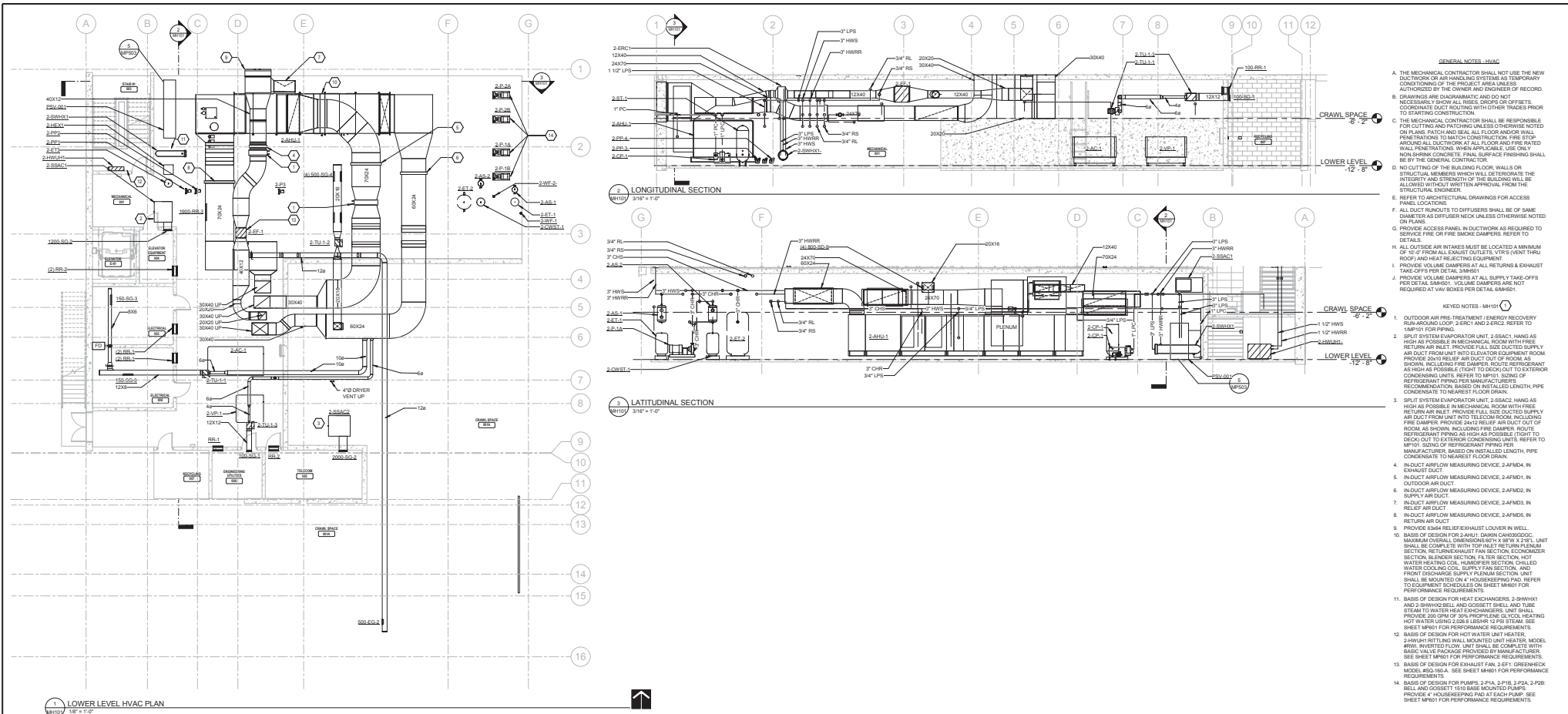
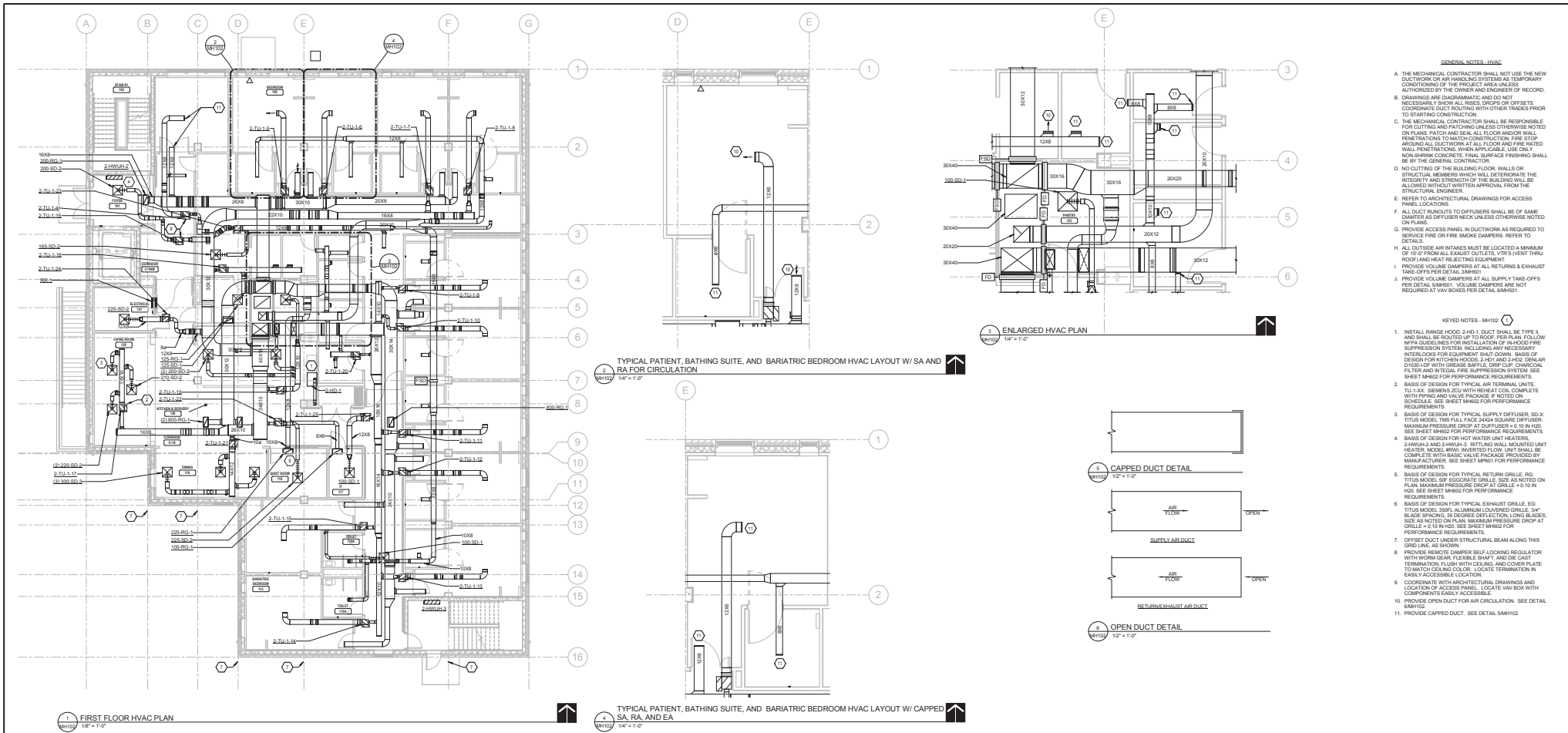


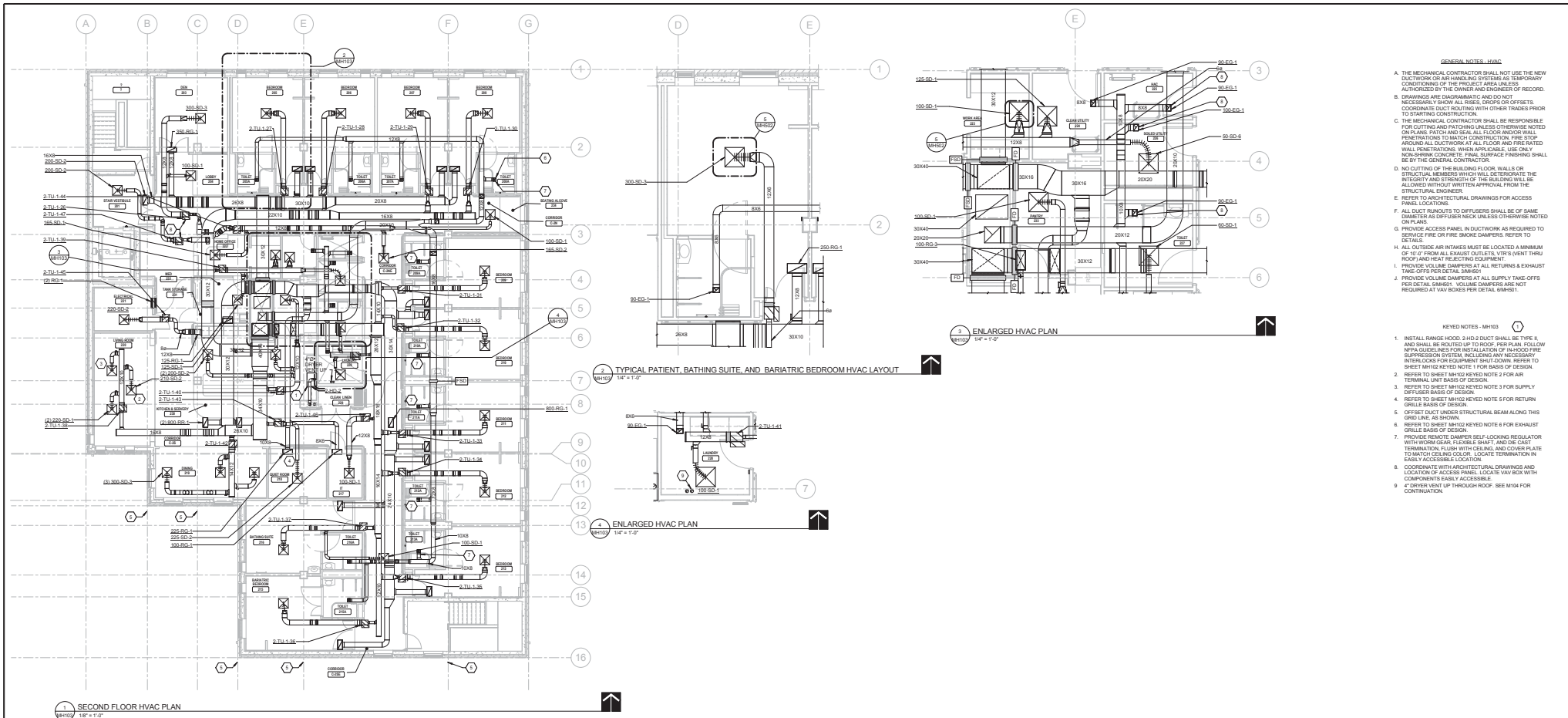


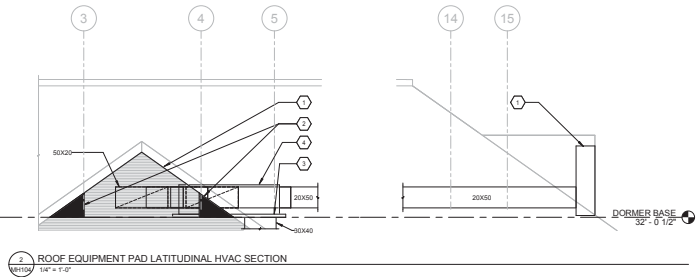
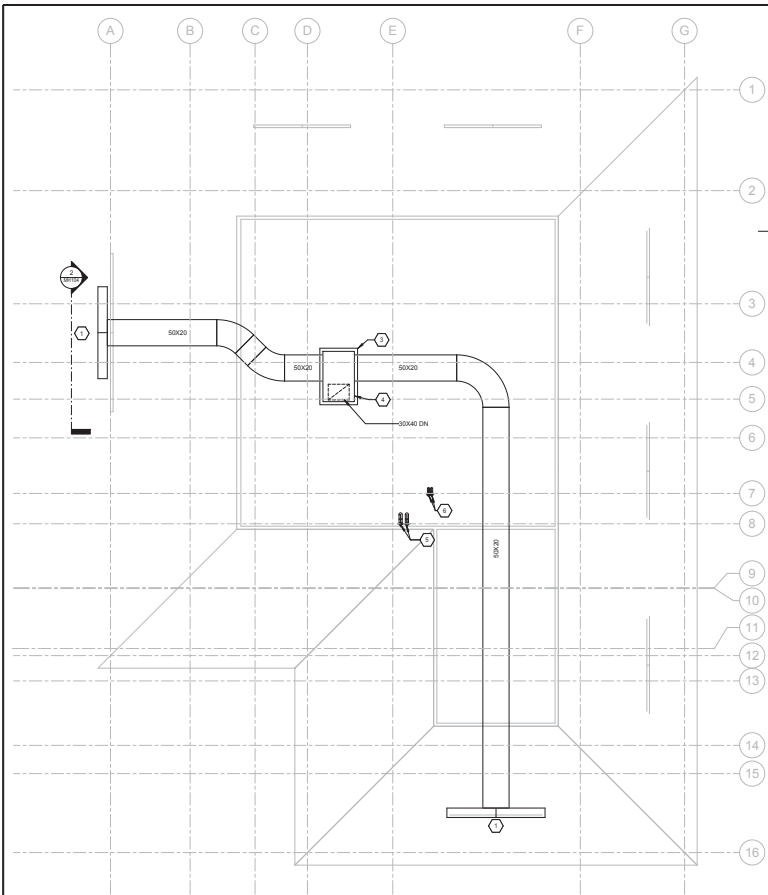
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DEDUCT ALTERNATE #5





- GENERAL NOTES - HVAC**
- THE MECHANICAL CONTRACTOR SHALL NOT USE THE NEW DUCTWORK OR AIR HANDLING SYSTEMS AS TEMPORARY CONDITIONING OF THE PROJECT AREA UNLESS AUTHORIZED BY THE OWNER AND ENGINEER OF RECORD.
 - DRAWINGS ARE DIAGRAMMATIC AND DO NOT NECESSARILY SHOW ALL RISERS, DROPS OR PYSIES. COORDINATE DUCT ROUTING WITH OTHER TRADES PRIOR TO STARTING CONSTRUCTION.
 - THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR CUTTING AND PATCHING UNLESS OTHERWISE NOTED ON PLANS. PATCH AND SEAL ALL FLOOR AND/OR WALL PENETRATIONS TO MATCH CONSTRUCTION. FIRE STOP AROUND ALL DUCTWORK AT ALL FLOOR AND FIRE RATED WALL PENETRATIONS. WHEN APPLICABLE, USE ONLY NON-SHRINK CONCRETE. FINAL SURFACE FINISHING SHALL BE BY THE GENERAL CONTRACTOR.
 - NO CUTTING OF THE BUILDING FLOOR, WALLS OR STRUCTURAL MEMBERS WHICH WILL COMPROMISE THE INTEGRITY AND STRENGTH OF THE BUILDING WILL BE ALLOWED WITHOUT WRITTEN APPROVAL FROM THE STRUCTURAL ENGINEER.
 - REFER TO ARCHITECTURAL DRAWINGS FOR ACCESS PANEL LOCATIONS.
 - ALL DUCT RUNOUTS TO DIFFUSERS SHALL BE OF SAME DIAMETER AS DIFFUSER NECK UNLESS OTHERWISE NOTED ON PLANS.
 - PROVIDE ACCESS PANEL IN DUCTWORK AS REQUIRED TO SERVICE FIRE OR FIRE SMOKE DAMPERS. REFER TO DETAILS.
 - ALL OUTSIDE AIR INTAKES MUST BE LOCATED A MINIMUM OF 10'-0" FROM ALL EXHAUST OUTLETS, VENTS (VENT THRU ROOF) AND HEAT REJECTING EQUIPMENT.
 - PROVIDE VOLUME DAMPERS AT ALL RETURNS & EXHAUST TAKE-OFFS PER DETAIL 6MRS01.
 - PROVIDE VOLUME DAMPERS AT ALL SUPPLY TAKE-OFFS PER DETAIL 6MRS01. VOLUME DAMPERS ARE NOT REQUIRED AT VAV BOXES PER DETAIL 6MRS01.

- KEYED NOTES - MH104**
- 18" DEEP PLENUM BENEATH LOUVER. MATCH ARCHITECTURAL LOUVER SHAPE AND SIZE. SEE ARCHITECTURAL DRAWINGS FOR LOUVER DIMENSIONS.
 - BLANK-OFF PORTION OF LOUVER BEHIND PLENUM.
 - COORDINATE EXACT FLOOR PENETRATION WITH STRUCTURAL. INSTALL DUCT PER DETAIL 6MRS02.
 - 18"x18" PLENUM BOX. CONNECT 30"x47" DUCT IN CHASE AND 30"x27" BRANCHES. PROVIDE BALANCING DAMPERS AT 30"x27" BRANCH CONNECTIONS.
 - KITCHEN HOOD EXHAUST DUCT UP THROUGH ROOF WITH GOOSENECK. SEE MH103 FOR CONTINUATION.
 - DRIVER VENT UP THROUGH ROOF WITH GOOSENECK.

1 ROOF ALCOVE
SECTION 1/8" = 1'-0"

Prepared by: Construction	12/20/16
Checked by: SEBESTA	DATE

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SUITE 1400
CHICAGO, ILLINOIS 60604-2895
(312) 654-1400



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SUITE 800H
ST. PAUL, MN 55102
(651) 788-7481
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PIERCE PINI & ASSOCIATES
5209 CLAYTON AVE. NE
SUITE 112
BLAINE, MN 55434
TEL: 763.533.1311
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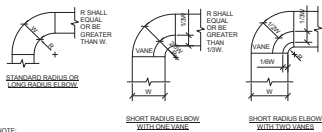
I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

DAVID W. JAWORSKI
Date: 12/20/2016 Reg. No. 28138

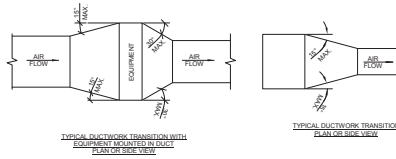
ST. CLOUD VA MC COMMUNITY LIVING CENTER COTTAGE #2	656-432
16 WESTERN AVENUE ST. CLOUD, MN 56301	08/10/16

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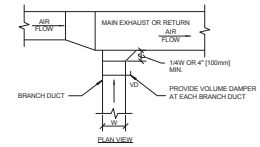
St. Cloud VA Health Care System
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- NOTE:**
1. THE INTERIOR SURFACE OF ALL RADIUS ELBOWS SHALL BE MADE ROUND.
 2. ALL STANDARD RADIUS ELBOWS CAN BE SUBSTITUTED WITH SHORT RADIUS ELBOWS. ALL SHORT RADIUS ELBOWS SHALL HAVE VANES. VANES SHALL BE CONSTRUCTED, SUPPORTED AND FASTENED AS RECOMMENDED BY BMA/CA.



- NOTE:**
- UNLESS OTHERWISE INDICATED ON PLANS, MAXIMUM ANGLES SHOWN SHALL APPLY.



1 DUCTWORK RADIUS ELBOWS

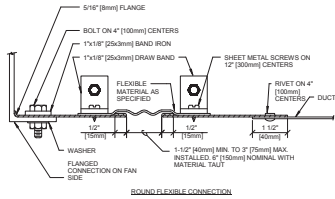
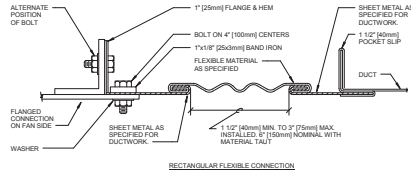
NOT TO SCALE

2 DUCTWORK TRANSITIONS (WITH EQUIPMENT MOUNTED IN DUCT)

NOT TO SCALE

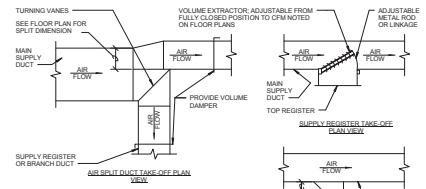
3 EXHAUST OR RETURN BRANCH DUCTWORK

NOT TO SCALE



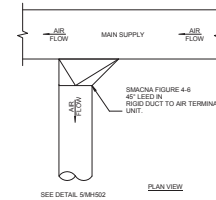
4 FLEXIBLE DUCT CONNECTIONS

NOT TO SCALE



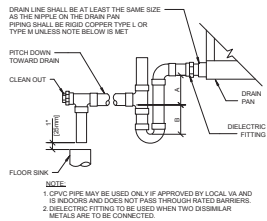
5 SUPPLY DUCTWORK TAKE - OFFS

NOT TO SCALE



6 SUPPLY DUCT TAKEOFF - AIR TERMINAL UNITS

NOT TO SCALE

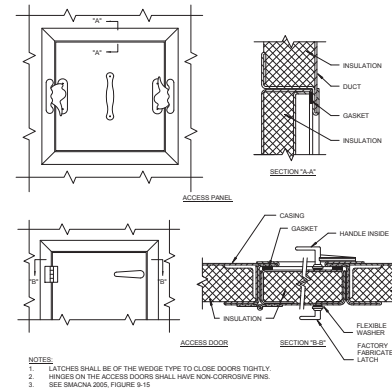


UNIT TYPE	A	B
DRAIN THRU	2" (50mm) PLUS X	X

WHERE X = STATIC PRESSURE IN PAN

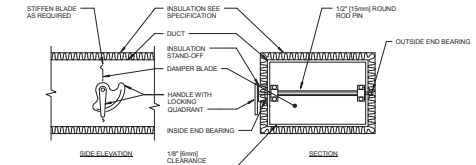
7 AIR HANDLING UNIT DRAIN TRAP DETAIL

NOT TO SCALE



8 ACCESS PANEL AND DOOR DETAIL

NOT TO SCALE



- NOTE:**
1. DELETE INSULATION STAND-OFF ON DUCTWORK WITHOUT EXTERIOR INSULATION.
 2. DETAIL SHOWS SINGLE BLADE DAMPER. DAMPER INSTALLATION SHALL BE SIMILAR FOR MULTI-BLADE DAMPERS & ROUND DAMPERS.

9 VOLUME DAMPER DETAIL

NOT TO SCALE

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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ARCHITECTURE (PLANNING & INTERIOR DESIGN)

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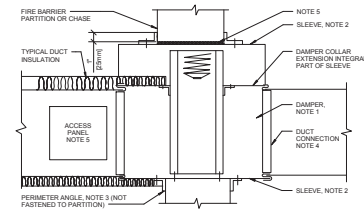
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DANIEL FARRER
LANDSCAPE ARCHITECTS
401 2nd Avenue North, Suite 410 Minneapolis, MN 55401 p 612.332.7522 f 612.332.0936 www.danrofarrer.com

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
DAVID W. JAMISON
Date: 12/20/2016 Reg. No.: 28138

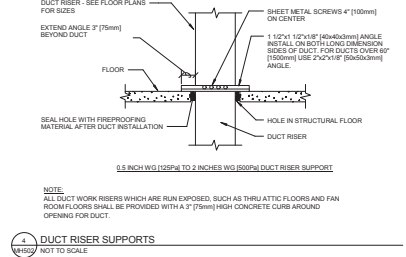
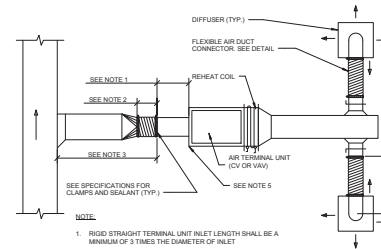
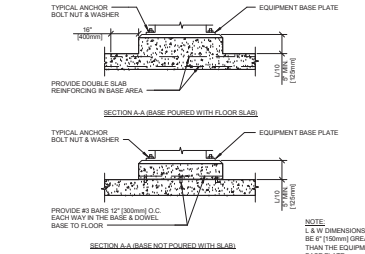
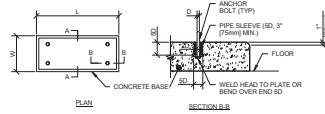
MECHANICAL DETAILS	ST. CLOUD VA MC COMMUNITY LIVING CENTER COTTAGE #2
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656-432	656-432
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- NOTE:**
1. A VERTICAL DAMPER IS SHOWN. HORIZONTAL DAMPER INSTALLATION IS SIMILAR. FOLLOW DAMPER MANUFACTURER'S INSTRUCTIONS, INCLUDING FASTENER OPTIONS AND GAGES FOR SLEEVE AND PERIMETER ANGLES. FIRE DAMPERS MUST BE INSTALLED IN THE PARTITION OR FLOOR AND NOT OUTSIDE THE PENETRATION.
 2. GALVANIZED SLEEVE: GAGE NOT LESS THAN CONNECTING DUCT. FASTEN SLEEVE TO DAMPER FRAME AND TO PERIMETER ANGLES.
 3. PERIMETER ANGLES: GALVANIZED STEEL, NOT LESS THAN 1/2"x1/2" (40x40mm), 14 GAUGE, TO PROVIDE 1/2" (12mm) MINIMUM OVERLAP OF OPENING ON ALL 4 SIDES.
 4. BREAKAWAY DUCT CONNECTION: CONTRACTOR'S OPTION OF TYPES SHOWN IN IMACNA ACCESS PANELS. SIZE AND LOCATION TO PERMIT SERVICING THE FUSIBLE LINK OR LINKS.
 5. ALL DUCT WORK RISERS WHICH ARE RUN EXPOSED, SUCH AS THRU ATTIC FLOORS AND MECHANICAL ROOM FLOORS, SHALL BE PROVIDED WITH 7" (75mm) HIGH CONCRETE CURBS AROUND OPENING FOR DUCT.



1 SECTION THROUGH FIRE DAMPER INSTALLATION

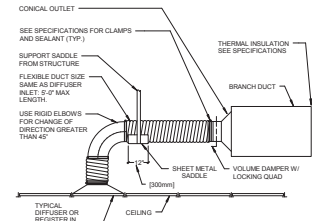
NOT TO SCALE

2 CONCRETE EQUIPMENT BASE - MECHANICAL

NOT TO SCALE

3 DUCT CONNECTIONS - AIR TERMINAL UNITS

NOT TO SCALE



6 FLEXIBLE AIR DUCT CONNECTOR

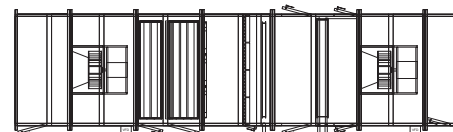
NOT TO SCALE

HANGER STRAPS OR RODS			
MAX. DUCT (IN. [mm])	QUANTITY/SIZE (IN. [mm])	MAX. LOAD (LBS. [kg])	MAX. SPACING (IN. [mm])
26 (665)	ONE 1 (25) x 22 GA STRAP	260 (119)	144 (3655)
36 (915)	ONE 1 (25) x 18 GA STRAP	430 (195)	144 (3655)
42 (1065)	ONE 1 (25) x 16 GA STRAP	700 (317)	144 (3655)
60 (1525)	TWO 3/8 (10) RODS	1300 (590)	144 (3655)
84 (2100)	TWO 1/2 (13) RODS	2500 (1133)	144 (3655)

NOTE: INSULATED DATA FROM IMACNA ALLOWS FOR DUCT REINFORCING AND INSULATION, BUT NO EXTERNAL LOAD.

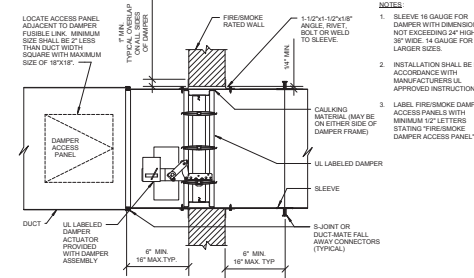
8 ROUND DUCT HANGERS

NOT TO SCALE



9 ACCESS DOOR SWING DETAIL FOR AIR HANDLING UNITS

NOT TO SCALE



10 DAMP-03 COMBINATION FIRE SMOKE DAMPER

NOT TO SCALE

1 POINTS LIST FOR VAV AIR HANDLING UNIT WITH MINIMUM OUTSIDE AIR
MH103 NOT TO SCALE



- 7.1 UPON FAILURE OF THE VSAC, THE SUPPLY AND RETURN FANS SHALL BE STARTED/STOPPED MANUALLY AT THE DIGITAL CONTROL PANEL OR THE ECC THROUGH THE BY-PASS STARTER. FANS SHALL THEN BE OPERATED AT CONSTANT SPEED.



TEMPERATURE SENSING ELEMENT FOR
TRANSMITTING TEMPERATURE TO EMCS
(PROVIDE 12 INCHES [200mm] MINIMUM
LENGTH IN DUCT WHEN SPACE PERMITS.)

TEMPERATURE SENSING ELEMENT FOR
TRANSMITTING TEMPERATURE TO EMCS
(PROVIDE 12 INCHES [200mm] MINIMUM
LENGTH IN DUCT WHEN SPACE PERMITS.)

 SENSOR WITH AVERAGING ELEMENT TO TRANSMIT TEMPERATURE TO EMC5

 ELECTRIC OPERATED CONTROL DAMPER/OR VALVE

ROOM NO	ROOM NAME	AIR HANDLING UNIT NO	TERMINAL UNIT	INDIVIDUAL ROOM TEMP CONTROL	ROOM AIR BALANCE SCHEDULE										ROOM AIR FLOW		ROOM AIR BALANCE		NET INFILTRATION		NET EXFILTRATION		REMARKS
					SUPPLY					RETURN OR EXHAUST					RETURN OR EXHAUST FAN		NET INFILTRATION		NET EXFILTRATION				
					ROOM AIR FLOW	# OF AIR DEVICES	AIR DEVICE MARK	SUPPLY FAN	RETURN OR EXHAUST (RE)	ROOM AIR FLOW	# OF AIR DEVICES	AIR DEVICE MARK	RETURN OR EXHAUST FAN	CV	WAV	CFM	[A]	CFM	[A]				
001	MECHANICAL	2-AHU1	2-TU-1-2	Y	2000	[940]	4	SS-4	2-SF1	R	150	[160]	1	RR-3	2-RF1	X	0	0	0	0	---		
001A	CRAWL SPACE	2-AHU1	-	Y	0	[]	-	-	-	E	600	[240]	1	ES-2	2-RF1	X	X	0	0	0	0	---	
003	ELECTRICAL	2-AHU1	2-TU-1-1	N	150	[71]	1	SS-3	2-SF1	R	150	[71]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
004	ELEV. EDU	2-SBAC1	2-SBAC1	Y	1200	[570]	1	SS-2	2-SF1	R	1200	[570]	1	RR-2	2-RF1	X	X	0	0	0	0	---	
005	TELECOM	2-SBAC2	2-SBAC2	Y	2000	[940]	1	SS-2	2-SF1	R	2000	[940]	1	RR-2	2-RF1	X	X	0	0	0	0	---	
006	ENG. UTILITIES	2-AHU1	2-TU-1-3	Y	100	[47]	1	SS-1	2-SF1	R	100	[47]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
007	RECYCLING	2-AHU1	2-TU-1-4	Y	0	[]	-	-	-	E	0	[]	-	-	-	X	X	0	0	0	0	---	
008	ELECTRICAL	2-AHU1	2-TU-1-1	Y	150	[71]	1	SS-1	2-SF1	R	150	[71]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
101	FOYER	2-AHU1	2-TU-1-14	Y	200	[94]	1	SS-3	2-SF1	R	200	[94]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
103	GEN	2-AHU1	2-TU-1-4	Y	300	[140]	1	SS-3	2-SF1	R	300	[140]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
104	LOBBY	2-AHU1	2-TU-1-4	N	100	[47]	1	SS-1	2-SF1	R	100	[47]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
105	MECH	2-AHU1	2-TU-1-5	Y	300	[140]	1	SS-3	2-SF1	R	200	[94]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
106	MECH	2-AHU1	2-TU-1-6	Y	300	[140]	1	SS-3	2-SF1	R	200	[94]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
107	MECH	2-AHU1	2-TU-1-7	Y	300	[140]	1	SS-3	2-SF1	R	200	[94]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
108	MECH	2-AHU1	2-TU-1-8	Y	300	[140]	1	SS-3	2-SF1	R	200	[94]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
109	MECH	2-AHU1	2-TU-1-9	Y	300	[140]	1	SS-3	2-SF1	R	200	[94]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
110	MECH	2-AHU1	2-TU-1-10	Y	300	[140]	1	SS-3	2-SF1	R	200	[94]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
111	MECH	2-AHU1	2-TU-1-11	Y	300	[140]	1	SS-3	2-SF1	R	200	[94]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
112	MECH	2-AHU1	2-TU-1-12	Y	300	[140]	1	SS-3	2-SF1	R	200	[94]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
113	MECH	2-AHU1	2-TU-1-13	Y	300	[140]	1	SS-3	2-SF1	R	200	[94]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
115	MECH	2-AHU1	2-TU-1-14	Y	300	[140]	1	SS-3	2-SF1	R	200	[94]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
116	BATHING SUITE	2-AHU1	2-TU-1-15	Y	300	[140]	1	SS-3	2-SF1	R	200	[94]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
117	IT	2-AHU1	2-TU-1-28	Y	100	[47]	1	SS-1	2-SF1	R	100	[47]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
118	QUET ROOM	2-AHU1	2-TU-1-22	Y	225	[110]	1	SS-2	2-SF1	R	225	[110]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
119	DINING	2-AHU1	2-TU-1-21	Y	900	[420]	3	SS-3	2-SF1	R	0	[]	0	-	-	X	X	0	0	0	0	---	
120	LIVING	2-AHU1	2-TU-1-17	Y	450	[210]	3	SS-2	2-SF1	R	0	[]	0	-	-	X	X	0	0	0	0	---	
121	MECH	2-AHU1	2-TU-1-24	Y	220	[100]	1	SS-2	2-SF1	R	220	[100]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
122	HOME OFFICE	2-AHU1	2-TU-1-23	Y	165	[78]	1	SS-2	2-SF1	-	0	[]	-	-	-	X	X	0	0	0	0	---	
123	WORK AREA	2-AHU1	2-TU-1-18	N	100	[47]	1	SS-1	2-SF1	-	0	[]	-	-	-	X	X	0	0	0	0	---	
124	CLEAN UTILITY	2-AHU1	2-TU-1-18	N	125	[59]	1	SS-1	2-SF1	E	60	[42]	1	ES-1	2-RF1	X	X	0	0	0	0	---	
125	HAC	2-AHU1	-	N	0	[]	0	-	-	E	60	[42]	1	ES-1	2-RF1	X	X	0	0	0	0	---	
126	SOLID UTILITY	2-AHU1	2-TU-1-18	N	60	[28]	1	SS-1	2-SF1	E	100	[47]	1	ES-1	2-RF1	X	X	0	0	0	0	---	
127	TOILET	2-AHU1	2-TU-1-20	N	60	[28]	1	SS-1	2-SF1	E	60	[42]	1	ES-1	2-RF1	X	X	0	0	0	0	---	
128	LAUNDRY	2-AHU1	2-TU-1-20	Y	100	[47]	1	SS-1	2-SF1	E	125	[59]	1	ES-1	2-RF1	X	X	0	0	0	0	---	
130	KITCHEN	2-AHU1	2-TU-1-19	Y	400	[190]	2	SS-1	2-RF1	-	0	[]	-	-	-	X	X	0	0	0	0	---	
131	PANTRY	2-AHU1	2-TU-1-19	N	100	[47]	1	SS-1	2-SF1	R	100	[47]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
132	MED	2-AHU1	2-TU-1-18	N	125	[59]	1	SS-1	2-SF1	R	125	[59]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
134	ALCOVE	2-AHU1	2-TU-1-23	N	100	[47]	1	SS-1	2-SF1	-	0	[]	-	-	-	X	X	0	0	0	0	---	
C-1NE	CORRIDOR	2-AHU1	2-TU-1-23	N	165	[78]	1	SS-2	2-SF1	-	0	[]	-	-	-	X	X	0	0	0	0	---	
C-1S	CORRIDOR	2-AHU1	-	N	0	[]	0	-	-	E	100	[760]	2	RR-1	2-RF1	X	X	0	0	0	0	---	
C-1SE	CORRIDOR	2-AHU1	2-TU-1-15	N	100	[47]	1	SS-1	2-SF1	R	800	[380]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
201	FOYER	2-AHU1	2-TU-1-47	Y	200	[94]	1	SS-2	2-SF1	R	200	[94]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
203	GEN	2-AHU1	2-TU-1-26	Y	300	[140]	1	SS-3	2-SF1	R	300	[140]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
204	STARVESTIBULE	2-AHU1	2-TU-1-28	N	100	[47]	1	SS-1	2-SF1	R	100	[47]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
205	MECH	2-AHU1	2-TU-1-27	Y	300	[140]	1	SS-3	2-SF1	R	200	[94]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
206	MECH	2-AHU1	2-TU-1-28	Y	300	[140]	1	SS-3	2-SF1	R	200	[94]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
207	MECH	2-AHU1	2-TU-1-29	Y	300	[140]	1	SS-3	2-SF1	R	200	[94]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
208	MECH	2-AHU1	2-TU-1-30	Y	300	[140]	1	SS-3	2-SF1	R	200	[94]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
209	MECH	2-AHU1	2-TU-1-31	Y	300	[140]	1	SS-3	2-SF1	R	200	[94]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
210	MECH	2-AHU1	2-TU-1-32	Y	300	[140]	1	SS-3	2-SF1	R	200	[94]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
211	MECH	2-AHU1	2-TU-1-33	Y	300	[140]	1	SS-3	2-SF1	R	200	[94]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
212	MECH	2-AHU1	2-TU-1-34	Y	300	[140]	1	SS-3	2-SF1	R	200	[94]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
213	MECH	2-AHU1	2-TU-1-35	Y	300	[140]	1	SS-3	2-SF1	R	200	[94]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
214	MECH	2-AHU1	2-TU-1-36	Y	300	[140]	1	SS-3	2-SF1	R	200	[94]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
216	BATHING SUITE	2-AHU1	2-TU-1-37	Y	300	[140]	1	SS-3	2-SF1	R	200	[94]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
217	IT	2-AHU1	2-TU-1-46	Y	100	[47]	1	SS-1	2-SF1	R	100	[47]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
218	QUIT ROOM	2-AHU1	2-TU-1-43	Y	225	[110]	1	SS-2	2-SF1	R	225	[110]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
219	DINING	2-AHU1	2-TU-1-42	Y	900	[420]	3	SS-3	2-SF1	R	900	[420]	2	RR-1	2-RF1	X	X	0	0	0	0	---	
220	LIVING	2-AHU1	2-TU-1-38	Y	650	[310]	3	SS-2	2-SF1	R	650	[310]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
221	ELECTRICAL	2-AHU1	2-TU-1-45	Y	220	[100]	1	SS-2	2-SF1	R	220	[100]	1	RR-1	2-RF1	X	X	0	0	0	0	---	
222	HOME OFFICE	2-AHU1	2-TU-1-44	Y	165	[78]	1	SS-2	2-SF1	-	0	[]	-	-	-	X	X	0	0	0	0	---	
223	WORK AREA	2-AHU1	2-TU-1-39	N	100	[47]	1	SS-1	2-SF1	-	0	[]	-	-	-	X	X	0	0	0	0	---	
224	CLEAN UTILITY	2-AHU1	2-TU-1-39	N	125	[59]	1	SS-1	2-SF1	E	60	[42]	1	ES-1	2-RF1	X	X	0	0	0	0	---	
225	HAC	2-AHU1	-	N	0	[]	0	-	-	E	60	[42]	1	ES-1	2-RF1	X	X	0	0	0	0	---	
226	SOLID UTILITY	2-AHU1	2-TU-1-39	N	60	[28]	1	SS-1	2-SF1	E	100	[47]	1	ES-1	2-RF1	X	X	0	0	0	0	---	
227	TOILET	2-AHU1	2-TU-1-41	N	60	[28]	1	SS-1	2-SF1	E	60	[42]	1	ES-1	2-RF1	X	X	0	0	0	0	---	
228	LAUNDRY	2-AHU1	2-TU-1-41	Y	100	[47]	1	SS-1	2-SF1	E	125	[59]	1	ES-1	2-RF1	X	X	0	0	0	0	---	

SINGLE DUCT AIR TERMINAL UNIT SCHEDULE															
MARK	LOCATION	AREA AND/OR ROOM SERVED	SYSTEM AIR HANDLING	SIZE	AIR FLOW		ADDITIONAL SOUND ATTENUATION REQUIRED	CONTROL TYPE	CONTROL SEQUENCE	REHEAT		PERMETER SUPPLEMENTAL HEAT LINK	REMARKS		
					CFM	[L/s]				HW	ELEC			NO	
2-TU-1.1	BASEMENT	ELECTRICAL	2-AHU-1	B	300	[140]	150	[67]	NONE	WAV	5 DEGREE DEADBAND	X		NONE	
2-TU-1.2	BASEMENT	MECHANICAL ROOM	2-AHU-1	F	2000	[940]	600	[280]	NONE	WAV	5 DEGREE DEADBAND	X		NONE	
2-TU-1.3	BASEMENT	ENGR UTILITIES	2-AHU-1	A	100	[47]	30	[14]	NONE	WAV	5 DEGREE DEADBAND	X		NONE	
2-TU-1.4	FIRST FLOOR	DEN	2-AHU-1	C	400	[180]	130	[61]	NONE	WAV	5 DEGREE DEADBAND	X		PERMETER RADIATION	
2-TU-1.5	FIRST FLOOR	BEDROOM	2-AHU-1	B	300	[140]	150	[60]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.6	FIRST FLOOR	BEDROOM	2-AHU-1	B	300	[140]	150	[60]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.7	FIRST FLOOR	BEDROOM	2-AHU-1	B	300	[140]	150	[60]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.8	FIRST FLOOR	BEDROOM	2-AHU-1	B	300	[140]	150	[60]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.9	FIRST FLOOR	BEDROOM	2-AHU-1	B	300	[140]	150	[60]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.10	FIRST FLOOR	BEDROOM	2-AHU-1	B	300	[140]	150	[60]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.11	FIRST FLOOR	BEDROOM	2-AHU-1	B	300	[140]	150	[60]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.12	FIRST FLOOR	BEDROOM	2-AHU-1	B	300	[140]	150	[60]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.13	FIRST FLOOR	BEDROOM	2-AHU-1	B	300	[140]	150	[60]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.14	FIRST FLOOR	BARIATRIC BEDROOM	2-AHU-1	B	300	[140]	150	[60]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.15	FIRST FLOOR	BATHING SUITE	2-AHU-1	C	400	[180]	150	[60]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.16	FIRST FLOOR	FOYER	2-AHU-1	D	200	[90]	170	[77]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.17	FIRST FLOOR	LIVING ROOM	2-AHU-1	D	650	[310]	190	[86]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.18	FIRST FLOOR	WORK AREA / MED	2-AHU-1	B	400	[180]	68	[32]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.19	FIRST FLOOR	PANTRY / KITCHEN	2-AHU-1	C	500	[240]	150	[71]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.20	FIRST FLOOR	LAUNDRY	2-AHU-1	A	160	[76]	68	[32]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.21	FIRST FLOOR	DINING	2-AHU-1	E	800	[400]	270	[130]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.22	FIRST FLOOR	QUIET ROOM	2-AHU-1	A	225	[110]	68	[32]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.23	FIRST FLOOR	CORRIDOR	2-AHU-1	C	400	[200]	150	[71]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.24	FIRST FLOOR	ELECTRICAL ROOM	2-AHU-1	A	225	[110]	68	[32]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.25	IT ROOM	IT ROOM	2-AHU-1	A	100	[47]	68	[32]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.26	SECOND FLOOR	DEN	2-AHU-1	C	400	[180]	150	[60]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.27	SECOND FLOOR	BEDROOM	2-AHU-1	B	300	[140]	150	[60]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.28	SECOND FLOOR	BEDROOM	2-AHU-1	B	300	[140]	150	[60]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.29	SECOND FLOOR	BEDROOM	2-AHU-1	B	300	[140]	150	[60]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.30	SECOND FLOOR	BEDROOM	2-AHU-1	B	300	[140]	150	[60]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.31	SECOND FLOOR	BEDROOM	2-AHU-1	B	300	[140]	150	[60]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.32	SECOND FLOOR	BEDROOM	2-AHU-1	B	300	[140]	150	[60]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.33	SECOND FLOOR	BEDROOM	2-AHU-1	B	300	[140]	150	[60]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.34	SECOND FLOOR	BEDROOM	2-AHU-1	B	300	[140]	150	[60]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.35	SECOND FLOOR	BEDROOM	2-AHU-1	B	300	[140]	150	[60]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.36	SECOND FLOOR	BARIATRIC BEDROOM	2-AHU-1	B	300	[140]	150	[60]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.37	SECOND FLOOR	BATHING SUITE	2-AHU-1	B	400	[180]	150	[60]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.38	SECOND FLOOR	LIVING ROOM	2-AHU-1	D	650	[310]	190	[86]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.39	SECOND FLOOR	HOM OFFICE / MED	2-AHU-1	D	400	[180]	68	[32]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.40	SECOND FLOOR	PANTRY / KITCHEN	2-AHU-1	C	500	[240]	150	[71]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.41	SECOND FLOOR	LAUNDRY	2-AHU-1	A	160	[76]	68	[32]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.42	SECOND FLOOR	DINING	2-AHU-1	E	800	[400]	270	[130]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.43	SECOND FLOOR	QUIET ROOM	2-AHU-1	A	225	[110]	68	[32]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.44	SECOND FLOOR	CORRIDOR	2-AHU-1	C	500	[240]	150	[71]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.45	SECOND FLOOR	ELECTRICAL ROOM	2-AHU-1	A	200	[94]	68	[32]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.46	SECOND FLOOR	IT ROOM	2-AHU-1	A	100	[47]	68	[32]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	
2-TU-1.47	SECOND FLOOR	STAR VESTIBULE	2-AHU-1	A	150	[71]	68	[32]	NONE	WAV	5 DEGREE DEADBAND	X		CONTROLS AND VALVING ACCESSIBLE THROUGH SINGLE ACCESS PANEL	

AIR FILTER SCHEDULE											CARTRIDGES					REMARKS
MARK	LOCATION	AREA AND/OR BLDG SERVED	SYSTEM AND/OR SERVICE	MERV RATIO	AIR FLOW				HOUSING TYPE	#	SIZE		ARRANGEMENT			
					CFM	[L/s]	IN [mm]	IN [in]			IN [mm]	IN [in]		SIZE [mm]	SIZE [in]	
2-PF1	001	COTTAGE 2	2-AHU-1	8	10000	[1700]	5.25	[6]	1	25	SIDE	8	20 x 24 x 2	500 x 600 x 50	4 WIDE BY 2 HIGH	---
2-PF2	001	COTTAGE 2	2-AHU-1	8	10000	[1700]	5.25	[6]	1	25	SIDE	4	12 x 24 x 2	500 x 600 x 50	1 WIDE BY 1 HIGH	---
2-PF1	001	COTTAGE 2	2-AHU-1	13	10000	[1700]	5.16	[4]	1	25	SIDE	8	20 x 24 x 4	500 x 600 x 100	4 WIDE BY 2 HIGH	---
2-PF2	001	COTTAGE 2	2-AHU-1	13	10000	[1700]	5.16	[4]	1	25	SIDE	4	12 x 24 x 4	500 x 600 x 100	4 WIDE BY 1 HIGH	---
2-PF1	001	COTTAGE 2	2-SSAC2	8	1000	[475]	5.25	[6]	0.5	13	SIDE	1	16 x 20 x 2	400 x 600 x 50	1 WIDE BY 1 HIGH	---
2-AF3	001	COTTAGE 2	2-SSAC2	8	1000	[940]	5.25	[6]	0.5	13	SIDE	1	20 x 20 x 2	500 x 600 x 50	1 WIDE BY 1 HIGH	---

CANOPY HOOD SCHEDULE										REMARKS
MARK	LOCATION	SYSTEM AND/OR SERVICE	HOOD TYPE	HOOD SIZE		AIR FLOW		APD HOOD ONLY		
				IN	[mm]	CFM	[L/s]	IN	WG	
2-4D1	ROOM 135	KITCHEN HOOD	II	36x26	(1200 x 660)	810	(240)	0.3	(75)	WITH INTEGRAL FAN AND FIRE SUPPRESSION SYSTEM
2-4D2	ROOM 226	KITCHEN HOOD	II	36x26	(1500 x 750)	510	(240)	0.3	(75)	WITH INTEGRAL FAN AND FIRE SUPPRESSION SYSTEM

AIR DEVICE SCHEDULE (SUPPLY)																
MARK	TYPE	AIR FLOW				MOUNTING	PANEL/FINISH		NECK SIZE		NC	DAMPER	FINISH	REMARKS		
		CFM	IN	CFM	IN		IN	IN	IN	IN						
80-1	DOVVERED FACE	40	(19)	160	(76)	0.080	(20)	CEILING	24 x 24	300 x 600	6 #	(152 #)	19	NONE	WHITE	
80-2	DOVVERED FACE	70	(33)	280	(130)	0.100	(25)	CEILING	24 x 24	300 x 600	6 #	(203 #)	23	NONE	WHITE	
80-3	DOVVERED FACE	110	(52)	380	(180)	0.080	(20)	CEILING	24 x 24	300 x 600	10 #	(254 #)	15	NONE	WHITE	
80-1	SUPPLY GRILLE	80	(38)	160	(76)	0.080	(20)	WALL	12 x 8	300 x 203	10 x 8	(254 x 102)	25	NONE	WHITE	
80-2	SUPPLY GRILLE	1200	(570)	2000	(1400)	0.100	(25)	WALL	36 x 36	500 x 254	30 x 30	(305 x 203)	34	NONE	WHITE	
80-3	DRUM LOUVER	80	(38)	150	(71)	0.080	(20)	DUCT MOUNTED	14 x 8	250 x 152	12 x 4	(208 x 201)	15	NONE	WHITE	
80-4	DRUM LOUVER	200	(140)	600	(280)	0.080	(20)	DUCT MOUNTED	22 x 10	500 x 254	20 x 8	(508 x 201)	21	OSD	WHITE	

- NOTES
- SEE FLOOR PLAN FOR THROAT PATTERN.
 - SEE DETAIL FOR DAMPER IN BRANCH DUCT SERVING EACH DIFFUSER.
 - PROVIDE SQUARE TO ROUND ADAPTER.

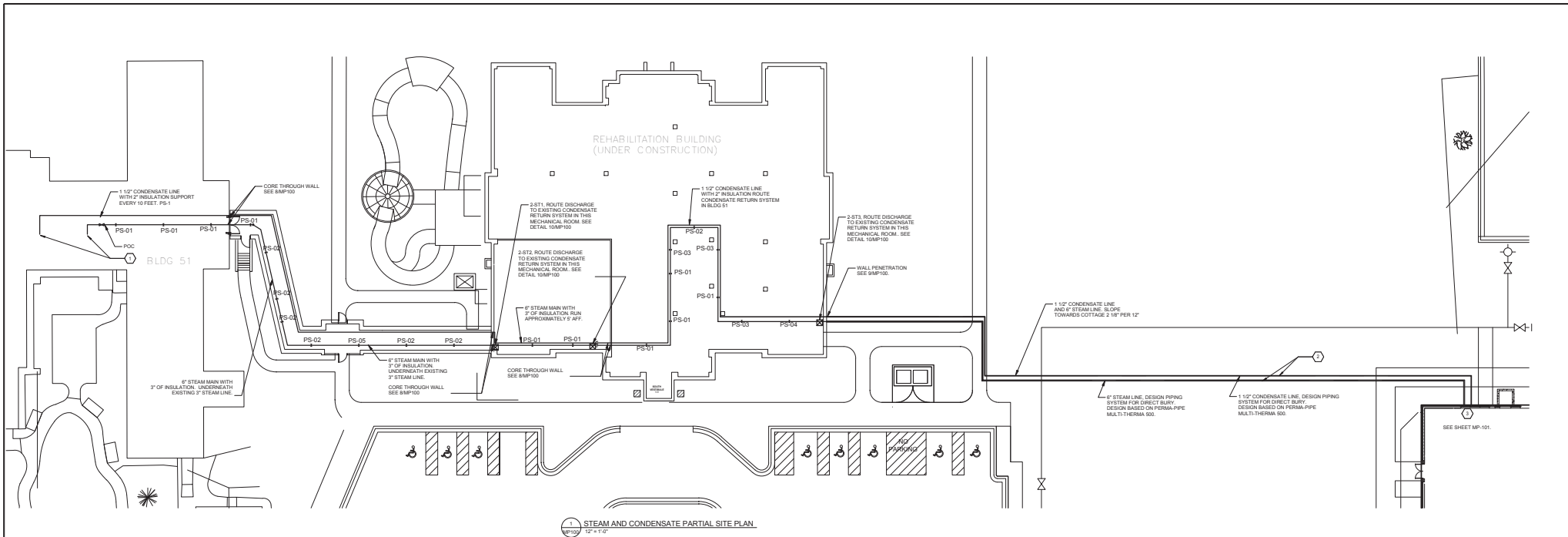
AIR DEVICE SCHEDULE (RETURN AND EXHAUST)																
MARK	TYPE	AIR FLOW				MOUNTING	PANEL FRAME SIZE		NECK SIZE		NC	DAMPER	FINISH	REMARKS		
		CFM	L/s	CFM	L/s		IN	IN	IN	IN						
80-1	RETURN REGISTER	0	[]	800	[380]	0.080	20.000	CEILING	12 x 24	300 x 600	10 x 22	[254 x 508]	14	NONE	WHITE	---
80-1	RETURN REGISTER	0	[]	200	[90]	0.070	20.000	WALL	12 x 12	300 x 300	10 x 10	[254 x 254]	15	NONE	WHITE	---
80-2	RETURN REGISTER	0	[]	2000	[900]	0.070	20.000	WALL	20 x 10	500 x 300	10 #	[254 x 254]	15	NONE	WHITE	---
80-3	RETURN GRILLE	0	[]	2000	[1400]	1.070	270.000	DUCT	42 x 24	500 x 300	40 x 22	[254 x 254]	18	NONE	WHITE	---
80-1	EXHAUST GRILLE	40	[19]	120	[57]	0.080	12.000	CEILING	6 x 8	220 x 203	6 x 8	[220 x 201]	11	NONE	WHITE	---
80-2	EXHAUST GRILLE	200	[140]	600	[270]	0.091	23.000	DUCT	22 x 10	500 x 254	20 x 8	[508 x 201]	21	NONE	WHITE	---

NOTE: PROVIDE SQUARE TO ROUND ADAPTER.

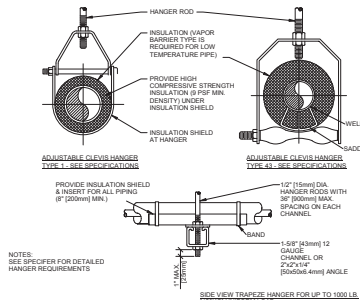
NOTE

PROVIDE SQUARE TO ROUND ADAPTER.

HVAC DESIGN DATA									
DESIGN CONDITIONS									
OUTDOOR DESIGN CONDITIONS	SUMMER				WINTER				LOWEST AVERAGE ANNUAL DEWPOINT
	TEMP °F	WET BULB TEMP °F	% HUMIDITY	TEMP °F	TEMP °F	DEWPOINT TEMP °F	% HUMIDITY	TEMP °F	
OUTDOOR DESIGN CONDITIONS	90	75	[73]	NA	20	[28]	NA	NA	NA
INDOOR AREA DESIGN CONDITIONS									
VESTIBULE	NA	NA	NA	NA	60	[10]	NA	NA	NA
CRAWL SPACE	NA	[20]	NA	NA	60	[10]	NA	NA	NA
ELEC. ROOMS	NA	[30]	NA	NA	40	[4]	NA	NA	NA
MECHANICAL	NA	[20]	NA	NA	50	[10]	NA	NA	NA
SECURITY	75	[24]	NA	NA	60	[17]	NA	NA	NA
BATHING SUITE	75	NA	NA	NA	60	[20]	NA	NA	NA
RESIDENT ROOM	75	[24]	NA	NA	60	70	[21]	NA	20
CORRIDOR	75	[24]	NA	NA	60	70	[21]	NA	20
DEN	75	[24]	NA	NA	60	70	[21]	NA	20
DINING	75	[24]	NA	NA	60	70	[21]	NA	20
KITCHEN/PANTRY	75	[24]	NA	NA	60	70	[21]	NA	20
LAUNDRY	75	[24]	NA	NA	60	70	[21]	NA	NA
PUBLIC TOILET	NA	NA	NA	NA	70	[21]	NA	NA	NA



1 STEAM AND CONDENSATE PARTIAL SITE PLAN
12\"/>



NOTES:
SEE SPECIFIER FOR DETAILED HANGER REQUIREMENTS

		MAXIMUM PIPE/TUBING SUPPORT SPACING																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
NOM. SIZE	IN. [mm]	THRU 3/4 THRU [20]	1 [25]	1 1/4 [32]	1 1/2 [40]	2 [50]	2 1/2 [63]	3 [76]	4 [102]	5 [127]	6 [152]	8 [203]	10 [254]	12 [305]	14 [356]	16 [406]	18 [457]	20 [508]	22 [559]	24 [610]	26 [660]	28 [711]	30 [762]	32 [813]	34 [864]	36 [914]	38 [965]	40 [1016]	42 [1067]	44 [1118]	46 [1168]	48 [1219]	50 [1270]	52 [1321]	54 [1372]	56 [1423]	58 [1473]	60 [1524]	62 [1575]	64 [1626]	66 [1677]	68 [1728]	70 [1778]	72 [1829]	74 [1880]	76 [1931]	78 [1982]	80 [2033]	82 [2084]	84 [2135]	86 [2186]	88 [2237]	90 [2288]	92 [2339]	94 [2390]	96 [2441]	98 [2492]	100 [2543]	102 [2594]	104 [2645]	106 [2696]	108 [2747]	110 [2798]	112 [2849]	114 [2900]	116 [2951]	118 [3002]	120 [3053]	122 [3104]	124 [3155]	126 [3206]	128 [3257]	130 [3308]	132 [3359]	134 [3410]	136 [3461]	138 [3512]	140 [3563]	142 [3614]	144 [3665]	146 [3716]	148 [3767]	150 [3818]	152 [3869]	154 [3920]	156 [3971]	158 [4022]	160 [4073]	162 [4124]	164 [4175]	166 [4226]	168 [4277]	170 [4328]	172 [4379]	174 [4430]	176 [4481]	178 [4532]	180 [4583]	182 [4634]	184 [4685]	186 [4736]	188 [4787]	190 [4838]	192 [4889]	194 [4940]	196 [4991]	198 [5042]	200 [5093]	202 [5144]	204 [5195]	206 [5246]	208 [5297]	210 [5348]	212 [5399]	214 [5450]	216 [5501]	218 [5552]	220 [5603]	222 [5654]	224 [5705]	226 [5756]	228 [5807]	230 [5858]	232 [5909]	234 [5960]	236 [6011]	238 [6062]	240 [6113]	242 [6164]	244 [6215]	246 [6266]	248 [6317]	250 [6368]	252 [6419]	254 [6470]	256 [6521]	258 [6572]	260 [6623]	262 [6674]	264 [6725]	266 [6776]	268 [6827]	270 [6878]	272 [6929]	274 [6980]	276 [7031]	278 [7082]	280 [7133]	282 [7184]	284 [7235]	286 [7286]	288 [7337]	290 [7388]	292 [7439]	294 [7490]	296 [7541]	298 [7592]	300 [7643]	302 [7694]	304 [7745]	306 [7796]	308 [7847]	310 [7898]	312 [7949]	314 [8000]	316 [8051]	318 [8102]	320 [8153]	322 [8204]	324 [8255]	326 [8306]	328 [8357]	330 [8408]	332 [8459]	334 [8510]	336 [8561]	338 [8612]	340 [8663]	342 [8714]	344 [8765]	346 [8816]	348 [8867]	350 [8918]	352 [8969]	354 [9020]	356 [9071]	358 [9122]	360 [9173]	362 [9224]	364 [9275]	366 [9326]	368 [9377]	370 [9428]	372 [9479]	374 [9530]	376 [9581]	378 [9632]	380 [9683]	382 [9734]	384 [9785]	386 [9836]	388 [9887]	390 [9938]	392 [9989]	394 [10040]	396 [10091]	398 [10142]	400 [10193]	402 [10244]	404 [10295]	406 [10346]	408 [10397]	410 [10448]	412 [10499]	414 [10550]	416 [10601]	418 [10652]	420 [10703]	422 [10754]	424 [10805]	426 [10856]	428 [10907]	430 [10958]	432 [11009]	434 [11060]	436 [11111]	438 [11162]	440 [11213]	442 [11264]	444 [11315]	446 [11366]	448 [11417]	450 [11468]	452 [11519]	454 [11570]	456 [11621]	458 [11672]	460 [11723]	462 [11774]	464 [11825]	466 [11876]	468 [11927]	470 [11978]	472 [12029]	474 [12080]	476 [12131]	478 [12182]	480 [12233]	482 [12284]	484 [12335]	486 [12386]	488 [12437]	490 [12488]	492 [12539]	494 [12590]	496 [12641]	498 [12692]	500 [12743]	502 [12794]	504 [12845]	506 [12896]	508 [12947]	510 [13008]	512 [13059]	514 [13110]	516 [13161]	518 [13212]	520 [13263]	522 [13314]	524 [13365]	526 [13416]	528 [13467]	530 [13518]	532 [13569]	534 [13620]	536 [13671]	538 [13722]	540 [13773]	542 [13824]	544 [13875]	546 [13926]	548 [13977]	550 [14028]	552 [14079]	554 [14130]	556 [14181]	558 [14232]	560 [14283]	562 [14334]	564 [14385]	566 [14436]	568 [14487]	570 [14538]	572 [14589]	574 [14640]	576 [14691]	578 [14742]	580 [14793]	582 [14844]	584 [14895]	586 [14946]	588 [14997]	590 [15048]	592 [15099]	594 [15150]	596 [15201]	598 [15252]	600 [15303]	602 [15354]	604 [15405]	606 [15456]	608 [15507]	610 [15558]	612 [15609]	614 [15660]	616 [15711]	618 [15762]	620 [15813]	622 [15864]	624 [15915]	626 [15966]	628 [16017]	630 [16068]	632 [16119]	634 [16170]	636 [16221]	638 [16272]	640 [16323]	642 [16374]	644 [16425]	646 [16476]	648 [16527]	650 [16578]	652 [16629]	654 [16680]	656 [16731]	658 [16782]	660 [16833]	662 [16884]	664 [16935]	666 [16986]	668 [17037]	670 [17088]	672 [17139]	674 [17190]	676 [17241]	678 [17292]	680 [17343]	682 [17394]	684 [17445]	686 [17496]	688 [17547]	690 [17598]	692 [17649]	694 [17700]	696 [17751]	698 [17802]	700 [17853]	702 [17904]	704 [17955]	706 [18006]	708 [18057]	710 [18108]	712 [18159]	714 [18210]	716 [18261]	718 [18312]	720 [18363]	722 [18414]	724 [18465]	726 [18516]	728 [18567]	730 [18618]	732 [18669]	734 [18720]	736 [18771]	738 [18822]	740 [18873]	742 [18924]	744 [18975]	746 [19026]	748 [19077]	750 [19128]	752 [19179]	754 [19230]	756 [19281]	758 [19332]	760 [19383]	762 [19434]	764 [19485]	766 [19536]	768 [19587]	770 [19638]	772 [19689]	774 [19740]	776 [19791]	778 [19842]	780 [19893]	782 [19944]	784 [19995]	786 [20046]	788 [20097]	790 [20148]	792 [20199]	794 [20250]	796 [20301]	798 [20352]	800 [20403]	802 [20454]	804 [20505]	806 [20556]	808 [20607]	810 [20658]	812 [20709]	814 [20760]	816 [20811]	818 [20862]	820 [20913]	822 [20964]	824 [21015]	826 [21066]	828 [21117]	830 [21168]	832 [21219]	834 [21270]	836 [21321]	838 [21372]	840 [21423]	842 [21474]	844 [21525]	846 [21576]	848 [21627]	850 [21678]	852 [21729]	854 [21780]	856 [21831]	858 [21882]	860 [21933]	862 [21984]	864 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PIPE	FT. [mm]	7	7	7	9	9	10	11	12	14	16	17	19	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110	112	114	116	118	120	122	124	126	128	130	132	134	136	138	140	142	144	146	148	150	152	154	156	158	160	162	164	166	168	170	172	174	176	178	180	182	184	186	188	190	192	194	196	198	200	202	204	206	208	210	212	214	216	218	220	222	224	226	228	230	232	234	236	238	240	242	244	246	248	250	252	254	256	258	260	262	264	266	268	270	272	274	276	278	280	282	284	286	288	290	292	294	296	298	300	302	304	306	308	310	312	314	316	318	320	322	324	326	328	330	332	334	336	338	340	342	344	346	348	350	352	354	356	358	360	362	364	366	368	370	372	374	376	378	380	382	384	386	388	390	392	394	396	398	400	402	404	406	408	410	412	414	416	418	420	422	424	426	428	430	432	434	436	438	440	442	444	446	448	450	452	454	456	458	460	462	464	466	468	470	472	474	476	478	480	482	484	486	488	490	492	494	496	498	500	502	504	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580	582	584	586	588	590	592	594	596	598	600	602	604	606	608	610	612	614	616	618	620	622	624	626	628	630	632	634	636	638	640	642	644	646	648	650	652	654	656	658	660	662	664	666	668	670	672	674	676	678	680	682	684	686	688	690	692	694	696	698	700	702	704	706	708	710	712	714	716	718	720	722	724	726	728	730	732	734	736	738	740	742	744	746	748	750	752	754	756	758	760	762	764	766	768	770	772	774	776	778	780	782	784	786	788	790	792	794	796	798	800	802	804	806	808	810	812	814	816	818	820	822	824	826	828	830	832	834	836	838	840	842	844	846	848	850	852	854	856	858	860	862	864	866	868	870	872	874	876	878	880	882	884	886	888	890	892	894	896	898	900	902	904	906	908	910	912	914	916	918	920	922	924	926	928	930	932	934	936	938	940	942	944	946	948	950	952	954	956	958	960	962	964	966	968	970	972	974	976	978	980	982	984	986	988	990	992	994	996	998	1000					
NOTE: FOR TRAPEZE HANGER TAKE SPACING OF SMALLEST SIZE ON TRAPEZE.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												



- [illegible]



1 FIRST FLOOR PIPING PLAN
MP102 1/8" = 1'-0"



Diagram illustrating a typical hydronic piping layout at a VAV (Variable Air Volume) unit. The layout shows a 3/4" HWS (Hot Water Supply) line and a 3/4" HWRR (Hot Water Return) line. A circled '9' indicates a specific component or connection point, labeled MP502.

- GENERAL NOTES - PIPING
- A. DRAWINGS ARE DIAGRAMMATIC AND NOT NECESSARILY SHOW ALL RISERS, DROPS OR OFFSETS REQUIRED TO CONNECT TO AND FROM OTHER TRACES PRIOR TO STARTING CONSTRUCTION.
 - B. FOR CLARITY, NOT ALL PIPING AND ANNOTATIONS ARE SHOWN TO SCALE. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.
 - C. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR CUTTING AND PATCHING UNLESS OTHERWISE NOTED ON DRAWINGS AND SEAL ALL FLOOR AND WALL PENETRATIONS TO MATCH CONSTRUCTION FIRE STOP AROUND ALL PIPING AT ALL PENETRATIONS. RATED WALLS AND FLOORS ARE NOT APPLICABLE. USE ONLY NON-SKINNING CONCRETE. FINAL APPROVAL BY ARCHITECT REQUIRED.
 - D. CLOSURE OF THE BUILDING FLOOR, WALLS OR STRUCTURAL MEMBERS WHICH WILL DEGRADATE THE BUILDING'S FIRE STRATEGY SHALL BE PROHIBITED. ALLOWED WITHOUT WRITTEN APPROVAL FROM THE STRUCTURAL ENGINEER.
 - E. ALL HORIZONTAL CONDENSATE PIPING SHALL BE SLOPED AT 1/8" PER FOOT.
 - F. DETAIL ALL BELLS OF DUCTWORK UNLESS NOTED OTHERWISE. KEEP DUCTWORK AS HIGH AS POSSIBLE.
 - G. REFER TO ARCHITECTURAL DRAWINGS FOR ACCESS PANEL LOCATIONS.
 - H. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF THE PIPING.

- [illegible]

B	Issued for Construction	12/20/16
No.	REVISION	DATE

VOA

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224 SOUTH MICHIGAN
AVENUE
SUITE 1400
CHICAGO, ILLINOIS 60604-2595
(312) 554-1400

ARCHITECTURE | PLANNING | INTERIOR DESIGN

6 WEST 5TH STREET
SUITE 800H
ST. PAUL, MN 55102
(651) 788-7461
ARCHITECTURE | COMMISSIONING | SCANNING

PIERCE PINI &
ASSOCIATES

SEBESTA

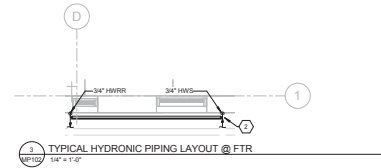
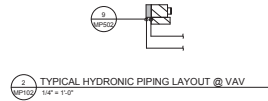
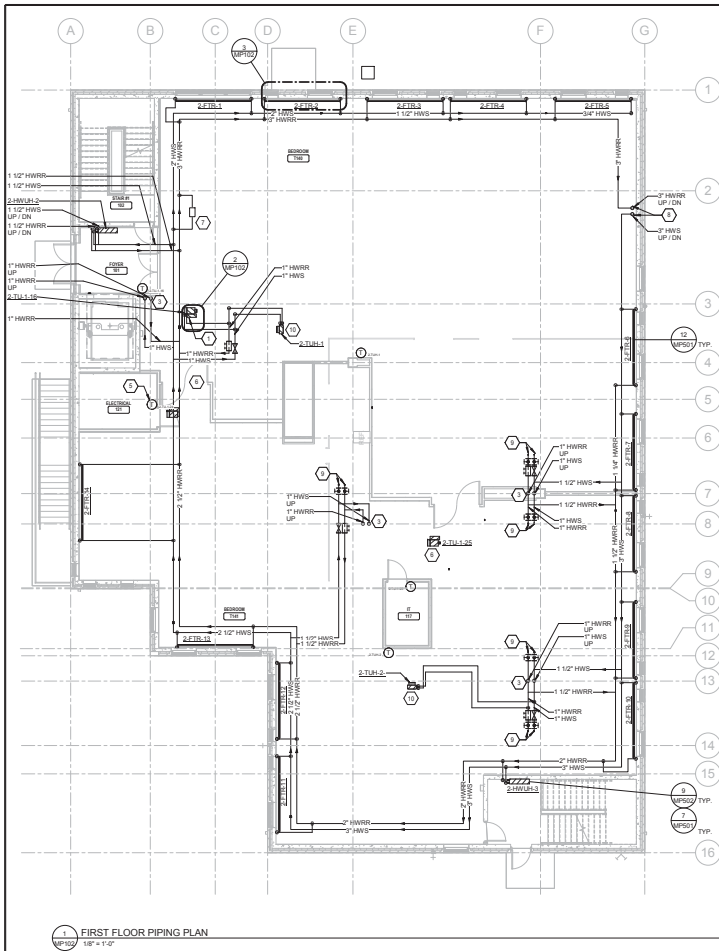
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www.damonfarber.com

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.


DAVID W. HARRISON
Date: 12/30/2016 Reg. No.: 2613

[illegible]

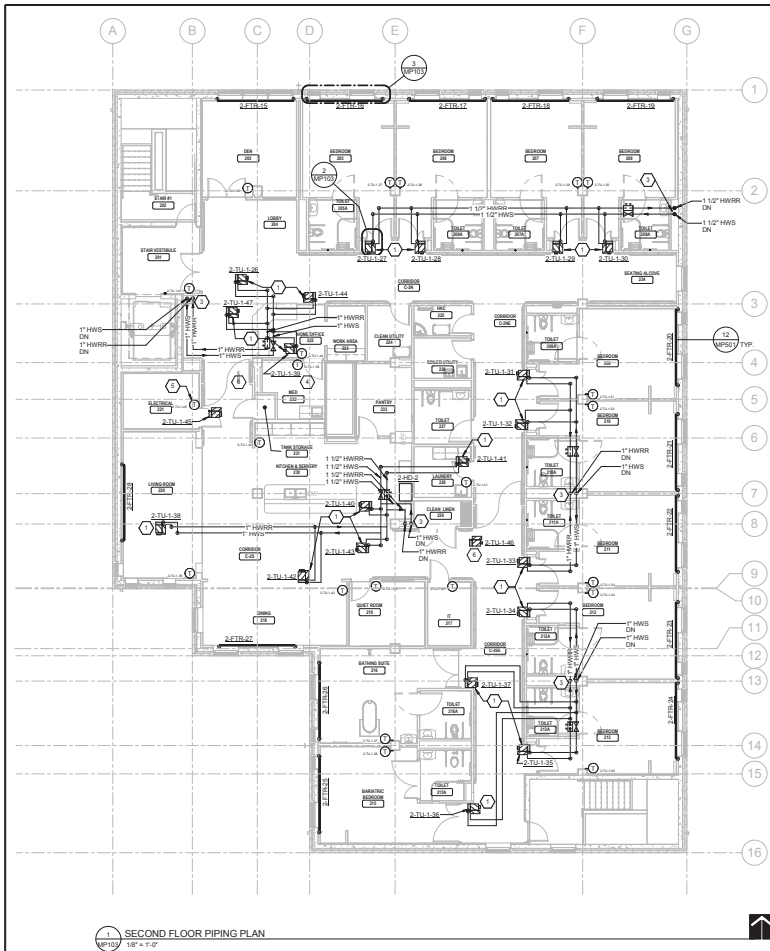


- GENERAL NOTES - PIPING
- DRAWINGS ARE DIAGNOSTIC AND DO NOT NECESSARILY SHOW ALL RISERS, DROP OR OFFSETS. LAYOUT PIPING AND COORDINATE WITH OTHER TRADES PRIOR TO STARTING CONSTRUCTION.
 - FOR CLARITY, NOT ALL PIPING AND/OR SIZES ARE SHOWN. REFER TO EACH AND/OR DIAGRAMS FOR ADDITIONAL INFORMATION.
 - THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR CUTTING AND PATCHING UNLESS OTHERWISE NOTED. PATCH AND SEAL ALL FLOOR AND/OR WALL PENETRATIONS TO MATCH CONSTRUCTION. FIRE STOP AROUND ALL PENALS AT ALL FLOOR AND FIRE RATED WALL PENETRATIONS. WHEN APPLICABLE, USE ONLY NON-BURNING CONCRETE. FINAL SURFACE FINISHING SHALL BE BY THE GENERAL CONTRACTOR.
 - NO CUTTING OF THE BUILDING FLOOR, WALLS OR STRUCTURAL MEMBERS WHICH WILL DETERIORATE THE INTEGRITY AND STRENGTH OF THE BUILDING WILL BE ALLOWED WITHOUT WRITTEN APPROVAL FROM THE STRUCTURAL ENGINEER.
 - ALL HORIZONTAL CONDENSATE PIPING SHALL BE SLOPED AT 1/8\"/>

KEYED NOTES - MP102 (1)

- VARIABLE AIR VOLUME BOX WITH HWHR RE-HEAT COIL. REFER TO DETAIL NOTE V.A. GUIDELINES REQUIRE THAT ACCESS TO VALVING AND CONTROLS FOR VAV BOX ABOVE CEILING ALL BE ACCESSIBLE WITH THE REMOVAL OF ONLY ONE (1) CEILING TILE. CONTRACTOR SHALL MEASURE OFF EACH VAV BOX LOCATION WITH RELATION TO THE CEILING GRID (SEE ARCHITECTURAL DRAWINGS) TO ENSURE PROPER ACCESS. THIS NOTE IS TYPICAL OF ALL VAV BOXES THIS PAGE.
- PANEL RADIATOR, PER DETAIL. BOTTOM OF PANEL SHALL BE 2\"/>

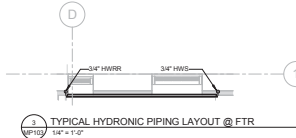
DEDUCT ALTERNATE #6



2 TYPICAL HYDRONIC PIPING LAYOUT @ VAV
1/4" = 1'-0"



3 TYPICAL HYDRONIC PIPING LAYOUT @ FTR
1/4" = 1'-0"



GENERAL NOTES - PIPING

- DRAWINGS ARE DIAGNOSTIC AND DO NOT NECESSARILY SHOW ALL RISER, SHOTS OR OFFSETS. LAYOUT PIPING AND COORDINATE WITH OTHER TRADES PRIOR TO STARTING CONSTRUCTION.
- FOR CLARITY, NOT ALL PIPING AND/OR SIZES ARE SHOWN. REFER TO DETAILS AND/OR SCHEMATICS FOR ADDITIONAL INFORMATION.
- THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR CUTTING AND PATCHING UNLESS OTHERWISE NOTED ON PLANS. PATCH AND SEAL ALL FLOOR AND/OR WALL PENETRATIONS TO MATCH CONSTRUCTION. PRE-STOP AND SEAL ALL PIPING AT ALL FLOOR AND FIRE RATED WALL PENETRATIONS. WHEN APPLICABLE, USE ONLY NON-BRICK CONCRETE. FINAL SURFACE FINISHING SHALL BE BY THE GENERAL CONTRACTOR.
- NO CUTTING OF THE BUILDING FLOOR, WALLS OR STRUCTURAL MEMBERS WHICH WILL DETERIORATE THE INTEGRITY AND STRENGTH OF THE BUILDING WILL BE ALLOWED WITHOUT WRITTEN APPROVAL FROM THE STRUCTURAL ENGINEER.
- ALL HORIZONTAL, CONCRETE PIPING SHALL BE SLOPED AT 1/8" PER FOOT.
- INSTALL PIPING BELOW DUCTWORK UNLESS NOTED OTHERWISE. KEEP DUCTWORK AS HIGH AS POSSIBLE.
- REFER TO ARCHITECTURAL DRAWINGS FOR ACCESS PANEL LOCATIONS.
- THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF THE DIRECT BURIED PIPING.

KEYED NOTES - MP103

- VARIABLE AIR VOLUME BOX WITH HWHR RE-HEAT COIL. REFER TO DETAIL NOTE V-A. GUIDELINES REQUIRE THAT ACCESS TO VALVING AND CONTROLS FOR VAV BOX ABOVE CEILING ALL BE ACCESSIBLE WITH THE REMOVAL OF ONLY ONE (1) CEILING TIE. CONTRACTOR SHALL MEASURE OFF EACH VAV BOX LOCATION WITH RELATION TO THE CEILING GRID (SEE ARCHITECTURAL) TO ENSURE PROPER ACCESS. THIS NOTE TYPICAL OF ALL VAV BOXES. THIS PAGE.
- NOT USED.
- HWHR PIPING IN PLUMBING CHASE DOWN TO FIRST FLOOR. SEE MP102 FOR CONTINUATION. COORDINATE WITH PLUMBING CONTRACTOR. EXACT LOCATION OF HWHR RISER, PRE-CAST CONCRETE FLOORS PRE-DRILLED WITH HOLES FOR PLUMBING AND HYDRONICS. REFER TO STRUCTURAL DRAWINGS.
- MEDICAL REFRIGERATORS (2) THESE CONTROLS CONTRACTOR SHALL PROVIDE TEMPERATURE MONITORING OF BOTH, WITH ALARM ROUTED TO BUILDING AUTOMATION SYSTEM (BMS) LOSS OF TEMPERATURE FOR GREATER THAN 5 MINUTES. COORDINATE ALARM SPECIFICS WITH OWNER.
- SENSOR, TYPICAL. INSTALL AT 5'-0" A.F.F.
- COOLING ONLY VAV BOX.

Revised By	Construction	12/20/19
By	MECHANICAL	DATE

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224 SOUTH MICHIGAN AVENUE
SUITE 1400
CHICAGO, ILLINOIS 60604-2895
(312) 654-1400



PIERCE PINI & ASSOCIATES
500 CLINTON AVE. N.E.
SUITE 112
ST. PAUL, MN 55102
(651) 788-7481
ARCHITECTURE (COMMISSIONING) | SCANNING

PIERCE PINI & ASSOCIATES
500 CLINTON AVE. N.E.
SUITE 112
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LANDSCAPE ARCHITECTS
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Minneapolis, MN 55401
p 612.332.7522 f 612.332.0936
www.damonfarmer.com

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

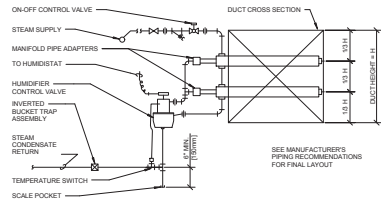
DAVID W. JAWORSKI
Date: 12/20/2019 Reg. No.: 28138

Project Name	ST. CLOUD VA MC COMMUNITY LIVING CENTER COTTAGE #2
Project Number	656-432
Project Location	ST. CLOUD, MN 56301
Project Date	12/20/2019

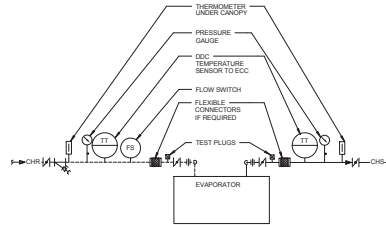
Project Name	ST. CLOUD VA MC COMMUNITY LIVING CENTER COTTAGE #2
Project Number	656-432
Project Location	ST. CLOUD, MN 56301
Project Date	12/20/2019

Project Name	ST. CLOUD VA MC COMMUNITY LIVING CENTER COTTAGE #2
Project Number	656-432
Project Location	ST. CLOUD, MN 56301
Project Date	12/20/2019

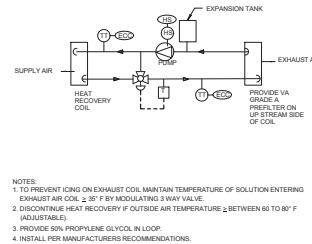
St. Cloud VA Health Care System
Brazier | Montevideo | Alexandria



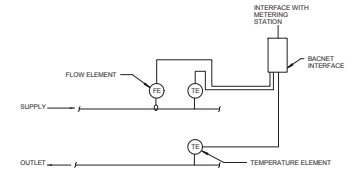
1 STEAM HUMIDIFIER - PIPING CONNECTIONS (MULTIPLE DISPERSION TUBES)
NOT TO SCALE



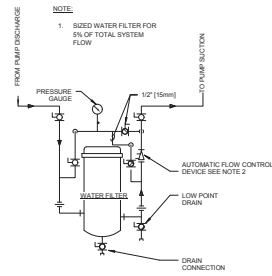
2 AIR COOLED CHILLER - PIPING CONNECTIONS
NOT TO SCALE



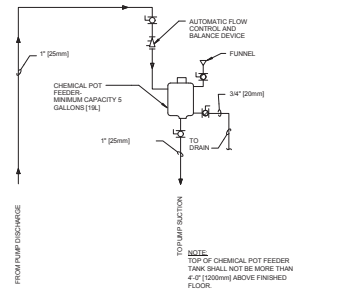
3 RUN AROUND HEAT RECOVERY COIL DETAIL
NOT TO SCALE



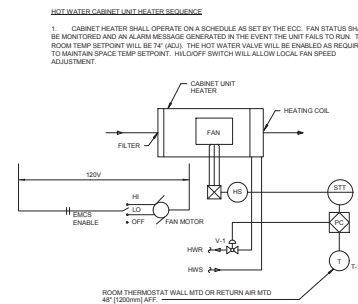
4 WATER FLOW MEASURING STATION (WITH BTU METER)
NOT TO SCALE



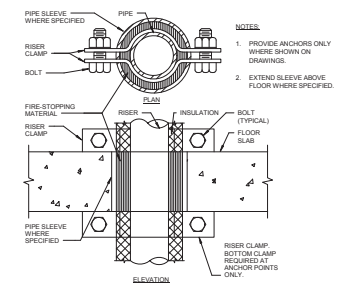
5 WATER FILTERS - CLOSED LOOP HYDRONIC SYSTEMS
NOT TO SCALE



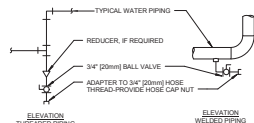
6 WATER TREATMENT - CLOSED SYSTEMS
NOT TO SCALE



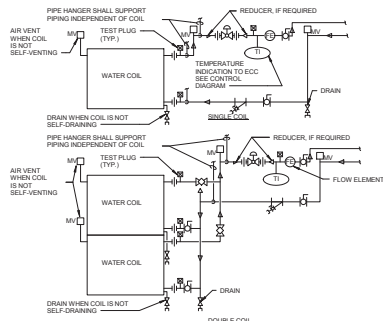
7 HOT WATER CABINET UNIT CONTROLS
NOT TO SCALE



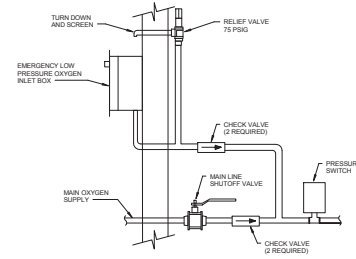
8 SUPPORT/ANCHOR FOR PIPE RISERS
NOT TO SCALE



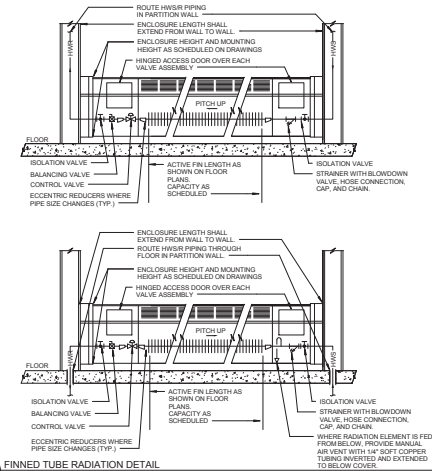
9 DRAIN VALVE AND AIR VENT CONNECTIONS (HYDRONIC SYSTEMS)
NOT TO SCALE



10 WATER COILS - PIPING CONNECTIONS
NOT TO SCALE



11 EMERGENCY OXYGEN SUPPLY CONNECTION
NOT TO SCALE



12 FINNED TUBE RADIATION DETAIL
NOT TO SCALE

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

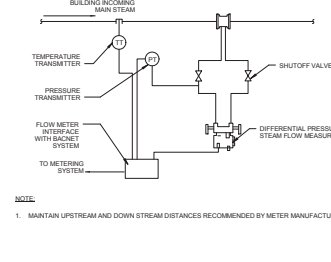
DAVID W. HARRISON
Date: 12/20/2016 Reg No: 28138

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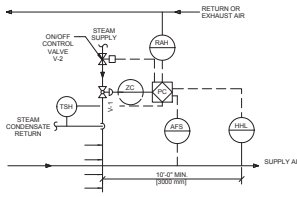
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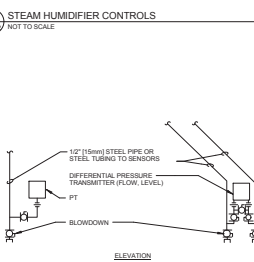
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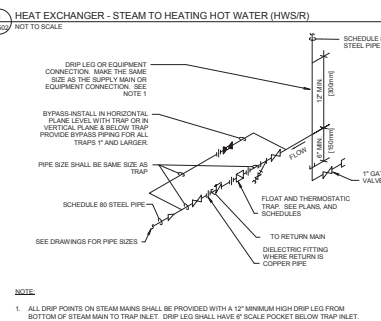
4 STEAM METER DETAIL



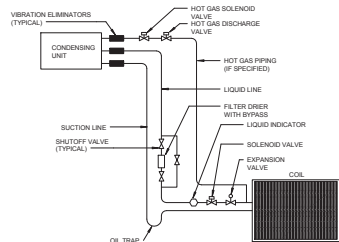
STEAM HUMIDIFIER
RETURN (OR EXHAUST) AIR HUMIDITY SHALL BE MONITORED, ON A CALL FOR HUMIDIFICATION, HUMIDIFIER VALVE V-1 SHALL MODULATE TO MAINTAIN THE RETURN (OR EXHAUST) AIR HUMIDITY SET POINT TO 30% (ADJUSTABLE), PRIOR TO ACTIVATION OF V-1, THE ON/OFF CONTROL VALVE V-2 SHALL BE ENABLED THROUGH ECC AND JACKET TEMPERATURE SENSED BY TSH SHALL BE WARM ENOUGH TO PREVENT CONDENSATION. THE HIGH LIMIT HUMIDITY SENSOR, LOCATED IN THE SUPPLY AIR DUCT 10 FEET AWAY FROM THE HUMIDIFIER SHALL DISABLE THE HUMIDIFIER AND GIVE AN ALARM SIGNAL TO THE ECC. IF THE SUPPLY AIR HUMIDITY EXCEEDS 90% RH (ADJUSTABLE), THE AIRFLOW SWITCH SHALL PROVE AIRFLOW BEFORE HUMIDIFIER CONTROLS ARE ACTIVATED.



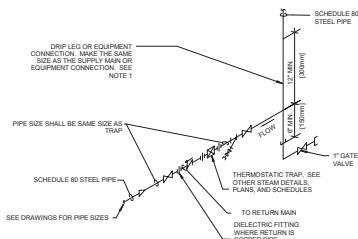
11 PRESSURE TRANSMITTER INSTALLATION
NOT TO SCALE



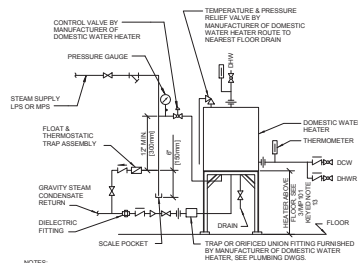
10. FLOAT AND THERMOSTATIC STEAM TRAP ASSEMBLY



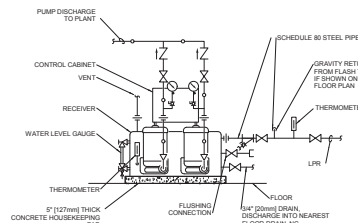
1 REFRIGERATION UNIT
NOT TO SCALE



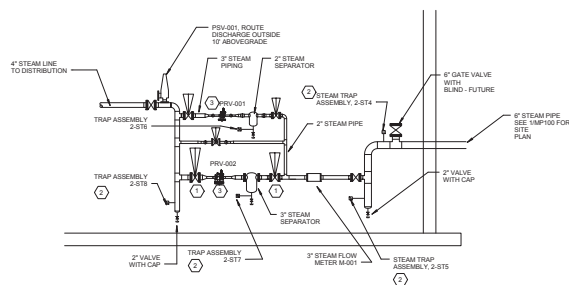
2 THERMOSTATIC STEAM TRAP ASSEMBLY
NOT TO SCALE



3 CONNECTIONS TO DOMESTIC WATER HEATER
NOT TO SCALE



4 CONDENSATE PUMPS - PIPING CONNECTIONS
NOT TO SCALE



5 STEAM PRESSURE REDUCING STATION
NOT TO SCALE

Revised By	Construction	12/20/15	DATE
By	MECHANICAL		

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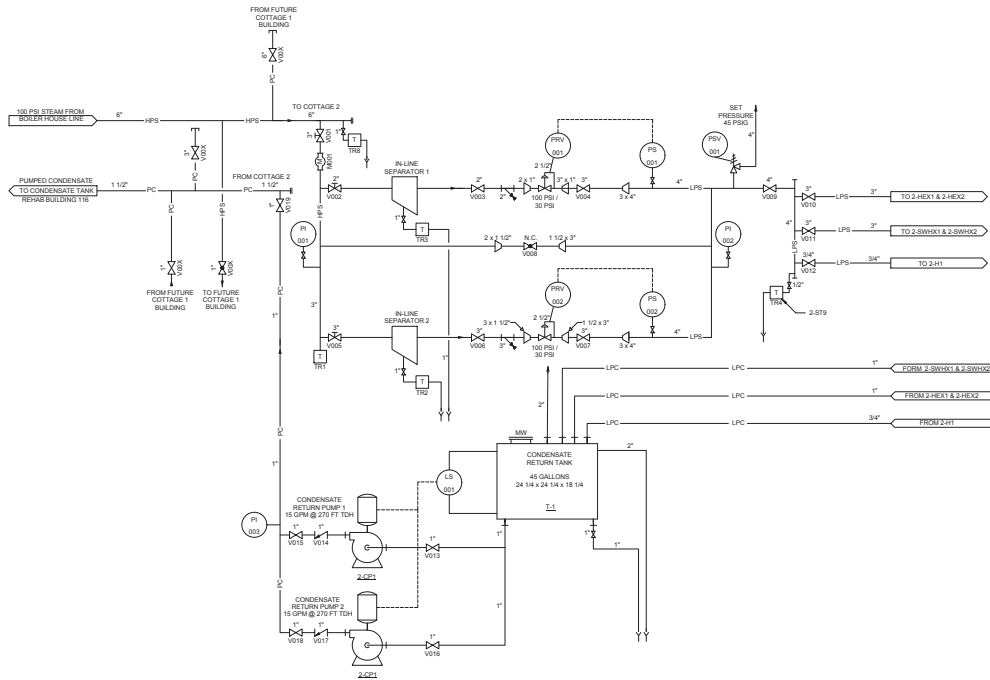
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I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
David W. Harrison
Date: 12/20/2015 Reg. No.: 28138

Project Name	ST. CLOUD VA MC COMMUNITY LIVING CENTER COTTAGE #2
Project Number	656-432
Project Location	140 MEDICAL CENTER ST. CLOUD, MN 56301
Project Date	07/20/15

Client Name	ST. CLOUD VA MC COMMUNITY LIVING CENTER COTTAGE #2
Client Address	140 MEDICAL CENTER ST. CLOUD, MN 56301
Client Phone	656-432
Client Email	07/20/15

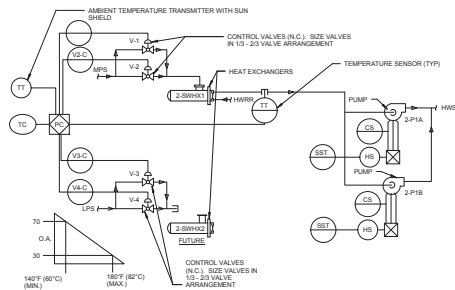
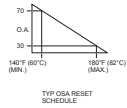
St. Cloud VA Health Care System
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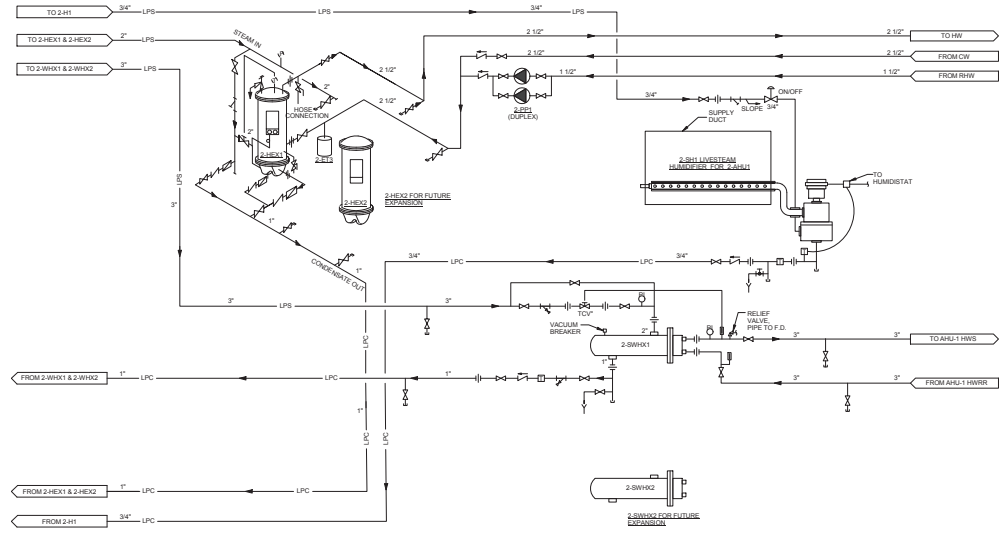
1. BUILDING STEAM SCHEMATIC
NOT TO SCALE

SEQUENCE OF OPERATION:
 1. STEAM CONTROL VALVE SHALL MODULATE TO MAINTAIN THE LEAVING HOT WATER TEMPERATURE AT SET POINT.
 2. THE LEAVING HOT WATER TEMPERATURE SHALL BE RESET INVERSELY WITH THE OUTDOOR TEMPERATURE AS SCHEDULED.
 3. THE LEAD AND LAG PUMPS AND HEAT EXCHANGERS SHALL BE SEQUENTIAL BY THE OPERATOR CONTROLS AT THE PRE-DETERMINED INTERVAL (USUALLY 7 DAYS). IN THE EVENT THE PUMP FAILS TO START WITHIN 30 SECONDS, AN ALARM SHALL BE INITIATED AND THE SECOND PUMP SHALL START AUTOMATICALLY.

VALVE SEQUENCE:
 1. V1 (1/3 CAPACITY) MODULATING FULLY OPEN TO MAINTAIN SET POINT.
 2. V2 (2/3 CAPACITY) MODULATE FULLY OPEN TO MAINTAIN SET POINT.
 3. BOTH V1 & V2 MODULATE TOGETHER TO MAINTAIN SET POINT.



2. DUAL HEAT EXCHANGER CONTROL (HEATING SYSTEM)
NOT TO SCALE



2. SYSTEM STEAM SCHEMATIC
NOT TO SCALE

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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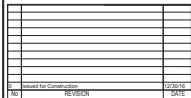
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 Date: 12/20/2016 Reg. No.: 28138

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ST. CLOUD VA MC COMMUNITY LIVING CENTER COTTAGE #2 655-432 14 MEDICAL CENTER ST. CLOUD, MN 56301	OPTION
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Date: 12/30/2016 Reg. No.: 2613

VA MEDICAL CENTER
ST CLOUD, MN 56303



EXPANSION TANK SCHEDULE																														
MARK	LOCATION	SYSTEM AND/OR SERVICE	TYPE	APPROX SYSTEM VOLUME	SYSTEM TEMPERATURE RANGE				INITIAL PRESSURE IN TANK		MAX OPERATING PRESSURE		FILL PRESSURE AT TANK		MIN VOLUME TANK		MIN BLADDER VOLUME	PIPE SIZE TO TANK		COLD WATER FILL SIZE	REMARKS									
					GAL	BTU	°F	°C	MIN	MAX	PSID	PSIG	PSID	PSIG	PSID	PSIG		RELIEF VALVE	AT TANK			GAL	BTU	IN	MM	IN	MM			
2/E11	001	HEATING WATER	VERT DAMPHRAGM	350 (1300)	50 (10)	180 (82)	18	120	29	200	30 (210)	18 (120)	53 (200)	3 (75)	1 (25)															
2/E12	001	CHILLED WATER	VERT DAMPHRAGM	500 (1900)	40 (4)	80 (27)	18	120	29	200	30 (210)	18 (120)	53 (200)	3 (75)	1 (25)															
AIR COOLED CHILLER SCHEDULE																														
MARK	LOCATION	AREA AND/OR BLEED SERVICED	TYPE	CAPACITY	# OF COMP	MAX KW/TON	MIN COP	MAX PLV (KW/TON)	EVAPORATOR				CONDENSER				ELECTRICAL				REMARKS									
									FLOW	EWT	LWT	MAX WPD	FOULING FACTOR	AMBIENT CA TEMP	# COMP	HP	KW	PHASE	VOLTS	# PHASE		NOMINAL POWER	HP	KW	PHASE	VOLT				
				TONS	[kW]				GPM	[L/M]	°F	[°C]	°F	[°C]	FT	[MPS]		°F	[°C]		# COMP	HP	KW	PHASE	VOLTS	# PHASE	HP	[kW]	PHASE	VOLT
2/ACDH	EXTERIOR	COTTAGE 2	SCROLL	4 (1170)	4	1.15	3.08	0.75	125 (181)	54 (121)	44 (17)	20 (80)	0.0001	95 (35)	4	12.5 (9)	3	480	4	1.5 (1100)	3	480								
NOTES																														
1. SEE SPECIFICATIONS FOR AVAILABLE ENGINEERING REQUIREMENTS.																														
2. MAX KW/TON AND MIN COP ARE AT DESIGN CONDITIONS INDICATED. KW/TON INCLUDES CONDENSER FANS.																														

AIR COOLED CHILLER SCHEDULE															
MARK	LOCATION	AREA AND/OR BLDG SERVED	TYPE	CAPACITY	# OF COMP	MAX WYTON	MIN COP	MAX PLV (WYTON)	EVAPORATOR		CONDENSER	ELECTRICAL		REMARKS	
									FLOW	SWT	UWT	MAX WPD	PHASE		
2-A04CH	EXT	COTTAGE 2	SCROLL	47 (170)	4	1.15	3.08	0.75	GPM [L/S]	°F [°C]	°F [°C]	HP [kW]	VOLTS	3	480

STEAM HUMIDIFIER SCHEDULE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
MARK	LOCATION	SYSTEM AND/OR SERVICE	HUMIDIFIER TYPE	AIR FLOW	# OF MINIFOLDS	EAT				LAT				SOURCE	STEAM				CONTROL TYPE	TRAP		REMARKS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
						DB	WB	DEWPOINT	DEWPOINT	DB	WB	DEWPOINT	DEWPOINT		PRESS ENT VALVE	PRESS ENT HEATER	PRESS ENT FLOW	LEAKAGE		CAPACITY																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
2-9H1	001	2-AHU1	UNIT MOUNTED DISPERSION TUBE	GPM 15000 (7100)	1	7	12	45	42	7	12	45	42	1	11	130	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PSIG	PS

CHILLED WATER COOLING COIL SCHEDULE																														
MARK	LOCATION	AREA AND/OR BLDG SERV	SYSTEM AND/OR SERVICE	AIR FLOW	MAX FACE VELOCITY				LAT				TOTAL CAPACITY	SENSIBLE CAPACITY		CHILLED WATER				REMARKS										
					CFM	FPM	DB	WB	DB	WB	DB	WB		MBH	BW	MBH	BW	FLOW	INVT		LVLT	WSD								
2-CWC01	001	COTTAGE 2	2-AHU1	15000 (1700)	600	1000	131	51.6	1190	80.1	27.1	87.1	52.1	61	12.1	63	12.1	567	1793	378	1103	118	1.1	44	12.1	54	15.2	12.2	4.1	—
NOTE: THE COOLING COIL FPN SPACING SHALL NOT EXCEED 132 FPN PER FOOT (400 FPN PER METER).																														

CHILLED WATER COOLING COIL SCHEDULE															
MARK	LOCATION	AREA AND/OR BLDG SERVED	SYSTEM AND/OR SERVICE	AIR FLOW	MAX FACE VELOCITY	APO	EAT		LAT		TOTAL CAPACITY		SENSIBLE CAPACITY		REMARKS
							DB	WB	DB	WB	MBH	[kW]	MBH	[kW]	
2-CW03	001	COTTAGE 2	2-AHU1	1000 (1700)	200	1300	1	0.75	100	80	127	67.3	20	120	4

PUMP SCHEDULE																					
MARK	LOCATION	AREA AND/OR BLDG SERVED	SYSTEM AND/OR SERVICE	TYPE	FLUID	CIRCULATING FLUID						SP GR	MIN % EFF	ELECTRICAL MOTOR				REMARKS			
						FLOW		HEAD		TEMPERATURE				NOMINAL POWER	PHASE	VOLT	WATTS				
						GPM [L/S]	FT [M]	PSID	PSIG	°F [°C]	°F [°C]								HP [kW]		
2-P1A	001	COTTAGE 2	HEATING WATER	BASE	30% PROPYLENE GLYCOL	200	133	60	1060	6.4	1000	120	440	1.028	74	7.5	3	480	1750	VFD	
2-P1B	001	COTTAGE 2	HEATING WATER	BASE	30% PROPYLENE GLYCOL	120	133	60	1060	6.4	1000	120	440	1.028	74	7.5	3	480	1750	VFD	
2-P2A	001	COTTAGE 2	CHILLED WATER	BASE	30% PROPYLENE GLYCOL	120	81	65	11000	4.5	172	44	17	1.028	71	5	4	3	480	1750	CONSTANT
2-P2B	001	COTTAGE 2	CHILLED WATER	BASE	30% PROPYLENE GLYCOL	120	81	65	11000	4.5	172	44	17	1.028	71	5	4	3	480	1750	CONSTANT
			ENERGY RECOVERY LOOP	WATER	30% PROPYLENE GLYCOL	120	81	65	11000	4.5	172	44	17	1.028	71	5	4	3	480	1750	CONSTANT

HOT WATER HEATING COIL SCHEDULE															
MARK	LOCATION	AREA AND/OR BLDG SERVED	SYSTEM AND/OR SERVICE	APPLICATION	AIR FLOW	MAX FACE VELOCITY	APO	TEMPERATURES		TOTAL MIN CAPACITY	HOT WATER		% GLYCOL	REMARKS	
								DB	WB		FLOW	SWT			
2-HW01	001	COTTAGE 2	2-AHU1	PREHEAT	15000 (1700)	200	1300	1	0.2	100	40	120	100	100	30

HOT WATER FINNED TUBE RADIATION SCHEDULE															
MARK	LOCATION	AREA SERVED	TYPE	ENCLOSURE TYPE	MOUNTING	ENCLOSURE LENGTH	CAPACITY	TEMPERATURES		FLOW	MAX WPD	REMARKS			
								DB	WB						
2-F101	001	BEDROOM 109	FIRST FLOOR	INSTITUTIONAL	ONE PIPE AL-WELDED	WALL	10	12	40	140	120	1	0.06	0.05	1

HOT WATER UNIT HEATER SCHEDULE															
MARK	LOCATION	AREA AND/OR BLDG SERVED	TYPE UNIT	AIR FLOW	MIN CAPACITY	TEMPERATURES		FLOW	WPD	CONTROL SEQUENCE	POWER		VOLT	PHASE	REMARKS
						DB	WB				HP	[kW]			
2-HW01	001	STARWELL	COTTAGE 2	FLOOR SLOPED	720 (240)	10100	10000	120	140	100	1	100	100	100	---

CHILLED WATER STORAGE TANK SCHEDULE															
MARK	LOCATION	TYPE	SYSTEM TEMPERATURE RANGE	MIN	MAX	MAX OPERATING PRESSURE	RELIEF VALVE	MIN VOLUME	INLET PIPE SIZES	OUTLET PIPE SIZES	REMARKS				
2-CW01	001	EXTERNAL LINED	40 (4)	80 (27)	30	200	30	300	3 (1100)	3 (75)	CHILLED WATER BUFFER TANK				

STEAM CONDENSATE PUMP SCHEDULE #															
MARK	LOCATION	SYSTEM AND/OR SERVICE	TYPE UNIT	GPM	FLOW	DISCHARGE PRESSURE	MIN INLET PRESS	MIN RECEIVER SIZE	NOMINAL POWER EACH	PHASE	VOLT	REMARKS			
2-CPI	BASEMENT	STEAM	DUPLX	15	1.1	40	280	45	170	34	480	345	---		

BUILDING - STEAM TRAP SCHEDULE															
MARK	LOCATION	SYSTEM AND/OR SERVICE	CAPACITY AT MIN OPER PRESS	LESSHR	IN [mm]	PSI	PSIG	PSI	PSIG	TRAP TYPE	IN [mm]	REMARKS			
2-S11	001	REHAB BLDG	LINE TRAP	200	100	100	100	100	100	IB	0.50	13	WITH BI-METALLIC ELEMENT		

WATER FILTER SCHEDULE (SIDE STREAM)															
MARK	LOCATION	SYSTEM AND/OR SERVICE	TYPE	FILTER SIZE	CAPACITY	MAX WPD	AUTOMATIC VALVE PRESSURE RANGE	REMARKS							
2-WF1	001	HWSR	PLEATED	5 MICRON	10	11	15	NA							

BUILDING - STEAM PRESSURE REDUCING VALVE SCHEDULE															
MARK	LOCATION	SYSTEM AND/OR SERVICE	QUANTITY	REQUIRED CAPACITY	MAX FLOW WIDE OPEN VALVE	PRESSURE RANGE	IN	OUT	REMARKS						
PRV-001	001	STEAM	1	2000	1450	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500

BOILER PLANT - STEAM FLOWMETER SCHEDULE															
MARK	LOCATION	SYSTEM AND/OR SERVICE	LINE PRESSURE	MIN	NORMAL	MAXIMUM	MIN ACCURACY (%)	REMARKS							
2-M01	001	DISTRIBUTION HEADER	100	400	140	2000	1400	3000	1400	1400	1400	1400	1400	1400	1400

AIR SEPARATOR SCHEDULE															
MARK	LOCATION	SYSTEM AND/OR SERVICE	TYPE	SIZE IN	FLOW	WPD	BUILT-IN STRAINER REQD	REMARKS							
2-A01	001	HEATING WATER	FULL FLOW TANGENTIAL	3	1200	200	113	2	15	15	15	15	15	15	15

STEAM PRESSURE RELIEF VALVE SCHEDULE									
MARK	LOCATION	SYSTEM AND/OR SERVICE	TEMPERATURE		MINIMUM CAPACITY	SET PRESSURE		REMARKS	
			°F	°C	LB/HR	[kg/HR]	PSIG		[kPa]
2-PRV-001	001	STEAM	274	[130]	4500	[2000]	15	[100]	—