UNIVERSITY OF MICHIGAN
ARCHITECTURE, ENGINEERING AND CONSTRUCTION

ARCHITECTURE & ENGINEERING
326 East Hoover, Mail Stop B
Ann Arbor, MI 48109-1002
Phone: 734-764-3414
Fax: 734-936-3334

BuildingName
The Description of the Project
P00000000 0000

SPECIFICATION DIVISION 22

NUMBER SECTION DESCRIPTION

DIVISION 22 PLUMBING
SECTION 220553 - MECHANICAL IDENTIFICATION

END OF CONTENTS TABLE

DIVISION 22 PLUMBING
SECTION 220553 - MECHANICAL IDENTIFICATION

REVISIONS:
10-12-00: SUBSTANTIALLY REVISED, APPROVED AS NEW MASTER
UPDATED BY PLMG/FP MTT OCTOBER 2017
UPDATED NAMING CONVENTIONS 2024

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

INCLUDE PARAGRAPH 1.1.A - IN EVERY SPECIFICATION SECTION.

A. Drawings and general provisions of the Contract, Standard General and Supplementary General Conditions, Division 1 Specification Sections, and other applicable Specification Sections including the Related Sections listed below, apply to this Section.

1.2 SCOPE OF WORK:

A. Mechanical identification on piping, ductwork and equipment, identification of underground pipe, valve tags, and architectural access panels.

1.3 QUALITY ASSURANCE

A. Comply with ANSI A13.1 for lettering, size, colors, and viewing angles of mechanical identification.

1.4 ACCEPTABLE MANUFACTURERS:

A. Provide mechanical identification materials from one of the following:

1. Brady Co.
2. Brimer
3. Craftmark
4. Seton
5. Marking Services Incorporated
6. Kolbi Marker Co.

PART 2 - PRODUCTS

2.1 PIPE MARKERS:

A. Manufacturer's standard, pre-printed, color-coded, plastic pipe markers, complying with ANSI A13.1, and requirements below. Self-adhesive markers are not acceptable.

B. For pipe diameter (with insulation) less than 6": full-band, semi-rigid, snap-on pipe markers, extending 360 degrees around pipe.

C. For pipe diameter (with insulation) of 6" and larger: full-band or strip-type pipe markers, but not narrower than 3 times letter height. Fasten with nylon or stainless steel bands for pipe 6" through 12". Fastened with stainless steel bands for piping over 12".

D. Lettering: Standard nomenclature which best describes piping system, as selected by Engineer (in cases of variance from table below).

E. Arrows: Pipe marker arrows indicating direction of flow, either integrally with piping system lettering, or as a separate marker.

F. Identify contents of piping by both fluid contained and unique temperature and /or pressure (if necessary to distinguish between other systems with same fluid at different conditions); e.g. Potable Hot Water - 110F vs Potable Hot Water - 140F.

G. Use the following color coding and nomenclature for pipe markers:

SPEC EDITOR: EDIT THIS LIST TO ADD ANY SPECIFIED SYSTEMS, NOT INCLUDED IN THIS LIST. COORDINATE NOMENCLATUE WITH SYMBOLS SHEET AND PLANS.

Plumbing and Waste Pipe System Labels	Drawing I.D. (For Reference Only)	Letter and Label Color
Acid Vent	AV	Black on Orange
Acid Waste	AW	Black on Orange
Brine	BR	Black on Orange
Cold Water, Potable	CW	White on Green
Compressed Air	A	White on Blue
Deionized Water	DI	White on Green
Deionized Water Return	DIR	White on Green
Fire Protection	FP	White on Red
Hazardous Waste	HAZ	Black on Yellow
Hot Water Supply, Potable	HW	Black on Yellow
Hot Water Return, Potable	HWR	Black on Yellow
Instrument Air	IA	White on Blue
Natural Gas	G	Black on Yellow
Non-Potable Water	NPW	Black on Yellow
Radiation Waste	RAD	Black on Yellow
Rainwater Conductor	RC	White on Green
Reverse Osmosis Water	RO	White on Green
Rev. Osmosis Return	ROR	White on Green
Sanitary Vent	V	White on Green
Sanitary Waste	SAN	White on Green
Silver Recovery	AG	Black on Yellow
Soft Cold Water	SCW	White on Green
Storm Sewer Water	ST	White on Green
Vacuum	VAC	White on Blue

Heating and Cooling Pipe System Labels	Drawing I.D. (For Reference Only)	Letter and Label Color
Chilled Beam Return	CBR	White on Green
Chilled Beam Supply	CBS	White on Green
Chilled Water Return	CHWR	White on Green
Chilled Water Supply	CHWS	White on Green
Condensate Vent	SCV	Black on Yellow
Condenser Water Return	CWR	White on Green
Condenser Water Supply	CWS	White on Green
Energy Recovery Wat. Ret.	ERWR	White on Green
Energy Recovery Wat. Supp.	ERWS	White on Green
Fuel Oil Return	FOR	Black on Yellow
Fuel Oil Supply	FOS	Black on Yellow
Geothermal Heat Return	GHXR	White on Green
Geothermal Heat Supply	GHXS	White on Green
High Pressure Condensate	HPC	Black on Yellow
High Pressure Steam	HPS	Black on Yellow
Hot Water Heating Return	HWHR	Black on Yellow
Hot Water Heating Supply	HWHS	Black on Yellow
Low Pressure Condensate	LPC	Black on Yellow
Low Pressure Steam (15#)	LPS	Black on Yellow
Medium Pressure Condensate	MPC	Black on Yellow
Medium Pressure Steam (60#)	MPS	Black on Yellow
Process Chilled Water Supply	PCHWS	White on Green
Process Chilled Water Return	PCHR	White on Green
Process Water Return	PWR	White on Green
Process Water Supply	PWS	White on Green
Pumped Steam Condensate	PC	Black on Yellow

Lab / Medical Gas Pipe System Labels	Drawing I.D. (For Reference Only)	Letter and Label Color
Carbon Dioxide	CO2	White/Black on Gray
Helium	HE	White on Brown
Dental Air	DA	Black on Yellow
Dental Vacuum	DVAC	Silver on Yellow
Laboratory Compressed Air	LCA	Black on Yellow & White Checkerboard
Laboratory Vacuum	Lab Vac	Block boxed on white and black checkerboard
Medical Air	Med Air	Black on Yellow
Medical Vacuum	Med Vac	Black on White
Nitrous Oxide	N2O	White on Blue
Nitrogen	N2	White on Black

Oxygen	O2	White on Green
Waste Anesthetic Gas Disposal	WAGD	White on Violet

All labeling shall conform to NFPA 99.

2.2 DUCT MARKERS:

A. Plastic, adhesive type color-coded duct markers, with arrow indicating direction of flow, and with fan system identified. Conform to the following color code and nomenclature:

Service/ Duct Label	Drawing I.D. (For Reference Only)	Letter and Label Color
|		
Exhaust Air (Equip.#)	EA (Eq.#)	Black on Yellow
Fume Hood Exhaust (Equip.#)	FHEA (Eq.#)	Black on Yellow
Hazardous Exhaust (Equip.#)	HAZ EX (Eq.#)	Black on Yellow
Lab General Exhaust (Equip.#)	LGEX (Eq.#)	Black on Yellow
Outdoor Air (Equip.#)	OA (Eq.#)	White on Green
Return Air (Equip.#)	RA (Eq.#)	White on Green
Smoke Evac Exhaust (Equip.#)	SMOKE EX (Eq.#)	Black on Yellow
Smoke Evac Supply (Equip.#)	SMOKE SUP (Eq.#)	White on Green
Supply Air (Equip.#)	SA (Eq.#)	White on Green

B. Provide plastic adhesive duct access door markers indicating item and associated equipment accessed, and appropriate safety and procedural information. (eg. Fire Damper AHU-1)

2.3 EQUIPMENT MARKERS AND DDC POINT TAGS:

A. Engraved plastic equipment markers for all scheduled equipment, (eg., chillers, pumps, air handling units, heat exchangers, and fans). Indicate drawing I.D., and service, (eg., EF-1 serving FH No.3 in Rm. 2035, or P-7 Primary Chilled Water), nominal capacity (tons, cfm or gpm). Scale marker and lettering to equipment labeled. Typical nomenclature:

Drawing I.D. & Equip. Label	Equipment
|	
AC	Air Compressor
ACC	Air Cooled Condenser
AHU	Air Handling Unit
BCU	Blower Coil Unit
CAD	Compressor Air Dryer
CB	Chilled Beam
CH	Chiller

CHWP	Chilled Water Pump
CP	Condensate Pump
CRAC	Computer Room AC Unit
CT	Cooling Tower
CUH	Cabinet Unit Heater
CWP	Condenser Water Pump
DA	Deaerator System
DWBP	Domestic Water Booster Pump
DOAS	Dedicated Outside Air System
EF	Exhaust Fan
ERC	Energy Recovery Coil
ERCP	Energy Recovery Coil Pump
ERU	Energy Recovery Unit
EUH	Electric Unit Heater
EWH	Electric Water Heater
FH	Fume Hood
FHEF	Fume Hood Exhaust Fan
FC	Fluid Cooler (Closed Loop Cooling Tower)
FCU	Fan Coil Unit
FFU	Fan Filter Unit
FP	Fire Pump
GHXP	Geothermal Heat Exchange Pump
GWH	Gas-fired Water Heater
H	Humidifier
HP	Heat Pump
HPC	Heat Pump Chiller
HTX	Heat Exchanger
HWB	Hot Water Boiler
HWHP	Hot Water Heating Pump
HWRP	Domestic Hot Water Recirculation Pump
IAC	Instrument Air Compressor
LEF	Lab Exhaust Fan
LTU	Lab Terminal Air Unit
MAU	Packaged Gas Fired Makeup Air Unit
MGC	Medical Gas Compressor
P	Pump (other than those listed)
PTAC	Packaged Terminal AC Unit
RF	Return Fan
RHP	Radiant Heating Panel
RMS	Refrigerant Mode Selector Unit
RTU	Packaged Rooftop Air Handling Unit
SB	Steam Boiler
SEW	Sensible Energy Wheel
SF	Supply Fan
SP	Sump Pump
TEC	Terminal Equipment Controller
TEW	Total Energy Wheel
TU	Terminal Air Unit
UH	Unit Heater

VFD	Variable Frequency Drive
VP	Vacuum Pump
VRF	Variable Refrigerant Flow Unit (Indoor & Outdoor unit)

2.4 IDENTIFICATION ACCESSORIES:

A. Underground Pipe Markers: Manufacturer's standard, permanent, bright-colored plastic tape, intended for direct-burial service, 6" wide x 4 mils thick, continuously printed to indicate service of buried pipe. For plastic pipe, provide label with detectable nonferrous locator.

SPEC EDITOR: VALVE TAGS ARE TYPICALLY NOT REQUIRED FOR RENOVATION PROJECTS. CONSIDER VALVE TAGS ONLY FOR NEW BUILDINGS, AND GUT RENOVATION PROJECTS.

B. Valve Tags: 1-1/2" diameter brass valve tags with 1/4" stamp-engraved designations with piping system abbreviation and sequenced valve numbers. Provide solid brass chain, or solid brass S-hooks of the size and type required for proper attachment of tags to valves.

SPEC EDITOR: COORDINATE ARCHITECTURAL ACCESS PANEL LABELING WITH ARCHITECT, ESPECIALLY IN AESTHETICALLY SENSITIVE AREAS..

C. Architectural Access Panel Markers: 1/16" thick engraved plastic laminate, with nomenclature corresponding to items for which access door was installed (eg. VAV-7, TEC-7 and HWH control valve V-23).

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS:

A. Coordination: Install identification after insulation is applied. Protect identification from paint, or apply after painting is complete. Install above ceiling identification prior to acoustical ceilings.

B. Attachment: Securely attach all mechanical identification to associated pipe, duct, panels and equipment. Locate identification to be readily visible.

3.2 PIPING SYSTEM IDENTIFICATION:

A. Install pipe markers on all piping systems in all locations where piping, whether concealed or non-concealed, and where accessible at manholes and access panels. Installed at all access panels or doors, adjacent to valves and branch connections, both sides of floors, ceilings and walls, and all major changes in direction,

B. Locate pipe markers near points where piping continues into shafts, underground, floor or wall; at 25' spacing along exposed runs (15' in congested areas), at valves, equipment and control devices, and where there could be question of flow pattern.

C. Install marker over pipe insulation segment on hot non-insulated pipes.

3.3 DUCTWORK IDENTIFICATION:

A. Install duct markers on all supply, return, exhaust, intake and relief ductwork, whether concealed or non-concealed, , and where accessible at access panels. Install at all access panels or doors, both sides of floors, ceilings and walls, and all major changes in direction.

B. Locate duct markers near points where ductwork originates or continues into shafts, floor or wall, and at 25' spacing along exposed runs (15' in congested areas), equipment and control devises, and where there could be a question of flow pattern.

C. Install duct access door markers on all access doors.

3.4 EQUIPMENT IDENTIFICATION:

A. Provide equipment markers on scheduled equipment.

3.5 UNDERGROUND PIPING IDENTIFICATION:

A. During back-filling, install continuous underground pipe markers over all buried piping, 6" to 8" below finished grade, at 24" intervals across the field. Where multiple pipes are in a trench up to 16" wide, install single line marker. For tile fields and similar installations, mark only edge pipe lines of field.

3.6 VALVE IDENTIFICATION:

A. Install valve tags on all new valves and regulators for the following piping systems, except for valves within factory-fabricated equipment, at plumbing fixture faucets, hose bibs, and valves located directly at the equipment served. Number valves in a logical sequence relative to location installed.

SPEC EDITOR: SPECIFY SYSTEMS TO RECEIVE VALVE TAGS

B. List each tagged valve in valve schedule for each piping system. Include a copy of the valve tag schedule in the Operation and Maintenance manuals, and mount a laminated copy on a wall as directed by the University.

C. Where building has previously tagged valves, coordinate numbering with old schedule, and note changes made to previously tagged valves on new schedule.

3.7 ARCHITECTURAL ACCESS PANEL IDENTIFICATION:

A. Install access panel markers on inside and/or outside of access doors, as directed by the University.

END OF SECTION 220553