SECTION 21 00 00 | 22 00 00 | 23 00 00 HVAC, PLUMBING, AND FIRE PROTECTION IDENTIFICATION

Valves, Steam Traps, and Strainers

Valves and steam traps located in the University utility tunnel system or in University buildings shall be given identifying tags in accordance with the following standard. All tags shall be 1-1/2" diameter brass tags with black lettering and shall be attached using 3/32" diameter galvanized, zinc plated steel wire rope with sealed oval sleeve compression connectors.

VALVE, STEAM TRAP, STRAINER IDENTIFICATION LEGEND - UTILITY TUNNELS

Building Code	System Code	Sequential Number	Tunnel Segment Code	Location Code
TUNN	MSV	001	B3	1+07

VALVE, STEAM TRAP, STRAINER IDENTIFICATION LEGEND - BUILDING LOCATIONS

Building Code	System Code	Sequential Number
CARR	CSV	1001

Building Code

The building code shall correspond to the standard 4-character building code used for all buildings on campus as entered in EMS (the space inventory and room scheduling software that the University uses). For utility tunnel locations this code is "TUNN".

System Code:

Chemical Feed Valve (for valves on steam, hydronic, and condenser water chemical treatment systems)	CFW
Chilled Beam Supply Valve	CBS
Chilled Beam Return Valve	CBR
Chilled Beam Strainer	CBS
Chilled Water Return Valve	CRV
Chilled Water Supply Valve	CSV
Chilled Water Strainer	CHS
Compressed Air Strainer - For service to tools, workshops, etc.	CAS
Compressed Air Valve – For service to tools, workshops, etc.	CAV
Condensate Return Expansion Joint	CDX
Condensate Return Strainer	CDS
Condensate Return Valve (pumped or gravity flow, regardless of pressure)	CDV
District Chilled Water Supply Valve	DCSV
District Chilled Water Return Valve	DCRV
District Chilled Water Expansion Joint	DCWX
Domestic Cold Water Strainer	DCS
Domestic Cold Water Valve	DCV

Domestic Hot Water Return Strainer	DRS
Domestic Hot Water Return Valve	DRV
Domestic Hot Water Strainer	DHS
Domestic Hot Water Valve	DHV
Domestic Tempered Water Valve	TWV
Domestic Termpered Water Return Valve	TRV
Domestic Tempered Water Return Strainer	TRS
Feed Water Strainer – Boiler feed water systems	FWS
Feed Water Valve – Boiler feed water systems	FWV
Fire Protection Valve	FPV
Fuel Oil Strainer	FOS
Fuel Oil Valve	FOV
Heat Pump Return Valve (Hydronic)	HPRV
Heat Pump Supply Valve (Hydronic)	HPSV
Heat Pump Strainer (Hydronic)	HPS
Heating Return Valve	HRV
Heating Supply Valve	HSV
Heating Strainer (Hydronic Building Heat)	HHS
Heating/Chilled Water Return Valve	HCRV
Heating/Chilled Water Supply Valve	HCSV
Heating/Chilled Water Strainer	HCS
High Pressure Steam Expansion Joint – Main Steam (for any exp. jt. at system pressure)	MSX
High Pressure Steam Strainer – Main Steam (for any strainer at system pressure)	MSS
High Pressure Steam Trap – Main Steam (for any trap at system pressure)	MST
High Pressure Steam Valve – Main Steam (for any steam valve at system pressure)	MSV
Instrument Air Strainer – For pneumatic controls or instruments	IAS
Instrument Air Valve – For pneumatic controls or instruments	IAV
Lab Compressed Air Valve – Compressed air serving laboratories (cleaner and drier than regular compressed air and typically 30 psi)	LCAV
Lab Compressed Air Strainer – Compressed air serving laboratories (cleaner and drier than regular compressed air and typically 30 psi)	LCAS
Lab Instrument Air Valve – Compressed air service laboratories for instrument use (cleaner and drier than regular compressed air and typically 100 psi)	LIAV
Lab Instrument Air Strainer – Compressed air serving laboratories for instrument use (cleaner and drier than regular compressed air and typically 100 psi)	LIAS
Lab Vacuum Strainer	LVS
Lab Vacuum Valve	LVV
Low Pressure Steam Strainer – Auxiliary Steam (any strainer downstream of a reducing valve)	ASS
Low Pressure Steam Trap – Auxiliary Steam (any trap downstream of a reducing valve)	AST
Low Pressure Steam Valve – Auxiliary Steam (any valve downstream of a reducing valve)	ASV
Natural Gas Regulator	NGR
Natural Gas Valve	NGV
Pure Water Supply Valve (typically deionized water)	PWSV
Pure Water Return Valve (typically deionized water)	PSRV
Pure Water Strainer (typically deionized water)	PWS
Soft Water Strainer	SWS
Soft Water Valve	SWV

Steam/Condensate – High Pressure Drains (drain valves, blow down valves and low point drains on the Main Steam header and boilers)	HPD
Sump Pump Discharge Valve	SPV
Water – City Water Strainer (any strainer on the domestic water header – outside of a building footprint)	DWS
Water – City Water Valve (any valve on the domestic water header – outside of a building footprint)	DWV
Water – Irrigation System Strainer (any strainer on the irrigation water header downstream of the well and domestic water header)	IWS
Water – Irrigation System Valve (any valve on the irrigation water header downstream of the well and domestic water header)	IWV
Water – Well Water Strainer (any strainer between well and irrigation or domestic water)	WWS
Water – Well Water Valve (any valve between well and irrigation or domestic water)	WWV

Sequential Number – Utility Tunnel Locations:

The sequential number shall start at 001 for each system and shall number sequentially for each unit within the system code located within the utility tunnel system. All sequential numbers shall include 3 digits. Include leading zeroes in numbers less than 99.

Sequential Number – Building Locations:

The sequential number indicates the floor of the building where the equipment is located followed by a three digit sequential number starting with 001 for each system and shall number sequentially for each unit within the system code and on the indicated floor within the building. The sequential number for each system shall start at 001 at each floor. The basement of a building shall be numbered 0, the first floor of a building shall be numbered 1, the second floor of a building shall be numbered 2, etc. If a building has ten or more floors, the tenth floor and above shall be numbered by floor followed by a three digit sequential number (for example the first valve for a particular system on the tenth floor of a building shall be 10001)

Tunnel Segment Code – Tunnel Locations:

The tunnel segment code shall correspond to the tunnel segment in which the item is located. Refer to the campus utility map for tunnel segment designations.

Location Code – Utility Tunnel Locations:

The location code shall correspond to the distance in feet from station 0+00 within the tunnel segment in which the valve or trap is located. Round the distance to the nearest foot. Tunnel segments and station points are marked in the tunnels at a maximum of 25 foot intervals for reference.

Example – Utility Tunnel Locations:

The example in the legend for tunnel locations at the top of this standard is the designation for the shut off valve on the high pressure steam system (main steam). The valve is located 107 feet from station 0+00 in tunnel segment B3. When written as a designation it will appear as follows: **TUNN-MSV-001-B3:1+07**

Example – Building Locations:

The example in the legend for the building locations at the top of this standard is the designation for a shut off valve on the chilled water supply piping located on the first floor of Carrington Hall. When written as a designation it will appear as follows: **CARR-CSV-1001**

Mechanical Equipment

All mechanical equipment shall be provided with plastic tags engraved with the equipment designation as noted within this standard. The tag shall be a minimum of 3" wide by 1" high and shall be attached to the equipment with mechanical fasteners so as to provide a permanent installation. Engraving stock shall be melamine plastic laminate punched or drilled for mechanical fasteners - 1/16-inch (1.6-mm) minimum thickness for signs up to 20 sq. in. or less than 8" long; 1/8-inch minimum thickness for larger sizes. Labels shall be engraved in black letters on white background. Fasteners for labels shall be self-tapping, stainless-steel screws or No. 10/32 stainless-steel machine screws with nuts and flat and lock washers. Labels may be factory installed as long as the meet these standards

Mechanical equipment located within University facilities shall be given designations in accordance with the following standard.

MECHANICAL EQUIPMENT IDENTIFICATION LEGEND

Building Code	Equipment Code	Sequential Number
CARR	AHU	1002

Building Code:

The building code shall correspond to the standard 4 character building code used for all buildings on campus as entered in EMS (the space inventory and room scheduling software that the University uses). For utility tunnel locations this code is "TUNN".

Equipment Code:

Equipment codes shall indicate the type of equipment in accordance with the following list.

Air Compressor – Fire Protection System	ACF
Air Compressor – Instrument Air (for pneumatic controls or instruments)	ACI
Air Compressor – Laboratory (for compressed air to laboratories)	ACL
Air Compressor – Pool or Spa Filter	ACP
Air Compressor – Service Air (for compressed air to workshops or tools)	ACS
Air and Dirt Separator	ADS
Ari Dryer – Non-refrigerated	NAD
Air Dryer - Refrigerated	RAD
Air Filter Housing	FLT
Air-Handling Unit	AHU
Boiler Chemical Injection Pump	BCP
Backflow Preventer	BFP
Boiler	BLR
Chemical Pot Feeder (Chemical Shot Feeder)	CPF
Chilled Water Pump – District	DCWP
Chilled Water Pump – Primary	PCP
Chilled Water Pump – Secondary	SCP
Chiller	CHL
Condensate Return Pump - Electric	CPE
Condensate Return Pump – Steam Powered	CPS
Condensing Unit – Air Cooled	CUA
Cooling Tower	CTR
Cooling Tower Basket Strainer	CBS

Cooling Tower Chemical Injection Pump	CCP
Domestic Water Booster Pump	DBP
Domestic Hot Water Recirculating Pump	DRP
Domestic Hot Water Tempering Valve (thermostatic mixing valve)	TMV
Domestic Water Heater - Electric	WHE
Domestic Water Heater - Gas	WHG
Domestic Water Heater - Steam	WHS
Electric Drinking Fountain	EDF
Electric Hydration Fountain	EHF
Energy Recovery Unit	ERU
Exhaust Fan – Fume Hoods (may serve fume hoods or other laboratory exhaust)	FEF
Exhaust Fan – General Exhaust (loading dock, general room exhaust, etc.)	GEF
Exhaust Fan – Kitchen Hood Service	KEF
Exhaust Fan – Serving Toilet Rooms (may also serve custodial closets)	TEF
Exhaust Fan – Smoke Control Systems	SEF
Expansion tank	EXT
Fan Coil Unit (chilled/hot water or direct expansion)	FCU
Fat, Oil, and Grease Trap	FOG
Filter Housing (not part of a piece of built up equipment)	FLT
Fire Hydrant	FHY
Fire Protection Service Post Indicator Valve	FPIV
Fire Protection Pump	FPP
Fire Protection Pump Controller	FPC
Fire Protection Booster Pump (Jockey Pump)	FPB
Fire Protection Booster Pump Controller (Jockey Pump)	FBC
Furnace – Gas Fired	FUR
Heat Exchanger – Steam to Water (shell and tube)	HXS
Heat Exchanger – Water to Water (shell and tube)	HXW
Heat Exchanger – Plate and Frame	HXP
Heat Pump – Air Cooled	HPA
Heating Hot Water Pump – Primary	PHP
Heating Hot Water Pump – Secondary	SHP
Heating/Chilled Water Pump	HCP
Heat Recovery Coil Housing (typically includes filter and access sections)	HRC
Heat Recovery Loop Pump (run around coil)	HRP
Hydronic Heat Pump	HHP
Hydronic Heat Pump Loop Pump	HPP
Loop Injection Pump	LIP
Meter – Chilled Water BTU Meter	BTM
Meter – Condensate Return	CDM
Meter – Domestic Water	DWM
Meter – Electric	ELM
Meter – Gas	GAM
Pool Basket Strainer	PBS
Pool or Spa Chemical Injection Pump	PIP
Pool or Spa Recirculating Pump	PRP
Pool or Spa Vacuum Blower Pump	PVB

Pool, Spa, or Fountain Filter	PFT
Pressure Reducing Valve – Steam	PRS
Pressure Reducing Valve - Water	PRW
Radiant Ceiling Panel	RCP
Relief Fan	RLF
Return Fan	RAF
Roof Hood (may be gravity, intake, exhaust, or relief)	RHD
Rooftop Air-handling Unit	RTU
Safety Relief Valve – Pressure and Temperature	SPT
Safety Relief Valve – Steam	SRS
Safety Relief Valve – Water	SRW
Storage Tank Heating/Chilled Water	SHC
Sump Pump	SMP
Ultraviolet Duct Cleaner	UVD
Unit Heater – Cabinet Type (floor, wall, or ceiling mounted)	CUH
Unit Heater - Horizontal Propeller Type (hydronic, gas fired, or electric)	HUH
Vacuum Pump	VAC
VAV Box – Constant Volume	VCV
VAV Box – Exhaust Service	VAE
VAV Box – No Reheat Coil	VAV
VAV Box – Parallel Fan-powered	VPF
VAV Box - Reheat	VRH
VAV Box – Series Fan-powered	VSF
Variable Frequency Drive (Variable Speed Drive)	VSD
Water Softener	WSF
Water-to-Water Heat Pump	WHP

Sequential Number:

The sequential number indicates the floor of the building where the equipment is located followed by a three digit sequential number starting with 001 for each system and shall number sequentially for each unit within the system code and on the indicated floor within the building. The sequential number for each system shall restart at 001 at each floor. The basement of a building shall be numbered 0, the first floor shall be numbered 1, the second floor shall be numbered 2, etc. If a building has ten or more floors the tenth floor and above shall be numbered by floor followed by a three digit sequential number (for example the first piece of equipment of a particular system that is on the tenth floor of a building shall be 10001).

Example – Building Locations:

The example in the table above is the designation for air-handling unit number 2 located on the first floor Carrington Hall. When written as a designation it will appear as follows: **CARR-AHU-1002**

Mechanical, Plumbing, and Fire Protection Piping

Pipe labels shall comply with ASME A13.1, "Scheme for the Identification of Piping Systems," for letter size and color, filed color, length, and viewing angle. Labeling shall indicate pressure and/or temperature when applicable, such as high-pressure steam, low pressure steam, domestic cold water, domestic hot water, etc. Pipe labels shall be color coded, preprinted, gloss vinyl film (minimum 2 mil thickness) with permanent pressure sensitive adhesive. At each end of pipe marker provide appropriately color-coded adhesive tape with flow direction arrows indicating the direction of flow. Adhesive tape banding shall be not less than 1-1/2 inch wide and shall lap the end of the pipe label. Tape banding shall wrap the pipe fully and lap itself a minimum of 3 inches.

Provide pipe labels where piping is exposed or above accessible ceilings in finished spaces; in machine rooms; in accessible maintenance spaces such as shafts, tunnels, and plenums; and at exterior exposed locations. Where piping runs are grouped, install pipe markers on each pipe in the same location to aid in differentiating each pipe in the group. Locate pipe labels as follows:

1. Near each valve and control device.
2. Near each branch connection, excluding short takeoffs for fixtures and terminal units.
3. Where flow pattern is not obvious, mark each pipe at branch.
4. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
5. At access doors, manholes, and similar access points that permit view of concealed piping.
6. Near major equipment items and other points of origination and termination.
7. Spaced at maximum intervals of 50 feet along each run. Spacing shall be reduced to 25 feet maximum in areas of congested piping and equipment.

If piping is to be color coded by continuously painting runs of piping, color coding shall be as outlined in the listing below. Note that if piping is to be painted for aesthetic purposes, such as to match adjacent surfaces in finished areas or at building exterior, this color coding is not required to be followed.

Domestic Water	Blue
Drain (HVAC condensate drain, storm water, sump pump discharge, etc.)	Green
Fire Suppression (Standpipes, fire sprinkler systems, etc.)	Red
Fuel Oil	Orange
Irrigation Water	Gray
Natural Gas or Propane	Yellow
Sanitary Sewer	Brown
Steam and Condensate Return	Silver