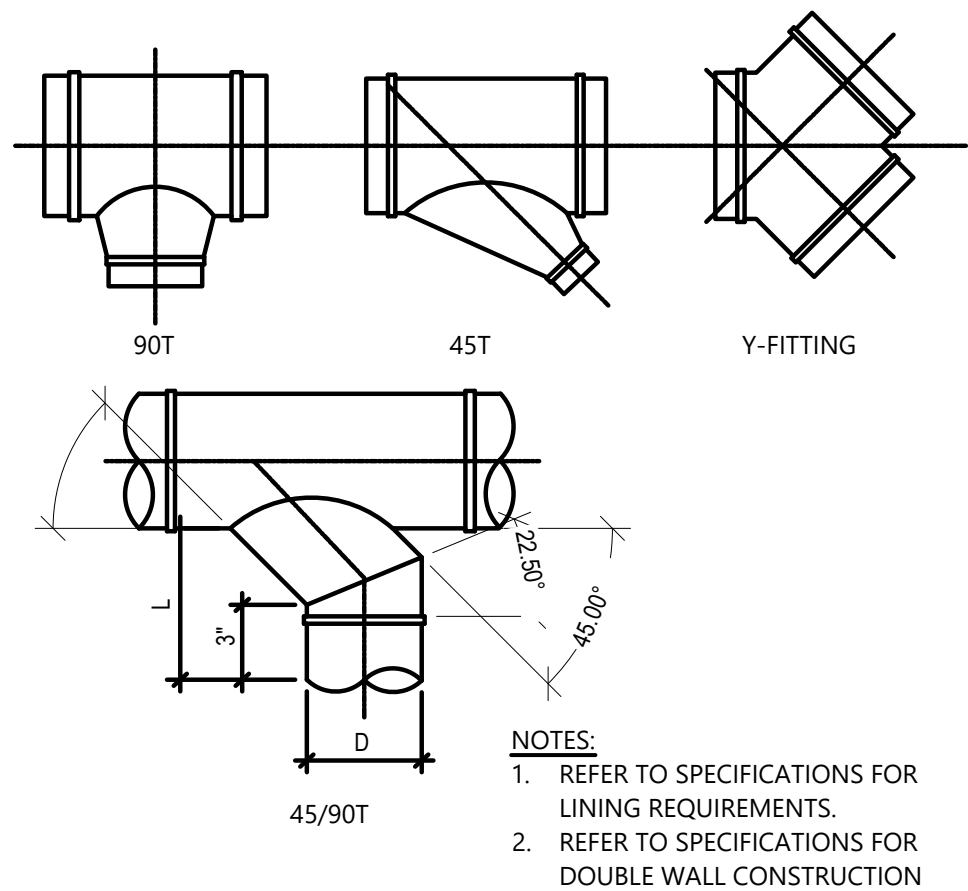
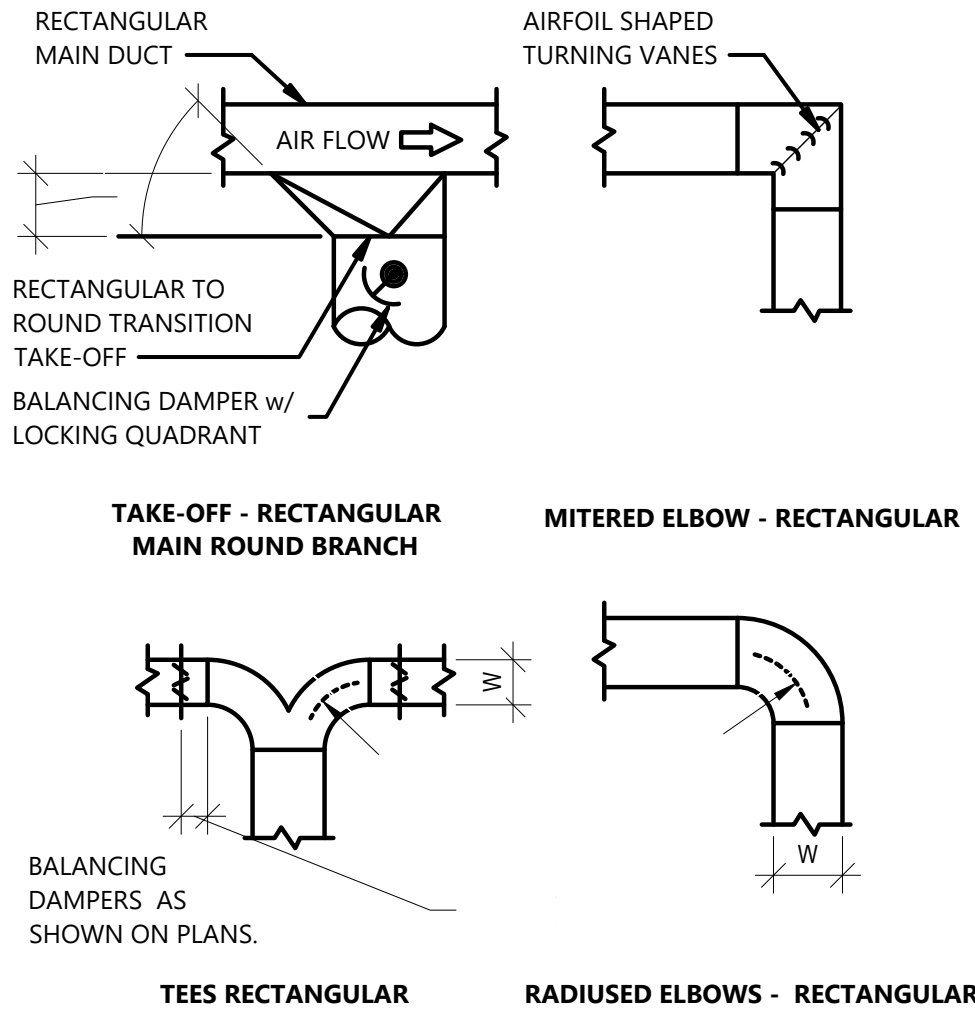
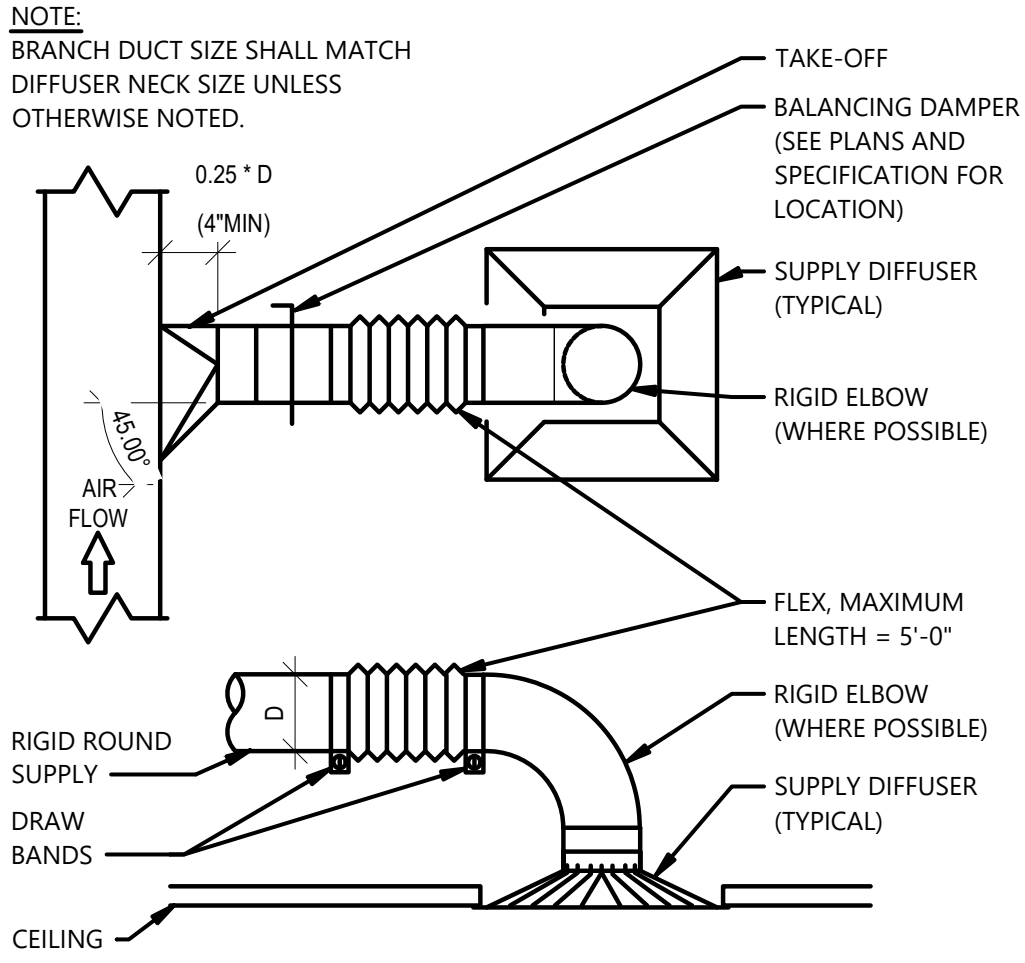




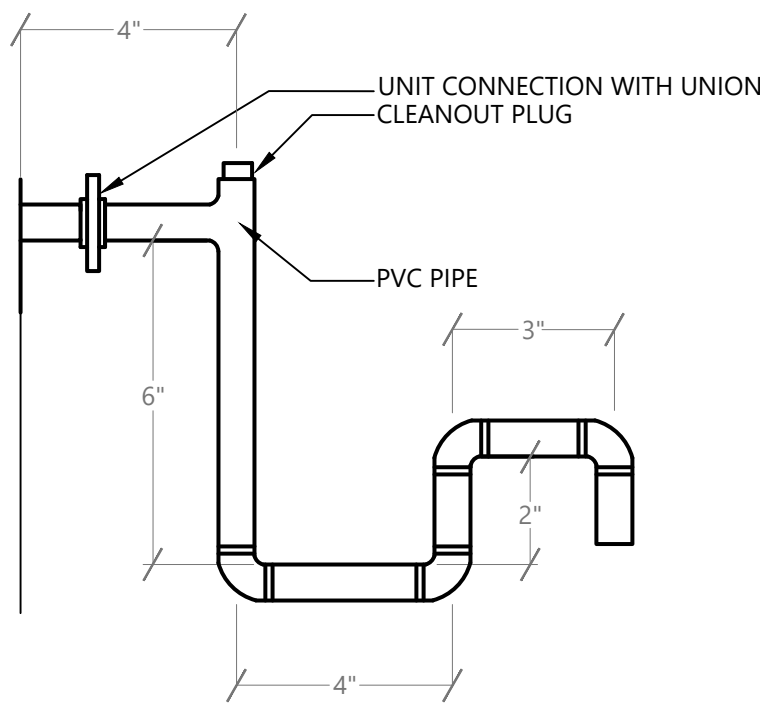
NO SCALE
① ROUND DUCT FITTINGS DETAIL



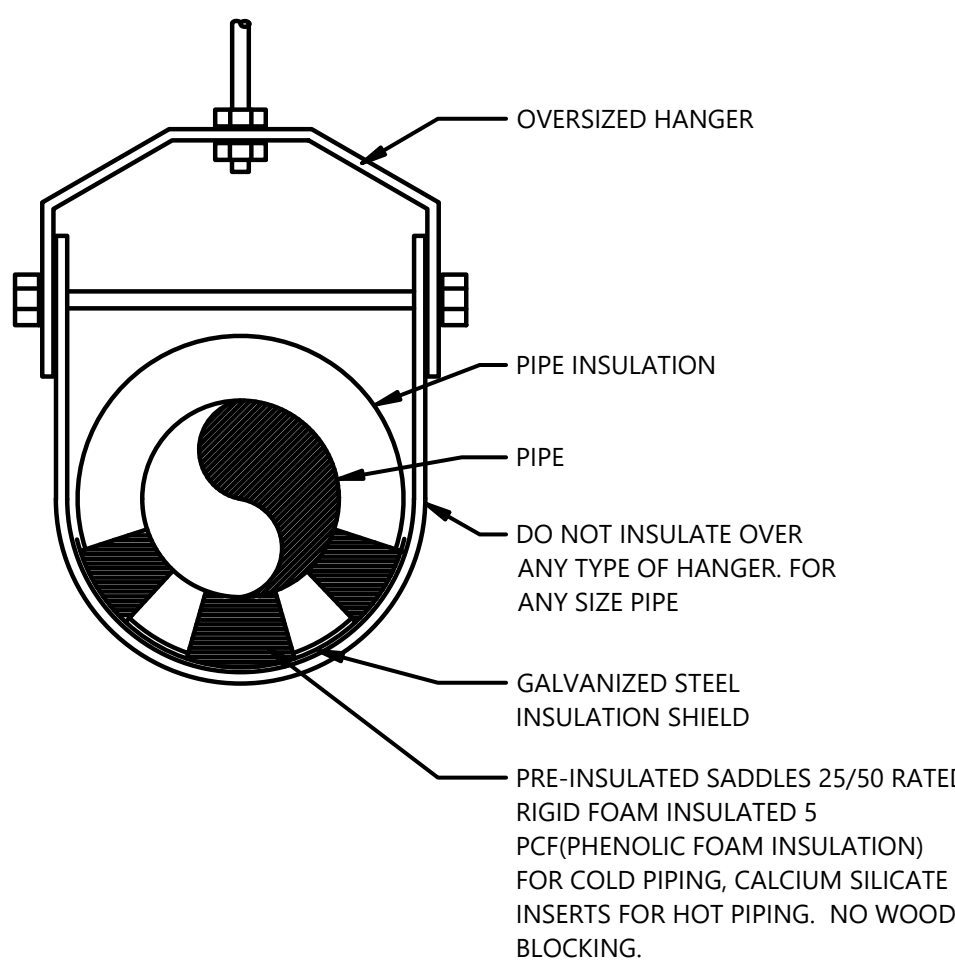
NO SCALE
② RECTANGULAR DUCT FITTINGS DETAIL



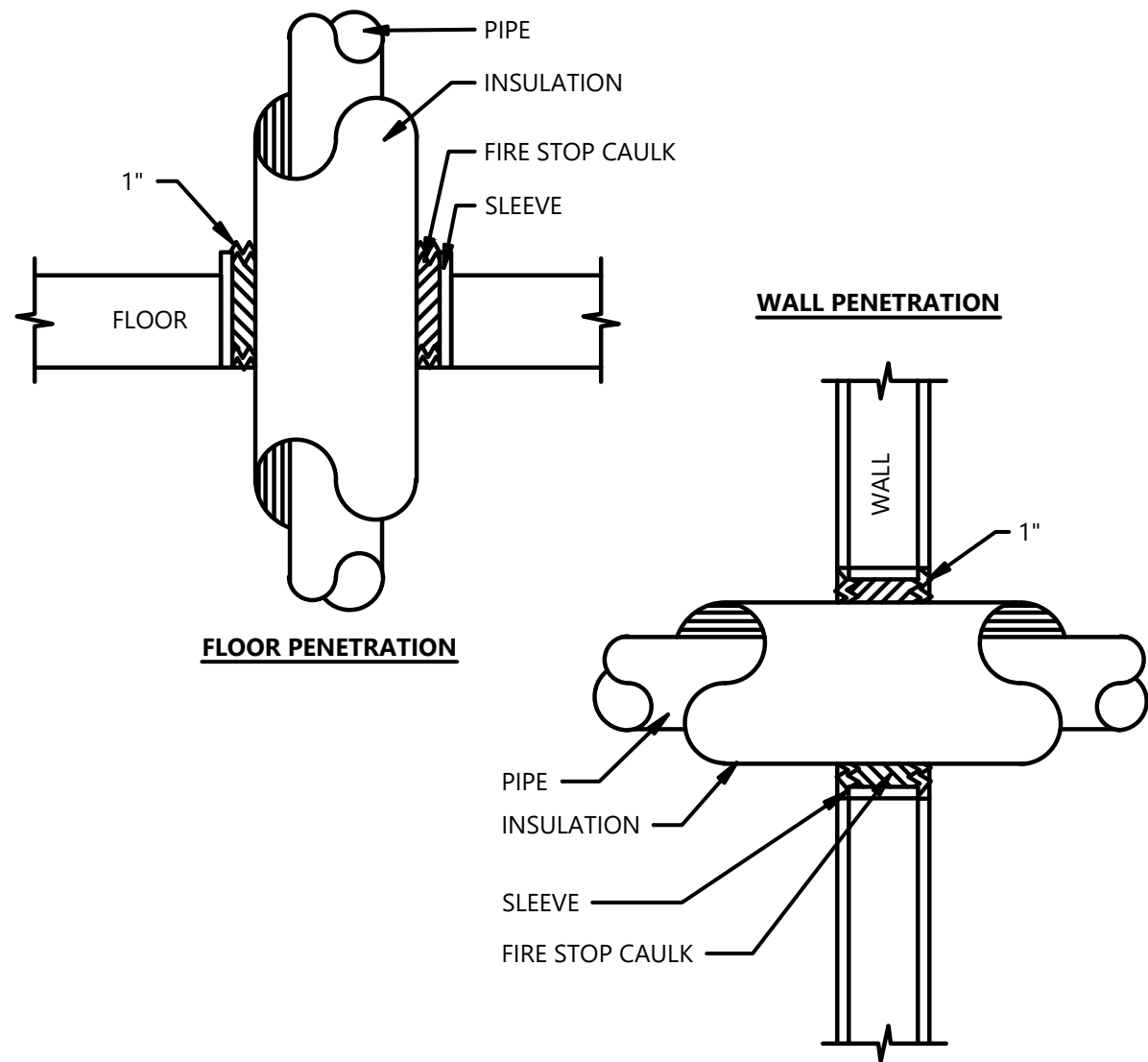
NO SCALE
③ ROUND BRANCH DUCT TAKE-OFF DETAIL



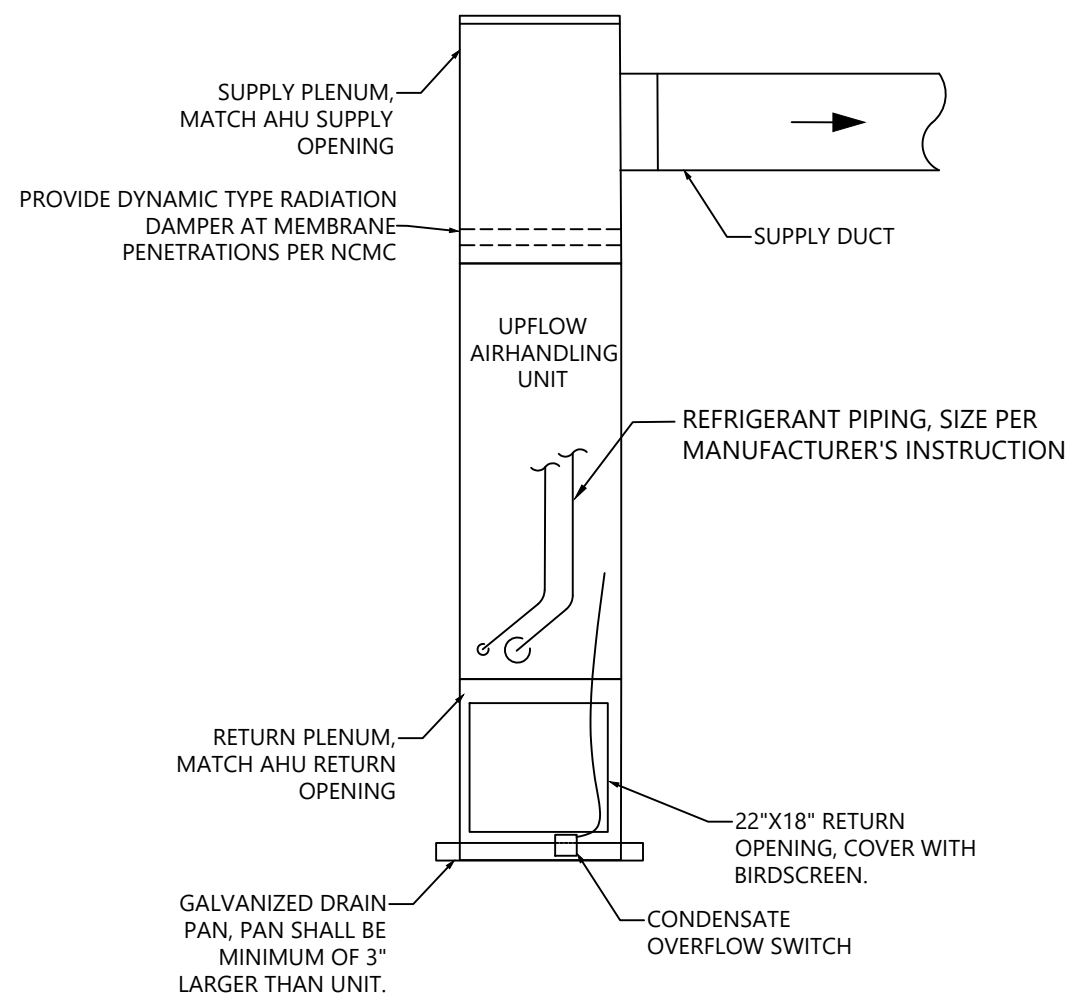
NO SCALE
④ DRAIN CONNECTION DETAIL



NO SCALE
⑤ TYPICAL PIPE HANGER DETAIL



NO SCALE
⑥ PIPE PENETRATION DETAILS



NO SCALE
⑦ APARTMENT AHU DETAIL

MECHANICAL GENERAL NOTES

- COMPLY WITH ALL APPLICABLE LOCAL AND STATE CODES AND REGULATIONS.
- DUCTWORK IS PERMITTED TO BE ABOVE ELECTRICAL EQUIPMENT ONLY IF IT IS INSTALLED OUTSIDE OF THE DEDICATED ELECTRICAL SPACE DEFINED AS THE SPACE EQUAL TO THE WIDTH AND DEPTH OF THE ELECTRICAL EQUIPMENT AND EXTENDING FROM THE FLOOR TO A HEIGHT OF 6'-0" ABOVE THE EQUIPMENT OR TO THE STRUCTURAL CEILING, WHICHEVER IS LOWER. DUCTWORK INSTALLED ABOVE ELECTRICAL EQUIPMENT SHALL BE PROVIDED WITH PROTECTION TO AVOID DAMAGE FROM CONDENSATION, LEAKS, BREAKS, ETC. REFER TO THE NEC FOR EXACT DEFINITION OF DEDICATED ELECTRICAL SPACE.
- ALL ISOLATION VALVES, EQUIPMENT, CONTROLS, ETC. REQUIRING ACCESS/SERVICE SHALL BE INSTALLED WITHIN 18" OF THE CEILING FOR EASY ACCESSIBILITY. LOCATIONS SHALL BE INDICATED ON THE CEILING GRID PER THE SPECIFICATIONS.
- ANY DEVICE REQUIRING A THERMOSTAT FOR CONTROL SHALL BE FURNISHED WITH A THERMOSTAT WHATEVER INDICATED ON THE DRAWINGS OR NOT.
- COORDINATE EXACT THERMOSTAT LOCATION WITH OWNER PRIOR TO INSTALLATION. STANDARD DEFAULT: INSTALL THE TOP OF ALL THERMOSTATS, SENSORS, AND SWITCHES AT 4'-0" ABOVE FINISHED FLOOR. DEVICES ON A PERIMETER WALL SHALL BE MOUNTED ON A FOAM-FILLED ELECTRICAL BOX, WITH ALL GAPS BETWEEN BOX AND WALL SEALED TO PREVENT INFILTRATION.
- PROVIDE ALL MISCELLANEOUS STEEL AND ITEMS REQUIRED FOR THE PROPER INSTALLATION OF ALL PIPE, SHEET METAL AND EQUIPMENT.
- COORDINATE FLOOR, WALL & ROOF PENETRATIONS ETC. WITH ARCHITECTURAL/STRUCTURAL TRADES. FIRESTOP SHALL BE PROVIDED IN HOLES AND PENETRATIONS IN RATED ASSEMBLIES. ALL PRING, DUCTS, VENTS, ETC., EXTENDING THROUGH WALLS AND ROOF SHALL BE FLASHED.
- EQUIPMENT OPERATED DURING CONSTRUCTION SHALL USE FILTERED MEDIA TO PREVENT CONSTRUCTION DEBRIS FROM ENTERING COILS, DUCTWORK SYSTEMS, AIR TERMINALS ETC. AT COMPLETION OF CONSTRUCTION, MECHANICAL CONTRACTOR SHALL CLEAN ALL SYSTEMS WITH ALL CONTROL DEVICES WIDE OPEN AND REMOVE ANY REMAINING DEBRIS PRIOR TO TEST AND BALANCING. MECHANICAL CONTRACTOR SHALL REPLACE ALL FILTRATION WITH NEW FILTERS AT COMPLETION OF CONSTRUCTION. ANY DUCTWORK, AIR TERMINALS, AND/OR OTHER EQUIPMENT UPSTREAM OF FILTRATION SHALL BE CLEANED THOROUGHLY OF CONSTRUCTION DEBRIS BEFORE HANDING OVER TO OWNER.
- ALL MECHANICAL EQUIPMENT SHALL BE U.L. LISTED AND LABELED AS A COMPLETE PACKAGE, NOT THROUGH INDIVIDUAL COMPONENTS OR PARTS. PROVIDE REQUIRED 3RD PARTY FIELD UL LISTING SERVICES AS REQUIRED TO COMPLY.
- UPON PROJECT COMPLETION, THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE OWNER INSTALLATION INFORMATION INCLUDING RECORD SUBMITTALS (WITH ANY SUBMITTAL REVIEW COMMENTS ADDRESSED) AND O&M MANUALS FOR EACH PIECE OF EQUIPMENT INCLUDING ALL SELECTED OPTIONS, THE NAME AND ADDRESS OF AT LEAST ONE SERVICE AGENCY, FULL CONTROL SYSTEM O&M AND CALIBRATION INFORMATION INCLUDING WIRING DIAGRAMS, SCHEMATICS, FULL SEQUENCE OF OPERATION, AND PROGRAMMED SETPOINTS. IN ADDITION, THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE TO HIRE A REGISTERED DESIGN PROFESSIONAL TO COMMISSION THE INSTALLED SYSTEM AND PROVIDE THE OWNER AND CODE REVIEWER A SEALED STATEMENT OF SYSTEM COMMISSIONING.
- PROVIDE A ONE YEAR WARRANTY FOR ALL WORK PERFORMED BEGINNING ON THE DAY THE SYSTEM IS COMPLETELY OPERATIONAL AND ACCEPTABLE BY THE OWNER.

SHEET METAL GENERAL NOTES

- STANDARD DUCTWORK SHALL BE GALVANIZED OR ALUMINUM SHEET METAL CONSTRUCTED IN ACCORDANCE WITH THE LATEST SMACNA STANDARDS. ALL CONCEALED SUPPLY, RETURN AND OUTSIDE AIR DUCTWORK SHALL BE WRAPPED WITH 2" THICK DUCT WRAP WITH VAPOR BARRIER. INSULATION (INCLUDING FLEXIBLE DUCT INSULATION) SHALL HAVE A MINIMUM INSTALLED R-VALUE OF 6.0.
- ALL DUCTWORK SHALL BE SEALED PER THE REQUIREMENTS OF THE STATE MECHANICAL CODE. SEAL LOW PRESSURE SUPPLY, RETURN, OUTSIDE AIR, AND EXHAUST DUCTWORK FOR POSITIVE/NEGATIVE 2" PRESSURE CLASS, SMACNA SEAL CLASS A, SMACNA LEAKAGE CLASS 4.
- NOT ALL REQUIRED OFFSETS AND FITTINGS ARE INDICATED ON DRAWINGS, BUT SHALL BE PROVIDED. REFER TO ARCHITECTURAL AND STRUCTURAL PLANS FOR CLEARANCES. SIGNIFICANT ALTERATIONS TO DUCT ROUTING SHALL BE APPROVED BY ARCHITECT/ENGINEER BEFORE PROCEEDING IN ORDER TO ENSURE ADEQUATE STATIC PRESSURE IS AVAILABLE.
- DUCTWORK LAYOUT HAS BEEN DESIGNED TO MINIMIZE SOUND TRANSMISSION. ALL FITTINGS SHALL BE PROVIDED AS INDICATED.
- WATERTIGHT CONCRETE CURBS SHALL BE PROVIDED AROUND ELEVATED FLOOR SLAB PENETRATIONS.
- UNLESS OTHERWISE NOTED, ALL DUCTWORK ABOVE CEILING OR EXPOSED IS OVERHEAD AND AS HIGH AS POSSIBLE TO THE UNDERSIDE OF THE STRUCTURE, WITH SPACE FOR INSULATION WHERE REQUIRED. DUCTWORK AND ASSOCIATED COMPONENTS SHALL CLEAR DOORS AND WINDOWS.
- PROVIDE FLEXIBLE CONNECTIONS IN ALL DUCTWORK SYSTEMS CONNECTED TO MECHANICAL EQUIPMENT THAT REQUIRE VIBRATION ISOLATION. FLEXIBLE CONNECTIONS SHALL BE PROVIDED AT THE POINT OF CONNECTION TO THE EQUIPMENT UNLESS OTHERWISE NOTED.
- RADIUS ELBOWS SHALL HAVE CENTERLINE RADIUS OF CURVATURE 1.5 TIMES THE DUCT DIAMETER OR WIDTH IN THE PLANE OF TURN. WHERE SQUARE (MITERED) ELBOWS ARE SHOWN, INSTALL TURNING VANES.
- DUCTWORK SIZES ARE INSIDE CLEAR DIMENSIONS. DUCTS CONNECTED TO EQUIPMENT SHALL EQUAL EQUIPMENT CONNECTION SIZE UNLESS NOTED OTHERWISE.
- MAXIMUM LENGTH ON FLEXIBLE DUCT SHALL BE 5'-0", UNLESS OTHERWISE NOTED ON DETAILS OR SPECIFICATIONS.
- THE MECHANICAL CONTRACTOR SHALL BALANCE ALL MECHANICAL SYSTEMS TO THE PERFORMANCE SPECIFICATIONS INDICATED ON PLANS AND PROVIDE THE ENGINEER WITH THREE COPIES OF A COMPLETE TEST AND BALANCE REPORT. THE REPORT IS TO BE ISSUED A MINIMUM OF TWO WEEKS PRIOR TO PROJECT COMPLETION. THE TEST AND BALANCE REPORT WILL BE SUBJECT TO REVIEW AND APPROVAL BY THE ENGINEER. ANY ADDITIONAL TESTING, ADJUSTING AND BALANCING REQUIRED (AT ENGINEER'S REQUEST) AFTER REVIEW OF THE INITIAL REPORT SHALL BE PROVIDED AT NO ADDITIONAL COST. TESTING AND BALANCING CONTRACTOR TO CONFIRM FILTERS ARE CLEAN, AND FREE OF DEBRIS PRIOR TO BEGINNING WORK. THE MECHANICAL CONTRACTOR SHALL REPLACE ANY DIRTY FILTERS, AS NEEDED. TEST AND BALANCE REPORT TO BE COMPLETED BY AN INDEPENDENT, CERTIFIED TEST AND BALANCE CONTRACTOR.

HVAC PIPING GENERAL NOTES

- CONDENSATE DRAIN PIPING SHALL BE SCHEDULE 40 PVC PIPE (OR TYPE 1" HARD DRAWN COPPER WHEN IN PLENUM) AND FITTINGS. DRAINS FROM AIR HANDLING UNITS SHALL BE TRAPPED. CONDENSATE DRAINS SHALL BE INSULATED WITH 1/2" THICK ARMAFLEX INSULATION. MINIMUM DRAIN SIZE SHALL BE 3/4". CONDENSATE LINE SHALL BE SLOPED AS REQUIRED BY CODE.
- ALL REFRIGERANT PIPE SHALL BE NITROGENIZED ACR COPPER TUBE. SIZE, INSULATE, AND INSTALL REFRIGERANT PIPING PER MANUFACTURER'S RECOMMENDATIONS. REFRIGERANT PIPING INSULATION EXPOSED OUTDOORS SHALL BE COVERED WITH AN OUTER ALUMINUM JACKET.
- PROVIDE UNIONS, FLANGES OR COUPLINGS AT CONNECTION TO ALL VALVES AND EQUIPMENT. DO NOT USE DIRECT WELDED OR THREADED CONNECTIONS TO VALVES, EQUIPMENT OR OTHER APPARATUS.
- PROVIDE NON-CONDUCTING DIELECTRIC UNIONS WHENEVER CONNECTING DISSIMILAR METALS.
- MECHANICAL CONTRACTOR SHALL PROVIDE PRE-PRINTED COLOR-CODED PIPE LABELS WITH 1-1/2" HIGH LETTERING INDICATING SERVICE AND FLOW DIRECTION. ALL PIPING TO MATCH EXISTING FACILITIES STANDARD (IF APPLICABLE). OTHERWISE, PIPE LABELS SHALL MATCH THE FOLLOWING: REFRIGERANT PIPING, YELLOW BACKGROUND, BLACK LETTERING. NATURAL GAS PIPING, YELLOW BACKGROUND, BLACK LETTERING.

MECHANICAL LEGEND

SYMBOL	DESCRIPTION
	THERMOSTAT / TEMP SENSOR (4'-0" AFF TO TOP)
	SUPPLY GRILLE
	RETURN AIR GRILLE
	EXHAUST AIR GRILLE
	CEILING RADIATION DAMPER
	MVD (MANUAL VOLUME DAMPER)
	DIFFUSER TAG
	NECK SIZE
	AIRFLOW-(TYPICAL QUANTITY)
AHU	AIR HANDLING UNIT
HP	HEAT PUMP
EE	EXHAUST FAN
ECUH	ELECTRIC CABINET UNIT HEATER
DB	DRYER BOOSTER FAN

Building Code - 2018 North Carolina NCBC

Prescriptive	Energy Cost Budget	2018 NCECC
Thermal Zone		3A
winter dry bulb		15.4°F
summer dry bulb		88°F
Interior design conditions		
winter dry bulb		70°F
summer dry bulb		75°F
relative humidity		50%RH
Building heating load		--- MBH
Building cooling load		--- MBH
Mechanical Space Conditioning System		
Unitary description of unit		DX SPLIT
heating efficiency (kW/COP)		-
cooling efficiency (EER)		-
heat output of unit		-
cooling output of unit		-
Equipment schedules with motors (mechanical systems)		N/A
motor horsepower		SEE EQUIPMENT SCHEDULES
number of phases		SEE EQUIPMENT SCHEDULES
minimum efficiency		SEE EQUIPMENT SCHEDULES
motor type		SEE EQUIPMENT SCHEDULES
# of poles		SEE EQUIPMENT SCHEDULES

#	REVISIONS	DATE

INDOOR UNIT SPLIT SYSTEM SCHEDULE

MARK	NOTES	INDOOR UNIT DATA							ELECTRICAL DATA					WEIGHT
		MFR	MODEL NO.	NOM. CAP. (MBH)	SUPPLY AIR FAN			FLA	HP	ELECTRIC HEATER	VOLTAGE/PH	MCA	MOCP	
					SA (CFM)	OA (CFM)	ESP (IN. W.C.)			(KW)				
AHU-1	1-8	GOODMAN	AWST18	18	600	-	0.2	2.6	1/3	3	230/1	18.9	20	84
AHU-2	1-8	GOODMAN	AWST24	24	800	-	0.3	2.6	1/3	5	230/1	28.3	30	84
AHU-3	1-8	GOODMAN	AWST30	30	1000	-	0.3	3.8	1/2	5	230/1	29.8	30	109
AHU-A	1-6, 9-12	GOODMAN	AHVE48	48	1400	200	0.2	5.2	3/4	5	230/1	31.5	35	158
AHU-B	1-6, 9-12	GOODMAN	AHVE48	48	1400	200	0.2	5.2	3/4	5	230/1	31.5	35	158

- NOTES:
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- FACTORY DISCONNECT.

PROVIDE 7-DAY PROGRAMMABLE CONTROLS W/ STANDARD WALL THERMOSTAT.

MERV-8 PRIMARY FILTERS - THROW-AWAY TYPE.

REFRIGERANT LINESET - SIZE, INSULATE, & ROUTE PIPING PER MANUFACTURER'S INSTRUCTIONS. PENETRATE THRU WALL SEALED WEATHERTIGHT.

CONDENSATE REMOVAL PUMP - EQUIVALENT TO LITTLE GIANT VCMA-15.

SECONDARY CONDENSATE OVERFLOW DRAIN PAN WITH UL 508 WATER LEVEL DETECTION DEVICE (EC TO PROVIDE SEPARATE CIRCUIT) TO SHUTOFF EQUIPMENT UPON ACTIVATION.

PROVIDE WALL MOUNT BRACKET.

PROVIDE FILTER RACK.

VARIABLE SPEED ECM BLOWER MOTOR.

FULLY COMMUNICATING.

ELECTRONIC EXPANSION VALVE.

PROVIDE HEATER KIT MODEL HKTS05X1 WITH SINGLE POINT WIRING KIT.

OUTDOOR UNIT SPLIT SYSTEM SCHEDULE

MARK	NOTES	OUTDOOR UNIT DATA									WEIGHT	
		MFR	MODEL NO.	REFRIG. TYPE	REFRIG. COOLING PERFORMANCE		REFRIG. HEATING PERFORMANCE		ELECTRICAL DATA			
					NOM. CAP.	SEER2	NOM. CAP	HSPF2	VOLTAGE/PH	MCA		MOCP
					(MBH)		(MBH)					
HP-1	1-3	GOODMAN	GLZS4MA18	R32	18	14.5	18	7.5	230/1	11.4	15	175
HP-2	1-3	GOODMAN	GLZS4MA24	R32	24	14.3	24	7.5	230/1	13.8	20	175
HP-3	1-3	GOODMAN	GLZS4MA30	R32	30	15.2	30	7.8	230/1	17	25	189
HP-A	1, 2, 4	GOODMAN	GZV6SA48	R32	48	17	48	8.2	230/1	31.8	35	185
HP-B	1, 2, 4	GOODMAN	GZV6SA48	R32	48	17	48	8.2	230/1	31.8	35	185

- NOTES:
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- PROVIDE 4" CONCRETE HOUSEKEEPING PAD.

EC TO PROVIDE ELECTRICAL DISCONNECT.

SCROLL COMPRESSOR.

VARIABLE SPEED SWING COMPRESSOR.

FAN SCHEDULE

MARK	NOTES	MANUFACTURER	MODEL NO.	SERVICE	LOCATION	FAN DATA					ELECTRICAL DATA				WEIGHT
						TYPE	AIRFLOW (CFM)	RPM	ESP (IN. W.C.)	MOTOR DATA (HP)	VOLTS	PHASE	MCA (A)	MOCP (A)	
EF-1	1-5	BROAN	XB50	EXHAUST	APARTMENT BATHROOMS	CEILING MOUNT	50	-	0.1	5.1W	115	1	-	-	12.5
EF-A	1, 2, 4, 5	GREENHECK	CSP-A200	EXHAUST	RECREATION/ADMIN. BLDG	INLINE	200	825	0.15	135W	115	1	-	-	23
DBF-1	1, 2, 4-12	FANTECH	DEDPV705	DRYER EXHAUST	APARTMENT	INLINE	150	2600	0.2	78W	120	1	-	-	23

- NOTES:
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- FACTORY MOUNTED DISCONNECT.

GRAVITY OPERATED DAMPER.

PROVIDE RADIATION DAMPER.

EC TO PROVIDE WALL SWITCH.

FAN SHALL RUN CONTINUOUSLY WHILE BUILDING IS OCCUPIED.

UL705 CERTIFIED.

EC TO PROVIDE OUTLET WITHIN 4' OF FAN.

PLUG TYPE DISCONNECT.

UL705 CERTIFIED.

PRESSURE SWITCH, THERMAL SHUTDOWN, LED WARNING PANEL

LOCATE WARNING PANEL ABOVE DRYER IN VISIBLE LOCATION.

MC SHALL PROVIDE PERMANENT LABEL INDICATING TOTAL EQUIVALENT LENGTH .

ELECTRIC UNIT HEATER SCHEDULE

MARK	NOTE LEGEND					MANUFACTURER	MODEL NO.	MOUNTING	ELECTRICAL DATA			
	1	2	3	4	5				CAPACITY (KW)	VOLTS	PHASE	AMPS
ECUH-1	X	X	X	X	X	QMARK	CWH1202DSF	WALL	2	240	1	8.3
ECUH-A	X	X	X	X	X	QMARK	CWH1202DSF	WALL	2	240	1	8.3

- NOTES:
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- FACTORY MOUNTED DISCONNECT AND THERMOSTAT.

PROVIDE SUMMER TIME SWITCH.

PROVIDE SEMI-RECESSED MOUNTING FRAME.

MOUNT HEATER @ 24" A.F.F.

U.L. LISTED.

AIR TERMINAL SCHEDULE (GRILLES, REGISTERS AND DIFFUSERS)

MARK	NOTES	MANUFACTURER	MODEL NO.	AIR TERMINAL TYPE	NECK SIZE	FACE SIZE	MATERIAL	MAX APD (IN. W.C.)	MAX NC
					Ø (IN.)	(CFM)			
SD-1A	1-3	PRICE	SPD	SQUARE PLAQUE DIFFUSER	SEE PLANS	24"x24"	STEEL	0.10	25
SD-1B	1-3		SPD	SQUARE PLAQUE DIFFUSER	SEE PLANS	12"x12"	STEEL		
RG-1	1-3		PDDR	PERFORATED RETURN GRILLE	SEE PLANS	24"x24"	STEEL		
SG-1	1-4		540	RESIDENTIAL SUPPLY GRILLE	SEE PLANS	12"x4"	STEEL		
SG-2	1-4		540	RESIDENTIAL SUPPLY GRILLE	SEE PLANS	10"x4"	STEEL		
TG-1	1-3		530	RESIDENTIAL RETURN GRILLE	SEE PLANS	14"x8"	STEEL		
EG-1	1-3		80	EGGCRATE RETURN/EXHAUST GRILLE	SEE PLANS	12"x12"	STEEL		

- NOTES:
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- BALANCING DAMPER PLACMENT ON PLANS IS COORDINATED WITH CEILING TYPES FOR ACCESSIBILITY AS PERMITTED BY THE DUCT LAYOUT.

WHERE DAMPER IS INACCESSIBLE, CONTRACTOR IS TO INSTALL A REMOTE CABLE-OPERATED ROD/DAMPER SYSTEM (EQUAL TO DURO ZONE: COD) TO AVOID ACCESS PANEL

COLOR: SELECTION BY ARCHITECT FROM MANUFACTURER STANDARD OFFERING (DEFAULT: WHITE)

REFER TO ARCHITECTURAL REFLECTED CEILING PLAN TO COORDINATE MOUNTING TYPES

PROVIDE UL 555C RADIATION DAMPER.



- PRELIMINARY -
NOT FOR CONSTRUCTION



SIGNATURE:

CLIENT:

The orchards at Naples Road, LLC
341 N main Street
Hendersonville, NC 28792
Luis Graef: President



PROJECT:

The Orchards at Naples Road
Apartment Complex
Hendersonville, North Carolina

REVISIONS DATE

DWG INFO:
ISSUE DATE: 1/31/25
PROJECT #: 22105
DRAWN BY: RS
CHECKED BY: JK

DWG DESCRIPTION:

MECHANICAL
SCHEDULES

SHEET #:
M-01

1 BEDROOM NATURAL VENTILATION CALCULATIONS (402.2 NCMC 2018)			
ROOM	SF	REQUIRED SF @ 4% OPENINGS	PROVIDED OPENINGS SF
PRIMARY BEDROOM	288	12	36
LIVING/DINING ROOM	578	23	96
TOTAL	866	35	132

2 BEDROOM NATURAL VENTILATION CALCULATIONS (402.2 NCMC 2018)			
ROOM	SF	REQUIRED SF @ 4% OPENINGS	PROVIDED OPENINGS SF
PRIMARY BEDROOM	269	11	54
BEDROOM #2	212	8	36
LIVING/DINING ROOM	562	22	96
TOTAL	1043	42	186

3 BEDROOM NATURAL VENTILATION CALCULATIONS (402.2 NCMC 2018)			
ROOM	SF	REQUIRED SF @ 4% OPENINGS	PROVIDED OPENINGS SF
PRIMARY BEDROOM	222	9	36
BEDROOM #2	169	7	36
BEDROOM #3	169	7	36
LIVING/DINING ROOM	639	26	96
TOTAL	1199	48	204

Air Ionization Device Schedule

Zone Tag	Flow	S/A Flow	O/A Flow	GPS Model	GPS Quantity	Pressure Drop	Voltage (AC)	Watts	Mounting Location	Min Ion Density (ions/cc)	Notes
GPS-A	CV	1400	355	GPS-DM48-AC	1	0.05" W.C.	120	12	Duct	200 Million	1 to 8
GPS-B	CV	1400	325	GPS-DM48-AC	1	0.05" W.C.	120	12	Duct	200 Million	1 to 8

- Basis of Design: GPS Air: Approved equals by Aerigenics and Bloxygen subject to specification compliance
- Mount bi-polar ion generator where indicated on schedule
- If contractor substitutes basis of design with another manufacturer, contractor shall coordinate all electrical and mechanical changes
- Bi-polar ionization systems requiring replacement glass tubes are not acceptable
- All manufacturers must pass UL-867-2007 ozone chamber testing by either UL or ETL
- Provide with integral BAS alarm contacts
- Provide with self-cleaning feature. Systems without self-cleaning shall not be acceptable.
- Provide with weatherproof enclosure.

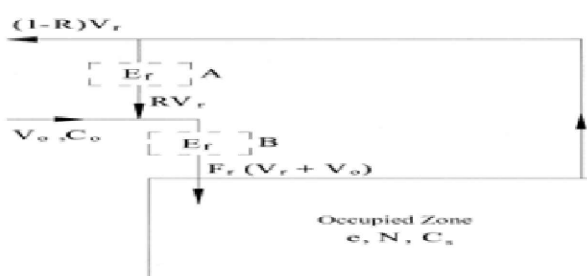
RECREATION/ADMIN. BUILDING REQUIRED OUTDOOR VENTILATION PER TABLE 403.3.1.1 (ASHRAE 62.1 VRP)											
ZONE/ROOM	SERVED BY	OCCUPANCY CLASSIFICATION	OA REQ. PER PERSON	ZONE POPULATION	OUTDOOR AIRFLOW RATE	ZONE FLOOR AREA	BREATHING ZONE OA	ZONE AIR DISTRIBUTION EFFECTIVENESS		ZONE OA	
			Rp	Pz	Ra	Az	Vbz	Ez		REQ	PROVIDED
MULTIPURPOSE EVENT ROOM	AHU-A	MULTIPURPOSE ASSEMBLY	5	44	0.06	1053	284	0.80		355	355
GYM/EXERCISE	AHU-B	HEALTH CLUB/WEIGHT ROOM	20	10	0.06	959	258	0.80		323	325
ENTRY LOBBY	AHU-B	OFFICE	5	0	0.06	224	14	0.80		18	20
MAIN OFFICE	AHU-B	OFFICE	5	2	0.06	279	27	0.80		34	35
PRIVATE OFFICE	AHU-B	OFFICE	5	1	0.06	185	17	0.80		21	25
TOTAL				57		2700				750	760



GPS Air
3101 Yorkmont Rd
Suite 400
Charlotte, NC 28208
www.gpsair.com
VERSION 2.2 running ASHRAE 62.1-2016

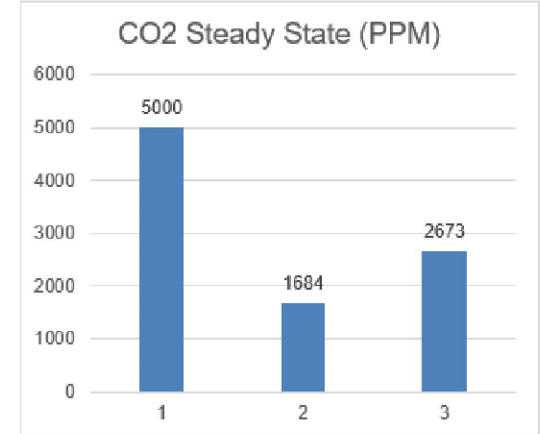
Zone Tag	Facility Type	Zone Use	Zone Floor Area (square ft)	Zone Max Occupancy	Table 6.1 OA per Occupant	Table 6.1 cfm/f2	Pz * Rp	Az * Ra	Table 6.2 Ventilation Effectiveness	Outdoor Air to Zone (CFM) with Ez correction (Vbz/Ez)
AHU-A	Public Assembly Spaces	Multipurpose Assembly	1,053.0	44.0	5.0	0.06	220	63	0.8	354 OA required per VRP

Zone Height (feet)	10.0
Desired Outside Air (ft3) IAQP (C)	120
Supply Air (ft3) (CFM)	1,400
Return Air (ft3)	1,280
Recirc. Flow Factor (R)	0.86
Ventilation Effectiveness (Ez)	0.8
Level of Physical Activity	Sedentary
Filter Location	B
HVAC Flow Type	Constant
Outdoor Air Flow Type	Constant



Air Changes Per Hour	8.8	VRP OA CFM per person	8.0
Outside Air Per VRP	354 CFM	IAQ OA CFM per person	4.5
Outside Air Per IAQ	200 CFM		
Outside Air Savings	154 CFM	Winter Heating Savings	
OA Summer Drybulb	95.0	OA Winter Design DB (F)	10
OA Summer Wetbulb	76.0	Supply Air DB Setpoint (F)	55
Coil Leaving Air Drybulb (F)	55.0	MBH Saved Winter	12.5
Coil Leaving Air Wetbulb (F)	55.0	KW Saved Winter	3.7
OA MBH Saved Summer*	#NAME?		
OA Tons Saved Summer*	#NAME?		

*OA = Outside Air
**OSHA, NIOSH & WHO most conservative values used
<http://www.cdc.gov/niosh/npg/npgsys-a.html>



Indoor Contaminants Generated By People & From Outdoors	Maximum Threshold Value Based on OSHA or NIOSH (PPM)	Steady State (lb/(R3)) Using the VRP*	Steady State (lb/(R3)) Using the IAQ Method (Reduced OA) Ionization On	Is Steady State Level Acceptable at Reduced OA Levels?	Contaminant Generation Rate lb/person/min	Filtration Effectiveness	Cognizant Authority**
Acetaldehyde	100.0	3.2535E-09	1.1684E-09	Yes	1.2903E-08	50%	OSHA
Acetone	250.0	2.0376E-09	1.0031E-09	Yes	1.2993E-07	50%	NIOSH
Ammonia	25.00	4.7432E-07	2.3503E-07	Yes	3.0522E-06	50%	NIOSH
Benzene	1.0	2.3188E-09	1.1313E-09	Yes	1.4802E-07	50%	OSHA
2- Butanone (MEK)	200.0	1.3735E-05	6.8055E-07	Yes	8.8395E-06	50%	NIOSH
Carbon dioxide**	5000	4.8792E-05	5.1746E-05	Yes	2.4692E-05	0%	NIOSH
Chloroform	2.0	4.2545E-08	2.1052E-08	Yes	2.7342E-07	50%	NIOSH
Dioxane	100.0	0.0000E+00	0.0000E+00	Yes	0.0000E+00	50%	OSHA
Hydrogen Sulfide	10.0	0.0000E+00	0.0000E+00	Yes	0.0000E+00	50%	NIOSH
Methane	NA	6.8698E-09	6.8698E-09	Yes	0.0000E+00	0%	NA
Methanol	200.0	1.7344E-08	3.0698E-08	Yes	1.1163E-07	0%	NIOSH
Methylene Chloride	25.0	1.2472E-09	6.1804E-07	Yes	8.0262E-06	50%	OSHA
Propane	1000.0	1.1242E-09	1.1242E-09	Yes	0.0000E+00	0%	NIOSH
Tetrachloroethane	5.0	0.0000E+00	0.0000E+00	Yes	0.0000E+00	50%	OSHA
Tetrachloroethylene	100.0	1.4163E-05	7.0190E-07	Yes	9.1140E-06	50%	OSHA
Toluene	100.0	4.7926E-09	1.9309E-09	Yes	2.2865E-08	50%	NIOSH
1,1,1 - Trichloroethane	350.0	5.9536E-05	2.9594E-05	Yes	3.8319E-04	50%	NIOSH
Xylene	100.0	6.2455E-10	8.7431E-11	Yes	0.0000E+00	50%	OSHA

Building materials and furnishings assumed to have no VOCs and off-gassing is complete
All yellow shaded boxes require user input or review.

Is IAQ acceptable at reduced outside air levels?

Yes

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The University of Denmark conducted a study to confirm CO2 levels at 5,000 PPM had no impact on cognitive function. Zhang X, Wangrocki P, Lien Z, Human Responses to Carbon Dioxide, a Follow-up Study at Recommended Exposure Limits

IMC 2006 & later allows for ASHRAE 62 IAQP through the engineered exception found in Section 403.2
Exhaust flow rates may differ from Table 6.5 based on ASHRAE 62 IAQP via Section 6.5.2

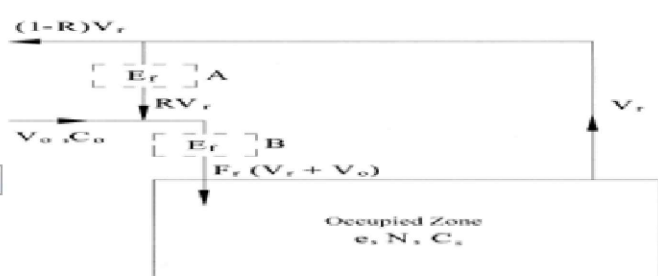
Date	1/28/2025
Job Name	Naples Road Apartments
Representative	-
Engineer	Wide Engineering
Contractor	-



GPS Air
3101 Yorkmont Rd
Suite 400
Charlotte, NC 28208
www.gpsair.com
VERSION 2.2 running ASHRAE 62.1-2016

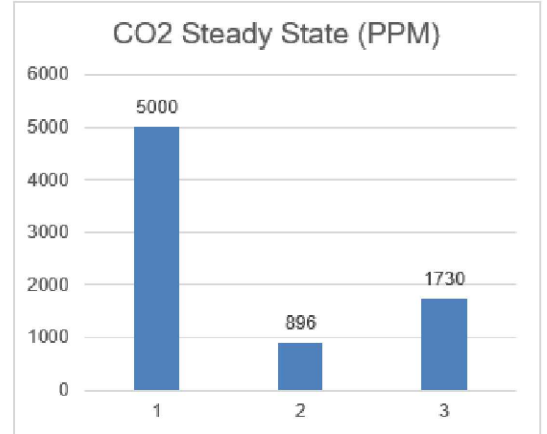
Zone Tag	Facility Type	Zone Use	Zone Floor Area (square ft)	Zone Max Occupancy	Table 6.1 OA per Occupant	Table 6.1 cfm/f2	Pz * Rp	Az * Ra	Table 6.2 Ventilation Effectiveness	Outdoor Air to Zone (CFM) with Ez correction (Vbz/Ez)
AHU-B	Sports & Entertainment	Health club/aerobics room	959.0	10.0	20.0	0.06	200	56	0.8	322 OA required per VRP

Zone Height (feet)	10.0
Desired Outside Air (ft3) IAQP (C)	120
Supply Air (ft3) (CFM)	1,400
Return Air (ft3)	1,280
Recirc. Flow Factor (R)	0.91
Ventilation Effectiveness (Ez)	0.8
Level of Physical Activity	Strenuous Exercise
Filter Location	B
HVAC Flow Type	Constant
Outdoor Air Flow Type	Constant



Air Changes Per Hour	8.8	VRP OA CFM per person	32.2
Outside Air Per VRP	322 CFM	IAQ OA CFM per person	12.0
Outside Air Per IAQ	120 CFM		
Outside Air Savings	202 CFM	Winter Heating Savings	
OA Summer Drybulb	95.0	OA Winter Design DB (F)	10
OA Summer Wetbulb	76.0	Supply Air DB Setpoint (F)	55
Coil Leaving Air Drybulb (F)	55.0	MBH Saved Winter	15.4
Coil Leaving Air Wetbulb (F)	55.0	KW Saved Winter	4.8
OA MBH Saved Summer*	#NAME?		
OA Tons Saved Summer*	#NAME?		

*OA = Outside Air
**OSHA, NIOSH & WHO most conservative values used
<http://www.cdc.gov/niosh/npg/npgsys-a.html>



Indoor Contaminants Generated By People & From Outdoors	Maximum Threshold Value Based on OSHA or NIOSH (PPM)	Steady State (lb/(R3)) Using the VRP* (Prescribed OA) Ionization Off	Steady State (lb/(R3)) Using the IAQ Method (Reduced OA) Ionization On	Is Steady State Level Acceptable at Reduced OA Levels?	Contaminant Generation Rate lb/person/min	Filtration Effectiveness	Cognizant Authority**
Acetaldehyde	100.0	4.3421E-09	1.5184E-09	Yes	7.9657E-08	50%	OSHA
Acetone	250.0	3.1333E-08	1.4235E-08	Yes	8.0213E-07	50%	NIOSH
Ammonia	25.00	7.3172E-07	3.3403E-07	Yes	1.9843E-05	50%	NIOSH
Benzene	1.0	3.5402E-08	1.6922E-08	Yes	3.0145E-07	50%	OSHA
2- Butanone (MEK)	200.0	2.1190E-06	9.6739E-07	Yes	5.4571E-05	50%	NIOSH
Carbon dioxide**	5000	5.0875E-05	6.0839E-05	Yes	1.5244E-04	0%	NIOSH
Chloroform	2.0	6.5564E-08	2.9327E-08	Yes	1.6880E-06	50%	NIOSH
Dioxane	100.0	0.0000E+00	0.0000E+00	Yes	0.0000E+00	50%	OSHA
Hydrogen Sulfide	10.0	0.0000E+00	0.0000E+00	Yes	0.0000E+00	50%	NIOSH
Methane	NA	6.8698E-08	6.8698E-08	Yes	0.0000E+00	0%	NA
Methanol	200.0	2.6759E-08	7.1784E-08	Yes	6.8913E-07	0%	NIOSH
Methylene Chloride	25.0	1.9341E-06	9.1615E-07	Yes	4.9450E-05	50%	OSHA
Propane	1000.0	1.1242E-09	1.1242E-09	Yes	0.0000E+00	0%	NIOSH
Tetrachloroethane	5.0	0.0000E+00	0.0000E+00	Yes	0.0000E+00	50%	OSHA
Tetrachloroethylene	100.0	2.1849E-06	9.9742E-07	Yes	5.6265E-05	50%	OSHA
Toluene	100.0	6.1769E-09	2.6020E-09	Yes	1.4079E-07	50%	NIOSH
1,1,1 - Trichloroethane	350.0	9.1954E-05	4.1934E-05	Yes	2.3656E-03	50%	NIOSH
Xylene	100.0	6.2455E-10	5.3141E-11	Yes	0.0000E+00	50%	OSHA

Building materials and furnishings assumed to have no VOCs and off-gassing is complete
All yellow shaded boxes require user input or review.

Is IAQ acceptable at reduced outside air levels?

Yes

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Date	1/28/2025
Job Name	Naples Road Apartments
Representative	-
Engineer	Wide Engineering
Contractor	-

IMC 2006 & later allows for ASHRAE 62 IAQP through the engineered exception found in Section 403.2
Exhaust flow rates may differ from Table 6.5 based on ASHRAE 62 IAQP via Section 6.5.2



- PRELIMINARY -
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341 N main Street
Hendersonville, NC 28792
Luis Graef: President



PROJECT:
The Orchards at Naples Road
Apartment Complex
Hendersonville, North Carolina

#	REVISIONS	DATE

DWG INFO:
ISSUE DATE: 1/31/25
PROJECT #: 22105
DRAWN BY: RS
CHECKED BY: JK

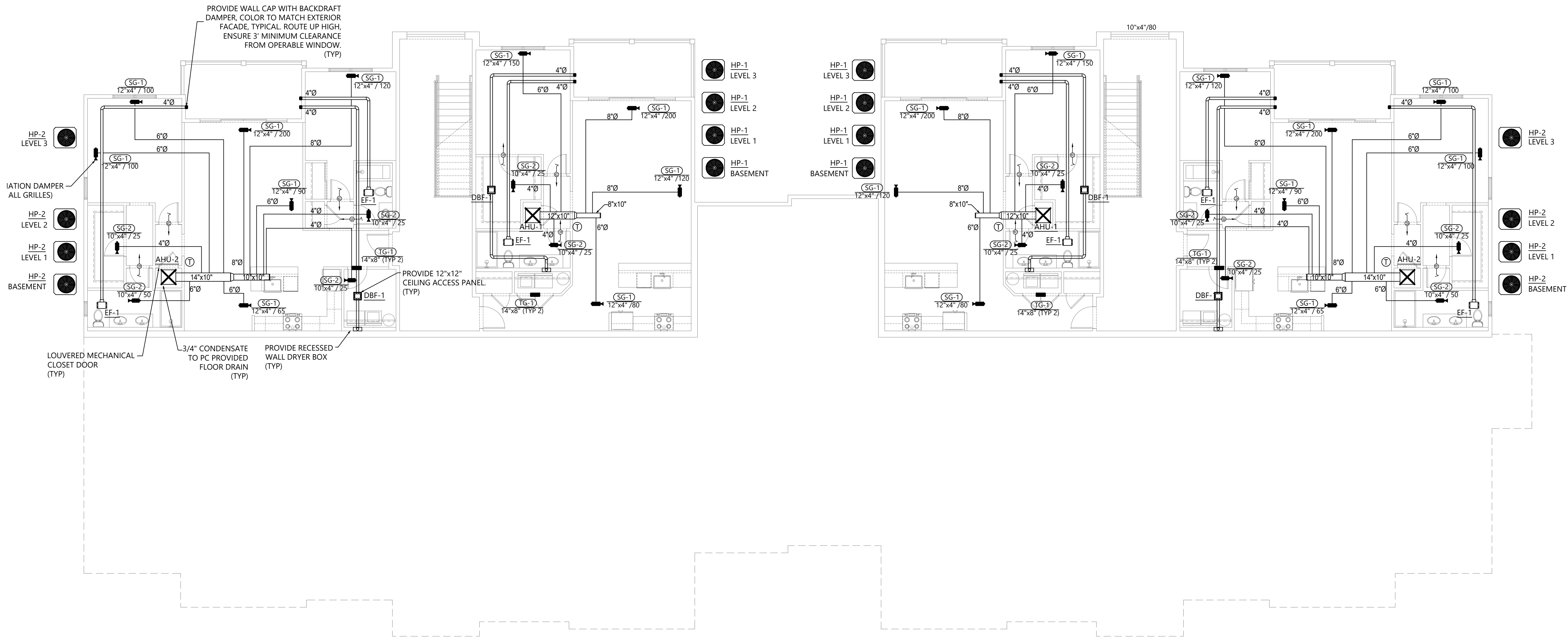
DWG DESCRIPTION:

MECHANICAL
SCHEDULES

SHEET #:

M-02

WILDE # 24-125



1 MECHANICAL PLAN - BUILDINGS 1 & 6 (28 UNIT BUILDING) - BASEMENT
1/8" = 1'-0"

- PRELIMINARY -
NOT FOR CONSTRUCTION

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Hendersonville, NC 28792
Luis Graef: President



PROJECT:
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#	REVISIONS	DATE

DWG INFO:

DWG DESCRIPTION:
MECHANICAL PLAN -
BASEMENT -
BUILDINGS 1 & 6

SHEET #:
M-1



SIGNATURE:

ENT:



SUBJECT:

The Orchards at Naples Road
Apartment Complex
Hendersonville, North Carolina

[illegible]

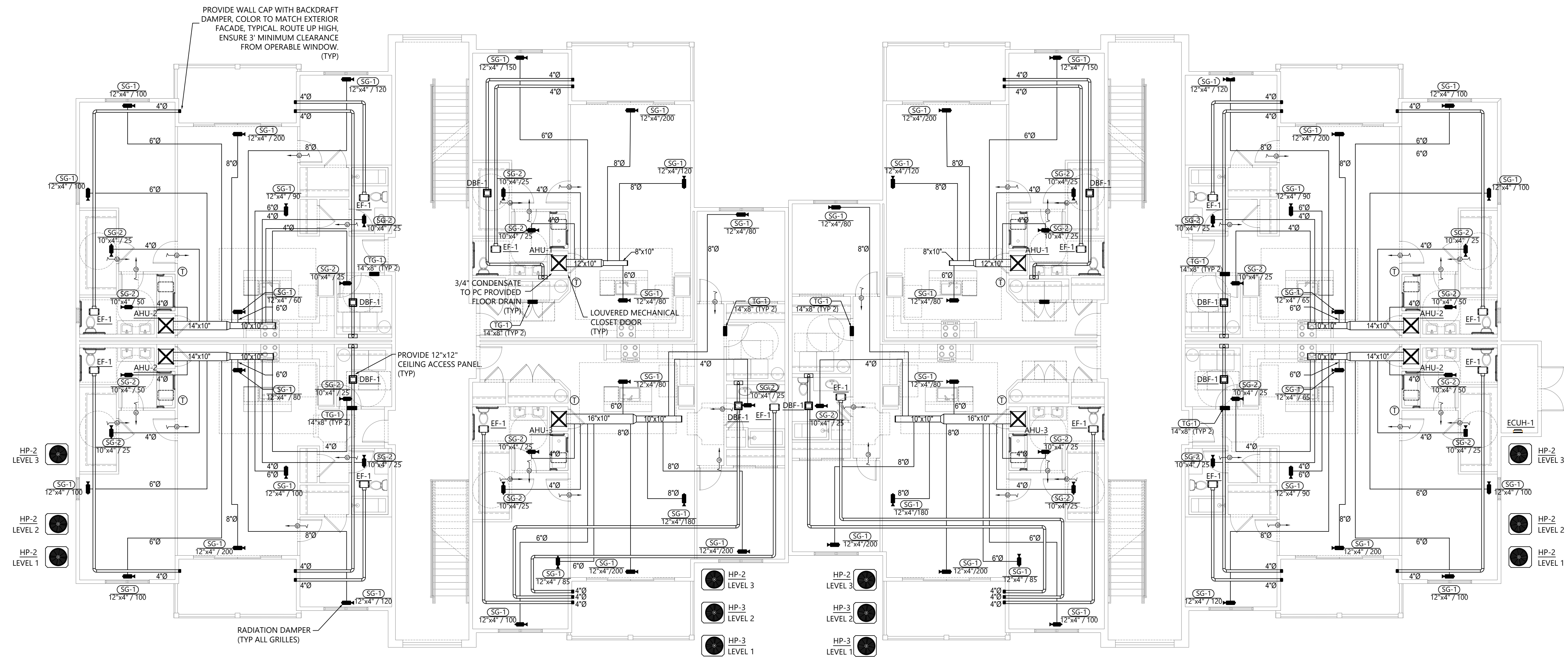
INFO :

DWG DESCRIPTION :
MECHANICAL PLAN -
FIRST FLOOR -
BUILDINGS 1 & 6

SET #:

M-2

WILDE #: 24-125



1 MECHANICAL PLAN - BUILDINGS 1 & 6 (28 UNIT BUILDING) - FIRST FLOOR
1/8"=1'-0"

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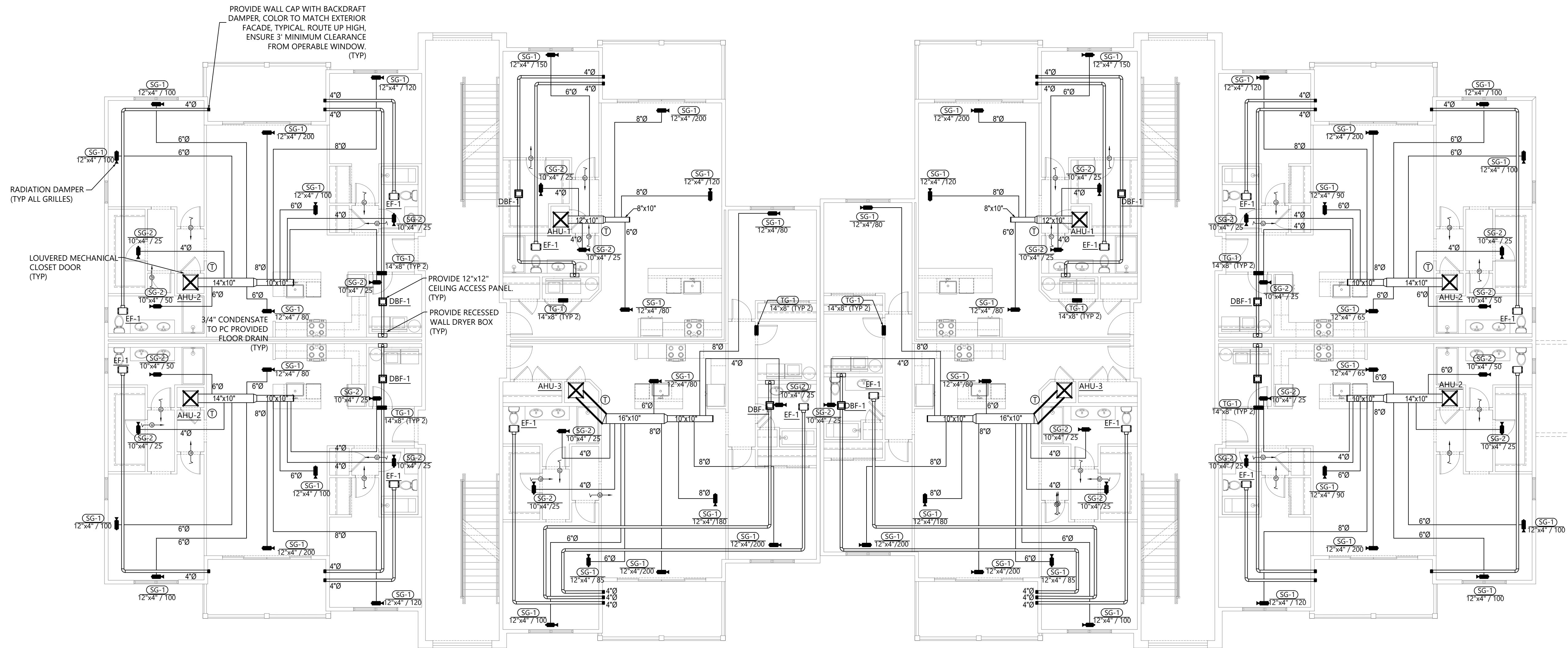
DWG INFO:

DWG DESCRIPTION:
MECHANICAL PLAN -
SECOND FLOOR -
BUILDINGS 1 & 6

SHEET #:

M-3

WILDE # 24-125



1 MECHANICAL PLAN - BUILDINGS 1 & 6 (28 UNIT BUILDING) - SECOND FLOOR
1/8"=1'-0"

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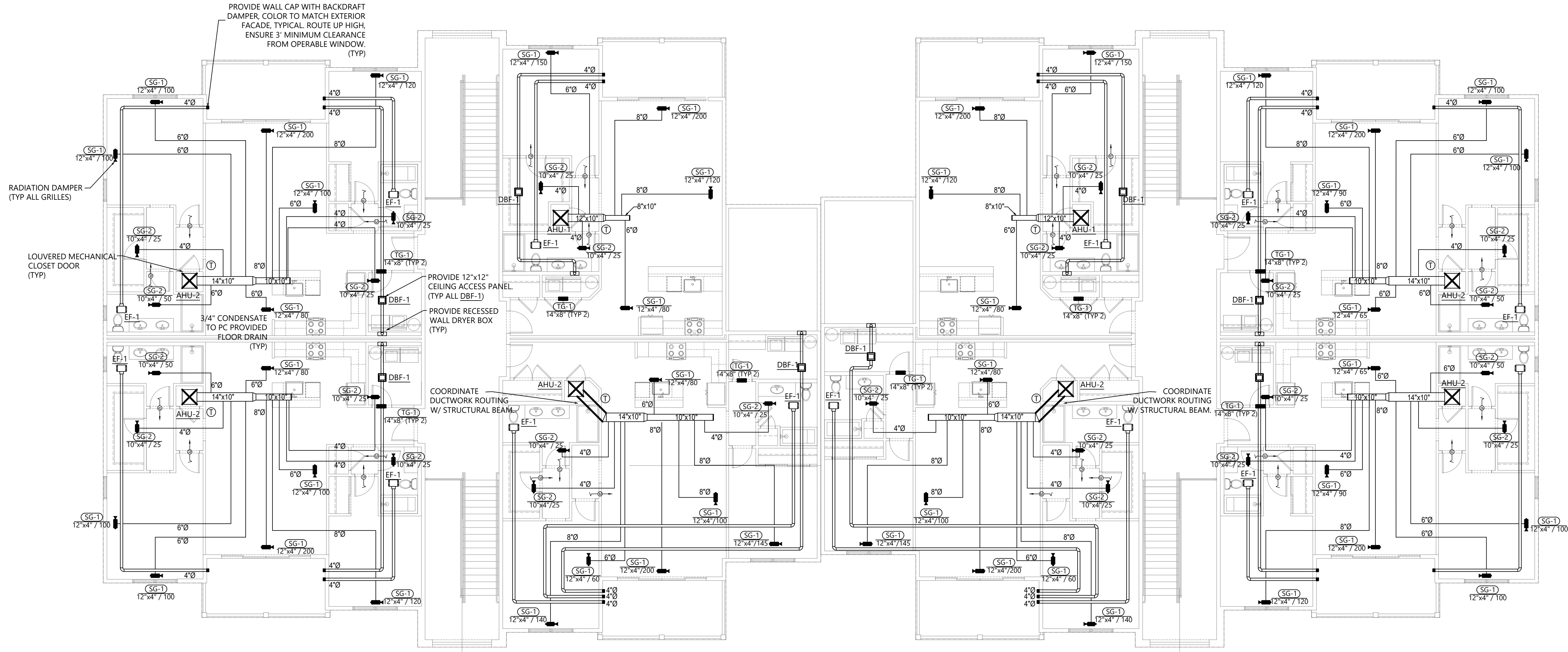
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DWG DESCRIPTION:
MECHANICAL PLAN -
THIRD FLOOR -
BUILDINGS 1 & 6

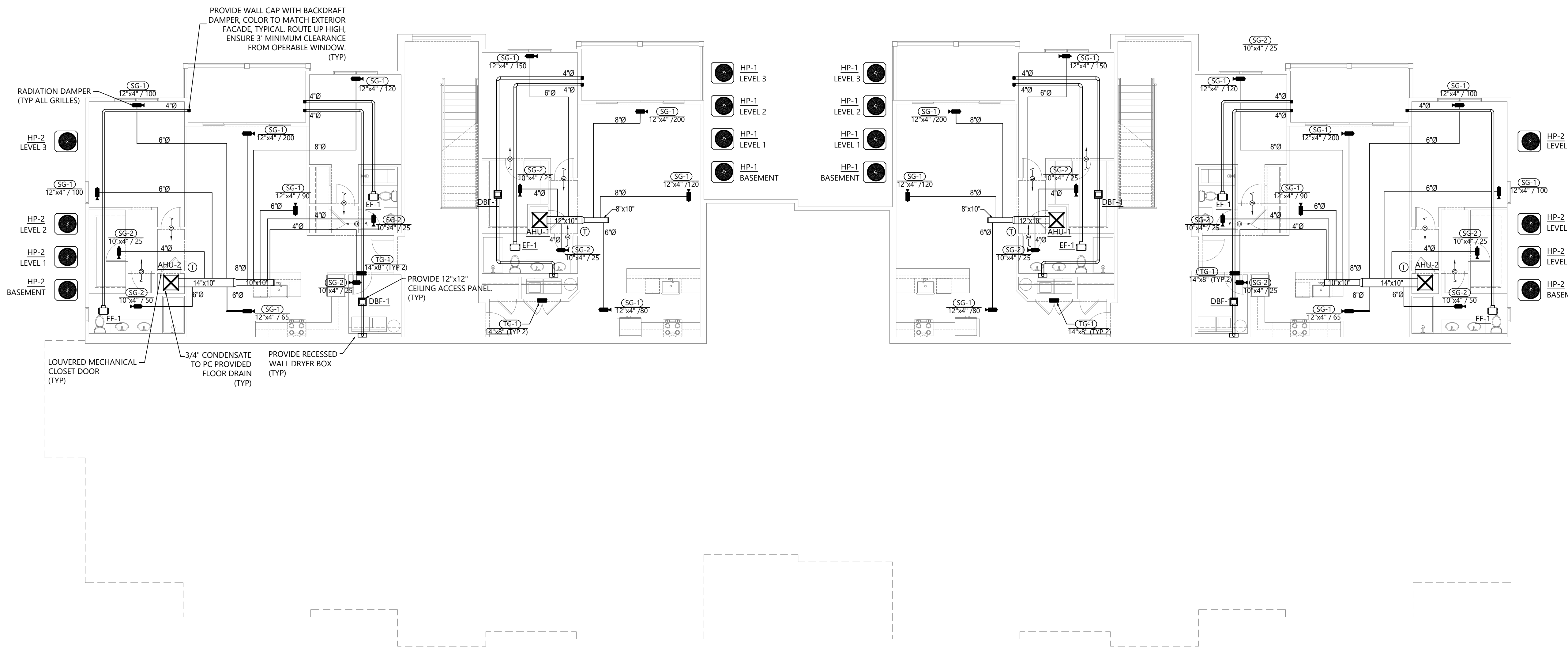
SHEET #:

M-4

WILDE # 24-125



1 MECHANICAL PLAN - BUILDINGS 1 & 6 (28 UNIT BUILDING) - THIRD FLOOR
1/8"=1'-0"



1 MECHANICAL PLAN - BUILDING 3 (28 UNIT BUILDING) - BASEMENT
1/8"=1'-0"

- PRELIMINARY -
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PROJECT:
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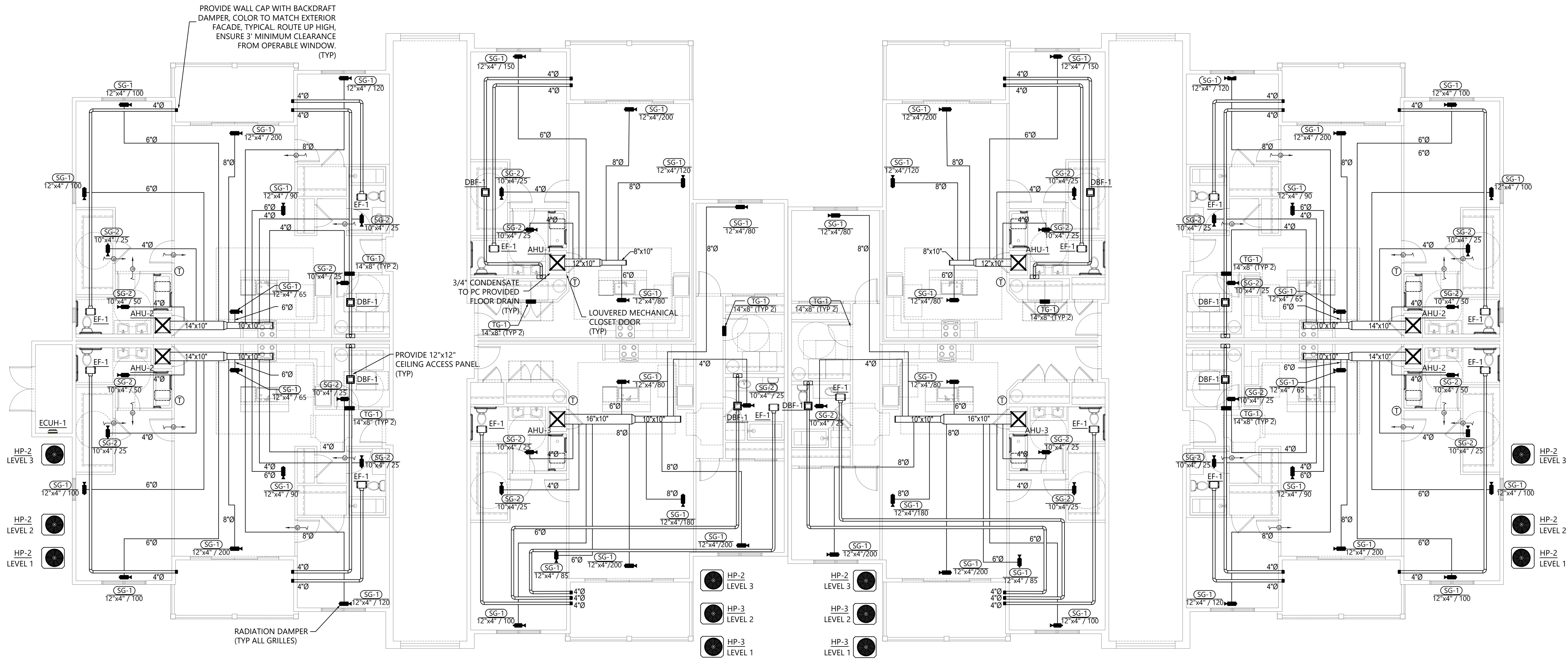
#	REVISIONS	DATE

DWG INFO:

DWG DESCRIPTION:
MECHANICAL PLAN -
BASEMENT -
BUILDING 3

SHEET #:

M-5



1 MECHANICAL PLAN - BUILDING 3 (28 UNIT BUILDING) - FIRST FLOOR
1/8"=1'-0"

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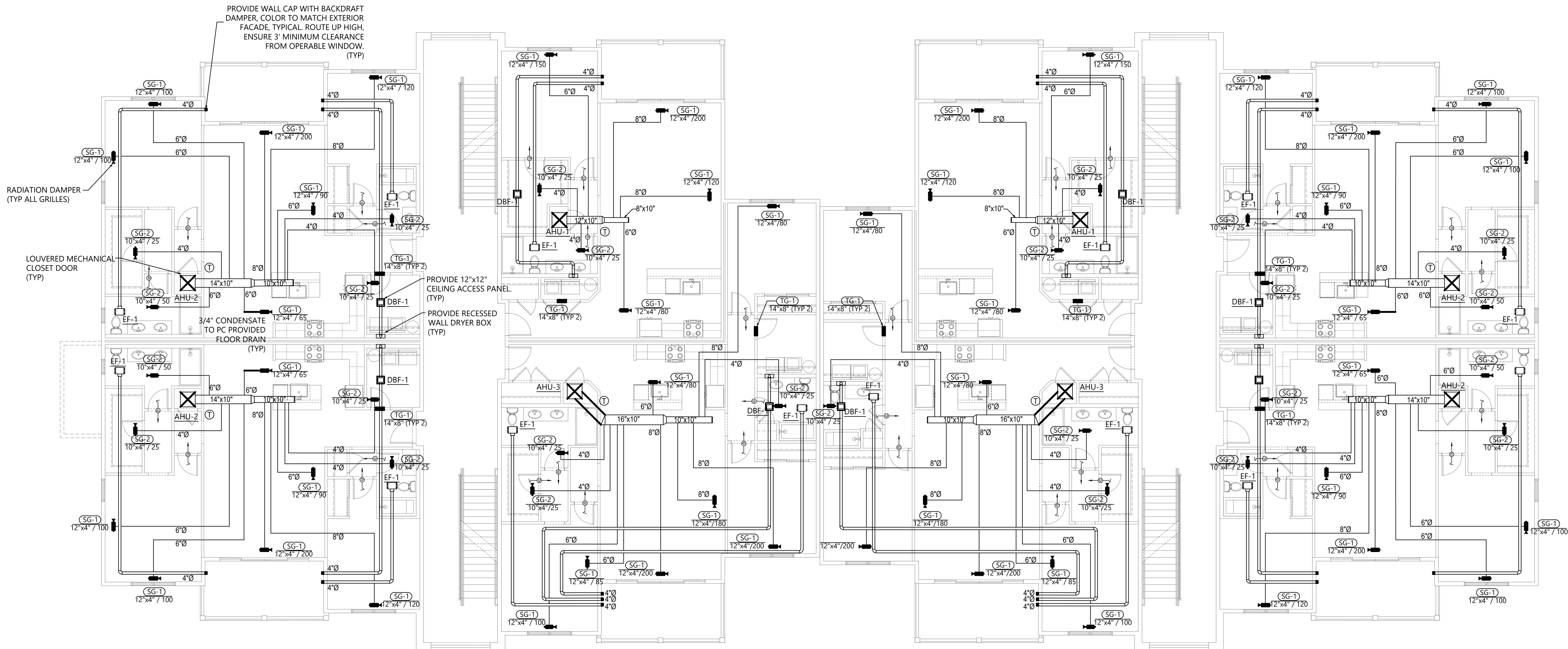
DWG INFO:

DWG DESCRIPTION:
MECHANICAL PLAN -
FIRST FLOOR -
BUILDING 3

SHEET #:

M-6

#	REVISIONS	DATE



1 MECHANICAL PLAN - BUILDING 3 (28 UNIT BUILDING) - SECOND FLOOR
1/8" = 1'-0"

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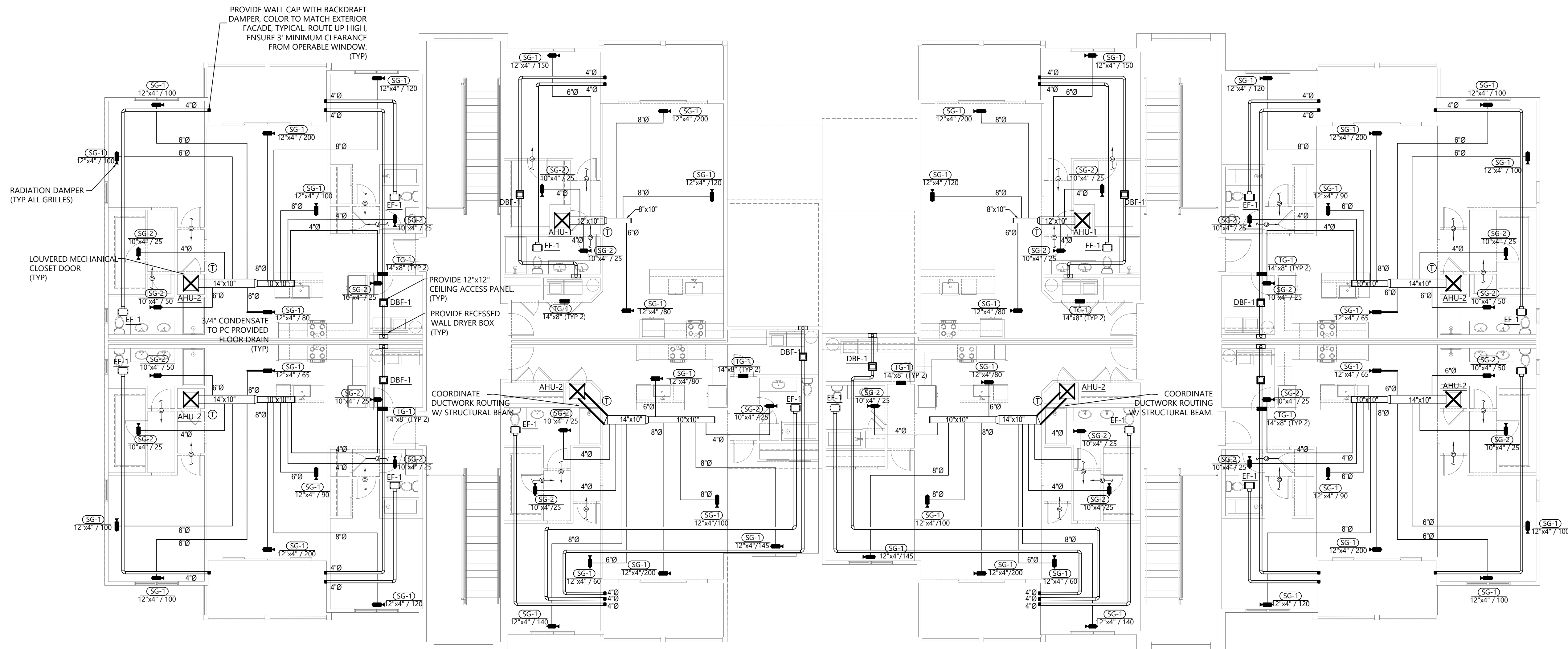
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DWG DESCRIPTION:
MECHANICAL PLAN -
THIRD FLOOR -
BUILDING 3

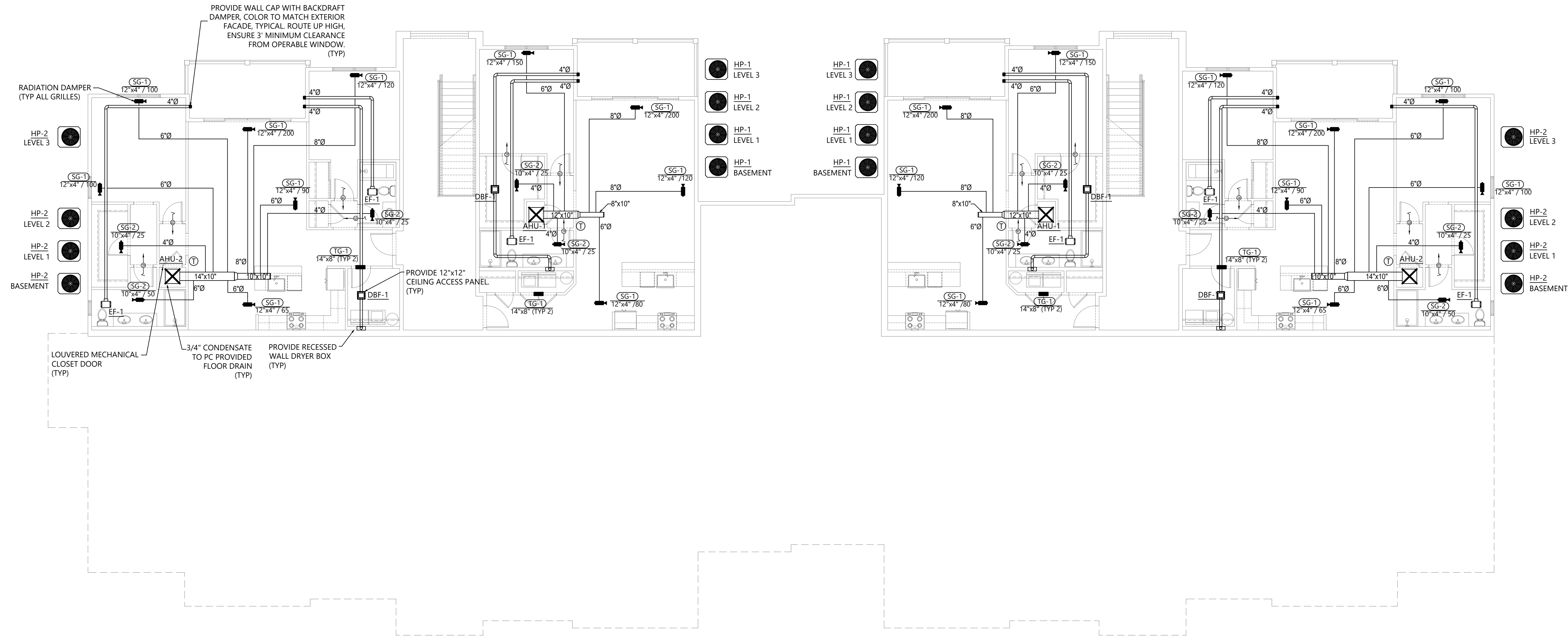
SHEET #:

M-8

WILDE # 24-125



1 MECHANICAL PLAN - BUILDING 3 (28 UNIT BUILDING) - THIRD FLOOR
1/8"=1'-0"



1 MECHANICAL PLAN - BUILDINGS 5 & 7 (28 UNIT BUILDING) - BASEMENT
1/8"=1'-0"

- PRELIMINARY -
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DWG INFO:

DWG DESCRIPTION:
MECHANICAL PLAN -
BASEMENT -
BUILDINGS 5 & 7

SHEET #:

M-9

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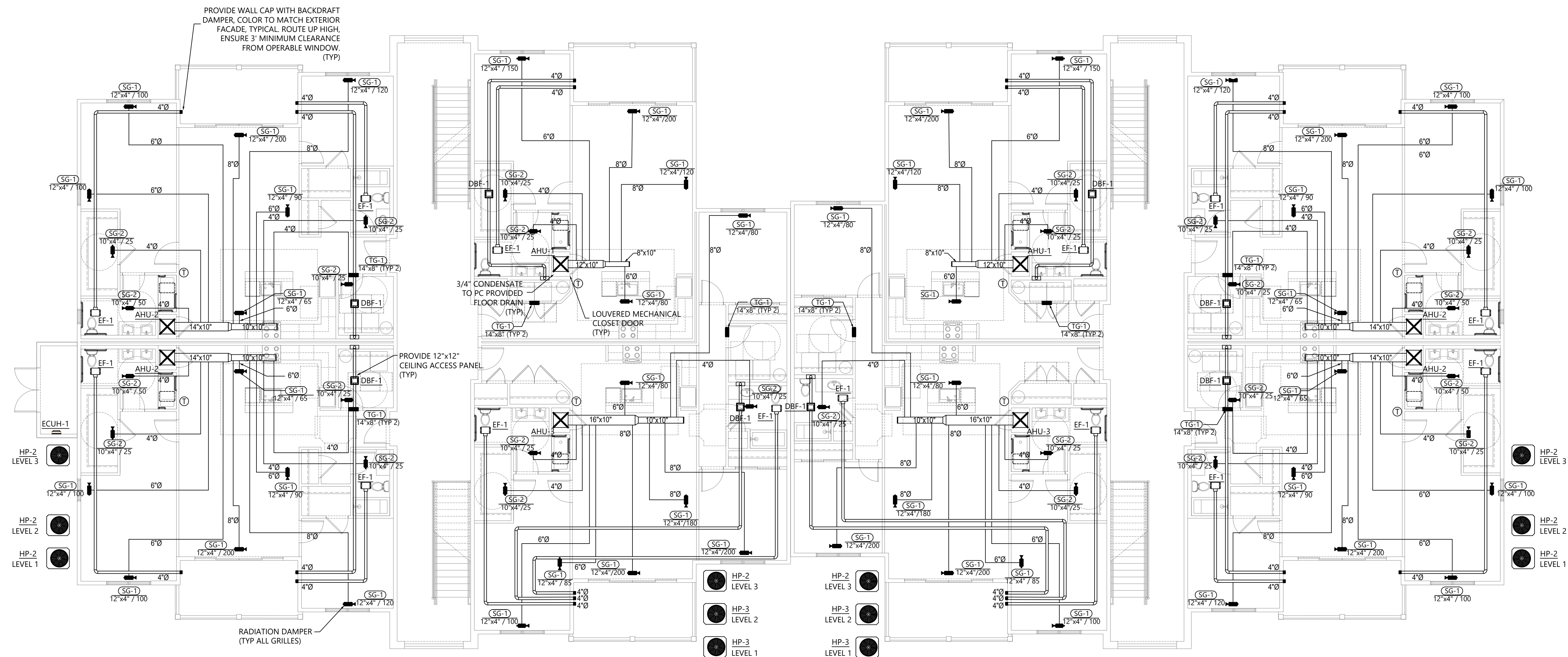
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MECHANICAL PLAN -
FIRST FLOOR -
BUILDINGS 5 & 7

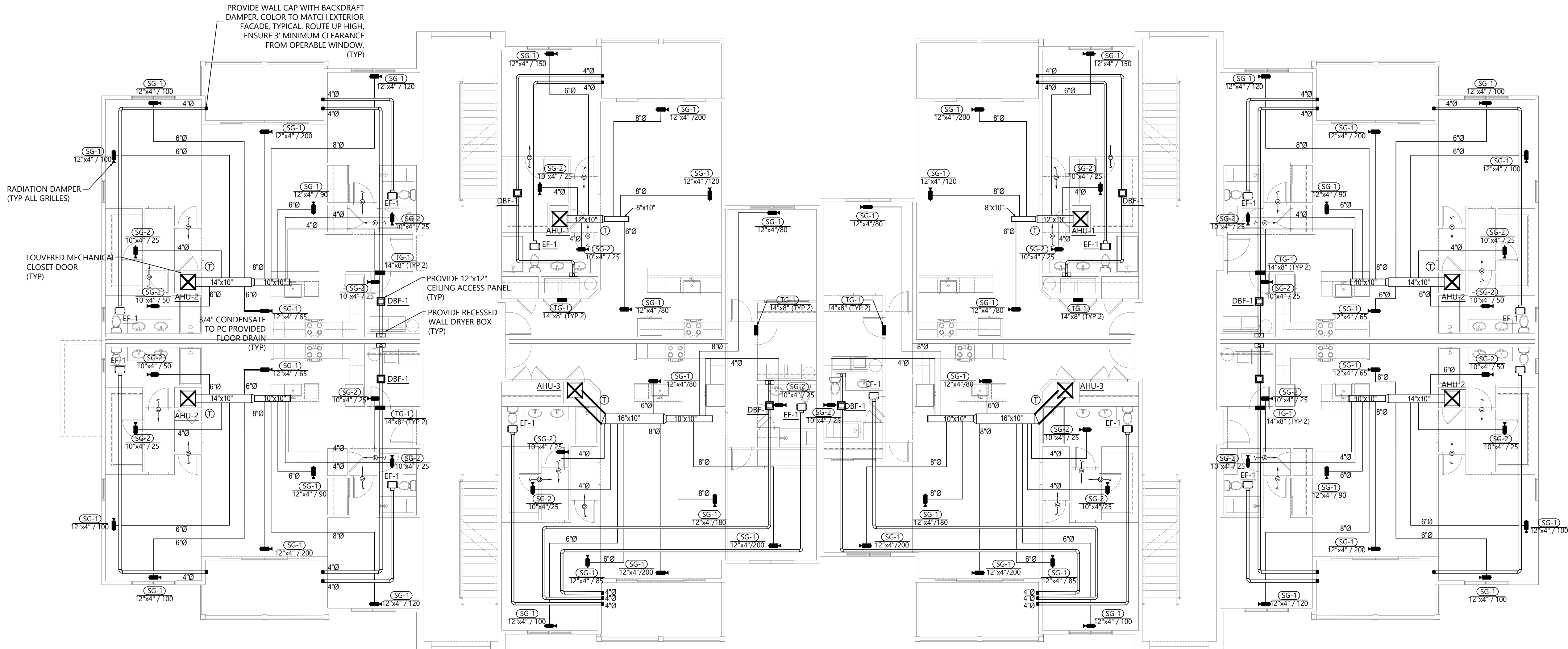
SHEET #:

M-10

WILDE # 24-125



1 MECHANICAL PLAN - BUILDINGS 5 & 7 (28 UNIT BUILDING) - FIRST FLOOR
1/8"=1'-0"



1 MECHANICAL PLAN - BUILDINGS 5 & 7 (28 UNIT BUILDING) - SECOND FLOOR
 1/8"=1'-0"

- PRELIMINARY -
 NOT FOR CONSTRUCTION

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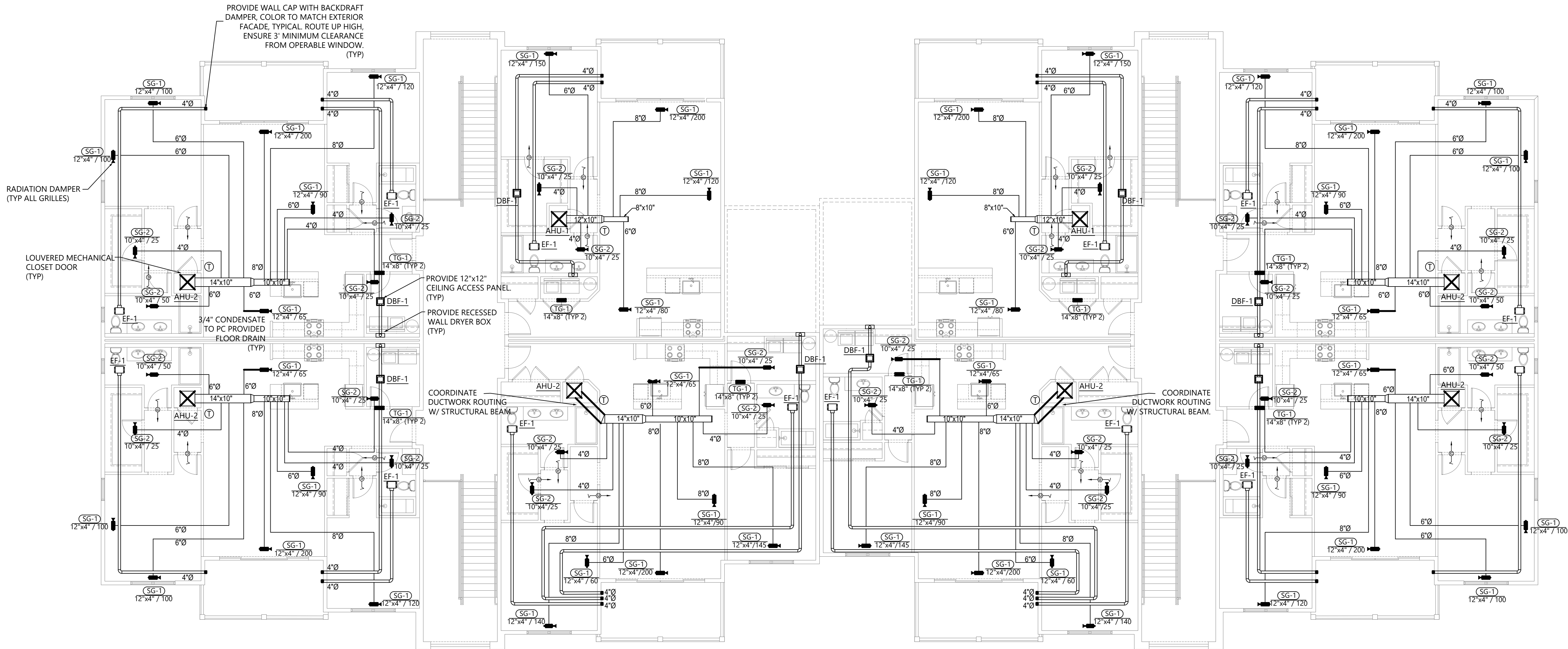
#	REVISIONS	DATE

DWG INFO:

DWG DESCRIPTION:
 MECHANICAL PLAN -
 SECOND FLOOR -
 BUILDINGS 5 & 7

SHEET #:

M-11



1 MECHANICAL PLAN - BUILDINGS 5 & 7 (28 UNIT BUILDING) - THIRD FLOOR
1/8"=1'-0"

- PRELIMINARY -
NOT FOR CONSTRUCTION

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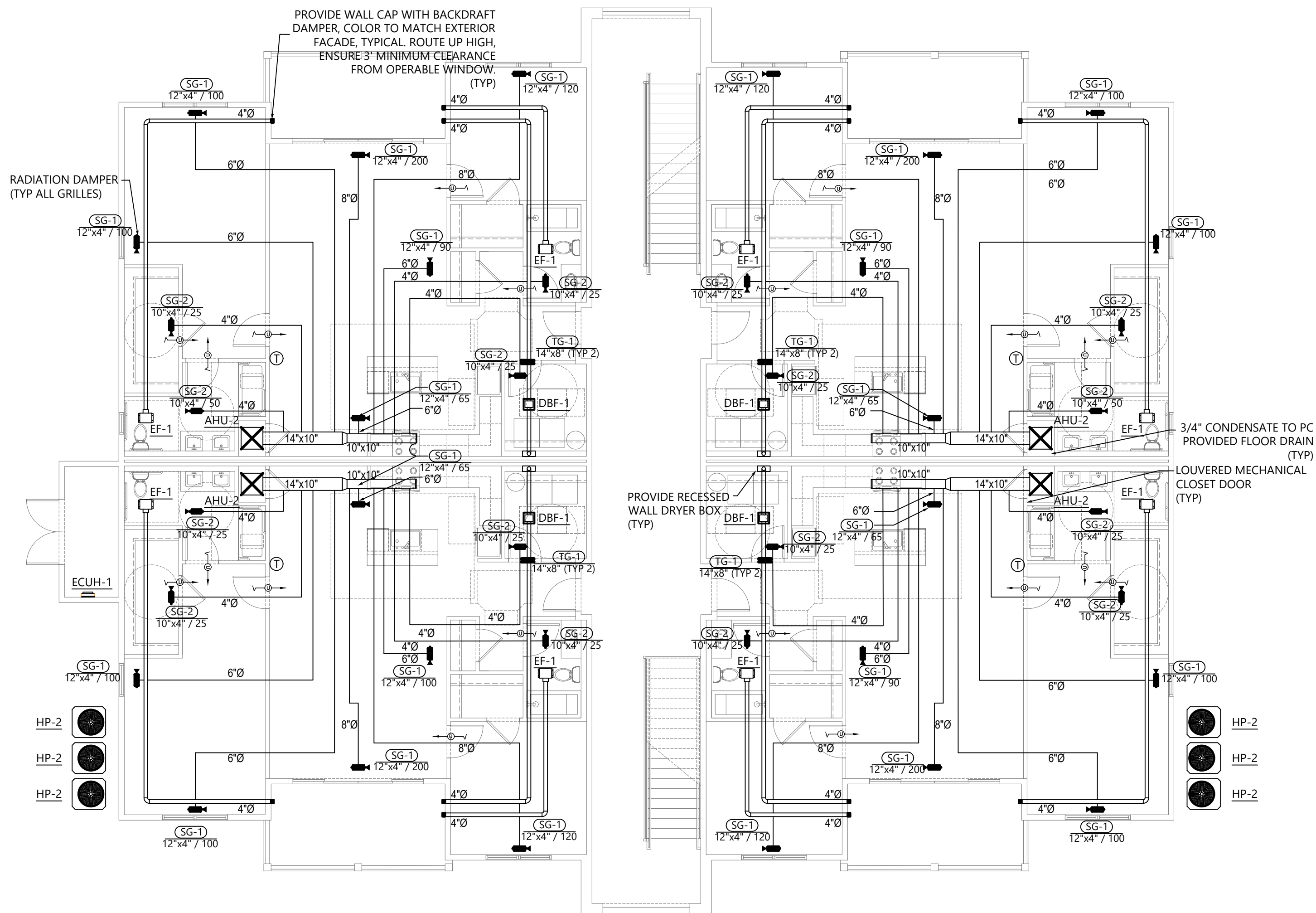
PROJECT:
The Orchards at Naples Road
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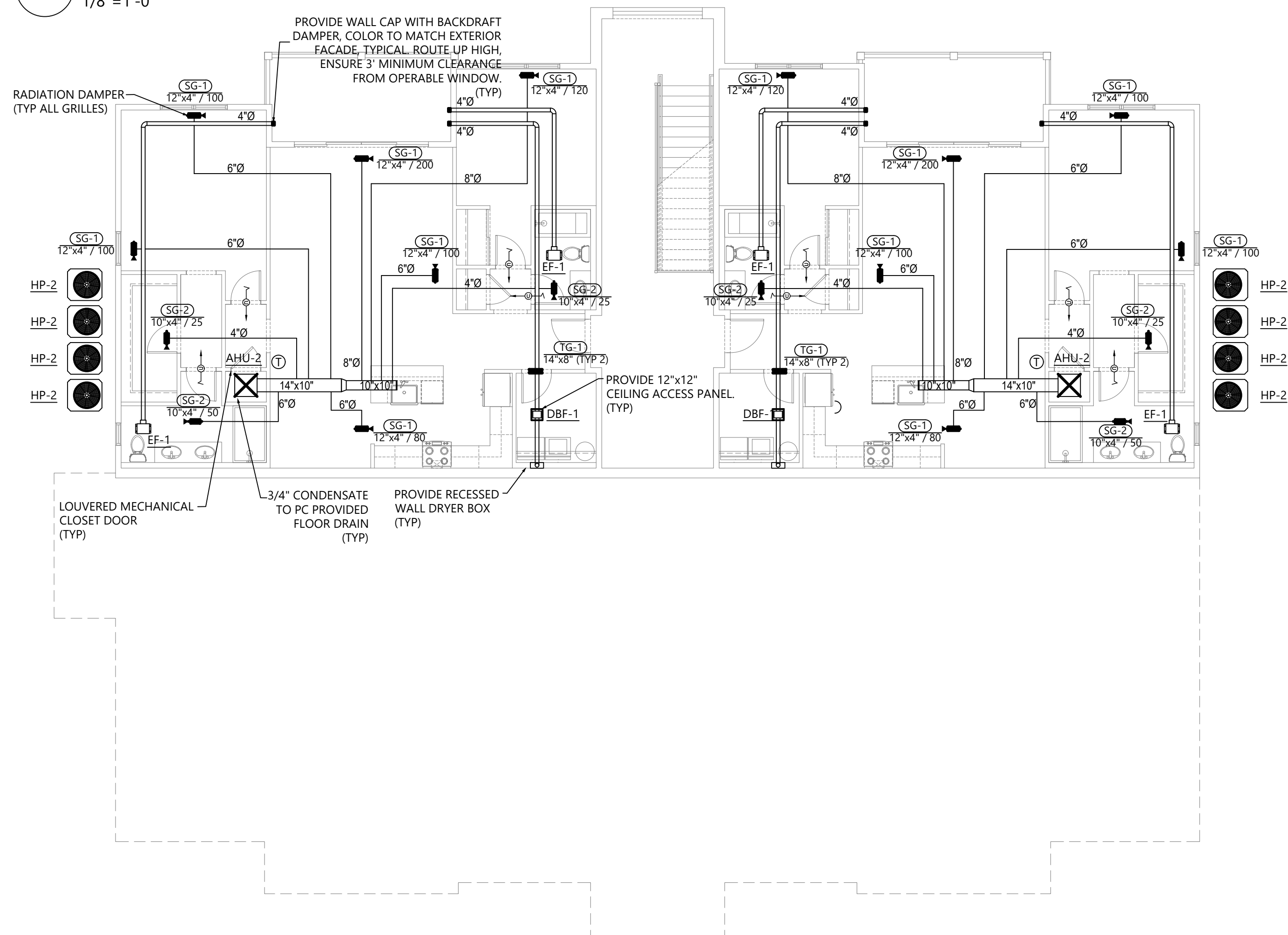
DWG INFO:

DWG DESCRIPTION:
MECHANICAL PLAN -
THIRD FLOOR -
BUILDINGS 5 & 7

SHEET #:
M-12



2 MECHANICAL PLAN - BUILDING 4 (14 UNIT BUILDING) - FIRST FLOOR
1/8" = 1'-0"



1 MECHANICAL PLAN - BUILDING 4 (14 UNIT BUILDING) - BASEMENT
1/8" = 1'-0"

- PRELIMINARY -
NOT FOR CONSTRUCTION

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Hendersonville, NC 28792
Luis Graef: President



PROJECT:

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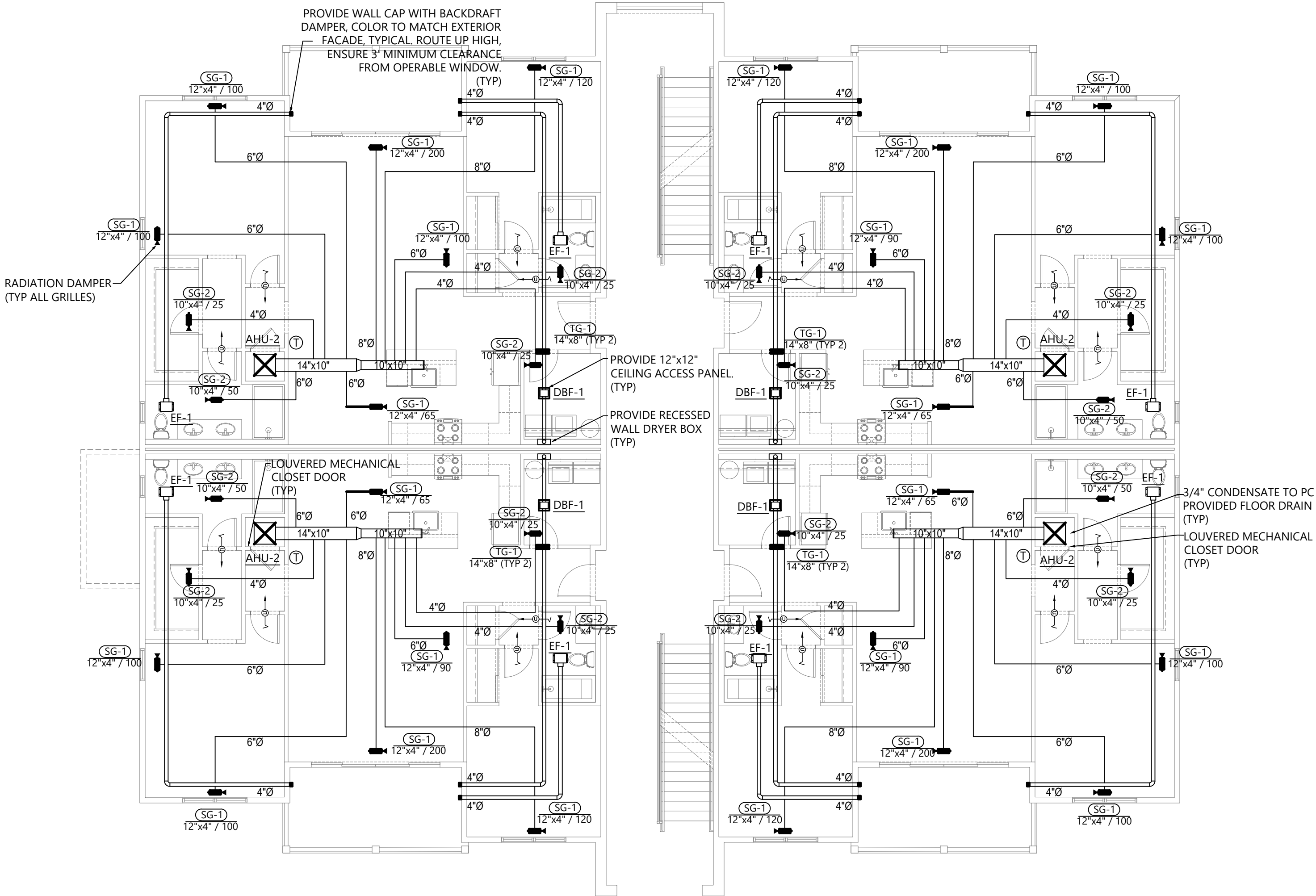
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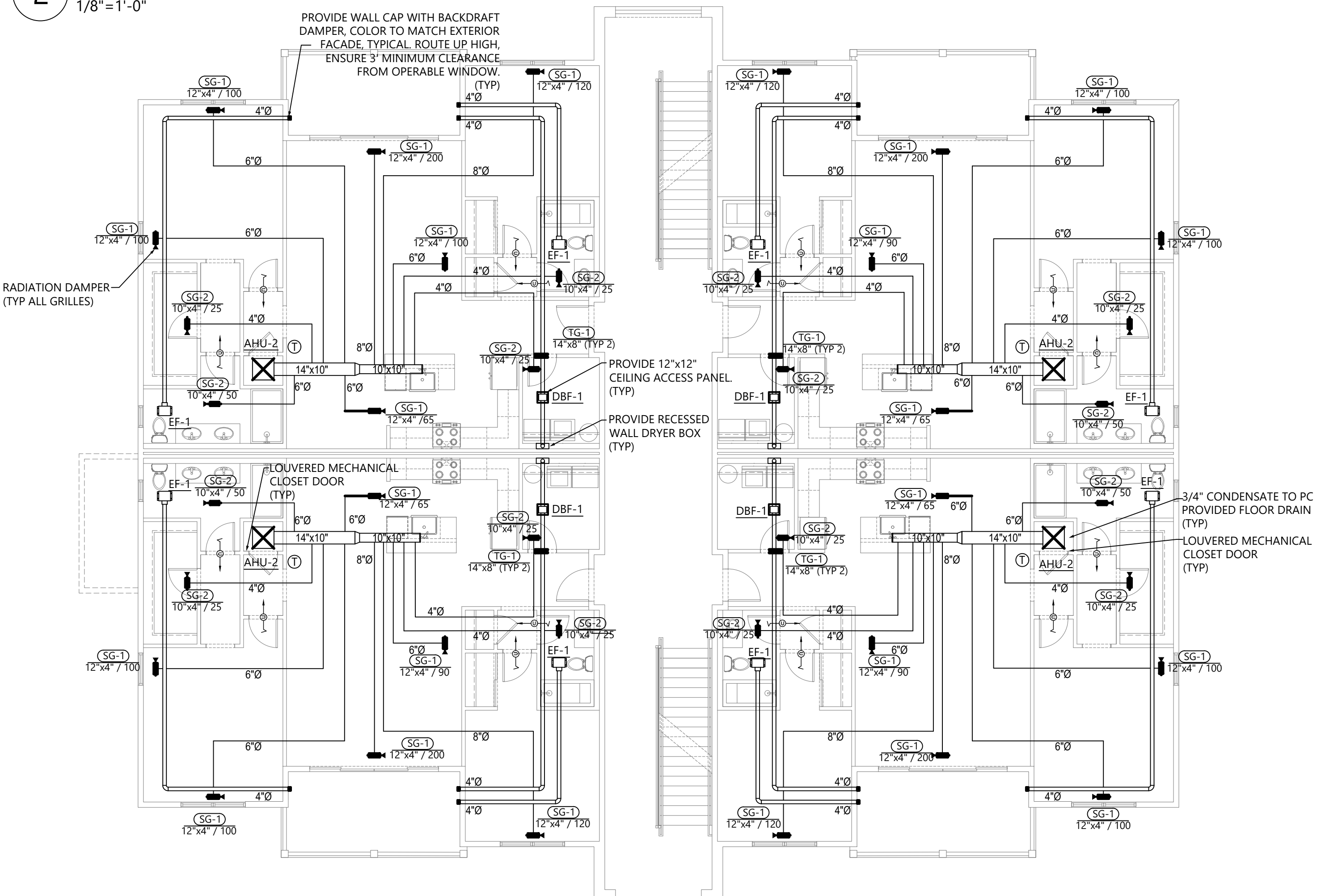
DWG DESCRIPTION:
MECHANICAL PLAN -
BASEMENT & FIRST FLOOR -
BUILDING 4

SHEET #:
M-13

#	REVISIONS	DATE

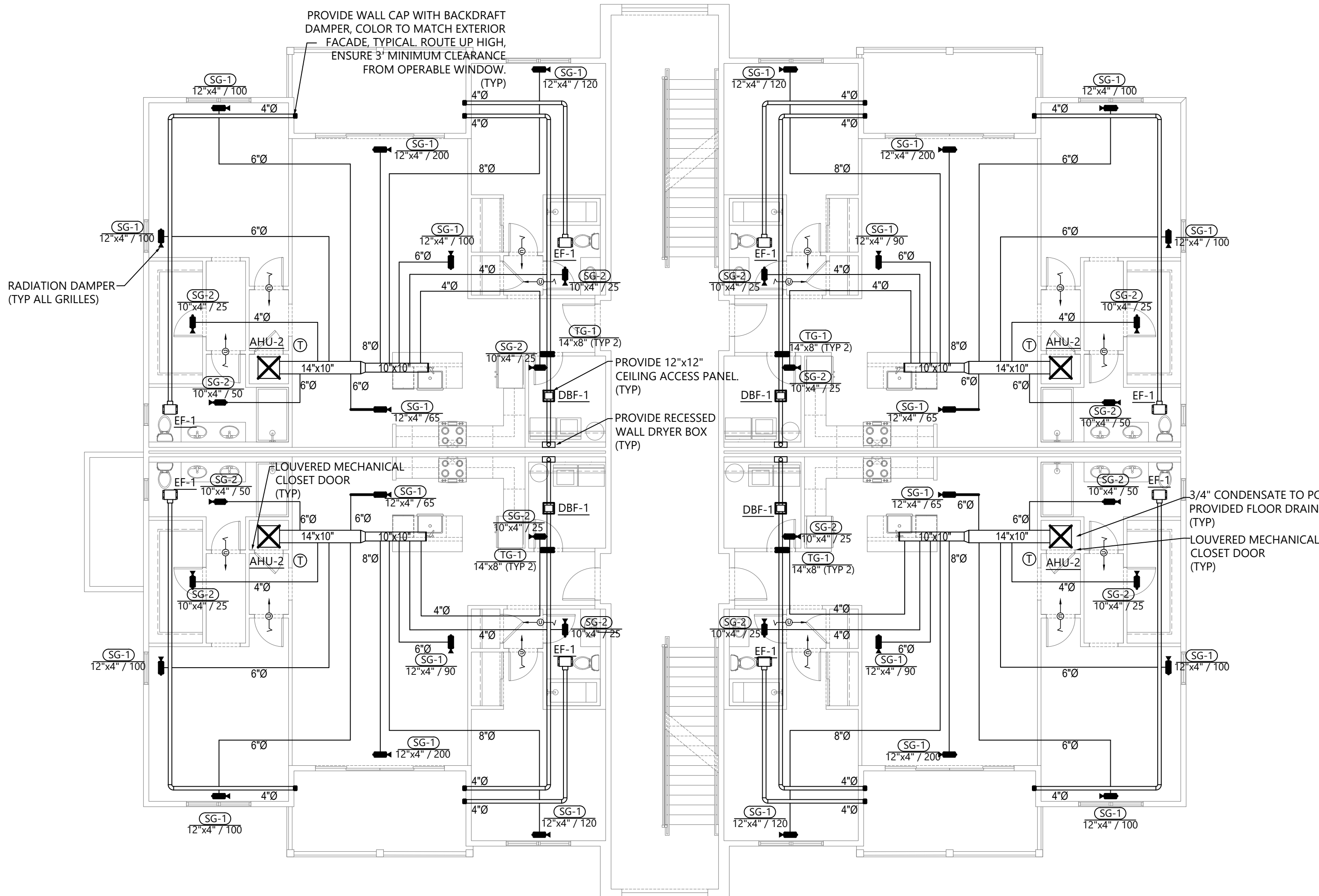


2 MECHANICAL PLAN - BUILDING 4 (14 UNIT BUILDING) - THIRD FLOOR
1/8" = 1'-0"

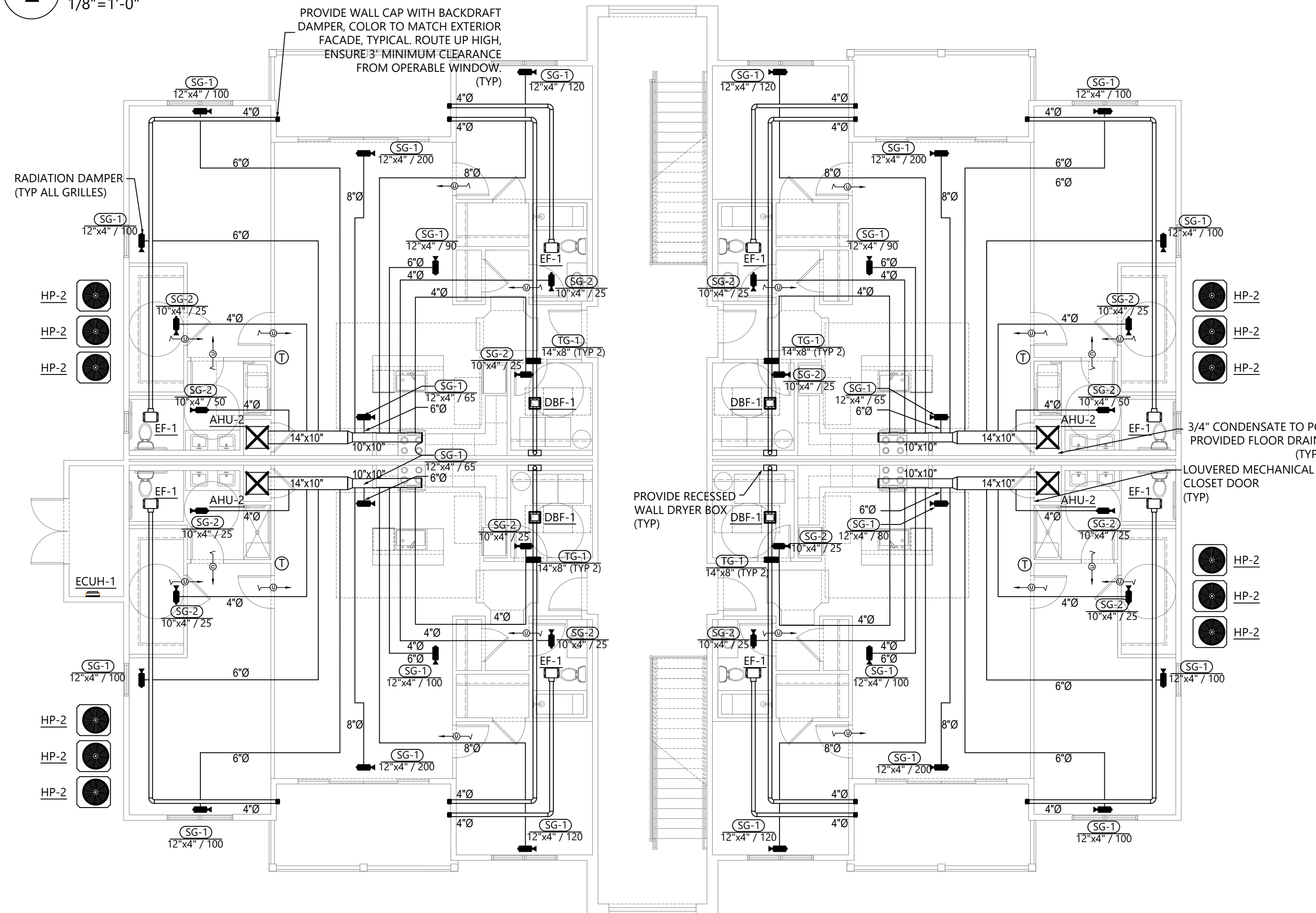


1 MECHANICAL PLAN - BUILDING 4 (14 UNIT BUILDING) - SECOND FLOOR
1/8" = 1'-0"

#	REVISIONS	DATE



2 MECHANICAL PLAN - BUILDING 2 (12UNIT BLDG) - SECOND FLOOR
1/8" = 1'-0"



1 MECHANICAL PLAN - BUILDING 2 (12-UNIT BLDG) - FIRST FLOOR
1/8" = 1'-0"

- PRELIMINARY -
NOT FOR CONSTRUCTION

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341 N main Street
Hendersonville, NC 28792
Luis Graef, President



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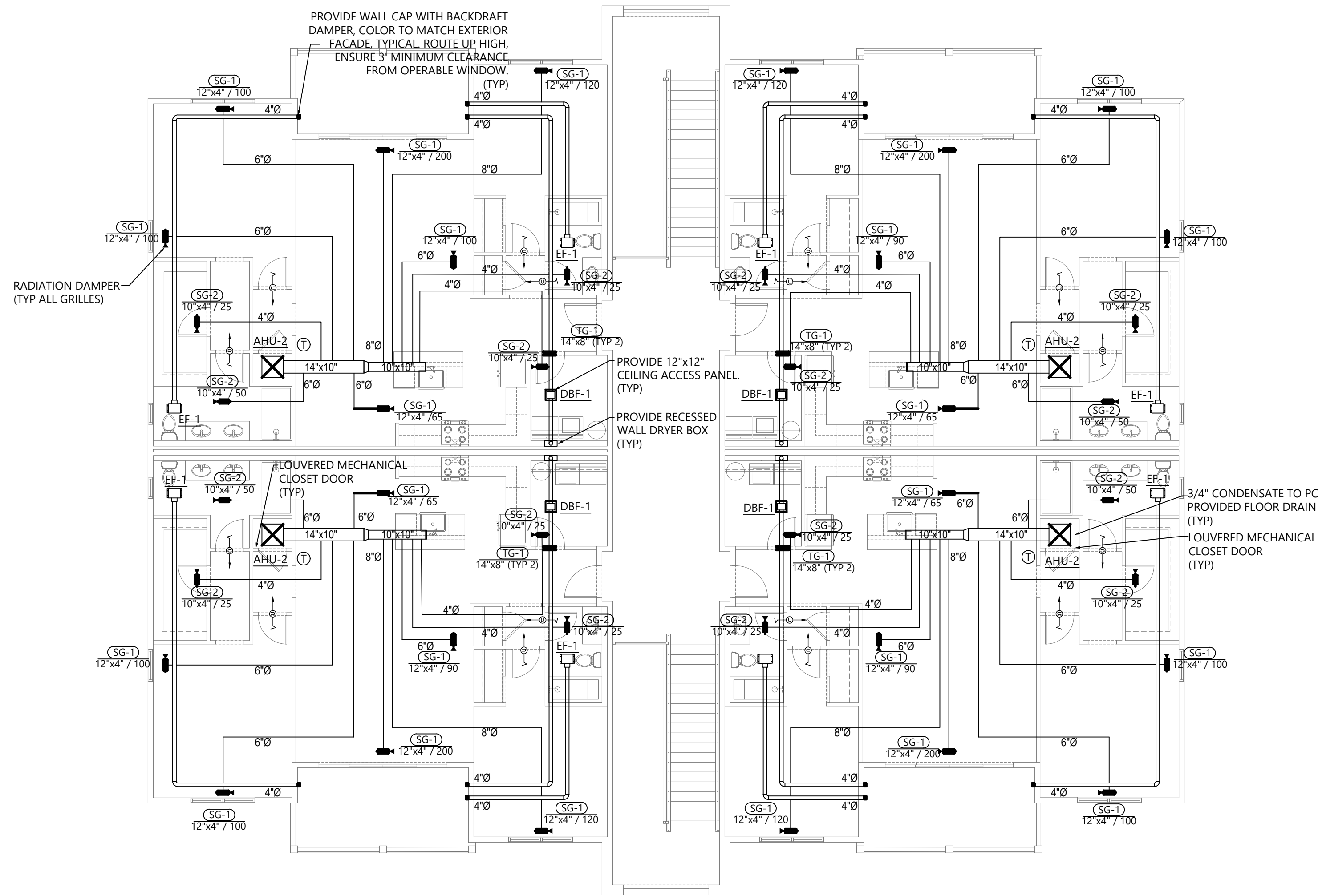
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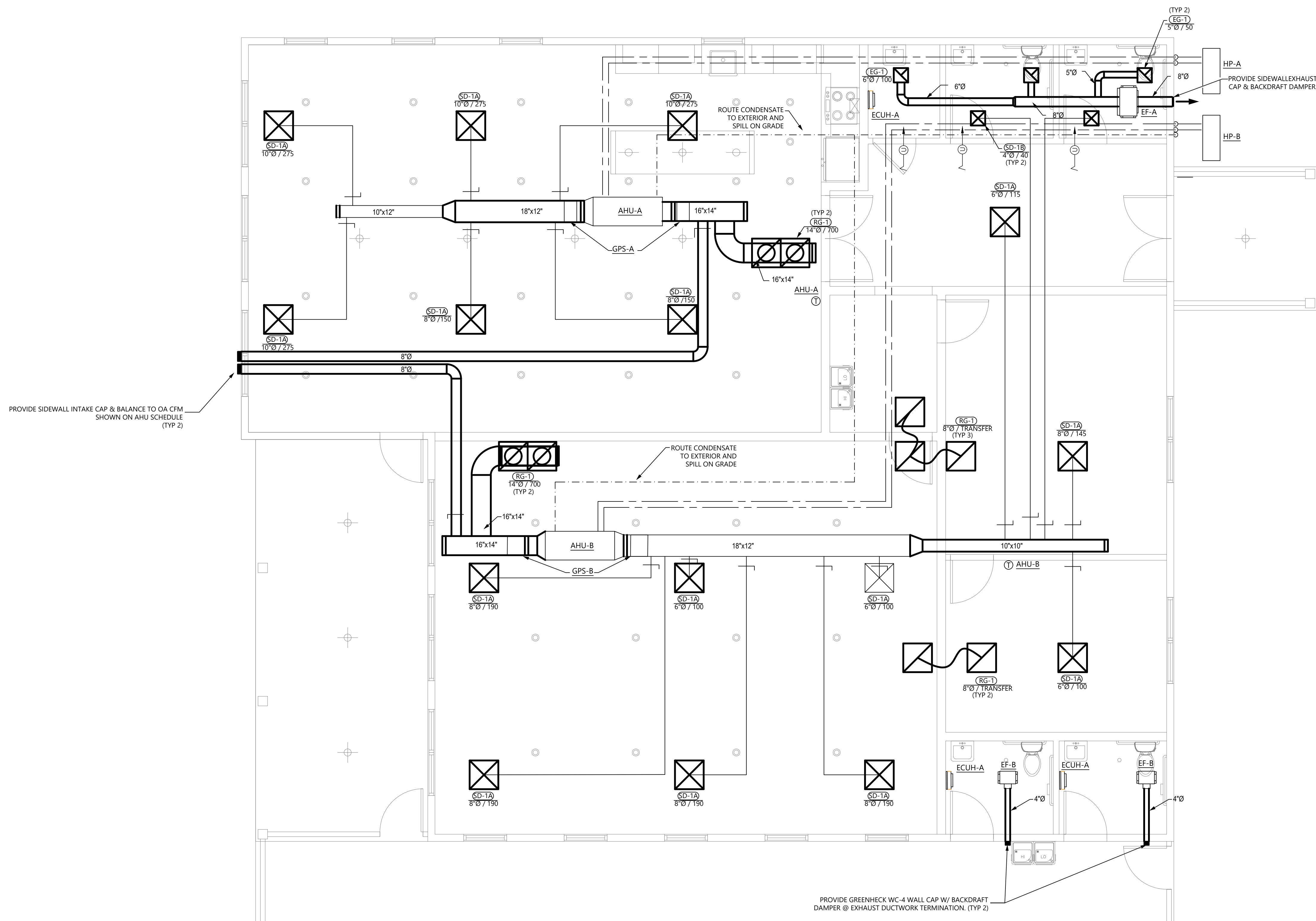
DWG DESCRIPTION:
MECHANICAL PLAN -
THIRD FLOOR -
BUILDING 2

SHEET #:

M-16



1 MECHANICAL PLAN - BUILDING 2 (12-UNIT BLDG) - THIRD FLOOR
1/8"=1'-0"



1 RECREATION/ADMIN. BUILDING MECHANICAL PLAN
1/4"=1'-0"

- PRELIMINARY -
NOT FOR CONSTRUCTION

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#	REVISIONS	DATE

DWG INFO:

DWG DESCRIPTION:
AMENITIES MECHANICAL
PLANS

SHEET #:
M-17