

**Task Order No. – 2019-2**  
**UV Design and Construction Phase Services In accordance with**  
**Agreement**  
**For**  
**On-Call Engineering Services**  
**Dated July 10, 2018**  
**By and Between**  
**T&B Engineering, P.C.**  
**and**  
**Poughkeepsies' Joint Water Project Board**

**1. Scope of Work:**

ENGINEER shall provide additional services in association with UPS building foundation and retaining wall design and construction phase services as described and clarified in the attached scope of work dated November 2, 2020.

**2. Time Schedule:**

ENGINEER anticipates a schedule for the design and construction of these items to be concurrent with the UV facility upgrade project deliverables.

**3. Compensation**

Services shall be provided on an hourly plus expense basis with a budget allocation of \$54,600. Invoicing will be in accordance with the terms of the AGREEMENT.

For information purposes, the below summary provides the anticipated break out of the project. The summary is presented to give the BOARD a better understanding of how the project budget was developed. Invoices will be submitted based on the total project fee and not individual line item budgets.

<b>Task</b>	<b>Budget</b>
Task 1 – Basis of Design Report – Incorporate Retaining Wall and UPS Foundation Design into Basis of Design Report	\$1,500
Task 3 – Retaining Wall & UPS Building Foundation Design	\$40,400
Task 6 – Retaining Wall & UPS Building Foundation CACO	\$12,700
<b>Task Order 2019-2 Amendment No. 1 Budget :</b>	<b>\$54,600</b>

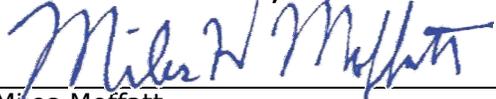
Accepted by:

**POUGHKEEPSIES' JOINT WATER PROJECT BOARD**

\_\_\_\_\_  
 Authorized Representative

\_\_\_\_\_  
 Date

**T&B ENGINEERING, P.C.**

  
 \_\_\_\_\_  
 Miles Moffatt

11-2-2020  
 \_\_\_\_\_  
 Date

**Task Order No. 2019-2 –UV Design and Construction Phase Services  
AMENDMENT 1 – Tank Wall Analysis and Retaining Wall Design  
SCOPE OF WORK – November 2, 2020**

In response to your request, ENGINEER has provided this amendment to Task Order No. 2019-2 for engineering services for design, bid and construction phase services for upgrading the UV reactors on the individual filter effluent piping at the Poughkeepsie Water Treatment Facility (WTF) in support of Poughkeepsie’s Joint Water Project Board (BOARD). Amendment services include retaining wall and building foundation design.

## Background

Tighe & Bond is actively engaged in the UV Disinfection system replacement design. As part of this work, the uninterruptible power supply (UPS) will be replaced. The original Task Order Scope assumed the UPS building would either:

- 1) Occupy the original UPS room, or
- 2) Housed in a new building on the slab currently occupied by the carbon dioxide system

During the design process, through several reviews and discussions with PJWTP staff, the most suitable area identified for the new building location is adjacent to the filter building; neither of the two locations addressed in the original Task Order Scope. Space is limited at the site and placement of the building will require removal of portions of the rock stabilized slope. Plant staff has indicated that operations would be better served by a UPS building site close to the filter building footprint. Doing so will require installation of a retaining wall.

As the UPS was to be located on an existing slab or in its current interior space, a building foundation design had not been included in the original scope and will be addressed by this amendment.

Site visits and review of the filter tank wall adjacent to the proposed retaining wall/building location indicate that the concrete has experienced deterioration and weathering in areas not protected by the rock slope. It is recommended the concrete wall be repaired in locations where damage has occurred and be restored appropriately in consideration of exposure to elements that will occur with rock slope removal.

In summary the following activities are presented in this Task Order Amendment:

- Geotechnical Investigation
- Design and Construction Phase Services of UPS Building Foundation
- Design and Construction Phase Services of Retaining Wall

This Task Order Amendment includes additional scope to the following engineering tasks that are part of the original 2019-2 Task Order:

- Task 1 – Basis of Design: The report for New York State Department of Health (NYSDOH) will be updated to address items included in this amendment.
- Task 3 – Design: This task amendment will include the design of the proposed retaining wall and UPS building foundation.

- Task 6 – Construction Phase Services: This task includes construction administration services, construction observation and record drawing work associated with the retaining wall and UPS building foundation construction.

## Scope of Services

ENGINEER has developed the following proposed Scope of Services based on our understanding of the project:

### Task 1 – Basis of Design

**Basis of Design Report** – The basis of design report will include necessary design data for the additional work included in this amendment. Basis of design will include an evaluation of alternatives for key design decisions including:

- Final design criteria and calculations for UPS building foundation and retaining wall
- Location of proposed improvements
- Opinion of probable construction cost

During the basis of design phase we will also provide assessment of the condition of the filter tank wall adjacent to the retaining wall and appropriate repair recommendations.

### Task 3 – Design

**3.1 Conduct Kick-Off Meeting/Field Visit** – We will conduct a kick-off meeting/site visit at the WTF to review and identify key design concerns for elements addressed in this amendment and prepare a summary of the meeting and submit to BOARD.

**3.2 Geotechnical Evaluation** – Tighe & Bond will coordinate a subsurface exploration program to evaluate the suitability of the site's subsurface conditions to support the proposed structure. Based on a preliminary review of the Surficial Geology of New York – Lower Hudson Plate, subsurface conditions in the area are mapped as either glacial till or recent alluvial deposits (fine sand to gravel), overlying bedrock. Bedrock in the area is mapped as graywacke and shale and is anticipated to be encountered within 30 feet of the existing ground surface.

**Exploration Layout and Coordination** - We will mark the proposed exploration locations in the field by measuring off of existing site features. Once exploration locations are marked, we coordinate the required Dig Safely utility clearance notification with our drilling subcontractor. It should be noted that Dig Safe only clears utilities on public roads and that utility clearance on private property is the responsibility of the Owner. Tighe & Bond and our drilling subcontractor will not be responsible for utilities that are not clearly marked on the property.

**Test Borings** – We will subcontract with a drilling contractor to complete one day of borings within or near the proposed UPS building and retaining wall. It is assumed that the boring locations will be truck rig accessible and it is anticipated that two borings will be completed within the time budgeted. Borings not completed within this time frame will either be eliminated or completed under a contract amendment. Borings will be advanced with hollow-stem augers or flush-joint casing using drive-and-wash methods to target depths of 30 feet below the existing ground surface, or refusal, whichever is shallower.

Split-spoon samples using Standard Penetration Test (SPT) procedures will be obtained continuously through any existing fill or organic soils to a maximum depth

of 12 feet, and at 5-foot maximum intervals thereafter. A 5-foot rock core will be taken in one of the borings, if refusal is encountered within proposed exploration depths. If auger or roller bit refusal is encountered at shallower depths, refusal will be confirmed by split-spoon refusal and the boring will be terminated. One offset boring will be performed to confirm shallow refusal depths as time allows. Groundwater monitoring wells are not proposed but groundwater levels will be noted during drilling, if encountered. The location and depth of the proposed boring may be modified in the field based on actual conditions encountered during drilling.

Boreholes will be backfilled with cuttings or sand if there is an insufficient amount of cuttings to fill the hole. No other surface repair is included. Any cuttings unable to be returned to the hole will be spread near the boring location in a vegetated upland area.

We anticipate that this proposal assumes that no investigation derived waste (IDW) requiring off-site disposal will be generated. However, if IDW is generated that should not be placed on the ground surface, the excess soils will then be drummed, and the cost of the drum and analytical testing and disposal of drummed soils will be mutually agreed upon under a contract amendment.

**Permits / Coordination** - A Tighe & Bond geotechnical engineer, geologist or environmental scientist will be onsite to observe and document the test borings. Scheduling of our field work will be coordinated with Poughkeepsie Joint Water Project Board personnel. We have assumed that the explorations will not be conducted in a public right of way; therefore, an allowance for a police detail or traffic controls has not been included. Our scope currently includes no local permitting effort for these subsurface explorations. We will inquire with the City prior to performing the explorations and if a local permit is required, we will amend our scope and fee accordingly.

Noise from the test boring drill rig can be disruptive. However, it is assumed that explorations can be performed within an 8-hour period during weekdays sometime between 7 am and 5 pm without interruption to reduce cost.

**Material Testing** - Conduct three index property tests (grain size analyses or Atterberg Limits tests) on select samples obtained in the explorations to aid in soil classification, assist with correlating properties of the subsurface materials, and evaluation of the suitability of materials for re-use as fill on-site.

**Geotechnical Evaluation and Recommendations** – We will prepare an internal geotechnical evaluation memorandum that provides the following: subsurface conditions, subsurface stability, foundation and slab requirements, bearing pressure and settlement, foundation and under slab drainage, lateral earth pressures, seismic design criteria, and geotechnical construction recommendations.

**3.3 Develop Design Documents** – We will evaluate and recommend the retaining wall construction and new UPS building foundation most appropriate and cost effective for the site. We will conduct a stability analysis for the type of retaining wall indicated during preliminary design, and provide sections, details, and specifications for construction of the new retaining wall. Design will also include repair recommendations for the filter tank wall. Design scope does not include repair design for other tank wall repairs.

We anticipate that approximately 4 design drawings will be developed for this task. Base plans will be developed from the available record and design drawings. A preliminary list of anticipated design drawings is as follows:

<b>Sheet No.</b>	<b>Drawing No.</b>	<b>Drawing Title</b>
Sheet 20	S-2	UPS Building Foundation Plan & Details
Sheet 21	S-3	Retaining Wall Plan and Sections
Sheet 22	S-4	Retaining Wall Details
Sheet 23	S-5	Retaining Wall & Filter Wall Repair Details

**3.4 Opinion of Probable Construction Cost** – We will provide an opinion of probable construction cost for the retaining wall and filter wall repair.

## **Task 6 – Construction Phase Services**

**6.1 Review Shop Drawings** – Review the Contractors’ proposed shop drawing and submittal schedule identifying all shop drawings, samples, and submittals required by the Contract along with anticipated dates for submission. Tighe & Bond will review the Contractors’ shop drawings, samples, and other submittals.

**6.2 Respond to Requests for Information** – We will review the Contractors’ requests for information or clarification of the contract documents and issue responses.

**6.3 Perform Supplemental Field Visits** – We will perform supplemental construction field visits by members of the design team as needed to address installation issues associated with the retaining wall or filter tank wall restoration. We have assumed 3 field visits for this supplemental effort.

**6.4 Prepare Record Drawings** – We will update the original design drawings to reflect the available record information provided by the Contractors. The record drawings will show significant changes made during construction. We will provide a mylar set of record drawings as well as an electronic copy in PDF format for the BOARD’s use.

## **Assumptions/Excluded Services**

In an effort to provide a limited budget based on a specific Scope of Services, ENGINEER has made the following assumptions and exclusions, which define the intended services and associated costs.

- Analysis of the structural capacity of the existing Filter Building structural members.
- Material sampling and testing to determine mechanical properties of members or hazardous materials

## **Fee**

<b>Activity</b>	<b>Fee</b>
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<b>TOTAL:</b>	<b>\$54,600</b>

## **Contact information for this Task Order:**

Project Director: Erin Moore at 845-516-5835