**PART 1 – GENERAL**

**1.01 SUMMARY**

A. Section Includes: Marking and identification required on mechanical piping systems, ducts, controls, valves, apparatus, etcetera.

B. Related Requirements:

1. Division 01: General Requirements.

2. Section 23 05 13: Basic HVAC Materials and Methods.

3. Section 23 09 00: HVAC Instrumentation and Controls.

4. Section 23 20 13: Above Ground HVAC Piping.

5. Section 23 20 16: Underground HVAC Piping.

6. Section 23 30 00: Air Distribution.

7. Section 23 64 16: Oil Lubricated Centrifugal Water Chillers.

8. Section 23 64 23: Scroll Water Chillers.

9. Section 23 64 28: Air-Cooled Rotary Screw Chillers.

10. Section 23 65 00: Cooling Towers.

11. Section 23 80 00: Heating, Ventilating and Air Conditioning Equipment.

**1.02 SUBMITTALS**

A. Submit in accordance with Division 01 and Section 23 05 00: Common Work Results for HVAC.

B. Submit product data and installation instructions for each item specified.

C. Submit Samples of materials.

**1.03 QUALITY ASSURANCE**

A. Comply with provisions of:

1. Section 23 05 00: Common Work Results for HVAC.

2. ANSI/ASME A13.1: Scheme for the Identification of Piping Systems.

3. APWA: Uniform Color Code.

Or

4. IAPMO: Uniform Plumbing Code (UPC).

**PART 2 – PRODUCTS**

**2.01 MATERIALS**

A. General: Piping systems, controls, valves, apparatus, etc., except those that are installed in inaccessible locations in partitions, walls, and floors, shall be permanently identified.

**2.02 VALVES**

A. Furnish prepared chart or diagram for each piping system, indicating by identifying letter or model number of each valve in the system, its location, and function.

B. Install charts in aluminum frame with clear glass front and secure on wall where designated by the Project Inspector.

C. Bind copies of each chart in operating instructions manual.

D. Provide each valve with a brass, aluminum, or plastic disc, not less than 1-1/4 inches diameter bearing engraved numbers corresponding to those indicated on chart. Fasten discs to valve with No. 14 brass wire.

E. Provide an additional tag for safety valves and other valves that could be hazardous to safety and health of occupants. Distinguish these tags from regular valve tags by color (such as yellow with black letters and marked "Danger"); submit Sample tag to the Architect for review.

**2.03 INSTRUMENTS AND CONTROLS**

A. Identify panel-mounted instruments and controls with engraved bakelite nameplates permanently affixed to panel boards.

B. Identify alarm indicating devices and alarm reset devices by nameplates.

C. Identify damper motors and automatic valves, flow switches, pressure switches, etc., with embossed aluminum or plastic tape affixed to controller, indicating service and setting.

**2.04 EQUIPMENT**

A. Identify each major piece of equipment with engraved bakelite nameplates permanently affixed to the equipment, indicating the room numbers it services, Equipment identification designation shall be the same to its designation indicated on the “As-Built Drawings”. Room numbers in the nameplates shall correspond to the final room numbers.

**2.05 ABOVE GRADE PIPE IDENTIFICATION**

A. Identify pipes by means of colored labels with directional flow arrows and identification of the pipe content, in conformance to ANSI/ASME A13.1 or the UPC.

B. Materials: Precoiled acrylic plastic with clear polyester coating, all-temperature, self-adhering, as manufactured by Brady, Brimar Industries, Seton, Stranco, Inc., or equal.

C. Size:

|  |  |  |
| --- | --- | --- |
| **Outside Diameter of Pipe or Insulation** | **Length of Color Field** | **Size of Letter** |
| ¾ to 1 ¼-inch | 8-inch | ½-inch |
| 1 ½ to 2-inch | 8-inch | ¾-inch |
| 2 ½ to 6-inch | 12-inch | 1 ¼-inch” |
| 8 to 10-inch | 24-inch | 2 ½-inch” |
| over 10-inch | 32-inch | 3 ½-inch |

D. Colors: As indicated in schedule.

E. Locations:

1. On accessible piping, whether insulated or not (including mechanical rooms, attic and ceiling spaces); except that labels shall be omitted from piping where contained material is obvious due to its connection to fixtures (such as faucets, water closets, etc.).

2. Near each valve and branch connection in such accessible piping.

3. At each pipe passage through wall or floor.

4. At not more than 20 feet spacing on straight pipe run between bands required in 2 and 3 above.

5. At each change in direction.

F. Application: Install on clean surfaces free of dust, grease, oil, or any material that will prevent proper adhesion. Replace non-adhering or curling labels with new labels, as required by the Project Inspector.

G. Schedule:

|  |  |  |  |
| --- | --- | --- | --- |
| **Content of Pipe** | **Legend** | **Background Color** | **Lettering Color** |
| Steam | Steam | Yellow | Black |
| Steam condensate | Stm. Cond. | Yellow | Black |
| Chilled water supply | Chill water supply | Green | White |
| Chilled water return | Chill water return | Green | White |
| Instrument air | Inst. Air | Green | White |
| Heating hot water supply | Heating hot water supply | Yellow | Black |
| Heating hot water return | Heating hot water return | Yellow | Black |
| Air conditioning condensation drain | A/C condensate drain | Green | White |

**2.06 UNDERGROUND PIPE**

A. Detectable Marking Tape:

1. Provide and install detectable marking tape along buried piping. Tape shall be specifically manufactured for marking and locating underground utilities with electronic equipment. Tape shall be acid and alkali resistant, and manufactured with integral wires or foil backing, encased with protective cladding. Tape shall be a minimum of two inches in width.

2. Manufacturer: Reef Industries, Inc., Advantage Brands, Inc., Northtown Company, Mutual Industries, Inc., or equal.

3. Detectable marking tape shall be color-coded per APWA Color Code:

a. Yellow: Steam.

b. Blue: Water.

c. Red: Electric power lines, cables, conduit and lighting cables. By Division 26.

d. Orange: Communication, alarm or signal cables. By Divisions 26 and 27.

B. Tracer Wire:

1. Solid copper wire type THWN, 12 AWG gage, with heat and moisture resistant insulation.

**2.07 IDENTIFICATION OF AIR CONDITIONING EQUIPMENT**

A. Provide identification markers to locate air conditioning equipment above T-bar ceilings. Install 3/4 inch to one inch diameter-colored self-adhesive dots to T-bar ceiling grid indicating point of access. The following identification markers shall be recorded on the project record documents:

1. Fire Damper and Combination Fire/Smoke Fire Damper: Red.

2. Manual Volume Dampers, Relief Dampers, Motorized Volume Dampers: Blue.

a. Supply air: Full dot.

b. Return air: Half dot.

3. Fan coil unit: Green.

4. Filter Location if separate from fan coil: Yellow.

**PART 3 – EXECUTION**

**3.01 INSTALLATION**

A. Correct detrimental conditions prior to commencing the Work of this Section. Install markers and identification tags as specified with materials and installation procedures recommended by manufacturer.

B. Place tracer wire on top of non-metal utility lines allowing some slack. Do not wrap tracer wire around pipe. Fasten tracer wire in place at approximately 10 feet on centers with non-metal ties.

C. Install underground detectable pipe marking tape continuously buried 8 to 10 inches above the buried utility pipe. Wrap tape on pipe risers up to a height of 12 inches above grade.

**3.02 CLEANUP**

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

END OF SECTION