MECHANICAL LEGEND

SYMBOL	DESCRIPTION
M1.0	DETAIL NUMBER, SHEET NUMBER
1 / M3.0	SECTION/ELEVATION NUMBER, SHEET NUMBER
1 / M3.0	INTERIOR ELEVATION NUMBER, SHEET NUMBER
1	NOTE TAG
1	REVISION TAG
HP-1	EQUIPMENT TAG
OR	SUPPLY DUCT OUT OF PAGE
OR	SUPPLY DUCT INTO PAGE
	SUPPLY DIFFUSER
OR	RETURN/EXHAUST/RELIEF DUCT OUT OF PAGE
OR	RETURN/EXHAUST/RELIEF DUCT INTO PAGE
OR	RETURN/EXHAUST/RELIEF GRILLE
	WALL REGISTER
1 10x4 / 40	DIFFUSER/GRILLE TAG (SIZE & CFM)
	OUTSIDE AIR DIRECTION
	HVAC AIR DIRECTION
8x10	RECTANGULAR DUCT DIMENSIONS (8" WIDTH X 10" DEPTH)
6ø	ROUND DUCT DIMENSIONS (6" DIAMETER)
	FLEXIBLE CONNECTION
	FLEX DUCT
	ROUND DUCT TAKE-OFF
	RECTANGULAR TO ROUND DUCT TRANSITION
	AIRFOIL TURNING VANES
	ENVELOPE PENETRATION
	CONCENTRIC DIRECT VENT EXHAUST/SUPPLY
	FIRE SMOKE DAMPER (FSD)
	BALANCING DAMPER
M	MOTORIZED DAMPER
	BAROMETRIC/BACKDRAFT DAMPER
	FIRE DAMPER
T-1	THERMOSTAT
CO2	CARBON DIOXIDE SENSOR
CO	CARBON MONOXIDE SENSOR
OS	OCCUPANCY SENSOR
P / P	PRESSURE GAGE
T / T	TEMPERATURE GAGE
	AUTOMATIC AIR VENT
	MANUAL AIR VENT
	SERVICE SHUTOFF VALVE
	BALANCING VALVE
	SWING CHECK VALVE
	SPRING CHECK VALVE (NO SLAM)
	MANUAL THREE-WAY BALANCING VALVE

MECHANICAL LEGEND

SYMBOL	DESCRIPTION
V-1	MOTORIZED ZONE VALVE
V-1	MOTORIZED 3-WAY MIXING VALVE
OR	PUMP
	EXPANSION TANK
	RADIANT MANIFOLD
	DIRECTION OF FLOW
	PIPE BREAK (CONTINUATION)
	PIPE CONNECTION
	PIPE UP
	PIPE DOWN
	PIPE OVER

MECHANICAL SYSTEMS COMMISSIONING NOTES

1. COMMISSIONING IS REQUIRED ON THIS PROJECT IN ACCORDANCE WITH THE WASHINGTON STATE ENERGY CODE (WSEC) SECTION 1416. THE MECHANICAL AND CONTROL CONTRACTORS ARE REQUIRED TO PERFORM THEIR OWN INTERNAL TESTING AND COMMISSIONING PRIOR TO THE START OF COMMISSIONING BY THE COMMISSIONING AGENT. THE CONTRACTOR SHALL PROVIDE THE NECESSARY ASSISTANCE TO THE COMMISSIONING AGENT TO PERFORM COMMISSIONING DUTIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TAKING CORRECTIVE ACTION IF ANY DEFICIENCIES ARE FOUND DURING COMMISSIONING.
2. BALANCING: ALL HVAC SYSTEMS SHALL BE BALANCED BY A LICENSED CONTRACTOR IN ACCORDANCE WITH ACCEPTED ENGINEERING STANDARDS AND SPECIFICATION SECTION 23 05 93 PRIOR TO COMMISSIONING.
3. OWNER TRAINING BY MECHANICAL AND CONTROL CONTRACTORS FOR EACH PIECE OF EQUIPMENT OR SYSTEM SHALL INCLUDE: SYSTEM/EQUIPMENT OVERVIEW (WHAT IT IS, WHAT IT DOES, AND WHICH OTHER SYSTEMS OR EQUIPMENT DOES IT INTERFACE WITH). REVIEW OF THE AVAILABLE O&M MATERIALS. REVIEW OF THE RECORD DRAWINGS ON THE SUBJECT SYSTEM/EQUIPMENT. HANDS-ON DEMONSTRATION OF ALL NORMAL MAINTENANCE PROCEDURES, NORMAL OPERATING MODES, AND ALL EMERGENCY SHUTDOWN AND START-UP PROCEDURES.

ENERGY CODE NOTES

1. SEE SCHEDULES (M0.1) FOR EQUIPMENT TYPE, CAPACITY AND EFFICIENCY.
2. PROVIDE DAMPERS FOR OUTSIDE AIR INTAKES AND EXHAUST FANS WHICH CLOSE AUTOMATICALLY WHEN THE SYSTEM IS OFF, EXCEPT FOR THOSE SYSTEMS WHICH OPERATE CONTINUOUSLY WITH LESS THAN 20 CFM/SF LEAKAGE FOR BAROMETRIC DAMPERS, AND LESS THAN 10 CFM/SF LEAKAGE FOR MOTORIZED DAMPERS.
3. PROVIDE A MEANS OF BALANCING EVERY AIR SUPPLY OUTLET AND AIR OR WATER TERMINAL DEVICE.
4. SEAL TRANSVERSE SEAMS OF ALL DUCTWORK.
5. DUCT AND PIPE INSULATION: COMPLY WITH 2018 SEATTLE ENERGY CODE AND PLANS
6. ALL ELECTRIC MOTORS GREATER THAN 1.0 HP SHALL MEET WSEC TABLE 14-4 EFFICIENCY REQUIREMENTS.
7. COMPLY WITH WSEC COMMISSIONING REQUIREMENTS OUTLINED IN SECTION 1416.

GENERAL NOTES

1. THESE PLANS ARE SCHEMATIC AND DO NOT SHOW EXACT ROUTING OR EVERY OFFSET WHICH MAY BE REQUIRED. THE HVAC CONTRACTOR IS TO COORDINATE WITH ALL OTHER TRADES AND IS TO VERIFY ALL CLEARANCES BEFORE COMMENCING WORK.
2. MATERIALS, METHODS, AND INSTALLATION SHALL COMPLY WITH THE PROVISIONS OF THE LATEST EDITION OF THE WASHINGTON STATE ENERGY CODE (WSEC), INTERNATIONAL MECHANICAL CODE (IMC) WITH WASHINGTON STATE AMENDMENTS, INTERNATIONAL BUILDING CODE (IBC) WITH WASHINGTON STATE AMENDMENTS, INTERNATIONAL FIRE CODE (IFC) AND LOCAL CODES AND ORDINANCES.
3. DUCT CONSTRUCTION AND HANGINGS SHALL COMPLY WITH THE LATEST IMC AND WITH CURRENT SMACNA STANDARDS.
4. JOINTS OF DUCT SYSTEM SHALL BE SEALED WITH DUCT MASTIC.
5. DUCTS SHALL BE INSULATED AS INDICATED ON PLANS TO MEET THE REQUIREMENTS OF CURRENT CODES AND SPECIFICATIONS.
6. FLEXIBLE DUCTS SHALL ONLY BE USED WHERE SHOWN AND SHALL NOT EXCEED 6 FT IN LENGTH UNLESS NOTED OTHERWISE.
7. PROVIDE EARTHQUAKE RESTRAINT FOR HVAC EQUIPMENT IN ACCORDANCE WITH THE CURRENT IBC.
8. PIPING PENETRATIONS OF FIRE RATED WALLS OR FLOOR SHALL BE SLEEVED AND FIRE STOPPED WITH LISTED MATERIALS SO AS TO MAINTAIN THE INTEGRITY AND RATING OF THE FLOOR OR WALL.
9. HVAC EQUIPMENT, VALVES, AND DAMPERS SHALL BE LOCATED IN EASILY ACCESSIBLE LOCATIONS, UNLESS SHOWN ON ARCHITECTURAL DRAWINGS. REQUIRED ACCESS PANELS SHALL BE PROVIDED BY THE HVAC CONTRACTOR AND INSTALLED BY THE GENERAL CONTRACTOR.
10. SEE ARCHITECTURAL DRAWINGS FOR LOCATION OF EXPOSED DUCTWORK AND GRILLES.

MECHANICAL AND PLUMBING SHEET LIST

BASIS OF DESIGN

DESCRIPTION:
THIS PROJECT CONSISTS OF REPLACING THE ELECTRIC HEAT 100% OUTSIDE AIR CORRIDOR VENTILATION UNIT WITH AN ENERGY RECOVERY VENTILATOR THAT WILL RECOVERY HEAT FROM THE WHOLE HOUSE EXHAUST FANS. THE EXISTING OUTSIDE AIR VENTILATION UNIT SHALL BE DEMOLISHED AND REMOVED. DUCTWORK SHALL BE INSTALLED ON THE ROOF TO COLLECT THE EXHAUST OUTLETS AND ROUTE THE AIR TO THE ERV. OUTSIDE AIR SHALL BE DUCTED TO THE EXISTING CORRIDOR VENTILATION SHAFT. THE ERV SHALL BE CONTROLLED TO MAINTAIN THE BALANCED NEGATIVE PRESSURE IN THE EXHAUST DUCTWORK TO ENSURE THAT THE UNITS HAVE SUFFICIENT EXHAUST FLOW. SUPPLY FLOW SHALL BE BALANCED AT THE CORRIDOR OUTLETS TO BE EVEN ON EACH FLOOR. BRANCH DUCTS SHALL BE BALANCED TO MAINTAIN CORRECT VENTILATION FLOW RATE.
IN ADDITION, THE RANGE HOODS SHALL BE REPLACED WITH UNITS WITH DAMPERS TO PREVENT UNNECESSARY WARM AIR LEAKAGE OUT THE KITCHEN EXHAUST DUCTS.

HEAT RECOVERY CALC

(WSEC 1436)

DESIGN OUTSIDE AIR TEMPERATURE (OAT) = 26°F

DESIGN INSIDE AIR TEMPERATURE (IAT) = 65°F (WSEC 1436)

$\frac{1}{2}$ * (OAT – IAT) = 43°F, ERV-1 SUPPLY AIR TEMPERATURE = 68°F

ERV-1 SEQUENCE OF OPERATIONS

SUPPLY FAN CONTROL:

1. BALANCE FAN TO PROVIDE 3,200 CFM OF OUTSIDE AIR AND RECORD PRESSURE.
2. CONTROL FAN TO MAINTAIN STATIC PRESSURE SETPOINT.
3. WHEN UNIT IS ENABLED, RAMP FAN UP FROM MINIMUM SPEED TO PRESSURE SETPOINT.
4. WHEN UNIT IS DISABLED, FAN SHALL BE SET TO MINIMUM SPEED.

EXHAUST FAN CONTROL:

1. BALANCE FAN TO PROVIDE 3,500 CFM OF EXHAUST AIR WITH UNIT EXHAUST FANS OFF, AND RECORD STATIC PRESSURE.
3. WHEN UNIT IS ENABLED, RAMP FAN UP FROM MINIMUM SPEED TO PRESSURE SETPOINT.
4. CONTROL EXHAUST FAN TO MAINTAIN STATIC PRESSURE SETPOINT AS UNIT EXHAUST FANS TURN ON/OFF.

DAMPER CONTROL:

1. OUTSIDE AIR AND EXHAUST AIR DAMPERS SHALL BE SHUT WHEN UNIT IS NOT ENABLED.

TRENDS: SET UNIT CONTROLLER TO TREND THE FOLLOWING POINTS

1. OUTSIDE AIR TEMPERATURE
2. EXHAUST AIR TEMPERATURE
3. SUPPLY AIR TEMPERATURE
4. SUPPLY FAN SPEED
5. EXHAUST FAN SPEED
6. SUPPLY STATIC
7. EXHAUST STATIC

ENERGY RECOVERY VENTILATORS

TAG	LOCATION/ SERVICE	MFR	MODEL	FLOW (CFM)	RECOVERY EFFICIENCY	S/R EXTERIOR STATIC PRESSURE (WC)	S/R FAN POWER (HP)	VOLTAGE/ PHASE	UNIT MCA	WEIGHT (LBS)	NOTES
ERV-1	ROOF/CORRIDOR VENTILATION	SWEGON	GOLD-RX-20	3,500	82%	1"/1"	4.6/4.6	208/3	52	2,000	1

NOTES:
1. PROVIDE UNIT WITH FACTORY INSTALLED BASE, 14" TALL, HAND TERMINAL CONTROLLER, ROOF AND WEATHER-HOODS FOR OUTDOOR INSTALLATION, EXTERNAL DUCT PRESSURE AND TEMPERATURE SENSORS, CONTROL UNIT TO MAINTAIN DUCT STATIC PRESSURE SETPOINT. BALANCE FOR 3,500 CFM EXHAUST FLOW.
2. BALANCE SUPPLY AIR TO SPLIT OUTSIDE AIR-FLOW EVENLY IN EACH CORRIDOR AIR OUTLET.

RANGE HOOD

TAG	LOCATION/ SERVICE	MFR	MODEL	WIDTH	FLOW (CFM)	VOLTS/PHASE/AMPS	NOTES
RH-1	KITCHEN(S)	AIR KING	ECQ	24" (VERIFY)	150	120/1	1

1. WHITE. PROVIDE WITH LED LIGHT, BACK-DRAFT DAMPER, DUCT FITTING, AND ADA CONTROLS. CONTRACTOR TO INSTALL NEW HOOD IN ALL (71) KITCHENS, VERIFY DIMENSIONS ONSITE PRIOR TO ORDERING HOODS. TURN OFF WHOLE HOUSE OPERATION, CONTROL WITH MANUAL SWITCH.

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PROJECT
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MORGAN B. HEATER
STATE OF WASHINGTON
45955
REGISTERED
PROFESSIONAL ENGINEER

DATE
03/09/2021
REVISIONS

SHEET TITLE
Schedules - Mechanical

SHEET NO.
M-0.1