

## TASK ORDER 7-18 SWR

### RICHARD A. HEYMAN WASTEWATER TREATMENT PLANT ENERGY EFFICIENCY MASTERPLAN

This TASK ORDER 7-18 SWR is issued under the terms and conditions of the MASTER AGREEMENT TO FURNISH GENERAL ENGINEERING SERVICES TO THE CITY OF KEY WEST ("AGREEMENT") between the City of Key West ("CITY") and CH2M Engineers, Inc. ("CONSULTANT") executed on November 03, 2017, which is incorporated herein by this reference.

A. SCOPE OF SERVICES

Specific services which the CONSULTANT agrees to furnish are summarized on the attached statement entitled TASK ORDER 7-18 SWR, "SCOPE OF SERVICES." The "Scope of Services" defines the work effort anticipated for the Task order.

This Task Order, when executed, shall be incorporated in and shall become an integral part of the November 03, 2017, Master Agreement.

B. TIME OF COMPLETION

Work under this Task order will begin immediately following acceptance and completed expeditiously subject to coordination with the City of Key West staff.

C. COMPENSATION

Compensation for the labor portions of TASK ORDER 7-18 SWR, Task A, and B will be on a lump sum fee basis as stipulated in Article 5, Paragraph 5.1.1 of the AGREEMENT. Compensation for Labor Portions of Tasks C, D, and all expenses will be on a Cost Reimbursable-Per Diem basis as stipulated in Article 5, Paragraph 5.1.2 of the AGREEMENT. The estimated compensation is shown on the attached statement entitled TASK ORDER 7-18 SWR COMPENSATION.

D. ACCEPTANCE

By signature, the parties each accept the provisions of this TASK ORDER 7-18 SWR, and authorize the CONSULTANT to proceed at the direction of the CITY's representative in accordance with the "SCOPE OF SERVICES." Start date for this project will be no later than ten (10) days after execution of this authorization.

For CH2M HILL Engineers, Inc.

For CITY OF KEY WEST

By:

Sirpa H. Hall  
Sr. Business Vice President

By:

Jim Scholl  
City Manager

Sean McCoy, P.E.  
Key West Project Manager

Dated the \_\_\_\_ day of \_\_\_\_, 20\_\_

ATTEST: \_\_\_\_\_

---

**TASK ORDER 7-18 SWR**  
**RICHARD A. HEYMAN WASTEWATER TREATMENT PLANT ENERGY EFFICIENCY MASTERPLAN**

## **SCOPE OF SERVICES**

### **Project Description**

Since commissioning the Richard A. Heyman Environmental Protection Facility (WWTP) in 1989, the City has proactively operated the Waste Water Treatment Plant, by implementing improvements and retrofits to more efficiently operate and treat the City's wastewater using current technologies and best practices. For Example:

- Abandonment of Ocean Outfalls, and installation of first Deep Injection Well in 1998
- Replacement of Chlorine Gas disinfection system, with an Ultraviolet Disinfection System in 2005.
- Increased capacity through headworks modifications in 2011.

Throughout the years, treatment processes have been modified, pumps and controls replaced, and concrete repaired. However, many of the electrical components throughout the WWTP are original, and nearing 30 years old. With decades of new technology available, and interest in both fiscal and energy conservation, the City would like to evaluate the WWTP for ways to reduce power consumption.

### **Purpose**

The CITY has requested that the CONSULTANT provide engineering design services for the preparation of an Energy Efficiency Master Plan for the Richard A Heyman WWTP.

### **Scope of Services**

#### **Task A – Data Collection / Kickoff**

Within 5 days of receiving NTP, the team will submit in writing, a request for data required prior to conducting a site visit, detailed as part of Task B below. The following items are the preliminary prioritized list of data, information, and coordination activities to support the site visit, and will be included in the Data Request:

- Floor plans for the buildings to be audited
- As-built drawings for process facilities, and/or equipment inventory
- Utility data as follows, if applicable:
  - Electric bills for past 2-3 years, including demand and consumption
  - Natural gas bills for past 2-3 years including commodity and transportation costs
  - Fuel oil bills for past 2-3 years
  - Water utility bills for past 2-3 years
  - Utility rate schedules for the above utilities including demand, time-of-day, and consumption components

- 
- Sub-meter data for last 12 months, if available
  - List of current or planned projects, particularly impacting energy or water use
  - Access to all mechanical/electrical rooms
  - Electronic copies (TIFF, PDF, DWG) of as-built drawings for each building to be audited - include mechanical and lighting floor plans, mechanical room plans, mechanical and lighting schedules, HVAC control diagrams, and dimensioned architectural floor plans, and similar

It is understood that all the requested information may not be available for all the areas and in that case the project team will document what information is unavailable and will proceed with their best effort using available information. If significant data are not available to allow the site visit team to complete the audit, the CONSULTANT will notify the CITY and work to identify the most appropriate steps to resolve.

Once Data has been received, the team will conduct a brief desktop review, and schedule a kick-off meeting. It is anticipated that this meeting will occur within 4 weeks of NTP. The meeting will be attended in person by the Project Manager, with two (2) Energy Engineers participating by conference call. The agenda will be prepared by CH2M, and will identify any data gaps, or areas where available data may be lacking.

#### *Deliverables*

- Data Request
- Kick off Agenda and Meeting Minutes

### Task B – Energy Efficiency Master Plan

Under this task, the CONSULTANT will visit the WWTP, and develop an Energy Efficiency Master Plan to reduce energy costs. The CONSULTANT will provide for an energy, water, and condition improvement opportunity assessment at the WWTP and identify potential energy conservation measures (ECMs). The assessments shall include examination of all significant energy and water using systems at the facilities including process plant components such as motors, generators, and pumps. Energy savings potential will be evaluated for all identified ECMs. Preliminary capital and operating costs for implementing such measures will be determined in order to estimate project payback periods.

#### *Subtask B.1 - Site Visit*

The project team will visit the site to collect site data and gather all requirements to complete this scope of work. The CONSULTANT has budgeted 3 days for three (3) Energy Engineers, to complete the site evaluation. Typical site data collection would involve at least the following steps:

- Visual observation and condition assessment of all the major energy and water systems
- Assessment of building envelope conditions
- Identification of energy/water/envelope system apparent deficiencies
- Name plate data collection as needed
- Sample data collection for terminal equipment or lighting or plumbing systems

- 
- Non-intrusive field measurements as needed (space temperatures, light levels, or similar)
  - Recording or confirmation of existing operational parameters (setpoints, schedules, and similar)

#### *Deliverables*

- N/A – all findings will be documented in the Energy Assessment Technical Memorandum.

#### *Subtask B.2 – Draft Efficiency Master Plan*

The CONSULTANT will prepare the draft deliverables to summarize the evaluation of potential opportunities for improvements or energy/water savings or renewable energy applications. The CONSULTANT will develop a baseline operating case based on observed conditions and information provided during the site visit. The identified ECMs will be evaluated by approximating energy savings values to within a range of confidence to select the ECMs to be further investigated as part of Final Deliverable phase. This task will define energy (kWh) and utility cost savings (\$) for the implementation of each of the ECMs. An estimate of capital and operating costs will be developed to evaluate the payback period for each selected viable ECM. A list observed deficiencies and recommended repairs will also be included.

Following completion of this task, the CONSULTANT will submit the Draft Efficiency Master Plan for CITY review. Upon receiving comments, the Project Manager will schedule a review conference call to be attended by Project Manager, CITY, and other technical staff as deemed necessary.

#### *Deliverables*

- Draft Energy Efficiency Master Plan
- Minutes from Review Conference, including responses to CITY comments

#### *Subtask B.3 – Final Efficiency Master Plan*

Under this subtask, the CONSULTANT will prepare the final deliverables to summarize the recommended implementation of ECMs. This task includes incorporating responses to CITY comments from the draft deliverables as well as a final cost and constructability review for viable ECMs identified. Viable ECMs will be selected based on CITY review of the Preliminary Assessment results.

#### *Deliverables*

- Final Energy Efficiency Master Plan

## **Assumptions**

The following assumptions were used in the development of this Task order

- Work under this Task Order will be completed in calendar year 2018.
- Submittals listed above shall be in an approved digital format unless specifically shown as otherwise.
- Legal, easement, or plat surveys are not included in the scope of work. If additional property is required it shall be the responsibility of the City to obtain.
- Existing system Record Drawings will be used when available. CH2M will reasonably rely upon the accuracy and completeness of the information/data provided by the City or other third parties.

- 
- Meetings will be attended in person by the Project Manager. All other CH2M team members will participate by phone unless availability allows for an in-person meeting.
  - It is assumed that only favorable ECMs will require a defined baseline and cost and savings estimates unless the CITY specifically requests that a certain ECM not classified as favorable be included. Less favorable ECMs will be evaluated at a less detailed screening level.
  - The project does not include design development documents. The scope of the recommended ECMs will be provided in a written description format. Photos and conceptual level sketches or drawings may accompany a write-up if needed to illustrate a specific detail or special consideration.
  - All recommended ECMs will be in compliance with current codes and standards, however, the project does not include review of existing facilities in relation to compliance requirements.
  - Condition assessments are limited to visual inspection of facilities and equipment.

## **Obligations of the CITY**

To assist meeting schedule and budget estimates contained in this proposal, the CITY will provide the following:

- Prompt review and comment on all deliverables (within 10 working days of receipt).
- Facilitate access to any required facilities
- Attendance of key personnel at meeting as requested
- Provide requested documentation in support of the energy assessments, such as utility bills, as-built drawings and maintenance logs. The CONSULTANT will provide a list of specific data needs prior to the site visit.

## **Additional Services**

The CONSULTANT will, as directed, provide additional services that are related to the project but not included within this Scope of Services. These and other services can be provided, if desired by the CITY, as an amendment to the Task Order. Work will begin for the Additional Services after receipt of a written notice to proceed from the CITY. Additional services may include, but are not limited to, the following:

- Design, Bid, and Construction Phase Services for identified improvements

## **Completion Dates**

NTP – Final Efficiency Report: 120 days

## **Compensation**

The estimated compensation for TASK ORDER 7-18 SWR, is shown as Attachment A, entitled TASK ORDER 7-18 SWR, COMPENSATION.

## Attachment A COMPENSATION

Task Order 7-18 SWR RAH WWTP Energy Efficiency MasterPlan											
Title	Engineer 7	Engineer 5	Engineer 5	Engineer 3	Engineer 1	Spec Processor	Clerical / Office	Subtask Labor Total	Expenses	Travel	Task/Line Item Subtotal
Rate:	\$ 216.68	\$ 181.88	\$ 181.88	\$ 134.72	\$ 99.92	\$ 79.71	\$ 71.85				
<b>A - Data Request / Kickoff</b>											
Data Request			4				2	\$871.22			\$871.22
KickOff	2	4	2		2			\$1,724.48			\$1,724.48
Hours Subtotal	2	4	6	0	2	0	2	16	---	---	16
Cost Subtotal	\$ 433.36	\$ 727.52	\$ 1,091.28	\$ -	\$ 199.84	\$ -	\$ 143.70	\$ 2,595.70	\$ -	\$ -	\$2,595.70
<b>B.1 - Engineering Site Visit</b>											
Site Visit Prep		1	8		8			\$2,436.28			\$2,436.28
Site Visit	24	4	24		24			\$12,691.04		\$8,400.00	\$21,091.04
Hours Subtotal	24	5	32	0	32	0	0	93	---	---	93
Cost Subtotal	\$ 5,200.32	\$ 909.40	\$ 5,820.16	\$ -	\$ 3,197.44	\$ -	\$ -	\$ 15,127.32	\$ -	\$ 8,400.00	\$23,527.32
<b>B.2 - Draft Energy Master Plan</b>											
Baseline Development (modeling)	16		8	20	24			\$10,014.40			\$10,014.40
Condition Assessments			8		16			\$3,053.76			\$3,053.76
ECM Savings Calculations	8		16		24			\$7,041.60			\$7,041.60
Cost Development			16		24			\$5,308.16			\$5,308.16
Draft Master Plan Report Development			24	8	40	4		\$9,758.52			\$9,758.52
Meetings	4	2	4		4			\$2,357.68			\$2,357.68
Hours Subtotal	28	2	76	28	132	4	0	270	---	---	270
Cost Subtotal	\$ 6,067.04	\$ 363.76	\$ 13,822.88	\$ 3,772.16	\$ 13,189.44	\$ 318.84	\$ -	\$ 37,534.12	\$ -	\$ -	\$37,534.12
<b>B.3 - Final Energy Master Plan</b>											
Final ECM Development	8		16		16		2	\$6,385.94			\$6,385.94
Final Master Plan Report Development			12		40	4		\$6,498.20			\$6,498.20
Meetings	4	2	4		4			\$2,357.68			\$2,357.68
Hours Subtotal	12	2	32	0	60	4	2	112	---	---	112
Cost Subtotal	\$ 2,600.16	\$ 363.76	\$ 5,820.16	\$ -	\$ 5,995.20	\$ 318.84	\$ 143.70	\$ 15,241.82	\$ -	\$ -	\$15,241.82
Total Hours by Per Diem Rate	66	13	146	28	226	8	4				491
Total Fee Estimate by Per Diem Rate	\$ 14,300.88	\$ 2,364.44	\$ 26,554.48	\$ 3,772.16	\$ 22,581.92	\$ 637.68	\$ 287.40				
TO Total Labor											\$70,498.96
TO Total Expenses											\$8,400.00
TO 3-18 Contract Total											\$ 78,898.96