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## Agenda



- Welcome/Introductions
- Meeting Objectives
- HRBT Expansion Project Overview
- Marine Construction Overview
- Navigation Plan
  - Typical Vessels to be Used
  - Potential Mooring and Anchorage Areas
  - Responsiveness to Navigational Interests
  - Communication During Construction
  - Safety
- Schedule
- Questions

- Focus on construction works in the marine environment
- Describe the proposed construction activities in the project area including interface with the Norfolk Harbor Entrance Reach Channel, Anchorage F-1, the F-1 Anchorage Approach, the Hampton Creek Approach Channel, Phoebus Channel, and the Willoughby Channel
- Describe equipment to be used during construction
- Provide anticipated construction schedule
- Obtain input from maritime community in support of Section 408 concurrence

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## The Design – Build Project



- Comprehensive Agreement between Commonwealth of Virginia and Hampton Roads Connector Partners (HRCP) signed in April 2019
- HRCP CJV Partners: Dragados, VINCI Construction, Flatiron Constructors, Dodin Campenon Bernard
- HRBT Expansion project is a design-build project
- Designers: HDR and Mott MacDonald
- Project Cost: \$3.8 Billion
- Scheduled Completion Date: November 2025



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HRBT Expansion Project Overview



Tunnels	Tunnel Boring	Two new two-lane tunnels
	Tunnel Portals	North Portal South Portal
	Tunnel Approach Structures (TAS)	
	Island Expansions	North Island South Island

Bridges	North Trestle Bridges replacement
	South Trestle Bridges replacement
	Willoughby Bay Bridge widening

Landside	Roadway and bridge improvements
	Roadway widening
	New bridge abutments
	Mallory Street Bridge replacement



- Buffers around each of the civil works projects
  - 200' for the Norfolk Harbor Entrance Reach, Anchorage F, and Anchorage F Approach
  - 85' setbacks for Hampton Creek Approach Channel and Phoebus Channel
  - 1000' buffer on Willoughby Channel due to Navy activity in the area
- Bored Tunnel NOT Immersed Tube Tunnel
  - Less Dredging Required (no surface dredging in the channel)
  - Less Marine Traffic in the main channel



Marine Construction Overview

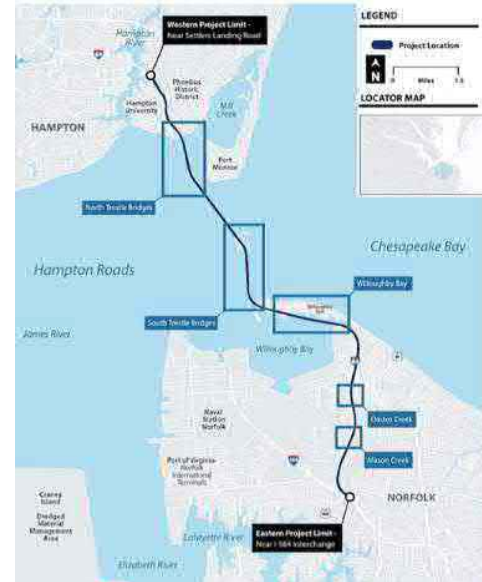


- North Trestle Bridge
- Tunnels
- South Trestle Bridge
- Willoughby Bay





- North Trestle Bridge
- Tunnels
- South Trestle Bridge
- Willoughby Bay



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## North Trestle Bridge Phases

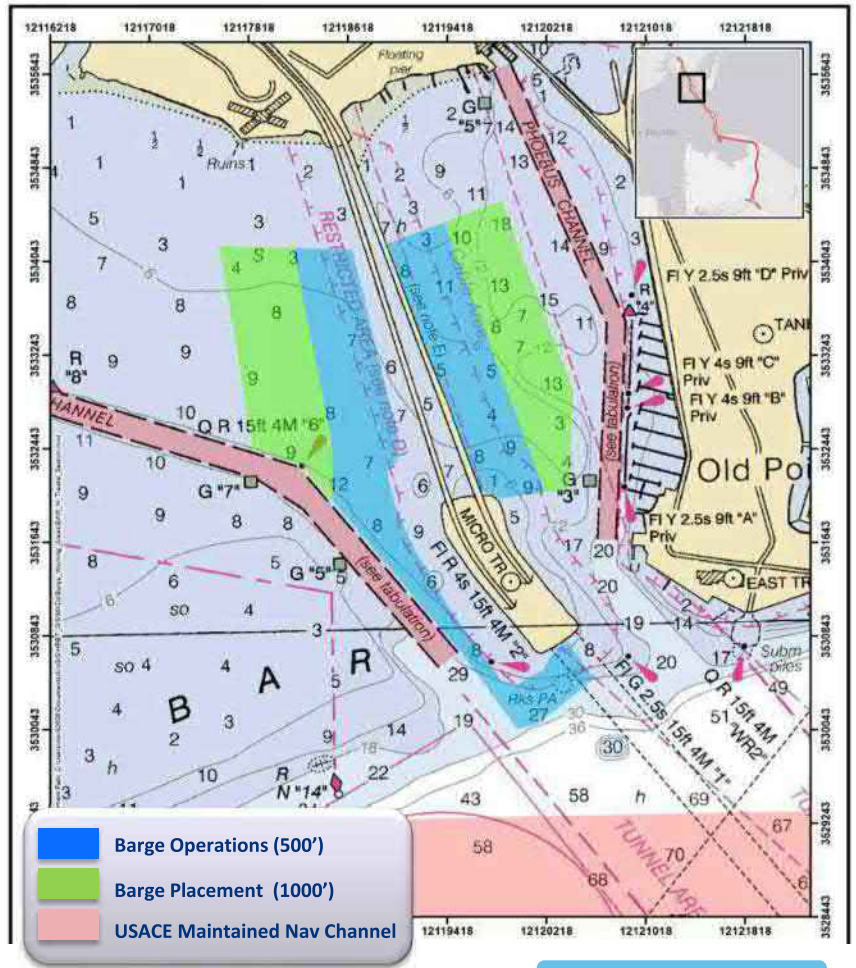


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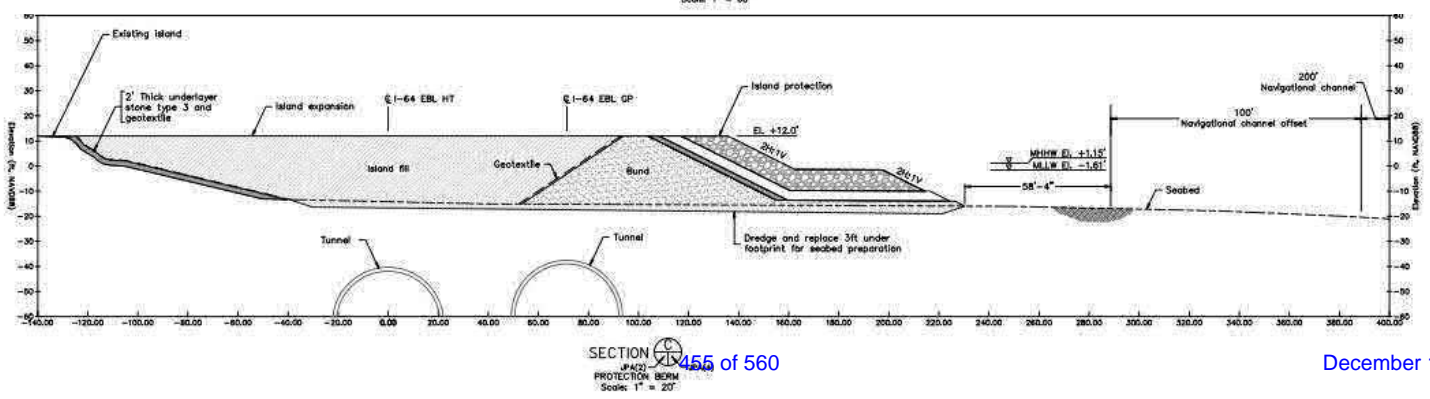
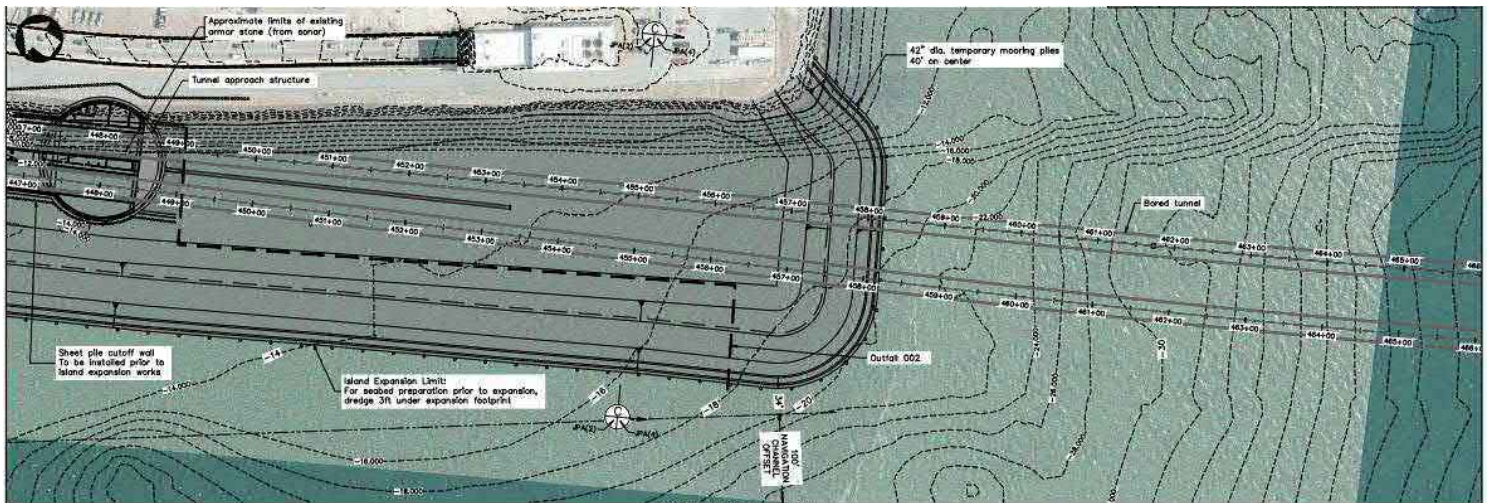
December 19, 2019

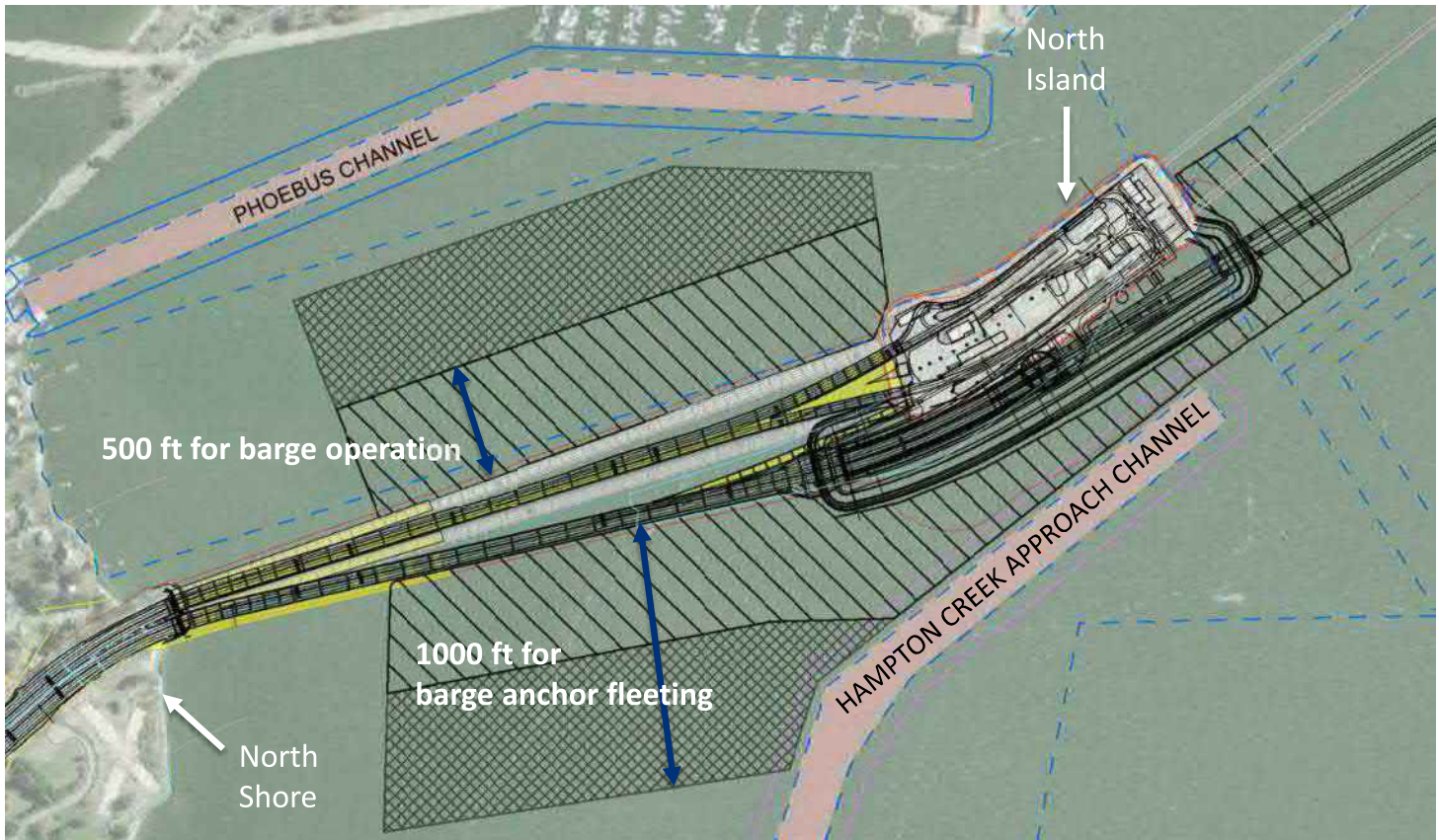
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Scope of Work	Existing two-lane bridges demolished
	Build two new four-lane bridges
	Expand North Island to the west (16.41 acres)
Schedule of Activities	Work to begin after JPA and IHA approval
	Last activity September 2024
	Additional 6 months to remove remaining structures
Barges on Water	Barge operation 500' from expansion area
	Barge anchoring 1000' from expansion area
	Spud and/or anchor barges used in water depths >7' MLW
	+/- 15 barges at peak
	Crane barges, up to 100' x 350'
	Supply barges, up to 100' x 350'



## North Island Expansion

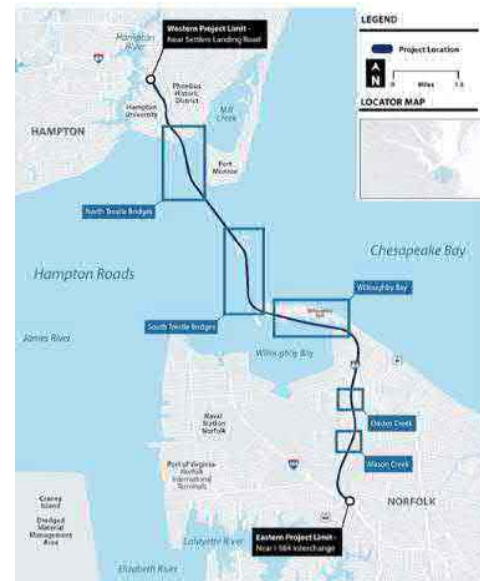




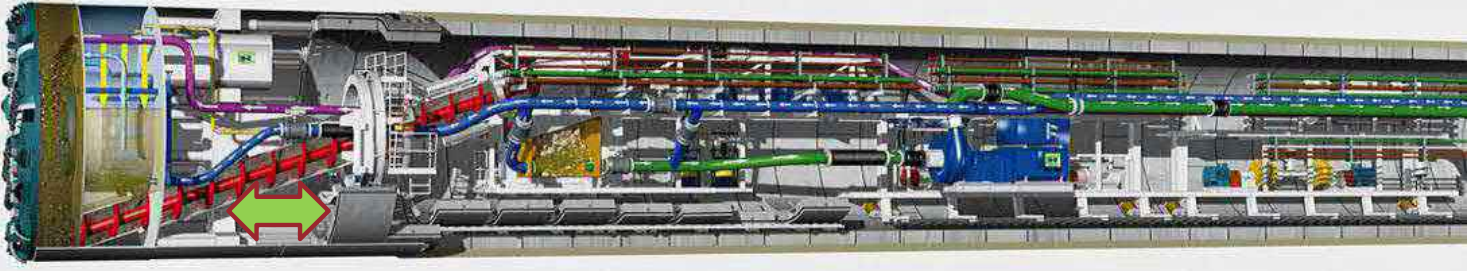
Marine Construction Overview



- North Trestle Bridge
- **Tunnels**
- South Trestle Bridge
- Willoughby Bay



## Tunnel Boring Machine

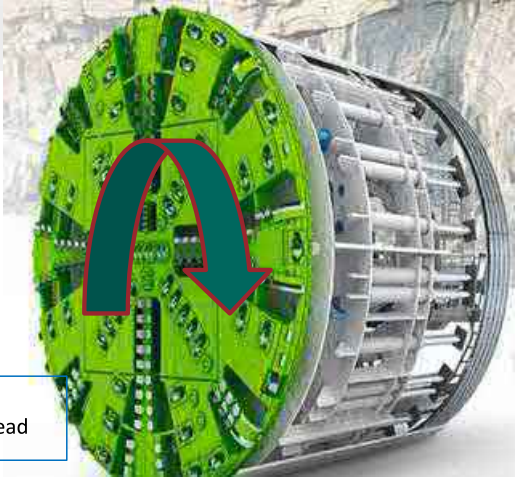


Hydraulic rams push against newly-placed concrete segments to drive machine forward

The machine is operated from the control room

Excavated earth removed by conveyor belt and/or pipeline

Pressure is maintained in the cutting chamber



Rotating cutter head

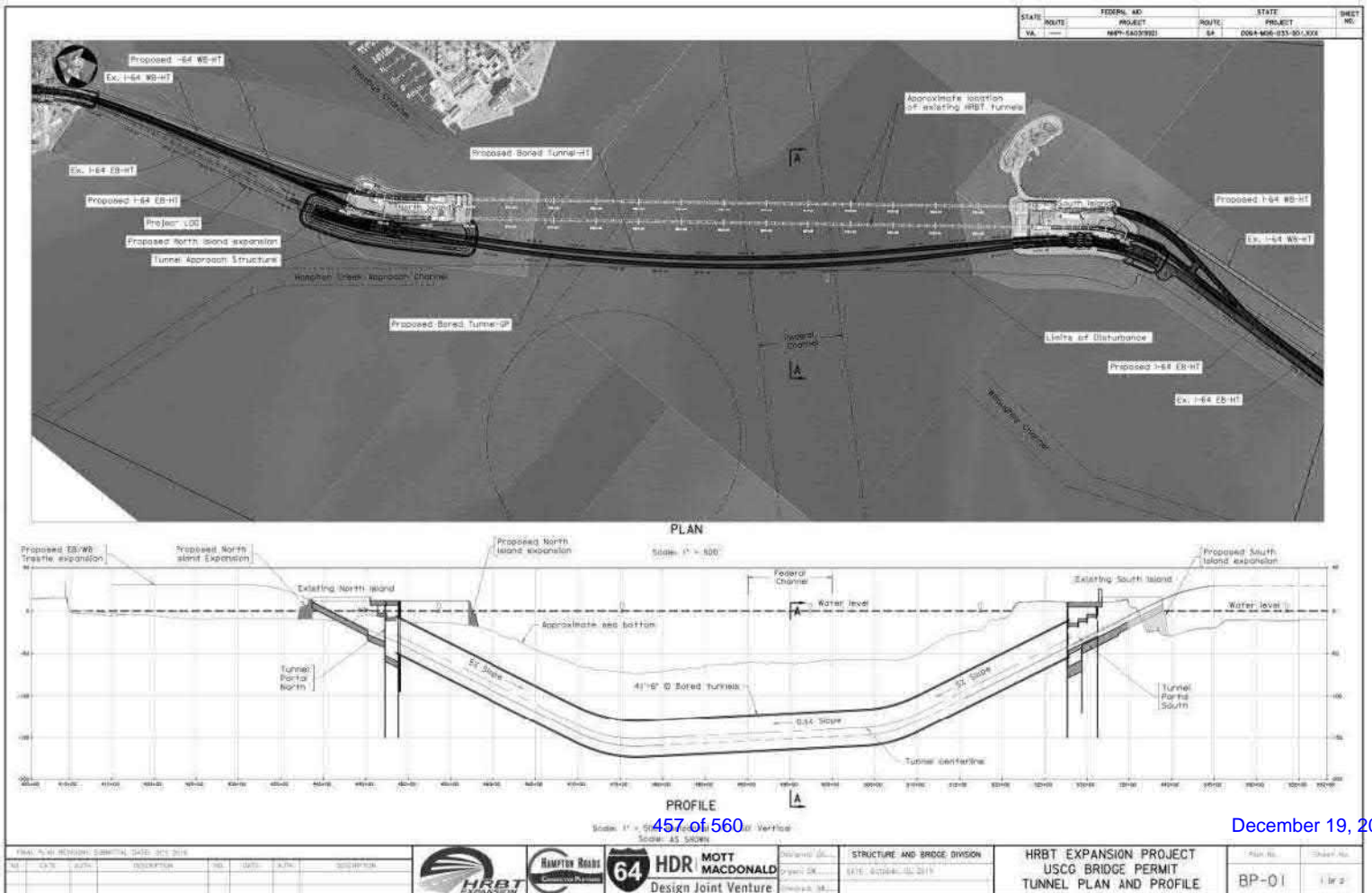
Rotating arm adds pre-cast concrete Tunnel segments to form a ring

Pre-cast concrete segments delivered to rotating arm

Approximate TBM excavated diameter is 44.5'

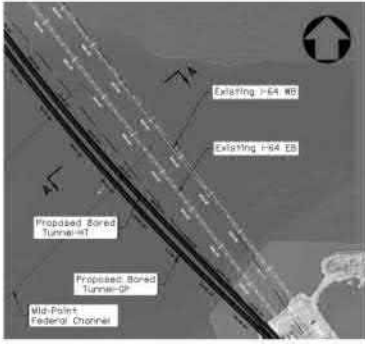
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## Tunnels

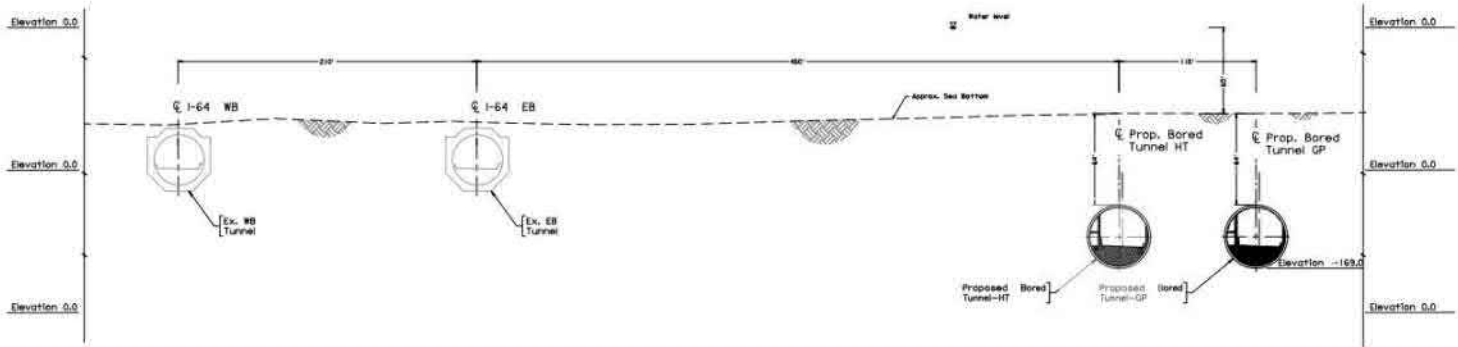




STATE	FEDERAL AID	STATE	SHEET
VA	PROJECT	PROJECT	NO.
	HRP-643992	64	004-NM-031-901-XXX



I-64 HRBT MID-POINT FEDERAL CHANNEL KEY PLAN  
Scale: 1" = 500'



SECTION A-A - MID-POINT FEDERAL CHANNEL  
Scale: 1" = 400'

FINAL PLAN REVISIONS SUBMITTAL DATE				    				designed: <u>HR</u> drawn: <u>SR</u> DATE: <u>October 5, 2019</u> checked: <u>SR</u>	HRBT EXPANSION PROJECT USCG BRIDGE PERMIT TUNNEL SECTION A-A	Plan No. BP-02	Sheet No. 2 of 2
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**Scope of Work**

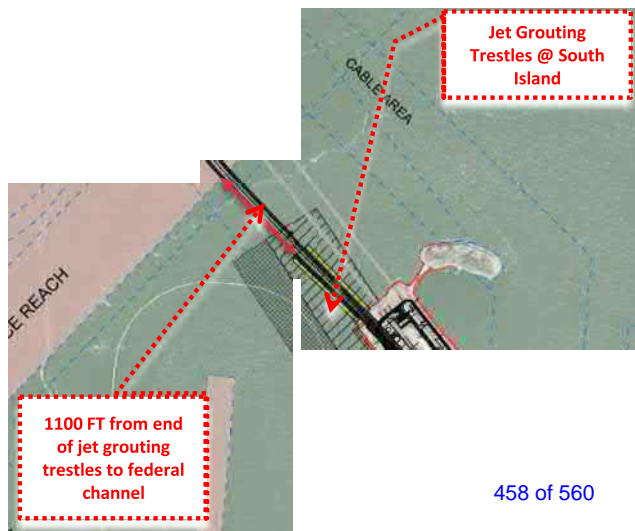
- Bore two new tunnels
- 44.5' diameter, 7,900' long
- 40-150 below water surface

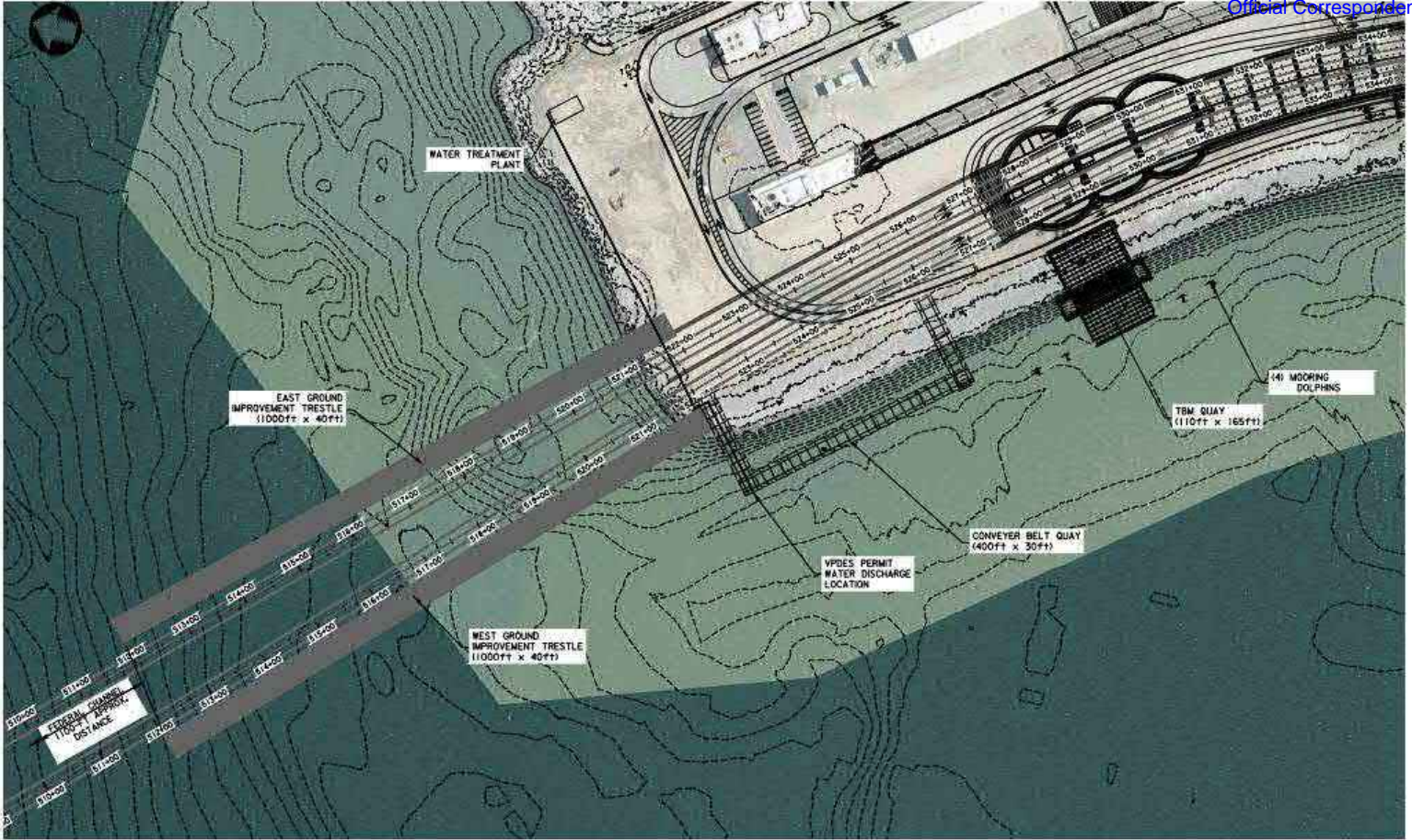
**Schedule of Activities**

- Work to begin completion of South Island Portal
- TBM assembly begins Sep 2021
- Boring begins early 2022
- TBM turnaround early 2023
- Boring complete Spring 2024

**Barges on Water**

- two pile driving barges up to 80' x 200'
- one supply barge up to 80' x 200'



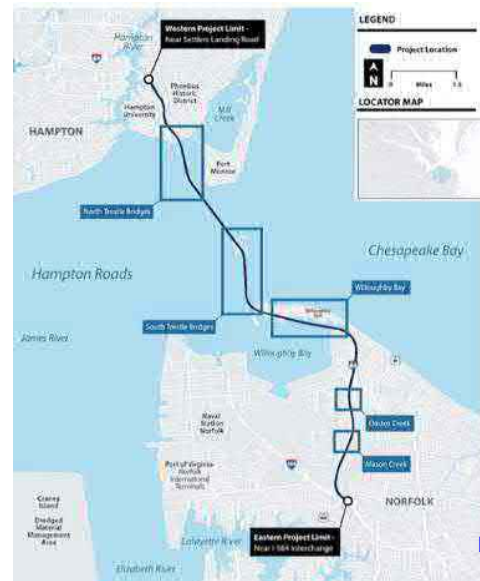


SOUTH ISLAND - TEMPORARY SITE PLAN  
Scale: 1" = 80'

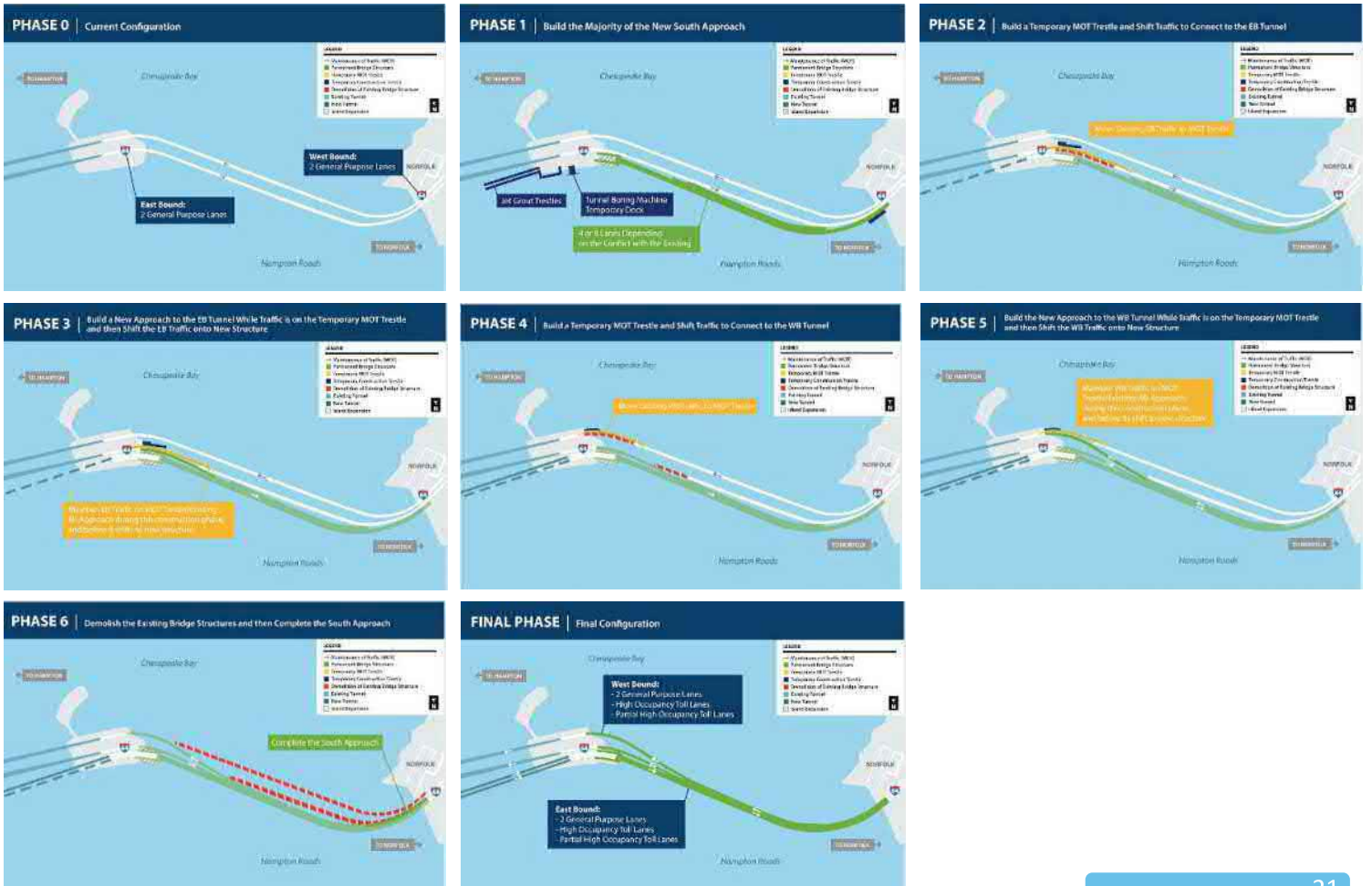
Marine Construction Overview



- North Trestle Bridge
- Tunnels
- **South Trestle Bridge**
- Willoughby Bay

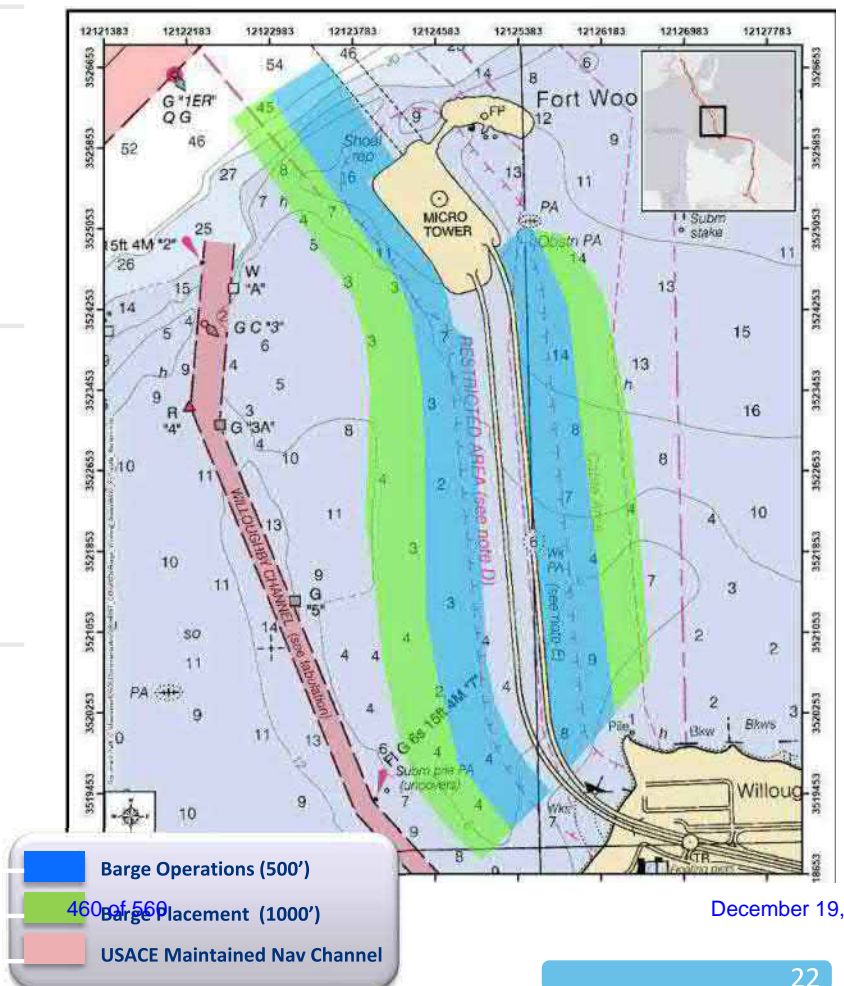


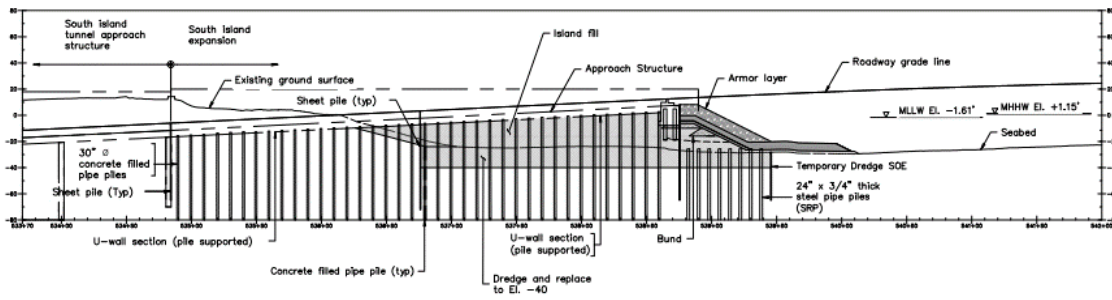
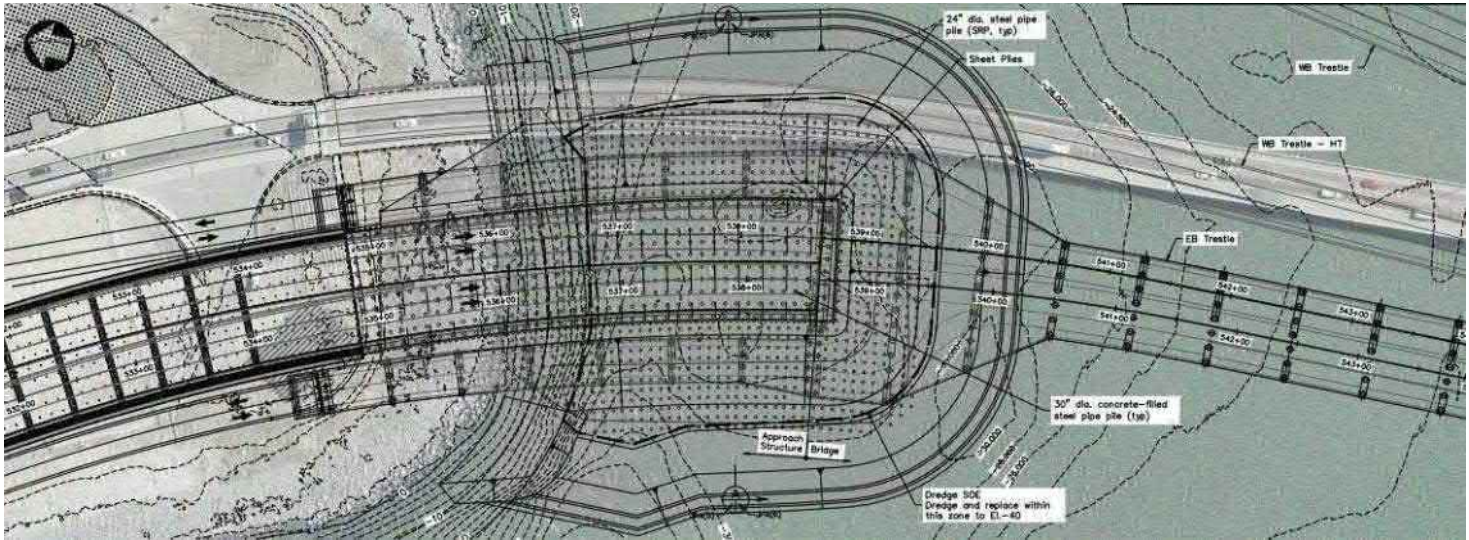
# South Trestle Bridge Phases



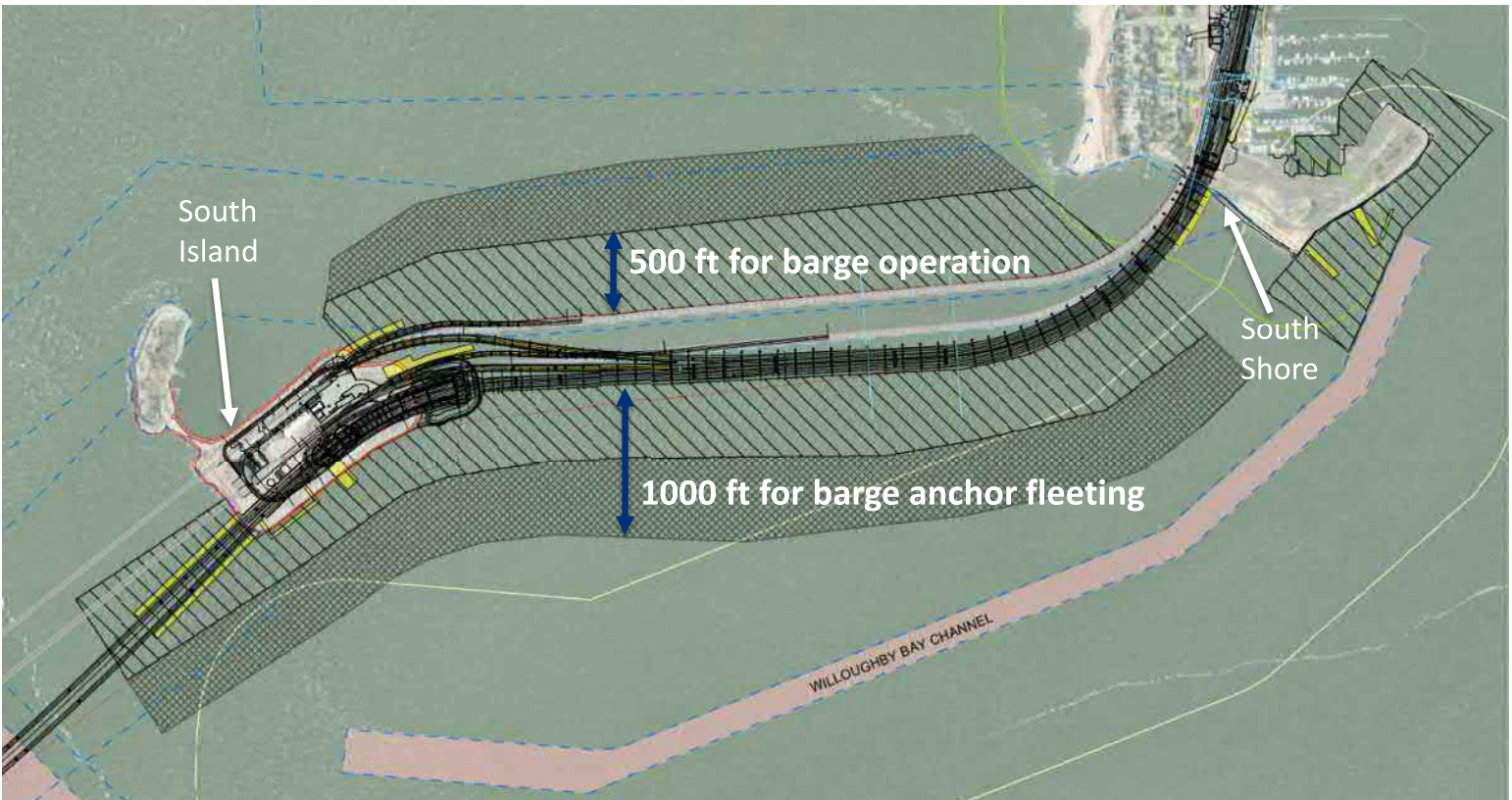
# South Bridges and South Island Expansion

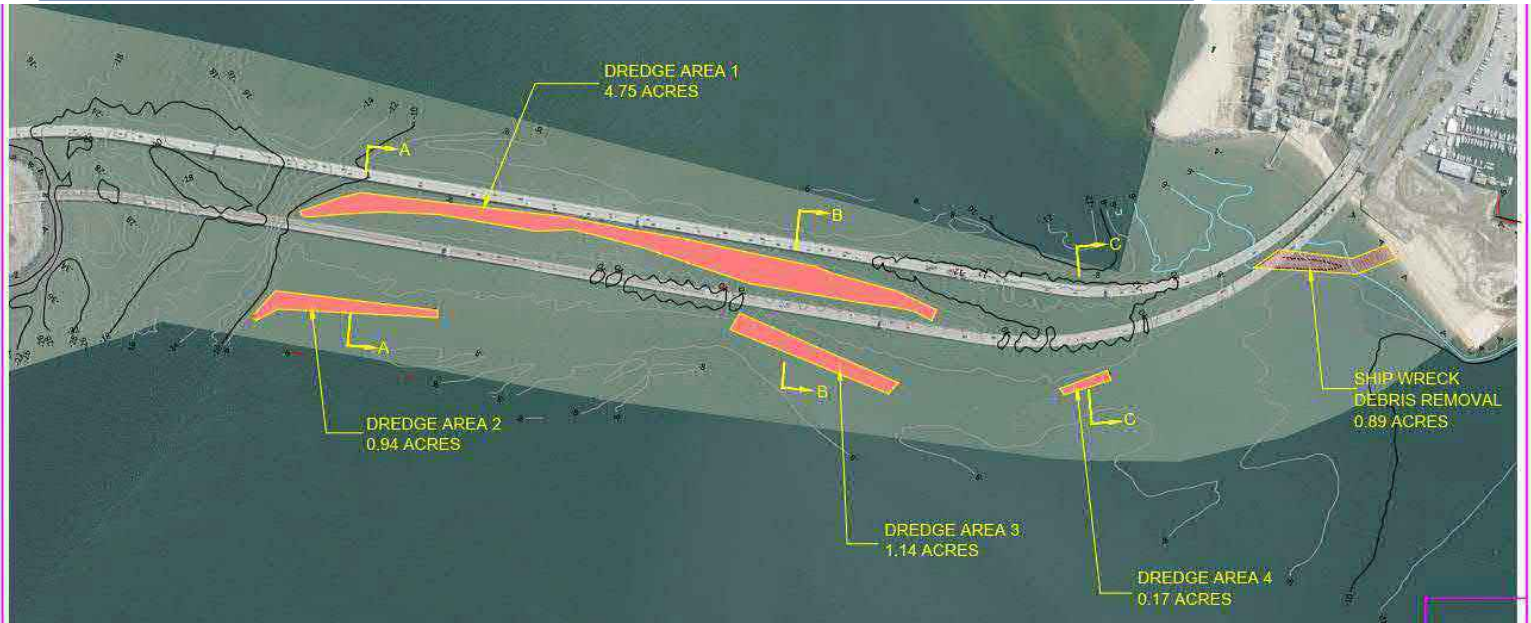
Scope of Work	Existing two-lane bridges demolished
	Build new eight-lane bridge
	Expand South Island to the south (2.64 acres)
Schedule of Activities	Work to begin after JPA and IHA approval
	Last activity September 2024
	Additional 6 months to remove remaining structures
Barges on Water	Barge operations 500' from expansion boundary
	Barge anchoring 1000' from expansion boundary
	Spud barges used in water depths >7' MLW
	+/- 25 barges for South Trestle at peak
	+/- 10 barges for South Island expansion at peak
	Crane barges, up to 100' x 350'
	Supply barges, up to 100' x 350'





South Island Expansion & South Bridges





Area (SF)	Volume (CY)	Dredge Depth (ft)
150,000	16,700	3
15,000	1,670	3
14,000	1,560	3
4,000	450	3
~45,000 (Willoughby Spit)	7,225	N/A – Debris Removal

Barge Routes from Project Site for Upland DM Disposal





- North Trestle Bridge
- Tunnels
- South Trestle Bridge
- **Willoughby Bay**



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Willoughby Bay Bridge



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Scope of Work: Widen existing structures in both directions to the outside

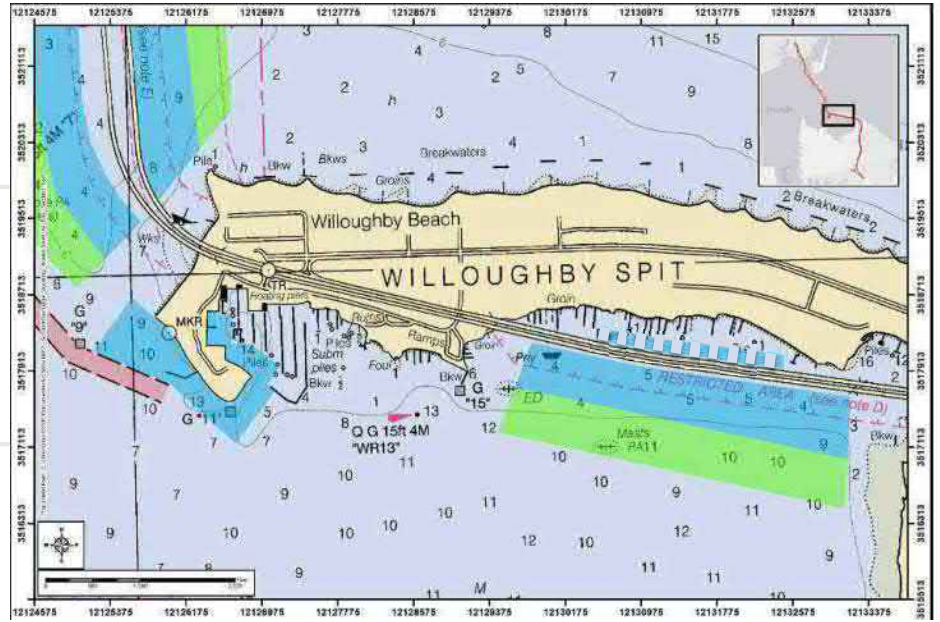
Schedule of Activities: Work to begin after JPA approval  
Last activity December 2024

Additional 3 months to remove remaining structures

Barges on Water: Spud barges used in water depths >7' MLW  
+/- 10 barges at peak

Crane barges, up to 100' x 350'

Supply barges, up to 100' x 350'



- Barge Operations (500')
- Barge Placement (1000')
- USACE Maintained Nav Channel

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# Willoughby Bay





Navigation Plan





- Crane barges will be outfitted with spuds and/or anchors. The mooring system will be defined by the operation, location and the environmental risk associated.
- Several material barges/deck barges will support the operations of the crane barges.
- Other barges anticipated on site include: hopper barges for support of rock work, scow barges for dredging applications, sectional barges for shallow water operations and anchor handling barges.



# Navigation Plan – Typical Tugboats



- The images show typical pushboat style tugboats
- The project anticipates using a combination of pushboats, model bow and shallow drafting truckable tugboats for the marine movements, towing and logistics
- Horsepower and sizes will vary. Estimated horsepower ranges between 600 and 4,000 HP.



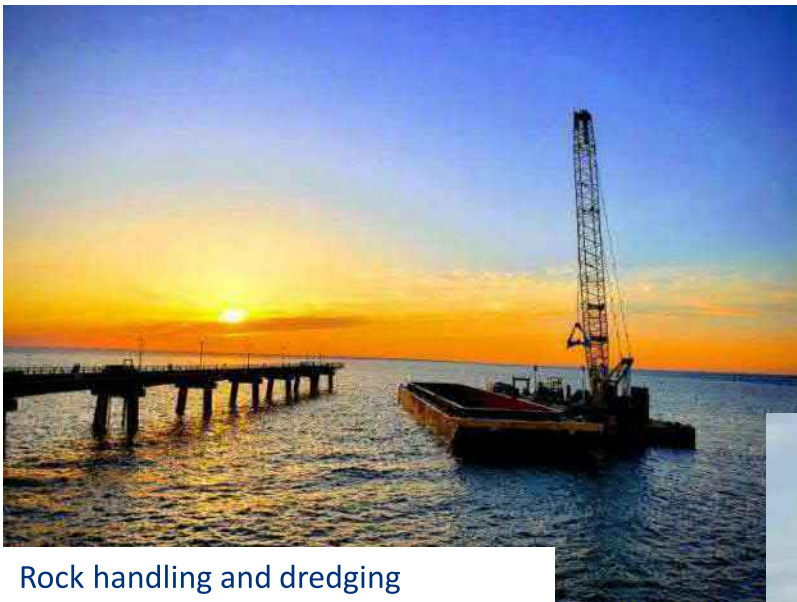
Pile driving



Barge secured on spuds and anchors



Typical Fixed Lead



Rock handling and dredging operation



Typical dredging with environmental bucket



Typical dredging



Typical Mooring Anchor

Typical Mooring Buoy



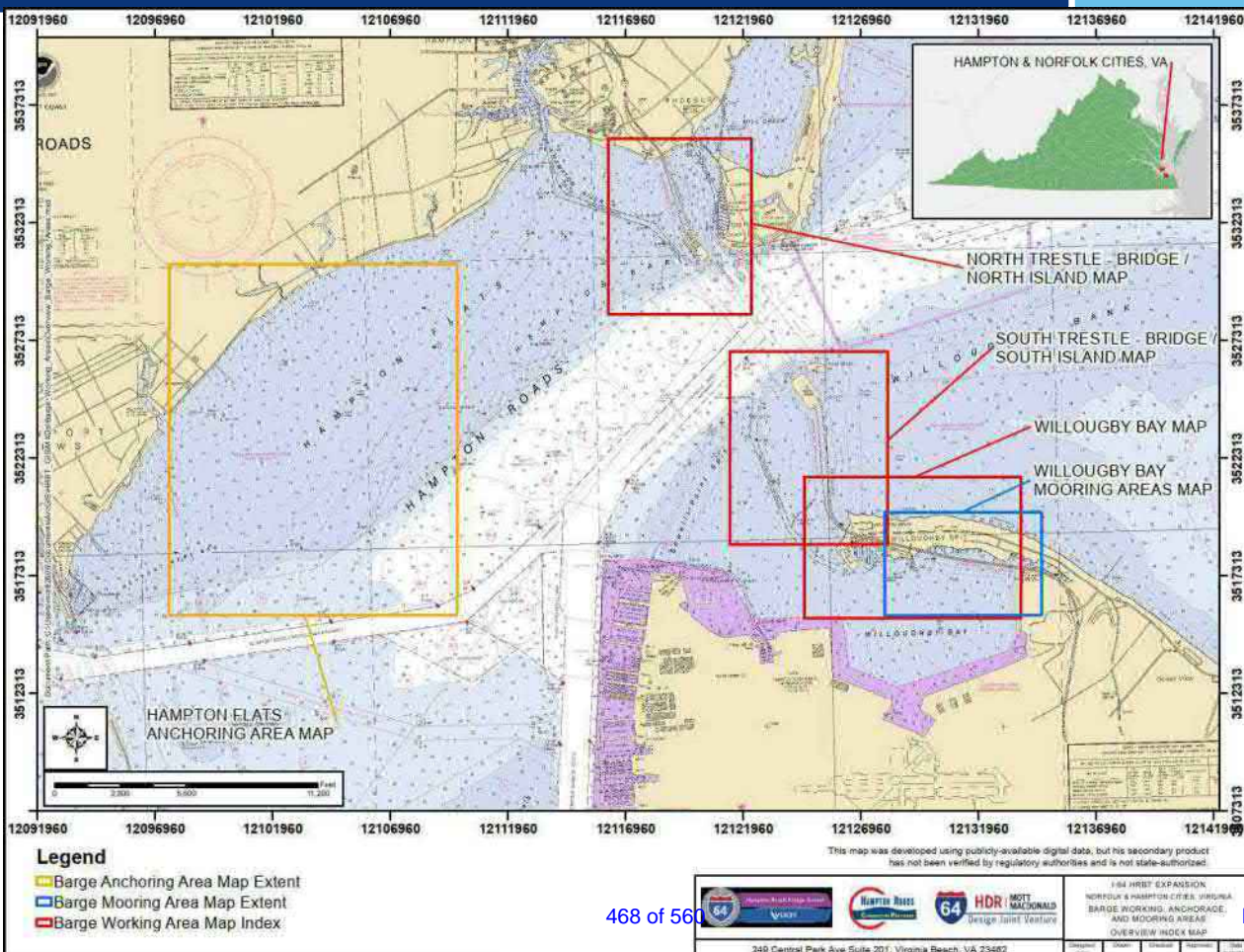
Material Barge on Mooring

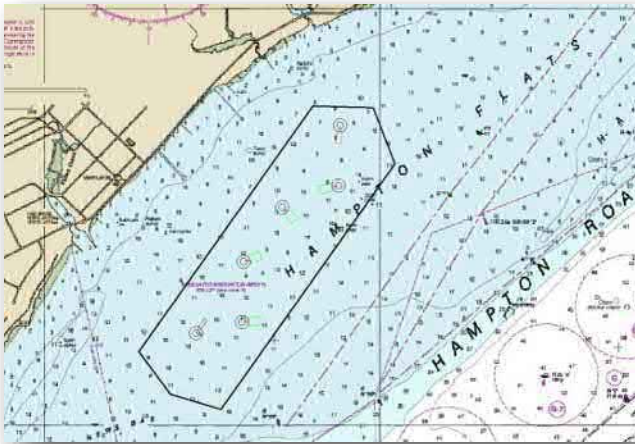


Typical Mooring Buoys

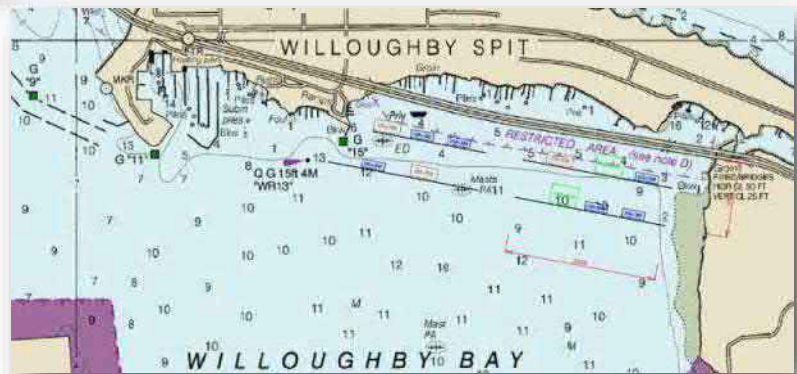


Navigation Plan – Proposed Mooring and Anchorage Areas





- 1) Anchorage Area - Hampton Flats  
Minimum of 1000' between anchorages
- 2) Mooring Area – Willoughby Bay  
Proposed pile moorings that will stay within the project limits



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## Navigation Plan



- The vessel captain will navigate to pre-determined locations, monitor ship traffic, communicate with local vessels via VHF radio, & coordinate with designated channel vessel/traffic authorities, as well as per instruction from the USCG.
- Weather and environmental conditions will be monitored continuously. When weather permits barges may remain on site on spuds or anchorages overnight.
- The vessel will go back to the mooring areas or their home ports during extended shutdowns.
- Crew boats and/or tugboats will transport project personnel from shore to vessel each day.
- Every barge and tugboat will be equipped with an AIS transponder (Automatic Identification System) which will aid in traffic and enhance coordination between vessels and other traffic authorities.
- Each and every barge, pile mooring and anchorage mooring will be lit and marked according to the clearly defined Coast Guard Standard.
- All barges will undergo a marine survey prior to on hire or off hire in order to ensure structural and mechanical integrity for the project working environment.
- Regular routine inspection will be carried on the barge to ensure structural and mechanical integrity.

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