



Blue Hill Wharves Resiliency Assessment and Preliminary Design

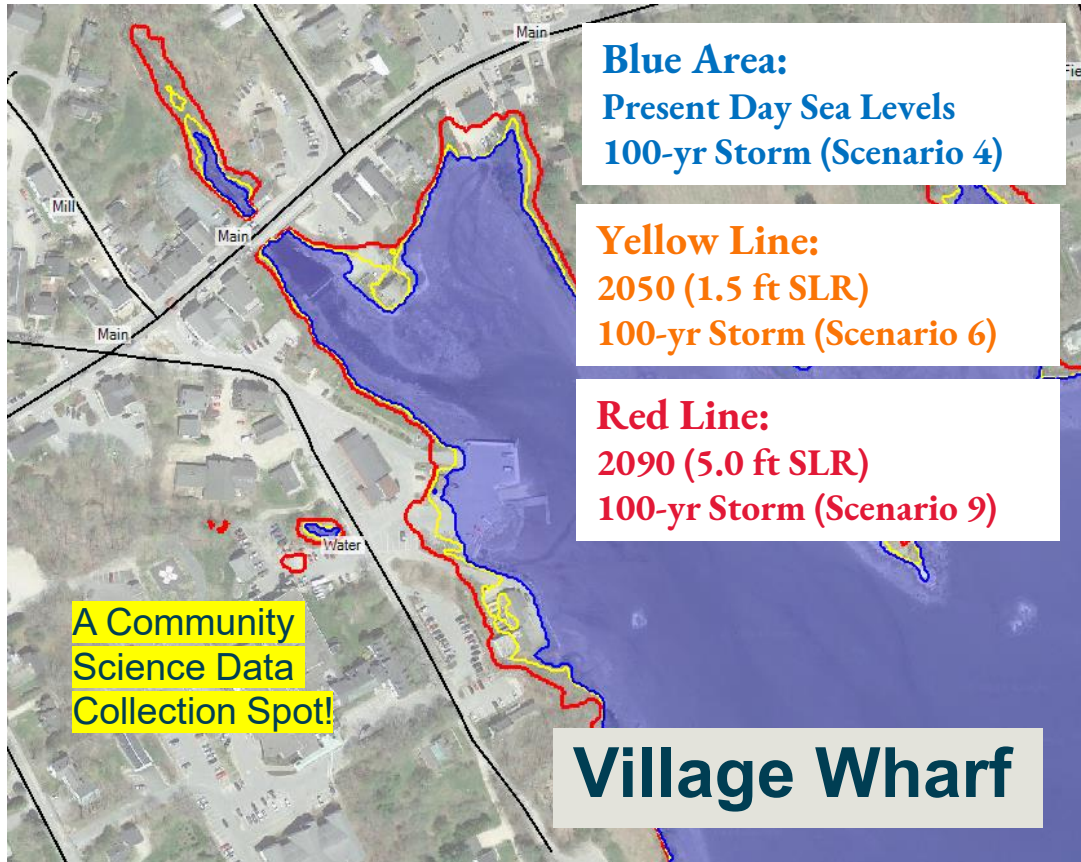
September 16, 2025

Meeting Agenda

1. Project scope and goals
2. Schedule and progress to date
3. Existing conditions
4. Coastal exposure and flood risk analysis
5. Concept design recommendations
6. Discuss next steps



2023-2024 Blue Hill Peninsula Flood Vulnerability Assessment



Project Scope

- Project Sites
 - Village Wharf
 - South Blue Hill Wharf
- Project Scope & Goals
 - Survey
 - Flood risk assessment
 - Concept design plans and cost estimates for recommended adaptation
 - Public engagement meeting
 - Schematic design (30%) of adaptations recommendations
 - Regulatory Review



Project funded in part by a Maine Coastal Program Shore and Harbor Planning Grant

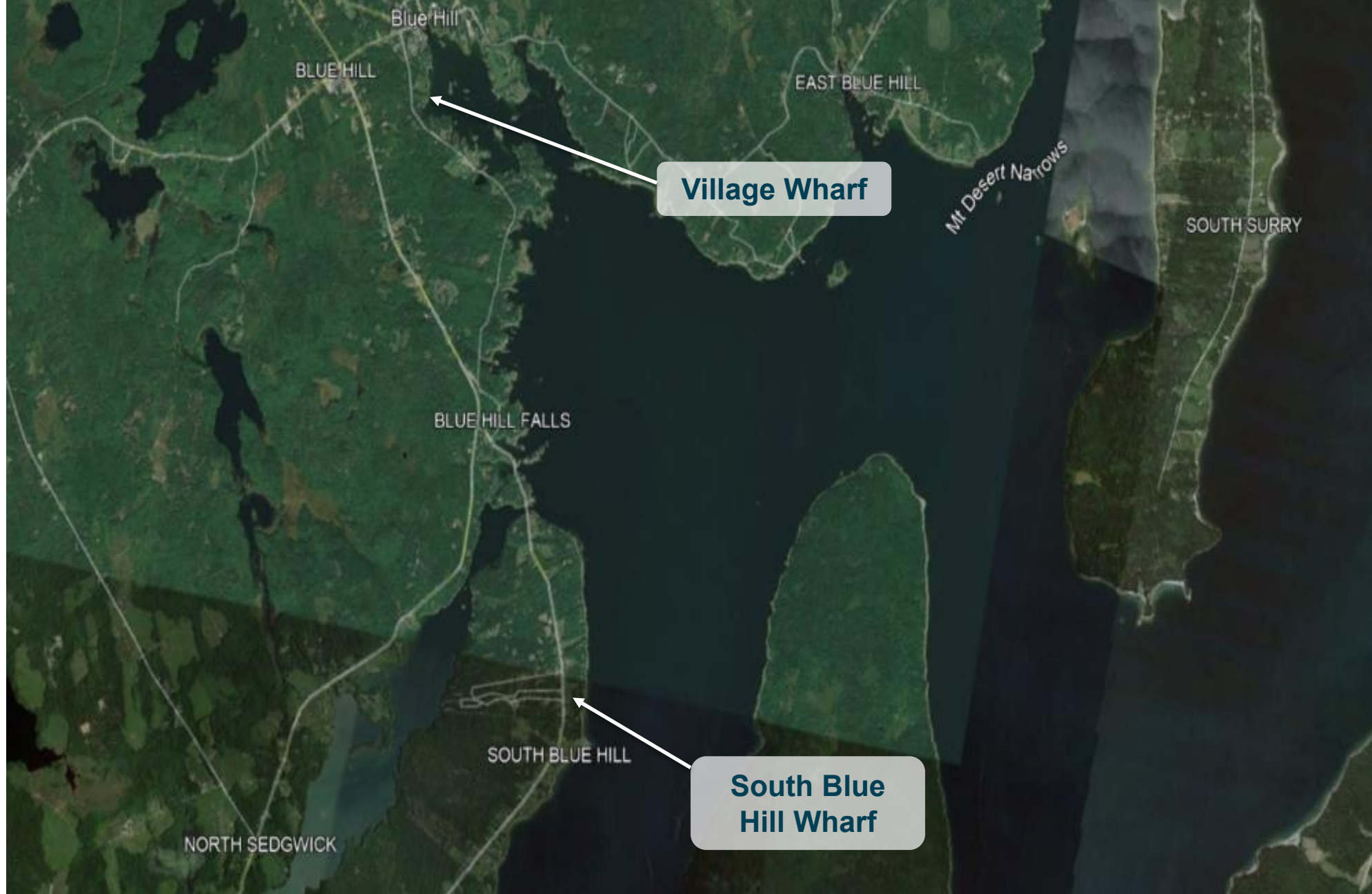


Project Schedule / Progress

- Project Kickoff/Site Visits, Drone Survey and Town Meeting: **Jan 2025**
- Site Survey: **July 2025**
- Background Data Collection: **Dec 2024-Feb 2025**
- Conceptual Design: **September 2025**
- Public Engagement – Review of Design Options: **September-October 2025**
- Schematic Design (30%): **October-November 2025** (Pending acceptance of Conceptual Design)
- Regulatory Review: **December 2025**

***Project Completion by December 31st, 2025 per grant requirements**





Village Wharf



Image Source: GEI



South Blue Hill Wharf



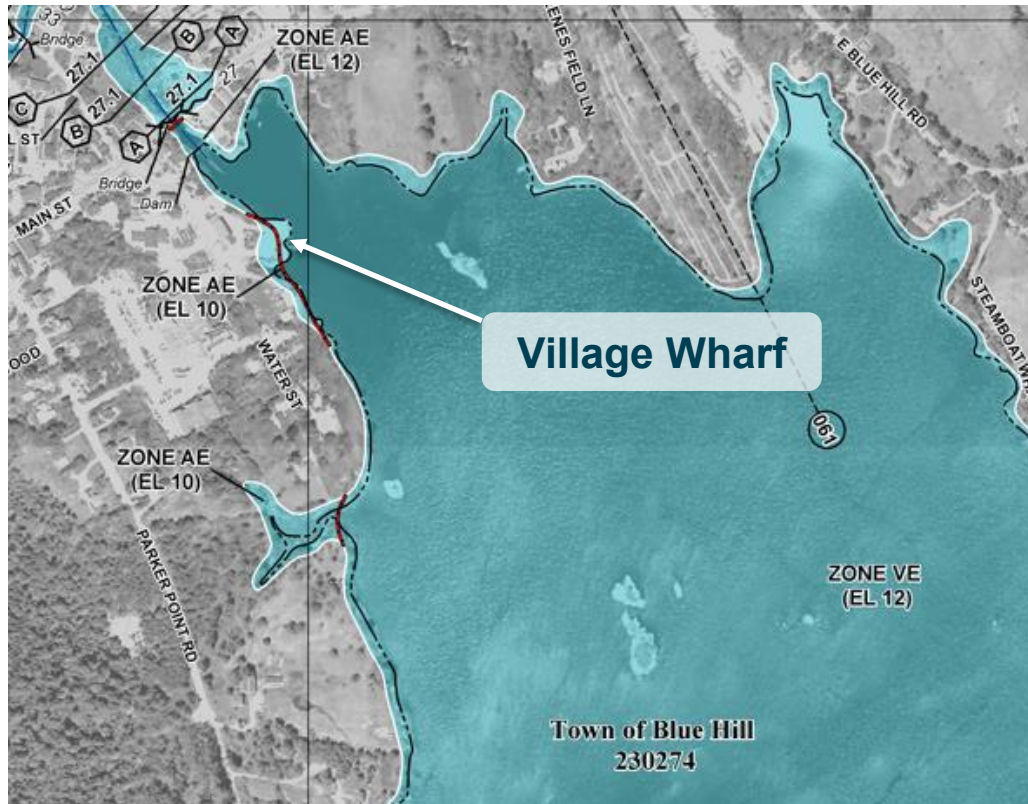
Images Source: GEI



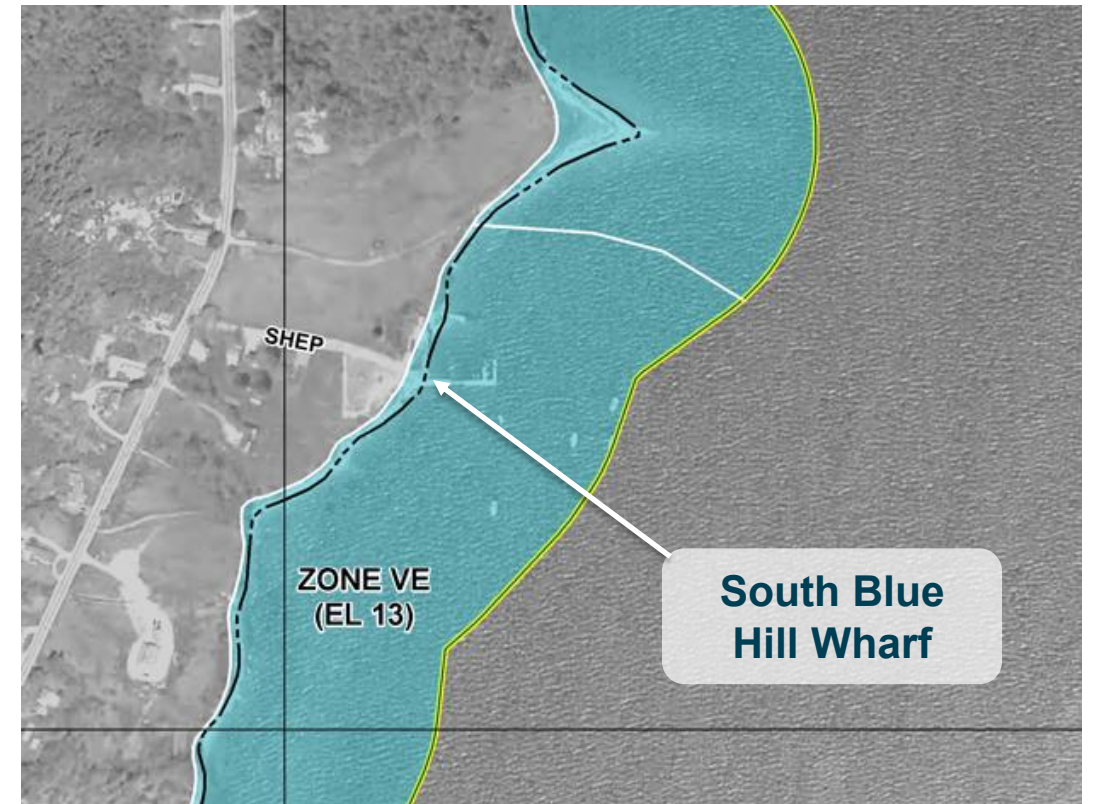
FEMA Flood Maps

- Base Flood Elevations (BFE) in NAVD88 datum
- VE zone indicates expected wave heights greater than 3 feet

Village Wharf: BFE EL. 12' (VE Zone)



South Blue Hill Wharf: BFE EL. 13' (VE Zone)



January 2024 Storms

Village Wharf: BFE EL. 12' (VE Zone)



~13' Tide (above MLLW)/Storm

South Blue Hill Wharf: BFE EL. 13' (VE Zone)

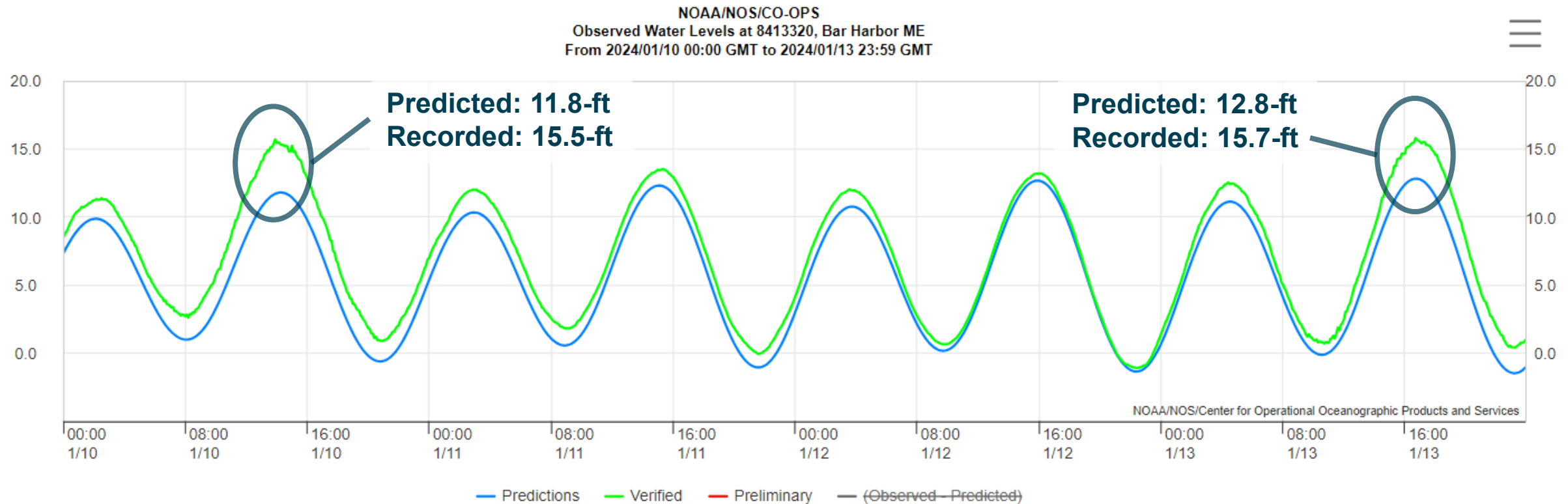


~13' Tide (above MLLW)/Storm

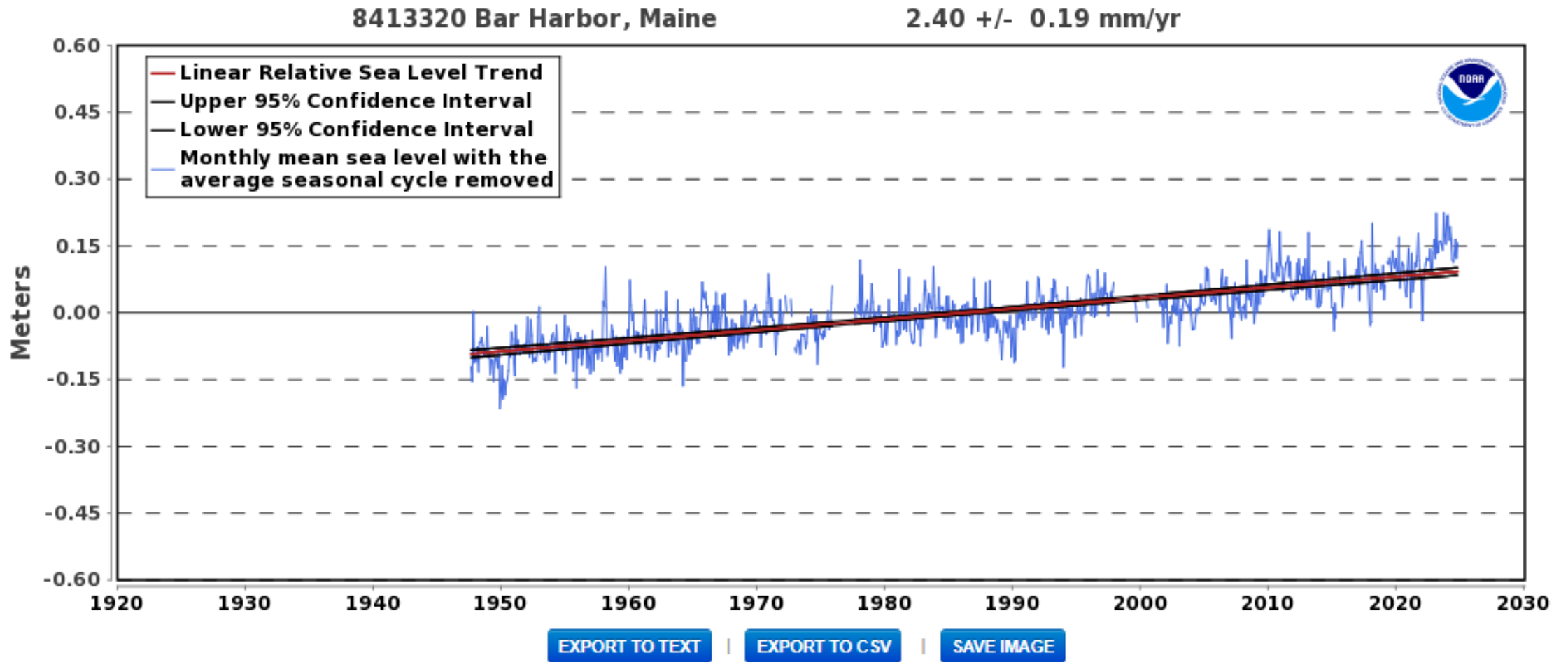


January 2024 Storms

Tidal observations below from Bar Harbor station do not include wave action.



Relative Sea Level Trend 8413320 Bar Harbor, Maine



The relative sea level trend is 2.4 millimeters/year with a 95% confidence interval of ± 0.19 mm/yr based on monthly mean sea level data from 1947 to 2023 which is equivalent to a change of 0.79 feet in 100 years.

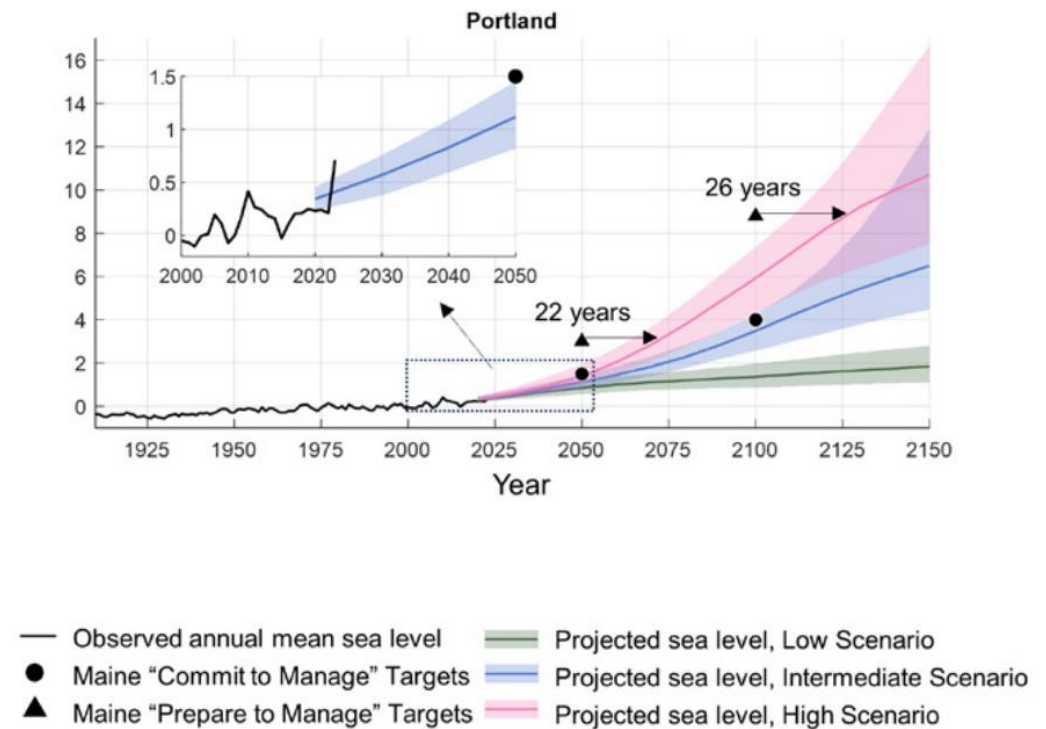


Scientific Assessment of Climate Change and Its Effects in Maine



**MAINE CLIMATE COUNCIL
SCIENTIFIC AND TECHNICAL SUBCOMMITTEE**

- Maine Climate Council
- 2020 Report – “Maine Won’t Wait”
- Recommendations for Sea Level Rise based on 2017 NOAA modeling
 - Commit to Manage Scenario
 - Prepare to Manage Scenario
- 2024 Update incorporates updated 2022 NOAA modeling



Tidal Datum

Village Wharf				
Elevation Reference (all elevations in feet)	Vertical Datum			Reference
			Project	
	Chart	NGVD	NAVD88	
Base Flood Elevation (BFE) Zone VE	17.8	12.6	12.0	FEMA Map 23009C0937D Effective July 20, 2016
0.2% (500-year) Stillwater	15.5	10.3	9.7	FEMA FIS Hancock County Transect 061
1% (100-year) Stillwater	15.1	9.9	9.3	
2% (50-year) Stillwater	14.6	9.4	8.8	
HAT	12.7	7.5	6.9	Maine DEP HAT 2018, Blue Hill Harbor
MHHW	11.1	5.9	5.3	NOAA Vdatum Online
MHW	10.7	5.5	4.9	
NAVD88	5.8	0.6	0.0	
NGVD29	5.2	0.0	-0.6	
MLW	0.4	-4.8	-5.5	
MLLW	0.0	-5.2	-5.8	

South Blue Hill Wharf				
Elevation Reference (all elevations in feet)	Vertical Datum			Reference
			Project	
	Chart	NGVD	NAVD88	
Base Flood Elevation (BFE) Zone VE	18.8	13.6	13.0	FEMA Map 23009C1156D Effective July 20, 2016
0.2% (500-year) Stillwater	15.5	10.3	9.7	FEMA FIS Hancock County Transect 059
1% (100-year) Stillwater	15.0	9.8	9.2	
2% (50-year) Stillwater	14.6	9.4	8.8	
HAT	12.7	7.5	6.9	Maine DEP HAT 2018, Blue Hill Harbor
MHHW	11.1	5.9	5.3	NOAA Vdatum Online
MHW	10.7	5.5	4.9	
NAVD88	5.8	0.6	0.0	
NGVD29	5.2	0.0	-0.6	
MLW	0.4	-4.8	-5.5	
MLLW	0.0	-5.2	-5.8	

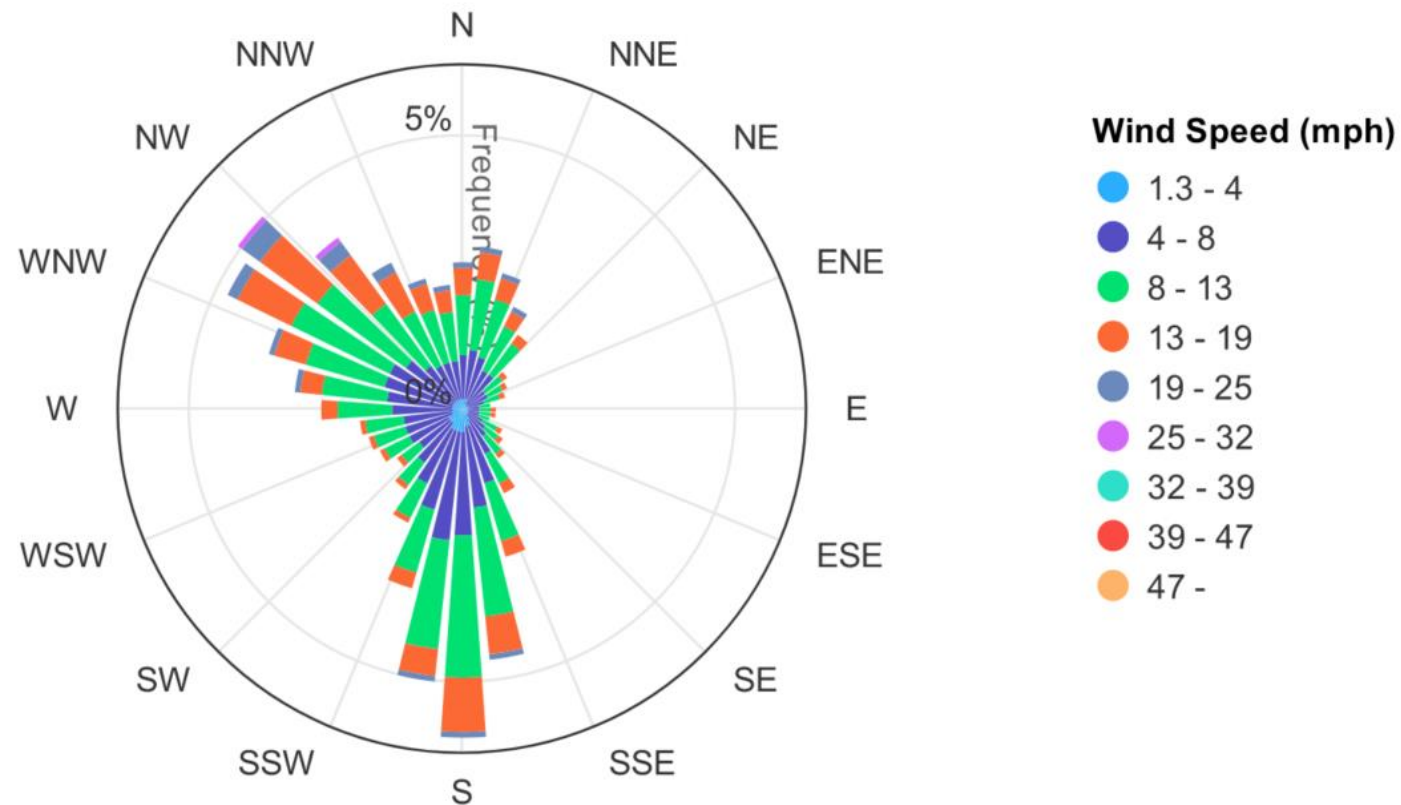


Annual Wind Rose

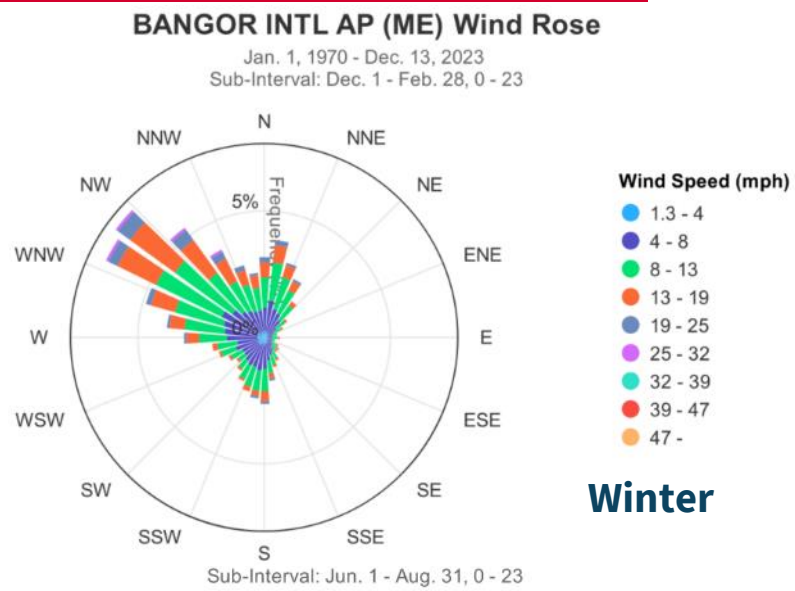
BANGOR INTL AP (ME) Wind Rose

Jan. 1, 1970 - Dec. 13, 2023

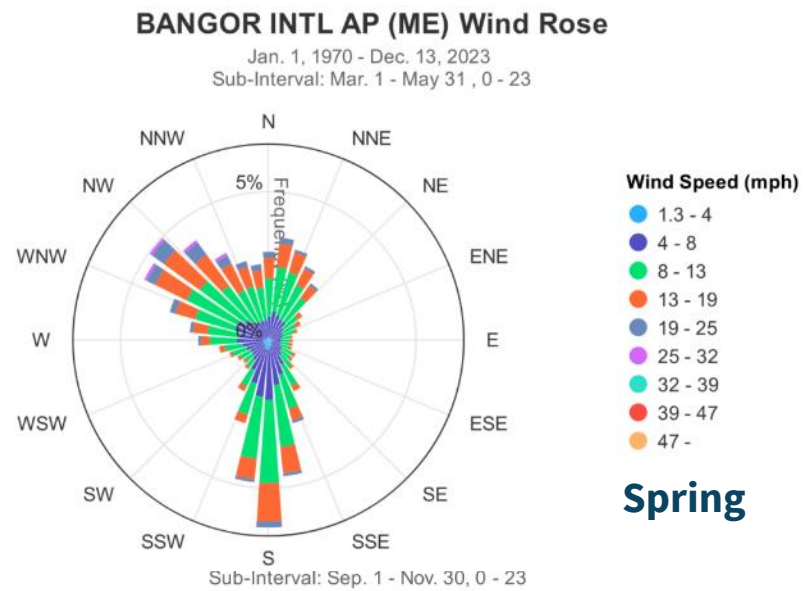
Sub-Interval: Jan. 1 - Dec. 31, 0 - 23



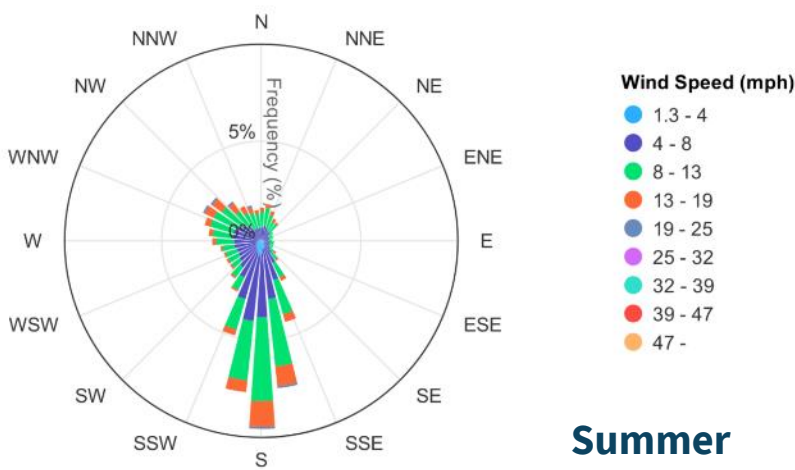
Seasonal Wind Roses



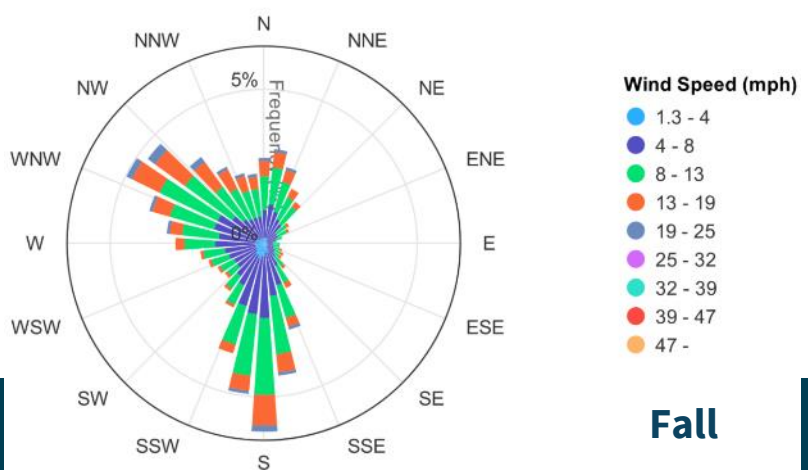
Winter



Spring



Summer



Fall



P.E. No.:
Approved:
Checked:
Drawn: JLD
Designed:
GEI Project 2408679

Attention: 1"
If this scale bar does not measure 1"
then drawing is not original scale.

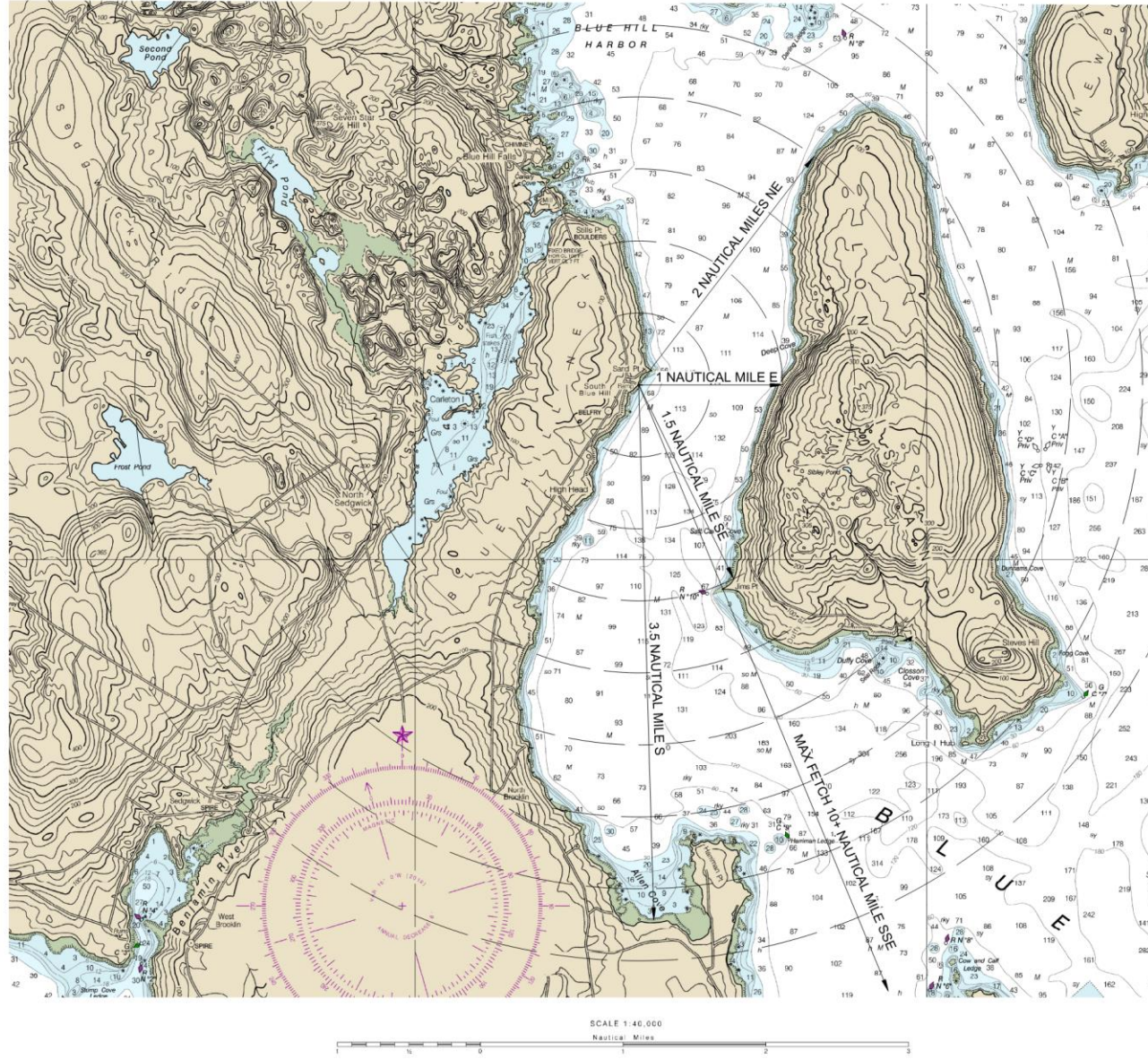
1 9/15/2025 CONCEPT 1
NO. DATE ISSUE/REVISION APP

SHEET NAME

SBHW FETCH
MAP

SHEET NO.

1



SOUTH BLUE HILL WHARF EXPOSURE

ELEVATION	CHART	NAVD83*
VILLAGE WHARF BFE	+17.8	+12.0
SOUTH BLUE HILL WHARF BFE	+18.8	+13.0
HAT	+12.7	+6.0
MHHW	+11.1	+5.3
MHW	+10.7	+4.9
MLW	+0.4	-5.5
MLLW	0.0	-5.8

*PROJECT DATUM

PRELIMINARY

Town Landing Sea Wall Average EL 7.8 NAVD88		Commit to Manage				Prepare to Manage			
		2030	2050	2070	2100	2030	2050	2070	2100
	NAVD88	0.8	1.5	2.4	3.9	1.4	3	5	8.8
BFE - Preliminary - VE Zone	12.0	12.8	13.5	14.4	15.9	13.4	15.0	17.0	20.8
0.2% (500-year) Stillwater	9.7	10.5	11.2	12.1	13.6	11.1	12.7	14.7	18.5
1% (100-year) Stillwater	9.3	10.1	10.8	11.7	13.2	10.7	12.3	14.3	18.1
2% (50-year) Stillwater	8.8	9.6	10.3	11.2	12.7	10.2	11.8	13.8	17.6
Highest Astronomical Tide	7.2	8.0	8.7	9.6	11.1	8.6	10.2	12.2	16.0
Highest Annual Tide	6.9	7.7	8.4	9.3	10.8	8.3	9.9	11.9	15.7
MHHW	5.3	6.1	6.8	7.7	9.2	6.7	8.3	10.3	14.1
MHW	4.9	5.7	6.4	7.3	8.8	6.3	7.9	9.9	13.7
NAVD88	0.0	0.8	1.5	2.4	3.9	1.4	3.0	5.0	8.8
NGVD29	-0.6	0.2	0.9	1.8	3.3	0.8	2.4	4.4	8.2
MLW	-5.5	-4.7	-4.0	-3.1	-1.6	-4.1	-2.5	-0.5	3.3
MLLW	-5.8	-5.0	-4.3	-3.4	-1.9	-4.4	-2.8	-0.8	3.0

South Blue Hill Average EL 7.5 NAVD88		Commit to Manage				Prepare to Manage			
		2030	2050	2070	2100	2030	2050	2070	2100
	NAVD88	0.8	1.5	2.4	3.9	1.4	3	5	8.8
BFE - Preliminary - VE Zone	13.0	13.8	14.5	15.4	16.9	14.4	16.0	18.0	21.8
0.2% (500-year) Stillwater	9.7	10.5	11.2	12.1	13.6	11.1	12.7	14.7	18.5
1% (100-year) Stillwater	9.2	10.0	10.7	11.6	13.1	10.6	12.2	14.2	18.0
2% (50-year) Stillwater	8.8	9.6	10.3	11.2	12.7	10.2	11.8	13.8	17.6
Highest Astronomical Tide	7.2	8.0	8.7	9.6	11.1	8.6	10.2	12.2	16.0
Highest Annual Tide	6.9	7.7	8.4	9.3	10.8	8.3	9.9	11.9	15.7
MHHW	5.3	6.1	6.8	7.7	9.2	6.7	8.3	10.3	14.1
MHW	4.9	5.7	6.4	7.3	8.8	6.3	7.9	9.9	13.7
NAVD88	0.0	0.8	1.5	2.4	3.9	1.4	3.0	5.0	8.8
NGVD29	-0.6	0.2	0.9	1.8	3.3	0.8	2.4	4.4	8.2
MLW	-5.5	-4.7	-4.0	-3.1	-1.6	-4.1	-2.5	-0.5	3.3
MLLW	-5.8	-5.0	-4.3	-3.4	-1.9	-4.4	-2.8	-0.8	3.0



Village Wharf	Existing Sea Wall AVG EL 7.8 NAVD88					Asset EL 10 NAVD88					Asset EL 12 NAVD88				
Reference Elevation		Commit to Manage					Commit to Manage					Commit to Manage			
		2030	2050	2070	2100		2030	2050	2070	2100		2030	2050	2070	2100
	NAVD88	0.8	1.5	2.4	3.9	NAVD88	0.8	1.5	2.4	3.9	NAVD88	0.8	1.5	2.4	3.9
BFE - Preliminary - VE Zone	12.0	12.8	13.5	14.4	15.9	12.0	12.8	13.5	14.4	15.9	12.0	12.8	13.5	14.4	15.9
0.2% (500-year) Stillwater	9.7	10.5	11.2	12.1	13.6	9.7	10.5	11.2	12.1	13.6	9.7	10.5	11.2	12.1	13.6
1% (100-year) Stillwater	9.3	10.1	10.8	11.7	13.2	9.3	10.1	10.8	11.7	13.2	9.3	10.1	10.8	11.7	13.2
2% (50-year) Stillwater	8.8	9.6	10.3	11.2	12.7	8.8	9.6	10.3	11.2	12.7	8.8	9.6	10.3	11.2	12.7
Highest Astronomical Tide	7.2	8.0	8.7	9.6	11.1	7.2	8.0	8.7	9.6	11.1	7.2	8.0	8.7	9.6	11.1
Highest Annual Tide	6.9	7.7	8.4	9.3	10.8	6.9	7.7	8.4	9.3	10.8	6.9	7.7	8.4	9.3	10.8
MHHW	5.3	6.1	6.8	7.7	9.2	5.3	6.1	6.8	7.7	9.2	5.3	6.1	6.8	7.7	9.2
MHW	4.9	5.7	6.4	7.3	8.8	4.9	5.7	6.4	7.3	8.8	4.9	5.7	6.4	7.3	8.8
NAVD88	0.0	0.8	1.5	2.4	3.9	0.0	0.8	1.5	2.4	3.9	0.0	0.8	1.5	2.4	3.9
NGVD29	-0.6	0.2	0.9	1.8	3.3	-0.6	0.2	0.9	1.8	3.3	-0.6	0.2	0.9	1.8	3.3
MLW	-5.5	-4.7	-4.0	-3.1	-1.6	-5.5	-4.7	-4.0	-3.1	-1.6	-5.5	-4.7	-4.0	-3.1	-1.6
MLLW	-5.8	-5.0	-4.3	-3.4	-1.9	-5.8	-5.0	-4.3	-3.4	-1.9	-5.8	-5.0	-4.3	-3.4	-1.9

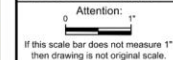
South Blue Hill	Existing Pier AVG EL 7.5 NAVD88					Asset EL 10 NAVD88					Asset EL 12 NAVD88				
Reference Elevation		Commit to Manage					Commit to Manage					Commit to Manage			
		2030	2050	2070	2100		2030	2050	2070	2100		2030	2050	2070	2100
	NAVD88	0.8	1.5	2.4	3.9	NAVD88	0.8	1.5	2.4	3.9	NAVD88	0.8	1.5	2.4	3.9
BFE - Preliminary - VE Zone	13.0	13.8	14.5	15.4	16.9	13.0	13.8	14.5	15.4	16.9	13.0	13.8	14.5	15.4	16.9
0.2% (500-year) Stillwater	9.7	10.5	11.2	12.1	13.6	9.7	10.5	11.2	12.1	13.6	9.7	10.5	11.2	12.1	13.6
1% (100-year) Stillwater	9.2	10.0	10.7	11.6	13.1	9.2	10.0	10.7	11.6	13.1	9.2	10.0	10.7	11.6	13.1
2% (50-year) Stillwater	8.8	9.6	10.3	11.2	12.7	8.8	9.6	10.3	11.2	12.7	8.8	9.6	10.3	11.2	12.7
Highest Astronomical Tide	7.2	8.0	8.7	9.6	11.1	7.2	8.0	8.7	9.6	11.1	7.2	8.0	8.7	9.6	11.1
Highest Annual Tide	6.9	7.7	8.4	9.3	10.8	6.9	7.7	8.4	9.3	10.8	6.9	7.7	8.4	9.3	10.8
MHHW	5.3	6.1	6.8	7.7	9.2	5.3	6.1	6.8	7.7	9.2	5.3	6.1	6.8	7.7	9.2
MHW	4.9	5.7	6.4	7.3	8.8	4.9	5.7	6.4	7.3	8.8	4.9	5.7	6.4	7.3	8.8
NAVD88	0.0	0.8	1.5	2.4	3.9	0.0	0.8	1.5	2.4	3.9	0.0	0.8	1.5	2.4	3.9
NGVD29	-0.6	0.2	0.9	1.8	3.3	-0.6	0.2	0.9	1.8	3.3	-0.6	0.2	0.9	1.8	3.3
MLW	-5.5	-4.7	-4.0	-3.1	-1.6	-5.5	-4.7	-4.0	-3.1	-1.6	-5.5	-4.7	-4.0	-3.1	-1.6
MLLW	-5.8	-5.0	-4.3	-3.4	-1.9	-5.8	-5.0	-4.3	-3.4	-1.9	-5.8	-5.0	-4.3	-3.4	-1.9



**BLUE HILL
WHARVES
RESILIENCE**

DRAFT

P.E. No.:	
Approved:	
Checked:	
Drawn:	JLD
Designed:	
GEI Project	2408679



1	9/15/2025	CONCEPT 1	
NO.	DATE	ISSUE/REVISION	APPROVED

SHEET NAME

EXISTING SITE PLAN

SHEET NO.

1



DRAFT

P.E. No.:
 Approved:
 Checked:
 Drawn: JLD
 Designed:
 GEI Project 2408679

Attention: 1"
 If this scale bar does not measure 1"
 then drawing is not original scale.

1	9/15/2025	CONCEPT 1	
NO.	DATE	ISSUE/REVISION	APP.

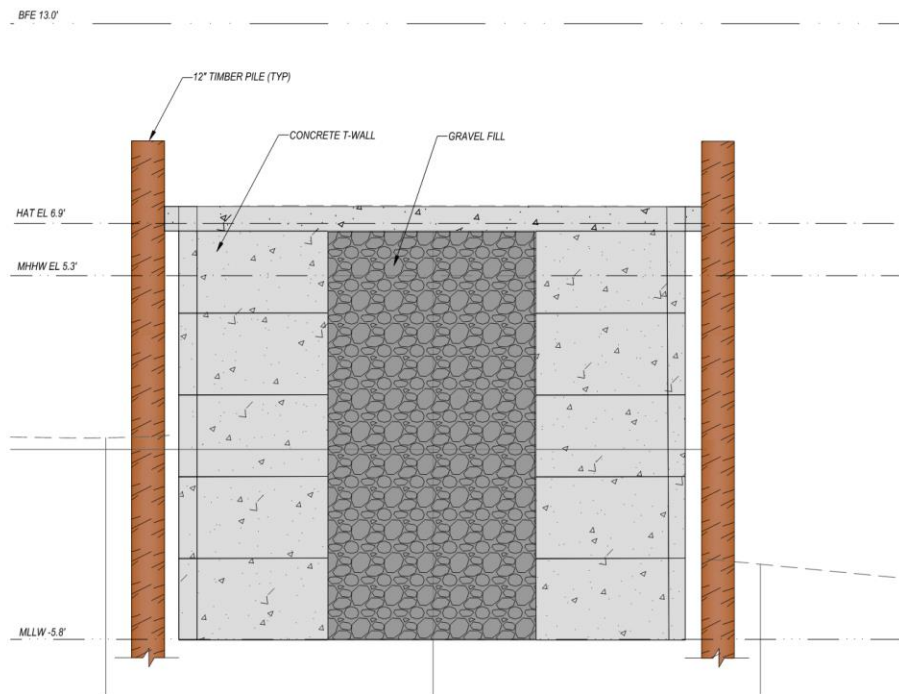
SHEET NAME

**SBHW PIER
 SECTIONS**

SHEET NO.

5

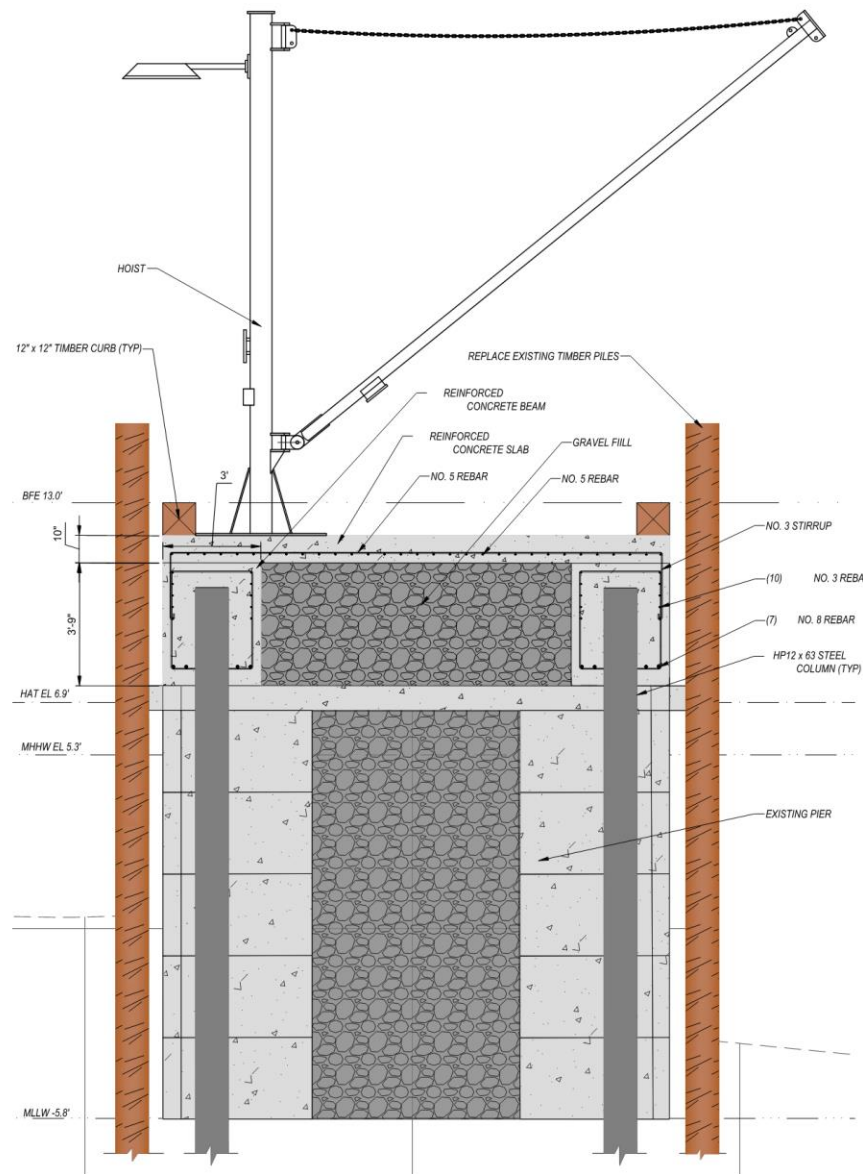
PRELIMINARY



ELEVATION	CHART	NAVD83*
VILLAGE WHARF BFE	+17.8	+12.0
SOUTH BLUE HILL WHARF BFE	+18.8	+13.0
HAT	+12.7	+6.0
MHHW	+11.1	+5.3
MHW	+10.7	+4.9
MLW	+0.4	-5.5
MLLW	0.0	-5.8

A SECTION
 - EXISTING PIER

SCALE: 1" = 2'



A SECTION
 - PROPOSED PIER

SCALE: 1" = 2'

P.E. No.:
Approved:
Checked:
Drawn: JLD
Designed:
GEI Project 2408679
Attention: 1"
If this scale bar does not measure 1" then drawing is not original scale.

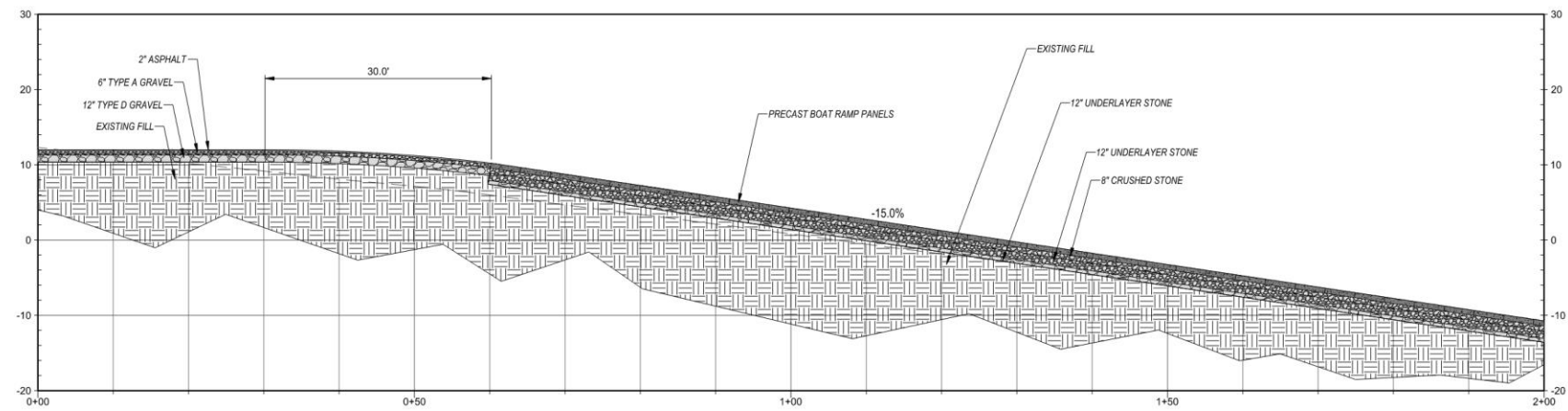
1	9/15/2025	CONCEPT 1	
NO.	DATE	ISSUE/REVISION	APP.

SHEET NAME

SBHW BOAT
RAMP PROFILE

SHEET NO.

6



1 PROFILE
BOAT RAMP
SCALE: 1" = 8'

ELEVATION	CHART	NAVD83*
VILLAGE WHARF BFE	+17.8	+12.0
SOUTH BLUE HILL WHARF BFE	+18.8	+13.0
HAT	+12.7	+6.0
MHHW	+11.1	+5.3
MHW	+10.7	+4.9
MLW	+0.4	-5.5
MLLW	0.0	-5.8

*PROJECT DATUM

PRELIMINARY

1	9/15/2025	CONCEPT 1	
NO.	DATE	ISSUE/REVISION	APP.

SHEET NAME

**SBHW
 CONCEPT
 PLAN C**

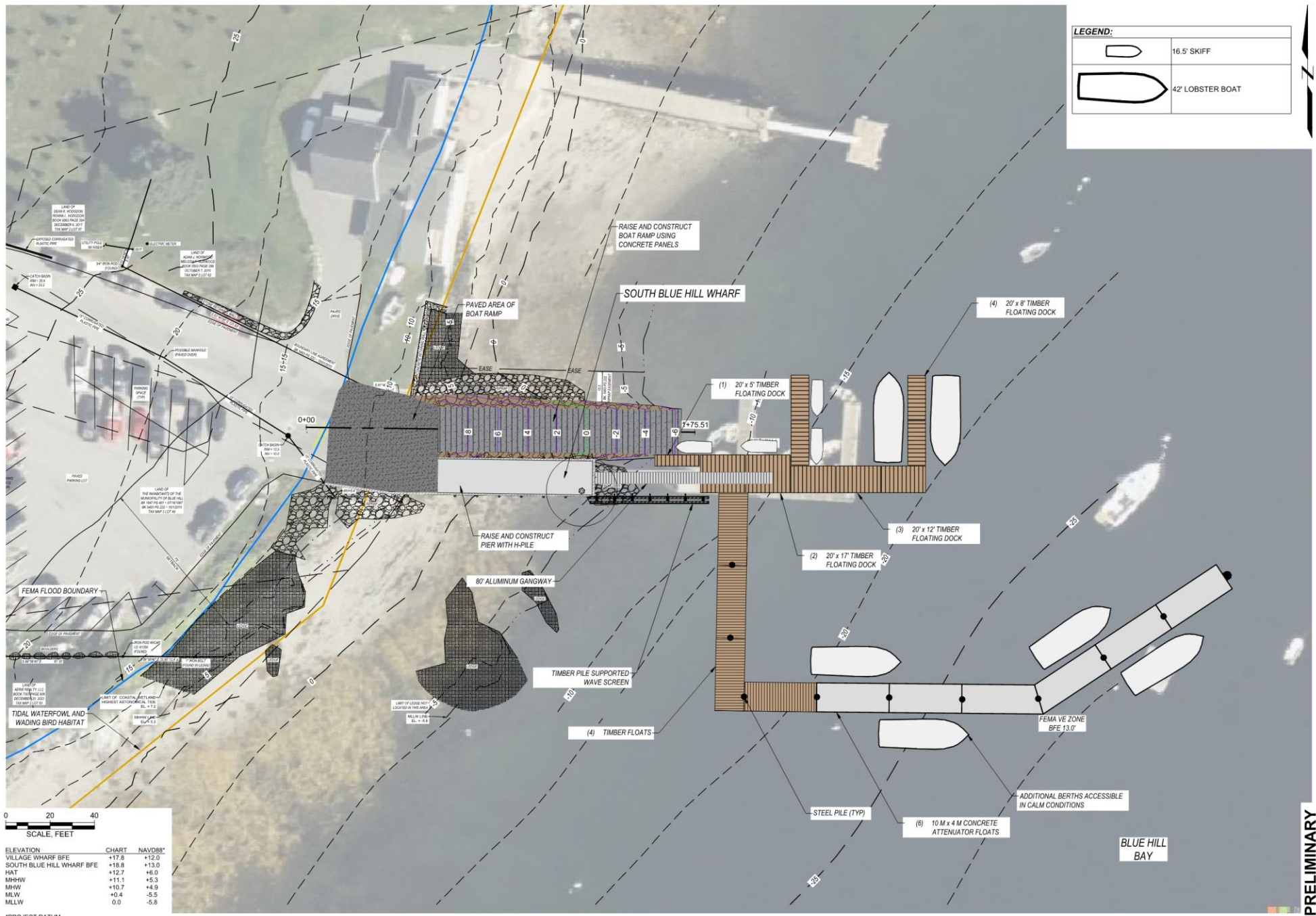
SHEET NO.

4

PRELIMINARY

LEGEND:

	16.5' SKIFF
	42' LOBSTER BOAT



ELEVATION

VILLAGE WHARF BFE	+17.8	+12.0
SOUTH BLUE HILL WHARF BFE	+18.8	+13.0
HAT	+12.7	+6.0
MHHW	+11.1	+5.3
MHW	+10.7	+4.9
MLW	+0.4	-5.5
MLLW	0.0	-5.8

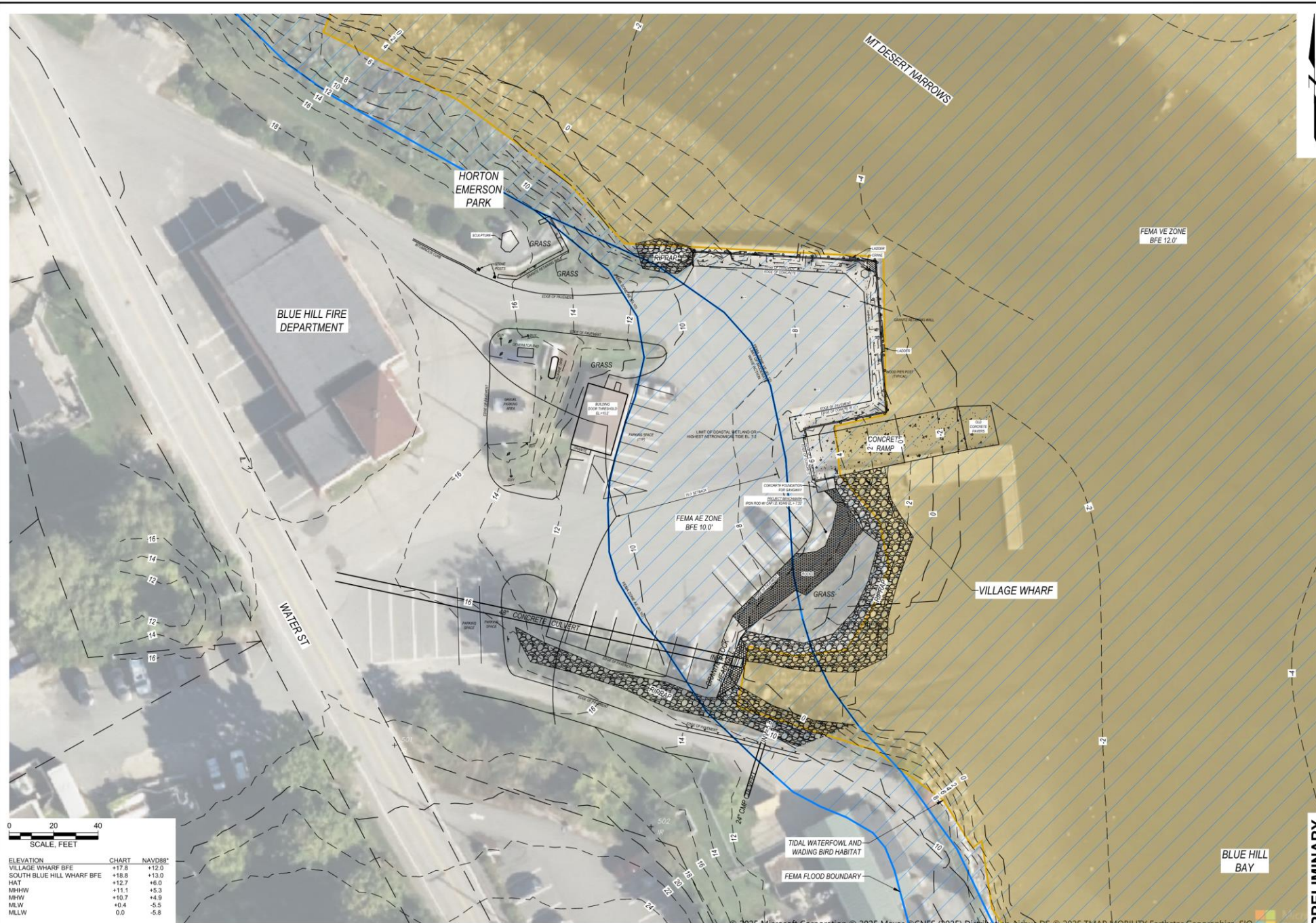
CHART

NAVD83*

*PROJECT DATUM

PROJECT: JACOB B. BROWN/BLUE HILL, ME. TOWN OF BLUE HILL, ME. SBHW CONCEPT PLAN C. CAD: Design/Build/2.0. Conceptual Design/Build/2.0. SBHW CONCEPT PLAN C. 9/15/2025

PROJECT: JACOBS ENGINEERING BLUE HILL, MA: TOWN OF BLUE HILL: 2408679: Blue Hill Wharves Resilience: EXISTING SITE PLAN.dwg: 9/15/2025



0 20 40
SCALE, FEET

ELEVATION	CHART	NAVD83*
VILLAGE WHARF BFE	+17.8	+12.0
SOUTH BLUE HILL WHARF BFE	+18.8	+13.0
HAT	+12.7	+6.0
MHHW	+11.1	+5.3
MHW	+10.7	+4.9
MLW	+0.4	-5.5
MLLW	0.0	-5.8

*PROJECT DATUM



TOWN OF
BLUE HILL
BLUE HILL, MAINE

BLUE HILL
WHARVES
RESILIENCE
BLUE HILL, MAINE

DRAFT

P.E. No.:
Approved:
Checked:
Drawn: JLD
Designed:
GEI Project 2408679

Attention: 1"
If this scale bar does not measure 1"
then drawing is not original scale.

1	9/15/2025	CONCEPT 1	
NO.	DATE	ISSUE/REVISION	APP.

SHEET NAME

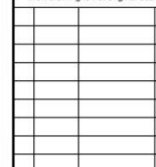
EXISTING SITE
PLAN

SHEET NO.

1

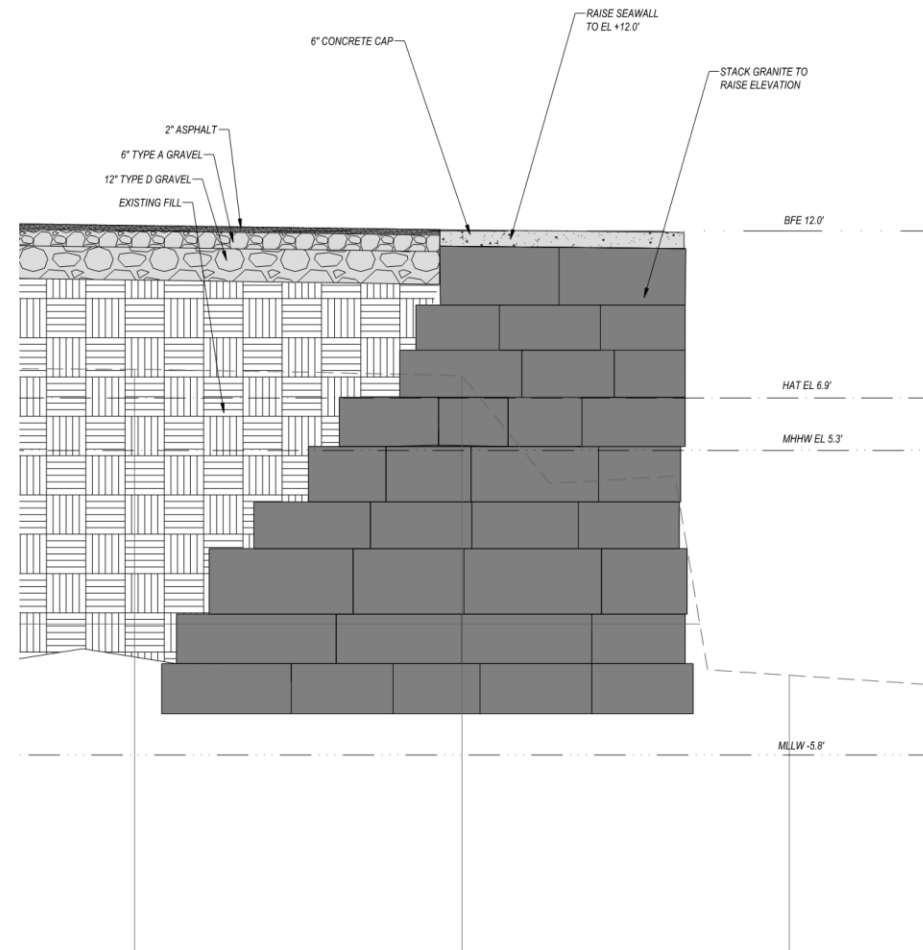
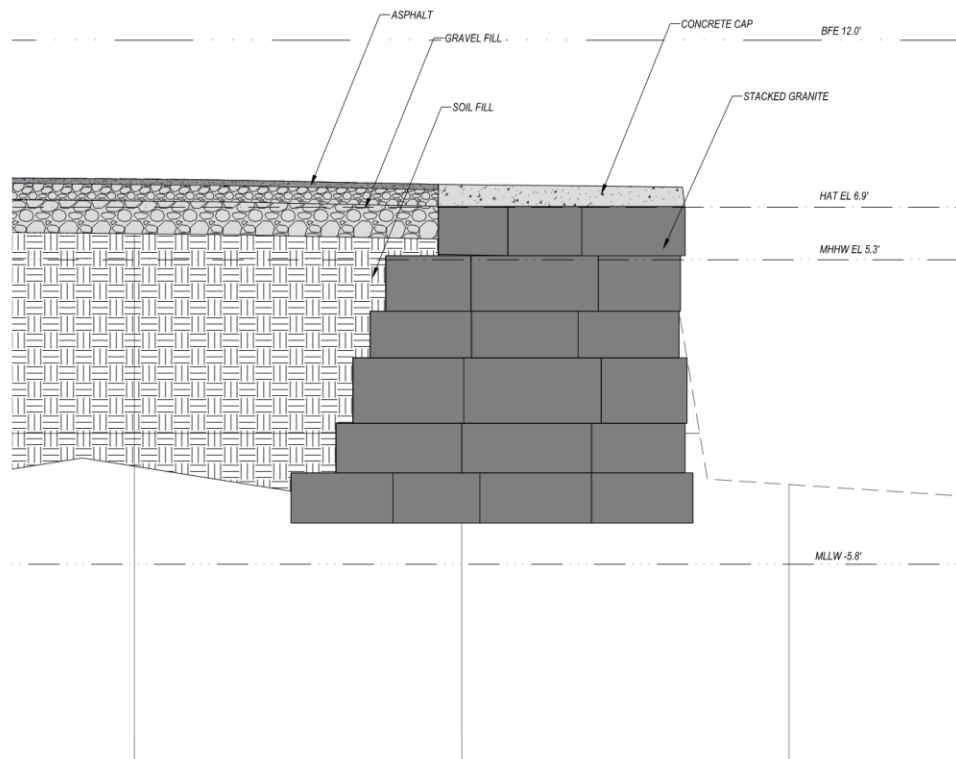
PRELIMINARY

P.E. No.:	
Approved:	
Checked:	
Drawn:	JLD
Designed:	
GEI Project	2408679

SHEET NAME

SHEET NO.

*PROJECT DATUM



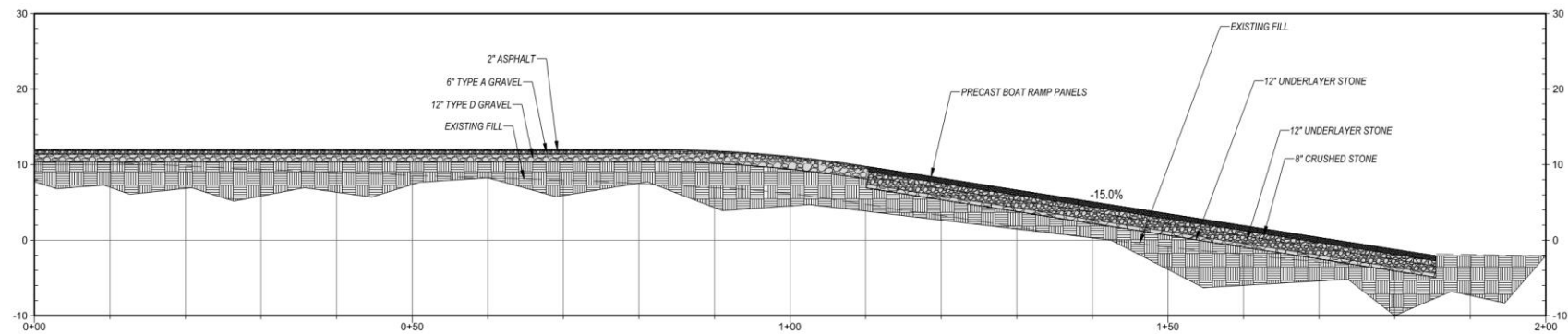
1 PROFILE
- EXISTING SEA WALL

1 PROFILE
- PROPOSED SEA WALL

ELEVATION	CHART	NAVD88*
VILLAGE WHARF BFE	+17.8	+12.0
SOUTH BLUE HILL WHARF BFE	+18.8	+13.0
HAT	+12.7	+6.0
MHHW	+11.1	+5.3
MHW	+10.7	+4.9
MLW	+0.4	-5.5
MLLW	0.0	-5.8

*PROJECT DATUM

PRELIMINARY



2 PROFILE
- BOAT RAMP

SCALE: 1"=8'



ELEVATION	CHART	NAVD88*
VILLAGE WHARF BFE	+17.8	+12.0
SOUTH BLUE HILL WHARF BFE	+18.8	+13.0
HAT	+12.7	+6.0
MHHW	+11.1	+5.3
MHW	+10.7	+4.9
MLW	+0.4	-5.5
MLLW	0.0	-5.8

*PROJECT DATUM

PRELIMINARY

Project Costs

SOUTH BLUE HILL WHARF	
Concept A	\$1.5M - \$2M
Concept B*	\$4M - \$5M
Concept C*	\$4M - \$5M

**Concepts B and C build on Concept A and include the cost of work included in Concept A*

VILLAGE WHARF	
Base Design	\$1.5M – \$2M

All estimates are Rough Order of Magnitude (- 25% to +50%) for Preliminary Planning. Estimates are subject to refinement through further design.



Next Steps

- Present Initial concept designs
- Gather input from stakeholders
- Refine concepts and cost estimates
- Complete schematic design (30%) for selected concepts
- Regulatory review
- Final deliverables by December 31, 2025



Thank you!
Questions?

Dan Bannon, P.E. CFM, BC.PE (GEI)
dbannon@geiconsultants.com

Jacob Steeves, E.I. (GEI)
jsteeves@geiconsultants.com

