BALCONES HEIGHTS POLICE DEPARTMENT

BALCONES HEIGHTS CITY HALL

3300 HILLCREST DR
SAN ANTONIO, TX 78201

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CONTRACTOR IS RESPONSIBLE FOR PROVIDING AN HVAC FACILITY PRE-AUDIT BEFORE BEGINNING CONSTRUCTION, AND A FACILITY POST-AUDIT AFTER COMPLETING THE WORK DETAILED HEREIN

ELECTRICAL LEGEND

(NOTE: ALL SYMBOLS SHOWN ARE NOT NECESSARILY USED ON DRAWINGS)

SYMBOL LEGEND

LIGHTING

A	ALL LIGHT FIXTURES IN THE ROOM ARE THE TYPE INDICATED UNLESS OTHERWISE NOTED.
A	FLUORESCENT LIGHTING FIXTURE. LETTER INDICATES TYPE.
A	INCANDESCENT, COMPACT FLUORESCENT OR HIGH INTENSITY DISCHARGE LIGHTING FIXTURE.
A	WALL MOUNTED INCANDESCENT, COMPACT FLUORESCENT OR HIGH INTENSITY DISCHARGE LIGHTING FIXTURE.
	EXIT LIGHTING FIXTURE. ARROW, WHEN USED, INDICATES DIRECTION. (BRACKET WHEN USED INDICATES WALL MOUNTED). SHADED AREA(S) INDICATE FACE(S).
	EMERGENCY BATTERY POWERED LIGHTING UNIT.
	FLUORESCENT EMERGENCY. "NL" DESIGNATION DEPICTS NIGHT LIGHTING FIXTURE.
S 3 4 P T WP D	SINGLE POLE SWITCH.. (3 INDICATES A THREE-WAY SWITCH) (4 INDICATES A FOUR-WAY SWITCH) (P INDICATES A SWITCH WITH PILOT LIGHT) (T INDICATES AN INTERVAL TIMER SWITCH) (WP INDICATES A WEATHERPROOF SWITCH) (D INDICATES A DIMMER SWITCH. 600 WATT MINIMUM)
OS	CORRIDOR OCCUPANCY SENSOR. CEILING MOUNTED
OS 1	ROOM OCCUPANCY SENSOR. WALL MOUNT AT SWITCH HEIGHT.
OS 2	ROOM OCCUPANCY SENSOR. CEILING MOUNT.
OSP	OCCUPANCY SENSOR POWER PACK.

WIRING DEVICES

CLK	SIMPLEX RECEPTACLE (CLK INDICATES CLOCK HANGER RECEPTACLE)
I.G. GFCI WP	DUPLEX RECEPTACLE. (I.G. INDICATES ISOLATED GROUND) (G.F.C.I. INDICATES INTERNAL GROUND FAULT PROTECTION) (W.P. INDICATES WEATHERPROOF)
	DUPLEX RECEPTACLE. MOUNT 48" A.F.F. OR 6" ABOVE COUNTER TOP WHERE COUNTER IS INDICATED. ALL DUPLEX RECEPTACLES ABOVE COUNTERTOPS TO BE MOUNTED HORIZONTALLY.
	QUADRAPLEX RECEPTACLE.
	FLUSH FLOOR DUPLEX RECEPTACLE.
	FLUSH WITH FLOOR COMBINATION DUPLEX RECEPTACLE AND TELEPHONE RECEPTACLE.
	FLUSH WITH FLOOR COMBINATION DUPLEX RECEPTACLE TELEPHONE AND DATA RECEPTACLES.
	SPECIAL PURPOSE RECEPTACLE. SIZE AND NEMA CONFIGURATION AS INDICATED ON DRAWING.

CONDUIT AND WIRE

	CONCEALED BRANCH CIRCUIT 3/4"C – 2#12 & 1#12 GROUND U.O.N.. CONDUIT OTHER THAN 3/4" AND CONDUCTORS OTHER THAN 2#12 & 1#12 GROUND SHALL BE PER THE MORE STRINGENT REQUIREMENTS OF THE DRAWINGS OR SPECIFICATIONS.
	SWITCH LEG. PROVIDE ADDITIONAL BRANCH CIRCUITRY AS REQUIRED TO ACCOMPLISH THE SWITCHING INIDICATED..
	INDICATES AN EXPOSED CONDUIT RUN.
L1A – 1,3,5	HOMERUN TO PANEL. NUMBER OF ARROWS INDICATES NUMBER OF POLE CONNECTIONS. EXCLUDING NEUTRALS AND GROUNDS.
	CAPPED CONDUIT
	CONDUIT TURNED UP.
	CONDUIT TURNED DOWN.
E	CONDUIT TRANSITION FROM CONCEALED TO EXPOSED
EC	EMPTY CONDUIT RUN. SIZE AS INDICATED. PROVIDE WITH PULLWIRE.
	CABLE TRAY.
	SURFACE METAL RACEWAY.

DISTRIBUTION & CONTROLS

J	JUNCTION BOX WITH COVER PLATE
E	ELECTRICAL CONNECTION. (CONTRACTOR SHALL FURNISH AND INSTALL ALL WIRING, RACEWAYS, MOTOR STARTER, OVERCURRENT PROTECTIVE DEVICE, DISCONNECT SWITCH, DUPLEX RECEPTACLES, ETC. REQUIRED TO CONNECT EQUIPMENT ELECTRICALLY. EQUIPMENT MAY BE PROVIDED BY DIVISION 26 OR OTHERS) REFER TO CONSTRUCTION DOCUMENTS. SUBSCRIPT "WP" WHEN USED INDICATES A WEATHER PROOF CONNECTION.
1/2	MOTOR CONNECTION, HP INDICATED.
	PANELBOARD (480/277 VOLT).
	PANELBOARD (208/120 VOLT).
3P/60/40/3R	FUSED DISCONNECT SWITCH. IN NEMA 1 ENCLOSURE U.O.N. 3P = NO. OF POLES, 60 = SWITCH RATING, 40 = FUSE RATING 3R = NEMA 3R.
3P/60/3R	NON-FUSED DISCONNECT SWITCH. IN NEMA 1 ENCLOSURE U.O.N. 3P = NO. OF POLES, 60 = SWITCH RATING, 3R = NEMA 3R.
	MAGNETIC MOTOR STARTER. MINIMUM NEMA SIZE 1.
	COMBINATION MAGNETIC STARTER AND DISCONNECT.
S_M	MANUAL MOTOR STARTER WITH THERMAL OVERLOADS.

C	CONTACTOR, RATING AND POLES AS INDICATED.
TC	TIME CLOCK, RATING AS INDICATED.
PE	PHOTO-ELECTRIC CONTROL.
	EMERGENCY POWER OFF "EPO" SWITCH.
T	DRY TYPE TRANSFORMER.
M	ELECTRICAL METER

GROUNDING

	GROUND ROD.
G	GROUND CONDUCTOR.
	GROUND CONNECTION.
	GROUND CONNECTION (EXOTHERMIC WELD)

FIRE ALARM SYSTEM

FACP	FIRE ALARM CONTROL PANEL.
ANN	FIRE ALARM SYSTEM REMOTE ANNUNCIATOR.
F	FIRE ALARM MANUAL PULL STATION.
S_F	FIRE ALARM SYSTEM SMOKE DETECTOR. MOUNT ON CEILING U.O.N. SUBSCRIPT "F", WHEN USED, INDICATES DETECTOR UNDER RAISED FLOOR.
D	DUCT MOUNTED SMOKE DETECTOR.
M	MAGNETIC DOOR HOLDER.
F	FIRE ALARM HORN.
T	REMOTE FIRE ALARM SYSTEM TROUBLE BELL (OR BUZZER).
WF	SPRINKLER SYSTEM FLOW SWITCH.
SS	SPRINKLER SYSTEM SUPERVISERY SWITCH.
P	SPRINKLER SYSTEM PRESSURE SWITCH.
K	KITCHEN HOOD FIRE EXTINGUISHING SYSTEM SWITCH
H	FIRE ALARM SYSTEM HEAT DETECTOR
AV	FIRE ALARM SYSTEM AUDIO/VISUAL DEVICES.
V	FIRE ALARM SYSTEM VISUAL DEVICE.

CLOCK & BELL SYSTEM

C_{DF}	DOUBLE FACE CLOCK, WALL MOUNTED @ 78" A.F.F.
B	4" BELL, WALL MOUNTED @ 78" A.F.F.
C_M	CLOCK MASTER CONTROLLER
C_{SF}	SINGLE FACE CLOCK, WALL MOUNTED @ 78" A.F.F.

SECURITY SYSTEM

DC	MAGNETIC DOOR CONTACTS
ES	ELECTRIC DOOR STRIKE SWITCH
EX	REQUEST TO EXIT MOTION DETECTOR
K	KEYPAD ACCESS/ CARD READER
DS	DURESS ALARM SWITCH
I	INTRUSION DETECTOR
MI	MAGNETIC INTRUSION SWITCH
	CLOSED CIRCUIT T.V. CAMERA
$_M$	CLOSED CIRCUIT T.V. MONITOR

SOUND AND PUBLIC ADDRESS SYSTEM

S	SPEAKER CEILING
S	SPEAKER WALL MOUNTED, 7' A.F.F.
S_I	LOCAL INTERCOM SPEAKER
S_M	LOCAL INTERCOM MASTER
M	MICROPHONE
S_V	VOLUME CONTROL MOUNT 48" A.F.F.
AMP	SOUND SYSTEM AMPLIFIER AND PROGRAM EQUIPMENT
S	VOLUME CONTROL MOUNT 48" A.F.F.

TELEPHONE AND DATA

	4'X8'X3/4" GRADE A/B FIRE TREATED PLYWOOD TELEPHONE TERMINAL BACKBOARD.
	FLUSH FLOOR TELEPHONE OUTLET.
W	TELEPHONE OUTLET. MOUNT 15" A.F.F. UNLESS U.O.N. BY DWG'S OR SPECIFICATIONS PROVIDE A 4" SQ. BOX W/ SINGLE DEVICE PLASTER RING, 3/4" E.C. WITH PULLSTRING STUBBED INTO NEAREST ACCESSIBLE. CEILING. SUBSCRIPT "W" WHEN USED INDICATES WALL MOUNTED DEVICE. MOUNT 48" A.F.F.
P	PAY TELEPHONE OUTLET MOUNT 15" A.F.F. UNLESS U.O.N. BY DWG'S OR SPECIFICATIONS PROVIDE A 4" SQ. BOX W/ SINGLE DEVICE PLASTER RING, 3/4" E.C. WITH PULLSTRING STUBBED INTO NEAREST ACCESSIBLE. CEILING.
	DATA OUTLET MOUNT 15" A.F.F. UNLESS DIRECTED OTHERWISE BY DWG'S OR SPECIFICATIONS PROVIDE A 4" SQ. BOX W/ SINGLE DEVICE PLASTER RING, 3/4" E.C. WITH PULLSTRING STUBBED INTO NEAREST ACCESSIBLE. CEILING.
2V/2D	COMBINATION VOICE AND DATA OUTLET MOUNT 15" A.F.F. UNLESS OTHERWISE DIRECTED BY DWG'S OR SPECIFICATIONS. PROVIDE A 4" SQ. BOX W/ SINGLE DEVICE PLASTER RING, 1" E.C. WITH PULLSTRING STUBBED INTO NEAREST ACCESSIBLE. CEILING. THE SUBSCRIPT 2V/2D INDICATES THAT THE QUANTITY OF VOICE JACKS IS TWO AND THE QUANTITY OF DATA JACKS IN TWO MINIMUM.

GENERAL

1	NOTE REFERENCE NUMBER.
168	ROOM NUMBER INDICATION

DEMOLITION

	HATCHING INDICATES REMOVAL OF EXISTING EQUIPMENT OR ITEM.
	REMOVE EXISTING TO THIS POINT.
	POINT OF CONNECTION. NEW TO EXISTING.

ABBREVIATIONS

A	A.F.F.	ABOVE FINISHED FLOOR
	A.F.G.	ABOVE FINISHED GRADE
	AF	AMP FRAME
	A	AMPERE
	AIC	AMPERE INTERRUPTING CAPACITY
	AHU	AIR HANDLING UNIT
	AT	AMP TRIP
	ATS	AUTOMATIC TRANSFER SWITCH
	AWG	AMERICAN WIRE GAUGE
C	C.B.	CIRCUIT BREAKER
	C.C.T.V.	CLOSED CIRCUIT TELEVISION
	C	CONDUIT
	CLK	CLOCK
	C.T.'S	CURRENT TRANSFORMERS
	C.U.	CONDENSING UNIT
E	ELEC.	ELECTRICAL
	E.D.F.	ELECTRIC DRINKING FOUNTAIN
	E.W.H.	ELECTRIC WATER HEATER
	E.C.	EMPTY CONDUIT W/PULLWIRE
	EF	EXHAUST FAN
	EXP	EXPLOSION PROOF
F	FCU	FAN COIL UNIT
	FLA	FULL LOAD AMPS
	FLUOR	FLUORESCENT
	FACP	FIRE ALARM CONTROL PANEL
G	GEN. SET	GENERATOR SET
	GFCI	GROUND FAULT CIRCUIT INTERRUPTER
	GND.	GROUND
H	HID	HIGH INTENSITY DISCHARGE
	H.P.S.	HIGH PRESSURE SODIUM
I	INC	INCANDESCENT
K	KVA	THOUSAND VOLT AMPERE
	KAIC	THOUSAND AMP INTERRUPTING CAPACITY RMS SYMMETRICAL
	KCMIL	THOUSAND CIRCULAR MILS
M	M.C.B.	MAIN CIRCUIT BREAKER
	M.L.O.	MAIN LUGS ONLY
	M.H.	METAL HALIDE
	MTD.	MOUNTED
	MV	MERCURY VAPOR
N	N.E.C.	NATIONAL ELECTRICAL CODE
	N.I.C.	NOT IN CONTRACT
	NL	NIGHT LIGHT
	N.T.S.	NOT TO SCALE
	N.E.M.A.	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
P	PL	COMPACT FLOURESCENT
	PNLBD.	PANELBOARD
R	RECEPT.	RECEPTACLE
	R.T.U.	ROOF TOP UNIT
	REQ'D.	REQUIRED
S	S.C	SPLIT BRANCH CIRCUIT INDICATES REFERENCED BRANCH CIRCUIT HAS MORE THAN ONE HOME RUN DESIGNATION. MAKE REQUIRED SPLICES IN A SEPARATE SPLICE BOX, OUTSIDE THE PANELBOARD ENCLOSURE.
	SQ.	SQUARE
T	T.V.	TELEVISION
	TRT	TRIPLE TUBE COMPACT FLUORESCENT
U	UH	UNIT HEATER
	U.O.N.	UNLESS OTHERWISE NOTED
	UPS	UNINTERRUPTABLE POWER SYSTEM.
V	VA	VOLTS AMPERE
	V	VOLT
	VFD	VARIABLE FREQUENCY DRIVE
W	WP	WEATHERPROOF
X	XFMR	TRANSFORMER

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Revisions:

No.	Description:	Date:

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Drawing Name
ELECTRICAL SYMBOLS LEGEND

Sheet No.
E1.0

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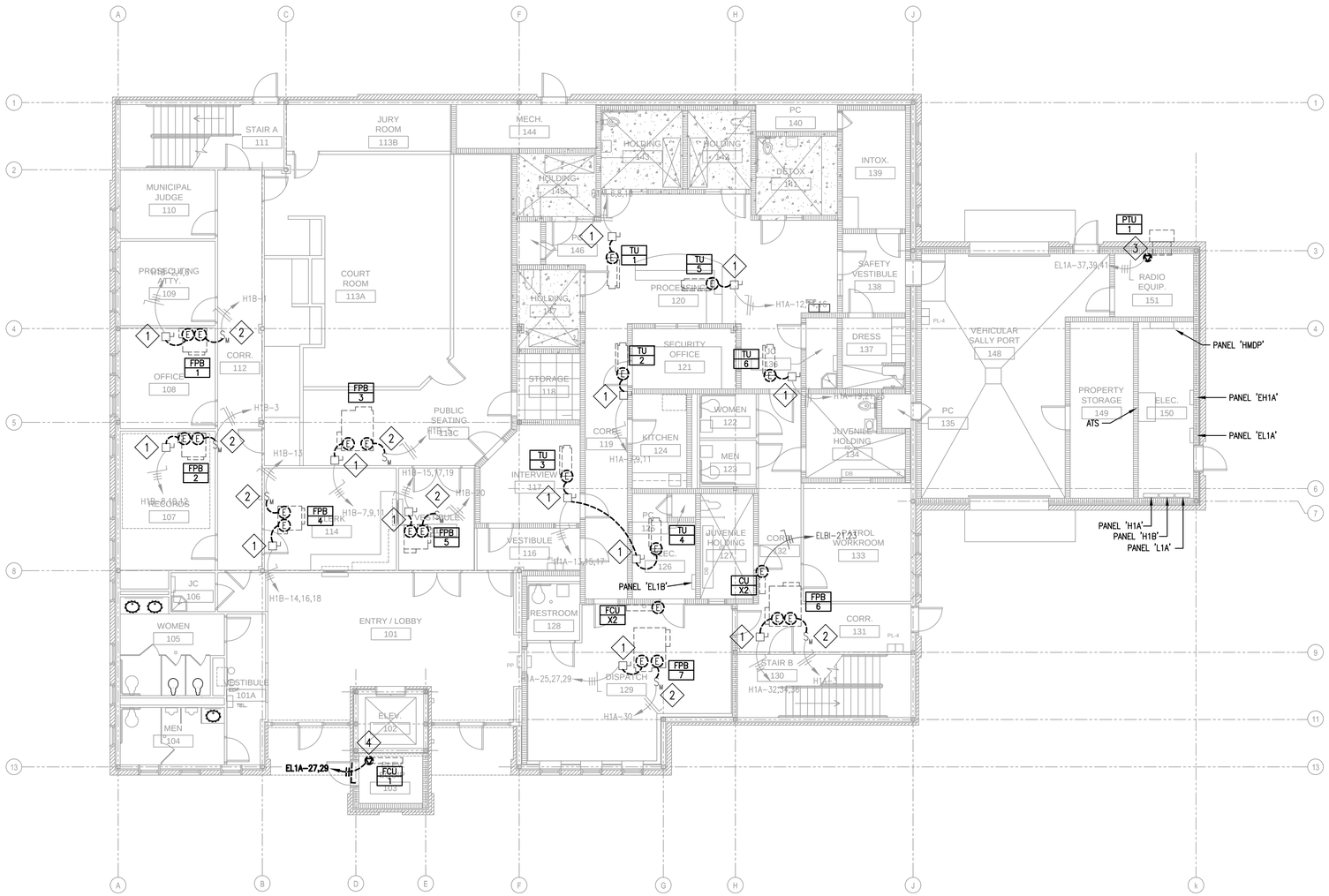

KEYED NOTES

1. EXISTING 30A/3P/600VAC NEMA 1 ENCLOSURE NON-FUSED DISCONNECT SWITCH AND BRANCH CIRCUITRY TO REMAIN. 3#10 & 1#10 GND. IN 3/4" C.
2. EXISTING MOTOR RATED SWITCH AND BRANCH CIRCUITRY TO REMAIN.
3. REMOVE EXISTING 30A/3P/250VAC SPECIAL PURPOSE RECEPTACLE NEMA L15-30. 3#10, 1#10 GND IN 3/4" C. BRANCH CIRCUITRY TO REMAIN.
4. REMOVE EXISTING 15A/2P/3W/250V SPECIAL PURPOSE RECEPTACLE NEMA L6-15. 2#10, 1#10 GND IN 3/4" C. BRANCH CIRCUITRY TO REMAIN.

GENERAL NOTES:

1. REMOVE ALL WIRING FROM EXISTING TO REMAIN DISCONNECT SWITCHES SERVING DEMOLISHED FAN POWERED BOXES.
2. REMOVE ALL WIRING FROM EXISTING TO REMAIN MOTOR SWITCHES SERVING DEMOLISHED FAN POWERED BOXES.
3. BRANCH CIRCUIT HOME RUNS TO BE LEFT IN PLACE TO SERVE NEW UNITS.

LINETYPE LEGEND	
———	INDICATES EXISTING EQUIPMENT & CIRCUITING TO REMAIN.
- - - -	INDICATES EXISTING EQUIPMENT AND CIRCUITING TO BE REMOVED OR RELOCATED.

NORTH

1 / E2.1 1ST FLOOR DEMOLITION PLAN – ELECTRICAL

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

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Drawing Name
1ST FLOOR DEMOLITION PLAN - ELECTRICAL

Sheet No.
E2.1

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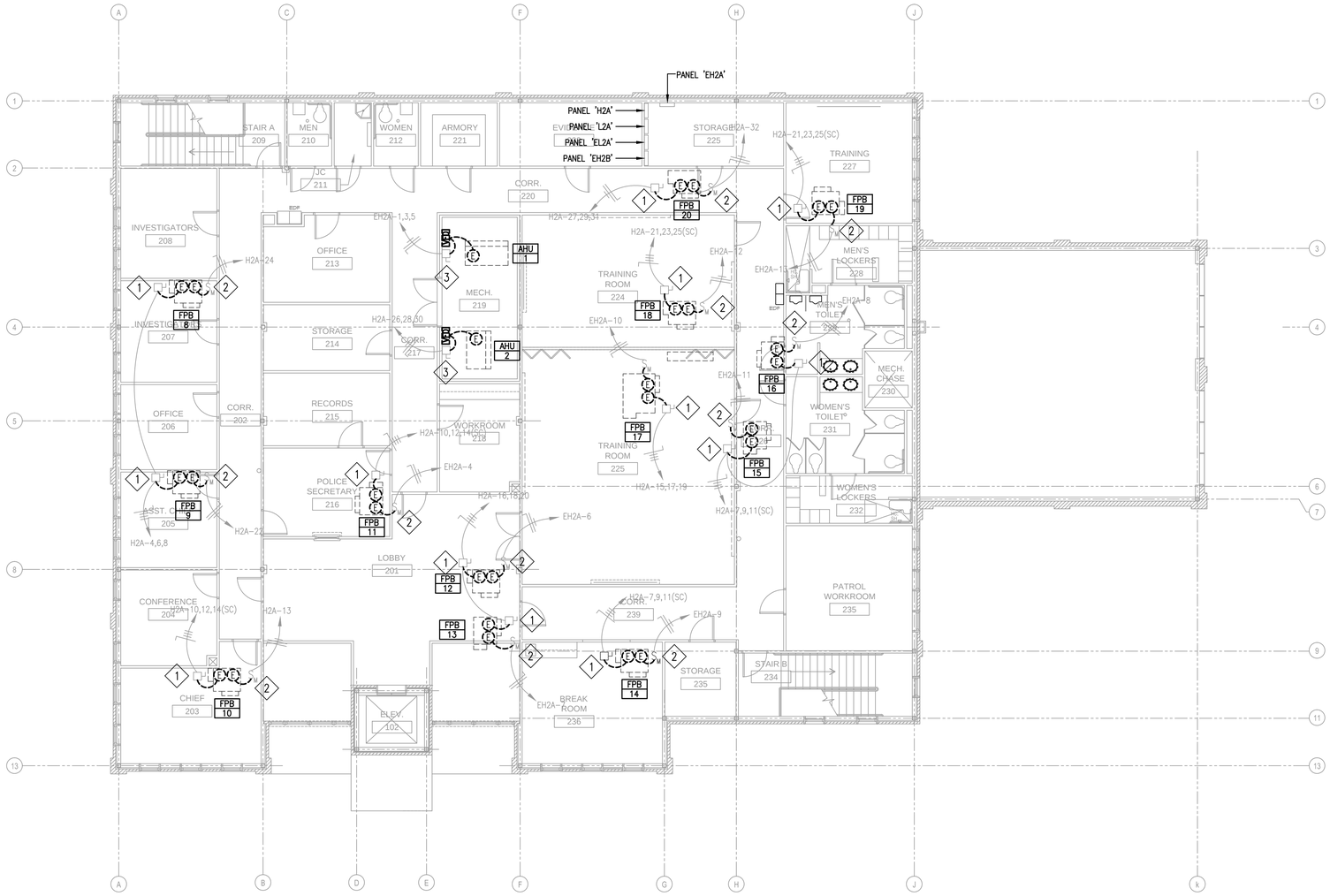

KEYED NOTES

1. EXISTING 30A/3P/4W/600VAC NEMA 1 ENCLOSURE NON-FUSED DISCONNECT SWITCH AND BRANCH CIRCUITRY TO REMAIN. 3#10 & 1#10 GND. IN 3/4" C.
2. EXISTING MOTOR RATED SWITCH AND BRANCH CIRCUITRY TO REMAIN.
3. EXISTING TO REMAIN AHU DISCONNECTS. REMOVE WIRING FROM LOAD SIDE OF EXISTING TO REMAIN DISCONNECT SWITCH TO AHU SCHEDULED FOR REMOVAL. EXISTING HOMERUN WIRING FROM THE LINE SIDE OF THE EXISTING DISCONNECT SWITCHES TO PANELBOARD SHALL REMAIN.

GENERAL NOTES:

1. REMOVE ALL WIRING FROM EXISTING TO REMAIN DISCONNECT SWITCHES SERVING DEMOLISHED FAN POWERED BOXES.
2. REMOVE ALL WIRING FROM EXISTING TO REMAIN MOTOR SWITCHES SERVING DEMOLISHED FAN POWERED BOXES.
3. BRANCH CIRCUIT HOME RUNS TO BE LEFT IN PLACE TO SERVE NEW UNITS.

LINETYPE LEGEND	
———	INDICATES EXISTING EQUIPMENT & CIRCUITING TO REMAIN.
- - - -	INDICATES EXISTING EQUIPMENT AND CIRCUITING TO BE REMOVED OR RELOCATED.

NORTH

1 E2.2 2ND FLOOR DEMOLITION PLAN – ELECTRICAL

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

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Drawing Name
2ND FLOOR DEMOLITION PLAN - ELECTRICAL

Sheet No.
E2.2

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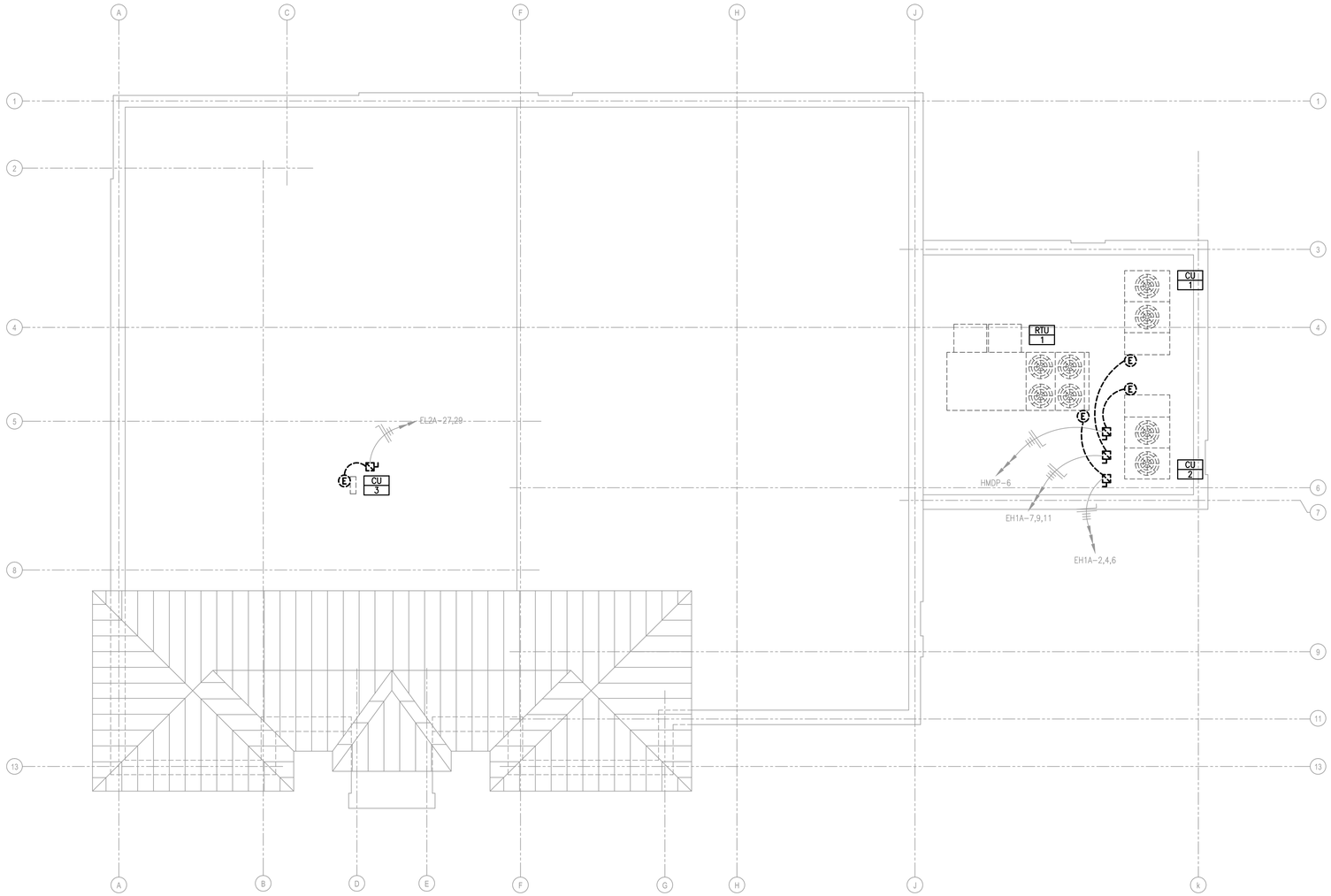

NORTH

1 E2.3 ROOF DEMOLITION PLAN – ELECTRICAL

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

GENERAL NOTES:

1. BRANCH CIRCUIT HOME RUNS TO BE LEFT IN PLACE TO SERVE NEW UNITS.

LINETYPE LEGEND	
———	INDICATES EXISTING EQUIPMENT & CIRCUITING TO REMAIN.
- - - -	INDICATES EXISTING EQUIPMENT AND CIRCUITING TO BE REMOVED OR RELOCATED.

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Drawing Name
ROOF DEMOLITION PLAN - ELECTRICAL

Sheet No.
E2.3

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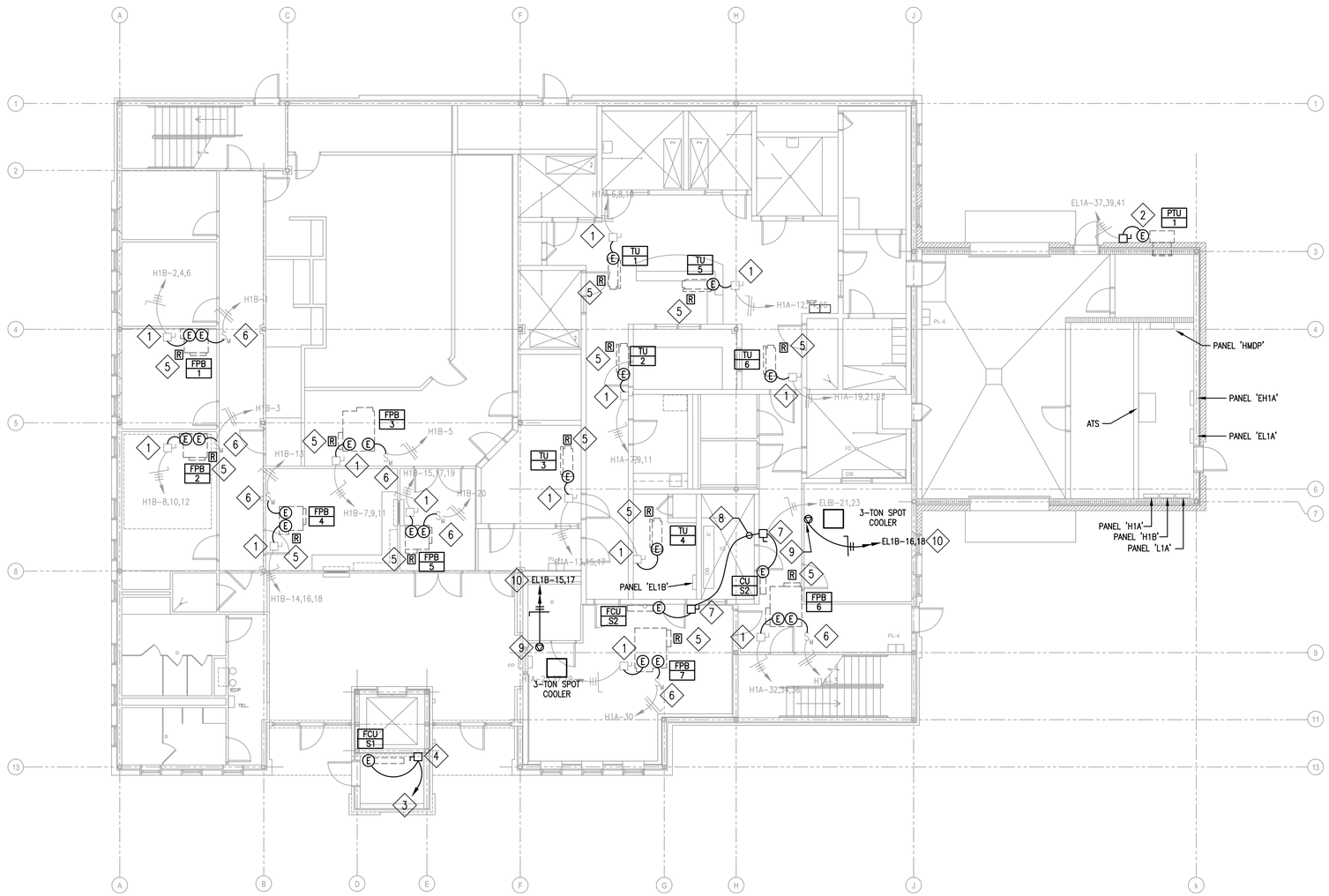

KEYED NOTES

1. RECONNECT EXISTING 30A/3P/600VAC NEMA 1 NON-FUSED DISCONNECT SWITCH TO UNIT HEATER.
2. ELECTRICAL CONNECTION TO PACKAGE TERMINAL UNIT, 208V 3-PHASE. 30A/3P/240VAC NEMA 3R NON-FUSED DISCONNECT SWITCH. 3#10 & 1#10 GND. IN 3/4" C.
3. ELECTRICAL CONNECTION TO FCU-S1, 208V 1-PHASE. POWER TO UNIT IS ROUTED FROM CONDENSING UNIT CU-S1 ON ROOF. REFER TO DETAIL 1/E4.1. ROUTE 3/4" C. WITH #10AWG CONTROL WIRING BETWEEN UNITS PER MANUFACTURERS INSTRUCTION.
4. 30A/2P/240VAC NEMA 1 ENCLOSURE NON-FUSED DISCONNECT SWITCH. 2#10 & 1#10 GND. IN 3/4" C.
5. THE CONTRACTOR SHALL FURNISH ALL EQUIPMENT, MATERIALS, TOOLS, LABOR, PLANNING, DRAWINGS, ETC. NECESSARY TO CONNECT NEW FIRE ALARM DEVICES TO THE EXISTING BUILDING FIRE ALARM SYSTEM. PROVIDE AND INSTALL FIRE ALARM SYSTEM WIRING, RELAY(S) AND EQUIPMENT AS REQUIRED TO SHUT-DOWN ALL FAN POWERED VAV BOX(ES) AND ASSOCIATED AIR HANDLING UNIT(S) UPON ALARM FROM THE BUILDING FIRE ALARM SYSTEM. PROVIDE ALL CONTROL AND POWER WIRING AS REQUIRED. COORDINATE THIS WORK WITH THE MECHANICAL CONTRACTOR AND THE BUILDING ENGINEER.
6. RECONNECT EXISTING MOTOR RATED SWITCH TO NEW MOTOR.
7. 30A/2P/240VAC NEMA 1 ENCLOSURE NON-FUSED DISCONNECT SWITCH. 2#10 & 1#10 GND. IN 3/4" C.
8. ELECTRICAL CONNECTION TO FCU-S2, 208V 1-PHASE. POWER TO UNIT IS ROUTED FROM CONDENSING UNIT CU-S3 ABOVE CEILING. ROUTE 3/4" C. WITH 10 AWG CONTROL WIRING BETWEEN UNITS PER MANUFACTURERS INSTRUCTION.
9. FURNISH AND INSTALL A NEMA 6-30R RECEPTACLE TO SERVE A TEMPORARY SPOT COOLER. COORDINATE EXACT LOCATION OF DEVICE WITH THE OWNER'S REPRESENTATIVE.
10. 1/2" CONDUIT. 2 #10 AND 1 #10 GROUND.

GENERAL NOTES:

1. ALL WIRING FROM EXISTING DISCONNECT SWITCH TO NEW UNIT HEATING ELEMENT SHALL BE 3#10 & 1#10 GND IN 1/2" EC U.O.N.
2. ALL WIRING FROM EXISTING MOTOR SWITCH SERVING NEW UNIT MOTOR SHALL BE 2#10 & 1#10 GND IN 1/2" EC U.O.N.

LINETYPE LEGEND	
———	INDICATES EXISTING EQUIPMENT & CIRCUITING TO REMAIN.
———	INDICATES NEW EQUIPMENT AND CIRCUITING.

NORTH

1 1ST FLOOR PLAN – ELECTRICAL

E3.1

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

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1ST FLOOR PLAN - ELECTRICAL

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E3.1

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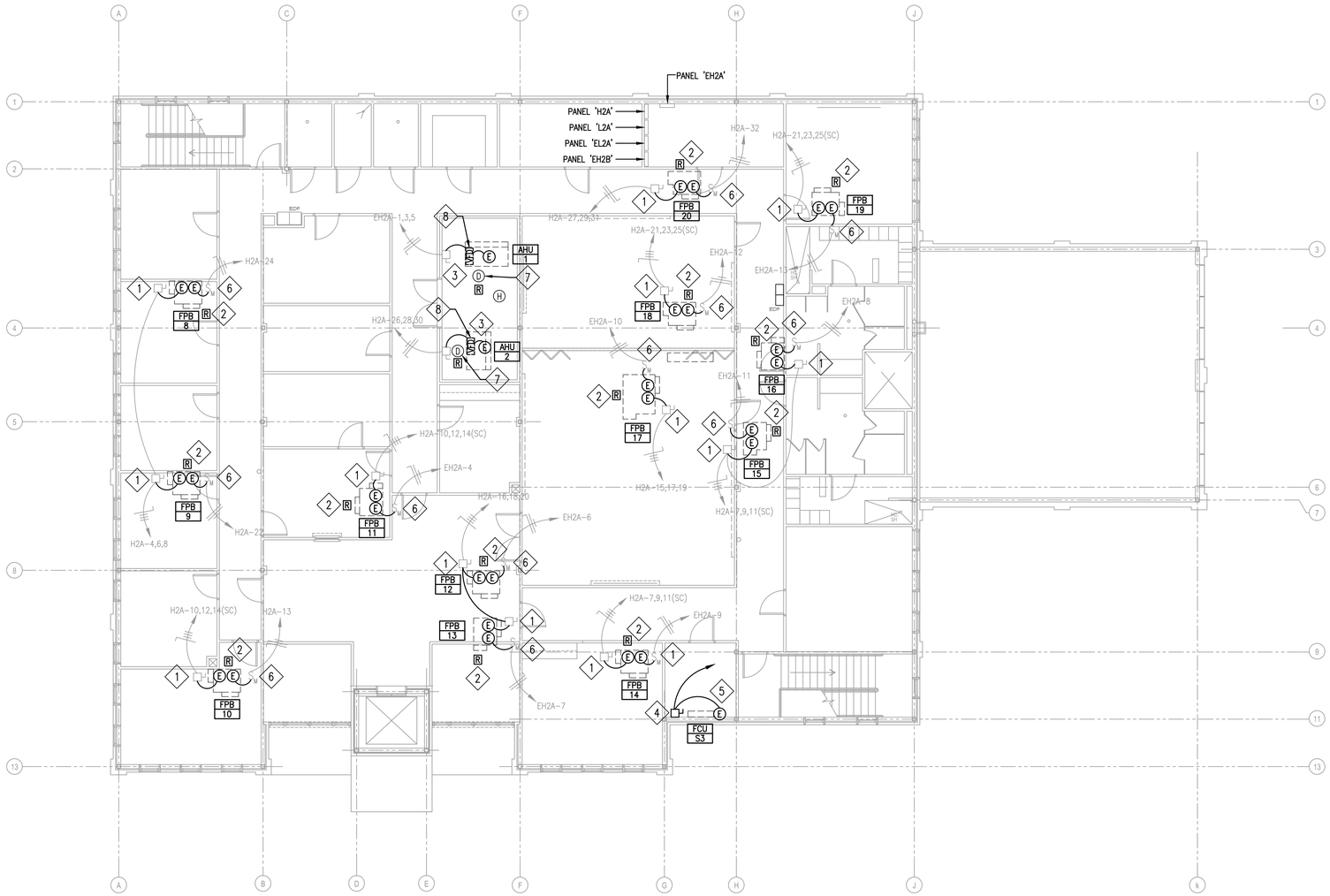

KEYED NOTES

1. RECONNECT 30A/3P/600VAC NEMA 1 ENCLOSURE NON-FUSED DISCONNECT SWITCH TO UNIT HEATER.
2. THE CONTRACTOR SHALL FURNISH ALL EQUIPMENT, MATERIALS, TOOLS, LABOR, PLANNING, DRAWINGS, ETC. NECESSARY TO CONNECT NEW FIRE ALARM DEVICES TO THE EXISTING BUILDING FIRE ALARM SYSTEM. PROVIDE AND INSTALL FIRE ALARM SYSTEM WIRING, RELAY(S) AND EQUIPMENT AS REQUIRED TO SHUT-DOWN ALL FAN POWERED VAV BOX(ES) AND ASSOCIATED AIR HANDLING UNIT(S) UPON ALARM FROM THE BUILDING FIRE ALARM SYSTEM. PROVIDE ALL CONTROL AND POWER WIRING AS REQUIRED. COORDINATE THIS WORK WITH THE MECHANICAL CONTRACTOR AND THE BUILDING ENGINEER.
3. ELECTRICAL CONNECTION TO AHU'S, 480V, 3-PHASE. 30A/3P/600VAC NEMA 1 ENCLOSURE NON-FUSED DISCONNECT SWITCH.
4. 30A/2P/240VAC NEMA 1 ENCLOSURE NON-FUSED DISCONNECT SWITCH. 2#10 & 1#10 GND. IN 3/4" C.
5. ELECTRICAL CONNECTION TO FCU-S3, 208V 1-PHASE. POWER TO UNIT IS ROUTED FROM CONDENSING UNIT CU-S3 ON ROOF. REFER TO DETAIL 1/E4.1. ROUTE 3/4" C. WITH 10AWG CONTROL WIRING BETWEEN UNITS PER MANUFACTURERS INSTRUCTION.
6. RECONNECT EXISTING MOTOR RATED SWITCH TO NEW MOTOR.
7. CONNECT NEW DUCT DETECTORS TO EXISTING FIRE ALARM CONTROL PANEL.
8. VFD IN INTEGRAL TO AIR HANDELING UNIT

GENERAL NOTES:

1. ALL WIRING FROM EXISTING DISCONNECT SWITCH TO NEW UNIT HEATING ELEMENT SHALL BE 3#10 & 1#10 GND IN 1/2" EC U.O.N.
2. ALL WIRING FROM EXISTING MOTOR SWITCH SERVING NEW UNIT MOTOR SHALL BE 2#10 & 1#10 GND IN 1/2" EC U.O.N.

LINETYPE LEGEND	
	INDICATES EXISTING EQUIPMENT & CIRCUITING TO REMAIN.
	INDICATES NEW EQUIPMENT AND CIRCUITING.

NORTH

1 / E3.2 2ND FLOOR PLAN – ELECTRICAL

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

STATE OF TEXAS
E.G. LOPEZ DEL CASTILLO
58483
REGISTERED
PROFESSIONAL ENGINEER
10/18/2017

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BALCONES HEIGHTS JUSTICE CENTER / CITY HALL HVAC REPLACEMENT

3300 HILLCREST DR
BALCONES HEIGHTS, TX. 78201

Revisions:

No.	Description:	Date:

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Drawn by:	CAD
Checked by:	EC
Project Number:	90501

Drawing Name
2ND FLOOR PLAN - ELECTRICAL

Sheet No.
E3.2

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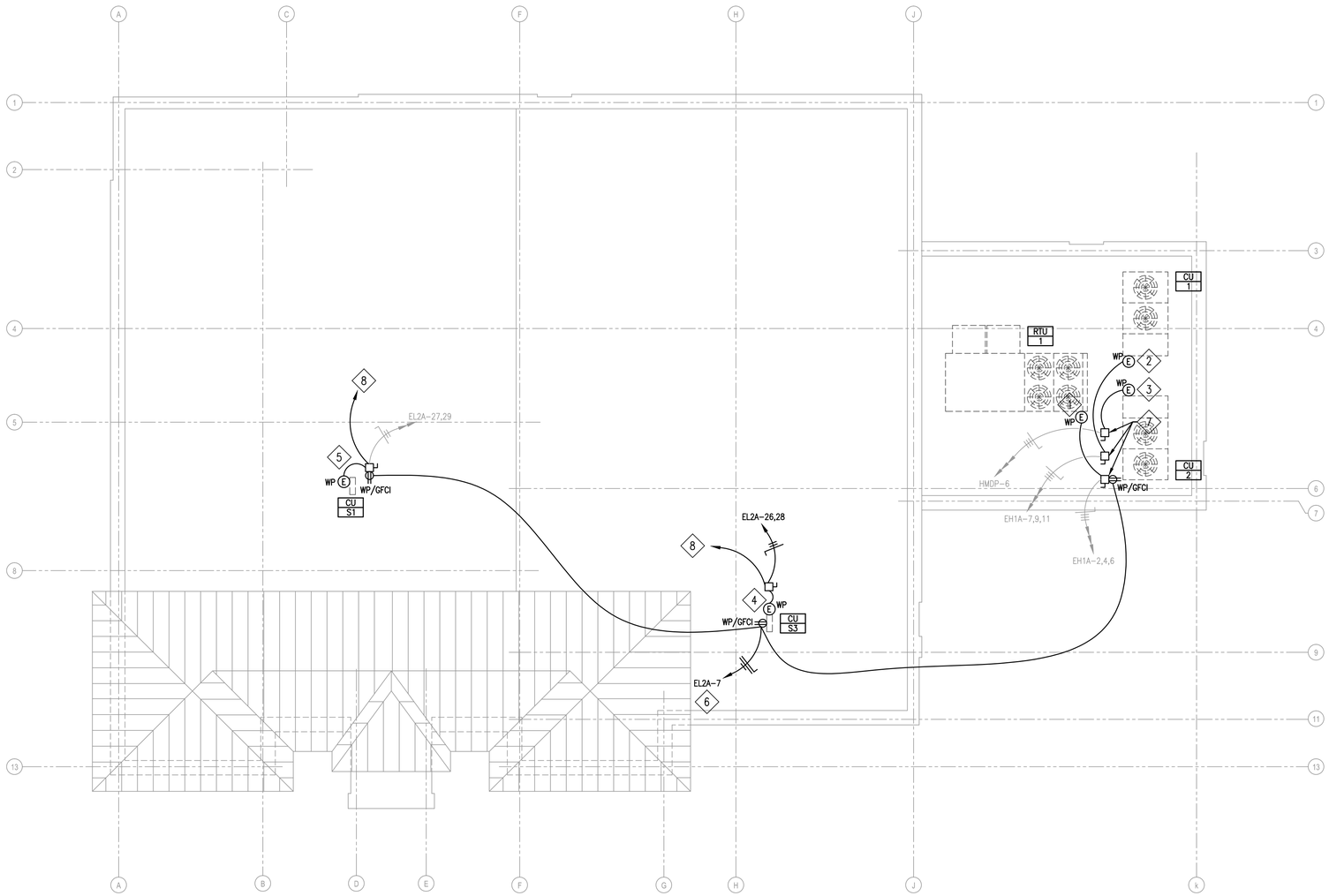
10/19/2017 10:49 a



NORTH

1 E3.3 ROOF PLAN – ELECTRICAL

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

KEYED NOTES

1. ELECTRICAL CONNECTION TO RTU-1, 480V, 3-PHASE. 200A/3P/600VAC NEMA 3R ENCLOSURE NON-FUSED DISCONNECT SWITCH. MOUNT TO EXISTING UNISTRUCT RACK. 3#2 & 1#6 GND IN 1-1/2" C.
2. ELECTRICAL CONNECTION TO CU-1, 480V, 3-PHASE. 60A/3P/600VAC NEMA 3R ENCLOSURE NON-FUSED DISCONNECT SWITCH. MOUNT TO EXISTING UNISTRUCT RACK. 3#8 & 1#10 GND IN 3/4" C.
3. ELECTRICAL CONNECTION TO CU-2, 480V, 3-PHASE. 60A/3P/600VAC NEMA 3R ENCLOSURE NON-FUSED DISCONNECT SWITCH. MOUNT TO EXISTING UNISTRUCT RACK. 3#8 & 1#10 GND IN 3/4" C.
4. ELECTRICAL CONNECTION TO CU-S3, 208V, 1-PHASE. 30A/2P/240VAC NEMA 3R ENCLOSURE NON-FUSED DISCONNECT SWITCH. 2#10 & 1#10 GND IN 1/2" C. MOUNT TO EXISTING UNISTRUCT RACK. REFER TO DETAIL 4/E4.1.
5. ELECTRICAL CONNECTION TO CU-S1, 208V, 1-PHASE. 30A/2P/240VAC NEMA 3R ENCLOSURE NON-FUSED DISCONNECT SWITCH. 2#10 & 1#10 GND IN 1/2" C. MOUNT TO EXISTING UNISTRUCT RACK. REFER TO DETAIL 4/E4.1.
6. 2#10 & 1#10 GND IN 3/4" C.
7. RECONNECT EXISTING CIRCUITRY TO NEW DISCONNECT SWITCH.
8. 3/4" WITH 10 AWG CONTROL WIRE ROUTED TO CORRESPONDING FAN COIL UNIT.

LINETYPE LEGEND	
	INDICATES EXISTING EQUIPMENT & CIRCUITING TO REMAIN.
	INDICATES NEW EQUIPMENT AND CIRCUITING.

STATE OF TEXAS
E.G. LOPEZ DEL CASTILLO
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BALCONES HEIGHTS JUSTICE CENTER / CITY HALL HVAC REPLACEMENT

3300 HILLCREST DR
BALCONES HEIGHTS, TX. 78201

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Drawing Name
ROOF PLAN - ELECTRICAL

Sheet No.
E3.3

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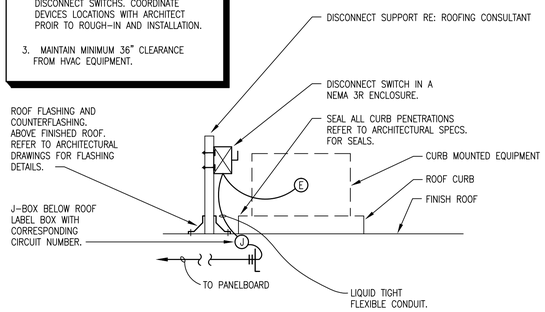
NOTE:

1. ALL CURB PENETRATIONS SHALL BE COORDINATED WITH ROOFING INSTALLER.
2. THE CONTRACTOR SHALL GROUP MOUNT COMBINATION STARTER/ DISCONNECT SWITCHS. COORDINATE DEVICES LOCATIONS WITH ARCHITECT PROIR TO ROUGH-IN AND INSTALLATION.
3. MAINTAIN MINIMUM 36" CLEARANCE FROM HVAC EQUIPMENT.



(FOR MINI-SPLITS ONLY)
1 / E4.1 CURB MOUNTED EQUIPMENT
SCALE: NOT TO SCALE

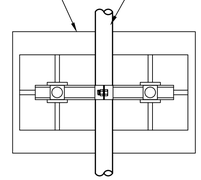
MAPA PRODUCTS MODEL MS-10SA7 STRUT CONDUIT SUPPORT. PROVIDE LARGER SUPPORT AS REQUIRED FOR MULTIPLE CONDUIT INSTALLATIONS. INSTALL PER MANUFACTURERS RECOMMENDATIONS.

NOTE:

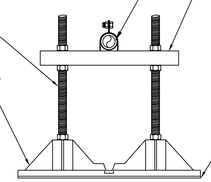
ALL EXPOSED CONDUIT ON ROOF SHALL BE RIGID GALVANIZED STEEL (HEAVY WALL) CONDUIT

NOTE:

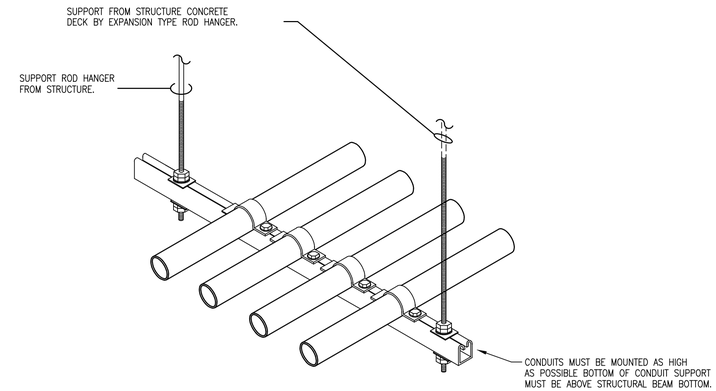
PROVIDE A SUPPORT ON EACH CHANGE IN DIRECTION AND AT 6'-0" ON CENTERS.



TOP



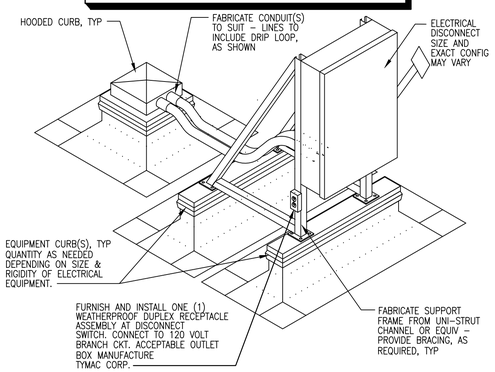
2 / E4.1 ELECTRICAL CONDUIT SUPPORT ON ROOF
SCALE: NOT TO SCALE



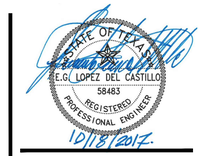
3 / E4.1 TYPICAL CONDUIT SYSTEM SUPPORT INSTALLATION DETAIL
SCALE: NOT TO SCALE

GENERAL NOTES:

1. ALL ROOF PENETRATIONS SHALL BE COORDINATED WITH ARCHITECT AND ROOFING CONTRACTOR PRIOR TO ANY WORK. ALL PENETRATIONS SHALL BE SEALED AS DIRECTED BY ARCHITECT & ROOFING CONTRACTOR. ALL FLASHING SHALL BE PERFORMED AS DIRECTED BY ARCHITECT & ROOFING CONTRACTOR



ROOFTOP MOUNTED
4 / E4.1 DISCONNECT SWITCH
SCALE: NOT TO SCALE



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Drawing Name
ELECTRICAL DETAILS

Sheet No.
E4.1

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EXISTING PANELBOARD "EL2A" SCHEDULE

Panel: 3ø, 4W, 208/120V — Location: STORAGE RM 250 — NEMA: 1 — ISCR: – — SURFACE [X] — 100 A. M.L.O.

Ckt. No.	Circuit Use	C.B.	VA Load/ Phase A	B	C	C.B.	Circuit Use	Ckt. No.
1	RECEPTS	20/1	1280 1440			20/1	RECEPTS	2
3	RECEPTS	20/1		1440 1260		20/1	RECEPTS	4
5	RECEPTS	20/1			1080 960	20/1	RECEPTS	6
7	RECEPTS (3)	20/1	540			20/1	SPARE	8
9	SPARE	20/1		–		20/1	SPARE	10
11	SPARE	20/1			–	20/1	SPARE	12
13	SPACE	–	–			–	SPACE	14
15	SPACE	–		–		–	SPACE	16
17	SPACE	–			–	–	SPACE	18
19	SPACE	–	–			–	SPACE	20
21	SPACE	–		–		–	SPACE	22
23	SPACE	–			–	–	SPACE	24
25	SPACE	–	2080			30/2	CU-S3 (2)	26
27	CU-S1 (1)	30/2		2080 2080				28
29					2080 696	15/1	F-3	30
			–	–	–		Total In KVA	

EXISTING PANELBOARD "EH2A" SCHEDULE

Panel: 3ø, 4W, 480/277V — Location: ELEC RM 150 — NEMA: 1 — ISCR: – — SURFACE [X] — 100 A. M.L.O.

Ckt. No.	Circuit Use	C.B.	VA Load/ Phase A	B	C	C.B.	Circuit Use	Ckt. No.
1	AHU-1	20/3	3047 2170			20/1	LTG	2
3				3047 696		20/1	FPB-11 (FAN)	4
5					3047 696	20/1	FPB-12 (FAN)	6
7	FPB-13 (FAN)	15/1	696 528			20/1	FPB-16 (FAN)	8
9	FPB-14 (FAN)	15/1		528 864		20/1	FPB-17 (FAN)	10
11	FPB-15 (FAN)	15/1			528 528	20/1	FPB-18 (FAN)	12
13	FPB-19 (FAN)	15/1	696 –			1P	SPACE	14
15	SPACE	1P		–		1P	SPACE	16
17	SPACE	1P			–	1P	SPACE	18
19	SPACE	1P	–			1P	SPACE	20
21	SPACE	1P		–		1P	SPACE	22
23	SPACE	1P			–	1P	SPACE	24
25	SPACE	1P	–			1P	SPACE	26
27	SPACE	1P		–		1P	SPACE	28
29	SPACE	1P			–	1P	SPACE	30
			–	–	–		Total In KVA	

EXISTING PANELBOARD "EL1B" SCHEDULE

Panel: 3ø, 4W, 208/120V — Location: STORAGE RM 250 — NEMA: 1 — ISCR: – — SURFACE [X] — 100 A. M.L.O.

Ckt. No.	Circuit Use	C.B.	VA Load/ Phase A	B	C	C.B.	Circuit Use	Ckt. No.
1	TELEPHONE BACKBOARD	20/1	1000 1000			20/1	911 DISPATCH	2
3	TELEPHONE BACKBOARD	20/1		1000 1000		20/1	911 DISPATCH	4
5	911 DISPATCH	20/1			1000 1000	20/1	911 DISPATCH	6
7	DISPATCH	20/1	720 500			20/1	DOOR CTRL PNL	8
9	VIDEO CONTROLS	20/1		500 500		20/1	VIDEO CONTROLS	10
11	DOOR RELAY	20/1			500 500	20/1	INTERCOM	12
13	INTERCOM RELAY CABINET	20/1	500 500			20/1	SECURITY CAMERA	14
15	TEMPORARY SPOT COOLER	30/2		1639 1639		30/2	TEMPORARY SPOT COOLER	16
17	(6)				1639 1639		(6)	18
19	SPARE	20/1	–			20/1	SPARE	20
21	CU-S2	30/2		2080 –		60/2	EXISTING LOAD	22
23					2080 –			24
			–	–	–		Total In KVA	

KEYED NOTES

1. REMOVE EXISTING 25 AMP 2-POLE BREAKER AND REPLACE WITH A 30 AMP 2-POLE BREAKER.
2. NEW 30 AMP 2-POLE BREAKER IN EXISTING AVAILABLE SPACE.
3. CONNECT NEW CIRCUITRY TO EXISTING SPARE CIRCUIT BREAKER.
4. REMOVE EXISTING 70 AMP 3-POLE BREAKER AND REPLACE WITH A 60 AMP 3-POLE BREAKER.
5. REMOVE EXISTING 150 AMP 3-POLE BREAKER AND REPLACE WITH A 125 AMP 3-POLE BREAKER.
6. REMOVE EXISTING SINGLE POLE 20 AMP SPARE CIRCUIT BREAKERS AND INSTALL A 30 AMP 2 POLE CIRCUIT BREAKER IN THE SPACES INDICATED.

LINETYPE LEGEND	
———	INDICATES EXISTING EQUIPMENT & CIRCUITING TO REMAIN.
———	INDICATES NEW EQUIPMENT AND CIRCUITING.

GENERAL NOTES:

1. AIC RATINGS OF NEW BREAKERS SHALL MATCH AIC RATING OF CORRESPONDING PANELBOARD.

EXISTING PANELBOARD "EH1A" SCHEDULE

Panel: 3ø, 4W, 480/277V — Location: ELEC RM 150 — NEMA: 1 — ISCR: – — SURFACE [X] — 600 A. M.L.O.

Ckt. No.	Circuit Use	C.B.	VA Load/ Phase A	B	C	C.B.	Circuit Use	Ckt. No.
1	LTG	20/1	3770 30761			125/3	RTU-1 (5)	2
3	FPB-6 (FAN)	15/1		6914 30761				4
5	DISPATCH	20/1			6914 30761			6
7	CU-1 (4)	60/3	15484			20/1	EXTERIOR LTG	8
9				15484 –		20/1	SPARE	10
11					15484	20/1	SPARE	12
13	SPARE	20/1	–			1P	SPACE	14
15	SPARE	20/1		–		1P	SPACE	16
17	SPARE	20/1			7287	30/3	XFMR ET2	18
19	ELEVATOR	70/3	9418 3287					20
21				9418 3287				22
23					9418 5871	60/3	PANEL EH2A	24
25	FPB-7 (HEAT)	25/3	4667 5871					26
27				4667 5871				28
29					4667 864	15/1	FPB-7 (FAN)	30
31	SALLY PORT OVERHEAD DOOR	15/3	8310 8800			25/3	FPB-6 (HEAT)	32
33				1330 5000				34
35					1330 5000			36
37	SALLY PORT OVERHEAD DOOR	15/3	1330 8610			50/3	XFMR ET-1	38
39				1330 8610				40
41					1330 8610			42
			–	–	–		Total In KVA	

EXISTING PANELBOARD "EL1A" SCHEDULE

Panel: 3ø, 4W, 208/120V — Location: ELEC RM 150 — NEMA: 1 — ISCR: – — SURFACE [X] — 100 A. M.C.B.

Ckt. No.	Circuit Use	C.B.	VA Load/ Phase A	B	C	C.B.	Circuit Use	Ckt. No.
1	RECEPTS	20/1	1440 1000			20/1	RADIO RM	2
3	RECEPTS	20/1		1440 1000		20/1	RADIO RM	4
5	RECEPTS	20/1			1440 1000	20/1	RADIO RM	6
7	FSD'S	20/1	696 500			20/1	FACP	8
9	GEN ANNUNCIATOR PNL	20/1		500 500		20/1	VENT CTRL PNL	10
11	DIRECT DIGITAL SYSTEM	20/1			500	20/1	SPARE	12
13	SPARE	20/1	–			20/1	SPARE	14
15	SPARE	20/1		–		20/1	SPARE	16
17	SPARE	20/1			–	1P	SPACE	18
19	SPACE	1P	–			1P	SPACE	20
21	SPACE	1P		–		1P	SPACE	22
23	SPACE	1P			–	1P	SPACE	24
25	SPACE	1P	–			1P	SPACE	26
27	FC-1	15/2		65 –		1P	SPACE	28
29					65 5277	60/3	PANEL EL2A	30
31	FC-2	15/3	257 3277					32
33				257 3277				34
35					257 696	15/1	F-4	36
37	PTU-1	30/1	2882 257			15/3	F-1	38
39				2882 257				40
41					2882 257			42
			–	–	–		Total In KVA	

EXISTING PANELBOARD "H2A" SCHEDULE

Panel: 3ø, 4W, 480/277V — Location: STORAGE RM 225 — NEMA: 1 — ISCR: – — SURFACE [X] — 225 A. M.L.O.

Ckt. No.	Circuit Use	C.B.	VA Load/ Phase A	B	C	C.B.	Circuit Use	Ckt. No.
1	LTG	20/1	2870 2310			20/1	LTG	2
3	LTG	20/1		2240 5000		25/3	FPB-8 & FPB-9 (HEAT)	4
5	LTG	20/1			2940 5000			6
7	FPB-14,FPB-15,FPB-16 (HEAT)	25/3	5000 5000					8
9				5000 5000		25/3	FPB-10 & FPB-11 (HEAT)	10
11					5000 5000			12
13	FPB-10 (FAN)	15/1	696 8000					14
15	FPB-17 (HEAT)	25/3		4667 5333		25/3	FPB-12 & FPB-13 (HEAT)	16
17					4667 5333			18
19			4667 5333					20
21	FPB-18 & FPB-19 (HEAT)	20/3		3667 –		15/1	FBP-9 (FAN)	22
23					3667	15/1	FBP-8 (FAN)	24
25			3667			15/3	AHU-2	26
27	FPB-20 (HEAT)	20/3		3667 –				28
29					3667			30
31			3667 –			15/1	FPB-20 (FAN)	32
33	EWH-1	30/3		8000 –		20/1	SPARE	34
35					8000	20/1	SPARE	36
37			8000 –			1P	SPACE	38
39	SPARE	20/1		–		1P	SPACE	40
41	SPARE	20/1			–	1P	SPACE	42
			–	–	–		Total In KVA	

ELECTRICAL DESIGN LOAD SUMMARY
208/120 VOLT, 3ø, 4W
PANEL EL2A – 100 AMPS

LOAD SERVED	CONNECTED LOAD (KVA)	DEMAND LOAD (KVA)
EXISTING LOAD:	15.1	15.1
LOADS ADDED:		
MINI SPLIT HVAC UNIT:	8.3	8.3
RECEPTS:	.5	.5
TOTAL:	23.9	23.9

THE EXISTING 100 AMP PANEL WILL SUPPORT THE ADDED LOADS.

EXISTING PANELBOARD "H1A" SCHEDULE

Panel: 3ø, 4W, 480/277V — Location: ELEC RM 150 — NEMA: 1 — ISCR: – — SURFACE [X] — 225 A. M.L.O.

Ckt. No.	Circuit Use	C.B.	VA Load/ Phase A	B	C	C.B.	Circuit Use	Ckt. No.
1	LTG	20/1	2455 2100			20/1	LTG	2
3	LTG	20/1		2765 1020		20/1	LTG	4
5	LTG	20/1			2400 4000	20/3	TU-1	6
7	TU-2	15/3	2333 4000					8
9				2333 4000				10
11					2333 3333	20/3	TU-5	12
13	TU-3 & TU-4	20/3	3333 3333					14
15				3333 3333				16
17					3333 1700	20/1	EXTERIOR LTG	18
19	TU-6	20/3	2333 2210			20/1	EXTERIOR LTG	20
21				2333 2250		20/1	EXTERIOR LTG	22
23					2333 2700	20/1	EXTERIOR LTG	24
25	SPACE	1P	–			1P	SPACE	26
27	SPACE	1P		–		1P	SPACE	28
29	SPACE	1P			–	1P	SPACE	30
31	SPACE	1P	–			1P	SPACE	32
33	SPACE	1P		–		1P	SPACE	34
35	SPACE	1P			–	1P	SPACE	36
37	SPACE	1P	–			1P	SPACE	38
39	SPACE	1P		–		1P	SPACE	40
41	SPACE	1P			–	1P	SPACE	42
			–	–	–		Total In KVA	

EXISTING PANELBOARD "H1B" SCHEDULE

Panel: 3ø, 4W, 480/277V — Location: ELEC RM 150 — NEMA: 1 — ISCR: – — SURFACE [X] — 225 A. M.L.O.

Ckt. No.	Circuit Use	C.B.	VA Load/ Phase A	B	C	C.B.	Circuit Use	Ckt. No.
1	FPB-1 (FAN)	15/1	696 2333			15/3	FPB-1 (HEAT)	2
3	FPB-2 (FAN)	15/1		696 2333				4
5	FPB-3 (FAN)	15/1			1587 2333			6
7	FPB-3 (HEAT)	30/3	5667 3333			15/3	FPB-2 (HEAT)	8
9				5667 3333				10
11					5667 3333			12
13	FPB-4 (FAN)	15/1	696 2333			15/3	FPB-4 (HEAT)	14
15	FPB-5 (HEAT)	15/3		3333 2333				16
17					3333 2333			18
19			3333 696			15/1	FPB-5 (FAN)	20
21	SPACE	1P		–		1P	SPACE	22
23	SPACE	1P			–	1P	SPACE	24
25	SPACE	1P	–			1P	SPACE	26
27	SPACE	1P		–		1P	SPACE	28
29	SPACE	1P			–	1P	SPACE	30
31	SPACE	1P	–			1P	SPACE	32
33	SPACE	1P		–		1P	SPACE	34
35	SPACE	1P			–	1P	SPACE	36
37	SPACE	1P	–			1P	SPACE	38
39	SPACE	1P		–		1P	SPACE	40
41	SPACE	1P			–	1P	SPACE	42
			–	–	–		Total In KVA	

EXISTING MAIN DISTRIBUTION BOARD HMDP

PROJECT NAME: BALCONIES HEIGHTS — MAINS: 800A MCB — DATE : 1/25/00
PROJECT NUMBER: 90501 — TYPE PNL: CCB — VOLTAGE : 480Y/277V, 3PH,4W
LOCATION: ELEC 150 — MOUNTING: SURFACE — BRACING : 65000 RMS AMPS SYMMETRICAL

CKT	SERVES	LOAD KVA	LOAD AMPS	PROTECTIVE DEVICE FRAME	POLE	TRIP	TYPE	CONDUIT SIZE	WIRE SIZE	NOTES
1	PANEL H1A	72	86	200	3	150	CB			
2	XFMR TI – PNL L1A	39	46	100	3	70	CB			
3	AT-1-PNL EH1A	283	341	600	3	500	CB			
4	TVSS			100	3	60	CB			
5	PANEL H2A	140	169	225	3	225	CB			
6	CU-2	42	50	60	3	60	CB			
7	PANEL H1B	55	67	100	3	100	CB			
8	SPACE			225	3	225				
9	SPACE			100	3	100				
10	SPACE			100	3	100				

STATE OF TEXAS — E.G. LOPEZ DEL CASTILLO — 58483 — REGISTERED PROFESSIONAL ENGINEER
10/18/2017

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BALCONES HEIGHTS JUSTICE CENTER / CITY HALL HVAC REPLACEMENT
3300 HILLCREST DR
BALCONES HEIGHTS, TX. 78201

Revisions:

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Drawing Name
PANELBOARD SCHEDULES

Sheet No.
E5.1

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MECHANICAL LEGEND

(NOTE: ALL SYMBOLS SHOWN ARE NOT NECESSARILY USED ON DRAWINGS)

SYMBOL LEGEND

DUCTWORK

- DUCTWORK SIZE, 1st NO. VISIBLE DIMENSION
- DUCTWORK TURNING VANES
- BRANCH DUCT TAKEOFF
- DUCT TEE
- TRANSITION (RECTANGULAR)
- TRANSITION (RECTANGULAR TO ROUND)
- FLEXIBLE DUCT
- FLEXIBLE CONNECTION
- VOLUME DAMPER
- FIRE DAMPER OR SMOKE DAMPER
- SUPPLY DUCT SECTION RECTANGULAR, FLAT, OVAL, ROUND
- RETURN/EXHAUST/OUTSIDE AIR DUCT SECTION
- SIDEWALL GRILLE OR REGISTER (SUPPLY)
- SIDEWALL GRILLE OR REGISTER (RETURN OR EXHAUST)
- CEILING GRILLE OR REGISTER (SUPPLY)
- CEILING GRILLE OR REGISTER (EXHAUST OR RETURN)
- SD — SMOKE DETECTOR
- T — TIMECLOCK OR TIME CONTROLLER
- H — HUMIDISTAT
- T — THERMOSTAT
- R — CHANGE IN ELEVATION (R), (F)
- HEPA FILTER MODULE
- DIRECTION OF FLOW
- CD — CONDENSATE DRAIN
- P – TRAP
- FLANGE CONNECTION
- DROP AT 45° ANGLE
- ELBOW TURNING DOWN
- ELBOW TURNING UP
- CAPPED PIPE
- SLOPE — DIRECTION OF SLOPE (DNWARD)
- EX / 150 — EXISTING DIFFUSER; CFM (IN THIS CASE 150 CFM)

GENERAL NOTES

1. THESE GENERAL NOTES APPLY TO ALL SHEETS
2. IN ANY CASE WHERE A PIPE OR DUCT SHOWN ON A PLAN SHEET DIFFERS FROM THAT SHOWN IN A SCHEMATIC OR DETAIL, USE THE LARGER OF THE TWO SIZES SHOWN.
3. PIPING SHOWN ON EACH PLAN IS RUN ABOVE THE CEILING ON THE FLOOR WHERE IT IS SHOWN UNLESS OTHERWISE NOTED.
4. MOUNT THERMOSTATS 48 INCHES ABOVE FINISHED FLOOR AND CENTERED ABOVE THE LIGHT SWITCHES WHERE BOTH OCCUR IN THE SAME LOCATION, UNLESS OTHERWISE NOTED.
5. NORMAL DESIGN CONDITIONS:

	OUTSIDE	INSIDE
SUMMER:	98 °F db, 78 °F wb	75 °F db, 50% RH
WINTER:	20 °F db	75 °F db

6. ALL DUCT DIMENSIONS SHOWN ARE CLEAR AIRSTREAM DIMENSIONS.
7. DO NOT RUN AIR HANDLERS OR EXHAUST FANS UNTIL ALL INTERIOR CLEANING AND PAINTING IS COMPLETE. THE CLEANING OF FOULED COILS OR FAN ASSEMBLIES DUE TO PAINT OR CONSTRUCTION DEBRIS WILL BE THE RESPONSIBILITY OF THE HVAC CONTRACTOR.
8. CONTRACTOR SHALL COMPLY WITH ORDINANCE NO. 20100408-051 AND 25-12-263 LOCAL AMENDMENTS TO THE ENERGY CODE.

ABBREVIATIONS

A	AW	ACID WASTE
	AV	ACID VENT
	A_R	ARGON
	A	MED. COMPRESSED AIR
B	B. VA.	BALL VALVE
	BAL. VA.	CKT. SETTER BALANCING VALVE
C	CA	COMPRESSED AIR (SHOP)
	CHS	CHILLED WATER SUPPLY
	CHR	CHILLED WATER RETURN
	CO	CLEANOUT
	CW	DOM. COLD WTR. (POTABLE)
D	DW	DISTILLED WATER
	DIW	DEIONIZED WATER LINE
	D	CONDENSATE DRAIN LINE
E	EOD	EMERGENCY OVERFLOW DRAIN
	EXT FCO	EXTERIOR FLOOR CLEANOUT
F	FS	FIRE SPRINKLER
	FCO	FLOOR CLEANOUT
	F	FIRE LINE (BUILDING MAIN)
	FD (OR) SD	FIRE / SMOKE DAMPER
G	GT. V	GATE VALVE
	GL. V	GLOBE VALVE
	G	NATURAL GAS
H	HPG	HIGH PRESSURE NATURAL GAS
	HW	DOMESTIC HOT WATER 140°F
	HWS	HEATING WATER SUPPLY
	HWR	HEATING WATER RETURN
	He	HELIUM
	H_2	HYDROGEN
M	MVD	MOTORIZED VOLUME DAMPER
N	NPW	NON-POTABLE WATER (COLD)
	NPHW	NON-POTABLE WATER (HOT)
	N_2	NITROGEN
	N_2O	NITROUS OXIDE
O	O_2	OXYGEN
	OA, RA, EXH	O.A.,R.A. EXH. AIR DUCT
P	PRV	PRV RELIEF VENT
	PW	DOMESTIC COLD WATER
	PRV	PRESSURE REDUCING VALVE
	PI	PRESSURE INDICATOR (GAUGE)
R	RED.	REDUCER
S	150#S	STEAM SUPPLY – 150 PSIG
	80#S	STEAM SUPPLY – 80 PSIG
	35#S	STEAM SUPPLY – 35 PSIG
	SAN	SOIL & WASTE (ABOVE GRADE)
	SD	STORM DRAIN
T	TI	TEMP. INDICATOR (THERMOMETER)
	T.&P.	TEMP. & PRESS. RELIEF VALVE
V	VAC	VACUUM
	VD	VOLUME DAMPER
	VTR	VENT THRU ROOF
	V	SANITARY VENT
W	WHA	WATER HAMMER ARRESTOR
	WCO	WALL CLEANOUT

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Drawing Name
MECHANICAL SYMBOLS LEGEND

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M1.0

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AIR HANDLING UNIT SCHEDULE

MARK	LOCATION	TYPE	TOTAL AIR	OUTSIDE AIR	EXTERNAL STATIC PRESSURE	ELECTRICAL				COOLING COIL (DX)						REMARKS	PRE-WIRED LIGHTS/RECEPTACLES TO JUNCTION BOX	VFD	EMERGENCY POWER
						MOTOR HORSEPOWER	V/PH/HZ	MCA	MCB	COIL CFM	MIN SENSIBLE CAPACITY	MIN TOTAL CAPACITY	MINIMUM ROWS	MINIMUM FACE AREA	EDB / EWB				
AHU-1	MECHANICAL ROOM 219	VERTICAL DRAW-THROUGH	7,250 CFM	920 CFM	3.54 inWG	10	460/3/60	15.4 A	25 A	7,250 CFM	193,800 BTUh	275,480 BTUh	6	14.9 FT^2	80 °F / 67 °F	CARRIER, MODEL # 39L; INTERLOCK WITH OAH-1	NO	●	
AHU-2	MECHANICAL ROOM 219	VERTICAL DRAW-THROUGH	4,300 CFM	1,850 CFM	3.16 inWG	7.5	460/3/60	11.8 A	20 A	4,300 CFM	147,570 BTUh	227,660 BTUh	4	9.5 FT^2	86 °F / 70 °F	CARRIER, MODEL # 39L; INTERLOCK WITH OAH-2	NO	●	

OUTDOOR CONDENSING UNIT SCHEDULE

MARK	MINIMUM CAPACITY	REFRIGERANT	ELECTRICAL			MINIMUM SEER	COMPRESSOR		CONDENSER		REMARKS
			V/PH/HZ	MCA	MCB		NO.	MAXIMUM SUCTION TEMPERATURE	MAXIMUM CONDENSING TEMPERATURE	AMBIENT TEMPERATURE	
CU-1	267,100 BTUh	R-410A	460 / 3 / 60	48.5 A	60 A	11.0	2	45 °F	135 °F	105 °F	CARRIER, MODEL # 38APD
CU-2	267,100 BTUh	R-410A	460 / 3 / 60	48.5 A	60 A	11.0	2	45 °F	135 °F	105 °F	CARRIER, MODEL # 38APD

ROOF TOP AIR CONDITIONING UNIT SCHEDULE (ELECTRIC HEAT)

MARK	SERVICE	TOTAL AIR	OUTSIDE AIR		EXTERNAL STATIC PRESSURE	CONDENSER ENTERING AIR TEMPERATURE	ELECTRICAL			COOLING COIL (DX)						HEATING COIL (ELECTRIC)							REFRIGERANT	MINIMUM SEER / IEER / EER ● AHRI	UNIT WEIGHT	UNIT DIMENSIONS			REMARKS	EMERGENCY POWER
			FLOW	PERCENTAGE			V/PH/HZ	MCA	MCB	COIL FLOW	MINIMUM SENSIBLE CAPACITY	MINIMUM TOTAL CAPACITY	EDB / EWB	LDB / LWB (UNIT DISCHARGE)	COMPRESSOR COUNT	COIL FLOW	MINIMUM FACE AREA	MINIMUM ROWS	HEATING ENERGY	V/PH/HZ	MINIMUM CAPACITY	EAT				LENGTH	WIDTH	HEIGHT		
RTU-1	LEVEL 2 VAVs	11,300 CFM	2,810 CFM	25%	3.0 inWG	105 °F	460/3/60	111 A	125 A	11,300 CFM	319,870 BTUh	510,210 BTUh	82 °F / 69 °F	55.8 °F / 54.8 °F	4	11,300 CFM			36 KW	460/3/60		68 °F	R-410A	– / 12.1 / 10	5750 LBS	17' 11"	7' 10"	6' 1"	CARRIER, MODEL # 50A3B050	

INCLUDE WITH ALL RTU'S EXCEPT AS SPECIFICALLY NOTED BELOW

(1) APPROVED MANUFACTURER'S ARE TRANE, LENNOX, AND CARRIER.
(2) CONDENSER HAIL GUARDS – BY UNIT MANUFACTURER.
(3) NON-FUSED DISCONNECT SWITCH AND THROUGH BASE ELECTRICAL OPTION – BY UNIT MANUFACTURER.
(4) PROVIDE RTU WITH 120V GFCI OUTLET – ELECTRICAL CONTRACTOR SHALL PROVIDE SEPARATE 120V/20 AMP CIRCUIT.
(5) SINGLE POINT ELECTRICAL CONNECTION.
(6) ECONOMIZERS – BY UNIT MANUFACTURER.
(7) BAROMETRIC RELIEF DAMPERS – BY UNIT MANUFACTURER.
(8) 1 YEAR PARTS AND LABOR WARRANTY BY MANUFACTURER AFTER SUBSTANTIAL COMPLETION AND 5 YEAR COMPRESSOR WARRANTY AFTER SUBSTANTIAL COMPLETION.
(9) VFD EQUIPPED FROM MANUFACTURER. VFD BY ABB.
(10) LOW AMBIENT COOLING DOWN TO 0°F.
(11) HOT GAS REHEAT AND DEHUMIDIFICATION CONTROL. PROVIDE HUMIDITY SENSOR ON WALL – BY UNIT MANUFACTURER AND INSTALLED BY MECHANICAL CONTRACTOR.
(12) 2" – MERV 8 FILTER.
(13) DRAIN OVERFLOW SWITCH – BY UNIT MANUFACTURER.
(14) IAQ SLOPING DRAIN PAN WITH BOTTOM CONNECTION FOR CONDENSATE PIPING WITHIN BUILDING.
(15) OUTSIDE AIR HOOD – BY UNIT MANUFACTURER.
(16) 2 COMPRESSORS OR A 2 SPEED COMPRESSOR – BY UNIT MANUFACTURER.
(17) HINGED ACCESS DOORS FOR COMPRESSOR, FAN, AND FILTER SECTIONS.
(18) OUTSIDE AIR CONDITIONS FOR MIXED AIR CALCULATIONS ARE: 98 °F DB / 78 °F WB.

SINGLE DUCT TERMINAL SCHEDULE

MARK	DESIGN AIR FLOW		STATIC PRESSURE DIFFERENTIAL	INLET SIZE	ENTERING AIR TEMPERATURE	ELECTRICAL CHARACTERISTICS		HEATING CHARACTERITICS			REMARKS
	MINIMUM	MAXIMUM				VOLTS / PHASE / HERTZ	HEATING ENERGY	FLOW	CAPACITY	STAGES	
TU-1	900	900	0.5" WC	10"ø	55 °F	480 / 3 / 60	12 KW	900 CFM	40,950 BTU/H	3	CARRIER ----- [1], [2]
TU-2	900	580	0.5" WC	10"ø	55 °F	480 / 3 / 60	7 KW	580 CFM	22,885 BTU/H	2	CARRIER ----- [1], [2]
TU-3	575	345	0.5" WC	8"ø	55 °F	480 / 3 / 60	4 KW	345 CFM	13,645 BTU/H	1	CARRIER ----- [1], [2]
TU-4	540	900	0.5" WC	10"ø	55 °F	480 / 3 / 60	6 KW	540 CFM	20,470 BTU/H	2	CARRIER ----- [1]
TU-5	1,770	1,062	0.5" WC	14"ø	55 °F	480 / 3 / 60	9 KW	1062 CFM	30,705 BTU/H	2	CARRIER ----- [1], [2]
TU-6	560	560	0.5" WC	8"ø	55 °F	480 / 3 / 60	7 KW	560 CFM	22,885 BTU/H	2	CARRIER ----- [1], [2]

[1] PROVIDE EACH UNIT WITH WITH 1/2" FOIL-FACED INSULATION, CONTROLS TRANSFORMER, POWER DISCONNECT, ACCESS PANEL, DDC ZONE SENSOR, AIRFLOW SWITCH, TOTAL AIRFLOW SENSOR, PRIMARY AIRFLOW SENSOR, NIGHT SET BACK, AND HANGER BRACKETS. ALL SINGLE-DUCT VAV BOXES ARE TO BE INTERLOCKED WITH THEIR RESPECTIVE AHU TO SHUT DOWN UPON SMOKE DETECTION. ELECTRICAL CONTRACTOR TO PROVIDE POWER TO EACH SINGLE-DUCT VAV BOX AS SCHEDULED.
[2] MAX/MIN CFM, INLET SIZE, HEAT KW, VOLTAGE, AND STAGES OF HEAT WERE NOT VERIFIED FOR ALL OF THE TU'S. CONTRACTOR SHALL VERIFY BEFORE SUBMITTING THE TU'S.

MINI-SPLIT CONDENSING UNIT SCHEDULE (COOLING ONLY)

MARK	MINIMUM CAPACITY	REFRIGERANT	MINIMUM SEER	ELECTRICAL			COMPRESSOR		CONDENSER		REMARKS	EMERGENCY POWER
				V/PH/HZ	MCA	MCB	QTY	MAXIMUM SUCTION TEMPERATURE	MAXIMUM CONDENSING TEMPERATURE	AMBIENT TEMPERATURE		
CU-S1	24,000 BTUh	R-410A	20.5	208 / 1 / 60	20 A	30 A	1	45 °F	135 °F	105 °F	CARRIER, MODEL # 38MAQB24R	●
CU-S2	24,000 BTUh	R-410A	20.5	208 / 1 / 60	20 A	30 A	1	45 °F	135 °F	105 °F	CARRIER, MODEL # 38MAQB24R	
CU-S3	24,000 BTUh	R-410A	19.8	208 / 1 / 60	20 A	30 A	1	45 °F	135 °F	105 °F	CARRIER, MODEL # 38MAQB24R	

(1) PROVIDE UNIT WITH FAN AND CONDENSER HAIL GUARDS
(2) PROVIDE UNIT WITH SINGLE-POINT ELECTRICAL CONNECTION FOR COMBINED POWER TO INDOOR AND OUTDOOR UNIT (WIRING BETWEEN UNITS BY ELECTRICAL CONTRACTOR)
(3) PROVIDE UNIT WITH LOW AMBIENT CONTROL.
(4) HEATING WILL NOT BE UTILIZED. LOCK OUT HEATING.

MINI-SPLIT FAN COIL UNIT SCHEDULE (COOLING ONLY)

MARK	MAXIMUM COIL FLOW	STATIC PRESSURE	V/PH/HZ	COOLING CHARACTERISTICS		REMARKS	EMERGENCY POWER
				MINIMUM TOTAL CAPACITY	REFRIGERANT		
FCU-S1	870 CFM	1.0 inWG	208 / 1 / 60	24,000 BTUh	R-410A	CARRIER, MODEL # 40MAQB24B	●
FCU-S2	870 CFM	1.0 inWG	208 / 1 / 60	24,000 BTUh	R-410A	CARRIER, MODEL # 40MAQB24B	
FCU-S3	870 CFM	1.0 inWG	208 / 1 / 60	24,000 BTUh	R-410A	CARRIER, MODEL # 40MAQB30B	

(1) PROVIDE UNIT WITH CONDENSATE PUMP.
(2) CONTRACTOR TO VERIFY LENGTH OF REFRIGERANT PIPING ROUTED BETWEEN INDOOR AND OUTDOOR UNITS, AND PROVIDE ADDITIONAL REFRIGERANT AS NECESSARY TO ENSURE SCHEDULED CAPACITIES ARE MET.
(4) HEATING WILL NOT BE UTILIZED. LOCK OUT HEATING.

PACKAGED TERMINAL UNIT SCHEDULE

MARK	LOCATION	TOTAL AIR	OUTSIDE AIR	EXTERNAL STATIC PRESSURE	MINIMUM EER / SEER	ELECTRICAL				COOLING COIL (DX)					HEATING COIL (ELECTRIC)					REMARKS
						MOTOR HORSEPOWER	V/PH/HZ	MCA	MCB	COIL FLOW	MIN SENSIBLE CAPACITY	MIN TOTAL CAPACITY	EDB / EWB	MAXIMUM CONDENSING TEMPERATURE	COIL FLOW	HEATING ENERGY	V/PH/HZ	MINIMUM CAPACITY	EDB	
PTU-1	RADIO EQUIPMENT # 151 (EXTERIOR)	1,260 CFM	0	0.8" WG	11.4 / 15.1	1/3	208 / 3 / 60	24	30	1,260 CFM	26,561	33,157 BTU/H	78 °F / 65 °F	105 °F	1,1260 CFM	6 KW	208/3/60	15,359 BTU/H	70 °F	BARD, MODEL # W36AA

PROVIDE THE FOLLOWING WITH THE PACKAGED TERMINAL UNIT:
(1) PROVIDE UNIT WITH SUPPLY AIR GRILLE AND RETURN AIR GRILLE.
(2) 1" FIBERGLASS
(3) FRONT OUTLET
(4) HIGH PRESSURE, LOW PRESSURE, COMPRESSOR CONTROL MODULE.
(5) TEMPERATURE AND HUMIDITY CONTROL PROGRAMMABLE THERMOSTAT 8403-060

FAN-POWERED TERMINAL UNIT SCHEDULE

MARK	PRIMARY AIR FLOW		INTERMITTENT FAN CHARACTERISTICS				HEATING COIL CHARACTERISTICS			INLET SIZE	STAGES	REMARKS
	MINIMUM	MAXIMUM	FLOW	EXTERNAL STATIC PRESSURE	VOLTS / PHASE / HERTZ	HP	MINIMUM CAPACITY	VOLTS / PHASE / HERTZ	HEATING ENERGY			
FPB-1	380 CFM	780 CFM	780 CFM	0.5" WC	277 / 1 / 60	1/4	23,885 BTU/H	480 / 3 / 60	7 KW	8"ø	2	CARRIER 45JC [1]
FPB-2	500 CFM	1,035 CFM	1,035 CFM	0.5" WC	277 / 1 / 60	1/4	34,120 BTU/H	480 / 3 / 60	10 KW	10"ø	2	CARRIER 45JC [1]
FPB-3	1,080 CFM	1,790 CFM	1,790 CFM	0.5" WC	277 / 1 / 60	3/4	58,005 BTU/H	480 / 3 / 60	17 KW	12"ø	3	CARRIER 45JC [1]
FPB-4	365 CFM	750 CFM	750 CFM	0.5" WC	277 / 1 / 60	1/4	23,885 BTU/H	480 / 3 / 60	7 KW	8"ø	2	CARRIER 45JC [1]
FPB-5	500 CFM	1,035 CFM	1,035 CFM	0.5" WC	277 / 1 / 60	1/4	34,120 BTU/H	480 / 3 / 60	10 KW	10"ø	2	CARRIER 45JC [1]
FPB-6	825 CFM	1,500 CFM	1,500 CFM	0.5" WC	277 / 1 / 60	1/2	51,180 BTU/H	480 / 3 / 60	15 KW	12"ø	3	CARRIER 45JC [1]
FPB-7	880 CFM	1,500 CFM	1,500 CFM	0.5" WC	277 / 1 / 60	1/2	47,770 BTU/H	480 / 3 / 60	14 KW	12"ø	3	CARRIER 45JC [1]
FPB-8	365 CFM	750 CFM	750 CFM	0.5" WC	277 / 1 / 60	1/4	23,885 BTU/H	480 / 3 / 60	7 KW	8"ø	2	CARRIER 45JC [1]
FPB-9	465 CFM	800 CFM	800 CFM	0.5" WC	277 / 1 / 60	1/4	27,290 BTU/H	480 / 3 / 60	8 KW	8"ø	2	CARRIER 45JC [1]
FPB-10	540 CFM	900 CFM	900 CFM	0.5" WC	277 / 1 / 60	1/4	30,705 BTU/H	480 / 3 / 60	9 KW	10"ø	2	CARRIER 45JC [1]
FPB-11	540 CFM	900 CFM	900 CFM	0.5" WC	277 / 1 / 60	1/4	30,705 BTU/H	480 / 3 / 60	9 KW	10"ø	2	CARRIER 45JC [1]
FPB-12	465 CFM	800 CFM	800 CFM	0.5" WC	277 / 1 / 60	1/4	27,290 BTU/H	480 / 3 / 60	8 KW	8"ø	2	CARRIER 45JC [1]
FPB-13	485 CFM	860 CFM	860 CFM	0.5" WC	277 / 1 / 60	1/4	27,290 BTU/H	480 / 3 / 60	8 KW	10"ø	2	CARRIER 45JC [1]
FPB-14	300 CFM	500 CFM	500 CFM	0.5" WC	277 / 1 / 60	1/4	17,060 BTU/H	480 / 3 / 60	5 KW	8"ø	1	CARRIER 45JC [1]
FPB-15	465 CFM	775 CFM	775 CFM	0.5" WC	277 / 1 / 60	1/4	20,470 BTU/H	480 / 3 / 60	6 KW	8"ø	2	CARRIER 45JC [1]
FPB-16	225 CFM	430 CFM	430 CFM	0.5" WC	277 / 1 / 60	1/4	13,645 BTU/H	480 / 3 / 60	4 KW	6"ø	1	CARRIER 45JC [1]
FPB-17	880 CFM	1,500 CFM	1,500 CFM	0.5" WC	277 / 1 / 60	1/2	47,770 BTU/H	480 / 3 / 60	14 KW	12"ø	3	CARRIER 45JC [1]
FPB-18	365 CFM	750 CFM	750 CFM	0.5" WC	277 / 1 / 60	1/4	23,885 BTU/H	480 / 3 / 60	7 KW	8"ø	2	CARRIER 45JC [1]
FPB-19	225 CFM	430 CFM	430 CFM	0.5" WC	277 / 1 / 60	1/4	13,645 BTU/H	480 / 3 / 60	4 KW	6"ø	1	CARRIER 45JC [1]
FPB-20	700 CFM	1,170 CFM	1,170 CFM	0.5" WC	277 / 1 / 60	1/2	37,530 BTU/H	480 / 3 / 60	11 KW	12"ø	3	CARRIER 45JC [1]

[1] PROVIDE EACH UNIT WITH WITH 1/2" FOIL-FACED INSULATION, CONTROLS TRANSFORMER, POWER DISCONNECT, ACCESS PANEL, DDC ZONE SENSOR, AIRFLOW SWITCH, TOTAL AIRFLOW SENSOR, PRIMARY AIRFLOW SENSOR, NIGHT SET BACK, AND HANGER BRACKETS. ALL FAN-POWERED VAV BOXES ARE TO BE INTERLOCKED WITH THEIR RESPECTIVE AHU TO SHUT DOWN UPON SMOKE DETECTION. ELECTRICAL CONTRACTOR TO PROVIDE POWER TO EACH SINGLE-DUCT VAV BOX AS SCHEDULED.

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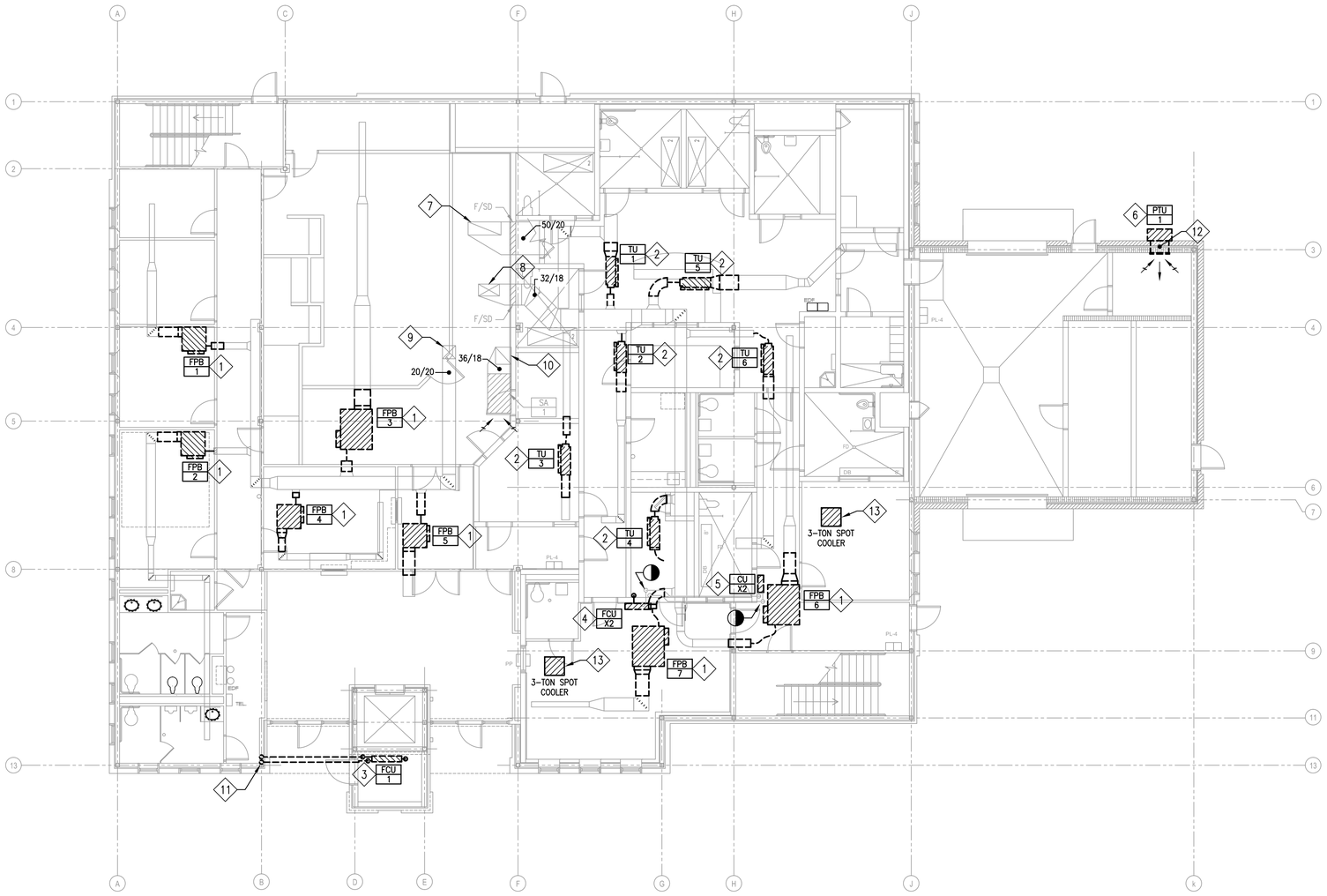
Drawing Name
MECH SCHEDULES

Sheet No.
M1.1



NORTH

1 M2.1 1ST FLOOR DEMOLITION PLAN – MECHANICAL

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

KEYED NOTES

1. REMOVE ALL FAN POWERED VAV BOXES AND A PORTION OF DUCT, (APPROXIMATELY 2 FEET) UP-STREAM AND DOWN-STREAM OF THE EXISTING BOX. THIS WILL FACILITATE THE REPLACEMENT OF THE EXISTING BOX WITH A NEW BOX.
2. REMOVE ALL SINGLE TERMINAL VAV BOXES AND A PORTION OF DUCT, (APPROXIMATELY 2 FEET) UP-STREAM AND DOWN-STREAM OF THE EXISTING BOX. THIS WILL FACILITATE THE REPLACEMENT OF THE EXISTING BOX WITH A NEW BOX.
3. REMOVE EXISTING MINI-SPLIT FAN COIL UNIT AND REFRIGERANT LINE SET.
4. REMOVE EXISTING MINI-SPLIT FAN COIL UNIT. EXISTING REFRIGERANT LINE SET TO REMAIN AND BE RE-USED.
5. REMOVE EXISTING MINI-SPLIT CONDENSING UNIT FROM ABOVE THE CEILING.
6. REMOVE EXISTING WALL UNIT.
7. 50/20 RETURN AIR UP TO AHU-1 ON LEVEL 2 ABOVE TO REMAIN.
8. 32/18 SUPPLY AIR UP TO AHU-1 ON LEVEL 2 ABOVE TO REMAIN.
9. 20/20 SUPPLY AIR UP TO AHU-2 ON LEVEL 2 ABOVE TO REMAIN.
10. 24/26 RETURN AIR UP TO AHU-2 ON LEVEL 2 ABOVE TO REMAIN.
11. DEMOLISH AND REMOVE EXISTING REFRIGERANT LINE SET FROM CU-3 ABOVE. REFER TO 1/M3.2 AND 1/M3.3 FOR CONTINUATION.
12. 28/8 SUPPLY AIR DUCT ABOVE AND 28/14 RETURN AIR DUCT BELOW TO BE DEMOLISHED AND REMOVED.
13. PROVIDE AND INSTALL TOPAZ MODEL #TZ-36A TEMPORARY 3-TON SPOT COOLER, (208-230V/1PH/60HZ, 1200 CFM, WITH A 5 GALLON CONDENSATE TANK).
    UNIT PHYSICAL CHARACTERISTICS: 30"L x 28"W x 51"H, 395 POUNDS.
    PROVIDE A 16"ø FLEX DUCT FROM THE CONDENSER EXHAUST INTO THE CEILING SPACE ABOVE.

PRE-AUDIT BALANCE REPORT NOTE:

MINI-SPLIT UNITS FCU-1/CU-3, FCU-X2/CU-X2, AND PACKAGED TERMINAL UNIT PTU-1 SHALL BE DEMOLISHED AND REPLACED AFTER THE PRE-AUDIT BALANCE TESTING IS CONDUCTED, BUT BEFORE COMMENCEMENT OF ANY OTHER DEMOLITION OR CONSTRUCTION WORK.

PRE-AUDIT BALANCE REPORT NOTE:

BEFORE COMENCING ANY DEMOLITION OR CONSTRUCTION WORK OF ANY KIND, THE CONTRACTOR SHALL CONDUCT A PRE-AUDIT OF THE EXISTING FACILITY HVAC SYSTEMS USING A TEST AND BALANCE CONTRACTOR. THIS AUDIT SHALL INCLUDE AIR FLOW MEASUREMENTS OF ALL SUPPLY AIR GRILLES THROUGH THE USE OF A FLOW HOOD, TRAVERSE MEASUREMENTS ON AIR HANDLER SUPPLY, RETURN AND OUTSIDE AIR DUCTS, AND TRAVERSE MEASUREMENTS ON THE ROOFTOP UNIT SUPPLY AND RETURN AIR DUCTS.

MECHANICAL DEMO LEGEND:

- EXISTING DUCTWORK, EQUIPMENT AND PIPING TO BE DEMOLISHED. (WORK SHOWN IN DARK DASHED LINES)
- EXISTING DUCTWORK, EQUIPMENT AND PIPING TO REMAIN. (WORK SHOWN IN HALF-TONE SOLID LINES)
- POINT OF DISCONNECTION. DUCTWORK, EQUIPMENT AND PIPING TO BE DISCONNECTED FROM EXISTING AND DEMOLISHED AS SHOWN PAST THIS POINT.

STATE OF TEXAS
MEHDI J. MIRMOMENI
113121
LICENSED
PROFESSIONAL ENGINEER
2017-OCT-18

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BALCONES HEIGHTS JUSTICE CENTER / CITY HALL HVAC REPLACEMENT

3300 HILLCREST DR
BALCONES HEIGHTS, TX. 78201

Revisions:

No.	Description:	Date:

Date:	2017-OCT-18
Designed by:	MM
Drawn by:	CAD
Checked by:	MM
Project Number:	90501

Drawing Name
1ST FLOOR DEMOLITION PLAN - MECHANICAL

Sheet No.
M2.1

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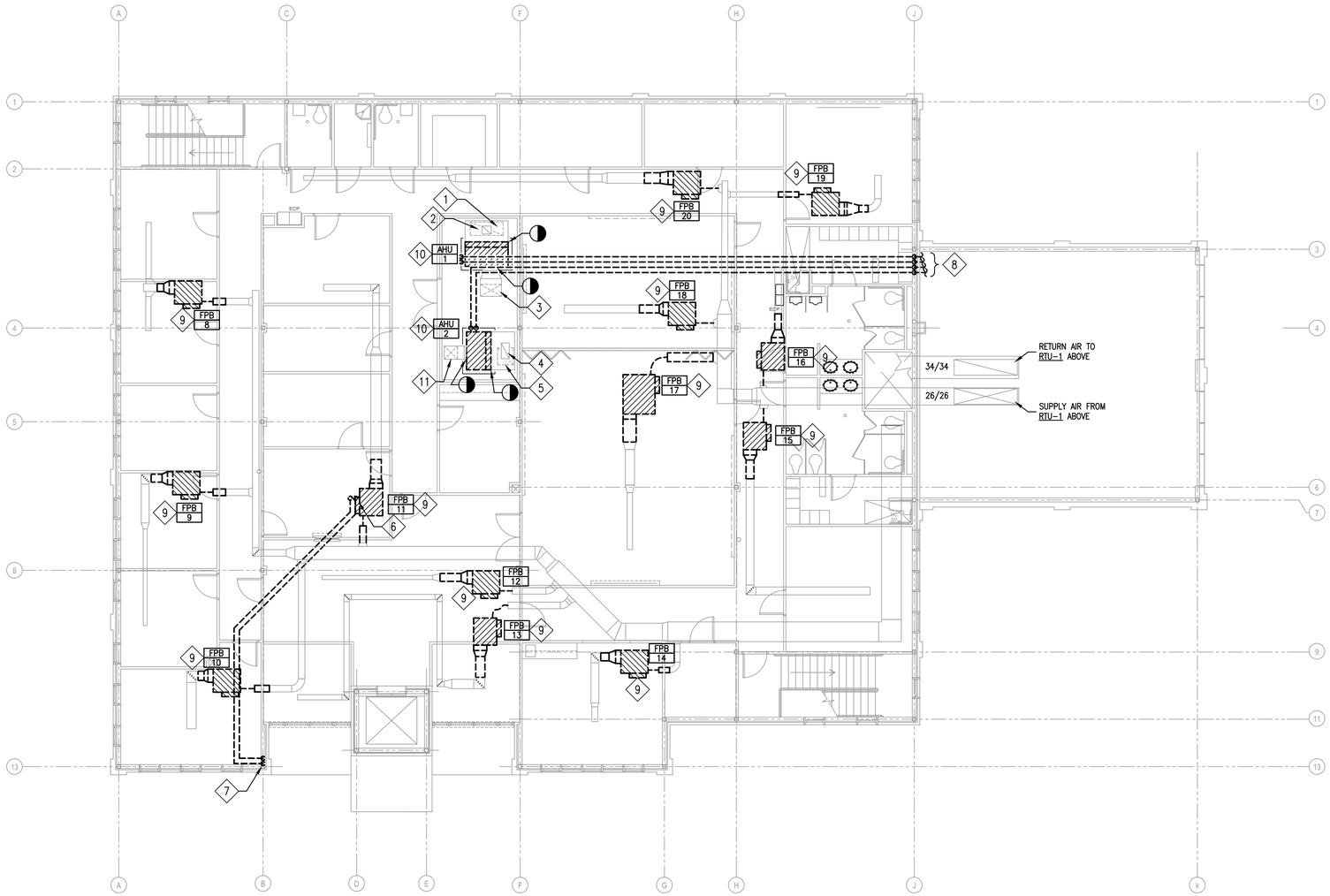
10/18/2017 10:54 a



KEYED NOTES

1. 50/20 RETURN AIR UP FROM LEVEL ONE BELOW TO BE REUSED. CUT BACK (APPROXIMATELY 2 FEET) AS NEEDED TO ACCOMMODATE THE NEW UNIT.
2. 14/12 OUTSIDE AIR DOWN FROM OAH-1 ON ROOF ABOVE TO BE REUSED. CUT BACK (APPROXIMATELY 2 FEET) AS NEEDED TO ACCOMMODATE THE NEW UNIT.
3. 32/18 SUPPLY AIR DOWN TO LEVEL ONE BELOW TO BE REUSED. CUT BACK (APPROXIMATELY 2 FEET) AS NEEDED TO ACCOMMODATE THE NEW UNIT.
4. 12/24 OUTSIDE AIR DOWN FROM OAH-2 ON ROOF ABOVE TO BE REUSED. CUT BACK (APPROXIMATELY 2 FEET) AS NEEDED TO ACCOMMODATE THE NEW UNIT.
5. 24/26 RETURN AIR UP FROM LEVEL ONE BELOW TO BE REUSED. CUT BACK (APPROXIMATELY 2 FEET) AS NEEDED TO ACCOMMODATE THE NEW UNIT.
6. REFRIGERANT LINES FROM CU-3 ABOVE TO BE DEMOLISHED AND REPLACED. REFER TO 1/M3.3 FOR CONTINUATION.
7. REFRIGERANT LINES FROM FCU-1 BELOW TO BE DEMOLISHED AND REPLACED. REFER TO 1/M3.1 FOR CONTINUATION.
8. REFRIGERANT LINES FROM CU-1 AND CU-2 TO BE DEMOLISHED AND REPLACED. REFER TO 1/M3.3 FOR CONTINUATION.
9. REMOVE ALL FAN POWERED VAV BOXES AND A PORTION OF DUCT, (APPROXIMATELY 2 FEET) UP-STREAM AND DOWN-STREAM OF THE EXISTING BOX. THIS WILL FACILITATE THE REPLACEMENT OF THE EXISTING BOX WITH A NEW BOX.
10. DEMOLISH AND REMOVE AHU. AHU TO BE COMPLETELY REPLACED.
11. 20/20 SUPPLY AIR DOWN TO LEVEL ONE BELOW TO BE REUSED. CUT BACK (APPROXIMATELY 2 FEET) AS NEEDED TO ACCOMMODATE THE NEW UNIT.

PRE-AUDIT BALANCE REPORT NOTE:

MINI-SPLIT UNITS FCU-1/CU-3, FCU-X2/CU-X2, AND PACKAGED TERMINAL UNIT PTU-1 SHALL BE DEMOLISHED AND REPLACED AFTER THE PRE-AUDIT BALANCE TESTING IS CONDUCTED, BUT BEFORE COMMENCEMENT OF ANY OTHER DEMOLITION OR CONSTRUCTION WORK.

PRE-AUDIT BALANCE REPORT NOTE:

BEFORE COMENCING ANY DEMOLITION OR CONSTRUCTION WORK OF ANY KIND, THE CONTRACTOR SHALL CONDUCT A PRE-AUDIT OF THE EXISTING FACILITY HVAC SYSTEMS USING A TEST AND BALANCE CONTRACTOR. THIS AUDIT SHALL INCLUDE AIR FLOW MEASUREMENTS OF ALL SUPPLY AIR GRILLES THROUGH THE USE OF A FLOW HOOD, TRAVERSE MEASUREMENTS ON AIR HANDLER SUPPLY, RETURN AND OUTSIDE AIR DUCTS, AND TRAVERSE MEASUREMENTS ON THE ROOFTOP UNIT SUPPLY AND RETURN AIR DUCTS.

MECHANICAL DEMO LEGEND:

- EXISTING DUCTWORK, EQUIPMENT AND PIPING TO BE DEMOLISHED. (WORK SHOWN IN DARK DASHED LINES)
- EXISTING DUCTWORK, EQUIPMENT AND PIPING TO REMAIN. (WORK SHOWN IN HALF-TONE SOLID LINES)
- POINT OF DISCONNECTION. DUCTWORK, EQUIPMENT AND PIPING TO BE DISCONNECTED FROM EXISTING AND DEMOLISHED AS SHOWN PAST THIS POINT.

NORTH

1 M2.2 2ND FLOOR DEMOLITION PLAN – MECHANICAL

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

STATE OF TEXAS
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BALCONES HEIGHTS, TX. 78201

Revisions:

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Project Number:	90501

Drawing Name
2ND FLOOR DEMOLITION PLAN - MECHANICAL

Sheet No.
M2.2

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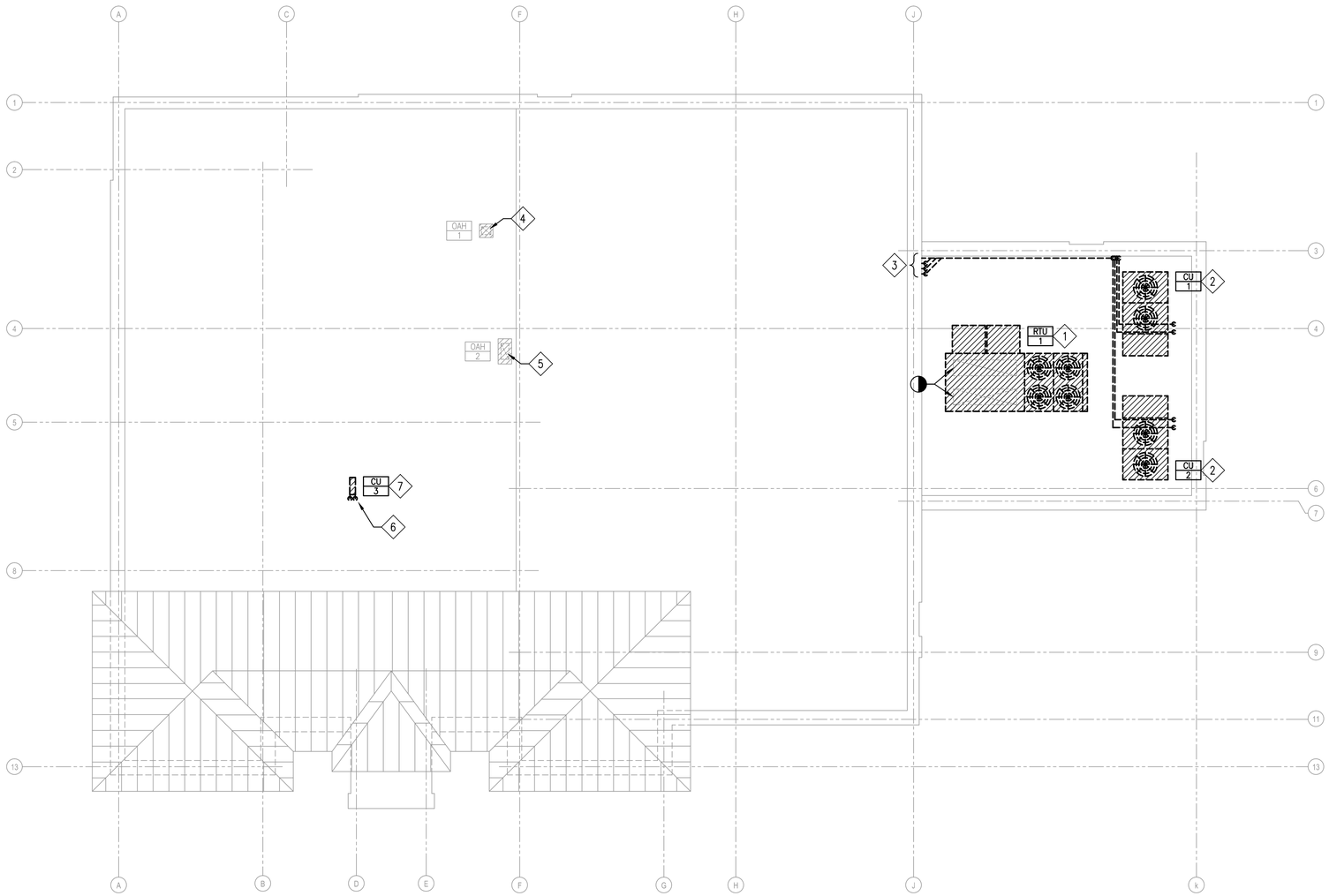
10/18/2017 10:54 a

KEYED NOTES

1. DEMOLISH AND REMOVE RTU-1. EXISTING CURB TO BE REUSED FOR NEW UNIT.
2. DEMOLISH AND REMOVE EXISTING CONDENSING UNITS AND PROPERLY RECOVER REFRIGERANT. EXISTING MOUNTING TO BE RE-USED FOR THE NEW UNITS.
3. DEMOLISH AND REMOVE EXISTING REFRIGERANT LINE SET FROM AHU-1 AND AHU-2. REFER TO 1/M2.2 FOR CONTINUATION.
4. 14/12 OUTSIDE AIR DOWN TO AHU-1 RETURN BELOW TO REMAIN.
5. 12/24 OUTSIDE AIR DOWN TO AHU-2 RETURN BELOW TO REMAIN.
6. REMOVE REFRIGERANT LINE SET FROM FCU-1 BELOW. REFER TO 1/M2.2 FOR CONTINUATION.
7. DEMOLISH AND REMOVE CU-3 AND PROPERLY RECOVER REFRIGERANT.



1 M2.3 NORTH

ROOF DEMOLITION PLAN – MECHANICAL

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

PRE-AUDIT BALANCE REPORT NOTE:

MINI-SPLIT UNITS FCU-1/CU-3, FCU-X2/CU-X2, AND PACKAGED TERMINAL UNIT PTU-1 SHALL BE DEMOLISHED AND REPLACED AFTER THE PRE-AUDIT BALANCE TESTING IS CONDUCTED, BUT BEFORE COMMENCEMENT OF ANY OTHER DEMOLITION OR CONSTRUCTION WORK.

PRE-AUDIT BALANCE REPORT NOTE:

BEFORE COMENCING ANY DEMOLITION OR CONSTRUCTION WORK OF ANY KIND, THE CONTRACTOR SHALL CONDUCT A PRE-AUDIT OF THE EXISTING FACILITY HVAC SYSTEMS USING A TEST AND BALANCE CONTRACTOR. THIS AUDIT SHALL INCLUDE AIR FLOW MEASUREMENTS OF ALL SUPPLY AIR GRILLES THROUGH THE USE OF A FLOW HOOD, TRAVERSE MEASUREMENTS ON AIR HANDLER SUPPLY, RETURN AND OUTSIDE AIR DUCTS, AND TRAVERSE MEASUREMENTS ON THE ROOFTOP UNIT SUPPLY AND RETURN AIR DUCTS.

MECHANICAL DEMO LEGEND:

- EXISTING DUCTWORK, EQUIPMENT AND PIPING TO BE DEMOLISHED. (WORK SHOWN IN DARK DASHED LINES)
- EXISTING DUCTWORK, EQUIPMENT AND PIPING TO REMAIN. (WORK SHOWN IN HALF-TONE SOLID LINES)
- POINT OF DISCONNECTION. DUCTWORK, EQUIPMENT AND PIPING TO BE DISCONNECTED FROM EXISTING AND DEMOLISHED AS SHOWN PAST THIS POINT.

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BALCONES HEIGHTS JUSTICE CENTER / CITY HALL HVAC REPLACEMENT

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BALCONES HEIGHTS, TX. 78201

Revisions:

No.	Description:	Date:

Date:	2017-OCT-18
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Drawing Name
ROOF DEMOLITION PLAN - MECHANICAL

Sheet No.
M2.3

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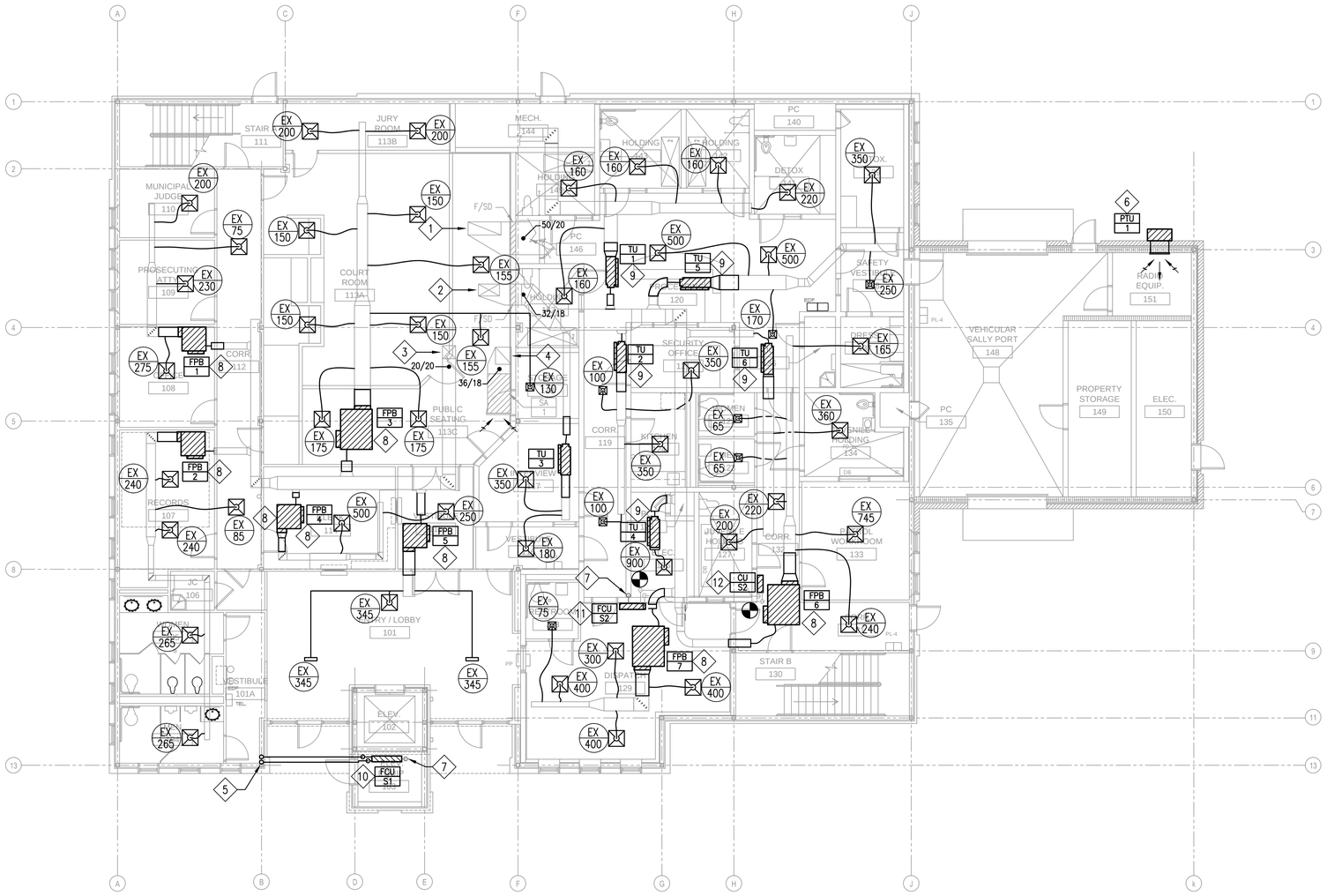

KEYED NOTES

1. 50/20 RETURN AIR UP TO AHU-1 ON LEVEL TWO ABOVE TO REMAIN.
2. 32/18 SUPPLY AIR UP TO AHU-1 ON LEVEL TWO ABOVE TO REMAIN.
3. 20/20 SUPPLY AIR UP TO AHU-2 ON LEVEL TWO ABOVE TO REMAIN.
4. 24/26 RETURN AIR UP TO AHU-2 ON LEVEL TWO ABOVE TO REMAIN.
5. PROVIDE AND INSTALL NEW REFRIGERANT LINE SET FROM CU-S1 TO ROOF. REFER TO 1/M3.2 FOR CONTINUATION.
6. PROVIDE AND INSTALL A NEW PTU-1. REFER TO MANUFACTURERS INSTALLATION RECOMMENDATIONS. PROVIDE ALL DUCTWORK NEEDED TO CONNECT TO NEW SUPPLY AND RETURN AIR GRILLES.
7. PROVIDE AND INSTALL A NEW CONDENSATE DRAIN TO THE EXISTING CONDENSATE DRAIN LINE.
8. PROVIDE AND INSTALL NEW FAN POWERED VAV BOX. REFER TO MANUFACTURERS INSTALLATION RECOMMENDATIONS. PROVIDE AND INSTALL REQUIRED DUCT WORK UP STREAM AND DOWN STREAM TO ACCOMMODATE NEW VAV BOX. INSULATE NEW DUCT AND SEAL TO EXISTING INSULATION.
9. PROVIDE AND INSTALL NEW VAV BOX. REFER TO MANUFACTURERS INSTALLATION RECOMMENDATIONS. PROVIDE AND INSTALL REQUIRED DUCT WORK UP STREAM AND DOWN STREAM TO ACCOMMODATE NEW VAV BOX. INSULATE NEW DUCT AND SEAL TO EXISTING INSULATION.
10. PROVIDE AND INSTALL A NEW FCU-S1. REFER TO MANUFACTURERS INSTALLATION RECOMMENDATIONS.
11. PROVIDE AND INSTALL A NEW FCU-S2. REFER TO MANUFACTURERS INSTALLATION RECOMMENDATIONS. REUSE THE EXISTING REFRIGERANT LINE SET.
12. PROVIDE AND INSTALL A NEW CU-S2 ABOVE THE CEILING WHERE THE FORMER CONDENSING UNIT WAS LOCATED. REFER TO MANUFACTURERS INSTALLATION RECOMMENDATIONS. REUSE THE EXISTING LINE SET.

NORTH

1 / M3.1 1ST FLOOR PLAN – MECH/ELEC

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

POST-AUDIT BALANCE REPORT NOTE:

AFTER COMPLETION OF ALL CONSTRUCTION WORK AND NEW EQUIPMENT INSTALLATION AND START-UP, THE CONTRACTOR SHALL CONDUCT A POST-AUDIT OF THE EXISTING FACILITY WITH THE NEW HVAC SYSTEMS USING THE SAME TEST AND BALANCE CONTRACTOR FROM THE PRE-AUDIT. THIS AUDIT SHALL INCLUDE AIR FLOW MEASUREMENTS OF ALL SUPPLY GRILLES THROUGH THE USE OF A FLOW HOOD, TRAVERSE MEASUREMENTS ON AIR HANDLER SUPPLY, RETURN AND OUTSIDE AIR DUCTS, AND TRAVERSE MEASUREMENTS ON THE ROOFTOP UNIT SUPPLY AND RETURN AIR DUCTS. IN ADDITION, THE CONTRACTOR SHALL ENSURE THAT ALL NEW EQUIPMENT AND EXISTING SUPPLY AIR TERMINALS HAVE BEEN BALANCED TO THE FLOW RATES SHOWN ON THIS SHEET. REFER TO AIR BALANCE SPECIFICATION # 23 08 00.

NEW MECHANICAL LEGEND:

NEW DUCTWORK, EQUIPMENT AND PIPING TO BE INSTALLED. (WORK SHOWN IN DARK SOLID LINES)

EXISTING DUCTWORK, EQUIPMENT AND PIPING OUTSIDE OF SCOPE. (WORK SHOWN IN HALF-TONE SOLID LINES)

POINT OF CONNECTION. NEW DUCTWORK, EQUIPMENT AND PIPING TO BE CONNECTED TO EXISTING AS SHOWN PAST THIS POINT.

STATE OF TEXAS
MEHDI J. MIRMOMENI
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PROFESSIONAL ENGINEER
2017-OCT-18

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BALCONES HEIGHTS JUSTICE CENTER / CITY HALL HVAC REPLACEMENT

3300 HILLCREST DR
BALCONES HEIGHTS, TX. 78201

Revisions:

No.	Description:	Date:

Date:	2017-OCT-18
Designed by:	MM
Drawn by:	CAD
Checked by:	MM
Project Number:	90501

Drawing Name
1ST FLOOR PLAN - MECHANICAL

Sheet No.
M3.1

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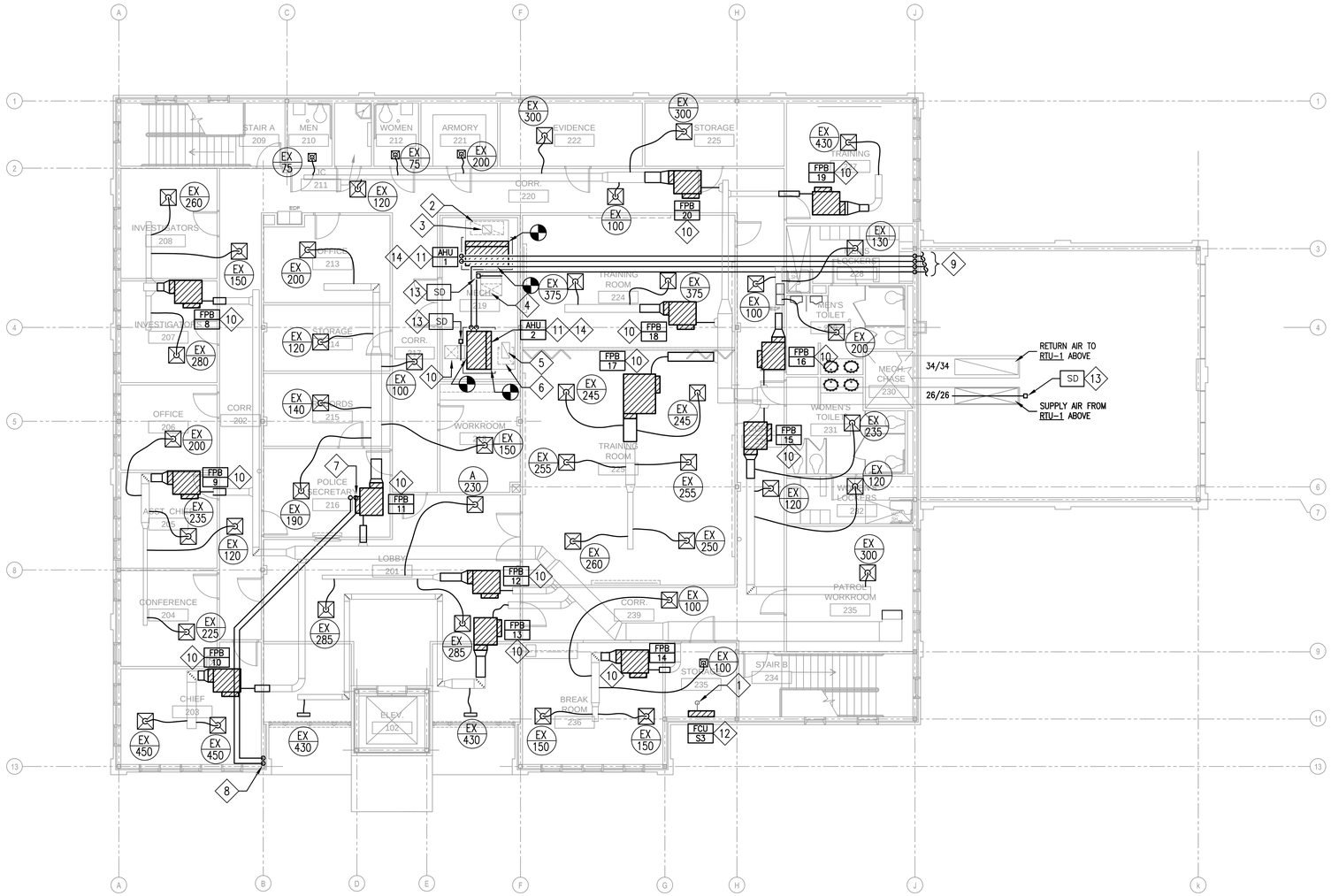

1 2ND FLOOR PLAN – MECH/ELEC

M3.2

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

KEYED NOTES

1. ROUTE FULL-SIZE CONDENSATE DRAIN LINE FROM FAN-COIL UNIT CONDENSATE PUMP TO NEAREST DRAIN.
2. 50/20 RETURN AIR UP FROM LEVEL ONE BELOW TO BE RECONNECTED TO AHU-1. PROVIDE AND INSTALL UP TO 24" OF DUCTWORK AS NEEDED TO RECONNECT. INSULATE AND SEAL TO EXISTING INSULATION.
3. 14/12 OUTSIDE AIR DOWN FROM OAH-1 ON ROOF ABOVE TO BE RECONNECTED TO AHU-1. PROVIDE AND INSTALL UP TO 24" OF DUCTWORK AS NEEDED TO RECONNECT. INSULATE AND SEAL TO EXISTING INSULATION.
4. 32/18 SUPPLY AIR DOWN TO LEVEL ONE BELOW TO BE RECONNECTED TO AHU-1. PROVIDE AND INSTALL UP TO 24" OF DUCTWORK AS NEEDED TO RECONNECT. INSULATE AND SEAL TO EXISTING INSULATION.
5. 12/24 OUTSIDE AIR DOWN FROM OAH-2 ON ROOF ABOVE TO BE RECONNECTED TO AHU-2. PROVIDE AND INSTALL UP TO 24" OF DUCTWORK AS NEEDED TO RECONNECT. INSULATE AND SEAL TO EXISTING INSULATION.
6. 24/26 RETURN AIR UP FROM LEVEL ONE BELOW TO BE RECONNECTED TO AHU-2. PROVIDE AND INSTALL UP TO 24" OF DUCTWORK AS NEEDED TO RECONNECT. INSULATE AND SEAL TO EXISTING INSULATION.
7. PROVIDE AND INSTALL NEW REFRIGERANT LINE SET FROM CU-S1 ABOVE. REFER TO 1/M3.3 FOR CONTINUATION.
8. NEW REFRIGERANT LINE SET FROM FCU-S1 BELOW. REFER TO 1/M3.1 FOR CONTINUATION.
9. PROVIDE AND INSTALL NEW REFRIGERANT LINE SETS FROM CU-1 AND CU-2. REFER TO 1/M3.3 FOR CONTINUATION.
10. PROVIDE AND INSTALL NEW FAN POWERED VAV BOX. REFER TO MANUFACTURERS INSTALLATION RECOMMENDATIONS. PROVIDE AND INSTALL REQUIRED DUCT WORK UP STREAM AND DOWN STREAM TO ACCOMMODATE NEW VAV BOX. INSULATE NEW DUCT AND SEAL TO EXISTING INSULATION.
11. PROVIDE AND INSTALL NEW AHU'S. REFER TO MANUFACTURERS INSTALLATION RECOMMENDATIONS. PROVIDE AND INSTALL REQUIRED SUPPLY DUCT WORK AND RETURN DUCTWORK TO ACCOMMODATE NEW AHU INSTALLATION. INSULATE ALL NEW DUCT WORK AND SEAL TO EXISTING INSULATION.
12. PROVIDE AND INSTALL NEW FCU-S3. REFER TO MANUFACTURERS INSTALLATION RECOMMENDATIONS. ROUTE A NEW LINE SET TO NEW UNIT CU-S3 ON THE ROOF. REFER TO 1/M3.3 FOR LOCATION OF NEW UNIT CU-S3.
13. PROVIDE AND INSTALL NEW DUCT SMOKE DETECTOR. REFER TO MANUFACTURERS INSTALLATION RECOMMENDATIONS. FIRE ALARM CONTRACTOR TO CONNECT SMOKE DETECTORS TO EXISTING FIRE ALARM PANEL.
14. INSTALL UNIT ELECTRICAL CONNECTIONS PER DETAIL 1/M4.1. CONNECT UNIT VFD TO BUILDING SYSTEMS PER DETAILS 2/M4.1 AND 3/M4.1. INSTALL CONDENSATE DRAIN P-TRAP PER DETAIL 5/M4.1 AND ATTACH TO REMAINING CONDENSATE DRAIN LINE.

POST-AUDIT BALANCE REPORT NOTE:

AFTER COMPLETION OF ALL CONSTRUCTION WORK AND NEW EQUIPMENT INSTALLATION AND START-UP, THE CONTRACTOR SHALL CONDUCT A POST-AUDIT OF THE EXISTING FACILITY WITH THE NEW HVAC SYSTEMS USING THE SAME TEST AND BALANCE CONTRACTOR FROM THE PRE-AUDIT. THIS AUDIT SHALL INCLUDE AIR FLOW MEASUREMENTS OF ALL SUPPLY GRILLES THROUGH THE USE OF A FLOW HOOD, TRAVERSE MEASUREMENTS ON AIR HANDLER SUPPLY, RETURN AND OUTSIDE AIR DUCTS, AND TRAVERSE MEASUREMENTS ON THE ROOFTOP UNIT SUPPLY AND RETURN AIR DUCTS. IN ADDITION, THE CONTRACTOR SHALL ENSURE THAT ALL NEW EQUIPMENT AND EXISTING SUPPLY AIR TERMINALS HAVE BEEN BALANCED TO THE FLOW RATES SHOWN ON THIS SHEET. REFER TO AIR BALANCE SPECIFICATION # 23 08 00.

NEW MECHANICAL LEGEND:

- NEW DUCTWORK, EQUIPMENT AND PIPING TO BE INSTALLED. (WORK SHOWN IN DARK SOLID LINES)
- EXISTING DUCTWORK, EQUIPMENT AND PIPING OUTSIDE OF SCOPE. (WORK SHOWN IN HALF-TONE SOLID LINES)
- POINT OF CONNECTION. NEW DUCTWORK, EQUIPMENT AND PIPING TO BE CONNECTED TO EXISTING AS SHOWN PAST THIS POINT.

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No.	Description:	Date:

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Drawing Name
2ND FLOOR PLAN - MECHANICAL

Sheet No.
M3.2

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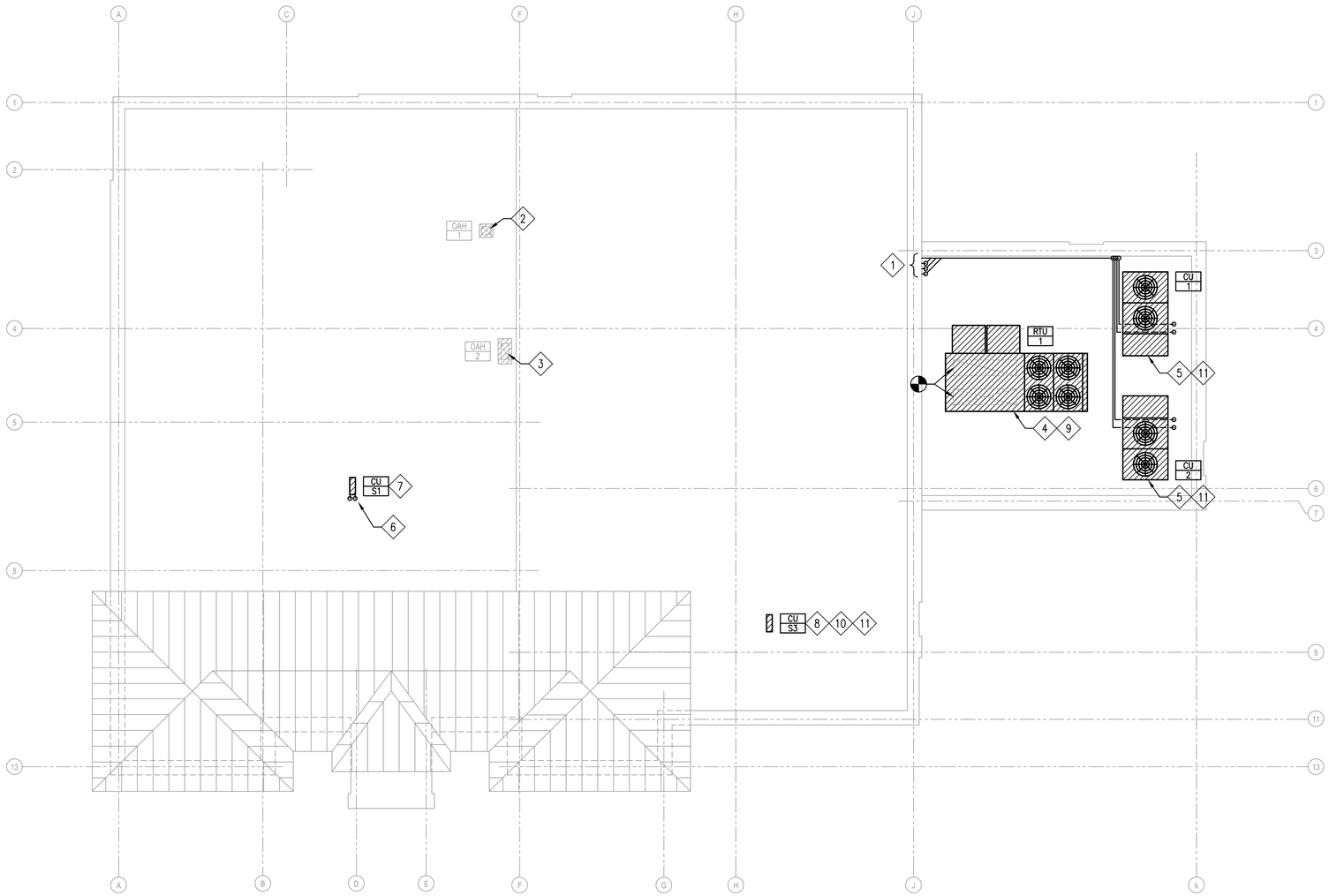
10/18/2017 10:55 a



NORTH

1 ROOF PLAN – MECH/ELEC
M3.3
SCALE: 1/8" = 1'-0"

KEYED NOTES

1. PROVIDE AND INSTALL NEW REFRIGERANT LINE SET FROM AHU-1 AND AHU-2. REFER TO 1/M3.2 FOR CONTINUATION.
2. 14/12 OUTSIDE AIR DOWN TO AHU-1 RETURN BELOW TO REMAIN.
3. 12/24 OUTSIDE AIR DOWN TO AHU-2 RETURN BELOW TO REMAIN.
4. PROVIDE AND INSTALL NEW RTU-1 ON EXISTING ROOF CURB. REFER TO MANUFACTURERS INSTALLATION RECOMMENDATIONS. PROVIDE ALL DUCTWORK REQUIRE TO RECONNECT UNIT TO EXISTING DUCTWORK. INSULATE AND SEAL TO EXISTING INSULATION.
5. PROVIDE AND INSTALL NEW CONDENSING UNITS. REFER TO MANUFACTURERS INSTALLATION RECOMMENDATIONS. INSTALL ON EXISTING CURBS.
6. PROVIDE AND INSTALL A NEW REFRIGERANT LINE SET FROM FCU-S1 BELOW. REFER TO 1/ME3.2 FOR CONTINUATION.
7. PROVIDE AND INSTALL A NEW CONDENSING UNIT CU-S1. INSTALL ON EXISTING CURB. REFER TO MANUFACTURERS INSTALLATION RECOMMENDATIONS. INSTALL NEW LINE SET PER DETAIL 4/M4.1.
8. PROVIDE AND INSTALL A NEW CONDENSING UNIT CU-S3. INSTALL ON NEW EQUIPMENT RAILS. PROVIDE AND INSTALL NEW REFRIGERANT LINE SET. REFER TO MANUFACTURERS INSTALLATION RECOMMENDATIONS.
9. CONNECT UNIT VFD TO BUILDING SYSTEMS PER DETAILS 2/M4.1 AND 3/M4.1. INSTALL CONDENSATE DRAIN P-TRAP PER DETAIL 5/M4.1 AND ATTACH TO REMAINING CONDENSATE DRAIN LINE.
10. PROVIDE NEW EQUIPMENT RAILS PER DETAIL 6/M4.1 AND INSTALL NEW EQUIPMENT ON RAILS AS SPECIFIED.
11. PROVIDE AND INSTALL NEW REFRIGERANT LINE SET TO ASSOCIATED INDOOR EQUIPMENT PER DETAIL 4/M4.1.

POST-AUDIT BALANCE REPORT NOTE:

AFTER COMPLETION OF ALL CONSTRUCTION WORK AND NEW EQUIPMENT INSTALLATION AND START-UP, THE CONTRACTOR SHALL CONDUCT A POST-AUDIT OF THE EXISTING FACILITY WITH THE NEW HVAC SYSTEMS USING THE SAME TEST AND BALANCE CONTRACTOR FROM THE PRE-AUDIT. THIS AUDIT SHALL INCLUDE AIR FLOW MEASUREMENTS OF ALL SUPPLY GRILLES THROUGH THE USE OF A FLOW HOOD, TRAVERSE MEASUREMENTS ON AIR HANDLER SUPPLY, RETURN AND OUTSIDE AIR DUCTS, AND TRAVERSE MEASUREMENTS ON THE ROOFTOP UNIT SUPPLY AND RETURN AIR DUCTS. IN ADDITION, THE CONTRACTOR SHALL ENSURE THAT ALL NEW EQUIPMENT AND EXISTING SUPPLY AIR TERMINALS HAVE BEEN BALANCED TO THE FLOW RATES SHOWN ON THIS SHEET. REFER TO AIR BALANCE SPECIFICATION # 23 08 00.

NEW MECHANICAL LEGEND:

- NEW DUCTWORK, EQUIPMENT AND PIPING TO BE INSTALLED. (WORK SHOWN IN DARK SOLID LINES)
- EXISTING DUCTWORK, EQUIPMENT AND PIPING OUTSIDE OF SCOPE. (WORK SHOWN IN HALF-TONE SOLID LINES)
- POINT OF CONNECTION. NEW DUCTWORK, EQUIPMENT AND PIPING TO BE CONNECTED TO EXISTING AS SHOWN PAST THIS POINT.

KEYED NOTES

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BALCONES HEIGHTS, TX. 78201

Revisions:

No.	Description:	Date:

Date:	2017-OCT-18
Designed by:	MM
Drawn by:	CAD
Checked by:	MM
Project Number:	90501

Drawing Name
ROOF PLAN - MECHANICAL

Sheet No.
M3.3

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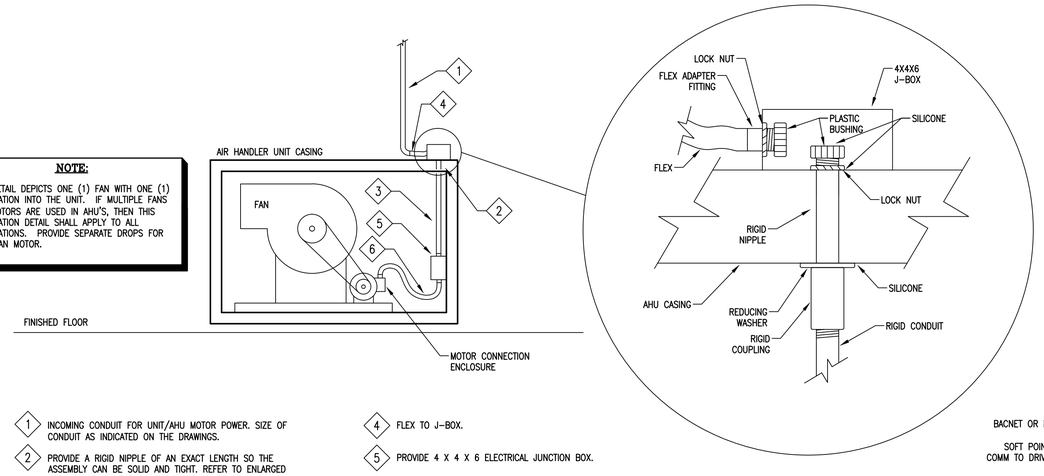
NOTE:

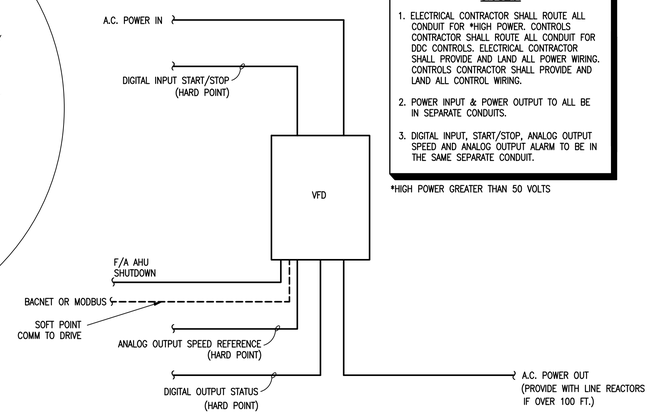
THIS DETAIL DEPICTS ONE (1) FAN WITH ONE (1) PENETRATION INTO THE UNIT. IF MULTIPLE FANS AND MOTORS ARE USED IN AHU'S, THEN THIS PENETRATION DETAIL SHALL APPLY TO ALL PENETRATIONS. PROVIDE SEPARATE DROPS FOR EACH FAN MOTOR.



1. INCOMING CONDUIT FOR UNIT/AHU MOTOR POWER. SIZE OF CONDUIT AS INDICATED ON THE DRAWINGS.
2. PROVIDE A RIGID NIPPLE OF AN EXACT LENGTH SO THE ASSEMBLY CAN BE SOLID AND TIGHT. REFER TO ENLARGED DETAIL. SEAL ON BOTH OUTSIDE AND INSIDE OF AHU CASING WITH SILICONE CAULK. AFTER WIRING IS PULLED INTO AHU SILICONE THE WIRE WAY TO PREVENT AIR FROM ENTERING AHU THROUGH THE J-BOX.
3. PROVIDE RIGID CONDUIT. (SIZE OF CONDUIT AS INDICATED ON THE DRAWINGS.)
4. FLEX TO J-BOX.
5. PROVIDE 4 X 4 X 6 ELECTRICAL JUNCTION BOX.
6. PROVIDE METAL FLEXIBLE CONDUIT NO LONGER THAN 36". DO NOT USE LIQUID TIGHT METAL FLEXIBLE CONDUIT.

1 M4.1 AIR HANDLING UNIT ELECTRICAL CONNECTION DETAIL

SCALE: NOT TO SCALE



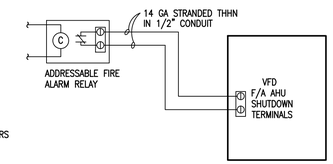
NOTES:

1. ELECTRICAL CONTRACTOR SHALL ROUTE ALL CONDUIT FOR *HIGH POWER. CONTROLS CONTRACTOR SHALL ROUTE ALL CONDUIT FOR DDC CONTROLS. ELECTRICAL CONTRACTOR SHALL PROVIDE AND LAND ALL POWER WIRING. CONTROLS CONTRACTOR SHALL PROVIDE AND LAND ALL CONTROL WIRING.
2. POWER INPUT & POWER OUTPUT TO ALL BE IN SEPARATE CONDUITS.
3. DIGITAL INPUT, START/STOP, ANALOG OUTPUT SPEED AND ANALOG OUTPUT ALARM TO BE IN THE SAME SEPARATE CONDUIT.

*HIGH POWER GREATER THAN 50 VOLTS

2 M4.1 VFD CONNECTION DETAIL

SCALE: NOT TO SCALE



NOTES:

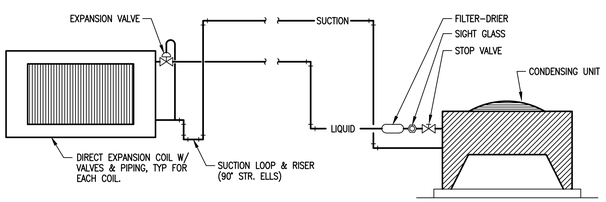
1. FIRE ALARM CONTRACTOR SHALL PROVIDE FIRE ALARM RELAY, CONDUIT AND WIRING BETWEEN RELAY AND VFD. ALLOW 24" OF WIRING IN THE VFD FOR TERMINATION.
2. FIRE ALARM CONTRACTOR SHALL TERMINATE WIRING IN FIRE ALARM RELAY.
3. MECHANICAL CONTRACTOR SHALL TERMINATE WIRING IN VFD ON THE APPROPRIATE TERMINALS FOR AHU SHUTDOWN ON A FIRE ALARM.

3 M4.1 VFD FIRE ALARM CONNECTION DETAIL

SCALE: NOT TO SCALE

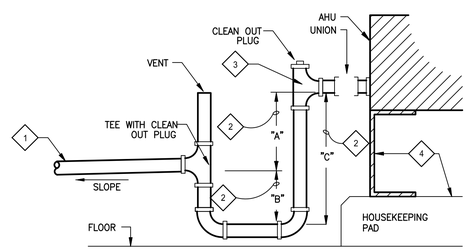
NOTE:

PROVIDE SOLENOID VALVES AND ASSOCIATED CONTROLS IF REQUIRED BY EQUIPMENT MANU-FACTURER. SIZE ALL REFRIGERANT PIPING PER MANUFACTURERS RECOMMENDATIONS.



4 M4.1 REFRIGERANT PIPING SCHEMATIC

SCALE: NOT TO SCALE



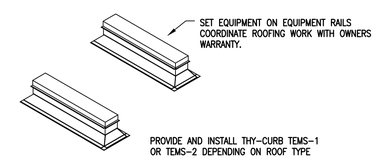
KEYED NOTES:

1. ROUTE CONDENSATE DRAIN TO NEAREST FLOOR DRAIN
2. "A" = FAN PLENUM NEGATIVE STATIC PRESSURE, IN. W.G.
   "B" = A/2 + 1-1/2" (MIN.)
   "C" = A + B
3. CONDENSATE DRAIN SHALL BE SIZED BY AIR HANDLING UNIT MANUFACTURER.
4. AHU CASING SUPPORT FRAME. PROVIDE ADDITIONAL SUPPORT OR THICKEN HOUSEKEEPING PAD TO MAINTAIN TRAP DEPTH.

FAN COIL UNITS, AHU'S AND OAHU'S

5 M4.1 CONDENSATE DRAIN PIPING DETAIL

SCALE: NOT TO SCALE



6 M4.1 EQUIPMENT ROOF SUPPORTS

SCALE: NOT TO SCALE

STATE OF TEXAS
MEHDI J. MIRMOMENI
113121
LICENSED
PROFESSIONAL ENGINEER
2017-OCT-18

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BALCONES HEIGHTS JUSTICE CENTER / CITY HALL HVAC REPLACEMENT

3300 HILLCREST DR
BALCONES HEIGHTS, TX. 78201

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Drawing Name
MECHANICAL DETAILS

Sheet No.
M4.1

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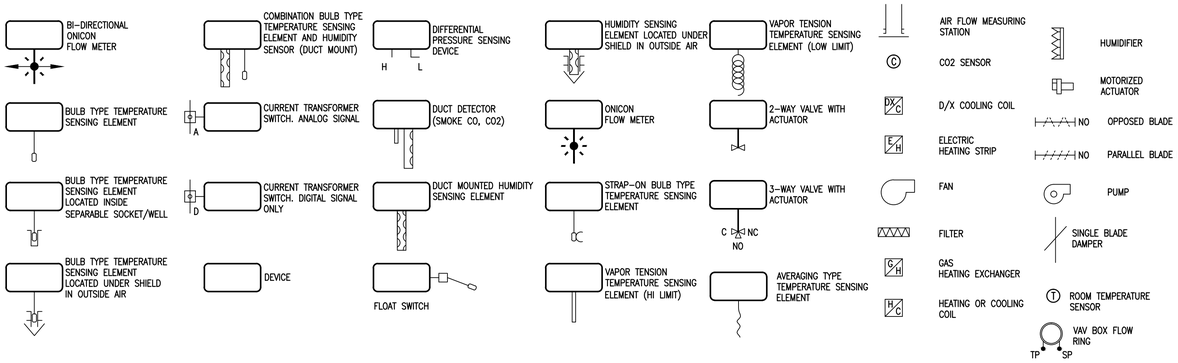
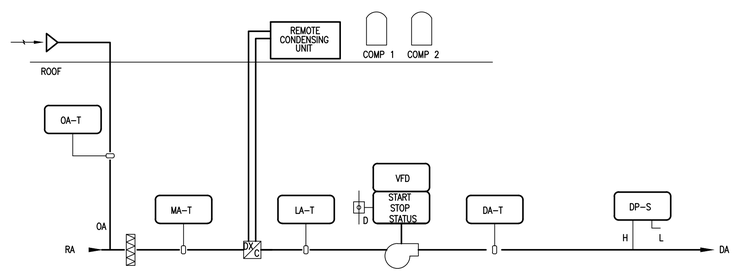


BPV	BY-PASS VALVE	N.O.	NORMALLY OPEN
CC-V	COOLING COIL VALVE	OA	OUTSIDE AIR
CH	CHILLER	OA-D	OUTSIDE AIR DAMPER
CHWR-T	CHILLED WATER RETURN TEMPERATURE	OA-RH	OUTSIDE AIR RELATIVE HUMIDITY
CHWS-T	CHILLED WATER SUPPLY TEMPERATURE	OA-T	OUTSIDE AIR TEMP.
CMV	CHILLER MODULATING VALVE	PCHWP	PRIMARY CHILLED WATER PUMP
CO2-DD	CO2 DUCT DETECTOR	PCHWR	PRIMARY CHILLED WATER RETURN
DA	DISCHARGE AIR	PCHWS	PRIMARY CHILLED WATER SUPPLY
DA-T	DISCHARGE AIR TEMP.	PHWR	PRIMARY HOT WATER RETURN
DC	DECOUPLER	PHWS	PRIMARY HOT WATER SUPPLY
DP-S	DIFFERENTIAL PRESSURE SENSOR	RA	RETURN AIR
D-SD	DUCT SMOKE DETECTOR	RA-H	RETURN AIR HUMIDITY
FLT-SW	FLOAT SWITCH	RA-T	RETURN AIR TEMP.
HC-V	HEATING COIL VALVE	SCHWP	SECONDARY CHILLED WATER PUMP
HSP-S	HIGH STATIC PRESSURE SAFETY	SCHWR	SECONDARY CHILLED WATER RETURN
HWR-T	HOT WATER RETURN TEMPERATURE	SCHWS	SECONDARY CHILLED WATER SUPPLY
HWS-T	HOT WATER SUPPLY TEMPERATURE	SHWR	SECONDARY HOT WATER RETURN
LA-T	LEAVING AIR TEMP.	SHWS	SECONDARY HOT WATER SUPPLY
LL-T	LOW LIMIT TEMP. SENSOR (FREEZE STAT)	VFD	VARIABLE FREQUENCY DRIVE
LSP-S	LOW STATIC PRESSURE SAFETY	W	WATER
MAD	MOTORIZED AIR DAMPER	WFM	WATER FLOW METER

NOTE #1:
ALL TEMPERATURE SENSORS TO BE 10K TYPE III THERMISTORS.

NOTE #2:
IT IS THE MECHANICAL CONTRACTOR'S AND HIS SUB-CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT ALL MECHANICAL EQUIPMENT IS ORDERED WITH ALL CONTROLS AND OTHER EQUIPMENT AS NOTED ON THE MECHANICAL CONTROL SEQUENCE DRAWING SERIES. DO NOT PROVIDE SUBMITTALS TO ENGINEER BASED SOLELY UPON THE SCHEDULE SHEETS. FULL COORDINATION IS REQUIRED.

NOTE #3:
VICONICS STYLE CONTROLLERS ARE NOT ALLOWED



SEQUENCE OF OPERATION
SINGLE ZONE DX COOLING – HEAT PUMP WITH AUX ELECTRIC HEAT

AHU-1&2:

OCCUPIED MODE

1. THE FAN SHALL BE STARTED AND STOPPED UNDER CONTROL OF SOFTWARE BY A TIME SCHEDULE. WHEN THE UNIT IS STARTED, THE FAN SHALL START AND RUN CONTINUOUSLY.
2. A CURRENT SENSING RELAY SHALL PROVE FAN STATUS. IF THE SENSOR FAILS TO PROVE STATUS IN 15 SECONDS (ADJUSTABLE), THE DDC SYSTEM SHALL IDENTIFY THE UNIT AND REPORT A FAN ALARM.
3. THERE IS A VFD FACTORY MOUNTED IN THE AHU. VARY THE SPEED OF THE FAN UTILIZING A DIFFERENTIAL PRESSURE SENSOR 2/3 UP THE MAIN DUCT TRUNK. INITAL SETTING IS 1" WC (ADJUSTABLE)
4. MAINTAIN A LEAVING AIR TEMPERATURE OFF THE COOLING COIL OF 55° (ADJUSTABLE).

UNOCCUPIED MODE

1. WHEN UNIT IS IN THE UNOCCUPIED MODE, ANY OVERRIDE BUTTON SHALL COMMAND THE SYSTEM TO THE OCCUPIED MODE FOR A PERIOD OF ONE HOUR (ADJUSTABLE).
2. PROVIDE A SETUP/SETBACK FEATURE WITH USER ADJUSTABLE VALUES. INITIAL SETTINGS SHALL BE 85° F AND 50° F. WHEN SPACE TEMP IS OUT OF RANGE OPERATE THE UNIT UNTIL SPACE TEMP IS WITHIN LIMITS W/ A 5°F DIFFERENTIAL. 5° F, ABOVE THE UPPER SETPOINT AND 5 DEGREES BELOW THE LOWER SETPOINT.

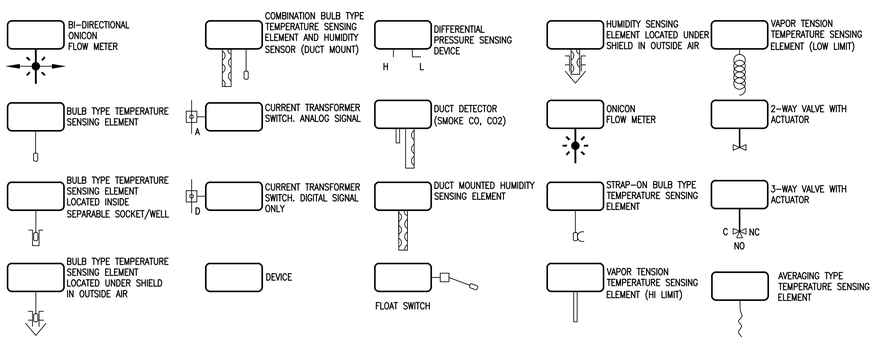
GENERAL

1. ALL CONTROL POINTS TO BE ACCESSIBLE FOR MONITORING, CONTROL AND OVERRIDE FROM HMI. ALL SETPOINTS SHALL BE ADJUSTABLE THROUGH THE HMI. PROVIDE MANUAL CONTROL OF ALL OUTPUTS THROUGH HMI.
2. PROVIDE A TYPICAL SAFETY CIRCUIT WITH MOTOR OVERLOADS, SMOKE DETECTOR, ETC., TO SHUT DOWN FAN MOTOR.
3. EACH SPACE SENSOR SHALL BE EQUIPPED WITH SETPOINT ADJUST AND OVERRIDE FUNCTIONS.

1 / M5.1 AHU-1 & 2: SINGLE ZONE, VARIALBE VOLUME, DX COOLING COIL,
DX SPLIT SYSTEM
SCALE: NOT TO SCALE

POINTS LIST

| | INPUTS | | | | | | | | | | | | | | | | | OUTPUTS | | | | | | | | | SOFTWARE FEATURES | | | | | | | | | | | | | | | | |



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CH	CHILLER	OA-D	OUTSIDE AIR DAMPER
CHWR-T	CHILLED WATER RETURN TEMPERATURE	OA-RH	OUTSIDE AIR RELATIVE HUMIDITY
CHWS-T	CHILLED WATER SUPPLY TEMPERATURE	OA-T	OUTSIDE AIR TEMP.
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DA-T	DISCHARGE AIR TEMP.	PHWR	PRIMARY HOT WATER RETURN
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NOTE #1:
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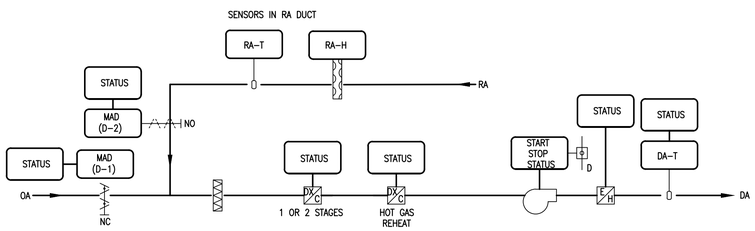
NOTE #3:
VICONICS STYLE CONTROLLERS ARE NOT ALLOWED



SEQUENCE OF OPERATION

SINGLE ZONE DX COOLING - ELECTRIC HEAT

MOST CONTROLS OF THE RTU ARE ACCOMPLISHED THROUGH AN ONBOARD CONTROLLER. REASON FOR DDC ON THIS PROJECT IS FOR TIME SCHEDULING, ENABLING, ADJUSTING HEATING AND COOLING SETPOINTS DISABLING, VARYING THE SPEED OF FAN TO MAINTAIN STATIC PRESSURE IN THE SUPPLY DUCT, AND MONITORING STATUS AND DISCHARGE AIR TEMPERATURE FROM THE UNITS. ALL INFORMATION SHALL BE DISPLAYED ON THE GRAPHIC USER INTERFACE (GUI). SYSTEM SHALL BE INTERNET BASED AND ACCESSIBLE THROUGH A INTERNET BROWSER.

OCCUPIED MODE:

1. THE FAN SHALL BE STARTED AND STOPPED UNDER CONTROL OF SOFTWARE BY A TIME SCHEDULE. WHEN THE UNIT IS STARTED, THE FAN SHALL START AND RUN CONTINUOUSLY. THE FAN SHALL BE STARTED AND STOPPED UNDER CONTROL OF SOFTWARE BY A TIME SCHEDULE. WHEN THE UNIT IS STARTED, THE FAN SHALL START AND RUN CONTINUOUSLY.
2. A CURRENT SENSING RELAY SHALL PROVE FAN STATUS. IF THE SENSOR FAILS TO PROVE STATUS, THE GUI, SHALL IDENTIFY THE UNIT AND REPORT A FAN ALARM.
3. USING THE VFD VARY THE SPEED OF THE FAN TO MEET THE SETPOINT OF THE STATIC PRESSURE SENSOR. THE INITIAL SETPOINT SHALL BE 1" WC (ADJUSTABLE).
4. PROVIDE AND INSTALL TEMPERATURE AND HUMIDITY SENSORS IN THE RETURN AIR DUCT. THESE WILL BE USED TO MONITOR THE RETURN AIR TEMPERATURE AND RELATIVE HUMIDITY.
5. PROVIDE STATUS OF CALL FOR COOLING/HEATING (1 OR 2 STAGES) AND HEATING STAGING (1 OR 2 STAGES).
6. PROVIDE STATUS OF REHEAT COIL STATUS (ENABLED/DISABLED)
7. PROVIDE STATUS OF DAMPERS AND COMMAND VALUE OF PERCENT OPEN.

ECONOMIZER

1. ALL ROOFTOP UNITS ARE EQUIPPED WITH FACTORY MOUNTED ECONOMIZERS. THESE ECONOMIZERS ARE CONTROLLED VIA THE ROOFTOP UNIT CONTROLS. SET ECONOMIZER TO BE ENABLED AT 55° F OUTSIDE OR LOWER.

UNOCCUPIED MODE:

1. EACH SPACE SENSOR SHALL BE EQUIPPED WITH SETPOINT ADJUST AND OVERRIDE FUNCTIONS.
2. PROVIDE EARLY MORNING COOL-DOWN/WARM-UP PRIOR TO OCCUPANCY TIME. THE O/A DAMPER SHALL REMAIN CLOSED DURING THIS CYCLE.

GENERAL:

1. ALL CONTROL POINTS TO BE ACCESSIBLE FOR MONITORING, CONTROL AND OVERRIDE FROM GUI. ALL SET POINTS SHALL BE ADJUSTABLE THROUGH THE GUI. PROVIDE MANUAL CONTROL OF ALL OUTPUTS THROUGH GUI.
2. PROVIDE A TYPICAL SAFETY CIRCUIT WITH MOTOR OVERLOADS, SMOKE DETECTOR, ZONE ADAPTER MODULE (ZAM), FREEZE STAT, HIGH STATIC PRESSURE, ETC., TO SHUT DOWN FAN MOTOR.
3. EACH SPACE SENSOR SHALL BE EQUIPPED WITH SETPOINT ADJUST AND OVERRIDE FUNCTIONS. SHOW OVERRIDE INDICATION ON THE GUI GRAPHIC DISPLAY.
4. ON A FIRE ALARM SIGNAL FOR SHUTDOWN, CONTROLS SHALL ENTER THE UNOCCUPIED MODE AND REMAIN AFTER FIRE ALARM IS RESET TO NORMAL.

1 / M5.2 SINGLE ZONE, 1 OR 2 STAGE D/X COOLING, 1 STAGE ELECTRIC HEAT, HOT GAS RE-HEAT
PACKAGED DX ROOFTOP UNIT
SCALE: NOT TO SCALE

BALCONES HEIGHTS CITY HALL

	INPUTS																	OUTPUTS								SOFTWARE FEATURES																				
	ANALOG							DIGITAL										DIGITAL			ANALOG					CALCULATED				ALARMS							PROGRAMS										
	TEMPERATURE 0-10V	DIFF. PRESSURE SENSOR	R. H. 4-20 MA	VOLTS/AMPS/K.W.	FLOW	CURRENT XFMR (C.T.)	CO2 4-20 MA	VFD SPEED FEEDBACK	BMS TERMINAL STRIP	DP SWITCH	TEMP. SWITCH	CURRENT SWITCH	OCCUPANCY SENSOR	SMOKE DETECTOR	AUX. CONTACT	VFD RUN STATUS	PULSE CONTACT	ON - OFF (H.O.A.)	START/STOP	OFF-HIGH-LOW	OPEN/CLOSE	0-10 Vdc	4-20 ma	PWM	VFD SPEED CMD.	FLOATING POINT	OVERRIDE	KWH/DEMAND	BTU'S	POSITION AS % OPEN	SETPOINT	TOTALIZATION	RUNTIME	HIGH ANALOG	LOW ANALOG	VFD FAULT	VFD BYPASS ALM.	BINARY	PROOF	MAINTENANCE ALM.	TIME OF DAY	STAR/STOP OPT.	ENTHALPY OPT.	DEMAND LIMITING	DDC/PID CONTROL	EVENT PROGRAM	ALARM MESSAGES	TREND REPORT	DYN. COLOR GRAPHIC	DYN. TREND GRAPH	COMMENTS
SUPPLY FAN						X																										X																		
COOLING																										X				X		X								X						X	X	
HEATING																										X				X		X								X						X	X	X
HUMIDITY CONTROL																																																
DISCHARGE AIR	X																																													X	X	X	STATUS ONLY. SHOW COMMAND VALUE
RETURN AIR	X																																X	X												X	X	X	
DAMPER RETURN																													X																	X	X	X	STATUS ONLY. SHOW COMMAND VALUE
DAMPER OSA																													X																	X	X	X	STATUS ONLY. SHOW COMMAND VALUE
COMPRESSOR 1																																X														X	X	X	STATUS ONLY. SHOW COMMAND VALUE
COMPRESSOR 2																																X														X	X	X	STATUS ONLY. SHOW COMMAND VALUE
HOT GAS REHEAT			X																							X				X		X														X	X	X	STATUS ONLY. SHOW COMMAND VALUE
VFD		X						X								X		X						X						X										X						X	X	X	
																																														X	X	X	

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STATE OF TEXAS
MEHDI J. MIRMOMENI
113121
LICENSED
PROFESSIONAL ENGINEER
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Texas Firm Registration #F-2597

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Drawing Name
MECHANICAL CONTROLS

Sheet No.
M5.2

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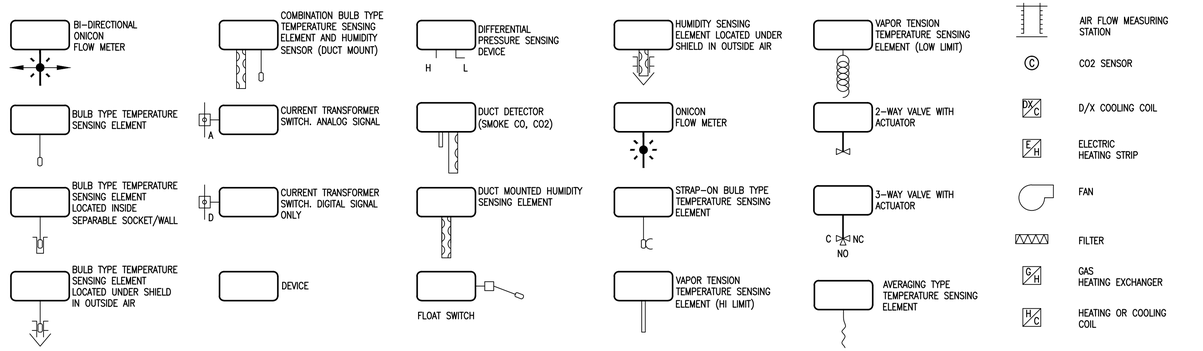
10/18/2017 10:55 a

CONTROLS SYMBOL LEGEND



A	AIR
AFMS	AIRFLOW MONITORING STATION
BPV	BY-PASS VALVE
CC-V	COOLING COIL VALVE
CH	CHILLER
CHWR-T	CHILLED WATER RETURN TEMPERATURE
CHWS-T	CHILLED WATER SUPPLY TEMPERATURE
CMV	CHILLER MODULATING VALVE
CO2-DD	CO2 DUCT DETECTOR
DA	DISCHARGE AIR
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HWS-T	HOT WATER SUPPLY TEMPERATURE
LA-T	LEAVING AIR TEMP.
LL-T	LOW LIMIT TEMP. SENSOR (FREEZE STAT)
LSP-S	LOW STATIC PRESSURE SAFETY
MAD	MOTORIZED AIR DAMPER
MA-T	MIXED AIR TEMP.
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
OA	OUTSIDE AIR
OA-D	OUTSIDE AIR DAMPER
OA-RH	OUTSIDE AIR RELATIVE HUMIDITY
OA-T	OUTSIDE AIR TEMP.
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PHWS	PRIMARY HOT WATER SUPPLY
RA	RETURN AIR
RA-H	RETURN AIR HUMIDITY
RA-T	RETURN AIR TEMP.
SCHWP	SECONDARY CHILLED WATER PUMP
SCHWR	SECONDARY CHILLED WATER RETURN
SCHWS	SECONDARY CHILLED WATER SUPPLY
SHWR	SECONDARY HOT WATER RETURN
SHWS	SECONDARY HOT WATER SUPPLY
VFD	VARIABLE FREQUENCY DRIVE
W	WATER
WFM	WATER FLOW METER

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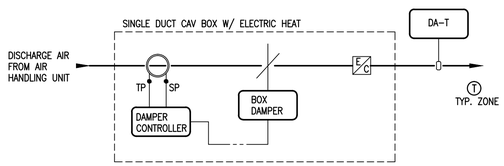
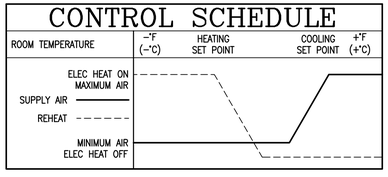


CONTROL SCHEDULE



SEQUENCE OF OPERATION

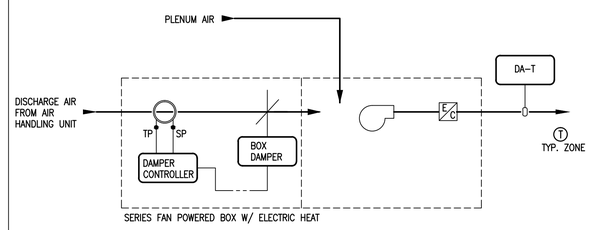
SINGLE DUCT VAV (VARIABLE AIR VOLUME) BOX WITH ELECTRIC HEAT:

OCCUPIED MODE:
1. DDC SHALL MONITOR THE SPACE TEMPERATURE AND MODULATE THE VAV DAMPER TO ADJUST COOLING FLOW AND TO MAINTAIN THE COOLING SPACE TEMPERATURE SETPOINT (ADJUSTABLE).
2. THE DDC SHALL MONITOR THE SPACE TEMPERATURE. AS THE TEMPERATURE IN THE SPACE BEGINS TO FALL THE VAV DAMPER WILL TRAVEL TO ITS MINIMUM POSTION. IF THE SPACE TEMPERATURE CONTINUES TO FALL DDC WILL STAGE ON ELECTRIC HEAT TO MAINTAIN THE HEATING TEMPERATURE SETPOINT (ADJUSTABLE).

UNOCCUPIED MODE
1. SET UP SPACE TEMPERATURE TO 82° F (ADJUSTABLE) AND SET BACK SPACE TEMPERATURE TO 63° F (ADJUSTABLE).
2. IF THE OVERRIDE BUTTON IS PUSHED PUT THE WHOLE SYSTEM IN THE OCCUPIED MODE FOR 2 HOURS (ADJUSTABLE).

GENERAL
1. ALL CONTROL POINTS SHALL BE ACCESSIBLE FOR MONITORING, CONTROL AND OVERRIDE FROM THE BAS. ALL SETPOINTS SHALL BE ADJUSTABLE THROUGH THE BAS. PROVIDE MANUAL CONTROL OF ALL OUTPUTS THROUGH THE BAS.
2. EACH SPACE SENSOR SHALL BE EQUIPPED WITH SETPOINT ADJUST AND OVERRIDE FUNCTIONS. SHOW OVERRIDE INDICATION ON THE BAS GRAPHIC DISPLAY.
3. A DISCHARGE AIR TEMPERATURE SENSOR SHALL BE PROVIDED ON EACH BOX FOR MONITORING PURPOSES.

1 / M5.3 SINGLE DUCT VAV BOX WITH ELECTRIC HEAT
SCALE: NOT TO SCALE



SEQUENCE OF OPERATION

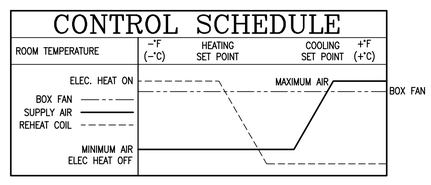
SERIES FAN POWERED VAV (VARIABLE AIR VOLUME) BOX WITH ELECTRIC HEAT:

OCCUPIED MODE:
1. THIS IS A SERIES BOX DESIGNED FOR THE FAN TO OPERATE AND MAINTAIN A CONSTANT FLOW IN THE OCCUPIED MODE.
2. DDC SHALL MONITOR THE SPACE TEMPERATURE AND MODULATE THE VAV DAMPER TO MAINTAIN THE COOLING SPACE TEMPERATURE SETPOINT INITIALLY 74° F. (ADJUSTABLE).
3. AS THE SPACE TEMPERATURE BEGINS TO FALL BELOW THE COOLING SETPOINT THE VAV DAMPER WILL BEGIN TO MODULATE TO ITS MINIMUM POSITION.
4. IF THE SPACE TEMPERATURE FALLS BELOW THE HEATING SETPOINT INITIALLY 68° F (ADJUSTABLE) BEGIN TO STAGE ON THE ELECTRIC HEAT TO MAINTAIN THE HEATING SETPOINT.

UNOCCUPIED MODE
1. SET UP SPACE TEMPERATURE TO 82° F (ADJUSTABLE) AND SET BACK SPACE TEMPERATURE TO 63° F (ADJUSTABLE).
2. FAN SHALL BE IN THE OFF POSITION DURING UNOCCUPIED UNLESS THE SENSORS CALL FOR HEAT TO THE SET BACK SETTING.
3. IF THE OVERRIDE BUTTON IS PUSHED ON ANY SENSOR. PUT SYSTEM IN THE OCCUPIED MODE FOR 2 HOURS (ADJUSTABLE).

GENERAL
1. ALL CONTROL POINTS SHALL BE ACCESSIBLE FOR MONITORING, CONTROL AND OVERRIDE FROM THE BAS. ALL SETPOINTS SHALL BE ADJUSTABLE THROUGH THE BAS. PROVIDE MANUAL CONTROL OF ALL OUTPUTS THROUGH THE BAS.
2. EACH SPACE SENSOR SHALL BE EQUIPPED WITH SETPOINT ADJUST AND OVERRIDE FUNCTIONS. SHOW OVERRIDE INDICATION ON THE BAS GRAPHIC DISPLAY.
3. A DISCHARGE AIR TEMPERATURE SENSOR SHALL BE PROVIDED ON EACH BOX FOR MONITORING PURPOSES.

CONTROL SCHEDULE



1 / M5.3 FAN-POWERED BOX WITH ELECTRIC HEAT
SCALE: NOT TO SCALE

BALCONES HEIGHTS CITY HALL
SAN ANTONIO, TEXAS

	INPUTS												OUTPUTS									SOFTWARE FEATURES																											
	ANALOG						DIGITAL						DIGITAL			ANALOG						CALCULATED				ALARMS			PROGRAMS																			
	TEMP. SENSOR 10K TYPE 2	PRESSURE	RELATIVE HUMIDITY 0-10 VDC	VOLTS/AMPS/K.W.	FLOW	CURRENT XFMR (C.T.)	GATEWAY	DP SWITCH	TEMP. SWITCH	CURRENT SWITCH	SMOKE DETECTOR	AUX. CONTACT	OCCUPANCY SENSOR	PULSE CONTACT	ON - OFF (H.O.A.)	START/STOP	OFF-HIGH-LOW	OPEN/CLOSE	0-10 Vdc	4-20 ma	P.W.M.	FLOATING POINT	OVERRIDE	KWHr/DEMAND	BTU'S	POSITION AS % OPEN	SETPOINT	TOTALIZATION	RUNTIME	HIGH ANALOG	LOW ANALOG	BINARY	PROOF	MAINTENANCE ALM.	TIME OF DAY	START/STOP OPT.	ENTHALPY OPT.	DEMAND LIMITING	DDC CONTROL	EVENT PROGRAM	ALARM MESSAGES	TREND REPORT	DYN. COLOR GRAPHIC	COMMENTS
SINGLE DUCT VAV BOXES WITH ELECTRIC HEAT																																																		
VAV BOX PRIMARY AIR FLOW					X														X				X											X								X	X	X		
ELECTRIC HEAT																		X					X																			X	X	X		
UNIT DISCHARGE TEMPERATURE	X																						X							X	X			X								X	X	X		
SPACE TEMPERATURE	X																						X				X			X	X			X								X	X	X		
DAMPER COMMAND POSITION					X				X											X		X				X								X								X	X	X		

BALCONES HEIGHTS CITY HALL
SAN ANTONIO, TEXAS

	INPUTS												OUTPUTS									SOFTWARE FEATURES																									
	ANALOG						DIGITAL						DIGITAL			ANALOG						CALCULATED				ALARMS			PROGRAMS																			
	TEMP. SENSOR 10K TYPE 2	PRESSURE	RELATIVE HUMIDITY 0-10 VDC	VOLTS/AMPS/K.W.	FLOW	CURRENT XFMR (C.T.)	GATEWAY	DP SWITCH	TEMP. SWITCH	CURRENT SWITCH	SMOKE DETECTOR	AUX. CONTACT	OCCUPANCY SENSOR	PULSE CONTACT	ON - OFF (H.O.A.)	START/STOP	OFF-HIGH-LOW	OPEN/CLOSE	0-10 Vdc	4-20 ma	P.W.M.	FLOATING POINT	OVERRIDE	KWHr/DEMAND	BTU'S	POSITION AS % OPEN	SETPOINT	TOTALIZATION	RUNTIME	HIGH ANALOG	LOW ANALOG	BINARY	PROOF	MAINTENANCE ALM.	TIME OF DAY	START/STOP OPT.	ENTHALPY OPT.	DEMAND LIMITING	DDC CONTROL	EVENT PROGRAM	ALARM MESSAGES	TREND REPORT	DYN. COLOR GRAPHIC	COMMENTS
FAN POWERED VAV BOXES WITH ELECTRIC HEAT																																																		
VAV BOX PRIMARY AIR FLOW					X														X				X																			X	X	X		
ELECTRIC HEAT																	X						X			X																X	X	X		
UNIT DISCHARGE TEMPERATURE	X																						X							X	X											X	X	X		
SPACE TEMPERATURE	X																						X				X			X	X											X	X	X		
DAMPER COMMAND POSITION					X				X												X		X			X																X	X	X		
BOX FAN															X								X																			X	X	X		

Revisions:

No.	Description:	Date:

Date: 2017-OCT-18
Designed by: MM
Drawn by: CAD
Checked by: MM
Project Number: 90501

Drawing Name
MECHANICAL CONTROLS

Sheet No.
M5.3

STATE OF TEXAS
MEHDI J. MIRMOMENI
113121
LICENSED
PROFESSIONAL ENGINEER
2017-OCT-18

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