1 General

1.1 General

.1 Remove the existing potable water (DCW) piping, including pipe insulation, electrical heat tracing, hangers and supports, and replace with/provide new. Both the existing piping and the new piping is located in an existing confined space Tunnel, as shown on the Drawings and as described with the project specifications. A certified third party “Rescue Team” is required to work along-side the successful Contractor’s work crew throughout the duration of this project. See also Specification Section 01 11 00 and Section 21 05 02 for additional details/specifics.

.2 Provide all flanges, welds, solvent cement, and/or other construction materials to make all piping, valve and fitting connections.

.3 Test all piping before insulation is installed. Submit the piping test report to the Departmental Representative.

1.2 RELATED SECTIONS

.1 Section 21 05 01 – Common Work Results – Mechanical.

.2 Section 21 05 02 – Selective Demolition.

.3 Section 23 05 29 – Hangers and Supports for HVAC Piping and Equipment.

.4 Section 23 05 53 – Mechanical Identification.

.5 Section 23 07 15 – Thermal Insulation for Piping.

.6 Section 23 08 02 – Cleaning and Startup of Mechanical Systems.

.7 Section 26 05 00 – Common Work Results – Electrical.

.8 Section 23 05 33 – Electrical Heat Tracing.

1.3 REFERENCES

.1 Canadian General Standards Board (CGSB):
  .1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.

.2 Green Seal Environmental Standards (GSES):
  .2 Standard GS-11-2008, 2nd Edition, Environmental Standard for Paints and Coatings.

2 Products

2.1 MATERIAL

.1 Piping material as per the following table:

Service	Sizes	Material	Specification Section
Plumbing- Potable Domestic Cold Water (DCW)			
Location - Jetty Tunnel	25, 50, 100 (mm)	PVC - SCH 40 Pressure Piping	22 11 16 - Domestic Water Piping
Location – Conditioned Backflow Preventer Closet (location of circulation pumps, immediately after coming through floor)	25, 38 (mm)	CU - Type L	22 11 16 – Domestic Water Piping

.2 Piping Joints: solvent cement, in accordance with Section 22 11 16.

.3 Pipe Insulation: in accordance with Section 23 07 15.

.4 Pipe Identification: in accordance with Section 23 05 53.

.5 Pipe Hangers and Supports: in accordance with Section 23 05 29.

.6 Electrical Heat Tracing: in accordance with Section 23 05 33.

.7 Cleaning and Start-up of Mechanical Piping Systems: in accordance with Section 23 08 02.

3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 CONNECTIONS TO EQUIPMENT

.1 In accordance with manufacturer's instructions unless otherwise indicated.

.2 Use valves and either unions or flanges for isolation and ease of maintenance and assembly.

3.3 CLEARANCES

.1 Provide clearance around systems, equipment and components for observation of operation, inspection, servicing, maintenance and as recommended by manufacturer and required by relevant codes.

.2 Provide space for disassembly, removal of equipment and components as recommended by manufacturer and as indicated without interrupting operation of other systems, equipment and/or components.

3.4 DRAINS

.1 Install piping with grade in direction of flow except as indicated.

.2 Install drain valve at low points in piping systems, at equipment and at section isolating valves.

.3 Drain valves: NPS 3/4 gate or globe valves unless indicated otherwise, with hose end male thread, cap and chain.

3.5 EXPANSION LOOPS

.1 Install where indicated.

.2 Provide anchors and guides.

3.6 DIELECTRIC CONNECTIONS

.1 General: compatible with system, to suit pressure rating of system.

.2 Use brass fittings (eg: valves, strainers) to join dissimilar metals on closed systems.

.3 Use dielectric unions to join dissimilar metals on open systems (ie: domestic cold water) 50 mm and smaller.

.4 Where dielectric connections are concealed, provide access through access doors or removable ceiling tiles.

3.7 PIPEWORK INSTALLATION

.1 Screwed fittings jointed with teflon tape.

.2 Cover open ends of pipe to protect openings against entry of foreign material.

.3 Install to isolate equipment and allow removal without interrupting operation of other equipment or systems.

.4 Assemble piping using fittings manufactured to ANSI standards.

.5 Install exposed piping, equipment, etc parallel or perpendicular to building lines.

.6 Install concealed pipework to minimize furring space, maximize headroom, and conserve space.

.7 Slope piping, except where indicated, in direction of flow for positive drainage and venting.

.8 Install, except where indicated, to permit separate thermal insulation of each pipe.

.9 Group piping wherever possible and as indicated.

.10 Ream pipes and remove scale and other foreign material before assembly.

.11 Use concentric reducers at pipe size changes unless shown differently on contract drawings.

.12 Provide for thermal expansion as indicated.

.13 Valves:
- .1 Install in accessible locations.
- .2 Remove interior parts before soldering.
- .3 Install with stems above horizontal position unless indicated.
- .4 Valves accessible for maintenance without removing adjacent piping.
- .5 Install globe valves in bypass around control valves.
- .6 Use gate or ball valves at branch take-offs for isolating purposes except where specified.

.14 Check Valves:
- .1 Install silent check valves on discharge of pumps and in vertical pipes with downward flow and as indicated.
- .2 Install swing check valves in horizontal lines on discharge of pumps and as indicated.

3.8 SLEEVES

.1 General: install where pipes pass through masonry, concrete structures, fire-rated assemblies, and elsewhere as indicated.

.2 Pipe sleeves shall be SCH 40 black steel pipe.

.3 Construction: use annular fins continuously welded at mid-point at foundation walls and where sleeves extend above finished floors.

.4 Sizes: 6 mm minimum clearance between sleeve and uninsulated pipe or between sleeve and insulation.

.5 Installation:
- .1 Concrete, masonry walls, and concrete floors on grade: terminate flush with finished surface.
- .2 Other floors: terminate 25 mm above finished floor.
- .3 Before installation, paint exposed exterior surfaces with heavy application of zinc-rich paint to CAN/CGSB-1.181.

.6 Sealing:
- .1 Foundation walls and below grade floors: fire retardant, waterproof non-hardening mastic.
- .2 Elsewhere:
  - .1 Provide space for fire-stopping.
  - .2 Maintain fire rating integrity.
- .3 Sleeves installed for future use: fill with lime plaster or other easily removable filler.
- .4 Ensure no contact between copper pipe or tube and sleeve.

3.9 ESCUTCHEONS

.1 Install on pipes passing through walls, partitions, floors, and ceilings in finished areas.

.2 Construction: one piece type with set screws.
- .1 Chrome, nickel plated brass or type 302 stainless steel.

.3 Sizes: outside diameter to cover opening or sleeve.
- .1 Inside diameter to fit around pipe or outside of insulation if so provided.

3.10 PREPARATION FOR FIRE-STOPPING

.1 Install fire-stopping where required within annular space between pipes, insulation and adjacent fire separation.

.2 Insulated pipes: ensure integrity of insulation and vapor barriers.

3.11 FLUSHING OUT OF PIPING SYSTEMS

.1 Flush system in accordance with Section 23 08 02 - Cleaning and Start-up of Mechanical Piping Systems.

.2 Before start-up, clean interior of piping systems in accordance with requirements of Section 01 74 11 - Cleaning supplemented as specified in relevant mechanical sections.

.3 Preparatory to acceptance, clean and refurbish equipment and leave in operating condition, including replacement of filters in piping systems.

3.12 PRESSURE TESTING OF PIPING

.1 Advise Departmental Representative 72 hours minimum prior to performance of pressure tests.

.2 Pressure test pipework according to following table:

Service	Minimum Pressure	Test Length
Domestic Cold Water (DCW)	860 kPa or 150% of maximum system pressure	4 hours

.3 Maintain specified test pressure without loss for 4 hours minimum unless specified for longer period of time in relevant mechanical sections.

.4 Prior to tests, isolate equipment and other parts which are not designed to withstand test pressure or media.

.5 Conduct tests in presence of Departmental Representative or approved third party.

.6 Pay costs for repairs or replacement, retesting, and making good. Departmental Representative to determine whether repair or replacement is appropriate.

.7 Insulate or conceal work only after approval and certification of tests by Departmental Representative.

.8 Record test results and provide copy to Departmental Representative.

3.13 EXISTING SYSTEMS

.1 Connect into existing piping systems at times approved by the Departmental Representative.

.2 Request written approval by Departmental Representative five (5) days minimum, prior to commencement of work.

.3 Be responsible for damage to existing systems by this work.

END OF SECTION