

## **SECTION 01320 SUPPLEMENTAL**

### **MAINTENANCE OF PLANT OPERATIONS**

#### **PART 1 – GENERAL**

1.1 SCOPE. This Section describes the requirements for maintenance of plant operations during the construction period.

1.2 GENERAL REQUIREMENTS. The WORK must be performed in such a manner that continuous, uninterrupted operation of the secondary wastewater treatment system, including the treatment of flow in the secondary clarifiers, transfer pumping of RAS to the Aeration Basins or Waste Activated Sludge (WAS) sludge to the plant's solids treatment facilities and all DWWTP essential services, utilities and facilities are maintained operational throughout the construction period.

The CONTRACTOR is advised that the WORK sequence and scheduling of system shutdowns will take place in a manner conducive to the OWNER maintaining compliance with the requirements of its National Pollutant Discharge Elimination System (NPDES) permit that among other requirements stipulates the OWNER must maintain secondary treatment system capacity of 930 million gallons per day (MGD). To maintain the minimum stipulated secondary treatment capacity will require strict regulation of the number of Aeration Basin and Secondary Clarifiers available for extended shutdown during the duration of the project.

Shutdown of more than one Aeration Basin and/or two Secondary Clarifiers will be permitted only during the dry weather season and will be restricted to a period of two weeks. Failure to return the equipment to service on the date specified by the MDEQ and OWNER will result in a transfer of all WWTP non-compliance fees and penalties to the CONTRACTOR for payment, which could amount to a minimum of \$25,000.00 per day. Additionally, the CONTRACTOR shall pay the OWNER \$1,000.00 per day that the secondary capacity is less than 930 mgd beyond the approved shutdown duration specified. The approval to take equipment out-of-service may further be restricted during emergency conditions, extreme wet weather or other unforeseen events at the discretion of the OWNER. Further, it will be the discretion of the OWNER as to sequencing of specific Aeration Basins out-of-service at any given time during construction.

Work under this Contract shall be so scheduled and conducted by the CONTRACTOR such that WORK will not impede any treatment process, create potential hazards to operating equipment or personnel, reduce the quality of secondary treatment operations and the plant effluent or cause odor or other nuisance. In performing the WORK shown or as specified, the CONTRACTOR shall plan and schedule WORK to meet the plant secondary treatment capacity requirements and additional constraints outlined in this Section.

Construction sequences presented in this section outline the intent of the OWNER with respect to the general progress of WORK. Sequences and construction activities noted are not intended to be comprehensive or all-inclusive. Many other construction activities and WORK

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components, although not specifically noted, are integral-parts of the WORK included in the Contract Documents and must be both scheduled and completed. The OWNER will consider sequences other than those specified provided they afford equivalent continuity of wastewater treatment and plant operations. Alternatives to the suggested approach and duration limits are possible; however, deviating from the suggested sequences or specified duration limits will require review by the ENGINEER and OWNER. Development and submission of an alternative approach or duration limit does not constitute approval by the ENGINEER and OWNER. The CONTRACTOR must be prepared to execute the WORK in concert with the manner and suggested sequences specified herein.

It is the intent of this Section to keep the areas of WORK in continuous operation by the OWNER to provide pumping and handling of wastewater and its residuals while in compliance with the secondary treatment capacity requirements stipulated in the NPDES permit.

The CONTRACTOR shall not shut off or disconnect any operating system of the plant. The OWNER shall execute all plant equipment shutdowns.

For brevity, the CONTRACTOR is advised that this Section of the specifications contains several references to equipment, piping, material, and appurtenances to be removed or reinstalled. The CONTRACTOR shall refer to Specification Section 02050, Demolition and the Contract Drawings for additional details of equipment, piping, material and appurtenances to be demolished and removed from the site by the CONTRACTOR.

### 1.3 RELATED WORK.

Summary of Work is included in Section 01030.

Control of Work is included in Section 01040.

Project Coordination is included in Section 01070.

Progress Schedule is included in Section 01320.

Demolition is included in Section 02050.

Installation of equipment and testing is included in Section 01180.

Valve installation is included in Section 15010.

Training is included in Section 01160.

1.4 GENERAL CONSTRAINTS. In PART 3: EXECUTION of this Section, the suggested sequence and shutdown of plant systems and process units that are to be taken out of service and demolished or rehabilitated are presented. The ENGINEER may only accept completed WORK after the specified testing and training has been completed to the

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satisfaction of the OWNER.

The following constraints shall be applied to all equipment, treatment units and appurtenant utility systems on the plant site.

1.4.01 Access to Plant Site. The CONTRACTOR shall utilize only designated access roads for site access. Any perimeter fence removed, damaged or modified by the CONTRACTOR must be replaced, repaired or returned to permanent status immediately. Temporary security fencing similar to the type and configuration of the permanent fencing may be installed and maintained by the CONTRACTOR with prior authorization from the ENGINEER. All temporary fencing shall be returned to permanent status prior to 95% project completion of the CONTRACTOR'S schedule.

1.4.02 Internal Roads Access. Vehicular access to all treatment units and buildings must be maintained at all times, except when otherwise permitted. All construction traffic on internal roads shall be approved by the ENGINEER and shall not prevent the OWNER'S personnel from gaining access to their WORK areas.

1.4.03 Access. The OWNER'S and ENGINEER'S personnel must have safe access to all areas that remain in operation throughout the construction period.

The OWNER will remove, as necessary, piping, boxes, pumps, hardware, and other plant property stored in WORK areas to permit the CONTRACTOR access to the WORK area. The CONTRACTOR shall make requests for the removal of such material to the ENGINEER and OWNER 30 days in advance of commencing WORK in that area.

1.4.04 Temporary Utility and Process Systems: Existing sludge, potable water, secondary water, natural gas and compressed air system processes must be kept in continuous service. Temporary bypass service pipes must be in place and tested before being placed in service.

Temporary installations for the purpose of maintaining plant operations shall conform to requirements of Division 15. Requests for variances from these requirements shall be submitted to the ENGINEER in writing for review and approval.

1.4.05 Plumbing Facilities. Except as otherwise permitted, all building plumbing systems such as roof and floor drains, sump pumps, and other systems shall remain in operation at all times.

1.4.06 Building Heating and Ventilating. Operation of building heating and ventilating systems shall be maintained in all structures. Where necessary, the CONTRACTOR shall make provisions to install temporary heating and ventilation systems for structures in which operation of existing or new heating and/or ventilation systems must be interrupted. The ambient temperatures in all interior plant areas shall be maintained at a minimum of 55 degrees F. Minimum ventilation rates shall be equal to the existing rates.

1.4.07 Electric Power, Light and Communication Systems. Electric power, lighting service and communication systems shall be maintained in uninterrupted operation in all areas that remain

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in operation.

Temporary electrical installations for the purpose of maintaining plant operations shall conform to the material and installation requirements of Division 16 of the specifications. Requests for variances from these requirements shall be submitted to the ENGINEER in writing for review and approval.

**1.4.08 Sump Pumps and Sumps.** All existing sumps and drainage areas where provided for the CONTRACTOR'S use shall be maintained in a satisfactory operating condition with either existing pumps or temporary pumps. If used for the catchment and/or conveyance of drainage, flushing, sludge or other waste liquids during pipe draining, wash down, cleaning, demolition or construction WORK, sumps will be immediately and thoroughly cleaned by the CONTRACTOR following termination of WORK in that area. Any failure of a sump pump or plugging of a line during the CONTRACTOR'S use or for a period of five (5) days following its use will be the responsibility of the CONTRACTOR to immediately clean, repair or replace the affected unit to satisfactory condition as determined by the ENGINEER. The Contractor shall provide temporary sump pumping equipment, if required, to deliver sump wastewater to discharge points during shutdown periods.

**1.4.09 Seal and Service Water Piping.** Service and seal water and the necessary connections to existing equipment shall be maintained during construction at all times. WORK shall not affect existing service and seal water flow, pressure and quantity.

**1.4.10 Draining Process Tanks, Pipes and Conduits.** The OWNER will drain all process tanks, pipes and conduits to the extent possible using existing plant drainage facilities. Basins may be considered successfully drained by the OWNER when 80% or greater of the contents have been removed. Where necessary, due to OWNER'S facilities being unable to drain the contents of pipes, basins and conduits, the CONTRACTOR shall be responsible for providing temporary drainage equipment.

The CONTRACTOR will be responsible for wash down and cleaning as necessary for the performance of his WORK. A source of secondary water (SW) will be designated when requested by the CONTRACTOR for the purposes of wash down and/or flushing. Uncontrolled or unattended use of SW will not be permitted. During draining, wash down or any cleaning activities by the CONTRACTOR, and if required, the OWNER retains the right to temporarily suspend any water use and draining operations that negatively affect plant operations.

If a drain is not available on the pipe or section of pipe to be drained, then the CONTRACTOR shall install a wet tap using a tapping saddle and valve. No uncontrolled spillage of a pipe's contents shall be allowed and all contents will be conveyed to an acceptable drainage point by hoses or conduits.

The CONTRACTOR shall immediately wash down any spillage and the floor drains, sumps and sump pump discharge piping shall be flushed clean to prevent clogging and septic odors.

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1.4.11 Temporary Partitions and Enclosures. The CONTRACTOR shall furnish and install temporary partitions, and enclosures as required to protect existing equipment from ongoing construction activities and existing facilities from the elements. Temporary partitions shall be installed at all exterior wall penetrations made in existing buildings where equipment or louvers have not yet been installed.

1.4.12 Shutdowns. Any and all shutdowns are to comply with the appropriate "OWNER's Standard Equipment Shutdown Request (ESR)" form completed and approved. The CONTRACTOR shall submit the completed forms and additional information as required to the OWNER 30 days in advance of the anticipated shutdown.

Following approval of the CONTRACTOR'S shutdown request and at the appointed time, the OWNER shall cause the WORK to be shutdown, and shall isolate and drain the WORK to the extent outlined in subsections 1.4.10. The CONTRACTOR shall complete the draining, flushing and cleaning as required prior to commencing the WORK.

- a. Shutdown shall be defined to indicate that the normal operation of a particular plant system or unit process has to be suspended or taken out of service in order to perform the specified WORK. For each shutdown, the CONTRACTOR shall submit the ESR form, compile an inventory of labor and materials required to perform the tasks, an estimate of the time required and a written description of the steps required to complete the tasks. The ESR form, inventory, time estimate and written procedure shall be submitted to the OWNER for review thirty (30) calendar days prior to the start date of the shutdown. The request shall be reviewed by the OWNER and returned approved or otherwise five (5) calendar days prior to the proposed shutdown date. No shutdown shall be initiated until the ESR form is approved and the OWNER has verified that the materials and labor listed is on site at least seven (7) days prior to the proposed start date. The OWNER may choose to waive the on-site verification of materials and labor on a case-by-case basis.
- b. The WORK specified herein and any other WORK required by the OWNER, which may interrupt the normal plant operations, shall be accomplished at such times that will be convenient to the OWNER. Shutdowns may have to be scheduled on off-shifts, weekends and holidays as required.
- c. The CONTRACTOR shall also have on hand, located in close proximity to the WORK area(s), all tools, equipment and materials, both temporary and permanent, necessary to complete each WORK task, without interruption prior to commencing WORK. Prefabrication of all piping and other assemblies shall be completed to the greatest degree possible, prior to any shutdowns.
- d. Where required, temporary bypass installations for sludge, process, and utility lines must be in place, tested and installation approved by the ENGINEER prior to a shutdown.

The OWNER and ENGINEER must be satisfied that the CONTRACTOR has complied Supplemental Specifications which are issued separately from the Master Specifications on a per contract basis shall supersede and govern over all other specifications or contract documents. All other wording in the Master Specifications that is not specifically stated to be modified in the Provisional Specifications shall remain in effect as is. The Supplemental Specification Summary is included to clarify and/or highlight changes.

with these requirements, to the fullest extent possible, before any shutdowns will be authorized.

1.4.13 Shutdown of Electrical Systems. Shutdown of an electrical system or component requires the CONTRACTOR to submit the appropriate "OWNER's Standard Equipment Shutdown Request (ESR)" form. The CONTRACTOR shall submit the completed forms and additional information as required to the ENGINEER 30 days in advance of the anticipated shutdown. The ESR form will delineate the task(s) to be performed, its duration, the areas and service affected, and additional information of relative to alternative power provisions as required. The plan will be submitted to the OWNER for approval 21 days in advance of the anticipated shutdown. Refer to 1.4.12, Shutdowns and the referenced DWP procedure. No electrical shutdown activity will be permitted until the ENGINEER and OWNER has provided official authorization to proceed. Following approval and at the CONTRACTOR'S request, the OWNER shall shutdown an existing electric system. The CONTRACTOR shall be responsible for following and implementing the appropriate lock out and tag out procedures for systems de-energized by the OWNER, and shall check cables and wires to be sure that they are de-energized before WORK begins. Upon completion of the WORK that necessitated the shutdown, the CONTRACTOR shall remove the locks and advise the ENGINEER that the facilities are available for use.

1.4.14 Overtime. Overtime WORK by the CONTRACTOR necessary to comply with the requirements of the Contract Documents shall be considered as normal procedure under this Contract, and the CONTRACTOR shall make no claims for extra compensation as a result thereof. Upon OWNER approval, the CONTRACTOR shall be prepared to WORK around-the-clock, weekends and holidays and supply multiple WORK crews as necessary to complete the WORK including testing and acceptance as specified, within the specified time frame.

1.4.15 Weather Constrained. Weather conditions produce increased hydraulic and solids loading to the treatment facility and processes. Initiation of a WORK item that constrains the process or facility from adequately processing these loadings may cause system imbalance and impact the treated effluent.

When an item is identified as weather constrained, it cannot be initiated if the above conditions apply without prior approval of the ENGINEER.

During times of inclement weather, the CONTRACTOR shall take steps as necessary to ensure an environment acceptable to performing WORK to include, but not necessarily limited to painting, welding, sandblasting, grouting, finish WORK, electrical WORK or other.

1.4.16 Coordination With Utility Companies. The CONTRACTOR shall notify the ENGINEER and request of the appropriate Utility Company to coordinate the relocation, shut off, (re-) energizing of existing or installation of new service as shown on the DRAWINGS, specified herein or as required for the performance of WORK. The CONTRACTOR shall submit the appropriate "OWNER's Standard Equipment Shutdown

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Request (ESR)" form. The CONTRACTOR shall submit the completed forms and additional information as required to the ENGINEER 30 days in advance of the anticipated shutdown. The ESR form will delineate the task(s) to be performed, its duration, the areas and service(s) affected, and additional information relative to alternative utility provisions as required. The plan will be submitted to the OWNER for approval 21 days in advance of the anticipated shutdown. Refer to 1.4.12, Shutdowns. No shutdown activity will be permitted until the ENGINEER and OWNER has provided official authorization to proceed in addition to the proper authorization of the affected Utility.

1.4.17 Illumination. Construction areas, roadways, offices, shops, corridors, process areas, storage areas, etc. shall be kept well lighted in conformance with OSHA (Electrical, Construction Part 1926) to not less than the minimum illumination intensities (foot candles) listed in Table D.3 of said standard while any WORK is in progress.

1.5 SUGGESTED SEQUENCE OF CONSTRUCTION AND OPERATION. In order to maintain continuous plant operation during construction, a phased removal and construction sequence shall be required as described herein. Specific constraints are outlined on the contract drawings. These constraints are intended to provide a required sequence and timing for specific activities related to that particular item.

1.5.01 Sequence. The WORK is presented in a logical sequence and does not preclude the CONTRACTOR from advocating changes and/or revisions to the suggested sequence that shall accomplish the WORK.

The WORK defined herein shall be incorporated by the CONTRACTOR into the CPM Schedule and updated regularly per the Division 1 Specifications.

While all WORK within the project scope shall be clearly identified within the schedule, WORK requiring a system, subsystem, or component shutdown shall be preceded by no less than a 30-day notice to the ENGINEER that the shutdown is planned to occur. The CONTRACTOR is to submit the appropriate "OWNER's Standard Equipment Shutdown Request (ESR)" form. The CONTRACTOR shall submit the completed forms and additional information as required to the ENGINEER by no less than 30 days in advance and to the OWNER for approval 21 days in advance of the anticipated shutdown. The request shall be reviewed by the OWNER and returned approved or otherwise five (5) calendar days prior to the proposed shutdown date. Refer to 1.4.12, Shutdowns and the referenced DWP procedure. At least seven (7) days prior to the proposed start date, the CONTRACTOR shall request verification by the ENGINEER that the listed materials and labor as being on site. No shutdown activity will be permitted until the ENGINEER and OWNER have provided official authorization to proceed and the CONTRACTOR is found to be in compliance with the specifications.

The ENGINEER may request additional information relative to the shutdown request, to include a detailed WORK Plan for accomplishing the WORK during the shutdown. The ENGINEER and OWNER as part of the ESR form submittal process shall review this WORK Plan. A coordination meeting may be required to ensure that all issues surrounding the

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accomplishment of the WORK during the shutdown are addressed and properly accommodated. The meeting will be held no less than seven (7) days prior to the planned WORK, and shall be attended by the CONTRACTOR, ENGINEER, and OWNER. At this meeting, the CONTRACTOR shall be prepared to review in detail the plan for accomplishing the WORK and shutdown. The WORK Plan shall include, at a minimum:

1. Start time and planned duration of the WORK.
2. Valves, breakers, circuits and temporary facilities that need to be secured in order to isolate the WORK to include timing and/or sequencing.
3. Process/Utility Piping Bypass Plan – Layout and details of bypass piping, fittings valves for individual WORK areas. Details of temporary pumping/power/HVAC systems, as required. Details of bypass connections to existing process and utility lines and shutdown sequencing for connections.
4. Safety Plan.
5. Procedures to drain, flush and clean the WORK items.
6. CONTRACTOR personnel required to effectively complete the WORK including supervisory personnel.
7. Tools, equipment and materials to be on hand during the WORK, including quantities of each.
8. Detailed sequences of WORK activities to effectively monitor, control, and complete the specific WORK.
9. Any preparatory WORK that required to be accomplished prior to initiating the interconnection WORK.
10. Other WORK or contracts that are known to be occurring simultaneously and within the vicinity as the proposed WORK.
11. Or other items pertinent to the shutdown and accomplishment of WORK that the CONTRACTOR, ENGINEER, or OWNER deem necessary or appropriate to incorporate into the plan.

All materials needed to effectively complete the WORK shall be procured and on site prior to initiating the shutdown. Where prefabrication and staging of WORK materials are required by the specifications, the ENGINEER shall review and confirm with the CONTRACTOR that all needed materials are staged at the specific WORK site no less than 24 hours prior to initiating the shutdown and WORK. Failure to have all materials properly staged will constitute failure by the CONTRACTOR to be prepared to effectively complete the WORK, and the WORK will be canceled and rescheduled via the process described herein.

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1.5.02 Tasks. The individual tasks, their steps and constraints are detailed in PART 3, EXECUTION of the section and indexed below:

The CONTRACTOR is advised that to complete the entire scope of the Contract within the specified construction duration concurrent WORK activities in multiple areas of the Aeration Basins, E/M Buildings and ILP Pump Station may be necessary.

## **PART 2 – PRODUCTS**

None This Section.

## **PART 3 – EXECUTION**

### **3.1 SUGGESTED SEQUENCING AND OPERATIONS.**

3.1.01 General: Insofar as possible, all equipment shall be tested and in operating condition before the final tie-ins are made connecting the new equipment to the existing facility.

During the course of the WORK, the shutdown of any services shall be limited to the minimum duration possible with close coordination with the OWNER. However, if requested by the OWNER, the CONTRACTOR shall ensure the means and methods to provide temporary services in lieu of the services that will be interrupted by the construction activities.

3.1.02 Construction Sequence: The suggested construction sequence is intended to outline major items of WORK and provide coordination of Aeration Basin shutdowns necessary to maintain the continuous operation of the secondary wastewater treatment system and other wastewater plant operations. A suggested sequence of construction schedule providing timing and sequencing of shutdowns is provided in Exhibit 01320-A, Suggested Sequence of Construction Schedule included in this Section. Refer to the plans and specifications for other required WORK under the project scope. Liquidated damages shall be applied if the work is not completed by the specified milestone dates.

All WORK requiring shutdowns must be scheduled and have prior approval of the OWNER as described in Sections 1.4 and 1.5 of this Section. Scheduling shutdowns will be at the discretion of the OWNER and will be performed in a manner to maintain compliance with requirements of its NPDES permit. The suggested construction sequence schedule is to serve as a general timeline for Aeration Basin shutdowns and WORK. The actual dates for shutdowns may be adjusted at the discretion of the OWNER to maintain compliance with secondary treatment capacity requirements of its NPDES permit.

The suggested sequence of construction for includes timing and execution constraints related to maintaining secondary treatment capacity during the construction duration.

There are also additional items of WORK included under the Contract scope of services that

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will not require Aeration Basin or Secondary Clarifier shutdowns for completion. It will be necessary to perform this WORK concurrently with WORK associated with the Aeration Basin shutdowns to maintain the project completion schedule.

3.2 SUGGESTED SEQUENCE OF CONSTRUCTION SCHEDULE. Exhibit 01320-A, Suggested Sequence of Construction Schedule follows the “End of Supplemental Section” designation and is part of this Specification section.

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EXHIBIT 01320-A\_SUGGESTED SEQUENCE OF CONSTRUCTION SCHEDULE

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