DIVISION 23

SECTION 23 05 53

IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Warning signs and labels.
2. Painted Identification Materials
3. Plastic Pipe Markers
4. Plastic Duct Markers
5. Valve Tags
6. Valve Schedule Frames
7. Plastic Equipment Markers
8. Plasticized Tags
9. Plastic Labels
10. Piping Painting Color-Code Requirements

B. Related Sections:

1. Section 01 51 23 - Temporary Heating
2. Section 23 05 00 – Common Work Results For HVAC
3. Section 23 05 13 - Common Motor Requirements For HVAC Equipment
4. Section 23 05 23 - General Duty Valves For HVAC Piping
5. Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment
6. Section 23 05 53 - Identification for HVAC Piping and Equipment
7. Section 23 05 93 - Testing, Adjusting and Balancing for HVAC
8. Section 23 07 00 - HVAC Insulation
9. Section 23 09 13 - Instrumentation and Control for HVAC
10. Section 23 09 14 - Natural Gas and CO Gas Leak Detection Equipment
11. Section 23 09 23 - Control Dampers
12. Section 23 09 24 - Steam Flow Meters
13. Section 23 22 13 - Steam and Condensate Heating Piping
14. Section 23 25 19 - Water Treatment for Steam System Feedwater
15. Section 23 31 13 - Metal Ducts
16. Section 23 33 00 - Air Duct Accessories
17. Section 23 34 16 - Boiler Room Combustion Air Makeup And Ventilation System
18. Section 23 51 00 - Chimney Liner
19. Section 23 51 16 - Prefabricated Breechings and Accessories
20. Section 23 51 23 - Gas Vents
21. Section 23 52 39 - Firetube Boilers
22. Section 23 53 12 - Vacuum Condensate Pumps
23. Section 23 53 13 - Boiler Feedwater Pumps

1.02 SUBMITTALS

A. Shop Drawings: Provide list of identification wording, symbols, letter size, and color coding.

B. Schedules:

1. Submit valve schedule for each piping system, typewritten and reproduced on 8½" x 11" bond paper. Include valve number, piping system, system abbreviation (as shown on tag), location of valve (room or space), and variations for identification (if any). Mark valves that are intended for emergency shut-off and similar special uses by special "flags" in margin of schedule. In addition to mounted copies, furnish extra copies for the maintenance manuals specified in Division 1.

2. Submit key identification schedule typewritten and reproduced on 8½" x 11" bond paper. Include location of equipment and/or unit that utilize the respective key and variations for identification (if any). Furnish extra copies for the maintenance manuals specified in Division 1.

1.03 QUALITY ASSURANCE

A. Codes and Standards

1. ANSI Standards: Comply with ANSI A13.1 for lettering size, length of color field, colors, and viewing angles.

PART 2 - PRODUCTS

2.01 MATERIALS AND MANUFACTURERS

A. Provide manufacturer's standard products of categories and types required for each application as referenced in other Division 15 Sections (HVAC), shown on the Drawings and/or Schedules. Where more than single type is specified for application, selection is the Authority's option, but provide single selection for each product category.

B. Paintings and coatings used in the interior of building to cover insulation for identification purposes shall not exceed the VOC content limits established in the Green Seal Standard GS-11 Paints, first edition, May 20, 1993.

C. Paints and coatings used in the interior of building for identification purposes of piping shall not:

a. Exceed the VOC content limits established in the Green Seal Standard GS-11 Paints, first edition, May 20, 1993.

b. Exceed the VOC content limit of 250 g/L established in the Green Seal Standard GC-03, Anti-Corrosive Paints, second edition, January 7, 1997.

D. All adhesives and sealants used for tags and charts shall comply with the South Coast Air Quality Management District (SCAQMD) Rule #1168; VOC limits shall comply with

the limits indicated in Table 1 of LEED Version **4.0**, Indoor Environmental Quality Section, Credit IEQ 4.1. Those limits correspond to an effective date of the SCAQMD Rule #1168 of July 1, 2005, and Rule Amendment date of January 7, 2005.

E. Painted Identification Materials:

1. Stencils: fiberboard stencils, prepared for required applications with letter sizes generally complying with recommendations of ANSI A13.1.

    a. Stencil Paint: exterior type stenciling enamel except as otherwise indicated on the Drawings; either brushing grade or pressurized spray-can form and grade.

    b. Identification Paint: enamel of colors indicated or, if not otherwise indicated for piping systems, comply with ANSI A13.1 for colors or as selected by the Project Architect.

F. Plastic Pipe Markers:

1. Snap-On Type: Pre-printed, semi-rigid snap-on, color-coded pipe markers, complying with ANSI A13.1 or as selected by the Project Architect.

2. Provide 1" thick molded fiberglass insulation with jacket for the plastic pipe marker to be installed on uninsulated pipes subjected to fluid temperatures of 125ºF or greater. Cut length to extend 2" beyond each end of plastic pipe marker.

3. Small Pipes: For external diameters less than 6" (including insulation if any), provide full-band pipe markers, extending 360º around pipe, fastened by snap-on application of pre-tensioned semi-rigid plastic pipe marker.

4. Large Pipes: For external diameters of 6" and larger (including insulation if any), provide either full-band or strip-type pipe markers, but not narrower than 3 times letter height, fastened by strapped-to-pipe (or insulation) application of semi-rigid type, with stainless steel bands.

5. Lettering: Pre-printed nomenclature which best describes piping system in each instance, as shown on the Drawings or as selected by the Project Architect or Engineer in cases of variance with name shown or specified.

    a. Arrows: Print each pipe marker with arrows indicating direction of flow, either integrally with piping system service lettering (to accommodate both directions), or as separate unit of plastic.

G. Plastic Duct Markers:

1. Laminated plastic, color coded duct markers. Conform to the following color code if not specified:
Green: Cold air.
Yellow: Hot air.
Yellow/Green: Supply air.
Blue: Exhaust, outside, return, and mixed air.

For hazardous exhausts, use colors and designs recommended by ANSI A13.1.

2. Nomenclature: Include the following:
Direction of air flow
Duct service (supply, return, exhaust, and all other items and accessories)
Duct origin (from)
Duct destination (to)
Design cfm.

H. Valve Tags

1. Brass Valve Tags: 19-gage polished brass valve tags with stamp-engraved piping system abbreviation in 1/4" high letters and sequenced valve numbers 1/2" high, and with 5/32" hole for fastener.

a. Provide 2" sq tags

b. Numbers and letters shall be block type, indented and filled with durable black compound.

2. Valve Tag Fasteners: solid brass chain (wire link or beaded type), or solid brass S-hooks of the size required for proper attachment of tags to valves, and manufactured specifically for that purpose.

I. Valve Schedules Frames: For each page of valve schedule, provide safety glass in wood or aluminum self-closing frame, with screws for mounting on masonry walls.

J. Plastic Equipment Markers:

1. Laminated plastic, color coded equipment markers. Conform to the following color code if not specified otherwise:
Green: Cooling equipment and components.
Yellow: Heating equipment and components.
Yellow/Green: Combination cooling and heating equipment and components.
Brown: Energy reclamation equipment and components.
Blue: Equipment and components that do not meet any of the above criteria.
For hazardous equipment, use colors and designs recommended by ANSI A13.1.

2. Nomenclature: Include the following matching terminology on schedules and Drawings as closely as possible:
Name and plan number
Equipment service
Design capacity
Other design parameters such as pressure drop, entering and leaving conditions, rpm, and all other items and accessories

3. Size: approximate 2½" x 4" markers for control devices, dampers and valves; and 4½" x 6" for equipment.

K. Plasticized Tags: Pre-printed or partially pre-printed accident-prevention tags, of plasticized card stock with matt finish suitable for writing, approximately 3¼ " x 5⅝", with

brass grommets and wire fasteners, and with appropriate pre-printed wording including large-size primary wording (as examples: DANGER, CAUTION, DO NOT OPERATE).

L. Plastic Labels: Printed labels created with label printer/maker similar to Brother P-Touch for marking white iron of ceiling grid for equipment and access concealed by the hung ceiling. Labels shall be 1/2" high black letters on clear background.

M. Key Identification Tag: Provide identification tag on every key provided as part of the maintenance materials specified in their respective sections. Tags shall be plastic stamped or engraved with 1/4" high letter for abbreviated name of unit and/or equipment and 1/2" for the number and with 5/32" hole for fastener. The tag shall be of the same color as the equipment with black lettering. Provide 2" square or round tags. Tag Fasteners: solid brass chain (wire link or beaded type), or solid brass S-hooks of the size required for proper attachment of tags to valves, and manufactured specifically for that purpose.

N. Lettering and Graphics:

1. Coordinate names, abbreviations and other designations used in the identification work with corresponding designations shown on the Drawings or Schedules, or specified. Provide numbers, lettering and wording as indicated or, if not otherwise indicated, as recommended by manufacturers or as required for proper identification and operation/maintenance of systems and equipment.

2. Multiple Systems: Where multiple systems of same generic name are shown on the Drawings or Schedules and specified, provide identification which indicates individual system number as well as service (for example: Boiler No. 2).

O. Approved Manufacturers

Allen Systems, Inc.
Brady (W.H.) Co.; Signmark Div.
Industrial Safety Supply Co., Inc.
Seton Name Plate Corp.
Brimar Industries, Inc.
Marking Services Inc.
EMED Co., Inc.

2.02 WARNING SIGNS AND LABELS

A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch (3.2 mm) thick, and having predrilled holes for attachment hardware.

B. Letter Color: Blue or Red

C. Background Color: Black

D. Maximum Temperature: Able to withstand temperatures up to 160 deg F (71 deg C).

E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch (64 by 19 mm).

F. Minimum Letter Size: 1/4 inch (6.4 mm) for name of units if viewing distance is less than 24 inches (600 mm), 1/2 inch (13 mm) for viewing distances up to 72 inches (1830 mm), and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.

G. Fasteners: Stainless-steel rivets or self-tapping screws.

H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

I. Label Content: Include caution and warning information, plus emergency notification instructions.

2.03 PIPING PAINTING COLOR CODING

A. Piping exterior surfaces shall be painted. For insulated piping, the exterior surfaces of the insulation or insulation covering shall be painted. Piping services shall be painted in accordance with the following Color Coding:

B. Utility Piping Services Painting Color Coding:
Steam and Condensate Piping: **Grey** with the steam and condensate piping clearly marked.
Cold water piping: **Green**
Hot Water Supply and Return Piping: **Deep Red** with the supply and return clearly marked as such.
Natural Gas: **Bright Yellow**
Electrical Conduits and Waste Piping: **Black**
Fire Standpipe Piping: **Fire Engine Red**
Sprinkler System Piping: **Mint Green**
Fuel Oil Piping: **Blue**
If there are more than one fuel oil tank, paint as follows:

- Tank #1 = Bright Red
- Tank #2 = School Bus Yellow
- Tank #3 = Orange
- Tank #4 = Royal Blue

PART 3 - EXECUTION

3.01 INSTALLATION

A. Coordination: Where identification is to be applied to surfaces that require insulation, painting or other covering or finish, including valve tags in finished mechanical spaces, install identification after completion of covering and painting.

B. Ductwork Identification:

1. Identify air supply, return, exhaust, intake, flue gas breeching and combustion air intake ductwork with duct markers or painted identification materials and provide arrows showing ductwork service and direction of flow, in black or white (whichever provides most contrast with ductwork color).

2. Location: In each space where ductwork is exposed, or concealed only by removable ceiling system, locate signs near points where ductwork originates or continues into concealed enclosures (shaft, underground or similar concealment), and at 50'-feet spacings along exposed runs.

3. Access Doors: Provide plastic duct markers on each access door in ductwork and housings, indicating purpose of access (to what equipment) and other maintenance and operating instructions, and appropriate safety and procedural information.

C. Piping System Identification: Install pipe markers and color bands and include arrows to show direction wherever piping is exposed to view in occupied spaces, machine rooms, accessible maintenance spaces (shafts, tunnels, plenums) and exterior non-concealed locations.

1. Near each valve and control device

2. Near each branch, excluding short take-offs for terminal units; mark each pipe at branch, where there could be question of flow pattern.

3. Near locations where pipes pass through walls or floors/ceilings, or enter non-accessible enclosures.

4. Near major equipment items and other points of origination and termination.

5. Spaced intermediately at maximum spacing of 50-feet along each piping run, except reduce spacing to 25-feet in congested areas of piping and equipment.

6. On piping above removable acoustical ceilings except omit intermediately spaced markers.

D. Valve Identification:

1. Provide valve tag on every valve, cock and control device in each piping system; exclude check valves, valves within factory-fabricated equipment units, and shut-off valves at HVAC terminal devices and similar rough-in connections of units. List each tagged valve in valve schedule for each piping system.

   a. Tagging Schedule: Comply with requirements of "Valve Tagging Schedule" at end of the Section.

2. Mount valve schedule on frames located in machine rooms where indicated or, if not otherwise indicated, where directed by the Authority.

3. Where more than one major machine room is shown on the Project, mount valve schedule in each major machine room, and repeat only main valves which are to be operated in conjunction with operations of more than single machine room.

E. A permanent factory-applied name-plate(s) shall be affixed to appliances (reference Section MC 301.6 of the 2014 NYC Mechanical Code) on which shall appear in legible lettering, the manufacturer's name or trademark, the model number, serial number and the seal or mark of the approved agency. A label shall also include the following:

1. Electrical equipment and appliances: Electrical rating in volts, amperes and motor phase; identification of individual electrical components in volts, amperes or watts, motor phase; Btu/h output; and required clearances.

2. Fuel-burning units: Hourly rating in Btu/h; type of fuel approved for use with the appliances; and required clearances.

3. Electric comfort heating appliances: Name and trade-mark of the manufacturer; the model number or equivalent; the electric rating in volts, ampacity and phase; Btu/h (W) output rating; individual marking for each electrical component in amperes or watts, volts and phase; required clearances from combustibles; and a seal indicating approval of the appliance by an approved agency.

G. Mechanical Equipment Identification:

1. Install plastic equipment marker near each major item of mechanical equipment and each operational device, as specified herein if not otherwise specified for each item or device in their respective sections. Provide signs for the following general categories of equipment and operational devices:

a. Main control and operating valves, including safety devices

b. Meters, gauges, thermometers and similar units

c. Strainers, filters, humidifiers, water treatment systems, thermostatic traps and similar equipment

d. Primary balancing dampers, mixing boxes

2. Provide permanent factory-applied name-plate(s) for all appliances as defined in Article 3.01.F above including but not limited to the following:

a. Fuel-burning units including boilers and heater units

b. Pumps and similar motor-driven units

c. Converters, heat exchangers, coils, evaporators, heat recovery units and similar equipment

d. Fans and blowers

e. Tanks and pressure vessels

3. Plastic equipment marker lettering Size: Minimum 1/4" high lettering for name of unit where viewing distance is less than 2', 1/2" high for distances up to 6', and proportionally larger lettering for greater distances. Provide secondary lettering 2/3 to 3/4 of size of principal lettering.

4. Text of Signs: In addition to name of identified unit, provide lettering to distinguish between multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.

5. Optional Use of Plasticized Tags: At the Authority's option, where equipment to be identified is concealed above acoustical ceiling or similar concealment, plasticized tags shall be installed within concealed space to reduce amount of text in exposed sign (outside concealment).

    a. Operational valves, dampers and similar minor items located in non-occupied spaces (including machine rooms) shall be identified by plasticized tags.

6. Key Identification Tag: Provide an identification tag on each and every key provided under this project and deliver to the Building Manager and NYCHA Maintenance Representative. Follow the valve tagging schedule specified herein for the numbering.

3.02 VALVE TAGGING SCHEDULES

A. Numbers: Arrange the numbering of valves in the following manner:

1. In Basement, Cellar, or Pipe Space below First Floor - No. 1 to No. 999

2. In First Story - No. 1000 to No. 1999.

B. In no case shall a number applying to one story, be assigned to a valve located in another story.

C. For other information, refer to the Contract Drawings.

END OF SECTION

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