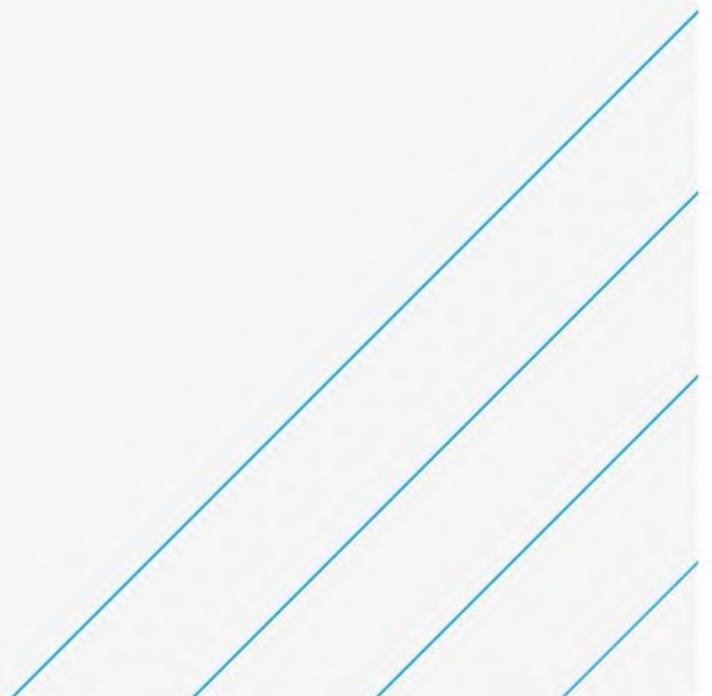


Manasota Key Road Feasibility Study (Final)

Long-term sustainable solutions for Manasota Key
Road

Sarasota County

September 2020



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Executive Summary

Manasota Key Road is located in Sarasota County, Florida and has experienced ongoing shoreline erosion, which has caused portions of the road backing the beach to be washed out or damaged. This roadway serves as critical infrastructure for evacuation off Manasota Key Island and also provides access to homes, parks, and other recreational areas. The southern shoreline along Manasota Key road is classified as “critically eroded” by the Florida Department of Environmental Protection (FDEP) and a segment of the road by Blind Pass beach park has already been undermined in the past. Atkins was tasked with performing a Manasota Key Road Feasibility Study to assess a portion of the roadway extending approximately 2,100 feet north of Blind Pass Beach Park and developing alternatives to mitigate the impact of erosion.

A total of nine alternatives were developed and evaluated for their potential environmental impacts, likelihood of permitting, cost, constructability issues, lifecycle concerns, public access/park impacts, and utility impacts. Utilizing an impact matrix, the top four alternatives were then further developed and compared through the use of a pros and cons matrix. Despite the historical erosion at the project site, the suggested alternative is the no build alternative. This alternative is recommended as the path forward, as there was a Sarasota County – Charlotte County beach nourishment project, which included placement of beach nourishment material at this project area in April of 2020. While the no-build alternative does not include any hardened construction, this option does include plantings along the back of the beach to stabilize the beach fronting the roadway. With this recommended alternative it is advised to develop a monitoring plan to document the performance of the beach nourishment and erosion over time. In addition, future structures, beach nourishments, vegetation, or a combination may be needed to provide additional protection.

1. Introduction and Project Description

The southern shoreline of Manasota Key is designated “critically eroded” by the Florida Department of Environmental Protection (FDEP, 2019). In recent years, storms impacting this already critically eroded segment of shoreline have damaged upland infrastructure, including a segment of Manasota Key Road at Blind Pass Beach Park. Having been washed out in 2017 with the passage of Hurricane Irma, Sarasota County has repaired the road and is seeking alternatives to ensure this important access and evacuation route, which is made vulnerable by continued erosion, is protected in the future. This feasibility study assesses the long-term sustainability of Manasota Key Road from Blind Pass Park to approximately 2,100 feet north of Blind Pass Beach Park, as seen in Figure 1-1.

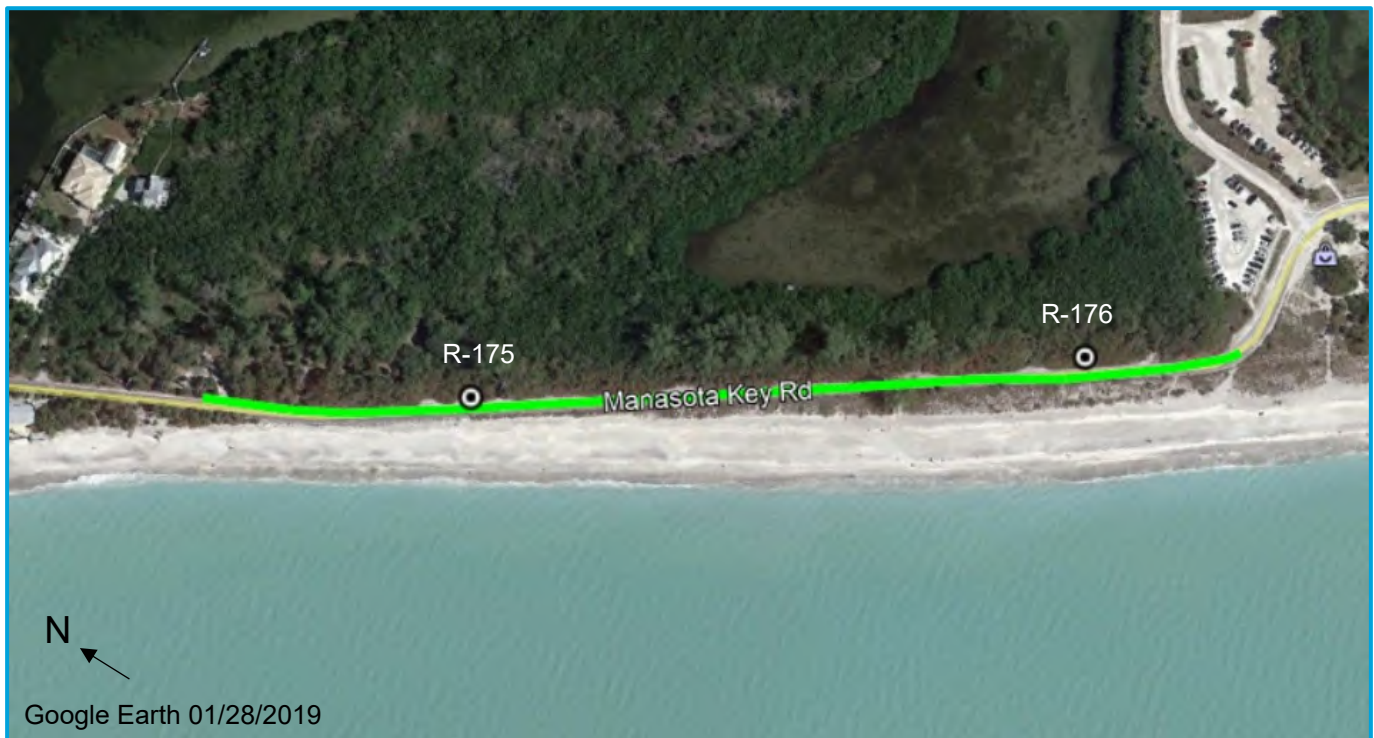


Figure 1-1 - Approximate extent (green line) of Manasota Key Road Feasibility Study.

2. Purpose and Need

Manasota Key Road traverses along Manasota Key which is bordered by the Gulf of Mexico to the west and the Lemon Bay Aquatic Preserve to the east. Manasota Key is home to many residential areas, as well as several outdoor attractions along the Gulf and Bay. There are only two exit points from Manasota Key Road to mainland Florida, which are Manasota Beach Road to the north and Beach Road to the south. This makes Manasota Key Road vital infrastructure in consideration to needed emergency and evacuation routes. In addition, this portion of the roadway has experienced ongoing shoreline erosion and regions of washout overtime, which have challenged the long-term sustainability of the roadway. The purpose of this feasibility study is to identify possible alternatives to mitigate the erosive impacts along Manasota Key Road.

3. Existing Conditions

Prior to developing the proposed structure alternatives, the current project site conditions were assessed. An initial site visit was performed along the extent of the project area in September 2019 to document and photograph areas of concern, erosion hotspots, vegetation, access connections, drainage features, habitats, water bodies, beaches, driveways, and other existing conditions to be considered in the alternative's analysis. Existing grades, slopes, retaining walls, and guardrails were also reviewed. Following the site visit, further desktop review was performed to collect information regarding traffic data, transportation and land use plans, utilities, cultural features, hazardous material and contamination information, and nearby natural features. The existing conditions of the project area are further identified and discussed in the following sections.

3.1. Traffic Data

Within the project limits, Manasota Key Road is a two-lane rural arterial road serving both local and regional traffic. The existing roadway characteristics that are relevant to this study include the follow:

- Roadway Maintaining Agency: Sarasota County
- Posted speed limit: 30 MPH
- Pavement width: 12-foot-wide travel lanes
- Sidewalks: none
- Shared use paths: natural trail on the east side
- Bike Lanes: none, sharrow marking on pavement
- Average annual daily traffic (AADT) volumes: 1988 (Adjusted to 2018)
- County Adopted Level of Service (LOS): LOS D
- Facility operation, LOS: LOS C

3.2. Transportation and Land Use Plans

The existing land use is a mix of residential, commercial and recreational along Manasota Key and Manasota Key Road. The County has no plans for future capacity improvements along Manasota Key Road. The future land use classification of "Barrier Island" is also not proposed to change. Recently there has been consideration to extend the Legacy Trail Corridor further south, along Manasota Key Road, see Section 3.4 for additional information.

3.3. Utilities

Three major utilities owners were identified, through the Sunshine One Call design ticket identification process, having facilities within the project limits. Englewood Water District has a water line on the east side of the project. There are overhead utilities, also along the east side of the roadway, on both concrete and wood utility poles carrying Florida Power & Light electrical lines and Frontier Communications CATV and commination lines. In addition, Englewood Water District as plans to up size the existing water line through the project corridor. Future coordination with each of these utilities is recommended to incorporate up-grades.

3.4. Cultural Features

Directly northeast of the project site is the Lemon Bay Aquatic Preserve, as seen in Figure 3-1. The preserve is approximately 7,227 acres and spans about 13 miles in length from south of Placida to almost north of Venice. Lemon Bay Aquatic Preserve is separated from the Gulf of Mexico by Manasota Key and Little Gasparilla Island and is composed of a submerged ecosystem of oyster beds, seagrasses, and mangroves. A breakdown of the preserve’s natural features can be seen in Table 3-1 based on the Florida Natural Areas Inventory (FNAI) (FDEP, 2017; FDEP, 2019b). The preserve is also open to recreational activities including fishing, birding, kayaking, wading, and beachcombing. Lemon Bay Aquatic Preserve is one of five Charlotte Harbor Aquatic Preserves (CHAP).



Figure 3-1 - Identified cultural features.

Table 3-1 - Natural communities of Lemon Bay aquatic preserve.

FNAI Natural Community Type	Acreage
Mollusk Reef	17
Salt Marsh	4
Mangrove Swamp	378
Seagrass Beds	3,744
Sponge Beds	Unknown
Unconsolidated Substrate	123
Consolidated Substrate	Unknown
Unclassified Submerged Land	2,695
Unclassified Land	266
Total Acreage	7,227

CHAP, similar to many other coastal areas in Florida, contains a vast array of historic and archaeological resources (FDEP, 2019b). Currently there are over 180 archaeological sites and 200 historical sites adjacent to or within the CHAP, which are recorded in the Florida Department of State (FDS) Florida Master Site File. These sites include remains of Native American and European villages, shipwrecks, and prehistoric shell kitchen middens (FDEP, 2017). While some of the historic and archaeological resources within CHAP have been identified, much of the area has not been surveyed (FDEP, 2019b). In 2017, the Charlotte Harbor Aquatic Preserve Management Plan (FDEP, 2017) contained a list of historic and archaeological sites, developed from the Florida Master Site File, that were located within or near the CHAP. However, the exact location of these sites was not made publicly available through the management plan or the Florida Master Site File website, making it unknown if any are contained within the project area for Manasota Key Road.

The National Register of Historic Places (NRHP) also contains an active list of U.S. properties that have been formally processed as being historically significant. However, most of the Florida Master Site Files are not included in the NRHP because they do not meet the requirements of those listed by the NRHP (FDS, accessed 2020). One historic site identified on the NRHP, Hermitage Whitney Historic District, is approximately 900 feet from the southern extent of the project area, as seen in Figure 3-1. The site consists of 5 historic buildings and 3 historic structures; however, they are not expected to be impacted by this project as they are located outside the proposed project location (National Archives Catalog, 2017).

Blind Pass Beach Park is located within the project area and is considered a Florida Conservation Land by the FNAI (FNAI, 2020). The park provides beach access to Blind Pass Beach located along the Gulf of Mexico, on the west side of Manasota Key Road. The park provides recreational opportunities through picnicking, trails, swimming, fishing, and wildlife watching (Sarasota County, accessed 2020). The main trail, Fred Duisberg Nature Trail, begins at Blind Pass Beach Park and continues with a series of boardwalks along Lemon Bay Aquatic Preserve through a mangrove forest (Florida Hikes, accessed 2020). There is expected to be minimal impact to Blind Pass Beach Park and the associated conservation land, depending on the selected alternative.

Florida also has several other walking and biking trails throughout the state, one of which is the Florida Legacy Trail. The Florida Legacy Trail starts at Venice and extends approximately 10.75 miles north towards Sarasota. The scenic and well-maintained bike trail also allows access to many state parks and historic sites along the way. Recently there has been consideration to extend the Legacy Trail Corridor further south, along Manasota Key Road, as seen in Figure 3-1 (Bike Florida, 2019; FDEP, 2019a).

Depending on the selected alternative and if/when the trail is extended, the project could have short-term impacts on the trail. However, if Manasota Key Road is undermined, the continuation of the trail would also likely come to an end.

3.5. Hazardous Material and Contamination Information

To assess any possible hazardous material and contamination information within the project area, historical aerial photographs (1971 – 2015) and historical topographic maps (1957 – 2018) were reviewed. In addition, databases of FDEP-listed facilities on or adjacent to the project area were collected. The aerial photographs and topographic maps did not identify any potential contamination concerns for the project area. Areas adjacent to the project were noted to be residential homes and/or access for a park (recreational). Review of the FDOT’s Efficient Transportation Decision Making (ETDM) Environmental Screening Tool (EST) did not identify any potential sites/sources of contamination within or adjacent to the project, see Figure 3-2 Contamination Site Map project area circled in green. Overall, there were no identified concerns regarding hazardous materials or contamination impacts in conjunction with the desktop review of the project.

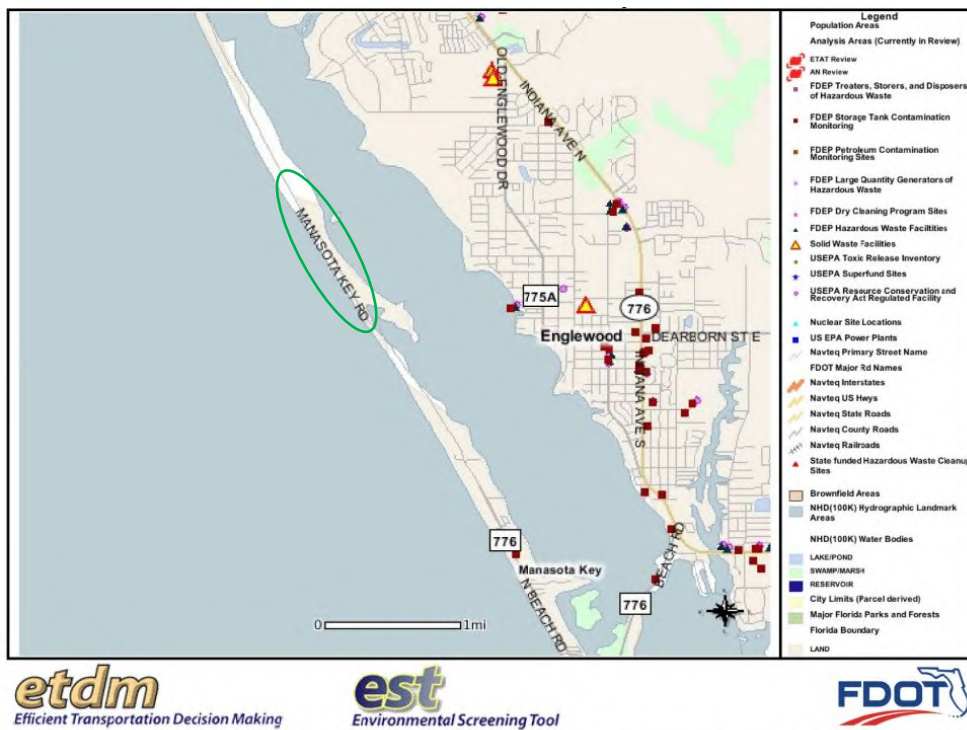


Figure 3-2 – Contamination Site Map.

3.6. Natural Features

A desktop review was performed to assess natural features within and adjacent to the project area that would potentially be impacted by the alternative solutions under consideration for stabilizing Manasota Key Road. The natural features review included that related to wetlands, threatened and endangered species, soils, and floodplain and drainage, which are further discussed in the following sections.

3.6.1. Wetlands

The U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory database (NWI), FDEP Statewide Land Use Land Cover database, and FNAI Critical Lands and Water Identification (CLIP) Project database was utilized in assessing the nearby wetlands (USFWS, 2020; FDEP, 2020; FNAI, 2016a). The USFWS NWI database was more descriptive than the FDEP database as it provided a wetland classification code,

which detailed the type of wetlands present, as well as their approximate extent. Estuarine wetlands were identified in the Lemon Bay Aquatic Preserve and marine wetlands were identified along the Gulf of Mexico shoreline (USFWS, 2020). The USFWS NWI identified wetlands and classification code breakdown can be seen in Appendix A.1 and A.2. A summary of the USFWS NWI wetlands located near the project area can be seen in Table 3-2.

Table 3-2 - USFWS NWI wetland classification near Manasota Key Road project area.

Wetland Classification Code	Classification Meaning
M1UBL	M – Marine 1 – Subtidal UB – Unconsolidated Bottom L – Subtidal
M2US2P	M – Marine 2 – Intertidal US – Unconsolidated Shore 2 – Sand P – Irregularly Flooded
E2SS3N	E – Estuarine 2 – Intertidal SS – Scrub-Shrub 3 – Broad-Leaved Evergreen N – Regularly Flooded
E2AB/USM	E – Estuarine 2 – Intertidal AB – Aquatic Bed US – Unconsolidated Shore M – Irregularly Exposed

The FDEP wetland areas do not provide classifications, but the wetland boundary can be seen in Appendix A.3 (FDEP, 2020). The FNAI CLIP database identified wetland areas that are critical to the conservation of Florida’s natural resources. The CLIP wetlands were also prioritized by the Land Use Intensity Index which ranges from 1-10 based on the level of surrounding development, with lower values indicating higher development and less ecological integrity. Values between 1-3 are categorized as having little to no ecological integrity; 4-7 have moderate ecological integrity; and 8-10 have high ecological integrity (FNAI, 2016b). The wetlands near the Manasota Key Road project area are categorized as Priority 3, as seen in Appendix A.4. Impacts to wetland areas may be present, depending on the selected alternative, which may require mitigative action.

3.6.2. Threatened and Endangered Species

A desktop evaluation of the Florida Natural Areas Inventory (FNAI) Biodiversity Matrix, U.S. Fish and Wildlife Service (USFWS) Critical Habitats database, and Florida Fish and Wildlife Conservation Commission (FWC) Beach Monitoring Program identified the potential presence of, and suitable foraging and nesting habitat for, species listed as threatened or endangered within and adjacent to the project area. Listed species with potential occurrence in the project area include, but are not limited to, gopher tortoises, loggerhead sea turtles, wood storks, and piping plovers (FNAI, 2020; FWC, accessed 2020b). A complete

list of threatened and endangered species, species of special concern, and other species tracked by the FNAI can be found in the FNAI Biodiversity Matrix database, as seen Appendix B (FNAI, 2020). The Biodiversity Matrix includes all federal and state species tracked by the FNAI; however, species that are common and wide-ranging are not included.

The FNAI Biodiversity Matrix was developed based on one-square-mile areas, with the project area located in Matrix Units 27071 and 27072, as seen in Figure 3-3. The matrix defines the occurrence status of species and communities as Documented, Documented-Historic, Likely, and Potential. Documented means there was a documented occurrence in the FNAI database of the species within the Matrix Unit. Documented-Historic means that there was a documented occurrence of the species within the Matrix Unit, but it occurred over twenty years ago. Likely means that the species or community has been documented in overlapping Matrix Units and is known to occur in the vicinity. Potential means that based on the predicted range of the species, it is possible to encounter these specific species within the Matrix Unit. There was no Documented species in Unit 27071 and one in Unit 27072, a Bald Eagle. There were no Documented-Historic species in either Matrix Unit. There were several Likely species in both units including the Loggerhead Sea Turtle, Green Sea Turtle, and West Indian Manatee. There were also several Potential Species in both Matrix Units, including the Leatherback Sea Turtle, Hawksbill Sea Turtle, and Florida Goldenaster, as seen in Appendix B.

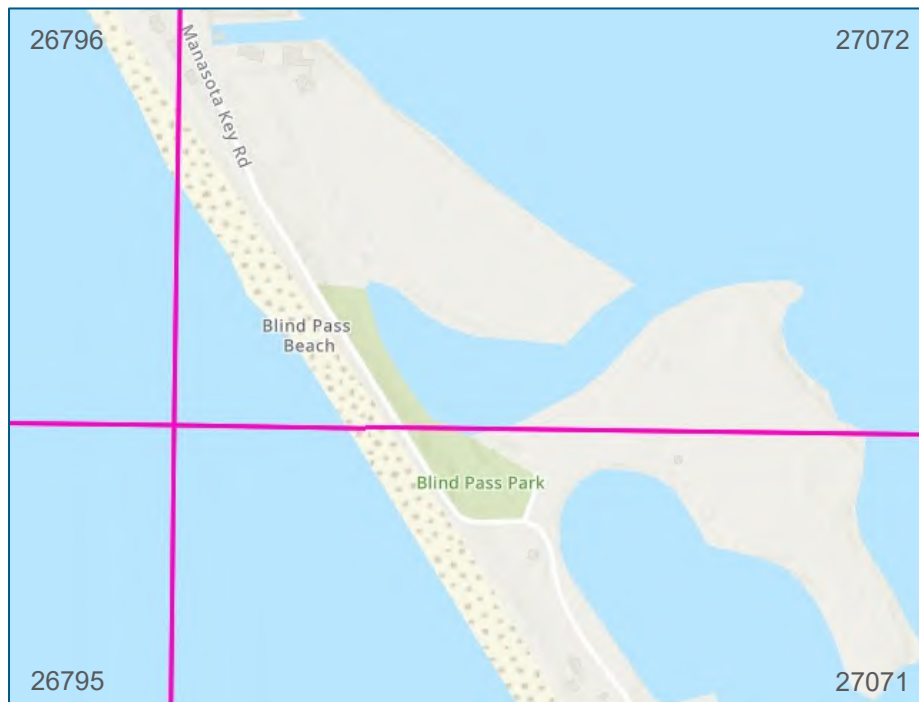


Figure 3-3 - FNAI Biodiversity Matrix Unit ID numbers.

USFWS also provides spatial data for threatened and endangered species habitat. The current dataset identified two critical habitats within the project area for the threatened Loggerhead sea turtle (*Caretta caretta*) and the endangered Aboriginal Prickly Apple (*Harrisia aboriginum*). The USFWS threatened and endangered species habitat can be seen in Figure 3-4.



Figure 3-4 - USFWS identified critical habitat.

The Florida Fish and Wildlife Conservation Commission (FWC) Beach Monitoring Program provides sea turtle nesting densities along the Florida coast (FWC, accessed 2020a). Based on data from 2014-2018, the project area is classified as a high-density nesting area for Loggerhead turtles and Green turtles and is also an observed nesting area for Kemp’s ridley turtles, as seen in Figure 3-5. The Leatherback turtle

and Hawksbill turtle have had no observed nesting activity in the project area. Consideration of sea turtle nesting habitat will be an important factor in the alternative selection and construction.

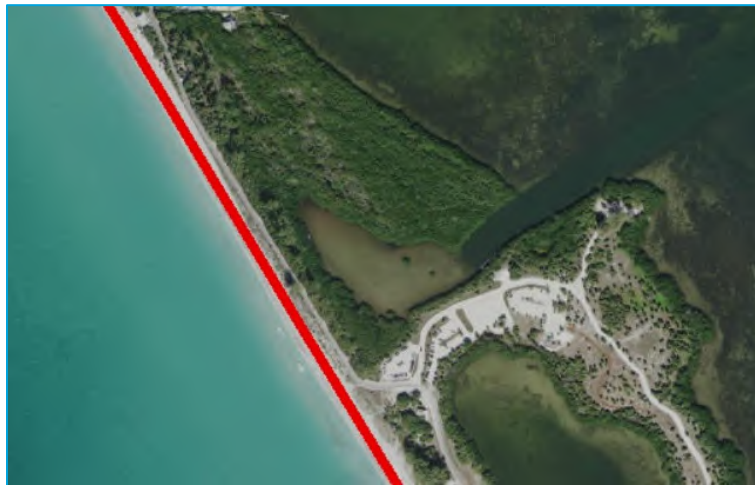


Figure 3-5 - High-density nesting (red line) for Leatherback and Green turtles (2014-2018).

3.6.3. Soils

Soil types within and around the project area were determined from the U.S. Department of Agriculture Natural Resources Conservation Services (NRCS) website and are mapped in Figure 3-6. The soil types in the direct proximity of the site include Beaches and Canaveral fine sand. Kesson and Wulfert mucks are also in the nearby proximity; however, are outside the direct project area (NRCS, 2020). The soils were then evaluated based on their soil properties through the NRCS Soil Data Explorer Suitabilities and Limitations for Local Roads and Streets use ratings. The ratings are based on the soil properties associated with excavation, grading, and traffic-supporting capacity of local roads and streets. The soils are then rated under the categories of Not Limited, Somewhat Limited, and Very Limited. A soil that is rated as Not Limited has favorable soil parameters for the use of roadways and is expected to have good performance and low maintenance. A Somewhat Limited soil indicates that the soil has moderately favorable conditions and the limitations can be minimized through special planning, design, and installation. A Very Limited soil has one or more unfavorable parameters, that cannot be overcome without major soil reclamation, special design, or extensive installation procedures (NRCS, 2020). The associated NRCS soil ratings based on roadway use can be seen in Figure 3-6 and

Table 3-3.

Based on the NRCS soil ratings for the use of local roads and streets, the site's soils were broken down by component name, overall rating, and reason for the given rating, as seen in

Table 3-3. The Beaches sediment is located to the west of Manasota Key Road and was Not Rated under the NRCS. The Canaveral fine sand is located at the project location and extends east towards the Lemon Bay Aquatic Preserve (NRCS, 2020). Canaveral fine sand was given a rating of Not Limited indicating that the soil has favorable soil parameters and conditions for roadway use. The Kesson and Wulfert mucks are located to the east, southeast, and northwest of the project site, bordering the Lemon Bay Aquatic Preserve. The Kesson and Wulfert mucks were found to have a Very Limited rating due to its proximity to the depth of saturation, probability to flooding, low soil strength, and occurrence of subsidence (NRCS, 2020). The soil ratings will need to be considered in the selection of an alternative, as unfavorable soil parameters may require major soil reclamation, a special design, extensive installation procedures, or result in increased project cost. Prior to the design and construction of the selected alternative, a geotechnical engineer will need to perform a soil assessment.

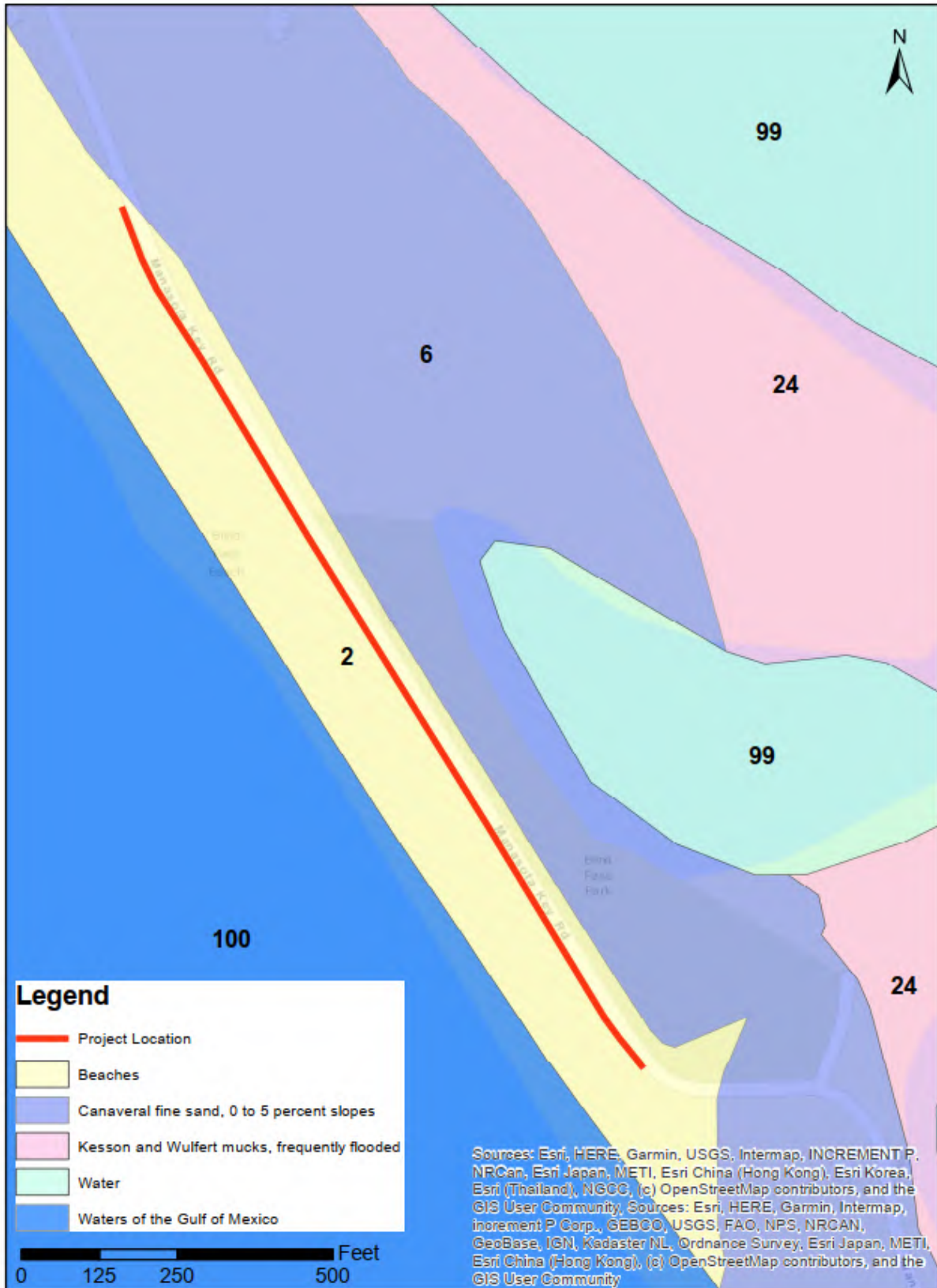


Figure 3-6 – NRCS site soils and ratings.

Table 3-3 - NRCS site soil ratings.

Map Unit Symbol	Map Unit Name	Rating	Component Name (percent)	Rating Reasons
2	Beaches	Not Rated	Beaches (100%)	-
6	Canaveral fine sand, 0 to 5 percent slopes	Not Limited	Canaveral (85%)	-
			St. Augustine (6%)	-
			Palm Beach (2%)	-
24	Kesson and Wulfert mucks, frequently flooded	Very Limited	Kesson Tidal (50%)	Depth to saturated zone
				Flooding
				Low strength
			Wulfert, Tidal (40%)	Depth to saturated zone
				Subsidence
				Flooding
			St. Augustine (5%)	Low strength
Depth to saturated zone				
99	Water	Not Rated	-	-
100	Waters of the Gulf of Mexico	Not Rated	-	-

3.6.4. Floodplain and Drainage

Based on photos from a site visit performed on September 26, 2019, along with imagery from Google Earth, there are several erosion hotspots on the east and west sides of Manasota Key Road, as seen in Figure 3-7. These areas appear to be due to stormwater drainage from the roadway towards the Gulf of Mexico and Lemon Bay. There are currently no drainage systems in place along Manasota Key Road; however, this may be a design consideration depending on the alternative selected.



Figure 3-7 - Erosion along beach front side of Manasota Key Road (September 2019).

The effective Federal Emergency Management Agency (FEMA) 2016 FIS report for Sarasota County provides stillwater elevation data for recurrence intervals pertaining to storm events (FEMA, 2016). The corresponding stillwater elevations are given for the 10%, 2%, 1%, and 0.2% annual chance events for Manasota Key and can be seen in Table 3-4 (FEMA, 2016). The effective floodplain is defined as a VE zone with a Base Flood Elevation (BFE) of 16 feet NAVD88 offshore. Further onshore and including a portion of Lemon Bay, the northern part of the project area is designated as an AE zone with a BFE of 12 feet NAVD88 and the southern part of the project area is a VE zone with a BFE of 13 feet NAVD88, as seen in Figure 3-8 (FEMA, accessed 2020).

Table 3-4 - Parameters for Manasota Key from FEMA effective 2016 FIS.

Flood Source	Stillwater Elevations (ft NAVD88)			
	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Manasota Key, approximately 3.97 miles west of North Port corporate limits	5.1	7.7	9.9	12.1



Figure 3-8 - FEMA 2016 effective floodplain zones.

In 2019, FEMA released a preliminary FIS report for Sarasota County, which provided more current stillwater elevation data for recurrence intervals pertaining to storm events (FEMA, 2019). Utilizing the report’s coastal transect numbers and the FEMA Flood Map Change Viewer, Transect 68 was identified as being closest to the project area, as seen in Figure 3-9 (FEMA, accessed 2020). The coastal transect parameters for Transect 68 are summarized in Table 3-5, with stillwater elevations given for the 10%, 2%, 1%, and 0.2% annual chance events (FEMA, 2019). The preliminary floodplain is defined as a VE zone with a BFE of 13 feet NAVD88 feet offshore. The VE zone BFE then decreases to 11 feet NAVD88 and 10 feet NAVD88 on the beach, moving landward. Landward of the beach, an AE zone is present with BFEs of 9 feet NAVD88 and 10 feet NAVD88. Lemon Bay is then defined as a VE zone with a BFE of 12 feet NAVD88. The zone designations and BFE values can be seen in Figure 3-9 (FEMA, 2019; FEMA, accessed 2020).

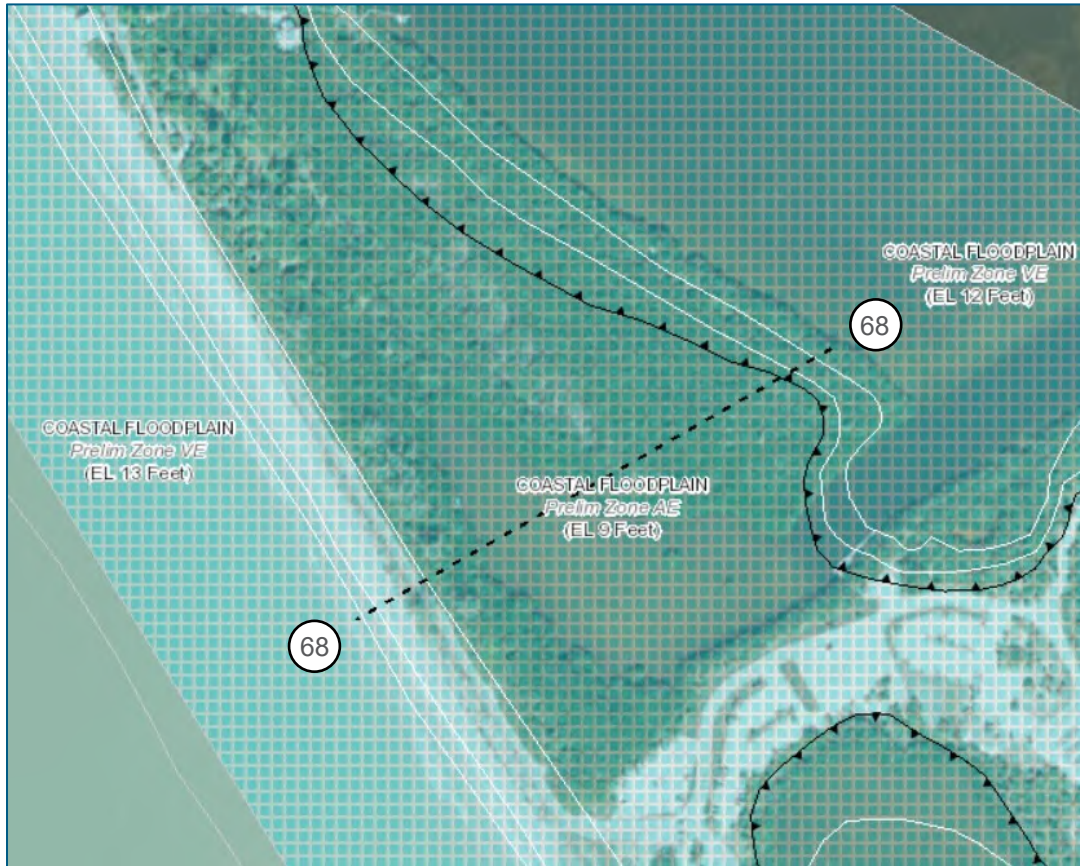


Figure 3-9 - FEMA 2019 preliminary FIS Transect 68 location and floodplain zones.

Table 3-5 - Parameters for coastal transect 68 from FEMA preliminary 2019 FIS.

Flood Source	Coastal Transect	Starting Wave Conditions for the 1% Annual Chance		Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88)				
		Significant Wave Height, H_s (ft)	Peak Wave Period, T_p (sec)	10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Gulf of Mexico	68	12.9	11.7	3.6	5.4	6.7	8.2	11.4
				3.6 - 3.6	5.4 - 5.5	6.7 - 6.9	8.1 - 8.3	11.4 - 11.9

4. Development of Alternatives

A total of nine alternatives were developed and evaluated as potential solutions to mitigate the erosive impacts along Manasota Key Road. These alternatives were then conceptually evaluated for their potential environmental impacts, potential permit issues, cost, constructability issues, lifecycle concerns, public access/park impacts, and utility impacts. An alternatives evaluation was also performed through the use of an impact matrix, as seen in Appendix C.

4.1. Design Criteria and Controls

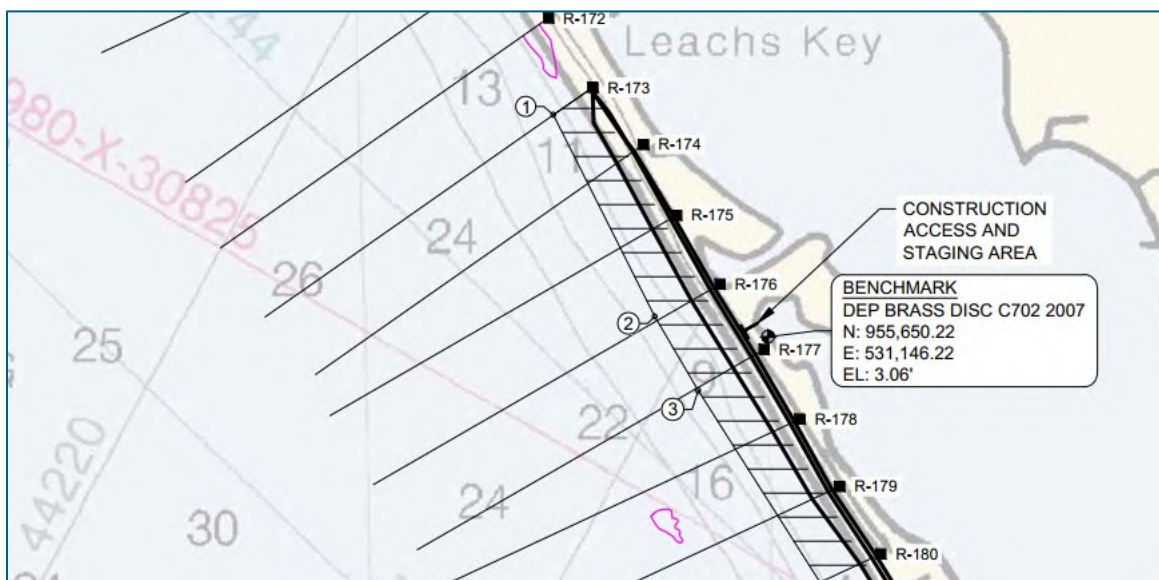
Utilizing the FEMA parameters identified in Section 3.6.4, the effective 2% and 1% annual chance stillwater elevations were found to be 7.7 feet NAVD88 and 9.9 feet NAVD88 and the preliminary 2% and 1% annual chance stillwater elevations were found to be 6.7 feet NAVD88 and 8.2 feet NAVD88, respectively. The existing top of road elevation is approximately 7.6 feet NAVD88, based on June 2019 survey data at range monument R-175 (CEC, 2019). At the existing roadway elevation, both the effective and preliminary 1% annual chance stillwater elevations would overtop the roadway. For the 2% annual chance exceedance event, the effective stillwater elevation would overtop the road, but the preliminary stillwater elevation would not. While the effective stillwater elevation is significantly higher than the preliminary stillwater elevation, the preliminary data is much more recent and is also based on local transect parameters. Even though the 2% annual chance stillwater elevation does not overtop the roadway with the preliminary data, further erosion of the beach fronting the road may cause the road to be undermined and overtopped in the future. For further design, it is recommended to utilize the FEMA preliminary 2019 FIS 2% annual chance exceedance stillwater elevation as a design condition, as the preliminary FIS is based on more recent data and methodology. The Mean High Water (MHW) for the project area is 0.32 feet NAVD88. This value was determined from the Sarasota County – Charlotte County beach nourishment project, for which the MHW was provided by the FDEP on 05/13/2019 (CEC, 2019). Other design criteria and applicable standards will be identified in future project development.

4.2. Alternatives

The initial nine alternatives developed are discussed in the following sections.

4.2.1. No Build

The no build alternative would not cost anything at the present time, but future project costs may arise if the adverse erosion conditions of the beach continue. However, a beach nourishment for Sarasota County and Charlotte County was completed for the project area in April 2020, which provided some immediate relief to the area. The nourishment extends from R-173 in Sarasota County to R-1 in Charlotte County. The Manasota Key Road Feasibility Study project area is approximately between R-174 and R-176, which was within the beach nourishment area, as seen in Figure 1-1 and Figure 4-1. The design berm elevation for R-174 through R-176 was +6.5 feet NAVD88 (CEC, 2019). The constructed berm elevation and beach width varies; however, based on pre- and post- construction surveys from March and April of 2020, the constructed berm elevation ranged from 6.2 feet NAVD88 to 7.5 feet NAVD88 and the beach width was expanded between approximately 50 feet to 130 feet (GBA, 2020).



impacts to existing utilities next to the roadway, and the potential need to model tidal and storm surge impacts. In addition, if the roadway was raised, armoring along the road would likely still be needed.

4.2.6. Bridge the Road Only at the Hotspot

This alternative includes constructing a bridge along the area that is experiencing the erosion hotspot. This option is anticipated to have high permit-ability issues, cost, and constructability issues. To determine the bridge elevation, length, and placement needed, a structural analysis would be required. This alternative would have significant impacts to traffic on Manasota Key Road during construction, as road closure would occur, and a potential onsite detour route would need to be established. Additional tidal and storm surge modeling is recommended for this alternative to assess the impact of water on and around the structure. Long-term concerns also include the potential push-through of water under the bridge, which could result in scour around the bridge supports or the connection of the Gulf of Mexico to Lemon Bay Aquatic Preserve.

4.2.7. Raise the Grade of the Road Along the Entire Beachfront

This alternative is an extended version of the alternative discussed in Section 4.2.5. There are expected to be high impacts in terms of environmental impacts, permitting issues, cost, and constructability impacts with this option. Raising the roadway will likely require tidal and storm surge modeling to determine the needed height of the road and assess overtopping; however, this is not included in the project scope or budget. Secondary impacts of water runoff are also a concern, which could cause the County to be liable for potential property damage. In addition, armor along the roadway to prevent undercutting of the road would likely still be necessary.

4.2.8. Place Entire Road on New Location

Shifting the entire roadway to a new location would result in high environmental impacts, permitting issues, cost, constructability issues, public access/park impacts, and utility impacts. In this option, it is recommended to shift the roadway parallel to the existing powerlines, in order to minimize impacts to the utilities. However, the roadway location is dependent on the soil conditions. The road cannot be moved too far due to the Kesson and Wulfert mucks, which have very limited conditions for the use of a roadway. The existing roadway is recommended to remain open during construction and then later converted into a walkway, recreation area, or a parking lot for additional benefits.

4.2.9. Partner with the Manasota Key Regional Beach Project

The original intention of partnering with the Manasota Key Regional Beach Project was to make suggested revisions to the beach project design within the roadway project area that would benefit both projects. However, it was determined that the roadway project was too late, the beach project was almost complete, permits had been secured, and bidding was soon to begin. At this stage partnering was removed from consideration. However, later in the study development it was determined a partnering effort could be included in the form of an addition to a long-term development plan that would utilize existing permits and assist in creating a management plan. A future management plan may include monitoring, additional planting nourishment, addition of a dune system, or other form of protection. This idea is currently being implemented by Sarasota County, so no further action is being taken at this time.

5. Alternatives Analysis and Evaluation

After establishing the nine project alternatives and reviewing the impact matrix in Appendix C, the alternatives discussed in Section 4.2.5 through 4.2.9 were removed from further consideration. The remaining alternatives under consideration, as discussed in Section 4.2.1 through 4.2.4, were:

- No-build
- Armor Hotspot Only
- Armor 1,100 feet of Road Along Beachfront
- Shift Road Away from the Beach Only at the Hotspot

These alternatives were selected for further consideration as they are anticipated to provide adequate protection to the roadway, while having minimal environmental impacts and permitting issues, lower costs, and the least constructability issues compared to other alternatives. There were also limited lifecycle concerns and public access/park impacts compared to other alternatives, except for the no-build option. Conceptual drawings, not for construction, of each alternative can be seen in Appendix D. The conceptual drawings are based on pre- and post- construction survey data of the Sarasota County - Charlotte County beach nourishment project from March 2020 and April 2020, respectively (GBA, 2020). Although new survey data will be needed for further design, this provided a preliminary view of the existing conditions. A pro/con comparison matrix was also developed and can be seen in Appendix E.

5.1. Alternative 1: No-Build

At the present time the no-build option would not have any cost; however, future costs would include a monitoring plan and potential beach nourishment cycles, via truck haul. The monitoring plan would document shoreline and volume changes, as well as the formation of erosion hotspots following the April 2020 beach nourishment. In addition, future beach nourishment could be used to mitigate erosive impacts and provide increased protection to Manasota Key Road. Monitoring of the site is estimated to cost \$5,000 per year and a beach nourishment via truck haul may cost approximately \$100,000 per event. There are no permitting concerns at the present time as there is an existing permit, 0359636-001-JC, which allows for truck haul treatment of erosion hot spots. Since no construction is currently recommended, there are also no constructability concerns. Prior to the April 2020 beach nourishment there was high concern for the lifecycle of Manasota Key Road and potential public access/park impacts, as seen in Appendix C.2. Following the beach nourishment, the lifecycle concerns have been reduced and the public access/park impacts have been minimized, as seen in Appendix C.2. An image from May 2020 at the project site, following the beach nourishment can be seen in Figure 5-1.

The no-build option has the benefit of having no immediate cost or action due to the April 2020 Sarasota County - Charlotte County beach nourishment project. The nourishment also allows for additional time to collect data and determine the most appropriate action. In addition, there are no present concerns to utilities or the environment. Disadvantages of this alternative are that no hardened structure will be provided for additional protection of the roadway, future analysis would be needed to determine the best solution, and there would be no stormwater drainage improvements. In the case that erosion continues, more frequent future beach nourishments may be needed, in addition to potential dune construction and plantings. In the case that the roadway is undermined, restriction in public access could also occur.



Figure 5-1 - Post beach nourishment.

5.2. Alternative 2: Armor Hotspot Only

The erosion hotspot spans about 500 linear feet and could be protected through the use of stone, flat slab, sheet pile, vegetation, or a combination of these. However, the shoreline along the southern portion of the project site is defined as critical habitat, as well as a high-density sea turtle nesting area. Due to the potential environmental impacts and permitting concerns, the use of a stone revetment is not recommended as it would result in a larger structure footprint. Alternatively, steel sheet pile with a concrete cap is recommended, and in potential combination with a vegetative buffer. The sheet pile would be located alongshore, have a narrower structure footprint, and result in fewer environmental impacts and permitting issues compared to the use of a stone revetment.

There is a potential to encounter obstructions during sheet pile installation; however, it would be easily constructible during a single turtle window. The steel sheet pile wall (500 linear feet) would cost approximately \$1.3 million, in the absence of geotechnical data. If the material is found to be all sand, there is a potential to save up to 20% of the estimated cost. Future maintenance may still include beach nourishment events for added protection and a monitoring plan to assess the erosion. Vegetation may also be added to help prevent scour in front of the sheet pile wall. Additional fill material between the roadway and sheet pile wall may be needed, if scour from stormwater or overtopping were to occur. Additionally, the implementation of stormwater drainage in the sheet pile wall, may need to be considered in the design.

Armoring only the hotspot has the benefit of being a more permanent structure that would also require little maintenance. This alternative would also have no known utility impacts and costs significantly less than armoring the entire roadway. Disadvantages of this alternative include the potential need for future beach nourishment and/or a vegetative buffer for additional protection, concern for vibration from

construction of the sheet pile wall impacting the roadway, and the potential for exacerbated erosion at the tie in locations of the sheet pile wall to the roadway.

5.3. Alternative 3: Armor 1,100 feet of Road Along Beachfront

In this alternative the armor discussed in Section 5.2 is extended to a length of approximately 1,100 linear feet. Similarly, this area could be protected through the use of stone, flat slab, sheet pile, vegetation, or a combination of these. However, due to environmental impacts and permitting concerns, the use of a stone revetment is not recommended as it would result in a larger structure footprint. Alternatively, steel sheet pile with a concrete cap is recommended, and in potential combination with a vegetative buffer. The sheet pile would be located alongshore, have a narrower structure footprint, and result in fewer environmental impacts and permitting concerns compared to the use of a stone revetment.

Compared to armoring only the erosion hotspot, this alternative may have more permitting issues, as the structure has a longer footprint and may disturb existing vegetation that is acting as roadway protection. In terms of constructability, there is a potential to encounter obstructions during sheet pile installation. In addition, it may be difficult to complete construction during a single turtle window. The steel sheet pile wall (1,100 linear feet) would cost approximately \$2.7 million, in the absence of geotechnical data. If the material is found to be all sand, there is a potential to save up to 20% of the estimate cost. Future maintenance may still include beach nourishment events for added protection and a monitoring plan to assess the erosion. Vegetation may also be added in vulnerable areas to help prevent scour in front of the sheet pile wall. Additional fill material between the roadway and sheet pile wall may be needed, if scour from stormwater or overtopping were to occur. Additionally, the implementation of stormwater drainage in the sheet pile wall, may need to be considered in the design.

Armoring the roadway along the entire beachfront has the benefit of being a more permanent structure that would require little maintenance and have no known utility impacts. A disadvantage of this alternative includes the disturbance of hundreds of feet of existing vegetation during installation, which would need to be replaced after construction. Vibration from construction of the sheet pile wall may also impact the roadway. In addition, there is a potential need for future beach nourishment and/or a vegetative buffer for additional protection. Lastly, extending the armoring protects an area of the roadway that is not currently at risk, creating an inclined concern for permitting and also significantly increasing the project cost.

5.4. Alternative 4: Shift Road Away from the Beach Only at the Hotspot

This alternative shifts the road to the east within the 500 foot hotspot area to protect the road during erosion events. The shift would begin approximately 600 feet to the north of the hot spot with a curve to shift to the east approximately 35 feet. The shift would move the roadway onto Sarasota County Parks and Recreation land for approximately 780 feet and would maintain the existing typical section with 12-foot-wide travel lanes and sharrow pavement markings. The roadway relocation would have significant impacts to the utility poles and underground utilities located on the east side of the road. However, no wetland impacts are anticipated and only impacts to the existing unimproved portion of the Park Trail.

There is a potential to encounter obstructions during roadway construction; however, it should be possible to construct during a single turtle window. To shift the road away from the beach only at the hotspot (1960 linear feet) would cost approximately \$1.9 million. Future maintenance may still include beach nourishment events for added protection and a monitoring plan to assess the erosion. Vegetation may also be added to help prevent scour in front of the roadway. Additionally, the implementation of stormwater drainage in the form of curb and/or inlets would be implemented to illuminate the existing roadway edge erosion.

Shifting the road only at the hotspot has the benefit of being a more permanent solution that would also require no additional maintenance above what is normally incurred for the roadway. Disadvantages of this alternative include removing hundreds of feet of existing trees and vegetation from the east side of the roadway and the potential need for future beach nourishment and/or a vegetative buffer for additional protection.

6. Stakeholder Outreach

6.1. Stakeholder Outreach

Stakeholder outreach culminated in a presentation on Monday, July 6, 2020 to present the Manasota Key Road Feasibility study to members of the Manasota Key Association. The presentation was held in person at the County BOB building on 1001 Sarasota Center Boulevard, Sarasota FL 34240 between 11:00am to 12:00pm and was also broadcast on video conference for people that could not be there in person. The presentation was attended by the Atkins staff, County Staff from Public Works, Parks, Recreation and Natural Resources, Environmental Permitting, and one representative of the Manasota Key Association.

The meeting included a 30-minute power point presentation of the project goals, purpose and conclusions. The existing site conditions were reviewed and shown in pictures from the project. The analysis process and steps used to evaluate the alternatives described in Sections 4 and 5 of this study were reviewed, and the path forward was summarized as shown below in Section 7. See Appendix F for attendees sign-in sheet.

6.2. Comments/issues/ideas/concerns raised

One issue raised during the meeting was to ensure that the new planting being proposed received the proper amount of watering for establishment. If possible, it was suggested that a temporary irrigation system be installed. Discussion included ensuring the types of plants that are used will be able to establish with minimal watering, and water would be provided by a watering truck.

The beach nourishment project was also noted to have the ability to bring in additional sand via truck haul (under the existing permit) for emergency repairs, as well as a couple re-nourishments over the next 15 years.

7. Recommendations

The recommended alternative is the No-Build alternative discussed in Section 4.2.1. With this alternative, monitoring is recommended to document the performance of the April 2020 beach nourishment and formation of any future erosion hotspots. The path forward includes using a combination of Alternatives 1 and 9 as summarized below:

- Alternative 1: "No Build"
- Beach nourishment project will monitor shoreline
- Emergency beach repair via truck haul

- Alternative 9: **Piggy-back on beach restoration**
- Additional roadside mitigation planting along the "hotspot"
- Provide additional monitoring of "hotspot"

8. Resources

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Appendices

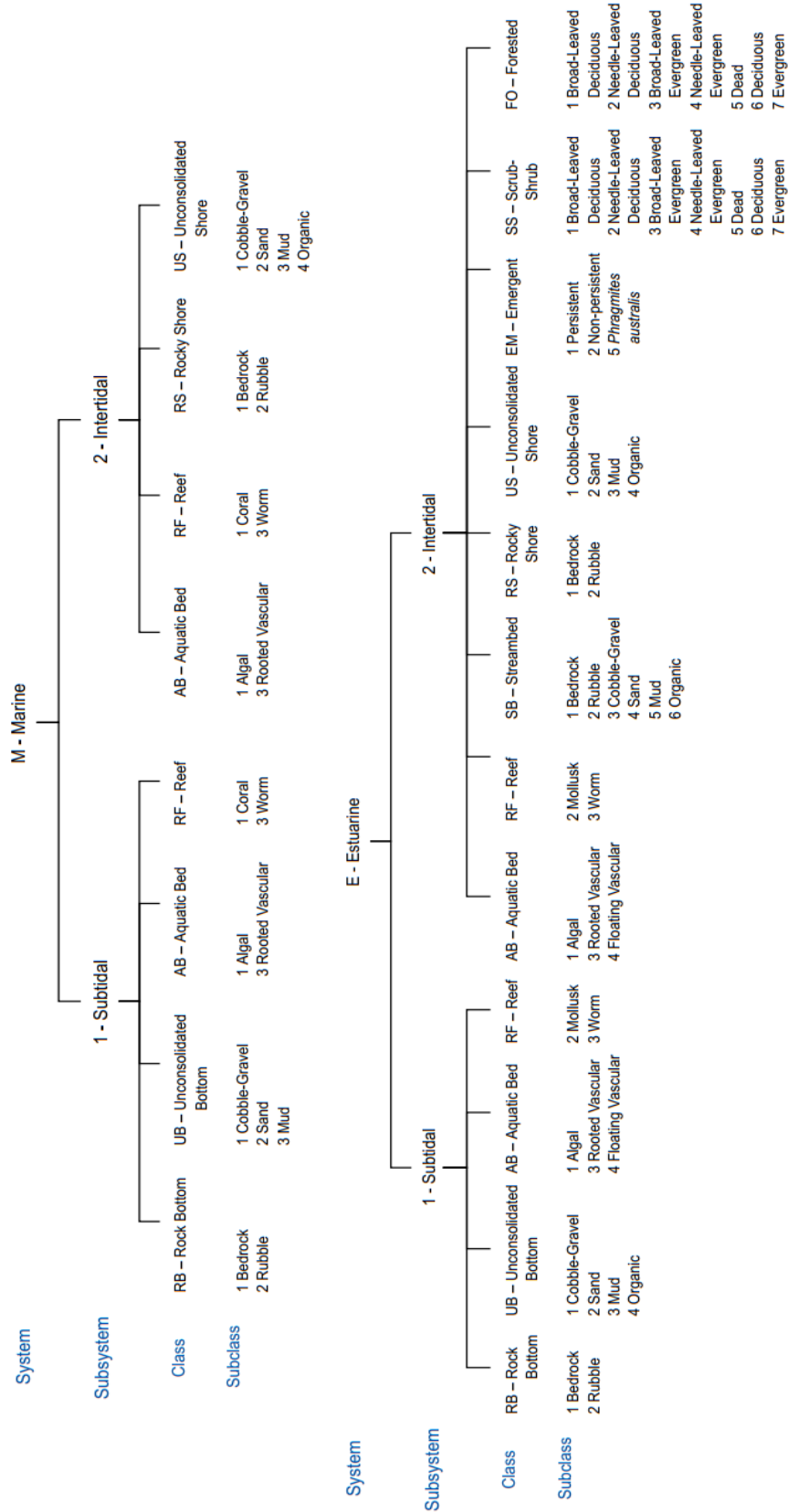
Appendix A. Wetlands

A.1. National Wetlands Inventory (NWI, 2020)



A.2. National Wetlands Inventory Classification (NWI, 2020)

WETLANDS AND DEEPWATER HABITATS CLASSIFICATION



A.3. Statewide Land Cover Land Use



A.4. FNAI CLIP Wetlands



Appendix B. FNAI Biodiversity Matrix

Status Key	
Symbol	Status
C	Concern
E	Endangered
FE	Federal Endangered
FT	Federal Threatened
LE	Listed Threatened
LT	Listen Endangered
N	None
SSC	Species of Special Concern
ST	State Threatened
T	Threatened

Likely Species: 27071				
Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
<i>Caretta caretta</i> Loggerhead Sea Turtle	G3	S3	T	FT
<i>Chelonia mydas</i> Green Sea Turtle	G3	S2S3	LE	FE
<i>Harrisia aboriginum</i> Aboriginal Prickly Apple	G1	S1	LE	E
<i>Mycteria americana</i> Wood Stork	G4	S2	LT	FT
<i>Trichechus manatus</i> West Indian Manatee	G2	S2	LE	FE

Documented Species: 27072				
Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
<i>Haliaeetus leucocephalus</i> Bald Eagle	G5	S3	N	N

Likely Species: 27072				
Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
<i>Caretta caretta</i> Loggerhead Sea Turtle	G3	S3	T	FT
<i>Chelonia mydas</i> Green Sea Turtle	G3	S2S3	LE	FE
<i>Gopherus polyphemus</i> Gopher Tortoise	G3	S3	C	ST
Mesic flatwoods	G4	S4	N	N
<i>Mycteria americana</i> Wood Stork	G4	S2	LT	FT
<i>Trichechus manatus</i> West Indian Manatee	G2	S2	LE	FE

Potential Species: 27071, 27072				
Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
<i>Acipenser oxyrinchus desotoi</i> Gulf Sturgeon	G3T2	S2	LT	FT
<i>Aphelocoma coerulescens</i> Florida Scrub-Jay	G2	S2	LT	FT
<i>Ardea herodias occidentalis</i> Great White Heron	G5T2	S2	N	N
<i>Athene cunicularia floridana</i> Florida Burrowing Owl	G4T3	S3	N	SSC
<i>Calopogon multiflorus</i> Many-flowered Grass-pink	G2G3	S2S3	N	T
<i>Centrosema arenicola</i> Sand Butterfly Pea	G2Q	S2	N	E
<i>Chamaesyce cumulicola</i> Sand-dune Spurge	G2	S2	N	E
<i>Chrysopsis floridana</i> Florida Goldenaster	G1	S1	LE	E
<i>Dermochelys coriacea</i> Leatherback Sea Turtle	G2	S2	LE	FE
<i>Drymarchon couperi</i> Eastern Indigo Snake	G3	S3	LT	FT
<i>Eragrostis pectinacea var. tracyi</i> Sanibel Lovegrass	G5T1	S1	N	E
<i>Eretmochelys imbricata</i> Hawksbill Sea Turtle	G3	S1	LE	FE
<i>Forestiera segregata var. pinetorum</i> Florida Pinewood Privet	G4T2	S2	N	N
<i>Glandularia tampensis</i> Tampa Vervain	G2	S2	N	E

Potential Species: 27071, 27072				
<i>Gopherus polyphemus</i> Gopher Tortoise	G3	S3	C	ST
<i>Grus canadensis pratensis</i> Florida Sandhill Crane	G5T2T3	S2S3	N	ST
<i>Harrisia aboriginum</i> Aboriginal Prickly Apple	G1	S1	LE	E
<i>Lechea cernua</i> Nodding Pinweed	G3	S3	N	T
<i>Lechea divaricata</i> Pine Pinweed	G2	S2	N	E
<i>Linum carteri var. smallii</i> Small's Flax	G2T2	S2	N	E
<i>Lithobates capito</i> Gopher Frog	G3	S3	N	SSC
<i>Mustela frenata peninsulæ</i> Florida Long-tailed Weasel	G5T3	S3	N	N
<i>Nemastylis floridana</i> Celestial Lily	G2	S2	N	E
<i>Pituophis melanoleucus mugitus</i> Florida Pine Snake	G4T3	S3	N	SSC
<i>Rallus longirostris scottii</i> Florida Clapper Rail	G5T3?	S3?	N	N
<i>Schizachyrium niveum</i> Scrub Bluestem	G1G2	S1S2	N	E
<i>Scrub</i>	G2	S2	N	N
<i>Selonodon mandibularis</i> Large-Jawed Cebrionid Beetle	G2G4	S2S4	N	N
<i>Setophaga discolor paludicola</i> Florida Prairie Warbler	G5T3	S3	N	N

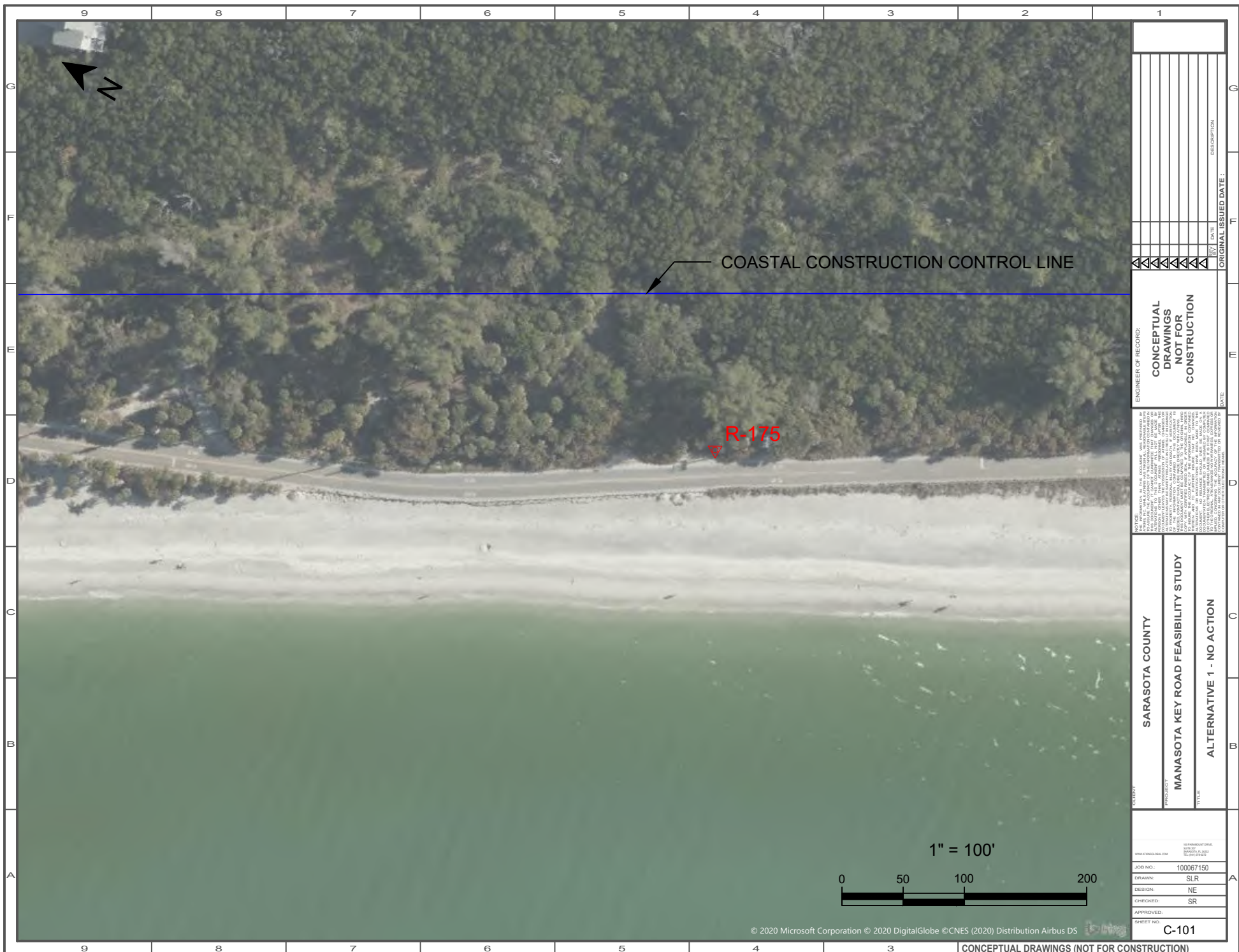
Appendix C. Alternatives Matrix

C.1. Alternatives Matrix for All Alternatives

Appendix D. Conceptual Drawings

D.1. Alternative 1 – No Build Alternative

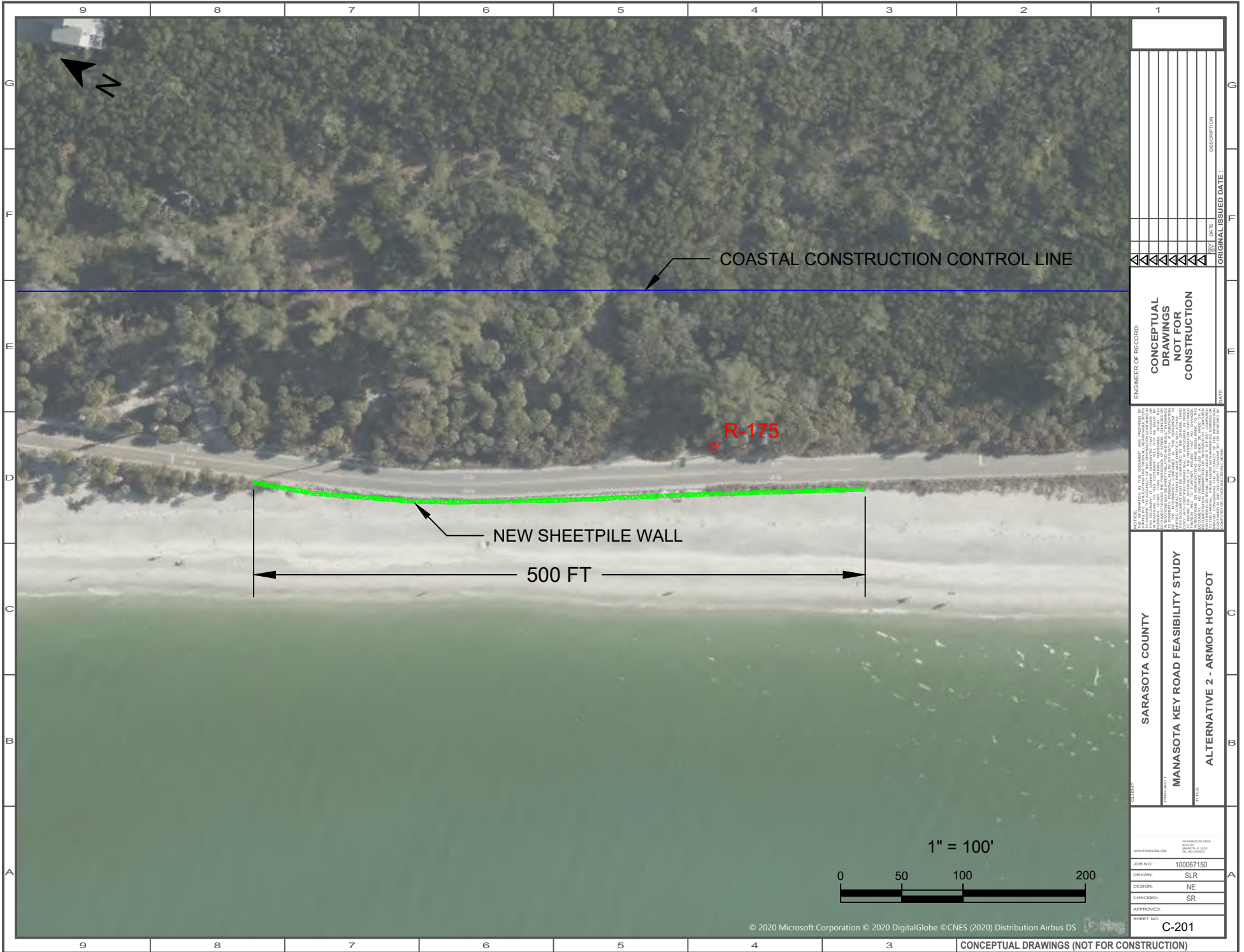
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D.2. Alternative 2 – Armor Hotspot Only

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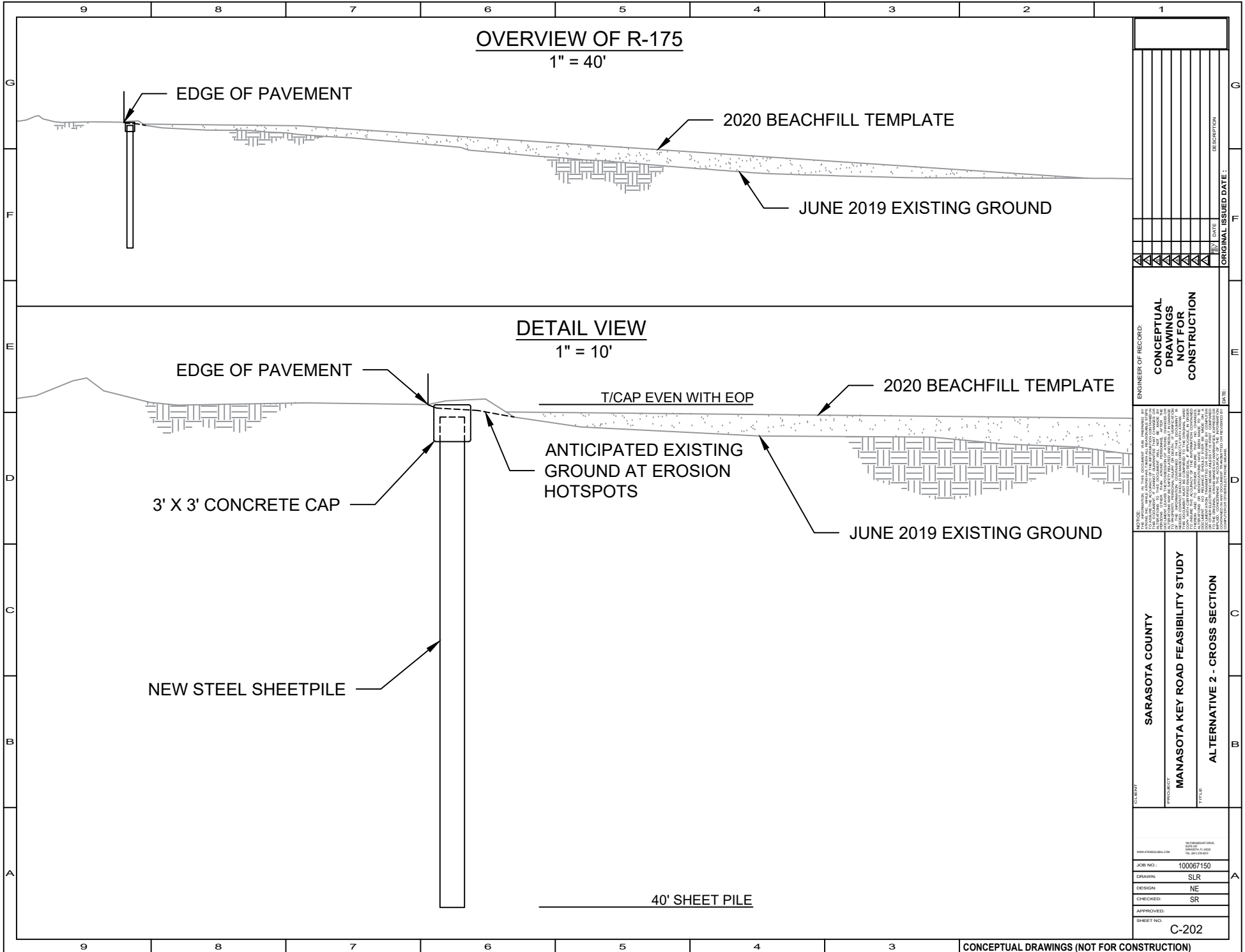


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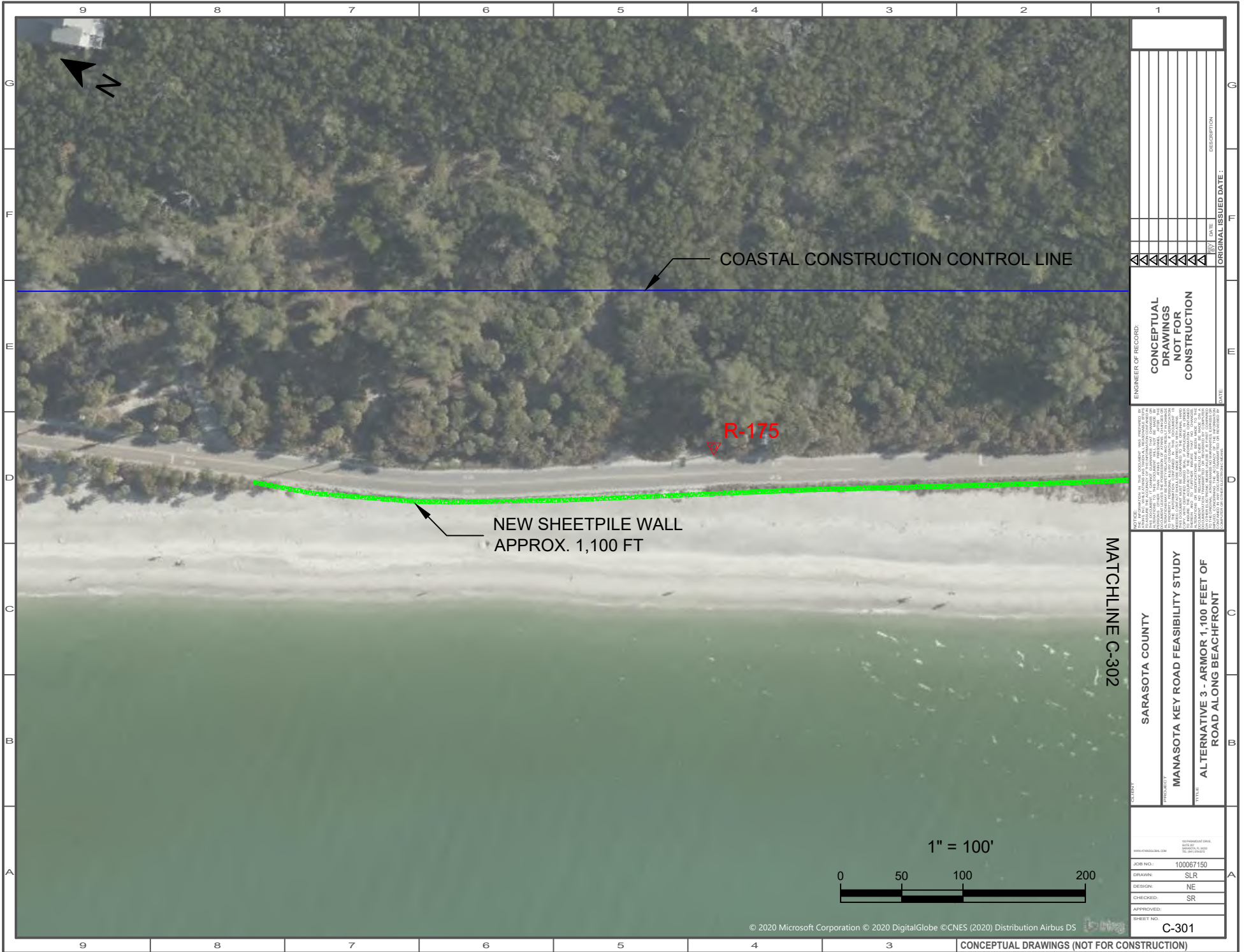
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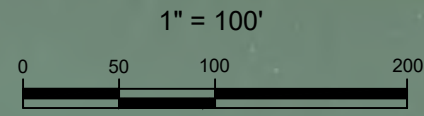


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D.3. Alternative 3 – Armor 1,100 feet of Road Along Beach Front



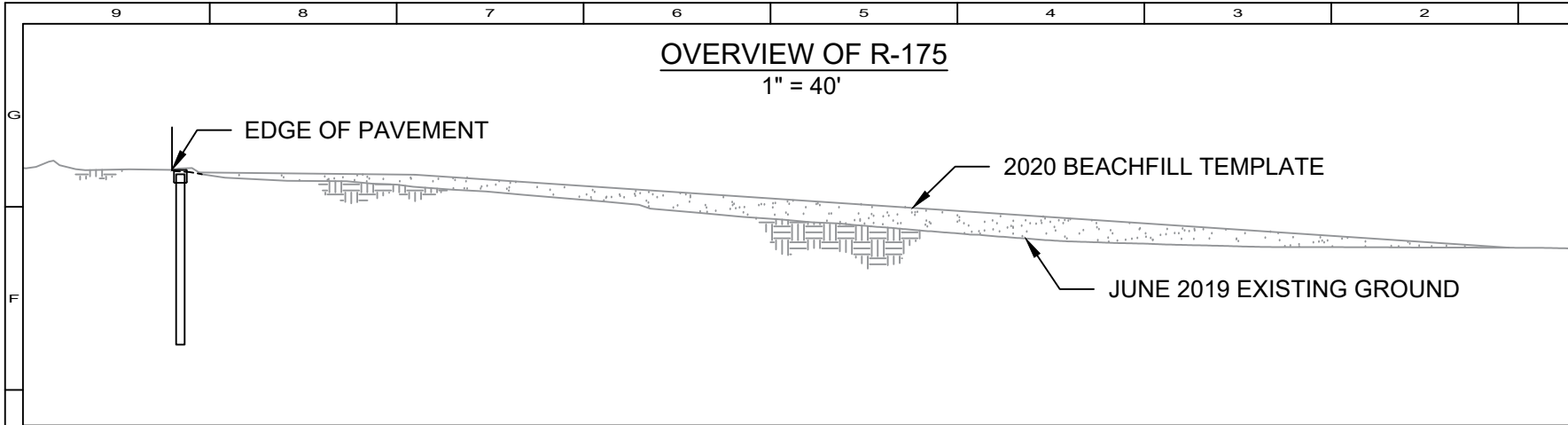
MATCHLINE C-302



SARASOTA COUNTY	
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ALTERNATIVE 3 - ARMOR 1,100 FEET OF ROAD ALONG BEACHFRONT	
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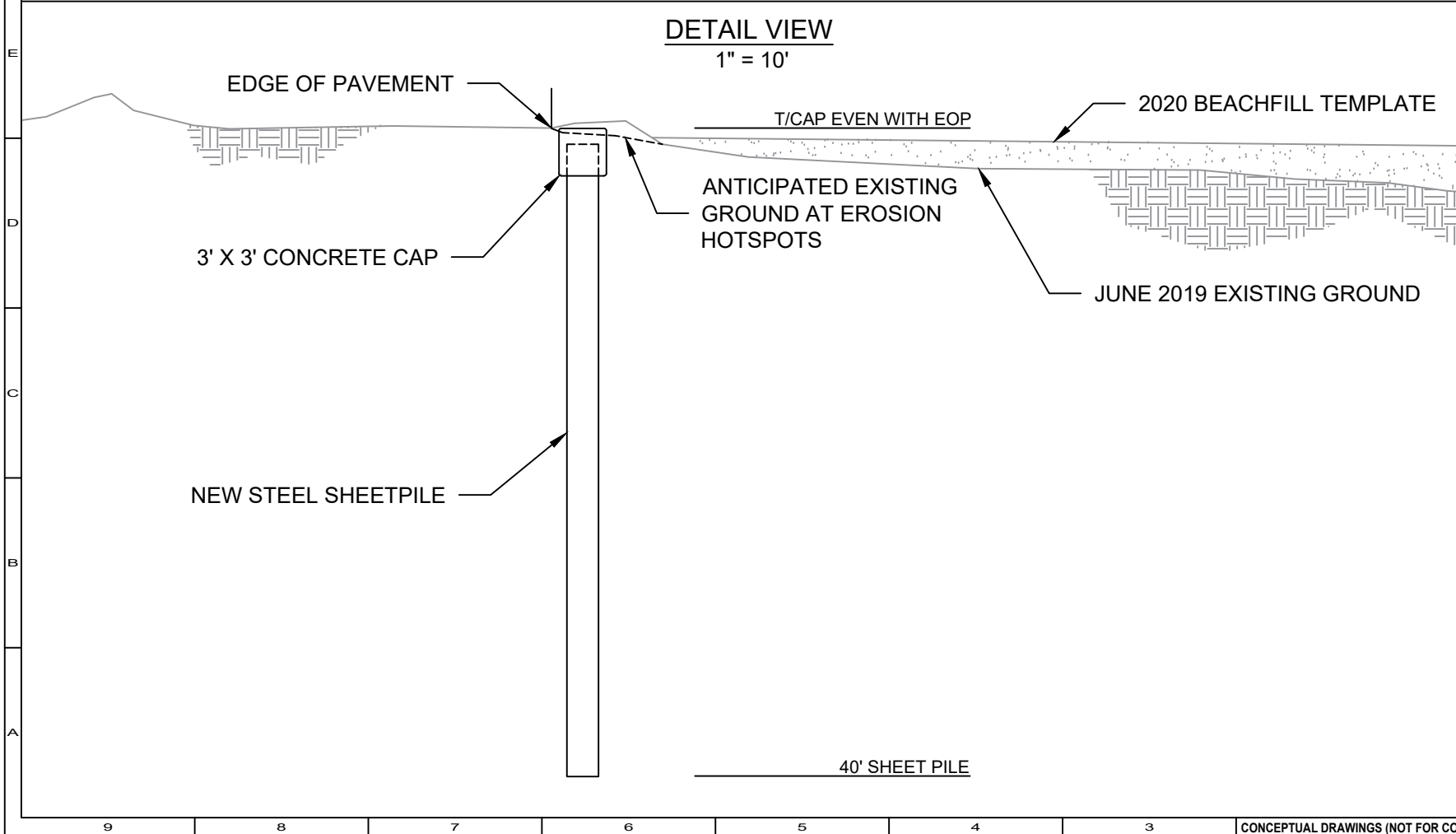
OVERVIEW OF R-175

1" = 40'



DETAIL VIEW

1" = 10'



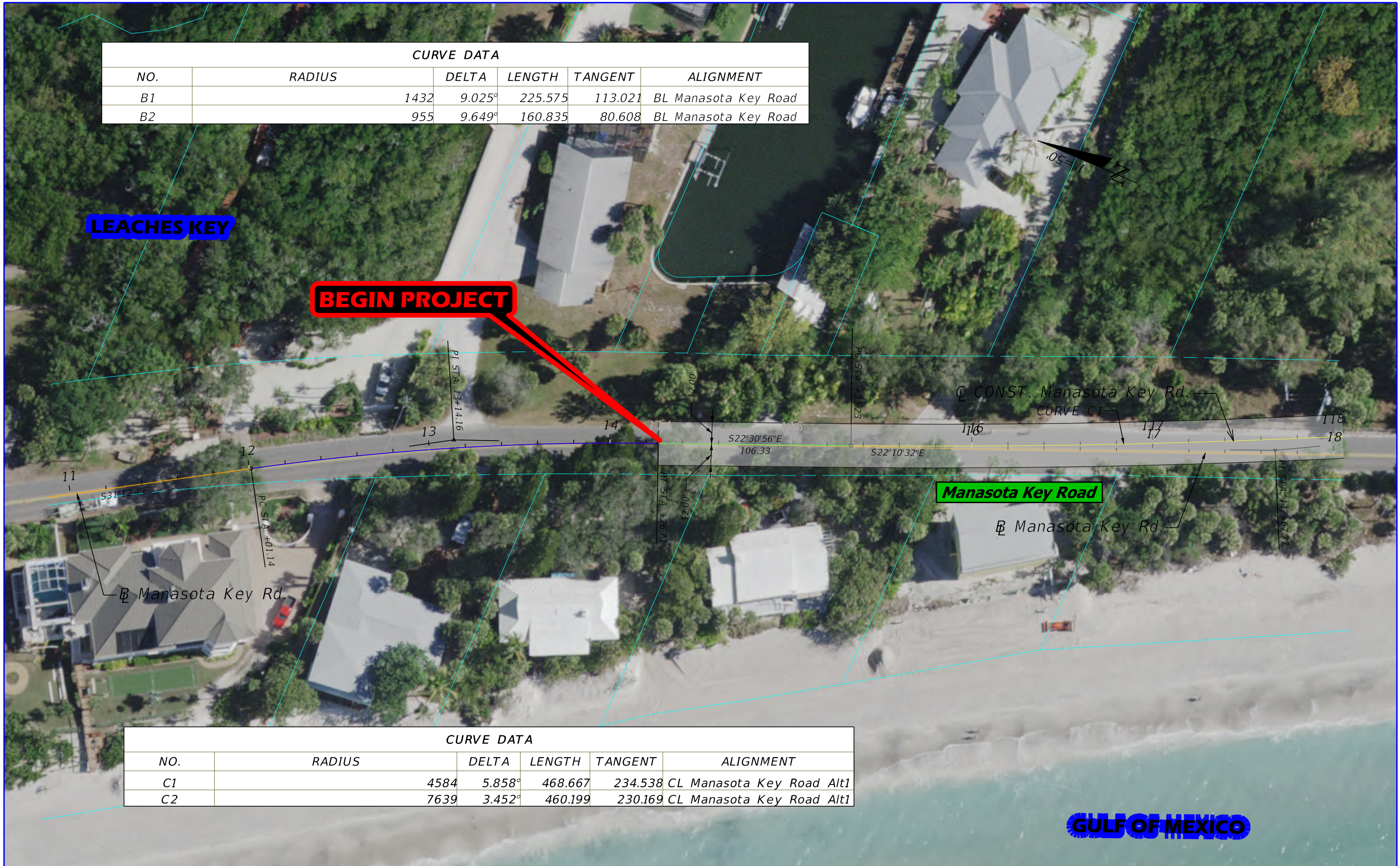
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CLIENT: SARASOTA COUNTY
 PROJECT: MANASOTA KEY ROAD FEASIBILITY STUDY
 TITLE: ALTERNATIVE 3 - CROSS SECTION
 JOB NO.: 100067150
 DRAWN: SLR
 DESIGN: NE
 CHECKED: SR
 APPROVED:
 SHEET NO.: C-303

D.4. [Alternative 4 – Shift Road Away from Beach Only at the Hotspot](#)

CURVE DATA					
NO.	RADIUS	DELTA	LENGTH	TANGENT	ALIGNMENT
B1	1432	9.025°	225.575	113.021	BL Manasota Key Road
B2	955	9.649°	160.835	80.608	BL Manasota Key Road



CURVE DATA					
NO.	RADIUS	DELTA	LENGTH	TANGENT	ALIGNMENT
C1	4584	5.858°	468.667	234.538	CL Manasota Key Road Alt1
C2	7639	3.452°	460.199	230.169	CL Manasota Key Road Alt1

GULF OF MEXICO

Manasota Key Road Feasibility Study

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	SARASOTA	

ALTERNATIVE 4
SHEET 1

SHEET NO.
PLAN 1

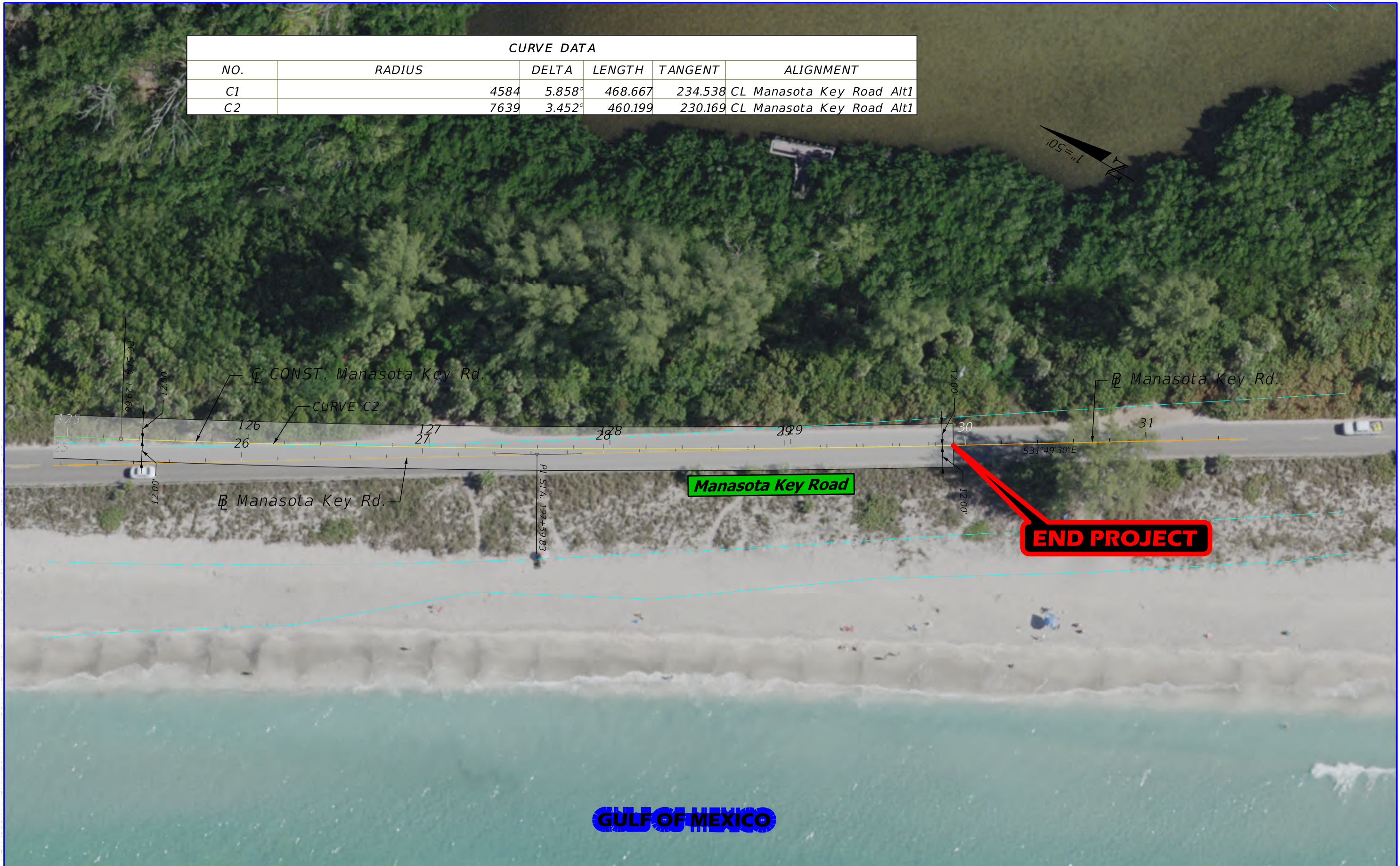
CURVE DATA					
NO.	RADIUS	DELTA	LENGTH	TANGENT	ALIGNMENT
B1	1432	9.025°	225.575	113.021	BL Manasota Key Road
B2	955	9.649°	160.835	80.608	BL Manasota Key Road

CURVE DATA					
NO.	RADIUS	DELTA	LENGTH	TANGENT	ALIGNMENT
C1	4584	5.858°	468.667	234.538	CL Manasota Key Road Alt1
C2	7639	3.452°	460.199	230.169	CL Manasota Key Road Alt1



ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	SARASOTA	

CURVE DATA					
NO.	RADIUS	DELTA	LENGTH	TANGENT	ALIGNMENT
C1	4584	5.858°	468.667	234.538	CL Manasota Key Road Alt1
C2	7639	3.452°	460.199	230.169	CL Manasota Key Road Alt1



GULF OF MEXICO

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	SARASOTA	

Appendix E. Pro/Con Alternatives Matrix and Cost Estimates

	Alternative 1 - No Action	Alternative 2 - Armor Hotspot Only	Alternative 3 - Armor Road Along Beachfront	Alternative 4 - Shift Road Away from Beach at Hotspot
Estimated Construction Cost	- \$0 at present - Future costs would include a monitoring plan (\$5,000/yr) and potential beach nourishment via truck haul (\$100,000/event)	- \$1.0M current estimate, in the absence of geotechnical data - Potential to save up to 20% if geotech shows material is all sand	- \$2.7M current estimate, in the absence of geotechnical data - Potential to save up to 20% if geotech shows material is all sand	- \$1.9M current estimate, using FDOT Cost-Per-Mile Model
Permitting	-No permitting necessary. Existing permit number 0359636-001-JC allows for truck haul treatment of erosion hot spots.	- Sheet pile wall proposed since rock armoring not likely permissible due to larger footprint and high levels of turtle nesting activity in the area - Shorter alongshore hardened structure footprint (compared to A3).	- Sheet pile wall proposed since rock armoring not likely permissible due to larger footprint and high levels of turtle nesting activity in the area - Longer alongshore hardened structure footprint (compared to A2).	- Water management permitting challenges to address water quality - No Floodplain impacts within the Coastal Zone - Would need Coastal Set Back Construction waiver
Constructability	-No construction proposed at this time.	- Potential to encounter obstructions during sheet pile installation - Easily constructible during a single turtle window	- Potential to encounter obstructions during sheet pile installation - May be difficult to complete construction in a single turtle window	- Maintenance of traffic challenges - Utility relocations required
Future Maintenance	- May need future beach nourishment events to maintain protection. - Monitoring plan should be implemented to document shoreline migration and formation of erosion hotspots following the beach nourishment.	- May still need future beach nourishment events for added protection - Monitoring plan should be implemented to assess erosion - May need vegetation to prevent scour in front of wall - Potential for need for additional fill material between pavement and structure	- May still need future beach nourishment events for added protection - Monitoring plan should be implemented to assess erosion - May need vegetation in vulnerable areas to prevent scour in front of wall - Potential for need for additional fill material between pavement and structure	- May still need future beach nourishment events for added protection - Monitoring plan should be implemented to assess erosion - May need vegetation in vulnerable areas to prevent scour on beach
Pros	- No immediate cost alternative - No immediate action needed due to 2020 beach nourishment project - Allows for additional data collection to determine best course of action over time. - No immediate concern for environmental or utility impacts.	- More permanent structure. Structure itself would require little maintenance. - No known utility impacts. - Significantly less expensive than Alternative 3 due to shorter length of sheet pile wall.	- More permanent structure. Structure itself would require little maintenance. - No known utility impacts.	- More permanent solution with road further from beach. - Roadway itself would require no additional maintenance. - Potential to improve lane width for increased safety of bicyclists. - Possible coordination with future Englewood Water District upgrades to both water and waste water facilities on Manasota Key.
Cons	- No hardened solution for protection of existing road. - Future analysis would be needed to determine best solution based on monitoring results. - Could result in restriction of public access if erosion continues and roadway is undermined. - Could require frequent beach nourishment activities and monitoring, potentially including dune construction and plantings, to maintain protection for roadway.	- May still need future beach nourishment events and/or vegetation for added protection - Vibration during construction may impact roadway - Potential for exacerbated erosion at tie-ins	- Would disturb hundreds of feet of existing vegetation during installation, which would need to be replaced after construction. - May still need future beachfill events for added protection - Vibration during construction may impact roadway - Added costs to extend structure where the road currently isn't at risk. - Extended alongshore footprint may be more difficult for permitting .	- Would remove hundreds of feet of existing vegetation and trees on the east side of the roadway. - Significant utility impacts to over head and buried utilities. - May still need future beachfill events for added protection. - Some minor impacts to the County Park Trail.

Rough Order of Magnitude Estimate - Conceptual Level - Current Est. w/ No Geotech					
Length of Wall = 1,100FT					4/27/2020
Steel Sheet Pile with Concrete Cap					
	DESCRIPTION	QTY.	UNIT	UNIT COST	TOTAL COST
	Steel Sheet Pile Wall - 40ft long sheet pile	44,000	SF	\$42.00	\$1,848,000
	Coal Tar Epoxy Coating for Steel Sheet Piling - 20 ft x 1 side only	22,000	SF	\$5.00	\$110,000
	Concrete Cap - 3ft x 3ft	367	CY	\$800.00	\$293,600
Total Base Cost					\$2,251,600
20% Contingency					\$450,320
TOTAL ESTIMATE FOR CONSTRUCTION COSTS (Including Contingency)					\$2,701,920.00
Cost per Linear foot					\$2,456.29
Notes: Total Estimate for Construction Cost includes material and installation. Does not include mobilization, bonding, insurance, etc.					
\$1,228,145.45 500 LF Wall					

Rough Order of Magnitude Estimate - Conceptual Level - Potential Savings if supported by Geotech					
Length of Wall = 1,100FT					4/27/2020
Steel Sheet Pile with Concrete Cap					
	DESCRIPTION	QTY.	UNIT	UNIT COST	TOTAL COST
	Steel Sheet Pile Wall - 30ft long sheet pile	33,000	SF	\$42.00	\$1,386,000
	Coal Tar Epoxy Coating for Steel Sheet Piling - 20 ft x 1 side only	22,000	SF	\$5.00	\$110,000
	Concrete Cap - 3ft x 3ft	367	CY	\$800.00	\$293,600
Total Base Cost					\$1,789,600
20% Contingency					\$357,920
TOTAL ESTIMATE FOR CONSTRUCTION COSTS (Including Contingency)					\$2,147,520.00
Cost per Linear foot					\$1,952.29
Notes: Total Estimate for Construction Cost includes material and installation. Does not include mobilization, bonding, insurance, etc.					
\$976,145.45 500 LF Wall					

Rough Order of Magnitude Estimate - Conceptual Level					
Length of Roadway = 1960 LF = 0.37 Miles					4/27/2020
Roadway Realignment					
	DESCRIPTION	QTY.	UNIT	UNIT COST	TOTAL COST
	New Construction Undivided 2 Lane Rural Road with 5' Paved Shoulders	0.37	MI	\$2,231,964.86	\$825,827
	Utility Pole Relocations	10	EA	\$50,000.00	\$500,000
	Englewood Water Line Relocation 12" PVC C900 DR 18	1,960	LF	\$80.00	\$156,800
Total Base Cost					\$1,482,627
25% Contingency					\$370,657
TOTAL ESTIMATE FOR CONSTRUCTION COSTS (Including Contingency)					\$1,853,283.75
Cost per Linear foot					\$945.55
Notes: Total Estimate for Construction Cost based on FDOT Long Range Estimating System - July 2019 Cost per Mile Models					

FDOT Long Range Estimating System - Production					
R4: Project Details Composite Report					
By Version					
Project: NUR2LN-R-01-BB			Letting Date: 01/2099		
Description: New Construction Undivided 2 Lane Rural Road with 5' Paved Shoulders					
District: 09	County: 99 DISTRICT/STATE WIDE				
Project Manager: Cost-Per-Mile Model					
Version 15-P Project Grand Total					\$2,231,964.86
Description: July 2019 Updates					
Pay Items	Description	Total Quantity	Unit	Weighted Avg. Unit Price	Total Amount
102-1	MAINTENANCE OF TRAFFIC	5.00			\$94,457.35
101-1	MOBILIZATION	10.00			\$198,360.44
104-10-3	SEDIMENT BARRIER	13,728.00	LF	\$1.70	\$23,337.60
104-11	FLOATING TURBIDITY BARRIER	250.00	LF	\$12.50	\$3,125.00
104-12	STAKED TURBIDITY BARRIER- NYL REINF PVC	250.00	LF	\$3.80	\$950.00
104-15	SOIL TRACKING PREVENTION DEVICE	1.00	EA	\$2,500.00	\$2,500.00
107-1	LITTER REMOVAL	1.20	AC	\$15.00	\$18.00
107-2	MOWING	1.20	AC	\$25.00	\$30.00
110-1-1	CLEARING & GRUBBING	14.12	AC	\$11,000.00	\$155,320.00
120-1	REGULAR EXCAVATION	19,360.00	CY	\$5.00	\$96,800.00
120-6	EMBANKMENT	54,493.51	CY	\$8.00	\$435,948.08
160-4	TYPE B STABILIZATION	25,813.33	SY	\$3.80	\$98,090.65
285-704	OPTIONAL BASE,BASE GROUP 04	6,253.87	SY	\$13.00	\$81,300.31
285-709	OPTIONAL BASE,BASE GROUP 09	14,467.20	SY	\$17.00	\$245,942.40
334-1-53	SUPERPAVE ASPH CONC, TRAF C, PG76-22	2,645.87	TN	\$105.00	\$277,816.35
337-7-25	ASPH CONC FC,INC BIT,FC-5,PG76-22	594.18	TN	\$135.00	\$80,214.30
400-2-2	CONC CLASS II, ENDWALLS	36.00	CY	\$1,400.00	\$50,400.00
425-1-541	INLETS, DT BOT, TYPE D,	1.00	EA	\$3,900.00	\$3,900.00
425-2-71	MANHOLES, J-7,	1.00	EA	\$7,100.00	\$7,100.00
430-173-124	PIPE CULV OPT MATL, ROUND, 24", GD	800.00	LF	\$92.00	\$73,600.00
430-175-130	PIPE CULV, OPT MATL, ROUND, 30"S/CD	168.00	LF	\$110.00	\$18,480.00
430-175-142	PIPE CULV, OPT MATL, ROUND, 42"S/CD	56.00	LF	\$150.00	\$8,400.00
430-175-160	PIPE CULV, OPT MATL, ROUND, 60"S/CD	200.00	LF	\$300.00	\$60,000.00
430-984-129	MITERED END SECT, OPTIONAL RD, 24" SD	40.00	EA	\$1,600.00	\$64,000.00

FDOT Long Range Estimating System - Production					
R4: Project Details Composite Report					
By Version					
Project: NUR2LN-R-01-BB			Letting Date: 01/2099		
Description: New Construction Undivided 2 Lane Rural Road with 5' Paved Shoulders					
District: 09	County: 99 DISTRICT/STATE WIDE				
Project Manager: Cost-Per-Mile Model					
Version 15-P Project Grand Total					\$2,231,964.86
Description: July 2019 Updates					
550-10-220	FENCING, TYPE B, 5.1-6.0', STANDARD	1,180.00	LF	\$17.00	\$20,060.00
550-60-234	FENCE GATE, TYP B, SLIDE/CANT, 18.1-20' OPEN	1.00	EA	\$1,800.00	\$1,800.00
570-1-2	PERFORMANCE TURF, SOD	16,250.67	SY	\$2.80	\$45,501.88
700-1-11	SINGLE POST SIGN, F&I GM,	2.00	AS	\$340.00	\$680.00
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	20.00	AS	\$1,200.00	\$24,000.00
700-2-11	MULTI- POST SIGN, F&I GM,	2.00	AS	\$2,300.00	\$4,600.00
706-3	RETRO-REFLECTIVE/RAISED PAVEMENT MARKERS	135.00	EA	\$3.50	\$472.50
710-11-111	PAINTED PAVT MARK, STD, WHITE, SOLID, 6"	4.00	NM	\$980.00	\$3,920.00
710-11-131	PAINTED PAVT MARK, STD, WHITE, SKIP, 6"	2.00	GM	\$420.00	\$840.00
999-25	INITIAL CONTINGENCY AMOUNT (DO NOT BID)	1.00	LS	\$50,000.00	\$50,000.00
Project Unknowns			0.00	%	\$0.00
Design/Build			0.00	%	\$0.00
Version 15-P Project Grand Total					\$2,231,964.86

Appendix F. Stakeholder Meeting Sign In Sheet



Visitors & Staff
Please Sign In

Manasota Key Road Feasibility Study - Presentation
BOB Conference Room #1
July 6, 2020 at 11:00am

PLEASE PRINT	Name	Representing	Phone	e-mail
	Mark Stroik	Atkins	(941) 225-4826	Mark.Stroik@atkinsglobal.com
*	John McIntyre	MKA member & Resident	(941) 321-5656	johnmc1645@gmail.com
	Richard Upregratt	Atkins	941-926-6598	Richard.Upregratt@atkinsglobal.com
	Karl Stolae	Sarasota County	941-861	KStolae@scgov.net
	Paula Wiggins	"	"	
	Joe Kraus	"	"	
	Larry May	"	"	
	Scott Morano	"	"	
	Spencer Anderson	"	"	

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