

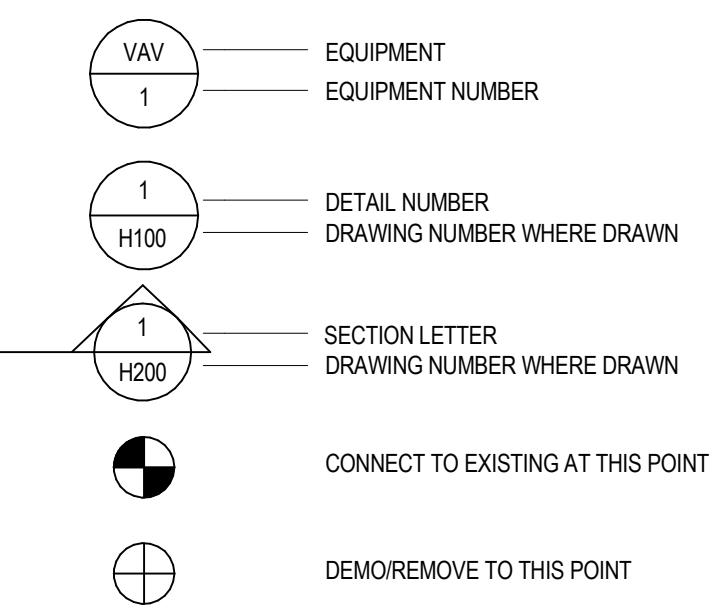
MISCELLANEOUS ABBREVIATIONS

ABV	ABOVE	IME	INSULATED METAL ENCLOSURE
APPROX	APPROXIMATELY	IN	INCHES
AUTO	AUTOMATIC	INCL	INCLUDED
AAV	AUTOMATIC AIR VENT	INSUL	INSULATION
AD	ACCESS DOOR	INTERLOCK	INTERLOCK
AFF	ABOVE FINISHED FLOOR	INV	INVERT
AFM	AIR FLOW MEASURING DEVICE	IER	INVERTED ECCENTRIC REDUCER
AP	ACCESS PANEL	ISV	ISOLATION VALVE STATION
ATC	AUTOMATIC TEMPERATURE CONTROL	LITG	LIGHTING
AWT	AVERAGE WATER TEMPERATURE	LAT	LEAVING AIR TEMPERATURE
		LDB	LEAVING DRY BULB
BLDG	BUILDING	LB	LINEAR FEET
BLW	BELOW	LFC	LINEAR SUPPLY DIFFUSER CEILING
BO	BALANCING COCK	LWB	LEAVING WET BULB
BDD	BACKDRAFT DAMPER	LWT	LEAVING WATER TEMPERATURE
		MAX	MAXIMUM
CAP	CAPACITY	MECH	MECHANICAL
CFH	CUBIC FEET/HOUR	MFR	MANUFACTURER
CHK V	CHECK VALVE	MN	MINIMUM
CHWS	CHILLED WATER SUPPLY	MNTD	MOUNTED
CHWR	CHILLED WATER RETURN	MTL	METAL
CHWS&R	CHILLED WATER SUPPLY/RETURN	MTR	MOTOR
CLS	CEILING	MAT	MIXED AIR TEMPERATURE
CLG MTD	CEILING MOUNTED COLUMN	MAV	MANUAL AIR VENT
CONC	CONCRETE	MBH	ONE THOUSAND BTU/HOUR
CON	CONNECTION	MOD	MOTOR OPERATED DAMPER
CONTR	CONTRACTOR	MH	MANHOLE
CONT	CONTINUE	MEK	MECHANICAL EQUIPMENT ROOM
CONV	CONNECTOR		
CORR	CORRIDOR		
CFM	CUBIC FEET PER MINUTE		
CO	CLEANOUT	NOT	NOT TO SCALE
CV	CONTROL VALVE	NA	NOT APPLICABLE
DB	DRY BULB	OPER	OPERATED
DHW	DOMESTIC HOT WATER	OPNG	OPENING
DCW	DOMESTIC COLD WATER	OA	OUTSIDE AIR
DIFF	DIFFUSER	OB	OPPOSED BLADE DAMPER
DISCH	DISCHARGE	OSBY	OUTSIDE SUEW AND YOK
DN	DOWN	PC	PLUMBING CONTRACTOR
DO	DITTO	PD	PRESSURE DIFFERENTIAL VALVE
DPR	DAMPEN	PD	PUMP DISCHARGE
DR	DRAIN	PG	PRESSURE GAUGE WITH COCK
DWG	DRAWING	PRV	PRESSURE REDUCING VALVE
DX	DIRECT EXPANSION	PT	PRESSURE TAP
		REQD	REQUIRED
EA	EXHAUST AIR	RET	RETURN
EMER	EMERGENCY	REX	REMOVE EXISTING
EQUIP	EQUIPMENT	RM	ROOM
EXH	EXHAUST	RA	RETURN AIR/RELIEF AIR
ETR	EXISTING TO REMAIN	RV	RELIEF VALVE
EAT	ENTERING AIR TEMPERATURE		
EC	ELECTRICAL CONTRACTOR	SCH	SCHEDULE
EDB	ENTERING DRY BULB	SA	SUPPLY AIR
EVB	ENTERING WET BULB	SHT	SHEET
EWT	ENTERING WATER TEMPERATURE	SHT MTL	SHEET METAL
EX	EXISTING	STL	STEEL
		STR	STRAINER
FLG C	FLANGE CONNECTION	SD	SMOKE DAMPER
FLR	FLOOR	SP	STATIC PRESSURE
FRM	FROM	SPS	STATIC PRESSURE SENSOR
FT HD	FEET OF HEAD	TA	THROWAWAY
FAT	FINAL AIR TEMPERATURE	TDV	TRIPLE DUTY VALVE
FC	FLEXIBLE CONNECTION	TEMP	TEMPERATURE
FD	FIRE DAMPER	TH	THERMOMETER
SFD	SMOKE/FIRE DAMPER	TRANS	TRANSITION
FLR DR	FLOOR DRAIN	TYP	TYPICAL
		TSTAT	THERMOSTAT
GA	GAUGE	TCV	TEMPERATURE CONTROL VALVE
GL V	GLOBE VALVE	TR	TEMPERATURE RISE
GRAV	GRAVITY	TV	TURNING VANES
OC	GENERAL CONTRACTOR		
QPM	GALLONS PER MINUTE		
GV	GATE VALVE		
		UC	UNDERCUT
HC	HEATING CONTRACTOR	V	VALVE
HP	HORSE POWER	VD	VOLUME CONTROL DAMPER
HPD	HIGH PRESSURE DRIP	VS	VENTURI FLOW STATION
HTG	HEATING		
HV	HIGH VELOCITY	WB	WET BULB
HWR	HOT WATER RETURN	WFM	WATER FLOW MEASURING DEVICE
HWS	HOT WATER SUPPLY	WG	WATER GAUGE
HWS&R	HOT WATER SUPPLY AND RETURN	WTD	WATER TEMPERATURE DROP
		W	WITH
		W/O	WITH OUT

EQUIPMENT TAG ABBREVIATIONS

ACC	AIR COOLED CHILLER	FT	FINNED TUBE RADIATION
ACCU	AIR COOLED CONDENSING UNIT	FCU	FAN COIL UNIT
ACCUM	ACCUMULATOR	FPB	FAN POWERED BOX
AHU	AIR HANDLING UNIT	FU	FURNACE
ASHP	AIR SOURCE HEAT PUMP	G/V	GRAVITY INTAKE VENTILATOR
		GRV	GRAVITY ROOF VENTILATOR
B	BOILER	H	HUMIDIFIER
BB	BASEBOARD HEATER	HC	HOT WATER HEATING COIL
BD	BAROMETRIC DAMPER	HU	HORIZONTAL UNIT HEATER
BDD	BACK DRAFT DAMPER		
		RG	RETURN GRILLE
CC	CHILLED WATER COOLING COIL	RR	RETURN REGISTER
CD	CONDENSATE DRAIN	RAG	RETURN AIR GRILLE
CIRC	CIRCULATOR	RCP	RADIANT CEILING PANEL
CMRP	COMPRESSOR	RTU	ROOF TOP UNIT
CONV	CONNECTOR		
CP	CONDENSATE PUMP	SF	SUPPLY FAN
CUH	CABINET UNIT HEATER	SSAC	SPLIT SYSTEM AIR CONDITIONING UNIT
		SSDC	SECURITY SUPPLY DIFFUSER CEILING
DC	DRY COOLER	SSF	SECURITY SMOKE EXHAUST FAN
EF	EXHAUST FANS	SSOC	SECURITY SUPPLY GRILLE WALL
ER	EXHAUST REGISTER	SSGW	SECURITY SUPPLY GRILLE WALL
ERW	EXHAUST REGISTER WALL	SSLD	SUPPLY LINEAR SLOT DIFFUSER
ET	EXPANSION TANK		
ECUH	ELECTRIC CABINET UNIT HEATER	P	PUMP
EUH	ELECTRIC UNIT HEATER	PTAC	PACKAGED TERMINAL AIR CONDITIONING UNIT
EW	ELECTRIC WALL HEATER		
EVAP	EVAPORATOR	UH	UNIT HEATER
		UV	UNIT VENTILATOR
		UCD	UNDER CUT DOOR
		VAV	VARIABLE AIR VOLUME

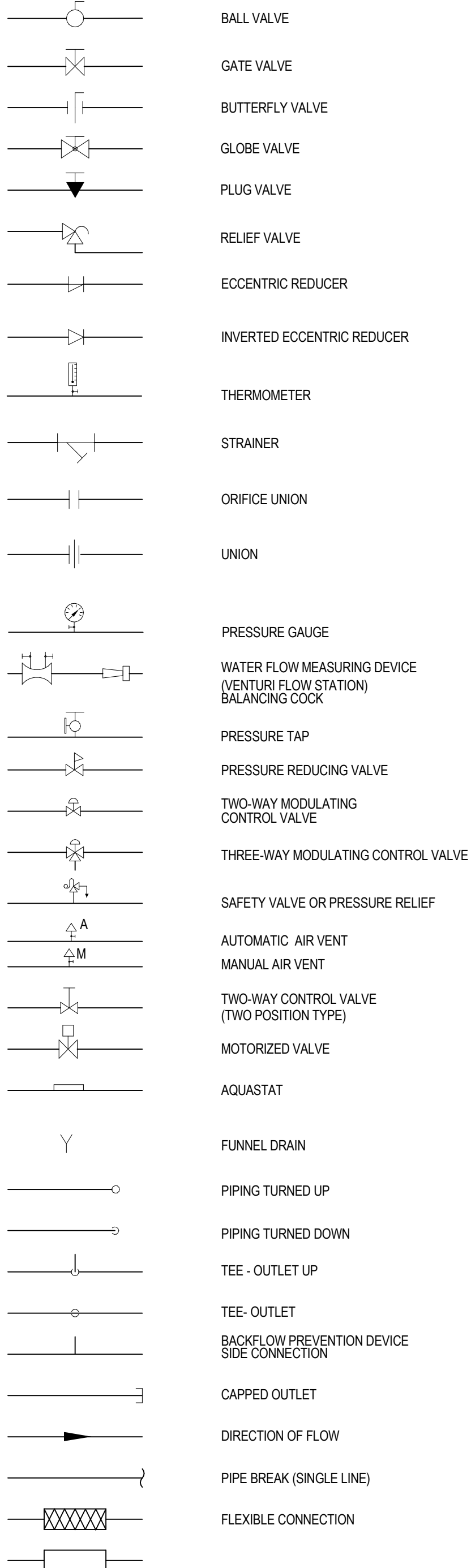
DRAWING SYMBOLS



PIPELINE ABBREVIATIONS

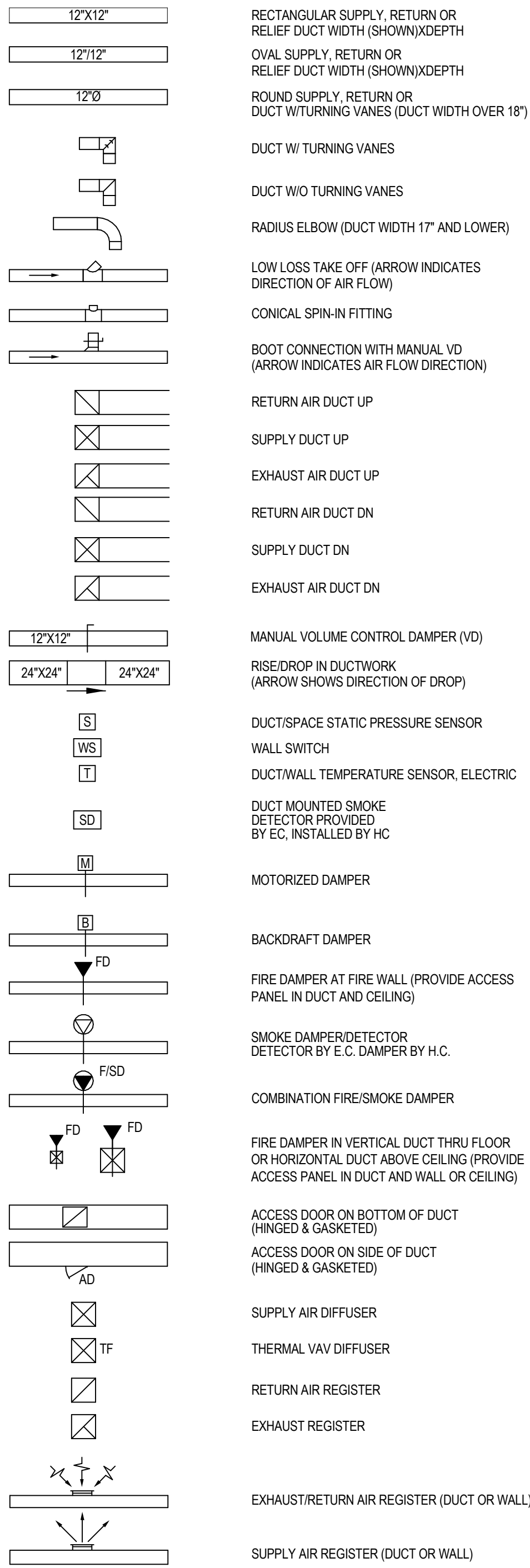
SYMBOLS	DESCRIPTION
CD	CONDENSATE DRAIN LINE
CTD	COOLING TOWER DRAIN LINE
CHWS	CHILLED WATER SUPPLY
CHWR	CHILLED WATER RETURN
CWS	CONDENSER WATER SUPPLY
CWR	CONDENSER WATER RETURN
HWS	HOT WATER HEATING SUPPLY
HWR	HOT WATER HEATING RETURN
LPS	LOW PRESSURE STEAM SUPPLY
LPCR	LOW PRESSURE CONDENSATE RETURN
MPS	MEDIUM PRESSURE STEAM SUPPLY
MPCR	MEDIUM PRESSURE CONDENSATE RETURN
HPS	HIGH PRESSURE STEAM SUPPLY
HPCR	HIGH PRESSURE CONDENSATE RETURN
PC	PUMPED CONDENSATE
HRS	ENERGY (HEAT) RECOVERY SUPPLY
HRR	ENERGY (HEAT) RECOVERY RETURN
RL	REFRIGERANT LINE
RS	REFRIGERANT SUCTION
NAME	PIPE TO BE REMOVED
NAME	EXISTING PIPING TO REMAIN

PIPELINE SYMBOLS

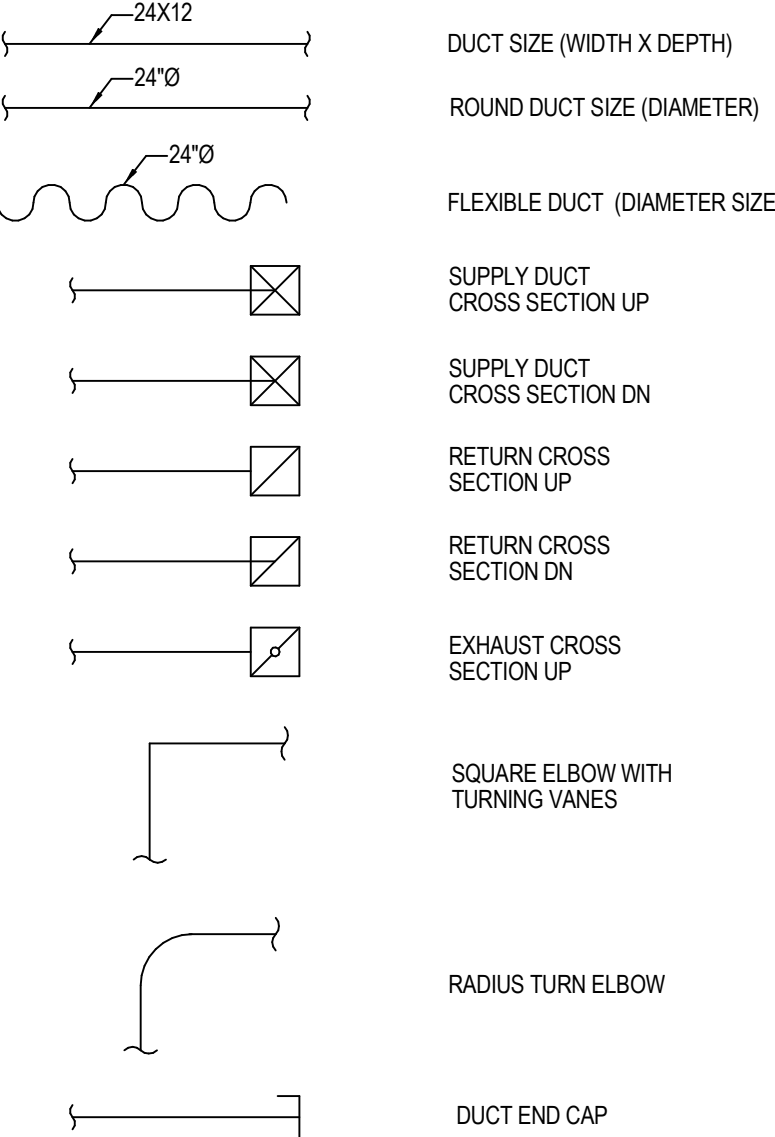


HVAC SYMBOLS

DOUBLE LINE SHEETMETAL SYMBOLS DESCRIPTION



SINGLE LINE - SHEET METAL SYMBOLS DESCRIPTION



HVAC GENERAL NOTES

- NOT ALL SYMBOLS ARE NECESSARILY USED.
- COORDINATE FINAL LOCATIONS OF DIFFUSERS AND GRILLES WITH ARCHITECTURAL REFLECTED CEILING PLANS.
- DRAWINGS ARE DIAGRAMMATIC. CONTRACTOR TO FIELD VERIFY DUCT AND PIPE ROUTING AND COORDINATE INTERFERENCE BETWEEN TRADES PRIOR TO INSTALLATION.
- ROOF OPENINGS, FLASHING, AND COUNTER FLASHING BY GENERAL CONTRACTOR. LOCATION OF OPENINGS BY HEATING CONTRACTOR.
- DUCTWORK TO BE INSTALLED TIGHT TO UNDERSIDE OF STRUCTURE ABOVE UNLESS NOTED OTHERWISE.
- PROVIDE ALL MATERIALS, EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE MECHANICAL SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED, AND AS REQUIRED BY CODE.
- CONTRACT DOCUMENT DRAWINGS FOR MECHANICAL WORK ARE DIAGRAMMATIC AND ARE INTENDED TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY. CONTRACTOR SHALL BE RESPONSIBLE TO FIELD SURVEY ACTUAL SITE CONDITIONS AND ACCOMMODATE ACTUAL SITE CONDITIONS AS PART OF SCOPE OF WORK AT NO COST TO OWNER.
- INSTALL ALL MECHANICAL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, CONTRACT DOCUMENTS, APPLICABLE BUILDING, STATE, AND LOCAL CODES, SEISMIC REQUIREMENTS, ENERGY CODES, AND INSURANCE UNDERWRITER REQUIREMENTS.
- COORDINATE CONSTRUCTION OF ALL MECHANICAL WORK WITH ARCHITECTURAL, STRUCTURAL, CIVIL, AND ELECTRICAL WORK, ETC. SHOWN ON OTHER CONTRACT DOCUMENT DRAWINGS.
- MAINTAIN A MINIMUM OF 6'-8" CLEARANCE TO UNDERSIDE OF PIPES, DUCTS, CONDUITS, SUSPENDED EQUIPMENT, SUPPORTS, ETC., THROUGHOUT ACCESS ROUTES IN MECHANICAL ROOMS.
- ALL TESTS SHALL BE COMPLETED AND ACCEPTED BY THE INSPECTOR BEFORE ANY MECHANICAL EQUIPMENT OR PIPING INSULATION IS APPLIED.
- LOCATE ALL TEMPERATURE, PRESSURE AND FLOW MEASURING DEVICES IN ACCESSIBLE LOCATIONS WITH A STRAIGHT SECTION OF PIPE OR DUCT UPSTREAM AND DOWNSTREAM, AS RECOMMENDED BY THE MANUFACTURER FOR ACCURACY.
- TESTING ADJUSTING AND BALANCING (TAB) AGENCY SHALL BE A MEMBER OF THE ASSOCIATED AIR BALANCING COUNCIL (AABC), THE NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB), OR THE TESTING, ADJUSTING AND BALANCING BUREAU (TAB). TAB FIRM SHALL HAVE A MINIMUM OF 5 YEARS EXPERIENCE ON SIMILAR PROJECTS. PERFORM TAB IN ACCORDANCE WITH THE REQUIREMENTS OF THE TAB PROCEDURAL STANDARD RECOMMENDED BY THE TAB TRADE ASSOCIATION THAT APPROVED THE TAB FIRMS QUALIFICATIONS.
- WHERE TWO OR MORE ITEMS OF THE SAME TYPE OF EQUIPMENT ARE REQUIRED, THE PRODUCTS OF A SINGLE MANUFACTURER SHALL BE USED.
- COORDINATE ALL FINAL EQUIPMENT CONNECTIONS WITH MANUFACTURER'S CERTIFIED DRAWINGS. COORDINATE AND PROVIDE ALL DUCTWORK AND PIPING TRANSITIONS REQUIRED FOR FINAL EQUIPMENT CONNECTIONS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE ALL DUCTWORK AND PIPING DIMENSIONS BEFORE FABRICATION.
- ALL CONTROL WIRE AND CONDUIT SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE, DIVISION 16 OF THE SPECIFICATIONS, ALL LOCAL CODES, AND OWNERS INSURANCE UNDERWRITER REQUIREMENTS.
- WHEN MECHANICAL WORK (HVAC, PLUMBING, FIRE PROTECTION, CONTROLS, ETC.) IS SUBCONTRACTED BY THE MC, IT SHALL BE THE MECHANICAL CONTRACTOR'S RESPONSIBILITY FOR COORDINATING SUBCONTRACTORS AND THEIR ASSOCIATED SCOPE OF WORK. WHEN DISCREPANCIES ARISE PERTAINING TO WHICH SUBCONTRACTOR PROVIDES A PARTICULAR ITEM OF THE MECHANICAL CONTRACT OR WHICH SUBCONTRACTOR PROVIDES FINAL CONNECTIONS FOR A PARTICULAR ITEM OF THE MECHANICAL CONTRACT, IT SHALL BE BROUGHT TO THE ATTENTION OF THE MECHANICAL CONTRACTOR AND HIS DECISION SHALL BE FINAL.
- THE LOCATIONS AND SIZES OF ALL ITEMS SHOWN ON THE DRAWINGS OR CALLED FOR IN THE SPECIFICATIONS THAT ARE NOT DEFINITELY FIXED BY DIMENSIONS ARE APPROXIMATE ONLY. THE EXACT LOCATIONS AND SIZES NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS SHALL BE DETERMINED BY THE PROJECT SITE CONDITIONS AND SHALL HAVE THE APPROVAL OF THE ENGINEER BEFORE BEING INSTALLED. DO NOT SCALE DRAWINGS.
- PLAN DRAWINGS AND SECTION CUTS WHICH SPECIFICALLY IDENTIFY SERVICE ROUTE OFFSETS, ELEVATION CHANGES, OBSTRUCTIONS, ACCESS DOORS, BALANCING DEVICES, ETC. ARE SHOWN FOR CLARITY WHERE SPECIFIC KNOWN CONDITIONS EXIST. MECHANICAL CONTRACTOR SHALL COORDINATE EQUIPMENT, DUCTWORK, AND PIPING ROUTINGS WITH ALL OTHER TRADES. REQUIREMENTS NOT SPECIFICALLY IDENTIFIED SHALL NOT BE INTERPRETED AS EXCLUSION FROM CONTRACTORS SCOPE OF WORK. CONTRACTOR SHALL BE RESPONSIBLE FOR ACTUAL SITE CONDITIONS AND SHALL INCLUDE SUCH CONDITIONS IN SCOPE OF WORK AT NO ADDITIONAL COST TO THE OWNER.
- ALL MISCELLANEOUS STEEL REQUIRED TO ENSURE PROPER INSTALLATION AND SUPPORT OF MECHANICAL WORK AS SHOWN IN DETAILS FOR PIPING, DUCTWORK AND EQUIPMENT (UNLESS OTHERWISE NOTED) SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
- PROVIDE ACCESS DOORS AND PANELS AS SPECIFIED FOR INSTALLATION IN WALLS AND CEILINGS. WHERE REQUIRED, TO SERVICE, BALANCE, ADJUST, MAINTAIN, AND/OR INSPECT DAMPERS, VALVES, SMOKE DETECTORS, CONTROLS, AND OTHER CONCEALED MECHANICAL EQUIPMENT. ACCESS PANELS SHALL BE GIVEN TO THE GENERAL CONTRACTOR FOR INSTALLATION. ACCESS PANEL LOCATIONS SHALL BE COORDINATED WITH ALL DISCIPLINES.
- ALL EQUIPMENT, PIPING, DUCTWORK, ETC. SHALL BE SUPPORTED AS DETAILED, SPECIFIED AND AS REQUIRED TO PROVIDE A VIBRATION FREE INSTALLATION.
- ALL OPENINGS IN FIRE RATED WALLS AND SMOKE PARTITIONS DUE TO DUCTWORK, PIPING, CONDUIT, ETC., SHALL BE FIRE STOPPED WITH APPROVED FIRESTOPPING MATERIALS.
- REFER TO TYPICAL DETAILS FOR DUCTWORK, PIPING AND EQUIPMENT INSTALLATION.
- UNLESS OTHERWISE SHOWN, LOCATE ALL ROOM THERMOSTATS 48" (CENTER LINE) ABOVE FINISHED FLOOR IN ACCORDANCE WITH ADA REQUIREMENTS. NOTIFY THE ENGINEER OF ANY ROOMS WHERE THE ABOVE LOCATION CAN NOT BE MAINTAINED OR WHERE THERE IS A QUESTION ON LOCATION. COORDINATE FINAL LOCATIONS WITH OWNER.
- LOCATE ALL MECHANICAL EQUIPMENT (VAV BOXES, CABINET HEATERS, UNIT HEATERS, ETC.) FOR UNOBSTRUCTED ACCESS TO UNIT ACCESS PANELS, FILTERS, CONTROLS AND VALVING. DO NOT LOCATE FAN POWERED VAV BOXES ABOVE LIGHTING FIXTURES.
- PROVIDE FLEXIBLE CONNECTIONS IN ALL DUCTWORK SYSTEMS (SUPPLY, RETURN AND EXHAUST) CONNECTED TO FANS AND OTHER EQUIPMENT WHICH REQUIRE VIBRATION ISOLATION. FLEXIBLE CONNECTIONS SHALL BE PROVIDED AT THE POINT OF CONNECTION TO THE EQUIPMENT UNLESS OTHERWISE INDICATED.
- ALL LOUVERS SHALL BE FURNISHED AND INSTALLED BY THE GENERAL CONTRACTOR (UNLESS OTHERWISE NOTED). GENERAL CONTRACTOR SHALL COORDINATE SIZES, LOCATIONS, AND CONNECTIONS WITH MECHANICAL CONTRACTOR. DUCTWORK CONNECTIONS TO LOUVERS SHALL BE FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR.
- PROVIDE AN AIR VENT AT THE HIGH POINT OF EACH DROP IN HYDRONIC WATER PIPING SYSTEMS. ALL PIPING SHALL SLOPE TO LOW POINTS. PROVIDE HOSE END DRAIN VALVES AT THE BOTTOM OF ALL RISERS AND LOW POINTS.
- INSTALL PIPING SO THAT ALL VALVES, STRAINERS, UNIONS, TRAPS, FLANGES, AND OTHER APPURTENANCES REQUIRING ACCESS ARE ACCESSIBLE.
- ALL ISOLATION VALVES SHALL BE IN A LOCATION AND ELEVATION WHICH ALLOWS FOR EQUIPMENT AND BRANCH PIPING REMOVAL, WHILE MAINTAINING SERVICE UPSTREAM OF THE ISOLATION VALVE.
- ALL BALANCING VALVES AND ISOLATION VALVES USED TO ADJUST FLOW RATES SHALL BE PROVIDED WITH POSITION INDICATORS AND MAXIMUM ADJUSTABLE STOPS (MEMORY STOPS).
- ALL ISOLATION VALVES (EXCEPT CONTROL VALVES), STRAINER, AND PIPING SPECIALTIES AND STRAINERS SHALL BE FULL LINE SIZE BEFORE REDUCING SIZE TO MAKE CONNECTIONS TO EQUIPMENT AND CONTROLS.
- MECHANICAL JOINTS SUCH AS UNIONS, FLANGES, OR THREADED FITTINGS SHALL BE INSTALLED AT EACH EQUIPMENT CONNECTION, IN BYPASSES, AT FLOOR PENETRATIONS, AT CONTROL DEVICES, AND IN LONG PIPE RUNS (100 FEET OR MORE) TO PERMIT DISASSEMBLY FOR ALTERATION AND REPAIRS.

FULLY SPRINKLERED CONSTRUCTION DOCUMENTS

CONSULTANTS:		SEAL		ARCHITECTS/ENGINEERS:		Drawing Title HVAC SYMBOLS, ABBREVIATIONS AND GENERAL NOTES		Project Title: ERIE VAMC - REPLACE ELEVATORS		Project Number 562-13-113	
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