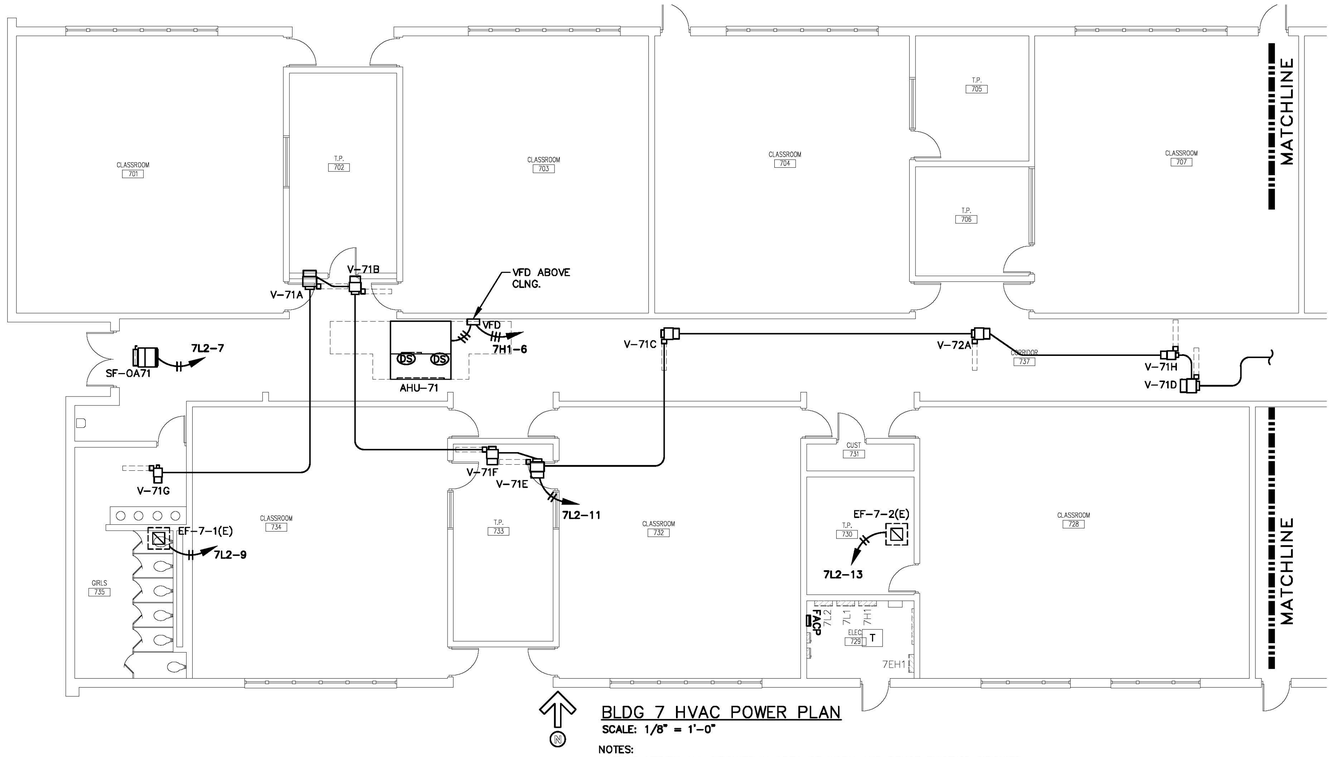
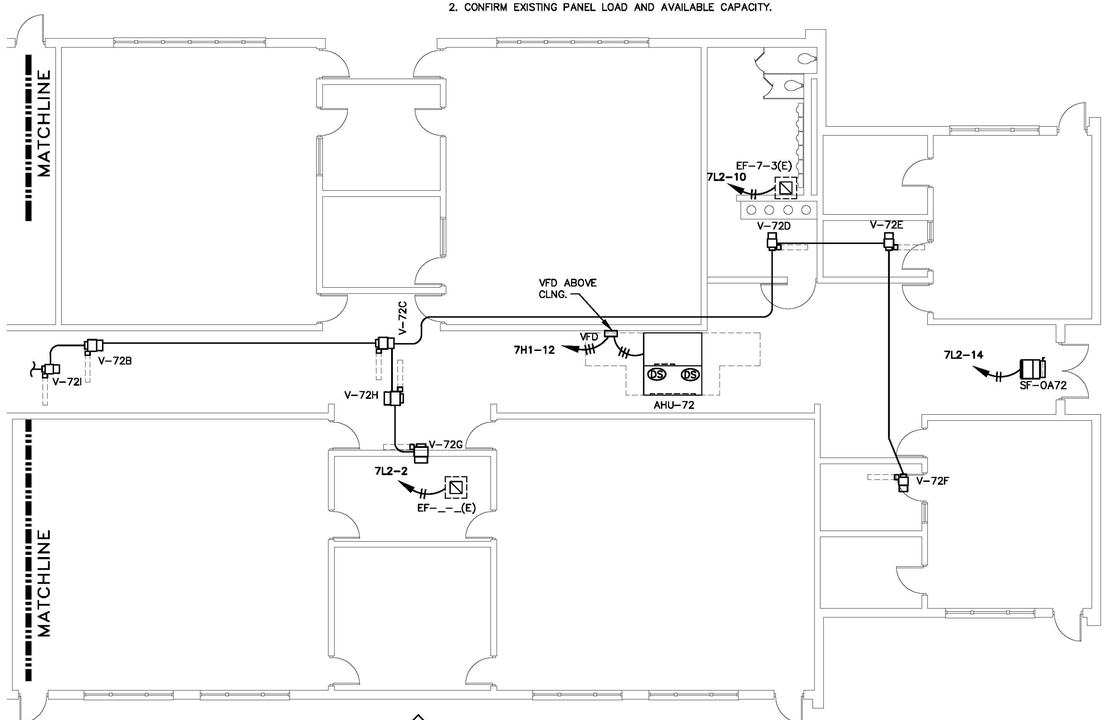


NOTES:
1. FIELD VERIFY ALL CIRCUITS IN AREA OF WORK AND REUSE EXISTING CIRCUITS WHERE PRACTICAL. REMOVE ALL CIRCUITS NOT BEING USED AND UPDATE PANEL SCHEDULES.
2. CONFIRM EXISTING PANEL LOAD AND AVAILABLE CAPACITY.



2/16/12
1947E1

REVISIONS

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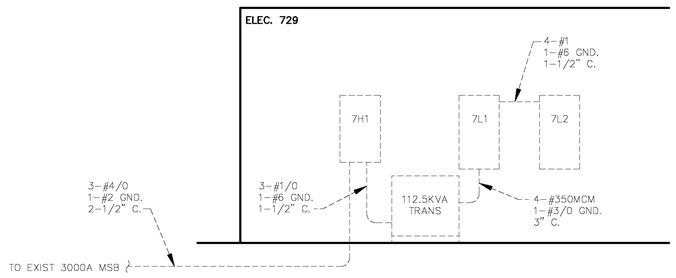
SUWANNEE COUNTY MIDDLE SCHOOL
HVAC MODIFICATIONS – BUILDING 7
LIVE OAK, FLORIDA

DATE: 2-17-12
SCALE: 1/8"=1'-0"
DRAWN: DBH
JOB: 1947
SHEET: E-1
OF 2 SHEETS

ELECTRICAL LEGEND

	CIRCUIT/ CONDUIT
	BRANCH CIRCUIT HOMERUN
(DS)	FA– DUCT SMOKE DETECTOR
AHU	AIR HANDLER UNIT
FA	FIRE ALARM
EF	EXHAUST FAN
FACP	FIRE ALARM CONTROL PANEL
SF	SUPPLY FAN
VAV	VARIABLE AIR VOLUME UNIT



BUILDING 7 PARTIAL POWER RISER

LOAD CALC. FOR BUILDING 7

BASED ON 18,215 SQ.FT.

HVAC	35.4 KVA
LTG. (2W/SQ.FT.)	36.4 KVA
RECEPTS. (3W/SQ.FT.)	54.6 KVA
MISC. (2W/SQ.FT.)	36.4 KVA
TOTAL	162.8 KVA (195.8 A)

GENERAL (EXISTING) NOTES:

A. ALL EQUIPMENT/APPARATUS/INFORMATION INDICATED BY 'LIGHT DASHED LINETYPE' IS EXISTING TO REMAIN.
B. POWER RISER/PANEL SCHEDULES ARE A REFERENCE POINT ONLY. PRIOR TO BIDDING PROJECT FIELD VERIFY EXISTING CONDITIONS AND REPORT TO ENGINEER IF ANY ELEC PANELS WILL REQUIRE THE ADDITION OF BREAKERS (AND/OR) HAVE NO AVAILABLE SPACE.

PANEL– 7H1 SURF MOUNTED BOT FEED 480/277 V, 3 PH, 4 W, 10,000 A.I.C. 225 AMP, MAIN BKR EXISTING PANEL

SERVING	AWG SIZE	KVA LOAD	AMP	CKT	PHASE A B C	CKT	AMP	KVA LOAD	AWG SIZE	SERVING
EXISTING LOADS				1		2				EXISTING LOADS
				3		4				⇩
				5		6	*	11.1	12	AHU–71 (1)
				7		8				
				9		10				
				11		12	*	16.7	10	AHU–72 (1)
				13		14				
				15		16				
				17		18				EXISTING LOADS
				19		20				
				21		22				⇩
SPARE			20	23		24				
				25		26	20			SPARE
SPARE			20	27		28				
				29		30				
				31		32	20			SPARE
SPARE			20	33		34				
				35		36				
				37		38	150		350	7L1 VIA 112.5 XFMR
				39		40				
				41		42				

TOTAL CONN. LOAD– 162.8 KVA (NET ADDITION OF 19.9 KVA, VERIFY EXISTING AMPACITY)

PANEL– 7L2 SURF MOUNTED BOT FEED 208/120 V, 3 PH, 4 W, 10,000 A.I.C. 125 AMP, MAIN LUGS EXISTING PANEL

SERVING	AWG SIZE	KVA LOAD	AMP	CKT	PHASE A B C	CKT	AMP	KVA LOAD	AWG SIZE	SERVING
SPARE			20	1		2	20	1.1	12	EF
SPARE			20	3		4				EXISTING LOADS
SPARE			20	5		6				
SF–OA–71	12	1.1	20	7		8				⇩
EF–7–1	12	1.1	20	9		10	20	1.1	12	EF–7–3(E)
VAV UNITS	12	1.0	20	11		12	20	1.1	12	SF–OA–72
EF–7–2(E)	12	1.1	20	13		14				EXISTING LOADS
EXISTING LOADS				15		16	20			SPARE
⇩				17		18				EXISTING LOADS
SPARE			20	19		20				
EXISTING LOADS				21		22				⇩
				23		24				
				25		26				
				27		28				
				29		30				
				31		32				
				33		34				
				35		36				
				37		38				
				39		40				
				41		42				⇩

TOTAL CONN. LOAD– KVA (NET SUBTRACTION OF 2.3 KVA FROM EXISTING LOAD)

(#) PANEL SCHEDULE(S) NOTES:

1. BREAKER SIZE IS FOR REFERENCE ONLY, PROVIDE BREAKER SIZE & TYPE TO MATCH MECHANICAL EQUIPMENT SELECTIONS.

ELECTRICAL SPECIFICATION

1. SCOPE: PROVIDE A COMPLETE ELECTRICAL SYSTEM AS SHOWN AND MEET THE REQUIREMENTS OF APPLICABLE STATE AND LOCAL CODES. OBTAIN AND PAY FOR ALL PERMITS, INSPECTIONS AND CONNECTIONS NECESSARY FOR THIS WORK.
2. SITE INSPECTION: VISIT AND THOROUGHLY INSPECT SITE BEFORE SUBMITTING BID. ASSUME RESPONSIBILITY FOR MEETING ALL EXISTING SITE CONDITIONS AFFECTING THE WORK
3. GUARANTEE: PROVIDE ALL NEW MATERIALS AND EQUIPMENT, AND GUARANTEE SAME FOR ONE YEAR FROM DATE OF ACCEPTANCE.
4. CIRCUIT BREAKERS SHALL BE MOLDED CASE, WITH QUICK–MAKE AND QUICK–BREAK ACTION FOR BOTH MANUAL AND AUTOMATIC OPERATION, WITH THERMAL MAGNETIC TRIP ELEMENTS. SAFETY SWITCHES SHALL BE QUICK–MAKE, QUICK–BREAK TYPE, IN GENERAL PURPOSE ENCLOSURE.
5. ELECTRICAL CONDUIT: INSTALL ALL WIRING IN MINIMUM SIZE 1/2" CONDUIT. EMT SHALL BE USED GENERALLY FOR INTERIOR WIRING. M/C CABLE MAY BE USED ONLY WHERE TOTALLY CONCEALED AND PERMITTED BY CODE. FLEXIBLE STEEL CONDUIT SHALL BE USED FOR FINAL CONNECTION TO ALL MOTORIZED EQUIPMENT. UNDERGROUND CONDUIT SHALL BE PVC.
6. WIRE AND CABLE: ALL WIRING SHALL BE COPPER WITH THHN OR XHHW INSULATION. WIRING SUBJECTED TO ELEVATED TEMPERATURES SHALL BE DERATED AS REQUIRED BY THE NEC. WIRE SIZES NO. 6 AND LARGER SHALL BE STRANDED.
7. BRANCH CIRCUITS: INSTALL ALL WIRING IN CONDUIT AS SHOWN. NO SMALLER THAN NO. 12 SHALL BE USED FOR ANY BRANCH CIRCUIT. WIRING FOR MOTORS, HEATING AND OTHER MISCELLANEOUS EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE DRAWINGS.
8. TESTING AND MARKING: COMPLETELY TEST AND MARK ALL WIRING AND EQUIPMENT INSTALLED AND LEAVE THE INSTALLATION IN PERFECT WORKING ORDER.
9. ELECTRICAL/MECHANICAL COORDINATION: UNLESS SPECIFICALLY REQUIRED OTHERWISE, PROVIDE ALL DISCONNECT DEVICES FOR A/C EQUIPMENT AND PROVIDE ALL POWER WIRING. MECHANICAL CONTRACTOR SHALL FURNISH AND INSTALL ALL A/C CONTROL DEVICES AND WIRING.
10. THE DUCT SMOKE DETECTORS SHALL TIE TO AND BE COMPLETELY COMPATIBLE WITH THE EXISTING BUILDING FIRE ALARM SYSTEM. DUCT SMOKE DETECTORS SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR AND INSTALLED BY MECHANICAL CONTRACTOR.

2/16/12
1947E2

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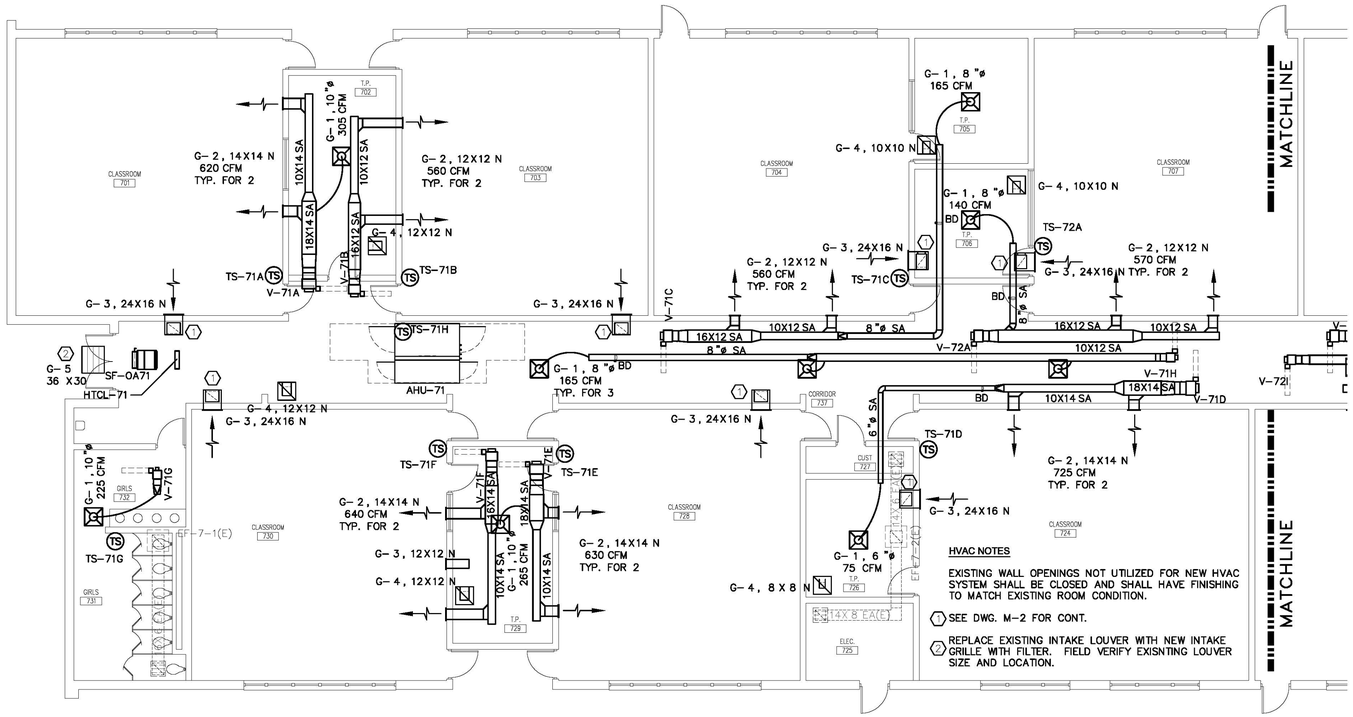
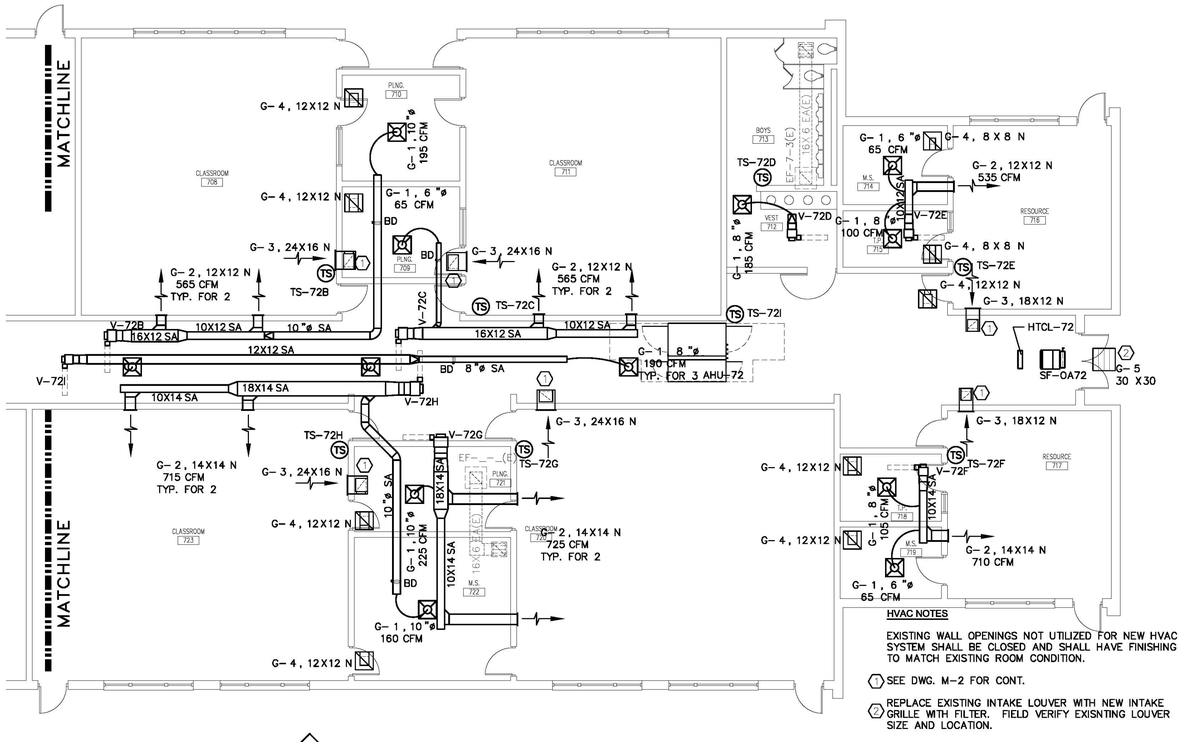
SUWANNEE COUNTY MIDDLE SCHOOL
HVAC MODIFICATIONS – BUILDING 7
LIVE OAK, FLORIDA

DATE: 2–17–12
SCALE: 1/8"=1'–0"
DRAWN: DBH
JOB: 1947
SHEET: E–2
OF 2 SHEETS



BLDG 7 PARTIAL HVAC PLAN "A" – LOW PRESSURE DUCT
SCALE: 1/8" = 1'-0"



BLDG 7 PARTIAL HVAC PLAN "B" – LOW PRESSURE DUCT
SCALE: 1/8" = 1'-0"

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1947HVAC LPD M01

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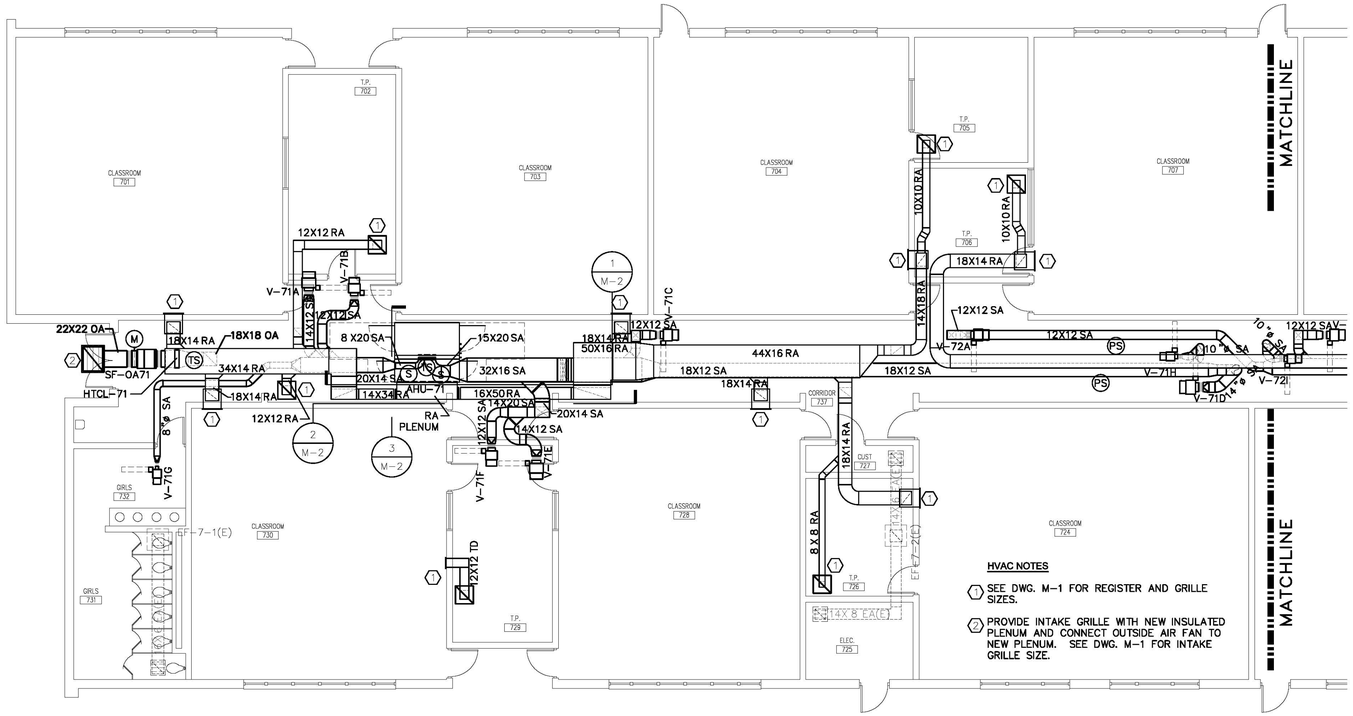
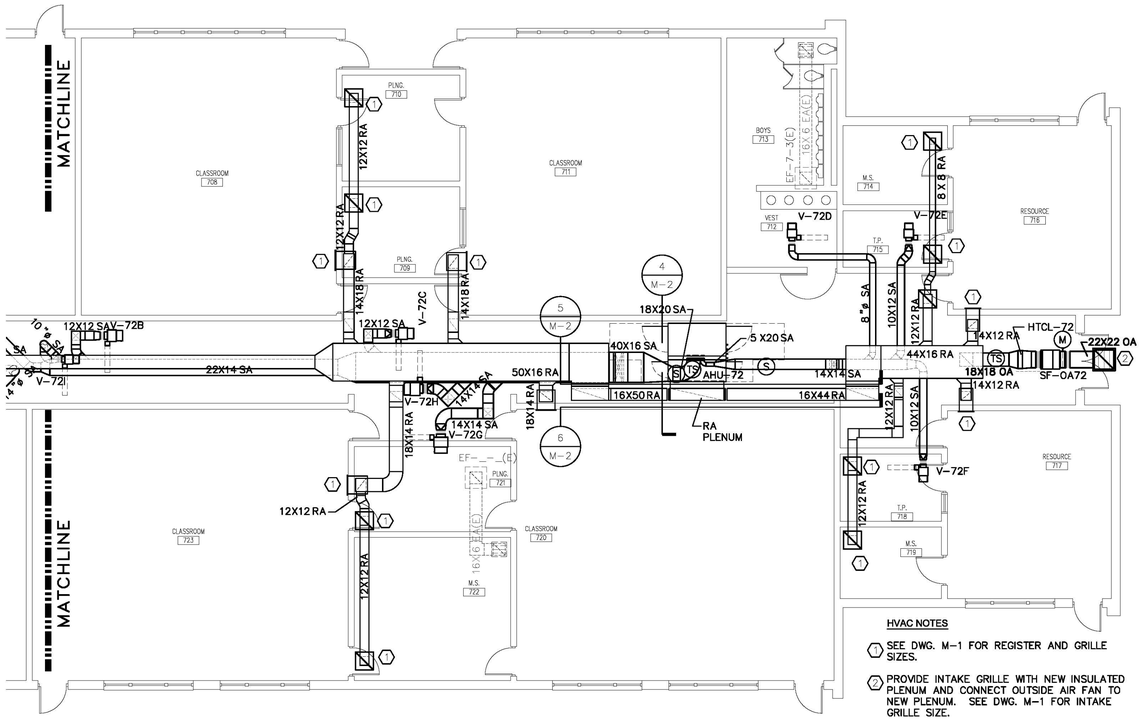
SUWANNEE COUNTY MIDDLE SCHOOL
HVAC MODIFICATIONS – BUILDING 7
LIVE OAK, FLORIDA

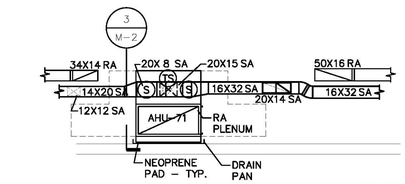
DATE: 2/17/12
SCALE: 1/8"
DRAWN: GCM
JOB: 1947
SHEET: M-1
OF 6 SHEETS



BLDG 7 PARTIAL HVAC PLAN "A" – PRIMARY AND RETURN AIR DUCT SYSTEM
SCALE: 1/8" = 1'-0"



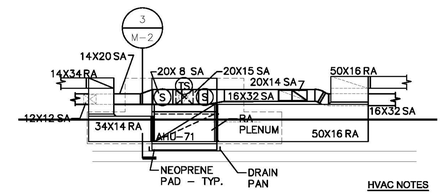
BLDG 7 PARTIAL HVAC PLAN "B" – PRIMARY AND RETURN DUCT SYSTEM
SCALE: 1/8" = 1'-0"



SECTION – AHU-71
SCALE: 1/8" = 1'-0"

HVAC NOTES

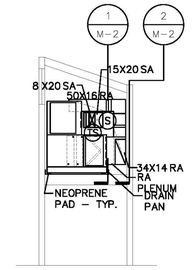
SMOKE DETECTORS TO BE PROVIDED BY ELECTRICAL CONTRACTOR AND TO BE INSTALLED BY HVAC CONTRACTOR.



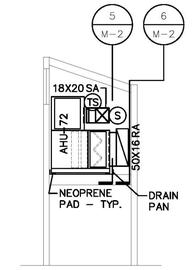
SECTION – AHU-71
SCALE: 1/8" = 1'-0"

HVAC NOTES

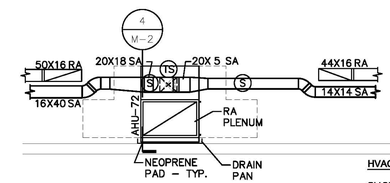
SMOKE DETECTORS TO BE PROVIDED BY ELECTRICAL CONTRACTOR AND TO BE INSTALLED BY HVAC CONTRACTOR.



SECTION – AHU-71
SCALE: 1/8" = 1'-0"



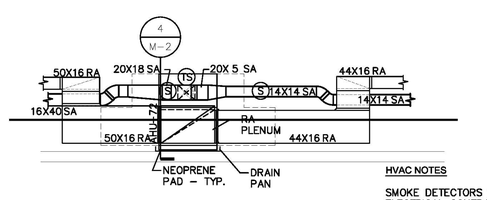
SECTION – AHU-72
SCALE: 1/8" = 1'-0"



SECTION – AHU-72
SCALE: 1/8" = 1'-0"

HVAC NOTES

SMOKE DETECTORS TO BE PROVIDED BY ELECTRICAL CONTRACTOR AND TO BE INSTALLED BY HVAC CONTRACTOR.



SECTION – AHU-72
SCALE: 1/8" = 1'-0"

HVAC NOTES

SMOKE DETECTORS TO BE PROVIDED BY ELECTRICAL CONTRACTOR AND TO BE INSTALLED BY HVAC CONTRACTOR.

FEB/15/12
1947HVAC PRD M02

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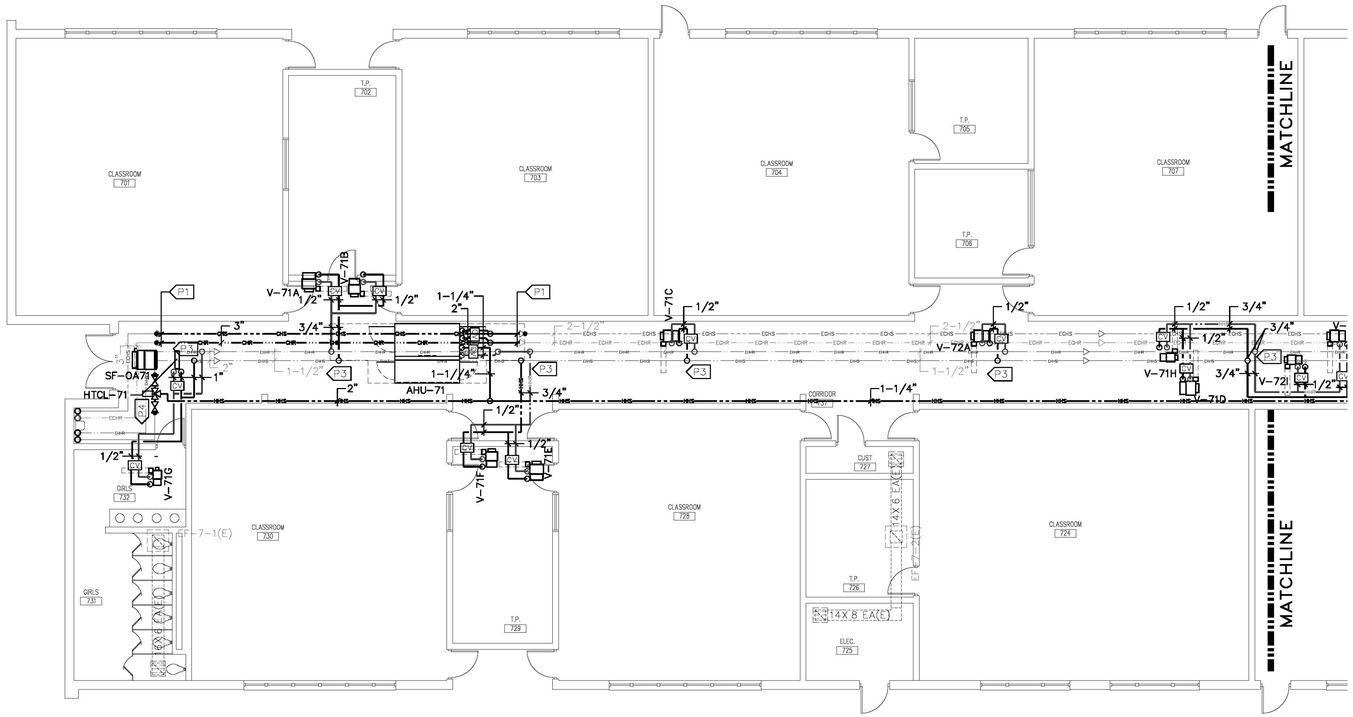
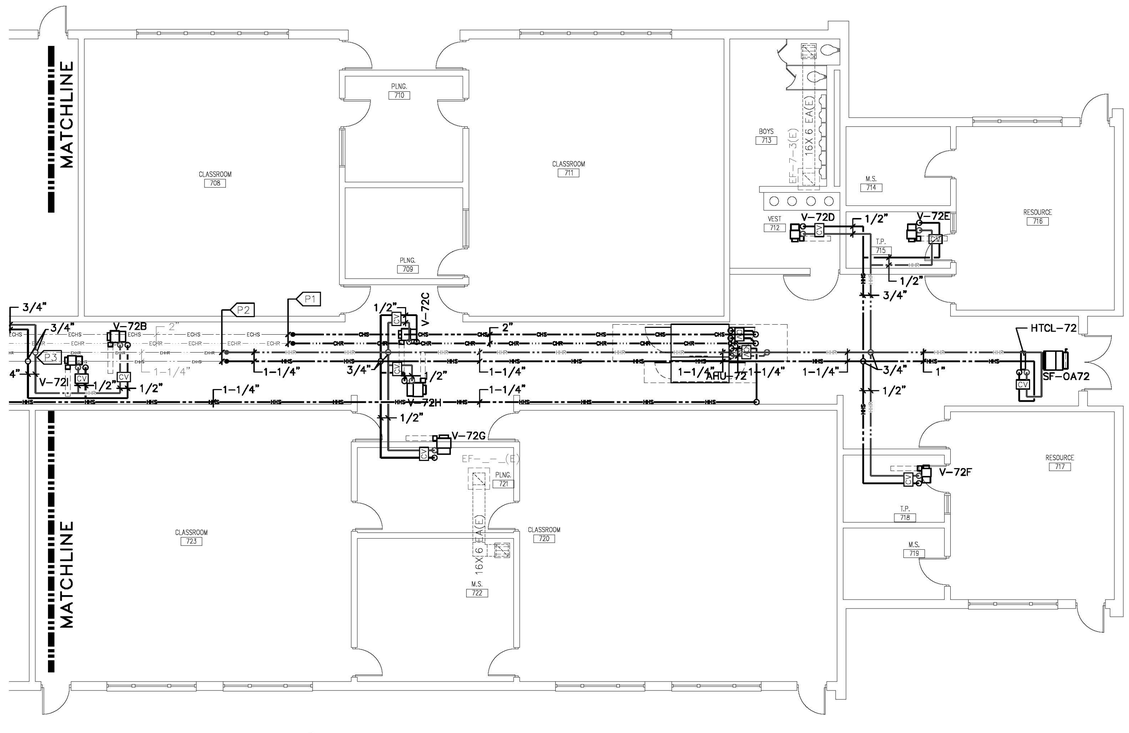
SUWANNEE COUNTY MIDDLE SCHOOL
HVAC MODIFICATIONS – BUILDING 7
LIVE OAK, FLORIDA

DATE: 2/17/12
SCALE: 1/8"
DRAWN: GCM
JOB: 1947
SHEET: M-2
OF 6 SHEETS



BLDG 7 PARTIAL PIPING PLAN "A"
SCALE: 1/8" = 1'-0"



BLDG 7 PARTIAL PIPING PLAN "B"
SCALE: 1/8" = 1'-0"

HVAC PIPING NOTES

P1 DISCONNECT AND REMOVE EXISTING SECTIONS OF CHILLED WATER SUPPLY AND RETURN MAINS AND REPLACE WITH NEW SUPPLY AND RETURN PIPING WITH PIPE SIZES AS INDICATED ON THE DRAWING. CONNECT NEW PIPING TO EXISTING SUPPLY AND RETURN MAINS.

P2 DISCONNECT AND REMOVE EXISTING HEATING HOT WATER SUPPLY AND RETURN MAINS AND REPLACE WITH NEW SUPPLY AND RETURN PIPING WITH PIPE SIZES AS INDICATED ON THE DRAWING. CONNECT NEW PIPING TO EXISTING SUPPLY AND RETURN MAINS.

P3 CONNECT NEW PIPE TO EXISTING PIPE WITH NEW FITTING

P4 INSTALL NEW SOLENOID VALVE ON EXISTING HEATING HOT WATER SUPPLY.

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1947HVAC CWHWP M03

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SUWANNEE COUNTY MIDDLE SCHOOL
HVAC MODIFICATIONS – BUILDING 7
LIVE OAK, FLORIDA

DATE: 2/17/12
SCALE: 1/8"
DRAWN: GCM
JOB: 1947
SHEET: M-3
OF 6 SHEETS

EQUIPMENT SCHEDULE - VAV UNIT

APPROVED MANUFACTURER		YORK							
EQUIPMENT NUMBER		V-71A	V-71B	V-71C	V-71D	V-71E	V-71F	V-71G	V-71H
DESIGN CFM	MAXIMUM	1550	1113	1291	1546	1527	1285	224	500
	MINIMUM	400	300	300	400	400	300	50	150
DELTA " P" AT MAX. CFM – IN. W.C.		0.29	0.29	0.38	0.28	0.28	0.38	0.13	0.23
HYDRONIC HEATING COIL	COIL CFM	800	700	800	800	800	700	120	400
	No. OF CIRCUIT(S)	1	1	1	1	1	1	1	1
	EAT – °F	55	55	55	55	55	55	55	55
	No. OF ROW (MIN.)	2	2	2	2	2	2	3	2
	FIN PER INCH (MAX.)	--	--	1.7	--	--	--	--	--
	TOTAL LOAD – MBH	45.1	28.8	33.2	38.2	37.3	29.0	10.9	12.6
	AIR FRICTION – IN.	--	--	--	--	--	--	--	--
	FLUID – CONC./BRINE	20% EG	20% EG	20% EG	20% EG	20% EG	20% EG	20% EG	20% EG
	EWT – °F	160°F	160°F	160°F	160°F	160°F	160°F	160°F	160°F
	LWT – °F	140°F	140°F	140°F	140°F	140°F	140°F	140°F	140°F
	FLUID – GPM	3.2	1.3	1.7	1.7	1.6	1.3	2.7	0.5
	FLUID PD – FT.	4.2	0.6	1.0	1.3	1.1	0.7	0.8	0.1
MODEL No.		SDR-14	SDR-12	SDR-12	SDR-14	SDR-14	SDR-12	SDR-04	SDR-08
ELECTRICAL DATA		120 V/1 ø	120 V/1 ø	120 V/1 ø	120 V/1 ø	120 V/1 ø	120 V/1 ø	120 V/1 ø	120 V/1 ø
AHU No.		AHU-71	AHU-71	AHU-71	AHU-71	AHU-71	AHU-71	AHU-71	AHU-71
ACCESSORIES/REMARK		(1) (2)	(1) (2)	(1) (2)	(1) (2)	(1) (2)	(1) (2)	(1) (2)	(1) (2)

NOTE:
(1) UNIT MOUNTED DISCONNECT, UNIT MOUNTED CONTROL VOLTAGE TRANSFORMER.
(2) UNIT CONTROL SYSTEM SHALL BE COMPATIBLE WITH EXISTING BLDG. HVAC CONTROL SYSTEM.

EQUIPMENT SCHEDULE - VAV UNIT

APPROVED MANUFACTURER		YORK								
EQUIPMENT NUMBER		V-72A	V-72B	V-72C	V-72D	V-72E	V-72F	V-72G	V-72H	V-72I
DESIGN CFM	MAXIMUM	1278	1326	1192	182	701	879	1674	1592	573
	MINIMUM	300	300	300	50	200	200	400	400	200
DELTA " P" AT MAX. CFM – IN. W.C.		0.37	0.4	0.32	0.06	0.23	0.34	0.33	0.3	0.34
HYDRONIC HEATING COIL	COIL CFM	800	800	800	120	400	500	800	800	200
	No. OF CIRCUIT(S)	1	1	1	1	1	1	1	1	1
	EAT – °F	55	55	55	55	55	55	55	55	55
	No. OF ROW (MIN.)	2	2	2	2	3	2	2	2	2
	FIN PER INCH (MAX.)	--	--	--	--	--	--	--	--	--
	TOTAL LOAD – MBH	31.5	33.7	31.8	8.2	23.2	26.2	38.8	40.4	9.7
	AIR FRICTION – IN.	--	--	--	--	--	--	--	--	--
	FLUID – CONC./BRINE	20% EG	20% EG	20% EG	20% EG	20% EG	20% EG	20% EG	20% EG	20% EG
	EWT – °F	160°F	160°F	160°F	160°F	160°F	160°F	160°F	160°F	160°F
	LWT – °F	140°F	140°F	140°F	140°F	140°F	140°F	140°F	140°F	140°F
	FLUID – GPM	1.4	1.7	1.5	1.0	2.5	2.5	1.8	2.0	0.5
	FLUID PD – FT.	0.8	1.1	0.8	0.3	1.8	1.9	1.4	1.8	0.1
MODEL No.		SDR-12	SDR-12	SDR-12	SDR-04	SDR-10	SDR-10	SDR-14	SDR-14	SDR-08
ELECTRICAL DATA		120 V/1 ø	120 V/1 ø	120 V/1 ø	120 V/1 ø	120 V/1 ø	120 V/1 ø	120 V/1 ø	120 V/1 ø	120 V/1 ø
AHU No.		AHU-72	AHU-72	AHU-72	AHU-72	AHU-72	AHU-72	AHU-72	AHU-72	AHU-72
ACCESSORIES/REMARK		(1) (2)	(1) (2)	(1) (2)	(1) (2)	(1) (2)	(1) (2)	(1) (2)	(1) (2)	(1) (2)

NOTE:
(1) UNIT MOUNTED DISCONNECT, UNIT MOUNTED CONTROL VOLTAGE TRANSFORMER.
(2) UNIT CONTROL SYSTEM SHALL BE COMPATIBLE WITH EXISTING BLDG. HVAC CONTROL SYSTEM.

EQUIPMENT SCHEDULE - DIFFUSERS, GRILLES & REGISTERS

NOTES: SEE ARCH. REFLECTED CEILING PLAN FOR EXACT LOCATION OF CEILING DIFFUSERS.
ALL FLEXIBLE DUCT CONNECTIONS TO RECTANGULAR DUCT TO BE SPIN-INS WITH AIR SCOOP AND BALANCE DAMPER. NECK SIZE AS SHOWN ON THE DRAWINGS.

APPROVED MANUFACTURER: TITUS (*EXCEPT AS NOTED)

EQUIP. NO.	MOUNTING TYPE	MODEL NUMBER	ACCESSORIES/REMARKS
G-1	LAY-IN CEILING (SUPPLY)	TMS (24X24)	(1)
G-2	SURFACE (SUPPLY)	272 RL	AG-35 DAMPER
G-3	SURFACE (RETURN)	50F	#1 BORDER
G-4	LAY-IN CEILING (SUPPLY)	50F (24X24)	(1)
G-5	SURGACE	350FLF2	FILTER INTAKE W/ 2" FILTER

(1): WHERE USED IN GYP. BOARD CEILING, PROVIDE TITUS MODEL "TRM" ANGLE MOUNTING FRAME FOR CUT OPENING AND USE LAY-IN TYPE DIFFUSER.

EQUIPMENT SCHEDULE - CENTRAL AIR HANDLER

APPROVED MANUFACTURER		YORK	
OUT DOOR DESIGN TEMP.	SUMMER	95°F	
	WINTER	30°F	
INDOOR DESIGN TEMP.	SUMMER	78°F	
	WINTER	72°F	
EQUIPMENT NUMBER		AHU-71	AHU-72
HYDRONIC HEATING COIL	COIL CFM	9,130	9,490
	No. OF CIRCUIT(S)	1	1
	EAT – °F	60°F	60°F
	No. OF ROW (MIN.)	1	1
	FIN PER INCH (MAX.)	9	10
	TOTAL LOAD – MBH	205.6	218.7
	AIR FRICTION – IN.	0.08	0.08
	FLUID – CONC./BRINE	20% EG	20% EG
	EWT – °F	160°F	160°F
	LWT – °F	140°F	139.7°F
	FLUID – GPM	21.6	22.9
	FLUID PD – FT.	10.5	8.6
HYDRONIC COOLING COIL	COIL CFM	9,130	9,490
	No. OF CIRCUIT(S)	1	1
	EAT DB/WB – °F.	81.1/68.0	81.0/67.9
	LAT DB/WB – °F.	53.3/53.1	53.3/53.7
	No. OF ROW (MIN.)	8	8
	FIN PER INCH (MAX.)	12	11
	SEN. LOAD – MBH	265.6	274.6
	TOTAL LOAD – MBH	403.4	417.3
	AIR FRICTION – IN.	1.01	1.01
	FLUID – CONC./BRINE	20% EG	20% EG
	EWT – °F	47°F	47°F
	LWT – °F	59°F	59°F
	FLUID – GPM	71.2	74.0
	FLUID PD – FT.	7.8	11.5
FILTER	TYPE	PLEATED	PLEATED
	THICKNESS – INCH	4"	4"
	AIR FRICTION – IN.	0.125	0.125
FAN	TYPE	AF 18-18	AF 182-I
	DRIVE	BELT	BELT
	MAX CFM	9,130	9,490
	HP	10	15
	EXT. S.P. – IN.	2.0	2.0
	VFD	VFD-DIRVE	VFD-DIRVE
OUTSIDE AIR CFM		2285	2345
MODEL No.		XTI-45X87	XTI-51X78
ELECTRICAL DATA		460/3	460/3
ACCESSORIES/REMARK		(1)	(1)

NOTE:
(1) DRAIN PAN WITH VIBRATION ISOLATION PAD.
(2) RIGHT HAND COIL CONNECTION WITH ACCESS DOORS ON BOTH SIDES.

EQUIPMENT SCHEDULE - FAN

APPROVED MANUFACTURER		COOK	
EQUIPMENT NUMBER		SF-OA71	SF-OA72
MOUNTING TYPE		INLINE	INLINE
FAN	TYPE	CENTRIF.	CENTRIF.
	DRIVE	DIRECT	DIRECT
	RPM	1053	1074
	CFM	2285	2345
	S.P. – IN.	0.375	0.375
	HP	1/2	1/2
MODEL No.		165SQN10D	165SQN10D
ELECTRICAL DATA		120 V/1 ø	120 V/1 ø
ACCESSORIES/REMARK		SEE NOTE	SEE NOTE

NOTE – PROVIDE FAN WITH THE FOLLOWING ACCESSORIES:
(1) UNIT MOUNTED DISCONNECT.
(2) UNIT MOUNTED SPEED CONTROLLER
(3) 120 VOLTS MOTORIZED OPPOSITE BLADE OA DAMPER.
(4) INLET AND OUTLET FLEX DUCT CONNECTIONS

EQUIPMENT SCHEDULE - HOT WATER HEATING COIL

APPROVED MANUFACTURER		YORK		
EQUIPMENT NUMBER		HTCL-71	HTCL-72	
HYDRONIC HEATING COIL	COIL CFM	2285	2345	
	No. OF CIRCUIT(S)	1	1	
	EAT – °F	25°F	25°F	
	No. OF ROW (MIN.)	1	1	
	FIN PER INCH (MAX.)	10	10	
	TOTAL LOAD – MBH	86.8	89.1	
	AIR FRICTION – IN.	0.11	0.12	
	FLUID – CONC./BRINE	20% EG	20% EG	
	EWT – °F	160°F	160°F	
	LWT – °F	140°F	140°F	
	FLUID – GPM	9.15	9.4	
	FLUID PD – FT.	8.4	8.7	
	HEIGHT – IN.	24	24	
	WIDTH – IN.	24	24	
MODEL NUMBER		CDW	CDW	
ACCESSORIES/REMARK				

LEGEND

12x12	DUCT W/ SIZE SHOWN	SA	SUPPLY AIR
	SUPPLY DUCT	RA	RETURN AIR
	RETURN/EXHAUST DUCT	EA	EXHAUST AIR
R	DUCT ELEV. CHANGE R-RISE/D-DOWN	EF	EXHAUST FAN
	ELBOW W/ TURNING VANES	OA	OUTSIDE AIR
	DUCT TRANSITION	SF	SUPPLY FAN
G-X	SUPPLY DIFFUSER/GRILLE	VAV	VARIABLE AIR VOLUME
G-X	RETURN DIFFUSER/GRILLE	EDH	ELEC. DUCT HEATER
	FLEX DUCT	AHU	AIR HANDLING UNIT
PS	PRESSURE SENSOR	BD	BALANCE DAMPER
S	SMOKE DETECTOR	TS	TEMPERATURE SENSOR
	CONTROL VALVE/REGULATOR	VFD	MOTOR VFD CONTROLLER
	STRAINER/FILTER		CHECK VALVE
	PIPE REDUCER		PRESSURE GAGE
(E)	EXISTING		THERMOMETER/TEMP. GAGE
	VALVE – CLOSE	CHS	CHS – CHILLED WATER SUPPLY
	VALVE – OPEN	CHR	CHR – CHILLED WATER RETURN
	FLEX PIPE CONNECTOR	ECHS	ECHS – EXIST. CHILLED WATER SUPPLY
CV	CV – CONTROL VALVE GROUP	ECHR	ECHR – EXIST. CHILLED WATER RETURN
	PIPE RISER DOWN	HHS	HHS – HEATING HOT WATER SUPPLY
	PIPE RISER UP	HHR	HHR – HEATING HOT WATER RETURN
	PIPE TEE UP	EHHS	EHHS – EXIST. HEATING HW SUPPLY
	PIPE TEE DOWN	EHHR	EHHR – EXIST. HEATING HW RETURN

FEB/10/12
1947HVAC SCHEDULES M04

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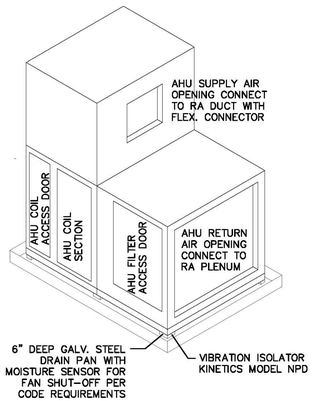
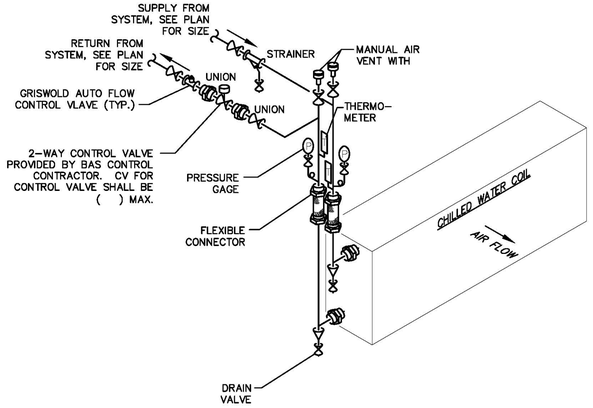
SUWANNEE COUNTY MIDDLE SCHOOL
HVAC MODIFICATIONS – BUILDING 7
LIVE OAK, FLORIDA

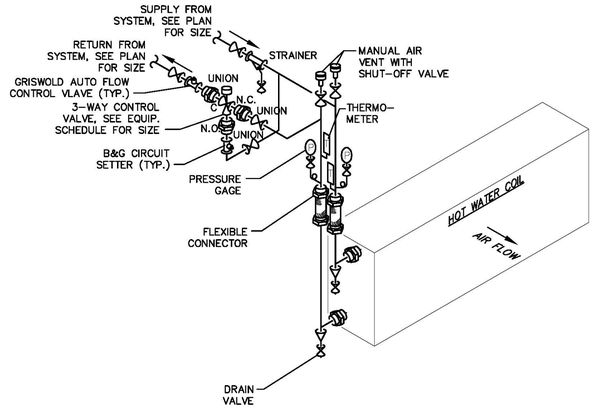
DATE: 2/17/12
SCALE: AS SHOWN
DRAWN: GCM
JOB: 1947
SHEET:
M-4
OF 6 SHEETS



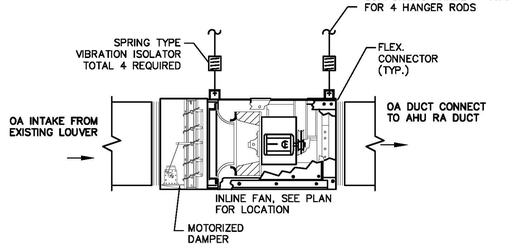
DETAIL – CENTRAL AIR HANDLER
NOT TO SCALE



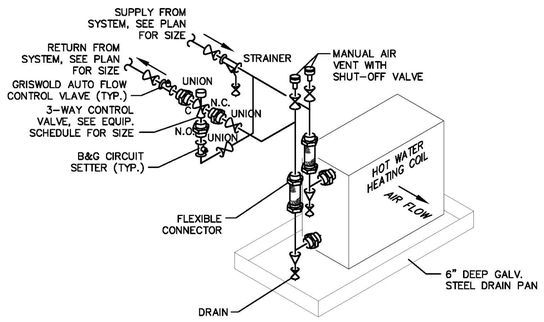
DETAIL – CENTRAL AIR HANDLER CHILLED WATER PIPING DIAGRAM
NOT TO SCALE



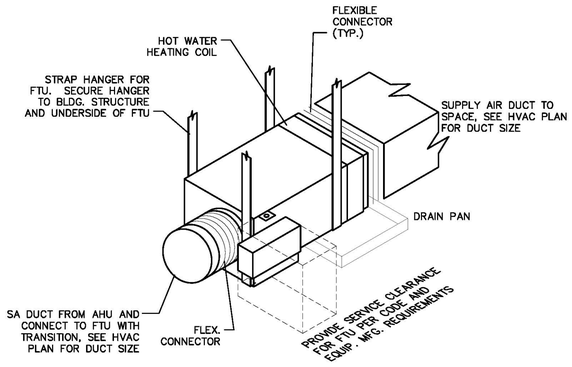
DETAIL – CENTRAL AIR HANDLER HOT WATER PIPING DIAGRAM
NOT TO SCALE



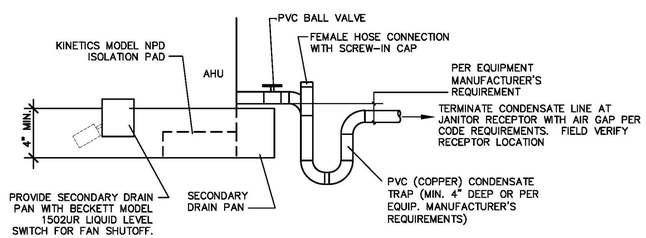
DETAIL – INLINE FAN
NOT TO SCALE



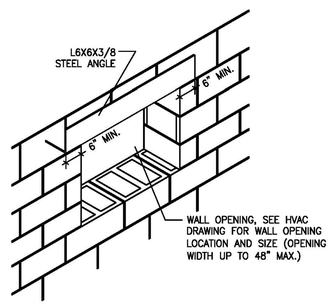
DETAIL – HEATING COIL FOR OA FAN AND VAV UNITS
NOT TO SCALE



DETAIL – VAV SUPPORT
NOT TO SCALE



DETAIL – DRAIN PAN AND CONDENSTE TRAP
NOT TO SCALE



WALL FRAMING
CMU WALL OPENING SECTION
NTS

FEB/10/12
1947HVAC SCHEDULES M05

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SUWANNEE COUNTY MIDDLE SCHOOL
HVAC MODIFICATIONS – BUILDING 7
LIVE OAK, FLORIDA

DATE: 2/17/12
SCALE: AS SHOWN
DRAWN: GCM
JOB: 1947
SHEET: M-5
OF 6 SHEETS

HEATING, VENTILATING & AIR CONDITIONING SPECIFICATIONS

1. SCOPE OF WORK: THE SCOPE OF WORK INCLUDES THE COMPLETE REPLACEMENT OF THE HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS AS SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN.

2. CODES, ORDINANCES: COMPLY WITH ALL CODES APPLYING TO THE WORK OF THIS CONTRACT INCLUDING BUT NOT LIMITED TO THE FLORIDA ENERGY EFFICIENCY CODE, FLORIDA BUILDING CODE 2007 AND FLORIDA BUILDING CODE 2007 – MECHANICAL. OBTAIN INFORMATION ON ALL CODE RESTRICTIONS AND REQUIREMENTS. IN CASE OF CONFLICT BETWEEN THE CONTRACT DOCUMENTS AND A GOVERNING CODE OR ORDINANCE, SUCH CONFLICT SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE OWNER FOR RESOLUTION. EXTRA PAYMENT WILL NOT BE ALLOWED FOR WORK REQUIRED BY CODE RESTRICTIONS EXCEPT THROUGH WRITTEN AGREEMENT WITH THE OWNER.

3. PERMITS: APPLY FOR, OBTAIN, AND PAY FOR ALL REQUIRED PERMITS AND INSPECTION CERTIFICATES. FINAL PAYMENT IS CONTINGENT UPON DELIVERY OF SUCH CERTIFICATES TO THE OWNER.

4. SUBMITTALS: SUBMIT SHOP DRAWINGS AND/OR CATALOG DATA TO THE ENGINEER FOR APPROVAL PRIOR TO THE START OF INSTALLATION. PROVIDE FOUR (4) COMPLETE SETS OF A COMPILATION OF CATALOG DATA; INSTALLATION, OPERATING AND MAINTENANCE DATA; AND BILL OF MATERIALS FOR ALL OPERATING EQUIPMENT USED IN THE MECHANICAL WORK.

5. CONTRACTOR COORDINATION: COORDINATE LOCATION OF EQUIPMENT, PIPING, AND DUCT WORK WITH ELECTRICAL CONTRACTOR TO MAINTAIN CLEARANCE FOR EQUIPMENT MAINTENANCE, PREVENT INTERFERENCE WITH DUCT AND PIPING RUNS, AND TO PREVENT DUCTS AND PIPING FROM BEING INSTALLED OVER ELECTRICAL PANELS.

6. MECHANICAL CONTRACTOR'S WARRANTY: PROVIDE WRITTEN ONE (1) YEAR WARRANTEE AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP. REPAIR ANY DEFECTS BECOMING APPARENT WITHIN THE WARRANTY PERIOD AS DIRECTED BY THE OWNER.

8. EQUIPMENT: ALL EQUIPMENT SHALL BE AS SCHEDULED ON THE DRAWINGS.

9. CONDENSATE DRAIN PIPING SHALL BE NON-INSULATED SCHEDULE 40 POLYVINYL CHLORIDE (PVC).

10. CHILED WATER AND HOT WATER PIPING 2-1/2" AND LARGER SHALL BE ASTM A 53, SCHEDULE 40, BLACK STEEL PIPE WITH WELDED OR FLANGED JOINTS. PIPING SMALLER THAN 2-1/2" SHALL BE ASTM A 53, SCHEDULE 40, BLACK STEEL PIPE WITH THREADED JOINTS OR ASTM B 88 TYPE "L" COPPER PIPE WITH SOLDER JOINTS.

11. PIPE HANGERS:

A. PIPE HANGERS SHALL BE AUTO-GRIP, FEE AND MASON, GRINNEL, GALVANIZED STEEL CLEVIS HANGERS, ROLLER OR FIXED AS SHOWN ON DRAWINGS, SELECTED WITHIN THE MANUFACTURER'S PUBLISHED LOAD RATINGS. GALVANIZED STEEL HANGER RODS SHALL BE AT LEAST:

PIPE TO 2"	3/8" DIAMETER
2-1/2" TO 3"	1/2" DIAMETER
4" TO 5"	5/8" DIAMETER
6"	3/4" DIAMETER
8" AND LARGER	7/8" DIAMETER

B. RODS FOR TRAPEZE HANGERS SUPPORTING SEVERAL PIPES SHALL BE SIZED FOR THE EQUIPMENT LOAD. SUPPORTS FOR PIPES WITH VAPOR BARRIER TYPE COVERING SHALL NOT CONTACT THE PIPE BUT SHALL SURROUND THE UNBROKEN COVERING. PROVIDE GALVANIZED STEEL SHIELDS WITH MITERED CORNERS PROPERLY FORMED TO THE JACKET OUTSIDE DIAMETER BETWEEN HANGER CLEVISES AND THE LOWER 1/3 OF THE CIRCUMFERENCE.A.

C. Supports for pipes with vapor barrier type covering shall not contact the pipe but shall surround the unbroken covering. Provide galvanized steel shields with mitered corners properly formed to the jacket outside diameter between hanger clevises and the lower 1/3 of the circumference.

12. EQUIPMENT SUPPORTS, VIBRATION ISOLATORS, AND IDENTIFICATION:

A. EQUIPMENT SUPPORTS SHALL BE SIZED AND DESIGNED TO SUPPORT THE EQUIPMENT AND SHALL BE FABRICATED FROM GALVANIZED STEEL.

B. VIBRATION ISOLATORS FOR AIR HANDLING UNITS SHALL BE HOUSED SPRING TYPE VIBRATION ISOLATORS, SIMILAR TO KINETICS MODEL SL AND SM, SIZED FOR EQUIPMENT LOAD, AND DESIGNED FOR 1" MAXIMUM DEFLECTION. AIR HANDLING UNITS WITH INTERNAL SPRING ISOLATION SHALL HAVE NEOPRENE INERTIA PADS, SIMILAR TO KINETICS MODEL NP OR NG, SIZED AND DESIGNED FOR UNIT LOAD.

C. ALL IDENTIFICATION LEGENDS, ARROWS AND COLOR BANDS SHALL BE STENCILED ON PRESSURE-SENSITIVE LABELING MATERIAL. LABELING MATERIAL COLORS FOR USE ON PIPING SHALL BE AS SPECIFIED IN ANSI A 13.1 LATEST REVISION.

D. VALVE TAGS SHALL BE PLASTIC, ALUMINUM OR BRASS AT LEAST 1" IN DIAMETER AND STAMPED WITH CONTRASTING COLORED FIGURES AS LARGE AS POSSIBLE. PIPE MARKERS SHALL BE SETON STYLE RPM OR APPROVED EQUAL.

13. DUCT WORK:

A. SUPPLY AIR, RETURN AIR AND OUTSIDE AIR DUCT WORK SHALL BE GALVANIZED SHEET METAL. FABRICATE SHEET METAL DUCT WORK IN ACCORDANCE WITH LATEST EDITION OF "HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE" AS PUBLISHED BY SMACNA AND TO MEET CONSTRUCTION REQUIREMENTS FOR THE FOLLOWING MINIMUM STATIC PRESSURES:

1. SUPPLY AIR DUCTS BETWEEN VARIABLE VOLUME AIR HANDLING UNITS AND VAV UNITS SHALL BE CONSTRUCTED FOR 3" W.G. AND SEAL CLASS "B".

2. SUPPLY AIR DUCTS AT DISCHARGE OF VAV UNITS SHALL BE CONSTRUCTED FOR 1" W.G. AND SEAL CLASS "C".

3. OUTSIDE AIR DUCTS SHALL BE CONSTRUCTED FOR 2" W.G. AND SEAL CLASS "C".

4. RETURN AIR DUCTS TO VARIABLE VOLUME AIR HANDLING UNITS SHALL BE CONSTRUCTED FOR 2" W.G. NEGATIVE AND SEAL CLASS "C".

B. FABRICATE AND SEAL DUCT JOINTS AND CONNECTIONS SUCH THAT AIR LEAKAGE DOES NOT EXCEED FIVE (5) PERCENT OF DESIGN AIR VOLUME.

14. A/C DUCT WORK ACCESSORIES:

A. MANUAL BALANCE/VOLUME DAMPERS SHALL BE OPPOSED BLADE TYPE AND SHALL BE 16 GAUGE MINIMUM GALVANIZED STEEL WITH ZINC-PLATED HARDWARE AND BRONZE OR NYLON BEARINGS. BLADES SHALL NOT BE OVER 8" WIDE NOR LESS THAN 16 GAGE GALVANIZED STEEL. MAXIMUM LEAKAGE SHALL BE LESS THAN 1% AT STATIC PRESSURE OF 4" W.G. PROVIDE LOCKING QUADRANT DAMPER OPERATORS ON MANUAL DAMPERS.

B. TURNING VANES SHALL BE FACTORY FABRICATED FULL RADIUS DOUBLE THICKNESS AIR FOIL TYPE WITH 24 GAUGE RAILS AND HOLLOW VANES.

C. EXTRACTORS AT BRANCH TAKE-OFFS SHALL BE ADJUSTABLE PUSH ROD TYPE WITH LOCKING HARDWARE. EXTRACTORS AT SIDEWALL SUPPLY GRILLES SHALL BE ADJUSTABLE BY REMOVING THE GRILLE FACE.

D. SPLITTERS SHALL BE CONSTRUCTED OF AT LEAST THE SAME GAUGE GALVANIZED STEEL AS THE DUCT WHEREIN THEY ARE USED AND SHALL NOT BE LESS THAN 24 GAUGE. BLADES SHALL BE FORMED IN TWO THICKNESS OF METAL TO PROVIDE ROUNDED NOSE TO AIR FLOW.

E. FLEXIBLE CONNECTORS SHALL MEET REQUIREMENTS OF UL 191 FOR CLASS 1 CONNECTORS.

15. INSULATION - GENERAL: ALL INSULATION MATERIALS AND COATINGS SHALL MEET FLAME SPREAD AND SMOKE DEVELOPED RATINGS PER NFPA BULLETIN 90-A WHEN TESTED IN ACCORDANCE WITH ASTM STANDARD E-84. SMOKE DEVELOPED LESS THAN OR EQUAL TO 50, AND FLAME SPREAD LESS THAN OR EQUAL TO 25. ALL COATINGS AND MASTICS SHALL BE NONFLAMMABLE IN WET STATE.

16. DUCT WORK INSULATION: FLEXIBLE EXTERNAL INSULATION SHALL BE FIBERGLASS AND SHALL HAVE AN "AS-PACKAGED" R VALUE NOT LESS THAN 25% GREATER THAN THE REQUIRED "AS-INSTALLED" VALUE AND SHALL HAVE A DUPLEX LAMINATED, REINFORCED ALUMINUM FOIL VAPOR BARRIER. DUCT INSULATION SHALL BE THE REQUIRED THICKNESS AND MATERIAL TO PROVIDE A MINIMUM THERMAL RESISTANCE "R" OF 4.2 WHEN LOCATED ON THE AIR CONDITIONED SIDE OF THE BUILDING INSULATION UNLESS OTHERWISE NOTED ON THE DRAWINGS. THIS R VALUE IS "AS-INSTALLED" MINIMUMS. INSULATION NOMINAL THICKNESS SHALL NOT EXCEED 2".

17. HOT WATER PIPE INSULATION: SUPPLY AND RETURN PIPING SHALL BE INSULATED WITH 1-1/2" THICK PRE-FORMED FIBER GLASS PIPE INSULATION WITH FIRE RETARDANT JACKET AND K FACTOR NO HIGHER THAN 0.29 (BTU X INCH) / (SQ. FT. X ° F. X HR) AT 200° F.

18. CHILLED WATER PIPE INSULATION: SUPPLY AND RETURN PIPING SHALL BE INSULATED WITH PRE-FORMED RIGID CELLULAR GLASS TYPE SIMILAR TO PITTSBURGH CORNING FOAMGLAS, INSTALLED WITH CEMENT JOINTS AND IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. FINISH WITH CANVAS JACKET, SIZE FOR FINISH PAINTING. INSULATION THICKNESS SHALL BE 1-1/2" THICK FOR PIPES UP TO 2" AND 2" THICK FOR PIPES OVER 2".

19. AIR DISTRIBUTION EQUIPMENT: AIR DISTRIBUTION DEVICES SHALL BE AS SCHEDULED ON THE DRAWINGS. ALL SUPPLY DIFFUSERS SHALL BE SELECTED TO DELIVER THE INDICATED VOLUME OF SUPPLY AIR WITHOUT EXCEEDING THE AVAILABLE THROW AND WITH AN NC RATING NOT TO EXCEED 25, INCLUDING HALF OPEN DAMPER. SUBMITTAL DATA SHALL CLEARLY INDICATE PERFORMANCE OF SELECTED DEVICES INCLUDING AIR QUANTITY, PATTERN, THROW, PRESSURE DROP, SOUND LEVEL, FINISH, DIMENSIONS AND CONSTRUCTION OF ALL AIR DISTRIBUTION DEVICES. SURFACE AND SIDEWALL SUPPLY REGISTERS SHALL, UNLESS OTHERWISE SCHEDULED, HAVE OPPOSED BLADE TYPE KEY OPERATED DAMPERS WITH A DETACHABLE KEY. ONE (1) KEY SHALL BE FURNISHED FOR EACH REGISTER.

20. DEMOLITION: REMOVE ALL EXISTING AIR HANDLING UNITS, FAN COIL UNITS, DUCT WORK, AND PIPING RELATED TO HVAC WORK WHERE SHOWN ON DRAWINGS. MATERIALS AND ITEMS OF EQUIPMENT THAT IS TO BE REMOVED AND NOT REUSED SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER FOR INSPECTION AND DETERMINATION OF DISPOSITION. MATERIALS AND ITEMS OF EQUIPMENT DESIGNATED AS "UNSALVAGEABLE" BY THE OWNER SHALL BE PROMPTLY REMOVED FROM THE PREMISES, DISPOSED OF IN A COMPLETELY LEGAL MANNER, AND SHALL NOT BE RE-USED IN THE NEW WORK UNLESS SPECIFICALLY AUTHORIZED BY THE OWNER. MATERIALS AND ITEMS OF EQUIPMENT DESIGNATED AS "SALVAGEABLE" BY THE OWNER TO KEEP FOR THEIR FUTURE USE SHALL BE CAREFULLY REMOVED AND MADE AVAILABLE FOR PICK-UP BY OWNER'S PERSONNEL AT THE JOB SITE.

21. CUTTING AND PATCHING: CUT AND PATCH EXISTING CONSTRUCTION AS REQUIRED FOR THE PROPER INSTALLATION OF THIS WORK. CUT OPENINGS CAREFULLY WITHOUT UNDUE WEAKENING OF THE STRUCTURE OR DAMAGE TO THE BUILDING. DO NOT CUT STRUCTURAL MEMBERS WITHOUT PERMISSION AND BEING UNDER THE DIRECTION OF THE ENGINEER. PROVIDE REQUIRED BRACING, SHORING, WEATHER PROTECTION, ETC. FOR OPENINGS. PATCHING SHALL REPLACE THE WORK TO A CONDITION AT LEAST EQUAL TO ITS CONDITION BEFORE THE CUTTING WAS DONE. REPAINTING WILL NOT BE REQUIRED UNDER THIS CONTRACT FOR NORMAL CUTTING AND PATCHING. CUTTING AND PATCHING INCLUDES NECESSARY RELOCATION OF EXISTING PIPES, CONDUITS, ETC, THAT PASS THROUGH OPENINGS AND THE PROPER CLOSING OF OPENINGS IN WALLS, FLOORS, CEILINGS, ETC. WHERE ABANDONED MECHANICAL FACILITIES ARE REMOVED.

22. INSTALLATION OF THE WORK:

A. ARRANGE THE WORK ESSENTIALLY AS SHOWN, EXACT LAYOUT TO BE MADE ON THE JOB TO SUIT ACTUAL CONDITIONS. CONFER AND COOPERATE WITH OTHER TRADES ON THE JOB SO ALL WORK WILL BE INSTALLED IN PROPER RELATIONSHIP AND COORDINATE PRECISE LOCATION OF PARTS WITH THE WORK OF OTHERS. INDICATED EQUIPMENT CONNECTIONS ARE NECESSARILY BASED ON EQUIPMENT OF A GIVEN MANUFACTURE. ASSUME RESPONSIBILITY FOR PROPER ARRANGEMENT OF PIPES, DUCTS, ETC. TO CONNECT APPROVED EQUIPMENT IN A PROPER AND APPROVED MANNER. FOLLOW EQUIPMENT MANUFACTURER'S DETAILED INSTRUCTIONS AND RECOMMENDATIONS IN THE INSTALLATION AND CONNECTION OF ALL EQUIPMENT. IN CASE OF CONFLICT BETWEEN MANUFACTURER'S INSTRUCTIONS AND THE CONTRACT DOCUMENTS, NOTIFY THE OWNER BEFORE PROCEEDING. NO EQUIPMENT INSTALLATION OR CONNECTIONS SHALL BE MADE IN A MANNER THAT VOIDS THE MANUFACTURER'S WARRANTY.

B. DUCT WORK SHOWN ON DRAWINGS IS DESIGNED TO PRODUCE REQUIRED AIR QUANTITY AT ESTIMATED PRESSURE DROP WHICH IS USED FOR AIR HANDLING UNIT AIR QUANTITY, PRESSURE, AND MOTOR HORSEPOWER. ACTUAL FIELD INSTALLATION MAY RESULT IN LOWER OR HIGHER PRESSURE DROP AT THE DESIGN AIR QUANTITY WHICH MAY REQUIRE ADJUSTMENT OF FAN SPEED. TAKE RESPONSIBILITY FOR THIS ADJUSTMENT INCLUDING REPLACEMENT OF FAN SHEAVE, IF REQUIRED, TO OBTAIN REQUIRED AIR QUANTITY AND MAINTAIN REQUIRED DUCT STATIC PRESSURE.

23. INSTALL ALL CHILLED WATER AND HOT WATER PIPING SYSTEMS IN SUCH A MANNER THAT SYSTEMS CAN BE DRAINED OR VENTED COMPLETELY BY PROVIDING VENTS AND DRAIN VALVES AT ALL HIGH AND LOW POINTS. PITCH ALL DRAIN PIPING AT LEAST 1/4" PER FOOT UNLESS OTHERWISE NOTED. EXTEND PIPING TO ALL EQUIPMENT FROM THE MAINS AS INDICATED ON THE DRAWINGS AND INSTALL VALVES ON ALL BRANCHES AT THE MAIN. AFTER COMPLETION OF ENTIRE SYSTEM AND BEFORE ANY PIPE IS COVERED, TEST THE ENTIRE PIPING SYSTEM TO ASSURE THAT IT IS ABSOLUTELY TIGHT. FILL SYSTEM WITH WATER AND APPLY A HYDROSTATIC PRESSURE OF 125 PSIG. HOLD TEST PRESSURE FOR AT LEAST 2 HOURS, REMAKE ALL LEAKING JOINTS AND RETEST. AFTER SYSTEM IS PROVED TIGHT, FLUSH WITH CLEAN WATER UNTIL ALL FOREIGN MATERIAL IS REMOVED AND FILL SYSTEM.

24. CONDENSATE DRAIN PIPE INSTALLATION: PROVIDE A VALVE, FEMALE HOSE CONNECTION WITH HOSE THREAD CAP AND RUBBER WASHER, AND 4" DEEP TRAP TO PREVENT BACK SUCTION INTO THE AIR UNIT AS DETAILED ON DRAWINGS. RUN CONDENSATE DRAIN LINE FROM EACH A/C UNIT AS NOTED ON THE DRAWINGS.

25. PIPE ASSEMBLY

A. THREADED JOINTS IN STEEL PIPE: CUT PIPE TO ACCURATE LENGTH, REAM THE ENDS, AND REMOVE BURRS. USE CLEAN, SHARP DIES. IMPERFECTLY FORMED OR TORN THREADS WILL BE REJECTED. USE APPROVED DOPE ON MALE THREADS ONLY AND CLEAN AWAY EXCESS DOPE.

B. SWEAT JOINTS IN COPPER PIPE (OTHER THAN REFRIGERANT PIPING): CUT PIPE SQUARELY TO ACCURATE LENGTH FOR FULL PENETRATION INTO FITTINGS. REMOVE BURRS FROM ENDS, CLEAN SOLDERING SURFACE THOROUGHLY, FLUX, ASSEMBLE AND SOLDER BEFORE SURFACES OXIDIZE. USE APPROVED NON-CORROSIVE FLUX. USE SUFFICIENT HEAT FOR COMPLETE PENETRATION OF SOLDER AND WIPE AWAY EXCESS FLUX AND SOLDER.

C. SOLVENT WELD JOINTS IN PVC PIPE: CUT PIPE SQUARELY TO ACCURATE LENGTH FOR FULL PENETRATION INTO FITTINGS. REMOVE BURRS FROM ENDS, CLEAN JOINING SURFACES THOROUGHLY AND FORM ALL JOINTS IN ACCORDANCE WITH THE PIPE MANUFACTURER'S RECOMMENDATIONS.

26. VALVE INSTALLATION: INSTALL ALL VALVES WITH THE STEMS OR SPINDLE ABOVE THE HORIZONTAL WHERE POSSIBLE AND EXERCISE UTMOST CARE NOT TO INSTALL VALVES OVER ELECTRICAL EQUIPMENT. LOCATE BALL VALVES AT ALL AUTOMATIC VALVES, CHECK VALVES, AT ALL EQUIPMENT SO THEY CAN BE ISOLATED FOR REPAIRS, AT ALL BRANCH LINES CONNECTING MAINS, AND ELSEWHERE AS SHOWN ON DRAWINGS. INSTALL CHILLED AND HOT WATER CONTROL VALVES IN ACCORDANCE WITH VALVE MANUFACTURER'S INSTRUCTIONS AND UNDER THE DIRECT SUPERVISION OF THE BAS INSTALLATION CONTRACTOR.

27. STRAINERS: LOCATE STRAINERS AHEAD OF EACH AUTOMATIC CONTROL VALVE, SUCTION SIDE OF EACH PUMP AND ELSEWHERE AS SHOWN ON DRAWINGS.

28. PIPE HANGER INSTALLATION:

A. SPACE HANGERS FOR HORIZONTAL PIPE AS FOLLOWS:

PVC PIPE	4' ON CENTER MAXIMUM
COPPER PIPE	
1/2" AND SMALLER	6' ON CENTER MAXIMUM
3/4" TO 1-1/2"	8' " " "
STEEL PIPE	12' ON CENTER MAXIMUM

B. ATTACH HANGER RODS TO SUFFICIENTLY RIGID STRUCTURAL BUILDING MEMBERS. IF HANGERS SHALL BE ATTACHED TO EITHER THE TOP CHORD OR BOTTOM CHORD OF STEEL BAR JOIST, ATTACH THE RODS BY CLAMP AT THE PANEL POINTS. DO NOT UNDER ANY CIRCUMSTANCES BURN OR DRILL HOLES IN EITHER CHORD. DO NOT WELD EITHER CHORD. PROVIDE ADDITIONAL HANGERS OR ANCHORING DEVICES NECESSARY FOR PROPER SUPPORT OF PIPING AT CORNERS, TOPS OF RISERS, ETC. PROVIDE GALVANIZED STEEL SHIELDS OVER PIPE INSULATION AT PIPE SUPPORTS.

29. CHEMICAL WATER TREATMENT: AFTER CHILLED AND HOT WATER PIPING HAS BEEN COMPLETED AND TESTED, FLUSH ALL PIPING AND REFILL SYSTEMS WITH WATER CONTAINING WATER TREATMENT CHEMICALS AS APPROVED BY THE OWNER.

30. HVAC DUCT WORK

A. INSTALL ALL DUCT WORK IN ACCORDANCE WITH SMACNA STANDARDS. INSTALL EXTRACTORS AND AIR BALANCE DAMPERS IN ALL BRANCH TAKE OFFS INCLUDING TAKE OFFS TO SUPPLY DIFFUSERS. PAINT INSIDE OF DIFFUSERS AND DUCT VISIBLE THROUGH DIFFUSERS FLAT BLACK.

B. SUPPORT DUCT FROM BUILDING STRUCTURE WITH STRAPS, RODS, OR ANGLES AS DETAILED IN "HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE" AS PUBLISHED BY SMACNA. HORIZONTAL AND DIAGONAL JOIST BRIDGING SHALL NOT BE CONSIDERED PART OF BUILDING STRUCTURE FOR DUCT SUPPORTING PURPOSES. WHERE JOIST ARE LOCATED TOO FAR APART FOR DUCT SUPPORT OR DUCT RUNS ARE PARALLEL TO JOIST, PROVIDE ANGLES BETWEEN JOIST DESIGNED TO SUPPORT DUCT WITHOUT SAGGING.

31. BALANCE DAMPERS

A. INSTALL BALANCE DAMPERS AT ALL BRANCH CONNECTIONS AND OTHER LOCATIONS SHOWN ON DRAWINGS. INSTALL BALANCE DAMPERS AT ALL FLEX DUCT CONNECTIONS FOR DIFFUSERS EXCEPT WHERE ONLY ONE DIFFUSER IS CONNECTED TO BRANCH DUCT.

B. INSTALL AUTOMATIC/MOTOR OPERATED VOLUME DAMPERS WHERE SHOWN ON DRAWINGS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTION.

32. CONTROLS: FURNISH ALL CONTROLS AND CONTROL WIRING TO PROVIDE FOR PROPER PERFORMANCE OF EQUIPMENT AS REQUIRED BY THE OWNER.

A. INSTALL ROOM TEMPERATURE SENSORS WHERE SHOWN ON DRAWINGS AND 48" ABOVE THE FLOOR UNLESS OTHERWISE NOTED ON DRAWINGS. INSTALL HUMIDISTATS WHERE SHOWN ON DRAWINGS NEXT TO THERMOSTATS.

B. INSTALL SMOKE DETECTORS IN SUPPLY AIR DUCTS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. LOCATE SMOKE DETECTORS IN SUPPLY DUCTS UP-STREAM FROM FIRST DIFFUSER OR BRANCH DUCT CONNECTION. CONNECT SMOKE DETECTORS TO AIR HANDLING UNITS AS REQUIRED TO TURN OFF SUPPLY AIR FAN AND ASSOCIATED EQUIPMENT WHEN SMOKE IS DETECTED. REMOTE STATIONS SHALL BE FLUSH MOUNTED IN 4" SQUARE BOX, AND LOCATED IN A NORMALLY OCCUPIED AREA GENERALLY AS INDICATED ON DRAWINGS.

C. PROVIDE SEQUENCE OF OPERATION FOR OWNER'S APPROVAL

33. EQUIPMENT INSTALLATION

A. INSTALL ALL EQUIPMENT IN ACCORDANCE TO EQUIPMENT MANUFACTURER'S INSTRUCTIONS. INSTALL ALL EQUIPMENT TO PERMIT REMOVAL OF COILS, FAN SHAFTS AND WHEELS, FILTERS, BELT GUARDS, SHEAVES AND DRIVES, AND ALL OTHER PARTS REQUIRING PERIODIC REPLACEMENT OR MAINTENANCE.

B. ARRANGE EQUIPMENT TO PERMIT READY ACCESS TO VALVES, COCKS, TRAPS, STARTERS, MOTORS AND CONTROL COMPONENTS, AND TO CLEAR THE OPENINGS OF SWINGING AND OVERHEAD DOORS AND OF ACCESS PANELS.

C. INSTALL SPRING TYPE VIBRATION ISOLATORS UNDER AIR HANDLING UNITS WHERE SHOWN ON DRAWINGS. INSTALL NEOPRENE INERTIA PADS UNDER FLOOR-MOUNTED AIR HANDLING UNITS WITH INTERNAL SPRING ISOLATION.

34. IDENTIFICATION OF EQUIPMENT

A. SECURELY ATTACH MANUFACTURER'S NAMEPLATE TO ALL EQUIPMENT GIVING DATA AS TO DESIGN AND OPERATING CHARACTERISTICS.

B. SECURELY ATTACH NAMEPLATES TO ALL SWITCHES, STARTERS, GAUGES, CONTROL DEVICES, INCLUDING THERMOSTATS, AND SIMILAR ITEMS, GIVING THE NAME AND NUMBER OF THE ITEM OF EQUIPMENT TO WHICH IT IS CONNECTED.

C. IDENTIFY ALL PIPING THROUGHOUT THE BUILDING WITH A LEGEND GIVING THE NATURE OF THE SERVICE AND DIRECTION OF FLOW. USE CHARACTERS OF SUFFICIENT SIZE TO BE READ FROM THE FLOOR LEVEL BELOW THE PIPING. PLACE LEGENDS AND ARROWS ADJACENT TO EACH CHANGE OF DIRECTION AND INTERMEDIATELY AS NECESSARY FOR PROPER IDENTIFICATION FROM REASONABLE ACCESS POINTS.

D. ATTACH IDENTIFICATION TAGS ON EACH VALVE WITH "S" HOOKS OR CHAINS. VALVE TAGS ARE TO CONTAIN THE VALVE NUMBER, LETTER, OR OTHER REQUIRED IDENTIFICATION.

35. INSULATION - GENERAL

A. USE APPLICATION DETAILS IN ACCORDANCE WITH THE INSULATING MATERIAL SUPPLIER'S RECOMMENDATIONS EXCEPT WHERE A HIGHER STANDARD IS SPECIFIED HEREIN. CLEAN EXTERIOR OF ALL PIPING AND DUCT WORK OF FOREIGN SUBSTANCES, INCLUDING MOISTURE, PRIOR TO APPLICATION OF INSULATION. APPLY INSULATION TO PIPING AND DUCT WORK WITH ALL JOINTS TIGHTLY FITTED TO ELIMINATE VOIDS. REPLACE BROKEN OR DAMAGED INSULATION WITH NEW INSULATION AND JOINT MATERIAL.

B. REPLACE OR REPAIR ALL EXISTING INSULATION DISTURBED BY NEW WORK AND REFINISH TO MATCH ADJACENT INSULATION.

36. PIPING INSULATION - GENERAL: RUN COVERING FOR PIPING UNBROKEN THROUGH HANGER CLEVISES, SLEEVES, ETC. AVOID METAL-TO-METAL CONTACT BETWEEN PIPES AND HANGERS. PROVIDE AN INSERT, NOT LESS THAN 6" LONG, OF THE SAME THICKNESS AND CONTOUR AS ADJOINING INSULATION, BETWEEN SUPPORT SHIELD AND PIPING, BUT UNDER THE FINISH JACKET, ON PIPING 2" OR LARGER, TO PREVENT INSULATION FROM SAGGING AT SUPPORT POINTS. USE HEAVY DENSITY INSULATING MATERIALS SUITABLE FOR THE SPECIFIED TEMPERATURE RANGE AND STRONG ENOUGH TO PREVENT CRUSHING. COVER FITTINGS, VALVES, IRREGULAR SURFACES, ETC., WITH SAME INSULATION SPECIFIED FOR PIPING INCLUDING JACKET. CUT JACKET TO FIT WITHOUT WRINKLES OR FOLDS.

37. HOT WATER PIPING INSULATION: INSULATE ALL HOT WATER SUPPLY AND RETURN PIPING WITH INSULATION TYPE SPECIFIED. COVER INSULATION WITH ALL SERVICE JACKETING. APPLY ALL SERVICE JACKET IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS INSURING MINIMUM 2" LAP AT ALL LONGITUDINAL JOINTS. BUT ALL CIRCUMFERENTIAL JOINTS TIGHTLY TOGETHER AND COVER WITH 3" WIDE BUTT STRIPS. SEAL ALL LAPS AND BUTT STRIPS OR USE ADHESIVE FACED (SELF-SEAL) MATERIAL.

38. CHILLED WATER PIPING INSULATION: INSULATE ALL CHILLED WATER SUPPLY AND RETURN PIPING WITH INSULATION TYPE SPECIFIED. COVER INSULATION WITH ALL SERVICE JACKETING. APPLY ALL SERVICE JACKET IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS INSURING MINIMUM 2" LAP AT ALL LONGITUDINAL JOINTS. BUT ALL CIRCUMFERENTIAL JOINTS TIGHTLY TOGETHER AND COVER WITH 3" WIDE BUTT STRIPS. SEAL ALL LAPS AND BUTT STRIPS OR USE ADHESIVE FACED (SELF-SEAL) MATERIAL.

39. DUCT WORK INSULATION: INSULATE ALL SHEET METAL SUPPLY AIR, OUTSIDE AIR AND RETURN AIR DUCT WORK WITH FLEXIBLE EXTERNAL INSULATION. INSULATE BACKS AND NECKS OF ALL DIFFUSERS AND RETURN GRILLES WITH FLEXIBLE EXTERNAL INSULATION.

40. AIR AND WATER SYSTEM TEST AND BALANCE

A. PLACE ALL HEATING, VENTILATING, AND AIR CONDITIONING SYSTEMS AND EQUIPMENT INTO FULL OPERATION AND MAINTAIN OPERATION DURING TEST AND BALANCE OPERATION. MAKE ANY CHANGES REQUIRED FOR CORRECT BALANCE AS REQUIRED. SUCH CHANGES MAY ENCOMPASS BUT ARE NOT LIMITED TO PULLEYS, BELTS, DUCT WORK, DAMPERS, OR THE ADDITION OF DAMPERS AND ACCESS DOORS.

B. MARK ALL DUCT TRAVERSE POINTS AND OTHER INFORMATION ON SET OF REPRODUCIBLE HVAC DRAWINGS. ASSIGN ID NUMBERS TO ALL DIFFUSERS AND GRILLES, NOTE ID NUMBERS ON REPRODUCIBLE HVAC DRAWING, AND USE ID NUMBERS IN TAB REPORT.

C. BEFORE COMMENCING TEST AND BALANCE WORK, VERIFY THAT SYSTEMS ARE COMPLETE AND OPERABLE. ENSURE THE EQUIPMENT IS OPERABLE AND IN A SAFE AND NORMAL CONDITION, TEMPERATURE CONTROL SYSTEMS ARE INSTALLED COMPLETE AND OPERABLE, PROPER THERMAL OVERLOAD PROTECTION IS IN PLACE FOR ELECTRICAL EQUIPMENT, FINAL FILTERS ARE CLEAN AND IN PLACE. CORRECT FAN ROTATION, DUCT SYSTEMS ARE CLEAN OF DEBRIS AND DUCT SYSTEM LEAKAGE HAS BEEN MINIMIZED.

D. ADJUST ALL AIR AND WATER SYSTEMS TO THE DESIGN VALUES. TEST AND RECORD ALL ACTUAL MOTOR CURRENTS AND NOTE CORRESPONDING NAMEPLATE FULL LOAD AMPERES. TEST AND ADJUST EACH DIFFUSER, GRILLE AND REGISTER TO WITHIN 5% OF DESIGN REQUIREMENTS AND IDENTIFY AND LIST EACH GRILLE, DIFFUSER AND REGISTER. USE MANUFACTURER'S RATINGS ON ALL EQUIPMENT FOR REQUIRED CALCULATIONS.

E. RECORDED DATA SHALL REPRESENT ACTUALLY MEASURED, OR OBSERVED CONDITIONS. PERMANENTLY MARK SETTINGS OF DAMPERS AND OTHER ADJUSTMENT DEVICES ALLOWING SETTINGS TO BE RESTORED. SET AND LOCK MEMORY STOPS. AFTER ADJUSTMENT, TAKE MEASUREMENTS TO VERIFY BALANCE HAS NOT BEEN DISRUPTED OR THAT SUCH DISRUPTION HAS BEEN RECTIFIED.

F. LEAVE SYSTEMS IN PROPER WORKING ORDER, REPLACING BELT GUARDS, CLOSING ACCESS DOORS, CLOSING DOORS TO ELECTRICAL SWITCH BOXES, AND RESTORING THERMOSTATS TO SPECIFIED SETTINGS.

G. UPON COMPLETION OF TEST AND BALANCE WORK, INSERT ALL DATA, INCLUDING COPY OF MARKED-UP HVAC DRAWING, INTO A COMPLETE TYPEWRITTEN REPORT AND SUBMIT SIX (6) COPIES OF THIS REPORT TO THE OWNER.

41. INSTRUCTION OF OWNER'S REPRESENTATIVE: AFTER FINAL ACCEPTANCE OF ALL WORK AND OCCUPANCY OF BUILDING, PROVIDE SERVICE TO MAKE SYSTEM ADJUSTMENTS TO SUIT CONDITIONS CREATED BY THE OCCUPANCY; INSTRUCT OWNER'S OPERATING PERSONNEL IN OPERATION ADJUSTMENT AND MAINTENANCE PROCEDURES OF SYSTEM COMPONENTS, ACQUAINT THEM WITH LOCATIONS AND FUNCTIONS OF VALVES, CONTROL DEVICES, ETC., IN THE SYSTEM, AND INSTRUCT THEM IN THE OPERATION OF THE HVAC CONTROL SYSTEM.

42. CLEANING AND RUBBISH

A. DURING THE WORK, KEEP THE PREMISES CLEAR OF RUBBISH CREATED AS A RESULT OF THE WORK. PROTECT AND PREVENT UNNECESSARY INDUCTION OF DIRT AND THOROUGHLY CLEAN ALL EQUIPMENT USED FOR TEMPORARY HEAT AND/OR VENTILATION.

B. USE AND MAINTAIN ADEQUATE FILTERS IN ALL FAN COIL EQUIPMENT USED FOR TEMPORARY HEAT AND/OR VENTILATION. REPLACE WITH NEW FILTERS AFTER CONSTRUCTION AND BEFORE UNITS ARE PLACED IN SERVICE. CLOSE ALL AIR DUCT OPENINGS TO EFFECTIVELY PREVENT THE ENTRANCE OF DUST AND CONSTRUCTION DEBRIS DURING CONSTRUCTION.

C. ON COMPLETION OF THE WORK, REMOVE ALL RUBBISH AND DEBRIS RESULTING FROM THE WORK AND DISPOSE OF SAME. THOROUGHLY CLEAN AND LEAVE IN A SATISFACTORY CONDITION FOR USE ALL EQUIPMENT, PIPE, FIXTURES, DUCT WORK, ETC.

43. COMPLETE SYSTEMS

A. LEAVE ALL SYSTEMS COMPLETELY OPERATIVE IN ALL DETAILS AND IN SATISFACTORY WORKING CONDITION, AS DETERMINED BY THE OWNER. FURNISH AND INSTALL AS PART OF THIS CONTRACT ALL APPARATUS AND MATERIAL OBVIOUSLY A PART OF THE SYSTEMS AND NECESSARY FOR THEIR OPERATION.

B. COORDINATE WORK SPECIFIED HEREIN AND SHOWN ON MECHANICAL DRAWINGS AND INSURE COMPLETION IN A TIMELY AND PROPER MANNER. PRIOR TO REQUESTING "SUBSTANTIAL COMPLETION INSPECTION", PROVIDE THE OWNER WITH LETTER STATING ALL REQUIREMENTS OF THIS SECTION HAVE BEEN MET. LETTER SHALL CONTAIN ITEMIZED LIST INDICATING EACH ITEM HAS BEEN PERSONALLY CHECKED BY THE SUPERINTENDENT AND THAT IT IS READY FOR INSPECTION. WITH LETTER, PROVIDE REPORTS, SCHEDULES, ETC., AS REQUIRED. THIS SECTION IS INTENDED AS A CHECKLIST TO INSURE ITEMS SPECIFIED ARE PROPERLY INSTALLED AND TO INSURE AGAINST PREMATURE "SUBSTANTIAL COMPLETION INSPECTION" REQUESTS.

C. CHECK AIR DISTRIBUTION SYSTEMS AND INSURE SYSTEMS ARE PROPERLY TESTED AND BALANCED. CHECK FILTERS AND, IF DIRTY, INSTALL NEW FILTERS IN UNITS WITH DISPOSABLE TYPE FILTERS AND REMOVE, WASH AND REINSTALL FILTERS IN UNITS WITH PERMANENT TYPE FILTERS. DIRTY FILTERS SHALL BE DEFINED AS PRESSURE DROP EXCEEDING 0.5" W.G. PROVIDE ONE ADDITIONAL SET OF DISPOSABLE AND/OR METAL, WASHABLE, PERMANENT, TYPE FILTERS AS APPLICABLE FOR EACH UNIT. LUBRICATE FANS, MOTORS, AND ALL OTHER MOVING EQUIPMENT REQUIRING LUBRICATION. PROVIDE A MAINTENANCE SCHEDULE LISTING EACH PIECE OF EQUIPMENT REQUIRING LUBRICATION, POINTS TO BE LUBRICATED, PRODUCT AND DEVICE TO BE USED, AND FREQUENCY OF LUBRICATION REQUIRED.

D. CHECK AND INSURE ALL EQUIPMENT IS PROPERLY INSTALLED, MOUNTED AS SPECIFIED OR SHOWN AND IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. AT EQUIPMENT START-UP, INSURE CONTROLS, POWER WIRING, AND INTERLOCKS ARE COMPLETE. CHECK ALIGNMENT OF MOTORS AND DRIVES. VERIFY OVERLOAD HEATERS ARE PROPERLY SIZED AND INSTALLED. CHECK FOR PROPER MOTOR ROTATION. PROVIDE SPECIFIED SYSTEM IDENTIFICATION.

E. PROVIDE FOR THOROUGH CLEANING OF INSTALLATION. CLEANING SHALL INCLUDE REMOVING TEMPORARY COVERS; REMOVING ADHESIVE APPLIED STICKERS EXCEPT THOSE GIVING SPECIFIC MAINTENANCE INSTRUCTIONS WHICH WERE INTENDED TO REMAIN ON EQUIPMENT; REMOVING CORD AND WIRE AFFIXED TAGS; REMOVING PAINT, COATING AND ADHESIVE SPATTERS; AND VACUUMING INSIDE AIR HANDLING UNIT PLENUMS.

F. PROVIDE FOR TOUCH-UP PAINTING OF FACTORY FINISHED EQUIPMENT. TOUCH-UP PAINTING IS INTENDED TO COVER MINOR DENTS, SCRATCHES, AND SCUFF MARKS. PREPARE SURFACE BY LIGHT SANDING OR REMOVE RUST WITH CHEMICAL COMPOUNDS DESIGNED FOR APPLICATION AND COAT SURFACE WITH PRIMER FOLLOWED BY MATCHING TOP COAT. WHERE EQUIPMENT HAS MAJOR SURFACE DAMAGE AND/OR RUSTING, REFINISH ENTIRE EQUIPMENT SURFACES AS DIRECTED BY THE OWNER.

G. PROVIDE ALL SPECIFIED OPERATION AND MAINTENANCE MANUALS TO THE OWNER.

END OF SPECIFICATION

2/16/12
1402M6SPEC

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P&H ENGINEERING

SUWANNEE COUNTY MIDDLE SCHOOL
HVAC MODIFICATIONS – BUILDING 7
LIVE OAK, FLORIDA

DATE: 2/17/12
SCALE: NA
DRAWN: RLH
JOB: 1402
SHEET: M-6
OF 6 SHEETS

GENERAL

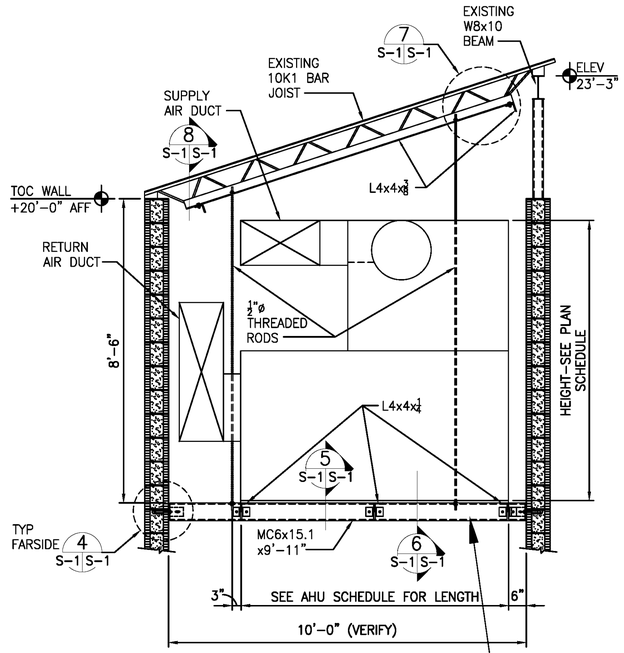
1. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS RELATING TO EXISTING CONSTRUCTION BY MAKING FIELD MEASUREMENTS PRIOR TO COMMENCING WORK.
2. CONTRACTOR SHALL PROTECT EXISTING STRUCTURES AND UTILITIES FROM DAMAGE.
3. TEMPORARY SHORING & BRACING FOR CONSTRUCTION IS THE RESPONSIBILITY OF THE CONTRACTOR
4. ALL CONSTRUCTION DEBRIS SHALL BE REMOVED FROM SITE & DISPOSED OF BY THE CONTRACTOR.
5. ALL WORK SHALL BE PERFORMED BY LICENSED & QUALIFIED SUBCONTRACTORS & CONTRACTORS
6. SCALE SHOWN ON DRAWINGS IS FOR REFERENCE ONLY. DRAWINGS SHALL NOT BE SCALED & ITEMS SHALL NOT BE CONTRUCTED FROM SCALED DRAWINGS. CALL ENGINEER IF IT CANNOT BE CONTRUCTED WITH DIMENSIONS SHOWN OR CONFLICTS WITH OTHER DRAWINGS. WRITTEN DIMENSIONS SHALL HAVE PRECEDENCE OVER SCALED DIMENSIONS.

STRUCTURAL STEEL

1. ALL STEEL ANGLES & CHANNELS SHALL BE ASTM A36 UNLESS OTHERWISE NOTED.
2. ALL WORK SHALL CONFORM TO THE LATEST EDITION OF THE AISC SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS.
3. SHOP CONNECTIONS SHALL BE WELDED. USE E70XX ELECTRODES.
4. FIELD CONNECTIONS SHALL BE BOLTED USING ASTM A307 BOLTS.
5. PROVIDE ONE SHOP COAT PRIMER ON ALL STEEL.
6. TEMPORARY BRACING & SHORING OF STRUCTURAL STEEL ELEMENTS IS THE RESPONSIBILITY OF THE CONTRACTOR.
7. THREADED ROD SHALL BE ASTM A36
8. ALL WELD OPERATORS SHALL BE AWS QUALIFIED.

CODE

1. FLORIDA BUILDING CODE 2004 EDITION WITH 2006 REVISIONS.

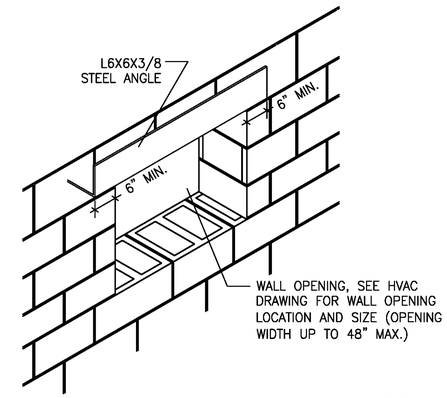


AIR HANDLING UNIT SUSPENSION DETAIL 1 S-1 S-1
NTS

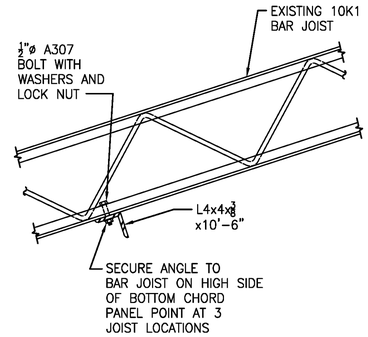
NOTE: PROVIDE 4" I-BEAM UNDER BOTH SIDES OF AIR HANDLING UNIT

AHU	LENGTH	WIDTH	HEIGHT	WEIGHT
41	83"	75"	90"	2.918#
42	83"	75"	90"	3.017#
61	83"	78"	96"	3.375#
62	89"	84"	102"	3.670#
71	78"	81"	90"	3.025#
72	83"	78"	96"	3.370#

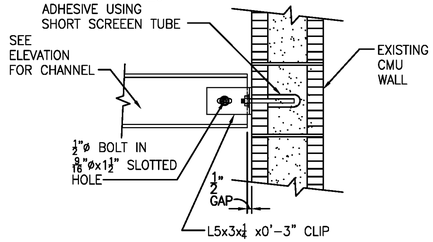
AIR HANDLING UNIT 2 SCHEDULE S-1 S-1
NTS



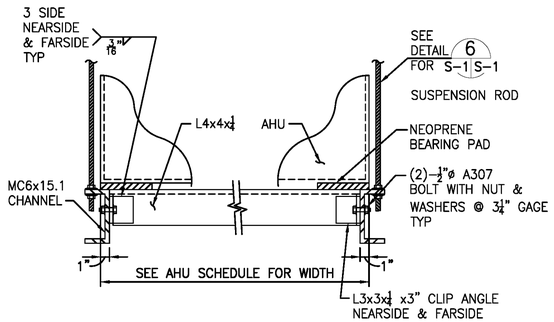
WALL FRAMING CMU WALL OPENING SECTION 9 S-1 S-1
NTS



BAR JOIST CONNECTION 3 S-1 S-1
NTS



CHANNEL TO CMU WALL CONNECTION 4 S-1 S-1
NTS



ANGLE TO CHANNEL CONNECTIONS 5 S-1 S-1
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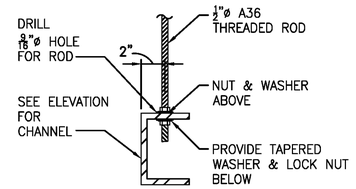
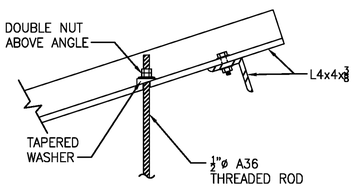
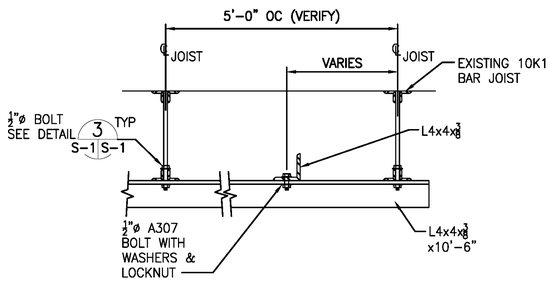


SUSPENSION ROD TO CHANNEL CONNECTION 6 S-1 S-1
NTS



SUSPENSION ROD TO GRID-IRON CONNECTION 7 S-1 S-1
NTS



ROOF FRAMING GRID-IRON SECTION 8 S-1 S-1
NTS

2/15/12
1947S1

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P&H ENGINEERING

SUWANNEE COUNTY MIDDLE SCHOOL
HVAC MODIFICATIONS - BUILDING 7
LIVE OAK, FLORIDA

DATE: 2/17/12
SCALE: AS NOTED
DRAWN: RLH
JOB: 1947
SHEET: S-1
OF 1 SHEETS