

SECTION 23 05 53
IDENTIFICATION FOR HVAC

PART 1 - GENERAL

1.1 STIPULATIONS

- A. The specifications sections "General Conditions to the Construction Contract", "Special Conditions" and "Division 01 - General Requirements" form a part of this Section by this reference thereto, and shall have the same force and effect as if printed herewith in full.

1.2 SUMMARY

- A. This Section includes HVAC identification materials and devices.

1.3 ACTION SUBMITTALS

- A. Product Data: For identification materials and devices.

1.4 INFORMATIONAL SUBMITTALS

- A. Piping and Ductwork System Labeling Scheme: For each duct and piping system.
- B. Equipment Labeling Scheme: For each scheduled piece of equipment on the project.
- C. Valve and Steam Trap Tagging Scheme: For each piping system.

1.5 CLOSEOUT SUBMITTALS

- A. Valve and Steam Trap Schedules: For each piping system. Reproduce on standard-size bond paper. Tabulate valve number, piping system, system abbreviation as shown on tag, room or space location of valve, type of valve, valve normal position, steam trap type, size, and capacity, and variations for identification. Mark valves intended for emergency shutoff and similar special uses. In addition to the building wall mounted copies, furnish copies for maintenance manuals.

1.6 QUALITY ASSURANCE

- A. ASME Compliance: Comply with ASME A13.1, "Scheme for the Identification of Piping Systems" for lettering size, length of color field, colors, and viewing angles of identification devices.

1.7 SEQUENCING AND SCHEDULING

- A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- B. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Almetek Industries Inc.
 2. Bunting
 3. Craftmark Pipe Markers
 4. EMED Co.
 5. Kolbi Pipe Marker Co.
 6. Marking Services, Inc.
 7. Rodgers Enterprises and Distributors Inc. (RED)
 8. Seton Identification Products
 9. W.H. Brady Corp.
 10. Or equal as approved by the Professional.

2.2 IDENTIFYING DEVICES AND LABELS

- A. Pressure-Sensitive Pipe Markers: Manufacturer's standard preprinted, color-coded, pressure-sensitive, vinyl type with permanent adhesive.
1. Pipes with OD, Including Insulation, Less Than 6 Inches: Full-band pipe markers, extending 360 degrees around pipe at each location.
 2. Pipes with OD, Including Insulation, 6 Inches and Larger: Either full-band or strip-type pipe markers, at least 3 times letter height and of length required for label.
 3. Lettering: Manufacturer's standard preprinted captions as selected by Architect/Engineer, and approved by the Client Agency. Letters shall be no smaller than 1-1/2-inches high.
 4. Arrows: Either integrally with piping system service lettering, to accommodate both directions, or as separate unit, on each pipe marker to indicate direction of flow.
- B. Plastic Duct Markers: Manufacturer's standard laminated plastic.
1. Color Coding:
 - a. Blue: Air supply.
 - b. Green: Outside, return, and mixed air.
 - c. Yellow: Exhaust air.
 2. Terminology and Lettering: Include direction of airflow; duct service such as supply, return, or exhaust, and size of duct, and name of connected air handling apparatus or fan.
 - a. Letters shall be no smaller than 1-1/2-inches high.
- C. Plastic Tape: Manufacturer's standard color-coded, pressure-sensitive, self-adhesive, vinyl tape, at least 3 mils thick.
1. Width: 1-1/2 inches on pipes with OD, including insulation, less than 6 inches; 2-1/2 inches for larger pipes.
 2. Color: Comply with ASME A13.1, unless otherwise indicated.

- D. Valve and Steam Trap Identification Materials:
1. Tags: Stamped or engraved with 1/4-inch letters for piping system abbreviation and 1/2-inch sequenced numbers. Include 5/32-inch hole for fastener.
 - a. Material: 0.0375-inch-thick stainless steel.
 - b. Size: 1-1/2-inches diameter, unless otherwise indicated.
 - c. Shape: Round.
 2. Tag Fasteners: Stainless steel, beaded chain or S-hooks.
 3. Schedule Frames: Glazed display frame for removable mounting on masonry walls for each page of valve schedule. Include screws.
 - a. Frame: Extruded aluminum.
 - b. Glazing: ASTM C 1036, Type I, Class 1, Glazing quality B, 2.5-mm, single-thickness glass.
- E. Engraved Plastic-Laminate Equipment Labels and Signs: ASTM D 709, Type I, cellulose, paper-base, phenolic-resin-laminate engraving stock; Grade ES-2, black surface, black phenolic core, with white melamine sub-core, unless otherwise indicated. Fabricate in sizes required for message. Provide holes for mechanical fastening.
1. Engraving: Engraver's standard letter style, of sizes and with terms to match equipment identification. Letter height shall be no less than 1/4-inch.
 2. Thickness: 1/16 inch, for units up to 20 sq. in. or 8 inches in length, and 1/8 inch for larger units.
 3. Fasteners: Self-tapping, stainless-steel screws or contact-type, permanent adhesive.
- F. Plasticized Warning Tags: Preprinted or partially preprinted, accident-prevention tags, of plasticized card stock with mat finish suitable for writing.
1. Size: 3-1/4 by 5-5/8 inches.
 2. Fasteners: Brass grommets and wire.
 3. Nomenclature: Large-size primary caption such as DANGER, CAUTION, or DO NOT OPERATE.
 4. Color: Yellow background with black lettering.
- G. Ceiling Markers: Markers shall be round, adhesive backed or push-pin type, a minimum of 7/8 inch diameter, and shall include engraving to indicate service. Place push pin type in the ceiling tiles, use adhesive backed markers on the lay in grid and on drywall ceilings.
- H. Access Panel Markers: Manufacturer's standard laminated plastic, adhesive backed, with abbreviated terms and numbers corresponding to concealed item. Black lettering on a white background. Letter height shall be no less than 1/4-inch.

PART 3 - EXECUTION

3.1 GENERAL

- A. Walking / head clearance hazards in mechanical room such as horizontal runs of piping or ductwork less than 6'-8" above the finished floor shall be identified according to ANSI Z535 OSHA standards.

- B. Tripping hazards in mechanical rooms shall be identified according to ANSI Z535 and OSHA standards.
- C. All steam traps shall be tagged and scheduled similarly as specified herein for valves. Post framed copies in each major mechanical room, in locations selected by the Client Agency.
- D. Lettering and Graphics: Coordinate names, abbreviations, and other designations used in mechanical identification with corresponding designations indicated on the Drawings. Use numbers, letters, and terms indicated for proper identification, operation, and maintenance of mechanical systems and equipment.
 - 1. Multiple Systems: Identify individual system number and service if multiple systems of same name are indicated.
- E. Clean piping and equipment surfaces of incompatible primers, paints, and encapsulants, as well as dirt, oil, grease, release agents, and other substances that could impair bond of identification devices.
- F. Warning-Tag Installation: Write required message on, and attach warning tags to, equipment and other items where required by OSHA standards.

3.2 LABELING AND IDENTIFYING PIPING SYSTEMS

- A. Install pipe markers on each system. Include arrows showing normal direction of flow, including pipes where flow is allowed in both directions.
- B. Marker Type: Plastic markers, with application systems.
- C. Do not apply plastic pipe labels or plastic tapes directly to bare pipes conveying fluids at temperatures of 125 deg. F or higher. Where these pipes are to remain uninsulated, provide a short section of insulation.
- D. Fasten markers on pipes and insulated pipes smaller than 6 inches in diameter by one of following methods:
 - 1. Adhesive lap joint in pipe marker overlap.
 - 2. Laminated or bonded application of pipe marker to pipe or insulation.
 - 3. Taped to pipe or insulation with color-coded plastic adhesive tape, not less than 3/4 inch wide, lapped a minimum of 1-1/2 inches at both ends of pipe marker, and covering full circumference of pipe.
- E. Fasten markers on pipes and insulated pipes 6 inches in diameter and larger by one of following methods:
 - 1. Laminated or bonded application of pipe marker to pipe or insulation.
 - 2. Taped to pipe or insulation with color-coded plastic adhesive tape, not less than 1-1/2 inches wide, lapped a minimum of 3 inches at both ends of pipe marker, and covering full circumference of pipe.
 - 3. Strapped to pipe or insulation with manufacturer's standard stainless-steel bands.
- F. Locations: Locate pipe markers and color bands where piping is located above accessible ceilings; exposed in mechanical rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior non-concealed locations according to the following:

1. Within 3 ft. of each valve and control device.
2. Within 3 ft. of each branch connection, excluding short takeoffs for terminal units. Mark each pipe at branch, where flow pattern is not obvious.
3. Within 3 ft. of penetrations through walls, floors, ceilings, or non-accessible enclosures.
4. At access doors, manholes, and similar access points that permit view of concealed piping.
5. Within 3 ft. of major equipment items and other points of origination and termination.
6. Spaced at a maximum of 25-foot intervals along each run. Reduce intervals to 10 feet in areas of congested piping and equipment.

G. Do NOT label piping where exposed in finished spaces.

3.3 VALVE TAGS

- A. Install on valves in piping systems, except check valves, valves within factory-fabricated equipment units, and HVAC terminal devices and similar roughing-in connections of end-use units/equipment which are within line of sight of such units/equipment. List tagged valves in a valve schedule. Mount the valve schedule to the wall where directed by the Architect / Engineer or the Client Agency.
1. Tag steam traps similarly, however all traps shall be tagged, including those immediately next to and serving coils, heat exchangers, etc.
 2. Provide labels on piping insulation / jacketing at check valves and unions so their locations can be identified afterwards.
- B. Install framed valve schedule in each major equipment room, in locations selected by the Client Agency.
- C. Control valves and balancing valves shall be provided with a plastic tag with the design GPM and final balance GPM value written in permanent marker . The tag shall be secured to the valve.

3.4 EQUIPMENT SIGNS AND LABELS

- A. Equipment Signs and Labels: Install and permanently fasten equipment nameplates on HVAC equipment. Locate nameplates where accessible and visible.
1. Include signs and labels for all equipment and devices scheduled or tagged on the Drawings.
 2. Terminology: Match schedules as closely as possible. Include the following:
 - a. Name and plan number.
 - b. Equipment service.
 - c. Design capacity.
 - d. Other design parameters such as pressure drop, entering and leaving conditions, and speed.
 - e. Regularly required maintenance actions for equipment and systems, including the title or publication number for the operation and maintenance manual for that particular model and type of product, as required by the 2018 International Energy Conservation Code.
 - f. Air handling rooftop mounted equipment (air handlers, rooftop air conditioners, exhaust fans, etc.) and split system condensing units shall be labeled with the name(s) of the rooms or areas served.

- B. Provide warning labels or tags in a conspicuous location on all electrically powered equipment that reads "DANGER - LOCK OUT ELECTRICITY BEFORE WORKING ON EQUIPMENT".

3.5 LABELING AND IDENTIFYING DUCTWORK SYSTEMS

- A. Identify all ducts with duct markers; and arrows indicating service and direction of flow.
 - 1. Location: Locate signs near points where ducts enter into concealed spaces, at all access panels and doors, on both sides of floor and wall penetrations, below roof penetrations, at all major changes in direction, and at maximum intervals of 30 feet.
 - 2. Label duct access doors with laminated plastic, adhesive backed markers. Text shall indicate the purpose of the door (e.g. "Fire Damper", "Inspection and Cleaning Access", etc.).
 - 3. Ducts and duct access doors exposed in finished areas shall NOT be labeled.

SPACE CONTROL DEVICE LABELS

- B. Label space thermostats, relative humidity sensors, carbon dioxide sensors, start/stop switches, override switches, and similar space control devices with the name/designation/number of the associated HVAC equipment / air system.
- C. Labels shall use 1/4" high black text on a white background. Labels shall be water resistant flexible plastic with adhesive backing, such as those produced by common handheld label makers. Apply labels to the device or box cover plate. Do not apply to walls or other surfaces unless approved by the Architect/Engineer.

3.6 CEILING AND ACCESS PANEL LABELS AND MARKERS

- A. Ceiling Markers: Provide for concealed equipment, dampers, VAV boxes, air valves, duct reheat coils, piping valves, smoke dampers, fire dampers, and combination fire/smoke dampers, duct mounted sensors, and other similar equipment, devices, and duct system accessories.
 - 1. Obtain approval from the Client Agency's maintenance personnel regarding the colors to be used for each type of device.
 - 2. Do not label drywall ceilings.
- B. Access Panel Labels: Provide labels on wall, shaft, and ceiling access panels, outside of finished spaces only.

3.7 ADJUSTING AND CLEANING

- A. Relocate mechanical identification materials and devices that have become visually blocked by work of this or other Divisions.
- B. Clean faces of identification devices and glass frames of valve and steam trap charts.

END OF SECTION