SECTION 02542
SEWER FLOW CONTROL

PART 1. GENERAL

1.01 SCOPE

A. Sewer flow control required to conduct the sewer line replacement, television inspection, sewer line testing, chemical root control application, and sewer line sealing operations effectively. Flow control will be required for all sewer line replacements and when sewer line flows are greater than one-third of the pipe diameter for inspection or other maintenance operations.

1.02 PERFORMANCE REQUIREMENTS

A. It is essential to the operation of the existing sewerage system that there be no interruption in the flow of sewage throughout the duration of the project. To this end, CONTRACTOR shall provide, maintain and operate all temporary facilities such as dams, plugs, pumping equipment (both primary and back-up units as necessary to intercept the sewage flow before it reaches the point where it would interfere with his work, carry it past his work and return it to the existing sewer downstream of his work.

B. Discharge of sewage into the construction trench shall not be permitted.

1.03 SUBMITTALS

A. Informational 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.
    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.
2. Permits to locate and operate flow control system.

PART 2 PRODUCTS

2.01 FLOW CONTROL SYSTEM

A. General: 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.
    b. Manufacturer: Lansas, Cherne Industries.

C. High-Density Polyethylene (HDPE) or Ductile Iron Discharge Piping:
1. Leak free.
2. Pressure rating at least 1.5 times the operating pressure.
3. HDPE Pressure Piping:
    a. In accordance with ASTM D3350.
    b. SDR of 32.5, maximum.
    c. Joints: Butt-fusion welded.
4. Ductile Iron:
    a. AWWA C151/A21.51, Centrifugally cast, Grade 60-42-10 iron.
    b. Joints: Rubber gasketed push-on in accordance with AWWA C111/21.11
    c. Fittings: In accordance with AWWA C110/A21.20.
5. May reuse for subsequent flow bypass pumping system placements. OWNER , at its sole discretion, shall have right to reject sections deemed unserviceable.

D. Flexible Discharge Pipe:
1. Small diameter flexible pipe may be used for low pressure and low flow conditions, as determined by the CONTRACTOR.
2. Use of this material is limited to controlling flow from 8-inch diameter collector sewer lines.

E. Bypass Pumps:

1. Fully automatic, self-priming units that do not require use of foot valves or vacuum pumps in priming system.
2. Open impeller 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. Engine: Equipped to minimize noise. Noise levels shall not exceed 86 dBA at a distance of 50 feet from the source.
5. Standby Pump: One of each size to be available onsite.

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. When depth of flow in a pipe section is above the maximum depth specified for television inspection, joint testing, or rehabilitation, reduce flow by plugging, diverting, or pumping flow around Work area.

D. Except at pipe sags, depth of flow during television inspection and joint testing shall not exceed that shown below for the respective pipe sizes:

Maximum Depth of Flow in Inches	
Pipe Size (Inches)	**Television Inspection and Joint Testing**
6	2.0
8	2.0
10	2.00
12	3.00
15	4.0
18	5.0
21	6.0
24	6.00

Maximum Depth of Flow in Inches	
Pipe Size (Inches)	**Television Inspection and Joint Testing**
27	7.00
30	8.00
Greater than 30	30% of Pipe Diameter

E. Eliminate all flow from sewer manhole-to-manhole segments during spot repair, service connection rehabilitation, manhole construction, and sewer pipe replacement or lining within that segment.

F. 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.

G. 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.

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. The CONTRACTOR shall obtain approval and secure all permits for placement of temporary bypass pumping system and pipeline within public right-of-way.

B. 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.

C. The CONTRACTOR shall submit to the OWNER for approval a description of the bypass pumping methodology, and bypass pumping plan before CONTRACTOR commences sewage bypass pumping

D. The CONTRACTOR shall furnish, install, and maintain power, primary and standby pumps, appurtenances, and bypass piping required to maintain existing flows and services.

E. The CONTRACTOR shall equip pump engines with noise suppression devices to keep pump noise to a minimum and comply with applicable noise ordinances.

F. The CONTRACTOR shall be responsible for continuity of sanitary sewer service to each facility connected to the section of sewer main during the execution of the Work, and shall also bypass the main sewer flow around the pipe to be replaced, or into adjacent sanitary sewers, if available.

G. The pumps and the bypass lines shall be of adequate capacity and size to handle all flows without sewage backup to private property.

H. Disconnected sewer service lateral connections shall be accommodated by bypass pumping or containment of 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.

I. The CONTRACTOR shall be solely responsible for clean-up, repair, property damage costs and claims resulting from failure of the diversion system.

J. The CONTRACTOR shall submit to the OWNER specifications for all pumping equipment to be used on the job (including all sizing calculations) and a list of all backup pumping equipment to be held in reserve on the Site.

K. The pumps and by-pass lines shall be of adequate capacity and size to handle all flows.

L. After Work is completed, flow shall be returned through replaced sewer and temporary equipment removed.

M. All costs for by-pass pumping, required during installation of the pipe shall be subsidiary to the pipe reconstruction item.

3.04 SERVICE LATERAL DISCONNECTION

A. When it is necessary to shutdown a private service line while work is in progress and before the service lines are reconnected, the OWNER shall be notified by CONTRACTOR at least one week prior to the shutdown.

B. The CONTRACTOR will notify building occupants twice regarding service lateral disconnection by placing door hangers: (1) not less than 1 week prior and (2) not more than 24 hours prior to disconnection.

C. When a service lateral must be disconnected from the main for more than 1 work day, the lateral shall be positively drained or pumped a minimum of once every 24 hours. Monitor status of flow and storage. Pump lateral more frequently where flows exceed the storage capacity of the lateral or such temporary storage as may be provided by CONTRACTOR.

D. Temporarily restore services in uncompleted sections during nonwork hours.

E. Notify building occupants when work is complete and full uninterrupted service restored.

F. No service is to remain shutdown for more than a period of 8 hours, unless CONTRACTOR provides substitute services for the residents. If the service is to be shutdown for more than 8 hours and CONTRACTOR cannot provide substitute services, then CONTRACTOR shall be required to provide temporary living quarters (i.e. hotel) for the resident at no additional cost to OWNER or the resident. Temporary living quarters shall be approved by OWNER and coordinated through OWNER's Customer Support Representative.

3.05 FIELD QUALITY CONTROL AND MAINTENANCE

A. Test: CONTRACTOR shall perform leakage and pressure tests 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.

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.

3.07 LIABILITY

A. CONTRACTOR shall be responsible for damages to private or public property that may result from his sewer flow control operations. CONTRACTOR shall be responsible for any violations of laws, regulations or permits and shall indemnify and hold OWNER harmless for any and all damages, including but not limited to, fines and penalties that arise from such violations.

END OF SECTION