



VEHICLE EXHAUST FAN CALCULATIONS:

THIS SERVICE BAY AREA IS BEING CONSIDERED AS A "VEHICLE REPAIR GARAGE" AND IS 1234 SF.

PER TABLE 403.3.1.1 OF THE AUTHORITY HAVING JURISDICTION MECHANICAL CODE, A VEHICLE REPAIR GARAGE REQUIRES 0.15 CFM/SF OF EXHAUST.

THEREFORE: (1234 SF) x (0.15 CFM/SF) = 924.3 CFM EXHAUST REQUIRED.

1025 CFM EXHAUST IS BEING PROVIDED BY THE NEW VENTILATION FAN (VF-1).

THIS FAN SHALL BE CONFIGURED TO BE OPERATIONAL 100% OF THE TIME THE BUILDING IS OCCUPIED AS NOTED BY OWNER BUSINESS HOURS.

THE MAKE-UP AIR FOR THIS FAN IS VIA THE OUTDOOR AIR LOUVER (OAL-1) AS SCHEDULED AND SHOWN ON THE FLOOR PLAN.

THE OWNER PREFERS THE MAKE-UP AIR TO BE VIA THE SERVICE BAY DOORS THAT SHALL BE OPEN AT ALL TIMES DURING BUSINESS HOURS, WITH A SIGN PLACED AT ONE DOOR STATING, "DOOR TO REMAIN OPEN AT ALL TIMES DURING BUSINESS HOURS". IF THE AUTHORITY HAVING JURISDICTION ALLOWS THIS METHOD OF PROVIDING THE MAKE-UP AIR, THE OUTDOOR AIR LOUVER MAY BE OMITTED. M.C. MUST GET APPROVAL OF AUTHORITY HAVING JURISDICTION PRIOR TO PROCEEDING WITH THIS METHOD.

SEQUENCE OF OPERATION

MINI-SPLIT SYSTEM (DS-1/DCU-1):
THE UNIT SHALL CYCLE ON AND OFF AS REQUIRED TO MAINTAIN SPACE TEMPERATURE
AS SET BY WALL MOUNTED AUTO-CHANGEOVER THERMOSTAT.
DEFAULT SET POINTS SHALL BE:
T2 DEG F (COOLING)
60 DEG F (HEATING)

EXHAUST FANS: (EF-1 & EF-2)
FANS SHALL TURN ON/OFF VIA OCCUPANCY SENSOR. THIS SENSOR MAY BE TIED TO LIGHT OCCUPANCY SENSOR.

VENTILATION FAN (SERVICE BAY): (VF-1 & VF-2)
FANS SHALL OPERATE CONTINUOUSLY DURING OCCUPIED HOURS AND SHALL BE TURNED ON AND OFF VIA A TIMECLOCK. THE FAN SHOULD BE COORDINATED WITH THE SPECIFIC STORE HOURS TO TURN ON AT THE START OF BUSINESS AND TURN OFF 15 MINUTES AFTER CLOSING TIME. COORDINATE SETPOINTS WITH OWNER.

VENTILATION FAN (OIL CHANGE PITS): (VF-2)
THIS FAN SHALL OPERATE 24/7 /365 AS IT IS INSTALLED AS A SAFETY MEASURE AS RELATED TO THE ELECTRICAL CODE REQUIREMENTS OF THE PIT LIGHTING AND

- MECHANICAL SPECIFICATION:
- ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE LOCAL STATE BUILDING CODE MECHANICAL, ENERGY, AND LOCAL CODES.
 - THE WORD "PROVIDE" AS USED ON THESE DRAWINGS AND IN THESE SPECIFICATIONS SHALL MEAN TO FURNISH AND INSTALL.
 - THE MECHANICAL CONTRACTOR SHALL COORDINATE HIS WORK WITH THAT OF THE OTHER TRADES PRIOR TO THE INSTALLATION OF ANY OF HIS EQUIPMENT, PIPING OR CONTROL WIRING.
 - MEASUREMENTS: BEFORE ORDERING ANY MATERIAL OR DOING ANY WORK, THE MECHANICAL CONTRACTOR SHALL VERIFY ALL MEASUREMENTS AND SHALL BE RESPONSIBLE FOR THE CORRECTNESS OF THE SAME.
 - STANDARDS OF MATERIALS: ALL MATERIALS USED SHALL BE NEW UNLESS OTHERWISE SHOWN OR CALLED FOR, AND SHALL BE FURNISHED IN ACCORDANCE WITH STANDARD SPECIFICATION OF THE AMERICAN SOCIETY FOR TESTING MATERIALS, THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS, ASHRAE, AND OTHER GUIDE SPECIFICATIONS.
 - DIAGRAMS AND COORDINATION: THE DRAWINGS ARE DIAGRAMMATIC AND SHALL BE FOLLOWED AS CLOSELY AS POSSIBLE. THE DRAWINGS INDICATE OFFSETS REQUIRED, BUT BY NO MEANS INDICATE ALL SUCH SITUATIONS.
 - INSULATION: ALL SUPPLY DUCTWORK SHALL BE INSULATED WITH 2" DUCT WRAP.
 - MAINTAIN ALL FIRE RAILINGS WHERE APPLICABLE. SUBMIT UL ASSEMBLY TO LOCAL FIRE MARSHAL FOR APPROVAL.
 - DO NOT SCALE THESE DRAWINGS.
 - ALL EQUIPMENT SHALL BE LOCATED AND INSTALLED TO PROVIDE MAXIMUM SPACE FOR MAINTENANCE AND SERVICE. ALL SERVICE CLEARANCES AS SHOWN IN THE MANUFACTURER'S INSTRUCTIONS MUST BE MAINTAINED.
 - THE MECHANICAL CONTRACTOR SHALL COORDINATE SIZE AND LOCATION OF ALL BUILDING PENETRATIONS.
 - MECHANICAL CONTRACTOR SHALL TEST AND BALANCE ALL SYSTEMS TO COMPLY WITH PLANS.

- KEY NOTES
- DUCTED SPLIT SYSTEM HEAT PUMP FAN COIL. PROVIDE COMPLETE WITH WALL MOUNTED AUTO-CHANGEOVER THERMOSTAT. COORDINATE INSTALLATION WITH STRUCTURAL DRAWINGS.
 - MINI-SPLIT OUTDOOR UNIT ON 4" THICK HOUSEKEEPING PAD.
 - ROUTE REFRIGERANT PIPING FROM UNIT TO BUILDING AND TURN UP INSIDE EXTERIOR WALL. ROUTE AS SHOWN ABOVE CEILING TO INDOOR UNIT. PROVIDE 1/2" ARMAFLEX INSULATION WITH ALUMINUM JACKET OUTSIDE. 3/4" ARMAFLEX INSULATION IS ACCEPTABLE INSIDE THE BUILDING.
 - EXTEND 1/2" CD (CONDENSATE DRAIN) LINE FROM UNIT. SLOPE DOWN TO DRAIN BY GRAVITY AND DISCHARGE INTO SERVICE SINK (SK). ATTACH PIPING TO WALL AND TERMINATE 2" ABOVE SINK RIM. LABEL PIPE AS "HVAC UNIT CONDENSATE".
 - CEILING MOUNTED EXHAUST FAN TIED TO RESTROOM LIGHT MOTION SENSOR. COORDINATE WITH E.G. ROUTE DISCHARGE TO 8"x8" EA DUCT ABOVE CEILING.
 - 8"x8" EA DUCT TO 10"x10" WALL LOUVER. COORDINATE WITH G.C. TO FLASH AND SEAL WALL LOUVER.
 - 24x24 EXHAUST AIR LOUVER (EAL-1). PROVIDE 24x24 DUCT THROUGH WALL AND TRANSITION TO FAN INLET (6x16). SEAL WALL PENETRATION WATER TIGHT. SEE ARCHITECTURAL DRAWINGS FOR REQUIRED FLASHING. APPROX LOUVER HEIGHT SHALL BE 12'-0" AFF TO TOP OF THE LOUVER SO THAT IT MATCHES THE HEIGHT OF THE GARAGE DOORS. REFER TO ARCHITECTURAL PLANS FOR EXACT ELEVATION.
 - 24x24 MAKE-UP AIR LOUVER (OAL-1). PROVIDE 24x24 DUCT THROUGH WALL AND PROVIDE DAMPER IN DUCT ON INSIDE OF BUILDING. SEAL WALL PENETRATION WATER TIGHT. SEE ARCHITECTURAL DRAWINGS FOR REQUIRED FLASHING. APPROX LOUVER HEIGHT SHALL BE 12'-0" AFF TO TOP OF THE LOUVER SO THAT IT MATCHES THE HEIGHT OF THE GARAGE DOORS. REFER TO ARCHITECTURAL PLANS FOR EXACT ELEVATION. REFER TO NOTES UNDER "VEHICLE EXHAUST FAN CALCULATIONS" ON MOI FOR ALTERNATE TO THIS LOUVER.
 - 5" OUTSIDE AIR DUCT FROM RETURN AIR DUCTWORK, UP THROUGH ROOF. PROVIDE VOLUME DAMPER AND BALANCE TO 50 CFM. TERMINATE WITH GOOSENECK AND BIRDSREEN. COORDINATE WITH G.C. AND ROOFING CONTRACTOR TO FLASH AND SEAL ROOF PENETRATION.
 - M.C. TO SAWCUT A 6" WIDE BORDER AROUND THE DCU-1 HOUSEKEEPING PAD AND FILL BORDER WITH MAINTAIN 4" BETWEEN PAD AND EDGE OF THIS IS PROVIDED TO ALLOW FOR THE MOISTURE CREATED FROM THE HEAT PUMP DEFROST CYCLE TO BE ABSORBED AND NOT BECOME A NUISANCE OR HAZARD. M.C. MAY WISH TO COORDINATE WITH G.C. TO FORM THIS PERIMETER PRIOR TO ASPHALT INSTALLATION AROUND BUILDING.
 - VENTILATION FAN FOR SERVICE PITS AS REQUIRED BY THE NATIONAL ELECTRIC CODE SECTION 511. MOUNT FAN ON WALL BESIDE COMPRESSED AIR DROP WITH FAN MOUNTED AT 8'-0" AFF. EXTEND 6" PVC DISCHARGE PIPE UP ALONG FACE OF WALL AND TERMINATE THROUGH EXTERIOR WALL AS HIGH AS POSSIBLE IN SPACE. CUT END OF PIPE AT 45 DEGREE ANGLE TO MITIGATE RAIN BLOW IN. 6" PVC INLET PIPE SHALL TIE IN FROM UNDERGROUND.
 - PVC SCHEDULE 40 DWV PIPING UNDERGROUND AT APPROX 12" BFF TO BOTTOM OF PIPE. ROUTED AS TRANSITION FROM 6" PIPE TO 4" WHERE SHOWN AND ROUTE 4" BRANCHES TO EACH PIT. THIS PIPING IS FOR SERVICE PIT VENTILATION PURPOSES.
 - IN EACH PIT AT 30" FROM REAR WALL, EXTEND PIPING INTO PIT THEN TURN DOWN AND TERMINATE PIPE WITH OPEN END AT 6" ABOVE PIT FLOOR. SEAL PIT WALL PENETRATION WATER TIGHT. PROVIDE ADHESIVE LABEL ON PIPE DROP THAT READS "PIT VENTILATION PIPE".
 - USE THE DESCRIBED PVC DWV FITTINGS AT THESE LOCATIONS.
 - ELECTRIC UNIT HEATER RECESSED INTO WALL FOR SPACE TEMPERING. SET INTERNAL HEATER THERMOSTAT TO 50 DEG F TO MAINTAIN TEMPERATURE ABOVE FREEZING. INSTALL AT 60" AFF TO BOTTOM OF UNIT. THIS ELEVATION IS NECESSARY DUE TO LIMITED WALL SPACE DOWN LOW. IF AN AVAILABLE LOCATION WITHIN 18" OF THE FLOOR CAN BE FOUND, M.C. MAY RELOCATE. DO NOT INSTALL UNDER WATER HEATER.
 - MOUNT ELECTRIC UNIT HEATER TO STRUCTURE PER MANUFACTURER'S INSTALLATION INSTRUCTIONS. VERIFY CLEARANCES WITH OVERHEAD DOORS PRIOR TO INSTALLATION. REFER TO DETAIL ON SHEET M2 FOR FURTHER INFORMATION. REFER TO ARCHITECTURAL FOR MOUNTING LOCATION.
 - NOT USED.
 - VENTILATION FAN FOR OFFICE/WASTE OIL AREA. FAN SHALL RUN CONTINUOUSLY DURING OCCUPIED TIMES VIA TIMECLOCK. REFER TO SEQUENCE OF OPERATION.

HVAC GENERAL NOTES

- THE CONTRACTOR SHALL FURNISH AND INSTALL ALL MATERIAL & EQUIPMENT IN STRICT ACCORDANCE WITH APPLICABLE CODES AND STANDARDS & PER MANUFACTURER'S DIRECTIONS.
- THE CONTRACTOR SHALL SECURE & PAY FOR ALL NECESSARY PERMITS, LICENSE, INSPECTIONS, APPROVALS, AND FEES.
- THE CONTRACTOR SHALL COORDINATE HIS WORK WITH ALL OTHER TRADES BEFORE INSTALLATION OF ANY MATERIALS OR EQUIPMENT.
- THESE DRAWINGS ARE DIAGRAMMATIC & SHOW GENERAL LOCATION & ARRANGEMENT OF ALL MATERIALS & EQUIPMENT. THE DRAWINGS SHALL BE FOLLOWED AS CLOSELY AS BUILDING CONSTRUCTION & ALL OTHER WORK WILL PERMIT.
- DO NOT SCALE DRAWINGS FOR MEASUREMENTS.
- ALL PENETRATIONS THROUGH EXTERIOR WALLS & ROOF SHALL BE FLASHED & COUNTERFLASHED IN A WATERPROOF MANNER. (COLOR TO MATCH EXTERIOR).
- SEAL ALL PENETRATIONS OF RATED WALLS WITH FIRE DAMPER, SEALANT MATERIAL APPROVED BY LOCAL CODE.
- ALL SUSPENDED MATERIALS AND EQUIPMENT SHALL BE INDIVIDUALLY SUPPORTED FROM THE BUILDING STRUCTURE. DO NOT SUSPEND ITEMS FROM THE CEILING OR ITS SUPPORT SYSTEM.
- INSTALL ALL CONTROL DEVICES, INCLUDING THERMOSTATS & SWITCHES, 4'-0" ABOVE FINISHED FLOOR. PROVIDE THE REQUIRED DEVICES FOR ALL SYSTEMS WHETHER LOCATED ON THE PLANS OR NOT.
- LOCATE CEILING DIFFUSERS IN ACCORDANCE WITH ARCHITECTURAL REFLECTED CEILING PLANS (IF PROVIDED).
- PROVIDE MANUFACTURER'S RECOMMENDED CLEARANCES AROUND MECHANICAL UNITS FOR MAINTENANCE & FILTER REMOVAL.
- ALL PIPING & DUCTWORK LOCATIONS SHALL BE COORDINATED IN WORK UNDER OTHER DIVISIONS OF THE SPECIFICATIONS, TO AVOID INTERFERENCE.
- PROVIDE 1 YEAR WARRANTY ON ALL EQUIPMENT AND 5 YEAR WARRANTY ON ALL COMPRESSORS.
- ALL INTAKE OPENINGS SHALL BE LOCATED A MINIMUM OF 10'-0" FROM ALL EXHAUST LOCATIONS.
- CONDENSATE DRAIN PIPING SHALL BE SCHEDULE 40 PVC PIPE AND FITTINGS. DRAINING FROM AIR HANDLING UNITS SHALL BE TRAPPED.
- THE MECHANICAL CONTRACTOR SHALL PROVIDE REFRIGERANT & LOW VOLTAGE CONTROL LINES FROM THE CONDENSER TO THE AIR HANDLING UNIT. COORDINATE ROUTING & INSTALLATION WITH THE GENERAL CONTRACTOR. SIZE REFRIGERANT LINES PER MANUFACTURER'S REQUIREMENTS.
- ELECTRICAL CONTRACTOR TO PROVIDE ALL HIGH VOLTAGE ELECTRICAL WIRING, CONDUIT, DISCONNECT SWITCHES, FUSES, ETC. TO SPLIT SYSTEM UNITS. ALL FINAL ELECTRICAL CONNECTIONS ARE BY ELECTRICAL CONTRACTOR.
- REFRIGERANT PIPING, NOT SHOWN ON PLANS, SHALL BE SIZED & INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, INSTALLATION INSTRUCTIONS & LOCAL CODES.
- MECHANICAL CONTRACTOR SHALL VERIFY LOCATION OF ALL PENETRATIONS FOR RELIEF HOODS, OUTSIDE AIR HOODS, LOUVERS, AND WALL CAPS WITH ARCHITECT & OWNER PRIOR TO INSTALLATION.
- MECHANICAL CONTRACTOR SHALL PAINT ALL RELIEF HOODS, INTAKE HOODS, LOUVERS & VENT CAPS. CONFIRM COLOR WITH ARCHITECT & OWNER PRIOR TO INSTALLATION.
- THE MECHANICAL CONTRACTOR SHALL COORDINATE THE REQUIRED OPENINGS IN ROOF TRUSSES WITH THE G.C. IN ORDER TO PROVIDE ADEQUATE SPACE, ACCESS & SUPPORT FOR THE MECHANICAL UNIT.
- THE GENERAL CONTRACTOR SHALL PROVIDE PLATFORMS AS REQUIRED FOR THE INSTALLATION OF THE MECHANICAL UNIT & SUITABLE WALKING SURFACES AND WORKING AREAS FOR ACCESS & MAINTENANCE. THE MECHANICAL CONTRACTOR SHALL COORDINATE THE REQUIREMENTS FOR THESE ITEMS WITH THE GENERAL CONTRACTOR.

VENTILATION CALCULATION

PER 2015 IMC TABLE 403.3.1.1

LOBBY: 120 SQ FT
Rp = 5 Pz = 30 Ra = 0.06 Ez = 1
Voz = 25.2 CFM

OFFICE: 100 SQ FT
Rp = 5 Pz = 5 Ra = 0.06 Ez = 1
Voz = 11 CFM

TOTAL OUTSIDE AIR REQUIREMENT: 36.2 CFM

OUTSIDE AIR PROVIDED:
50 CFM

