

New Castle-Rye 16127 Preliminary Design



New Castle-Rye Bridge
Cultural Resources Coordination Meeting
November 14, 2013



Hoyle, Tanner
& Associates, Inc.

Meeting Agenda

- Welcome & introductions
- Today's presentation – progress update on project
 1. Project Background
 2. Public Involvement
 3. Overview of Alternatives
 4. Bridge Rehabilitation
 5. Bridge Replacement
 6. Comparison of Alternatives
- Moving Forward

1. Project Background

- Completed Inspection and Condition Report of Bridge in 2011
- Began investigating rehabilitation/replacement options in 2012
- Four alternatives introduced in July 2012
- Two alternatives currently under review
 - Rehabilitation
 - Replacement with bascule

Project Background

- Raised Profile and Off-Alignment Alternatives previously recommended for elimination due to unreasonable impacts to environment, surrounding areas and community
- Rehabilitation and Replacement with a bascule structure under on-going consideration
- Designs are heavily informed by the on-going Public Involvement process



2. Public Involvement

- Public Involvement Plan developed in early 2013, called for:
 - Creation of a Public Advisory Committee (PAC), formed in early 2013
 - Public Informational Meetings
 - Providing notification to public of project and meetings
 - Project website with key materials



New Hampshire
DOT **Public Information Meeting**
NEW CASTLE - RYE BRIDGE PROJECT



Wednesday August 14, 2013
7:00 - 9:00pm
(doors will open at 6:30pm)

The Common - Recreation Center
301 Wentworth Road (Route 1B)
New Castle, NH

Public Involvement

- First PAC meeting held in January 2013
- Key focal points voiced by the PAC:
 - Minimizing bridge closures is critical
 - Provide a solid deck on the bridge
 - Move sidewalk to the east side of the bridge
- Additional concerns voiced by PAC:
 - Minimize impacts to marine environment
 - Coordinate project with Sagamore Bridge
 - Protect vegetation



Public Involvement

- Second PAC and First Public Informational Meeting held in Summer 2013
 - Summary of Natural, Historic and Archeological Resources provided
 - Four design alternatives presented
- Concerns and needs expressed at these two meetings were largely similar to input provided in first PAC meeting
- Attendees of Public Informational Meeting surveyed at end for opinions



Public Involvement

- Results yielded from survey:
 - Majority of public would prefer a bascule span, regardless of selected alternative
 - Public wants winter construction of the bridge to minimize impacts to community
 - Large majority prefers a solid bridge deck over an open grate deck
 - Majority of public prefers moving sidewalk to East side of roadway
 - An overwhelming majority of the public supports a replacement option

3. Overview of Alternatives

- Rehabilitation
 - Requires intensive structural analysis of existing structure
 - Bridge must carry modern truck loads
 - If possible, bridge should be updated with wider shoulders and sidewalk, and given a solid deck surface
- Replacement with bascule
 - Other moveable structure types eliminated
 - Structure designed with sidewalk and shoulder widths meeting modern standards, and given a solid decking surface
 - Structure layout considers both aesthetics and constructability, minimizing construction duration – a key concern of the community

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Rehabilitation



New Castle

Rye

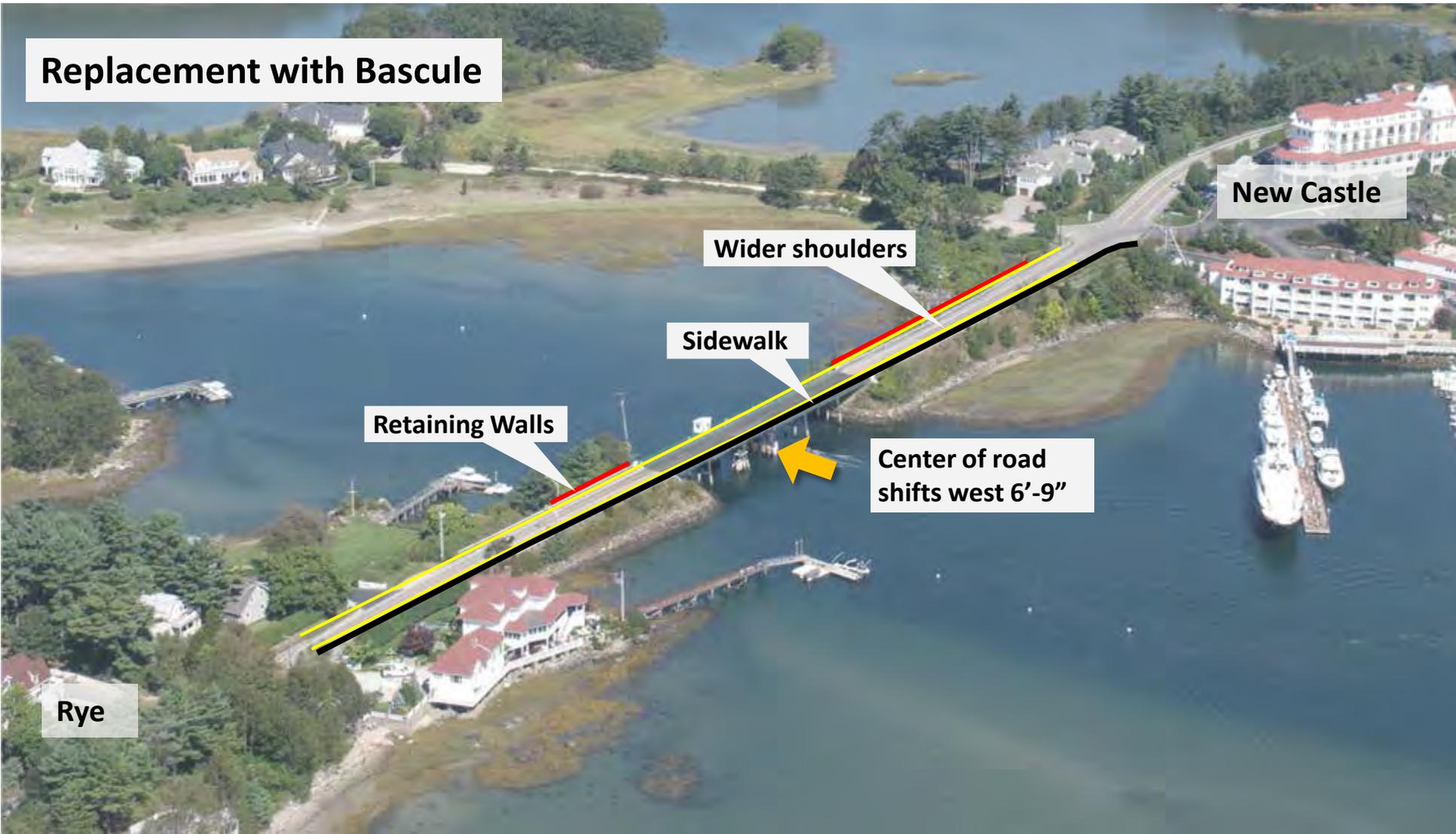


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Replacement with Bascule



Wider shoulders

Sidewalk

Retaining Walls

Center of road shifts west 6'-9"

New Castle

Rye



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4. Bridge Rehabilitation

- First step: analyze the existing structure
- Initial analysis assumed existing bridge sustaining modern statutory loads – did not include additional weight for wider roadway or closed deck
- Analysis determined that virtually all members are inadequate
 - Bridge designed for “H20” Truck – 20 tons
 - Bridge required to carry “HL93” Loading – a 36 ton truck plus 64 pounds/square foot (roughly 25 tons per span)
 - Additionally, requirements for seismic activity are much greater
 - Deterioration of bridge further reduces its capacity

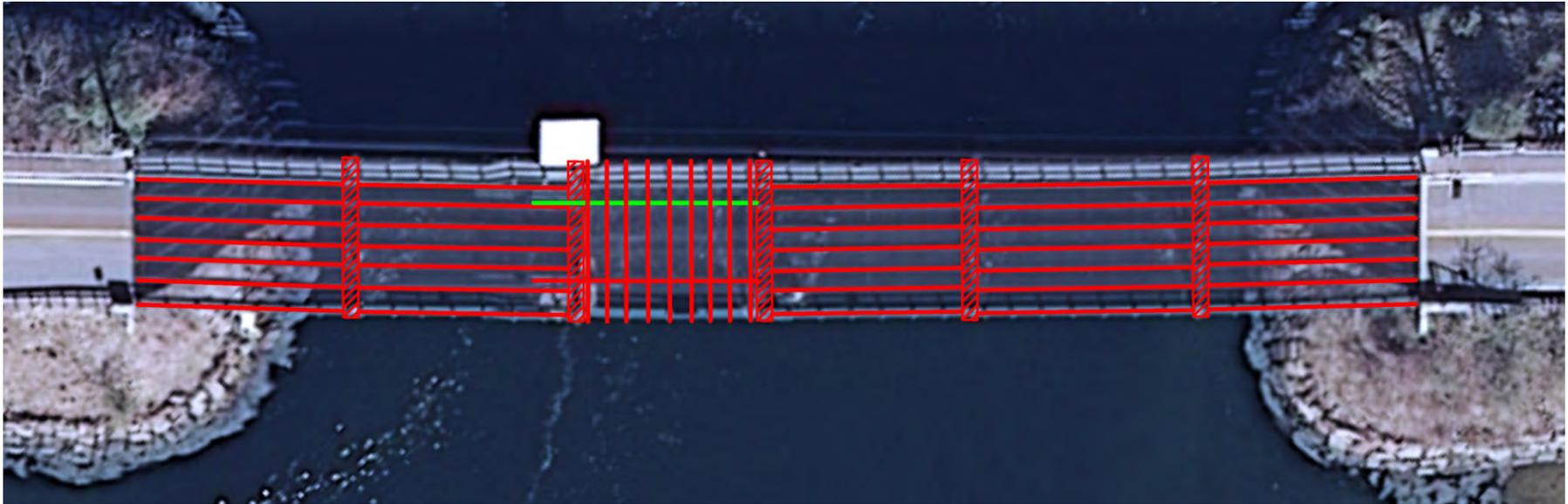
Structural Condition of the Bridge

- 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
- Machinery is obsolete



Bridge Rehabilitation

- Analysis determined that virtually all members are inadequate

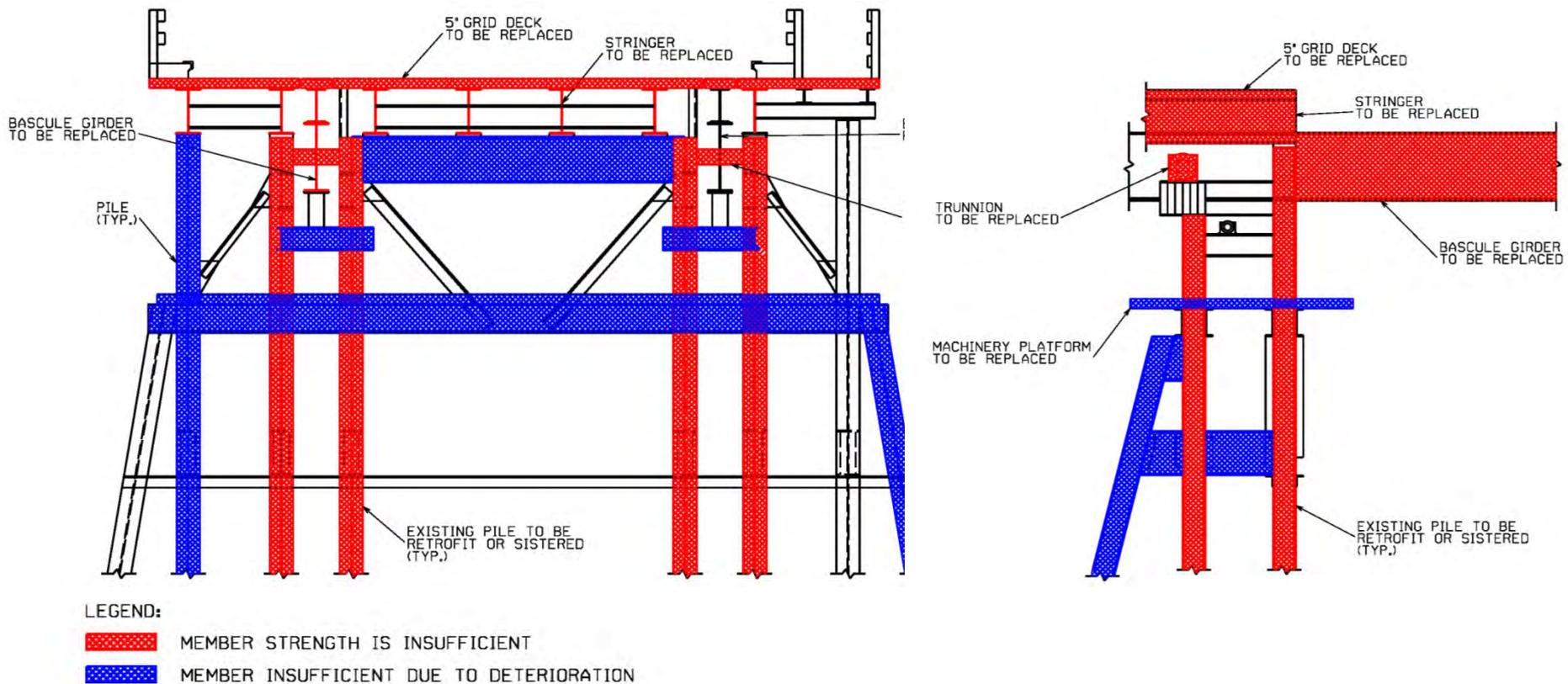


LEGEND:

- MEMBER STRENGTH IS SUFFICIENT
- MEMBER STRENGTH IS INSUFFICIENT

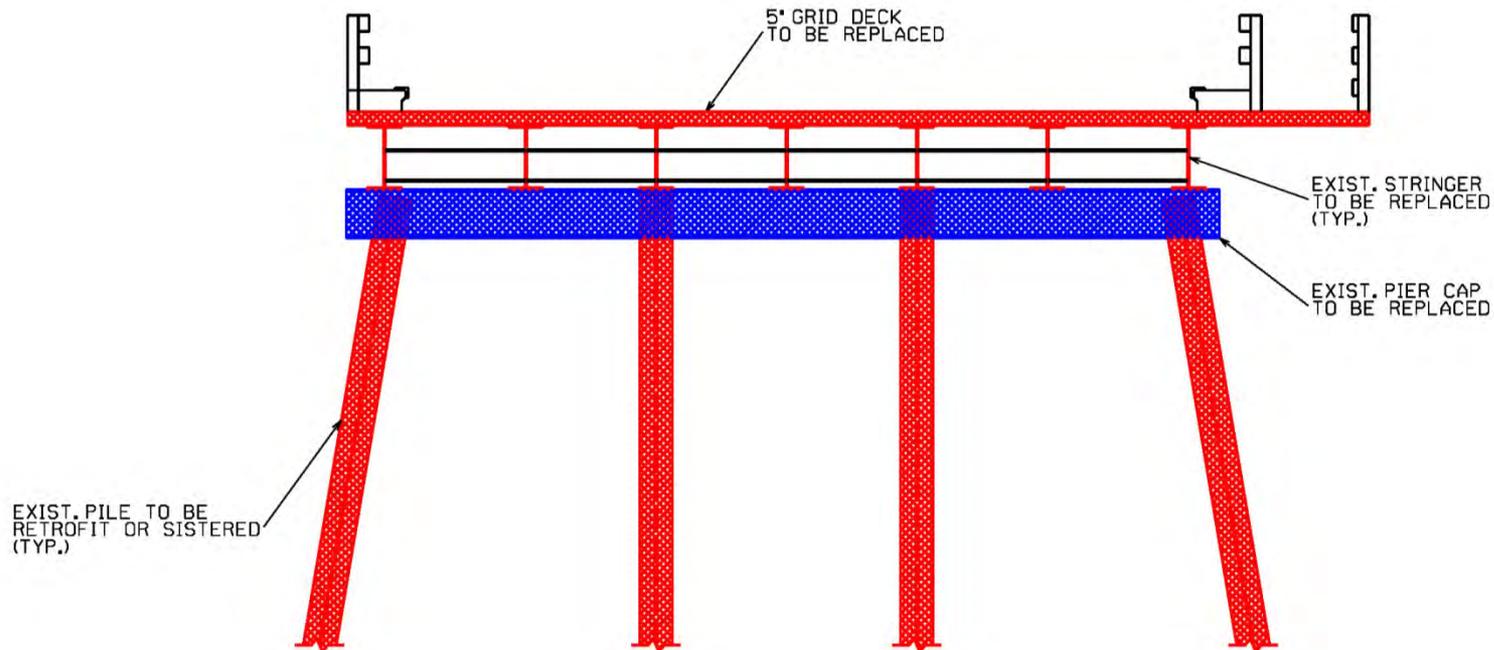
Bridge Rehabilitation

- Analysis determined that virtually all members are inadequate



Bridge Rehabilitation

- Analysis determined that virtually all members are inadequate



LEGEND:

-  MEMBER STRENGTH IS INSUFFICIENT
-  MEMBER INSUFFICIENT DUE TO DETERIORATION

Bridge Rehabilitation

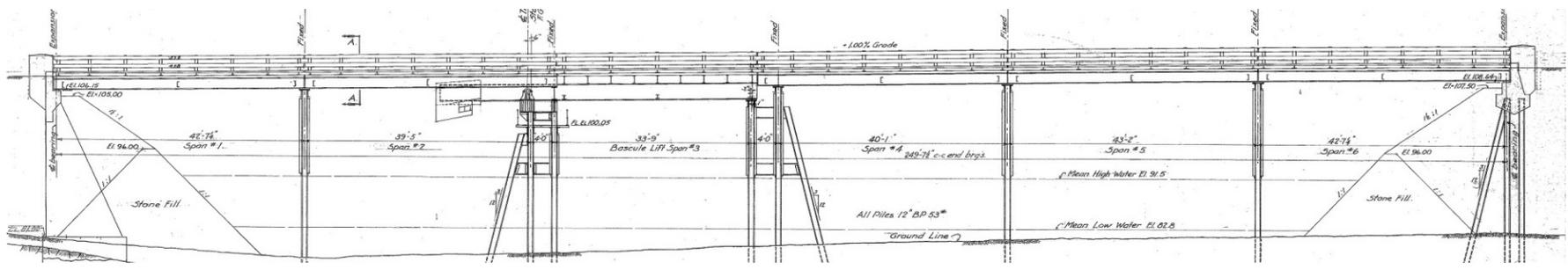
- Rehabilitation would require a complete dismantling of the structure
 - All approach stringers and caps are inadequate
 - Existing piles require retrofit or replacement
 - Machinery platform and trunnions are inadequate
 - Existing machinery requires replacement due to condition and obsolescence
 - Existing operator house is too small, and cannot fit required electrical controls
 - Rehabilitation is effectively construction of a replica bridge



Bridge Rehabilitation

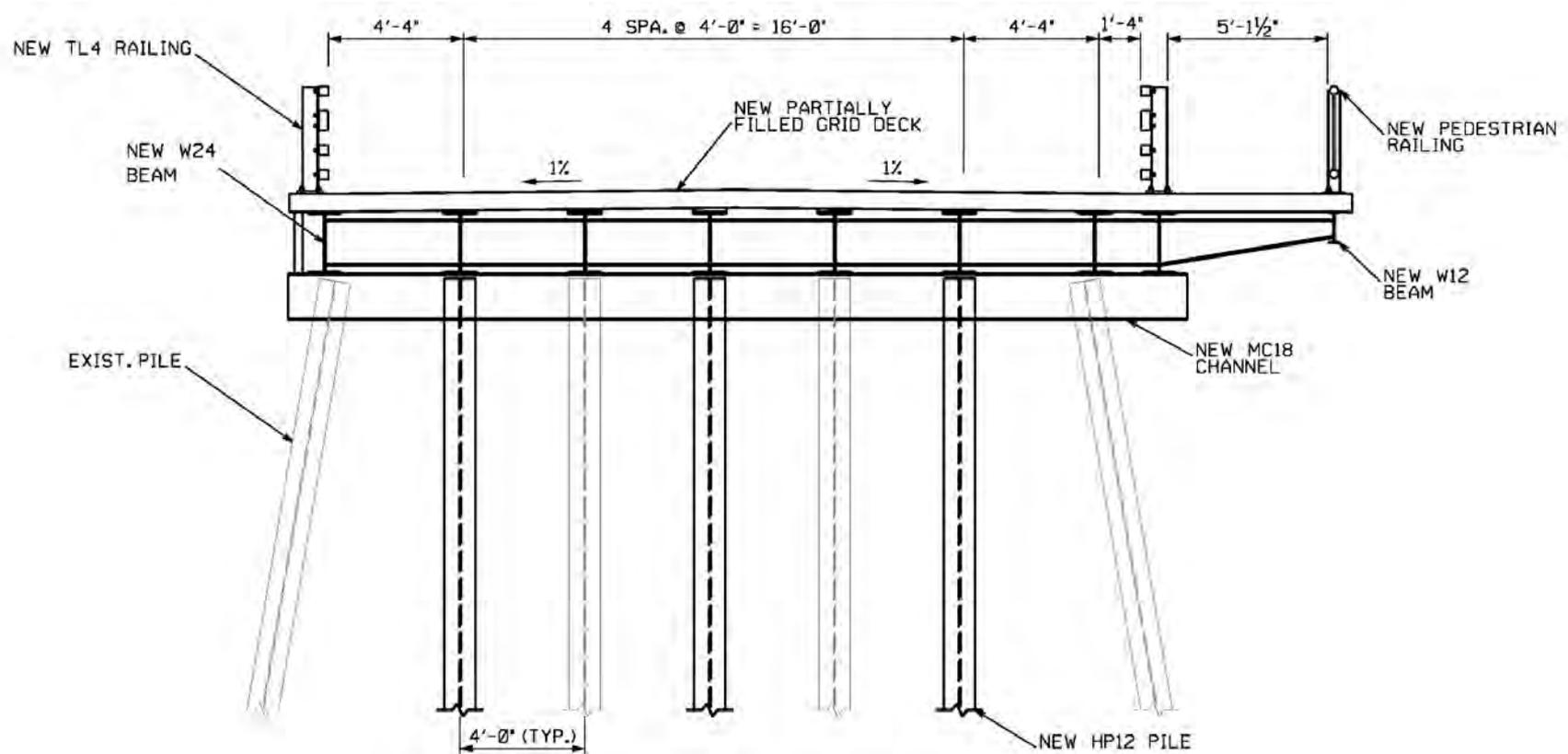
- A Rehabilitated Structure:
 - Should provide roadway shoulders that are at least 2' wide (increase of 1')
 - Should provide a sidewalk that is at least 5' wide (increase of 2'±)
 - Requires retaining walls on approaches due to widening
- The existing bascule span cannot support a solid deck
- Because a rehabilitation would maintain the structure's location, the sidewalk cannot be moved to the east side

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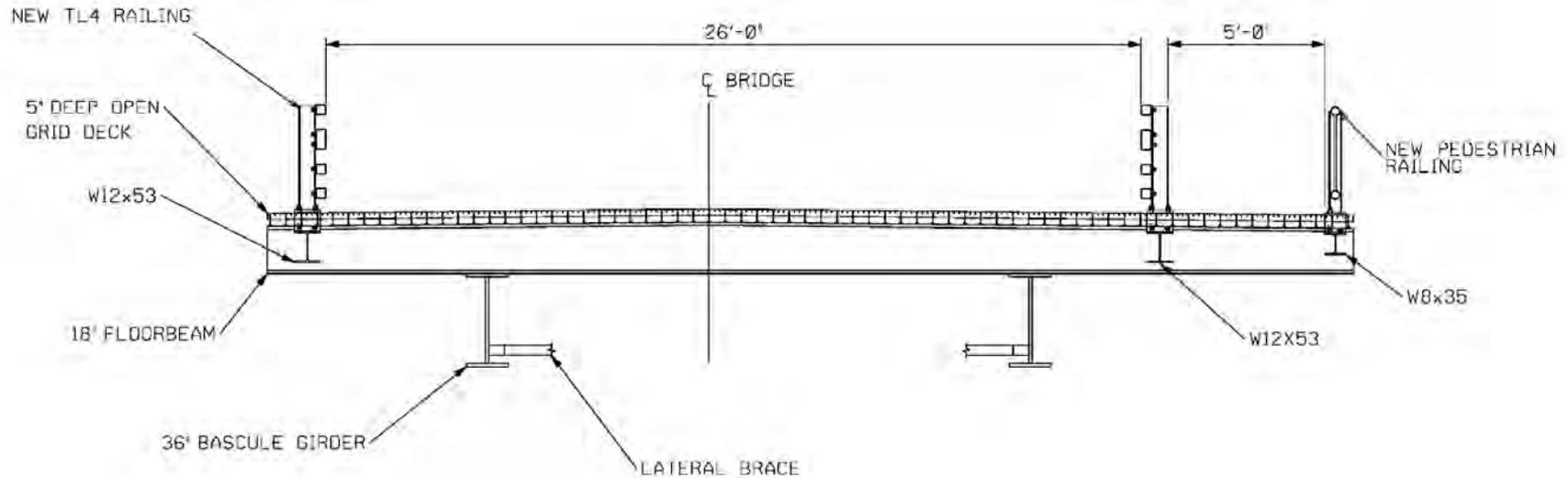


**WENTWORTH BRIDGE
NEW CASTLE-RYE - 16127
EXISTING BRIDGE
ELEVATION**

Bridge Rehabilitation

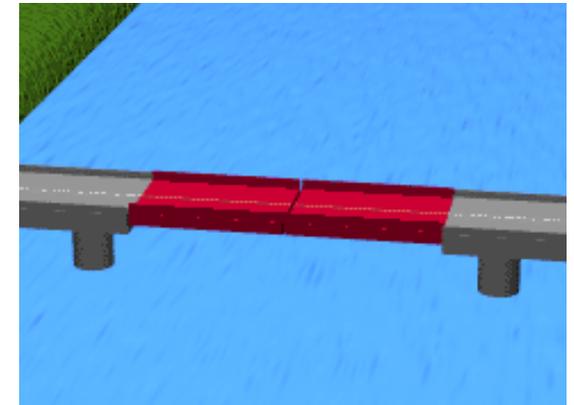


Bridge Rehabilitation



5. Bridge Replacement

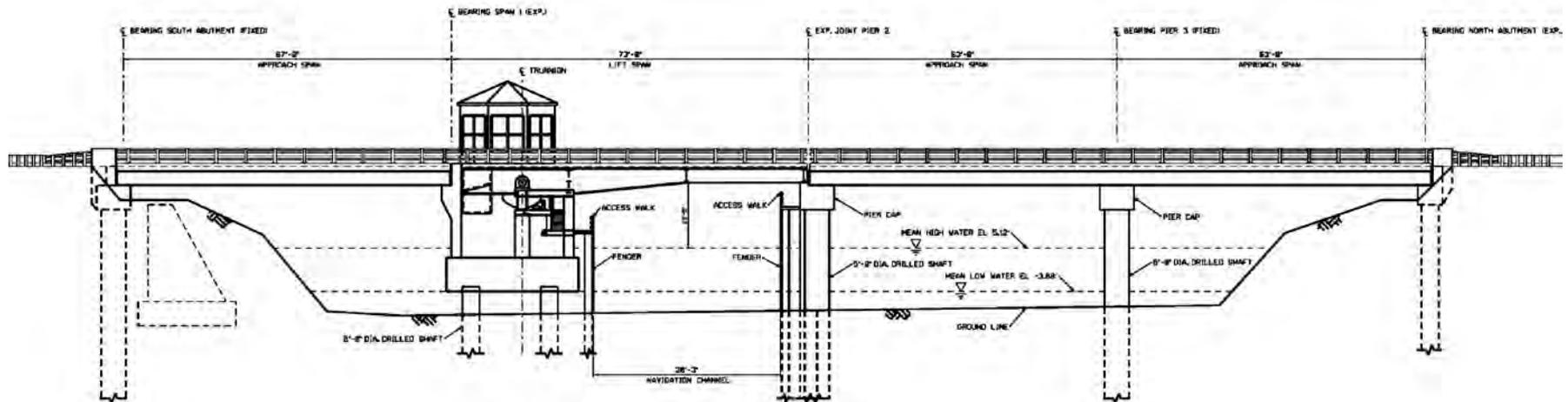
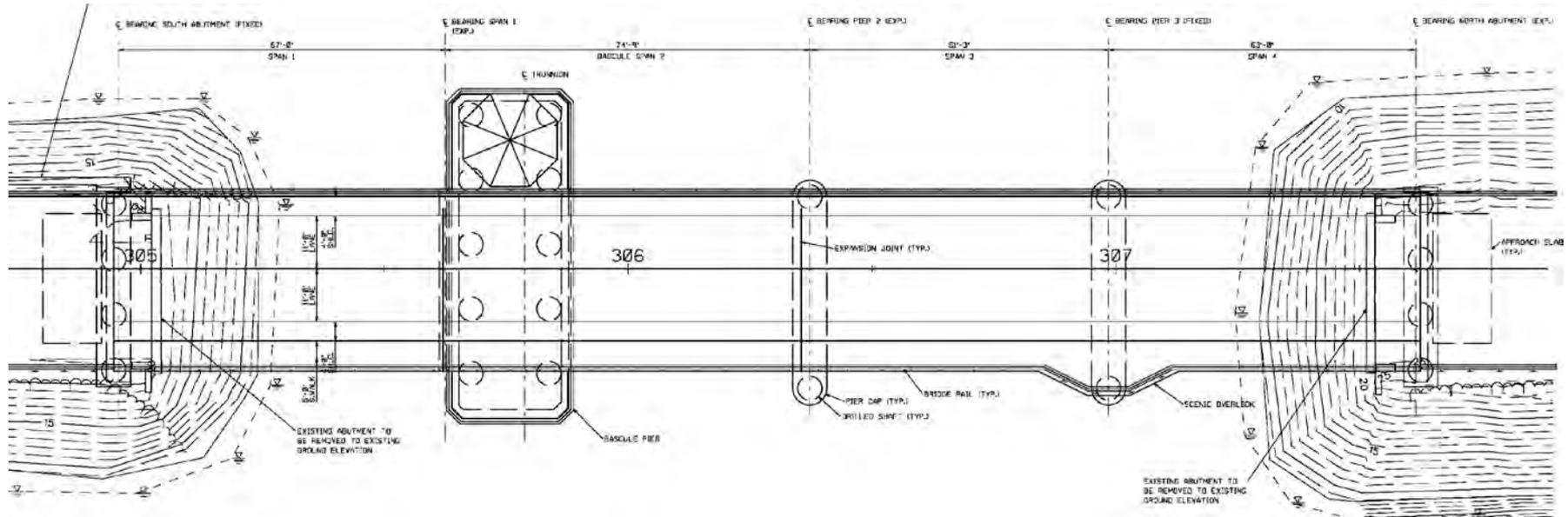
- Replacement with bascule structure
 - Maintains 2 bascule bridges in the state of New Hampshire
 - Maintains existing navigable channel clearances
 - Maintains aesthetic of the existing bridge as much as practical
 - Preferred by the public
- Four foot wide shoulders are preferred – increased safety for vehicles and bicyclists
- Sidewalk moved to east side of roadway, thereby improving pedestrian safety
- Closed deck permitted



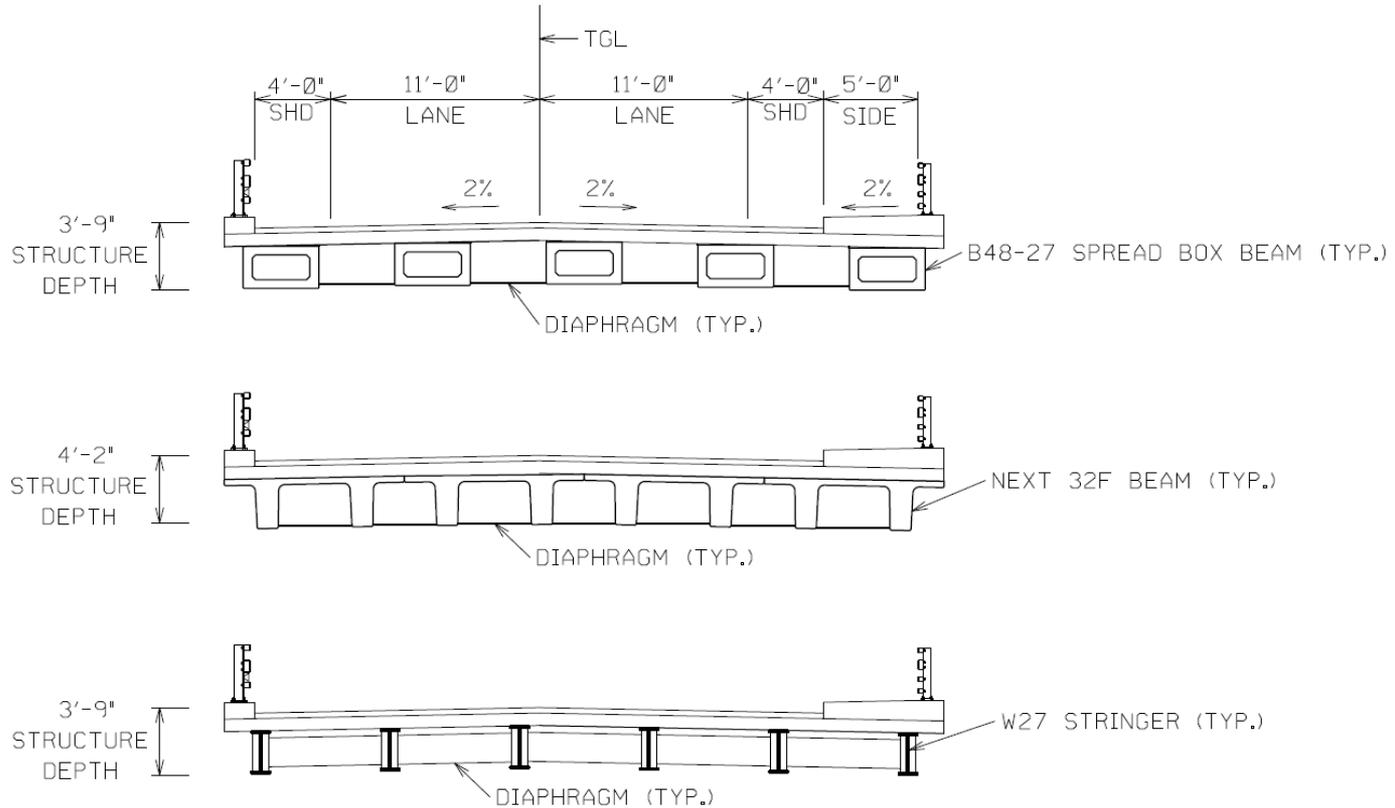
Bridge Replacement - Design Features

- Three structure types under consideration for approach spans
 - Steel stringers
 - Precast concrete box beams
 - Precast concrete “NEXT” beams – similar in shape to Greek symbol “pi” – π
- Scenic Overlook added to bridge sidewalk
- Closed bridge deck permitted
- Two designs for operator house
 - Similar to existing aesthetic
 - Mimicking look of Historic Wentworth Hotel

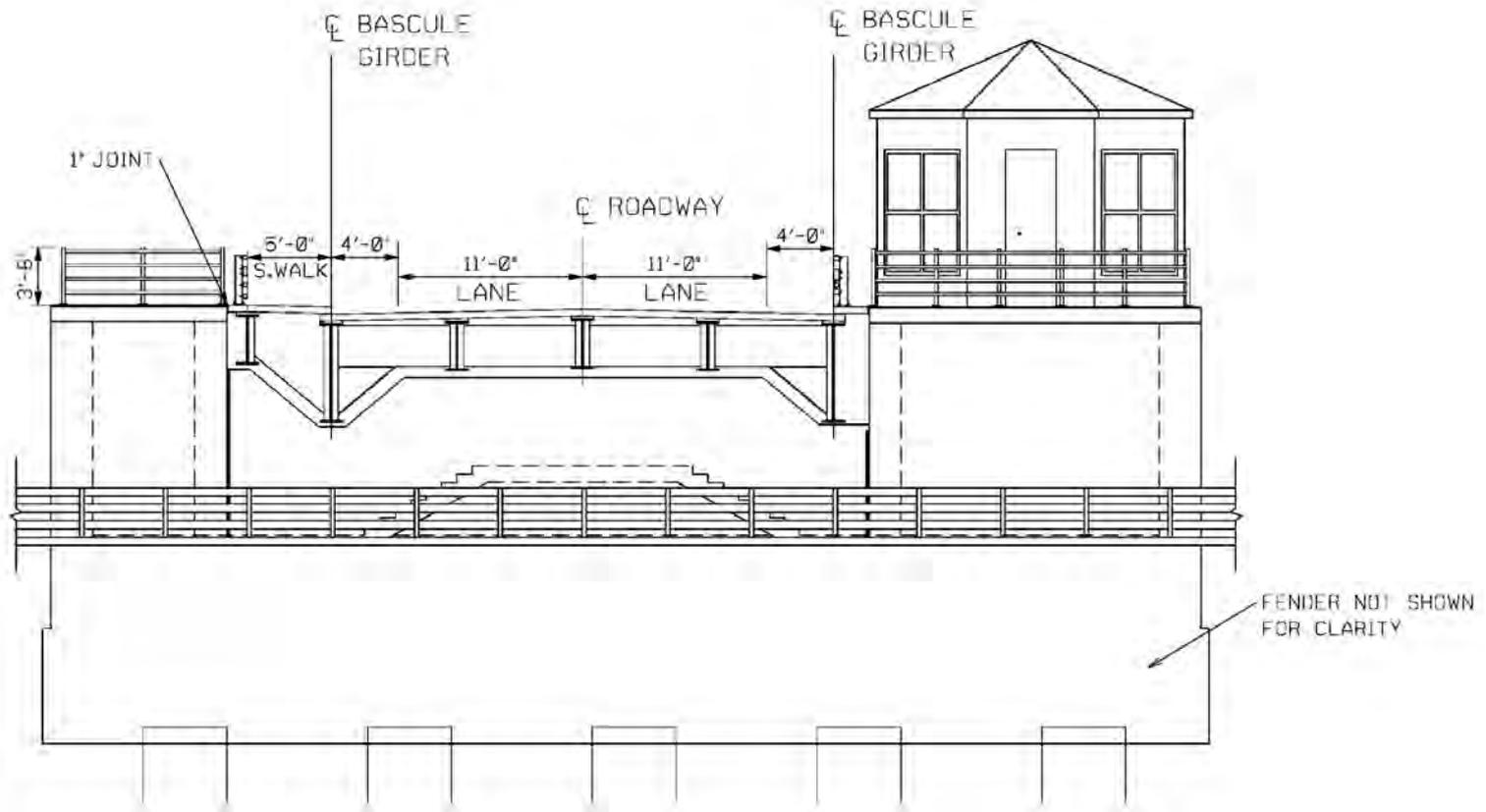
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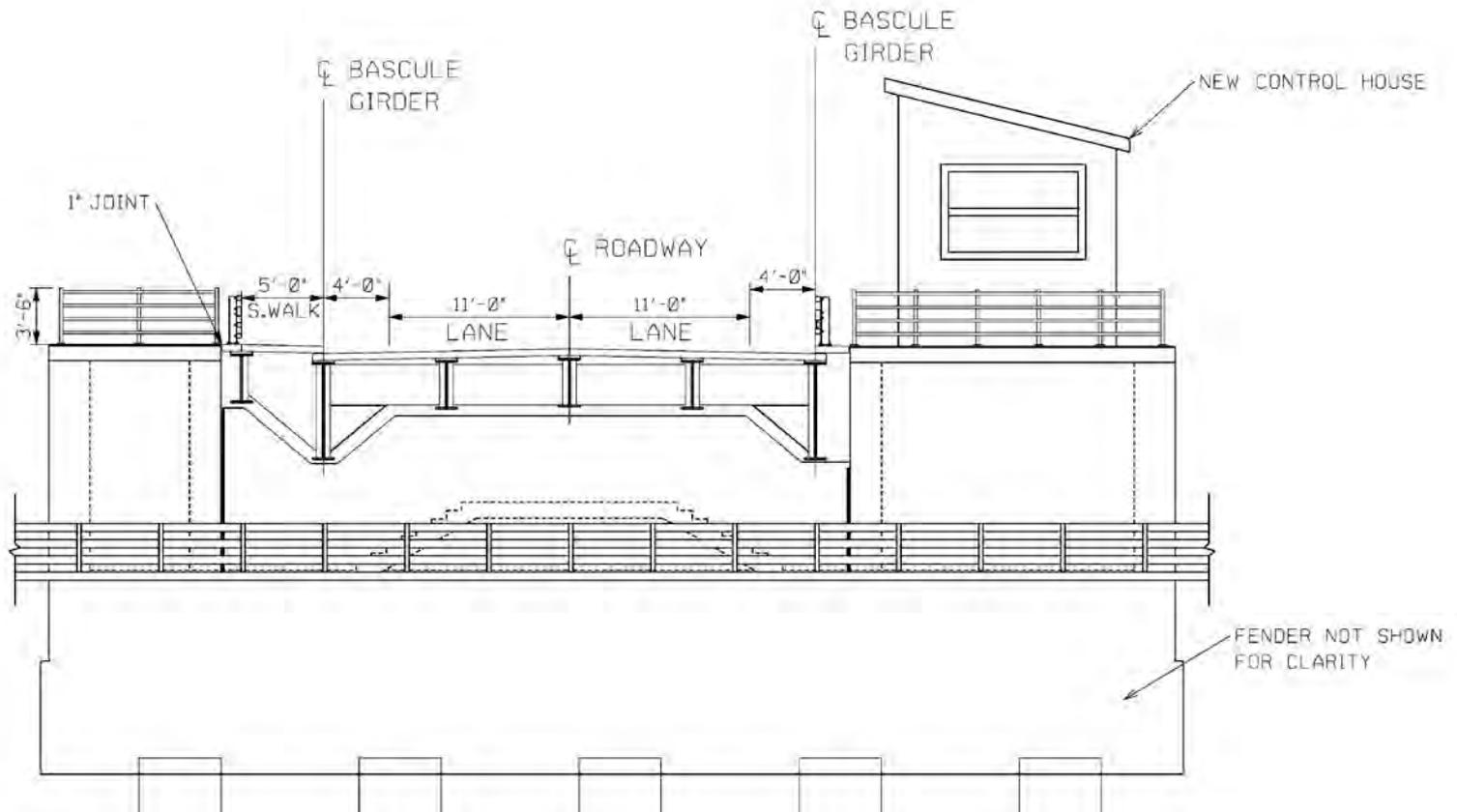
Bridge Replacement



Bridge Replacement



Bridge Replacement



6. Comparison of Alternatives

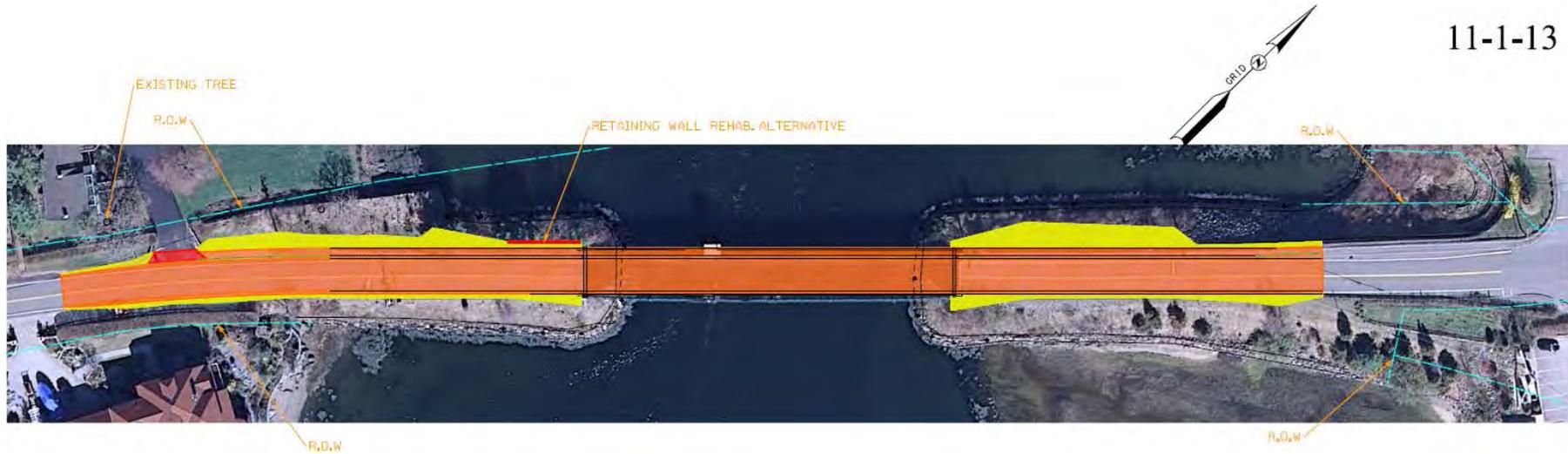
- Impact considerations:
 - Both Rehabilitation and Replacement will be wider than the current layout, and both will impact approaches
 - Neither alternative impacts private properties
 - Both alternatives will require in-water work at piers
 - Both alternatives will minimize impacts to sensitive natural resources

Comparison of Alternatives

- Rehabilitation
 - Would require replacement of virtually all of bridge's original fabric, resulting in a "replica" bridge
 - Indirect visual effects anticipated to be negligible
 - Would require prolonged closure (at least 9 months)
 - Little flexibility in construction seasons – impacts public
 - Would not resolve pedestrian and bicycle safety concerns
 - Costs in the order of \$14.5 million, with lifetime costs in the order of \$45 million over 75 years (calculated assuming 2013 expenditure)
 - Shorter life-span (30-40 years)
 - Is not favored by public
 - In accordance with Scammell MOA
 - This alternative would likely result in an Adverse Effect

Comparison of Alternatives

11-1-13



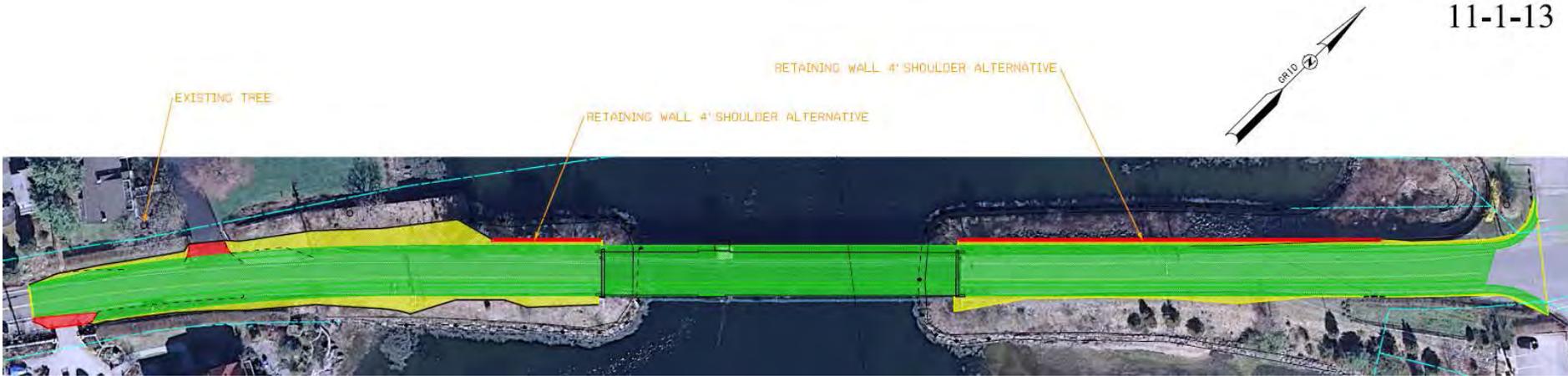
Bridge Rehabilitation Impacts

Comparison of Alternatives

- Replacement
 - Would replace with bascule span – similar in profile to existing
 - Indirect visual effects anticipated to be minimal
 - Would require brief closure (3 months)
 - Flexibility in construction season limits impacts to public
 - Would improve pedestrian and bicycle safety
 - Cost in the order of \$16.5 million, with lifetime costs in the order of \$30 million over 75 years (calculated assuming 2013 expenditure)
 - Longer life-span (75 years)
 - Favored by public
 - Not in accordance with Scammell MOA
 - This alternative would result in an Adverse Effect

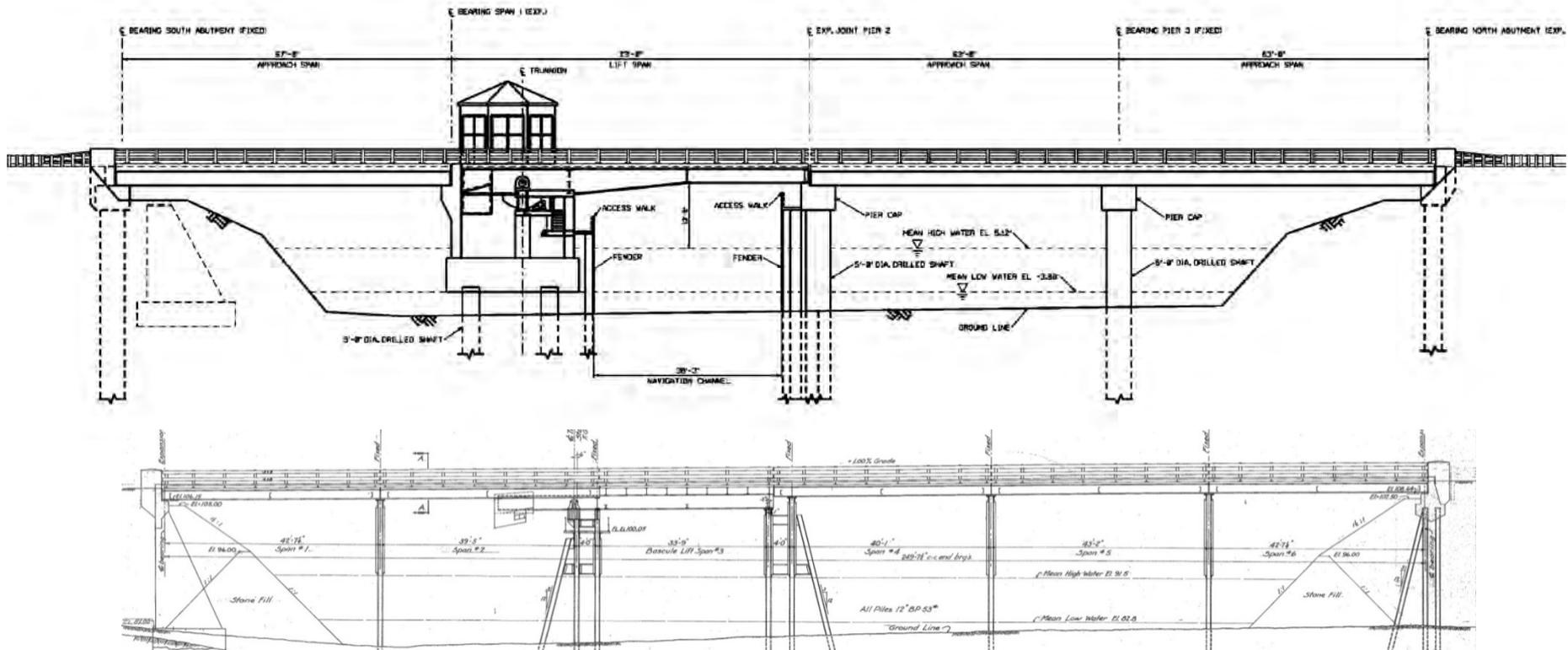
Comparison of Alternatives

11-1-13



Bridge Replacement Impacts

Comparison of Alternatives



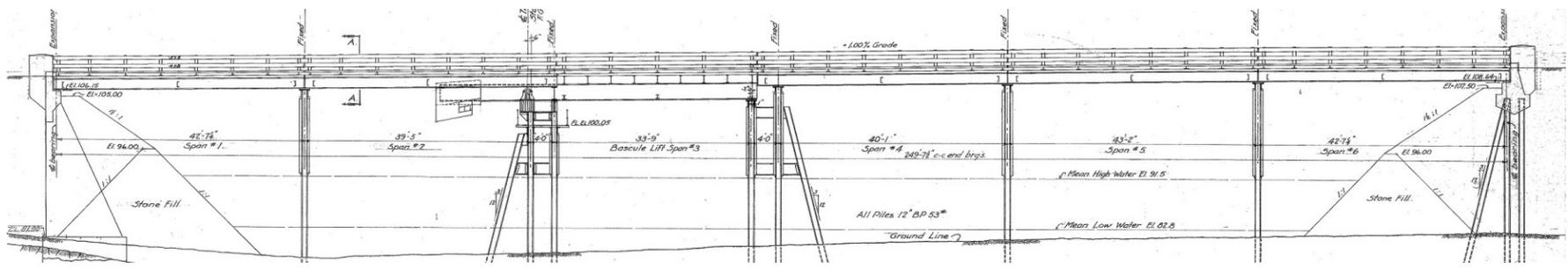
Moving Forward

- Type, Size & Location Study submitted December 2013 – recommendation on alternatives provided
- Life Cycle costs for replacement and rehabilitation alternatives
- PAC and Public Information meeting – early 2014
- Determination of Effect
- 30% Design Submission – July 2014

Thank You

Miscellaneous Information

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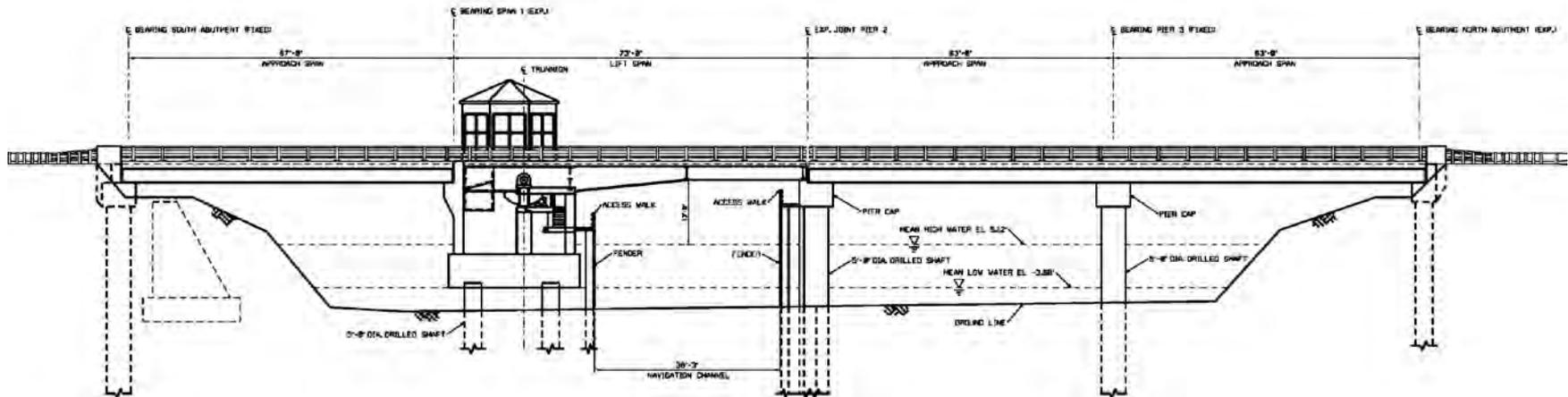


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EXISTING BRIDGE
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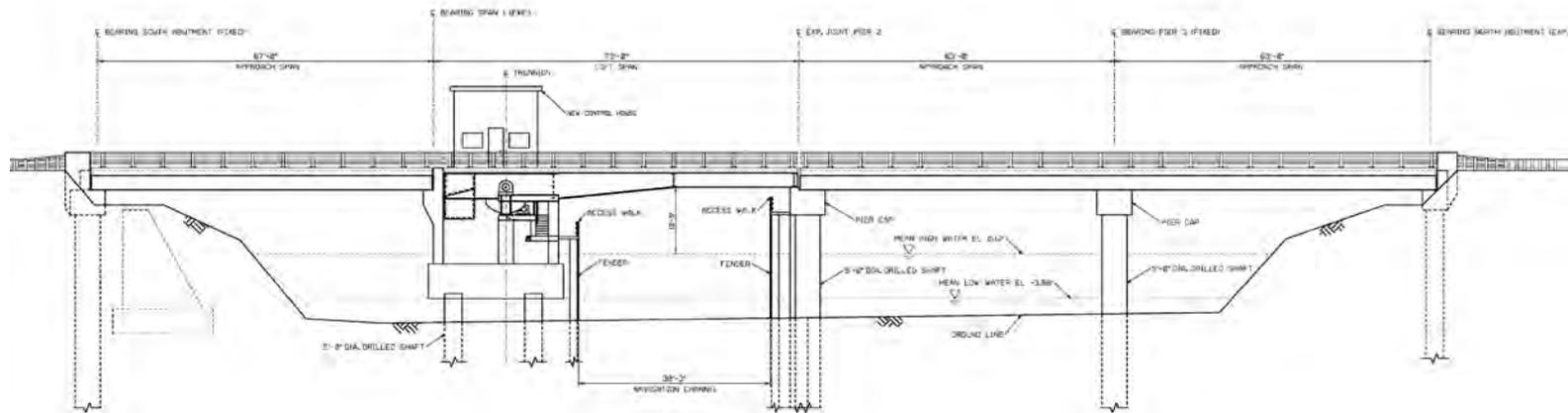
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Bridge Replacement



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

Bridge Replacement



WENTWORTH BRIDGE
NEW CASTLE-RYE - 16127
BRIDGE REPLACEMENT OPTION 2
ELEVATION

Bridge Replacement

