



TECHNICAL MEMORANDUM

To: City of Tarpon Springs Planning & Zoning Staff

From: Matt Brosman, P.E., CFM (*see attached résumé*)
Kimley-Horn and Associates, Inc.

Date: October 14, 2021

Subject: Anclote Harbor
Future Operation and Potential Adaptation Needs Analysis

As requested by Tarpon Springs staff in condition 8 of the most recent Technical Review Committee comments, Kimley-Horn has prepared an analysis of the future operating condition and potential adaptation needs of the proposed Anclote Harbor project. The proposed project consists of the development of 64-acre site located in Tarpon Springs, Florida. The project proposes five multiple-family residential buildings, a clubhouse, associated parking, stormwater system, and utilities. All elevations in this report refer to the North American Vertical Datum of 1988 (NAVD 88) unless otherwise stated.

SUMMARIZED CONCLUSION

The results of this analysis show the proposed development's stormwater and wastewater systems will not require additional operation or adaptation measures to function as designed in the NOAA 2050 Intermediate-High projection scenario. The following sections describe the data review performed to develop this conclusion.

SITE CHARACTERISTICS

Existing Conditions

The site is currently vacant with open space and wooded areas. In its existing condition, stormwater runoff in the northern portion of the site sheet flows directly to the Anclote River. The southern portion of the site drains to an existing wetland.

Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps released in 2021 for Pinellas County show the FEMA Base Flood Elevation (BFE) at the project site to be 8.0'. The FEMA BFE refers to the current conditions 100-year flood elevation, to which the NOAA 2050 Intermediate-High sea level rise projections can then be applied to estimate the Base Flood in future conditions.

The FEMA Flood Insurance Rate Maps are based on the revised 2021 Flood Insurance Study for Pinellas County. The Flood Insurance Study for Pinellas County considers the current-condition flood risk due to combined riverine and coastal flooding effects throughout the County.

Proposed Conditions

This project proposes the construction of five multiple-family residential buildings, a clubhouse, associated parking, and stormwater system. The onsite stormwater will be managed by two interconnected dry retention ponds and an approximately 4-acre wet pond.

The ponds will provide stormwater treatment and attenuation in accordance with criteria established in the Southwest Florida Water Management District (SWFWMD) Applicant’s Handbook and related Florida Administrative Code requirements. Per the pending SWFWMD permit, the wet pond rises to an elevation of approximately 5.9’, and the dry retention areas stage to elevations ranging between 7.0’ and 7.5’, during the 25-year, 24-hour storm event.

After required treatment is achieved, the project discharges into the wetland to the south of the property. The wet stormwater pond and dry retention areas are also designed to safely overtop into the Anclote River prior to inundating the paved, regularly occupied portions of the site during a 100-year, 24-hour storm event on the site.

Proposed elements of the site are elevated to varying degrees. A summary of proposed site element elevations has been provided below in Table 1.

Table 1: Proposed Site Element Elevations

Proposed Element	Elevation
Wet Pond Control Elevation	3.7’
Bottom of Dry Retention Area	5.5’
Top of Dry Retention Areas	8.0’
Top of Wet Pond	8.0’
Minimum Parking Lot Elevation	8.6’
Sanitary Sewer Lift Station	10.0’
Finished Floor Elevation of all habitable structures	11.0’

POTENTIAL ADAPTATION NEEDS ANALYSIS

Determination of Future Conditions BFE

FEMA Flood Insurance Rate Maps at the project site, published in August 2021, indicate a Base Flood Elevation associated with coastal risks at the site of 8.0’. FEMA FIRMs consider flood risk at the date of publication.

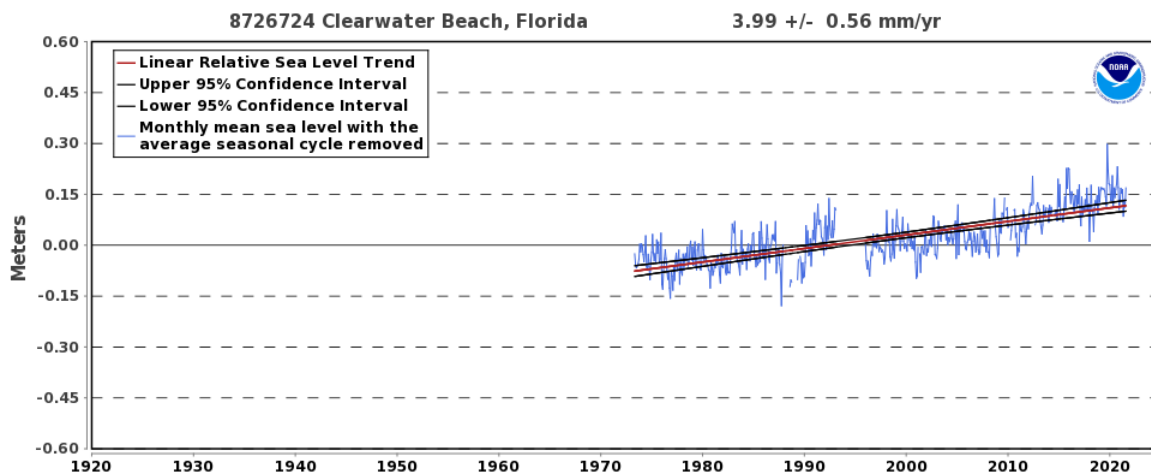
The nearest NOAA tidal gauge to the project site is station number 8726724 in Clearwater Beach. The 2017 NOAA Intermediate High sea level rise projection for the Clearwater Beach coastal gauge projects 2.05 feet of sea level rise over Mean Sea Level (MSL), as established by the 1983-2001 tidal epoch, by the year 2050. The published 2017 NOAA sea level rise curve dataset for the Clearwater Beach gauge relative to 1992 MSL is provided below in Table 2.

Table 2: 2017 NOAA Sea Level Rise Projections for Clearwater Beach relative to 1992 Mean Sea Level

Year	SLR Scenario (elevations above 1992 MSL)						
	VLM	Low	Int-Low	Intermediate	Int-High	High	Extreme
2000	0.08	0.08	0.08	0.08	0.08	0.08	0.08
2010	0.11	0.21	0.25	0.31	0.38	0.44	0.44
2020	0.14	0.38	0.44	0.58	0.71	0.8	0.87
2030	0.16	0.51	0.61	0.84	1.07	1.3	1.43
2040	0.19	0.67	0.8	1.17	1.49	1.89	2.15
2050	0.22	0.87	1.03	1.53	2.05	2.64	3.04
2060	0.25	1	1.23	1.95	2.74	3.56	4.22
2070	0.27	1.17	1.43	2.41	3.5	4.64	5.53
2080	0.3	1.3	1.63	2.94	4.32	5.82	7.04
2090	0.33	1.36	1.76	3.43	5.23	7.14	8.74
2100	0.36	1.49	1.92	3.95	6.19	8.55	10.58

Review of NOAA Relative Sea Level Trend data for the Clearwater Beach coastal gauge indicates 3.99 millimeters per year of observed sea level rise has occurred during the current tidal epoch. Between 1992 and 2021, this has resulted in approximately 0.38 feet of sea level rise over MSL. Observed sea level rise trend data for the Clearwater Beach NOAA gauge is provided below in Figure 1.

Figure 1: Observed sea level rise trend data for the Clearwater Beach NOAA gauge



Per the 2017 NOAA Sea Level Rise Intermediate-High projection for Clearwater Beach, a total of 2.05 feet of sea level rise is anticipated to occur between 1992 and 2050. Of that 2.05 feet, approximately 0.38 feet has occurred between 1992 and 2021. Therefore, the 2017 NOAA Intermediate High projects the remaining 1.67 feet of sea level rise to occur between 2021 and 2050.

Applying the aforementioned 1.67' of sea level rise to the current FEMA BFE of 8.0' indicates the BFE due to coastal risks at the site may rise to 9.67' by the year 2050.

Review of Proposed Site Elements

Review of the proposed site elements indicate most of the designed site elements, including the sanitary sewer lift station and all habitable structures, are to be elevated above elevation 9.67'. A comparison table of the proposed site elevations and the potential future BFE with 2050 sea level rise applied is provided below in Table 3.

Table 3: Comparison table of proposed site elements and potential 2050 future BFE

Proposed Element	Elevation (NAVD 88)	Potential 2050 BFE (NAVD 88)
Minimum Parking Lot Elevation	8.6'	9.67'
Sanitary Sewer Lift Station	10.0'	9.67'
Finished Floor Elevation of all proposed habitable structures	11.0'	9.67'

The proposed stormwater system is designed to be inundated during the coastally influenced Base Flood in existing and future conditions. Per the pending SWFWMD permit, the design riverine tailwater of the stormwater system is 0.79', which matches the 100-year 24-hour peak stage of Node NA00000 in the SWFWMD-adopted Anclote West watershed model. Applying 1.67' of sea level rise to this tailwater condition results in a future tailwater of 2.46'. This future tailwater condition is below the control elevation of the proposed wet pond. Therefore, no change in the modeled condition of the stormwater system is anticipated due to projected 2050 sea level rise.

A review of the proposed parking areas indicates less than 10% of the proposed parking spaces may be inundated by between 6" and 12" of floodwaters during the coastally influenced Base Flood in future conditions. **In addition, the sanitary sewer lift station and all habitable structures are elevated above the FEMA Base Flood Elevation plus the 2017 NOAA 2050 Intermediate-High sea level rise projections.**

CONCLUSION

Kimley-Horn has reviewed the proposed development within the context of regionally adopted sea level rise projections and the FEMA Base Flood Elevation adopted in August 2021. This review shows the 2017 NOAA Intermediate-High Sea Level Rise projection, when applied to the FEMA Base Flood Elevation, reveals a potential future Base Flood Elevation at the project site of 9.67'. **The proposed sanitary sewer lift station and all habitable structures are elevated above the FEMA Base Flood Elevation plus 2017 NOAA 2050 Intermediate-High sea level rise projections.**

Florida Building Code requires most buildings, including the proposed buildings, to be elevated one foot above the FEMA Base Flood Elevation. The proposed habitable structures are to be elevated three feet above the current FEMA Base Flood Elevation at the project site. Based on the data in this review, the proposed project will provide housing within Tarpon Springs elevated above the 100-year FEMA Base Flood Elevation, in both current and projected 2050 future conditions.