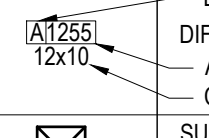

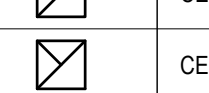
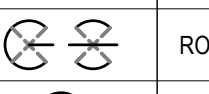
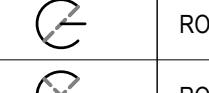

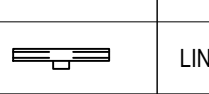
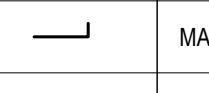
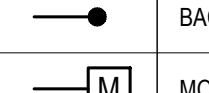

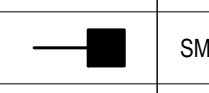


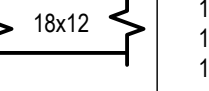
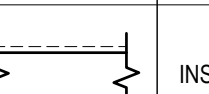
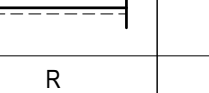
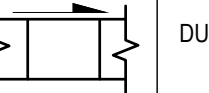
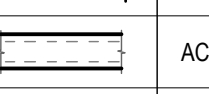
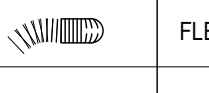





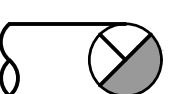
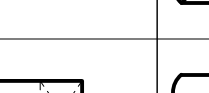

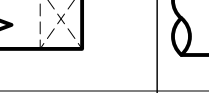


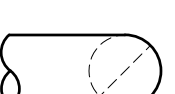

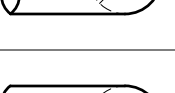


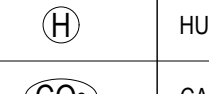
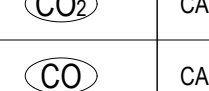


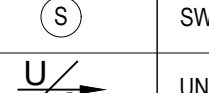
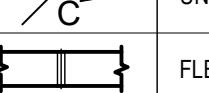
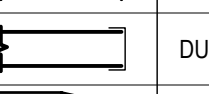
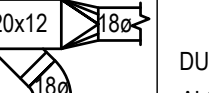
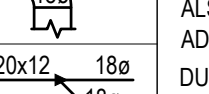
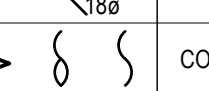

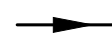
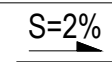


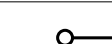

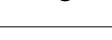
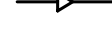
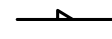
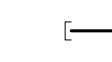

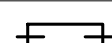




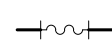
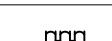
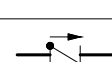
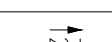


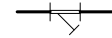
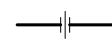

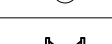
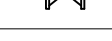
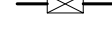
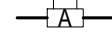
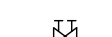
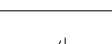


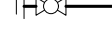
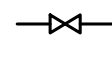

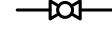
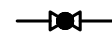

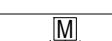
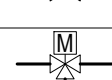
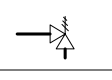
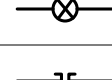
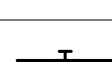
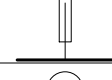
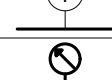
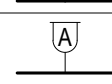


MECHANICAL ABBREVIATIONS		
	ALL ABBREVIATIONS DO NOT NECESSARILY APPEAR ON DRAWINGS ADDITIONAL ABBREVIATIONS MAY BE LISTED THROUGHOUT DRAWINGS	
AAV	AUTOMATIC AIR VENT	
A/C, AC	AIR CONDITIONING	
AFS	AIR FLOW SWITCH	
AFF	ABOVE FINISH FLOOR	
AG	ABOVE GROUND	
AHU	AIR HANDLING UNIT	
AL	ACOUSTIC LINED	
APPROX.	APPROXIMATE	
ARCH	ARCHITECT OR ARCHITECTURAL	
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS	
BDD	BACKDRAFT DAMPER	
BFF	BELOW FINISH FLOOR	
BHP	BRAKE HORSEPOWER	
B.H.P.	BOILER HORSEPOWER	
BLDG	BUILDING	
BP	BYPASS	
BTU	BRITISH THERMAL UNIT	
BTUH, BTU/H	BRITISH THERMAL UNIT PER HOUR	
BV	BALANCING VALVE	
BG	BELOW GROUND	
C	CELCIUS	
CA	COMPRESSED AIR	
CC	COOLING COIL	
CD	CONDENSATE DRAIN	
CFM	CUBIC FEET PER MINUTE	
CHWS, CHS	CHILLED WATER SUPPLY	
CHWR, CHR	CHILLED WATER RETURN	
CLG	CEILING	
CMU	CONCRETE MASONRY UNIT	
CM	CONDENSATE METER	
CO	CLEAN OUT	
CO2	CARBON DIOXIDE	
COP	COEFFICIENT OF PERFORMANCE	
CT	COOLING TOWER	
CU	CONDENSING UNIT	
CWS	CONDENSER WATER SUPPLY	
CWR	CONDENSER WATER RETURN	
DCW	DOMESTIC COLD WATER	
DB	DRY BULB	
DIA, ø	DIAMETER (DUCTWORK)	
DDC	DIRECT DIGITAL CONTROL	
DEMO	DEMOLISH	
DN	DOWN	
DPS	DIFFERENTIAL PRESSURE SWITCH	
DWG	DRAWING	
DX	DIRECT EXPANSION	
EA	EXHAUST AIR	
EA	EACH	
EAT	ENTERING AIR TEMPERATURE	
EDB	ENTERING DRY BULB	
EDR	EQUIVALENT DIRECT RADIATION	
EER	ENERGY EFFICIENCY RATIO	
EF	EXHAUST FAN	
EFF	EFFICIENCY	
ELEC	ELECTRIC OR ELECTRICAL	
ELEV	ELEVATION	
EMCS	ENERGY MANAGEMENT CONTROL SYSTEM	
EOR	ENGINEER OF RECORD	
EQUIP	EQUIPMENT	
ESP	EXTERNAL STATIC PRESSURE	
EWB	ENTERING WET BULB	
EWT	ENTERING WATER TEMPERATURE	
EXH	EXHAUST	
EXIST, (E)	EXISTING	
F	FAHRENHEIT	
f	CUBIC FEET PER MINUTE (SEE ALSO CFM)	
FC	FAN COIL (AKA FAN COIL UNIT)	
FCU	FAN COIL UNIT	
FP	FIRE PROTECTION	
FD	FIRE DAMPER	
FF	FINAL FILTER	
FLA	FULL LOAD AMPS	
FLS	FIRE LIFE SAFETY	
FPI	FINS PER INCH	
FPS	FEET PER SECOND	
FSD	FIRE SMOKE DAMPER	
FT	FEET	
G	NATURAL GAS	
GA	GAUGE	
GAL	GALLONS	
GALV	GALVANIZED	
GPH	GALLONS PER HOUR	
GPM	GALLONS PER MINUTE	
HC	HEATING COIL	
HD	HEAD	
HHWS	HEATING HOT WATER SUPPLY	
HHWR	HEATING HOT WATER RETURN	
HL	HIGH LIMIT	
hp	HORSEPOWER (UNITS)	
HP	HEAT PUMP (EQUIPMENT)	
HR	HOUR	
HTG	HEATING	
HHWS	HEATING HOT WATER SUPPLY	
HHWR	HEATING HOT WATER RETURN	
HW	HOT WATER (SEE ALSO DHW)	
HFC	HIGH-WALL FAN COIL (EQUIPMENT)	
HFC	HYDROFLUOROCARBON (REFRIGERANTS)	
HPR	HIGH PRESSURE CONDENSATE RETURN	
HPS	HIGH PRESSURE STEAM	
HUM	HUMIDIFIER	
HVAC	HEATING, VENTILATION & AIR CONDITIONING	
HX	HEAT EXCHANGER	
HZ	HERTZ	

MECHANICAL ABBREVIATIONS		
KW	KILOWATT	
KWH	KILOWATT HOUR	
LAT	LEAVING AIR TEMPERATURE	
LB	POUND	
LDB	LEAVING DRY BULB	
LF	LINEAL FOOT	
LPR	LOW PRESSURE CONDENSATE RETURN	
LPS	LOW PRESSURE STEAM	
LWB	LEAVING WET BULB	
LWT	LEAVING WATER TEMPERATURE	
MAU	MAKE-UP AIR UNIT	
MAV	MANUAL AIR VENT	
MAX	MAXIMUM	
MBH, kBTUH	THOUSANDS BTU PER HOUR	
MCA	MINIMUM CIRCUIT AMPACITY	
MD	MODULATING DAMPER	
MECH	MECHANICAL	
MFR	MANUFACTURER	
MIN	MINIMUM (DIMENSION), MINUTES (TIME)	
MMBH, MMBTU	MILLIONS BTU PER HOUR	
MOP, MOCp	MAXIMUM OVERCURRENT PROTECTION	
MPG	MEDIUM PRESSURE GAS	
MPR	MEDIUM PRESSURE CONDENSATE RETURN	
MPS	MEDIUM PRESSURE STEAM	
MS	MOTOR STARTER	
MJA	MAKE-UP AIR	
MVD	MANUAL VOLUME DAMPER	
N/A	NOT APPLICABLE	
NC	NOISE CRITERIA	
N.C.	NORMALLY CLOSED	
N.I.C.	NOT IN CONTRACT	
N.O.	NORMALLY OPEN	
NPT	NATIONAL PIPE THREAD	
NTS	NOT TO SCALE	
OA, OSA	OUTSIDE AIR	
OBd	OPPOSED BLADE DAMPER	
PXXX	PRIMARY XXX	
PBD	PARALLEL BLADE DAMPER	
PD	PRESSURE DROP	
PG	PROPYLENE GLYCOL	
PH, Ph, ø	PHASE (ELECTRICAL)	
PLBG	PLUMBING	
POC	POINT OF CONNECTION	
POD	POINT OF DISCONNECTION	
PRV	PRESSURE REDUCING VALVE	
P.R.V.	PRESSURE REGULATING VALVE	
PSI	POUNDS PER SQUARE INCH	
PSIG	POUNDS PER SQUARE INCH GAUGE	
P/T	PRESSURE/TEMPERATURE	
RA	RETURN AIR	
REQD	REQUIRED	
REV	REVISION	
RFI	REQUEST FOR INFORMATION	
RND	ROUND	
R.O.	ROUGH OPENING	
RPM	REVOLUTION(S) PER MINUTE	
RR	REFRIGERANT RETURN (VRF SYSTEMS)	
RS/RL	REFRIGERANT SUCTION (GAS) / REFRIGERANT LIQUID	
RTU	ROOF-TOP UNIT	
SXXX	SECONDARY XXX	
SA	SUPPLY AIR	
SCFM	STANDARD CUBIC FEET PER MINUTE	
SD	SMOKE DETECTOR	
SEER	SEASONAL ENERGY EFFICIENCY RATIO	
SENS	SENSIBLE	
SF	SUPPLY FAN	
SQ	SQUARE	
SQ FT	SQUARE FEET	
SQ IN	SQUARE INCHES	
SP	STATIC PRESSURE	
SS	STAINLESS STEEL	
STD	STANDARD	
T	TEMPERATURE	
TXXX	TERTIARY XXX	
TA	TRANSFER AIR	
TAB	TEST, ADJUST & BALANCE	
TB	TERMINAL BOX	
THK	THICK	
THR	TOTAL HEAT REJECTION	
TSP	TOTAL STATIC PRESSURE	
TSTAT	THERMOSTAT	
TYP	TYPICAL	
UF	UNDER FLOOR	
UG	UNDERGROUND	
UH	UNIT HEATER	
UMC	UNIFORM MECHANICAL CODE	
UNO	UNLESS NOTED OTHERWISE	
USO	UNLESS SPECIFIED OTHERWISE	
US	UNDERSLAB	
UTR	UP THROUGH ROOF	
V	VOLTS	
VAC	VOLTS, ALTERNATING CURRENT	
VAV	VARIABLE AIR VOLUME	
VFD	VARIABLE FREQUENCY DRIVE	
VRF	VARIABLE REFRIGERANT FLOW	
VRV	VARIABLE REFRIGERANT VOLUME	
*WC	INCHES OF WATER COLUMN	
W/	WITH	
W/O	WITHOUT	
WB	WET BULB	
WH	WATER HEATER	
WPD	WATER PRESSURE DROP	
WT	WEIGHT	
X	REPRESENTING ANY LETTER OR NUMBER	
x	BY (DIMENSIONS)	

HVAC DUCTWORK LEGEND		
SYMBOL	DESCRIPTION	
	ALL SYMBOLS DO NOT NECESSARILY APPEAR ON DRAWINGS	
	DEVICE IDENTIFIER (SEE SCHEDULES) DIFFUSER/ GRILLE/ REGISTER TAG AIRFLOW (CFM) CORE SIZE (SIDEWALL GRILLES ONLY).	
	SUPPLY AIR CEILING DIFFUSER, FOUR WAY UNO (OPEN QUADRANT INDICATES THROW PATTERN)	
	CEILING RETURN/EXHAUST OR TRANSFER GRILLE	
	CEILING EXHAUST	
	ROUND SUPPLY AIR DIFFUSER	
	ROUND RETURN/EXHAUST	
	ROUND EXHAUST	
	WALL/DUCT GRILLE/REGISTER	
	LINEAR SLOT DIFFUSER	
	MANUAL VOLUME DAMPER	
	BACKDRAFT DAMPER	
	MOTORIZED DAMPER	
	FIRE DAMPER	
	SMOKE DAMPER	
	FIRE/SMOKE DAMPER	
	DIRECTION OF AIR FLOW	
	DUCT SIZE IN INCHES (FIRST SIZE LISTED IS SIDE SHOWN) 18x12 RECTANGULAR 18ø ROUND 18/12 OVAL	
	INSULATED DUCT (NOT ALWAYS INDICATED. COMPLY WITH CODE)	
	DUCT RISE (R) OR DUCT DROP (D) IN DIRECTION OF ARROW	
	ACOUSTIC INSULATION-LINED DUCT	
	FLEXIBLE DUCT	
		SUPPLY DUCT TURNED UP / SECTION
		RETURN DUCT TURNED UP / SECTION
		EXHAUST DUCT TURNED UP / SECTION
		SUPPLY DUCT TURNED DOWN / HIDDEN SECTION
		RETURN DUCT TURNED DOWN / HIDDEN SECTION
		EXHAUST DUCT TURNED DOWN / HIDDEN SECTION
	THERMOSTAT	
	HUMIDISTAT	
	CARBON DIOXIDE SENSOR	
	CARBON MONOXIDE SENSOR	
	DUCT SMOKE DETECTOR	
	WALL SWITCH	
	SWITCH	
	UNDERCUT DOOR, 3/4" UNO	
	FLEXIBLE DUCT CONNECTION	
	DUCT CAP	
	DUCT TRANSITION EXAMPLE (DOUBLE LINE) ALSO SEE MECHANICAL DETAILS AND SMACNA GUIDELINES FOR ADDITIONAL DUCT FITTING INFO AND EXAMPLES.	
	DUCT TRANSITION EXAMPLE (SINGLE LINE)	
	CONTINUATIONS	

HVAC PIPING LEGEND	
SYMBOL	DESCRIPTION
	ALL SYMBOLS DO NOT NECESSARILY APPEAR ON DRAWINGS
	FLOW DIRECTION
	PIPE SLOPE DIRECTION DOWN
	PUMP (ARROWHEAD INDICATES PUMP DIRECTION)
	PIPE DOWN
	PIPE UP
	DOWN IN PIPE
	REDUCER, CONCENTRIC
	REDUCER, ECCENTRIC
	END CAP
	EXPANSION LOOP
	EXPANSION JOINT
	EXPANSION GUIDE
	ANCHOR
	FLEX CONNECTION, BRAIDED
	FLEX COUPLING
	VICTAULIC FLEX COUPLINGS
	SWING CHECK VALVE
	SPRING CHECK VALVE
	STRAINER WITH BLOW DOWN VALVE AND HOSE ADAPTOR
	STRAINER
	UNION
	BASKET STRAINER
	TRIPLE DUTY VALVE
	BALANCE VALVE (MANUAL)
	BALANCE VALVE (AUTOMATIC)
	CIRCUIT SETTER
	HOSE BIBB
	HOSE THREAD DRAIN VALVE W/ END CAP
	HOSE THREAD BALL DRAIN VALVE W/ END CAP
	ISOLATION VALVE. PROVIDE BALL VALVE UNLESS SPECIFIED OTHERWISE
	GATE VALVE
	BALL VALVE
	GLOBE VALVE
	BUTTERFLY VALVE
	MOTORIZED (M) VALVE OR SOLENOID (S) VALVE
	3-WAY MOTORIZED OR SOLENOID VALVE
	PRESSURE RELIEF
	STEAM TRAP ASSEMBLY
	THERMOWELL
	PRESSURE TEMPERATURE PORT, AKA PETE'S PLUG
	THERMOMETER (LIQUID IN GLASS)
	DIAL THERMOMETER
	PRESSURE GAUGE W/ COCK
	AUTOMATIC AIR VENT
	MANUAL AIR VENT
	FLOW SWITCH
	PRESSURE SWITCH