1.0   GENERAL

.1   Summary

.1   Provide identification and labelling on all HVAC Systems and equipment.

.2   References and Related BCIT Standards

.1   22 05 52 Identification for Plumbing.

.3   Coordination Requirements

.1   Coordinate installation of identifying devices with location of access panels and doors. Install identifying devices before installing acoustical ceilings and similar concealment.

.4   Quality Assurance

.1   Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum five years documented experience.

.2   Installer Qualifications: Company specializing in performing work of this section with minimum five years documented experience.

.5   Extra Materials

.1   Furnish minimum of 5% extra stock of each mechanical identification material required, including additional numbered valve tags, additional piping system identification markers, and additional plastic laminate engraving banks of assorted size.

2.0   PRODUCT AND DESIGN REQUIREMENTS

.1   Identification General

.1   Provide pipe identification labels including direction-of-flow arrows and with service indicated. Labels shall have background colours matched with specific service designation.

.2   Provide valve tag numbers on all valves.

.3   Include building number for each label as a subtext to each identification, such as SW5 CC-1 for cooling coil CC-1 located in building SW5. Coordinate labelling with the DDC system identification.

.2   Equipment Labels

.1   Plastic Labels for Equipment – Indoor Application:

.1   Material and Thickness: Multilayer, multicolour, plastic labels for mechanical engraving, 1/16 inch thick.

.2   Letter Colour: Black.

.3   Background Colour: White.

Consultants are to provide complete specifications, and review these Technical Standards documents to include BCIT requirements within the specifications as applicable to the project.

    .4   Minimum Label Size: Length and width vary for required label content, but not less than 1 x 3 inches.

    .5   Minimum Letter Size: 1/4 inch.

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

.2   Plastic Labels for Equipment – Outdoor Application:

    .1   Material: MS-215 Max-Tek with printed graphics protected by a chemical and UV resistant MS-3000 top laminate.

    .2   Letter Colour: Black.

    .3   Background Colour: White.

    .4   Minimum Label Size: Length and width vary for required label content, but not less than 1 x 3 inches.

    .5   Minimum Letter Size: 1/4 inch.

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

.3   Identification of HVAC Piping

.1   Provide painted colours and banding for HVAC piping systems as follows:

Services	Identification Lettering	Primary Colour	Secondary Colour
Boiler Piping	-	yellow	black
Boiler Feed Water	B.F.W.	yellow	black
Chilled Water Return/Supply	CH.W./CH.W.S	green	-
Cold Water Service	C.W.	green	-
Fire Combined Standpipes	SPR/S.P.	red	white
Compressed Air - 0 to 690 kPa	COMP.A.	green	-
Compressed Air - 690 kPa and higher	COMP.A.	yellow	black
Condensate – Medium Pressure	M.P.Cond.	yellow	black
Condensate - Low Pressure	L.P.Cond.	yellow	black
Condensate - Pumped	Pump.Cond.	yellow	black
Condenser Water Return/Supply	C.W.R./C.W.S.	green	-
Cooling Tower Sump Water Supply/Return	C.T.W.S./C.T.W.R.	green	-
Non-Potable Cold Water	N.P.W.	purple	-
Exhaust Piping	-	yellow	black
Fire Lines W.S.	F.S.	red	white
Fuel Oil 2,3,4,5,6	F.O.#	yellow	orange
Glycol Heating Return/Supply	GLR/GLS	yellow	black
Heat Pump Water Return/supply	H.P.W.R./H.P.W.S.	yellow	black
Heat Recovery (cool)	HRC - do not drain	yellow	black
Heat Recovery (warm)	HRC - do not drain	yellow	black
Hot Water Return/ Supply	H.W.R./H.W.S.	yellow	black
Natural Gas	Gas	yellow	orange
Propane	LP GAS	yellow	orange
Safety Valve Blowdown	-	yellow	black
Fire Sprinkler Lines	SPR	red	white
Fire Sprinkler Lines (Dry)	SPR (DRY)	red	white

Consultants are to provide complete specifications, and review these Technical Standards documents to include BCIT requirements within the specifications as applicable to the project.

Steam	kPa (psi)	yellow	black
Boiler Piping	-	yellow	black

.2 Locate colour banding on maximum 3M centres. Paint gas piping and fire protection piping in the primary colour for the full length of the pipe from source to terminal equipment.

.4 Letters with Direction of Flow Arrows

.1 12 mm high - 1-1/4 NPS pipe and smaller.

.2 25 mm high - 1-1/2 NPS up to 2-1/2 NPS pipe.

.3 50 mm high - 3 NPS and larger pipe.

.4 Bands:

.1 38 mm wide, except arrow bands 50 mm wide.

.5 Colours:

.1 Horizontally hatched - primary colour.

.2 Vertically hatched - secondary colour.

.3 Black letters and arrows on yellow primary colour.

.4 Background, white letters and arrows or red, blue or green backgrounds.

.5 Pipe Labels – Exterior

.1 Provide labels for above ground piping located outside, and exposed to sunlight or a harsh environment, the following product is specified.

.2 Provide pre-printed, colour-coded, with lettering indicating service and flow direction.

.3 Pipe markers shall be constructed of MS-995 Maxilar material. Pipe markers shall withstand direct contact with all process chemicals, operating temperatures up to 250 degrees F, and prolonged exposure to direct sunlight. Markers shall be pre-coiled to wrap entirely around the circumference of pipe up to 10 inch outside diameter, and self-sealed with a strip of clear ultra violet and chemical resistant plastic film.

.4 Pipe Labels for pipe O.D. up to 10 inches: Label with a single piece, pre-printed marker that wraps entirely around circumference of pipe, and overlaps and seals to itself rather than adhere to the pipe surface. Pipe Labels for pipe O.D. 10 inches and greater: Shall be constructed of printed 5 mil (0.005 inch) polyester and top laminated with MS1000 clear ultra violet and chemical resistant plastic film.

.6 Pipe Labels Schedule – Exterior

Pipe O.D. (including insulation)	Marker Style	Marker Width	Lettering Height	Marker Type
3/4 inch to 1 inch	MS995-A	8 inches	1/2 inch	Wraparound
1-1/8 inch to 2-3/8 inch	MS995-B	8 inches	3/4 inch	Wraparound
2-1/2 inch to 4-3/4 inch	MS995-D	12 inches	1-1/4 inch	Wraparound
5 inch to 7-7/8 inch	MS995-E	12 inches	1-1/4 inch	Wraparound

Consultants are to provide complete specifications, and review these Technical Standards documents to include BCIT requirements within the specifications as applicable to the project.

| 8 inch to 10 inch | MS995-J | 12 inches | 1-1/4 inch | Wraparound |
| Over 10 inch | MS995-MB | 32 inches | 2-1/2 inch | Carrier |

.7 **Valve Tags**

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

.2 Material: Brass, 0.032 inch minimum thickness. Background Colour: Natural brass.

.3 Letter Colour: Black.

.4 Tag Size: 1-1/2 inches, round.

.8 **Valve Tags – Outdoor Labeling of Process Valves**

.1 Material: MS-215 Max-Tek with printed graphics protected by a chemical and UV resistant MS-3000 top laminate.

.2 Background Colour: To match pipe label colour by system.

.3 Letter Colour: Either white or black for best contrast to background colour.

.4 Tag Size: Minimum 1-1/2 inches.

.9 **Valve Schedules**

.1 Provide schedule for each piping system on standard-size 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.

.2 Valve schedule to be included in O&M Manual, and mounted in durable frame in all mechanical and water entry rooms (rooms where valves are present).

.10 **Warning Tags**

.1 Preprinted or partially preprinted, accident-prevention tags; of plasticized card stock with matte finish suitable for writing.

.2 Size: 3 by 5-1/4 inches minimum.

.3 Fasteners: Brass grommet and wire.

.4 Nomenclature: Large-size primary caption such as DANGER, CAUTION, or DO NOT OPERATE.

.5 Colour: Yellow background with black lettering.

3.0 **EXECUTION**

.1 **Examination**

Consultants are to provide complete specifications, and review these Technical Standards documents to include BCIT requirements within the specifications as applicable to the project.

.1 Examine substrates for proper preparation and ensure substrate is acceptable for installation. If substrate preparation is the responsibility of another installer, notify Consultant of unsatisfactory preparation before proceeding.

.2 Preparation

.1 Install identifying devices after completion of coverings and painting.

.2 Clean surfaces thoroughly prior to installation.

.3 For pipe markers that are pre-coiled or strap-on type and do not adhere directly to the piping, no surface preparation is necessary.

.3 Labelling Installation

.1 Buried Piping Identification/Markers:

.1 Metallic Pipe: Provide continuously printed 100 mm wide x 4 mil thick "Blaze Orange" plastic tape with printing indicating type of service of buried pipe. Place tape at ±300 mm above buried pipe in backfill.

.2 Non-Metallic Piping: Provide detectable multi-ply tape consisting of aluminum foil core between two (2) layers of 100 mm x 4 mill thick "Blaze Orange" plastic tape with printing indicating type of service of buried pipe. Place tape at ±300 mm above buried pipe in backfill lifts.

.3 Where multiple small pipes are buried in a common trench and do not exceed an overall width of 450 mm, install a single tape line marker.

.2 Equipment Labels:

.1 Install or permanently fasten labels on each major item of mechanical equipment. Locate equipment labels where accessible and visible.

.3 Pipe Labels:

.1 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. Near penetrations and on both sides of through walls, floors, ceilings, and inaccessible enclosures.

.3 At access doors, manholes, and similar access points that permit view of concealed piping.

.4 Spaced at maximum intervals of 50 feet along each run. Reduce intervals to 25 feet in areas of congested piping and equipment.

.4 Valve Tags:

.1 Install tags on all shut-off valves and control devices in piping systems.

    .5   Location:

         .1   Mark location of equipment or valves located above ceilings with identifying "label" to help in identification for maintenance. These label marking should be coordinated with the architects.

.4   Protection

    .1   Protect installed products until completion of Project.

.5   Cleaning

    .1   Clean faces of mechanical identification devices and glass frames of valve schedules.

*** END OF **IDENTIFICATION FOR HVAC** SECTION ***