LEGEND

AD	ACCESS DOOR (DUCT)
A.F.F.	ELEVATION/ABOVE FINISHED FLOOR
—C—	CONDENSATE DRAIN LINE
RBJ	RUN BETWEEN JOISTS
SA	SUPPLY AIR
RA	RETURN AIR
OA	OUTDOOR AIR
EA	EXHAUST AIR
TA	TRANSFER AIR
N/A	NOT APPLICABLE
	UNION JOINT
	FLANGE JOINTS
	ELBOW – UP
	ELBOW – DOWN
	DIRECTION OF FLOW
	FLEXIBLE CONNECTION
	THERMOMETER
(0-60)	PRESSURE GAUGE WITH GAUGE COCK (DIAL RANGE)
	CEILING SUPPLY AIR DEVICE → ARROW DENOTES DIRECTION OF THROW
	RETURN AIR DEVICE
24 X 12	SUPPLY, RETURN, EXHAUST OR OUTSIDE AIR DUCTWORK FIRST DESIGNATION IS SIDE SHOWN.
24 X 12	DOUBLE WALL INSULATED DUCT, SUPPLY OR RETURN FIRST DESIGNATION IS SIDE SHOWN, FREE AREA DIMENSION.
	TURNING VANES (No. OF VANES SHALL BE BASED ON ACTUAL DUCT SIZE & NOT ON SYMBOL ON DRAWING – SEE SMACNA)
	RETURN OR OUTSIDE AIR DUCT
	DISCHARGE OR SUPPLY DUCT
	EXHAUST FAN OR GRILLE
	FLEXIBLE DUCT CONNECTION
MD	VOLUME DAMPER (WITH OR WITHOUT MD)
F AD	FIRE DAMPER
F	FLOW MEASURING STATION
DN	DROP IN DIRECTION OF AIR FLOW
R	RISE IN DIRECTION OF AIR FLOW
	FLEXIBLE AIR DUCT
	SPIN COLLAR WITH MANUAL DAMPER
M AD	AUTOMATIC MOTORIZED DAMPER
T	THERMOSTAT OR TEMPERATURE SENSOR
S	SMOKE DETECTOR
H	HUMIDISTAT OR HUMIDITY SENSOR
	BALL VALVES
FOT	FLAT ON TOP TRANSITION
FOB	FLAT ON BOTTOM TRANSITION
	EXISTING DUCTWORK OR EQUIPMENT TO REMAIN
	CROSS HATCH PATTERN INDICATES EXISTING DUCTWORK OR EQUIPMENT TO BE REMOVED
	EXISTING CHILLED WATER PIPING TO REMAIN
	EXISTING CHILLED WATER PIPING TO BE REMOVED
EX-CD CFM	EXISTING CEILING SUPPLY DIFFUSER
EX-RG CFM	EXISTING RETURN AIR GRILLE
EX-EG CFM	EXISTING EXHAUST GRILLE
	EXISTING EQUIPMENT DESIGNATION

GENERAL MECHANICAL NOTES

1. ALL SUPPLY, RETURN, EXHAUST, AND OUTSIDE AIR DUCTWORK SHALL BE CONSTRUCTED OF GALVANIZED SHEET METAL, UNLESS NOTED OTHERWISE ON PLANS. DUCTS SHALL BE FABRICATED IN COMPLIANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS METAL AND FLEXIBLE." REFER TO THE PROJECT SPECIFICATIONS FOR PRESSURE CLASSIFICATION AND SEALING REQUIREMENTS. THE FIRST 20 FEET OF SUPPLY AND RETURN AIR DUCTWORK FROM THE AIR HANDLING UNITS SHALL BE CONSTRUCTED OF THE DUAL WALL TYPE WITH A PERFORATED GALVANIZED INNER WALL, 1" THICK MYLAR ENCAPSULATED DUCT LINER, AND GALVANIZED OUTER WALL EQUAL TO UNITED MCGILL K–27. SEE SPECIFICATIONS FOR REQUIREMENTS. SEAL ALL DUCTWORK TO SEAL CLASS 'A'. ALL LONGITUDINAL SEAMS 12" AND LARGER ARE TO BE PITTSBURGH LOCK TYPE.
2. REFER TO SPECIFICATIONS FOR INSULATION REQUIREMENTS OF SUPPLY, RETURN, TRANSFER, RELIEF AND OUTSIDE AIR DUCTWORK.
3. EXACT LOCATION OF AIR DISTRIBUTION DEVICES SHALL BE COORDINATED WITH THE LIGHTS, SPRINKLER HEADS AND WITH THE SUSPENDED CEILING TILES, AND AS SHOWN ON THE ARCHITECTURAL REFLECTED CEILING PLANS..
4. NEW REFRIGERANT PIPING SHALL BE TYPE "L" COPPER. VALVES AND FITTINGS IN COPPER LINES SHALL HAVE BRAZED JOINTS.
5. PROVIDE ACCESS DOORS AT ALL FIRE DAMPERS, SMOKE DAMPERS, COMBINATION FIRE/SMOKE DAMPERS, DUCT HEATERS, AND AUTOMATIC TEMPERATURE CONTROL DEVICES WITH MAXIMUM ALLOWABLE STANDARD SIZE PERMITTED BY DUCT DIMENSIONS. DOORS SHALL HAVE SAFETY CHAIN WITH CAM LATCHES AND FULLY GASKETED TO THE PERIMETER. PROVIDE ACCESS PANELS IN CEILING WHERE REQUIRED TO PROVIDE ACCESS TO DAMPERS, DUCT HEATERS AND SIMILAR DEVICES.
6. COORDINATE INSTALLATION WITH ALL OTHER INVOLVED TRADES. IN THE CASE OF CONFLICT BETWEEN DRAWINGS AND SPECIFICATION, THE MORE STRINGENT REQUIREMENT AS DETERMINED BY THE ENGINEER SHALL TAKE PRECEDENT.
7. FLEXIBLE AIR DUCT SHALL BE USED FOR RUNOUTS BETWEEN THE SUPPLY AND RETURN AIR DUCTS AND AIR DISTRIBUTION DEVICES WHERE INDICATED. FLEXIBLE DUCT SHALL BE A MINIMUM OF SIX FEET AND A MAXIMUM OF FOURTEEN FEET IN LENGTH AND OF THE MYLAR–COATED WIRE HELIX TYPE WITH 1" THICK FIBERGLASS INSULATION AND METALIZED MYLAR LAMINATE VAPOR BARRIER COVER. ATTACH FLEXIBLE AIR DUCT TO DIFFUSERS AND SPIN COLLARS WITH PLASTIC OR METAL DRAW BANDS AND SEAL THE ENDS WITH TAPE AND MASTIC TO MAINTAIN THE VAPOR BARRIER. FLEXIBLE DUCT AND SPIN COLLAR SIZE SHALL BE THE SAME NOMINAL DIAMETER AS THE NECK OF THE AIR DISTRIBUTION DEVICE IT IS CONNECTED TO. FLEXIBLE DUCT SHALL BE ONE–PIECE AND NOT BE SPLICED TOGETHER.
8. ELEVATIONS GIVEN: B.E. = BOTTOM ELEVATION, C.E. = CENTERLINE ELEVATION, T.E. = TOP ELEVATION, ARE TAKEN FROM THE CONCRETE FLOOR SLAB. THESE ELEVATIONS ARE APPROXIMATE AND MUST BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO FABRICATION OF ANY DUCTWORK.
9. PROVIDE SINGLE THICKNESS METAL TURNING VANES IN ALL SQUARE ELBOWS INCLUDING SUPPLY, RETURN, EXHAUST AND OUTSIDE AIR DUCTS. WHERE UNEQUAL SQUARE ELBOWS ARE SHOWN, TURNING VANES WITH TRAILING EDGE EXTENSIONS SHALL BE USED.
10. DOCUMENTS ARE SCHEMATIC IN NATURE AND DO NOT INDICATE EVERY BEND, ELBOW, OR OFFSET REQUIRED IN DUCTWORK AND PIPING. FIELD VERIFY ALL DUCTWORK SIZES AND ELEVATIONS PRIOR TO FABRICATION/INSTALLATION. PROVIDE MODIFICATIONS WHERE REQUIRED FOR COORDINATION IN BASE CONTRACT PRICE AT NO ADDITIONAL COST.
11. LOUVERS SHALL BE CONSTRUCTED OF ALUMINUM WITH A BAKED KYNAR FINISH TO MATCH THE BUILDING COLOR, EQUAL TO RUSKIN MODEL EME520MD, WITH MIAMI–DADE NOA APPROVAL FOR LARGE MISSILE IMPACT RATING. LOUVERS ARE TO BE FURNISHED WITH ALUMINUM BIRDSCREENS. COLOR TO BE SELECTED BY THE ARCHITECT. PROVIDE ALUMINUM PLENUM ON BACK OF LOUVER. SEE DETAIL.
12. ENDS OF DUCTWORK AND PIPING SHALL BE KEPT SEALED USING PLASTIC SHEETING AND DUCT TAPE DURING CONSTRUCTION.
13. EQUIPMENT SHALL BE SUPPLIED AND INSTALLED WITH PROVISION FOR IN–PLACE CLEANING AND SIMILAR MAINTENANCE TASKS IN ACCORDANCE WITH THE REQUIREMENTS OF ASHRAE 62–1999.
14. PROVIDE MISCELLANEOUS STRUCTURAL STEEL TO SPAN ACROSS BEAMS, JOISTS AND PURLINS WHERE REQUIRED FOR INTERMEDIATE SUPPORT.
15. OUTDOOR AND EXHAUST AIR DUCTS SHALL BE SLOPED TOWARDS THE INTAKE OR EXHAUST LOUVERS.
16. THE CONTRACTOR IS TO CLEAN, PRIME, AND PAINT FLAT BLACK THE INSIDE OF ALL DUCTWORK THAT IS VISIBLE THROUGH ANY LOUVER OR AIR DEVICE.
17. LOCATIONS FOR TEMPERATURE AND HUMIDITY SENSORS ARE APPROXIMATE IN NATURE AND SHALL NOT BE SCALED FROM THE DRAWINGS. COORDINATE EXACT LOCATIONS WITH ROOM FURNITURE LAYOUT AND CONFIRM PROPOSED LOCATION WITH THE OWNER'S REPRESENTATIVE PRIOR TO ROUGH–IN.
18. FOR ALL MANUAL VOLUME DAMPERS LOCATED ABOVE A HARD CEILING OR INACCESSIBLE CEILING, PROVIDE A REMOTE CABLE OPERATED DAMPER ACTUATOR ASSEMBLY MOUNTED IN THE CEILING, EQUAL TO "YOUNG REGULATOR".
19. EXTERIOR MOUNTED EQUIPMENT SHALL BE DESIGNED, MANUFACTURED AND INSTALLED TO WITHSTAND THE APPLIED WIND FORCE. THE APPLICABLE WIND FORCE SHALL BE AS DETERMINED IN ACCORDANCE WITH THE FLORIDA BUILDING CODE CHAPTER 16. A 'SPECIALTY ENGINEER' LICENSED TO PRACTICE IN FLORIDA SHALL DETERMINE THE APPLICABLE WIND FORCE AND CERTIFY THE PROPOSED EQUIPMENT CONSTRUCTION AND MOUNTING MEETS THE APPLIED WIND FORCE WITH SUITABLE DOCUMENTATION PROVIDED TO THE PERMITTING AUTHORITIES.
20. EXPOSED DUCTWORK ROUTED THRU AREAS WITH NO SUSPENDED CEILING SHALL BE CLEANED, PRIMED, AND PAINTED, COLOR AS PER THE ARCHITECTS DIRECTION. THE DUCT INSULATION FOR SUCH EXPOSED DUCTWORK SHALL BE RIGID TYPE EXTERNAL DUCT BOARD. DOUBLE–WALL PRE–INSULATED DUCTWORK IS AN ACCEPTABLE ALTERNATIVE IN EXPOSED LOCATIONS.

EQUIPMENT MARK DESIGNATION

CD CEILING DIFFUSER
EG EXHAUST GRILLE
RG RETURN GRILLE
SG SIDEWALL GRILLE
TG TRANSFER GRILLE
OSG OUTDOOR SOFFIT GRILLE

CD–X XXX
X = UNIT NUMBER
XXX = AIR QUANTITY IN CFM (CUBIC FEET PER MINUTE)

AHU = AIR HANDLING UNIT
SF = SUPPLY FAN
EF = EXHAUST FAN
CH = CHILLER
P = PUMP
CU = CONDENSING UNIT
CV = CONTROL VALVE
TB = VAV TERMINAL BOX
DX = DIRECT EXPANSION AHU

AHU 2
AIR HANDLING UNIT DESIGNATION — UNIT NUMBER

DUCTWORK SIZE COORDINATION

NEW DUCTWORK SHOWN IN CONCEALED LOCATIONS SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO FABRICATION. IF A DUCT SIZE IS DETERMINE TO BE NEEDED TO BE REVISED, THE CONTRACTOR SHALL ISSUE AN RFI AND NOTIFY THE ENGINEER TO ASSIST IN DETERMINING AN ALTERNATIVE DUCT SIZE.

UNFORESEEN CONDITIONS OFFSET REQUIREMENTS

THE CONTRACTOR SHALL INCLUDE IN THE BASE BID THE COST OF MATERIALS AND LABOR ASSOCIATED WITH PROVIDING DUCTWORK OFFSETS OVER, UNDER, OR AROUND OTHER TRADES WORK OR EXISTING UNFORESEEN CONDITIONS.

1. IN ADDITION TO THE DUCTWORK OFFSETS SHOWN ON THESE DRAWINGS, PROVIDE AN ADDITIONAL TWENTY–FIVE (25) DUCTWORK OFFSETS. EACH OFFSET SHALL CONSIST OF 4 ELBOWS AND 10 FEET OF DUCTWORK, INCLUDING INSULATION, USING AN AVERAGE DUCT SIZE OF 16"x16".
2. IN ADDITION TO THE CHILLED WATER PIPING OFFSETS SHOWN ON THESE DRAWINGS, PROVIDE AN ADDITIONAL TWENTY–FIVE (25) PIPING OFFSETS. EACH OFFSET SHALL CONSIST OF 8 ELBOWS AND 20 FEET OF PIPING, INCLUDING PIPE INSULATION, USING AN AVERAGE PIPE SIZE OF 2 1/2".

THE CONTRACTOR SHALL DOCUMENT THESE ADDITIONAL OFFSETS WHEN PROVIDED BY ISSUING AN RFI, TAKING A PHOTOGRAPH OF THE OFFSET, AND INCLUDING IT IN THE AS–BUILT DRAWINGS.

SHEET LIST TABLE

GLIDDEN • SPINA & PARTNERS
ARCHITECTURE • INTERIOR DESIGN, INC.
PHONE : 561.684.6844 • FAX : 561.684.5594 • E-MAIL : info@gsp-architects.com
1401 FORUM WAY, SUITE 100 • WEST PALM BEACH, FLORIDA 33401
FL License: #AA26001692
Keith M. Spina #AR13419 Benjamin John Glidden, III #AR0536

CONSTRUCTION DOCUMENT SET FOR:

ADMIRAL'S COVE
MAIN CLUBHOUSE
200 ADMIRALS COVE BOULEVARD
JUPITER, FLORIDA 33477

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JOHNSON, LEVINSON RAGAN, DAVILA, INC.
CONSULTING ENGINEERS
1450 Centrepark Boulevard, Suite 350
West Palm Beach, Florida 33401
(561)689.2303•(561)689.2703 Fax
www.jldinc.com
Certification Number 6059
Harold L. Ragan, P.E. 48983
Michael P. Linden, P.E. 58094
JLRD Project No. 111061

M-0.1

BID SET

DESIGN CONDITIONS

SUMMER	INDOOR	75°F DB	50% RH
	OUTDOOR	92°F DB	78°F WB
WINTER	INDOOR	72°F DB	–
	OUTDOOR	45°F DB	–

AIR CONDITIONING SYSTEM SCHEDULE

UNIT NO.	MAKE	AIR HANDLING UNIT DATA					CAPACITY DATA				AIR COOLED CONDENSING UNIT DATA						REMARKS
		MODEL	CFM	EXT. SP	FAN FLA	V/ø	COOLING MBTU MIN	COOLING MBTU MAX	HEATING KW	HEATING VØ	PLAN MARK	MODEL	SEER	VOLTS/ø	COMP. R.L.A.	FAN F.L.A.	
DX–1	MITSUBISHI	MSY–GE15NA	300	–	0.76	208/1	3.1	15	–	–	CU–1	MUY–GE15NA	21	208/1	12	0.52	(1)(2)(3)(4)(5)(6)(7)(8)(9)(10)
DX–2	MITSUBISHI	MSY–GE24NA	500	–	0.76	208/1	8.2	31	–	–	CU–2	MUY–GE24NA	19	208/1	17	0.93	(1)(2)(3)(4)(5)(6)(7)(8)(9)(10)
DX–3	MITSUBISHI	MSY–GE24NA	500	–	0.76	208/1	8.2	31	–	–	CU–3	MUY–GE24NA	19	208/1	17	0.93	(1)(2)(3)(4)(5)(6)(7)(8)(9)(10)
DX–4	MITSUBISHI	MSY–GE24NA	500	–	0.76	208/1	8.2	31	–	–	CU–4	MUY–GE24NA	19	208/1	17	0.93	(1)(2)(3)(4)(5)(6)(7)(8)(9)(10)

(1) SEE DETAILS FOR ANCHORING REQUIREMENTS FOR ROOF MOUNTED OR GRADE MOUNTED CONDENSING UNITS.

(2) FACTORY MOUNTING KIT.

(3) PROVIDE WITH MANUFACTURERS THERMOSTAT.

(4) PROVIDE WITH FACTORY CONTROLS.

(5) PROVIDE WITH HERESITE COATING ON CONDENSING UNIT COIL.

(6) ALL CONDENSATE DRAIN LINES SHALL BE FULL SIZE OF THE DRAIN CONNECTION OR 3/4" DIA., WHICHEVER IS LARGER.

(7) PROVIDE WITH UNIT MOUNTED DISCONNECT AND POWER RECEPTACLE.

(8) START ASSIST KIT

(9) INTEGRAL INVERTER TO ALLOW COMPRESSOR TO MODULATE TO LOW COOLING LEVELS

(10) INTEGRAL CONDENSATE PUMP

DESIGN CRITERIA

AHU MARK	OUTDOOR AIR CFM	DESIGN OCCUPANCY	OA RATE CFM / PERSON	OUTSIDE TEMP. DB / WB	INSIDE TEMP. DB / WB
AHU 4–1	750	10	75	92 / 78	75 / 62.5
AHU 4–2	300	1	300	92 / 78	75 / 62.5
AHU 4–3	750	54	13.9	92 / 78	75 / 62.5
AHU 4–4	1400	54	25.9	92 / 78	75 / 62.5
AHU 4–5	600	60	10	92 / 78	75 / 62.5
AHU 4–6	130	11	11.8	92 / 78	75 / 62.5
AHU 4–7	1270	106	12	92 / 78	75 / 62.5
AHU 4–8	170	14	12.1	92 / 78	75 / 62.5
AHU 3–1	950	50	19	92 / 78	75 / 62.5

DESIGN BASED ON THE VENTILATION RATE PROCEDURE PER FLORIDA BUILDING CODE, 2007, AND ASHRAE 62.1 – 2007

SUPPLY AND EXHAUST FAN SCHEDULE

PLAN MARK	MAKE	MODEL NUMBER	SPACE SERVED	CFM	E.S.P. IN INCHES OF H_2O	DRIVE	DISCONN. SWITCH	FAN RPM	MOTOR HP	MOTOR RPM	MOTOR VOLTS	MOTOR PH	MOUNTING	REMARKS	INTERLOCK
EF 4–1–2	GREENHECK	G – 101	DISHWASHER	650	0.75	DIRECT	YES	1725	1/4	1725	120	1	ROOF	(1)(3)(4)(6)(9)(10)(16)	INTERLOCK TO OPERATE WHEN DISHWASHER IS ON
EF 4–2–1	GREENHECK	G – 090	MARINA RESTROOM	400	0.375	DIRECT	YES	1550	1/15	1550	120	1	ROOF	(1)(3)(4)(6)(9)(10)(16)	INTERLOCK TO OPERATE WITH AHU 4–2 OA DAMPER
EF 4–3–1	GREENHECK	SP – B110	KIDS TOILET	75	0.375	DIRECT	YES	950	80 W	950	120	1	CEILING	(1)(2)(3)(5)(6)(7)	INTERLOCK TO OPERATE WITH AHU 4–3 OA DAMPER
EF 4–3–2	GREENHECK	BSQ – 240	GOLF CART	8000	0.50	BELT	YES	920	3	1750	480	3	IN–LINE	(1)(4)(5)(6)	CONTINUOUS RUN
EF 4–3–3	GREENHECK	SP – B110	WATER HEATER ROOM	120	0.375	DIRECT	YES	1050	129W	1050	120	1	CEILING	(1)(2)(3)(5)(6)(7)	CONTROLLED BY THERMOSTAT SET AT 80 DEGRESS
EF 4–4–1	GREENHECK	G – 070	FITNESS RESTROOMS	150	0.375	DIRECT	YES	1550	1/30	1550	120	1	ROOF	(1)(3)(4)(6)(9)(10)(16)	INTERLOCK TO OPERATE WITH AHU 4–4 OA DAMPER

(1) PROVIDE BACKDRAFT DAMPERS

(2) "W" INDICATES WATTAGE OF FRACTIONAL HORSEPOWER FANS

(3) ELECTRONIC SPEED CONTROLLER MOUNTED AT FAN OR CLOSEST ACCESSIBLE LOCATION

(4) MOTOR COVER AND BELT GUARD

(5) PROVIDE RUBBER IN SHEAR VIBRATION ISOLATORS

(6) PROVIDE FAN WITH UNIT MOUNTED DISCONNECT

(7) PROVIDE WITH INTEGRAL CEILING GRILLE

(8) INSULATED HOUSING

(9) PROVIDE WITH PRE–MANUFACTURED INSULATED ROOF CURB.

(10) PROVIDE WITH BIRD SCREEN

(11) DRAIN CONNECTION AND GREASE CUP

(12) PROVIDE WITH HEAT FAN BAFFLE

(13) PROVIDE PRE–MANUFACTURED ROOF CURB AND EXTENSION TO ENSURE DISCHARGE AIR IS MINIMUM 40" ABOVE FINISHED ROOF.

(14) PROVIDE WITH 2" ALUMINUM WASHABLE FILTERS.

(15) PROVIDE FACTORY MOUNTED HINGE KIT AND RETAINING CABLES.

(16) FAN SHALL HAVE MIAMI–DADE COUNTY NOA FOR LARGE MISSILE IMPACT RATING.

GLIDDEN • SPINA & PARTNERS
ARCHITECTURE • INTERIOR DESIGN, INC.
PHONE: 561.684.6844 • FAX: 561.684.5594 • E-MAIL: info@gsp-architects.com
1401 FORUM WAY, SUITE 100 • WEST PALM BEACH, FLORIDA 33401
FL License: #AA26001692
Keith M. Spina #AR13419 Benjamin John Glidden, III #AR0536

CONSTRUCTION DOCUMENT SET FOR:

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MAIN CLUBHOUSE
200 ADMIRALS COVE BOULEVARD
JUPITER, FLORIDA 33477

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JOHNSON, LEVINSON RAGAN, DAVILA, INC.
CONSULTING ENGINEERS
1450 Centrepark Boulevard, Suite 350
West Palm Beach, Florida 33401
(561)689.2303•(561)689.2702 Fax
www.jldinc.com
Certification Number 6059
Harold L. Ragan, P.E. 48983
Michael P. Linder, P.E. 58094
JLRD Project No. 111061

M-0.2

BID SET

AIR HANDLING UNIT SCHEDULE

BLOWER UNITS

PLAN MARK	MAKE	MODEL	LOCATION	SERVICE	OUTDOOR AIR CFM	SUPPLY AIR CFM	STATIC PRESSURE INCHES OF WATER		BLOWER RPM		MOTOR					UNIT TYPE
							EXTERNAL	TOTAL			HP	BHP	RPM	VOLTS	PH	
AHU 4–1	CARRIER	39 MW–10	ROOF	KITCHEN	750	3000	0.97	3.08	1338		3	2.1	1750	480	3	HORIZ SZ
AHU 4–2	CARRIER	42 BHE 08	MECH. 156	TOWELS AND TOILET AREA	300	720	0.89	1.16	1191		1/2	0.3	1750	120	1	HORIZ SZ
AHU 4–3	CARRIER	39 MN–06	MECH. 156	PRE–TEEN	750	2700	1.18	2.58	1577		3	2.2	1750	480	3	HORIZ SZ
AHU 4–4	CARRIER	39 MW–21	ROOF	FITNESS 214	1400	7500	1.23	3.42	946		7.5	6.4	1750	480	3	HORIZ SZ
AHU 4–5	CARRIER	42 BHE 16	ABOVE CEILING	CARD ROOM 216	600	1600	0.98	1.64	1127		1	0.7	1750	120	1	HORIZ SZ
AHU 4–6	CARRIER	42 BHE 16	CHART ROOM	HARBOR MASTER	130	1470	1.09	1.48	1030		3/4	0.5	1750	120	1	HORIZ SZ
AHU 4–7	CARRIER	39 MW–14	ROOF	DINING	1270	5100	1.10	3.42	1078		7.5	5.9	1750	480	3	HORIZ SZ
AHU 4–8	CARRIER	42 BHE 08	CHART ROOM	CHART ROOM	170	700	0.87	1.24	1235		1/2	0.3	1750	120	1	HORIZ SZ
AHU 3–1	CARRIER	39 LH–08	EXIST MECH	AEROBICS AND THERAPY	950	4000	2.49	3.82	1569		5	4.4	1750	480	3	HORIZ VAV

CHILLED WATER COOLING COIL

FACE AREA FT^2	FACE VELOCITY FPM	AIR TEMP F ENTER DB	AIR TEMP F ENTER WB	AIR TEMP F LEAVE DB	AIR TEMP F LEAVE WB	CAPACITY MBH TOTAL	CAPACITY MBH SENSIBLE	WATER TEMP F ENTER	WATER TEMP F LEAVE	GPM	WATER PRESSURE DROP FEET H_2O	NUMBER OF ROWS	FINS PER INCH	AIR SIDE PRESSURE DROP INCHES H_2O	REMARKS AND NOTES
6.3	474	79.4	66.4	52.7	52.6	124	84	45	59	18	22	8	11	1.07	①②③④⑤⑥⑦⑩⑫⑬⑭⑮⑯⑰⑲
–	–	82.5	68.6	51.7	51.2	34	20	45	50	14	25	6	11	–	②③④⑤⑥⑦⑪
5.9	457	79.8	66.5	51.8	51.6	119	75	45	56	22	13	8	11	1.04	①②③④⑤⑥⑦⑨⑯⑱
15.8	474	78.0	64.6	51.7	51.5	282	204	45	56	51	9	8	11	1.04	①②③④⑤⑥⑦⑩⑫⑬⑭⑮⑯⑰⑲
–	–	80.8	69.9	53.3	53.2	91	52	45	55	19	12	8	11	–	②③④⑤⑥⑦⑪
–	–	76.6	61.9	50.4	50.2	44	35	45	53	9	3	8	11	–	②③④⑤⑥⑦⑪
10.2	498	79.1	66.7	53.6	53.4	207	124	45	60	27	27	8	11	1.15	①②③④⑤⑥⑦⑩⑫⑬⑭⑮⑯⑰⑲
–	–	79.1	65.0	50.5	50.3	30	20	45	52	9	4	8	11	–	②③④⑤⑥⑦⑪
7.9	506	80.2	68.0	56.0	55.5	158	93	45	57	26	11	6	11	0.91	②③④⑤⑥⑧⑯⑱

① MODULES SHALL BE DOUBLE WALL INSULATED CONSTRUCTION

② PREMIUM EFFICIENCY TEFC MOTOR

③ FAN MODULE WITH ACCESS DOOR

④ SLOPED DOUBLE WALL STAINLESS STEEL DRAIN PAN WITH SIDE OUTLET

⑤ PROVIDE FLAT FILTER MODULE WITH 2" 30–35 PERCENT EFFICIENT THROW–AWAY FILTERS. SELECT UNIT USING 0.50" ADDITIONAL S.P. FOR DIRTY FILTER ALLOWANCE

⑥ FAN AND DRIVE SHALL HAVE INTERNAL VIBRATION ISOLATION SUPPORTS. SPRING TYPE – 2" DEFLECTION.

⑦ HORIZONTAL COOLING COIL MODULE

⑧ 1" THICK INTERNALLY LINED INSULATION

⑨ PROVIDE EXTERNAL FACE AND BYPASS MODULE

⑩ 18" HIGH SELF–FLASHING ALUMINUM OR STAINLESS STEEL ROOF CURB

⑪ HORIZONTAL SUSPENDED BLOWER COIL UNIT

⑫ NO EXPOSED GALVANIZED MATERIALS OR MOUNTING HARDWARE ALLOWED OUTDOORS. USE ALL STAINLESS STEEL MOUNTING HARDWARE.

⑬ BACK INLET HOOD WITH MOTORIZED OUTSIDE AIR DAMPER

⑭ FILTER/MIXING BOX MODULE WITH ACCESS DOOR AND BOTTOM INLET WITH GRATING OVER OPENING.

⑮ PROVIDE INTERNAL FACE AND BYPASS MODULE

⑯ ON THE AHU FILTER MODULE, PROVIDE A DIFFERENTIAL PRESSURE GAUGE MOUNTED ON THE EXTERNAL CASING AND ROUTE ASSOCIATED TUBING ACROSS THE FILTERS

⑰ PROVIDE FIELD APPLIED ADSIL COATING TO THE INTERIOR AND EXTERIOR OF THE ENTIRE UNIT INCLUDING THE COOLING COIL, AND SUPPORT RAILS.

⑱ PROVIDE EXTENDED GREASE LINES SO ALL FAN BEARINGS CAN BE LUBRICATED FROM ACCESS SIDE OF UNIT.

⑲ PROVIDE WITH EXTERNAL PIPING CABINET

CONTROL VALVE SCHEDULE

PLAN MARK	MAKE	MODEL NUMBER	GPM	C_V	VALVE SIZE	SERVES	ACTUATOR	P.D. PSIG	REMARKS
CV 4–1	JOHNSON CONTROLS	VB–4324	18	13.9	1	AHU 4–1	ELECTRONIC	1.7	①②③
CV 4–2	JOHNSON CONTROLS	VB–4324	14	8.6	3/4	AHU 4–2	ELECTRONIC	2.1	①②③
CV 4–3	JOHNSON CONTROLS	VB–4324	22	13.9	1	AHU 4–3	ELECTRONIC	2.5	①②③
CV 4–4	JOHNSON CONTROLS	VB–4324	51	27.5	1 1/2	AHU 4–4	ELECTRONIC	3.4	①②③
CV 4–5	JOHNSON CONTROLS	VB–4324	19	13.9	1	AHU 4–5	ELECTRONIC	1.9	①②③
CV 4–6	JOHNSON CONTROLS	VB–4324	9	4.4	1 1/2	AHU 4–6	ELECTRONIC	4.1	①②③
CV 4–7	JOHNSON CONTROLS	VB–4324	27	13.9	1	AHU 4–7	ELECTRONIC	3.8	①②③
CV 4–8	JOHNSON CONTROLS	VB–4324	9	4.4	1 1/2	AHU 4–8	ELECTRONIC	4.1	①②③
CV 3–1	JOHNSON CONTROLS	VB–4324	26	13.9	1	AHU 3–1	ELECTRONIC	3.5	①②③

① THREE WAY VALVE

② MODULATING

③ PROVIDE REDUCERS AT VALVE INLET AND OUTLET WHERE REQUIRED.

DUCT HEATER SCHEDULE

PLAN MARK	MANUFACTURER	SERVES	KW	STEPS	VOLTS/PH	CFM	E.A.T.	L.A.T.	MBH	DUCT SIZE	REMARKS
DH 4–1	BRASCH SLIP–IN	AHU 4–1	17	⑨	480/3	3000	63.7	81.5	58	26 X 16	①②③④⑤⑥⑦⑧
DH 4–2	BRASCH SLIP–IN	AHU 4–2	5	⑨	480/3	770	61.0	81.4	17	12 X 12	①②③④⑤⑥⑦⑧
DH 4–3	BRASCH SLIP–IN	AHU 4–3	15	⑨	480/3	2700	63.0	80.5	51	28 X 14	①②③④⑤⑥⑦⑧
DH 4–4	BRASCH SLIP–IN	AHU 4–4	30	⑨	480/3	7500	65.4	78.0	102	42 X 18	①②③④⑤⑥⑦⑧
DH 4–5	BRASCH SLIP–IN	AHU 4–5	10	⑨	480/3	1600	61.4	81.1	34	20 X 14	①②③④⑤⑥⑦⑧
DH 4–6	BRASCH SLIP–IN	AHU 4–6	6	⑨	480/3	1470	67.6	81.1	20	20 X 12	①②③④⑤⑥⑦⑧
DH 4–7	BRASCH SLIP–IN	AHU 4–7	25	⑨	480/3	5100	63.7	79.1	85	34 X 18	①②③④⑤⑥⑦⑧
DH 4–8	BRASCH SLIP–IN	AHU 4–8	4	⑨	480/3	700	64.0	81.9	13	12 X 12	①②③④⑤⑥⑦⑧

① WITH MANUAL AND AUTOMATIC RESET THERMAL CUTOUTS

② WITH DOOR MOUNTED DISCONNECT AND PILOT LIGHT

③ WITH 24 VOLT CONTROL TRANSFORMER WITH PRIMARY FUSING

④ WITH AIR FLOW SWITCH

⑤ WITH MAGNETIC CONTACTORS

⑥ WITH INSULATED TERMINAL BOX BACK

⑦ MAINTAIN 42" CLEAR SPACE IN FRONT OF ENTIRE CONTROL CABINET

⑧ SEE PLANS FOR MOUNTING LOCATIONS AND CONFIGURATION

⑨ PROVIDE WITH SRC CONTROLS SEE SPECIFICATIONS

FLOW METER SCHEDULE

PLAN MARK	MAKE	SERVES	GPM	SIZE	BETA RATIO	END STYLE	METER ΔP	HEAD LOSS	SERVICE	REMARKS
FM 4–1	GERAND	AHU 4–1	18	1.5	505	THREADED	19	1.9	CHILLED WATER	①②③④
FM 4–2	GERAND	AHU 4–2	14	1.5	505	THREADED	13	1.3	CHILLED WATER	①②③④
FM 4–3	GERAND	AHU 4–3	22	2	485	THREADED	14	1.4	CHILLED WATER	①②③④
FM 4–4	GERAND	AHU 4–4	51	2.5	608	THREADED	18	1.8	CHILLED WATER	①②③④
FM 4–5	GERAND	AHU 4–5	19	2	485	THREADED	11	1.1	CHILLED WATER	①②③④
FM 4–6	GERAND	AHU 4–6	9	1.25	500	THREADED	9	0.9	CHILLED WATER	①②③④
FM 4–7	GERAND	AHU 4–7	27	2	485	THREADED	21	2.1	CHILLED WATER	①②③④
FM 4–8	GERAND	AHU 4–8	9	1.25	500	THREADED	9	0.9	CHILLED WATER	①②③④
FM 3–1	GERAND	AHU 3–1	26	2	485	THREADED	19	1.9	CHILLED WATER	①②③④

① PROVIDE A MINIMUM OF 5 STRAIGHT PIPE DIAMETERS UP–STREAM OF VENTURI.

② PROVIDE A MINIMUM OF 2 STRAIGHT PIPE DIAMETERS DOWN–STREAM OF VENTURI.

③ CONFIRM ALL PIPE SIZES PRIOR TO ORDERING FLOW METER.

④ INSTALL VENTURI TEST PORTS 45° FROM THE TOP OF PIPE.

GLIDDEN • SPINA & PARTNERS
ARCHITECTURE • INTERIOR DESIGN, INC
PHONE: 561.684.6844 • FAX: 561.684.5594 • E-MAIL: info@gsp-architects.com
1401 FORUM WAY, SUITE 100 • WEST PALM BEACH, FLORIDA 33401
FL License: #AA26001692
Keith M. Spina #AR13419 Benjamin John Glidden, III #AR0536

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JUPITER, FLORIDA 33477

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JOHNSON, LEVINSON RAGAN, DAVILA, INC.
CONSULTING ENGINEERS
1450 Centrepark Boulevard, Suite 350
West Palm Beach, Florida 33401
(561)689.2303 ●(561)689.2703 Fax
www.jldinc.com
Certification Number 6059
Harold L. Ragan, P.E. 48983
Michael P. Linder, P.E. 58094
JLRD Project No. 111061

M-0.3

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VARIABLE AIR VOLUME TERMINAL BOX SCHEDULE

PLAN MARK	MAKE	MODEL NUMBER	CFM			PRIMARY AIR INLET DIA.	MAXIMUM INLET STATIC	ELECTRIC HEATING COIL					REMARKS
			VALVE		MIN. HEAT			KW	STEPS	E.A.T.	L.A.T.	VOLTS/PH	
			MAX COOLING	MIN VENTIL.									
TB 3-1-1	CARRIER	35EN-14	2050	400	600	14"ø	0.45"	6	1	45.0	76.5	277/1	(1)(2)(3)(4)(5)(6)(7)
TB 3-1-2	CARRIER	35EN-08	630	200	300	8"ø	0.45"	3	1	45.0	76.5	277/1	(1)(2)(3)(4)(5)(6)(7)
TB 3-1-3	CARRIER	35EN-06	475	100	200	6"ø	0.45"	2	1	45.0	76.5	277/1	(1)(2)(3)(4)(5)(6)(7)
TB 3-1-4	CARRIER	35EN-08	770	200	300	8"ø	0.45"	3	1	45.0	76.5	277/1	(1)(2)(3)(4)(5)(6)(7)
TB 3-1-5	CARRIER	35EN-06	375	100	200	6"ø	0.45"	2	1	45.0	76.5	277/1	(1)(2)(3)(4)(5)(6)(7)

(1) THREE MINIMUMS
(A) AT ROOM MINIMUM VENTILATION RATE OCCUPIED
(B) MINIMUM HEATER CFM
(C) 0 – CFM UNOCCUPIED

(2) INCLUDES 0.25" ALLOWANCE FOR DOWNSTREAM DUCT STATIC

(3) TRANSITION FROM ELECTRIC HEATER ON TERMINAL BOX DISCHARGE TO DUCT SIZE SHOWN ON PLANS.

(4) MAINTAIN 42" MIN. CLEARANCE IN FRONT OF TB HEATER CONTROL PANEL.

(5) IF TB COMES WITH BOTTOM ACCESS, DO NOT INSTALL IT ABOVE A LIGHT FIXTURE; POSITION TB TO PROVIDE CLEAR ACCESS.

(6) PROVIDE WITH BOTTOM ACCESS PANEL FOR VALVE AND ACTUATOR

(7) SEE SPECIFICATION FOR NOISE CRITERIA FOR BOXES

DIFFUSER, GRILLE, AND REGISTER SCHEDULE

PLAN MARK	MAKE	MODEL NUMBER	NECK SIZE	THROW PATTERN	FINISH	MATERIAL	MOUNTING	REMARKS
CD-1	TITUS	TDC-AA	6 X 6	SEE PLANS	WHITE	ALUMINUM	SURFACE	(2)(3)(5)
CD-2	TITUS	TDC-AA	9 X 9	SEE PLANS	WHITE	ALUMINUM	SURFACE	(2)(3)(5)
CD-3	TITUS	TDC-AA	12 X 12	SEE PLANS	WHITE	ALUMINUM	SURFACE	(2)(3)(5)
CD-4	TITUS	TDC-AA	9 X 9	SEE PLANS	WHITE	ALUMINUM	LAY-IN	(2)(3)
CD-5	TITUS	TDC-AA	12 X 12	SEE PLANS	WHITE	ALUMINUM	LAY-IN	(2)(3)
CD-6	TITUS	TDC-AA	15 X 15	ADJUSTABLE	WHITE	ALUMINUM	LAY-IN	(2)(3)
LD-1	TITUS	LL-2	48 X 6	2-WAY	WHITE	ALUMINUM	SURFACE	(1)(2)(3)(12)(13)
LD-2	TITUS	CT-480	36 X 3	FIXED	WHITE	ALUMINUM	SURFACE	(1)(2)(3)(13)
LD-3	TITUS	LL-2	48 X 8	2-WAY	WHITE	ALUMINUM	SURFACE	(1)(2)(3)(12)(13)
SG-1	TITUS	300-FS	10 X 6	ADJUSTABLE	WHITE	ALUMINUM	SIDEWALL	(2)(5)(8)
SG-2	TITUS	300-FS	24 X 14	ADJUSTABLE	WHITE	ALUMINUM	SIDEWALL	(2)(5)(8)
EG-1	TITUS	4FL	6 X 6	EXHAUST	WHITE	ALUMINUM	SURFACE	(2)(5)(9)
EG-2	TITUS	4FL	10 X 10	EXHAUST	WHITE	ALUMINUM	SURFACE	(2)(5)(9)
EG-3	TITUS	4FL	16 X 16	EXHAUST	WHITE	ALUMINUM	SURFACE	(2)(5)(9)
EG-4	TITUS	8F	24 X 10	EXHAUST	WHITE	ALUMINUM	SURFACE	(2)(5)(9)
RG-1	TITUS	4FL	6 X 6	RETURN	WHITE	ALUMINUM	SURFACE	(1)(2)(5)
RG-2	TITUS	4FL	10 X 10	RETURN	WHITE	ALUMINUM	SURFACE	(1)(2)(5)
RG-3	TITUS	4FL	16 X 16	RETURN	WHITE	ALUMINUM	SURFACE	(1)(2)(5)
RG-4	TITUS	4FL	10 X 10	RETURN	WHITE	ALUMINUM	LAY-IN	(1)(2)(5)
RG-5	TITUS	4FL	16 X 16	RETURN	WHITE	ALUMINUM	LAY-IN	(1)(2)(5)
RG-6	TITUS	4FL	20 X 20	RETURN	WHITE	ALUMINUM	SURFACE	(1)(2)(5)
RG-7	TITUS	4FL	20 X 20	RETURN	WHITE	ALUMINUM	LAY-IN	(1)(2)(5)
RG-8	TITUS	8F	46 X 22	RETURN	WHITE	ALUMINUM	LAY-IN	(1)(2)(5)(11)
RG-9	TITUS	8F	30 X 18	RETURN	WHITE	ALUMINUM	SURFACE	(1)(2)(5)(11)
RG-10	TITUS	8F	20 X 20	RETURN	WHITE	ALUMINUM	SURFACE	(1)(2)(5)(11)
RG-11	TITUS	4FL	42 X 18	RETURN	WHITE	ALUMINUM	SURFACE	(2)(5)
TG-1	TITUS	4FL	10 X 10	TRANSFER	WHITE	ALUMINUM	LAY-IN	(2)
TG-2	TITUS	4FL	16 X 16	TRANSFER	WHITE	ALUMINUM	SURFACE	(2)(5)
OSG-1	TITUS	50F	12 X 12	NONE	WHITE	ALUMINUM	SURFACE	(2)(5)(14)
OSG-2	TITUS	50F	18 X 12	NONE	WHITE	ALUMINUM	SURFACE	(2)(5)(14)

(1) PROVIDE EXTERNALLY INSULATED PLENUM BOX ON GRILLE WHERE REQUIRED FOR FLEX CONNECTION

(2) CONFIRM ALL MOUNTING TYPES PRIOR TO ORDERING

(3) INSULATE BACK OF LAY-IN PANEL OR PLENUM BOX

(4) TYPICAL FOR ALL DEVICES, SHADE OF WHITE TO MATCH CEILING GRID

(5) FLANGED BORDER

(6) PROVIDE INSULATED SHEET METAL SQUARE TO ROUND TRANSITION.

(7) SUSPENDED INDEPENDENTLY FROM STRUCTURE WHERE REQUIRED, ALL DEVICES

(8) REMOVABLE CORE

(9) PROVIDE WITH OPPOSED BLADE DAMPER ACCESSIBLE THRU FACE OF GRILLE WHERE NO MANUAL DAMPER CAN BE PROVIDED IN THE BRANCH DUCT

(10) FOR SUPPLY AND RETURN GRILLES LOCATED IN A HARD CEILING, PROVIDE REMOTE CABLE OPERATED MANUAL CONTROL DAMPER, EQUAL TO 'POTTORFF' MODEL RCS-10R, OR 'YOUNG REGULATOR'.

(11) PERFORATED GRILLE

(12) LINEAR ARCHITECTURAL LOUVER, 2-WAY THROW, INTERNAL THROW AND BALANCING BLADES.

(13) ALL LINEAR DIFFUSERS SHALL BE PROVIDED WITH BALANCING BLADES ACCESSIBLE THRU THE FACE OF THE GRILLE

(14) 1/2" X 1/2" ALUMINUM EGG CRATE GRILLE MOUNTED IN THE HORIZONTAL FACE OF THE OUTSIDE SOFFIT

GLIDDEN • SPINA & PARTNERS
ARCHITECTURE • INTERIOR DESIGN, INC.
PHONE: 561.684.6844 • FAX: 561.684.5594 • E-MAIL: info@gsp-architects.com
1401 FORUM WAY, SUITE 100 • WEST PALM BEACH, FLORIDA 33401
FL License: #AA26001692
Keith M. Spina #AR13419 Benjamin John Glidden, III #AR0536

CONSTRUCTION DOCUMENT SET FOR:

ADMIRAL'S COVE
MAIN CLUBHOUSE

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JUPITER, FLORIDA 33477

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JOHNSON, LEVINSON RAGAN, DAVILA, INC.
CONSULTING ENGINEERS
1450 Centrepark Boulevard, Suite 350
West Palm Beach, Florida 33401
(561) 689.2303 • (561) 689.2702 Fax
www.jldinc.com
Certification Number 6059
Harold L. Ragan, P.E. 48983
Michael P. Linder, P.E. 58094
JLRD Project No. 111061

M-0.4

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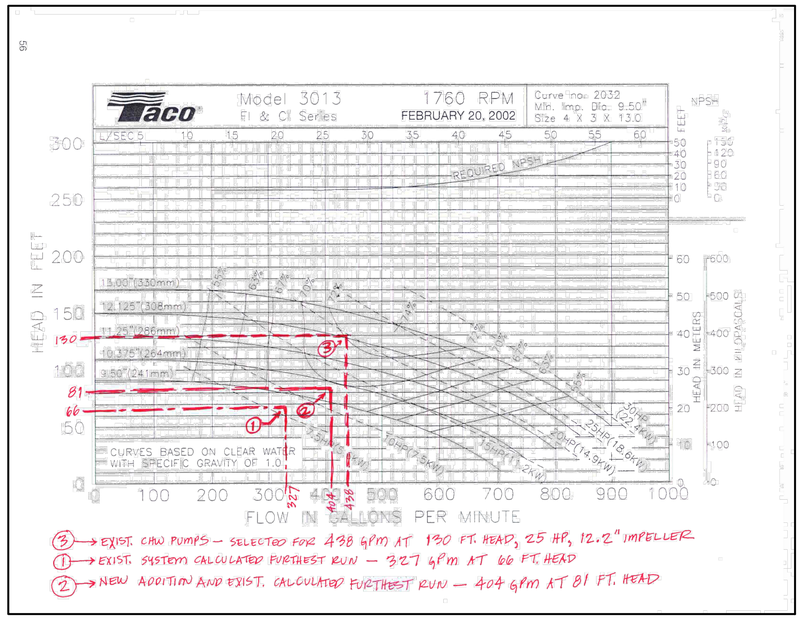

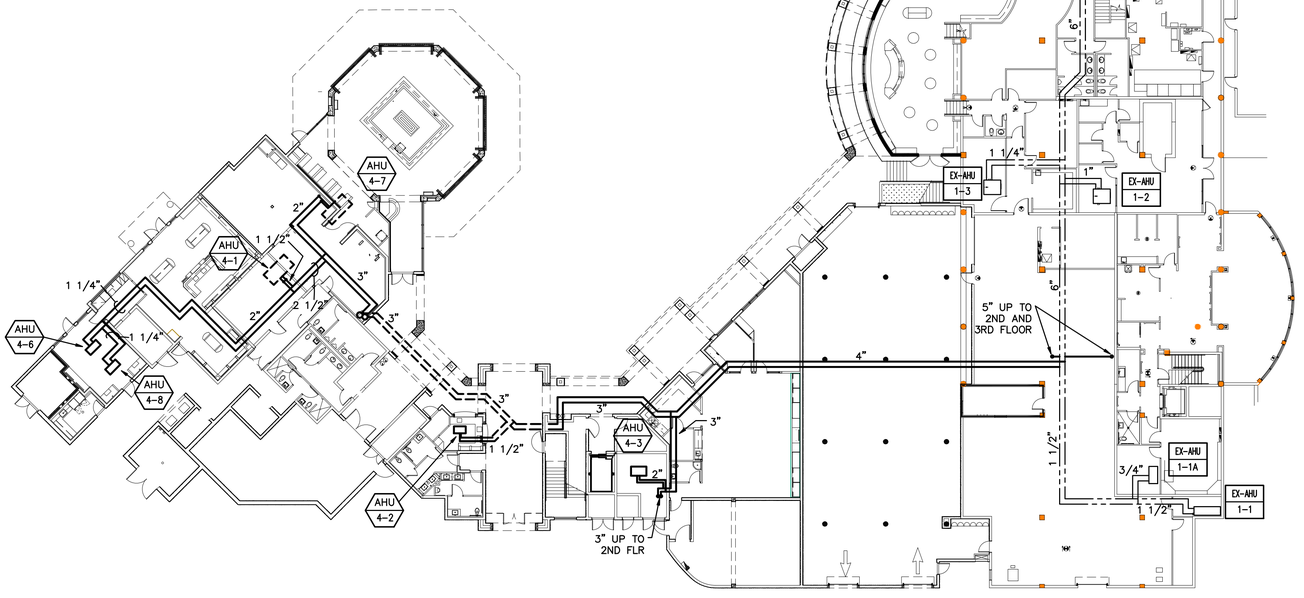

1 M-0.5 **MECHANICAL SITE PLAN**

SCALE: 1" = 20'-0"

EXISTING CHILLED WATER EQUIPMENT							
CHILLERS							
CH-1	CARRIER	23XL4242	250 TONS CAPACITY	438 GPM		56° EWT	42° LWT
CH-2	CARRIER	23XL4242	250 TONS CAPACITY	438 GPM		56° EWT	42° LWT
CHILLED WATER PUMPS							
CHWP-1	TACO	FI-3013	438 GPM	130 FT. HD.	25 HP	12.2" IMPELLER	
CHWP-2	TACO	FI-3013	438 GPM	130 FT. HD.	25 HP	12.2" IMPELLER	
CHWP-3	TACO	FI-3013	438 GPM	130 FT. HD.	25 HP	12.2" IMPELLER	
(PUMP CHWP-3 IS STAND-BY)							

CHILLER CAPACITY TOTALS	
EXISTING CHILLERS=	500 TONS AVAILABLE
EXISTING AHU'S=	326 TONS
EXISTING HOTEL RISERS=	56 TONS
NEW AHU'S=	75 TONS
326+56+75=	457 TONS FULL LOAD
500-457=	43 TONS REMAINS AVAILABLE

CHILLED WATER PUMP TOTALS	
EXISTING PUMPS (2)=	876 GPM AVAILABLE
EXISTING AHU'S=	556 GPM
EXISTING HOTEL RISERS=	97 GPM
NEW AHU'S=	154 GPM
556+97+154=	807 GPM FULL LOAD
876-807=	69 GPM REMAINS AVAILABLE
EXISTING PUMP HEAD=	130 FT
CALCULATED NEW HEAD=	81 FT
130-81=	49 FT HEAD REMAINS AVAILABLE

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ARCHITECTURE • INTERIOR DESIGN, INC
PHONE: 561.684.6844 • FAX: 561.684.5594 • E-MAIL: info@gsp-architects.com
1401 FORUM WAY, SUITE 100 • WEST PALM BEACH, FLORIDA 33401
FL License #AA26001602
Keith M. Spina #AR13419 Benjamin John Glidden, III #AR0536

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JOHNSON, LEVINSON RAGAN, DAVILA, INC.
CONSULTING ENGINEERS
1450 Centerpark Boulevard, Suite 350
West Palm Beach, Florida 33401
(561) 689.2303 • (561) 689.2302 Fax
www.jldinc.com
Certification Number 6059
Harold L. Ragan, P.E. 48983
Michael P. Linden, P.E. 58094
JLRD Project No. 111061

M-0.5

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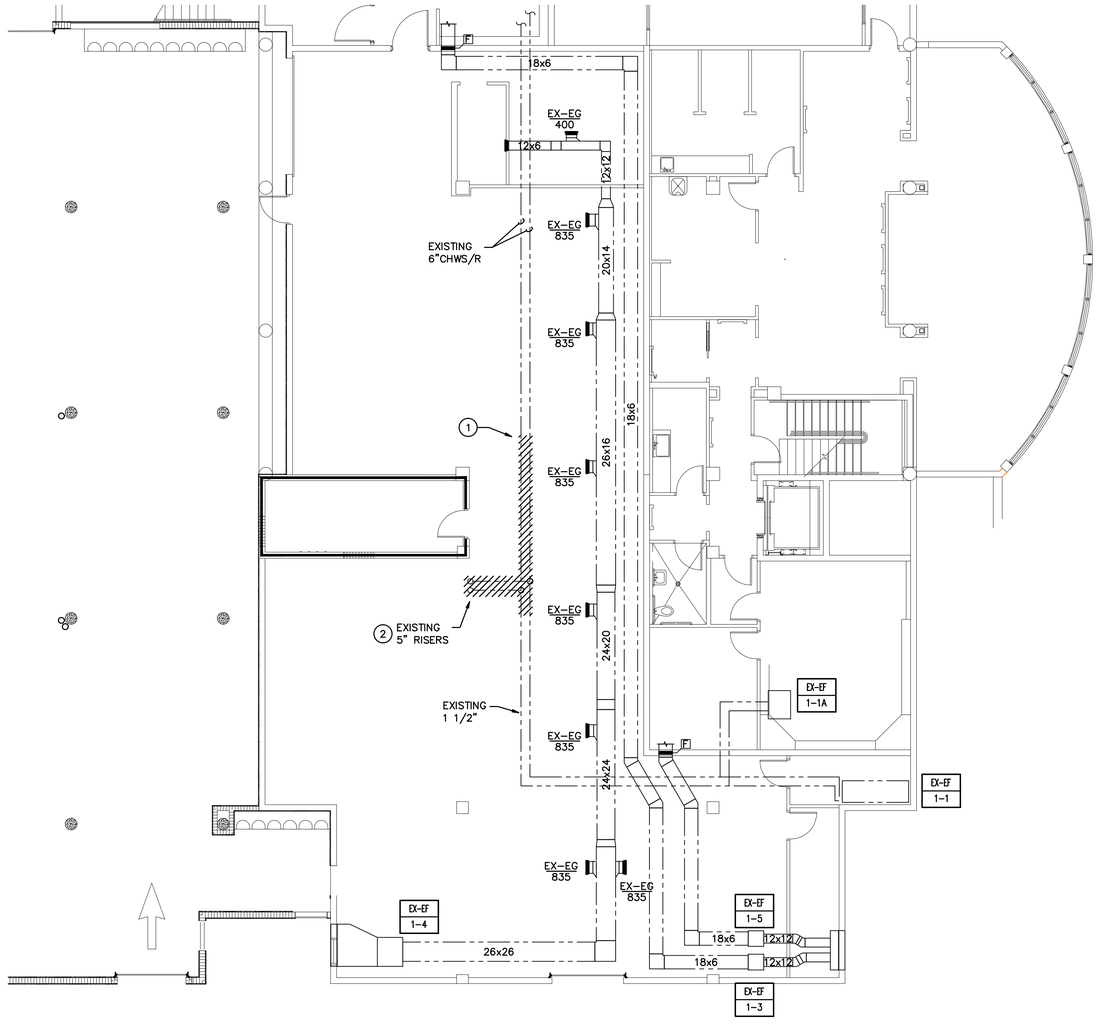

1 M-1.1 PARTIAL 1ST FLOOR MECHANICAL HVAC PLAN - DEMOLITION

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

NORTH

PLAN NOTES

1. ISOLATE THIS SECTION OF PIPING TO THE MAXIMUM EXTENT POSSIBLE AND DRAIN CHILLED WATER, DISPOSE OF DRAINED CHILLED WATER TO A SANITARY DRAIN AND NOT TO A STORM DRAIN, REMOVE SECTION OF EXISTING 6" CHILLED WATER SUPPLY AND RETURN PIPING AND INSULATION FOR CONNECTION OF NEW 4" PIPES, AND FOR RELOCATION OF 5" RISERS.

2. REMOVE 5" RISERS UP THRU FLOOR SLAB AND UP INTO SECOND FLOOR CEILING SPACE. PATCH FLOOR SLAB OPENINGS WITH NEW CONCRETE AND DOWEL INTO EXISTING ADJACENT FLOOR SLAB.

GLIDDEN • SPINA & PARTNERS
ARCHITECTURE • INTERIOR DESIGN, INC
GS&P
PHONE: 561.684.6844 • FAX: 561.684.5594 • E-MAIL: info@gsp-architects.com
1401 FORUM WAY, SUITE 100 • WEST PALM BEACH, FLORIDA 33401
FL License: #AA26001692
Keith M. Spina #AR13419 Benjamin John Glidden, III #AR0536

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JOHNSON, LEVINSON RAGAN, DAVILA, INC.
CONSULTING ENGINEERS
1450 Centrepark Boulevard, Suite 350
West Palm Beach, Florida 33401
(561) 689-2303 • (561) 689-2302 Fax
www.jldinc.com
Certification Number 6059
Harold L. Ragan, P.E. 48983
Michael P. Linden, P.E. 58094
JLRD Project No. 111061

M-1.1

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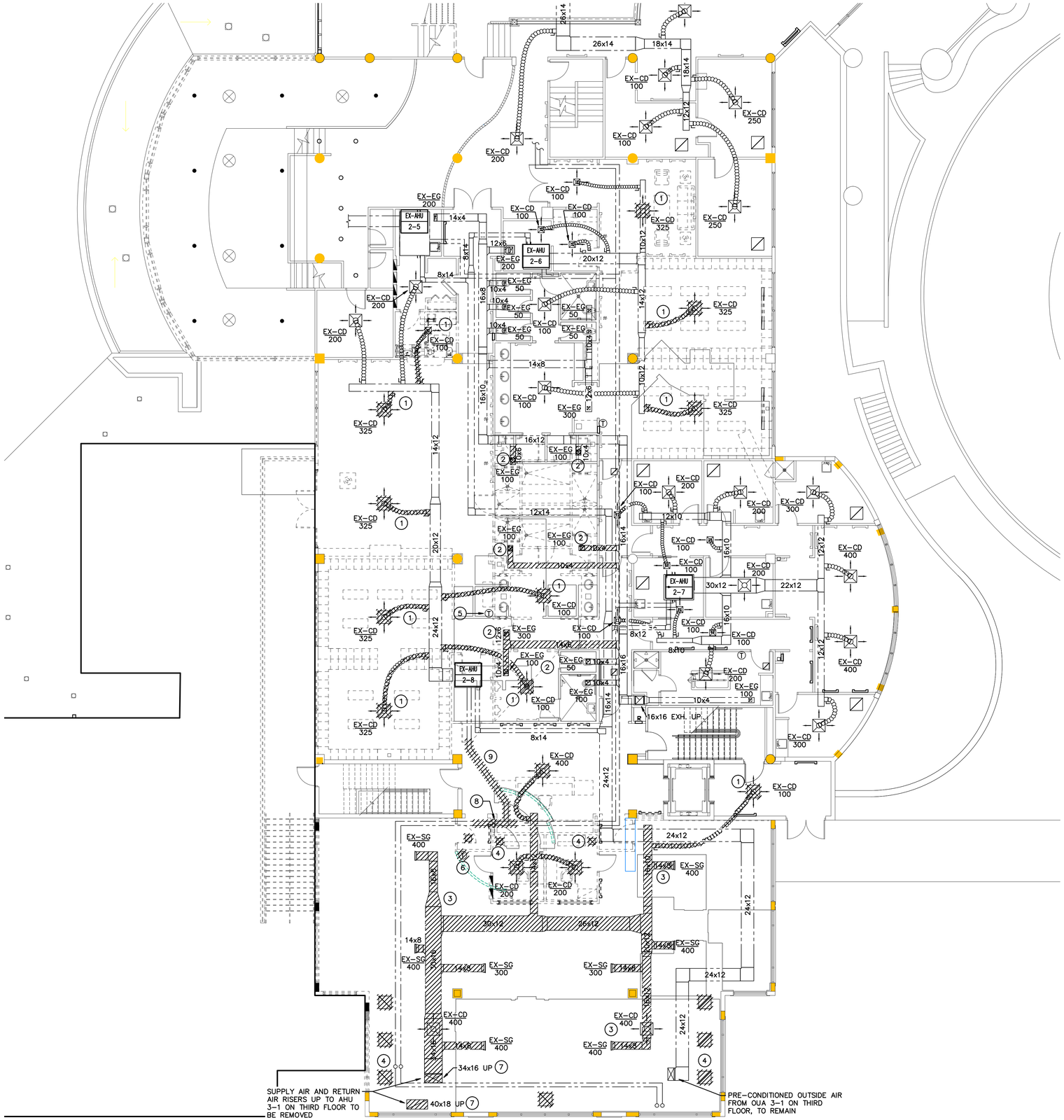

1 M-1.2 PARTIAL 2ND FLOOR MECHANICAL HVAC PLAN - DEMOLITION

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

NORTH

PLAN NOTES

1. REMOVE SUPPLY GRILLE AND FLEX DUCT BACK TO SUPPLY MAIN.
2. REMOVE EXHAUST GRILLE AND BRANCH DUCT FAR ENOUGH TO ALLOW FOR CONVENIENT RECONNECTION.
3. REMOVE SUPPLY GRILLES AND DUCTWORK ALL THE WAY BACK TO THE AIR HANDLING UNIT ON THIRD FLOOR, AND REMOVE ASSOCIATED DUCT SUPPORTS.
4. REMOVE RETURN GRILLES.
5. EXISTING THERMOSTAT TO BE RELOCATED. REMOVE CONTROL WIRING AND CONDUIT AS NEEDED TO EXTEND TO NEW THERMOSTAT LOCATION.
6. EXISTING THERMOSTAT AND ASSOCIATED CONTROL WIRING AND CONDUIT SHALL BE REMOVED.
7. REMOVE DUCT DROPS THRU FLOOR FROM AHU 3-1 IN MECHANICAL ROOM ABOVE ON THIRD FLOOR. PATCH FLOOR OPENINGS WITH NEW CONCRETE TO MATCH EXISTING, AND DOWEL INTO EXISTING ADJACENT CONCRETE FLOOR AT 6" ON CENTER EACH WAY.
8. REMOVE 5" CHW RISERS FROM FIRST FLOOR BELOW AND UP INTO CEILING SPACE.
9. REMOVE PORTIONS OF CHW PIPING ABOVE CEILING TO ALLOW RECONNECTION TO NEW CHW PIPE MAINS.

GLIDDEN • SPINA & PARTNERS
ARCHITECTURE • INTERIOR DESIGN, INC.
PHONE: 561.684.6844 • FAX: 561.684.5594 • E-MAIL: info@gsp-architects.com
1401 FORUM WAY, SUITE 100 • WEST PALM BEACH, FLORIDA 33401
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JOHNSON, LEVINSON RAGAN, DAVILA, INC.
CONSULTING ENGINEERS
1450 Centrepark Boulevard, Suite 350
West Palm Beach, Florida 33401
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www.jlrdinc.com
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Michael P. Linden, P.E. 58094
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M-1.2

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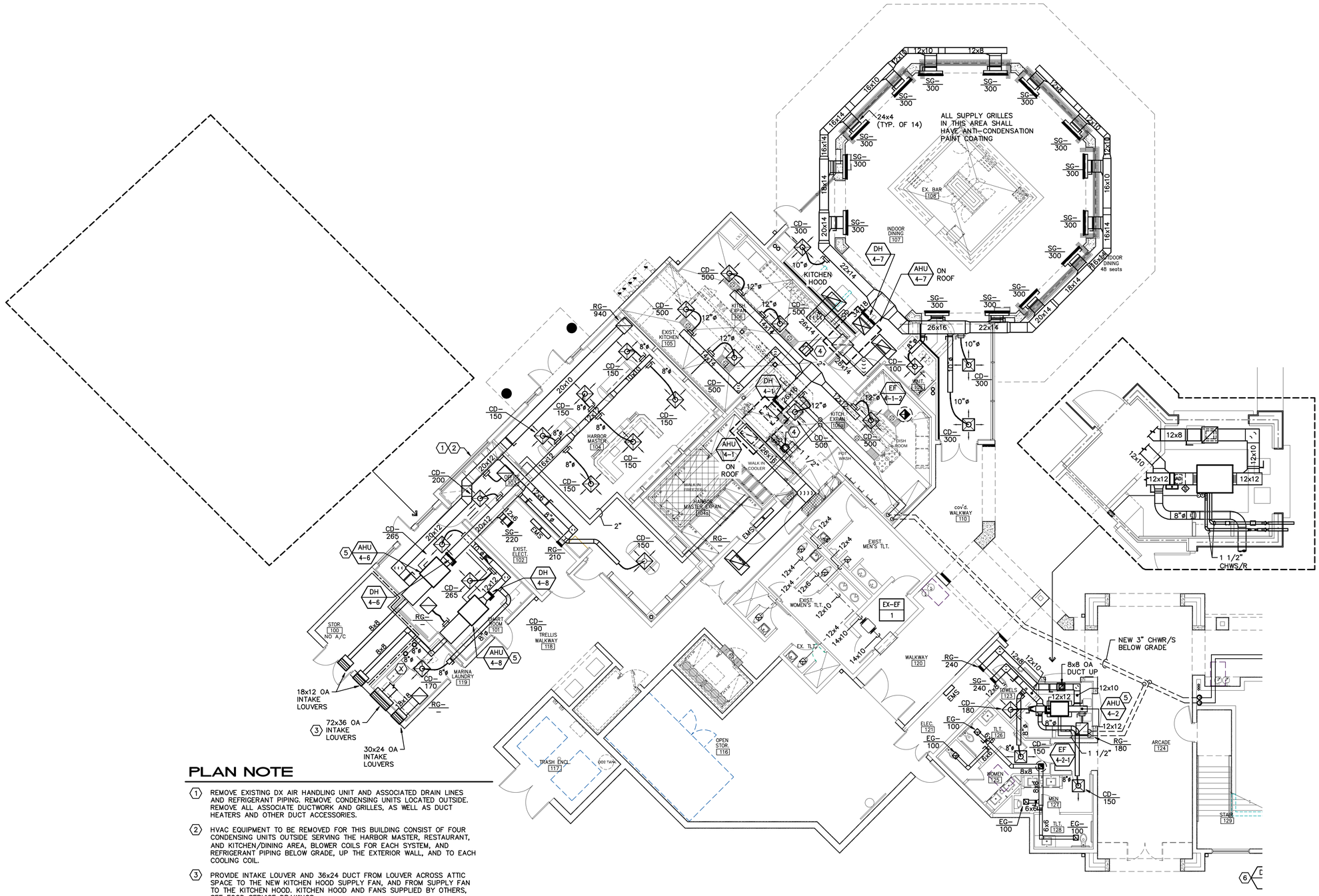

PLAN NOTE

1. REMOVE EXISTING DX AIR HANDLING UNIT AND ASSOCIATED DRAIN LINES AND REFRIGERANT PIPING. REMOVE CONDENSING UNITS LOCATED OUTSIDE. REMOVE ALL ASSOCIATE DUCTWORK AND GRILLES, AS WELL AS DUCT HEATERS AND OTHER DUCT ACCESSORIES.
2. HVAC EQUIPMENT TO BE REMOVED FOR THIS BUILDING CONSIST OF FOUR CONDENSING UNITS OUTSIDE SERVING THE HARBOR MASTER, RESTAURANT, AND KITCHEN/DINING AREA, BLOWER COILS FOR EACH SYSTEM, AND REFRIGERANT PIPING BELOW GRADE, UP THE EXTERIOR WALL, AND TO EACH COOLING COIL.
3. PROVIDE INTAKE LOUVER AND 36x24 DUCT FROM LOUVER ACROSS ATTIC SPACE TO THE NEW KITCHEN HOOD SUPPLY FAN, AND FROM SUPPLY FAN TO THE KITCHEN HOOD. KITCHEN HOOD AND FANS SUPPLIED BY OTHERS, SEE FOOD SERVICE DRAWINGS.
4. VALVES AND ACCESSORIES FOR ROOFTOP UNIT SHALL BE LOCATED ABOVE THE CEILING. PROVIDE 24" BY 24" HINGES ACCESS PANEL IN CEILING LOCATED TO PROVIDE ACCESS.
5. AHU INSTALLED ABOVE SUSPENDED CEILING. PROVIDE SAFETY PAN BELOW ENTIRE UNIT WITH MOISTURE SENSOR TO SHUT DOWN UNIT IF MOISTURE IS SENSED. PROVIDE HINGED ACCESS PANEL IN CEILING, MINIMUM 36"x24" TO ALLOW ACCESS TO FILTERS, MOTOR, AND PIPING VALVES AND ACCESSORIES.

1 M-1.3 **PARTIAL 1ST FLOOR MECHANICAL HVAC PLAN - NEW WORK**

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

GLIDDEN • SPINA & PARTNERS
ARCHITECTURE • INTERIOR DESIGN, INC.
GS&P
PHONE: 561.684.6844 • FAX: 561.684.5594 • E-MAIL: info@gsp-architects.com
1401 FORUM WAY, SUITE 100 • WEST PALM BEACH, FLORIDA 33401
FL License: #AA26001692
Keith M. Spina #AR13419 Benjamin John Glidden, III #AR0536

CONSTRUCTION DOCUMENT SET FOR:

ADMIRAL'S COVE
MAIN CLUBHOUSE
200 ADMIRALS COVE BOULEVARD
JUPITER, FLORIDA 33477

sheet title: PARTIAL 1ST FLOOR MECHANICAL HVAC PLAN - NEW WORK
file name: M-1.3 PARTIAL 1ST FLOOR MECHANICAL HVAC PLAN - NEW WORK.dwg

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JOHNSON, LEVINSON RAGAN, DAVILA, INC.
CONSULTING ENGINEERS
1450 Centrepark Boulevard, Suite 350
West Palm Beach, Florida 33401
(561)689.2303 (561)689.2703 Fax
www.jldinc.com
Certification Number 6059
Harold L. Ragan, P.E. 48983
Michael P. Linder, P.E. 58094
JLRD Project No. 111061

M-1.3

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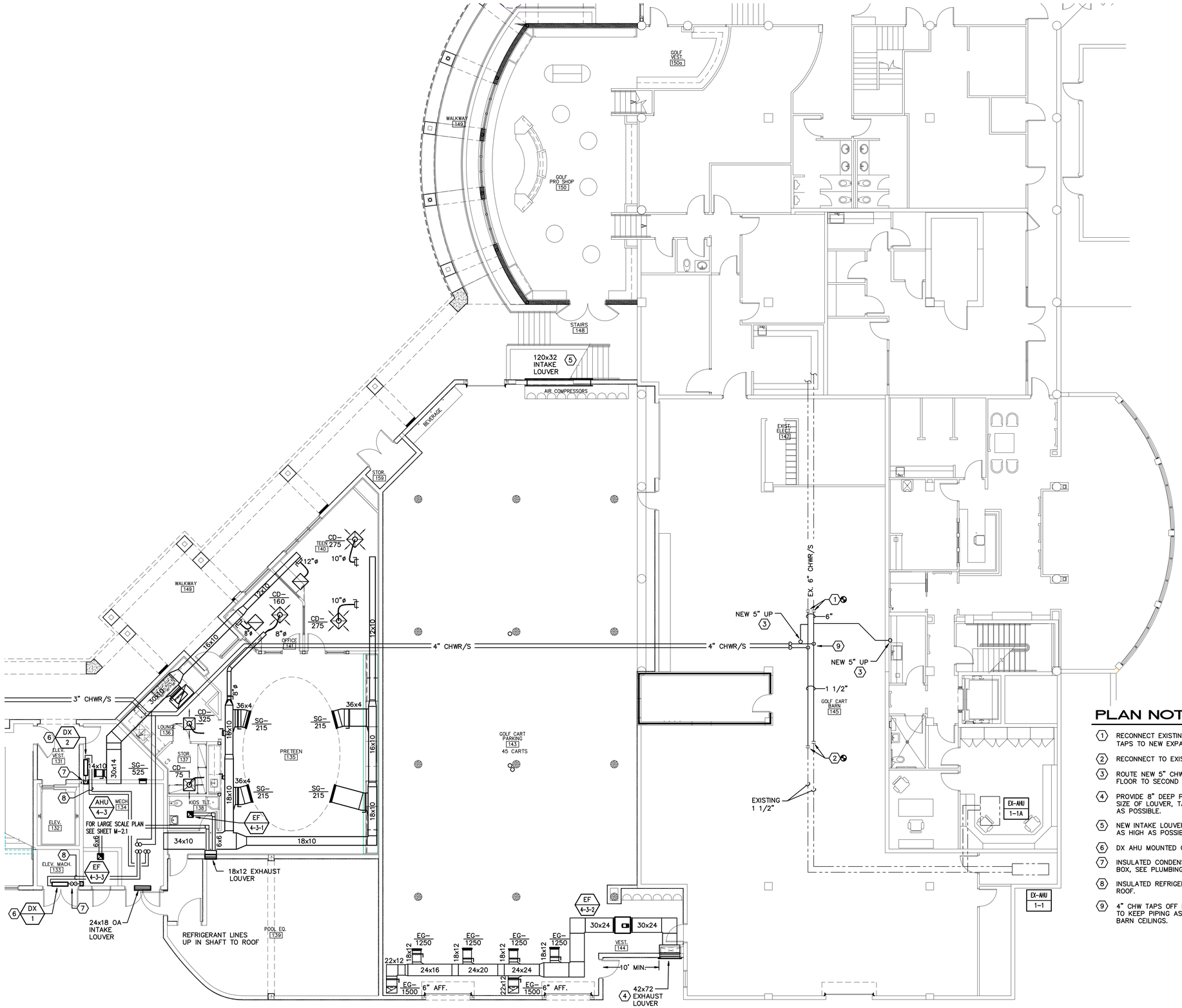

PLAN NOTE

1. RECONNECT EXISTING 6" CHWS/R TO NEW, ONCE BEYOND 4" TAPS TO NEW EXPANSION, REDUCE TO 1 1/2".
2. RECONNECT TO EXISTING 1 1/2" CHWR/S.
3. ROUTE NEW 5" CHWS/R UP IN NEW CHASE ON SECOND FLOOR TO SECOND FLOOR CEILING SPACE.
4. PROVIDE 8" DEEP PLENUM ON BACK OF NEW LOUVER, FULL SIZE OF LOUVER, TAP EXHAUST DUCT INTO PLENUM AS HIGH AS POSSIBLE.
5. NEW INTAKE LOUVER WITH ALUMINUM BIRDSCREEN, INSTALL AS HIGH AS POSSIBLE.
6. DX AHU MOUNTED ON WALL AT 8' ± ABOVE FLOOR.
7. INSULATED CONDENSATE P=TRP AND DRAIN LINE TO WALL BOX, SEE PLUMBING.
8. INSULATED REFRIGERANT PIPING TO CONDENSING UNIT ON ROOF.
9. 4" CHW TAPS OFF BOTTOM OF 6" MAINS AT 45°, THE RISE TO KEEP PIPING AS HIGH AS POSSIBLE ACROSS GOLF CART BARN CEILINGS.

1 M-1.4 **PARTIAL 1ST FLOOR MECHANICAL HVAC PLAN - NEW WORK**

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

NORTH

GLIDDEN • SPINA & PARTNERS
ARCHITECTURE • INTERIOR DESIGN, INC.
GS&P
PHONE: 561.684.6844 • FAX: 561.684.5594 • E-MAIL: info@gsp-architects.com
1401 FORUM WAY, SUITE 100 • WEST PALM BEACH, FLORIDA 33401
FL License #AA26001692
Keith M. Spina #AR13419 Benjamin John Glidden, III #AR0536

CONSTRUCTION DOCUMENT SET FOR:

ADMIRAL'S COVE MAIN CLUBHOUSE

200 ADMIRALS COVE BOULEVARD
JUPITER, FLORIDA 33477

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JOHNSON, LEVINSON RAGAN, DAVILA, INC.
CONSULTING ENGINEERS
1450 Centrepark Boulevard, Suite 350
West Palm Beach, Florida 33401
(561) 689-2303 • (561) 689-2302 Fax
www.jldlaw.com
Certification Number 6059
Harold L. Ragan, P.E. 48983
Michael P. Linden, P.E. 58094
JLRD Project No. 111061

M-1.4

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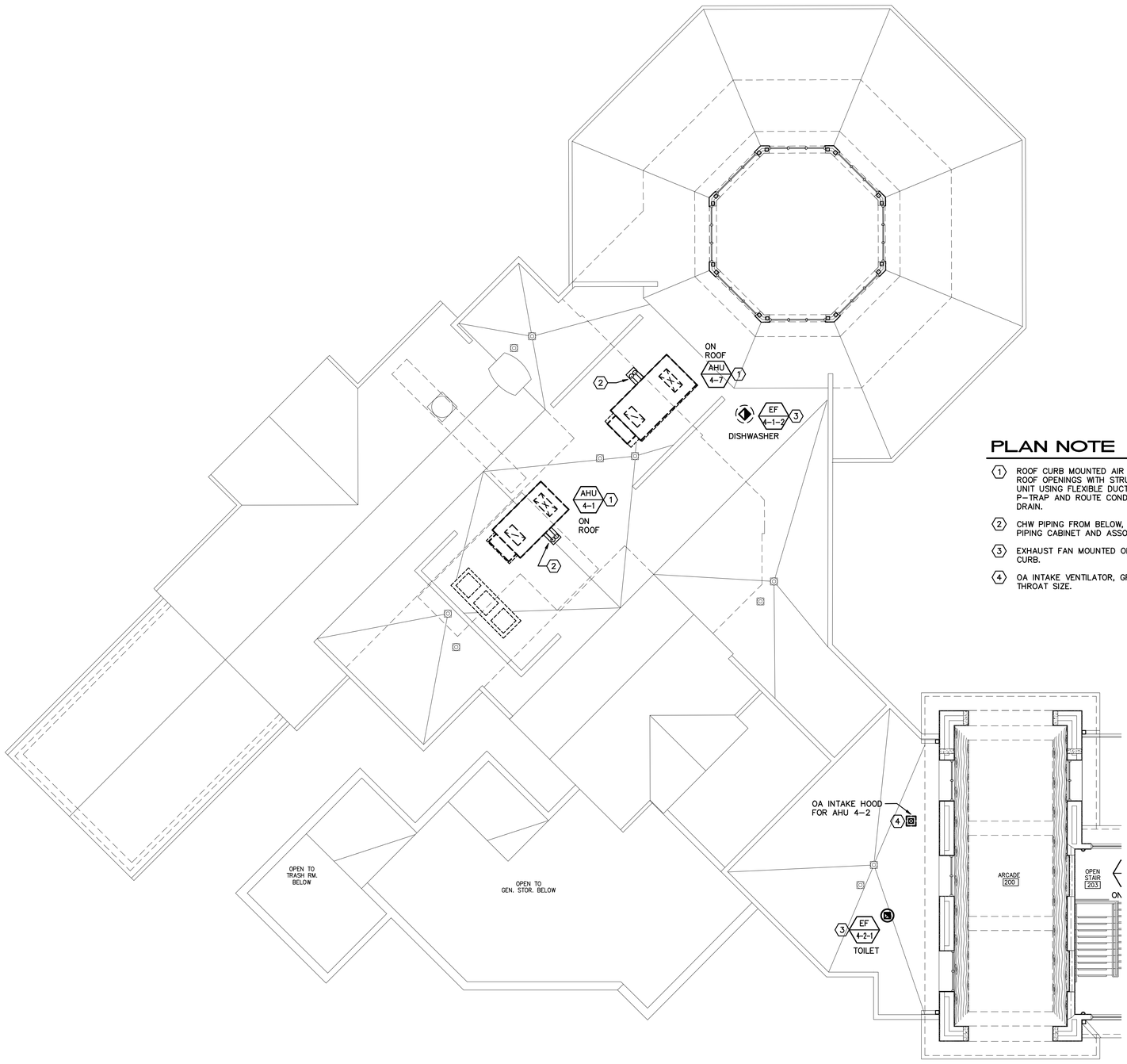

PLAN NOTE

1. ROOF CURB MOUNTED AIR HANDLING UNIT, COORDINATE ROOF OPENINGS WITH STRUCTURE, CONNECT DUCTWORK TO UNIT USING FLEXIBLE DUCT CONNECTORS, PROVIDE COPPER P-TRAP AND ROUTE CONDENSATE DRAIN TO NEAREST ROOF DRAIN.
2. CHW PIPING FROM BELOW, PENETRATE ROOF INSIDE OF AHU PIPING CABINET AND ASSOCIATED ROOF CURB.
3. EXHAUST FAN MOUNTED ON PRE-MANUFACTURED ROOF CURB.
4. OA INTAKE VENTILATOR, GREENHECK MODEL GRSI, 12x12 THROAT SIZE.

1 M-1.5 PARTIAL 1ST FLOOR ROOF MECHANICAL HVAC PLAN

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

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GLIDDEN • SPINA & PARTNERS
ARCHITECTURE • INTERIOR DESIGN, INC.
GS&P
PHONE: 561.684.6844 • FAX: 561.684.5594 • E-MAIL: info@gsp-architects.com
1401 FORUM WAY, SUITE 100 • WEST PALM BEACH, FLORIDA 33401
FL License: #AA26001692
Keith M. Spina #AR13419 Benjamin John Glidden, III #AR0536

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200 ADMIRALS COVE BOULEVARD
JUPITER, FLORIDA 33477

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file name: M-1.5 PARTIAL 1ST FLOOR ROOF MECHANICAL HVAC PLAN.DWG

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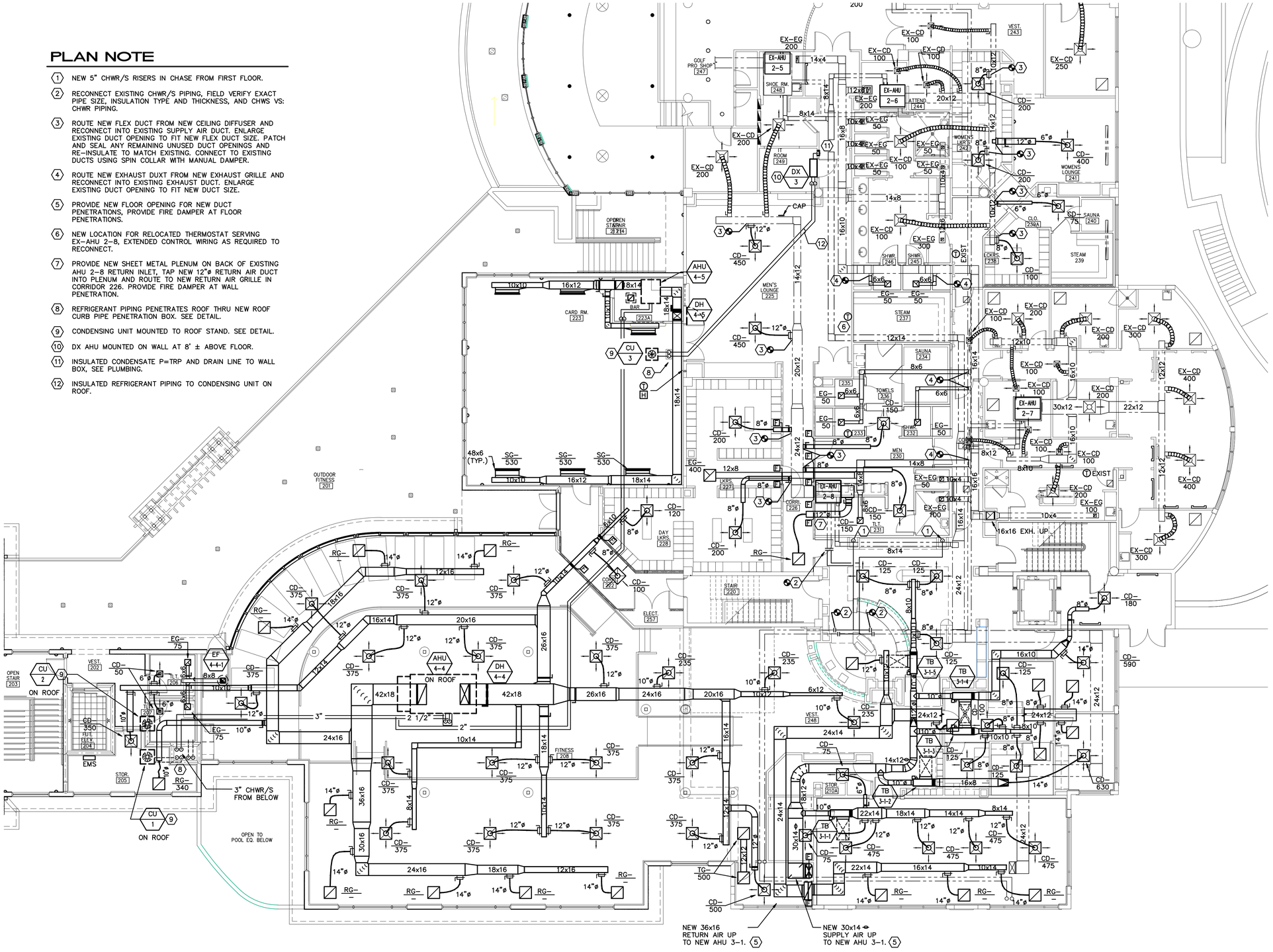
JOHNSON, LEVINSON RAGAN, DAVILA, INC.
CONSULTING ENGINEERS
1450 Centrepark Boulevard, Suite 350
West Palm Beach, Florida 33401
(561) 689-2303 • (561) 689-2302 Fax
www.jlrdinc.com
Certification Number 6059
Harold L. Ragan, P.E. 48983
Michael P. Linden, P.E. 58094
JLRD Project No. 111061

M-1.5

BID SET

PLAN NOTE

1. NEW 5" CHWR/S RISERS IN CHASE FROM FIRST FLOOR.
2. RECONNECT EXISTING CHWR/S PIPING, FIELD VERIFY EXACT PIPE SIZE, INSULATION TYPE AND THICKNESS, AND CHWS VS: CHWR PIPING.
3. ROUTE NEW FLEX DUCT FROM NEW CEILING DIFFUSER AND RECONNECT INTO EXISTING SUPPLY AIR DUCT. ENLARGE EXISTING DUCT OPENING TO FIT NEW FLEX DUCT SIZE. PATCH AND SEAL ANY REMAINING UNUSED DUCT OPENINGS AND RE-INSULATE TO MATCH EXISTING. CONNECT TO EXISTING DUCTS USING SPIN COLLAR WITH MANUAL DAMPER.
4. ROUTE NEW EXHAUST DUXT FROM NEW EXHAUST GRILLE AND RECONNECT INTO EXISTING EXHAUST DUCT. ENLARGE EXISTING DUCT OPENING TO FIT NEW DUCT SIZE.
5. PROVIDE NEW FLOOR OPENING FOR NEW DUCT PENETRATIONS, PROVIDE FIRE DAMPER AT FLOOR PENETRATIONS.
6. NEW LOCATION FOR RELOCATED THERMOSTAT SERVING EX-AHU 2-8, EXTENDED CONTROL WIRING AS REQUIRED TO RECONNECT.
7. PROVIDE NEW SHEET METAL PLENUM ON BACK OF EXISTING AHU 2-8 RETURN INLET, TAP NEW 12"ø RETURN AIR DUCT INTO PLENUM AND ROUTE TO NEW RETURN AIR GRILLE IN CORRIDOR 226. PROVIDE FIRE DAMPER AT WALL PENETRATION.
8. REFRIGERANT PIPING PENETRATES ROOF THRU NEW ROOF CURB PIPE PENETRATION BOX. SEE DETAIL.
9. CONDENSING UNIT MOUNTED TO ROOF STAND. SEE DETAIL.
10. DX AHU MOUNTED ON WALL AT 8' ± ABOVE FLOOR.
11. INSULATED CONDENSATE P-TRP AND DRAIN LINE TO WALL BOX, SEE PLUMBING.
12. INSULATED REFRIGERANT PIPING TO CONDENSING UNIT ON ROOF.



1 M-1.6 **PARTIAL 2ND FLOOR MECHANICAL HVAC PLAN**

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

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ARCHITECTURE • INTERIOR DESIGN, INC
PHONE: 561.684.6844 • FAX: 561.684.5594 • E-MAIL: info@gsp-architects.com
1401 FORUM WAY, SUITE 100 • WEST PALM BEACH, FLORIDA 33401
FL License: #AA26001692
Keith M. Spina #AR13419 Benjamin John Glidden, III #AR0536

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JUPITER, FLORIDA 33477

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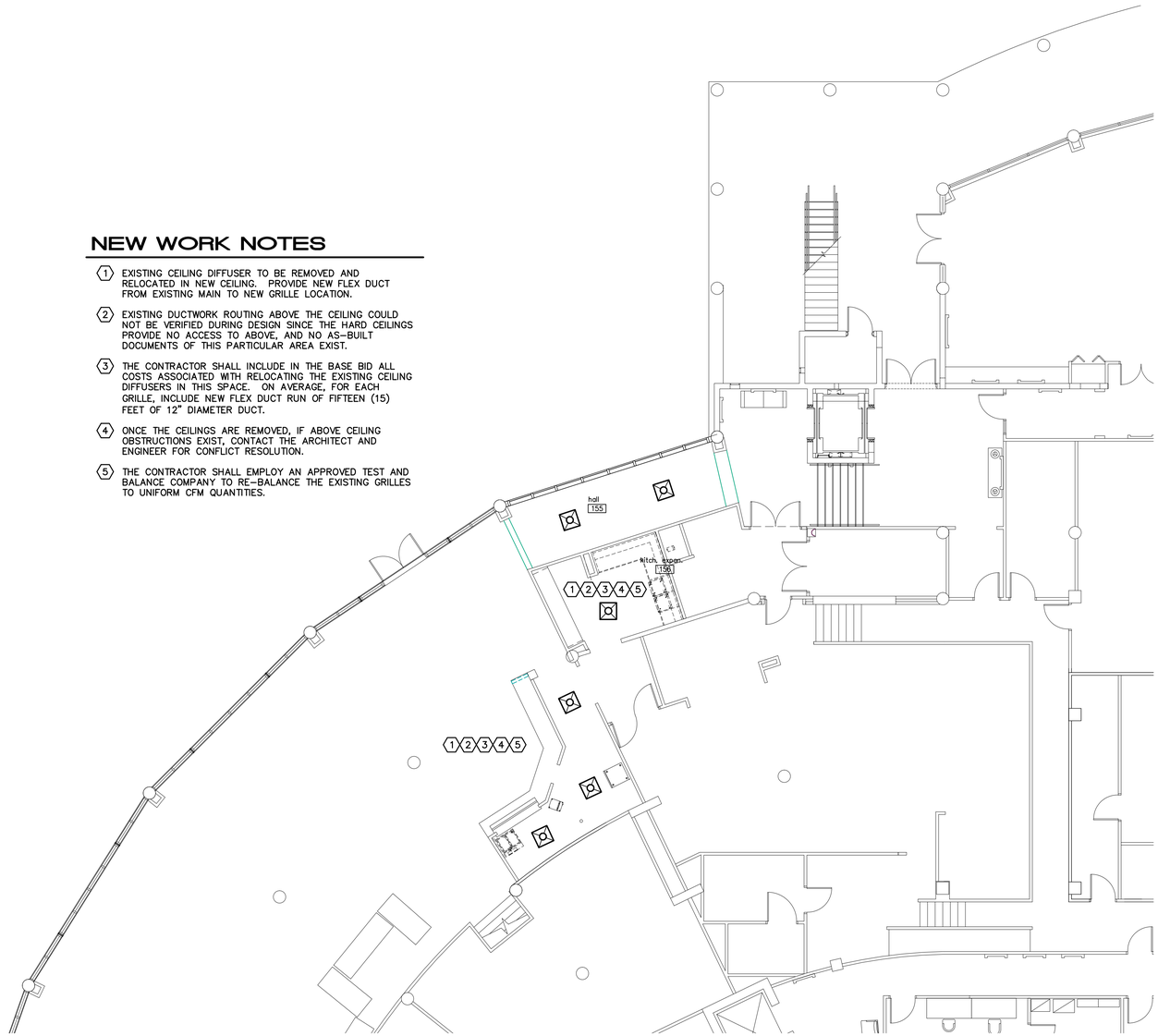
JOHNSON, LEVINSON RAGAN, DAVILA, INC.
CONSULTING ENGINEERS
1450 Centerpark Boulevard, Suite 350
West Palm Beach, Florida 33401
(561) 689.2303 • (561) 689.2302 Fax
www.jldinc.com
Certification Number 6059
Harold L. Ragan, P.E. 48983
Michael P. Linden, P.E. 58094
JLRD Project No. 111061

M-1.6

BID SET

NEW WORK NOTES

1. EXISTING CEILING DIFFUSER TO BE REMOVED AND RELOCATED IN NEW CEILING. PROVIDE NEW FLEX DUCT FROM EXISTING MAIN TO NEW GRILLE LOCATION.
2. EXISTING DUCTWORK ROUTING ABOVE THE CEILING COULD NOT BE VERIFIED DURING DESIGN SINCE THE HARD CEILINGS PROVIDE NO ACCESS TO ABOVE, AND NO AS-BUILT DOCUMENTS OF THIS PARTICULAR AREA EXIST.
3. THE CONTRACTOR SHALL INCLUDE IN THE BASE BID ALL COSTS ASSOCIATED WITH RELOCATING THE EXISTING CEILING DIFFUSERS IN THIS SPACE. ON AVERAGE, FOR EACH GRILLE, INCLUDE NEW FLEX DUCT RUN OF FIFTEEN (15) FEET OF 12" DIAMETER DUCT.
4. ONCE THE CEILINGS ARE REMOVED, IF ABOVE CEILING OBSTRUCTIONS EXIST, CONTACT THE ARCHITECT AND ENGINEER FOR CONFLICT RESOLUTION.
5. THE CONTRACTOR SHALL EMPLOY AN APPROVED TEST AND BALANCE COMPANY TO RE-BALANCE THE EXISTING GRILLES TO UNIFORM CFM QUANTITIES.



1 / M-1.7 PARTIAL 1ST FLOOR MECHANICAL HVAC PLAN

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

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ARCHITECTURE • INTERIOR DESIGN, INC.
PHONE: 561.684.6844 • FAX: 561.684.5594 • E-MAIL: info@gsp-architects.com
1401 FORUM WAY, SUITE 100 • WEST PALM BEACH, FLORIDA 33401
FL License: #AA26001692
Keith M. Spina #AR13419 Benjamin John Glidden, III #AR0536

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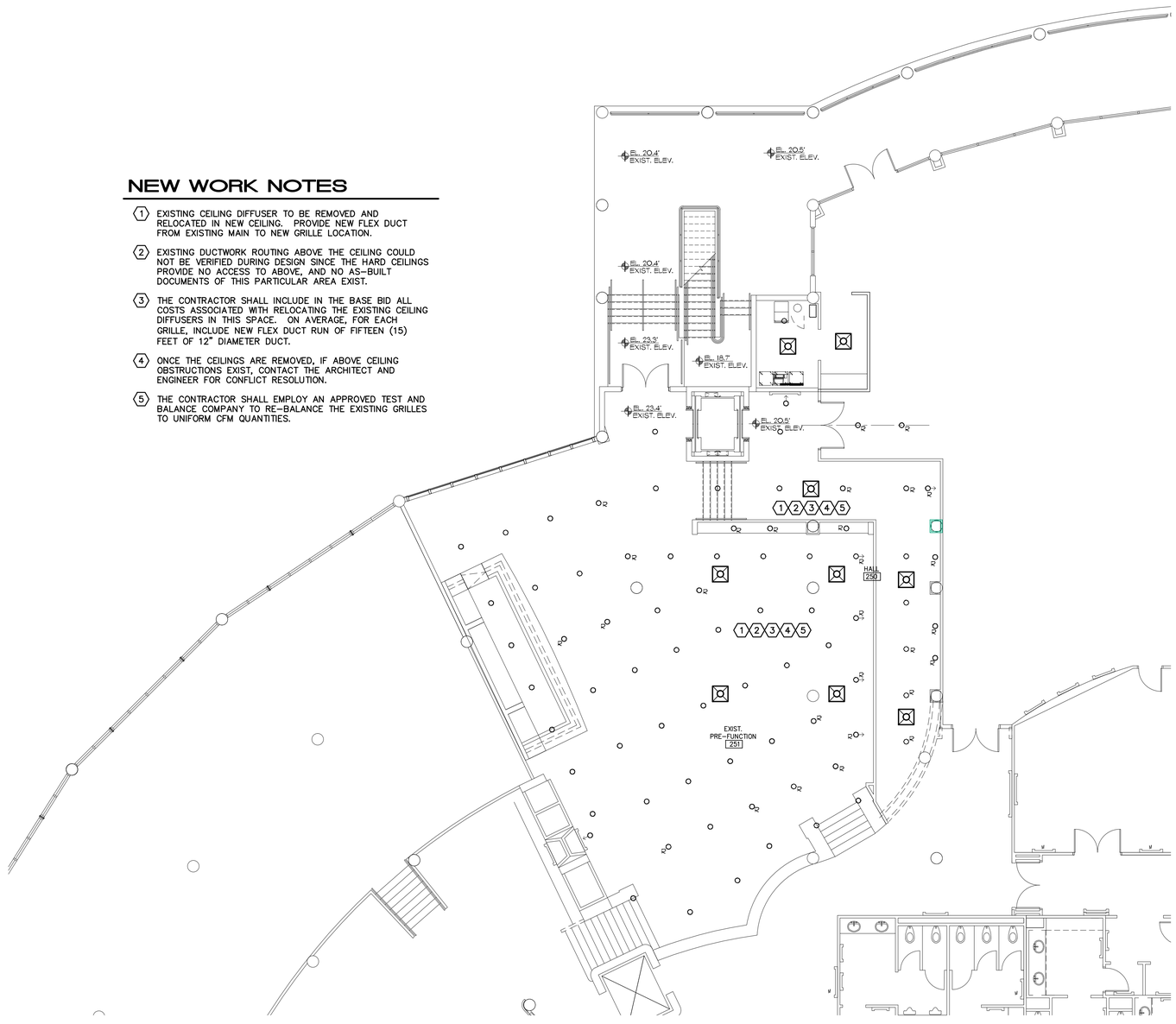
CONSULTING ENGINEERS
1450 Centrepark Boulevard, Suite 350
West Palm Beach, Florida 33401
(561) 689.2303 • (561) 689.2302 Fax
www.jldinc.com
Certification Number 6059
Harold L. Ragan, P.E. 48983
Michael P. Linden, P.E. 58094
JLRD Project No. 111061

M-1.7

BID SET

NEW WORK NOTES

1. EXISTING CEILING DIFFUSER TO BE REMOVED AND RELOCATED IN NEW CEILING. PROVIDE NEW FLEX DUCT FROM EXISTING MAIN TO NEW GRILLE LOCATION.
2. EXISTING DUCTWORK ROUTING ABOVE THE CEILING COULD NOT BE VERIFIED DURING DESIGN SINCE THE HARD CEILINGS PROVIDE NO ACCESS TO ABOVE, AND NO AS-BUILT DOCUMENTS OF THIS PARTICULAR AREA EXIST.
3. THE CONTRACTOR SHALL INCLUDE IN THE BASE BID ALL COSTS ASSOCIATED WITH RELOCATING THE EXISTING CEILING DIFFUSERS IN THIS SPACE. ON AVERAGE, FOR EACH GRILLE, INCLUDE NEW FLEX DUCT RUN OF FIFTEEN (15) FEET OF 12" DIAMETER DUCT.
4. ONCE THE CEILINGS ARE REMOVED, IF ABOVE CEILING OBSTRUCTIONS EXIST, CONTACT THE ARCHITECT AND ENGINEER FOR CONFLICT RESOLUTION.
5. THE CONTRACTOR SHALL EMPLOY AN APPROVED TEST AND BALANCE COMPANY TO RE-BALANCE THE EXISTING GRILLES TO UNIFORM CFM QUANTITIES.



1 / M-1.8 PARTIAL 2ND FLOOR MECHANICAL HVAC PLAN

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

NORTH

JOHNSON, LEVINSON RAGAN, DAVILA, INC.
CONSULTING ENGINEERS
1450 Centerpark Boulevard, Suite 350
West Palm Beach, Florida 33401
(561) 689.2303 ● (561) 689.2302 Fax
www.jldinc.com
Certification Number 6059
Harold L. Ragan, P.E. 48983
Michael P. Linden, P.E. 58094
JLRD Project No. 111061

GLIDDEN • SPINA & PARTNERS
ARCHITECTURE • INTERIOR DESIGN, INC
PHONE: 561.684.6844 • FAX: 561.684.5594 • E-MAIL: info@gsp-architects.com
1401 FORUM WAY, SUITE 100 • WEST PALM BEACH, FLORIDA 33401
FL License: #AA26001692
Keith M. Spina #AR13419 Benjamin John Glidden, III #AR0536

CONSTRUCTION DOCUMENT SET FOR:

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JUPITER, FLORIDA 33477

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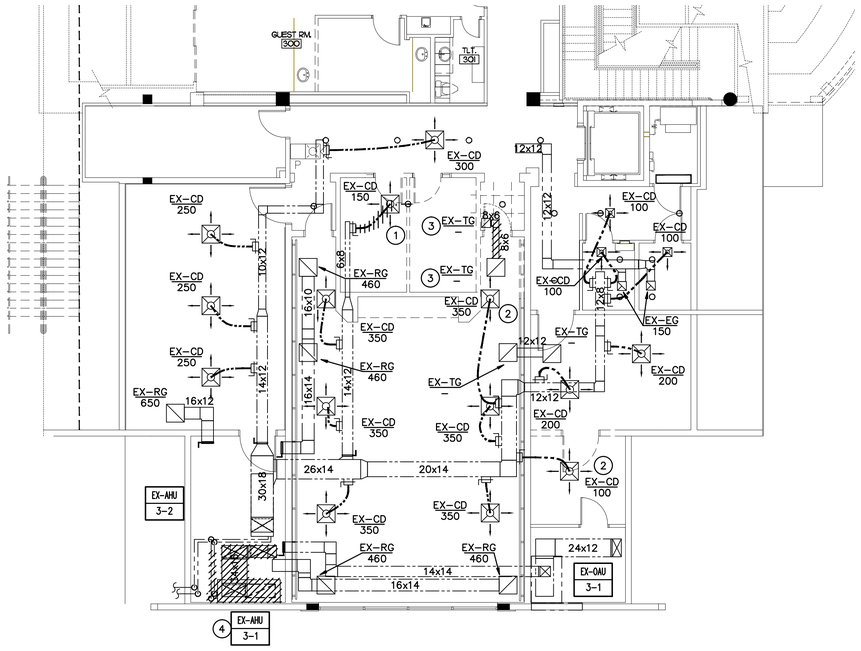

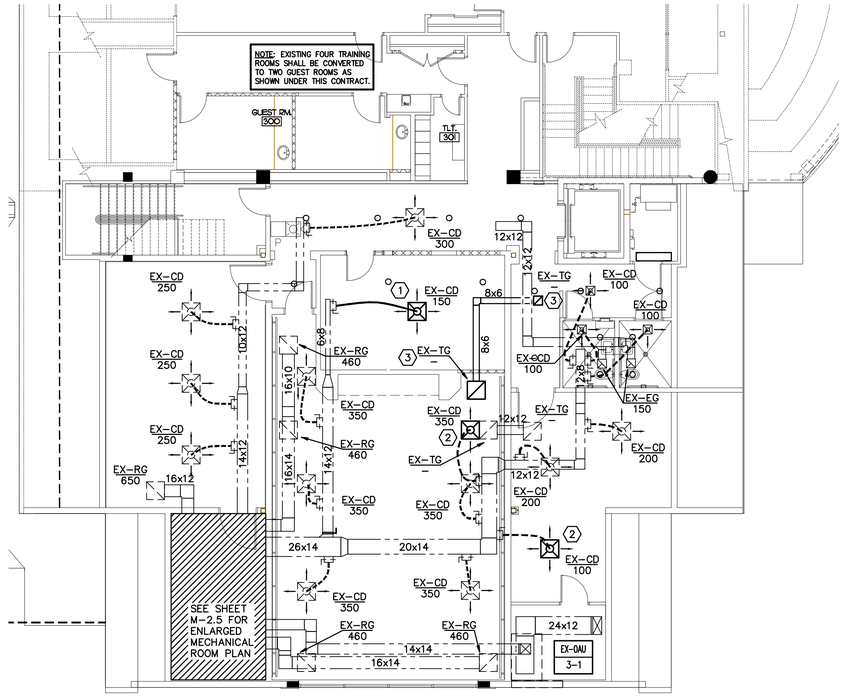

1 M-1.9 PARTIAL 3RD FLOOR MECHANICAL HVAC PLAN – DEMOLITION

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

2 M-1.9 PARTIAL 3RD FLOOR MECHANICAL HVAC PLAN – NEW WORK

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

DEMOLITION PLAN NOTES

1. REMOVE FLEX DUCT SERVING THIS CEILING DIFFUSER. CEILING DIFFUSER SHALL BE RELOCATED INTO NEW CEILING.
2. THIS CEILING DIFFUSER SHALL BE RELOCATED INTO NEW CEILING. FLEX DUCT MAY BE RE-USED.
3. TRANSFER GRILLES SHALL BE RELOCATED INTO NEW CEILING. TRANSFER DUCT BETWEEN THESE TWO GRILLES SHALL BE REMOVED.
4. EXISTING AHU 3-1 SHALL BE REMOVED. SEE SHEET M-2.5 FOR ENLARGED SCALE PLANS OF THIS MECHANICAL ROOM.

NEW WORK PLAN NOTES

1. RELOCATE EXISTING CEILING DIFFUSER TO THIS LOCATION IN THE NEW CEILING. PROVIDE NEW FLEX DUCT, SAME SIZE AS EXISTING, FROM EXISTING DUCT TAP.
2. RELOCATE EXISTING CEILING DIFFUSER TO THIS LOCATION IN THE NEW CEILING.
3. RELOCATE EXISTING TRANSFER GRILLES TO THIS LOCATION IN THE NEW CEILING. PROVIDE NEW TRANSFER DUCT, SAME SIZE AS EXISTING, TO RECONNECT THE TWO GRILLES.

GLIDDEN • SPINA & PARTNERS
ARCHITECTURE • INTERIOR DESIGN, INC.
PHONE: 561.684.6844 • FAX: 561.684.5594 • E-MAIL: info@gsp-architects.com
1401 FORUM WAY, SUITE 100 • WEST PALM BEACH, FLORIDA 33401
FL License: #AA26001692
Keith M. Spina #AR13419 Benjamin John Glidden, III #AR0536

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JUPITER, FLORIDA 33477

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JOHNSON, LEVINSON RAGAN, DAVILA, INC.
CONSULTING ENGINEERS
1450 Centrepark Boulevard, Suite 350
West Palm Beach, Florida 33401
(561) 689.2303 ● (561) 689.2302 Fax
www.jldinc.com
Certification Number 6059
Harold L. Ragan, P.E. 48983
Michael P. Linden, P.E. 58094
JLRD Project No. 111061

M-1.9

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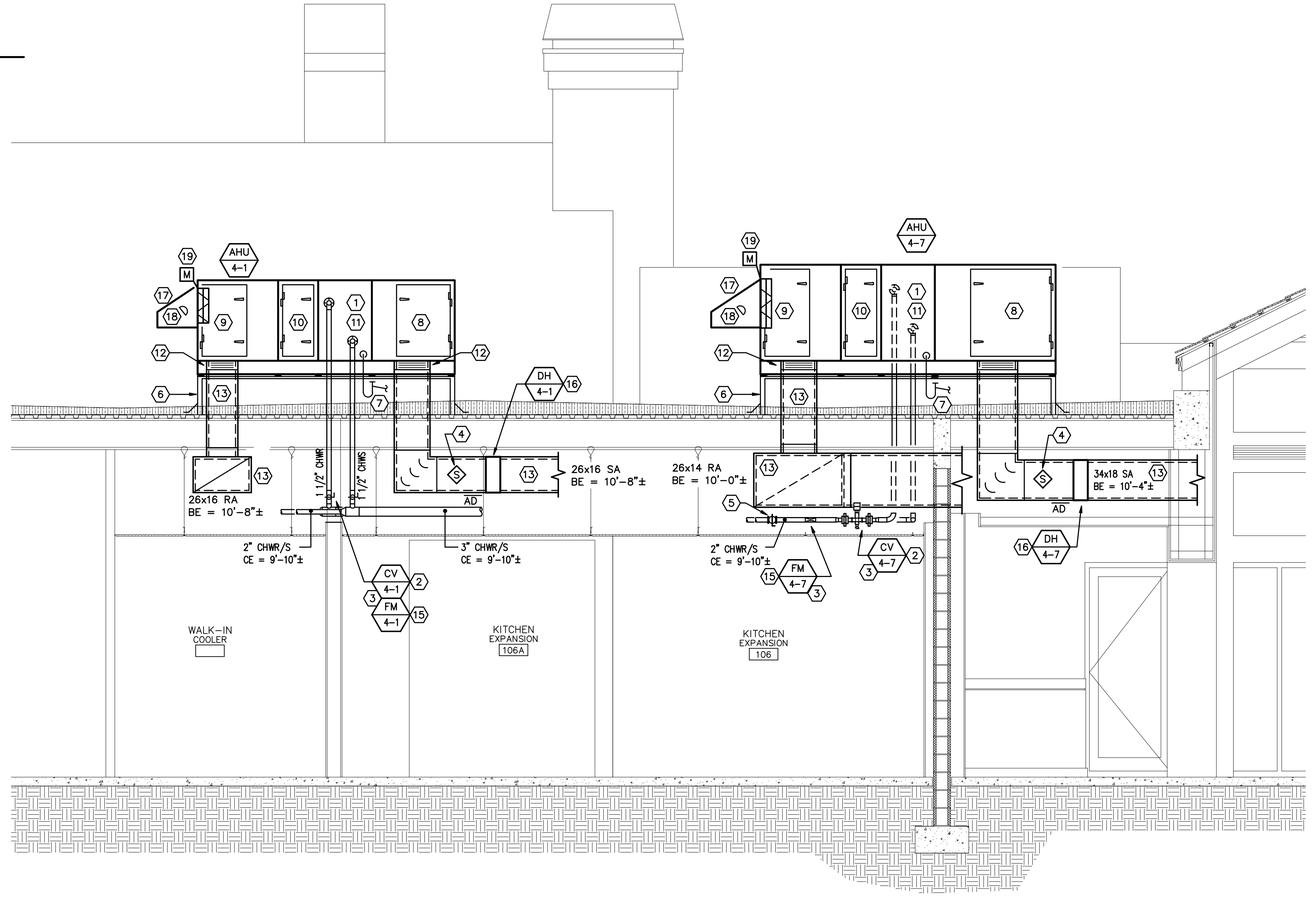
MECHANICAL ROOFTOP UNIT SECTION NOTES

1. CHILLED WATER SUPPLY AND RETURN TO AHU. LOCATE PIPING INSIDE OF MANUFACTURER PROVIDED EXTERNAL PIPING CABINET AND ASSOCIATED ROOF CURB HOUSING.
2. 3-WAY CONTROL VALVE WITH ACTUATOR IN AHU CHILLED WATER RETURN. SEE SCHEDULE SHEET FOR SIZE.
3. ALL CHW VALVES AND ACCESSORIES SHALL BE LOCATED ABOVE SUSPENDED CEILING. SEE COIL PIPING SCHEMATIC.
4. TYPICAL SMOKE DETECTOR LOCATED IN THE SUPPLY DUCT FOR EACH AIR HANDLING UNIT. SMOKE DETECTOR TO BE PROVIDED AND WIRED UNDER DIVISION 16, AND MOUNTED UNDER DIVISION 15. WIRE TO ACTIVATE FIRE ALARM SYSTEM UPON DETECTION OF SMOKE. THE FAN SHALL SHUT DOWN UPON ACTIVATION OF ANY STATION OF THE FIRE ALARM SYSTEM.
5. CHILLED WATER SHUT-OFF VALVES IN CHWS AND CHWR TO AHU. BALL VALVE WITH NIBCO "NIB-SEAL" INSULATED HANDLE EXTENSION THRU 2" IN SIZE, BUTTERFLY VALVE WITH LEVER OPERATOR 2 1/2" AND ABOVE.
6. AIR HANDLER MANUFACTURER PROVIDED INSULATED ROOF CURB. SEE INSTALLATION DETAIL.
7. TYPICAL CONDENSATE DRAIN LINE WITH TRAP, SEE DETAIL. RUN FULL SIZE TO ROOF DRAIN. SEE PLUMBING.
8. FAN SECTION WITH ACCESS DOOR.
9. FILTER/MIXING BOX SECTION WITH ACCESS DOOR.
10. INTERNAL FACE AND BYPASS SECTION WITH MODULATING DAMPERS
11. CHILLED WATER COOLING COIL SECTION.
12. FLEXIBLE DUCT CONNECTION DURO-DYNE "METAL-FAB" HEAVY DUTY EXCELON. INSULATE WITH FLEXIBLE DUCT WRAP.
13. DOUBLE WALL PRE-INSULATED DUCT.
14. Y-TYPE STRAINER WITH BLOWDOWN VALVE.
15. VENTURI FLOW METER, SEE SCHEDULE AND INSTALLATION DETAIL.
16. SLIP-IN DUCT HEATER. PROVIDE HINGED CEILING ACCESS PANEL, MIN. 24x24, TO ALLOW DUCT HEATER ACCESS.
17. PROVIDE UNIT MANUFACTURERS RAIN HOOD OVER INTAKE OPENING
18. FLOW MEASURING STATION POSITIONED INSIDE RAIN HOOD, CONNECTED TO EMS TO MODULATE OUTDOOR AIR DAMPER.
19. AUTOMATIC MOTORIZED MODULATING DAMPER ON OUTDOOR AIR INTAKE OPENING.



AHU 4-1 / 4-7 ROOF TOP UNIT SECTION

1 / M-2.1

SCALE: 3/8" = 1'-0"

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ARCHITECTURE • INTERIOR DESIGN, INC
PHONE: 561.684.6844 • FAX: 561.684.5594 • E-MAIL: info@gsp-architects.com
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FL License: #AA26001692
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ADMIRAL'S COVE MAIN CLUBHOUSE

200 ADMIRALS COVE BOULEVARD
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CONSULTING ENGINEERS
1450 Centrepark Boulevard, Suite 350
West Palm Beach, Florida 33401
(561)689.2303 ●(561) 689.2302 Fax
www.jldinc.com
Certification Number 6059
Harold L. Ragan, P.E. 48983
Michael P. Linden, P.E. 58094
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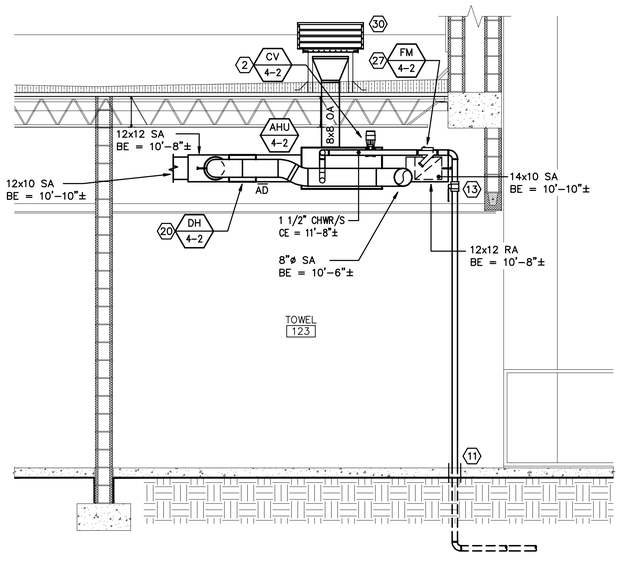
M-2.1

BID SET

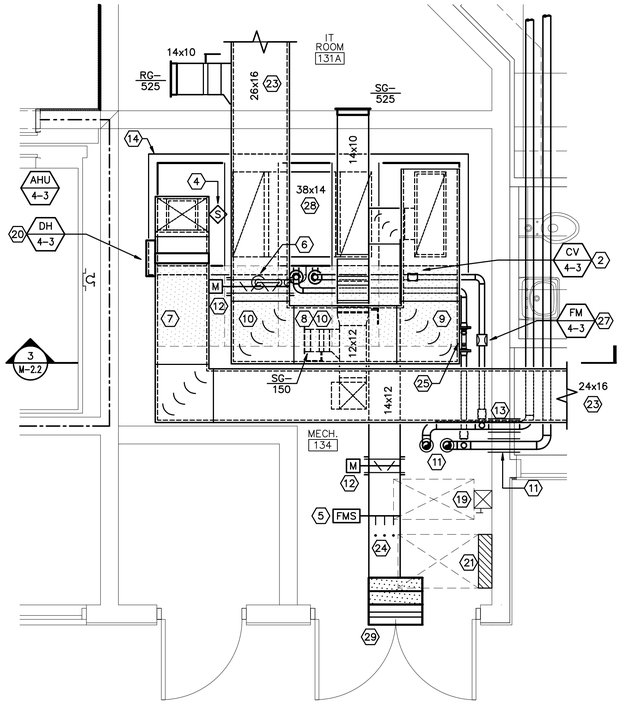
MECHANICAL ROOM PLAN AND SECTION NOTES

1. CHILLED WATER SUPPLY AND RETURN TO AHU. SEE COIL PIPING SCHEMATIC. INSTALL CHILLED WATER PIPING TO AHU COILS CLEAR OF UNIT FILTERS, FAN MOTORS AND ACCESS DOORS. SIZE AS NOTED.
2. 3-WAY CONTROL VALVE WITH ACTUATOR IN AHU CHILLED WATER RETURN. SEE SCHEDULE SHEET FOR SIZE.
3. NEOPRENE PADS UNDER AHU WITH INTERNAL ISOLATORS. PROVIDE AT ALL AHU MODULE MOUNTING POINTS AND SIZE PER MANUFACTURERS RECOMMENDATIONS.
4. TYPICAL SMOKE DETECTOR LOCATED IN THE SUPPLY AND RETURN DUCT FOR EACH AIR HANDLING UNIT. SMOKE DETECTOR TO BE PROVIDED AND WIRED UNDER DIVISION 16, AND MOUNTED UNDER DIVISION 15. WIRE TO ACTIVATE FIRE ALARM SYSTEM UPON DETECTION OF SMOKE. THE FAN SHALL SHUT DOWN UPON ACTIVATION OF ANY STATION OF THE FIRE ALARM SYSTEM.
5. FLOW MONITORING SENSOR, EBTRON GOLD SERIES OR APPROVED EQUAL.
6. TYPICAL CONDENSATE DRAIN LINE WITH TRAP, SEE DETAIL. RUN FULL SIZE TO HUB DRAIN. SEE PLUMBING.
7. FAN MOTOR, DRIVE AND BEARING ACCESS AREA.
8. COIL PULL ACCESS AND SERVICE AREA.
9. FILTER REMOVAL AND ACCESS AREA.
10. ACCESS AREA
11. PROVIDE PIPE SLEEVE WHERE PIPES PENETRATE WALLS AND FLOORS. SEE DETAIL.
12. AUTOMATIC MOTORIZED DAMPER, RUSKIN MODEL CD-50 OR APPROVED EQUAL. SEE CONTROL SERIES DRAWINGS.
13. CHILLED WATER SHUT-OFF VALVES IN CHWS AND CHWR TO AHU. BALL VALVE WITH NIBCO "NIB-SEAL" INSULATED HANDLE EXTENSION THRU 2" IN SIZE, BUTTERFLY VALVE WITH LEVER OPERATOR 2 1/2" AND ABOVE.
14. HOUSEKEEPING PAD HEIGHT SHALL BE AS REQUIRED TO PROVIDE PROPER CONDENSATE TRAP DEPTH, 6" TALL MINIMUM, 4" LARGER THAN UNIT FOOTPRINT IN EACH DIMENSION.
15. FAN SECTION WITH ACCESS DOOR
16. FILTER/MIXING BOX SECTION WITH ACCESS DOOR
17. MEDIUM BLANK SECTION WITH ACCESS DOOR
18. CHILLED WATER COOLING COIL SECTION
19. COMBINATION STARTER/DISCONNECT BY DIVISION 16.
20. SLIP-IN DUCT HEATER.
21. E.M.S. PANEL WITH N.E.C. REQUIRED ACCESS AREA. ELECTRICAL CONDUIT BETWEEN PANELS BY DIVISION 16.
22. FLEXIBLE DUCT CONNECTION DURO-DYNE "METAL-FAB" HEAVY DUTY EXCELON. INSULATE WITH FLEXIBLE DUCT WRAP.
23. DOUBLE WALL PRE-INSULATED DUCT.
24. TEST AND BALANCE INSTRUMENT TEST PORT FOR DUCT TRAVERSE WITH PLASTIC CAPS.
25. Y-TYPE STRAINER WITH BLOWDOWN VALVE.
26. UNION PIPE.
27. VENTURI FLOW METER, SEE SCHEDULE AND INSTALLATION DETAIL.
28. FULL SIZE FACE AND BYPASS DUCT.
29. 24 X 18 OA LOUVER, RUSKIN MODEL ELF 6375DXD. PROVIDE WITH PLENUM ON BACK OF LOUVER. VERIFY COLOR WITH ARCHITECT PRIOR TO INSTALLATION. SEE DETAIL.



1 M-2.2 MECHANICAL ROOM SECTION

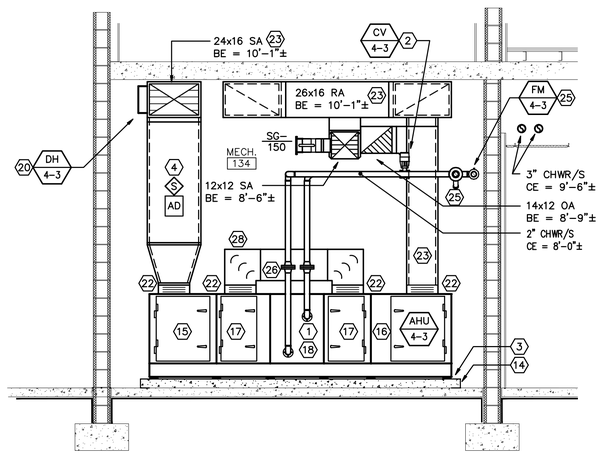
SCALE: 3/8" = 1'-0"



2 M-2.2 MECHANICAL ROOM PLAN

SCALE: 3/8" = 1'-0"

NORTH



3 M-2.2 MECHANICAL ROOM SECTION

SCALE: 3/8" = 1'-0"

GLIDDEN • SPINA & PARTNERS
ARCHITECTURE • INTERIOR DESIGN, INC.
GS&P
PHONE: 561.684.6844 • FAX: 561.684.5594 • E-MAIL: info@gsp-architects.com
1401 FORUM WAY, SUITE 100 • WEST PALM BEACH, FLORIDA 33401
FL License: #AA26001692
Keith M. Spina #AR13419 Benjamin John Glidden, III #AR0536

CONSTRUCTION DOCUMENT SET FOR:

ADMIRAL'S COVE
MAIN CLUBHOUSE
200 ADMIRALS COVE BOULEVARD
JUPITER, FLORIDA 33477

sheet title: MECHANICAL ROOM PLAN AND SECTION
file name:

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checked by: TMF

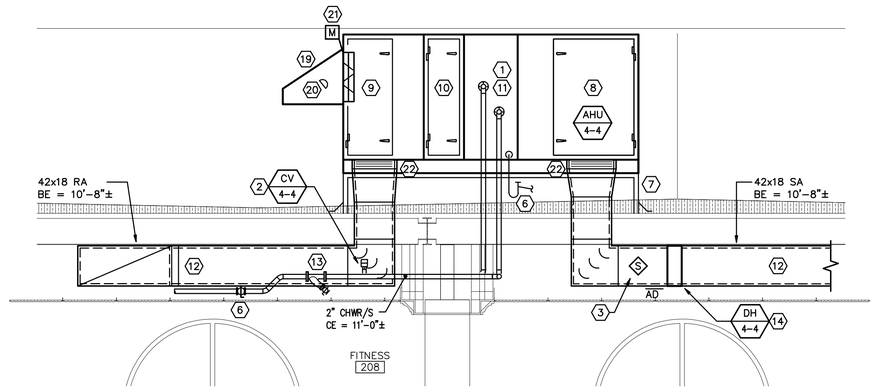
JOHNSON, LEVINSON RAGAN, DAVILA, INC.
CONSULTING ENGINEERS
1450 Centrepark Boulevard, Suite 350
West Palm Beach, Florida 33401
(561) 689-2303 • (561) 689-2302 Fax
www.jldinc.com
Certification Number 6059
Harold L. Ragan, P.E. 48983
Michael P. Linder, P.E. 58094
JLRD Project No. 111061

M-2.2

BID SET

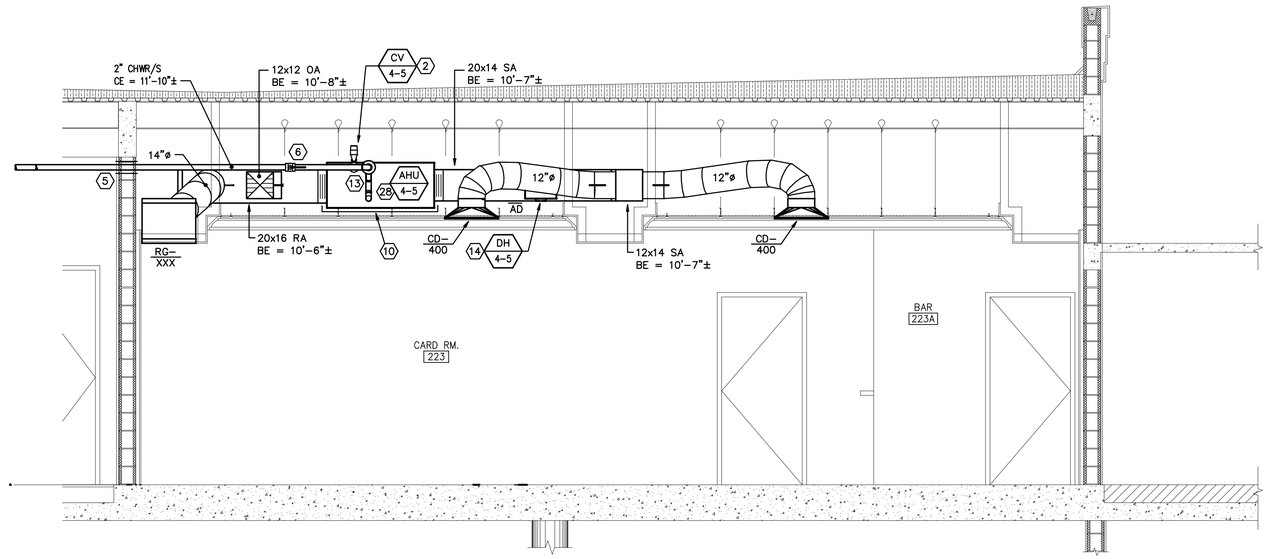
MECHANICAL ROOM PLAN AND SECTION NOTES

1. CHILLED WATER SUPPLY AND RETURN TO AHU. LOCATE PIPING INSIDE OF MANUFACTURER PROVIDED EXTERNAL PIPING CABINET AND ASSOCIATED ROOF CURB HOUSING.
2. 3-WAY CONTROL VALVE WITH ACTUATOR IN AHU CHILLED WATER RETURN. SEE SCHEDULE SHEET FOR SIZE.
3. ALL CHW VALVES AND ACCESSORIES SHALL BE LOCATED ABOVE SUSPENDED CEILING. SEE COIL PIPING SCHEMATIC.
4. TYPICAL SMOKE DETECTOR LOCATED IN THE SUPPLY DUCT FOR EACH AIR HANDLING UNIT. SMOKE DETECTOR TO BE PROVIDED AND WIRED UNDER DIVISION 16, AND MOUNTED UNDER DIVISION 15. WIRE TO ACTIVATE FIRE ALARM SYSTEM UPON DETECTION OF SMOKE. THE FAN SHALL SHUT DOWN UPON ACTIVATION OF ANY STATION OF THE FIRE ALARM SYSTEM.
5. KEEP FLANGES AND/OR UNIONS FREE OF COIL PULL SPACE.
6. TYPICAL CONDENSATE DRAIN LINE WITH TRAP, SEE DETAIL. RUN FULL SIZE TO ROOF DRAIN. SEE PLUMBING.
7. AIR HANDLER MANUFACTURER PROVIDED INSULATED ROOF CURB. SEE INSTALLATION DETAIL.
8. COIL PULL ACCESS AND SERVICE AREA.
9. FILTER REMOVAL AND ACCESS AREA.
10. SAFETY DRAIN PAN BELOW ENTIRE UNIT, PROVIDE MOISTURE SENSOR IN PAN TO SHUT DOWN UNIT IF MOISTURE IS SENSED.
11. PROVIDE PIPE SLEEVE WHERE PIPES PENETRATE WALLS AND FLOORS. SEE DETAIL.
12. AUTOMATIC MOTORIZED DAMPER, RUSKIN MODEL CD-50 OR APPROVED EQUAL. SEE CONTROL SERIES DRAWINGS.
13. CHILLED WATER SHUT-OFF VALVES IN CHWS AND CHWR TO AHU. BALL VALVE WITH NIBCO "NIB-SEAL" INSULATED HANDLE EXTENSION THRU 2" IN SIZE, BUTTERFLY VALVE WITH LEVER OPERATOR 2 1/2" AND ABOVE.
14. SLIP-IN DUCT HEATER. PROVIDE HINGED CEILING ACCESS PANEL, MIN. 24"x24", TO ALLOW DUCT HEATER ACCESS
15. FAN SECTION WITH ACCESS DOOR
16. FILTER/MIXING BOX SECTION WITH ACCESS DOOR
17. INTERNAL FACE AND BYPASS SECTION WITH MODULATING DAMPERS
18. CHILLED WATER COOLING COIL SECTION
19. PROVIDE UNIT MANUFACTURERS RAIN HOOD OVER INTAKE OPENING.
20. FLOW MEASURING STATION POSITIONED INSIDE RAIN HOOD, CONNECTED TO EMS TO MODULATE OUTDOOR AIR DAMPER.
21. AUTOMATIC MOTORIZED MODULATING DAMPER ON OUTDOOR AIR INTAKE OPENING.
22. FLEXIBLE DUCT CONNECTION DURO-DYNE "METAL-FAB" HEAVY DUTY EXCELON. INSULATE WITH FLEXIBLE DUCT WRAP.
23. DOUBLE WALL PRE-INSULATED DUCT.
24. TEST AND BALANCE INSTRUMENT TEST PORT FOR DUCT TRAVERSE WITH PLASTIC CAPS.
25. Y-TYPE STRAINER WITH BLOWDOWN VALVE.
26. FLEXIBLE PIPE.
27. VENTURI FLOW METER, SEE SCHEDULE AND INSTALLATION DETAIL.
28. AHU SUSPENDED FROM STRUCTURE USING 4 - 1/2" DIAMETER THREADED RODS AND IN-LINE VIBRATION ISOLATORS FOR EACH SUPPORT ROD.



1 M-2.3 **AHU 4-4 ROOFTOP UNIT SECTION**

SCALE: 3/8" = 1'-0"



2 M-2.3 **MECHANICAL AHU 4-5 SECTION**

SCALE: 3/8" = 1'-0"

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ARCHITECTURE • INTERIOR DESIGN, INC.
PHONE: 561.684.6844 • FAX: 561.684.5594 • E-MAIL: info@gsp-architects.com
1401 FORUM WAY, SUITE 100 • WEST PALM BEACH, FLORIDA 33401
FL License: #AA26001692
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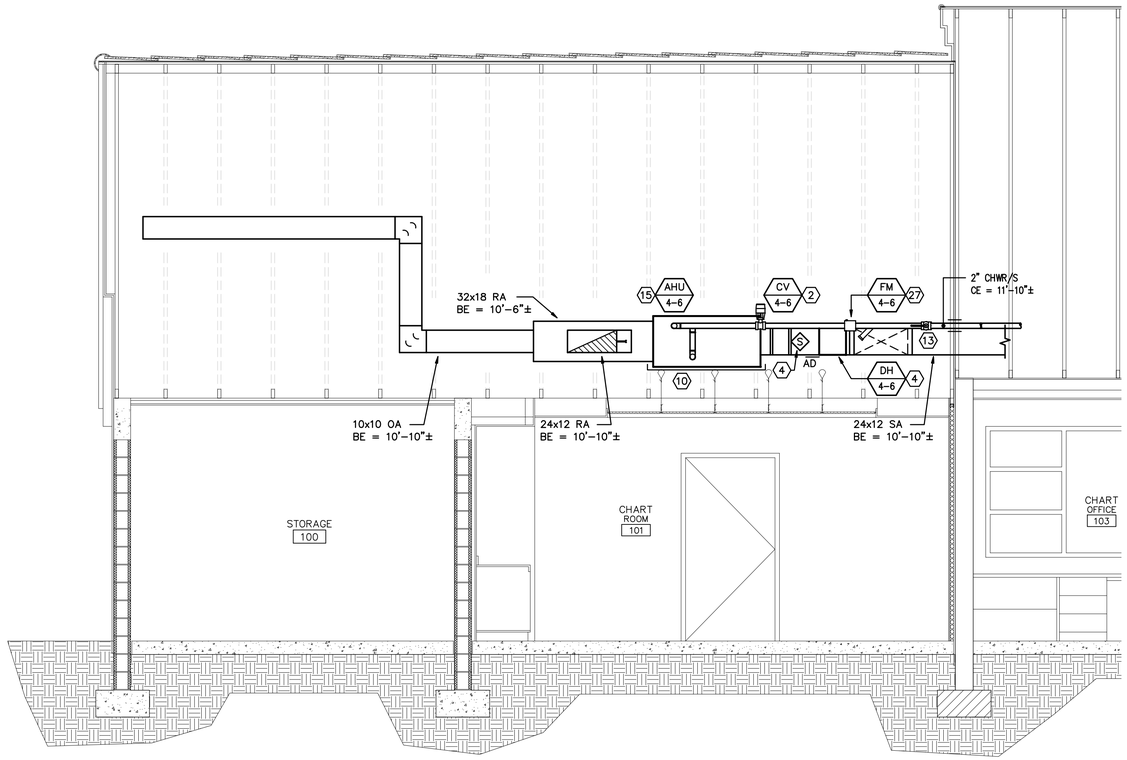
JOHNSON, LEVINSON RAGAN, DAVILA, INC.
CONSULTING ENGINEERS
1450 Centrepark Boulevard, Suite 350
West Palm Beach, Florida 33401
(561) 689-2303 • (561) 689-2302 Fax
www.jlrdinc.com
Certification Number 6059
Harold L. Ragan, P.E. 48983
Michael P. Linden, P.E. 58094
JLRD Project No. 111061

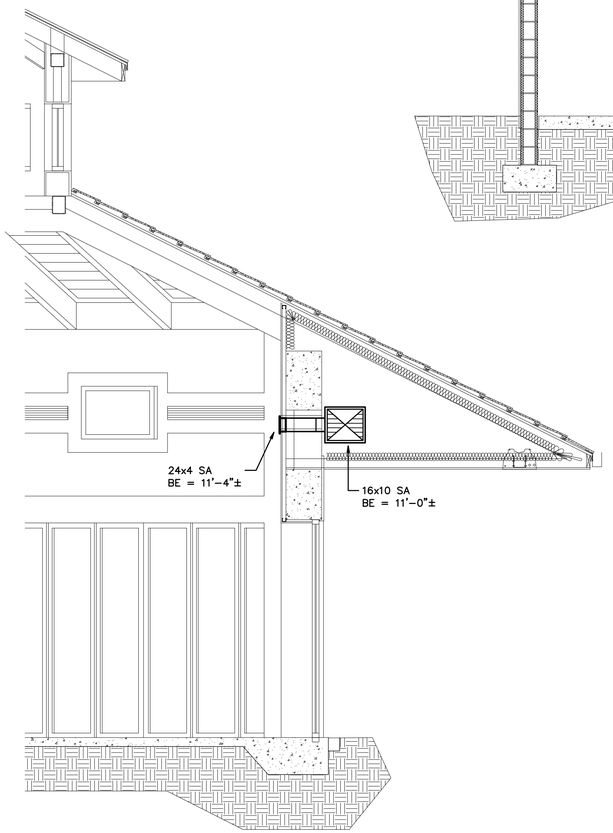
M-2.3

BID SET



1 M-2.4 MECHANICAL AHU 4-6 SECTION

SCALE: 3/8" = 1'-0"



2 M-2.4 PARTIAL INDOOR DINING SECTION

SCALE: 3/8" = 1'-0"

MECHANICAL ROOM PLAN AND SECTION NOTES

1. CHILLED WATER SUPPLY AND RETURN TO AHU. SEE COIL PIPING SCHEMATIC. INSTALL CHILLED WATER PIPING TO AHU COILS CLEAR OF UNIT FILTERS, FAN MOTORS AND ACCESS DOORS. SIZE AS NOTED.
2. 3-WAY CONTROL VALVE WITH ACTUATOR IN AHU CHILLED WATER RETURN. SEE SCHEDULE SHEET FOR SIZE.
3. ALL CHW VALVES AND ACCESSORIES SHALL BE LOCATED ABOVE SUSPENDED CEILING. SEE COIL PIPING SCHEMATIC.
4. TYPICAL SMOKE DETECTOR LOCATED IN THE SUPPLY DUCT FOR EACH AIR HANDLING UNIT. SMOKE DETECTOR TO BE PROVIDED AND WIRED UNDER DIVISION 16, AND MOUNTED UNDER DIVISION 15. WIRE TO ACTIVATE FIRE ALARM SYSTEM UPON DETECTION OF SMOKE. THE FAN SHALL SHUT DOWN UPON ACTIVATION OF ANY STATION OF THE FIRE ALARM SYSTEM.
5. KEEP FLANGES AND/OR UNIONS FREE OF COIL PULL SPACE.
6. TYPICAL CONDENSATE DRAIN LINE WITH TRAP, SEE DETAIL. RUN FULL SIZE TO HUB DRAIN. SEE PLUMBING.
7. FAN MOTOR, DRIVE AND BEARING ACCESS AREA.
8. COIL PULL ACCESS AND SERVICE AREA.
9. FILTER REMOVAL AND ACCESS AREA.
10. SAFETY DRAIN PAN BELOW ENTIRE UNIT, PROVIDE MOISTURE SENSOR IN PAN TO SHUT DOWN UNIT IF MOISTURE IS SENSED.
11. PROVIDE PIPE SLEEVE WHERE PIPES PENETRATE WALLS AND FLOORS. SEE DETAIL.
12. AUTOMATIC MOTORIZED DAMPER, RUSKIN MODEL CD-50 OR APPROVED EQUAL. SEE CONTROL SERIES DRAWINGS.
13. CHILLED WATER SHUT-OFF VALVES IN CHWS AND CHWR TO AHU. BALL VALVE WITH NIBCO "NIB-SEAL" INSULATED HANDLE EXTENSION THRU 2" IN SIZE, BUTTERFLY VALVE WITH LEVER OPERATOR 2 1/2" AND ABOVE.
14. SLIP-IN DUCT HEATER. PROVIDE HINGED CEILING ACCESS PANEL, MIN. 24"x24", TO ALLOW DUCT HEATER ACCESS
15. AHU SUSPENDED FROM STRUCTURE USING 4 – 1/2" DIAMETER THREADED RODS AND IN-LINE VIBRATION ISOLATORS FOR EACH SUPPORT ROD.
16. FLEXIBLE DUCT CONNECTION DURO-DYNE "METAL-FAB" HEAVY DUTY EXCELON. INSULATE WITH FLEXIBLE DUCT WRAP.
17. TEST AND BALANCE INSTRUMENT TEST PORT FOR DUCT TRAVERSE WITH PLASTIC CAPS.
18. Y-TYPE STRAINER WITH BLOWDOWN VALVE.
19. FLEXIBLE PIPE.
20. VENTURI FLOW METER, SEE SCHEDULE AND INSTALLATION DETAIL.

JOHNSON, LEVINSON RAGAN, DAVILA, INC.
CONSULTING ENGINEERS
1450 Centrepark Boulevard, Suite 350
West Palm Beach, Florida 33401
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1401 FORUM WAY, SUITE 100 • WEST PALM BEACH, FLORIDA 33401
FL License: #AA26001692
Keith M. Spina #AR13419 Benjamin John Glidden, III #AR0536

CONSTRUCTION DOCUMENT SET FOR:

ADMIRAL'S COVE MAIN CLUBHOUSE

200 ADMIRALS COVE BOULEVARD
JUPITER, FLORIDA 33477

sheet title: MECHANICAL ROOM SECTION
file name:

revisions:

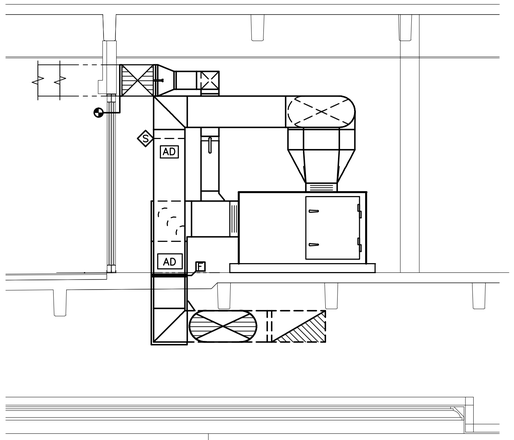
project no: 09165
date: 02/06/12
drawn by: WLM
checked by: TMF

M-2.4

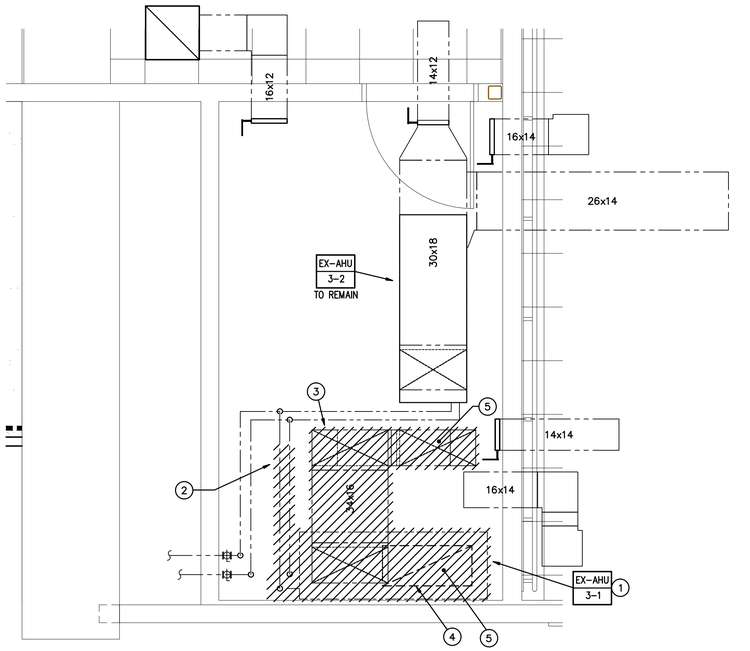
BID SET

MECHANICAL ROOM PLAN AND SECTION NOTES

1. CHILLED WATER SUPPLY AND RETURN TO AHU. SEE COIL PIPING SCHEMATIC. INSTALL CHILLED WATER PIPING TO AHU COILS CLEAR OF UNIT FILTERS, FAN MOTORS AND ACCESS DOORS. SIZE AS NOTED.
2. 3-WAY CONTROL VALVE WITH ACTUATOR IN AHU CHILLED WATER RETURN. SEE SCHEDULE SHEET FOR SIZE.
3. NEOPRENE PADS UNDER AHU WITH INTERNAL ISOLATORS. PROVIDE AT ALL AHU MODULE MOUNTING POINTS AND SIZE PER MANUFACTURERS RECOMMENDATIONS.
4. TYPICAL SMOKE DETECTOR LOCATED IN THE SUPPLY DUCT FOR EACH AIR HANDLING UNIT. SMOKE DETECTOR TO BE PROVIDED AND WIRED UNDER DIVISION 16, AND MOUNTED UNDER DIVISION 15. WIRE TO ACTIVATE FIRE ALARM SYSTEM UPON DETECTION OF SMOKE. THE FAN SHALL SHUT DOWN UPON ACTIVATION OF ANY STATION OF THE FIRE ALARM SYSTEM.
5. VENTURI FLOW METER, SEE SCHEDULE AND INSTALLATION DETAIL.
6. TYPICAL CONDENSATE DRAIN LINE WITH TRAP, SEE DETAIL. RUN FULL SIZE TO RECONNECT TO EXISTING DRAIN. SEE PLUMBING.
7. FAN MOTOR, DRIVE AND BEARING ACCESS AREA.
8. COIL PULL ACCESS AND SERVICE AREA.
9. FILTER REMOVAL AND ACCESS AREA.
10. ACCESS AREA
11. PROVIDE PIPE SLEEVE WHERE PIPES PENETRATE WALLS AND FLOORS. SEE DETAIL.
12. AUTOMATIC MOTORIZED DAMPER, RUSKIN MODEL CD-50 OR APPROVED EQUAL. SEE CONTROL SERIES DRAWINGS.
13. CHILLED WATER SHUT-OFF VALVES IN CHWS AND CHWR TO AHU. BALL VALVE WITH NIBCO "NIB-SEAL" INSULATED HANDLE EXTENSION THRU 2" IN SIZE, BUTTERFLY VALVE WITH LEVER OPERATOR 2 1/2" AND ABOVE.
14. PROVIDE 6" HIGH ALUMINUM I-BEAM BELOW UNIT, BOTH SIDES OF UNIT, AND SECURE AHU TO I-BEAMS
15. FAN SECTION WITH ACCESS DOOR
16. FILTER/MIXING BOX SECTION WITH ACCESS DOOR
17. MEDIUM BLANK SECTION WITH ACCESS DOOR
18. CHILLED WATER COOLING COIL SECTION
19. FLEXIBLE PIPE.
20. VARIABLE FREQUENCY DRIVE FOR AHU FAN SPEED (VAV) CONTROL
21. E.M.S. PANEL WITH N.E.C. REQUIRED ACCESS AREA. ELECTRICAL CONDUIT BETWEEN PANELS BY DIVISION 16.
22. FLEXIBLE DUCT CONNECTION DURO-DYNE "METAL-FAB" HEAVY DUTY EXCELON. INSULATE WITH FLEXIBLE DUCT WRAP.
23. DOUBLE WALL PRE-INSULATED DUCT.
24. TEST AND BALANCE INSTRUMENT TEST PORT FOR DUCT TRAVERSE WITH PLASTIC CAPS.
25. Y-TYPE STRAINER WITH BLOWDOWN VALVE.



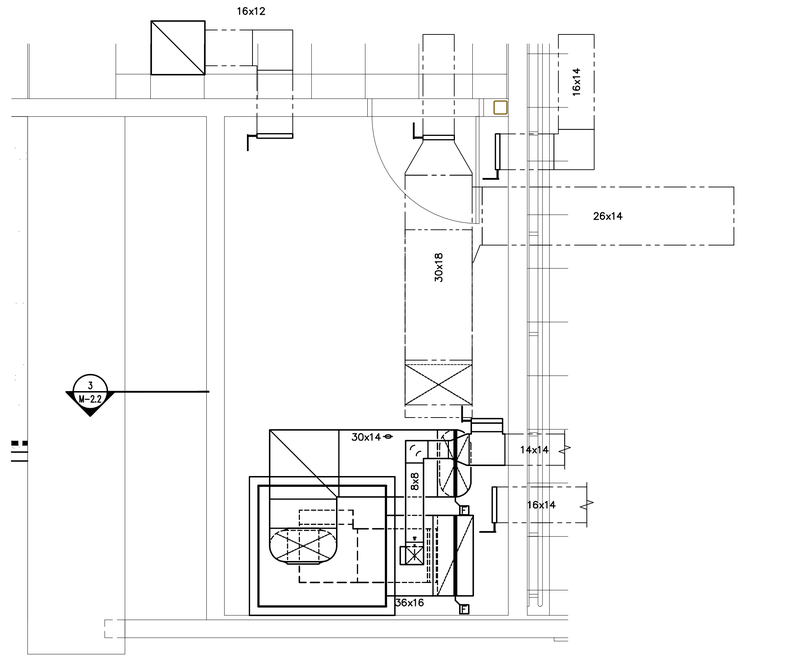
3 / M-2.5 AHU 3-1 MECHANICAL ROOM SECTION



1 / M-2.5 AHU 3-1 MECHANICAL ROOM PLAN DEMOLITION

SCALE: 3/8" = 1'-0"

1. REMOVE EXISTING AHU 3-1 AND ASSOCIATE SUPPORTS
2. REMOVE CHWS AND CHWR SERVING EX AHU 3-1, REMOVE ASSOCIATED VALVES AND ACCESSORIES AND PIPE SUPPORTS.
3. REMOVE SUPPLY DUCT AND DUCT DROP THRU FLOOR.
4. REMOVE RETURN DUCT THRU FLOOR AND INTO BOTTOM OF UNIT.
5. FOUR NEW CONCRETE PATCH TO INFILL EXISTING FLOOR OPENING. DOWEL NEW INFILL INTO EXISTING CONCRETE FLOOR USING #5 REBARS AT 6" O.C. EACH WAY.



2 / M-2.5 AHU 3-1 MECHANICAL ROOM PLAN NEW WORK

SCALE: 3/8" = 1'-0"

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ARCHITECTURE • INTERIOR DESIGN, INC.
PHONE: 561.684.6844 • FAX: 561.684.5594 • E-MAIL: info@gsp-architects.com
1401 FORUM WAY, SUITE 100 • WEST PALM BEACH, FLORIDA 33401
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JOHNSON, LEVINSON RAGAN, DAVILA, INC.
CONSULTING ENGINEERS
1450 Centrepark Boulevard, Suite 350
West Palm Beach, Florida 33401
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M-2.5

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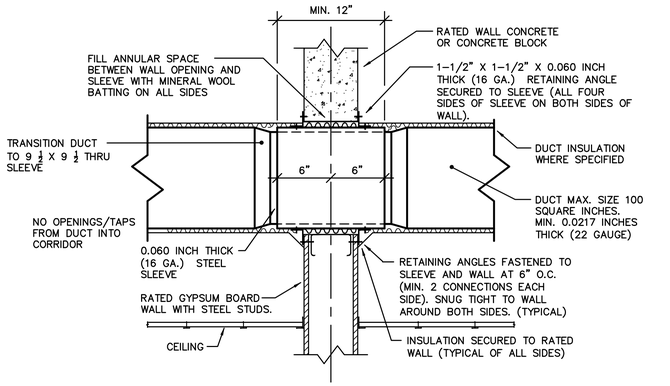
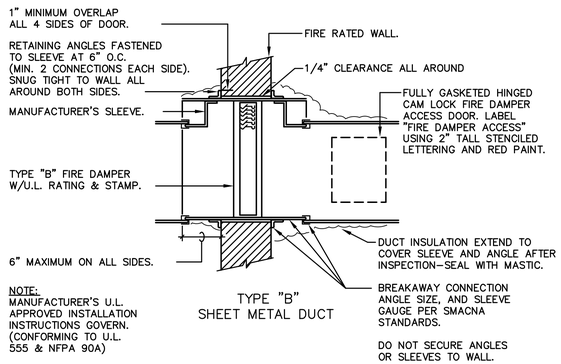


DUCT THRU SLEEVE IN RATED WALL WITHOUT FIRE DAMPER

1 M-3.1 — SCALE: NONE

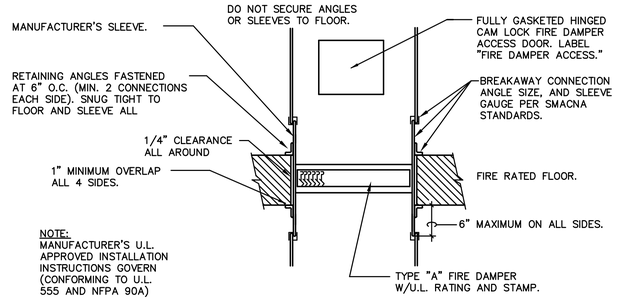


FIRE DAMPER DETAIL (WALL)

2 M-3.1 — SCALE: NONE

FIRE DAMPER NOTES

1. FIELD FABRICATED SLEEVE MAY BE PERMITTED. SUBMIT DETAIL TO ARCHITECT/ ENGINEER FOR APPROVAL.
2. DAMPERS AT LOUVERS SHALL BE TYPE "A", WITH RETAINING ANGLES AT LOUVERS TURNED INWARD.

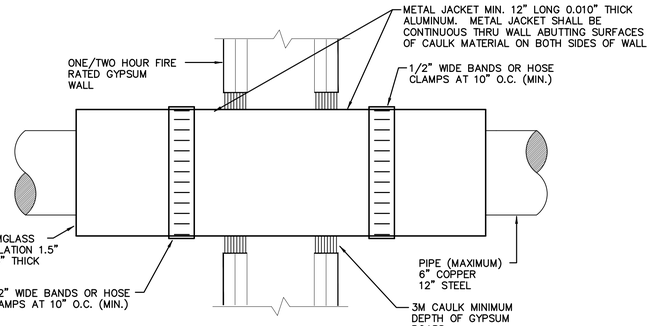


FIRE DAMPER DETAIL (FLOOR)

3 M-3.1 — SCALE: NONE

FIRE DAMPER NOTES:

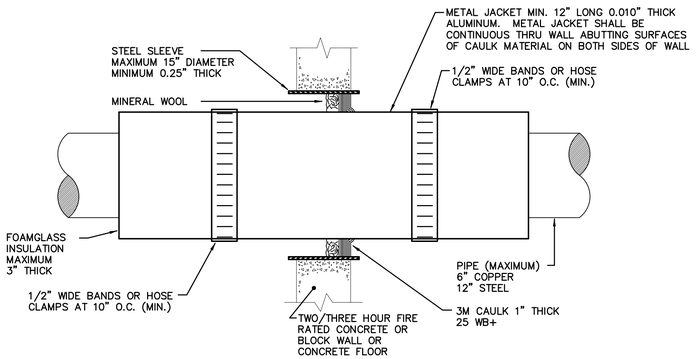
1. FIELD FABRICATED SLEEVE MAY BE PERMITTED. SUBMIT DETAIL TO ARCHITECT/ ENGINEER FOR APPROVAL.
2. ACCESS DOOR SHALL BE LOCATED ON SIDE OR BOTTOM OF DUCT AS APPROPRIATE TO PERMIT RESET OF DAMPER LINK. SIZE OF DOOR SHALL BE NOT LESS THAN 4 INCHES SMALLER THAN THE DUCT WIDTH IN WHICH IT IS INSTALLED.
3. THE CONTRACTOR SHALL DEMONSTRATE THE DAMPER CAN BE RESET BY REMOVAL AND REINSTALLATION OF THE FUSIBLE LINK.



PIPE THRU RATED WALL (GYPSUM)

4 M-3.1 — UL SYSTEM W-L-5045 — SCALE: NONE

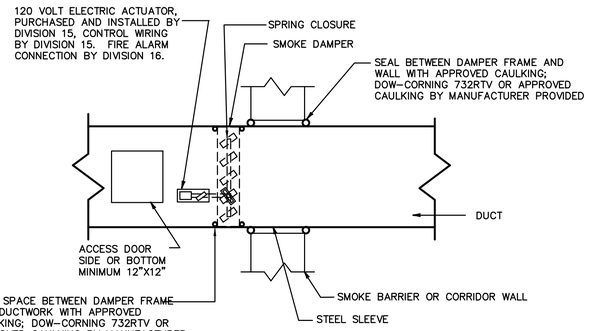
NOTE: DETAIL APPLIES TO FOAMGLASS INSULATED PIPING PENETRATING RATED GYPSUM WALLS. MANUFACTURES PUBLISHED REQUIREMENTS GOVERN.



PIPE THRU RATED WALL (CONCTRETE/BLOCK)

5 M-3.1 — UL SYSTEM C-AJ-5060 — SCALE: NONE

NOTE: DETAIL APPLIES TO FOAMGLASS INSULATED PIPING PENETRATING RATED CONCRETE/BLOCK WALLS OR FLOORS. MANUFACTURES PUBLISHED REQUIREMENTS GOVERN.

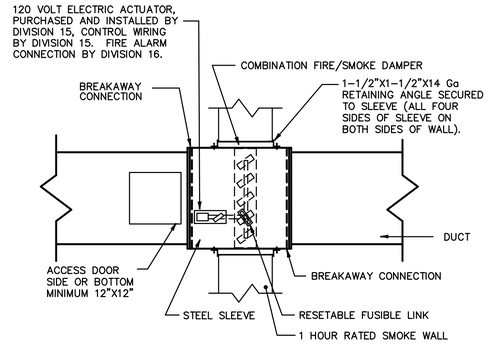


SMOKE DAMPER DETAIL

6 M-3.1 — SCALE: NONE

SMOKE DAMPER NOTES

1. CLEARANCE BETWEEN FIRE AND/OR FIRE/SMOKE DAMPER SLEEVE AND OPENING SHALL BE A MINIMUM OF 1/8 INCH PER FOOT OF HEIGHT (OR WIDTH) UNLESS OTHERWISE STATED IN THE LISTING OF ASSEMBLY.
2. NO MATERIAL IS ALLOWED IN THE CLEARANCE GAP BETWEEN A SMOKE DAMPER SLEEVE AND THE OPENING UNLESS SPECIFIED BY THE DAMPER MANUFACTURER'S INSTRUCTIONS. CAULK THE EXTERIOR PERIMETER OF FIRE/SMOKE DAMPER RETAINING ANGLES WITH A FILLET OF AN APPROVED CAULKING MATERIAL TO PREVENT THE PASSAGE OF SMOKE AND ALLOW FOR MOVEMENT OF THE DAMPER
3. SMOKE AND FIRE/SMOKE DAMPERS AND THEIR RESPECTIVE ACTUATORS SHALL BE U.L. TESTED AND LABELED AS AN ASSEMBLY.
4. THE MAXIMUM DISTANCE BETWEEN SMOKE DAMPER CLOSED BLADES ARE WITHIN 24" INCHES OF SMOKE BARRIER AND BEFORE AND DUCT INLETS AND OUTLETS (ACCESS DOORS NOT INCLUDED).
5. ACTUATOR TO BE MOUNTED ON STEEL SLEEVE. DO NOT MOUNT ON DUCT.



FIRE AND SMOKE DAMPER DETAIL

7 M-3.1 — SCALE: NONE

FIRE AND SMOKE DAMPER NOTES

1. FIRE/SMOKE DAMPER RETAINING ANGLES MUST OVERLAP THE EDGE OF THE WALL FRAMING BY A MINIMUM OF 1 INCH OVER AND BEYOND ALL MATERIAL IN THE OPENING. DO NOT WELD OR FASTEN ANGLES TOGETHER AT CORNER OF DAMPERS.
2. CLEARENCE BETWEEN FIRE/SMOKE DAMPER SLEEVE AND OPENING SHALL BE A MINIMUM OF 1/8 INCH PER FOOT OF HEIGHT (OR WIDTH) UNLESS OTHERWISE STATED IN THE LISTING OF ASSEMBLY.
3. NO MATERIAL IS ALLOWED IN THE CLEARANCE GAP BETWEEN A FIRE/SMOKE DAMPER SLEEVE AND THE OPENING UNLESS SPECIFIED BY THE DAMPER MANUFACTURER'S INSTRUCTIONS. CAULK THE EXTERIOR PERIMETER OF FIRE/SMOKE DAMPER RETAINING ANGLES WITH A FILLET OF AN APPROVED CAULKING MATERIAL TO PREVENT THE PASSAGE OF SMOKE AND ALLOW FOR MOVEMENT OF THE ANGLE.
4. SMOKE AND FIRE/SMOKE DAMPERS AND THEIR RESPECTIVE ACTUATORS SHALL BE U.L. TESTED AND LABELED AS AN ASSEMBLY.
5. ACTUATOR TO BE MOUNTED ON STEEL SLEEVE. DO NOT MOUNT ON DUCT.
6. SMOKE DAMPERS CLOSE WHEN THE ASSOCIATED AIR HANDLER OR FAN SHUTS DOWN, AND OPEN WHEN THE FAN RE-STARTS AND SHALL BE ACTIVATED BY THE FIRE ALARM SYSTEM.

JOHNSON, LEVINSON RAGAN, DAVILA, INC.
CONSULTING ENGINEERS
1450 Centrepark Boulevard, Suite 350
West Palm Beach, Florida 33401
(561)689.2303 (561)689.2703 Fax
www.jldla.com
Certification Number 6059
Harold L. Ragan, P.E. 48983
Michael P. Linden, P.E. 58094
JLRD Project No. 111061

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1401 FORUM WAY, SUITE 100 • WEST PALM BEACH, FLORIDA 33401
FL License: #AA26001692
Keith M. Spina #AR13419 Benjamin John Glidden, III #AR0536

CONSTRUCTION DOCUMENT SET FOR:

ADMIRAL'S COVE MAIN CLUBHOUSE

200 ADMIRALS COVE BOULEVARD
JUPITER, FLORIDA 33477

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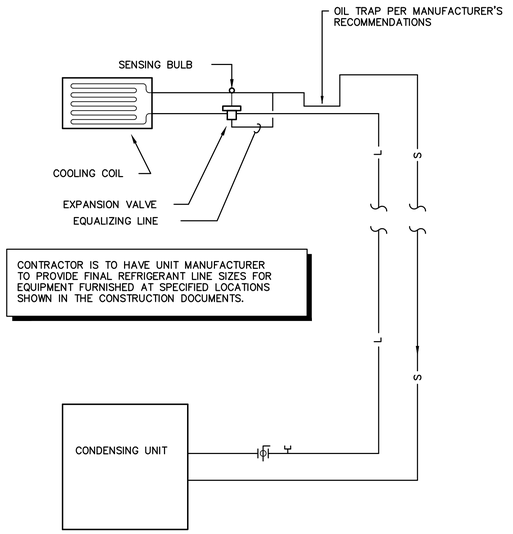
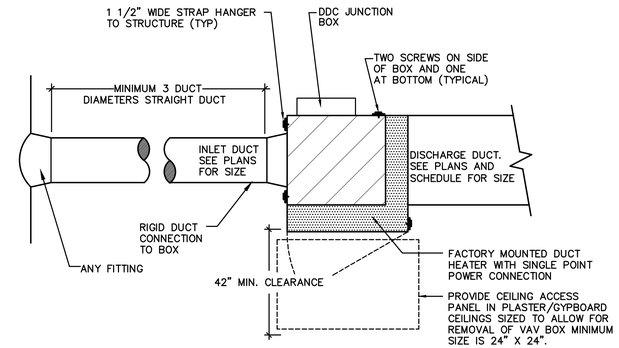


REFRIGERANT PIPING NOTES

A. PROVIDE 3-WAY SHRADER FITTINGS IF NOT PROVIDED WITH CONDENSING UNIT. SHRADER FITTING SHALL BE INSTALLED DIRECTLY INTO PIPE; NO EXTENDED TUBES ALLOWED.

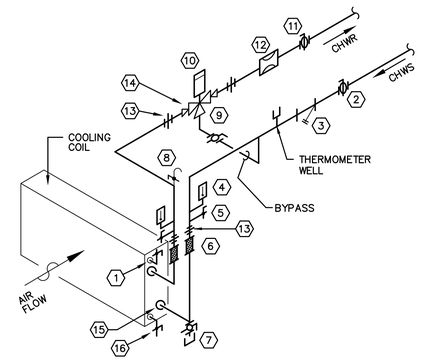
1 M-3.2 **REFRIGERANT PIPING SCHEMATIC**

SCALE: NONE



2 M-3.2 **VAV TERMINAL BOX DETAIL**

SCALE: NONE



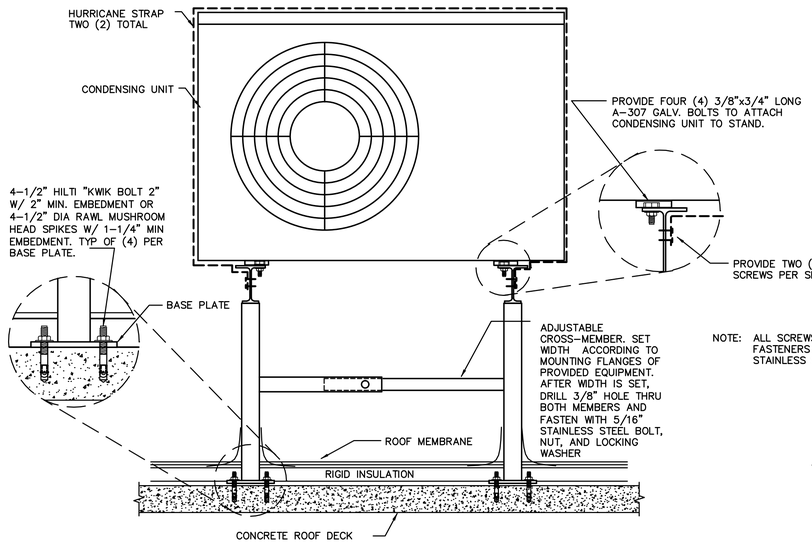
1. MANUAL COIL VENT, 1/4" BALL VALVE.
2. BALL VALVE, 2" AND SMALLER-TAPPED LUG TYPE BUTTERFLY VALVE, 2-1/2" AND LARGER WITH LEVER OPERATOR.
3. Y-TYPE STRAINER, BRONZE CONSTRUCTION, STAINLESS STEEL 20 MESH SCREEN-MUESSCO #351 THRU 2", #751 ABOVE 2".
4. THERMOMETER, 9" SCALE ADJUSTABLE ANGLE, RANGE 0-100 DEGREES F WITH 3/4 INCH THERMOWELL.
5. GAGE COCK, 1/4" BALL VALVE.
6. FLEXIBLE CONNECTOR, STAINLESS STEEL CONSTRUCTION, ANNULAR CORRUGATIONS WITH WOVEN WIRE BRAID. (2-1/2" AND LARGER PIPING ONLY)
7. 1/2" BALL VALVE WITH HOSE END CONNECTION.
8. MANUAL AIR VENT. 1/4" BALL VALVE, LOCATE AT PIPING HIGH POINT.
9. LOCATE FLANGES/UNIONS IMMEDIATELY ABOVE COIL PULL SPACE TO ALLOW FOR COIL PULL WITH MINIMAL REMOVAL OF PIPING.
10. THREE-WAY CONTROL VALVE, SEE SCHEDULE
11. SAME AS ITEM #2, EXCEPT WITH ADJUSTABLE MEMORY STOP.
12. VENTURI FLOW METER. SEE DETAIL
13. UNION 2" AND SMALLER, FLANGE 2-1/2" AND LARGER.
14. REDUCER WHERE REQUIRED.
15. DIELECTRIC FITTINGS AT CONNECTION TO COIL.
16. COIL DRAIN LINE AND VALVE

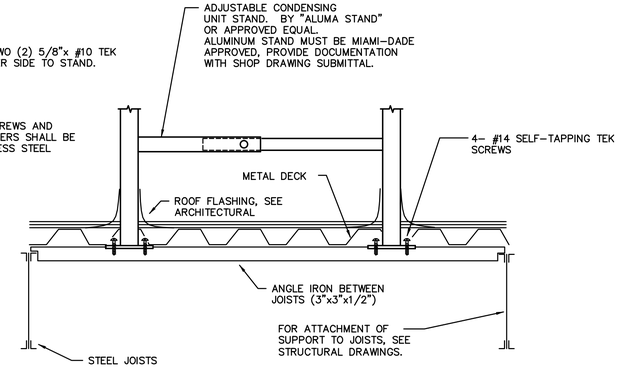
3 M-3.2 **CHW COOLING COIL PIPING SCHEMATIC**

SCALE: NONE

PIPING SCHEMATIC NOTES:

1. PIPING SHALL BE ARRANGED TO PROVIDE UNOBSTRUCTED ACCESS TO FILTER SECTION, FAN SECTION, AND COIL SECTION.
2. PROVIDE EXTENDED VALVE STEMS IN ORDER FOR HANDLES TO CLEAR PIPE INSULATION.
3. CONTROL VALVE ACTUATOR SHALL BE INSTALLED IN AN UPRIGHT POSITION
4. IF A DUAL COIL AIR HANDLER IS PROVIDED A BALANCING PLUG VALVE IS REQUIRED FOR EACH INDIVIDUAL COIL PIPE.





4 M-3.2 **ADJUSTABLE CONDENSING UNIT BASE DETAIL**

NOTES: FASTENING OF HURRICANE STRAP TO UNIT WITH TEK SCREWS WILL VOID MANUFACTURES WARRANTY AND IS NOT PERMITTED IN THIS APPLICATION.

SCALE: NONE

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ARCHITECTURE • INTERIOR DESIGN, INC
PHONE: 561.684.6844 • FAX: 561.684.5594 • E-MAIL: info@gsp-architects.com
1401 FORUM WAY, SUITE 100 • WEST PALM BEACH, FLORIDA 33401
FL License: #AA26001692
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CONSULTING ENGINEERS
1450 Centrepark Boulevard, Suite 350
West Palm Beach, Florida 33401
(561) 689-2303 • (561) 689-2302 Fax
www.jldinc.com
Certification Number 6059
Harold L. Ragan, P.E. 48983
Michael P. Linder, P.E. 58094
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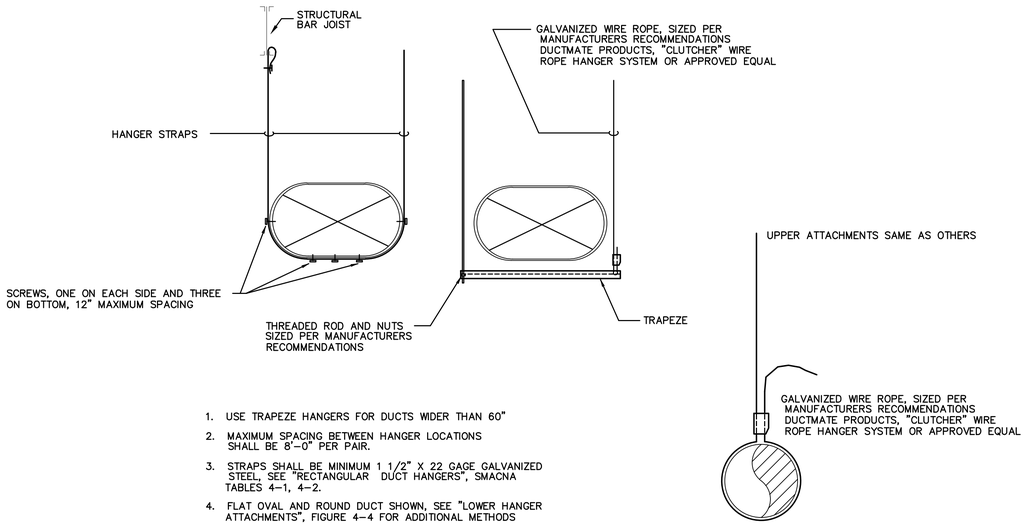
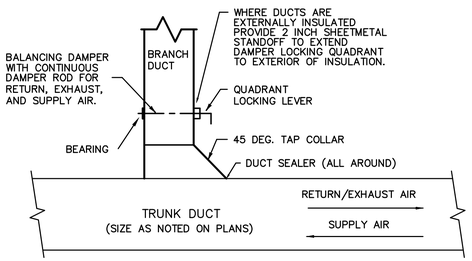


1. USE TRAPEZE HANGERS FOR DUCTS WIDER THAN 60"
2. MAXIMUM SPACING BETWEEN HANGER LOCATIONS SHALL BE 8'–0" PER PAIR.
3. STRAPS SHALL BE MINIMUM 1 1/2" X 22 GAGE GALVANIZED STEEL, SEE "RECTANGULAR DUCT HANGERS", SMACNA TABLES 4–1, 4–2.
4. FLAT OVAL AND ROUND DUCT SHOWN, SEE "LOWER HANGER ATTACHMENTS", FIGURE 4–4 FOR ADDITIONAL METHODS
5. ALTERNATE METHODS MAY BE UTILIZED, CONTRACTOR SHALL SUBMIT SHOP DRAWING TO ENGINEER FOR APPROVAL

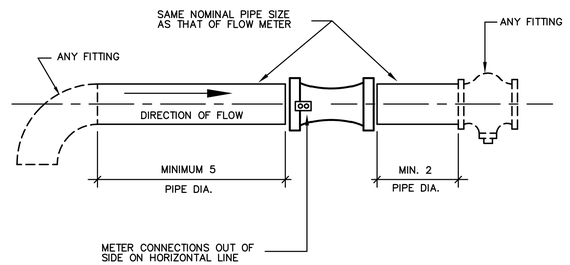
1 M-3.3 FLAT OVAL AND ROUND DUCT HANGER DETAIL

SCALE : NONE



3 M-3.3 BRANCH DUCT TAKE-OFF DETAIL

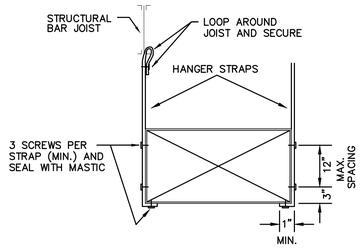
SCALE: NONE



4 M-3.3 FLOW METER INSTALLATION DETAIL

(VENTURI TYPE)

SCALE: NONE

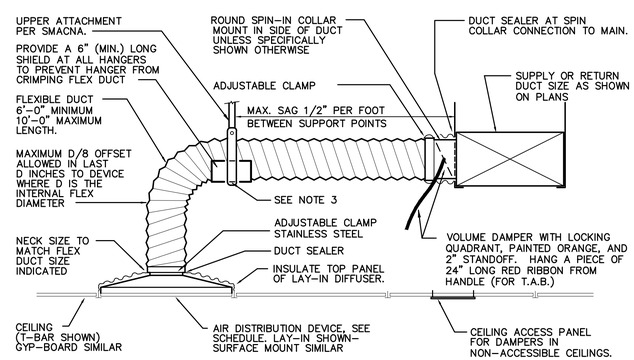


2 M-3.3 DUCT HANGING DETAIL

SCALE: NONE

DUCT HANGER NOTES:

1. USE TRAPEZE HANGERS FOR DUCTS WIDER THAN 59"
2. MAXIMUM SPACING BETWEEN HANGER LOCATIONS SHALL BE 8'–0" PER PAIR.
3. STRAPS SHALL BE MINIMUM 1 1/2" X 22 GAGE GALVANIZED STEEL, SEE "RECTANGULAR DUCT HANGERS", SMACNA TABLES 4–1, 4–2.
4. RECTANGULAR DUCT SHOWN, SEE "LOWER HANGER ATTACHMENTS", FIGURE 4–4 FOR ROUND DUCT.
5. FOR ATTACHMENTS OTHER THAN SHOWN, PROVIDE SHOP DRAWINGS TO ENGINEER FOR APPROVAL.



5 M-3.3 FLEXIBLE DUCT DETAIL

SCALE: NONE

FLEXIBLE DUCT NOTES

1. FLEXIBLE DUCTS SHALL BE ONE–PIECE AND SHALL NOT BE SPLICED TOGETHER.
2. EXTEND FLEXIBLE DUCT INSULATION TO DUCT/DIFFUSER PANEL INSULATION AND SEAL WITH MASTIC.
3. MINIMUM 1 1/2" WIDE, 22 GAUGE GALVANIZED STRAP HANGER WITH HEMMED EDGES PER SMACNA FIGURE 3–10.
4. FLEXIBLE AIR DUCT SHALL BE FULLY EXTENDED AND NOT COMPRESSED WITH ELBOW RADIUS NO LESS THAN R/D = 1.0.

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ARCHITECTURE • INTERIOR DESIGN, INC.
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FL License: #AA26001692
Keith M. Spina #AR13419 Benjamin John Glidden, III #AR0536

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CONSULTING ENGINEERS
1450 Centrepark Boulevard, Suite 350
West Palm Beach, Florida 33401
(561) 689.2303 • (561) 689.2302 Fax
www.jldinc.com
Certification Number 6059
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M-3.3

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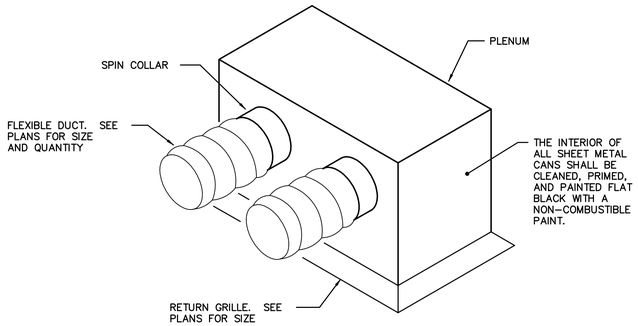
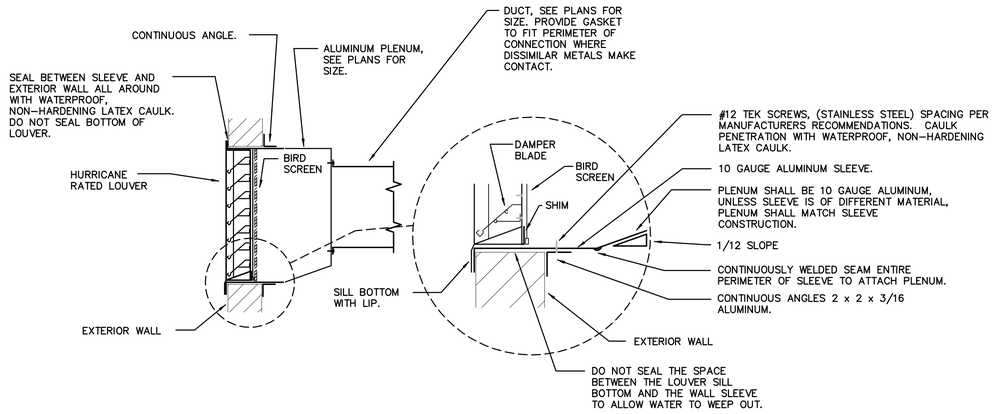


3 M-3.4 RETURN GRILLE DETAIL

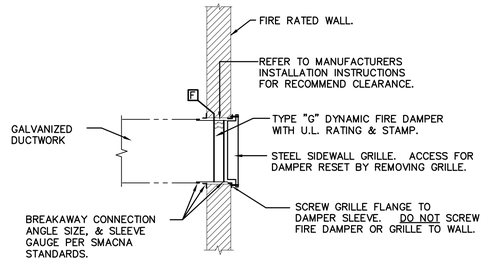
SCALE: NONE



2 M-3.4 OA DUCT CONNECTION TO WALL LOUVER DETAIL

1. OUTDOOR AIR DUCT SHOWN, EXHAUST LOUVER CONNECTIONS SIMILAR.

SCALE: NONE



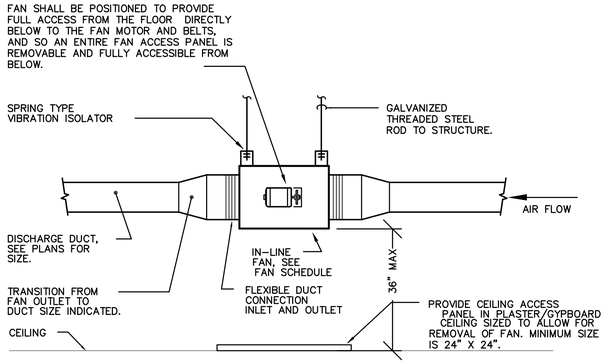
(A) FIELD FABRICATED SLEEVE MAY BE PERMITTED. SUBMIT DETAIL FOR APPROVAL.

(B) MANUFACTURER'S U.L. APPROVED INSTALLATION INSTRUCTIONS (CONFORMING TO U.L. 555 & NFPA 90A) GOVERN.

3 M-3.4 FIRE DAMPER AT GRILLE

FLUSH MOUNTED GRILLE

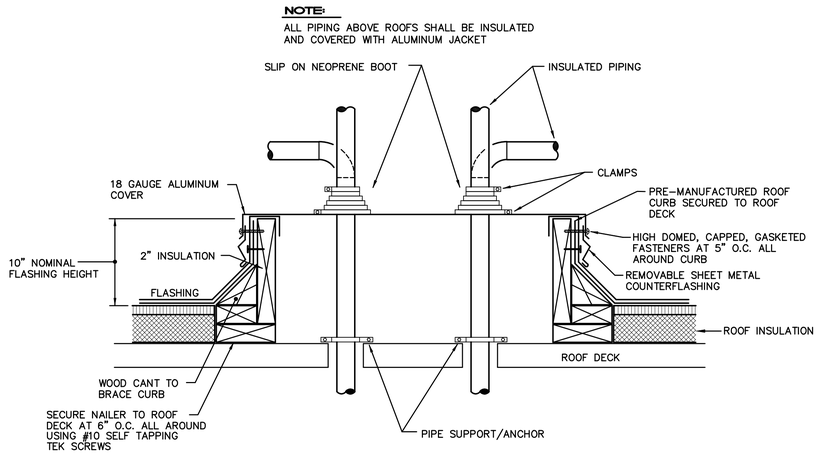
SCALE: NONE



NOTE: PROVIDE FLEXIBLE DUCT CONNECTION TO DUCTWORK FOR ALL IN-LINE FANS AND FOR ALL CEILING MOUNTED FANS.

4 M-3.4 IN-LINE FAN DETAIL

SCALE: NONE



5 M-3.4 PIPE THRU ROOF DETAIL

SCALE: NONE

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1401 FORUM WAY, SUITE 100 • WEST PALM BEACH, FLORIDA 33401
FL License: #AA26001692
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CONSULTING ENGINEERS
1450 Centrepark Boulevard, Suite 350
West Palm Beach, Florida 33401
(561)689.2303 ●(561)689.2703 Fax
www.jldinc.com
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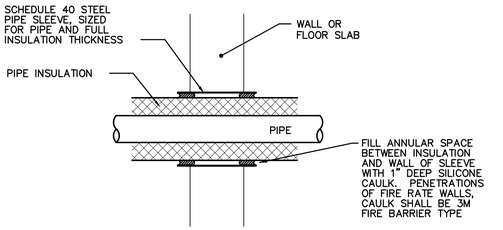
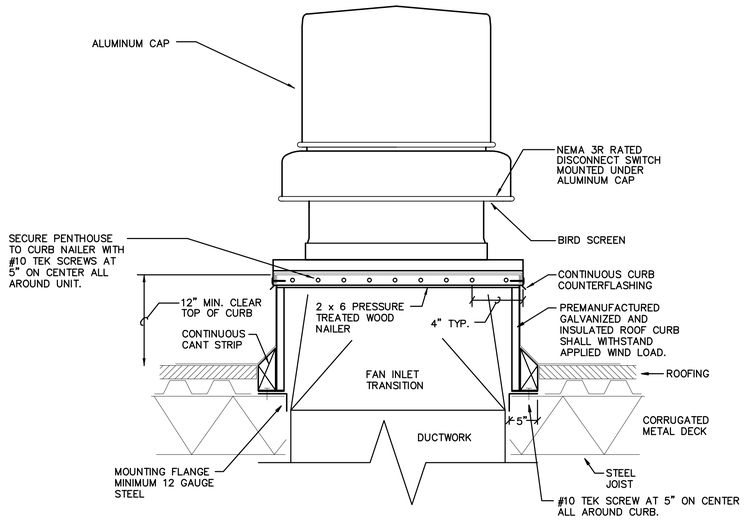


1 M-3.5 PIPE SLEEVE DETAIL

THIS DETAIL APPLIES ONLY TO NON-RATED WALLS

SCALE: NONE

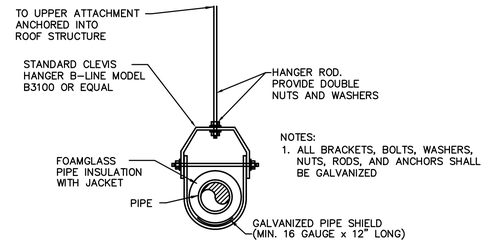


2 M-3.5 ROOF MOUNTED EXHAUST FAN

A. PROVIDE A MINIMUM CLEARANCE OF 12" FROM TOP OF ROOFING TO TOP OF CURB.

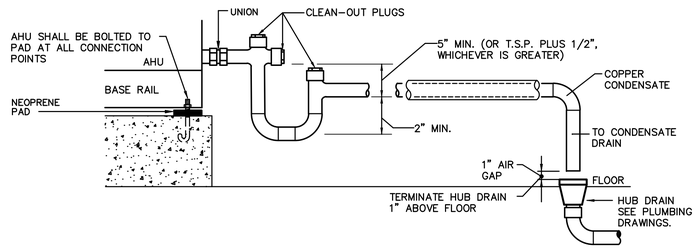
B. CENTRIFUGAL STYLE FAN SHOWN, UPBLAST TYPE SIMILAR

SCALE: NONE



3 M-3.5 PIPE HANGER DETAIL

SCALE : NONE

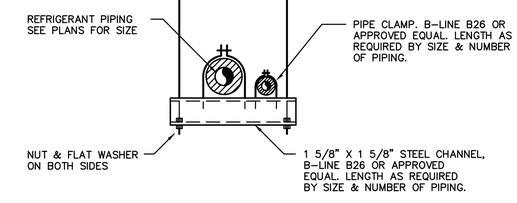


4 M-3.5 A.H.U. CONDENSATE DRAIN DETAIL

SCALE: NONE

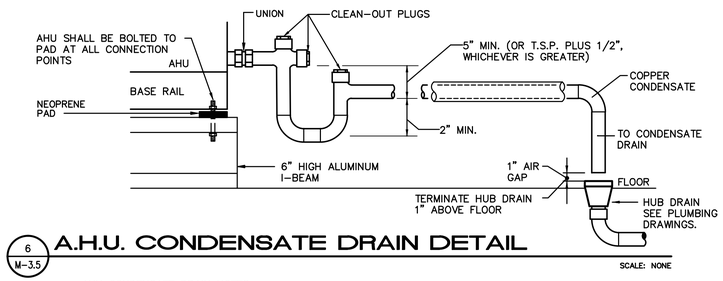
AHU CONDENSATE DRAIN NOTES

1. CONDENSATE DRAIN SHALL BE PIPED FULL SIZE OF UNIT CONNECTION
2. PROVIDE NEOPRENE PAD BETWEEN UNIT AND BASE RAIL.
3. CONDENSATE PIPING SHALL BE INSULATED PER SPECIFICATIONS.
4. CONDENSATE PIPING SHALL BE SUPPORTED FROM FLOOR AT 5'-0" (MIN) INTERVALS



5 M-3.5 REFRIGERANT PIPING SUPPORT DETAIL

SCALE: NONE



6 M-3.5 A.H.U. CONDENSATE DRAIN DETAIL

SCALE: NONE

AHU CONDENSATE DRAIN NOTES

1. CONDENSATE DRAIN SHALL BE PIPED FULL SIZE OF UNIT CONNECTION
2. PROVIDE NEOPRENE PAD BETWEEN UNIT AND BASE RAIL.
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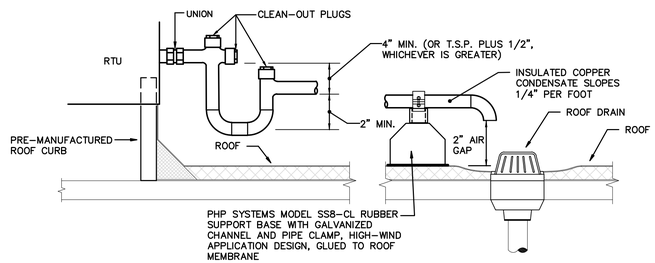
4. CONDENSATE PIPING SHALL BE SUPPORTED FROM FLOOR AT 5'-0" (MIN) INTERVALS



7 M-3.5 CONDENSATE DRAIN DETAIL

SCALE: NONE

AHU CONDENSATE DRAIN NOTES

1. CONDENSATE PIPING SHALL BE SUPPORTED FROM ROOF AT 5'-0" (MIN) INTERVALS TO MAINTAIN 1/4" SLOPE. CONTRACTOR SHALL SUBMIT SHOP DRAWING TO ENGINEER FOR REVIEW OF CONDENSATE SUPPORT.
2. CONDENSATE DRAIN SHALL BE PIPED FULL SIZE OF UNIT CONNECTION

JOHNSON, LEVINSON RAGAN, DAVILA, INC.
CONSULTING ENGINEERS
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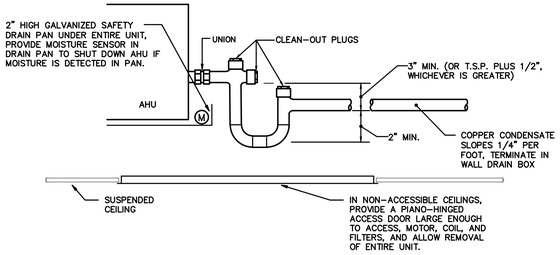
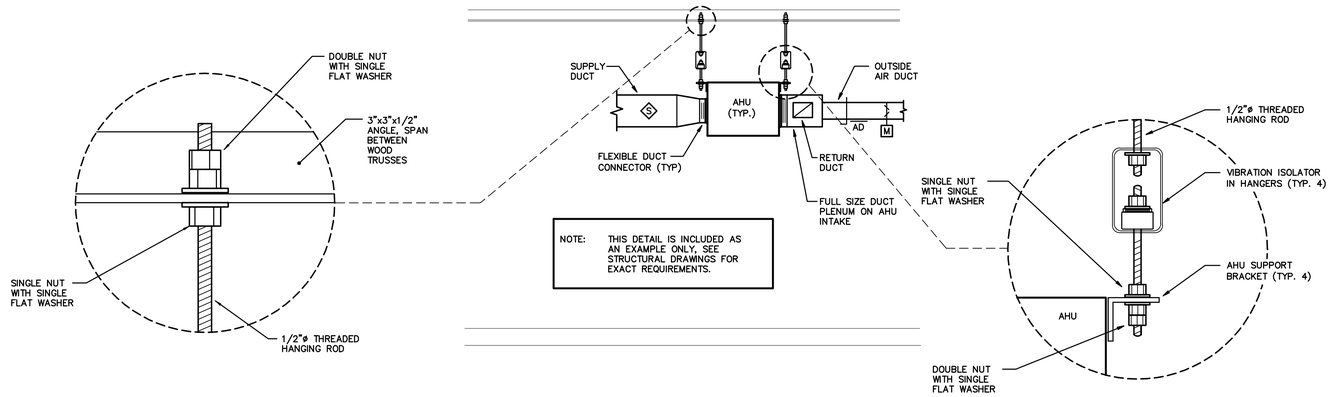


1 M-3.6 A.H.U. CONDENSATE DRAIN DETAIL

SCALE: NONE

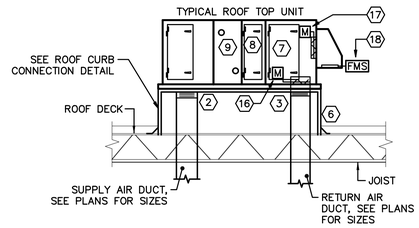
AHU CONDENSATE DRAIN NOTES

1. CONDENSATE PIPING SHALL BE SUPPORTED FROM STRUCTURE TO MAINTAIN 1/4" SLOPE.
2. CONDENSATE DRAIN SHALL BE PIPED FULL SIZE OF UNIT CONNECTION
3. CONDENSATE PIPING SHALL BE INSULATED PER SPECIFICATIONS.



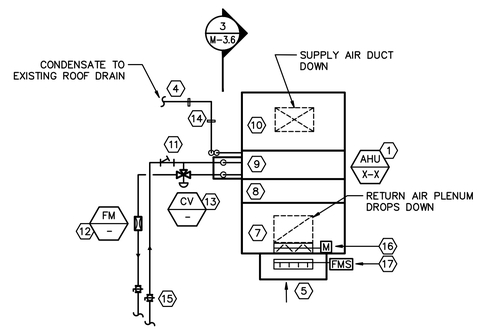
2 M-3.6 TYPICAL SUPPORT DETAIL FOR SUSPENDED AHU'S

SCALE: NONE



3 M-3.6 TYPICAL ROOF TOP UNIT SECTION

SCALE: NONE



4 M-3.6 TYPICAL ROOF TOP UNIT PLAN

SCALE: NONE

ROOF TOP UNIT DETAIL NOTES

1. INSTALL NEW RTU ON NEW ROOF CURB, FLASH AND SEAL ROOFING MEMBRANE INTO NEW CURB.
2. CONNECT SUPPLY DUCT TO RTU USING FLEXIBLE DUCT CONNECTOR. TRANSITION AS REQUIRED TO UNIT CONNECTION.
3. CONNECT RETURN DUCT TO RTU USING FLEXIBLE DUCT CONNECTOR, DROP FULL SIZE PLENUM DOWN TO ALLOW FOR RETURN AIR DUCT TO TAP INTO. TRANSITION AS REQUIRED TO UNIT CONNECTION.
4. ROUTE NEW FULL SIZE CONDENSATE DRAIN FROM RTU TO NEAREST EXISTING ROOF DRAIN. SUPPORT DRAIN LINE TO MAINTAIN SLOPE 1/4" PER LINEAR FOOT,
5. OUTDOOR AIR INTAKE HOOD, PROVIDE WITH ALUMINUM BIRD SCREEN AND BOTTOM INLET OPENING.
6. NEW PRE-MANUFACTURED ROOF CURB, FLASH AND SEAL INTO EXISTING ROOF.
7. FILTER MIXING SECTION WITH ACCESS DOOR
8. INTERNAL FACE AND BYPASS SECTION WITH ACCESS DOOR.
9. CHILLED WATER COIL SECTION.
10. SUPPLY FAN SECTION WITH ACCESS DOOR.
11. "Y" TYPE STRAINER
12. VENUTRI FLOW METER, SEE SCHEDULE AND INSTALLATION DETAIL.
13. 3-WAY CONTROL VALVE
14. ROOF MOUNTED PIPING SUPPORT (TYP)
15. CHILLED WATER COIL ISOLATION VALVES
16. PROVIDE MOTORIZED MODULATING DAMPER ON OUTDOOR AIR INLET OPENING FOR ALL RTU'S.
17. PROVIDE FLOW MONITORING STATION AT THE OUTDOOR AIR INTAKE HOOD FOR ALL RTU'S, FMS SHALL BE SIZED FOR VELOCITY RECOMMENDED BY MANUFACTURER.

GLIDDEN • SPINA & PARTNERS
ARCHITECTURE • INTERIOR DESIGN, INC.
GS&P
PHONE: 561.684.6844 • FAX: 561.684.5594 • E-MAIL: info@gsp-architects.com
1401 FORUM WAY, SUITE 100 • WEST PALM BEACH, FLORIDA 33401
FL License: #AA26001692
Keith M. Spina #AR13419 Benjamin John Glidden, III #AR0536

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200 ADMIRALS COVE BOULEVARD
JUPITER, FLORIDA 33477

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JOHNSON, LEVINSON RAGAN, DAVILA, INC.
CONSULTING ENGINEERS
1450 Centrepark Boulevard, Suite 350
West Palm Beach, Florida 33401
(561) 689-2305 • (561) 689-2302 Fax
www.jlrdinc.com
Certification Number 6059
Harold L. Ragan, P.E. 48983
Michael P. Linden, P.E. 58094
JLRD Project No. 111061

M-3.6

BID SET

CONTROLS LEGEND

AI	ANALOG INPUT
AHJ	AUTHORITY HAVING JURISDICTION
AHU	AIR HANDLING UNIT
AO	ANALOG OUTPUT
ASC	APPLICATION SPECIFIC CONTROLLER
ATS	AUTOMATIC TRANSFER SWITCH
C	COMMON
CAC	CUSTOM APPLICATION CONTROLLER
CCP	CHILLER CONTROL PANEL
CH	CHILLER
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CHWV	CHILLED WATER VALVE
CP	CONDENSER PUMP
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
CV	CONSTANT VOLUME
DDC	DIRECT DIGITAL CONTROL
DI	DIGITAL INPUT
DO	DIGITAL OUTPUT
DP	DIFFERENTIAL PRESSURE SWITCH
DPS	DIFFERENTIAL PRESSURE SENSOR
EF	EXHUAST FAN
EMS	ENERGY MANAGEMENT SYSTEM
F/S	FIRE SMOKE
FAS	FIRE ALARM SYSTEM
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HX	HEAT EXCHANGER
LP	LIGHTNING PROTECTION
LS	LIMIT SWITCH
MWL	MAKE-UP WATER LINE
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
OA	OUTSIDE AIR
OAF	OUTSIDE AIR FAN
OWS	OPERATORS WORK STATION
P	PUMP
PP	PRIMARY PUMP
RA	RETURN AIR
REL	RELIEF
RM	ROOM
RTD	RESISTANCE THERMOCOUPLE DEVICE
RTU	ROOF TOP UNIT
RV	REHEAT VALVE
SA	SUPPLY AIR
SYS	SYSTEM
SF	SUPPLY FAN
SP	SECONDARY PUMP
UPS	UNINTERRUPTABLE POWER SUPPLY
VFD	VARIABLE FREQUENCY DRIVE
VAC	VOLTS ALTERNATING CURRENT
VAV	VARIABLE AIR VOLUME

TEMPERATURE SENSOR (AVERAGING)

TEMPERATURE SENSOR (POINT)

TEMPERATURE PIPING WELL WITH ADJACENT PETE'S PLUG

GAUGE COCK (BALL VALVE)

SP — STATIC PRESSURE SENSOR

P/E — PNEUMATIC/ELECTRIC SWITCH

CURRENT SWITCH

BUTTERFLY VALVE

TWO-WAY VALVE

MANUAL GLOBE VALVE

PUMP

P — ACTUATOR (P = PNEUMATIC) (E = ELECTRICAL)

DISCONNECT

DAMPER

G — GATEWAY

CONTACTS

COMBINATION STARTER

Ⓒ — COIL

Ⓡ — RELAY

Ⓣ — THERMOSTAT

P — PRESSURE SENSOR

T — TEMPERATURE SENSOR (SPACE) WITH OVERRIDE BUTTON AND COMMUNICATIONS JACK

H — HUMIDITY SENSOR (SPACE)

FMS — AIR FLOW MEASURING STATION

Ⓢ — SMOKE DETECTOR

X / XX — CONTROL SYSTEM POINT

THREE-WAY VALVE

CO — CARBON DIOXIDE SENSOR (DUCT MOUNTED)

PUSH BUTTON START/STOP

E — ELECTRIC ACTUATOR

OS — OCCUPANCY SENSOR

V — VIBRATION SWITCH

FS — FREEZE STAT

FLOAT SWITCH

GENERAL CONTROL NOTES

1. THE ENERGY MANAGEMENT SYSTEM (EMS) SHALL PROVIDE FOR GLOBAL DISTRIBUTED CONTROL AND MONITORING OF THE INDIVIDUAL ITEMS OF EQUIPMENT, AND HVAC SYSTEMS. ALL NECESSARY HARDWARE, SOFTWARE, PROGRAMMING AND SERVICES SHALL BE PROVIDED AS REQUIRED TO PROVIDE A COMPLETELY AUTOMATIC, FUNCTIONAL AND OPERATIONAL SYSTEM.

2. THE EMS CONFIGURATION IS BASED UPON JOHNSON CONTROLS (METASYS). OTHER ACCEPTABLE MANUFACTURERS ARE AUTOMATED LOGIC.

3. THE WORK SHALL INCLUDE, BUT NOT BY WAY OF LIMITATION, MICROPROCESSOR BASED CONTROLLERS, SENSORS, PANELS, SWITCHES, CONDUIT, WIRING, PROGRAMMING, SOFTWARE, FIRMWARE, ROUTERS, HUBS, WORKSTATION SYSTEM GRAPHICS, TERMINATIONS, COMMUNICATIONS WIRING/CABLING, CALIBRATION, ACTIVATION, DE-BUGGING, COMMISSIONING, DEMONSTRATIONS AND TRAINING.

4. COORDINATE THE RANGE, SET POINT, DEAD BAND, CHARACTERISTICS AND MOUNTING LOCATIONS OF SENSORS WITH THE ACTUAL EQUIPMENT FURNISHED. INSTALL SENSORS, TUBING AND WIRING TO BE ACCESSIBLE, PROPERLY SUPPORTED AND ARRANGED SO AS NOT TO IMPEDE OR ENCROACH UPON EQUIPMENT SERVICE AND ACCESS AREAS. ALL DEVICES MOUNTED ON INSULATED SURFACES SHALL INCLUDE APPROPRIATE GALVANIZED STEEL STAND-OFF BRACKETS, THERMOMETER WELLS SHALL HAVE LAGGING EXTENSIONS.

5. WHERE PROPOSED SEQUENCES COULD DEFEAT THE EQUIPMENT MANUFACTURERS RECOMMENDED SAFETIES OR BE INJURIOUS TO THE EQUIPMENT CONTROLLED, ALERT ENGINEER OF CONFLICT PRIOR TO PROCEEDING WITH THE WORK.

6. SEQUENCES DO NOT REFER TO SPECIFIC DEAD BANDS, INTERLOCKS, RESET RATIOS, DELAYS AND RANGES REQUIRED FOR STABLE OPERATION, BUT SHALL BE PROVIDED AND BE FULLY USER ADJUSTABLE AT THE OPERATOR WORKSTATION. ALL OWS ENTERED VALUES AND SET POINTS SHALL BE RETAINED THROUGH A LOSS IN POWER.

7. INCLUDE IN BASE BID NOT LESS THAN 80 HOURS OR PROGRAMMING TIME FOR PROVIDING MODIFICATION OF CONTROL SEQUENCES BASED UPON DIRECTION, CLARIFICATIONS, MODIFICATIONS AND REVISIONS ISSUED BY THE ENGINEER. IN ADDITION, THE BASE BID SHALL INCLUDE FIELD CALIBRATION OF ALL SENSORS, REVISION TO SET POINTS, SCHEDULES, PID PARAMETERS, DEAD BANDS, DELAYS AND RANGES BASED UPON ACTUAL PERFORMANCE OF CONTROLLED EQUIPMENT, TO PROVIDE FOR STABLE OPERATION WITHOUT EXCESSIVE CYCLING OR HYSTERESIS.

8. DEMONSTRATE SEQUENCE OF OPERATION IN THE PRESENCE OF THE OWNER, AND TEST AND BALANCE FIRM FOR ALL CONTROLLED EQUIPMENT, TO INCLUDE GENERATION OF ALARMS AND SIMULATION OF POWER OUTAGES, REMOTE RESET OF CHILLER PLANT SHUTDOWN, OPERATION ON EMERGENCY POWER, AUTOMATIC RESTART AFTER POWER RESTORATION, AND GENERAL EQUIPMENT FAILURES. PROVIDE MANPOWER TO ASSIST AND SUPPORT CALIBRATION OF ALL SENSORS.

9. IN ADDITION TO SPECIFIC EQUIPMENT ALARMS NOTED IN THE SEQUENCE, PROVIDE STANDARD ALARMS FOR ITEMS SUCH AS SENSOR FAILURE, OUT OF RANGE (HIGH-LOW LIMITS) AND SIMILAR ITEMS.

10. COORDINATE SEQUENCES AND DATA ACQUISITION REQUIREMENTS AND PROVIDE FOR TREND LOGGING, REPORT GENERATION, CALCULATE RUN HOURS AND SIMILAR PREVENTIVE MAINTENANCE FUNCTIONS.

11. CAC/ASC POINT TABLES, SEQUENCES OF OPERATION, INPUT/OUTPUT SUMMARY TABLES AND CONTROLLER SOFTWARE REQUIREMENTS SHALL BE CONSIDERED COMPLEMENTARY, IN THAT THE WORK OR FEATURES CALLED FOR OR REQUIRED BY ANY ONE, SHALL APPLY TO ALL. THE CONTRACTOR SHALL COORDINATE THESE REQUIREMENTS, RECONCILE ANY DIFFERENCES, AND PROVIDE A COMPLETE SYSTEM WITH ALL OF THE FEATURES, FUNCTIONS AND SEQUENCES SPECIFIED, NOTED INDICATED AND/OR REQUIRED.

12. ALL CONTROL WIRING, INCLUDING POWER, SIGNALING AND COMMUNICATIONS SHALL MEET THE REQUIREMENTS SPECIFIED IN DIVISION 16, EXCEPT THAT ONE HALF INCH DIAMETER CONDUIT IS ACCEPTABLE. POWER WIRING SHALL NOT BE RUN IN THE SAME CONDUIT AS LOW VOLTAGE WIRING, SIGNAL OR COMMUNICATIONS WIRING. FINAL CONNECTION TO SENSORS AND ACTUATORS MAY BE MADE WITH FLEXIBLE CONDUIT NOT EXCEEDING 24 INCHES IN LENGTH. EXPOSED COMMUNICATION CABLING SHALL BE INSTALLED IN CONDUIT, CONCEALED COMMUNICATION CABLING MAY BE RUN EXPOSED BUT SHALL BE PLENUM RATED, SUPPORTED FROM BRIDAL RINGS OR USING 'J' HOOKS FROM THE SIDE OF THE CABLE TRAY, INSTALLATION OF THE WIRING WITHIN THE TRAY IS NOT ALLOWED.

13. WIRING SHALL BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE. CONDUCTORS SHALL BE COPPER, ONE-PIECE, INSTALLED WITHOUT SPLICES. WIRE NUTS ARE ALLOWED ONLY AT CONNECTION TO END DEVICES. CAC'S SHALL BE INSTALLED WITHIN CONTROL PANELS. TERMINAL STRIP TYPE CONNECTIONS SHALL BE USED WITHIN CONTROL PANELS WITH NO MORE THAN TWO CONDUCTORS LANDED TO ANY ONE TERMINAL, USE JUMPERS TO AN ADJACENT TERMINAL WHERE NECESSARY TO LAND MORE THAN TWO CONDUCTORS. WIRING WITHIN PANELS SHALL BE RUN PARALLEL AND PERPENDICULAR TO THE PANEL, ARRANGED NEATLY, USING WIRING DUCT FOR MULTIPLE CONDUCTOR RUNS AND SPIRAL WRAPPING OF WIRE BUNDLES. WIRING SHALL BE COLOR CODED AND NUMBER CODED ON BOTH ENDS USING PANDUIT TYPESET PRE-PRINTED LABELS TO MATCH AS-BUILT WIRING DIAGRAMS. CABLING SHALL BE COLOR CODED.

14. 120-VOLT POWER TO AHU CAC CONTROLLERS WILL BE PROVIDED UNDER DIVISION 16. POWER WIRING SHALL BE MINIMUM #12 THWN, LABELED FOR THE CIRCUIT AND PANEL NUMBER FED FROM. MOTOR CONTROL CIRCUITS SHALL BE A MINIMUM OF #14 THWN. TRANSFORMERS, DC POWER RECTIFIERS, 24 VOLT POWER SUPPLIES AND EXTENSION OF POWER TO ACTUATORS, TRANSMITTERS, AND SIMILAR CONTROL DEVICES AND SENSORS SHALL BE PROVIDED UNDER DIVISON 15.

15. SENSOR WIRING SHALL BE STRANDED #18 HOOK-UP WIRE, 300 VAC LABELED AT BOTH ENDS AS TO THE DEVICE IT SERVES. ANALOG CIRCUIT (4-20 MA / 0-10 VDC) WIRING SHALL BE A SHIELDED TWISTED PAIR WITH THE SHIELD GROUNDED AT THE CONTROLLER END ONLY.

16. A DEDICATED COMMUNICATIONS NETWORK SHALL BE PROVIDED FOR INTERCONNECTION OF THE CONTROL SYSTEM CONTROLLERS. CONTROL SYSTEM COMMUNICATION NETWORK SHALL BE RUN SEPARATELY FROM OTHER WIRING AND MEET THE MANUFACTURERS REQUIREMENTS.

17. THE DESIGN IS BASED UPON A HARD WIRED SYSTEM; WIRELESS DEVICES SHALL NOT BE USED UNLESS OTHERWISE APPROVED BY THE ENGINEER.

18. A GRAPHIC OF EACH SYSTEM AND ITEM OF HVAC EQUIPMENT SHALL BE PROVIDED. GRAPHICS SHALL BE LOGICALLY PRESENTED, STARTING WITH AN OVERALL REPRESENTATION OF THE CAMPUS INCLUDING MAJOR MECHANICAL SYSTEMS AND EQUIPMENT TO THE AHU LEVEL. SELECTION OF THE EQUIPMENT/SYSTEM SHALL BRING UP LOWER LEVEL GRAPHICS APPROPRIATE TO THE ITEM OF EQUIPMENT SELECTED. AS A SUB GRAPHIC TO EACH AHU, PROVIDE A BUILDING FLOOR PLAN FOR THE AREA SERVED BY THAT UNIT WHICH GRAPHICALLY SHOWS EACH TERMINAL BOX (VAV SYSTEMS) THE LIMITS IT SERVES, SPACE TEMPERATURE (AND HUMIDITY), AND A SUB GRAPHIC OF EACH TERMINAL BOX SHALL BE DISPLAYED WHEN SELECTED. THE GRAPHICS SHALL DISPLAY A SCHEMATIC REPRESENTATION OF ALL HVAC EQUIPMENT AND OR SYSTEMS (CHW/CW), ITS ROOM LOCATION, AND DISPLAY THE DATA REFERENCED IN THE POINT TABLES, SET POINTS AND INCLUDE A VISUAL NOTIFICATION OF ALARM CONDITIONS. GRAPHICS SHALL ALSO DISPLAY ITEMS SUCH AS EQUIPMENT SCHEDULES, TREND LOGS, RUN HOURS, OCCUPIED/UNOCCUPIED STATUS, SEQUENCE OPERATING MODE AND A BUILDING WIDE SUMMARY ALARM SCREEN.

19. IN THE EVENT OF A POWER FAILURE/OUTAGE ALL CONTROLS SHALL RECYCLE TO A NORMAL START SEQUENCE WHEN POWER IS RESTORED. WHERE MULTIPLE UNITS HAVE THE SAME OPERATOR DEFINED START TIME, OR SOFTWARE CALCULATED OPTIMUM START TIME, START-UP OF UNITS SHALL BE STAGGERED TO LIMIT THE KW DEMAND.

20. THE CONFIGURATION DIAGRAM REFLECTS THE REQUIREMENTS OF THE MANUFACTURER USED AS THE BASIS OF DESIGN. THE CONTROL SYSTEM SHALL INCLUDE ALL HARDWARE NECESSARY TO MEET THE SPECIFIED REQUIREMENTS.

21. THE CONTROL OF MODULATING VALVES, DAMPERS, AND VFDs SHALL UTILIZE PROPORTIONAL-INTEGRAL-DERIVATIVE (PID) CONTROL LOOPS. THE CONTRACTOR SHALL TUNE THE LOOPS TO PROVIDE STABLE OPERATION. CONTROL STABILITY SHALL BE DEMONSTRATED BY SIMULATING OR CAUSING A LARGE OFFSET IN THE MEASURED CONTROL INPUT VARIABLE AND PROVIDING A TIME BASED GRAPHICAL TREND LOG OF THE CONTROLLED VARIABLE.

22. COORDINATE VFD COMMUNICATION CARD AND I/O REQUIREMENTS WITH THE DIVISION 16 CONTRACTOR AND PROVIDE PERSONNEL TO ASSIST IN VFD START-UP. COORDINATE INTERFACE TO THE CHILLER MANUFACTURERS TRANSLATOR PANEL FOR ACCESS TO DETAILED CHILLER DATA. EVEN WHERE DATA IS AVAILABLE THROUGH INTERFACES HARD VFD/CHILLER POINTS SHALL BE PROVIDED AS INDICATED IN THE CAC POINT LIST TABLES. COORDINATE WITH DIVISION 16 FOR MULTIPLEXED INTERFACE TO THE GENERATOR.

23. ALL ROOM NAMES AND NUMBERS USED FOR PROGRAMMING, GRAPHICS, LABELING AND SHOP DRAWINGS SHALL BE COORDINATED WITH THOSE ACTUALLY USED, WHICH MAY DIFFER FROM THE NAMES/NUMBERS ON THE DOCUMENTS.

24. SMOKE DAMPERS ASSOCIATED WITH EACH AHU SHALL BE WIRED THROUGH THE FIRE ALARM SHUTDOWN AND AHU FAN STOP/START RELAY AUXILIARY N.O. CONTACTS UNDER DIVISION 16, THE DAMPERS SHALL BE SHUT WHENEVER THE AHU FAN IS OFF.

25. ALL CACs, 24 VAC POWER SOURCES AND RELAYS SHALL BE LOCATED WITHIN EMS CONTROL PANELS. SENSORS LOCATED OUTDOORS SHALL BE PROVIDED WITH SURGE SUPPRESSION.

26. EACH CAC SHALL INCLUDE A MINIMUM OF THREE LIGHTING CIRCUIT ON/OFF OUTPUTS AND OVERRIDE INPUTS FOR BIDDING PURPOSES. A LIGHTING CONTROL TERMINAL CABINET WILL BE PROVIDED UNDER DIVISION 16 IN EACH ELECTRICAL ROOM. UNDER DIVISION 15 EMS LIGHTING INPUTS/OUTPUTS SHALL BE CONNECTED TO THE TERMINAL CABINET AND ON-OFF TIME PROGRAMMED. THE DIVISION 15 CONTRACTOR SHALL COORDINATE THE ACTUAL POINTS REQUIRED IN EACH CAC WITH THE DIVISION 16 CONTRACTOR. ACTUAL TIE-IN LOCATION TO EMS IS AT THE OPTION OF THE DIVISION 15 CONTRACTOR.

GLIDDEN • SPINA & PARTNERS
ARCHITECTURE • INTERIOR DESIGN, INC
PHONE: 561.684.6844 • FAX: 561.684.5594 • E-MAIL: info@gsp-architects.com
1401 FORUM WAY, SUITE 100 • WEST PALM BEACH, FLORIDA 33401
FL License: #AA26001692
Keith M. Spina #AR13419 Benjamin John Glidden, III #AR0536

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MAIN CLUBHOUSE
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JOHNSON, LEVINSON RAGAN, DAVILA, INC.
CONSULTING ENGINEERS
1450 Centrepark Boulevard, Suite 350
West Palm Beach, Florida 33401
(561)689.2303 ●(561)689.2302 Fax
www.jldinc.com
Certification Number 6059
Harold L. Ragan, P.E. 48983
Michael P. Linden, P.E. 58094
JLRD Project No. 111061

M-4.1

BID SET

SEQUENCE OF OPERATION

CONSTANT VOLUME AHU WITH FACE & BYPASS

START–STOP: THE UNIT IS STARTED BY PLACING THE HAND–OFF–AUTO SWITCH IN THE HAND POSITION OR BY THE EMS BASED UPON A TIME OF DAY SCHEDULE WHEN THE HOA SWITCH IS IN THE AUTO POSITION, OR BY THE EMS WHEN THE SPACE CONDITIONS EXCEED THE UNOCCUPIED SETUP/SETBACK TEMPERATURES. IN THE AUTOMATIC MODE DURING OCCUPIED PERIODS THE FAN SHALL BE ON, DURING UNOCCUPIED PERIODS THE FAN SHALL BE OFF. OCCUPIED–UNOCCUPIED PERIODS SHALL BE AS DEFINED AT THE OPERATORS WORKSTATION. PROOF OF FAN OPERATION SHALL BE VERIFIED THROUGH A CURRENT SWITCH, SHOULD A FAN START COMMAND BE ISSUED AND CURRENT IS NOT SENSED AFTER AN APPROPRIATE DELAY (60 SECONDS – ADJUSTABLE), AN ALARM SHALL BE GENERATED AT THE OPERATORS WORKSTATION. WHEN A FAN STOP COMMAND IS ISSUED AND CURRENT CONTINUES TO BE SENSED, AN ALARM SHALL BE GENERATED AT THE OPERATORS WORKSTATION AFTER AN APPROPRIATE DELAY (60 SECONDS – ADJUSTABLE). PROVIDE AN ALARM FOR UNAUTHORIZED START/STOP DURING UNOCCUPIED/OCCUPIED PERIODS.

TEMPERATURE SET POINTS: THERE SHALL BE SEPARATE OCCUPIED/UNOCCUPIED COOLING AND HEATING SET POINTS. DURING THE UNOCCUPIED SCHEDULE, THE CONTROLLER SHALL INDEX THE ROOM TEMPERATURE TO A PREDETERMINED (ADJUSTABLE) SETBACK (HEATING – 68 DEGREES F)/SETUP (COOLING – 85 DEGREES F) SET POINT. DURING OCCUPIED PERIODS THE SET POINTS SHALL BE 75 DEGREES F COOLING, 70 DEGREES F HEATING (ADJUSTABLE AT THE OWS). IN

HUMIDITY SET POINTS: THERE SHALL BE SEPARATE OCCUPIED/UNOCCUPIED HIGH HUMIDITY SET POINTS. DURING THE UNOCCUPIED SCHEDULE, THE HIGH HUMIDITY SET POINT SHALL BE 70 PERCENT (ADJUSTABLE AT THE OWS). DURING OCCUPIED PERIODS THE HIGH HUMIDITY SET POINT SHALL BE 60 PERCENT (ADJUSTABLE AT THE OWS). HUMIDITY SET POINTS SHALL NOT BE ADJUSTABLE AT THE SENSOR.

OPTIMUM START: THE OPERATORS WORKSTATION SHALL INCLUDE AN OPTION FOR AN OPTIMUM START ROUTINE THAT ADJUSTS THE START TIME OF THE AHU WHEN SELECTED. THE ROUTINE SHALL CONSIDER THE ACTUAL OUTSIDE AIR DRY BULB TEMPERATURE AS WELL AS THE HISTORICAL OUTSIDE AIR TEMPERATURE DATA AND BUILDING TEMPERATURE TO CALCULATE WHEN THE SYSTEM IS TO BE STARTED TO PRE–COOL/PRE–HEAT THE BUILDING TO THE DESIRED OCCUPIED SPACE TEMPERATURE SET POINT PRIOR TO THE SCHEDULED OCCUPANCY PERIOD. THE OUTSIDE AIR DAMPER SHALL BE CLOSED AND THE EXHAUST FAN(S) SHALL BE OFF DURING THIS COOL DOWN/WARM UP PERIOD. STARTING OF AHU'S SHALL BE AUTOMATICALLY STAGGERED TO LIMIT THE BUILDING KW DEMAND.

FIRE/SMOKE CONTROL: THE UNIT SHALL BE INTERLOCKED UNDER DIVISION 16 WITH THE AHU DUCT MOUNTED SMOKE DETECTORS (NUMBER OF DETECTORS PER UNIT AS SHOWN ON THE BUILDING FLOOR PLANS). UPON SENSING PRODUCTS OF COMBUSTION THE SMOKE DETECTOR SHALL SIGNAL THE BUILDING FIRE ALARM SYSTEM. THE FIRE ALARM SYSTEM SHALL IN–TURN ACTIVATE A FIRE ALARM SHUTDOWN RELAY WHICH SHALL BE INTERLOCKED WITH THE AHU STARTER TO SHUT OFF THE FAN, PREVENTING UNIT OPERATION WHEN AN UNIT SMOKE DETECTOR ALARM CONDITION EXISTS.

TEMPERATURE CONTROL: WHEN THE FAN IS OPERATIONAL AS DETECTED BY THE FAN CURRENT SWITCH THE TEMPERATURE CONTROL SEQUENCE SHALL BE INITIATED. THE USER ADJUSTABLE SPACE TEMPERATURE SENSOR DETERMINES THE COOLING OR HEATING MODE. WHEN THE SPACE TEMPERATURE IS BELOW THE HEATING SET POINT THE HEATING MODE IS ACTIVE, WHEN THE SPACE TEMPERATURE IS ABOVE THE COOLING SPACE SET POINT THE COOLING MODE IS ACTIVE.

COOLING COIL: WHEN THE SPACE TEMPERATURE SENSOR IS CALLING FOR COOLING THE CHW CONTROL VALVE SHALL MODULATE TO MAINTAIN THE LEAVING COOLING COIL TEMPERATURE OF 54'F (ADJUSTABLE). WHEN THE LEAVING COIL TEMPERATURE EXCEEDS THE SET POINT THE VALVE SHALL SLOWLY MODULATE OPEN TO INCREASE CHW FLOW THROUGH THE COIL. AS THE LEAVING COIL TEMPERATURE DROPS BELOW THE SET POINT THE VALVE SHALL SLOWLY MODULATE TOWARDS THE CLOSED POSITION TO REDUCE CHW FLOW THROUGH THE COIL.

SPACE TEMPERATURE: WHEN THE SPACE TEMPERATURE EXCEEDS THE THERMOSTAT SET POINT THE FACE AND BYPASS DAMPER SHALL MODULATE TO INCREASE AIR FLOW THROUGH THE COOLING COIL. AS THE SPACE TEMPERATURE DROPS BELOW THE SET POINT THE FACE AND BYPASS DAMPER SHALL MODULATE TO DECREASE AIR FLOW THROUGH THE COOLING COIL. WHEN THE FACE AND BYPASS IS IN THE FULL BYPASS POSITION THE COOLING CONTROL VALVE SHALL BE CLOSED, UPON A CONTINUED DROP IN SPACE TEMPERATURE THROUGH THE DEAD BAND TO THE HEATING SET POINT (72 DEGREES F – ADJUSTABLE) THE ELECTRIC DUCT HEAT SHALL BE ENERGIZED IN STAGES. A SHORT PERIOD AFTER THE FIRST STAGE OF DUCT HEAT IS ENERGIZED (5 MINUTES ADJUSTABLE) IF THE SPACE TEMPERATURE CONTINUES TO FALL SUBSEQUENT STAGES SHALL BE ENERGIZED (REFER TO THE DUCT HEAT SCHEDULE FOR NUMBER OF STAGES REQUIRED). WHEN THE FAN IS OFF, THE NORMALLY OPEN CHILLED WATER VALVE SHALL BE CLOSED TO THE COIL AND THE FACE AND BYPASS DAMPER OPEN TO THE COIL. UPON A LOSS OF THE CONTROL VALVE SIGNAL, THE VALVE SHALL FAIL TO THE FULL FLOW THROUGH THE COIL POSITION AND THE FACE AND BYPASS DAMPER TO FULL AIR FLOW THROUGH THE COOLING COIL. AN ALARM SHALL BE GENERATED IF THE CHW VALVE IS IN THE FULL OPEN POSITION AND THE LEAVING COIL TEMPERATURE EXCEEDS THE SCHEDULED COIL LAT OR IF THE LEAVING COIL TEMPERATURE IS EXCEEDS HIGH/LOW LIMITS.

DEHUMIDIFICATION: WHEN THE SENSED SPACE RELATIVE HUMIDITY RISES ABOVE THE OCCUPIED HIGH LIMIT SET POINT THE DEHUMIDIFICATION SEQUENCE SHALL BE ACTIVATED. IN THE DEHUMIDIFICATION MODE CONTROL OF THE COOLING COIL SHALL BE OVERRIDDEN AND THE COOLING CONTROL VALVE SHALL MODULATE OPEN TO PROVIDE FULL FLOW THROUGH THE COOLING COIL. THE SPACE TEMPERATURE SENSOR SHALL MODULATE THE FACE AND BYPASS DAMPER TO MAINTAIN THE SPACE TEMPERATURE SET POINT. AFTER A TIME DELAY (15 MINUTES ADJUSTABLE, 5 MINUTES FOR 100% OA UNITS) IF THE SPACE HUMIDITY REMAINS ABOVE THE SET POINT THE FACE AND BYPASS DAMPER SHALL BE POSITIONED TO FULL AIR FLOW THROUGH THE COIL (COOLING COIL CONTROL VALVE REMAINS FULL FLOW TO THE COIL) AND THE HEATING COIL SHALL BE ENERGIZED IN STAGES TO MAINTAIN THE SPACE SET POINT TEMPERATURE. ONCE THE SPACE RELATIVE HUMIDITY FALLS BELOW THE SET POINT PLUS THE DEAD BAND, THE UNIT SHALL REVERT TO THE HEATING OR COOLING MODE OF OPERATION AS APPROPRIATE.

THE SPACE TEMPERATURE AND SPACE HUMIDITY SENSOR SHALL MONITOR SPACE CONDITIONS IN THE UNOCCUPIED MODE. SHOULD THE SPACE TEMPERATURE RISE ABOVE THE COOLING SET–UP TEMPERATURE (95 DEGREES ADJUSTABLE), OR THE SPACE TEMPERATURE FALL BELOW THE HEATING SET–BACK TEMPERATURE (68 DEGREES ADJUSTABLE), OR THE SPACE HUMIDITY RISE ABOVE THE UNOCCUPIED SET POINT (60% ADJUSTABLE) THE UNIT SHALL BE STARTED AND RUN WITH THE OUTSIDE AIR DAMPER CLOSED AND EXHAUST FANS OFF UNTIL THE SPACE TEMPERATURE/HUMIDITY CONDITIONS ARE WITHIN THE SET POINT PLUS THE DEAD BAND, BUT NOT LESS THAN FOR 15 MINUTES.

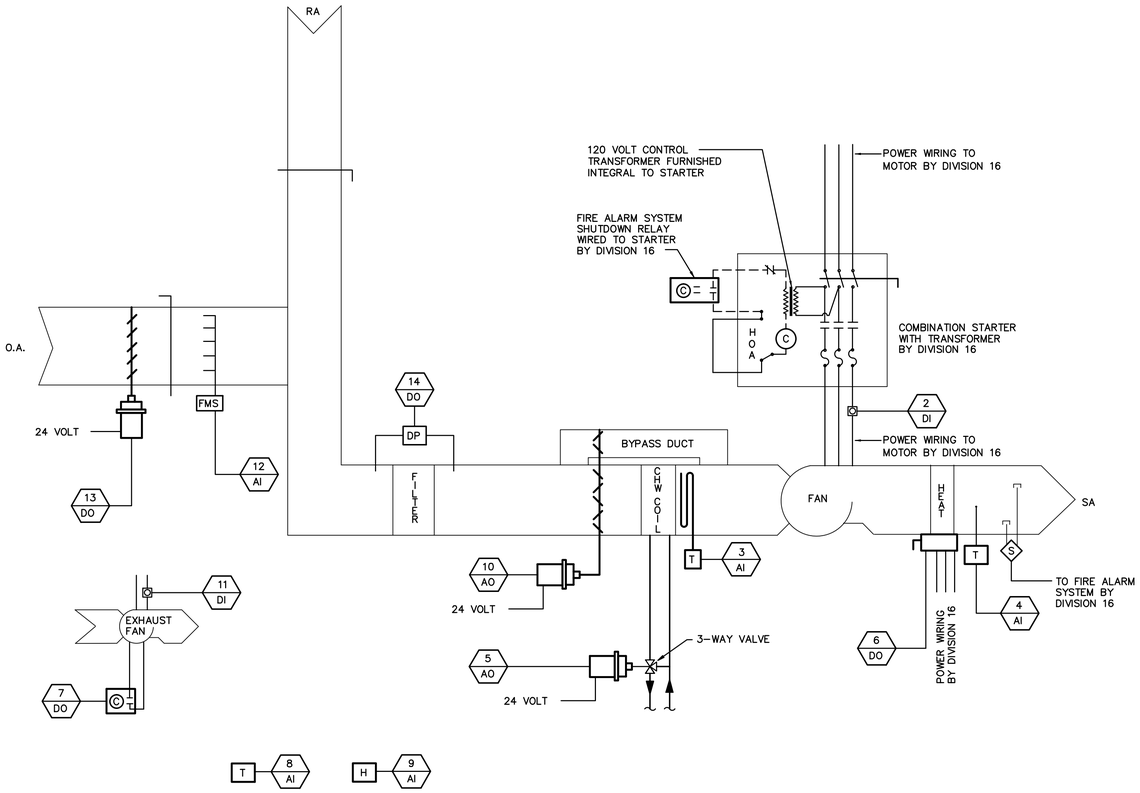
WHEN THE FACILITY IS IN OCCUPIED MODE, THE OUTSIDE AIR DAMPER SHALL OPEN. AT ALL OTHER TIMES THE AIR DAMPER SHALL BE CLOSED.

FILTERS: A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR THE PRESSURE DROP ACROSS EACH BANK OF FILTERS. WHEN THE FILTER PRESSURE DROP EXCEEDS THE SET POINT A DIRTY FILTER NOTIFICATION SHALL BE SENT TO THE OPERATORS WORKSTATION.

MONITORING POINTS: THE FMS SHALL MONITOR EQUIPMENT AND PROVIDE A REAL–TIME GRAPHICAL DISPLAY OF THE STATUS AND VALUE OF THE AHU POINTS AT THE WORKSTATION. THE AHU OPERATING STATUS AND MODE SHALL BE DISPLAYED (OCCUPIED/UNOCCUPIED/OVERRIDE) AS WELL AS THE ACTIVE CONTROL MODE(S) OF OPERATION (NORMAL/OPTIMUM START/DEHUMIDIFICATION). IN ADDITION THE LEAVING CHW DRY BULB COIL TEMPERATURE, SUPPLY TEMPERATURE, OUTSIDE AIRFLOW RATE, FAN STATUS, ALARMS/SAFETY STATUS AND THE FACE AND BYPASS DAMPER AND CHW VALVE PERCENT OPEN POSITION (BASED UPON OUTPUT SIGNAL TO THE ACTUATOR) SHALL BE DISPLAYED.

EXHAUST FAN INTERLOCK: BUILDING EXHAUST FANS SHALL BE INTERLOCKED WITH THE AIR HANDLING UNIT OUTSIDE AIR DAMPER AS INDICATED IN THE EXHAUST FAN INTERLOCK SCHEDULE. THE EXHAUST FAN SHALL BE ON WHENEVER THE AHU OUTSIDE AIR DAMPER IS OPEN, AND OFF WHEN THE OUTSIDE AIR DAMPER IS CLOSED.

POWER FAILURE: UPON A LOSS OF POWER THE AHU FAN SHALL STOP, THE CHILLED WATER VALVE AND OUTSIDE AIR DAMPER SHALL CLOSE. WHEN THE POWER IS RESTORED THE UNIT SHALL RESTART AUTOMATICALLY. AHU START–UP SHALL BE STAGGERED TO LIMIT THE KW DEMAND.



1 / M-4.2 CONSTANT VOLUME AHU WITH FACE AND BYPASS

AHU XXX

CAC POINT TABLE – C.V. AHU WITH FACE AND BYPASS

INPUTS			OUTPUTS		
POINT	TYPE	DESCRIPTION	POINT	TYPE	DESCRIPTION
2	DIGITAL	AHU FAN STATUS ON/OFF	1	DIGITAL	AHU FAN START/STOP
3	ANALOG	CHW COIL LEAVING AIR DB TEMP	5	ANALOG	CHW CONTROL VALVE MODULATE
4	ANALOG	AHU SUPPLY AIR DB TEMP	6	DIGITAL	DUCT HEAT (1 DO PER STAGE)
8	ANALOG	SPACE DB TEMPERATURE	7	DIGITAL	EXHAUST FAN START/STOP
9	ANALOG	SPACE RELATIVE HUMIDITY	10	ANALOG	F & B DAMPER MODULATE
11	DIGITAL	EXHAUST FAN STATUS (1 PER FAN)	13	DIGITAL	O.A. DAMPER OPEN/CLOSE
12	ANALOG	O.A. FLOW–MINIMUM	14	DIGITAL	DIRTY FILTER

NOTE: ALL POINTS TO BE TIED INTO THE EXISTING EMS SYSTEM.

GLIDDEN • SPINA & PARTNERS
ARCHITECTURE • INTERIOR DESIGN, INC.
PHONE: 561.684.6844 • FAX: 561.684.5594 • E-MAIL: info@gsp-architects.com
1401 FORUM WAY, SUITE 100 • WEST PALM BEACH, FLORIDA 33401
FL License: #AA26001692
Keith M. Spina #AR13419 Benjamin John Glidden, III #AR0536

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JOHNSON, LEVINSON RAGAN, DAVILA, INC.
CONSULTING ENGINEERS
1450 Centrepark Boulevard, Suite 350
West Palm Beach, Florida 33401
(561) 689-2303 • (561) 689-2302 Fax
www.jldinc.com
Certification Number 6059
Harold L. Ragan, P.E. 48983
Michael P. Linden, P.E. 58094
JLRD Project No. 111061

M-4.2

BID SET

SEQUENCE OF OPERATION

CONSTANT VOLUME AHU WITH FACE & BYPASS

START–STOP: THE UNIT IS STARTED BY PLACING THE HAND–OFF–AUTO SWITCH IN THE HAND POSITION OR BY THE EMS BASED UPON A TIME OF DAY SCHEDULE WHEN THE HOA SWITCH IS IN THE AUTO POSITION, OR BY THE EMS WHEN THE SPACE CONDITIONS EXCEED THE UNOCCUPIED SETUP/SETBACK TEMPERATURES. IN THE AUTOMATIC MODE DURING OCCUPIED PERIODS THE FAN SHALL BE ON, DURING UNOCCUPIED PERIODS THE FAN SHALL BE OFF. OCCUPIED–UNOCCUPIED PERIODS SHALL BE AS DEFINED AT THE OPERATORS WORKSTATION. PROOF OF FAN OPERATION SHALL BE VERIFIED THROUGH A CURRENT SWITCH. SHOULD A FAN START COMMAND BE ISSUED AND CURRENT IS NOT SENSED AFTER AN APPROPRIATE DELAY (60 SECONDS – ADJUSTABLE), AN ALARM SHALL BE GENERATED AT THE OPERATORS WORKSTATION. WHEN A FAN STOP COMMAND IS ISSUED AND CURRENT CONTINUES TO BE SENSED, AN ALARM SHALL BE GENERATED AT THE OPERATORS WORKSTATION AFTER AN APPROPRIATE DELAY (60 SECONDS – ADJUSTABLE). PROVIDE AN ALARM FOR UNAUTHORIZED START/STOP DURING UNOCCUPIED/OCCUPIED PERIODS.

TEMPERATURE SET POINTS: THERE SHALL BE SEPARATE OCCUPIED/UNOCCUPIED COOLING AND HEATING SET POINTS. DURING THE UNOCCUPIED SCHEDULE, THE CONTROLLER SHALL INDEX THE ROOM TEMPERATURE TO A PREDETERMINED (ADJUSTABLE) SETBACK (HEATING – 68 DEGREES F)/SETUP (COOLING – 85 DEGREES F) SET POINT. DURING OCCUPIED PERIODS THE SET POINTS SHALL BE 75 DEGREES F COOLING, 70 DEGREES F HEATING (ADJUSTABLE AT THE OWS). IN

HUMIDITY SET POINTS: THERE SHALL BE SEPARATE OCCUPIED/UNOCCUPIED HIGH HUMIDITY SET POINTS. DURING THE UNOCCUPIED SCHEDULE, THE HIGH HUMIDITY SET POINT SHALL BE 70 PERCENT (ADJUSTABLE AT THE OWS). DURING OCCUPIED PERIODS THE HIGH HUMIDITY SET POINT SHALL BE 60 PERCENT (ADJUSTABLE AT THE OWS). HUMIDITY SET POINTS SHALL NOT BE ADJUSTABLE AT THE SENSOR.

OPTIMUM START: THE OPERATORS WORKSTATION SHALL INCLUDE AN OPTION FOR AN OPTIMUM START ROUTINE THAT ADJUSTS THE START TIME OF THE AHU WHEN SELECTED. THE ROUTINE SHALL CONSIDER THE ACTUAL OUTSIDE AIR DRY BULB TEMPERATURE AS WELL AS THE HISTORICAL OUTSIDE AIR TEMPERATURE DATA AND BUILDING TEMPERATURE TO CALCULATE WHEN THE SYSTEM IS TO BE STARTED TO PRE–COOL/PRE–HEAT THE BUILDING TO THE DESIRED OCCUPIED SPACE TEMPERATURE SET POINT PRIOR TO THE SCHEDULED OCCUPANCY PERIOD. THE OUTSIDE AIR DAMPER SHALL BE CLOSED AND THE EXHAUST FAN(S) SHALL BE OFF DURING THIS COOL DOWN/WARM UP PERIOD. STARTING OF AHU'S SHALL BE AUTOMATICALLY STAGGERED TO LIMIT THE BUILDING KW DEMAND.

FIRE/SMOKE CONTROL: THE UNIT SHALL BE INTERLOCKED UNDER DIVISION 16 WITH THE AHU DUCT MOUNTED SMOKE DETECTORS (NUMBER OF DETECTORS PER UNIT AS SHOWN ON THE BUILDING FLOOR PLANS). UPON SENSING PRODUCTS OF COMBUSTION THE SMOKE DETECTOR SHALL SIGNAL THE BUILDING FIRE ALARM SYSTEM. THE FIRE ALARM SYSTEM SHALL IN–TURN ACTIVATE A FIRE ALARM SHUTDOWN RELAY WHICH SHALL BE INTERLOCKED WITH THE AHU STARTER TO SHUT OFF THE FAN, PREVENTING UNIT OPERATION WHEN AN UNIT SMOKE DETECTOR ALARM CONDITION EXISTS.

TEMPERATURE CONTROL: WHEN THE FAN IS OPERATIONAL AS DETECTED BY THE FAN CURRENT SWITCH THE TEMPERATURE CONTROL SEQUENCE SHALL BE INITIATED. THE USER ADJUSTABLE SPACE TEMPERATURE SENSOR DETERMINES THE COOLING OR HEATING MODE. WHEN THE SPACE TEMPERATURE IS BELOW THE HEATING SET POINT THE HEATING MODE IS ACTIVE, WHEN THE SPACE TEMPERATURE IS ABOVE THE COOLING SPACE SET POINT THE COOLING MODE IS ACTIVE.

COOLING COIL: WHEN THE SPACE TEMPERATURE SENSOR IS CALLING FOR COOLING THE CHW CONTROL VALVE SHALL MODULATE TO MAINTAIN THE LEAVING COOLING COIL TEMPERATURE OF 54°F (ADJUSTABLE). WHEN THE LEAVING COIL TEMPERATURE EXCEEDS THE SET POINT THE VALVE SHALL SLOWLY MODULATE OPEN TO INCREASE CHW FLOW THROUGH THE COIL. AS THE LEAVING COIL TEMPERATURE DROPS BELOW THE SET POINT THE VALVE SHALL SLOWLY MODULATE TOWARDS THE CLOSED POSITION TO REDUCE CHW FLOW THROUGH THE COIL.

SPACE TEMPERATURE: WHEN THE SPACE TEMPERATURE EXCEEDS THE THERMOSTAT SET POINT THE FACE AND BYPASS DAMPER SHALL MODULATE TO INCREASE AIR FLOW THROUGH THE COOLING COIL. AS THE SPACE TEMPERATURE DROPS BELOW THE SET POINT THE FACE AND BYPASS DAMPER SHALL MODULATE TO DECREASE AIR FLOW THROUGH THE COOLING COIL. WHEN THE FACE AND BYPASS IS IN THE FULL BYPASS POSITION THE COOLING CONTROL VALVE SHALL BE CLOSED, UPON A CONTINUED DROP IN SPACE TEMPERATURE THROUGH THE DEAD BAND TO THE HEATING SET POINT (72 DEGREES F – ADJUSTABLE) THE ELECTRIC DUCT HEAT SHALL BE ENERGIZED IN STAGES. A SHORT PERIOD AFTER THE FIRST STAGE OF DUCT HEAT IS ENERGIZED (5 MINUTES ADJUSTABLE) IF THE SPACE TEMPERATURE CONTINUES TO FALL SUBSEQUENT STAGES SHALL BE ENERGIZED (REFER TO THE DUCT HEAT SCHEDULE FOR NUMBER OF STAGES REQUIRED). WHEN THE FAN IS OFF, THE NORMALLY OPEN CHILLED WATER VALVE SHALL BE CLOSED TO THE COIL AND THE FACE AND BYPASS DAMPER OPEN TO THE COIL. UPON A LOSS OF THE CONTROL VALVE SIGNAL, THE VALVE SHALL FAIL TO THE FULL FLOW THROUGH THE COIL POSITION AND THE FACE AND BYPASS DAMPER TO FULL AIR FLOW THROUGH THE COOLING COIL. AN ALARM SHALL BE GENERATED IF THE CHW VALVE IS IN THE FULL OPEN POSITION AND THE LEAVING COIL TEMPERATURE EXCEEDS THE SCHEDULED COIL LAT OR IF THE LEAVING COIL TEMPERATURE IS EXCEEDS HIGH/LOW LIMITS.

DEHUMIDIFICATION: WHEN THE SENSED SPACE RELATIVE HUMIDITY RISES ABOVE THE OCCUPIED HIGH LIMIT SET POINT THE DEHUMIDIFICATION SEQUENCE SHALL BE ACTIVATED. IN THE DEHUMIDIFICATION MODE CONTROL OF THE COOLING COIL SHALL BE OVERRIDDEN AND THE COOLING CONTROL VALVE SHALL MODULATE OPEN TO PROVIDE FULL FLOW THROUGH THE COOLING COIL. THE SPACE TEMPERATURE SENSOR SHALL MODULATE THE FACE AND BYPASS DAMPER TO MAINTAIN THE SPACE TEMPERATURE SET POINT. AFTER A TIME DELAY (15 MINUTES ADJUSTABLE, 5 MINUTES FOR 100% OA UNITS) IF THE SPACE HUMIDITY REMAINS ABOVE THE SET POINT THE FACE AND BYPASS DAMPER SHALL BE POSITIONED TO FULL AIR FLOW THROUGH THE COIL (COOLING COIL CONTROL VALVE REMAINS FULL FLOW TO THE COIL) AND THE HEATING COIL SHALL BE ENERGIZED IN STAGES TO MAINTAIN THE SPACE SET POINT TEMPERATURE. ONCE THE SPACE RELATIVE HUMIDITY FALLS BELOW THE SET POINT PLUS THE DEAD BAND, THE UNIT SHALL REVERT TO THE HEATING OR COOLING MODE OF OPERATION AS APPROPRIATE.

THE SPACE TEMPERATURE AND SPACE HUMIDITY SENSOR SHALL MONITOR SPACE CONDITIONS IN THE UNOCCUPIED MODE. SHOULD THE SPACE TEMPERATURE RISE ABOVE THE COOLING SET–UP TEMPERATURE (95 DEGREES ADJUSTABLE), OR THE SPACE TEMPERATURE FALL BELOW THE HEATING SET–BACK TEMPERATURE (68 DEGREES ADJUSTABLE), OR THE SPACE HUMIDITY RISE ABOVE THE UNOCCUPIED SET POINT (60% ADJUSTABLE) THE UNIT SHALL BE STARTED AND RUN WITH THE OUTSIDE AIR DAMPER CLOSED AND EXHAUST FANS OFF UNTIL THE SPACE TEMPERATURE/HUMIDITY CONDITIONS ARE WITHIN THE SET POINT PLUS THE DEAD BAND, BUT NOT LESS THAN FOR 15 MINUTES.

WHEN THE FACILITY IS IN OCCUPIED MODE, THE OUTSIDE AIR DAMPER SHALL OPEN. AT ALL OTHER TIMES THE AIR DAMPER SHALL BE CLOSED.

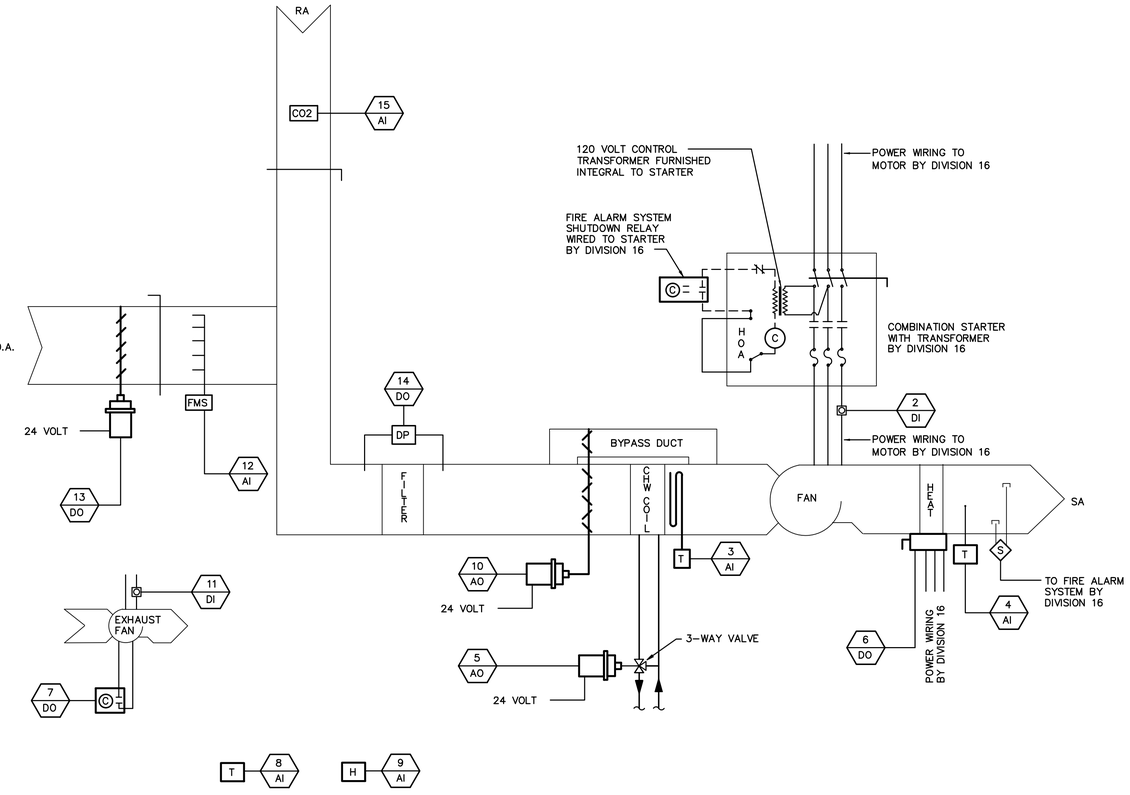
FILTERS: A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR THE PRESSURE DROP ACROSS EACH BANK OF FILTERS. WHEN THE FILTER PRESSURE DROP EXCEEDS THE SET POINT A DIRTY FILTER NOTIFICATION SHALL BE SENT TO THE OPERATORS WORKSTATION.

MONITORING POINTS: THE FMS SHALL MONITOR EQUIPMENT AND PROVIDE A REAL–TIME GRAPHICAL DISPLAY OF THE STATUS AND VALUE OF THE AHU POINTS AT THE WORKSTATION. THE AHU OPERATING STATUS AND MODE SHALL BE DISPLAYED (OCCUPIED/UNOCCUPIED/OVERRIDE) AS WELL AS THE ACTIVE CONTROL MODE(S) OF OPERATION (NORMAL/OPTIMUM START/DEHUMIDIFICATION). IN ADDITION THE LEAVING CHW DRY BULB COIL TEMPERATURE, SUPPLY TEMPERATURE, OUTSIDE AIRFLOW RATE, FAN STATUS, ALARMS/SAFETY STATUS AND THE FACE AND BYPASS DAMPER AND CHW VALVE PERCENT OPEN POSITION (BASED UPON OUTPUT SIGNAL TO THE ACTUATOR) SHALL BE DISPLAYED.

EXHAUST FAN INTERLOCK: BUILDING EXHAUST FANS SHALL BE INTERLOCKED WITH THE AIR HANDLING UNIT OUTSIDE AIR DAMPER AS INDICATED IN THE EXHAUST FAN INTERLOCK SCHEDULE. THE EXHAUST FAN SHALL BE ON WHENEVER THE AHU OUTSIDE AIR DAMPER IS OPEN, AND OFF WHEN THE OUTSIDE AIR DAMPER IS CLOSED.

POWER FAILURE: UPON A LOSS OF POWER THE AHU FAN SHALL STOP, THE CHILLED WATER VALVE AND OUTSIDE AIR DAMPER SHALL CLOSE. WHEN THE POWER IS RESTORED THE UNIT SHALL RESTART AUTOMATICALLY. AHU START–UP SHALL BE STAGGERED TO LIMIT THE KW DEMAND.

CO2 CONTROL OF OUTSIDE AIR DAMPER: WHEN THE OUTSIDE AIR IS ENABLED, THE OUTSIDE AIR DAMPER SHALL BE OPEN. AT ALL OTHER TIMES THE OUTSIDE AIR DAMPER SHALL BE CLOSED. AN AIRFLOW STATION IN THE OUTSIDE AIR STREAM SHALL MEASURE THE OUTSIDE AIR FLOW RATE AND PROVIDE AN ANALOG SIGNAL FOR CONTROL OF THE MODULATING OUTSIDE AIR DAMPER. THE OUTDOOR AIR SETPOINT SHALL VARY BETWEEN THE SCHEDULED MINIMUM AND MAXIMUM VALUES BASED UPON SPACE CO2 LEVELS. THE OUTSIDE CO2 LEVEL SHALL BE TAKEN AS 400 PPM. AS THE CO2 LEVEL VARIES BETWEEN 700 PPM AND 850 PPM THE OUTSIDE AIR SETPOINT SHALL VARY BETWEEN THE SCHEDULED MINIMUM AND MAXIMUM VALUES. AN ALARM SHALL BE GENERATED IF THE CO2 PPM REACHES 930 PPM.



1 / M–4.3 CONSTANT VOLUME AHU WITH FACE AND BYPASS AND CO2 CONTROL

AHU XXX

CAC POINT TABLE – C.V. AHU WITH FACE AND BYPASS

INPUTS			OUTPUTS		
POINT	TYPE	DESCRIPTION	POINT	TYPE	DESCRIPTION
2	DIGITAL	AHU FAN STATUS ON/OFF	1	DIGITAL	AHU FAN START/STOP
3	ANALOG	CHW COIL LEAVING AIR DB TEMP	5	ANALOG	CHW CONTROL VALVE MODULATE
4	ANALOG	AHU SUPPLY AIR DB TEMP	6	DIGITAL	DUCT HEAT (1 DO PER STAGE)
8	ANALOG	SPACE DB TEMPERATURE	7	DIGITAL	EXHAUST FAN START/STOP
9	ANALOG	SPACE RELATIVE HUMIDITY	10	ANALOG	F & B DAMPER MODULATE
11	DIGITAL	EXHAUST FAN STATUS (1 PER FAN)	13	DIGITAL	O.A. DAMPER OPEN/CLOSE
12	ANALOG	O.A. FLOW–MINIMUM	14	DIGITAL	DIRTY FILTER
15	ANALOG	CO2 LEVEL PPM			

NOTE: ALL POINTS TO BE TIED INTO THE EXISTING EMS SYSTEM.

GLIDDEN • SPINA & PARTNERS
ARCHITECTURE • INTERIOR DESIGN, INC
PHONE: 561.684.6844 • FAX: 561.684.5594 • E-MAIL: info@gsp-architects.com
1401 FORUM WAY, SUITE 100 • WEST PALM BEACH, FLORIDA 33401
FL License: #AA26001692
Keith M. Spina #AR13419 Benjamin John Glidden, III #AR0536

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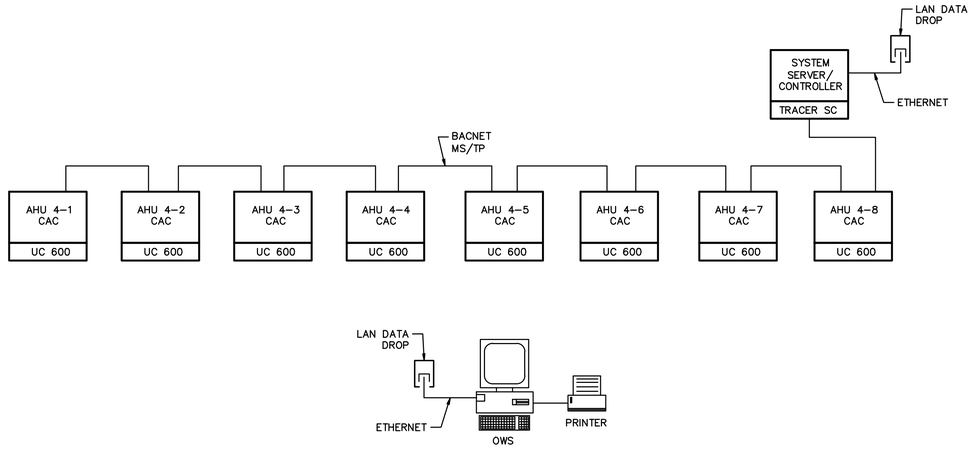
JOHNSON, LEVINSON RAGAN, DAVILA, INC.
CONSULTING ENGINEERS
1450 Centrepark Boulevard, Suite 350
West Palm Beach, Florida 33401
(561) 689-2303 • (561) 689-2302 Fax
www.jlrdinc.com
Certification Number 6059
Harold L. Ragan, P.E. 48983
Michael P. Linden, P.E. 58094
JLRD Project No. 111061

M-4.3

BID SET

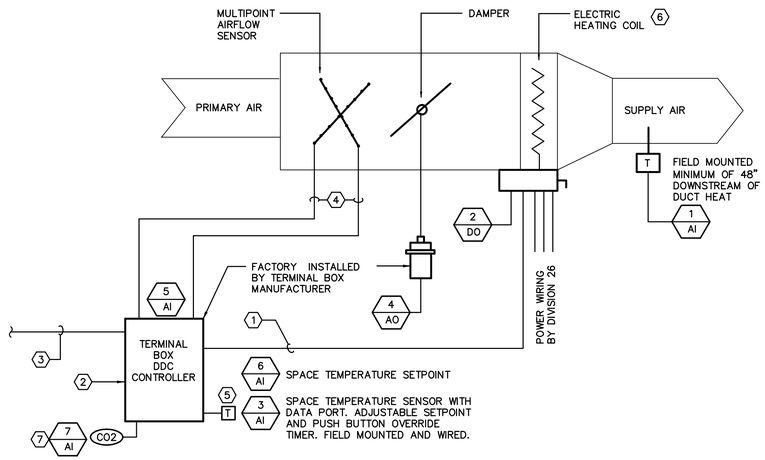


1 M-6.4 ENERGY MANAGEMENT SYSTEM - CONFIGURATION DIAGRAM

SEQUENCE OF OPERATION

ENERGY MANAGEMENT SYSTEM CONFIGURATION DIAGRAM GENERAL NOTES

1. THIS DRAWING IS A SCHEMATIC REPRESENTATION OF THE ENERGY MANAGEMENT SYSTEM (EMS) ARCHITECTURE, TO THE AHU CONTROLLER LEVEL ONLY; REFER TO OTHER SHEETS FOR POINT ASSIGNMENT TO THE VARIOUS CONTROLLERS. LAYOUT SHOWN IS BASED UPON TRANE.
2. 120 VOLT POWER SHALL BE PROVIDED TO THE TRACER SC, AND THE AHU CONTROLLERS (UC 600'S) UNDER DIVISION 26. EXTENSION OF POWER TO ACTUATORS AND SIMILAR DEVICES SHALL BE PERFORMED UNDER DIVISION 25. 24 VOLT POWER FOR VAV BOX ASC'S SHALL BE PROVIDED BY A TRANSFORMER PROVIDED WITH THE TERMINAL BOX HEATER.
3. DESIGN IS FOR A NATIVE BACNET SYSTEM WITH A MS/TP COMMUNICATION PROTOCOL. THE EMS COMMUNICATION DATA BUS WIRING SHALL BE DEDICATED TO THE EMS SYSTEM AND BE IN ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS.
4. COMMUNICATION CABLING SHALL BE RUN IN CONDUIT WHERE EXPOSED AND IN EQUIPMENT ROOMS AND SHALL BE PROVIDED UNDER DIVISION 25. COMMUNICATIONS CABLING ABOVE CEILINGS SHALL BE PLENUM RATED AND MAY BE RUN WITHOUT CONDUIT BUT SHALL BE PROPERLY SUPPORTED USING BRIDAL RINGS OR 'J' HOOKS OFF CABLE TRAY.
5. MISCELLANEOUS POINTS MAY TIE INTO THE NEAREST CAC OR A GENERIC CONTROLLER MAY BE PROVIDED. VFD COMMUNICATION CABLING SHALL TIE INTO THEIR ASSOCIATED CAC OR BE A PART OF THE COMMUNICATIONS BUS AS STANDARD WITH THE MANUFACTURER.
6. AHU CONTROLLERS SHALL BE OF THE CUSTOM APPLICATION TYPE.
7. VAV BOX APPLICATION SPECIFIC CONTROLLERS ARE NOT SHOWN, BUT SHALL BE TIED INTO THE NETWORK.
8. EXACT CONFIGURATION OF INTERCONNECTING COMMUNICATIONS DATA BUS IS AT THE INSTALLERS OPTION. COORDINATE ADDITIONAL POWER REQUIREMENTS WITH DIVISION 26 AND WAN/LAN ETHERNET CONNECTIONS WITH DIVISION 27 AT NO ADDITIONAL COST TO THE OWNER.



2 M-6.4 TERMINAL BOX WITH ELECTRIC HEAT

1. 24 VAC POWER TO DDC CONTROLLER FROM HEATER CONTROL TRANSFORMER.
2. CONTROLLER FACTORY MOUNTED ON TERMINAL BOX IN DUST PROOF METAL ENCLOSURE – (ONE FOR EACH BOX)
3. MANUFACTURERS MULTIPLEXED TERMINAL BOX COMMUNICATIONS INPUT TO ENERGY MANAGEMENT SYSTEM.
4. PNEUMATIC TUBING FROM AIRFLOW SENSOR TO CONTROLLER, FACTORY INSTALLED.
5. 1/2" EMT IN WALL FROM TSTAT TO ABOVE CEILING
6. SELECTED TERMINAL BOXES HAVE REMOTE ELECTRIC DUCT HEATERS.
7. CO2 SENSOR

ASC POINT TABLE - TERMINAL BOX WITH ELECTRIC HEAT

INPUTS			OUTPUTS		
POINT	TYPE	DESCRIPTION	POINT	TYPE	DESCRIPTION
1	ANALOG	SUPPLY AIR TEMPERATURE	2	DIGITAL	ELECTRIC DUCT HEAT (1 PER STAGE)
3	ANALOG	SPACE TEMPERATURE	4	ANALOG	TERMINAL BOX DAMPER
5	ANALOG	TERMINAL BOX AIRFLOW			
6	ANALOG	SPACE TEMPERATURE SETPOINT			
7	ANALOG	SPACE CO2 LEVEL			

SEQUENCE OF OPERATION

TERMINAL BOX WITH ELECTRIC HEAT

1. OCCUPANCY

THE TERMINAL BOX APPLICATION SPECIFIC CONTROLLER SHALL BE INDEXED TO THE OCCUPIED OR UNOCCUPIED MODE BY ITS ASSOCIATED AHU. WHEN THE AHU IS IN THE OCCUPIED MODE, THE BOX IS IN THE OCCUPIED MODE. WHEN THE AHU IS IN THE UNOCCUPIED MODE THE BOX IS IN THE UNOCCUPIED MODE.

2. TEMPERATURE SET POINTS

THERE SHALL BE SEPARATE UNOCCUPIED COOLING AND HEATING SET POINTS. DURING THE UNOCCUPIED SCHEDULE, BASED UPON THE OUTDOOR CONDITIONS THE CONTROLLER SHALL INDEX THE ROOM TEMPERATURE TO A PREDETERMINED (ADJUSTABLE) SETBACK (HEATING – 50 DEGREES F)/SETUP (COOLING – 90 DEGREES F) SET POINT. DURING OCCUPIED PERIODS THE SET POINTS SHALL BE 74 DEGREES F COOLING, 70 DEGREES F HEATING (AS SET AT THE OWS – ADJUSTABLE). IN ADDITION THE TEMPERATURE SETPOINTS SHALL BE ADJUSTABLE BY THE BUILDING OCCUPANTS THROUGH A DIAL MOUNTED ON THE TEMPERATURE SENSOR OVER A LIMITED RANGE (+/– 4 DEGREES F ADJUSTABLE) AS DEFINED AT THE OPERATORS WORKSTATION.

3. VARIABLE AIR VOLUME

WHEN THE SPACE TEMPERATURE EXCEEDS THE COOLING SET POINT, THE DAMPER SHALL SLOWLY MODULATE TOWARDS AN OPEN POSITION TO INCREASE AIRFLOW. UPON A FALL IN ROOM TEMPERATURE BELOW THE SET POINT, THE DAMPER SHALL SLOWLY MODULATE TOWARDS A CLOSED POSITION TO DECREASE THE AIRFLOW DOWN TO THE SCHEDULED MINIMUM VENTILATION VALUE. UPON A FURTHER DROP IN ROOM TEMPERATURE BEYOND THE (ADJUSTABLE) DEAD BAND THE BOX AIRFLOW SHALL INDEX TO THE SCHEDULED MINIMUM HEATING CFM AND THE ELECTRIC HEATING COIL SHALL BE ENERGIZED AND STAGED ON AND OFF TO MAINTAIN THE SPACE TEMPERATURE.

4. UNOCCUPIED MODE

WHEN A SUFFICIENT NUMBER (AS DEFINED AT THE OPERATORS WORKSTATION – ADJUSTABLE) OF TERMINAL BOX SPACE TEMPERATURE SENSORS ARE BELOW/ABOVE THE UNOCCUPIED SETBACK/SETUP TEMPERATURE, THE AIR HANDLING UNIT SHALL BE STARTED, THE OUTSIDE AIR FAN AND DAMPER SHALL REMAIN CLOSED AND INTERLOCKED FANS OFF. TEMPERATURE CONTROL SHALL BE AS DESCRIBED ABOVE FOR THE SETBACK/SETUP TEMPERATURE SETTINGS. THE AHU SHALL BE RUN FOR A MINIMUM OF 15 MINUTES TO LIMIT STARTS TO FOUR PER HOUR.

DEPRESSING THE MANUAL OVERRIDE BUTTON LOCATED ON THE ROOM TEMPERATURE SENSOR SHALL OVERRIDE THE UNOCCUPIED CYCLE FOR 4 HOURS (ADJUSTABLE AT THE OWS) WHEN DEPRESSED, STARTING THE AHU AND INDEXING THE CONTROLS FOR THAT UNIT TO THE OCCUPIED CONTROL PARAMETERS.

5. MONITORING POINTS

THE EMS SHALL MONITOR EQUIPMENT AND PROVIDE A REAL–TIME GRAPHICAL DISPLAY OF THE STATUS AND VALUE OF THE TERMINAL BOX POINTS AT THE OPERATORS WORKSTATION AND WHETHER IT IS IN THE OCCUPIED/UNOCCUPIED OR OVERRIDE MODE OF OPERATION. FOR EACH TERMINAL BOX THE SPACE TEMPERATURE, OWS SET POINT, USER ADJUSTED SET POINT, AIRFLOW, DAMPER POSITION, AND ELECTRIC HEAT ON–OFF STATUS SHALL BE DISPLAYED. AN OVERALL FLOOR PLAN OF THE AREA SERVED BY EACH AHU SHALL BE PROVIDED THAT DISPLAYS THE LOCATION OF EACH TERMINAL BOX AND THE TEMPERATURE AT EACH TERMINAL BOX ROOM SENSOR AND GRAPHICALLY INDICATE THE LIMITS OF THE AREA THAT EACH BOX SERVES.

6. CO2 SENSORS

SELECTED TERMINAL BOXES SHALL BE PROVIDED WITH CO2 SENSORS AS NOTED. THE SENSORS SHALL BE USED TO RESET THE OUTSIDE AIR SETPOINT, SEE THE AHU SEQUENCE OF OPERATION.

7. ALARMS

PROVIDE THE FOLLOWING ALARMS (INCLUDE SUITABLE TIME DELAYS AND DEAD BANDS AS APPROPRIATE):

HIGH/LOW SPACE TEMPERATURE OCCUPIED MODE.
HIGH/LOW SPACE TEMPERATURE UNOCCUPIED MODE.

GLIDDEN • SPINA & PARTNERS
ARCHITECTURE • INTERIOR DESIGN, INC.
PHONE: 561.684.6844 • FAX: 561.684.5594 • E-MAIL: info@gsp-architects.com
1401 FORUM WAY, SUITE 100 • WEST PALM BEACH, FLORIDA 33401
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JOHNSON, LEVINSON RAGAN, DAVILA, INC.
CONSULTING ENGINEERS
1450 Centrepark Boulevard, Suite 350
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(561) 689-2303 • (561) 689-2302 Fax
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M-4.4

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