

TEMPORARY BYPASS PUMPING

For Pipelines 12" Diameter and Larger or With Peak Flow in Excess of 1.0 cfs (450 gal/min)

PART 1 GENERAL

1.1 DESCRIPTION

- A. Section includes requirements for implementing a temporary pumping system to divert existing sewage flow around work area.

1.2 QUALITY ASSURANCE

- A. Perform leakage and pressure tests on discharge piping before operation. Notify Inspector prior to testing.
- B. Maintain and inspect temporary pumping system every two hours. An operator, trained in the operation of the bypass equipment, must be on-site at all times.
- C. Maintain spare parts for pumps and piping on site, as required for emergency repairs.
- D. Maintain adequate hoisting equipment and accessories on site for each pump.

1.3 SUBMITTALS

- A. Submit following a part of bypass pumping plan:
 - 1. Detailed plan and description of proposed pumping system. Indicate number, size, material, location and method of installation of suction and discharge piping, size of pipeline or conveyance system to be bypassed, staging area for pumps, site access point, and expected flow.
 - a. Size and location of manhole or access points for suction and discharge hose or piping.
 - b. Sections showing suction and discharge pipe depth, embedment, select fill and special backfill, if buried.
 - c. Temporary pipe supports and anchoring required.
 - d. Thrust and restraint block sizes and locations.
 - e. Sewer plugging method and type of plugs.
 - f. Bypass pump sizes, capacity, number of each size to be on site and power requirements.
 - g. Backup pump, power and piping equipment.
 - h. Calculations of static lift, friction losses, and flow velocity. Pump curves showing pump operating range.

- i. Design plans and computation for access to bypass pumping locations indicated on drawings.
- j. Calculations for selection of bypass pumping pipe size.
- k. Method of noise control for each pump and/or generator.
- l. Method of protecting discharge manholes or structures from erosion and damage.
- m. Schedule for installation and maintenance of bypass pumping lines.
- n. Procedures to monitor upstream mains for backup impacts.
- o. Procedures for setup and breakdown of pumping operations.
- p. Emergency plan detailing procedures to be followed in event of pump failures, sewer overflows, service backups, and sewage spillage.
 - 1) Maintain copy of emergency plan on site for duration of project.

B. Submit following certification:

- 1. Certify bypass system will meet requirements of codes, and regulatory agencies having jurisdiction.

1.4 CONTRACTORS RESPONSIBILITY FOR OVERFLOWS AND SPILLS

- A. Perform work in manner that does not cause a release or overflow of sewage from sanitary sewer system.
- B. Contractor is liable for all damages caused by failure or inadequacy of bypass pumping system.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Discharge and Suction Pipes: Approved by Engineer.
 - 1. Discharge piping: Determined according to flow calculations and system operating calculations.
 - 2. Suction piping: Determined according to pump size, flow calculations, and manhole depth following manufacturer's specifications and recommendations.

- B. Polyethylene Plastic Pipe:
 - 1. High density solid wall and following ASTM F714 Polyethylene (PE) Plastic Pipe (SDR-DR) based on Outside Diameter, ASTM D1248 and ASTM D3550
 - 2. Homogenous throughout, free of visible cracks, discoloration, pitting, varying wall thickness, holes, foreign material, blisters, or other deleterious faults.

- C. High-Density Polyethylene (HDPE).
 - 1. Homogenous throughout, free of visible cracks, discoloration, pitting, varying wall thickness, holes, foreign material, blisters, or other deleterious faults.
 - a. Defective areas of pipe: Cut out and joint fused as stated herein.
 - 2. Assembled and joined at site using couplings, flanges or butt-fusion method to provide leak proof joint. Follow manufacturer's instructions and ASTM D 2657.
 - a. Threaded or solvent joints and connections are not permitted.
 - 3. Fusing: By personnel certified as fusion technicians by manufacturer of HDPE pipe and/or fusing equipment.
 - 4. Butt-fused joint: True alignment and uniform roll-back beads resulting from use of proper temperature and pressure.
 - a. Allow adequate cooling time before removal of pressure.
 - b. Watertight and have tensile strength equal to that of pipe.
 - c. Acceptance by Engineer before insertion.
 - 5. Use in streams, storm water culverts and environmentally sensitive areas.

- D. Flexible Hoses and Associated Couplings and Connectors.
 - 1. Abrasion resistant.
 - 2. Suitable for intended service.
 - 3. Rated for external and internal loads anticipated, including test pressure.
 - a. External loading design: Incorporate anticipated traffic loadings, including traffic impact loading.
 - 4. When subject to traffic loading, compose system, such as traffic ramps or covers.
 - a. Install system and maintain H-20 loading requirements while in use or as directed by the Engineer.

- E. Valves and Fittings: Determined according to flow calculations, pump sizes previously determined, and system operating pressures.

- F. Plugs: Selected and installed according to size of line to be plugged, pipe and manhole configurations, and based on specific site.
 - 1. Additional plugs: Available in the event a plug fails. Plugs will be inspected before use for defects which may lead to failure.

- G. Aluminum "irrigation type" piping or glued PVC piping will not be permitted.

- H. Discharge hose will only be allowed in short sections when approved by Engineer.

2.2 EQUIPMENT

- A. Pumps.
 - 1. Fully automatic self-priming units that do not require the use of foot-valves or vacuum pumps in priming system.
 - 2. Electric or diesel powered.
 - 3. Constructed to accommodate cyclical nature of sewer flows.

- B. Provide.
 - 1. Necessary stop/start controls for each pump.
 - 2. One standby pump of each size maintained on site. Standby pump on-line and isolated from primary system by a valve.
 - 3. Noise attenuated pumps required outside of the hours of 7 am to 7 pm or in residential areas.

2.3 DESIGN REQUIREMENTS

- A. Bypass pumping systems:
 - 1. Sufficient capacity to pump peak flow of ____ gal/min
 - 2. Operate 24 hours per day.

- B. Provide pipeline plugs and pumps of adequate size to handle peak flow, and temporary discharge piping to ensure total flow of main can be safely diverted around section to be repaired.

PART 3 EXECUTION

3.1 PUBLIC NOTIFICATION

- A. As required by Engineer

3.2 PREPARATION

- A. Determining location of bypass pipelines.
 - 1. Minimal disturbance to existing utilities.
 - 2. Obtain approvals for placement within public or private property.
 - 3. Obtain Engineer's approval of location.

3.3 INSTALLATION AND REMOVAL

- A. Follow approved bypass pumping plan.

PART 4 MEASUREMENT AND PAYMENT

4.1 Measurement and payment will be lump sum.