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M EMORANDUM

January 25, 2019

To: Marshall Labadie, Town Manager
TOWN OF HIGHLAND BEACH
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Kim Delaney, Ph.D.
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From: Joseph W. Capra, P.E.
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RE: HIGHLAND BEACH PROJECT

As requested by the Highland Beach Town Manager, the purpose of this memorandum is to provide additional background and technical information regarding the Highland Beach/SR A1A Complete Streets project, which could potentially include stormwater management, pedestrian and bicycling amenities, beautification, and undergrounding of utilities.

ROAD ELEVATIONS

CAPTEC was provided an FDOT 2008 survey, which notes that SR A1A road elevations vary from 5.20 NGVD to 6.80 NGVD. It should be noted the NGVD Datum was established in 1929 and is being phased out to utilize the newer NAVD datum established in 1988. There is a difference between the two datums, for design and permitting, and all new improvements are required to utilize the NAVD datum. In the Highland Beach area, the difference between the old and current datum is 1.6+/- feet. To convert from NGVD to NAVD, you have to subtract 1.6' from the NGVD elevation.

Therefore, in the new NAVD Datum, the SR A1A elevations range from 3.6 NAVD to 5.2 NAVD. The average of the existing road elevations noted in the 2008 FDOT survey, converts to an average 4.25 NAVD elevation.

SEA LEVEL RISE

CAPTEC utilized the current US Army Corps of Engineers (ACOE) sea level rise curves, which predict an average sea level rise in 50 years (2070) of 1.2-feet. The most recent data indicates "king high tides" in the Town have reached a level of 3.20 NAVD. Therefore, $3.20 + 1.20 = 4.40$ NAVD is the minimum level of the edge of pavement of the road CAPTEC utilized in the conceptual design. This equates to approximately 5.00 NAVD at the center crown of the road.

Therefore on an average, in the Town's conceptual plans propose the center of the road be elevated from the average of 4.25 NAVD to 5.00 NAVD or approximately 0.75-ft (9 inches). The road varies in elevation, and as a result, not all areas would need to be elevated above their existing elevations.

UNDERGROUNDING COST

The Undergrounding Cost estimate includes all identified costs to complete undergrounding and restore the surface. This estimate includes restoring the area around the ground level transformer pads and repairing the damaged areas to the private property. The budget also includes some easement acquisition at the location of the pad mounted transformers

BIKE LANES WIDTHS

In due diligence meetings for the project, FDOT indicated it plans to improve the dedicated bike lanes in this corridor. The conceptual alternatives include two options for the Town to consider, five (5)-foot standard bike lanes or seven (7)-foot buffered bike lanes.

THE PROPOSED STORMWATER MANAGEMENT SYSTEM ITEMS

Baffle Boxes

Baffle boxes are a common component of stormwater systems to provide stormwater treatment prior to discharge into the Intracoastal Waterway. They are utilized in confined areas where local governments have limited area to provide stormwater retention to clean stormwater prior to its discharge into a waterway. Baffle boxes vary depending on the basin area that drains into them. Typically, boxes are 6-feet wide and 12-feet long and are located underground with manhole lid access. For Highland Beach, baffle boxes would be placed in easements or right-of-way dedicated to the public. In addition, the proposed stormwater system would include exfiltration perforated pipes wrapped in rock/fabric to provide additional stormwater treatment and storage. The proposed pervious walkway also provides storage/treatment.

The proposed stormwater system is designed for a 16-inch rainfall event (which is a 25-year/3-day rainfall event which is a SFWMD permit standard. The SFWMD permit criteria requires a 12-day recovery period.

Outfalls

In stormwater management systems, outfalls are located to discharge stormwater into waterways such as the Intracoastal after stormwater has been stored and treated within an exfiltration system, baffle boxes, or other facilities. They are designed to address the amount of stormwater produced in pre-selected storm event. In the Town of Highland Beach, the selected storm event is a 25-year/3-day rainfall event, which typically produces 16 inches of rainfall. The FDOT requires all outfalls to be designed to a 25-year/3-day rainfall event. For the Town's system, outfalls are proposed to be placed in eight (8) different locations in areas dedicated to the public. In areas of wetlands, a weir with a control valve would be provided to keep the tides from backing into the system. In the areas of an existing seawall, the outfall will be constructed through the seawalls with a control valve in the pipe system. The control valves will be set at the current King high tide elevations to avoid roadway flooding. No existing seawalls are proposed to be lowered in the conceptual plan.

Hurricanes

Hurricanes are typically described by wind speed, storm surge and rainfall events.

All the proposed above-ground facilities would be placed to withstand wind speeds as per the Building Code requirements for the Town and FDOT.

The storm surge levels vary in all storms. The proposed stormwater system would not impact the surge levels. If a Hurricane surge is above the current seawall elevation, it would continue to stage above the new seawall elevation. The Outfall weir with control valves would reduce backflow into the stormwater pipe systems.

The rainfall events in Hurricanes vary. In the past three Hurricanes, the rainfall events were greater than the 100-year rainfall amount, which is 22 inches. In a theoretical 100-year rainfall event, the proposed stormwater system may be flooded but would recover after discharge.

Maintenance

The proposed system will alleviate flooding in all major storm events and when properly maintained, this will help prevent and/or alleviate long periods of flooding after major storm events. The system will require annual maintenance, and it is recommended that consistent with most local governments, regular preventative maintenance be undertaken annually prior to Hurricane season. In many Municipalities, properly documented stormwater maintenance does provide reductions in property insurance rates. The proposed project includes a series of improvements that will require maintenance (e.g., pervious walkway, exfiltration, inlets, baffle boxes, outfalls). These items are estimated to cost approximately \$130,000-\$150,000 annually to maintain. The Town can pay for these annual costs through its General Fund or establish a Stormwater Utility Fund. However, the Town can also reduce these maintenance costs with proper restrictions on private properties for activities that include soil erosion or poor placement of vegetative yard waste.

Permitting

Finally, the proposed stormwater system would be reviewed and permitted by several stormwater engineers, including the SFWMD and the FDOT. It has been recommended the Town pursue the many grants available for the proposed projects that may reduce the cost to the Town.

In these grant entities, various Engineers would also review the proposed designs. The types of proposed improvements are utilized in most coastal communities throughout South Florida.

CONSTRUCTION

The current plan would be to construct the project in three phases: First, Stormwater/Walkway/Pocket Parks; Second, Undergrounding of Dry Utilities and; Third, the FDOT 3R Project. This would be accomplished in at least three different construction contracts, and some improvements could overlap others.

The estimated Construction duration is as follows:

- Stormwater/Walkway/Pocket Parks: 1.5 years
- Undergrounding Dry Utilities: 1 year
- FDOT 3R Project: 1 year

This schedule could change depending on the availability of funding through grants and FDOT. The standard FDOT requirement for roadway projects of this type is to provide Maintenance of Traffic plans prior to any construction activities and to provide access to private properties at all times. However, short-term delays and single lane closures with flagmen in off-peak hours can occasionally occur. Utility coordination during the design phase would be utilized to avoid conflicts with any existing utilities. During the construction of the proposed walkway, alternative accommodations would be provided for pedestrians. The bike traffic would also need to be accommodated in the Maintenance of Traffic plan.