

List of Possible Options

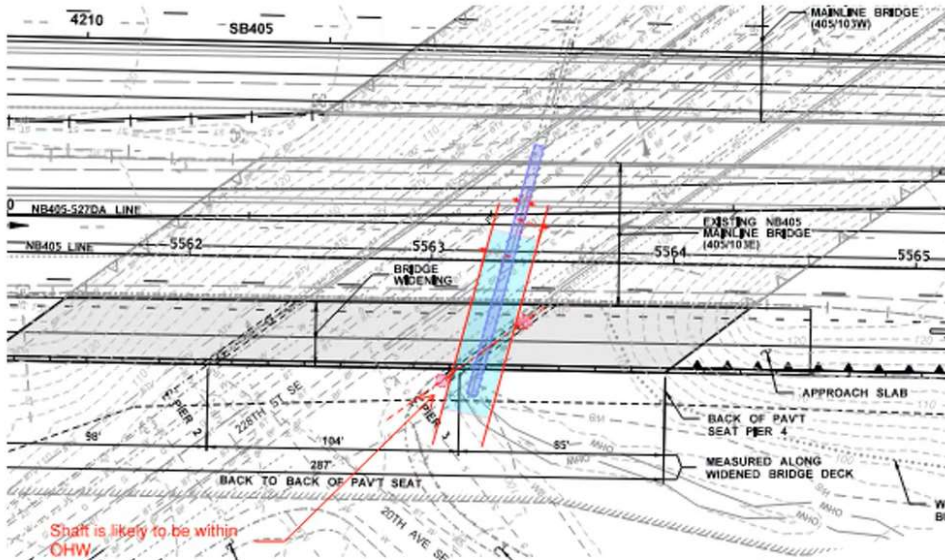
- Option 1 – RFP Reference Design
- Option 2 – ATC 01 Conceptual
- Option 3 – BD Proposed Conceptual
- Option 4 – Column Jacking Option (NO Infill Wall)
- Option 5 – Weak Link
- Option 6 - RFP Reference Design Modification 1
- Option 7 - RFP Reference Design Modification 2
- Option 8 – Special Option

Ranking the options based on: overall approval for WSDOT, simplest design, constructability

- WSDOT - what is the minimum amount of widening to get down to 1 extra pier
- Consider options 1 - 4
- #3 is non-starter for WSDOT - won't accept without DBIC, won't approve the DBIC, no forward compatibility
- WSDOT believes ATC is the baseline TODAY, anything else is a DBIC
- What is the contract requirement that sets the minimum depth for the footing?
- WSDOT: 1 & 2 = easy, 4 = doable, 3 = impossible
- Sammy ranking: 2, 3, 4, 1
- Const: 3, 2, 4
- **FOCUS on 2 & 4 (altered 2)**
 - If we remove 1 girder line in either option, can all the foundation be on just 1 side of the pipe?

405 BY – 103E Widening and Seismic Type Selection

Option 1 - RFP Design Conceptual **Pier Wall + Col/Shaft**

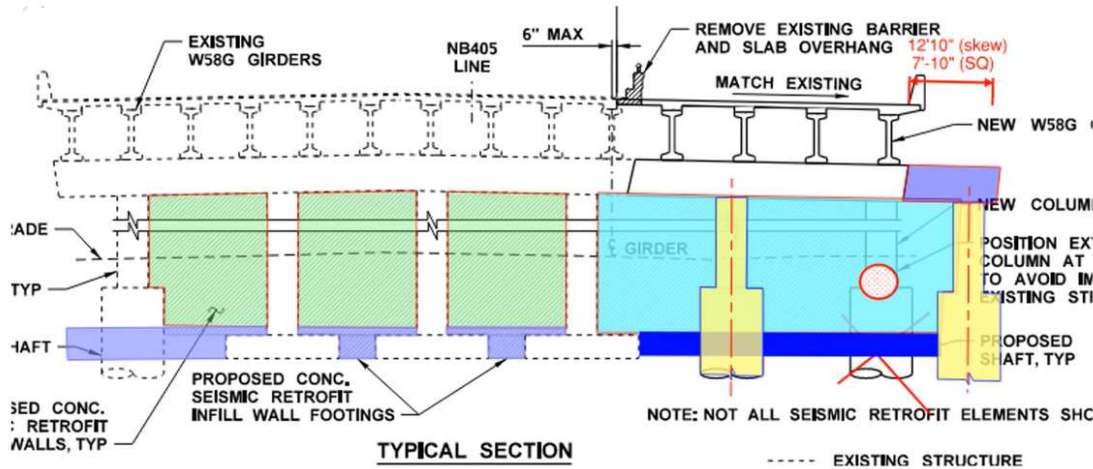


Features

- New Col/Shaft need to be 8ft clear to existing culvert
- The Shaft at East is likely at OHW

Option 1 - RFP Design Conceptual

Pier Wall + Col/Shaft



Features

- Retrofit: Deep Buried Infill wall and footing overlay
- Widening: Col/Shaft & deep buried in-fill wall
- Existing Culvert to be protected during construction.
- Outrigger Bent at Pier 3

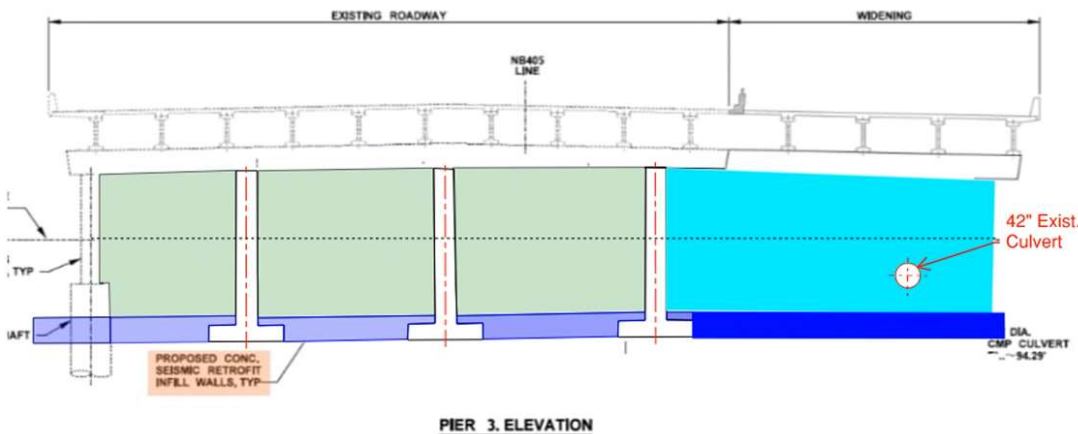
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Use of casing would help mitigate risk
 Pothole to know exactly where the edge is and go in with casing
 Largest concern is where equipment is placed to do the work
 Clearzone is 10'
 10' diameter shafts

Option 2 – ATC 01 Design Conceptual

Pier Wall + Col/Shaft



Features

- Retrofit: Deep Buried Infill wall and footing overlay
- Widening: Col/Shaft & deep buried in-fill wall
- Existing Culvert to be protected during construction.
- ~~Outrigger Bent at Pier 3~~
- In-ground plastic hinge

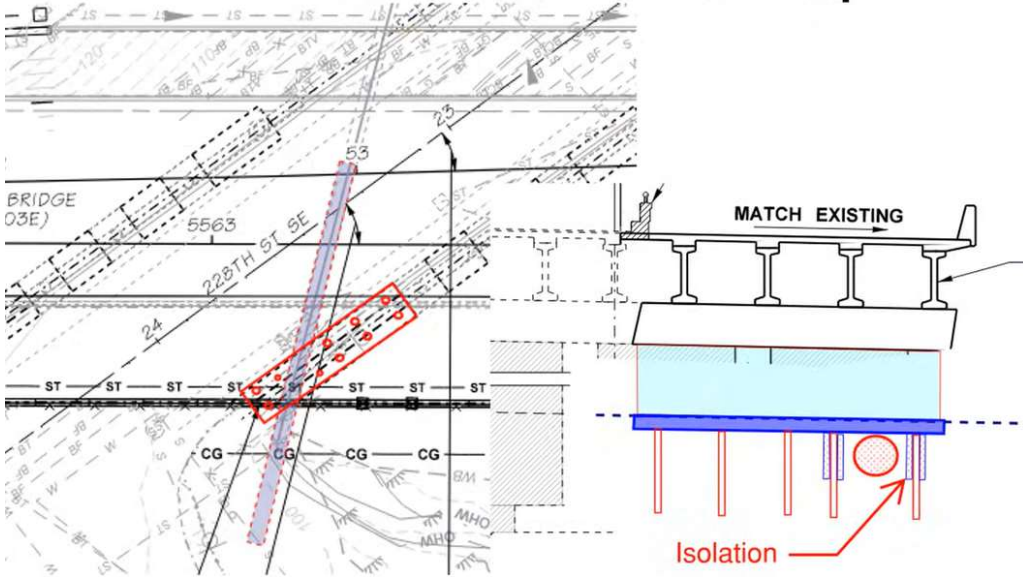
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If we shrink the bridge 7.5' can we just cantilever over the culvert?

Option 3 – BD Proposed Design Conceptual

Raised New Pier Wall Up



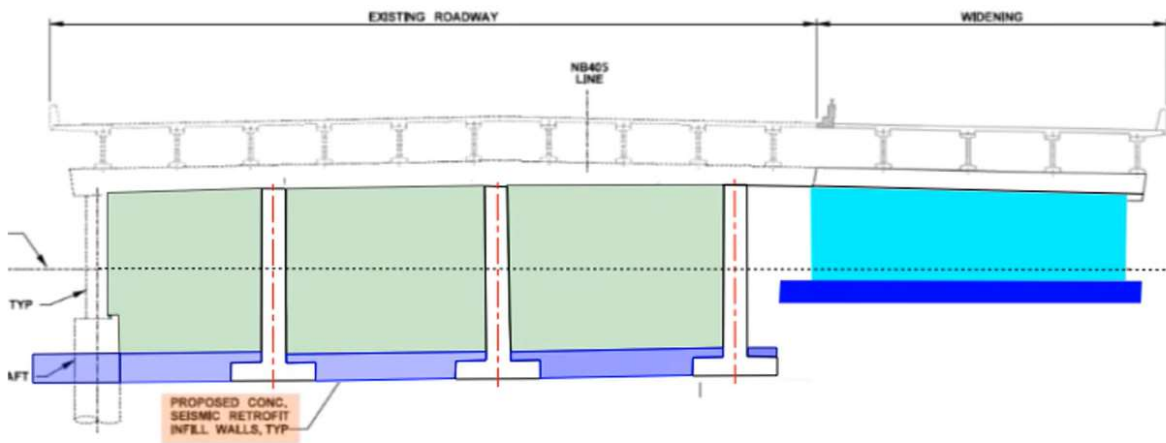
- Provide column isolation measures for piles located less than 8 feet from the existing culvert to ensure its protection

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Option 3 – BD Proposed Design Conceptual

Raised New Pier Wall Up



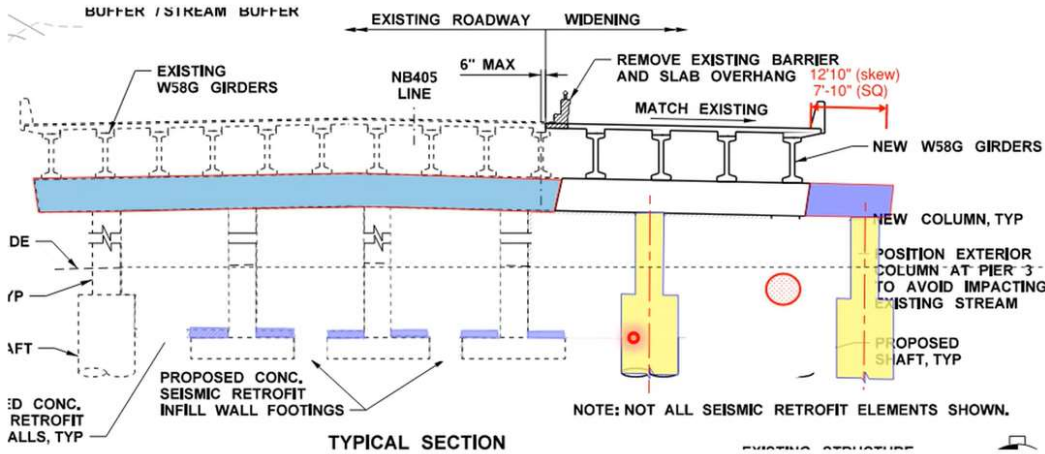
Pier 2

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Are there other options where the pier footing is not raised?

Option 4 – Colmn Jacketing (No Infill Wall)

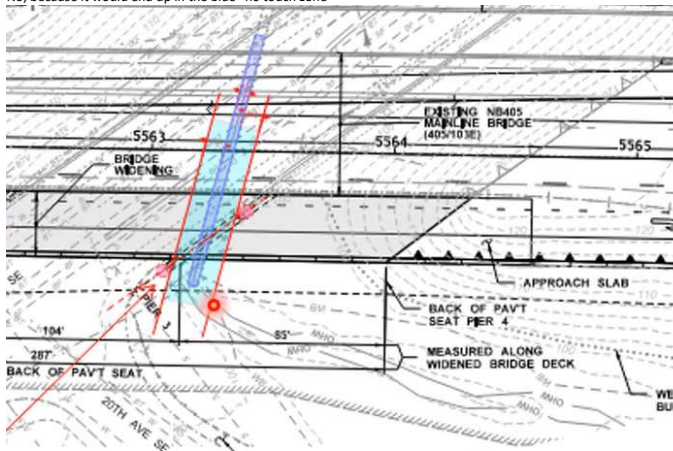


Features

- Retrofit: Footing Overlay + column Jacketing + Cross beam bolster
- Widening Column/Shaft Foundation
- Column 8ft clear to Existing Culvert construction.
- Outrigger Bent at Pier 3 need special design
- Balanced Stiffness(?)
- Ductility demand (?)

Torsion, load thru superstructure to resist the moment forces
 Hinged diaphragm on the top
 Balanced stiffness - there is flexibility from deviating
 Ductility demand - less flexibility from deviating
 Steel jacketing will provide stiffness
 FRP might not be used?
 If this got widened less, would it be possible to get that column on the other side of the culvert next to the first column?

No, because it would end up in the blue "no touch zone"

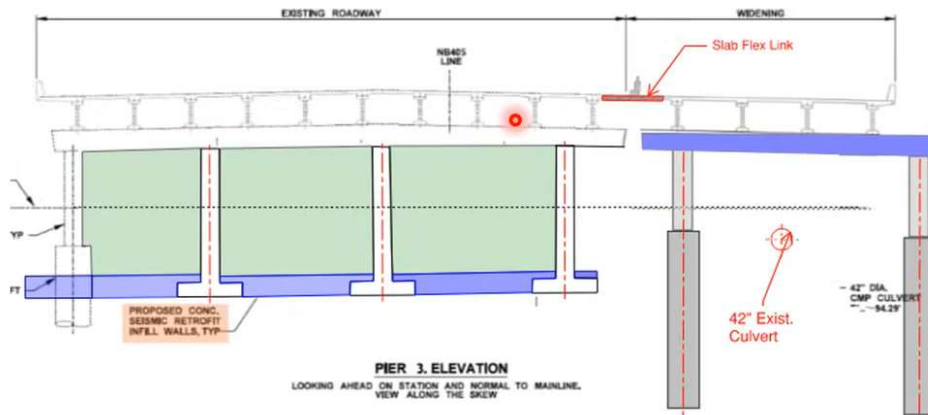


What if the bridge gets widened in the other direction

Option 5 – Weak Link

Features

- Retrofit: Deep Buried Infill wall and footing overlay
- Widening: Col/Shaft
- Existing Culvert is protected by providing 8ft min clear to footing

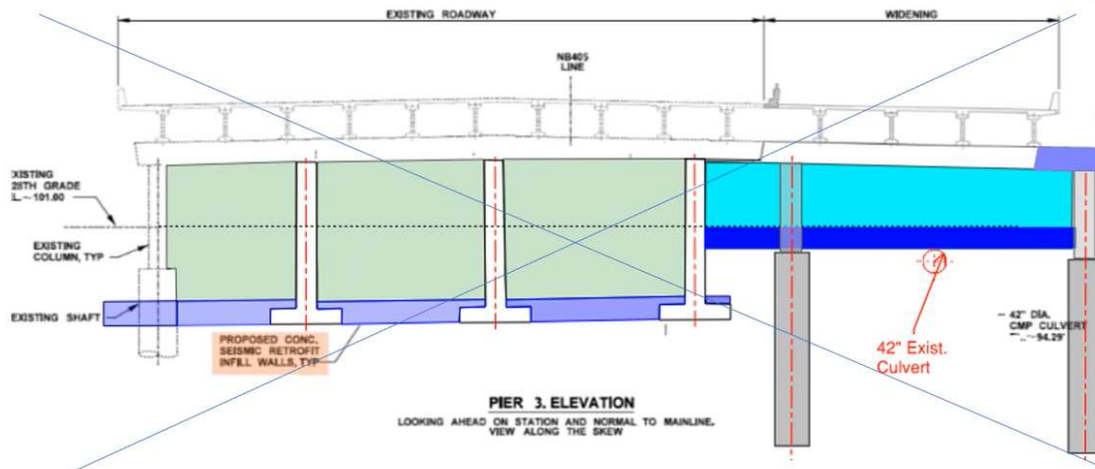


DO NOT DO THIS!!!!

Option 6 – RFP Modification 1 Raise Up Infill wall footing

Features

- Retrofit: Deep Buried Infill wall and footing overlay
- Widening: Col/Shaft & shallow buried in-fill wall
- Existing Culvert is not protected



NOT DOING THIS!
Still creates a seismic pressure?

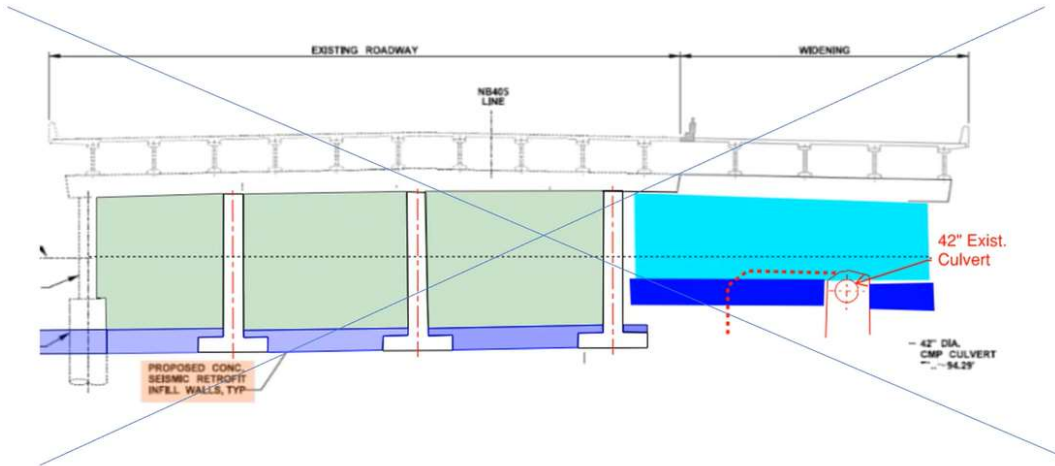
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Option 7 – RFP Modification 2

Isolating Existing culvert

Features

- Retrofit: Deep Buried Infill wall and footing overlay
- Isolating culvert from bridge impact
- Not feasible due to skew



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Widening Example



I-405 MAIN LINE BRIDGE OVER TALBOT ROAD
STREET VIEW FROM GOOGLE EARTH (LOOKING WEST)

- When the widening portion is substantial, it is common practice to provide a separate substructure for the widening and the existing bridge
- All options assume that the existing structure and the widening portion are separate in substructure

Option 8 - Special Consideration

Challenge: Dewatering

Previous widening construction looked like having a field change from spread footing to Drilled Shaft

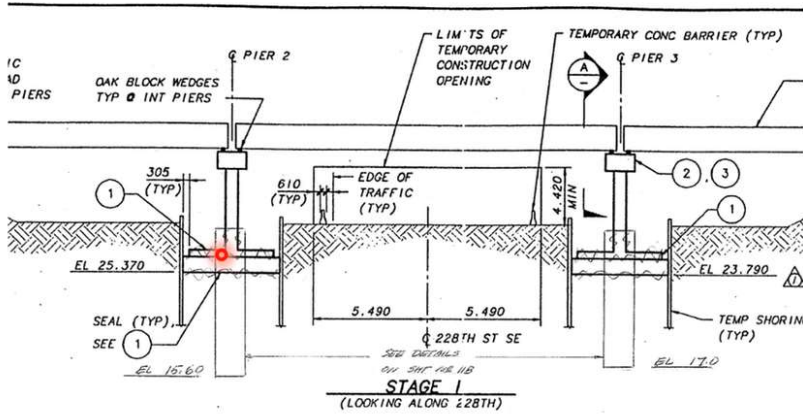


Figure C-24. Groundwater Elevation Versus Time
NE-42p-19



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