

**GENERAL ABBREVIATIONS:**

AD AREA DRAIN	FLR FLOOR	PD PRESSURE DROP
APF ABOVE FINISH FLOOR	FT FEET	PH PHASE
BOB BOTTOM OF BEAM	GC GENERAL CONTRACTOR	PSI POUND PER SQUARE INCH
BOD BOTTOM OF DUCT	HD HEAD (FEET)	RPM REVOLUTIONS PER MINUTE
BOJ BOTTOM OF JOIST	HP HORSEPOWER	RTD RESISTIVE THERMAL DEVICE
BOP BOTTOM OF PIPE	ID INSIDE DIAMETER	SHT SHEET
BOS BOTTOM OF STEEL	IN INCH	TFA TO FLOOR ABOVE
CL CENTERLINE	IWS IN WALL SPACE	TFB TO FLOOR BELOW
CTB CLOSE TO BEAM	KW KILOWATT	TJA THRU JOISTS ABOVE
CTC CLOSE TO COLUMN	MFR MANUFACTURER	TOB TOP OF BEAM
CTJ CLOSE TO JOIST	NC NORMALLY CLOSED	TOD TOP OF DUCT
CTW CLOSE TO WALL	NIC NOT IN CONTRACT	TOP TOP OF PIPE
DA DIAMETER	NO NORMALLY OPEN	TOS TOP OF STEEL
DN DOWN	NPS NOMINAL PIPE SIZE	TYP TYPICAL
E EXISTING	OC ON CENTER	V VOLTS
EL ELEVATION	OD OUTSIDE DIAMETER	
ETR EXISTING TO REMAIN	OFCI OWNER FURNISHED CONTRACTOR INSTALLED	
FC FLEXIBLE CONNECTION	OFOI OWNER FURNISHED, OWNER INSTALLED	
FFA FROM FLOOR ABOVE		
FFB FROM FLOOR BELOW		

**MECHANICAL ABBREVIATIONS:**

A COMPRESSOR AIR	FAF FORCED AIR FURNACE	MBH THOUSANDS OF BTU'S PER HOUR
AC AIR COMPRESSOR	FCU FAN COIL UNIT	MD MAIN DRIP
ACV AUTOMATIC CONTROL VALVE	FM FLOWMETER	NG NATURAL GAS
AD AIR DROP/ACCESS DOOR	FOR FUEL OIL RETURN	P PUMP
AF AIR FILTER	FOS FUEL OIL SUPPLY	PCV PRESSURE CONTROL VALVE
B BOILER	FS FUEL SWITCH	PF PRE-FILTER
BBS BOILER BLOWDOWN SEPARATOR	FT FLASH TANK	PRV PRESSURE REGULATING/REDUCING VALVE
BTU BRITISH THERMAL UNIT	FTC FIN TUBE CONVECTOR	RAD RADIATOR
BTUH BTU'S PER HOUR	GLR GLYCOL RETURN	RC REHEAT COIL
CA COMBUSTION AIR/COMPRESSED AIR	GLS GLYCOL SUPPLY	RCP RADIANT CEILING PANEL
CH CHILLER	GRV GAS REGULATOR VALVE	RTU ROOFTOP AIR HANDLING UNIT
COND CONDENSATE	HC HEATING COIL	RV RELIEF VENT/RELIEF VALVE
COND CONDENSATE RETURN PUMP	HE HEAT EXCHANGER	SMF STEAM FILTER
CT COOLING TOWER	HJM HUMIDIFIER	SRV SAFETY RELIEF VALVE
CUH CABINET UNIT HEATER	HP HEAT PUMP	UH UNIT HEATER
D CONDENSATE DRAIN	HPR HEAT PUMP RETURN	VEL VELOCITY
DDC DIRECT DIGITAL CONTROL	HPS HEAT PUMP SUPPLY	VFD VARIABLE FREQUENCY DRIVE
ED EQUIPMENT DRAIN	HWB HOT WATER BOILER	VI VIBRATION ISOLATOR
ET EXPANSION TANK	LP LIQUID PETROLEUM	WCC WATER COOLED CONDENSER
EWT ENTERING WATER TEMPERATURE	LWT LEAVING WATER TEMPERATURE	

**GENERAL NOTES:**

- ABBREVIATIONS INDICATED HERE AND NOT USED IN THE CONTRACT DOCUMENTS DO NOT APPLY TO THIS PROJECT. ADDITIONAL ABBREVIATIONS MAY BE INDICATED IN THE CONTRACT DOCUMENTS.
- THESE DRAWINGS ARE DESIGN DRAWINGS AND ARE DIAGRAMMATIC. THEY MAY NOT SHOW ALL PHYSICAL ARRANGEMENTS, OFFSETS, BENDS, OR ELBOWS WHICH MAY BE REQUIRED FOR PROPER INSTALLATION OF VARIOUS MATERIALS, EQUIPMENT, PIPING AND DUCTWORK SYSTEMS IN ALLOTTED SPACES. EXAMINE THESE AND OTHER AVAILABLE DRAWINGS TO DETERMINE SPACE LIMITATIONS AND INTERFERENCES. MAKE ANY MINOR CHANGES IN LOCATIONS OF EQUIPMENT, PIPING, AND DUCTWORK FROM THAT SHOWN ON DRAWINGS AND FOR ALL PHYSICAL DETAILS REQUIRED FOR INSTALLATION. COST FOR ADAPTING WORK TO JOB SITE CONDITIONS SHALL NOT BE CONSIDERED AS BASIS OF AN EXTRA COST TO CONTRACT.
- ELEVATION OF PIPING AND DUCTWORK INDICATED ON THESE DRAWINGS ARE TO BE USED AS GUIDELINES TO ASSIST WITH INSTALLATIONS. MINOR CHANGES TO THESE ELEVATIONS MAY BE NECESSARY TO ELIMINATE UNFORESEEN INTERFERENCES. ANY CHANGE IN ELEVATION SHALL BE APPROVED PRIOR TO CHANGE.
- ANY AND ALL INFORMATION SHOWN ON THESE DRAWINGS WITH RESPECT TO EXISTING STRUCTURES, UTILITIES, AND MECHANICAL SYSTEMS, IS AS EXACT AS COULD BE SECURED. THE INFORMATION IS NOT WARRANTED NOR GUARANTEED ACCURATE. FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO PROCEEDING WITH WORK.
- ACCURATE AND LEGIBLE RECORD (AS-BUILT) DRAWINGS SHALL BE MAINTAINED AT THE JOB SITE, AND BE SUBMITTED PRIOR TO FINAL PAYMENT.
- ALL NEW AND EXISTING ROOFING SYSTEMS SHALL BE PROTECTED FROM DAMAGE DURING CONSTRUCTION ACTIVITIES.
- TEMPORARILY PATCH ALL ROOF OPENINGS WATERTIGHT UNTIL FINAL CLOSURE CAN BE MADE.
- VERIFY ALL EQUIPMENT LOCATIONS AND PIPE ROUTING WITH OWNER PRIOR TO INSTALLATION.
- SEQUENCE OF WORK AND/OR PLACE OF COMMENCEMENT OF WORK SHALL BE APPROVED PRIOR TO WORK BEING STARTED. SCHEDULED SHUTDOWNS SHALL BE CLOSELY COORDINATED WITH EXISTING OPERATIONS.

**GENERAL SYMBOLS:**

	AUTOMATIC CONTROL VALVE (2-WAY)		PIPE GUIDE
	AUTOMATIC CONTROL VALVE (3-WAY)		FLEXIBLE CONNECTOR
	BALANCING VALVE		UNION
	BALL VALVE		BLIND FLANGE
	BUTTERFLY VALVE		REDUCER (CONCENTRIC)
	CHECK VALVE		REDUCER (ECCENTRIC)
	GLOBE VALVE		PIPE CAP
	GATE VALVE		PIPE PLUG
	GLOBE, ANGLE VALVE		PRESSURE GAUGE WITH COCK
	PLUG VALVE		TEMPERATURE GAUGE WITH COCK
	PRESSURE REDUCING VALVE		FLUID FLOW DIRECTION
	PRESSURE REGULATING VALVE		PIPE PITCH DIRECTION
	SHUTOFF/ISOLATION VALVE		NEW CONNECTION TO EXISTING
	SOLENOID VALVE ONE-WAY (ELECTRIC)		EXISTING - TO REMAIN
	STRAINER		EXISTING - TO BE REMOVED
	PIPE TURNED TOWARD		PROPOSED - TO BE INSTALLED
	PIPE TURNED AWAY		AIR VENT (MANUAL)
	BRANCH BOTTOM CONNECTION		VACUUM BREAKER
	BRANCH TOP CONNECTION		
	PLUGGED TEE-TURNED TOWARD		
	PIPE ANCHOR (INTERMEDIATE)		
	RELIEF VALVE		
	GAUGE CONNECTION		

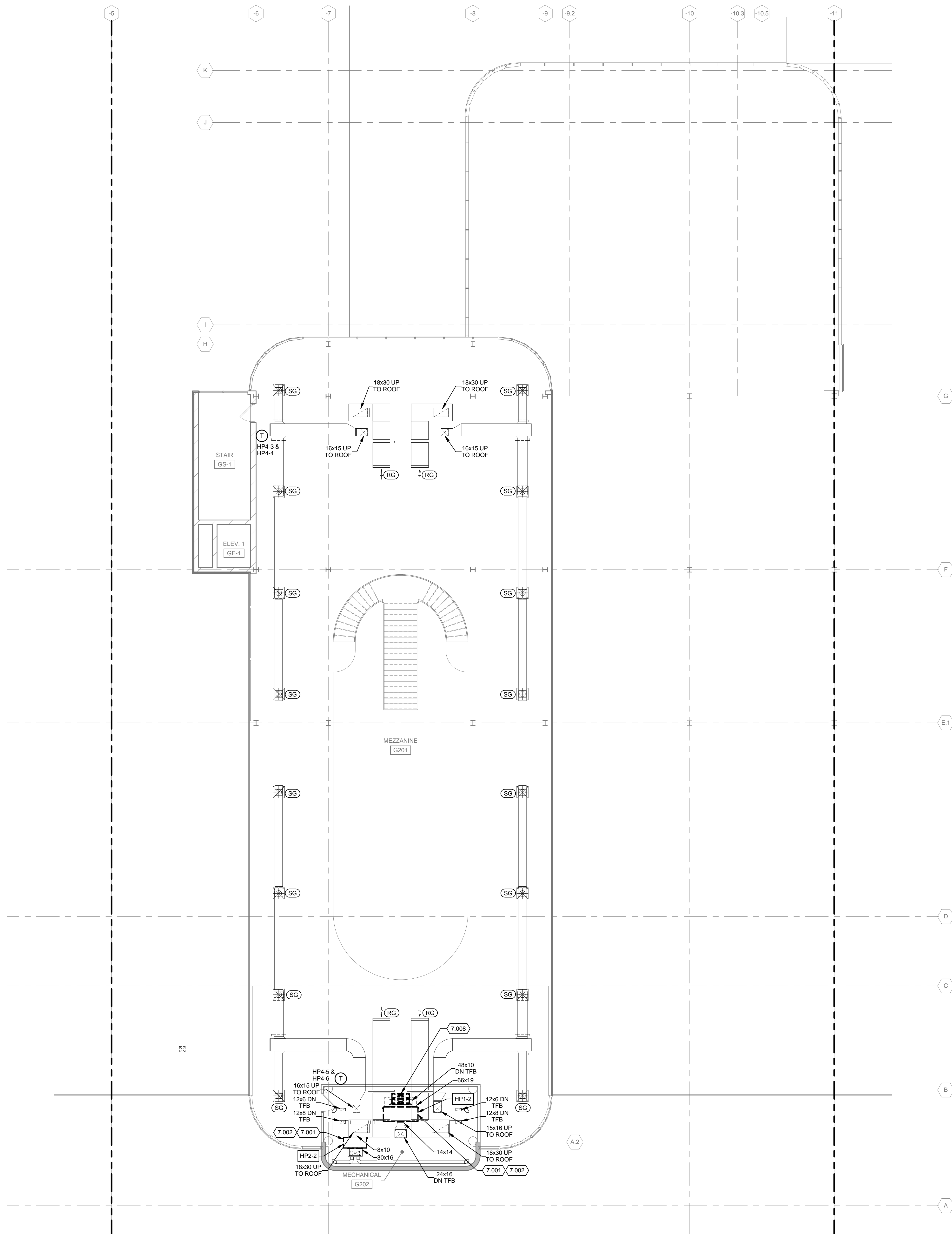
**MECHANICAL SYMBOLS:**

	AIRFLOW (SUPPLY)		12x12 DUCT
	AIRFLOW (RETURN)		FLEXIBLE CONNECTION
	AIRFLOW (DOOR GRILLE)		DUCT (RIGID ROUND)
	SUPPLY OR OUTDOOR AIR		DUCT (FLEXIBLE ROUND)
	RETURN		TURNING VANES
	EXHAUST		TRANSITION (SQUARE-TO-ROUND)
	DUCT TURNED AWAY		BACKDRAFT DAMPER
	SUPPLY DUCT TURNED TOWARD		VOLUME DAMPER
	DUCT SIZE (FIRST FIGURE IS SIDE SHOWN)		FIRE DAMPER & ACCESS DOOR
	FLEXIBLE CONNECTION		MOTOR OPERATED DAMPER
	DUCT (RIGID ROUND)		OPPOSED BLADE DAMPER
	DUCT (FLEXIBLE ROUND)		PARALLEL BLADE DAMPER
	TURNING VANES		CARBON MONOXIDE (CO) SENSOR
	TRANSITION (SQUARE-TO-ROUND)		NITROGEN DIOXIDE (NO2) SENSOR
	BACKDRAFT DAMPER		ROOM SENSOR
	VOLUME DAMPER		STATIC PRESSURE SENSOR
	FIRE DAMPER & ACCESS DOOR		HUMIDISTAT
	MOTOR OPERATED DAMPER		TEMPERATURE SENSOR
	OPPOSED BLADE DAMPER		THERMOSTAT
	PARALLEL BLADE DAMPER		INSULATED BASE THERMOSTAT
	CARBON MONOXIDE (CO) SENSOR		SMOKE DETECTOR
	NITROGEN DIOXIDE (NO2) SENSOR		AIR OUTLET/INLET TYPE (CFM)
	ROOM SENSOR		
	STATIC PRESSURE SENSOR		
	HUMIDISTAT		
	TEMPERATURE SENSOR		
	THERMOSTAT		
	INSULATED BASE THERMOSTAT		
	SMOKE DETECTOR		
	AIR OUTLET/INLET TYPE (CFM)		

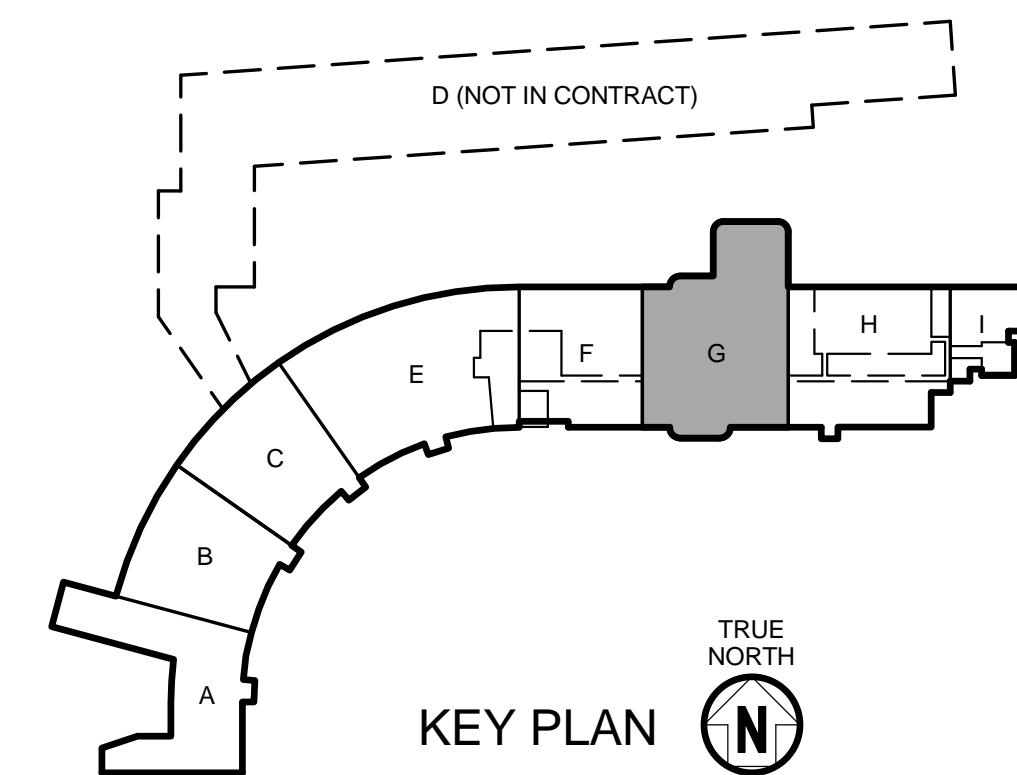
**MECHANICAL PIPING:**

	COMPRESSED AIR		BOILER FEED WATER
	BOILER SURFACE BLOW DOWN		BOILER BOTTOM BLOW DOWN
	CHEMICAL FEED		CHILLED WATER SUPPLY
	CHILLED WATER RETURN		COOLING TOWER WATER SUPPLY
	COOLING TOWER WATER RETURN		CONDENSER WATER SUPPLY
	CONDENSER WATER RETURN		CONDENSATE DRAIN
	GLYCOL WATER SUPPLY		GLYCOL WATER RETURN
	HEAT PUMP SUPPLY		HEAT PUMP RETURN
	HOT WATER SUPPLY		HOT WATER RETURN
	ICE WATER SUPPLY		ICE WATER RETURN
	LIQUID PETROLEUM		LOW PRESSURE STEAM
	LOW PRESSURE STEAM RETURN		LOW PRESSURE CONDENSATE RETURN
	MEDIUM PRESSURE STEAM RETURN		MEDIUM PRESSURE CONDENSATE RETURN
	NATURAL GAS		PUMPED CONDENSATE RETURN
	REFRIGERANT LIQUID		REFRIGERANT SUCTION
	STEAM RELIEF VENT		VACUUM

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**SECOND FLOOR  
HVAC DEMOLITION PLAN - AREA G**  
1/8" = 1'-0"



**MECHANICAL HVAC DEMOLITION  
GENERAL NOTES:**

1. REFER TO SHEET M-001 FOR SYMBOLS, ABBREVIATIONS, AND ADDITIONAL NOTES PERTAINING TO THIS SHEET.
2. PRIOR TO HEAT PUMP REMOVAL, CONTRACTOR SHALL TURN OFF ELECTRICAL POWER TO THE UNIT AND CLOSE THE PIPING ISOLATION VALVES.
3. REMOVE CEILING TILE, CEILING FRAME, LIGHTS AND DEVICES NECESSARY FOR REMOVAL OF HEAT PUMP. ALL ITEMS SHALL BE SAVED FOR REINSTALLATION AND STORED IN A MANNER PROTECTING THEM FROM DAMAGE. ALL DAMAGED TILES, FRAMES, LIGHTS, ETC. WILL BE REPLACED BY THIS CONTRACTOR.

**KEYED NOTES**

- 7.001 CONTRACTOR SHALL DISCONNECT PIPING AND ELECTRICAL CONNECTIONS AT PUMP AND CAREFULLY DISCONNECT HEAT PUMP FROM DUCTWORK AT SERVICE SIDE OF FLEXIBLE CONNECTIONS. REMOVE TRANSITIONS AT HEAT PUMP SUPPLY AND RETURN. REMOVE BRAIDED SUPPLY AND RETURN HOSES.
- 7.002 CONTRACTOR SHALL REMOVE THE HEAT PUMP FROM PROJECT SITE, UNLESS OTHERWISE DIRECTED TO DELIVER TO OWNER DESIGNATED STORAGE AREA.
- 7.008 REMOVE DUCTWORK AS SHOWN AND PATCH REMAINING DUCT OPENING AIRTIGHT, UNLESS IT IS TO BE USED FOR NEW CONNECTION.

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**sbn south bend INTERNATIONAL**

**St. Joseph County Airport Authority  
South Bend International Airport (SBN) HVAC Replacement**  
4477 Progress Drive  
South Bend, IN 46628

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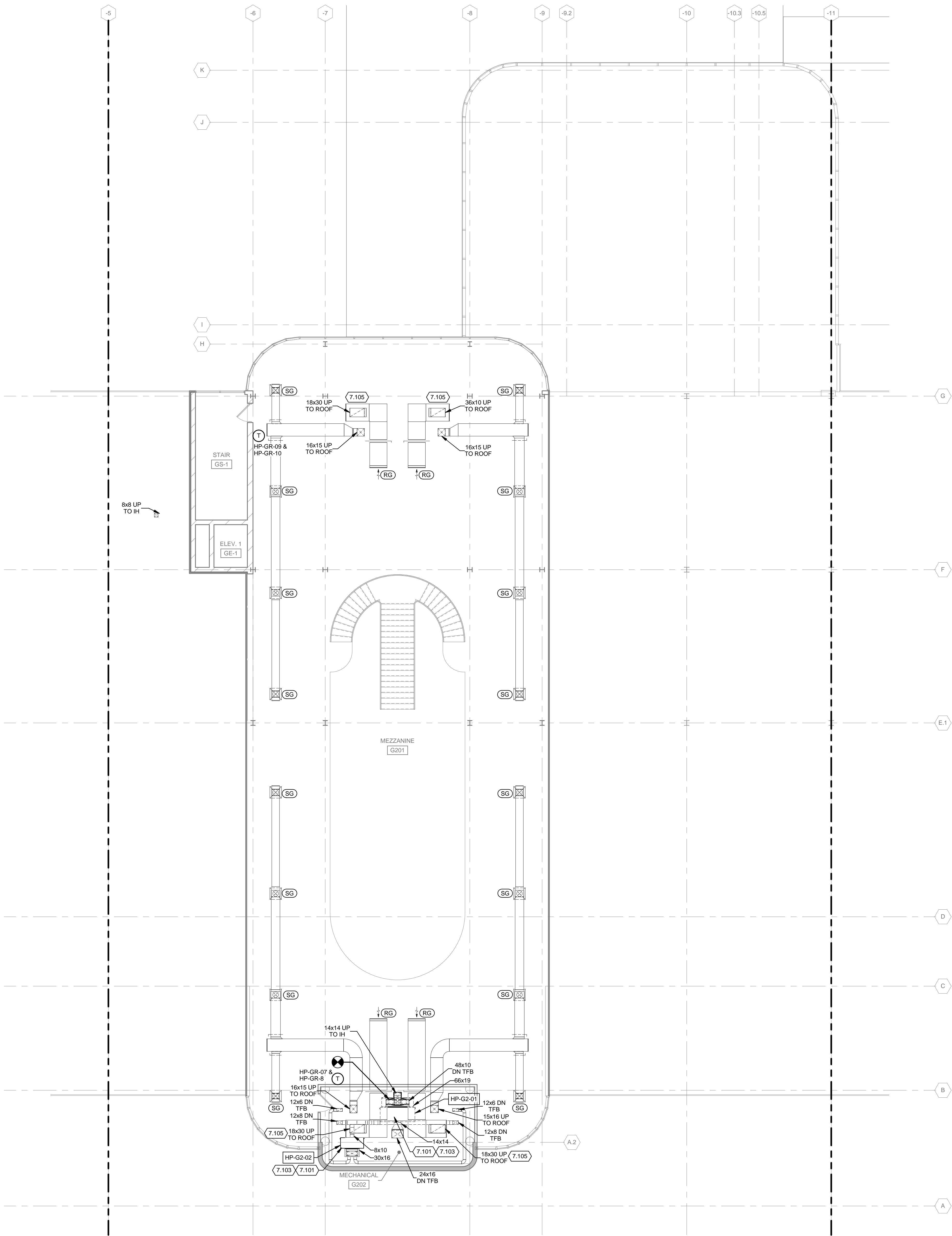
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SBN NO: 2892200-132107.01  
DATE: October 10, 2014  
DESIGNED BY: AMT  
DRAWN BY: RRW  
CHECKED BY: SNW

DO NOT SCALE DRAWINGS  
SHEET CONTENTS  
SECOND FLOOR  
HVAC DEMOLITION  
PLAN - AREA G

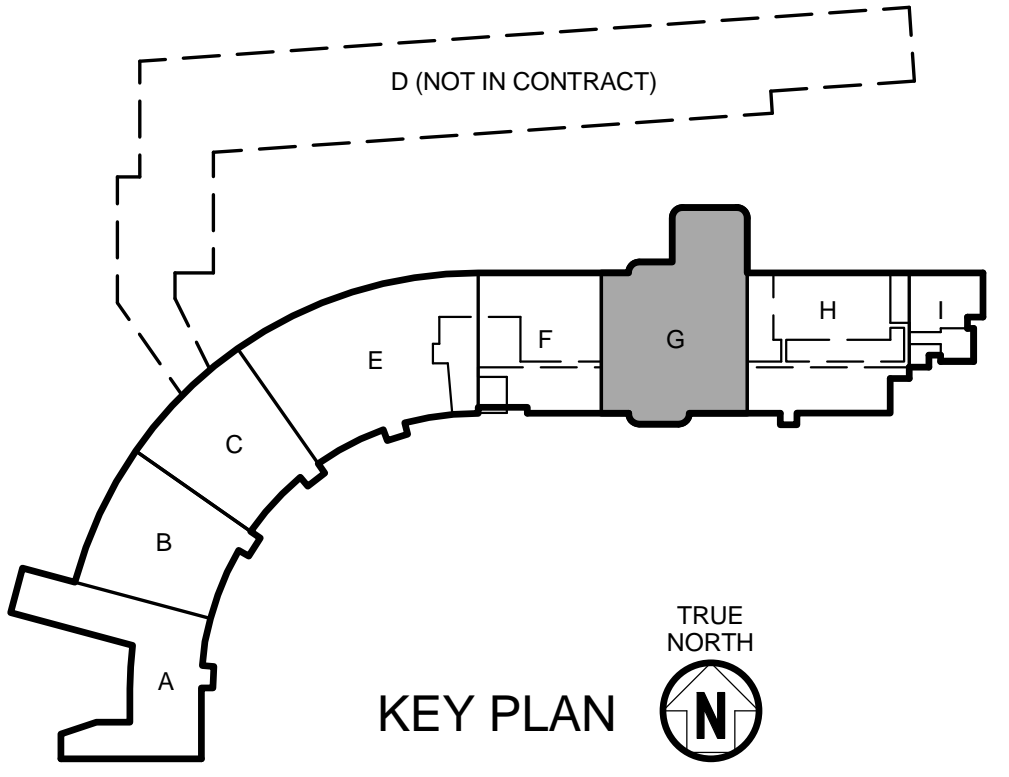
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**SECOND FLOOR  
HVAC PLAN - AREA G**  
1  
1/8" = 1'-0"  
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**MECHANICAL HVAC  
GENERAL NOTES:**

1. REFER TO SHEET M-001 FOR SYMBOLS, ABBREVIATIONS, AND ADDITIONAL NOTES PERTAINING TO THIS SHEET.
2. REFER TO M-500 SERIES SHEETS FOR DETAILS PERTAINING TO THIS SHEET.
3. REFER TO M-600 SERIES SHEETS FOR SCHEDULES PERTAINING TO THIS SHEET.

**KEYED NOTES**

- 7.101 INSTALL NEW HEAT PUMP IN PREVIOUS PUMP LOCATION USING NEW MOUNTING HARDWARE AND VIBRATION ISOLATORS. CONTRACTOR SHALL PROVIDE NEW FLEXIBLE CONNECTIONS AND FIELD FABRICATE DUCTWORK TO MATCH EXISTING. IF NECESSARY, CONTRACTOR SHALL FABRICATE NEW FILTER HOUSING ON RETURN SIDE OF HEAT PUMP AND COORDINATE FILTER CHANGE ACCESSIBILITY LOCATION TO AVOID NEARBY OBSTRUCTIONS.
- 7.103 CONTRACTOR SHALL TAG EACH HEAT PUMP WITH THE CORRESPONDING MARK DESIGNATION FOUND ON THE HEAT PUMP SCHEDULE. THE LETTERS AND NUMBERS SHALL BE ACCORDING TO SPEC. SECTION 230553. TAG THE HEAT PUMP HOUSING IN A CONSISTANT LOCATION VIEWABLE FROM GROUND, CATWALK OR ANY OTHER ACCESSIBLE LEVELS.
- 7.105 TRANSITION EXISTING SUPPLY AND RETURN DUCTWORK TO OPENING ON NEW ROOFTOP HEAT PUMP UNIT.

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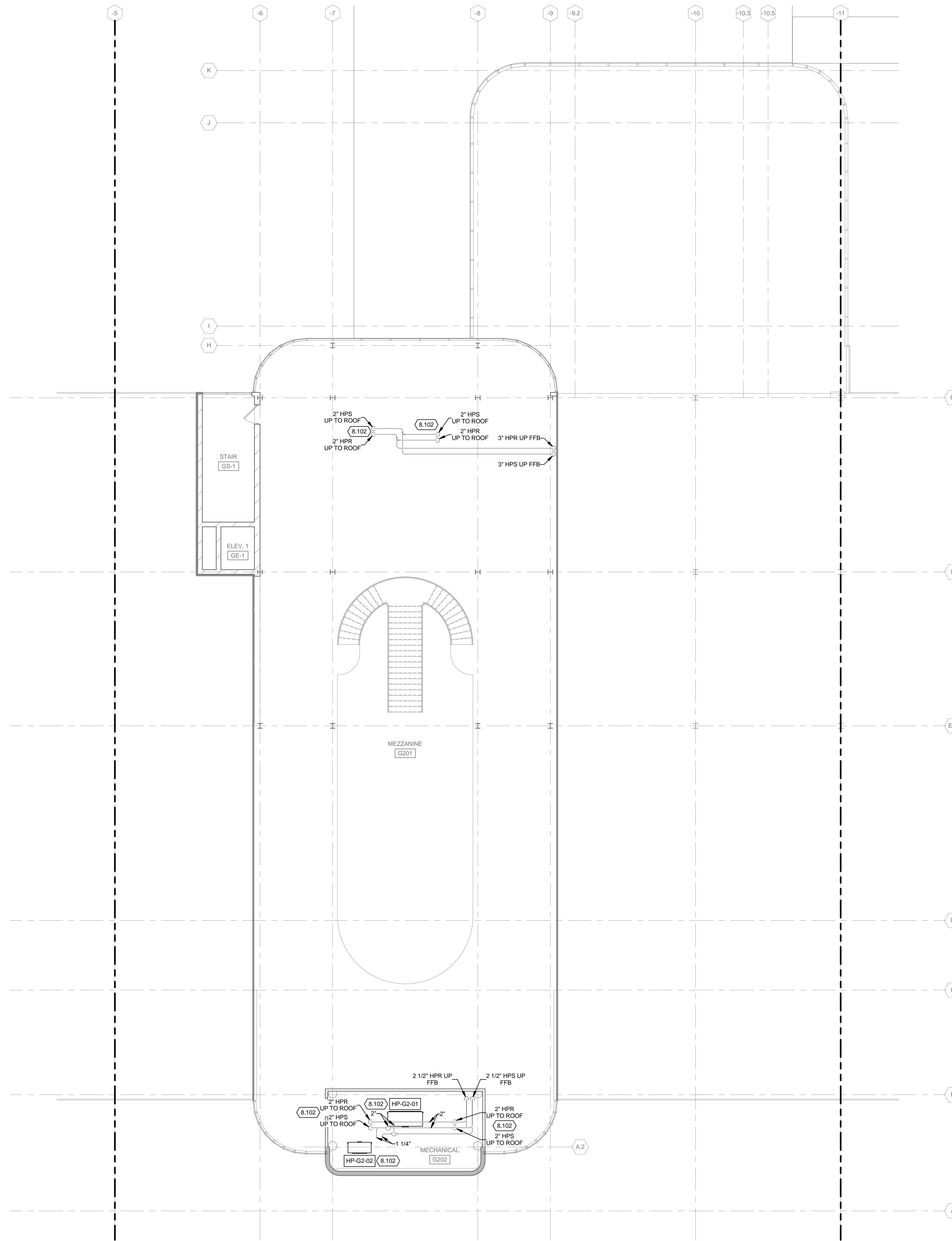
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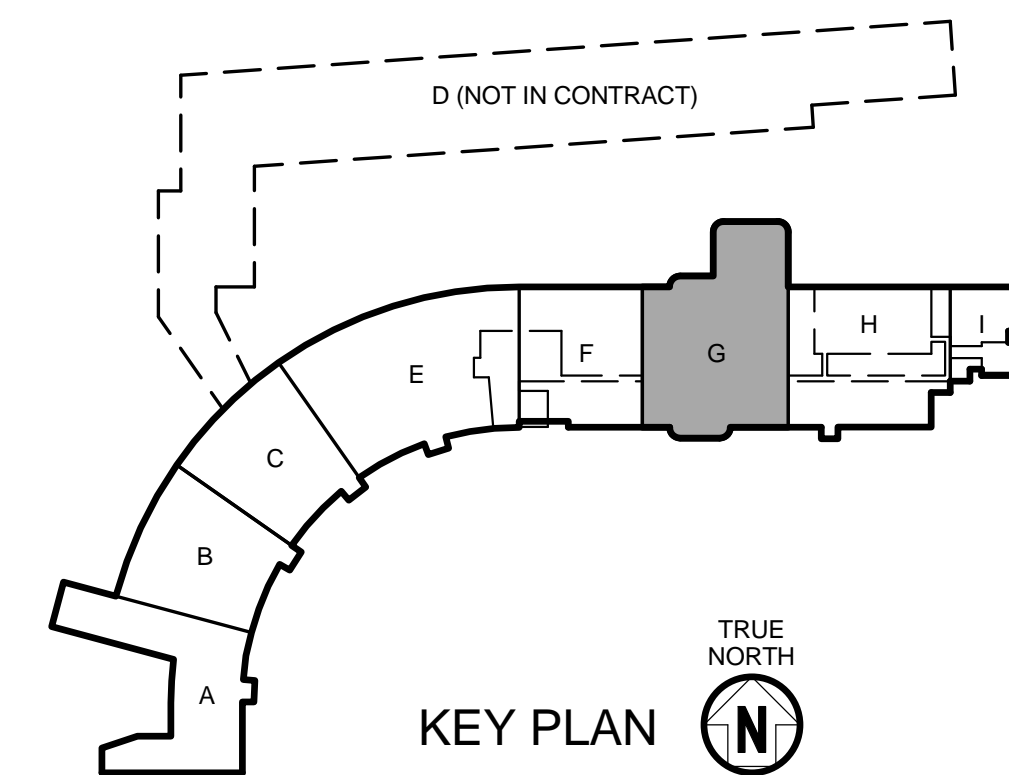
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SECOND FLOOR  
HVAC PLAN - AREA G

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**SECOND FLOOR MECHANICAL PIPING PLAN - AREA G**  
 NORTH 1  
 1/8" = 1'-0"



**MECHANICAL PIPING GENERAL NOTES:**

1. REFER TO SHEET M-001 FOR SYMBOLS, ABBREVIATIONS, AND ADDITIONAL NOTES PERTAINING TO THIS SHEET.
2. REFER TO M-500 SERIES SHEETS FOR DETAILS PERTAINING TO THIS SHEET.
3. REFER TO M-600 SERIES SHEETS FOR SCHEDULES PERTAINING TO THIS SHEET.
4. INSULATE ALL EXISTING AND NEW HEAT PUMP LOOP PIPING PER SCHEDULES AND SPECIFICATIONS. INSULATE PIPING MAINS AND BRANCHES UP TO HEAT PUMP UNIT ISOLATION VALVES. REMOVE EXISTING HANGERS AND SUPPORTS AND REPLACE WITH NEW HANGERS AND SUPPORTS TO ACCOMMODATE PIPE INSULATION.

**KEYED NOTES**

- 8.102 PROVIDE NEW BRAIDED FLEXIBLE HOSES FOR HEAT PUMP SIZE BASED ON HEAT PUMP CONNECTIONS. RECONNECT NEW COIL CONDENSATE TO EXISTING DRAIN SYSTEM.

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 SHEET CONTENTS  
 SECOND FLOOR MECHANICAL PIPING PLAN - AREA G

SHEET NO:  
**M-132g**





