

SECTION 02542
SEWER FLOW CONTROL

PART 1. GENERAL

1.01 SCOPE

- A. The Work to be performed includes the reduction or elimination of flow in a downstream sewer to a level adequate for proper inspection, rehabilitation, or replacement according to the Specifications and the Standard Drawings herein.

1.02 PERFORMANCE REQUIREMENTS

- A. It is essential to the operation of the existing sewerage system and a requirement that there is no interruption in the flow of sewage throughout the duration of the Project, continuity of sewer service must be maintained at all times.
- B. Provide, maintain, and operate temporary facilities such as dams, plugs, pumping equipment, pipes, conduits, and necessary power to intercept sewage flow before it reaches the area of Work.
- C. Properly size all equipment, components, and appurtenances to maintain sewer flow around Work area in a manner that will not cause surcharging of sewers, damage to sewers, and that will protect public and private property from discharge or damage.
- D. Any discharge of sewage including discharges into the construction trench shall not be permitted.

1.03 SUBMITTALS

- A. Action Submittals:
 - 1. Flow Control Plan: Submit at least 48 hours prior to controlling flows. Include, as a minimum, the following:
 - a. Estimate of peak amount of flow to be controlled for each flow control setup
 - b. Detailed procedures for handling peak estimated flow.
 - c. Schedule
 - d. Drawing of plug, bypass pump, and pipeline locations.
 - e. Listing of equipment
 - 1) Bypass pump sizes, capacities, number of each size to be onsite, and power requirements including standby equipment
 - 2) Bypass pipeline sizes and material types
 - f. Sewer user notification plan
 - g. Operation plan

- h. Emergency procedures
- i. Completed Bypass Pumping Checklist

B. Informational Submittals

- 1. Permits to locate and operate flow control system

1.04 QUALITY ASSURANCE

A. Qualifications:

- 1. Flow Control System Designer: For bypassing of sewerlines larger than 12 inches, Professional Engineer experienced in the design of bypass pumping systems.

PART 2. PRODUCTS

2.01 FLOW CONTROL SYSTEM

A. General:

- 1. Provide adequate capacity and size to handle existing flows plus additional flows that may occur during periods of rainstorm. Estimate peak amount of flow to be bypassed and provide bypass flow capacity of at least 125 percent of peak flow estimate.

B. Plugs:

- 1. Provide with taps for connection of pressure gauges and air hoses, and flow-through capability.
- 2. Pipe Diameters 24 inches and Smaller: Use mechanical plugs with rubber gaskets or pneumatic plugs with rubber boots.
- 3. Pipe Diameters Larger than 24 inches:
 - a. Use inflatable bag stoppers made in two or more pieces.

C. Piping:

- 1. Material:
 - a. High-Density Polyethylene (HDPE):
 - 1) In accordance with ASTM D3350.
 - 2) Minimum wall thickness conforming to SDR 32.5
 - 3) Joints: Butt-fusion welded.
 - b. Ductile Iron Discharge Piping:
 - 1) AWWA C151/A21.51, Centrifugally cast, Grade 60-42-10 iron.
 - 2) Joints: Rubber gasketed push-on in accordance with AWWA C111/21.11.
 - 3) Fittings: In accordance with AWWA C110/A21.20.
 - c. Flexible Discharge Pipe:

- 1) Small diameter flexible pipe may be used for low pressure and low flow conditions from 8-inch and smaller gravity sewer lines, as approved by the OWNER.
 2. Leak free.
 3. Pressure rating at least 1.5 times the operating pressure.
 4. May reuse for subsequent flow bypass pumping system placements. OWNER, at their sole discretion, shall have right to reject sections deemed unserviceable.
- D. Bypass Pumps:
1. Fully automatic, self-priming units that do not require use of foot valves or vacuum pumps in priming system.
 2. Solids handling design with ability to pump minimum 3-inch diameter solids.
 3. Able to run dry for long periods of time to accommodate cyclical nature of flows.
 4. Equipped to minimize noise. Noise levels shall not exceed 86 dBA at a distance of 50 feet from the source and, if more stringent, comply with all local noise ordinances.
 5. Standby Pump: One of each size to be available onsite.
- E. Electric Power Generators
1. Be able to simultaneously start and run all electric powered pumps required for the flow to be controlled.
 2. Equipped to minimize noise. Noise levels shall not exceed 86 dBA at a distance of 50 feet from the source and, if more stringent, comply with all local noise ordinances.
 3. Shall include automatic transfer switch if the flow control system is to operate unattended.

PART 3. EXECUTION

3.01 GENERAL

- A. Notify OWNER at least 48 hours prior to implementing flow control system.
- B. Operate and maintain flow control system 24 hours per day, 7 days per week, including holidays, as required, to control flow.
- C. Take all necessary precautions to ensure no private or public properties are subjected to a sewage backup or spill. CONTRACTOR shall be solely responsible for all cleanup, damages, and resultant fines in the event of a backup or spill. In the event of a backup or spill, CONTRACTOR shall immediately notify the OWNER and begin clean-up operations.

- D. When depth of flow in a pipe section is above the maximum depth specified for inspection, or testing, reduce flow by plugging, diverting, or pumping flow around Work area.
- E. Except at pipe sags, depth of flow during television inspection and joint testing shall not exceed the requirements of Section 02541, Sewer Television Inspection.
- F. Eliminate all flow from sewer manhole-to-manhole segments during point repairs, service connection rehabilitation, manhole construction, and sewer pipe replacement or lining within that segment.
- G. If flow reaches peak estimated flow that flow control system was designed for, stop all Work that requires flow control, secure work area, and restore flow in sewer until flow recedes.
- H. After the Work is completed, return flow to replaced sewer and remove temporary equipment.

3.02 PLUGGING OR BLOCKING

- A. Flow control may consist of blocking flow with mechanical or pneumatic plugs if only a small amount of flow needs to be controlled and adequate storage is available. Plugging or blocking of flow must be pre-approved by the OWNER.
- B. Use primary and secondary plugs for each flow control location.
- C. When blocking flow is no longer needed for performance and acceptance of the Work, remove plugs in a manner that permits sewage flow to slowly return to normal without surcharging or causing other major disturbances downstream.
- D. Remove temporary plugs at end of each working day and restore normal flow. If downstream work is not or cannot be completed during the workday provide, operate, and maintain bypass pumping system.
- E. Use bypass pumping if the Work cannot be scheduled at a time when flow is low or completed during low flow period.

3.03 BYPASS PUMPING

- A. When blocking flow in upstream sewers is not appropriate or allowed by the OWNER, use flow bypass pumping for reducing flow below the maximum depth or completely bypassing flow.
- B. Design, furnish, install, and maintain all power, primary and standby pumps, appurtenances, tanks, and trucks, and bypass piping required to maintain existing flows and services.

- C. The CONTRACTOR shall obtain approval and secure all permits for placement of temporary bypass pumping system and pipeline within public right-of-way.
- D. Site Verification:
 - 1. Locate existing utilities in area of bypass pipelines.
 - 2. Bypass Pipeline Location:
 - a. Minimize disturbance of existing utilities
 - b. Confine bypass discharge pipeline within public rights-of-way or temporary construction area and permanent easement
 - c. When bypass pipeline crosses local streets and private driveways, place bypass pipeline in trench and cover with temporary pavement.
 - d. Installation of bypass pipelines is prohibited in riparian/wetland areas unless approved by OWNER.
- E. Flow bypass shall be done in such a manner that will not damage private or public property, or create a nuisance or public menace. Pumped sewage shall be in an enclosed pipe that is adequately protected from traffic, and shall be redirected into sanitary sewer system or alternatively into an enclosed tank for hauling to the wastewater treatment plant. Dumping or free flow of sewage on private or public property, gutters, streets, sidewalks, or into storm sewers is prohibited.
- F. The CONTRACTOR shall equip pump engines with noise suppression devices to keep pump noise to a minimum and comply with applicable noise ordinances.

3.04 SERVICE LATERAL BY-PASSING

- A. When it is necessary to temporarily disconnect a service lateral the CONTRACTOR shall do so in accordance with Section 02532, Sanitary Sewer (Gravity)
- B. Disconnected sewer service lateral connections shall be accommodated by bypass pumping or containment from time of disconnection to time of reconnection. This shall be accomplished by a mechanical pump and manifold system or by storage system such as a bladder tank system. The storage system shall be capable of holding adequate sewage from each sewer service connection for period of 24 hours. Each storage system shall be emptied or pumped during each 24-hour period and properly disposed of in accordance with TDEC requirements.
- C. CONTRACTOR shall monitor status of flow and storage and pump disconnected laterals more frequently where flows exceed the storage capacity of the lateral or bladder tank system.
- D. CONTRACTOR shall adhere to the listed performance requirements herein, see Performance Requirements above.

3.05 FIELD QUALITY CONTROL AND MAINTENANCE

- A. Test: CONTRACTOR shall perform a leakage pressure test of the bypass pumping discharge piping using clean water prior to actual operation. Prior to operation, test each section of discharge piping with maximum pressure equal to 1.5 times the maximum operating pressure of system. OWNER shall be given 24 hours' notice prior to testing.
- B. Inspection: CONTRACTOR shall inspect bypass-pumping system every 2 hours to ensure that system is working correctly.
- C. Maintenance Service: CONTRACTOR shall ensure that the temporary pumping system is properly maintained and a responsible operator shall be on hand at all times when pumps are operating.

3.06 CLEANING

- A. Before bypass pumping system is broken down, and moved to next section or removed at the completion of the Work, discharge sewage remaining in bypass discharge pipeline and pumping equipment to working sewer. Sewage shall not be spilled or discharged to the ground or environment.
- B. Disturbed Areas: Upon completion of bypass pumping operation, clean disturbed areas and restore to condition, including pavement restoration, at least equal to that which existed prior to start of the Work.

END OF SECTION