CONSULTING SERVICE AUTHORIZATION

DATE: 10/5/17

SERVICE AUTHORIZATION NO. 17-01 FOR ENGINEERING CONSULTING SERVICES

CITY P.O. NO. _____ CITY EXPENSE CODE _____

CITY PROJECT NOS. 17-048 CONSULTANT PROJECT NO. 631233074

This Service Authorization, when executed, shall be incorporated in and shall become an integral part of, the "Agreement for General Consulting Services" contract executed August 31, 2017.

Title: Agreement for Engineering Services for a Seawall Vulnerability Analysis for the Public and Private Seawalls in Delray Beach

I. PROJECT DESCRIPTION

This Service Authorization is for engineering services associated with City Project No. 17-048:

The City of Delray Beach's (City) cost to properly maintain the existing seawall with the City limits increases as the flooding occurrences to higher high tides increases annually. City streets, parks and other facilities are inundated seasonally during these tidal occurrences. As other coastal Florida communities have addressed these tidal impacts, the City will perform the analysis below to determine the best path forward to protect the City and its citizens' property. The Seawall Vulnerability Analysis recommendations will contribute to the City's Strategic Plan by determining the most effective path to protect the City's infrastructure from rising tidal impacts. The proposed costs and project component's schedule will be folded into the Capital Improvement Plan (CIP).

The goal of the Seawall Vulnerability Analysis is to assess the ability of the existing seawalls to protect the City's infrastructure and its citizens' property from higher high tides. Phase I is an existing conditions survey of tidally influenced seawalls in the City limits to determine ownership, type, elevation and general condition. An additional component of the survey will be investigate the approximately 137 public drainage pipes that connect the City to the Intracoastal Waterway. These pipes act as conduits for tidal waters during extreme High Tides causing intra-coastal waters to back up onto City streets causing flooding. An assessment is required to determine type, size, condition and associated inlet

elevations to design the proper check valves, flap-gates or duckbill to prevent or reduce tidal backflow out the catch-basins and onto the City's streets. Also included in the first phase is a study to establish a seawall height increase for a given duration/project life.

The Second Phase is to evaluate cost effective ways to implement the established seawall height increase for the privately owned seawalls. The proposed options will include but are not limited to adoption of an ordinance requiring a given height, established in phase 1, giving citizens an allotted time to raise their own seawalls; or levy an assessment by the City along with easements allowing the city to perform the task of contracting and raising the seawalls.

II. SCOPE OF SERVICES FOR SEAWALL VULNERABILITY ANALYSIS

Aptim Environmental & Infrastructure, Inc., f/k/a CB&I Environmental & Infrastructure, Inc. (APTIM) shall provide engineering services in accordance with the Agreement for Engineering Services with the City, dated September 20, 2017.

Specifically, APTIM shall provide the following services:

Phase I - Study, Existing Conditions and Report Phase

a) Sea Level Vulnerability Study ($16,216.00)
APTIM will review available water level data, climate data, and sea level rise modeling performed by NOAA and USACE to develop a recommendation for a minimum seawall height for the City of Delray Beach's tidally influenced seawalls (both City and privately owned) for the next 30 and 75 year time horizons. In developing the recommendation, APTIM will coordinate with City staff to identify City objectives as well as research seawall height requirements and ordinances currently in place in neighboring municipalities. Engineers, familiar with the Southeast Florida Regional Climate Compact guidance document and objectives to integrate sea level rise projections into community planning, will summarize the findings of the data review and detail the minimum height recommendations into a draft Seawall Vulnerability Report. Existing City water level data will be analyzed and incorporated into the findings as appropriate. The draft report will be submitted to the City for review and comment.

b) Existing Conditions Survey of Intracoastal Seawalls ($92,090)

1. APTIM will perform a survey of approximately 21.4 miles of tidally influenced seawalls within the City of Delray Beach. The survey will collect elevations in NAVD using RTK GPS at both publically and City-owned parcels within the investigation area. All data will be collected via boat access. Data will be certified by a Professional Surveyor & Mapper (PSM) and delivered in hardcopy and digital format to the City.
2. Structural inspections will be conducted at City owned seawalls that are not currently included in an improvement project. Approximately 2,126 linear feet of seawall in 14 segments will be inspected via topside observations by a APTIM engineer. Observation reports will be developed for each seawall segment and will include seawall type, cap elevation, condition, photographs, as well as a recommendation for future improvement if needed (repair, raise, or replace).
3. APTIM will collect GPS coordinated video of approximately 21.4 miles of tidally influenced seawalls within the City of Delray Beach. The video will be collected in a continuous manner via small vessel travelling in close proximity to the seawalls at slow/idle speeds. Simultaneous to video collection, a APTIM engineer will perform a rapid conditions assessment of visible seawalls using ASCE standard practice manuals' condition assessment ratings. The video will be incorporated into a GIS framework for review and analysis. A APTIM engineer will review the collected video to provide a general account of the types of seawalls, caps, and visible conditions throughout the City.

c) Existing Conditions Survey of Intracoastal Drainage Pipes and Inlets ($42,305)

1. APTIM will perform a survey of approximately 137 public drainage pipes within the City that connect to the Intracoastal waterway. Observations will include the pipe size, type, invert, condition, respect to the seawall (flush or protruding), and any other applicable information regarding the installation of a device to prevent tidal backflow. All pipes currently containing a device preventing tidal flow onto the streets will be identified.

2. Rim elevations of the most waterward stormwater inlets/catch basins associated with the drainage pipes will be surveyed.
3. Based on the observed conditions of the City's existing devices and available literature, APTIM will assess the 3 types of tidal flow prevention devices (inline check valve, duckbill, flap gate) for use on City drainage pipes. Based on elevations of inlets and the types of the associated drainage pipe, a recommended improvement installation order (lowest inlet first) and type of tidal flow prevention device (inline check valve, duckbill or flap gate) will be developed for the pipes connected to the Intracoastal Waterway that are currently without devices.

4. Elevation data will be certified by a Professional Surveyor & Mapper (PSM) and delivered in hardcopy and digital format to the City. An engineering report of the pipe conditions and backflow prevention devices will be provided to the City.

d) Engineering Assessment of Existing Conditions & Incorporation into Final Seawall Vulnerability Report ($21,240)

Following the existing conditions surveys, data will be incorporated into a GIS framework for review and analysis. APTIM engineers will assess the current conditions in relation to the suggested minimum seawall heights and incorporate the findings into the Final Seawall Vulnerability Report. The report will include construction cost estimates for the repairs and raising of all City owned seawalls to the suggested minimum height requirements. In addition, a study of comparable municipalities will be undertaken to evaluate options for cost effectively implementing conformance of privately owned seawalls to the recommended minimum seawall height.

Comments from the City's review of the Draft Seawall Vulnerability Report(s) will be incorporated into the Final Seawall Vulnerability Report. APTIM will meet with City staff to present the Seawall Vulnerability Report results.

Phase II - Implementation Planning ($7,730)

Lessons can be learned from other municipalities who are within the South East Climate Change Compact. Consultation with cities such as Fort Lauderdale and Miami Beach, will be performed from their experiences on how the City can minimize resistance while

cost effectively implementing the raising of seawalls ahead of the rising water levels.

APTIM will review and recommend revisions to a proposed City Ordinance (by others) to achieve the recommended minimum seawall heights throughout the City. APTIM will make a presentation to the City Commission regarding implementation of the recommendations.

As Needed - Underwater Inspection of City Owned Seawalls ($18,892.00)

If task 2 , above, determines that the existing City owned seawalls require structural repairs, or replacement, then an underwater observation of the seawalls will be performed by a coastal engineer. An observation report for each city-owned seawall segment will be provided.

III. COMPENSATION

The compensation for services provided shall be billed on a lump sum basis, plus reimbursable expenses for each phase of work, in accordance with Exhibit B up to the following not-to-exceed cost for each phase.

Engineering Services - (City Project Nos. 17-048)

Phase I - Study, Existing Conditions and Report Phase

a)	Sea Level Vulnerability Study	$16,216.00
b)	Existing Conditions of Intracoastal Seawalls	$92,090.00
c)	Existing Conditions of Drainage Pipes and Inlets	$42,305.00
d)	Assessment & Seawall Vulnerability Report	$21,240.00
Phase II - Implementation Planning		$7,730.00
	Sub-Total Phase I & II	$179,581
Underwater Inspection (as needed)		$18,892.00
	Total Compensation	$198,473.00

IV. COMPLETION DATE

June 29, 2018

This service authorization is approved contingent upon the City's acceptance of and satisfaction with the completion of the services rendered in the previous phase or as encompassed by the previous service authorization. If the City in its sole discretion is unsatisfied with the services provided in the previous phase or service authorization, the City may terminate the contract without incurring any further liability. APTIM shall commence work on any service authorization approved by the City to be included as part of the contract without a further notice to proceed. Aptim requests that any authorization to proceed be issued to our current licensed contracting entity Aptim Environmental & Infrastructure, Inc.

Approved by:

CITY OF DELRAY BEACH:

Date _____

By: _____
Cary D. Glickstein
Mayor

CONSULTANT:

Date 10/5/2017

By: _____ (Seal)
Thomas Pierro
Director of Operations

Stacy E Buck
Witness (Signature)

Stacy E. Buck
Witness (Printed)

Attest: _____

Approved as to Legal Sufficiency

_____
R. Max Lohman City Attorney

BEFORE ME, the foregoing instrument, this 5 day of October, 2017, was acknowledged by Thomas Pierro on behalf of the Corporation Aptim Environmental & Infrastructure, and said person executed the same free and voluntarily for the purpose therein expressed.

Witness my hand and seal in the County and State aforesaid this 5 day of October, 2017.

Tracie H McCauley
Notary Public
State of Florida
My Commission Expires:

Notary Public State of Florida
Tracie H McCauley
My Commission FF 139613
Expires 08/19/2018