

SECTION 02600 – SITE MECHANICAL UTILITIES

PART I - GENERAL

1.01 DESCRIPTION

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1, General Requirements, shall be considered a part of this specification.
- B. Codes, Ordinances, and Permits: All permits, connection fees, tap fees, licenses, approvals, and other arrangements, including plumbing and riser diagrams, if required, shall be obtained by the contractor(s) at his expense. Should any changes be necessary in the drawings, or specifications, to secure such approval, this contractor shall include in his bid all costs for such changes to comply with these departments without extra costs to Walgreen Co. It will be this contractor's responsibility to provide all systems complete and operable.
- C. Scope of Work: Contractor shall furnish all materials, tools, equipment, labor, and services and pay all costs of whatever nature, as may be necessarily expended, for a proper workmanlike and fully operable installation, and completion of all site mechanical utility work beyond 5 feet from the building. The following complete piping systems shall be provided as applicable and noted:
 - 1. Fire Service Water or Combined Fire and Domestic
 - 2. Domestic Water
 - 3. Sanitary Sewers – Gravity Flow
 - 4. Storm Drainage – Gravity Flow
 - 5. Natural Gas
 - 6. Well – Irrigation Water Supply (The Engineer of Record (EOR) shall evaluate and submit a written economic justification. The EOR shall specify only when there is a Total Life Cycle Cost benefit, subject to Walgreens approval.)
 - 7. Well – Potable Water Supply (Provide when public water is not available or the EOR shall submit a written economic justification and specify a potable water supply when there is a Total Life Cycle Cost benefit, subject to Walgreens approval.)
 - 8. Lift Stations (Walgreens prefers not to have lift stations. The EOR shall evaluate the need, indicate alternative solutions, and submit a written economic justification. The EOR shall show the proposed location on the site, indicate who is served by the lift station, who owns it, how it is monitored and who pays to maintain it. The EOR shall specify lift station(s) only when there is a Total Life Cycle Cost benefit, subject to Walgreens approval.)

1.02 SUBMITTALS

- A. The contractor(s) doing the site utility work shall submit product data for all material, equipment, trim and accessories.

1.03 QUALITY ASSURANCE

- A. At Walgreens discretion, any store where any of the site utility systems operation, installation or material is considered "defective" shall be inspected, at the Landlord's/Contractor's expense, using a video camera within the underground pipe. All necessary repairs shall be made at the Landlord's/Contractor's expense.

PART II - PRODUCTS

2.01 FIRE SERVICE WATER OR COMBINED FIRE AND DOMESTIC

- A. Fire service water main and fittings 2 ½ inch diameter and larger in the ground shall be class 150 ductile-iron pipe, AWWA C151, with mechanical-joint or bell and plain spigot ends, AWWA C110 or C153. Material shall be FM approved and comply with applicable NFPA standards.
- B. If permitted by the Code and the authority having jurisdiction, the fire service water main and fittings 2 ½ inch diameter and over in the ground may be polyvinyl chloride plastic (PVC), AWWA C-900 be class 150 or 200 with bell end with gasket and spigot end. Solder shall have a 20% maximum lead content.
- C. Detector Check Valves, UL312 listed, iron body, 175 psi working pressure, with bypass water meter.
- D. Backflow preventer, reduced pressure principle type, AWWA C511, with strainer, double check valves, air gap between, test cocks and OS&Y isolation valves.
- E. Concrete Vault, precast, reinforced, 48 in. minimum inside length and width, Ladder, grey cast-iron frame and 24-inch minimum manhole cover, A16 loading, per ASTM C857/C858.

2.02 DOMESTIC WATER

- A. Domestic water main and fittings 2 ½ inch diameter and larger in the ground shall be class 150 ductile-iron pipe, AWWA C151, with mechanical-joint or bell and plain spigot ends, AWWA C110 or C153.
- B. Buried water main 2 inch diameter and under shall be ASTM B-88, Type "K" hard or soft copper pipe and ASTM B16.22 wrought copper or ASTM B16.18 Cast-copper alloy fittings.
- C. If permitted by the Code and the authority having jurisdiction, the domestic water pipe in the ground may be PVC, schedule 40, ASTM D1785 with schedule 40 socket type fittings ASTM D2466.

2.03 SANITARY SEWERS – GRAVITY FLOW

- A. Shall be standard weight grey cast-iron soil pipe with hub-and-spigot fittings conforming to ASTM 74 with ASTM C564 rubber gaskets.
- B. Standard weight ductile iron sewer pipe, ASTM A-746, with push-on joints may be used in lieu of cast-iron pipe and fittings.
- C. Where such use is acceptable to the authority having jurisdiction, pipes and fittings, may be SDR 35, schedule 40 PVC DWV sewer pipe and fittings, ASTM D-2321, with solvent cemented or gasketed joints per ASTM D3034 SDR 35. The manufacturer of the pipe and fittings shall furnish the solvent.
- D. Manholes shall be precast, reinforced concrete, 48 inch minimum inside length and width, complete with base, steps, eccentric top section and cast-iron cover with a 24-inch minimum ID.

2.04 STORM DRAINAGE – GRAVITY FLOW

- A. The specification for sanitary sewers applies
- B. Catch Basins shall be precast, reinforced concrete, 48 inch minimum inside length and width, complete with base, steps, eccentric top section and cast-iron grate with a 24-inch minimum ID, rated for traffic.

2.05 NATURAL GAS

- A. Piping shall be schedule 40 black steel pipe, ASTM A53, Type E or S, Grade B. Fittings shall be ASME B16.9, wrought steel butt-welding-type fittings or ASME B16.11 forged steel fittings. Pipe and fittings shall be wrapped with a polyethylene jacketed (PE) to minimize corrosion.
- B. Above ground pipe, 2-inch and smaller, fittings may be ASME B16.3, Class 150, and standard pattern malleable-iron fittings with threads.
- C. Underground piping, when permitted by Code and by the authorities having jurisdiction, may be polyethylene plastic (PE) ASTM D 2513 SDR 11 pipe, PE socket type ASTM D 2683 fittings or PE butt type ASTM D 3261 fittings and heat-fusion joints. Provide a tracer wire adjacent to PE pipe, terminated above grade, to facilitate locating the underground piping.
- D. Piping system shall be suitable for a working pressure of 100 psig.
- E. Comply with NFPA 54 for gas piping materials, components, installation, inspecting and testing.
- F. Include valves, gas pressure regulator(s) and all other appurtenances required.

2.06 WELL - IRRIGATION WATER SUPPLY

- A. General Description: Provide a well water system that is functional and located and constructed in such a manner that it yields water at all times and under all conditions. Provide complete with labor, casing materials, grout, well screen, and packing materials, well pump and all other accessories, controls and appurtenances as required for a complete operational system. The well shall be designed to supply the actual requirements of the irrigation system, not less than 20,000 gallons per month with a minimum constant flow of 5 GPM.
- B. Requirements Unique to Irrigation: Provide any and all Code and/or County Public Health Department requirements that are unique to irrigation water supply systems. This may include but is not necessarily limited to backflow prevention of chemical treatment for landscaping that could reverse flow into the water source below ground.
- C. Codes having Jurisdiction: The well water system shall be designed and provided in accordance with the applicable State, County and Local Codes. In any case, surface drainage shall not allow surface water to accumulate within a 15-foot radius of the well. The well shall not be closer than 10 feet to sewers, 50 feet to septic tanks or 75 feet to sewage seepage fields. The contractor performing the work shall be an experienced water supply well driller licensed in the jurisdiction where the Project is located. Comply with AWWA A100 for water supply wells.
- D. Geophysical Data: This information shall be obtained to determine the yield and quality of the water that is available. Review operating and test analysis of neighborhood well data. Take water sample (S) to verify the water is not contaminated and is safe for the environment, plants and people. Generally, a 4-inch minimum diameter well, shall be down to a deep aquifer layer of sand or gravel that will yield suitable water. Field report shall be prepared and retained that describe substrata formations, water-bearing formations, water levels, laboratory water analysis and well performance data.
- E. Well Casing: Provide a Code approved casing pipe material that allows water to enter and that keeps sand out. Casing shall comply with the applicable AWWA or ASTM standard. An approved well cap or seal shall be installed at the top of the well casing to prevent any vermin or other contamination from entering the well Provide a well vent terminating at least 8 inches above grade, turned down with an insect screen. To prevent contamination, the annular space between the drill hole and the well casing shall be grouted in accordance with Code.
- F. Pump: An electric motor driven pump shall be placed at the bottom of the well to push water up to the surface. The pump shall be a vertical-turbine submersible type well pump, complying with AWWA E101, appropriate for the water service. The screen shall be fabricated of ASTM A 666, Type 304, stainless steel. All suction, discharge, vent and electrical lines shall enter the casing through a watertight seal. Water lines entering the building shall be buried below the frost line. A closed bladder type pressure storage tank shall be located inside a heated portion of the building

and sized to handle the instantaneous water demands and prevents short cycling of the pump. A water pressure sensor shall cycle the well pump.

2.07 WELL - POTABLE WATER SUPPLY

- A. General Description: Provide a well water system that is located and constructed in such a manner that it yields safe water at all times and under all conditions. Provide complete with all accessories, controls and appurtenances as required for a complete operational system. The well system shall be designed to adequately supply the installed plumbing systems, not less than two times the average domestic water consumption of 10,000 gallons per month with an instantaneous demand of not less than two toilet flush valves totaling 50 GPM for 15 seconds. If an irrigation system is supplied from this potable well, the well water system shall adequately support the actual irrigation water requirements concurrently with the domestic water demand. The well water system shall be capable of replenishing the fire protection water storage system.
- B. Common Requirements: Paragraphs C through F. of the preceding "WELL - IRRIGATION WATER SUPPLY" specification applies to this "WELL - POTABLE WATER SUPPLY" specification.
- C. Requirements Unique to a Potable Well: Provide and comply with all Code requirements that apply to a potable well used for this commercial property to include but not necessarily limited to a design from a qualified engineer, a larger diameter outside casing, equipment to chlorinate, equipment to remove sulfur and other items deemed necessary by the authorities having jurisdiction.
- D. Disinfection: Provide an approved bleach-water solution until the well is thoroughly disinfected. Comply with AWWA A100 and AWWA C654

2.08 LIFT STATION

- A. General Description: Provide a prefabricated or equivalent built-up Lift Station as shown in the plans and as specified herein complete with all accessories, controls and appurtenances and as required for a complete operational system. The pump shall be removable for inspection or service without the need to enter the wet-well. Each pump shall be fitted with a stainless steel lifting chain. The pump shall conform to applicable requirements of NEMA, IEEE, NEC, SWPA and the Hydraulic Institute and be UL listed. Factory test the complete assembly and provide a one-year warranty for material and workmanship.
- B. Product: The duplex submersible pumping units shall be self-contained, designed to operate in a partially or completely submerged condition. Bearings shall be permanently lubricated and have a minimum L10 Bearing life of 25,000 hours. Two independent mechanical seals shall be provided. The submersible motors shall be NEMA Design B. The pump casing, impeller, motor housing and base shall be cast iron.
- C. Prefabricated Fiberglass Basin: The assembly shall be airtight and laminated of commercial grade resins and glass fiber-reinforcing material to withstand a hydrostatic pressure of 120 pound per square foot. Provide an attached exterior valve box with a hinged steel cover that contains the discharge pipes, fittings, check valves and shut-off valves.
- D. Automatic Control System: House in a NEMA 4x stainless steel enclosure that includes the following: Main disconnect, motor starter/protector for each pump, top mounted flashing alarm light, audible alarm with silence switch, normal pump run Indicator, automatic pump alternator control, H-O-A selector for each pump, pump seal failure alarm, aux. contact for high-level alarm and phase monitor.
- E. Installation. Perform in accordance with manufacturers written instructions.
- F. Acceptable Manufacturers: Chicago Pump Co., Metropolitan Pump Co., Yeomans Chicago Corp. or Walgreens approved equal

2.09 LAWN SPRINKLER (IRRIGATION) PIPING

- A. Refer to Section 02900-2, Part II, 2.02 for the applicable specification

PART III – EXECUTION

3.01 EXCAVATING AND BACKFILLING TRENCHES

- A. Excavate trenches to a depth 4 inches deeper than bottom of finished pipe elevation.
- B. Provide bedding material, a graded mixture of gravel, crushed stone and sand, ASTM D2940, with 100 % passing a 1-inch sieve and not more than 8% passing a 0.075m sieve.
- C. Shape the trench bottoms to provide uniform bearing and support of pipe, fittings, bells, joints and barrels
- D. Over the pipe, in layers not exceeding 12 inches, place and compact suitable fill material that has no vegetation, trash and is free of particles larger than 1 inch

3.02 INSTALLATION

- A. Drawing plans, schematics and diagrams indicate general location and arrangement of piping systems. Install piping as indicated unless Code requires otherwise or necessary to avoid physical conflicts, etc.
- B. Piping in General: All pipes shall be run with proper grades. Pipes shall be installed with the correct pitch, free of sags and bends. The site utility contractor(s) shall consult with the construction superintendent before installation of pipe lines. Piping shall be run as shown on the drawings, but the construction superintendent reserves the right to direct slight changes to avoid conflict with other work at no change in cost to Walgreens.
- C. Cleanouts: Full-sized brass screw plugs, cleanout plugs shall be furnished and installed where required by Code and at every turn in the waste line greater than 45 Degrees.
- D. Install schedule 40 sleeves for pipes passing through concrete and masonry walls and concrete floors. Provide a 0.25 inch minimum annular space between sleeve and pipe, then fill with an elastic watertight sealant.

3.03 TESTING, FLUSHING AND CLEANING

- A. Fire Service Water Systems: Test at 1.5 times working pressure, 100 psi minimum, for two hours without more than 2 quarts of loss per 100 joints. Comply with NFPA 24 for testing and flushing
- B. Domestic Water Systems: Test at 1.5 times working pressure, 100 psi minimum, for two hours without more than 2 quarts of loss per 100 joints.
- C. Clean and disinfect water system with a chlorine solution in accordance with NFPA 24 and AWWA C657.
- D. Sewer Systems: 10 feet (minimum) hydrostatic for one hour without leakage.
- E. Irrigation Wells: Conduct a final pumping test after the well has been constructed, cleaned, checked for plumbness and alignment.
- F. Potable Wells: Conduct a final pumping test after the well has been constructed, cleaned, checked for plumbness and alignment. Engage a qualified testing agency to perform bacteriological, nitrate, physical and other chemical analysis of water from the finished well. Submit well water samples to a laboratory certified by the authority having jurisdiction. Make analysis according to the authorities having jurisdiction. Provide Walgreens the laboratory report that shows the water meets the required health and safety standards for the subject well(s).

- G. Lift Station: In the presence of an appropriate Walgreens representative, demonstrate the proper operation to include the alternator feature, alarms and backup pump operation. Instruct maintenance personnel on access, service and preventative maintenance recommendations.

END OF SECTION