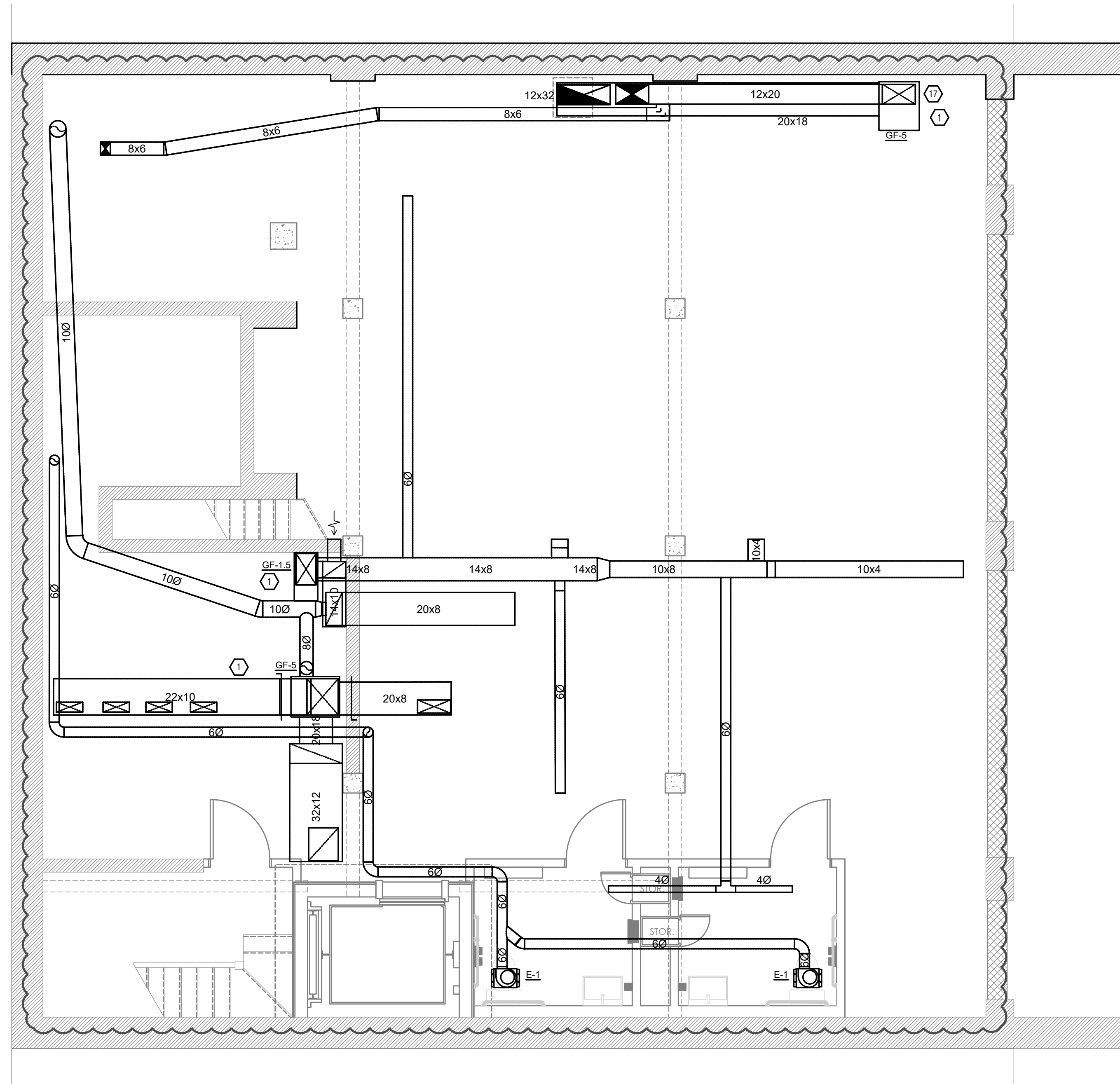


Z:\Project_Directories\7700-7799\7711 - Durner Building - Gilbert Ave - Construction Documents\7711-M1-0-MECHANICAL-FLOOR-PLAN.dwg - ERS, Plot Date/Time: Apr 13, 2023 - 10:15am - By: r.welshes
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MECHANICAL BASEMENT PLAN
 SCALE: 1/4" = 1'-0"

MECHANICAL SCOPE OF WORK

PROVIDE MECHANICAL EQUIPMENT FOR TENANT FIT OUT IN BUILDING.

CODES REFERENCED

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

HVAC DESIGN CONDITIONS

COOLING: OUTDOOR: 93 DB / 75 WB INDOOR: 72
 HEATING: OUTDOOR: 0 DB INDOOR: 72

GENERAL NOTES

- FOR FULL SCHEDULES, SPECIFICATIONS, AND COMPLETE LISTING SEE DETAIL SHEETS.
- COORDINATE ROUTING OF ALL WORK WITH OTHER TRADES.
- COORDINATE WITH ELECTRICAL CONTRACTOR FOR POWER CONNECTIONS TO ALL MECHANICAL EQUIPMENT.
- INSTALL ALL EQUIPMENT PER MANUFACTURER'S REQUIREMENTS. MAINTAIN ALL CODE RECOMMENDED CLEARANCES FOR ACCESS AND MAINTENANCE.
- REFER TO ARCHITECTURAL PLANS FOR DIMENSIONS, AND FINAL CEILING DIFFUSER LOCATIONS.
- MAINTAIN ALL CODE REQUIRED SERVICE CLEARANCES. FOLLOW CLEARANCE TO COMBUSTIBLE DISTANCE PER MANUFACTURER'S INSTRUCTIONS.
- PROVIDE BACKDRAFT DAMPERS FOR ALL EXHAUST SYSTEMS AND EITHER LOUVER, BRICK VENT, OR CAPS AT ALL EXTERIOR BUILDING PENETRATIONS.
- 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.
- 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.

KEYED SHEET NOTES

- ROUTE 3/4" CONDENSATE DRAIN LINE TO MECHANICAL CLOSET FLOOR DRAIN. SLOPE PIPE A MINIMUM OF 1/8" PER FOOT AWAY FROM UNIT.
- ROUTE 3/4" CONDENSATE DRAIN LINE TO STORAGE ROOM FLOOR DRAIN. SLOPE PIPE A MINIMUM OF 1/8" PER FOOT AWAY FROM UNIT.
- DUCT EXHAUST UP THROUGH ROOF WITH RAIN-PROOF CAP.
- ROUTE EXHAUST TO EXTERIOR WALL. INSTALL A LOUVERED VENT. SEE ARCHITECT BEFORE PENETRATION FOR EXACT LOCATION AND COLOR COORDINATION. ALL EXHAUST SHALL MEET THE FOLLOWING REQUIREMENTS.
 - 3" FROM PROPERTY LINE.
 - 3" FROM OPERABLE OPENINGS INTO BUILDING.
 - 10' FROM MECHANICAL AIR INTAKE
- ROUTE LINE SET FROM OUTDOOR UNIT TO INDOOR AIR HANDLER. ALL PIPING SHALL BE CONCEALED IN FINISHED AREA AND EXPOSED IN MECHANICAL UTILITY SPACES. SIZE PER MANUFACTURER'S RECOMMENDATIONS.
- 4" EXHAUST DUCT TO BE ROUTED DIRECTLY TO ROOF. AS ALLOWED PER 717.6.1 EXCEPTION. DUCT MUST BE MINIMUM 26 GA. AND BE CONTAINED WITHIN WALL CAVITY FOR FULL LENGTH. FIRE CALK AROUND ALL RATED PENETRATIONS.
- EXHAUST DUCT UP THROUGH ROOF WITH RAIN-PROOF CAP.
- OUTSIDE AIR/ EXHAUST DUCTWORK TO BE CENTERED ABOVE/BELOW WINDOWS.

NOTE: EXHAUST PIPING CONCEALED IN WALLS OR TO THE ROOF.
- ROUTE FLUE PIPING DIRECTLY TO THE ROOF.
- ROUTE OPEN DUCTWORK INTO SPACE FOR FUTURE FIT-OUT. ROUTE HIGH TO FLOOR CEILING. LEAVE DUCTWORK END OPEN FOR SYSTEM AIRFLOW. DISTRIBUTION AND AIR DEVICES TO BE PROVIDED DURING FIT OUT.
- ROUTE FLUE PIPING UP TO FIRST FLOOR AND OUT THROUGH EXTERIOR WALL AS SHOWN.
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SYMBOLS LEGEND - HVAC

	THERMOSTAT
	CEILING DIFFUSER
	SIDE WALL GRILL
	RETURN WALL GRILL
	AIR FLOW DIRECTION
	DUCTWORK
	TYPICAL SUPPLY DUCT DN
	TYPICAL RETURN DUCT DN
	TYPICAL EXHAUST DUCT
	TURNING VANES
	FLEXIBLE DUCT, 8'-0" LONG MAX.
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	ROUND DUCT UP
	1.5 HR FIRE DAMPER
	MVO MANUAL VOLUME DAMPER
	DROPPED CEILING/SOFFT



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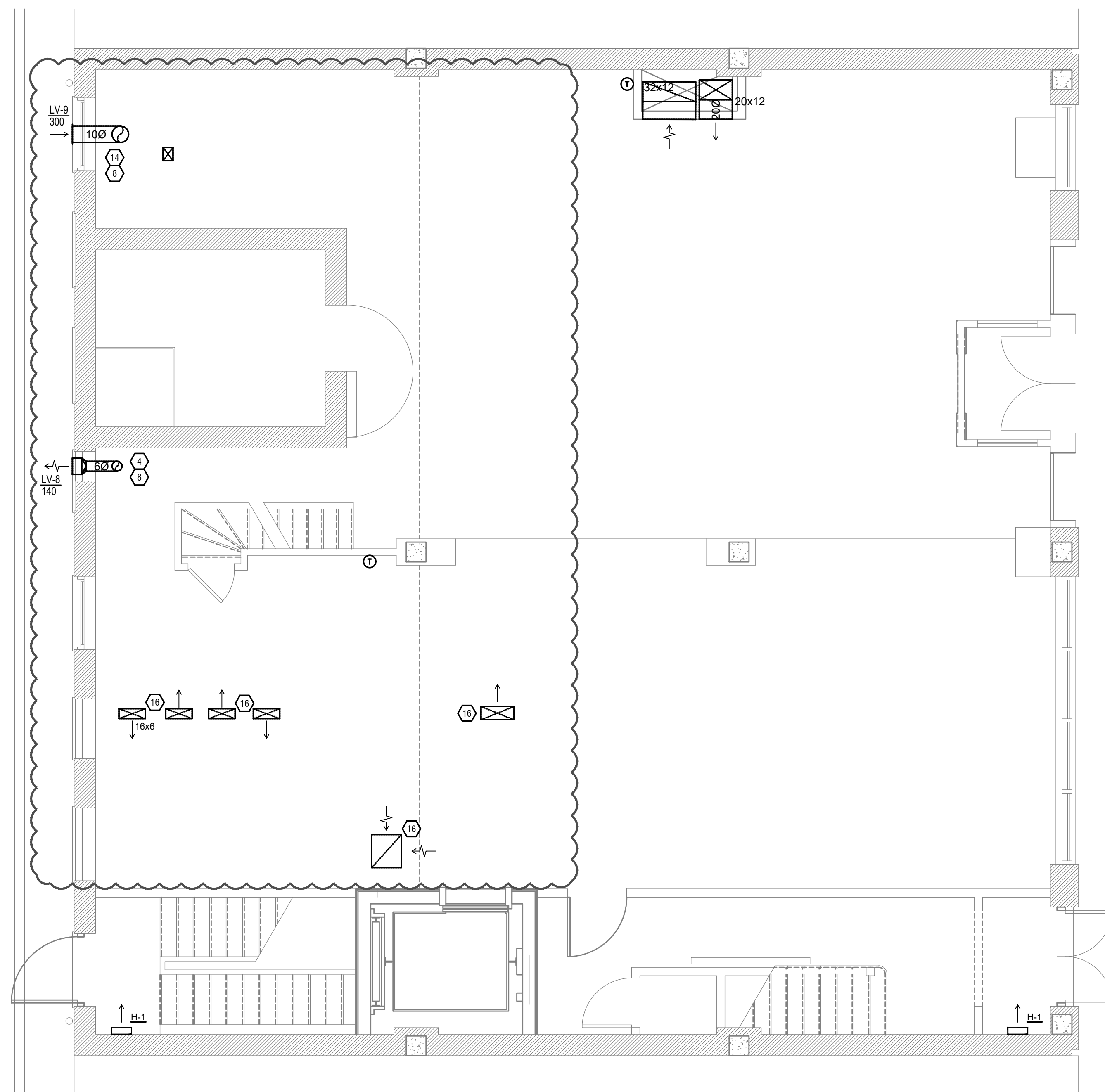
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M1.0
 MECHANICAL BASEMENT PLAN

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MECHANICAL FIRST FLOOR PLAN
 M1.1a SCALE: 1/4" = 1'-0"

MECHANICAL SCOPE OF WORK

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SYMBOLS LEGEND -- HVAC

	THERMOSTAT
	CEILING DIFFUSER
	SIDE WALL GRILL
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	AIR FLOW DIRECTION
	DUCTWORK
	TYPICAL SUPPLY DUCT DN
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	TYPICAL EXHAUST DUCT
	TURNING VANES
	FLEXIBLE DUCT, 8'-0" LONG MAX.
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	ROUND DUCT UP
	1.5 HR FIRE DAMPER
	MVD MANUAL VOLUME DAMPER
	DROPPED CEILING/SOFFIT



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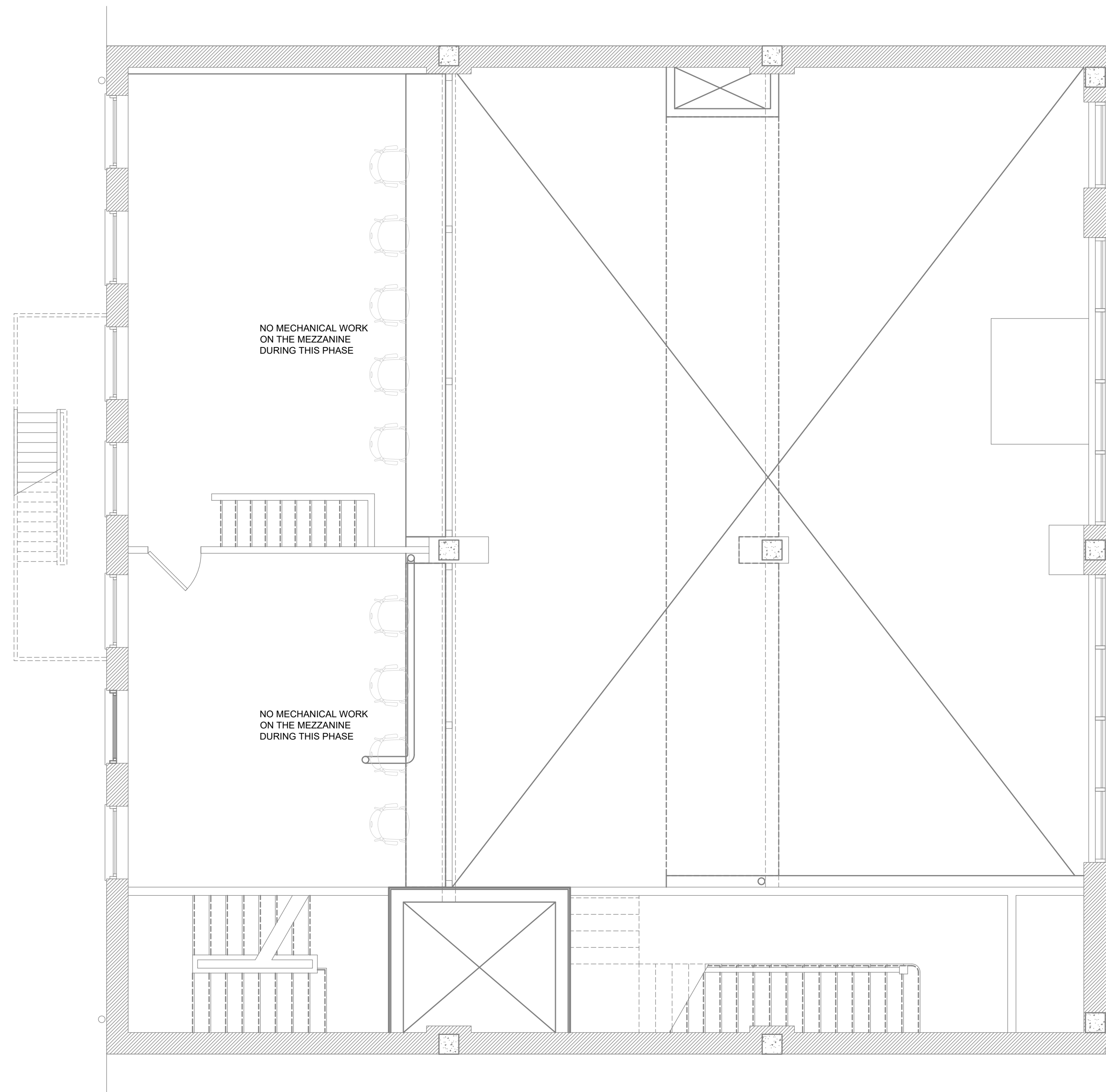
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M1.1a
 MECHANICAL
 FIRST FLOOR PLAN

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MECHANICAL MEZZANINE PLAN
 M1.1b SCALE: 1/4" = 1'-0"

MECHANICAL SCOPE OF WORK

PROVIDE MECHANICAL EQUIPMENT FOR TENANT FIT OUT IN BUILDING.

CODES REFERENCED

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- 2017 OHIO BUILDING CODE
- ASHRAE 90.1-2010

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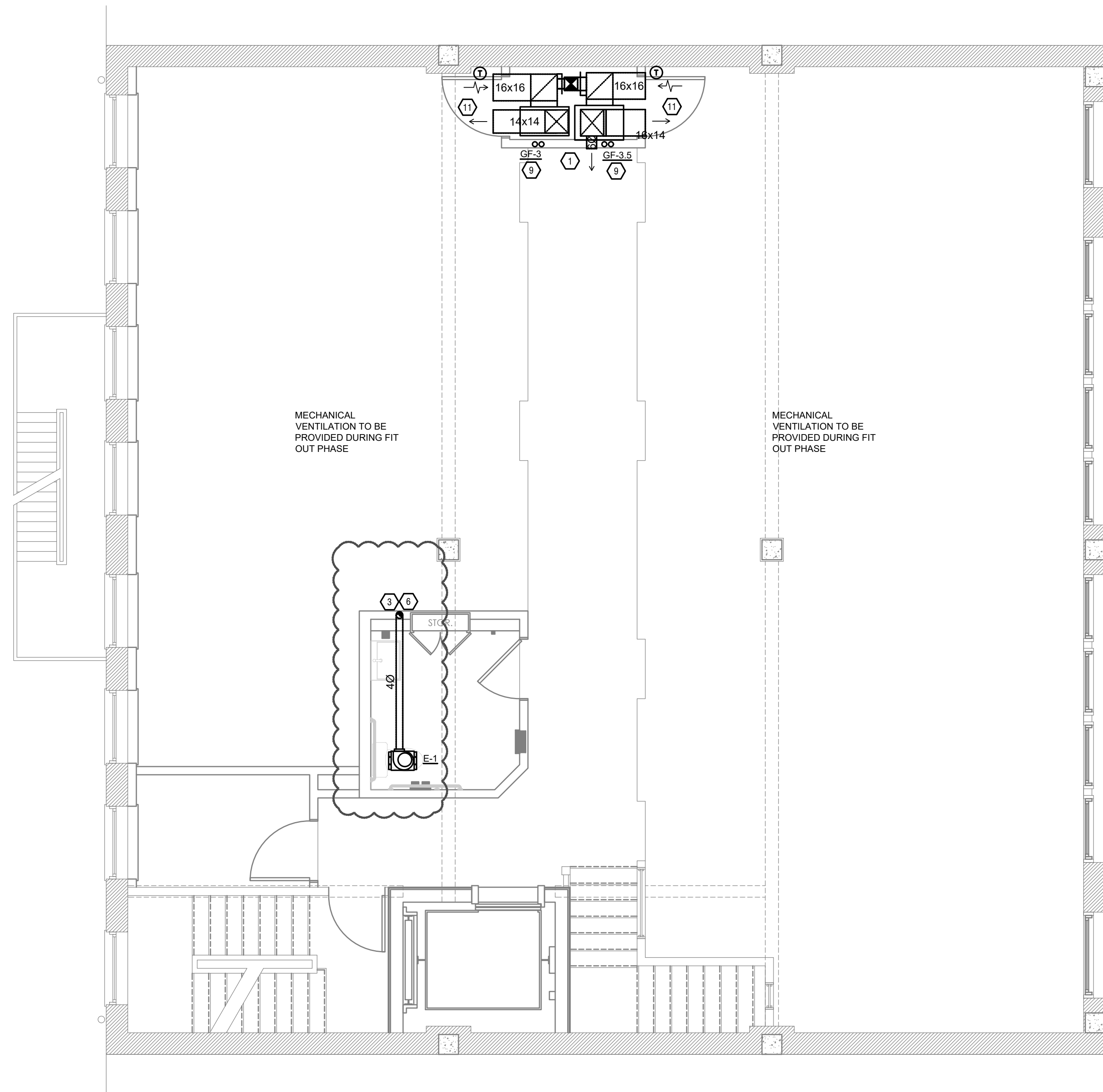
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M1.1b
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 MEZZANINE PLAN

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MECHANICAL SECOND FLOOR PLAN
 SCALE: 1/4" = 1'-0"

MECHANICAL SCOPE OF WORK

PROVIDE MECHANICAL EQUIPMENT FOR TENANT FIT OUT IN BUILDING.

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- ROUTE LINE SET FROM OUTDOOR UNIT TO INDOOR AIR HANDLER. ALL PIPING SHALL BE CONCEALED IN FINISHED AREA AND EXPOSED IN MECHANICAL UTILITY SPACES. SIZE PER MANUFACTURER'S RECOMMENDATIONS.
- 4" EXHAUST DUCT TO BE ROUTED DIRECTLY TO ROOF, AS ALLOWED PER 717.6.1 EXCEPTION. DUCT MUST BE MINIMUM 26 GA. AND BE CONTAINED WITHIN WALL CAVITY FOR FULL LENGTH. FIRE CALK AROUND ALL RATED PENETRATIONS.
- OUTSIDE AIR EXHAUST DUCTWORK TO BE CENTERED ABOVE/BELOW WINDOWS.
- NOTE: ALL PIPING IS CONCEALED UNLESS NOTED OTHERWISE.
- ROUTE FLUE PIPING DIRECTLY TO THE ROOF.
- ROUTE OPEN DUCTWORK INTO SPACE FOR FUTURE FIT-OUT. ROUTE HIGH TO FLOOR CEILING. LEAVE DUCTWORK END OPEN FOR SYSTEM AIRFLOW. DISTRIBUTION AND AIR DEVICES TO BE PROVIDED DURING FIT OUT.
- ROUTE FLUE PIPING UP TO FIRST FLOOR AND OUT THROUGH EXTERIOR WALL AS SHOWN.
- ROUTE 3/4" CONDENSATE DRAIN LINE TO MECHANICAL CLOSET MOP SINK. SLOPE PIPE A MINIMUM OF 1/8" PER FOOT AWAY FROM UNIT.
- ROUTE OUTSIDE AIR DUCT A MINIMUM OF 10 FEET AWAY FROM GAS FURNACE FLUE VENTING. PROVIDE EXTERIOR WEATHER PROOF WRAP TO ALL DUCTWORK LOCATED OUTDOORS. REFER TO DUCT INSULATION SCHEDULE FOR DETAILS. PROVIDE BIRD SCREEN ON INTAKE OPENING. REFER TO DUCT SUPPORT DETAIL FOR MOUNTING INSTRUCTIONS.
- PROVIDE LINE SET CURB/DOGHOUSE FOR REFRIGERATION LINESET THROUGH ROOF. REFER TO LINE SET ROOF CURB DETAIL. MECHANICAL CONTRACTOR TO HAVE OWNER/ARCHITECT APPROVE LINE SET CURB PRIOR TO INSTALLATION.
- COORDINATE DUCT COMING UP FROM BASEMENT WITH FUTURE TENANT WALLS AND CONCRETE JOISTS IN FLOOR.

SYMBOLS LEGEND - HVAC

	THERMOSTAT
	CEILING DIFFUSER
	SIDE WALL GRILL
	RETURN WALL GRILL
	AIR FLOW DIRECTION
	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
	1.5 HR FIRE DAMPER
	MVD MANUAL VOLUME DAMPER
	DROPPED CEILING/SOFFIT



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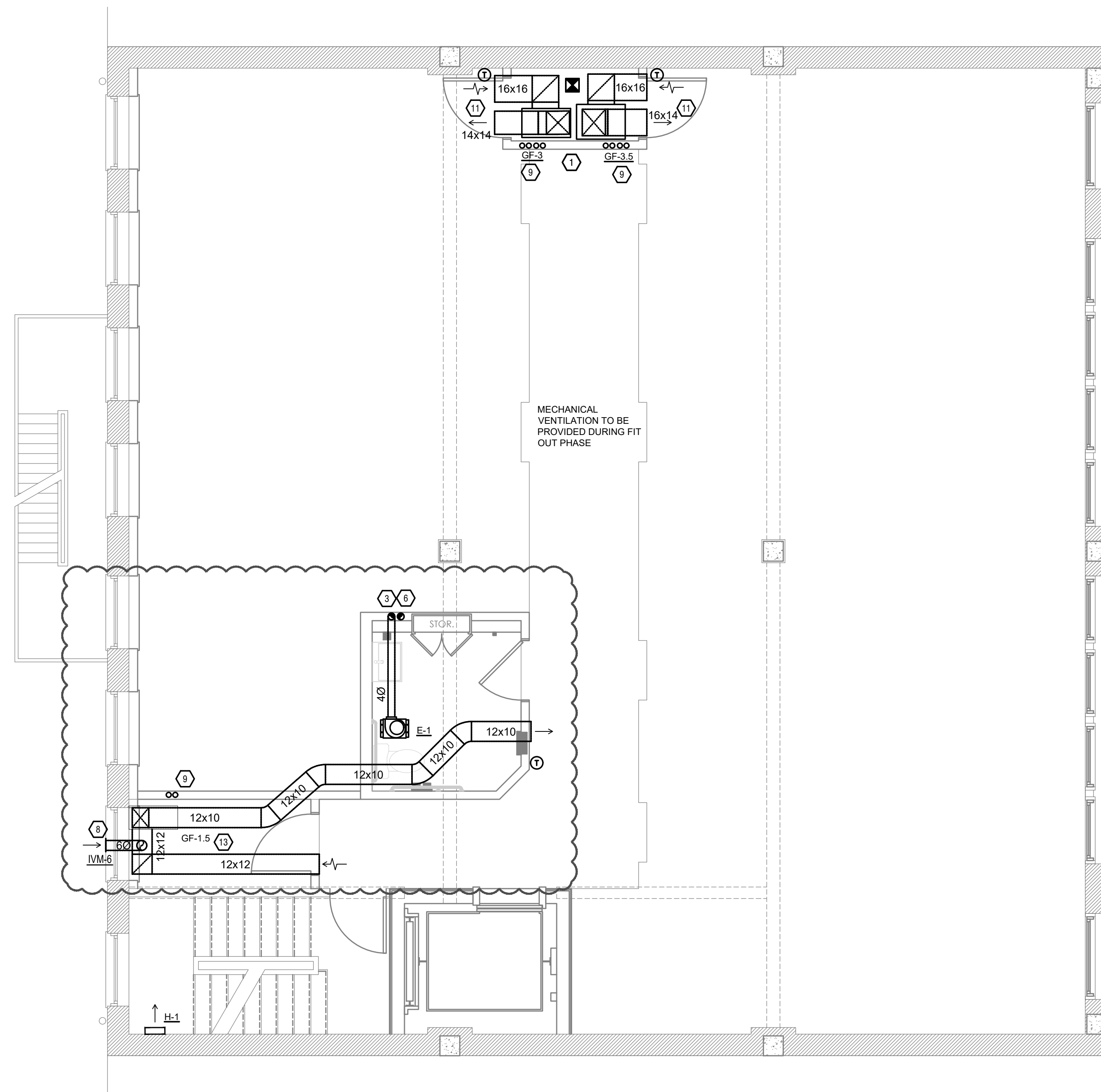
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M1.2
 MECHANICAL
 SECOND FLOOR PLAN

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MECHANICAL THIRD FLOOR PLAN
 M1.3 SCALE: 1/4" = 1'-0"

MECHANICAL SCOPE OF WORK

PROVIDE MECHANICAL EQUIPMENT FOR TENANT FIT OUT IN BUILDING.

CODES REFERENCED

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

HVAC DESIGN CONDITIONS

COOLING: OUTDOOR: 93 DB / 75 WB, INDOOR: 72
 HEATING: OUTDOOR: 0 DB, INDOOR: 72

GENERAL NOTES

- FOR FULL SCHEDULES, SPECIFICATIONS, AND COMPLETE LISTING SEE DETAIL SHEETS.
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- COORDINATE WITH ELECTRICAL CONTRACTOR FOR POWER CONNECTIONS TO ALL MECHANICAL EQUIPMENT.
- INSTALL ALL EQUIPMENT PER MANUFACTURER'S REQUIREMENTS. MAINTAIN ALL CODE RECOMMENDED CLEARANCES FOR ACCESS AND MAINTENANCE.
- REFER TO ARCHITECTURAL PLANS FOR DIMENSIONS, AND FINAL CEILING DIFFUSER LOCATIONS.
- MAINTAIN ALL CODE REQUIRED SERVICE CLEARANCES. FOLLOW CLEARANCE TO COMBUSTIBLE DISTANCE PER MANUFACTURER'S INSTRUCTIONS.
- PROVIDE BACKDRAFT DAMPERS FOR ALL EXHAUST SYSTEMS AND EITHER LOUVER, BRICK VENT, OR CAPS AT ALL EXTERIOR BUILDING PENETRATIONS.
- 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.
- 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.

KEYED SHEET NOTES

- ROUTE 3/4" CONDENSATE DRAIN LINE TO MECHANICAL CLOSET FLOOR DRAIN. SLOPE PIPE A MINIMUM OF 1/8" PER FOOT AWAY FROM UNIT.
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- DUCT EXHAUST UP THROUGH ROOF WITH RAIN-PROOF CAP.
- ROUTE EXHAUST TO EXTERIOR WALL. INSTALL A LOUVERED VENT. SEE ARCHITECT BEFORE PENETRATION FOR EXACT LOCATION AND COLOR COORDINATION. ALL EXHAUST SHALL MEET THE FOLLOWING REQUIREMENTS.
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- OUTSIDE AIR EXHAUST DUCTWORK TO BE CENTERED ABOVE/BELOW WINDOWS.

NOTE: THE PIPING CONCERNED HEREIN IS TO BE RATED TO THE ROOF.
- ROUTE FLUE PIPING DIRECTLY TO THE ROOF.
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SYMBOLS LEGEND - HVAC

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	SIDE WALL GRILL
	RETURN WALL GRILL
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	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
	1.5 HR FIRE DAMPER
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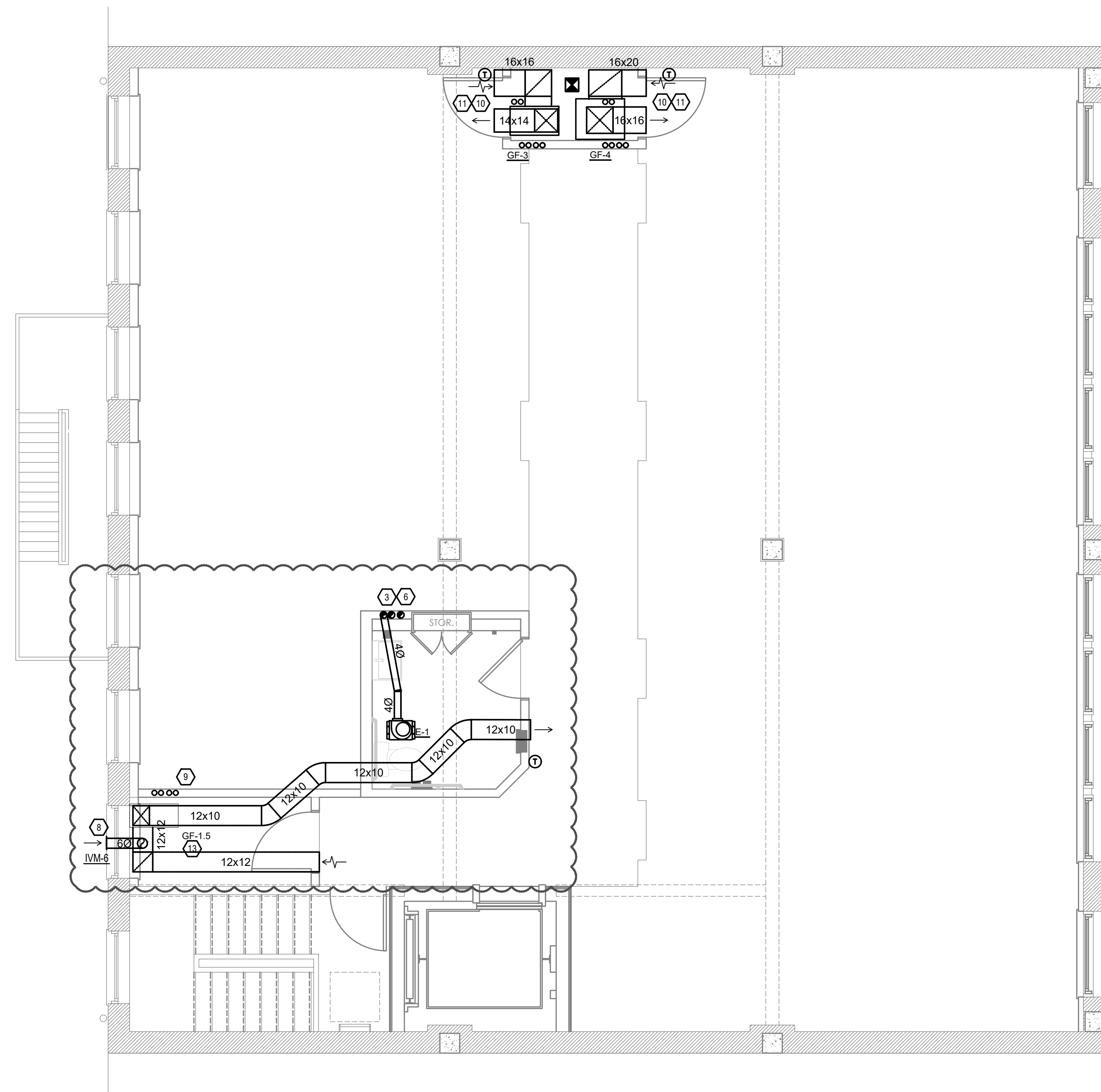
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M1.3
 MECHANICAL
 THIRD FLOOR PLAN

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MECHANICAL FOURTH FLOOR PLAN
 M1.4 SCALE: 1/4" = 1'-0"

MECHANICAL SCOPE OF WORK

PROVIDE MECHANICAL EQUIPMENT FOR TENANT FIT OUT IN BUILDING.

CODES REFERENCED

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

HVAC DESIGN CONDITIONS

COOLING: OUTDOOR: 93 DB / 75 WB, INDOOR: 72
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SYMBOLS LEGEND - HVAC

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	CEILING DIFFUSER
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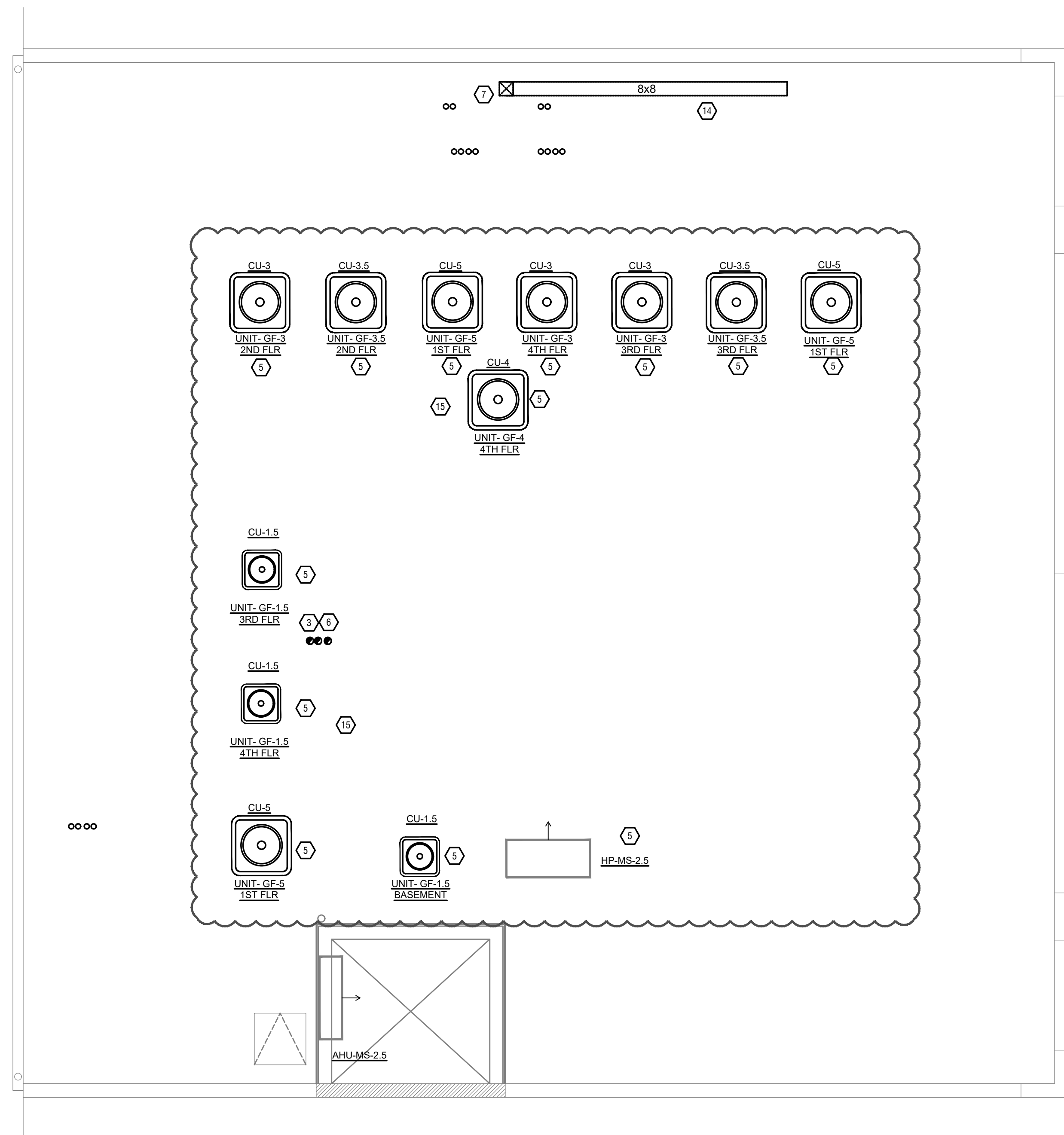
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M1.4
 MECHANICAL
 FOURTH FLOOR PLAN

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MECHANICAL ROOF PLAN
 M1.5 SCALE: 1/4" = 1'-0"

MECHANICAL SCOPE OF WORK

PROVIDE MECHANICAL EQUIPMENT FOR TENANT FIT OUT IN BUILDING.

CODES REFERENCED

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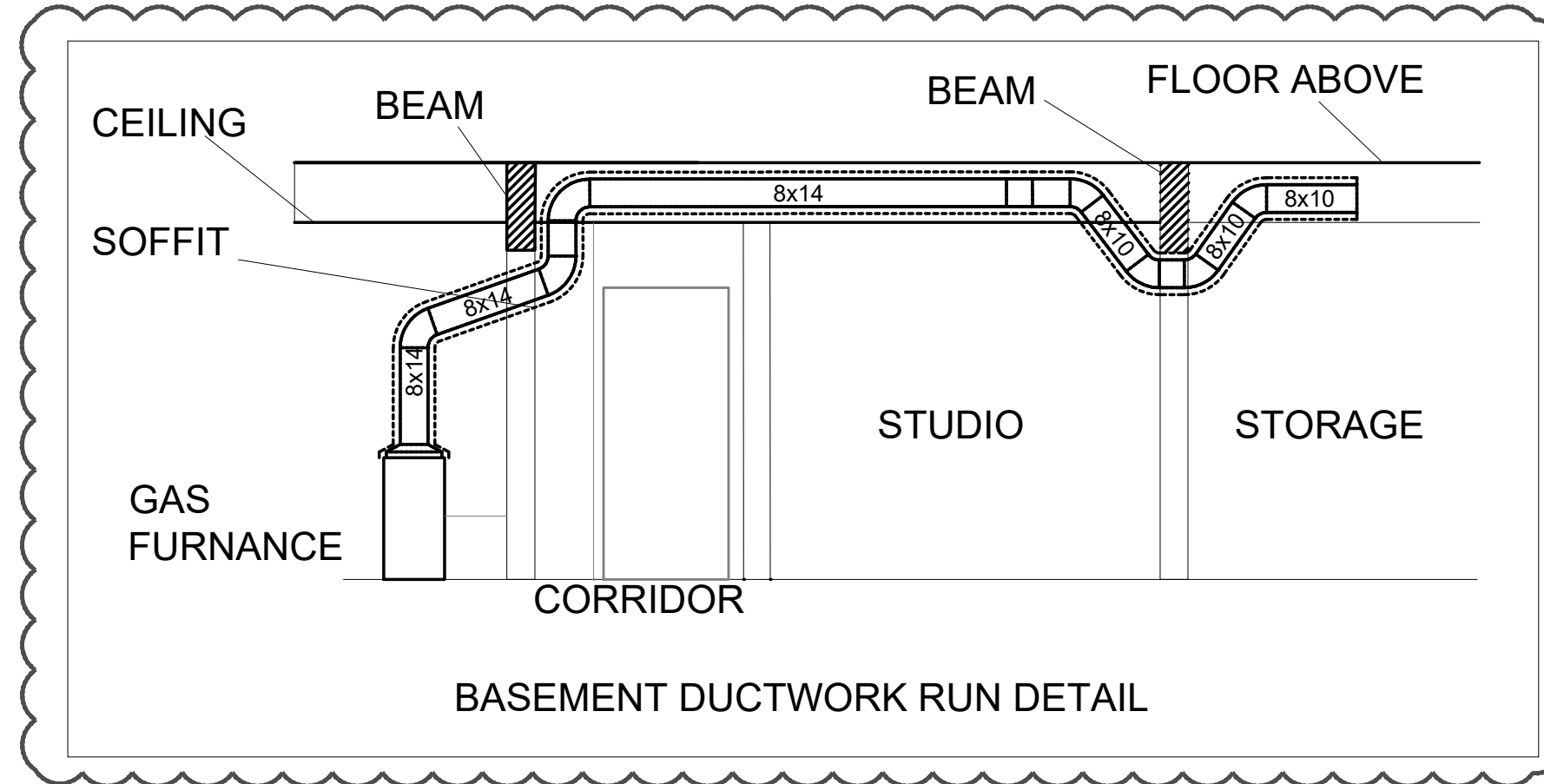
M1.5
 MECHANICAL ROOF PLAN

Z:\Project_Directories\7700-7799\7711 - Durner Building - Gilbert Ave - Construction Documents\7711-M2-0-MECHANICAL-DETAILS.dwg-EBS-Plt Date/Time: Apr 13, 2023-10:45am - Bk: r1helius
 THESE DRAWINGS AND SPECIFICATIONS ARE NOT AUTHORIZED TO BE USED AS CONTRACT DOCUMENTS. THESE DRAWINGS HAVE BEEN PREPARED TO DEMONSTRATE COMPLIANCE WITH APPLICABLE CODES, AND ARE INTENDED TO PROVIDE THE AUTHORITIES HAVING JURISDICTION WITH INFORMATION TO DETERMINE CODE COMPLIANCE. THE INSTALLING CONTRACTOR IS RESPONSIBLE TO ENSURE THAT MEANS, METHODS, AND MATERIALS USED IN CONSTRUCTION ARE INSTALLED IN ACCORDANCE WITH ANY CONTRACTUAL AGREEMENT THAT MAY EXIST WITH AN OWNER, CONSTRUCTION MANAGER, GENERAL CONTRACTOR, ETC.

Split System Schedule

Unit Tag	Manufacturer	Outdoor Tag	Outdoor Condensing Unit							Furnace											Evaporator Coil							Accessories								
			Model Number	Nominal SEER	Nominal Tons	Out DB	Stages	Volts	Phase	MCA Amps	MOCF Amps	Weight lb	Furnace Tag	Model Number	Orientation	AFUE	Heating Input Btuh	Heating Output Btuh	Stages	Max Equivalent Vent Length (ft) / Diameter	Nominal Air Flow cfm	Outside Air cfm	Static in wg.	HP	MCA Amps	MOCF Amps	Weight lb		Model Number	EAT DB °F	EAT WB °F	FLAT DB °F	FLAT WB °F	TOT MBH	SENS MBH	Weight lb
SYS-01	Carrier	CU-1.5	24ACC418A003	14	1.5	95	1	208/230	1	11.7	20	123	GF-1.5	595P6A040V14-10	Vertical	0.96	40000	39000	1	155' / 2"	600	90	0.5	0.5	7	15	123	CNPVP181A1A	80	67	58.19	57.68	17.84	14.13	36	1-4
SYS-03	Carrier	CU-3	24ACC436A003	14	3.0	95	1	208/230	1	18.1	30	134	GF-3	595P6A080V17-16	Vertical	0.96	80000	78000	1	55' / 2"	1200	180	0.5	0.75	10	15	150	CNPVP3617A1A	80	67	58.81	58.12	34.13	27.46	48.5	1-4
SYS-3.5	Carrier	CU-3.5	24ACC442A003	14	3.5	95	1	208/230	1	22.3	35	192	GF-3.5	595P6A080V21-20	Vertical	0.96	80000	78000	1	55' / 2"	1400	210	0.5	1	12.8	20	161	CNPVP4217A1A	80	67	60.29	59.02	36.14	29.8	56.5	1-4
SYS-04	Carrier	CU-4	24ACC448A003	14	4.0	95	1	208/230	1	20.8	35	182	GF-4	595P6A100V21-20	Vertical	0.96	100000	97000	1	175' / 3"	1600	240	0.5	1	12.6	20	170	CNPVP4821A1A	80	67	60.48	58.91	41.87	33.73	65.5	1-4
SYS-05	Carrier	CU-5	24ACC460A003	14	5.0	95	1	208/230	1	27.5	40	197	GF-5	595P6A120V24-22	Vertical	0.96	120000	117000	1	75' / 3"	2000	300	0.5	1	12.6	20	189	CNPVP6024A1A	80	67	59.86	58.21	56.41	43.5	78	1-4

1 Motomaster Low Ambient Kit for cooling operation down to 0°F
 2 Concentric Vent Kit
 3 Long Line Accessories for refrigerant piping lengths between 80ft. - 200ft.:
 4 Thermostat 7 Day Programmable
 5 2" Diversitech Condensing Unit Pad



OUTDOOR MINI SPLIT SYSTEM SCHEDULE

TAG	AREA SERVED	MANUFACTURER	MODEL	CLG-MBH	NOMINAL TONS	MIN SEER	HEAT-MBH	MAX HEAT @ 5 DEGREES/MBH	COOLING OPERATING RANGE (F)	HEATING OPERATING RANGE (F)	VOLT/PHASE	MCA	MOCF	REFRIGERANT	WEIGHT	NOTES
HP-MS-2.5	REFER TO DRAWINGS	LG	LSU303HLV3	30	2.5	20	32.4	28.08	0-118	-13-65	208-230/1	23	30	R410A	160	1,2,3

1. PROVIDE EQUIPMENT STAND EQUAL TO DIVERSITECH MODEL QSMS2100
2. NO LOW TEMP CUT OUT OR RESTART.
3. LOW AMBIENT WIND BAFFLE

INDOOR MINI SPLIT SYSTEM SCHEDULE

TAG	AREA SERVED	MANUFACTURER	MODEL	CFM	ESP	VOLT/PHASE	WEIGHT	NOTE
AHU-MS-2.5	REFER TO DRAWINGS	LG	LSN303HLV3	1100/883/742/601	N/A	208-230/1	49	1,2

1. PROVIDE 7-DAY PROGRAMMABLE THERMOSTAT.
2. PROVIDE/INSTALL PRE-FABRICATED HONEYWELL JACKETED METAL CLAD MINI-SPLIT CABLE FOR INDOOR/OUTDOOR UNIT CONNECTION

FAN SCHEDULE

TAG	TYPE	AREA SERVED	MANUFACTURER	MODEL	DRIVE	CFM	ESP	WATTS	AMPS	RPM	VOLT/PHASE	MOUNTING	WEIGHT	NOTES
E-1	EXHAUST	TOILET	GREENHECK	SP-B80	DIRECT	70	0.2	18	0.16	900	115/60/1	CEILING	9	1

1. FAN TO RUN OFF A SWITCH.
2. FAN TO RUN OFF OF A TIMELOCK.

HEATER SCHEDULE

TAG	TYPE	AREA SERVED	MANUFACTURER	MODEL	HEAT-MBH	FUEL	HEAT-KW	AMPS	VOLT/PHASE	MOUNTING	WEIGHT	NOTES
H-1	WALL HEATER	REFER TO PLANS	BERKO	FR4020	6.8	ELECTRIC	2	-	208/1/60	WALL	22	1,2

1. SURFACE MOUNT FRAME
2. INTEGRAL THERMOSTAT

MECHANICAL EXHAUST SCHEDULE - 2017 OHIO MECHANICAL CODE

ROOM NUMBER	ROOMNAME	OCCUPANCY CLASSIFICATION	AREA (ft2)	EXHAUST AIRFLOW RATE (CFM/R2)	FIXTURES			TOTAL EXHAUST AIRFLOW REQ. (CFM)	TOTAL EXHAUST AIRFLOW ACT. (CFM)	
					EXHAUST RATE PER FIXTURE (CFM)	LOWER CONTINUOUS RATE?	HIGHER INTERMITTENT RATE?			
N/A	1ST FLR RESTROOM	PUBLIC SPACES - TOILET ROOM	48	N/A	50/70	NO	YES	1	70	70
N/A	1ST FLR RESTROOM	PUBLIC SPACES - TOILET ROOM	48	N/A	50/70	NO	YES	1	70	70
N/A	2ND FLR RESTROOM	PUBLIC SPACES - TOILET ROOM	56	N/A	50/70	NO	YES	1	70	70
N/A	3RD FLR RESTROOM	PUBLIC SPACES - TOILET ROOM	56	N/A	50/70	NO	YES	1	70	70
N/A	4TH FLR RESTROOM	PUBLIC SPACES - TOILET ROOM	56	N/A	50/70	NO	YES	1	70	70

DUCT INSULATION SCHEDULE

EQUIPMENT	AIR DISTRIBUTION TYPE				ADDITIONAL NOTES
	SA	RA	OA	EA	
GF-1.5	R-3.5	N/A	R-3.5	N/A	-
GF-3	R-3.5	N/A	R-3.5	N/A	-
GF-3.5	R-3.5	N/A	R-3.5	N/A	-
GF-4	R-3.5	N/A	N/A	N/A	-
GF-5	R-3.5	N/A	N/A	N/A	-
EX-1	N/A	N/A	N/A	R-3.5	1

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, 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.

1. EXHAUST AIR DUCTS TO HAVE R-3.5 INSULATION A MINIMUM OF 5FT FROM EXTERIOR PENETRATIONS.
- Duct Thermal Insulation
- a. 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.

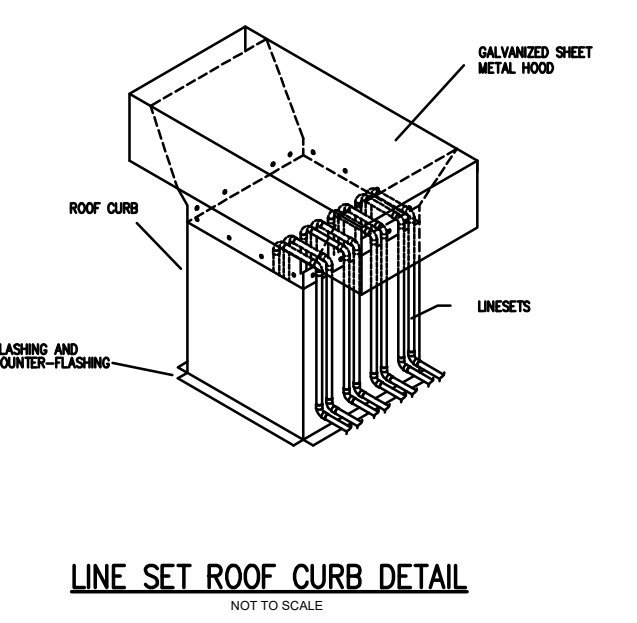
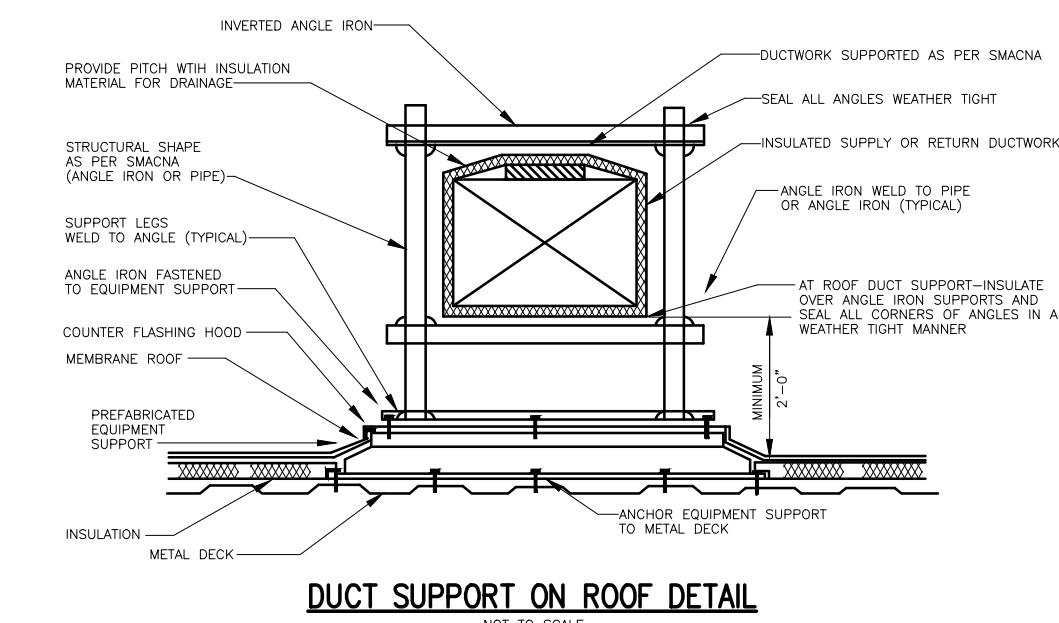
NATURAL VENTILATION SCHEDULE

UNIT	ROOMNAME	AREA	DOOR OPENABLE AREA (SQ. FT)	WINDOW OPENABLE AREA (SQ. FT)	TOTAL OPENABLE AREA	4% OF FLOOR AREA	8% OF FLOOR AREA	UNOBSTRUCTED OPENING
FIRST FLOOR SPACE		1800	35	12	47	72	144	164
MEZZ LOUNGE		382	0	27	27	15	N/A	N/A
MEZZ BREAK ROOM		296	0	20	20	11	N/A	N/A
THRID FLOOR EAST		1100	0	110	110	44	N/A	N/A
THRID FLOOR WEST		648	0	66	66	26	N/A	N/A
FOURTH FLOOR EAST		1100	0	110	110	44	N/A	N/A
FOURTH FLOOR WEST		648	0	66	66	26	N/A	N/A

NATURAL VENTILATION CALCULATIONS PER SEC 402.1 OF 2017 OHIO MECHANICAL CODE

NATURAL VENTILATION 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.

** OPENABLE AREA IS THROUGH ADJOINING SPACES PER SECTION 402.3 OF THE 2017 OMC. THE OPENING BETWEEN ADJOINING SPACES MUST BE UNOBSTRUCTED AND SHALL HAVE AN AREA NOT LESS THAN 8 PERCENT OF THE INTERIOR AREA OR A MINIMUM OF 25 SQUARE FEET. SINCE THE MEZZANINE OPEN TO THE FLOOR BELOW THE 8% MINIMUM IS ACHIEVED.



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M2.0
 MECHANICAL
 DETAILS & SCHEDULES

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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.
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. Temperature controls
 - iv. Sheet metal coordination drawings
 - 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. 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.
13. 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.
14. 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.
15. 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.
16. 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.
17. 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.
18. Finish
 - 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.
19. 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 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.
20. 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.
21. Duct Supports
 - a. Furnish and install hot-dipped galvanized steel fasteners, hangers, anchors, rods, straps, trim, and angles for support of ductwork.
22. Flexible Connections
 - a. Furnish and install neoprene flexible duct connections at the inlet and discharge of units and fans.
23. Duct Manual Volume Dampers
 - a. 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.
24. Duct Access Doors
 - a. Furnish and install conveniently located duct access doors of ample size and quantity for servicing the dampers.
25. Exhaust Fan
 - a. Fan manufacturer shall be Broan, Cook, Greenheck, or engineered approved equal. Refer to drawings and schedules for unit location, technical data, and any applicable accessories.
26. Ducted Split Systems
 - a. Split systems shall consist of high efficient air handling unit and associated heat pump. Equipment shall have manufacturer's standard warranty.
 - b. Split system manufacturer shall be Tempstar, Carrier, Goodman, or engineered equal.
27. Condensate Drain Piping
 - a. 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 or CPVC. 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.
 - b. 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.
29. Piping Supports (Metal Pipe)
 - a. Furnish and install hot-dipped galvanized steel fasteners, hangers, anchors, rods, straps, trim and angles for support of piping.
30. Piping Supports (Plastic Pipe)
 - a. Furnish and install hangers for plastic piping per manufacturer's requirements.
31. 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.
32. 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.
33. Sequence of Operation
 - a. Heaters
 - i. H-1: heater shall be controlled from the integral thermostat. When the temperature of the stairwell drops below the thermostat setpoint, the heater fan shall run and the electric heating element shall engage to maintain temperature setpoint.
 - b. Exhaust Fans
 - i. E-1/2: exhaust fan shall run on a switch (furnished by the electrical contractor).
 - c. Split Systems
 - i. GF/CU-X:
 - ii. 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.
 - iii. Cooling mode - when the thermostat calls for cooling the condensing unit shall engage, furnace fan shall run, and the dx cooling coil shall cool the air to maintain temperature set point.



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M2.1
 MECHANICAL
 DETAILS & SCHEDULES

*VENTILATION CALCULATIONS PER OMC 2017 TABLE 403.3.1.1