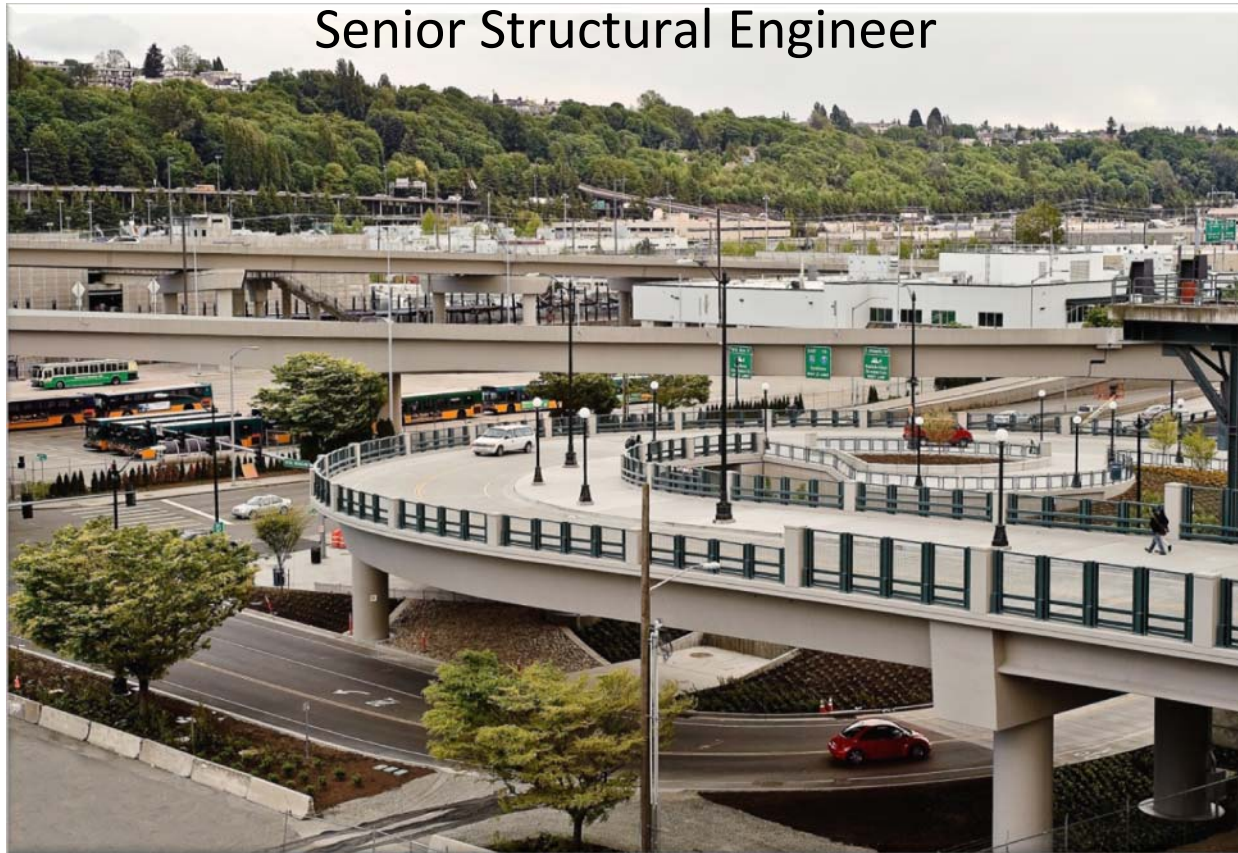


Royal Brougham Way Grade Separation Bridge Design

RBW Bridge - Challenges and Innovations

Sammy Tu PEng, PE, SE

Senior Structural Engineer



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Project Overview



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Project Overview

Owner:



Contractor:



Designer:



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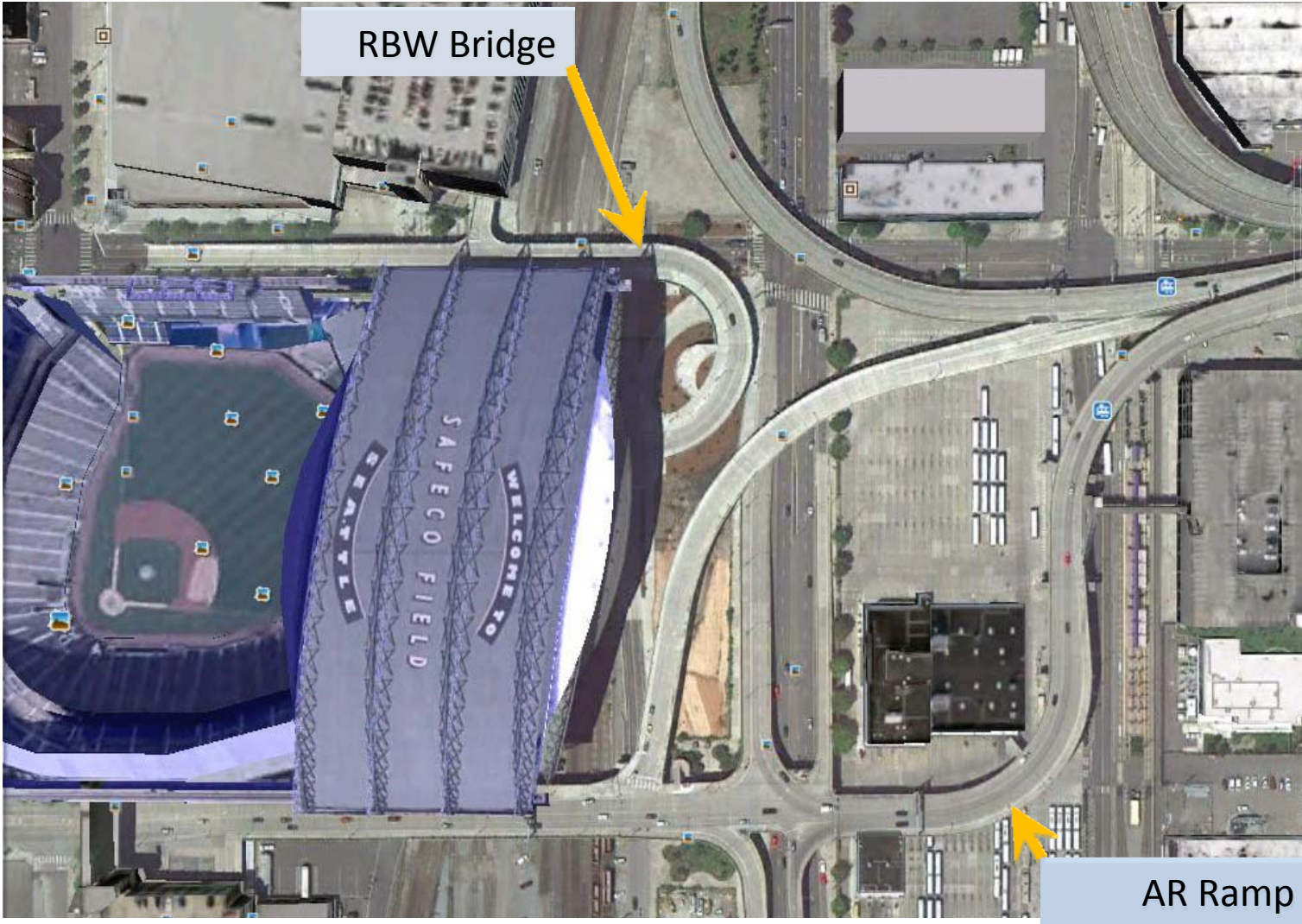
Project Overview

- ❑ Start:
Nov. 2008
- ❑ Design Done:
July 2009
- ❑ Open :
April 2010

**One Year Ahead
of Schedule**



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RBW Bridge

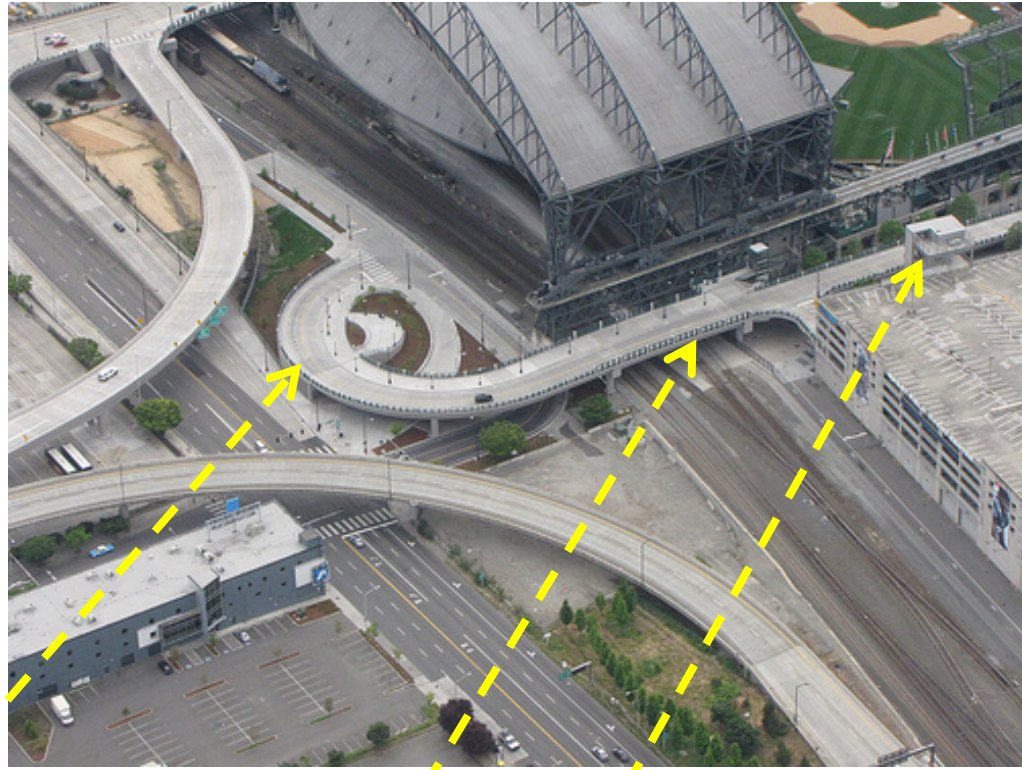
- ✓ Bridge
- ✓ Garage Ramp
- ✓ Stair & Elevator



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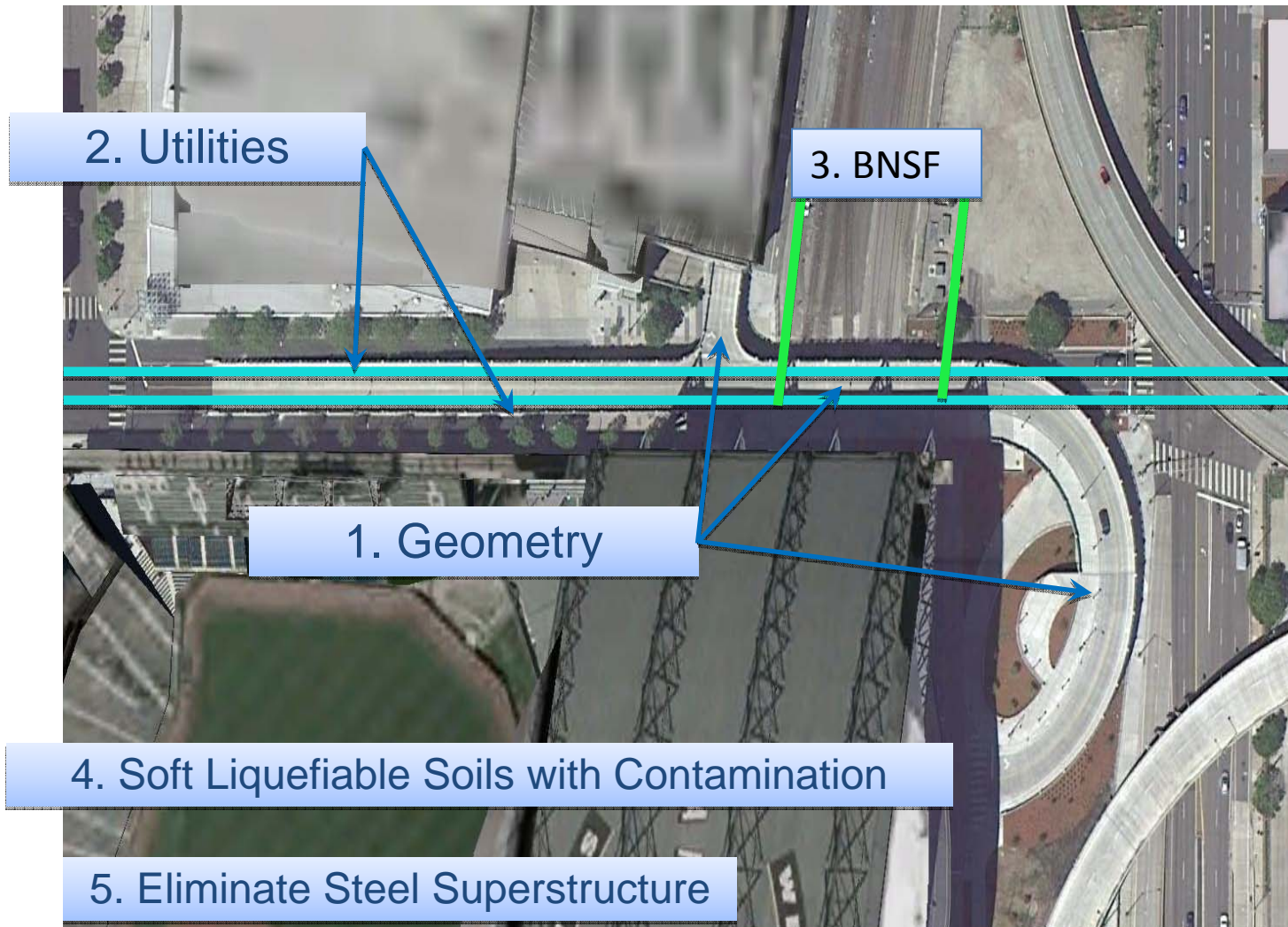
RBW Bridge

- 5 Span Bridge
- ✓ 2 span PT Box
- ✓ 1 span PC Girder
- ✓ 2 Span RC



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Challenges



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Innovation 1 - Geofoam

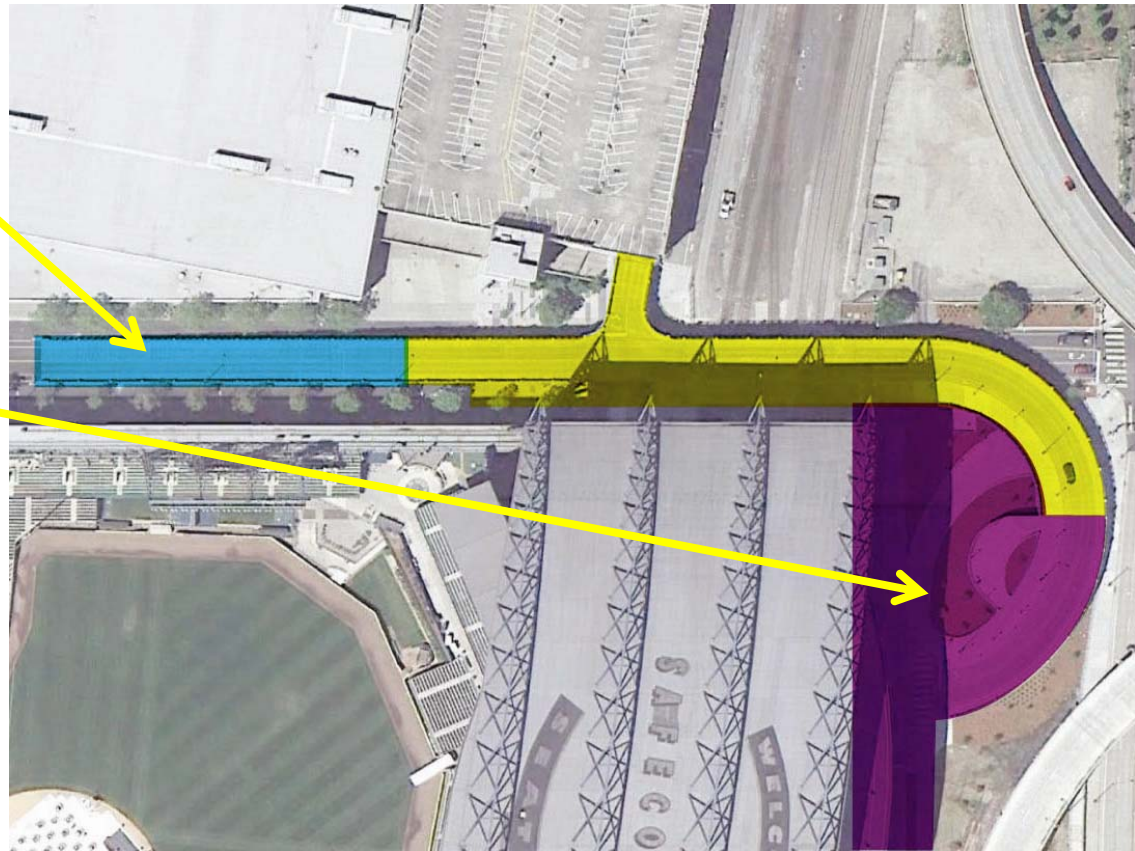


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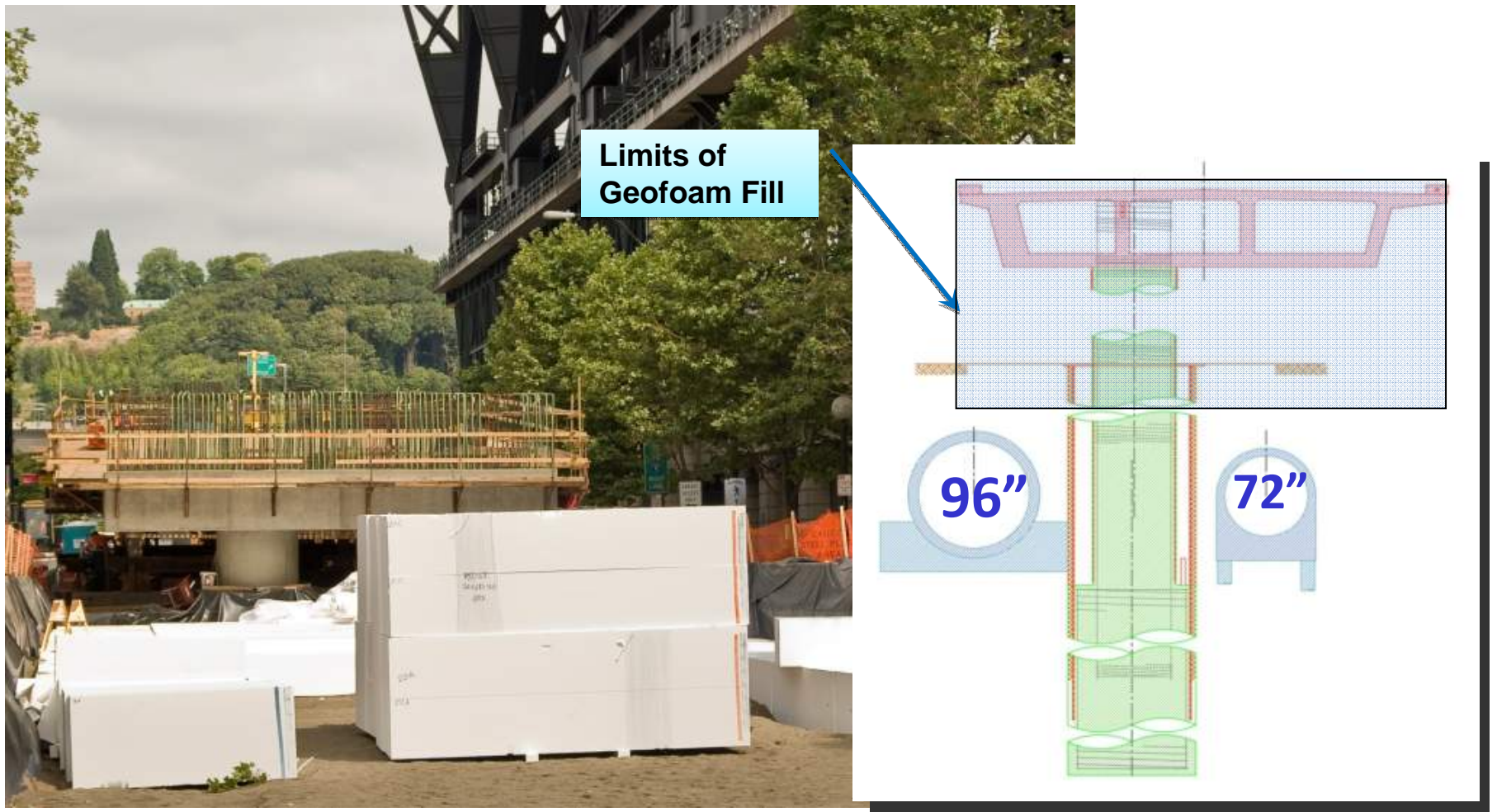
Innovation 1 - Geofoam

- ✓ Eliminate 4 Bridge Spans
- ✓ No Ground Improvements
- ✓ Reduce Risk
- ✓ Meet Schedule



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Innovation 1 - Geofoam



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Innovation 1 - Geof foam



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Innovation 1 - Geof foam



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Innovation 1 - Geof foam



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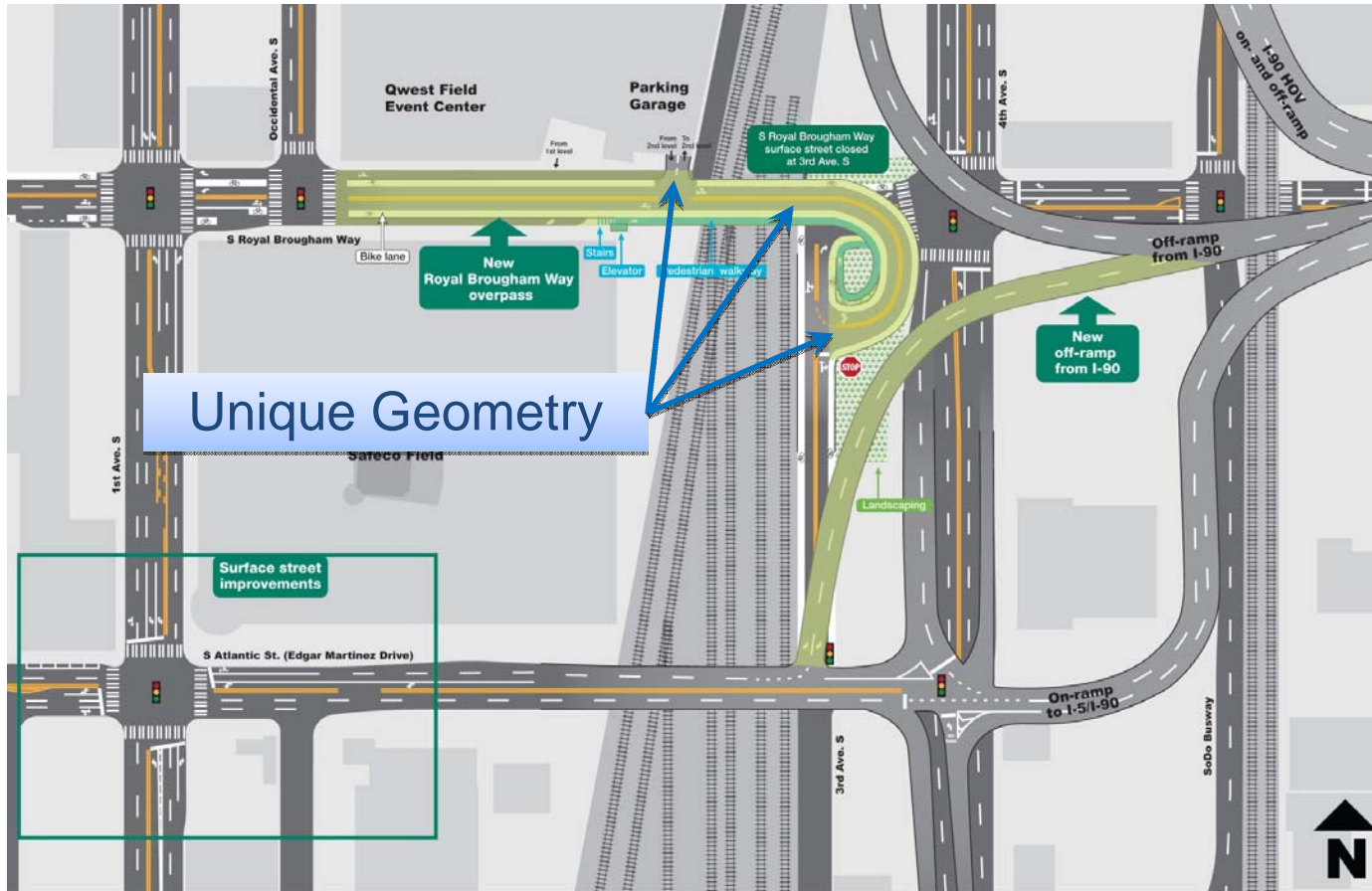
Innovation 2 - Pre-Cambered PC Girder



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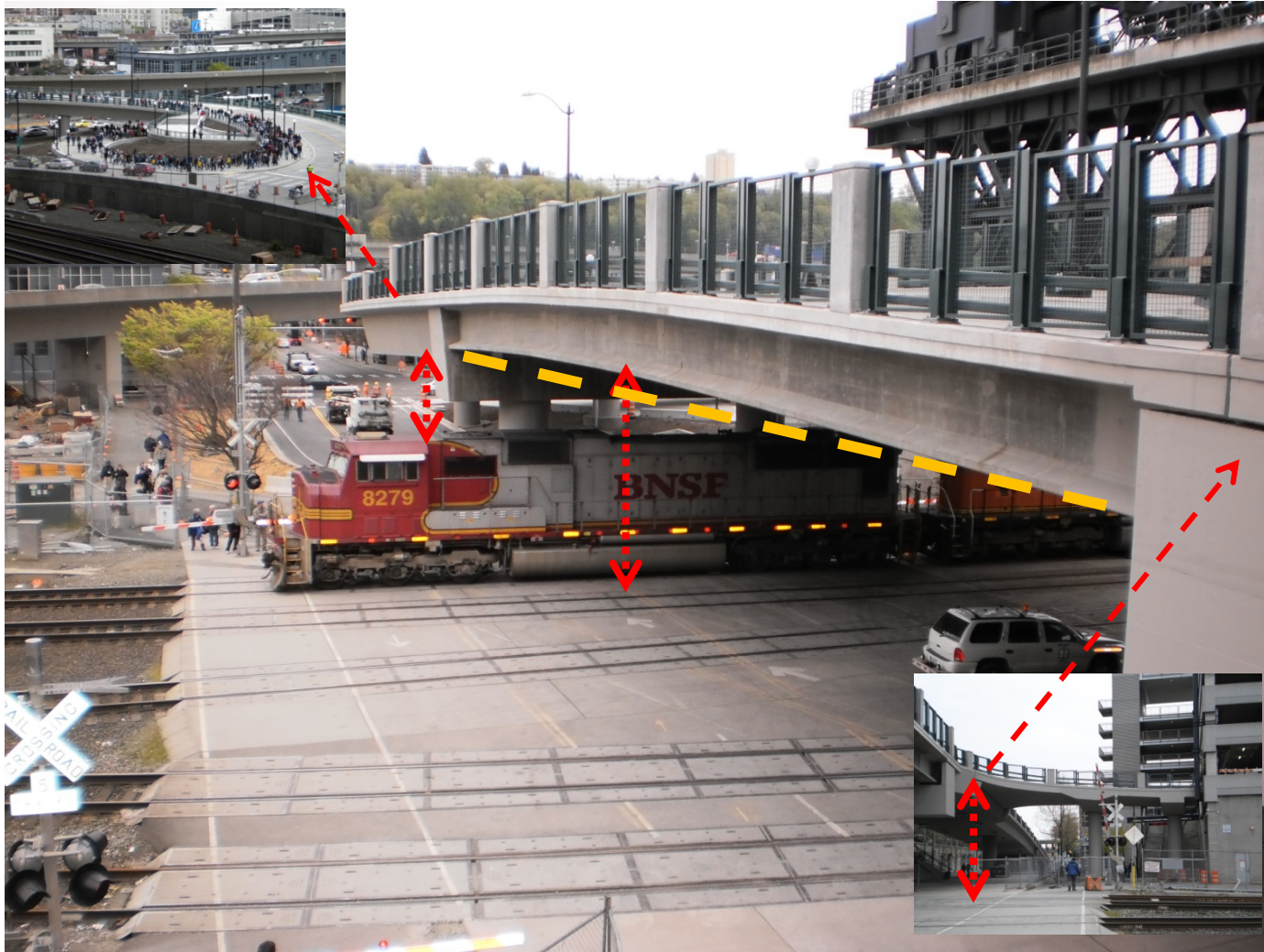
Innovation 2 - Pre-Cambered PC Girder



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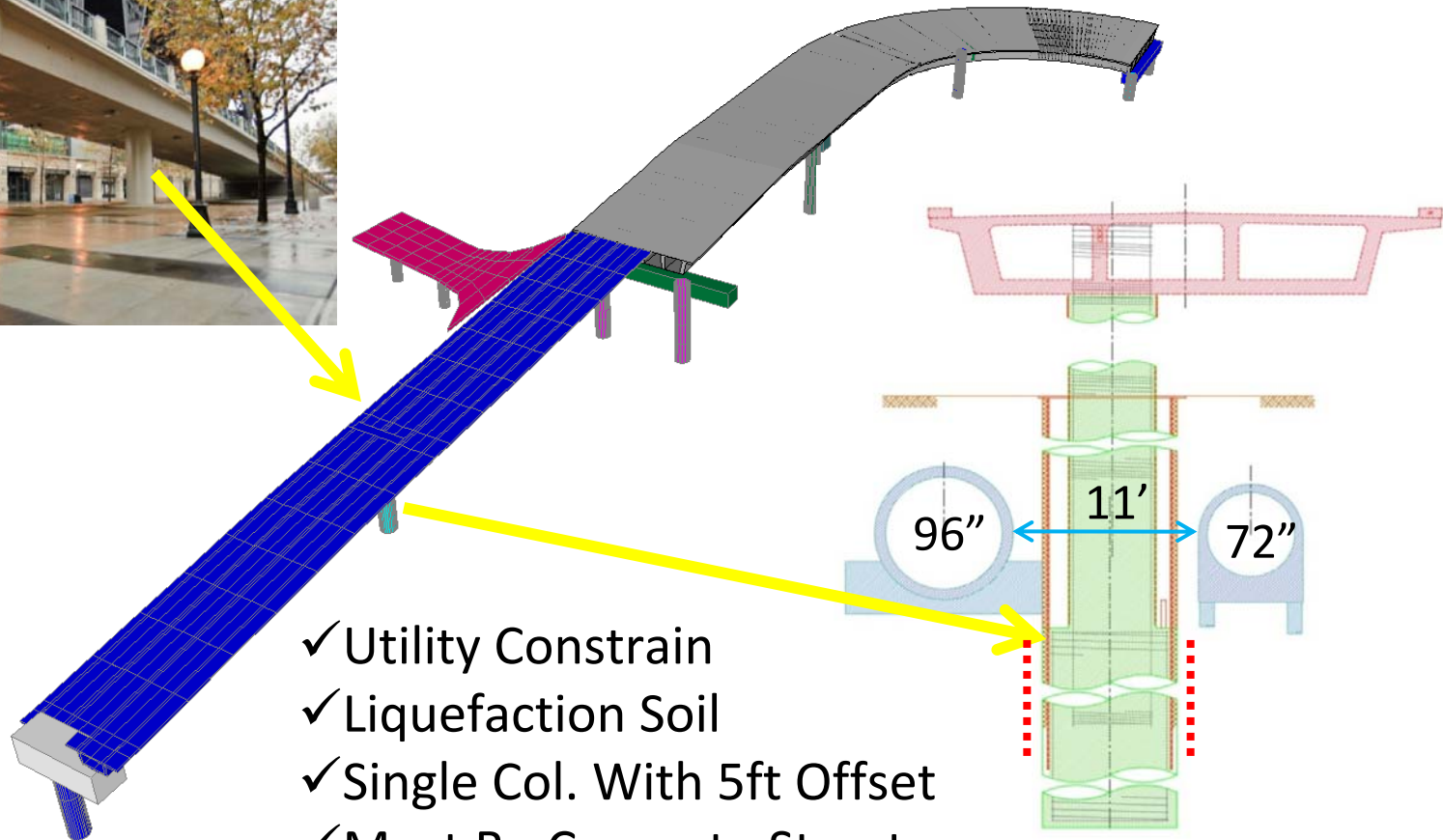
Innovation 2 - Pre-Cambered PC Girder



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Innovation 3 – Unique Design

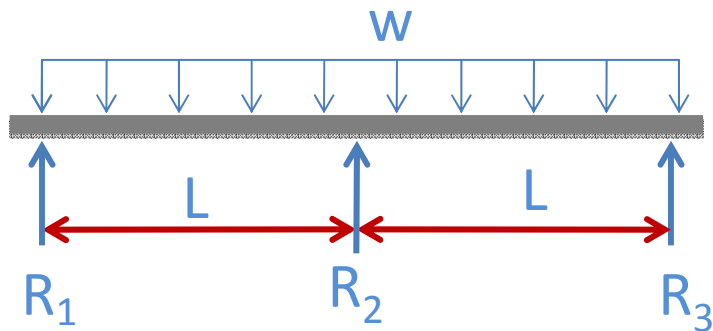


- ✓ Utility Constrain
- ✓ Liquefaction Soil
- ✓ Single Col. With 5ft Offset
- ✓ Must Be Concrete Structure
- ✓ 1000 Year Return Earthquake

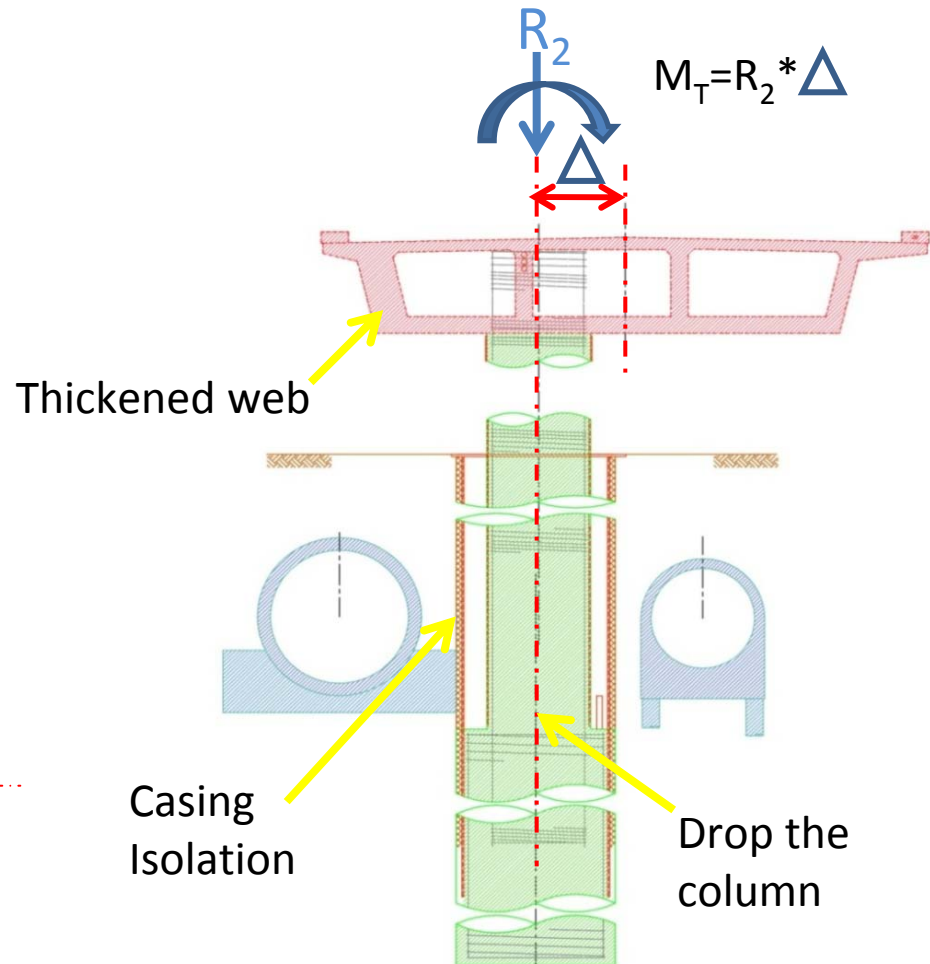
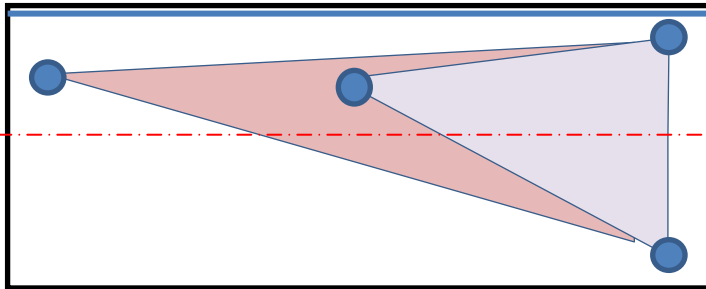
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Innovation 3 – Unique Design

2D – Simple Design

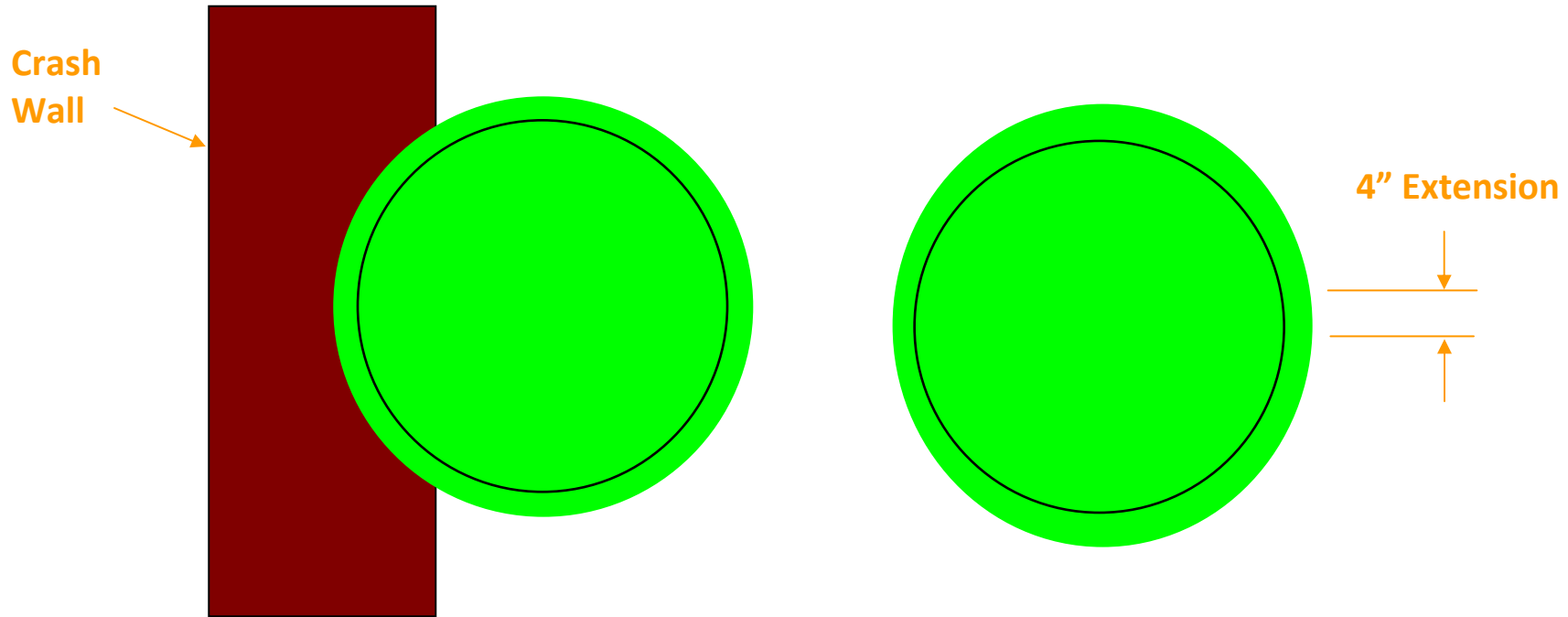


“Triangle Support”



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RBW – Piers 3 & 4 Columns
15 feet from C.L. BNSF Tracks



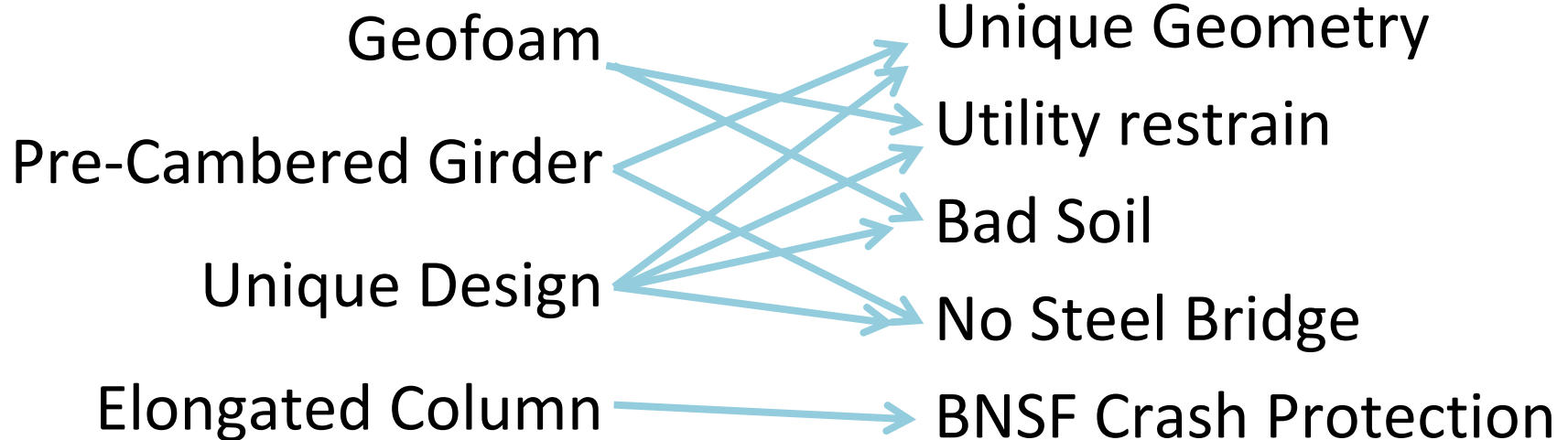
6' diameter shaft = 28 sf
Requires Crash Walls

6' diameter shaft with
4" extension = 30 sf
No Crash Walls

Royal Brougham Way Grade Separation Bridge Design

Innovations

Challenges



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Questions ?



Mariners opening day – April 12, 2010

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