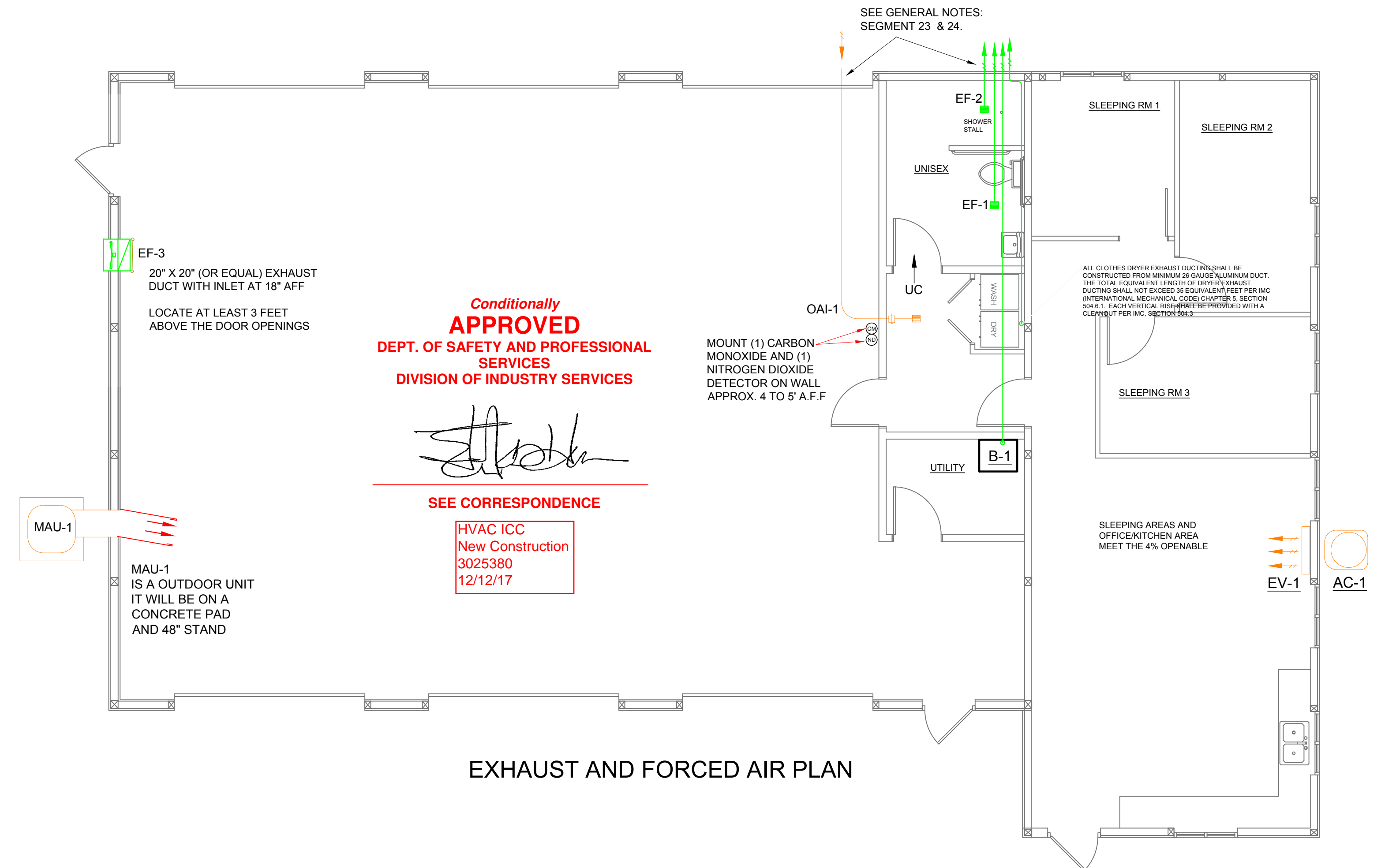


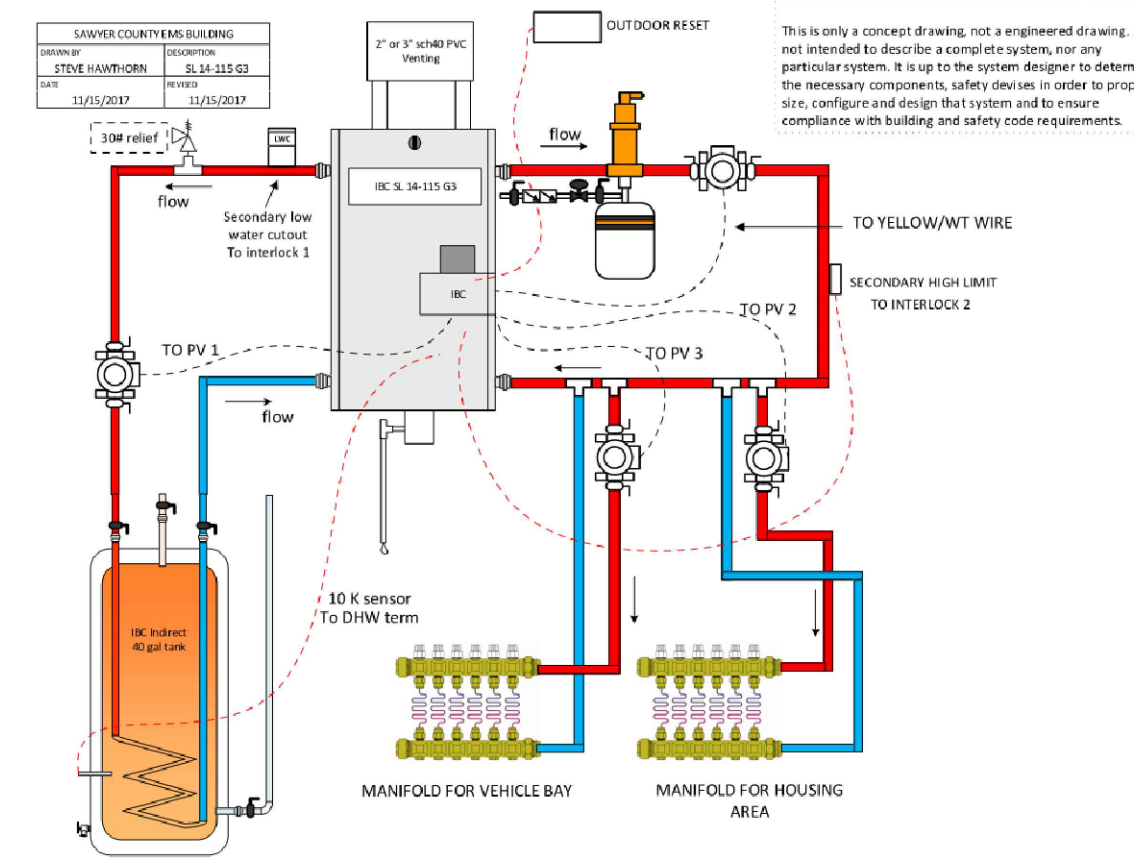
HYDRONIC PLAN



EXHAUST AND FORCED AIR PLAN

**GENERAL CONSTRUCTION NOTES:**

- ALL WORK TO BE DONE IN COMPLIANCE WITH ALL STATE AND LOCAL CODES AND ALL MANUFACTURER'S INSTRUCTIONS.
- SUPPLY FANS TO RUN CONSTANTLY DURING OCCUPIED PERIODS OF BUILDING OPERATION.
- MAINTAIN 10'-0" BETWEEN ALL VENT/EXHAUST AND OUTSIDE AIR INTAKES.
- PROVIDE AND INSTALL TURNING VANES OR LARGE RADIUS TURNS ON ALL DUCT CORNERS.
- PROVIDE AND INSTALL SPLITTER DAMPERS AT ALL SUPPLY DUCT TEES AND TAKE-OFFS.
- ALL SUPPLY DUCT TAKE-OFFS SHALL BE PROVIDED WITH MANUALLY ADJUSTABLE AIR BALANCING DAMPER WITH LOCKING QUADRANTS OR WINGS.
- UNDERCUT DOORS OR PROVIDE DOOR OR TRANSFER GRILLES WHERE NECESSARY TO PROVIDE FOR PROPER TRANSFER OF AIR. DO NOT PENETRATE ANY FIRE BARRIERS.
- ALL DUCT INSTALLATION SHALL CONFORM TO ASHRAE AND SMACNA STANDARDS AS REGARDS BUT NOT LIMITED TO DUCT GAUGES, TURNING RADII AND THE INSTALLATION OF TURNING VANES AND/OR EXTRACTORS, WHETHER OR NOT SHOWN ON PLANS. EXISTING DUCTWORK MAY BE REUSED ONLY IF THE SIZING AND CONDITION PROVIDES FOR THE PERFORMANCE LISTED ON THE DRAWINGS.
- ALL CLOTHES DRYER EXHAUST DUCTING SHALL BE CONSTRUCTED FROM MINIMUM 26 GAUGE ALUMINUM DUCT. THE TOTAL EQUIVALENT LENGTH OF DRYER EXHAUST DUCTING SHALL NOT EXCEED 35 EQUIVALENT FEET PER IMC (INTERNATIONAL MECHANICAL CODE) CHAPTER 5, SECTION 504.6.1. EACH VERTICAL RISE SHALL BE PROVIDED WITH A CLEANOUT PER IMC, SECTION 504.3.
- ALL DUCTWORK AND PIPING SHALL RUN STRAIGHT AND TRUE AND SHALL BE INSTALLED IN A WORKMANLIKE MANNER. ALL REUSED DUCTWORK WILL BE BROUGHT UP TO CURRENT STANDARDS AND SHALL BE CONSIDERED FIT AS NEW OR IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REPLACE ALL DUCTWORK FOUND TO BE UNFIT FOR USE.
- STEEL OR ALUMINUM DUCTWORK THAT REQUIRES INSULATION SHALL CONFORM WITH ALL APPLICABLE CODES. DIMENSIONS LISTED ARE INSIDE AREA SIZES. MINIMUM INSULATION R VALUES SHALL BE DETERMINED BY IECC CODE 503.2.7. ALL SUPPLY AND RETURN DUCTS SHALL BE INSULATED WITH A MINIMUM OF R-5 INSULATION WHEN LOCATED IN UNCONDITIONED SPACES AND WITH A MINIMUM OF R-8 INSULATION WHEN LOCATED OUTSIDE THE BUILDING ENVELOPE.
- DUCTWORK SEAMS AND JOINTS: ALL LONGITUDINAL & TRANSVERSE JOINTS, SEAMS AND CONNECTIONS OF SUPPLY, RETURN AND EXHAUST DUCTS TO BE SECURELY FASTENED AND SEALED. THIS SYSTEM IS A LOW PRESSURE (LESS THAN OR EQUAL TO 2" W.G.) DUCT SYSTEM. TAPES AND MASTICS SHALL BE LISTED AND LABELED IN ACCORDANCE WITH UL 181A. ALL DUCT SEALING WORK SHALL COMPLY WITH IECC 503.2.7.1 & IMC 603.0.
- GRILLES AND REGISTERS ARE GENERAL SIZES AND SHOULD BE VERIFIED FOR FINAL SELECTION AND TYPE.
- GAS PIPING PROVIDED TO MEET ALL STATE AND LOCAL CODES, INCLUDING LOCAL GAS UTILITY COMPANY REQUIREMENTS AND THE NATIONAL FUEL GAS CODE, NFPA NO. 54.
- HVAC CONTRACTOR SHALL FURNISH AND INSTALL ALL CONDENSATE DRAIN LINES AND REFRIGERATION PIPING IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- ALL LOW VOLTAGE CONTROL WIRING SHALL BE FURNISHED AND INSTALLED BY HVAC CONTRACTOR.
- HVAC CONTRACTOR OR BALANCING AGENT SHALL TEST AND BALANCE THE ENTIRE HVAC SYSTEM PER REQUIREMENTS OF SPS 384, SECTION 384.0313(1). THE BALANCE REPORT SHALL BE SUBMITTED TO THE ENGINEER OR HVAC DESIGNER ALONG WITH ONE COPY RETAINED ON SITE WITH APPROVED HVAC PLANS. NOTE THAT FINAL INSPECTIONS SHALL NOT BE PERFORMED AND COMPLIANCE STATEMENTS (REQUIRED FOR OCCUPANCY) SHALL NOT BE PROVIDED WITHOUT A VALID AIR BALANCE REPORT ON FILE WITH THE ENGINEER OR HVAC DESIGNER.
- HVAC CONTRACTOR SHALL PROVIDE ONE SET OF OPERATION & MAINTENANCE MANUALS TO THE OWNER AS REQUIRED BY CODE SPS 384, SECTION 384.0313(3). THIS MANUAL SHALL INCLUDE ALL EQUIPMENT O & M MANUALS, ALL THERMOSTAT PROGRAMMING MANUALS AND INSTRUCTIONS AND ANY AND ALL RELEVANT WIRING DIAGRAMS OR CONTROL SCHEMATICS AND ALL EQUIPMENT WARRANTY INFORMATION.
- PER IMC SECTION 306: ACCESS AND SERVICE SPACE REQUIREMENTS: CLEARANCES AROUND APPLIANCES TO ELEMENTS OF PERMANENT CONSTRUCTION, INCLUDING OTHER INSTALLED EQUIPMENT AND APPLIANCES, SHALL BE SUFFICIENT TO ALLOW INSPECTION, SERVICE, REPAIR OR REPLACEMENT WITHOUT REMOVING SUCH ELEMENTS OF PERMANENT CONSTRUCTION OR DISABLING THE FUNCTION OF A REQUIRED FIRE-RESISTANCE-RATED ASSEMBLY. A LEVEL WORKING SPACE AT LEAST 30 INCHES DEEP AND 30 INCHES WIDE SHALL BE PROVIDED IN FRONT OF THE CONTROL SIDE TO SERVICE THE APPLIANCE.
- EXHAUST OUTLETS FOR "ENVIRONMENTAL AIR" EXHAUST OPENINGS SHALL BE LOCATED ≥ 3 FEET FROM PROPERTY LINES AND > 3 FEET FROM OPENINGS INTO THE BUILDING. "ENVIRONMENTAL AIR" IS AIR THAT IS CONVEYED TO OR FROM OCCUPIED AREAS THROUGH DUCTS WHICH ARE NOT PART OF THE HEATING OR AIR-CONDITIONING SYSTEM, SUCH AS VENTILATION FOR HUMAN USAGE, DOMESTIC KITCHEN RANGE EXHAUST, BATHROOM EXHAUST AND DOMESTIC CLOTHES DRYER EXHAUST. THE EXHAUST FROM A BATHROOM OR KITCHEN IN A RESIDENTIAL DWELLING SHALL NOT BE CONSIDERED TO BE HAZARDOUS OR NOXIOUS CONTAMINANT. OTHER TYPES OF EXHAUST OPENINGS SHALL BE LOCATED 10 FEET FROM PROPERTY LINES AND 10 FEET FROM OPERABLE OPENINGS INTO BUILDINGS. SEE IMC 501.2.1.
- OUTDOOR AIR INTAKES MUST BE LOCATED MINIMUM 10 FEET HORIZONTALLY FROM ANY HAZARDOUS OR NOXIOUS CONTAMINANT SOURCE, SUCH AS VENTS, CHIMNEYS, PLUMBING VENTS, STREETS, ALLEY, PARKING LOTS AND LOADING DOCKS. WHERE A CONTAMINANT SOURCE IS WITHIN 10 FEET HORIZONTALLY OUTSIDE AIR OPENING SHALL BE LOCATED A MINIMUM OF 3 FEET BELOW THE CONTAMINANT SOURCE.
- IMC 601.1: PROVIDE SHEET METAL DUCTS, DUCT LINER AND FITTINGS WHICH ARE CONSTRUCTED IN COMPLIANCE WITH THE STANDARDS APPROVED BY ASHRAE, SMACNA, & ACCA. THE USE OF FIBERGLASS CONSTRUCTED DUCT, (DUCTBOARD) WILL NOT BE PERMITTED ON THIS PROJECT.
- HVAC CONTRACTOR SHALL FIELD VERIFY ALL DUCT DIMENSIONS PRIOR TO FABRICATION.
- THE DESIGNER AND LARSON COMPANY WILL NOT BE RESPONSIBLE FOR THE ABILITY TO INSTALL PREFABRICATED DUCT WITHOUT FIELD MEASUREMENTS.
- HVAC CONTRACTOR SHALL BE RESPONSIBLE FOR DUCTWORK ROUTING, INSTALLATION AND RESOLVING INTERFERENCE WITH OTHER TRADES.
- PROVIDE HVAC SYSTEMS WITH AUTOMATIC SETBACK OR SHUTDOWN CONTROLS.
- ALL THERMOSTATS SHALL BE LOCATED AT A MAXIMUM OF 48 INCHES AND A MINIMUM OF 15 INCHES ABOVE FINISHED FLOOR.
- ALL EXHAUST FANS SHALL BE WIRED PER REQUIREMENTS NOTED IN THE SCHEDULE. ALL WIRING PROVIDED BY ELECTRICAL CONTRACTOR.
- PER IFGC 306.6/IMC 304.1/IBC 1607.7 WHERE MECHANICAL EQUIPMENT IS LOCATED WITHIN 10 FEET OF A ROOF EDGE, AND SUCH EDGE OR OPEN SIDE IS MORE THAN 30" ABOVE THE FLOOR, ROOF OR GRADE BELOW, EQUIPMENT MUST BE GUARDED. THE GUARD SHALL EXTEND NOT LESS THAN 30" BEYOND EACH END OF THE EQUIPMENT AND THE TOP OF THE GUARD SHALL BE LOCATED NOT LESS THAN 42 INCHES ABOVE THE ELEVATED SURFACE ADJACENT TO THE GUARD. THE GUARD SHALL PREVENT THE PASSAGE OF A 2" DIAMETER SPHERE.
- PER IFGC 306.5/IMC 306.5 PROVIDE A PERMANENT MEANS OF EGRESS FOR APPLIANCES INSTALLED ON ROOFS OR ELEVATED STRUCTURES WITH A HEIGHT EXCEEDING 16 FEET. ACCESS SHALL NOT REQUIRE CLIMBING OVER OBSTRUCTIONS GREATER THAN 30 INCHES, OR WALKING ON ROOFS HAVING A SLOPE GREATER THAN 4/12. EXCEPTION: THESE PROVISIONS DO NOT APPLY WHEN THE INSTALLATION CONSISTS OF FANS ONLY - PER WISCONSIN COMM 64.0306.
- THESE DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO SHOW THE INTENT OF THE PLANS AND SPECIFICATIONS. SOME FIELD CHANGES THAT DO NOT AFFECT THE PERFORMANCE OR INTENT OF THE DESIGN ARE ACCEPTABLE AND SHOULD BE EXPECTED. DO NOT SCALE DRAWINGS. THE CONTRACTOR SHALL FIELD VERIFY ALL MEASUREMENTS AND ACCEPT RESPONSIBILITY FOR THEIR ACCURACY.
- OWNERSHIP OF INSTRUMENTS OF SERVICE: THESE PLANS AND ALL RELATED WORK PERFORMED AND PROVIDED, INCLUDING BUT NOT LIMITED TO LOAD CALCULATIONS ARE INTENDED FOR USE ONLY BY THE SPECIFIC HVAC CONTRACTOR NAMED IN THE TITLE BLOCK CONTAINED IN AND SHOWN ON THIS PLAN. TRANSFER OF THIS PLAN ALONG WITH ANY AND ALL RELATED WORK SHALL NOT BE PERMITTED WITHOUT SPECIFIC WRITTEN AUTHORIZATION FROM THE LARSON COMPANY. IF SAID WRITTEN AUTHORIZATION IS NOT OBTAINED, THE LARSON COMPANY SHALL NOT BE RESPONSIBLE FOR THE DESIGN OR PERFORMANCE OF THE HVAC SYSTEM ON THIS PARTICULAR PROJECT.
- THE DESIGN AND INSTALLATION OF THE HVAC SYSTEM FOR THIS PARTICULAR PROJECT SHALL BE STRICTLY ADHERED TO WITH REGARDS TO THE TYPE OF HVAC EQUIPMENT AND THE MANUFACTURER OF SAID EQUIPMENT AS LISTED IN THE EQUIPMENT SCHEDULES. IF ANY CHANGES ARE REQUESTED, PRIOR WRITTEN APPROVAL OF EQUIPMENT AND SHOP DRAWING APPROVAL MUST BE OBTAINED. IF THE TYPE AND MANUFACTURER OF THE HVAC EQUIPMENT UTILIZED ON THIS PROJECT IS NOT PROVIDED AS SCHEDULED, THE LARSON COMPANY SHALL NOT BE RESPONSIBLE FOR THE DESIGN OR PERFORMANCE OF THE HVAC SYSTEM.



Manifolds							
Name	Manifold Type	# Circuits	Tubing Size	Supply Temp (°F)	Total Flow (USGPM)	Head Loss (ft water)	Total Load (Btu/hr)
Manifold 1	Stainless Steel 76100 Series	4	1/2	114	3.15	8.6	31,369
Manifold 2	Stainless Steel 76100 Series	5	5/8	114	6.14	13.6	61,155

Circuit Information						
Number	Length (ft)	Tube Size	Manifold	Flow (USGPM)	Head Loss (ft water)	TOTAL LOAD (Btu/hr)
A-1	297	1/2	Manifold 1	0.81	7.4	8,031
A-2	288	1/2	Manifold 1	0.78	6.8	7,795
A-3	290	1/2	Manifold 1	0.78	6.9	7,800
A-4	285	1/2	Manifold 1	0.78	6.7	7,743
A-5	450	5/8	Manifold 2	1.16	8.8	11,588
A-6	472	5/8	Manifold 2	1.23	10.2	12,227
A-7	477	5/8	Manifold 2	1.25	10.6	12,456
A-8	481	5/8	Manifold 2	1.25	10.8	12,497
A-9	481	5/8	Manifold 2	1.24	10.6	12,388

MINI-SPLIT AIR-CONDITIONING SCHEDULE									
MARK	MODEL	MANUFACTURER	HEAT TYPE	HEATING BTU OUT	SCFM	COOLING BTU TOTAL	SEER	NOTE:	
MS-1	GXH18LSK4DH	GIBSON	HEAT PUMP	19,000	600	18,000	16	1.2,3	

- WALL MOUNTED.
- PROVIDE WITH LOW-AMBIENT COOLING TO 0 DEGREES.
- FURNISH WITH PRE-CHARGED LINESET.

BOILER SCHEDULE											
MARK	MODEL	MANUFACTURE	GAS TYPE	BTU INPUT	NET IRR	PSIG	MAX LWT	GPM	AFUE	NOTE	DETAIL
B-1	IBC SL 14-115	IBC	LP	115,000	109,250	12W	180"	10	95%	1	

1. Vent boiler to outside using 3" solid core PVC

MAKE-UP AIR SCHEDULE									
MARK	MODEL NUMBER	MANUFACTURER	HEAT TYPE	HEATING	AMPS	CFM	TEMP RISE	UNIT VOLTAGE	NOTE:
MAU-1	TA-109 LP VHR	TITAN AIR	GAS	6600	12.5	1500	90	120 - 1 - 60	1,2,3

- PROVIDE WITH ONE TOUCH ROOM CONTROLLER
- INCLUDES FAN SPEED CONTROL
- INCLUDES BUILT-IN ELECTRONIC TEMPERATURE CONTROLLER AND SENSOR

EXHAUST FAN SCHEDULE							
MARK	EXHAUST FAN MODEL	MANUFACTURER	EXHAUST CFM	MOTOR SIZE	ESP	MOTOR VOLTAGE	NOTE:
EF-1	FV-05-11VKL1	PANASONIC	80	0.3 AMPS	0.25	115 - 1 - 60	1,2
EF-2	FV-05-11VKL1	PANASONIC	80	0.3 AMPS	0.25	115 - 1 - 60	1,2 & 4
EF-3	DFE-16	S&P	1500	1/2 HP	0.50	115 - 1 - 60	1,2,3

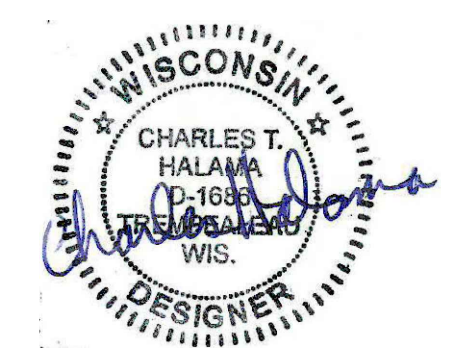
- PROVIDE WALL OR ROOF VENT WITH BACKDRAFT DAMPER.
- MUST BE INTERLOCKED TO OPERATE DURING OCCUPIED HOURS AND HAVE A MOTION SENSOR.
- SHOWER AREA TO HAVE A HUMIDISTAT
- EF-3 IS TIED TO THE MAU-1

OAI-1 HONEYWELL MODEL ARD8TZ / U. 8" ROUND DAMPER WHICH IS A 24 VOLT NORMALLY OPEN UNIT. THIS UNIT IS INTERLOCKED WITH EF-1, EF-2 & DRYER (EXHAUST FAN & DRYER) UNIT SHALL BE OPEN ANYTIME ONE OF THE UNITS ARE OPERATING.

NOTE: BALANCE REPORT SHALL BE SUPPLIED TO THE BUILDING OWNER AND A COPY SHALL BE SUPPLIED TO THE DESIGN ENGINEER OF RECORD. IN ADDITION, THE CONTRACTOR SHALL RETAIN A COPY FOR THESE RECORDS.

**HVAC FIRST FLOOR PLAN**

SCALE: 3/16" = 1' - 0"



Sheet: 1 of 1  
Date: 12-12-17  
Scale: NOTED  
Sheet: HV-1

Sawyer City Ambulance garage  
 4395 N Hwy 27  
 Ojibwa, WI 52862  
 REVISION: 00/00/2017  
 TRANSACTION ID: