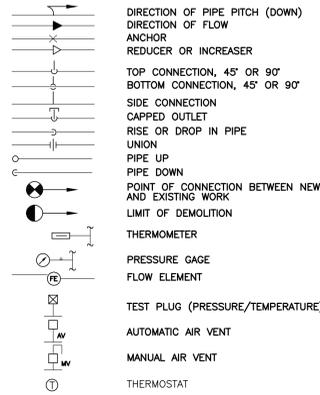
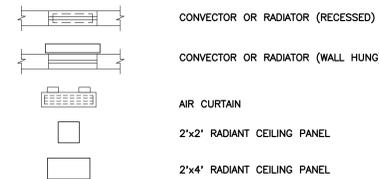


GENERAL SYMBOLS



TERMINAL UNIT SYMBOLS



GENERAL NOTES

- 1. ALL WORK SHALL BE IN COMPLIANCE WITH THE MOST STRINGENT OF FEDERAL, STATE AND LOCAL CODES, HOSPITAL POLICY, AND THE MARCH 2011 HVAC DESIGN MANUAL FOR NEW, REPLACEMENT, ADDITION, AND RENOVATION OF EXISTING VA FACILITIES.
2. INSTALL ALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
3. CONTRACTOR SHALL REMOVE ALL ABANDONED PIPES AND DUCTS BACK TO MAIN OR SOURCE. REMOVE ALL HANGERS AND SUPPORTS ASSOCIATED WITH ABANDONED SYSTEM.
4. EXISTING UTILITIES TO BE ABANDONED SHALL BE PROPERLY DISCONNECTED AND CAPPED AS REQUIRED BACK TO SOURCE.
5. THESE DRAWINGS ARE DIAGRAMMATIC AND SHALL NOT BE SCALED. ADDITIONAL DATA SHALL BE FROM THE ENGINEER THROUGH WRITTEN CLARIFICATION ONLY. VERIFY ALL EXISTING CONDITIONS, ELEVATIONS, AND DIMENSIONS PRIOR TO PROCEEDING WITH ANY PORTION OF ANY WORK. THE CONTRACTOR SHALL PROVIDE ALL OFFSETS AND TRANSITIONS REQUIRED TO MEET EXISTING CONDITIONS. A PRE-BID SITE SURVEY IS RECOMMENDED. NO ADDITIONAL CHARGES, AT OWNERS EXPENSE, FOR REVISIONS DUE TO EXISTING SITE CONDITIONS.
6. THE CONTRACTOR SHALL PERFORM WORK IN A SKILLED AND PROFESSIONAL MANNER.
7. ALL CONTRACTORS ARE RESPONSIBLE TO FIELD COORDINATE WORK SCHEDULE AND VERIFY AREA SHUTDOWN WITH THE OWNER REPRESENTATIVE (COTR) PRIOR TO CONSTRUCTION. PROVIDE A MINIMUM OF 2 WEEKS ADVANCED NOTIFICATION.
8. THE CONTRACTOR SHALL WORK AND COORDINATE WITH THE OTHER TRADES.
9. ALL EQUIPMENT SHALL BE NEW AND IN UNDAMAGED CONDITION. ANY EQUIPMENT FOUND DEFECTIVE SHALL BE IMMEDIATELY REMOVED FROM THE PROJECT.
10. ALL EQUIPMENT SHALL BE INSTALLED IN A MANNER TO ALLOW SERVICE. SEE SPECIFICATIONS.
11. MECHANICAL CONTRACTOR TO REPAIR ANY DAMAGE DONE TO THE FIRE PROOFING WHILE INSTALLING THE MECHANICAL TRADES. SEAL ALL PENETRATIONS THROUGH RATED STRUCTURES WITH UL LISTED FIRE SEAL DESIGNED FOR THE SPECIFIED APPLICATION.
12. CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES TO PROTECT THE PUBLIC AND ADJACENT PROPERTIES FROM DAMAGE THROUGHOUT CONSTRUCTION.
13. CONTRACTOR SHALL GUARANTEE ALL WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION OR AS OTHERWISE REQUIRED IN THE SPECIFICATIONS.
14. PROJECT COMPLETION, RECORD (AS-BUILT) DRAWINGS SHALL BE PROVIDED BY THE CONTRACTOR TO THE FACILITIES ENGINEERING SERVICES DEPARTMENT, TO BE ADDED TO THE CAD FILES THAT ARE MAINTAINED THERE. ALL CHANGES IN PIPING AND DUCTWORK ARRANGEMENTS SHALL BE NOTED ON THE RECORD DRAWINGS.
15. CONTRACTOR SHALL SUPPLY ALL MATERIALS AND DEVICES TO MAINTAIN AND MONITOR NEGATIVE PRESSURE IN ALL CONSTRUCTION ZONES AND SHALL WORK WITHIN INTERIM LIFE SAFETY MEASURES (ILSM) PROVIDED BY THE OWNER.
16. ALL WORK IN CORRIDORS AND PUBLIC AREAS MUST BE COMPLETED DURING WEEKEND HOURS. NO LOUD NOISES, VIBRATIONS, OR DRILLING SHALL BE DONE AFTER 9:00 PM.
17. ALL WORK SHALL BE PERFORMED BY PERSONNEL LICENSED IN THE STATE OF MICHIGAN. (AS REQUIRED)
18. ALL SECONDARY HUMIDIFICATION ROOM CONTROL POINTS TO BE CONNECTED TO THE EXISTING BUILDING AUTOMATION SYSTEM (BAS).
19. CONTRACTOR TO OFFSET, REVISE OR RELOCATE EQUIPMENT, DUCTWORK AND PIPING LOCATIONS AS REQUIRED FOR INSTALLATION. SUBMIT REVISIONS TO OWNER (COTR) AND ENGINEER FOR APPROVAL PRIOR TO INSTALLATION.
20. CONTRACTOR TO MAKE ALTERATIONS TO EXISTING SERVICE PIPING AT TIMES THAT WILL PROVIDE THE LEAST INTERFERENCE WITH THE NORMAL OPERATION OF THE FACILITY.
21. CONTRACTOR TO REMOVE AND REPLACE DUCT SECTIONS AS REQUIRED FOR NEW DUCT AND PIPING INSTALLATION. COORDINATE WORK SCHEDULE AND AREA SHUTDOWN WITH THE OWNER REPRESENTATIVE (COTR) PRIOR TO CONSTRUCTION.
22. CONTRACTOR TO VERIFY FINAL FINISH AND MATERIAL SELECTIONS SUCH AS CEILINGS AND OTHER SURFACES WITH VA MEDICAL CENTER.
23. PROVIDE FIRE AND SMOKE STOPPING IN ACCORDANCE WITH UL APPROVED SYSTEMS.
24. VERIFY ALL EXISTING CONDITIONS NOTIFY ENGINEER OF ANY CONFLICTS BETWEEN CONTRACT DRAWINGS AND ACTUAL CONDITIONS.

GENERAL MECHANICAL COORDINATION NOTES:

THE MECHANICAL CONTRACTOR, HAVING RESPONSIBILITY FOR INSTALLATION OF THE LARGEST SYSTEM EQUIPMENT AND COMPONENTS; AND HAVING THE BENEFIT OF BEING ABLE TO VIEW THE SPACE FOLLOWING REMOVAL OF EXISTING EQUIPMENT AND SYSTEMS SHALL:
1. PROVIDE LEGIBLE AND CLEARLY MARKED UP DRAWINGS (1/4"=1') TO THE OWNER AND THE ENGINEER INDICATING LOCATION OF BEAMS AND JOISTS AND PROVIDING A MEASUREMENT OF THE ELEVATION OF THE BOTTOM OF BEAMS AND JOISTS ABOVE THE FINISHED FLOOR.
2. PROVIDE TO THE OWNER AND ENGINEER COMPREHENSIVE, HIGH RESOLUTION, ORGANIZED, PHOTOGRAPHS OF THE CLEARED SPACE AFTER DEMOLITION IS COMPLETE AND BEFORE THE START OF INSTALLATION.
3. PROVIDE TO THE OWNER AND ENGINEER TO SCALE (MINIMUM 1/4"=1') DIMENSIONED FLOOR AND STRUCTURAL DRAWINGS CLEARLY ESTABLISHING LOCATIONS AND SIZES OF OPENINGS FROM THE 6TH FLOOR TO THE 7TH FLOOR PENTHOUSE AND FROM THE 6TH FLOOR TO THE ROOF. THESE LOCATIONS MUST BE DOCUMENTED ON INSTALLATION COORDINATION DRAWINGS INDICATED IN THE FOLLOWING.
4. REVIEW FINDINGS FROM ABOVE WITH ENGINEER, OWNER, AND ALL OTHER TRADES AND USE INFORMATION OBTAINED TO DEVELOP INSTALLATION TRADE COORDINATION AND GENERAL ARRANGEMENT DRAWINGS INDICATING MECHANICAL EQUIPMENT AND SYSTEM INSTALLATION IN ACCORDANCE WITH ARCHITECTURAL PLANS AND ALLOWING FOR INSTALLATION OF OTHER TRADES.
5. INSTALLATION TRADE COORDINATION DRAWINGS SHALL BE PROVIDED AND SHALL BE TO SCALE (MINIMUM 1/4"=1'). DIMENSIONED DRAWINGS, CLEARLY SHOWING HOW MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING ARE PLANNED TO BE INSTALLED WHILE TAKING ACCOUNT THE WORK OF OTHER TRADES - PLUMBING, ELECTRICAL, POWER AND LIGHTING, FIRE PROTECTION, GENERAL CONSTRUCTION AND OTHERS, AND CLEARLY SHOWING STRUCTURAL COMPONENTS AND FIXED BUILDING FEATURES THAT MUST BE ADDRESSED DURING INSTALLATION.
6. IN ADDITION TO PLAN VIEWS, PROVIDE SECTIONS AND 3 DIMENSION DRAWINGS, OR MODELS, CLEARLY ESTABLISHING PLANNED INSTALLATION WORK.
7. PROVIDE SUGGESTIONS AS TO METHODS THAT WOULD SIMPLIFY INSTALLATIONS.
8. REVIEW TRADE COORDINATION PLANS WITH ENGINEER AND OWNER PRIOR TO ORDERING EQUIPMENT, FABRICATING DUCTWORK OR PIPE, AND PRIOR TO ANY INSTALLATION WORK.
THE INS:
1. BUILDING SYSTEMS AND EQUIPMENT SERVING AREAS OF THE BUILDING WHICH REMAIN OCCUPIED DURING CONSTRUCTION MUST REMAIN IN OPERATION AND SHALL NOT BE AFFECTED BY CONSTRUCTION WORK.
2. PRIOR TO COMMENCING WORK, ESTABLISH THE EXISTING PERFORMANCE OF AHU11 AND ERU-3.
3. COORDINATE ALL WORK ON SYSTEMS INTENDED TO REMAIN IN SERVICE DURING CONSTRUCTION WITH THE OWNER AND OTHER TRADES.
4. COORDINATE TIE INS TO EXISTING BUILDING SYSTEMS WITH OWNER AND OTHER TRADES.
5. PLAN WORK TO MINIMIZE DISRUPTION TO CONTINUING OPERATION OF THE BUILDING.
6. WORK ON SYSTEMS REMAINING IN OPERATION DURING CONSTRUCTION INCLUDES BUT NOT LIMITED TO:
a. REMOVAL OF 6TH FLOOR DUCT CONNECTION TO ERU-2
b. REMOVAL OF 6TH FLOOR DUCT CONNECTION TO ERU-3
c. INSTALLATION OF TEMPORARY DUCT CAP ON DUCT RISER TO ERU-3
d. TIE IN OF NEW 6TH FLOOR RETURN DUCT TO DUCT RISER TO ERU-3
e. RECONSTRUCTION OF THE RA AND SA RISERS AND ELBOWS FOR AHU-11
f. TIE IN TO HWS/R HEATING SYSTEMS
g. TIE IN TO CHS/R CHILLED WATER SYSTEM
h. TIE IN TO STEAM AND CONDENSATE SYSTEMS
i. REMOVAL OF EF-13 DUCTWORK ON 2ND FLOOR
j. REWORK OF EF-38 DUCTWORK TO AVOID 6TH FLOOR INTERFERENCES
k. RELOCATION OF BSC FROM EXISTING TO REMODELED LAB

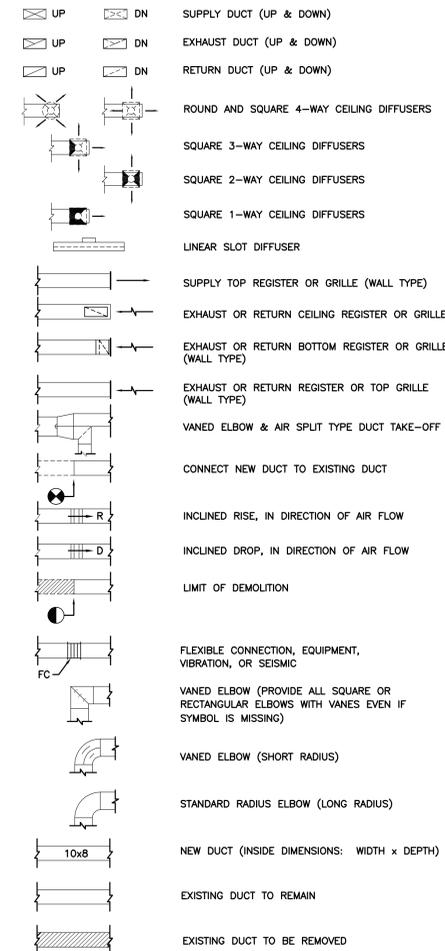
ABBREVIATIONS

Table of abbreviations for mechanical components and units, including A/E, AA, AC, AD, AFF, AFMD, AFW, AHU, APD, BDD, BFP, BHP, BTU, BTUH, C, CFM, COP, CV, D, Db, DDC, DEG, DIA, EA, EAT, EER, EF, EG, EJ, ESP, EX, F, F/SDPR, FA, FC, FD, FPM, FPS, FTR, FV, GPM, HC, HP, HRP, HWC, HWR, HWS, HZ, I/O, IAQ, ICF, IN WC, IN WG, IN-LB, KG, KPA, KW, KWH, L/S, LAT, LH, LSD, LWT, M, MAU, MAV, MAX, MBH, MIN, MM, NA, NC, NTS, OA, PA, PD, PG, PRV, PSI, PSIG, RA, RG, RH, RHC, RPM, SA, SAT, SD, SDP, SP, T & PV, TAB, TG, TSTAT, TU, VAV, VD, VFD, VIV, Wb.

GENERAL NOTES

- 25. CONTRACTOR SHALL BE RESPONSIBLE FOR PRESSURE TESTING OF DUCTS SERVING THE REMODELED AREA FROM POINTS OF CONNECTION AT EXISTING MAINS AND RISERS THROUGH TO GRILLES, DIFFUSERS AND REGISTERS.
26. PROVIDE CAPS ON ALL OPEN DUCTWORK TO PREVENT DIRT AND DEBRIS FROM ENTERING DUCTWORK.
27. CONTRACTOR SHALL CLEAN INSIDE OF ALL EXISTING RETURN AND EXHAUST DUCTS FROM CONSTRUCTION CONNECTION AT EXISTING DUCT MAIN OR RISER BACK TO THE FILTER IN ASSOCIATED AHU(S) AND ERV(S).
28. VISUALLY INSPECT AHU SUPPLY DUCTWORK TO VERIFY INTERIOR CLEANLINESS. DOCUMENT FINDINGS AND REVIEW WITH VA PROJECT MANAGER (COTR). OWNER WILL INSPECT DUCTWORK AT JOB COMPLETION. IF DUCTWORK IS FOUND DIRTY, CONTRACTOR WILL BE RESPONSIBLE FOR CLEANING FROM CONSTRUCTION ZONE DUCT CONNECTION TO AHU DISCHARGE.
29. ALL NEW DUCTS SHOULD BE CLEANED INSIDE AND OUTSIDE.
30. REFER TO ARCHITECTURAL PLANS A.101 AND A.102 FOR IDENTIFICATION OF RATED WALL.

DUCTWORK SYMBOLS



STEAM PIPING LINETYPES

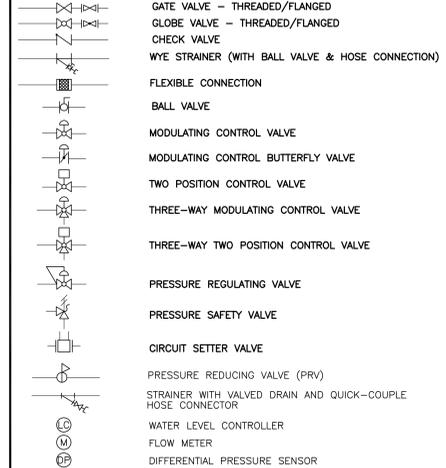
Table with 2 columns: LINETYPE and DESCRIPTION. Includes LPS (LOW PRESSURE STEAM), LPC (LOW PRESSURE CONDENSATE), HPS (EXISTING HIGH PRESSURE STEAM), MPS (EXISTING MEDIUM PRESSURE STEAM), LPS (EXISTING LOW PRESSURE STEAM), HPC (EXISTING HIGH PRESSURE CONDENSATE), MPC (EXISTING MEDIUM PRESSURE CONDENSATE), LPC (EXISTING LOW PRESSURE CONDENSATE), PCC (EXISTING PUMPED CONDENSATE), and a dashed line for EXISTING PIPING TO BE REMOVED.

CHILLED WATER SYSTEM LINETYPES

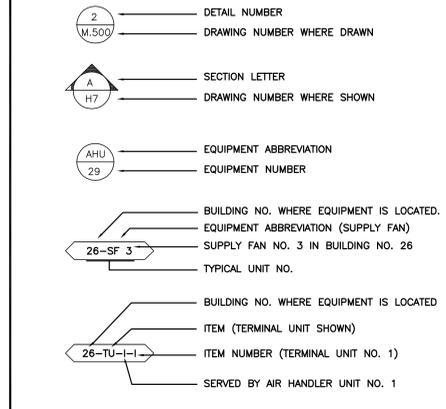
Table with 2 columns: LINETYPE and DESCRIPTION. Includes CWS (CHILLED WATER SUPPLY), CWR (CHILLED WATER RETURN), CWS (EXISTING CHILLED WATER SUPPLY), CWR (EXISTING CHILLED WATER RETURN), GCS (EXISTING CHILLED GLYCOL SUPPLY), GCR (EXISTING CHILLED GLYCOL RETURN), CS (EXISTING CONDENSER SUPPLY), CR (EXISTING CONDENSER RETURN), CDD (EXISTING COOLING COIL CONDENSATE DRAIN), RL (REFRIGERANT LIQUID), RS (REFRIGERANT SUCTION), and a dashed line for EXISTING PIPING TO BE REMOVED.

Table with 2 columns: LINETYPE and DESCRIPTION. Includes HWS (HOT WATER SUPPLY), HWR (HOT WATER RETURN), HWS (EXISTING HOT WATER SUPPLY), HWR (EXISTING HOT WATER RETURN), GHS (EXISTING GLYCOL HEATING SUPPLY), GHR (EXISTING GLYCOL HEATING RETURN), and a dashed line for EXISTING PIPING TO BE REMOVED.

PIPING SYMBOLS



DRAWING SYMBOLS



AIR TERMINAL SYMBOLS



MECHANICAL SHEET INDEX

Table listing sheet numbers and descriptions, such as M.001 MECHANICAL - GENERAL NOTES, SYMBOLS AND ABBREVIATIONS; MD.101 MECHANICAL - DEMOLITION PLAN 6TH FLOOR WEST - HVAC; MH.101 MECHANICAL - HVAC PLAN 6TH FLOOR WEST; etc.

CONSULTANTS: MEP ASSOCIATES, LLC logo and contact information.

ARCHITECT/ENGINEERS: NORTHERN DESIGN WORKS logo and contact information.

Drawing Title: GENERAL NOTES, SYMBOLS AND ABBREVIATIONS. Approved Project Director.

Project Title: Renovate 6th Floor Lab. Project Number: 585-11-14. Building Number: 1. Location: IRON MOUNTAIN, MICHIGAN. Date: 2-15-2012. Checked: JM. Drawn: JRM. Drawing Number: M.001. Dwg. 36 of 82.

Office of Construction and Facilities Management. Department of Veterans Affairs logo.

Vertical scale markers on the left side of the page, ranging from 1 to 16 inches.

HVAC DESIGN DATA												
DESIGN CONDITIONS	SUMMER					WINTER					LOWEST AVERAGE ANNUAL DEWPOINT	
	TEMP		WET BULB TEMP		% HUMIDITY	TEMP		DEWPOINT TEMP		% HUMIDITY		
	"F	"C	"F	"C		"F	"C	"F	"C			
OUTDOOR DESIGN CONDITIONS	88.2	[31]	72.2	[22]	46	-10.7	[-24]	-15	[-26]	NA	30	[-1]
INDOOR AREA DESIGN CONDITIONS												
BLOOD DRAW	75	[24]	65.3	[19]	60	70	[21]	28.5	[-2]	20		
CLASS ROOM	75	[24]	65.3	[19]	60	70	[21]	28.5	[-2]	20		
CLEAN UTILITY / STORAGE ROOM	N/A		N/A		N/A	N/A		N/A		N/A		
COMPUTER LAB ROOM	75	[24]	65.3	[19]	60	70	[21]	28.5	[-2]	20		
CONFERENCE ROOM	75	[24]	65.3	[19]	60	70	[21]	28.5	[-2]	20		
CORRIDOR	75	[24]	65.3	[19]	60	70	[21]	28.5	[-2]	20		
HISTOLOGY	75	[24]	65.3	[19]	60	70	[21]	28.5	[-2]	20		
LIBRARY	75	[24]	65.3	[19]	60	70	[21]	28.5	[-2]	20		
LOUNGE	75	[24]	65.3	[19]	60	70	[21]	28.5	[-2]	20		
MICROBIOLOGY	75	[24]	65.3	[19]	60	70	[21]	28.5	[-2]	20		
OFFICE	75	[24]	65.3	[19]	60	70	[21]	28.5	[-2]	20		
TOILET PATIENT INTERIOR	N/A		N/A		N/A	N/A		N/A		N/A		
TOILET PUBLIC PERIMETER	N/A		N/A		N/A	68		N/A		N/A		
SOILED UTILITY AND STORAGE	N/A		N/A		N/A	N/A		N/A		N/A		
WALK-IN COOLER	36	[2]	N/A		N/A	36	[2]	N/A		N/A		

AIR TERMINAL UNIT SIZING SCHEDULE															
SIZE	MIN ALLOWABLE AIR FLOW		MAX ALLOWABLE AIR FLOW		DUCT INLET SIZE	MAX APD	MAXIMUM SOUND POWER LEVEL (Re: 10 ⁻¹² WATTS) FOR BOX DISCHARGE AT MAXIMUM INLET DUCT							REMARKS	
							OCTAVE BANDS								
	CFM	[L/s]	CFM	[L/s]			2	3	4	5	6	7			
A	60	[28]	170	[80]	4	[100]	0.4	[100]	69	65	58	52	51	47	----
B	90	[42]	260	[120]	5	[130]	0.4	[100]	69	63	59	52	51	47	----
C	130	[61]	380	[180]	6	[150]	0.4	[100]	69	67	61	55	52	49	----
D	160	[76]	490	[230]	7	[180]	0.4	[100]	70	68	63	57	53	49	----
E	230	[110]	680	[320]	8	[200]	0.4	[100]	71	68	59	53	51	47	----
F	270	[130]	790	[370]	9	[230]	0.4	[100]	71	69	60	54	51	47	----
G	350	[170]	1050	[500]	10	[250]	0.4	[100]	74	68	61	57	54	52	----
H	500	[240]	1500	[710]	12	[300]	0.4	[100]	73	69	64	59	57	53	----
I	750	[350]	2250	[1100]	14	[350]	0.4	[100]	73	68	65	61	61	59	----
J	1000	[470]	3000	[1400]	16	[400]	0.4	[100]	73	68	66	60	58	55	----

NOTES
1. INLET STATIC BASED ON ARI 885-98.
2. THIS SCHEDULE IS USED WITH THE TERMINAL UNIT SCHEDULE.
3. CONTROL SEQUENCE SHALL BE AS INDICATED ON THE AIR TERMINAL UNIT SCHEDULE.
4. PROVIDE SOUND ATTENUATION AFTER-SECTION AS REQUIRED TO MEET ROOM NC LEVEL.

ROOM AIR BALANCE SCHEDULE - AHU-11 (EXISTING)																												
ROOM NO	ROOM NAME	AIR HANDLING UNIT NO	TERMINAL UNIT	INDIVIDUAL ROOM TEMP CONTROL	SUPPLY				RETURN AND/OR EXHAUST				ROOM AIR BALANCE		NET INFILTRATION		NET EXFILTRATION		SUPPLY AIR					REMARKS				
					ROOM AIR FLOW		# OF AIR DEVICES	AIR DEVICE MARK	SUPPLY FAN	RETURN, TRANSFER, OR EXHAUST (R/T/E)	ROOM AIR FLOW		# OF AIR DEVICES	AIR DEVICE MARK	RETURN OR EXHAUST FAN	ROOM AIR BALANCE	ROOM AIR BALANCE	CFM	[L/s]	CFM	[L/s]	ROOM VOLUME	VENTILATION AIR REQUIRED		VENTILATION AIR PROVIDED	OUTSIDE AIR REQUIRED	OUTSIDE AIR PROVIDED	
					CFM	[L/s]					CFM	[L/s]																CV
6101	WOMENS TOILET	1-AHU-11	N/A	Y	0	[]	0	N/A															270 CFM TRANSFER FROM CORR					
6105	CPAC	1-AHU-11	1-TU-11-15	Y	415	[200]	5	SD-1, CD-1		R	415	[200]	1	RG-1		X	0	0	[]	0	[]	2840	4	9	2	6	6-98	
6105A	OFFICE	1-AHU-11	1-TU-11-14	Y	125	[59]	3	SD-1		R	125	[59]	1	RG-1		X	0	0	[]	0	[]	864	4	9	2	2	6-98	
6106	C UNION	1-AHU-11	1-TU-11-18	Y	130	[61]	1	SD-314		R	130	[61]	1	RG-1		X	0	0	[]	0	[]	968	4	8	2	2	6-98	
6107	VOLUNTEERS	1-AHU-11	1-TU-11-13	Y	285	[130]	2	SD-1, CD-1		R	285	[130]	1	RG-1		X	0	0	[]	0	[]	1616	4	11	2	3	6-98	
6107A	OFFICE	1-AHU-11	1-TU-11-11	Y	125	[59]	4	SD-1		R	125	[59]	1	RG-1		X	0	0	[]	0	[]	864	4	9	2	2	6-98	
6109	DRIVER LOUNGE	1-AHU-11	1-TU-11-12	Y	105	[50]	1	CD-1		R	105	[50]	1	RG-1		X	0	0	[]	0	[]	680	4	9	2	2	6-96	
6110	DSS	1-AHU-11	1-TU-11-16	Y	245	[120]	1	SD-1, CD-1		R	245	[120]	1	RG-1		X	0	0	[]	0	[]	1520	4	10	2	2	6-98	
6112	ESCORTS	1-AHU-11	1-TU-11-6	Y	135	[64]	1	CD-1		R/T	60	[28]	1	RG-1		X	0	0	[]	75	[36]	1008	4	8	2	2	6-96	75 CFM TRANSFER TO 6112A
6112A	STORAGE	1-AHU-11	N/A	Y	0	[]	0	N/A		T/E	75	[35]	1	EG-1	ERU-2	X						728	6	-6	0	0	6-100	75 CFM TRANSFER FROM 6112
6113	NURSE EDUCATION	1-AHU-11	1-TU-11-10	Y	325	[150]	4	SD-1, CD-1		R	325	[150]	1	RG-1		X	0	0	[]	0	[]	2080	4	9	2	2	6-95	
6114	PRIVACY	1-AHU-11	1-TU-11-6	N	130	[61]	1	CD-1		R	130	[61]	1	RG-1		X	0	0	[]	0	[]	960	4	8	2	2	6-98	
6116	ISO	1-AHU-11	1-TU-11-6	Y	120	[57]	1	CD-1		R	120	[57]	1	RG-1		X	0	0	[]	0	[]	880	4	8	2	2	6-98	
6119	NURSE EDUCATION	1-AHU-11	1-TU-11-11	Y	165	[78]	2	SD-1, CD-1		R	165	[78]	1	RG-1		X	0	0	[]	0	[]	1072	4	9	2	2	6-95	
6120	HOME & COMMUNICATION BASED CARE	1-AHU-11	1-TU-11-1, 1-TA-11-4A, 1-TA-11-4B, 1-TU-11-5	Y	1630	[770]	19	SD-1, SD-2, CD-1		R	1630	[770]	2	RG-1		X	0	0	[]	0	[]	10936	4	9	2	2	6-95	
6120A	OFFICE	1-AHU-11	1-TU-11-2	Y	220	[100]	3	SD-1		R	220	[100]	1	RG-1		X	0	0	[]	0	[]	1080	4	12	2	3	6-98	
6120B	EQUIPMENT STORAGE	1-AHU-11	1-TU-11-8	N	100	[47]	1	CD-1		R	100	[47]	1	RG-1		X	0	0	[]	0	[]	672	6	9	0	2	6-100	
6122	PHONE/DATA	1-AHU-11	1-TU-11-7	Y	80	[38]	1	CD-2		R	80	[38]	1	RG-2		X	0	0	[]	0	[]	280	0	17	0	4	6-101	
6124	CLEAN SUPPLY	1-AHU-11	1-TU-11-8	N	90	[42]	1	CD-1		T	0	[]	1	TG-2		X	+	0	[]	90	[42]	984	4	5	0	1	6-100	40 CFM TRANSFER TO CORR.
6125	HOUSEKEEPING	1-AHU-11	N/A	N	0	[]	0	N/A		T/E	60	[28]	1	EG-2	ERU-2	X						328	10	-11	0	0	6-103	60 CFM TRANSFER FROM CORR.
6126	HOUSEKEEPING	1-AHU-11	N/A	N	0	[]	0	N/A		T/E	60	[28]	1	EG-2	ERU-2	X						264	10	-14	0	0	6-103	60 CFM TRANSFER FROM CORR.
6201	MENS TOILET	1-AHU-11	N/A	Y	0	[]	0	N/A		T/E	270	[130]	2	EG-1, TG-1	ERU-2	X						1528	10	-11	0	0	6-98	270 CFM TRANSFER FROM CORR.
6205	CONFERENCE	1-AHU-11	1-TU-11-22	Y	355	[170]	5	SD-1, CD-1		R	355	[170]	1	RG-1		X	0	0	[]	0	[]	2568	4	8	2	2	6-95	
6206	LIBRARY	1-AHU-11	1-TU-11-19	Y	200	[94]	1	CD-1		R	200	[94]	1	RG-1		X	0	0	[]	0	[]	1488	4	8	2	2	6-96	
6206A	CCTV	1-AHU-11	1-TU-11-3	Y	220	[100]	2	SD-1		R	220	[100]	1	RG-1		X	0	0	[]	0	[]	544	4	24	2	6	6-98	
6206B	LIBRARY OFFICE & TMS	1-AHU-11	1-TU-11-21	Y	265	[130]	2	SD-1		R	265	[130]	1	RG-1		X	0	0	[]	0	[]	1320	4	12	2	3	6-98	
6206C	COMPUTER TRAINING	1-AHU-11	1-TU-11-17	Y	750	[350]	3	CD-1		R	750	[350]	1	RG-1		X	0	0	[]	0	[]	3056	4	15	2	4	6-100	
6206D	PATIENT EDUCATION & RESOURCE CENTER	1-AHU-11	1-TU-11-20	Y	295	[140]	4	SD-1		R	295	[140]	1	RG-1		X	0	0	[]	0	[]	1256	4	14	2	4	6-95	
CORR.	CORRIDOR	1-AHU-11	1-TU-11-8	Y	1280	[600]	2	CD-1		T/R	710	[340]	3	RG-1, TG-1		X						9520	4	8	2	2	6-95	90 CFM TRANSFER FROM 6124, 660 TOTAL CFM TRANSFER TO 6101(270), 6125(60), 6126(60), 6201(270)

NOTE
ROOMS OR AREAS DO NOT HAVE INDIVIDUAL HUMIDITY CONTROL UNLESS NOTED.
SUPPLY CFM BASED ON MINIMUM 25% OUTSIDE AIR.

ROOM AIR BALANCE SCHEDULE - AHU-29 (NEW)																												
ROOM NO	ROOM NAME	AIR HANDLING UNIT NO	TERMINAL UNIT	INDIVIDUAL ROOM TEMP CONTROL	SUPPLY				RETURN AND/OR EXHAUST				ROOM AIR BALANCE		NET INFILTRATION		NET EXFILTRATION		SUPPLY AIR					REMARKS				
					ROOM AIR FLOW		# OF AIR DEVICES	AIR DEVICE MARK	SUPPLY FAN	RETURN, TRANSFER, OR EXHAUST (R/T/E)	ROOM AIR FLOW		# OF AIR DEVICES	AIR DEVICE MARK	RETURN OR EXHAUST FAN	ROOM AIR BALANCE	ROOM AIR BALANCE	CFM	[L/s]	ROOM VOLUME	VENTILATION AIR REQUIRED	VENTILATION AIR PROVIDED	OUTSIDE AIR REQUIRED		OUTSIDE AIR PROVIDED			
					CFM	[L/s]					CFM	[L/s]														CV	VAV	ACH
6209	RECEPTION	1-AHU-29	1-TU-29-26	Y	105	[50]	1	CD-1		R/T	55	[26]	2	RG-2, TG-1		X						1128	4	6	2	6	6-100	50 CFM TRANSFER TO 6213
6210	CLEAN SUPPLY	1-AHU-29	1-TU-29-24	Y	90	[42]	1	CD-1		R/T	75	[35]	1	RG-1		X						1336	4	4	0	4		

ROTARY AIR TO AIR HEAT RECOVERY WHEEL SCHEDULE																																
MARK	LOCATION	SYSTEM AND/OR SERVICE	MODE	SUPPLY AIR										EXHAUST AIR								ROTOR MOTOR				REMARKS						
				SUPPLY AIR FLOW		APD		EAT		LAT		AIR FLOW		APD		EAT		LAT		HP	[kW]	PHASE	VOLT									
				CFM	[L/s]	IN	[Pa]	*F	[*C]	*F	[*C]	*F	[*C]	*F	[*C]	*F	[*C]	*F	[*C]													
				Db	Wb	Db	Wb	Db	Wb	Db	Wb	Db	Wb	Db	Wb	Db	Wb	Db	Wb													
RAHX-29	B1200	AHU-29	SUMMER	6500	[3100]	0.8	[75]	92	[33]	76	[24]	80	[27]	68	[20]	6500	[3100]	0.8	[20]	75	[24]	62	[17]	87	[31]	71	[22]	0	[]	3	208	UNIT TO BE BALANCED TO 5310 CFM SA AND 3890 CFM EXHAUST AIR. NOTES 1-4.
			WINTER	6500	[3100]	0.8	[20]	-20	[-29]	-20	[-29]	28	[-2]	28	[-2]	6500	[3100]	0.8	[20]	70	[21]	53	[12]	22	[-6]	22	[-6]					UNIT TO BE BALANCED TO 5310 CFM SA AND 3890 CFM EXHAUST AIR. NOTES 1-4.

- NOTES:
- UNIT MOUNTED ENERGY RECOVERY WHEEL CONTROLLER WITH FROST CONTROL, ROTATION FAILURE OUTPUT FOR ECC, COMMUNICATION PROTOCOL FOR SIEMENS P1 NETWORK.
 - UNIT MOUNTED ENERGY RECOVERY WHEEL VFD WITH COMMUNICATION CARD FOR SIEMENS P1 NETWORK.
 - BASIS OF DESIGN ANNEXAIR CUSTOM AIR HANDLING UNIT. THERMO-DYNE - 763-557-4900.
 - PROVIDE CUSTOM CURB FOR AIR HANDLING UNIT. SEE DETAIL 3/M.503. BASIS OF DESIGN - THYBAR CORPORATION.

FAN SCHEDULE																								
MARK	LOCATION	AREA AND/OR BLDG SERVED	SYSTEM AND/OR SERVICE	AIR FLOW		TSP		FAN						MOTOR ELECTRICAL						CONTROL SEQUENCE	REMARKS			
				CFM	[L/s]	IN	[Pa]	TYPE	WHEEL	CLASS	ARRANGEMENT, ROTATION AND DISCHARGE	DIAMETER IN [mm]	MIN % EFF	DRIVE	FAN MAX RPM	NOMINAL POWER		PHASE	VOLT			RPM	SPEED CONTROL	
				BHP	HP	[kW]																		
EF-13	ROOF	6TH EAST LAB	AHU-29	161	[76]	1.25	[310]	UTILITY	CENTR.	II	BOTTOM ANGLE UPW/CW ARRANGEMENT 10 SW/SI	[]	85%	DIRECT	4500	NA	0.50	[]	3	208	1725	CONSTANT	CONTINUOUS	1,2,3
EF-14	ROOF	6TH EAST LAB	AHU-29	810	[380]	1	[250]	UTILITY	CENTR.	II	BOTTOM ANGLE UPW/CW ARRANGEMENT 10 SW/SI	[]	85%	DIRECT	4270	NA	0.50	[]	3	208	1725	CONSTANT	CONTINUOUS	1,2,3
EF-17	ROOF	6TH EAST LAB	AHU-29	450	[210]	0.75	[190]	UTILITY	CENTR.	II	BOTTOM ANGLE UPW/CW ARRANGEMENT 10 SW/SI	[]	85%	DIRECT	4500	NA	0.50	[]	3	208	1725	CONSTANT	CONTINUOUS	1,2,3
SF-29	AHU-29	6TH EAST LAB	AHU-292	6500	[3100]	5.4	[1400]	PLUG	AIRFOIL	II	VERTICAL DISCHARGE	[]	85%	DIRECT		NA	0.50	[]	3	208		VARIABLE	CONTINUOUS	---
EF-29	AHU-29	6TH EAST LAB	AHU-29	5080	[2400]	2.7	[680]	PLUG	AIRFOIL	II	VERTICAL DISCHARGE	[]	85%	DIRECT		NA	0.50	[]	3	208		VARIABLE	CONTINUOUS	---

- NOTE:
- INVERTER DUTY MOTOR FOR FUTURE VFD.
 - PROVIDE SPARK RESISTANT FAN.
 - PROVIDE EXPLOSION PROOF MOTOR.
- SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

VIBRATION ISOLATION SCHEDULE						
MARK	LOCATION	EQUIPMENT AND/OR SERVICE	TYPE BASE	TYPE ISOLATOR	MIN STATIC DEFLECTION IN [mm]	REMARKS
5-V11	ROOF	EF13	B	S	1.1 [28]	---
5-V11	ROOF	EF14	B	S	1.1 [28]	
5-V11	ROOF	EF17	B	S	1.1 [28]	

MAKE-UP AIR HEATING AND VENTILATING UNIT SCHEDULE																	
MARK	LOCATION	AREA AND/OR BLDG SERVED	TYPE	MAX CAPACITY		MIN AIR FLOW		SUPPLY FAN MARK	EXHAUST FAN MARK	PREFILTER MARK	AFTER FILTER MARK	PREHEAT COIL MARK	TEMPERATURES				REMARKS
				MBH	[kW]	CFM	[L/s]						EAT		LAT		
				*F	[*C]	*F	[*C]										
AHU-29	7TH PENTHOUSE	6TH LAB	MAKEUP	[]	[]	6500	[3100]	1-SF5	1-EF5	1-PF5	1-AF5	1-PHC5	-20	[-29]	65	[18]	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

- ROTARY AIR TO AIR HEAT RECOVERY WHEEL SEE SCHEDULE.
- CHILLED WATER COIL - C0CW29.
- STEAM HUMIDIFIER SEE SCHEDULE.
- UNIT MOUNTED AIRFLOW CONTROLLER WITH SUPPLY AND EXHAUST AIRFLOW MEASURING STATIONS, COMMUNICATION PROTOCOL FOR SIEMENS P1 NETWORK. SUPPLY AND EXHAUST FANS CONTROLLED TO MAINTAIN DUCT STATIC PRESSURE (ADJUSTABLE).
- UNIT MOUNTED SUPPLY AND EXHAUST FAN VFDs (ABB OR PRE-APPROVED EQUAL) WITH COMMUNICATION CARD FOR SIEMENS P1 NETWORK.
- UNIT MOUNTED DISCONNECTS.
- UNIT MOUNTED ENERGY RECOVERY WHEEL CONTROLLER WITH FROST CONTROL, ROTATION FAILURE OUTPUT FOR ECC, COMMUNICATION PROTOCOL FOR SIEMENS P1 NETWORK.
- UNIT MOUNTED ENERGY RECOVERY WHEEL VFD WITH COMMUNICATION CARD FOR SIEMENS P1 NETWORK.
- SIEMENS UNIT CONTROLLER PROVIDED BY CONTROLS CONTRACTOR.
- BASIS OF DESIGN ANNEXAIR CUSTOM AIR HANDLING UNIT. THERMO-DYNE - 763-557-4900.
- PROVIDE CUSTOM PLENUM CURB FOR AIR HANDLING UNIT. SEE DETAIL 3/M.503. BASIS OF DESIGN - THYBAR CORPORATION.

EXISTING AIR HANDLING UNIT SCHEDULE																					
MARK	LOCATION	AREA AND/OR BLDG SERVED	TYPE	AIR FLOW	AIR FLOW				SUPPLY FAN MARK	RETURN OR RELIEF FAN MARK	EXHAUST FAN MARK	PREFILTER MARK	AFTER FILTER MARK	FINAL FILTER MARK	HEAT RECOVERY MARK	PREHEAT COIL MARK	COOLING COIL MARK	REHEAT COIL	HUMIDIFIER MARK	REMARKS	
					SUPPLY		RETURN														
					CFM	[L/s]	CFM	[L/s]													
AHU-11	5122A 6TH PENTHOUSE	6TH WEST	CUSTOM	VAV	60000	[28000]	12500	[5900]	47500	[22000]	1-SF11A, SF11B	1-RF11A, RF11B	1-N/A	1-PF5	1-AF11A, B	1-FF5	N/A	1-PHC11A, B, C, D	1-CC11A, B, C, D	1-H11	1, 2, 3, 4

- SCHEDULED AIRFLOWS ARE MAXIMUM DESIGN, ORIGINAL SELECTION PROVIDED ADDITIONAL CAPACITY FOR ADDING MORE SERVED SPACE SUCH AS 6TH FLOOR WEST OFFICES.
- EXISTING UNIT, REBALANCE (SUPPLY, RETURN, AND OUTSIDE AIRFLOW) AND ADJUST AIR HANDLING UNIT TO ADDRESS ADDITIONAL 6TH FLOOR WEST SERVED SPACES, AS MAY BE NECESSARY, CHANGE SHEAVES.
- CONTROLS CONTRACTOR TO WORK WITH TEST AND BALANCE AND MECHANICAL CONTRACTORS TO ADJUST CONTROL SETPOINTS TO ADDRESS ADDITIONAL SERVED SPACES.
- SEE AIR BALANCE SCHEDULE FOR ADDITIONAL SUPPLY AIRFLOWS AND OUTDOOR AIR REQUIREMENTS.

AIR FLOW MEASURING DEVICE SCHEDULE															
MARK	LOCATION	SYSTEM AND/OR SERVICE	AIR FLOW				DUCT SIZE				APD		REMARKS	NOTES	
			MIN		MAX		WIDTH		HEIGHT		IN	[mm]			
			CFM	[L/s]	CFM	[L/s]	IN	[mm]	IN	[mm]					
1	MECH ROOM	AHU-29	3890	[1800]	4300	[2000]	32	[800]	75	[1900]	0.05	[11]		EXHAUST AIR	1,3
2	MECH ROOM	AHU-29	5310	[2500]	5190	[2400]	48	[1200]	75	[1900]	0.05	[11]		SUPPLY AIR	1,3
3	6218	EF-17	450	[210]	450	[210]	[]	[]	[]	[]	0.05	[11]		12" ROUND	2,3
4	6212	EF-13	160	[76]	160	[76]	[]	[]	[]	[]	0.05	[11]		8" ROUND	2,3
5	6212	RETURN AIR	435	[210]	435	[210]	14	[350]	8	[200]	0.05	[11]		ROOM PRESSURIZATION	2,3
6	6210	RETURN AIR	75	[35]	75	[35]	6	[150]	6	[150]	0.05	[11]		ROOM PRESSURIZATION	2,3

- NOTES:
- FAN DIFFERENTIAL PRESSURE.
 - AIRFLOW THERMAL DISPERSION TYPE.
 - INSTALL PER MANUFACTURES RECOMMENDATION FOR DUCT LENGHS UPSTEAM AND DOWNSTREAM.

AIR FILTER SCHEDULE																
MARK	LOCATION	AREA AND/OR BLDG SERVED	SYSTEM AND/OR SERVICE	MERV RATING	AIR FLOW		APD			HOUSING TYPE	#	CARTRIDGES		ARRANGEMENT	REMARKS	
					CFM	[L/s]	INITIAL	CHANGEOVER	SIZE							
					IN	[mm]	IN	[mm]	IN			[mm]				
1-PF1	MER PENTHOUSE	3 NORTH (BONE MARROW TRANSPLANT)	1-AHU1	8	30000	[14000]	0.25	[6]	0.5	[13]	SIDE	18	24 x 24 x 2	[600 x 600 x 50]	6 WIDE BY 3 HIGH	----
1-FF1	MER PENTHOUSE	3 NORTH (BONE MARROW TRANSPLANT)	1-AHU1	14	30000	[14000]	0.65	[16]	1.3	[33]	SIDE	18	24 x 24 x 12	[600 x 600 x 300]	6 WIDE BY 3 HIGH	----
1-FF1	MER PENTHOUSE	3 NORTH (BONE MARROW TRANSPLANT)	1-AHU1	17	30000	[14000]	1	[25]	2	[50]	SIDE	18	24 x 24 x 12	[600 x 600 x 300]	6 WIDE BY 3 HIGH	----
1-PF2	MER PENTHOUSE	4 NORTH (INTENSIVE CARE UNIT)	1-AHU2	8	16000	[7600]	0.25	[6]	0.5	[13]	SIDE	10	24 x 24 x 2	[600 x 600 x 50]	5 WIDE BY 2 HIGH	----

FUME HOOD EXHAUST SCHEDULE											
MARK	LOCATION	SYSTEM AND/OR SERVICE	HOOD TYPE	HOOD SIZE (WIDTH)		EXHAUST				REMARKS	
				IN	[mm]	AIR FLOW		APD HOOD ONLY			
				CFM	[L/s]	IN WG	[Pa]				
1-HD1	6218	EF-14	H7	48	[1200]	810	[380]	0.4	[100]		BENCHTOP FUME HOOD
1-HD2	6218	EF-17	BACKDRAFT	#VALUE!		455	[210]	0.4	[100]		GROSSING TABLE

- NOTE
- THE HOOD DATA (EXHAUST AIR VOLUME AND PRESSURE DROP) IS BASED ON A REPRESENTATIVE MAKE AND MODEL NUMBER. IN THE EVENT THE HOOD SELECTED AND FURNISHED BY THE CONTRACTOR HAS DIFFERENT HOOD DATA, THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING NECESSARY MODIFICATIONS TO THE DESIGN AND CONSTRUCTION WITHOUT ANY ADDITIONAL COST TO THE GOVERNMENT.
 - HOOD PROVIDED BY GENERAL CONTRACTOR, DUCT CONNECTIONS BY MECHANICAL CONTRACTOR, MECHANICAL TO COORDINATE FOR DUCT SIZE AND HEIGHT ABOVE FLOOR, SEE DETAILS.
 - PROVIDE FUME HOOD AIRFLOW MONITOR.

BIOLOGICAL SAFETY CABINET EXHAUST SCHEDULE											
MARK	LOCATION	SYSTEM AND/OR SERVICE	HOOD TYPE	HOOD SIZE (WIDTH)		EXHAUST				REMARKS	
				IN	[mm]	AIR FLOW		APD HOOD ONLY			
				CFM	[L/s]	IN WG	[Pa]				
1-HD3	6212	1-EF-13	CLASS II TYPE A2	36	[900]	161	[76]	1	[250]		----

- NOTE
- THE HOOD DATA (EXHAUST AIR VOLUME AND PRESSURE DROP) IS BASED ON A REPRESENTATIVE MAKE AND MODEL NUMBER. IN THE EVENT THE HOOD SELECTED AND FURNISHED BY THE CONTRACTOR HAS DIFFERENT HOOD DATA, THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING NECESSARY MODIFICATIONS TO THE DESIGN AND CONSTRUCTION WITHOUT ANY ADDITIONAL COST TO THE GOVERNMENT.
 - RELOCATED HOOD, SEE SPECIFICATIONS FOR WORK SCOPE.

LOUVER SCHEDULE							
MARK	LOCATION	SERVING	SIZE W" x H"	MINIMUM FREE AREA	FLANGE	CONSTRUCTION	REMARKS
L-1	MECH ROOM	AHU-29 IA	48X72	12.5 SF	NO	EXTRUDED ALUMINUM	INTAKE LOUVER. NOTES 1, 2, 3, 4, 5, 6
L-2	MECH ROOM	AHU-29 EA	54X60 ACTIVE 54X64 OVERALL	17.27 SF	NO	EXTRUDED ALUMINUM	EXHAUST LOUVER. NOTES 1, 2, 3, 4, 5, 6, 7

- NOTES:
- COLOR BY OWNER.
 - COAT 70% KYNAR 500/HYLAR 5000.
 - STATIONARY LOUVER, DRAINABLE BLADE, 37 DEGREE, 6 INCH ON CENTER.
 - PROVIDE TWO POSITION, MOTOR DRIVEN, LOW LEAK DAMPER WITH BLADE AND JAMB SEALS AT LOUVER TO DUCT CONNECTION.
 - PROVIDE BIRD SCREEN IN REMOVABLE ALUMINUM FRAME.
 - BEGINNING POINT OF WATER PENETRATION 1030 FPM FREE AREA VELOCITY.
 - VERIFY LOUVER DIMENSIONS IN COORDINATION WITH GENERAL CONTRACTOR AND INSTALLTION REQUIREMENTS VERIFIED AT LOCATION OF INSTALLATION.
 - PROVIDE FACTORY BLANKOFF PLATE FOR UNDUCTED LOWER PORTION OF LOUVER, 2" INSULATED. VERIFY BLANKOFF DIMENSIONS IN COORDINATION WITH GENERAL CONTRACTOR AND INSTALLTION REQUIREMENTS VERIFIED AT LOCATION OF INSTALLATION.

CONSULTANTS:  engineers consultants commissioning MEP Associates, LLC 2750 Arbor Court Eau Claire, WI 54701 Phone: 715.832.5690 Fax: 715.832.5668 www.mepassociates.com MEP PROJECT NO.: N08.11.03		 ARCHITECT/ENGINEERS:  420 RAIL STREET NEGAUNEE, MI 49866 PHONE: 906-475-6616 FAX: 906-475-6954 NDW PROJECT NUMBER: 1111		Drawing Title MECHANICAL SCHEDULES Approved Project Director		Project Title Renovate 6th Floor Lab Location IRON MOUNTAIN, MICHIGAN Date 2-15-2012 Checked JIM Drawn JRM		Project Number 585-11-14 Building Number 1 Drawing Number M.603 Dwg. 62 of 82		Office of Construction and Facilities Management 	
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