

POWER & UTILITY EQUIPMENT	
SYMBOL	DESCRIPTION
	CENTRIFUGAL PUMP
	ROTARY PUMP
	AIR SEPARATOR
	EXPANSION TANK (BLADDER TYPE)
	SUMP PUMP
	POT FEEDER
	MIXER
	DEAERATOR
	MIXING TANK
	BLOWDOWN TANK

POWER & UTILITY MECHANICAL LEGEND	
SYMBOL	DESCRIPTION
	OPEN DRAIN HUB
	VENTURI TUBE
	FLOW NOZZLE
	SINGLE PORT PITOT TUBE
	FLOW SWITCH
	AVERAGING PITOT TUBE
	STEAM SAMPLE EXTRACTION CONDITIONER
	TURBINE METER FLOW ELEMENT
	FLOW GLASS (SIGHT GLASS)
	POSITIVE DISPLACEMENT METER
	VORTEX SHEDDING METER FLOW ELEMENT
	SLOPING LINE ANGLE NOTED
	STEAM TRAP
	Y-TYPE STRAINER
	IN-LINE FILTER
	TEMP STRAINER
	HOSE CONNECTION
	BRAIDED METAL HOSE
	FLEXIBLE HOSE CONNECT
	FLANGES
	ORIFICE FLANGES
	SPECTACLE BLIND
	PLAIN BLIND
	EXPANSION JOINT
	VENT SILENCER
	POINT-OF-CONNECTION BETWEEN NEW AND EXISTING WORK
	STANDARD HANGER
	ENGINEERED HANGER
	BALL JOINT
	VENDOR FURNISHED (SUPPLIED LOOSE)
	EXISTING OR PREVIOUSLY INSTALLED EQUIPMENT
	FLOW METER
	DRAIN
	CAR SEAL OPEN
	CAR SEAL CLOSED
	THE POINT REFERENCE
	SPECIALTY ITEM
	XXXX - DRAWING REFERENCE
	VENT OUTSIDE
	INJECTION QUILL
	VENT WITH SCREEN
	DIRECTION OF PIPE PITCH (DOWN)
	DIRECTION OF FLOW
	ANCHOR
	REDUCER OR INCREASER
	ECCENTRIC REDUCER
	TOP CONNECTION, 45° OR 90°
	BOTTOM CONNECTION, 45° OR 90°
	SIDE CONNECTION
	CAPPED OUTLET
	RISE OR DROP IN PIPE
	UNION
	PIPE UP
	PIPE DOWN
	PRESSURE GAUGE
	TEMPERATURE GAUGE
	PUMP

POWER & UTILITY VALVE LEGEND	
SYMBOL	DESCRIPTION
	BACK FLOW PREVENTER VALVE
	CHECK VALVE
	ANGLE STOP CHECK VALVE
	STOP CHECK VALVE
	DOUBLE BORE AND BORE BALL VALVE
	PLUG VALVE
	BALANCING VALVE
	EXCESS FLOW VALVE
	3 WAY AUTOMATIC RECIRC. VALVE (ARV)
	PRESSURE SAFETY RELIEF VALVE SINGLE PORT SPRING
	PRESSURE REGULATOR WITH EXTERNAL PRESSURE TAP
	PRESSURE REGULATOR, SELF CONTAINED
	CONTROL VALVE, DIAPHRAGM-ACTUATED
	CONTROL VALVE, WITH HAND WHEEL
	PISTON OPERATED VALVE
	MOTOR OPERATED VALVE
	SOLENOID OPERATED VALVE
	SOLENOID WITH MANUAL RESET
	SOLENOID WITH REMOTE RESET
	FAIL CLOSED ON ACTUATOR POWER FAILURE
	FAIL OPEN ON ACTUATOR POWER FAILURE
	FAIL LOCKED (LAST POSITION) ON ACTUATOR POWER FAILURE
	VACUUM BREAKER

NORMALLY OPEN & CLOSED VALVES		
SYMBOL NORMALLY OPEN	DESCRIPTION	SYMBOL NORMALLY CLOSED
	BALL VALVE	
	GLOBE VALVE	
	GATE VALVE	
	BUTTERFLY VALVE	
	PLUG VALVE	
	DIAPHRAGM VALVE	
	AIR RELEASE VALVE	
	NEEDLE VALVE	
	ANGLE VALVE	
	3-WAY VALVE	
	4-WAY VALVE	

MECHANICAL LEGEND CONTROL SYSTEMS	
SYMBOL	DESCRIPTION
	ANALOG INPUT
	ANALOG OUTPUT
	BINARY INPUT
	BINARY OUTPUT
	WALL THERMOSTAT WITH SENSOR, USER ADJUSTMENT AND UNOCCUPIED OVERRIDE
	AUTOMATIC CONTROL VALVE (TWO WAY BALL VALVE)
	WATER LEVEL CONTROLLER
	LEVEL TRANSMITTER

ABBREVIATIONS			
A/E	ARCHITECT / ENGINEER	FS	FLOW SWITCH
AHX	AIR-TO-AIR HEAT EXCHANGER	FSAT	FREESTAT
AAV	AUTOMATIC AIR VENT	FT	FEET
AB	AIR BLENDER	FT-LB	FOOT-POUND
ACC	AIR-COOLED CONDENSER	FTB	FIN TUBE RADIATION
ACCH	AIR-COOLED CHILLER	FV	FACE VELOCITY
ACCU	AIR-COOLED CONDENSING UNIT	GA	GAUGE
ACU	AIR CONDITIONING UNIT	GAL	GALLONS
ACD	AUTOMATIC CONTROL DAMPER, MODULATING	GD	GALLONS PER DAY
ACD-TP	AUTOMATIC CONTROL DAMPER, TWO POSITION	GPH	GALLONS PER HOUR
AD	ACCESS DOOR	GPM	GALLONS PER MINUTE
AF	AFTER FILTER	GR	GAS PRESSURE REGULATOR
AFV	AFTER FILTER CONTROL VALVE	GS	GALVANIZED STEEL
AFF	ABOVE FINISHED FLOOR	H	HUMIDIFIER
AMP	AIR FLOW MEASURING DEVICE	H&C	HOT & COLD WATER
AW	AIR FLOW WHEEL (FAN)	HAC	HOUSEKEEPING AID CLOSET
AHU	AIR-HANDLING UNIT	HOB	HOSE BIB
AMP	AMPERE	HC	HEATING COIL
AP	ACCESS PANEL	HD	HEAD
APD	AIR PRESSURE DROP	HOA	HAND/OFF/AUTOMATIC
ARI	AIR CONDITIONING AND REFRIGERATION INSTITUTE	HP	HEAT PUMP
AS	AIR SEPARATOR	HP	HORSEPOWER
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS	HPT	HIGH-PRESSURE DRIP TRAP
AW	AIR WASHER	HPR	HIGH-PRESSURE RETURN (STEAM CONDENSATE)
AXF	AXIAL FLOW	HPS	HIGH-PRESSURE SUPPLY (STEAM)
B	BOILER	HRC	HEAT RECOVERY COIL
BD	BUTTERFLY DAMPER	HRD	HEAT RECOVERY DEVICE
BD	BACKDRIFT DAMPER	HRT	HYDROIC RADIANT (CEILING) PANEL
BDR	BACKDRIFT DAMPER	HRW	HEAT RECOVERY WHEEL
BFP	BACK FLOW PREVENTER	HSTAT	HUMIDISTAT
BFT	BOILER PLANT FIRE TUBE	HUM	HUMIDIFIER UNIT MOUNTED
BG	BOTTOM GRILLE	HVU	HEATING AND VENTILATING UNIT
BHP	BRAKE HORSEPOWER	HWC	HOT WATER COIL
BHW	HOT WATER HEATING BOILER	HWHC	HOT WATER HEATING COIL
BW	BACKWARD-INCLINED WHEEL (FAN)	HW	HEATING HOT WATER PUMP
BMT	BONE MARROW TRANSPLANT	HWR	HEATING HOT WATER RETURN
BR	BOTTOM REGISTER	HWS	HEATING HOT WATER SUPPLY
BSC	BIOLOGICAL SAFETY CABINETS	HWH	HOT WATER UNIT HEATER
BT	BLOWOFF TANK	HWD	HOTWAY VENT DAMPER
BTG	BLOWOFF TANK CONTROL VALVE	HX	HEAT EXCHANGER
BTU	BRITISH THERMAL UNIT	HZ	HERTZ
BTUH	BRITISH THERMAL UNIT PER HOUR	I/O	INPUT/OUTPUT
BWT	BOILER PLANT WATER TUBE	IAQ	INDOOR AIR QUALITY
C	CENTIGRADE (CELOUS)	IBT	INVERTED BUCKET TRAP
CC	COOLING COIL	ICF	IN-LINE CENTRIFUGAL FAN
CCD	COOLING COIL CONDENSATE DRAIN	IG	INSIDE DIAMETER
CD	CEILING DIFFUSER	IFS	INTEGRAL FACE AND BYPASS
CD-1	CONSTRUCTION DOCUMENTS (SUBMISSION #1)	IN	INCHES
CD-2	CONSTRUCTION DOCUMENTS (SUBMISSION #2)	IN HG	INCHES OF MERCURY
CENT	CENTRIFUGAL	IN WC	INCH WATER COLUMN
CPH	CUBIC FEET PER HOUR	IN-W	INCH WATER GAUGE
CPM	CUBIC FEET PER MINUTE	IN-LB	INCH-POUND
CT	CUBIC FEET	IRH	INTEGRATED PART LOAD VALVE
CFP	CHEMICAL FEED PUMP	IS	INSECT SCREEN
CG	CEILING GRILLE	IJ	INDUCTION UNIT
CH	CHILLER	IV	INLET VANES
CHP	CHILLED WATER PUMP	J	INTENTIONALLY LEFT BLANK
CHR	CHILLED WATER RETURN	kg/hr	KILOGRAM PER HOUR
CHS	CHILLED WATER SUPPLY	K	KILOCAL
CHW	CHILLED WATER	KW	KILOWATT
CI	CAST IRON	kWh	KILOWATT HOUR
CM	CARBON MONOXIDE	L	LITER
CM/S	CUBIC METER PER SECOND	L/h	LITERS PER HOUR (OR LITERS/HOURS)
CO	CARBON DIOXIDE	L/h	LITERS PER MINUTE (OR LITERS/MINUTE)
CO2	CARBON DIOXIDE	L/s	LITERS PER SECOND (OR LITERS/SECOND)
COMP	COMPRESSOR UNIT	LAT	LEAVING AIR TEMPERATURE
CP	Coefficient of Performance	LBS	POUNDS PER HOUR
CP	CONDENSATE PUMP	LF	LINEAR FOOT
CR	CEILING REGISTER	LGT	LEAVING GYLOU TEMPERATURE
CS	CONDENSATE STORAGE TANK	LH	LATENT HEAT
CSC	CLEAN STEAM GENERATOR	LPG	LIQUID PROPANE GAS
CT	COOLING TOWER	LPR	LOW PRESSURE RETURN (STEAM CONDENSATE)
COND	CONDENSING UNIT	LPRC	LOW PRESSURE STEAM RETURN (CLEAN)
CUH	CABINET UNIT HEATER	LLHX	LIQUID-TO-LIQUID HEAT EXCHANGER
CV	CONSTANT VOLUME	LPS	LOW PRESSURE STEAM
CW	COLD WATER (POTABLE)	LPRC	LOW PRESSURE STEAM (CLEAN)
OWCC	COLD WATER COOLING COIL	LSD	LINEAR SLOT DIFFUSER
CWC	CONDENSER WATER PUMP	LTP	LOCAL TEMPERATURE CONTROL PANEL
CWR	CONDENSER WATER RETURN (TO COOLING TOWER)	LWG	LEAVING LOUVER
CWS	CONDENSER WATER SUPPLY (FROM COOLING TOWER)	LWT	LEAVING WATER TEMPERATURE
D	DAMPER- AUTOMATIC	M	METER, SI UNIT
D-1	OUTDOOR AIR DAMPER	M/s	METERS PER SECOND (OR METERS/SECOND)
D-2	RETURN AIR DAMPER	MA	MIXED AIR
D-3	RELIEF AIR DAMPER	MAT	MIXED AIR TEMPERATURE
DB	DECELS	MAU	MAKE-UP AIR UNIT
DB	DRY-BULB TEMPERATURE	MAX	MAXIMUM
DD-1	DESIGN DEVELOPMENT (SUBMISSION #1)	MB	MIXING BOX
DD-2	DESIGN DEVELOPMENT (SUBMISSION #2)	MBQ	1000 BTUH
DDC	DIRECT DIGITAL CONTROLS	MCA	MINIMUM BRANCH CIRCUIT AMPACITY
DEG	DEGREE	MER	MECHANICAL EQUIPMENT ROOM
DF	DIFFUSER	MERV	MINIMUM EFFICIENCY REPORTING VALUE
DIA	DIAMETER	MH	MANHOLE
DW	DEIONIZED WATER	MHP	MOTOR HORSE POWER
DP	DEW POINT TEMPERATURE	MIN	MINIMUM
DP	DIFFUSER PLATE	MM	MILLIMETER
DPA	DIFFERENTIAL PLATE ASSEMBLY	MOV	MOTOR-OPERATED VALVE
DPS	DIFFERENTIAL PRESSURE SENSOR	MPR	MEDIUM PRESSURE RETURN (STEAM CONDENSATE)
DX	DIRECT EXPANSION	MPS	MEDIUM PRESSURE STEAM
DXCC	DIRECT EXPANSION COOLING COIL	MRI	MAGNETIC RESONANCE IMAGING
E	EXHAUST AIR	MTD	MEAN TEMPERATURE DIFFERENCE
EA	ENTERING AIR TEMPERATURE	MVD	MANUAL VOLUME DAMPER
EC	EVAPORATIVE COOLER	MZ	MULTI-ZONE
ECC	ENGINEERING CONTROL CENTER	NA	NOT APPLICABLE
ECU	EVAPORATIVE CONDENSER UNIT	NC	NOISE CRITERIA
EDH	ELECTRIC DUCT HEATER	NC	NORMALLY CLOSED
EER	ENERGY EFFICIENCY RATIO	NG	NATURAL GAS
EF	EXHAUST FAN	NGFM	NATURAL GAS FLOW METER
EG	EXHAUST GRILLE	NO	NORMALLY OPEN
EGS	EMERGENCY GAS SHUTOFF	NDA	NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION
EST	ENTERING GYLOU TEMPERATURE	NOM	NOMINAL
EH	EXHAUST HOOD	NPLV	NON-STANDARD PART LOAD VALVE
EJ	EXPANSION JOINT	NPSH	NET POSITIVE SUCTION HEAD
END	END OF MAIN DRIP (STEAM)	NTS	NOT TO SCALE
ENT	ENTERING	OA	OUTSIDE AIR
ER	EXHAUST REGISTER	OAG	OUTSIDE AIR GRILLE
ERC	ELECTRIC REHEAT COIL	OAI	OUTSIDE AIR INTAKE
ERP	ELECTRIC RADIANT PANEL	OD	OUTSIDE DIAMETER
ESP	EXTERNAL STATIC PRESSURE	OFM	OIL FLOWMETER
ET	EXPANSION TANK	OR	OPERATING ROOM
ETO	ETHYLENE OXIDE	P	PUMP
EUH	ELECTRIC UNIT HEATER	PA	PASCAL
EW	EVAPORATIVE WATER COOLER	PC	PUMPED CONDENSATE
EW	ENTERING WATER TEMPERATURE	PCF	POUNDS PER CUBIC FOOT (FEET)
EX	EXISTING	PD	PRESSURE DROP
F	FARENHEIT	PEF	PROPELLER-TYPE EXHAUST FAN
F&T	FLOAT & THERMOSTATIC	PF	PRE-FILTER
F&SPDR	COMBINATION FIRE SMOKE DAMPER	PG	PRESSURE GAUGE
FA	FIRE AREA	POW	PROPYLENE GLYCOL-WATER (SOLUTION)
FC	FLEXIBLE CONNECTION	PHC	PREHEAT COIL
FCU	FAN COIL UNIT (4 PIPE)	PPM	PARTS PER MILLION
FCU	FAN COIL UNIT- COOLING ONLY	PR	PRESSURE-REGULATING VALVE
FCU	FAN COIL UNIT- HEATING ONLY	PRV	PRESSURE-REGULATING VALVE
FCW	FORWARD-CURVED WHEEL (FAN)	PS	POUNDS PER SQUARE INCH
FD	FLOOR DRAIN	PSA	POUNDS PER SQUARE INCH- ABSOLUTE
FD	FIRE DAMPER	PSS	POUNDS PER SQUARE INCH- GAUGE
FF	FINAL FILTER	PST	PRIMARY- SECONDARY SYSTEM
FHV	FIRE HOSE VALVE CABINET	PSV	PRESSURE SAFETY VALVE
FK	FLUE GAS/FEEDWATER HEAT EXCHANGER	PTAC	PACKAGED TERMINAL AIR CONDITIONER
FOP	FUEL OIL PUMP	R/E	RETURN OR EXHAUST
FOT	FUEL OIL TANK	RA	RETURN AIR
FOH	FUEL OIL HEAT EXCHANGER	RAV	REFRIGERANT AIR DRYER
FT	FEET PER MINUTE	RF	RADIO FREQUENCY
FPS	FEET PER SECOND		
FTU	FAN-POWERED TERMINAL UNIT		
FR	FLOOR REGISTER		
FR	FIBER-REINFORCED POLYESTER		

LEGEND FOR PIPING AND INSTRUMENTATION DIAGRAMS				
PIPING MATERIAL CLASSES AND VALVE SPECIFICATION SHEETS				
MATERIAL CLASS	PRESSURE RATING	PIPING MATERIAL	DESIGN SPECIFICATION	FLUID SERVICES
C15086	CLASS 150	CARBON STEEL	B31.1	FD
C15001	CLASS 150	CARBON STEEL	NFPA 13	FW
D125F1	CLASS 150	CAST IRON	IPC	D

SERVICE CODES		
D	DRAIN	D125F1 / C15086
FO	FUEL OIL - NO.2	C15086
FW	FIREWATER / FIRE PROTECTION	B150B2
SA	SERVICE AIR	S150B1
SP	SAMPLE LINES	C150B2
V	VENT	

INSULATION TYPE	
CS	CALCIUM SILICATE - ABOVE 400 F (HEAT CONSERVATION) WITH ALUMINUM JACKET
FG	FIBER GLASS, INDOOR PIPING SYSTEM AT OR BELOW 400F (HEAT CONSERVATION) WITH ALL SERVICE JACKET
FGA	FIBER GLASS, INDOOR PIPING SYSTEM AT OR BELOW 400F (HEAT CONSERVATION) WITH ALUMINUM JACKET
EC	ELASTOMERIC CELLULAR FOAM- 0° F (NET APPLICATION) TO 140° F
CG	CELLULAR GLASS- 0° F (NET APPLICATION) WITH ALL TO 900° F SERVICE JACKET
MW	MINERAL WOOL- ABOVE 400° F (DRY OR OUTDOOR APPLICATION) WITH ALUMINUM JACKET AS SPECIFIED
PF	POLY FOAM INSULATION

PIPING SYMBOLS	
—HPS—HPS—HPS—	HIGH PRESSURE STEAM (60 PSIG AND ABOVE)
—HPR—HPR—HPR—	HIGH PRESSURE STEAM CONDENSATE RETURN
—MPS—MPS—MPS—	MEDIUM PRESSURE STEAM (16 PSIG THRU 59 PSIG)
—MPR—MPR—MPR—	MEDIUM PRESSURE STEAM CONDENSATE RETURN
—LPS—LPS—LPS—	LOW PRESSURE STEAM (15 PSIG AND BELOW)
—LPR—LPR—LPR—	LOW PRESSURE STEAM CONDENSATE RETURN
—PC—PC—PC—	CONDENSATE PUMP DISCHARGE
—MW—MW—MW—	MAKE-UP WATER
—D—D—D—	DRAIN LINE
—V—V—V—V—	VENT LINE
—GRS—GRS—GRS—	GLYCOL-WATER RUN AROUND SUPPLY
—GRR—GRR—GRR—	GLYCOL-WATER RUN AROUND RETURN
~~~~~	EXISTING PIPE AND EQUIPMENT TO BE REMOVED
—HPR—HPR—HPR—	HIGH PRESSURE GRAVITY CONDENSATE RETURN
—MPR—MPR—MPR—	MEDIUM PRESSURE GRAVITY CONDENSATE RETURN
—LPR—LPR—LPR—	LOW PRESSURE GRAVITY CONDENSATE RETURN
—FWPD—FWPD—FWPD—	FEEDWATER PUMP DISCHARGE
—FWPS—FWPS—FWPS—	FEEDWATER PUMP SUCTION
—CTPD—CTPD—CTPD—	CONDENSATE TRANSFER PUMP DISCHARGE
—CTPS—CTPS—CTPS—	CONDENSATE TRANSFER PUMP SUCTION
—BO—BO—BO—	BOILER BLOWOFF
—CBD—CBD—CBD—	CONTINUOUS BLOWDOWN
—BWS—BWS—BWS—	BOILER WATER SAMPLE
—FWS—FWS—FWS—	FEEDWATER SAMPLE (FROM DEARATOR)
—CF—CF—CF—CF—	CHEMICAL FEED
—OFL—OFL—OFL—	OVERFLOW
—A—A—A—A—	COMPRESSED AIR
—G—G—G—G—	NATURAL GAS MAIN FUEL
—GO—GO—GO—GO—	NATURAL GAS IGNITER FUEL
—LP(O)—LP(O)—LP(O)—	LIQUEFIED PETROLEUM GAS IGNITER FUEL
—FOS—FOS—FOS—	FUEL OIL SUPPLY
—FOR—FOR—FOR—	FUEL OIL RETURN
—CW—CW—CW—	COLD WATER (CITY WATER)
—SW—SW—SW—	SOFTENED WATER
—HW—HW—HW—	HOT WATER
—	TEMPORARY PIPING
—RL—RL—RL—	REFRIGERANT LIQUID PIPING
—RS—RS—RS—	REFRIGERANT SUCTION PIPING
~~~~~	PIPING TO BE REMOVED (SINGLE LINE)
~~~~~	PIPING TO BE REMOVED (DOUBLE LINE)
—RH—	ROLLER-TYPE HANGER
—SH—	VARIABLE SPRING-TYPE HANGER (TYPE 51)*
—CSH—	SPRING CUSHION-TYPE HANGER (TYPE 48 OR 49)*
—	CLEVIS-TYPE HANGER
—TH—	TRAPEZE HANGER (PROVIDE U-BOLT PIPE ATTACHMENT TO TRAPEZE EXCEPT TUBING, JOBS ARE INDICATED)
—PS—	FLOOR-SUPPORTED PIPE STAND
—RC—	RISER CLAMP (TYPE 42)*
—WB—	WALL BRACKET (TYPE 31, 32, 33)*
—CSH—	CONSTANT SUPPORT HANGER (TYPE 54, 55, 56)*
—SS—	SLIDING SUPPORTS (TYPE 35)*

* TYPE NUMBERS REFER TO MANUFACTURER'S STANDARDIZATION SOCIETY STANDARD PRACTICE SP-58
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EQUIPMENT ACCESS NOTE	
ALL ITEMS THAT REQUIRE ACCESS, SUCH AS FOR OPERATING, CLEANING, SERVICING, MAINTENANCE AND CALIBRATION, SHALL BE EASILY AND SAFELY ACCESSIBLE BY PERSONS STANDING AT FLOOR LEVEL, OR STANDING ON PERMANENT PLATFORMS, WITHOUT THE USE OF PORTABLE LADDERS. EXAMPLES OF THESE ITEMS INCLUDE, BUT ARE NOT LIMITED TO: ALL TYPES OF VALVES, FILTERS AND STRAINERS, TRANSMITTERS, CONTROL DEVICES, ETC.	