SPECIFICATION FOR TEMPORARY

BYPASS PUMPING SYSTEMS

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1.1 SCOPE

A. Under this item the Contractor is required to furnish all materials, labor, equipment, power, maintenance, etc. to implement a temporary pumping system for the purpose of diverting the existing flow around the work area for the duration of the project.
B. The design, installation and operation of the temporary pumping system shall be the Contractor's responsibility. The Contractor shall provide the services of a professional company who can demonstrate to the Owner and Engineer that the provider specializes in the design and operation of the temporary bypass pumping systems.

1.2 REQUIREMENTS

A. Furnish pumping units and all accessories from a single bypass vendor, if not Contractor provided. Contractor's Bypass Vendor must have a physical location and service facility within _____ miles of the project.

B. The Contractor shall submit to the Engineer a detailed bypass plan containing descriptions and
outlining all provisions and precautions to be taken by the Contractor regarding the handling of existing wastewater flows. This plan must be specific and complete, including such items as locations, elevations, capacities of equipment, materials and all other incidental items necessary and/or required to ensure proper protection of the facilities, including protection of the access and bypass pumping locations from damage due to discharge flows, and compliance with the requirements and permit conditions specified in these Contract Documents. No construction shall begin until all provisions and requirements have been reviewed and approval by the Engineer.

C. The Contractor or Contractor's Bypass Vendor shall submit five references of bypass projects performed in the last (10) years of projects greater than ____million gallons per day (mgd). References shall include owner and contractor contact information.

D. The example bypass plan shall include but not limited to details of the following:

1. Staging area for pumps;
2. Sewer plugging method and types of plugs;
3. Number, size, material, location and method of installation of suction piping;
4. Number, size, material, method of installation and location of installation of discharge piping;

5. Bypass pump sizes, capacity, number of each size to be on site and power requirements;
6. Calculations of static lift, friction losses, and flow velocity (pump curves showing pump operating range shall be submitted);
7. Standby power generator size, location;
8. Downstream discharge plan;
9. Method of protecting discharge manholes or structures from erosion and damage;
10. Thrust and restraint block sizes and locations;
11. Sections showing suction and discharge pipe depth, embedment, select fill and special backfill;
12. Method of noise control for each pump and/or generator;
13. Any temporary pipe supports and anchoring required;
14. Design plans and computation, of amount of potential bypass plus a safety margin, for access to bypass pumping locations indicated on the drawings;
15. Calculations for selection of bypass pumping pipe size;
16. Schedule for installation of and maintenance of bypass pumping lines;
17. Plan indicating selected location of bypass pumping line locations, including proposed vehicle and pedestrian ramps; the plan must show any locations where bypass lines or equipment are located outside of public right-of-way, or existing utility easements.
18. Any required manholes to be altered for access.
19. Any required trenching.
20. Any required traffic control.

1.3 EQUIPMENT

A. Each temporary bypass pumping system shall be complete including pumps, drives, piping, piping headers, valves, controls, appurtenances, and other equipment as required for a complete system.

B. The Contractor or the Contractor's Bypass Vendor shall be required to own and maintain all bypass equipment necessary to perform the bypasses on this project.

C. 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. All pumps used must be constructed to allow dry running for long periods of time to accommodate the cyclical nature of effluent flows. The pumping equipment shall be sound attenuated (70 dba @ 23') and be mounted on an environmental skid which has the capacity of containing any and all hazardous fluids utilized within the engine compartment.

D. All temporary pumps' diesel engines must be Tier 3 or newer.

E. Provide the necessary stop/start controls for each pump. The stop/start control shall be an integral part of the engine control panel. For bypassing sewers 30" and larger, automatic level transducers are required to maintain the proper surcharge levels in the sewer line.

F. Standby pumps shall be provided with a minimum flow redundancy of 50% of peak bypass system design flow (*note: the % redundancy may be varied based upon Owner requirements and risk/project conditions. The % redundancy required will likely impact project cost)*. Back-up pumps shall be on-line, isolated from the primary system by a valve and capable of becoming operational via automatic controls.

G. 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 shall be allowed. Discharge hose will only be allowed in short sections and by specific permission from the Engineer.

   Allowable piping materials will be fused, high-density polyethylene pipe. The fusion operator(s) shall be certified by a manufacturer of pipe fusion equipment.

   The minimum wall thickness for all high-density polyethylene is SDR 26. SDR 32.5 will not be allowed.

   All pumps shall be sound attenuated to 70 dBA @ 23ft. (*note: sound attenuation requirements may be optional depending on project site conditions and local ordinances).*

H. A USA pump company shall manufacture the pumps. The pump manufacturer shall be in business in the United States of America for a minimum of 15 years from date of bypass pump submittal. The pump manufacturer must be able to provide documentation to this effect in the bid submittal to engineer. Pumps produced by companies which are licensees or distributors of foreign pump manufacturers are not considered American made pumps.

I. The pumps used must be manufactured by a company that is ISO 9001 registered with a RAB (registration accreditation board) accredited third party registrar. The pump manufacturer is to also be ISO 9001 certified for Engineering Design Services and After Market Service. A copy of the ISO 9001 certificate is to be included with the bypass pump submittal to the engineer.

J. Acceptable Bypass Pumping Contractors:
   1.
   2.
   3.

1.4 SYSTEM DESCRIPTION

A. Design Requirements:

1. Bypass pumping systems shall have sufficient capacity to pump a peak flow of the line segment to be bypassed. All pipeline plugs, pumps, and temporary discharge piping and fittings shall be of adequate size to handle peak flow and ensure that the total flow in the wastewater system can be safely diverted around the section to be repaired. Bypass pumping system will be required to be operated 24 hours a day.

2. Flow Requirements

    i. Line segment XX _____mgd (Average)_____mgd (Peak)
    ii. Line Segment XX _____ mgd (Average) _____ mgd (Peak)

3. Surcharge limits

    Surcharges in the sanitary system where suction of the bypass is occurring shall not exceed elevation _____feet. *(note: optional, however definition of the allowable surcharge elevation in the system may reduce costs)*

4. Adequate standby equipment with a minimum flow redundancy of 50% of peak bypass system design flow shall be available and ready for immediate operation and tied into the bypass system.

5. Laterals sewers 15” and larger requiring bypass must have primary and standby diesel auto-priming pumps. If connecting to the main bypass discharge line the connection must have an isolating gate valve.

6. If connecting discharge piping to an existing force main, the bypass system must overcome the static and friction force main head pressure at the point of connection to the existing force main.

7. The bypass pumps, if over 6” in size, must use an automatic level transducer.

B. Performance Requirements:

1. The construction and operation of the bypass must be performed by the Contractor or Bypass Vendor originally proposed by the Contractor, unless otherwise approved by Owner.

It is essential to the operation of the existing sewerage system that there is 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 their work, carry it past their work and return it to the existing sewer downstream of the work.

The design, installation and operation of the temporary pumping system shall be the Contractor's responsibility.

2. The bypass system shall safely convey the sewage past the work area without stopping or impeding wastewater system flows and in a manner that will protect public and private property from flooding and damage.

3. Contractor shall be responsible for any and all damages to public or private property resulting from deficiencies in or failure of the bypass system.

4. Plugging or blocking of sewage flows shall incorporate a primary and secondary plugging device.

1.5 FIELD QUALITY CONTROL AND MAINTENANCE

A. Test:

1. Leakage and pressure testing of the bypass pumping discharge piping shall be performed using clean water prior to actual operation. The Engineer will be given 24 hours notice prior to testing.

2. Test pressure shall be 1.5 times the system operating pressure, or 5 psi below the maximum HDPE pipe rated pressure, whichever is the lowest number. The test must hold pressure for a minimum of 2 hours.

3. The bypass design operating pressure must not exceed 10 psi below the maximum pressure rating of the HDPE pipe.

B. Inspection:

1. The bypass discharge piping system shall be inspected every two hours to ensure no damage or leaks.

C. Maintenance Service:

1. The temporary pumping system shall be

properly maintained and a trained pump mechanic with a fully stocked service vehicle shall be onsite 24/7 when pumps are operating.

2. The pump mechanic must be a full-time employee of the Contractor or Bypass Vendor with at least 1 year experience with bypass pumping. No temporary employees are permitted to operate or watch the bypass.

3. Bypass pump watch logs shall be maintained onsite at all times recording every ½ hour:

    i. System Discharge Pressure
    ii. Pump RPM
    iii. Suction Manhole surcharge level
    iv. Plug Pressure
    v. Fuel levels
    vi. Flow - if flow meter is required
    vii. Discharge line condition (every two hours)

D. Extra Materials:

1. Spare parts for pumps and piping shall be kept on site as required.

2. HDPE pipe repair bands for each size HDPE pipe shall be kept on site.

3. Fuel (not including fuel in equipment) for the operation of the bypass pumps for a period of 24 hours shall be stored onsite.

1.6 PREPARATION

A. Precautions

1. Contractor is responsible for locating any existing utilities in the area selected to locate bypass pipelines. The Contractor shall locate bypass pipelines to minimize any disturbance to existing utilities and shall obtain approval of the pipeline locations from the Owner and the Engineer.

2. Bypass system equipment, piping, and operation shall protect Owner's existing wastewater system infrastructure.

1.7 INSTALLATION AND REMOVAL

A. The Contractor shall remove manhole sections or make connections to the

existing sewer and construct temporary bypass pumping structures only at the access location indicated on the Drawings and as may be required to provide adequate suction conduit.

B. When plugging or blocking is no longer needed for performance and acceptance or work, it is to be removed in a manner that permits the sewage flow to slowly return to normal without surge, to prevent surcharging or causing other major disturbances downstream.

C. The Contractor shall exercise caution and comply with all local, state or provincial and federal safety requirements when working in the presence of sewer gases, combustible or oxygen-deficient atmospheres, or in any confined space.

D. When the bypass pipeline crosses local streets and private driveways, the Contractor must place the bypass pipelines in trenches and cover with flowable fill and temporary asphalt or steel road plates, or utilize approved bypass road ramps. Upon completion of the bypass pumping operations, and after the receipt of written permission of the Engineer, the Contractor shall remove all the piping, restore all property to pre-construction condition and restore all pavement.