New Castle-Rye 16127
Preliminary Design

New Hampshire DOT
Department of Transportation

New Castle-Rye Bridge
Public Advisory Committee Meeting
July 23,2013

HDR | Hoyle, Tanner & Associates, Inc.

Meeting Agenda

- Welcome & introductions
- Review of Jan 24th PAC meeting
- Today's presentation – status update on project
    1. Natural Resources review
    2. Historic Resources review
    3. Archeological Resources review
    4. Four Conceptual Design Alternatives
- Public Information Meeting – August 14, 7 p.m.
- Next steps

1. Natural Resources Review

- Coordination with Natural Resource Agencies
- Environmental Resources
- Considerations for bridge design

Coordination with Natural Resource Agencies

- US Fish & Wildlife
- National Oceanographic and Atmospheric Administration
- US Coast Guard
- New Hampshire Natural Heritage Bureau
- New Hampshire Fish and Game

1. Natural Resources

- Little Harbor
- Tidal wetlands
  - Three wetland areas
    - (1 in northeast, southeast and northwest quadrants)
  - Permits likely required
- Near eelgrass beds
- Threatened and Endangered Species
  - Several species of Atlantic sturgeon
  - Marsh elder & bald eagle outside project area

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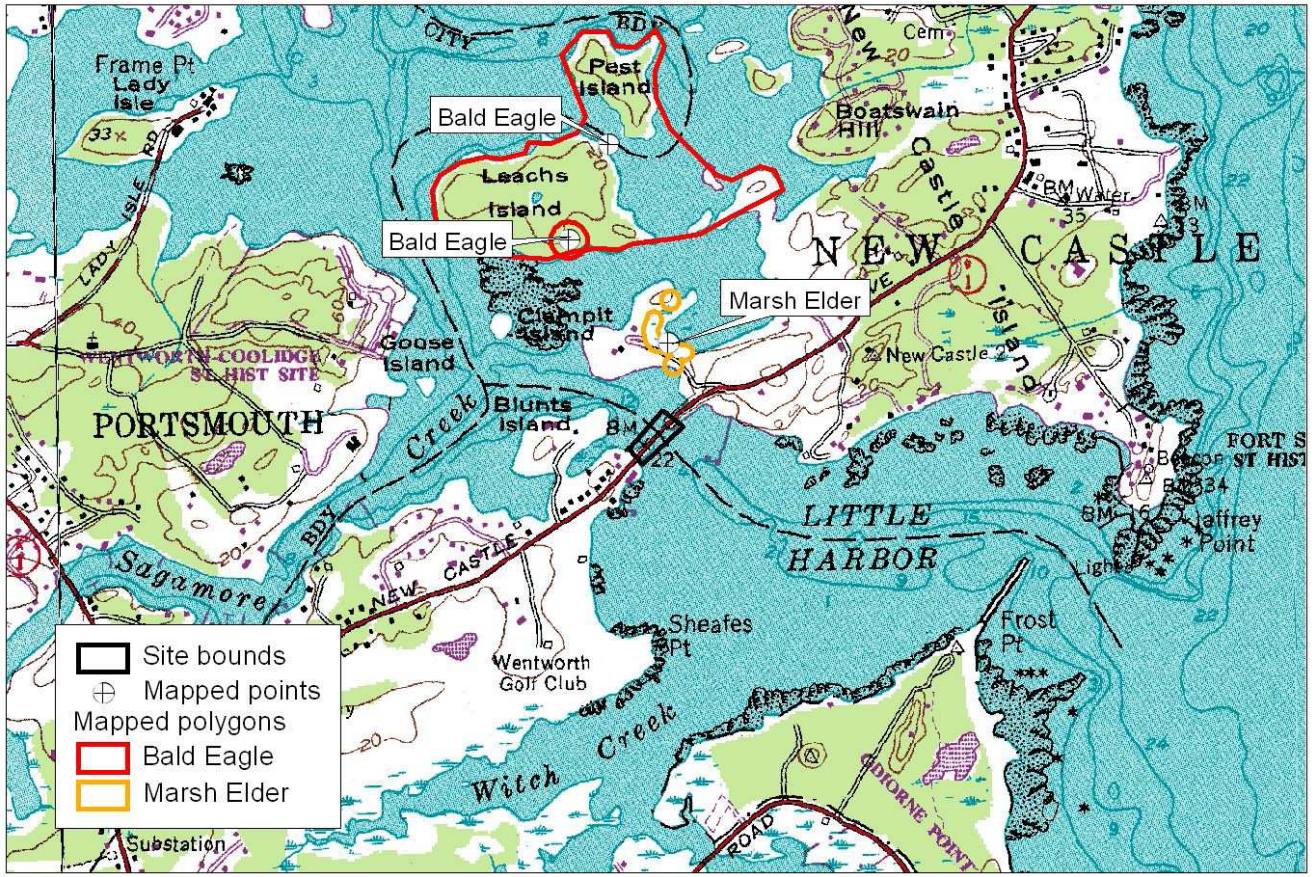
NH Natural Heritage Bureau

Known locations of rare species and exemplary natural communities

Note: Mapped locations are not always exact. Occurrences that are not in the vicinity of the project are not shown.



Valid for one year from this date: 30 Jan 2013

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2. Historic Resources Review

Work Completed

- Initial Coordination with State Historic Preservation Office
- Area of Potential Effect (APE)
  - Why it's required
  - How an APE is determined
- APE for the New Castle-Rye Bridge
- Individual Inventory Form completed for bridge

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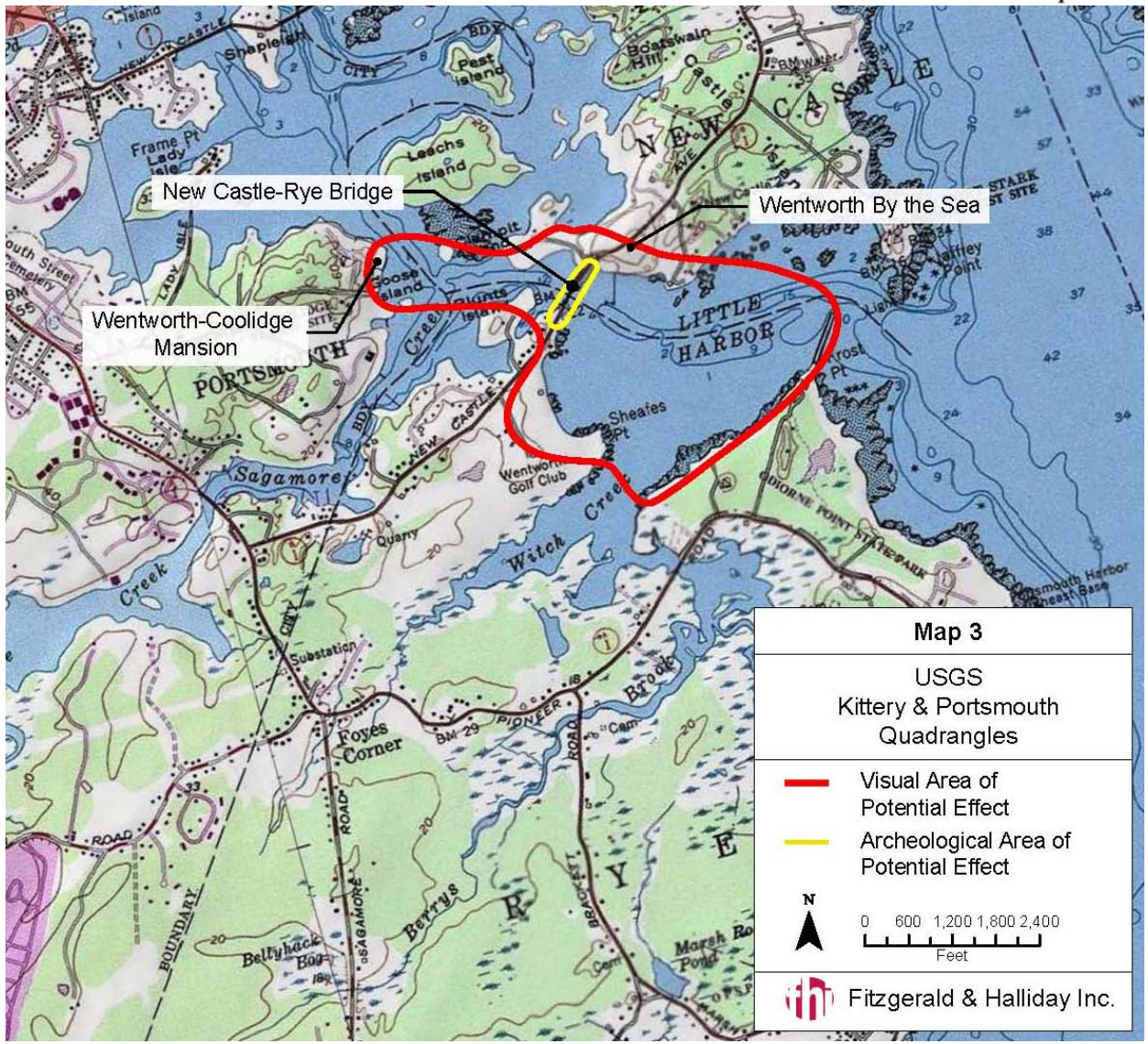

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Historic Resources Review

Conclusions:

- Bridge eligible for National Register of Historic Places

  Criterion A – association with historical event (defense of Portsmouth Harbor during WW II)

  Criterion C – distinctive characteristics (1 of 2 bascule bridges in NH) of type, period or method of construction

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What is a Bascule Bridge?

- Popular bridge type used throughout US
- "Bascule" is a French word for seesaw
- Mechanical system that uses counterweights to "bala segments
- Rare in NH because of limited shoreline and navigable rivers

3. Archaeological Review

- Fieldwork for Phase 1a Archaeological Study completed
- Report underway
- 1874 bridge abutments

Environmental Considerations for Bridge Design

- Avoidance of disrupting Atlantic sturgeon habitat, spawning season
- Minimize/avoid wetland disturbance
- Avoid eelgrass beds during construction

Bridge Background

- 5 approach spans, with a single leaf bascule bridge
- Approximately 250-feet long
- Two 11 foot travel lanes, 1 foot shoulders, one 4 foot sidewalk
- Average Daily Traffic (2010) 4,200 vehicles per day
- Built in 1941, Rehabilitated in 1975, with additional repairs in 1978 and 2009
- In-depth bridge inspection in 2011 indicated significant deficiencies
- Bridge located in USACE-maintained federal channel
- Steel grate bridge deck
- Posted speed 25 mph
- 15 Ton Weight Limit

Existing Bridge Conditions

- Narrow roadway shoulders and sidewalk
- Need to cross road on north roadway approach to use bridge sidewalk
- Lack of stormwater treatment on south side of bridge
- Bascule span machinery doesn't meet current code
- Inadequate fail safes on bascule span
- Open deck a hazard to bicyclists and is noisy
- Bridge rail substandard and inadequate for vehicular impact

Structural Condition of the Bridge

- Paint masks current condition of bridge
- Stringers, floorbeams and bascule girders exhibit advanced section loss.
- Pier caps and piles exhibit advanced section loss. Some piles are buckled.
- Approach span stringers exhibit varying levels of advanced section loss

4. What Alternatives will be considered?

- Rehabilitation
- Replacement on same alignment
  - New lift bridge (likely bascule design)
  - Raise bridge profile (stationary bridge)
- Replacement on new alignment

Four roadway alignment alternatives

- Alternative 1 – Existing Horizontal Alignment/ Existing Profile (Rehabilitation)
- Alternative 2 – Existing Horizontal Alignment/ Raised Profile (Replacement)
- Alternative 3 – Shifted Horizontal Alignment (Replacement)
- Alternative 4 – Offline Horizontal Alignment (Replacement)

Bridge Rehabilitation – What is Required?

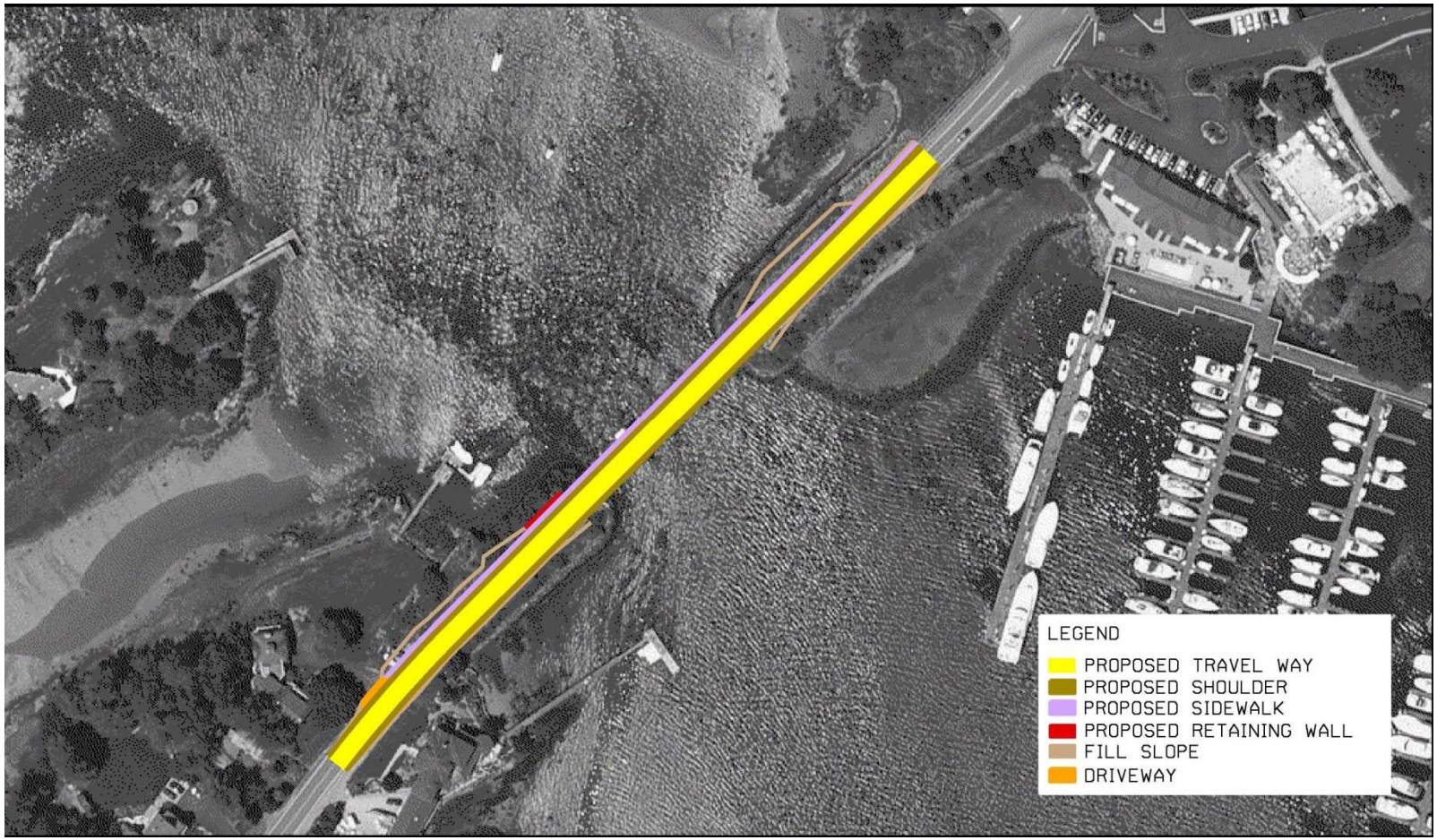
- Structural Members requiring rehabilitation:
  - Deck
  - Approach Stringers
  - Bascule Span Floorbeams
  - Bascule Girders
  - Pier Caps
  - Pier Piles
- Bridge railing requires replacement
- Approach slab may be required at abutments
- Electrical systems require replacement
- New mechanical components required to meet modern standards
- Machinery, Trunnion, and Counterweight will not allow for solid deck

Alternative 1 – Existing Horizontal Alignment/Existing Profile

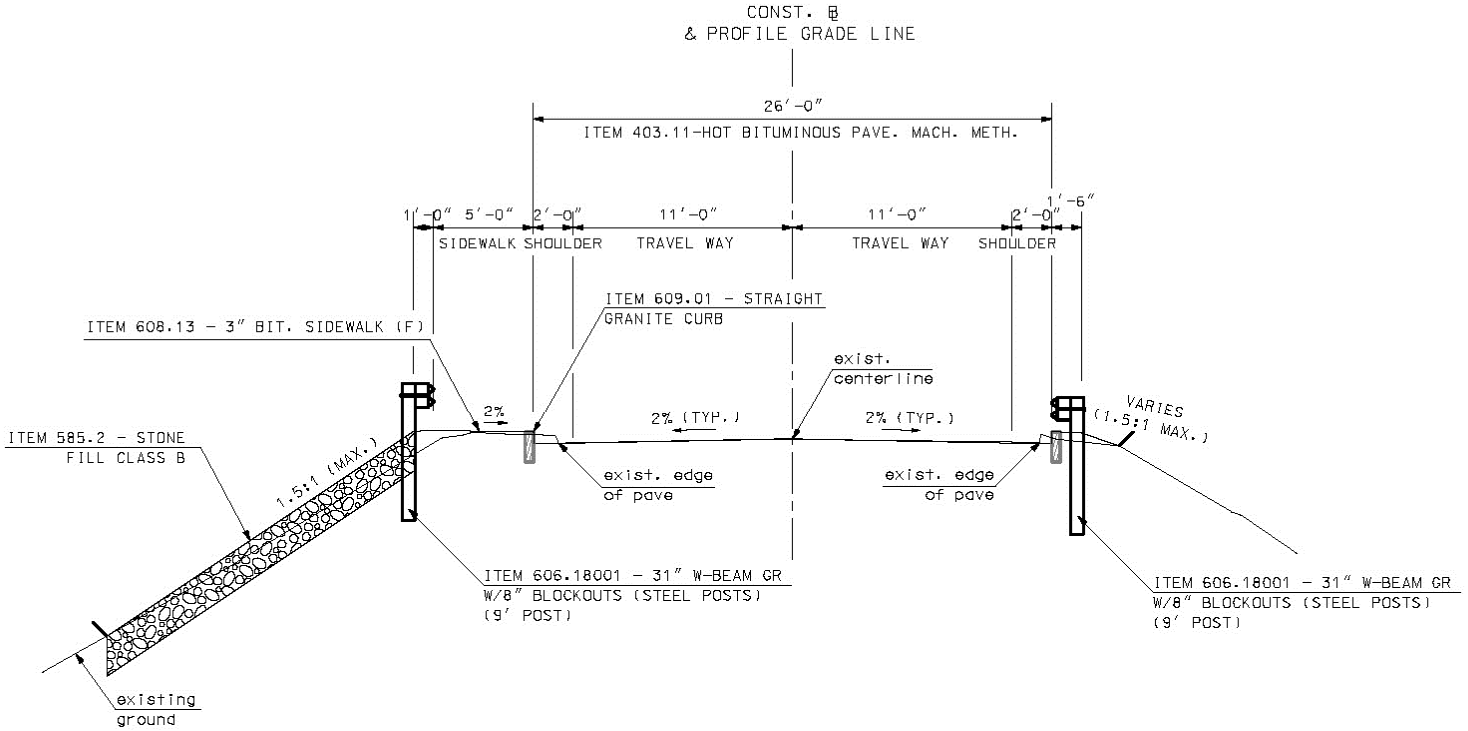
- Considered for Bridge Rehabilitation
- Matches geometry of existing roadway – horizontal and vertical
- Paved roadway shoulder width increased from 1 to 2 feet
- Sidewalk width increased from 4 to 5 feet
- Does not realign north approach sidewalk with bridge sidewalk
- Full bridge closure during rehabilitation of bascule span and rehabilitation substructure.

Alternative 1 – Rehabilitation

Existing Horizontal Alignment / Existing Profile



Alternative 1 – Existing Horizontal Alignment / Existing Profile



ALTERNATIVE 1 - EXISTING HORIZONTAL ALIGNMENT / EXISTING PROFILE

SCALE: 1″ = 10′

Alternative 2 – Existing Horizontal Alignment / Raised Profile

- Raised Vertical profile by 6 feet - 3 inches for Fixed Span
- Profile increase based upon **minimum** requirement of active USCG vessels
- Requires significant driveway tie-ins (re-grading) and potentially reduces sight distance
- Requires new retaining walls in all four bridge quadrants; will impact existing stonewalls, and will require additional work in water. May impact Amurcork tree
- Full bridge closure during replacement of bridge.

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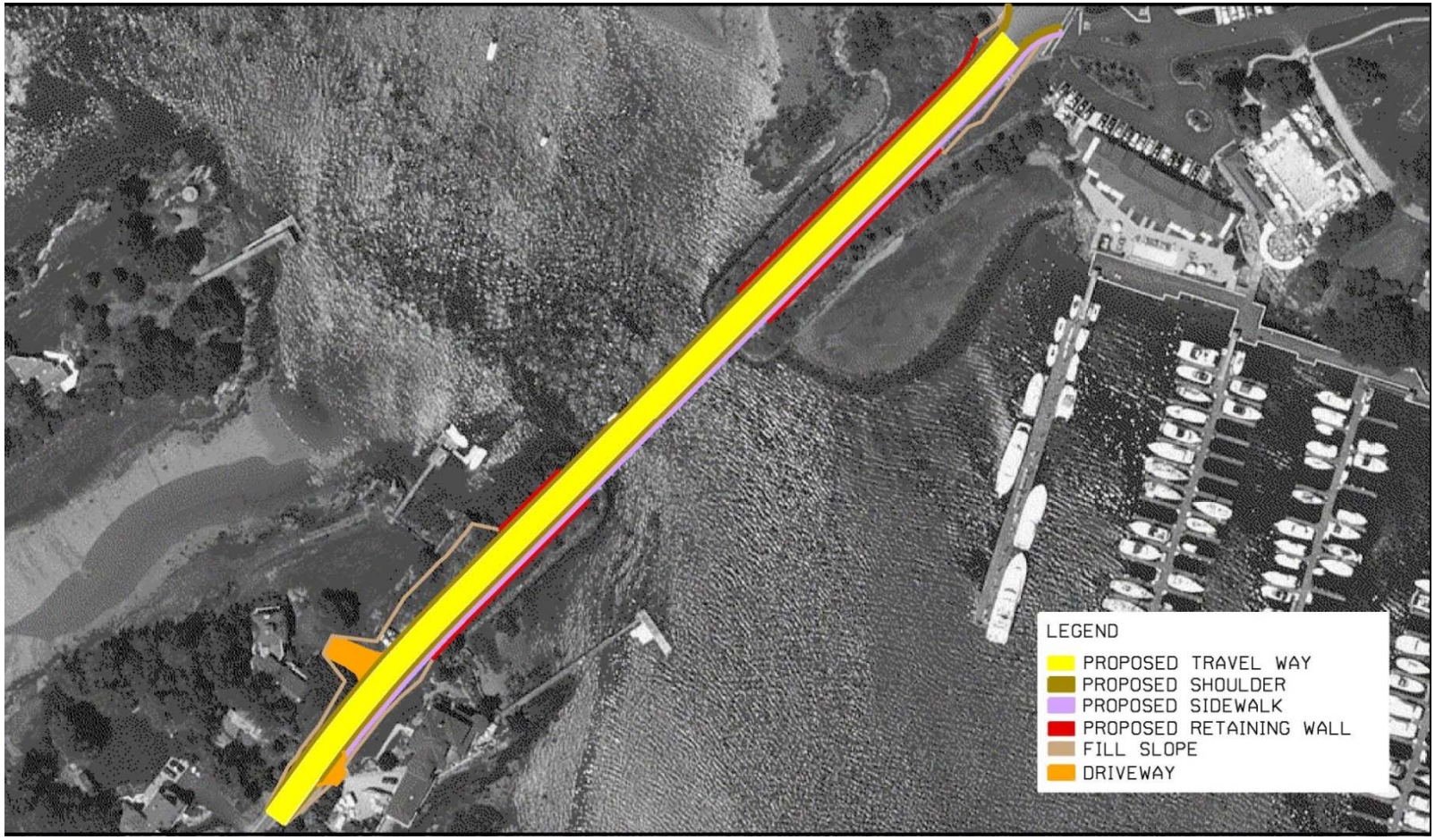
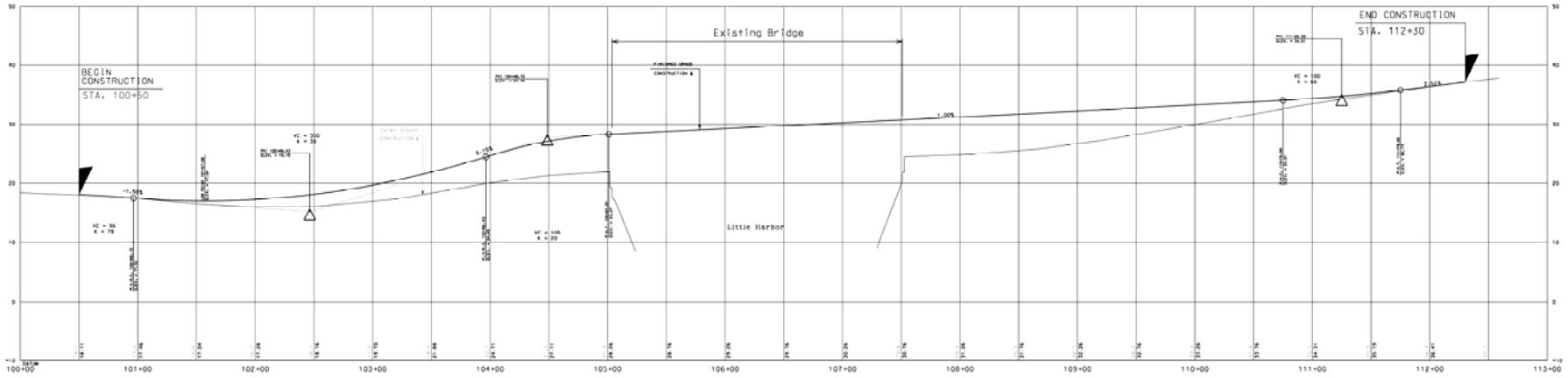
Alternative 2 - Replacement

Existing Horizontal Alignment/Raised Profile



Alternative 2 - Replacement

Existing Horizontal Alignment / Raised Profile



Alternative 3 – Shifted Horizontal Alignment

- Matches vertical geometry of existing roadway, widens approach area to bridge by approximately 1 feet – 9 inches on west side; Centerline of Roadway shifts 6 feet – 9 inches west required by sidewalk relocation to north side
- Majority of impacts on western side of roadway
- Roadway with 4 foot shoulders may require extension of existing retaining wall on northwest quadrant; 2 foot shoulders will also be investigated
- Full bridge closure during replacement of bridge.

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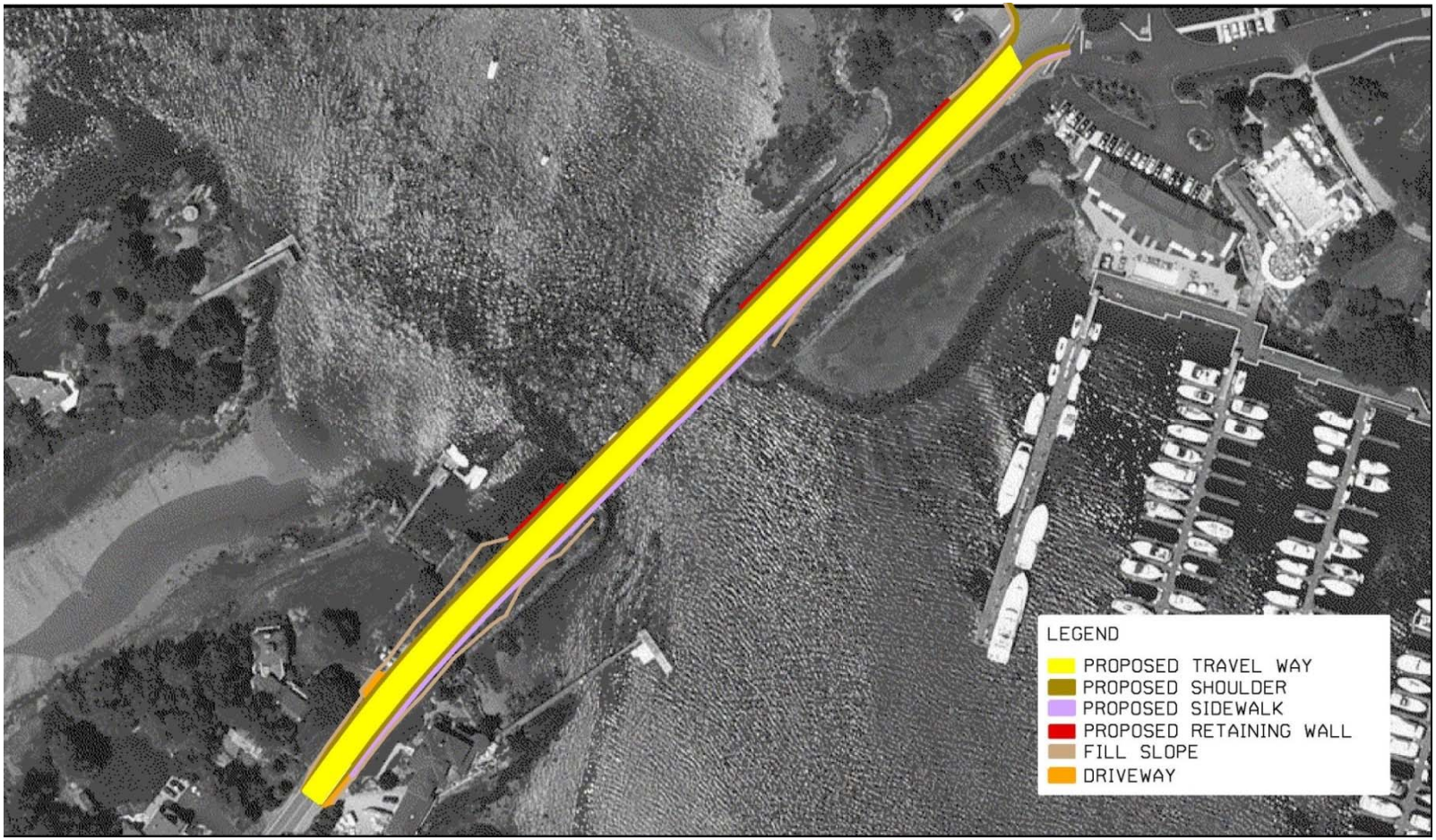
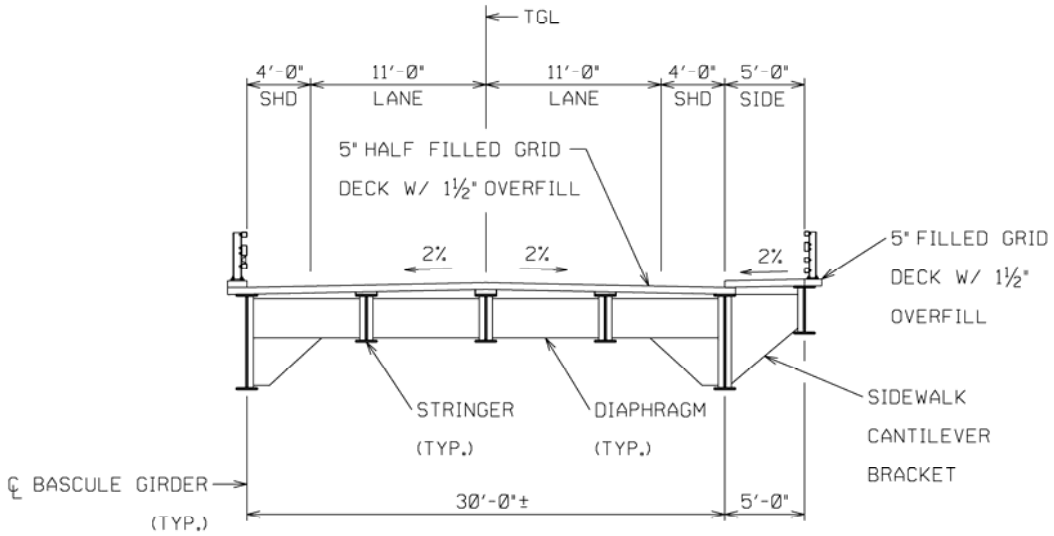
Alternative 3 – Replacement

Shifted Horizontal Alignment



Alternative 3 – Shifted Horizontal Alignment

PH6



WENTWORTH BRIDGE
NEW CASTLE-RYE - 16127
CONCEPTUAL BRIDGE REPLACEMENT
BASCULE SPAN - CROSS SECTION

Slide 27

PH6 Sidewalk should be 3 in filled grid deck.
Protin, Herbert, 7/17/2013

Alternative 4 – Offline Horizontal Alignment (Phased construction)

- New bridge built on new alignment, 17 feet to the west
- Greatest environmental impacts to harbor and stonewalls
- Amurcork tree
- Bridge will remain open during the majority of construction with 1 lane alternating traffic; road detours will occur during portions of bascule construction
- Significantly longer construction duration than other replacement alternatives

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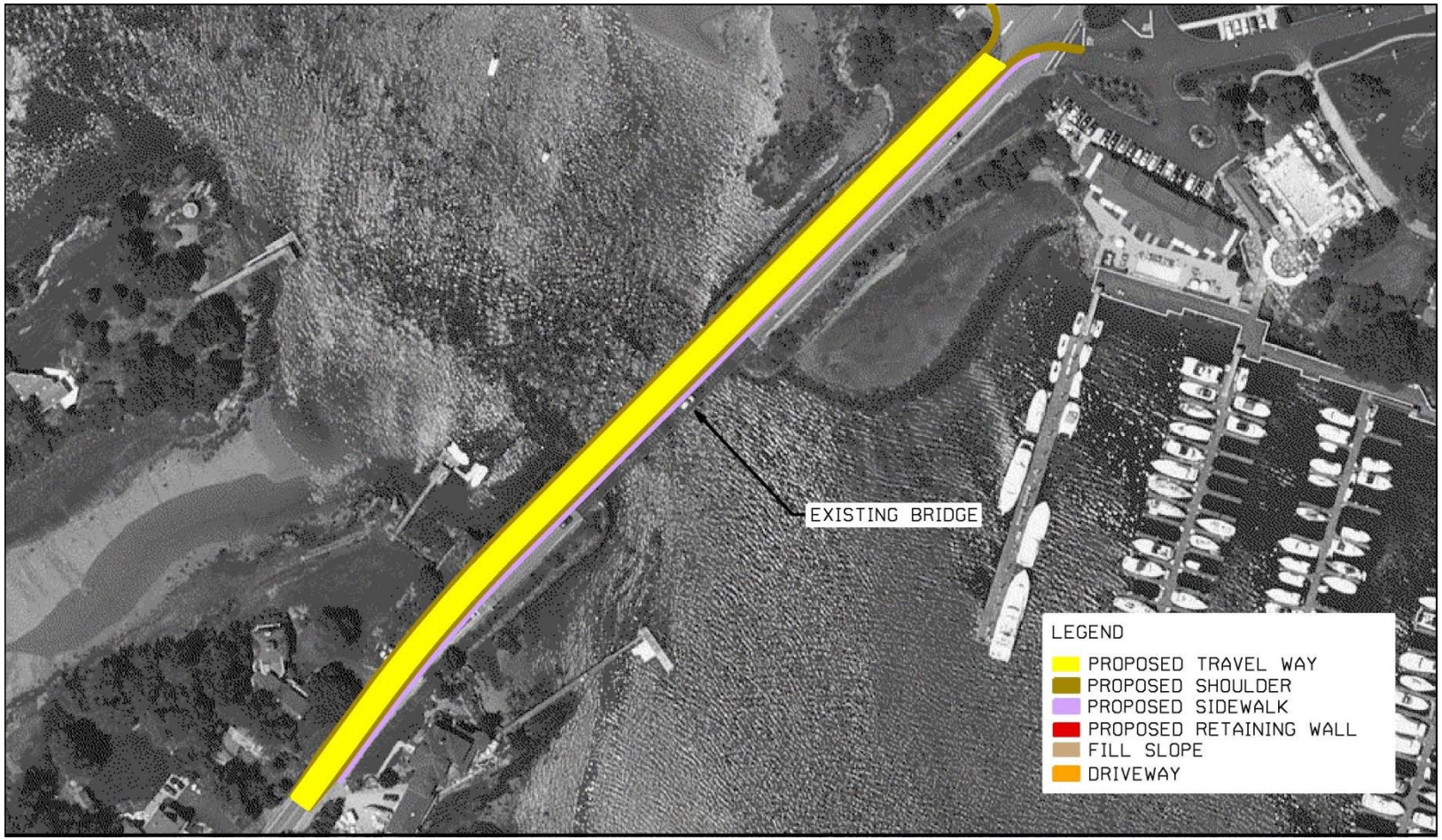
Alternative 4 - Replacement

Offline Horizontal Alignment (Phased Construction)



Recommended Alternatives for further study

- Alternative 1 – Existing Horizontal Alignment / Existing Profile (Rehabilitation)
- Alternative 3 – Shifted Horizontal Alignment (Replacement)
- Alternatives 2 and 4 not recommended

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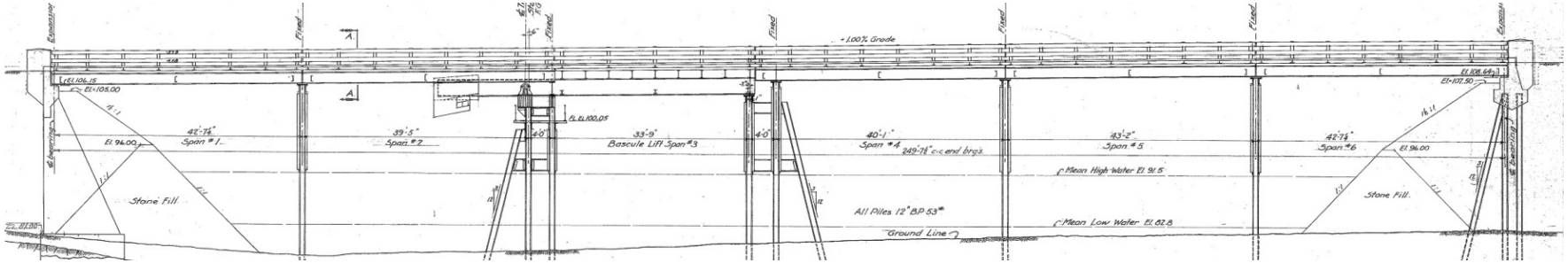

WENTWORTH BRIDGE
NEW CASTLE-RYE - 16127
EXISTING BRIDGE
ELEVATION

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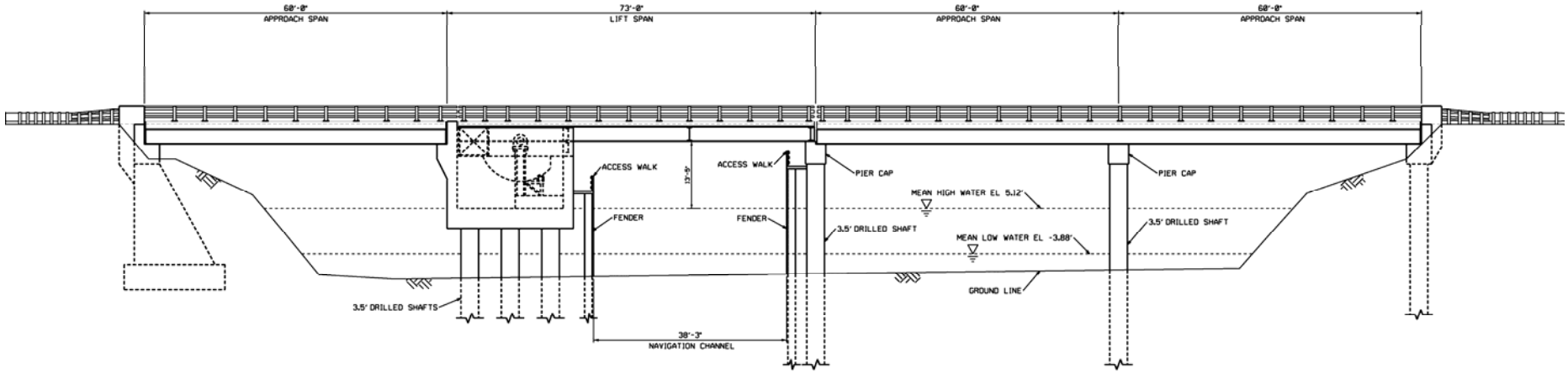

WENTWORTH BRIDGE
NEW CASTLE-RYE - 16127
CONCEPTUAL BRIDGE REPLACEMENT
ELEVATION

Estimated project cost

- ***Rehabilitated Bridge***

  Alternative 1 – Existing Horizontal $17.0 million

  Expected Life: 30-40 Years

- ***New Bridge Construction***

  Alternative 3 – Shifted Horizontal Alignment $20.0 million

  Expected Life: 75 Years

Construction

- Construction projected to begin in late 2015 at the earliest
- Project **WILL NOT BEGIN** until Sagamore Bridge (US 1 A) reopens
- Memorial Bridge will also be open
- Additional travel time of 15 minutes, 6 miles

Minimize Construction Impacts

- Avoid sensitive environmental (spawning) seasons with in water work
  - Based on Memorial Bridge, in-water work Nov 15th to April 1st
  - Spawning season for Atlantic sturgeon
  - Minimize silt disturbance on eelgrass beds

Minimize Construction Impacts

- What timeframes would a closure have the greatest and least impacts on:
  - Mobility
  - Business
  - Marine Navigation
  - Environment

Initial Construction Impact Comparison between Alternatives

- Longer Closure for all modes of traffic with Rehabilitation versus Replacement
- Less flexibility of Closure Season with Rehabilitation versus Replacement
- More opportunities for construction means and methods with Replacement versus Rehabilitation

Next steps

- Public Information Meeting – August 14 at 7 p.m. at The Common (Recreation Center), New Castle
- Complete Type, Size & Location Study – December 2013
- Review Type, Size & Location Study at PAC meeting – January 2014