SECTION 027200
CONTROL OF WASTEWATER FLOWS
(TEMPORARY BYPASS PUMPING SYSTEMS)

1. GENERAL

1.1 DESCRIPTION

A. This specification shall govern all work necessary for designing, installing, implementing, operating, and maintaining a temporary bypass pumping and flow control system, as provided by the Contractor for the purpose of diverting wastewater flow around the work area for the duration necessary to complete the work (i.e., control of wastewater flows). The Contractor shall furnish all materials, labor, equipment, power, maintenance, and incidentals required to maintain continuous and reliable wastewater service in all lines for the duration of the project.

1.2 SUBMITTALS

A. **Bypass Pumping Plan Form**: It shall be the Contractor's responsibility to legibly and thoroughly complete, in its entirety, the attached Bypass Pumping Plan Form and submit it to the Engineer and/or the appropriate City staff for review and approval, prior to the installation of any pumping system proposed for use.

Unless the bypass pumping is associated with an emergency work order, the standard approval protocol is as follows: The Contractor prepares and submits the plan to the Engineer a minimum of 7 days prior to mobilizing to site. The Engineer reviews the bypass plan and coordinates approval with Engineering Services and the Operating Department. Engineer and City will put forth a reasonable level of effort to expedite the review and approval process. No deviation from the procedure shall be allowed.

B. **Bypass Pumping Plan Schematic:** In addition to the above referenced form, the Contractor shall also furnish a sufficiently detailed schematic drawing identifying the approximate location of all bypass pumping system components. The schematic drawing shall clearly label parallel/crossing streets, identify landmark structures, and depict the locations of all pumps and piping.

At a minimum, the bypass pumping plan schematic drawing and associated attachments should include the following items:
1) Pump curves showing designed operation point for this specific project
2) Approximate location of bypass system pumping components
3) Location of manhole or access point for suction and discharge
4) Configuration, routing, location and depth of the suction and discharge piping
5) General arrangement/type of additional support equipment.
6) Temporary pipe supports, anchoring and thrust restraint blocks, if required
7) Traffic Control Plan and Traffic Department permit if the bypass is within the right-of-way.
8) Description of the method for removing pressure and all wastewater from existing force mains being taken out of service, if necessary.
9) All other City-department and Regulatory requirements.

10) Sewer plugging locations, method, and types of plugs
11) Method of protecting discharge manholes or structures from erosion and damage.

1.3 RESPONSIBILITY / AUTHORITY

A. It is essential to the operation of the existing wastewater system that there is no interruption in the flow of wastewater throughout the duration of the project. The Contractor shall be completely responsible for designing, scheduling, providing, installing, operating, fueling and maintaining the temporary bypass pumping system in a manner that does not cause or contribute to overflows, releases, or spills of wastewater from the wastewater or bypass system. The Contractor shall neither anticipate nor expect any assistance from the City of Corpus Christi departments for any of the bypass operation.

B. Contractor shall provide a responsible employee to man the bypass system 24 hours per day, 7 days per week during operation. The monitoring employee shall be properly trained, experienced, and mechanically qualified such that they can quickly and effectively address any potential emergency and non-emergency situations associated with the bypass system which must remain in operation. The wastewater and bypass systems should be inspected at least once every 2 hours. The Contractor shall be responsible for ensuring that the wastewater collection system is not compromised during bypass installation or operation, and contractor shall ensure that the system operates properly during this period.

C. The Contractor shall consider and be responsible for the impacts on the collection system area, both upstream and downstream of the bypass and shall maintain the system in a manner that will protect public and private property from damage and flooding. Upstream impacts may include, but are not limited to backups and overflows. Downstream impacts may include, but are not limited to surcharges and overflows.

D. Contractor shall make all effort to minimize spills of raw wastewater during the improvements and bypassing. All spills and sanitary sewer overflows shall immediately be reported to the City at 361-826-2489 and the Contractor shall be solely responsible for wash down, clean-up and disinfection of said spillages or overflows to the satisfaction of the owner at no additional cost to the City of Corpus Christi.

E. The City is permitted through the Texas Commission on Environmental Quality to operate the wastewater system. The final authority comes from the City as to the operation of the wastewater system and as such it reserves the right to halt the bypassing operation at any time in order to maintain public health and safety.

2. PRODUCTS

2.1 MATERIALS

A. Bypass Pumps

a. Pumps shall be fully automatic self-priming pumps that do not require the use of foot-valves or vacuum pumps in the priming system. The pumps may be electric or diesel powered. Pre-approved manufacturers are Godwin or Rain-for-Rent. Approved equals may be considered by the Engineer if they meet all requirements in this specification but Contractor shall provide submittal package for Engineer's review and approval prior to installation. Pumps shall be equipped with critically silenced, sound attenuated enclosures with a maximum 65 dB (10-feet from pump), a diesel day tank with a minimum 24-hour runtime without refuel, and automatic start/stop controls for each pump.

b. Pumping capacity of the bypass pump shall be capable of handling the flow conditions at all times and shall provide a minimum of 1.5 times the existing capacity of whatever line or lift station is being bypassed.

c. The Contractor shall have adequate standby equipment available and ready for immediate operation and use in the event of an emergency or breakdown. In critical installations, as determined by the Engineer, one standby pump for each size pump utilized shall be installed at the mainline flow bypassing locations, ready for use in the event of primary pump failure.

B. Suction and Discharge Piping: Determined according to pump size, flow calculations, system operating conditions, manhole depth, and length of suction piping in accordance with the pump manufacturers specifications and recommendations. In order to prevent the accidental spillage of flows, all discharge systems shall be temporarily constructed of heavy-duty pipe with positive restrained joints.

a. High Density Polyethylene (HDPE)

i. Homogeneous throughout, free of visible cracks, discoloration, pitting, varying wall thickness, holes, foreign material, blisters, or other deleterious faults. Defective areas shall be cut out and butt-fusion welded as per manufacturer's recommendations.

ii. Assembled and joined at site using couplings, flanges, or butt-fusion method to provide leak proof joint, as per manufacturer's recommendations and ASTM D-2657.

iii. Fusing must be performed by personnel certified as fusion technicians by manufacturer of HDPE pipe and/or fusing equipment. Fused joints shall be watertight and have tensile strength equal to that of pipe.

iv. HDPE is required to be used in or adjacent to environmentally sensitive areas.

b. Polyethylene Plastic Pipe (PE)

i. High density solid wall and following ASTM F714 Polyethylene (PE) Plastic Pipe (SDR-DR) based on outside diameter, ASTM D1248 and ASTM D3550

ii. Homogeneous throughout, free of visible cracks, discoloration, pitting, varying wall thickness, holes, foreign material, blisters, or other deleterious faults.

c. Quick-Disconnect Steel Galvanized Pipe and Heavy-Duty Flexible Hoses

i. Must consist of heavy-duty steel with high tensile strength, x-ray welded, abrasion resistant and suitable for intended service with a maximum pressure rating of at least 174 PSI
ii. Bauer quick-disconnect fittings/joints shall be restrained and watertight. Joints shall consist of vacuum sealing O-rings to help pumps prime faster and perform at their designed flow rates with no leaks, even at high pressure ratings
iii. Joints shall provide 30-degree articulation at every coupling and shall not require perfect alignment to make each connection.
iv. The galvanized couplings shall not be hindered by sand, mud, and grit.

d. Valves and Fittings
   i. Contractor shall provide valves and fittings as necessary and in accordance with the approved pipe materials shown above.

e. Plugs
   i. Selected and installed according to size of line to be plugged, pipe, manhole configurations, and based on specific application.
   ii. Prior to use, Engineer may inspect plugs for defects which may lead to failure.
   iii. Contractor shall provide additional plugs in the case of failure

f. Miscellaneous
   i. When temporary piping crosses local streets/roadways and private driveways, Contractor shall provide traffic ramps or covers designed, installed, and maintained for H-20 loading requirements while in use.

3. EXECUTION

3.1 SCHEDULING & COORDINATION

A. Unless the bypass pumping is associated with an emergency work order, the Contractor shall provide a minimum of 48 hour notice to the Engineer and Wastewater Department for the startup of bypass operations once the completed bypass plan has been approved by the design engineer. Unless needed otherwise for emergency work, no bypassing shall be initiated on Friday, Saturday or Sunday, or the day immediately preceding a City holiday.

B. Inclement Weather: The Contractor shall not be allowed to commence bypass operation should inclement weather be forecast for the period of the scheduled improvements.

C. Under special circumstances, as identified by the Engineer, where critical lines with large service areas are being bypassed, the Contractor is responsible for setting up a meeting between the Engineer/City/Operating Department to affirm and coordinate the approved bypass plan and to verify the intended site installation conforms to the approved plan. Engineer may also require the bypass system to be in service for at least 24-hours prior to taking existing gravity lines or force mains out of service to demonstrate reliability.

D. Before beginning bypass operations, the Engineer/City Operating Department must be notified for field verification of pumps, piping, and equipment, etc., to ensure the site installation conforms to the approved plan.

E. Before beginning bypass operations, the Contractor shall confirm appropriate emergency contact information has been provided to the City and Engineer on the Bypass Pumping Plan Form including emergency cell phone number of bypass operators/monitors responsibly manning the bypass system 24 hours per day along with the project superintendent and pump supplier.

F. The Contractor can work extended hours, if approved by the Engineer, to perform the improvements during the bypass operation. Work during extended hours cannot create a nuisance for the neighbors.

G. Once a lift station is taken out of service and bypass operations begun, work shall be continuous on the lift station improvements until all improvements are completed and the lift station is returned to normal service.

H. The Contractor shall cease bypass pumping operations and return flows to the new and/or existing wastewater system when directed by the Owner. This may be expected if the bypass system is not in accordance with this specification or if inclement weather is in the forecast.

3.2 INSTALLATION & OPERATIONS

A. Installation of Temporary Force Mains

a. Force mains may be placed along shoulder of road, medians, and/or outside of pavement. Do not place in streets or sidewalks without Engineers approval.

b. When temporary piping crosses local streets/roadways and/or private driveways, Contractor shall provide traffic ramps or covers designed, installed, and maintained for H-20 loading requirements while in use.

c. When traffic ramps cannot be used, install temporary piping in trenches and cover with temporary pavement, as approved by the Engineer.

B. Discharge piping to gravity lines or manholes shall be designed in such a manner as to prevent discharge from contacting manhole walls or benching with as minimal turbulence as possible.

C. Plugging or blocking of wastewater flows shall incorporate a primary and secondary plugging device. When plugging or blocking is no longer needed for performance and acceptance of work, it is to be removed in a manner that permits the wastewater flow to slowly return to normal without surge, to prevent surcharging or causing other major disturbances downstream.

D. The Contractor shall not cut existing force mains or gravity lines until it is determined that the containment area in place is sufficient for handling any wastewater within the pipe.

E. Some locations may require multiple bypass systems. If bypass system is provided with air release valves, then the valve drains shall be piped to a manhole for discharge.

F. Upon completion of the bypass pumping operations, remove piping, restore property to pre-construction condition and restore pavement.

4. MEASUREMENT AND PAYMENT

Unless otherwise specified in the Bid Form, Control of Wastewater Flows (Temporary Bypass Pumping Systems) shall not be measured for pay but will be considered subsidiary to the applicable pay item, to include all material, labor, equipment and supervision necessary to complete the bypass design, planning, coordination, installation, operation, maintenance and removal.

BYPASS PUMPING PLAN FORM

Date: _____ _____

Project Title: _____ No.: _____
Engineer: _____ Contractor: _____

Service Area: _____ Lift Station No. (if applicable):_____
Start Date & Time: _____ Completion Date & Time: _____

Sewer Line Size being Bypassed: _____ Estimated Peak Flow: _____
Line Plugging Method & Locations: _____
Suction Manhole or Lift Station Number and Depth: _____
Discharge Manhole or Lift Station Number and Depth: _____
Maximum Surcharge Depth Allowed: _____
Bypass Forcemain Size, Material & Length: _____
Pump Description: (Self-Priming, Critically Silenced, and Automatic Level Controls Required)
Make, Model, Suction/Discharge Size:_____ Diesel or Electric
Total Number of Pumps/Standby Pumps: _____
Total & Firm Capacity (GPM @ TDH): _____

Vacuum Trucks (if required, number and capacity): _____
Contractor Personnel Manning Bypass System (24 hours/day):
Name: _____ Phone: _____
Name: _____ Phone: _____
Emergency Contacts:
Name: _____ Phone: _____
Name: _____ Phone: _____

Additional Notes:
_____
_____

Required Checklist:

YES	NO	
☐	☐	Schematic drawing providing details of proposed bypass pumping system, routing of bypass lines (using manhole numbers and/or lift station names as applicable), equipment location, and proposed sequencing.
☐	☐	Has traffic control plan been appropriately modified to facilitate the bypass pumping equipment?
☐	☐	Pumps: Self-priming & Critically Silenced. Provide pump curve with Bypass plan. (Requirement).
☐	☐	Contractor shall coordinate with Supplier for appropriate instruction and training on pump operation.
☐	☐	Have emergency and/or backup provisions been made for quick pump change out in the case of system failure?
☐	☐	Contractor has confirmed no rain (less than ½-in) in the forecast?

Prepared by: Reviewed by:

_____ _____
Contractor Representative Date Wastewater Representative Date