



TAYLOR ENGINEERING, INC.

City of Venice Vulnerability Assessment Update

March 12, 2024

WA #2022-03ENG

DEP Agreement: 22PLN97



Michael DelCharco, P.E., CFM

Agenda

- Scope of Work
- Data and Methodologies Used
- Results
- Focus Areas
- Conclusions

Primary Focus: Update Data

- Complete a City-wide VA that satisfies FDEP Resilient Florida Program guidelines and State Statutes (F.S. 380.093)
- Update City's VA with new NOAA 2017 Sea Level Rise Curves
- Update City's VA with new LiDAR topographic data

Primary Focus: Update Data

- Task 1 – Update Critical Assets Maintained by City
- Task 2 – Exposure Analysis
 - Assess and map the flood hazards
 - Tidal flooding, storm surge, sea level rise
- Task 3 – Sensitivity Analysis
 - How bad is the flooding? How much damage does that do to each asset type?
- Task 4 – Public Presentation
- Task 5 – Final Vulnerability Assessment

Task 1 – Past Vulnerability Assessments

- February 2017 – Sea Level Rise in Sarasota County Vulnerability Assessment
- October 2017 – Embracing Our Future: Sarasota Bay Estuary Program Climate Vulnerability Assessment
- January 2019 – City of Venice - Preliminary Vulnerability Assessment – Flooding Assessment – Technical Memorandum
- April 2021 – City of Venice, Florida Resilience Plan
- May 2021 – Sarasota County Coastal Resilience – Baseline Coastal Analysis Task 3 Deliverable: Vulnerability Assessment of Coastal Infrastructure
- April 2023 – Sarasota Manatee MPO Resiliency/Vulnerability Assessment Study

Task 1 – Critical Assets

Build Community Resilience | City of Venice Critical Asset Map

Instructions

CITY OF VENICE CRITICAL ASSET INVENTORY

Open in Map Viewer Classic Sign In

Legend

- COV Boundary
- CRITICAL COMMUNITY & EMERGENCY FACILITIES**
- Affordable Public Housing
- Community Centers
- Disaster Recovery Centers
- Fire Stations
- Health Care Facilities
- Hospitals
- Law Enforcement Facilities

University of South Florida, Sarasota County GIS, FDEP, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA, USFWS | Taylor Engineering, Inc

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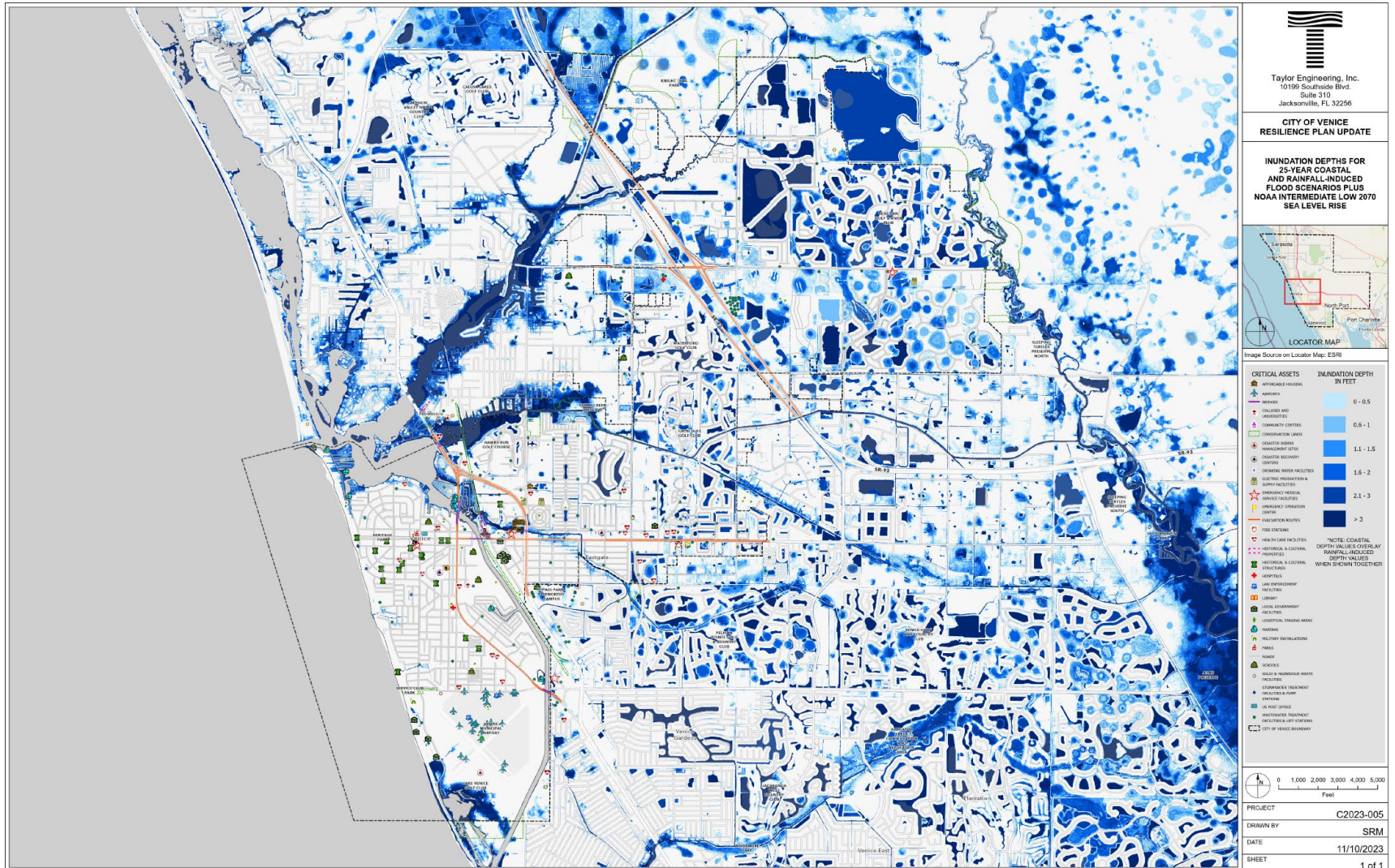
Task 2 – Flood Hazard/Exposure Analysis

Taylor Engineering evaluated 30 scenarios for this Exposure Analysis:

- Tidal flooding scenarios based on Mean Higher High Water (MHHW)
- Two storm surge flooding scenarios (25- and 100-yr)
- Three rainfall-induced flooding
- Coupled with 4 SLR scenarios

Flood Scenario Type	Current Conditions	2040 Int-Low	2040 Int-High	2070 Int-Low	2070 Int-High
Tidal Flooding (MHHW)	X	X	X	X	X
25-Year Storm Surge Flooding	X	X	X	X	X
100-Year Storm Surge Flooding	X	X	X	X	X
25-Year Rainfall Induced Flooding	X	X	X	X	X
100-Year Rainfall Induced Flooding	X	X	X	X	X
500-Year Rainfall Induced Flooding	X	X	X	X	X

Task 2 – Flood Hazard/Exposure Analysis



Task 3 – Sensitivity Analysis

1. Critical Assets
 - a) Critical Community and Emergency Facilities
 - b) Critical Infrastructure
 - c) Natural, Cultural, and Historic resources
 - d) Transportation and Evacuation Routes
2. Depth of Flooding
 - a) How much flooding does how much damage?

Task 3 – Sensitivity Analysis

Critical Asset Type	Critical Community & Emergency Facilities	Critical Infrastructure	Natural, Cultural, and Historic Resources		Transportation & Evacuation Routes	
			Buildings	Parcels	Bus Terminals & Marinas	Roadway Intersections
Low	< 3"	< 3"	< 3"	< 25%	< 3"	< 6" of centerline of roadway
Medium	3" – 15"	3" – 18"	3" – 15"	25% – 50%	3" – 15"	0" - 6" above centerline of roadway
High	> 15"	> 18"	> 15"	> 50%	> 15"	> 6" above centerline of roadway

Task 3 – Sensitivity Analysis

Overall Risk Assessment	Land Area Inundated (% of census tract or neighborhood)	Critical Assets Affected (% of total assets or within each asset category)
None	0%	0%
Low	<25%	<25%
Medium	25-50%	25-50%
High	50-75%	50-75%
Extreme	>75%	>75%

Task 3 – Sensitivity Analysis - Coastal

Coastal Threat Summary

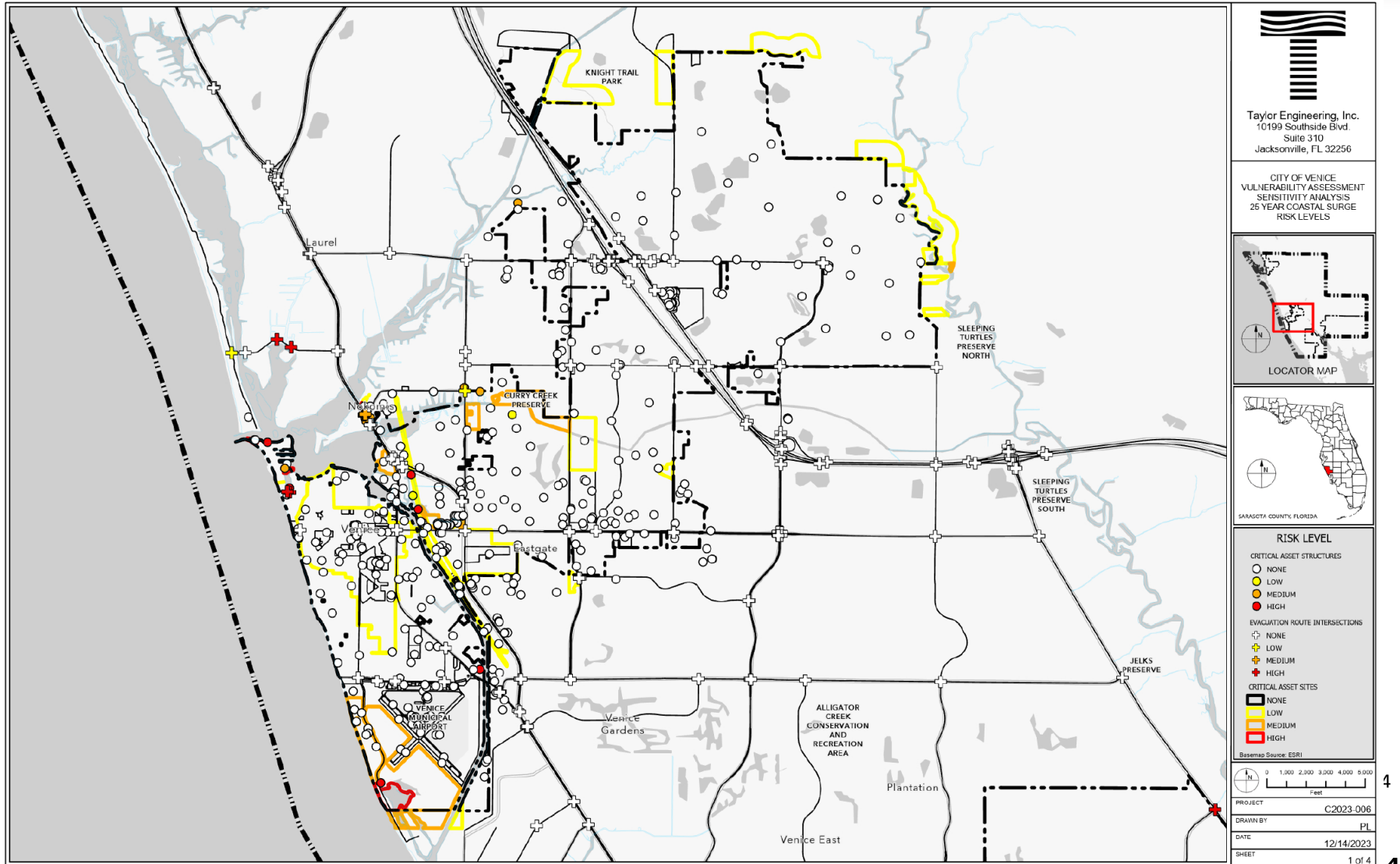
Asset Group	Asset Type	Asset Total	Assets Impacted by Flood Scenario															
			Tidal	Tidal + 2040 Intermediate Low	Tidal + 2040 Intermediate High	Tidal + 2070 Intermediate Low	Tidal + 2070 Intermediate High	25 Year	25 Year + 2040 Intermediate Low	25 Year + 2040 Intermediate High	25 Year + 2070 Intermediate Low	25 Year + 2070 Intermediate High	100 Year	100 Year + 2040 Intermediate Low	100 Year + 2040 Intermediate High	100 Year + 2070 Intermediate Low	100 Year + 2070 Intermediate High	
Critical Community and Emergency Facilities	Affordable Public Housing Colleges and Universities Community Centers Correctional Facilities Disaster Recovery Centers Emergency Operation Centers Fire Stations Health Care Facilities Hospitals Law Enforcement Facilities Local Government Facilities Risk Shelters Schools State Government Facilities US Post Office	68	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (1.5%)	1 (1.5%)	1 (1.5%)	1 (1.5%)	1 (1.5%)	1 (1.5%)	1 (1.5%)	9 (13.2%)
Critical Infrastructure	Communication Facilities Disaster Debris Management Sites Drinking Water Facilities Electric Production and Supply Facilities Fuel Storage Military Installations Solid and Hazardous Waste Facilities Stormwater Treatment Facilities and Pump Stations Wastewater Treatment Facilities and Lift Stations	288	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	3 (1.0%)	13 (4.5%)	17 (5.9%)	23 (8.0%)	23 (8.0%)	45 (15.6%)	36 (12.5%)	42 (14.6%)	47 (16.3%)	47 (16.3%)	47 (16.3%)	76 (26.4%)
Natural, Cultural, and Historical Resources	Historic Structures Libraries	27	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (3.7%)	1 (3.7%)	1 (3.7%)	1 (3.7%)	3 (11.1%)
Transportation and Evacuation Routes	Airports Marinas	16	1 (6.3%)	1 (6.3%)	1 (6.3%)	1 (6.3%)	3 (18.8%)	3 (18.8%)	4 (25.0%)	5 (31.3%)	5 (31.3%)	7 (43.8%)	7 (43.8%)	7 (43.8%)	7 (43.8%)	7 (43.8%)	7 (43.8%)	7 (43.8%)
	Evacuation Routes	80	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (2.5%)	7 (8.8%)	7 (8.8%)	8 (10.0%)	10 (12.5%)	15 (18.8%)	15 (18.8%)	15 (18.8%)	16 (20.0%)	16 (20.0%)	16 (20.0%)	20 (25.0%)
Site Analysis*	Airport Sites Cemeteries City Owned Parcels Disaster Debris Management Sites Historic Sites/Districts Natural Areas and Parks	159	31 (19.5%)	31 (19.5%)	33 (20.8%)	33 (20.8%)	35 (22.0%)	43 (27.0%)	45 (28.3%)	47 (29.6%)	48 (30.2%)	56 (35.2%)	55 (34.6%)	57 (33.8%)	59 (37.1%)	62 (39.0%)	62 (39.0%)	79 (49.7%)

Task 3 – Sensitivity Analysis – Rainfall-Induced

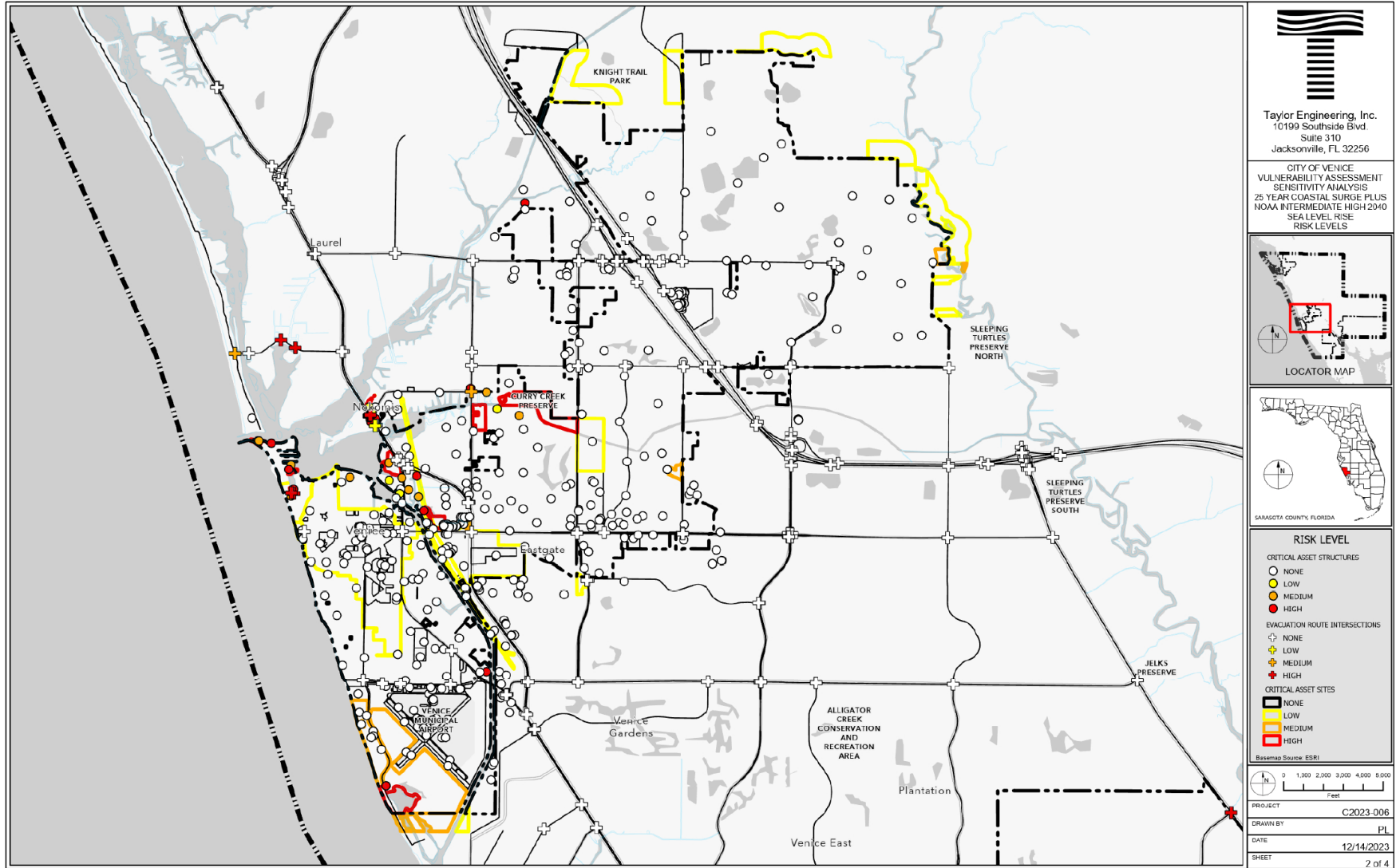
Rainfall-Induced Threat Summary

Asset Group	Asset Type	Asset Total	Assets Impacted by Flood Scenario															
			25 Year	25 Year + 2040 Intermediate Low	25 Year + 2040 Intermediate High	25 Year + 2070 Intermediate Low	25 Year + 2070 Intermediate High	100 Year	100 Year + 2040 Intermediate Low	100 Year + 2040 Intermediate High	100 Year + 2070 Intermediate Low	100 Year + 2070 Intermediate High	500 Year	500 Year + 2040 Intermediate Low	500 Year + 2040 Intermediate High	500 Year + 2070 Intermediate Low	500 Year + 2070 Intermediate High	
Critical Community and Emergency Facilities	Affordable Public Housing Colleges and Universities Community Centers Correctional Facilities Disaster Recovery Centers Emergency Operation Centers Fire Stations Health Care Facilities Hospitals Law Enforcement Facilities Local Government Facilities Risk Shelters Schools State Government Facilities US Post Office	38	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (2.6%)	1 (2.6%)	1 (2.6%)	1 (2.6%)	1 (2.6%)	2 (5.3%)	2 (5.3%)	2 (5.3%)	2 (5.3%)
Critical Infrastructure	Communication Facilities Disaster Debris Management Sites Drinking Water Facilities Electric Production and Supply Facilities Fuel Storage Military Installations Solid and Hazardous Waste Facilities Stormwater Treatment Facilities and Pump Stations Wastewater Treatment Facilities and Lift Stations	231	8 (3.5%)	13 (5.6%)	13 (5.6%)	14 (6.1%)	16 (6.9%)	14 (6.1%)	30 (13.0%)	30 (13.0%)	36 (15.6%)	40 (17.3%)	30 (13.0%)	61 (26.4%)	62 (26.8%)	67 (29.0%)	69 (29.9%)	69 (29.9%)
Natural, Cultural, and Historical Resources	Historic Structures Libraries	3	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Transportation and Evacuation Routes	Airports Marinas	0																
	Evacuation Routes	67	2 (3.0%)	3 (4.5%)	3 (4.5%)	3 (4.5%)	6 (9.0%)	3 (4.5%)	11 (16.4%)	11 (16.4%)	12 (17.9%)	13 (19.4%)	10 (14.9%)	15 (22.4%)	15 (22.4%)	15 (22.4%)	15 (22.4%)	
Site Analysis*	Airport Sites Cemeteries City Owned Parcels Disaster Debris Management Sites Historic Sites/Districts Natural Areas and Parks	64	46 (71.9%)	49 (76.6%)	50 (78.1%)	50 (78.1%)	53 (82.8%)	48 (75.0%)	53 (82.8%)	56 (87.5%)	56 (87.5%)	56 (87.5%)	51 (79.7%)	56 (87.5%)	56 (87.5%)	56 (87.5%)	58 (90.6%)	

Task 3 – Sensitivity Analysis – 25-yr

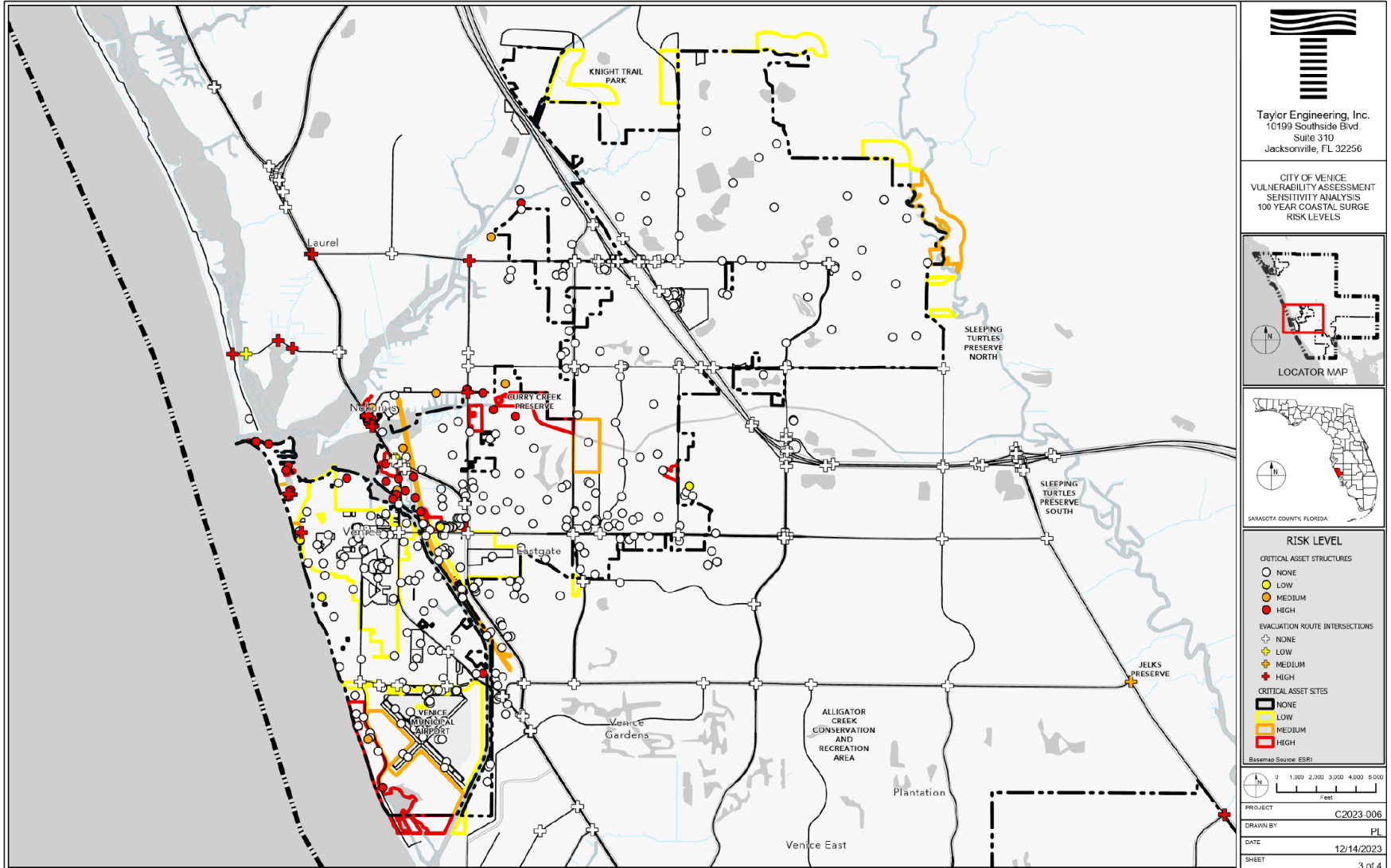


Task 3 – Sensitivity Analysis – 25-yr + 2040 IH SLR

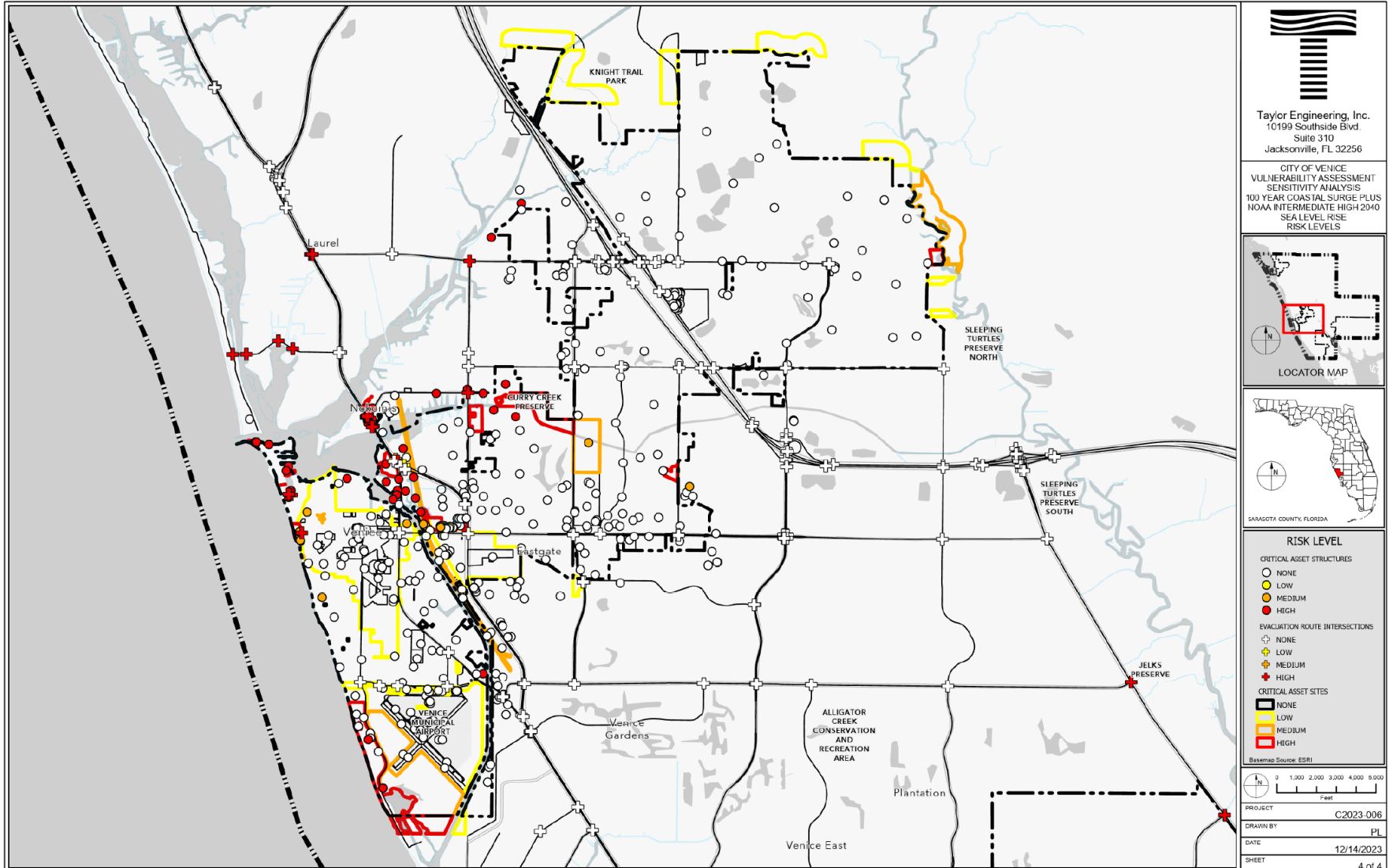


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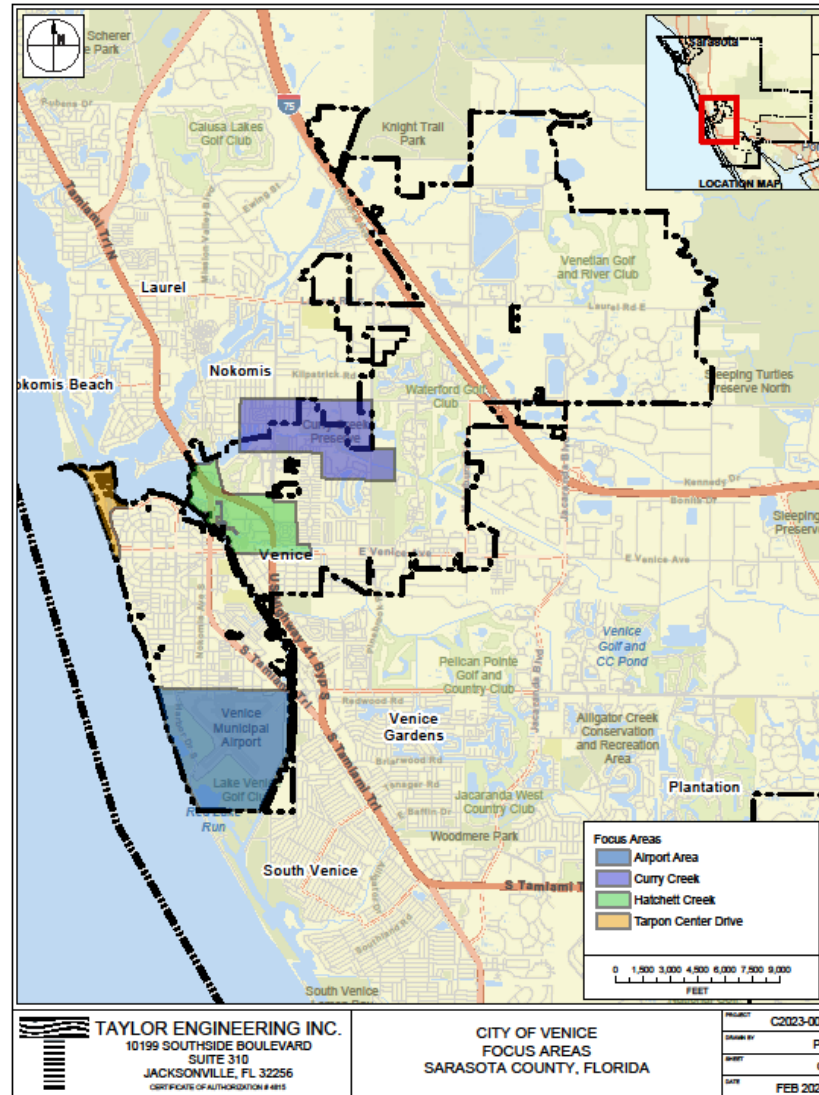
Task 3 – Sensitivity Analysis – 100-yr



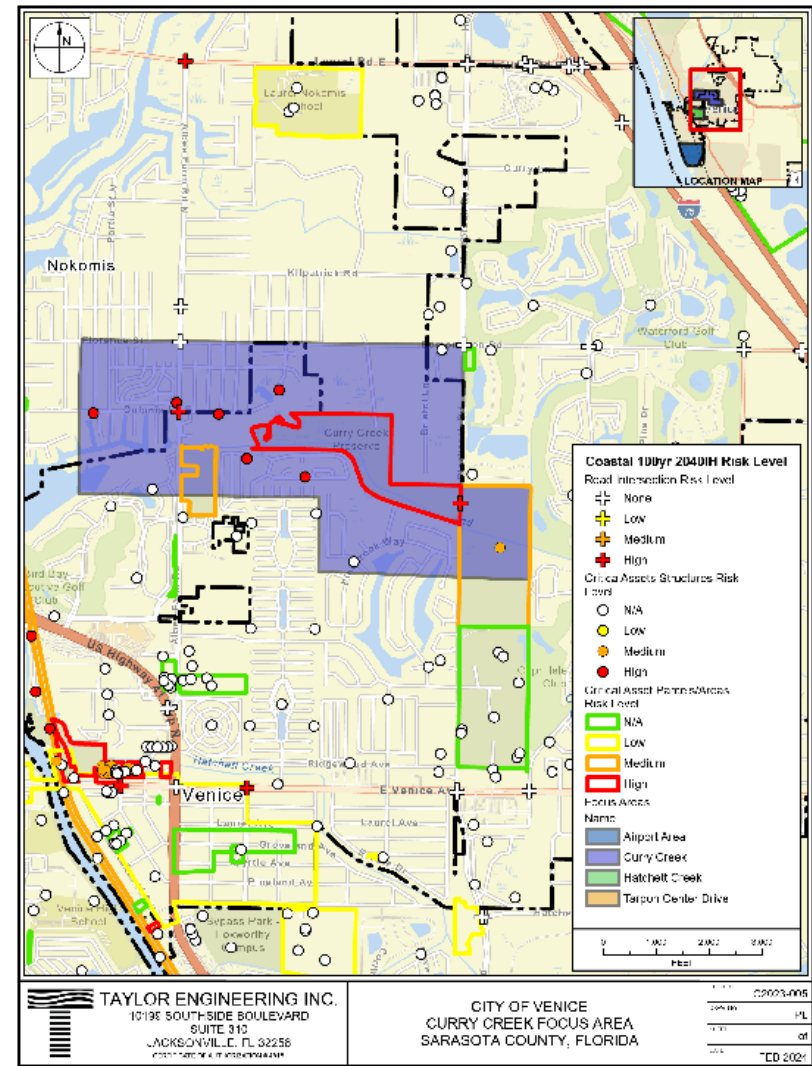
Task 3 – Sensitivity Analysis – 100-yr + 2040 IH SLR



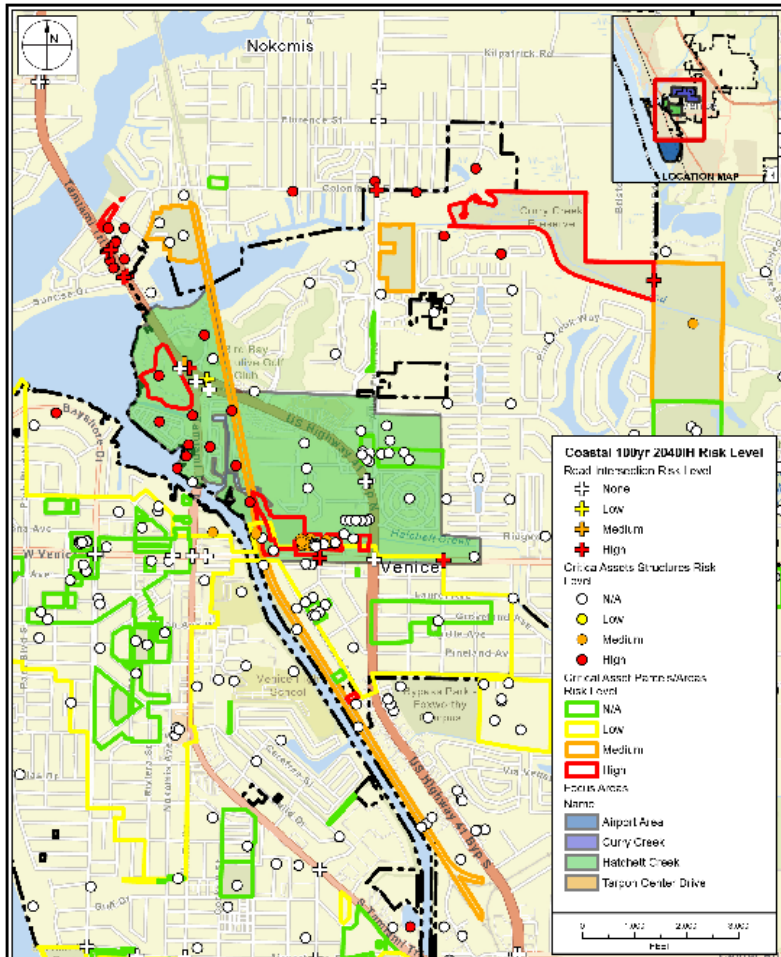
Task 5 – Focus Areas



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<p>TAYLOR ENGINEERING INC. 10198 SOUTH-SIDE BOULEVARD SUITE 310 JACKSONVILLE, FL 32256 904.734.4444</p>	<p>CITY OF VENICE HATCHETT CREEK FOCUS AREA SARASOTA COUNTY, FLORIDA</p>		<p>DATE: 02/03/2025</p> <p>SCALE: 1" = 100'</p> <p>BY: [Signature]</p> <p>CD 2025</p>
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<p>TAYLOR ENGINEERING INC. 10198 SOUTH-SIDE BOULEVARD SUITE 310 JACKSONVILLE, FL 32256 904.734.4444</p>	<p>CITY OF VENICE TARPON CENTER DRIVE FOCUS AREA SARASOTA COUNTY, FLORIDA</p>		<p>DATE: 02/03/2025</p> <p>SCALE: 1" = 100'</p> <p>BY: [Signature]</p> <p>CD 2025</p>
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Task 5 – Adaptation Strategies

Protection						
Backup Generator	Install Check Valve	Dune Restoration & Beach Nourishment	Flood Barrier	Flood Gates	Temporary Flood Barrier	Temporary Flood Wrap

Accommodation				
Elevate Finished First Floor	Elevate Structure	Elevate Utilities	Flood Resistant Materials	Flood Vents

Managed Relocation	
Raising Land	Relocate Structure

THANK YOU
Questions?
