PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Perform excavation and backfill required for installation of work of this Section.
   2. Furnish and install fire water system as described in Contract Documents.
   3. Furnish and install connection to water main.

B. Related Sections:
   1. Section 31 2316: Procedure and quality of excavating.
   2. Section 31 2323: Procedure and quality of backfilling and compacting.
   3. Section 08 7103: Padlock for post indicator valve.

1.2 REFERENCES

A. American Water Works Association / American National Standards Institute:
   1. AWWA C110 / ANSI A21.10-2003, 'Ductile-Iron and Gray-Iron Fittings, 3 in through 48 in, for Water and Other Fluids.'
   5. AWWA / ANSI C 502-2005, 'Dry Barrel Fire Hydrants.'

B. American Society For Testing And Materials:
   2. ASTM A 197-00, 'Standard Specification for Cupola Malleable Iron.'
   3. ASTM A 307-02, 'Standard Specification for Carbon Steel Bolts and Studs 60 000 psi Tensile Strength.'
   4. ASTM A 506-00, 'Standard Specification for Steel, Sheet and Strip, Alloy, Hot-Rolled and Cold-Rolled, Regular Quality and Structural Quality.'

C. National Fire Protection Association / American National Standards Institute:
   2. NFPA / ANSI 24-2002, 'Installation of Private Fire Service Mains and Their Appurtenances.'

1.3 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies:
   1. Install exterior fire water system according to NFPA 13, NFPA 24, and Cast Iron Pipe Research Institute Procedures unless specified otherwise below.
   2. Install hydrant in accordance with AWWA C 502.
   3. Install exterior fire water system up to and including pipe flange 12 inches 300 mm above floor inside building.

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

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<td>Project Name</td>
<td>Fire Suppression Water Distribution Piping</td>
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2.1 MANUFACTURED UNITS

A. Pipe:
   1. Ductile iron pipe in accordance with ANSI A21.51 / AWWA C 151 and ANSI A21.50 / AWWA C 150.
   2. Blue-Brut by Ipex Inc

B. Fittings: Ductile iron pipe fitting in accordance with ANSI A21.10 / AWWA C 110 and rubber gaskets joints in accordance with ANSI A21.11 / AWWA C 111.

C. Hydrants:
   1. Dry-barrel fire hydrant (base valve type) complying with AWWA C 502, with 150 psi working pressure with two 2-1/2 inch 63 mm hose connections and one 4-1/2 inch 113 mm pumper connection with caps and chains. Nozzle cap nuts to match operating stem nuts.
   2. Class Two Quality Standard. See Section 01 6000. Hydrants accepted by authority having jurisdiction are approved.

D. Gate Valves:
   1. Cast iron body with bolted bonnet.
   2. Indicator post pattern.
   3. Non-rising stem.
   4. 175 psi working pressure.
   5. Approved Products:
      b. Mueller: Model F-609 with flanged connection.

E. Indicator Post Valve:
   1. UL / ULC / FM Approved.
   2. Adjustable type.
   3. Cast iron body.
   4. Approved Products:
      a. Nibco: Model NIP1A Vertical Post.
      b. Mueller: Model A-20800

F. Tamper Switch:
   1. UL / ULC / FM Approved.
   2. Weather and tamper resistant.
   4. Approved Product:
      a. Potter Electric Signal: Model PCVS

G. Anchorages:
   1. Provide anchorages for tees, plugs, caps, bends, and hydrants in accordance with NFPA 24.
   2. Miscellaneous Fittings:
      a. Clamps, Straps, And Washers: Steel, meeting requirements of ASTM A 506.
      b. Rods: Steel, meeting requirements of ASTM A 575.
      c. Rod Couplings: Malleable iron, meeting requirements of ASTM A 197.
      e. Cast Iron Washers: Meeting requirements of ASTM A 126, Class A.
      f. Thrust Block: 2500 psi 17.237 Kpa concrete.

Deleted: Acceptable Products
Deleted: ¶
2.2 MANUFACTURERS

A. Contact Information:

PART 3 - EXECUTION

3.1 EXAMINATION

A. Before installation, inspect pipe for defects and cracks. Do not use defective, damaged, or unsound pipe.

3.2 PREPARATION

A. Excavate and backfill as specified in Sections 31 2316 and 31 2323 with following additional requirements:
   1. Runs shall be as close as possible to those shown on Drawings.
   2. Excavate to required depth.
   3. Grade to obtain fall required.
   4. Bottom of trenches shall be hard. Tamp as required.
   5. Remove debris from trench prior to laying of pipe.
   6. Do not cut trenches near footings without consulting Architect.
   7. Excavate trenches so outside pipe will be 12 inches 300 mm minimum below frost line or 48 inches 450 mm minimum below finish grade, whichever is deeper.
   8. Cover pipe only after testing is complete and accepted by Architect.

3.3 INSTALLATION

A. General:
   1. When work is not in progress, close open ends of pipe and fittings so no trench water, soil, or other substances will enter pipes or fittings.
   2. Keep trenches free from water until pipe jointing material has set. Do not lay pipe when condition of trench or weather is unsuitable for such work.

B. Placing And Laying of Underground Pipe:
   1. Deflections from straight line or grade, as required by vertical curves, horizontal curves, or offsets, shall not exceed $6/D$ inches per linear foot 12 500/D mm per m of pipe where D represents nominal diameter of pipe expressed in inches mm.
   2. Deflections to be determined between center lines extended of two connecting pipes.
   3. If alignment requires deflection in excess of these limitations, provide special bends or sufficient number of shorter lengths of pipe to provide angular deflections within limits approved by Architect.
   4. Laying:
      a. Shape trench bottom to give substantially uniform circumferential support to lower third of each pipe.
      b. Pipe laying shall proceed up-grade with spigot ends of bell-and-spigot pipe pointing in direction of flow.
      c. Lay each pipe true to line and grade and in such manner as to form close concentric joint with adjoining pipe and to prevent sudden offsets of flow line.
      d. Support fittings at bends in pipe line by concrete thrust blocks firmly wedged against vertical face of trench. Blocks shall be at least two cu ft 0.06 cu m in size.
e. As work progresses, clear interior of pipe of dirt and superfluous materials. Where cleaning after laying is difficult because of small pipe, keep suitable swab or drag in pipe and pull forward past each joint immediately after jointing has been completed.

C. Make joints between ductile iron and cast iron pipe and other types of pipe with standard manufactured cast-iron adapters and fittings.

D. Provide cast iron valve box for fire protection valve. Encase valve box in concrete.

E. Install ductile iron pipe to flange connection 12 inches 300 mm above floor. Provide 2 inch 50 mm minimum clearance around pipe at penetration through floor. Fill clearance with mastic.

F. Make joints between ductile iron and other types of pipe with standard manufactured adapters and fittings. Make connections between new work and existing mains using specials fittings to suit actual conditions.

G. Incidental Items of Work:
   1. Valve, plug, or cap, as directed by Architect, where pipe ends are left for future connections.
   2. Make key for unlocking valve handle identical to key used to open doors to building.

3.4 FIELD QUALITY CONTROL

A. Test system according to 'Contractor's Material & Test Certification for Underground Piping' NFPA 13, figure 1-10.1(b).2.

END OF SECTION