ERIE COUNTY WATER AUTHORITY

INTEROFFICE MEMORANDUM

July 10, 2025

To: Terrence D. McCracken, Secretary to the Authority

From: Michael J. Quinn, PE, Senior Distribution Engineer

Subject: Contract MP-090
Sturgeon Point WTP Filtration Piping, Valve, and Underdrain System Improvements
Change Order No. 2 for MP-090-E and **MP-090-G**
Change Order No. 1 for MP-090-H and MP-090-P
ECWA Project No. 202200014

Attached are the following Change Orders:

- Change Order No. 2 for Contract MP-090-E (Electrical)
- **Change Order No. 2 for Contract MP-090-G (General Construction)**
- Change Order No. 1 for Contract MP-090-H (HVAC)
- Change Order No. 1 for Contract MP-090-P (Plumbing)

Above-referenced Change Orders include the following revisions:

- Specification Section 01 13 13 - Milestones - modifications to Paragraph 1.2 Milestone Requirements;
- Specification Section 01 14 16 – Coordination with Owner's Operations – Modifications to Paragraph 1.4 Sequence of Work;
- Project Milestones 1, 2 and 3 and;
- Substantial and final completion dates.

The executed contract for the project included detailed requirements for work contemplated for a series of project milestones as well as a specific sequence of work. During construction, these items have been modified to better incorporate existing plant operations and prevent the opportunity for plant disruptions in future phases of the work. In addition, the work has been delayed by unforeseen conditions encountered due to conflicts with the construction of a new Washwater Tank constructed under Contract MP-088 and in particular the installation of the filter to waste and wash water supply piping to be completed under Contract MP-090-G. This delay also precluded the completion of a significant amount of other work not only for Contract MP-09-G but work under all other Prime Contracts.

Therefore, the Authority's Engineering Department and consultant, Arcadis, are recommending that the milestone tasks and sequence of work be revised through reissuing both specification sections in their entirety and the dates for milestone completion and substantial and final completion be revised as follows:

- Milestone 1 - Changed from August 30, 2024 to April 9, 2025.
- Milestone 2 – Changed from May 30, 2025 to August 17, 2026
- Milestone 3 - Changed from April 24, 2026 to March 27, 2027
- Substantial Completion - Changed from April 30, 2027 to January 18, 2028
- Final Completion - Changed from June 4, 2027 to February 22, 2028

These changes apply to all Prime Contracts.

Budget Information:
No change to final contract amount.

MJQ:jmf
Attachments
cc: L.Kowalski, PE
CONT-MP-090-2201-X-14

ERIE COUNTY WATER AUTHORITY
AUTHORIZATION FORM
For Approval/Execution of Board Meeting Documents

Document Name: MP-090 **Project No.:** 202200014

Description: Sturgeon Point WTP Filtration Piping, Valve, and Underdrain System Improvements

Item Description:

Choose one: Change Order

Other:

Action Requested:

Choose one: Board Authorization to Execute

Other: Execution by the Chairman

Approvals Required:

APPROVED AS TO CONTENT:

☑	Chief Financial Officer	Date:	07/10/2025
☑	Chief Operating Officer	Date:	07/10/2025
☑	Claims Rep. – Risk Manager	Date:	7/11/2025
☐	Comptroller	Date:	
☑	Director of Administration	Date:	07/10/2025
☑	Director of Distribution	Date:	7/10/2025
☐	Director of Human Resources	Date:	
☐	Director of IT	Date:	
☐	Director of Production	Date:	
☐	Director of Water Quality	Date:	
☑	Executive Engineer	Date:	7/10/2025
☑	General Counsel (Legal)	Date:	7/14/2025
☐	Other:	Date:	

APPROVED FOR BOARD RESOLUTION:

Secretary to the Authority Date: 7/14/25

Remarks: Change Order #2 for MP-090-E & MP-090-G, Change Order #1 for MP-090-H & MP-090-P

Resolution Date: **Item No:**

CHANGE ORDER NO.: G-02

Owner:	Erie County Water Authority	Owner's Project No.:	202200014
Engineer:	Arcadis of New York, Inc.	Engineer's Project No.:	30164370
Contractor:	American Contracting & Environmental Services, Inc.	Contractor's Project No.:	255
Project:	Sturgeon Point Water Treatment Plant Filtration Piping, Valve, and Underdrain System Improvements		
Contract Name:	MP-090-G-General		
Date Issued:	6/6/2025	Effective Date of Change Order:	7/17/2025

The Contract is modified as follows upon execution of this Change Order:

Description:

This Change Order is necessary to account for the delays experienced by American Contracting & Environmental Services, Inc. (ACE) for Contract No. MP-090-G – General for the installation of 42" washwater pipe and 24" filter to waste pipe due to the overlapping Project Areas for Contract No. MP-090-G-General and Contract No. MP-088. This delay is acknowledged per 00 72 13 General Conditions Article 4.05. This Change Order also includes revisions to the sequence of work and work associated with each milestone to provide flexibility to the Contractor in executing the work within revised Contract Time of this Change Order. The scope of this Change Order does not include a change in Contract Price. Contractor will separately submit claim documentation concerning the proposed change in Contract Price associated with these delays and sequence revisions, and its rights to such additional compensation are expressly reserved and will be addressed either in a future change order or via the disputes process in the parties' Contract.

This Change Order includes the following:

- REMOVE Section 01 13 13 in its entirety and REPLACE with Section 01 13 13 (REV1) dated May 6, 2025.
- REMOVE Section 01 14 16 in its entirety and REPLACE with Section 01 14 16 (REV1) dated May 27, 2025.
- Section 00 52 13-G – Agreement MP-090-G-General, Page 00 52 13-G-2: REMOVE paragraph 4.02.A. in its entirety and REPLACE with the following:

  A. The Work will be substantially complete on or before **January 18, 2028**, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before **February 22, 2028**.

- Section 00 52 13-G – Agreement MP-090-G-General, Page 00 52 13-G-2: REMOVE paragraph 4.03.A.1. in its entirety and REPLACE with the following:

  1. Milestone 1 –The work associated with Milestone 1 as defined in Section 01 13 13 (REV1) shall be completed by **April 9, 2025.** Owner agrees the work associated with Milestone 1 was completed as of April 9, 2025.

- Section 00 52 13-G – Agreement MP-090-G-General, Page 00 52 13-G-2: REMOVE paragraph 4.03.A.2. in its entirety and REPLACE with the following:

  2. Milestone 2 –The work associated with Milestone 2 as defined in Section 01 13 13 (REV1) shall be completed by **August 17, 2026.**

- Section 00 52 13-G – Agreement MP-090-G-General, Page 00 52 13-G-2: REMOVE paragraph 4.03.A.3. in its entirety and REPLACE with the following:

  2. Milestone 3 –The work associated with Milestone 3 as defined in Section 01 13 13 (REV1) shall be completed by **March 27, 2027.**

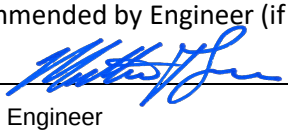
Attachments:

- ACE RFI 123 – Arcadis response dated 11/22/2024
- Section 01 13 13 (REV1)
- Section 01 14 16 (REV1)

CHANGE ORDER NO.: G-02

Change in Contract Price	Change in Contract Times
Original Contract Price: $ 28,470,000.00	Original Contract Times: Substantial Completion: 4/30/2027 Ready for final payment: 6/4/2027
Increase from previously approved Change Orders No. 01 to No. 1: $ 0.00	Increase from previously approved Change Orders No. 01 to No. 01: Substantial Completion: 0 Calendar Days Ready for final payment: 0 Calendar Days
Contract Price prior to this Change Order: $ 28,470,000.00	Contract Times prior to this Change Order: Substantial Completion: 4/30/2027 Ready for final payment: 6/4/2027
Increase this Change Order: $ 0.00	Increase this Change Order: Substantial Completion: 263 Calendar Days Ready for final payment: 263 Calendar Days
Contract Price incorporating this Change Order: $ $28,470,000.00	Contract Times with all approved Change Orders: Substantial Completion: 1/18/2028 Ready for final payment: 2/22/2028

Recommended by Engineer (if required)

By: 

Title: Principal Engineer

Date: 6/6/2025

Accepted by Contractor

Joseph P Godin

President

6/9/2025

Authorized by Owner

By: _____

Title: _____

Date: _____

REQUEST FOR INTERPRETATION

Owner: Erie County Water Authority
Project Name: MP-090 Sturgeon Point WTP Filtration Piping, Valve, and Underdrain System Improvements

Contractor: ACE
Date Transmitted: 11/14/24
Date Response Requested: 11/22/24

RFI No. 123
Date Received:
Date Response Transmitted:

Subject: Breakdown of Items Not Included in Milestone #1
Specification Section and Paragraph:

Drawing References:

INTERPRETATION REQUESTED:

Please see the attached list of items ACE is considering not part of milestone #1 based on constructibility or other factors.

Please confirm Arcadis & ECWA agrees with these items. If not, ACE requests a meeting to discuss further.

Name: **Sam Roux** Date: **11/14/24**

ENGINEER'S RESPONSE:

See attached table that includes ACE's proposed change to Milestone #1 scope and Arcadis' response.

Signature: cn=Matthew J. Czora, o=Arcadis US, Inc. , email=matt.czora@arcadis.com, c=US 2024.11.22 15:12:10 -05'00' Date: **11/22/24**

Location	Scope	ACE Comment	Arcadis Response
Site Work	Site Restoration	Needs to be completed during planting seasons. Multiple RFPs Pending: Stormwater catch basin, Sample line, Additional Site Paving Includes Backfill and final grading around buildings	This is acceptable to exclude this work for Milestone 1 completion but work needs to be completed by 5/30/2025.
	Final Paving around blower and chemical buildings	Top coat of paving is planned to be installed in one sequence	This is acceptable to exclude this work for Milestone 1 completion but work needs to be completed by 5/30/2025.
	Bioretention Facility	Needs to be completed during planting season	Sturctures and piping shall be included in Milstone 1. The final grading and planting can be excluded for Milestone 1 completion but work needs to be completed by 5/30/2025.
	Exterior Concrete at FBE	Installed once filter rehabilitation is completed	This is acceptable to exclude this work for Milestone 1 completion but work needs to be completed prior to Substantial Completion.
Filter Building Extension (FBE)	Masonry wall and stairwell in filter building extension	Minimal to no clearance for bring in new and removing existing piping from the filter gallery if the wall is in place. Wall and stairwell will be constructed at the completion of the filter gallery piping rehab	Temporary stairwell or point of egress will need to be installed prior to Milestone 1 completion and maintained until the permanent stairwell can be construction.
	Double door at hoist	Main access point for duration of project. Temp door installed	Temp door currently installed is not sufficient. Install a temporary hollow metal door that will last for the full duration of the project.
	FBE Instrumentation testing	Wont be completed until filter testing in order to have water to confirm instrumentation is functioning properly.	FBE instruentation testing shall be completed incrementally prior to each filter being completed and placed into services.

Location	Scope	ACE Comment	Arcadis Response
	Final Architectural painting in FBE	-Active work site for duration of the project - ACE working to resolve roof coating issue, but work cannot be completed in winter months	Provide all required painting prior to Milestone 1 completion and recoat as required prior to Project Completion if going to be used as an active work site. It is acknowledged that the FBE roof coating can not be completed in cold weather and can be excluded from Milestone 1 as a punchlist item. Work needs to be completed by 6/30/2025
	Piping Insulation	Will be installed as far as possible to tie in points while maintaining flexibility	Acknowledged. Install insulation as much as possible to tie in points.
	Aluminum Storefronts (doors and windows)	Use for filter operation floor access for the duration of the project	Provide temporary door/enclosure that will last for the full duration of the project.
	Final Signage	Waiting on approved wording, location, etc for release	All signage for Milestone 1 shall be installed prior to Milestone 1 completion date.
Blower Building	Exterior Door Pads	Will need to be completed after 24". Plan to wait for spring to avoid cold weather concrete	This is acceptable to exclude this work for Milestone 1 completion but work needs to be completed by 5/30/2025.
	Blower Building Silencer	No Specifications of design included. Working through design w/ Arcadis	Arcadis will continue to work with ACE on reviewing and approving the silencer. The silencer will be required to be installed prior to Milestone 1.
	Final Signage	Waiting on approval wording, locations, etc for release	All signage for Milestone 1 shall be installed prior to Milestone 1 completion date.

Location	Scope	ACE Comment	Arcadis Response
Chemical Building	Chemical Building will have feed line to chemcal injection manhole	-RFI pending for control sequence - Remainder of building not in Milestone #1	RFI received on 11/14 and is currenrly under review. Include this work per the Contract Documents in Milestone 1.

ACE
Building to Last | AMERICAN CONTRACTING & ENVIRONMENTAL SERVICES, INC.

Please see the below list of items ACE is considering not part of milestone #1 based on constructability or other factors.

Please confirm Arcadis and ECWA agree with these items. If not, ACE requests a meeting to discuss.

General Contract:

- **Site Work:**
  - Site Restoration
    - Needs to be completed during planting seasons
      - *Multiple RFPs Pending*
        - *Stormwater Catch Basin*
        - *Sample Line*
        - *Additional Site Paving*
      - *Includes Backfill and final grading around buildings*
  - Final Paving around blower and chemical buildings
    - *Top coat of paving is planned to be installed in one sequence*
  - Bioretention facility
    - *Needs to be completed during planting season*
  - Exterior concrete at FBE
    - *Installed once filter rehabilitation is completed.*

- **Filter Building Extension (FBE):**
  - Masonry wall and stairwell in filter building extension
    - *Minimal to no clearance for bring in new and removing existing piping from the filter gallery if the wall is in place. Wall and stairwell will be constructed at the completion of the filter gallery piping rehab.*
  - Double door at hoist
    - *Main access point for duration of project. Temp door installed*.
  - FBE Instrumentation Testing
    - *Won't be completed until filter testing in order to have water to confirm instrumentation is functioning properly.*
  - Final Architectural painting in FBE
    - *Active work site for duration of the project*
    - *ACE working to resolve roof coating issue, but work cannot be completed in winter months.*
  - Piping insulation
    - *Will be installed as far as possible to tie in points while maintaining flexibility*
  - Aluminum Storefronts (doors and windows)

        - *Used for filter operation floor access for the duration of the project*
    - Final Signage
        - *Waiting on approved wording, locations, etc for release.*

- **Blower Building:**
    - Exterior Door Pads
        - *Will need to be completed after 24". Plan to wait for spring to avoid cold weather concrete*
    - Blower Building Silencer
        - *No specifications of design included. Working through design w/ Arcadis.*
    - Final Signage
        - *Waiting on approved wording, locations, etc for release.*

- **Chemical Building:**
    - Chemical Building will have feed line to chemical injection manhole
        - *RFI pending for control sequence*
        - *Remainder of building not in Milestone #1*

Waiting on additional information from other primes (but wanted GC portion submitted):

Plumbing Contract:

- XXX

HVAC Contract:

- *XXX*

Electrical Contract:

- *XXX*

SECTION 01 13 13

MILESTONES

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:
   1. This Section describes Work to be substantially completed to comply with Milestones indicated in the Agreement. This Section is not intended to describe all the Work or its constraints, interrelationships, or sequential requirements required.
   2. Prime CONTRACTOR shall provide all labor, materials, equipment, tools, and incidentals required to perform the Work in accordance with the Contract Times provisions of the Contract Documents.
   3. To achieve each Milestone indicated in this Section, substantially complete those elements of the Work indicated starting with Article 1.2 of this Section, together with related equipment, systems, and appurtenant Work and activities.
   4. Comply with the General Conditions, as may be modified by the Supplementary Conditions, regarding partial utilization and property insurance.

1.2 MILESTONE REQUIREMENTS (ALL CONTRACTS)

A. Milestone M1:
   1. Contract Time: Refer to 00 52 13, Agreement.
   2. Work associated with the blower building, filter building extension, wash water supply piping from new wash water tank to filter building extension, air scour piping from blower building to the filter building extension, filter to waste piping from filter building extension to chamber S-2, chemical feed piping from residuals pump station to chemical injection manhole shall be completed and placed into continuous, successful operation. Checkout, start-up, field quality control testing, and training of operations and maintenance personnel shall be completed prior to this Milestone.
   3. Work not included with this Milestone is as follows:
      a. Site Work:
         i. Site restoration
         ii. Final paving around blower and chemical buildings.
         iii. Final grading and plantings for bioretention facility.
         iv. Filter Building Extension and Blower Building exterior concrete.
      b. Filter Building Extension:
         i. Interior masonry walls and stairwell at operating floor and pipe gallery extension.
         ii. Double door (F08-1).

c. Filter Building:
    i. Aluminum storefront at Filter Building operating floor.
    ii. Hose bibs and associated piping on the operating floor.
d. Blower Building: Bypass silencer.

4. Contractor shall provide temporary generator in place of SPGEN004 if it is not available before completion of Milestone M1. Temporary generator shall be connected to automatic transfer switch ATS-3B for fully automated control (including SCADA communications) as if the permanent unit is installed.

B. Milestone M2:
1. Contract Time: Refer to 00 52 13, Agreement
2. Work associated with Filter Nos. 5, 6, 7, 8, 9, & 10 improvements completed and placed into continuous, successful operation including but not limited to new filter underdrain system, media placement, new filter piping, valves, actuators, new air scour piping, re-installed analyzers and transmitters, associated plumbing, HVAC, electrical and instrumentation improvements. Checkout, start-up, field quality control testing, and training of operations and maintenance personnel shall be completed prior to this Milestone.
3. Work associated with all site restoration, all final paving, bioretention facility, Blower Building bypass silencer, Filter Building Extension and Blower Building exterior concrete, and Filter Building hose bibs and associated piping.
4. This milestone does not include the filter influent valves which will be completed after Milestone M3.

C. Milestone M3:
1. Contract Time: Refer to 00 52 13, Agreement
2. Work associated with Filter Nos. 3 & 4 improvements completed and placed into continuous, successful operation including but not limited to new filter underdrain system, media placement, new filter piping, valves, actuators, new air scour piping, re-installed analyzers and transmitters, associated electrical and instrumentation improvements. Checkout, start-up, field quality control testing, and training of operations and maintenance personnel shall be completed prior to this Milestone.
3. Work associated with Filter Nos. 5, 6, 7, 8, 9, and 10 washwater header and washwater supply piping.
4. This milestone does not include the filter influent valves which will be completed after Milestone M3.

D. Substantial Completion:
1. Contract Time: Refer to 00 52 13, Agreement
2. Work associated with Filter Nos. 1 & 2 improvements completed and placed into continuous, successful operation including but not limited to new filter underdrain system, media placement, new filter piping, valves, actuators, new air scour piping, re-installed analyzers and transmitters, associated electrical and instrumentation improvements. Checkout, start-up, field quality control

testing, and training of operations and maintenance personnel shall be completed prior to this Milestone.

3. Work associated with Filter Nos. 1, 2, 3 & 4 washwater header and washwater supply piping.
4. Work associated with Filter Building Extension including the masonry wall, stairwell, and double door at hoist.
5. Work associated with Filter Building operating level aluminum storefront.
6. This milestone includes all filter influent valves, and all remaining work not included in previous milestones.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

+ + END OF SECTION + +

SECTION 01 14 16

COORDINATION WITH OWNER'S OPERATIONS

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:
   1. This Section includes requirements for coordinating with OWNER's operations during the Work and includes requirements for tie-ins and shutdowns necessary to complete the Work without impact on OWNER's operations except as allowed in this Section.
   2. CONTRACTOR shall provide labor, materials, tools, equipment, and incidentals shown, specified and required to coordinate with OWNER's operations during the Work

B. Coordination:
   1. Review installation procedures under other Specification sections and coordinate Work that must be performed with or before the Work specified in this Section.
   2. Notify other contractors in advance of Work requiring coordination with OWNER's operations, to provide other contractors sufficient time for work included in their contracts that will be performed with or before Work specified in this Section.

C. Related Sections:
   1. Section 01 11 13, Summary of Work.
   2. Section 01 73 24, Connections to Existing Facilities.
   3. Section 01 73 29, Cutting and Patching.

D. Except for shutdowns specified in this Section, perform the Work such that OWNER's facility remains in continuous satisfactory operation during the Project. Schedule and conduct the Work such that the Work does not impede OWNER's production or processes, create potential hazards to operating equipment and personnel, reduce the quality of the facility's products or effluent, or cause odors or other nuisances.

E. Work not specifically covered in this Section or in referenced Sections may, in general, be completed at any time during regular working hours at the Site, as defined below, subject to the requirements in this Section.
   1. Except where otherwise prohibited by Laws or Regulations or by consent of OWNER, regular working hours at the Site are defined as up to eight hours per day, beginning no earlier than 7:00 a.m. and ending no later than 4:00 p.m.

2. Maintenance and cleanup activities may be performed during hours other than regular working hours provided that such activities do not require the startup of construction equipment.
3. If it shall become necessary to perform Work at night or on Saturdays, Sundays, or legal holidays, written notice shall be submitted to OWNER and ENGINEER at least two days in advance of the need for such Work. OWNER will only consider the performance of such Work as can be performed satisfactorily under the conditions. Good lighting and all other necessary facilities for carrying out and observing the Work shall be provided and maintained where such Work is being performed at night.
4. If OWNER authorizes Work during other than regular working hours, CONTRACTOR shall reimburse OWNER for all OWNER's additional costs associated with such Work, including, but not necessarily limited to, the overtime costs for OWNER's and ENGINEER's personnel on the Site and other additional costs assessed against or incurred by the OWNER. At Owner's option, such additional costs may either be deducted from CONTRACTOR's progress payments or deducted from the retained amount prior to release following Substantial Completion.

F. Coordinate shutdowns with OWNER and ENGINEER. When possible, combine multiple tie-ins into a single shutdown to minimize impacts on OWNER's operations and processes.

G. The Sturgeon Point Water Treatment Plant will remain in continuous service during the Work under the Contract including all pumping, treatment, chemical application, residuals conveyance and processing, and operations and maintenance work.

H. CONTRACTOR shall cooperate fully with the OWNER when the production and/or quality of the Treatment Plant is threatened due to the CONTRACTOR's operations or unforeseen conditions beyond the OWNER's control that negatively effect the operation of the water system and therefore may affect the CONTRACTOR's operation. The CONTRACTOR shall cooperate fully with the OWNER including stopping of work to avoid loss of pumping and/or detrimental water quality at no additional cost to OWNER.

I. Do not shut off or disconnect existing operating systems, unless accepted by ENGINEER in writing. Operation of existing equipment will be by OWNER unless otherwise specified or indicated. Where necessary for the Work, CONTRACTOR shall seal or bulkhead OWNER-operated gates and valves to prevent leakage that may affect the Work, OWNER's operations, or both. Provide temporary watertight plugs or bulkheads as required. After completing the Work, remove seals, plugs, and bulkhead to satisfaction of ENGINEER.

1.2 SUBMITTALS

A. Action Submittals: Submit the following:

1. Substitute Sequence Submittal: When deviation from specified sequence or procedures is proposed, furnish submittal explaining in detail the proposed sequence or procedures and associated effects, including evidence that OWNER's operations will not be adversely affected, to an extent greater than originally contemplated in the Contract Documents, by proposed substitution. List benefits of proposed substitution, including benefits to Progress Schedule. Submit in accordance with Section 01 25 00, Substitution Procedures, and other requirements of the Contract Documents regarding substitution requests.

B. Informational Submittals: Submit the following:
   1. Shutdown Planning Submittal:
      a. For each shutdown, submit an inventory of labor, materials, and equipment required to perform the shutdown and tie-in tasks, an estimate of time required to accomplish the complete shutdown including time for OWNER to take down and start up existing equipment, systems, or conduits, and written description of steps required to complete the Work associated with the shutdown.
      b. Furnish submittal to ENGINEER at least thirty days prior to proposed shutdown start date. Do not start shutdown until obtaining ENGINEER's acceptance of shutdown planning submittal.
   2. Shutdown Notification: After ENGINEER's acceptance of shutdown planning submittal and prior to starting the shutdown, submit written notification to OWNER and ENGINEER of date and time each shutdown is to start. Submit notification not less than 72 hours in advance of each shutdown.

1.3 GENERAL CONSTRAINTS

A. Indicated in the Contract Documents are the sequence and shutdown durations, where applicable, for OWNER's equipment, systems, and conduits (including piping and ducting) that are to be taken out of service temporarily for the Work. New materials, equipment, and systems may be used by OWNER after the specified field quality controls and testing are successfully completed and the materials or equipment are substantially complete in accordance with the Contract Documents.

B. The following constraints apply to coordination with OWNER's operations:
   1. Operational Access: OWNER's personnel shall have access to equipment and areas that remain in operation.
   2. Temporary Partitions and Enclosures: CONTRACTOR shall provide temporary partitions and enclosures around each filter cell where demolition is being performed necessary to maintain dust-free, and ventilated spaces in areas that are adjacent to the filters that must be kept operational.
   3. CONTRACTOR shall schedule and perform start-ups for Monday through Thursday. Equipment and systems shall not be placed into operation on Friday, Saturday, Sunday, and OWNER holidays without prior approval of OWNER.

4. Dead End Valves or Conduits: Provide blind flanges, watertight bulkheads, or valves at temporary and permanent terminuses of conduits, including piping and ducting. Blind flanges and bulkheads shall be suitable for the service and braced and blocked, as required, or otherwise restrained as directed by ENGINEER. Temporary valves shall be suitable for their associated service. Where a valve is provided at permanent terminus of conduit, including piping or ducting, also provide on downstream side of valve a blind flange with drain/flushing connection.
5. Removals shall be made with caution to prevent damage to existing facilities.
6. Draining and Cleaning of Conduits, Tanks, and Basins:
    a. Unless otherwise shown or indicated, CONTRACTOR shall dewater process tanks, basins, conduits (including piping) at beginning of each shutdown. Flush, wash down, and clean tanks, basins, conduits (including piping), and other work areas.
    b. CONTRACTOR shall remove solids and dispose of off-site. Unless otherwise specified or indicated, contents of tanks, basins, and conduits (including piping) undergoing modifications shall be transferred to existing process tanks or conduits at the Site with capacity sufficient to accept such discharges, using hoses, temporary piping, temporary pumps, or other means provided by CONTRACTOR. Discharge of fluids across floors is not allowed. Unless otherwise specified or indicated, remaining contents of chemical tanks and chemical piping that could not be transferred to existing tanks or conduits shall be removed and disposed of off-site.
    c. If drainage point is not available on the conduit (including piping) to be drained, provide a wet tap using tapping saddle and valve or other method approved by ENGINEER. Uncontrolled spillage of contents of conduits (including piping) is not allowed.
    d. Spillage shall be brought to ENGINEER's attention immediately, both verbally and in writing, and reported in accordance with Laws and Regulations. CONTRACTOR shall wash down spillage to floor drains or sumps or other appropriate location and flush the system to prevent clogging and odors. If spillage is not suitable for discharge to the drainage system, such as chemical spills, as determined by ENGINEER, CONTRACTOR shall remove spillage by other method, such as vactor truck, sorbents, or other method acceptable to ENGINEER.

1.4 SEQUENCE OF WORK

A. Perform Work in the indicated sequence. Certain phases or stages of the Work may require working 24-hour days or work during hours outside of regular working hours. Work may be accelerated from a later stage to an earlier stage if OWNER's operations are not adversely affected by proposed sequence change, with ENGINEER's acceptance. Stages specified in this Article 1.4 are sequence dependent.

B. Phase Ia: New Blower Building:

1. During this stage, the following Work shall be completed:
    a) Excavation and re-routing of existing buried utilities including, 4" & 6" PW, 2 ½" & 3" gas lines.
    b) Construction of new blower building, including the excavation and installation of the electrical service from the Substation Building.
    c) Installation of new blowers, 18" air piping, valves and appurtenances within blower building.
    d) Installation of HVAC, Plumbing, Electrical, and Instrumentation within blower building.

C. Phase Ib: Filter Building Extension:
    1. During this stage, the following Work shall be completed:
        a) Excavation and re-routing of existing storm sewer lines.
        b) Demolition of existing filter building west wall.
        c) Construction of the filter building extension.
        d) Installation of 42" washwater supply piping, valves, appurtenances, and rate of flow controller, 16" filter to waste piping, valves, appurtenances, and rate of flow controller, 18" air supply piping and appurtenances within the filter building extension.
        e) Installation of HVAC, Plumbing, Electrical, and Instrumentation. Excavation and installation of the electrical feeds from the blower building to the filter building extension and the filter building Electrical Room.

D. Phase Ic: 42" Wash Water Piping:
    1. During this stage, the following Work shall be completed:
        a) Installation of new 42" wash water piping from new wash water tank through the Filter Building Extension to the west end of the existing filter gallery.
        b) Complete cleaning, testing, and disinfection on new wash water piping.

E. Phase Id: 18" Air Supply Piping:
    1. During this stage, the following Work shall be completed:
        a) Installation of new exterior 18" air supply piping and supports from new blower building to the new filter building extension.
        b) Installation of new 18" air supply piping headers from the Filter Building Extension through the Filter Operating Level including the valves at each filter.

F. Phase Ie: 8" Wash Water Supply and Altitude Valve:
    1. During this stage, the following Work shall be completed:
        a) Installation of new 6" wash water tank supply piping from the existing 6" plant waterline to PV-WWS-2 in the Filter Building Extension.
        b) Installation of new 8" wash water supply piping, altitude valve, and appurtenances from west end of the existing filter gallery to tie-in point on new 42" wash water supply pipe in the Filter Building Extension.

c) Complete cleaning, testing, and disinfection on new wash water supply piping.

G. Phase If: Filter to Waste Piping:
1. During this stage, the following Work shall be completed:
   a) Installation of new 24" and 30" filter to waste piping, manholes, and filter to waste air gap chamber from filter building extension to and including the new filter to waste mixing chamber.
   b) Installation of remaining 30" filter to waste piping including filter to waste manholes to existing chamber S-2.
   c) Tie-in existing 20" plant overflow to new filter to waste manhole No.2.

H. Phase Ig: Sodium Bisulfite Chemical Feed Piping:
1. During this stage, the following Work shall be completed:
   a) Demolition of one existing chemical feed tubing, carrier pipe, and heat trace from the existing chemical injection manhole to the Residuals Pump Station.
   b) Installation of one new chemical feed tubing, carrier pipe, and heat trace from chemical injection manhole to Residuals Pump Station.
   c) Complete tie-in of new chemical feed piping to existing sodium bisulfite feed system.

I. Phase Ih: Fiber Optic Network:
1. During this stage, the following Work shall be completed:
   a) Installation of the new fiber optic cable ring between all of the filter control panels, blower control panel, flash mixer room, and control room.

J. Phase Ii: New Chemical Storage Building:
1. During this stage, the following Work shall be completed. Note that this phase does not need to be completed prior to starting any filter rehabilitation work.
   a) Excavation and re-routing of existing buried utilities.
   b) Demolition of existing Residuals Building north wall.
   c) Construction of new chemical storage building.
   d) Installation of equipment, piping, valves, and appurtenances.
   e) Installation of HVAC, Plumbing, Electrical, and Instrumentation.

K. Phase II: Filter No.10:
1. During this stage, the following Work shall be completed.
   a) Isolate Filter No. 10 by closing valves EXV-FI-10, EXV-FE-10, EXV-SWW-10, EXV-WW-10, EXV-FTW-10, EXV-SW-10a, and EXV-SW-10b.
   b) Demolish and remove existing filter effluent piping, surface wash piping, wash water piping, filter to waste piping, valves, and appurtenances in the filter gallery. Valves EXV-WW-10, EXV-SW-10a&10b to remain until Phase VIII.

c) Demolish and remove existing surface wash system, filter underdrains, and filter media within the filter box.
d) Demolish existing spent washwater valve EXV-SWW-10 and install new spent washwater valve PV-SWW-10.
e) Install new underdrain system, air scour piping, valves and appurtenances.
f) Install new filter media.
g) Install new conduit, power and control wiring to all new valve actuators.
h) Install new conduit and control wiring to existing valve actuators for EXV-WW-10 and EXV-FI-10.
i) Temporarily recircuit valve actuator for EXV-WW-10 to a 20A-1P circuit breaker in Panel LP-4B using 2#12, 1#12G, ¾"C. Retain existing disconnect switch for temporary reuse.
j) Temporarily recircuit valve actuator for EXV-FI-10 to a 15A-3P circuit breaker in Panel LP-4B using 3#12, 1#12G, ¾"C. Retain existing disconnect switch for temporary reuse.
k) Install new 16” filter to waste piping from filter building extension past Filter No.10 and install blind flange BF-FTW-10.
l) Install new filter effluent piping, washwater piping and field instruments. Connect new washwater piping to valve EXV-WW-10.
m) Complete disinfection of new washwater tank.
n) Complete cleaning, testing, and disinfection of piping and underdrain system.
o) Complete 2-week performance test.

L. Phase III: Filter No.9:
1. During this stage, the following Work shall be completed.
a) Isolate Filter No.9 by closing valves EXV-FI-9, EXV-FE-9, EXV-SWW-9, EXV-WW-9, EXV-FTW-9, EXV-SW-9a, and EXV-SW-9b.
b) Demolish and remove existing filter effluent piping, surface wash piping, wash water piping, filter to waste piping, valves, and appurtenances in the filter gallery. Valves EXV-WW-9, EXV-SW-9a&9b to remain until Phase VIII.
c) Demolish and remove existing surface wash system, filter underdrains, and filter media within the filter box.
d) Demolish existing spent washwater valve EXV-SWW-9 and install new spent washwater valve PV-SWW-9.
e) Install new underdrain system, air scour piping, valves and appurtenances.
f) Install new filter media.
g) Install new conduit, power and control wiring to all new valve actuators.
h) Install new conduit and control wiring to existing valve actuators for EXV-WW-9 and EXV-FI-9.
i) Temporarily recircuit valve actuator for EXV-WW-9 to a 20A-1P circuit breaker in Panel LP-4B using 2#12, 1#12G, ¾"C. Retain existing disconnect switch for temporary reuse.

j) Temporarily recircuit valve actuator for EXV-FI-9 to a 15A-3P circuit breaker in Panel LP-4B using 3#12, 1#12G, ¾"C. Retain existing disconnect switch for temporary reuse.
k) Install new 16” filter to waste piping from filter building extension past Filter No.9 and install blind flange BF-FTW-9.
l) Install new filter effluent piping, washwater piping and field instruments. Connect new washwater piping to valve EXV-WW-9.
m) Complete cleaning, testing, and disinfection of piping and underdrain system.
n) Complete 2-week performance test.

M. Phase IV: Filter No. 8:
1. During this stage, the following Work shall be completed.
a) Isolate Filter 8 by closing valves EXV-FI-8, EXV-FE-8, EXV-SWW-8, EXV-WW-8, EXV-FTW-8, EXV-SW-8a, and EXV-SW-8b.
b) Demolish and remove existing filter effluent piping, surface wash piping, wash water piping, filter to waste piping, valves, and appurtenances in the filter gallery. Valves EXV-WW-8, EXV-SW-8a&8b to remain until Phase VIII.
c) Demolish and remove existing surface wash system, filter underdrains, and filter media within the filter box.
d) Demolish existing spent washwater valve EXV-SWW-8 and install new spent washwater valve PV-SWW-8.
e) Install new underdrain system, air scour piping, valves and appurtenances.
f) Install new filter media.
g) Install new conduit, power and control wiring to all new valve actuators.
h) Install new conduit and control wiring to existing valve actuators for EXV-WW-8 and EXV-FI-8.
i) Temporarily recircuit valve actuator for EXV-WW-8 to a 20A-1P circuit breaker in Panel LP-4B using 2#12, 1#12G, ¾"C. Retain existing disconnect switch for temporary reuse.
j) Temporarily recircuit valve actuator for EXV-FI-8 to a 15A-3P circuit breaker in Panel LP-4B using 3#12, 1#12G, ¾"C. Retain existing disconnect switch for temporary reuse.
k) Remove blind flange BF-FTW-10 and install new 16” filter to waste piping from Filter No.10 past Filter No.8. Install blind flange BF-FTW-8.
l) Install new filter effluent piping, washwater piping and field instruments. Connect new washwater piping to valve EXV-WW-8.
m) Complete cleaning, testing, and disinfection of piping and underdrain system.
n) Complete 1-week performance test.

N. Phase V: Filter No.7:
2. During this stage, the following Work shall be completed.

a) Isolate Filter No.7 by closing valves EXV-FI-7, EXV-FE-7, EXV-SWW-7, EXV-WW-7, EXV-FTW-7, EXV-SW-7a, and EXV-SW-7b.
b) Demolish and remove existing filter effluent piping, surface wash piping, wash water piping, filter to waste piping, valves, and appurtenances in the filter gallery. Valves EXV-WW-7, EXV-SW-7a&7b to remain until Phase VIII.
c) Demolish and remove existing surface wash system, filter underdrains, and filter media within the filter box.
d) Demolish existing spent washwater valve EXV-SWW-7 and install new spent washwater valve PV-SWW-7.
e) Install new underdrain system, air scour piping, valves and appurtenances.
f) Install new filter media.
g) Install new conduit, power and control wiring to all new valve actuators.
h) Install new conduit and control wiring to existing valve actuators for EXV-WW-7 and EXV-FI-7.
i) Temporarily recircuit valve actuator for EXV-WW-7 to a 20A-1P circuit breaker in Panel LP-4B using 2#12, 1#12G, ¾"C. Retain existing disconnect switch for temporary reuse.
j) Temporarily recircuit valve actuator for EXV-FI-7 to a 15A-3P circuit breaker in Panel LP-4B using 3#12, 1#12G, ¾"C. Retain existing disconnect switch for temporary reuse.
k) Remove blind flange BF-FTW-9 and install new 16” filter to waste piping from Filter No.9 past Filter No.7. Install blind flange BF-FTW-7.
l) Install new filter effluent piping, washwater piping and field instruments. Connect new washwater piping to valve EXV-WW-7.
m) Complete cleaning, testing, and disinfection of piping and underdrain system.
n) Complete 1-week performance test.

O. Phase VI: Filter No.6:
1. During this stage, the following Work shall be completed.
a) Isolate Filter No.6 by closing valves EXV-FI-6, EXV-FE-6, EXV-SWW-6, EXV-WW-6, EXV-FTW-6, EXV-SW-6a, and EXV-SW-6b.
b) Demolish and remove existing filter effluent piping, surface wash piping, wash water piping, filter to waste piping, valves, and appurtenances in the filter gallery. Valves EXV-WW-6, EXV-SW-6a&6b to remain until Phase VIII.
c) Demolish and remove existing surface wash system, filter underdrains, and filter media within the filter box.
d) Demolish existing spent washwater valve EXV-SWW-6 and install new spent washwater valve PV-SWW-6.
e) Install new underdrain system, air scour piping, valves and appurtenances.
f) Install new filter media.
g) Install new conduit, power and control wiring to all new valve actuators.

h) Install new conduit and control wiring to existing valve actuators for EXV-WW-6 and EXV-FI-6.
i) Temporarily recircuit valve actuator for EXV-WW-6 to a 20A-1P circuit breaker in Panel LP-4B using 2#12, 1#12G, ¾"C. Retain existing disconnect switch for temporary reuse.
j) Temporarily recircuit valve actuator for EXV-FI-6 to a 15A-3P circuit breaker in Panel LP-4B using 3#12, 1#12G, ¾"C. Retain existing disconnect switch for temporary reuse.
k) Remove blind flange BF-FTW-8 and install new 16" filter to waste piping from Filter No.8 past Filter No.6. Install blind flange BF-FTW-6.
l) Install new filter effluent piping, washwater piping and field instruments. Connect new washwater piping to valve EXV-WW-6.
m) Complete cleaning, testing, and disinfection of piping and underdrain system.
n) Complete 1-week performance test.

P. Phase VII: Filter No.5:
1. During this stage, the following Work shall be completed.
a) Isolate Filter 5 by closing valves EXV-FI-5, EXV-FE-5, EXV-SWW-5, EXV-WW-5, EXV-FTW-5, EXV-SW-5a, and EXV-SW-5b.
b) Demolish and remove existing filter effluent piping, surface wash piping, wash water piping, filter to waste piping, valves, and appurtenances in the filter gallery. Valves EXV-WW-5, EXV-SW-5a&5b to remain until Phase VIII.
c) Demolish and remove existing surface wash system, filter underdrains, and filter media within the filter box.
d) Demolish existing spent washwater valve EXV-SWW-5 and install new spent washwater valve PV-SWW-5.
e) Install new underdrain system, air scour piping, valves and appurtenances.
f) Install new filter media.
g) Install new conduit, power and control wiring to all new valve actuators.
h) Install new conduit and control wiring to existing valve actuators for EXV-WW-5 and EXV-FI-5.
i) Temporarily recircuit valve actuator for EXV-WW-5 to a 20A-1P circuit breaker in Panel LP-4B using 2#12, 1#12G, ¾"C. Retain existing disconnect switch for temporary reuse.
j) Temporarily recircuit valve actuator for EXV-FI-5 to a 15A-3P circuit breaker in Panel LP-4B using 3#12, 1#12G, ¾"C. Retain existing disconnect switch for temporary reuse.
k) Remove blind flange BF-FTW-7 and install new 16" filter to waste piping from Filter No.7 past Filter No.5. Install blind flange BF-FTW-5.
l) Install new filter effluent piping, washwater piping and field instruments. Connect new washwater piping to valve EXV-WW-5.

m) Complete cleaning, testing, and disinfection of piping and underdrain system.
n) Complete 1-week performance test.

Q. Phase VIII: Filter Nos. 5, 6, 7, 8, 9, and 10 Washwater Header and Washwater Supply Piping:
1. Filter Nos. 9 and 10 washwater header and washwater supply piping - during this stage, the following Work shall be completed.
a) Isolate Filter Nos. 9 and 10 by closing valves EXV-FI-9&10, PV-FE-9&10, PV-SWW-9&10, PV-FTW-9&10, EXV-WW-9&10, PV-AS-9a&9b, and PV-AS-10a&10b.
b) Isolate the existing washwater header by closing valve EXV-ROFC-1. Isolate the new washwater header in the filter building extension by closing valve PV-ROFC-2. Drain the existing and new washwater headers.
c) Isolate the existing surface wash header by closing all existing surface wash valves on Filters 1-8 and EXV-WWS-1. Drain the existing surface wash header.
d) Remove existing washwater header at harnessed connection between Filter Nos. 7,8 and 9,10 and install blind flange on the existing pipe to remain in service. Harness the blind flange to existing pipe lugs and return existing washwater header to service. Remove existing surface wash header at flanged connection between Filters 7/8 and 9/10 and install blind flange BF-WWS-9/10 on the existing header to remain in service. Return existing surface wash header to service.
e) Demolish and remove remaining sections of the existing surface wash header and washwater header, including valves EXV-WW-9, EXV-WW-10, EXV-SW-9a&9b, and EXV-SW-10a&10b.
f) Disconnect temporary power feed and control wiring to valve actuators EXV-WW-9 and EXV-WW-10.
g) Install the new washwater header and valve PV-WWH-9/10.
h) Install new valves PV-WW-9 and PV-WW-10 including permanent power for actuators from Filter Gallery Disconnect Panel 9 (Filter 9) and Filter Gallery Disconnect Panel 10 (Filter No. 10). Reconnect control wiring.
i) Install new washwater supply piping and install dust cover over the end of the new washwater supply piping adjacent to blind flange BF-WWS-9/10. Pipe to remain empty until remaining sections are completed.
j) Complete cleaning, testing, and disinfection of the new washwater header then place Filter Nos. 9 and 10 and new washwater header into service.

2. Filter Nos. 7 and 8 washwater header and washwater supply piping - during this stage, the following Work shall be completed.
a) Isolate Filter Nos. 7 and 8 by closing valves EXV-FI-7&8, PV-FE-7&8, PV-SWW-7&8, PV-FTW-7&8, EXV-WW-7&8, PV-AS-7a&7b, and PV-AS-8a&8b.

b) Isolate the existing washwater header by closing the valve EXV-ROFC-1. Isolate the existing surface wash header by closing all existing surface wash valves on Filter Nos. 1-6 and EXV-WWS-1. Drain the existing washwater header and surface wash header.

c) Remove existing washwater header at harnessed connection between Filter Nos. 7,8 and 5,6 and install blind flange on the existing pipe to remain in service. Harness the blind flange to existing pipe lugs and return existing washwater header to service. Remove existing surface wash header at flanged connection between Filter Nos. 7,8 and 5,6 and install blind flange BF-WWS-7/8 on the existing header to remain in service. Return existing surface wash header to service.

d) Demolish and remove remaining sections of the existing surface wash header and washwater header, including valves EXV-WW-7, EXV-WW-8, EXV-SW-7a&7b, EXV-SW-8a&8b.

e) Disconnect temporary power feed and control wiring to valve actuators EXV-WW-7 and EXV-WW-8.

f) Connect to valve PV-WWH-9/10 and install new washwater header. Install valves PV-WWH-7/8, PV-WW-7, and PV-WW-8.

g) Install permanent power to new valve actuators for PV-WW-7 and PV-WW-8 from Filter Gallery Disconnect Panel 7 (Filter No.7) and Filter Gallery Disconnect Panel 8 (Filter No.8). Reconnect control wiring.

h) Install new washwater supply piping and install dust cover over the end of the new washwater supply piping adjacent to blind flange BF-WWS-7/8. Pipe to remain empty until remaining sections are completed.

i) Complete cleaning, testing, and disinfection of new wash water header.

j) Place Filter Nos. 7 and 8 and new washwater header into service.

3. Filter Nos. 5 and 6 washwater header and washwater supply piping - during this stage, the following Work shall be completed.

a) Isolate Filter Nos. 5 and 6 by closing valves EXV-FI-5&6, PV-FE-5&6, PV-SWW-5&6, PV-FTW-5&6, EXV-WW-5&6, PV-AS-5a&5b, and PV-AS-6a&6b.

b) Isolate the existing washwater header by closing the valve EXV-ROFC-1. Isolate the existing surface wash header by closing all existing surface wash valves on Filter Nos. 1-4 and EXV-WWS-1. Drain the existing washwater header and surface wash piping.

c) Remove existing washwater header at harnessed connection between Filter Nos. 5,6 and 3,4 and install blind flange on the existing pipe to remain in service. Harness the blind flange to existing pipe lugs and return existing washwater header to service. Remove existing surface wash header at flanged connection between Filter Nos. 5,6 and 3,4 and install blind flange BF-WWS-5/6 on the existing header to remain in service. Return existing surface wash piping to service.

d) Demolish and remove remaining sections of the existing surface wash header and washwater header, including valves EXV-WW-5, EXV-WW-6, EXV-SW-5a&5b, EXV-SW-6a&6b.

e) Disconnect temporary power feed and control wiring to valve actuators EXV-WW-5 and EXV-WW-6.
f) Connect to valve PV-WWH-7/8 and install the new washwater header. Install valves PV-WWH-5/6, PV-WW-5, and PV-WW-6.
g) Install permanent power to new valve actuators for PV-WW-5 and PV-WW-6 from Filter Gallery Disconnect Panel 5 (Filter No.5) and Filter Gallery Disconnect Panel 6 (Filter No.6). Reconnect control wiring.
h) Install new washwater supply piping and install dust cover over the end of the new washwater supply piping adjacent to blind flange BF-WWS-5/6. Pipe to remain empty until remaining sections are completed.
i) Complete cleaning, testing, and disinfection of new wash water header.
j) Place Filter Nos. 5 and 6 and new washwater header into service.

R. Phase IX: Filter No.4:

1. During this stage, the following Work shall be completed.
   a) Isolate Filter No.4 by closing valves EXV-FI-4, EXV-FE-4, EXV-SWW-4, EXV-WW-4, EXV-FTW-4, EXV-SW-4.
   b) Demolish and remove existing filter effluent piping, surface wash piping, wash water piping, filter to waste piping, valves, and appurtenances in the filter gallery. Valves EXV-WW-4 and EXV-SW-4 to remain until Phase XIII.
   c) Demolish and remove existing surface wash system, filter underdrains, and filter media within the filter box.
   d) Demolish existing spent washwater valve EXV-SWW-4 and install new spent washwater valve PV-SWW-4.
   e) Install new underdrain system, air scour piping, valve and appurtenances.
   f) Install new filter media.
   g) Install new conduit, power and control wiring to all new valve actuators.
   h) Install new conduit and control wiring to existing valve actuators for EXV-WW-4 and EXV-FI-4.
   i) Temporarily recircuit valve actuator for EXV-WW-4 to a 20A-1P circuit breaker in Panel LP-4A using 2#12, 1#12G, ¾"C. Retain existing disconnect switch for temporary reuse.
   j) Temporarily recircuit valve actuator for EXV-FI-4 to a 15A-3P circuit breaker in Panel LP-4A using 3#12, 1#12G, ¾"C. Retain existing disconnect switch for temporary reuse.
   k) Remove blind flange BF-FTW-6 and install new 16” filter to waste piping from Filter No.6 past Filter No.4. Install blind flange BF-FTW-4.
   l) Install new filter effluent piping, washwater piping and field instruments. Connect new washwater piping to valve EXV-WW-4.
   m) Complete cleaning, testing, and disinfection of piping and underdrain system.
   n) Complete 1-week performance test.

S. Phase X: Filter No.3:

1. During this stage, the following Work shall be completed.
    a) Isolate Filter No.3 by closing valves EXV-FI-3, EXV-FE-3, EXV-SWW-3, EXV-WW-3, EXV-FTW-3, EXV-SW-3.
    b) Demolish and remove existing filter effluent piping, surface wash piping, wash water piping, filter to waste piping, valves, and appurtenances in the filter gallery. Valves EXV-WW-3 and EXV-SW-3 to remain until Phase XIII.
    c) Demolish and remove existing surface wash system, filter underdrains, and filter media within the filter box.
    d) Demolish existing spent washwater valve EXV-SWW-3 and install new spent washwater valve PV-SWW-3.
    e) Install new underdrain system, air scour piping, valves and appurtenances.
    f) Install new filter media.
    g) Install new conduit, power and control wiring to all new valve actuators.
    h) Install new conduit and control wiring to existing valve actuators for EXV-WW-3 and EXV-FI-3.
    i) Temporarily recircuit valve actuator for EXV-WW-3 to a 20A-1P circuit breaker in Panel LP-4A using 2#12, 1#12G, ¾"C. Retain existing disconnect switch for temporary reuse.
    j) Temporarily recircuit valve actuator for EXV-FI-3 to a 15A-3P circuit breaker in Panel LP-4A using 3#12, 1#12G, ¾"C. Retain existing disconnect switch for temporary reuse.
    k) Remove blind flange BF-FTW-5 and install new 16” filter to waste piping from Filter No.5 past Filter No.3. Install blind flange BF-FTW-3.
    l) Install new filter effluent piping, washwater piping and field instruments. Connect new washwater piping to valve EXV-WW-3.
    m) Complete cleaning, testing, and disinfection of piping and underdrain system.
    n) Complete 1-week performance test.

T. Phase XI: Filter No.2:
    1. During this stage, the following Work shall be completed.
        a) Isolate Filter No.2 by closing valves EXV-FI-2, EXV-FE-2, EXV-SWW-2, EXV-WW-2, EXV-FTW-2, EXV-SW-2.
        b) Demolish and remove existing filter effluent piping, surface wash piping, wash water piping, filter to waste piping, valves, and appurtenances in the filter gallery. Valves EXV-WW-2 and EXV-SW-2 to remain until Phase XIII.
        c) Demolish and remove existing surface wash system, filter underdrains, and filter media within the filter box.
        d) Demolish existing spent washwater valve EXV-SWW-2 and install new spent washwater valve PV-SWW-2.
        e) Install new underdrain system, air scour piping, valves and appurtenances.
        f) Install new filter media.

g) Install new conduit, power and control wiring to all new valve actuators.
h) Install new conduit and control wiring to existing valve actuators for EXV-WW-2 and EXV-FI-2.
i) Temporarily recircuit valve actuator for EXV-WW-2 to a 20A-1P circuit breaker in Panel LP-4A using 2#12, 1#12G, ¾"C. Retain existing disconnect switch for temporary reuse.
j) Temporarily recircuit valve actuator for EXV-FI-2 to a 15A-3P circuit breaker in Panel LP-4A using 3#12, 1#12G, ¾"C. Retain existing disconnect switch for temporary reuse.
k) Remove blind flange BF-FTW-4 and install new 16" filter to waste piping to PV-FTW-2.
l) Install new filter effluent piping, washwater piping and field instruments. Connect new washwater piping to valve EXV-WW-2.
m) Complete cleaning, testing, and disinfection of piping and underdrain system.
n) Complete 1-week performance test.

U. Phase XII: Filter No.1:
1. During this stage, the following Work shall be completed.
a) Isolate Filter No.1 by closing valves EXV-FI-1, EXV-FE-1, EXV-SWW-1, EXV-WW-1, EXV-FTW-1, EXV-SW-1.
b) Demolish and remove existing filter effluent piping, surface wash piping, wash water piping, filter to waste piping, valves, and appurtenances in the filter gallery. Valves EXV-WW-1 and EXV-SW-1 to remain until Phase XIII.
c) Demolish and remove existing surface wash system, filter underdrains, and filter media within the filter box.
d) Demolish existing spent washwater valve EXV-SWW-1 and install new spent washwater valve PV-SWW-1.
e) Install new underdrain system, air scour piping, valves and appurtenances.
f) Install new filter media.
g) Install new conduit, power and control wiring to all new valve actuators.
h) Install new conduit and control wiring to existing valve actuators for EXV-WW-1 and EXV-FI-1.
i) Temporarily recircuit valve actuator for EXV-WW-1 to a 20A-1P circuit breaker in Panel LP-4A using 2#12, 1#12G, ¾"C. Retain existing disconnect switch for temporary reuse.
j) Temporarily recircuit valve actuator for EXV-FI-1 to a 15A-3P circuit breaker in Panel LP-4A using 3#12, 1#12G, ¾"C. Retain existing disconnect switch for temporary reuse.
k) Remove blind flange BF-FTW-3 and install new 16" filter to waste piping from Filter No.3 to PV-FTW-1.
l) Install new filter effluent piping, washwater piping and field instruments. Connect new washwater piping to valve EXV-WW-1.
m) Complete cleaning, testing, and disinfection of piping and underdrain system.

n) Complete 1-week performance test.

V. Phase XIII: Filter Nos. 1, 2, 3, and 4 Washwater Header and Washwater Supply Piping:

1. Filter Nos. 3 and 4 washwater header and washwater supply piping - during this stage, the following Work shall be completed.
   a) Isolate Filter Nos. 3 and 4 by closing valves EXV-FI-3&4, PV-FE-3&4, PV-SWW-3&4, PV-FTW-3&4, EXV-WW-3&4, PV-AS-3a&3b, and PV-AS-4a&4b.
   b) Isolate the existing washwater header by closing the valve EXV-ROFC-1. Isolate the existing surface wash header by closing the existing surface wash valves on Filter Nos. 1-2 and EXV-WWS-1. Drain the existing washwater header and surface wash piping.
   c) Remove existing washwater header at harnessed connection between Filter Nos. 3,4 and 1,2 and install blind flange on the existing pipe to remain in service. Harness the blind flange to existing pipe lugs and return existing washwater header to service. Remove existing surface wash header at flanged connection between Filter Nos. 3,4 and 1,2 and install blind flange BF-WWS-3/4 on the existing header to remain in service. Return existing surface wash piping to service.
   d) Demolish and remove remaining sections of the existing surface wash header and washwater header, including valves EXV-WW-3, EXV-WW4, EXV-SW3, and EXV-SW-4.
   e) Disconnect temporary power feed and control wiring to valve actuators EXV-WW-3 and EXV-WW-4.
   f) Connect to PV-WWH-5/6 and install the new washwater header. Install valves PV-WWH-3/4, PV-WW-3, and PV-WW-4.
   g) Install permanent power to new valve actuators for PV-WW-3 and PV-WW-4 from Filter Gallery Disconnect Panel 3 (Filter No.3) and Filter Gallery Disconnect Panel 4 (Filter No.4). Reconnect control wiring.
   h) Install new washwater supply piping and install dust cover over the end of the new washwater supply piping adjacent to blind flange BF-WWS-3/4. Pipe to remain empty until remaining sections are completed.
   i) Complete cleaning, testing, and disinfection of new wash water header.
   j) Place Filter Nos. 3 and 4 and new washwater header into service.

2. Filter Nos. 1 and 2 washwater header and washwater supply piping - during this stage, the following Work shall be completed.
   a) Isolate Filter Nos. 1 and 2 by closing valves EXV-FI-1&2, PV-FE-1&2, PV-SWW-1&2, PV-FTW-1&2, EXV-WW-1&2, PV-AS-1a&1b, and PV-AS-2a&2b.
   b) Isolate the existing washwater header by closing the valve EXV-WWH-1. Isolate the existing surface wash header by closing EXV-WWS-1 and isolation valve on wash water header/wash water supply line in garage area of the Control Building addition. Drain the existing washwater header and surface wash piping.

c) Demolish and remove remaining sections of the existing surface wash header and washwater header, including valves EXV-WW-1, EXV-WW-2, EXV-SW-1, and EXV-SW-2.
d) Disconnect temporary power feed and control wiring to valve actuators EXV-WW-1 and EXV-WW-2.
e) Connect to PV-WWH-3/4 and install the new washwater header. Install valves PV-WW-1, PV-WW-2, and rate of flow controller PV-ROFC-1.
f) Install permanent power to new valve actuators for PV-WW-1 and PV-WW-2 from Filter Gallery Disconnect Panel 1 (Filter No.1) and Filter Gallery Disconnect Panel 2 (Filter No.2). Reconnect control wiring.
g) Install all remaining washwater supply piping.
h) Complete cleaning, testing, and disinfection of new wash water header and wash water supply piping.
i) Place Filter Nos. 1 and 2, new washwater header, and new washwater supply piping into service.

W. Phase XIV: Filter Influent Valves:
1. Filter Nos. 9 and 10 Influent Valves - during this stage, the following Work shall be completed
a) Isolate Filter Nos. 9 and 10 by closing valves EXV-FI-9, EXV-FI-10, EXV-5, EXV-6, EXV-7, and EXV-8 and isolating sedimentation basins 3,4, and 5 and the north settled water conduit. Install plugs P-1 and P-2 in North and South Settled Water Distribution Chambers. Return sedimentation basins 3, 4, and 5 to service.
b) Open valves PV-SWW-9 and PV-SWW-10 to drain the filter gullets.
c) Remove valves EXV-FI-9 and EXV-FI-10. Disconnect temporary power feed and control wiring.
d) Install new valves PV-FI-9 and PV-FI-10 including permanent power to new actuators from Filter Gallery Disconnect Panel 9 (Filter 9) and Filter Gallery Disconnect Panel 10 (Filter No.10). Reconnect control wiring.
e) Complete testing of influent valves.
f) Isolate Filter Nos. 9 and 10 by closing valves PV-FI-9, PV-FI-10, EXV-5, EXV-6, EXV-7, and EXV-8 and isolating sedimentation basins 3,4, and 5 and the north settled water conduit. Remove plugs P-1 and P-2 in North and South Settled Water Distribution Chambers. Return sedimentation basin Nos. 3, 4, and 5 and Filter Nos. 9 and 10 to service.

2. Filter Nos. 6 and 8 Influent Valves - during this stage, the following Work shall be completed
a) Isolate Filter Nos. 6 and 8 by closing valves EXV-FI-6, EXV-FI-8, EXV-4, EXV-6, and EXV-8.
b) Open valves PV-SWW-6 and PV-SWW-8 to drain the filter gullets.
c) Remove valves EXV-FI-6 and EXV-FI-8. Disconnect temporary power feed and control wiring.
d) Install new valves PV-FI-6 and PV-FI-8 including permanent power to new actuators from Filter Gallery Disconnect Panel 6 (Filter No.6) and

Filter Gallery Disconnect Panel 8 (Filter No.8). Reconnect control wiring.

e) Complete testing of influent valves.
f) Return Filter Nos. 6 and 8 to service.

3. Filter Nos. 2 and 4 Influent Valves - during this stage, the following Work shall be completed
   a) Isolate Filter Nos. 2 and 4 by closing valves EXV-FI-2, EXV-FI-4, EXV-2.
   b) Open valves PV-SWW-2 and PV-SWW-4 to drain the filter gullets.
   c) Remove valves EXV-FI-2 and EXV-FI-4. Disconnect temporary power feed and control wiring.
   d) Install new valves PV-FI-2 and PV-FI-4 including permanent power to new actuators from Filter Gallery Disconnect Panel 2 (Filter No.2) and Filter Gallery Disconnect Panel 4 (Filter No.4). Reconnect control wiring.
   e) Complete testing of influent valves.
   f) Return Filter Nos. 2 and 4 to service.

4. Filter Nos. 5 and 7 Influent Valves - during this stage, the following Work shall be completed
   a) Isolate Filter Nos. 5 and 7 by closing valves EXV-FI-5, EXV-FI-7, EXV-3, EXV-5, and EXV-7.
   b) Open valves PV-SWW-5 and PV-SWW-7 to drain the filter gullets.
   c) Remove valves EXV-FI-5 and EXV-FI-7. Disconnect temporary power feed and control wiring.
   d) Install new valves PV-FI-5 and PV-FI-7 including permanent power to new actuators from Filter Gallery Disconnect Panel 5 (Filter No.5) and Filter Gallery Disconnect Panel 7 (Filter No.7). Reconnect control wiring.
   e) Complete testing of influent valves.
   f) Return Filter Nos. 5 and 7 to service.

5. Filter Nos. 1 and 3 Influent Valves - during this stage, the following Work shall be completed
   a) Isolate Filter Nos. 1 and 3 by closing valves EXV-FI-1, EXV-FI-3, and EXV-1.
   b) Open valves PV-SWW-1 and PV-SWW-3 to drain the filter gullets.
   c) Remove valves EXV-FI-1 and EXV-FI-3. Disconnect temporary power feed and control wiring.
   d) Install new valves PV-FI-1 and PV-FI-3 including permanent power to new actuators from Filter Gallery Disconnect Panel 1 (Filter No.1) and Filter Gallery Disconnect Panel 3 (Filter No.3). Reconnect control wiring.
   e) Complete testing of influent valves.
   f) Return Filter Nos. 1 and 3 to service.

X. Phase XV: Miscellaneous Items to be Completed:
1. During this stage, the following Work shall be completed:
a) Installation, Testing and Start-up of the Dehumidification System.
b) Installation, Testing and Start-up of the new generator.
c) Fill in floor openings in the vestibule of the Filter Building.
d) Complete all remaining HVAC, Electrical and Instrumentation Items in the Filter Building.
e) Complete all Paving, Grading, and Restoration Work.
Complete all remaining items for the new chemical building addition.
f) Complete all remaining contract requirements.

1.5 TIE-INS

A. Table 01 14 16-A in this Section lists connections by CONTRACTOR to existing facilities. Table 01 14 16-A may not include all tie-ins required for the Work; CONTRACTOR shall perform tie-ins required to complete the Work as shown or indicated regardless of whether tie-in is indicated in Table 01 14 16-A. For tie-ins not included in Table 01 14 16-A, obtain requirements for tie-ins from ENGINEER by requesting an interpretation or clarification.

1.6 SHUTDOWNS

A. General:
1. Terminology: A "shutdown" is when a portion of the normal operation of OWNER's facility, whether equipment, systems, piping, or channel, must be temporarily suspended or taken out of service to perform the Work.
2. Work that may interrupt normal operations shall be accomplished at times convenient to OWNER.
3. Furnish at the Site, in close proximity to the shutdown and tie-in work areas, tools, materials, equipment, spare parts, both temporary and permanent, necessary to successfully perform the shutdown. Complete to the extent possible, prefabrication of piping and other assemblies prior to commencing the associated shutdown. Demonstrate to ENGINEER's satisfaction that CONTRACTOR has complied with such requirements before commencing the shutdown.
4. If CONTRACTOR's operations cause an unscheduled interruption of OWNER's operations, immediately re-establish satisfactory operation for OWNER.
5. Unscheduled shutdowns or interruptions of continued safe and satisfactory operation of OWNER's facilities that result in fines or penalties by authorities having jurisdiction shall be paid solely by CONTRACTOR if, in ENGINEER's opinion, CONTRACTOR did not conform to the requirements of the Contract Documents, or was negligent in the Work, or did not exercise proper precautions in performing the Work and complying with applicable permits, Laws, and Regulations.

6. Shutdowns shall be in accordance with Table 01 14 16-B of this Section. Work requiring service interruptions for tie-ins shall be performed during scheduled shutdowns.
7. Temporary, short-term shutdowns of smaller conduits (including piping and ducting), equipment, and systems may not be included in Table 01 14 16-B. Coordinate requirements for such shutdowns with ENGINEER and OWNER. Where necessary, obtain ENGINEER's interpretation or clarification before proceeding.

B. Shutdowns of Electrical Systems:
1. Comply with Laws and Regulations, including the National Electric Code.
2. CONTRACTOR shall lock out and tag circuit breakers and switches operated by OWNER and shall verify that affected cables and wires are de-energized to ground potential before shutdown Work is started.
3. Upon completion of shutdown Work, remove the locks and tags and notify ENGINEER that facilities are available for use.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 GENERAL

A. In addition to requirements of this Section, comply with Section 01 73 29, Cutting and Patching, and Section 01 73 24, Connections to Existing Facilities, and other Contract Documents applicable to Work associated with shutdowns, tie-ins, temporary pumping (where applicable), and similar Work.

3.2 (NOT USED)

3.3 SCHEDULES

A. The schedules indicated below, attached following this Section's "End of Section" designation, are part of this Specification Section:
1. Table 01 14 16-A, Schedule of Tie-ins.
2. Table 01 14 16-B, Schedule of Shutdowns.

+ + END OF SECTION + +

TABLE 01 14 16-A
SCHEDULE OF TIE-INS

Tie-In No.	New Line Size and Service	Existing (Connecting) Line Size & Service	Tie-In Building/Location	Construction Phase	Remarks
1	2 ½” or 3” Gas	2 ½” or 3” Gas	New Blower Building	Ia	
2	6” PW	6” PW	Between New Blower Building and Filter Building Extension	Ia	
3	6” PW	6” PW	Raw Water	Ia	
4	30” FTW	20” FTW	Filter to Waste Manhole No.2	If	
5	20” Filter Effluent Piping	20” Filter Effluent	Filter Gallery - Filter 10	II	
6	30” Washwater Supply Piping	30” Washwater Supply	Filter Gallery - Filter 10	II	
7	20” Filter Effluent Piping	20” Filter Effluent	Filter Gallery - Filter 9	III	
8	30” Washwater Supply Piping	30” Washwater Supply	Filter Gallery - Filter 9	III	
9	20” Filter Effluent Piping	20” Filter Effluent	Filter Gallery - Filter 8	IV	
10	30” Washwater Supply Piping	30” Washwater Supply	Filter Gallery - Filter 8	IV	
11	20” Filter Effluent Piping	20” Filter Effluent	Filter Gallery - Filter 7	V	
12	30” Washwater Supply Piping	30” Washwater Supply	Filter Gallery - Filter 7	V	
13	20” Filter Effluent Piping	20” Filter Effluent	Filter Gallery - Filter 6	VI	
14	30” Washwater Supply Piping	30” Washwater Supply	Filter Gallery - Filter 6	VI	
15	20” Filter Effluent Piping	20” Filter Effluent	Filter Gallery - Filter 5	VII	
16	30” Washwater Supply Piping	30” Washwater Supply	Filter Gallery - Filter 5	VII	
17	20” Filter Effluent Piping	16” Filter Effluent	Filter Gallery - Filter 4	IX	
18	30” Washwater Supply Piping	42” Washwater Supply	Filter Gallery - Filter 4	IX	
19	20” Filter Effluent Piping	16” Filter Effluent	Filter Gallery - Filter 3	X	
20	30” Washwater Supply Piping	42” Washwater Supply	Filter Gallery - Filter 3	X	
21	20” Filter Effluent Piping	16” Filter Effluent	Filter Gallery - Filter 2	XI	
22	30” Washwater Supply Piping	42” Washwater Supply	Filter Gallery - Filter 2	XI	
23	20” Filter Effluent Piping	16” Filter Effluent	Filter Gallery - Filter 1	XII	
24	30” Washwater Supply Piping	42” Washwater Supply	Filter Gallery - Filter 1	XII	
25	42” Washwater Header	42” Washwater Header	Filter Gallery - East	XIII	
26	8” Washwater Supply	12” Surface Wash	Filter Gallery - East	XIII	

TABLE 01 14 16-B
SCHEDULE OF SHUTDOWNS

Phase	Process Equipment and Service Lines Out-of-Service During Shutdown	Process Equipment In Operation During Shutdown	Tie-In Nos.	Maximum Duration	Milestone
Ia	• Raw Water Screens • Raw Water Pumps	-	2,3		M1
II	• Filter 10	• Filters 1-9	5,6	98 days	M2
III	• Filter 9	• Filters 1-8 • Filter 10	7,8	98 days	M2
VIII-1	• Filter 9 • Filter 10	• Filters 1-8	-	7 days	M3
IV	• Filter 8	• Filters 1-7 • Filters 9-10	9,10	84 days	M2
V	• Filter 7	• Filters 1-6 • Filters 8-10	11,12	70 days	M2
VIII-2	• Filter 7 • Filter 8	• Filters 1-6 • Filters 9-10	-	7 days	M3
VI	• Filter 6	• Filters 1-5 • Filters 7-10	13,14	70 days	M2
VII	• Filter 5	• Filters 1-4 • Filters 6-10	15,16	70 days	M2
VIII-3	• Filter 5 • Filter 6	• Filters 1-4 • Filters 7-10	-	7 days	M3
IX	• Filter 4	• Filters 1-3 • Filters 5-10	17,18	98 days	M3
X	• Filter 3	• Filters 1-2 • Filters 4-10	19,20	98 days	M3
XIII-1	• Filter 3 • Filter 4	• Filters 1-2 • Filters 5-10	-	7 days	Substantial Completion
XI	• Filter 2	• Filter 1 • Filters 3-10	21,22	84 days	Substantial Completion
XII	• Filter 1	• Filters 2-10	23, 24	84 days	Substantial Completion
XIII-2	• Filter1 • Filter2	• Filters 3-10	25,26	20 days	Substantial Completion
XIV-1	• Filter 9 • Filter 10	• Filters 1-8	-	14 days	Substantial Completion

XIV-2	• Filter 6 • Filter 8	• Filters 1-5 • Filter 7 • Filters 9-10	-	14 days	Substantial Completion
XIV-3	• Filter 2 • Filter 4	• Filter 1 • Filter 3 • Filters 5-10	-	14 days	Substantial Completion
XIV-4	• Filter 5 • Filter 7	• Filters 1-4 • Filter 6 • Filters 8-10	-	14 days	Substantial Completion
XIV-5	• Filter 1 • Filter 3	• Filter 2 • Filters 4-10	-	14 days	Substantial Completion
--	Each remaining tie-in can be made with either a “minor shutdown” or no shutdown. Tie-ins requiring a “minor shutdown” can be done during one of the major shutdowns. Tie-ins that do not require a shutdown may require re-routing process flow through an alternate line/pipe.		--	--	
Note: 1.					