SECTION 812

BYPASS PUMPING

I. GENERAL

1.1 DESCRIPTION OF WORK

A. All applicable requirements of other portions of the Contract Documents apply to the Work of this Section.

B. The Work covered by this section consists of providing all labor, equipment, material and supplies and performing all operations required to bypass pump storm and wastewater (hereinafter referred to as sewage) around a manhole or sewer section in which Work is to be performed. The Contractor shall provide all pumps, piping and other equipment necessary to accomplish bypass pumping; perform all construction; obtain all permits; pay all costs; and perform complete restoration of all existing facilities and areas disturbed to conditions equal to or better than pre-construction conditions and to the satisfaction of the Owner.

C. General Requirements

1. The estimated daily flow rates for dry weather and wet weather flows will be provided for specific projects identified in need of Bypass Pumping.

2. If the depth of flow in the sewer line being televised or repaired is above the maximum allowable for the proposed Work, then the Contractor shall reduce the flow to the levels shown in Section 811 – Television Inspection, by manual operation of pump stations, plugging or blocking of the flow, or by pumping and bypassing of the flow, as acceptable to the Owner. Plugging or blocking of the flow shall only be allowed when the Contractor can demonstrate that the upstream gravity collection system can accommodate the surcharging without any adverse impact. Operation of pumping stations must be performed by the Owner and scheduled by the Contractor.

3. Violations from sewage spills shall be the sole responsibility of the Contractor.

4. The bypass system shall meet the requirements of all codes and regulatory agencies having jurisdiction in accordance with Section 107 - Legal Relations and Responsibility to the Public.

5. The Contractor shall provide bypass pumping redundancy of a minimum of 100% pump capacity of the total required flow within the system. The intent of the redundant pump capacity is to ensure adequate back-up pumps are immediately available to the system. Back-up pumps shall be on-line, isolated from the primary system by a valve.

1.2 SUBMITTALS

Submittals shall be made by the Contractor in accordance with the procedures set forth in Section 105 - Control of Work, and as described below.

The Contractor shall submit to the Owner a detailed plan and description outlining all provisions and

precautions that the Contractor shall take regarding the handling of sewage flows. The plan shall be submitted to the Owner for review and approval at least 7 Days prior to commencing Work on each portion of the system to be bypassed. The plan must be specific and shall include, but not be limited to, the following details.

A. Schedule for installation and maintenance of bypass pumping system.

B. Staging areas for pumps.

C. Bypass pump sizes, capacity, number of each size to be on site and power requirements.

D. Calculations of static lift, friction losses, and flow velocity

E. Pump curves showing pump operating range.

F. Road crossing details.

G. Protection against main breaks.

H. Sewer plugging methods and bypass time duration for each sewer section.

I. Size, length, material, location and method of installation for suction and discharge piping. This shall include any wet tap or hot tap procedures.

J. Sections showing suction and discharge pipe depth, embedment, select fill and special backfill.

K. Method of noise control for each pump and/or generator.

L. Standby power generator size and location.

M. Downstream discharging plan.

N. Methods of protecting discharge manholes or structures from erosion and damage.

O. Restraining lengths for piping. Thrust blocks will not be allowed as a method of restraint for bypass pumping systems.

P. Location of fuel tank(s) and other potential contaminants.

Q. Control and reliability methods including float switches, visual and audible alarms, and pump controls.

R. Overflow Prevention, Containment and Cleanup Plan

II. EXECUTION

2.1 GENERAL

A. The Contractor shall provide the necessary operating controls for each pump.

B. To prevent the accidental spillage of flows, all discharge systems shall be temporarily constructed of rigid pipe with positive, restrained joints. Only materials that withstand pressures greater than the peak bypass system pressures may be used. All materials shall be suitable for constant contact with domestic sanitary sewage. Under no circumstances will aluminum "irrigation" type piping or glued PVC pipe be allowed. Discharge hose will only be allowed in short sections and by specific permission from the Owner. The bypass pumping system shall be 100% watertight.

2.2 CONSTRUCTION REQUIREMENTS

A. Preparation:

1. The Contractor is responsible for locating any existing utilities in the area where the Contractor elects to locate the bypass pipelines. The Contractor shall locate his bypass pipelines to minimize any disturbance to existing utilities and shall obtain approval of the temporary pipeline locations from the Owner. All costs associated with relocating utilities and obtaining all approvals shall be paid by the Contractor.

2. When working inside a manhole or force main, the Contractor shall exercise caution and comply with OSHA requirements when working in the presence of sewer gases, combustible or oxygen-deficient atmospheres, and confined spaces.

3. The Contractor is responsible for obtaining any approvals for placement of the temporary pipeline within public rights-of-way from the Virginia Department of Transportation and Local Regulatory and Permitting Agencies.

B. Plugging and Blocking:

A sewer line plug shall be inserted into the line upstream of the section being bypassed. The plug shall be so designed that all or any portion of the upstream flow can be released. During television inspections and repair operations, flow through the line being worked shall be reduced to within the maximum limits established in Section 811 - Television Inspection, or as may otherwise be specified in Section 110 – Special Provisions. After the work has been completed, the flow shall be restored to normal.

C. Pumping and Bypassing.

1. When bypass pumping is required, the Contractor shall supply all necessary pumps, conduits and other equipment to divert the flow around the pipe section or manhole in which Work is to be performed. The bypass system shall be of sufficient capacity to handle existing peak dry-weather flow plus additional flow that may occur during wet-weather (i.e. rainfall or snowmelt events). The Contractor shall be responsible for furnishing the necessary labor and supervision to set up and operate the bypass

system. Pumps and equipment shall be continuously monitored by the Contractor during the periods that bypassing is required.

2. The Contractor shall select pumping/bypassing equipment that will not have excessive noise levels from pumping/bypassing equipment and shall be restricted to a maximum of seventy decibels (70 dB) at a distance of 50 feet, or as may be required in Section 110 – Special Provisions. If pumping is required on a 24-hour basis, engines shall be equipped in a manner to keep noise to a minimum and in accordance with the local requirements for noise control.

D. Flow Control Precautions

1. When flow in a sewer line is plugged, blocked or bypassed by the Contractor, Contractor shall take sufficient precautions to protect the public health and to protect the sewer lines from damage that might result from sewer surcharging. Further, the Contractor shall take precautions to ensure that sewer flow control operations do not cause flooding or damage to public or private property being served by the sewers involved. The Contractor shall be responsible for any damage resulting from his flow control operations.

2. When flow in a sewer line is plugged or blocked by the Contractor, he shall monitor the conditions upstream of the plug and shall be prepared to immediately start bypass pumping, if needed. Any liquid or solid matter which is bypass pumped from the sewer collection system shall be discharged to another sewer manhole or appropriate vehicle or container only. No such liquid or solid matter shall be allowed to be discharged, stored or deposited to the open environment. The Contractor shall protect all pumps, conduit and other equipment used for bypass from traffic or other possible sources of damage.

3. Should any liquid or solid matter from the sewer system be spilled, discharged, leaked or otherwise deposited to the open environment as a result of the Contractor's flow control operations, he shall be responsible for all cleanup and disinfection of the affected area and all associated costs. The Contractor shall also be responsible for notifying the sewer system operating personnel and appropriate regulatory agencies and performing all required cleanup operations at no additional cost to the Owner.

III. MEASUREMENT FOR PAYMENT

A. No separate measurement or payment will be made for bypass pumping in sewers with an estimated daily flow of less than 2 million gallons per day (mgd).

B. Estimated daily flows shall be provided by the Owner to the Contractor prior to initiating a specific project.

C. For sewers with estimated daily flows of greater than 2 mgd as defined above, the Contractor will be paid for bypass pumping based on the flow rates and localized conditions. Payment shall be made on a daily or lump sum basis as indicated on the Bid form. Measurement and payment shall include all labor, materials, equipment, tools and incidentals for pump setup, plugging, pumping and diversion of sewage flow, development of the flow control and bypassing plan, setup, pumps, piping, fuel/electricity, maintenance, transportation and storage, temporary bypass and service piping, confined space entry and equipment, inserting

and removing pipe plugs, constructing bulkheads, pumping flows, monitoring water levels, installing bypass/diversion piping, trenching, jacking and boring, abandoning the jacked casing, plating for diversion piping, backfill, compaction, placing temporary pavement, traffic control, and surface restoration.

End of Section