



Stantec Consulting Services Inc.
6900 Professional Parkway East, Sarasota FL 34240-8414

November 17, 2020

Attention: Peter A. Kunen, P.E., CFM
630 NW 2nd St.
Hallandale Beach, FL
33009

Reference: Sea-Level Rise and Coastal Resiliency Plan

Project Introduction

The City of Hallandale Beach is taking a pro-active step in combatting the effects of sea-level rise on their community. This proposed study will evaluate the City's "at-risk" infrastructure – specifically Stormwater Utilities. This study will evaluate all the infrastructure components in different sea-level rise scenarios (different sea level rise levels). Once these infrastructure components have been evaluated and a subset has been identified of the most "At-Risk" infrastructure, a report will be developed that will outline the methodology of the study, but more importantly, provide recommendations for potential capital improvement strategies as well as recommendations to future zoning and / or development code that can help future development account for sea-level rise appropriately.

Scope

Task 1.0: Project Kickoff & Public Information Workshop #1

Overview: Stantec will host 1 virtual Kickoff Meeting with the client to review project schedule, task deliverables, identify key personnel from both parties and their respective roles, project billing/invoice schedules, among other topics to ensure project success. During the timeline of this task Stantec will also request and receive data from the client and begin initial set-up steps for subsequent tasks. Also during this timeline, Stantec will help coordinate and supply supporting documentation for the Initial Public Information Workshop. The Client will lead the public workshop (intended to be presented at City Commission meeting) however Stantec will attend and provide support where/when called upon.

Deliverables: Kickoff meeting minutes, GIS exhibits (limit 5 unique exhibits) to be used at initial public information workshop

Assumptions: Public Information Workshop will be held at scheduled City Commission meeting. This will be presented to commission and public by client, with Stantec support. Stantec will provide supporting documentation/exhibits as needed/requested (limit 5 unique GIS Exhibits). Stantec to

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provide client with a list of data needed for project that is City owned and maintained, client to fulfill request where applicable. Meetings are expected to be virtual/remote due to COVID-19 concerns.

Task 2.0: Stormwater System Mapping

Overview: To ensure an accurate and successful analysis, it is imperative that the GIS data being used is accurate. In this task Stantec will use existing Stormwater Infrastructure GIS data provided by the client and will field verify/GPS the following areas known to City staff as "Critical At-Risk Areas" ...

1. Northeast Drainage Basin
 - a. NE 14th Ave between Hallandale Beach Blvd and Atlantic Shores Blvd
2. Southwest Drainage Basin
 - a. Schafer Canal
3. Coastal Corridor
 - a. Barrier Island Infrastructure from Hallandale Beach Blvd to County Line Rd

Stantec will deploy a dynamic approach to data collection which includes automated attribute Extract, Transform, and Load processes from CAD as-builts and designs into GIS data as well as utilizing Trimble R2 receivers in conjunction with iPads to verify the locations of above ground Stormwater infrastructure including inlets, outfalls, weirs, gates (total list to be determined in kickoff meeting). Stantec will post-process the data in the office and snap linework to the now highly accurate spatial locations captured in the field. It is important to note that the analysis and study performed later in the project will encompass the city as a whole, this effort is to make sure that the data in these known trouble areas is as accurate as possible.

Once Stormwater infrastructure has been accurately mapped and field verified in these specific areas, Stantec will develop a Digital Elevation Model of the City. Using the most current Lidar data available, a Digital Elevation Model (D.E.M.) will be made to represent the true and accurate elevations of bare ground. This D.E.M. will serve as the backbone that all other analysis and datasets will be built on top of.

Deliverables: A file geodatabase containing Stormwater infrastructure with updated GPS locations as well as condition assessments. A Digital Elevation model, that can be used for spatial and 3D analysis. The file format can be in a number of different storage formats such as GeoTIFF, .dem, file geodatabase raster mosaic, etc. The specifics of the storage format will be determined and agreed upon in coordination with the clients GIS department. A 3d web viewer of the City, showing ground elevations with high resolution draped imagery and stormwater infrastructure locations (stormwater infrastructure – inlets, outfalls, subsurface pipes, etc – will be in 2D)

Assumptions: It is estimated that there are ~125 assets per each area. Stantec will deploy a 1-person team to visit each of these assets. If additional areas or features need to be collected, a change order will be required. Client to provide ground classified Lidar data to be used to convert

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to a digital elevation model. Final D.E.M. cell size will depend on the point spacing and density of the supplied .las data. Stantec will not be capturing elevations of assets. If Elevations need to be captured (particularly for inlets), it is recommended a traditional survey be used.

Task 3.0: Public Workshop #2 & 30-day Public Comment Period

Overview: Stantec will help coordinate and supply supporting documentation for the Second Public Information Workshop. The Client will lead this public workshop (intended to be presented at City Commission meeting) however Stantec will attend and provide support where/when called upon. An interactive dashboard/web-app will be developed to help aid City staff in effectively communicating project status and any preliminary analysis findings, if possible at the time of the meeting.

Deliverables: An interactive web-app/dashboard hosted in the City's ArcGIS Online (AGO) organization to help aid the city in relaying information to Commission and Public.

Assumptions: Stantec will have access to the clients AGO organization through group membership, or a dedicated account in the clients AGO to be used by Stantec for the duration of the project.

Task 4.0: GIS “At-risk Infrastructure” Analysis

Overview: This task will perform the analysis and identify the features at-risk from various sea-level rise scenarios.

Several different Stormwater features will be assessed, and two different sea-level rise scenarios will be evaluated (scenarios being different heights of sea-level rise – 1ft, 3ft, 5ft, 10ft). This assessment will be able to show the level of inundation from each sea-level rise scenario, as well as identify the features that are “at-risk” and will be affected by sea-level rise.

Stantec will develop, in coordination with the client, a significance scoring range for features that are at-risk. Features that have a higher significance scoring will be those that will be impacted the most by sea-level rise.

Deliverables: Shapefiles, or a single file geodatabase, will be provided to the client that will include a subset of each of the features identified as being at-risk. Stantec will also provide a breakdown of the “at-risk significance scoring matrix” (developed in coordination with client) that will be used and applied to features that are identified during this analysis. All output layers will be added to the 3D viewer created in Task 2.0.

Assumptions: Stantec will use publicly available sea-level rise data provided by NOAA. NOAA provides sea-level rise data for increases of sea level ranging from 1ft to 10ft. Stantec will perform the analysis for 2 different scenarios (to be determined in coordination the client, though 1ft, 3ft,

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5ft, and 10ft are commonly used). Stantec will not perform any hydrologic/hydraulic modelling of stormwater infrastructure.

Task 5.0: Stormwater Resiliency Plan

Overview: Once an assessment has been performed and specific features have been identified as “at-risk”, a resiliency plan will be developed to help outline the methodology of the study, and more importantly, highlight and prioritize at-risk infrastructure for sea-level rise. Included in the resiliency plan will be recommendations for potential capital improvement strategies as well as recommendations to future zoning and / or development code that can help future development account for sea-level rise appropriately.

The plan will discuss the identified vulnerabilities, identify strategies to reduce or eliminate vulnerabilities and provide suggested practices (and associated costs) and policy to provide for resiliency planning in the future.

Deliverables: A Stormwater resiliency plan document will be provided in both Word and PDF formats to the client. The document will outline methodology, at-risk features, and recommendations for current infrastructure as well as future developments. Stantec will also develop an ArcGIS Online Story Map (using the 3D viewer developed throughout the project as a baseline) outlining the same information. This app can be used as an informative tool for the public and used as a tool to plan for future CIP funding projects and track progress of resiliency related construction activities.

Assumptions: Stantec will go through no more than 2 rounds of document review with the client.

Task 6: Project Management

Overview: This task will cover meeting scheduling, status updates, staff coordination, project set-up, and other administrative tasks necessary for budgeting and successful project performance.

Client Responsibilities

The City of Hallandale Beach (client) will designate a Project Manager who will be the primary point of contact for the project. The client will designate at least one staff member to serve as the GIS point of contact for data transfers. The client is expected to provide Stantec (consultant) with any datasets the client owns that should be considered and evaluated in this project. The client will identify what personnel will be present for meetings, as well as what personnel will be involved in the draft resiliency plan review process.

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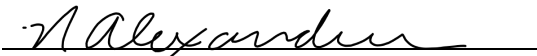
Schedule and Fee Summary

The dates listed below were submitted by the client and approved by Florida Department of Environmental Protections (FDEP) without Stantec coordination or input. Stantec will attempt to follow as closely as possible the timelines for each task, however, certain tasks may extend longer than the specified date, potentially pushing the total project completion date into May. Stantec will monitor project status closely and coordinate with the client well in advance for a time extension. The project is being proposed as a Fixed Fee, not to exceed \$75,000. Stantec reserves the right to re-appropriate funds between tasks to ensure the project is completed, however no increases to total project fee are anticipated and should they arise, will not commence without prior written approval from the client.

Task Number	Task Title	Deliverable Due Date	Task Amount
200	Project Kick-off & Public Information Workshop #1	12/31/2021	\$3,000
300	Stormwater System Mapping	1/31/2021	\$35,000
400	Public Workshop #2 & 30-day Public Comment Period	2/28/2021	\$5,000
500	GIS "At-risk Infrastructure" Analysis	3/30/2021	\$10,000
600	Resiliency Plan	4/30/2021	\$14,000
700	Project Management	4/30/2021	\$7,500
Total Fee			\$75,000

Regards,

Stantec Consulting Services Inc.



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Approved for City of Hallandale Beach By:

Peter A. Kunen, P.E., CFM

Name (Type or Printed)

**Assistant Director of Public Works/City
Engineer**

Title

Signature

11/3/2020

Date