

STANDARD SPECIFICATIONS
SECTION 02960
TEMPORARY BYPASS PUMPING SYSTEMS

PART 1 GENERAL

1.1 DESCRIPTION

- A. Section includes requirements for implementing a temporary pumping system for the purpose of diverting existing sewage flow around work area for duration of the project.

1.2 QUALITY ASSURANCE

- A. Follow national standards and as specified herein.
- B. Perform leakage and pressure tests on discharge piping using clean water, before operation. Notify Engineer 24 hours prior to testing.
- C. Maintain and inspect temporary pumping system every two hours. Responsible operator: on site when pumps are operating.
- D. Keep and maintain spare parts for pumps and piping on site, as required.
- E. Maintain adequate hoisting equipment and accessories on site for each pump.

1.3 SUBMITTALS

- A. Submit following Section 01330.
 - 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 Section 01450.
- 1. Certify bypass system will meet requirements of codes, and regulatory agencies having jurisdiction.

1.4 CONTRACTORS RESPONSIBILITY FOR OVERFLOWS AND SPILLS

- A. Schedule and perform work in manner that does not cause or contribute to incidence of overflows, releases or spills of sewage from sanitary sewer system or bypass operation.

1.5 DELIVERY AND STORAGE

- A. Transport, deliver, handle, and store pipe, fittings, pumps, ancillary equipment and materials to prevent damage and following manufacturer's recommendations.
 - 1. Inspect all material and equipment for proper operation before initiating work.
- B. Material found to be defective or damaged due to manufacturer or shipment.
 - 1. When Engineer deems repairable: Repair as recommended by manufacturer.
 - 2. When Engineer deems not repairable: Replace as directed by Engineer before initiating work.
 - 3. Repair or replacement of defective or damaged material and equipment will be at no cost to Commission.

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. When approved by Engineer, discharge hose will be allowed in short sections.

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 allow dry running for long periods of time to accommodate cyclical nature of effluent flows.
 - 4. Provide.
 - a. Necessary stop/start controls for each pump.
 - b. One standby pump of each size maintained on site.
 - 1) On-line, isolated from primary system by a valve.
 - c. Quiet flow pumps at request of Engineer.

2.3 DESIGN REQUIREMENTS

- A. Bypass pumping systems:
 - 1. Sufficient capacity to pump peak flow of 15 mgd.
 - a. Peak flows greater than 15 mgd as approved by Engineer.
 - b. Commission will provide flow data for bypass system.
 - 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. Follow Section 01110.

3.2 PREPARATION

- A. Determining location of bypass pipelines.
 - 1. Minimal disturbance to existing utilities.
 - a. Field locate existing utilities in proposed bypass area.
 - 2. Obtain approvals for placement within public or private property.
 - 3. Obtain Engineer's approval of location.
 - 4. Costs associated with relocation of utilities and obtaining approvals at no cost to the Commission.

3.3 INSTALLATION AND REMOVAL

- A. Provisions and requirements must be reviewed by Engineer before starting construction.

- B. Remove manhole sections or make connections to existing sewer and construct temporary bypass pumping structures at access location indicated on Drawings and as required to provide adequate suction conduit.
- C. Plugging or blocking of sewage flows shall incorporate a primary and secondary plugging device. When plugging or blocking is no longer needed for performance and acceptance of work, remove in a manner that permits the sewage flow to slowly return to normal without surge, to prevent surcharging or causing other major disturbances downstream.
- D. When working inside manhole or force main, exercise caution. Follow OSHA, Local, State and Federal requirements. Take required measures to protect workforce against sewer gases and/or combustible or oxygen-deficient atmosphere.
- E. Installation of Bypass Pipelines:
 - 1. Pipeline may be placed along shoulder of roads.
 - a. Do not place in streets or sidewalks.
 - 2. When bypass pipeline crosses local streets and private driveways, place in roadway ramps.
 - a. When roadway ramps cannot be used, place bypass in trenches and cover with temporary pavement as approved by Engineer.
 - b. Follow Section 02510.
- F. During bypass pumping operation, protect sewer lines from damage inflicted by equipment.
- G. Upon completion of bypass pumping operations, and after the receipt of written permission from Engineer, remove piping, restore property to pre-construction condition and restore pavement.

PART 4 MEASUREMENT AND PAYMENT

- 4.1 Except as otherwise specified herein, providing for and complying with requirements in this Section will not be measured for payment, but cost will be considered incidental to Contract.

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