

# DESIGN SERVICES FOR EAST WASTEWATER TREATMENT PLANT UPGRADE ENGINEERING

## AMENDMENT NO. 2 SCOPE OF WORK

The following describes the ENGINEER'S modified scope of work to be conducted under this Amendment No. 2:

### *The Changing Roles of the City's Wastewater Treatment Plants*

*The upgrades to the East WWTP have evolved over the past year and a half from just adding additional capacity to the 51-year old small East WWTP to complement the larger, existing 36-year old West WWTP, to repurposing the East WWTP to become the "core" treatment facility for the City.*

*A few basic facts for the treatment process are:*

- 1. The City has one permitted combined discharge of 10.1 million gallons per day (mgd).*
- 2. The West WWTP contributes 7.9 mgd of the allowed permitted capacity.*
- 3. The East WWTP contributes 2.2 mgd of the allowed permitted capacity.*
- 4. The West WWTP uses an outdated rotating biological contractor (RBC) technology that is failing rapidly and with a very limited supply of replacement parts available nationally. The current working capacity of the West WWTP has diminished to just 75% of its original capacity, with a high probability of more capacity loss in the near term. The West WWTP can no longer be relied upon to carry the majority of the City's wastewater treatment burden.*

*It is in this context that upgrading the East WWTP with a process "intensification" IFAS technology to a "reliable" treatment capacity of 5 mgd is critical. That fundamental shift in priority of the East WWTP becoming the "core" of wastewater treatment in the City instead of the West WWTP is the overarching principle that guides technical decision-making for the East WWTP Upgrade project.*

Replace Section 1.3.2.19 in its entirety with the following:

- "1.3.2.19. Design an upgrade of the existing circular secondary clarifier by replacement of mechanical equipment, and painting the interior steel wall and exterior steel wall of the clarifier. The scum collection and removal equipment, inlet feedwell, effluent weirs, and sludge collector mechanism with a new drive unit are planned for replacement. An energy dissipating inlet is to be added to improve clarifier performance. Effluent weir covers will be added around the periphery of the existing and new clarifiers. The new equipment is planned to be from the same suppliers as the equipment for the new secondary clarifier and will be similar in design considering the configuration of the existing secondary clarifier. A steel bridge connecting the existing clarifier elevated walkway to the new clarifier elevated walkways will be provided.

Final design deliverables will be incorporated into the deliverables described in Section 1.7"

***Rationale:*** The current East WWTP facility has only one clarifier for settling of solids with no backup unit for this critical process. For the East WWTP to function as the “core” facility, a backup clarifier is necessary. The second clarifier also is needed to meet Florida DEP and USEPA design guidelines. Excerpt from these guidelines with key text are highlighted below

*This additional clarifier was added as part of Amendment No. 1. in March 2019. To enhance the needed reliability and performance of sedimentation, the City decided to replace the internal equipment in the existing clarifier to be of similar quality to that of the new clarifier.*

*Additionally, since the clarifiers are approximately 16 ft. above grade, to improve operational efficiency, an elevated walkway between the two clarifiers was added to the design.*

***Ten States Standards, Recommended Standard for Wastewater Facilities***, adhered to by Florida DEP, “Multiple units capable of independent operation are desirable and shall be provided in all plants where design average flows exceed 100,000 gallons/day (380 m<sup>3</sup>/d). Plants not having multiple units shall include, other provisions to assure continuity of treatment.”

***Design Criteria for Mechanical, Electrical and Fluid Systems and Component Reliability, EPA 430-99-74-001.*** Class I Reliability. Final and Chemical Sedimentation Basins, Trickling Filters, Filters and Activated Carbon Columns. There shall be sufficient number of units of a size such that with the largest flow capacity unit out of services, the remaining units shall have a design flow capacity of at least 75% of the total design flow to that unit operation.

Replace Section 1.3.2.26 in its entirety with the following new section:

- "1.3.2.26 Provide a site design including site grading, roads, yard piping, underground utility locations, coordination with the City on the location of existing underground utilities and connection points of new facilities to existing facilities, site grading, landscaping, and stormwater mitigation measures in accordance with permit requirements.

Final design deliverables will be incorporated into the deliverables described in Section 1.7"

***Rationale:*** The improvements to the East WWTP to meet the needs of a core facility meant that substantially more piping connections were needed. Complicating the design effort are a large number of existing pipes that have been abandoned in place or not accurately represented. To develop the design, multiple additional site visits and additional subcontracted pipeline location and design services were required. These activities are reflected in the highlighted changes to this scope item above. Showing existing pipes more accurately during design will reduce construction costs due to potential changes during construction.

Replace Section 1.3.2.28 in its entirety with the following new section:

- "1.3.2.28. Design a new Dumping Station to be located at the West WWTP between and south of the existing aerobic digesters. The new Dumping Station will replace the existing dumping station located at the East WWTP that needs to be demolished to enable construction of a new secondary clarifier.

The new Dumping Station drain line will connect by gravity to existing Manhole No. 2 within the West WWTP site. The concept for the new Dumping Station is based on the Craig A. Smith & Associates 90% Submittal design drawings prepared in December 2016 for the East WWTP site, but with a modified pad slope and smaller drain grating openings.

Final design deliverables will be incorporated into the deliverables described in Section 1.7"

***Rationale:*** *Incorporating the new secondary clarifier into the design and development of a compact, efficient site layout, a new Dumping Station needs to be located on the West WWTP site. Also, the City added new design requirements to the Dumping Station.*

Add a new Section 1.3.2.29 as follows:

- "1.3.29. Design a new odor control system consisting of an in-ground biofilter to treat foul air collected from the following facilities: headworks screening chamber, new screenings dumpster, and existing influent channels between the screenings chamber and just upstream of the location where screened influent is introduced to the new anoxic zones located within the existing aeration basins. The odor control facilities include:
- 1.3.29.1 FRP fans and FRP foul air ductwork to convey foul air from the above-described existing wastewater facilities to the biofilter.
  - 1.3.29.2 Covers over the existing screening chamber and screened influent channels.
  - 1.3.29.3 Modified or new existing screenings chute piping.
  - 1.3.29.4 New dumpster with a cover modified to allow odor withdrawal from the dumpster. The dumpster will have a removable hinged plastic cover for containing the odor.

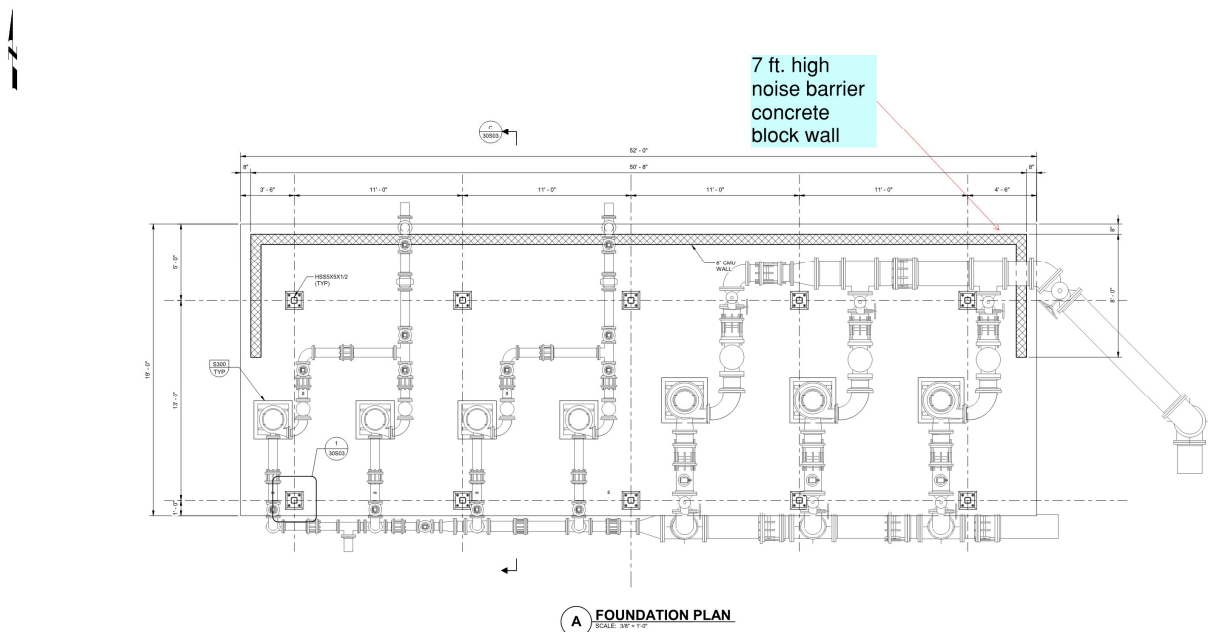
Final design deliverables will be incorporated into the deliverables described in Section 1.7"

***Rationale:*** *During development of the Amendment No. 1 design scope of work, the need for odor control for the most odorous part of the new facilities, the raw wastewater influent screen structure, was discussed with the City. The upgraded East WWTP would be designed to accept 5 mgd of average daily flow versus a current average capacity of 2.2 mgd. While the added flow and associated odors were considered, it was determined by the City that the existing East WWTP has had limited odor concerns from the raw wastewater influent screens; therefore, new odor control facilities were not included in the project scope of work. During a 60% design review workshop, the City revisited the need for odor control recognizing that adding odor control at this time would be the most overall cost-effective time for implementation. Waiting may result in odor complaints by City residents adjacent to the WWTP and higher costs to add the facilities at a later time.*

"1.3.2.30 Conduct an acoustic analysis from on-site noise measurements for the new sludge pumps. Develop a report summarizing the results of the analysis with recommendations to mitigate noise from new sludge pumping equipment as indicated by the analysis to meet the City's noise ordinance. Design a single-sided concrete wall placed on the north side of the sludge pumping equipment pad to mitigate noise from the new sludge pumps."

*To reduce the cost of these new pump facilities, it was decided not to expand the existing pump building or design a new building, but to locate the pumps outdoors on a pad to take advantage the nice Florida weather. A fabric weather shade is included to provide protection from rain and direct summer sunlight.*

*During the 60% design review workshop, the City raised a concern about added noise for abutting residents to the north. It was agreed that a noise study would be conducted. The noise study indicted a borderline noise condition, resulting in a City decision to design a block noise barrier wall on the northern side of the new pumping complex. The City determined that adding noise control at this time would be the most overall cost-effective time for implementation. Waiting may result in noise complaints by City residents adjacent to the WWTP and higher costs to add the facilities at a later time.*



Replace Sections 2 and 3 in their entirety with the following:

## "2 TIME OF PERFORMANCE

Preliminary Design Technical Memorandum submittal to OWNER: August 23, 2019.

Intermediate Design: October 25, 2019.

Final Design draft submittal to OWNER: 75 calendar days from approval of this Amendment No. 2. *(Note: Alternatively, we could just use March 20, 2020 if the amendment is approved fairly quickly.*

Bidding Services: According to OWNER'S schedule.

Construction Management Services: According to OWNER'S schedule, but for budgeting purpose estimated to be 12 months.

## 3 PAYMENT

- 3.1 Compensation for the design, permitting, and bidding services for the additional scope of work associated with this Amendment No. 2: OWNER agrees to pay the ENGINEER an amount not to exceed \$160,097 for the additional services. The total compensation for design, permitting, and bidding services under this Agreement is \$1,168,078. Payments will be made monthly on a lump sum basis.
- 3.2 Compensation for engineering services during construction for the additional scope of work associated with this Amendment No. 2: There is no change in compensation attributable to this Amendment No. 2. The fees for engineering services during construction will remain as identified in the original Agreement and Amendment No. 1. The total compensation for engineering services during construction for this Agreement is \$491,898, as memorialized in the City's Purchase Order dated 2/20/2019.
- 3.3 Compensation for optional reimbursable tasks for the additional scope of work associated with this Amendment No. 2: The original Agreement (Section 3.5) contained a budget allowance amount of \$25,000, which will remain unchanged. The total compensation for optional reimbursable tasks for this Agreement is \$25,000, based on the City's Purchase Order dated 2/20/2019.
- 3.4 The total compensation for the design, permitting, and bidding services; engineering services during construction; and optional reimbursable tasks associated with this contract, including Amendment No. 1 and this Amendment No. 2, is \$1,684,976, based on the City's Purchase Order dated 2/20/2019 and this Amendment No. 2.









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