

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Nameplates.
- B. Tags.
- C. Adhesive-backed duct markers.
- D. Stencils.
- E. Pipe markers.
- F. Ceiling tacks.
- G. Engraved plastic-laminate signs.

1.02 SUBMITTALS

- A. Custom Signage: Submit list of wording, symbols, letter size, and color coding for mechanical identification.
- B. Valve Tag Schedule: Submit 8-1/2 x 11 inch typewritten valve schedule. Furnish one extra copy for each maintenance manual. Include the following information in the schedule:
 - 1. Valve tag number.
 - 2. Piping system and system abbreviation as shown on tag.
 - 3. Location of valve (room or space).
 - 4. Variations for identification (if any).
 - 5. Function. Specially mark valves which are intended for emergency shut-off and similar special uses in margin of schedule.
 - 6. Valve manufacturer's name and model number.
- C. Product Data: Submit manufacturer's technical product data for each product required.
- D. Manufacturer's Installation Instructions: Indicate special procedures and installation for each product required.

1.03 SPARE PARTS

- A. Furnish minimum of 5 percent extra stock of each mechanical identification material required for each system that uses the identification material.
- B. Furnish not less than 3 additional numbered valve tags for each piping system.
- C. Where stenciled markers are provided, clean and retain stencils after completion of stenciling and include used stencils in extra stock along with stenciling paints and applicators.

PART 2 - PRODUCTS AND MATERIALS

2.01 ACCEPTABLE MANUFACTURERS

- A. Advanced Graphic Engraving, LLC.
- B. Brady Corporation.
- C. Brimar Industries, Inc.
- D. Craftmark.
- E. Industrial Safety Supply Co., Inc.
- F. Kolbi Pipe Marker Co.
- G. MIFAB, Inc.
- H. Seton Identification Products, a Tricor Direct Company..

2.02 IDENTIFICATION APPLICATIONS AND REQUIREMENTS

- A. General:
 - 1. Provide manufacturer's standard products of categories and types required for each application as referenced in other Division 23 sections. Where more than a single type is specified for application, selection is the installer's option, but provide single selection for each product category.

2. Lettering: Coordinate names, abbreviations, and other designations used in mechanical identification work with the corresponding designations shown on the drawings, scheduled, and specified. If not otherwise indicated, provide numbering, lettering, and wording as recommended by the manufacturer or as required for proper identification, operation, and maintenance of mechanical systems and equipment.
 3. Where multiple systems of same generic name are shown and specified, provide identification which indicates individual system number as well as service (e.g., Boiler No. 3, Air Supply No. 1H, etc.).
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- B. Air Handling Units: Nameplates, stencils, or engraved plastic laminate signs.
 - C. Air Terminal Units: Tags, stencils, or engraved plastic laminate signs.
 - D. Automatic Controls: Tags, use the same naming convention coordinated with the building automation system.
 - E. Control Panels: Nameplates.
 - F. Dampers: Ceiling tacks where located above lay-in ceiling. Do not use ceiling tacks in a gyp ceiling.
 - G. Ductwork: Adhesive-backed duct markers. Stencils are only acceptable for concealed ductwork, exterior ductwork, or in mechanical rooms.
 - H. Fans: Nameplates, stencils, or engraved plastic laminate signs.
 - I. Instrumentation: Tags.
 - J. Major Control Components including Variable Frequency Drives: Nameplates or engraved plastic laminate signs.
 - K. Piping: Pipe Markers.
 - L. Pumps: Nameplates or engraved plastic laminate signs.
 - M. Relays: Tags.
 - N. Small-sized Equipment: Tags.
 - O. Tanks: Nameplates or engraved plastic laminate signs.

- P. Thermostats: Nameplates.
- Q. Valves: Tags. Ceiling tacks are acceptable where located above a lay-in ceiling. Do not use ceiling tacks in a gyp ceiling.
- R. Water Treatment Devices: Nameplates or engraved plastic laminate signs.
- S. General Signs: Engraved plastic laminate signs.

2.03 NAMEPLATES

- A. Nomenclature: Include the following, matching terminology on schedules as closely as possible:
 - 1. Name and mark number.
 - 2. Equipment service.
 - 3. Design capacity.
 - 4. Other design parameters such as pressure drop, entering and leaving conditions, rpm, etc.
- B. Size: 2-1/2 inch x 4 inch for control panels and components, 4-1/2 inch x 6 inch for equipment.
- C. Letter Color: White.
- D. Letter Height: 1/4 inch.
- E. Background Color:
 - 1. Cooling equipment: Green.
 - 2. Heating equipment: Yellow.
 - 3. Combination cooling and heating equipment: Yellow/Green.
 - 4. Energy reclamation equipment: Brown.
 - 5. Hazardous equipment: Colors and designs recommended by ASME.
 - 6. Equipment and components that do not meet any of the above criteria: Blue.
- F. Plastic: Conform to ASTM D709.

2.04 TAGS

- A. Plastic Laminate Tags: Laminated three-layer plastic, minimum 3/32 inch thick, with engraved black letters on light contrasting background color. Tag size minimum 1-1/2 inch diameter and 5/32 inch hole for fastener.
- B. Solid Plastic Tags: Solid plastic, minimum 3/32 inch thick, with printed black letters on white color. Tag size minimum 1-1/2 inch diameter and 5/32 inch hole for fastener.
- C. Metal Tags: Provide 19-gauge polished brass with stamped letters. Tag size minimum 1-1/2 inch diameter with smooth edges and 5/32 inch hole for fastener. Fill tag engraving with black enamel paint.
- D. Accident Prevention Tags: Pre-printed or partially pre-printed, of plasticized card stock with matte finish suitable for writing, minimum 3-1/4 inch x 5-5/8 inch size, with brass grommet in hole for fastener. Order with appropriate pre-printed wording (e.g., DANGER, CAUTION, DO NOT OPERATE, etc.).
- E. 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, manufactured specifically for that purpose.
- F. Valve Tag Chart: Typewritten letter size list in anodized aluminum or finished hardwood frame, covered with SSB-grade sheet glass. Provide frame and mounting screws for removable mounting.
- G. Letter Height:
 - 1. System Abbreviation: Minimum 1/4 inch.
 - 2. Valve Number: Minimum 1/2 inch.

2.05 ADHESIVE-BACKED DUCT MARKERS

- A. Material: High gloss acrylic adhesive-backed vinyl film 0.0032 inch; printed with UV and chemical resistant inks.
- B. Style: Individual label.
- C. Nomenclature: Include air handling unit identification number, duct size, service, and arrows indicating direction of flow.

- D. Specialty Exhaust: Identify the specialty using the system terminology (e.g., Grease, Dishwasher, Dryer, Fume Hood, etc.).
- E. Color: Yellow background with black lettering or blue background with white lettering.
 - 1. Hazardous Exhaust: Use colors and designs recommended by ASME A13.1.

2.06 STENCILS

- A. Stencils: With clean cut symbols and letters of following size, complying with ASME A13.1:
 - 1. 3/4 to 1-1/4 inch Outside Diameter of Insulation or Pipe: 8 inch long color field, 1/2 inch high letters.
 - 2. 1-1/2 to 2 inch Outside Diameter of Insulation or Pipe: 8 inch long color field, 3/4 inch high letters.
 - 3. 2-1/2 to 6 inch Outside Diameter of Insulation or Pipe: 12 inch long color field, 1-1/4 inch high letters.
 - 4. 8 to 10 inch Outside Diameter of Insulation or Pipe: 24 inch long color field, 2-1/2 inch high letters.
 - 5. Over 10 inch Outside Diameter of Insulation or Pipe: 32 inch long color field, 3-1/2 inch high letters.
 - 6. Ductwork and Equipment: 2-1/2 inch high letters.
 - 7. Access Doors: 3/4 inch high letters.
 - 8. Operational Instructions: 3/4 inch high letters.
 - 9. Provide arrows indicating direction of flow.
- B. Stencil Paint: Oil based, alkyd enamel, either brushing grade or pressurized spray-can form and grade, black color, except for piping. For piping systems use colors conforming to ASME A13.1.

2.07 PIPE MARKERS

- A. Semi-rigid Plastic Pipe Markers: Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid being conveyed.
- B. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings, minimum 3 mil thick.
 - 1. Width: 1-1/2 inch for pipes less than 6 inches (including insulation), 2-1/2 inch for pipes 6 inches and larger (including insulation).

- C. Pipe Marker with Insulation: 1 inch thick molded fiberglass insulation with jacket for each plastic pipe marker to be installed on uninsulated pipes subjected to fluid temperatures of 125 degrees F or greater. Insulation shall extend 2 inches beyond each end of plastic pipe marker.
- D. Underground Plastic Pipe Markers: Bright colored continuously printed plastic ribbon tape, minimum 6 inches wide by 4 mil thick, manufactured for direct burial service.
 - 1. Detection: Provide multi-ply tape consisting of solid aluminum foil core between two layers of plastic ribbon tape.
- E. Nomenclature: Manufacturer's standard pre-printed nomenclature which best describes piping system. Differentiate between supply and return. In the case of a variance, provide nomenclature as selected by the Engineer.
- F. Arrows: Provide pipe markers with integral arrows indicating direction of flow or as a separate unit of plastic.
- G. Color:
 - 1. Conform to ASME A13.1.
 - 2. Heating, Cooling, and Boiler Feedwater: Green with white letters.
 - 3. Toxic and Corrosive Fluids: Orange with black letters.
 - 4. Compressed Air: Blue with white letters.
- H. Letter Height: Minimum 1/2 inch for pipes up to 3 inch, minimum 1 inch for larger pipes.

2.08 CEILING TACKS

- A. Description: Steel with 3/4 inch diameter color coded head.
- B. Color:
 - 1. HVAC Equipment: Yellow.
 - 2. Fire Dampers and Smoke Dampers: Red.
 - 3. Heating/Cooling Valves: Blue.

2.09 ENGRAVED PLASTIC-LAMINATE SIGNS

- A. General: Engraving stock melamine plastic laminate, engraved with manufacturer's standard letter style, black with white core letter color except as

otherwise indicated, punched for mechanical fastening except where adhesive mounting is necessary because of substrate.

- B. Thickness: 1/16 inch thick for units up to 20 square inches, or 8 inches in length; 1/8 inch thick for larger units.
- C. Fasteners: Self-tapping stainless steel screws, except contact-type permanent adhesive where screws cannot or should not penetrate the substrate.
- D. Nomenclature: When used to identify equipment, match terminology on schedules, including the following:
 - 1. Name and mark number.
 - 2. Equipment service.
 - 3. Design capacity.
- E. Access Panel Markers: Laminated three-layer plastic, minimum 1/16 inch thick and 1/8 inch hole for fastener, with abbreviations and numbers corresponding to concealed valve.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Degrease and clean surfaces to receive adhesive for identification materials.
- B. Prepare surfaces in accordance with Division 09 for stencil painting.

3.02 GENERAL INSTALLATION

- A. Coordination: Where identification is to be applied to surfaces which require insulation, painting or other covering or finish, including valve tags in finished mechanical spaces, install identification after completion of covering and painting. Install identification prior to installation of acoustical ceilings and similar removable concealment.
- B. Install products in accordance with manufacturer's instructions.
- C. Install nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.

- D. Install tags on piping 3/4 inch diameter and smaller.
- E. Install in clear view and align with axis of piping.
- F. Apply stencil painting in accordance with Division 09.
- G. Identify service, flow direction, and pressure.

3.03 PIPING IDENTIFICATION

- A. General: Install identification on the most obviously visible portion of the pipe from the point of access.
- B. Install plastic tape pipe markers complete around pipe in accordance with manufacturer's instructions.
- C. Install underground plastic pipe markers 6 to 8 inches below finished grade, directly above buried pipe during back-filling/top-soiling of each underground piping system, Where multiple pipes are buried in common trench and do not exceed overall width of 16 inches, install single pipe marker. For tile fields and similar artificial field installations, mark only edge pipe lines of field.
- D. Pipes less than 6 inches diameter (including insulation):, Provide full-band pipe markers with 360 degree coverage.
- E. Pipes 6 inches diameter and larger (including insulation): Provide either full-band or strip-type pipe markers.
- F. Location: Install piping identification where piping is exposed to view, concealed by a removable ceiling system, located in accessible maintenance spaces (shafts, tunnels, plenums, etc.) and exterior non-concealed locations as follows:
 - 1. Within 5 feet of each valve, tee, and control device.
 - 2. Within 5 feet of each branch, excluding branches less than 25 feet in length to fixtures or terminal heating and cooling units.
 - 3. Within 5 feet of each side of a penetration of a wall, floor, ceiling, structure, or enclosure.
 - 4. At access doors, manholes and similar access points which permit view of concealed piping.
 - 5. Within 5 feet of equipment outlets and other points of origination and termination.

6. Spaced intermediately at a maximum spacing of 50 feet along each riser and run. Reduce spacing to 25 feet in congested areas where there are more than two piping systems or pieces of equipment.

3.04 VALVE IDENTIFICATION

- A. Provide a tag on each valve, cock, and control device. Exclude check valves, valves within factory-fabricated equipment, HVAC terminal devices, and similar rough-in connections of end-use fixtures and units.
- B. Mount valve tag chart and schedule frame in mechanical room, or where indicated on plans. If not indicated, mount where directed by Engineer. Where more than one mechanical room is included on the project, mount framed copies of valve tag chart and schedule in each mechanical room.

3.05 DUCTWORK IDENTIFICATION

- A. Install identification on the most obviously visible portion of the duct from the point of access.
- B. Location: Install ductwork identification where ductwork is exposed to view, concealed by a removable ceiling system, located in accessible maintenance spaces (shafts, tunnels, plenums, etc), and exterior non-concealed locations as follows:
 1. Within 5 feet of each control damper or balancing damper, excluding balancing dampers installed in duct take-offs to individual grilles, registers, or diffusers that are less than 25 feet in lengths and installed in the same space as the air device.
 2. Within 5 feet of each branch duct, excluding branch ducts that are less than 25 feet in length and located in the same space as the main duct.
 3. Within 5 feet of each side of a penetration of a wall, floor, ceiling, structure, or enclosure.
 4. Spaced intermittently at a maximum spacing of 50 feet along each duct run. Reduce spacing to 25 feet in congested areas when there are more than two types of duct systems or pieces of equipment.
 5. Within 5 feet of equipment outlets and other points of origin or termination.
 6. Install marker on the most obviously visible portion of the duct from point of access.

3.06 ACCESS DOOR IDENTIFICATION

- A. Provide identification on each access door, indicating purpose of access, maintenance and operating instructions, and appropriate safety and procedural information.
- B. Where access doors are concealed above a removeable ceiling system or similar concealment, tags may be used in lieu of specified identification.

3.07 CEILING TACK INSTALLATION

- A. Locate ceiling tacks to locate valves or dampers above lay-in panel ceilings. Locate in corner of panel closest to equipment.

3.08 EQUIPMENT IDENTIFICATION

- A. Install nameplates and engraved plastic laminate signs for identification of equipment. Provide additional signs and lettering as follows:
 - 1. To distinguish between multiple units in close proximity.
 - 2. To inform operator of operational requirements.
 - 3. To indicate safety and emergency precautions.
 - 4. To warn of hazards and improper operations.
- B. Adjust lettering size based on viewing distance from normal location of identification:
 - 1. Less than 2 feet: Minimum 1/4 inch.
 - 2. Up to 6 feet: Minimum 1/2 inch.
 - 3. Greater than 6 feet: Proportionally increase letter size based on recommendations above.
 - 4. Provide secondary lettering 2/3 to 3/4 of size of principal lettering.
 - 5. Stencils may be used in lieu of nameplates when lettering greater than 1 inch is needed for proper identification because of distance from normal location of required identification.
- C. Where equipment to be identified is concealed above acoustical ceilings or similar removeable concealment, equipment tags may be installed in the concealed space to reduce the amount of text in exposed sign.

END OF SECTION

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