NEW VARIABLE VOLUME TERMINAL BOX SCHEDULE

DESIGNATION	1	15	21	24	25	26	27	28	31	35	36	37	38	39	41	43	44	45	49	50	51	56	57	60	80	81	82	83
SPACE NUMBER	1116	2141	2116A	2125	2124	2123	2122	2111	2117	2212	2207	2210	2201	2210	2212	2148	2148	2165	2177	2179	2194	2184	2181	2187	2132	2132E	2132E	2135
CFM	750	815	350	1156	533	731	485	538	491	837	1586	770	872	770	837	600	600	2936	760	806	794	835	1079	501	666	625	625	1170
MIN SUPPLY CFM	486	326	113	463	267	366	194	265	246	420	397	273	436	273	420	328	328	1100	380	403	199	335	270	125	333	250	250	470
MAX SP-H_2O	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
SOUND POWER LEVEL (NC) - MAX.	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
MODEL VCWF	08	08	05	10	08	08	06	08	06	08	12	08	08	08	08	08	08	14	08	08	08	08	10	06	08	08	08	10
DUCT RUN-OUT SIZE	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	14"	EXISTING	EXISTING	EXISTING	EXISTING		EXISTING	EXISTING	EXISTING	EXISTING	11"	EXISTING	12"	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING
REHEAT COIL																												
BTU HR	18,983	13,706	5886	19,441	8480	14,295	9472	8913	8274	14,127	26,673	12,950	14,665	12,950	14,665	11,365	11,365	49,376	12,781	13,555	13,353	14,043	18,146	8408	13,730	8951	8951	16,981
ENT WTR TEMP (F°)	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°
GPM	1.9	1.4	0.6	1.9	0.9	1.4	0.9	0.9	0.8	1.4	2.7	1.3	1.5	1.3	1.5	1.1	1.1	4.9	1.3	1.4	1.3	1.4	1.8	0.8	1.4	0.9	0.9	1.7
ROWS	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D
WTR PD FT. (MAX.)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
EAT DB.	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	47°F	47°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	47°F	47°F	47°F	47°F
LAT DB.	85°F	80°F	80°F	80°F	80°F	85°F	85°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	85°F	90°F	90°F	90°F	80°F
PIPING RUN-OUT SIZE	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING

REMARKS: (ALL NOTES APPLY TO ALL BOXES)

① ALL BOXES TO BE PRESSURE INDEPENDENT.
② DUCT RUN-OUT SIZE DOES NOT MEAN INLET BOX SIZE. A TRANSITION MAY BE REQUIRED.
③ ALL BOXES TO BE EQUIPPED WITH DDC AUXILIARY TEMPERATURE SENSOR.
④ SEE SHEET M-504 FOR VAV BOX PLENUM DETAIL (CONNECTIONS TO DIFFUSERS).
⑤ CONTRACTOR TO VERIFY ALL VALVE BOX NUMBERS MATCH SPACE NUMBERS AS INDICATED ON SCHEDULE.

NEW VARIABLE VOLUME TERMINAL BOX SCHEDULE

DESIGNATION	84	85	89	90	92	99	101	103	104	114	115	117	125	134	136	138	139	142	145	153	156	159	160	161	162	163	165	166
SPACE NUMBER	2133	2128	2132	2132	2129	2107	2120	2109	2109A	2199	2208	2208	2150A	2150D	2149	2151	2151	2151B	2176	2160B	2162	2218	2218	2217	2211	2115	2205	2205
CFM	1321	1121	666	666	904	1130	1567	507	435	1420	813	813	637	93	1151	573	573	178	726	646	109	475	475	750	887	797	548	548
MIN SUPPLY CFM	667	490	333	333	226	619	627	80	200	675	407	407	255	24	378	144	144	89	271	258	40	194	194	214	222	399	274	219
MAX SP-H_2O	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
SOUND POWER LEVEL (NC)	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
MODEL VCWF	10	10	08	08	08	10	12	06	06	14	08	08	08	04	10	08	08	04	08	08	04	06	06	08	08	08	08	08
DUCT RUN-OUT SIZE	12"	12"	EXISTING	EXISTING	EXISTING	12"	EXISTING	8"	8"	14"	EXISTING	EXISTING	EXISTING	EXISTING	12"	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING
REHEAT COIL																												
BTU HR	22,216	18,852	13,730	13,730	15,203	20,820	28,053	8527	7315	27,733	13,689	13,689	12,440	1564	19,660	9636	9636	2993	11,751	12,616	1833	9277	7988	14,648	17,323	13,403	9216	7366
ENT WTR TEMP (F°)	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°
GPM	2.2	1.9	1.4	1.4	1.5	2.1	2.8	0.9	0.7	2.8	1.4	1.4	1.2	0.2	1.9	1.0	1.0	0.3	1.2	1.3	0.2	0.9	0.8	1.5	1.7	1.3	0.9	0.7
ROWS	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D
WTR PD FT. (MAX.)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
EAT DB.	49°F	49°F	47°F	47°F	49°F	49°F	47°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F
LAT DB.	80°F	80°F	85°F	85°F	80°F	80°F	85°F	80°F	80°F	85°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	85°F	80°F	85°F	80°F	85°F	85°F	80°F	80°F	85°F
PIPING RUN-OUT SIZE	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING

REMARKS: (ALL NOTES APPLY TO ALL BOXES)

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NEW VARIABLE VOLUME TERMINAL BOX SCHEDULE

DESIGNATION	167	168	169	170	171A	174	176	180A	181A	184	185	188	189	191	192	193	196	197	198	199	200	202	203	205	207	208	215	220
SPACE NUMBER	2203B	2203A	2119	2119	1178	1186	1186	1126	1126	1125A	1125B	1135	1137	1172	1190	1190	1196	1196	1212C	1212	1212B	1205	1204	1201	1192A	1197	1179	1189
CFM	744	731	320	320	1609	1120	1120	1911	1911	346	346	498	959	1708	592	592	492	492	2408	493	394	918	917	1339	960	1418	1120	1044
MIN SUPPLY CFM	372	366	155	155	646	450	450	955	955	173	173	182	240	854	174	174	194	194	641	123	99	230	230	670	240	709	353	313
MAX SP-H_2O	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		0.5
SOUND POWER LEVEL (NC)	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
MODEL VCWF	08	08	05	05	12	10	10	12	12	05	05	06	10	12	08	08	06	06	16	06	06	10	10	10	10	12	10	10
DUCT RUN-OUT SIZE	EXISTING	EXISTING	EXISTING	EXISTING	14"	EXISTING	EXISTING	14"	14"	EXISTING	EXISTING	EXISTING	12"	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	18"	9"	9"	EXISTING	EXISTING	EXISTING	12"	14"	12"	12"
REHEAT COIL																												
BTU HR	14,530	14,276	5382	5382	27,059	15,136	15,136	37,322	37,322	5819	5819	8375	16,128	28,724	9956	9956	8274	8274	40,497	8291	6626	15,439	15,439	22,535	18,949	23,847	18,836	17,558
ENT WTR TEMP (F°)	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°
GPM	1.5	1.4	0.5	0.5	2.7	1.5	1.5	3.7	3.7	0.6	0.6	0.8	1.6	2.9	1.0	1.0	0.8	0.8	4.0	0.8	0.7	1.5	1.5	2.3	1.9	2.4	1.9	1.8
ROWS	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D
WTR PD FT. (MAX.)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
EAT DB.	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	47°F	47°F	47°F	47°F	47°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F
LAT DB.	85°F	85°F	80°F	80°F	80°F	80°F	80°F	85°F	85°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F
PIPING RUN-OUT SIZE	EXISTING	EXISTING	EXISTING	EXISTING	¾"	EXISTING	EXISTING	1"	1"	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	1"	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	1"	EXISTING	EXISTING

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NEW VARIABLE VOLUME TERMINAL BOX SCHEDULE

DESIGNATION	221	224	225	238	239	240	241	241A	245	246	247	248	248A	249	250	258	260	263	267	275	277	278	283	288	290	293	295	
SPACE NUMBER	1189	1193	1193	1106	1121	1210	1115	1115	1127	1127	1133	1131	1131	1130	1130A	1118G	1164E	1163D	1142	1161A	1161	1161	1148	1150	1150A	1152A	1152B	
CFM	1044	502	502	704	658	1245	1042	1042	2654	2654	575	600	600	1215	1570	188	290	1603	714	550	635	635	2691	537	200	113	113	
MIN SUPPLY CFM	313	157	157	174	165	654	372	372	1327	1327	400	180	180	608	728	94	73	802	294	200	159	159	1076	134	80	57	57	
MAX SP-H_2O	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
SOUND POWER LEVEL (NC)	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	
MODEL VCWF	10	06	06	08	08	10	10	08	14	14	08	08	08	10	12	04	05	12	08	08	08	08	14	06	04	04	04	
DUCT RUN-OUT SIZE	12"	EXISTING	EXISTING	10"	10"	12"	12"	10"	16"	16"	EXISTING	11"	11"	12"	14"	EXISTING	EXISTING	14"	10"	10"	12"	12"	EXISTING	EXISTING	EXISTING	EXISTING	7"	
REHEAT COIL																												
BTU HR	17,558	8,350	8,350	11,840	11,066	25,545	17,524	17,524	44,936	44,936	13,020	10,090	10,090	20,450	26,403	3162	4877	26,975	9889	10,742	10,679	10,679	45,255	9031	3364	1900	1900	
ENT WTR TEMP (F°)	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	
GPM	1.8	0.8	0.8	1.2	1.1	2.6	1.8	1.8	4.5	4.5	1.3	1.0	1.0	2.0	2.6	0.3	0.5	2.7	1.0	1.1	1.1	1.1	4.5	0.9	0.3	0.2	0.2	
ROWS	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	
WTR PD FT. (MAX.)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
EAT DB.	49°F	49°F	49°F	47°F	49°F	49°F	47°F	47°F	47°F	47°F	47°F	47°F	47°F	47°F	47°F	47°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	
LAT DB.	80°F	80°F	80°F	80°F	80°F	85°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	85°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	
PIPING RUN-OUT SIZE	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	¾"	1¼"	1¼"	EXISTING	EXISTING	¾"	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	1"	EXISTING	EXISTING	EXISTING	EXISTING	

REMARKS: (ALL NOTES APPLY TO ALL BOXES)

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THESE DOCUMENTS HAVE BEEN PREPARED PRIMARILY BASED ON INFORMATION PROVIDED BY OTHERS. I.C. THOMASSON HAS NOT VERIFIED THE ACCURACY OF ALL INFORMATION PROVIDED BY OTHERS. SEE LIMIT OF LIAIBILITIES STATEMENT ON COVER SHEET.

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Description / Date / Symbol / Appr.

Date: 02/27/04
Checked by: WTT
Dwn by: ICT
CADD File Name: 312M001.DGN
DACA87-03-D-0006
ICT Project No. 203121
Plot date: 02/27/04
Approved by: Chief, Prj. Mgmt. Division
Plot scale:

TASK ORDER #: FRA004

VANGUARD

PADUCAH, KENTUCKY VOICE 270-442-8620

I.C. Thomasson Associates Inc.
NASHVILLE, TENNESSEE PHONE (615) 346-3400

ICT

DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND

MECHANICAL SCHEDULES

Sheet reference number:
M-001

NEW VARIABLE VOLUME TERMINAL BOX SCHEDULE

DESIGNATION	296	300	302	303	307	309	310	311	313	314	316	318	319	320	321	322	323	327	329	330	331
SPACE NUMBER	1174	1175	1177A	1177B	1176	1177C	1177D	1169	1142	1142	1155	1153	1154	1154	1154	1154	1154	1151, 1151A	1145	1142	1142
CFM	1066	518	253	253	518	253	253	1363	1110	1110	780	789	1115	1115	1115	1115	1115	406	858	1000	1250
MIN SUPPLY CFM	267	130	127	127	130	127	127	235	820	820	312	197	330	330	330	330	330	203	215	500	625
MAX SP-H_2O	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
SOUND POWER LEVEL (NC)	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
MODEL VCWF	10	06	05	05	06	05	05	10	10	10	08	08	10	10	10	10	10	06	08	10	10
DUCT RUN-OUT SIZE	12"	8"	EXISTING	EXISTING	8"	EXISTING	EXISTING	12"	EXISTING	EXISTING	11"	11"	12"	EXISTING	EXISTING	EXISTING	EXISTING	8"	12"	EXISTING	EXISTING
REHEAT COIL																					
BTU HR	17,927	8712	4255	4255	8712	4255	4255	22,922	27,581	27,581	13,118	13,269	18,751	18,751	21,776	18,751	18,751	6828	14,429	19,530	24,413
ENT WTR TEMP (F°)	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°
GPM	1.8	0.9	0.4	0.4	0.9	0.4	0.4	2.3	2.8	2.8	1.3	1.3	1.9	1.9	2.2	1.9	1.9	0.7	1.4	2.0	2.4
ROWS	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D	AS REQ'D
WTR PD FT. (MAX.)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
EAT DB.	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F	49°F
LAT DB.	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	80°F	85°F	80°F	80°F	80°F	85°F	80°F	80°F	80°F	80°F	85°F	85°F
PIPING RUN-OUT SIZE	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING

REMARKS: (ALL NOTES APPLY TO ALL BOXES)

① ALL BOXES TO BE PRESSURE INDEPENDENT.
② DUCT RUN-OUT SIZE DOES NOT MEAN INLET BOX SIZE. A TRANSITION MAY BE REQUIRED.
③ ALL BOXES TO BE EQUIPPED WITH DDC AUXILIARY TEMPERATURE SENSOR.
④ SEE SHEET M-504 FOR VAV BOX PLENUM DETAIL (CONNECTIONS TO DIFFUSERS).
⑤ CONTRACTOR TO VERIFY ALL VALVE BOX NUMBERS MATCH SPACE NUMBERS AS INDICATED ON SCHEDULE.

REBALANCE EXISTING VARIABLE VOLUME TERMINAL BOX SCHEDULE

DESIGNATION	2	3	4	5	6	7	8	9	10	11	12	13	14	16	17	18	19	20	22	23	29	30	32	33	34	40	42	46
SPACE NUMBER	1118L	1118K	1118J	1118H	1118A	1118B	1118C	1118D	1118E	1118F	2135	2137	2139	2108	2110	2112	2114	2116	2143A	2143	2115B	2115A	2216	2216	2214	2214	2230	2171
EXISTING SUPPLY CFM	180	176	176	180	170	170	170	170	170	170	1501	1578	1578	1501	1578	1578	1578	432	432	432	640	640	1380	340	1660	1660	1053	741
NEW SUPPLY CFM	213	195	197	209	173	177	177	177	177	173	1105	1105	1105	1105	1105	1105	1105	383	398	398	557	557	1254	455	957	957	900	747
MINIMUM SUPPLY CFM	53	72	72	73	72	71	71	71	71	69	442	442	442	442	442	442	442	150	179	179	223	223	278	114	479	479	360	208
EXISTING REHEAT COIL BTU	2683	2623	2623	2623	2623	2623	2623	2623	2623	2623	28693	30165	30165	28693	30165	30165	30165	8258	8258	8258	8294	8294	9,000	2,000	11,000	11,000	12623	14142
NEW REHEAT COIL BTU	3582	3279	3313	3515	2909	2977	2977	2977	2977	2909	18,593	18,593	18,593	18,593	18,593	18,593	18,593	6441	6693	6693	9367	9367	23,208	7635	16,111	16,111	15,136	12,563
EXISTING GPM	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	2.8	3.0	3.0	2.8	3.0	3.0	3.0	0.8	0.8	0.8	0.8	0.8	0.9	0.2	1.1	1.1	1.3	1.4
NEW HW GPM	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	1.9	1.9	1.9	1.9	1.9	1.9	1.9	0.6	0.7	0.7	0.9	0.9	2.3	0.8	1.6	1.6	1.5	1.3

REMARKS: (ALL NOTES APPLY TO ALL BOXES)

① USE EXISTING DUCTWORK, PIPE & VAV BOX, REBALANCE TO MEET NEW REQUIREMENTS.
② CONTRACTOR TO VERIFY ALL VAV BOX NUMBERS MATCH SPACE NUMBERS AS INDICATED ON SCHEDULE.

REBALANCE EXISTING VARIABLE VOLUME TERMINAL BOX SCHEDULE

DESIGNATION	47	48	52	53	54	55	58	59	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	78	79	83	86
SPACE NUMBER	2173	2175	2192	2190	2188	2186	2183	2185	2189	2191	2189	2191	2196	2196	2195	2195F	2195E	2195D	2195C	2195B	2195A	2146D	2146A	2146B	2138	2136	2136	2132C
EXISTING SUPPLY CFM	704	704	773	704	704	1620	1998	2001	742	742	742	742	1580	1580	433	95	89	121	60	63	67	25	418	1580	1279	2125	2125	260
NEW SUPPLY CFM	696	760	789	704	790	934	1860	1860	681	665	681	665	1033	1033	528	100	96	160	231	70	80	55	313	1109	1283	1170	1170	320
MINIMUM SUPPLY CFM	217	305	227	222	316	334	680	640	203	209	203	209	266	266	197	40	40	40	116	40	40	40	125	460	642	420	420	85
EXISTING REHEAT COIL BTU	14142	14142	15528	14142	14142	25,000	40136	40136	14905	14908	14905	14908	23,000	23,000	8698	1908	4250	2431	10,000	1266	1346	373	6230	11,000	19055	31671	31671	11,000
NEW REHEAT COIL BTU	11718	12,781	13,269	11718	11,839	11,234	31,280	31,281	11,452	11,183	11,453	11,184	17,284	17,284	8880	1682	1614	2690	3900	2355	1345	1345	5264	17,967	21353	23,554	23,544	5381
EXISTING GPM	1.4	1.4	1.6	1.4	1.4	2.5	4.0	4.0	1.5	1.5	1.5	1.5	2.3	2.3	0.9	0.2	0.2	0.2	1.0	0.1	0.1	0.1	0.6	1.1	1.9	3.2	3.2	1.1
NEW HW GPM	1.2	1.3	1.3	1.2	1.2	1.1	3.1	3.1	1.1	1.1	1.1	1.1	1.7	1.7	0.9	0.2	0.2	0.3	0.4	0.2	0.1	0.1	0.5	1.8	2.1	2.4	2.4	0.5

REMARKS: (ALL NOTES APPLY TO ALL BOXES)

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REBALANCE EXISTING VARIABLE VOLUME TERMINAL BOX SCHEDULE

DESIGNATION	87	88	91	93	94	95	96	97	98	100	102	105	106	107	108	109	110	111	112	113	116	118	119	120	121	122	123	124
SPACE NUMBER	2132	2132D	2132E	2132B	2132G	2132F	2130	2131A	2131B	2120A	2120B	2121	2126A	2126	2126B	2126C	2126D	2126E	2126F	2132A	2206	2206	2197	2197	2198	2200	2200	2200
EXISTING SUPPLY CFM	762	630	660	95	69	282	386	203	80	220	935	460	163	546	222	313	159	80	72	255	1029	1029	1580	1580	350	945	1417	945
NEW SUPPLY CFM	762	835	666	121	100	312	466	215	98	225	886	500	130	553	290	412	214	98	94	372	813	813	1048	1048	504	855	1290	855
MINIMUM SUPPLY CFM	370	209	333	48	40	125	186	86	40	110	355	200	65	221	119	165	86	40	40	149	407	407	314	314	126	460	460	460
EXISTING REHEAT COIL BTU	8000	10,000	8000	1575	1028	4203	5753	3026	1192	2,000	10427	4,000	2429	8138	3309	4665	2370	1192	1073	3801	13996	13996	11,000	11,000	2000	30163	15082	30163
NEW REHEAT COIL BTU	12,815	14,025	13,730	2052	1681	5247	7837	3616	1648	4535	14,900	7161	2186	9300	4877	6929	3599	1648	1581	6256	13,689	13,689	17,187	17,187	8408	15,472	21,695	14,379
EXISTING GPM	0.8	1.0	0.8	0.1	0.1	0.4	0.6	0.3	0.1	0.2	1.0	0.4	0.2	0.8	0.3	0.5	0.2	0.1	0.1	0.4	1.4	1.4	1.1	1.1	0.2	2.0	1.0	3.0
NEW HW GPM	1.3	1.4	1.4	0.2	0.2	0.5	0.8	0.4	0.2	0.5	1.5	0.7	0.2	0.9	0.5	0.7	0.4	0.2	0.2	0.6	1.4	1.4	1.7	1.7	0.8	1.5	2.2	1.4

REMARKS: (ALL NOTES APPLY TO ALL BOXES)

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② CONTRACTOR TO VERIFY ALL VAV BOX NUMBERS MATCH SPACE NUMBERS AS INDICATED ON SCHEDULE.

THESE DOCUMENTS HAVE BEEN PREPARED PRIMARILY BASED ON INFORMATION PROVIDED BY OTHERS. I.C. THOMASSON HAS NOT VERIFIED THE ACCURACY OF ALL INFORMATION PROVIDED BY OTHERS. SEE LIMIT OF LIABILITIES STATEMENT ON COVER SHEET.

STATE OF MARYLAND — MECHANICAL ENGINEER

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Date: 02/27/04 | Checked by: WTT | CADD File Name: 312M002.DGN | ICT Project No. 20312 | Plot date: 02/27/04

Drawn by: ICT | DAC87-03-D-0006 | Approved by: Chief, Prj. Mgmt. Division | Plot scale:

TASK ORDER #: FRR004

ENGINEERED

I.C. Thomasson Associates, Inc.
PADUCAH, KENTUCKY VOICE 270-442-8620
NASHVILLE, TENNESSEE PHONE (615) 346-3400

ICT

DEFENSE INFORMATION SCHOOL
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MECHANICAL SCHEDULES

Sheet reference number:
M-002

REBALANCE EXISTING VARIABLE VOLUME TERMINAL BOX SCHEDULE

DESIGNATION	126	127	128	129	130	131	132	133	135	137	140	141	143	144	146	147	148	149	150	151	152	154	155	157	158	164	171	172
SPACE NUMBER	2150B	2150C	2150	2150	2150	2150	2150	2150	2150E	2150F	2151A	2178	2153	2174	2155	2157	2170	2159	2160A	2160	2160	2160	2160	2160	2160	2209	1178	1178
EXISTING SUPPLY CFM	222	222	1146	1146	1146	1146	1146	1146	73	73	80	147	707	707	707	707	707	707	93	1012	1012	1012	1012	1012	1012	1273	828	828
NEW SUPPLY CFM	205	226	1192	1192	1192	1192	1192	1192	99	99	107	134	1201	726	1201	1148	703	1156	115	867	867	867	867	867	867	1151	696	696
MINIMUM SUPPLY CFM	82	90	596	596	596	596	596	596	40	40	40	40	601	215	601	574	271	578	40	433	433	433	433	433	433	460	309	373
EXISTING REHEAT COIL BTU	3524	2524	18194	18194	18194	18194	18194	18194	1159	1159	1270	2334	8000	11224	8000	8000	11224	9000	1476	16077	16077	16077	16077	16077	16077	16498	9658	9658
NEW REHEAT COIL BTU	3448	3800	20,047	20,047	20,047	20,047	20,047	20,047	1681	1681	1800	2254	20,214	12,210	20,214	19,306	11,823	19,441	1934	14,564	14,564	14,564	14,564	14,564	14,564	19,357	11,705	11,705
EXISTING GPM	0.4	0.3	1.8	1.8	1.8	1.8	1.8	1.8	0.2	0.2	0.1	0.2	0.8	1.1	0.8	0.8	1.1	0.9	0.1	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.0	1.0
NEW HW GPM	0.3	0.4	2.0	2.0	2.0	2.0	2.0	2.2	0.2	0.2	0.2	0.2	2.0	1.2	2.0	2.0	1.2	2.0	0.2	1.5	1.5	1.5	1.5	1.5	1.5	1.9	1.2	1.2

REMARKS: (ALL NOTES APPLY TO ALL BOXES)

① USE EXISTING DUCTWORK, PIPE & VAV BOX, REBALANCE TO MEET NEW REQUIREMENTS.

② CONTRACTOR TO VERIFY ALL VAV BOX NUMBERS MATCH SPACE NUMBERS AS INDICATED ON SCHEDULE.

REBALANCE EXISTING VARIABLE VOLUME TERMINAL BOX SCHEDULE

DESIGNATION	177	178	179	180	181	182	183	186	187	195	201	204	206	209	210	211	212	213	214	216	217	218	219	222	223	226	227	228
SPACE NUMBER	1188	1188	1179A	1126	1126	1128	1128	1124	1114	1194	1205A	1204A	1199	1183ABCD	1184ABCD	1183EFG	1184EFG	1183HJK	1184HJK	1185	1185	1187	1187	1191	1191	1181D	1181C	1181A
EXISTING SUPPLY CFM	828	828	36	1833	1833	1177	1096	1269	876	1500	208	208	1081	48	48	36	36	36	36	525	525	525	525	513	513	850	850	850
NEW SUPPLY CFM	866	866	240	1911	1911	613	613	1234	900	991	234	232	715	94	94	72	63	70	62	356	356	356	356	500	500	781	788	771
MINIMUM SUPPLY CFM	309	309	120	955	955	225	225	494	268	316	59	58	190	40	40	40	40	40	40	154	154	154	154	125	125	312	315	308
EXISTING REHEAT COIL BTU	7000	7000	2,000	25537	25537	16398	14000	17680	11215	11,000	3100	3100	25709	715	715	531	531	531	531	8,000	8,000	8,000	8,000	9807	9807	6000	6000	6000
NEW REHEAT COIL BTU	14,564	14,564	4036	32,138	32,138	11,972	10,309	20,753	15,136	16,649	3935	3901	14,061	1580	1580	1345	1345	1345	1345	5514	5514	5514	5514	8409	8409	13,135	13,252	12,966
EXISTING GPM	0.7	0.7	0.2	2.6	2.6	0.9	1.4	1.7	1.1	1.1	0.3	0.3	2.6	0.1	0.1	0.1	0.1	0.1	0.1	0.8	0.8	0.8	0.8	1.0	1.0	0.4	0.4	0.4
NEW HW GPM	1.5	1.5	0.4	3.2	3.2	1.2	1.0	2.1	1.5	1.7	0.4	0.4	1.4	0.2	0.2	0.1	0.1	0.1	0.1	0.5	0.5	0.5	0.5	0.8	0.8	1.3	1.3	1.3

REMARKS: (ALL NOTES APPLY TO ALL BOXES)

① USE EXISTING DUCTWORK, PIPE & VAV BOX, REBALANCE TO MEET NEW REQUIREMENTS.

② CONTRACTOR TO VERIFY ALL VAV BOX NUMBERS MATCH SPACE NUMBERS AS INDICATED ON SCHEDULE.

REBALANCE EXISTING VARIABLE VOLUME TERMINAL BOX SCHEDULE

DESIGNATION	229	235	236	237	242	243	244	251	252	253	254	255	256	257	259	261	262	264	265	266	268	269	270	271	272	273	274	276
SPACE NUMBER	1181B	1105	1105	1104	1101	1101	1122	1132A	1132	1132	1132	1132	1132B	1132C	1129	1164D	1163E	1164B	1164C	1164A	1161	1161	1161	1161A	1160	1161B	1161C	1161
EXISTING SUPPLY CFM	850	464	464	435	925	925	681	81	789	789	789	789	38	130	197	1040	217	986	82	259	642	642	642	602	656	130	132	642
NEW SUPPLY CFM	788	374	374	371	981	981	837	149	923	923	923	923	131	62	320	742	170	780	173	200	714	714	714	694	706	131	149	714
MINIMUM SUPPLY CFM	315	174	174	91	530	530	335	40	370	370	370	370	40	40	160	346	43	195	43	95	294	294	294	278	181	66	40	294
EXISTING REHEAT COIL BTU	6000	8419	8419	5000	23,000	23,000	12356	1470	14307	14307	14307	14307	689	2359	2,000	21,000	3374	15334	1275	4028	9981	9981	9981	9362	10202	2022	2053	9981
NEW REHEAT COIL BTU	13,252	5852	5852	6642	24,727	24,727	14,076	2523	15,523	15,523	15,523	15,523	2203	1345	5381	11,638	2859	13,118	2909	3364	12,008	12,008	12,008	11,671	11,873	2220	2522	12,008
EXISTING GPM	0.4	0.8	0.8	0.5	2.3	2.3	1.2	0.1	1.4	1.4	1.4	1.4	0.1	0.2	0.2	2.1	0.3	1.5	0.1	0.4	1.0	1.0	1.0	0.9	1.0	0.2	0.2	1.0
NEW HW GPM	1.3	0.6	0.6	0.7	2.5	2.5	1.4	0.3	1.6	1.6	1.6	1.6	0.2	0.1	0.5	1.2	0.3	1.3	0.3	0.3	1.2	1.2	1.2	1.2	1.2	0.2	0.3	1.2

REMARKS: (ALL NOTES APPLY TO ALL BOXES)

① USE EXISTING DUCTWORK, PIPE & VAV BOX, REBALANCE TO MEET NEW REQUIREMENTS.

② CONTRACTOR TO VERIFY ALL VAV BOX NUMBERS MATCH SPACE NUMBERS AS INDICATED ON SCHEDULE.

REBALANCE EXISTING VARIABLE VOLUME TERMINAL BOX SCHEDULE

DESIGNATION	279	280	282	285	286	291	292	297	298	299	301	304	305	306	308	312	315	317	324	325	326	328	332	333	334	335	336	337
SPACE NUMBER	1146B	1146A	1146	1148A	1148B	1152	1152	1175DEF	1175GHJ	1175KLMN	1175ABC	1176GHJ	1176DEF	1176KLM	1176ABC	1170	1156	1155A	1151F	1151E	1151D	1151B	1144	1144	1111A	1111B	1117	1119B
EXISTING SUPPLY CFM	150	150	2351	150	150	2201	2201	108	108	144	108	108	108	108	108	1110	636	90	54	54	93	65	448	448	705	711	757	711
NEW SUPPLY CFM	143	113	1738	148	148	1768	1768	130	130	350	130	136	130	130	130	538	699	140	80	80	150	105	371	371	507	520	660	520
MINIMUM SUPPLY CFM	57	57	675	57	57	706	706	40	40	120	40	57	40	40	40	215	350	56	40	40	40	40	186	186	254	238	265	240
EXISTING REHEAT COIL BTU	1409	1409	22090	1409	1409	20681	20681	1715	1715	2286	1715	1715	1715	1715	1715	24,000	10097	2000	857	857	1476	1032	5000	5000	8523	8523	9075	8523
NEW REHEAT COIL BTU	2422	1900	29,229	2489	2489	29,700	29,700	2186	2186	4296	2186	2287	2186	2186	2186	9048	11,772	2000	1302	1302	2522	1367	6256	6256	8543	8745	11,100	8745
EXISTING GPM	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.7	1.7	0.2	0.2	0.2	0.2	0.2	0.2	2.4	1.0	0.2	0.1	0.1	0.1	0.1	0.5	0.5	0.8	0.5	0.6	0.5
NEW HW GPM	0.2	0.2	2.9	0.2	0.2	3.0	3.0	0.2	0.2	0.4	0.2	0.2	0.2	0.2	0.2	0.9	1.2	0.2	0.1	0.1	0.3	0.1	0.6	0.6	0.9	0.9	1.1	0.9

REMARKS:

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2. CONTRACTOR TO VERIFY ALL VAV BOX NUMBERS MATCH SPACE NUMBERS AS INDICATED ON SCHEDULE.

REBALANCE EXISTING VARIABLE VOLUME TERMINAL BOX SCHEDULE

DESIGNATION	338	339
SPACE NUMBER	1119A	1211
EXISTING SUPPLY CFM	705	35
NEW SUPPLY CFM	515	192
MINIMUM SUPPLY CFM	242	48
EXISTING REHEAT COIL BTU	8452	2,000
NEW REHEAT COIL BTU	8661	3229
EXISTING GPM	0.8	0.2
NEW HW GPM	0.9	0.3

REMARKS:

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STATE OF MARYLAND — WILLIAM THOMASSON — REGISTERED — MECHANICAL ENGINEER

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol | Description | Date | Appr.

TASK ORDER #: FRR004

VANGUARD CONTRACTORS INC. — PADUCAH, KENTUCKY — VOICE 270-442-8620

I.C. Thomasson Associates, Inc. — NASHVILLE, TENNESSEE — PHONE (615) 346-3400

Checked by: WTT | Date: 02/27/04
Dwn by: ICT | CADD File Name: 3121M003.DGN
DACA87-03-D-0006 | ICT Project No. 203121
Approved by: | Plot date: 02/27/04
Chief, Prj. Mgmt. Division | Plot scale:

DEFENSE INFORMATION SCHOOL

FT. MEADE MARYLAND

MECHANICAL SCHEDULES

Sheet reference number: M-003

AHU UNIT SCHEDULE

UNIT NUMBER	NEW 1	NEW 2	NEW 3	NEW 4	NEW 5	NEW 6	EXISTING 7 ④	EXISTING 8 ④	NEW 9	NEW 10	NEW 11	NEW 12	NEW 13	NEW 14
MANUFACTURER	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE
MODEL														
TOTAL AIR FLOW (cfm)	1065	1072	1079	1086	2722	23,019	13,793	2861	6819	12,095	3128	5516	4869	7313
TOTAL COOLING CAPACITY (MBH)	47.39	47.7	47.65	47.96	137.9	1069.97	---	108.0	301.11	668.84	129.79	390.36	234.76	399.13
OUTSIDE AIR (min. cfm)	240	240	240	240	1000	5616	2155	373	1514	4834	555	3777	1603	2831
MINIMUM AIR FLOW (cfm)	1065	1072	1079	1086	1239	9475	4820	1144	6819	6410	1251	4253	1981	2925
TYPE	CV	CV	CV	CV	VAV	VAV	VAV	VAV	CV	VAV	VAV	VAV	VAV	VAV
FILTER:														
TYPE	30% ROUGHING	30% ROUGHING	30% ROUGHING	30% ROUGHING	30% ROUGHING	30% ROUGHING	30% ROUGHING	30% ROUGHING	30% ROUGHING	30% ROUGHING	30% ROUGHING	30% ROUGHING	30% ROUGHING	30% ROUGHING
	85% CARTRIDGE	85% CARTRIDGE	85% CARTRIDGE	85% CARTRIDGE	85% CARTRIDGE	85% CARTRIDGE	85% CARTRIDGE	85% CARTRIDGE	85% CARTRIDGE	85% CARTRIDGE	85% CARTRIDGE	85% CARTRIDGE	85% CARTRIDGE	85% CARTRIDGE
SUPPLY FAN:														
TYPE	FC	FC	FC	FC	BI	AF	AF	AF	BI	BI	BI	BI	BI	BI
TOTAL S.P. (in. H_2O)	3.31	3.33	3.32	3.32	4.42	4.93	5.79	3.51	4.07	5.11	3.27	3.51	3.61	3.94
MAX. FAN RPM	2040	2047	2047	2047	2081	1338	1770		1882	1754	2233	1485	2468	1640
MIN. MOTOR HP	2	2	2	2	5 ①	30 ①	--- ⑥	3 ⑥	10	20 ①	5 ①	7.5 ①	7.5 ①	10 ①
ELECTRICAL	460/3	460/3	460/3	460/3	460/3	460/3	460/3	460/3	460/3	460/3	460/3	460/3	460/3	460/3
EXTERNAL S.P. (IN H_2O)	0.6	0.6	0.6	0.6	1.4	1.4	1.62	0.83	0.7	1.7	1.0	1.0	1.0	1.10
MODIFICATIONS	NEW	NEW	NEW	NEW	NEW	NEW	EXISTING ②	EXISTING ②	NEW	NEW	NEW	NEW	NEW	NEW
RETURN FAN:														
TYPE	*	*	*	*	FC	FC			*	FC	BI	BI	BI	BI
CFM	*	*	*	*	1722	21821	11638	2491	*	6999	2970	1741	3266	5399
TOTAL S.P. (in. H_2O)	*	*	*	*	2.55	2.72	1.65	1.38	*	2.58	1.58	1.38	1.79	1.71
MAX. FAN RPM	*	*	*	*	1583	1092			*	1446	1759	1240	1556	1119
MIN. MOTOR HP	*	*	*	*	2 ①	15 ①	10 ⑥	1 ⑥	*	5 ①	2 ①	1 ①	2 ①	3 ①
ELECTRICAL	*	*	*	*	460/3	460/3	460/3	460/3	*	460/3	460/3	460/3	460/3	460/3
MODIFICATIONS	*	*	*	*	NEW	NEW	EXISTING ②	EXISTING ②	*	NEW	NEW	NEW	NEW	NEW
HEATING COIL:														
SERVICE	RE-HEAT ⑩	RE-HEAT ⑩	RE-HEAT ⑩	RE-HEAT ⑩	HEAT	HEAT			RE-HEAT ⑩	HEAT	HEAT	HEAT	HEAT	HEAT
TYPE	HOT WATER	HOT WATER	HOT WATER	HOT WATER	HOT WATER	HOT WATER			HOT WATER	HOT WATER	HOT WATER	HOT WATER	HOT WATER	HOT WATER
MAX. FACE VELOCITY (fpm)	500	500	500	500	500	500			500	600	600	600	600	600
EAT/LAT (°F.)	55.2/90	55.3/90	55.3/90	55.4/90	11/55	11/55			55.3/90	11/55	11/55	11/55	11/55	11/55
CAPACITY (MBH)	40.2	40.4	40.6	40.8	57.2	268.1			256.7	230.8	26.5	181.1	95.5	135.2
MAX. P.D. (ft. H O)	0.06	0.07	0.07	0.07	0.23	1.54			0.23	1.24	0.2	0.92	0.40	0.55
WATER FLOW (gpm)	2.69	2.70	2.72	2.74	10	17.9			25.86	15.4	1.8	15	9	9.0
EWT/LWT (°F.)	180/150	180/150	180/150	180/150	180/150	180/150			180/150	180/150	180/150	180/150	180/150	180/150
ROWS/FINS	1/88	1/89	1/89	1/89	2/6	1/11			1/101	1/80	1/80	1/80	1/80	1/80
MODIFICATIONS	NEW	NEW	NEW	NEW	NEW	NEW	DUCT MTD		NEW	NEW	NEW	NEW	NEW	NEW
COOLING COIL	COOLING ⑧	COOLING ⑧	COOLING ⑧	COOLING ⑧	COOLING ⑧	COOLING ⑧	COOLING	COOLING	COOLING ⑧	COOLING ⑧	COOLING ⑧	COOLING ⑧	COOLING ⑧	COOLING ⑧
SERVICE	CH. WATER	CH. WATER	CH. WATER	CH. WATER	CH. WATER	CH. WATER	CH. WATER	CH. WATER	CH. WATER	CH. WATER	CH. WATER	CH. WATER	CH. WATER	CH. WATER
TYPE	T SERIES	T SERIES	T SERIES	T SERIES	T SERIES	T SERIES			T SERIES	T SERIES	T SERIES	T SERIES	T SERIES	T SERIES
MAX. FACE VELOCITY (fpm)	500	500	500	500	500	500	500	500	500	515	500	500	500	500
EAT DB/WB (°F.)	76.3/64.5	76.3/64.5	76.2/64.4	76.2/64.4	79.0/66.3	76.5/64.7	75.4/63.6	74.5/62.7	76.2/64.4	79.6/67.6	75.4/63.6	85/71	78.3/65.6	79.4/67.4
LAT DB/WB (F°)	49.3/48	49/48.9	49.3/48.9	49/48.9	49/48.9	49/48.9	48.9/48.8	49.3/49.2	49/48.9	49/48.9	49/48.9	49/48.9	49/48.9	49/48.9
SENSIBLE CAPACITY (MBH)	32.02	32.22	32.32	32.53	90	717.61	346.5	78.2	204.27	408.72	85.2	220	157.2	245.47
MAX. P.D. (ft. H_2O)	5.47	5.54	5.64	5.83	7.85	26.9	6.67	20.25	6.76	22.76	11.56	14.89	5.02	25.19
WATER FLOW (gpm)	5.7	5.73	5.79	5.90	23	116	51	11	37.88	80.4	14.04	56.32	25.4	43.17
EWT/LWT (F°)	40/58	40/58	40/57.6	40/57.6	40/53	40/59.9	40/59.9	40/59.8	40/57.2	40/60	40/60	40/55	40/56	40/60
ROWS/FINS	8/151	8/151	8/148	8/145	8/151	8/164	6/144	6/144	8/158	8/162	8/139	8/146	8/155	8/157
MODIFICATIONS	NEW ⑦	NEW ⑦	NEW ⑦	NEW ⑦	NEW ⑦	NEW ⑦	②⑤	②⑤	NEW ⑦	NEW ⑦	NEW ⑦	NEW ⑦	NEW ⑦	NEW ⑦
OTHER NOTES						⑬								

UNIT NUMBER	NEW 15	NEW 16	NEW 17	NEW 18	EXISTING 19 ④	EXISTING 20 ④	NEW 21	EXISTING 22	NEW 23	NEW 24		EXISTING 26 ④	NEW 27	NEW 28	NEW 29
MANUFACTURER	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE		TRANE	TRANE	TRANE	TRANE
MODEL															
TOTAL AIR FLOW (cfm)	9771	5042	9956	7106	10,553	24,037	21,155	3375	1356	24,160		21,543	10,195	11,028	925
TOTAL COOLING CAPACITY (MBH)	444.4	227.74	480.23	285.38	634.9	1503.5	905.38	81.3	63.56	978.17		1199.2	429.54	453.81	60.79
OUTSIDE AIR (min. cfm)	2769	1185	2820	1335	4131	10,797	4946	225	360	4638		6888	2272	2106	524
MINIMUM AIR FLOW (cfm)	3699	2017	3982	2198	4538	13,220	7638	3375	1356	9086		8617	3520	5319	925
TYPE	VAV	VAV	VAV	VAV	VAV	VAV	VAV	CV	CV	VAV		VAV	VAV	VAV	CV
FILTER:															
TYPE	30% ROUGHING	30% ROUGHING	30% ROUGHING	30% ROUGHING	30% ROUGHING	30% ROUGHING	30% ROUGHING	30% ROUGHING	30% ROUGHING	30% ROUGHING		30% ROUGHING	30% ROUGHING	30% ROUGHING	30% ROUGHING
	85% CARTRIDGE	85% CARTRIDGE	85% CARTRIDGE	85% CARTRIDGE	85% CARTRIDGE	85% CARTRIDGE	85% CARTRIDGE	85% CARTRIDGE	85% CARTRIDGE	85% CARTRIDGE		85% CARTRIDGE	85% CARTRIDGE	85% CARTRIDGE	85% CARTRIDGE
SUPPLY FAN:															
TYPE	BI	BI	BI	BI	AF	AF	AF	FC	FC	AF		AF	BI	AF	FC
TOTAL S.P. (in. H_2O)	3.7	3.73	3.88	3.99	5.31	5.59	4.17	4.30	3.98	4.81		6.28	3.38	3.86	3.03
MAX. FAN RPM	1447	2308	1501	2443			1186		2233	1307			1382	1426	1956
MIN. MOTOR HP	10 ①	7.5 ①	15 ①	10 ①	25 ⑥	40 ⑥	25 ①	10 ⑥	2	30 ①		40 ⑥	5 ①	15	1.5
ELECTRICAL	460/3	460/3	460/3	460/3	460/3	460/3	460/3	460/3	460/3	460/3		460/3	460/3	460/3	460/3
EXTERNAL S.P. (IN H_2O)	0.9	0.9	1.0	0.9	1.48	1.83	1.5	0.25	0.5	1.5		1.73	1.0	1.3	0.6
MODIFICATIONS	NEW	NEW	NEW	NEW	EXISTING ②	EXISTING ②	NEW	EXISTING ②	NEW	NEW		EXISTING ②	NEW	NEW	NEW
RETURN FAN:															
TYPE	BI	BI	BI	BI			AF		*	AF			BI	BI	*
CFM	7001	4849	9578	5771	8452	21212	16209		*	19522		20417	7923	8922	*
TOTAL S.P. (in. H_2O)	1.68	1.91	1.86	2.17	1.85	2.41	2.33		*	2.6		2.13	1.86	1.98	*
MAX. FAN RPM	1009	1921	1187	1779			917		*	1025			1090	1166	*
MIN. MOTOR HP	5 ①	3 ①	5 ①	5 ①	7.5 ⑥	15 ⑥	10 ⑥		*	15 ①		20 ⑥	5 ①	5	*
ELECTRICAL	460/3	460/3	460/3	460/3	460/3	460/3	460/3		*	460/3		460/3	460/3	460/3	*
MODIFICATIONS	NEW	NEW	NEW	NEW	EXISTING ②	EXISTING ②	NEW		*	NEW		EXISTING ②	NEW	NEW	*
HEATING COIL:															
SERVICE	HEAT	HEAT	HEAT	HEAT			HEAT	RE-HEAT ⑨	RE-HEAT ⑩	HEAT			HEAT	HEAT	RE-HEAT ⑩
TYPE	HOT WATER	HOT WATER	HOT WATER	HOT WATER			HOT WATER	HOT WATER	HOT WATER	HOT WATER			HOT WATER	HOT WATER	HOT WATER
MAX. FACE VELOCITY (fpm)	600	600	600	600			600	500	500	600			600	600	500
EAT/LAT (°F.)	11/55	11/55	11/55	11/55			11/55	53.1/90	52.9/90	11/55			11/55	11/55	35.7/90
CAPACITY (MBH)	198.4	56.6	134.6	112.5			297	135.1	54.6	303.02			194.8	301.9	54.5
MAX. P.D. (ft. H O)	0.57	0.24	0.59	0.24			1.32		0.11	1.41			0.50	0.84	0.51
WATER FLOW (gpm)	15	3.8	9.0	9			48	9.0	3.64	48			15	15	3.6
EWT/LWT (°F.)	180/150	180/150	180/150	180/150			180/150	180/150	180/150	180/150			180/150	180/150	180/150
ROWS/FINS	1/80	1/80	1/80	1/80			1/80	1/80	1/106	1/80			1/80	1/80	1/80
MODIFICATIONS	NEW	NEW	NEW	NEW	DUCT MTD	DUCT MTD	NEW	REBALANCE	NEW	NEW		DUCT MTD	NEW	NEW	NEW
COOLING COIL	COOLING ⑧	COOLING ⑧	COOLING ⑧	COOLING ⑧	COOLING	COOLING	COOLING ⑧	COOLING	COOLING ⑧	COOLING ⑧		COOLING	COOLING ⑧	COOLING ⑧	COOLING ⑧
SERVICE	CH. WATER	CH. WATER	CH. WATER	CH. WATER	CH. WATER	CH. WATER	CH. WATER	CH. WATER	CH. WATER	CH. WATER		CH. WATER	CH. WATER	CH. WATER	CH. WATER
TYPE	T SERIES	T SERIES	T SERIES	T SERIES			T SERIES		T SERIES	T SERIES			T SERIES	T SERIES	T SERIES
MAX. FACE VELOCITY (fpm)	500	500	520	500	500	500	500	500	500	500		500	500	500	450
EAT DB/WB (°F.)	77.4/64.8	76.5/64.7	77.4/65.6	75.6/63.2	79.4/67.5	80.5/68.5	76.5/64	73.3/61.4	77.0/65.2	75.7/63.3		78.1/66.2	76.3/63.8	75.7/63.5	82.8/70.4
LAT DB/WB (F°)	49/48.9	49/48.9	49/48.9	49/48.9	46.8/46.7	47.3/47.2	49/48.9	53.1/53	49/48.9	49/48.9		46.8/46.7	49/48.9	49/48.9	49/48.9
SENSIBLE CAPACITY (MBH)	305.6	152.74	314.97	207.92	373.3	865.9	640	74.0	41.84	709.62		731.6	429.5	323.99	34.61
MAX. P.D. (ft. H_2O)	14.47	8.58	16.82	14.44	5.24	5.34	19.39	8.86	11.12	5.9		14.10	12.2	14.28	17.78
WATER FLOW (gpm)	53.4	28.16	57.72	38.6	64	152	98	8	8.34	141.14		138	48.9	60	7.46
EWT/LWT (F°)	40/58	40/58	40/60	40/56	40/60	40/59.9	40/60	40/60.4	40/56.5	40/55		40/60	40/59	40/60	40/59.5
ROWS/FINS	8/149	8/154	8/140	8/159	6/144	6/144	8/144	6/144	8/153	8/157		6/144	8/143	8/146	8/153
MODIFICATIONS	NEW ⑦	NEW ⑦	NEW ⑦	NEW ⑦	②⑤	②⑤	NEW ⑦	②⑤	NEW ⑦	NEW ⑦		②⑤	NEW ⑦	NEW ⑦	NEW ⑦
OTHER NOTES							⑬								

REMARKS: SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
① INVERTER DUTY MOTOR, FACTORY MOUNTED VFD.
② MODIFY FAN AS NECESSARY TO ACHIEVE NEW CFM AND STATIC PRESSURE REQUIREMENTS.
③ FOULING FACTOR 0.00025 FT^2-°F/BTU
④ WATER AND AIRFLOW FOR EACH AHU TO BE REBALANCED TO MATCH NEW CONDITIONS AS INDICATED BY THIS SCHEDULE FOR ALL EXISTING UNITS.
⑤ CONTRACTOR TO VERIFY CORRECT ECONOMIZER OPERATION FOR ALL NEW AND EXISTING AHUs. IF OPERATION IS INCORRECT CONTRACTOR TO REPLACE ACTUATORS AND DAMPERS AS REQUIRED TO ENSURE PROPER OPERATION.
✳ NOT REQUIRED
⑥ REMOVE EXISTING VARIABLE FREQUENCY DRIVE AND ASSOCIATED ISOLATION TRANSFORMERS AND PROVIDE NEW VFD WITH INPUT LINE REACTORS PER SPECIFICATIONS. INSTALL VFD WITHIN AHU CABINET.
⑦ SINGLE POINT ELECTRICAL CONNECTION TO BE PROVIDED BY VENDOR FOR ALL NEW AHU's.
⑧ NOTE ALL CHILLED WATER COILS TO BE SELECTED WITH 30% PROPYLENE GLYCOL.
⑨ EXISTING FACE-AND-BYPASS REHEAT COIL, AHU-22.
⑩ FULL FLOW HEATING COIL IN THE REHEAT POSITION.
⑪ EQUIPMENT SELECTIONS BASED ON 91° DB/77° WB SUMMER AMBIENT AND 11° WINTER AMBIENT AND 72° DB SUMMER SPACE SET POINT AND 68° DB WINTER SPACE SET POINT.
⑫ ALL EXISTING AHU'S SHALL BE RETROFITTED WITH: (a) RUSKIN IAQ50, OSA AIRFLOW MONITOR SEE DETAIL 4, SHEET M502 (b) REPLACE MOTORIZED RELIEF DAMPER WITH BAROMETRIC RELIEF DAMPER BALANCED FOR 0.02" W.C. OPENING STATIC, AND (c) CONTROL VALVES & ACTUATOR FOR COOLING AND HEATING COIL.
⑬ PROVIDE FIRE/SMOKE ISOLATION DAMPER PER NFPA 90A AT UNIT RETURN AND DISCHARGE.

DUCT MOUNTED REHEAT COILS

SERVICE	7	19	20		26
TYPE	REHEAT	REHEAT	REHEAT		REHEAT
AIR FLOW (cfm)	4820	4538	13220		8617
MIN. SQ. FT.	12.25	11.67	18.0		14.69
MAX. FACE VELOCITY (fpm)	400	400	500		500
E.A.D.B. (°F.)	35	17	23		24
L.A.D.B. (°F.)	49	49	49		49
WATER FLOW (gpm)	9.52	12.25	32.48		16.91
WATER TEMP. ENTERING (°F.)	180	180	180		180
MAX. P.D. (ft. H_2O)	5.0	5.0	2.21		5.0
ROWS/FINS	1/80	1/80	1/100		1/80
MAX. AIR S.P. (in. H_2O)	0.25	0.25	0.25		0.25
EXISTING SUPPLY DUCT SIZE	42"ϕ	40"ϕ	54"x48"		47"ϕ
REHEAT COIL SIZE (LxH)	42x42	40x42	54x48		47x45

REMARKS: REHEAT COILS TO BE MOUNTED IN EXISTING DUCT ABOVE ROOF. DUCT TRANSITIONS, INSULATION TO BE IN ACCORDANCE WITH SMACNA MEDIUM PRESSURE DUCT DESIGN AND IN ACCORDANCE WITH DUCT EXPOSED TO WEATHER. MATCH EXISTING WHERE APPLICABLE

ELECTRIC DUCT HUMIDIFIER

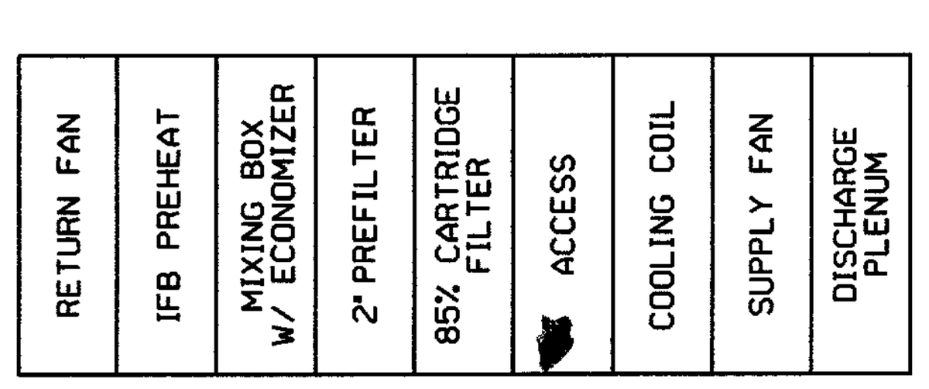
AHU	1	2	3	4	16	18	22	23
DESIGNATION	EDH-1	EDH-2	EDH-3	EDH-4	EDH-16	EDH-18	EDH-22	EDH-23
MANUFACTURER	DRI-STEEM	DRI-STEEM	DRI-STEEM	DRI-STEEM	DRI-STEEM	DRI-STEEM	DRI-STEEM	DRI-STEEM
TYPE	ELECTRIC	ELECTRIC	ELECTRIC	ELECTRIC	ELECTRIC	ELECTRIC	ELECTRIC	ELECTRIC
MODEL	VLC 6-1	VLC 6-1	VLC 6-1	VLC 6-1	VLC 6-1	VLC 9-1	VLC 6-1	VLC 6-1
E.T. DB. (°F.)/%R.H.	49°/40%	49°/40%	49°/40%	49°/40%	49°/40%	49°/40%	49°/40%	49°/40%
HUMIDIFIED AREA	12x9	12x9	12x9	12x9	24x21	26x20	20x15	12x9
L.A.T.DB. (°F)/%R.H.	49°/77%	49°/77%	49°/77%	49°/77%	49°/72%	49°/77%	49°/77%	49°/77%
DISPERSION	RAPIDSORB 1.5"	RAPIDSORB 1.5"	RAPIDSORB 1.5"	RAPIDSORB 1.5"	RAPIDSORB 1.5"	RAPIDSORB 1.5"	RAPIDSORB 1.5"	RAPIDSORB 1.5"
LOAD (LB/HR)	3.08	3.10	3.12	3.14	15.23	16.59	2.55	4.61
VOLTAGE	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60
AMPS	7.2	7.2	7.2	7.2	7.2	10.8	7.2	7.2

NOTES: ① 1½" DIA. TUBES, STEP MODULATION HUMIDITY OUTPUT CONTROL, FACTORY MOUNTED CONTROL CABINET, FREEZE PROTECTION, DUCT HIGH LIMIT HUMIDISTAT. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
② HUMIDIFIER TO BE MOUNTED IN VERTICAL RUN OF SUPPLY DUCT BELOW ROOF AND ABOVE CEILING OF EACH AHU INDICATED IN SCHEDULE.
③ SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

RELIEF DAMPERS

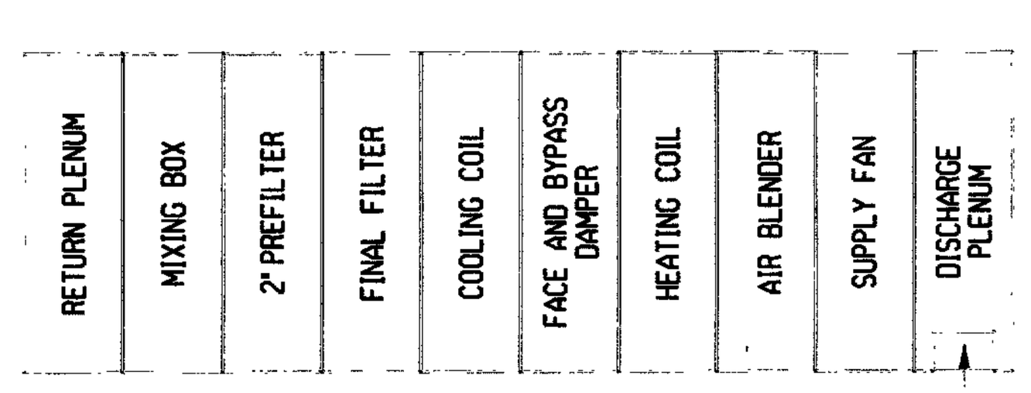
EXISTING AHU NUMBER	7	8	19	20	22	26
SERVICE	ECONOMIZER	ECONOMIZER	ECONOMIZER	ECONOMIZER	ECONOMIZER	ECONOMIZER
TYPE	PARALLEL BLADE	PARALLEL BLADE	PARALLEL BLADE	PARALLEL BLADE	PARALLEL BLADE	PARALLEL BLADE
AIR FLOW (cfm)	11648	2491	8452	21212	3150	20417
MAX FACE VELOCITY (fpm)	300	300	300	300	300	300
MAX AIR SP (in H2O)	0.05	0.05	0.05	0.05	0.05	0.05
DAMPER SIZE (WxH inches)	90x62	34x36	68x60	104x98	39x39	106x92

NOTES:
REMARKS: SEE SPECIFICATIONS FOR ADDITIONAL DETAILS. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS AND ENSURE NO INTERFERENCES EXIST WHEN REPLACING EXISTING EXHAUST DAMPERS WITH NEW FULL-SIZE DAMPERS.



AHU-5, 6, 10, 11, 12, 13, 14, 15, 16, 17, 18, 21, 24, 27 AND 28
VARIBLE VOLUME SYSTEM

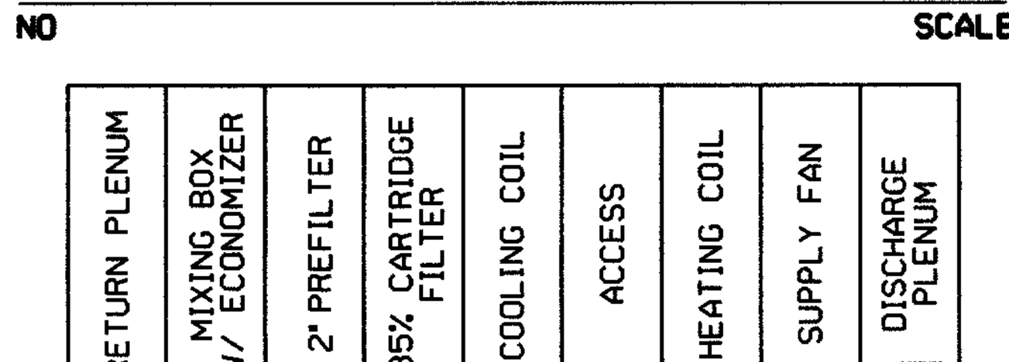
TYPICAL ROOF TOP UNIT ARRANGEMENT
NO SCALE



EXISTING AHU-22
CONSTANT VOLUME SYSTEM

ELECTRIC HUMIDIFIER CABINET

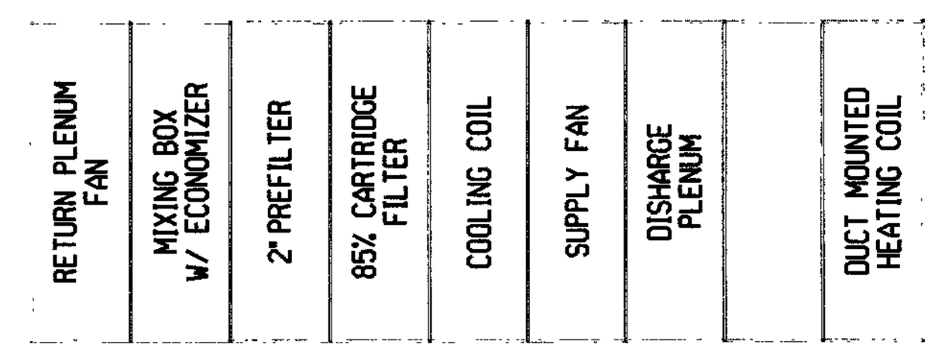
TYPICAL ROOF TOP UNIT ARRANGEMENT
NO SCALE



AHU-1, 2, 3, 4, 9, 23 AND 29
CONSTANT VOLUME SYSTEM

ELECTRIC HUMIDIFIER CABINET UNITS 1,2,3,4,23

TYPICAL ROOF TOP UNIT ARRANGEMENT
NO SCALE



EXISTING AHU-7, 8, 19, 20, AND 26
VARIABLE VOLUME SYSTEM

NOTE: AHU-8 PROVIDED WITHOUT DUCT-MOUNTED HEATER COIL

TYPICAL ROOF TOP UNIT ARRANGEMENT
NO SCALE

PUMP SCHEDULE

DESIGNATION	P-11	BP-1, BP-2	P-9, P-10
SERVICE	CHILLER CH-4	BOILER IN-LINE	HW DISTRIBUTION
MANUFACTURER	B&G	B&G	B&G
TYPE	1510	Series 60	1510
MODEL	6G	1½x1½x5¼	2½BB
GPM	1600	45	300
TDH FT H_2O	100	20	75
IMPELLER SIZE (in)	8.875	4.750	9.250
TEMPERATURE	25.5	180	180
CASING WORKING PRESS	175	175	175
MIN MOTOR HP	60	¾	10
VOLTAGE/PHASE	480/3/60	480/3/60	480/3/60
RPM	1750	1750	1750
SUCTION/DISCHARGE (in)	8/6	1½/1½	3/2.5
ACCESSORIES	①③	③	①②③

REMARKS:
① TEFC HIGH EFFICIENCY MOTOR.
② MOTOR SUITABLE FOR VARIABLE SPEED INVERTER SERVICE. PROVIDE VARIABLE FREQUENCY DRIVE AS REQUIRED FOR NEW MOTOR SIZE. SEE SPECIFICATIONS SECTION 16261N FOR ADDITIONAL REQUIREMENTS. COORDINATE WITH DIVISION 16, SEE ALSO ONE LINE DIAGRAM ON E-101.
③ SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

BOILER SCHEDULE

DESIGNATION	B-1, B-2
TYPE	HOT WATER
OUTPUT BTU/HR	3,600,000
INPUT BTU/HR	4,500,000
GPM	170
PD (FT) MAX.	2
DESIGN PRESSURE PSI	30
OPERATING PRESS PSI	15
FUEL	NATURAL GAS
BLOWER MOTOR HP	3
BLOWER VOLTAGE/PHASE	460/3
CONTROL VOLTAGE	120/1/60
TYPE OF CONTROL	①
MANUFACTURER	BRYAN
MODEL NUMBER	RV-450-W
OPERATING WEIGHT (lbs)	8,320
GAS CONNECTION	2"
GAS PRESSURE	1" PSI

ACCESSORIES:
① FORCED DRAFT, FULL MODULATION FIRING WITH MINIMUM 6:1 TURNDOWN RATIO, PILOT SAFETY CONTROL, ELECTRONIC IGNITION, IRI APPROVED CONTROLS AND GAS TRAIN, LOW WATER CUTOFF, ASME RELIEF VALVE, & GAS PRESSURE REGULATOR. PROVIDE INTEGRAL CONTROL PANEL WITH GATEWAY. GATEWAY WILL ALLOW REMOTE DDC ON/OFF AND SHALL PASS BOILER STATUS TO DDC INCLUDING: PERCENT FIRING AND SAFETY STATUS ALARM. CONTROL PANEL PACKAGE SHALL INCLUDE FVNR STARTER.

THESE DOCUMENTS HAVE BEEN PREPARED PRIMARILY BASED ON INFORMATION PROVIDED BY OTHERS. I.C. THOMASSON HAS NOT VERIFIED THE ACCURACY OF ALL INFORMATION PROVIDED BY OTHERS. SEE LIMIT OF LIAIBILITIES STATEMENT ON COVER SHEET.

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

TASK ORDER #: FRR004
VANGUARD CONTRACTORS INC. PADUCAH, KENTUCKY VOICE 270-442-8620
I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400

Checked by: WTT	Date: 02/27/04
Dwn by: ICT	CADD File Name: 3121M004.DGN
DACA87-03-D-0006	ICT Project No. 203121
Approved by:	Plot date: 02/27/04
Chief, Prj. Mgmt. Division	Plot scale:

DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND

MECHANICAL SCHEDULES

Sheet reference number: M-004

CHILLER SCHEDULE

IDENTIFICATION	CH-4
MANUFACTURER	TRANE
MODEL No.	RTAC
TYPE	AIR-COOLED
NOMINAL CAPACITY (tons)	500
ACTUAL CAPACITY (tons)	351.40
O. A. TEMPERATURE	80
GPM	1600
EWT (F)	38.10
LWT (F)	25.5
CONDENSING TEMP (F)	80
SCALE FACTOR	0.00010
MAX WTR PD (FT H ₂0)	25.10
COMPRESSOR FANS:	
ELECTRICAL (KW)	42.10
NUMBER OF FANS	28
R.L.A. - EACH (amps)	3.00
COMPRESSOR:	
ELECTRICAL (KW)	387.30
UNIT ELECTRICAL	460/60/3
L.R.A. TOTAL EACH COMP.	800/200 each
L.R.A.	1384/346 each
STARTER TYPE	WYE DELTA CLOSED STARTER
UNIT KW	435.30
MCA (A)	934.00
ELECTRICAL CIRCUITS (#)	2
MOP (A)	600 each
ACCESSORIES	

REMARKS: (ALL NOTES APPLY)

(1) 30% PROPYLENE GLYCOL

(2) FIELD CONTROLS, TRANSFORMER, DISCONNECTS, FLOW SWITCH, HEAT-TRACED EVAPORATOR, DUAL POINT CONNECTIONS.

(3) PROVIDE ISOLATION VALVES ON INLET AND OUTLET. Y-TYPE START-UP STRAINER ON INLET.

(4) SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

(5) INTEGRAL CONTROL PANEL.WITH GATEWAY TO EXISTING ANDOVER SYSTEM.

(6) EVAPORATOR COOLER SHALL INCLUDE ELECTRICAL HEATING CABLE FOR FREEZE PROTECTION DOWN TO 15°F AMBIENT.

(6) PROVIDE FACTORY J-BOX, FACTORY MOUNTED PREWIRED STARTERS.

DUCTWORK LEGEND

- RECTANGULAR DUCT TURNING DOWN
- ROUND DUCT TURNING DOWN
- DUCT TURNING DOWN TO SIDEWALL REGISTER AT FLOOR
- DOUBLE LINE TO SINGLE LINE DUCTWORK
- BRANCH TAP OFF MAIN W/DUCT EXTRACTOR OR SPIN-IN FITTING W/DAMPER (LOW PRESSURE)
- TRANSITION IN DUCT (NOT DIRECTION OF AIRFLOW)
- REGISTER TAPPING INTO BOTTOM OF DUCT
- CONTROL DAMPER
- FD — FIRE DAMPER (SINGLE LINE DUCT)
- FD — FIRE DAMPER (DOUBLE LINE DUCT)
- SD — SMOKE DAMPER
- SD — SMOKE DAMPER (DOUBLE LINE DUCT)
- FSD — FIRE/SMOKE DAMPER
- FSD — FIRE/SMOKE DAMPER (DOUBLE LINE DUCT)
- DUCT TERMINATION
- 45 FULL RADIUS TURN
- SQUARE ELBOW W/TURNING VANES
- FULL RADIUS TURN
- (T) ADJUSTABLE T'STAT
- (T)C CONCEALED T'STAT
- MVD — MANUAL VOLUME DAMPER
- SWR — SIDEWALL RETURN REGISTER
- SAR — SIDEWALL SUPPLY REGISTER
- SD 400 — INDICATES A SIZE "D" SUPPLY DIFFUSER SET FOR 400 CFM
- RB 100 — INDICATES A SIZE "B" RETURN REGISTER SET FOR 100 CFM
- EA 50 — INDICATES A SIZE "A" EXHAUST REGISTER SET FOR 50 CFM
- SUPPLY DIFFUSER (4-WAY)
- LINEAR SLOT DIFFUSER (SUPPLY OR RETURN)
- RETURN / EXHAUST GRILLE
- VARIABLE AIR VOLUME BOX (VAV)

PIPING LEGEND

- S-60 — STEAM LINE-STEAM PRESSURE (60 PSI)
- GC — GRAVITY CONDENSATE RETURN
- PC — PUMPED CONDENSATE RETURN
- MCD — MOISTURE CONDENSATE DRAIN LINE
- HWS — HOT WATER SUPPLY
- HWR — HOT WATER RETURN
- CHWS — CHILLED WATER SUPPLY
- CHWR — CHILLED WATER RETURN
- CS — CONDENSER WATER SUPPLY TO CHILLER
- CR — CONDENSER WATER RETURN TO TOWER
- DIRECTION OF WATER FLOW
- TEE
- LATERAL
- GUIDE
- ANCHOR
- PIPE TURNING DOWN
- PIPE TURNING UP
- C.O. O.S.&Y. — CHAIN OPERATED O.S.&Y. VALVE
- EMD — END OF MAIN DRIP

COMBUSTION VENT/SUPPLY FAN SCHEDULE

FAN NUMBER	CVF-1 (1)(2)	CSF-1(2)
SERVICE	BOILER FLUE	BOILER COMBUSTION AIR
TYPE	INLINE	INLINE
CFM	3400	2300
INLET PRESSURE IN WC	-0.030	-0.75
MIN MOTOR HP	2	2
ELECTRICAL	480/3/60	480/3/60
MODEL	RSV-450	BESB31S
MFG	EXHAUSTO	EXHAUSTO

REMARKS:

(1) PROVIDE STACK ADAPTOR FOR CONNECTION OF CVF-1 TO EXISTING BOILER STACK.

(2) SUPPLIER SHALL PROVIDE ALL NECESSARY CONTROLS FOR A COMPLETE PACKAGE INCLUDING VFD. SEE M-602. COORDINATE WITH CONTROLS PROVIDER

MECHANICAL GENERAL NOTES:

1. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS. DRAWINGS SHALL NOT BE SCALED.

2. THE CONTRACTOR IS REQUIRED TO VISIT THE SITE AND BECOME FAMILIAR WITH EXISTING CONDITIONS PRIOR TO SUBMITTING A BID.

3. THE DRAWINGS MAY NOT SHOW ALL EXISTING ITEMS OR CONDITIONS. IN THE EVENT CONCEALED CONDITIONS ARE ENCOUNTERED WHICH MAY VARY SIGNIFICANTLY FROM THOSE INDICATED ON THE DRAWINGS, NOTIFY THE DESIGNER BEFORE PROCEEDING WITH WORK.

4. CONTRACTOR SHALL FIELD VERIFY BY MEASUREMENT THE EXACT LOCATION OF EQUIPMENT, DUCTWORK, PIPING, STRUCTURE, AND OTHER CONDITIONS WHICH WILL AFFECT INSTALLATION. CONTRACTOR SHALL LOCATE EQUIPMENT AND ROUTE DUCTWORK AND PIPING TO AVOID CONFLICTS AND INTERFERENCES WITH FIELD CONDITIONS.

5. PRIOR TO ANY INSTALLATION, CLOSELY COORDINATE ALL MECHANICAL WORK WITH PLUMBING, FIRE PROTECTION, ELECTRICAL, ARCHITECTURAL, AND STRUCTURAL WORK. CONTRACTOR TO ENSURE ALL EQUIPMENT AND SERVICES WILL FIT IN AVAILABLE SPACES ALLOWING CEILING HEIGHTS. INSTALL EQUIPMENT SO AS TO PROVIDE CLEARANCES SHOWN ON DRAWINGS AND AS RECOMMENDED BY MANUFACTURER FOR AIRFLOW, SERVICE, MAINTENANCE, AND FILTER REMOVAL AS APPLICABLE.

6. COORDINATE DUCT, PIPING, AND EQUIPMENT LOCATIONS WITH ELECTRICAL PANEL LOCATIONS. DO NOT PASS ANY MECHANICAL OR PLUMBING ITEMS DIRECTLY OVER ELECTRICAL PANELS. FIELD VERIFY EXACT PANEL LOCATIONS.

7. ALL CUTTING AND PATCHING SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR. ALL PATCHING SHALL RESTORE EACH DAMAGED SURFACE TO ITS ORIGINAL FINISH.

8. CEILING DIFFUSER AND REGISTER LOCATIONS ARE APPROXIMATE ONLY. EXACT LOCATIONS TO BE DETERMINED BY FIELD COORDINATION. MANY DUCTS AND PIPES ARE ROUTED ABOVE FURRED DOWN/LOWERED CEILINGS. CLOSELY COORDINATE DUCT AND PIPE ROUTING WITH EXISTING CEILING HEIGHTS. COORDINATE SIDEWALL REGISTER MOUNTING HEIGHTS AND LOCATIONS WITH EXISTING CEILING HEIGHTS.

9. ALL DUCT DIMENSIONS SHOWN ON DRAWINGS ARE INSIDE CLEAR. ALLOWANCE MUST BE MADE IN SHEET METAL SIZE WHERE DUCT LINER IS SPECIFIED.

10. LOW-PRESSURE DUCT RUNOUTS TO DIFFUSERS AND REGISTERS TO BE AS SCHEDULED UNLESS OTHERWISE INDICATED ON PLANS. CONTRACTOR TO PROVIDE A DISCHARGE AIR PLENUM ON EACH AIR TERMINAL DEVICE AS NECESSARY (SEE DETAIL).

11. DUCT RUNOUT SIZES TO VAV TERMINAL BOXES TO BE AS SCHEDULED UNLESS OTHERWISE INDICATED ON PLANS. CONTRACTOR TO PROVIDE A TRANSITION AND MINIMUM 18" LENGTH RIGID BOX CONNECTION SIZE DUCT AT BOX INLET.

12. NO FLEXIBLE DUCT SHALL PASS THROUGH ANY WALL, FIRE RATED OR OTHERWISE. NO FLEXIBLE DUCT SHALL BE EXPOSED. FIELD VERIFY EXISTING INSTALLATION HAS FLEXIBLE DUCT LENGTHS GREATER THAN 10 FT AS INDICATED ON AS-BUILT DRAWINGS. IF INSTALLATION USES FLEXIBLE DUCT FROM TERMINAL BOXES TO AIR DISTRIBUTION DEVICES, MATCH EXISTING. IF INSTALLATION USES MAXIMUM OF 10 FT OF FLEXIBLE DUCT, MATCH EXISTING. FLEXIBLE DUCT LENGTHS SHALL NOT EXCEED 3'-0" AT EACH VAV AIR TERMINAL DEVICE CONNECTION.

13. WHERE BRANCH TAPS OCCUR, PROVIDE INDIVIDUAL SPIN-IN FITTINGS WITH MANUAL-VOLUME DAMPERS FOR BALANCING. DO NOT USE TYPE WITH AIR SCOOP/EXTRACTOR. ADDITIONALLY, PROVIDE OPPOSED-BLADE VOLUME DAMPERS AT EACH AIR DISTRIBUTION DEVICE.

14. PROVIDE ACCESS DOORS IN DUCTS, WALLS, AND CEILINGS AS REQUIRED TO ACCESS DAMPERS, VALVES, AND OTHER ENCLOSED ITEMS. COORDINATE LOCATION OF ALL DOORS WITH GENERAL CONTRACTOR.

15. COORDINATE LOCATION AND PROVIDE DUCT ACCESS DOORS FOR ACCESS TO ALL FIRE DAMPERS. DUCT ACCESS DOORS MAY BE OMITTED WHERE TYPE "A" FIRE DAMPERS ARE ACCESSIBLE THROUGH SIDEWALL REGISTER FACE. INSURE DUCT ACCESS DOORS AND DAMPERS ARE ACCESSIBLE THROUGH CEILINGS AND WALLS. LOCATE DUCT ACCESS DOORS ABOVE SPACES WITH LAY-IN CEILINGS OR EXPOSED CEILINGS WHERE POSSIBLE.

16. ALL EXPOSED DUCTWORK, PIPING, AND EQUIPMENT IN FINISHED SPACES TO BE INSTALLED AS HIGH AS POSSIBLE ABOVE FINISHED FLOOR.

17. PROVIDE CANVAS, FLAME RETARDANT FLEXIBLE DUCT CONNECTORS AT ALL CONNECTIONS OF FANS TO DUCTWORK.

18. ALL MOISTURE CONDENSATE DRAIN (MCD) LINES SHALL BE "DWV" COPPER. SLOPE PIPING MINIMUM ⅛" PER FOOT TOWARD DRAIN. PROVIDE LINE SIZE CLEANOUTS AT CHANGES IN DIRECTION AND SPACED MAXIMUM 50'-0" ON CENTER.

19. PATCH ALL RATED FLOOR AND RATED WALL PENETRATIONS WITH U.L. APPROVED ASSEMBLIES IN ACCORDANCE WITH IBC REQUIREMENTS.

20. PROVIDE A MINIMUM 20'-0" SEPARATION BETWEEN ANY FRESH AIR INTAKE AND ANY MECHANICAL EXHAUST, GAS VENT, PLUMBING VENT, OR OTHER VENT OUTLETS.

21. PAINT CHILLERS TO MATCH SURROUNDING SURFACES IN ACCORDANCE WITH OWNER'S INSTRUCTIONS.

22. WHERE EXISTING DUCT IS REPLACED AND DEMOLISHED DUCT ICONTAINED MANUAL VOLUME DAMPER (MVD), CONTRACTOR SHALL PROVIDE MVD AS REQUIRED FOR THE REPLACEMENT DUCT.

23. ALL FLOOR OR RATED CHASE PENETRATIONS OF DUCT SHALL BE PROTECTED WITH FIRE/SMOKE DAMPERS.

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US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Symbol	Description	Date	Appr.

Date: 02/27/04
Checked by: WTT
Drwn by: ICT
CADD File Name: 312M005.DGN
DACA87-03-D-0006
ICT Project No. 203121
Approved by:
Plot date: 02/27/04
Chief, Prj. Mgmt. Division
Plot scale:

TASK ORDER #: FRR004

I.C. Thomasson Associates, Inc.
PADUCAH, KENTUCKY VOICE 270-442-8620
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DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND
MECHANICAL SCHEDULES

Sheet reference number:
M-005

EXISTING CEILING DIFFUSER SCHEDULE

NUMBER	APPROXIMATE NECK SIZE (INCHES)	TYPE	CFM	MAX T.P. LOSS (IN. WG)	REMARKS
CD-1	12X12	4 WAY	372	.05	*. MAX NC=14, TYP OF 12 **REBALANCE TO 568 CFM** (1)
CD-2	12X21	4 WAY	1021	.05	*. MAX NC=20, TYP OF 8
CD-3	12X12	4 WAY	333	.03	*. MOUNT 14 FT AFF, MAX NC=10, TYPICAL OF 11
CD-4	18X18	4 WAY	918	.05	*. MAX NC=18, TYP OF 15
CD-5	21X21	4 WAY	1610	.09	*. MAX NC=30, TYP OF 9
CD-6	8" NECK	4 WAY	185	.06	*. MAX NC=23, TYP OF 4 MANUFACTURER SPECIFIED FOR VAV APPLICATION
CD-7	15" NECK	4 WAY	734	.06	*. MAX NC=26, TYP OF 6, MANUFACTURER SPECIFIED FOR VAV APPLICATION
CD-8	9x9	4 WAY	205	.1	*. TYP OF 6, MANUFACTURER SPECIFIED FOR VAV APPLICATION **REBALANCE TO 401 CFM EACH** (1)

* ALL CEILING DIFFUSERS SHALL BE 24"x24" CEILING MODULE W/ ADJUSTABLE VANES

EXISTING SUPPLY REGISTER SCHEDULE

UNIT NUMBER	APPROXIMATE SIZE	TYPE	CFM	MAX. S.P. LOSS (IN. WG)	QTY.	REMARKS
SR-1	16X14	4 WAY	741	.06	TYP. OF 3	
SR-2	12X4	4 WAY	231	.13	TYP. OF 8 MAX. NC=29	
SR-3	12X4	4 WAY	207	.12	TYP. OF 9 MAX. NC=29	
SR-4	24X24	4 WAY	1254	.02	TYP. OF 2	
SR-5	NOT USED					
SR-6	24X24	4 WAY	1282	.02	TYP. OF 1	
SR-7	10X10	4 WAY	200	.02	TYP. OF 1	
SR-8	16X16	4 WAY	631	.02	TYP. OF 2	
SR-9	24X24	4 WAY	1280	.02	TYP. OF 3	
SR-10	24X24	4 WAY	1983	.045	TYP. OF 1	
SR-11	10X10	4 WAY	177	.02	TYP. OF 2 LIGHTPROOF	
SR-12	24X24	4 WAY	1368	.02	TYP. OF 1	
SR-13	24X24	4 WAY	1482	.04	TYP. OF 2	
SR-14	24X24	4 WAY	1404	.02	TYP. OF 2	
SR-15	24X24	4 WAY	1722	.045	TYP. OF 2	
SR-16	18X18	4 WAY	751	.02	TYP. OF 2	
SR-17	24X24	4 WAY	1512	.04	TYP. OF 1	
SR-18	18X18	4 WAY	861	.025	TYP. OF 2	
SR-19	24X24	4 WAY	1860	.045	TYP. OF 2	
SR-20	18X18	4 WAY	753	.02	TYP. OF 1	

S.P. LOSS SIZED AT 45° DEFLECTION.

EXISTING RETURN REGISTER SCHEDULE

NUMBER	CFM	MAX S.P. LOSS (IN. WG)	APPROX. SIZE (INCHES)	QTY.	REMARKS
RR-1	279	.03	12X10	TYP. OF 15	**REBALANCE TO 426 CFM EACH** (1)
RR-2	1021	.03	22X20	TYP. OF 8	
RR-3	731	.05	16X16	TYP. OF 5 MOUNT 14' AFF	
RR-4	1377	.08	20X18	TYP. OF 10	
RR-5	1207	.08	18X18	TYP. OF 12	
RR-6	511	.05	14X12	TYP. OF 19	
RR-7	820	.03	24X24	TYP. OF 4	
RR-8	425	.006	24X24	TYP. OF 3	
RR-9	271	.006	24X24	TYP. OF 6	
RR-10	241	.006	24X24	TYP. OF 6	
RR-11	425	.006	24X24	TYP. OF 3	
RR-12	433	.006	24X24	TYP. OF 4	
RR-13	425	.006	24X24	TYP. OF 4	
RR-14	659	.006	24X24	TYP. OF 4	
RR-15	507	.006	24X24	TYP. OF 6	
RR-16	542	.06	18X10	TYP. OF 18	
RR-17	784	.02	24X24	TYP. OF 12	
RR-18	247	.006	24X24	TYP. OF 3	
RR-19	734	.02	24X24	TYP. OF 6	
RR-20	176	.06	10X6	TYP. OF 7	**REBALANCE TO 344 CFM EACH** (1)

EXISTING EXHAUST REGISTER SCHEDULE

NUMBER	CFM	MAX S.P. LOSS (IN. WG)	APPROX. SIZE (INCHES)	QTY.	REMARKS
ER-1	100	.08	6X6	TYP. OF 2	
ER-2	150	.08	8X6	TYP. OF 8	
ER-3	250	.08	10X8	TYP. OF 8	
ER-4	70	.08	6X5	TYP. OF 9	
ER-5	741	.03	18X18	TYP. OF 3	
ER-6	641	.05	16X14	TYP. OF 2	
ER-7	450	.05	12X12	TYP. OF 2	
ER-8	375	.05	14X10	TYP. OF 2	
ER-9	262	.05	16X6	TYP. OF 2	
ER-10	247	.05	16X6	TYP. OF 2	
ER-11	242	.05	16X6	TYP. OF 2	
ER-12	282	.05	10X10	TYP. OF 2	
ER-13	188	.05	8X6	TYP. OF 2	
ER-14	1044	.08	10X8	TYP. OF 2	
ER-15	80	.05	6X6	TYP. OF 1	
ER-16	188	.05	8X6	TYP. OF 4	
ER-17	522	.05	14X12	TYP. OF 2	
ER-18	NOT USED				
ER-18	NOT USED				
ER-20	NOT USED				
ER-21	266	.05	16X6	TYP. OF 2	
ER-22	256	.05	16X6	TYP. OF 2	
ER-23	75	.05	7X4	TYP. OF 4	
ER-24	453	.05	12X12	TYP. OF 2	
ER-25	390	.05	14X10	TYP. OF 2	
ER-26	240	.05	16X6	TYP. OF 1	
ER-27	453	.05	12X12	TYP. OF 2	
ER-28	313	.05	12X10	TYP. OF 2	
ER-29	150	.05	14X4	TYP. OF 2	
ER-30	225	.05	10X8	TYP. OF 6	
ER-31	113	.05	8X5	TYP. OF 4	
ER-32	NOT USED				
ER-33	173	.05	10X6	TYP. OF 2	
ER-34	295	.05	10X10	TYP. OF 1	
ER-35	172	.05	10X6	TYP. OF 2	
ER-36	136	.05	14X4	TYP. OF 2	
ER-37	285	.05	10X10	TYP. OF 1	
ER-38	266	.05	10X10	TYP. OF 1	
ER-39	264	.05	10X10	TYP. OF 8	
ER-40	80	.05	7X4	TYP. OF 1	

EXISTING EXHAUST FAN SCHEDULE

NUMBER	FAN TYPE	CFM	S.P. LOSS (IN. WG)	HP	ELECTRICAL CHAR. VOLTS	PHASE	HERTZ	REMARKS
EF-1	UPBLAST ROOF CENTRIFUGAL	940	.375	1/6	115	1	60	18" ROOF CURB HEIGHT MOTORIZED DAMPER, TYP OF 4
EF-2	UPBLAST ROOF CENTRIFUGAL	270	.3	1/6	115	1	60	18" ROOF CURB HEIGHT MOTORIZED DAMPER
EF-3	UPBLAST ROOF CENTRIFUGAL	741	.25	1/6	115	1	60	18" ROOF CURB HEIGHT MOTORIZED DAMPER, TYP OF 3
EF-4	WALL MOUNTED CENTRIFUGAL	3090	.5	3/4	115	1	60	V BELT DRIVE GRAVITY DAMPER
EF-5	UPBLAST ROOF CENTRIFUGAL	19400/ 9700	.5	7-1/2	460	3	60	18" ROOF CURB HGT., TWO SPEED V BELT DRIVE,GRAVITY DAMPER
EF-6	WALL MOUNTED CENTRIFUGAL	200	.25	1/12	115	1	60	DIRECT DRIVE, GRAVITY DAMPER VARIABLE SPEED CONTROLLER
EF-7	UPBLAST ROOF CENTRIFUGAL	900	.5	1/6	115	1	60	18" ROOF CURB HEIGHT MOTORIZED DAMPER, TYP OF 1
EF-8	UPBLAST ROOF CENTRIFUGAL	901	.25	1/6	115	1	60	18" ROOF CURB HEIGHT MOTORIZED DAMPER, TYP OF 2
EF-9	UPBLAST ROOF CENTRIFUGAL	1602	.25	1/4	115	1	60	18" ROOF CURB HEIGHT MOTORIZED DAMPER, TYP OF 1
EF-10	UPBLAST ROOF CENTRIFUGAL	1643	.25	1/4	115	1	60	18" ROOF CURB HEIGHT MOTORIZED DAMPER, TYP OF 1
EF-11	UPBLAST ROOF CENTRIFUGAL	1685	.25	1/4	115	1	60	18" ROOF CURB HEIGHT MOTORIZED DAMPER, TYP OF 1
EF-12	UPBLAST ROOF CENTRIFUGAL	1771	.25	1/4	115	1	60	18" ROOF CURB HEIGHT MOTORIZED DAMPER, TYP OF 1
EF-13	UPBLAST ROOF CENTRIFUGAL	978	.25	1/6	115	1	60	18" ROOF CURB HEIGHT MOTORIZED DAMPER, TYP OF 1
EF-14	UPBLAST ROOF CENTRIFUGAL	1044	.25	1/4	115	1	60	18" ROOF CURB HEIGHT MOTORIZED DAMPER, TYP OF 1
EF-15	UPBLAST ROOF CENTRIFUGAL	2208	.25	1/2	115	1	60	18" ROOF CURB HEIGHT MOTORIZED DAMPER, TYP OF 1
EF-16	UPBLAST ROOF CENTRIFUGAL	2182	.25	1/2	115	1	60	18" ROOF CURB HEIGHT MOTORIZED DAMPER, TYP OF 1
EF-17	UPBLAST ROOF CENTRIFUGAL	1274	.25	1/4	115	1	60	18" ROOF CURB HEIGHT MOTORIZED DAMPER, TYP OF 1
EF-18	UPBLAST ROOF CENTRIFUGAL	2458	.25	3/4	115	1	60	18" ROOF CURB HEIGHT MOTORIZED DAMPER, TYP OF 1

EXISTING DOOR GRILLE SCHEDULE

DOOR GRILLE NUMBER	CFM	MAXIMUM S.P. LOSS (IN. WG)	REMARKS
DG-1	150	.2	TYPICAL OF 8, VISION PROOF WOMENS TOILETS, MAIN BUILDING
DG-2	100	.2	TYPICAL OF 2, VISION PROOF MENS AND WOMENS TOILET, LIBRARY ANNEX
DG-3	250	.2	TYPICAL OF 8, VISION PROOF MENS TOILETS, MAIN BUILDING

EXISTING LOUVER SCHEDULE

NUMBER	DIMENSIONS WIDTH (INCHES)	DIMENSIONS HEIGHT (INCHES)	CFM	MAX. S.P. LOSS (IN. WG)	REMARKS
L-1	36	36	3000	.17	OPERABLE MOTOR OPERATED DAMPER OR BLADES, INTAKE, ZERO WATER PENETRATION
L-2	120	96	19400	.17	OPERABLE MOTOR OPERATED DAMPER OR BLADES, INTAKE, ZERO WATER PENETRATION
L-3	24	24	2000	--	EXHAUST, RELIEF DAMPER WITH COUNTERBALANCE, SET AT .1 INCH OF WATER, ADJUSTABLE

EXISTING EXHAUST GRILLE SCHEDULE

NUMBER	CFM	MAX. S.P. LOSS (IN WG)	APPROX. SIZE (INCHES)	QTY.	REMARKS
EG-1	741	.06	16X14	TYP. OF 3	
EG-2	1254	.025	24X24	TYP. OF 2	
EG-3	NOT USED				
EG-4	1282	.025	24X24	TYP. OF 1	
EG-5	200	.025	10X10	TYP. OF 1	
EG-6	631	.026	16X16	TYP. OF 2	
EG-7	1280	.025	24X24	TYP. OF 3	
EG-8	1983	.055	24X24	TYP. OF 1	
EG-9	177	.025	10X10	TYP. OF 2 LIGHTPROOF	
EG-10	1368	.025	24X24	TYP. OF 1	
EG-11	1482	.03	24X24	TYP. OF 2	
EG-12	1404	.025	24X24	TYP. OF 2	
EG-13	1722	.055	24X24	TYP. OF 2	
EG-14	751	.025	18X18	TYP. OF 2	
EG-15	1512	.035	24X24	TYP. OF 1	
EG-16	861	.03	18X18	TYP. OF 2	
EG-17	1860	.057	24X24	TYP. OF 2	
EG-18	753	.025	18X18	TYP. OF 1	
EG-19	900	.08	18X12	TYP. OF 1	

NOTES:

(1) WORK REQUIRED UNDER THIS PROJECT.

THESE DOCUMENTS HAVE BEEN PREPARED PRIMARILY BASED ON INFORMATION PROVIDED BY OTHERS. I.C. THOMASSON HAS NOT VERIFIED THE ACCURACY OF ALL INFORMATION PROVIDED BY OTHERS. SEE LIMIT OF LIABILITIES STATEMENT ON COVER SHEET.

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.	Symbol	Description	Date	Appr.

Checked by: WTT | Date: 02/27/04
Dwn by: ICT | CADD File Name: 3121M007.DGN
DACA87-03-0-0006 | ICT Project No. 20312.1
Approved by: Chief, Prj. Mgmt. Division | Plot date: 02/27/04 | Plot scale:

TASK ORDER #: FRR004

VENGUARD

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ICT

DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND

MECHANICAL SCHEDULES

STATE OF MARYLAND — MECHANICAL ENGINEER

Sheet reference number:
M-006

EXISTING LINEAR SLOT DIFFUSER SCHEDULE

ROOM NUMBER	TYPE OF DIFFUSER	LENGTH (FT.)	CFM (EA.)	MAX S.P. LOSS (IN. WG)	QTY.	WORK REQUIRED UNDER THIS PROJECT
1146	2W/4S	4	392	.06	TYP OF 12	REBALANCE TO 145 CFM EACH
1146A	2W/2S		150	.07	TYP OF 1	REBALANCE TO 113 CFM
1146B			150	.07	TYP OF 1	REBALANCE TO 143 CFM
1148	2W/4S		392	.06	TYP OF 12	REBALANCE TO 224 CFM EACH
1148A	2W/2S		150	.07	TYP OF 1	REBALANCE TO 148 CFM
1148B			150	.07	TYP OF 1	REBALANCE TO 148 CFM
1150A	2W/4S		260	.07	TYP OF 1	REBALANCE TO 80 CFM
1150	2W/4S	2		.05	TYP OF 4	REBALANCE EXISTING CD-6 TO 133 CFM EA.
1150C NOT USED						
1152A	2W/4S	2	100	.05	TYP OF 1	REBALANCE TO 113 CFM
1152B	2W/4S	4	200	.06	TYP OF 2	REBALANCE TO 57 CFM EACH
1152C	2W/2S	2	100	.05	TYP OF 1	CHANGE EXISTING TO 4'(2W/4S) BAL FOR 295 CFM
1105	2W/4S	4	232	.06	TYP OF 4	REBALANCE TO 94 CFM EACH
1104			213	.06	TYP OF 2	REPLACE W/2 2W/2S BALANCE TO 186 CFM EACH
1106			175	.06	TYP OF 1	ADD 2W/2S BALANCE TO 352 CFM EA.
1115	2W/2S	2	51	.05	TYP OF 6	ADD 4 MORE 2W/2S DIFFUSERS BALANCE TO 208 CFM EACH
1121	2W/4S	4	175	.06	TYP OF 1	ADD 2 MORE 2W/4S DIFFUSERS BALANCE TO 219 CFM EACH
1210	2W/2S		182	.07	TYP OF 4	ADD 2 MORE 2W/2S DIFFUSERS BALANCE TO 207 CFM EACH
1118G	2W/4S		276	.07	TYP OF 1	REBALANCE TO 188 CFM
	2W/2S	2	52	.05	TYP OF 1	NOT USED
1122		4	170	.07	TYP OF 4	REBALANCE TO 170 CFM EACH
1131		2	56	.05	TYP OF 3	REBALANCE TO 200 CFM EACH
			55	.05	TYP OF 1	NOT USED
1127	2W/4S	4	240	.06	TYP OF 12	REBALANCE TO 221 CFM EACH
1133			201	.06	TYP OF 4	REMOVE 2 DIFFUSERS REBALANCE REMAINING TO 144 CFM EACH
1130A	2W/2S		124	.07	TYP OF 4	ADD 4 DIFFUSERS BALANCE ALL TO 364 CFM EACH
1132	2W/4S		210	.06	TYP OF 15	REBALANCE TO 246 CFM
	2W/2S		55	.07	TYP OF 1	NOT USED
1130	2W/4S		149	.06	TYP OF 4	REBALANCE TO 304 CFM EACH
1129	2W/2S		97	.07	TYP OF 2	REBALANCE TO 160 CFM EACH
1132A			81	.07	TYP OF 1	REBALANCE TO 149 CFM
1132B		2	38	.05	TYP OF 1	REBALANCE TO 131 CFM
1132C		4	130	.07	TYP OF 1	REBALANCE TO 62 CFM
1174			76	.07	TYP OF 1	ADD 3 2W/2S DIFFUSERS BALANCE ALL TO 267 CFM EACH
1175A-C		2	36	.05	TYP OF 3	REBALANCE TO 44 CFM EACH
1175D-F			36		TYP OF 3	REBALANCE TO 44 CFM EACH
1175G-J			36		TYP OF 3	REBALANCE TO 44 CFM EACH
1175K-N			48		TYP OF 4	REBALANCE TO 88 CFM EACH
1176A-C			36		TYP OF 3	REBALANCE TO 44 CFM EACH
1176D-F			36		TYP OF 3	REBALANCE TO 44 CFM EACH
1176G-J			36		TYP OF 3	REBALANCE TO 45 CFM EACH
1176K-M			36		TYP OF 3	REBALANCE TO 44 CFM EACH
1169			52		TYP OF 3	ADD 2 2W/2S DIFFUSERS BALANCE ALL TO 273 CFM EACH
			55		TYP OF 1	NOT USED
1156		4	159	.07	TYP OF 4	REBALANCE TO 175 CFM EACH
1154	2W/4S	4	210	.06	TYP OF 23	REBALANCE TO 242 CFM EACH
1153	2W/2S	2	60	.05	TYP OF 3	REBALANCE TO 263 CFM EACH
1145		2	37	.05	TYP OF 3	REBALANCE TO 286 CFM EACH
1144		4	112	.07	TYP OF 8	REBALANCE TO 56 CFM EACH
1152	4W/4S	4	275	.07	TYP OF 6	REBALANCE TO 366 CFM EACH

NOTE:

① MAXIMUM CFM FOR 1W/1S, 2 FT. LONG = 15 CFM.

② MAXIMUM CFM FOR 2W/2S, 2 FT. LONG = 100 CFM.
4 FT. LONG = 200 CFM.

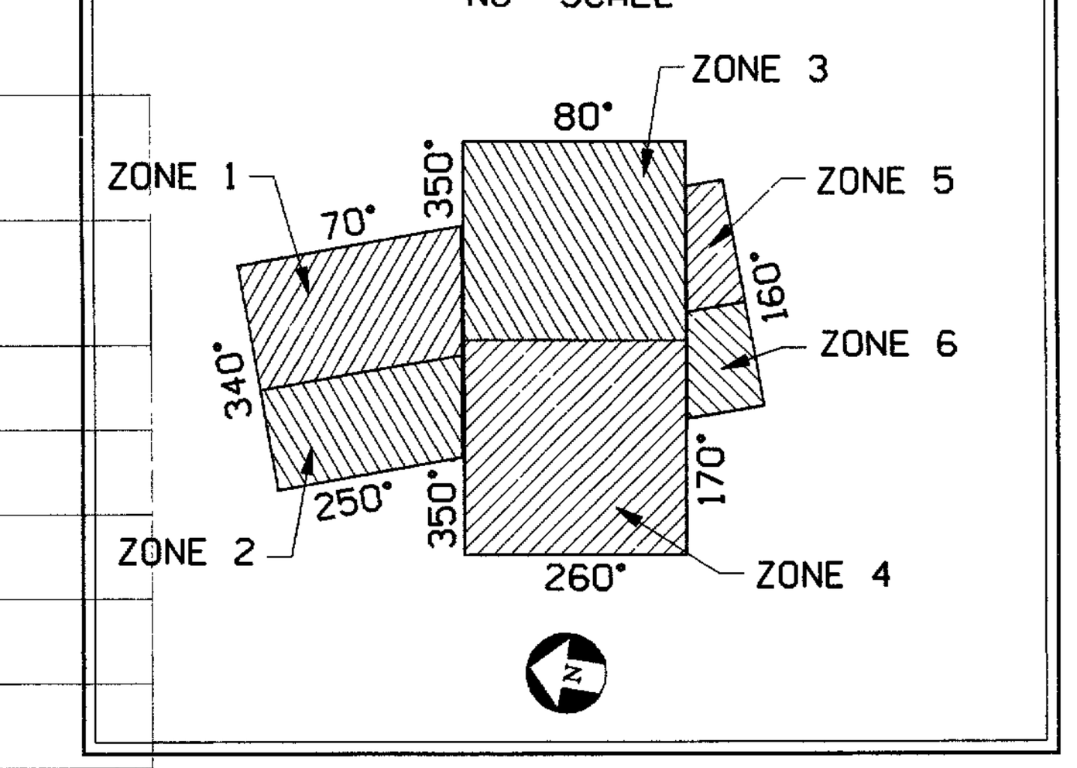
③ MAXIMUM CFM FOR 2W/4S, 2 FT. LONG = 200 CFM.
4 FT. LONG = 400 CFM.

EXISTING LINEAR SLOT DIFFUSER SCHEDULE

ROOM NUMBER	TYPE OF DIFFUSER	LENGTH (FT.)	CFM (EA.)	MAX S.P. LOSS (IN. WG)	QTY.	WORK REQUIRED UNDER THIS PROJECT
1170	2W/4S	4	179	.06	TYP OF 6	REBALANCE TO 185 CFM EACH
1151	2W/2S	4	107	.07	TYP OF 1	REBALANCE TO 320 CFM
1151A	2W/2S	2	51	.05	TYP OF 1	REBALANCE TO 86 CFM
1159	2W/4S	2	217	.07	TYP OF 2	REBALANCE EXISTING 10-2W/4S TO 222 CFM EA.
1177A OUTER	2W/4S	4	283	.06	TYP OF 2	REBALANCE TO 213 CFM EACH
1177A INNER	2W/2S	2	50	.05	TYP OF 1	REBALANCE TO 40 CFM
1177B OUTER	2W/4S	4	283	.06	TYP OF 2	REBALANCE TO 213 CFM
1177B INNER	2W/2S	2	50	.05	TYP OF 1	REBALANCE TO 40 CFM EACH
1177C OUTER	2W/4S	4	283	.06	TYP OF 2	REBALANCE TO 213 CFM EACH
1177C INNER	2W/2S	2	50	.05	TYP OF 1	REBALANCE TO 40 CFM EACH
1177D OUTER	2W/4S	4	283	.06	TYP OF 2	REBALANCE TO 213 CFM
1177D INNER	2W/2S	2	50	.05	TYP OF 1	REBALANCE TO 40 CFM EACH
1155A	2W/2S	4	90	.07	TYP OF 1	REBALANCE TO 140 CFM
1155	2W/4S		283	.06	TYP OF 2	REBALANCE TO 390 CFM EACH
1151B	2W/2S		65	.07	TYP OF 1	REBALANCE TO 105 CFM
1151D			93		TYP OF 1	REBALANCE TO 150 CFM
1151E			54		TYP OF 1	REBALANCE TO 80 CFM
1151F			54		TYP OF 1	REBALANCE TO 80 CFM
1175	2W/4S		89	.06	TYP OF 2	REBALANCE TO 130 CFM EACH
1176	2W/4S		89	.06	TYP OF 2	REBALANCE TO 259 CFM EACH
1211	2W/2S	2	34	.05	TYP OF 1	REBALANCE TO 192 CFM
1212		4	122	.07	TYP OF 2	REBALANCE TO 247 CFM EACH
			123		TYP OF 2	NOT USED
1205A			208		TYP OF 1	REBALANCE TO 234 CFM
1205	2W/4S		239	.06	TYP OF 3	REBALANCE TO 306 CFM EACH
1204A	2W/2S		208	.08	TYP OF 1	REBALANCE TO 232 CFM
1204	2W/4S		239	.06	TYP OF 3	REBALANCE TO 306 CFM EACH
	2W/2S	2	55	.07	TYP OF 1	NOT USED
1197	2W/2S	4	83	.05	TYP OF 2	ADD 2- 2W/2S DIFFUSERS REBALANCE TO 178 CFM EACH
1199	2W/4S	4	288	.06	TYP OF 4	REBALANCE TO 180 CFM EACH
1201	2W/4S	4	270	.06	TYP OF 4	REBALANCE TO 335 CFM EACH
1192A	2W/2S	2	59	.05	TYP OF 1	ADD 2- 2W/2S DIFFUSERS REBALANCE TO 320 CFM EACH
1179/1182			61		TYP OF 3	ADD 8- 2W/2S DIFFUSERS REBALANCE TO 96 CFM EACH
1183A-D			12		TYP OF 4	REBALANCE TO 24 CFM EACH
1183E-G			12		TYP OF 3	REBALANCE TO 24 CFM EACH
1183H-K			12		TYP OF 3	REBALANCE TO 23 CFM EACH
1184A-D			12		TYP OF 4	REBALANCE TO 24 CFM EACH
1184E-G			12		TYP OF 3	REBALANCE TO 21 CFM EACH
1184H-K			12		TYP OF 3	REBALANCE TO 21 CFM EACH
——	——	——	——	——	——	
1118A OUTER	1W/2S	2	15	.02	TYP OF 1	REBALANCE TO 60 CFM
1118A INNER	2W/2S	4	155			REBALANCE TO 113 CFM
1118B OUTER	1W/2S	2	15			REBALANCE TO 60 CFM
1118B INNER	2W/2S	4	155			REBALANCE TO 117 CFM
1118C OUTER	1W/2S	2	15			REBALANCE TO 60 CFM
1118C INNER	2W/2S	4	155			REBALANCE TO 117 CFM
1118D OUTER	1W/2S	2	15			REBALANCE TO 60 CFM
1118D INNER	2W/2S	4	155			REBALANCE TO 117 CFM
1118E OUTER	1W/2S	2	15			REBALANCE TO 60 CFM
1118E INNER	2W/2S	4	155			REBALANCE TO 117 CFM
2121	2W/2S	2	125	.05		
1118F OUTER	1W/2S	2	15	.02		REBALANCE TO 60 CFM
1118F INNER	2W/2S	4	155			REBALANCE TO 117 CFM

KEY PLAN

NO SCALE



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US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Symbol	Description	Date	Appr.

TASK ORDER #: FRR004

VANGUARD — PADUCAH, KENTUCKY VOICE 270-442-8620

I.C. Thomasson Associates, Inc. — NASHVILLE, TENNESSEE PHONE (615) 346-3400

Checked by: WTT
Date: 02/27/04
Dwn by: ICT
CADD File Name: 3121M008.DGN
DACA87-03-D-0006
ICT Project No. 203121
Approved by:
Plot date: 02/27/04
Chief, Prj. Mgmt. Division
Plot scale:

DEFENSE INFORMATION SCHOOL

FT. MEADE MARYLAND

MECHANICAL SCHEDULES

Sheet reference number:

M-007

EXISTING LINEAR SLOT DIFFUSER SCHEDULE

ROOM NUMBER	TYPE OF DIFFUSER	LENGTH (FT.)	CFM (EA.)	MAX S.P. LOSS (IN. WG)	QTY.	WORK REQUIRED UNDER THIS PROJECT
1118F OUTER	1W/2S	2	15	.02	TYP OF 1	
1118F INNER	2W/2S	4	155			REBALANCE TO 129 CFM
1118H OUTER	1W/2S	2'	15			
1118H INNER	2W/2S	4	155			REBALANCE TO 129 CFM
1118J OUTER	1W/2S	2	15			
1118J INNER	2W/2S	4	155			REBALANCE TO 129 CFM
1118K OUTER	1W/2S	2	15			
1118K INNER	2W/2S	4	155			REBALANCE TO 129 CFM
1118L OUTER	1W/2S	2	15			
1118L INNER	2W/2S	4	155			REBALANCE TO 129 CFM
1116	2W/2S		82	.07	TYP OF 2	ADD 2- 2W/2S DIFFUSERS BALANCE ALL TO 187 CFM EACH
2125	2W/4S		345	.06	TYP OF 6	REBALANCE TO 193 CFM EACH
2124			335			REBALANCE TO 89 CFM EACH
2123			345			REBALANCE TO 122 CFM EACH
2111			467	.1	TYP OF 6	REBALANCE TO 90 CFM EACH
2115A			320	.06	TYP OF 2	REBALANCE TO 279 CFM EACH
2115B			320		TYP OF 2	REBALANCE TO 279 CFM EACH
2117			215		TYP OF 4	REBALANCE TO 123 CFM EACH
2122			339		TYP OF 4	REBALANCE TO 121 CFM EACH
	2W/4S	2	186	.05		NOT USED
2165	2W/4S	2	168	.05		ADD 11- 2W/4S DIFFUSERS FOR A TOTAL OF 15 DIFFUSERS BALANCE ALL TO 196 CFM EACH
2171	2W/2S	4	185	.07		REBALANCE TO 187 CFM EACH
2173			176			REBALANCE TO 174 CFM EACH
2175			176			REBALANCE TO 190 CFM EACH
2177	2W/4S		395	.06		REBALANCE TO 190 CFM EACH
2179	2W/4S		395	.06		REBALANCE TO 202 CFM EACH
2181	2W/2S	2	87	.05	TYP OF 5	REPLACE EXIST. W/ 2W/4S (2FT) & LP DUCT FEEDS & ADD 1-2W/4S DIFFUSERS BALANCE ALL TO 80 CFM EACH
2183	2W/4S	4	333	.06	TYP OF 6	REBALANCE TO 310 CFM EACH
2184			395		TYP OF 4	REBALANCE TO 209 CFM EACH
2185			334		TYP OF 6	REBALANCE TO 310 CFM EACH
2186			395		TYP OF 4	REBALANCE TO 234 CFM EACH
2187			361		TYP OF 2	REBALANCE TO 251 CFM EACH
2188	2W/2S		176	.07	TYP OF 4	REBALANCE TO 198 CFM EACH
2189			186		TYP OF 8	REBALANCE TO 86 CFM EACH
2190			176		TYP OF 4	REBALANCE TO 176 CFM EACH
2191			186		TYP OF 8	REBALANCE TO 166 CFM EACH
2192			193		TYP OF 4	REBALANCE TO 197 CFM EACH
2194		2	72	.05	TYP OF 3	REPLACE EXIST. W/ 2W/4S (2FT) & LP DUCT FEEDS & ADD 1-2W/4S DIFFUSERS BALANCE ALL TO 199 CFM EACH
2195		2	108	.05	TYP OF 4	REBALANCE TO 132 CFM EACH
2196	2W/4S	4	386	.06	TYP OF 8	REBALANCE TO 258 CFM EACH
	2W/2S	2	62	.05	TYP OF 1	NOT USED
2195A			67			REBALANCE TO 80 CFM EACH
2195B			63			REBALANCE TO 70 CFM EACH
2195C	1W/2S	4	63	.02		REPLACE EXIST. W/ 2W/4S (4FT) DIFFUSER BALANCE ALL TO 231 CFM
2195D	2W/2S		121	.07		REBALANCE TO 96 CFM EACH
2195E			86			REBALANCE TO 96 CFM EACH
2195F			95			REBALANCE TO 100 CFM EACH
2128/2133		2	94	.05	TYP OF 5	REPLACE EXIST. W/ 2W/4S (2FT) & LP DUCT FEEDS & ADD 1-2W/4S DIFFUSERS BALANCE ALL TO 187 CFM EACH
		2	62	.05	TYP OF 1	NOT USED
2146A	2W/4S	4	209	.06	TYP OF 2	REBALANCE TO 157 CFM EACH

NOTE:

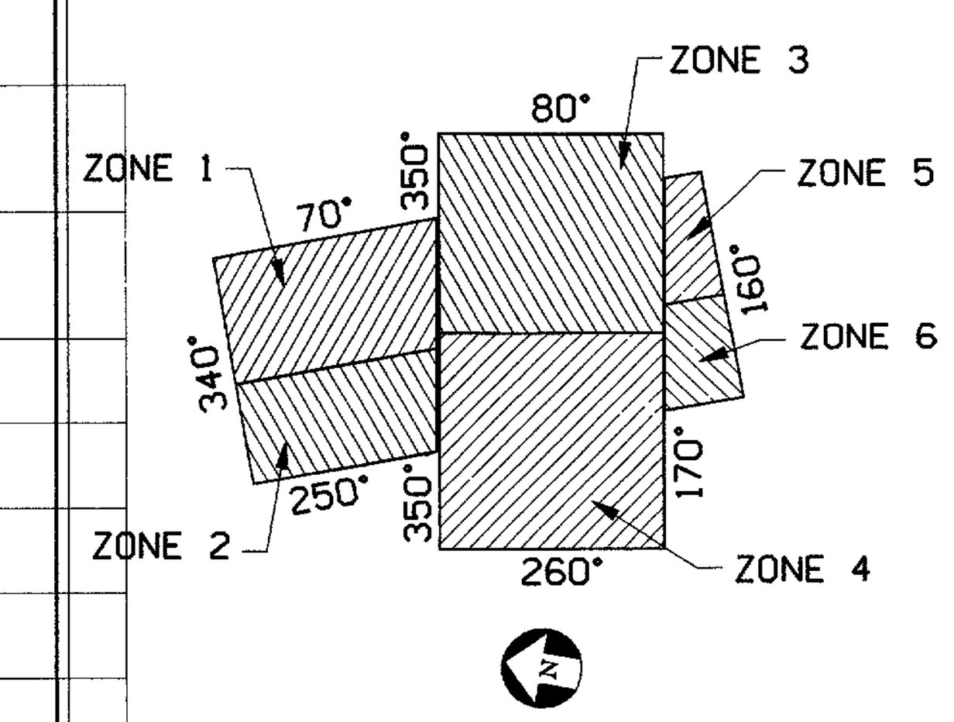
1. MAXIMUM CFM FOR 1W/1S, 2 FT. LONG = 15 CFM.
2. MAXIMUM CFM FOR 2W/2S, 2 FT. LONG = 100 CFM. 4 FT. LONG = 200 CFM.
3. MAXIMUM CFM FOR 2W/4S, 2 FT. LONG = 200 CFM. 4 FT. LONG = 400 CFM.

EXISTING LINEAR SLOT DIFFUSER SCHEDULE

ROOM NUMBER	TYPE OF DIFFUSER	LENGTH (FT.)	CFM (EA.)	MAX S.P. LOSS (IN. WG)	QTY.	WORK REQUIRED UNDER THIS PROJECT
2138	2W/4S	4	284	.06	TYP OF 9	REBALANCE TO 143 CFM EACH
2136	2W/4S		354	.06	TYP OF 12	REBALANCE TO 195 CFM EACH
2132 2132E	2W/2S		118	.07	TYP OF 35	REBALANCE TO 41 CFM EACH
2130	2W/2S		193	07	TYP OF 2	REBALANCE TO 233 CFM EACH
2129	2W/4S		235	.06	TYP OF 6	REBALANCE TO 151 CFM EACH
2126	2W/2S		182	.07	TYP OF 3	REBALANCE TO 184 CFM EACH
2121/2102 2118	2W/4S	2	113	.05	TYP OF 4	REBALANCE TO 125 CFM EACH
2107	2W/2S		90		TYP OF 5	REPLACE EXIST. W/ 2W/4S (2FT) DIFFUSERS BALANCE ALL TO 192 CFM EACH
2105A	2W/2S		62		TYP OF 1	REPLACE EXIST. W/ 2W/4S (2FT) DIFFUSER BALANCE ALL TO 192 CFM
2109	2W/4S	4	251	.06	TYP OF 1	ADD 1- 2W/4S DIFFUSER BALANCE TO 254 CFM EACH
2109A		4	251		TYP OF 1	REBALANCE TO 435 CFM
2120			351		TYP OF 4	REBALANCE TO 392 CFM EACH
2120A			219		TYP OF 1	REBALANCE TO 225 CFM
2120B			234		TYP OF 4	REBALANCE TO 222 CFM EACH
2132C			258		TYP OF 1	REBALANCE TO 320 CFM
2132D	2W/2S		204	.07	TYP OF 3	ADD 1- 2W/2S (4FT) DIFFUSER FOR A TOTAL OF 4 DIFFUSERS BALANCE ALL TO 209 CFM EACH
2132B			95		TYP OF 1	REBALANCE TO 121 CFM
2132A			255		TYP OF 1	ADD 1- 2W/2S (4FT) DIFFUSER FOR A TOTAL OF 2 DIFFUSERS BALANCE ALL TO 186 CFM EACH
2146B	2W/4S		257	.06	TYP OF 6	REBALANCE TO 185 CFM EACH
2131B	2W/2S	2	80	.05	TYP OF 1	REBALANCE TO 98 CFM
2146D			25		TYP OF 1	REBALANCE TO 55 CFM
2126A			82		TYP OF 2	REBALANCE TO 65 CFM EACH
2126B	2W/4S	4	222	.06	TYP OF 1	REBALANCE TO 290 CFM
2126C	2W/4S	2	104	.05	TYP OF 3	REBALANCE TO 137 CFM EACH
2126D	2W/2S	4	159	.07	TYP OF 1	REBALANCE TO 214 CFM
2126E			80		TYP OF 1	REBALANCE TO 98 CFM
2126F			72		TYP OF 1	REBALANCE TO 94 CFM
2132F	2W/4S		94	.06	TYP OF 3	REBALANCE TO 104 CFM EACH
2132G	2W/2S		69	.07	TYP OF 1	REBALANCE TO 100 CFM
2131A	2W/4S		102	.06	TYP OF 2	REBALANCE TO 108 CFM EACH
2108			375	.06	TYP OF 4	REBALANCE TO 276 CFM EACH
2110			395		TYP OF 4	REBALANCE TO 276 CFM EACH
2112			395		TYP OF 4	REBALANCE TO 276 CFM EACH
2114			395		TYP OF 4	REBALANCE TO 276 CFM EACH
2116			216		TYP OF 2	REBALANCE TO 192 CFM EACH
2116A			216		TYP OF 4	REBALANCE TO 87 CFM EACH
2135			375		TYP OF 4	REBALANCE TO 276 CFM EACH
2137			395		TYP OF 4	REBALANCE TO 276 CFM EACH
2139			395		TYP OF 4	REBALANCE TO 276 CFM EACH
2141			395		TYP OF 4	REBALANCE TO 204 CFM EACH
2143			216		TYP OF 2	REBALANCE TO 199 CFM EACH
2143A			216		TYP OF 2	REBALANCE TO 199 CFM EACH
2208	2W/4S		406	.07	TYP OF 8	REBALANCE TO 203 CFM EACH
2206			406	.07	TYP OF 8	REBALANCE TO 203 CFM EACH
2200			236	.06	TYP OF 14	REBALANCE TO 214 CFM EACH
2197			386	.06	TYP OF 8	REBALANCE TO 262 CFM EACH
2198		2	116	.05	TYP OF 3	REBALANCE TO 168 CFM EACH
2199		2	87	.05	TYP OF 5	ADD 2- 2W/4S (2FT) DIFFUSERS BALANCE ALL TO 203 CFM EACH
2214		4	406	.07	TYP OF 8	REBALANCE TO 239 CFM EACH
2212					TYP OF 8	REBALANCE TO 209 CFM EACH
2210					TYP OF 8	REBALANCE TO 193 CFM EACH
2180/2230			250	.06	TYP OF 4	REBALANCE TO 180 CFM EACH

KEY PLAN

NO SCALE



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US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Symbol	Description	Date	Appr.

TASK ORDER #: FRR004

VANGUARD CONTRACTORS INC. PADUCAH, KENTUCKY VOICE 270-442-8620

ICT I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400

Checked by: WTT | Date: 02/27/04
Dwn by: ICT | CADD File Name: 3121M008.DGN
DACA87-03-D-0006 | ICT Project No. 203121
Approved by: | Plot date: 02/27/04
Chief, Prj. Mgmt. Division | Plot scale:

DEFENSE INFORMATION SCHOOL

FT. MEADE MARYLAND

MECHANICAL SCHEDULES

Sheet reference number: M-008

EXISTING LINEAR SLOT DIFFUSER SCHEDULE

ROOM NUMBER	TYPE OF DIFFUSER	LENGTH (FT.)	CFM (EA.)	MAX S.P. LOSS (IN. WG)	QTY.	WORK REQUIRED UNDER THIS PROJECT
	2W/2S	2	55	.05	TYP OF 1	
2207	2W/2S	2	84	.05	TYP OF 4	REBALANCE TO 397 CFM EACH
2216	2W/2S	2	84	.05	TYP OF 4	REBALANCE TO 114 CFM EACH
2219	2W/4S	4	336	.06	TYP OF 4	REBALANCE TO 314 CFM EACH
2201		4	359	.06	TYP OF 2	
2201		2	179	.05	TYP OF 4	
2151B	2W/2S	2	61		TYP OF 1	REBALANCE TO 178 CFM
2178	2W/4S	2	147		TYP OF 1	REBALANCE TO 134 CFM
2151A	2W/2S	2	80		TYP OF 1	REBALANCE TO 107 CFM
2151	2W/2S	4	149	.07	TYP OF 6	REBALANCE TO 191 CFM EACH
2176	2W/4S		177	.06	TYP OF 4	REBALANCE TO 182 CFM EACH
2174			177		TYP OF 4	REBALANCE TO 182 CFM EACH
2170			177		TYP OF 4	REBALANCE TO 176 CFM EACH
2153			177		TYP OF 4	REBALANCE TO 300 CFM EACH
2155			177		TYP OF 4	REBALANCE TO 300 CFM EACH
2157			177		TYP OF 4	REBALANCE TO 287 CFM EACH
2159			177		TYP OF 4	REBALANCE TO 289 CFM EACH
2150C			222		TYP OF 1	REBALANCE TO 226 CFM
2150B			222		TYP OF 1	REBALANCE TO 205 CFM
2150A			251		TYP OF 2	REBALANCE TO 319 CFM EACH
2150D	2W/2S	2	73	.05	TYP OF 2	REBALANCE TO 47 CFM EACH
2150E	2W/2S	2	73	.05	TYP OF 2	REBALANCE TO 50 CFM EACH
2150F	2W/2S	2	73	.05	TYP OF 2	REBALANCE TO 50 CFM EACH
2150	2W/4S	4	229	.06	TYP OF 30	
2160A	2W/2S	4	93	.07	TYP OF 1	REBALANCE TO 115 CFM
2160B	2W/2S	4	265	.08	TYP OF 2	REBALANCE TO 323 CFM EACH
2160	2W/2S	4	217	.07	TYP OF 28	
2149/2162	2W/2S	2	98	.05	TYP OF 6	REBALANCE TO 504/36 CFM EACH
2218	2W/4S	4	410	.06	TYP OF 8	REBALANCE TO 119 CFM EACH
2217			318		TYP OF 4	REBALANCE TO 188 CFM EACH
2211			271		TYP OF 6	REBALANCE TO 148 CFM EACH
2215			241		TYP OF 6	REBALANCE TO 134 CFM EACH
2209			318		TYP OF 4	REBALANCE TO 288 CFM EACH
2203B			288		TYP OF 6	REBALANCE TO 124 CFM EACH
2203A			283		TYP OF 6	REBALANCE TO 122 CFM EACH
2205			293		TYP OF 9	REBALANCE TO 61 CFM EACH
1190	2W/4S		376		TYP OF 8	REBALANCE TO 148 CFM EACH
1172			380		TYP OF 8	REBALANCE TO 214 CFM EACH
1194			366		TYP OF 8	REBALANCE TO 124 CFM EACH
1196			367		TYP OF 8	REBALANCE TO 123 CFM EACH
1114	2W/4S		219		TYP OF 4	REBALANCE TO 238 CFM EACH
1124			317		TYP OF 4	REBALANCE TO 309 CFM EACH
1125A			268		TYP OF 3	REBALANCE TO 115 CFM EACH
1125B			268		TYP OF 3	REBALANCE TO 115 CFM EACH
1135			263		TYP OF 6	DEMO 2 DIFFUSERS REBALANCE REMAINING TO 125 CFM EACH
1137			213		TYP OF 2	REPLACE W/2 2W/4S BALANCE TO 480 CFM EACH
1126			305		TYP OF 12	ADD 12 DIFFUSERS BALANCE ALL TO 319 CFM EACH
1128			214		TYP OF 11	REBALANCE TO 111 CFM EACH
2119			358		TYP OF 8	REBALANCE TO 80 CFM EACH
1178			207		TYP OF 8	ADD 4- 2W/4S DIFFUSERS BALANCE TO 300 CFM EACH
1186	2W/4S	4	407	.06	TYP OF 24	REMOVE 8 DIFFUSERS REBALANCE TO 140 CFM EACH

EXISTING LINEAR SLOT DIFFUSER SCHEDULE

ROOM NUMBER	TYPE OF DIFFUSER	LENGTH (FT.)	CFM (EA.)	MAX S.P. LOSS (IN. WG)	QTY.	WORK REQUIRED UNDER THIS PROJECT
1188	2W/4S	4	207	.06	TYP OF 8	REBALANCE TO 216 CFM EACH
1179A	2W/2S		36	.07	TYP OF 1	REBALANCE TO 240 CFM
1181F NOT USED						
1181G NOT USED						
1181B	2W/4S	4	213	.06	TYP OF 4	REBALANCE TO 197 CFM EACH
1181A	2W/4S	4	213	.07	TYP OF 4	REBALANCE TO 193 CFM EACH
1181E NOT USED						
1181D	2W/4S	4	213	.06	TYP OF 4	REBALANCE TO 195 CFM EACH
1181C	2W/4S		213	.06	TYP OF 4	REBALANCE TO 197 CFM EACH
1185	2W/2S		128	.07	TYP OF 8	REBALANCE TO 89 CFM EACH
1187	2W/2S		128		TYP OF 8	REBALANCE TO 89 CFM EACH
1189	2W/2S		132		TYP OF 8	ADD 4-2W/4S DIFFUSERS BALANCE TO 258 CFM EACH REBALANCE EXIST TO 129 CFM EACH
1191	2W/2S		128		TYP OF 8	REBALANCE TO 125 CFM EACH
1193	2W/4S		371	.06	TYP OF 8	REBALANCE TO 126 CFM EACH
1164E	2W/4S		218	.06	TYP OF 4	REBALANCE TO 73 CFM EACH
1163E	2W/4S		217	.06	TYP OF 1	REBALANCE TO 170 CFM
1163D	2W/4S		267	.06	TYP OF 2	REBALANCE TO 802 CFM EACH
1164D	2W/4S		253	.06	TYP OF 4	REBALANCE TO 186 CFM EACH
1164B	2W/4S		246	.06	TYP OF 4	REBALANCE TO 195 CFM EACH
1164A	2W/4S		259	.06	TYP OF 1	REBALANCE TO 53 CFM
1164C	2W/2S		82	.05	TYP OF 1	REBALANCE TO 173 CFM
1161	2W/4S		219	.06	TYP OF 19	REBALANCE TO 255 CFM EA
1161A	2W/4S		201	.06	TYP OF 1	ADD 2- 2W/4S DIFFUSERS REBALANCE ALL TO 230 CFM EACH
1161B	2W/2S		130	.05	TYP OF 1	REBALANCE TO 131 CFM
1161C	2W/2S		132	.05	TYP OF 1	REBALANCE TO 149 CFM
1111A	2W/4S		353	.06	TYP OF 2	REBALANCE TO 245 CFM EACH
1111B	2W/4S		356			REBALANCE TO 257 CFM EACH
1119A	2W/4S		353			REBALANCE TO 96 CFM EACH
1119B	2W/4S		356			REBALANCE TO 255 CFM EACH
1117	2W/4S		100		TYP OF 1	REBALANCE TO 662 CFM
1160	2W/4S		219	.06	TYP OF 3	REBALANCE TO 235 CFM EACH
	2W/2S		69	.05	TYP OF 2	NOT USED
2119	2W/2S	2			TYP OF 6	REBALANCE TO 106 CFM EACH
2148	2W/2S	2		.05	TYP OF 5	ADD 6- 2W/2S DIFFUSERS REBALANCE ALL TO 240 CFM EACH
2165	2W/2S	2		.06	TYP OF 4	ADD 4- 2W/2S DIFFUSERS REBALANCE ALL TO 276 CFM EACH
1153A	2W/2S	2		.05	TYP OF 1	REBALANCE TO 36 CFM EACH

NOTE:

① MAXIMUM CFM FOR 1W/1S, 2 FT. LONG = 15 CFM.

② MAXIMUM CFM FOR 2W/2S, 2 FT. LONG = 100 CFM.
4 FT. LONG = 200 CFM.

③ MAXIMUM CFM FOR 2W/4S, 2 FT. LONG = 200 CFM.
4 FT. LONG = 400 CFM.

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

TASK ORDER #: FRR004
VANGUARD CONTRACTORS INC. PADUCAH, KENTUCKY VOICE 270-442-8620
I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400
Checked by: WTT | Date: 02/27/04
Dwn by: ICT | CADD File Name: 3121M010.DGN
DACA87-03-D-0006 | ICT Project No. 203121
Approved by: | Plot date: 02/27/04
Chief, Prj. Mgmt. Division | Plot scale:

DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND
MECHANICAL SCHEDULES

Sheet reference number: M-009

EXISTING LINEAR SLOT RETURN SCHEDULE

ROOM NUMBER	TYPE OF DIFFUSER	LENGTH (FT.)	CFM (EA.)	MAX S.P. LOSS (IN. WG)	QTY.	WORK REQUIRED UNDER THIS PROJECT
1105	2W/2S	4	155	.06	TYP OF 6	REBALANCE TO 150 CFM EACH
1104			213	.065	TYP OF 2	REBALANCE TO 218 CFM EACH
1118G			138	.06	TYP OF 2	
1127			144		TYP OF 20	REBALANCE TO 265 CFM EACH
1133			161		TYP OF 4	REBALANCE TO 144 CFM EACH
1130A			166		TYP OF 3	REBALANCE TO 224 CFM EACH
1132			137		TYP OF 23	REBALANCE TO 161 CFM EACH
1130			119		TYP OF 5	REBALANCE TO 243 CFM EACH
1129			97		TYP OF 2	REBALANCE TO 160 CFM EACH
1132A			81		TYP OF 1	REBALANCE TO 149 CFM
1132C			130		TYP OF 1	REBALANCE TO 62 CFM
2119		4	204	.065	TYP OF 14	
1114			97	.06	TYP OF 9	REBALANCE TO 100 CFM EACH
1124			181		TYP OF 7	REBALANCE TO 176 CFM EACH
1125A			201		TYP OF 4	REBALANCE TO 87 CFM EACH
1125B			201		TYP OF 4	REBALANCE TO 87 CFM EACH
1126			175		TYP OF 21	ADD 9 REGISTERS BALANCE ALL TO 255 CFM EACH
1128			169		TYP OF 14	REBALANCE TO 88 CFM EACH
1135			197		TYP OF 6	DEMO 2 REGISTERS REBALANCE 4 TO 125 CFM EACH
1137			106		TYP OF 4	REBALANCE TO 240 CFM EACH
1118A		4	77	.011	TYP OF 1	
1118B			77			
1118C			77			
1118D			77			
1118E			77			
1118F			77			
1118H			82			
1118J			80			
1118K			80			
1118L			82			
1116			65		TYP OF 5	VERIFY 5 DIFFUSERS IN SPACE REBALANCE TO 150 CFM EACH
1212		4	122	.06	TYP OF 2	REBALANCE TO 247 CFM EACH
1212B		4	123	.06	TYP OF 2	REBALANCE TO 197 CFM EACH
1205A		2	104	.055	TYP OF 2	REBALANCE TO 117 CFM EACH
1205		4	179	.06	TYP OF 4	REBALANCE TO 230 CFM EACH
1204A		2	104	.055	TYP OF 2	REBALANCE TO 116 CFM EACH
1204		4	179	06	TYP OF 4	REBALANCE TO 229 CFM EACH
1199			216	.065	TYP OF 9	REBALANCE TO 80 CFM EACH
1201			120	.06	TYP OF 8	REBALANCE TO 167 CFM EACH
					—	
1181F NOT USED						
1181G NOT USED						
1181B	2W/2S	4	106	.06	TYP OF 8	REBALANCE TO 99 CFM EACH
1181A	2W/2S	4	106	.06	TYP OF 8	REBALANCE TO 96 CFM EACH
1181E NOT USED						
1181D	2W/2S	4	106	.06	TYP OF 8	REBALANCE TO 98 CFM EACH
1181C			106		TYP OF 8	REBALANCE TO 99 CFM EACH
1185			128		TYP OF 8	REBALANCE TO 89 CFM EACH
1187			128		TYP OF 8	REBALANCE TO 89 CFM EACH
1189	2W/2S		132		TYP OF 8	REBALANCE TO 261 CFM EACH

EXISTING LINEAR SLOT RETURN SCHEDULE

ROOM NUMBER	TYPE OF DIFFUSER	LENGTH (FT.)	CFM (EA.)	MAX S.P. LOSS (IN. WG)	QTY.	WORK REQUIRED UNDER THIS PROJECT
1191	2W/2S	4	128	.06	TYP OF 8	REBALANCE TO 125 CFM EACH
1193			186		TYP OF 16	REBALANCE TO 63 CFM EACH
1190 EAST			167		TYP OF 9	
1190 WEST			188		TYP OF 8	
1194			183		TYP OF 16	REBALANCE TO 62 CFM EACH
1196			184		TYP OF 16	REBALANCE TO 61 CFM EACH
1178			138		TYP OF 12	ADD 3- 2W/2S DIFFUSERS REBALANCE ALL TO 200 CFM EACH
1188			127		TYP OF 13	REBALANCE TO 133 CFM EACH
1150A			130		TYP OF 2	REBALANCE TO 100 CFM EACH
1152B			133		TYP OF 3	REBALANCE TO 38 CFM EACH
		2	103	.051	TYP OF 3	
2123		4	207	.062	TYP OF 8	
2111			280	.15	TYP OF 6	REBALANCE TO 184 CFM EACH
2115A			160	.035	TYP OF 4	REBALANCE TO 139 CFM EACH
2115B			160	.035	TYP OF 4	REBALANCE TO 139 CFM EACH
2117			143	.035	TYP OF 6	REBALANCE TO 82 CFM EACH
2122		2	113	.065	TYP OF 12	REBALANCE TO 40 CFM EACH
2108		4	250	.10	TYP OF 6	REBALANCE TO 184 CFM EACH
2110			263	.11		REBALANCE TO 184 CFM EACH
2112			263	.11		REBALANCE TO 184 CFM EACH
2114			263	.11		REBALANCE TO 184 CFM EACH
2116			108	.06	TYP OF 4	REBALANCE TO 96 CFM EACH
2116A			108	.06	TYP OF 4	REBALANCE TO 87 CFM EACH
2135			250	.10	TYP OF 6	REBALANCE TO 184 CFM EACH
2137			263	.10		REBALANCE TO 184 CFM EACH
2139			263	.11		REBALANCE TO 184 CFM EACH
2141			263	.11		REBALANCE TO 136 CFM EACH
2143A			108	.06	TYP OF 4	REBALANCE TO 100 CFM EACH
2143			108		TYP OF 4	REBALANCE TO 100 CFM EACH
2208			180		TYP OF 18	REBALANCE TO 90 CFM EACH
2206			180		TYP OF 18	REBALANCE TO 90 CFM EACH
2200			138		TYP OF 24	REBALANCE TO 125 CFM EACH
2197			193		TYP OF 16	REBALANCE TO 131 CFM EACH
2171		4	247	.10	TYP OF 3	REBALANCE TO 249 CFM EACH
2173			235	.095	TYP OF 3	REBALANCE TO 232 CFM EACH
2175			235	.095	TYP OF 3	REBALANCE TO 253 CFM EACH
2177			197	.06	TYP OF 8	REBALANCE TO 95 CFM EACH
2179			197	.06	TYP OF 8	REBALANCE TO 101 CFM EACH
2183			250	.10	TYP OF 8	REBALANCE TO 233 CFM EACH
2184			175	.06	TYP OF 9	REBALANCE TO 93 CFM EACH
2185			222	.095	TYP OF 9	REBALANCE TO 207 CFM EACH
2186			175	.06	TYP OF 9	REBALANCE TO 104 CFM EACH
2187			241	.10	TYP OF 3	REBALANCE TO 167 CFM EACH
2188			235	.095	TYP OF 3	REBALANCE TO 263 CFM EACH
2189			124	.06	TYP OF 12	REBALANCE TO 113 CFM EACH
2190			235	.095	TYP OF 3	REBALANCE TO 235 CFM EACH
2191			124	.06	TYP OF 12	REBALANCE TO 111 CFM EACH
2192			257	.11	TYP OF 3	REBALANCE TO 263 CFM EACH
2195	2W/2S	4	144	.06	TYP OF 3	REBALANCE TO 176 CFM EACH

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US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Symbol	Description	Date	Appr.

TASK ORDER #: FRR004

VANGUARD — PADUCAH, KENTUCKY VOICE 270-442-8620

I.C. Thomasson Associates, Inc. — NASHVILLE, TENNESSEE PHONE (615) 346-3400

Checked by: WTT	Date: 02/27/04
Dwn by: ICT	CADD File Name: 3121M011.DGN
DACA87-03-D-0006	ICT Project No. 203121
Approved by:	Plot date: 02/27/04
Chief, Prj. Mgmt. Division	Plot scale:

DEFENSE INFORMATION SCHOOL

FT. MEADE MARYLAND

MECHANICAL SCHEDULES

Sheet reference number: M-010

EXISTING LINEAR SLOT RETURN SCHEDULE

ROOM NUMBER	TYPE OF DIFFUSER	LENGTH (FT.)	CFM (EA.)	MAX S.P. LOSS (IN. WG)	QTY.	WORK REQUIRED UNDER THIS PROJECT
2196	2W/2S	4	193	.06	TYP OF 16	REBALANCE TO 129 CFM EACH
2195A		2	67	.05	TYP OF 1	REBALANCE TO 80 CFM
2195B			63		TYP OF 1	REBALANCE TO 78 CFM
2195C			63		TYP OF 1	REBALANCE TO 231 CFM
2195D			61		TYP OF 2	REBALANCE TO 80 CFM EACH
2195E			86		TYP OF 1	REBALANCE TO 96 CFM
2195F			95		TYP OF 1	REBALANCE TO 100 CFM
1175		4	89	.06	TYP OF 2	REBALANCE TO 259 CFM EACH
1176			89		TYP OF 2	REBALANCE TO 259 CFM EACH
1174/1142			186		TYP OF 10	REBALANCE TO 332 CFM EACH
1144			179		TYP OF 5	REBALANCE TO 148 CFM EACH
1154			179		TYP OF 27	REBALANCE TO 207 CFM EACH
1170			134		TYP OF 8	REBALANCE TO 67 CFM EACH
1159			180		TYP OF 12	REBALANCE TO 124 CFM EACH
1156			159		TYP OF 4	REBALANCE TO 175 CFM EACH
			90		TYP OF 1	
1155			141		TYP OF 4	REBALANCE TO 195 CFM EACH
1151			79		TYP OF 2	REBALANCE TO 203 CFM EACH
1151B		2	65	.05	TYP OF 1	REBALANCE TO 105 CFM
1151D			93		TYP OF 1	REBALANCE TO 150 CFM
1151E			54		TYP OF 1	REBALANCE TO 80 CFM
1151F			54		TYP OF 1	REBALANCE TO 80 CFM
2151B			61		TYP OF 1	REBALANCE TO 178 CFM
2151A			80		TYP OF 1	REBALANCE TO 107 CFM
2151		4	100	.06	TYP OF 9	REBALANCE TO 147 CFM EACH
2176			88		TYP OF 9	REBALANCE TO 81 CFM EACH
2174			79		TYP OF 9	REBALANCE TO 81 CFM EACH
2170			79			REBALANCE TO 78 CFM EACH
2153			79			REBALANCE TO 133 CFM EACH
2155			79			REBALANCE TO 133 CFM EACH
2157			79			REBALANCE TO 128 CFM EACH
2159			79			REBALANCE TO 128 CFM EACH
2150C			111		TYP OF 2	REBALANCE TO 113 CFM EACH
2150B			111		TYP OF 2	REBALANCE TO 103 CFM EACH
2150A			167		TYP OF 3	REBALANCE TO 212 CFM EACH
2150D		2	73	.05	TYP OF 1	REBALANCE TO 93 CFM
2150E		2	73	.05	TYP OF 1	REBALANCE TO 99 CFM
2150F		2	73	.05	TYP OF 1	REBALANCE TO 99 CFM
2150		4	149	.06	TYP OF 46	REBALANCE TO 155 CFM EACH
2160A			93		TYP OF 1	REBALANCE TO 115 CFM
2160			163		TYP OF 37	REBALANCE TO 141 CFM EACH
2160B			177		TYP OF 3	
1164E			159		TYP OF 3	
1164E		2	79	.05	TYP OF 5	
1163E		4	108	.06	TYP OF 2	REBALANCE TO 85 CFM EACH
1163D		4	178	.06	TYP OF 2	
1163D		2	89	.05	TYP OF 2	
1164D		4	112	.06	TYP OF 9	REBALANCE TO 82 CFM EACH
1164B		4	109	.06	TYP OF 9	REBALANCE TO 87 CFM EACH
1164A		4	129	.06	TYP OF 2	REBALANCE TO 100 CFM EACH
1164C	2W/2S	4	41	.06	TYP OF 2	REBALANCE TO 87 CFM EACH

EXISTING LINEAR SLOT RETURN SCHEDULE

ROOM NUMBER	TYPE OF DIFFUSER	LENGTH (FT.)	CFM (EA.)	MIN S.P. LOSS (IN. WG)	QTY.	WORK REQUIRED UNDER THIS PROJECT
1161	2W/2S	4	166	.06	TYP OF 25	
1161A		4	150	.06	TYP OF 4	
2214		4	180	.06	TYP OF 18	REBALANCE TO 186 CFM EACH
2212		4	180	.06	TYP OF 18	REBALANCE TO 93 CFM EACH
2210		4	180	.06	TYP OF 18	REBALANCE TO 86 CFM EACH
2219		4	150	.06	TYP OF 9	REBALANCE TO 139 CFM EACH
2201		2	90	.05	TYP OF 8	
2201		4	179	.06	TYP OF 4	
2146A		4	139	.06	TYP OF 3	REBALANCE TO 184 CFM EACH
2138		4	213	.06	TYP OF 8	
2138		2	106	.055	TYP OF 8	
2132 2132E			79	.05	TYP OF 52	REBALANCE TO 90 CFM EACH
2130			97	.05	TYP OF 4	REBALANCE TO 117 CFM EACH
2129			88	.05	TYP OF 4	
2129		4	176	.06	TYP OF 6	
2109			126		TYP OF 2	ADD 1- 2W/2S DIFFUSER REBALANCE ALL TO 170 CFM EACH
2109A			126		TYP OF 2	REBALANCE TO 218 CFM EACH
2120			234		TYP OF 6	REBALANCE TO 261 CFM EACH
2120A			109		TYP OF 2	REBALANCE TO 113 CFM EACH
2120B			234		TYP OF 4	REBALANCE TO 222 CFM EACH
2132C			129		TYP OF 2	REBALANCE TO 160 CFM EACH
2132D			153		TYP OF 4	REBALANCE TO 209 CFM EACH
2132B			95		TYP OF 1	REBALANCE TO 121 CFM
2132A			128		TYP OF 2	REBALANCE TO 186 CFM EACH
2146B			171		TYP OF 9	REBALANCE TO 123 CFM EACH
2131B			80		TYP OF 1	REBALANCE TO 98 CFM
2126A		2	82	.05	TYP OF 2	REBALANCE TO 65 CFM EACH
2126B		4	74	.06	TYP OF 3	REBALANCE TO 97 CFM EACH
2126C		4	78	.06	TYP OF 4	REBALANCE TO 103 CFM EACH
2126D		2	53	.05	TYP OF 3	REBALANCE TO 71 CFM EACH
2126E			80		TYP OF 1	REBALANCE TO 98 CFM
2126F			72		TYP OF 1	REBALANCE TO 94 CFM
2132F			94		TYP OF 3	REBALANCE TO 184 CFM EACH
2132G		4	69	.06	TYP OF 1	REBALANCE TO 81 CFM
2131A		2	102	.06	TYP OF 2	REBALANCE TO 188 CFM EACH
2136		4	212	.065	TYP OF 13	
2136		2	106	.055	TYP OF 14	
2126		4	182	.06	TYP OF 3	REBALANCE TO 184 CFM EACH
2125		2	103	.051	TYP OF 4	
2125		4	207	.062	TYP OF 8	
2124		2	103	.051	TYP OF 4	
2124		4	207	.062	TYP OF 8	
1111A			176	.06	TYP OF 4	REBALANCE TO 127 CFM EACH
1111B			178		TYP OF 4	REBALANCE TO 129 CFM EACH
1119A			176		TYP OF 4	REBALANCE TO 129 CFM EACH
1119B			178		TYP OF 4	REBALANCE TO 127 CFM EACH
1117	2W/2S	4	189	.06	TYP OF 4	REBALANCE TO 166 CFM EACH
1161B	2W/2S	4	65	.06	TYP OF 2	REBALANCE TO 66 CFM EACH
1161C	2W/2S	4	66	.06	TYP OF 2	REBALANCE TO 75 CFM EACH
1160	2W/2S	4	164	.06	TYP OF 4	REBALANCE TO 177 CFM EACH

THESE DOCUMENTS HAVE BEEN PREPARED PRIMARILY BASED ON INFORMATION PROVIDED BY OTHERS. I.C. THOMASSON HAS NOT VERIFIED THE ACCURACY OF ALL INFORMATION PROVIDED BY OTHERS. SEE LIMIT OF LIABILITIES STATEMENT ON COVER SHEET.

STATE OF MARYLAND — MECHANICAL ENGINEER

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Symbol	Description	Date	Appr.

TASK ORDER #: FRR004

KINGDOM — PADUCAH, KENTUCKY VOICE 270-442-8620

I.C. Thomasson Associates, Inc. — NASHVILLE, TENNESSEE PHONE (615) 346-3400

ICT

Checked by: WTT
Dwn by: ICT
DACA87-03-D-0006
Approved by: Chief, Prj. Mgmt. Division

Date: 02/27/04
CADD File Name: 312M012.DGN
ICT Project No. 203121
Plot date: 02/27/04
Plot scale:

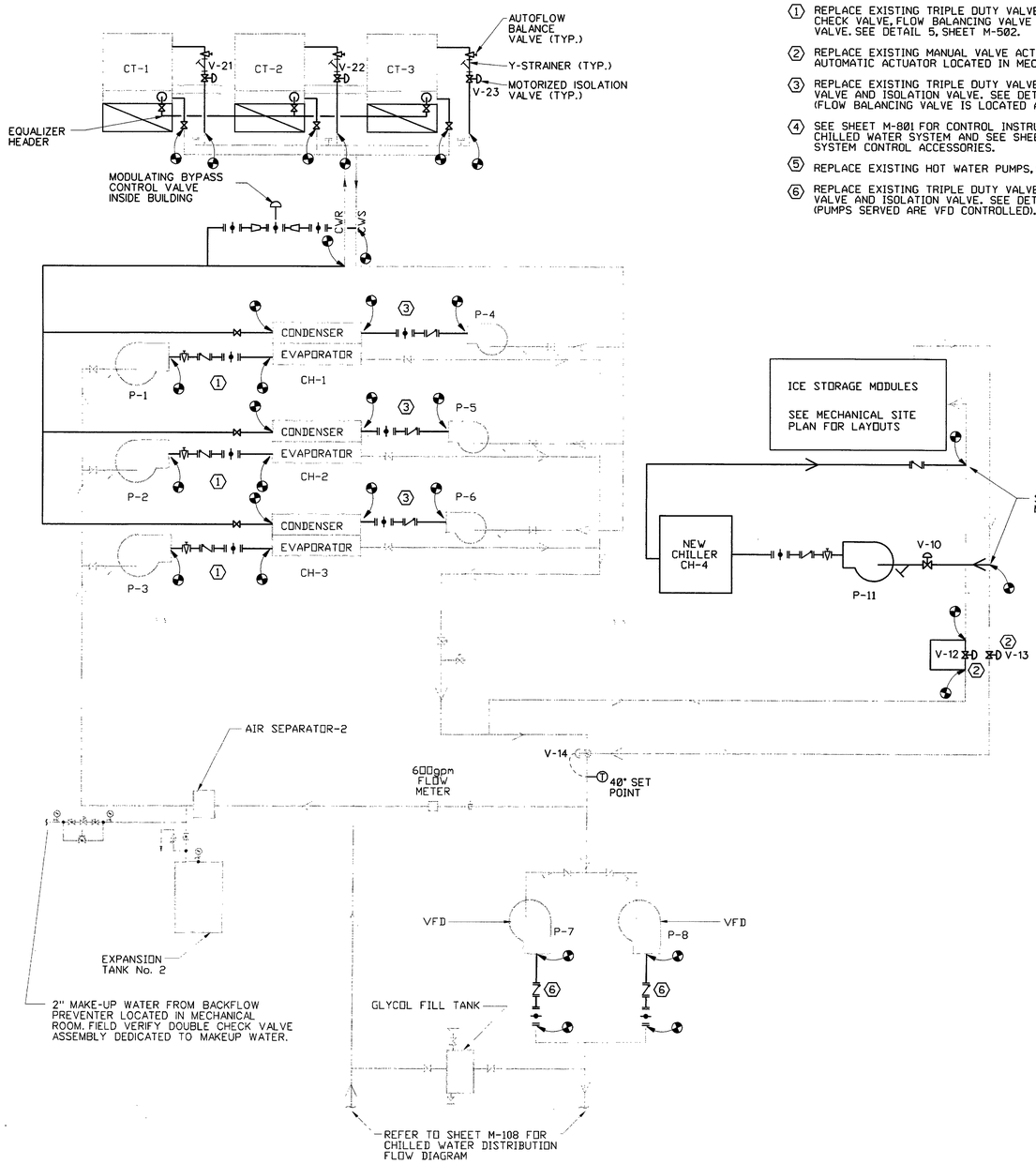
DEFENSE INFORMATION SCHOOL — FT. MEADE MARYLAND

MECHANICAL SCHEDULES

Sheet reference number: M-011

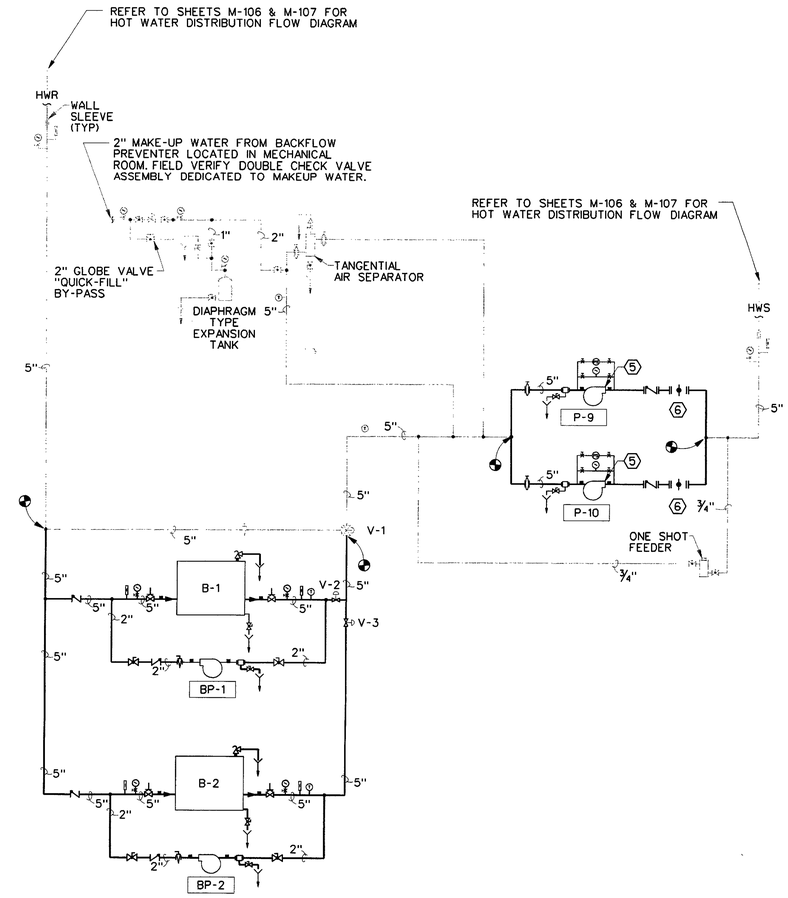
CHILLED WATER/HOT WATER SCHEMATIC NOTES

1. REPLACE EXISTING TRIPLE DUTY VALVES WITH NEW CHECK VALVE, FLOW BALANCING VALVE AND ISOLATION VALVE. SEE DETAIL 5, SHEET M-502.
2. REPLACE EXISTING MANUAL VALVE ACTUATOR WITH NEW AUTOMATIC ACTUATOR LOCATED IN MECHANICAL ROOM.
3. REPLACE EXISTING TRIPLE DUTY VALVES WITH NEW CHECK VALVE AND ISOLATION VALVE. SEE DETAIL 5, SHEET M-502. (FLOW BALANCING VALVE IS LOCATED AT COOLING TOWER.)
4. SEE SHEET M-801 FOR CONTROL INSTRUMENT ACCESSORIES FOR CHILLED WATER SYSTEM AND SEE SHEET M-802 FOR HOT WATER SYSTEM CONTROL ACCESSORIES.
5. REPLACE EXISTING HOT WATER PUMPS, SEE SCHEDULE.
6. REPLACE EXISTING TRIPLE DUTY VALVES WITH NEW CHECK VALVE AND ISOLATION VALVE. SEE DETAIL 5 ON SHEET M-502 (PUMPS SERVED ARE VFD CONTROLLED).



CHILLED WATER FLOW SCHEMATIC

NO SCALE



HOT WATER FLOW SCHEMATIC

NO SCALE

LEGEND

- NEW
- EXISTING
- CONNECT TO EXIST

THESE DOCUMENTS HAVE BEEN PREPARED PRIMARILY BASED ON INFORMATION PROVIDED BY OTHERS. I.C. THOMASSON HAS NOT VERIFIED THE ACCURACY OF ALL INFORMATION PROVIDED BY OTHERS. SEE LIMIT OF LIAIBILITIES STATEMENT ON COVER SHEET.

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

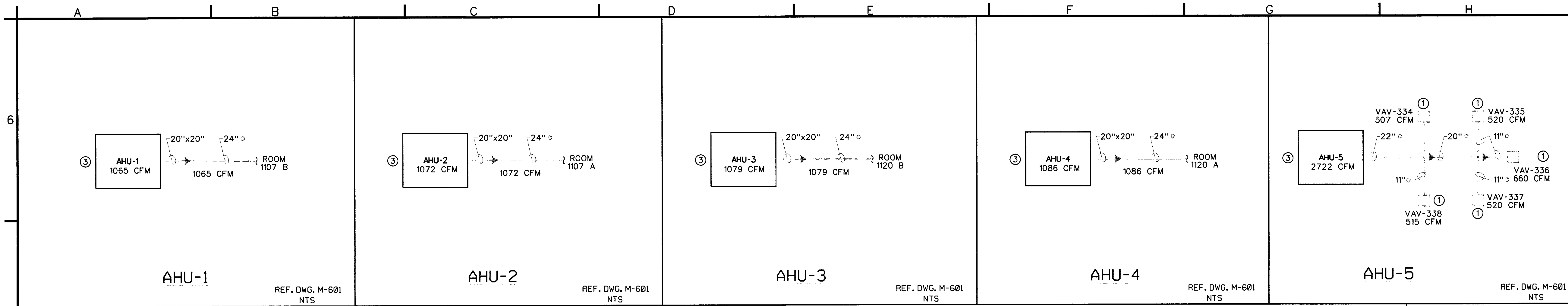
Date: 02/27/04
Checked by: WTT
CADD File Name: 32MD1DSN
Dwn by: ICT
ICT Project No. 203121
DACA87-03-D-0006
Plot date: 02/27/04
Approved by:
Plot scale:
Chief, Prj. Mgmt. Division

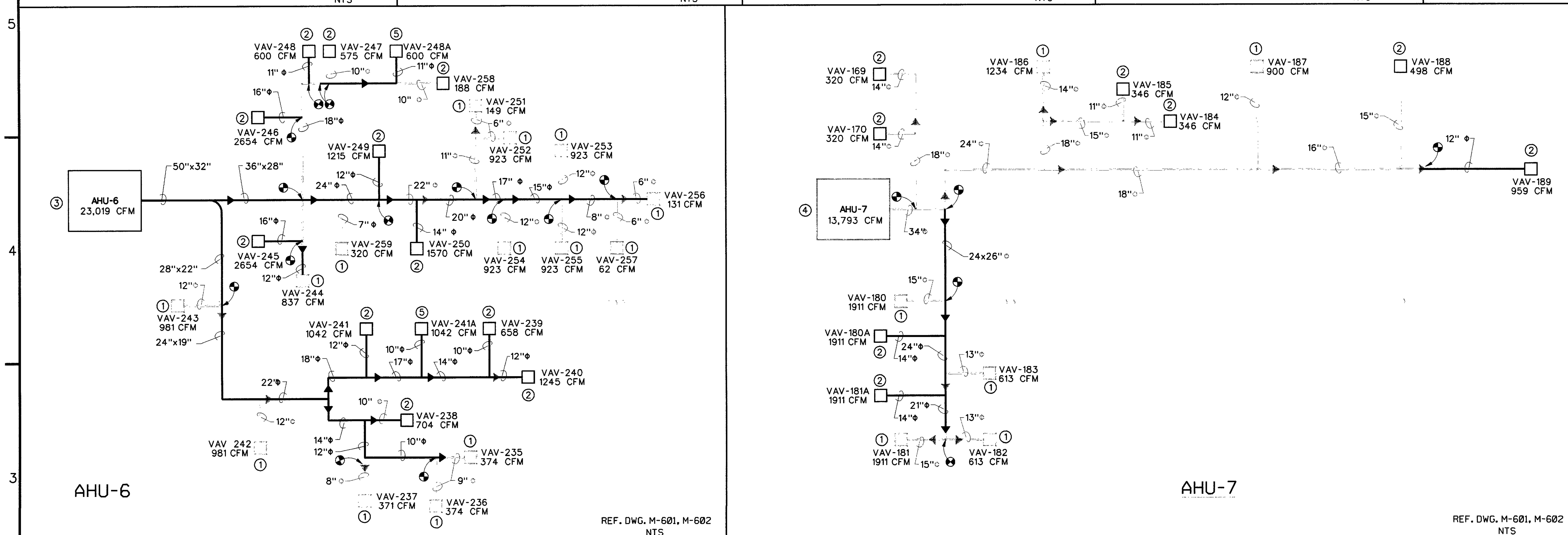
TASK ORDER #: FRR004

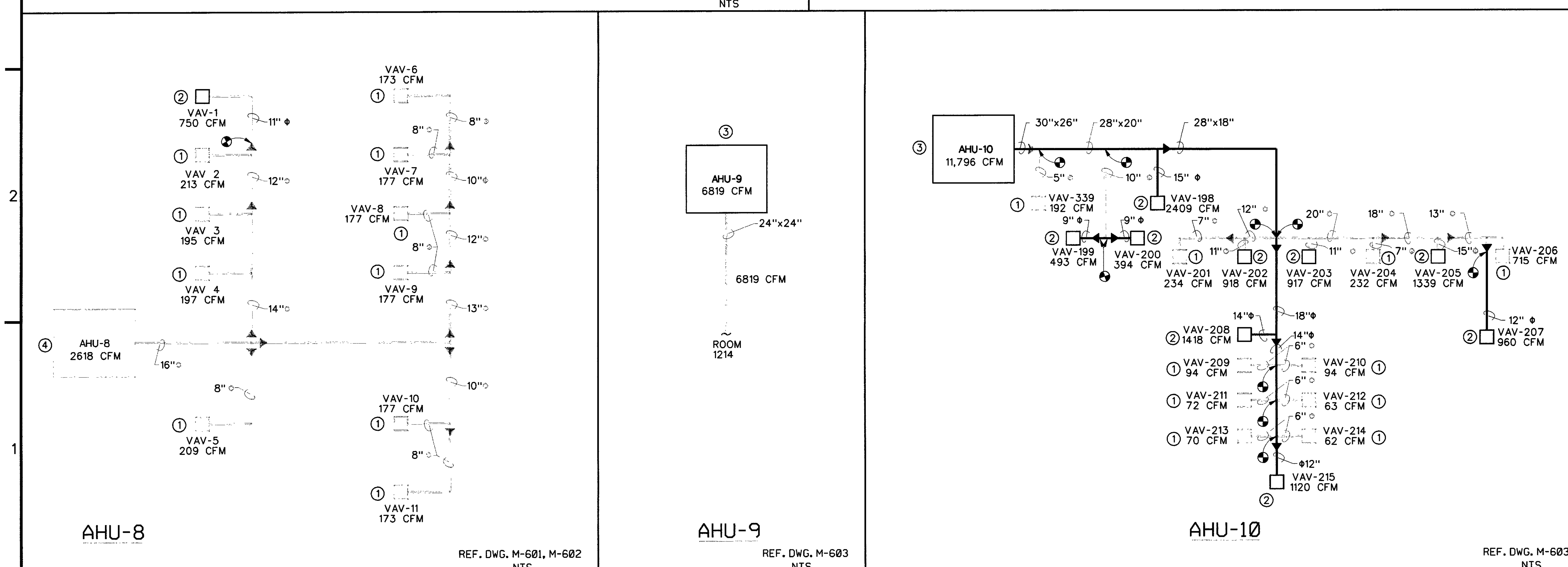
PADUCAH, KENTUCKY VOICE: 270-442-8620
I.C. Thomasson Associates, Inc.
NASHVILLE, TENNESSEE PHONE (615) 346-3400

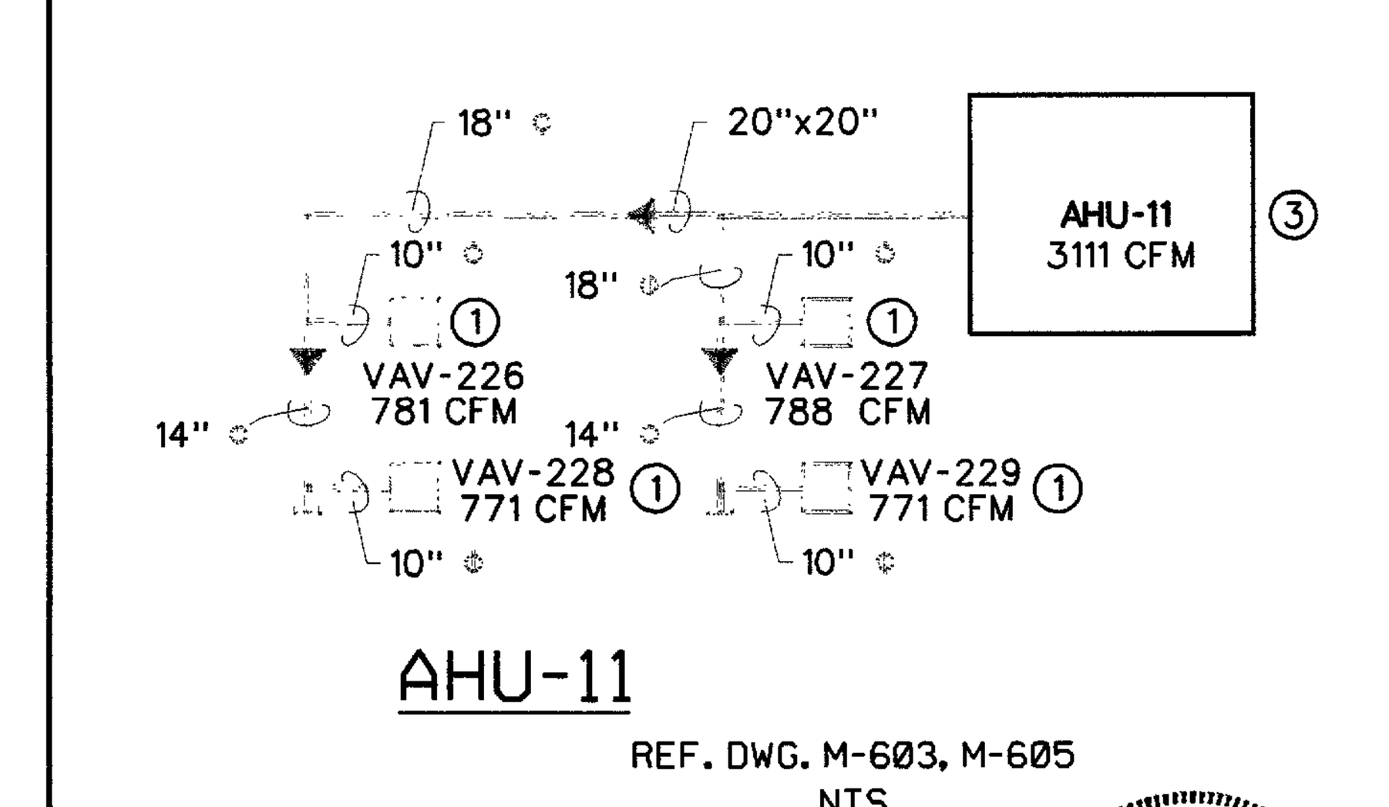
DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND
CHW & HW FLOW SCHEMATIC

Sheet reference number:
M-101









LEGEND

EXISTING
NEW
DEMO

NOTE(S):

① REBALANCE VAV (AIR AND HOT WATER FLOW) PER VAV BOX SCHEDULE.

② REPLACE VAV BOX SHOWN AS NEW. SEE VAV BOX SCHEDULE FOR DETAILS.

③ REPLACE AHU SHOWN AS NEW. SEE AHU SCHEDULE FOR DETAILS.

④ REBALANCE AHU. SEE SCHEDULE FOR DETAILS.

⑤ NEW VAV BOX WILL REQUIRE NEW MP DUCT, HOTWATER PIPING, ELECTRICAL CONNECTION TO BOX AND NEW LP DUCT AND DIFFUSER FROM BOX. SEE SCHEDULE AND FLOOR PLANS FOR DETAILS.

THESE DOCUMENTS HAVE BEEN PREPARED PRIMARILY BASED ON INFORMATION PROVIDED BY OTHERS. I.C. THOMASSON HAS NOT VERIFIED THE ACCURACY OF ALL INFORMATION PROVIDED BY OTHERS. SEE LIMIT OF LIAIBILITIES STATEMENT ON COVER SHEET.

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Date: 02/27/04 | CADD File Name: 312M102.DGN | ICT Project No. 203121 | Plot date: 02/27/04 | Plot scale:

Checked by: WTT | Dwn by: ICT | DACA87-03-D-0006 | Approved by: | Chief, Prj. Mgmt. Division

TASK ORDER #: FRR004

VANGUARD PADUCAH, KENTUCKY VOICE 270-442-8620

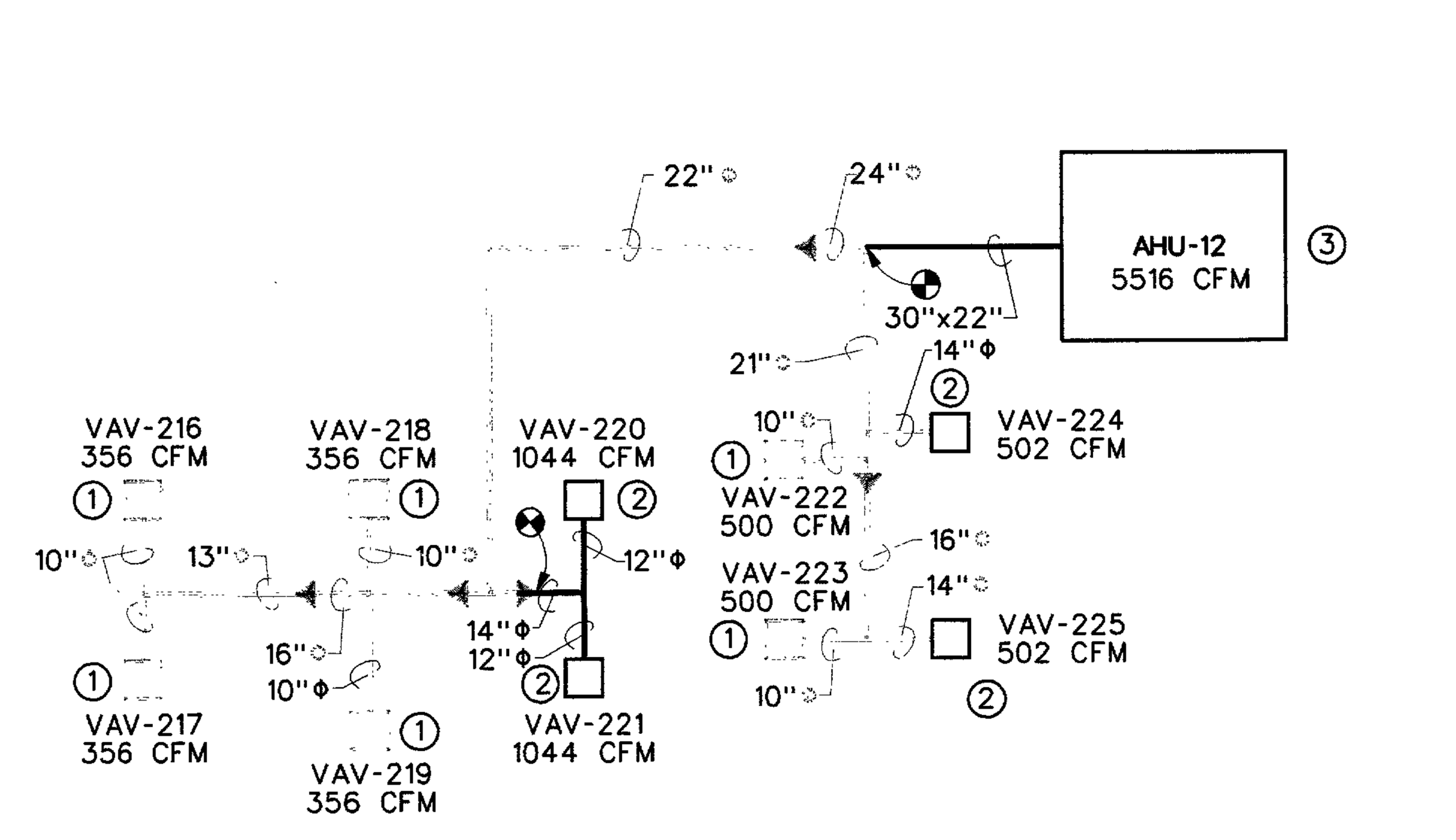
ICT I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400

DEFENSE INFORMATION SCHOOL

FT. MEADE MARYLAND

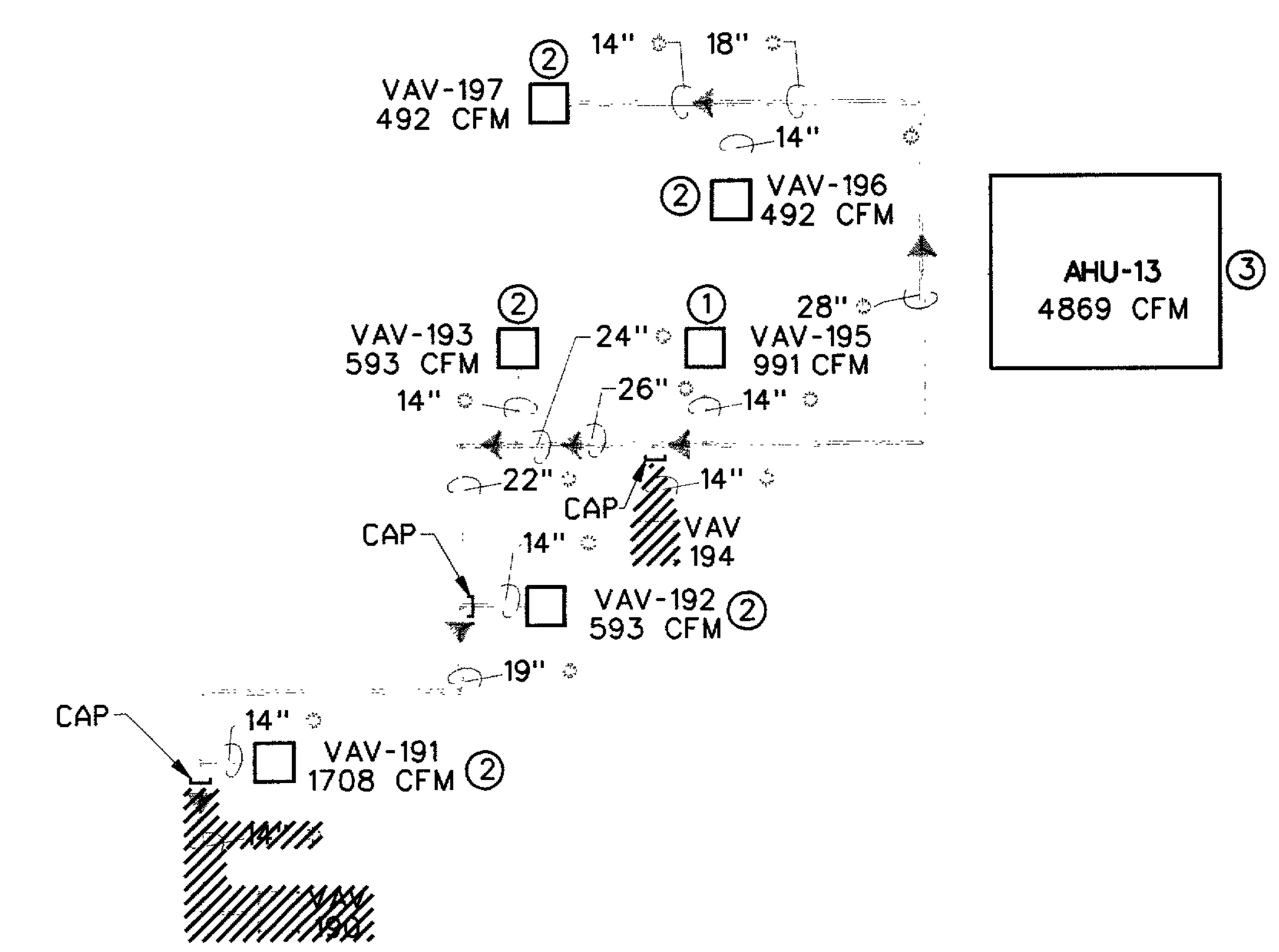
AHU FLOW SCHEMATIC DIAGRAMS

Sheet reference number: M-102



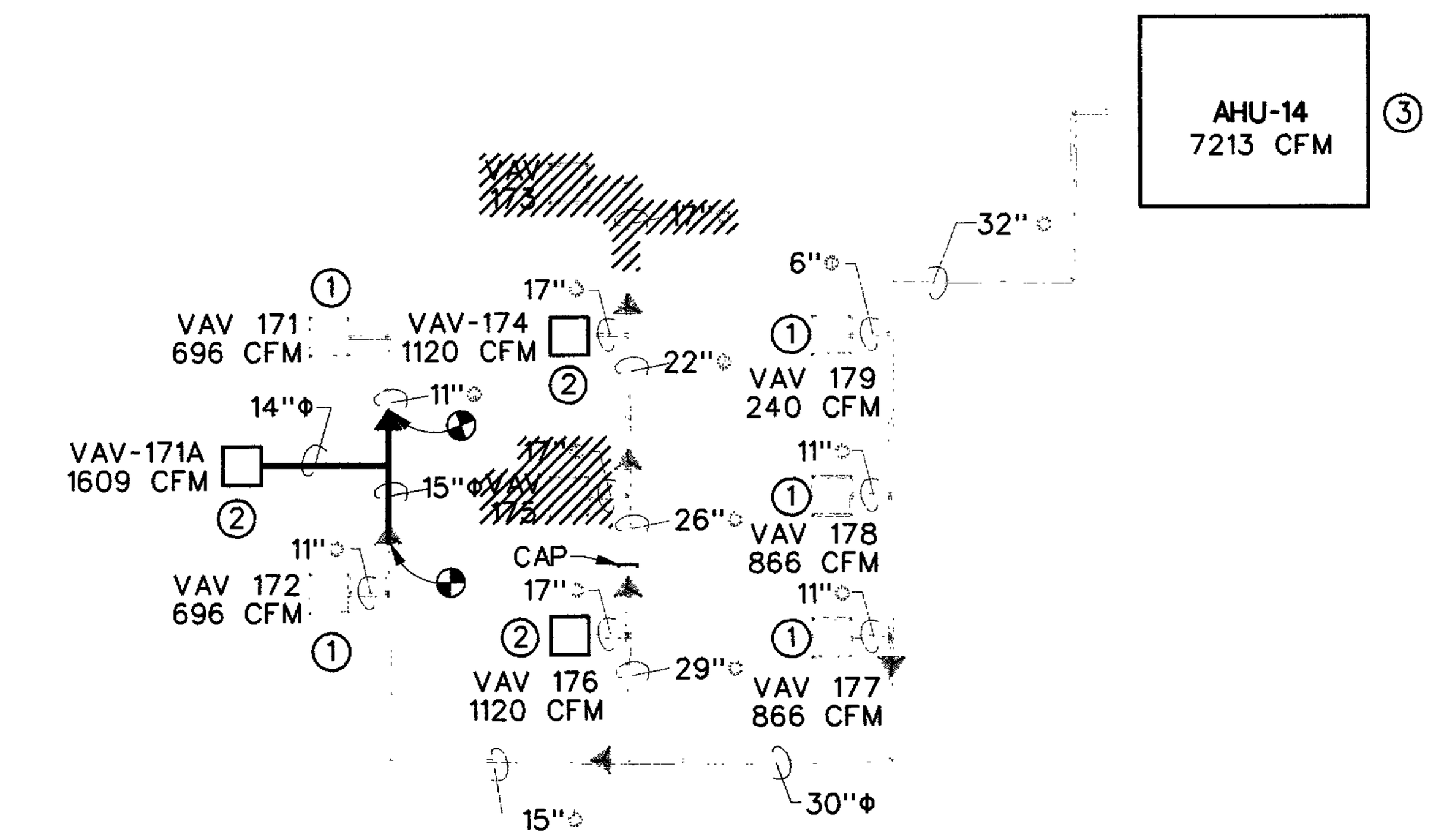
AHU-12

REF. DWG. M-603, M-605
NTS



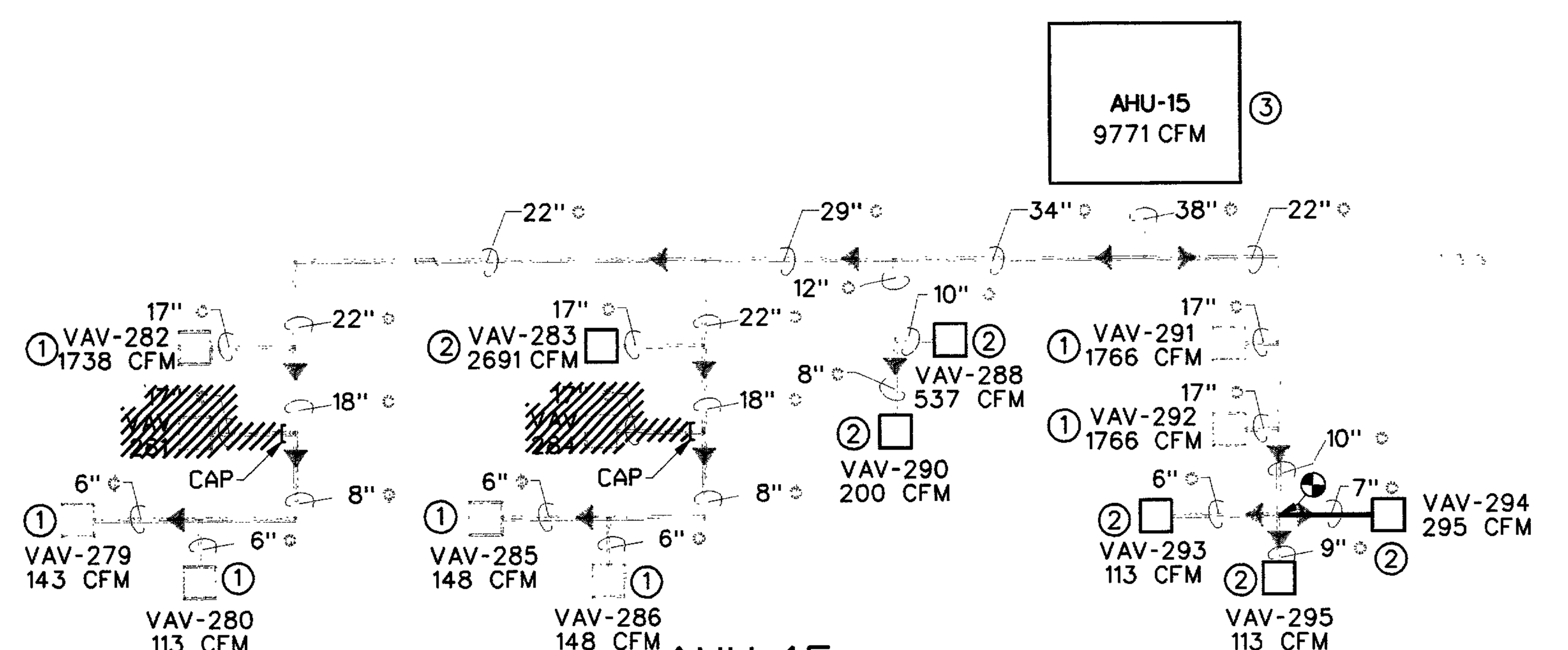
AHU-13

REF. DWG. M-603, M-604, M-605
NTS



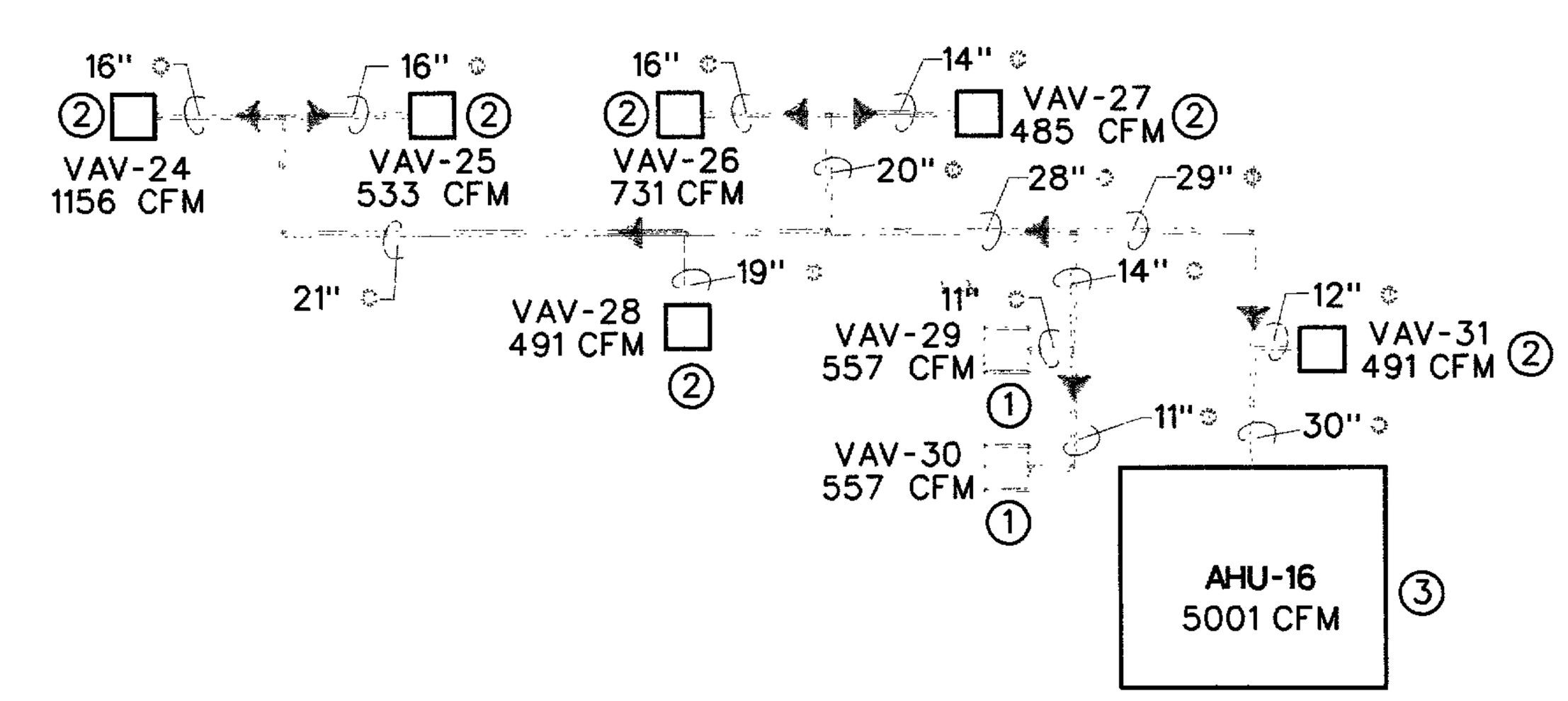
AHU-14

REF. DWG. M-603, M-604, M-605
NTS



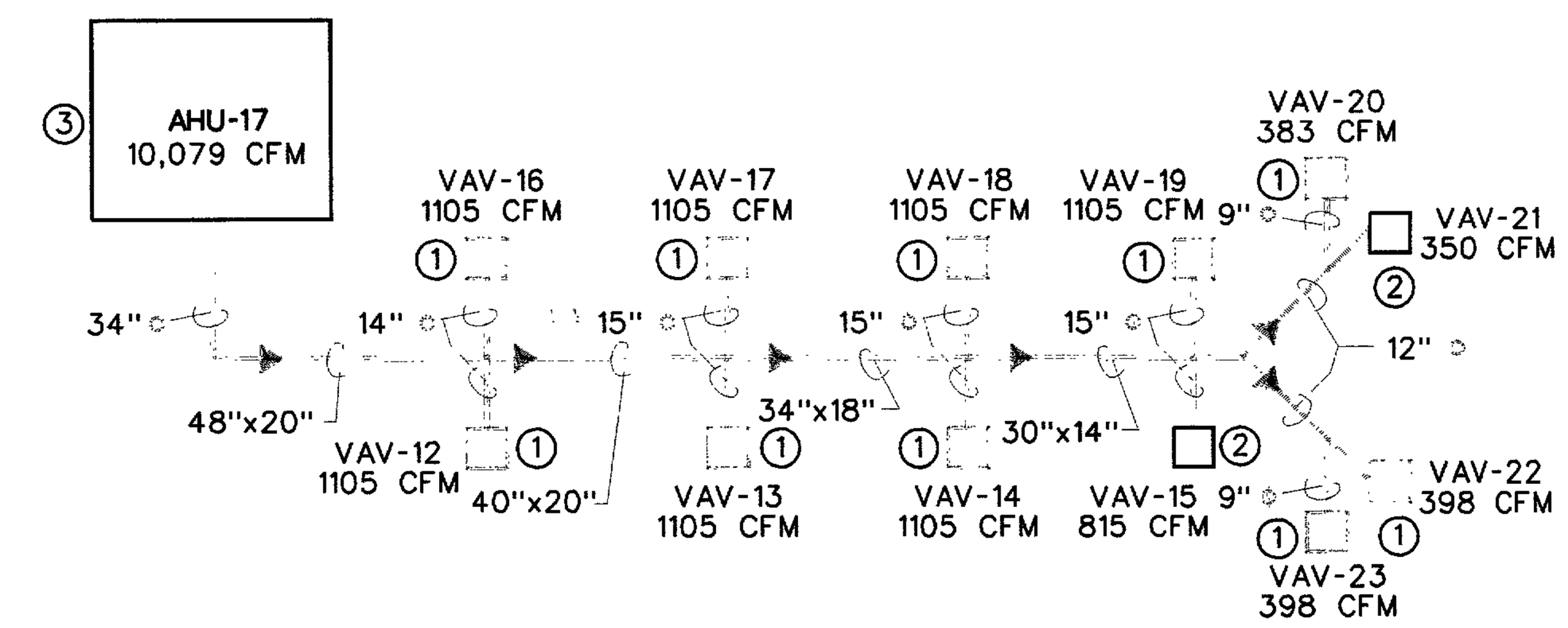
AHU-15

REF. DWG. M-604
NTS



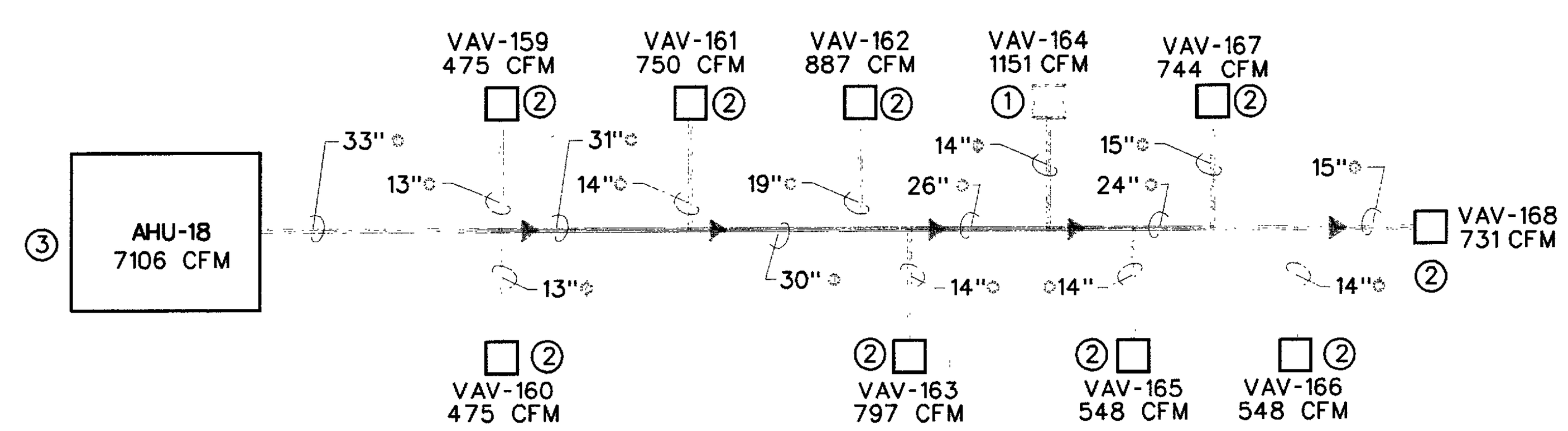
AHU-16

REF. DWG. M-606
NTS



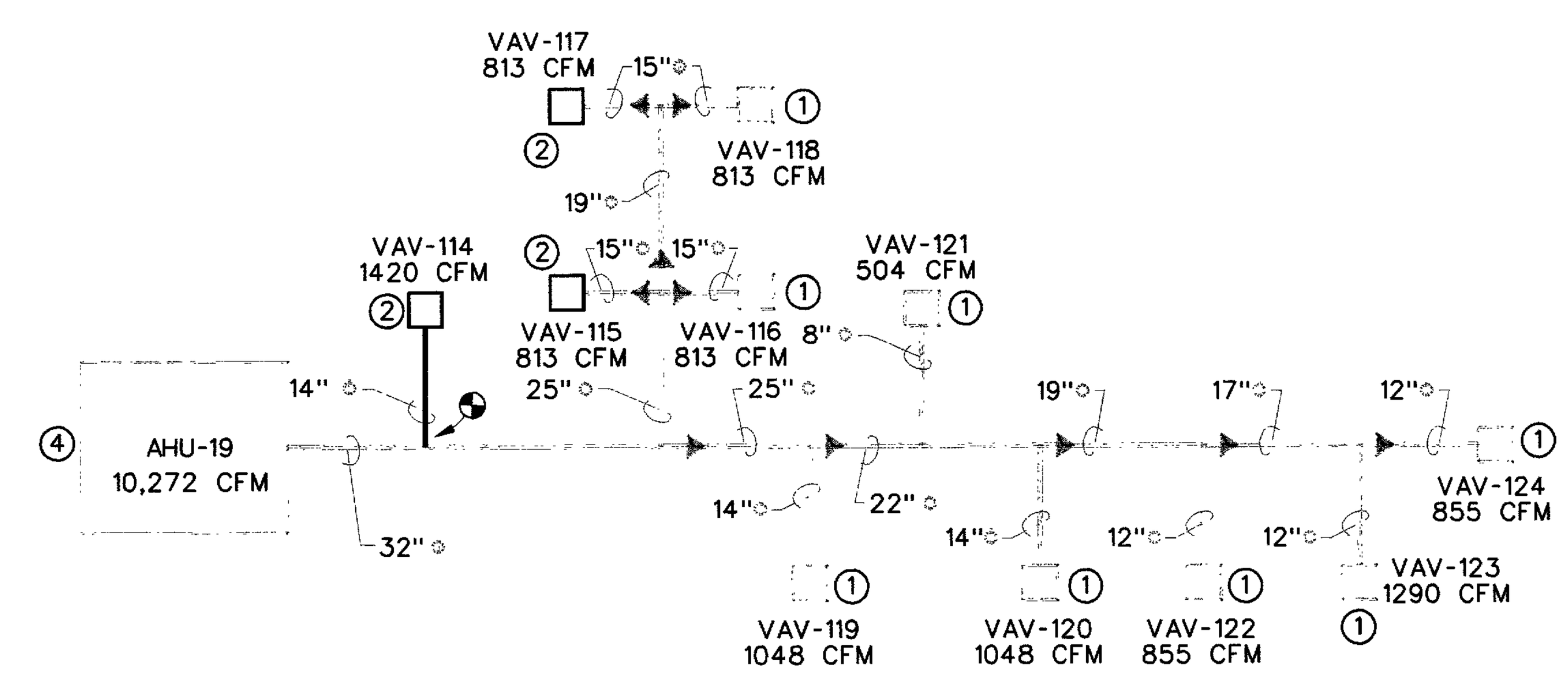
AHU-17

REF. DWG. M-606, M-607
NTS



AHU-18

REF. DWG. M-608
NTS



AHU-19

REF. DWG. M-608
NTS

LEGEND

EXISTING
NEW
DEMO

NOTE(S):

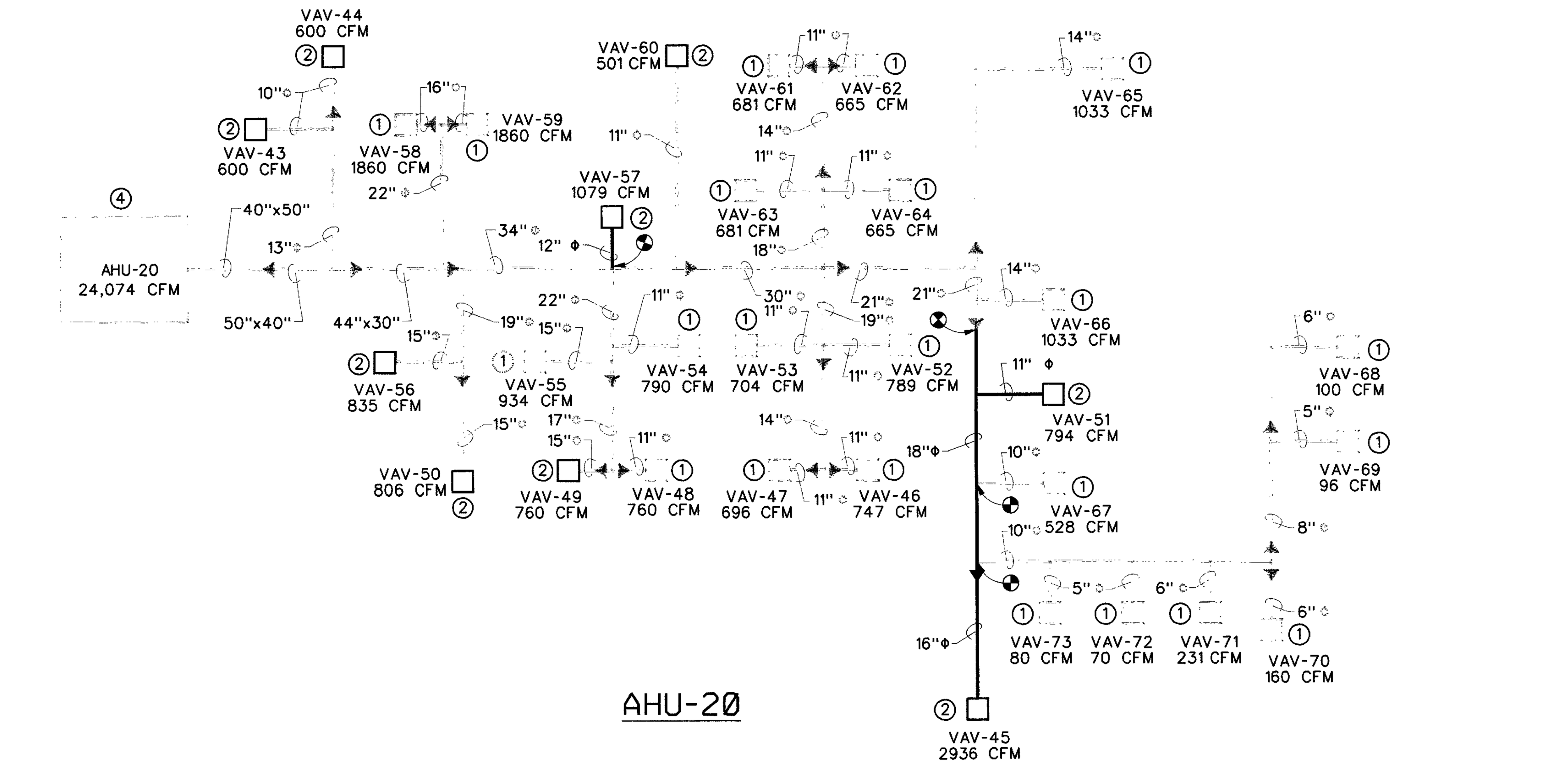
1. REBALANCE VAV (AIR AND HOT WATER FLOW) PER VAV BOX SCHEDULE.
2. REPLACE VAV BOX SHOWN AS NEW. SEE VAV BOX SCHEDULE FOR DETAILS.
3. REPLACE AHU SHOWN AS NEW. SEE AHU SCHEDULE FOR DETAILS.
4. REBALANCE AHU. SEE SCHEDULE FOR DETAILS.
5. NEW VAV BOX WILL REQUIRE NEW MP DUCT, HOTWATER PIPING, ELECTRICAL CONNECTION TO BOX AND NEW LP DUCT AND DIFFUSER FROM BOX. SEE SCHEDULE AND FLOOR PLANS FOR DETAILS.

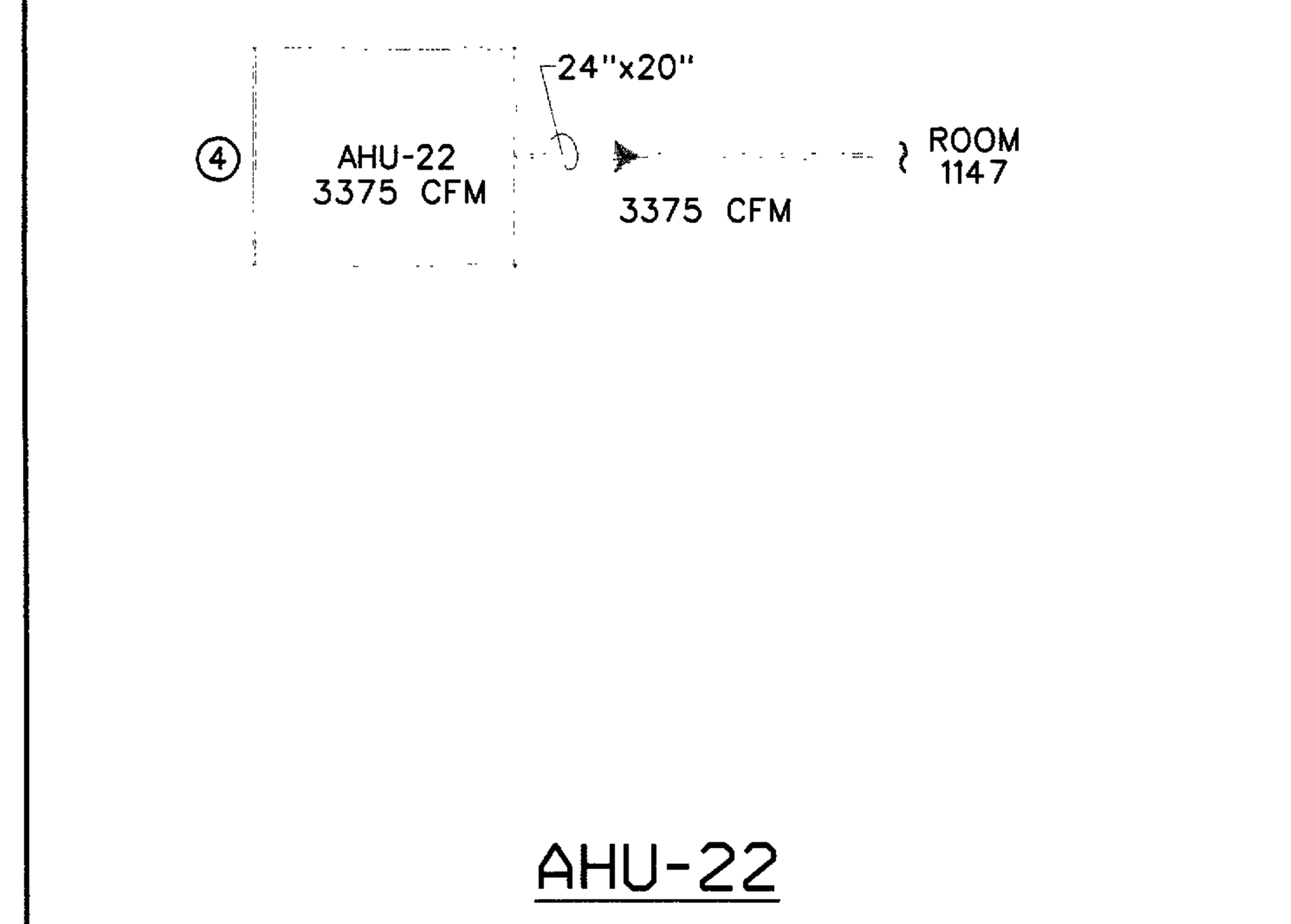
US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

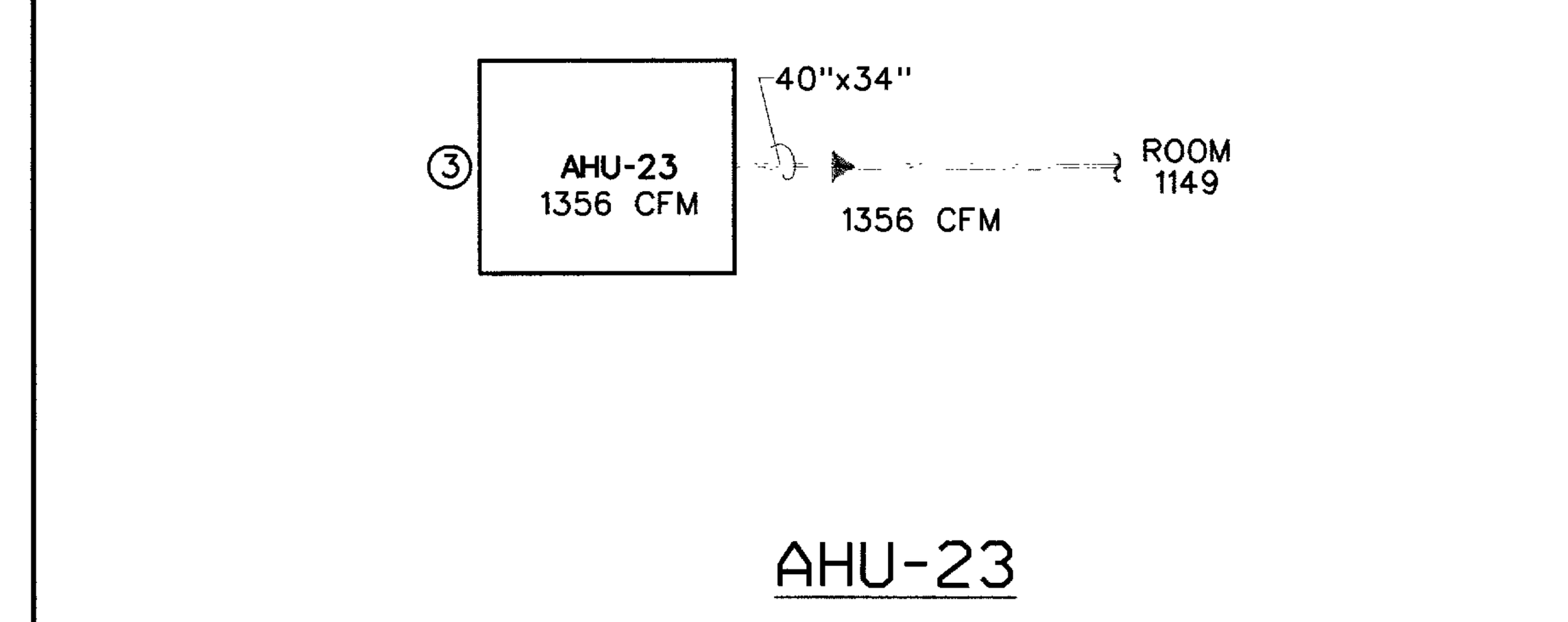
TASK ORDER #: FRR004
PADUCAH, KENTUCKY VOICE 270-442-8620
I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400
Checked by: WTT | Dwn by: ICT | DACA87-03-D-0006 | Approved by: Chief, Prj. Mgmt. Division
Date: 02/27/04 | CADD File Name: 3121M103.DGN | ICT Project No. 203121 | Plot date: 02/27/04 | Plot scale:

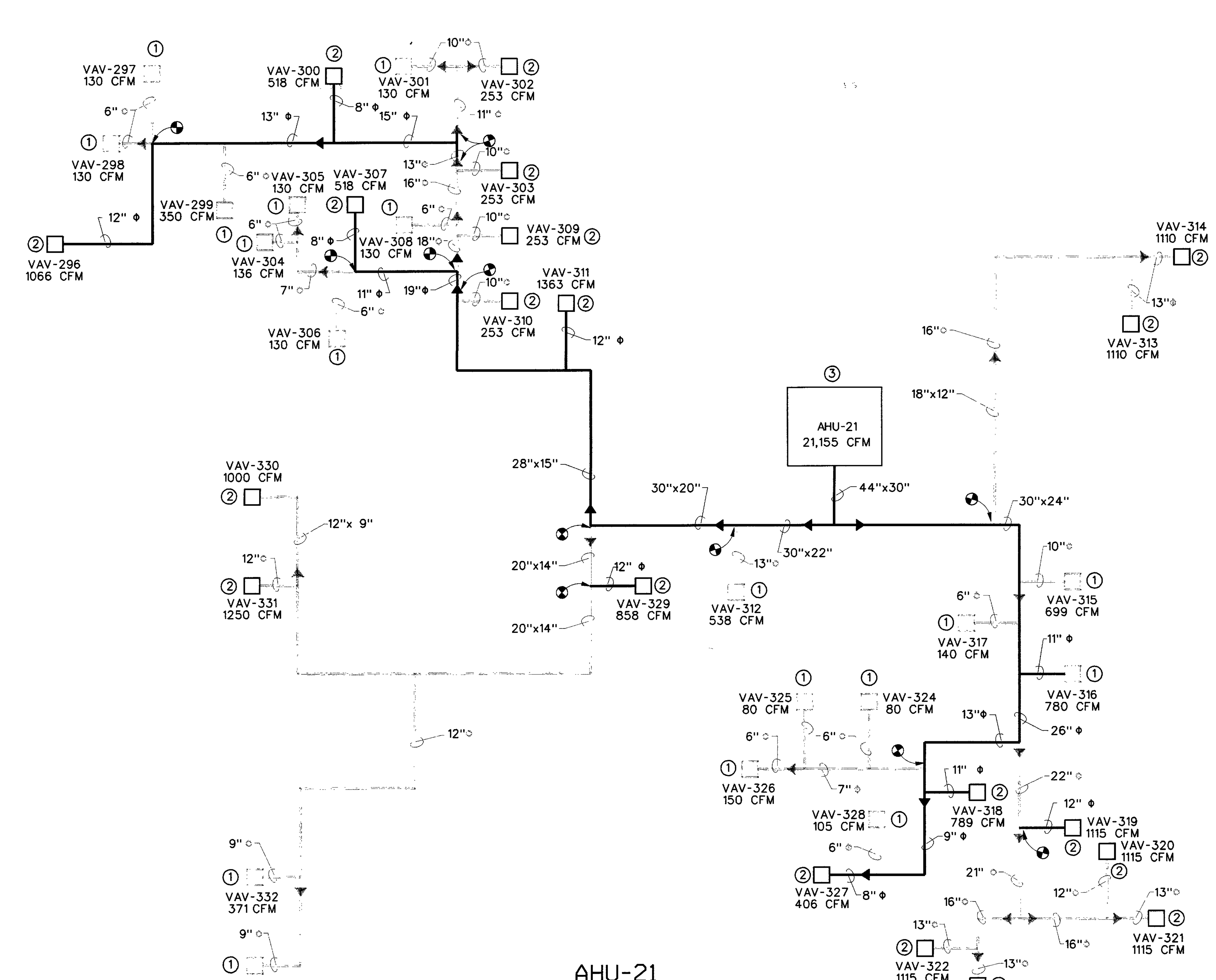
DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND
AHU FLOW SCHEMATIC DIAGRAMS

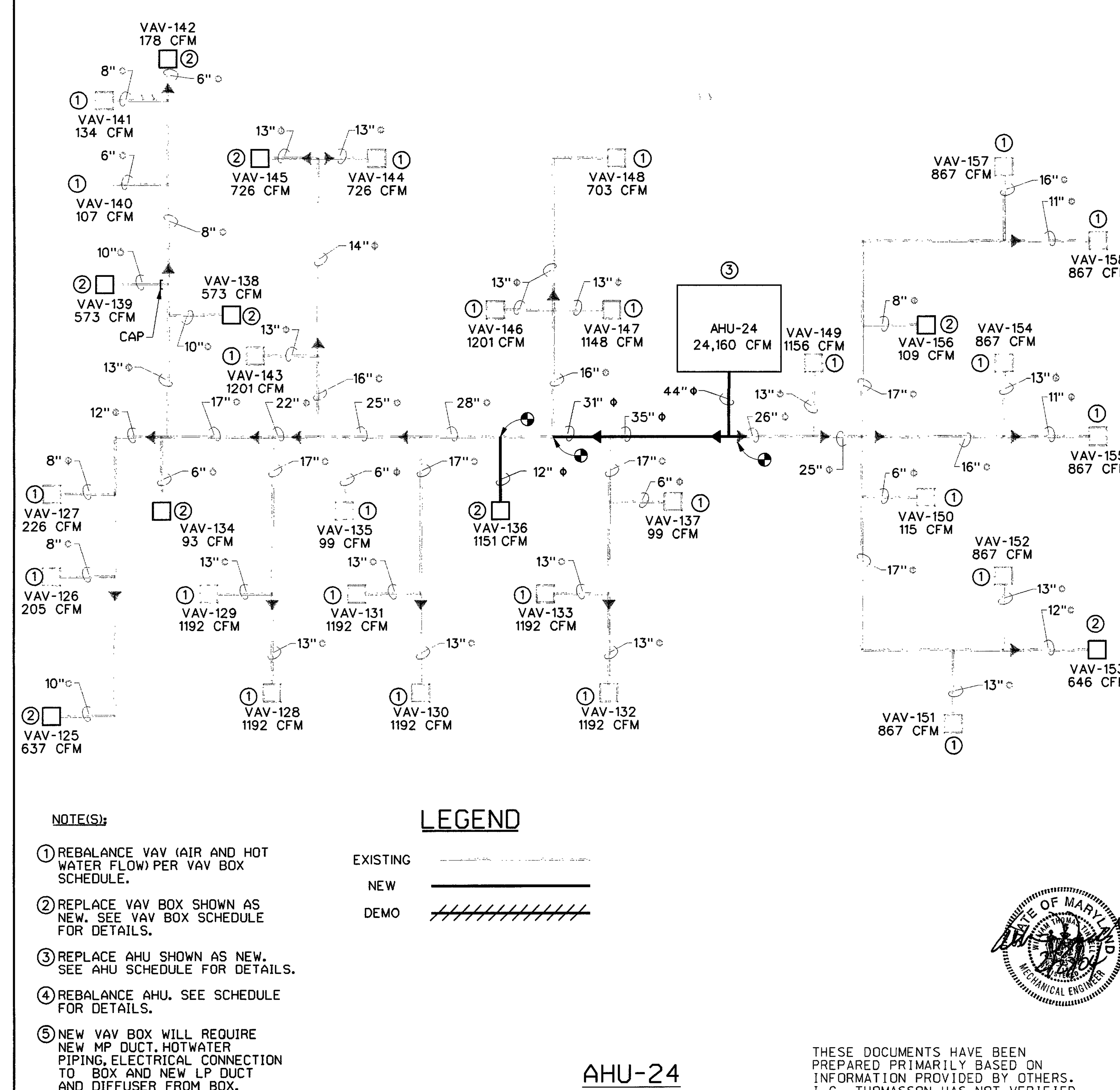
Sheet reference number:
M-103











NOTE(S):

1. REBALANCE VAV (AIR AND HOT WATER FLOW) PER VAV BOX SCHEDULE.
2. REPLACE VAV BOX SHOWN AS NEW. SEE VAV BOX SCHEDULE FOR DETAILS.
3. REPLACE AHU SHOWN AS NEW. SEE AHU SCHEDULE FOR DETAILS.
4. REBALANCE AHU. SEE SCHEDULE FOR DETAILS.
5. NEW VAV BOX WILL REQUIRE NEW MP DUCT, HOTWATER PIPING, ELECTRICAL CONNECTION TO BOX AND NEW LP DUCT AND DIFFUSER FROM BOX. SEE SCHEDULE AND FLOOR PLANS FOR DETAILS.

LEGEND

EXISTING
NEW
DEMO

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US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

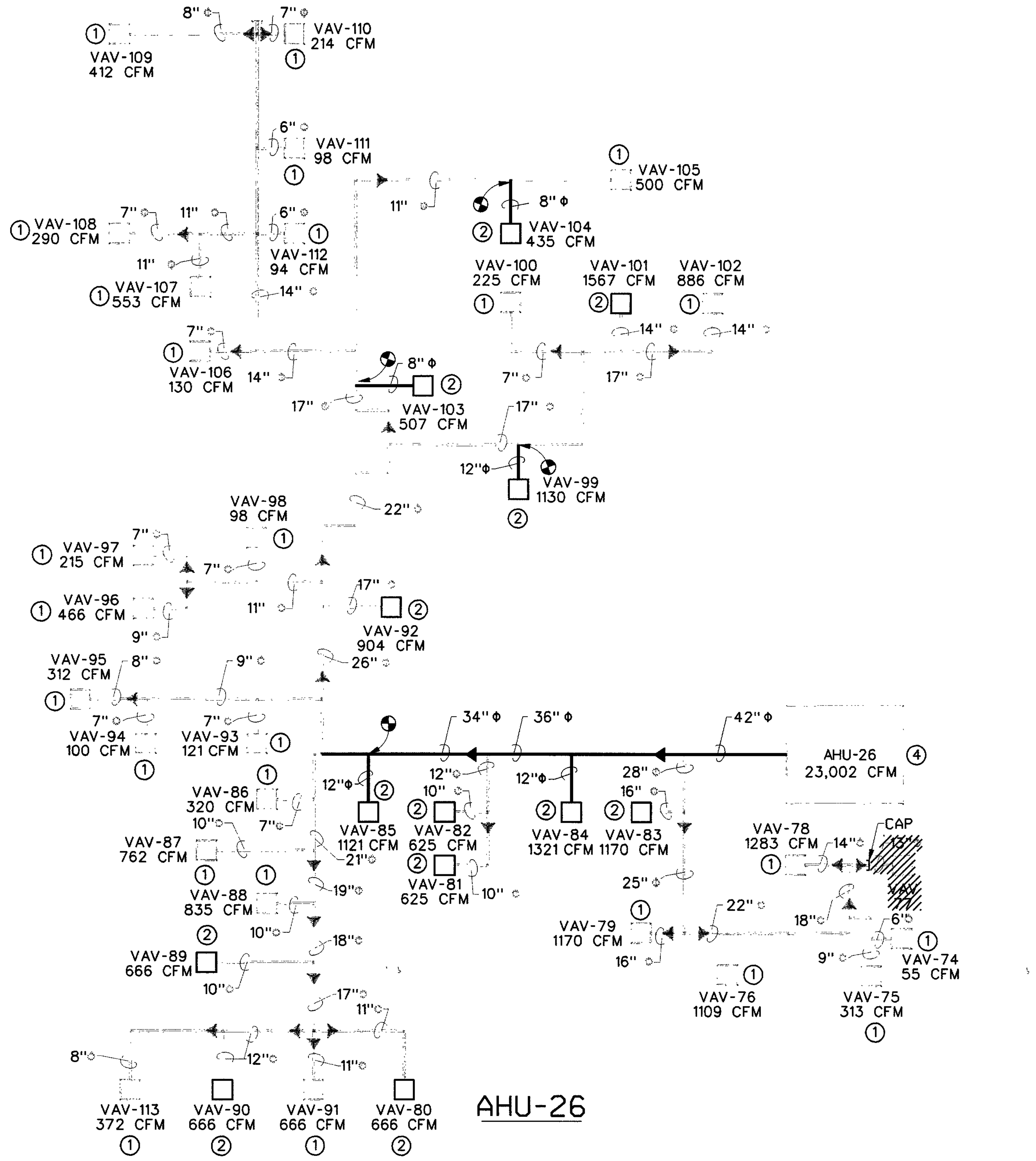
TASK ORDER #: FR004
VANGUARD — PADUCAH, KENTUCKY VOICE 270-442-8620
ICT — I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400

Checked by: WTT	Dwn by: ICT	Approved by: Chief, Prj. Mgmt. Division
Date: 02/27/04	CADD File Name: 312M104.DGN	ICT Project No. 203121
DACA87-03-D-0006	Plot date: 02/27/04	Plot scale:

DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND

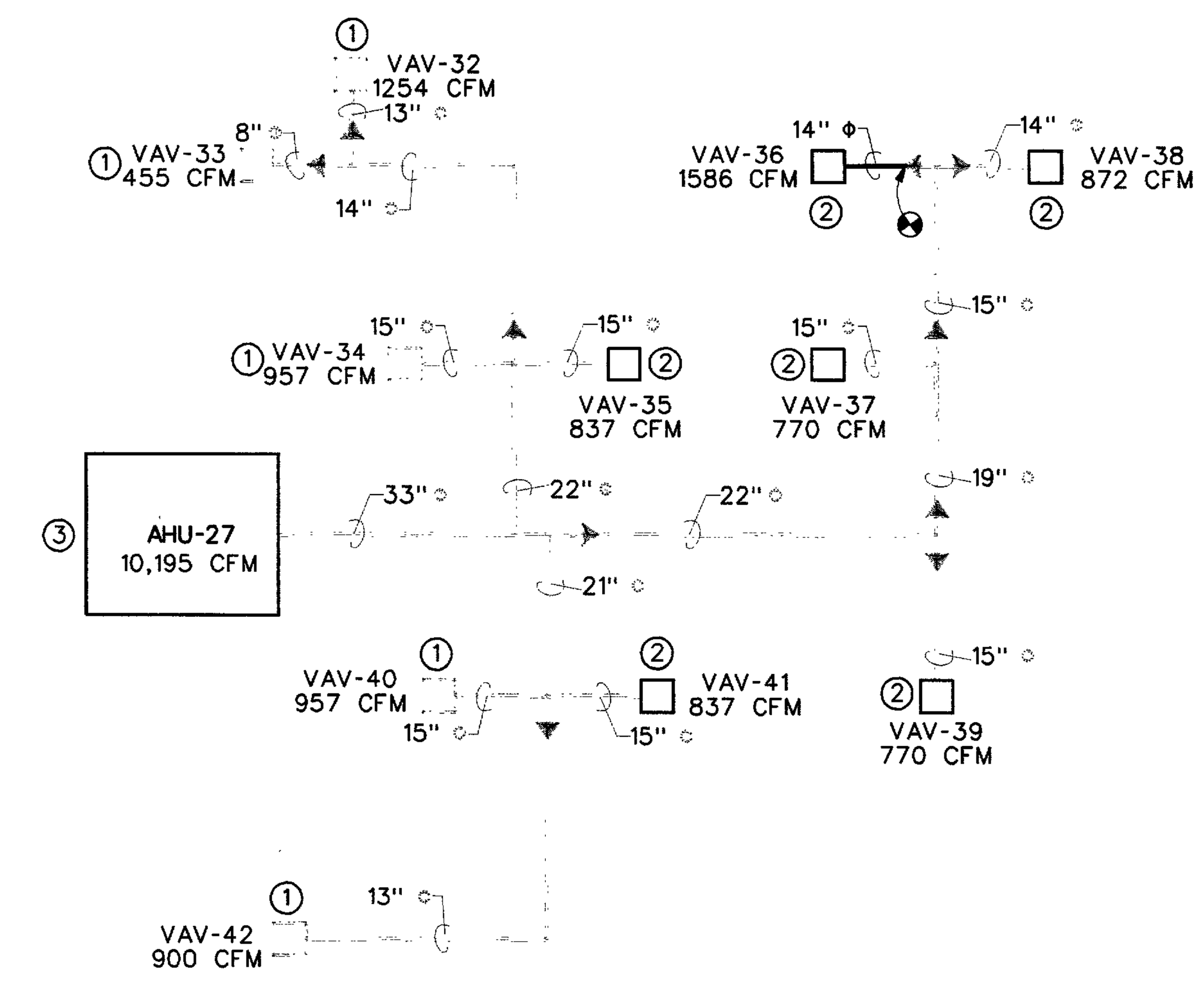
AHU FLOW SCHEMATIC DIAGRAMS

Sheet reference number: M-104



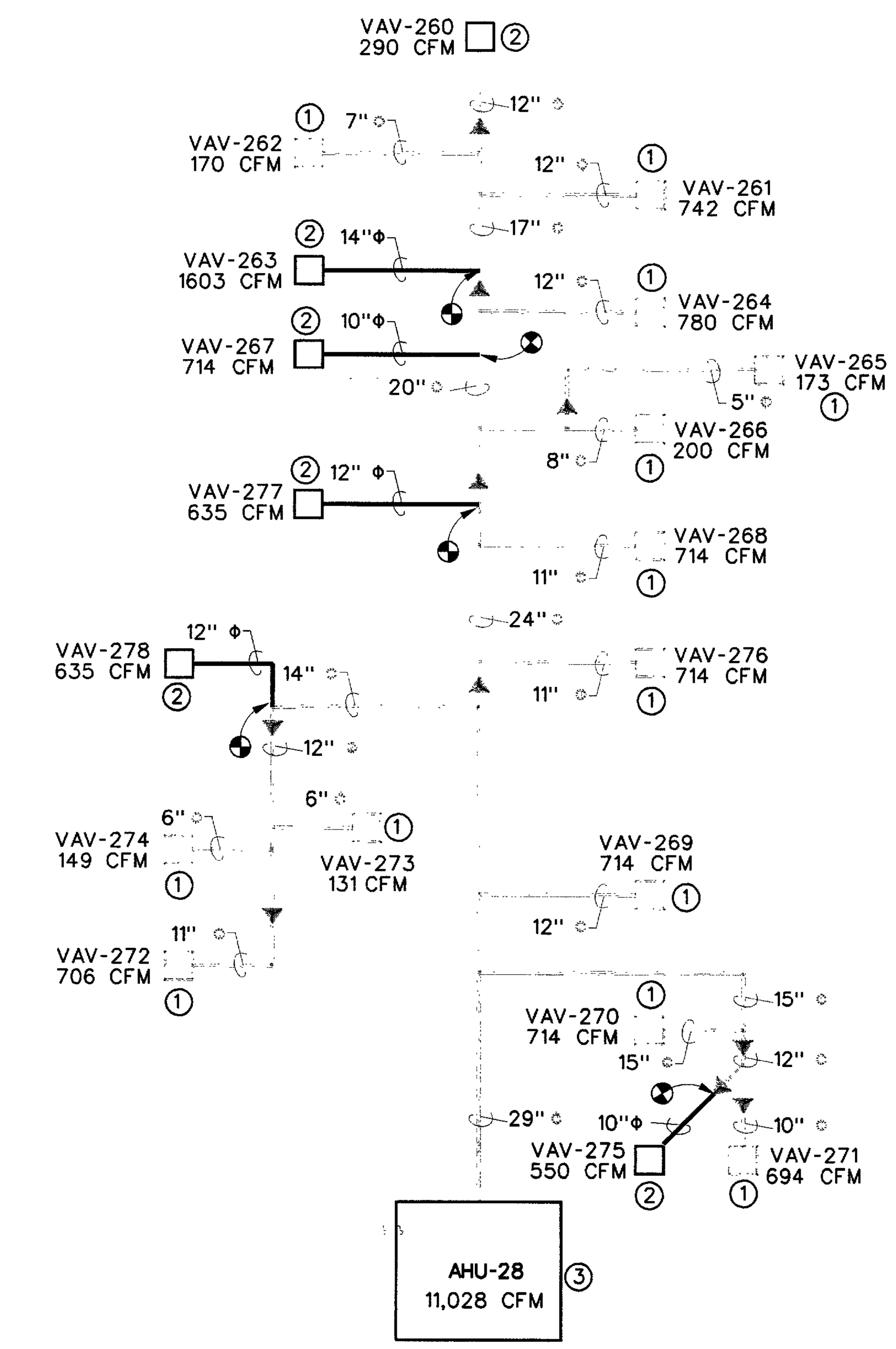
AHU-26

REF. DWG. M-606, M-607
NTS



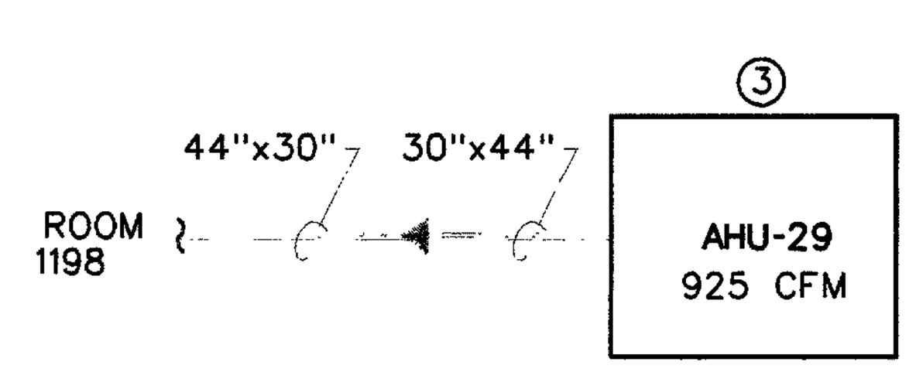
AHU-27

REF. DWG. M-606, M-608
NTS



AHU-28

REF. DWG. M-605



AHU-29

REF. DWG. M-603, M-605
NTS

LEGEND

EXISTING
NEW
DEMO

NOTE(S):

1. REBALANCE VAV (AIR AND HOT WATER FLOW) PER VAV BOX SCHEDULE.
2. REPLACE VAV BOX SHOWN AS NEW. SEE VAV BOX SCHEDULE FOR DETAILS.
3. REPLACE AHU SHOWN AS NEW. SEE AHU SCHEDULE FOR DETAILS.
4. REBALANCE AHU. SEE SCHEDULE FOR DETAILS.
5. NEW VAV BOX WILL REQUIRE NEW MP DUCT, HOTWATER PIPING, ELECTRICAL CONNECTION TO BOX AND NEW LP DUCT AND DIFFUSER FROM BOX. SEE SCHEDULE AND FLOOR PLANS FOR DETAILS.

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US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

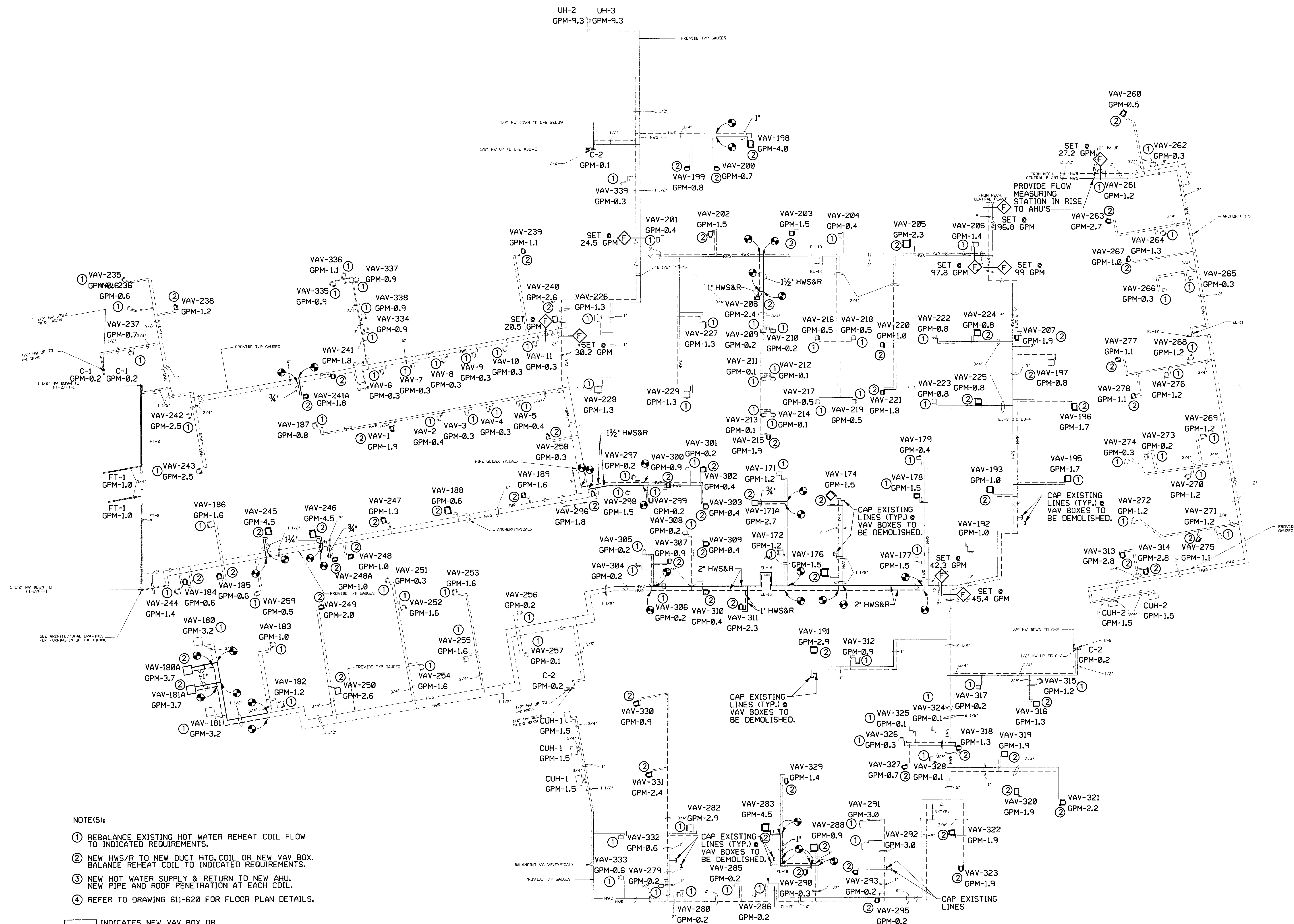
Date: 02/27/04
CADD File Name: 312M105.DGN
ICT Project No. 203121
Plot date: 02/27/04
Plot scale:
Checked by: WTT
Dwn by: ICT
DACA87-03-D-0006
Approved by:
Chief, Prj. Mgmt. Division

TASK ORDER #: FR004
VANGUARD PADUCAH, KENTUCKY VOICE 270-442-8620
I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400

DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND

AHU FLOW SCHEMATIC DIAGRAMS

Sheet reference number: M-105



NOTE(S):

1. REBALANCE EXISTING HOT WATER REHEAT COIL FLOW TO INDICATED REQUIREMENTS.
2. NEW HWS/R TO NEW DUCT HTG. COIL OR NEW VAV BOX. BALANCE REHEAT COIL TO INDICATED REQUIREMENTS.
3. NEW HOT WATER SUPPLY & RETURN TO NEW AHU. NEW PIPE AND ROOF PENETRATION AT EACH COIL.
4. REFER TO DRAWING 611-620 FOR FLOOR PLAN DETAILS.

INDICATES NEW VAV BOX OR AHU AND FLOW REQUIREMENTS.

INDICATES EXISTING VAV BOX OR AHU

(F) FLOW MEASURING STATION. SEE DETAIL M-501.

HW - FLOW SCHEMATIC - 1st FLOOR PLAN

NTS

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US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

TASK ORDER #: FRR004

VANGUARD — PADUCAH, KENTUCKY VOICE 270-442-8620

ICT — I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400

Checked by: WIT | Date: 02/27/04

Dwn by: ICT | CADD File Name: 312M106.DGN

DACA87-03-D-0006 | ICT Project No. 203121

Approved by: | Plot date: 02/27/04

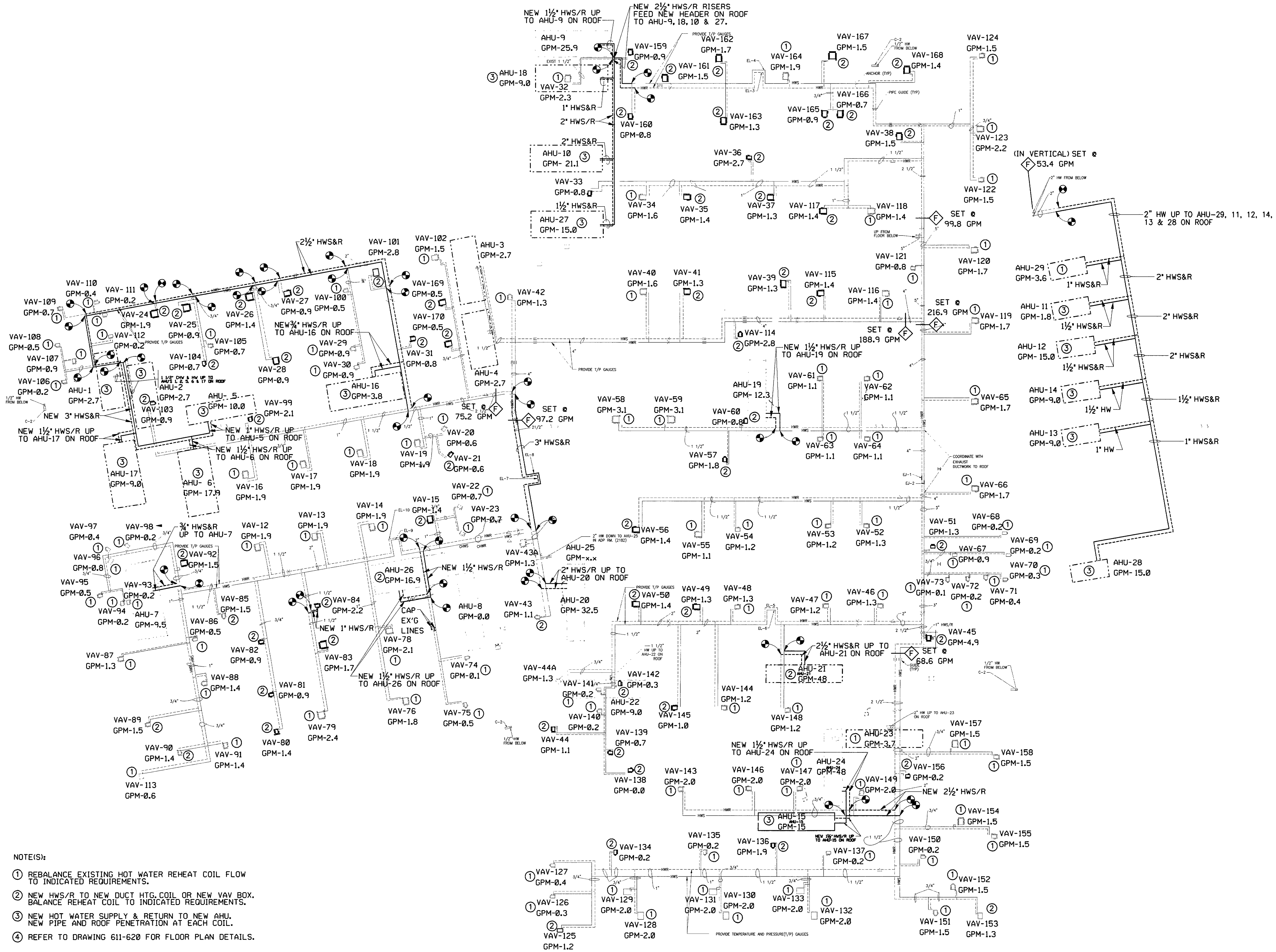
Chief, Prj. Mgmt. Division | Plot scale:

DEFENSE INFORMATION SCHOOL

FT. MEADE — MARYLAND

1 st FLOOR HOT WATER FLOW SCHEMATIC DIAGRAM

Sheet reference number: M-106



NOTE(S):

1. REBALANCE EXISTING HOT WATER REHEAT COIL FLOW TO INDICATED REQUIREMENTS.
2. NEW HWS/R TO NEW DUCT HTG. COIL OR NEW VAV BOX. BALANCE REHEAT COIL TO INDICATED REQUIREMENTS.
3. NEW HOT WATER SUPPLY & RETURN TO NEW AHU. NEW PIPE AND ROOF PENETRATION AT EACH COIL.
4. REFER TO DRAWING 611-620 FOR FLOOR PLAN DETAILS.

INDICATES NEW VAV BOX OR AHU AND FLOW REQUIREMENTS.

INDICATES EXISTING VAV BOX OR AHU

(F) FLOW MEASURING STATION, SEE DETAIL M-501.

HW - FLOW SCHEMATIC - 2nd FLOOR & ROOF

NTS

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US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Symbol	Description	Date	Appr.

TASK ORDER #: FRR004

Checked by: WTT | Date: 02/27/04

Dwn by: ICT | CADD File Name: 312M107.DGN

DACA87-03-D-0006 | ICT Project No. 203121

Approved by: | Plot date: 02/27/04

Chief, Prj. Mgmt. Division | Plot scale:

VANGUARD — PADUCAH, KENTUCKY — VOICE 270-442-8620

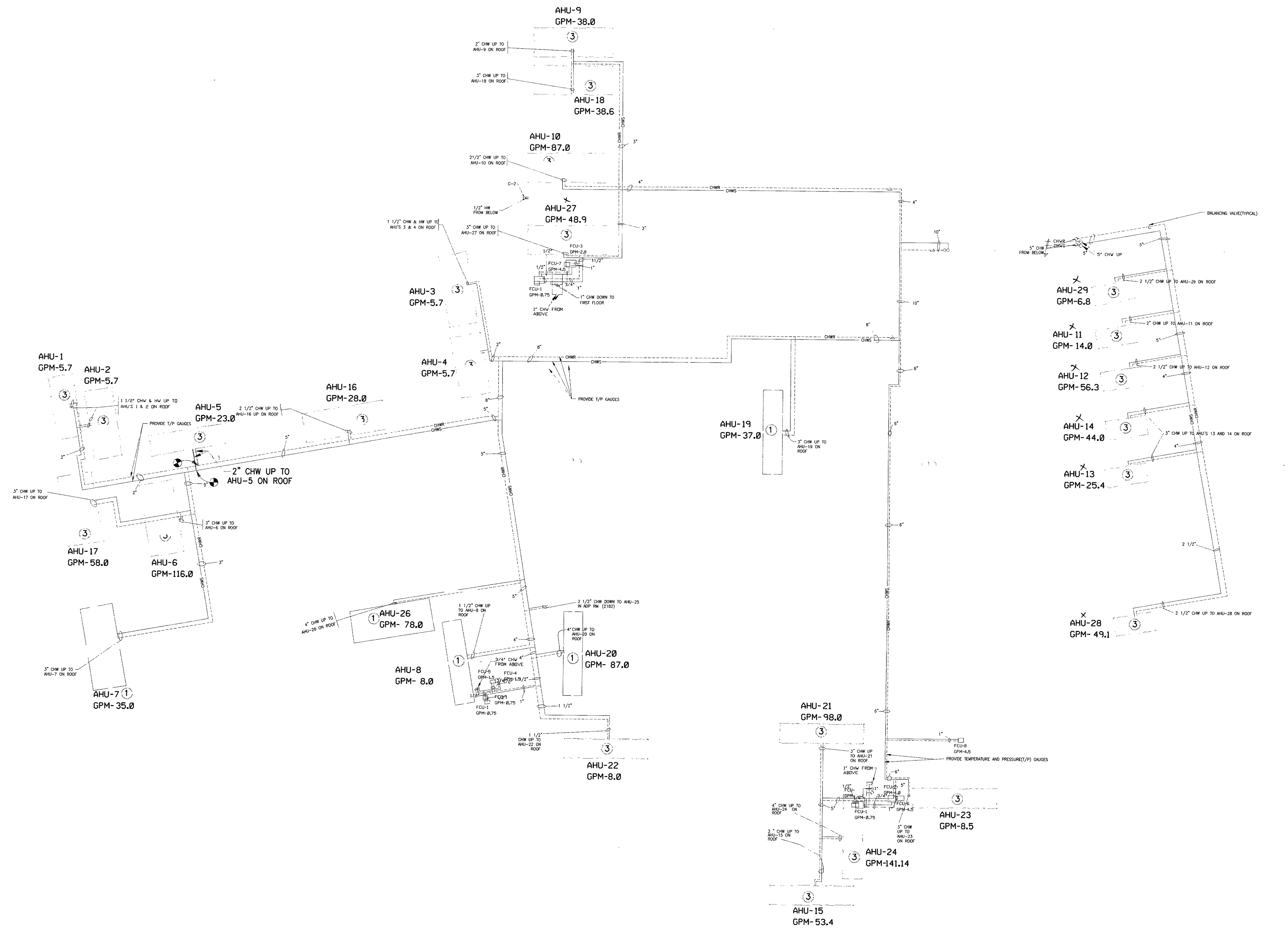
ICT — I.C. Thomasson Associates, Inc. — NASHVILLE, TENNESSEE — PHONE (615) 346-3400

DEFENSE INFORMATION SCHOOL

FT. MEADE MARYLAND

2nd FLOOR HOT WATER FLOW SCHEMATIC DIAGRAM

Sheet reference number: M-107



NOTE(S):

1. REBALANCE EXISTING HOT WATER REHEAT COIL FLOW TO INDICATED REQUIREMENTS.
2. NEW HWS/R TO NEW DUCT HTG. COIL OR NEW VAV BOX. BALANCE REHEAT COIL TO INDICATED REQUIREMENTS.
3. NEW HOT WATER SUPPLY & RETURN TO NEW AHU. NEW PIPE AND ROOF PENETRATION AT EACH COIL.
4. REFER TO DRAWING 611-620 FOR FLOOR PLAN DETAILS.

INDICATES NEW VAV BOX OR AHU AND FLOW REQUIREMENTS.

INDICATES EXISTING VAV BOX OR AHU

CW - FLOW SCHEMATIC - 2nd FLOOR PLAN

NTS

THESE DOCUMENTS HAVE BEEN PREPARED PRIMARILY BASED ON INFORMATION PROVIDED BY OTHERS. I.C. THOMASSON HAS NOT VERIFIED THE ACCURACY OF ALL INFORMATION PROVIDED BY OTHERS. SEE LIMIT OF LIAIBILITIES STATEMENT ON COVER SHEET.

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

TASK ORDER #: FRR004

PADUCAH, KENTUCKY VOICE 270-442-8620

I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400

Checked by: WTT | Date: 02/27/04

Dwn by: ICT | CADD File Name: 312M108.DGN

DACA87-03-D-0006 | ICT Project No. 203121

Approved by: | Plot date: 02/27/04

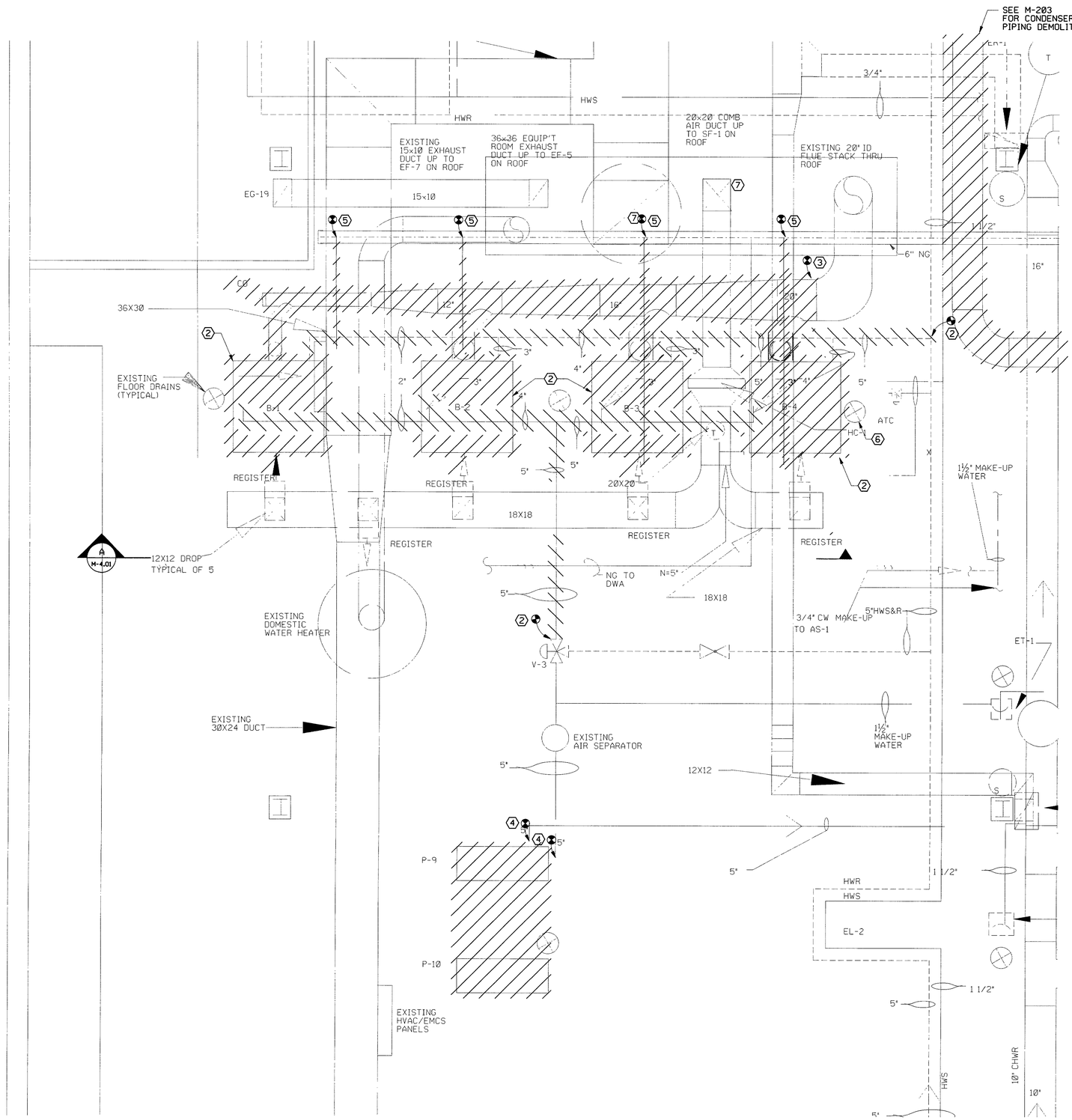
Chief, Prj. Mgmt. Division | Plot scale:

DEFENSE INFORMATION SCHOOL

FT. MEADE MARYLAND

CHILLED WATER FLOW SCHEMATIC DIAGRAM

Sheet reference number: M-108



PARTIAL MECHANICAL ROOM HW DEMOLITION

0 5

½" = 1'-0"

NOTES:
~~NOT USED~~

1. REMOVE EXISTING BOILERS AND ALL APPURTENANCES INCLUDING PIPING, POWER WIRING AND CONTROLS. (TYPICAL FOR 4 BOILERS)
2. REMOVE EXISTING FLUE GAS VENT TO POINT INDICATED.
3. REMOVE TWO EXISTING HOT WATER PUMPS (P-9 & P-10) WITH ASSOCIATED PIPING INCLUDING TRIPLE DUTY VALVES AS REQUIRED FOR INSTALLATION OF NEW PUMPS (FIELD VERIFY ACTUAL EXTENT OF PIPE DEMOLITION). REMOVE EXISTING VFD POWERING PUMPS.
4. REMOVE EXISTING NATURAL GAS PIPING BACK TO HEADER.
5. REMOVE EXISTING FLOOR DRAIN AND ASSOCIATED PIPING TO BELOW FLOOR SLAB. CAP EXISTING PIPING AND PATCH EXISTING SLAB AS REQUIRED.
6. REMOVE EXISTING COMBUSTION AIR FAN SF-1 ON ROOF, SEE M-301 AND M-503 FOR ADDITIONAL INFORMATION.

LEGEND
- DEMO
- EXISTING
- EXTENT OF DEMOLITION

THESE DOCUMENTS HAVE BEEN PREPARED PRIMARILY BASED ON INFORMATION PROVIDED BY OTHERS. I.C. THOMASSON HAS NOT VERIFIED THE ACCURACY OF ALL INFORMATION PROVIDED BY OTHERS. SEE LIMIT OF LIABILITIES STATEMENT ON COVER SHEET.

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Date: 02/27/04
Checked by: WTT
CADD File Name: 312W201DGN
Drawn by: ICT
ICT Project No. 203121
DACA87-03-D-0006
Plot date: 02/27/04
Plot scale:
Approved by:
Chief, Prj. Mgmt. Division

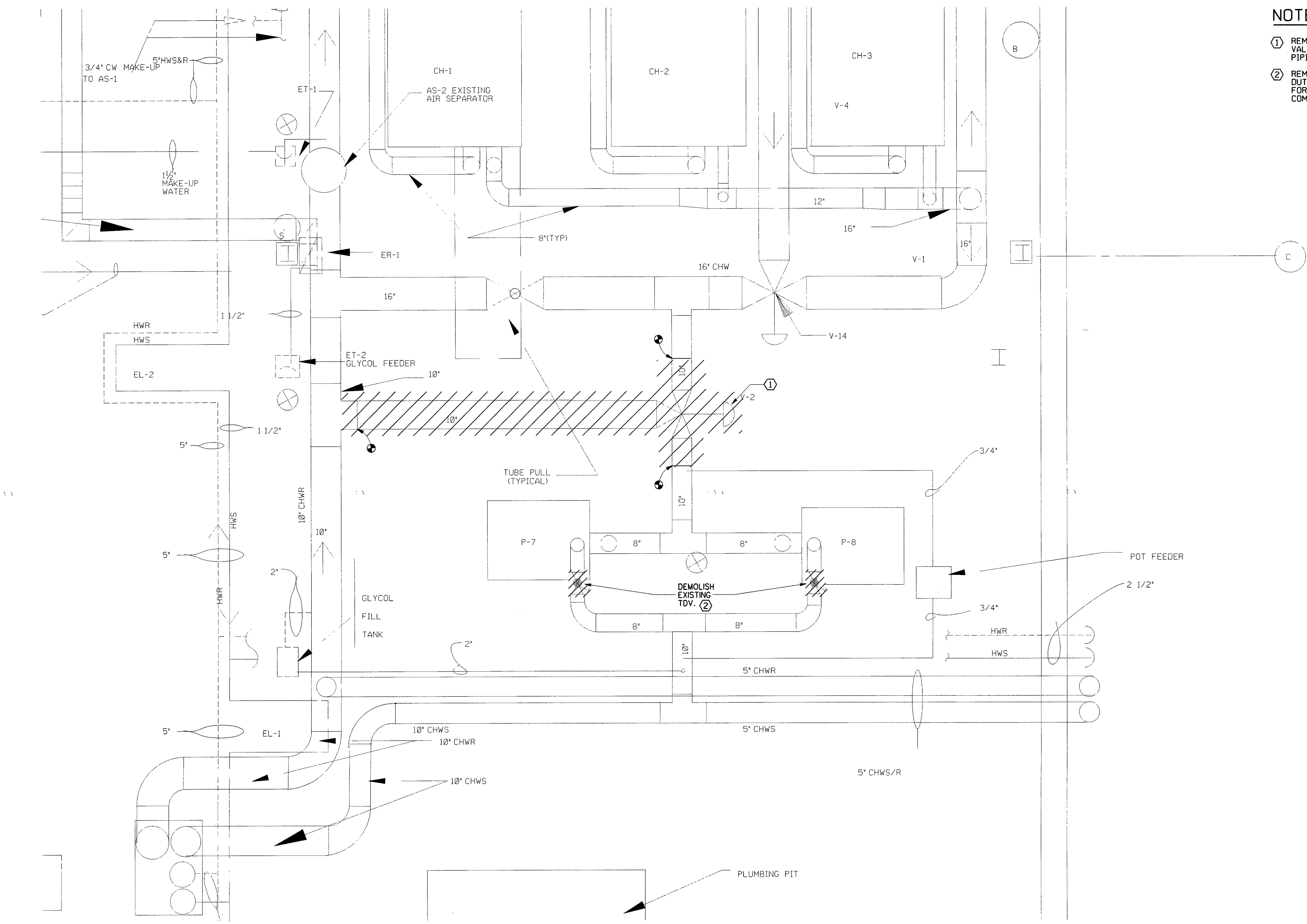
TASK ORDER #1 FRR004

PADUCAH, KENTUCKY VOICE 270-442-8620
I.C. Thomasson Associates, Inc.
NASHVILLE, TENNESSEE PHONE (615) 346-3400

DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND

MECHANICAL ROOM HOT WATER DEMOLITION

Sheet reference number:
M-201



PARTIAL MECHANICAL ROOM CHW DEMOLITION

0 5
½" = 1'-0"

NOTES:

1. REMOVE EXISTING CONTROL VALVE V-2 AND ASSOCIATED PIPING AS INDICATED.
2. REMOVE EXISTING TRIPLE-DUTY VALVE. SEE M-502 FOR REPLACEMENT COMPONENTS.

LEGEND

- DEMO
- EXISTING
- EXTENT OF DEMOLITION

THESE DOCUMENTS HAVE BEEN PREPARED PRIMARILY BASED ON INFORMATION PROVIDED BY OTHERS. I.C. THOMASSON HAS NOT VERIFIED THE ACCURACY OF ALL INFORMATION PROVIDED BY OTHERS. SEE LIMIT OF LIAIBILITIES STATEMENT ON COVER SHEET.

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Symbol	Description	Date	Appr.

TASK ORDER #: FRR004

VANGUARD CONTRACTORS INC.
PADUCAH, KENTUCKY
VOICE 270-442-8620

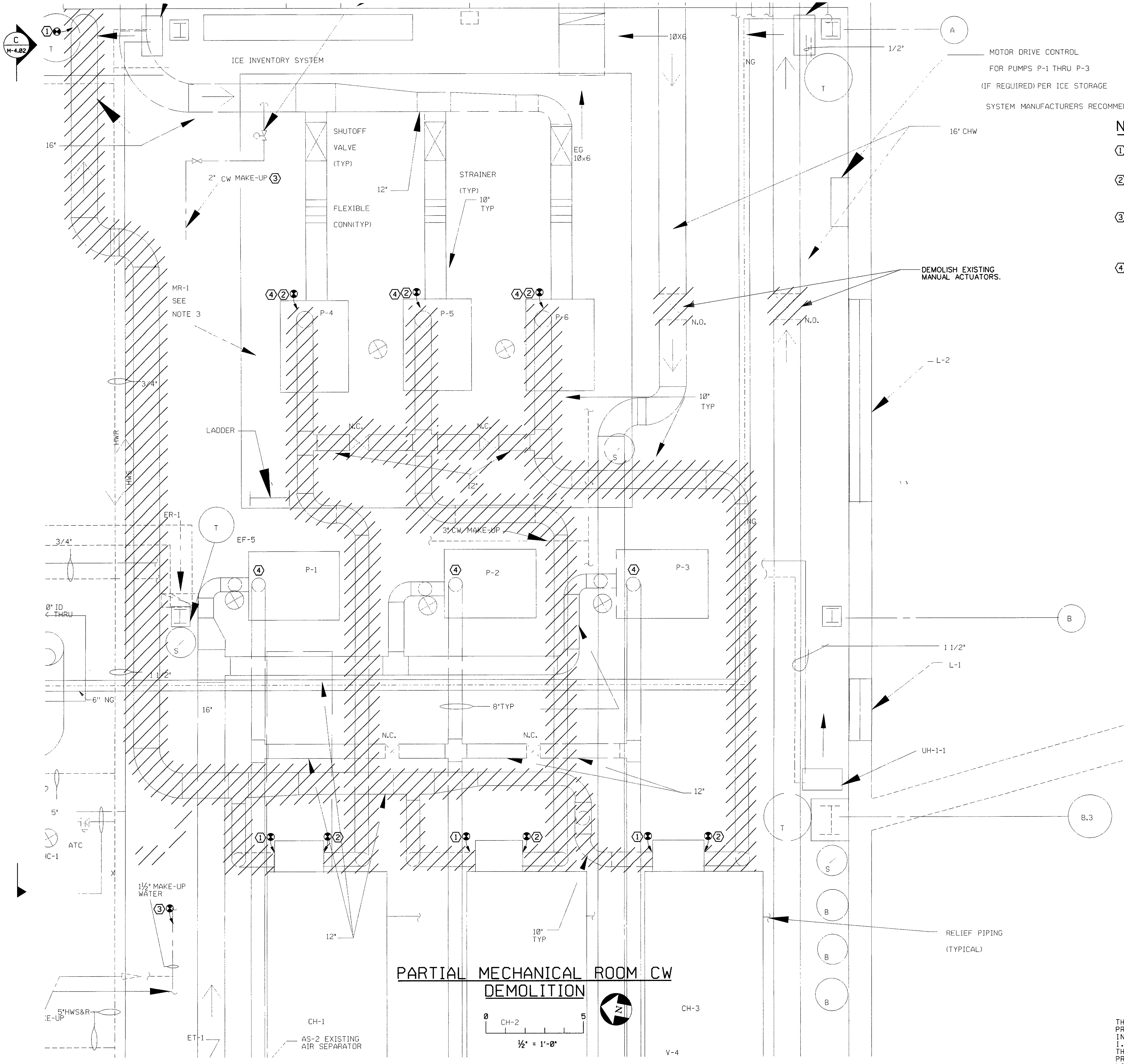
ICT
I.C. Thomasson Associates, Inc.
NASHVILLE, TENNESSEE
PHONE (615) 346-3400

Checked by: WTT	Date: 02/27/04
Dwn by: ICT	CADD File Name: 3121M202.DGN
DACA87-03-D-0006	ICT Project No. 203121
Approved by:	Plot date: 02/27/04
Chief, Prj. Mgmt. Division	Plot scale:

DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND

MECHANICAL ROOM CHILLED WATER DEMOLITION

Sheet reference number:
M-202



PARTIAL MECHANICAL ROOM CW DEMOLITION

0 — 5

½" = 1'-0"

NOTES:

1. REMOVE EXISTING CONDENSER WATER PIPING FROM FLOOR PENETRATION BACK TO CHILLER MARINE BOXES.
2. REMOVE EXISTING CONDENSER WATER PIPING (INCLUDING TRIPLE DUTY VALVES) FROM CONDENSER PUMP DISCHARGE TO CHILLER MARINE BOXES AS INDICATED.
3. FIELD VERIFY CONNECTION POINTS FOR CONDENSER WATER MAKEUP WATER AND CHEMICAL FEED. RECONNECT AS REQUIRED FOR NEW CONSTRUCTION. FIELD VERIFY MAKEUP WATER SUPPLIED VIA DEDICATED DOUBLE CHECK VALVE BACKFLOW PREVENTER.
4. REFER TO SCHEDULE ON M-502 FOR WORK REQUIRED AT PUMPS INCLUDING REPLACEMENTOF TRIPLE DUTY VALVES.

LEGEND

- DEMO
- EXISTING
- EXTENT OF DEMOLITION

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US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Symbol	Description	Date	Appr.

TASK ORDER #: FRR004

VANGUARD — PADUCAH, KENTUCKY VOICE 270-442-8620

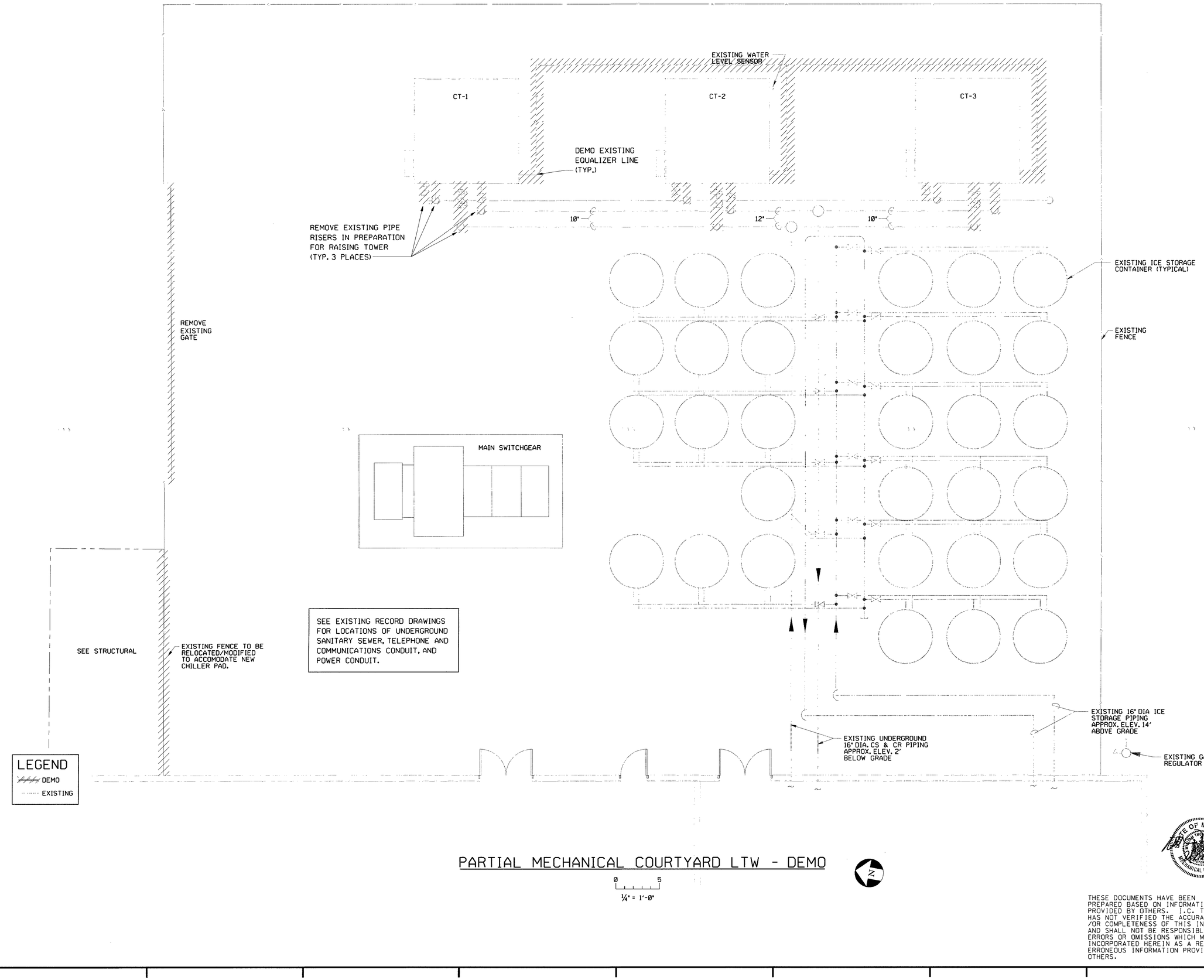
I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400

Checked by: WTT | Date: 02/27/04
Dwn by: ICT | CADD File Name: 312M203.DGN
DACA87-03-D-0006 | ICT Project No. 203121
Approved by: | Plot date: 02/27/04
Chief, Prj. Mgmt. Division | Plot scale:

DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND

MECHANICAL ROOM CONDENSER WATER DEMOLITION

Sheet reference number: M-203



PARTIAL MECHANICAL COURTYARD LTW - DEMO

0 5

1/4" = 1'-0"

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US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Symbol	Description	Date	Appr.

Checked by: WTT | Date: 02/27/04
Dsn by: ICT | CADD File Name: 312M204.DGN
DACA87-03-D-0006 | ICT Project No. 203121
Approved by: Chief, Prj Mgmt. Division | Plot date: 02/27/04
Plot scale:

TASK ORDER #: FRR004

I.C. Thomasson Associates Inc.
PADUCAH, KENTUCKY VOICE 270-442-8620
NASHVILLE, TENNESSEE PHONE (615) 346-3400

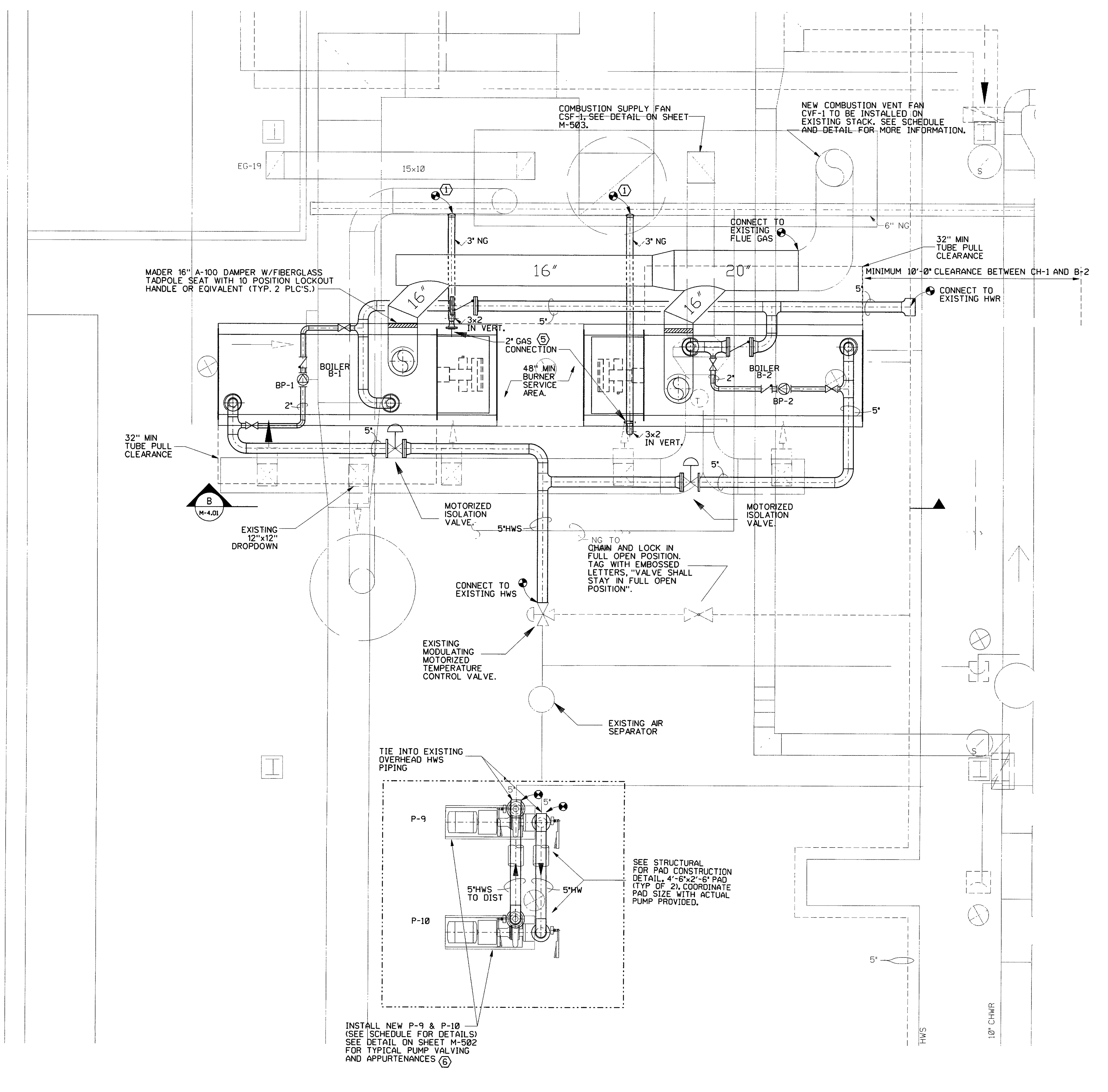
ICT

DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND

COURTYARD LTW DEMOLITION

Sheet reference number:

M-204



PARTIAL MECHANICAL ROOM HW NEW WORK

0 5

½" = 1'-0"

NOTES:

1. RECONNECT TO EXISTING NAT. GAS HEADER.
2. RECONNECT MAKEUP WATER AND GLYCOL FEEDER AS REQUIRED. FIELD VERIFY MAKEUP WATER SUPPLIED VIA DEDICATED DOUBLE CHECK VALVE BACKFLOW PREVENTER.
3. INSULATE ALL HWS&R PIPING PER SPECS. PROVIDE ALUMINUM CLAD COVERING FOR ALL INSULATED PIPING TO 6 FT ABOVE FIN. FLR. PER SPECIFICATIONS.
4. ALL MANUAL VALVE OPERATORS MORE THAN 10 FT ABOVE FIN. FLR. SHALL BE INSTALLED WITH CHAIN OPERATORS.
5. EXTEND NAT. GAS REGULATOR RELIEF VENT PIPING TO DISCHARGE OUTSIDE OF BUILDING.
6. PROVIDE NEW VARIABLE FREQUENCY DRIVES FOR NEW PUMPS P-9 & P-10.

LEGEND

- NEW
- EXISTING
- CONNECT TO EXISTING

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US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Symbol	Description	Date	Appr.

TASK ORDER #: FRR004

PADUCAH, KENTUCKY VOICE 270-442-8620

I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400

Checked by: WTT | Dwn by: ICT | DACA87-03-D-0006 | Approved by: Chief, Prj. Mgmt. Division

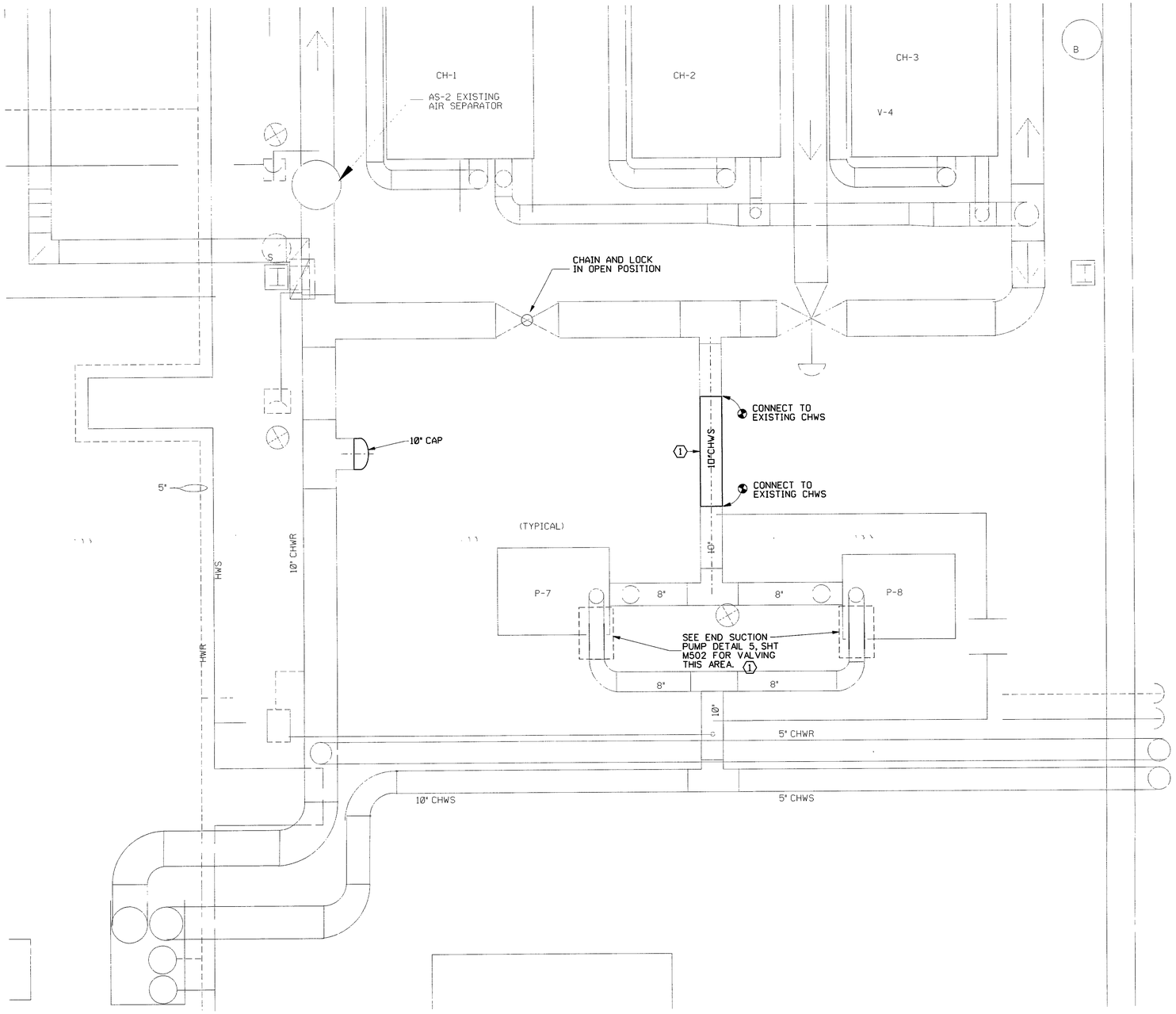
Date: 02/27/04 | CADD File Name: 312M301.DGN | ICT Project No. 203121 | Plot date: 02/27/04 | Plot scale:

DEFENSE INFORMATION SCHOOL

FT. MEADE MARYLAND

MECHANICAL ROOM HOT WATER NEW WORK

Sheet reference number: M-301



NOTES:

1. INSULATE CHWS&R PIPING PER SPECIFICATIONS. INSTALL ALUMINUM CLAD COVERING FOR ALL INSULATED PIPING TO 6 FT ABOVE FIN. FLR. PER SPECIFICATIONS.

PARTIAL MECHANICAL ROOM CHW NEW WORK

0 5

½" = 1'-0"

LEGEND

- NEW
- EXISTING
- CONNECT TO EXISTING

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US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Symbol	Description	Date	Appr.

Date: 02/27/04
Checked by: WTT
CADD File Name: 312MA302.DGN
Dwn by: ICT
ICT Project No. 203121
DACA87-03-D-0006
Plot date: 02/27/04
Approved by:
Plot scale:
Chief, Prj. Mgmt. Division

TASK ORDER #: FRR004

PADUCAH, KENTUCKY VOICE 270-442-8620

I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400

ICT

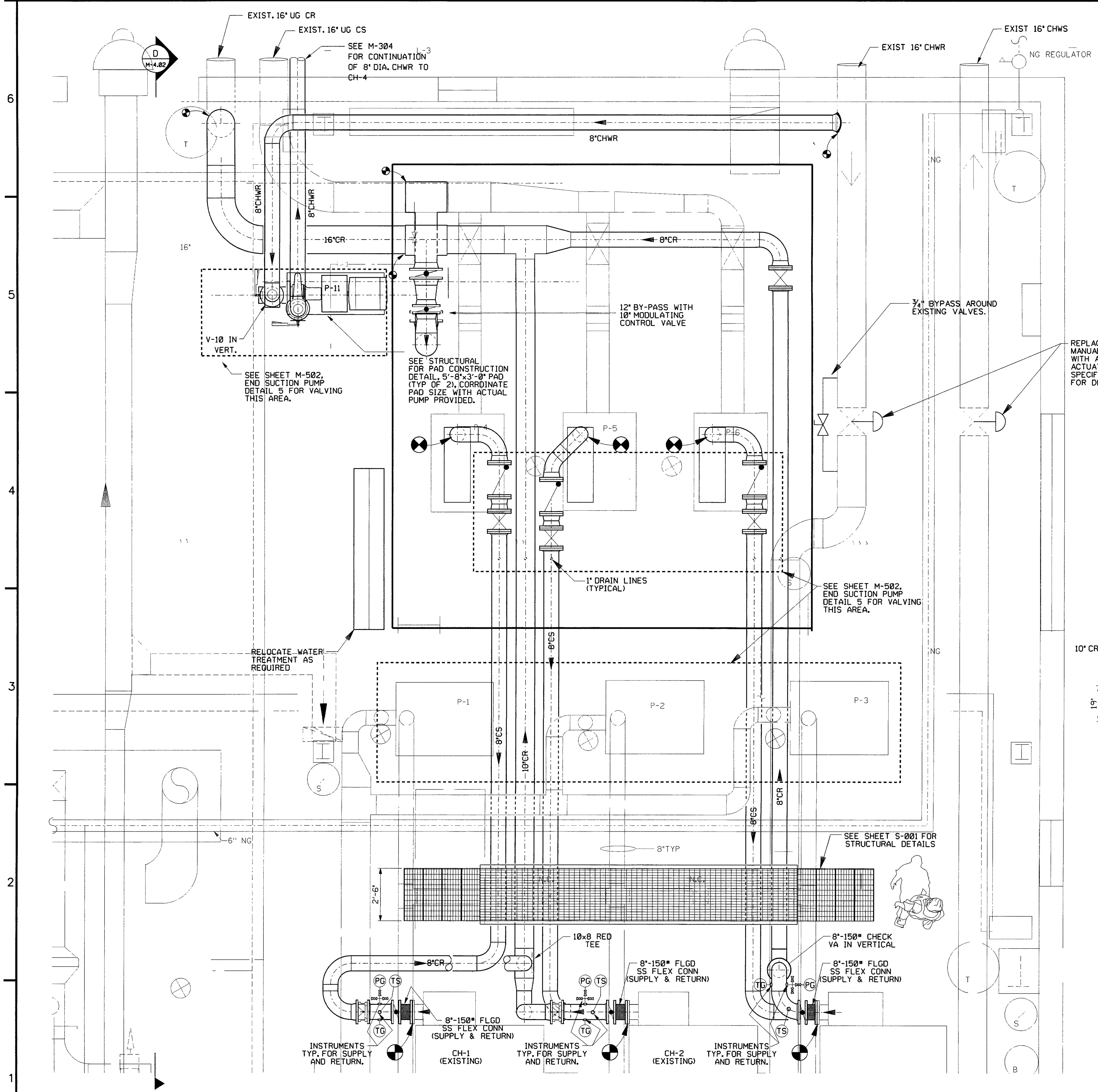
DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND

MECHANICAL ROOM CHILLED WATER NEW WORK

STATE OF MARYLAND — MECHANICAL ENGINEER

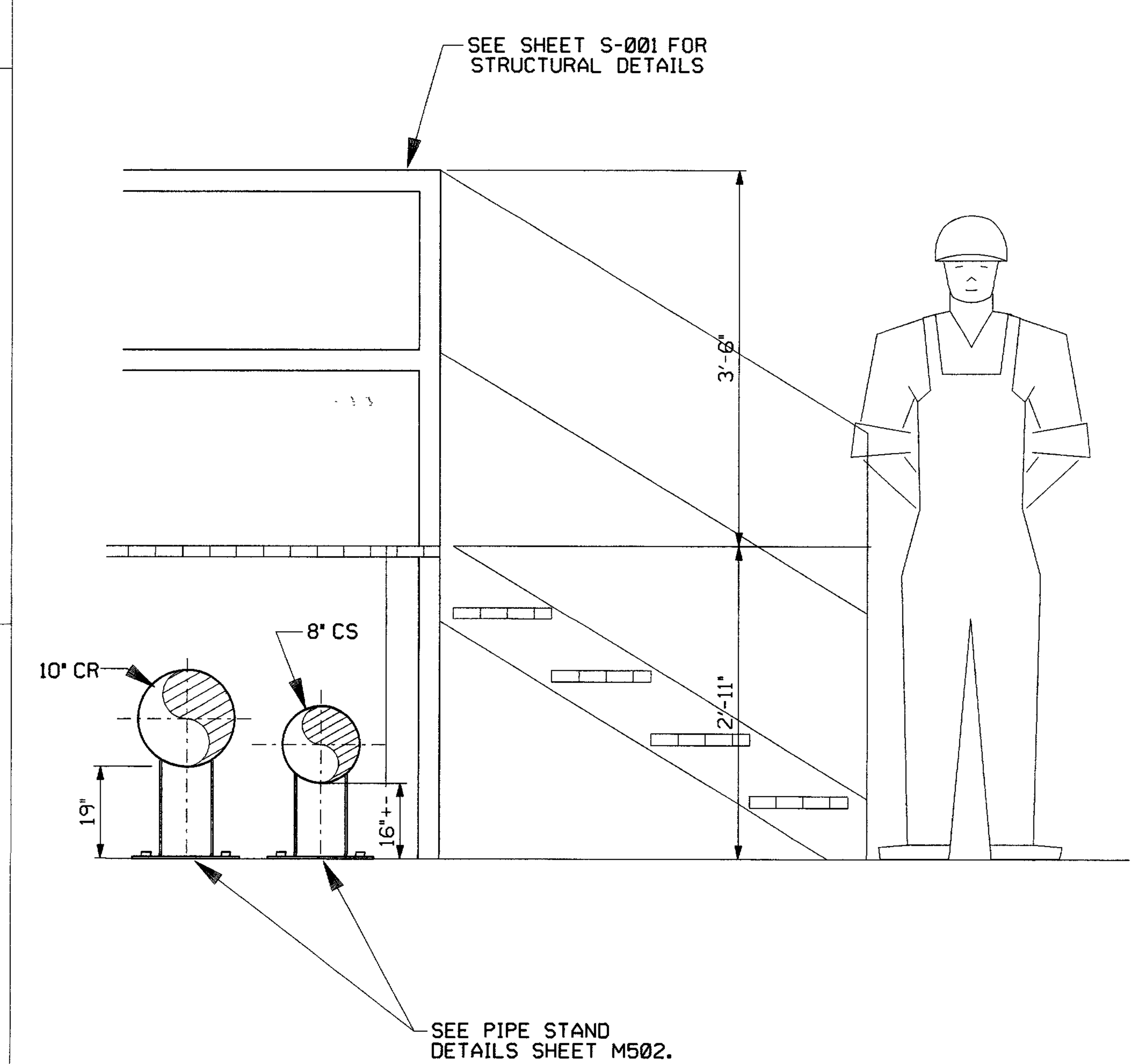
Sheet reference number:

M-302



MECHANICAL ROOM CW NEW WORK

0 5
1/2" = 1'-0"



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LEGEND

- NEW
- EXISTING
- CONNECT TO EXISTING

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

TASK ORDER #: FRR004

Date: 02/27/04 | Checked by: WTT | Dwn by: ICT | CADD File Name: 312M303.DGN | ICT Project No. 203121 | DACA87-03-D-0006 | Approved by: | Plot date: 02/27/04 | Plot scale: | Chief, Prj. Mgmt. Division

PADUCAH, KENTUCKY VOICE 270-442-8620

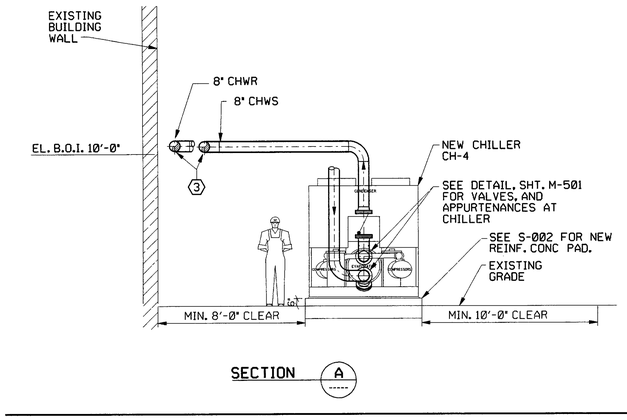
I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400

DEFENSE INFORMATION SCHOOL

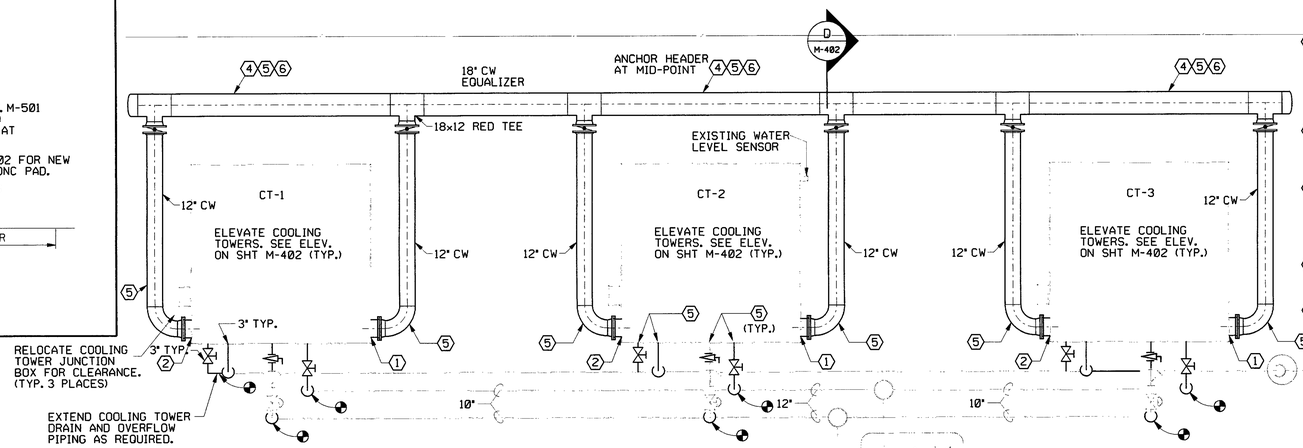
FT. MEADE MARYLAND

MECHANICAL ROOM CONDENSER WATER NEW WORK

Sheet reference number: M-303



SECTION A

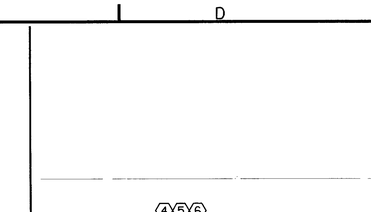


NOTES:

1. REMOVE EXISTING 8" EQUALIZER NOZZLE. PROVIDE AND INSTALL NEW 12" DIA S/S COLD WATER BASIN NOZZLE KIT AT DEPRESSED END OF SUMP. WELD 12" 304 S/S STUB-END TO PROJECTING NOZZLE AND INSTALL 12"-150# CS LAP JOINT FLANGE
2. PROVIDE AND INSTALL NEW 12" DIA S/S COLD WATER BASIN NOZZLE KINT AT DEPRESSED END OF SUMP, WELD 12" 304S/S STUB-END TO PROJECTING NOZZLE AND INSTALL 12'-150# CS LAP-JOINT FLANGE.
3. INSULATE NEW CHILLER PIPING WITH FOAMGLASS INSUL. WITH ALUMINUM JACKET PER SPECIFICATIONS.
4. SEE PIPE STAND STRUCTURAL DETAIL, SHEET S-002. SEE SPECIFICATIONS FOR MAXIMUM PIPE SPANS. MAINTAIN MIN 8" CLEARANCE BETWEEN PIPE AND BUILDING EXTERIOR.
5. HEAT TRACE EXTERIOR INSULATED PIPE PER SPECIFICATIONS.
6. ENSURE ALL EQUALIZER PIPING IS INSTALLED AT THE SAME C ELEVATION WITH NO POCKETS.

REMOVE EXISTING GATE

CONTRACTOR SHALL DRILL CORE SAMPLE OF EXISITNG MECHANICAL YARD SURFACE. EXPANSION OF MECHANICAL YARD SHALL MATCH EXISTING CORE SAMPLE WITH REGARD TO EXCAVATION TO NATIVE SOIL, UNDERLAYMENT AND TOP COAT.



PARTIAL MECHANICAL COURTYARD LTW NEW WORK

0 5
1/4" = 1'-0"

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LEGEND
- NEW
- EXISTING
- CONNECT TO EXISTING

STATE OF MARYLAND — MECHANICAL ENGINEER

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Symbol	Description	Date	Appr.

Date: 02/27/04
CADD File Name:
Checked by: WTT
Dwn by: ICT
DACA87-03-D-0006
Approved by:
Chief, Prj. Mgmt. Division
ICT Project No. 203121
Plot date: 02/27/04
Plot scale: 1/8"=1'-0"

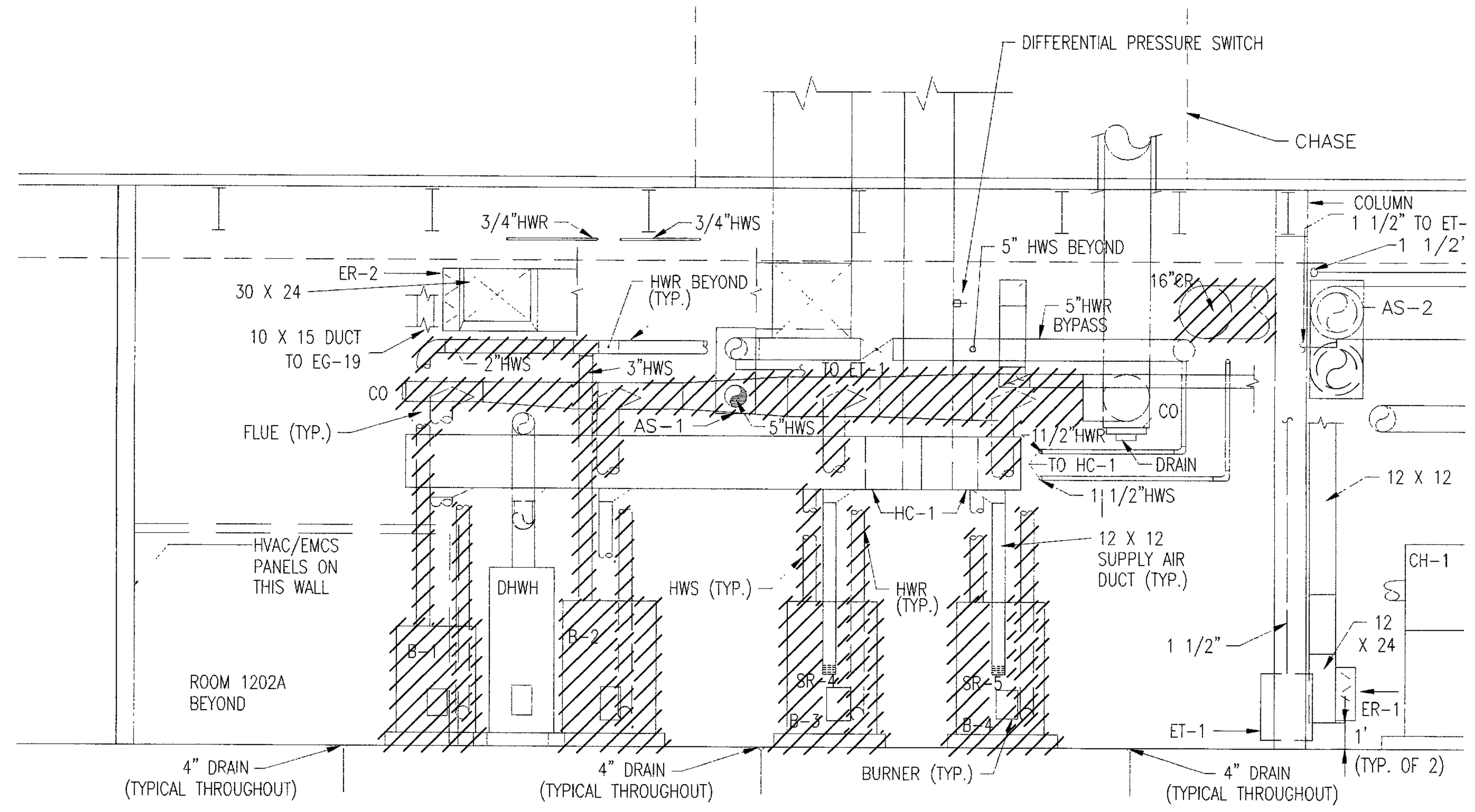
TASK ORDER #: FRR004

PADUCAH, KENTUCKY
VOICE 270-442-8620
I.C. Thomasson Associates, Inc.
NASHVILLE, TENNESSEE
PHONE (615) 346-3400

DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND

COURTYARD LTW NEW WORK

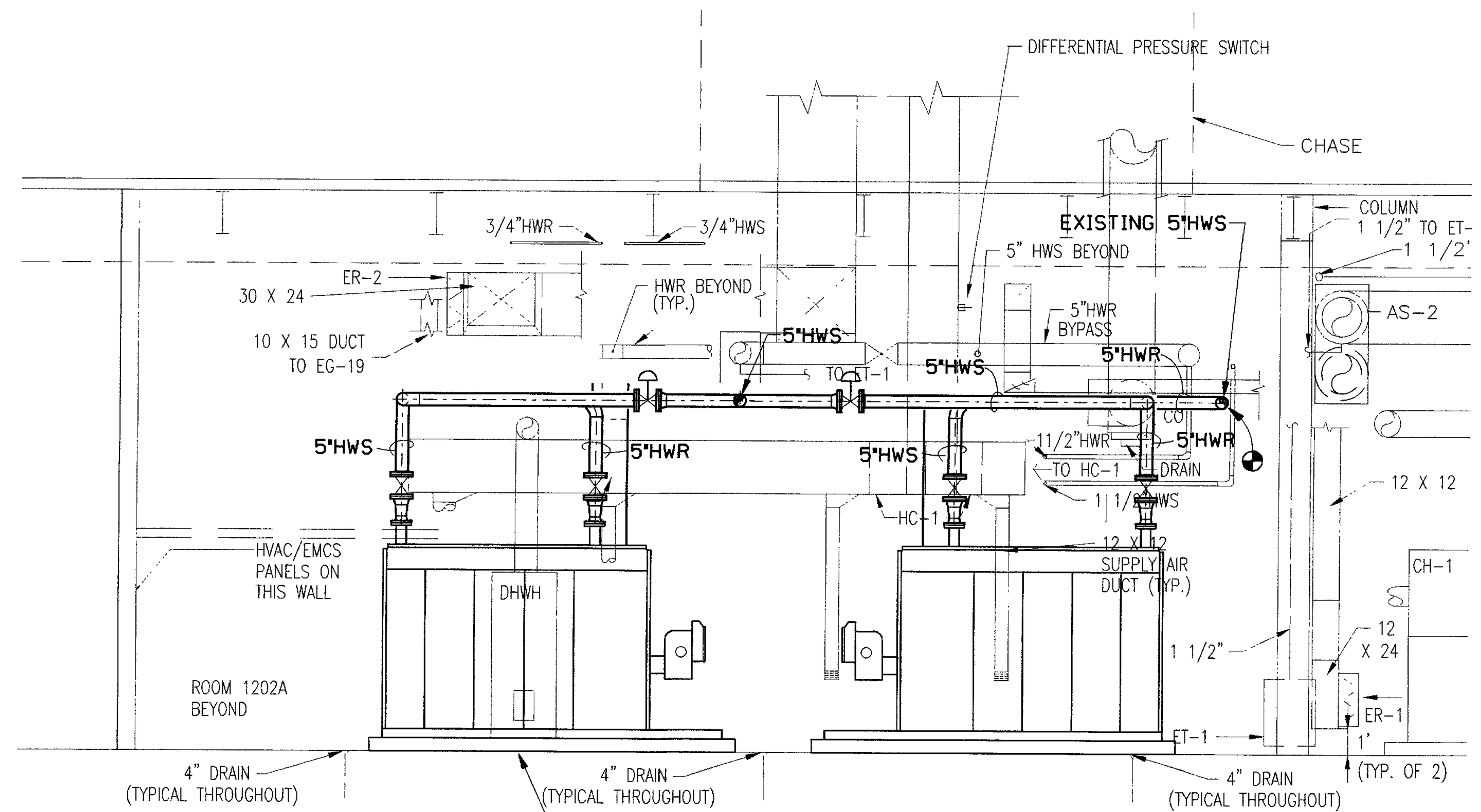
Sheet reference number:
M-304



SECTION A M-2.01

0 5

¼" = 1'-0"



DEMO 4" DRAIN. SEE M-201 FOR DETAILS.

SCARIFY EXIST CONCRETE AND APPLY EPOXY BONDING AGENT. INSTALL 6" REINFORCED CONCRETE BOILER PAD. PAD PERIMETER SHALL EXTEND 4" AROUND EQUIPMENT BASE. INSTALL EQUIPMENT WITH 1" LEVELLING GROUT AND ANCHOR ACCORDING TO BOILER MANUFACTURER'S SPECIFICATIONS. SEE SPECIFICATIONS FOR FURTHER REQUIREMENTS.

SECTION B M=3.01

0 5

¼" = 1'-0"

LEGEND

- NEW
- DEMO
- EXISTING

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US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

TASK ORDER #: FRR004

PADUCAH, KENTUCKY VOICE 270-442-8620

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Checked by: WTT | Dwn by: ICT | DACA87-03-D-0006 | Approved by: | Chief, Prj. Mgmt. Division

Date: 02/27/04 | CADD File Name: 3121M401.DGN | ICT Project No. 203121 | Plot date: 02/27/04 | Plot scale:

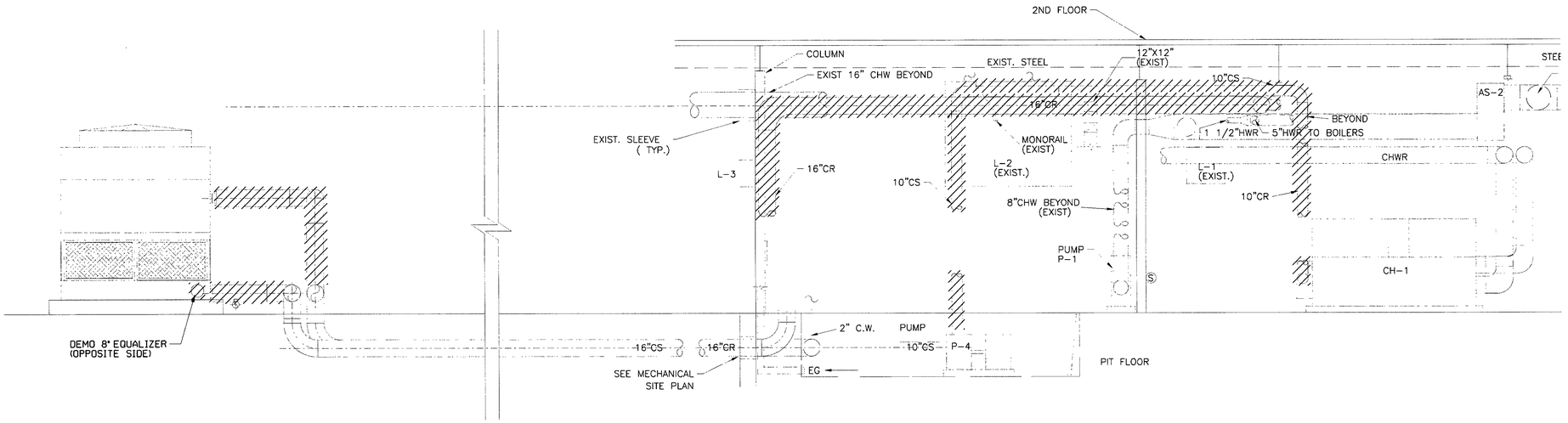
DEFENSE INFORMATION SCHOOL

FT. MEADE MARYLAND

MECHANICAL SECTIONS

Sheet reference number:

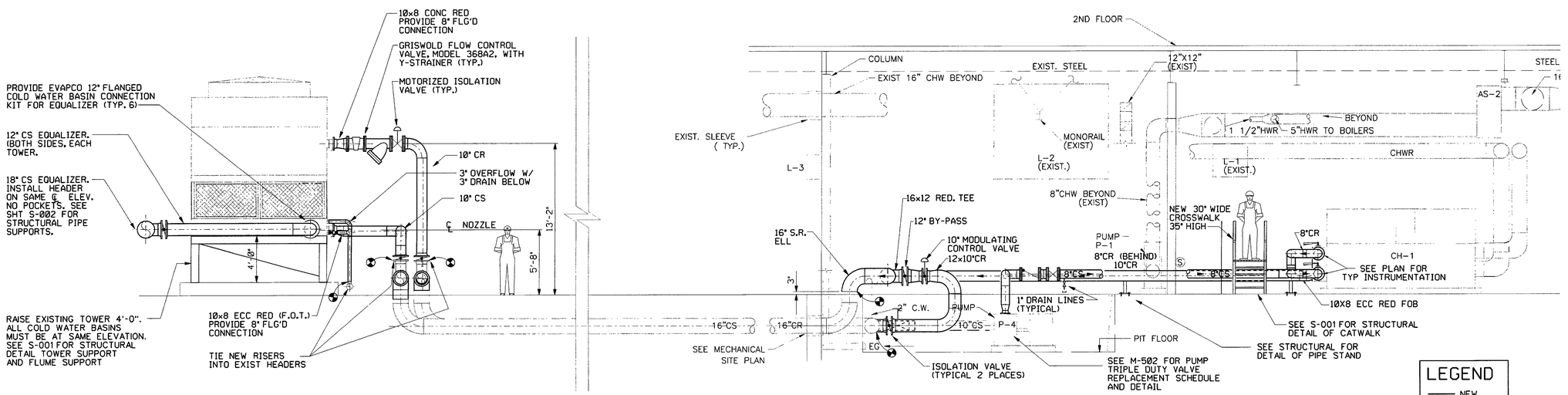
M-401



SECTION C
M-2.03

0 5

¼" = 1'-0"



SECTION D
M-3.03 & M-3.04

0 5

¼" = 1'-0"

LEGEND
- NEW
- DEMO
- EXISTING

THESE DOCUMENTS HAVE BEEN PREPARED PRIMARILY BASED ON INFORMATION PROVIDED BY OTHERS. I.C. THOMASSON HAS NOT VERIFIED THE ACCURACY OF ALL INFORMATION PROVIDED BY OTHERS. SEE LIMIT OF LIAIBILITIES STATEMENT ON COVER SHEET.

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Date: 02/27/04
Checked by: WTT
Dwn by: ICT
CADD File Name: 312M402.DGN
ICT Project No. 203121
DACA87-03-D-0006
Plot date: 02/27/04
Approved by:
Plot scale:
Chief, Prj. Mgmt. Division

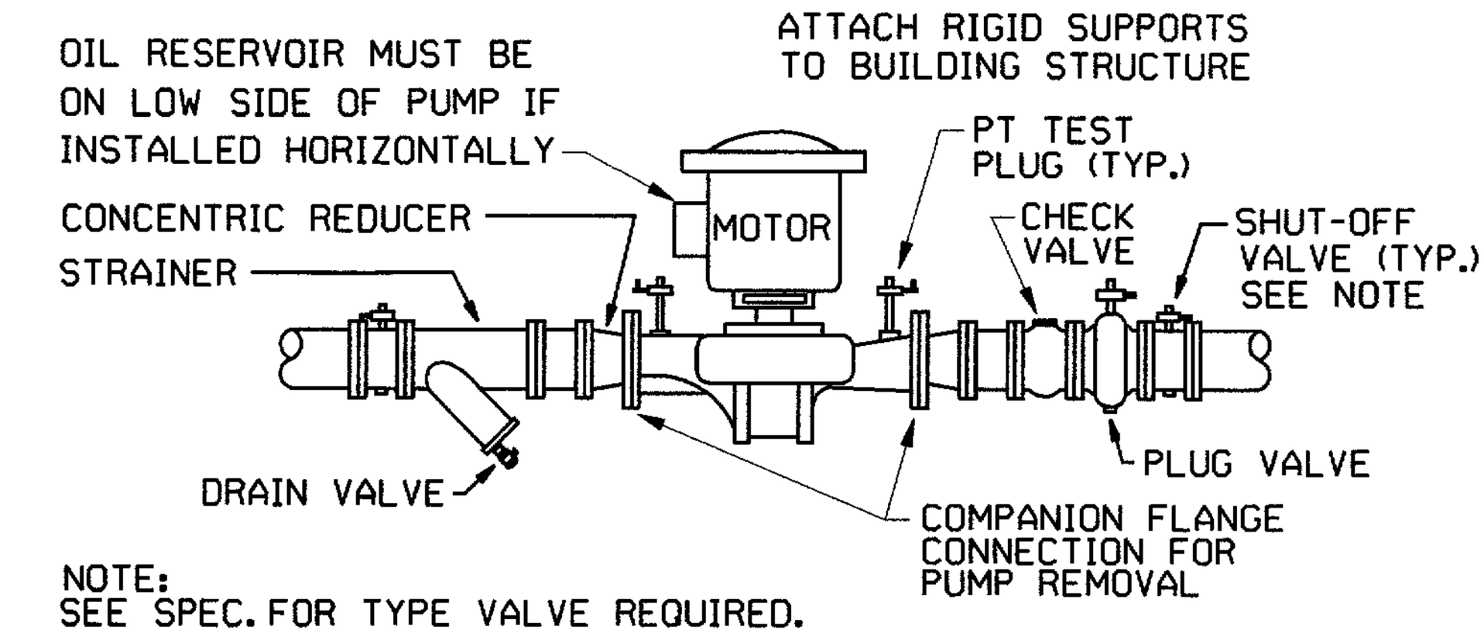
TASK ORDER "; FRR004

PADUCAH, KENTUCKY
VOICE 270-442-8620
I.C. Thomasson Associates Inc.
NASHVILLE, TENNESSEE
PHONE (615) 346-3400

DEFENSE INFORMATION SCHOOL
FT. MEADE
MARYLAND

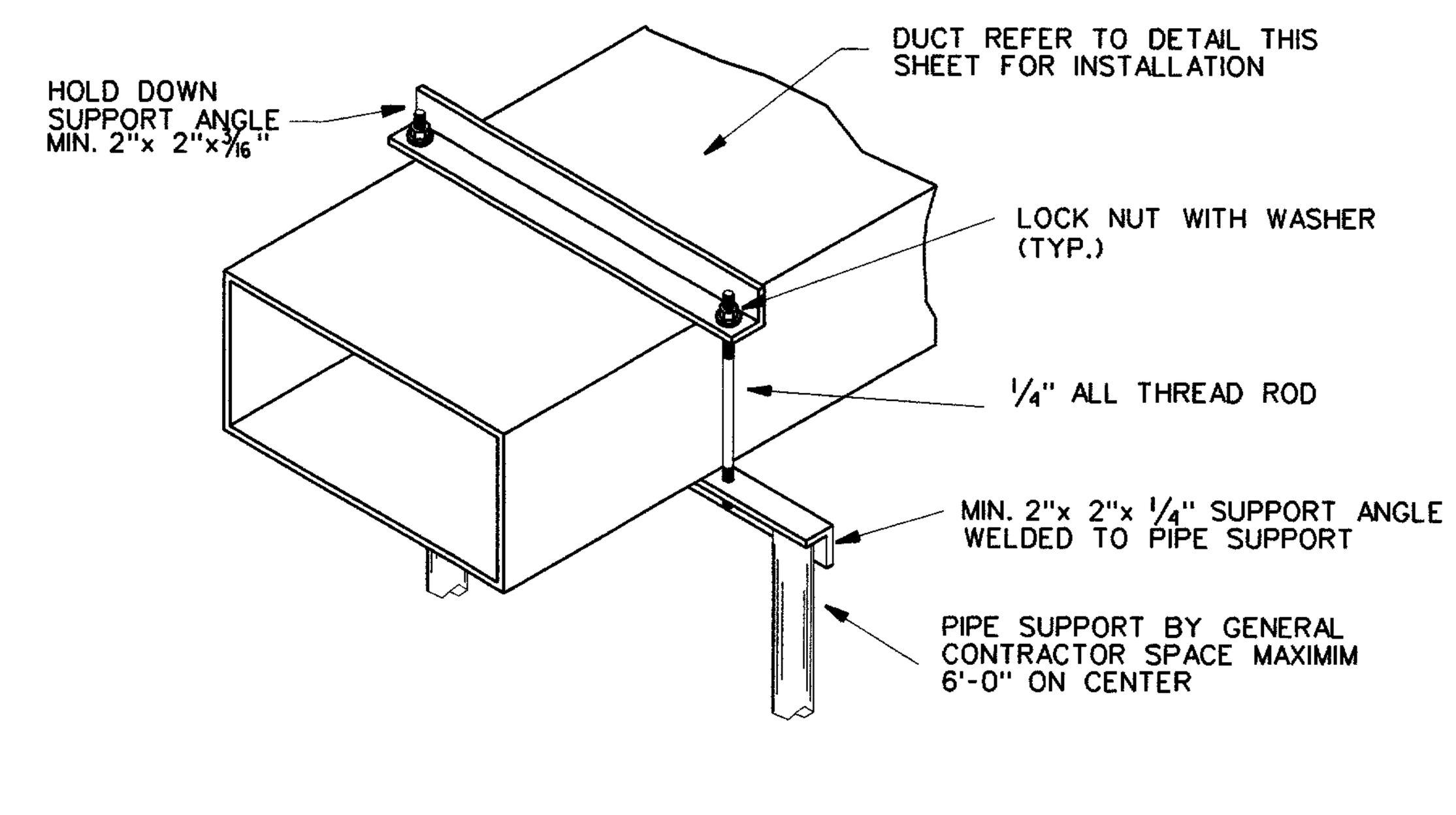
MECHANICAL SECTIONS

Sheet reference number:
M-402

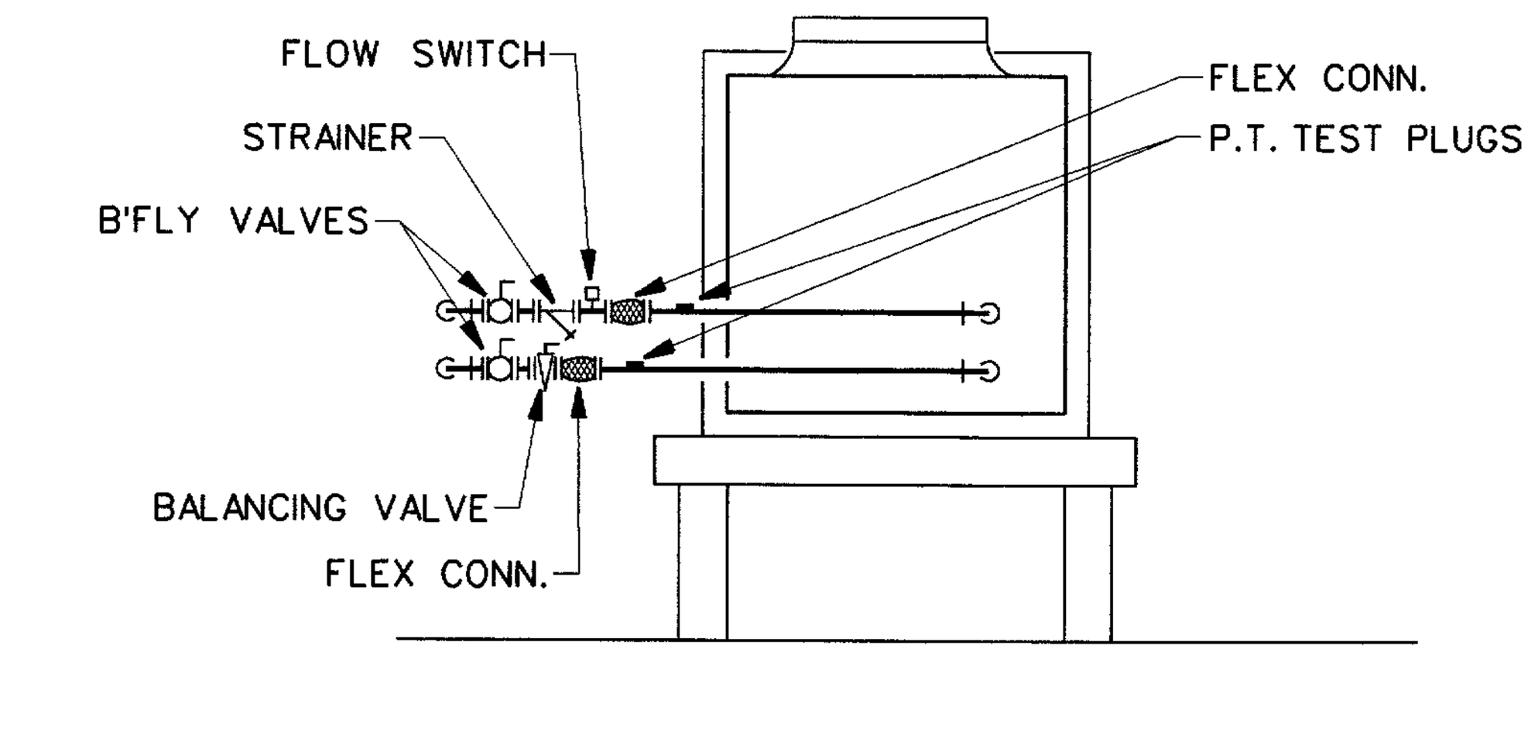


NOTE:
SEE SPEC. FOR TYPE VALVE REQUIRED.

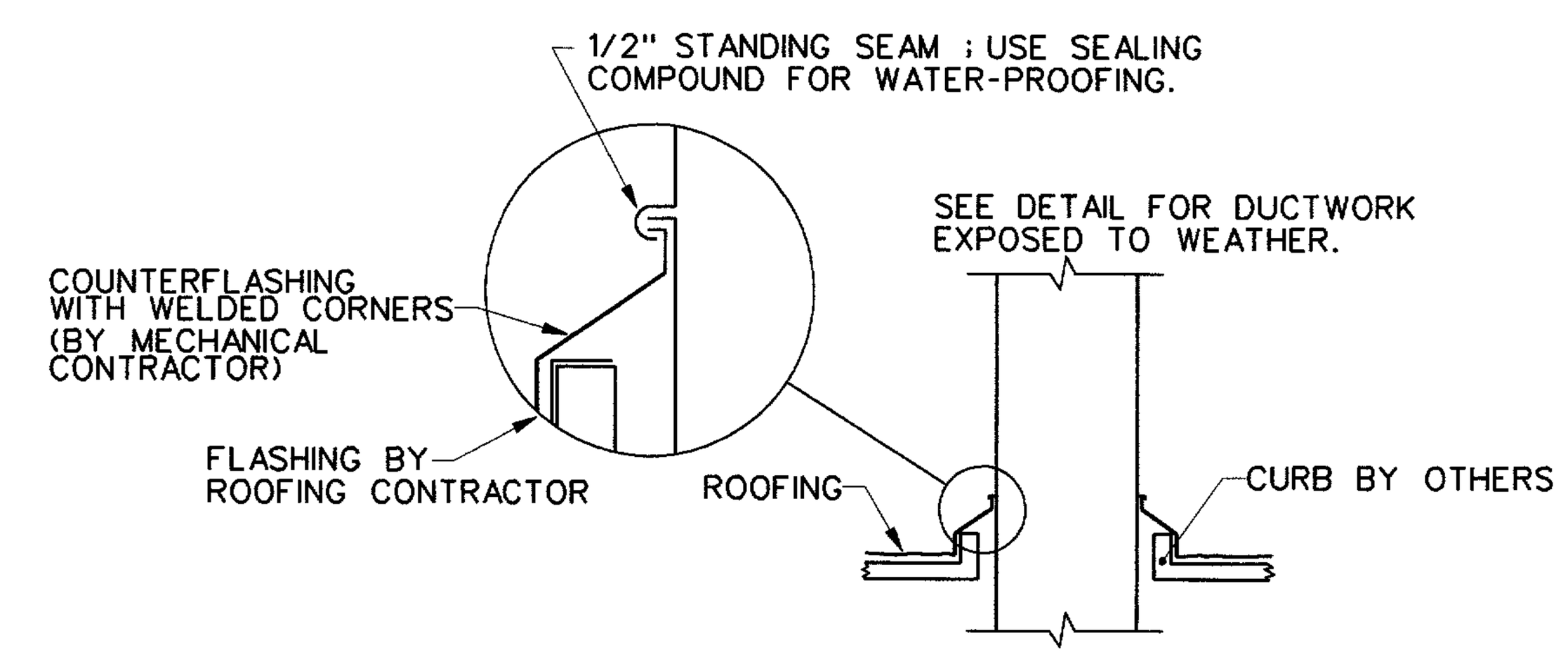
1 IN-LINE CIRCULATING PUMP DETAIL
NO SCALE
BP-1 & BP-2



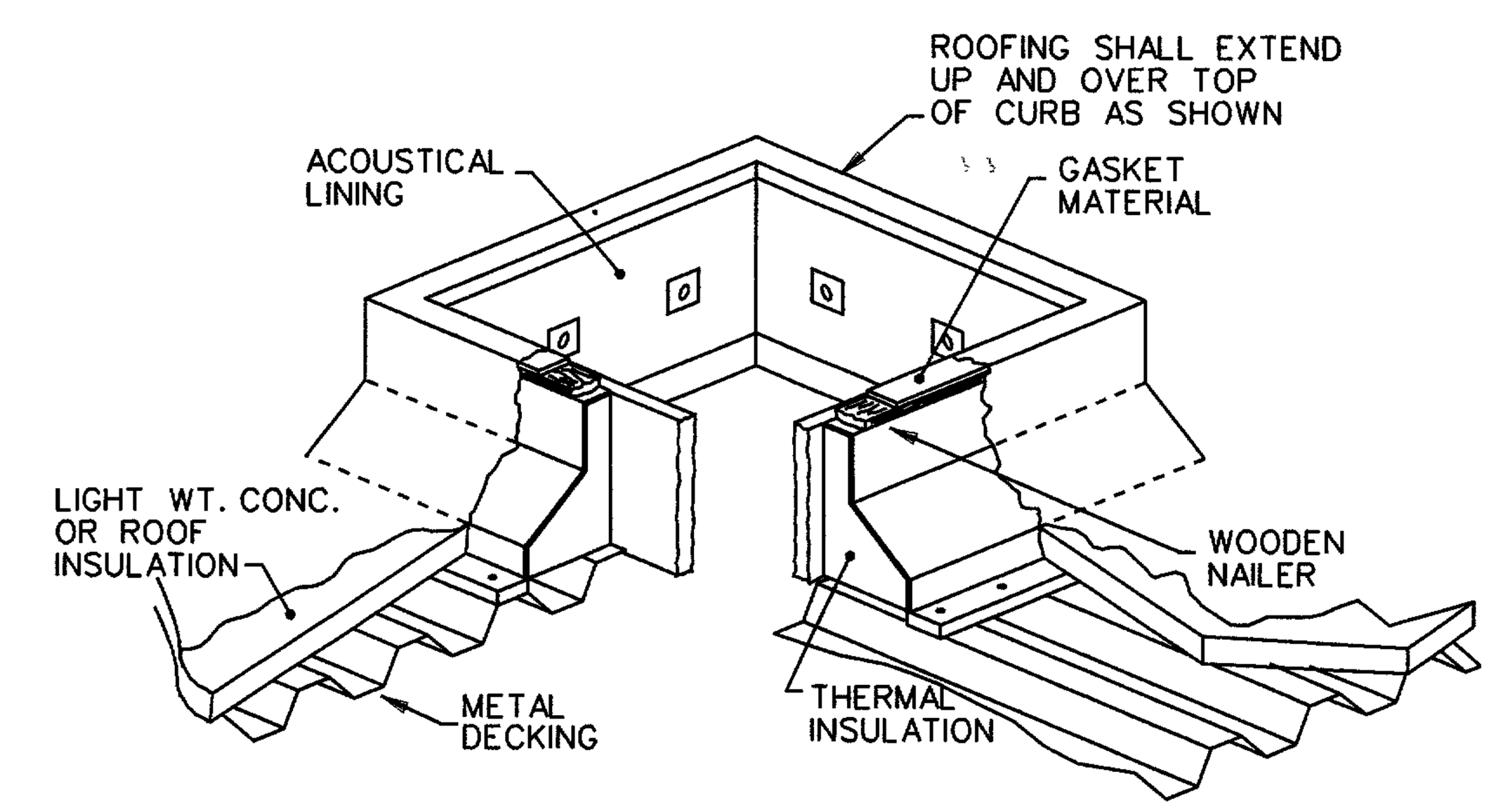
2 DUCT SUPPORT ON ROOF DETAIL
NO SCALE



4 CHILLED WATER PIPING CONNECTION AT CHILLER CH-4
NO SCALE

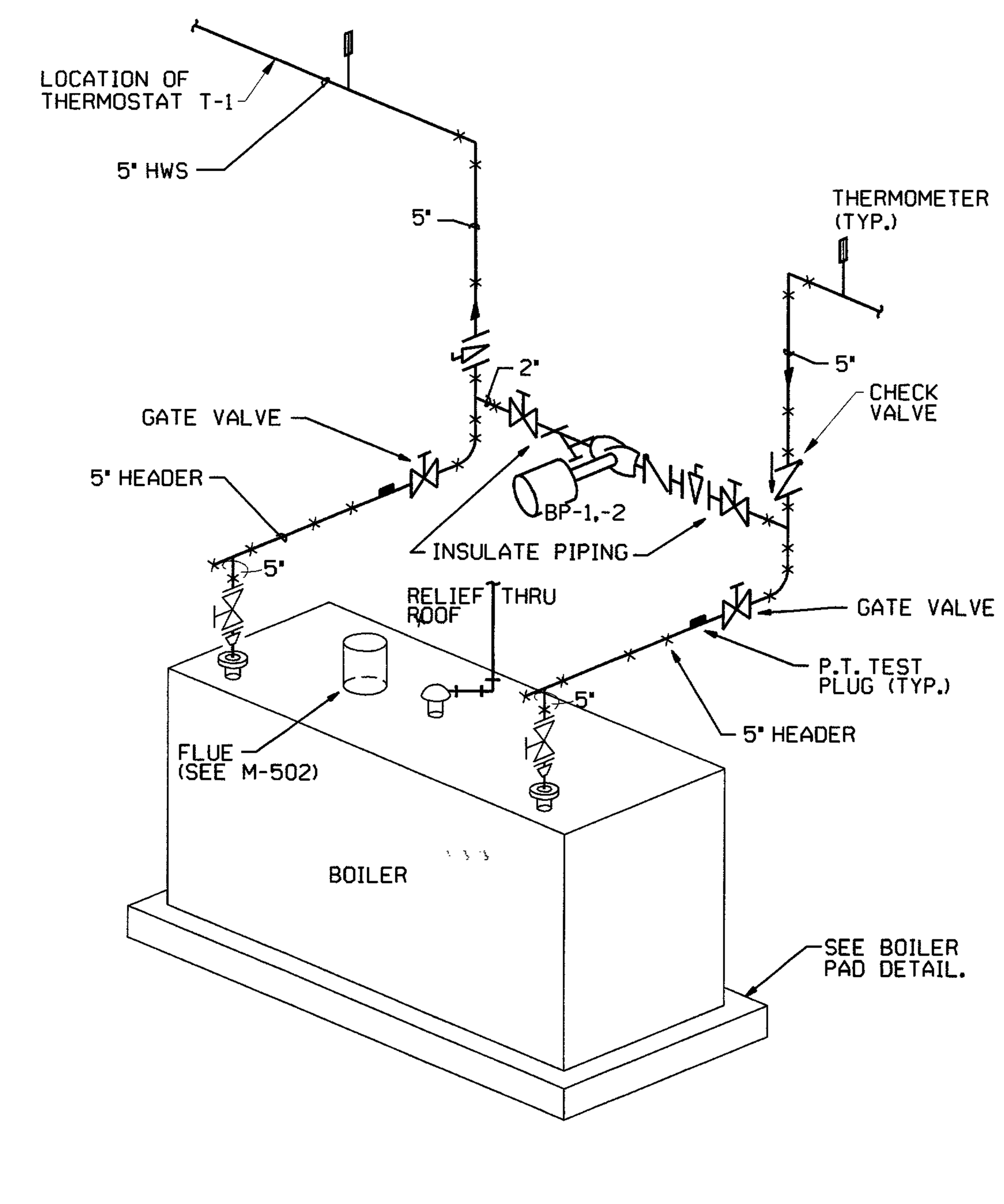


6 DETAIL OF DUCT THRU ROOF
NO SCALE

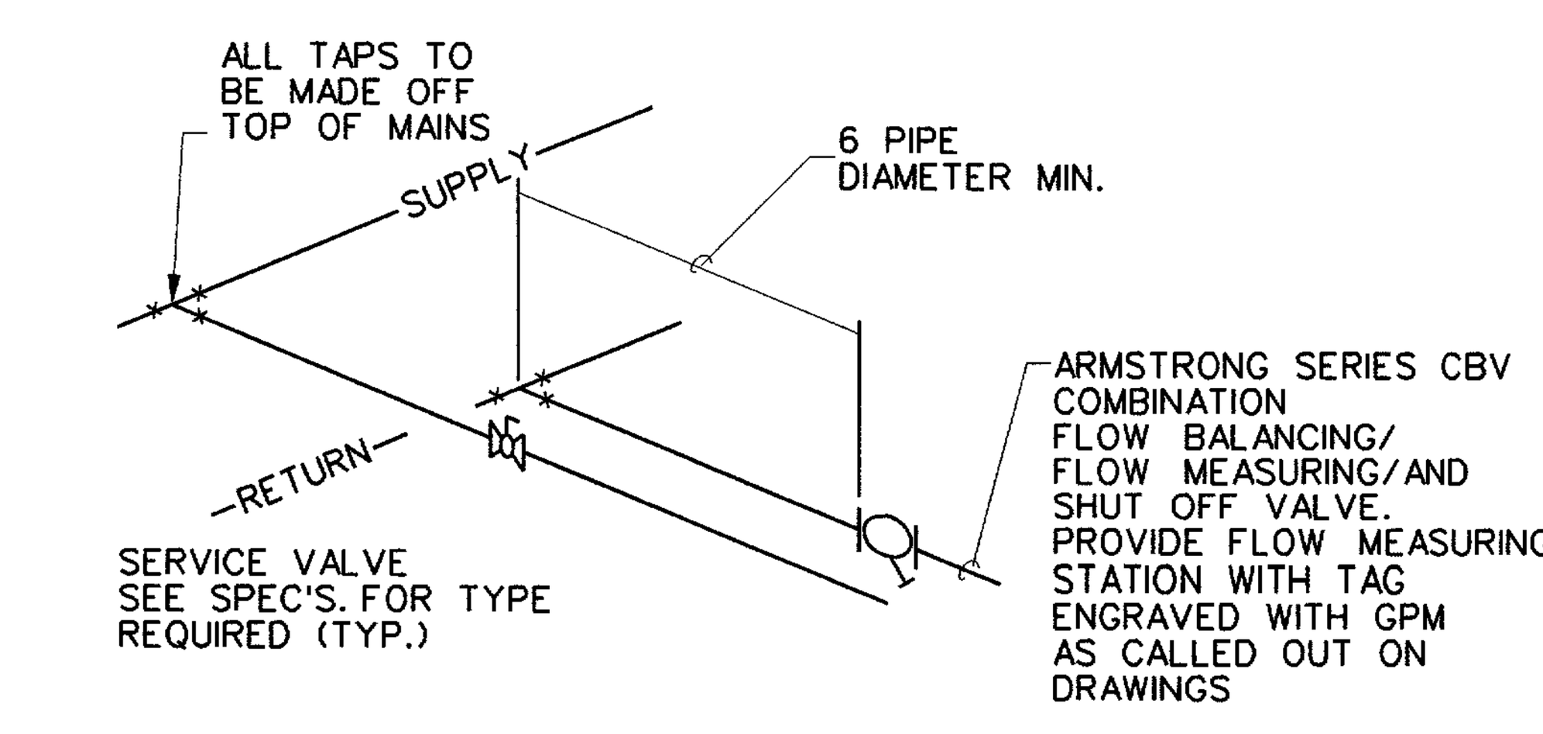


CURB HEIGHT 12" TO 18" AS SET FORTH IN MECH. SPECS. SECURE CURB TO ROOF WITH SHEET METAL SCREWS, LAG BOLTS,OR OTHER METHODS CONSISTANT WITH ROOF CONSTRUCTION.

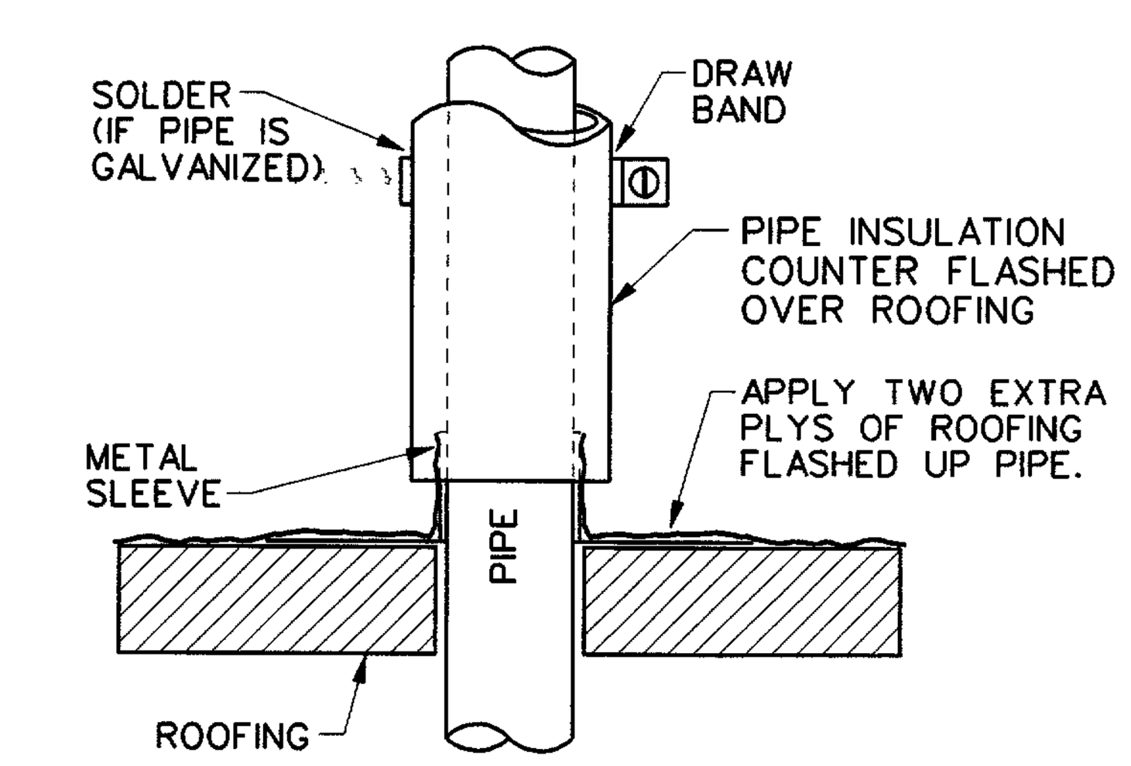
7 THERMAL/ACOUSTICAL ROOF CURB DETAIL
NO SCALE



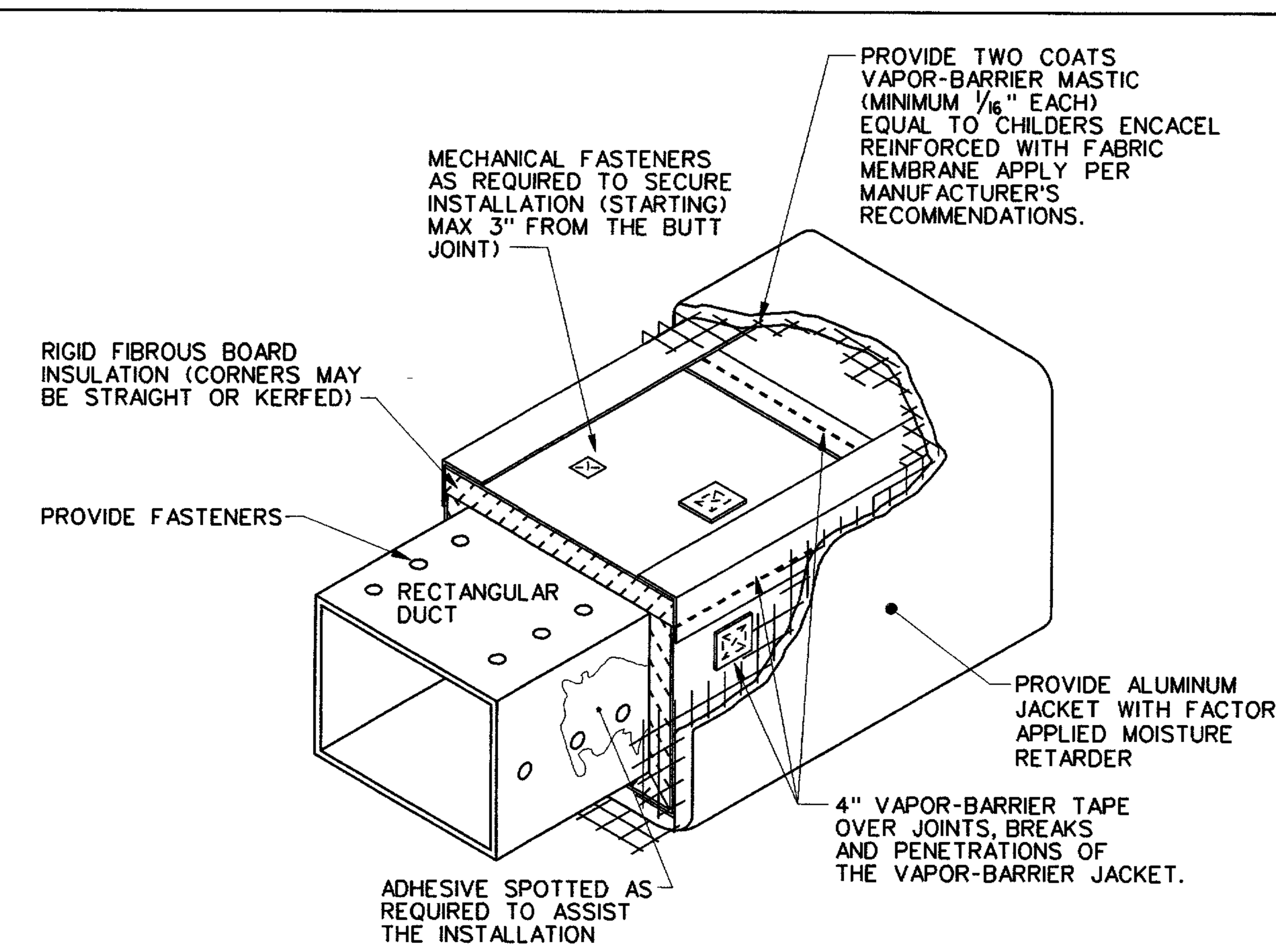
8 BOILER PIPING SCHEMATIC
NO SCALE



9 DETAIL OF PIPING AT FLOW MEASURING STATION
NO SCALE

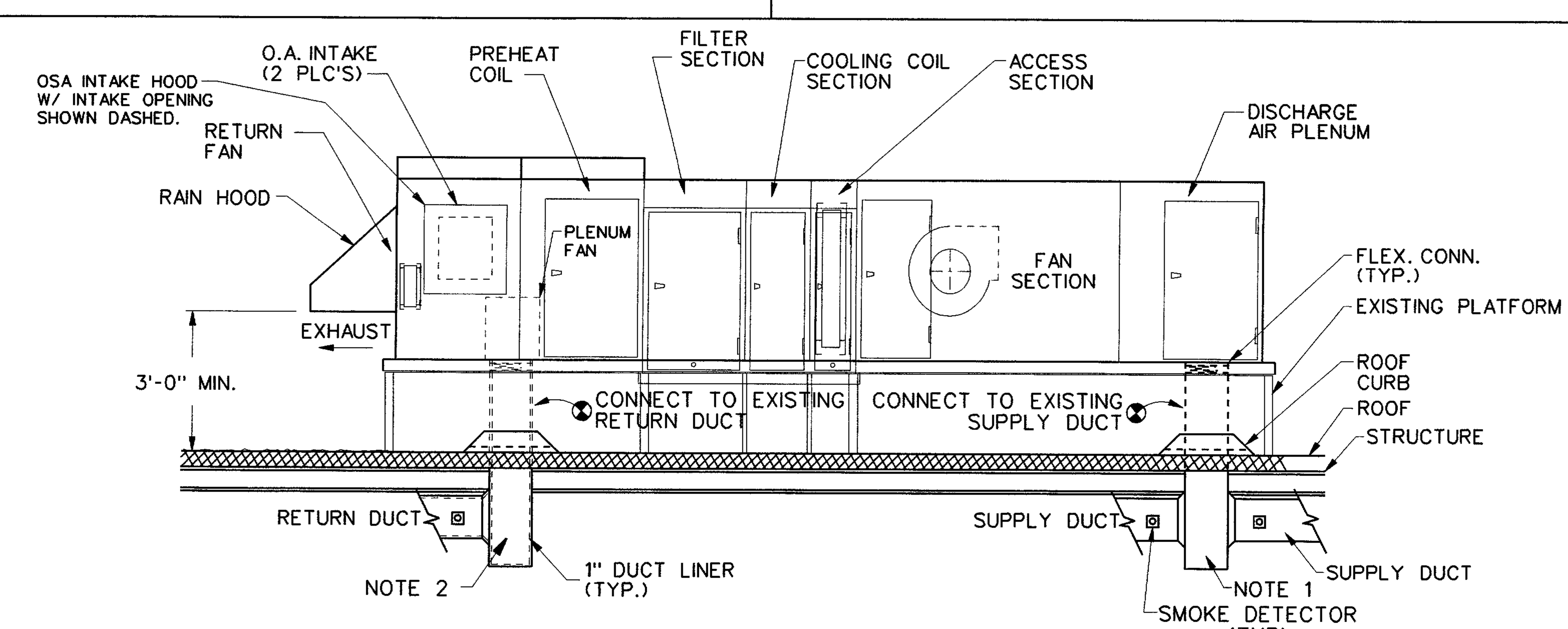


10 PIPING THRU ROOF DETAIL
NO SCALE



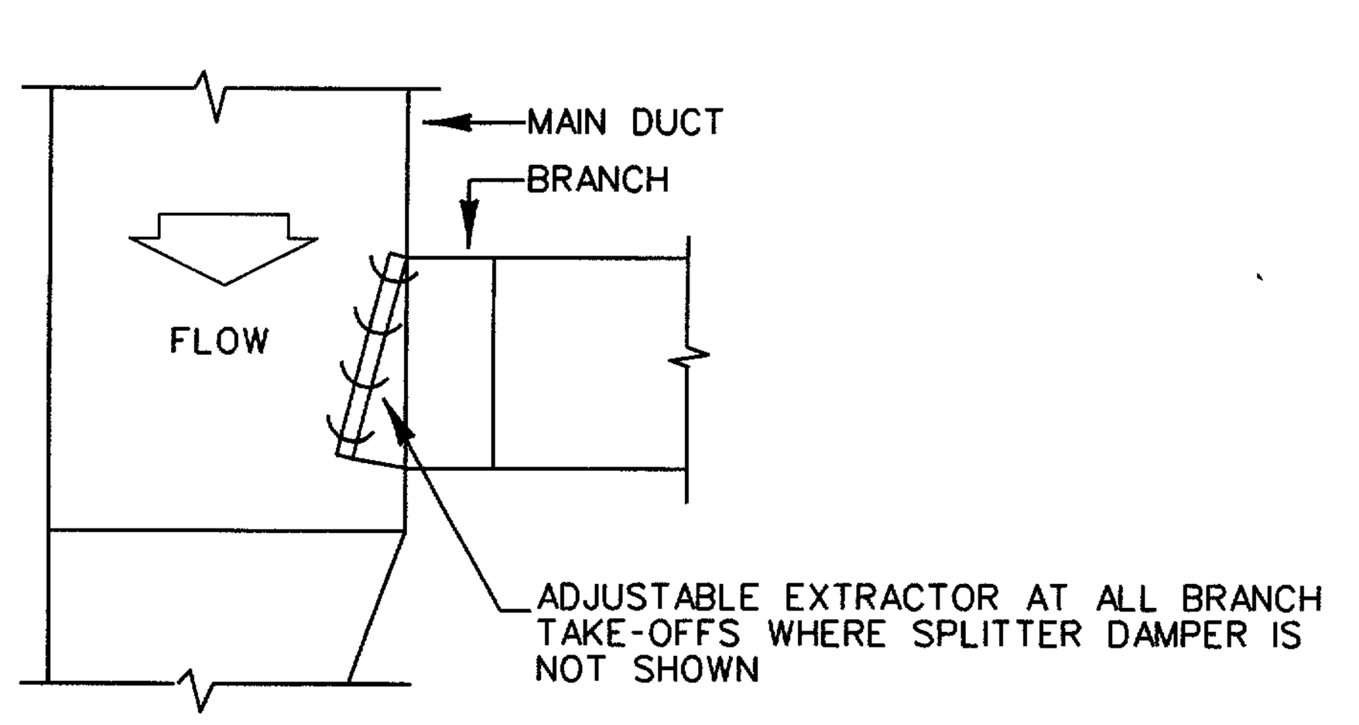
11 RECTANGULAR DUCT EXPOSED TO WEATHER
NO SCALE
(ROUND DUCTS SIMILAR EXCEPT FLEXIBLE INSULATION IN LIEU OF RIGID INSULATION)

NOTES
1. DUCT TO HAVE DRIVE SLIP JOINTS.
2. ENCACEL FINISH TO BE WHITE.
3. SEE SPECIFICATION 15080A



12 NEW ROOFTOP UNIT DETAIL
NO SCALE

NOTES:
1. PROVIDE CONNECTION SIZE PLENUM. PLENUM TO BE CONSTRUCTED OF MINIMUM 12 GAUGE STEEL WITH ANGLE IRON REINFORCING. EXTERNALLY INSULATE WITH TWO LAYERS OF 1" DUCT BOARD.
2. PROVIDE CONNECTION SIZE PLENUM. PLENUM TO BE CONSTRUCTED OF MINIMUM 12 GAUGE STEEL WITH ANGLE IRON REINFORCING. INTERNALLY INSULATE WITH 1" DUCT LINER.
3. ADD ACCESS SECTIONS AS REQUIRED SUCH THAT NEW UNIT SUPPLY & RETURN OPENINGS ALIGN WITH EXISTING ROOF PENETRATIONS, WHERE NEW UNITS ARE SMALLER THAN EXISTING UNITS.
4. DETAIL IS DIAGRAMATIC. ACTUAL INSTALLATION REQUIREMENTS VARY DEPENDENT ON TYPE OF UNIT, HUMIDIFICATION REQUIREMENTS AND SIZE OF EXISTING BELOW ROOF PLENUM. SEE PLANS FOR INDIVIDUAL REQUIREMENTS.



13 DETAIL FOR BRANCH TAKEOFFS
NO SCALE

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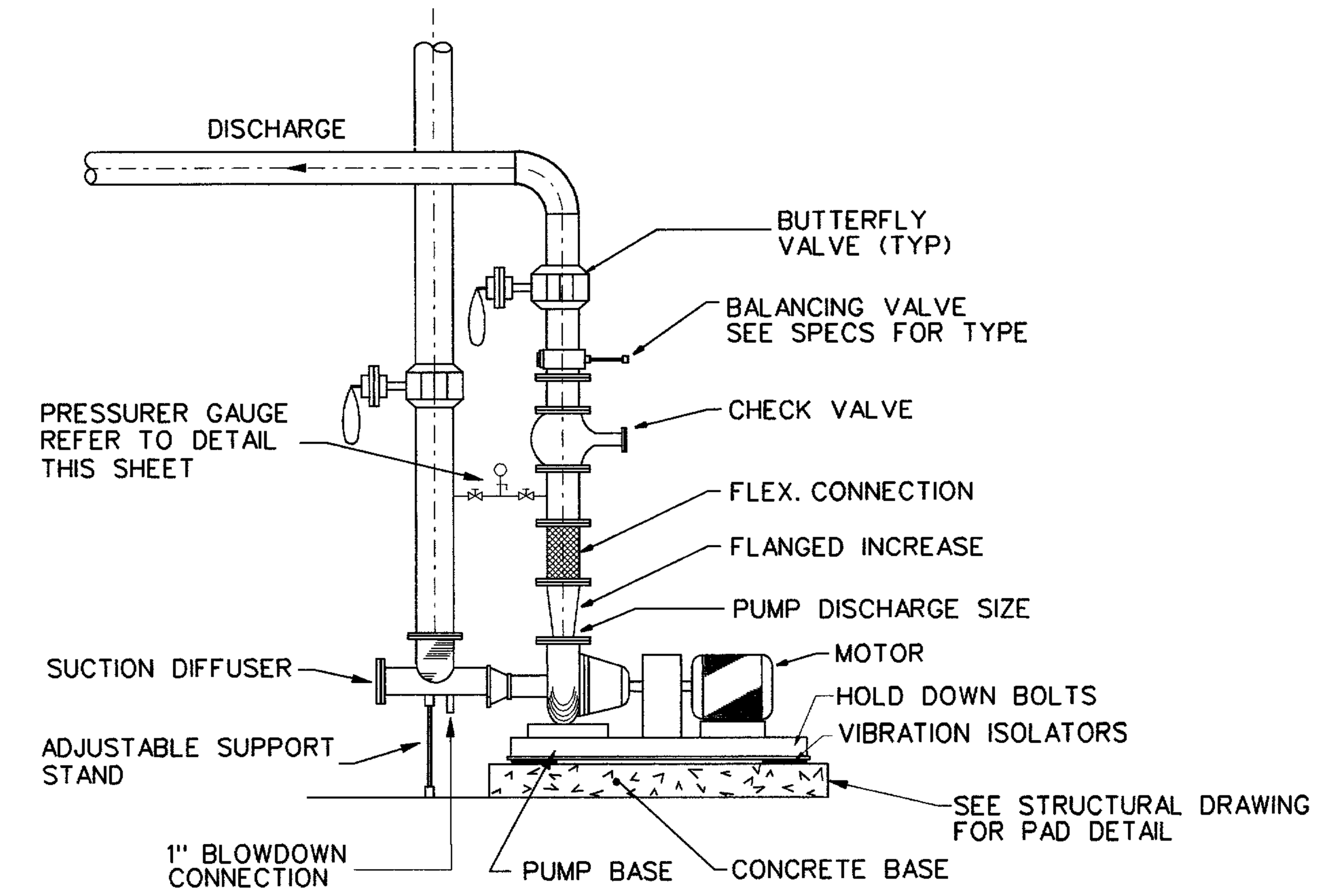
US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

TASK ORDER #: FRR004
PADUCAH, KENTUCKY VOICE 270-442-8620
I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400
Checked by: WTT | Date: 02/27/04
Dwn by: ICT | CADD File Name: 312M501.DGN
DACA87-03-D-0006 | ICT Project No. 203121
Approved by: | Plot date: 02/27/04
Chief, Prj. Mgmt. Division | Plot scale:

DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND
MECHANICAL DETAILS

Sheet reference number:
M-501



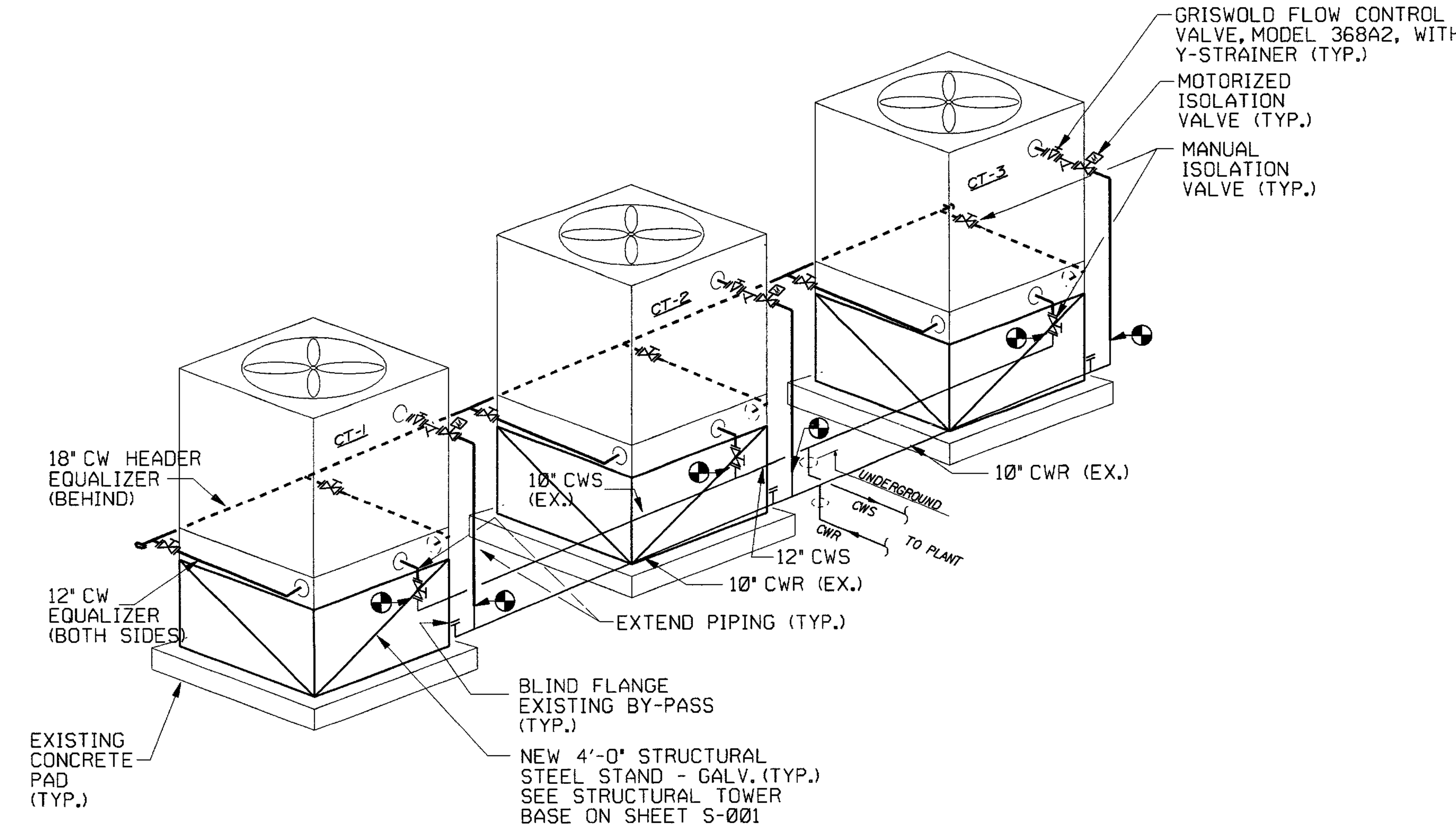
PUMP SCHEDULE

DESIGNATION	DISCHARGE SIZE (in.)	SYSTEM PIPE SIZE (in.)	METRAFLEX FLEX. CONN.	NON-SLAM SWING CHECK VALVE *	BALANCING VALVE **	ISOLATION VALVE ***
P-1 - PRIMARY CHWP	4	6	RSS 4 to 6 REDUCER	6	6	6
P-2 - PRIMARY CHWP	4	6	RSS 4 to 6 REDUCER	6	6	6
P-3 - PRIMARY CHWP	4	6	RSS 4 to 6 REDUCER	6	6	6
P-4 - CWP	5	8	MLP8	8	AT TOWER	8
P-5 - CWP	5	8	MLP8	8	AT TOWER	8
P-6 - CWP	5	8	MLP8	8	AT TOWER	8
P-7 - SECONDARY CHWP	4	8	MLP 8	8	N/A	8
P-8 - SECONDARY CHWP	4	8	MLP 8	8	N/A	8
P-9 & P-10 (HW CIRC)	3	5	MLP 5	5	N/A	5
P-11 - ICE CHWP	8	8	MLP 8	8	8	8

* EQUIVALENT TO STOCKHAM FIG.# G932B.
** EQUIVALENT TO GRISWOLD FLOW CONTROL VALVE MOD.3682A
*** EQUIVALENT TO CRANE MONARCH FIG. #24N CENTERLINE SERIES LT.
N/A - NON-APPLICABLE. SECONDARY CHW AND HW ARE VARIABLE SPEED PUMPS.
AT TOWER - AUTOMATIC BALANCE VALVE AT COOLING TOWER. SEE DETAIL.

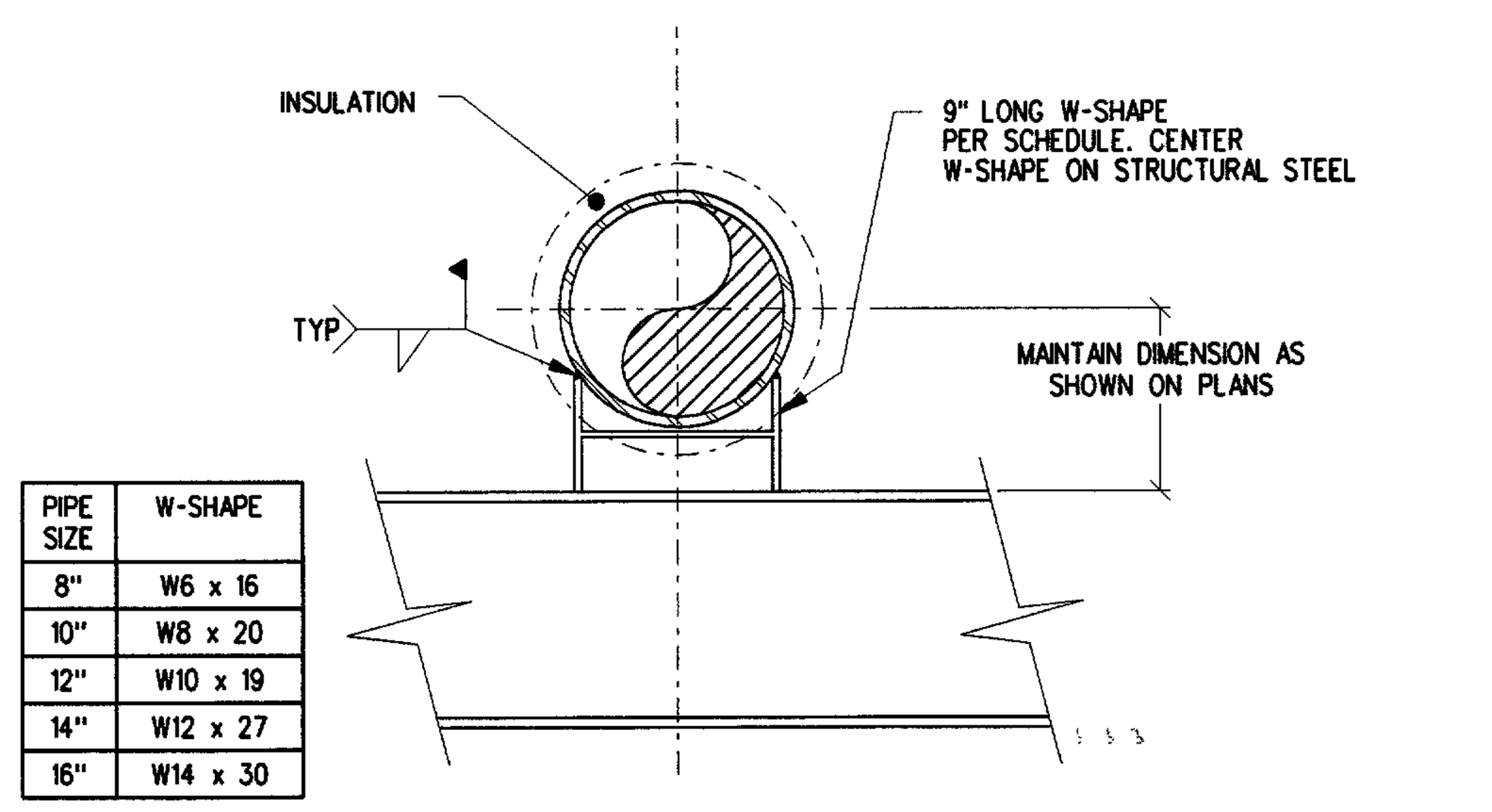
(5) TYPICAL END SUCTION PUMP DETAIL

NO SCALE



(8) EXISTING COOLING TOWER MODIFICATION DETAIL

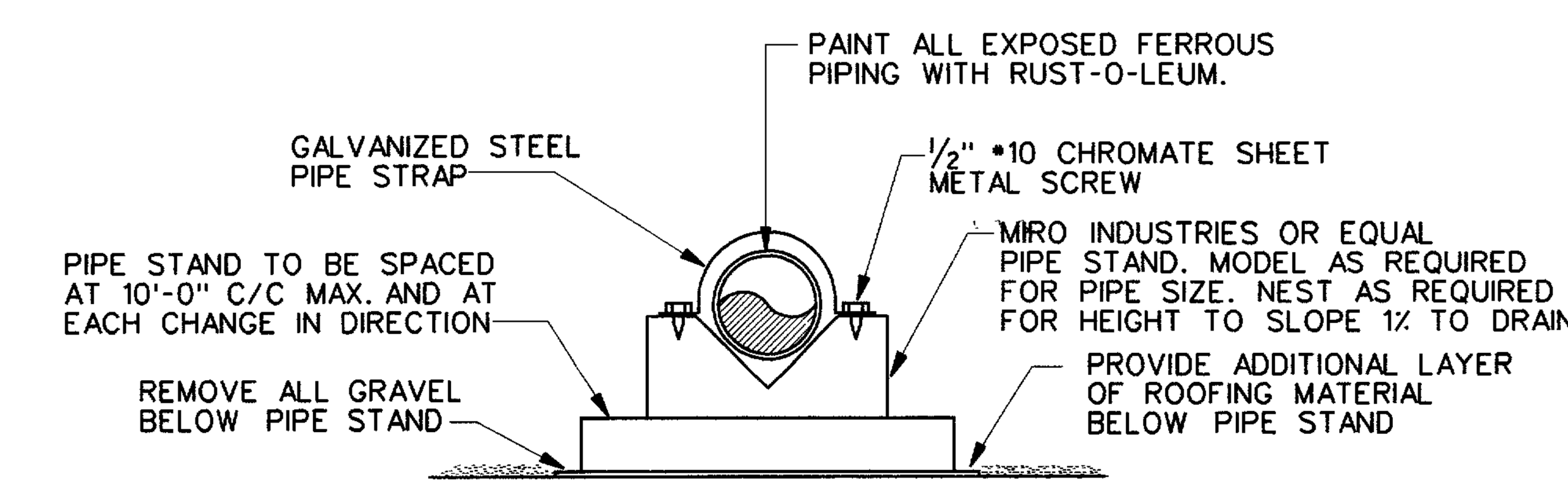
NO SCALE



PIPE SIZE	W-SHAPE
8"	W6 x 16
10"	W8 x 20
12"	W10 x 19
14"	W12 x 27
16"	W14 x 30

(2) FLOOR MOUNT CONDENSER WATER PIPE

NO SCALE

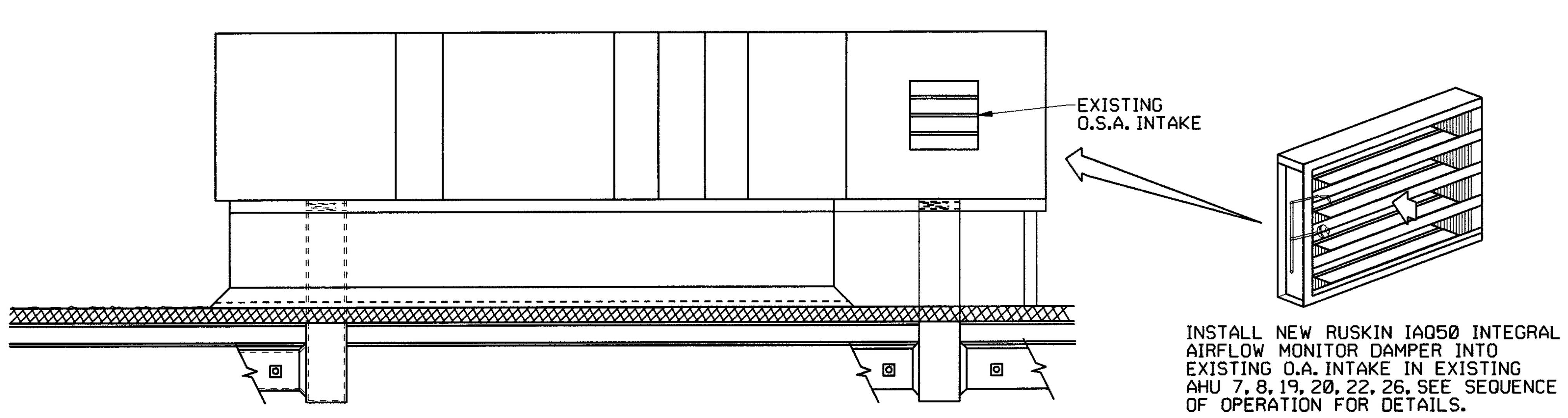


(9) CONDENSATE PIPE SUPPORT DETAIL

NO SCALE

AHU	* OSA OPENING ON UNIT	SIZE OF EXIST. OPENINGS	MIN. OSA (cfm)	MIN. OA DAMPER FREE AREA
7	2	2'-1 13/16" × 4'-1 11/16"	2155	(2)
8	2	1'-8" × 1'-10 5/8"	373	0.6ф (2)
19	2	2'-1 13/16" × 4'-1 11/16"	4131	(2)
20	2	3'-7 11/16" × 3'-5 1/4"	10,797	(2)
22	1	4'-1" × 2'-9 3/8"	225	0.6ф (1)
26	2	3'-7 1/2" × 3'-5 1/4"	6888	(3)

(1) COMBINATION IAQ50 & ECONOMIZER DAMPER
(2) PROVIDE IAQ50 DAMPER IN UPPER SECTION OF ONE OSA OPENING OF THE AREA INDICATED, BLANK-OFF REMAINING OPENING AND PROVIDE ECONOMIZER DAMPER IN OPPOSITE OSA OPENING.
(3) PROVIDE IAQ50 DAMPER FULL SIZE OF EXISTING OPENING AND ECONOMIZER DAMPER OPPOSITE OSA OPENING.

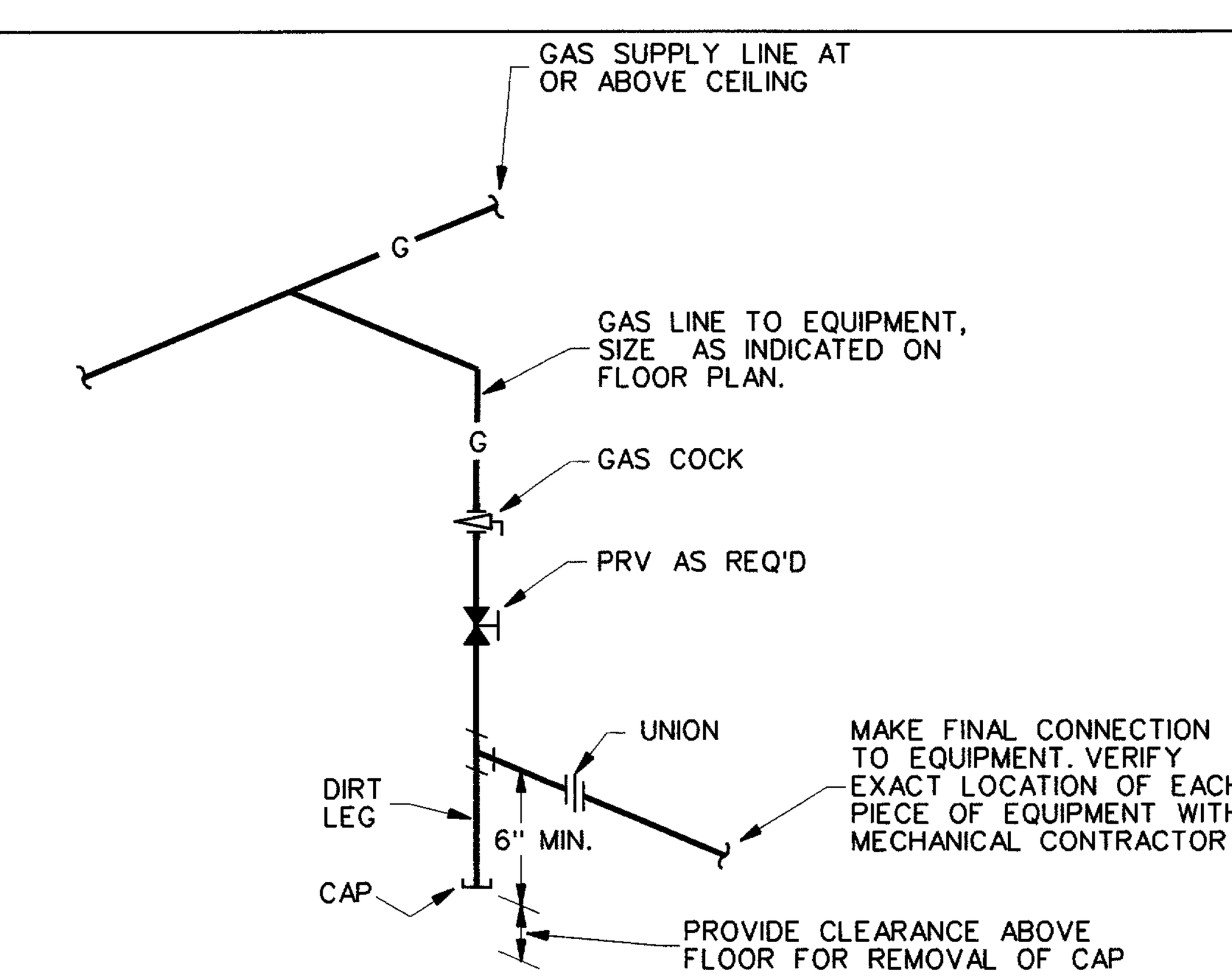


INSTALL NEW RUSKIN IAQ50 INTEGRAL AIRFLOW MONITOR DAMPER INTO EXISTING O.A. INTAKE IN EXISTING AHU 7, 8, 19, 20, 22, 26. SEE SEQUENCE OF OPERATION FOR DETAILS.

SEQUENCE TO INSTALL AIR FLOW SENSORS IN THE OUTDOOR INTAKES OF EXISTING AHU

A. NEW DAMPER TO BE RUSKIN IAQ50 INTEGRAL AIRFLOW MONITOR/DAMPER INSTALLATION AS FOLLOWS:
1. UNBOLT AND REMOVE OA RAIN HOOD.
2. REMOVE OA PREFILTER ASSEMBLY (UNDER RAIN HOOD).
3. UNATTACH EXISTING DAMPER LINKAGES (ONE SHAFT PER DAMPER. ONE OA DAMPER ON EACH SIDE OF UNIT).
4. UNATTACH DAMPER POSITION LINKAGE (CONNECTED TO JOHNSON CONTROLS ELECTRIC RELAY).
5. UNBOLT, UNSEAL AND REMOVE DAMPER ASSEMBLY.
6. PROVIDE NEW DAMPER ASSEMBLY OF SIZE TO FIT OPENING (SPECIAL NOTE: INSTALL NEW DAMPERS SO THAT SHAFTS DON'T INTERFERE WITH CASING).
7. REATTACH ACTUATOR LINKAGES; MAY REQUIRE REMOUNTING OF ACTUATORS.
8. REPLACE POSITION LINKAGE AND RELAY.
9. REINSTALL OA PREFILTER ASSEMBLY ON OUTSIDE OF UNIT.
10. RESEAL AND REBOLT OA RAIN HOOD. ENSURE NO INTERFERENCE WITH NEW DAMPER ASSEMBLY.

(4)



(10) TYPICAL GAS CONNECTION DETAIL

NO SCALE

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US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Symbol	Description	Date	Appr.

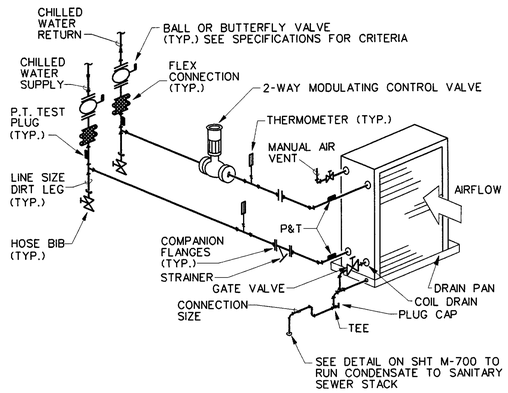
TASK ORDER #: FRR004
VANGUARD CONTRACTORS INC. PADUCAH, KENTUCKY VOICE 270-442-8620
ICT I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400
Checked by: WTT | Date: 02/27/04
Dwn by: ICT | CADD File Name: 3121M502.DGN
DACA87-03-D-0006 | ICT Project No. 203121
Approved by: | Plot date: 02/27/04
Chief, Prj. Mgmt. Division | Plot scale:

DEFENSE INFORMATION SCHOOL

FT. MEADE MARYLAND

MECHANICAL DETAILS

Sheet reference number: M-502

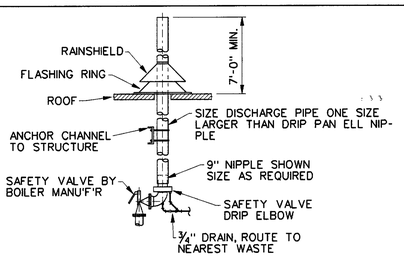


1 TYPICAL PIPING AT AHU COOLING COIL

NO SCALE

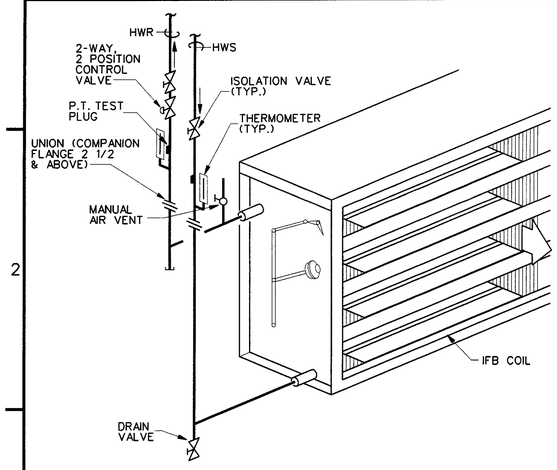
NOTES (FOR ALL NEW AND EXISTING CHILLED WATER COILS):

1. PROVIDE MANUAL AIR VENT AT HIGH POINT OF RETURN LINE.
2. WATER TO ENTER COIL ON AIR LEAVING SIDE FOR COIL TO OPERATE CORRECTLY.
3. INSTALL PRESSURE AND TEMPERATURE PLUGS EQUIVALENT TO FLOW DESIGN AS SHOWN ON ALL NEW AND EXISTING COILS.
4. CONTROL VALVE SHALL BE DODGE ENGINEERING CONTROLS, MODEL BV WITH STAINLESS STEEL BALL & STEAM, PTFE SEATS, METALLIC CHARACTERISTIC DISC, 600 PSI WOG, BLOWOUT PROOF STEM AND EQUAL PERCENTAGE FLOW CURVE. ACTUATORS SHALL BE NEMA 4, SPRING RETURN TO NORMALLY OPEN OR CLOSED POSITION AS REQUIRED WITH SUFFICIENT TORQUE TO CLOSE OFF VALVES AT A RATING OF 80 PSI DIFFERENTIAL.



11 CONNECTION AT SAFETY VALVE DRIP PAN ELBOW

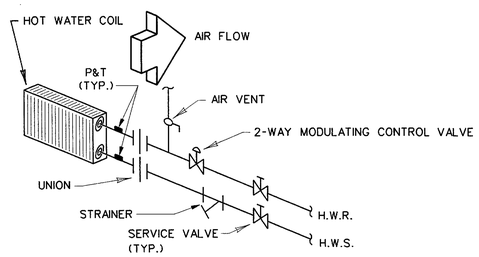
NO SCALE



13 HW IFB PREHEAT COIL PIPING

NO SCALE

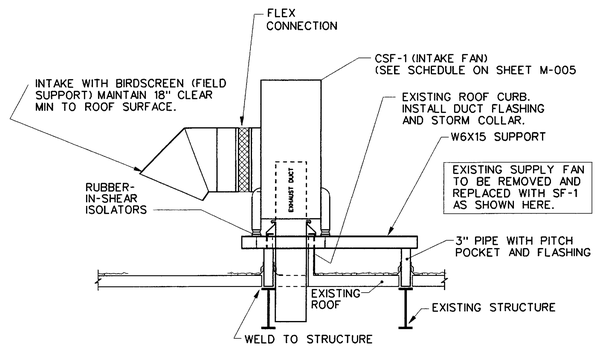
1. PROVIDE MANUAL AIR VENT AT HIGH POINT OF RETURN LINE.
2. WATER TO ENTER COIL ON AIR LEAVING SIDE FOR COIL TO OPERATE CORRECTLY.
3. INSTALL PRESSURE AND TEMPERATURE PLUGS EQUIVALENT TO FLOW DESIGN AS SHOWN ON ALL NEW AND EXISTING COILS.
4. CONTROL VALVE SHALL BE DODGE ENGINEERING CONTROLS, MODEL BV WITH STAINLESS STEEL BALL & STEAM, PTFE SEATS, METALLIC CHARACTERISTIC DISC, 600 PSI WOG, BLOWOUT PROOF STEM AND EQUAL PERCENTAGE FLOW CURVE. ACTUATORS SHALL BE NEMA 4, SPRING RETURN TO NORMALLY OPEN OR CLOSED POSITION AS REQUIRED WITH SUFFICIENT TORQUE TO CLOSE OFF VALVES AT A RATING OF 80 PSI DIFFERENTIAL.



2 PIPING AT EXISTING AHU OR DUCT MOUNTED HOT WATER REHEAT COIL

NO SCALE

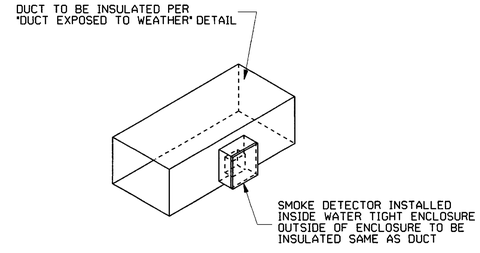
1. PROVIDE MANUAL AIR VENT AT HIGH POINT OF RETURN LINE.
2. WATER TO ENTER COIL ON AIR LEAVING SIDE FOR COIL TO OPERATE CORRECTLY.
3. INSTALL PRESSURE AND TEMPERATURE PLUGS EQUIVALENT TO FLOW DESIGN AS SHOWN ON ALL NEW AND EXISTING COILS.
4. CONTROL VALVE SHALL BE DODGE ENGINEERING CONTROLS, MODEL BV WITH STAINLESS STEEL BALL & STEAM, PTFE SEATS, METALLIC CHARACTERISTIC DISC, 600 PSI WOG, BLOWOUT PROOF STEM AND EQUAL PERCENTAGE FLOW CURVE. ACTUATORS SHALL BE NEMA 4, SPRING RETURN TO NORMALLY OPEN OR CLOSED POSITION AS REQUIRED WITH SUFFICIENT TORQUE TO CLOSE OFF VALVES AT A RATING OF 80 PSI DIFFERENTIAL.



NOTE: PROVIDE MEANS TO LUBRICATE BEARINGS EITHER BY ACCESS PANEL OR EXTERIOR MOUNTED GREASE FITTING.

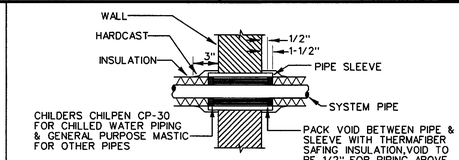
COMBUSTION SUPPLY FAN DETAIL

NO SCALE



4 SMOKE DETECTOR EXPOSED TO WEATHER INSTALLATION DETAIL

NO SCALE

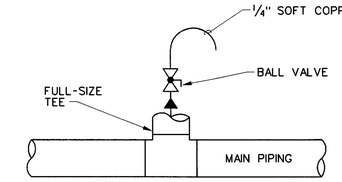


8 DETAIL PIPE SLEEVE THRU WALL

NO SCALE

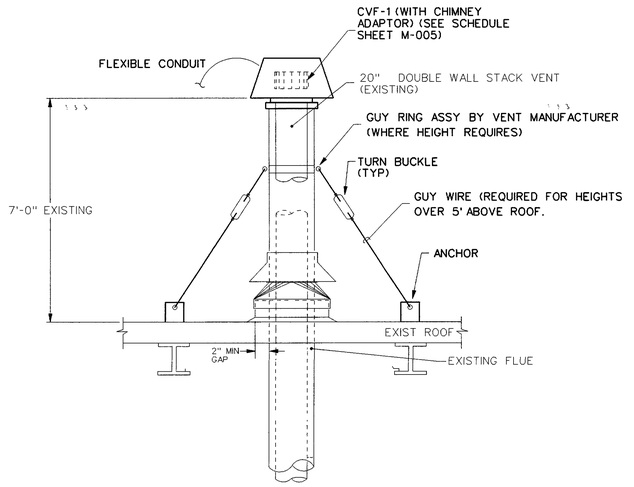
NOTES

1. WRAP JOINTS FORMED BY THE INSULATION & PIPE SLEEVE W/2 LAYERS OF "HARDCAST" DUCT JOINT WRAP.
2. SEE SPEC'S FOR MORE DETAILED INSTALLATION REQUIREMENTS.



9 TYPICAL VENT DETAIL FOR CHILLED AND HOT WATER PIPING

NO SCALE



BOILER STACK DETAIL

NO SCALE

NOTES:
1. ALL COMPONENTS ARE EXISTING EXCEPT FAN AND STACK ADAPTOR (FIELD VERIFY). PROVIDE GUY WIRES AS REQUIRED.
2. ATTACH ADAPTOR TO EXISTING STACK WITH SELF-TAPPING STAINLESS STEEL SCREWS FROM INSIDE TO OUT.
3. PROVIDE BEAD OF HI-TEMP SILICONE AT CIRCUMFERENCE OF ADAPTOR AND FAN INTERFACE.
4. SECURE FAN TO ADAPTOR THRU PRE-DRILLED HOLES IN FAN BASE WITH SELF TAPPING STAINLESS STEEL SCREWS.
5. PROVIDE BEAD OF HI-TEMP SILICONE AT OUTTER INTERFACE OF FAN AND ADAPTOR FOR WATER-PROOFING (DO NOT BLOCK DRAIN HOLES).

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US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Checked by: WTT	Date: 02/27/04
Dwn by: ICT	CADD File Name: 312M502.DGN
DACA87-03-D-0006	ICT Project No. 203121
Approved by: Chief, Prj. Mgmt. Division	Plot date: 02/27/04 Plot scale:

TASK ORDER #: FRR004

PADUCAH, KENTUCKY VOICE 270-442-8620
I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400

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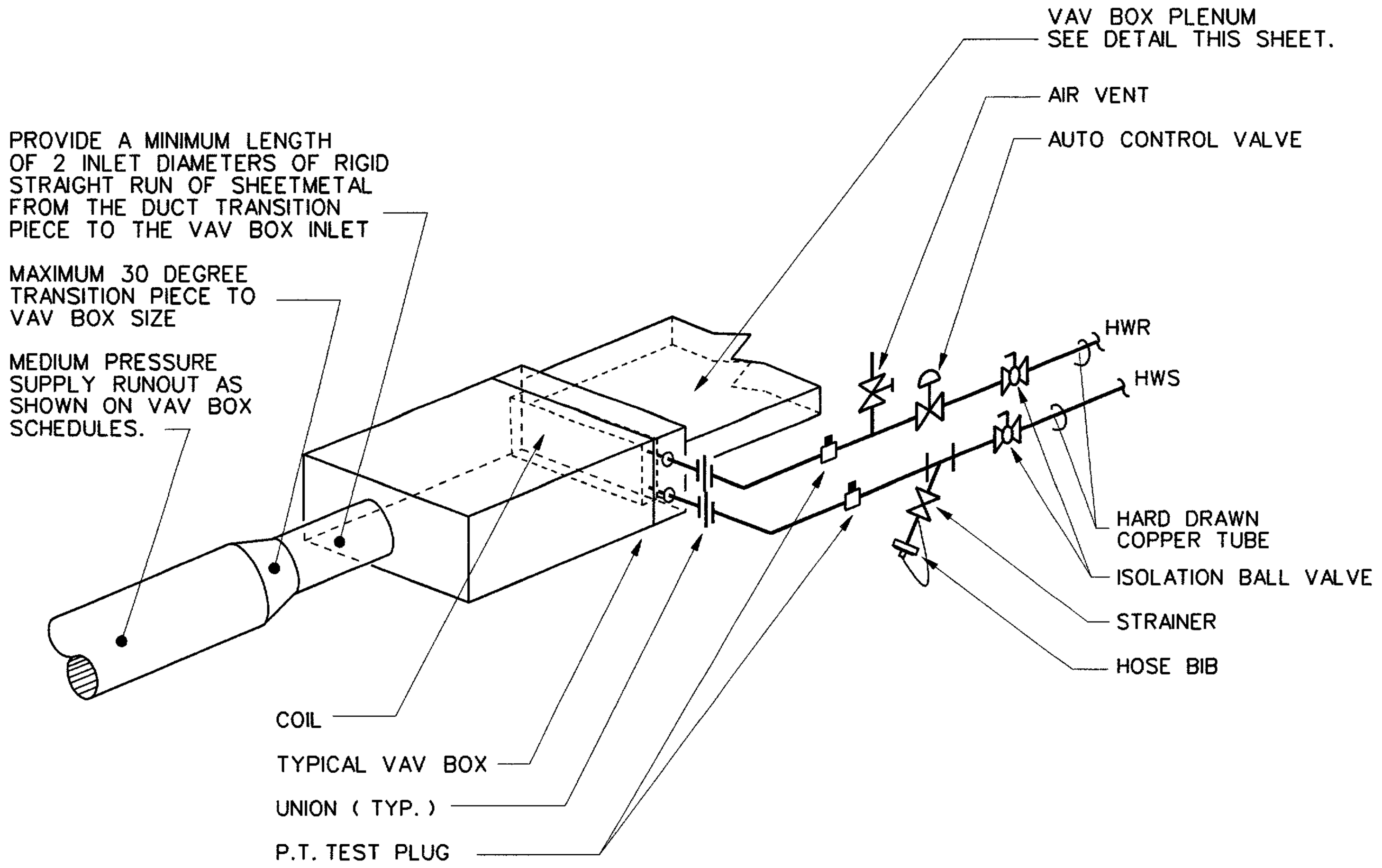
STATE OF MARYLAND — MECHANICAL ENGINEER

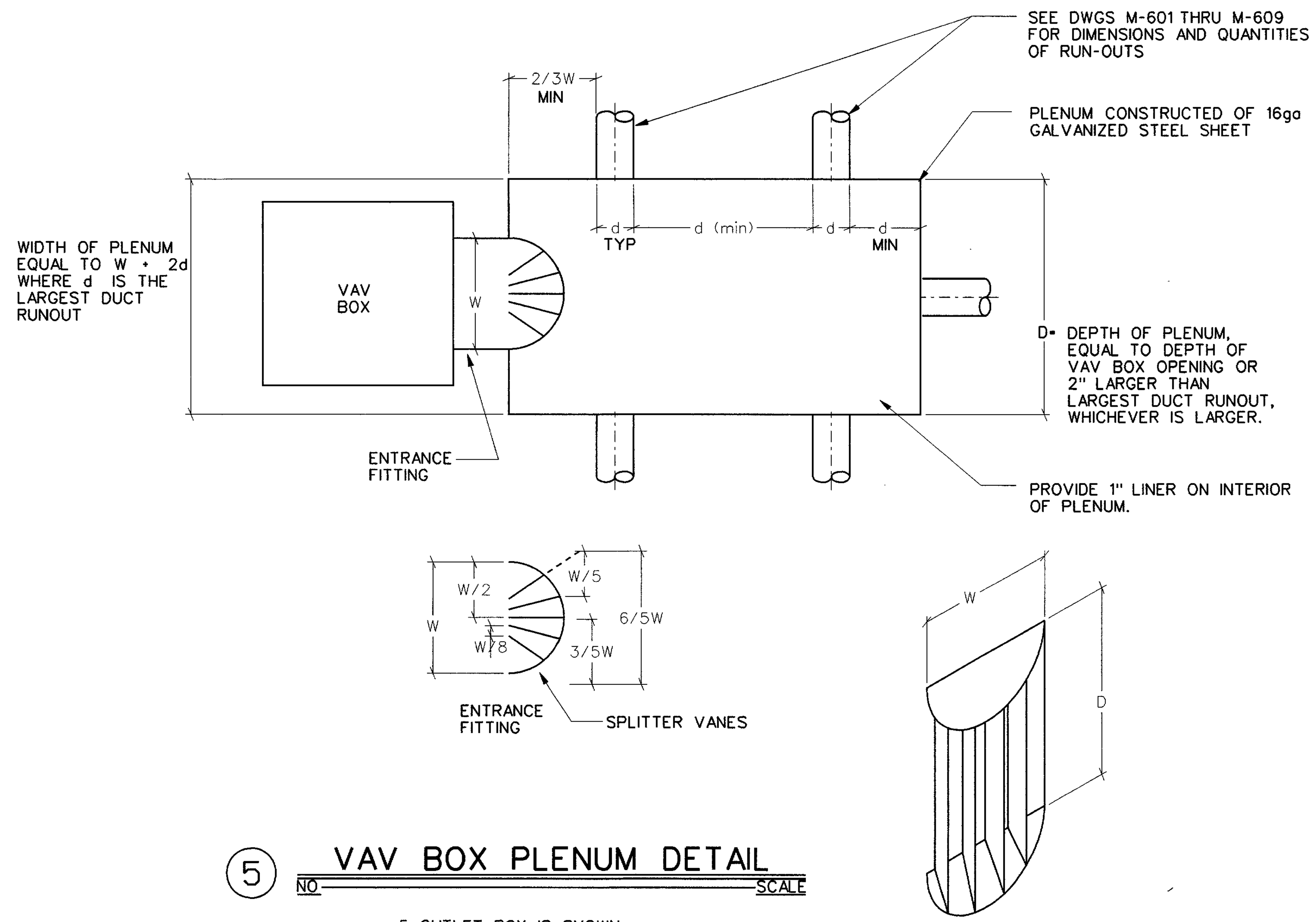
Sheet reference number:
M-503

A | B | C | D | E | F | G | H



1 NEW VARIABLE VOLUME BOX CONNECTION DETAIL

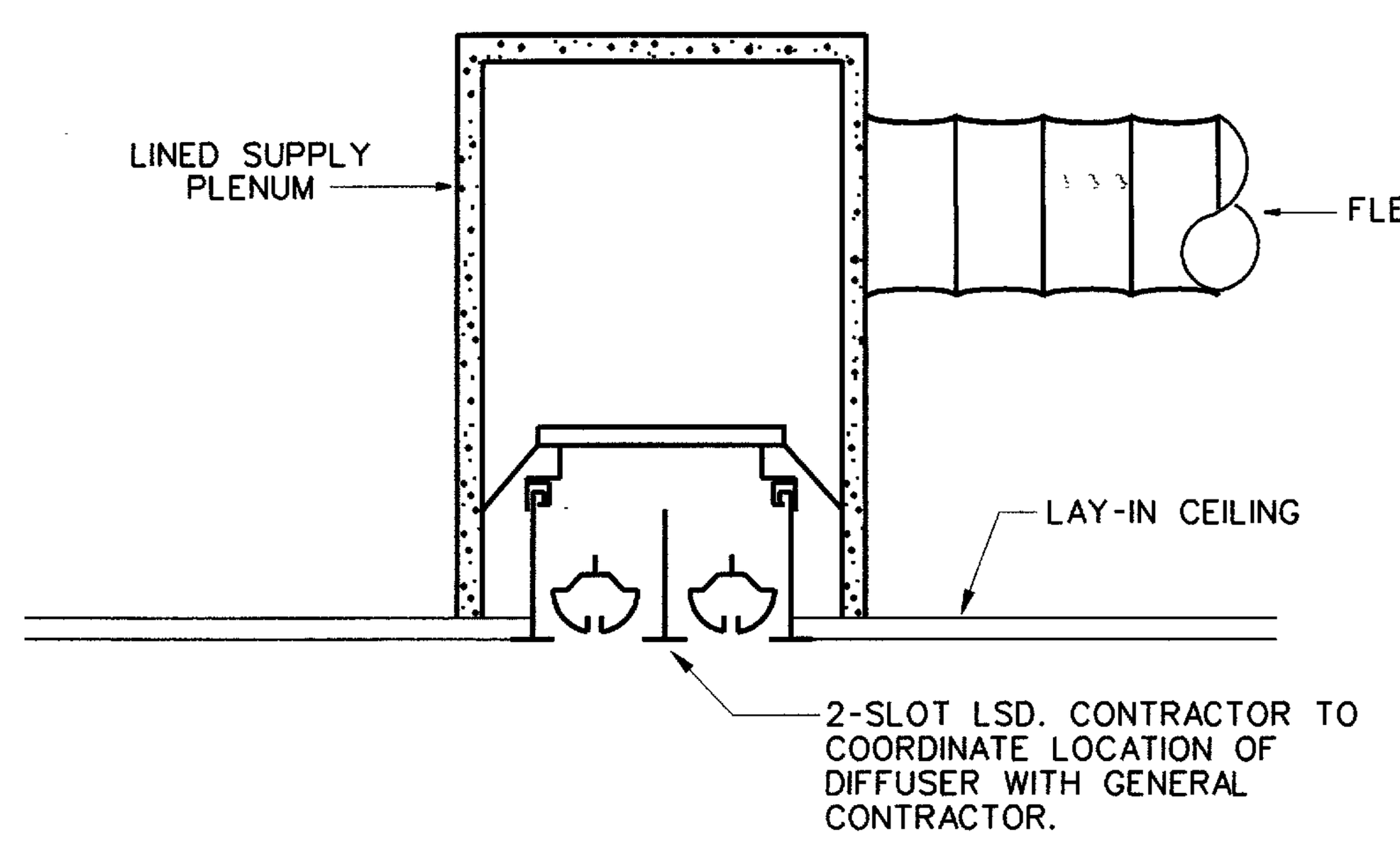
NO SCALE



5 VAV BOX PLENUM DETAIL

NO SCALE

5 OUTLET BOX IS SHOWN. MODIFY BOX TO SUIT QUANTITY OF OUTLETS AS INDICATED ON FLOOR PLANS.



2 LSD DETAIL

NO SCALE

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

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Checked by: WTT | Date: 02/27/04

Dwn by: ICT | CADD File Name: 312M501.DGN

DACA87-03-D-0006 | ICT Project No. 203121

Approved by: | Plot date: 02/27/04

Chief, Prj. Mgmt. Division | Plot scale:

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MECHANICAL DETAILS

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Sheet reference number: M-504

SUPPLY DROP TO BE 10" DIA. TYP. OF 6. REPLACE EXISTING SUPPLY DIFFUSERS WITH NEW 10x10 DIFFUSERS TYP. OF 6 AND PROVIDE VOLUME DAMPERS IN EACH DROP. PROVIDE PLAQUE DIFFUSERS AS DETAILED (178 CFM EACH.)

SUPPLY DROP TO BE 10" DIA. TYP. OF 6. REPLACE EXISTING SUPPLY DIFFUSERS WITH NEW 10x10 DIFFUSERS TYP. OF 6 AND PROVIDE VOLUME DAMPERS IN EACH DROP. PROVIDE PLAQUE DIFFUSERS AS DETAILED (179 CFM EACH.)

TECH CONTROL ROOM: PROVIDE 6 FLOOR SUPPLY REGISTERS SIZED AT 110 CFM @ .03" WC. MOUNT 3 REGISTERS UNDER EQUIPMENT RACKS EACH SIDE OF ROOM.

SUPPLY DROP TO BE 10" DIA. TYP. OF 6. REPLACE EXISTING SUPPLY DIFFUSERS WITH NEW 10x10 DIFFUSERS TYP. OF 6 AND PROVIDE VOLUME DAMPERS IN EACH DROP. PROVIDE PLAQUE DIFFUSERS AS DETAILED (180 CFM EACH.)

SUPPLY DROP TO BE 10" DIA. TYP. OF 6. REPLACE EXISTING SUPPLY DIFFUSERS WITH NEW 10x10 DIFFUSERS TYP. OF 6 AND PROVIDE VOLUME DAMPERS IN EACH DROP. PROVIDE PLAQUE DIFFUSERS AS DETAILED (181 CFM EACH.)

NEW DIFFUSERS

REPLACE VAV-238, SEE SCHEDULE FOR DETAILS.

REPLACE VAV-241, SEE SCHEDULE FOR DETAILS & ADD 4 NEW DIFFUSERS

NEW VAV-241A, SEE SCHEDULE FOR DETAILS.

NEW 8" DIA. LP DUCT AND DIFFUSERS (TYP. 2 PLACES.)

REPLACE VAV-239

NEW 9"Φ L.P. RUNOUT TO DIFFUSERS (TYP 2 PLACES)

REPLACE VAV-240

NEW 10"Φ L.P. RUNOUT TO DIFFUSERS (TYP 3 PLACES)

REBALANCE VAV-187, SEE SCHEDULE FOR DETAILS.

REPLACE VAV-1, SEE SCHEDULE FOR DETAILS.

REPLACE VAV-258, SEE SCHEDULE FOR DETAILS.

2 NEW DIFFUSERS

REPLACE VAV-246, SEE SCHEDULE FOR DETAILS.

REPLACE VAV-247

REPLACE VAV-188, SEE SCHEDULE FOR DETAILS.

REPLACE VAV-189, SEE SCHEDULE FOR DETAILS.

REPLACE EXISTING DIFFUSERS (TYP. 2 PLACES.)

NEW 6" ROUND TO VAV-248A TYPICAL OF 4

NEW 6" ROUND TO VAV-248 TYPICAL OF 4

REPLACE VAV-185, SEE SCHEDULE FOR DETAILS.

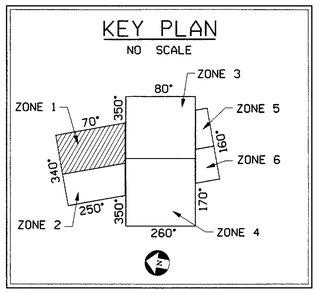
REPLACE VAV-245, SEE SCHEDULE FOR

MATCHLINE SEE SHEET M-602

MATCHLINE SEE SHEET M-603

KEY PLAN

NO SCALE



LEGEND

EXISTING

NEW

DEMO

NOTE(S):

1. REBALANCE VAV (AIR AND HOT WATER FLOW) PER VAV BOX SCHEDULE.
2. REPLACE VAV BOX SHOWN AS NEW. SEE VAV BOX SCHEDULE FOR DETAILS.
3. NEW VAV BOX. RUN NEW MP DUCT, HOTWATER PIPING ELECTRICAL WIRE AND CONDUIT TO BOX. BALANCE PER SCHEDULE.

ZONE No. 1 - 1st FLOOR HVAC

0 5 10

1/8" = 1'-0"

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US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Dates: 02/27/04
Checked by: WTT
CADD File Name: 312M601.DGN
Dwn by: ICT
ICT Project No. 203121
DACA87-03-D-0006
Plot date: 02/27/04
Approved by:
Plot scale:
Chief, Prj. Mgmt. Division

TASK ORDER #: FRR004

VANGUARD

PADUCAH, KENTUCKY
VOICE 270-442-8620

I.C. Thomasson Associates Inc.
NASHVILLE, TENNESSEE
PHONE (615) 346-3400

ICT

DEFENSE INFORMATION SCHOOL

FT. MEADE

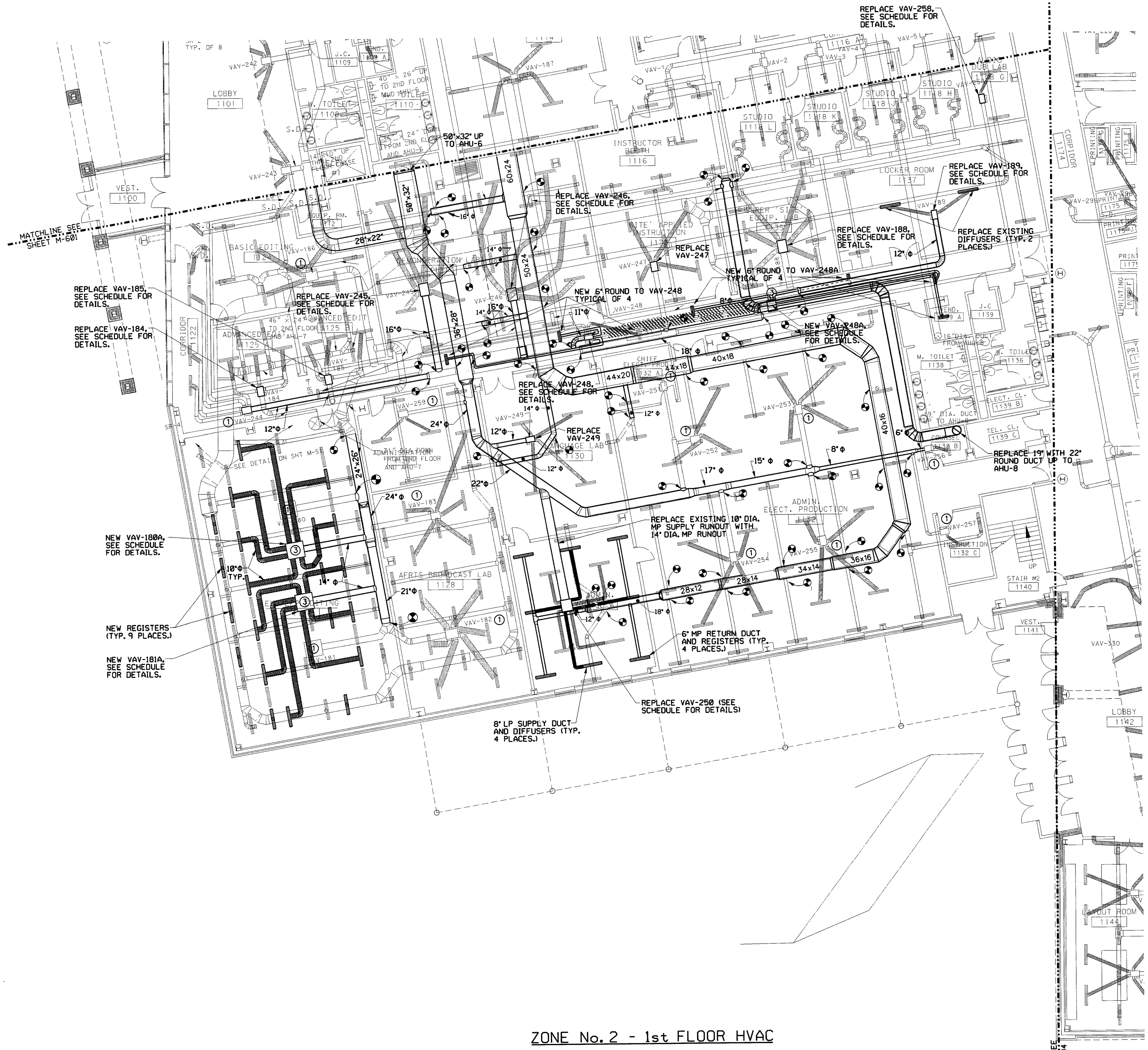
MARYLAND

ZONE 1 - 1st FLOOR HVAC

STATE OF MARYLAND
MECHANICAL ENGINEER

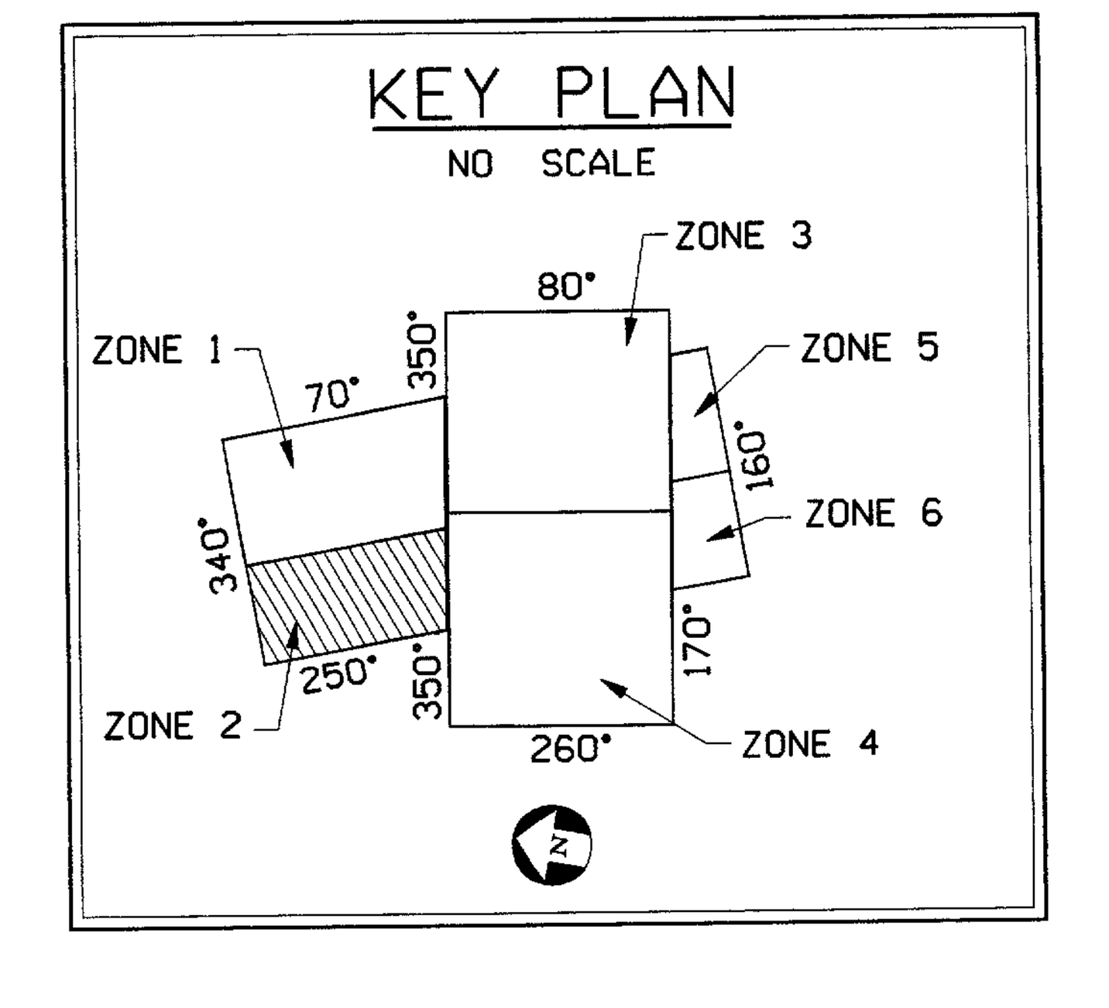
Sheet reference number:

M-601



ZONE No. 2 - 1st FLOOR HVAC

0 5 10
1/8" = 1'-0"



LEGEND

EXISTING
NEW
DEMO

NOTE(S):

1. REBALANCE VAV (AIR AND HOT WATER FLOW) PER VAV BOX SCHEDULE.
2. REPLACE VAV BOX SHOWN AS NEW. SEE VAV BOX SCHEDULE FOR DETAILS.
3. NEW VAV BOX. RUN NEW MP DUCT, HOTWATER PIPING ELECTRICAL WIRE AND CONDUIT TO BOX. BALANCE PER SCHEDULE.

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VANGUARD — PADUCAH, KENTUCKY VOICE 270-442-8620
I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400

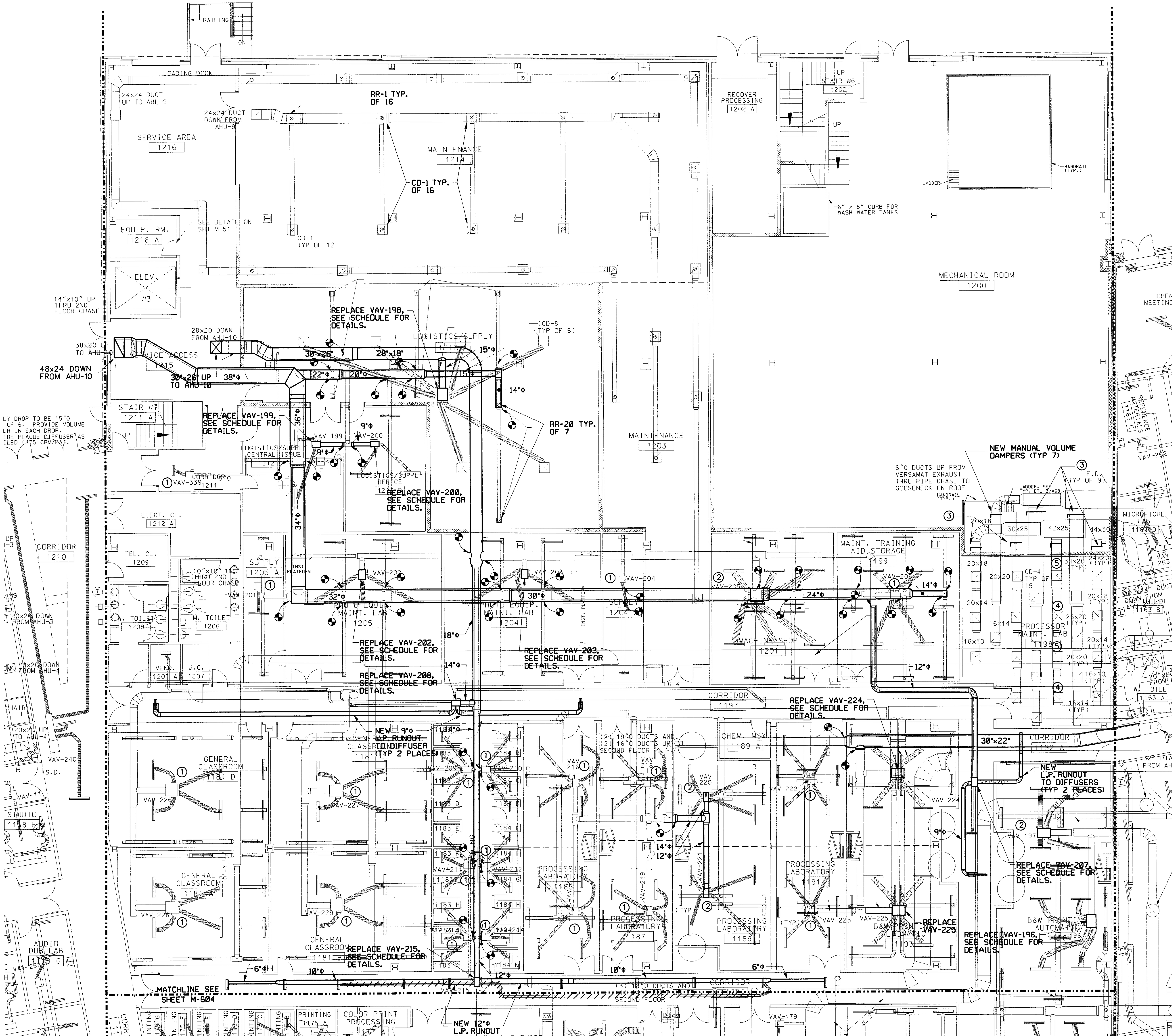
Checked by: WTT	Date: 02/27/04
Dwn by: ICT	CADD File Name: 312M602.DGN
DACA87-03-D-0006	ICT Project No. 203121
Approved by: Chief, Prj. Mgmt. Division	Plot date: 02/27/04
	Plot scale:

DEFENSE INFORMATION SCHOOL

FT. MEADE MARYLAND

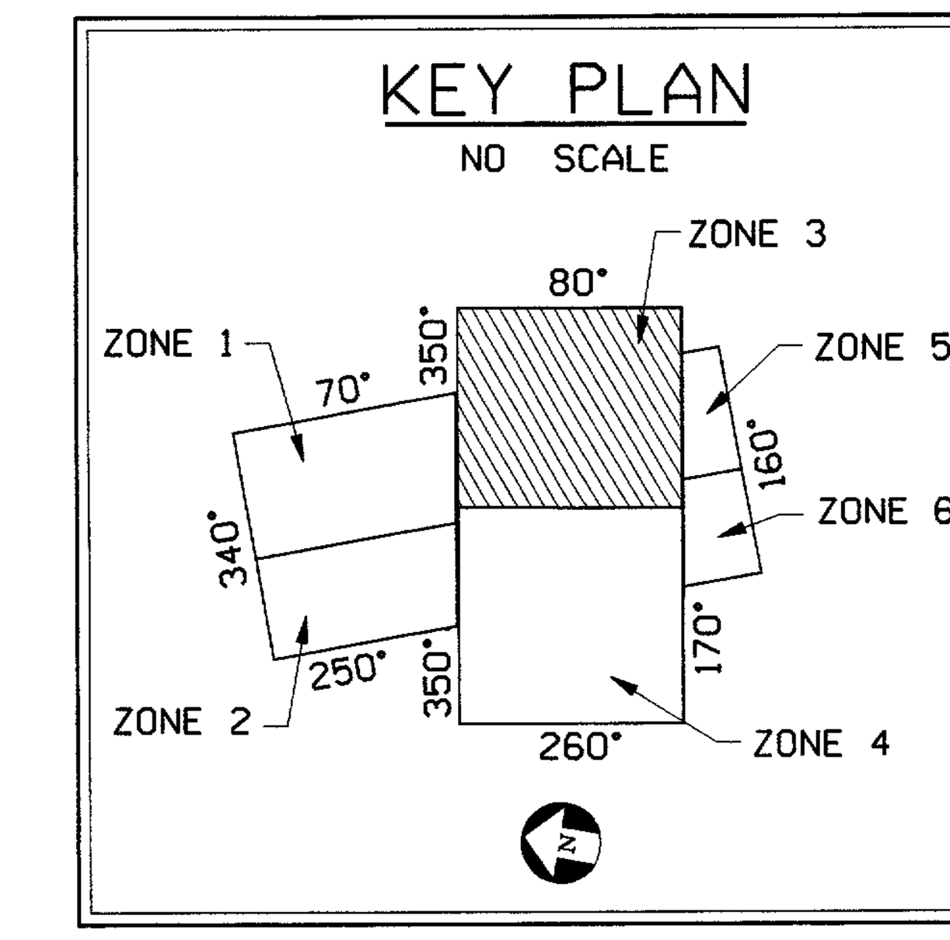
ZONE 2 - 1st FLOOR HVAC

Sheet reference number: M-602



ZONE No. 3 - 1st FLOOR HVAC

0 5 10
1/8" = 1'-0"



LEGEND

EXISTING
NEW
DEMO

NOTE(S):

1. REBALANCE VAV (AIR AND HOT WATER FLOW) PER VAV BOX SCHEDULE.
2. REPLACE VAV BOX SHOWN AS NEW. SEE VAV BOX SCHEDULE FOR DETAILS.
3. CLOSE OFF MANUAL VOLUME DAMPERS.
4. BLANK-OFF RUN-OUT TO EXISTING CEILING DIFFUSERS.
5. REPLACE EXISTING DIFFUSER WITH NEW 14" ROUND NECK DIFFUSER, MATCH EXISTING STYLE.

THESE DOCUMENTS HAVE BEEN PREPARED PRIMARILY BASED ON INFORMATION PROVIDED BY OTHERS. I.C. THOMASSON HAS NOT VERIFIED THE ACCURACY OF ALL INFORMATION PROVIDED BY OTHERS. SEE LIMIT OF LIAIBILITIES STATEMENT ON COVER SHEET.

STATE OF MARYLAND — MECHANICAL ENGINEER

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Symbol	Description	Date	Appr.

TASK ORDER #: FRR004

VANGUARD — PADUCAH, KENTUCKY VOICE 270-442-8620

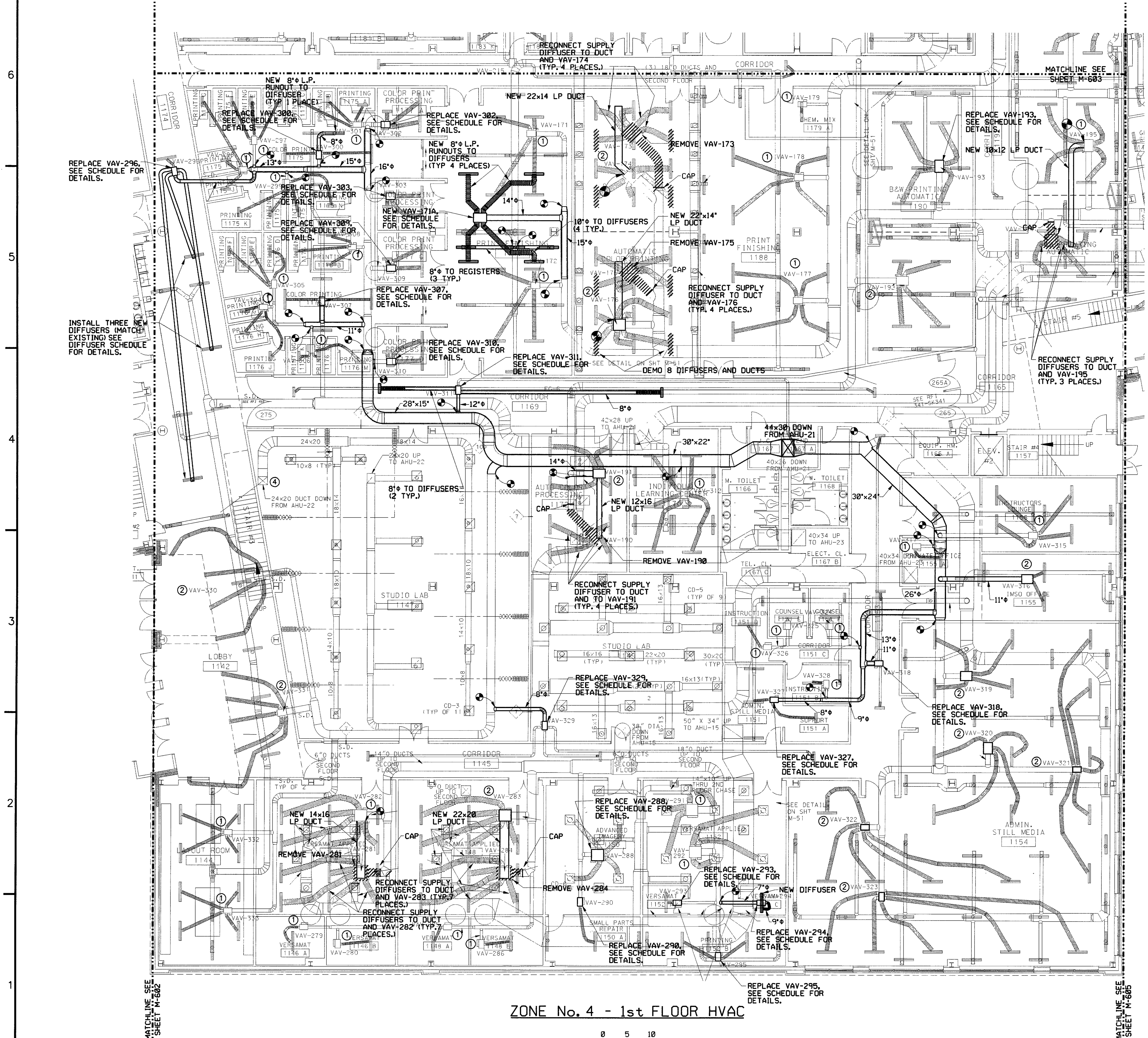
ICT — I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400

Checked by: WTT | Date: 02/27/04
Dwn by: ICT | CADD File Name: 3121M603.DGN
DACA87-03-D-0006 | ICT Project No. 203121
Approved by: | Plot date: 02/27/04
Chief, Prj. Mgmt. Division | Plot scale:

DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND

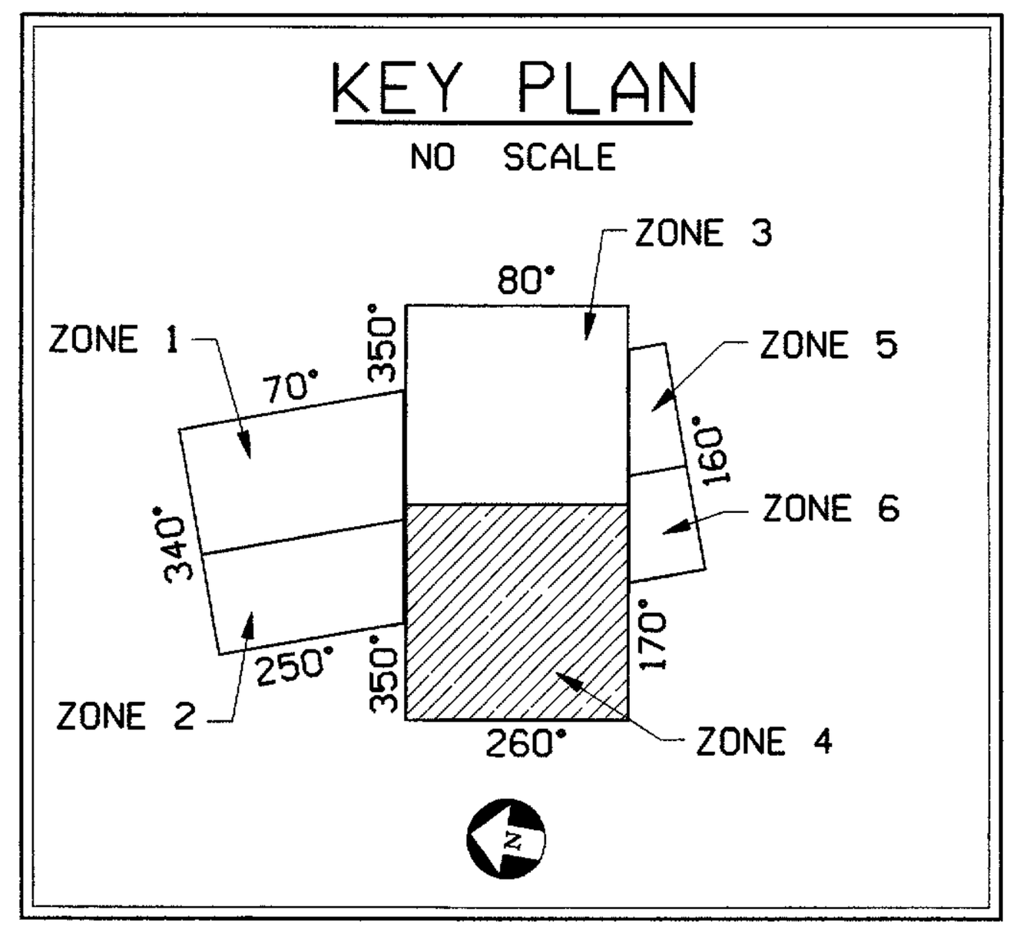
ZONE 3 - 1st FLOOR HVAC

Sheet reference number: M-603



ZONE No. 4 - 1st FLOOR HVAC

0 5 10
1/8" = 1'-0"



LEGEND

EXISTING
NEW
DEMO

NOTE(S):

1. REBALANCE VAV (AIR AND HOT WATER FLOW) PER VAV BOX SCHEDULE.
2. REPLACE VAV BOX SHOWN AS NEW. SEE VAV BOX SCHEDULE FOR DETAILS.

THESE DOCUMENTS HAVE BEEN PREPARED PRIMARILY BASED ON INFORMATION PROVIDED BY OTHERS. I.C. THOMASSON HAS NOT VERIFIED THE ACCURACY OF ALL INFORMATION PROVIDED BY OTHERS. SEE LIMIT OF LIAIBILITIES STATEMENT ON COVER SHEET.

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

TASK ORDER #: FRR004

PADUCAH, KENTUCKY VOICE 270-442-8620

I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400

Checked by: WTT	Dwn by: ICT	DACA87-03-D-0006
Approved by:	Chief, Prj. Mgmt. Division	
Date: 02/27/04	CADD File Name: 312M604.DGN	ICT Project No. 203121
Plot date: 02/27/04	Plot scale:	

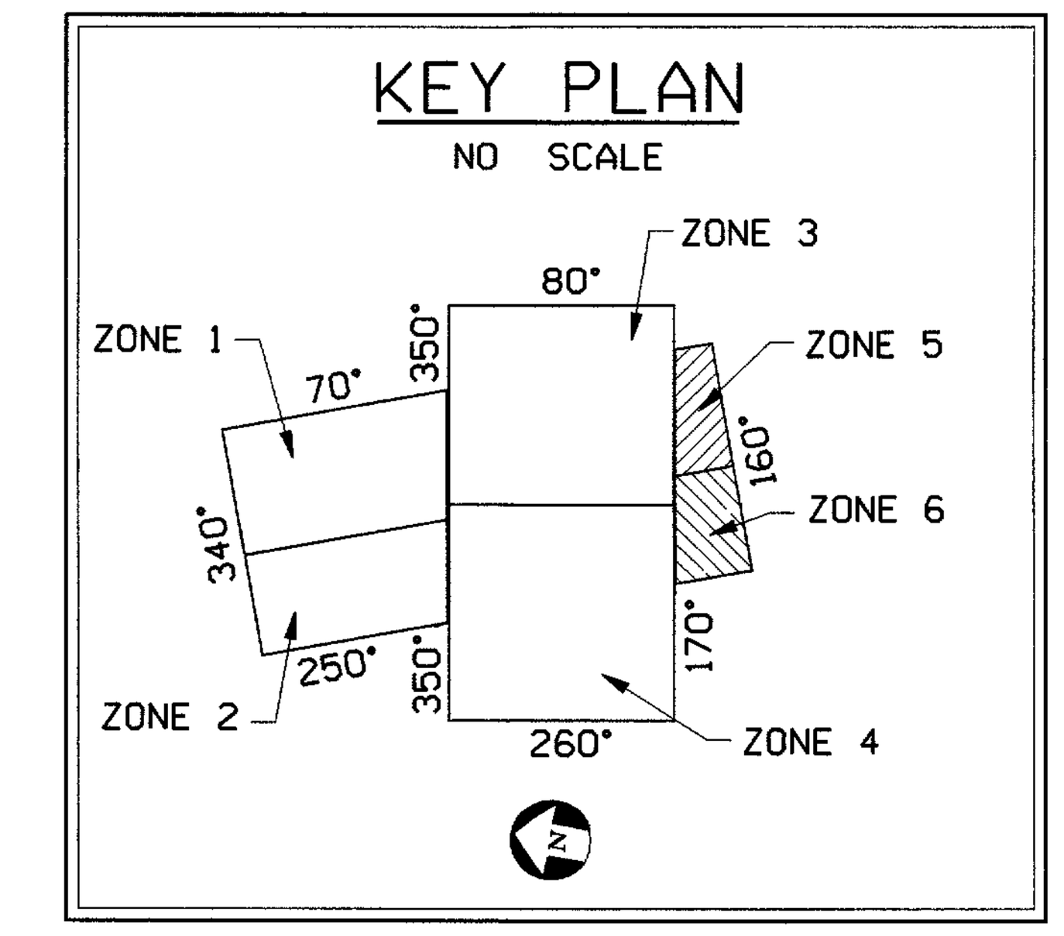
DEFENSE INFORMATION SCHOOL

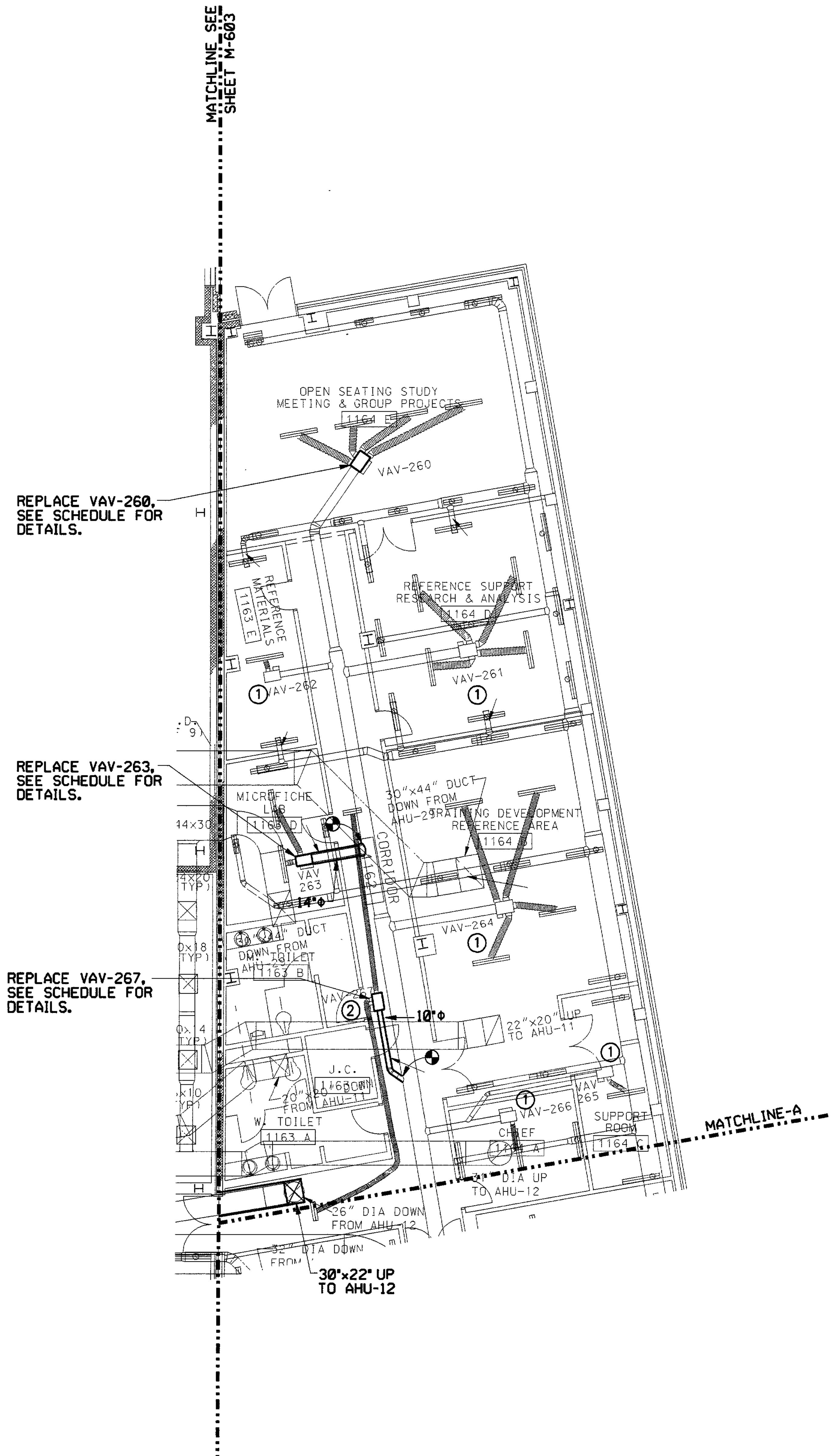
FT. MEADE MARYLAND

ZONE 4 - 1st FLOOR HVAC

Sheet reference number:

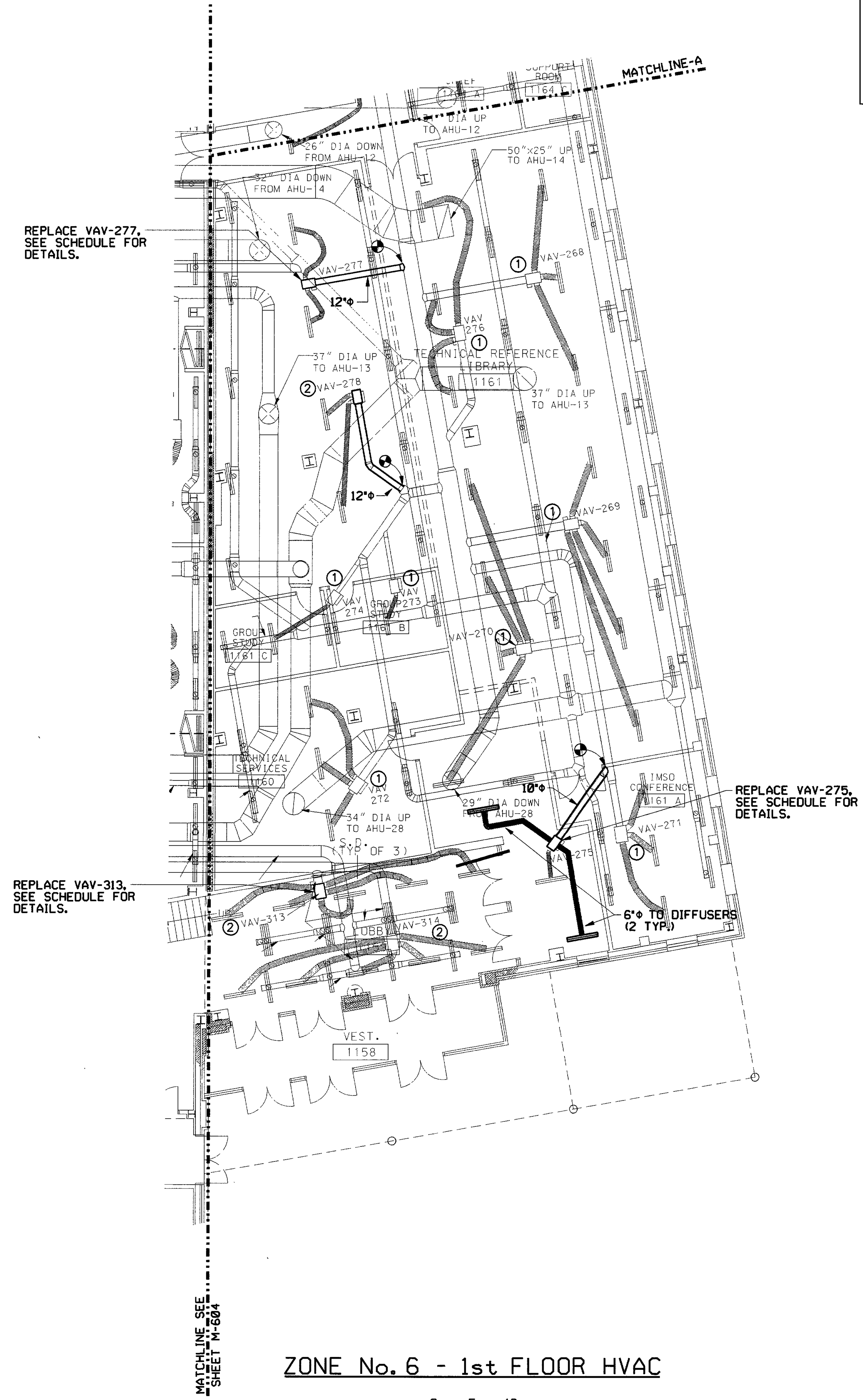
M-604





ZONE No. 5 - 1st FLOOR HVAC

0 5 10
1/8" = 1'-0"



ZONE No. 6 - 1st FLOOR HVAC

0 5 10
1/8" = 1'-0"

LEGEND

EXISTING	
NEW	
DEMO	

NOTE(S):

1. REBALANCE VAV (AIR AND HOT WATER FLOW) PER VAV BOX SCHEDULE.
2. REPLACE VAV BOX SHOWN AS NEW. SEE VAV BOX SCHEDULE FOR DETAILS.

THESE DOCUMENTS HAVE BEEN PREPARED PRIMARILY BASED ON INFORMATION PROVIDED BY OTHERS. I.C. THOMASSON HAS NOT VERIFIED THE ACCURACY OF ALL INFORMATION PROVIDED BY OTHERS. SEE LIMIT OF LIAIBILITIES STATEMENT ON COVER SHEET.

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

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PADUCAH, KENTUCKY VOICE 270-442-8620

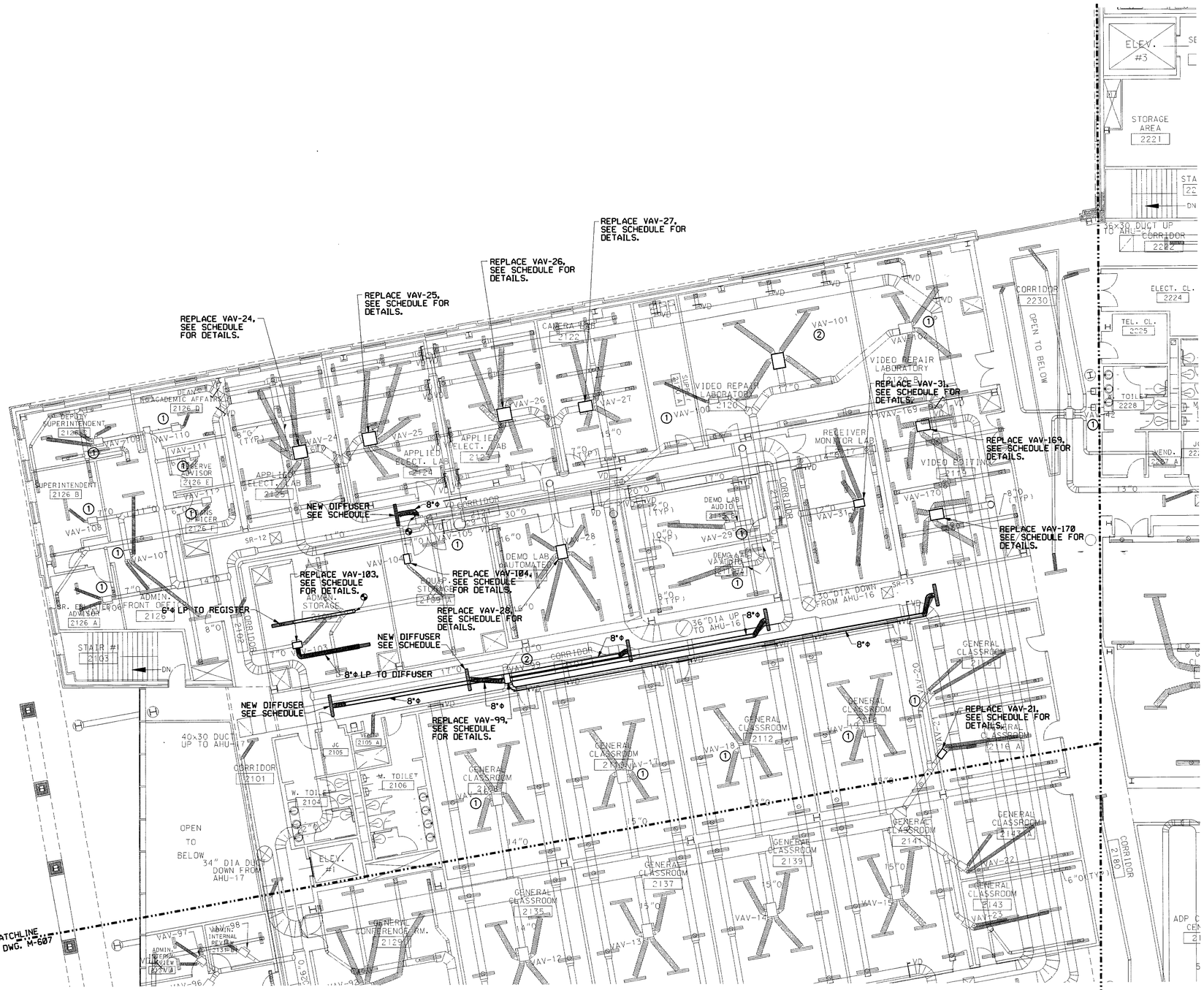
I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400

Checked by: WTT | Date: 02/27/04
Dwn by: ICT | CADD File Name: 3121M605.DGN
DACA87-03-D-0006 | ICT Project No. 203121
Approved by: | Plot date: 02/27/04
Chief, Prj. Mgmt. Division | Plot scale:

DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND

ZONE 5 & 6 - 1st FLOOR HVAC

Sheet reference number: M-605



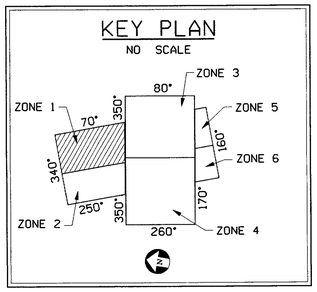
ZONE No. 1 - 2nd FLOOR HVAC

0 5 10

1/8" = 1'-0"

KEY PLAN

NO SCALE



LEGEND

EXISTING

NEW

DEMO

NOTE(S):

(1) REBALANCE VAV (AIR AND HOT WATER FLOW) PER VAV BOX SCHEDULE.

(2) REPLACE VAV BOX SHOWN AS NEW. SEE VAV BOX SCHEDULE FOR DETAILS.

THESE DOCUMENTS HAVE BEEN PREPARED PRIMARILY BASED ON INFORMATION PROVIDED BY OTHERS. I.C. THOMASSON HAS NOT VERIFIED THE ACCURACY OF ALL INFORMATION PROVIDED BY OTHERS. SEE LIMIT OF LIABILITIES STATEMENT ON COVER SHEET.

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

TASK ORDER #: FRR004

VANGUARD

I.C. THOMASSON Associates, Inc.
NASHVILLE, TENNESSEE
PHONE (615) 346-3400

PADUCAH, KENTUCKY
VOICE 270-442-8620

ICT

Checked by: WTT
Dwn by: ICT
DACA87-03-D-0006
Approved by:
Chief, Proj. Mgmt. Division

Date: 02/27/04
CADD File Name: 312M606.DGN
ICT Project No. 203121
Plot date: 02/27/04
Plot scale:

DEFENSE INFORMATION SCHOOL
FT. MEADE
MARYLAND

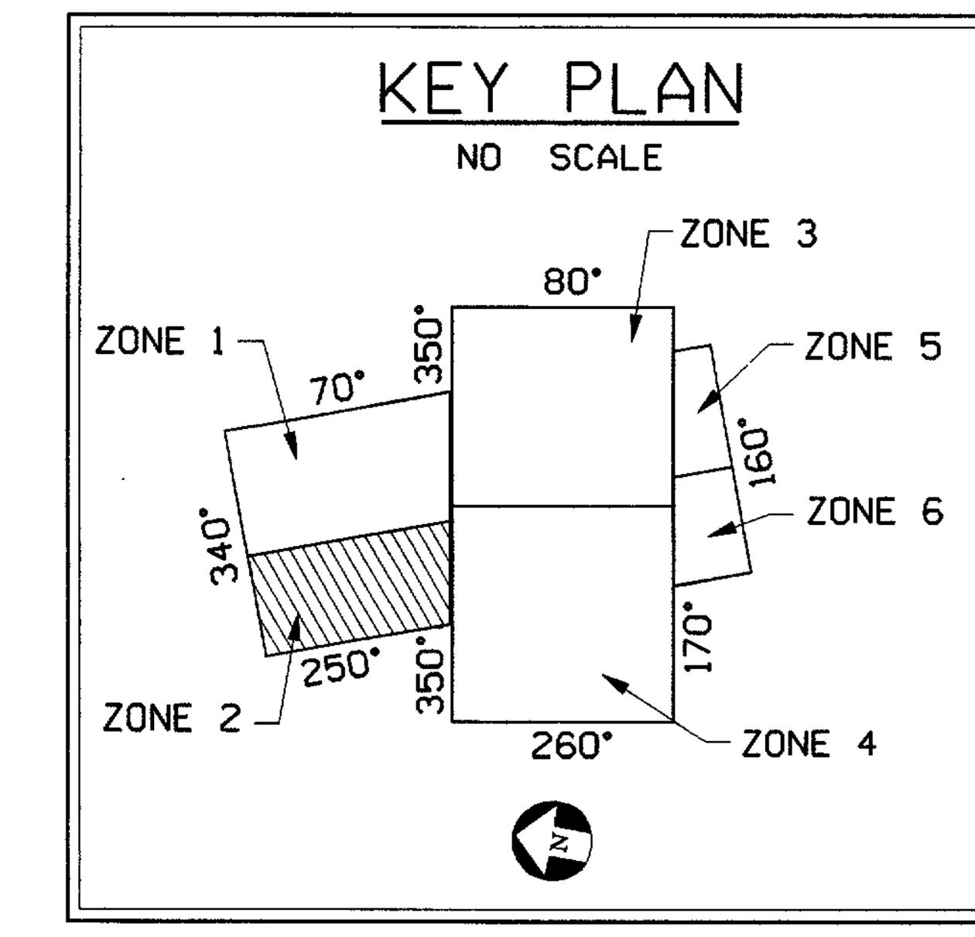
ZONE 1 - 2nd FLOOR HVAC

STATE OF MARYLAND
MECHANICAL ENGINEER

Sheet reference number:
M-606

ZONE No. 2 - 2nd FLOOR HVAC

0 5 10
1/8" = 1'-0"



LEGEND

EXISTING
NEW
DEMO

NOTE(S):

① REBALANCE VAV (AIR AND HOT WATER FLOW) PER VAV BOX SCHEDULE.

② REPLACE VAV BOX SHOWN AS NEW. SEE VAV BOX SCHEDULE FOR DETAILS.

THESE DOCUMENTS HAVE BEEN PREPARED PRIMARILY BASED ON INFORMATION PROVIDED BY OTHERS. I.C. THOMASSON HAS NOT VERIFIED THE ACCURACY OF ALL INFORMATION PROVIDED BY OTHERS. SEE LIMIT OF LIAIBILITIES STATEMENT ON COVER SHEET.

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

TASK ORDER #: FRR004

PADUCAH, KENTUCKY VOICE 270-442-8620

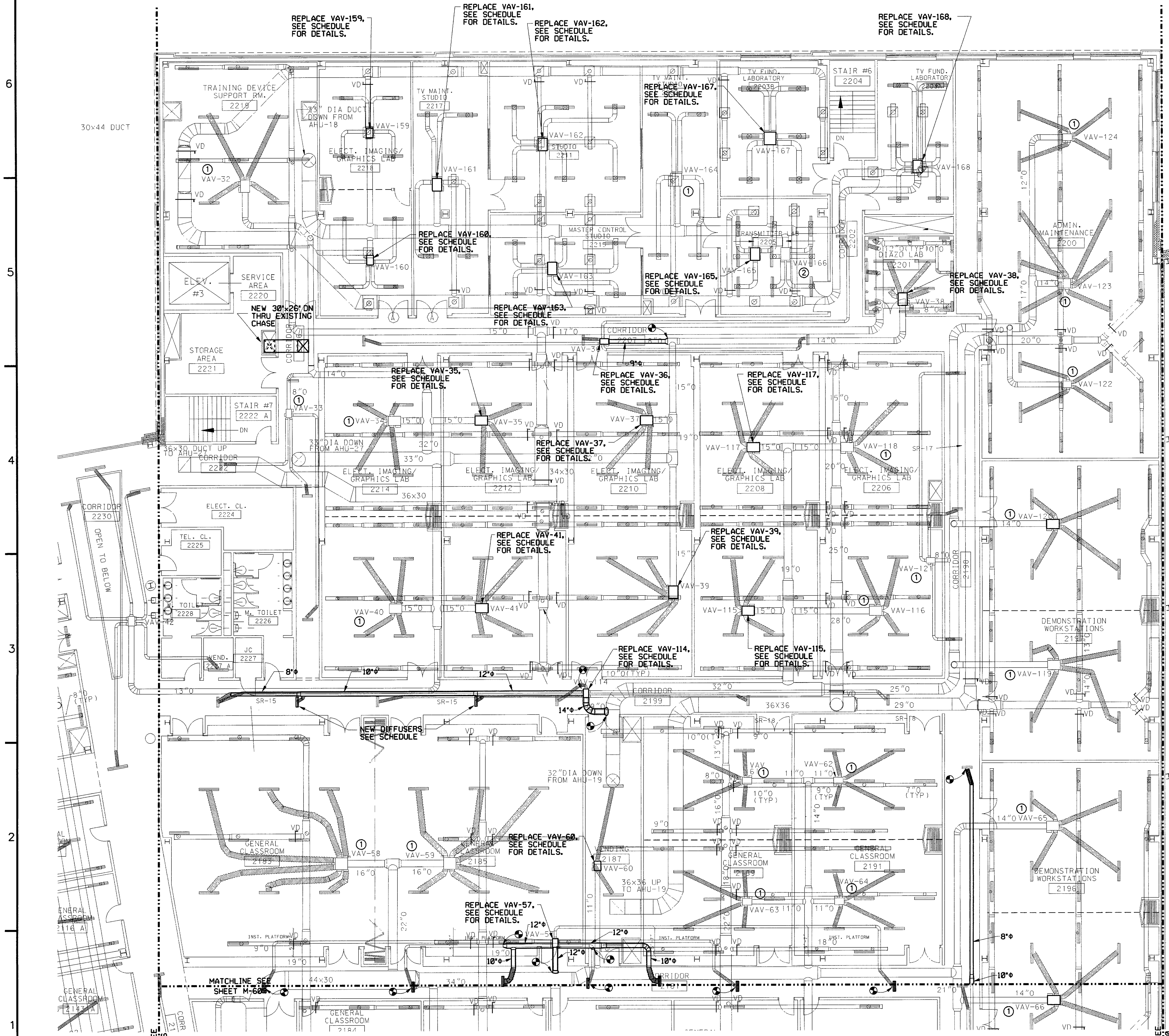
I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400

Checked by: WTT | Date: 02/27/04
Dwn by: ICT | CADD File Name: 3121M607.DGN
DACA87-03-D-0006 | ICT Project No. 203121
Approved by: | Plot date: 02/27/04
Chief, Prj. Mgmt. Division | Plot scale:

DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND

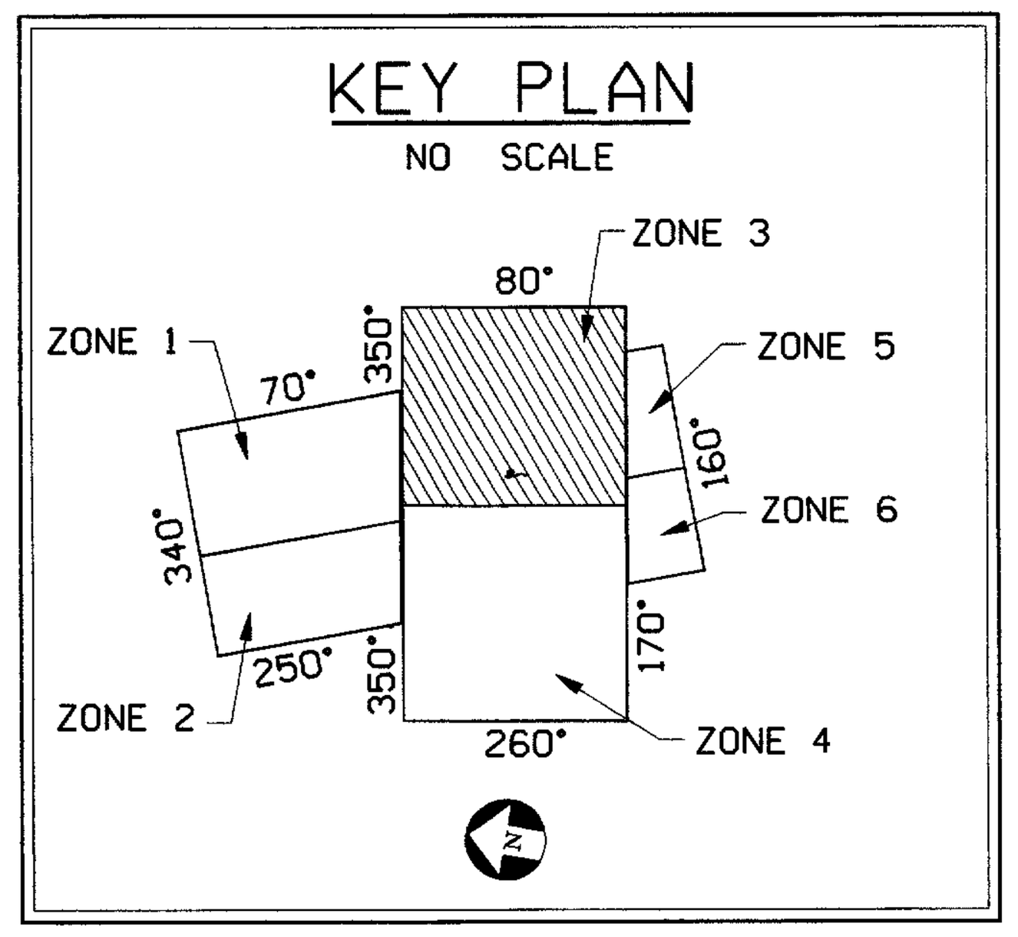
ZONE 2 - 2nd FLOOR HVAC

Sheet reference number:
M-607



ZONE No. 3 - 2nd FLOOR HVAC

0 5 10
1/8" = 1'-0"



LEGEND

EXISTING
NEW
DEMO

NOTE(S):

1. REBALANCE VAV (AIR AND HOT WATER FLOW) PER VAV BOX SCHEDULE.
2. REPLACE VAV BOX SHOWN AS NEW. SEE VAV BOX SCHEDULE FOR DETAILS.

THESE DOCUMENTS HAVE BEEN PREPARED PRIMARILY BASED ON INFORMATION PROVIDED BY OTHERS. I.C. THOMASSON HAS NOT VERIFIED THE ACCURACY OF ALL INFORMATION PROVIDED BY OTHERS. SEE LIMIT OF LIAIBILITIES STATEMENT ON COVER SHEET.

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

TASK ORDER #: FR004

PADUCAH, KENTUCKY VOICE 270-442-8620

I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400

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Date: 02/27/04 | CADD File Name: 312M608.DGN | ICT Project No. 203121 | Plot date: 02/27/04 | Plot scale:

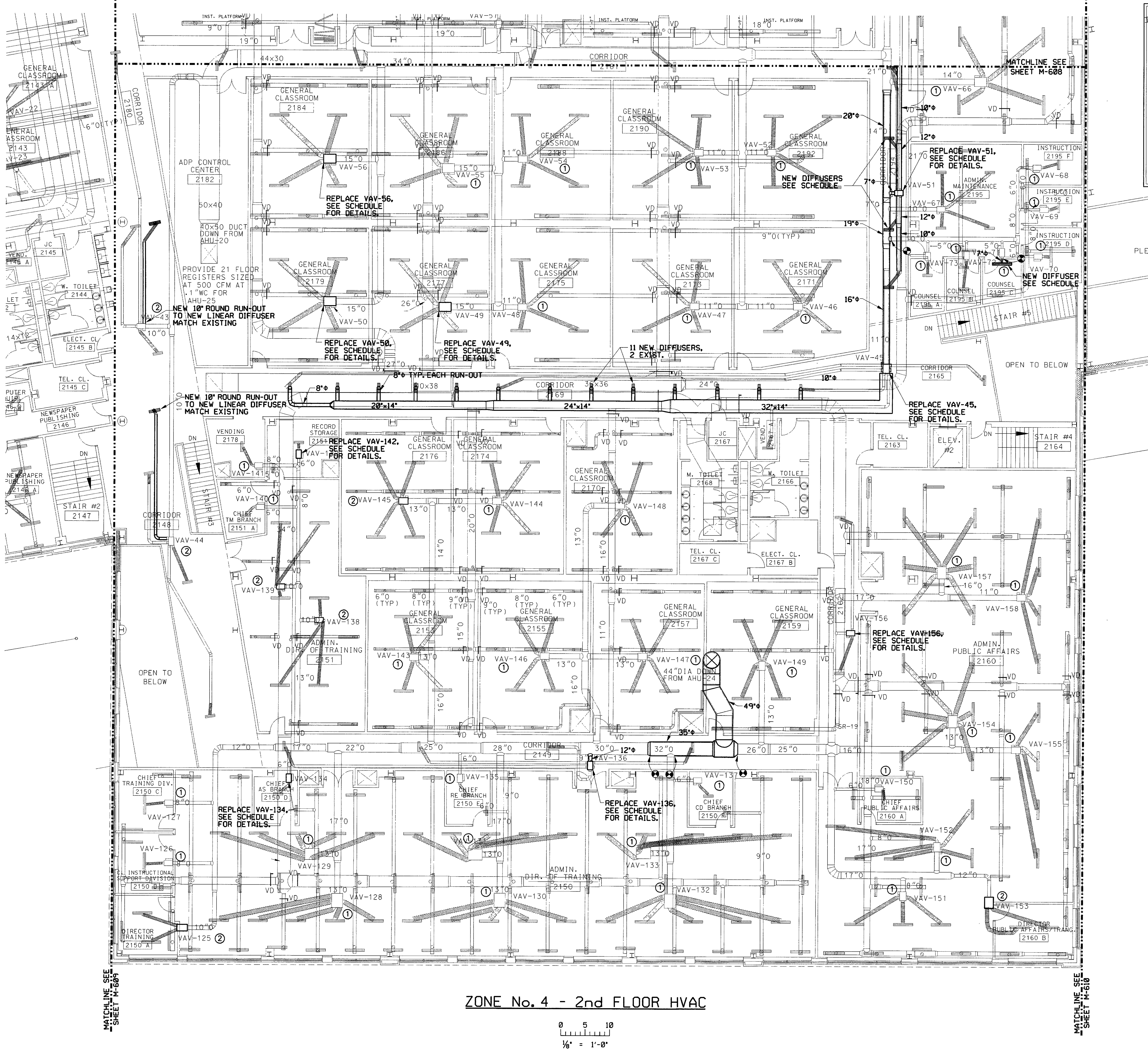
DEFENSE INFORMATION SCHOOL

FT. MEADE MARYLAND

ZONE 3 - 2nd FLOOR HVAC

Sheet reference number:

M-608

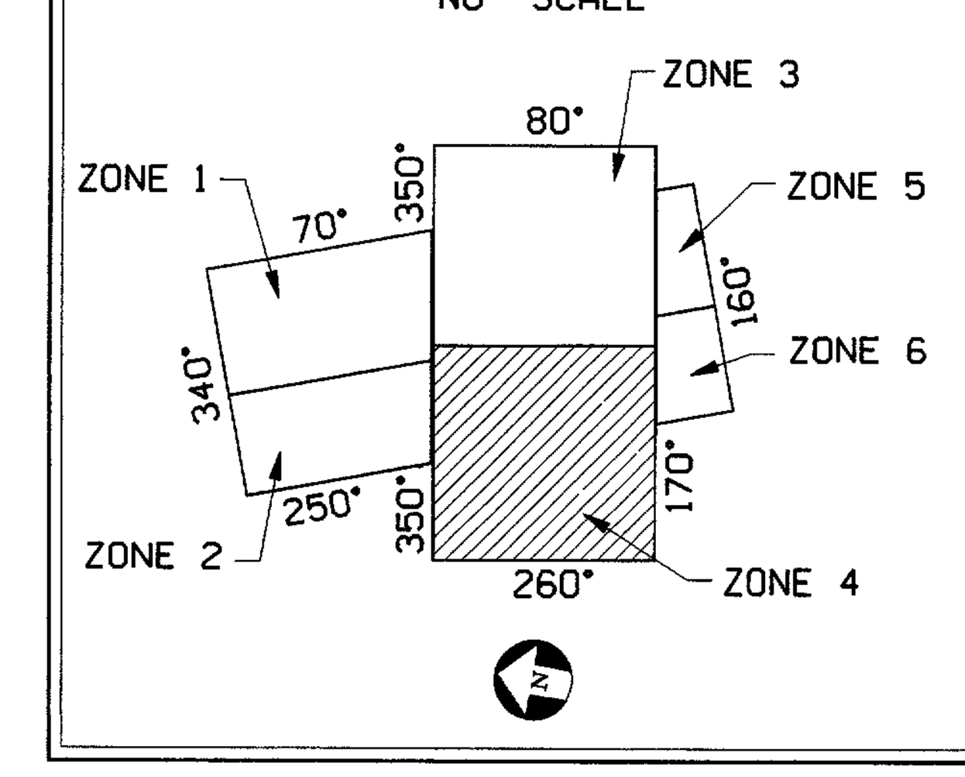


ZONE No. 4 - 2nd FLOOR HVAC

0 5 10
1/8" = 1'-0"

KEY PLAN

NO SCALE



LEGEND

EXISTING
NEW
DEMO

NOTE(S):

1. REBALANCE VAV (AIR AND HOT WATER FLOW) PER VAV BOX SCHEDULE.
2. REPLACE VAV BOX SHOWN AS NEW. SEE VAV BOX SCHEDULE FOR DETAILS.

THESE DOCUMENTS HAVE BEEN PREPARED PRIMARILY BASED ON INFORMATION PROVIDED BY OTHERS. I.C. THOMASSON HAS NOT VERIFIED THE ACCURACY OF ALL INFORMATION PROVIDED BY OTHERS. SEE LIMIT OF LIAIBILITIES STATEMENT ON COVER SHEET.

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Date: 02/27/04
Checked by: WTT
Dwn by: ICT
CADD File Name: 3121M609.DGN
ICT Project No. 203121
DACA87-03-D-0006
Approved by:
Plot date: 02/27/04
Plot scale:
Chief, Prj. Mgmt. Division

TASK ORDER #: FRR004
PADUCAH, KENTUCKY VOICE 270-442-8620
I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400

DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND
ZONE 4 - 2nd FLOOR HVAC

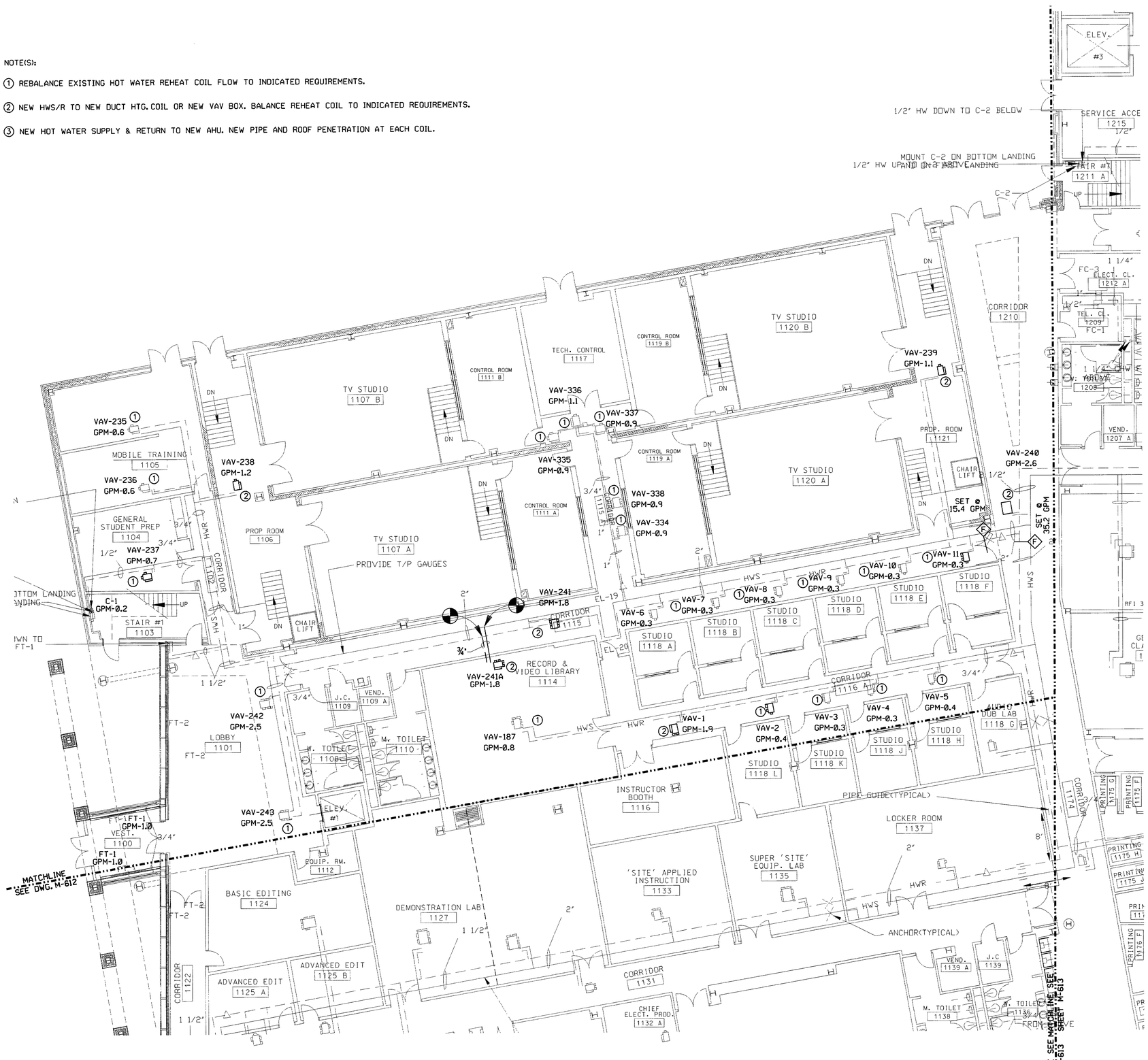
Sheet reference number: M-609

NOTE(S):

(1) REBALANCE EXISTING HOT WATER REHEAT COIL FLOW TO INDICATED REQUIREMENTS.

(2) NEW HWS/R TO NEW DUCT HTG.COIL OR NEW VAV BOX. BALANCE REHEAT COIL TO INDICATED REQUIREMENTS.

(3) NEW HOT WATER SUPPLY & RETURN TO NEW AHU. NEW PIPE AND ROOF PENETRATION AT EACH COIL.



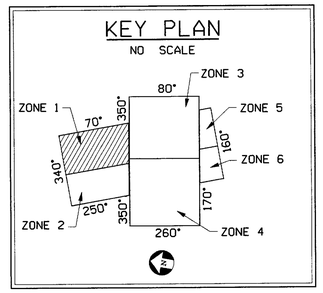
ZONE No. 1 - 1st FLOOR HVAC PIPING

0 5 10

1/8" = 1'-0"

KEY PLAN

NO SCALE



THESE DOCUMENTS HAVE BEEN PREPARED PRIMARILY BASED ON INFORMATION PROVIDED BY OTHERS. I.C. THOMASSON HAS NOT VERIFIED THE ACCURACY OF ALL INFORMATION PROVIDED BY OTHERS. SEE LIMIT OF LIAIBILITIES STATEMENT ON COVER SHEET.

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Date: 02/27/04
Checked by: WIT
CADD File Name: 312M611DN
Dwn by: ICT
ICT Project No. 203121
DAC#87-03-D-0006
Plot date: 02/27/04
Approved by:
Plot scale:
Chief, Prj. Mgmt. Division

TASK ORDER #, FRR004

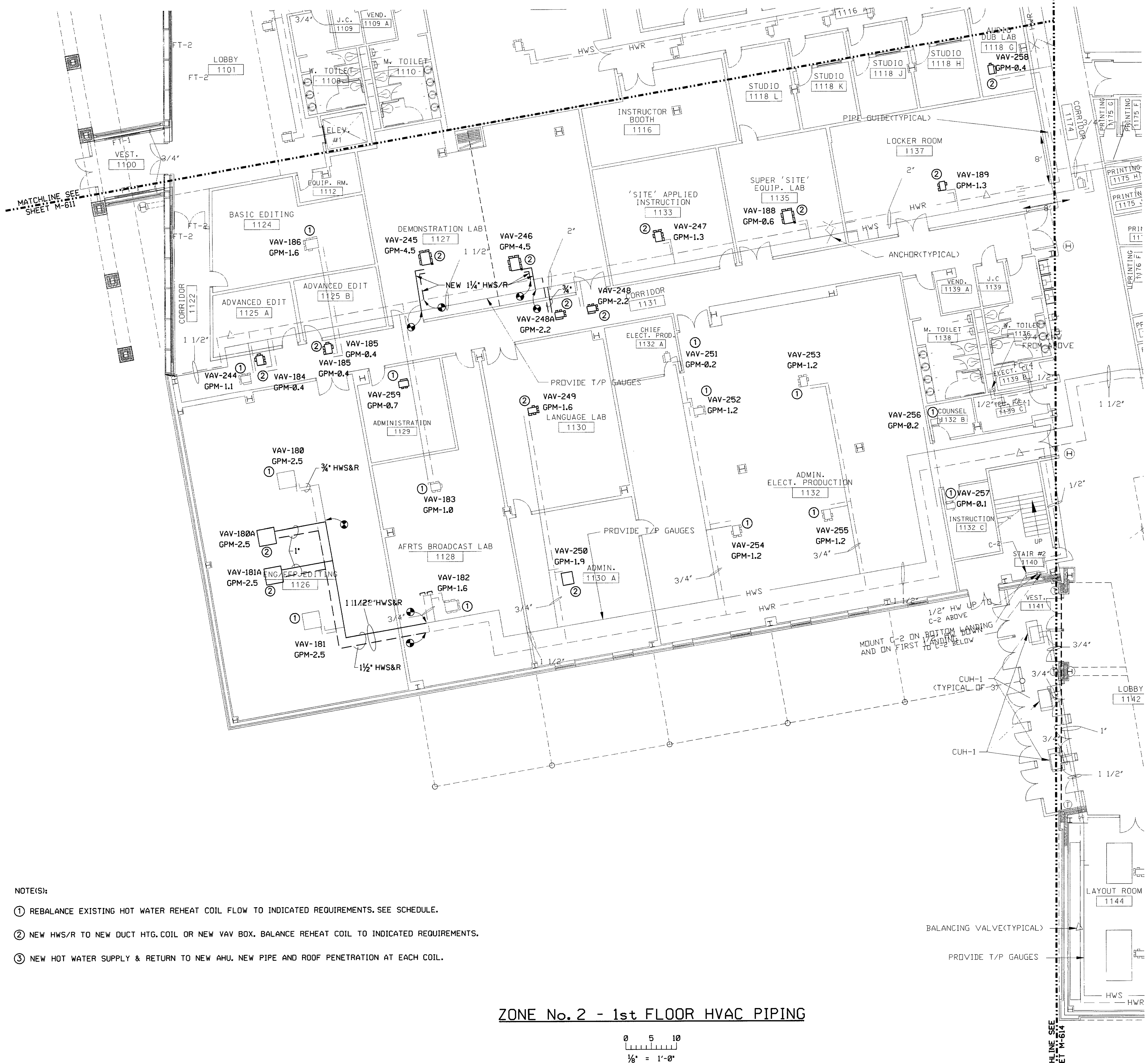
PADUCAH, KENTUCKY
VOICE 270-442-8620

I.C. Thomasson Associates, Inc.
NASHVILLE, TENNESSEE
PHONE (615) 346-3400

DEFENSE INFORMATION SCHOOL
FT. MEADE
MARYLAND

ZONE 1 - 1st FLOOR HW PIPING

Sheet reference number:
M-611



NOTE(S):

① REBALANCE EXISTING HOT WATER REHEAT COIL FLOW TO INDICATED REQUIREMENTS. SEE SCHEDULE.

② NEW HWS/R TO NEW DUCT HTG. COIL OR NEW VAV BOX. BALANCE REHEAT COIL TO INDICATED REQUIREMENTS.

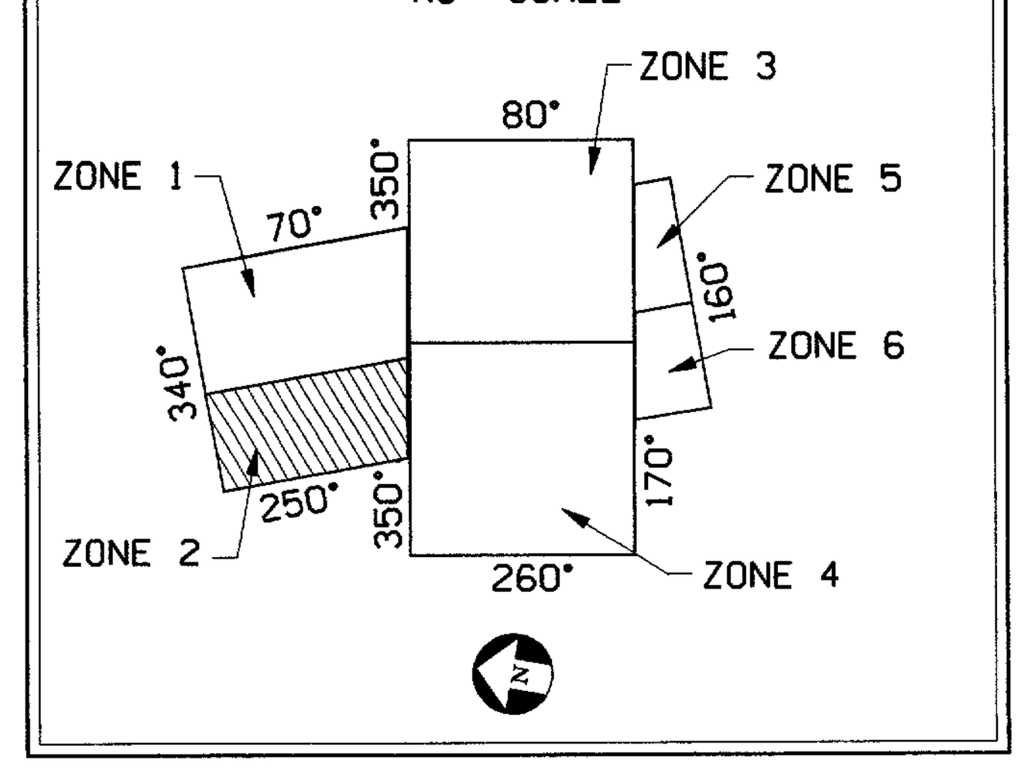
③ NEW HOT WATER SUPPLY & RETURN TO NEW AHU. NEW PIPE AND ROOF PENETRATION AT EACH COIL.

ZONE No. 2 - 1st FLOOR HVAC PIPING

0 5 10
1/8" = 1'-0"

KEY PLAN

NO SCALE



US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

TASK ORDER #: FRR004

VANGUARD — PADUCAH, KENTUCKY VOICE 270-442-8620

ICT — I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400

Checked by: WTT | Drn by: ICT | DACA87-03-D-0006 | Approved by: Chief, Prj. Mgmt. Division

Date: 02/27/04 | CADD File Name: 312M612.DGN | ICT Project No. 203121 | Plot date: 02/27/04 | Plot scale:

DEFENSE INFORMATION SCHOOL

FT. MEADE MARYLAND

ZONE 2 - 1st FLOOR HW PIPING

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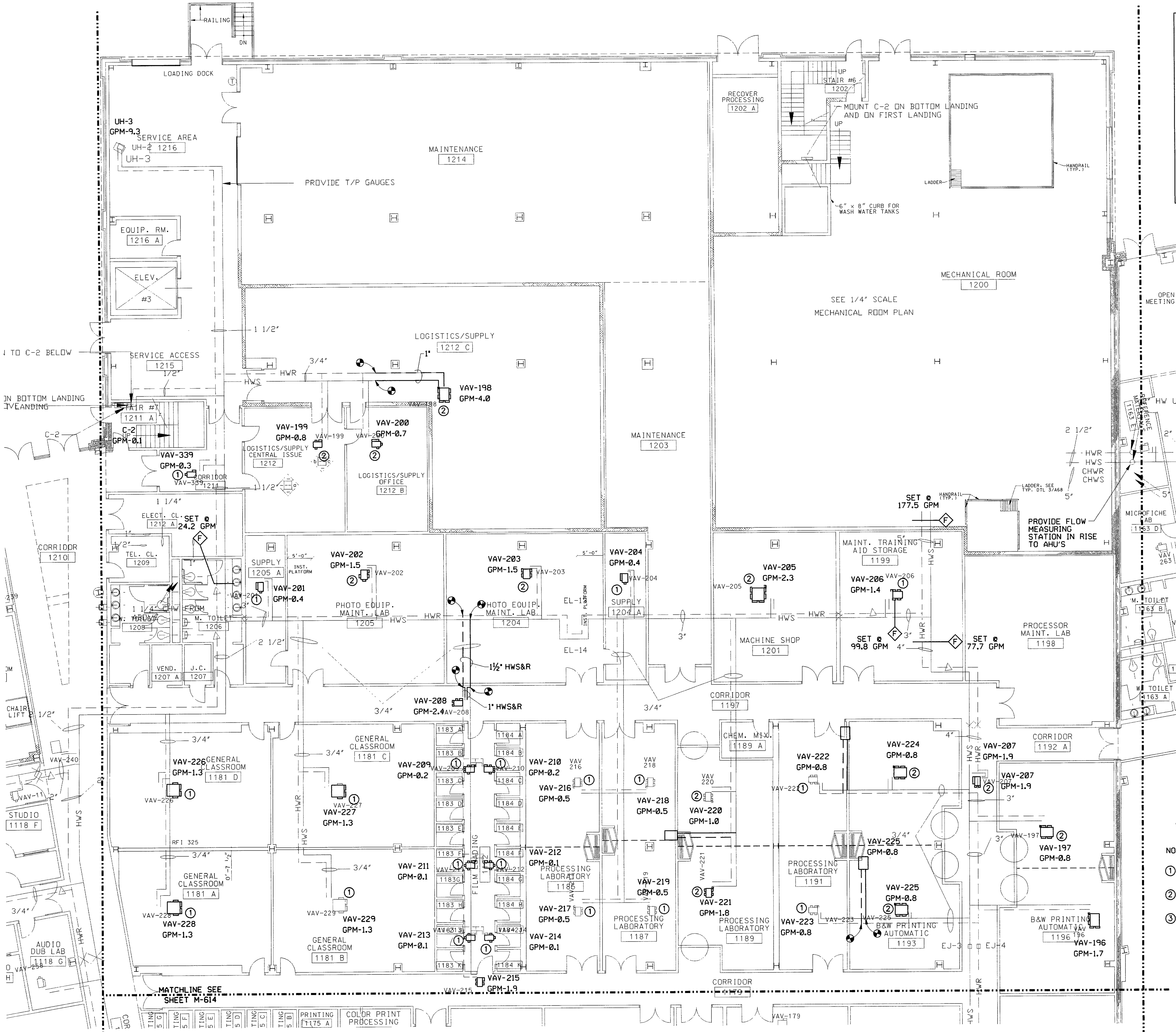
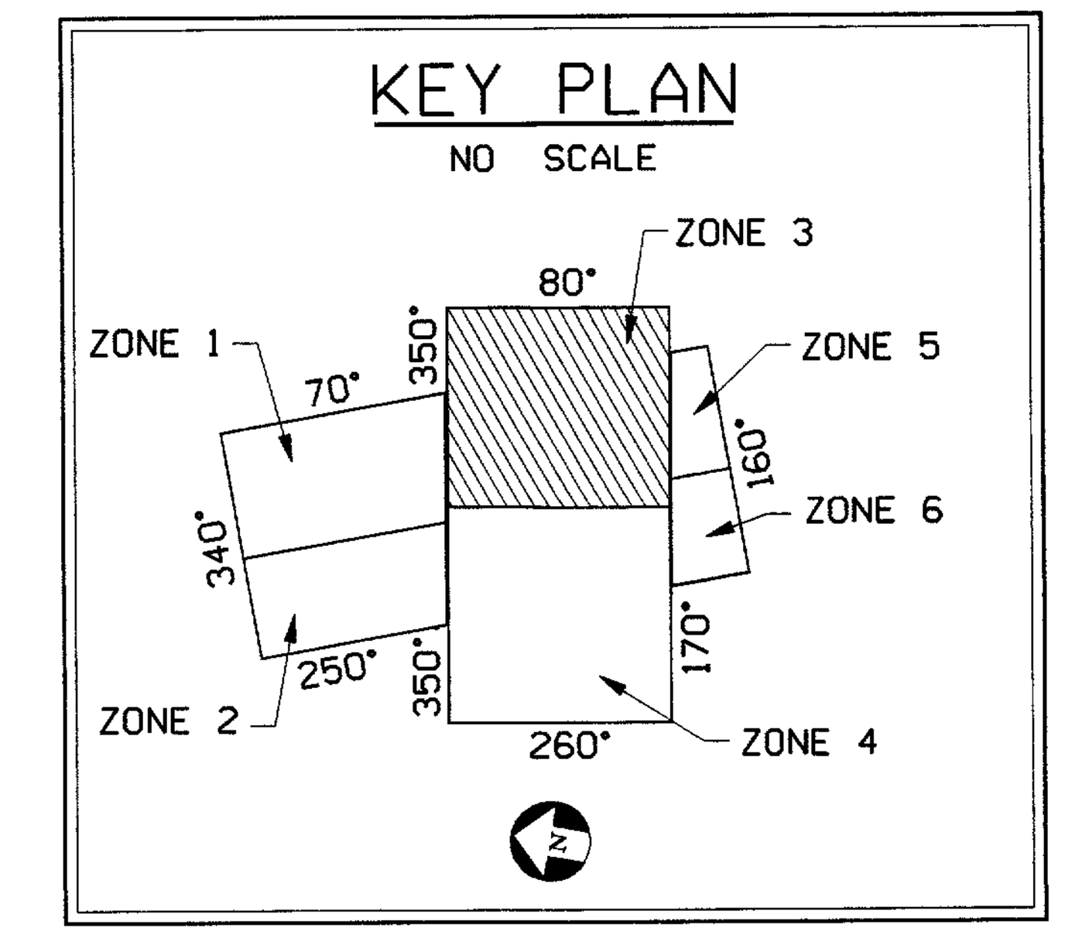
Sheet reference number:

M-612



ZONE No. 3 - 1st FLOOR HVAC PIPING

0 5 10
1/8" = 1'-0"



NOTE(S):

1. REBALANCE EXISTING HOT WATER REHEAT COIL FLOW TO INDICATED REQUIREMENTS. SEE SCHEDULE.
2. NEW HWS/R TO NEW DUCT HTG. COIL OR NEW VAV BOX. BALANCE REHEAT COIL TO INDICATED REQUIREMENTS.
3. NEW HOT WATER SUPPLY & RETURN TO NEW AHU. NEW PIPE AND ROOF PENETRATION AT EACH COIL.

THESE DOCUMENTS HAVE BEEN PREPARED PRIMARILY BASED ON INFORMATION PROVIDED BY OTHERS. I.C. THOMASSON HAS NOT VERIFIED THE ACCURACY OF ALL INFORMATION PROVIDED BY OTHERS. SEE LIMIT OF LIAIBILITIES STATEMENT ON COVER SHEET.

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

TASK ORDER #: FRR004

VANGUARD PADUCAH, KENTUCKY VOICE 270-442-8620

I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400

Checked by: WTT | Date: 02/27/04
Dwn by: ICT | CADD File Name: 3121M613.DGN
DACA87-03-D-0006 | ICT Project No. 203121
Approved by: | Plot date: 02/27/04
Chief, Prj. Mgmt. Division | Plot scale:

DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND

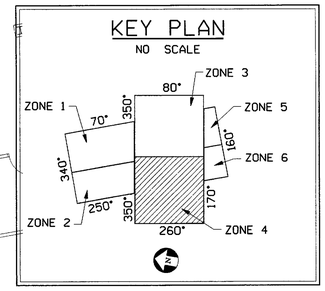
ZONE 3 - 1st FLOOR HW PIPING

Sheet reference number: M-613

ZONE No. 4 - 1st FLOOR HVAC PIPING

0 5 10
1/8" = 1'-0"

KEY PLAN
NO SCALE



NOTE(S):

1. REBALANCE EXISTING HOT WATER REHEAT COIL FLOW TO INDICATED REQUIREMENTS. SEE SCHEDULE.
2. NEW HWS/R TO NEW DUCT HTG. COIL OR NEW VAV BOX. BALANCE REHEAT COIL TO INDICATED REQUIREMENTS.
3. NEW HOT WATER SUPPLY & RETURN TO NEW AHU. NEW PIPE AND ROOF PENETRATION AT EACH COIL.

THESE DOCUMENTS HAVE BEEN PREPARED PRIMARILY BASED ON INFORMATION PROVIDED BY OTHERS. I.C. THOMASSON HAS NOT VERIFIED THE ACCURACY OF ALL INFORMATION PROVIDED BY OTHERS. SEE LIMIT OF LIAIBILITIES STATEMENT ON COVER SHEET.

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Checked by: WTT
Dwn by: ICT
CADD File Name: 312M614.DGN
ICT Project No. 20321
DACA87-03-D-0006
Approved by:
Chief, Prj. Mgmt. Division
Date: 02/27/04
Plot date: 02/27/04
Plot scale:

TASK ORDER #: FRR004

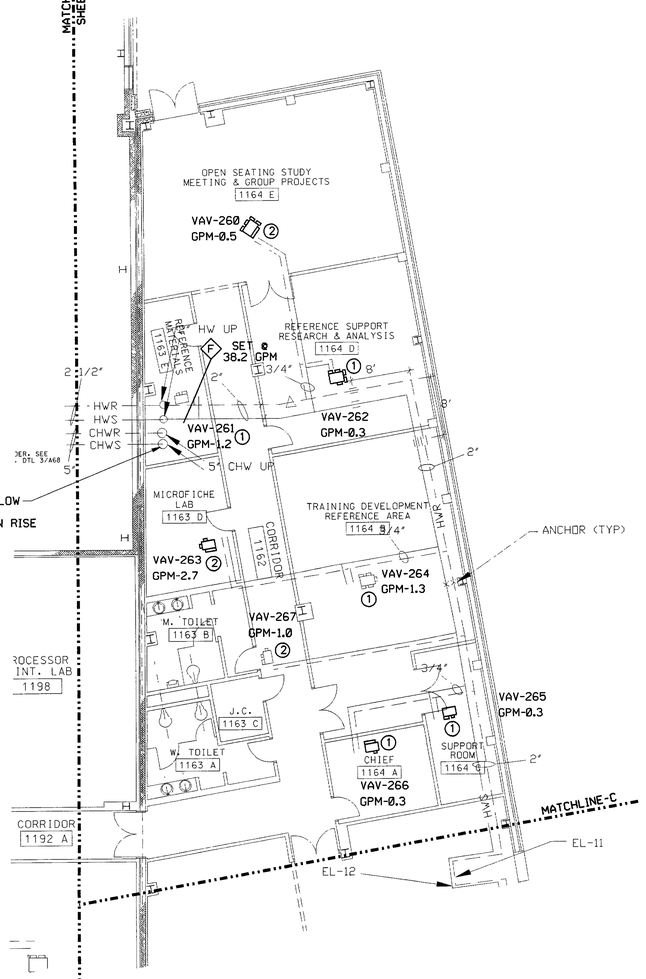
I.C. Thomasson Associates, Inc.
PADUCAH, KENTUCKY VOICE 270-442-8620
NASHVILLE, TENNESSEE PHONE (615) 346-3400

VANGUARD ICT

DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND
ZONE 4 - 1st FLOOR HW PIPING

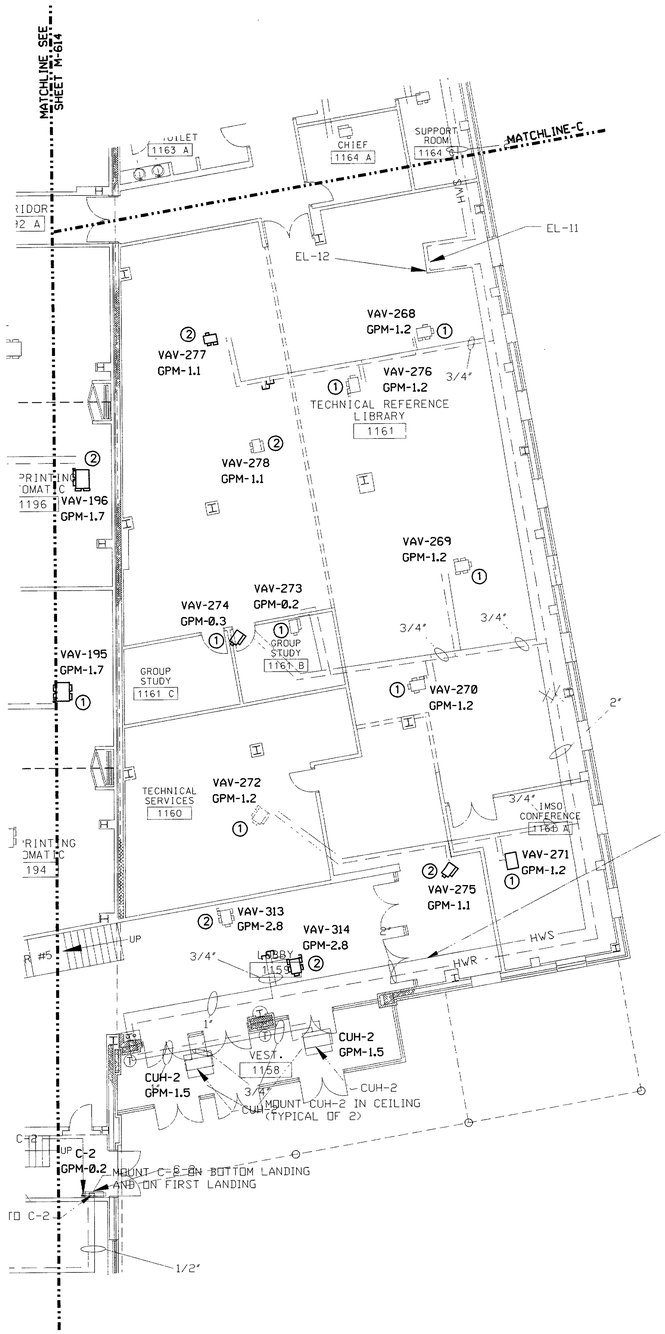
STATE OF MARYLAND — MECHANICAL ENGINEER

Sheet reference number: M-614



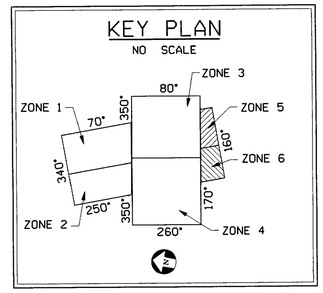
ZONE No. 5 - 1st FLOOR HVAC PIPING

0 5 10
1/8" = 1'-0"



ZONE No. 6 - 1st FLOOR HVAC PIPING

0 5 10
1/8" = 1'-0"



NOTE(S):

1. REBALANCE EXISTING HOT WATER REHEAT COIL FLOW TO INDICATED REQUIREMENTS. SEE SCHEDULE.
2. NEW HWS/R TO NEW DUCT HTG. COIL OR NEW VAV BOX. BALANCE REHEAT COIL TO INDICATED REQUIREMENTS.
3. NEW HOT WATER SUPPLY & RETURN TO NEW AHU. NEW PIPE AND ROOF PENETRATION AT EACH COIL.

THESE DOCUMENTS HAVE BEEN PREPARED PRIMARILY BASED ON INFORMATION PROVIDED BY OTHERS. I.C. THOMASSON HAS NOT VERIFIED THE ACCURACY OF ALL INFORMATION PROVIDED BY OTHERS. SEE LIMIT OF LIABILITIES STATEMENT ON COVER SHEET.

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

TASK ORDER #: FRR004

VANGUARD

PADUCAH, KENTUCKY
VOICE 270-442-8620

I.C. Thomasson Associates, Inc.

NASHVILLE, TENNESSEE
PHONE (615) 346-3400

ICT

Checked by: WTT
Dwn by: ICT
DACA87-03-D-0006
Approved by:
Chief, Prj. Mgmt. Division

Date: 02/27/04
CADD File Name: 312M615.DGN
ICT Project No. 203121
Plot date: 02/27/04
Plot scale:

DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND

ZONE 5 & 6 - 1st FLOOR
HW PIPING

Sheet reference number:
M-615

ZONE No. 1 - 2nd FLOOR HVAC PIPING

0 5 10

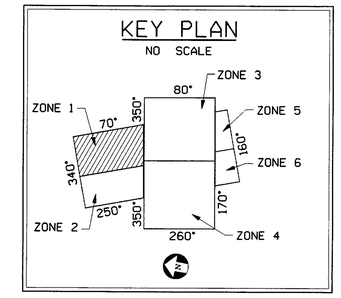
1/8" = 1'-0"

NOTE(S):

① REBALANCE EXISTING HOT WATER REHEAT COIL FLOW TO INDICATED REQUIREMENTS. SEE SCHEDULE.

② NEW HWS/R TO NEW DUCT HTG. COIL OR NEW VAV BOX. BALANCE REHEAT COIL TO INDICATED REQUIREMENTS.

③ NEW HOT WATER SUPPLY & RETURN TO NEW AHU. NEW PIPE AND ROOF PENETRATION AT EACH COIL.



US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Date: 02/27/04
Checked by: WTT
CADD File Name: 312MG16.DGN
Dwn by: ICT
ICT Project No. 203121
DAC-87-03-D-0006
Plot date: 02/27/04
Approved by:
Plot scale:
Chief, Prj. Mgmt. Division

TASK ORDER #: FRR004

I.C. Thomasson Associates, Inc.
PADUCAH, KENTUCKY VOICE 270-442-8620
NASHVILLE, TENNESSEE PHONE (615) 346-3400

ENGINEERS ICT

DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND

ZONE 1 - 2nd FLOOR
HW PIPING

STATE OF MARYLAND — MECHANICAL ENGINEER

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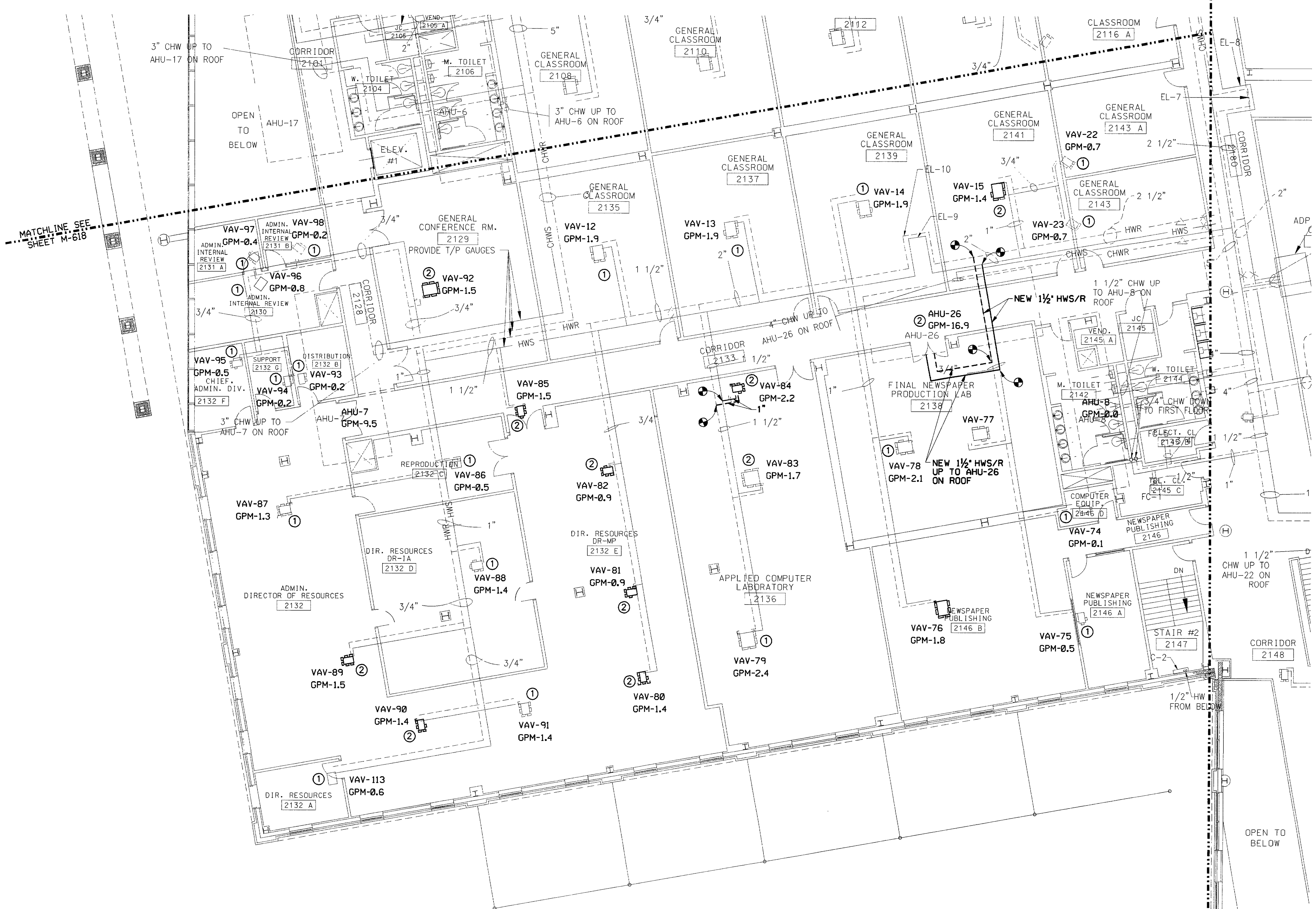
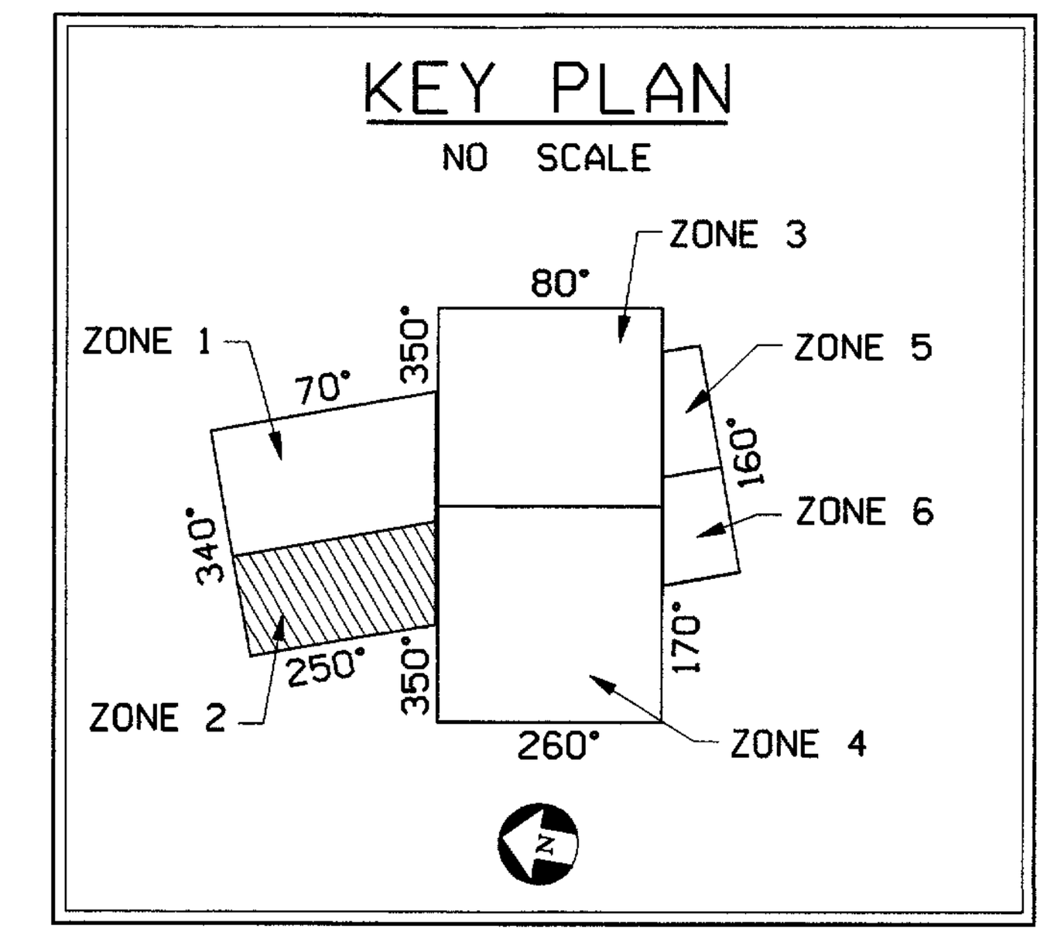
Sheet reference number:
M-616





NOTE(S):

① REBALANCE EXISTING HOT WATER REHEAT COIL FLOW TO INDICATED REQUIREMENTS.

② NEW HWS/R TO NEW DUCT HTG. COIL OR NEW VAV BOX. BALANCE REHEAT COIL TO INDICATED REQUIREMENTS.

③ NEW HOT WATER SUPPLY & RETURN TO NEW AHU. NEW PIPE AND ROOF PENETRATION AT EACH COIL.

ZONE No. 2 - 2nd FLOOR HVAC PIPING

0 5 10

1/8" = 1'-0"

MATCHLINE SEE SHEET M-614

THESE DOCUMENTS HAVE BEEN PREPARED PRIMARILY BASED ON INFORMATION PROVIDED BY OTHERS. I.C. THOMASSON HAS NOT VERIFIED THE ACCURACY OF ALL INFORMATION PROVIDED BY OTHERS. SEE LIMIT OF LIAIBILITIES STATEMENT ON COVER SHEET.

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

TASK ORDER #: FRR004

PADUCAH, KENTUCKY VOICE 270-442-8620

I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400

Checked by: WTT | Date: 02/27/04

Dwn by: ICT | CADD File Name: 317M617.DGN

DACA87-03-D-0006 | ICT Project No. 203121

Approved by: | Plot date: 02/27/04

Chief, Prj. Mgmt. Division | Plot scale:

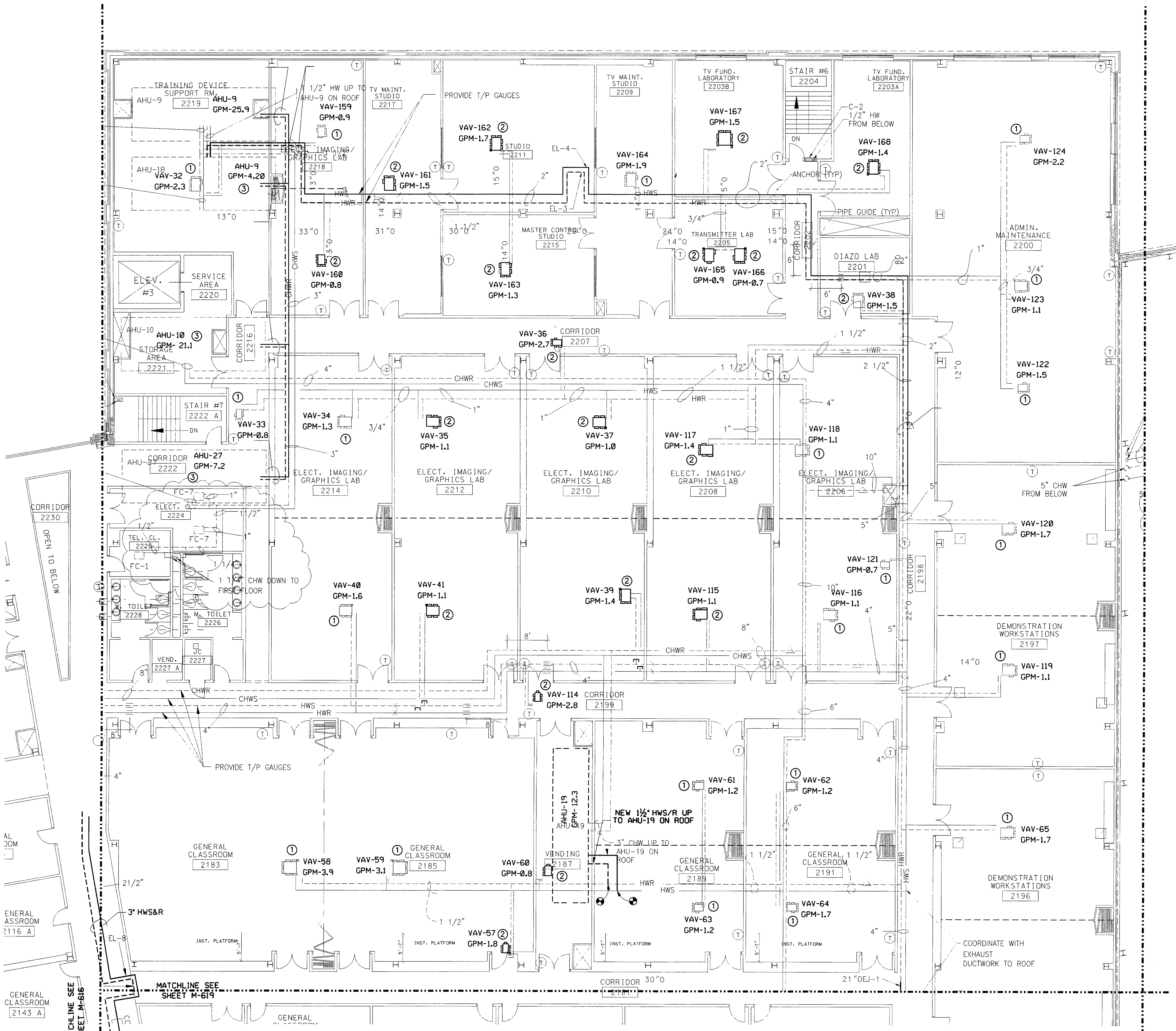
DEFENSE INFORMATION SCHOOL

FT. MEADE MARYLAND

ZONE 2 - 2nd FLOOR HW PIPING

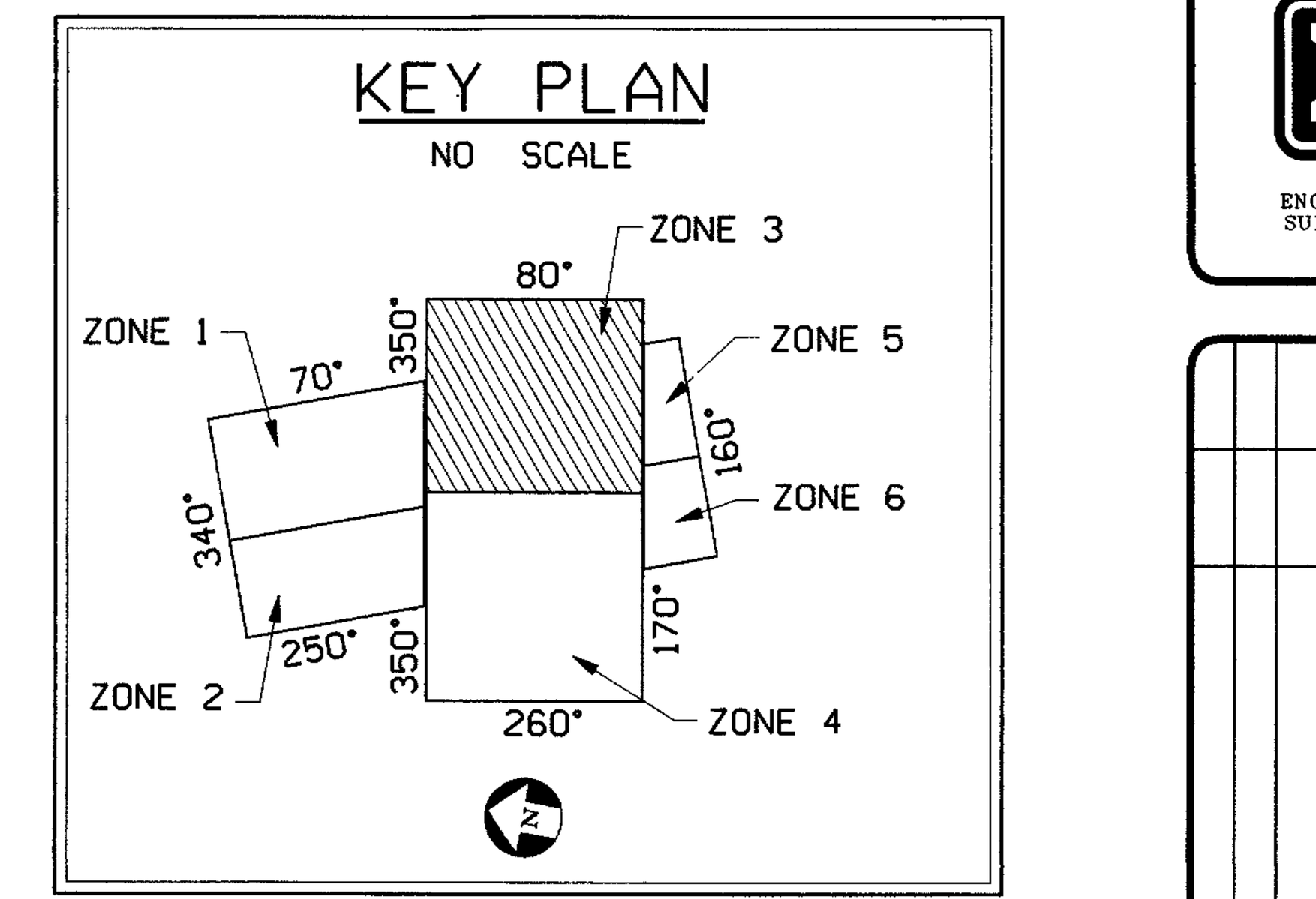
Sheet reference number:

M-617



ZONE No. 3 - 2nd FLOOR HVAC PIPING

0 5 10
1/8" = 1'-0"



NOTE(S):

1. REBALANCE EXISTING HOT WATER REHEAT COIL FLOW TO INDICATED REQUIREMENTS.
2. NEW HWS/R TO NEW DUCT HTG. COIL OR NEW VAV BOX. BALANCE REHEAT COIL TO INDICATED REQUIREMENTS.
3. NEW HOT WATER SUPPLY & RETURN TO NEW AHU. NEW PIPE AND ROOF PENETRATION AT EACH COIL.

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US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

TASK ORDER #: FRR004

VANGUARD PADUCAH, KENTUCKY VOICE 270-442-8620

I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400

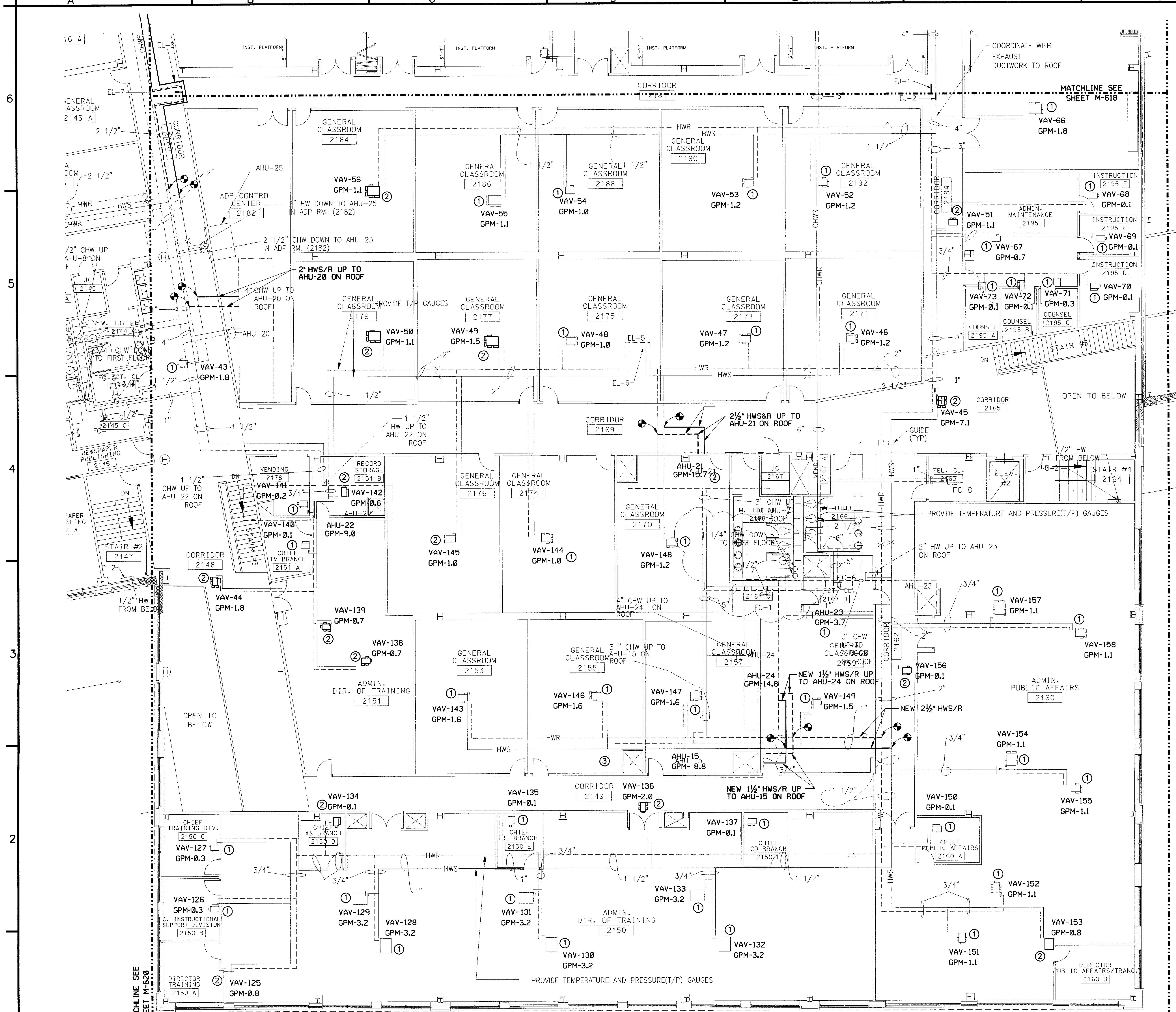
Checked by: WTT	Date: 02/27/04
Dwn by: ICT	CADD File Name: 3121M618.DGN
DACA87-03-D-0006	ICT Project No. 203121
Approved by:	Plot date: 02/27/04
Chief, Prj. Mgmt. Division	Plot scale:

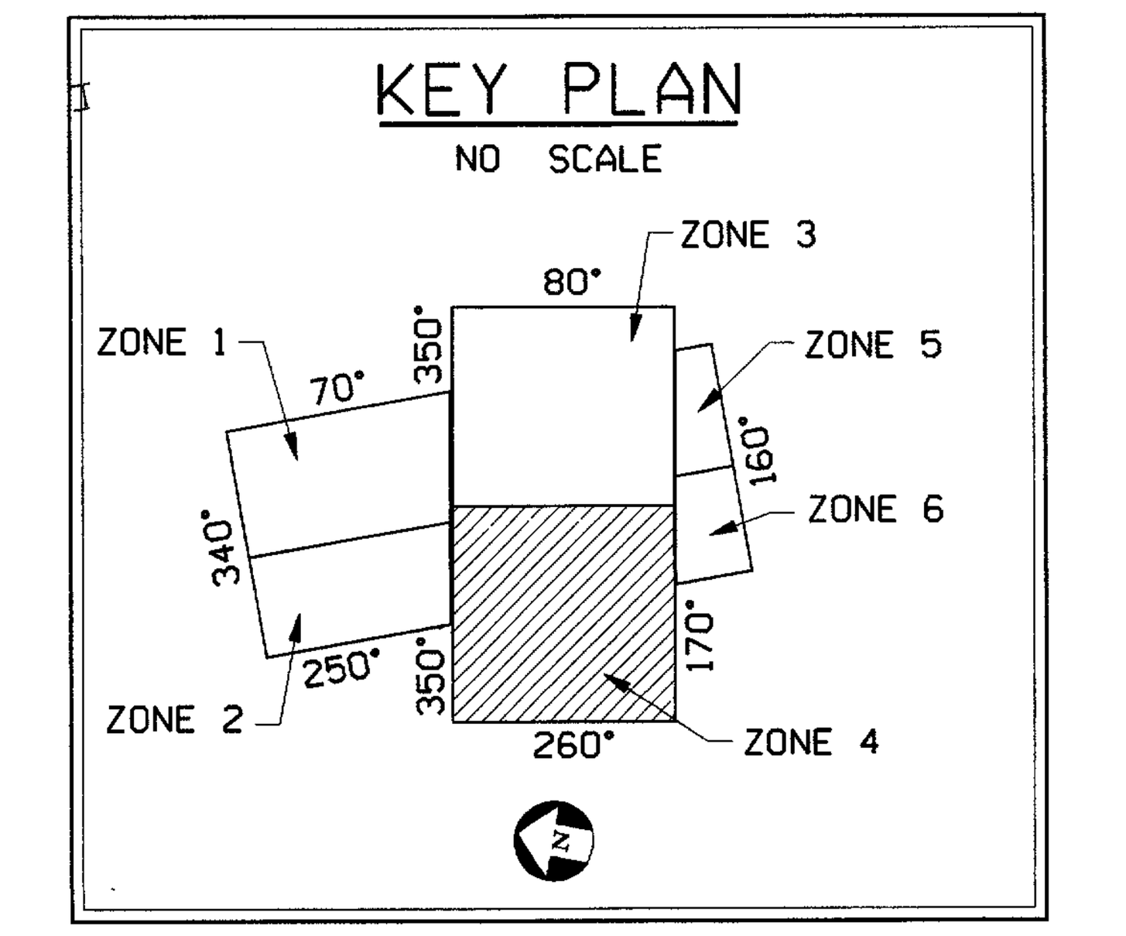
DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND

ZONE 3 - 2nd FLOOR HW PIPING

Sheet reference number:

M-618





NOTE(S):

① REBALANCE EXISTING HOT WATER REHEAT COIL FLOW TO INDICATED REQUIREMENTS.

② NEW HWS/R TO NEW DUCT HTG. COIL OR NEW VAV BOX. BALANCE REHEAT COIL TO INDICATED REQUIREMENTS.

③ NEW HOT WATER SUPPLY & RETURN TO NEW AHU. NEW PIPE AND ROOF PENETRATION AT EACH COIL.

ZONE No. 4 - 2nd FLOOR HVAC PIPING

0 5 10
⅛" = 1'-0"

NOTE(S):

① REBALANCE HW FLOW TO VAV REHEAT COIL. SEE SCHEDULE FOR REQUIREMENTS.

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US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

TASK ORDER #: FRR004
PADUCAH, KENTUCKY VOICE 270-442-8620
I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400

Checked by: WTT | Date: 02/27/04
Dwn by: ICT | CADD File Name: 312M619.DGN
DACA87-03-D-0006 | ICT Project No. 203121
Approved by: | Plot date: 02/27/04
Chief, Prj. Mgmt. Division | Plot scale:

DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND
ZONE 4 - 2nd FLOOR HW PIPING

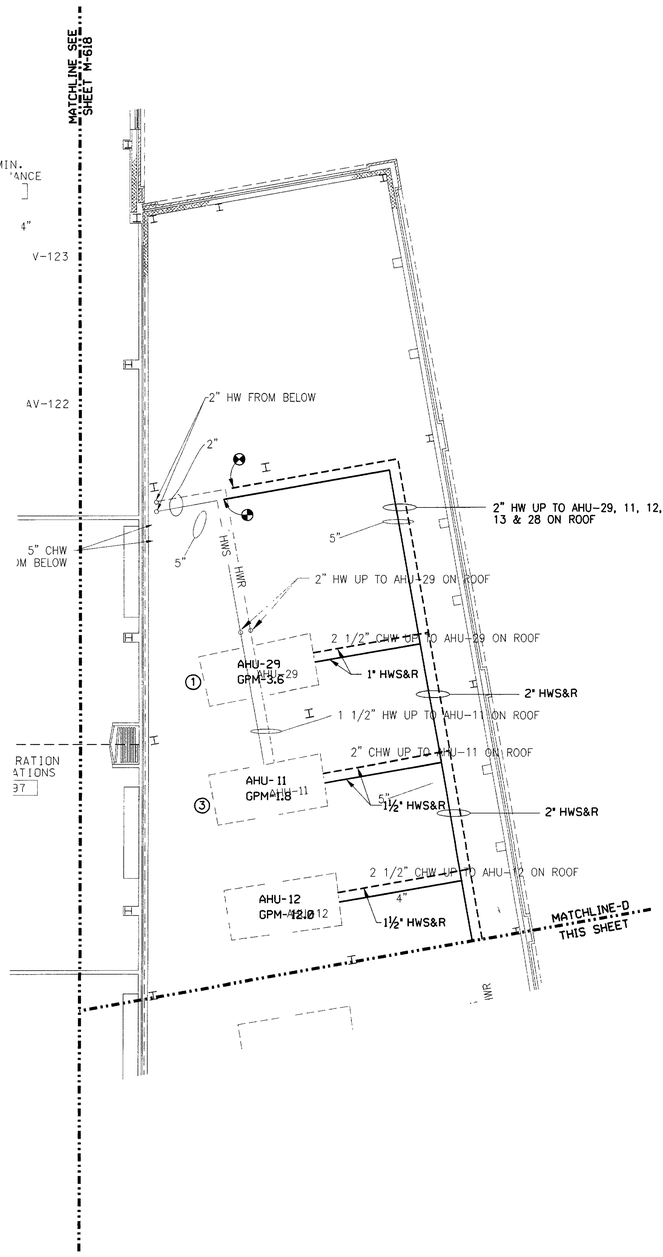
Sheet reference number: M-619

NOTE(S):

① REBALANCE EXISTING HOT WATER REHEAT COIL FLOW TO INDICATED REQUIREMENTS.

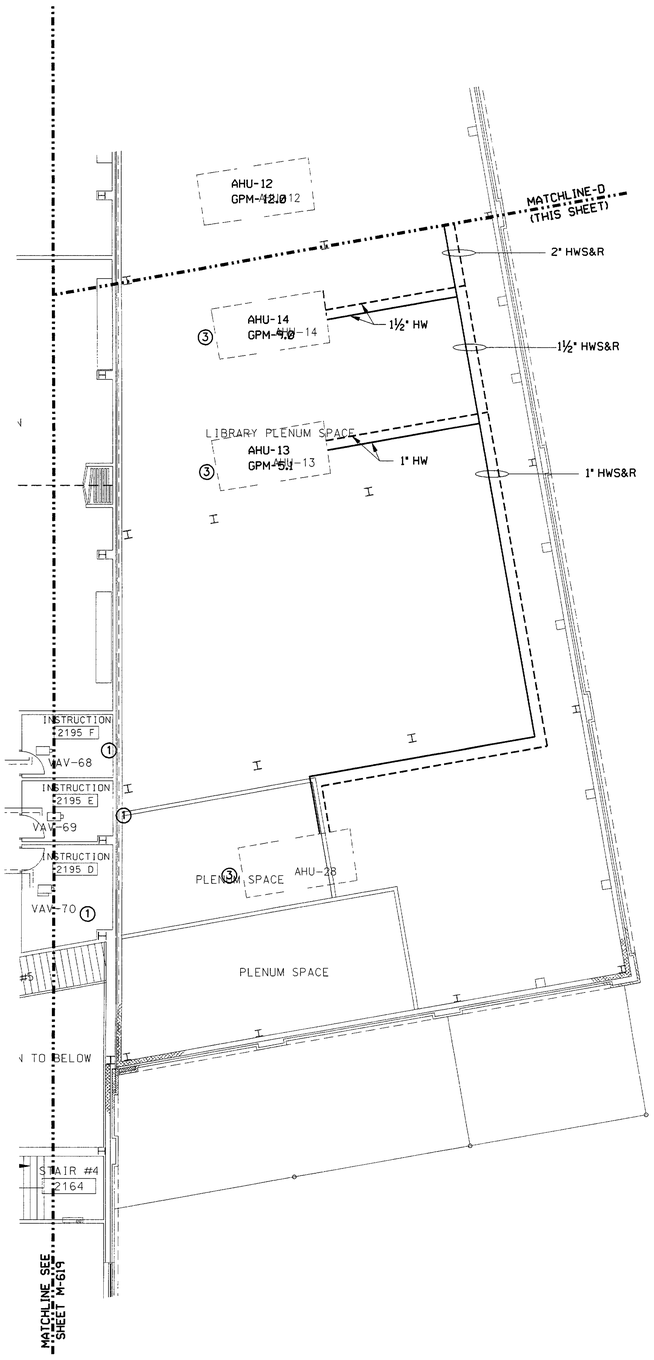
② NEW HWS/R TO NEW DUCT HTG. COIL OR NEW VAV BOX. BALANCE REHEAT COIL TO INDICATED REQUIREMENTS.

③ NEW HOT WATER SUPPLY & RETURN TO NEW AHU. NEW PIPE AND ROOF PENETRATION AT EACH COIL.



ZONE No. 5 - 2nd FLOOR HVAC PIPING

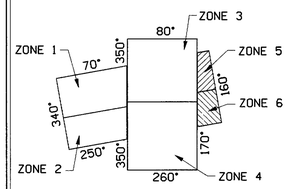
0 5 10
1/8" = 1'-0"



ZONE No. 6 - 2nd FLOOR HVAC PIPING

0 5 10
1/8" = 1'-0"

KEY PLAN
NO SCALE



US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Date: 02/27/04
Checked by: WTT
CADD File Name: 312M620.DGN
Dwn by: ICT
ICT Project No. 20312
DACA87-03-D-0006
Plot date: 02/27/04
Approved by:
Plot scale:
Chief, Prj. Mgmt. Division

TASK ORDER #: FRR004
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VANGUARD
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NASHVILLE, TENNESSEE
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ICT

DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND
ZONE 5 & 6 - 2nd FLOOR HW PIPING

STATE OF MARYLAND
WILLIAM T. TAYLOR
MECHANICAL ENGINEER

Sheet reference number:
M-620

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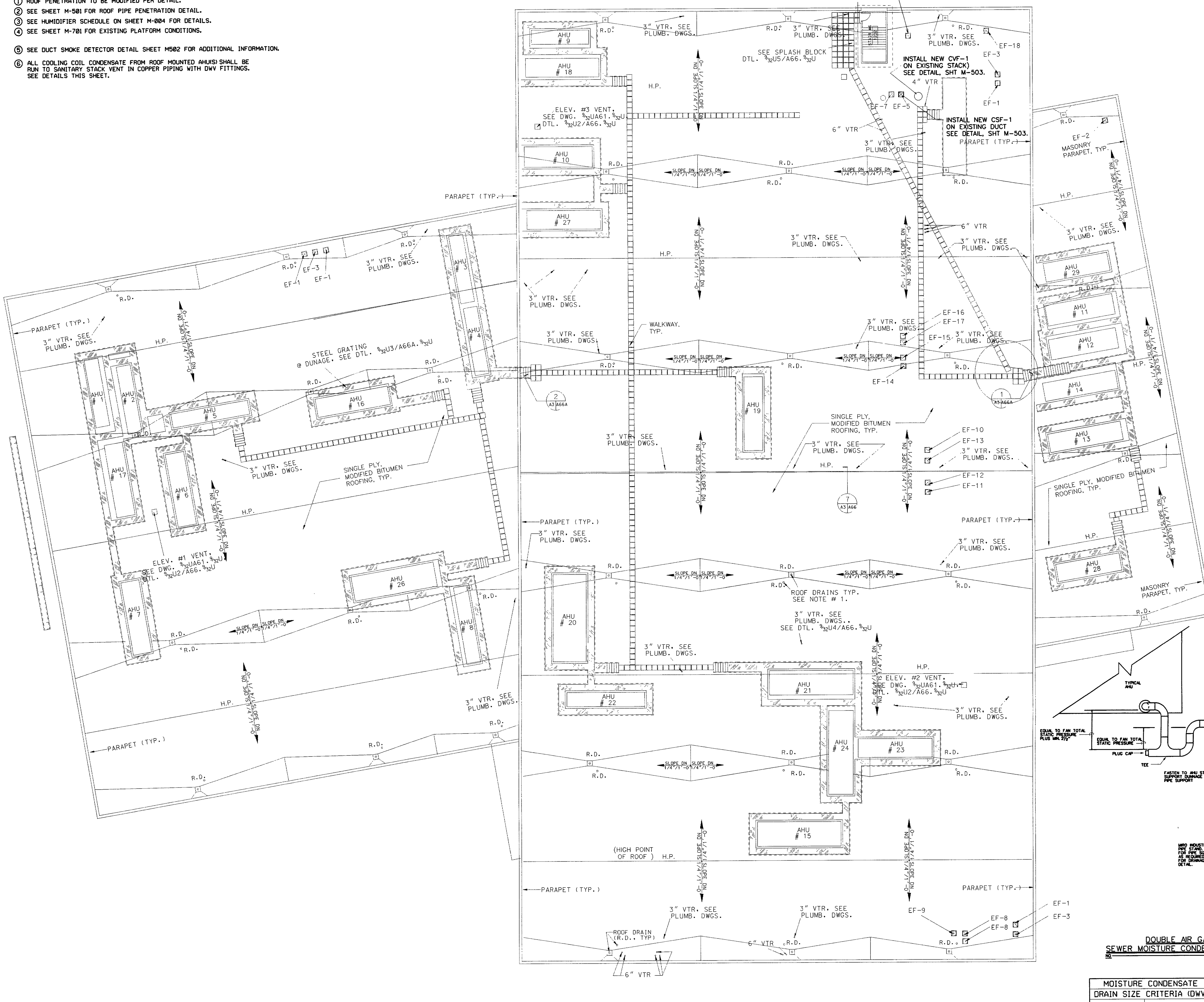
NOTES:

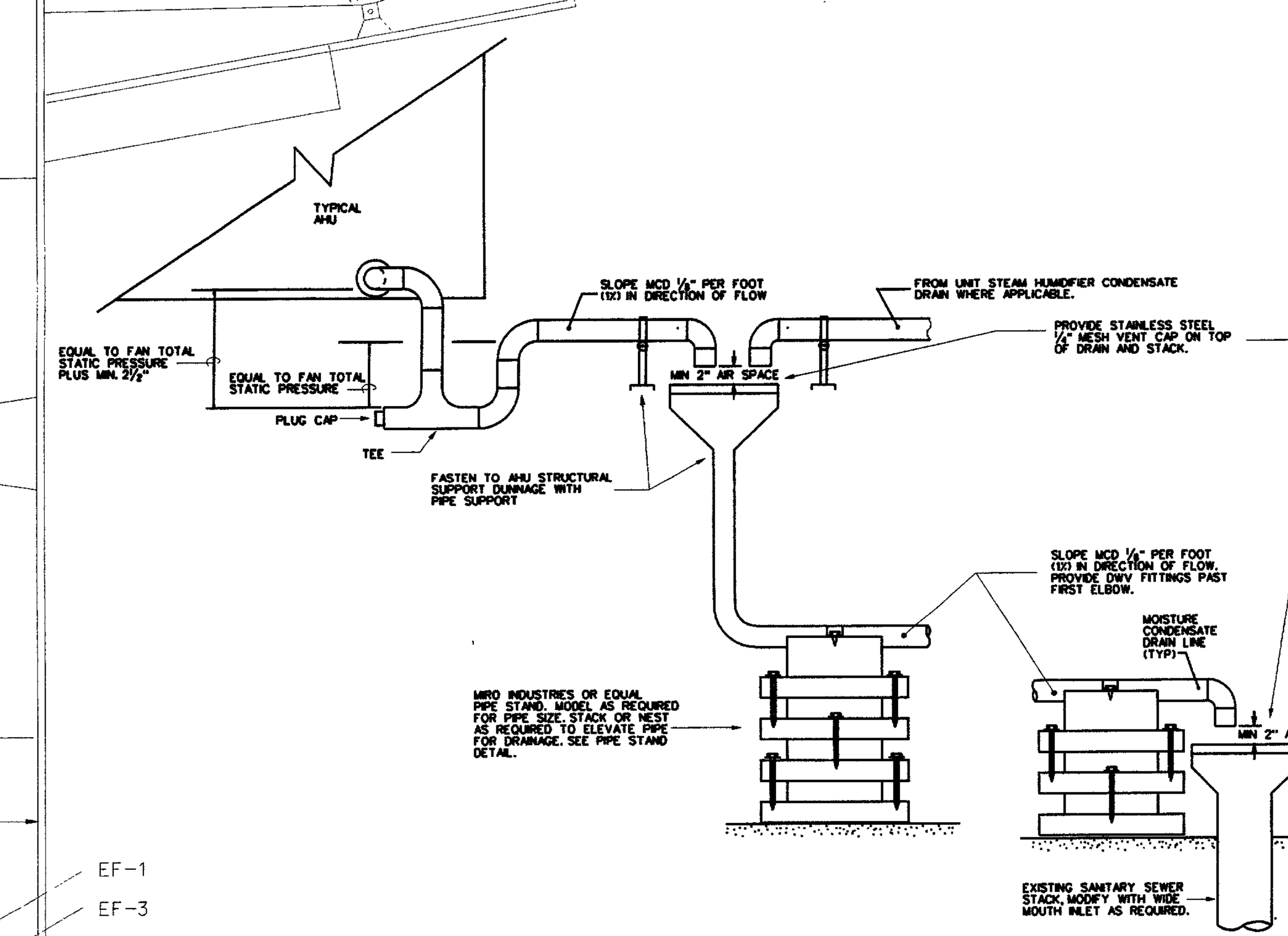
SEE SHEET M-004, AHU SCHEDULE, FOR ADDITIONAL INFORMATION. ALL NEW AHU WILL HAVE ELECTRICAL MODIFICATIONS. SEE SHEET E-701 FOR DETAILS.

1. ROOF PENETRATION TO BE MODIFIED PER DETAIL.
2. SEE SHEET M-501 FOR ROOF PIPE PENETRATION DETAIL.
3. SEE HUMIDIFIER SCHEDULE ON SHEET M-004 FOR DETAILS.
4. SEE SHEET M-701 FOR EXISTING PLATFORM CONDITIONS.
5. SEE DUCT SMOKE DETECTOR DETAIL SHEET M502 FOR ADDITIONAL INFORMATION.
6. ALL COOLING COIL CONDENSATE FROM ROOF MOUNTED AHU(S) SHALL BE RUN TO SANITARY STACK VENT IN COPPER PIPING WITH DWV FITTINGS. SEE DETAILS THIS SHEET.



EXISTING AHU ROOF PLAN

1/16" = 1'-0"



DOUBLE AIR GAP SANITARY SEWER MOISTURE CONDENSATE DRAIN SYSTEM

MOISTURE CONDENSATE DRAIN SIZE CRITERIA (DWV)	
COPPER DIRECT WASTE AND VENT PIPE SIZE	INDIVIDUAL OR MANIFOLDED CAPACITY CONNECTED (TONS)
1"	< 5
1¼"	=> 5 & < 30
1½"	=> 30 & < 50
2"	=> 50 & < 170
3"	=> 170 & < 300
4"	=> 300 & < 430
5"	=> 430 & < 675
--	---

1. MCD SHALL SLOPE 1% IN DIRECTION OF FLOW.

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US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

TASK ORDER #: FRR004

VANGUARD — PADUCAH, KENTUCKY VOICE 270-442-8620

I.C. Thomasson Associates, Inc. — NASHVILLE, TENNESSEE PHONE (615) 346-3400

Checked by: WTT | Date: 02/27/04
Dwn by: ICT | CADD File Name: 3121M700
DACA87-03-D-0006 | ICT Project No. 203121
Approved by: | Plot date: 02/27/04
Chief, Prj. Mgmt. Division | Plot scale:

DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND

ROOF PLAN - EXIST. AHU AND DRAIN LOCATION

Sheet reference number: M-700

GENERAL NOTES:

1. PLATFORMS ARE EXISTING TO REMAIN. EACH PLATFORM SHALL SUPPORT THE NEW AHU WITH A MINIMUM OF 3 CROSS MEMBERS. MAXIMUM LOAD ON EACH MEMBER SHALL NOT EXCEED 8 KIPS.
2. AHU TO HAVE ACCESS SECTIONS ADDED TO EXTEND UNIT TO ENABLE EXISTING SUPPLY AND RETURN DUCT ROOF PENETRATIONS TO BE UTILIZED IF NEW UNIT IS SHORTER THAN EXISTING.
3. REPLACE AHU SHOWN AS NEW. SEE AHU SCHEDULE FOR DETAILS.
4. REBALANCE AHU. SEE SCHEDULE FOR DETAILS.
5. SEE DETAILS FOR UNITS THAT ARE LONGER THAN EXISTING UNITS. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS.

ROOF PLAN AND AHU LOCATIONS

1/16" = 1'-0"

TYPICAL AHU CONNECTION DETAIL

FOR AHU-5, 10, 11, 14, 16, 21 & 28

LENGTH (FT)				
AHU	SUPPLY OR RETURN	LENGTH (FT)	WIDTH (FT)	EXISTING DUCT SIZE
6	RETURN	6	4	44"x20"
12	RETURN	5	5	39" DIA.
13	RETURN	5	5	45" DIA.

TYPICAL PLENUM DETAIL

FOR AHU-6, 12 & 13

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US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Checked by: WTT
Dwn by: ICT
DAC-A87-03-D-0006
Approved by:
Chief, Prj. Mgmt. Division
Date: 02/27/04
CADD File Name: 312M7101
ICT Project No. 203121
Plot date: 02/27/04
Plot scale:

TASK ORDER #1 FRR004

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ICT

DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND

ROOF PLAN - MECHANICAL PLATFORM LOCATION

STATE OF MARYLAND — MECHANICAL ENGINEER

Sheet reference number:
M-701

DDC CONTROL POINT SCHEDULE

PANEL DESIGNATION: CHILLED WATER, CONDENSER WATER, & ICE BUILDING

FT. MEADE, DINFOS

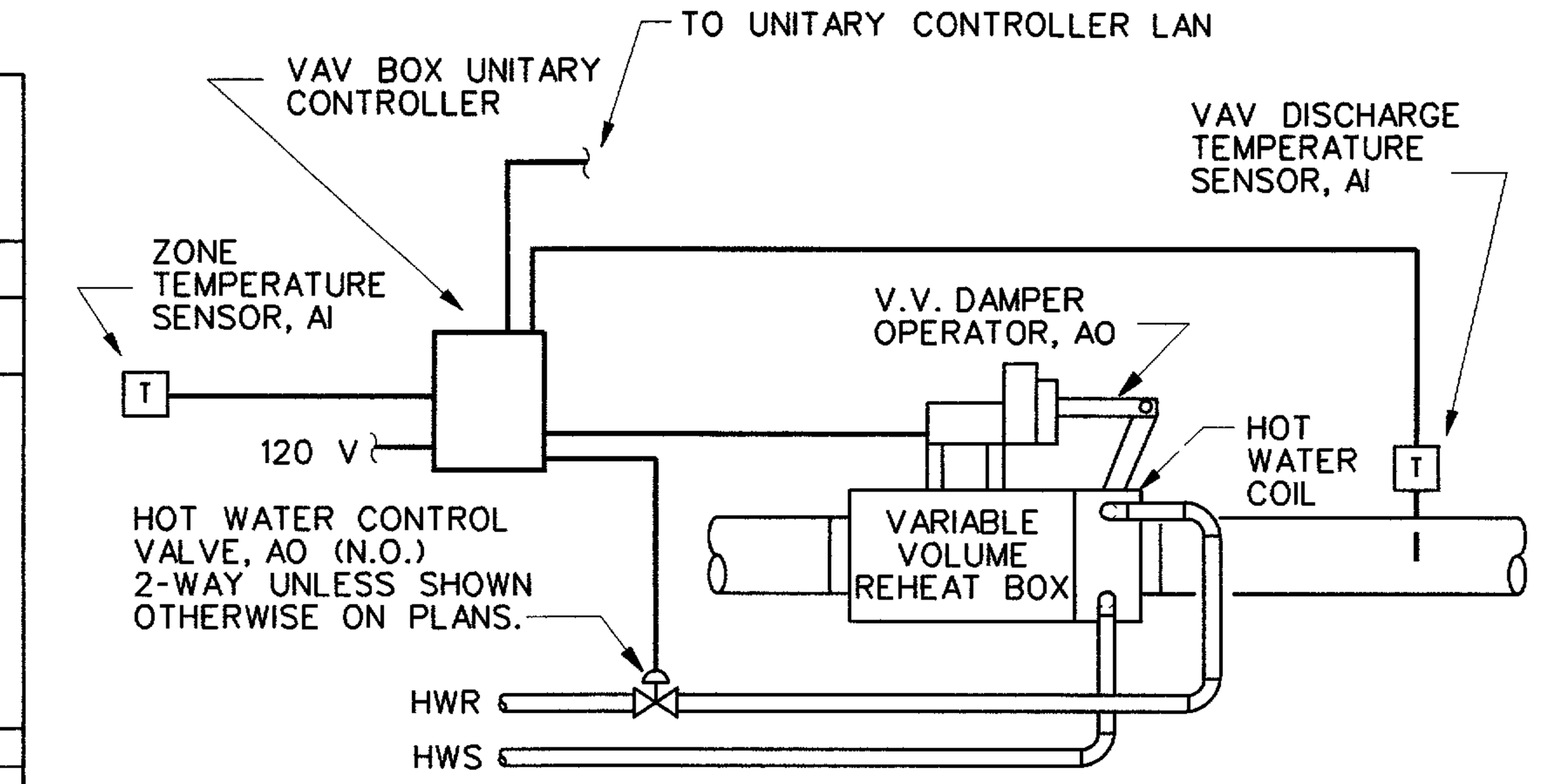
INPUTS

PANEL DESIGNATION	ANALOG – MEASURED										ANALOG – CALC.						DIGITAL								
	TEMPERATURE	PRESSURE	RH	AIR FLOW	AIR QUALITY	KW	WATER FLOW	VOLTAGE	STEAM FLOW lbs./hr.	ICE LEVEL	KWH	ENTHALPY	RUN TIME	EFFICIENCY	SYS. CAP. (TONS)	BACNET INTERFACE	STATUS	FILTER	SMOKE	LOW TEMP.	AIR FLOW	METER	CURRENT SWITCH	FIRE ALARM	PRESSURE
CHILLERS:																									
CH-1 W/GATEWAY	X					X							X	X	X	X	X								
CH-2 W/GATEWAY	X					X							X	X	X	X	X								
CH-3 W/GATEWAY	X					X							X	X	X	X	X								
CH-4 W/GATEWAY	X					X							X	X	X	X	X								
CH-1 START/STOP																									
CH-2 START/STOP																									
CH-3 START/STOP																									
CH-4 START/STOP																									
CHILLED WATER SYSTEM:																									
PRIMARY PUMP P-1 START/STOP																									
PRIMARY PUMP P-2 START/STOP																									
PRIMARY PUMP P-3 START/STOP																									
PRIMARY PUMP P-11 START/STOP																									
PRIMARY PUMP P-12 START/STOP																									
PRIMARY PUMP P-1 STATUS																	X								
PRIMARY PUMP P-2 STATUS																	X								
PRIMARY PUMP P-3 STATUS																	X								
PRIMARY PUMP P-11 STATUS																	X								
SECONDARY PUMP P-7 VFD																X									
SECONDARY PUMP P-8 VFD																X									
SECONDARY PUMP P-7 STATUS																	X								
SECONDARY PUMP P-8 STATUS																	X								
CHILLED WTR DIFF. PRESS. (1 LOCATION)		X																							
SECONDARY CHWR TEMP. (SYS)	X														X										
SECONDARY CHWS TEMP. (SYS)	X														X										
ENTERING THERMAL STOR. RETURN WATER TEMP.	X																								
LEAVING THERMAL STOR. SUPPLY WATER TEMP.	X																								
ENTERING WATER TEMP. (CH-1)	X															X									
LEAVING WATER TEMP. (CH-1)	X															X									
ENTERING WATER TEMP. (CH-2)	X															X									
LEAVING WATER TEMP. (CH-2)	X															X									
ENTERING WATER TEMP. (CH-3)	X															X									
LEAVING WATER TEMP. (CH-3)	X															X									
ENTERING WATER TEMP. (CH-4)	X															X									
LEAVING WATER TEMP. (CH-4)	X															X									
PRIMARY CHILLED WTR TEMP.	X																								
DECOUPLE CHILLED WTR TEMP.	X																								
SECONDARY CHILLED WTR FLOW							X								X										
PRIMARY LOOP CHILLED WTR TONS															X	X									
ISOLATION VALVE V-10																									
TEMP. CONTROL VALVE V-14																									
CALMAC ICE LEVEL INDICATOR										X															
ISOLATION VALVE V-12, V-13																									
CONDENSER WATER SYSTEM:																									
COND. WTR. PUMP P-4 START/STOP																									
COND. WTR. PUMP P-5 START/STOP																									
COND. WTR. PUMP P-6 START/STOP																									
CONDENSER WTR. PUMP P-4 STATUS																	X								
CONDENSER WTR. PUMP P-5 STATUS																	X								
CONDENSER WTR. PUMP P-6 STATUS																	X								
ENTERING COND. WTR.TEMP. (CH-1, -2, -3)	X																								
LEAVING COND. WTR.TEMP. (CH-1, -2, -3)	X																								
CT-1 - TWO SPEED																									
CT-2 - TWO SPEED																									
CT-3 - TWO SPEED																									
COND WATER BYPASS VALVE V-20																									
ISOLATION VALVE V-21, V-22, V-23																									

OUTPUTS / SYSTEM FEATURES

PANEL DESIGNATION	OUTPUTS – DIGITAL					OUTPUTS – ANALOG				SYSTEM FEATURES – ALARMS						SYSTEM FEATURES – PROGRAMS							
	ON-OFF	OFF-AUTO-ON	OFF-HIGH-LOW	OPEN-CLOSE	2-POSITION VALVES	DAMPER POSI.	VALVE POSI.	SET POINT ADJ.	4-20 mA	HI ANALOG	LOW ANALOG	HI BINARY	LOW BINARY	BINARY	PROOF	TIME SCHEDULING	DEMAND LIMITING	START/STOP OPTIM.	SPEED CONTROL	HOT WATER RESET	ALARM INSTRUCTION	LEAD/ LAG CONTROL	ICE BUILDING
CHILLERS:																							
CH-1 W/GATEWAY	X															X	X	X				X	
CH-2 W/GATEWAY	X															X	X	X				X	
CH-3 W/GATEWAY	X															X	X	X				X	
CH-4 W/GATEWAY	X															X		X					X
CH-1 START/STOP	X																					X	
CH-2 START/STOP	X																					X	
CH-3 START/STOP	X																					X	
CH-4 START/STOP	X																						X
CHILLED WATER SYSTEM:																							
PRIMARY PUMP P-1 START/STOP	X																						
PRIMARY PUMP P-2 START/STOP	X																						
PRIMARY PUMP P-3 START/STOP	X																						
PRIMARY PUMP P-11 START/STOP	X																					X	
PRIMARY PUMP P-12 START/STOP	X																					X	
PRIMARY PUMP P-1 STATUS																							
PRIMARY PUMP P-2 STATUS																							
PRIMARY PUMP P-3 STATUS																							
PRIMARY PUMP P-11 STATUS																							
SECONDARY PUMP P-7 VFD	X								X										X				
SECONDARY PUMP P-8 VFD	X								X										X				
SECONDARY PUMP P-7 STATUS																							
SECONDARY PUMP P-8 STATUS																							
CHILLED WTR DIFF. PRESS. (1 LOCATION)																							
SECONDARY CHWR TEMP. (SYS)																							
SECONDARY CHWS TEMP. (SYS)																							
ENTERING THERMAL STOR. RETURN WATER TEMP.																							
LEAVING THERMAL STOR. SUPPLY WATER TEMP.																							
ENTERING WATER TEMP. (CH-1)																							
LEAVING WATER TEMP. (CH-1)																							
ENTERING WATER TEMP. (CH-2)																							
LEAVING WATER TEMP. (CH-2)																							
ENTERING WATER TEMP. (CH-3)																							
LEAVING WATER TEMP. (CH-3)																							
ENTERING WATER TEMP. (CH-4)																							
LEAVING WATER TEMP. (CH-4)																							
PRIMARY CHILLED WTR TEMP.																							
DECOUPLE CHILLED WTR TEMP.																							
SECONDARY CHILLED WTR FLOW																							
PRIMARY LOOP CHILLED WTR TONS																							
ISOLATION VALVE V-10					X																	X	
TEMP. CONTROL VALVE V-14							X		X														
CALMAC ICE LEVEL INDICATOR																						X	
ISOLATION VALVE V-12, V-13					X																	X	
CONDENSER WATER SYSTEM:																							
COND. WTR. PUMP P-4 START/STOP	X																						
COND. WTR. PUMP P-5 START/STOP	X																						
COND. WTR. PUMP P-6 START/STOP	X																						
CONDENSER WTR. PUMP P-4 STATUS																							
CONDENSER WTR. PUMP P-5 STATUS																							
CONDENSER WTR. PUMP P-6 STATUS																							
ENTERING COND. WTR.TEMP. (CH-1, -2, -3)																							
LEAVING COND. WTR.TEMP. (CH-1, -2, -3)																							
CT-1 - TWO SPEED			X						X										X				
CT-2 - TWO SPEED			X						X										X				
CT-3 - TWO SPEED			X						X										X				
COND WATER BYPASS VALVE V-20									X														
ISOLATION VALVE V-21, V-22, V-23					X																		

NOTE: PROVIDE DYNAMIC GRAPHIC REPRESENTATIVE OF EACH PIECE OF EQUIPMENT.



TYPICAL NEW & EXISTING VARIABLE VOLUME REHEAT BOX CONTROL

NOTES:

1. EXISTING BOXES SHALL HAVE VAV DISCHARGE TEMPERATURE SENSOR ADDED (ALL OTHER DEVICES ARE EXISTING).
2. SEE VAV SCHEDULE FOR MAXIMUM DISCHARGE AIR TEMPERATURES.

TYPICAL VARIABLE VOLUME

SEQUENCE OF OPERATION

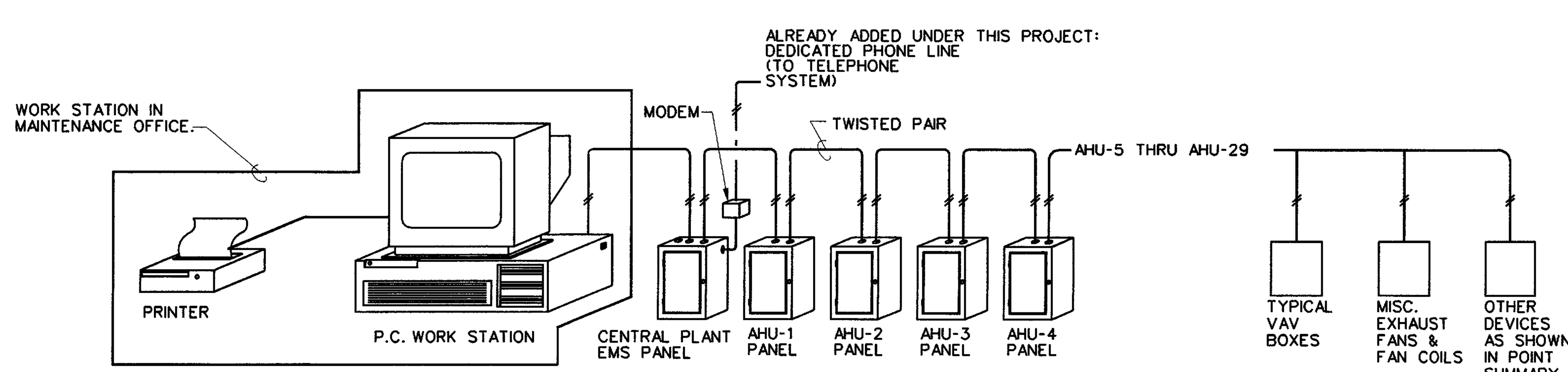
1. BOX STATUS (OCCUPIED/UNOCCUPIED): THE VARIABLE AIR VOLUME REHEAT BOX WILL HAVE TWO STATES OF OPERATION. DURING THE OCCUPIED MODE WHEN THE DEVICE IS SCHEDULED OR IN THE UNOCCUPIED MODE WHEN THE DEVICE IS SCHEDULED FOR OPTIMUM START OR NIGHT SETBACK (HEATING OR COOLING), IN EITHER CASE, THE DAMPER AND HOT WATER VALVE WILL BE ENABLED TO MAINTAIN THE SPACE TEMPERATURE SETPOINT. DURING THE UNOCCUPIED PERIODS, THE DAMPER WILL REMAIN AT THE MINIMUM (CFM) POSITION AND THE HOT WATER VALVE WILL REMAIN CLOSED EXCEPT TO SATISFY NIGHT SETBACK SETPOINTS OF 85°LAT (ADJUSTABLE) FROM APRIL TO SEPTEMBER AND 55°LAT (ADJUSTABLE) FROM OCTOBER TO MARCH.
2. DAMPER MODULATION: DURING THE OCCUPIED STATE, THE DDC CONTROLLER WILL MODULATE THE AIR VOLUME DAMPER BETWEEN MAXIMUM (CFM) AND MINIMUM (CFM) AIRFLOW. ON A RISE IN SPACE TEMPERATURE, AIRFLOW IS INCREASED FROM MINIMUM TO MAXIMUM. ON A DECREASE IN TEMPERATUE, AIRFLOW IS DECREASED FROM MAXIMUM TO MINIMUM.
3. REHEAT VALVE MODULATION: DURING THE OCCUPIED STATE, THE DDC CONTROLLER WILL MODULATE THE HOT WATER CONTROL VALVE BETWEEN FULLY OPEN AND CLOSED POSITION. ON A RISE IN TEMPERATURE, THE HOT WATER VALVE MODULATES FROM FULLY OPEN TO CLOSED AND SEQUENTIAL DAMPER MODULATION BEGINS. ON A DROP IN SPACE TEMPERATURE, ONCE THE AIR DAMPER IS AT A MINIMUM (CFM) POSITION, THE DDC CONTROLLER WILL MODULATE THE HOT WATER VALVE FROM CLOSED TO FULLY OPEN.
4. HEATING AND COOLING REQUESTS: ANY VARIABLE AIR VOLUME BOX MAY INITIATE A REQUEST TO ITS RESPECTIVE AIR HANDLING UNIT FOR HEATING OR COOLING, DURING THE UNOCCUPIED STATE WHEN AIR IS REQUIRED FOR OPTIMUM START OR NIGHT SETBACK (HEATING OR COOLING), THE AIR HANDLING UNIT WILL START TO SATISFY THE ZONE SERVED BY THE VARIABLE AIR VOLUME BOX. IN ADDITION, EACH DEVICE WILL BE ABLE TO REQUEST THE RESPECTIVE HEAT SOURCE (HOT WATER PUMPS/BOILER) DURING THIS UNOCCUPIED STATE.

PANEL DESIGNATION FT. MEADE, DINFOS — LOCATION: VAV BOX CONTROLS	HARDWARE – OUTPUT (O) – DIGITAL			HARDWARE – OUTPUT (O) – ANALOG			HARDWARE – INPUT (T,D,V,C) – DIGITAL					HARDWARE – INPUT (T,D,V,C) – ANALOG					SOFTWARE – ALARMS – DIGITAL		SOFTWARE – ALARMS – ANALOG			SOFTWARE – HARDWARE											
POINT DESCRIPTION	Control Relay	Solenoid	Contactor	Pneumatic Transducer	Electrical Transducer	4-20MA Module	Pressure Switch	Flow Switch	Switch Closure	Auxiliary Contact	KW	Temperature	Relative Humidity	PSIg, PSIa, PSId	Position	Flow	Equipment Status	Maintenance	High Limit	Low Limit	Run Time	Scheduled Start/Stop	Optimum Start/Stop	Duty Cycling	Demand Limiting	Night Setback	Economizer	Ventilation/Recirculation	Temperature Control	Hot Water Reset	Chiller Optimization	Chilled Water Reset	Position
ZONE TEMPERATURE												●							●	●						●							
VAV DISCHARGE TEMP.												●							●	●						●							
FLOW (CFM)																●			●	●													
CONTROL OUTPUT-DAMPER						●																							●				●
CONTROL OUTPUT-VALVE						●																							●				●
UNIT ENABLE/DISABLE	●																					●	●										
UNIT STATUS									●								●																

NOTE: PROVIDE DYNAMIC GRAPHIC REPRESENTATIVE OF EACH PIECE OF EQUIPMENT

INTERLOCK SCHEDULE

ENERGIZE EXHAUST FAN	SERVING	WHEN AHU MIN. OSA DAMPER(S) ARE OPEN ON AHU(S)
EF-1A	TOILETS (1108-1110) & (2104-2106)	AHU-6 & AHU-26
EF-1B	TOILETS (1136-1138) & (2142-2144)	AHU-6 & AHU-26
EF-1C	TOILETS (1206-1208) &(2226-2228)	AHU-10 & AHU-19
EF-1D	TOILETS (1166-1168) & (2166-2168)	AHU-21 & AHU-20
EF-2	TOILET 1163	AHU-28
EF-3A	EQUIPMENT ROOM 1165	AHU-21
EF-3B	EQUIPMENT ROOM 1112	AHU-6
EF-3C	EQUIPMENT ROOM 1216	AHU-9
EF-8A	VERSAMAT 1148	AHU-15
EF-8B	VERSAMAT 1146	AHU-15
EF-9	APPLIED IMAGERY	AHU-15
EF-10	COLOR PRINTING (1175, 1177A,B, C, & D, & 1172)	AHU-21
EF-11	AUTOMATIC COLOR FINISHING (1178, 1186)	AHU-14
EF-12	B & W PRINT FINISHING (1179A, 1188, 1190)	AHU-13 & AHU-14
EF-13	B & W PRINTING AUTOMATIC (1194, 1196)	AHU-13
EF-14	CORRIDOR 1197	AHU-10
EF-15	PROCESSING LAB (1185, 1187, 1189, 1191, 1193)	AHU-12
EF-16	LOGISTICS SUPPLY & PHOTO EQUIPT MAINT (1205, 1212C)	AHU-10
EF-17	MACHINE SHOP (1201) & PROCESS MAINT LAB (1198, 1199)	AHU-10 & AHU-29
EF-18	DEMO WORKSTATIONS (2196, 2197) & TRANS. LAB (2205)	AHU-19 & AHU-20



EXISTING ANDOVER ENERGY MANAGEMENT SYSTEM NETWORK WIRING SCHEMATIC

EXISTING ANDOVER CONTROL SYSTEM:

1. REUSE AS MUCH OF THE EXISTING SYSTEM AS POSSIBLE.
2. ALL VALVE AND DAMPER ACTUATORS SERVING NEW AND EXISTING ROOF MOUNTED AHU(S) SHALL BE ALL ELECTRIC. CAP EXISTING PNEUMATIC LINES WHERE APPLICALBE.
3. EXISTING VALVE ACUTATORS LOCATED IN MAIN MECHANICAL ROOM UNTOUCHED BY THIS UPGRADE SHALL REMAIN PNUMATIC.

LEGEND

▲	LOCATE PILOT LGT IN STARTER COVER
▲▲	LOCATE PILOT LGT IN LOCAL CONTROL PANEL
AO	ANALOG OUTPUT
AI	ANALOG INPUT
DO	DIGITAL OUTPUT
DI	DIGITAL INPUT
NO	NORMALLY OPEN
NC	NORMALLY CLOSED

THESE DOCUMENTS HAVE BEEN PREPARED PRIMARILY BASED ON INFORMATION PROVIDED BY OTHERS. I.C. THOMASSON HAS NOT VERIFIED THE ACCURACY OF ALL INFORMATION PROVIDED BY OTHERS. SEE LIMIT OF LIAIBILITIES STATEMENT ON COVER SHEET.

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Symbol	Description	Date	Appr.

TASK ORDER #: FRR004

VANGUARD — PADUCAH, KENTUCKY VOICE 270-442-8620

ICT — I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400

Checked by: WTT | Date: 02/27/04

Dwn by: ICT | CADD File Name: 3121M801.DGN

DACA87-03-D-0006 | ICT Project No. 203121

Approved by: | Plot date: 02/27/04

Chief, Prj. Mgmt. Division | Plot scale:

DEFENSE INFORMATION SCHOOL

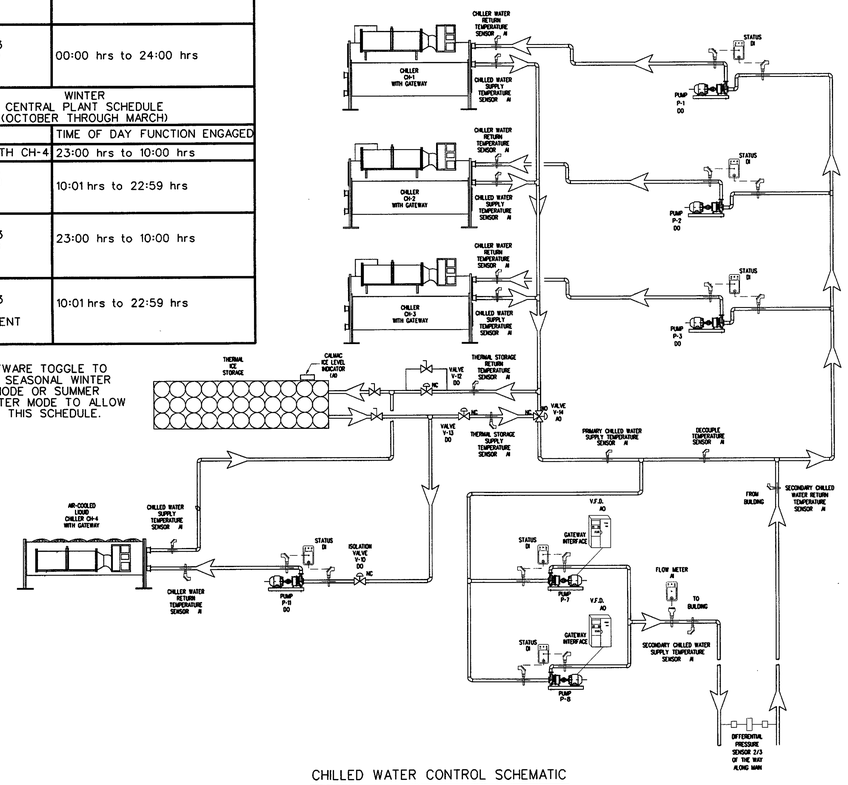
FT. MEADE MARYLAND

VAV CONTROLS

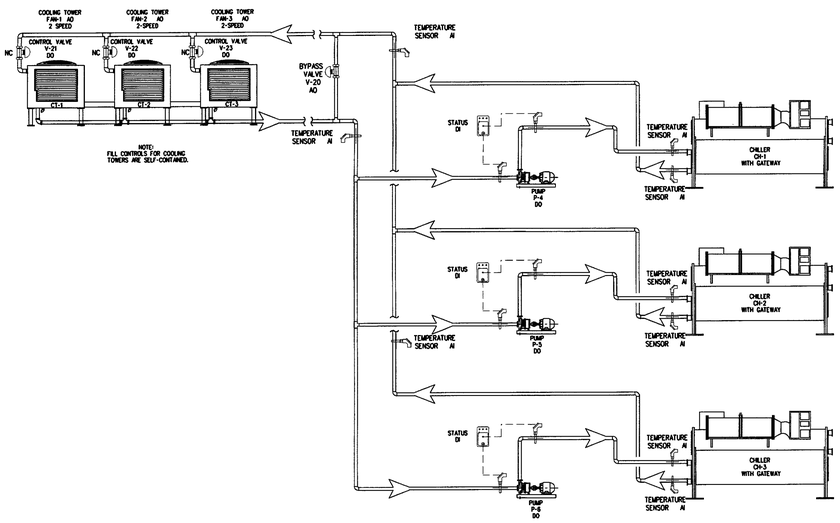
Sheet reference number: M-800

SUMMER CENTRAL PLANT SCHEDULE (APRIL THROUGH SEPTEMBER)	
FUNCTION	TIME OF DAY FUNCTION ENGAGED
BUILD ICE WITH CH-4	23:00 hrs to 10:00 hrs
MELT ICE AS REQUIRED TO SUPPLEMENT CH-1, CH-2 & CH-3	10:01 hrs to 22:59 hrs
STAGE CH-1, CH-2 & CH-3 AS REQUIRED TO SATISFY BLDG. LOAD	00:00 hrs to 24:00 hrs
WINTER CENTRAL PLANT SCHEDULE (OCTOBER THROUGH MARCH)	
FUNCTION	TIME OF DAY FUNCTION ENGAGED
BUILD ICE WITH CH-4	23:00 hrs to 10:00 hrs
MELT ICE AS REQUIRED TO TO SATISFY BLDG. LOAD	10:01 hrs to 22:59 hrs
STAGE CH-1, CH-2 & CH-3 AS REQUIRED TO SATISFY BLDG. LOAD	23:00 hrs to 10:00 hrs
STAGE CH-1, CH-2 & CH-3 AS REQUIRED TO SUPPLEMENT ICE MELTING	10:01 hrs to 22:59 hrs

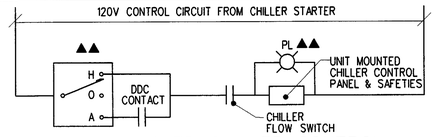
PROVIDE SOFTWARE TOGGLE TO SWITCH FROM SEASONAL WINTER TO SUMMER MODE OR SUMMER MODE TO WINTER MODE TO ALLOW OVER-RIDE OF THIS SCHEDULE.



CHILLED WATER CONTROL SCHEMATIC



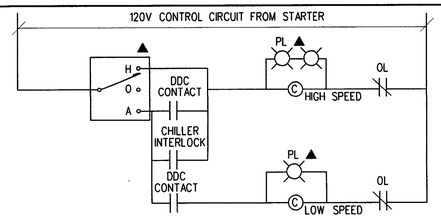
CONDENSER WATER CONTROL SCHEMATIC



AIR-COOLED CHILLER CONTROL

CH-4

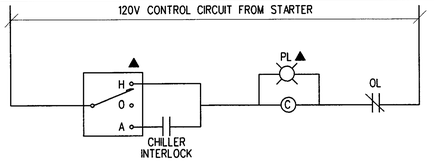
▲▲ UNIT MOUNTED



PRIMARY CHILLED WATER PUMP CONTROL

P-1, 2 & 3

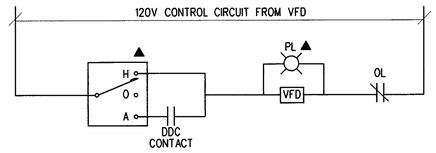
▲ STARTER MOUNTED



CONDENSER WATER PUMP CONTROL

P-4, 5 & 6

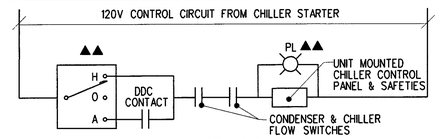
▲ STARTER MOUNTED



SECONDARY CHILLED WATER PUMP CONTROL

P-7 & 8

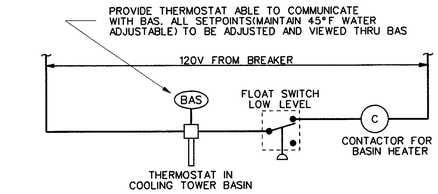
▲ STARTER MOUNTED



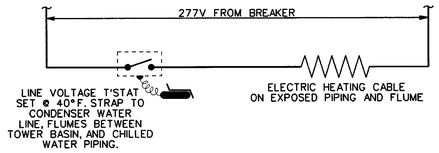
CHILLER CONTROL

CH-1, 2 & 3

▲▲ UNIT MOUNTED



COOLING TOWER FREEZE PROTECTION



HEAT TRACE

SEQUENCE OF OPERATION
CHILLERS, CHILLED WATER PUMPS, CONDENSER WATER PUMPS AND COOLING TOWERS

1. THE BUILDING IS SERVED BY THREE EXISTING ROTARY SCREW CHILLERS CH-1, CH-2, & CH-3. CHILLERS ARE CONTROLLED BY EXISTING UNIT-MOUNTED MICRO-PROCESSOR BASED CONTROLS WITH GATEWAY TO EXISTING ANDOVER DDC SYSTEM. EACH CHILLER IS PROVIDED WITH A DEDICATED PRIMARY CHILLED WATER PUMP (P-1, P-2 & P-3). SECONDARY CHILLED WATER PUMPS (P-7 & P-8) PROVIDE CAPACITY FOR DISTRIBUTION TO AIR-HANDLING UNITS THROUGH-OUT THE BUILDING.
2. CHILLERS ARE ENERGIZED THROUGH ACTION OF H-O-A SWITCH LOCATED IN RESPECTIVE CHILLER CONTROL PANEL WHEN IN HAND POSITION OR BY DDC SYSTEM WHEN IN AUTO POSITION TO MAINTAIN 40°F DISCHARGE SUPPLY TEMPERATURE (ADJ.). LEAD/LAG CONTROL OF CHILLERS IS ACCOMPLISHED BY THE DDC SYSTEM.
3. CHILLED WATER PRIMARY PUMP (P-1, P-2 OR P-3) IS ENERGIZED THROUGH ACTION OF H-O-A SWITCH LOCATED IN STARTER COVER WHEN IN HAND POSITION OR BY CHILLER INTERLOCK IN THE AUTO POSITION. ALSO IN THE AUTO POSITION, PUMPS MAY BE STARTED BY THE DDC SYSTEM AS REQUIRED IN THE MELT ICE MODE.
4. DDC SHALL CONTROL THE STAGING OF CHILLERS VIA CHILLER OPTIMIZATION SOFTWARE AS FOLLOWS:
   a. START AN ADDITIONAL CHILLER WHEN: a). THE BUILDING LOAD AS CALCULATED BY SECONDARY FLOW METER AND DELTA 'T' BETWEEN SECONDARY CHILLED WATER SUPPLY AND RETURN IS 90% (ADJ.) OF THE SUM OF THE DESIGN COOLING CAPACITY OF THE CHILLERS ONLINE FOR A PERIOD OF 10 MINUTES (ADJ.) AND b). DECOUPLE TEMPERATURE SENSOR INDICATES HIGHER TEMPERATURE THAN PRIMARY CHILLED WATER SUPPLY TEMPERATURE FOR 10 MINUTES.
   b. SUMMER MODE (SEE SCHEDULE) WHEN THE CALCULATED BUILDING LOAD IS 100% OF THE COMBINED CAPACITY OF CHILLERS (CH-1, CH-2 AND CH-3) FOR 10 MINUTES, ISOLATION VALVES V-12 AND V-13 SHALL OPEN AND CONTROL VALVE V-14 SHALL DIVERT FLOW TO THE ICE STORAGE SYSTEM AS REQUIRED TO MAINTAIN 40°F CHILLED WATER SUPPLY TO THE BUILDING AS DETERMINED BY TEMPERATURE SENSOR DOWNSTREAM OF V-14. IF THE CALCULATED BUILDING LOAD IS LESS THAN 95% OF THE COMBINED CAPACITY OF CHILLERS (CH-1, CH-2 AND CH-3) FOR 10 MINUTES, MODULATING VALVE V-14 SHALL CLOSE AND ISOLATION VALVES V-12 AND V-13 SHALL CLOSE.
   c. WINTER ICE MELT MODE: ENERGIZE TWO SPEED LEAD AND LAG PUMPS (P1, P-2 AND P-3) AS REQUIRED SUCH THAT PRIMARY LOOP FLOW (SUMMATION OF SCHEDULED LOW SPEED AND HIGH SPEED VALUES) EXCEEDS SECONDARY LOOP FLOW (MEASURED BY FLOW METER). VALVES V-12 AND V-13 SHALL OPEN AND VALVE V-14 SHALL MODULATE AS REQUIRED TO MAINTAIN PRIMARY CHILLED WATER TEMPER-ATURE OF 40°F. DDC SHALL START DESIGNATED LEAD CHILLER WHEN ICE LEVEL INDICATOR REPORTS LESS THAN 5% ICE LEVEL AND THERMAL STORAGE SUPPLY IS WITHIN 0.5°F OF THERMAL STORAGE RETURN TEMPERATURE.
   d. STOP THE LAG CHILLER MOST RECENTLY STARTED WHEN: a.) THE CALCULATED DIFFERENCE OF THE SUM OF THE COOLING CAPACITIES OF THE CHILLERS ON THE LINE MINUS THE DESIGN COOLING CAPACITY OF THE LAST CHILLER BROUGHT ON LINE EXCEEDS THE BUILDING LOAD FOR A PERIOD OF 15 MINUTES (ADJ.): AND , b.) DECOUPLE TEMPERATURE IS EQUAL TO PRIMARY CHILLED WATER (PLUS OR MINUS 2°F) FOR 10 MINUTES.
   e. THE DDC SYSTEM SHALL BE PROGRAMMED TO ACCOMMODATE USER ASSIGNMENT OF THE ORDER OF MULTIPLE CHILLERS TO BE STAGED. THE SYSTEM SHALL ALSO BE PROGRAMMED TO PERMIT THE USER TO DESIGNATE ANY CHILLER AS BEING "OUT OF SERVICE" WITHOUT AFFECTING THE SYSTEMS ABILITY TO STAGE THE REMAINING CHILLERS AUTOMATICALLY BASED ON SECONDARY LOOP LOAD.
   f. THE AUTOMATIC CHILLER PROCESS SHALL NOT ATTEMPT TO START ANY CHILLER THE USER HAS DESIGNATED AS " OUT OF SERVICE " BUT SHALL START THE NEXT CHILLER IN THE LEAD/LAG SEQUENCE.
5. SECONDARY CHILLED WATER PUMPS (P-7 & P-8) ARE ENERGIZED THROUGH ACTION OF H-O-A LOCATED ON VFD COVER WHEN IN HAND POSITION AND BY DDC WHEN IN THE AUTO POSITION. IN HAND POSITION, PUMP MOTOR SPEED IS CONTROLLED BY MANUAL SWITCH. IN AUTO POSITION, PUMP SPEED IS CONTROLLED BY DDC TO MAINTAIN SET DIFFERENTIAL PRESSURE AS SENSED BY DIFFERENTIAL PRESSURE SENSOR LOCATED AT THE TOP OF RISER. PUMPS SHALL START AT THE MINIMUM SPEED.
6. CONDENSER WATER PUMPS (P-4, P-5 OR P-6) ARE ENERGIZED THROUGH ACTION OF H-O-A SWITCH LOCATED ON STARTER COVER WHEN IN HAND POSITION OR BY INTERLOCK WITH RESPECTIVE CHILLER WHEN IN THE AUTO POSTION. PUMP IS ENERGIZED WHENEVER IT'S RESPECTIVE CHILLER IS ENERGIZED.
7. COOLING TOWER FANS 1, 2 OR 3 ARE ENERGIZED THROUGH ACTION OF H-O-A LOCATED IN STARTER COVER WHEN IN HAND POSITION AND BY DDC WHEN IN AUTO POSITION. FANS ARE TWO SPEED. DDC CONTROLS COOLING TOWER FANS TO MAINTAIN CONDENSER WATER TEMPERATURE (85°F). WHEN CHILLER CH-1 IS ENERGIZED, ISOLATION VALVE V-21 OPENS, PUMP P4 IS STARTED AND TWO SPEED COOLING TOWER FAN CT-1 IS ENABLED. DDC SHALL MONITOR CONDENSER WATER SUPPLY TEMPERATURE AND START LOW SPEED FAN OPERATION AS TEMPERATURE RISES ABOVE 85°F. IF CONDENSER WATER SUPPLY TEMPERATURE CONTINUES TO RISE, DDC SHALL ENGAGE HIGH SPEED FAN OPERATION. THE OPPOSITE SHALL OCCUR AS WATER TEMPERATURE FALLS BELOW 85° SETPOINT. CH-2 AND CH-3 SIMILAR. WHEN CHILLERS CH-1, CH-2, AND CH-3 ARE OFF AND INITIAL STARTUP IS ENGAGED AND OUTDOOR AMBIENT TEMPERATURE IS BELOW 40°F, ALL COOLING TOWER ISOLATION VALVES SHALL BE CLOSED AND BYPASS VALVE SHALL OPEN. WHEN CONDENSER WATER SUPPPLY TEMPERATURE RISES ABOVE 50°F, DDC SHALL OPEN APPROPRIATE COOLING TOWER ISOLATION VALVE AND CLOSE TWO-WAY BYPASS CONTROL VALVE. IF CONDENSER WATER SUPPLY TEMPERATURE FALLS BELOW 50°F, BYPASS CONTROL VALVE SHALL MODULATE OPEN AS REQUIRED TO MAINTAIN MINIMUM 50°F CONDENSER WATER SUPPLY SET POINT TEMPERATURE. NO MORE THAN 50% OF ONE COOLING TOWER WATER FLOW SHALL BE BYPASSED.

SEQUENCE OF OPERATION
ICE BUILDING CHILLER AND ASSOCIATED CHILLED WATER PUMPS

1. IN ADDITION TO THE THREE ROTARY SCREW CHILLERS, THE BUILDING IS SERVED BY A NEW AIR COOLED CHILLER CH-4 CONTROLLED BY NEW UNIT-MOUNTED MICRO PROCESSOR CONTROLS WITH GATEWAY TO EXISTING ANDOVER DDC SYSTEM. THE CHILLER IS PROVIDED WITH A DEDICATED CHILLED WATER PUMP (P-11) FOR ICE CHARGING OF THE EXISTING CALMAC THERMAL STORAGE UNITS.
2. CHILLER IS ENERGIZED THROUGH ACTION OF H-O-A SWITCH LOCATED IN RESPECTIVE CHILLER CONTROL PANEL WHEN IN HAND POSITION OR BY DDC SYSTEM WHEN IN AUTO POSITION.
3. CHILLED WATER PUMP IS ENERGIZED THROUGH ACTION OF H-O-A SWITCH LOCATED IN STARTER COVER WHEN IN HAND POSITION OR BY DDC SYSTEM WHEN IN THE AUTO POSITION. WHEN PUMP P-11 IS SELECTED TO RUN, ASSOCIATED ISOLATION CONTROL VALVE V-10 SHALL BE OPENED (WHEN PUMP IS SWITCHED OFF, VALVE SHALL CLOSE). DDC SYSTEM SHALL NOT ATTEMPT TO START ANY DEVICE SWITCHED TO OUT OF SERVICE THROUGH THE DDC SYSTEM.
4. ICE BUILDING WILL CEASE AND THE CHILLER AND ASSOCIATED PUMPS DEENERGIZED BASED ON THE INDICATED ADJUSTABLE SEASONAL SCHEDULE OR WHEN CHILLER CH-4 RETURN WATER TEMPERATURE IS WITHIN 0.5°F OF SUPPLY WATER SETPOINT AND CALMAC ICE LEVEL INDICATOR REPORTS 95% ICE LEVEL.

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Checked by:WTT | Date: 02/27/04
Dwn by: ICT | CADD File Name: 312M805.DGN
DAC487-03-D-0006 | ICT Project No. 203121
Approved by: | Plot date: 02/27/04
Chief, Prj. Mgmt. Division | Plot scale:

TASK ORDER #: FRR004

PADUCAH, KENTUCKY
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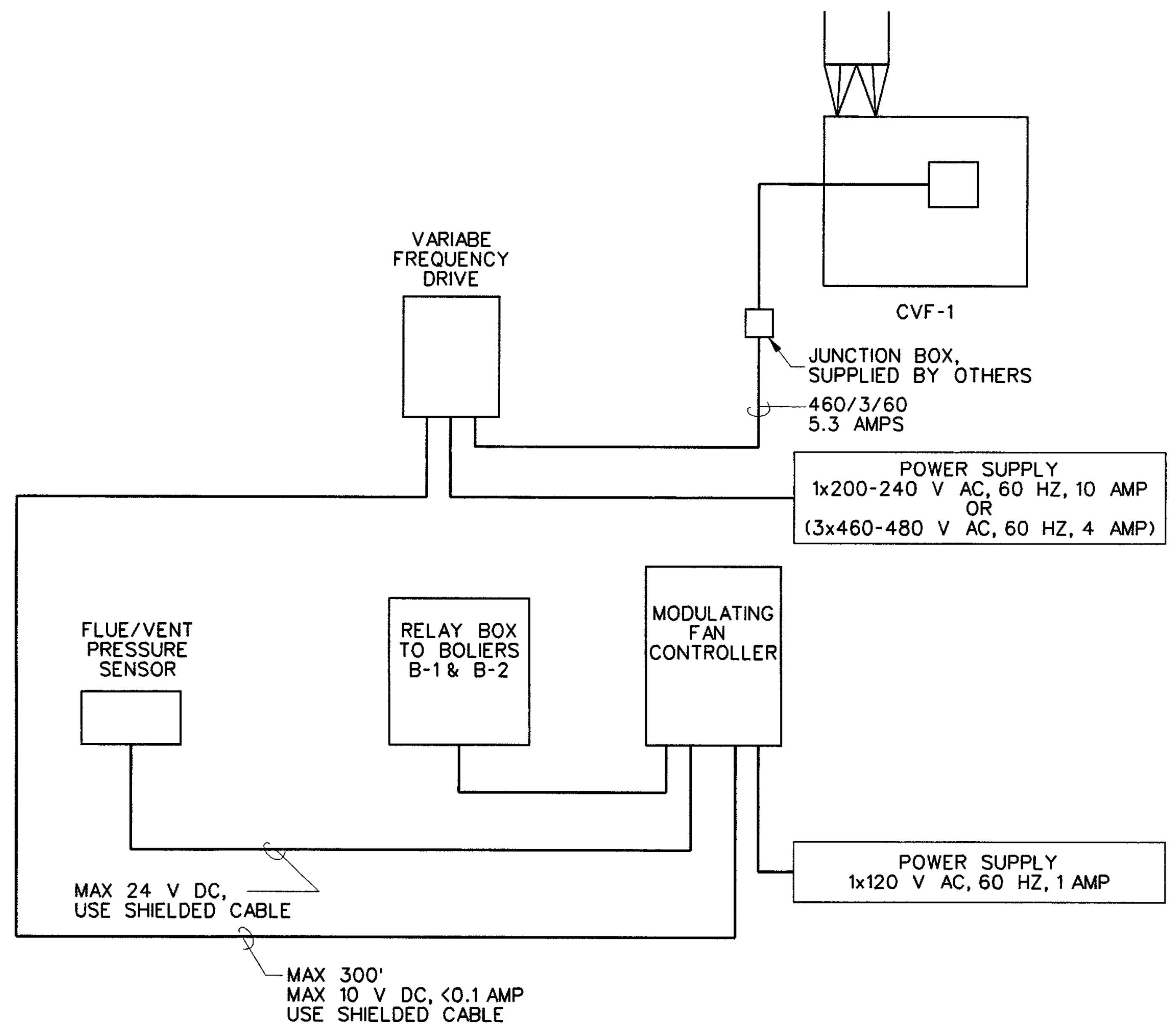
I.C. Thomasson Associates, Inc.
NASHVILLE, TENNESSEE
PHONE (615) 346-3400

VANGUARD ICT

DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND

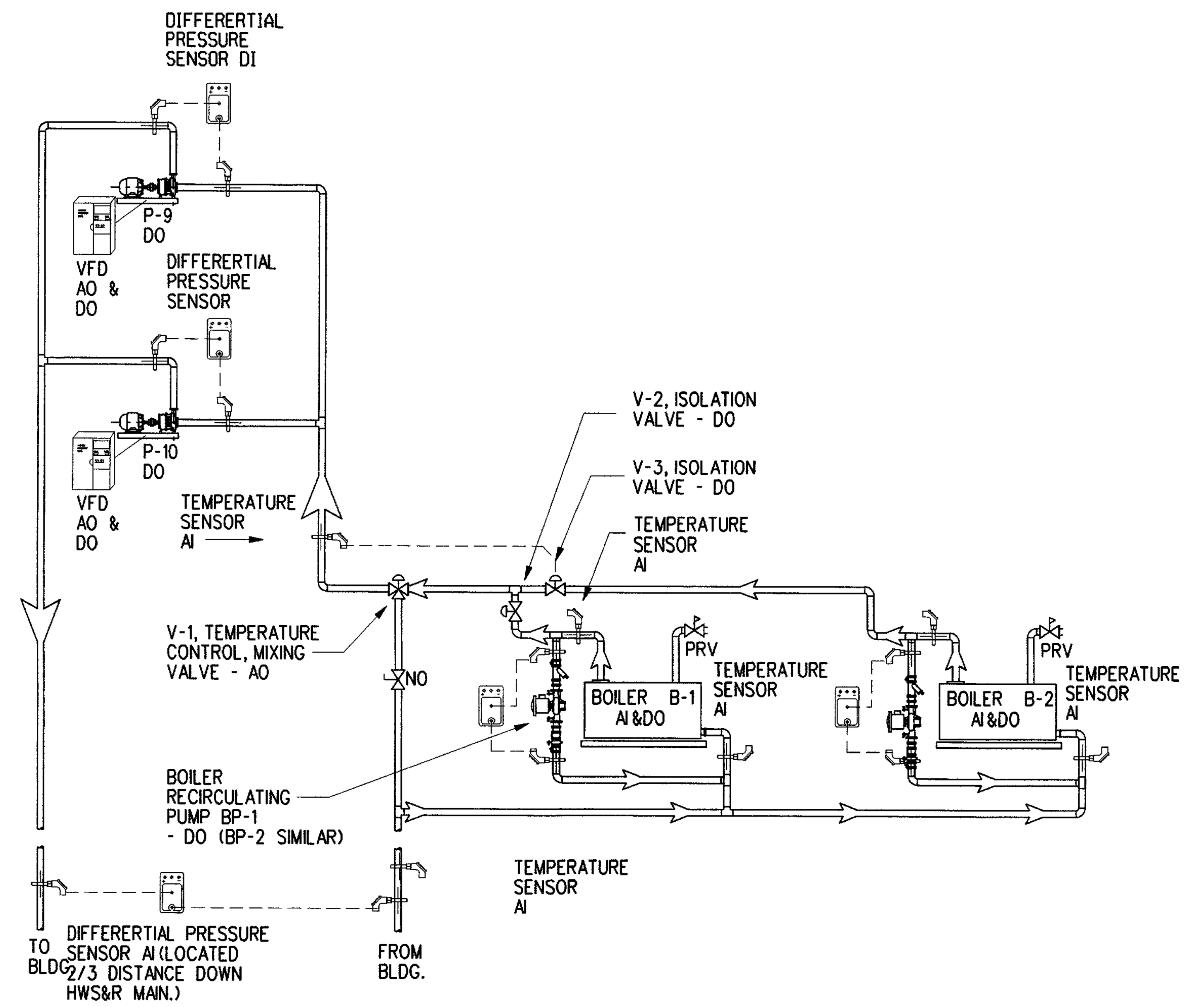
CHILLER / COOLING TOWER/ ICE STORAGE CONTROLS

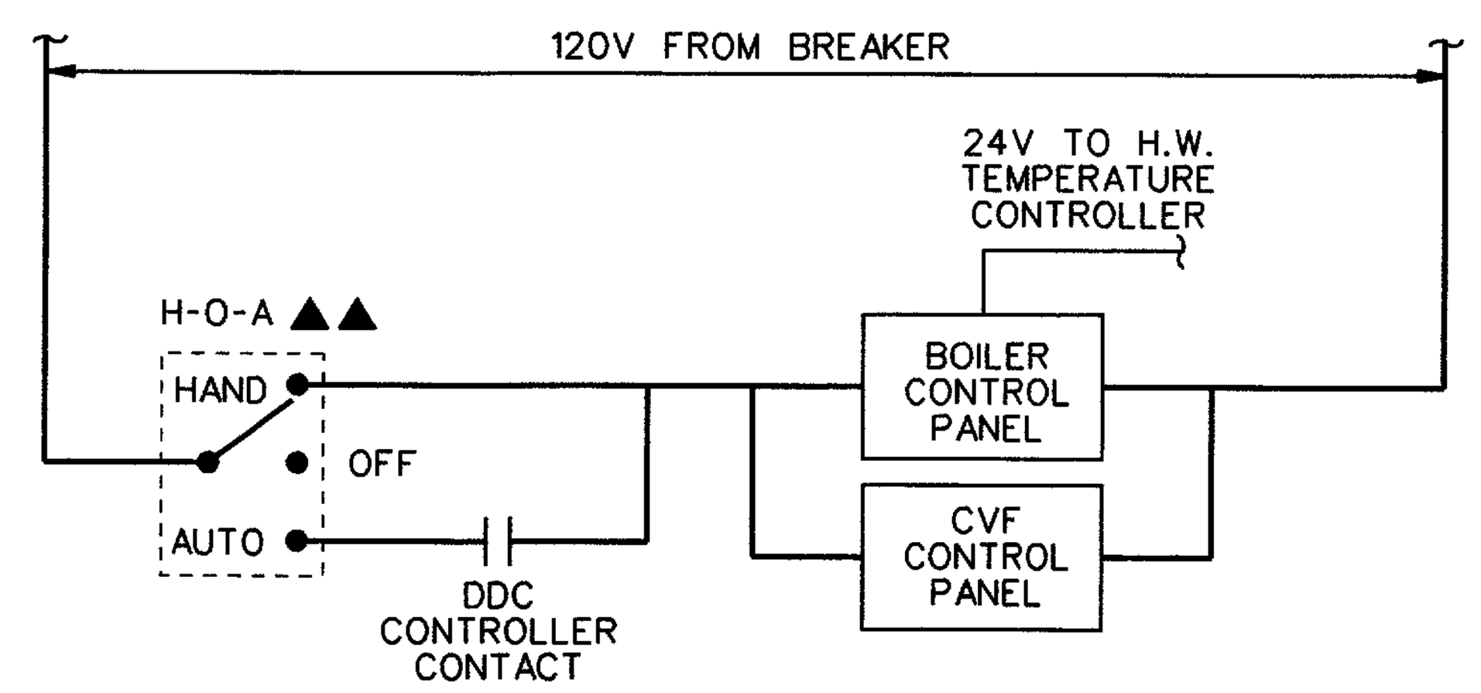
Sheet reference number:
M-801



COMBUSTION VENTILATION FAN CONTROL DETAIL

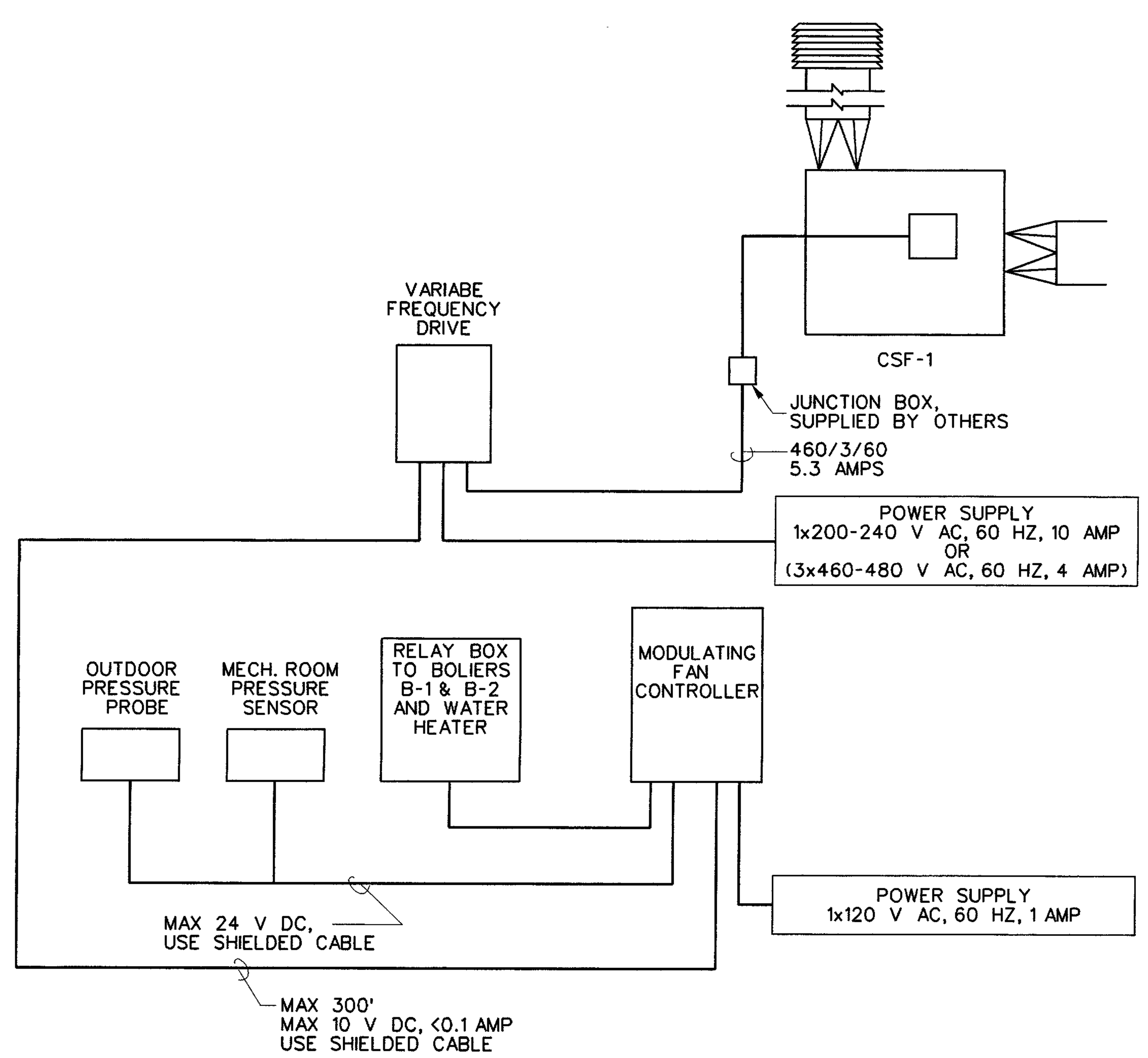
NO SCALE





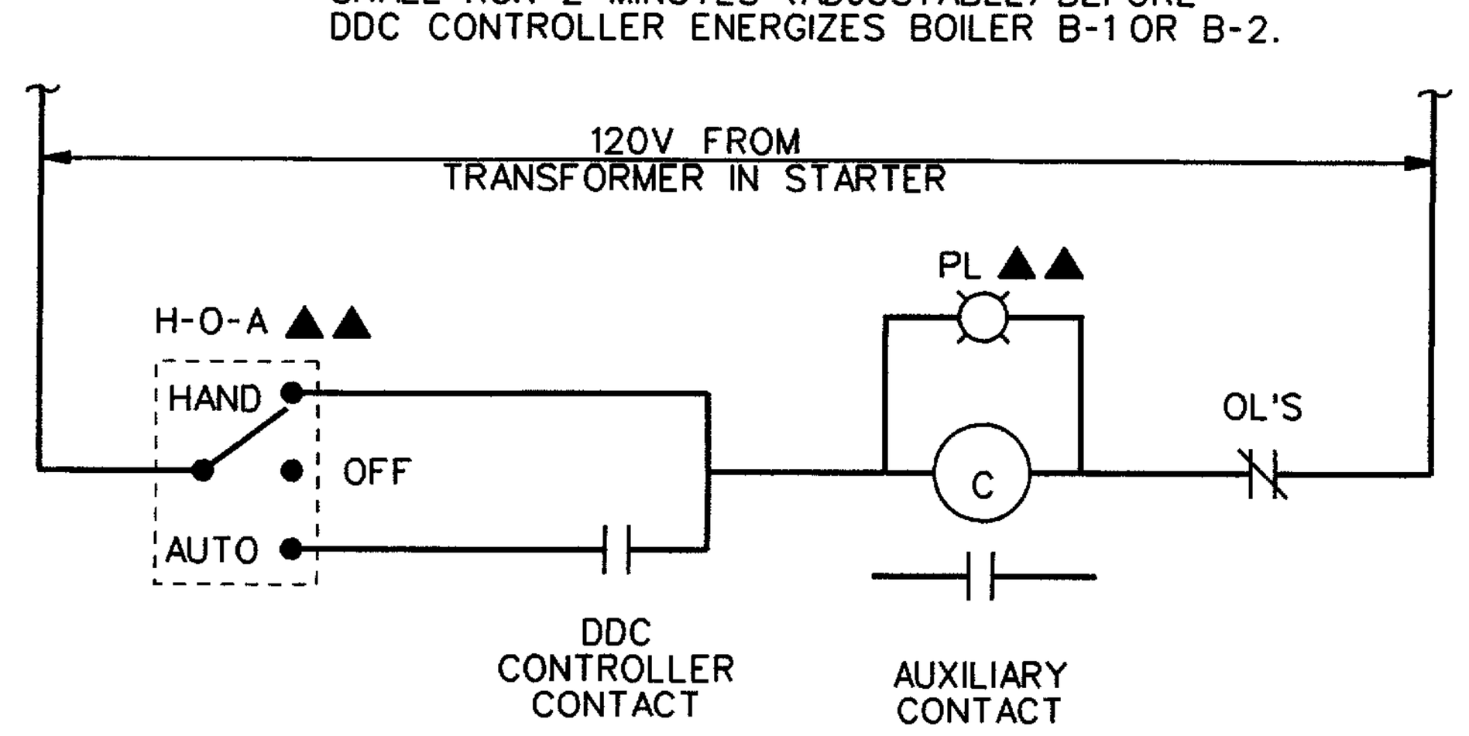
BOILER CONTROLS

NOTE: PROOF OF FLOW OF HWP-1 OR HWP-2 SHALL BE ESTABLISHED AND RESPECTIVE BP-1 OR BP-2 SHALL RUN 2 MINUTES (ADJUSTABLE) BEFORE DDC CONTROLLER ENERGIZES BOILER B-1 OR B-2.



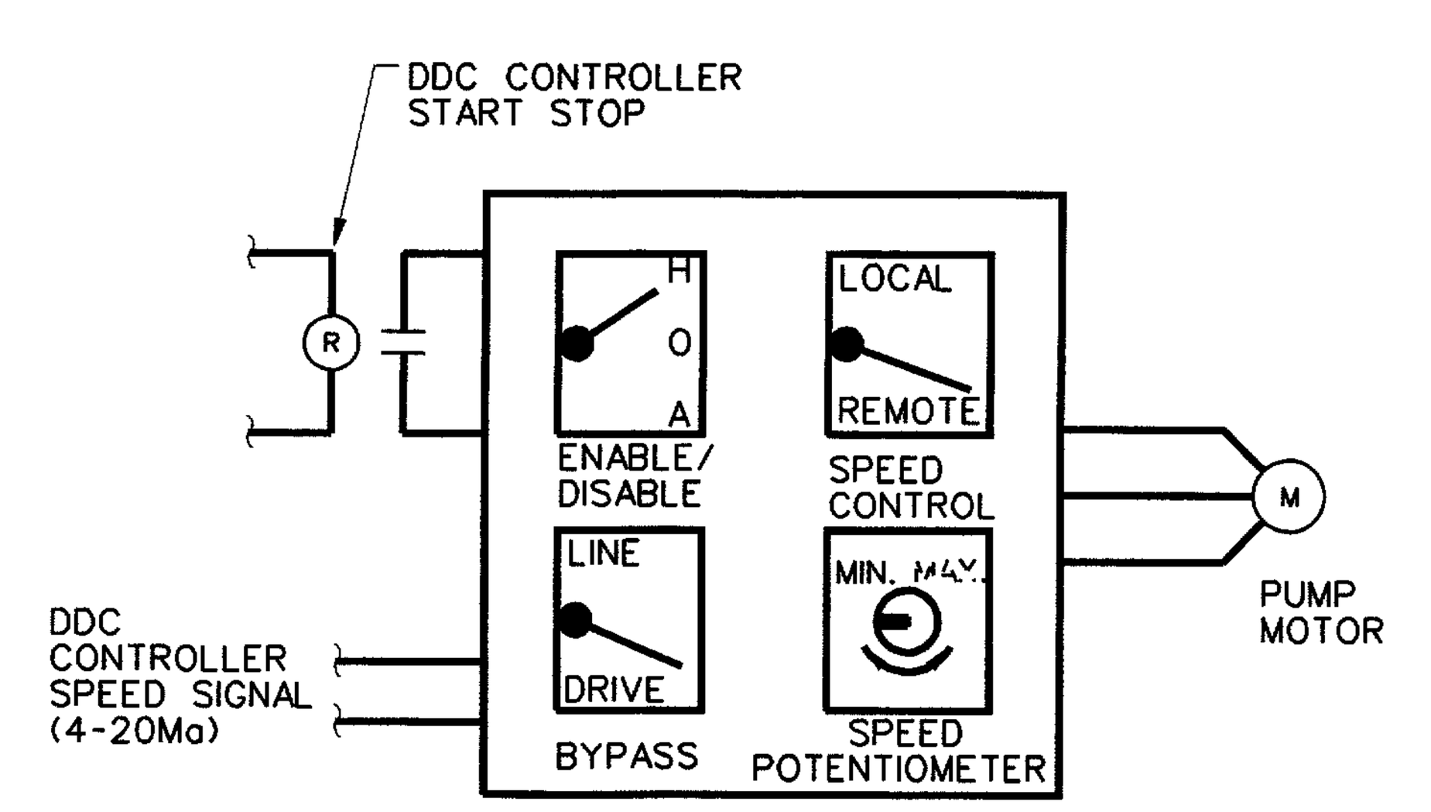
COMBUSTION SUPPLY FAN CONTROL DETAIL

NO SCALE

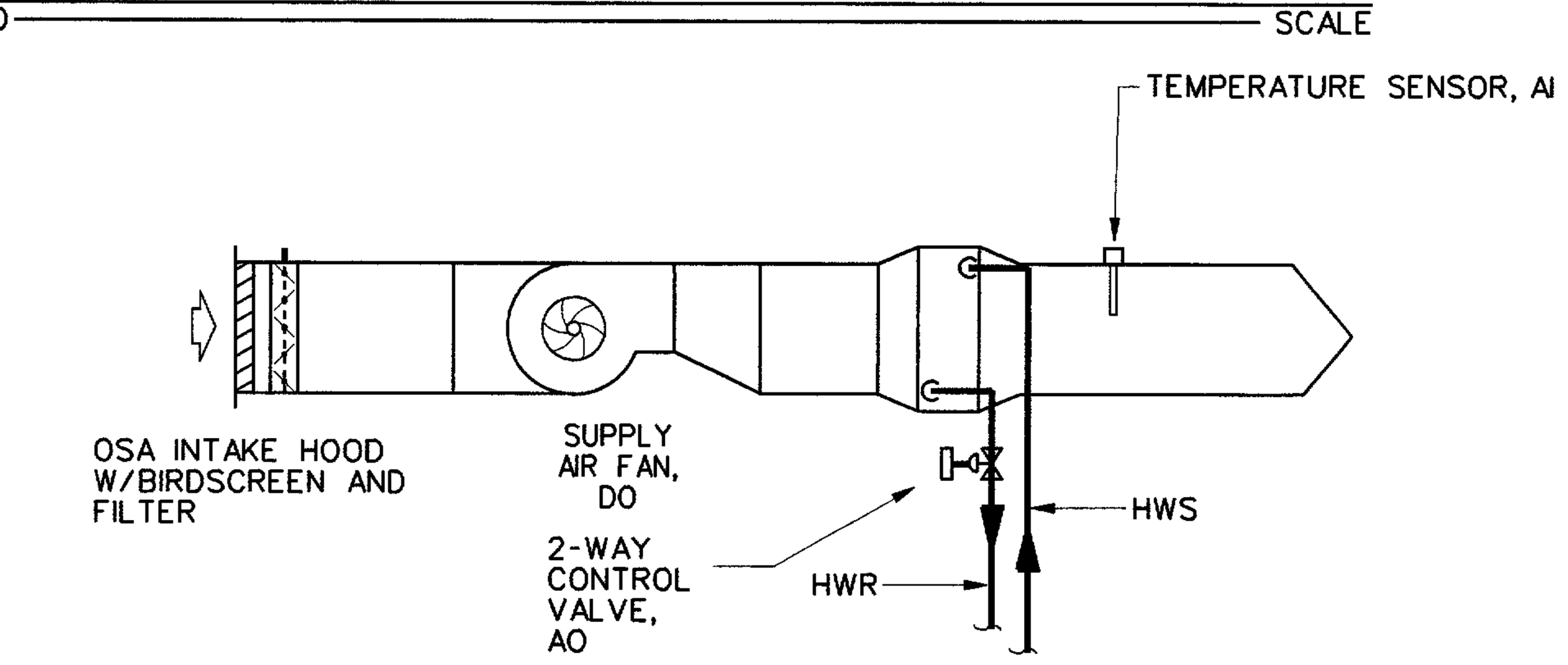


BOILER RECIRCULATING PUMP CONTROLS

NOTE: PUMP BP-1 SHALL RUN TWO MINUTES BEFORE B-1 IS ENERGIZED AND SHALL RUN FOR THIRTY MINUTES AFTER B-1 IS DE-ENERGIZED. BP-2 AND B-2 SIMILAR.



HOT WATER PUMP VFD



CSF TEMPERATURE CONTROL DIAGRAM

PANEL DESIGNATION: FT. MEADE DINFOS
LOCATION: MAIN MECHANICAL ROOM

POINT DESCRIPTION	Control Relay	Solenoid	Contactor	Electrical Transducer	4-20MA Module	Pressure Switch	Auxiliary Contact	Temperature	Differential Pressure	Position	Equipment Status	Maintenance	High Limit	Low Limit	Run Time	Scheduled Start/Stop	Duty Cycling	VFD Speed Control	Lead/Lag Control	Temperature Control	Hot Water Boiler Opt.	HW OA Reset	Boiler Enable
(group)	HARDWARE – OUTPUT (O) – DIGITAL			HARDWARE – OUTPUT (O) – ANALOG		HARDWARE – INPUT (T,D,V,C) – DIGITAL		HARDWARE – INPUT – ANALOG			SOFTWARE – ALARMS – DIGITAL		SOFTWARE – ALARMS – ANALOG			SOFTWARE – HARDWARE/SOFTWARE							
BOILER NO. 1 S/S	●										●		●	●	●	●	●		●		●		●
BOILER NO. 2 S/S	●										●		●	●	●	●	●		●		●		●
BP-1	●										●				●	●					●		
BP-2	●										●				●	●					●		
HOT WTR PUMP P-9 VFD	●					●			●		●				●	●	●	●	●		●		
HOT WTR PUMP P-10 VFD	●				●	●			●		●				●	●	●	●	●		●		
HWS TEMP CTRL V-1										●										●		●	
ISOLATION VALVE V-2	●																●		●				
ISOLATION VALVE V-3	●																●		●				
COMBUSTION VENT FAN, CVF-1	●										●												
COMBUSTION SUPPLY FAN CSF-1	●										●												
COMBUSTION SUPPLY AIR								●						●									
HOT WATER VALVE					●																		
SECONDARY HWS TEMP SENSOR								●															
SECONDARY HWR TEMP SENSOR								●															
HWS TEMP B-1								●					●	●									
HWR TEMP B-1								●						●									
HWS TEMP B-2								●					●	●									
HWR TEMP B-2								●						●									
HW LOOP PRESSURE									●														
OUTSIDE AIR TEMP								●												●		●	
EXIST. REFRIG. SENSOR	●																						●

SEQUENCE OF OPERATION BOILERS & HOT WATER PUMPS

1. THE BUILDING IS SERVED BY TWO HEATING WATER BOILERS B-1 AND B-2. BOILERS ARE CONTROLLED BY UNIT-MOUNTED, FACTORY-FURNISHED DDC MICROPROCESSORS, WITH A GATEWAY TO THE EXISTING ANDOVER DDC SYSTEM TO COMMUNICATE STATUS AND ALARMS AND ISSUE BOILER START/STOP. HOT WATER SYSTEM TO RUN CONTINUOUSLY TO SATISFY BUILDING HEATING LOAD AND VAV REHEAT COIL PERFORMANCE AND TO CONTROL HUMIDITY AS REQUIRED AT CONSTANT VOLUME AHU REHEAT HUMIDITY CONTROL.

2. HOT WATER PUMPS P-9 AND P-10 ARE ENERGIZED THROUGH ACTION OF H-O-A LOCATED IN STARTER. MANUAL START WHEN IN HAND POSITION OR BY DDC CONTROLLER WHEN IN AUTO POSITION. AFTER ENERGIZED, PUMPS SHALL START IN THE MINIMUM SPEED POSITION. PUMP SPEED SHALL RAMP UP OR DOWN AS REQUIRED VIA DDC CONTROL SIGNAL TO PUMP VFD TO MAINTAIN DIFFERENTIAL PRESSURE (INITIALLY SET AT 6 PSI) MEASURED APPROXIMATELY TWO-THIRDS ALONG HEATING WATER SUPPLY AND RETURN MAIN HEADER.

3. AFTER PROOF OF FLOW OF P-9 OR P-10 AS DETERMINED BY PUMP DIFFERENTIAL PRESSURE SWITCH IS ESTABLISHED, BOILERS B-1 AND B-2 MAY BE ENERGIZED THROUGH ACTION OF UNIT MOUNTED H-O-A- SWITCH. BOILERS MAY BE STARTED MANUALLY WHEN IN THE HAND POSITION OR BY DDC WHEN IN AUTO POSITION.
   A) RESPECTIVE RECIRCULATING PUMPS BP-1 (FOR BOILER B-1) AND BP-2 (FOR BOILER B-2) SHALL BE ENERGIZED WHEN RESPECTIVE BOILER IS ENERGIZED. RECIRCULATING PUMPS SHALL BE STARTED AND RUN FOR TWO MINUTES BEFORE BOILER IS ENERGIZED AND SHALL CONTINUE TO RUN FOR THIRTY MINUTES AFTER BOILER IS DE-ENERGIZED. COMBUSTION VENTILATION FAN CVF IS ENABLED WHEN EITHER BOILER B-1 OR B-2 IS ENABLED. WHEN BOILER IS ENERGIZED AND BOILER DISCHARGE TEMPERATURE SETPOINT IS ACHIEVED, ASSOCIATED ISOLATION VALVE (V2 OR V3) SHALL OPEN AND REMAIN OPEN UNTIL BOILER IS DE-ENERGIZED BY THE DDC SYSTEM.
   B) ON A CALL FOR HEAT FROM LEAD/LAG BOILER, CVF-1 CONTROLS SHALL BE ENABLED. STACK PRESSURE PROBE SHALL SIGNAL THAT PRESSURE DIFFERNETIAL REQUIREMENT IN STACK HAS CHANGED AND CONTROLLER WILL ENABLE CVF-1 VFD TO RAMP UP FAN SPEED TO MEET DIFFERENTIAL REQUIREMENT. ONCE DIFFERENTIAL REQUIREMENT IS MET, CVF-1 CONTROLLER SHALL ENABLE LEAD/LAG BOILER BURNER. IF AT ANYTIME THERE IS FAILURE TO ESTABLISH DIFFERENTIAL PRESSURE REQUIREMENT (40% BELOW SETPOINT FOR MORE THAN 12 SECONDS), CVF-1 CONTROLLER SHALL DISABLE BOILERS AND GENERATE AN ALARM AT THE BAS. CVF-1 SHALL CONTINUE TO RUN FOR 3 MINUTES AFTER BOILERS ARE DEENERGIZED.
   C) ON A CALL FOR HEAT FROM LEAD/LAG BOILER OR WATER HEATER, CSF-1 CONTROLS SHALL BE ENABLED. CSF-1 CONTROLLER SHALL MONITOR MECHANICAL ROOM PRESSURE COMPARED TO OUTDOOR PRESSURE AND RAMP VFD FOR CSF-1 UP OR DOWN AS REQUIRED TO MAINTAIN POSSITIVE PRESSURE CONDITION IN MECHANICAL ROOM. IF ROOM PRESSURE DROPS BELOW ESTABLISHED SETPOINT, CSF-1 CONTROLLER SHALL SHUT-DOWN WATER HEATER AND BOILERS AS REQUIRED AND ALARM THE DDC SYSTEM. HOT WATER HEATING VALVE FOR HC-1 (CSF-1) SHALL MODULATE OPEN TO CLOSED AS REQUIRED TO MAINTAIN A MINIMUM OF 50°F DISCHARGE TEMPERATURE.

4. LEAD/LAG CONTROL OF BOILERS AND HOT WATER PUMPS IS ACCOMPLISHED BY THE DDC SYSTEM. WHEN LEAD BOILER IS AT FULL FIRING AND HW LOOP IS 5°F BELOW SETPOINT FOR 20 MINUTES, DDC CONTROLLER SHALL ENERGIZE LAG BOILER. INTEGRAL BOILER CONTROL SHALL ENSURE EQUAL LOADING OF BOILERS. IF AFTER 20 MINUTES BOTH BOILERS ARE AT LESS THAN 50% FIRING, AND LOOP SETPOINT TEMPERATURE IS SATISFIED, DDC SYSTEM SHALL SHUT DOWN LAG BOILER. IF AFTER 10 MINUTES, LEAD PUMP CANNOT SATISFY LOOP DIFFERENTIAL PRESSURE SETPOINT (6 PSI ADJUSTABLE), DDC SYSTEM SHALL START LAG PUMP IN THE MINIMUM SPEED POSITION. OPTIMIZATION PROGRAM SHALL ENSURE EQUAL LOADING OF PUMPS. WHEN AFTER 10 MINUTES, BOTH PUMPS ARE OPERATING AT 23 HZ OR LESS (ADJUSTABLE) AND LOOP DIFFERENTIAL PRESSURE SETPOINT IS SATISFIED, DDC SHALL SHUT DOWN LAG PUMP.

5. TEMPERATURE CONTROL MIXING VALVE (V-1) TO MODULATE TO MAINTAIN HOT WATER TEMPERATURE IN HW LOOP AS INDICATED BY TEMPERATURE RESET SCHEDULE. TEMPERATURE CONTROL MIXING MODULATION SHALL BE LIMITED SUCH THAT BOILER ENTERING WATER TEMPEATURE DOES NOT FALL BELOW 150°F.

6. COMBUSTION SUPPLY FAN (CSF) SHALL RUN CONTINUOUSLY.

7. AN ALARM SHALL BE GENERATED AT THE CENTRAL CONTROL STATION IF BOILER ENTERING WATER TEMPERATURE IS BELOW 140°F OR BOILER LEAVING WATER TEMPERATURE EXCEEDS 205°F (ADJUSTABLE) OR A STATUS ALARM GENERATED BY INTEGRAL DDC BOILER CONTROL PANEL IS PASSED TO THE EXISTING CENTRAL ANDOVER SYSTEM.

8. UPON ACTIVATION OF MACHINERY ROOM REFRIGERANT LEAK DETECTION, THE DDC SYSTEM SHALL SHUT-DOWN BOILERS B-1 AND B-2.

HOT WATER TEMPERATURE RESET SCHEDULE

O.A. TEMP.	HOT WATER TEMP.
≥ 70°	170°F
<11°	200°F

STATE OF MARYLAND – WILLIAM THOMAS TINKLE – REGISTERED MECHANICAL ENGINEER

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

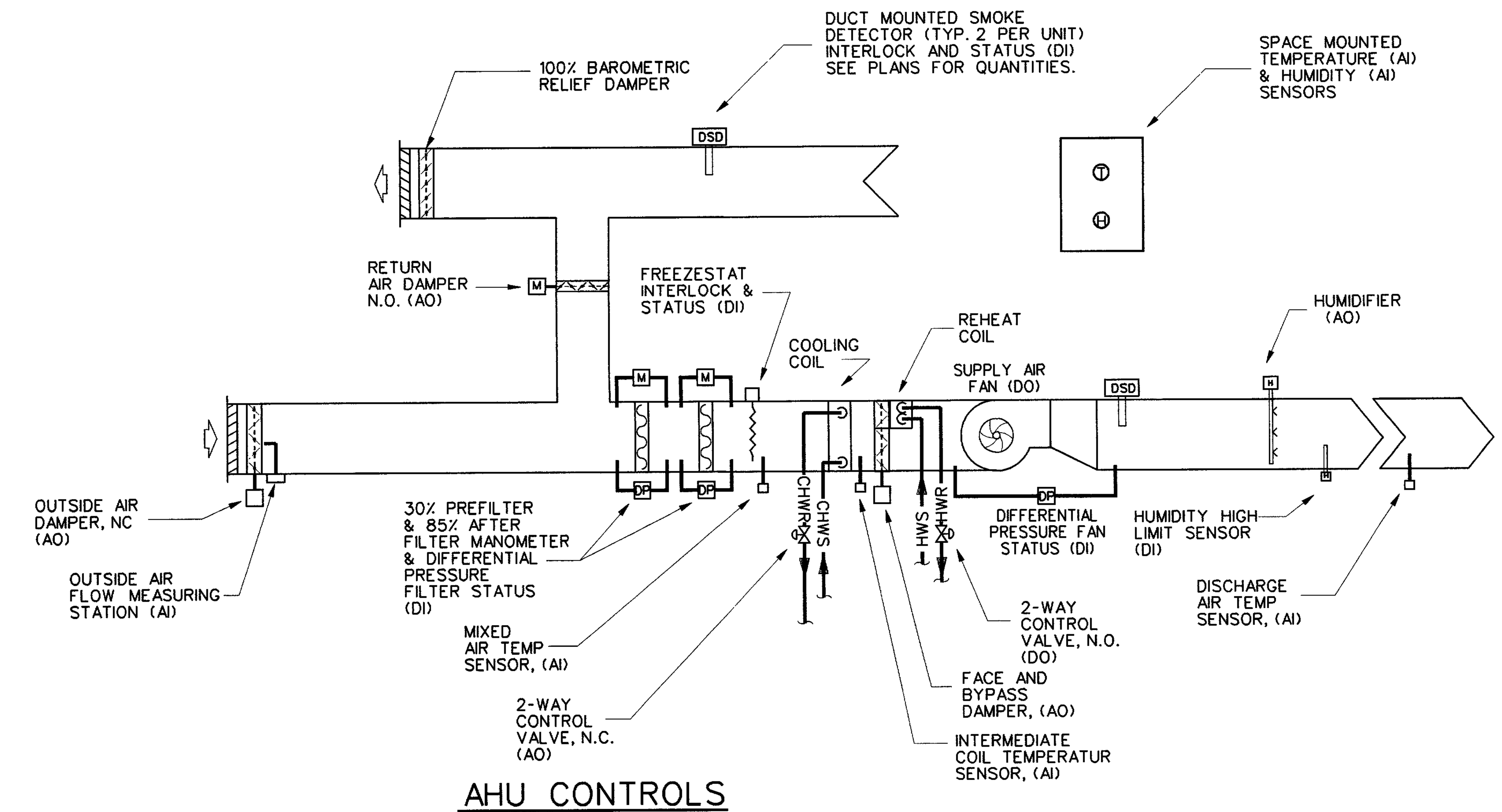
Symbol	Description	Date	Appr.

TASK ORDER #: FRR004
VANGUARD CONTRACTORS INC. PADUCAH, KENTUCKY VOICE 270-442-8620
ICT I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400
Checked by: WTT | Date: 02/27/04
Dwn by: ICT | CADD File Name: 3121M804.DGN
DACA87-03-D-0006 | ICT Project No. 203121
Approved by: | Plot date: 02/27/04
Chief, Prj. Mgmt. Division | Plot scale:

DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND
BOILER CONTROLS

Sheet reference number: M-802

A B C D E F G H



AHU CONTROLS

SINGLE ZONE CONSTANT VOLUME UNIT - AHU-22

UNIT TYPE "A"

PANEL DESIGNATION FT. MEADE - DINFOS	HARDWARE																			
	OUTPUT (O)								INPUT (T,D,V,C)											
	DIGITAL				ANALOG				DIGITAL						ANALOG					
AHU CONTROLS SINGLE ZONE CONSTANT VOLUME AIR HANDLING UNITS UNIT TYPE "A" / POINT DESCRIPTION	Control Relay	Solenoid	Contactor		Pneumatic Transducer	Electrical Transducer	4-20MA Module		Pressure Switch	Flow Switch	Switch Closure	Auxiliary Contact	Open/Close		Temperature	Relative Humidity	PSIg, PSIa, PSId	Position	Flow	
SUPPLY AIR FAN S/S	●																			
SUPPLY AIR FAN STATUS									●											
SPACE HUMIDITY																●				
SPACE AIR TEMPERATURE															●					
MIXED AIR TEMPERATURE															●					
INTERMEDIATE COIL AIR TEMP.															●					
DISCHARGE AIR TEMPERATURE															●					
OUTSIDE AIR HUMIDITY																●				
OUTSIDE AIR TEMPERATURE															●					
HUMIDIFIER							●													
HUMIDIFIER HIGH LIMIT											●									
OSA DAMPER CTL (2 THUS)							●													
RETURN AIR DAMPER CONTROL							●													
FACE & BYPASS DAMPER CTL							●													
OUTSIDE AIRFLOW STATION																			●	
FILTER (2 THUS)									●											
HOT WATER VALVE CONTROL		●																		
CHILLED WATER VALVE CONTROL							●													
FREEZESTAT																				
DUCT SMOKE DETECTOR																				

PANEL DESIGNATION FT. MEADE - DINFOS	SOFTWARE																		
	ALARMS							PROGRAM											
	DIGITAL			ANALOG															
POINT DESCRIPTION	Equipment Status	Maintenance		High Limit	Low Limit	Run Time		Scheduled	Optimum Start/Stop	Duty Cycling	Demand Limiting	Day/Night Setback	Economizer	Ventilation/Recirculation	Temperature Control	Hot Water Reset	Chiller Optimization	Chilled Water Reset	Position
SUPPLY AIR FAN S/S						●		●	●										
SUPPLY AIR FAN STATUS	●																		
SPACE HUMIDITY				●	●								●						
SPACE AIR TEMPERATURE				●	●								●						
MIXED AIR TEMPERATURE				●	●														
INTERMEDIATE COIL AIR TEMP.				●	●														
DISCHARGE AIR TEMPERATURE				●	●														
OUTSIDE AIR HUMIDITY													●						
OUTSIDE AIR TEMPERATURE													●						
HUMIDIFIER																			
HUMIDIFIER HIGH LIMIT	●																		
OSA DAMPER CTL (2 THUS)								●	●			●	●		●				●
RETURN AIR DAMPER CONTROL								●	●			●	●		●				●
FACE & BYPASS DAMPER CTL															●				●
OUTSIDE AIRFLOW STATION													●						
FILTER (2 THUS)		●																	
HOT WATER VALVE CONTROL															●				●
CHILLED WATER VALVE CONTROL													●		●				●
FREEZESTAT	●																		
DUCT SMOKE DETECTOR	●																		

NOTE: PROVIDE DYNAMIC GRAPHIC REPRESENTATIVE OF EACH PIECE OF EQUIPMENT

SEQUENCE OF OPERATION
SINGLE-ZONE CONSTANT VOLUME AIR-HANDLING UNIT

1. SUPPLY AIR FAN (SAF): THE SUPPLY AIR FAN IS STARTED MANUALLY THROUGH THE HAND POSITION OF THE H-O-A SWITCH. IN THE AUTO POSITION, IF SCHEDULED OR WHEN AIR IS REQUIRED FOR OPTIMUM START OR NIGHT SETBACK (HEATING OR COOLING), THE DDC CONTROLLER WILL ENABLE THE SUPPLY AIR FAN.

2. FAN STATUS: WHEN THE FAN IS ENERGIZED, DIFFERENTIAL PRESSURE SENSOR DETERMINES IF THERE IS AIR MOVEMENT IN THE DUCT. AFTER AN OPERATOR-DEFINED FEEDBACK TIME DELAY, IF THERE IS NO AIR MOVEMENT, AN ALARM WILL BE GENERATED. ONCE THE TIME DELAY HAS PASSED, IF THE FAN STATUS INDICATES OFF (FIRE ALARM/FREEZESTAT, OVERLOADS, MANUAL SHUTDOWN) AND THE FAN IS COMMANDED ON, AN ALARM WILL BE GENERATED.

3. MINIMUM OUTSIDE AIR DAMPERS: THE MINIMUM OUTSIDE AIR DAMPERS WILL BE OPENED WHENEVER THE AIR-HANDLING UNIT IS SCHEDULED TO OPERATE, RETURN AIR TEMP IS MINIMUM 65°F, AND THE FAN STATUS INDICATES "ON". MINIMUM OUTSIDE AIR DAMPER SHALL MODULATE AS REQUIRED TO DELIVER SCHEDULED MINIMUM OSA BASED UPON MEASUREMENTS OF OUTSIDE AIRFLOW MEASURING STATION.

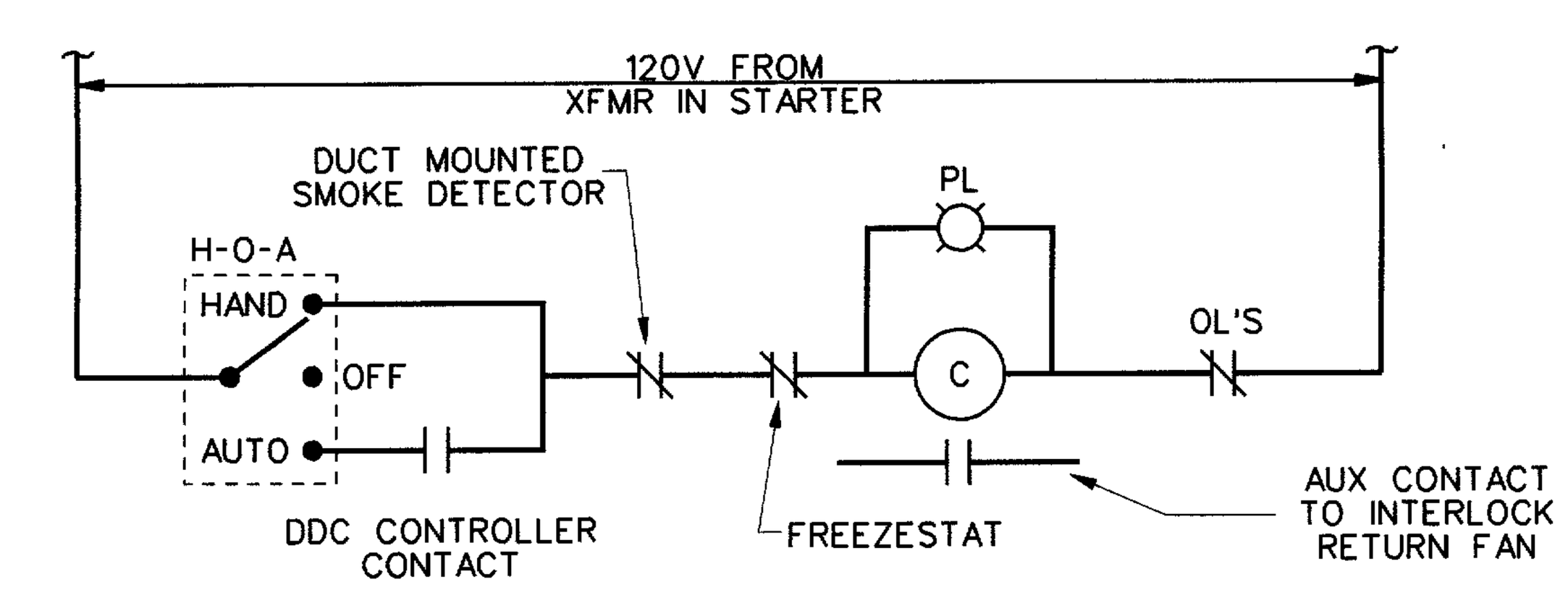
4. DISCHARGE AIR CONTROL:
   A. AIR TEMPERATURE CONTROL: THE DDC CONTROLLER WILL MODULATE THE CHILLED WATER VALVE AS REQUIRED TO SATISFY SPACE COOLING REQUIREMENTS. ON A CALL FOR HEATING FROM THE SPACE THERMOSTAT, COOLING COIL VALVE SHALL INDEX TO THE CLOSED POSITION, HEATING COIL VALVE WILL OPEN AND FACE AND BYPASS DAMPER SHALL DIVERT FLOW ACROSS HEATING COIL AS REQUIRED TO SATISFY SPACE HEATING DEMAND. THE OPPOSITE SHALL OCCUR WHEN SPACE CALLS FOR COOLING. SOFTWARE LOGIC SHALL PREVENT SIMULTANEOUS HEATING AND COOLING EXCEPT AS REQUIRED FOR DEHUMIDIFICATION. THE DISCHARGE AIR TEMPERATURE SENSOR SHALL PREVENT DISCHARGE AIR TEMPERATURES FROM EXCEEDING OPERATOR DEFINED LIMITS SET FOR HEATING AND COOLING MODES (INITIALLY SET AT 49°F COOLING AND 90°F HEATING). FREQUENCY OF MODE CHANGE SHALL BE OPERATOR DEFINED AND INITIALLY SET AT NOT LESS THAN 5 MINUTE INTERVAL.

   B. HUMIDIFICATION: (UNIT AHU-22)
   THE DDC CONTROLLER WILL ENERGIZE HUMIDIFIER WHEN SPACE HUMIDITY SENSOR REPORTS RH BELOW 35% AND COOLING COIL VALVE IS IN CLOSED POSITION. THE CONTROLLER SHALL DEENERGIZE IF THERE IS A ZONE THERMOSTAT CALL FOR COOLING OPENING COOLING COIL VALVE, OR IF SPACE HUMIDITY SENSOR REPORTS RH GREATER THAN 50%.

   C. DEHUMIDIFICATION: (UNIT AHU-22)
   WHEN SPACE HUMIDITY SENSOR REPORTS RH GREATER THAN 58% AND THE SPACE IS NOT CALLING FOR COOLING OR HEATING, THE DDC CONTROLLER SHALL MODULATE THE COOLING COIL VALVE FROM CLOSED TO OPEN TO DEVELOP A 50°F INTERMEDIATE COIL AIR TEMPERATURE. SIMULTANEOUSLY THE DDC CONTROLLER SHALL OPEN THE REHEAT COIL VALVE FROM CLOSED TO OPEN AND MODULATE THE FACE AND BYPASS DAMPER TO DEVELOP 68 OR 72 DEGREE DISCHARGE AIR DEPENDENT ON SEASONAL SETPOINT OF SPACE. A CALL FOR HEATING OR COOLING SHALL REVERT THE CONTROL FROM DEHUMIFICATION TO COOLING OR HEATING AS REQUIRED.

6. ECONOMIZER COOLING: ECONOMIZER COOLING IS ENABLED WHENEVER THE OUTSIDE AIR ENTHALPY IS LESS THAN THE SPACE AIR ENTHALPY. WHEN THE ECONOMIZER IS ENABLED, THE DDC CONTROLLER WILL MODULATE IN CONCERT THE OUTSIDE AIR DAMPER TO THE FULL OPEN POSITION AND THE RETURN AIR DAMPER TO THE FULL CLOSED POSITION AND THE COOLING COIL VALVE WILL MODULATE AS REQUIRED TO MAINTAIN THE SPACE AIR TEMP. SETPOINT. AS OSA TEMP. DROPS, THE RETURN AIR AND OSA DAMPER SHALL MODULATE IN TANDEM (CLOSING OSA TO THE MIN. DAMPER POSITION) TO SATISFY SPACE TEMPERATURE SETPOINT. WHEN OSA DAMPER CLOSES TO THE MINIMUM POSITION, THE REHEAT COIL VALVE WILL OPEN AND FACE AND BYPASS WILL MODULATE TO SATISFY SPACE SETPOINT OR MINIMUM DISCHARGE TEMPERATURE.THE REVERSE SEQUENCE WILL OCCUR AS THE OUTSIDE AIR TEMPERATUR RISES.

7. SAFETIES: SAFETY DEVICES
   SAFETY DEVICES (DUCT SMOKE DETECTOR AND FREEZESTAT) ARE INTERLOCKED WITH THE FAN STARTER CIRCUIT. THE DEVICES DISABLE THE SUPPLY FAN, CLOSE THE MINIMUM AND MAXIMUM OSA DAMPERS, AND FULLY OPEN THE RETURN DAMPERS. ALL SAFETIES SHALL HAVE AUXILIARY CONTACTS SUCH THAT WHEN ACTIVATED THE DDC CONTROLLER WILL GENERATE AN ALARM. ANY FIRE ALARM SYSTEM SIGNAL GENERATED IN THE BUILDING SHALL CAUSE THE DDC SYSTEM TO SHUT DOWN ALL AHUs.



SINGLE ZONE CONSTANT VOLUME CONTROL

THESE DOCUMENTS HAVE BEEN PREPARED PRIMARILY BASED ON INFORMATION PROVIDED BY OTHERS. I.C. THOMASSON HAS NOT VERIFIED THE ACCURACY OF ALL INFORMATION PROVIDED BY OTHERS. SEE LIMIT OF LIAIBILITIES STATEMENT ON COVER SHEET.

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Symbol	Description	Date	Appr.

TASK ORDER #: FRR004

VANGUARD — PADUCAH, KENTUCKY VOICE 270-442-8620

ICT — I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400

Checked by: WTT	Date: 02/27/04	
Dwn by: ICT	CADD File Name: 3121M803.DGN	
DACA87-03-D-0006	ICT Project No. 203121	
Approved by:	Plot date: 02/27/04	
Chief, Prj. Mgmt. Division	Plot scale:	

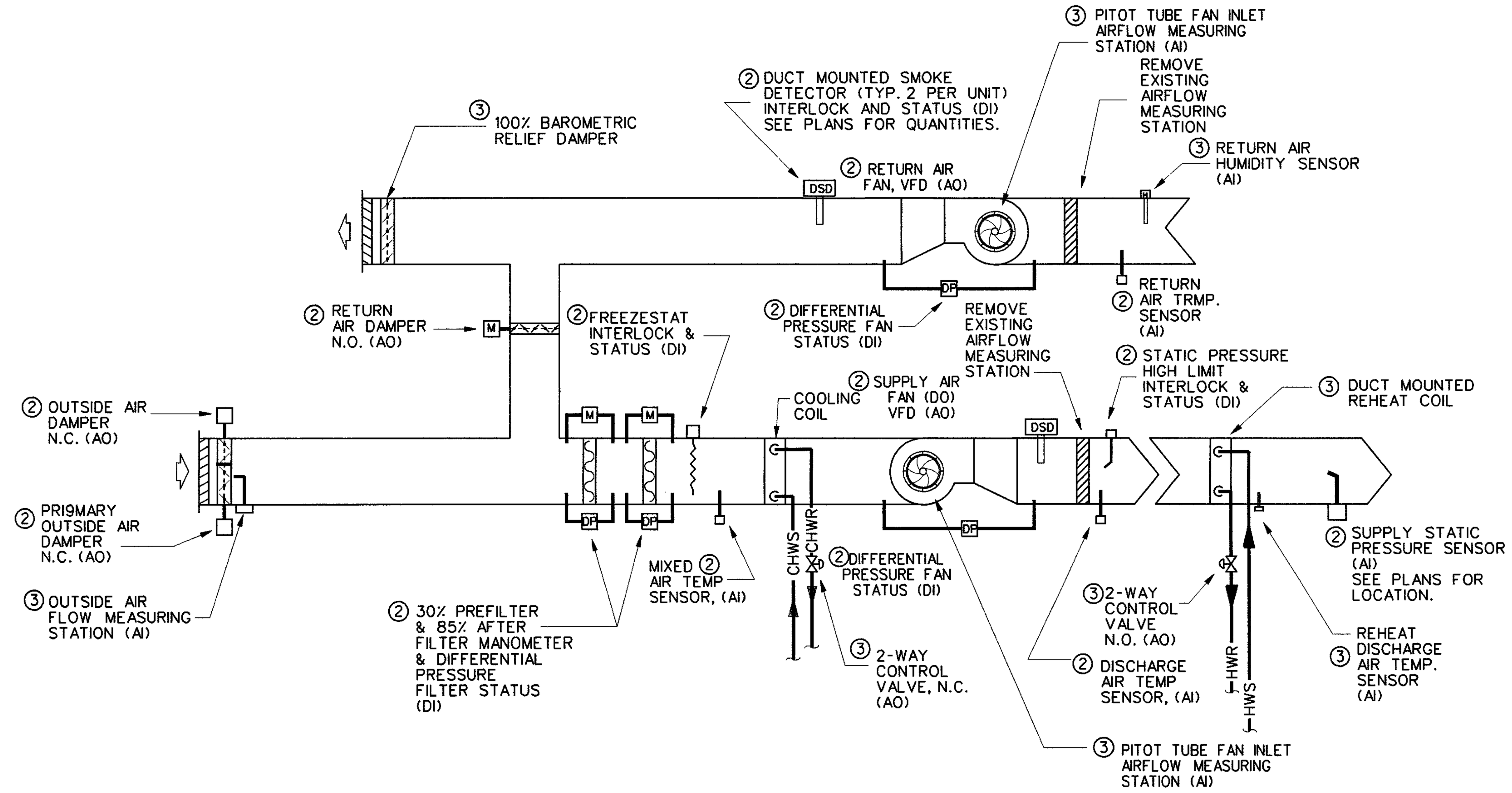
DEFENSE INFORMATION SCHOOL

FT. MEADE MARYLAND

EXISTING CONSTANT VOLUME CONTROLS

Sheet reference number:

M-803



AHU CONTROLS

TYPICAL FOR VARIABLE AIR VOLUME UNITS

UNIT TYPE "B"

(1) EXISTING AHU-7, -8, -19, -20, & 26 ARE UNIT TYPE B.

(2) FIELD VERIFY EXISTING CONTROL DEVICE. NOTIFY ENGINEER IF DISCREPANCY IS DISCOVERED.

(3) PROVIDE (a) BAROMETRIC RELIEF DAMPER, (b) OSA AIRFLOW MONITOR, SEE SCHEDULE, (c) CONTROL VALVE AND ACTUATOR AND (d) PITOT TUBE FAN INLET AIRLOW MEASURING STATION.

SEQUENCE OF OPERATION VARIABLE AIR VOLUME AIR-HANDLING UNIT

1. SUPPLY AIR FAN (SAF): THE SUPPLY AIR FAN VARIABLE FREQUENCY DRIVE (VFD) IS MANUALLY ENABLED WHEN THE VFD H-O-A SWITCH IS IN THE HAND POSITION. IN THE AUTO POSITION, WHEN AIR IS REQUIRED FOR OPTIMUM START OR NIGHT SETBACK (HEATING OR COOLING) OR IF THE AIR-HANDLING UNIT IS SCHEDULED TO RUN, THE DDC CONTROLLER WILL ENABLE THE SUPPLY FAN VFD.

2. FAN STATUS: ALL FANS CONTROLLED BY VFDs WILL START AT A MINIMUM SPEED (CFM) AND STATUS SWITCHES WILL BE COORDINATED WITH THE MINIMUM FAN OUTPUT.

   WHEN THE FAN IS TURNED ON, THE FAN STATUS DETERMINES IF THERE IS AIR MOVEMENT IN THE DUCT. AFTER AN OPERATOR-DEFINED FEEDBACK TIME DELAY, IF THERE IS NO AIR MOVEMENT IN THE DUCT, AN ALARM WILL BE GENERATED. ONCE THE TIME DELAY HAS PASSED, IF THE FAN STATUS INDICATES OFF (FIRE ALARM/FREEZESTAT, OVERLOADS, MANUAL SHUTDOWN) AND THE FAN IS COMMANDED ON, AN ALARM WILL BE GENERATED.

3. RETURN AIR FAN (RAF): THE RESPECTIVE RETURN AIR FAN VFD IS INTERLOCKED WITH THE SUPPLY FAN VFD TO BE ENABLED WHEN THE SUPPLY FAN VFD IS ENABLED. STATUS IS MONITORED TO GENERATE AN ALARM IF THE SUPPLY FAN VFD IS ENABLED BUT THE RETURN FAN STATUS INDICATES OFF AFTER THE PROOF FEEDBACK TIME DELAY HAS EXPIRED.

4. OUTSIDE AIR DAMPERS: THE PRIMARY OUTSIDE AIR DAMPER SHALL OPEN TO THE MINIMUM POSITION AS DETERMINED BY OSA FLOW MONITOR WHEN THE AIR-HANDLING UNIT IS SCHEDULED, RETURN AIR TEMP IS MIN. 65°F, AND THE FAN STATUS INDICATES "ON". OUTSIDE AIR DAMPER SHALL MODULATE AS REQUIRED TO DELIVER SCHEDULED MINIMUM OSA BASED UPON MEASUREMENTS OF OUTSIDE AIRFLOW MEASURING STATION.

5. DISCHARGE AIR CONTROL:
   A. AIR TEMPERATURE CONTROL: THE DDC CONTROLLER WILL MODULATE THE CHILLED WATER VALVE AS REQUIRED TO MAINTAIN THE SCHEDULED DISCHARGE AIR TEMPERATURE SETPOINT. WHEN COOLING COIL VAVLE IS IN THE CLOSED POSITION AND OSA IS TRACKING MINIMUM OSA AND DISCHARGE AIR TEMPERATUR IS 2°F BELOW UNIT SCHEDULED DISCHARGE AIR TEMPERATURE, REHEAT COIL VALVE SHALL MODULATE AS REQUIRED TO MAINTAIN DISCHARGE AIR SETPOINT. SOFTWARE LOGIC WILL PREVENT SIMULTANEOUS HEATING AND COOLING. WHEN THE MIXED AIR TEMPERATURE DROPS BELOW 25°F, THE COOLING COIL VALVE SHALL OPEN TO THE 50% OPEN POSITION FOR FREEZE PROTECTION. THE DISCHARGE AIR TEMPERATURE SENSOR WILL PREVENT DISCHARGE AIR TEMPERATURES FROM EXCEEDING LIMITS SET FOR HEATING MODE AND COOLING MODE. LIMITS FOR EACH MODE WILL BE OPERATOR DEFINED. MODE CHANGE FREQUENCY WILL BE OPERATOR DEFINED.
   B. DISCHARGE TEMPERATURE RESET: WHEN THE UNIT IS IN THE SCHEDULED UNOCCUPIED MODE, COOLING COIL VALVE SHALL MODULATE AS REQUIRED TO MAINTAIN A DISCHARGE AIR TEMPERATURE OF 72°F WITH ALL ASSOCIATED VAV TERMINAL DEVICES INDEXED TO THE MINIMUM CFM POSITION. UPON A CALL FOR COOLING FROM ANY VAV ZONE (SPACE TEMP. GREATER THAN 85°F), THE DISCHARGE TEMP. SHALL RETURN TO SCHEDULED VALUE FOR 15 MINUTES AND THEN RETURN TO 72°F. WHEN THE UNIT RETURN AIR HUMIDITY SENSOR INDICATES RH GREATER THAN 58%, THE DISCHARGE AIR TEMP. SHALL RETURN TO THE SCHEDULED VALUE FOR 15 MINUTES AND THEN RETURN TO 72°F.

6. SUPPLY DUCT STATIC PRESSURE CONTROL: THE DDC CONTROLLER WILL AUTOMATICALLY MODULATE THE SUPPLY FAN VFD WHEN THE VFD CONTROLLER SWITCH IS IN AUTOMATIC POSITION. SUPPLY FAN VFD WILL BE CONTROLLED MANUALLY WHEN THE VFD CONTROLLER SWITCH IS IN THE LOCAL POSITION.THE VFD WILL MODULATE BETWEEN THE MINIMUM AND MAXIMUM SPEED (CFM) SETTINGS TO MAINTAIN THE SUPPLY DUCT STATIC PRESSURE SETPOINT (INITIALLY SET AT 1.5" W.C., ADJUSTABLE).

7. FAN TRACKING CONTROL:
   A. (FOR RETURN FAN CONTROL): THE DDC CONTROLLER WILL AUTOMATICALLY MODULATE THE RETURN FAN VFD WHEN THE VFD CONTROLLER SWITCH IS IN THE AUTOMATIC POSITION. RETURN FAN VFD WILL BE CONTROLLED MANUALLY WHEN THE VFD CONTROLLER SWITCH IS IN THE HAND POSITION. THE VFD WILL MODULATE BETWEEN A MINIMUM AND MAXIMUM SPEED (CFM) TO MAINTAIN FAN TRACKING RELATIONSHIP WITH SUPPLY FAN AS INDICATED IN THE SCHEDULE BELOW.

AHU	RETURN FAN SETTING AT SUPPLY FAN MAX. (CFM)
7	11647
8	2491
19	8452
20	21212
26	20417

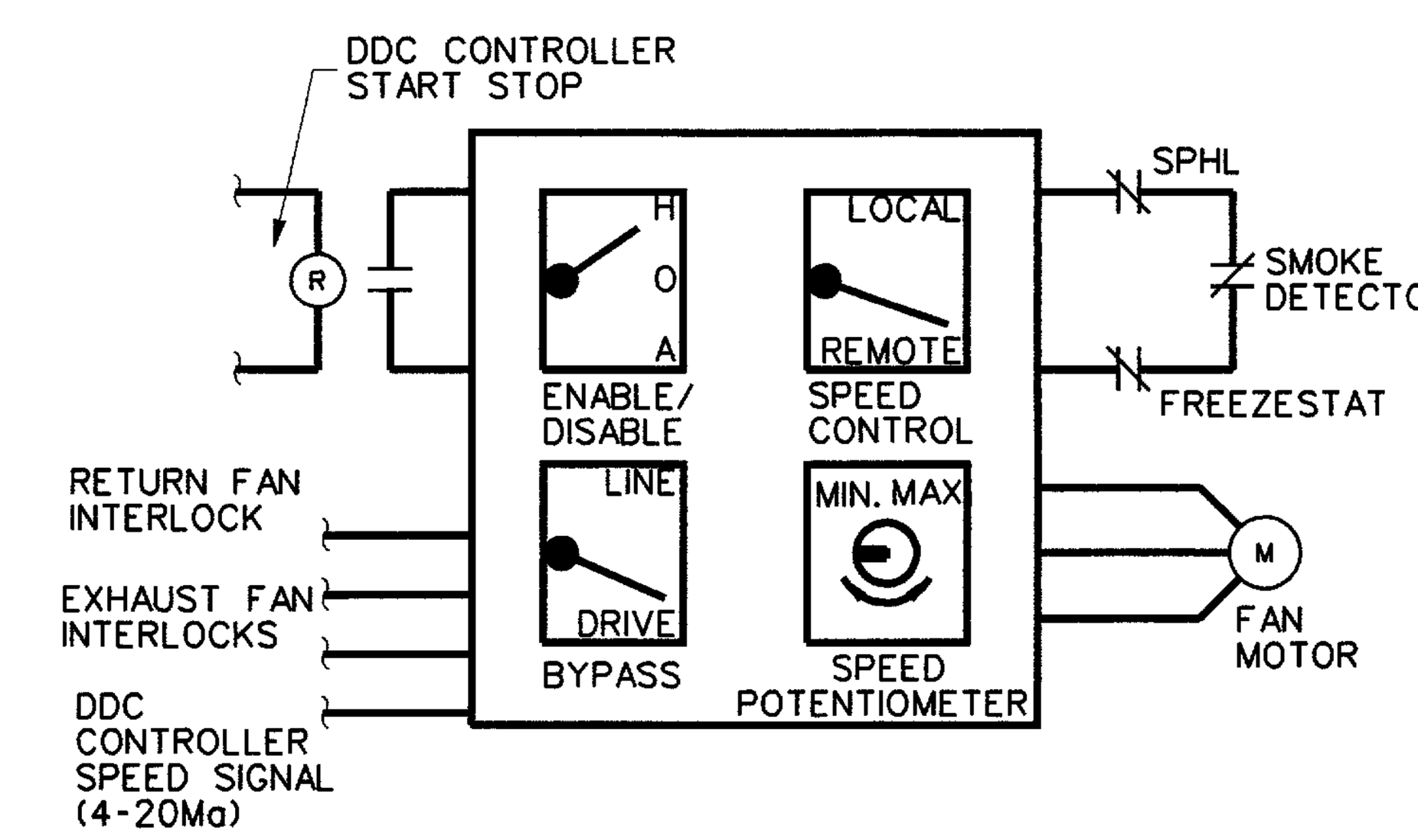
   B. (FOR EXHAUST FAN): THE DDC CONTROLLER SHALL ENERGIZE THE ASSOCIATED EXHAUST FAN(S) ONLY WHEN MINIMUM OUTSIDE AIR DAMPER IS OPEN. SEE EXHAUST FAN INTERLOCK SCHEDULE.

8. ECONOMIZER COOLING: ECONOMIZER COOLING IS ENABLED WHENEVER THE OUTSIDE AIR ENTHALPY IS LESS THAN THE RETURN AIR ENTHALPY. WHEN THE ECONOMIZER IS ENABLED, THE DDC CONTROLLER WILL MODULATE IN CONCERT THE OUTSIDE AIR DAMPERS TO THE FULL OPEN POSITION AND THE RETURN AIR DAMPER TO THE FULL CLOSED POSITION AND THE COOLING COIL VALVE WILL MODULATE AS REQUIRED TO MAINTAIN THE DISCHARGE AIR TEMP. SETPOINT. AS OSA TEMP. DROPS, THE RETURN AIR AND OSA DAMPERS SHALL MODULATE IN TANDEM (CLOSING MAX. OSA DAMPERS) TO MAINTAIN SCHEDULED AHU DISCHARGE SETPOINT. WHEN OSA DAMPER CLOSES TO THE MINIMUM OSA POSITION, THE ECONOMIZER MODE SHALL END.

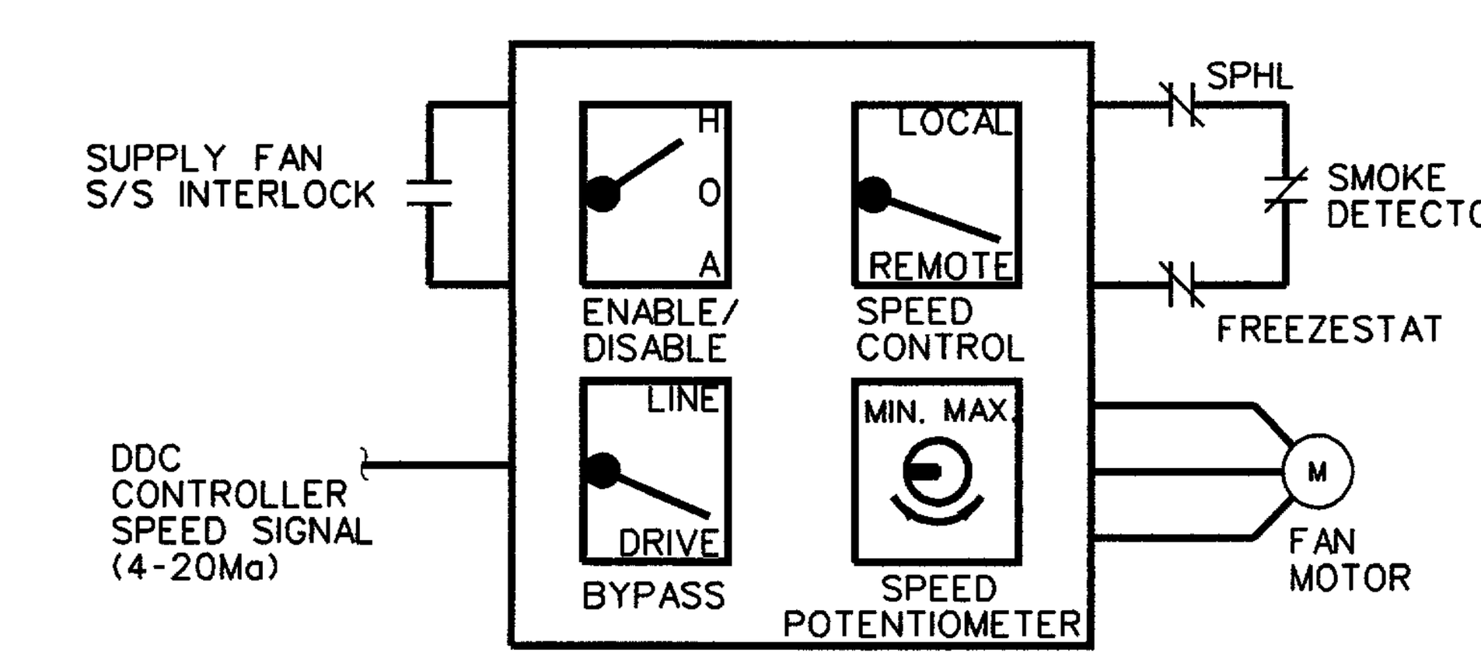
9. SAFETIES: SAFETY DEVICES (DUCT SMOKE DETECTOR, FREEZESTAT, STATIC PRESSURE HIGH LIMIT) ARE INTERLOCKED WITH THE FAN STARTER CIRCUIT. THE DEVICES DISABLE THE SUPPLY FAN AND RETURN FAN VFDs, CLOSE THE OUTSIDE AIR DAMPER, AND FULLY OPENS THE RETURN DAMPER. ALL SAFETIES SHALL HAVE AUXILIARY CONTACTS SUCH THAT WHEN ACTIVATED THE DDC CONTROLLER WILL GENERATE AN ALARM. ANY FIRE ALARM SYSTEM SIGNAL GENERATED IN THE BUILDING SHALL CAUSE THE DDC SYSTEM TO SHUT DOWN ALL AHUs.

PANEL DESIGNATION FT. MEADE - DINFOS	HARDWARE																				SOFTWARE																		
	OUTPUT (O)								INPUT (T,D,V,C)												ALARMS							PROGRAM											
	DIGITAL				ANALOG				DIGITAL						ANALOG						DIGITAL			ANALOG															
AHU CONTROLS VARIABLE AIR VOLUME AIR HANDLING UNIT UNIT TYPE "B" / POINT DESCRIPTION	Control Relay	Solenoid	Contactor		Pneumatic Transducer	Electrical Transducer	4-20MA Module		Differential Pressure	Flow Switch	Pres. Switch Closure	Auxiliary Contact	Open/Close	Contact Closure	Temperature	Relative Humidity	Pressure	Position	Flow		Equipment Status	Maintenance		High Limit	Low Limit	Run Time		Scheduled	Optimum Start/Stop	Duty Cycling	Demand Limiting	Day/Night Setback	Economizer	Ventilation/Recirculation	Temperature Control	Hot Water Reset	Supply Static Pressure	Speed Control	Position
SUPPLY AIR FAN S/S	●																									●		●	●										
SUPPLY AIR FAN STATUS									●												●																		
RETURN AIR FAN STATUS									●												●																		
SUPPLY STATIC PRESSURE																	●							●	●												●	●	
SUPPLY PRESSURE HIGH LIMIT											●										●			●															
SUPPLY FAN VFD							●																	●	●												●	●	
RETURN FAN VFD							●																	●	●													●	
SUPPLY AIRFLOW STATION																			●																				
RETURN AIRFLOW STATION																			●																			●	
RETURN AIR TEMPERATURE															●																	●							
RETURN AIR HUMIDITY																●																●							
MIXED AIR TEMPERATURE															●																								
UNIT DISCHARGE AIR TEMP.															●									●	●														
REHEAT COIL AIR TEMPERATURE															●									●	●														
OUTSIDE AIR HUMIDITY																●																●							
OUTSIDE AIR TEMPERATURE															●																	●							
OSA DAMPER CTL (2 THUS)							●																					●	●			●	●		●				●
RETURN AIR DAMPER CONTROL							●																					●	●			●	●		●				●
OUTSIDE AIRFLOW STATION																			●																				
FILTER (2 THUS)									●													●																	
HOT WATER VALVE CONTROL							●																												●				●
CHILLED WATER VALVE CONTROL							●																									●		●				●
DUCT SMOKE DETECTOR														●							●																		
FREEZESTAT														●							●																		

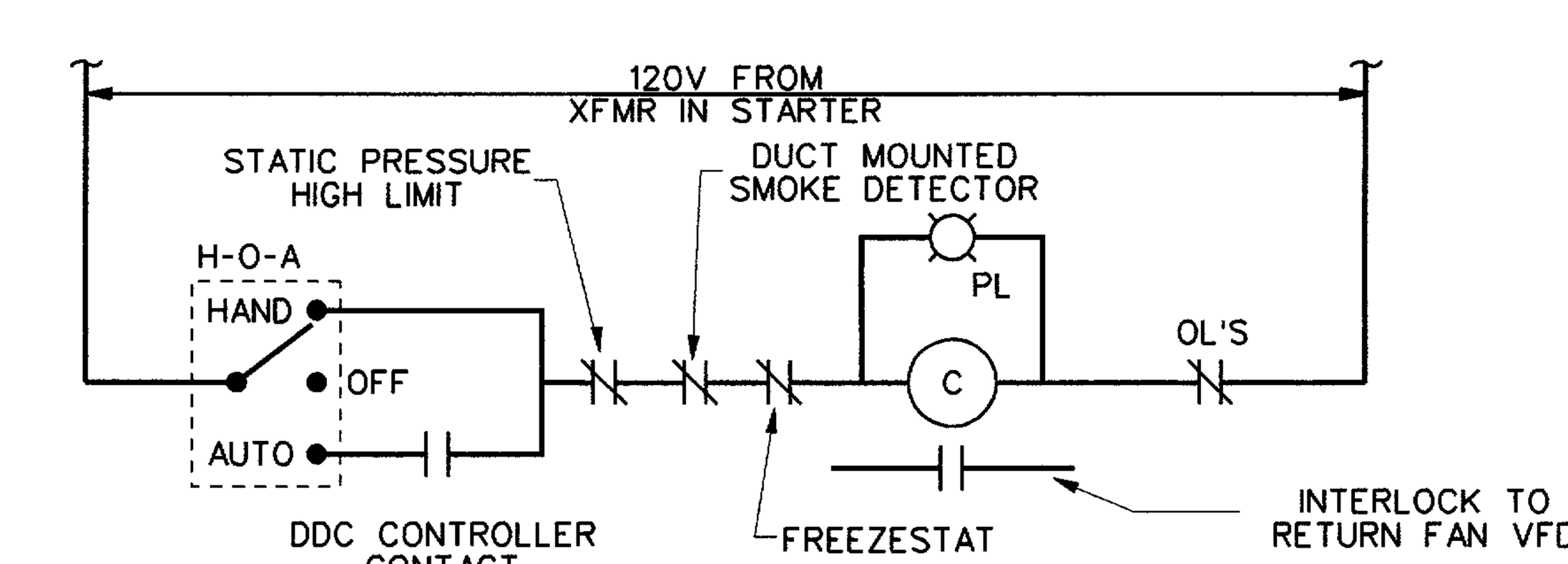
NOTE: PROVIDE DYNAMIC GRAPHIC REPRESENTATIVE OF EACH PIECE OF EQUIPMENT



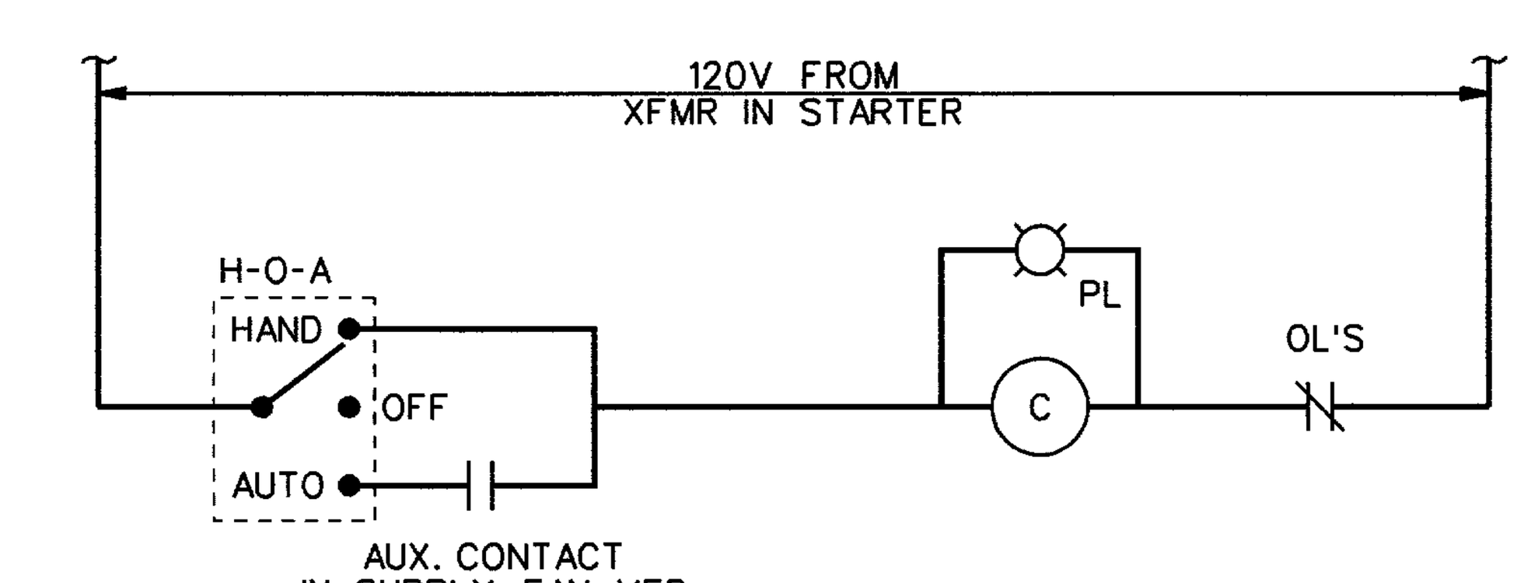
SUPPLY FAN VFD



RETURN FAN VFD



VARIABLE AIR VOLUME CONTROL



RETURN FAN CONTROL

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Date: 02/27/04 | CADD File Name: 312M804.DGN | ICT Project No. 203121 | Plot date: 02/27/04 | Plot scale:

Checked by: WTT | Dwn by: ICT | DACA87-03-D-0006 | Approved by: | Chief, Prj. Mgmt. Division

TASK ORDER #: FRR004

PADUCAH, KENTUCKY VOICE 270-442-8620

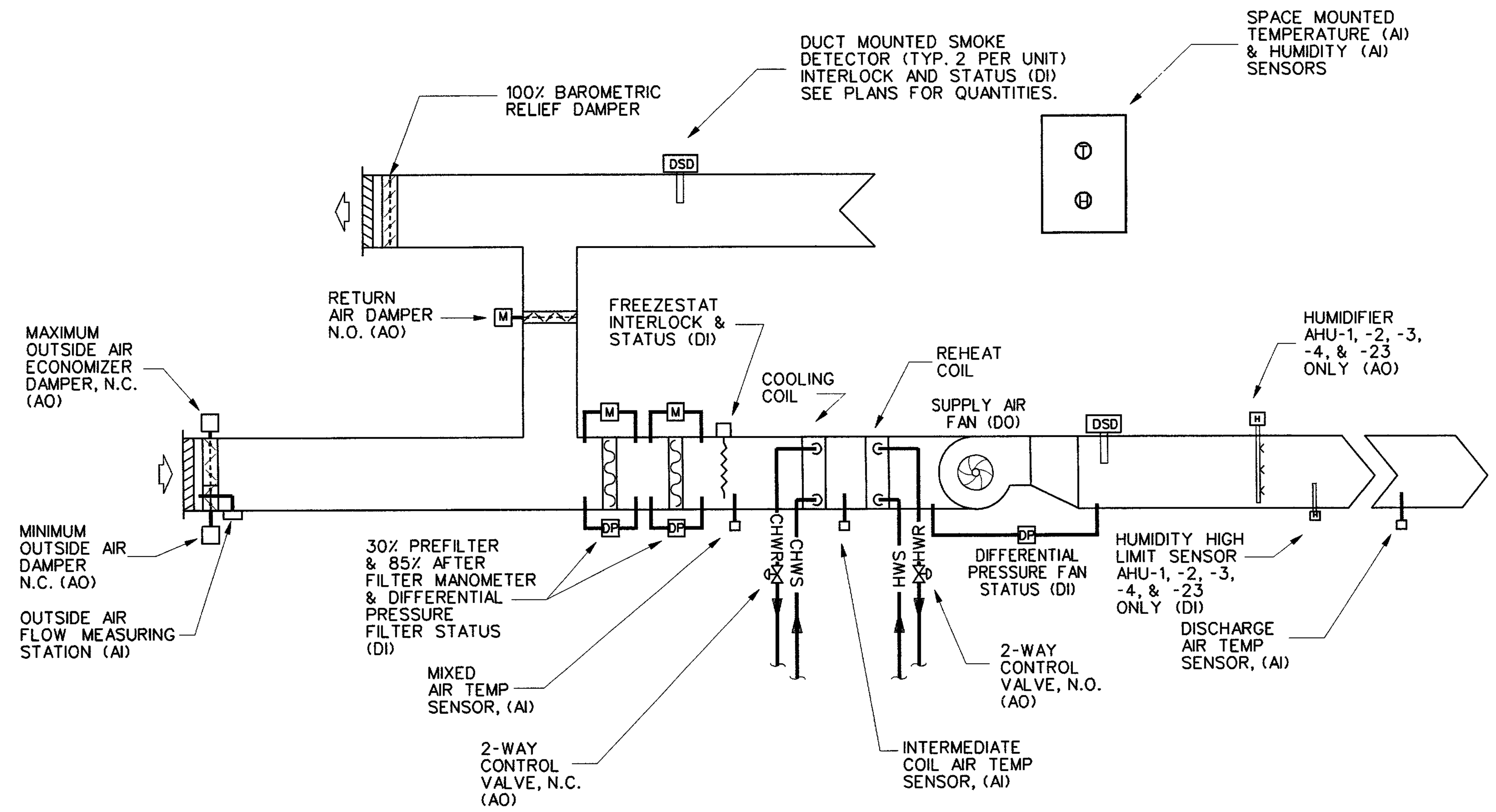
I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400

DEFENSE INFORMATION SCHOOL

FT. MEADE MARYLAND

EXISTING VARIABLE VOLUME AHU CONTROLS

Sheet reference number: M-804



AHU CONTROLS

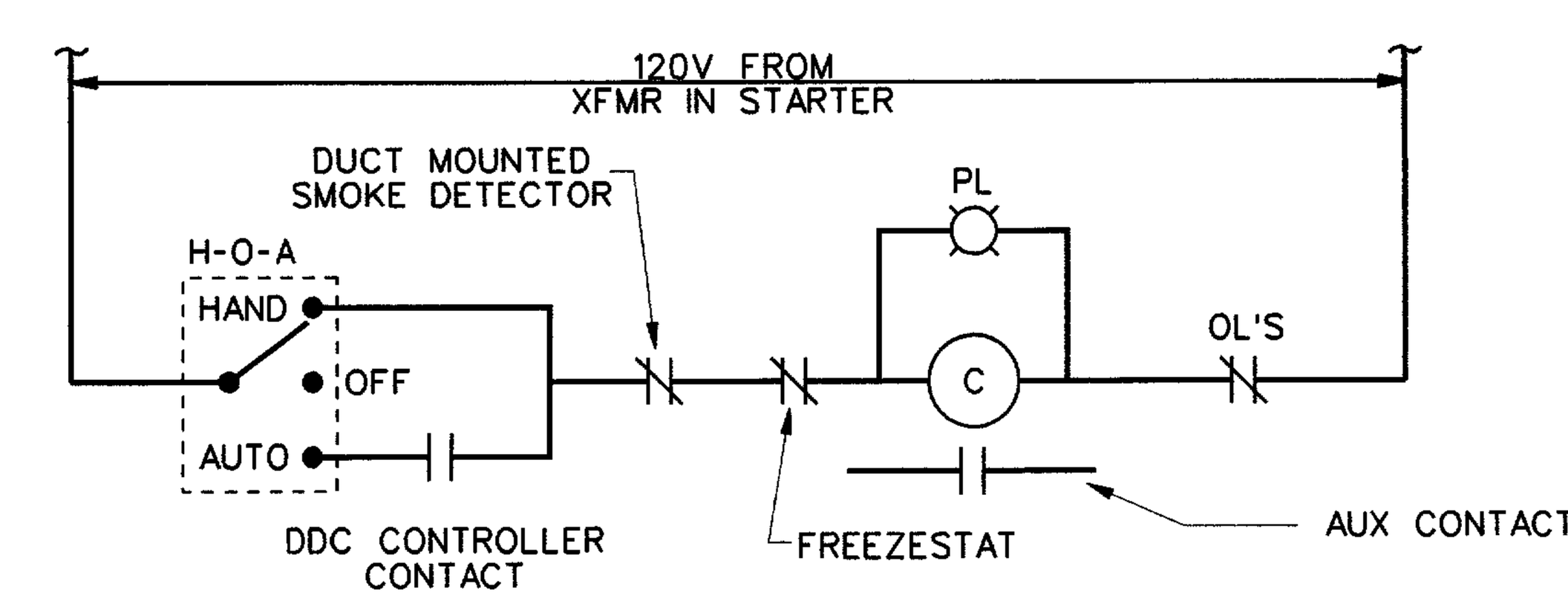
TYPICAL FOR SINGLE ZONE CONSTANT VOLUME UNITS

UNIT TYPE "C"

① AHU-1, 2, 3, 4, 9, 23, 29 ARE UNIT TYPE "C"

PANEL DESIGNATION FT. MEADE - DINFOS	HARDWARE																				SOFTWARE																		
	OUTPUT (O)								INPUT (T,D,V,C)												ALARMS							PROGRAM											
	DIGITAL				ANALOG				DIGITAL						ANALOG						DIGITAL			ANALOG															
AHU CONTROLS SINGLE ZONE CONSTANT VOLUME AIR HANDLING UNITS UNIT TYPE "C" / POINT DESCRIPTION	Control Relay	Solenoid	Contactor		Pneumatic Transducer	Electrical Transducer	4-20MA Module		Pressure Switch	Flow Switch	Switch Closure	Auxiliary Contact	Open/Close		Temperature	Relative Humidity	PSIg, PSIa, PSId	Position	Flow		Equipment Status	Maintenance		High Limit	Low Limit	Run Time		Scheduled	Optimum Start/Stop	Duty Cycling	Demand Limiting	Day/Night Setback	Economizer	Ventilation/Recirculation	Temperature Control	Hot Water Reset	Chiller Optimization	Chilled Water Reset	Position
SUPPLY AIR FAN S/S	●																									●		●	●										
SUPPLY AIR FAN STATUS									●												●																		
SPACE HUMIDITY																●								●	●								●						
SPACE AIR TEMPERATURE															●									●	●								●						
MIXED AIR TEMPERATURE															●									●	●														
INTERMEDIATE COIL AIR TEMP.															●									●	●														
DISCHARGE AIR TEMPERATURE															●									●	●														
OUTSIDE AIR HUMIDITY																●																	●						
OUTSIDE AIR TEMPERATURE															●																		●						
HUMIDIFIER							●																																
HUMIDIFIER HIGH LIMIT											●										●																		
MAX. OSA DAMPER CTL							●																					●	●			●	●		●				●
MIN. OSA DAMPER CTL							●																					●	●			●	●						●
RETURN AIR DAMPER CONTROL							●																					●	●			●	●		●				●
OUTSIDE AIRFLOW STATION																			●														●						
FILTER (2 THUS)									●													●																	
HOT WATER VALVE CONTROL							●																												●				●
CHILLED WATER VALVE CONTROL							●																										●		●				●
FREEZESTAT																					●																		
DUCT SMOKE DETECTOR																					●																		

NOTE: PROVIDE DYNAMIC GRAPHIC REPRESENTATIVE OF EACH PIECE OF EQUIPMENT



SINGLE ZONE CONSTANT VOLUME CONTROL

SEQUENCE OF OPERATION
SINGLE-ZONE CONSTANT VOLUME AIR-HANDLING UNIT

1. SUPPLY AIR FAN (SAF): THE SUPPLY AIR FAN IS STARTED MANUALLY THROUGH THE HAND POSITION OF THE H-O-A SWITCH. IN THE AUTO POSITION, IF SCHEDULED OR WHEN AIR IS REQUIRED FOR OPTIMUM START OR NIGHT SETBACK (HEATING OR COOLING), THE DDC CONTROLLER WILL ENABLE THE SUPPLY AIR FAN.

2. FAN STATUS: WHEN THE FAN IS ENERGIZED, DIFFERENTIAL PRESSURE SENSOR DETERMINES IF THERE IS AIR MOVEMENT IN THE DUCT. AFTER AN OPERATOR-DEFINED FEEDBACK TIME DELAY, IF THERE IS NO AIR MOVEMENT, AN ALARM WILL BE GENERATED. ONCE THE TIME DELAY HAS PASSED, IF THE FAN STATUS INDICATES OFF (FIRE ALARM/FREEZESTAT, OVERLOADS, MANUAL SHUTDOWN) AND THE FAN IS COMMANDED ON, AN ALARM WILL BE GENERATED.

3. MINIMUM OUTSIDE AIR DAMPERS: THE MINIMUM OUTSIDE AIR DAMPERS WILL BE OPENED WHENEVER THE AIR-HANDLING UNIT IS SCHEDULED TO OPERATE, RETURN AIR TEMP IS MINIMUM 65°F, AND THE FAN STATUS INDICATES "ON". MINIMUM OUTSIDE AIR DAMPER SHALL MODULATE AS REQUIRED TO DELIVER SCHEDULED MINIMUM OSA BASED UPON MEASUREMENTS OF OUTSIDE AIRFLOW MEASURING STATION.

4. DISCHARGE AIR CONTROL:
   A. AIR TEMPERATURE CONTROL: THE DDC CONTROLLER WILL MODULATE THE HOT WATER AND CHILLED WATER VALVES INDEPENDENTLY TO MAINTAIN THE SPACE TEMPERATURE SETPOINT. SOFTWARE LOGIC WILL PREVENT SIMULTANEOUS HEATING AND COOLING. THE DISCHARGE AIR TEMPERATURE SENSOR WILL PREVENT DISCHARGE AIR TEMPERATURES FROM EXCEEDING LIMITS SET FOR HEATING MODE AND COOLING MODE. LIMITS FOR EACH MODE WILL BE OPERATOR DEFINED. MODE CHANGE FREQUENCY WILL BE OPERATOR DEFINED.
   B. HUMIDIFICATION: (UNITS AHU-1,2,3,4, AND 23) THE DDC CONTROLLER WILL ENERGIZE HUMIDIFIER WHEN RETURN HUMIDITY SENSOR REPORTS RH BELOW 40% AND COOLING COIL VALVE IS IN CLOSED POSITION. THE CONTROLLER SHALL DEENERGIZE IF THERE IS A ZONE THERMOSTAT CALL FOR COOLING OPENING COOLING COIL VALVE, OR IF RETURN HUMIDITY SENSOR REPORTS RH GREATER THAN 50%.
   C. DEHUMIDIFICATION: (UNITS AHU-1,2,3,4, AND 23) WHEN RETURN HUMIDITY SENSOR REPORTS RH GREATER THAN 58% AND THE SPACE IS NOT CALLING FOR COOLING OR HEATING, THE DDC CONTROLLER SHALL MODULATE THE COOLING COIL VALVE FROM CLOSED TO OPEN TO DEVELOP A 55 DEGREE INTERMEDIATE AIR TEMPERATURE. SIMULTANEOUSLY THE DDC CONTROLLER SHALL MODULATE THE REHEAT COIL VALVE FROM CLOSED TO OPEN TO DEVELOP 68 OR 72 DEGREE DISCHARGE AIR DEPENDENT ON SEASONAL SETPOINT OF SPACE. A CALL FOR HEATING OR COOLING SHALL REVERT THE CONTROL FROM DEHUMIFICATION TO COOLING OR HEATING AS REQUIRED.

6. ECONOMIZER COOLING: ECONOMIZER COOLING IS ENABLED WHENEVER THE OUTSIDE AIR ENTHALPY IS LESS THAN THE RETURN AIR ENTHALPY. WHEN THE ECONOMIZER IS ENABLED, THE DDC CONTROLLER WILL MODULATE IN CONCERT THE MAXIMUM OUTSIDE AIR DAMPER TO THE FULL OPEN POSITION AND THE RETURN AIR DAMPER TO THE FULL CLOSED POSITION AND THE COOLING COIL VALVE WILL MODULATE AS REQUIRED TO MAINTAIN THE SPACE AIR TEMP. SETPOINT. AS OSA TEMP. DROPS, THE RETURN AIR AND MAX. OSA DAMPER SHALL MODULATE IN TANDEM (CLOSING MAX. OSA DAMPER) TO SATISFY SPACE TEMPERATURE SETPOINT. WHEN MAX. OSA DAMPER CLOSES TO THE FULL CLOSED POSITION, THE REHEAT COIL VALVE WILL MODULATE TO SATISFY SPACE SETPOINT. THE REVERSE SEQUENCE WILL OCCUR AS THE OUTSIDE AIR TEMPERATUR RISES.

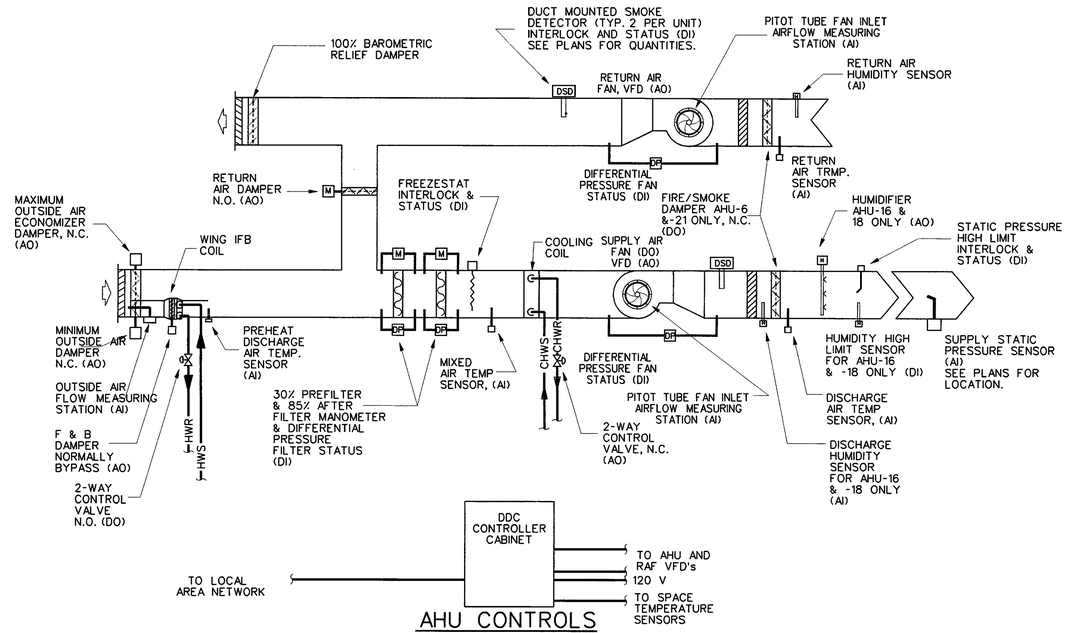
7. SAFETIES: SAFETY DEVICES SAFETY DEVICES (DUCT SMOKE DETECTOR AND FREEZESTAT) ARE INTERLOCKED WITH THE FAN STARTER CIRCUIT. THE DEVICES DISABLE THE SUPPLY FAN, CLOSE THE MINIMUM AND MAXIMUM OSA DAMPERS, AND FULLY OPEN THE RETURN DAMPERS. ALL SAFETIES SHALL HAVE AUXILIARY CONTACTS SUCH THAT WHEN ACTIVATED THE DDC CONTROLLER WILL GENERATE AN ALARM. ANY FIRE ALARM SYSTEM SIGNAL GENERATED IN THE BUILDING SHALL CAUSE THE DDC SYSTEM TO SHUT DOWN ALL AHUs.

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

TASK ORDER #: FRR004
PADUCAH, KENTUCKY VOICE 270-442-8620
I.C. Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400
Checked by: WTT | Date: 02/27/04
Dwn by: ICT | CADD File Name: 3121M802.DGN
DACA87-03-D-0006 | ICT Project No. 203121
Approved by: | Plot date: 02/27/04
Chief, Prj. Mgmt. Division | Plot scale:

DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND
NEW CONSTANT VOLUME AHU CONTROLS

Sheet reference number: M-805



AHU CONTROLS

TYPICAL FOR VARIABLE AIR VOLUME UNITS

UNIT TYPE "D"

① HUMIDITY SENSORS SHALL BE DUCT MOUNTED WITHIN BUILDING A MINIMUM OF TWENTY FEET FROM ROOF PENETRATION.

② AHU-5, 6, 10, 11, 12, 13, 14, 15, 16, 17, 18, 21, 24, 27, 28 ARE UNIT TYPE "D"

PANEL DESIGNATION FT. MEADE - DINFOS	HARDWARE																		SOFTWARE																	
	OUTPUT (O)								INPUT (T,D,V,C)										ALARMS				PROGRAM													
	DIGITAL				ANALOG				DIGITAL				ANALOG						DIGITAL		ANALOG																
AHU CONTROLS VARIABLE AIR VOLUME AIR HANDLING UNIT UNIT TYPE "B"	Control Relay	Solenoid	Contactor		Pneumatic Transducer	Electrical Transducer	4-20MA Module		Differential Pressure	Flow Switch	Pres. Switch Closure	Switch Closure	Open/Close	Contact Closure	Temperature	Relative Humidity	Pressure	Position	Flow	Equipment Status	Maintenance	High Limit	Low Limit	Run Time	Scheduled	Optimum Start/Stop	Duty Cycling	Demand Limiting	Day/Night Setback	Economizer	Ventilation/Recirculation	Temperature Control	Humidity Control	Supply Static Pressure	Speed Control	Position
POINT DESCRIPTION																																				
SUPPLY AIR FAN S/S	•																		•				•	•	•											
SUPPLY AIR FAN STATUS									•										•																	
RETURN AIR FAN STATUS									•										•																	
SUPPLY STATIC PRESSURE																•					•	•													•	•
SUPPLY PRESSURE HIGH LIMIT											•								•			•														
SUPPLY FAN VFD					•																	•	•												•	•
RETURN FAN VFD					•																	•	•												•	
SUPPLY AIRFLOW STATION																	•																			
RETURN AIRFLOW STATION																	•																		•	
RETURN AIR TEMPERATURE															•																	•				
RETURN AIR HUMIDITY																•																•				
MIXED AIR TEMPERATURE															•																					
UNIT DISCHARGE AIR TEMP.															•							•	•													
PREHEAT COIL AIR TEMPERATURE															•							•	•													
OUTSIDE AIR HUMIDITY																•																•				
OUTSIDE AIR TEMPERATURE															•																	•				
MIN. OSA DAMPER CTL					•																				•	•			•	•					•
MAX. OSA DAMPER CTL					•																				•	•			•	•	•				•
RETURN AIR DAMPER CONTROL					•																				•	•			•	•	•				•
OUTSIDE AIRFLOW STATION																	•																			
FILTER (2 THUS)									•											•																
HOT WATER VALVE CONTROL	•																															•				•
CHILLED WATER VALVE CONTROL					•																											•	•	•		•
FACE & BYPASS DAMPER CTL					•																				•	•			•		•				•
F/S DAMPER CTL (AHU-6 & -21)	•																			•																•
HUMIDIFIER (AHU-6 & -21)					•																											•				
HUMIDIFIER HIGH LIMIT (AHU-6&21)											•									•													•			
SUPPLY HUMIDITY (AHU-6&21)																•																•	•			
DUCT SMOKE DETECTOR														•						•																
FREEZESTAT														•						•																

NOTE: PROVIDE DYNAMIC GRAPHIC REPRESENTATIVE OF EACH PIECE OF EQUIPMENT

SEQUENCE OF OPERATION
VARIABLE AIR VOLUME AIR-HANDLING UNIT

1. SUPPLY AIR FAN (SAF): THE SUPPLY AIR FAN VARIABLE FREQUENCY DRIVE (VFD) IS MANUALLY ENABLED WHEN THE VFD H-O-A SWITCH IS IN THE HAND POSITION. IN THE AUTO POSITION, WHEN AIR IS REQUIRED FOR OPTIMUM START OR NIGHT SETBACK (HEATING OR COOLING) OR IF THE AIR-HANDLING UNIT IS SCHEDULED TO RUN, THE DDC CONTROLLER WILL ENABLE THE SUPPLY FAN VFD. WHEN AHU-6 AND AHU-21 ARE COMMANDED ON BY OR AUTOMATIC OR MANUAL INITIATION, THE DDC CONTROLLER SHALL OPEN SUPPLY AND RETURN FIRE/SMOKE DAMPERS AND CLOSE DAMPERS WHEN COMMANDED OFF. DAMPERS SHALL CLOSE IN ALARM CONDITION.

2. FAN STATUS: ALL FANS CONTROLLED BY VFDs WILL START AT A MINIMUM SPEED (CFM) AND STATUS SWITCHES WILL BE COORDINATED WITH THE MINIMUM FAN OUTPUT.

   WHEN THE FAN IS TURNED ON, THE FAN STATUS DETERMINES IF THERE IS AIR MOVEMENT IN THE DUCT. AFTER AN OPERATOR-DEFINED FEEDBACK TIME DELAY, IF THERE IS NO AIR MOVEMENT IN THE DUCT, AN ALARM WILL BE GENERATED. ONCE THE TIME DELAY HAS PASSED, IF THE FAN STATUS INDICATES OFF (FIRE ALARM/FREEZESTAT, OVERLOADS, MANUAL SHUTDOWN) AND THE FAN IS COMMANDED ON, AN ALARM WILL BE GENERATED.

3. RETURN AIR FAN (RAF): THE RESPECTIVE RETURN AIR FAN VFD IS INTERLOCKED WITH THE SUPPLY FAN VFD TO BE ENABLED WHEN THE SUPPLY FAN VFD IS ENABLED. STATUS IS MONITORED TO GENERATE AN ALARM IF THE SUPPLY FAN VFD IS ENABLED BUT THE RETURN FAN STATUS INDICATES OFF AFTER THE PROOF FEEDBACK TIME DELAY HAS EXPIRED.

4. MINIMUM OUTSIDE AIR DAMPERS: THE MINIMUM OUTSIDE AIR DAMPERS WILL BE OPENED WHENEVER THE AIR-HANDLING UNIT IS SCHEDULED TO OPERATE, RETURN AIR TEMP IS MINIMUM 65°F, AND THE FAN STATUS INDICATES "ON". MINIMUM OUTSIDE AIR DAMPER SHALL MODULATE AS REQUIRED TO DELIVER SCHEDULED MINIMUM OSA BASED UPON MEASUREMENTS OF OUTSIDE AIRFLOW MEASURING STATION. WHEN OUTSIDE AMBIENT AIR TEMP. DROPS BELOW 40°F, FACE & BYPASS PREHEAT COIL VALVE SHALL OPEN TO ALLOW FULL FLOW OF HW THROUGH COIL. DAMPERS OF FACE & BYPASS PREHEAT COIL SHALL MODULATE AS REQUIRED TO MAINTAIN SCHEDULED DISCHARGE AIR TEMPERATURE OF AHU. WHEN THE AIR-HANDLING UNIT STARTS FOR OPTIMUM START OR NIGHT SETBACK, THE MINUMUM OUTSIDE AIR DAMPERS WILL REMAIN CLOSED.

5. DISCHARGE AIR CONTROL:
   A. AIR TEMPERATURE CONTROL: THE DDC CONTROLLER WILL MODULATE THE CHILLED WATER VALVE AS REQUIRED TO MAINTAIN THE SCHEDULED DISCHARGE AIR TEMPERATURE SETPOINT. SOFTWARE LOGIC WILL PREVENT SIMULTANEOUS HEATING AND COOLING. THE DISCHARGE AIR TEMPERATURE SENSOR WILL PREVENT DISCHARGE AIR TEMPERATURES FROM EXCEEDING LIMITS SET FOR PRE-HEAT MODE AND COOLING MODE. LIMITS FOR EACH MODE WILL BE OPERATOR DEFINED. MODE CHANGE FREQUENCY WILL BE OPERATOR DEFINED.

   B. DISCHARGE TEMPERATURE RESET: WHEN THE UNIT IS IN THE SCHEDULED UNOCCUPIED MODE, COOLING COIL VALVE SHALL MODULATE TO MAINTAIN A MAXIMUM DISCHARGE AIR TEMPERATURE OF 72°F WITH ALL ASSOCIATED VAV TERMINAL DEVICES INDEXED TO THE MINIMUM CFM POSITION. UPON A CALL FOR COOLING FROM ANY VAV ZONE (SPACE TEMP. GREATER THAN 85°F), THE DISCHARGE TEMP. SHALL RETURN TO SCHEDULED VALUE FOR 15 MINUTES AND THEN RETURN TO 72°F. WHEN THE UNIT RETURN AIR HUMIDITY SENSOR INDICATES RH GREATER THAN 58%, THE DISCHARGE AIR TEMP. SHALL RETURN TO THE SCHEDULED VALUE FOR 15 MINUTES AND THEN RETURN TO 72°F.

   C. HUMIDIFICATION: (UNITS AHU-16, 18) THE DDC CONTROLLER WILL ENERGIZE HUMIDIFIER WHEN RETURN HUMIDITY SENSOR REPORTS RH BELOW 35%. THE CONTROLLER SHALL DEENERGIZE IF THE DISCHARGE HUMIDITY SENSOR INDICATES 95% RH OR GREATER.

6. SUPPLY DUCT STATIC PRESSURE CONTROL: THE DDC CONTROLLER WILL AUTOMATICALLY MODULATE THE SUPPLY FAN VFD WHEN THE VFD CONTROLLER SWITCH IS IN THE AUTOMATIC POSITION. SUPPLY FAN VFD WILL BE CONTROLLED MANUALLY WHEN THE VFD CONTROLLER SWITCH IS IN THE LOCAL POSITION. THE VFD WILL MODULATE BETWEEN THE MINIMUM AND MAXIMUM SPEED (CFM) SETTINGS TO MAINTAIN THE SUPPLY DUCT STATIC PRESSURE SETPOINT (INITIALLY SET AT 1.5" W.C., ADJUSTABLE).

7. FAN TRACKING CONTROL:
   A. (FOR RETURN FAN CONTROL): THE DDC CONTROLLER WILL AUTOMATICALLY MODULATE THE RETURN FAN VFD WHEN THE VFD CONTROLLER SWITCH IS IN THE AUTOMATIC POSITION. RETURN FAN VFD WILL BE CONTROLLED MANUALLY WHEN THE VFD CONTROLLER SWITCH IS IN THE HAND POSITION. THE VFD WILL MODULATE BETWEEN A MINIMUM AND MAXIMUM SPEED (CFM) TO MAINTAIN FAN TRACKING RELATIONSHIP WITH SUPPLY FAN AS INDICATED BELOW.

AHU	RETURN FAN SETTING AT SUPPLY FAN MAX. (CFM)
5	5164
6	21821
10	6999
11	2970
12	8221
13	2004
14	5399
15	9015

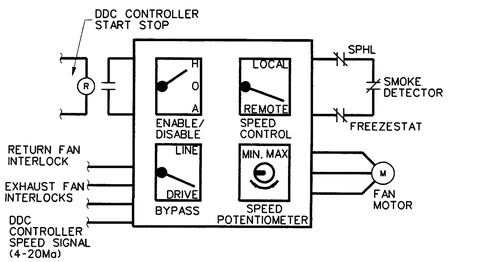
AHU	RETURN FAN SETTING AT SUPPLY FAN MAX. (CFM)
16	4849
17	9578
18	5203
21	15571
24	21741
27	8353
28	12275

   B. (FOR EXHAUST FAN): THE DDC CONTROLLER SHALL ENERGIZE THE ASSOCIATED EXHAUST FAN(S) ONLY WHEN MINIMUM OUTSIDE AIR DAMPER IS OPEN. SEE EXHAUST FAN INTERLOCK SCHEDULE.

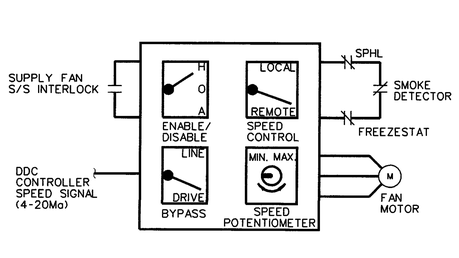
8. ECONOMIZER COOLING: ECONOMIZER COOLING IS ENABLED WHENEVER THE OUTSIDE AIR ENTHALPY IS LESS THAN THE RETURN AIR ENTHALPY. WHEN THE ECONOMIZER IS ENABLED, THE DDC CONTROLLER WILL MODULATE IN CONCERT THE MAXIMUM OUTSIDE AIR DAMPER TO THE FULL OPEN POSITION AND THE RETURN AIR DAMPER TO THE FULL CLOSED POSITION AND THE COOLING COIL VALVE WILL MODULATE AS REQUIRED TO MAINTAIN THE DISCHARGE AIR TEMP. SETPOINT. AS OSA TEMP. DROPS, THE RETURN AIR AND MAX. OSA DAMPER SHALL MODULATE IN TANDEM (CLOSING MAX. OSA DAMPER) TO MAINTAIN SCHEDULED AHU DISCHARGE SETPOINT. WHEN MAX. OSA DAMPER CLOSES TO THE FULL CLOSED POSITION, THE PREHEAT SEQUENCE BEGINS.

9. SAFETIES: SAFETY DEVICES (DUCT SMOKE DETECTOR, FREEZESTAT, STATIC PRESSURE HIGH LIMIT) ARE INTERLOCKED WITH THE FAN STARTER CIRCUIT. THE DEVICES DISABLE THE SUPPLY FAN AND RETURN FAN VFDs, CLOSE THE MINIMUM AND MAXIMUM OSA DAMPERS, AND FULLY OPEN THE RETURN DAMPERS. ALL SAFETIES SHALL HAVE AUXILIARY CONTACTS SUCH THAT WHEN ACTIVATED THE DDC CONTROLLER WILL GENERATE AN ALARM. ANY FIRE ALARM SYSTEM SIGNAL GENERATED IN THE BUILDING SHALL CAUSE THE DDC SYSTEM TO SHUT DOWN ALL AHUS.

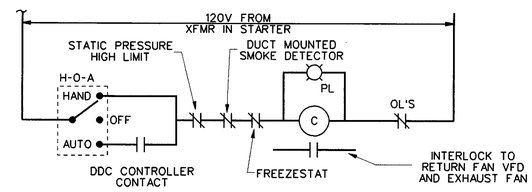
10. PREHEAT COIL CONTROL: THE DDC CONTROLLER WILL ENABLE THE IFB PREHEAT COIL HOT WATER VALVE WHENEVER THE OUTSIDE AIR TEMPERATURE IS BELOW 40°F. REGARDLESS OF WHETHER THE UNIT IS COMMANDED ON OR NOT. THE DDC CONTROLLER WILL MODULATE THE FACE AND BYPASS DAMPERS TO MAINTAIN SCHEDULED AHU DISCHARGE AIR TEMP.



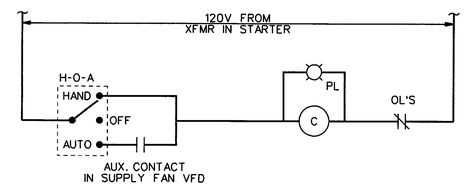
SUPPLY FAN VFD



RETURN FAN VFD



SUPPLY FAN CONTROL



RETURN FAN CONTROL

THESE DOCUMENTS HAVE BEEN PREPARED PRIMARILY BASED ON INFORMATION PROVIDED BY OTHERS. I.C. THOMASSON HAS NOT VERIFIED THE ACCURACY OF ALL INFORMATION PROVIDED BY OTHERS. SEE LIMIT OF LIAIBILITIES STATEMENT ON COVER SHEET.

US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Symbol	Description	Date	Appr.

Date: 02/27/84 | Checked by: WTT
CADD File Name: 312M803.DGN | Dwn by: ICT
Project No. 20321 | ICT Project No. DACA87-03-D-0006
Plot date: 02/27/04 | Approved by:
Plot scale: | Chief, Prj. Mgmt. Division

TASK ORDER #: FRR004

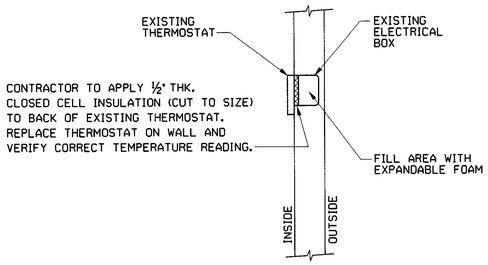
I.C. THOMASSON ASSOCIATES, INC.
PADUCAH, KENTUCKY VOICE 270-442-8620
NASHVILLE, TENNESSEE PHONE (615) 346-3400

DEFENSE INFORMATION SCHOOL FT. MEADE MARYLAND

NEW VARIABLE VOLUME AHU CONTROLS

STATE OF MARYLAND — WILLIAM T. THOMASSON — REGISTERED PROFESSIONAL MECHANICAL ENGINEER

Sheet reference number: M-806



THERMOSTAT INSULATION DETAIL

NOTE(S):

1. THERMOSTAT ON EXTERIOR WALL (SEE THERMOSTAT INSULATION DETAIL, THIS SHEET)
2. THERMOSTAT ON INTERIOR WALL
3. NEW HUMIDISTAT (LOCATE NEXT TO NEW THERMOSTAT LOCATION).

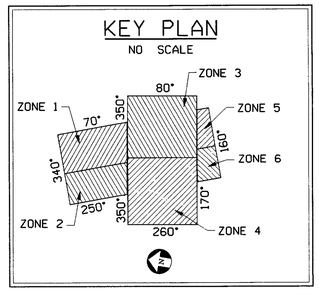
1st FLOOR PLAN

0 5 10

1/16" = 1'-0"

KEY PLAN

NO SCALE



US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.	Symbol	Description	Date	Appr.

Date: 02/27/04
Checked by:
Dwn by: ICT
CADD File Name: 312M901.DGN
DACA87-03-D-0006
ICT Project No. 203121
Approved by:
Chief, Proj. Mgmt. Division
Plot date: 02/27/04
Plot scale:

TASK ORDER #: FRF004

ENGLAND

PADUCAH, KENTUCKY VOICE 270-442-8620

J.C. Thomasson Associates Inc.
NASHVILLE, TENNESSEE
PHONE (615) 345-3400

ICT

DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND

1st FLOOR THERMOSTAT LOCATIONS

STATE OF MARYLAND
MECHANICAL ENGINEER

Sheet reference number:
M-901

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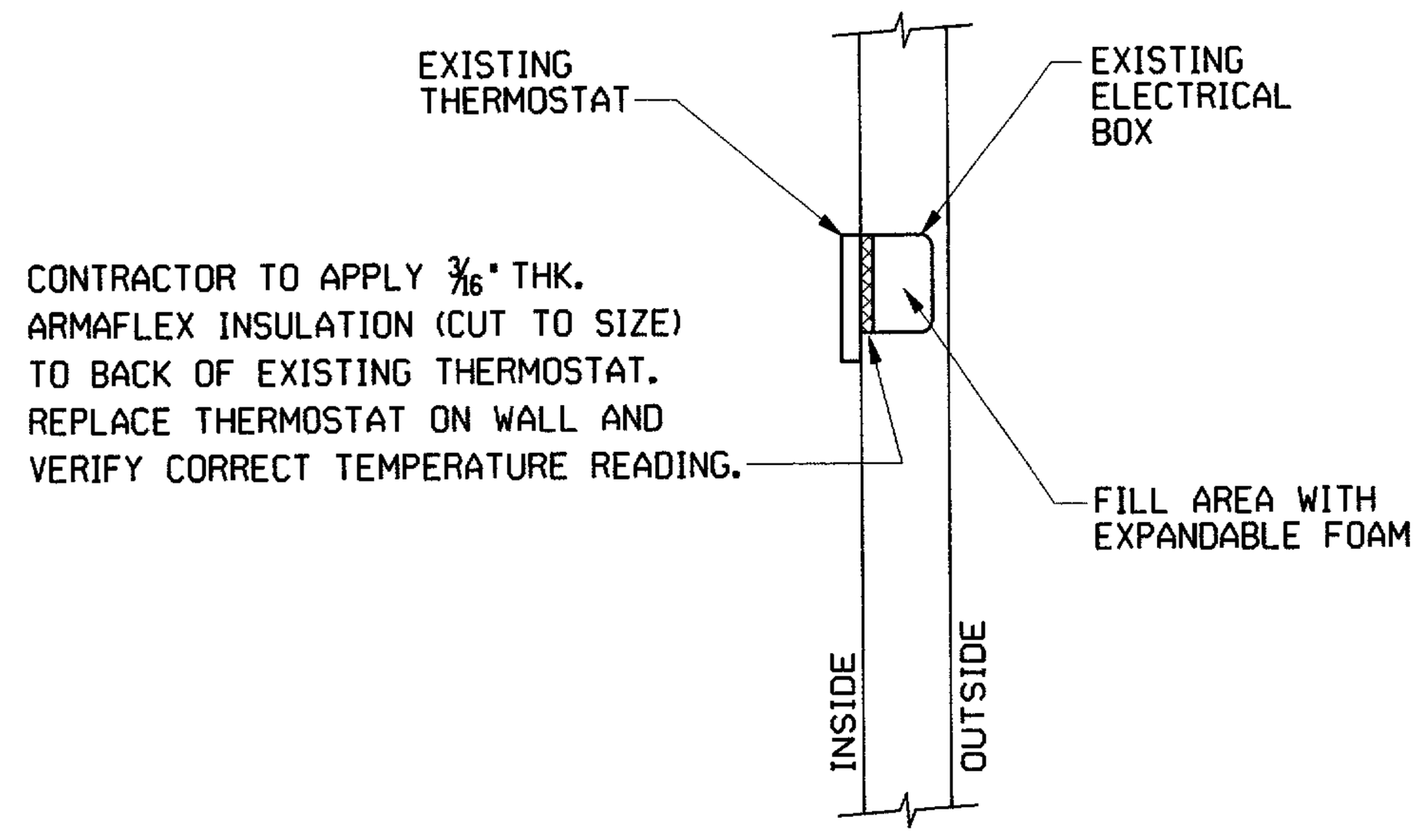
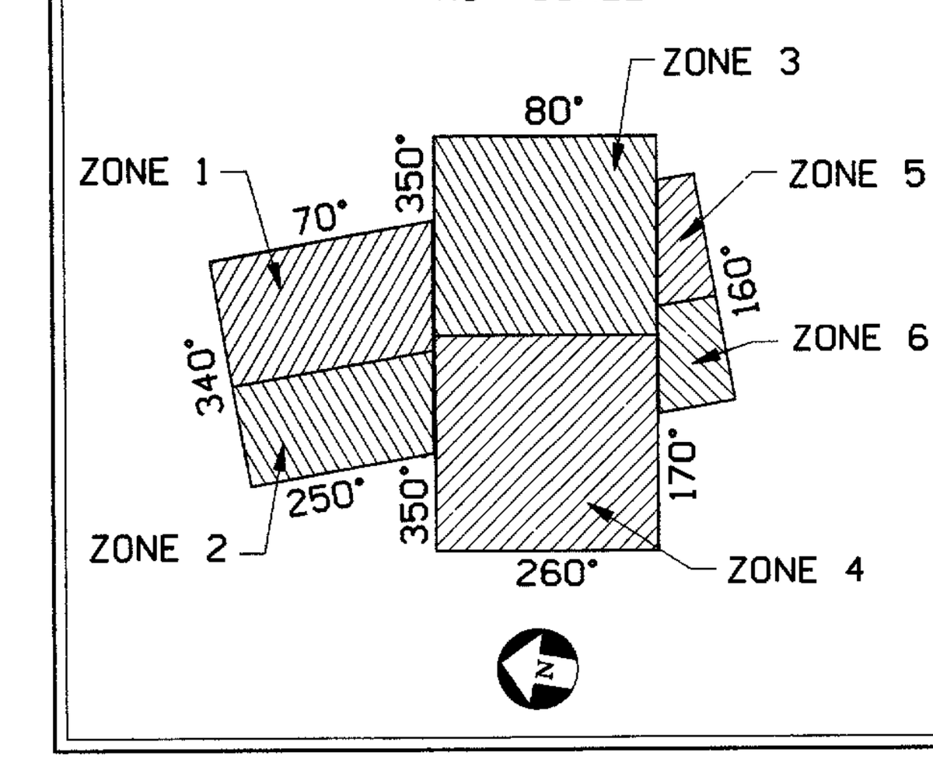
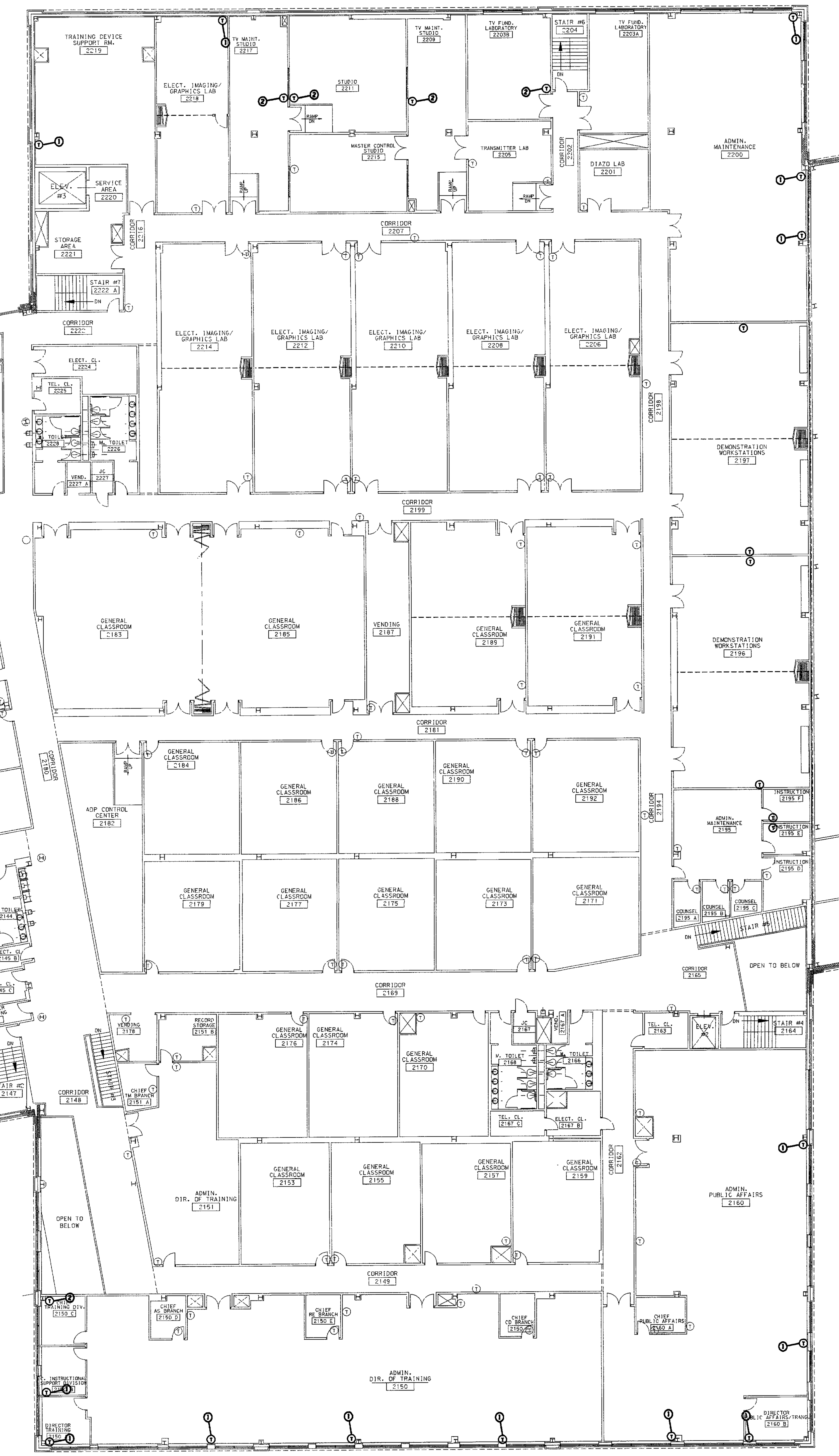


THERMOSTAT INSULATION DETAIL

KEY PLAN

NO SCALE






NOTE(S):

1. THERMOSTAT ON EXTERIOR WALL (SEE THERMOSTAT INSULATION DETAIL, THIS SHEET)
2. THERMOSTAT ON INTERIOR WALL

2nd FLOOR PLAN

0 5 10

1/16" = 1'-0"

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US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

TASK ORDER #: FRR004

PADUCAH, KENTUCKY VOICE 270-442-8620

NASHVILLE, TENNESSEE PHONE (615) 346-3400

Checked by: WTT | Date: 02/27/04

Dwn by: ICT | CADD File Name: 312M902.DGN

DACA87-03-D-0006 | ICT Project No. 203121

Approved by: | Plot date: 02/27/04

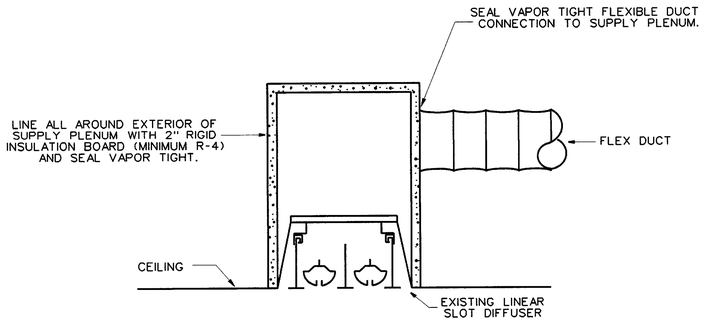
Chief, Prj. Mgmt. Division | Plot scale:

DEFENSE INFORMATION SCHOOL

FT. MEADE MARYLAND

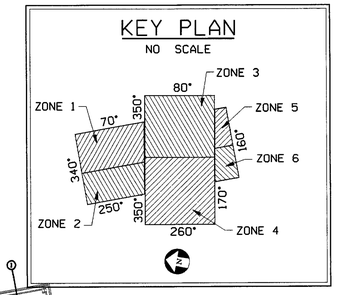
2nd FLOOR THERMOSTAT LOCATIONS

Sheet reference number: M-902



EXISTING LSD INSULATION DETAIL

NO SCALE



NOTES:

1. INSULATE EXISTING PERIMETER SUPPLY AIR SLOT DIFFUSER (SEE LSD INSULATION DETAIL THIS SHEET.)
2. INSULATE EXISTING PERIMETER SUPPLY AIR SQUARE CEILING DIFFUSER. (SEE SQUARE CEILING DIFFUSER INSULATION DETAIL THIS SHEET.)

SQUARE CEILING DIFFUSER INSULATION DETAIL

NO SCALE

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US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Checked by:
Drn by: ICT
Date: 02/27/04
CADD File Name: 312M903.DGN
ICT Project No. 203121
DAC.A87-03-D-0006
Plot date: 02/27/04
Approved by:
Plot scale:
Chief, Prj Mgmt. Division
Mgmt. Division

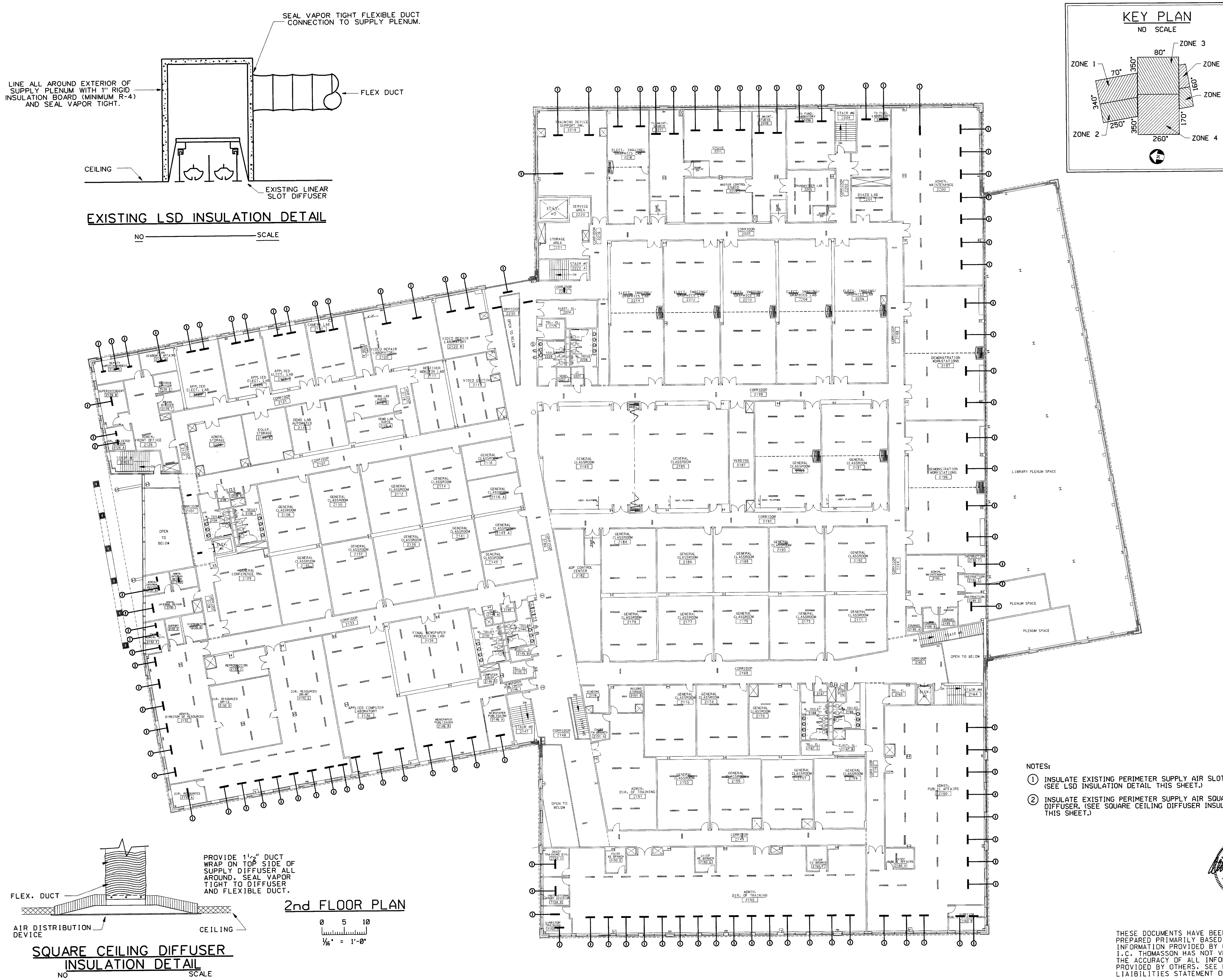
TASK ORDER *1, FRR004

I.C. Thomasson Associates, Inc.
PADUCAH, KENTUCKY VOICE 270-442-8620
NASHVILLE, TENNESSEE PHONE (615) 346-3400

DEFENSE INFORMATION SCHOOL
FT. MEADE MARYLAND

1st FLOOR SUPPLY DIFFUSER LOCATIONS

Sheet reference number:
M-903



EXISTING LSD INSULATION DETAIL

NO SCALE

2nd FLOOR PLAN

0 5 10

1/16" = 1'-0"

SQUARE CEILING DIFFUSER INSULATION DETAIL

NO SCALE

NOTES:

1. INSULATE EXISTING PERIMETER SUPPLY AIR SLOT DIFFUSER (SEE LSD INSULATION DETAIL THIS SHEET.)
2. INSULATE EXISTING PERIMETER SUPPLY AIR SQUARE CEILING DIFFUSER. (SEE SQUARE CEILING DIFFUSER INSULATION DETAIL THIS SHEET.)

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US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

Symbol	Description	Date	Appr.

TASK ORDER #: FRR004

VANGUARD — PADUCAH, KENTUCKY VOICE 270-442-8620

ICT — I.C.Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400

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DEFENSE INFORMATION SCHOOL

FT. MEADE MARYLAND

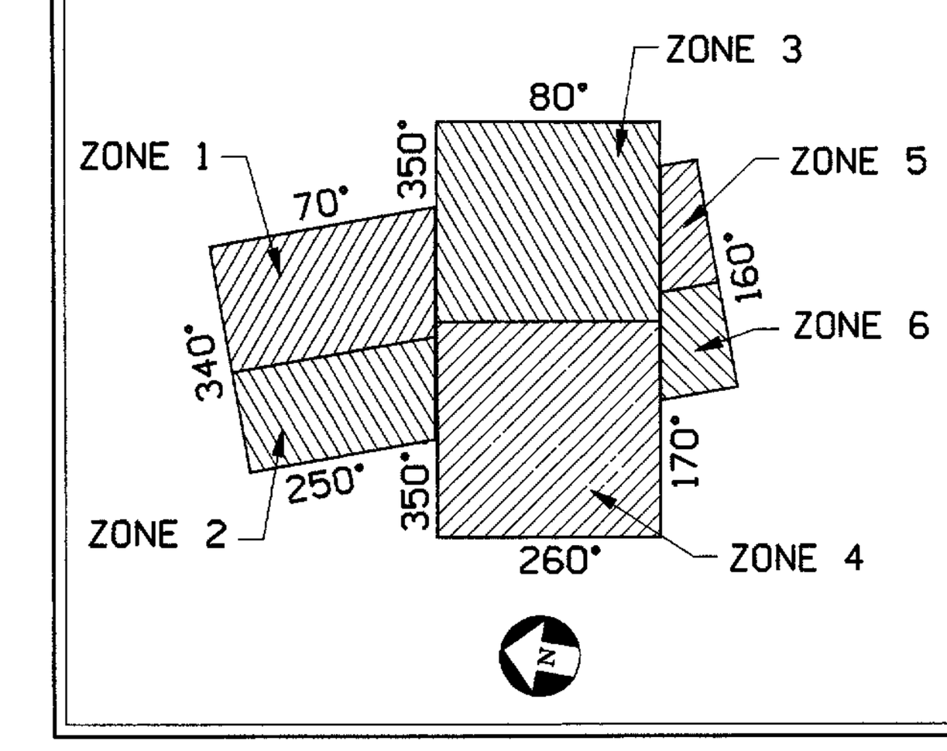
2nd FLOOR SUPPLY DIFFUSER LOCATIONS

Sheet reference number:

M-904

KEY PLAN

NO SCALE



1st FLOOR PLAN

0 5 10

1/16" = 1'-0"

① ADD TRANE X13790068-01 DDC AUXILIARY TEMP SENSOR TO ALL EXISTING VAV BOXES.

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US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

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Symbol	Description	Date	Appr.

Date: 02/27/04

CADD File Name: 3121M905.DGN

ICT Project No. 203121

Plot date: 02/27/04

Plot scale:

Checked by:

Dwn by: ICT

DACA87-03-D-0006

Approved by:

Chief, Prj. Mgmt. Division

TASK ORDER #: FRR004

VANGUARD CONTRACTORS INC. PADUCAH, KENTUCKY VOICE 270-442-8620

ICT I.C.Thomasson Associates, Inc. NASHVILLE, TENNESSEE PHONE (615) 346-3400

DEFENSE INFORMATION SCHOOL

FT. MEADE MARYLAND

1st FLOOR VAV BOX LOCATIONS

STATE OF MARYLAND WILLIAM THOMASSON MECHANICAL ENGINEER

Sheet reference number:

M-905

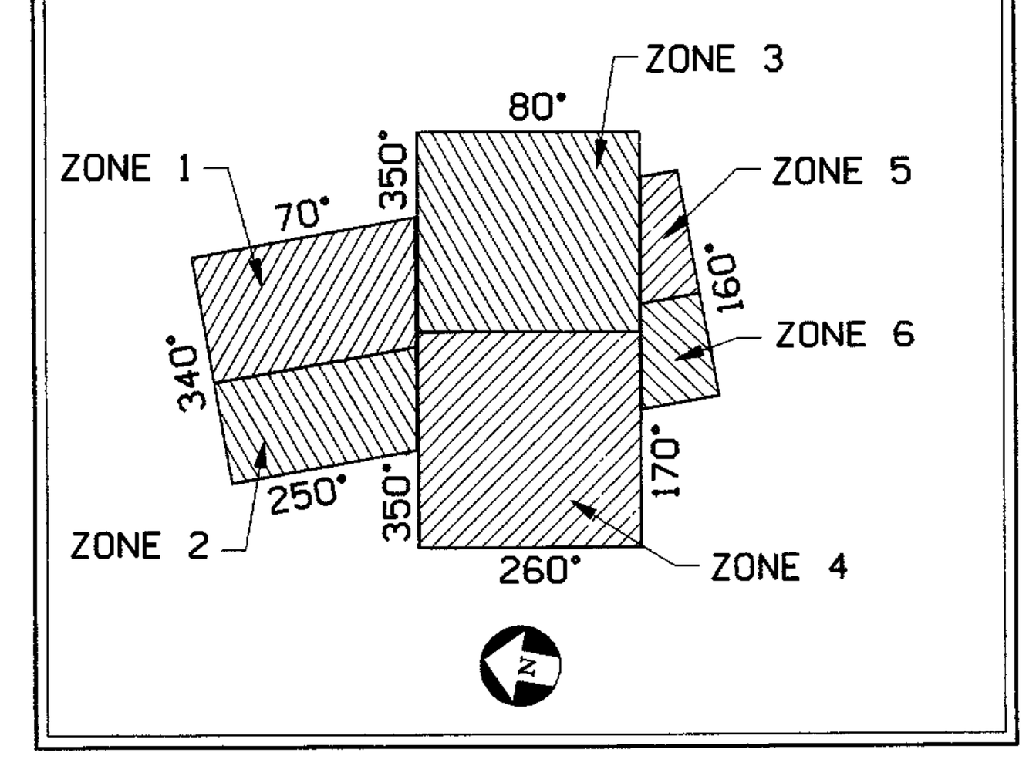
2nd FLOOR PLAN

0 5 10

1/16" = 1'-0"

KEY PLAN

NO SCALE



① ADD TRANE X13790068-01 DDC AUXILIARY TEMP SENSOR TO ALL EXISTING VAV BOXES.

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US ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

Symbol	Description	Date	Appr.

TASK ORDER #: FRR004

Checked by: WTT

Date: 02/27/04

VANGUARD

PADUCAH KENTUCKY VOICE 270-442-8620

Dwn by: ICT

CADD File Name: 3121M906.DGN

DACA87-03-D-0006

ICT Project No. 203121

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Approved by: Chief, Prj. Mgmt. Division

Plot date: 02/27/04

Plot scale:

DEFENSE INFORMATION SCHOOL

FT. MEADE MARYLAND

2nd FLOOR VAV BOX LOCATIONS

Sheet reference number:

M-906