WORK ORDER No. 37

KIMLEY-HORN AND ASSOCIATES, INC. INDIAN RIVER COUNTY VULNERABILITY ASSESSMENT STUDY

This Work Order Number 37 is entered into as of this 17th day of November, 2020, pursuant to that certain Continuing Consulting Engineering Services Agreement for Professional Services entered into as of this 17th day of April, 2018 (collectively referred to as the "Agreement"), by and between INDIAN RIVER COUNTY, a political subdivision of the State of Florida ("COUNTY") and Kimley-Horn and Associates, Inc. ("Consultant").

The COUNTY has selected the Consultant to perform the professional services set forth on Exhibit A (Scope of Work), attached to this Work Order and made part hereof by this reference. The professional services will be performed by the Consultant for the fee schedule set forth in Exhibit B (Fee Schedule), attached to this Work Order and made a part hereof by this reference. The Consultant will perform the professional services within the timeframe more particularly set forth in Exhibit C (Time Schedule), attached to this Work Order and made a part hereof by this reference all in accordance with the terms and provisions set forth in the Agreement. Pursuant to paragraph 1.4 of the Agreement, nothing contained in any Work Order shall conflict with the terms of the Agreement and the terms of the Agreement shall be deemed to be incorporated in each individual Work Order as if fully set forth herein.

IN WITNESS WHEREOF, the parties hereto have executed this Work Order as of the date first written above.

CONSULTANT:

By: _____

Print Name: _____

Title: _____

BOARD OF COUNTY COMMISSIONERS OF INDIAN RIVER COUNTY

By: _____
, Chairman

BCC Approved Date: _____

Attest: Jeffrey R. Smith, Clerk of Court and Comptroller

By: _____
Deputy Clerk

Approved: _____
Jason E. Brown, County Administrator

Approved as to form and legal sufficiency: _____
Dylan T. Reingold, County Attorney

Exhibit A – Scope of Work

Overview

Kimley-Horn Associates Inc., hereinafter referred to as the "Consultant," has been contracted by the Indian River County, hereinafter referred to as the "County, to provide Continuing Engineering Services under Agreement RFQ 2018008. The contractual terms and reference for this task order are based on Agreement RFQ 2018008.

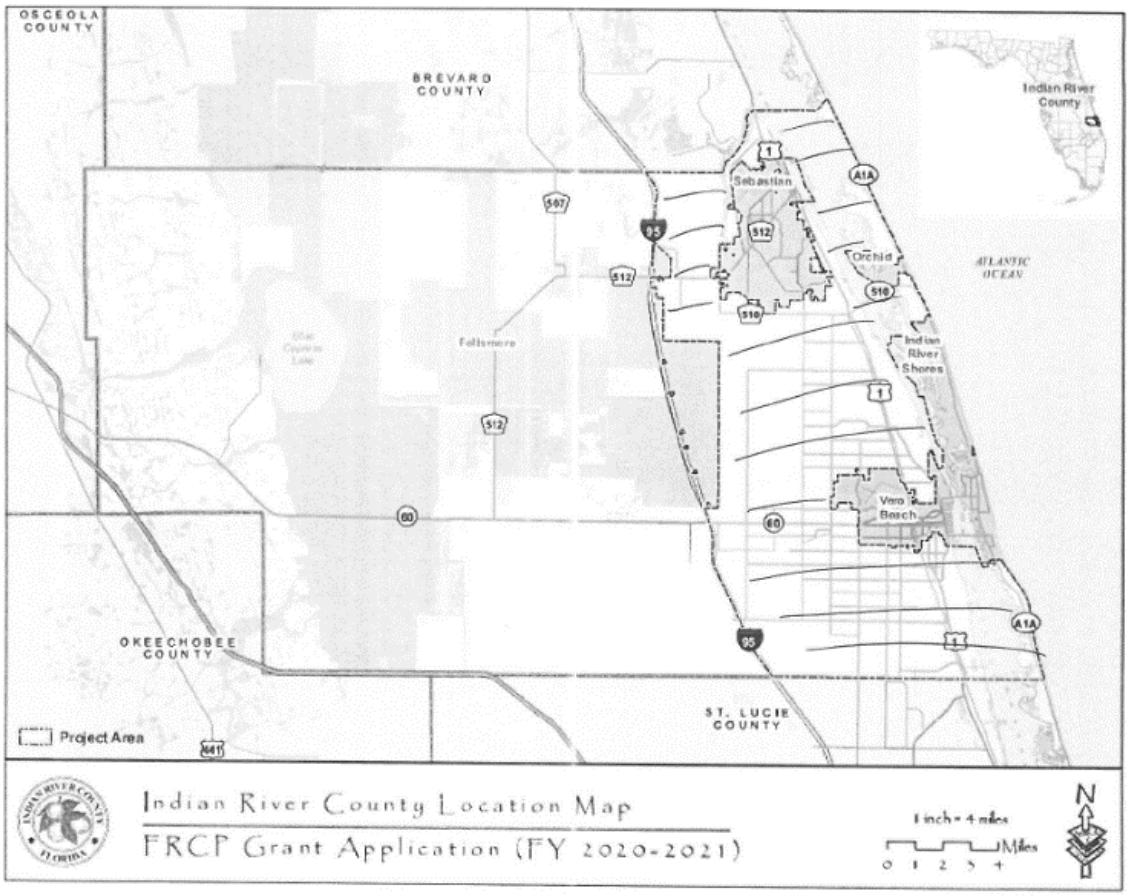
Background

In 2018, Indian River County revised its 2030 Comprehensive Plan - Coastal Management Element (CME) to bring it into compliance with the Peril of Flood Requirements of Sec. 163.3178(2)(f) F.S. During that process, potential sea level rise (SLR) inundation scenarios were mapped and impacts based on general land use types were analyzed. Basic mitigation and adaptation strategies were also discussed during the CME update.

To build upon this effort, a more specific analysis of SLR and flooding risk is needed. To do this, a vulnerability assessment for assets, infrastructure, and communities in Indian River County will be completed. In addition, and as part of this project, the vulnerability assessment will be used to develop adaptation strategies that address the risk of impacts from SLR and coastal flooding.

While the proposed grant project will cover the unincorporated areas of Indian River County located east of I-95 (excluding the City of Vero Beach, City of Sebastian, City of Fellsmere, Town of Orchid and Town of Indian River Shores), the main area of focus will be the coastal areas along the eastern end of the study area (see Figure 1 below). The grant for this project was made possible through the Florida Department of Environmental Protection's Resilient Coastlines Program.

Figure 1 - Project Area



The tasks required to deliver this project are identified below.

Task #1

A. **Title:** Coordination and Public Meeting

B. **Goal:** The County will establish a working group who will be involved in the project and aid in delivery. The County will advertise and schedule a public meeting to solicit information from the general public, community representatives, and stakeholders with respect to coastal flooding.

C. **Description: (COORDINATION)** The Consultant will attend a kickoff meeting (web-based) with the County to introduce team members, establish the lines of communication and flow of information. Prior to the kick-off meeting, the County will assemble an internal working group. During the kick-off meeting the Consultant will liaise with the working group to solicit information regarding perceived or real threats from SLR and coastal flooding to assets, infrastructure, and communities in the County. The working group members will provide the following information to the Consultant for inclusion in the project:

- Latest GIS file including shapefiles of the COUNTY's boundaries;
- Copy of the County's 2030 Comprehensive Plan - Coastal Management Element (CME) published in 2018
- Existing and future land use;
- Latest Digital Elevation Model (2007);
- Inventory or stormwater/water/wastewater assets;
- COUNTY-maintained streets;
- Shelters/Schools/Hospitals/County building – shapefile of building footprints and available finished floor information;
- County Maintained parks;
- Highwater marks and repetitive loss reports at or near the critical infrastructure owned or maintained by the COUNTY;
- Known trouble spots or reports of concern at or near as selected by the COUNTY.

The Consultant will prepare a register to track data collected from the County and to be further supplemented in Task 2.

Description: (PUBLIC MEETING): The County will advertise and schedule a public meeting to solicit information from the public, community representatives, and stakeholders regarding real and perceived threats from SLR and coastal flooding for inclusion in the project. The Consultant will attend the public meeting (web-based) and will assist the County in answering questions from the public.

D. **Deliverable(s):**

1) Agendas and sign-in sheets for all workshops/meetings showing the location, date and time of the workshop/meetings
2) Copies of presentations and workshop/meeting materials – where pertinent
3) Brief summary reports (meeting highlights) of each workshop/meeting including attendee input and workshop/meeting outputs
4) Register of inventory of assets, infrastructure, and communities identified – prepared in a technical memorandum.
5) Attend one web-based public meeting

Task #2

A. **Title:** Data Collection and Review

B. **Goal:** Acquire recent SLR and coastal flooding data from government sources. Establish a planning level horizon for vulnerability assessment.

C. **Description:** The Consultant will review the data provided by the County in Task 1 and will acquire the latest Digital Elevation Model (DEM) to use as the basis for the vulnerability assessment. *The DEM will provide the basis of the Vulnerability Assessment and will be used "as is" to project flood depth. Initial*

conditions will be set based on the DEM. The CONSULTANT will not review the DEM for topographic voids and will not include any as-built conditions or cut-over dates since the publication of the DEM. The Consultant will also collect the following published data:

- SLR information from both the Army Corps of Engineers and National Oceanic Atmospheric Administration (NOAA). SLR information will be based on the 2017 NOAA rates;
- Available tidal elevations from nearby NOAA gauges;
- Design rainfall even based on the South Florida Water Management District's Basis of Review for the 100-year/1-day event;
- Latest Federal Emergency Management Agency (FEMA) flood maps;
- Predicted storm surge for a Category 1 and 3 Hurricanes (based on available data from the Indian River County Emergency Management Division)

The Consultant will facilitate a meeting with County Staff to establish the planning horizon for the project (i.e. 30 years or 2050 based on asset class).

D. Deliverable(s):

1) Technical memorandum summarizing the data collection results and the planning level horizon.

Task #3

A. Title: Preliminary Exposure Analysis

B. Goal: Create a paired asset threat matrix based on ranking of SLR and coastal flooding impacts to County assets, infrastructure, and communities.

C. Description: Based on the assets identified in Task 1 (Working Group and Public Meeting) unincorporated areas of the County located east of I-95 will be screened for exposure to SLR and coastal flooding using online tools such as NOAA's Coastal Flood Exposure Mapper, NOAA's Sea Level Rise Viewer, University of Florida Sea Level Rise Sketch Tool Viewer, and other resources.

The following are examples of screening parameters for Task 3:

- SLR for the low/medium/high projections-given exposure (i.e. if SLR does not impact all assets on a given curve – the next highest curve will be used)
- Top 3 King Tide elevations (highest recorded elevation through 2019 as available on nearby NOAA gauge)
- Predicted storm surge for a Category 1 Hurricane (based on data from Indian River County Emergency Management Division)
- Predicted storm surge for Category 3 Hurricane (based on date from Indian River County Emergency Management Division)
- Combined sea-level rise (low projection) with FEMA flood information – (static evaluation – no coastal modeling of wave action will be performed)
- Combined sea-level rise (high projection) with FEMA flood information (static evaluation – no coastal modeling of wave action will be performed)
- Category 1 event with combined SLR – high projection (static evaluation – no coastal modeling of wave action will be performed)

A preliminary ranking of areas, as reasonably defined by topography or exposure limits, will be established based on flooding depths and potential disruption of services. (The areas will be ranked (qualitatively) to assign criticality for the paired asset threat matrix for the purposes of completing a vulnerability assessment in Task 4).

D. Deliverable(s):

1) Technical memorandum of the paired asset threat matrix, showing the preliminary exposure analysis.

Task #4

A. Title: Vulnerability Assessment

B. Goal: Complete a vulnerability assessment based on a paired-asset threat matrix, flood inundation information, and other available risk data.

C. Description: The Preliminary Exposure Analysis from Task 3 will be populated with DEM and SLR inundation data to generate flood rasters. Once the paired-asset threat matrix has been populated with these data, qualitative risks (i.e. high, medium or low) will be assigned based on direct or operational impact to the assets, infrastructure, and communities. The results will be organized into the formal vulnerability assessment.

D. Deliverables(s):

1) Vulnerability Assessment Technical Memorandum

Task #5

A. Title: Public Meeting

B. Goal: Present draft findings during advertised/scheduled public meeting to solicit feedback to the final acceptance of report.

C. Description: The project results will be presented during a public meeting and feedback will be incorporated into the final report. The Consultant will assist the County in developing a presentation to be used at the public meeting (web-based).

D. Deliverable(s):

1) Agenda and sign-in sheets from each workshop/meeting, indicating location, date, and time of workshop/meeting
2) Presentation(s) and other material from each workshop/meeting
3) Brief summary report from one workshop/meeting including attendee input and workshop/meeting outcomes.
4) Attendance at 1 public-meeting (web-based)

Task #6

A. Title: Development of Adaptation Strategies

B. Goal: Develop adaptation strategies for the assets, infrastructure, and communities identified to be vulnerable to SLR or coastal flooding.

C. Description: Based on the results from Task 3 and Task 4, a range of adaptation strategies for the exposed assets, infrastructure, and communities in the County will be assembled. These strategies will be screened according to the following criteria:

- Ability to Increase Resilience
- Economic Feasibility
- Environmental Impacts
- Ability to Implement

The results from the screening will be provided in a report based on a qualitative analysis (i.e. high/medium/low) to implement. *An Engineer's Opinion of Probable Construction will not be provided.*

D. Deliverable(s):

1) Adaptation Strategies Report – summarizing previous efforts and addressing adaptive strategies.

Assumptions applying to all Tasks.

- The County is responsible for making key staff available during the delivery of this project.
- Deliverables will be issued as a draft for review by the County. We have estimated an approximate 14-day time frame for the comments. After receiving the comments from the County, the Consultant will reconcile the comments/edits into a final version. The Consultant will address one round of County comments.
- All Stakeholder and Community Engagement logistics as it relates to securing meeting locations, procuring safety, providing visual and audio platforms, internet connections, and invitations to the public are the responsibility of the COUNTY.

Exhibit B – Fee Schedule

The Consultant will commence professional services upon written receipt of Notice to Proceed (NTP) from the County. The fees for this project will be lump sum based on deliverables submitted to the County. An illustration of the fee and schedule is provided in the Table below.

Task	Task Title	Task Amount	Senior Professional $230/hr	Registered Professional $170/hr	Professional $130/hr	Support Staff $70/hr	Total Cost
1	Coordination & Public Meeting	$2,932	6 hrs.		10 hrs.	3.6 hrs.	$2,932
2	Data Collection & Review	$8,966	4 hrs.	12 hrs.	44 hrs.	4.1 hrs.	$8,966
3	Preliminary Exposure Analysis	$20,966	8 hrs.	28 hrs.	104 hrs.	12.1 hrs.	$20,966
4	Initial Vulnerability Assessment	$8,966	4 hrs.	12 hrs.	44 hrs.	4.1 hrs.	$8,966
5	Public Meeting	$5,932	4 hrs.	4 hrs.	24 hrs.	17.3 hrs.	$5,932
6	Development of Adaptation Strategies	$18,966	24 hrs.	16 hrs.	80 hrs.	4.7 hrs.	$18,966
	Total	**$66,728**	**50 hrs.**	**72 hrs.**	**306 hrs.**	**45.8 hrs.**	**$66,728**

Exhibit C – Time Schedule

Upon authorization to proceed by the COUNTY, the above described services will be provided by the Consultant based on the following schedule:

Task #	Task Title	Deliverable due date (on or before)
1	Coordination & Public Meeting	2/28/2021
2	Data Collection & Review	2/28/2021
3	Preliminary Exposure Analysis	2/28/2021
4	Initial Vulnerability Assessment	3/31/2021
5	Public Meeting	4/30/2021
6	Development of Adaptation Strategies	5/31/2021