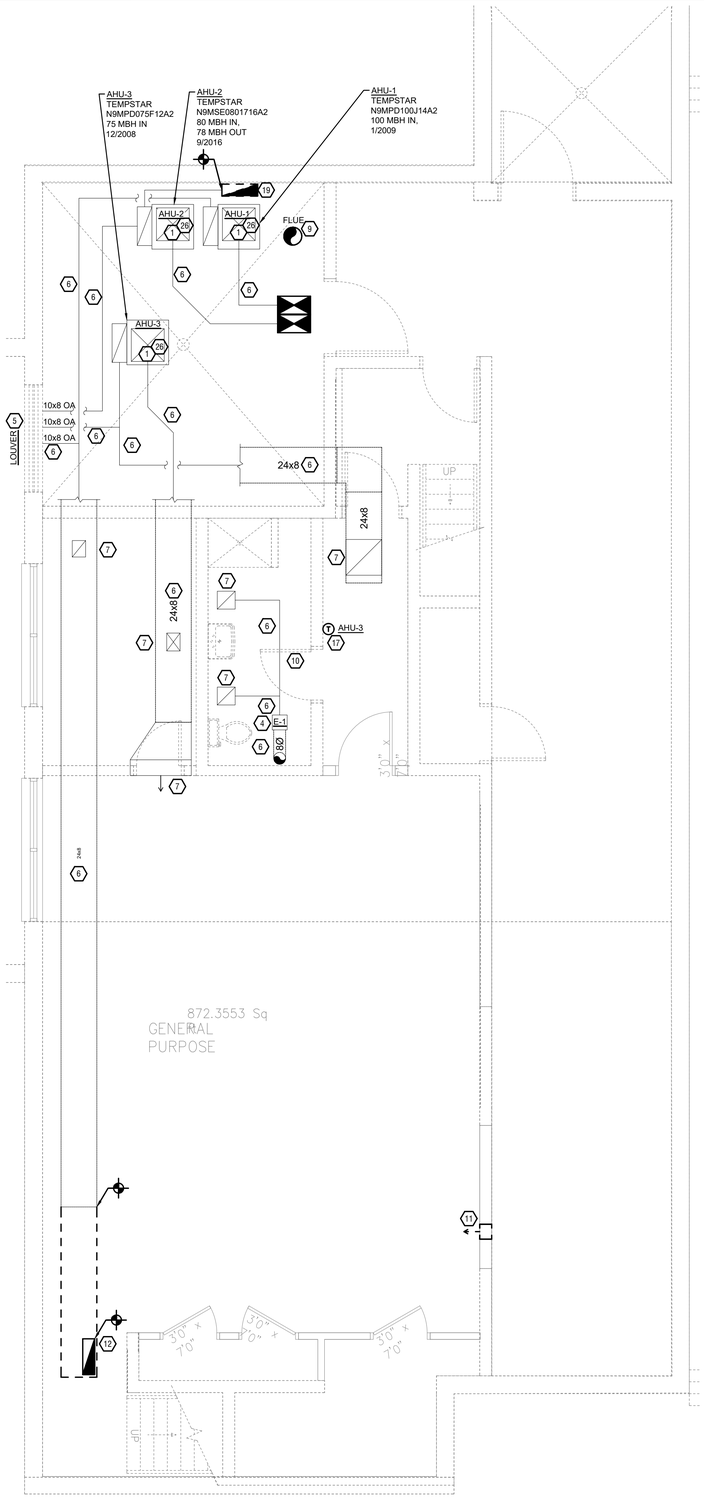
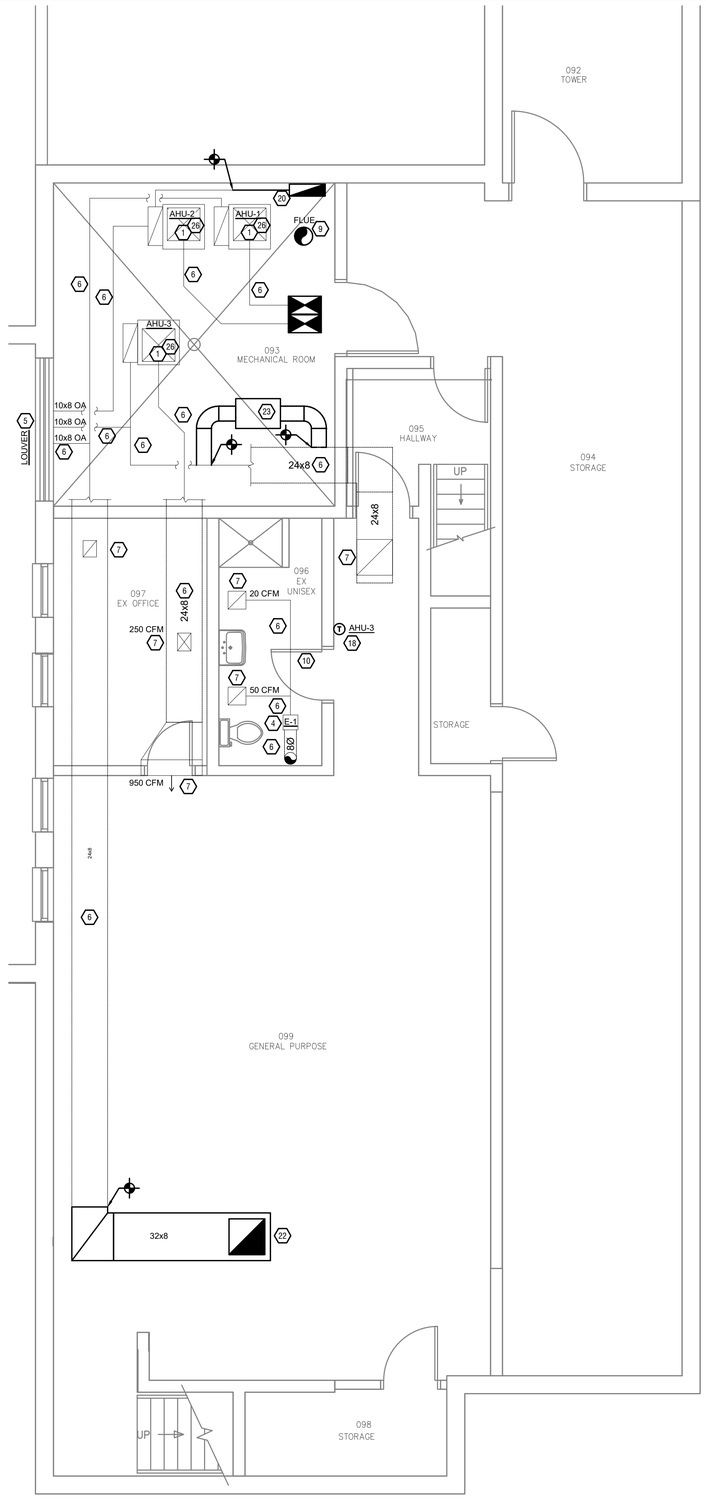


1 M100 N MECHANICAL BASEMENT DEMO PLAN
SCALE: 1/4" = 1'-0"



2 M100 N MECHANICAL BASEMENT PLAN
SCALE: 1/4" = 1'-0"

KEYED SHEET NOTES

1. EXISTING AIR HANDLING UNIT TO REMAIN. CONTRACTOR TO MODIFY / PROVIDE ALL FLUE AND COMBUSTION AIR PIPING AND TERMINATIONS AS REQUIRED FOR THE BUILDING ADDITION. PROVIDE NEW AIR FILTERS. REPLACE PREVIOUSLY REMOVED APRIL AIRE HUMIDIFIER WITH NEW ONE. BALANCE TO AIRFLOW RATES SHOWN. REFER TO KEYED NOTE 26.
2. EXISTING CONDENSING UNITS TO BE RELOCATED AS REQUIRED FOR INSTALLATION OF NEW BUILDING ADDITION AND WALKWAY. MECHANICAL CONTRACTOR TO MODIFY / PROVIDE ALL REFRIGERANT PIPING, CHECK FOR SYSTEM LEAKS, RECHARGE REFRIGERANT LEVELS WITH SAME REFRIGERANT AND TO LEVELS PER MANUFACTURER'S INSTRUCTIONS, CONTROLS AND CONTROL WIRING AS REQUIRED. COORDINATE EXACT LOCATION OF HVAC EQUIPMENT, LENGTH OF PIPE, AND NUMBER OF ELBOWS BETWEEN INDOOR AND OUTDOOR UNITS WITH MANUFACTURE AND ARCHITECT BEFORE MODIFYING REFRIGERATION PIPING. ROUTE REFRIGERANT PIPING FROM OUTDOOR UNIT TO INDOOR UNIT. ALL PIPING SHALL BE CONCEALED IN FINISHED AREA. SIZE PER MANUFACTURES RECOMMENDATIONS. REFER TO KEYED NOTE 26.
3. EXISTING UNIT HEATER TO REMAIN.
4. EXISTING EXHAUST FAN, AND EXHAUST DUCT UP THROUGH ROOF, TO REMAIN.
5. EXISTING OUTDOOR AIR AND COMBUSTION AIR LOUVER TO REMAIN.
6. EXISTING DUCTWORK TO REMAIN.
7. EXISTING AIR DEVICE TO REMAIN. CLEAN TO LIKE NEW CONDITION. BALANCE TO AIR FLOW RATE SHOWN AND / OR AS LISTED IN SCHEDULES.
8. REWORK DUCTWORK AS REQUIRED FOR RANGE HOOD.
9. REMOVE EXISTING FLUE. COORDINATE WITH PLUMBING CONTRACTOR, AND ALL CONNECTIONS, TO VERIFY THAT FLUE CAN BE REMOVED. NEW WATER HEATER FLUES WILL BE PVC, AND NOT NEED THE EXISTING FLUE.
10. UNDERCUT DOOR 1" FOR TRANSFER AIR.
11. REMOVE EXISTING THROUGH THE WALL FAN.
12. REMOVE THE RETURN AIR GRILLE. AND DUCTWORK TO MAIN DUCT BELOW FLOOR, TO POINT INDICATED IN BASEMENT PLAN. PATCH FLOOR AS REQUIRED TO MATCH EXISTING. REFER TO KEYED SHEET NOTE NUMBER 22, AND COORDINATE WITH ARCHITECT AND OWNER'S REPRESENTATIVE BEFORE DEMOLITION.
13. REMOVE EXISTING AIR DEVICES AND TRANSFER AIR DUCT.
14. REMOVE EXISTING AIR DEVICE AND DUCTWORK BACK TO MAIN. CAP AND INSULATE TO MATCH EXISTING.
15. REMOVE EXISTING AIR DEVICE AND DUCTWORK BACK POINT INDICATED. CAP AND INSULATE TO MATCH EXISTING.
16. REMOVE EXISTING EXHAUST FAN AND DUCTWORK BACK POINT INDICATED. CAP AND INSULATE TO MATCH EXISTING.
17. REMOVE EXISTING THERMOSTAT. MODIFY EXISTING CONTROL WIRING AS REQUIRED.
18. PROVIDE PROGRAMMABLE THERMOSTAT / HUMIDISTAT THAT IS COMPATIBLE WITH THE MODIFIED SYSTEM. COORDINATE FINAL LOCATION OF THERMOSTAT WITH ARCHITECT / OWNER PRIOR TO INSTALLATION. FOR THERMOSTATS INSTALLED ON EXPOSED BRICK WALLS, PROVIDE CONDUIT FOR THERMOSTAT WIRE. FOR THERMOSTATS INSTALLED ON EXTERIOR WALLS, INSULATE BACKSIDE OF THERMOSTAT.
19. REMOVE RETURN DUCT TO MAIN RETURN DUCT BELOW FLOOR. REFER TO BASEMENT PLAN. PATCH FLOOR AS REQUIRED TO MATCH EXISTING.
20. EXTEND RETURN DUCT SAME SIZE AS EXISTING, AND ROUTE UP THROUGH FLOOR TO ABOVE FIRST FLOOR CEILING. RELOCATE FLUES, CONDUITS, AND ALL OTHER ITEMS AS REQUIRED. SAW CUT CONCRETE FLOOR AND SUPPORT OPENING AS REQUIRED.
21. DUCT EXHAUST UP THROUGH ROOF, AT LEAST 10' FROM MECHANICAL AIR INTAKES. LINE UP WITH EXISTING EXHAUST PENETRATIONS ON ROOF. PROVIDE RAIN-PROOF CAP TERMINATION WITH BUILT IN BACKDRAFT DAMPER TO MATCH EXISTING ROOF EXHAUST VENTS. PROVIDE BIRD-SCREEN FOR BATH EXHAUST. PROVIDE ROOFING AS TO NOT VOID EXISTING ROOF WARRANTEE.
22. PROVIDE RETURN DUCT SAME SIZE AS FLOOR REGISTER NECK, AND ROUTE THROUGH FLOOR TO FLOOR REGISTER. RELOCATE ITEMS AS REQUIRED. COORDINATE EXACT LOCATION WITH FURNITURE LAYOUT, FIELD CONDITIONS, ARCHITECT, AND OWNER'S REPRESENTATIVE BEFORE SAW CUTTING AND ORDERING MATERIALS. SAW CUT CONCRETE FLOOR AND SUPPORT OPENING AS REQUIRED. EXTEND DUCTWORK IN BASEMENT TO MAIN AS SHOWN IN BASEMENT PLAN. COORDINATE ALL LOCATIONS WITH NEW FURNITURE LAYOUT, AND ALL OTHER TRADES.
23. PROVIDE DUCTED APRILAIRE 130 PINT ENERGY STAR DEHUMIDIFIER. INSTALL PER MANUFACTURER'S INSTRUCTIONS. PROVIDE ALL CONTROLS AND LEAVE UNIT IN OPERATING CONDITION. MODIFY EXISTING SHELVING AS REQUIRED FOR INSTALLATION. PROVIDE CONDENSATE DRAIN IN MECHANICAL ROOM.
24. PROVIDE INDOOR UNIT. VERIFY LOCATION WITH ALL OTHER TRADES. MECHANICAL CONTRACTOR TO PROVIDE 3/4" CONDENSATE DRAIN LINE TO NEAREST FLOOR DRAIN. SLOPE PIPE A MINIMUM OF 1/8" PER FOOT AWAY FROM UNIT. PROVIDE CONDENSATE PUMP HARDWIRED TO UNIT TO PROVIDE THE NECESSARY LIFT TO DRAIN CONDENSATE BY GRAVITY IF REQUIRED. CONDENSATE PUMP SHALL BE COMPLETELY CONCEALED IN UNIT CABINET. ROUTE ALL PIPING AND WIRES, CONCEALED WHERE FEASIBLE, TO AVOID SIGNIFICANT TRIM AND ARCHITECTURAL FEATURES WHEN INSTALLING THEM.
25. PROVIDE OUTDOOR UNIT. COORDINATE EXACT LOCATION OF HVAC EQUIPMENT, LENGTH OF PIPE, AND NUMBER OF ELBOWS, WITH ALL OTHER TRADES AND MANUFACTURE BEFORE ORDERING EQUIPMENT OR ANY MATERIALS. ROUTE REFRIGERANT PIPING FROM OUTDOOR UNIT TO INDOOR UNIT(S). ALL PIPING SHALL BE CONCEALED IN FINISHED AREA. SIZE PER MANUFACTURES RECOMMENDATIONS. MECHANICAL CONTRACTOR TO PROVIDE ALL CONTROLS AND CONTROL WIRING AND LEAVE UNITS IN OPERATING CONDITION.
    - 25.1. MINI SPLIT SYSTEMS: POWER WIRING TO HEAT PUMP BY ELECTRICAL CONTRACTOR. MECHANICAL CONTRACTOR TO FURNISH AND INSTALL METAL CLAD (MC) CABLE BETWEEN OUTDOOR UNIT (ODU) AND INDOOR UNIT (IDU), INCLUDING A DISCONNECT SWITCH NEXT TO IDU. MC CABLE TO BE 14 GA IF PROTECTED BY 15 AMP FUSES IN ODU, OR A MINIMUM GAUGE AS REQUIRED FOR FULL AMPERAGE OF ODU.
26. MECHANICAL CONTRACTOR TO VERIFY WORKING CONDITION OF EXISTING EQUIPMENT AND PERFORM ROUTINE MAINTENANCE, CLEAN COILS, CHECK REFRIGERANT LEVELS, CHECK FOR REFRIGERANT LEAKS, AND ELECTRICAL COMPONENTS. REPORT ANY DEFICIENCIES TO GENERAL CONTRACTOR. CLEAN TO LIKE NEW CONDITION. MECHANICAL CONTRACTOR TO MODIFY ALL CONTROLS AND CONTROL WIRING AS REQUIRED, AND LEAVE UNITS IN OPERATING CONDITION.

MECHANICAL SCOPE OF WORK

MODIFY HVAC SYSTEM IN EXISTING FIRE HOUSE'S LIVING QUARTERS FOR REVISED FLOOR PLAN. ADD HVAC SYSTEM FOR BUILDING ADDITION.

CODES REFERENCED

- 2017 OHIO MECHANICAL CODE
- 2017 OHIO BUILDING CODE
- ASHRAE 90.1-2010

HVAC DESIGN CONDITIONS

COOLING	HEATING
OUTDOOR: 93 DB / 75 WB	OUTDOOR: 0 DB
INDOOR: 74	INDOOR: 70

GENERAL NOTES

A. THE CONTRACT DRAWINGS ARE DIAGRAMMATIC AND INTENDED TO COVER THE SCOPE OF THE WORK AND TO INDICATE THE GENERAL ARRANGEMENT AND APPROXIMATE SIZE AND LOCATION OF EQUIPMENT, DUCTS, PIPES, ETC. THEY ARE NOT INTENDED TO SHOW EVERY OFFSET, FITTING, AND COMPONENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CHECKING AND VERIFYING ALL CONDITIONS AND DIMENSIONS. DO NOT SCALE THE DRAWINGS. CONTRACTOR TO VERIFY EXISTING SUPPLY AND RETURN DUCTWORK AND PIPING, SYSTEMS, SIZE, AND DUCT AND PIPE TYPE PRIOR TO MAKING CONNECTIONS.
B. FOR FULL SCHEDULES, SPECIFICATIONS, AND COMPLETE LISTING SEE DETAIL SHEETS.
C. COORDINATE ROUTING OF ALL WORK WITH OTHER TRADES.
D. COORDINATE WITH ELECTRICAL CONTRACTOR FOR POWER CONNECTIONS TO ALL MECHANICAL EQUIPMENT.
E. INSTALL ALL EQUIPMENT PER MANUFACTURER'S REQUIREMENTS. MAINTAIN ALL CODE RECOMMENDED CLEARANCES FOR ACCESS AND MAINTENANCE.
F. REFER TO ARCHITECTURAL PLANS FOR DIMENSIONS, AND FINAL CEILING DIFFUSER LOCATIONS.
G. MAINTAIN ALL CODE REQUIRED SERVICE CLEARANCES. FOLLOW CLEARANCE TO COMBUSTIBLE DISTANCE PER MANUFACTURER'S INSTRUCTIONS.
H. PROVIDE BACKDRAFT DAMPERS FOR ALL EXHAUST SYSTEMS AND EITHER LOUVER, BRICK VENT, OR CAPS AT ALL EXTERIOR BUILDING PENETRATIONS.
I. ROUTE ALL SUPPLY, RETURN, AND EXHAUST DUCTWORK ABOVE DROP CEILING OR IN BULKHEADS. COORDINATE ROUTING WITH ARCHITECTURAL DRAWINGS. PROVIDE FIRE, SMOKE, AND FIRE / SMOKE RATED DAMPERS ON ALL PENETRATIONS TO RATED WALLS, CEILINGS, AND FLOORS. PROVIDE RADIATION DAMPERS ON ALL AIR DEVICES, FANS, ETC., THAT PENETRATE THE MEMBRANE OF THE RATED FLOOR/CEILING ASSEMBLY. REFER TO ARCHITECTURAL PLANS FOR LOCATIONS.
J. ROUTE ALL AIR CONDITIONER CONDENSATE TO NEARBY FLOOR DRAIN. PROVIDE MINIMUM SLOPE OF 1/8 " PER FOOT. SIZE CONDENSATE PER SECTION 307.2.2 OF THE OHIO MECHANICAL CODE.
K. PROVIDE AN APPROVED THROUGH PENETRATION FIRESTOP FOR ALL PIPING INSTALLED AS TESTED IN ACCORDANCE WITH ASTM E814 OR UL 1479. FIRESTOP SHALL HAVE A MINIMUM POSITIVE PRESSURE DIFFERENTIAL OF 0.01 INCHES OF WATER AND SHALL HAVE AN F RATING OF NOT LESS THAN THE REQUIRED FIRE-RESISTANCE RATING OF THE WALL OR FLOOR PENETRATED.
L. ANY EQUIPMENT THAT IS SUBSTITUTED SHALL FIT IN THE SPACE PROVIDED WITH ADEQUATE ROOM FOR SERVICING, INCLUDING SUBSTITUTE EQUIPMENT NAMED IN THE SPECIFICATIONS. SUBMIT A 1/4" SCALE DRAWING OF ALL EQUIPMENT SUBSTITUTED FOR APPROVAL PRIOR TO INSTALLATION, INCLUDING, BUT NOT LIMITED TO, STRUCTURAL AND ARCHITECTURAL IMPACT, CLEARANCE REQUIREMENTS AND UTILITY REQUIREMENTS. IT IS THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR TO COORDINATE ALL NEW ELECTRICAL AND PLUMBING REQUIREMENTS WITH THE ELECTRICAL AND PLUMBING CONTRACTORS.
M. PROVIDE ALL NECESSARY MODIFICATIONS TO CONTROL WIRING, ETC. TO RELOCATED EXISTING MECHANICAL EQUIPMENT TO NEW LOCATIONS SHOWN.
N. PROVIDE COMPLETE CONTROL SYSTEM, AND LEAVE UNITS IN OPERATING CONDITION.

SYMBOLS LEGEND – HVAC

T	THERMOSTAT
L	LINE VOLTAGE THERMOSTAT
R	REMOTE SENSOR
C	CO2 SENSOR
H	HUMIDISTAT
	CEILING DIFFUSER
	SIDE WALL GRILL
	RETURN WALL GRILL
	AIR FLOW DIRECTION
14x10	DUCTWORK
14x10	LINED DUCTWORK
	TYPICAL SUPPLY DUCT DN
	TYPICAL RETURN DUCT DN
	TYPICAL EXHAUST DUCT
	TURNING VANES
	FLEXIBLE DUCT, 8'-0" LONG MAX.
	TYPICAL ROUND DUCT DN
	ROUND DUCT UP
DS	DUCT SMOKE DETECTOR
FD	FIRE DAMPER
	MVD MANUAL VOLUME DAMPER
MOD	MOD MOTOR OPERATED DAMPER
ANN	ANNUNCIATER PANEL
	DROPPED CEILING/SOFFIT
	DUCT CONTINUATION
COND	CONDENSATE PIPING
	CONNECTION POINT

STATE OF OHIO
SCOTT SEVERT STILKEY
E-77755
REGISTERED PROFESSIONAL ENGINEER

ISSUANCES

NO.	DESCRIPTION	DATE
1	FOR PERMIT	10/07/2021
2	REVISION #1	09/27/2022

FIRE STATION 25

335 ERIE BOULEVARD
HAMILTON, OHIO 45011

PR-08989

ENGINEERED BUILDING SYSTEMS INC.
Shared Success Through Collaboration and Efficiency
515 Monmouth Street, Suite 201
Newport, KY 41071 (859) 261-0585
MEP Consulting Services, Inc. in OH

DRAWN BY	CHECKED BY
SRB	SSS

PROJECT NO.: 8989

SCALE: AS NOTED

DATE: 10-07-2021

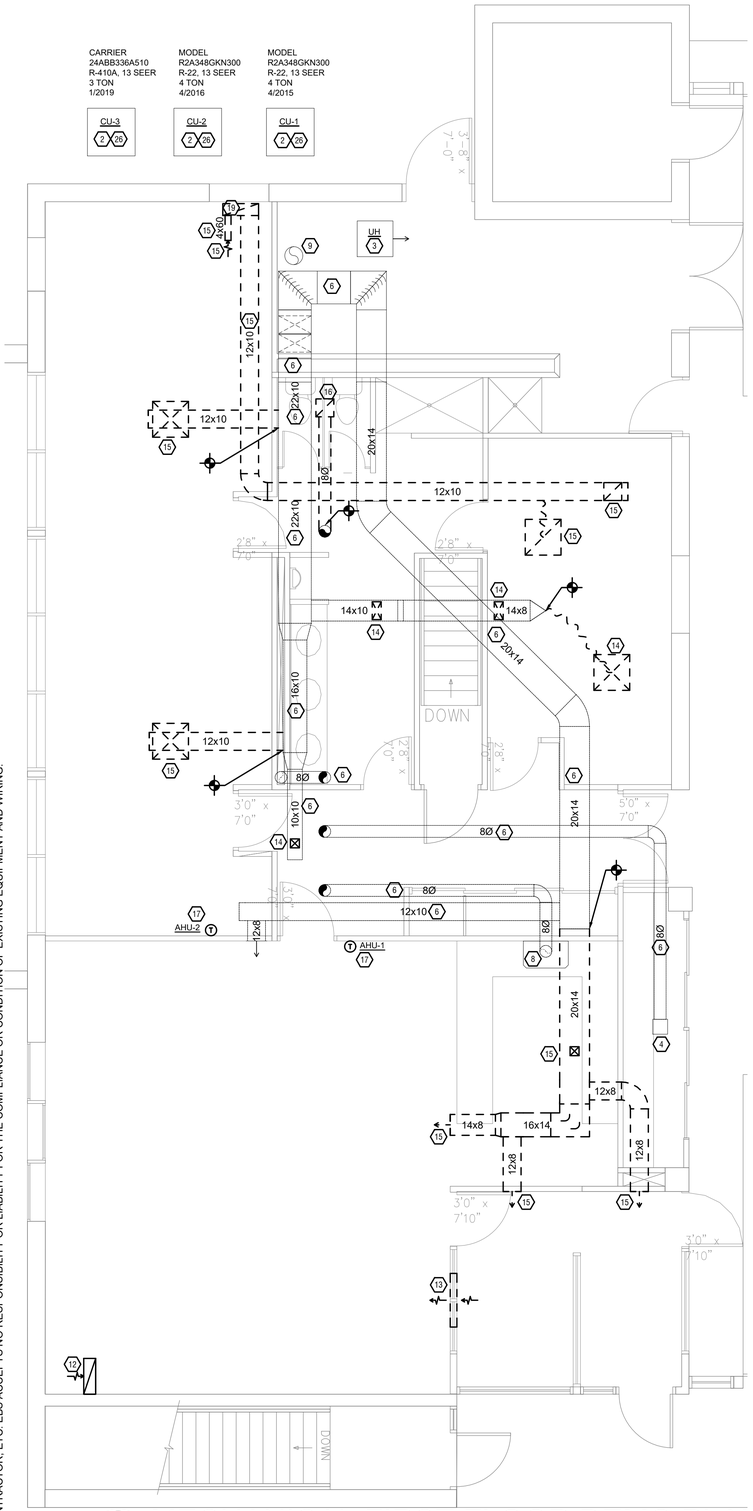
DRAWING TITLE
MECHANICAL
BASEMENT PLANS

SHEET NO.
M100

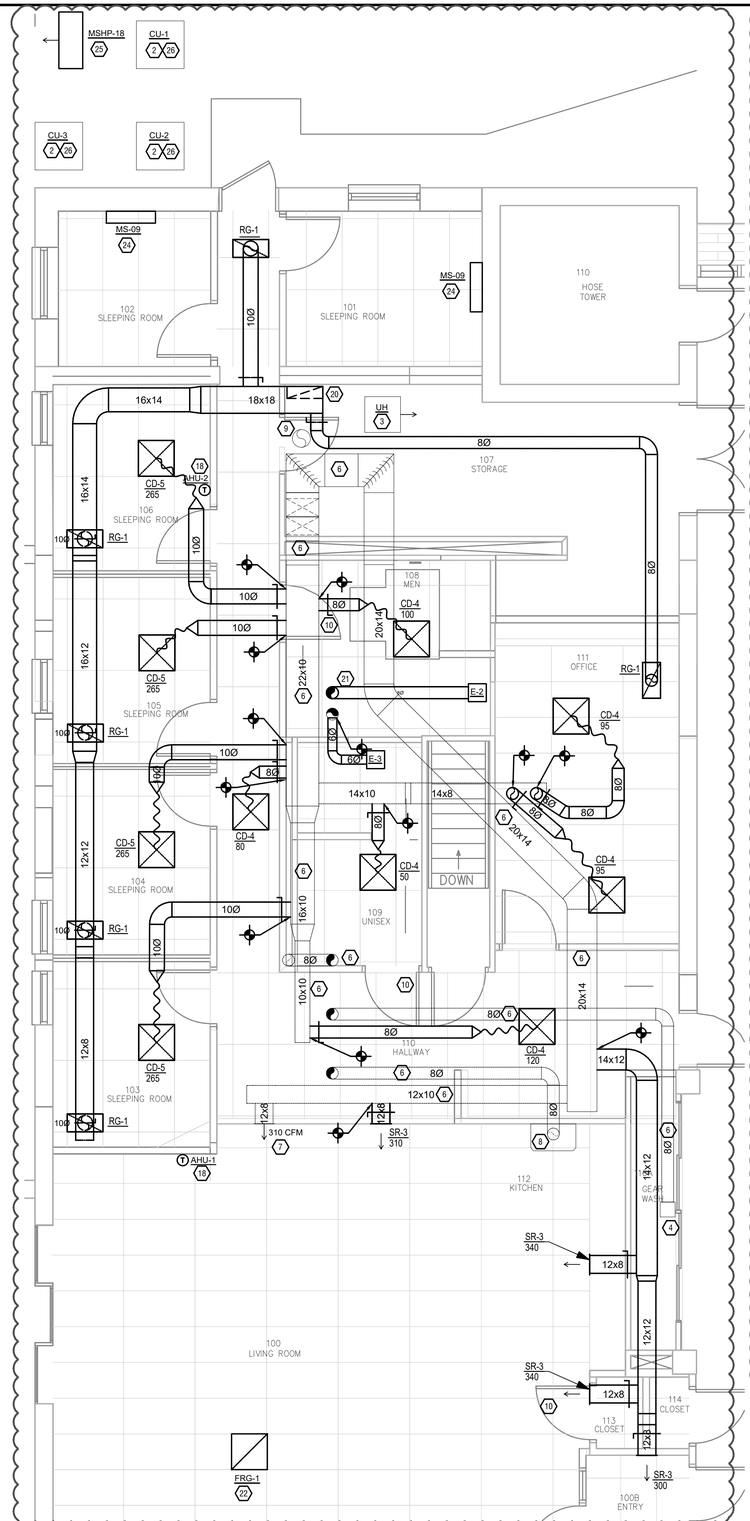
CARRIER
24ABB336A510
R-410A, 13 SEER
3 TON
1/2019

MODEL
R2A348GKN300
R-22, 13 SEER
4 TON
4/2016

MODEL
R2A348GKN300
R-22, 13 SEER
4 TON
4/2015



1 M101 MECHANICAL FIRST FLOOR DEMO PLAN
SCALE: 1/4" = 1'-0"



2 M101 MECHANICAL FIRST FLOOR PLAN
SCALE: 1/4" = 1'-0"

KEYED SHEET NOTES

1. EXISTING AIR HANDLING UNIT TO REMAIN. CONTRACTOR TO MODIFY / PROVIDE ALL FLUE AND COMBUSTION AIR PIPING AND TERMINATIONS AS REQUIRED FOR THE BUILDING ADDITION. PROVIDE NEW AIR FILTERS. REPLACE PREVIOUSLY REMOVED APRIL AIRE HUMIDIFIER WITH NEW ONE. BALANCE TO AIRFLOW RATES SHOWN. REFER TO KEYED NOTE 26.
2. EXISTING CONDENSING UNITS TO BE RELOCATED AS REQUIRED FOR INSTALLATION OF NEW BUILDING ADDITION AND WALKWAY. MECHANICAL CONTRACTOR TO MODIFY / PROVIDE ALL REFRIGERANT PIPING, CHECK FOR SYSTEM LEAKS, RECHARGE REFRIGERANT LEVELS WITH SAME REFRIGERANT AND TO LEVELS PER MANUFACTURER'S INSTRUCTIONS, CONTROLS AND CONTROL WIRING AS REQUIRED. COORDINATE EXACT LOCATION OF HVAC EQUIPMENT, LENGTH OF PIPE, AND NUMBER OF ELBOWS BETWEEN INDOOR AND OUTDOOR UNITS WITH MANUFACTURE AND ARCHITECT BEFORE MODIFYING REFRIGERATION PIPING. ROUTE REFRIGERANT PIPING FROM OUTDOOR UNIT TO INDOOR UNIT. ALL PIPING SHALL BE CONCEALED IN FINISHED AREA. SIZE PER MANUFACTURES RECOMMENDATIONS. REFER TO KEYED NOTE 26.
3. EXISTING UNIT HEATER TO REMAIN.
4. EXISTING EXHAUST FAN, AND EXHAUST DUCT UP THROUGH ROOF, TO REMAIN.
5. EXISTING OUTDOOR AIR AND COMBUSTION AIR LOUVER TO REMAIN.
6. EXISTING DUCTWORK TO REMAIN.
7. EXISTING AIR DEVICE TO REMAIN. CLEAN TO LIKE NEW CONDITION. BALANCE TO AIR FLOW RATE SHOWN AND / OR AS LISTED IN SCHEDULES.
8. REWORK DUCTWORK AS REQUIRED FOR RANGE HOOD.
9. REMOVE EXISTING FLUE. COORDINATE WITH PLUMBING CONTRACTOR, AND ALL CONNECTIONS, TO VERIFY THAT FLUE CAN BE REMOVED. NEW WATER HEATER FLUES WILL BE PVC, AND NOT NEED THE EXISTING FLUE.
10. UNDERCUT DOOR 1" FOR TRANSFER AIR.
11. REMOVE EXISTING THROUGH THE WALL FAN.
12. REMOVE THE RETURN AIR GRILLE, AND DUCTWORK TO MAIN DUCT BELOW FLOOR, TO POINT INDICATED IN BASEMENT PLAN. PATCH FLOOR AS REQUIRED TO MATCH EXISTING. REFER TO KEYED SHEET NOTE NUMBER 22, AND COORDINATE WITH ARCHITECT AND OWNER'S REPRESENTATIVE BEFORE DEMOLITION.
13. REMOVE EXISTING AIR DEVICES AND TRANSFER AIR DUCT.
14. REMOVE EXISTING AIR DEVICE AND DUCTWORK BACK TO MAIN. CAP AND INSULATE TO MATCH EXISTING.
15. REMOVE EXISTING AIR DEVICE AND DUCTWORK BACK POINT INDICATED. CAP AND INSULATE TO MATCH EXISTING.
16. REMOVE EXISTING EXHAUST FAN AND DUCTWORK BACK POINT INDICATED. CAP AND INSULATE TO MATCH EXISTING.
17. REMOVE EXISTING THERMOSTAT. MODIFY EXISTING CONTROL WIRING AS REQUIRED.
18. PROVIDE PROGRAMMABLE THERMOSTAT / HUMIDISTAT THAT IS COMPATIBLE WITH THE MODIFIED SYSTEM. COORDINATE FINAL LOCATION OF THERMOSTAT WITH ARCHITECT / OWNER PRIOR TO INSTALLATION. FOR THERMOSTATS INSTALLED ON EXPOSED BRICK WALLS, PROVIDE CONDUIT FOR THERMOSTAT WIRE. FOR THERMOSTATS INSTALLED ON EXTERIOR WALLS, INSULATE BACKSIDE OF THERMOSTAT.
19. REMOVE RETURN DUCT TO MAIN RETURN DUCT BELOW FLOOR. REFER TO BASEMENT PLAN. PATCH FLOOR AS REQUIRED TO MATCH EXISTING.
20. EXTEND RETURN DUCT SAME SIZE AS EXISTING, AND ROUTE UP THROUGH FLOOR TO ABOVE FIRST FLOOR CEILING. RELOCATE FLUES, CONDUITS, AND ALL OTHER ITEMS AS REQUIRED. SAW CUT CONCRETE FLOOR AND SUPPORT OPENING AS REQUIRED.
21. DUCT EXHAUST UP THROUGH ROOF, AT LEAST 10' FROM MECHANICAL AIR INTAKES. LINE UP WITH EXISTING EXHAUST PENETRATIONS ON ROOF. PROVIDE RAIN-PROOF CAP TERMINATION WITH BUILT IN BACKDRAFT DAMPER TO MATCH EXISTING ROOF EXHAUST VENTS. PROVIDE BIRD-SCREEN FOR BATH EXHAUST. PROVIDE ROOFING AS TO NOT VOID EXISTING ROOF WARRANTEE.
22. PROVIDE RETURN DUCT SAME SIZE AS FLOOR REGISTER NECK, AND ROUTE THROUGH FLOOR TO FLOOR REGISTER. RELOCATE ITEMS AS REQUIRED. COORDINATE EXACT LOCATION WITH FURNITURE LAYOUT, FIELD CONDITIONS, ARCHITECT, AND OWNER'S REPRESENTATIVE BEFORE SAW CUTTING AND ORDERING MATERIALS. SAW CUT CONCRETE FLOOR AND SUPPORT OPENING AS REQUIRED. EXTEND DUCTWORK IN BASEMENT TO MAIN AS SHOWN IN BASEMENT PLAN. COORDINATE ALL LOCATIONS WITH NEW FURNITURE LAYOUT, AND ALL OTHER TRADES.
23. PROVIDE DUCTED APRILAIRE 130 PINT ENERGY STAR DEHUMIDIFIER. INSTALL PER MANUFACTURER'S INSTRUCTIONS. PROVIDE ALL CONTROLS AND LEAVE UNIT IN OPERATING CONDITION. MODIFY EXISTING SHELVING AS REQUIRED FOR INSTALLATION. PROVIDE CONDENSATE DRAIN IN MECHANICAL ROOM.
24. PROVIDE INDOOR UNIT. VERIFY LOCATION WITH ALL OTHER TRADES. MECHANICAL CONTRACTOR TO PROVIDE 3/4" CONDENSATE DRAIN LINE TO NEAREST FLOOR DRAIN. SLOPE PIPE A MINIMUM OF 1/8" PER FOOT AWAY FROM UNIT. PROVIDE CONDENSATE PUMP HARDWIRED TO UNIT TO PROVIDE THE NECESSARY LIFT TO DRAIN CONDENSATE BY GRAVITY IF REQUIRED. CONDENSATE PUMP SHALL BE COMPLETELY CONCEALED IN UNIT CABINET. ROUTE ALL PIPING AND WIRES, CONCEALED WHERE FEASIBLE, TO AVOID SIGNIFICANT TRIM AND ARCHITECTURAL FEATURES WHEN INSTALLING THEM.
25. PROVIDE OUTDOOR UNIT. COORDINATE EXACT LOCATION OF HVAC EQUIPMENT, LENGTH OF PIPE, AND NUMBER OF ELBOWS, WITH ALL OTHER TRADES AND MANUFACTURE BEFORE ORDERING EQUIPMENT OR ANY MATERIALS. ROUTE REFRIGERANT PIPING FROM OUTDOOR UNIT TO INDOOR UNIT(S). ALL PIPING SHALL BE CONCEALED IN FINISHED AREA. SIZE PER MANUFACTURES RECOMMENDATIONS. MECHANICAL CONTRACTOR TO PROVIDE ALL CONTROLS AND CONTROL WIRING AND LEAVE UNITS IN OPERATING CONDITION.
    - 25.1. MINI SPLIT SYSTEMS: POWER WIRING TO HEAT PUMP BY ELECTRICAL CONTRACTOR. MECHANICAL CONTRACTOR TO FURNISH AND INSTALL METAL CLAD (MC) CABLE BETWEEN OUTDOOR UNIT (ODU) AND INDOOR UNIT (IDU), INCLUDING A DISCONNECT SWITCH NEXT TO IDU. MC CABLE TO BE 14 GA. IF PROTECTED BY 15 AMP FUSES IN ODU, OR A MINIMUM GAUGE AS REQUIRED FOR FULL AMPERAGE OF ODU.
26. MECHANICAL CONTRACTOR TO VERIFY WORKING CONDITION OF EXISTING EQUIPMENT AND PERFORM ROUTINE MAINTENANCE, CLEAN COILS, CHECK REFRIGERANT LEVELS, CHECK FOR REFRIGERANT LEAKS, AND ELECTRICAL COMPONENTS. REPORT ANY DEFICIENCIES TO GENERAL CONTRACTOR. CLEAN TO LIKE NEW CONDITION. MECHANICAL CONTRACTOR TO MODIFY ALL CONTROLS AND CONTROL WIRING AS REQUIRED, AND LEAVE UNITS IN OPERATING CONDITION.

MECHANICAL SCOPE OF WORK

MODIFY HVAC SYSTEM IN EXISTING FIRE HOUSE'S LIVING QUARTERS FOR REVISED FLOOR PLAN. ADD HVAC SYSTEM FOR BUILDING ADDITION.

CODES REFERENCED

- 2017 OHIO MECHANICAL CODE
- 2017 OHIO BUILDING CODE
- ASHRAE 90.1-2010

HVAC DESIGN CONDITIONS

COOLING	HEATING
OUTDOOR: 93 DB / 75 WB	OUTDOOR: 0 DB
INDOOR: 74	INDOOR: 70

GENERAL NOTES

A. THE CONTRACT DRAWINGS ARE DIAGRAMMATIC AND INTENDED TO COVER THE SCOPE OF THE WORK AND TO INDICATE THE GENERAL ARRANGEMENT AND APPROXIMATE SIZE AND LOCATION OF EQUIPMENT, DUCTS, PIPES, ETC. THEY ARE NOT INTENDED TO SHOW EVERY OFFSET, FITTING, AND COMPONENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CHECKING AND VERIFYING ALL CONDITIONS AND DIMENSIONS. DO NOT SCALE THE DRAWINGS. CONTRACTOR TO VERIFY EXISTING SUPPLY AND RETURN DUCTWORK AND PIPING, SYSTEMS, SIZE, AND DUCT AND PIPE TYPE PRIOR TO MAKING CONNECTIONS.
B. FOR FULL SCHEDULES, SPECIFICATIONS, AND COMPLETE LISTING SEE DETAIL SHEETS.
C. COORDINATE ROUTING OF ALL WORK WITH OTHER TRADES.
D. COORDINATE WITH ELECTRICAL CONTRACTOR FOR POWER CONNECTIONS TO ALL MECHANICAL EQUIPMENT.
E. INSTALL ALL EQUIPMENT PER MANUFACTURER'S REQUIREMENTS. MAINTAIN ALL CODE RECOMMENDED CLEARANCES FOR ACCESS AND MAINTENANCE.
F. REFER TO ARCHITECTURAL PLANS FOR DIMENSIONS, AND FINAL CEILING DIFFUSER LOCATIONS.
G. MAINTAIN ALL CODE REQUIRED SERVICE CLEARANCES. FOLLOW CLEARANCE TO COMBUSTIBLE DISTANCE PER MANUFACTURER'S INSTRUCTIONS.
H. PROVIDE BACKDRAFT DAMPERS FOR ALL EXHAUST SYSTEMS AND EITHER LOUVER, BRICK VENT, OR CAPS AT ALL EXTERIOR BUILDING PENETRATIONS.
I. ROUTE ALL SUPPLY, RETURN, AND EXHAUST DUCTWORK ABOVE DROP CEILING OR IN BULKHEADS. COORDINATE ROUTING WITH ARCHITECTURAL DRAWINGS. PROVIDE FIRE, SMOKE, AND FIRE / SMOKE RATED DAMPERS ON ALL PENETRATIONS TO RATED WALLS, CEILINGS, AND FLOORS. PROVIDE RADIATION DAMPERS ON ALL AIR DEVICES, FANS, ETC., THAT PENETRATE THE MEMBRANE OF THE RATED FLOOR/CEILING ASSEMBLY. REFER TO ARCHITECTURAL PLANS FOR LOCATIONS.
J. ROUTE ALL AIR CONDITIONER CONDENSATE TO NEARBY FLOOR DRAIN. PROVIDE MINIMUM SLOPE OF 1/8 " PER FOOT. SIZE CONDENSATE PER SECTION 307.2.2 OF THE OHIO MECHANICAL CODE.
K. PROVIDE AN APPROVED THROUGH PENETRATION FIRESTOP FOR ALL PIPING INSTALLED AS TESTED IN ACCORDANCE WITH ASTM E814 OR UL 1479. FIRESTOP SHALL HAVE A MINIMUM POSITIVE PRESSURE DIFFERENTIAL OF 0.01 INCHES OF WATER AND SHALL HAVE AN F RATING OF NOT LESS THAN THE REQUIRED FIRE-RESISTANCE RATING OF THE WALL OR FLOOR PENETRATED.
L. ANY EQUIPMENT THAT IS SUBSTITUTED SHALL FIT IN THE SPACE PROVIDED WITH ADEQUATE ROOM FOR SERVICING, INCLUDING SUBSTITUTE EQUIPMENT NAMED IN THE SPECIFICATIONS. SUBMIT A 1/4" SCALE DRAWING OF ALL EQUIPMENT SUBSTITUTED FOR APPROVAL PRIOR TO INSTALLATION, INCLUDING, BUT NOT LIMITED TO, STRUCTURAL AND ARCHITECTURAL IMPACT, CLEARANCE REQUIREMENTS AND UTILITY REQUIREMENTS. IT IS THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR TO COORDINATE ALL NEW ELECTRICAL AND PLUMBING REQUIREMENTS WITH THE ELECTRICAL AND PLUMBING CONTRACTORS.
M. PROVIDE ALL NECESSARY MODIFICATIONS TO CONTROL WIRING, ETC. TO RELOCATED EXISTING MECHANICAL EQUIPMENT TO NEW LOCATIONS SHOWN.
N. PROVIDE COMPLETE CONTROL SYSTEM, AND LEAVE UNITS IN OPERATING CONDITION.

SYMBOLS LEGEND – HVAC

T	THERMOSTAT
L	LINE VOLTAGE THERMOSTAT
R	REMOTE SENSOR
C	CO2 SENSOR
H	HUMIDISTAT
	CEILING DIFFUSER
	SIDE WALL GRILL
	RETURN WALL GRILL
	AIR FLOW DIRECTION
14x10	DUCTWORK
14x10	LINED DUCTWORK
	TYPICAL SUPPLY DUCT DN
	TYPICAL RETURN DUCT DN
	TYPICAL EXHAUST DUCT
	TURNING VANES
	FLEXIBLE DUCT, 8'-0" LONG MAX.
	TYPICAL ROUND DUCT DN
	ROUND DUCT UP
DS	DUCT SMOKE DETECTOR
FD	FIRE DAMPER
	MVD MANUAL VOLUME DAMPER
MOD	MOD MOTOR OPERATED DAMPER
ANN	ANNUNCIATER PANEL
	DROPPED CEILING/SOFFIT
	DUCT CONTINUATION
COND	CONDENSATE PIPING
	CONNECTION POINT

STATE OF OHIO
SCOTT SEVERT STILKEY
E-77795
REGISTERED PROFESSIONAL ENGINEER

ISSUANCES

NO.	DESCRIPTION	DATE
1	FOR PERMIT	10/07/2021
2	REVISION #1	09/27/2022

FIRE STATION 25

335 ERIE BOULEVARD
HAMILTON, OHIO 45011

PR-08889
ENGINEERED BUILDING SYSTEMS INC.
Shared Success Through Collaboration and Efficiency
515 Monmouth Street, Suite 201
Newport, KY 41071 (859) 261-0585
MEP Consulting Services, Inc. in OH

DRAWN BY	CHECKED BY
SRB	SSS

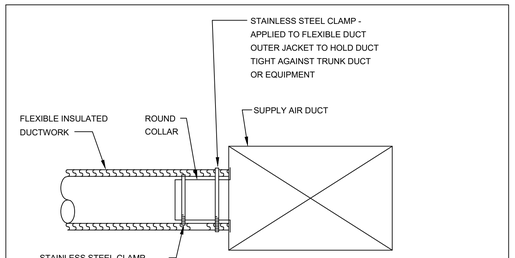
PROJECT NO.: 8989

SCALE:AS NOTED

DATE:10-07-2021

DRAWING TITLE
MECHANICAL FIRST FLOOR PLANS

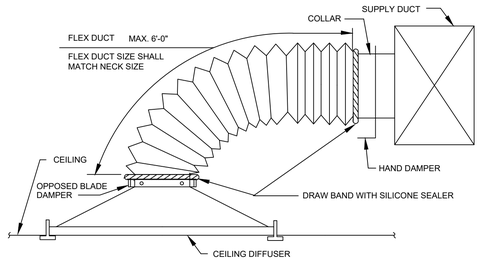
SHEET NO.
M101



TYPICAL FLEXIBLE DUCT CONNECTION

N.T.S.

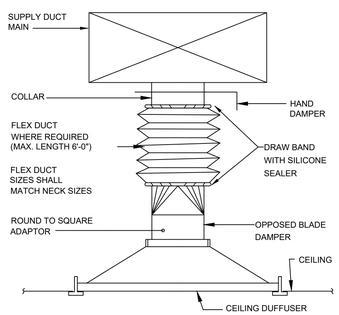
1



TYPICAL DIFFUSER CONNECTION
(SIDE OF DUCT CONNECTION)

NOT TO SCALE

2



TYPICAL DIFFUSER CONNECTION
(BOTTOM OF DUCT CONNECTION)

NOT TO SCALE

3

MULTI ZONE - MINI SPLIT SYSTEM SCHEDULE

TAG	AREA SERVED	MANUFACTURER	MODEL	CFM	RATED CLG MBH	RATED HTG MBH	VOLT/PHASE	MCA	MOCP	SEER - NON DUCTED UNITS	HSPF - NON DUCTED UNITS	MOUNTING	NOTES
MSHP-18	ADDITION	LG "MULTI - F WITH LGRED"	LMU180HHV	-	18	22	208-230 / 1	18.6	30	21	10	OUTDOORS	2 / 2 (MIN./MAX. INDOOR CONNECTED UNITS)
MS-09	SLEEPING ROOM 101	LG	LSN090HSV5	169 / 218 / 268	9	10.9	208-230 / 1	0.4	-	-	-	WALL INDOORS	-
MS-09	SLEEPING ROOM 102	LG	LSN090HSV5	169 / 218 / 268	9	10.9	208-230 / 1	0.4	-	-	-	WALL INDOORS	-

NOTES FOR ALL UNITS
1. R410A REFRIGERANT
2. COOLING OPERATING RANGE 14F TO 118F
3. HEATING OPERATING RANGE -13F TO 75F
4. ELECTRICAL POWER BY ELECTRICAL CONTRACTOR. INDOOR UNITS FED FROM OUTDOOR UNIT.
5. PROVIDE LG PREMTA000 WIRED REMOTE CONTROLLER
6. PROVIDE LG PZCWRCG3 GROUP CONTROL KIT.
7. MECHANICAL CONTRACTOR TO FURNISH AND INSTALL MC CABLE BETWEEN OUTDOOR UNIT (ODU) AND INDOOR UNIT (IDU), INCLUDING A DISCONNECT SWITCH NEXT TO IDU. MC CABLE TO BE 14 GA IF PROTECTED BY 15 AMP FUSES IN ODU, OR A MINIMUM GAUGE AS REQUIRED FOR FULL AMPERAGE OF ODU.
8. MECHANICAL CONTRACTOR TO PROVIDE ALL CONTROLS AND CONTROL WIRING.
9. PROVIDE CONDENSATE PUMP WHERE REQUIRED TO LIFT CONDENSATE PIPE TO BE DRAINED BY GRAVITY.
10. LOW AMBIENT KIT.
11. PROVIDE REFRIGERATION PIPING AND COORDINATE SIZING WITH MANUFACTURER.
12. HEAT PUMP PAD EQUIVALENT TO DIVERSITECH 8 INCH HEAT PUMP PAD FOR GROUND MOUNTING. COORDINATE EXACT REQUIREMENTS AND LOCATION WITH ARCHITECT.
13. COORDINATE LOCATION OF ALL UNITS WITH ARCHITECT
14. PROVIDE REMOTE SENSOR, BRANCH DISTRIBUTION, ALL OTHER REQUIRED ACCESSORIES REQUIRED.

FAN SCHEDULE

TAG	TYPE	AREA SERVED	MANUFACTURER	MODEL	DRIVE	CFM	ESP	WATTS	RPM	VOLT/PHASE	MOUNTING	WEIGHT	NOTES
E-1	EXHAUST	BASEMENT RESTROOM	-	-	-	70	-	-	-	-	INLINE	-	1, EXISTING TO REMAIN
E-2	EXHAUST	1ST FLOOR MENS ROOM	GREENHECK	SP-A190	DIRECT	170	0.25	37	1400	115 / 1	CEILING	17	1
E-3	EXHAUST	1ST FLOOR UNISEX ROOM	GREENHECK	SP-B80	DIRECT	70	0.25	18	900	115 / 1	CEILING	9	1

1. FAN SHALL RUN CONTINUOUSLY.

MECHANICAL VENTILATION SCHEDULE* (AHU-1/CU-1) LIVING QUARTERS

SYSTEM TAG	ROOM NUMBER	ROOMNAME	AREA Az (ft2)	OCCUPANCY DENSITY (PEOPLE/1000 ft2)	RATE Rp (CFM/PERSON)	PEOPLE (Pz)	TOTAL Rp*Pz (CFM)	RATE Ra (CFM/ft2)	TOTAL Ra*Az (CFM)	BREATHING ZONE OUTDOOR AIRFLOW Vbz (CFM)	ZONE EFFECTIVENESS (EZ)	ZONE OUTDOOR AIRFLOW Voz (CFM)	REQUIRED SUPPLY AIRFLOW CFM	OUTSIDE AIR PRIMARY AIR RATIO, (Zp)	ACTUAL OA CFM	ACTUAL OUTDOOR AIR %	REMARKS
AHU-1/CU-1	100B	ENTRY	34	0	0	1	0	0.06	2	2	0.8	2.6	300	0.01	3	4.8%	
AHU-1/CU-1	100	LIVING QUARTERS	764	5	15	5	75	0	0	75	0.8	93.8	1,300	0.07	94	4.8%	
TOTALS:			798			6	75		2	77		96.3	1,600	0.07	96		

* ALL VENTILATION CALCULATIONS PERFORMED PER CHAPTER 403 OF THE OHIO MECHANICAL CODE.

Vou (CFM UNCORRECTED OUTDOOR AIR INTAKE) = 77
Ev (SYSTEM VENTILATION EFFICIENCY) = 1.0
Vot (CFM OUTDOOR AIR INTAKE REQUIRED PER 403 OMC MULTIPLE ZONE EQUATIONS) = 77

CFM REQUIRED AT 15 CFM / PERSON = 90
CFM REQUIRED AT 0.3.5 ACH = 47

MECHANICAL VENTILATION SCHEDULE* (AHU-2/CU-2) SLEEPING ROOMS

SYSTEM TAG	ROOM NUMBER	ROOMNAME	AREA Az (ft2)	OCCUPANCY DENSITY (PEOPLE/1000 ft2)	RATE Rp (CFM/PERSON)	PEOPLE (Pz)	TOTAL Rp*Pz (CFM)	RATE Ra (CFM/ft2)	TOTAL Ra*Az (CFM)	BREATHING ZONE OUTDOOR AIRFLOW Vbz (CFM)	ZONE EFFECTIVENESS (EZ)	ZONE OUTDOOR AIRFLOW Voz (CFM)	REQUIRED SUPPLY AIRFLOW CFM	OUTSIDE AIR PRIMARY AIR RATIO, (Zp)	ACTUAL OA CFM	ACTUAL OUTDOOR AIR %	REMARKS
AHU-2/CU-2	103	SLEEPING ROOM #3	91	5	15	1	15	0	0	15	0.8	18.8	265	0.07	16	6.1%	
AHU-2/CU-2	104	SLEEPING ROOM #4	91	5	15	1	15	0	0	15	0.8	18.8	265	0.07	16	6.1%	
AHU-2/CU-2	105	SLEEPING ROOM #5	92	5	15	1	15	0	0	15	0.8	18.8	265	0.07	16	6.1%	
AHU-2/CU-2	106	SLEEPING ROOM #6	92	5	15	1	15	0	0	15	0.8	18.8	265	0.07	16	6.1%	
AHU-2/CU-2	110	HALL - NORTH	148	0	0	0	0	0.06	9	9	0.8	11.0	80	0.14	5	6.1%	
AHU-2/CU-2	110	HALL - SOUTH	224	0	0	0	0	0.06	13	13	0.8	16.8	120	0.14	7	6.1%	
AHU-2/CU-2	108	MENS	112	0	0	0	0	0	0	0	0.8	0.0	100	0.00	6	6.1%	
AHU-2/CU-2	109	UNISEX	87	0	0	0	0	0	0	0	0.8	0.0	50	0.00	3	6.1%	
AHU-2/CU-2	111	OFFICE	185	5	5	1	5	0.06	11	16	0.8	20.1	190	0.11	12	6.1%	
TOTALS:			1,120			5	65		33	98		122.9	1,600	0.14	98		

* ALL VENTILATION CALCULATIONS PERFORMED PER CHAPTER 403 OF THE OHIO MECHANICAL CODE.

Vou (CFM UNCORRECTED OUTDOOR AIR INTAKE) = 98
Ev (SYSTEM VENTILATION EFFICIENCY) = 1.0
Vot (CFM OUTDOOR AIR INTAKE REQUIRED PER 403 OMC MULTIPLE ZONE EQUATIONS) = 98

CFM REQUIRED AT 15 CFM / PERSON = 75
CFM REQUIRED AT 0.3.5 ACH = 66

MECHANICAL VENTILATION SCHEDULE* (AHU-3/CU-3) BASEMENT

SYSTEM TAG	ROOM NUMBER	ROOMNAME	AREA Az (ft2)	OCCUPANCY DENSITY (PEOPLE/1000 ft2)	RATE Rp (CFM/PERSON)	PEOPLE (Pz)	TOTAL Rp*Pz (CFM)	RATE Ra (CFM/ft2)	TOTAL Ra*Az (CFM)	BREATHING ZONE OUTDOOR AIRFLOW Vbz (CFM)	ZONE EFFECTIVENESS (EZ)	ZONE OUTDOOR AIRFLOW Voz (CFM)	REQUIRED SUPPLY AIRFLOW CFM	OUTSIDE AIR PRIMARY AIR RATIO, (Zp)	ACTUAL OA CFM	ACTUAL OUTDOOR AIR %	REMARKS
AHU-3/CU-3	099	GENERAL PURPOSE - STAIRS	1,370	5	15	7	105	0	0	105	0.8	131.3	650	0.20	100	15.4%	
AHU-3/CU-3	094	STORAGE	406	0	0	0	0	0.12	49	49	0.8	60.9	300	0.20	46	15.4%	
AHU-3/CU-3	096	RESTROOM	80	0	0	0	0	0	0	0	0.8	0.0	0	0.00	0	15.4%	
AHU-3/CU-3	097	OFFICE	119	5	5	1	5	0.06	7	12	0.8	15.2	250	0.06	38	15.4%	
TOTALS:			1,975			8	110		56	166		207.3	1,200	0.20	184		

* ALL VENTILATION CALCULATIONS PERFORMED PER CHAPTER 403 OF THE OHIO MECHANICAL CODE.

Vou (CFM UNCORRECTED OUTDOOR AIR INTAKE) = 166
Ev (SYSTEM VENTILATION EFFICIENCY) = 0.9
Vot (CFM OUTDOOR AIR INTAKE REQUIRED PER 403 OMC MULTIPLE ZONE EQUATIONS) = 184

CFM REQUIRED AT 15 CFM / PERSON = 120
CFM REQUIRED AT 0.3.5 ACH = 116

DIFFUSER, GRILLE, AND REGISTER SCHEDULE

CALLOUT	DESCRIPTION	FACE SIZE (IN)	INLET SIZE (IN)	MODEL	NOTES
CD-4	4-WAY THREE CONE DIFFUSER	24x24	8Ø	TITUS TMS	REMOVABLE CORE FROM FACE OF DIFFUSER. INSULATE BACK OF DIFFUSER.
CD-5	4-WAY THREE CONE DIFFUSER	24x24	10Ø	TITUS TMS	REMOVABLE CORE FROM FACE OF DIFFUSER. INSULATE BACK OF DIFFUSER.
FRG-1	FLOOR RETURN GRILLE	26x26	24x24	HART & COOLEY MODEL 265	GOLDEN SAND ENAMEL FINISH.
RG-1	EGGCRATE RETURN GRILLE	24x12	22x10	TITUS 50F	#26 WHITE FINISH.
SR-3	STEEL DOUBLE DEFLECTION, 3/4" BLADE SPACING, FRONT BLADES PARALLEL TO LONG DIMENSION.	14x10	12x8	TITUS 300RL	STEEL OPPOSED-BLADE DAMPER OPERABLE FROM THE FACE OF THE GRILLE.

NOTES FOR ALL AIR DEVICES:
1. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR MOUNTING TYPE
2. DUCT RUN-OUT SAME SIZE AS NECK UNLESS NOTED OTHERWISE
3. PLASTER FRAME WHERE LOCATED IN GYPSUM CEILING
4. PAINT DUCTWORK THAT IS VISIBLE BEHIND AIR DEVICES MATTE BLACK
5. AIR DEVICES SHALL BE ALUMINUM IN HIGH MOISTURE AREAS
6. DO NOT CONNECT AIR DEVICE DIRECTLY TO DUCT. PROVIDE FULL SIZE TAKE-OFF WITH BALANCING DAMPER TO MAIN OR BRANCH DUCT.
7. WHERE AIR DEVICES ARE LOCATED IN A FIRE RATED ASSEMBLY, PROVIDE CEILING RADIATION DAMPERS, FIRE DAMPER, FIRE RATED INSULATION, AS REQUIRED PER CODE.
8. PROVIDE SAMPLE AIR DEVICES STYLE AND COLOR, FOR OWNER'S REPRESENTATIVE APPROVAL, BEFORE ORDERING FINAL AIR DEVICES.
9. ADD INSULATION TO THE BACK OF ALL AIR DEVICES.

MECHANICAL EXHAUST SCHEDULE

ROOM NUMBER	ROOMNAME	OCCUPANCY CLASSIFICATION	FIXTURES: EXHAUST RATE PER FIXTURE (CFM)	FIXTURES: LOWER CONTINUOUS RATE?	FIXTURES: HIGHER INTERMITTENT RATE?	FIXTURES: QTY. OF FIXTURES	TOTAL EXHAUST AIRFLOW REQ. (CFM)	TOTAL EXHAUST AIRFLOW ACT. (CFM)	NOTES
-	BASEMENT RESTROOM	TOILET ROOM	50 / 70	YES	NO	1	50	50	E-1
-	BASEMENT RESTROOM	SHOWER ROOM (PER HEAD)	20 / 50	YES	NO	1	20	20	E-1
	BASEMENT RESTROOM							70	E-1 (TOTAL)
-	FIRST FLOOR MENS	TOILET ROOM	50 / 70	YES	NO	2	100	100	E-2
-	FIRST FLOOR MENS	SHOWER ROOM (PER HEAD)	20 / 50	YES	NO	1	20	20	E-2
	FIRST FLOOR MENS							120	E-2 (TOTAL)
-	FIRST FLOOR UNISEX	TOILET ROOM	50 / 70	YES	NO	1	50	50	E-3
-	FIRST FLOOR UNISEX	SHOWER ROOM (PER HEAD)	20 / 50	YES	NO	1	20	20	E-3
	FIRST FLOOR UNISEX							70	E-3 (TOTAL)

EXHAUST CALCULATIONS PER SEC 403 OF 2017 OHIO MECHANICAL CODE

NATURAL VENTILATION SCHEDULE -

ROOM NUMBER	ROOMNAME	AREA	WINDOW OPENABLE AREA [SQ. FT]	TOTAL OPENABLE AREA	4% OF FLOOR AREA
101	SLEEPING ROOM 1	95	18.0	18.0	3.8
102	SLEEPING ROOM 2	74	18.0	18.0	3.0

NATURAL VENTILATION CALCULATIONS PER SEC 402.1 OF 2017 OMC

NATURAL VENILATION OF THE OCCUPIED SPACE SHALL BE THROUGH WINDOWS, DOORS, OR OTHER OPENINGS TO THE SPACE. THE OPERATING MECHANISM FOR SUCH OPENINGS SHALL BE PROVIDED WITH READY ACCESS SO THAT THE OPENINGS ARE READILY CONTROLLABLE BY THE BUILDING OCCUPANTS.

AIR BALANCE SCHEDULE

TAG	AREA DESCRIPTION	EXHAUST CFM	OUTSIDE AIR CFM	NET PRESSURE
AHU-1	LIVING QUARTERS	-	100	
AHU-2	SLEEPING AREAS	-	100	
AHU-3	BASEMENT	-	185	
E-1	BASEMENT RESTROOM	70	-	
E-2	1ST FLOOR MENS ROOM	170	-	
E-3	1ST FLOOR UNISEX ROOM	70	-	
	TOTALS (CFM)	310	385	75

SCOTT SEVERT STILKEY E-77795 REGISTERED PROFESSIONAL ENGINEER STATE OF OHIO

ISSUANCES

NO.	DESCRIPTION	DATE
1	FOR PERMIT	10/07/2021
2	REVISION #1	09/27/2022

FIRE STATION 25

335 ERIE BOULEVARD
HAMILTON, OHIO 45011

PR-08989

ENGINEERED BUILDING SYSTEMS INC.
Shared Success Through Collaboration and Efficiency
515 Monmouth Street, Suite 201
Newport, KY 41071 (859) 261-0585
MEP Consulting Services, Inc. in OH

DRAWN BY	CHECKED BY
SRB	SSS

PROJECT NO.: 8989

SCALE:AS NOTED

DATE:10-07-2021

DRAWING TITLE
MECHANICAL DETAILS AND SCHEDULES

SHEET NO.
M200

MECHANICAL SPECIFICATIONS

1. GENERAL
   a. REFER TO ARCHITECTURAL DRAWINGS, GENERAL NOTES, INSTRUCTIONS TO BIDDERS, GENERAL CONDITIONS, SUPPLEMENTARY GENERAL CONDITIONS, BASE BUILDING SPECIFICATIONS AND DRAWINGS, SHOP DRAWING MANUALS AND AS-BUILT PLANS, EXCEPT AS NOTED HEREIN, WHICH APPLY IN ALL RESPECTS TO THIS SECTION. THE CONTRACTOR SHALL VISIT THE SITE AND FAMILIARIZE HIMSELF WITH ALL EXISTING CONDITIONS PRIOR TO BIDDING THE WORK
2. USE OF DRAWINGS AND SPECIFICATIONS
   a. EBS DRAWINGS AND SPECIFICATIONS ARE INTENDED TO CONVEY DESIGN INTENT ONLY. ALL MEANS AND METHODS SEQUENCES, TECHNIQUES, AND PROCEDURES OF CONSTRUCTION AS WELL AS ANY ASSOCIATED SAFETY PRECAUTIONS AND PROGRAMS, AND ALL INCIDENTAL AND TEMPORARY DEVICES REQUIRED TO CONSTRUCT THE PROJECT, AND TO PROVIDE A COMPLETE AND FULLY OPERATIONAL MECHANICAL SYSTEM ARE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR.
3. STANDARDS
   a. EQUIPMENT AND MATERIALS SHALL CONFORM WITH APPROPRIATE PROVISIONS OF AGA, ARI, ASME, ASTM, CISPI, UL, NEMA, ANSI, SMACNA, ASHRAE, NFPA, NEC, AS APPLICABLE TO EACH INDIVIDUAL UNIT OR ASSEMBLY. ALL EQUIPMENT MUST BEAR UL LABEL.
4. LICENSE / EXPERIENCE
   a. CONTRACTOR MUST BE LICENSED BY THE STATE TO INSTALL HVAC SYSTEMS/EQUIPMENT. CONTRACTOR MUST ALSO HAVE A MINIMUM OF 5 YEARS OF EXPERIENCE AND HAVE INSTALLED AT LEAST (5) SUCCESSFUL PROJECT INSTALLATIONS OF SIMILAR SIZE AND SCOPE. REFERENCES MUST BE PROVIDED UPON REQUEST.
5. CODES
   a. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH ALL APPLICABLE STATE AND LOCAL CODES AND ORDINANCES. THE MECHANICAL CONTRACTOR SHALL SATISFY CODE REQUIREMENTS AT A MINIMUM WITHOUT ANY EXTRA COST TO THE OWNER. IN CASE OF CONFLICT BETWEEN THE DRAWINGS/SPECIFICATIONS AND THE CODES AND ORDINANCES, THE HIGHEST STANDARD SHALL APPLY.
6. PERMITS AND FEES
   a. THE MECHANICAL CONTRACTOR SHALL PROCURE AND PAY FOR ALL PERMITS, FEES, TAXES, AND INSPECTIONS NECESSARY TO COMPLETE THE MECHANICAL WORK. FURNISH CERTIFICATE OF APPROVAL FOR WORK FROM INSPECTION AUTHORITY TO OWNER BEFORE FINAL ACCEPTANCE FOR WORK. CERTIFICATE OF FINAL INSPECTION AND APPROVAL SHALL BE SUBMITTED WITH THE CONTRACTOR'S REQUEST FOR PAYMENT. NO FINAL PAYMENT WILL BE APPROVED WITHOUT THIS CERTIFICATE.
7. SITE EXAMINATION
   a. THE MECHANICAL CONTRACTOR SHALL THOROUGHLY EXAMINE ALL AREAS OF WORK WHERE EQUIPMENT, DUCTWORK, AND PIPING WILL BE INSTALLED AND SHALL REPORT ANY CONDITION THAT, IN HIS OPINION, PREVENTS THE PROPER INSTALLATION OF THE MECHANICAL WORK PRIOR TO BID. CONTRACTOR SHALL ALSO EXAMINE THE DRAWINGS AND SPECIFICATIONS OF OTHER BRANCHES OF WORK, MAKING REFERENCE TO THEM FOR DETAILS OF NEW OR EXISTING BUILDING CONDITIONS. NO EXTRAS WILL BE ALLOWED FOR FAILURE TO INCLUDE ALL REQUIRED WORK IN BID.
   b. ALL WORK SHALL BE DONE AT TIMES CONVENIENT TO THE OWNER AND ONLY DURING NORMAL WORKING HOURS, UNLESS SPECIFIED OTHERWISE.
   c. MECHANICAL CONTRACTOR SHALL TAKE THEIR OWN MEASUREMENTS AND BE RESPONSIBLE FOR THEM.
   d. ACCESS PANELS ARE NOT SHOWN ON DRAWINGS. DURING SITE EXAMINATION, CONTRACTOR SHALL IDENTIFY ALL AREAS WHERE ACCESS PANELS ARE REQUIRED, AND REPORT TO GENERAL CONTRACTOR. DESIGNATION OF WHO FURNISHES AND WHO INSTALLS ACCESS PANELS MUST BE COORDINATED WITH GENERAL CONTRACTOR PRIOR TO STARTING WORK.
   e. MECHANICAL CONTRACTOR RESPONSIBLE FOR SITE INVESTIGATION PRIOR TO BID TO REVEAL FULL SCOPE OF WORK.
8. CONTRACTOR COORDINATION
   a. COORDINATION DRAWINGS SHOWING SYSTEM AND COMPONENT INSTALLATION LAYOUT, ROUTING, DETAILS, ETC. SHALL BE PRODUCED BY THE MECHANICAL CONTRACTOR AND UNDER THE SUPERVISION OF THE GENERAL CONTRACTOR/CONSTRUCTION MANAGER, OR APPROPRIATE PARTY AS APPLICABLE.
   b. ALL SYSTEMS INSTALLED BY EACH SUB-CONTRACTOR SHALL BE COORDINATED WITH ONE ANOTHER AND APPROVED BY GENERAL CONTRACTOR/CONSTRUCTION MANAGER, ETC. PRIOR TO INSTALLATION AND/OR FABRICATION.
   c. IF QUESTIONS CONCERNING DESIGN INTENT ARISE DURING COORDINATION, EBS CAN ASSIST WHERE APPROPRIATE.
   d. THE ARCHITECTURAL DRAWINGS SHALL TAKE PRECEDENCE OVER ALL OTHER DRAWINGS. DO NOT SCALE DISTANCES OFF THE MECHANICAL DRAWINGS; USE ACTUAL BUILDING DIMENSIONS.
9. SHOP DRAWINGS / SUBMITTALS
   a. SUBMIT TO THE ARCHITECT ELECTRONIC COPIES OF COMPLETE AND CERTIFIED SHOP DRAWINGS, DESCRIPTIVE DATA, PERFORMANCE DATA AND RATINGS, DIAGRAMS AND SPECIFICATIONS ON ALL SPECIFIED EQUIPMENT, INCLUDING ACCESSORIES, AND MATERIALS FOR REVIEW. THE MAKE, MODEL NUMBER, TYPE, FINISH AND ACCESSORIES OF ALL EQUIPMENT AND MATERIALS SHALL BE REVIEWED AND APPROVED BY THE MECHANICAL CONTRACTOR AND GENERAL CONTRACTOR PRIOR TO SUBMITTING TO THE ARCHITECT FOR THEIR REVIEW AND APPROVAL. APPROVAL OF SHOP DRAWINGS DOES NOT RELIEVE THE MECHANICAL CONTRACTOR/VENDOR FROM COMPLIANCE WITH THE REQUIREMENTS OF THE CONTRACT DRAWINGS, SPECIFICATIONS AND APPLICABLE CODES.
   b. SHOP DRAWINGS SHALL BE REQUIRED FOR THE FOLLOWING:
      i. HVAC EQUIPMENT
      ii. FANS
      iii. DIFFUSERS, REGISTERS, GRILLES, DAMPERS, LOUVERS, AND ALL SHEET METAL ACCESSORIES
      iv. TEMPERATURE CONTROLS
      v. SHEET METAL COORDINATION DRAWINGS
      vi. DUCT SEALANTS FOR LEED PROJECTS
      vii. AIR BALANCE REPORT
   c. PRODUCTS INSTALLED BY THE MECHANICAL CONTRACTOR AND PROVIDED BY OTHERS MUST BE SUBMITTED FOR REVIEW PRIOR TO PURCHASING. PRODUCTS SHALL NOT BE SELECTED BASED ON PERMIT DRAWINGS WITHOUT EXPRESS PERMISSION - PRODUCTS SHALL BE SELECTED BASED ON CONSTRUCTION DRAWINGS.
10. RECORD DRAWING
    a. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR CREATING RECORD DRAWINGS WHERE REQUIRED. DRAWINGS SHALL BE PRODUCED IN AUTOCAD 2004 FORMAT OR LATER.
11. TESTING
    a. ALL MECHANICAL SYSTEMS SHALL BE TESTED FOR PROPER OPERATION.
12. FIRE STOPPING
    a. PROVIDE FIRE STOPPING AT ALL PENETRATIONS THROUGH RATED SEPARATIONS PER LOCAL CODES & REGULATIONS & PER UL RECOMMENDATIONS FOR ASSEMBLIES ENCOUNTERED IN PROJECT.
    b. THE FIRE STOPPING MATERIAL SHALL MEET THE INTEGRITY OF THE FIRE RATED WALL, FLOOR, CEILING & ROOF BEING PENETRATED. REFER TO ARCHITECT'S DRAWINGS FOR WALL, FLOOR, CEILING & ROOF FIRE RATINGS PRIOR TO BIDDING WORK.
    c. REFER TO ARCHITECT'S DRAWINGS FOR WALL, FLOOR, CEILING, AND ROOF FIRE RATINGS PRIOR TO BIDDING WORK.
13. ACCESS PANELS
    a. PROVIDE CEILING AND WALL ACCESS PANEL QUANTITIES & LOCATIONS TO THE GENERAL CONTRACTOR PRIOR TO BIDDING. ACCESS PANELS ARE REQUIRED FOR ALL CONCEALED APPLIANCES, CONTROLS DEVICES, HEAT EXCHANGERS AND HVAC SYSTEM COMPONENTS THAT UTILIZE ENERGY. WHERE ACCESS PANELS ARE USED, THE ACCESS PANEL SHOULD BE SIZED TO ALLOW ACCESSIBILITY FOR INSPECTION, SERVICE, REPAIR AND REPLACEMENT WITHOUT DISABLING THE FUNCTION OF A FIRE-RESISTANCE-RATED ASSEMBLY OR REMOVING PERMANENT CONSTRUCTION, OTHER APPLIANCES, VENTING SYSTEMS OR ANY OTHER PIPING OR DUCTS NOT CONNECTED TO THE APPLIANCE BEING INSPECTED, SERVICED, REPAIRED OR REPLACED. THERE SHALL BE NO EXTRAS FOR HAVING TO ADD ACCESS PANELS AFTER BIDS ARE AWARDED.
    b. PROVIDE ACCESS PANELS, DOORS, ETC. WHERE REQUIRED TO ALLOW FOR COMPLETE REMOVAL OF APPLIANCES WITHOUT THE REMOVAL OF PERMANENT BUILDING CONSTRUCTION MATERIALS.
14. CUTTING AND PATCHING
    a. NEATLY DO ALL CUTTING AS REQUIRED AND PATCH ALL CUT SURFACES TO MATCH BUILDING CONSTRUCTION. THE CONTRACTOR SHALL EMPLOY AND PAY A TRADE TRAINED AND QUALIFIED TO PERFORM THE REQUIRED PATCHING WORK. ALL SURFACES DISTURBED SHALL BE RESTORED WITH LIKE MATERIALS TO THE SATISFACTION OF THE OWNER. ALL PENETRATIONS THROUGH ROOF SHALL BE MADE BY BONDED ROOFER. MECHANICAL CONTRACTOR SHALL PAY ALL FEES REQUIRED.
15. FLASHING & COUNTERFLASHING
    a. ROOF FLASHING SHALL BE FURNISHED AND INSTALLED BY THE ROOFING CONTRACTOR. ROOF COUNTERFLASHING SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR. COORDINATE WORK WITH ROOFING CONTRACTOR AND PAY ALL FEES.
    b. OBTAIN APPROVAL FROM GENERAL CONTRACTOR, CONSTRUCTION MANAGER, OWNER AND/OR ROOFING CONTRACTOR PRIOR TO MAKING ANY PENETRATIONS SO THAT WARRANTIES ARE NOT COMPROMISED OR VOIDED.
16. WARRANTY
    a. THE MECHANICAL CONTRACTOR SHALL UNCONDITIONALLY WARRANT ALL WORK TO BE FREE OF DEFECTS IN EQUIPMENT, MATERIAL AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF FINAL ACCEPTANCE BY OWNER. THE MECHANICAL CONTRACTOR WILL REPAIR OR REPLACE ANY DEFECTIVE WORK PROMPTLY AND WITHOUT CHARGE TO THE OWNER.
    b. RESTORE ANY OTHER EXISTING WORK DAMAGED IN THE COURSE OF REPAIRING DEFECTIVE EQUIPMENT, MATERIALS AND WORKMANSHIP.
17. MECHANICAL WORK
    a. THE MECHANICAL CONTRACTOR SHALL PROVIDE NEW HVAC EQUIPMENT, FANS, DUCTWORK, PIPING, AIR DEVICES, CONTROLS AS INDICATED ON DRAWINGS AND AS SPECIFIED. STARTUP AND 1ST YEAR PARTS AND LABOR WARRANTY SHALL BE INCLUDED AND MANUFACTURER'S EXTENDED WARRANTIES, EQUIPMENT AND APPLIANCES SHALL BE INSTALLED AS REQUIRED BY THE TERMS OF THEIR APPROVAL, IN ACCORDANCE WITH THE CONDITIONS OF THE LISTING, THE MANUFACTURER'S INSTALLATION INSTRUCTIONS, AND THE APPLICABLE CODE.
18. OWNER'S INSTRUCTIONS
    a. PROVIDE TWO SETS OF COMPLETE OPERATING AND MAINTENANCE INSTRUCTIONS WITH DRAWINGS, TYPEWRITTEN INSTRUCTIONS AND OPERATING SEQUENCES AND DESCRIPTIVE DATA SHEETS. ASSEMBLE EACH SET IN A HARD-BOUND COVER. PROVIDE PDF FILES OF ALL DOCUMENTATION.
19. FINALE
    a. PUT ALL EQUIPMENT IN SERVICE AND DEMONSTRATE THAT ALL CONDITIONS OF THE CONTRACT HAVE BEEN FULFILLED. REMOVE ALL TOOLS, DEBRIS, ETC. OCCASIONED BY WORK UNDER THIS CONTRACT. SUBMIT ALL WARRANTIES, TEST REPORTS, OPERATING AND MAINTENANCE MANUALS FOR HVAC SYSTEMS, LOG SHEETS AND CHARTS, AND GUARANTEES AS PREVIOUSLY SPECIFIED. PROVIDE ALL REPORTS, FORMS, ETC. REQUIRED BY INSPECTORS TO THE SATISFACTION OF THE OWNER. PROVIDE AS-BUILT RECORD DRAWINGS (IN AUTOCAD 2007 OR LATER) SHOWING AN ACCURATE ACCOUNT OF THE FINAL INSTALLED SYSTEMS. SYSTEMS INCLUDING BUT NOT LIMITED TO ALL EQUIPMENT AND ASSOCIATED CONTROLS, DUCTWORK/PIPING, AIR DEVICES, ETC.
20. SHEETMETAL DUCTWORK
    a. ALL SIZES OF DUCTS SHOWN ON THE DRAWINGS ARE INTERIOR DUCT DIMENSIONS. ALL DUCTWORK SHALL BE RIGID SHEETMETAL CONSTRUCTED FROM GALVANIZED SHEET STEEL IN ACCORDANCE WITH SMACNA LOW VELOCITY DUCT CONSTRUCTION STANDARDS. ALL EXPOSED DUCTWORK SHALL BE ROUND, SPIRAL, OR RECTANGULAR LOCK-SEAM TYPE, AS SHOWN ON HVAC DRAWINGS. ASSEMBLE AND INSTALL DUCTWORK IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICE FOR ACHIEVING AIR TIGHT (5% LEAKAGE) AND NOISELESS (NO OBJECTIONABLE NOISE) SYSTEMS, CAPABLE OF PERFORMING EACH INDICATED SERVICE. FURNISH ALL REQUIRED DAMPERS, TRANSITIONS, OFFSETS, CONNECTIONS TO AIR DEVICES, AND OTHER ACCESSORIES NECESSARY FOR A COMPLETE OPERATING SYSTEM. FLEXIBLE DUCTWORK SHALL NOT EXCEED 8'-0" LONG.
21. ADHESIVES AND SEALANTS
    a. SEAL ALL LONGITUDINAL AND TRANSVERSE DUCT JOINTS WITH A UL 181A OR 181B NON-HARDENING, NON-MIGRATING MASTIC OR LIQUID ELASTIC SEALANT OF A TYPE RECOMMENDED BY THE MANUFACTURER FOR SEALING JOINTS AND SEAMS IN SHEET METAL DUCTWORK. COVER ALL FIELD JOINTS, JOINTS AROUND SPIN-IN FITTINGS AND FASTENING SCREWS WITH MASTIC. ALL SEALANTS AND GASKETS SHALL HAVE SURFACE-BURNING CHARACTERISTICS WITH A MAXIMUM FLAME-SPREAD INDEX OF 25 AND A MAXIMUM SMOKE-DEVELOPED INDEX OF 50 WHEN TESTED ACCORDING TO UL 723.
    b. EXPOSED DUCTWORK: TRIM DUCT SEALANTS FLUSH WITH METAL. CREATE A SMOOTH AND UNIFORM EXPOSED BEAD. DO NOT USE TWO-PART TAPE SEALING SYSTEM.
22. DUCT SUPPORTS
    a. FURNISH AND INSTALL HOT-DIPPED GALVANIZED STEEL FASTENERS, HANGERS, ANCHORS, RODS, STRAPS, TRIM, AND ANGLES FOR SUPPORT OF DUCTWORK.
23. FLEXIBLE CONNECTIONS
    a. FURNISH AND INSTALL NEOPRENE FLEXIBLE DUCT CONNECTIONS AT THE INLET AND DISCHARGE OF UNITS AND FANS.
24. DAMPERS
    a. DUCT MANUAL VOLUME DAMPERS - FURNISH AND INSTALL OPPOSED-BLADE, LEAK-PROOF VOLUME CONTROL DAMPERS WHERE INDICATED ON DRAWINGS AND LOCATIONS IN SUPPLY, RETURN AND EXHAUST DUCTS WHERE BRANCHES ARE TAKEN FROM LARGER DUCTS OR AT EACH INDIVIDUAL DUCT REGISTER IN ORDER TO ACHIEVE SYSTEM AIR BALANCE QUANTITIES. BALANCING DEVICES MUST BE PROVIDED IN ACCORDANCE WITH IMC 603.17. ALL MANUAL VOLUME DAMPERS MUST BE SHOWN ON COORDINATION DRAWINGS WHEN SUBMITTED FOR REVIEW.
    b. PROVIDE MANUAL DAMPERS IN ACCESSIBLE LOCATIONS, AND NOT ABOVE DRYWALL CEILINGS WHERE FEASIBLE. WHERE DAMPER IN DUCTWORK IS NOT ACCESSIBLE, PROVIDE METROPOLITAN AIR TRANSFER (MAT) MODEL RT-150 SERIES CABLE ACTUATED DAMPER DRIVE SYSTEM, OR APPROVED EQUAL.
    c. PROVIDE FIRE, SMOKE, AND FIRE / SMOKE RATED DAMPERS ON ALL PENETRATIONS TO RATED WALLS, CEILINGS, AND FLOORS. REFER TO ARCHITECTURAL PLANS FOR LOCATIONS.
    d. PROVIDE RADIATION DAMPERS ON ALL AIR DEVICES, FANS, ETC., THAT PENETRATE THE MEMBRANE OF THE RATED FLOOR/CEILING ASSEMBLY.
25. DUCT ACCESS DOORS
    a. FURNISH AND INSTALL CONVENIENTLY LOCATED DUCT ACCESS DOORS OF AMPLE SIZE AND QUANTITY FOR SERVICING THE DAMPERS.
26. DIFFUSERS, GRILLES AND REGISTERS
    a. DIFFUSERS, GRILLES AND REGISTERS SHALL BE MANUFACTURED BY TITUS, PRICE, OR ENGINEERED APPROVED EQUAL AND SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR. DIFFUSERS SHALL BE INSTALLED AS INDICATED ON THE DRAWINGS AND SCHEDULES. THE MECHANICAL CONTRACTOR SHALL PROVIDE ALL MISCELLANEOUS ITEMS NECESSARY FOR A COMPLETE AND PROPER INSTALLATION IN THE TYPE OF CEILING AND WALLS USED IN THIS PROJECT.
    b. ALL NEW DIFFUSERS AND GRILLES, INSTALL PER MFR'S INSTRUCTIONS, PROVIDE INSULATION ON ALL SUPPLY GRILLE/DIFFUSER BACKS, COORDINATE WITH CEILING WORK.
27. EXHAUST FAN
    a. FAN MANUFACTURER SHALL BE PANASONIC, BROAN, S&P, COOK, GREENHECK, OR ENGINEERED APPROVED EQUAL. REFER TO DRAWINGS AND SCHEDULES FOR UNIT LOCATION, TECHNICAL DATA, AND ANY APPLICABLE ACCESSORIES.
28. INDOOR FURNACE
    a. SPLIT SYSTEMS SHALL CONSIST OF HIGH EFFICIENT CONDENSING GAS FURNACE AND ASSOCIATED CONDENSING UNIT. FURNACE SHALL BE A 4-WAY MULTIPOISE DESIGN AND INSTALLED PER MANUFACTURER'S REQUIREMENTS. REFER TO DRAWINGS AND SCHEDULES FOR UNIT LOCATION, TECHNICAL DATA, AND ACCESSORIES.
    b. MANUFACTURER SHALL BE LENNOX, TEMPMASTER, CARRIER, OR EQUIVALENT.
29. OUTDOOR CONDENSING UNIT
    a. REFER TO DRAWINGS AND SCHEDULES FOR UNIT LOCATION, TECHNICAL DATA, AND ACCESSORIES.
    b. MANUFACTURER SHALL BE LENNOX, TEMPMASTER, CARRIER, OR EQUIVALENT.
30. NON-DUCTED MINI-SPLIT SYSTEMS
    a. SPLIT SYSTEMS SHALL CONSIST OF INDOOR AIR HANDLER AND ASSOCIATED OUTDOOR HEAT PUMP UNIT. EQUIPMENT SHALL HAVE MANUFACTURER'S STANDARD WARRANTY. PROVIDE AN INLINE CHECK VALVE LOCATED IN THE DRAIN LINE OR TRAP.
    b. MINI-SPLIT SYSTEM MANUFACTURER SHALL BE LG, CARRIER, MITSUBISHI, DAIKIN, OR ENGINEERED EQUAL.
31. REFRIGERATION PIPING
    a. ROUTE REFRIGERANT PIPING FROM INDOOR AIR HANDLERS TO OUTDOOR CONDENSING UNITS AND / OR HEAT PUMPS LOCATED ON GRADE / ROOF / REFER TO DRAWINGS AS SHOWN. REFRIGERANT PIPE MATERIAL, SIZE, AND ROUTING PER MANUFACTURER'S REQUIREMENTS.
    b. COORDINATE EXACT LOCATION OF HVAC EQUIPMENT, LENGTH OF PIPE, NUMBER OF ELBOWS, AND MAXIMUM RISE BETWEEN INDOOR AND OUTDOOR UNITS; WITH ALL OTHER TRADES AND MANUFACTURE BEFORE ORDERING EQUIPMENT OR ANY MATERIALS.
    c. IF REFRIGERANT LINES ARE BURIED (COORDINATE WITH ARCHITECT, OWNER AND ENGINEER PRIOR TO ROUTING) FOLLOW THE MANUFACTURER'S CHECKLIST CONSISTING BUT NOT LIMITED TO THE FOLLOWING:
       - INSULATE LIQUID AND SUCTION LINES SEPARATELY.
       - ENCLOSE ALL UNDERGROUND PORTIONS OF REFRIGERANT LINES IN WATERPROOF MATERIAL (CONDUIT OR PIPE) SEALING THE ENDS WHERE TUBING ENTERS/EXITS THE ENCLOSURE.
       - IF LINES PASS UNDER OR THROUGH A CONCRETE SLAB, ENSURE LINES ARE ADEQUATELY PROTECTED AND SEALED
    d. PROVIDE LONG LINE SET KITS AS NEEDED TO ACCOMMODATE FINAL INSTALLATION.
    e. WHERE REFRIGERANT PIPES PENETRATE FIRE RATED PARTITIONS / BARRIERS PROTECT THE ANNULAR SPACE AROUND THE PIPE WITH FIRE CAULK OR APPROVED MATERIALS THAT PREVENT THE PASSAGE OF FLAME AND HOT GASES.
    f. ROUTE ALL PIPING AND WIRES, CONCEALED WHERE FEASIBLE, TO AVOID SIGNIFICANT TRIM AND ARCHITECTURAL FEATURES WHEN INSTALLING THEM.
    g. PROVIDE EXTERNAL INSULATION WRAP ON ALL REFRIGERANT PIPING AS REQUIRED PER ENERGY CODE REQUIREMENTS.
32. CONDENSATE DRAIN PIPING.
    a. MECHANICAL CONTRACTOR TO PROVIDE CONDENSATE DRAIN LINE, FROM CONDENSATE PRODUCING EQUIPMENT, TO EITHER NEAREST WASHER BOX BY WASHER / DRYER, FLOOR DRAIN, OR HUB DRAIN. COORDINATE WITH PLUMBING CONTRACTOR. SLOPE PIPE A MINIMUM OF 1/8" PER FOOT AWAY FROM UNIT. PROVIDE CONDENSATE PUMP HARDWIRED TO UNIT TO PROVIDE THE NECESSARY LIFT TO DRAIN CONDENSATE BY GRAVITY IF REQUIRED. CONDENSATE PUMP SHALL BE COMPLETELY CONCEALED IN UNIT CABINET.
    b. THE MECHANICAL CONTRACTOR SHALL FURNISH AND INSTALL CONDENSATE DRAINS, P-TRAPS WITH REMOVABLE CLEANOUT CAPS FOR AIR EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. THE P-TRAP DEPTH SHALL BE AT LEAST THE DEPTH SPECIFIED FOR THE RESPECTIVE PRESSURE DROP OF THE UNIT. CONDENSATE DRAIN PIPING SHALL BE SCHEDULE 40 PVC PIPE WITH SOLVENT WELD FITTINGS, EXCEPT IN PLENUM RETURNS, WHERE PIPING SHALL BE SCHEDULE 40 CPVC PIPE WITH SOLVENT WELD FITTINGS. INSULATE WHERE PIPING IS CONCEALED AND THERE IS A CONCERN FOR PIPES TO CONDENSE. [INSULATE CONDENSATE WALLS OF PIPE WITH ARMAFLEX AP, FLEXIBLE CLOSED CELL ELASTOMERIC FOAM, SELF-SEALING INSULATION. PROVIDE 1/2" THICK INSULATION ON PIPING < 1" IN DIAMETER AND 1" THICK INSULATION ON PIPING BETWEEN 1" AND 1-1/2" IN DIAMETER. PIPE INSULATION SHALL NOT EXCEED 25/50 FLAME-SMOKE RATINGS]. ALL CONDENSATE DRAIN LINES SHALL BE CONFIGURED TO PERMIT THE CLEARING OF BLOCKAGES AND PERFORMANCE OF MAINTENANCE WITHOUT REQUIRING THE DRAIN LINE TO BE CUT. FOR CONDENSATE PUMPS LOCATED IN UNINHABITABLE SPACES (I.E. ATTICS AND CRAWL SPACES), PROVIDE CONTROLS THAT WILL SHUT DOWN THE AIR EQUIPMENT IF THE CONDENSATE PUMP FAILS.
    c. ALL COOLING EQUIPMENT SHALL HAVE A WET SWITCH IN THE PRIMARY DRAIN LINE, THE OVERFLOW DRAIN LINE, OR IN THE EQUIPMENT-SUPPLIED DRAIN PAN (LOCATED AT A POINT HIGHER THAN THE PRIMARY DRAIN LINE CONNECTION AND BELOW THE OVERFLOW RIM OF THE PAN) THAT WILL SHUT DOWN THE UNIT WHEN THE CONDENSATE IS CLOGGED..
33. PIPING SUPPORTS (METAL PIPE)
    a. FURNISH AND INSTALL HOT-DIPPED GALVANIZED STEEL FASTENERS, HANGERS, ANCHORS, RODS, STRAPS, TRIM AND ANGLES FOR SUPPORT OF PIPING.
34. PIPING SUPPORTS (PLASTIC PIPE)
    a. FURNISH AND INSTALL HANGERS FOR PLASTIC PIPING PER MANUFACTURER'S REQUIREMENTS.
35. TEMPERATURE CONTROLS AND CONTROL WIRING
    a. THE MECHANICAL CONTRACTOR SHALL PROVIDE ALL CONTROL WIRING NECESSARY FOR THE COMPLETE AND PROPER OPERATING TEMPERATURE CONTROL SYSTEM. PROGRAMMABLE THERMOSTATS SHALL BE PROVIDED WITH EQUIPMENT PACKAGES UNLESS OTHERWISE NOTED.
    b. EXPOSED WIRING: ALL WIRING EXPOSED TO THE SPACE SHALL BE RUN IN CONDUIT. COORDINATE REQUIREMENTS WITH ARCHITECTURAL DRAWINGS.
36. TESTING, BALANCING, AND ADJUSTING
    a. THE INDIVIDUAL PERFORMING THE AIR BALANCING SHALL BE A CERTIFIED TEST AND BALANCER AND A MEMBER OF NEBB OR AABC, USING CALIBRATED EQUIPMENT. THE CERTIFIED AIR BALANCE CONTRACTOR SHALL ACCURATELY BALANCE THE SYSTEMS TO PROVIDE AIR QUANTITIES AS INDICATED ON THE DRAWINGS AND IN THE SCHEDULES/SPECIFICATIONS, OPERATE AUTOMATIC CONTROL SYSTEMS, AND VERIFY SET POINTS DURING BALANCING.
37. SEQUENCE OF OPERATION
    a. EXHAUST FANS
    - E-X: EXHAUST FAN SHALL RUN PER EQUIPMENT SCHEDULE NOTES.
    c. SPLIT SYSTEMS
    - AHU/CU-X:
    - HEATING MODE - INDOOR FURNACES SHALL BE CONTROLLED FROM A THERMOSTAT IN THE SPACE. WHEN THE THERMOSTAT CALLS FOR HEATING THE FAN SHALL RUN AND THE GAS FIRED HEAT EXCHANGER SHALL FIRE TO MAINTAIN TEMPERATURE SETPOINT. WHEN THE SETPOINT IS REACHED THE UNIT SHALL SHUT OFF.
    - COOLING MODE - WHEN THE THERMOSTAT CALLS FOR COOLING THE CONDENSING UNIT SHALL ENGAGE, THE FURNACE FAN SHALL RUN, AND THE DX COOLING COIL SHALL COOL THE AIR TO MAINTAIN TEMPERATURE SETPOINT.
    - MS-X/MSHP-X:
    - HEATING MODE - INDOOR AIR HANDLER SHALL BE CONTROLLED FROM A THERMOSTAT IN THE SPACE. WHEN THE THERMOSTAT CALLS FOR HEATING THE FAN SHALL RUN AND THE HEAT PUMP IN HEATING MODE SHALL RUN TO MAINTAIN TEMPERATURE SETPOINT. WHEN THE SETPOINT IS REACHED THE UNIT SHALL SHUT OFF.
    - COOLING MODE - WHEN THE THERMOSTAT CALLS FOR COOLING THE HEAT PUMP UNIT SHALL RUN IN COOLING MODE, THE AIR HANDLER FAN SHALL RUN, AND THE DX COOLING COIL SHALL COOL THE AIR TO MAINTAIN TEMPERATURE SETPOINT.

DUCT THERMAL INSULATION
   a. PROVIDE EXTERNAL THERMAL INSULATION WITH AN INTEGRAL VAPOR BARRIER FACING OF SUFFICIENT THICKNESS AND THERMAL RESISTANCE TO MEET LOCAL ENERGY CODE REQUIREMENTS (MINIMUM 1-1/2" THICK, .75 LB. PER CU./FT. DENSITY, WITH FSK JACKET, .002 THICK REINFORCED ALUMINUM FOIL VAPOR BARRIER). DO NOT INSULATE DUCTWORK THAT ARE INTERNALLY LINED AS NOTED ON DRAWINGS. DUCTWORK EXPOSED TO THE WEATHER SHALL BE PROTECTED WITH AN APPROVED WEATHERPROOF BARRIER/JACKETING. INSULATION OF ALL DUCTWORK SHALL BE CONTINUOUS THRU ALL WALLS AND FLOORS. THERMAL INSULATION AND SEALERS SHALL COMPLY WITH NFPA FLAME SPREAD OF 25 OR LESS, AND SMOKE DEVELOPED INDEX OF 50 OR LESS.

INSULATION REQUIREMENTS:
   a. ALL SUPPLY AND RETURN DUCTS AND PLENUMS INSTALLED AS PART OF THE HVAC DISTRIBUTION AIR SYSTEM SHALL BE INSULATED IN ACCORDANCE WITH BELOW TABLE. THE FOLLOWING R VALUES ARE REQUIRED:

DUCT INSULATION SCHEDULE

EQUIPMENT		AIR DISTRIBUTION TYPE				
		SA	RA	OA	EA/REL	ADDITIONAL NOTES
	ALL	R-3.5	-	R-3.5	R-3.5, BETWEEN ISOLATION DAMPER AND PENETRATION OF BUILDING EXTERIOR OR A MINIMUM OF 5' FROM EXTERIOR PENETRATION OF BUILDING EXTERIOR	-

DUCT INSULATION REQUIREMENTS ARE BASED ON TABLE 6.8.2B OF ASHRAE 90.1 2010 ENERGY CODE.

PROVIDE DUCTWORK OF SUFFICIENT THICKNESS TO MEET THE INSTALLED R-VALUE REQUIREMENTS LISTED ABOVE.

ITEMS NOT REQUIRED TO BE INSULATED:
•FIBROUS-GLASS DUCTS
•EXPOSED SPIRAL DUCTS
•DUCTS WITH LINER THAT MEETS ASHRAE 90.1
•FACTORY-INSULATED FLEXIBLE DUCTS
•FACTORY-INSULATED PLENUMS AND CASINGS
•FLEX CONNECTORS
•VIBRATION-CONTROL DEVICES
•FACTORY-INSULATED ACCESS PANELS AND DOORS

STATE OF OHIO
SCOTT BEVERT STILKEY
E-77795
REGISTERED PROFESSIONAL ENGINEER

ISSUANCES

NO.	DESCRIPTION	DATE
1	FOR PERMIT	10/07/2021
2	REVISION #1	09/27/2022

FIRE STATION 25

335 ERIE BOULEVARD
HAMILTON, OHIO 45011

PR-08989

ENGINEERED BUILDING SYSTEMS INC.

Shared Success Through Collaboration and Efficiency
515 Monmouth Street, Suite 201
Newport, KY 41071 (859) 261-0585
MEP Consulting Services, Inc. in OH

DRAWN BY	CHECKED BY
SRB	SSS

PROJECT NO.: 8989

SCALE:AS NOTED

DATE:10-07-2021

DRAWING TITLE
MECHANICAL SPECIFICATIONS

SHEET NO.
M201