SECTION 230553 - IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Equipment labels.
2. Warning signs and labels.
3. Pipe labels.
4. Valve tags.
5. Warning tags.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Equipment Label Schedule: Include a listing of all equipment to be labeled with the proposed content for each label.

C. Valve numbering scheme.

D. Valve Schedules: For each piping system to include in maintenance manuals.

1.4 COORDINATION

A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

B. Coordinate installation of identifying devices with locations of access panels and doors.

C. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 LETTERING AND GRAPHICS

A. Coordinate names, abbreviations and other designations used in mechanical identification work with corresponding designations shown pre-existing, specified or scheduled. 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 mechanical systems and equipment.

B. Multiple Systems: Where multiple systems of same generic name are shown and specified, provide identification which indicates individual system number as well as service (for example: Boiler No. 1; AHU-1; etc.).

2.2 EQUIPMENT LABELS (for applicable equipment as scheduled on drawings)

A. Metal Labels for Equipment:

1. Material and Thickness: Aluminum, 0.032-inchminimum thickness, and having predrilled or stamped holes for attachment hardware.
2. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
3. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
4. Fasteners: Stainless-steel rivets or self-tapping screws.
5. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
6. For all equipment located above lay-in ceilings, provide indicators at ceiling grid attached with screws. Labels shall show:

    a. Box # or Unit #

B. Plastic Labels for Equipment:

1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/16 inch or 1/8 inch thick, and having predrilled holes for attachment hardware.
2. Letter Color: Black.
3. Background Color: Yellow.
4. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
5. Minimum Label Size: Length and width vary for required label content, but not less than 5 inches x 4 inches.
6. Minimum Letter Size: 1/4 inch for principal lettering; include secondary lettering two-thirds to three-fourths the size of principal lettering.
7. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

C. Label Content: Include equipment's unique equipment number, areas served (use actual room numbers used at the facility – not architectural room numbers, substantial completion date (S.C.D.), extended warranty period, number and size of filters and capacity. The following are examples of labeling to be used:

1. Air Handling Units:
   AHU-1 (Classrooms #212, 213, 214 & 215)
   S.C.D.: 06/01/2011
   Filters: 4(24x24x2 inch)
   2(24x12x2 inch)
   Capacity: 4000 CFM @ 1.0 inch ESP
2. Condensing Units:
   CU-1 (Office #202 & 203)
   S.C.D.: S.C.D.: 06/01/20011 (5 years Comp. Warranty)
   Capacity: 3 Tons
3. Fan Coil Units:
   FCU-2 (Office #122 & Storage #122A)
   S.C.D.: S.C.D.: 06/01/2011
   Filters: 1(60x10x1 inch)
   Capacity: 1200 CFM
4. Use similar protocol for Chillers, Boilers, Pumps, Fans, and VFD’s.

D. A phenol tag (3” x 2”) shall visually identify all VAV boxes with the box number engraved on it, permanently attached by screws to the ceiling grid directly under the VAV box.

E. A phenol tag (3” x 2”) shall visually identify all HVAC hydronic system isolating valves, permanently attached by screws to the ceiling grid directly under the valves.

F. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number and identify Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

2.3 WARNING SIGNS AND LABELS

A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/16 inch > thick, and having predrilled holes for attachment hardware.

B. Letter Color: Comply with ANSI A13.1, except where another color selection is indicated.

C. Maximum Temperature: Able to withstand temperatures up to 160 deg F.

D. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.

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

F. Fasteners: Stainless-steel self-tapping screws.

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

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

2.4 PIPE LABELS

A. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction.

1. Dielectric unions shall be labelled.

B. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to [partially cover] [cover full] circumference of pipe and to attach to pipe without fasteners or adhesive.

C. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.

D. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.

1. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions, or as separate unit on each pipe label to indicate flow direction.
2. Lettering Size: At least 1-1/2 inches high.

2.5 VALVE TAGS

A. Valve Tags: Stamped or engraved with 1/4-inch letters for piping system abbreviation and 1/2-inch numbers.

1. Tag Material: Brass, polished finish, minimum 19-gauge, and having predrilled or stamped holes for attachment hardware.
2. Fasteners: Solid brass chain (wire link or beaded type); size as required for attaching tags.
3. Tag Size: 1-1/2-inch diameter, except as otherwise indicated.

B. Valve Schedules: For each piping system, on 8-1/2-by-11-inch bond paper. Tabulate valve number, piping system, system abbreviation (as shown on valve tag), location of valve (room or space), normal-operating position (open, closed, or modulating), and variations for identification. Mark valves for emergency shutoff and similar special uses.

1. Valve-tag schedule shall be included in operation and maintenance data.
2. Valve schedule shall be mounted in Boiler Room in frame on wall.

2.6 WARNING TAGS

A. Warning Tags: Preprinted or partially preprinted, accident-prevention tags, of plasticized card stock with matte finish suitable for writing.

1. Size: Approximately 4 by 7 inches.
2. Fasteners: Brass grommet and wire.
3. Nomenclature: Large-size primary caption such as "DANGER," "CAUTION," or "DO NOT OPERATE."
4. Color: Yellow background with black lettering.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

3.2 EQUIPMENT LABEL INSTALLATION

A. Install or permanently fasten labels on each major item of mechanical equipment.

1. Major mechanical equipment shall include:

a. VAV Boxes
b. Air Handlers
c. All AC units and heat pump units (split or packaged, water or air cooled)
d. Fan coil units
e. Chillers
f. Boilers
g. Pumps
h. Fans
i. Expansion Tanks
j. Air Separators
k. Cooling towers

B. Locate equipment labels where accessible and visible.

3.3 PIPE LABEL INSTALLATION

A. Piping Color-Coding: Painting of piping is specified in Section 099123 "Interior Painting".

B. Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:

1. Near each valve and control device.

2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
3. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
4. At access doors, manholes, and similar access points that permit view of concealed piping.
5. Near major equipment items and other points of origination and termination.
6. Spaced at maximum intervals of 10 feet> along each run. On piping above removable acoustical ceiling spaced at maximum intervals of 25 feet. Omit intermediately spaced labels.

C. Pipe Label Color Schedule:

1. Chilled-Water Piping:

   a. Background Color: Black
   b. Letter Color: White

2. Condenser-Water Piping:

   a. Background Color: Black
   b. Letter Color: White

3. Heating Water Piping:

   a. Background Color: Black
   b. Letter Color: White

4. Refrigerant Piping:

   a. Background Color: Black
   b. Letter Color: White

3.4 VALVE-TAG INSTALLATION

A. Install tags on valves and control devices in piping systems, except check valves; valves within factory-fabricated equipment units; shutoff valves; faucets; convenience and lawn-watering hose connections; and HVAC terminal devices and similar roughing-in connections of end-use fixtures and units. List tagged valves in a valve schedule.

B. Valve-Tag Application Schedule: Tag valves according to size, shape, and color scheme and with captions similar to those indicated in the following subparagraphs:

1. Valve-Tag Size and Shape:

   a. Chilled Water: 1-1/2 inches round
   b. Condenser Water: 1-1/2 inches round
   c. Refrigerant: 1-1/2 inches round
   d. Hot Water: 1-1/2 inches round
   e. Gas: 1-1/2 inches round

2. Valve-Tag Color:

   a. Chilled Water: Blue
   b. Condenser Water: Green
   c. Refrigerant: Green
   d. Hot Water: Red
   e. Gas: Yellow

3. Letter Color:

    a. Chilled Water: White
    b. Condenser Water: White
    c. Refrigerant: White
    d. Hot Water: White
    e. Gas: White

3.5 WARNING-TAG INSTALLATION

A. Write required message on, and attach warning tags to, equipment and other items where required.

3.6 PIPE TRACE

A. All non-accessible, non-metallic piping shall be detectable by means of tracer wire or marking tape buried 18-inches above the piping. Turn marker tape up at the building foundation toward the finish grade.

END OF SECTION 230553