PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Perform excavating and backfilling required by work of this Section.
   2. Furnish and install potable water piping complete with necessary valves, connections, and accessories inside building and connect with outside utility lines 5 feet 1 500 mm from building perimeter as described in Contract Documents.

B. Related Sections:
   1. Section 22 0501: Common Piping Requirements.
   2. Section 22 0583: Plumbing Piping Insulation.
   5. Section 33 1116: Domestic water piping from 5 feet 1 500 mm from building perimeter to main.

1.2 REFERENCES

A. American Society For Testing And Materials:
   1. ASTM B 88-03, 'Standard Specification for Seamless Copper Water Tube.'

1.3 SUBMITTALS

A. Product Data: Manufacturer's literature on PEX pipe and PEX pipe fittings.
B. Sample: PEX pipe fitting.
C. Quality Assurance / Control: Written report of sterilization test.

1.4 QUALITY ASSURANCE

A. Pre-Installation Conference: Participate in pre-installation conference specified in Section 03 3111.

PART 2 - PRODUCTS

2.1 COMPONENTS

A. Copper:
   1. Pipe:
      a. Above-Grade: Meet requirements of ASTM B 88, Type L.
      b. Below-Grade:
         1) Meet requirements of ASTM B 88, Type K. 3/4 inch 19 mm minimum under slabs.
            a) 2 inches 50 mm And Smaller: Annealed soft drawn.
            b) 2-1/2 inches 63 mm And Larger: Hard Drawn.
   2. Fittings: Wrought copper.
   3. Connections:
      a. Above-Grade:
1) Sweat copper type with 95/5 or 96/4 Tin-Antimony solder, Bridgit solder, or Silvabrite 100 solder. Use only lead-free solder.
2) Viega ProPress System

b. Below Grade:
   1) Brazed using following type rods:
      a) Copper to Copper Connections:
      b) AWS Classification BCuP-4 Copper Phosphorus (6 percent silver).
      c) AWS Classification BCuP-5 Copper Phosphorus (15 percent silver).
      d) Copper to Brass or Copper to Steel Connections: AWS Classification BAg-5 Silver (45 percent silver).
      e) Do not use rods containing Cadmium.
   2) Brazing Flux:
      a) Approved Products:
      b) Stay-Silv white brazing flux by J W Harris.
      c) High quality silver solder flux by Handy & Harmon.
   3) Joints under slabs acceptable only if allowed by local codes.

B. Cross-Linked Polyethylene (PEX):
   1. Pipe:
      b. Copper tube size (CTS) outside dimensions and Standard Dimension Ratio (SDR) of 9.
      c. Pressure rated for 160 psi at 73 deg F, 100 psi at 180 deg F, and 80 psi at 200 deg F.
      d. Marked with Manufacturer's name, design pressure and temperature ratings, and third party certification stamp for NSF-PW.
      e. Manufactured in accordance with Noveon Chemicals TempRite PEX's multilayer construction for potable water system service.
   2. Fittings:
      a. Category Four Approved Product. See Section 01 6000 for definitions of Categories.
      1) Superpex by Bow.
      2) Ipex.
      3) Vanex Ultra by Vanguard Piping Systems.

C. Ball Valves:
   1. Use ball valves exclusively unless otherwise specified. Ball valves shall be by single manufacturer from approved list below.
   2. Valves shall be two-piece, full port for 150 PSI SWP.
      a. Operate with flow in either direction, suitable for throttling and tight shut-off. Full port, three-piece maintenance design.
      b. Body: Bronze, 150 psig wsp at 350 deg F and 400 psig wog.
      c. Seat: Bubble tight at 100 psig under water.
   3. Class One Quality Standard: Nibco T585 or S585, S595
      a. Equal by ConBraCo 'Apollo,' Hammond, Milwaukee, Nibco, Watts, Honeywell-Braukmann, Jenkins, or Stockham.

D. Combination Pressure Reducing Valve / Strainer:
   1. Integral stainless steel strainer, or separate 'Y' strainer installed upstream of pressure reducing valve.
   2. Built-in thermal expansion bypass check valve.
   3. Class One Quality Standard: Watts U5B.
      a. Equal by Cash Acme, Cla-Val Hi Capacity, Con Braco 36C, Honeywell-Braukmann, Spence Hi Capacity, Watts, or Wilkins. See Section 01 6000.

E. Mixing Valves:
   1. For 110 deg F 43 deg C Service:
      a. Water inlets with stop valves, check valves, and removable strainers.
      b. Water outlet with volume control valve and direct reading dial thermometer
      c. Flow: 12 GPM with maximum 5 psi pressure drop.
2. Category Four Approved Products. See Section 01 6000 for definitions of Categories.
   a. Lawler: 802
   b. Symmons: 5-200A

2.2 MANUFACTURERS

   A. Contact Information:
      4. Cash Acme, Cullman, AL  www_cashacme.com
     10. Honeywell-Braukmann (Honeywell Ltd), Scarborough, ON  www.honeywell.ca/braukmann.
     11. Ipex, Mississauga, ON  www.ipexinc.com
     15. Mueller Co, Decatur, IL  www.muellerflo.com
     21. Taco,
     22. Tour & Anderson,

PART 3 - EXECUTION

3.1 INSTALLATION

   A. Below Grade:
      1. Install piping under slabs without joints where possible.
      2. Insulate water piping buried within building perimeter.
      3. Bury water piping 6 inches 150 mm minimum below bottom of slab and encase in 2 inches 50 mm minimum of sand.

   B. Locate cold water lines a minimum of 6 inches 150 mm from hot water line.

3.2 FIELD QUALITY CONTROL

   A. Site Tests: Before pipes are covered, test systems in presence of Architect at 125 psi 862 kPa hydrostatic pressure for 4 hours and show no leaks. Disconnect equipment not suitable for 125 psig 862 kPa pressure from piping system during test period.
3.3 CLEANING

A. Sterilize potable water system with solution containing 200 parts per million minimum of available chlorine and maintaining pH of 7.5 minimum. Introduce chlorinating materials into system in manner approved by Architect. Allow sterilization solution to remain for 24 hours and open and close valves and faucets several times during that time.

B. After sterilization, flush solution from system with clean water until residual chlorine content is less than 0.2 parts per million.

C. Water system will not be accepted until negative bacteriological test is made on water taken from system. Repeat dosing as necessary until such negative test is accomplished.

END OF SECTION