EXHIBIT A

CITY OF PORTLAND

CONTRACT NUMBER 30008410

CBWTP Wet Weather Clarifier and Sodium Hypochlorite System Modifications

As authorized by [Ordinance _____ and] Portland City Code 5.68.035, this Design Services Contract ("Contract") is entered into by and between the City of Portland ("City," or "Bureau") and **Jacobs Engineering Group Inc.** ("Consultant").

Effective Date and Term

This Contract shall commence on the Effective Date, 27 October 2023 or upon final signature, whichever comes later, and shall continue in full force and effect until 27 June 2030 or such other date on the Contract is terminated or extended pursuant to the terms of this Contract ("Term").

Consideration

(a) City agrees to pay Consultant a sum not to exceed $15,684,614 US Dollars to complete the work in accordance with the Statement of Work (SOW), attached hereto as Exhibit A.

(b) Payments shall be made in accordance with the Compensation section, attached hereto as Exhibit B.

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CONSULTANT DATA AND CERTIFICATION

Name (print full legal name): Jacobs Engineering Group Inc.

Address: 2020 SW Fourth Ave., Suite 300, Portland, OR 97201

Business Designation (check one): ☐ Individual ☐ Sole Proprietorship ☐ Partnership ☒ Corporation ☐ Limited Liability Co (LLC) ☐ Public Service Corp. ☐ Government/Nonprofit

Payment information will be reported to the IRS under the name provided above. Information must be provided prior to contract approval.

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TERMS AND CONDITIONS

1) Standard of Care

In providing services under this Contract, the Consultant shall exercise that degree of skill and care ordinarily used by other reputable members of Consultant's profession, practicing in the same or similar locality and under similar circumstances (the "Standard of Care").

2) Effect of Expiration

Expiration of the Term shall not extinguish, prejudice, or limit either party's right to enforce this Contract with respect to any default or uncorrected defect in performance.

3) Order of Precedence

This Contract consists of these Terms and Conditions, the SOW, all Exhibits, and the City's RFP and Consultant's Proposal. Any apparent or alleged conflict between these items will be resolved by using the following order of precedence:

(a) Amendments executed by the parties after Contract award;

(b) This form Contract as executed by the Parties, including all Exhibits;

(c) RFP Requirements as set forth in City's RFP, including without limitations all Exhibits and any Addenda; and

(d) Consultant's Proposal in response to the RFP, including without limitation, to all supplementary materials.

4) Early Termination of Contract

(a) The City may terminate this Contract for convenience at any time for any reason deemed appropriate in its sole discretion. Termination shall be effective immediately upon City's delivery of a written notice of termination to Consultant.

(b) Either party may terminate this Contract in the event of a material breach by the other party that is not timely cured. Before termination is permitted, the party seeking termination shall give the other party written notice of the nature of the alleged breach, its intent to terminate, and provide fifteen (15) calendar days within which to cure the breach. If the breach is not cured within 15 days, the party seeking termination may terminate immediately by giving written notice that the Contract is terminated.

5) Remedies and Payment on Early Termination

(a) If the City terminates pursuant to 4(a) above, the City shall pay the Consultant for work performed in accordance with the Contract prior to the date of the termination notice. No other costs or loss of anticipated profits shall be due or payable.

(b) If the City terminates pursuant to 4(b) above, the City is entitled all remedies available at law or equity. In addition, Consultant shall pay the City for the costs to defend any claim, and all damages, costs, and sums incurred by the City as a result of the breach.

(c) If the Consultant terminates the Contract pursuant to subsection 4(b), the Consultant's sole remedy shall be payment for work completed prior to date of City's receipt of the termination notice. No other costs, loss of anticipated profits or consequential damages shall be paid.

(d) If the City's termination under Section 4(b) was wrongful, the termination shall be automatically converted to one for convenience and the Consultant shall be paid as if the Contract was terminated under Section 4(a).

(e) In the event of early termination, the Consultant's work product completed prior to the date of termination shall be deemed the property of the City and copies and/or data shall be immediately released to the City.

6) Assignment

Consultant shall not subcontract, assign, or transfer any of the work scheduled under this agreement without the prior written consent of the City. Notwithstanding City consent, the Consultant shall remain responsible for full performance hereunder. The Consultant agrees that if subcontractor(s) are employed in the performance of the SOW under this Contract, both Consultant and any subcontractors remain subject to the requirements of ORS Chapter 656, Workers' Compensation.

7) Compliance with Applicable Laws; Funding Requirements

Consultant shall perform all services in accordance with all applicable federal, state, and local laws and regulations, including without limitations tax laws and terms and conditions incident to receipt of any grant funds. Consultant represents and warrants that it is and will remain in compliance with all laws and expressly represents that it is and shall remain in compliance with Title VI of the Civil Rights Act of 1964 and its corresponding regulations during the Term of this Contract.

8) Respectful Workplace Behavior

The City is committed to a respectful work environment, free of harassment, discrimination and retaliation and other inappropriate conduct. Every individual has a right to work in a professional atmosphere where all individuals are treated with respect and dignity. The City's HR Rule 2.02 covers all employees of the City as well as consultants, vendors or contractors who provide services to the City. Consultant warrants its compliance with the terms and conditions of HR 2.02 as further described at: https://www.portlandoregon.gov/citycode/27929.

9) Indemnification for Property Damage and Personal Injury. Consultant shall indemnify, defend, and hold harmless the City, its officers, agents, and employees, from all claims, losses, damages, and costs (including reasonable attorney fees) for personal injury and property damage arising out of the intentional or negligent acts or omissions of the Consultant, its Subconsultants, suppliers, employees or agents in the performance of its services. Nothing in this paragraph requires the Consultant or its insurer to indemnify the City for claims of personal injury or property damage to the extent caused by the negligence or willful misconduct of the City. This duty shall survive the expiration or termination of this Contract or final payment hereunder.

The indemnity obligations of Consultant under this Contract will not in any way be affected or limited by the absence of insurance coverage or by the failure or refusal of any insurance carrier to perform any obligation under insurance policies

affecting this Contract. Consultant's indemnity obligations are in addition to any other rights or remedies available under this Contract, or in law or in equity to the City.

10) Insurance

Consultant shall obtain and maintain in full force at Consultant's sole cost and expense, throughout the Term and any warranty or extension periods, the required insurance identified below. The City reserves the right to require additional insurance coverage as required by statutory or legal changes to the maximum liability that may be imposed on Oregon cities during the term of the Contract.

(a) Workers' compensation insurance as required by ORS Chapter 656 and as it may be amended. Unless exempt under ORS Chapter 656, the Consultant and all Subconsultants shall maintain applicable coverage for all subject workers.

☒ Required and attached ☐ Certified statement of exemption (i.e., completion of Independent Contractor Certification Statement or similar)

(b) General commercial liability (CGL) insurance covering bodily injury, personal injury, property damage, including coverage for independent Consultant's protection (required if any work will be subcontracted), premises/operations, contractual liability, products and completed operations, in per occurrence limit of $1,000,000, and aggregate limit of $2,000,000.

☒ Required and attached ☐ Waived by Bureau Director or designee ☐ Reduce by Bureau Director or designee

(c) Automobile liability insurance with coverage of $2,000,000 each accident. The insurance shall include coverage for any auto or all owned, scheduled, hired and non-owned auto. This coverage may be combined with the commercial general liability insurance policy.

☒ Required and attached ☐ Waived by Bureau Director or designee ☐ Reduce by Bureau Director or designee

(d) Professional Liability and/or Errors & Omissions insurance to cover damages caused by negligent acts, errors or omissions related to the professional services, and performance of duties and responsibilities of the Consultant under this Contract in an amount with a of $1,000,000 per occurrence and aggregate of $3,000,000 for all claims per occurrence. If Consultant has a claims-made policy, the Consultant will provide continuation of coverage for a period of not less than three (3) years following the termination or expiration of the Contract.

☒ Required and attached ☐ Waived by Bureau Director or designee ☐ Reduce by Bureau Director or designee

Continuous Coverage; Notice of Cancellation: The Consultant agrees to maintain continuous, uninterrupted coverage for the duration of the Contract. There shall be no termination, cancellation, material change, potential exhaustion of aggregate limits or non-renewal of coverage without thirty (30) days written notice from Consultant to the City. If the insurance is canceled or terminated prior to completion of the Contract, Consultant shall immediately notify the City and provide a new policy with the same terms. Any failure to comply with this clause shall constitute a material breach of Contract and shall be grounds for immediate termination of this Contract.

Additional Insured: The liability insurance coverages, except Professional Liability, Errors and Omissions, or Workers' Compensation, shall be without prejudice to coverage otherwise existing, and shall include the City of Portland and its bureaus/divisions, officers, and employees as Additional Insureds, with respect to the Consultant's activities to be performed, or products or services to be provided. The coverage required by the preceding sentence shall be primary and non-contributory with any other insurance and self-insurance. The insurance afforded to the additional insureds shall protect each additional insured in the same manner as though a separate policy had been issued to each (subject to the standard ISO CG 20 10 Additional Insured endorsement).

Certificate(s) of Insurance: Consultant shall provide proof of insurance through certificate(s) of insurance that are approvable as to form by the City Attorney, including additional insured endorsement form(s) and all other relevant endorsements, to the City prior to the award of the Contract if required by the procurement documents (e.g., request for proposal), or at execution of Contract and prior to any commencement of work or delivery of goods or services under the Contract. The Certificate(s)

will specify the parties who are endorsed on the policy as Additional Insureds (or Loss Payees). Insurance coverages required under this Contract shall be obtained from insurance companies acceptable to the City of Portland. The Consultant shall pay for all deductibles and premium. The City reserves the right to require, at any time, redacted copies of required insurance policies, at the Jacobs office housing said insurance policies including blanket endorsements evidencing the coverage the required.

Subconsultant(s): Consultant shall contractually require its Subconsultants to acquire and maintain in effect until full performance of their Work under this Contract, insurance equal to the minimum coverage limits required above.

11) Ownership of Work Product

The City acknowledges that such design documents are not intended or represented to be suitable for use on the project unless completed by the Consultant, or for any other use or purpose, without written verification or adaptation by the Consultant; (2) any such use or reuse, or any modification of the design documents, without written verification, completion, or adaptation by the Consultant, as appropriate for the specific purpose intended, will be at the City's sole risk and without liability or legal exposure to the Consultant or to its officers, directors, members, partners, agents, employees, and consultants; (3) the City shall indemnify and hold harmless the Consultant and its officers, directors, members, partners, agents, employees, and consultants from all claims, damages, losses, and expenses, including attorneys' fees, arising out of or resulting from any use, reuse, or modification of the design documents without written verification, completion, or adaptation by the Consultant.

12) Business Tax Registration
The Consultant shall obtain a City of Portland business tax registration number as required by Portland City Code ("PCC") 7.02 prior to beginning work under this Contract.

13) Successors in Interest
The provisions of this Contract shall be binding upon and shall inure to the benefit of the parties hereto, and their respective successors and approved assigns.

14) Severability
The parties agree that if any term or provision of this Contract is declared by a court of competent jurisdiction to be illegal or in conflict with any law, the validity of the remaining terms and provisions shall not be affected, and the rights and obligations of the parties shall be construed and enforced as if the Contract did not contain the particular term or provision held to be invalid.

15) Waiver
The failure of the City to enforce any provision of this Contract shall not constitute a waiver by the City of that or any other provision.

16) Errors
The Consultant shall, without cost to the City, promptly correct errors or omissions related to the services required by this Contract.

17) Governing Law/Venue
The provisions of this Contract shall be interpreted, construed and enforced in accordance with, and governed by, the laws of the State of Oregon without reference to its conflict of laws provisions that might otherwise require the application of the law of any other jurisdiction. Any action or suits involving any question arising under this Contract must be brought in the appropriate court in Multnomah County, Oregon.

18) Amendments; Minor Amendments
Any changes to the provisions of this Contract's dollar amount, must be made by written amendment and approved by the Chief Procurement Officer or City Council to be valid. Any other changes to the provisions of this Contract, including changes to the scope of work, key personnel, Subconsultants or other changes, must be made by written amendment and approved as pursuant to PCC 5.68 and the PTE Manual.

(a) Amendment of the Contract. Any material change(s) to the provisions of this Contract shall be in the form of an Amendment. A "material change" means a change that increases risk to the City, or that increases the cost of the

Contract to exceed the Contract Price. Amendments must be in writing, must be approved as to form by the City Attorney, and must be executed in writing by authorized representatives of the Parties. Any proposed material amendment to this Contract that does not meet the requirements of this section will be deemed null, void, invalid, non-binding, and of no legal force or effect. "Material Amendment" does not mean a Minor Amendment as described in (b) below and does not mean an administrative change which the City may effect unilaterally. An administrative change means a written Contract change that does not affect the substantive rights of the Parties.

(b) Minor Amendments to Contract or Change Orders to a Statement of Work. The City and Consultant may make minor changes that do or do not impact the substantive rights or obligations of the Parties but that are not material amendments. Minor Amendments shall be made through the use of a Change Order that modifies a Statement of Work or Task Order. Following mutual approval of the Change Order, the parties will update the SOW to reflect changes to the description of services and any resulting changes to the timeframe of deliverables.

19) Prohibited Conduct

The Consultant shall not hire any City employee who evaluated the proposals or authorized the award of this Contract for two years after the date the Contract was authorized without the express written permission of the City and provided the hiring is permitted by state law.

20) Payment to Vendors and Subconsultants

The Consultant shall timely pay all Subconsultants and suppliers providing services or goods for this Contract. If the Consultant fails to make timely payments to its Subcontractors, Subconsultants, or suppliers, the City is entitled to take any action permitted by law, including, but not limited to, the following:

(a) Withhold all or part of any progress payment until Consultant makes payment;
(b) Find that the Consultant is not a qualified bidder for future projects per the City's consideration of the Consultant's record of past performance pursuant to ORS 279C.110(3);
(c) Directly make payment to the Subcontractor, Subconsultant, and supplier who has not received proper payment; and
(d) Terminate the Contract for and Event of Default as provided herein.

21) Access to Records and Audits

(a) The Consultant and its subconsultants and suppliers shall maintain all fiscal records relating to the Contract in accordance with generally accepted accounting principles. The Consultant and its subconsultants shall maintain all other records necessary to clearly document their performance of the work and any claims for additional compensation or requests for additional contract time arising from or relating to their performance under the Contract.
(b) The Consultant shall include in its subcontracts, purchase orders and all other written agreements a provision requiring all subconsultants, material suppliers, providers of rented operated equipment and persons submitting cost or pricing data according to the term of a contract, at all tiers, to comply with this section.
(c) The City and its authorized representatives shall have timely access to, and an opportunity to inspect, examine, copy and audit all books and records relating to the Contract, for any reason, upon reasonable notice.
    i) Such books and records shall be maintained by the Consultant and all subconsultants, suppliers and persons with cost or pricing data for a minimum period of six (6) years from the date of Final Payment under the Contract, or until the conclusion of any audit, controversy, litigation, dispute or claim arising out of, or related to, the Contract, whichever is longer.
    ii) The Consultant and all subconsultants, suppliers, and persons with cost or pricing data shall maintain all records in such a manner that providing a complete copy is neither unreasonably time consuming nor unreasonably burdensome for the Consultant or the City. Failure to maintain the records in this manner shall not be an excuse for not providing the records.
    iii) The Consultant and all subconsultants, suppliers, and persons with cost or pricing data shall produce all such books and records in Portland, Oregon, regardless of whether the records are produced pursuant to this provision of the Contract or as a result of a claim, litigation, arbitration or other proceeding. The Consultant or a subconsultant, supplier, or other person may produce the books and records elsewhere if it fully compensates the City for the reasonable costs of travel to and from the place where the records are produced and the reasonable cost of any employee's time in having to travel.
(d) If an audit discloses that payments to the Consultant were in excess of the amount to which the Consultant was entitled, the Consultant shall repay the amount of the excess to the City. Under no circumstances will the payment of previous invoices constitute an acceptance of the charges associated with those invoices.

22) Electronic Signatures
The City and Consultant may conduct this transaction, including any Contract amendments, by electronic means, including through the use of electronic signatures.

23) Merger Clause
This Contract, and the Contract Documents identified at Section 3 above shall be deemed to encompass the entire agreement of the parties and supersede all previous understandings and agreements between the parties, whether verbal or written.

24) Dispute Resolution/Work Regardless of Disputes
The parties shall participate in mediation to resolve disputes before conducting litigation. The mediation shall occur at a reasonable time after the conclusion of the Contract with a mediator jointly selected by the parties. For any claim or dispute that is subject to mediation under this section, the statute of limitations and statute of repose shall not begin to run until the time period set forth in Section 30 below or upon the conclusion of mediation, whichever is later. Notwithstanding any dispute under this Contract, the Consultant shall continue to perform its work pending resolution of a dispute, and the City shall make payments as required by the Contract for undisputed portions of the work. In the event of litigation, no attorney fees are recoverable. No different dispute resolution paragraph(s) in this Contract or any attachment hereto shall supersede or take precedence over this provision.

25) Progress Reports: ☒Applicable / ☐ Not Applicable
If applicable, the Consultant shall provide monthly progress reports to the Project Manager as described in the Statement of the Work and Payment Schedule.

26) Consultant's Key Personnel: ☒ Applicable / ☐ Not Applicable
If applicable, the Consultant shall assign the Key Personnel listed in the Statement of the Work and Payment Schedule for the work required by the Contract and shall not change Key Personnel without the prior written consent of the City, which shall not be unreasonably withheld. Notwithstanding anything to the contrary herein, Consultant shall, within 30 (thirty) days of receipt a request from the City replace any Key Person who is not meeting City performance requirements.

The Consultant agrees that the primary personnel assigned to perform the services shall be listed in in the Statement of Work and Consultant shall not change such personnel without the prior written consent of the authorized representative of the City as designated in the SOW. The City will enforce all social equity contracting for Disadvantaged, Minority, Women, Emerging Small Business and Service-Disabled Veteran Business Enterprise (D/M/W/ESB/SDVBE) Subconsultant commitments submitted by the Consultant in its proposals. Failure to use the identified D/M/W/ESB/SDVBE Subconsultants without prior written consent is a material breach of contract.

27) Third Party Beneficiaries
There are no third-party beneficiaries to this Contract. Enforcement of this Contract is reserved to the parties.

28) Conflict of Interest
Consultant hereby certifies that, if applicable, its Contract proposal was made in good faith without fraud, collusion or connection of any kind with any other proposer of the same request for proposals or other City procurement solicitation(s), and that the Consultant as a proposer competed solely on its own behalf and without connection or obligation to any undisclosed person or firm. Consultant certifies that it is not a City official/employee or a business with which a City official/employee is associated, and that to the best of its knowledge, Consultant, its employee(s), its officer(s) or its director(s) are not City officials/employees or a relative of any City official/employee who:

(a) has responsibility in making decisions or ability to influence decision-making on the Contract or project to which this Contract pertains;
(b) has or will participate in evaluation or management of the Contract; or
(c) has or will have financial benefits in the Contract.

Consultant understands that should it elect to employ any former City official/employee during the term of the Contract then that the former City official/Consultant employee must comply with applicable government ethics and conflicts of interest provisions in ORS Chapter 244, including but not limited to ORS 244.040(5) and ORS 244.047, and the City's Charter, Codes and administrative rules, including lobbying prohibitions under Portland City Code Section 2.12.080.

29) Contractual Statute of Limitations/Statute of Repose for Design Services Claims

The statute of limitations applicable to Design Services provided pursuant to this Contract shall be 2 years from the date of final completion of the project. The statute of repose applicable to Design Services provided pursuant to this Contract shall be 10 years from Final Completion of the project. The statute of limitations and statute of repose set forth herein shall not begin to run until the project reaches Final Completion, regardless of discovery of any condition, act, error, or omission. This provision shall be included in any Subconsultant agreement executed by the Consultant for the performance of services.

30) Notices and Communications

All notices and other communications concerning this Contract shall bear the Contract number assigned by the City. Notices and other communications may be delivered personally, by facsimile, email, by regular, certified or registered mail or other commercial delivery service. A notice to the City will be effective only if it is delivered to that person designated in writing in either:

(a) the Notice of Award of this Contract,
(b) the Notice to Proceed under this Contract, or
(c) to another individual specifically designated by this Contract.

A notice to the Consultant shall be effective if it is delivered to the individual who signed this Contract on behalf of Consultant at the address shown with that signature, to a corporate officer if Consultant is a corporation, to a general partner if Consultant is a partnership, or to another individual designated in writing by the Consultant in the Contract or in a written notice to the City.

31) Safety

Consultant shall ensure that all Work is performed in a safe manner protective of workers and the environment. Accordingly, Consultant shall maintain in place a safety plan that provides for compliance with all safety laws and regulations in effect during the Term. **Consultant shall bear the cost of compliance with its safety plan. The City agrees to increase Consultant's compensation only in the event of a change of law that directly and actually results in an increase in Consultant's costs of compliance with the new law. The City reserves the right but not the obligation to issue a "halt work" order in the event of a potential life safety risk as determined at the City's discretion.**

32) Access to Facilities

Consultant agrees that Consultant's physical or remote access to City facilities shall be subject to the security interests and health controls necessary to protect public property, City employees and the public. The City shall not be liable for any delays necessary in granting Consultant access to any portion of the facilities or systems.

33) Force Majeure

(a) If a Force Majeure Event occurs, the Party that is prevented by that Force Majeure Event from performing any one or more obligations under this Contract (the "Nonperforming Party") will be excused from performing those obligations, on condition that (1) the Nonperforming Party used reasonable efforts to perform those obligations, (2) the Nonperforming Party's inability to perform those obligations is not due to its failure to take reasonable measures to protect itself against the event or circumstance giving rise to the Force Majeure Event, and (3) the Nonperforming Party complies with its obligations under section 33(c).
(b) For purposes of this Contract, "Force Majeure Event" means, with respect to a Party, any event or circumstance, regardless of whether it was foreseeable, that was not caused by that party and that prevents a party from complying with any of its obligations under this Contract, except that a Force Majeure Event will not include a strike or other labor unrest that affects only one Party, an increase in prices, or a change in law.
(c) Upon occurrence of a Force Majeure Event, the Nonperforming Party shall promptly notify the other party of occurrence of that Force Majeure Event, its effect on performance, and how long that Party expects it to last. Thereafter the Nonperforming Party shall update that information as reasonably necessary. During a Force Majeure Event, the Nonperforming Party shall use reasonable efforts to limit damages to the other party and to resume its performance under this Contract.

34) Attachments

The following attachments are incorporated into this Contract.

(a) Exhibit A – Statement of Work
(b) Exhibit B – Compensation
(c) Exhibit C – Consultant's Hourly Rates
(d) Exhibit D – Sample Change Order
(e) Exhibit E – Drawing List

CONSULTANT SIGNATURE:

Consultant represents that Consultant has had the opportunity to consult with its own independently selected attorney in the review of this Contract. Neither Party has relied upon any representations or statements made by the other Party that are not specifically set forth in this Contract.

This Contract constitutes the entire agreement between the City and Consultant and supersedes all prior and contemporaneous proposals and oral and written agreements, between the Parties on this subject, and any different or additional terms on a City purchase order or Consultant quotation or invoice.

The Parties agree that they may execute this Contract and any Amendments to this Contract, by electronic means, including the use of electronic signatures.

This Contract may be signed in two (2) or more counterparts, each of which shall be deemed an original, and which, when taken together, shall constitute one and the same agreement.

IN WITNESS WHEREOF, the Parties hereby cause this Contract to be executed.

I, the undersigned, agree to perform work outlined in this Contract in accordance to the Terms and Conditions and the Statement of Work (Exhibit A); hereby certify under penalty of perjury that I/my business am not/is not in violation of any Oregon tax laws; hereby certify that my business is certified as an Equal Employment Opportunity Affirmative Action Employer and is in compliance with the Equal Benefits Program as prescribed by Chapters 5.33.076 and 5.33.077 of Code of the City of Portland; and hereby certify I am an independent consultant as defined in ORS 670.600.

Jacobs Engineering Group Inc.

BY:_____ Date:_____

Name:_____

Title:_____

CONTRACT NUMBER: 30008410

CONTRACT TITLE: **CBWTP WET WEATHER CLARIFIER AND SODIUM HYPOCHLORITE SYSTEM MODIFICATIONS**

CITY OF PORTLAND SIGNATURES:

By: _____ Date: _____
Bureau Director

By: _____ Date: _____
Chief Procurement Officer

By: _____ Date: _____
Elected Official

Approved:

By: _____ Date: _____
Office of City Auditor

Approved as to Form:

By: _____ Date: _____
Office of City Attorney

STATEMENT OF WORK

Consultant's and City's Project Manager for this Contract are:

For City of Portland: Environmental Services	For Consultant: Jacobs Engineering Group Inc.
Name: Tressie Word	Name: Gregg Thompson
Title: Project Manager	Title: Project Manager / Vice President
e-mail: Tressie.Word@portlandoregon.gov	e-mail: gregg.thompson@jacobs.com
Phone: 503-823-2926	Phone: 208.383.6107
Copy to: Jin Huang	Copy to: Kristen Jackson
e-mail: jin.huang@portlandoregon.gov	e-mail: kristen.jackson@jacobs.com

1. SCOPE OF WORK

Consultant agrees to provide all of the Design Services described below on an ongoing basis in support of, and in conformance with, the time frames described in the Request for Proposals.

PROJECT UNDERSTANDING

The City of Portland Bureau of Environmental Services (BES) serves the Portland community by providing water quality protection, watershed planning, wastewater collection and treatment, sewer installation, and stormwater management. The Columbia Boulevard Wastewater Treatment Plant treats an annual daily average of 76 million gallons per day of municipal wastewater and treats a peak flow of 450 million gallons per day of combined sewer.

To support its mission, Jacobs Engineering Group Inc. (Consultant) is to provide engineering services related to BES's project, the Columbia Boulevard Wastewater Treatment Plant Wet Weather Clarifier and Sodium Hypochlorite System Modifications (project). Generally, the project includes the rehabilitation of the eight existing wet weather clarifiers and replacement of the storage and distribution for the disinfection system (currently sodium hypochlorite). Additionally, the Consultant will provide engineering and professional services related to a combination of projects that are either in proximity or operationally connected, including demolition of the gravity thickeners.

BES will act as Program Manager. The project will be implemented under a Construction Manager/General Contractor (CM/GC or Contractor) delivery approach. The project is driven by improving the reliability and resiliency of the wet weather treatment train.
Consultant will provide engineering services under this agreement to consider, define, design, and support construction and startup of the project. The final project may include the following elements:

- Wet weather clarifiers
  - Coating the structural concrete and expansion joint repairs
  - Replacing or rehabilitating the primary clarifier mechanism and drives
  - Upgrading the primary scum system, including scum suppression sprays, automation collection conveyance, storage, and pumping (new scum system includes new scum tank, decanting and pumping, and scum piping to the digester)
  - Replacing well water/plant water piping, valves, sprays, hydrants, and cannons
  - Installing tank wash down system (primary effluent) – wet weather flushing valves
  - Field investigating and rehabilitating the primary clarifier underdrain
  - Replacing electrical components and instrumentation
  - Constructing a new electrical building or identifying an existing code compliant facility for electrical systems
  - Replacing, repairing, or revising the 48 primary influent gates
- Pipe gallery tunnel (tan tunnel) and transfer buildings
  - Removing or replacing existing electrical gear
  - Replacing steam piping and condensate return
  - Rehabilitating primary influent channel and repairing leaks from channel into tan tunnel

- Replacing primary sludge discharge valve actuator
- Improving or upgrading to tunnel ventilation to meet National Fire Protection Association (NFPA) 820 requirements and environmental ventilation requirements

- Thickeners
  - Demolishing abandoned thickeners and associated mechanical and electrical
  - Demolishing tipping berm
  - Restoring site and providing contractor staging area

- Disinfection system
  - Consolidating disinfection system into a single receiving, storage, and loop pumping facility
  - Providing disinfection metering system (including metering and piping to the feed points) for wet weather disinfection
  - Providing disinfection metering system (including metering and piping to the feed points) for secondary effluent (two locations) and return activated sludge, replacing all hypochlorite piping, and providing chemical piping to the future installation location to the water reuse disinfection metering pumps
  - Demolishing mechanical and electrical equipment associated with existing hypochlorite receiving and storage building, demolishing structure, and restoring site
  - Demolishing structural, mechanical, and electrical systems associated with hypochlorite loop tank storage and loop circulation pumps.
  - Demolishing the chemical piping associated with the existing hypochlorite system.

GENERAL ASSUMPTIONS

- Design will follow the BES Treatment and Pumping System Division (TPSD) design guidelines (including updates and changes to the guidelines). Drawings will follow the BES TPSD computer-aided design (CAD) standards.
- All deliverables, including drawing deliverables, will be provided by a PDF unless specified otherwise.
- Drawings will be prepared in REVIT/AUTOCAD/Civil 3D. Final drawings and record drawings will be delivered in REVIT/AUTOCAD/Civil 3D.
- A sample REVIT/AUTOCAD/Civil 3D drawing for each discipline at each design phase will be provided.
- All BES reviews will be completed in BlueBeam Studio hosted by the Consultant. All CM/GC reviews will be completed in BlueBeam Studio hosted by the Consultant.
- Standard details will be included in a separate 8.5-inch by 11-inch electronic volume. Final Record Drawings will include the standard details on drawing sheets.
- There will be two construction packages negotiated as guaranteed maximum price. Other than the two packages, CM/GC will divide documents as appropriate for subcontractors. Up to three early equipment procurement packages are assumed.
- Consultant will submit a drawing border variation for approval that is consistent with the waiver that was approved during STEP.
- Area sheets are based on STEP grid with scale 1"=20' per TPSD guidelines for record drawing consistency.
- BES will make its facilities safely accessible to Consultant as required for Consultant's performance of its services, including, but not limited to wash down of process basins. BES will perform, at no cost to Consultant, such tests of equipment, machinery, pipelines, and other components of BES's facilities as may be required in connection for safe access. Consultant will provide access and safety equipment as needed to perform the field work in this scope of work such as field visits, inspections, confined space entry, and other field activities. Requirements of the confined space entry will be based on the organization with the most restrictive interpretation.
- Consultant will manage the health, safety, and environmental activities of its staff and the staff of its subcontractors to achieve compliance with applicable health and safety laws and regulations.
- Consultant will coordinate its health, safety, and environmental program with the responsibilities for health, safety, and environmental compliance specified in the contract for construction. Consultant will coordinate with responsible parties to correct conditions that do not meet applicable federal, state, and local occupational safety and health laws and regulations when such conditions expose Consultant staff or Consultant subcontractor staff to unsafe conditions.
- Consultant will notify affected personnel of any site conditions posing an imminent danger to them that Consultant observes.
- Consultant will not be responsible for the means, methods, techniques, sequences, or procedures of the CM/GC, nor will Consultant be responsible for the CM/GC's failure to perform in accordance with the contract documents.
- The construction will be delivered as a CM/GC project. It is assumed that the CM/GC will be engaged early in the

Predesign Phase of the project.

- Only BES (or its agent) will issue decisions on CM/GC claims and disputes. Consultant will not issue decisions on CM/GC claims or disputes. Consultant will not, except as part of additional services, undertake comprehensive and detailed investigation or analysis of CM/GC's claims and disputes, nor participate in judicial or alternative dispute resolution procedures for the claims or disputes.
- BES will make its facilities cleaned with appropriate lock out/tag out for safe Consultant entry as required for Consultant's performance of its services. Labor and safety equipment for entry will be provided by Consultant.
- BES will provide to Consultant all data in BES's possession relating to Consultant's services on the project. Consultant will reasonably rely upon the accuracy, timeliness, and completeness of the information provided by BES.
- BES will give prompt notice to Consultant whenever BES observes or becomes aware of any development that affects the scope or timing of Consultant's services or of any defect in the work of Consultant or the CM/GC.
- BES will examine information submitted by Consultant and render in writing or otherwise provide decisions in a timely manner.
- BES will furnish required information and approvals in a timely manner.
- BES will make all agreements with the CM/GC consistent with Consultant's Agreement.
- Drawing deliverables are based on the preliminary drawing list included with the scope of work.
- For all workshops and meetings led by Jacobs, Jacobs will provide the meeting agenda, presentation slides, and other meeting materials to BES at least one week before the meeting.
- Unless otherwise defined, assume Management Meetings will not exceed 1 hours in duration and include no more than 2 Jacobs staff. Budget will include 4 hours total per meeting (includes preparation and meeting notes).
- Unless otherwise defined, assume Kickoff Meetings and Focus Meetings will not exceed 2 hours in duration and include no more than 5 Jacobs staff. Budget will include 20 hours total per meeting (includes preparation and meeting notes).
- Unless otherwise defined, assume CM/GC Coordination Meetings will not exceed 3 hours in duration and include no more than 4 Jacobs staff. Budget will include 24 hours total per meeting (includes preparation and meeting notes).
- WWCL Structural Condition and Repair
  - Jacobs basis for the structural repair work is supported by the previous structural condition assessments by others (West Yost report).
  - Jacobs is not performing an additional condition assessment of the WWCLs structural condition.
  - Repair locations will be based on field validation check in two basins and West Yost report.
- Assume demolition inside the transfer buildings only and no restoration work.
- Assume WWCL and transfer building electrical plans include facility plans and power plans on the same sheet.
- Assume no new scope in the red tunnel and RAS chlorination will occur within 50 feet of the new hypochlorite facility.
- Structural and geotechnical seismic alternatives for existing facilities will be evaluated during Project Definition but not included in the design.
- Assume the construction duration will occur over a 3 year period.
- In soils, foundation, groundwater, and other subsurface investigations, the actual characteristics may vary significantly between successive test points and sample intervals and at locations other than where observations, exploration, and investigations have been made. Because of the inherent uncertainties in subsurface evaluations, changed or unanticipated underground conditions may occur that could affect total project cost and/or execution. These conditions and cost/execution effects are not the responsibility of Consultant.
- In providing opinions of cost, financial analyses, economic feasibility projections, and schedules for the project, Consultant has no control over cost or price of labor and materials; unknown or latent conditions of existing equipment or structures that may affect operation or maintenance costs; competitive bidding procedures and market conditions; time or quality of performance by operating personnel or third parties; and other economic and operational factors that may materially affect the ultimate project cost or schedule. Therefore, Consultant makes no warranty that BES's actual project costs, financial aspects, economic feasibility, or schedules will not vary from Consultant's opinions, analyses, projections, or estimates. If BES wishes greater assurance as to any element of project cost, feasibility, or schedule, BES will employ an independent cost estimator, contractor, or other appropriate advisor.
- The consultant's scope of work is based on this document which supersedes the scope in the BES RFP Number 00001987.

GENERAL EXCLUSIONS

- Consultant is not responsible for health or safety precautions of construction workers. Consultant is not responsible for the CM/GC's compliance with the health and safety requirements in the contract for construction or with federal, state, and local occupational safety and health laws and regulations.
- Consultant is not providing software integration for the project.
- Consultant will not provide survey for baseline control for construction.
- Chemically enhanced primary treatment design changes are not within the scope of this project.
- Factory and offsite witness testing and inspections are not included.
- No geotechnical work is included at existing facilities. Geotechnical work is only included for the new hypochlorite facility and the new electrical building.
- No significant geotechnical and structural/seismic improvements are included in the detailed design scope of work.
- Fire alarm and sprinkler system design is not included except at the new hypochlorite facility.
- ADA accessibility design is not included.
- Detailed erosion control provided by CM/GC, consultant is only providing general sheets.
- No Road Signage included in Consultant design scope of work. The Construction Traffic Route will be in CM/GC CM plan.
- Online O&M manuals are not included.
- Testing and evaluation of Contaminated Soils are not included. BES will evaluate soils. BES will sample and evaluate potential hazards, as necessary.
- BES will test and evaluate Lead, Asbestos, and Hazardous Materials and report analyzed data and evaluate each facility and site location.
- The scope of work does not include plant-wide communication systems, security design, video design, and intercom systems—only accommodation of these systems for new structures. Assume that Consultant design work accommodates these systems but assume they will be installed by BES or separate vendors (to match existing systems).

ACRONYMS AND ABBREVIATIONS

3D	Three-dimensional
AACE International	Association for the Advancement of Cost Engineering International
ASCE	American Society of Civil Engineers
BDS	City of Portland Bureau of Development Services
BES	City of Portland Bureau of Environmental Services
CAD	computer-aided design
CBWTP	Columbia Boulevard Wastewater Treatment Plant
CFD	computational fluid dynamics
CM	Construction Manager
CM/GC	Construction Manager/General Contractor
COBID	Certification Office for Business Inclusion and Diversity
Consultant	Jacobs
DEQ	Oregon Department of Environmental Quality
DTM	digital terrain model
DMWESB/SDVBE	Disadvantaged, Minority-owned, Women-owned, Emerging Small Business, Service Disabled Veterans Business Enterprises
GMP	guaranteed maximum price

HVAC	heating, ventilation, and air conditioning
I&C	instrumentation and controls
I/O	input/output
MCC	motor control center
NFPA	National Fire Protection Association
NTP	notice to proceed
O&M	operations and maintenance
P&ID	process and instrumentation diagram
PLC	programmable logic controller
Project	Columbia Boulevard Wastewater Treatment Plant Wet Weather Clarifier and Sodium Hypochlorite System Modifications
QA	quality assurance
QC	quality control
QMP	Quality Management Plan
RFI	request for information
RI	Resident Inspector
SCADA	Supervisory control and data acquisition
SDC	Services during construction
SOP	Standard operating procedure
TM	Technical memorandum
UPS	Uninterruptable power supply
WWCL	Wet weather clarifier
WWEFCS	Wet weather effluent flow control structure
WWPW	Well water/plant water

Task 01 Project Development

The Columbia Boulevard Wastewater Treatment Plant Wet Weather Clarifier and Sodium Hypochlorite System Modifications (project) Development Phase provides the following outcome: The Project Development Report that is composed of alternatives evaluations technical memorandums (TMs) and is used by The City of Portland Bureau of Environmental Services (BES) as the Stage Gate 2 Deliverable.

Task 01.01 Client Standards and Data Requests

The purpose of this task is to define BES's objectives and success factors for the project and to document BES's institutional standards as they pertain to this work. Jacobs (Consultant) will focus on the intended outcome achieved from established standards to propose, as applicable, updates to be in line with current industry standards and emerging trends. Project objectives and standards in the following areas will be considered and documented in a TM:

- **Project objectives –** Discussion of the overall purpose for this project to ensure that all participants have the same understanding. BES will define for the project team what will make this a successful project from their perspective.
- **BES design criteria standards and preferences** – Document of BES guidelines and standards for design criteria or standard products.
- **Seismic operational resiliency criteria –** Document of City of Portland and BES standard seismic resiliency goals

and criteria. Consistent with the Oregon Structural Specialty Code and drawing on the level of service work previously done by Portland BES, seismic resiliency criteria will be defined for structures and equipment.

- **Sustainability criteria –** Document City of Portland and BES sustainability goals and criteria. Identify opportunities to further City of Portland sustainability goals through the project.
- **Graphic standards –** Standard drawing size/border, standard symbols/legends, computer-aided design (CAD) software standards (including software versions), requirements for electronic deliverables, standards/preferences for process and instrumentation diagrams (P&IDs), and process flow stream identifications. This task will also include a kickoff meeting and follow-up with all design team subconsultants to coordinate CAD design standards and document presentation standards.
- **Procurement policies –** Bidding/procurement requirements, sole source restrictions, any existing primary agreement for the purchase of materials, and equipment.
- **Labor standards and policies –** Design provisions for staff/visitors with accessibility limitations, any existing noise restrictions, any existing labor union restrictions, site security requirements, and parking requirements.
- **Approach to alternatives analysis and decision process –** Document approach to alternative evaluations to be applied throughout the project. Evaluations will include triple bottom-line analysis, including life-cycle cost criteria, capital costs, and non-cost criteria to support the decision process. Establish local parameters to be used in cost models and estimating tools.
- **File Management System –** Working project files to be shared on the BES Sharepoint site. BES to grant access to Jacobs. Final deliverables will be uploaded to Heron/E-Builder.

Field Visits – None

Meetings – Client standards will be discussed during a workshop as described in Task Technical Workshops.

Assumptions

- This task will occur at the beginning of the project and assume that no major changes will occur in later design phases.
- BES will provide available electrical one-line as-builts. BES will provide as-builts of the facility in electronic or hard copy.

Deliverables

Documentation of the agreed upon standards in TM format

Task 01.02 Field Investigations

The purpose of this task is to document characteristics of the existing facility. Results of this task will be documented in several TMs or field reports, intended to serve as appendices to the BODR.

Field Visits

- Structural – Two visits to include:
  - First visit
    - One walk through and inspection of accessible facilities.
    - Confined space entry to two WWCLs for inspection.
    - Assume three (3) consulting staff.
  - Second visit
    - Support core sampling, one day.
    - Assume three (3) consulting staff.
- Electrical – Two electrical site visits. Each visit assume 3 consulting staff.
- Mechanical – One visit concurrent with Structural visit to include:
  - One walk through and inspection of accessible facilities.
  - Confined space entry to two WWCLs for inspection.
  - Assume five (5) consulting staff.
- Site survey
  - Scope includes a maximum of fifteen (15) days of site survey
  - One (1) to two (2) days in the field to scan Primary Clarifier eight (8)
  - Locate and identify utilities significant to the design prior to onboarding of the Construction Manager/General Contractor (CM/GC).

- Potholing – BES will provide up to five (5) potholes using vacuum trucks prior to geotechnical field exploration.
- Geotechnical – One site visit before field work. Assume two (2) consulting staff members.
- Geotechnical field exploration. Assume two (2) consulting staff members.

Meetings

- Field investigation plan – Focus meeting to understand BES understanding of the condition of the equipment and discuss the boundaries of the condition assessment
- Electrical - Focus group meeting with second (2) site visit
- Survey - Kickoff meeting to discuss the survey plan
- Geotechnical – Focus meeting to discuss the geotechnical field exploration plan

Assumptions

- BES will provide five (5) years of process performance data.
- BES will provide existing information relative to existing equipment, capacities, and age, including operational data, maintenance data, and equipment manuals.
- BES will provide concrete core sampling and quantitative laboratory analysis of the wet weather clarifier and adjacent channels in accordance with the Structural Assessment Plan.
- Consultant will provide equipment and personnel for confined space entries of Consultant staff. Requirements of the confined space entry will be based on the organization with the most restrictive interpretation.
- Visual observations will only serve to orient the design team.
- No evaluation of the external buried structures will be included.
- BES will provide existing record drawing information and existing equipment information.
- BES will provide latest electrical system study information and current site electrical metering information.
- Plant fiber-optic duct banks will comply with TPSD design guidelines on the date of the agreement. Work is limited to modifying a portion of the existing fiber-optic system on the north end of the plant.
- Electrical review of existing facilities or building areas that are not specifically included in the project scope are not included.
- BES will provide record drawings of existing utilities. BES will conduct potholing, including identifying relevant design information of the located utilities.
- Surveyors will provide for one additional site visit for the collection of supplemental topographic data identified as necessary with the design development task, including sufficient data for the generation of the digital terrain model (DTM) for the future design and surface visible utilities. Legal, easement, or plat surveys will not be provided under this scope.
- Three-dimensional (3D) scanning of tan tunnel (piping gallery) and transfer building was completed by BES.
- BES will provide copies of all available geotechnical, geologic, and groundwater reports and studies completed at the project site.
- BES will provide access to site required to complete geotechnical explorations.
- BES will assist Consultant with reviewing potential underground utility interferences with proposed geotechnical exploration locations.
- Geotechnical exploration will commence within three (3) months of the notice to proceed (NTP) and be completed within 6 months of the NTP.
- It is assumed that explorations will encounter ground having limited contamination. Therefore, the following will be done:
  - The drill cuttings will be stored in 55-gallon drums. Drums will be stored onsite until environmental testing/characterization is complete. The level of effort does not include costs for constructing storage facilities. It is assumed that the cuttings are non-hazardous. BES will dispose of drums according to the results of the testing.
  - Air monitoring during completion of the geotechnical explorations will not be required.
  - Sonic-core drilling techniques will be used to advance the geotechnical borings. The drill rods will be steam cleaned at the end of the drilling process but will not be steam cleaned between the drill holes.
  - BES will collect environmental samples within the upper 20 feet of the sonic borings. Additional SPT samples will be performed as necessary to obtain enough sample.

Deliverables

- Data Collection and Structural Assessment TM
- Data Collection and Electrical Assessment TM

- Data Collection and Mechanical Assessment TM
- Site Survey Plan
- Digital Terrain Model (DTM) and CAD files of surveyed data
- Geotechnical field exploration plan
- Geotechnical Data Report

Task 01.02.01 Data Review

Provide initial assessment of the major components affected by the proposed scope of work, including such assets as structural components, pumping systems, electrical, communications network, and major equipment. The intent of this initial condition assessment is a broad-based review of the age, the capacity, and the condition of existing facilities that are likely to be reused as part of the future facilities.

The approach will be as follows:

- Collect existing documents and data, including hydraulic profiles, dimensions and location of treatment infrastructure (basins, channels, pipeline, substations, control panels, and utilities), process data, electrical data, and communication data.
- Review collected documentation and identified data gaps and inconsistencies.

Task 01.02.02 Structural Investigations

- Site visit for structural evaluation of the existing facilities (wet weather clarifiers, tunnel, channels, and two candidate structures for electrical room as a base assumption for this scope).
- Prepare structural sampling plan for clarifiers that includes such items as the clarifier walls, columns, floor, and the adjacent channels. Evaluations do not include an evaluation of equipment anchoring or other elements that are not a part of the structure. The structural evaluation plan will be presented in a workshop.
- Advisor for the structural sampling (core samples) of the wet weather clarifiers and channels. Sampling not performed by Consultant.
- Condition assessment for transfer buildings, tan tunnel, and associated features.
- Validation of two WWCL condition assessment consistency with the condition assessment described in the West Yost report. Assessment will be completed on the two WWCLs that will be entered already as part of the Field Investigations task. If conditions are found to be drastically different in the two basins, more field investigation may be required that is not included in this scope of work.

Task 01.02.03 Electrical Investigations

- One trip for an electrical survey of existing equipment
- Detailed bucket inventory
- BES Electrician support photographing the interior of each cabinet
- Focus group meeting with second site visit; site trip to identify the spaces, conduct the motor control centers (MCCs), and photograph each bucket
- Condition assessment and visual inspection; no sampling and no oil samples
- Third site visit for electrical evaluation of the existing facilities, including substations, MCCs, and conduit runs in the project area
- Determination of preferred tie-in locations and routing for new fiber-optic control duct banks to help achieve BES goal of creating a fiber loop

Task 01.02.04 Mechanical Investigations

Visually inspect mechanical systems as determined during the task Data Review and Initial Condition Assessment. Obtain previous condition assessments, maintenance records, performance data and manufacturer data from BES staff.

- Clarifier underdrain – Specialized inspection to be developed during planning
- Clarifier mechanism, including the gear drives
- Primary sludge pump discharge valve and valve actuator; no change to pump capacity
- Scum collection, storage, and pumping systems
- Ventilation for tan tunnel and transfer buildings
- Steam and condensate pipe and pipe supports
- Primary effluent flushing valves and actuator
- Tunnel sump system
- Site mechanical demolition requirements

Task 01.02.05 Site Survey Work

The site survey work will include of the following activities:

- Prepare a site survey plan, including site visit and review of existing information and discussions with BES team.
- Establish a horizontal and vertical control network for the project area. Horizontal control will be based on the Oregon Coordinate Reference System datum. Vertical control will be based upon City of Portland vertical datum.
- Perform site survey of the intended project area with the following guidelines:
  - Tie features within the survey limits of the project and include 3D coordinates. Topographic features include utilities, drainage, trees (6-inch diameter at breast height or greater) and shrubs, and improvements (paved areas, curb, sidewalk, fences, and structures).
  - Collect supplemental topographical data to create points and break lines in adequate quantity to accurately represent the surface of the ground to be included in the DTM.
  - Map and record utility facility structures (for example, concrete pads, top slab of vaults, pump station housing, equipment pads and enclosures, barrier screens, or fenced enclosures). Individual pieces of equipment will not be tied.
  - Establish field ties of utility features, including underground stormwater lines and structures, underground wastewater lines and structures, underground water lines and structures, underground and overhead power lines, and underground gas lines.
  - Collect data for the top of each of the 8 existing clarifiers' basin walls (and influent/effluent channels, wet weather effluent channel) and measure 8 to 10 water surface elevation points. This activity will be coordinated with the BES staff to note the specific flows at the time of measurement.
- Create detailed base map file with survey data collected.
- Provide 3D scanning. Provide detailed survey of Primary Clarifier 8.
- Provide survey of hydraulic features, including Parshall flumes, channels, primary influent channels, effluent, and underdrain.
- Not included: Locate/verify existing below ground utilities using test pits, magnetic meters, or ground penetrating radar.

Task 01.02.06 Geotechnical Investigations

Perform geotechnical investigations to support design development. This subtask includes the following:

- Develop plan for ground penetrating radar in the vicinity of the proposed geotechnical borings.
- Perform desktop review of existing geotechnical information. Review existing groundwater and dewatering data.
- Plan geotechnical field explorations. Develop preliminary approach and locations for geotechnical field explorations. Focus meeting with BES to discuss geotechnical field explorations.
- Conduct site visit to observe site access and ground conditions for geotechnical field investigations.
- Finalize geotechnical field exploration plan.
- Consultant to stake out locations of proposed explorations and complete the "1-811" one-call utility locates notification. Consultant will provide utility locating with input from BES on locations of known utilities. Evaluate the presence of underground utilities using a third-party utility locates firm.
- Use results of environmental review to inform drilling and decontamination practices.
- Perform a geotechnical exploration program consisting of the following:

- Three geotechnical soil borings similar to Figure 1. The depth of these borings will be about 60 to 100 feet. The locations will depend on the location of the electrical building and the need to obtain subsurface information in the vicinity of that structure.
- Installation of one vibrating wire piezometer with data loggers to facilitate observation of groundwater fluctuations near the wet weather clarifiers (WWCLs).

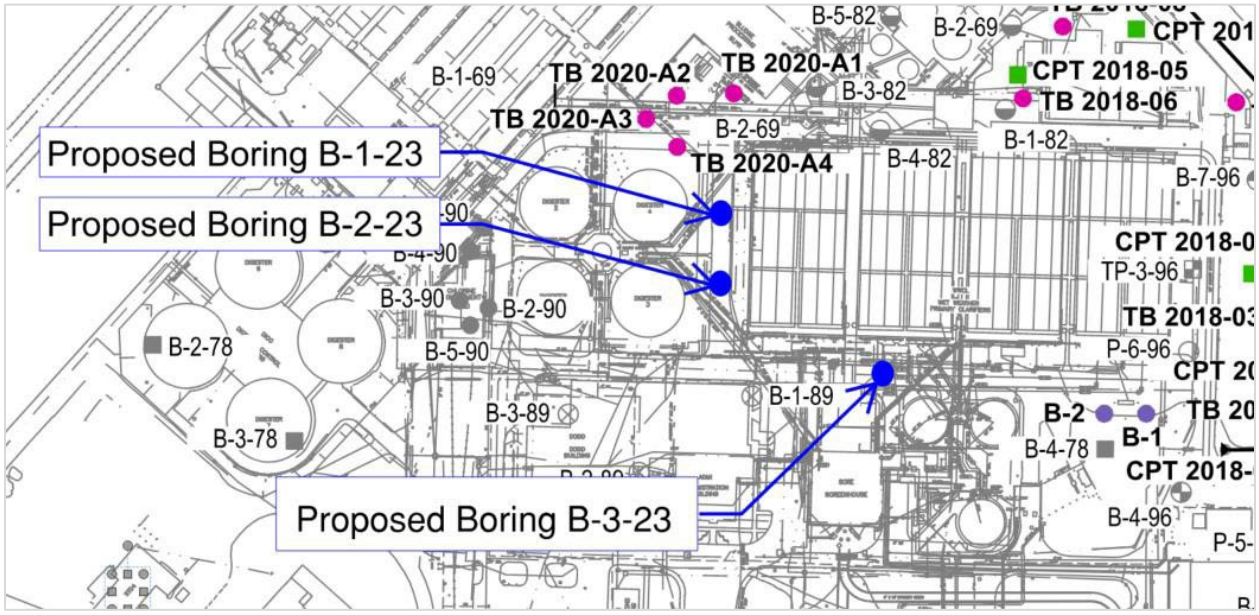

Figure 1. Proposed Boring Locations

- Collect soil samples from soil borings using standard penetration test samplers and thin-walled Shelby tube samples at regular 5-foot intervals. Log the borings in accordance with the Unified Soil Classification System and ASTM International D2488 by observing cuttings and collect samples.
- Develop laboratory testing program and complete laboratory testing on select representative soil samples to develop engineering parameters. The laboratory testing will consist of up to 25 moisture content tests, twelve (12) grain size analyses, twelve (12) Atterberg limits, up to four (4) one-dimensional consolidation tests, and up to four (4) sets of pH, electrical resistivity, chlorides, and sulfates tests.
- Use ground penetrating radar to identify potential issues with subsurface conditions around the primary clarifiers.
- Specialized laboratory testing to evaluate the ground response of low-plasticity silts to cyclic shaking will not be completed.
- Prepare a Geotechnical Data Report that includes both previously existing geotechnical information and data obtained during the current geotechnical exploration.

Task 01.03 Alternative Evaluations

Complete analysis and a series of TMs to aid in the preliminary selection of the component improvements. Alternative analysis will consider construction cost and life-cycle cost, construction risks, procurement constraints, operations and maintenance, resiliency, and footprint, among other aspects.

Field Visits

Assume three (3) visits to site by two (2) Consultant staff to complete alternative evaluations

Meetings

- Focus meetings – Two (2) meetings with BES to discuss geotechnical design alternatives
- One meeting with three Consultant staff, not to exceed two (2) hours, to review the alternatives evaluations.

Assumptions

- BES will provide native (spreadsheet) files of unit process performance data for the last five (5) years.

Consultant will prepare a data request.

- BES will provide updated process control data for the last five (5) years.
- Chemically enhanced primary treatment is not within the scope of this project.
- There will be no change to tunnel dewatering.
- Process performance modeling is not included in the scope.
- NFPA 820 analysis is limited to the facilities to be modified in this project.

Deliverables

- Alternative Evaluations TMs:
  - Seismic Resiliency Alternatives
  - Geotechnical Design Alternatives
  - Primary Clarification Alternatives
  - Sodium Hypochlorite System Modifications Alternatives
  - Demolition Alternatives
  - Mass Balance Table

Task 01.03.01 Mass Balance Update

The purpose of this task is to document the mass balance for sizing process equipment associated with primary treatment. The task will be completed with a criteria sheet as a drawing.
Use existing Columbia Boulevard Wastewater Treatment Plant (CBWTP) process models (developed as part of Secondary Treatment Expansion Project) to prepare mass balance to support design criteria determination.\

Task 01.03.02 Seismic Resiliency Alternatives

Develop and evaluate alternative design approaches to support adequate seismic resiliency of improvements. TM will include results of the following activities:

- Based on BES goals and criteria and work previously completed for the Secondary Treatment Expansion Program, work with BES to define specific seismic resiliency criteria for geotechnical improvements, structural performance requirements, and mechanical and electrical equipment seismic performance.
- Based on the settlement and lateral spreading estimated, provide qualitative assessment of structural performance of the WWCL without ground improvements and with an intermediate level of seismic settlement and lateral spreading mitigation.
- Document seismic retrofit alternatives evaluation and recommended approaches for existing facilities.
- Establish seismic resiliency criteria for new facilities.
- Develop and document foundation and construction approaches for new structures.

Task 01.03.03 Geotechnical Design Alternatives

Develop and evaluate alternative geotechnical design approaches to support development of improvements. TM will include results of the following activities:

- Complete simplified liquefaction triggering evaluation.
- Estimate seismic settlement using simplified analyses.
- Use simplified methods to evaluate potential for seismically induced flow failures and lateral spread. Results from the site-specific seismic analyses and the numerical model developed as part of the Secondary Treatment Expansion Program (STEP) will also be used to estimate lateral spread potential.
- Develop code-based spectral accelerations to be used for preliminary seismic design.
- Complete assessment of ground improvement alternatives to mitigate seismic settlement and lateral spreading below wet weather clarifiers, electrical building, and the hypochlorite facility. Three to four preferred alternatives will be selected based on cost, constructability considerations, and acceptance/performance of the method. Additional detailed assessment will be completed for the one preferred alternative. Develop cost information, including input from CM/GC (if available) on ground improvement subcontractor costs.

Task 01.03.04 Primary Clarification Alternatives

Develop and evaluate components of primary clarification improvements related to the rehabilitation of the existing clarifiers:

- Hydraulic
  - Develop a hydraulic model for the current operation and the preferred alternative.

- Evaluate primary influent isolation gate alternatives.
- Evaluate implementation of strategic baffles, and ability to improve system performance with available treatment volume.

- Computational fluid dynamics (CFD)
  - Prepare a CFD model of one existing clarifier. Calibrate against current performance.
  - Evaluate the flow and settling potential in the wet weather clarifier at the CBWTP. This information will assist with understanding the hydraulics in the wet weather clarifier and determine potential for improvement in flow distribution and solids management. The models will be used to characterize the hydraulics and solids settling characteristics in the existing wet weather clarifier, evaluate the potential for poor flow distribution or solids settling due to hydraulic conditions such as recirculation or dead zones, and evaluate modifications to the clarifier to determine the potential for improved performance.
  - Include two (2) flow scenarios—a peak flow rate and alternative flow and load condition to be decided. The evaluation will focus on hydraulic flow distribution and solids settling behavior. This wet weather facility clarifier handles primary wastewater with highly variable solids, which include grit and floatable solids. The model will be used to evaluate hydraulics and identify zones of potential settling or resuspension based on velocity. Additionally, heavier particles can be simulated directly and tracked to identify likely regions of deposition.
  - Based on the results of the existing conditions, use the model to propose up to two (2) additional improvements to be evaluated for the two model scenarios for a total of six model runs.
- Process – Evaluate the impact of structural rehabilitation on clarifier performance, specifically focused on the change in dimensions and as included in CFD modeling.
- Primary clarifier mechanism
  - Evaluate if the mechanism (chain and flights) should be rehabilitated or replaced.
  - Evaluate if the drives should be replaced in-kind or an alternative approach.
- Primary influent gates and alternative approaches – Evaluate how to replace primary influent gates, including controls approach or improvements that could reduce the quantity of gates.
- Primary clarifier structural rehabilitation
  - Prepare seismic evaluation similar to American Society of Civil Engineers (ASCE) 41 Tier 1. Analyze and perform evaluation of existing structure seismic performance (in absence of soil movement).
  - Prepare up to three alternatives for the structural rehabilitations for improving seismic resiliency. Determine the criteria for selecting the rehabilitation approach. Document the preferred rehabilitation method.
  - Expansion joint maintenance – Identify the general materials and approach for expansion joint maintenance. This does not include tying together the walls and the floor slabs.
  - Use of mortar repair or structural rehabilitation in lieu of an applied coating is expected. If a coating system is required, select based on previous West Yost study.
  - Determine approach to Clarifier 8 vertical variation, such as mechanical rehabilitation, below slab void identification, ground penetrating radar around the structure, soils improvement, or structural monitoring.
- Scum systems upgrade
  - Evaluate scum suppression system and recommend modifications.
  - Automate the existing scum collector based on current manual operations.
  - Estimate current scum collection quantities and pumping. Identify alternative operational approaches consistent with the new scum collection systems identified, including items such as decanting and pumping.
- Well water/plant water (WWPW)
  - Identify the boundaries of WWPW replacement.
  - Evaluate current spray cannon system, and provide preferred alternative, such as reuse and move.
- Primary effluent flushing system – Identify the boundaries of primary effluent flushing system replacement or repair.
- Electrical and instrumentation
  - Evaluate where the wet weather system will be controlled. The current system is a centralized control system. Evaluate if a local control system should be implemented.
  - Evaluate location of the electrical gear (such as MCCs and control panels). Options include the current transfer buildings, two alternative existing facilities, or constructing a new facility. Consider structural criteria, resiliency, and fire code (National Fire Protection Association [NFPA] 820).
  - Include arc flash requirements for the new MCCs.
  - Evaluate the overall control approach for communication and control. Wet weather effluent flow control

structure (WWEFCS) programmable logic controller (PLC) could be converted to a remote rack. Flow meter in WWEFCS is not in scope of this project.

- Ventilation – Evaluate if the current ventilation is appropriate for occupancy and NFPA 820 requirements.
- Primary sludge discharge valve actuators – Evaluate existing actuator and select replacement approach. Evaluate the need to rehabilitate or replace the discharge valves.
- Primary sludge pump – Identify any changes to pump operations associated with primary clarifier rehabilitation. None are expected.
- Tan tunnel and transfer buildings upgrades – Document upgrades required within the tan tunnel based on the future use of the transfer building. Consider the following system components:
  - Steam and condensate piping – Define the limits of piping replacement.
  - Identify probable cause of water intrusion into the tunnel.
  - Identify ventilation and lighting improvements.
  - Access – Evaluate the need and criteria for equipment access to the tunnel.
  - Include evaluation of Wi-Fi connectivity needs, such as personnel communications.
  - Conduct an ASCE 41 – Tier 1 Evaluation.

Task 01.03.05 Sodium Hypochlorite System Modifications Alternatives

- Assume disinfection method is sodium hypochlorite with no on site generation.
- Evaluate site location/layout for sodium hypochlorite facility.
- Verify sodium hypochlorite storage and delivery resiliency criteria.
- Confirm truck traffic routes and hypochlorite offloading approach.
- Identify geotechnical approach. Identify potential site conflicts with the selected approach.
- Develop a final arrangement for the sodium hypochlorite facility, and identify up to three implementations options. Select the scope for this project. Develop initial construction sequence for the selected approach.
- Consider methods for improving control of the hypochlorite dosing. Minimize hypochlorite dosing to reduce dechlorination chemical usage.
- Hypochlorite receiving building
  - Conduct an ASCE 41 – Tier 1 Evaluation.
  - Identify the potential impact of changing the occupancy code of the building. This is limited to two alternative occupancy codes.
  - Identify preferred alternative.
  - Identify restoration if structure is removed.

Task 01.03.06 Additional Structural Evaluations – Optional

- Provide ASCE 41 Tier 2 evaluation of the Hypochlorite Receiving Building.
- Provide Condition assessment of two structures that will be considered for a new primary clarifier electrical building. Optional Task is to be approved by the BES Project Manager in writing.
- No budget has been included for optional tasks. Optional Task is to be approved by the BES Project Manager in writing. BES project manager will approve use of contingency if task is required.

Task 01.03.07 Demolition Alternatives

- Identify the boundaries of demolition for structural, mechanical, electrical, instrumentation, and civil.
- Identify approaches for meeting sustainability goals.
- Evaluate reuse options for the Hypochlorite receiving building.

Task 01.04 Technical Workshops

Workshops with BES staff will be held to review the development of design criteria, results of technical evaluations, and review of work products. Workshop materials will be developed based on the technical work being conducted and presented to BES in workshops. A preliminary list of workshops for the Project Development Phase is provided in Table 1.

Field Visits – None

Meetings – Per workshop list in Table 1

Assumptions

- Technical Workshops – For the Project Development design phase, assume the total number of workshops listed in Table 1, each two (2) hours long (or as indicated) with BES's personnel to review the progress of the work, make decisions, and provide direction.
- Review Session – The design team will conduct two (2) three (3)-hour workshops to review work products associated with alternative analysis and the BODR. One additional session will be conducted to review the process flow diagrams.
- Each two (2)-hour workshop is assumed to entail three (3) hours of workshop labor plus two (2) hours of preparation for five (5) consulting team members per workshop, as well as two (2) hours of meeting notes by junior staff.

Deliverables

- Agenda and meeting materials in advance of the workshops
- Meeting notes from the workshops, distributed to attendees and included in the BODR.

Table 1. Proposed List of Project Development Workshops

1	In Person	Workshop	Project Kickoff	2
2	Virtual	Workshop	Client Standards and Design Criteria/ Field Investigation Preparations	2
3	In Person	Workshop	Resiliency and Rehabilitation Criteria	2
4	In Person	Workshop	Wet Weather Clarifiers	3
5	In Person	Workshop	Hypochlorite and Demolition	2
6	In Person	Workshop	Structural, Geotechnical, Resiliency	2
7	In Person	Workshop	Electrical/Standby Power, Schedule	2
8	In Person	Workshop	Wet Weather Clarifiers	2
9	Virtual	Workshop	Hypochlorite Facility	2
10	Virtual	Workshop	Demolition (GTs, Transfer, Hypo, etc.)	2
11	Virtual	Workshop	Project Development Review (orientation)	3
12	Virtual	Workshop	Project Development Review (post comments conflict resolution)	3
13	Virtual	Workshop	Process Operational Workshop & Process Flow Diagrams	2
			Total hours	29

Notes:
Additional meetings not identified in this table: Management Meetings, Kickoff Meetings, Focus Meetings, CM/GC Coordination Meetings No. = number

Task 01.05 Project Development Report

Develop the proposed project with a preliminary scope description and preliminary drawings. The intent is to perform sufficient development to support development of a Class 5 budgetary cost estimate and provide a clear basis for the scope management efforts.

The Project Development Report will serve as the documentation for Stage Gate 2. The contents of the Project Development report include the following:

- Scope Narrative – A short description of the project intent and limits of project improvements by facility (5 pages).
- Preliminary Drawings (25 drawings)
  - Overall Process Flow Diagram
  - Overall Demolition Plan
  - Overall Site Plan
  - Preliminary Facility Structural and Mechanical Plans
  - Electrical One-lines
- Cost – Provide Engineer's Opinion of Cost with an expected accuracy range of an Association for the Advancement of Cost Engineering International (AACE International) Class 5 budgetary cost estimate: −50% to +100%.
- Appendix
  - Field Investigation TMs
  - Alternatives Evaluation TMs
  - Project Development Workshop Notes
  - Draft Risk Register

Field Visits – None

Meetings

Review workshops – As described in Task Technical Workshops, review workshops will be held during the BES review period.

Assumptions

There will be no update to the Project Development Report. The BODR will supersede the Project Development Report in later design phases.

- The Class 5 budgetary cost estimate will be provided in a summary. Volumes of materials will be estimated based on review of the as-builts, site walk observations, and selected alternatives. Estimate organized by facility and division. Detailed take offs of each as-built are not included in this scope of work.

Deliverables

Project Development Report

Task 01.06 Scope Management Review – Optional Task

Using the 20% design cost estimate and the feedback from the CM/GC, conduct a detailed scope allocation/validation/prioritization to define the scope of the final design work (and the scope of the project). Identify scope items that can be deferred, scope items that could be contracted outside the core project, and scope items that could be advanced as bid alternates. The goal of this exercise is to develop a project that meets the BES budget.

No budget has been included for optional tasks. Optional Task is to be approved by the BES Project Manager in writing. BES project manager will approve use of contingency if task is required.

Task 01.07 Project Management

Task 01.07.01 Project Management Planning and Initiation

Develop a set of procedures in the form of a Work Plan and a Management Plan to facilitate management of the project. The project instructions and Management Plan will cover operating procedures, information and BES review requests, communications flow, document and file management, records management, and communications protocol between BES and the Consultant team, regulatory agencies, and other outside parties.

Prepare for and conduct a Project Kickoff Meeting, including Agenda and Summary Notes, including decisions/action items. Include discussion of project goals, scope, constraints, project team roles and responsibilities, inspections and safety, communication, schedule, and action items.

Design Schedule – Use the work breakdown structure developed in this scope of work, and include the expected timing of tasks, preliminary dates for deliverables, and anticipated dates for workshops, meetings, submittals, and critical points of coordination with BES or the CM/GC. Identify float or contingencies.
Prepare a Change Management Plan that addresses the schedule and budget impacts of implementing changes and scope modifications.
BES developed an initial risk register that will be provided at the project kickoff and serve as the basis for the project risk register. Develop a risk register using a template approved by BES. The register will be used to inform initial project development to characterize items that have the potential to significantly affect cost. The initial risk register will include the following information at minimum:

- Risk and opportunity identification
- Activity or activities affected (tied to schedule activities)
- Risk description, including qualitative categorization of risk
- Estimated probability that risk may occur
- Phase of project that risk could impact
- Potential schedule impact should risk occur
- Potential cost impact should risk occur
- Potential health and safety impacts should risk occur
- Risk trigger
- Risk owner
- Risk management strategy (transfer, mitigate, accept, exploit)

Field Visits – None

Meetings – Project Kickoff Meeting

Assumptions

- Consultant team will develop the initial risk register for use by the CM/GC.
- Project Work Plan/Management Plan – Include the approach to project progress, communications, and expenditure tracking. Plan is not to exceed 30 pages.
- BES will provide comments on templates within 2 weeks of receipt of documents for review.

Deliverables

- Draft risk register
- Agenda and summary notes for the Project Kickoff Meeting
  - Project meeting and project workshop templates
  - Invoice templates and project status report template
  - Risk register template
  - Cost estimate template
- Project Work Plan/Management Plan
- Initial Design schedule
- Change Management Plan, including a change log template

Task 01.07.02 Project Management

The following activities will be part of the routine work or as requested:

- Supervise and control activities of staff assigned to the project. Coordinate and schedule appropriate project staffing discussions and assignments to meet project requirements and commensurate with project risk register. Arrange for the scheduled project workshops, review meetings, and project team meetings. Coordinate the participation of senior staff at appropriate points in the project.
- Manage team success – Coordinate with other projects and BES staff to complete work on schedule and within budget.
- Change management – Monitor project activities for potential changes. Should a change occur, and with BES approval, modify project tasks, task budgets, and approach. Inform BES if any changes will affect the cost of engineering services, the construction cost, or the schedule. Submit change management forms as needed to document scope, schedule, and budget changes.
- Administration – Maintain project records, manage and process project communications, and coordinate project administrative matters using the BES Sharepoint site.
- Work plan – Maintain and update the final work plan for the project that combines staffing commitments and

budgets with the deliverables and schedule for the project. Specific responsibilities of each member of the final design project team will be maintained.

- Internal initiation – Prepare for and conduct a kickoff meeting for Consultant team members, including subconsultants.

The following activities will happen at a regular interval:

- Monthly project invoice
  - Invoice page – Contract value, previous invoice amount, monthly invoice amount, and remaining value for the top tasks
  - Detailed labor report by top task – Category, staff name, labor rate, hours, and cost
  - Subtask Estimate at Complete Report
- Monthly Progress Report – Prepare monthly progress reports and submit with the monthly invoice.
  - Status summary – Provide a status summary of current project tasks, activities completed in the last month, activities planned for the next month, a project action issues checklist, performance compared to budget, and identification of items of concern.
  - Risk management – Consultant will participate in monthly meetings with CM/GC and BES to provide input. BES will lead and document meetings.
  - Deliverables log – Update of the deliverables exchanged between BES, CM/GC, and the Consultant.
  - Project schedule – Update the overall design schedule each month and review with BES, as needed.
  - Decision log – Update the decision log. Add decisions identified during the last month. Remove decisions that were formalized in the previous report.
  - Change management updates – Update the change log, review proposed changes, and scope modifications with BES as part of the project management meetings.
- Regular project management meetings – Consultant Project Manager and Design Manager will participate in every other week conference calls with BES Project Manager. Review the project status and discuss activities and needed actions. Prepare and discuss the 3-week look-ahead schedule. Include discussion of invoicing requirements, meeting/workshop templates, and risk register template.

Field Visit - None

Meetings

- Project Management Meetings - Remote meeting conducted for one (1) hour every month with BES project management team. Assume two (2) Consultant staff members participate.
- Quarterly Risk Register Meetings – Assume each meeting is no longer than one (1) hour, and three (3) Consultant staff members participate.

Assumptions

- The cost of project management is based on the duration of the phase. Budgeting is based on the schedule provided in the Consultant's proposal. Extended period in each phase will increase the cost of project management.
- Monthly invoices and major project submittals will be submitted through the BES Sharepoint site.
- The extent of the Consultant's involvement will be limited to the budget available.
- BES (or its agent) will review monthly pay requests from the CM/GC.
- Separate from contract modification support previously described, labor and expenses required to address construction claims, claims resolution, or litigation assistance requested of Consultant will constitute additional services.

Deliverables

- Monthly project invoices and monthly progress reports
- Change management forms, as needed
- Risk register updates

Task 01.08 DMWESB/SDVBE Development Program

Provide structured support to Disadvantaged, Minority-owned, Women-owned, Emerging Small Business, Service Disabled Veterans Business Enterprises (DMWESB/SDVBE) subconsultants with the goals of high-quality deliverables production, schedule compliance, and long-term DMWESB/SDVBE capacity development. Conduct a

DMWESB/SDVBE Development Program, as described in the following subtasks. The Consultant will do the following as part of this subtask:

- **DMWESB/SDVBE Kickoff Meeting** – Conduct a subconsultant kickoff meeting, including team communication procedures (including designated contact for each sub), file management, invoicing requirements, and capacity-building program opportunities.
- **DMWESB/SDVBE Capacity-building Program –** Conduct planning meetings with up to fourteen (14) DMWESB/SDVBE partners and prepare project plans outlining support activities to be conducted for each participating firm. Support provided will be a combination of specific support for individual firms and training opportunities offered to all firms.
- **DMWESB/SDVBE Performance Program –** Following up to five (5) project milestones, conduct 360 performance assessments of each COBID partner focusing on whether each partner has met quality and schedule expectations. Consultant staff with direct knowledge of the COBID firms' work will provide an assessment of the quality and schedule compliance of each draft deliverable. COBID firms will provide a self-assessment and have an opportunity to identify support needs. Where responses indicate that expectations were not met, the subcontractor will facilitate a conversation between the Consultant Project Manager and the COBID firm to review the issue(s) and identify needed actions for the partner to meet expectations for the next deliverable.
- **DMWESB/SDVBE Development Program Memorandum –** Following completion of the individual project plans, the planned DMWESB/SDVBE Development Program will be summarized in a brief memorandum. The memorandum will be updated upon completion of the design phase to summarize program results.
- **DMWESB/SDVBE Monthly Reporting –** Monthly DMWESB/SDVBE Program progress reports will summarize progress on performance assessments and capacity-building activities, with a final update at program conclusion.
- **DMWESB/SDVBE Coordination Meetings –** Conduct monthly coordination meetings during the design phase, focused on identifying and addressing any ongoing performance issues, and providing updates on capacity-building support.

Field Visits – None

Meetings

- DMWESB/SDVBE Program Client Report Out presented during monthly management meetings

Assumptions

- Assume participation of up to fourteen (14) firms in the DMWESB/SDVBE program.
- Fees are based on an average level of effort per participating firm. Allocation among firms will depend on level of effort and duration of engagement on the project.
- Program will be delivered during the design phase of the project.

Deliverables

- DMWESB/SDVBE Development Plan Memorandum
- DMWESB/SDVBE Development Plan Results Memorandum
- DMWESB/SDVBE Monthly Reporting

Task 01.09 Quality Management

The Consultant will develop and implement the Quality Management Plan (QMP). The Consultant will ensure quality program activities are conducted throughout this design phase, and Consultant will manage multidiscipline internal quality control (QC) review activities with the senior review team throughout this design phase. Formal QC reviews by the Consulting team will be performed before BES's review of the deliverables.

A QMP will be prepared and updated for the project to serve as a guide for all phases of the project. Key features of the QMP will include the following:

- A single point of contact responsible for all quality management
- A project-specific QMP that focuses on delivering BES project quality objectives and guiding principles, as well as meeting the requirements of the BES Design Checklists
- Review of quality policy and procedures instituted by subcontractors
- Independent quality review performed by discipline-specific quality reviewers to ensure critical analysis without bias. The focus of this effort will accomplish the following:
  - Establish functional quality assurance (QA)/QC processes and procedures.
  - Train design team personnel to use the processes and procedures.
  - Verify that the processes have been properly implemented and all requirements are being met through

checking and auditing.

- Design criteria, standards, and processes
- Procedures for engineers, detailed checks of design reports, calculations, drawings, and specifications
- Administration of the Bluebeam Studio for BES review of deliverables

Audits by QA personnel will be conducted to verify conformance with project-specific design standards, BES checklists, and the approved QMP. The Consultant will confirm that required checking and review functions are completed, culminating in either approval or a corrective action. The QA audits follow checklists based on project procedures applicable to the area being audited. Quality review documentation will demonstrate that the quality review process is complete and review comments are acceptably addressed as a component of the overall records management system.

Field Visits – None

Meetings – None

Assumptions

- No hard copy documents will be provided. Deliverables will be provided as a PDF.
- BES will use the BlueBeam Studio software product to provide review comments. The studio session will be setup by the Consultant. BES will adjudicate their comments (eliminate conflicting comments).
- For major deliverables, Consultant will provide document in PDF format, and BES will submit review comments within the period allocated in the project schedule (typically four (4) weeks following BES receipt of the review
- submittal).
- For smaller TMs and meeting notes, Consultant will provide document in PDF format, and BES will submit review comments within two (2) weeks following BES receipt of the deliverable.
- Consultant's responses to BES consolidated review comments will be returned to BES for their records.

Deliverables

- Quality Management Plan
- Quality Review Forms - Responses to BES deliverable comments
- BES milestone checklists, signed by the reviewer and the appropriate project staff
- Review-related correspondence with BES staff and other external agencies or entities
- Technical Verification Form and corrective action documentation

Task 01.10 Owner's Contingency

This task provides an owner's contingency. The owner's contingency will be managed by BES within the overall contract not-to-exceed amount. The intent of the owner's contingency is to provide budget for tasks for professional services that meet the following criteria:

- Additional scope required to complete the project that was not anticipated in the original scope of work
- Results from decisions made by permitting agencies or other parties that influence the scope of professional services required to ensure project completion

- Services needed to increase task budgets where the assumptions made to create the budget are exceeded and the exceedance is beyond the control of the Consultant. Written authorization with level of effort from BES's Project Manager is required to reallocate budget from this owner's contingency task to an existing task or a new subtask that is within the overall scope of the project but not clearly defined as within the scope of services.

Task 02 Design

Task 02.01 Predesign (30% Design)

The purpose of the 30% design phase is the selection of key project and design features over which cost estimates and risks are developed with enough confidence to proceed within the approved budget and schedule or that allow implementation of change management measures.

Consultant will conduct and facilitate workshops during this phase to present project updates and solicit focused BES input to inform the development of project deliverables before the conclusion of this task.

The 30% design will be sufficient to use as the basis for beginning design development and will provide the information needed for BES and CM/GC to make decisions related to confirming the limits of the project scope and associated risks.

Specific work activities and deliverables from this task are as identified in the text that follows.

Field Visits

- Assume six (6) two (2)-hour field visits by two Consultant staff.

Meetings

- Technical Workshop – Client standards will be discussed during a workshop as described in Task Technical Workshops.

Assumptions

- The scope of the Consultant's work does not include public meetings.
- Two eco-roofs are included in the project.
- The existing electrical service to the site does not require upgrades.
- Changes between Project Development and Predesign will not affect more than 20% of the BODR document and drafted sheets.
- Assume complete demolition of the Hypochlorite receiving building and no alternative reuse option.

Deliverables

- Geotechnical Design Report
- BODR
- 30% plans
- Specification table of contents
- 30% cost estimate

Task 02.01.01 Design Discipline Activities

Develop the BODR (as defined by Task 1 Subtask Basis of Design Report) with additional detail specific to the following disciplines.

Demolition

- Provide Handling and Disposal Plan if contaminated media are encountered. Assume that contaminated soils will be encountered and a Handling and Disposal Plan will be required.
- Define the boundaries of demolition for each facility and component of the project and for each of the disciplines.
- Provide preliminary demolition plans.

Architectural

- Perform a code review of existing facilities (sludge transfer building, tan tunnel, hypochlorite receiving building, and building next to abandoned solids conveyor) that require retrofit/rehabilitation to identify areas where the facilities do not meet current seismic codes and occupancy requirements. Determine requirements to bring existing facilities into compliance with current codes and standards, when necessary. Because the requirements for this work are unknown at this time, the scope does not include design for bringing facilities into compliance with code.
- For new buildings, establish preliminary room sizes and egress requirements. Develop architectural theme for exterior of buildings. Select interior and exterior construction materials for each building. Select roof type, slope, and roof support system for each building, along with maintenance access requirements and features.
- Assign code classification to each building. Meet with local code official or authority having jurisdiction to review code classifications and discuss any waivers, if applicable.
- Compile list of chemicals and amounts to be used. Coordinate with other disciplines (mechanical and electrical) to resolve code compliance issues specific to these disciplines (for example, National Electrical Code and NFPA 820 issues).
- Coordinate with other disciplines to prepare preliminary building layouts (including plans, sections, and elevations). Develop alternative layouts if required.
- Review concepts and draft work products with QC reviewer and seek their approval.
- Develop life safety/egress plans for each building.
- Develop green building criteria for this phase such as eco-roofs or demolition. Coordinate with other disciplines to incorporate requirements into the design.

Heating, Ventilation, and Air Conditioning/Plumbing

- For each building, select type of ventilation system to be used in process buildings (inlet air tempered with both inlet and outlet fans or simple exhaust fan system).
- Select type of heating system to be used (hot water boiler, hot air furnace, or space heaters). Identify fuel (gas, oil, or other fuel) for heating buildings, and identify local fuel storage requirements.
- Select type of air conditioning system to be used in personnel spaces (variable air volume system, zoned constant air volume system).
- Coordinate with the architectural discipline to establish design R-values for all exterior walls.
- Perform a ventilation code review of the existing facilities that require retrofit/rehabilitation to identify areas where the facilities do not meet current codes. Develop a plan to bring existing facilities into code compliance where necessary. The scope is based on evaluating the tan tunnel but not the connected tunnels.
- Coordinate with local fire marshal and architect to determine requirements for sprinklers and fire protection. Assume that combustible gas monitoring and fire/smoke alarms in non-occupied areas can be monitored through the plant PLC panels and supervisory control and data acquisition (SCADA) system.

Civil and Site Development

- Confirm adequacy of topographical and boundary mapping. Evaluate legal, ownership, permitting, and zoning constraints. Identify environmentally sensitive areas, such as wetlands, floodplains, or known hazardous waste areas.
- Develop plant site layout as required. This will include activities such as the following:
  - Determine structure size, location, and orientation
  - Determine layout roadways/truck access corridors, and define maneuvering requirements (design vehicle)
  - Determine size and locate parking lots for employees and visitors to the facility
  - Determine emergency vehicle access requirements
  - Evaluate floodplain impacts and constraints
  - Locate stormwater management facilities
  - Locate utility and piping corridors (horizontal and vertical)
  - Determine dewatering needs and location of facilities
  - Locate possible construction staging area and equipment/contractor access ways
- Coordinate with surveyors, define surveyors' scope of work, coordinate with geotechnical engineer on boring locations, and record boring locations on site drawings.
- Develop preliminary erosion control plan for project. Determine if erosion control ponds are required; locate ponds on site plan drawings as required. Prepare preliminary stormwater calculations suitable for submission to local site permitting authorities. Develop preliminary stormwater control concepts (swales, curb, and gutter). Meet with local stormwater and erosion and sediment control agency to determine permitting requirements for site plans and the impact of requirements on preparation of contract documents. Document findings.
- Set preliminary finished floor levels for new structures. Establish preliminary finished grades, overall major surfaces, and road profiles. Iterate preliminary surfaces and structures to optimize earthwork if necessary.
- Provide Handling and Disposal Plan if contaminated media are encountered. Assume that contaminated soils will be encountered and a Handling and Disposal Plan will be required.
- Determine dewatering needs.
- Establish preliminary finished grades, overall major surfaces, and road profiles. Iterate preliminary surfaces and structures to optimize earthwork if necessary.
- Work with the geotechnical team to develop excavation profiles for the areas of major earthwork. Assume three profiles will be developed through the new secondary clarifier site and two additional profiles will be developed through the site of the new dewatering/loadout building.

Landscape Architecture

- Coordinate with other disciplines to prepare preliminary design and layout of pedestrian circulation routes and exterior hardscape spaces.
- Attend focus meeting that will focus on site-related development relevant to the landscape design.
- Identify site furnishing options, to include site lighting fixtures, benches, bike racks, and other site amenities.
- Coordinate location and design of vegetated stormwater management facilities with other disciplines.
- Develop preliminary planting plan for project. Work to include development of landscape typologies and specific potential plant species and materials to be used in different landscape types. Include coordination with BES facilities maintenance staff.
- Develop preliminary irrigation plan for the project, defining areas to be irrigated, water sources, and type of

proposed equipment. Includes coordination with other disciplines and with BES facilities maintenance staff.

- Coordinate with architect for design of eco-roofs.
- Provide review of grading concept design and input to civil.
- Coordinate landscape design activities with other disciplines.
- Provide graphic illustrations of site and landscape improvements for public involvement meetings and website.

Electrical

- Prepare one-line diagrams for proposed facilities.
- Prepare site electrical plans.
- Prepare preliminary load calculations.
- Document MCC standards.
- Document flood recovery approach.
- Develop a construction phasing description for medium-voltage systems.
- Determine requirements for standby power.
- Identify electrical room space requirements.
- Determine redundancy requirements for power supplies and power distribution.
- Establish preferred voltages for power distribution and utilization equipment.
- Identify proposed fiber-optic duct bank routing on site plans.
- Perform an electrical code review of existing facilities that require retrofit/rehabilitation to identify areas where the facilities do not meet current codes. Develop a plan to bring existing facilities into code compliance where necessary.
- Coordinate with other disciplines (for example, architectural and mechanical) to resolve code compliance issues specific to these disciplines. Develop preliminary schedule of hazardous and corrosive locations.
- Develop area classification table.
- Develop construction sequence for electrical work.

Instrumentation and Control Systems

- Using the preliminary instrument and equipment lists and the preliminary process flow diagrams, coordinate with the process engineers to refine preliminary P&IDs for each treatment process. Information to be included on each P&ID includes, at a minimum, process configuration; flow streams; valve and gate locations (manual and powered); instruments; chemical additions points/types; process equipment location/type; including packaged control panels and adjustable-speed drives; flow meters; and other process control or monitoring devices.
- Finalize equipment/instrument tag numbering, naming, and abbreviation conventions.
- Review existing plant equipment/instrument tag numbering, naming, and abbreviation conventions.
- Work with Process Engineer to prepare written operational description of each major process.
- Review and revise current overall control philosophy, including local control approach, level of automation, and supervisory control.
- Develop overall control philosophy including local control approach, control system, level of automation, and supervisory control.
- Update control system network diagram.
- Identify fiber-optic/site-wide control system requirements.

Process

- Use hydraulic simulation model to advance hydraulic design (size pumps and pipes).
- Use process model to select design criteria for major equipment (primary clarifier mechanism).
- Select electrical equipment features and approach, including automation.
- Evaluate equipment. Visit site to support equipment selections. Assume design team members accompany BES on up to five separate site visits.
- Determine effluent flow measurement and integration.
- Determine size/capacity of all unit treatment processes and ancillary systems.
- Review capacity of all existing processes and equipment to remain in service where appropriate. Assign capacity to existing processes.
- Prepare process flow diagrams.
- Prepare solids balance to be carried into final design.
- Develop process narratives.
-

Process Mechanical

- Select and size all major process equipment, including pumps. Prepare sizing calculations and obtain review. Establish level of redundancy required for all process equipment.
- Prepare equipment list with sizing for major equipment. Coordinate with BES on preferences of equipment manufacturer and processes.
- Determine valve types and actuator types for each service.
- Determine pipe materials and develop preliminary pipe schedule.
- Determine approach for tie-ins of major yard piping with existing piping/facilities.
- Prepare preliminary drawings for equipment arrangements.
- Prepare preliminary hydraulic profile.
- Review capacity and condition of existing equipment to remain in service where appropriate. Review capacity requirements for existing equipment.
- Determine capacity requirements for ancillary facilities and utilities and determine whether adequate capacities are available for systems such as plant water and instrument air.
- Determine flow measurement and sampling requirements.
- Develop process control narratives in coordination with I&C.
- Determine pipe flexibility and seismic resiliency requirements.
- Corrosion control engineer will develop recommendations for the project based on site and facility characteristics, including material selection.

Fire Protection

- Define the level of design for fire protection systems that will be included in the final drawings— detailed drawings or performance specification.
- The fire protection scope is based on expanding the system to address only new facilities. The existing fire protection system and main site fire connection are expected to be sufficient for this expansion.
- Determine site-specific fire protection requirements conditions for each facility and structure, including fire hydrants, fire sprinklers, fire alarms, and ventilation.

Geotechnical

- Determine site-specific geotechnical conditions for each new facility. Develop specific foundation requirements.
- Meet with CM/GC to discuss and evaluate alternatives for ground improvement and seismic mitigation. Include specialty ground improvements subcontractor or technical committee, if possible.
- Develop proposed approach for ground improvements.
- Determine requirements for addressing groundwater during construction and after facilities are in service.
- Verify constructability (shoring and bracing requirements, dewatering issues).
- In addition to the Geotechnical Fact Sheet, provide a draft geotechnical design report documenting geotechnical analyses and providing preliminary geotechnical design and construction recommendations.

Structural

- Coordinate with architectural discipline on the selection of building concepts. Consult with lead process engineer on building/structure layouts.
- Structural solutions are limited to bracing in the WWCLs and expansion joint repairs.
- Finalize coating approach for primary clarifier, no structural rehabilitation is included.
- Develop building foundation and structure concepts based on schematic building layouts.
- Determine design approach for addressing groundwater conditions.
- Provide preliminary building layout plans.

Project Cost and Construction Schedule

- Describe maintenance of plant operations, based on the 30% predesign. Identify key operational constraints for the recommended project.
- Update construction sequence and operation during construction.
- Support CM/GC's update of the preliminary construction schedule.

Provide construction cost estimate in sufficient detail to provide the expected accuracy range of an AACE International Class 3 estimate: −20% to +30%.

Task 02.01.02 Basis of Design Report

Develop the proposed project through a series of fact sheets and preliminary drawings. The intent is to perform sufficient development to support development of a Class 3 budgetary cost estimate and provide a clear basis for the scope management efforts. The report will encompass the deliverables developed during the Project Development Phase (20%). The contents of the BODR include the following:

- Executive Summary
- Project Objectives Fact Sheets
  - Resiliency Plan
  - Sustainability Plan
  - External Constraints and Standards
- Facility Fact Sheets
  - Wet Weather Primary Clarifiers and Tan Tunnel
  - Hypochlorite Facility
  - Demolition
- Unit Process Fact Sheets
  - Preliminary equipment list and equipment selections
  - Preliminary major/controlling instrument list
  - Preliminary process control narratives
  - Temporary facilities
- Discipline Fact Sheets
  - Civil – Site civil, plant utilities, and stormwater criteria
  - Landscape architecture – concepts and criteria, including pedestrian circulation and hardscapes, planting, and irrigation design
  - Yard Piping and Potholing Plan
  - Geotechnical
  - Structural – does not include structural or seismic upgrades
  - Preliminary excavation and shoring requirements
  - Architectural – Concepts and criteria, including facility access and egress, bird-friendly design, green building policy attributes, and any lab space and control room requirements
  - Acoustical criteria and improvements
  - Building mechanical – Design criteria, including ventilation to address NFPA 820 requirements
  - Fire protection
  - Coatings/corrosion
  - Process mechanical
  - Electrical
  - Instrumentation and controls (I&C)
- Preliminary Drawings
  - Preliminary Process Design Criteria Sheet
  - Process Flow Diagrams
  - Hydraulic Profile
  - Yard Piping Layout
  - Site Plan
  - Preliminary Facility Structural and Mechanical Plans
  - Electrical One-lines
  - Preliminary Geotechnical Plan (if available)
- Project Implementation Plan (this portion of the deliverable will be delayed, included in project Development)
  - Delivery Approach – Describe the current understanding of the delivery method and packaging.
  - Schedule – Develop a Preliminary Project Schedule that estimates durations and sequence of work. Reflect major activities, including temporary facilities, and reflect process and operational constraints. Identify all critical path items in the schedule.
  - Permits – Document Permitting Plan (developed as part of Task 2).
  - Cost – Provide Engineer's Opinion of Cost with an expected accuracy range of an Association for the Advancement of Cost Engineering International (AACE International) Class 3 budgetary cost estimate: −10% to +30%.

- Appendix
  - Field Investigation TMs (updated with client comments)
  - Alternatives Evaluation TMs (updated with client comments)
  - Predesign Workshop Notes
- Fact sheet format – Fact sheets will include the topics as required for that deliverable:
  - Introduction
  - Background
  - Modifications to previous deliverables
  - External constraints and standards
  - Existing conditions
  - Design criteria
  - Alternatives considered
  - Alternatives selected
  - Control narratives
  - Drawings
  - Outstanding issues
  - References
  - Appendix
- Project Development Report for the BES Stage Gate 2.

Field Visits – None

Meetings

- Review workshops – As described in Task Technical Workshops, review workshops will be held during the BES review period.

Assumptions

- Final report will be provided during the predesign phase and will incorporate BES comments.
- BES will provide a compiled, adjudicated set of comments to be incorporated into the 30% design.
- The scope of work does not include plant-wide communication systems, security design, and intercom systems—only accommodation of these systems for new structures. Assume that Consultant design work accommodates these systems but assume they will be installed by BES or separate vendors (to match existing systems).
- BES will provide available electrical one-line as-builts. BES will provide as-builts of the facility in electronic or hard copy.
- The Class 3 budgetary cost estimate will be provided in a summary. Volumes of materials will be estimated based on review of the as-builts, site walk observations, and selected alternatives. Estimate organized by facility and division. Detailed take offs of each as-built are not included in this scope of work.
- Current permitting requirements will be evaluated and included in the plan; however, they may change or increase in the final project. A Permitting Plan will be developed that will assist in monitoring these potential changes.
- Planning documents, including a Traffic Control Plan and Waste Management Plan, will be developed in an abbreviated format to allow for the initial planning activities. More detailed plans will be developed in later stages by CM/GC.
- The graphics for the individual areas of the plant site will be simple blowups of the overall site map with some highlights and callouts that will be referenced in the text.
- NFPA 820 analysis is limited to the facilities to be modified in this project.

Deliverables

- Draft BODR

Task 02.01.03 Risk Mitigation and Field Investigations – Optional Task

This subtask is to pursue mitigation related to engineering effort that is identified to reduce overall risk of project implementation but was not clearly defined at the onset of design activities. As an example, the Consultant may conduct field investigation based on the current understanding of the project. The task will be started with a focus meeting to agree on the gaps to be filed with this follow-up task.

After agreeing on the form of the field investigations, the Consultant will arrange dates and equipment. BES will provide support maintenance or operations staff as necessary to complete each field investigation.
No budget has been included for optional tasks. Optional Task is to be approved by the BES Project Manager in writing. BES project manager will approve use of contingency if task is required.

Task 02.02 Scope Management Review

Task 02.02.01 Scope Management Review
The project team (BES, CM/GC, and Consultant) will conduct a scope review of the BODR to identify cost optimization options. The review will include the following activities:

- Kickoff meeting – The team will meet to determine the scope review process.
- Concept development – The individual members will independently develop concepts for managing the scope of project and generate a list of scope items that includes the following:
  - Title
  - Description
  - Order of magnitude change
  - Impacted areas of the project
- Focus Meeting – to review concepts
  - The team will meet to understand the different concepts developed by the members. Each team member will present the concepts from the Scope Management concept development.
  - Additional concepts may be developed as a team.
  - The team will assign a color:
    - Green – CM/GC will provide detailed price; Consultant will develop supporting design documents as needed for pricing.
    - Yellow – CM/GC will provide detailed price; Consultant will develop supporting design documents as needed for pricing.
    - Red – The concept was not accepted, and no further evaluation is required.
- Cost generation for concepts
  - CM/GC will develop order of magnitude costs for selected concepts with drawings/sketches as needed from Consultant design team.
- Follow-up
  - Team will meet to review green and yellow light items for acceptance into the design.
  - Final colors are assigned:
    - Green – Consultant will develop a conceptual design and description of the change. Incorporate the change in the next design phase.
    - Yellow – Provide project definition by further development and costing of the concept to determine whether the concept has merit.
    - Red – The concept was not accepted, and no further evaluation is required.
- Deliverable includes a Scope Management Summary that has a cost optimization log that identifies cost reduction items to meet BES objectives and budget.

Field Visits

None.

Meetings

- Kickoff Meeting – Virtual, 2 hours
- Focus Meeting to review concepts – Virtual, two meetings that are 2 hours each
- Follow-up Meeting – Virtual
- No more than four Consultant staff will attend per meeting

Assumptions

- Consultant will develop supporting documentation for costing for no more than 30 concepts.
- Assume that this process requires approximately 6 weeks.
- Assume cost estimating teams from both the CM/GC and the design team are involved with developing costs for scope change items.
- Design will continue on the approved scope during the review.

Deliverables

- List of concepts
- Green Light Descriptions
- Yellow Light Project Definition
- Supporting design documentation for cost estimating exercise
- Scope Management Summary

Task 02.02.02 Energy Trust Application – Optional Task

Provide support to BES in the development and compilation of information needed for Energy Trust funding. Work with the Energy Trust to define the project elements that have the most likelihood of funding. Support the preparation of engineering materials as well as the applications.

No budget has been included for optional tasks. Optional Task is to be approved by the BES Project Manager in writing. BES project manager will approve use of contingency if task is required.

Task 02.03 Design Development (60% Design)

The purpose of this task is to use the conceptual decisions of the project that were made in the previous phase, complete and finalize the preliminary calculations of the previous phase, and develop the project design to achieve a true "design freeze" at the conclusion of this phase. Structures, equipment, major plant piping, process, major electrical, and site plan are all finalized during this phase to allow final detailing of the same in the next phase of design. Drawings and other materials that may be required exhibits for permit applications will be available at the conclusion of this phase. The majority of the QC review and approval will occur before finalization of the work products from the design development phase. Specific activities and work products from this phase are described in the following subtasks.

Field Visits

- Assume six 2-hour field visits by two Consultant staff.

Meetings

- Assume virtual focus meetings to discuss facilities once a month with BES staff. Assume three Consultant staff to attend.

Assumptions

- BES will provide Division 0 and Division 1 specifications. Consultant will contribute to Division 1 specifications (scope of work, startup and testing, and environmental conditions).
- Specifications will be provided following the 6-digit Construction Specifications Institute format.
- Workshops for process facilities design are scoped/budgeted under Task Technical Workshops.
- Piping support approaches will be preliminary during this phase and will be developed for piping 24 inches in diameter and larger. Piping smaller than 24-inches in diameter will be designed by the CM/GC based on specification requirements.
- Rebar requirements will be presented in schedule format.
- Standard details will be bound in a separate volume or volumes in 8.5-inch by 11-inch format.
- Tables and schedules will be bound with the specifications except as noted in the drawing list. Tables and schedules to be provided per TPSD guidelines.
- Americans with Disabilities Act–compliant features are not required.
- Additional control system features are not part of the current design scope, including the following:
  - Communications and paging systems
  - Security systems
  - Closed-circuit television systems
  - Cable television systems
  - Preventive maintenance software
  - Process management reporting
  - Laboratory information systems
  - Information technology needs, such as local-area networks, wide-area networks, and intranets
- Site work, including road repaving, is only included for areas included in the project in the drawing list.
- Corrosion control systems other than materials selection and coating are not required.
- Consultant will provide fire protection performance specification. Building sprinkler system drawings and detailed

specifications will be provided by CM/GC.

Deliverables

- 60% 22-inch by 34-inch drawings (1 electronic copy in PDF format)
- 60% specifications and draft standard details (8.5-inch by 11-inch format)
- Equipment list that includes equipment number, equipment size, equipment power requirements, and basic controls
- Instrument list and loop/index list (one electronic copy in PDF format)
- Responses to 30% BES design review comments
- Opinion of Cost - Construction cost estimate in sufficient detail to provide the expected accuracy range of an AACE International Class 2 cost estimate: −15% to +20%. Cost estimate will be provided with a database of most modeled content, including size, material, flow stream, volume of concrete, and other major components.
- Revit/CAD file examples for each discipline
- Meeting notes
- Operational Constraints Plan
- Draft Operational and Control Strategy TM

Task 02.03.01 60% Design

Prepare 60% design documents, including the following.

Demolition

- Define demolition requirements and limits. Define contractor staging, storage, access, and offsite access corridors.

Architectural

- Develop building models in Revit for all buildings.
- Coordinate with facility lead, I&C, and electrical disciplines to size and locate electrical and control rooms.
- Coordinate with the mechanical discipline to select the type of heating, ventilation, and air conditioning (HVAC) equipment; locate HVAC equipment rooms; determine space requirements and routing for ductwork if required; and establish design R-values for all exterior walls.
- Coordinate with structural engineer to define the structural design concepts for the facilities.
- Establish applicable codes for all buildings/structures with local code officials and fire marshal. Complete building and fire code analysis. Meet with local code official to review floor plans.
- Prepare draft of technical specifications.
- Review design development and draft work products with QC reviewer and seek their approval.

Heating, Ventilation, and Air Conditioning/Plumbing

- Prepare sizing calculations for HVAC equipment based on energy code requirements and selected building construction materials. Prepare HVAC equipment data sheets and cut sheets.
- Create ventilation concept drawing (louver locations, fan locations, type of equipment, and air flows).
- Identify routing or right-of-way for major duct runs. Locate major air handling equipment. Confirm size of mechanical equipment rooms.
- Prepare HVAC system block diagrams. Define HVAC system control philosophy.
- Coordinate with civil engineer for potable water and fire water supply and distribution, as well as plant drain system.
- Prepare draft of technical specifications.
- Review design development and draft work products with QC reviewer and seek their approval.

Civil and Site Development

- Prepare site plan package at the end of the design development phase (if required) and submit it to the local site permitting agency. Timing and content of this submittal may vary and must be coordinated with the local agency throughout the design process.
- Freeze civil design concept. Structures, road, and major site element horizontal locations are finalized. Structure floor/control levels and finished grades are finalized.
- Prepare preliminary site grading drawings.
- Download survey data to create site-drawing files for final design.
- Set final building and structure elevations.

- Develop preliminary yard piping plan and profile (18-inch-diameter and larger) and plant drain layouts. Identify corridors for smaller piping and other utilities.
- Show stormwater control concepts (swales, curb, and gutter) on the design development drawings. Include civil details.
- Finalize traffic flow and parking and lay out road access to all buildings and structures. Finalize project staging. Coordinate handicap requirements with architectural discipline and local site plan regulations.
- Prepare draft of technical specifications.
- Review design development and draft work products with QC reviewer and seek their approval.

Landscape Architecture

- Prepare 60% hardscape plans package for pedestrian paving areas for project facilities. This will include definition of materials and layout of paving joints and locations of site furnishings, exterior lighting, and other site elements. Develop requisite construction details.
- Coordinate exterior lighting locations with electrical and civil disciplines.
- Prepare 60% site planting and irrigation plans, eco-roof planting, and irrigation plans. Develop requisite irrigation and planting details. Coordinate with the architect and structural engineer for eco-roof landscape design.
- Review site grading and provide input to civil. For special hardscape outdoor areas, landscape architect may provide detailed grading plan to be integrated with the overall site grading plan.
- Review vegetated stormwater facility design and provide input to civil. Coordinate planting design of vegetated stormwater facilities with civil.
- Coordinate landscape improvements with work of other disciplines.
- Prepare draft of technical specifications.
- Review design development and draft work products with QC reviewer and seek their approval.

Electrical

- Determine locations and sizes for electrical distribution equipment. Prepare one-line diagrams for proposed facilities. Coordinate with lead process engineers to size equipment motors.
- Prepare detailed electrical load calculations.
- Provide power plan, lighting plan, and panel layout.
- Develop site plans with major electrical equipment and duct banks, including fiber-optic duct banks required to help BES achieve fiber-optic control loop.
- Size electrical rooms and prepare a preliminary layout of the major electrical equipment located in each electrical room.
- Coordinate with I&C discipline to determine space requirements and locations for control equipment.
- Locate major input/output (I/O) termination panels, terminal junction boxes, and control panels. Determine equipment requiring uninterruptable power supplies (UPS) and locations of UPS equipment.
- Define/document requirements and concepts for special systems:
  - Telephone (including incoming service location and scope of supply)
  - Data highway (control system)
  - Data highway (local-area network, office automation)
  - Fire alarm system
- Special systems, such as paging system, security system, closed-circuit television system, and security systems will be identified but are not currently included in the scope of the project.
- Identify rights-of-way and routing methods for electrical conduit and tray. Lay out duct bank system (major runs/maintenance holes). Coordinate with civil yard piping. Locate maintenance holes and hand holes.
- Develop detailed lighting concepts; select luminaire types in conjunction with architect. Prepare preliminary lighting layouts and initial lighting calculations. Prepare preliminary site lighting layout.
- Define hazardous locations (NFPA 820), and document in the area classification table. Define corrosive locations and document.
- During design, a preliminary selective coordination study will be performed based on equipment from one of the approved equipment vendors. The intent of this study is to show that at least one of the approved vendors can meet the NFPA 70 requirements for selective coordination.
- Prepare draft of technical specifications.
- Review design development and draft work products with QC reviewer and seek their approval.

Instrumentation and Control Systems

- Coordinate with BES to generate equipment and loop numbers.
- Prepare final CAD-based P&ID drawings, including loop numbers and all instrumentation.
- Prepare preliminary I/O count. Size and locate I/O panels. Coordinate space requirements with electrical and architectural disciplines.
- Summarize I&C system design philosophy for each major process in a process control narrative. Include a description of the field elements to be used for each application and preliminary set points for major I&C elements. Update/finalize control system block diagram. Finalize typical control diagrams/loop diagrams for each type of control scheme to be used.
- Coordinate with HVAC engineer regarding control system requirements.
- Coordinate with electrical on requirements for fiber-optic system.
- Determine UPS requirements.
- Define control interfaces for all package systems with local controls, including adjustable frequency drives.
- Review mechanical equipment specifications to confirm coordination with P&IDs and control system interface requirements.
- Coordinate locations of control panels and instruments.
- Prepare draft of technical specifications.
- Review design development and draft work products with QC reviewer and seek their approval.

Process

- Finalize major equipment sizing calculations.
- Coordinate process requirements during construction.
- Finalize hydraulics.
- Continue to use simulation model to advance hydraulics design (verify equipment selection and evaluate overflow/drain scenarios).
- Use simulation model to advance I&C design and develop process control strategies.
- Conduct failure and risk workshop with operational staff and management.
- Evaluate risk of various critical failure events (network communication error, flowmeter erroneous reading, and actuator failure).
- Evaluate plant performance and risk of overflow at various storm events (1-year, 10-year, and 50-year).
- Coordinate with I&C on completion of P&IDs.
- Coordinate with I&C on development of process control narratives.
- Develop process equipment specifications.
- Coordinate with all disciplines for process facility layouts, yard piping, and utility requirements.
- Review design development and draft work products with QC reviewer and seek their approval.
- Attend meetings with BES and operations staff to review facility layouts and walk through 3D models of process facilities.

Process Mechanical

- Calculate the hydraulic profile for all major gravity process pipelines and hydraulic structures. Establish maximum and minimum water surface elevations for all process tanks and operating levels for effluent pump station.
- Prepare 3D electronic models or building and structure layouts (plans and major sections).
- Assemble catalog cuts for all major process equipment. Complete equipment data sheets or equipment list on all major equipment items.
- Coordinate with I&C in the finalization of P&IDs.
- Final ancillary equipment sizing and line sizing calculations.
- Final equipment selection (type, size, weight, and arrangement).
- Update pipe schedule.
- Develop preliminary gate schedule and actuated valve schedule; confirm valve actuator types and power requirements.
- Determine approach for tie-ins of major yard piping with existing piping/facilities and pipe flexibility details.
- Prepare draft of technical specifications.
- Review design development and draft work products with QC reviewer and seek their approval.

Fire Protection

- Identify fire protection requirements including fire hydrant coverage, requirements for fire suppression, fire alarms, and HVAC monitoring.

Geotechnical

- Coordinate with structural engineer to develop foundation loading criteria for proposed facilities.
- Finalize geotechnical analyses based on building layouts and loads and performance criteria.
- Develop horizontal and vertical layouts for ground improvement for proposed facilities.
- Prepare draft of earthwork technical specifications.
- Finalize geotechnical design report.

Structural

- Coordinate with geotechnical engineer to establish foundation design criteria for new facilities only. Review geotechnical report and discuss foundation design approach with geotechnical engineer and senior structural reviewer.
- Document structural design concept for each building and structure. Finalize materials of construction (cast-in-place versus precast concrete, and roof structures). Preliminary framing plan for buildings and other structures.
- Develop engineering sizing for all foundations, walls, and elevated slabs.
- Coordinate major pipe tie-ins to new and existing structures.
- Prepare Revit models for all major structures.
- Develop plans and sections for all structures.
- Prepare draft of technical specifications.
- Review design development and draft work products with QC reviewer and seek their approval.

60% Cost Estimate

- Support CM/GC's update of the construction schedule.
- At 60% design, provide construction cost estimate in sufficient detail to provide the expected accuracy range of an AACE International Class 2 cost estimate: −15% to +20%.

Project Sequencing and Constraints Analysis

Conduct a review of the existing plant operating facilities that are affected by the proposed construction. This review will list process areas that are affected by the proposed construction and identify the nature and estimated duration of the impact. The results of this effort will be presented to the BES's personnel and CM/GC during Monthly CM/GC Coordination Meetings. The information developed, including BES input, will be incorporated into the project Maintenance of Plant Operation Plan.

Task 02.03.02 Operational Strategy Technical Memorandum

Based on the current design, develop an Operational Strategy TM that captures the process control narratives in accordance with BES standards for each of the major unit processes. This document will narratively describe the operational strategies associated with the design (in conjunction with the process control description specifications) for each unit process. This manual will explain the various primary modes of process operation that may be used, including both normal operation and initial emergency operation procedures, such as peak wet weather events, loss of duty units, and power failures.

Assumptions

- The Operational Strategy TM will evolve through the rest of design and then form the basis for the Process Operations Manual delivered as part of the Startup and Testing scope section.
- Draft TM will be submitted as part of the 60% design phase. Updates will be provided at the 90% and 100% design phase.
- This Operational Strategy TM will organize and present the process control narratives developed during design, relying on the P&IDs for reference. Enhanced process flow diagrams and other graphics will be developed and funded under the Process Operations Manual task (scoped under the startup and closeout phase).

Task 02.04 Permitting Set (90% Design)

Provide final documents that are stamped and intended for review by the authority having jurisdiction and Oregon Department of Environmental Quality (DEQ).

Deliverables will include the following:

- General symbols, legends, and abbreviations complete.

- Design data and criteria complete.
- Site plan with final location of structures, CM/GC staging, storage, and access.
- Pedestrian hardscape and site furnishings enlarged plan and details.
- Site landscape plans and details – planting and irrigation.
- Eco-roof landscape plans and details – planting and irrigation.
- Final grading plans and stormwater design.
- Details of pavement and trench sections, and other civil details.
- Sedimentation and Erosion Control Plan and details.
- Structural plans, sections, and details coordinated with other design disciplines. Include seismic requirements, piping supports, and structural member sizes.
- Mechanical plans, sections, and details with final location of major equipment, piping, and appurtenances. All piping layouts essentially complete.
- Final electrical site drawings, one-line diagrams, control room layouts, and panel layouts.
- Power plans, control diagrams, and schedules complete and coordinated with mechanical design.
- Final lighting plans.
- Preliminary short circuit protective device coordination and preliminary arc flash hazard study report.
- Final P&IDs coordinated with final operational control strategies and final network diagrams.
- Complete utility and yard piping plans with profiles.
- Architectural plans, sections and elevations that depict the final exterior architectural theme, materials of construction and floor plan of structures.
- HVAC/Plumbing plans and sections complete. Complete equipment schedules and system schematics.
- Final version of Specifications Divisions 1 through 46 incorporating comments from the 60% submittal review and reflecting full coordination with drawings. Include final construction sequence, milestones and constraints, measurement and payment, and proposed bid form.
- Equipment list that includes equipment number, equipment size, equipment power requirements, and basic controls and operating strategies for all equipment on the project.
- Responses to 60% BES design review comments.
- At 90% design and final design, provide construction cost estimate in sufficient detail to provide the expected accuracy range of an AACE International Class 1 cost estimate: −10% to +15%.
- Support CM/GC's update of the construction schedule.

Field Visits - None

Meetings

- Assume a virtual focus meetings to discuss facilities every other week with BES staff. Assume three Consultant staff to attend.

Assumptions

- Prepare sealed final design submittal documents, calculations, reports, and other documents required for complete applications for building permits from BES to the City of Portland Bureau of Development Services (BDS). BES staff will submit the building permit application and pay permit and plan review fees directly to BDS.
- Provide clarifications and changes to the final design submittal documents as required to address plan review check sheets issued by BDS and comments from BES or the CM/GC.
- 90% design package for building department review. Assume BES coordinate and lead interface with building department.

Deliverables

- Draft contract documents (electronically stamped)
  - Specifications
  - Drawings
  - Standard details
  - Investigations reports
- Sample CAD files for each discipline
- Class 1 opinion of cost
- Sealed project plans, specifications, structural calculations, and other reports and documents required for a complete building permit application from BDS in PDF electronic format, and a complete source document set with no password

protection.

Task 02.05 Contract Documents (100% Design)

Provide final documents that incorporate comments by the authority having jurisdiction:

- Finalize specifications.
- Prepare final construction drawings.
- Prepare final technical specifications.
- Update the final design documents to incorporate and consolidate all changes made during the building permit plan review.
- Prepare final calculations.
- Complete final checking and coordination review.

Field Visits - None

Meetings - None

Assumptions - No client review required of the 100% documents

Deliverables

- Contract documents (electronically stamped)
  - Specifications
  - Drawings
  - Standard details
  - Investigations reports

Task 02.06 Permitting

Identify and acquire the permits and approvals required from the BDS, the State of Oregon, and other regulatory agencies for construction of the project (Table 2). Permit fees will be paid directly by BES.

Table 2. List of Permits

Agency	Permit	Stage	Prepare	Submit	Pay Fees
DEQ	Predesign Report	Task 2	Consultant	BES	BES
DEQ	Authority to Construct	Task 2	Consultant	BES	BES
DEQ	1200-C Construction Stormwater General Permit	Task 2	Consultant	BES	BES
BDS	Building Permit	Task 2	Consultant	BES	BES
BDS	Land Use Compatibility Statement	Task 2	Consultant	BES	BES
City of Portland	Conditional Use or Amendment to Master Plan	Task 2	Support	BES	BES
City of Portland	Groundwater Discharge Permit	Task 2	Consultant	BES	BES
City of Portland	Office of Community & Civic Life Noise Variance	Task 3	Support	BES	BES

Note: Trade permits are completed by others based on building permit application.

Field Visits - Up to three in-person visits with permitting agency and Consultant's staff

Meetings

- Meeting with BES staff to review permitting-related issues.
- BES review of draft deliverables.

Assumptions

- Work under this task will be on a time and materials basis.
- Assume no tree removal permit is needed.

Deliverables

- Preliminary Permitting TM
- Draft and final Permitting TM Brief
- TM describing land use approach
- Land use amendment application

Task 02.06.01 Permitting Plan

Prepare a Permitting Plan that will serve as a working document, updated at specific stages of the project (for example, 30%, 60%, and 90% design), and can be integrated into the BODR. Key steps include the following:

Early Field Review and Agency Coordination

- Field review of project site and proposed improvements, considering thresholds for review, approval criteria, and mitigation opportunities.
- Review field findings with design team to identify steps that may allow project to avoid or minimize specific permits (such as avoiding jurisdictional waters).
- Early coordination with Mike Reed (BES Streamlining Team coordinator) and, if warranted, coordinate early presentation of project to Streamlining Team.
- Coordination with BES environmental planning staff, DEQ, and other regulatory agencies.

Prepare Draft Permitting Technical Memorandum

- Prepare initial draft of a Permitting TM incorporating findings from preliminary design, including the following elements:
  - Permit name, issuing agency, contact information
  - Project element triggering permit and project-specific requirements
  - Permit schedule with permit review process milestones, BES review periods, public comment periods, agency meetings, synchronized with design milestones
  - Summary of permit status, comments, unresolved issues, and action plan
  - Permit costs and team responsibilities
  - Coordination and review of design plan sheets/specifications related to permit
  - Reference section listing code citations, correspondence, supporting documentation
- Identify opportunities for early coordination with regulatory agencies that may facilitate permitting process.
- Prepare a draft permit tracking matrix (with summary of permit needs, requirements, and criteria) to track permits and identify rapid "permit impact" response to any proposed design or construction changes.

Update Permitting Technical Memorandum to Address Basis of Design

- Review the BODR, including proposed structures and uses, programming, grading, access plan, stormwater and sanitary utilities. Update Permitting TM as appropriate.

Task 02.06.02 Land Use Permitting

Provide consultation on land use issues as the project develops, identifying whether planned changes fit within the existing Master Plan (land use permit). Where feasible, work with design team to incorporate changes in a fashion consistent with approved site Master Plan.

Task 02.06.03 Site Master Plan Amendment – Optional Task

Due to the early planning levels in the project, a Site Master Plan Amendment may be required to accommodate the most cost-effective alternatives.
No budget has been included for optional tasks. Optional Task is to be approved by the BES Project Manager in writing. BES project manager will approve use of contingency if task is required.

Task 02.07 Technical Workshops

Workshops with BES staff will be held to review the design approach and design work products. Workshop materials will be developed based on the technical work being conducted and presented to BES in workshops. A preliminary list of workshops for the design phase is provided in Table 3.

Table 3. Proposed List of Design Workshops

No.	Attend	Format	Title	Duration (hours)
14	Virtual	Workshop	Seismic Resiliency	2
15	Virtual	Workshop	WWCLs and Sustainability	2
16	Virtual	Workshop	Hypochlorite and Process Mechanical/ Corrosion Control	2
17	Virtual	Workshop	Electrical/Instrumentation	2
18	Virtual	Workshop	Demolition and Structural/ Architectural	2
19	Virtual	Workshop	WWCL and Mechanical/Civil	2
20	Virtual	Workshop	Hypochlorite	2
21	Virtual	Workshop	Failure and Risk, Sequencing and Constraints	2
22	Virtual	Workshop	Electrical/Instrumentation	2
23	Virtual	Workshop	Predesign Review (30%)	2
24	Virtual	Workshop	Predesign Review (30%)	2
25	Virtual	Workshop	Process Operational Workshop & P&IDs	2
26	Virtual	Workshop	Scope Confirmation	2
27	Virtual	Workshop	60% Design Review Orientation	2
28	Virtual	Workshop	60% Design Review	2
			Total hours	30

Task 02.08 Project Management

The following activities will be part of the routine work or as requested:

- Supervise and control activities of staff assigned to the project. Coordinate and schedule appropriate project staffing discussions and assignments to meet project requirements and commensurate with project risk register. Arrange for the scheduled project workshops, review meetings, and project team meetings. Coordinate the participation of senior staff at appropriate points in the project.
- Manage team success – Coordinate with other projects and BES staff to complete work on schedule and within budget.
- Change Management – Monitor project activities for potential changes. Should change occur, and with BES approval, modify project tasks, task budgets, and approach. Inform BES if any changes will affect the cost of engineering services, the construction cost, or the schedule. Submit change management forms as needed to document scope, schedule, and budget changes.
- Administration – Maintain project records, manage and process project communications, and coordinate project administrative matters using the BES Sharepoint site.
- Work plan – Maintain and update the final work plan for the project that combines staffing commitments and budgets with the deliverables and schedule for the project. Specific responsibilities of each member of the final design project team will be maintained.
- Internal Initiation – Prepare for and conduct a kickoff meeting for Consultant team members, including subconsultants.

The following activities will happen at a regular interval:

- Monthly project invoice
  - Invoice page – Contract value, previous invoice amount, monthly invoice amount, remaining value for the top tasks
  - Detailed labor report by top task – Category, staff name, labor rate, hour, cost
  - Subtask Estimate at Complete report
- Monthly Progress Report – Prepare monthly progress reports and submit with the monthly invoice.
  - Status summary – Provide a status summary of current project tasks, activities completed in the last month, activities planned for the next month, a project action issues checklist, performance compared to budget, and identification of items of concern.
  - Risk management – Consultant will participate in monthly meetings with CM/GC, and BES to provide input. BES will lead and document meetings.
  - Deliverables log – Update of the deliverables exchanged between BES, CM/GC, and the Consultant.
  - Project schedule – Update the overall design schedule each month and review with the BES, as needed.
  - Decision log – Update the decision log. Add decisions identified during the last month. Remove decisions that were formalized in the previous report.
  - Change management updates – Update the change log, and review proposed changes and scope modifications with the BES as part of the project management meetings.
- Regular project management meetings – Consultant Project Manager and Design Manager will participate in every other week conference calls with BES Project Manager. Review the project status and discuss activities and needed actions. Prepare and discuss the 3-week look-ahead schedule.

Field Visits - None

Meetings

- Project Management Meetings - Remote meeting conducted for 1 hour every month with BES project management team for the first year of 30% design, then weekly 0.5 hour meetings for the remaining duration of design. Assume two Consultant staff members participate. Assumes that the contractor is on-board one year after the start of 30% design.
- Quarterly Risk Register Meetings – Assume each meeting is no longer than 1 hour, and three Consultant staff members participate.

Assumptions

- The cost of project management is based on the duration of the phase. Budgeting is based on the schedule provided in the Consultants proposal. Extended period in each phase will increase the cost of project management.
- Monthly invoices and major project submittals will be submitted through the BES Sharepoint site.
- Any reproduction, distribution, and mailing costs for the bidding of the contract for construction will be paid by BES.
- BES (or its agent) will review monthly pay requests from the CM/GC.
- Separate from contract modification support previously described, labor and expenses required to address construction claims, claims resolution, or litigation assistance requested of Consultant will constitute additional services.

Deliverables

- Monthly project invoices and monthly progress reports
- Change management forms, as needed
- Risk register updates

Task 02.09 DMWESB/SDVBE Management

Provide structured support to DMWESB/SDVBE subconsultants with the goals of high-quality deliverables production, schedule compliance, and long-term DMWESB/SDVBE capacity development. Conduct a DMWESB/SDVBE Development Program, as described in the following subtasks.

The Consultant will do the following as part of this subtask:

- **DMWESB/SDVBE Performance Program –** Following up to 5 project milestones, conduct 360 performance assessments of each COBID partner focusing on whether each partner has met quality and schedule expectations. Consultant staff with direct knowledge of the COBID firms' work will provide an assessment of the quality and schedule

compliance of each draft deliverable. COBID firms will provide a self-assessment and have an opportunity to identify support needs. Where responses indicate that expectations were not met, the subcontractor will facilitate a conversation between the Consultant Project Manager and the COBID firm to review the issue(s) and identify needed actions for the partner to meet expectations for the next deliverable.

- **DMWESB/SDVBE Development Program Memorandum –** Following completion of the individual project plans, the planned DMWESB/SDVBE Development Program will be summarized in a brief memorandum. The memorandum will be updated upon completion of the design phase to summarize program results.
- **DMWESB/SDVBE Monthly Reporting –** Monthly DMWESB/SDVBE Program progress reports will summarize progress on performance assessments and capacity-building activities, with a final update at program conclusion.
- **DMWESB/SDVBE Coordination Meetings –** Conduct monthly coordination meetings during the design phase, focused on identifying and addressing any ongoing performance issues, and providing updates on capacity-building support.
- **DMWESB/SDVBE Program Client Report Out –** DMWESB/SDVBE Development Program progress will be shared with the Client at three intervals: (1) following completion of project plans, (2) one interim update, and (3) one final report out at the completion of design.

Field Visits - None

Meetings

- DMWESB/SDVBE Program Client Report Out

Assumptions

- Assumes participation of up to 14 firms in the DMWESB/SDVBE program.
- Fees are based on an average level of effort per participating firm. Allocation among firms will depend on level of effort and duration of engagement on the project.
- Program will be delivered during the design phase of the project.

Deliverables

- DMWESB/SDVBE Development Plan Memorandum
- DMWESB/SDVBE Development Plan Results Memorandum
- DMWESB/SDVBE Monthly Reporting – Up to 24 monthly reports.

Task 02.10 Quality Management

The Consultant will implement the QMP. The Consultant will ensure QA activities are conducted throughout this design phase, and Consultant will manage multidiscipline internal QC review activities with the senior review team throughout this design phase. Formal QC reviews by the Consulting team will be performed before BES review of the deliverables.
A QMP will be updated for the project to serve as a guide for all phases of the project. Key features of the QMP will include the following:

- A single point of contact responsible for all quality management
- A project-specific QMP that focuses on delivering BES project quality objectives and guiding principles and meeting the requirements of the BES Design Checklists
- Independent quality review performed by discipline-specific quality reviewers to ensure critical analysis without bias. The focus of this effort will accomplish the following:
  - Establish functional QA/QC processes and procedures
  - Train design team personnel to use the processes and procedures
  - Verify that the processes have been properly implemented and all requirements are being met through checking and auditing
- Design criteria, standards, and processes
- Administer the Bluebeam Studio for BES review of deliverables

Audits by QA personnel will be conducted to verify conformance with project-specific design standards, BES checklists, and the approved QMP. The Consultant will confirm that required checking and review functions are completed, culminating in either approval or a corrective action. The QA audits follow checklists based on project procedures applicable to the area being audited. Quality review documentation will demonstrate that the quality review process is complete and review comments are acceptably addressed as a component of the overall records management system.

Field Visits – None

Meetings – None

Assumptions

- No hard copy documents will be provided. Deliverables will be provided as a PDF.
- BES will use the BlueBeam Studio software product for review comments. The Studio session will be setup by Consultant. BES will adjudicate their comments (eliminate conflicting comments).
- For major deliverables, Consultant will provide document in PDF format, and BES will submit review comments within the period allocated in the project schedule (typically 4 weeks following BES receipt of the review submittal).
- For smaller TMs and meeting notes, Consultant will provide document in PDF format, and BES will submit review comments within 14 days following BES receipt of the deliverable.
- Consultant's responses to BES consolidated review comments will be returned to BES for their records.

Deliverables

- QMP
- Quality Review Forms - Responses to BES deliverable comments
- BES milestone checklists, signed by the reviewer and the appropriate project staff
- Review-related correspondence with BES staff and other external agencies or entities
- Technical Verification Form and corrective action documentation

Task 02.11 Owner's Contingency

This task provides an owner's contingency. The owner's contingency will be managed by BES within the overall contract not-to-exceed amount. The intent of the owner's contingency is to provide budget for tasks for professional services that meet the following criteria:

- Additional scope required to complete the project that was not anticipated in the original scope of work
- Result from decisions made by permitting agencies or other parties that influence the scope of professional services required to ensure project completion
- Are needed to increase task budgets where the assumptions made to create the budget are exceeded and the exceedance is beyond the control of the Consultant

Written authorization with level of effort from BES's Project Manager is required to reallocate budget from this owner's contingency task to an existing task or a new subtask that is within the overall scope of the project but not clearly defined as within the scope of services.

Task 03 Construction, Startup and Closeout

Provide direct support to the BES in its efforts to support the CM/GC including onboarding, risk management, and price development.

Provide services during construction (SDC) as defined in the text that follows. These SDC would commence when the CM/GC is given NTP on construction activities. These SDC are intended to assist BES to verify that the CM/GC's work is in substantial compliance with the intent of the contract documents, monitor the performance of the construction CM/GC as requested, and assist BES in responding to requests and events that occur during the construction. These SDC are based upon the understanding that BES will contract directly with the CM/GC and will be actively involved in the construction process to make decisions, provide approvals, and perform other actions necessary for the completion of the construction. These SDC assume that BES will provide Program Management and Construction Management/Inspection services through other contracts or through BES staff.

Construction, Startup and Closeout General Assumptions:

- The presence or duties of Consultant's personnel at a construction site, whether as onsite representatives or otherwise, do not make Consultant or Consultant's personnel in any way responsible for those duties that belong to BES and/or the construction contractors or other entities, and do not relieve the construction contractors or any other entity of their obligations, duties, and responsibilities, including, but not limited to, all construction methods, means, techniques, sequences, and procedures necessary for coordinating and completing all portions of the construction work in accordance with the construction Contract Documents and any health or safety precautions required by such construction work.
- Consultant and Consultant's personnel have no authority to exercise any control over any construction contractor or other entity or their employees in connection with their work or any health or safety precautions and have no duty for

inspecting, noting, observing, correcting, or reporting on health or safety deficiencies of the construction contractor(s) or other entity or any other persons at the site except Consultant's own personnel.

- The presence of Consultant's personnel at a construction site is for the purpose of providing to BES a greater degree of confidence that the completed construction work will conform generally to the construction documents and that the integrity of the design concept as reflected in the construction documents has been implemented and preserved by the construction contractor(s). Consultant neither guarantees the performance of the construction contractor(s) nor assumes responsibility for construction contractor's failure to perform work in accordance with the construction documents.
- For this agreement only, construction sites include places of manufacture for materials incorporated into the construction work, and construction contractors include manufacturers of materials incorporated into the construction work.

Task 03.01 Alternative Project Delivery Support

Support BES with CM/GC collaboration during design and guaranteed maximum price development.

Field Visits - None

Meetings

- CM/GC Kickoff
- Project Pass Down
- CM/GC coordination meetings – Monthly meetings

Assumptions

- There will be one 2-hour CM/GC Kickoff meeting with five Consultant staff members attending (includes Consultant Field Engineer).
- There will be two 4-hour project pass-down meetings with eight Consultant staff members attending.
- Assume 24 months of 1.5-hour monthly meetings. Assume attendance by four Consultant staff members.
- It is anticipated that CM/GC will participate in BES design review meetings. No hours are included to support CM/GC review of design deliverables.
- Assume 50 bidder requests for clarification at 4 hours each during GMP development.
- Assume 16 hours per month for 24 months to manage documentation process.
- Incorporation of responses and milestone review comments from the CM/GC will be addressed as part of the design progression (no hours included in this task).
- Cost Reconciliation – assume four Consultant staff members at 24 hours per estimate. Assume 2 estimates, one at 30% and 60% design.
- Cost review – BES staff will document results of cost and quantity review.
- The extent of the Consultant's involvement will be limited to the budgeted hours.

Deliverables

- Responses to the BES's Representative on CM/GC questions.
- Meeting agenda and meeting notes.

Construction Manager/General Contractor Onboarding

- CM/GC Kickoff – Participate in a Kickoff Meeting that includes the key project team members from BES, the CM/GC and the Consultant team. Assume that BES will plan and facilitate this meeting.
- Project Pass Down – Lead a series of meetings with CM/GC contractor to get them quickly up to speed and engaged on the project. Review current state of design documents, risk register, and cost estimate. Assume multiple workshops involving design managers, facility leads, and discipline staff to review the following:
  - Project overview
  - Facility-by-facility review
  - Discipline-by-discipline review (involving CM/GC major subcontractors)
  - Preliminary project sequencing/schedule
  - Known constructability issues

Construction Manager/General Contractor Design Interface

Meet regularly during design with BES staff and the CM/GC contractor to coordinate review and feedback. These meetings are outside the regular design review and BES interface meetings.

- Development of a construction sequencing and packaging plan
- Identify site features or facilities that may require CM/GC preconstruction phase field investigations by the CM/GC to support final design
- Constructability/means and methods evaluations
- Concrete mix design and specification details
- Detailed development of sequencing and constraints approaches specific to operational interfaces and connections to operating systems

Respond to Construction Manager/General Contractor Information Requests

This task is scoped as an allowance. The task includes the following:

- Provide technical interpretation and clarification of the design documents during design and prepare proposed responses to all questions and requests, which will then be incorporated into the contract documents as part of design completion.
- Provide technical interpretation of design documents used for bidding and prepare proposed responses to bidders' questions and requests during CM/GC development of the Guaranteed Maximum Price.
- Manage documentation for CM/GC information requests during the design phase. Document proposed responses to all questions and requests. Assume that the procedures and documentation log will be developed by BES staff.

Construction Manager/General Contractor Scope Management and Cost Optimization

This task is scoped as an allowance, to support scope management and cost optimization activities at various stages of the design and guaranteed maximum price (GMP) development process. These activities are outside the scope of normal design development and are intended to allow for investigation of concepts and redesign of components to realize overall project cost or value goals. This task includes the following:

- Work with BES and CM/GC to identify opportunities for cost savings or value-add approaches.
- Support CM/GC cost estimating of concepts through conceptual design development.
- Perform redesign of vetted/frozen design concepts when cost optimization ideas are determined to provide value.
- This task is specifically intended to be used for project scope changes to existing design concepts, driven by CM/GC innovations or means/methods.

Construction Manager/General Contractor Cost Reconciliation

- Review 30% and 60% CM/GC cost estimates, with the intent to identify and reconcile differences between the Consultant and CM/GC estimates. Consultant will work with the CM/GC and BES to reconcile cost estimates and identify and update project risk allocations and usage.

Guaranteed Maximum Price Development Support

This subtask is scoped as a support activity and Consultant engagement will be as directed by BES. Activities include the following:

- Arrange and conduct up to three informational conferences to summarize key elements of the design work to support the CM/GC's bidding process for subcontractors.
- Support BES in review of major subcontractors from whom the CM/GC solicits bids during GMP development.
- Participate in review of major equipment procurement proposals solicited during GMP development. Provide review and feedback on acceptability of proposals for conformance with technical specifications.
- Support BES in discussion of appropriate allocation of risk and basis of assumptions for GMP.
- Assist BES in evaluation of GMP against Consultant's opinions of probable cost.

Task 03.02 Field Engineering Services During Construction (Onsite Services)

Provide field engineering staff onsite to assist BES in interpretation of the design documents, communication with the office design staff, and resolution of design issues or alternative solutions offered by the CM/GC. Other field office services (that is, CM, Resident Inspector [RI], Construction Inspectors, and field Office Manager) will be provided by BES. The field engineering services are estimated based upon the contract times set forth herein. This position is only provide for selected periods during the most significant construction such as during the summers of wet weather clarifier rehabilitation. Consultant field engineering services will include the following:

- **Submittals –** Through BES's construction management software, the Field Engineer will track submittals in the design team's court at the project site; log in and monitor the status of the submittals and responses; and work with the designers and document control team to provide timely and complete responses. Submittals will be reviewed onsite to the extent possible based on staff availability and complexity of the submittal.
- **RFIs and Design Clarifications –** Clarifications requested from the contractor, or initiated by the designers, will be coordinated through the Field Engineer, working with the office design staff. Responses will be issued in a timely manner and commensurate with project risk. The Field Engineer may recommend minor variations in the work that do not involve an adjustment in the contract price nor time of construction and are consistent with the intent of the contract documents (for example, field orders). All variations in work, whether field orders, design clarifications, or responses through RFIs, will be provided to the BES representative and documented through the BES Sharepoint site.
- **Rejecting Defective Work –** Assist the CM and RI staff to disapprove or reject work that the CM and RI believe to be deficient and non-conforming to the requirements of the contract documents. Coordinate with the CM and the design team for the correction, acceptance, or other resolution of the work.
- **Construction Progress Meetings –** Participate in construction progress meetings as appropriate to assist in review of the work progress, response to questions and clarifications, interpretation of the contract documents, and coordination requirements between construction contracts. This activity assumes progress meetings are held weekly throughout the construction contract period. Field engineer will only attend during period that the field engineer is assigned.
- **Schedules –** The Field Engineer will support the CM's review and monitoring of the CM/GC's progress schedules, the schedule of submittals, and the schedule of values prepared by the CM/GC. Field Engineer will consult with design staff as needed and provide input on key construction constraints and tie-ins to existing systems.
- **Payment Requests –** The Field Engineer will support the CM and RI review of the CM/GC's request for payment.
- **Design Change Notices –** The Field Engineer will assist the CM and BES with the preparation and issuance of design changes to the contract documents.
- **Evaluations of CM/GC Cost Savings Proposal Request and Change Order Proposal Request** – Respond to cost savings proposals.
- **Field Observation Reports –** Prepare as required by BES or Portland Building Official.
- **Substantial Completion –** The Field Engineer will support the CM and RI inspections at completion, representing the design team, to verify the work is in accordance with the contract documents. Field Engineer will assist in preparing a punch list of items requiring completion or correction and make recommendations regarding acceptance of the work.

Field Visits - On-site work

Meetings - Construction Progress Meetings

Assumptions

- The project will be completed using up to two construction packages:
  - Field Services (and Office Services) are based on 3 years of construction, plus zero additional workdays from substantial completion to final completion.
  - Field services are not budgeted for full time effort.
  - CM/GC's schedule will be published at a later date and may vary engineer's proposed schedule. Consultant team will request additional fees if construction contract time exceeds the assumed durations.
- Staffing approach for Field Engineer: assume 25% full time equivalent (FTE) that equals 1,560 hours.
- Subsurface and physical conditions – Assume 10 visits of 6 hours of onsite work. Assume an additional 5 visits of 4 hours each for QC of geotechnical field engineering. Significant field assignment for subsurface improvements is identified under the field engineering services.
- No effort included for Sustainability certification of facilities.

Deliverables - Email communication of field issues that arise.

Task 03.03 Office Engineering Services During Construction (Offsite Services)

Furnish the following engineering support services from the Engineer's office during construction of the project. The office support services are estimated based upon the contract times set forth herein.

The office services fee estimate is based on providing the services outlined as follows. The amount of time furnished and the cost of performing such services are estimates based on the assumptions listed in this task.

Field Visits

- Construction visits
- Structural observations
- Performance testing
- Subsurface and physical conditions
- Substantial completion

Meetings

- GMP Kickoff Meeting
- Construction Progress Meetings
- Software Predesign Workshops

Assumptions

- BES will pay any fees for reviews, permits, and systems development levied by applicable agencies toward the project.
- Calculating/determining development fees may be completed as an additional service.
- Point-to-point wiring diagrams will be provided by others (CM/GC).
- Materials testing, specialty testing, witness testing, factory testing, and construction phase surveying services will be provided by others.
- The following services are not included in the estimate of Office Engineering Services:
  - Services necessary due to the default of the CM/GC
  - Services for the investigation and analysis of contractor claims, preparation of reports on contractor claims, provision of professional claims analysis services, and participation in litigation or alternative dispute resolution of claims
  - Preparation for and serving as a witness in connection with any public or private hearing or other forum related to the project
  - Services to support, prepare, document, bring, defend, or assist in litigation undertaken or defended by BES
- BES or others will provide periodic labor evaluations and processing of prevailing wage documentation.
- Consultant's project manager, design manager, lead structural, mechanical, civil, instrumentation, electrical, and process engineers will attend these Kickoff meetings. The time for the Field Engineer is accounted for in the preceding text.
- Assume there will be two GMP packages.
- Twenty project site meetings with three attendees each (including the Field Engineer who is budgeted under task 03.02).
- Office staff effort is based on review of 852 submittals based on the following:
  - two submittals (including resubmittals and substitutions) per drawing (426 drawings) and each submittal/resubmittal will require 5.7 hours of effort. This assumes that some submittal review will be accomplished by BES's Project Representative.
- Review of all shop drawings, samples, and submittals will be for general conformance with the design concept and general compliance with the requirements of the contract for construction. Such review will not relieve the CM/GC from its responsibility for performance in accordance with the contract for construction, nor is such review a guarantee that the work covered by the shop drawings, samples, and submittals is free of errors, inconsistencies, or omissions.
- Office staff effort is based on review of 639 RFIs based on the following:
  - One and a half RFIs per drawing (426 drawings), and each RFI will require 4.5 hours of effort. This assumes that some interpretation of contract documents will be accomplished by BES's Project Representative or Consultant's Field Engineer.
- Construction visits – Assume design team visits average 8 hours per week during the entire project. This estimate is reduced assuming the presence of a Field Engineer as previously described.
- Substantial completion – Assume two staff for 1 day for each of two partial substantial completion. Assume no Consultant staff support for final completion.
- Assuming that the BES Project Representative leads the contract modification effort, the total Consultant effort for this task is estimated to be 500 hours.
- Design and engineering services beyond the limits of this budget will be subject to additional compensation.

- BES will coordinate vendor O&M manuals and training.

Deliverables
- RFI Responses
- Submittal Responses
- Design Change Clarifications (contract modifications)

Task 03.03.01 Meetings
- Office engineering staff will attend meetings on site during construction.
- GMP Kickoff Meeting – Attend a kickoff meeting at the start of each GMP NTP meeting with the CM/GC, significant subcontractors, and BES at the project site before the commencement of each.
- Project Site Meetings – Participate in periodic onsite meetings with the CM/GC, as requested. Others will prepare the minutes of these meetings.
- Construction Progress Meetings – Office staff will attend the construction progress meeting when specific issues require. The Project Manager or Design Manager will attend at least once per month.

Task 03.03.02 Shop Drawings and Samples Reviews
- Submittals: Review and approve shop drawings and samples in conformance with design documents and specification requirements.
- Assist BES in reviewing and responding to the CM/GC's requests for substitution of materials and equipment. Review such requests and advise BES as to the acceptability of such substitutions.

Task 03.03.03 Interpretation of Contract Documents (Requests for Information)
Office support staff will issue such written clarifications or interpretations of the requirements of the contract documents as BES may determine necessary. Coordinate such review with the design team and BES as appropriate. Such written clarifications will be binding on BES and the CM/GC for the limited purposes established in the contract documents associated with the role of the Engineer. The team will also respond to any questions raised by regulatory agencies (for example, DEQ) or the building department.

Task 03.03.04 Design Team Site Visits
The elements of this task are as follows:
- **Construction visits:** Consultant will coordinate visits to the site by the design team members to review progress and quality of the work. The visits will observe the general quality of the work at the time of the visit and review any specific items of work that are brought to the attention of the design team members by the CM/GC or BES. Schedule and frequency of visits will be as needed.
- **Structural observations**: Structural engineers will provide the required structural observations, as defined in the final design documents. The Structural Engineer of Record's responsibilities include the following:
  - Provide onsite structural inspection and review as required by the contract documents.
  - Monitor CM/GC compliance with plans and specifications for rebar placement, concrete placement, dimensional requirements, completeness, and acceptability of structural work.
  - Report to Building Official.
- **Performance testing:** Attend performance tests as specified in the contract for construction and this contract scope.
- **Subsurface and physical conditions:** When the CM/GC notifies BES of subsurface or physical conditions at the site that the contract for construction provides should be so notified, advise BES and inspect the conditions at the site. Advise BES as to the appropriate action(s), and assist BES in responding to the CM/GC.
- **Substantial completion:** Assist BES with inspections at substantial completion for each construction package, in accordance with the contract for construction. Assist in the preparation of up to eight separate punch lists of items requiring completion or correction during substantial completion walk.

Task 03.03.05 Design Change Clarifications (Contract Modifications)
Assist BES with the issuance of contract modifications during construction, as follows:
- **Rejecting defective work –** Office support staff will support BES's Project Representative and field staff to disapprove or reject work that Consultant believes to be defective, or that Consultant believes will not produce a completed project that conforms to the contract documents or that will prejudice the integrity of the design concept of the completed project as a functioning whole as indicated by the contract documents.
- **Authorizing variations in work –** Office support staff will support BES's Project Representative and field staff to

authorize minor variations in the work from the requirements of the contract documents that do not involve an adjustment in the contract price or the contract times and are compatible with the design concept of the completed project as a functioning whole as indicated by the contract documents.

- **Contract modifications –** Office support staff will review potential changes to the contract as requested by BES's Project Representative and field staff and make recommendations to BES regarding the acceptability of the change. Office staff will assist in preparation of contract modifications to the contract documents for the CM/GC and BES's review and approval. Includes design and engineering services to review CM/GC-initiated changes and to prepare drawings and specifications for issuance to the CM/GC . Activity budget is based on contract modification being consistent with the current Project Understanding.

Task 03.04 Electrical Short Circuit Study – Optional

Provide short circuit, protective device coordination, harmonic and arc flash study report. Perform a study on proposed new equipment and modified existing equipment for short circuit analysis, protective device coordination, harmonic and arc flash analysis. Existing equipment included in the study will only include items being replaced or modified. Equipment included will be those devices defined by National Electrical Code and NFPA 70E. Coordinate with Utility to obtain short circuit data and X/R ratios. Coordinate with BES to obtain copies of previous electrical studies and models and use this to inform updated studies. Draft studies will be prepared during design and will be used to inform final equipment ratings. Final studies will be coordinated with equipment submittals and construction sequencing. Arc flash labels will be provided and applied to all installed equipment in coordination with CM/GC's work. PowerTools for Windows SKM will be used for all power system modeling.

Task 03.05 Wiring Diagrams – Optional

- Provide examples of point-to-point wiring diagrams for use by the contractor.
- Review of wiring diagrams will be provided by BES.

Task 03.06 Programming - Optional

Software integration of the SCADA system will be provided by BES staff.

No budget has been included for optional tasks. Optional Task is to be approved by the BES Project Manager in writing. BES project manager will approve use of contingency if task is required.

Task 03.07 Operator Process Training

Provide supplemental instruction to BES's staff in the operation, maintenance, and testing of the unit processes provided under this project. This instruction will cover both the basic operational concept and actual operation of the systems and components under both normal and abnormal operations that are likely to occur. The instruction will also include training of the staff for equipment maintenance. This task includes the following:

- Support BES staff in providing operator training based on design intent and installed systems.
- Conduct two workshops to discuss process theory, project improvements, and operational strategies associated with each process area (primary clarifiers, sodium hypochlorite storage). This instruction will cover both the basic operational concept and actual operation of the systems and components under both normal and abnormal operations that are likely to occur.
- Each workshop will be conducted twice to allow multiple shifts to attend. Agenda and training material provided to BES ahead of training sessions.

Field Visits

- Included in meetings below

Meetings

- Training – Operator Process Training
- Training – Electrical Systems Training

Assumptions

- Process training will be developed and coordinated with BES's senior process engineer.
- Assume 16 hours per training session. Session will be conducted in 2-hour training, twice in a day for 4 hours total. Assume two staff and 8 hours preparation. Training sessions will be conducted for
  - Wet weather clarifiers
  - Hypochlorite

- Electrical systems
- BES or CM/GC will separately coordinate the services of qualified representatives from equipment manufacturers. Process engineer will attend manufacturers' training, assuming 2 hours for 10 pieces of equipment.

Deliverables
- Process training materials
- Electrical training materials

Task 03.08 Process Operations Manual

Develop a Process Operations Manual describing the operation of the project facilities and systems. This manual will explain the various primary modes of process operation that may be used, including both normal operation and initial emergency operation procedures. The manual will explain the purpose and basic concept of the various processes that are incorporated into the overall plant. Where appropriate, reference will be made to the manufacturers' detailed O&M submittals. It will include instructions for process operations and test or laboratory procedures that may be required to monitor the performance of the facilities. The manual will be suitable for use as an operational tool and to facilitate operator training.

Field Visits – None

Meetings – None

Assumptions
- Process Operations Manual will be developed and coordinated with BES's senior process engineer.
- The Operational Strategy TM (previously developed) will form the basis for the Process Operations Manual.
- Fee assumes 200 hours to prepare a Process Operations Manual. The exact scope of the Consultant's work will be determined before beginning work on this task, and the extent of the Consultant's involvement will be limited to the approved budget.

Deliverables
- Process Operations Manual.

Task 03.09 Startup Support

Provide O&M liaison support to the BES Ops and Maintenance staff throughout construction and startup/commissioning, assisting with O&M training, coordinating operational issues with the CM/GC, and representing plant staff during construction meetings.

Provide process engineering support and O&M support during startup of each major process system. Process engineering support will be involved in ensuring that the new process systems are operating as they were designed. This assistance includes the following:
- Review CM/GC's startup plan.
- Assist BES as the CM/GC team prepares a Startup and Commissioning Plan, which will include the following:
  - Specific actions and related completion dates for startup and operation of the new facilities
  - Definition of testing parameters to verify conformance with design conditions
- Provide engineering input and oversight during startup and commissioning of individual unit processes:
  - Witness performance tests as specified in the contract documents, review test reports applicable to the equipment and systems, and make recommendations to BES as to acceptance.
  - Analyze equipment and process performance for conformance with intended design conditions.
  - Assist with punch list and deficiency items identification.
  - Performance testing – Assume 8 work weeks to start up the major processes.
- Assist BES during initial startup of the facilities by assisting assigned operating personnel.
  - Participate in weekly teleconferences, respond to email inquiries, and evaluate operational data and procedures.
  - Provide recommendations for operational, system, or control narrative changes to improve system performance.

Field Visits – None

Meetings – None

Assumptions

- Engineering startup support will be closely coordinated with BES's senior process engineer.
- The extent of the Consultant's involvement will be limited to the budget available.

Deliverables

- Comments on the CM/GC's startup plan
- Field notes from startup and commissioning onsite support

Task 03.10 Operational Process Support – Optional

- No budget has been included for optional tasks. Optional Task is to be approved by the BES Project Manager in writing. BES project manager will approve use of contingency if task is required.
- In addition to the Process Operations Manual previously described, assist BES process and operations staff in preparing SOPs describing step-by-step operations for each unit process.
- Visit the CBWTP to observe system operation and conformance with the intended design.
- Provide operations support after startup, as requested.
- Provide additional support as requested by BES. Support may include the following activities:
  - Provide support to plant's process analyst.
  - Provide onsite support during transition of process operating modes.
  - Troubleshoot operational and process issues during and after startup.

Task 03.11 Record Drawings and Closeout Files

At the conclusion of the project, prepare record drawings on the basis of information furnished by the CM/GC and the field staff.

No printed copies will be provided. The budget and level of effort included for this task is an allowance for use as directed by BES's staff. Consultant will provide services under this task up to the limits of the budget allocated. Specific activities are to be authorized in advance.

Field Visits - None

Meetings - None

Assumptions

- Assume 1,278 hours based on 3.0 hours of effort per drawing for 426 drawings for preparation of a single set of record drawings, including all 3D elements.
- Exclude project closeout file processing – assume BES will create closeout files from submittals, O&Ms, record drawings, etc.

Deliverables

- Record drawings Record drawings will be delivered in PDF, AutoCAD, and provide final Revit model.

Task 03.12 Project Management

The following activities will be part of the routine work or as requested:

- Supervise and control activities of staff assigned to the project. Coordinate and schedule appropriate project staffing discussions and assignments to meet project requirements and commensurate with project risk register. Arrange for the scheduled project workshops, review meetings, and project team meetings. Coordinate the participation of senior staff at appropriate points in the project.
- Manage team success – Coordinate with other projects and BES staff to complete work on schedule and within budget.
- Change Management – Monitor project activities for potential changes. Should change occur, and with BES approval, modify project tasks, task budgets, and approach. Inform BES if any changes will affect the cost of engineering services, the construction cost, or the schedule. Submit change management forms as needed to document scope, schedule, and budget changes.
- Administration – Maintain project records, manage and process project communications, and coordinate

project administrative matters using the BES Sharepoint site.

- Work plan – Maintain and update the final work plan for the project that combines staffing commitments and budgets with the deliverables and schedule for the project. Specific responsibilities of each member of the final design project team will be maintained.
- Internal Initiation – Prepare for and conduct a kickoff meeting for Consultant team members, including subconsultants to review processes and procedures for Construction Support activities.

The following activities will happen at a regular interval:

- Monthly project invoice
  - Invoice page – Contract value, previous invoice amount, monthly invoice amount, remaining value for the top tasks
  - Detailed labor report by top task – Category, staff name, labor rate, hour, cost
  - Subtask Estimate at Complete report
- Monthly Progress Report – Prepare monthly progress reports and submit with the monthly invoice.
  - Status summary – Provide a status summary of current project tasks, activities completed in the last month, activities planned for the next month, a project action issues checklist, performance compared to budget, and identification of items of concern.
  - Risk management – Consultant will participate in monthly meetings with CM/GC, and BES to provide input. BES will lead and document meetings.
  - Deliverables log – Update of the deliverables exchanged between BES, CM/GC, and the Consultant.
  - Project schedule – Update the overall design schedule each month and review with the BES, as needed.
  - Decision log – Update the decision log. Add decisions identified during the last month. Remove decisions that were formalized in the previous report.
  - Change management updates – Update the change log, and review proposed changes and scope modifications with the BES as part of the project management meetings.
- Regular project management meetings – Consultant Project Manager and Design Manager will participate in every other week conference calls with BES Project Manager. Review the project status and discuss activities and needed actions. Prepare and discuss the 3-week look-ahead schedule. Include discussion of invoicing requirements, meeting/workshop templates, and risk register template.

Field Visits - None

Meetings

- Project Management Meetings - Remote meeting conducted for 1 hour every month with BES project management team. Assume two Consultant staff members participate.
- Quarterly Risk Register Meetings – Assume each meeting is no longer than 1 hour, and three Consultant staff members participate.
- Internal kickoff meeting

Assumptions

- The cost of project management is based on the duration of the phase. Budgeting is based on the schedule provided in the Consultants proposal. Extended period in each phase will increase the cost of project management.
- Monthly invoices and major project submittals will be submitted through the BES Sharepoint site.
- The extent of the Consultant's involvement will be limited to the budget available.
- Consultant's SDC are based on the schedule or duration of construction anticipated at the time that these services are agreed to. Deviations from the anticipated schedule or duration of construction will materially affect the scope of these SDC and Consultant's compensation for the SDC, and will require an adjustment to Consultant's compensation.
- Expected duration of the construction phase is 36 months (3 years) after completion of final design.
- Any reproduction, distribution, and mailing costs for the bidding of the contract for construction will be paid by BES.
- BES (or its agent) will review monthly pay requests from the CM/GC.
- Separate from contract modification support previously described, labor and expenses required to address construction claims, claims resolution, or litigation assistance requested of Consultant will constitute additional services.

Deliverables

- Monthly project invoices and monthly progress reports
- Change management forms, as needed
- Risk register updates

Task 03.13 Owner's Contingency

This task provides an owner's contingency. The owner's contingency will be managed by BES within the overall contract not-to-exceed amount. The intent of the owner's contingency is to provide budget for tasks for professional services that meet the following criteria:

- Additional scope required to complete the project that was not anticipated in the original scope of work
- Result from decisions made by permitting agencies or other parties that influence the scope of professional services required to ensure project completion
- Are needed to increase task budgets where the assumptions made to create the budget are exceeded and the exceedance is beyond the control of the Consultant

Written authorization with level of effort from BES's Project Manager is required to reallocate budget from this owner's contingency task to an existing task or a new subtask that is within the overall scope of the project but not clearly defined as within the scope of services.

2. SCHEDULE:

The period of performance for this contract ends six (6) years and eight (8) months after issuance of Notice to Proceed.

3. CONSULTANT KEY PERSONNEL

The Consultant shall assign the following Key Personnel to do the work in the capacities designated and agrees not to substitute these personnel while working on the Contract without the express approval of the City, which approval shall not unreasonably be withheld:

Name	Company	Role on Project
Gregg Thompson	Jacobs Engineering Group Inc.	Project Manager
Kristen Jackson	Jacobs Engineering Group Inc.	Design Manager
Nicki Pozos	The Formation Lab LLC	COBID Integration Manager
Jennifer Chang	Jacobs Engineering Group Inc.	WW Clarifier Facility Lead and Disinfection System Technical Lead
Richard Forrest	Jacobs Engineering Group Inc.	WW Clarifier Technical Lead and Structural Design Lead
Kwabena Adu-Sarkodie	Shrewsberry & Associates, LLC	Disinfection System Facility Lead
Jason Krumsick	Jacobs Engineering Group Inc.	Mechanical Design Lead
Ryan Harbert	Jacobs Engineering Group Inc.	Electrical Design Lead

4. SUBCONSULTANTS

The Consultant shall assign the following Subconsultants to perform work in the capacities designated:

Firm Name	DMWESB/SDVBE Certification Type	Role on Project	Subcontract Percent	Subcontract Amount*
ABHT, LLC	DBE/MBE 3230	Structural Design	2.00%	$ 293,170
Allen Construction Management Services (ACMS Northwest, LLC)	DBE/WBE 9304	Constructability	1.40%	$ 205,219
Caldera Project Services, Inc.	ESB/WBE 11706	Project Controls	1.20%	$ 175,902
Concise Communications Inc.	DBE/ESB/MBE/WBE 9079	Document Control	0.30%	$ 43,976
Convergence Architecture	DBE/WBE 7559	Architecture/Sustainability	3.40%	$ 498,390
Emerio Design LLC	DBE/MBE 5611	Civil Design	5.40%	$ 791,560
Kalos Ergon Engineering LLC	DBE/ESB/MBE 8650	Electrical Design	1.20%	$ 175,902
Minority Construction Group LLC	MBE/WBE 12582	Construction Document Management	2.10%	$ 307,829
OCD Automation, Inc	ESB 10811	Instrumentation and Controls	1.30%	$ 190,561
Ott-Sakai & Associates LLC	DBE/MBE 9994	Cost Estimating	1.40%	$ 205,219
Rhino One LLC	DBE/MBE 6760	Seismic Resiliency	0.90%	$ 131,927
Shrewsberry & Associates, LLC	DBE 10433	Facility Lead, Mechanical, Demolition	8.50%	$1,245,974
The Formation Lab LLC	DBE/ESB/MBE/WBE 12434	COBID Integration Manager	0.60%	$ 87,951
WaterDude Solutions LLC	ESB 10792	O&M Liaison	0.30%	$ 43,976
Total DMWESB/SDVBE Subcontracting Participation:			**30%**	**$4,397,556**

*Subcontract amounts based on total contract amount without Owner's Contingency. Upon authorization, Consultant will include DMWESB/SDVBE participation so that overall participation goal of 30% of the total contract is maintained.

Total subcontracting to COBID certified firms on this contract is estimated at 30% of the Contract Amount.

The City will enforce all social equity Contracting and subcontracting commitments of COBID certified firms indicated in the table above. Consultant shall not add, eliminate, or replace any Subconsultant assignments without the prior written consent of the Chief Procurement Officer. Failure to use the identified COBID certified Subconsultants without prior written consent is a material breach of contract. Any changes must be reported and submitted to the PTE Contract Compliance Specialist. All changes to this Contract, including changes to the Subconsultant participation, must be made by written amendment and approved by the Chief Procurement Officer to be valid.

For Contracts valued $50,000 or more, the Consultant shall submit Subconsultant payment and utilization information electronically in the Contract Compliance Reporting System, reporting ALL Subconsultants employed in the performance of this agreement. More information on this process may be viewed on the City Procurement website at: https://www.portlandoregon.gov/brfs/75932.

COMPENSATION

The maximum that the Consultant will be paid for the work on this Contract is $15,684,614 (hereafter the "not to exceed" amount).

The "not to exceed" amount includes all payments to be made pursuant to this Contract, including reimbursable expenses, and Contract Mitigation if any. Contract Mitigation can be used only with prior written approval of the City prior to any effort being accomplished on added tasks. Nothing in this Contract requires the City to pay for work that does not meet the Standard of Care or other requirements of the Contract. The actual amount to be paid to the Consultant may be less than that amount.

The Consultant shall be paid based on its hourly rates, plus any authorized expenses, in accordance with the tasks listed below. If a task is completed and accepted by the City, and the amount billed by the Consultant is less than the estimated budget for the task, the remaining amount may be used on the other tasks as authorized in writing by the Project Manager. In no event shall the Consultant bill for an amount greater than what is shown for each task.

Task/Phase	Description	Amount
1	Project Development	$1,719,977
2	Design	$9,990,003
3	Construction, Startup and Closeout	$3,974,635
Total Not to Exceed:		$15,684,614

The Consultant is entitled to receive progress payments for its work pursuant to the Contract as provided in more detail below. The City will pay Consultant based on invoices for acceptable work performed and approved until the "not to exceed" amount is reached. Thereafter, Consultant must complete work based on the Contract without additional compensation unless there is a change to the scope of work.

Any estimate of the hours necessary to perform the work is not binding on the City. The Consultant remains responsible if the estimate proves to be incorrect. Exceeding the number of estimated hours to complete the work does not impose any liability on the City for additional payment.

If the work is completed before the "not to exceed" amount is reached, the Consultant's compensation will be based on the Consultant's bills previously submitted for acceptable work performed and approved.

1. Payment Terms: Net 30 Days

The City shall pay the Consultant as follows upon the submission of invoices approved.

2. Standard Reimbursable Costs

The following costs will be reimbursed without cost-increase:

2.1. If pre-approved by the City, allowable costs of travel shall be determined in accordance with the General Services Administration (GSA) per diem rates in effect on the date of the cost. Consultant's time spent traveling to the Portland area, however, will not be reimbursed, except as noted below. All costs incurred for local travel within the Portland metropolitan area, and a 100-mile radius, including but not limited to, vehicle mileage and parking fees are considered as included in the overhead rate, and shall not be reimbursed separately.

2.2. Travel costs included in the negotiated scope of work shall be considered pre-approved.

2.3. Pre-approved and explicitly authorized travel for Shrewsberry and Associates shall include consultant time spent traveling to the Portland Area.

3. Hourly Rates

3.1. The Consultant shall be compensated at a raw labor multiplier. The compensated rate for each staff member shall be calculated as the staff members raw labor rate multiplied by 3.075, unless that compensation exceeds the maximum rate indicated for each classification as shown in attached Exhibit C, Maximum Hourly Billing Rate Table. In no way shall the cost of hours billed by the Consultant exceed the total Contract amount throughout the term of this Contract.

3.2. The City has authorized an annual increase of 3.5% to the maximum rates for each year of this Contract, unless negotiated otherwise based on market conditions. The first increase to the maximum rates is estimated to be January 1, 2025. This applies to the maximum rates in Exhibit C.

4. Subconsultant Costs

Compensation for Subconsultants shall be in accordance with the hourly rates set forth in Exhibit D, Subconsultant Hourly Billing Rate Table. Annual hourly rate increase per year shall be the same as the Consultant. Consultant may bill Subconsultant services at cost plus a 5% mark-up. Other direct expenses, as stated under Standard Reimbursable Costs, shall be billed at cost without mark-up. Allowable Subconsultant services can only be marked-up once. For example, the Consultant is not allowed to mark-up on a second tier Subconsultant's services if it has already been marked-up by the Consultant's Subconsultant. Mark-up is not allowed when using intergovernmental resources to complete work and will not be accepted.

5. Progress Payments

5.1. Compensation to the Consultant shall be based on the following:

5.1.1. Invoices submitted to the City, including the appropriate required information as outlined below and all supporting documentation relating to charges expressed on the invoice.

5.1.2. The invoice shall be submitted to Project No. E11485 in HERON.

5.1.3. Detailed monthly Project Progress Reports submitted to the City Project Manager by email.

5.2. The Consultant is required to follow Generally Accepted Accounting Principles (GAAP). Personal expenditures or expenditures not related to the Project or part of the Contract are not eligible for reimbursement. On or before the 15th of each month, the Consultant shall submit to the City Accounts Payable Department an invoice for work performed by the Consultant during the preceding month.

5.3. The Consultant shall enter all the following information on their invoice in order for the City to review and authorize the invoice for payment.

5.3.1. Contract Number, City's Project Title and any other identifying information requested by the City

5.3.2. Invoice date

5.3.3. Date range during which the services are being invoiced for work provided

5.3.4. Invoice number. The last invoice submitted on the Project must be clearly labeled "Final Invoice"

5.3.5. City Project Manager's name

5.3.6. Amount being invoiced for the current invoice

5.3.7. Consultant shall describe all services performed with particularity and by whom it was performed (Consultant's individuals or Subconsultant, labor category, raw labor multiplier rate, hours worked during the period) and shall itemize and explain all expenses for which reimbursement is claimed. If reimbursable expenses are authorized, identify by line item categories, 1) Travel Expenses and 2) General Reimbursable Expenses. Note: Invoices for Basic Services under a specific Task shall be for completed Basic Services only and shall indicate the percentage of the total Basic Services for that Task that the amount invoiced represents

5.3.8. The Consultant shall also attach photocopies of claimed reimbursable expenses, as applicable and preapproved authorization document from the City Project Manager for all expenses above $75.

5.3.9. The Consultant shall stamp and approve all Subconsultant invoices and note on Subconsultant invoice what they are approving as "billable" under the Contract

5.3.10. The billing from the Consultant must clearly roll up labor and reimbursable costs for the Consultant and Subconsultants. Any billings for Subconsultants must match the Subconsultant invoices.

5.4. To the extent the City disputes any portion of the amount requested in the application for payment, the City shall indicate the undisputed amounts and the amounts that are in dispute. The City shall pay the undisputed amounts and

indicate to whom such payments shall be made. The Consultant shall make such payments to itself and to Subconsultants as indicated by the City for such undisputed amounts. The City and Consultant and, if applicable, the Subconsultant shall then work to reach agreement on the disputed amounts.

5.5. Prior to initial billing, the Consultant shall develop a billing format for approval by the City. Submission of the draft billing document shall be emailed to the City Project Manager for final review and approval.

6. ACH Payments

It is the City's policy to pay its Consultant invoices via electronic funds transfers through the automated clearing house (ACH) network. To initiate payment of invoices, Consultants shall execute the City's standard ACH Vendor Payment Authorization Agreement and provide required documentation. Upon verification of the data provided, the Payment Authorization Agreement will authorize the City to deposit payments directly into Consultant's accounts with financial institutions. All payments shall be in United States currency.

7. Authorization to Proceed

Irrespective of the effective date of the Contract, the Consultant shall not proceed with any work required under this Contract without a written authorization to proceed from the City. Any work performed or expenses incurred by the Consultant prior to the Consultant's receipt of authorization to proceed shall be entirely at the Consultant's risk.

Exhibit C - Billing Rates

Prime Maximum Hourly Billing Rate Table with 3.075 Multiplier

Classification	Maximum Hourly Billing Rate (Includes 3.5% escalation per year)						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Prime - Jacobs Engineering Group Inc.							
Support 1	$91	$94	$97	$100	$104	$108	$112
Support 2	$107	$111	$115	$119	$123	$127	$131
Support 3	$128	$132	$137	$142	$147	$152	$157
Support 4	$154	$159	$165	$171	$177	$183	$189
Technician 1	$116	$120	$124	$128	$132	$137	$142
Technician 2	$140	$145	$150	$155	$160	$166	$172
Technician 3	$175	$181	$187	$194	$201	$208	$215
Technician 4	$221	$229	$237	$245	$254	$263	$272
Technician 5	$278	$288	$298	$308	$319	$330	$342
Professional 0 (interns)	$110	$114	$118	$122	$126	$130	$135
Professional 1	$138	$143	$148	$153	$158	$164	$170
Professional 2/Manager 1	$165	$171	$177	$183	$189	$196	$203
Professional 3/Manager 2	$204	$211	$218	$226	$234	$242	$250
Professional 4/Manager 3	$253	$262	$271	$280	$290	$300	$311
Professional 5/Manager 4	$301	$312	$323	$334	$346	$350	$350
Professional 6/Manager 5	$350	$350	$350	$350	$350	$350	$350
Professional 7/Manager 6	$350	$350	$350	$350	$350	$350	$350
Professional 8/Manager 7	$350	$350	$350	$350	$350	$350	$350

Subconsultant Hourly Billing Rate Table

Classification	Hourly Billing Rate (Includes 3.5% escalation per year)						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
ABHT, LLC							
Administrative	$100.00	$103.50	$107.12	$110.87	$114.75	$118.77	$122.93
Drafter 1	$105.00	$108.68	$112.48	$116.42	$120.49	$124.71	$129.07
Drafter 2	$120.00	$124.20	$128.55	$133.05	$137.70	$142.52	$147.51
Design Engineer 1	$120.00	$124.20	$128.55	$133.05	$137.70	$142.52	$147.51
Design Engineer 2	$128.00	$132.48	$137.12	$141.92	$146.88	$152.02	$157.34
Design Engineer 3	$135.00	$139.73	$144.62	$149.68	$154.92	$160.34	$165.95
Associate 1	$125.00	$129.38	$133.90	$138.59	$143.44	$148.46	$153.66
Associate 2	$145.00	$150.08	$155.33	$160.76	$166.39	$172.21	$178.24
Project Manager 1	$130.00	$134.55	$139.26	$144.13	$149.18	$154.40	$159.80
Project Manager 2	$140.00	$144.90	$149.97	$155.22	$160.65	$166.28	$172.10
Principal	$250.00	$258.75	$267.81	$277.18	$286.88	$296.92	$307.31
Allen Construction Management Services (ACMS Northwest, LLC)							
Public Works Inspector	$160.00	$165.60	$171.40	$177.39	$183.60	$190.03	$196.68
Construction Manager	$234.00	$242.19	$250.67	$259.44	$268.52	$277.92	$287.65
Caldera Project Services, Inc.							
Project Assistant 1	$74.52	$77.13	$79.83	$82.62	$85.51	$88.51	$91.60
Project Assistant 2	$93.00	$96.26	$99.62	$103.11	$106.72	$110.45	$114.32
Project Controls Specialist 2	$185.24	$191.72	$198.43	$205.38	$212.57	$220.01	$227.71
Project Controls Specialist 3	$210.00	$217.35	$224.96	$232.83	$240.98	$249.41	$258.14
Concise Communications Inc.							
Technical Editor	$112.00	$115.92	$119.98	$124.18	$128.52	$133.02	$137.68

Convergence Architecture							
Admin-II	$105.00	$108.68	$112.48	$116.42	$120.49	$124.71	$129.07
Arch-I	$98.00	$101.43	$104.98	$108.65	$112.46	$116.39	$120.47
Arch-II	$136.00	$140.76	$145.69	$150.79	$156.06	$161.53	$167.18
Arch-III	$144.00	$149.04	$154.26	$159.66	$165.24	$171.03	$177.01
Arch-IV	$177.00	$183.20	$189.61	$196.24	$203.11	$210.22	$217.58
Emerio Design LLC							
Civil Engineering Intern I	$93.00	$96.26	$99.62	$103.11	$106.72	$110.45	$114.32
Civil Designer I	$93.00	$96.26	$99.62	$103.11	$106.72	$110.45	$114.32
Civil Engineering Intern II	$108.50	$112.30	$116.23	$120.30	$124.51	$128.86	$133.37
Civil Designer II	$117.80	$121.92	$126.19	$130.61	$135.18	$139.91	$144.81
Civil Project Engineer IV	$136.40	$141.17	$146.12	$151.23	$156.52	$162.00	$167.67
Civil Project Engineer V	$144.15	$149.20	$154.42	$159.82	$165.42	$171.20	$177.20
Civil Engineering Intern III	$139.50	$144.38	$149.44	$154.67	$160.08	$165.68	$171.48
Civil Designer III (I)	$141.05	$145.99	$151.10	$156.38	$161.86	$167.52	$173.39
Civil Project Engineer VI (I)	$148.80	$154.01	$159.40	$164.98	$170.75	$176.73	$182.91
Civil Project Engineer VI (II)	$161.20	$166.84	$172.68	$178.73	$184.98	$191.46	$198.16
Civil Designer III (II)	$176.70	$182.88	$189.29	$195.91	$202.77	$209.86	$217.21
Civil Project Engineer VI (III)	$192.20	$198.93	$205.89	$213.10	$220.55	$228.27	$236.26
Civil Designer III (III)	$195.30	$202.14	$209.21	$216.53	$224.11	$231.96	$240.07
Civil Senior Project Manager VIII	$268.27	$277.66	$287.38	$297.44	$307.85	$318.63	$329.78
Design Intern	$68.20	$70.59	$73.06	$75.61	$78.26	$81.00	$83.84
Structural Project Engineer VI (I)	$201.50	$208.55	$215.85	$223.41	$231.23	$239.32	$247.69
Structural Project Engineer VI (III)	$226.30	$234.22	$242.42	$250.90	$259.68	$268.77	$278.18
Structural Senior Project Manager VIII	$248.00	$256.68	$265.66	$274.96	$284.59	$294.55	$304.86
Construction Inspector II	$93.00	$96.26	$99.62	$103.11	$106.72	$110.45	$114.32
Construction Inspector IV	$114.70	$118.71	$122.87	$127.17	$131.62	$136.23	$141.00
Construction Inspector VI (I)	$124.00	$128.34	$132.83	$137.48	$142.29	$147.27	$152.43
Construction Inspector VI (II)	$136.40	$141.17	$146.12	$151.23	$156.52	$162.00	$167.67
Construction Inspector VI (III)	$173.60	$179.68	$185.96	$192.47	$199.21	$206.18	$213.40
Construction Inspector Senior Project Manager VIII	$176.70	$182.88	$189.29	$195.91	$202.77	$209.86	$217.21
Project/Construction Specialist VI	$137.95	$142.78	$147.78	$152.95	$158.30	$163.84	$169.58
Land Use Planner VI	$146.07	$151.18	$156.48	$161.95	$167.62	$173.49	$179.56
Project Accountant	$113.15	$117.11	$121.21	$125.45	$129.84	$134.39	$139.09
Project Coordinator	$108.50	$112.30	$116.23	$120.30	$124.51	$128.86	$133.37
Survey Technician I	$83.70	$86.63	$89.66	$92.80	$96.05	$99.41	$102.89
Survey Technician II	$102.30	$105.88	$109.59	$113.42	$117.39	$121.50	$125.75
Survey Technician III (I)	$124.00	$128.34	$132.83	$137.48	$142.29	$147.27	$152.43
Professional Land Surveyor VI	$136.40	$141.17	$146.12	$151.23	$156.52	$162.00	$167.67
Survey Technician III (II)	$136.40	$141.17	$146.12	$151.23	$156.52	$162.00	$167.67
Survey Operations Coordinator IV	$155.00	$160.43	$166.04	$171.85	$177.87	$184.09	$190.53
Survey Technician III (III)	$144.15	$149.20	$154.42	$159.82	$165.42	$171.20	$177.20
Survey Project Manager VII	$155.00	$160.43	$166.04	$171.85	$177.87	$184.09	$190.53
Survey Senior Project Manager VIII	$176.70	$182.88	$189.29	$195.91	$202.77	$209.86	$217.21
Survey Technician - Field I	$99.86	$103.36	$106.97	$110.72	$114.59	$118.60	$122.75
Survey Technician - Field II	$115.36	$119.40	$123.58	$127.90	$132.38	$137.01	$141.81
Survey Technician - Field III (I)	$123.42	$127.74	$132.21	$136.84	$141.63	$146.58	$151.71
Survey Technician - Field III (II)	$135.82	$140.57	$145.49	$150.59	$155.86	$161.31	$166.96
Survey Technician - Field III (III)	$145.12	$150.20	$155.46	$160.90	$166.53	$172.36	$178.39
One Person Crew Rate	$168.02	$173.90	$179.99	$186.29	$192.81	$199.56	$206.54
Two Person Crew Rate	$230.38	$238.44	$246.79	$255.43	$264.37	$273.62	$283.20
Three Person Crew Rate	$292.74	$302.99	$313.59	$324.57	$335.93	$347.68	$359.85
One Person 3D Scanner Rate	$373.02	$386.08	$399.59	$413.57	$428.05	$443.03	$458.54

Two Person 3D Scanner Rate	$430.38	$445.44	$461.03	$477.17	$493.87	$511.16	$529.05
Three Person 3D Scanner Rate	$487.74	$504.81	$522.48	$540.77	$559.69	$579.28	$599.56
Survey Intern	$87.36	$90.42	$93.58	$96.86	$100.25	$103.76	$107.39
Kalos Ergon Engineering LLC							
Technician 1	$96.00	$99.36	$102.84	$106.44	$110.16	$114.02	$118.01
Professional 1	$113.00	$116.96	$121.05	$125.29	$129.67	$134.21	$138.91
Professional 2	$133.00	$137.66	$142.47	$147.46	$152.62	$157.96	$163.49
Professional 3	$153.00	$158.36	$163.90	$169.63	$175.57	$181.72	$188.08
Professional 4	$192.00	$198.72	$205.68	$212.87	$220.32	$228.04	$236.02
Professional 5	$209.00	$216.32	$223.89	$231.72	$239.83	$248.23	$256.91
Minority Construction Group LLC							
Project Coordinator/Assistant	$108.00	$111.78	$115.69	$119.74	$123.93	$128.27	$132.76
Estimator	$164.00	$169.74	$175.68	$181.83	$188.19	$194.78	$201.60
Project Controls Specialist	$167.00	$172.85	$178.89	$185.16	$191.64	$198.34	$205.29
Senior Project Controls Specialist	$186.00	$192.51	$199.25	$206.22	$213.44	$220.91	$228.64
Project Executive/Project Lead	$253.00	$261.86	$271.02	$280.51	$290.32	$300.48	$311.00
Principal	$257.00	$266.00	$275.30	$284.94	$294.91	$305.24	$315.92
OCD Automation, Inc.							
A1	$75.00	$77.63	$80.34	$83.15	$86.06	$89.08	$92.19
A2	$85.00	$87.98	$91.05	$94.24	$97.54	$100.95	$104.49
E1	$85.00	$87.98	$91.05	$94.24	$97.54	$100.95	$104.49
E2	$100.00	$103.50	$107.12	$110.87	$114.75	$118.77	$122.93
E3	$125.00	$129.38	$133.90	$138.59	$143.44	$148.46	$153.66
E4	$150.00	$155.25	$160.68	$166.31	$172.13	$178.15	$184.39
E5	$175.00	$181.13	$187.46	$194.03	$200.82	$207.85	$215.12
E6	$200.00	$207.00	$214.25	$221.74	$229.50	$237.54	$245.85
Ott-Sakai & Associates LLC							
Contracts Administrator	$185.03	$191.51	$198.21	$205.15	$212.33	$219.76	$227.45
Construction Specialist	$246.00	$254.61	$263.52	$272.74	$282.29	$292.17	$302.40
Principal	$260.97	$270.10	$279.56	$289.34	$299.47	$309.95	$320.80
Sr. Construction Specialist	$260.97	$270.10	$279.56	$289.34	$299.47	$309.95	$320.80
Rhino One LLC							
Field Technician 1	$92.40	$95.63	$98.98	$102.45	$106.03	$109.74	$113.58
GIS Technician 1	$104.00	$107.64	$111.41	$115.31	$119.34	$123.52	$127.84
Staff Geotechnical Engineer	$105.00	$108.68	$112.48	$116.42	$120.49	$124.71	$129.07
CAD Technician 3	$106.40	$110.12	$113.98	$117.97	$122.10	$126.37	$130.79
Engineering Geologist	$117.60	$121.72	$125.98	$130.39	$134.95	$139.67	$144.56
Project Geotechnical Engineer	$133.00	$137.66	$142.47	$147.46	$152.62	$157.96	$163.49
Principal Geotechnical Engineer	$218.75	$226.41	$234.33	$242.53	$251.02	$259.81	$268.90
Shrewsberry & Associates LLC							
Administration 1	$69.74	$72.18	$74.71	$77.32	$80.03	$82.83	$85.73
Administration 2	$82.02	$84.89	$87.86	$90.94	$94.12	$97.41	$100.82
Administration 3	$154.58	$159.99	$165.59	$171.39	$177.38	$183.59	$190.02
CADD Drafter 1	$65.85	$68.15	$70.54	$73.01	$75.56	$78.21	$80.95
CADD Drafter 2	$78.61	$81.36	$84.21	$87.16	$90.21	$93.36	$96.63
Engineer 1	$117.05	$121.15	$125.39	$129.78	$134.32	$139.02	$143.88
Engineer 2	$133.77	$138.45	$143.30	$148.31	$153.50	$158.88	$164.44
Engineer 3	$161.57	$167.22	$173.08	$179.14	$185.41	$191.89	$198.61
Engineer 4	$201.85	$208.91	$216.23	$223.79	$231.63	$239.73	$248.13
Engineer 5	$235.01	$243.24	$251.75	$260.56	$269.68	$279.12	$288.89
Engineer 6	$254.68	$263.59	$272.82	$282.37	$292.25	$302.48	$313.07
Engineer 7	$324.31	$335.66	$347.41	$359.57	$372.15	$385.18	$398.66
Designer 1	$88.26	$91.35	$94.55	$97.86	$101.28	$104.83	$108.49
Designer 2	$91.79	$95.00	$98.33	$101.77	$105.33	$109.02	$112.83

Designer 3	$125.21	$129.59	$134.13	$138.82	$143.68	$148.71	$153.92
Designer 4	$152.27	$157.60	$163.12	$168.82	$174.73	$180.85	$187.18
Designer 5	$179.34	$185.62	$192.11	$198.84	$205.80	$213.00	$220.45
The Formation Lab LLC							
Administration	$93.00	$96.26	$99.62	$103.11	$106.72	$110.45	$114.32
Project Assistant	$110.00	$113.85	$117.83	$121.96	$126.23	$130.65	$135.22
Project Coordinator	$145.00	$150.08	$155.33	$160.76	$166.39	$172.21	$178.24
Associate	$181.00	$187.34	$193.89	$200.68	$207.70	$214.97	$222.50
Senior Associate	$220.00	$227.70	$235.67	$243.92	$252.46	$261.29	$270.44
Principal	$265.00	$274.28	$283.87	$293.81	$304.09	$314.74	$325.75
WaterDude Solutions LLC							
O&M Specialist	$185.00	$191.48	$198.18	$205.11	$212.29	$219.72	$227.41

Reimbursables

1 Mileage - (if travel is outside 100 Miles from CBWTP) – GSA mileage rate on the date of cost

2 Daily Lodging Rates (excluding taxes) - GSA per diem rate on the date of cost

3 Meals and Incidental Expenses - GSA per diem rate on the date of cost

4 Air transportation and other travel - at cost

5 Laboratory testing - at cost

6 Recovery Charge Advanced Hydraulics Group staff only - Specialized technology - $90 per staff hour

7 Reimbursable expenses - at cost paper reproductions - at cost for major deliverables drawing reproductions - at cost

8 Subconsultants - 5% markup on invoiced amount

Exhibit D: Sample Change Order

	BUREAU NAME	LOGO

CHANGE ORDER

Consultant		Project Title	
Contract No.		Change Order No.	*SAMPLE*
Contract Date		Change Order Date	

Select	Type	Description and Reason for Change	Modification to:
☐	Time		Project Schedule and/or Contract
☐	Scope or Specifications		Statement of Work Acceptance Requirements
☐	Deliverables		Statement of Work Acceptance Requirements
☐	Price		Statement of Work and/or Contract
☐	Terms and Conditions		Request Amendment to Contract
☐	Other		

1. Additional time is necessary and the Project Schedule for the Statement of Work or a specific Deliverable is hereby extended through (DATE) or modified as shown on the attached Project Schedule.
2. Additional work or a change in work or Specifications is necessary. For example, changes to the Statement of Work, Deliverables and/or the Acceptance.
3. A price adjustment is necessary for the following Deliverables. These changes will NOT affect the total not-to-exceed value of the Contract. For example, price changes that show the original price and the modified price.
4. An Amendment to the Contract is requested for the following reasons. For example, any change to the total value of the Contract, the term or ending date of the Contract, or the Contract terms and conditions requires an Amendment.

The Change Order is subject to the terms and conditions of the above-referenced Contract.

The rest of the Statement of Work shall remain unchanged and in full force and effect.

CITY OF PORTLAND CONTRACTOR

_____ _____

Authorized Signature Date Authorized Signature Date

_____ _____

Printed Name Printed Name

_____ _____

Title Title

Exhibit E – Drawing List

No.	DRAWING NUMBER	DRAWING TITLE
	GENERAL	
1	G000	COVER SHEET
2	G001	INDEX TO DRAWINGS - SHEET 1
3	G002	INDEX TO DRAWINGS - SHEET 2
4	G007	ABBREVIATIONS - SHEET 1
5	G008	ABBREVIATIONS - SHEET 2
6	G009	ABBREVIATIONS - SHEET 3
7	G010	GENERAL LEGEND
8	G015	CIVIL AND YARD PIPING LEGEND
9	G016	LANDSCAPING LEGEND
10	G017	INSTRUMENTATION AND CONTROL LEGEND - SHEET 1
11	G018	INSTRUMENTATION AND CONTROL LEGEND - SHEET 2
12	G025	ARCHITECTURAL GENERAL NOTES, MATERIAL SYMBOLS, LEGEND AND WALL TYPES
13	G026	ARCHITECTURAL VERTICAL AND HORIZONTAL ASSEMBLIES
14	G027	CODE DATA AND LIFE SAFETY PLAN WET WEATHER CLARIFIER ELECTRICAL BUILDING
15	G028	CODE DATA AND LIFE SAFETY PLAN SODIUM HYPOCHLORITE RECEIVING BUILDING
16	G029	CODE DATA AND LIFE SAFETY PLAN SODIUM HYPOCHLORITE LOOP TANKS BUILDING
17	G030	ARCHITECTURAL DOOR AND FINISH SCHEDULES
18	G035	STRUCTURAL GENERAL NOTES - SHEET 1
19	G036	STRUCTURAL GENERAL NOTES - SHEET 2
20	G037	STRUCTURAL STATEMENT OF SPECIAL INSPECTION, OBSERVATION AND TESTING PLAN - SHEET 1
21	G038	STRUCTURAL STATEMENT OF SPECIAL INSPECTION, OBSERVATION AND TESTING PLAN - SHEET 2
22	G039	STRUCTURAL STATEMENT OF SPECIAL INSPECTION, OBSERVATION AND TESTING PLAN - SHEET 3
23	G040	STRUCTURAL STATEMENT OF SPECIAL INSPECTION, OBSERVATION AND TESTING PLAN - SHEET 4
24	G041	STRUCTURAL STATEMENT OF SPECIAL INSPECTION, OBSERVATION AND TESTING PLAN - SHEET 5
25	G045	MECHANICAL LEGEND
26	G050	HVAC LEGEND
27	G051	PLUMBING LEGEND
28	G052	HVAC EQUIPMENT SCHEDULES - SHEET 1
29	G053	HVAC EQUIPMENT SCHEDULES - SHEET 2

30	G062	ELECTRICAL LEGEND - SHEET 1
31	G063	ELECTRICAL LEGEND - SHEET 2
32	G064	ELECTRICAL LEGEND - SHEET 3
33	G066	PROCESS FLOW DIAGRAM - WETWEATHER
34	G076	DESIGN CRITERIA - SHEET 1 OF 2
35	G077	DESIGN CRITERIA - SHEET 2 OF 2
36	G078	HYDRAULIC PROFILE - SHEET 1 OF 2
37	G080	PIPING SCHEDULE
38	G083	AREA CLASSIFICATION AND MATERIALS SELECTION TABLE - SHEET 1
39	G084	AREA CLASSIFICATION AND MATERIALS SELECTION TABLE - SHEET 2
40	G085	AREA CLASSIFICATION AND MATERIALS SELECTION TABLE - SHEET 3
	SITE RENDERING	
41	R001	RENDERING - FOR PERSPECTIVE ONLY
42	R002	RENDERING - FOR PERSPECTIVE ONLY
43	R003	RENDERING - FOR PERSPECTIVE ONLY
	EROSION CONTROL	
44	EC100	EROSION CONTROL OVERALL PLAN
45	EC401	EROSION CONTROL DETAILS
	DEMOLITION	
46	D100	DEMOLITION OVERALL PLAN
47	D100	DEMOLITION PLAN - AREA 2.5
48	D101	DEMOLITION PLAN - AREA 3.3
49	D102	DEMOLITION PLAN - AREA 3.4
50	D103	DEMOLITION PLAN - AREA 3.5
51	D104	DEMOLITION PLAN - AREA 4.4
52	D105	DEMOLITION PLAN - AREA 4.5
53	D106	DEMOLITION PLAN - AREA 5.4
54	D107	DEMOLITION PLAN - AREA 5.5
55	D108	DEMOLITION ENLARGED PLAN - TIPPING BERM
56	D109	DEMOLITION ENLARGED PLAN - SLUDGE GRAVITY THICKENERS
57	D110	DEMOLITION ENLARGED PLAN - SODIUM HYPOCHLORITE RECEIVING BUILDING
58	D501	DEMOLITION PHOTO DETAILS 1
59	D502	DEMOLITION PHOTO DETAILS 2
60	D503	DEMOLITION PHOTO DETAILS 3
61	D504	DEMOLITION PHOTO DETAILS 4
62	D505	REFERENCE DRAWING 9 - SLUDGE GRAVITY THICKENERS
63	D506	REFERENCE DRAWING 10 - SLUDGE GRAVITY THICKENERS

64	D507	REFERENCE DRAWING 11 - SODIUM HYPOCHLORITE RECEIVING BUILDING
65	D508	REFERENCE DRAWING 12 - SODIUM HYPOCHLORITE RECEIVING BUILDING
66	D509	REFERENCE DRAWING 13 - SODIUM HYPOCHLORITE RECEIVING BUILDING
67	D510	REFERENCE DRAWING 14 - SODIUM HYPOCHLORITE RECEIVING BUILDING
	CIVIL	
68	C001	OVERALL PROJECT KEY MAP AND SURVEY CONTROL
69	C120	OVERALL LOCATION PLAN
70	C121	LOCATION PLAN - AREA 2.5
71	C122	LOCATION PLAN - AREA 3.3
72	C123	LOCATION PLAN - AREA 3.4
73	C124	LOCATION PLAN - AREA 3.5
74	C125	LOCATION PLAN - AREA 4.4
75	C126	LOCATION PLAN - AREA 4.5
76	C128	LOCATION PLAN - AREA 5.5
77	C129	ENLARGED PLAN - WWEFCS
78	C160	OVERALL GRADING PLAN
79	C161	GRADING PLAN - AREA 2.5
80	C162	GRADING PLAN - AREA 3.3
81	C163	GRADING PLAN - AREA 3.4
82	C164	GRADING PLAN - AREA 3.5
83	C165	GRADING PLAN - AREA 4.4
84	C166	GRADING PLAN - AREA 4.5
85	C168	GRADING PLAN - AREA 5.5
86	C201	TYPICAL ROAD & PAVEMENT SECTIONS
87	C401	DETAILS
88	C402	CLSM BACKFILL CROSS SECTION
	YARD PIPING	
89	Y120	OVERALL PLAN
90	Y123	YARD PIPING PLAN - AREA 3.4
91	Y124	YARD PIPING PLAN - AREA 3.5
92	Y125	YARD PIPING PLAN - AREA 4.4
93	Y126	YARD PIPING PLAN - AREA 4.5
94	Y128	YARD PIPING PLAN - AREA 5.5
95	Y181	ENLARGED PLAN
96	Y182	ENLARGED PLANS
97	Y201	PROFILE
98	Y202	PROFILES
99	Y301	SECTIONS

100	Y401	DETAIL AND SECTIONS
101	Y402	DETAILS
	LANDSCAPING	
102	L100	OVERALL PLAN
103	L101	LANDSCAPE PLAN - AREA 2.5
104	L104	LANDSCAPE PLAN - AREA 3.5
105	L120	OVERALL IRRIGATION PLAN
106	L121	IRRIGATION PLAN - AREA 2.5
107	L124	IRRIGATION PLAN - AREA 3.5
108	L181	ENLARGED PLAN AND DETAILS
109	L183	ENLARGED PLAN - WET WEATHER CLARIFIER ELECTRICAL BUILDING ECOROOF PLANTING
110	L185	ENLARGED PLAN - SODIUM HYPOCHLORITE LOOP TANKS BUILDING ECOROOF PLANTING
111	L401	DETAILS
112	L403	DETAILS - ECOROOF
113	L404	DETAILS - ECOROOF
114	L501	PLANT SCHEDULE - ECOROOF
	ELECTRICAL	
115	E000	PERMITTING SITE PLAN
116	E100	ELECTRICAL SITE PLAN - OVERALL
117	E103	ELECTRICAL SITE PLAN - AREA 2.5
118	E103	ELECTRICAL SITE PLAN - AREA 3.4
119	E104	ELECTRICAL SITE PLAN - AREA 3.5
120	E105	ELECTRICAL SITE PLAN - AREA 4.4
121	E106	ELECTRICAL SITE PLAN - AREA 4.5
122	E108	ELECTRICAL SITE PLAN - AREA 5.5
123	E184	TUNNEL AREA PLAN
124	E501	DEMOLITION ONE-LINE DIAGRAM - WWCL
125	E502	DEMOLITION ONE-LINE DIAGRAM - WWCL
126	E503	DEMOLITION ONE-LINE DIAGRAM - HYPOCHLORITE RECEIVING BUILDING
127	E504	DEMOLITION ONE-LINE DIAGRAM - HYPOCHLORITE LOOP TANKS
128	E505	DEMOLITION ONE-LINE DIAGRAM - GRAVITY THICKENER
129	E511	DEMOLITION OVERALL ONE-LINE DIAGRAM
130	E512	OVERALL ONE-LINE DIAGRAM
131	E515	ONE-LINE DIAGRAM
132	E516	ONE-LINE DIAGRAM
133	E517	ONE-LINE DIAGRAM
134	E518	ONE-LINE DIAGRAM
135	E530	LUMINAIRE SCHEDULE

136	E531	EXTERIOR LIGHTING CONTROL DIAGRAM
137	E540	TYPICAL GROUNDING DIAGRAM
138	E545	COMMUNICATIONS BLOCK DIAGRAM
139	E556	MOTOR CONTROL INDEX
140	E557	MOTOR CONTROL DIAGRAMS
141	E558	MOTOR CONTROL DIAGRAMS
142	E559	MOTOR CONTROL DIAGRAMS
143	E560	MOTOR CONTROL DIAGRAMS
144	E573	BES STANDARD MOTOR CONTROL DIAGRAM EXAMPLE
145	E573	BES STANDARD INTERCONNECTION DIAGRAM FOR VALVE ACTUATOR
146	E581	DUCTBANK SCHEDULE
147	E582	DUCTBANK SCHEDULE
148	E583	DUCTBANK SCHEDULE
149	E590	CIRCUIT SCHEDULE
150	E591	CIRCUIT SCHEDULE
151	E592	CIRCUIT SCHEDULE
152	E593	CIRCUIT SCHEDULE
153	E594	CIRCUIT SCHEDULE
154	E595	CIRCUIT SCHEDULE
	INSTRUMENTATION AND CONTROL	
155	P001	WET WEATHER CLARIFIER 1
156	P002	WET WEATHER CLARIFIER 2
157	P003	WET WEATHER CLARIFIER 3
158	P004	WET WEATHER CLARIFIER 4
159	P005	WET WEATHER CLARIFIER 5
160	P006	WET WEATHER CLARIFIER 6
161	P007	WET WEATHER CLARIFIER 7
162	P008	WET WEATHER CLARIFIER 8
163	P009	WET WEATHER CLARIFIER 1 DEWATERING
164	P010	WET WEATHER CLARIFIER 2 DEWATERING
165	P011	WET WEATHER CLARIFIER 3 DEWATERING
166	P012	WET WEATHER CLARIFIER 4 DEWATERING
167	P013	WET WEATHER CLARIFIER 5 DEWATERING
168	P014	WET WEATHER CLARIFIER 6 DEWATERING
169	P015	WET WEATHER CLARIFIER 7 DEWATERING
170	P016	WET WEATHER CLARIFIER 8 DEWATERING
171	P017	TRANSFER BUILDING 1
172	P018	TRANSFER BUILDING 2
173	P019	TRANSFER BUILDING 3
174	P020	TRANSFER BUILDING 4
175	P021	SODIUM HYPOCHLORITE TANK 1

176	P022	SODIUM HYPOCHLORITE TANK 2
177	P023	SODIUM HYPOCHLORITE TANK 3
178	P026	SCUM P&ID
179	P027	SCUM P&ID
180	P028	TUSI - HYPOCHLORITE METERING PUMP
181	P029	TU08 - HYPOCHLORITE METERING PUMP 1 & 2
182	P030	TU08 - HYPOCHLORITE METERING PUMP 3 & 4
183	P031	TUBL - HYPOCHLORITE METERING PUMP 1 & 2
184	P032	TUBL - HYPOCHLORITE METERING PUMP 3 & 4
185	P501	NETWORK BLOCK DIAGRAM
186	P502	NETWORK BLOCK DIAGRAM
187	P601	LOOP DRAWING - TYPICAL
188	P602	LOOP DRAWING - TYPICAL
189	P603	LOOP DRAWING - TYPICAL
190	P604	LOOP DRAWING - TYPICAL
191	P605	LOOP DRAWING - TYPICAL
192	P606	LOOP DRAWING - TYPICAL
193	P607	LOOP DRAWING - TYPICAL
194	P608	LOOP DRAWING - TYPICAL
195	P609	LOOP DRAWING - TYPICAL
196	P610	LOOP DRAWING - TYPICAL
197	P611	LOOP DRAWING TABLE
198	P612	PLC PANEL LAYOUT CONCEPT DRAWING
199	P613	PLC PANEL LAYOUT CONCEPT DRAWING
200	P614	PLC PANEL LAYOUT CONCEPT DRAWING
201	P615	PLC PANEL LAYOUT CONCEPT DRAWING
202	P616	PLC PANEL POWER DIAGRAM - TYPICAL
203	P617	PLC PANEL POWER DIAGRAM - TYPICAL
204	P618	PLC PANEL DISCRETE INPUT MODULE WIRING - TYPICAL
205	P619	PLC PANEL DISCRETE OUTPUT MODULE WIRING - TYPICAL
206	P620	PLC PANEL ANALOG MODULE WIRING - TYPICAL
207	P621	NETWORK PANEL LAYOUT CONCEPT
208	P622	MISC - UPS
	WET WEATHER CLARIFIERS	
209	21R001	RENDERING - FOR PERSPECTIVE ONLY

210	21X000	PERMITTING SITE PLAN
211	21D100	DEMOLITION OVERALL PLAN
212	21D101	DEMOLITION PLAN - AREA A (WWCL 1 AND 2)
213	21D102	DEMOLITION PLAN - AREA B (WWCL 3 AND 4)
214	21D103	DEMOLITION PLAN - AREA C (WWCL 5 AND 6)
215	21D104	DEMOLITION PLAN - AREA D (WWCL 7 AND 8)
216	21D181	DEMOLITION ENLARGED PLAN - TRANSFER BUILDING UPPER LEVEL TYPICAL
217	21D201	DEMOLITION SECTIONS TYPICAL
218	21D405	DEMOLITION DETAIL TYPICAL
219	21D406	DEMOLITION PHOTO DETAIL TYPICAL
220	21S100	STRUCTURAL OVERALL PLAN
221	21S101	STRUCTURAL PLAN - AREA A (WWCL 1 AND 2)
222	21S102	STRUCTURAL PLAN - AREA B (WWCL 3 AND 4)
223	21S103	STRUCTURAL PLAN - AREA C (WWCL 5 AND 6)
224	21S104	STRUCTURAL PLAN - AREA D (WWCL 7 AND 8)
225	21S201	STRUCTURAL SECTIONS TYPICAL
226	21S404	STRUCTURAL DETAILS TYPICAL
227	21S405	STRUCTURAL DETAILS TYPICAL
228	21M100	PROCESS MECHANICAL OVERALL PLAN
229	21M101	PROCESS MECHANICAL PLAN - AREA A (WWCL 1 AND 2)
230	21M102	PROCESS MECHANICAL PLAN - AREA B (WWCL 3 AND 4)
231	21M103	PROCESS MECHANICAL PLAN - AREA C (WWCL 5 AND 6)
232	21M104	PROCESS MECHANICAL PLAN - AREA D (WWCL 7 AND 8)
233	21M105	PROCESS MECHANICAL ENLARGED PLAN
234	21M105	PROCESS MECHANICAL ENLARGED PLAN - SCUM SYSTEM
235	21M106	PROCESS MECHANICAL ENLARGED PLAN - SCUM SYSTEM
236	21M201	PROCESS MECHANICAL SECTIONS - TYPICAL

237	21M202	PROCESS MECHANICAL SECTIONS - AREA D
238	21M206	PROCESS MECHANICAL SECTIONS - SCUM SYSTEM
239	21M207	PROCESS MECHANICAL SECTIONS - SCUM SYSTEM
240	21M401	PROCESS MECHANICAL DETAILS
241	21M402	PROCESS MECHANICAL DETAILS
242	21M403	PROCESS MECHANICAL DETAILS
243	21M407	PROCESS MECHANICAL DETAILS - SCUM SYSTEM
244	21M408	PROCESS MECHANICAL DETAILS - SCUM SYSTEM
245	21H100	HVAC OVERALL PLAN
246	21H101	HVAC ENLARGED PLAN - TRANSFER BUILDING 1
247	21H102	HVAC ENLARGED PLAN - TRANSFER BUILDING 2
248	21H103	HVAC ENLARGED PLAN - TRANSFER BUILDING 3
249	21H104	HVAC ENLARGED PLAN - TRANSFER BUILDING 4
250	22H201	HVAC SECTION
251	22H202	HVAC SECTION
252	22H401	HVAC DETAIL
253	22H501	HVAC AIRFLOW AND CONTROL SCHEMATICS
254	2.10E+101	ELECTRICAL OVERALL PLAN
255	2.10E+102	ELECTRICAL PROCESS/FACILITY PLAN - AREA A
256	2.10E+103	ELECTRICAL PROCESS/FACILITY PLAN - AREA B
257	2.10E+104	ELECTRICAL PROCESS/FACILITY PLAN - AREA C
258	2.10E+105	ELECTRICAL PROCESS/FACILITY PLAN - AREA D
259	2.10E+182	ELECTRICAL ENLARGED PROCESS/FACILITY PLAN - TRANSFER BUILDING 1
260	2.10E+183	ELECTRICAL ENLARGED PROCESS/FACILITY PLAN - TRANSFER BUILDING 2
261	2.10E+184	ELECTRICAL ENLARGED PROCESS/FACILITY PLAN - TRANSFER BUILDING 3

262	2.10E+185	ELECTRICAL ENLARGED PROCESS/FACILITY PLAN - TRANSFER BUILDING 4
	WET WEATHER CLARIFIER ELECTRICAL BUILDING	
263	22R001	RENDERING - FOR PERSPECTIVE ONLY
264	22X000	PERMITTING SITE PLAN
265	22A001	ARCHITECTRUAL OVERALL SLAB PLAN
266	22A100	ARCHITECTRUAL OVERALL PLAN
267	22A120	ARCHITECTRUAL OVERALL ROOF PLAN
268	22A201	ARCHITECTRUAL BUILDING SECTIONS
269	22A202	ARCHITECTRUAL WALL SECTIONS
270	22A301	ARCHITECTRUAL ELEVATIONS
271	22A401	ARCHITECTRUAL EXTERIOR DETAILS
272	22S100	STRUCTURAL OVERALL FOUNDATION PLAN
273	22S105	STRUCTURAL OVERALL ROOF PLAN
274	22S301	STRUCTURAL ELEVATIONS
275	22S302	STRUCTURAL DETAILS - GEOTECHNICAL PILES
276	22S401	STRUCTURAL DETAILS
277	22S402	STRUCTURAL DETAILS
278	22S403	STRUCTURAL DETAILS
279	22H100	HVAC OVERALL PLAN
280	22H120	HVAC OVERALL ROOF PLAN
281	22H501	HVAC AIR FLOW AND CONTROL SCHEMATIC
282	2.20E+102	ELECTRICAL OVERALL PROCESS PLAN
283	2.20E+103	ELECTRICAL OVERALL CABLE TRAY PLAN
284	2.20E+104	ELECTRICAL OVERALL FACILITY PLAN
285	22E501	ELECTRICAL PANELBOARD SCHEDULE
	TUNNEL PIPE GALLERY	
286	32X100	DEMOLITION OVERALL PLAN
287	32H100	HVAC OVERALL TUNNEL PLAN
288	32H101	HVAC VENTILATION PLAN
289	32H401	HVAC PHOTO DETAILS
290	32H402	HVAC PHOTO DETAILS
291	32PL100	PLUMBING OVERALL TUNNEL PLAN
292	32PL201	PLUMBING SECTION
293	32PL202	PLUMBING SECTION
294	32PL203	PLUMBING ISOMETRIC

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	RAS PUMP HOUSE	
295	4.70E+102	ELECTRICAL OVERALL LOWER LEVEL PROCESS PLAN
296	4.70E+121	ELECTRICAL OVERALL UPPER LEVEL PROCESS PLAN
297	47E503	ELECTRICAL PANELBOARD SCHEDULE
	RED TUNNEL	
298	41D510	DEMOLITION OVERALL PLAN
	SILVER TUNNEL	
299	43D510	DEMOLITION OVERALL PLAN
300	43D511	DEMOLITION PLAN - AREA D
301	43D512	DEMOLITION PLAN - AREA E
302	43D201	DEMOLITION SECTIONS
303	43M150	PROCESS MECHANICAL OVERALL PLAN
304	43M151	PROCESS MECHANICAL PLAN - AREA B
305	43M152	PROCESS MECHANICAL PLAN - AREA C
306	43M153	PROCESS MECHANICAL PLAN - AREA D
307	43M154	PROCESS MECHANICAL PLAN - AREA E
308	43M155	PROCESS MECHANICAL PLAN - AREA F
309	43M201	PROCESS MECHANICAL SECTIONS
310	43M401	PROCESS MECHANICAL DETAILS
	BLUE TUNNEL	
311	43D170	DEMOLITION OVERALL PLAN
312	43D171	DEMOLITION PLAN - AREA A AND B
313	43D172	DEMOLITION PLAN - AREA C
314	43D201	DEMOLITION SECTIONS
315	43D401	DEMOLITION PHOTO DETAILS
316	43M170	PROCESS MECHANICAL OVERALL PLAN
317	43M171	PROCESS MECHANICAL PLAN - AREA A AND B
318	43M172	PROCESS MECHANICAL PLAN - AREA C
319	43M201	PROCESS MECHANICAL SECTIONS
320	43M401	PROCESS MECHANICAL DETAILS
	TUNNEL 08	
321	43D185	DEMOLITION OVERALL PLAN
322	43D186	DEMOLITION ENLARGED PLAN
323	43D201	DEMOLITION SECTIONS
324	43D401	DEMOLITION PHOTO DETAILS
325	43M185	PROCESS MECHANICAL OVERALL PLAN
326	43M186	PROCESS MECHANICAL ENLARGED PLAN
327	43M201	PROCESS MECHANICAL SECTIONS
328	43M401	PROCESS MECHANICAL DETAILS

	SODIUM HYPOCHLORITE LOOP TANK BUILDING	
329	60D100	DEMOLITION OVERALL PLAN
330	60D401	DEMOLITION PHOTO AND DETAILS
331	60D402	DEMOLITION PHOTO AND DETAILS
332	60D403	DEMOLITION PHOTO AND DETAILS
333	60D404	DEMOLITION PHOTO AND DETAILS
	HYPOCHLORITE FACILITY	
334	60R001	RENDERING - FOR PERSPECTIVE ONLY
335	60X000	PERMITTING SITE PLAN
336	60A100	ARCHITECTURAL OVERALL PLAN
337	60A120	ARCHITECTURAL OVERALL ROOF PLAN
338	60A201	ARCHITECTURAL BUILDING SECTIONS
339	60A301	ARCHITECTURAL ELEVATIONS
340	60A401	ARCHITECTURAL EXTERIOR DETAILS
341	60S100	STRUCTURAL OVERALL FOUNDATION PLAN
342	60S101	STRUCTURAL OVERALL GROUND FLOOR PLAN
343	60S105	STRUCTURAL OVERALL ROOF PLAN
344	60S106	STRUCTURAL ELEVATIONS
345	60S301	STRUCTURAL SECTIONS
346	60S302	STRUCTURAL SECTIONS
347	60S401	STRUCTURAL DETAILS
348	60M100	PROCESS MECHANICAL OVERALL PLAN
349	60M150	PROCESS MECHANICAL ENLARGED PLAN - METERING PUMPS
350	60M201	PROCESS MECHANICAL SECTIONS
351	60M203	PROCESS MECHANICAL SECTION - METERING PUMPS
352	60M401	PROCESS MECHANICAL DETAILS
353	60H100	HVACOVERALL PLAN
354	60H120	HVAC OVERALL ROOF PLAN
355	60H501	HVAC AIR FLOW AND CONTROL SCHEMATIC
356	60PL100	PLUMBING OVERALL UNDER SLAB PLAN
357	60PL101	PLUMBING OVERALL PLAN
358	60PL102	PLUMBING OVERALL ROOF PLAN
359	60FS100	OVERALL FIRE SUPRESSION PLAN
360	60FS120	OVERALL FIRE SUPRESSION ROOF PLAN
361	60FA100	OVERALL FIRE ALARM PLAN
362	6.00E+102	ELECTRICAL OVERALL PROCESS PLAN
363	6.00E+103	ELECTRICAL OVERALL FACILITY PLAN
364	60E501	ELECTRICAL PANELBOARD SCHEDULE

	STANDARD DETAILS	
365	SDD001	STRUCTURAL DESIGN DETAILS 1
366	SDD002	STRUCTURAL DESIGN DETAILS 2
367	SDD003	STRUCTURAL DESIGN DETAILS 3
368	SDD004	STRUCTURAL DESIGN DETAILS 4
369	SDD005	STRUCTURAL DESIGN DETAILS 5
370	SDD006	STRUCTURAL DESIGN DETAILS 6
371	SDD007	STRUCTURAL DESIGN DETAILS 7
372	SDD008	STRUCTURAL DESIGN DETAILS 8
373	SDD009	STRUCTURAL DESIGN DETAILS 9
374	SDD010	STRUCTURAL DESIGN DETAILS 10
375	SDD011	STRUCTURAL DESIGN DETAILS 11
376	SDD012	STRUCTURAL DESIGN DETAILS 12
377	SDD013	STRUCTURAL DESIGN DETAILS 13
378	SDD014	STRUCTURAL DESIGN DETAILS 14
379	SDD015	STRUCTURAL DESIGN DETAILS 15
380	ADD001	ARCHITECTURAL DESIGN DETAILS 1
381	ADD002	ARCHITECTURAL DESIGN DETAILS 2
382	ADD003	ARCHITECTURAL DESIGN DETAILS 3
383	ADD004	ARCHITECTURAL DESIGN DETAILS 4
384	ADD005	ARCHITECTURAL DESIGN DETAILS 5
385	ADD006	ARCHITECTURAL DESIGN DETAILS 6
386	ADD007	ARCHITECTURAL DESIGN DETAILS 7
387	ADD008	ARCHITECTURAL DESIGN DETAILS 8
388	ADD009	ARCHITECTURAL DESIGN DETAILS 9
389	ADD010	ARCHITECTURAL DESIGN DETAILS 10
390	MDD001	PROCESS MECHANICAL DESIGN DETAILS 1
391	MDD002	PROCESS MECHANICAL DESIGN DETAILS 2
392	MDD003	PROCESS MECHANICAL DESIGN DETAILS 3
393	MDD004	PROCESS MECHANICAL DESIGN DETAILS 4
394	MDD005	PROCESS MECHANICAL DESIGN DETAILS 5
395	MDD006	PROCESS MECHANICAL DESIGN DETAILS 6
396	MDD007	PROCESS MECHANICAL DESIGN DETAILS 7
397	MDD008	PROCESS MECHANICAL DESIGN DETAILS 8
398	MDD009	PROCESS MECHANICAL DESIGN DETAILS 9
399	MDD010	PROCESS MECHANICAL DESIGN DETAILS 10
400	HDD001	HVAC DESIGN DETAIL 1
401	HDD002	HVAC DESIGN DETAIL 2
402	HDD003	HVAC DESIGN DETAIL 3
403	PLDD001	PLUMBING DESIGN DETAIL 1
404	PLDD002	PLUMBING DESIGN DETAIL 2

405	CDD001	CIVIL DESIGN DETAIL 1
406	CDD002	CIVIL DESIGN DETAIL 2
407	CDD003	CIVIL DESIGN DETAIL 3
408	CDD004	CIVIL DESIGN DETAIL 4
409	CDD005	CIVIL DESIGN DETAIL 5
410	CDD006	CIVIL DESIGN DETAIL 6
411	CDD007	CIVIL DESIGN DETAIL 7
412	EDD001	ELECTRICAL DESIGN DETAIL 1
413	EDD002	ELECTRICAL DESIGN DETAIL 2
414	EDD003	ELECTRICAL DESIGN DETAIL 3
415	EDD004	ELECTRICAL DESIGN DETAIL 4
416	EDD005	ELECTRICAL DESIGN DETAIL 5
417	EDD006	ELECTRICAL DESIGN DETAIL 6
418	EDD007	ELECTRICAL DESIGN DETAIL 7
419	EDD008	ELECTRICAL DESIGN DETAIL 8
420	EDD009	ELECTRICAL DESIGN DETAIL 9
421	PDD001	I&C DESIGN DETAIL 1
422	PDD002	I&C DESIGN DETAIL 2
423	PDD003	I&C DESIGN DETAIL 3
424	PDD004	I&C DESIGN DETAIL 4
425	PDD005	I&C DESIGN DETAIL 5
426	PDD006	I&C DESIGN DETAIL 6

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