

SECTION 01520
MAINTENANCE OF PIPELINE AND PUMPING OPERATIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. The intent of this specification is to have the Contractor schedule and perform the force main tie-in work, sanitary manhole or gravity sewer rehabilitation, and pump station shutdowns, bypasses, and startups in a manner such that the Owner can maintain service in continuous dependable operation and meet all regulatory requirements. The Contractor shall adhere to the constraints listed in this Section. *{Engineer to modify this Specification section in collaboration with HRSD's Project Manager to the specific situations to be encountered for each project}*

1.2 GENERAL CONSTRAINTS

- A. All shutdown operations shall be approved by the Owner. All shutdown operations shall be coordinated with and scheduled at times suitable to the Owner.
1. HRSD Operations field support is limited to Tuesdays, Wednesdays, and Thursdays (excluding HRSD observed holidays) only.
 2. Flow diversions and pump station / pressure reducing station shutdowns will be between the hours of 10 PM and 4 AM unless otherwise noted or approved.
- B. Bypass pumping systems or temporary emergency generators required for work on force mains, gravity mains, pump stations, or pressure reducing stations to be tested and alarmed as follows:
1. Pumps and generators to be successfully tested for 24 hours continuously.
 2. Alarms to be installed to insure adequate response time for operational issues.
 3. Contractor to be the first responder to alarms throughout the bypass / shutdown event.
 4. Contractor responsible for fuel and required maintenance and documentation
- C. HRSD does not guarantee complete system valve closures. The Contractor's Plan of Operation shall account for this situation in the developed plan.
- D. Shop drawing submittals for all pipe and appurtenance materials required for the tie-in work shall be reviewed and approved by the Engineer prior to scheduling of the tie-in.
- E. Shutdowns shall not begin until all required materials are on-hand and ready for installation and a written Plan of Operation has been submitted and approved by the Owner.

At a time approved by the Owner, the shutdown period will commence, and the Contractor shall proceed with the Work continuously, start to finish, unless otherwise noted, until the Work is completed and the system is tested and ready for operation. If the Contractor completes all required Work before the specified shutdown period has ended, the Owner may immediately place the existing system back in service.

1. If problems occur, Contractor along with appropriate staff and equipment to remain on site to be an extension of HRSD operational response until all operational issues have been resolved to the satisfaction of HRSD.
 2. Labor crews involved with a tie-in must be switched out after a maximum of 12-hour shifts.
 3. Consideration shall be given to extreme weather conditions as to whether or not reductions in crew shift time periods will be required at Owner's discretion
- F. The Owner reserves the right to cancel scheduled shutdowns if conditions warrant.
- G. Both Interim Record Drawings and Interim Valve Guides must be submitted and approved by HRSD in accordance with "Section 01323 – Record Documents" prior to a tie-in, shutdown, or system bypass.

1.3 GENERAL WORK SEQUENCE

- A. Notification and Meetings:

1. The Contractor to submit a tentative schedule to the Engineer at least 30 calendar days prior to any work on or work affecting active HRSD force mains, pump stations, and gravity sewer mains for Owner to evaluate resources and prepare to support the Contractor's work efforts.
2. The Contractor shall provide written notice in the form of Contractor's Plan of Operation and tie-in checklist to the Owner and Engineer 10 business days prior to his anticipated tie-in date.
3. The Contractor shall develop and submit Interim Valve Guides and Interim Record Drawings to the Engineer for review a minimum of 5 business days in advance of the scheduled tie-in, shutdown, or startup. No tie-ins or shutdowns of an active HRSD system will be allowed until the referenced Interim Valve Guides and Interim Record Drawing are submitted and approved.
4. The Contractor shall schedule a Pre-tie-in and/or Pre-Startup Coordination Meeting 5 business days prior to the scheduled tie-in to review the previously submitted and approved Plan of Operation with the Owner, the Engineer, and *{representatives from affected locality and private utility owners}*. This meeting will not be held until the Plan of Operation has been approved by the Engineer and the Owner. The following will be discussed at this meeting:
 - a. Review of tie-in checklist
 - b. Review of site conditions to include rodding of air vents, operation of valves, access to all appurtenances, etc.
 - c. Review of weather forecast/weather impacts to include freezing temperatures for pump & haul operations.
 - d. Review contact information
5. The Contractor is required to schedule a meeting on site on the morning of a planned nighttime tie-in *{or one business day prior to a daytime allowable tie-in}* and shall notify the Owner, Engineer, and the *{representatives from affected locality and private utility owners}*. At the time of the meeting, the Contractor shall have all materials and equipment necessary for the tie-in on site, operable and assembled for inspection by the Owner and Engineer. The following will be discussed at this meeting:
 - a. Review of site conditions
 - b. Review weather forecasts / weather impacts
 - c. Review work and contingency plans
 - d. Review contact information
 - e. Review of emergency equipment
6. The Owner reserves the right to postpone the scheduled tie-in if:
 - a. The site or Contractor is not prepared as required in the plan notes and as agreed upon at the pre-tie-in meeting.
 - b. The Owner or the *{insert name of locality where work is being performed}* has an emergency in another part of their system.
 - c. A rain event has occurred in the 3 calendar days before the scheduled tie-in date or is forecasted in the 24 to 48 hours after the scheduled tie-in date in a portion of the sewer system with historical problems with inflow and/or infiltration.

B. Coordination:

1. The Contractor shall coordinate all activities with the Owner, Engineer, and the *{representatives from affected locality and private utility owners}* for acceptable dates for connection to force mains and any pipe removal and/or abandonment.
 - a. Contractor's coordination shall include phone calls, meetings and discussions with the Owner, Engineer, and the *{representatives from affected locality and private utility owners}*.
 - b. Contact with these entities shall be initiated simultaneously with the written notice of the scheduled tie-in to the Owner and Engineer.
 - c. Text messaging shall not be an acceptable form of communication for coordination, or any other purposes related to the project.

2. The Contractor shall coordinate with the Engineer for preparation and submission of a Request for Valve Operation to Owner as follows:
 - a. 5 business day notification to Owner for more than 2 required valve operations.
 - b. 2 business day notification to Owner for 1-2 required valve operations.
 - c. If the shutdown requires the operation of newly installed valves, a temporary valve guide must accompany the request.
 3. *{Insert CCTV inspection requirements during shutdown/tie-in operation, as applicable}*.
- C. Plan of Operation: At a minimum the Contractor's Plan of Operation shall include the following:
1. Schedule:
 - a. Starting date.
 - b. Sequential listing of specific tasks required to complete the tie-in.
 - c. Anticipated duration for each task of the tie-in operation.
 2. Method of dewatering the existing force main including where the sewage is to be disposed, and provide quantity of wastewater anticipated in dewatering.
 3. Method of handling constant flow if valves or line stops do not close completely. HRSD cannot guarantee that full stoppage of flow will be achieved.
 4. List of pump stations that must be maintained including HRSD, Locality and private stations.
 5. Number of pumper trucks, to include capacity of each truck, to be supplied to handle flow at the existing stations and the pipe dewatering operations.
 6. Contingency plan for handling flow at the existing pump station if the shutdown hours exceed the anticipated time frame.
 7. Contingency plan for meeting a deadline for full traffic to be restored if a Locality roadway is taken out of service or the capacity reduced during the tie-in and the completion schedule cannot be met.
 8. Mobile phone contacts (local phone number) for Contractor personnel, HRSD key personnel, Locality operations personnel, and other identified key stakeholders.
 9. List of equipment and number of crews to verify adequacy of Contractor's ability to work both ends of the tie-in simultaneously and continuously until connections are complete.
 10. Stone and other backfill materials to be on-site if rain is forecast and to be used if a heavy rain event occurs during the tie-in backfill and compaction stage.
 11. Confirmation of availability and scheduling of asphalt placement and proper cure time for tie-ins under existing pavement to restore traffic movement.
- D. Connection Work:
1. Shutdowns shall occur between the hours of 10 PM to 4 AM Tuesday through Thursday or as directed by the Owner or the *{insert name of locality where work is being performed}* at the time of shutdown.
 2. The operation of all existing HRSD-owned mainline valves, air vents, and pump stations will be performed ONLY by HRSD forces.
 3. The operation of all existing locality-owned mainline valves, air vents, and pump stations will be performed only by locality forces.
 4. The operation of all existing privately-owned mainline valves, air vents, and pump stations will be performed only by forces of the private utility.
 5. A decision point will be established by HRSD and the Engineer for the Contractor to cut the active force main. This decision during the tie-in will be based upon the Contractor's progress leading up to the cutting into the active force main. Inadequate progress by the Contractor leading up to this critical decision point may lead to a postponement of the tie-in completion, backfilling the excavation, placing temporary pavement, and rescheduling the remainder of the tie-in work.

6. Unless otherwise noted herein, the Contractor shall work continuously once the force main has been cut until the connection work is complete, operating pressure restored, visual test for leaks is complete, and the trench is backfilled to the satisfaction of the Owner's Representative.
7. The Contractor shall provide a crew with equipment for each connection point so that multiple connections can be completed simultaneously.
8. The Contractor is responsible for conveying sewage from all affected pump stations to prevent overflow throughout the entire duration of each shutdown. The fact that a facility served by one of these stations is closed at night is not a guarantee of zero sewage flow.
9. The amount of sewage within the force main anticipated to be handled by the Contractor during the shutdown, at the tie-in areas, is estimated for each service transfer. This data is given for information only, is derived from record drawings (not verified in the field) and no guarantees are given to the Contractor regarding volume of remaining sewage.
10. Once the dewatering of the force main has begun, all dewatering efforts in the tie-in trenches must be directed to an approved collection facility (e.g. vacuum truck or existing sanitary sewer collection system). This shall continue for the entire remaining duration of the tie-in. The Contractor is to be aware that discharging sewage from the tie-in excavation into an unapproved collection facility (e.g. creek, storm drainage, or drainage ditch) is unlawful and will not be permitted. Contractor to provide to Owner's Representative tickets or other documentation for each truck / tanker cycle of fill / dump used for pump & haul operations during tie-in or shutdown.
11. *{Engineer to coordinate with HRSD's Project Manager to specify allowable time duration for HRSD to perform CCTV related to condition assessment of existing pipe to be connected to following the Contractor's dewatering of the pipeline}.*
12. The Contractor is responsible for providing adequate screening during any bypass pumping or pump & haul operations in order to minimize debris.
13. The Contractor is responsible for providing adequate support and restraint, against system pressure of the exposed piping prior to and during startup and final backfill.
14. The Contractor shall follow the procedures herein for any joints of the new force main and fittings that have not been previously hydrostatically pressure tested:
 - a. HRSD reestablishes services in the line.
 - b. One half hour will elapse, after air venting is complete by HRSD.
 - c. Joints will be visually inspected for signs of leakage by Owner or Owner's Representative.
 - b. Any leakage noted shall be corrected to the satisfaction of the Owner or the Owner's Representative.
 - c. After satisfactory visual testing of exposed joints by the Owner's Representative and any corrective action, the Contractor shall wrap the pipe and/or fitting as required and immediately proceed to backfill the pipe and restore to grade conditions or for reestablishment of traffic if in a roadway. Soil backfill compaction tests may be specified by the Owner or Owner's Representative for work within roadway travel lanes.
 - d. If specified, utility warning tape shall be installed above the connection in accordance with the Bid Documents..
 - e. Any joints not inspected by the Owner or the Owner's Representative, will not be approved and shall be excavated for inspection.
15. The Contractor shall assist the Owner during the reestablishment of flows as follows:
 - a. Provide riser pipe, fittings, sewage containment drums for each control air vent locations, and temporary valve at the air release point to vent air.
 - b. Provide means of electronic communication to coordinate this operation.

1.4 LINE {INSERT HRSD LINE NUMBER} SHUTDOWN:

- A. General: This section describes, in general, the Work required to connect the relocated *{insert HRSD line number}* Force Main. The interconnections shall be completed in two phases, using both pump and haul and a line stop/bypass operation. This shutdown procedure describes, in general, the overall connection sequences. Refer to Contract Drawings for additional details.

1. *{Add additional details as necessary}*.

B. Maximum Duration:

1. *{Insert duration of shutdown in hours}*. Shutdown will only be allowed between the hours of *{insert time period indicating PM and AM}* *{insert days of shutdown, e.g. "Tuesday through Thursday"}*.

C. Affected Pump Stations: The Pump Stations directly impacted by the shutdown of Line *{insert HRSD line number}* are:

1. *{Insert all applicable pump stations affected}*.

D. Prior Work:

1. *{Describe as needed}*.

E. Bypass Pumping:

1. This shutdown will require temporary bypass pumping *{use if needed}*.
 - a. The average daily flow into the HRSD *{insert pump station name}* Pump Station is estimated to be *{insert flow}* gpm and the maximum daily flow is estimated to be *{insert flow}* gpm.
 - b. Supply all necessary pumps, conduits, operating controls, and other equipment to divert the flow around the section of force main pipe that is shut down and isolated.
 - c. The Contractor is responsible for furnishing the necessary labor and supervision to set up and operate the pumping and bypassing system.
 - d. Pumps and equipment shall be continuously monitored and maintained by the Contractor during periods that pumping and bypassing are required.
 - e. Provide redundancy within the bypass pumping system. Back-up pumps shall be on-line and capable of isolating from the primary system by a valve.
 - f. 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 required to be in compliance with locality specific noise ordinances. Additional sound attenuation may be required in residential areas or as specified by HRSD.
 - g. Contractor is solely responsible for sewage spills.
 - h. The Contractor shall provide alarms during bypass operations.
 - 1) Bypass operations need alarms to contact Contractor as the primary responder and responsible operator.
 - 2) The bypass operation shall tie-into the existing HRSD SCADA/Telemetry system for secondary backup by HRSD Operations.
 - 3) HRSD requirements for bypass pumping operations is detailed in Part 3 Execution.
 - 4) This work is to be scheduled through HRSD at least 10 business days in advance of planned work.
2. Submit a bypass pumping plan that includes the following details:
 - a. Bypass pump sizes, capacity, number of each size to be on site, and power requirements.
 - b. Calculations of static lift, friction losses, and flow velocity.
 - c. Pump curves showing pump operating range.
 - d. Size, length, material, location, and method of installation for suction and discharge piping. At a minimum, each pump shall have a separate leg consisting of a suction isolation valve, a discharge check valve, (separate from pump), and a discharge isolation valve. The layout of which shall be capable of completely isolating the pump and check valve. All piping shall be rated for vacuum conditions.
 - e. Method of noise abatement for each pump and/or generator.
 - f. Standby power generator size and location.
3. The Contractor shall test operate bypass pumping system for 24 hours to confirm reliable operation of pumps, temporary systems, and alarms prior to bypass use. The start of the 24 hour bypass pumping test shall not start after Noon on Thursday or before Monday at 8:00 AM.

4. The operating bypass shall not terminate and be switched over to the newly installed infrastructure between Thursday Noon and Monday 8:00 AM unless otherwise stated or approved.

F. Work to be completed during Shutdown:

1. *{Describe work to be completed}*.

1.5 LINE {INSERT HRSD LINE NUMBER} SHUTDOWN: {REPEAT AS NEEDED}

- A. *{Describe work to be completed in a similar fashion as in 1.4 above}*

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 TEMPORARY PORTABLE PUMP ALARMS AND SETUP REQUIREMENTS

When a project requires a temporary portable pump to be alarmed, the following requirements need to be followed.

- A. **When work is performed at station:** If power is available, all alarms are to be routed through existing HRSD's SCADA system. Portable pump manufacture call box is not acceptable unless otherwise approved for site specific situations. If power is not available then, HRSD solar SCADA panel will be provided. A portable generator may be required depending on site specific situations.
- B. **When work is performed at a manhole:** If power is available, all alarms are to be routed through existing HRSD's SCADA system. Portable pump manufacture call box is not acceptable unless otherwise approved for site specific situations. If power is not available then, HRSD solar SCADA panel will be provided. A portable generator may be required depending on site specific situations. Naming of the alarms from a manhole should indicate the location of the manhole (i.e. Pearl and Ligon)
- C. The name of the site is to be used followed by temporary lead, lag or second lag, depending on the number of pumps. (Example: Arctic Temporary Lead, Arctic Temporary Lag and Arctic Second Lag.)
- D. Both Contractor and HRSD will be alerted in the event of a pump alarm. The Contractor is responsible to be primary responder with the support of HRSD staff.
- E. All pump maintenance and fuel requirement are the contractor's responsibility.
- F. Pump maintenance records are to be provided monthly through the duration of the project by Contractor, depending on length of project.
- G. Battery chargers are required with all pumps. In situations where power is not available a portable generator may be required.
- H. All discharge piping is to be pressure rated flanged or fused pipe. Isolations valves are required at each pump along with an additional external swing check valve. A means to bleed air off the discharge piping is required.
- I. Float balls, level transducers and pressure transducers are acceptable. In a Lift station or manhole application, level transducers are preferred. If float balls are used for control, a two-float setup is required per pump. All floats are to be secured in manhole or wet well so as not to become tangled, hindering pump operation. In a temporary PRS setup, owner furnished sensor valve will be provided to allow Contractor to connect pressure transducers for

control. An isolation valve is required to be furnished by Contractor at this location.

- J. If work is to be performed during cold weather, the Contractor is responsible for providing freeze protection on pumps and controls, specifically transducers.
- K. Depending on location and duration of job, concrete protective barrier wall may be required.
- L. All manholes and wet wells where temporary pumps are being used must be secured to prevent trip hazards, fall risks and odor issues.

The following standard alarms are required. Site specific alarms will be evaluated on a as need basis.

TWO PUMP LIFT STATION OR MANHOLE (DIESEL PUMPS)

Lead	Fail / Normal
Lag	On / off
High well	Alarm / Normal (HRSD furnished float ball if station alarms cannot be used)
Overflow	Alarm / Normal (Determined necessary according to length of Job. HRSD furnished float ball if station alarms cannot be used.)

THREE PUMP LIFT STATION OR MANHOLE (DIESEL PUMPS)

Lead	Fail / Normal
Lag	On / off
Second Lag	On / Off
High well	Alarm / Normal (HRSD furnished float ball if station alarms cannot be used)
Overflow	Alarm / Normal (Determined necessary according to length of Job. HRSD furnished float ball if station alarms cannot be used.)

TWO PUMP LIFT STATION OR MANHOLE (DIESEL PUMPS) NEW PRIME GUARD CONTROLLER

Lead	Fail / Normal
Lag	On / off and Fail / Normal
High well	Alarm / Normal (HRSD furnished float ball if station alarms cannot be used)
Overflow	Alarm / Normal (Determined necessary according to length of Job. HRSD furnished float ball if station alarms cannot be used.)

**TWO PUMP LIFT STATION OR MANHOLE (ONE ELECTRIC ONE DIESEL PUMP)
NEW PRIME GUARD CONTROLLER**

Dominion Power	On / OFF
Lead	Fail / Normal (Electric)
Lag	On / off and Fail / Normal
High well	Alarm / Normal (HRSD furnished float ball if station alarms cannot be used)
Overflow	Alarm / Normal (Determined necessary according to length of Job. HRSD furnished float ball if station alarms cannot be used.)

(For HRSD monitoring purposes only, provide well level.)

**THREE PUMP LIFT STATION OR MANHOLE (ONE ELECTRIC TWO DIESEL PUMP)
NEW PRIME GUARD CONTROLLER**

Dominion Power	On / OFF
Lead	Fail / Normal (Electric)
Lag	On / off and Fail / Normal
Second Lag	On / off and Fail / Normal
High well	Alarm / Normal (HRSD furnished float ball if station alarms cannot be used)
Overflow	Alarm / Normal (Determined necessary according to length of Job. HRSD furnished float ball if station alarms cannot be used.)

(For HRSD monitoring purposes only, provide well level.)

TWO PUMP PRS (DIESEL PUMPS) NEW PRIME GUARD CONTROLLER

Lead	Fail / Normal
Lag	On / off and Fail / Normal

(For HRSD monitoring purposes only, provide Suction and Discharge pressures.)

THREE PUMP PRS (DIESEL PUMPS) NEW PRIME GUARD CONTROLLER

Lead	Fail / Normal
Lag	On / off and Fail / Normal

Second Lag	On / off and Fail / Normal
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(For HRSD monitoring purposes only, provide Suction and Discharge pressures.)

TWO PUMP PRS (ONE ELECTRIC ONE DIESEL PUMP) NEW PRIME GUARD CONTROLLER

Dominion Power	On / OFF
Lead	Fail / Normal (Electric)
Lag	On / off and Fail / Normal

(For HRSD monitoring purposes only, provide Suction and Discharge pressures.)

THREE PUMP PRS (ONE ELECTRIC TWO DIESEL PUMP) NEW PRIME GUARD CONTROLLER

Dominion Power	On / OFF
Lead	Fail / Normal (Electric)
Lag	On / off and Fail / Normal
Second Lag	On / off and Fail / Normal

(For HRSD monitoring purposes only, provide Suction and Discharge pressures.)

END OF SECTION