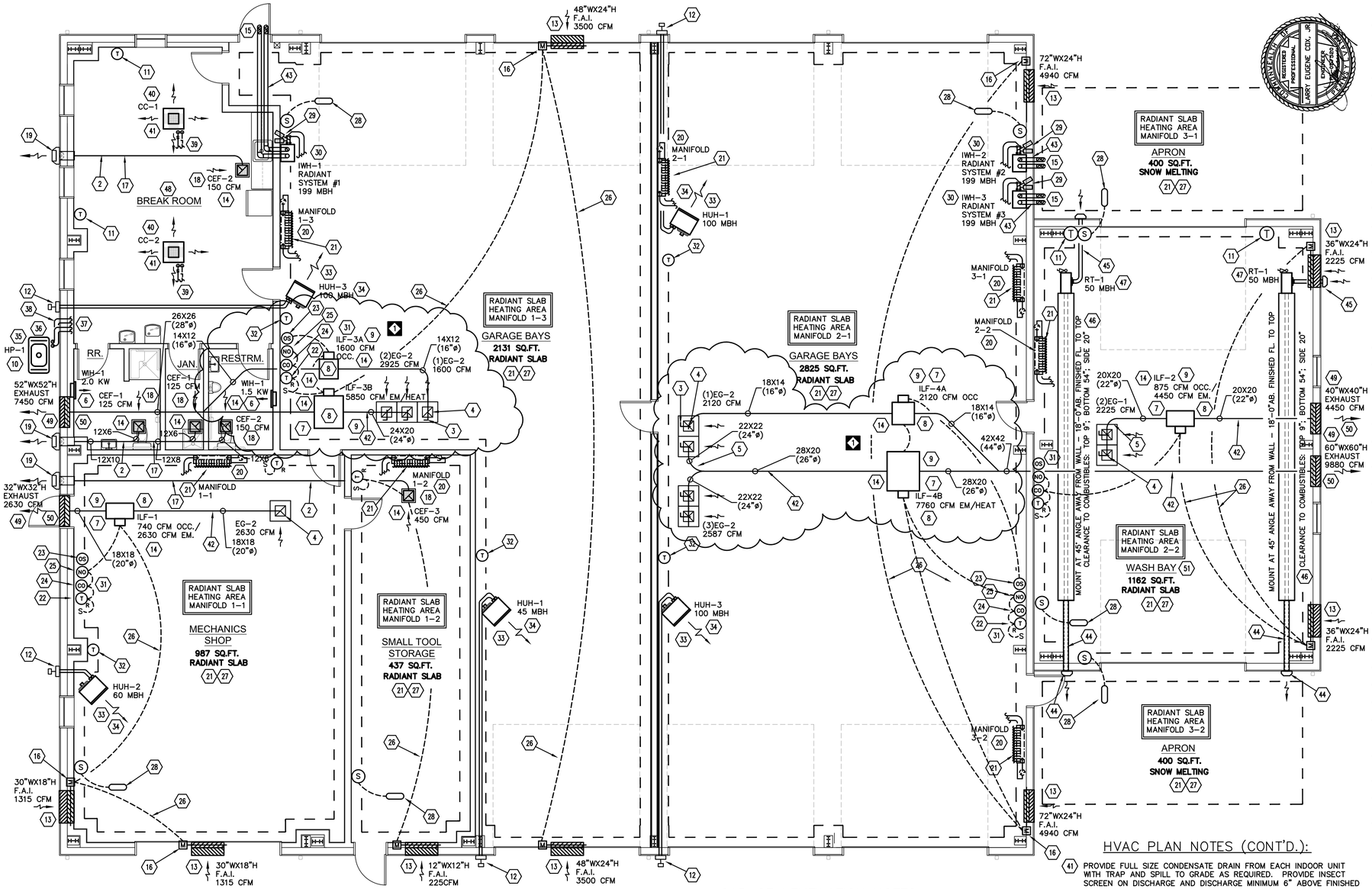

PROPOSED BUILDING – HVAC (1)

SCALE 3/16"=1'-0"

HVAC PLAN NOTES:

1. THIS CONTRACTOR SHALL COORDINATE THE LOCATION OF ALL EQUIPMENT AND RECOMMENDED CLEARANCES FOR INSTALLATION PRIOR TO BIDDING AND CONSTRUCTION.
2. DUCTWORK RUN ABOVE CEILING SPACE.
3. MANUAL DAMPER, LOCKING BLADE TYPE (TYPICAL).
4. TRANSITION DUCT TO AIR DEVICE AS REQUIRED. (TYPICAL).
5. PROVIDE RADIUS ELBOWS AT ALL TURNS. (TYPICAL).
6. MOUNT WALL INSERT HEATER 12" ABOVE FINISHED FLOOR.
7. EXHAUST FAN ON VIBRATION ISOLATORS AS REQURIED.
8. DUCT TRANSITION TO EQUIPMENT AS REQUIRED. (TYPICAL).
9. PROVIDE FLEXIBLE EXHAUST AND INTAKE CONNECTIONS AT UNIT.
10. PROVIDE VIBRATION ISOLATION FOR HEAT PUMP UNITS.
11. THERMOSTAT MOUNTED AT 42" ABOVE FINISHED FLOOR. VERIFY LOCATION WITH OWNER.
12. CONCENTRIC FLUE/INTAKE ADAPTER TO BE PAINTED AS DIRECTED BY ARCHITECT.
13. ALL WEATHER LOUVER FOR FRESH AIR INTAKE. PROVIDE WITH MOTORIZED DAMPER, SHALL BE INTERLOCKED WITH RESPECTIVE EXHAUST FAN FOR OCCUPIED VENTILATION, SUMMER VENTILATION AND EMERGENCY REMOVAL OF CARBON MONOXIDE AND NOX FROM VEHICLE EMISSIONS. PROVIDE 4" DRAINABLE, EXTRUDED ALUMINUM LOUVER. GREENHECK MODEL ESD-435. LOUVER COLOR SHALL BE BY ARCHITECT/OWNER. VERIFY MOUNTING HEIGHT WITH ARCHITECT.
14. SECURE EXHAUST FAN TO STRUCTURE AS REQUIRED.
15. PVC FLUE & INTAKE FOR WALL MOUNTED BOILER. SIZE ACCORDING TO MANUFACTURERS RECOMMENDATIONS. RUN AS HIGH AS POSSIBLE AND TERMINATE WITH CONCENTRIC WALL ADAPTER. INSURE FLUE DISCHARGE MEETS MINIMUM CLEARANCE REQUIREMENTS FROM ANY FRESH AIR INTAKE AS REQUIRED BY THE INTERNATIONAL MECHANICAL CODE.
16. MOTORIZED DAMPERS FOR FRESH AIR CONTROLS. (TYPICAL).
17. RUN EXHAUST DUCT ABOVE CEILING TO WALL CAP WITH INSECT SCREEN AND BACK DRAFT DAMPER.
18. CEILING MOUNTED EXHAUST FAN. SEE SCHEDULE DWG. H2.
19. WALL CAP. (TYPICAL).
20. RADIANT SLAB HEATING MANIFOLD CABINET FLOOR/WALL MOUNTED AS DIRECTED BY OWNER. NUMBER OF CIRCUITS, SQ. FT. PER CIRCUIT, BTUH PER CIRCUIT, PEX TUBING SIZE AND SPACING, TOTAL LENGTH PER CIRCUIT, GPM FLOW RATE, AND HEAD LOSS TO BE PROVIDED BY SYSTEM MANUFACTURER. DO NOT EXCEED MANUFACTURERS BEND RADIUS. USE OXYGEN BARRIER PEX TUBING IN SLAB FOR RADIANT FLOOR HEATING CLOSED LOOP SYSTEM. SEE TYPICAL DETAIL AND SPECIFICATIONS DRAWING H-2.
21. RADIANT TUBE RUN IN FLOOR SLAB. SPACING SHALL BE AS SPECIFIED BY SYSTEM MANUFACTURER. DO NOT EXCEED MANUFACTURERS MAXIMUM BEND RADIUS.
22. REVERSE ACTING THERMOSTAT SET AT 85° F. TO ENERGIZE EXHAUST FAN. (TYPICAL).
23. OCCUPANCY SENSOR BY E.C. TYPE, NUMBER AND LOCATION(S) BY E.C. (TYPICAL).
24. CO SENSOR BY E.C. (TYPICAL).
25. NOX SENSOR BY E.C. (TYPICAL).
26. CONTROL WIRING (TYPICAL)
27. SLAB RADIANT TUBE SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS. ACTUAL LAYOUT SHALL BE BASED ON SPECIFICATIONS. (SEE SPECIFICATIONS DRAWING H-3).
28. THERMOSTAT OR SLAB SENSOR AS RECOMMENDED BY MANUFACTURER FOR CONTROLLING CIRCULATING PUMP(S).
29. PROVIDE THERMOMETERS ON INLET AND OUTLET OF HEATING LOOP.
30. RADIANT SLAB SYSTEM BOILER. VERIFY SIZE WITH SYSTEM MANUFACTURER. SEE TYPICAL DETAIL DRAWING H-2.
31. EXHAUST FAN CONTROLS BY E.C., PROVIDE OCCUPANCY SENSOR, CO SENSOR, NOX SENSOR, REVERSE ACTING THERMOSTAT SET AT 85° F. AND DEDICATED SWITCH FOR MANUAL OPERATION. MOUNT DEDICATED SWITCH AT 42" ABOVE FINISHED FLOOR AND MOUNT SENSORS AS RECOMMENDED BY MANUFACTURER. TWO PLACES IF REQUIRED.
32. REMOTE WALL MOUNTED THERMOSTAT. MOUNT AT 42" ABOVE FINISHED FLOOR. LOCATE THERMOSTATS ACCORDING TO MANUFACTURERS RECOMMENDATIONS. TYPICAL ALL HUH-X UNITS. PROVIDE WITH TAMPER PROOF LOCK BOX. COORDINATE LOCATION WITH ARCHITECTURAL, STRUCTURAL AND OWNERS REPRESENTATIVE PRIOR TO INSTALLATION.
33. HUH-X – SEE SCHEDULE DRAWING H-2. PROVIDE WITH THROUGH THE WALL CONCENTRIC VENT KIT. SEE TYPICAL DETAILS DRAWING H-2. COORDINATE LOCATIONS WITH STRUCTURAL DRAWINGS AND ACTUAL FIELD CONDITIONS AND INSTALL WITH MAXIMUM HEAD ROOM AND CLEARANCE WHILE IMPACTING AIR FLOW MINIMALLY.
34. MOUNT HORIZONTAL UNIT HEATER AS HIGH AS POSSIBLE. MAINTAIN ALL CLEARANCES REQUIRED BY UNIT MANUFACTURER FOR CLEARANCE TO COMBUSTIBLES AND MAINTENANCE CLEARANCES ALLOWING FOR PROPER AIR FLOW. IN MAINTENANCE AREA MUST BE MINIMUM 18" FROM CEILING TO MEET ARTICLE 511 OF THE NEC.
35. OUTDOOR HEAT PUMP UNIT SEE SCHEDULE DRAWING H-2.
36. MOUNT MINI SPLIT HEAT PUMP OUTDOOR UNIT ON WALL BRACKET. SECURE TO COLUMN AS REQUIRED AND SEAL PENETRATION WEATHER TIGHT AS REQUIRED. MINIMUM 9' ABOVE FINISHED GRADE. MOUNT ON VIBRATION ISOLATION AND SECURE AS REQUIRED.
37. REFRIGERANT LINE SET FROM OUTDOOR HEAT PUMP THROUGH EXTERIOR TO ABOVE CEILING AND RUN TO RESPECTIVE INDOOR CEILING CASSETTE AS REQUIRED. WEATHER SEAL WALL PENETRATION AS REQUIRED. INSULATE REFRIGERANT PIPING WITH MINIMUM 1" AP ARMAFLEX PIPING INSULATION.
38. VERIFY REFRIGERANT LINE SIZES FOR LENGTH OF RUN WITH EQUIPMENT MANUFACTURER PRIOR TO ORDERING.
39. REFRIGERANT LINE SETS RUN TO RESPECTIVE OUTDOOR HEAT PUMP UNIT AS REQUIRED. INSULATE REFRIGERANT PIPING WITH MINIMUM 1" AP ARMAFLEX PIPING INSULATION.
40. CC-X – INDOOR MINI SPLIT CEILING CASSETTE. SEE SCHEDULE DRAWING H-2.

HVAC PLAN NOTES (CONT'D.):

41. PROVIDE FULL SIZE CONDENSATE DRAIN FROM EACH INDOOR UNIT WITH TRAP AND SPILL TO GRADE AS REQUIRED. PROVIDE INSECT SCREEN ON DISCHARGE AND DISCHARGE MINIMUM 6" ABOVE FINISHED GRADE.
42. EXPOSED EXHAUST DUCTWORK RUN AS HIGH AS POSSIBLE.
43. PVC FLUE AND COMBUSTION AIR INTAKE PIPING RUN AS HIGH AS POSSIBLE. SIZE PIPING AS RECOMMENDED BY UNIT MANUFACTURER.
44. 4"ø SINGLE WALL VENT PIPE. PENETRATE WALL WITH 2" CLEARANCE THIMBLE AND TERMINATE MINIMUM 3' ABOVE ROOF. PROVIDE VENT CAP AS REQUIRED. MAXIMUM EQUIVALENT VENT LENGTH PER MANUFACTURER IS 20 LINEAL FEET.
45. OUTSIDE AIR KIT INSTALLATION 4"ø RIGID PIPE AND ACCESSORIES. MAXIMUM LENGTH PER MANUFACTURER IS 40 LINEAL FEET.
46. VERIFY CLEARANCE(S) TO COMBUSTIBLES WITH ALL SURROUNDING EQUIPMENT AND STRUCTURE PRIOR TO INSTALLATION. COORDINATE INSTALLATION WITH ALL OTHER TRADES. (I.E. ELECTRICAL, STRUCTURAL, PLUMBING, ETC.)
47. INFRA-RED TUBE HEATERS SHALL BE MOUNTED AT APPROXIMATELY 18'-0" ABOVE FINISHED FLOOR. SHIELDS SHALL BE ADJUSTED AS REQUIRED TO AVOID COMBUSTIBLES. (SEE SCHEDULE DRAWING H-2).
48. THIS SPACE MEETS OR EXCEEDS THE REQUIREMENTS FOR NATURAL IN ACCORDANCE WITH THE 2018 INTERNATION MECHANICAL CODE, SECTION 402.1. SEE CALCULATION THIS SHEET.
49. ALL WEATHER LOUVER FOR EXHAUST AIR FOR OCCUPIED VENTILATION AND EMERGENCY/HEAT VENTILATION. PROVIDE 6" DRAINABLE, EXTRUDED ALUMINUM LOUVER. GREENHECK MODEL ESD-635. LOUVER COLOR SHALL BE BY ARCHITECT/OWNER. VERIFY MOUNTING HEIGHT WITH ARCHITECT. MOUNT AS HIGH AS POSSIBLE.
50. DUCT TRANSITION TO LOUVER AS REQUIRED. (TYPICAL).
51. ALL EQUIPMENT IN THIS SPACE SHALL BE APPROVED FOR WET ENVIRONMENTS.

GARAGE VENTILATION NOTES

BASED UPON THE IMC 2018, THE GARAGE BAYS REQUIRE A CONSTANT MINIMUM VENTILATION RATE OF 0.75 CFM WHILE OCCUPIED. A TWO-STAGE EXHAUST FAN INTERLOCKED WITH MOTORIZED DAMPERS ON THE FRESH AIR INTAKE LOUVER(S) SHALL BE IN OPERATION ON FIRST STAGE AT ALL TIMES WHEN OCCUPIED TO FULFILL THIS REQUIREMENT. FANS AND INTERLOCKED LOUVER SHALL BE CONTROLLED BY OCCUPANCY SENSORS BY E.C.

A VENTILATION SYSTEM FOR THE EMERGENCY REMOVAL OF CARBON MONOXIDE AND NOX ALONG WITH SUMMER VENTILATION FOR HEAT REMOVAL IS BEING PROVIDED AT A RATE OF 10 AIR CHANGES PER HOUR UTILIZING THE SAME FAN(S) AND LOUVERS CONTROLLED BY A CARBON MONOXIDE SENSORS, NOX SENSORS, REVERSE ACTING STATS (FOR HEAT REMOVAL) AND A MANUAL OVERRIDE SWITCH TO ALLOW FOR MANUAL OPERATION. THE FAN SHALL BE INITIATED AND INCREASD TO SECOND STAGE BY THESE CONTROLS AND SHALL BE INTERLOCKED WITH THE MOTORIZED DAMPER ON THE FRESH AIR INTAKE LOUVER. THE CONTROLS AND WIRING FOR THIS VENTILATION SYSTEM SHALL BE BY THE ELECTRICAL CONTRACTOR. COORDINATE INSTALLATION WITH E.C.

THIS ENGINEER RECOMMENDS INSTALLING A 100% MAKE-UP AIR UNIT TO PROVIDE TEMPERED AIR TO THE SPACES, BUT DUE TO BUDGET CONSTRAINITS, THE OWNER HAS OPTED NOT TO INSTALL A TEMPERED MAKE UP AIR UNIT. HORIZONTAL UNIT HEATERS ARE PROVIDED TO HELP TEMPER THE OUTSIDE AIR.

BREAKROOM VENTILATION NOTE

BASED UPON THE IMC 2018, THE BREAK ROOM AREA OF THIS PROJECT EXCEEDS THE REQUIREMENTS FOR NATURAL VENTILATION IN ACCORDANCE WITH SECTION SECTION 402 OF THE IMC 2018.

SPACE EXCEEDS THE REQUIREMENT FOR NATURAL VENTILATION AS INDICATED IN SECTION 402 NATURAL VENTILATION, PARAGRAPH 402.1 NATURAL VENTILATION AND PARAGRAPH 402.2 VENTILATION AREA REQUIRED. "THE MINIMUM OPENABLE AREA TO THE OUTDOORS SHALL BE 4 PERCENT OF THE FLOOR AREA BEING VENTILATED."

THE FOLLOWING CALCULATIONS CONFIRM THAT THIS AREA MEETS THIS REQUIREMENT:

BREAK ROOM, 609 S.F. X 0.04 = 24.36 S.F. FREE AREA REQUIRED.

MAN DOOR = 20 S.F. FREE AREA X 1 DOOR = 20 S.F. FREE AREA
WINDOW = 5.66 S.F. FREE AREA X 3 WINDOWS = 17 S.F. FREE AREA
TOTAL S.F. FREE AREA = 37 S.F FREE AREA

THE REQUIRED FREE AREA OPENING TO THE OUTSIDE PER IMC 2018 SECTION 402.1 = 24.36 THE TOTAL S.F. FREE AREA FOR THE DOOR AND WINDOWS = 37 S.F. FREE AREA AND THEREFORE EXCEEDS THIS REQUIREMENT.

NOTE:
THIS CONTRACTOR SHALL COORDINATE EQUIPMENT LOCATIONS & DUCT PACKAGE WITH ARCHITECTURAL, STRUCTURAL, PLUMBING & ELECTRICAL DRAWINGS PRIOR TO ORDERING EQUIPMENT AND DUCTWORK.

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UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE.

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NO.	REVISION NOTES	DATE
1	ADDENDUM – ADD (2) EX. FANS	09/06/23

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NOT FOR CONSTRUCTION – ISSUED FOR BID AND PERMIT 08-21-23

EQUIPMENT BUILDING
CONSTRUCTION DRAWING
FOR
PROPOSED FIRST FLOOR PLAN
SOUTHAMPTON TWP. CUMBERLAND COUNTY, PA

Drawn By: LEC
Designed By: LEC
Checked By: LEC
File: 2022-SH-009
Date: 08/18/2023
Scale: 3/16"=1'-0"
Drawing No.
H-1