

TASK ORDER 3-20 STM
ENGINEERING SERVICES FOR THE CITY OF KEY WEST STORMWATER
MASTER PLAN 2020 UPDATE

This TASK ORDER 3-20 STM is issued under the terms and conditions of the AGREEMENT TO FURNISH GENERAL ENGINEERING SERVICES TO THE CITY OF KEY WEST ("AGREEMENT") between the City of Key West ("CITY") and CH2M HILL, Engineers, Inc. ("CONSULTANT") dated November 3, 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 3-20 STM "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 3, 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 3-20 STM, Tasks A, B, C, and D will be on a lump sum fee basis as stipulated in Article 5, Paragraph 5.1.1 of the AGREEMENT. Compensation for subconsultants 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 3-20 STM COMPENSATION.

D. ACCEPTANCE

By signature, the parties each accept the provisions of this TASK ORDER 3-20 STM 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 two (2) days after execution of this authorization.

For CH2M HILL ENGINEERS, INC.

For CITY OF KEY WEST

By:  6/12/20
Sirpa H. Hall, P.E.
Senior Business Vice President

By: _____
Greg Veliz
City Manager


Sean McCoy, P.E.
Key West Project Manager

Dated the _____ day of _____, 2019

ATTEST: _____

TASK ORDER 3-20 STM
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SCOPE OF SERVICES

Project Background

The City of Key West completed a comprehensive Stormwater Master Plan in 2011 which prioritized stormwater projects that could be implemented to address the City's stormwater management needs. Over the last 10 years several of the prioritized projects from the plan have been constructed. To support the designs, computer simulation modeling has improved by adding more detail around projects. There have been sufficient changes to justify updating the City's inventory and stormwater master plan (SWMP) to reevaluate the capital improvement plan to continue moving the City's Stormwater Program forward in an efficient manner. Updated information is needed for new facilities and the elevations of the existing stormwater pipes may need to be verified in selected areas.

A future follow on effort will use the updated modeling results to develop a new list of prioritized projects updating the Long-Range Stormwater Utility Plan.

City of Key West Utilities has budgeted work under Tasks A and B to occur in FY 20. Tasks C and D are planned to be delivered during FY 21 and will be contracted as Amendment 1.

Purpose

The objectives of this effort are as follows:

- Develop a SWMP that updates the City's inventory of facilities
- Consolidate and include recent and proposed projects under development
- Future:
 - Identify new projects to reduce flooding generated by rainfall (not storm surge)
 - Develop conceptual cost estimates
 - Prioritize the projects

Project Description

The SWMP consists of the following steps:

- Task A Information Collection – Collect existing reports and data, field reconnaissance, supplemental field survey, and inventory of drainage facilities.
- Task B Hydrologic/Hydraulic Simulation – Build updated ICPR models of the drainage basins.

- Future Amendment:
 - Task C Alternative Analysis – Develop projects that would address flooding and water quality concerns and estimate planning-level costs of each proposed project.
 - Task D Planning Report Preparation – Prepare final report and executive summary (handouts), and present recommendations to the City commission.

Scope of Services

Task A Information Collection

GIS data for the CITY will be searched from state and local sources. Data layers of interest include building footprints, land use, zoning, and transportation ownership. GIS data layers used previously will be retrieved. The CITY will provide as much data as they have, including the latest version of their stormwater database. Since 2011, the CITY has implemented several drainage and streetscape projects that were constructed. The previous inventory that is in the CITY'S Geographic Information System (GIS) needs to be reviewed and updated for projects since 2011. Some of the designs may include some spot elevations of inlets or facilities which will be reviewed, and data updated as appropriate.

The previous inventory was collected using a survey-grade GPS unit, but not by certified surveyors. Certified surveys are considered more accurate. As-built survey will be utilized to add details to areas where new work has been completed since 2011. Additional projects are under design. The new construction plans need to be reviewed and data included in the SWMP evaluations. It will be determined, in discussions with the Client, if the projects under design will be included in this model update. If new topographic data are determined to be required (lack of information or need more detail at a location), then a surveyor will be contracted through the CITY to obtain new elevations.

The U.S. Geologic Service has recently collected updated LiDAR in late 2019. This topographic data for the Key West area will be obtained (not publicly available as of March 2020). If not available, the topographic LiDAR data from 2009 should still be relative accurate for the land topography to use for planning purposes.

Task B Hydrologic/Hydraulic Simulation

The 2011 SWMP utilized ICPR version 3, which is no longer supported or works with the current Windows operating system. The latest version of ICPR (version 4) will be used for the 2020 Update. The new version allows for importation of the version 3 data, but the interface with the program is much different than before. The input data will need to be better aligned to the GIS mapping to create a model that is organized to utilize some of ICPR version 4 advanced features. One feature that could be useful in portions of the City is the 2-dimensional modeling of streets and overland flow. This works best when building footprints are available. The version 3 model had streets included as overland channels to interconnect drainage basins. A 2-dimensional model will be explored to replace the approximated connections with a digital surface based on LiDAR. If there are sufficient input data (including building footprints), then areas where it is especially flat or there are known widespread flooding, the CONSULTANT will utilize 2-dimensional modeling to improve the definition of impact areas. It is assumed that not all of the City will be modeled

with 2-dimensional, and that the existing model representation will be judged sufficient for most areas.

The CONSULTANT will modify the existing condition model to include the new projects, replace approximate channels with the LiDAR, and other adjustments required to make the simulations work in ICPR4.

The CONSULTANT will update rainfall input to reflect newer NOAA Atlas 14 data. Boundary conditions for the ocean will be updated as needed. New simulations will be conducted for the same suite of design storms that the 2011 SWMP conducted with updated volumes. Suggested changes to the climate and sea levels will be based on recent literature about future conditions. The CITY will need to consider what future climate and sea level conditions to use in assessing new projects and provide guidance to the CONSULTANT. These changes will be documented in a draft technical memorandum, which will document the entire data collection and conversion process.

The CONSULTANT will simulate four design storms: 5-year, 24-hour; 10-year, 24-hour; 25-year, 72-hour; and 100-year, 72-hour. No tidal surge from tropical storms will be simulated. The current high tide, as reported by NOAA, will be used at the ocean outfalls. The groundwater table will be assumed based on the location of the wells with respect to the ocean. Additionally, the design storms will be simulated for one future condition Sea Level, based on the current high tide elevation plus increases.

A meeting will be held with the CITY to discuss the results, compare the results to known flooding problems and/or water quality issues, and to discuss where the Alternative Analysis will focus.

Deliverables

- A Technical Memorandum will be prepared to describe the background data collection and field effort, preliminary modeling approach and set-up, and initial results. Maps of predicted flooding areas will be provided in the memorandum. This memorandum will be provided to the CITY electronically for their review.
- One meeting to review the results, with agenda, presentation materials, and a meeting summary will be provided electronically.

Task C Alternative Analysis (Future delivery under Amendment 1)

The CONSULTANT will prepare a list of recommended projects throughout the City based on previously recommended projects, existing conditions, depth of flooding, and engineering judgment. Projects will be grouped into basins, subbasins or intersections, depending on their scope. Some Low Impact Development (LID) concepts may be included, but because of the limited available space, it is anticipated to be minor opportunity to implement these LID concepts. A meeting will be held with the CITY to preview and discuss the list of recommended projects. The list of projects may be modified based on CITY comments. For scoping purpose, up to seven (7) projects will be taken forward for alternative analysis.

The CONSULTANT will develop the 7 selected projects for inclusion into the computer model. The model elements are expected to include new inlets, pipes, gravity wells, water quality treatment boxes, and pressurized well systems. A second meeting with the CITY

will be held to review the effectiveness of the 7 projects. Minor changes to the projects may be warranted after this meeting that will require model adjustments.

The CONSULTANT will prepare conceptual construction cost estimates of the projects at Class 5 accuracy as defined by the American Association of Cost Engineers. Tables will be developed to rank the projects depending on factors such as number of households affected, length of road treated, does the project improve adjacent basin flooding, and similar criteria that was used previously in the 2011 SWMP.

Deliverables

The following deliverables will be provided under this Task:

- Two (2) meetings with CITY to review the projects and their affect. One meeting is proposed to discuss the ranking methods utilizing the results with the CITY. The second meeting is included for a review of the ranking results and to discuss potential projects to include in the final report. Agenda and meeting minutes will be prepared and delivered electronically.
- A brief draft and final Technical Memorandum will be prepared with tables and figures describing the proposed alternatives. This memorandum will be delivered electronically.

Task D Planning Report Preparation (Future delivery under Amendment 1)

- The CONSULTANT will prepare draft report containing the SWMP for CITY review based on the previous Technical Memorandums. The report shall contain the study purpose, data collection description, project descriptions, modeling of existing and future conditions, ranking process, conceptual cost estimates, and project rankings. Appendices will be available for review during the draft report upon request.
- The CITY and CONSULTANT will meet to discuss the comments. Agenda and meeting minutes will be prepared and delivered electronically.
- The CONSULTANT will address one set of CITY comments on the draft report and prepare a Final Report with attachments. The draft report will be delivered electronically for CITY review and comment. The final report will include both electronic and hard copy reports.
- The CONSULTANT will prepare a draft and final PowerPoint presentation (PPT) for the City to use for public meetings. The CITY will review a draft PPT and provide comments at one meeting. The PPT will be finalized and provided to the CITY.
- The CONSULTANT will present PPT at one public meeting in Key West.

Deliverables

The following deliverables will be provided under this Task:

- Draft report without attachments, electronically.
- Five copies: Final SWMP report with attachments. Copies for operations are included in this deliverable. Electronic files will be included in the delivery.
- One draft PowerPoint file (PPT) for review. One final PPT file.

- One review meeting with Key West. Agenda and meeting minutes will be prepared and delivered electronically.
- One presentation of the PPT file at a public meeting.

Assumptions

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

- All electronic deliverables will utilize Adobe format (pdf), or another common software format as noted in scope.
- Meetings may be held utilizing on-line resources (Microsoft Teams, or similar) for all or some of the attendees.
- The CITY maintains records and collects GIS data pertinent to its operations. GIS and GPS data will be obtained and provided by CITY.
- The geographic extent of the SWMP updates will be limited to the main island of Key West and Stock Island, not including Navy facilities, or Fleming Key. The airport internal drainage will not be studied, only to the extent that it may affect CITY drainage. Stock Island was studied separately in 2011 by CH2M. No changes are known or anticipated for Stock Island. This area previous hydrologic model will be updated to version 4 and new simulations run for reference purposes.
- The previous input data files to ICPR are available and will be used as the basis of the computer modeling. Importation of the input does not allow geographic registering the data (no x,y coordinates). Adjustments will be made using aerial photographs to approximate the drainage nodes. Typically, one node will represent an intersection or subbasin.
- The accuracy of the GPS elevations may vary but will be about 1-foot or less. Detailed survey will be accurate to approximately 0.05 foot.
- The location of stormwater facilities is available from literature and CITY GIS.
- Meetings will be held in Key West and attended by up to two CONSULTANT's staff, additional CONSULTANT staff may attend via conference call.
- The level-of-service for projects will be estimated on a relative basis. Projects will be ranked on relative improvements. It is assumed that there will be wide-spread flooding for storms exceeding a few inches per day. No mapping of flood extents is included in the SWMP.
- No design work or state and county agency coordination is included in this Task Order. Recommendations for project design elements are to be based on the CONSULTANT's recent CITY experience and details of past work.
- Only existing land use shall be used in the hydrologic/hydraulic evaluation of the study area as it is a mature development.
- Assumptions about ponding into lots/parcels will be made on each block included in the model.

- The evaluations will be based on the federal, state and local codes and standards in effect at the start of the project. Any changes in these codes may necessitate a change in scope.
- Cost opinions are based on Association for the Advancement of Cost Engineering Class 5 guidelines (no detailed design). No land costs shall be included in cost estimating for the project. It will be assumed that all linear drainage projects can be in City rights-of-way.
- Legal, easement, or plat survey or acquisitions will be the responsibility of CITY, it is assumed that the City will acquire an easement for proposed projects.
- No permitting or agency meeting is required.
- CONSULTANT will reasonably rely upon the accuracy, and completeness of any information/data provided by the CITY or other third parties.
- No work on Tasks C and D will be performed without authorization from the CITY
- Schedule shown in attachment B assumes that amendment 1 will be executed and in place when Tasks A and B are completed.

Obligations of the CITY

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

- Available drawings and files.
- Prompt review and comment on all deliverables.
- Facilitate access to any required facilities.
- Attendance of key personnel at meeting as requested.
- CITY will assist in obtaining reports or drawings from past designs.

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:

- Completion of Tasks C and D
- Additional GPS data collection of the sanitary facilities not collocated with stormwater
- Additional design services if requested by the CITY
- Bid or construction phase services
- Permitting Services

Compensation

The estimated compensation for TASK ORDER NO. 3-20 STM Tasks A and B is **\$77,365.82**. Compensation listed by task and per diem rate is included as Attachment A.

Schedule

A draft schedule for TASK ORDER NO. 3-20 STM is presented as Attachment B. This schedule is based on a 1-year period of performance and assumes a July 2020 Notice to Proceed. Actual progress will depend on the level of new data collection required.

Attachment A COMPENSATION

ATTACHMENT A City of Key West Stormwater Master Plan 2020 Update

Task No.	Name:	Mc Coy Engineer 5 (PM)	Griffin Engineer 7 (QA/QC)	Pati Engineer 6	Greco Engineer 4	Moe Engineer 1	Montminy Technician 5	Tech. Editor	Admin Clerical	Total	Total Cost
	Description	\$192.96	\$229.88	\$210.82	\$166.76	\$106.01	\$121.50	\$84.56	\$76.23	Hours	Cost
A	Information Collection	12	8	24	40	40		4	4	132	\$20,768.20
B	Hydrologic/Hydraulic Simulation	10	24	32	88	180		8	4	346	\$48,931.04
	updating the model with 1D features	4	4	8	16	60					
	2D areas identification and model		4	8	20	40					
	combined 1D/2D model	2	4	16	20	40					
	Model results		4	4	16	16					
	TM preparation - draft and final	2	4	4	16	24		8	4		
	One (1) meeting	2	4	4							
E	Project Management & QA/QC	8	10	2					2		\$4,416.58
	Tasks A and B Travel and Expenses										\$3,250.00
	Subtotal Labor Tasks A and B	22	32	56	128	220	0	12	8	478	\$74,115.82
	TO 3-20 Total										\$77,365.82
C	Alternative Analysis	24	68	52	138	220	116	8	4	630	\$92,636.00
	Projects identification per flood depths	2	4	40	8	16					
	Alternative analysis - upto 7 projects	16	40	40	90	140	40				
	Results comparison		4		16	24					
	Cost Estimates		8				60				
	TM preparation - draft and final	2	4	4	16	40	16	8	4		
	two (2) meetings	4	8	8	8						
D	Planning Report Preparation	6	16	12	32	56	20	8	4	154	\$22,049.96
	Draft	2	4	4	16	40	16				
	Final		4		8	16	4	8	4		
	two (2) meetings	4	8	8	8						
E	Project Management & QA/QC	8	10	3					2	23	\$4,627.40
	Travel Expenses										\$3,250.00
	Total	130	276	277	684	1,172	272	64	40	1,763	\$199,929.18

Attachment B

SCHEDULE

City of Key West Stormwater Master Plan 2020 Update														
Task No.	Description	Task Order 3-20						Future Amendment 1						
		Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21
A	Information Collection													
B	Hydrologic/Hydraulic Simulation													
	updating the model with 1D features													
	2D areas identification and model													
	combined 1D/2D model													
	Model results													
	TM preparation - draft and final													
	One (1) meeting													
C	Alternative Analysis													
	Projects identification per flood depths													
	Alternative analysis - upto 7 projects													
	Results comparison													
	Cost Estimates													
	TM preparation - draft and final													
	two (2) meetings													
D	Planning Report Preparation													
	Draft													
	Final													
	two (2) meetings													