

ITEM 51

BYPASS PUMPING

1.0 DESCRIPTION. The Contractor shall provide all labor, materials and equipment necessary to maintain uninterrupted flow around a portion of the sewage collection system to be temporarily out of service for any reason, including, but not limited to sections of host pipe that are to be lined, repairs, sewer to be video recorded or inspected, sewer to be cleaned, any new manhole and/or pipe installation and any manhole repair or modification. The design, installation and operation of the temporary pumping and/or piping system shall be the Contractor's responsibility.

2.0 SUBMITTALS. The Contractor shall provide the following information:

A. Reference Standards.

1. The bypass system shall meet the requirements and codes of all regulatory agencies having jurisdiction.

B. Shop Drawings.

1. Bypass Pumping Plan.
 - a. The Contractor shall employ the services of a pump supplier who can demonstrate to the Engineer that he specializes in the design and operation of temporary bypass pumping systems.
 - b. As part of the shop drawing requirements the Contractor shall submit to the Engineer detailed plans and descriptions outlining all provisions and precautions to be taken by the Contractor regarding the handling of existing wastewater flows.
2. This plan must be specific and complete, including such items as schedules, locations, elevations, capacities of equipment, materials and other incidental items necessary and/or required to insure proper protection of the facilities and nearby property owners.
3. This includes protection of the access and bypass pumping locations from damage due to the discharge flows, and compliance with the requirements and permit conditions specified in these Contract Documents.
4. No construction shall begin until all provisions and requirements have been reviewed and approved by the Engineer.
5. Damage brought about by the execution of an unapproved bypass plan shall solely be the responsibility of the Contractor.
6. Bypassing plan proposed will include but not be limited to:
 - a. A recommended sequence of operations to include maintaining access and utility services to all residences and businesses. Low profile, temporary steel road ramps a minimum of 12' wide and capable of passing all flow may be required.

- i. Proof that the bypass pumping system will be operated 24 hours every day without fail.
- ii. Sketches or drawings showing locations of the bypass sewer, locations of manholes from which sewage is to be pumped and locations of receiving manholes, staging areas for pumps, procedures for crossing streets and methods of maintaining traffic.
- iii. Provide for bypass pumps' hourly fuel consumption, and fuel tank storage capacities.
- iv. Sewer plugging method and types of plugs.
- v. Standby power generator size, location, hourly fuel consumption, and fuel tank storage capacities.
- vi. Downstream discharge plan.
- vii. Method of protecting discharge manholes or structures from erosion and damage.
- viii. Thrust and restraint block sizes and locations.
- ix. Sections showing suction and discharge pipe depth, embedment, select fill and special backfill.
- x. Method of noise control for each pump and/or generator. (Bypass pumps and generators used in residential areas shall be Critically Silenced.)
- xi. Any temporary pipe supports and anchoring required.
- xii. Any temporary storage tankage required including tank material type and transportation/disposal plans.
- xiii. Schedule for installation of and maintenance of bypass pumping lines.
- xiv. Photocopies of permit applications for access to public streets, and evidence that fees have been paid.
- xv. Adequate hoisting equipment for each pump and accessories shall be maintained on the site.
- xvi. Spare parts including manufacturers' recommended kits for pumps and piping shall be kept on site as required.
- xvii. Proof that storm water conveyance will be maintained if storm conduits will be used for bypass pump street crossings.
- xviii. Proof that the system will be manned 24-hours per day or that a satisfactory alarm system is installed to monitor the bypass system.
- xix. All pumps are sized so that the smallest bypass pump will have the capacity to transport the peak daily flow of each bypassed manhole.

C. Calculations.

1. Selection of bypass pumping flow rate(s) and pipe size(s) shall be justified to the satisfaction of the SCMSD.
2. Provide pump curves, calculations of static head, friction losses, and flow velocity.

D. Certifications. This section is not applicable.

E. Property Owner and/or Resident Notification.

1. The Contractor shall submit a copy of all property owner/resident notifications concerning this work to the Engineer prior to notification distribution.
2. The Contractor shall provide 48-hour prior written notification to all property owners, businesses and or residents that may be affected by the diversion of flow in the sewer, explaining work that is to take place and its time frame.
3. The notification shall include approximate time when sewage cannot be received during sewer work as well as when the sewer will be available again for receiving sewage.
4. All commercial establishments shall be provided with temporary sewer service. The means and methods shall be coordinated with the managers and the affected residents.
5. A door hanger reminder shall be placed 24 hours prior to affecting the sanitary service.
6. The Contractor shall distribute all property owner approved notifications prior to commencement of any work.

F. Supplier References. The pump supplier shall provide at least five (5) project references of similar size and complexity as this project performed by his firm within the past three years. References shall include points of contacts and phone numbers and/or email addresses.

3.0 MATERIALS. All equipment utilized for bypass pumping shall be in accordance with the following requirements.

A. Pump Equipment Requirements.

1. All pumps used shall be fully automatic self-priming units that do not require the use of foot valves or vacuum pumps in the priming system. The pumps may be electric or diesel powered.
 - a. All pumps used must be constructed to allow dry running for long periods of time to accommodate the cyclical nature of effluent flows.
2. All pumps shall be Godwin Dri-Prime® Automatic self-priming pumps (CD, DPC, or HL Series) as manufactured by Godwin Pumps of America, Inc., Global Pump Co. or approved equal.
3. The Contractor shall provide the necessary stop/start controls for each pump.
4. The Contractor shall include one stand-by pump of each size to be maintained on site. Back-up pumps shall be on-line, isolated from the primary system by a valve.
5. Discharge Piping - In order to prevent the accidental spillage of flows all discharge systems shall be temporarily constructed of rigid pipe with positive, restrained joints. Under no circumstances will aluminum "irrigation" type piping or glued PVC pipe be allowed. Discharge "lay flat" hose or gasketed PVC piping will only be allowed in short sections and by specific permission from the Engineer.

6. Allowable piping materials will be Godwin “QD” Steel Pipe (Godwin Pumps of America, Inc.), fused HDPE, high-density polyethylene pipe, meeting the requirements of ASTM F714 and with a DR rating to withstand at least 2 times the highest expected pressure in the pipe.

4.0 EXECUTION. The Contractor shall make all arrangements for bypass pumping during all times when the sewer(s) is to be out of service for any reason. The contractor shall manage and coordinate on site all necessary sub-contractors in the carrying out of this work. The county will not be responsible for directing any of the operations.

A. Bypass Pumping.

1. Bypass Pumping shall be established prior to sewer video recording and inspection per SCSE Item 40, sewer cleaning per SCSE Item 52, CIPP lining per SCSE Item 50, and new pipe/manhole installations.
2. The bypass shall be made by plugging an existing upstream manhole, if necessary, and pumping the sewage into a downstream manhole or adjacent system approved by the Engineer. The pump and the temporary bypass sewer shall be of adequate capacity and size to handle the peak flow and any dewatering.
3. The contractor/pump supplier shall maintain the by-pass pumping in a safe and operative condition at all times and shall be responsible for the protection of the lines, property and the prevention of injury to persons and structures. Safeguards shall be provided by the Contractor to the satisfaction of the Engineer, but such provisions shall not relieve the Contractor of full responsibility for the adequacy of protection.
 - a. All lines crossing roadways shall be placed below existing road grade, except for side streets approved by the Engineer to be ramped with premix asphalt on both sides of the pipe, to a slope of one inch per foot.
4. The bypass sewer shall either have temporary pavement or be securely plated (if approved by the *Engineer*). The bypass sewer may be laid over ground within the established traffic maintenance area. The bypass shall be a header for all bypass and dewatering pumping. Check valves shall be placed ahead of all pumping connections.
5. The Contractor may suggest alternate methods of bypassing the sewage but, in any event, the method used shall be approved by the Engineer.
6. The Contractor/pump supplier shall ensure around the clock (24-hours per day, 7 days per week) operation for the bypass pumping system for the duration of the flow bypassing operation *through either of the following methods*.
 - a. The supplier/vendor shall qualify each operator (one-hour training with delivery/pickup from supplier/vendor). If, upon random inspections by the County, it is determined that the bypass pumping operation is unmanned, the project shall be terminated immediately and the prime Contractor notified.

Or,

- b. A County approved monitoring and alarm system equipped with acceptable level settings and auto-dialer type functionality to notify appropriate, available personnel in accord with all other parts of this Item.
- 7. The Contractor/pump supplier shall have personnel available for immediate callout, after normal working hours, to make necessary repairs to temporarily bypass lines, install steel plates, establish road crossings, etc. The names, telephone numbers and locations of residency of these employees shall be given to the Engineer, who shall be informed of all changes.
- 8. If the failure to keep the pumps running adequately causes the sanitary sewer system to backup/overflow and flood basements of homes and/or businesses connected to the system or to cause an illicit discharge, both the contractor and on-site pump supplier representative shall report the incident, its severity, the proposed solution, the amount discharged and the amount estimated to be discharged before repair, to the owner immediately.
 - a. The Contractor shall be responsible to report the unanticipated discharge to OEPA hot line or NE district.
 - b. The Contractor shall be responsible for all:
 - i. Cleanup Costs as a result of the illicit discharge and/or spill.
 - ii. Damage Costs as a result of the illicit discharge and/or spill.
 - iii. Potential fines levied by OEPA or reviewing and monitoring agencies as a result of the illicit discharge and/or spill.
- 9. The Contractor shall coordinate the bypass pumping/piping setup with all property owners and utilities. All modifications and changes to the bypass pumping/piping setup required after initial setup due to conditions on properties, easements or right of ways shall be at the Contractor's expense.
- 10. Under no circumstances will the dumping of raw sewage on private property, streets and roads be allowed nor will surcharge of the sewers be allowed due to insufficient pumping.
- 11. Estimated flows from total service connections in the existing sewer systems on are as detailed in Item 51 – Appendix 'A'.
- 12. At the conclusion of bypass pumping, the Contractor/Pump supplier shall flush all pumps and equipment used for bypass pumping with clean water. The flush water shall be discharged into the sanitary sewer.

B. Performance Requirements.

- 1. 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, the Contractor shall provide, maintain and operate all temporary facilities such as dams, plugs, pumping equipment (both primary and back-up units as required), conduits, all necessary power, and all other labor and equipment 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.

2. The design, installation and operation of the temporary pumping and/or piping system shall be the Contractor's responsibility. The bypass system shall meet the requirements and codes of all regulatory agencies having jurisdiction.
3. The Contractor shall provide all necessary means to safely convey the sewage past the work area. The Contractor will not be permitted to stop or impede the main flows under any circumstance.
4. The Contractor shall maintain sewer flow around the work area in a manner that will not cause surcharging of sewers, damage to sewers and that will protect public and private property from damage and flooding. This protection shall include maintaining sewer service to all users both upstream and downstream of the Work.
5. The Contractor shall protect all water resources including streams and other waterways, storm sewers, wetlands and all-natural resources from any sewage discharge. The Contractor shall also exercise care in disassembling/decommissioning bypass pumping. Sewage shall be flushed out of the piping before disassembling.
6. The Contractor shall provide means and methods of sealing the manholes and other openings required by the bypass pump intake and discharge piping to prevent sewer gases from escaping the sanitary sewer system to the approval of the Engineer.

5.0 ELECTRICAL. This section is not applicable.

6.0 QUALITY ASSURANCE.

A. Testing.

1. The Contractor shall perform leakage and pressure tests of the bypass pumping discharge piping using clean water prior to actual operation. Test shall be a 15-minute hydrostatic test and shall be performed at a minimum pressure of 50 psi (up to the lowest rated working pressure for any joint or appurtenance). Quantity of make-up water shall not exceed amount as calculated in AWWA C-605. Any visible leaks shall be repaired.

B. Observation.

1. SCMSD designated representative will visually observe the work performed. The representative will notify the Engineer of any discrepancies with the contract documents in the course of the contractor performing the work. The progress observations by the SCMSD do not waive any rights or remedies, nor divest the Contractor of any responsibility for contract compliance or liability for damage.

C. Warranty.

1. This section is not applicable.

7.0 MEASUREMENT. This section is not applicable.

8.0 PAYMENT. The price for this item shall be a lump sum price bid and shall include all material, labor, equipment, and appurtenances required to accomplish the work as specified herein:

<u>Item</u>	<u>Unit</u>	<u>Description</u>
51	LS	Bypass Pumping

END OF SECTION