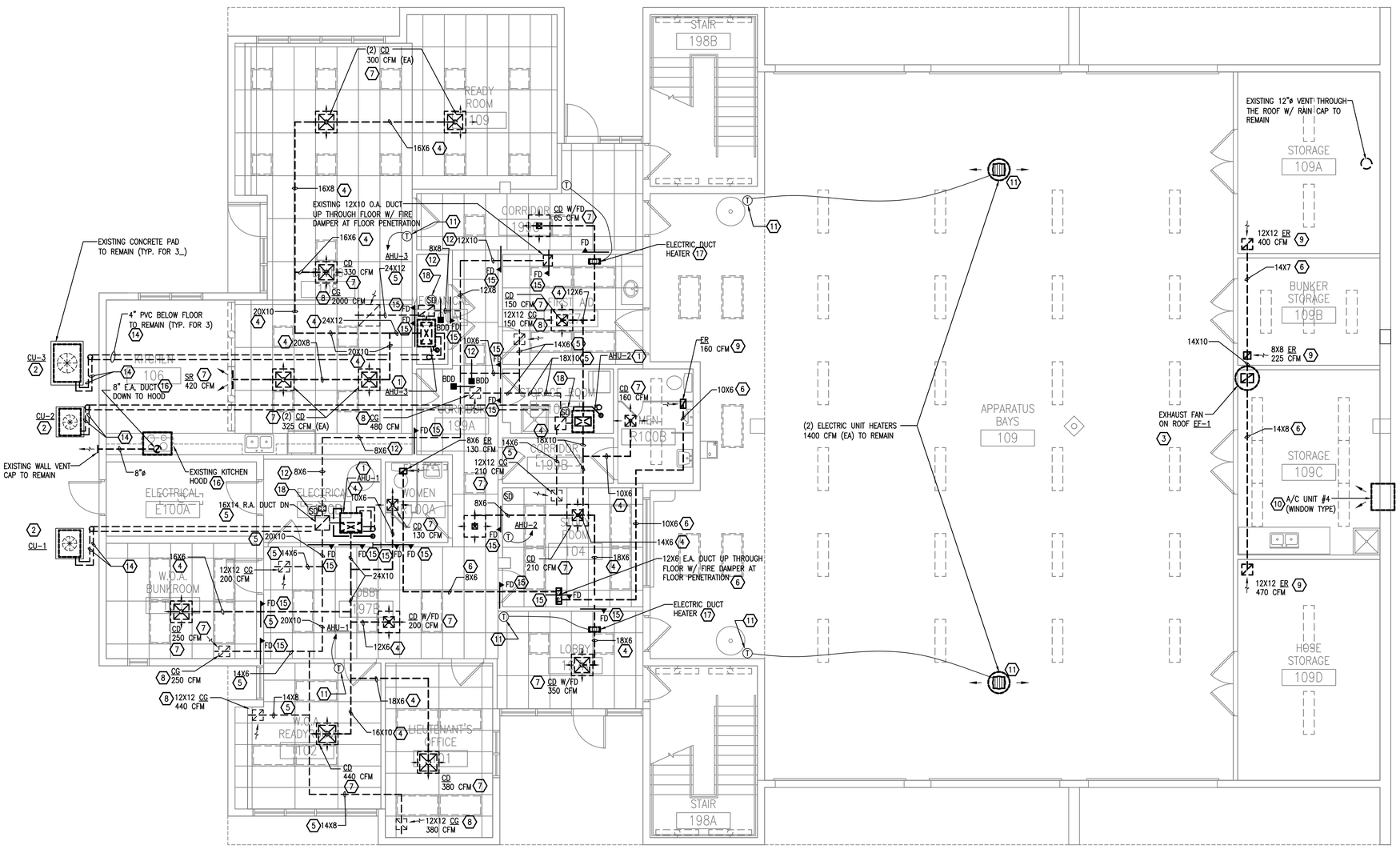
Drawing Title:

HVAC PHASING PLAN & SCOPE OF WORK

BID DOCUMENTS

Drawing No.

PH-1.1



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FIRST FLOOR PLAN - HVAC - DEMOLITION

SCALE: 3/16"=1'-0"

HVAC KEY NOTES - DEMOLITION

1. REMOVE EXISTING AIR HANDLING UNIT. DISCONNECT POWER TO AHU. DISCONNECT SUPPLY AIR AND RETURN AIR DUCTWORK CONNECTED TO AHU. DISCONNECT REFRIGERANT & CONDENSATE PIPING CONNECTED TO AHU.
2. REMOVE EXISTING HEAT PUMP UNIT. DISCONNECT POWER TO HEAT PUMP UNIT. DISCONNECT REFRIGERANT PIPING CONNECTED TO HPU. DISCONNECT CONTROL WIRING CONNECTED TO HPU AND REMOVE CONTROL WIRING BACK TO ITS SOURCE.
3. REMOVE EXISTING ROOF EXHAUST FAN. DISCONNECT POWER TO EXHAUST FAN.. DISCONNECT CONNECTING EXHAUST DUCTWORK CONNECTED TO FAN. EXISTING ROOF CURB TO REMAIN.
4. REMOVE EXISTING SUPPLY AIR DUCTWORK ABOVE THE CEILING. REMOVE DUCT HANGERS AND SUPPORTS.
5. REMOVE EXISTING RETURN AIR DUCTWORK RUN ABOVE THE CEILING REMOVE ALL DUCT HANGERS AND SUPPORTS.
6. REMOVE EXISTING EXHAUST DUCT RUN ABOVE THE CEILING OR EXPOSED IN APPARATUS BAY STORAGE ROOMS. REMOVE EXISTING DUCT HANGERS AND SUPPORTS.
7. REMOVE EXISTING CEILING SUPPLY AIR DIFFUSERS (CD) OR SIDE WALL SUPPLY GRILLE (SR). REMOVE CONNECTING DUCTWORK, RIGID OR FLEXIBLE BACK TO BRANCH DUCT CONNECTION.
8. REMOVE EXISTING CEILING RETURN AIR GRILLE (CG). REMOVE EXISTING DUCTWORK CONNECT TO GRILLE.
9. REMOVE EXISTING CEILING EXHAUST AIR GRILLE (ER). REMOVE CONNECTING DUCTWORK CONNECTED TO GRILLE.
10. REMOVE EXISTING THROUGH THE WALL AIR CONDTIONING UNIT. TEMPORARILY COVER THE WALL OPENING UNTIL NEW A/C UNIT IS INSTALLED.. DISCONNECT POWER TO THE A/C UNIT.
11. EXISTING WALL TEMPERATURE SENSOR AND ELECTRIC UNIT HEATER TO REMAIN. CONTRACTOR TO PROTECT THIS EQUIPMENT AND CONTROLS THROUGH OUT CONSTRUCTION.
12. REMOVE EXISTING OUTDOOR AIR DUCTWORK RUN ABOVE THE CEILING AND CONNECTED TO AHU RETURN AIR DUCT. REMOVE EXISTING DUCT HANGERS AND SUPPORTS.
13. REMOVE EXISTING CONDENSATE PIPING CONNECTED EXISTING AHU AND RUN TO FLOOR DRAIN. EXISTING FLOOR DRAIN TO REMAIN.
14. REMOVE EXISTING REFRIGERANT PIPING CONNECTED EXISTING AHU AND RUN BELOW THE FLOOR IN EXISTING PVC CONDUIT TO HEAT PUMP UNIT OUTSIDE. 4" PVC CONDUIT TO REMAIN.
15. REMOVE EXISTING FIRE DAMPER AT DUCTWORK WALL PENETRATION OF CORRIDORS. ALL EXISTING CORRIDOR WALLS ARE A MINIMUM OF 1 HOUR RATED. SEAL ANY UNUSED WALL OPENINGS WITH FIRE RATED GYPSUM WALL BOARD.
16. REMOVE EXISTING KITCHEN EXHAUST HOOD AND CONNECTING DUCTWORK. REMOVE POWER TO THE EXHAUST HOOD FAN & LIGHT.
17. REMOVE EXISTING ELECTRIC DUCT HEATER ABOVE THE CEILING. DISCONNECT AND REMOVE POWER WIRING CONNECTED TO ELECTRIC HEATER. DISCONNECT AND REMOVE CONTROL WIRING.
18. REMOVE EXISTING SMOKE DETECTOR IN RETURN AIR DUCT. SMOKE DETECTOR F/A POINT TO BE REUSED. COORDINATE WITH EXISTING FIRE ALARM (F/A) SYSTEM SERVING THE BUILDING.

GENERAL NOTES

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

AIR HANDLING UNIT AHU-1 TO BE REMOVED AND REPLACED

AIR HANDLING UNIT AHU-2 TO BE REMOVED AND REPLACED

AIR HANDLING UNIT AHU-3 TO BE REMOVED AND REPLACED

EXISTING UNIT HEATER TO REMAIN

WALL A/C UNIT (WAC) TO BE REMOVED AND REPLACED

CONDENSING UNITS CU-1, CU-2 & CU-3 TO BE REMOVED AND REPLACED

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

Drawing Title:

FIRST FLOOR PLAN - HVAC DEMOLITION

BID DOCUMENTS

Drawing No.

MD-1.1

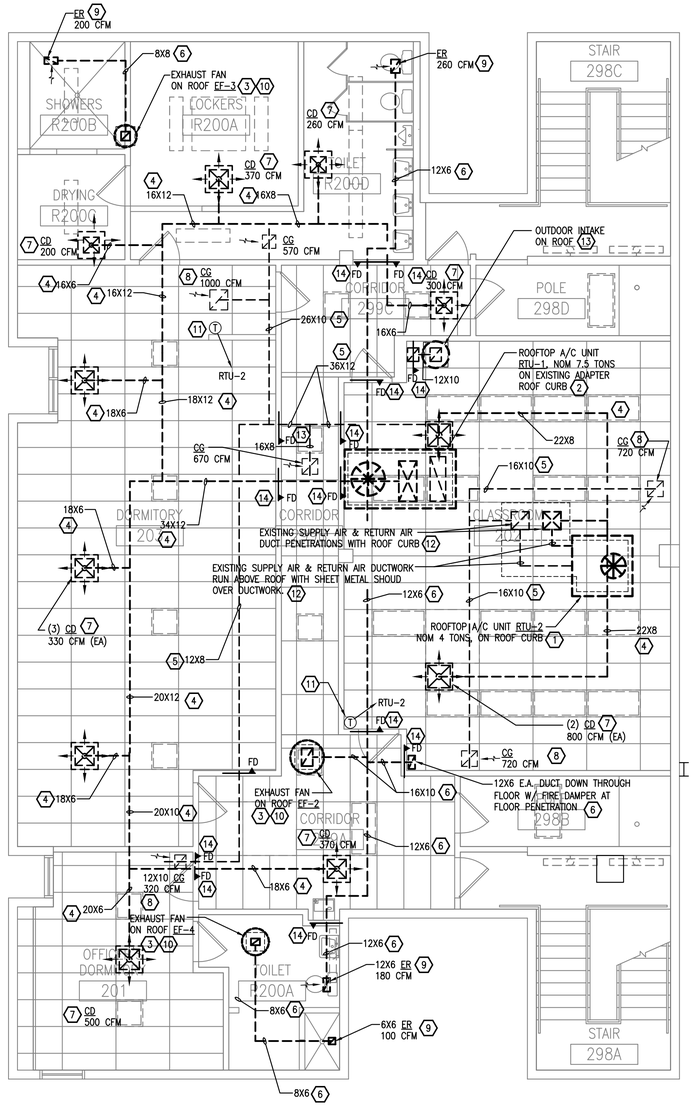
ROOFTOP UNIT RTU-1
TO BE REMOVED
AND REPLACED

ROOFTOP UNIT RTU-2
TO BE REMOVED
AND REPLACED

EXHAUST FAN EF-3
TO BE REMOVED
AND REPLACED

EXHAUST FANS EF-2 & EF-4
TO BE REMOVED
AND REPLACED

EXHAUST FAN EF-1
TO BE REMOVED
AND REPLACED



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SECOND FLOOR PLAN - HVAC - DEMOLITION
SCALE: 3/16"=1'-0"

HVAC KEY NOTES - DEMOLITION

1. REMOVE EXISTING ROOFTOP AIR HANDLING UNIT RTU-1. DISCONNECT POWER TO RTU. DISCONNECT SUPPLY AIR AND RETURN AIR DUCTWORK CONNECTED TO RTU. DISCONNECT AND REMOVE CONDENSATE PIPING CONNECTED TO RTU AND RUN ALONG THE ROOF. EXISTING ROOF CURBS TO REMAIN. TEMPORARILY CAP ROOF OPENINGS UNTIL NEW RTU IS INSTALLED.
2. REMOVE EXISTING ROOFTOP AIR HANDLING UNIT RTU-2. DISCONNECT POWER TO RTU. DISCONNECT SUPPLY AIR AND RETURN AIR DUCTWORK CONNECTED TO RTU. DISCONNECT AND REMOVE CONDENSATE PIPING CONNECTED TO RTU AND RUN ALONG THE ROOF. EXISTING METAL ADAPTER ROOF CURB TO BE REMOVED. EXISTING ROOF CURB TO REMAIN. TEMPORARILY CAP ROOF OPENINGS UNTIL NEW RTU IS INSTALLED.
3. REMOVE EXISTING ROOF EXHAUST FAN. DISCONNECT POWER TO EXHAUST FAN. DISCONNECT CONNECTING EXHAUST DUCTWORK CONNECTED TO FAN. EXISTING ROOF CURB TO REMAIN. PROVIDE TEMPORARY CAP OVER ROOF CURB OPENING UNTIL NEW EXHAUST FAN IS INSTSLLED.
4. REMOVE EXISTING SUPPLY AIR DUCTWORK ABOVE THE CEILING. REMOVE DUCT HANGERS AND SUPPORTS.
5. REMOVE EXISTING RETURN AIR DUCTWORK RUN ABOVE THE CELING BAY. REMOVE ALL DUCT HANGERS AND SUPPORTS.
6. REMOVE EXISTING EXHAUST DUCT RUN ABOVE THE CEILING. REMOVE EXISTING DUCT HANGERS AND SUPPORTS.
7. REMOVE EXISTING CEILING SUPPLY AIR DIFFUSERS (CD). REMOVE CONNECTING FLEXIBLE DUCT BACK TO BRANCH DUCT CONNETION.
8. REMOVE EXISTING CEILING RETURN AIR GRILLE (CG). REMOVE EXISTING DUCTWORK CONNECT TO GRILLE.
9. REMOVE EXISTING CEILING EXHAUST AIR GRILLE (ER). REMOVE CONNECTING DUCTWORK CONNECTED TO GRILLE.
10. REMOVE EXISTING EXHAUST DUCT PENETRATING ROOF OPENING. EXISTING ROOF OPENING TO REMAIN.
11. REMOVE EXISTING WALL TEMPERATURE SENSOR. REMOVE ALL CONTROL WIRING AND SUPPORTS.
12. REMOVE EXISTING SUPPLY AIR AND RETURN AIR DUCTWORK RUN ABOVE THE ROOF. REMOVE EXISTING SHEET METAL SHROUD OVER THE EXISTING DUCTWORK. REMOVE EXISTING S.A. & R.A. DUCT PENETRATIONS THROUGH THE ROOF. EXISTING ROOF CURBS TO REMAIN.
13. REMOVE EXISTING ROOF O.A. INTAKE VENT. EXISTING ROOF CURB TO REMAIN.
14. REMOVE EXISTING FIRE DAMPER AT DUCTWORK WALL PENETRATION OF CORRIDORS. REPAIR ANY WALL OPENING NOT BEING REUSED WITH FIRE RATED GYPSUM BOARD.

GENERAL NOTES

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

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ORANGE COUNTY FIRE STATION #31 HVAC REPLACEMENT

Revisions

No.	Date	Description

Key Plan

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Designed By: RR

Drawn By: RR

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

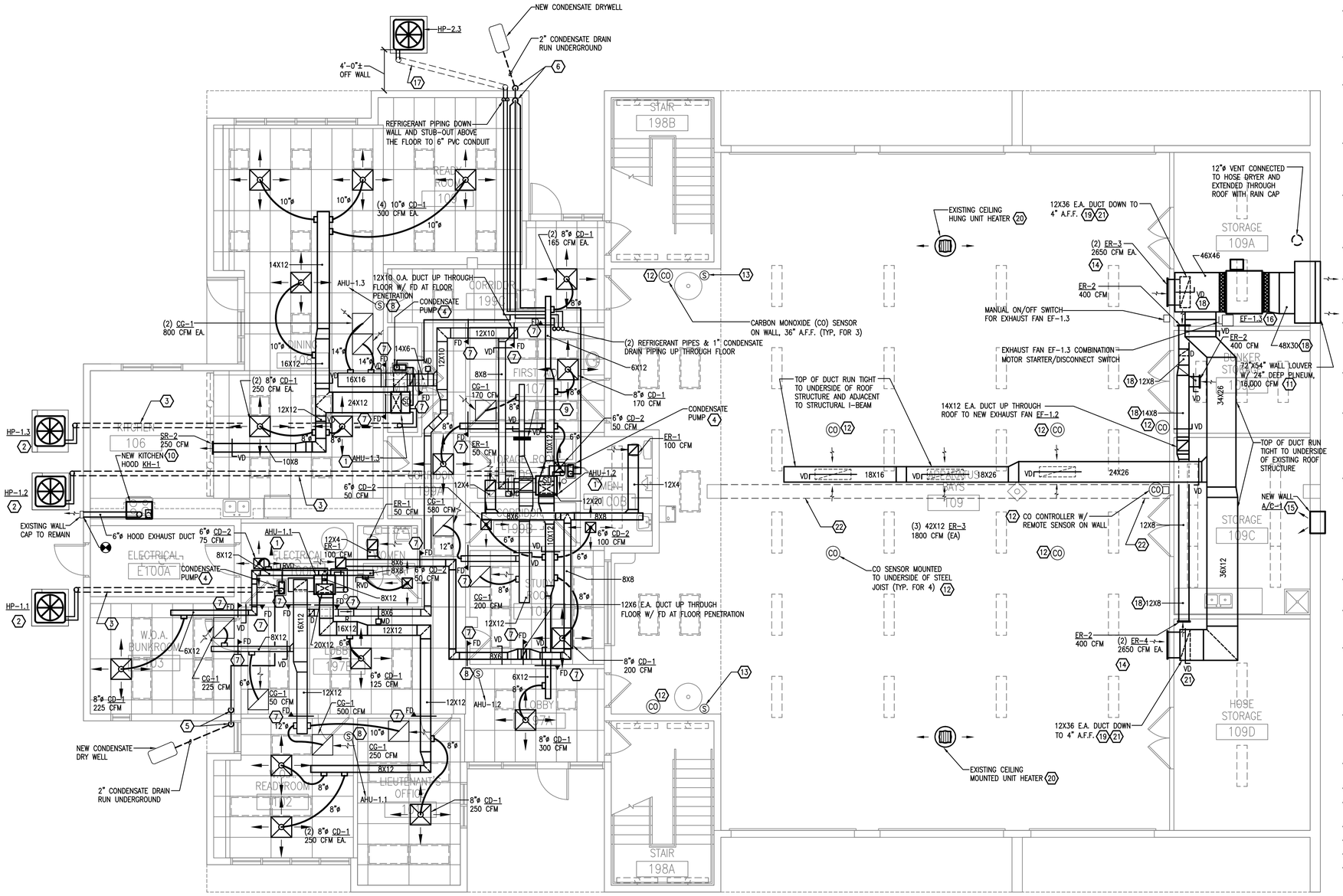
Drawing Title:

SECOND FLOOR PLAN - HVAC DEMOLITION

BID DOCUMENTS

Drawing No.

MD-1.2



FIRST FLOOR PLAN - HVAC - RENOVATION

SCALE: 3/16"=1'-0"

AIR BALANCE SCHEDULE

UNIT TAG	SUPPLY AIR (CFM)	RETURN AIR (CFM)	OUTSIDE AIR (CFM)	EXHAUST AIR (CFM)	NET EFFECT (CFM)
AHU-1.1	1225	1025	200*	– –	+200
AHU-1.2	1200	950	250*	– –	+250
AHU-1.3	1950	1600	350*	– –	+350
EF-1.1	– –	– –	– –	300	-300
EXISTING KITCHEN HOOD KH-1	– –	– –	– –	300	-300
1ST FLR TOTAL	4375	3575	800	-600	+200
AHU-2.3	1200	1050	150*	– –	+150
RTU-2.2	2500	2050	450*	– –	+450
EF-2.1	– –	– –	– –	100	-100
EF-2.2	– –	– –	– –	300	-300
2ND FLR TOTAL	3700	3100	600	-400	+200
BUILDING TOTAL	8,075	6,675	1,400	-1,000	+400

*VENTILATION AIR IS PROVIDED TO ALL AHUS & RTU BY 100% OUTDOOR AIR SYSTEM RTU-2.1

HVAC KEY NOTES - RENOVATION

1. NEW AIR HANDLING UNIT (AHU) INSTALLED ON METAL STAND. RE-CONNECT POWER TO AHU. PROVIDE NEW REFRIGERANT PIPING AND CONDENSATE DRAIN PIPING CONNECTED TO AHU. PROVIDE NEW SUPPLY AIR & RETURN AIR DUCTWORK CONNECTED TO AHU.
2. NEW HEAT PUMP UNIT (HPU) INSTALLED ON EXPANDED CONCRETE PAD. RE-CONNECT POWER TO HEAT PUMP UNIT. CONNECT NEW REFRIGERANT PIPING TO HPU. PROVIDE NEW CONTROL WIRING CONNECTED TO HPU. EXPAND EXISTING CONCRETE PADS, COORDINATE WITH EXISTING SITE/DRIVEWAY LAYOUT.
3. RUN NEW REFRIGERANT PIPING IN EXISTING 4" UNDERGROUND PVC CONDUIT. RUN NEW CONTROL WIRING FOR HEAT PUMP UNIT CONTROL IN SAME PVC CONDUIT.
4. PROVIDE NEW CONDENSATE PUMP ON FLOOR W/DRAIN PAN. CONDENSATE PUMP SHALL BE LITTLE GIANT MODEL VCMA-20ULS OR EQUAL. PUMP SHALL BE 1/30 HP, 120 VOLTS, SINGLE PHASE, 1 AMP, PUMP SHALL BE HARD WIRED TO POWER SOURCE. PROVIDE FLOAT SWITCH IN PUMP DRAIN PAN TO SHUT-DOWN ITS ASSOCIATED AHU SHOULD THERE BE CONDENSATE WATER BUILD-UP IN THE DRAIN PAN.
5. NEW 2" PVC DRAIN PIPE RUN UP ABOVE CEILING AND STUBBED OUT THROUGH THE EXTERIOR WALL, ABOVE THE FLOOR, TO RUN UNDERGROUND TO CONDENSATE DRY WELL. CONNECT 3/4" PUMPED CONDENSATE TO 2" DRAIN PIPE ABOVE THE CEILING. PROVIDE CLEANOUT ON END OF 2" DRAIN PIPE ABOVE THE CEILING.
6. NEW 2" PVC DRAIN PIPE RUN UP ABOVE CEILING AND STUBBED OUT THROUGH THE EXTERIOR WALL, ABOVE THE FLOOR, TO RUN UNDERGROUND TO CONDENSATE DRY WELL. CONNECT (2) 3/4" PUMPED CONDENSATE TO 2" DRAIN PIPE ABOVE THE CEILING. PROVIDE CLEAN OUT ON END OF 2" DRAIN PIPE ABOVE THE CEILING.
7. PROVIDE NEW DYNAMIC TYPE FIRE DAMPER STYLE "B" IN NEW DUCTWORK PENETRATIONS OF CORRIDOR WALLS OR THROUGH FLOOR OPENINGS.
8. NEW WALL TEMPERATURE/HUMIDITY SENSOR MOUNTED ON WALL APPROX. 48" TO 54" A.F.F.. COORDINATE EXACT LOCATION OF SENSOR WITH OWNER. CONNECT TEMPERATURE/HUMIDITY SENSOR TO NEW BUILDING AUTOMATED CONTROL SYSTEM (BAS)
9. NEW BUILDING AUTOMATION CONTROL PANEL (BAS) MOUNTED ON WALL IN NEMA 1 CABINET WITH HINGED AND LOCKABLE ACCESS DOOR. CONNECT ALL CONTROL DEVICES TO THE BAS SYSTEM AND PROVIDE COMMUNICATION PORT FOR EXTERNAL REMOTE CONNECTION TO BAS SYSTEM.
10. NEW KITCHEN HOOD KH-1 INSTALL BELOW EXISTING CABINETRY. PROVIDE NEW 6" EXHAUST DUCT CONNECTED TO HOOD AND RUN TO EXISTING WALL EXHAUST CAP. PROVIDE FIRE SUPPRESSION SYSTEM FOR NEW KITCHEN HOOD, SEE DETAIL.
11. WALL LOUVER SHALL HAVE EXTEND SILL AND ANODIZED FINISH WITH COLOR TO CLOSELY MATCH THE EXTERIOR BUILDING COLOR, COLOR TO BE SELECTED BY THE OWNER. INSTALL LOUVER PER MANUFACTURERS INSTRUCTIONS FOR INSTALLATION IN CONCRETE BLOCK WALLS. WALL LOUVER SHALL BE DRAINABLE, WIND DRIVEN RAIN RESISTANT. LOUVER SHALL MEET MIAMI-DADE HURRICANE WIND LOAD REQUIREMENTS AND SHALL BE FLORIDA PRODUCT APPROVED.
12. PROVIDE CARBON MONOXIDE (CO) GAS MONITORING SYSTEM IN THE APPARATUS BAY. CO MONITORING SYSTEM SHALL BE AS MANUFACTURER BY MSA MODEL Z GARD COmbo GAS MONITOR OR APPOVED EQUAL. CO MONITOR SHALL HAVE INTERNAL CO SENSOR AND BE RATED FOR 120 VOLTS SINGLE PHASE, .5 AMPS, 60 HZ. PROVIDE ADDITIONAL REMOTE CO SENSORS MSA Z GARD S SENSOR OR EQUAL CONNECTED TO THE MONITORING SYSTEM. ALL CO SENSORS SHALL BE SET TO ALARM AT CO LEVELS OF 50 PPM OR HIGHER. CO MONITOR SHALL ACTIVATE EXHAUST FAN EF-1.3 SHOULD ANY CO SENSOR EXCEED 50 PPM LEVEL AND ACTIVATE AN INTERNAL AND REMOTE ALARM. UPON CO ALARM ACTIVATION ONE APPARATUS BAY DOOR SHALL OPEN.
13. PROVIDE NEW TEMPERATURE SENSOR TO CONTROL EXISTING CEILING HUNG UNIT HEATERS IN THE APPARATUS BAY. CONNECT SENSOR TO NEW BAS CONTROL SYSTEM.
14. PROVIDE(2) NEW EXHAUST GRILLES CONNECTED TO 36X12 EXHAUST DUCT DROP. BOTTOM OF LOWER GRILLE SHALL BE 8"± ABOVE FINISHED FLOOR AND BOTTOM OF HIGHER GRILLE SHALL BE 6'-0"± A.F.F..
15. PROVIDE NEW THRU-THE-WALL PACKAGED AIR AIR CONDITIONING UNIT (A/C) INSTALLED IN EXISTING 26"X17" WALL OPENING IN STORAGE ROOM 109C. WALL AIR CONDITIONER SHALL HAVE 12,000 BTU COOLING CAPACITY (1 TON), 208/230 VOLTS, SINGLE PHASE, 60 HZ. REUSE EXISTING WALL POWER OUTLET FOR NEW A/C UNIT. PROVIDE A/C UNIT MANUFACTURERS WALL SLEEVE AND INFILL REMAINING WALL OPENING AS REQUIRED.
16. NEW IN-LINE EXHAUST FAN EF-1.3 SHALL BE HUNG FROM EXISTING ROOF STRUCTURE AS HIGH AS POSSIBLE FROM FINISHED FLOOR. PROVIDE MANUAL ON/OFF SWITCH AND MOTOR STARTER TO CONTROL EXHAUST FAN. PROVIDE AUXILIARY CONTACT AT MOTOR STARTER TO ACTIVATE EXHAUST FAN FROM CO MONITORING SYSTEM.
17. REFRIGERANT PIPING AND CONTROL WIRING RUN UNDERGROUND IN 4" PVC CONDUIT TO HEAT PUMP CONDENSING UNIT HP-2.3.
18. NOT USED.
19. ALL EXHAUST AIR DUCTWORK LOCATED BELOW 10'-0" SHALL BE WELDED CONSTRUCTION WITH NO EXPOSED SHARP EDGES.
20. CONTRACTOR TO PROTECT THIS HEATER THROUGHOUT CONSTRUCTION.
21. VOLUME DAMPER IN VERTICAL DUCT SECTION AT 36" A.F.F.
22. EXPOSED SOLID I-BEAM BENEATH ROOF STRUCTURE.
23. PROVIDE 12" DEEP X 42" X 12" COLLAR WITH VOLUME DAMPER AT ER-3.

GENERAL NOTES

1. CONTRACTOR TO REMOVE AND RE-INSTALL SECTIONS OF CEILING TILES AND CEILING GRID AS REQUIRED TO INSTALL NEW DUCTWORK ABOVE THE CEILING. CONTRACTOR TO REPLACE ANY DAMAGED CEILING TILES OR GRID DURING CONSTRUCTION.
2. CONTRACTOR TO REMOVE AND REPAIR SECTIONS OF HARD GYPSUM CEILING AS REQUIRED TO INSTALL NEW DUCTWORK ABOVE THE CEILING. CONTRACTOR TO REPAIR/REPLACE HARD GYPSUM CEILING REMOVED DURING CONSTRUCTION.
3. CONTRACTOR TO REMOVE EXISTING CEILING LIGHTS AS REQUIRED TO INSTALL NEW DUCTWORK ABOVE THE CEILING. REPAIR/REPLACE ANY CEILING LIGHT DAMAGED DURING CONSTRUCTION. DISCONNECT & RECONNECT POWER TO THE LIGHTS AS REQUIRED.
4. CEILING LIGHT LOCATIONS IN APPARATUS BAY AFFECTED BY NEW EXHAUST DUCTWORK RUN TIGHT TO ROOF STRUCTURE SHALL BE RELOCATED TO CLEAR NEW DUCTWORK. PROVIDE NEW SUPPORTS FOR RELOCATED LIGHTS AND RECONNECT POWER TO THE LIGHTS.

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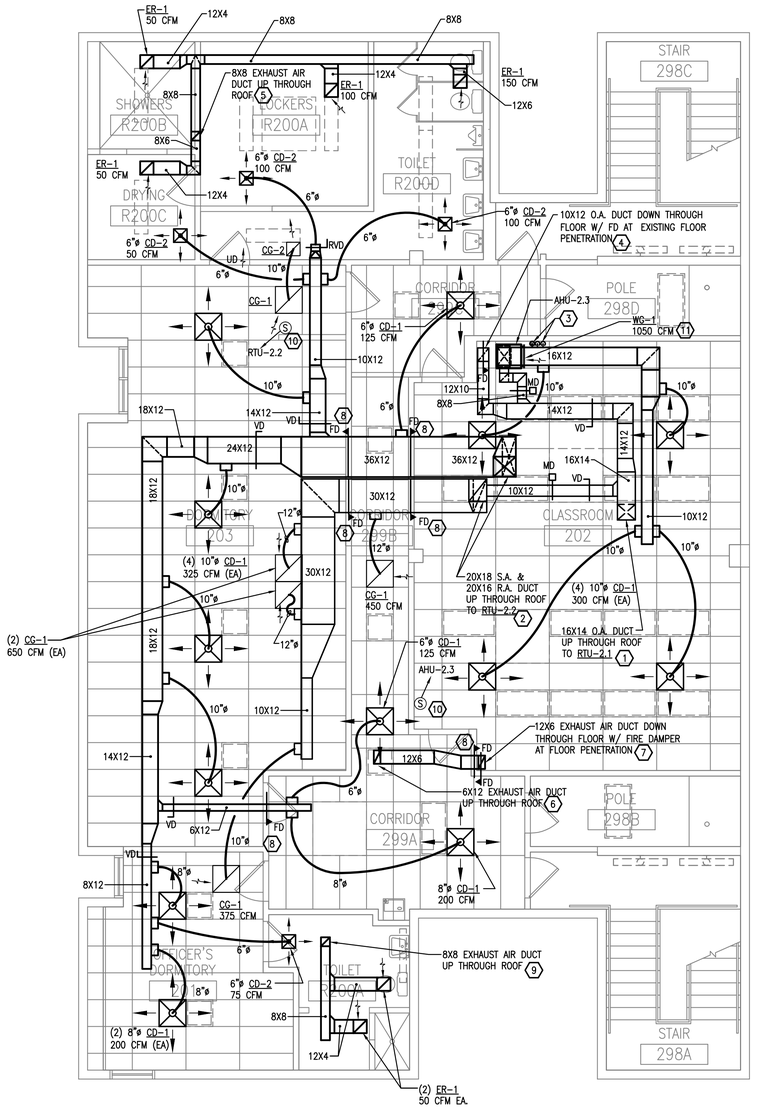
FIRST FLOOR PLAN – HVAC RENOVATION

BID DOCUMENTS

Drawing No.

M-1.1



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SECOND FLOOR PLAN - HVAC - RENOVATION

SCALE: 3/16"=1'-0"

HVAC KEY NOTES - RENOVATION

1. NEW CONDITIONED OUTDOOR AIR DUCT UP THROUGH EXISTING ROOF OPENINGS TO NEW ROOFTOP UNIT RTU-2.1. COORDINATED DUCT SIZES WITH EXISTING ROOF OPENING SIZE. CAP UNUSED DUCT OPENING AS REQUIRED.
2. NEW SUPPLY AIR AND RETURN AIR DUCTS UP THROUGH EXISTING ROOF OPENINGS TO NEW ROOFTOP UNIT RTU-2.2. COORDINATED DUCT SIZES WITH EXISTING ROOF OPENING SIZE.
3. NEW REFRIGERANT PIPING AND 3/4" CONDENSATE DRAIN PIPING DOWN THROUGH THE FLOOR TO 1ST FLOOR CEILING. PROVIDE FIRE SEALING OF PIPE PENETRATIONS.
4. NEW CONDITIONED OUTSIDE AIR DUCT DOWN THROUGH EXISTING FLOOR OPENING. COORDINATE DUCT SIZE WITH EXISTING FLOOR OPENING SIZE. PROVIDE NEW FIRE DAMPER AT FLOOR PENETRATION.
5. NEW EXHAUST AIR DUCT UP THROUGH ROOF IN EXISTING ROOF OPENING. COORDINATE DUCT SIZE WITH EXISTING ROOF OPENING SIZE.
6. NEW EXHAUST AIR DUCT UP THROUGH ROOF IN EXISTING ROOF OPENING. COORDINATE DUCT SIZE WITH EXISTING ROOF OPENING SIZE.
7. NEW EXHAUST AIR DUCT DOWN THROUGH EXISTING FLOOR OPENING. COORDINATE DUCT SIZE WITH EXISTING FLOOR OPENING SIZE. PROVIDE NEW FIRE DAMPER AT FLOOR PENETRATION.
8. PROVIDE NEW FIRE DAMPER AT DUCTWORK WALL PENETRATION.
9. NEW EXHAUST AIR DUCT UP THROUGH ROOF IN EXISTING ROOF OPENING. COORDINATE DUCT SIZE WITH EXISTING ROOF OPENING SIZE.
10. NEW TEMPERATURE AND HUMIDITY SENSOR MOUNTED ON WALL 48" TO 54" A.F.F.. CONNECT SENSOR TO NEW BUILDING MANAGEMENT CONTROL SYSTEM.
11. PROVIDE VOLUME DAMPER IN R.A. DUCT.

GENERAL NOTES

1. CONTRACTOR SHALL REPAIR/PATCH CORRIDOR WALL OPENINGS NOT BEING RE-USED TO RUN NEW DUCTWORK. CORRIDOR WALLS TO BE 1 HOUR FIRE RATED.

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

ORANGE COUNTY FIRE STATION #31 HVAC REPLACEMENT

Revisions

No.	Date	Description

Key Plan

MPE PROJ#: 2013-177

Designed By: RR

Drawn By: RR

Checked By: ABJr

Issue Date: 06/10/15

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

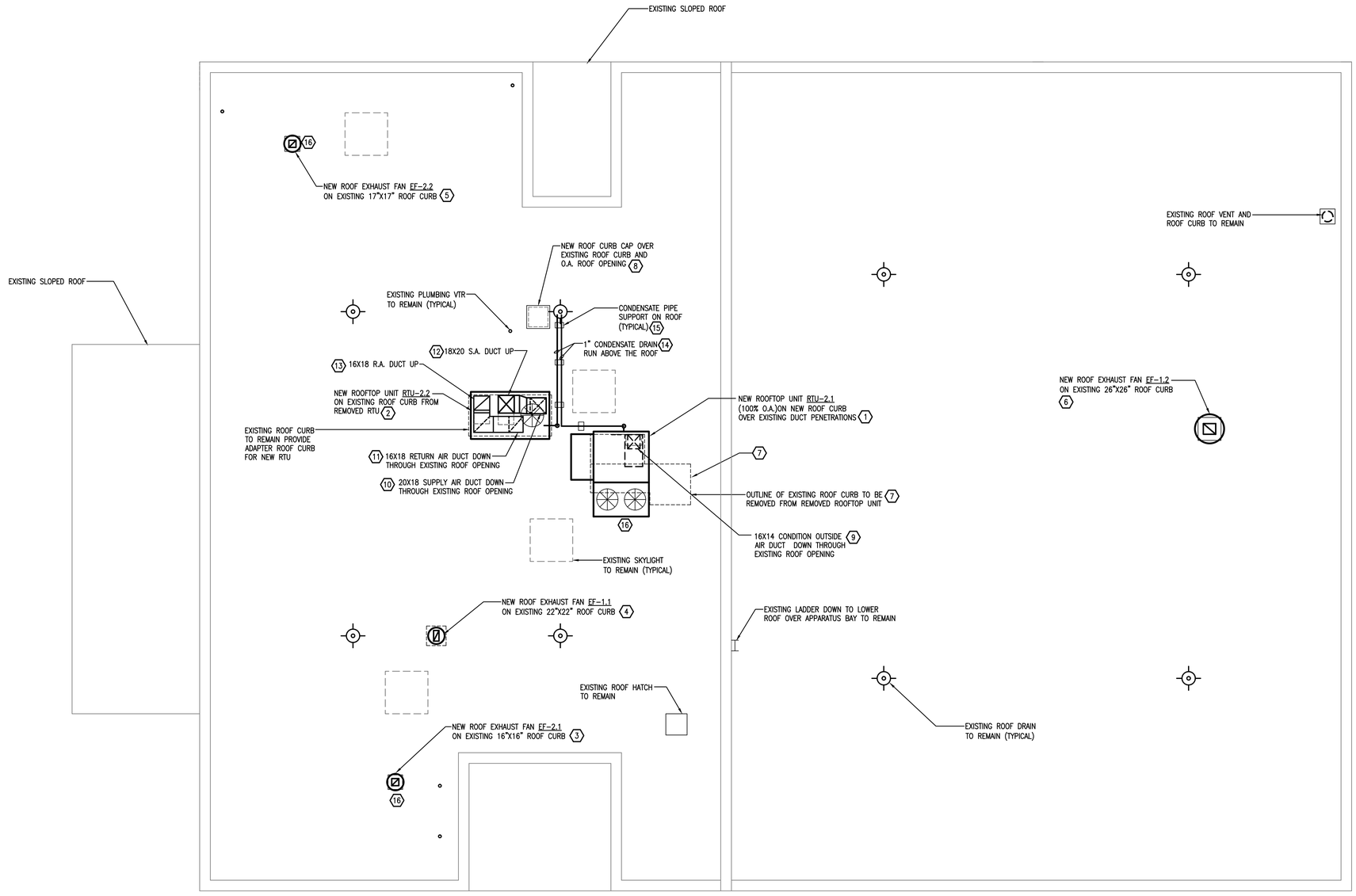
Drawing Title:

SECOND FLOOR PLAN - HVAC RENOVATION

BID DOCUMENTS

Drawing No.

M-1.2



N

ROOF PLAN - HVAC - RENOVATION

SCALE: 3/16"=1'-0"

HVAC KEY NOTES - RENOVATION

1. NEW ROOFTOP UNIT RTU-2.1 INSTALLED NEW ROOF CURB OVER EXISTING ROOF OPENINGS FROM REMOVED ROOF CURB AND REMOVED RTU-5. REMOVE ALL EXISTING DUCTWORK FROM REMOVED RTU RUN ABOVE THE ROOF. CONTRACTOR TO COORDINATE NEW ROOF CURB LAYOUT/DIMENSION WITH EXISTING ROOF OPENINGS. RECONNECT POWER TO NEW RTU. CONNECT NEW BMS CONTROLS TO RTU.
2. NEW ROOFTOP UNIT RTU-2.2 INSTALLED ON ADAPTER ROOF CURB OVER EXISTING ROOF CURB FROM REMOVED RTU-6 ON THE ROOF. CONTRACTOR TO COORDINATE EXISTING ROOF CURB LAYOUT/DIMENSION WITH NEW ADAPTER ROOF CURB. RECONNECT POWER TO NEW RTU. CONNECT NEW BMS CONTROLS TO RTU.
3. NEW ROOF EXHAUST FAN EF-2.1 INSTALLED ON EXISTING ROOF CURB. PROVIDE ADAPTER ROOF CURB AS REQUIRED. RECONNECT POWER TO EXHAUST FAN. CONNECT NEW BMS CONTROLS TO ROOF EXHAUST FAN.
4. NEW ROOF EXHAUST FAN EF-1.1 INSTALLED ON EXISTING ROOF CURB. PROVIDE ADAPTER ROOF CURB AS REQUIRED. RECONNECT POWER TO EXHAUST FAN. CONNECT NEW BMS CONTROLS TO ROOF EXHAUST FAN.
5. NEW ROOF EXHAUST FAN EF-2.2 INSTALLED ON EXISTING ROOF CURB. PROVIDE ADAPTER ROOF CURB AS REQUIRED. RECONNECT POWER TO EXHAUST FAN. CONNECT NEW BMS CONTROLS TO ROOF EXHAUST FAN.
6. NEW ROOF EXHAUST FAN EF-1.2 INSTALLED ON EXISTING ROOF CURB. PROVIDE ADAPTER ROOF CURB AS REQUIRED. RECONNECT POWER TO EXHAUST FAN. CONNECT NEW BMS CONTROLS TO ROOF EXHAUST FAN.
7. CONTRACTOR TO REPAIR/REPLACE EXISTING ROOF AROUND REMOVED ROOF CURB AND WHERE REMOVED TO INSTALL NEW ROOF CURB FOR ROOFTOP UNIT RTU-2.1. ROOFING MATERIAL AND ROOF INSULATION TO MATCH EXISTING. CONTRACTOR TO CONFIRM WITH OWNER ANY ROOF WARRANTY THAT EXISTING WITH ROOF.
8. INSTALL NEW CURB CAP OVER EXISTING ROOF CURB AND ROOF OPENING. SEAL ROOF CURB CAP WEATHER TIGHT.
9. NEW 16X14 CONDITIONED OUTDOOR AIR DUCT DOWN THROUGH ROOF IN EXISTING ROOF OPENING. CONTRACTOR TO COORDINATE DUCT SIZE AT ROOF PENETRATION WITH EXISTING ROOF OPENING SIZE, PROVIDE DUCT TRANSITION AS REQUIRED. EXISTING ROOF OPENING TO REMAIN AT PRESENT DIMENSIONS.
10. NEW 20X18 SUPPLY AIR DUCT DOWN THROUGH ROOF IN EXISTING ROOF OPENING. CONTRACTOR TO COORDINATE DUCT SIZE AT ROOF PENETRATION WITH EXISTING ROOF OPENING SIZE, PROVIDE DUCT TRANSITION AS REQUIRED. EXISTING ROOF OPENING TO REMAIN AT PRESENT DIMENSIONS.
11. NEW 18X16 RETURN AIR DUCT DOWN THROUGH ROOF IN EXISTING ROOF OPENING. CONTRACTOR TO COORDINATE DUCT SIZE AT ROOF PENETRATION WITH EXISTING ROOF OPENING SIZE, PROVIDE DUCT TRANSITION AS REQUIRED. EXISTING ROOF OPENING TO REMAIN AT PRESENT DIMENSIONS.
12. PROVIDE 20X18 SUPPLY AIR DUCT RUN INSIDE RTU ADAPTER CURB WITH 20X18 DUCT UP TO RTU DISCHARGE OPENING. PROVIDE DUCT TRANSITION OR PLENUM AT CONNECTION TO RTU DISCHARGE OPENING AS REQUIRED.
13. PROVIDE 18X16 RETURN AIR DUCT RUN INSIDE ADAPTER CURB WITH 18X16 R.A. DUCT UP TO RTU R.A. INTAKE OPENING. PROVIDE DUCT TRANSITION OR PLENUM AT CONNECTION TO R.A. INTAKE OPENING AS REQUIRED.
14. PROVIDE 1" PVC CONDENSATE PIPE FROM NEW RTU CONDENSATE DRAIN OUTLET RUN ABOVE THE ROOF TO NEAREST EXISTING ROOF DRAIN. CONDENSATE PIPE SHALL SLOPE 1/4" PER FOOT (2%) OVER ITS ENTIRE RUN.
15. PROVIDE COOPER B-LINE DURABLOCK DBE OR EQUAL PIPE SUPPORT ON THE ROOF TO SUPPORT NEW CONDENSATE DRAIN PIPING ABOVE THE EXISTING ROOF. PIPE SUPPORT SPACING SHALL COMPLY WITH 2010 FLORIDA BUILDING CODE MECHANICAL SECTION 305. PROVIDE PIPE CLAMP OVER SUPPORTED PIPE AND ATTACHED TO PIPE SUPPORT.
16. PROVIDE ROOF GUARD PER 2010 FBCM SECTION 304.11 – SEE STRUCTURAL DRAWINGS FOR DETAILED INFORMATION.

GENERAL NOTES

1. EXISTING ROOF OF THE BUILDING TO REMAIN. CONTRACTOR TO PROTECT THE ROOF SURFACE THROUGHOUT CONSTRUCTION WHEN ANY ROOF WORK IS PERFORMED. CONTRACTOR SHALL REPAIR ANY ROOF LEAKS THAT OCCUR DUE TO DEMOLITION OR RENOVATION WORK PERFORMED ON THE EXISTING ROOF.
2. CONTRACTOR SHALL KEEP ROOF DRAINS CLEAR THROUGHOUT CONSTRUCTION OF ANY DEBRIS DUE TO ANY DEMOLITION OR RENOVATION WORK PREFORMED ON THE EXISTING ROOF.
3. REFER TO STRUCTURAL DRAWINGS FOR ROOF GUARDS TO COMPLY WITH 2010 FLORIDA MECHANICAL CODE SECTION 304.11 AND THE 2010 FLORIDA BUILDING CODE SECTION 1013.1. ROOF GUARDS SHALL BE PROVIDED WHEN ANY EQUIPMENT OR ROOF HATCH IS WITH 10' OF THE EXISTING ROOF EDGE.

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ORANGE COUNTY FIRE STATION #31 HVAC REPLACEMENT

Revisions

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Key Plan

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Drawing Title:

ROOF PLAN HVAC RENOVATION

BID DOCUMENTS

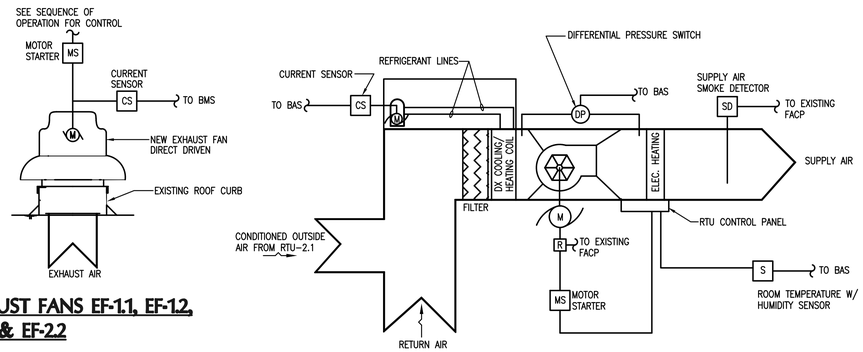
Drawing No.

M-1.3

CONTROL POINTS SCHEDULE

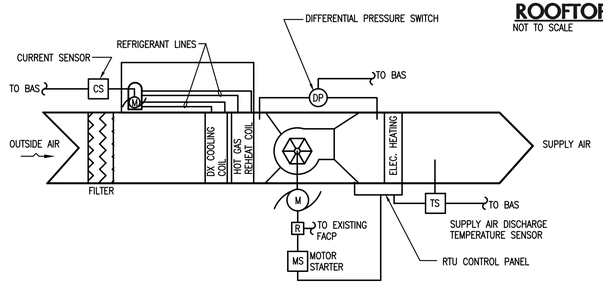
	INPUTS: ANALOG: OUTSIDE AIR TEMPERATURE (°F)	O. A. RELATIVE HUMIDITY (%RH)	ROOM TEMPERATURE (°F)	ROOM HUMIDITY (%RH)	SUPPLY AIR TEMPERATURE (°F)	R.A. TEMPERATURE (°F)	STATIC PRESSURE ("WC)	CO LEVEL (PPM)	INPUTS: DIGITAL: FAN STATUS, DIFF. PRESSURE	MOTOR CURRENT SENSOR	OUTPUTS: ANALOG: ELEC. HEAT STAGING	O.A. DAMPER (OPEN/CLOSED)	OUTPUTS: DIGITAL: FAN MOTOR START/STOP	DAMPER POSITION (% OPEN)	ELECTRIC HEAT LOCK-OUT (BY STAGES)	COND. UNIT COMPRESSOR (START/STOP)	HEAT PUMP DEFROST MODE	SOFTWARE: APPLICATIONS: OCCUP/UNOCCUP	OPTIMAL START/STOP	DEMAND LIMITING	DUTY CYCLING	DYNAMIC COLOR GRAPHIC	SOFTWARE INTERLOCK
AIR HANDLING UNIT AHU-1.1			X	X	X	X			X		X	X	X					X	X		X	X	X
AIR HANDLING UNIT AHU-1.2			X	X	X	X			X		X	X	X					X	X		X	X	X
AIR HANDLING UNIT AHU-1.3			X	X	X	X			X		X	X	X					X	X		X	X	X
AIR HANDLING UNIT AHU-2.3			X	X	X	X			X		X	X	X					X	X		X	X	X
ROOFTOP UNIT RTU-2.1			X	X	X	X			X		X	X	X			X	X	X	X		X	X	X
ROOFTOP UNIT RTU-2.2			X	X	X	X			X		X	X	X			X	X	X	X		X	X	X
HEAT PUMP UNIT HP-1.1										X						X	X	X	X		X	X	X
HEAT PUMP UNIT HP-1.2										X						X	X	X	X		X	X	X
HEAT PUMP UNIT HP-1.3										X						X	X	X	X		X	X	X
HEAT PUMP UNIT HP-2.3										X						X	X	X	X		X	X	X
EXHAUST FAN EF-1.1										X			X					X				X	X
EXHAUST FAN EF-1.2										X			X					X				X	X
EXHAUST FAN EF-1.3								X		X			X					X				X	X
EXHAUST FAN EF-2.1										X			X					X				X	X
EXHAUST FAN EF-2.2										X			X					X				X	X
NEW KITCHEN HOOD KH-1 EXHAUST FAN										X								X				X	X
BUILDING POINTS	▲	▲																					

ALL CONTROL POINTS SHALL BE MONITORED. PROVIDE ALARM POINTS AS INDICATED IN SEQUENCE OF OPERATION.
▲ ONE PER BUILDING

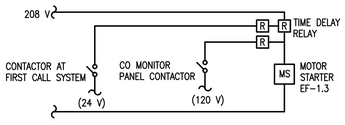


EXHAUST FANS EF-1.1, EF-1.2, EF-2.1 & EF-2.2
NO SCALE

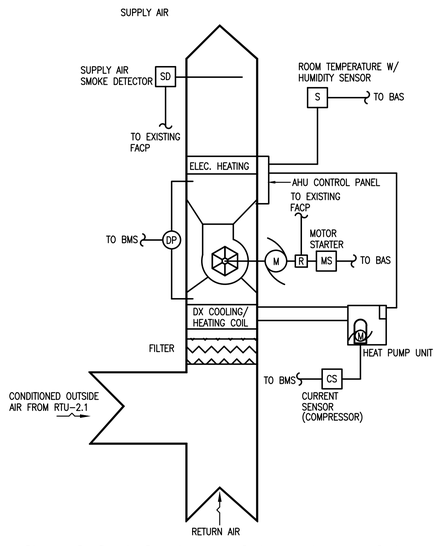
ROOFTOP UNIT RTU-2.2
NOT TO SCALE



ROOFTOP UNIT RTU-2.1 (100% O.A.)
NOT TO SCALE



EXHAUST FAN EF-3 CONTROL SCHEMATIC
NOT TO SCALE



SPLIT SYSTEMS - AHU-1.1/HP1.-1, AHU-1.2/HP-1.2 AHU-1.3/ HP1.-3 & AHU-2.3/HP-2.3
NOT TO SCALE

SEQUENCE OF OPERATION

A. GENERAL:

1. THE BUILDING AUTOMATION SYSTEM (BAS) SHALL HAVE ALL SYSTEM CONTROLLERS, RELAYS, TIME CLOCK AND CONTROL POWER TRANSFORMER (120V/24V) IN A NEMA 1 ENCLOSURE WITH DOOR LOCK. SEE SHEET M1.1 FOR LOCATION OF BMS CONTROL PANEL. CONTRACTOR SHALL PROVIDE ALL LOW VOLTAGE WIRING TO REMOTE CONTROLLERS, EXHAUST FANS AND SENSORS FOR A COMPLETE AND WORKING HVAC CONTROL SYSTEM.

2. THE BAS SYSTEM SHALL BE A STAND ALONE SYSTEM SERVING ONLY THIS BUILDING. HOWEVER THE BAS SYSTEM SHALL HAVE A WEB BASE USER INTERFACE BASED ON MICROSOFT INTERNET EXPLORER. PROPRIETARY SOFTWARE IS NOT ALLOWED ON THIS PROJECT. COORDINATE WITH ORANGE COUNTY ISS DEPARTMENT FOR REMOTE ACCESS COMMUNICATION PORT.

B. SPLIT SYSTEM AHU-1.1/HP-1.1, AHU-1.2/HP-1.2 & AHU-1.3/HP-1.3 AND AHU-2.3/HP-2.3 (CONSTANT VOLUME)

1. **OCCUPIED:**

a. THE BUILDING IS OPEN AND OPERATIONAL 24 HOURS A DAY AND 7 DAYS A WEEK, THE BUILDING AUTOMATION SYSTEM (BAS) SHALL ENERGIZE THE AIR HANDLING UNITS AHU-1.1, AHU-1.2, AHU-1.3 AND AHU-2.3 CONTROLS. AHU-1.1, AHU-1.2 AND AHU-1.3 AHU SUPPLY FAN SHALL START AND RUN CONTINUOUSLY. AHU-2.1 SUPPLY FAN SHALL CYCLE WITH ITS HEAT PUMP COMPRESSOR. THE DIFFERENTIAL PRESSURE SWITCH AT AHU-1.1, AHU-1.2, AHU-1.3 OR AHU-2.3 FAN SHALL SIGNAL THE BAS TO ACTIVATE AN ALARM SHOULD ITS SUPPLY FAN FAIL TO RUN WHEN COMMANDED TO START. THE BAS SHALL PROVIDE AN "OFF NORMAL" ADVISORY SIGNAL TO A REMOTE LOCATION.

b. THE BAS SHALL ENERGIZE HEAT PUMP UNIT HP-1.1, HP-1.2, HP-1.3 & HP-2.3 CONTROLS AND THE HEAT PUMP UNIT SHALL CYCLE TO MAINTAIN COOLING OR HEATING SET-POINT TEMPERATURE. PROVIDE A CURRENT SENSOR TO ACTIVATE AN ALARM SHOULD THE COMPRESSOR FAIL RUN WHEN COMMANDED TO START. THE ALARM SHALL SIGNAL "OFF NORMAL" ADVISORY AT A REMOTE LOCATION.

c. THE SPACE TEMPERATURE SENSOR CONTROLLING AHU-1.1/HP-1.1, AHU-1.2/HP-1.2, AHU-1.3/HP-1.3 OR AHU-2.3/HP-2.3 SHALL HAVE A COOLING SET-POINT TEMPERATURE OF 72°F (ADJUSTABLE) AND HEATING SET-POINT TEMPERATURE OF 70°F (ADJUSTABLE). PROVIDE A MINIMUM OF A 5°F DEAD BAND BETWEEN COOLING AND HEATING ACTIVATION SET-POINTS.

2. **COOLING MODE:**

a. THE HEAT PUMP COMPRESSOR SHALL BE ACTIVATED IN THE COOLING MODE WHENEVER SPACE TEMPERATURE IS 3°F ABOVE THE COOLING SET-POINT TEMPERATURE. THE HEAT PUMP COMPRESSOR SHALL CYCLE TO MAINTAIN SET-POINT TEMPERATURE. THE HEAT PUMP COMPRESSOR SHALL BE OFF WHEN SPACE TEMPERATURE IS AT OR BELOW COOLING SET-POINT TEMPERATURE.

3. **HEATING MODE:**

a. THE HEAT PUMP COMPRESSOR SHALL BE ACTIVATED IN THE HEATING MODE WHENEVER SPACE TEMPERATURE IS 3°F BELOW HEATING SET-POINT TEMPERATURE. THE HEAT PUMP COMPRESSOR SHALL CYCLE TO MAINTAIN SET-POINT TEMPERATURE. THE HEAT PUMP COMPRESSOR SHALL BE OFF WHEN SPACE TEMPERATURE IS AT OR ABOVE THE HEATING SET-POINT TEMPERATURE.

b. SHOULD THE HEAT PUMP COMPRESSOR INITIATE ITS DEFROST CYCLE THE ELECTRIC HEATER AT THE AIR HANDLING UNIT SHALL BE ACTIVATED TO MAINTAIN HEATING SET-POINT TEMPERATURE. WHEN DEFROST CYCLE IS COMPLETE THE ELECTRIC HEATER SHALL BE DE-ACTIVATED.

c. SHOULD SPACE TEMPERATURE FALL 8°F BELOW SET-POINT TEMPERATURE THE ELECTRIC HEATER AT AHU-1 AHU-2 OR AHU-3 SHALL BE ACTIVATED TO MAINTAIN SPACE TEMPERATURE. THE ELECTRIC HEATER SHALL BE DE-ACTIVATED WHEN SPACE TEMPERATURE IS AT THE HEATING SET-POINT TEMPERATURE.

4. **UNOCCUPIED:**

a. THERE IS NO UNOCCUPIED MODE FOR THIS BUILDING.

5. **NIGHT SET BACK:**

a. THE BAS CONTROL SYSTEM SHALL RE-SET AIR HANDLING UNITS AHU-1.1 SPACE TEMPERATURE SENSOR TO 68°F IN COOLING MODE FOR NIGHT TIME OPERATION. THE OTHER AIR HANDLING UNITS AHU-1.2 AHU-1.3 & AHU-2.3 SPACE TEMPERATURE SENSOR SHALL REMAIN AT OCCUPIED SET-POINT.

B. ROOFTOP UNIT RTU-2.2 (CONSTANT VOLUME)

1. **OCCUPIED:**

a. THE BUILDING IS OPEN AND OPERATIONAL 24 HOURS A DAY AND 7 DAYS A WEEK, THE BUILDING AUTOMATION SYSTEM (BAS) SHALL ENERGIZE THE ROOFTOP UNIT RTU-2.2 CONTROLS IN THE OCCUPIED MODE. THE RTU SUPPLY FAN SHALL START AND RUN CONTINUOUSLY. THE DIFFERENTIAL PRESSURE SWITCH AT RTU-2.2 SUPPLY FAN SHALL SIGNAL THE BAS TO ACTIVATE AN ALARM SHOULD ITS SUPPLY FAN FAIL TO RUN WHEN COMMANDED TO START. THE BAS SHALL PROVIDE AN "OFF NORMAL" ADVISORY SIGNAL TO A REMOTE LOCATION.

b. THE SPACE TEMPERATURE SENSOR CONTROLLING RTU-2.2 SHALL HAVE A COOLING SET-POINT TEMPERATURE OF 72°F (ADJUSTABLE) AND HEATING SET-POINT TEMPERATURE OF 70°F (ADJUSTABLE). PROVIDE A MINIMUM OF A 5°F DEAD BAND BETWEEN COOLING AND HEATING ACTIVATION SET-POINTS.

2. **COOLING MODE:**

a. THE ROOFTOP UNIT COMPRESSOR SHALL BE ACTIVATED IN THE COOLING MODE WHENEVER SPACE TEMPERATURE IS 3°F ABOVE THE COOLING SET-POINT TEMPERATURE. THE ROOFTOP UNIT COMPRESSOR SHALL CYCLE TO MAINTAIN SET-POINT TEMPERATURE. THE ROOFTOP UNIT COMPRESSOR SHALL BE OFF WHEN SPACE TEMPERATURE IS AT OR BELOW COOLING SET-POINT TEMPERATURE.

3. **HEATING MODE:**

a. THE ROOFTOP UNIT COMPRESSOR SHALL BE ACTIVATED IN THE HEATING MODE WHENEVER SPACE TEMPERATURE IS 3°F BELOW HEATING SET-POINT TEMPERATURE. THE ROOFTOP UNIT COMPRESSOR SHALL CYCLE TO MAINTAIN SET-POINT TEMPERATURE. THE HEAT PUMP COMPRESSOR SHALL BE OFF WHEN SPACE TEMPERATURE IS AT OR ABOVE THE HEATING SET-POINT TEMPERATURE.

b. SHOULD THE ROOFTOP UNIT COMPRESSOR INITIATE ITS DEFROST CYCLE THE ELECTRIC HEATER AT THE ROOFTOP UNIT SHALL BE ACTIVATED TO MAINTAIN HEATING SET-POINT TEMPERATURE. WHEN DEFROST CYCLE IS COMPLETE THE ELECTRIC HEATER SHALL BE DE-ACTIVATED.

c. SHOULD SPACE TEMPERATURE FALL 8°F BELOW SET-POINT TEMPERATURE THE ELECTRIC HEATER AT RTU-2.2 SHALL BE ACTIVATED TO MAINTAIN SPACE TEMPERATURE. THE ELECTRIC HEATER SHALL BE DE-ACTIVATED WHEN SPACE TEMPERATURE IS AT THE HEATING SET-POINT TEMPERATURE.

4. **UNOCCUPIED:**

a. THERE IS NO UNOCCUPIED MODE FOR THIS BUILDING.

5. **NIGHT SET BACK:**

a. THE BAS CONTROLS SHALL RESET ROOFTOP UNIT RTU-2.2 SPACE TEMPERATURE SENSOR TO 68°F (ADJUSTABLE) IN COOLING MODE FOR NIGHT TIME OPERATION. THE ROOFTOP UNIT COMPRESSOR SHALL CYCLE TO MAINTAIN SPACE TEMPERATURE.

C. 100% OUTDOOR AIR ROOFTOP UNIT RTU-2.1 (CONSTANT VOLUME)

1. **OCCUPIED:**

a. THE BUILDING IS OPEN AND OPERATIONAL 24 HOURS A DAY AND 7 DAYS A WEEK, THE BUILDING AUTOMATION SYSTEM (BAS) SHALL ENERGIZE THE ROOFTOP UNIT RTU-2.1 CONTROLS IN THE OCCUPIED MODE. THE RTU SUPPLY FAN SHALL START AND RUN CONTINUOUSLY. A DIFFERENTIAL PRESSURE SWITCH AT AHU-2.3 SUPPLY FAN SHALL SIGNAL THE BAS TO ACTIVATE AN ALARM SHOULD ITS SUPPLY FAN FAIL TO RUN WHEN COMMANDED TO START. THE BAS SHALL PROVIDE AN "OFF NORMAL" ADVISORY SIGNAL TO A REMOTE LOCATION.

b. THE AIR HANDLING UNIT COMPRESSOR SHALL CYCLE ITS OPERATION TO MAINTAIN A DISCHARGE TEMPERATURE OF 68°F TO 72 F (ADJUSTABLE) LEAVING AIR TEMPERATURE

2. **COOLING MODE:**

a. THE ROOFTOP UNIT RTU-2.1 COMPRESSOR SHALL BE ACTIVATED IN THE COOLING MODE WHENEVER OUTDOOR AIR TEMPERATURE IS 60°F OR HIGHER. THE COMPRESSOR SHALL START WHEN DISCHARGE TEMPERATURE IS 2°F ABOVE SET-POINT TEMPERATURE AND CYCLE OFF WHEN AT OR BELOW DISCHARGE SET-POINT TEMPERATURE. THE RTU HOT GAS REHEAT COIL SHALL BE ACTIVATED AS REQUIRED TO MAINTAIN DISCHARGE LEAVING AIR TEMPERATURE SET-POINT.

3. **HEATING MODE:**

a. THE ROOFTOP UNIT RTU-2.1 ELECTRIC HEATER SHALL BE ACTIVATED WHEN OUTDOOR AIR TEMPERATURE IS 50°F OR LOWER. THE ROOFTOP UNIT RTU-2.1 SUPPLY FAN SHALL RUN CONTINUOUSLY AND ASSOCIATED ELECTRIC HEATER SHALL CYCLE TO MAINTAIN A 70°F DISCHARGE TEMPERATURE. THE RTU COOLING MODE SHALL BE LOCKED OUT WHEN IN THE HEATING MODE.

D. PACKAGE THRU THE WALL A/C SYSTEM A/C-4 (CONSTANT VOLUME)

1. **OCCUPIED:**

a. THE PACKAGE THRU THE WALL A/C SYSTEM SERVING STORAGE ROOM 109C SHALL BE MANUALLY OPERATED TO MAINTAIN 75°F (ADJUSTABLE) SPACE TEMPERATURE WHEN ACTIVATED. THE A/C UNIT SHALL CYCLE ITS OPERATION TO MAINTAIN SPACE TEMPERATURE.

E. EXHAUST FANS:

1. THE EXHAUST FAN EF-1.1 SHALL BE ACTIVATED BY THE BUILDING AUTOMATION SYSTEM (BAS) TO RUN WHEN THE LIGHT SWITCH OR OCCUPANCY SENSOR IN THE EITHER 1ST FLOOR RESTROOM (WOMENS OR MENS) SERVED THE EXHAUST FAN IS ACTIVATED. PROVIDE A CURRENT SENSOR FOR THE EXHAUST FAN, SHOULD THE FAN FAIL TO RUN WHEN COMMANDED TO START. THE BAS SHALL ISSUE AN "OFF NORMAL" ADVISORY TO A REMOTE LOCATION. THE FAN SHALL CONTINUE TO OPERATE FOR 15 MINUTES AFTER THE BOTH LIGHT SWITCHES ARE TURNED OFF OR BOTH OCCUPANCY SENSORS ARE DE-ACTIVATED.

2. THE APPARATUS BAY STORAGE ROOM EXHAUST FAN EF-1.2 SHALL BE ACTIVATED BY THE BUILDING AUTOMATION SYSTEM (BAS) TO RUN BY A MANUAL WALL SWITCH. WHEN THE SWITCH IS IN THE ON POSITION THE EXHAUST FAN SHALL START AND RUN CONTINUOUSLY. WHEN THE SWITCH IS IN THE OFF POSITION THE FAN SHALL BE OFF. SHOULD THE FAN FAIL TO RUN WHEN COMMANDED TO START. THE BAS SHALL ISSUE AN "OFF NORMAL" ADVISORY TO A REMOTE LOCATION.

3. THE BUILDING AUTOMATION SYSTEM (BAS) SHALL ENERGIZE APPARATUS BAY EXHAUST FANS EF-1.3 CONTROLS 24/7. THE EXHAUST FAN SHALL BE ACTIVATED BY THE FIRE STATION FIRST CALL SYSTEM OR BY THE CO MONITORING SYSTEM. WHEN THE FAN IS ACTIVATED IT SHALL START AND RUN CONTINUOUSLY. A CURRENT SENSOR SHALL SIGNAL THE BAS TO ISSUE AN" OFF NORMAL" ADVISORY ALARM SHOULD THE FAN FAIL TO RUN WHEN COMMANDED TO START. UPON FAN ACTIVATION AN APPARATUS BAY ROLL-UP DOOR SHALL OPEN.

a. THE FIRE STATION FIRST CALL SYSTEM WHEN ITS RECEIVES A CALL FOR THIS STATION SHALL ACTIVATE THE EXHAUST FAN AND THE FAN SHALL RUN CONTINUOUSLY. THE FAN SHALL OPERATE FOR 15 MINUTES (ADJUSTABLE) UPON ACTIVATION AND THEN THE FAN SHALL TURN -OFF.

b. THE CO MONITORING SYSTEM SHALL ACTIVATE THE EXHAUST FANS EF-1.3 OR MAINTAIN OPERATION IF THE FAN IS ALREADY RUNNING, SHOULD CO LEVEL AT ANY CO SENSOR RISE ABOVE 50 PPM. THE EXHAUST FAN SHALL RUN CONTINUOUSLY UNTIL CO LEVEL IS AT OR BELOW 35 PPM AND THE FAN SHALL SHUT-OFF. ONE APPARATUS BAY ROLL-UP DOOR SHALL OPEN IF THE CO MONITORING SYSTEM IS ACTIVATED. THE BAS SHALL ISSUE AN ALARM ADVISORY TO A REMOTE LOCATION AND AT THE CO MONITORING PANEL SHOULD CO MONITOR SYSTEM ACTIVATE THE APPARATUS BAY EXHAUST FAN. A CURRENT SENSOR SHALL SIGNAL THE BAS SHOULD THE EXHAUST FAN FAIL TO RUN WHEN COMMANDED TO START. THE BAS SHALL ISSUE AN "OFF NORMAL" ADVISORY TO A REMOTE LOCATION.

4. THE BAS CONTROL SYSTEM SHALL ENERGIZE EXHAUST FAN EF-2.1 CONTROLS IN THE OCCUPIED MODE. THE EXHAUST FAN EF-2.1 SHALL BE OPERATED BY THE LIGHT SWITCH OR OCCUPANCY SENSOR IN THE RESTROOM SERVED. WHEN THE LIGHT SWITCH IS IN THE ON POSITION OR THE OCCUPANCY SENSOR IS ACTIVATED THE EXHAUST FAN SHALL START AND RUN CONTINUOUSLY. A CURRENT SENSOR SHALL SIGNAL THE BAS SHOULD THE FAN FAIL TO RUN WHEN COMMANDED TO START. THE BAS SHALL ISSUE AN "OFF NORMAL" ADVISORY TO A REMOTE LOCATION. WHEN THE LIGHT SWITCH IS OFF OR THE OCCUPANCY SENSOR IS DE-ACTIVATED THE EXHAUST FAN SHALL RUN FOR 15 MINUTES (ADJUSTABLE) AND THEN TURN OFF.

5. THE EXHAUST FAN EF-2.2 SHALL BE OPERATED BY THE BUILDING AUTOMATION SYSTEM (BAS) TO RUN 24/7. SHOULD THE FAN FAIL TO RUN WHEN COMMANDED TO START. THE BAS SHALL ISSUE AN "OFF NORMAL OPERATION" ADVISORY TO A REMOTE LOCATION.

6. THE KITCHEN HOOD KH-1 EXHAUST FAN SHALL BE ACTIVATED BY THE MANUAL ON/OFF FAN SWITCH AT THE EXHAUST HOOD. PROVIDE A HEAT SENSOR AND RELAYS IN THE EXHAUST HOOD THAT WILL AUTOMATICALLY ACTIVATE THE HOOD EXHAUST FAN SHOULD THE COOKING APPLIANCE UNDER THE HOOD BE ON. CURRENT SENSOR AT THE HOOD EXHAUST FAN SHALL SIGNAL THE BAS SHOULD THE FAN FAIL TO RUN WHEN COMMANDED TO START. THE BAS SHALL ISSUE AN "OFF NORMAL" ADVISORY TO A REMOTE LOCATION.

G. EMERGENCY:

1. THE SUPPLY AIR SMOKE DETECTOR AT AHU-1.1, AHU-1.2 AHU-1.3 OR RTU-2.2 SHALL SIGNAL THE EXISTING BUILDING FIRE ALARM CONTROL PANEL (FACP) UPON SMOKE DETECTOR ACTIVATION. THE FACP SHALL DETERMINE IF THE FIRE ALARM SYSTEM SHOULD BE ACTIVATED. SHOULD THE FACP ACTIVATE AN ALARM CONDITION ALL AIR HANDLING UNIT SUPPLY FANS AHU-1.1, AHU-1.2, AHU-1.3, AHU-2.3, RTU-2.1 AND RTU-2.2 SHALL BE SHUT-OFF.

2. THE NEW KITCHEN WET CHEMICAL FIRE SUPPRESSION SYSTEM UPON ACTIVATION SHALL SIGNAL THE EXISTING FACP TO ACTIVATE AN ALARM CONDITION. KITCHEN HOOD EXHAUST FAN SHALL TURN OFF UPON HOOD FIRE SUPPRESSION SYSTEM ACTIVATION.

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ORANGE COUNTY FIRE STATION #31 HVAC REPLACEMENT

Revisions

No.	Date	Description

Key Plan

MPE PROJ#: 2013-177
Designed By: RR
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Drawing Title:

BUILDING CONTROLS HVAC

BID DOCUMENTS

Drawing No.

M-2.1

ROOFTOP UNIT SCHEDULE

UNIT NUMBER	FAN DATA: NOMINAL CAPACITY TONS	FAN DATA: LOCATION	FAN DATA: AREA SERVED	FAN DATA: OUTSIDE AIR	FAN DATA: CFM	FAN DATA: TOTAL STATIC IN. W.G.	FAN DATA: MIN. EXT. STATIC IN. W.G.	FAN DATA: MAX. OUTLET VEL. F.P.M.	FAN DATA: RPM	FAN DATA: BHP	FAN DATA: HP	COOLING COIL DATA: ENT. AIR °F DB	ENT. AIR °F WB	LVG. AIR °F DB	LVG. AIR °F WB	TOTAL MBH	SENS. MBH	F.P.I	FACE AREA	No. ROWS	STATIC IN. W.G.	HEATING DATA: ENT. AIR DB	LVG. AIR DB	HEATING MBH @37°F	ELECTRIC HEATING COIL DATA: ENT. AIR DB	LVG. AIR DB	KW	VOLTS	PHASE	HERTZ	AMPS	ELECTRIC DATA: VOLTS	PHASE	UNIT MCA	MOPD	FILTER DATA: TYPE	CLEAN P.D. IN. W.G.	NO./SIZE	SEER	EER	HEATING COP	MANUFACTURER/MODEL	WEIGHT LBS	NOTES
RTU-2.1	10	ROOF	HVAC EQUIP. VENT	1400	1400	– –	1.0	2000	– –	.42	.5	95	78	54.9	53.3	121	65	12	8.0	6	– –	– –	– –	– –	36	69.8	15	208	3	60	50	208	3	62.5	70	DISP.	.2"	— — —	– –	13.1	--	ADDISON TRSA 120 OR APPROVED EQUAL	1995	1
RTU-2.2	6	ROOF	DORM/RESTROOMS	450*	2500	– –	1.0	2000	1004	1.15	1.0	71.8	62.0	52.7	51.6	74.4	54.5	16	9.89	4	– –	70	92.7	61.53	70	87	18.0	208	3	60	--	208	3	83.2	90	DISP.	.2"	4/ 16"X25"X2"	– –	11.4	2.3	TRANE WSC072E3RGA-00A OR APPROVED EQUAL	900	2

NOTES:
1. 100% OUTDOOR AIR ROOFTOP UNIT SHALL HAVE SINGLE POINT POWER CONNECTION AND ROOF CURB.
2. ROOFTOP UNIT SHALL HAVE SINGLE POINT POWER CONNECTION, SUPPLY AIR SMOKE DETECTOR, HINGED SERVICE PANELS, MERV 8 FILTERS, FROST STAT, UN-POWERED RECEPTACLE. CONTRACTOR TO PROVIDE ADAPTER ROOF CURB FOR NEW ROOFTOP UNIT.
* OUTDOOR VENTILATION AIR IS SUPPLIED FROM AIR HANDLING UNIT RTU-2.1.

AIR HANDLING UNIT SCHEDULE

UNIT NUMBER	FAN DATA: NOMINAL CAPACITY TONS	LOCATION	AREA SERVED	OUTSIDE AIR	CFM	TOTAL STATIC IN. W.G.	MIN. EXT. STATIC IN. W.G.	MAX. OUTLET VEL. F.P.M.	RPM	BHP	HP	DX. COOLING COIL DATA: ENT. AIR °F DB	ENT. AIR °F WB	LVG. AIR °F DB	LVG. AIR °F WB	TOTAL MBH	SENS. MBH	F.P.I	FACE AREA	No. ROWS	STATIC IN. W.G.	HEATING DATA: ENT. AIR DB	LVG. AIR DB	HEATING MBH @ 47°F	ELECTRIC HEATING COIL: ENT. AIR °F	LVG. AIR °F	KW.	AMPS	ELECTRIC DATA: VOLTS	PHASE	UNIT MCA	MOPD	FILTER DATA: TYPE	CLEAN P.D. IN. W.G.	NO./SIZE	SEER /EER	MANUFACTURER/MODEL	WEIGHT LBS	NOTES
AHU-1.1	3	ELEC. ROOM 100A	LT. OFF./ W.O.A. READY&BUNK RM/ LOBBY	200*	1225	--	.5	--	HIGH	--	1/2	72.9	62.4	52.8	52.2	36.0	26.7	14.0	5.5	4	– –	70	94.6	32.6	70	88.5	9.6	20	208	3	30	30	DISP.	.2"	1/ 22" X 20" X 1"	16.0/–	TRANE GAM5B0B036 OR APPROVED EQUAL	142	1 & 2
AHU-1.2	3	STORAGE 105	FIRST AID/OFFICES/LOBBY	250*	1200	--	.5	--	HIGH	--	1/2	71.8	62.0	51.7	51.5	36.0	26.1	14.0	5.5	4	– –	70	95.1	32.6	70	88.9	9.6	20	208	3	30	30	DISP.	.2"	1/ 22" X 20" X 1"	16.0/–	TRANE GAM5B0B036 OR APPROVED EQUAL	142	1 & 2
AHU-1.3	5	MECH RM M100A	DINING/KITCHEN & READY ROOM AREA	350*	1950	--	.5	--	HIGH	--	1.0	72.3	62.2	52.9	52.6	54.0	41.0	14.0	5.96	4	– –	70	95.6	54.0	70	87.5	14.4	30	208	3	46	50	DISP.	.2"	1/ 22" X 20" X 1"	15.0/–	TRANE GAM5B0C060 OR APPROVED EQUAL	170	1 & 2
AHU-2.3	3	WEIGHT RM 202	AIR HANDLING & ROOFTOP UNITS	150*	1200	--	.5	--	970	--	1/2	74.0	63.2	53.9	53.0	36.0	26.1	14.0	5.5	4	– –	70	95.1	32.6	70	88.9	9.6	20	208	3	30	30	DISP.	.2"	1/ 22" X 20" X 1"	16.0/–	TRANE GAM5B0B036 OR APPROVED EQUAL	142	1 & 2

NOTES:
1. AIR HANDLING UNIT SHALL BE VERTICAL CONFIGURATION WITH ECM FAN MOTOR, ELECTRIC HEAT, AND SINGLE POINT POWER CONNECTION. ELECTRIC HEAT KW VALUE INDICATED IS THE INSTALLED KW @ 240 VOLTS, 208 VOLT OUTPUT 75% OF INSTALLED KW.
2. AIR HANDLING UNIT SHALL UTILIZE REFRIGERANT R-410A.

*OUTDOOR VENTILATION AIR PROVIDED FROM RTU-2.1

FAN SCHEDULE

UNIT NUMBER	PERFORMANCE DATA: CFM	SP	RPM	SONES	BHP	CONSTRUCTION DATA: FAN TYPE	CLASS	ROT	DISCH	MOTOR DATA: HP	WATTS	START TYPE	ELECTRICAL: VOLTS	PHASE	CYCLES	MANUFACTURER/MODEL	WEIGHT (LBS)	NOTES
EF-1.1	300	.50	1520	7.2	--	ROOF CENTRIFUGAL, DIRECT	– –	– –	– –	1/8	– –	– –	120	1	60	LOREN COOK ACED-90C15DM OR APPROVED EQUAL	28	1
EF-1.2	1200	.375	1272	9.8	--	ROOF CENTRIFUGAL, DIRECT	– –	– –	– –	1/4	– –	– –	120	1	60	LOREN COOK ACED-120C15D OR APPROVED EQUAL	72	1
EF-1.3	12,000	.50	615	--	2.54	IN-LINE CENTRIFUGAL, BELT	– –	– –	– –	3	– –	– –	208	3	60	LOREN COOK 330 SQN-B OR APPROVED EQUAL	500	2
EF-2.1	100	.25	685	3.2	--	ROOF CENTRIFUGAL, DIRECT	– –	– –	– –	1/25	– –	– –	120	1	60	LOREN COOK ACED-90C10DM OR APPROVED EQUAL	28	1
EF-2.2	300	.375	1426	9.1	--	ROOF CENTRIFUGAL, DIRECT	– –	– –	– –	1/8	– –	– –	120	1	60	LOREN COOK ACED-100C15DL OR APPROVED EQUAL	30	1

NOTES:
1. MANUFACTURER SHALL PROVIDE BACKDRAFT DAMPER, BIRDSCREEN, SOLID STATE VARIABLE SPEED CONTROLLER. PROVIDE MOTOR STARTER. INSTALL FAN ON EXISTING ROOF CURB, PROVIDE ADAPTER CURB AS REQUIRED.
2. MANUFACTURER TO PROVIDE BACKDRAFT DAMPER. PROVIDE MOTOR STARTER AND FURNISH (2) EXTRA SETS OF FAN BELTS.

HEAT PUMP UNIT SCHEDULE

UNIT NUMBER	NOMINAL CAPACITY TONS	COOLING CAPACITY BTU/HR AT ARI CONDITION	SEER/ EER	HEATING CAPACITY BTU/HR AT 47°F	HSPF /IEER	COMPRESSOR DATA: NO.	HP/KW	RLA	LRA	CONDENSER FAN: NO.	HP/KW	FLA	ELECTRICAL: MCA	FUSE	VOLTS	PHASE	CYCLE	MANUFACTURER/MODEL	WEIGHT LBS	NOTES
HP-1.1	3	36,000	16.0/–	34,000	9.0/–	1	———	16.7	82	1	1/8 HP	.74	22	35	208	1	60	TRANE 4TWR7036A1000A OR APPROVED EQUAL	236	1, 2 & 3
HP-1.2	3	36,000	16.0/–	34,000	9.0/–	1	———	16.7	82	1	1/8 HP	.74	22	35	208	1	60	TRANE 4TWR7036A1000A OR APPROVED EQUAL	236	1, 2 & 3
HP-1.3	5	55,000	15.0/–	54,000	8.5/–	1	———	28.8	152.9	1	1/4 HP	1.3	37	60	208	1	60	TRANE 4TWR7060A1000A OR APPROVED EQUAL	293	1, 2 & 3
HP-2.3	3	36,000	16.0/–	34,000	9.0/–	1	———	16.7	82	1	1/8 HP	.74	22	35	208	1	60	TRANE 4TWR7036A1000A OR APPROVED EQUAL	236	1, 2 & 3

NOTES:
1. HEAT PUMP UNIT SHALL HAVE 2 STAGE COMPRESSOR, PSC FAN MOTOR, AND LIQUID LINE FILTER/DRYER. PROVIDE THERMAL EXPANSION VALVE (TXV).
2. HEAT PUMP SHALL UTILIZE REFRIGERANT R-410A.

AIR GRILLE + REGISTER SCHEDULE

UNIT NUMBER	SERVICE	MOUNT	C.F.M. RANGE	SIZE L"xH"	N.C. MAX	FRAME	MAX. P.D. IN. W.G.	PATTERN	DAMPER	GRID	CONSTRUCTION	FINISH	MANUFACTURER/MODEL	NOTES
CG-1	RETURN	CLG	SEE DWG	24x24	24	LAY-IN	0.054	EGG CRATE	NO	1/2"	ALUMINUM	WHITE	TITUS 50F/PRICE 80 OR APPROVED EQUAL	1 & 2
CG-2	RETURN	CLG	SEE DWG	12X12	20	SURFACE	0.073	EGG CRATE	NO	1/2"	ALUMINUM	WHITE	TITUS 50F/PRICE 80 OR APPROVED EQUAL	1 & 2
SR-1	SUPPLY	WALL	SEE DWG	18X10	20	SURFACE	0.073	DOUBLE DEFLECTION	NO	--	ALUMINUM	WHITE	TITUS 350FS/PRICE 620 OR APPROVED EQUAL	1
SR-2	SUPPLY	WALL	SEE DWG	10X10	20	SURFACE	0.073	DOUBLE DEFLECTION	NO	--	ALUMINUM	WHITE	TITUS 350FS/PRICE 620 OR APPROVED EQUAL	1
ER-1	EXHAUST	CLG	SEE DWG	8X8	20	SURFACE	0.073	EGG CRATE	NO	1/2"	ALUMINUM	WHITE	TITUS 50F/PRICE 80 OR APPROVED EQUAL	1 & 2
ER-2	EXHAUST	CLG	SEE DWG	24X24	20	LAY-IN	0.073	EGG CRATE	NO	1/2"	ALUMINUM	WHITE	TITUS 50F/PRICE 80 OR APPROVED EQUAL	1 & 2
ER-3	EXHAUST	DUCT	1800	42X12	20	DUCT	0.073	EGG CRATE	NO	1/2"	ALUMINUM	WHITE	TITUS 50F/PRICE 80 OR APPROVED EQUAL	1

1. ALL GRILLES, REGISTERS AND DIFFUSERS SHALL HAVE A MAXIMUM FLAME SPREAD RATING OF 25 AND A MAXIMUM SMOKE DEVELOPED RATING OF 50 IN COMPLIANCE WITH SECTIONS 603.15 AND 603.15.1 OF THE 2010 FLORIDA BUILDING CODE.
2. PAINT FLAT BLACK INSIDE OF DUCTS BEHIND GRILLES WITH NON TOXIC PAINT.

DIFFUSER SCHEDULE

MARK	FRAME	MOUNT	DIFFUSER SIZE	NECK SIZE	C.F.M. RANGE	N.C. MAX	MAX. PD IN.W.G.	PATTERN	DAMPER	FINISH	SURFACE PANEL	CONSTRUCTION	MANUFACTURER/MODEL	NOTES
CD-1	LAY-IN	CEILING	24x24	SEE DWG.	SEE DWG.	25	0.13	4-WAY	NO	WHITE	24x24	ALUMINUM	TITUS TMSA-AA OR APPROVED EQUAL	1 & 2
CD-2	SURFACE	CEILING	12x12	SEE DWG.	SEE DWG.	25	0.13	4-WAY	NO	WHITE	--	ALUMINUM	TITUS TMSA-AA OR APPROVED EQUAL	1 & 2
CD-3	SURFACE	CEILING	6X6	SEE DWG.	SEE DWG.	25	0.13	4-WAY	NO	WHITE	--	ALUMINUM	TITUS TDCA-AA OR APPROVED EQUAL	1 & 2

REMARKS:
1. SEE ARCHITECTURAL CEILING PLAN FOR FRAME TYPE.
2. ALL DIFFUSERS AND REGISTERS SHALL HAVE A MINIMUM FLAME SPREAD RATING OF NOT OVER 25 AND A MINIMUM SMOKE DEVELOPED RATING OF NOT OVER 50 AND SHALL BE IN COMPLIANCE WITH SECTIONS 603.15 AND 603.15.1 OF THE FLORIDA BUILDING CODE, MECHANICAL.

EXHAUST HOOD SCHEDULE

HOOD QUANTITY	TAG	MODEL	LENGTH	WIDTH	MAX. COOKING TEMP.	EXHAUST PLENUM: TOTAL EXH. CFM	S.P.	DUCT OPENING: WIDTH	LENG.	DIA.	MUA CFM	HOOD CONSTRUCTION	HOOD CONFIG.: END TO END	ROW	FILTER(S): TYPE	QTY.	HEIGHT	LENGTH	LIGHT(S): QTY.	TYPE	WIRE GUARD	LOCATION	ELECTRICAL	SWITCHES: QUANTITY	FIRE SYSTEM PIPING	HOOD HANGING WEIGHT	NOTES
1	KH-1	QP136	36"	20 1/8"	600 Deg.	300	-0.1"	10"	3 ¼"	7"	– –	430 SS Where Exposed	LEFT	ALONE	ALUMINUM, ANTI MICROBIAL PROTECTION	1	12"	12"	4	MR 16L 35W/ GU10 BASE	NO	RIGHT & LEFT	120V, 2.3 AMPS	1 Light 1 Fan	YES, SEE NOTE 5	27 LBS	1, 2, 3, 4 & 5

1. EXHAUST HOOD SHALL BE AS MANUFACTURER BY BROAN-NU TONE OR APPROVED EQUAL.
2. HOOD FILTER SHALL BE REMOVABLE AND DISHWASHER -SAFE.
3. HOOD FAN SHALL BE 2 SPEED, 110 CFM MIN. & 300 CFM MAX.
4. CONTRACTOR TO PROVIDE (4) HALOGEN 35 WATT LIGHTS BY HOOD MANUFACTURER.
5. CONTRACTOR TO FIELD INSTALL FIRE SUPPRESSION SYSTEM, SEE HOOD DETAIL.

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ORANGE COUNTY FIRE STATION #31 HVAC REPLACEMENT

Revisions

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Key Plan

MPE PROJ#: 2013-177

Designed By: RR

Drawn By: RR

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Issue Date: 06/10/15

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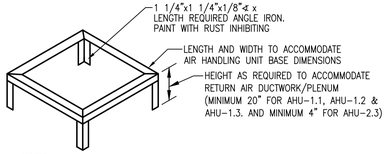
Drawing Title:

SCHEDULES
HVAC

BID DOCUMENTS

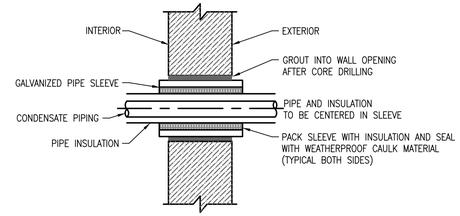
Drawing No.

M-3.1

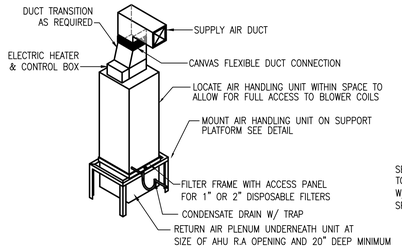


NOTES
1. ALL JOINTS OR SUPPORT BASE SHALL BE CONTINUOUSLY WELDED.
2. PAINT ENTIRE SUPPORT BASE WITH RUST INHIBITING PAINT AFTER ASSEMBLY.
3. PROVIDE 20 GAGE SHEET METAL AUXILIARY DRAIN PAN FOR AHU-2.3, UNDERNEATH SUPPORT STAND. PROVIDE FLOW SWITCH IN AUXILIARY DRAIN PAN TO SHUT-OFF AHU-2.3 SHOULD ANY WATER BUILD-UP IN DRAIN PAN.

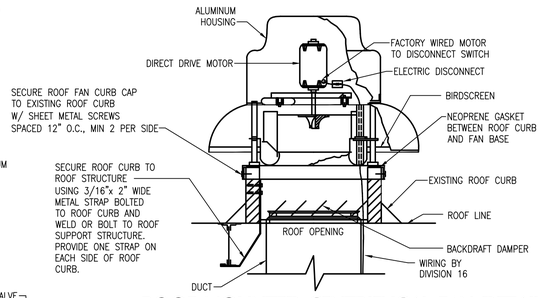
AHU SUPPORT BASE DETAIL
NOT TO SCALE



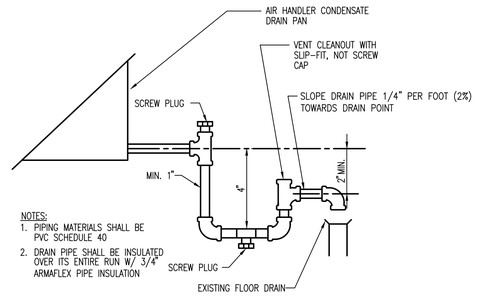
CONDENSATE PIPING EXTERIOR WALL PENETRATION DETAIL
NOT TO SCALE



VERTICAL AIR HANDLING UNIT MOUNTING DETAIL
NOT TO SCALE

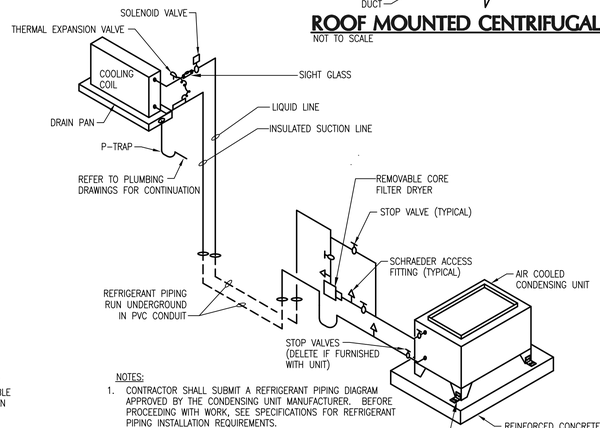


ROOF MOUNTED CENTRIFUGAL FAN DETAIL
NOT TO SCALE



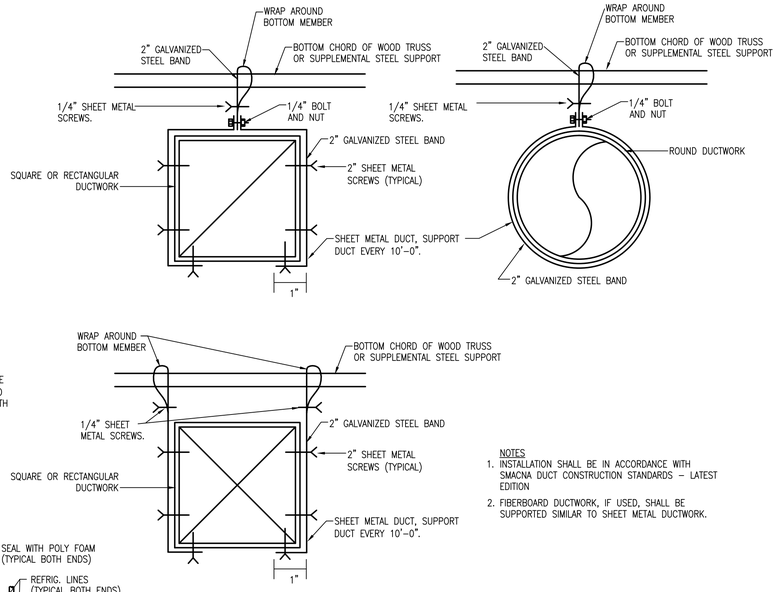
NOTES:
1. PIPING MATERIALS SHALL BE PVC SCHEDULE 40
2. DRAIN PIPE SHALL BE INSULATED OVER ITS ENTIRE RUN W/ 3/4" ARMAFLEX PIPE INSULATION

AIR HANDLING UNIT CONDENSATE TRAP DETAIL
NOT TO SCALE



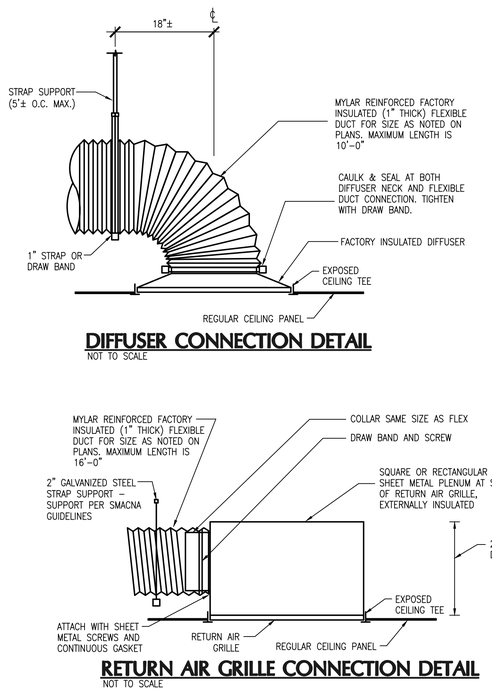
NOTES:
1. CONTRACTOR SHALL SUBMIT A REFRIGERANT PIPING DIAGRAM APPROVED BY THE CONDENSING UNIT MANUFACTURER. BEFORE PROCEEDING WITH WORK, SEE SPECIFICATIONS FOR REFRIGERANT PIPING INSTALLATION REQUIREMENTS.
2. DELETE ANY VALVES OR MATERIAL THAT IS FURNISHED WITH UNIT.
3. REFRIGERANT PIPING SHALL BE SIZED PER MANUFACTURER OPTIMUM PERFORMANCE RATING.
4. ALL PIPING CONNECTIONS TO EQUIPMENT AND ACCESSORIES SHALL BE SWEAT TYPE AND BRAZED OR SOLDERED ACCORDING TO SPECIFICATIONS.
5. DIAGRAM DOES NOT INDICATE HOT GAS REFRIGERANT LINES AND CONTROL VALVE. PROVIDE HOT GAS LINES AND TWO PAIR OF REFRIGERANT LINES FOR SYSTEMS REQUIRING THESE FEATURES.

REFRIGERANT PIPING DETAIL
NOT TO SCALE



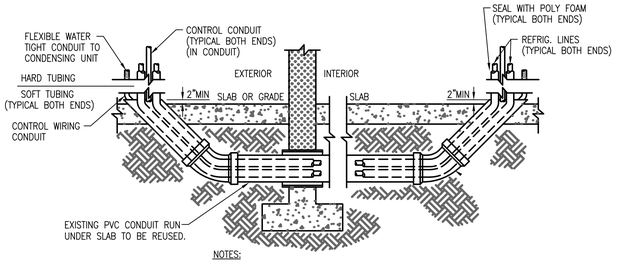
NOTES
1. INSTALLATION SHALL BE IN ACCORDANCE WITH SMACNA DUCT CONSTRUCTION STANDARDS – LATEST EDITION
2. FIBERBOARD DUCTWORK, IF USED, SHALL BE SUPPORTED SIMILAR TO SHEET METAL DUCTWORK.

SHEET METAL DUCT HANGING DETAIL
NOT TO SCALE



DIFFUSER CONNECTION DETAIL
NOT TO SCALE

RETURN AIR GRILLE CONNECTION DETAIL
NOT TO SCALE

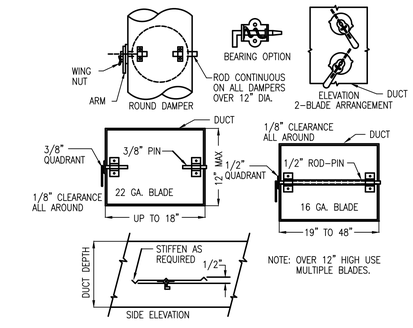


NOTES:
1. ALL EXPOSED PIPING TO OUTSIDE SHALL BE WRAPPED WITH AN ALUMINUM JACKET OVER PIPE INSUALTION.

PIPE CHASE SIZES

SUCTION PIPE SIZE	PVC REFRIGERANT PIPE CHASE SIZE
5/8" TO 1 5/8"	4"
1 7/8" TO 2 5/8"	6"
3 1/8" TO 4 1/8"	8"

REFRIGERANT PIPING CONDUIT DETAIL
NOT TO SCALE



VOLUME DAMPERS-SINGLE BLADE TYPE
NOT TO SCALE

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

ORANGE COUNTY FIRE STATION #31 HVAC REPLACEMENT

Revisions

No.	Date	Description

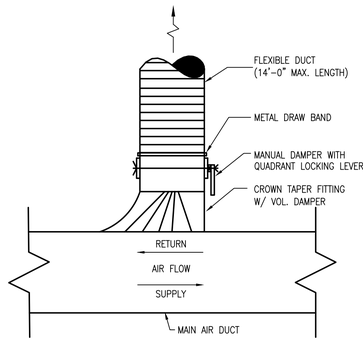
Key Plan

MPE PROJ#: 2013-177
Designed By: RR
Drawn By: RR
Checked By: ABJr
Issue Date: 06/10/15
Drawing Scale: NO SCALE

Drawing Title:
DETAILS HVAC

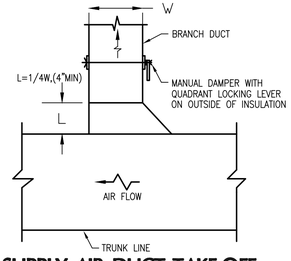
BID DOCUMENTS

Drawing No.
M-4.1



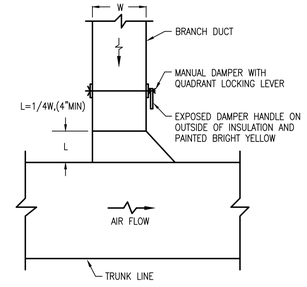
TYPICAL FLEXIBLE DUCT CONNECTION DETAIL - SUPPLY & RETURN

NOT TO SCALE



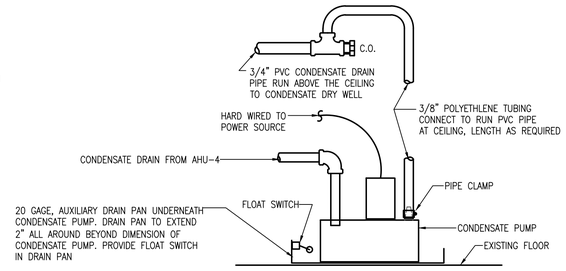
SUPPLY AIR DUCT TAKE-OFF INSTALLATION DETAIL

NOT TO SCALE



TYPICAL RETURN OR EXHAUST DUCT CONNECTION DETAIL

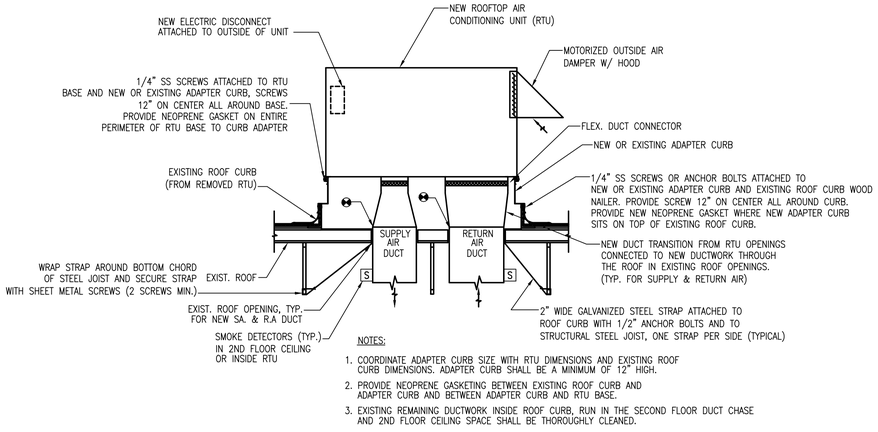
NOT TO SCALE



NOTE: FLOAT SWITCH IN DRAIN PAN UPON ACTIVATION SHALL DE-ACTIVATE AIR HANDLING EQUIPMENT ASSOCIATED WITH THE CONDENSATE PUMP.

CONDENSATE PUMP DETAIL

NOT TO SCALE

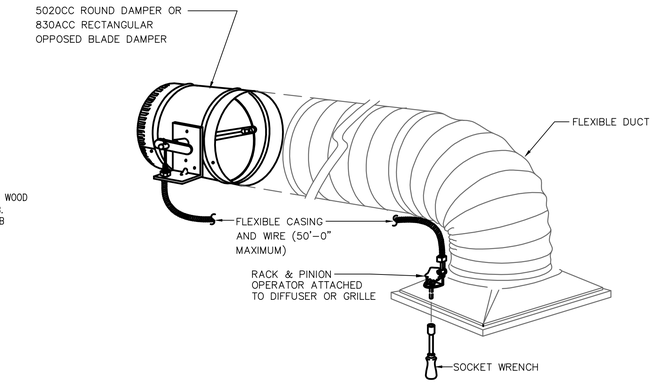


NOTES:

1. COORDINATE ADAPTER CURB SIZE WITH RTU DIMENSIONS AND EXISTING ROOF CURB DIMENSIONS. ADAPTER CURB SHALL BE A MINIMUM OF 12" HIGH.
2. PROVIDE NEOPRENE GASKETING BETWEEN EXISTING ROOF CURB AND ADAPTER CURB AND BETWEEN ADAPTER CURB AND RTU BASE.
3. EXISTING REMAINING DUCTWORK INSIDE ROOF CURB, RUN IN THE SECOND FLOOR DUCT CHASE AND 2ND FLOOR CEILING SPACE SHALL BE THOROUGHLY CLEANED.

ROOFTOP UNIT MOUNTING DETAIL WITH ADAPTER CURB (REPLACEMENT)

NOT TO SCALE

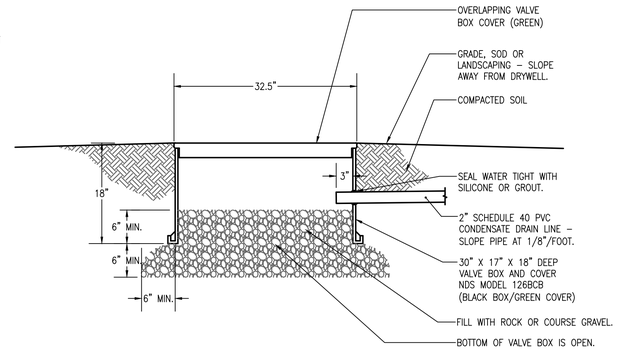


NOTES:

1) COORDINATE EXACT LOCATION OF CEILING MOUNTED CONCEALED REGULATOR WITH DIFFUSER OR GRILLE FACE. CONTROL SHAFT TO BE ACCESSIBLE THROUGH FACE OF DIFFUSER OR GRILLE.
2) CABLE SHALL CONSIST OF BOWDEN CABLE 0.054" STAINLESS STEEL CONTROL WIRE ENCAPSULATED IN 1/16" FLEXIBLE GALVANIZED SPIRAL WIRE SHEATH.
3) LOCKING RACK AND PINION GEAR DRIVE SHALL BE CONSTRUCTED OF 14 GAUGE STEEL AND SHALL BE USED TO CONVERT ROTARY MOTION INTO PUSH-PULL MOTION.
4) CONTROL SHAFT SHALL BE "D"-STYLE FLATTENED 1/4" DIAMETER WITH 265° ROTATION PROVIDING 1-1/2" LINEAR TRAVEL CAPABILITY.

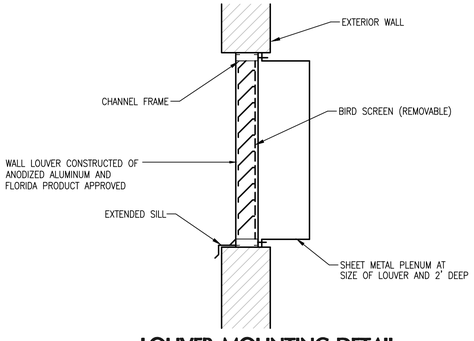
REMOTE VOLUME DAMPER DETAIL

NOT TO SCALE



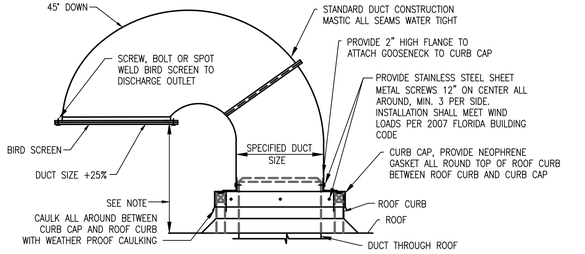
CONDENSATE DRYWELL DETAIL

NOT TO SCALE



LOUVER MOUNTING DETAIL

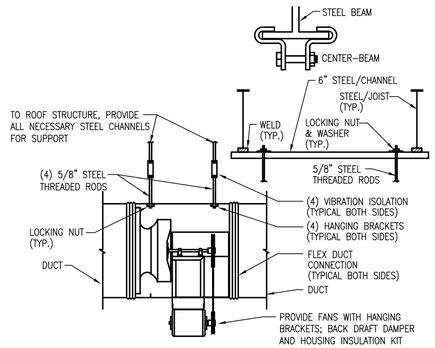
NOT TO SCALE



NOTE: GOOSENECK INLET HEIGHT SHALL BE A MINIMUM OF 10 FEET AWAY FROM EXISTING PLUMBING VTR NEAR GOOSENECK ROOF CURB.

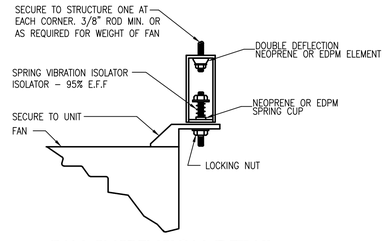
GOOSENECK DETAIL

NOT TO SCALE



INLINE FAN HANGING DETAIL

NOT TO SCALE



FAN SUSPENSION DETAIL

NOT TO SCALE

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Revisions

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Key Plan

MPE PROJ#: 2013-177

Designed By: RR

Drawn By: RR

Checked By: ABJr

Issue Date: 06/10/15

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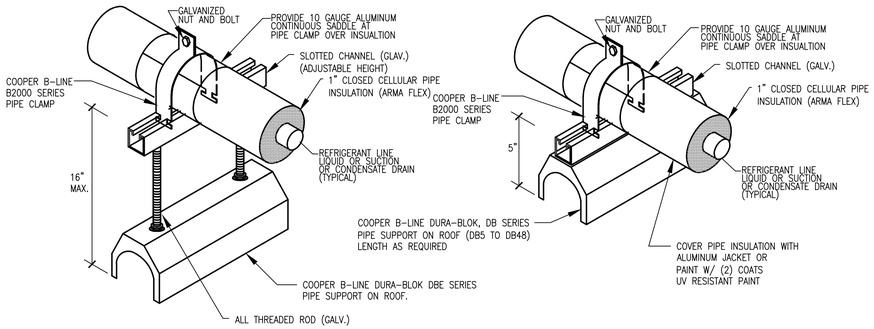
Drawing Title:

DETAILS II
HVAC

BID DOCUMENTS

Drawing No.

M-4.2

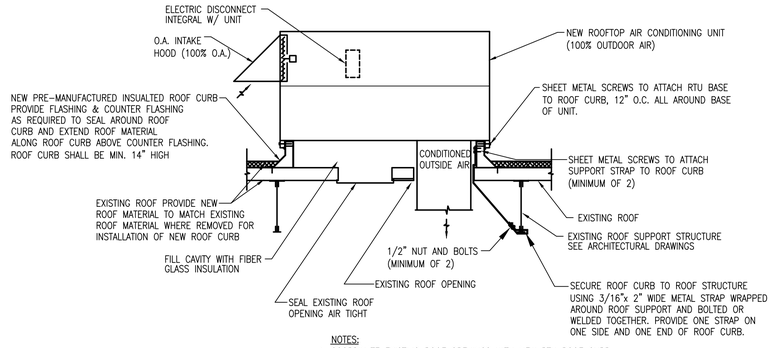


NOTES:

1. CONDENSING UNIT CONTROL CONDUIT CAN ALSO BE ATTACHED TO UNISTRUT/CHANNEL.
2. PROVIDE REFRIGERANT PIPE SUPPORT SPACE IN COMPLIANCE WITH 2010 FBCM SECTION 305, TABLE 305.4.
3. FOR PVC CONDENSATE DRAIN PIPING PROVIDE COOPER B-LINE DBE10-12 PIPE SUPPORT. SPACING OF PIPE SUPPORT SHALL COMPLY 2010 FBCM SECTION 305, TABLE 305.4. SLOPE CONDENSATE DRAIN TOWARDS ROOF DRAIN, 1% MINIMUM.

REFRIGERANT PIPE OR CONDENSATE DRAIN SUPPORT DETAIL

NOT TO SCALE

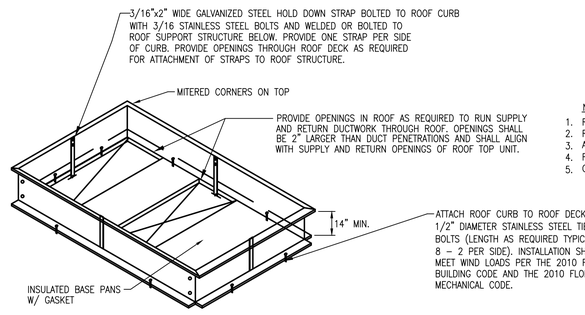


NOTES:

1. COORDINATE EXISTING ROOF OPENINGS WITH NEW RTU ROOF CURB.

100% OUTDOOR AIR ROOF TOP UNIT MOUNTING DETAIL

NOT TO SCALE



NOTES:

1. REFER TO MANUFACTURERS CERTIFIED DRAWINGS FOR DIMENSIONS.
2. ROOF CURB SHALL BE INSTALLED PER MANUFACTURERS DATA.
3. ALL CURBS SHALL BE INSULATED DOUBLE WALL.
4. FOR FLASHING SEE ARCHITECTURAL DRAWINGS.
5. CONSTRUCTION SHALL BE GALVANIZED STEEL WITH STAINLESS STEEL BOLTS/NUTS.

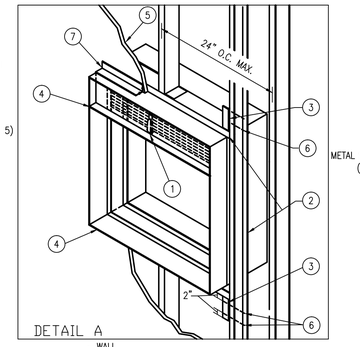
ROOF MOUNTING CURB DETAIL

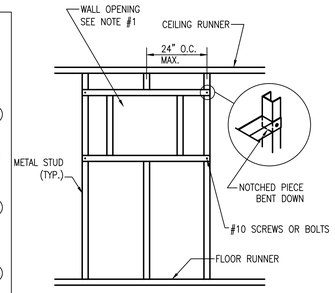
NOT TO SCALE

ITEM	DESCRIPTION
1.	DIBD20 DYNAMIC FIRE DAMPER (1 1/2 HR.)
2.	MINIMUM 25 GUAGE (.52) STEEL STUD AT EACH CORNER OF OPENING
3.	STEEL STUD, 12" LONG, AT EACH CORNER. FOR OPENINGS LARGER THAN 36" W x 36" H PROVIDE DOUBLE VERTICAL RUNNERS.
4.	DUCT CONNECTION AT SLEEVE (BREAKAWAY)
5.	GYPSUM WALLBOARD
6.	SCREW (SEE NOTE 2)
7	MOUNTING ANGLE (TOP & BOTTOM, SEE NOTE 5)

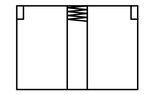
NOTES:

1. WALL OPENING SHALL BE 1/4" TO 1" LARGER THAN DAMPER/SLEEVE OPENING WHEN USED WITH ANGLE SUPPORTS.
2. FASTEN ANGLES & DAMPER TO SLEEVE WITH NO. 10 BOLTS OR SCREWS, 5/16 RIVETS, OR TACK WELDS 12" ON CENTER
3. DAMPER SLEEVE THICKNESS SHALL BE EQUAL TO OR GREATER THAN DUCT CONNECTED TO IT AND SHALL COMPLY WITH NFPA 90A TABLE 5.4.6.3.1 MINIMUM SLEEVE THICKNESS
4. USE "AIR FLOW" AND "MOUNT WITH ARROW UP" LABELS ON DYNAMIC DIBD MODELS FOR PROPER DAMPER ORIENTATION.
5. MOUNTING ANGLES SHALL BE A MINIMUM OF 1 1/2"x 1 1/2" x 20 GAUGE STEEL.





ALTERNATE FRAMING



SLEEVE LENGTH

DIBD20	12" (305)

FIGURE 1

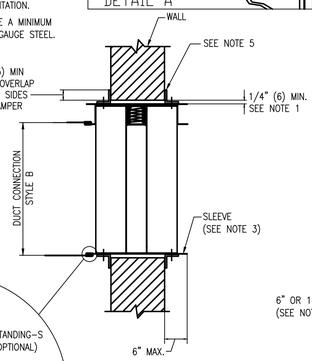


FIGURE 2 (VERTICAL)

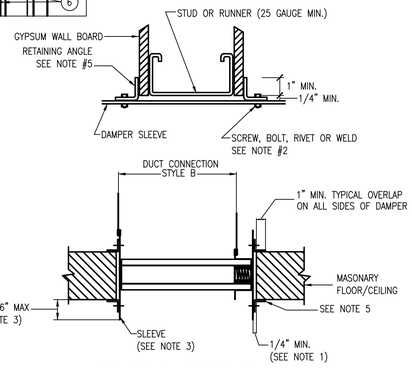
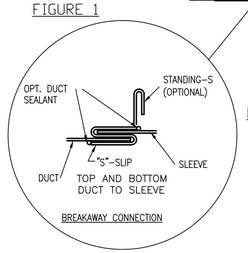


FIGURE 3 (HORIZONTAL)

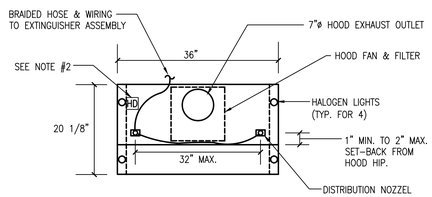


ACCESS DOOR SCHEDULE		
DUCT SIZE	DUCT ACCESS DOOR SIZE	CEILING ACCESS DOOR SIZE
8" TO 10"	6"x12"	24"x24"
12" TO 16"	10"x12"	24"x24"
18" TO 20"	12"x12"	24"x24"
22" AND OVER	18"x18"	24"x24"

NOTE: INFORMATION FROM RUSKIN.COM FIRE & SMOKE DAMPERS

FIRE DAMPER DETAIL

NOT TO SCALE

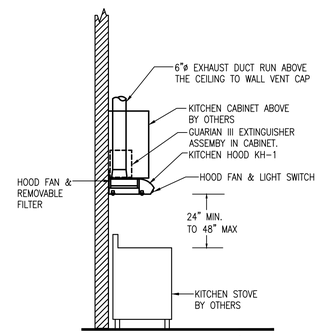


NOTES:

1. INSTALL KITCHEN EXHAUST HOOD UNDERNEATH KITCHEN CABINETRY AS RECOMMENDED BY HOOD MANUFACTURER.
2. PROVIDE HEAT DETECTOR INSIDE HOOD TO ACTIVATE HOOD EXHAUST FAN SHOULD COOKING EQUIPMENT UNDER HOOD BE LEFT ON.
3. CONTRACTOR TO FIELD INSTALL HOOD FIRE PROTECTION SYSTEM. HOOD FIRE PROTECTION SYSTEM SHALL BE GUARDIAN III MODEL G300-B AS MANUFACTURER GUARDIAN SAFETY SOLUTIONS INTERNATIONAL (GSSI) OR APPOVED EQUAL. INSTALL HOOD FIRE PROTECTION SYSTEM PER MANUFACTURERS WRITTEN INSTRUCTIONS.

KITCHEN EXHAUST HOOD DETAIL

NOT TO SCALE



EXHAUST HOOD (SIDE VIEW)

NOT TO SCALE

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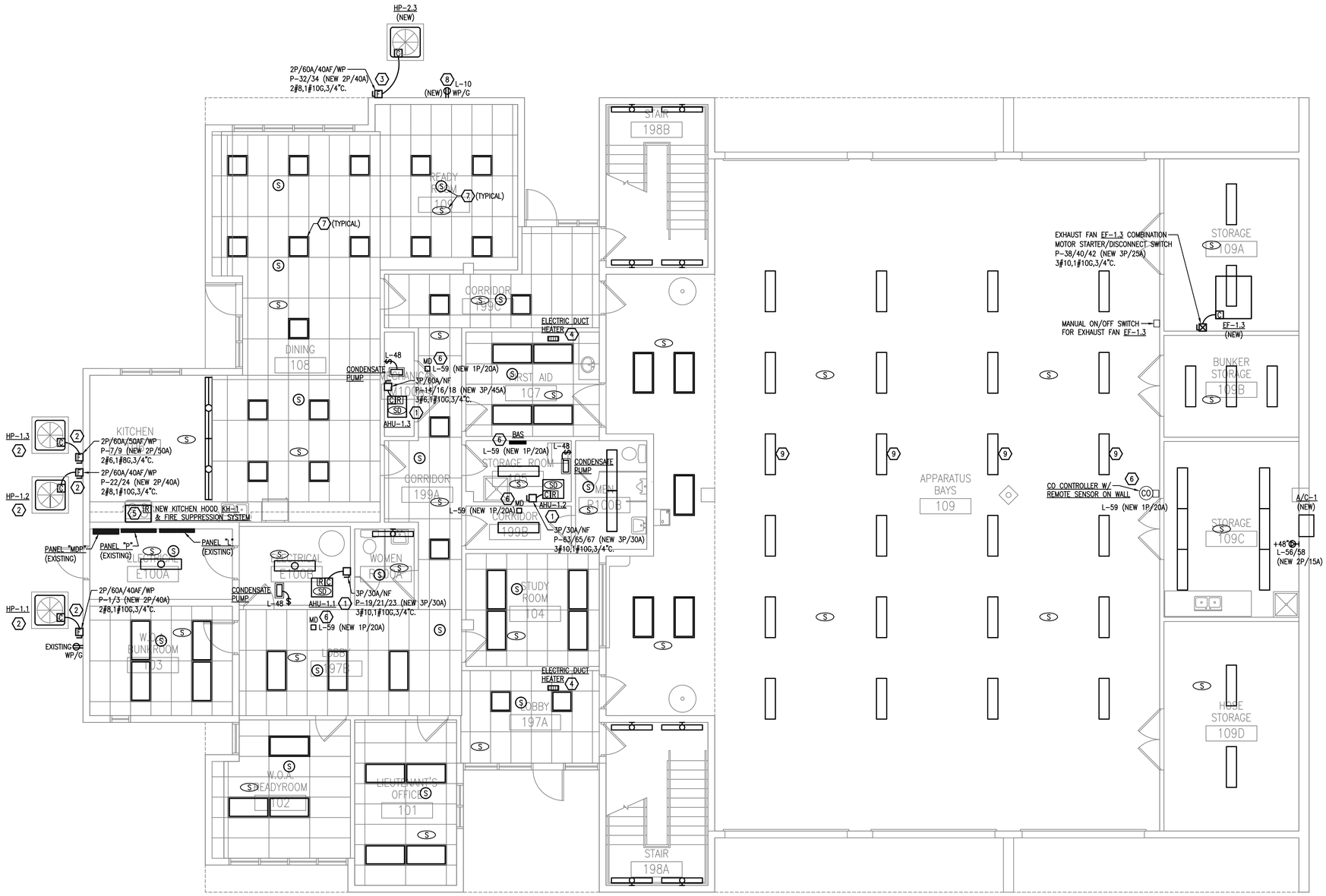
DETAILS III
HVAC

BID DOCUMENTS

Drawing No.

M-4.3



N

FIRST FLOOR PLAN - ELECTRICAL

SCALE: 3/16"=1'-0"

DEMOLITION AND RENOVATION KEY NOTES

1. AIR HANDLING UNIT IS TO BE REPLACED. DISCONNECT POWER FROM EXISTING AHU AND REMOVE DISCONNECT SWITCH, CONDUIT, WIRING AND ASSOCIATED EQUIPMENT (CONDUIT MAY BE REUSED IF CORRECT SIZE AND IN GOOD CONDITION). PROVIDE POWER FOR NEW AHU AS SHOWN ON PLAN AND PER INFORMATION ON NAMEPLATE OF NEW AHU. MAKE ALL CONNECTIONS TO AHU ACCORDING TO MANUFACTURER'S INSTRUCTIONS.
   PANEL AND CIRCUIT NUMBER WERE OBTAINED FROM FIELD INVESTIGATION AND MUST BE VERIFIED FOR ACCURACY BY CONTRACTOR AND ADJUSTED FOR ACTUAL FIELD CONDITION IF NECESSARY. UPDATE PANEL DIRECTORY WITH A LEGIBLE DESCRIPTION OF ACTUAL LOAD.
2. HEAT PUMP UNIT IS TO BE REPLACED. DISCONNECT POWER FROM EXISTING HEAT PUMP UNIT AND REMOVE DISCONNECT SWITCH, CONDUIT, WIRING AND ASSOCIATED EQUIPMENT (CONDUIT MAY BE REUSED IF CORRECT SIZE AND IN GOOD CONDITION). PROVIDE POWER FOR NEW HEAT PUMP UNIT AS SHOWN ON PLAN AND PER INFORMATION ON NAMEPLATE OF UNIT. MAKE ALL CONNECTIONS TO HEAT PUMP UNIT ACCORDING TO MANUFACTURER'S INSTRUCTIONS.
   PANEL AND CIRCUIT NUMBER WERE OBTAINED FROM FIELD INVESTIGATION AND MUST BE VERIFIED FOR ACCURACY BY CONTRACTOR AND ADJUSTED FOR ACTUAL FIELD CONDITION IF NECESSARY. UPDATE PANEL DIRECTORY WITH A LEGIBLE DESCRIPTION OF ACTUAL LOAD.
3. PROVIDE POWER FOR NEW HEAT PUMP UNIT AS SHOWN ON PLAN AND PER INFORMATION ON NAMEPLATE OF UNIT. MAKE ALL CONNECTIONS TO HEAT PUMP UNIT ACCORDING TO MANUFACTURER'S INSTRUCTIONS.
   PANEL AND CIRCUIT NUMBER WERE OBTAINED FROM FIELD INVESTIGATION AND MUST BE VERIFIED FOR ACCURACY BY CONTRACTOR AND ADJUSTED FOR ACTUAL FIELD CONDITION IF NECESSARY. UPDATE PANEL DIRECTORY WITH A LEGIBLE DESCRIPTION OF ACTUAL LOAD.
4. DISCONNECT AND REMOVE CONDUIT AND WIRING FROM ELECTRIC DUCT HEATER TO BE DELETED.
5. EXISTING KITCHEN HOOD IS TO BE REPLACED WITH NEW HOOD AND FIRE SUPPRESSION SYSTEM. REUSE EXISTING KITCHEN HOOD CIRCUIT TO PROVIDE POWER FOR NEW EQUIPMENT. PROVIDE CONNECTION FROM FIRE SUPPRESSION SYSTEM TO FIRE ALARM CONTROL PANEL AND MAKE ALL CONNECTIONS PER SYSTEM MANUFACTURER'S INSTRUCTIONS.
6. PROVIDE POWER FOR NEW BUILDING AUTOMATION SYSTEM (BAS) CONTROL PANEL, MOTORIZED DAMPERS AND CARBON MONOXIDE CONTROL PANEL AS REQUIRED.
7. CONTRACTOR SHALL REMOVE AND REINSTALL ANY LIGHTING FIXTURES, SPEAKERS, FIRE ALARM DEVICES, ETC. THAT MAY INTERFERE WITH THE INSTALLATION OF NEW MECHANICAL EQUIPMENT AND DUCT WORK. COORDINATE WITH MECHANICAL CONTRACTOR. CONTRACTOR SHALL REPLACE ANY EQUIPMENT DAMAGED DURING CONSTRUCTION.
8. CONNECT RECEPTACLE TO NEAREST 120V EXTERIOR RECEPTACLE CIRCUIT. VERIFY CIRCUIT NUMBER.
9. SHIFT LIGHT FIXTURE APPROXIMATELY 12"-24" TO THE NORTH AS NECESSARY TO ACCOMMODATE NEW EXHAUST DUCTWORK IN APPARATUS BAY ADJACENT TO I-BEAM, FIELD COORDINATE.

SYMBOL LIST

- 2X2 FLUORESCENT FIXTURE
- 2X4 FLUORESCENT FIXTURE
- 1X4 FLUORESCENT FIXTURE
- RECESSED DOWNLIGHT
- DISCONNECT SWITCH, "F" INDICATES FUSED
- MANUAL MOTOR STARTER
- CONNECTION TO EQUIPMENT
- DISTRIBUTION PANEL
- CEILING MOUNTED SPEAKER
- CEILING MOUNTED SMOKE DETECTOR
- DUCT MOUNTED SMOKE DETECTOR
- MOTOR RATED DISCONNECT SWITCH
- FIRE ALARM SHUTDOWN RELAY
- CEILING MOUNTED FIRE ALARM DEVICE
- WP/G DUPLEX RECEPTACLE, WP/G INDICATES GFCI RECEPTACLE WITH WEATHERPROOF-IN-USE COVER
- CEILING FAN

GENERAL NOTES

1. PROVIDE PROPER NUMBER OF WIRES IN EACH CONDUIT AS REQUIRED BY INDICATED CIRCUITRY AND SWITCHING.
2. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT (ADA) AND 2008 NATIONAL ELECTRICAL CODE (NEC).
3. COORDINATE ALL WORK DONE UNDER THIS DIVISION WITH WORK TO BE PERFORMED UNDER DIVISION 15.
4. COORDINATE WITH OTHER TRADES FOR EXACT LOCATIONS OF ALL MOTORS AND OTHER EQUIPMENT TO BE INSTALLED AND/OR WIRED UNDER THIS DIVISION BUT FURNISHED UNDER ANOTHER DIVISION.
5. TYPE AC CABLE AND ELECTRICAL NON-METALLIC TUBING SHALL NOT BE PERMITTED. TYPE MC CABLE IS PERMITTED AS LONG AS IT IS ACCEPTABLE TO THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ).
6. ALL CONDUITS ABOVE SLAB, WHETHER EXPOSED OR CONCEALED, SHALL BE EMT, IMC, OR RIGID GALVANIZED STEEL.
7. ALL BOXES, PLASTER RINGS, EXTENSION RINGS AND BOX COVERS SHALL BE METAL.
8. ALL CONDUITS SHALL BE PARALLEL AND PERPENDICULAR TO STRUCTURAL MEMBERS.
9. ALL BENDS SHALL BE MADE IN CONDUIT USING PROPER EQUIPMENT AND MEET NATIONAL ELECTRICAL CODE (NEC) REQUIREMENTS.
10. ALL WIRE, INCLUDING BUT NOT LIMITED TO FEEDERS AND BRANCH CIRCUIT WIRING, SHALL BE COPPER – #12 AWG THWN MINIMUM.
11. ALL DEVICES SHALL BE COMMERCIAL OR SPECIFICATION GRADE.
12. ALL ELECTRICAL EQUIPMENT SHALL BE UL LISTED.
13. A GREEN INSULATED COPPER GROUND CONDUCTOR SHALL BE INSTALLED IN ALL RACEWAYS, SIZED PER REQUIREMENTS OF N.E.C..
14. GROUNDING SYSTEM SHALL BE IN ACCORDANCE WITH NEC ARTICLE 250 AND APPLICABLE REQUIREMENTS OF IEEE STANDARDS 142 AND 241.
15. CONDUCTORS ARE SIZED FOR VOLTAGE DROP PER N.E.C. ARTICLE 210.19(A)(1) FPN No. 4 AND THE 2010 F.B.C. ENERGY CONSERVATION CODE 505.7.3.1&2. ELECTRICAL CONTRACTOR SHALL PERFORM VOLTAGE DROP CALCULATIONS IN ACCORDANCE WITH N.E.C. ARTICLE 210.19 (A)(1) FPN No. 4 AND THE 2010 F.B.C. ENERGY CONSERVATION CODE 505.7.3.1&2 ON ANY CIRCUITS THAT ARE INSTALLED THAT DIFFER FROM THE DESIGN SHOWN IN THESE PLANS. FEEDER CONDUCTORS SHALL BE SIZED FOR A MAXIMUM VOLTAGE DROP OF 2% AND BRANCH CIRCUIT CONDUCTORS 3% AT DESIGN LOAD.
16. LIGHT FIXTURES SUPPORTED BY CEILING GRID SHALL BE SUPPORTED AS PER FIELD TECHNICAL INFORMATION NO.40. LIGHT FIXTURES WEIGHING LESS THAN 10 POUNDS SHALL HAVE ONE 12 GAGE HANGER WIRE CONNECTED FROM THE FIXTURE TO THE STRUCTURE ABOVE. LIGHT FIXTURES WEIGHING MORE THAN 10 POUNDS SHALL HAVE TWO 12 GAGE WIRES ATTACHED AT OPPOSING CORNERS OF EACH LIGHT FIXTURE.

EXISTING CONDITIONS NOTES

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

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

ORANGE COUNTY FIRE STATION #31 HVAC REPLACEMENT

Revisions

No.	Date	Description

Key Plan

MPE PROJ#: 2013-177

Designed By: WMC

Drawn By: WMC

Checked By: ABJr

Issue Date: 06/10/15

Drawing Scale: 3/16" = 1'-0"

Drawing Title:

FIRST FLOOR PLAN ELECTRICAL

BID DOCUMENTS

Drawing No.

E-1.1

PANEL IS EXISTING TO BE REUSED. ADD NEW CIRCUIT BREAKERS AS REQUIRED TO MATCH PANEL SCHEDULE.

PANEL LOCATION: ELECTRICAL ROOM E100A | PANEL DESIGNATION: P | VOLTAGE: 120/208V,3ø,4W | AIC RATING: EXISTING
PANEL FED FROM: 400A CIRCUIT BREAKER IN MDP | PANELBOARD RATING: 400A | MANUFACTURER: SQUARE D | MOUNTING: SURFACE
MAINS: MAIN LUGS ONLY | STYLE: NQO | NEMA TYPE: 1

LOAD DESCRIPTION	WATTS PER PHASE PH A	PH B	PH C	BKR	POLE	CKT	CKT	POLE	BKR	WATTS PER PHASE PH A	PH B	PH C	LOAD DESCRIPTION
HP-1.1 (NEW)	2205			40	2	1	2	3	25	X			SPARE (EXISTING)
–		2205		–	–	3	4	–	–		X		–
SPACE (NEW)			X	X	X	5	6	–	–			X	–
HP-1.3 (NEW)	3151			50	2	7	8	3	40	X			SPARE (NEW)
–		3151		–	–	9	10	–	–		X		–
SPACE (NEW)			X	X	X	11	12	–	–			X	–
SPARE (EXISTING)	X			50	2	13	14	3	45	5278			AHU-1.3 (NEW)
–		X		–	–	15	16	–	–		5278		–
SPACE (EXISTING)			X	X	X	17	18	–	–			5278	–
AHU-1.1 (NEW)	3359			30	3	19	20	1	20	X			SHUNT TRIP (EXISTING)
–		3359		–	–	21	22	2	40		2205		HP-1.2 (NEW)
–			3359	–	–	23	24	–	–			2205	–
SPARE (NEW)	X			70	3	25	26	3	25	X			SPARE (EXISTING)
–		X		–	–	27	28	–	–		X		–
–			X	–	–	29	30	–	–			X	–
SPACE (EXISTING)	X			X	X	31	32	2	40	2205			HP-2.3 (NEW)
SPACE (EXISTING)		X		X	X	33	34	–	–		2205		–
SPACE (EXISTING)			X	X	X	35	36	X	X			X	SPACE (EXISTING)
SPACE (EXISTING)	X			X	X	37	38	3	25	1319			EF-1.3 (NEW)
SPACE (EXISTING)		X		X	X	39	40	–	–		1319		–
SPACE (EXISTING)			X	X	X	41	42	–	–			1319	–
SPACE (EXISTING)	X			X	X	43	44	X	X	X			SPACE (EXISTING)
SPARE (NEW)		X		15	3	45	46	3	20		840		COMPRESSOR (EXISTING)
–			X	–	–	47	48	–	–			840	–
–	X			–	–	49	50	–	–	840			–
WATER HEATER (EXISTING)		5000		60	3	51	52	3	60		5000		SOUTH BAY HEATER (EXISTING)
–			5000	–	–	53	54	–	–			5000	–
–	5000			–	–	55	56	–	–	5000			–
NORTH BAY HEATER (EXISTING)		5000		60	3	57	58	2	20		1248		SPECIAL RECEPTACLE (EXISTING)
–			5000	–	–	59	60	–	–			1248	–
–	5000			–	–	61	62	1	20	180			ROOF RECEPTACLE (EXISTING)
AHU-1.2 (NEW)		3359		30	3	63	64	1	20		1440		SHORE LINE (EXISTING)
–			3359	–	–	65	66	1	20			1440	SHORE LINE (EXISTING)
–	3359			–	–	67	68	1	20	1440			SHORE LINE (EXISTING)
AHU-2.3 (NEW)		3359		30	3	69	70	1	20		1440		SHORE LINE (EXISTING)
–			3359	–	–	71	72	1	20			1440	SHORE LINE (EXISTING)
–	3359			–	–	73	74	1	30	2400			UNKNOWN (EXISTING)
SPACE (EXISTING)		X		X	X	75	76	X	X		X		SPACE (EXISTING)
SPACE (EXISTING)			X	X	X	77	78	X	X			X	SPACE (EXISTING)
SPACE (EXISTING)	X			X	X	79	80	X	X	X			SPACE (EXISTING)
SPACE (EXISTING)		X		X	X	81	82	X	X		X		SPACE (EXISTING)
SPACE (EXISTING)			X	X	X	83	84	X	X			X	SPACE (EXISTING)
PANELBOARD SUB-TOTALS	25433	25433	20077							18662	20975	18770	PANELBOARD SUB-TOTALS

LOAD CALCULATIONS:	CONNECTED LOAD (WATTS)	DEMAND FACTOR	ESTIMATED DEMAND LOAD (WATTS)	NOTES:
LIGHTING	X	1.25	X	
RECEPTACLES (FIRST 10 KW)	180	1.00	180	
RECEPTACLES (REMAINDER)	X	0.50	X	
HVAC (WORST CASE)	99554	1.00	99554	
WATER HEATING	15000	1.00	15000	
KITCHEN	X	0.65	X	
MISCELLANEOUS	14616	1.00	14616	
PANELBOARD TOTALS:	129350W (359A)		129350W (359A)	

PANEL IS EXISTING TO BE REUSED. ADD NEW CIRCUIT BREAKERS TO MATCH PANEL SCHEDULE.

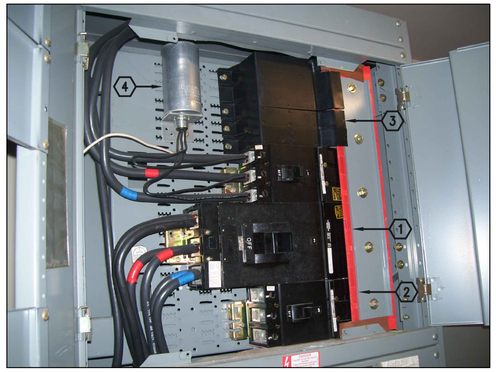
PANEL LOCATION: ELECT. RM. E100A | PANEL DESIGNATION: MDP | VOLTAGE: 120/208V,3ø,4W | AIC RATING: EXISTING
PANEL FED FROM: UTILITY TRANSFORMER | PANELBOARD RATING: 600A | MANUFACTURER: SQUARE D | MOUNTING: SURFACE
MAINS: 600A M.C.B. | STYLE: MA I-LINE | NEMA TYPE: 1

LOAD DESCRIPTION	WATTS PER PHASE PH A	PH B	PH C	POLE	BKR	CKT
SPACE	X			X	X	1
SPACE		X		X	X	2
SPACE			X	X	X	3
RTU-2.1 (NEW)	5998			3	70	4
–		5998		–	–	5
–			5998	–	–	6
PANEL "E" (EXISTING)	17993			3	200	7
–		17993		–	–	8
–			17993	–	–	9
PANEL "P" (EXISTING – INSTALL NEW CIRCUIT BREAKER)	44095			3	400	10
–		46408		–	–	11
–			38847	–	–	12
RTU-2.2 (NEW)	9980			3	90	13
–		9980		–	–	14
–			9980	–	–	15
PANELBOARD SUB-TOTALS	78066	80379	72818			

LOAD CALCULATIONS:	CONNECTED LOAD (WATTS)	DEMAND FACTOR	ESTIMATED DEMAND LOAD (WATTS)
LIGHTING	X	1.25	X
RECEPTACLES (FIRST 10 KW)	X	1.00	X
RECEPTACLES (REMAINDER)	X	0.50	X
HVAC (HEATING)	X	1.00	X
HVAC (COOLING)	X	1.00	X
WATER HEATING	X	1.00	X
KITCHEN	X	0.70	X
MISCELLANEOUS	X	1.00	X
PANELBOARD TOTALS:	231263W (643A)		SEE MDP NOTE 1

MDP NOTES

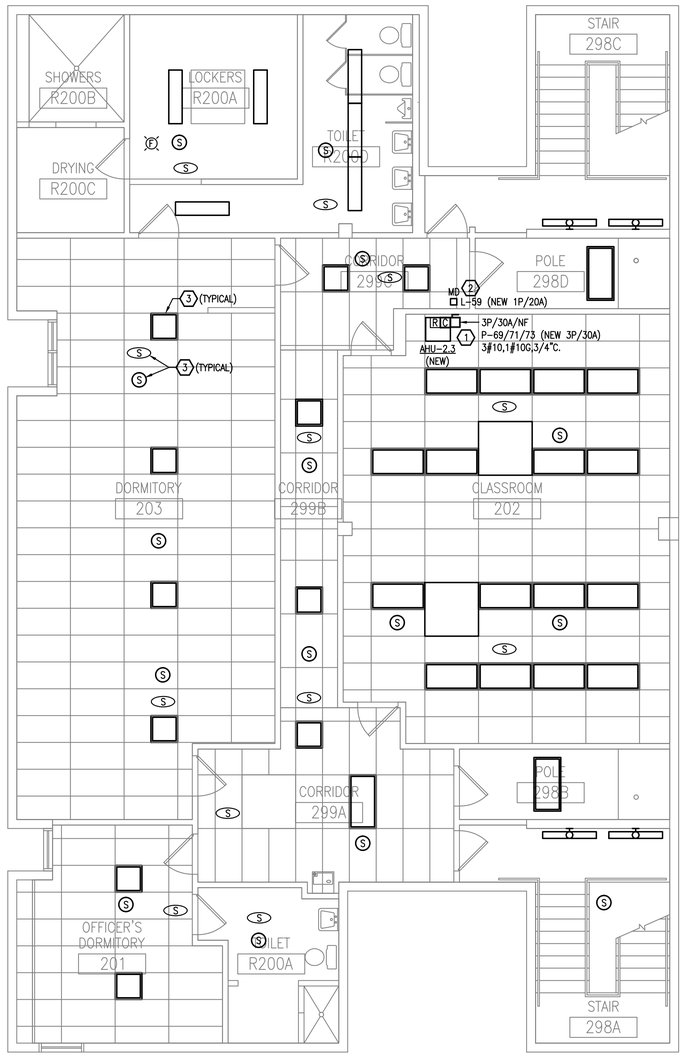
1. BASED ON UTILITY RECORDS, THE MAXIMUM ELECTRICAL DEMAND FOR THIS PANEL FOR A TWELVE MONTH PERIOD HAS BEEN 45KW ON 11/13. THE CALCULATED LOAD TO BE ADDED FROM THE HVAC RENOVATION IS 34.7KW. BASED ON NEC 220.87, THE MAXIMUM DEMAND LOAD OF 45KW X 125% PLUS THE ADDED LOAD OF 34.7KW EQUALS A NEW DEMAND LOAD OF 91KW OR 253 AMPS.



EXISTING MDP DISTRIBUTION SECTION

MDP KEY NOTES

1. REPLACE THE 3P/300A CIRCUIT BREAKER FEEDING PANEL "P" WITH A NEW 3P/400A CIRCUIT BREAKER. VERIFY AIC RATING MATCHES EXISTING AND INCREASE FEEDER EQUIPMENT GROUNDING CONDUCTOR TO #3 AWG IF DIFFERENT SIZE. EXISTING FEEDER CONDUCTORS TO REMAIN ARE (2)#3/0 PER PHASE.
2. REPLACE THE SPARE 3P/150A CIRCUIT BREAKER WITH A NEW 3P/90A CIRCUIT BREAKER TO FEED RTU-2.2. VERIFY AIC RATING MATCHES EXISTING.
3. INSTALL A NEW 3P/70A CIRCUIT BREAKER TO FEED RTU-2.1. VERIFY AIC RATING MATCHES EXISTING BREAKERS.
4. DISCONNECT AND REMOVE LIGHTNING ARRESTOR. NEW LIGHTNING ARRESTOR AND SURGE SUPPRESSOR ARE TO BE INSTALLED ON THE NEW SERVICE ENTRANCE AS PART OF THE EMERGENCY GENERATOR UPGRADE PROJECT.



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SECOND FLOOR PLAN - ELECTRICAL

SCALE: 3/16"=1'-0"

GENERAL NOTES

1. FOR COMPLETE GENERAL NOTES SEE SHEET E-1.1.

DEMOLITION AND RENOVATION KEY NOTES

1. PROVIDE POWER FOR NEW AHU AS SHOWN ON PLAN AND PER INFORMATION ON NAMEPLATE OF NEW AHU. MAKE ALL CONNECTIONS TO AHU ACCORDING TO MANUFACTURER'S INSTRUCTIONS. PANEL AND CIRCUIT NUMBER WERE OBTAINED FROM FIELD INVESTIGATION AND MUST BE VERIFIED FOR ACCURACY BY CONTRACTOR AND ADJUSTED FOR ACTUAL FIELD CONDITION IF NECESSARY. UPDATE PANEL DIRECTORY WITH A LEGIBLE DESCRIPTION OF ACTUAL LOAD.
2. PROVIDE POWER FOR MOTORIZED DAMPER AS REQUIRED.
3. CONTRACTOR SHALL REMOVE AND REINSTALL ANY LIGHTING FIXTURES, SPEAKERS, FIRE ALARM DEVICES, ETC. THAT MAY INTERFERE WITH THE INSTALLATION OF NEW MECHANICAL EQUIPMENT AND DUCT WORK. COORDINATE WITH MECHANICAL CONTRACTOR. CONTRACTOR SHALL REPLACE ANY EQUIPMENT DAMAGED DURING CONSTRUCTION.

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Revisions

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Key Plan

MPE PROJ#: 2013-177
Designed By: WMC
Drawn By: WMC
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Issue Date: 06/10/15
Drawing Scale: 3/16" = 1'-0"

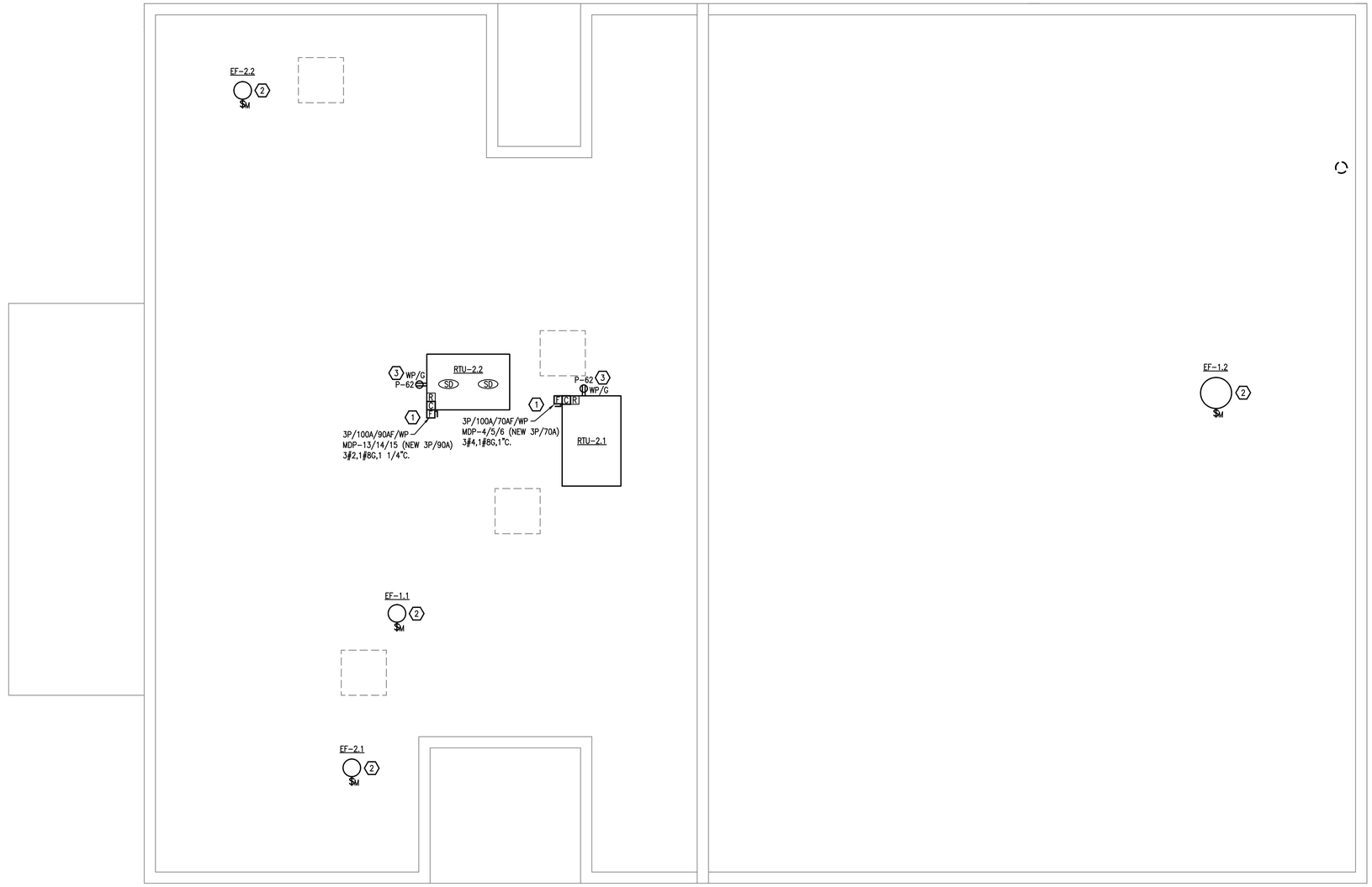
Drawing Title:

SECOND FLOOR PLAN ELECTRICAL

BID DOCUMENTS

Drawing No.

E-1.2



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ROOF PLAN - ELECTRICAL
SCALE: 3/16"=1'-0"

GENERAL NOTES

1. FOR COMPLETE GENERAL NOTES SEE SHEET E-1.1.

DEMOLITION AND RENOVATION KEY NOTES

1. ROOF TOP UNIT IS TO BE REPLACED. DISCONNECT POWER FROM EXISTING RTU AND REMOVE DISCONNECT SWITCH, CONDUIT, WIRING AND ASSOCIATED EQUIPMENT (CONDUIT MAY BE REUSED IF CORRECT SIZE AND IN GOOD CONDITION). PROVIDE POWER FOR NEW RTU AS SHOWN ON PLAN AND PER INFORMATION ON NAMEPLATE OF NEW RTU. MAKE ALL CONNECTIONS TO RTU ACCORDING TO MANUFACTURER'S INSTRUCTIONS.
   PANEL AND CIRCUIT NUMBER WERE OBTAINED FROM FIELD INVESTIGATION AND MUST BE VERIFIED FOR ACCURACY BY CONTRACTOR AND ADJUSTED FOR ACTUAL FIELD CONDITION IF NECESSARY. UPDATE PANEL DIRECTORY WITH A LEGIBLE DESCRIPTION OF ACTUAL LOAD.
2. EXHAUST FAN IS TO BE REPLACED. DISCONNECT POWER FROM EXISTING FAN AND RECONNECT TO NEW FAN.
3. REPLACE EXISTING RECEPTACLE WITH NEW AND CONNECT NEW RECEPTACLE TO EXISTING ROOF RECEPTACLE CIRCUIT.

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No.	Date	Description

Key Plan

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Drawing Title:
ROOF PLAN ELECTRICAL

BID DOCUMENTS

Drawing No.
E-1.3