

North Carolina
DEPARTMENT OF TRANSPORTATION

**Rehabilitation of US-158 over Soft Organic Soils Through
Vibration Sensitive Historic Elizabeth City, NC**

Michael Valiquette
NCDOT Geotechnical Engineering Unit
April 10, 2015



Rehabilitation of US-158 through Elizabeth City, NC

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Retain 1970's Bascule

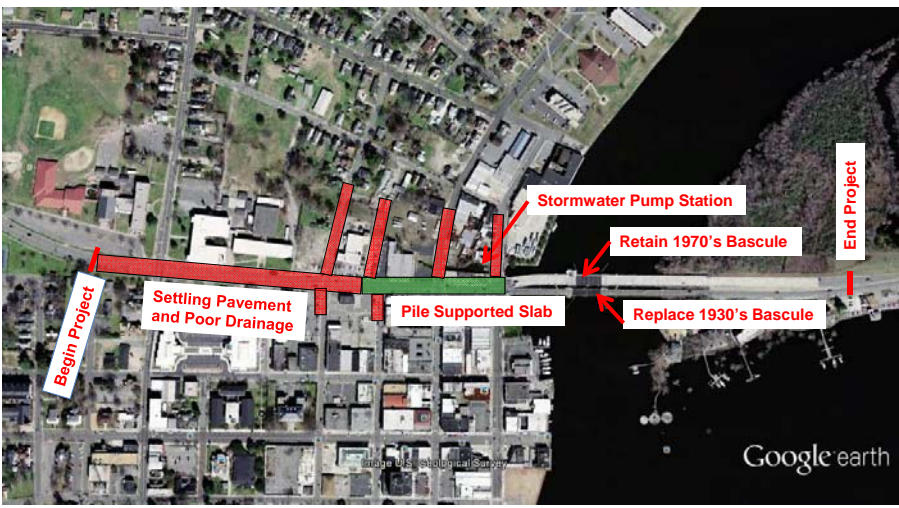
Replace 1930's Bascule

Main Project Objectives

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Begin Project

Settling Pavement and Poor Drainage

Pile Supported Slab

Stormwater Pump Station

Retain 1970's Bascule

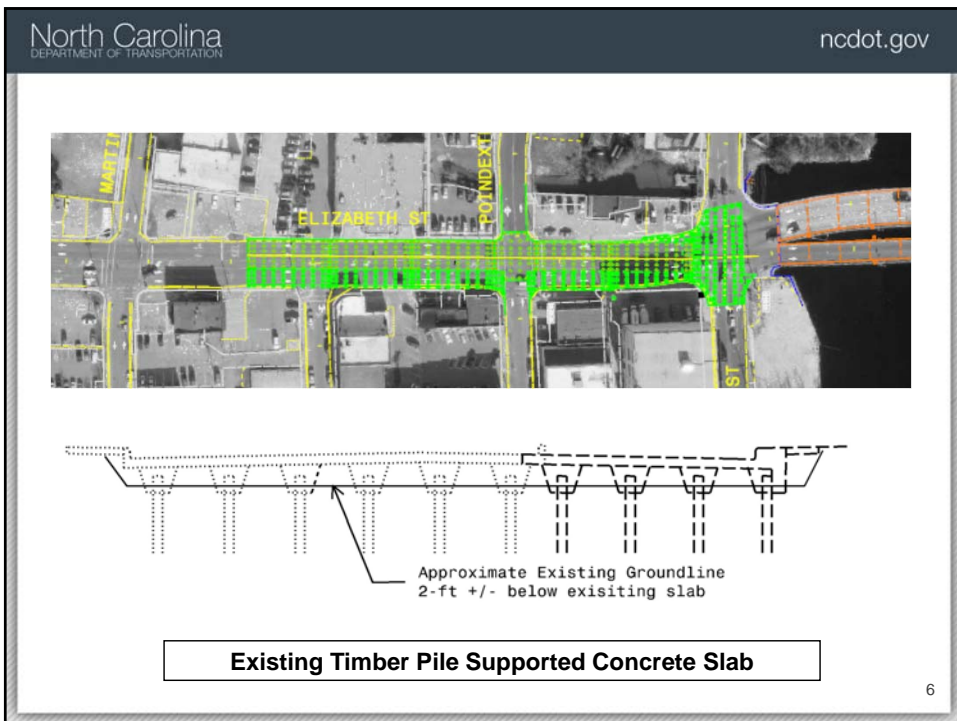
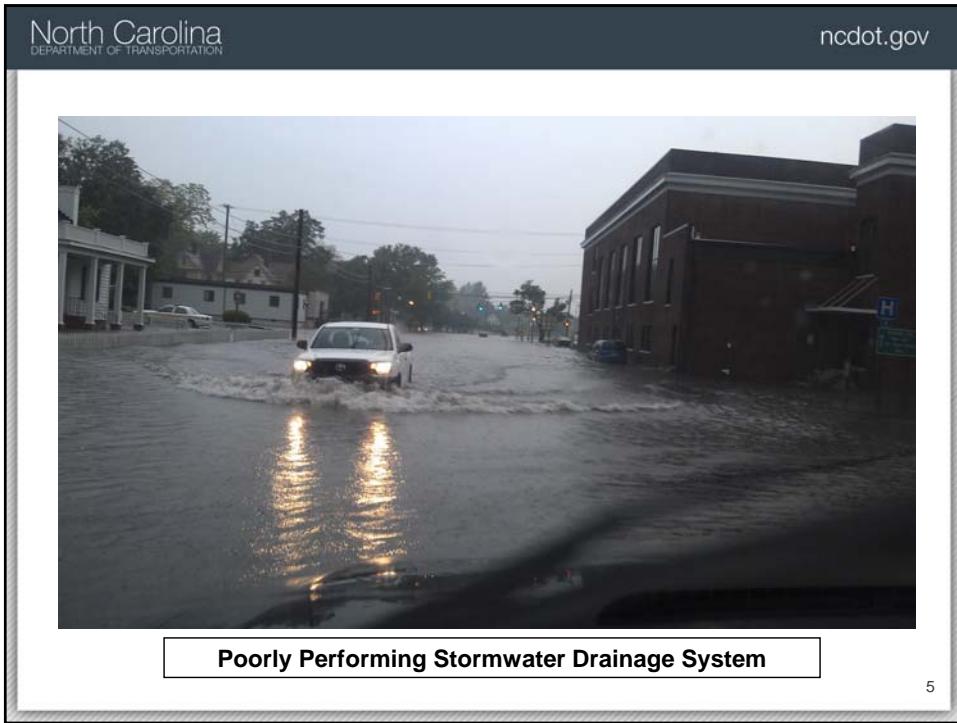
Replace 1930's Bascule

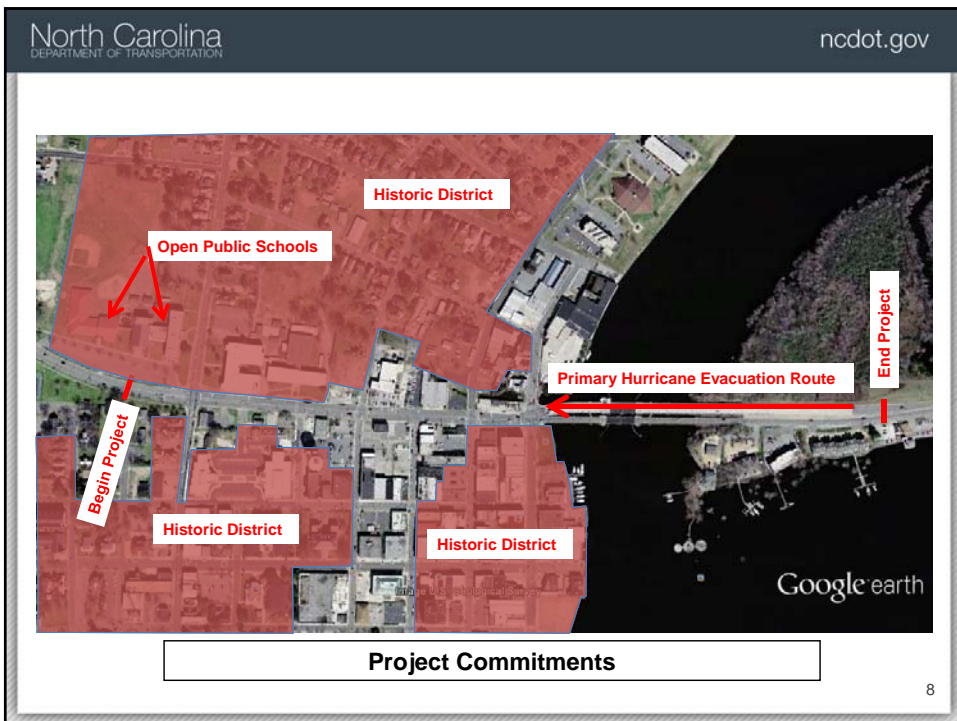
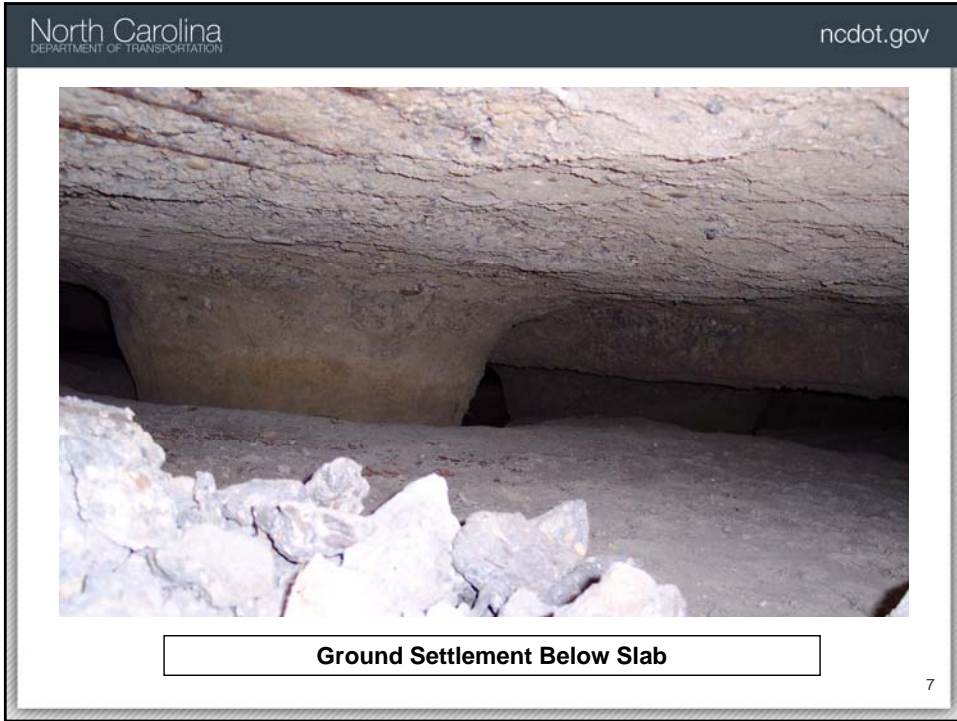
End Project

Google earth

Project Limits and Main Objectives


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Project Commitments

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This slide features an aerial photograph of a town situated along a river. A bridge spans the river, and the town below is densely packed with buildings, including a prominent water tower. The slide is framed by a dark header with the North Carolina Department of Transportation logo and website, and a white border containing a caption box and a page number.

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Vibration Sensitive Buildings

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This slide shows a close-up photograph of a light-colored brick building. Several vertical and diagonal cracks are clearly visible on the masonry. A dark pickup truck is partially visible in the foreground. A yellow date stamp '03/1' is present in the bottom right corner of the image. The slide is framed by a dark header with the North Carolina Department of Transportation logo and website, and a white border containing a caption box and a page number.

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03/18/2010

Vibration Sensitive Buildings

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8/2010

Vibration Sensitive Buildings

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Questionable Construction

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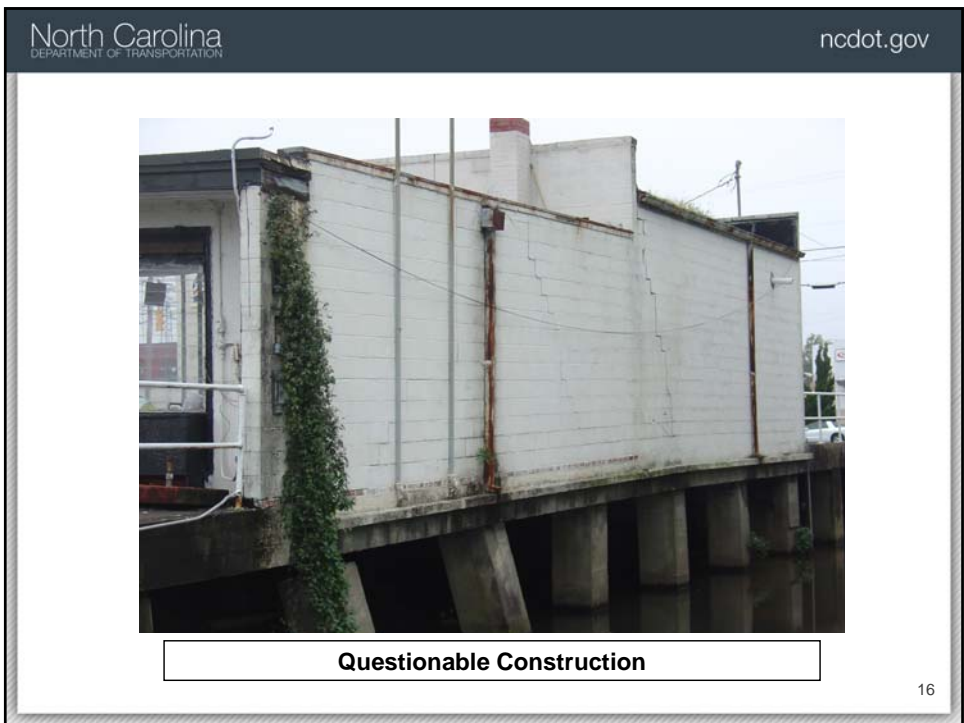
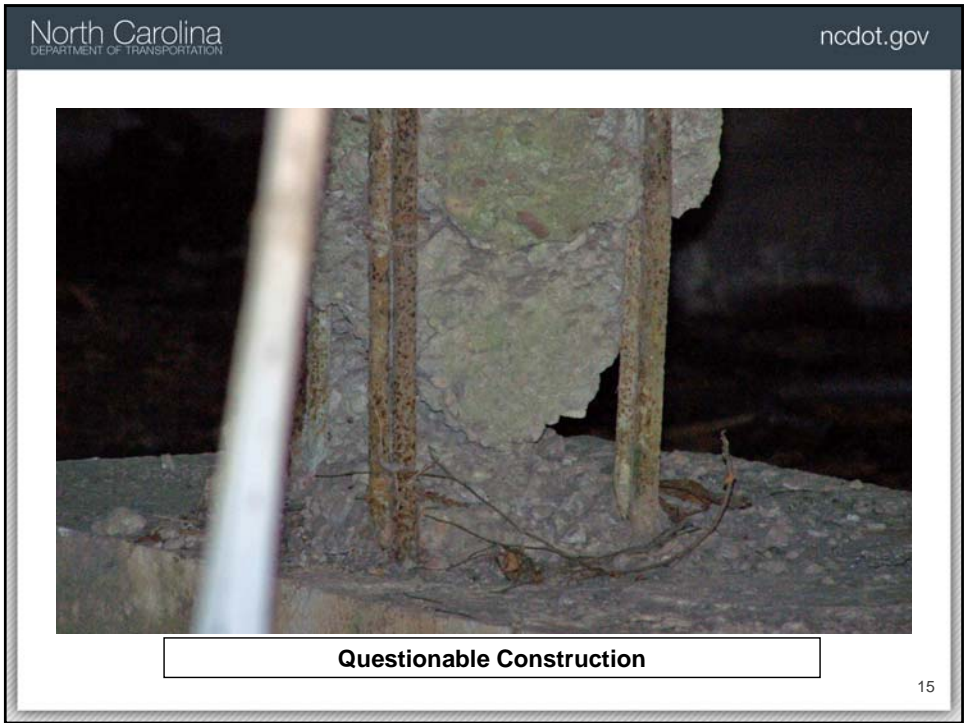
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Questionable Construction

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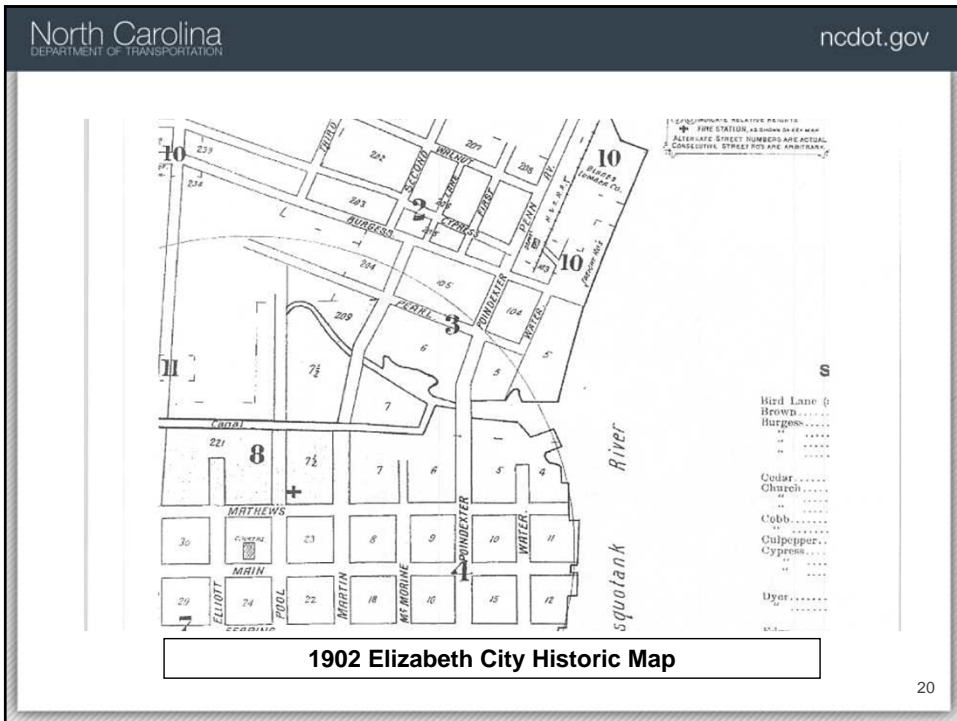
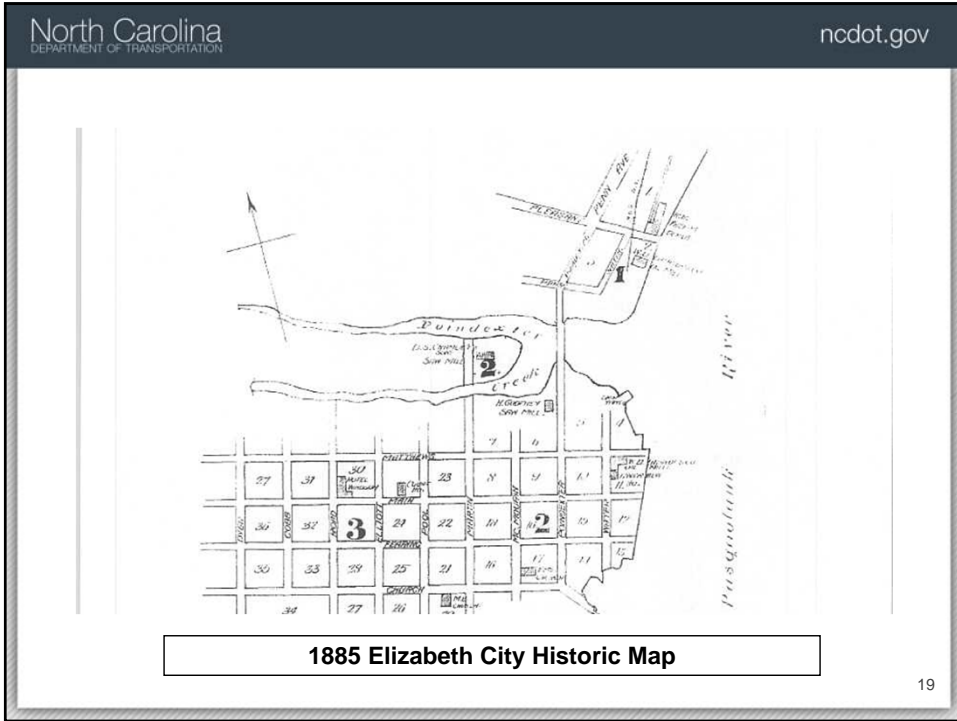
Pre-existing Building Settlement

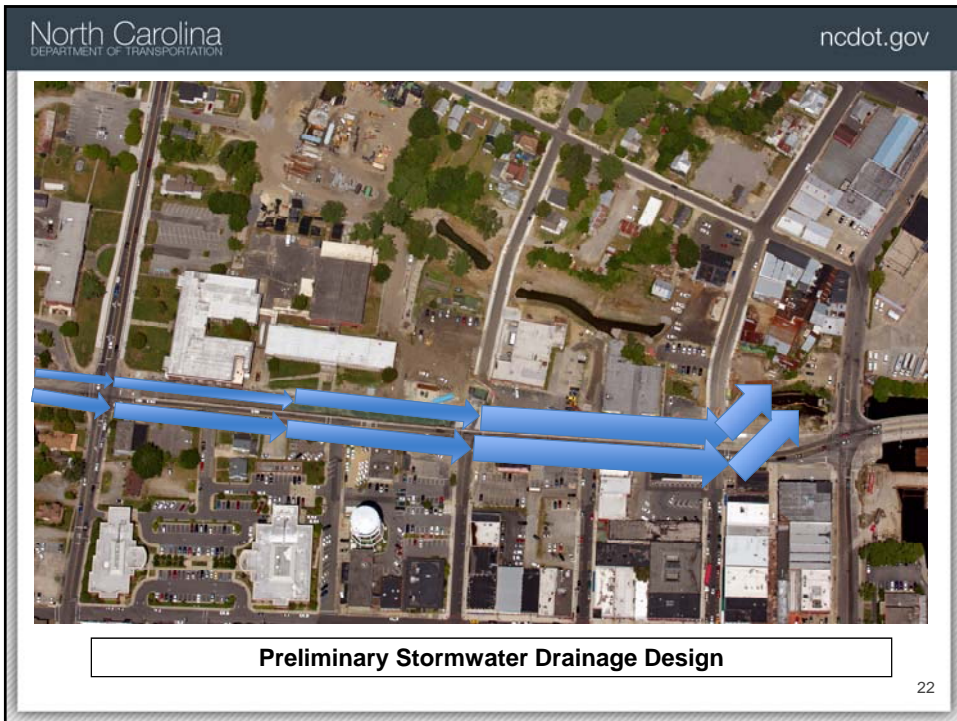
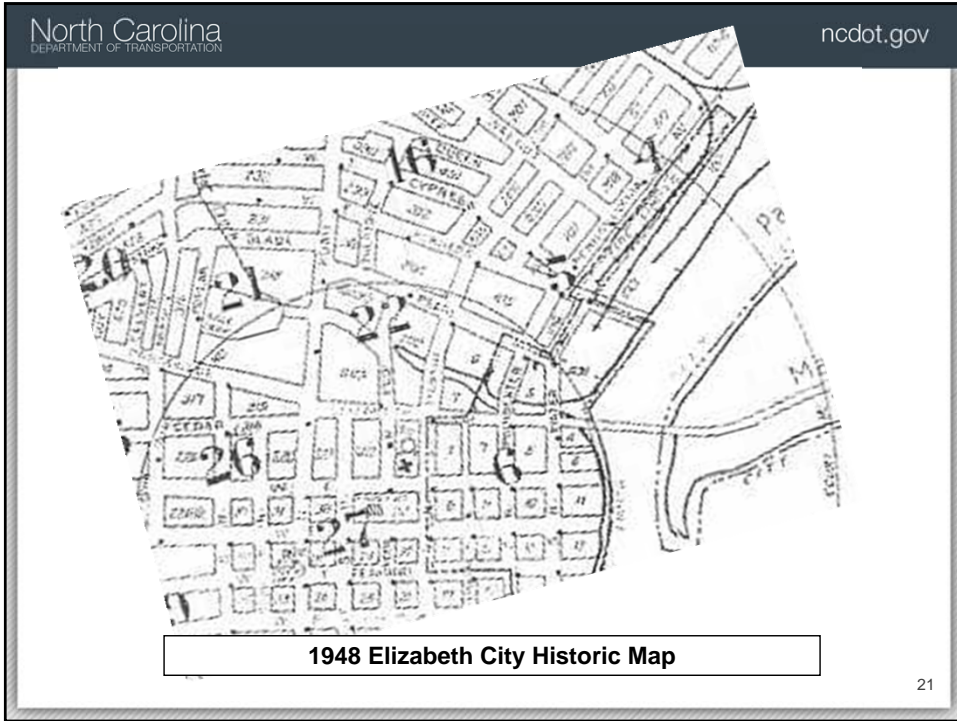
17

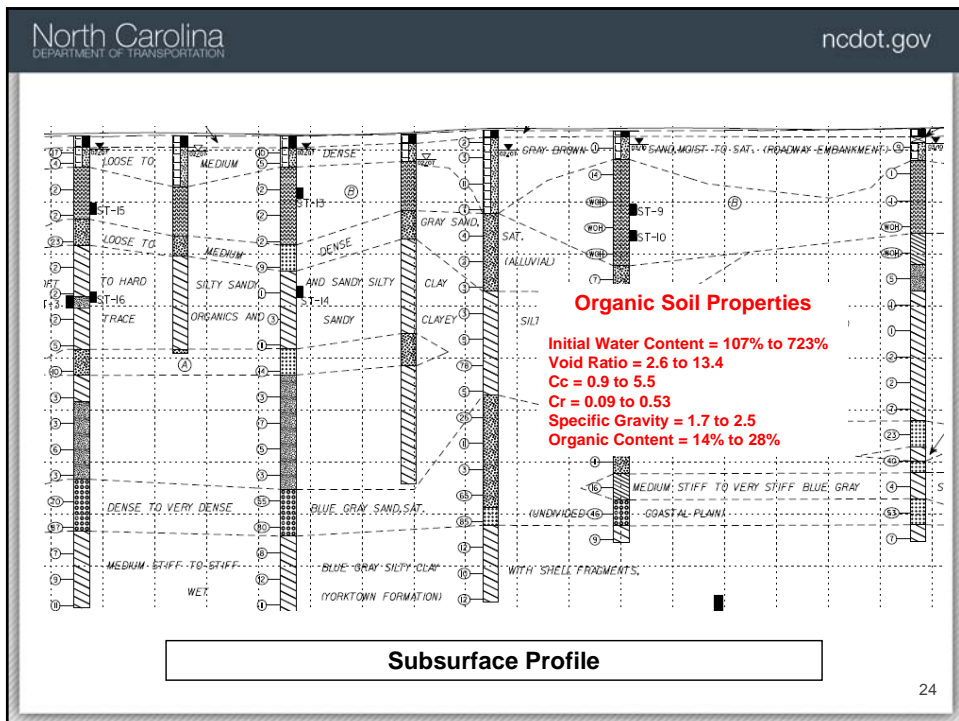


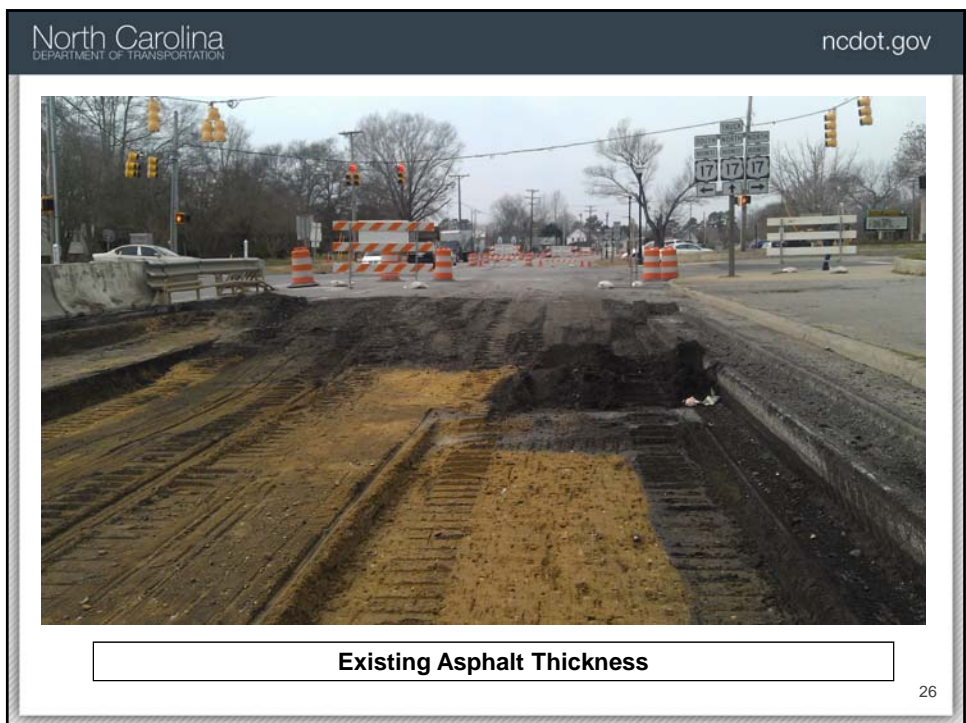
Pavement Settlement

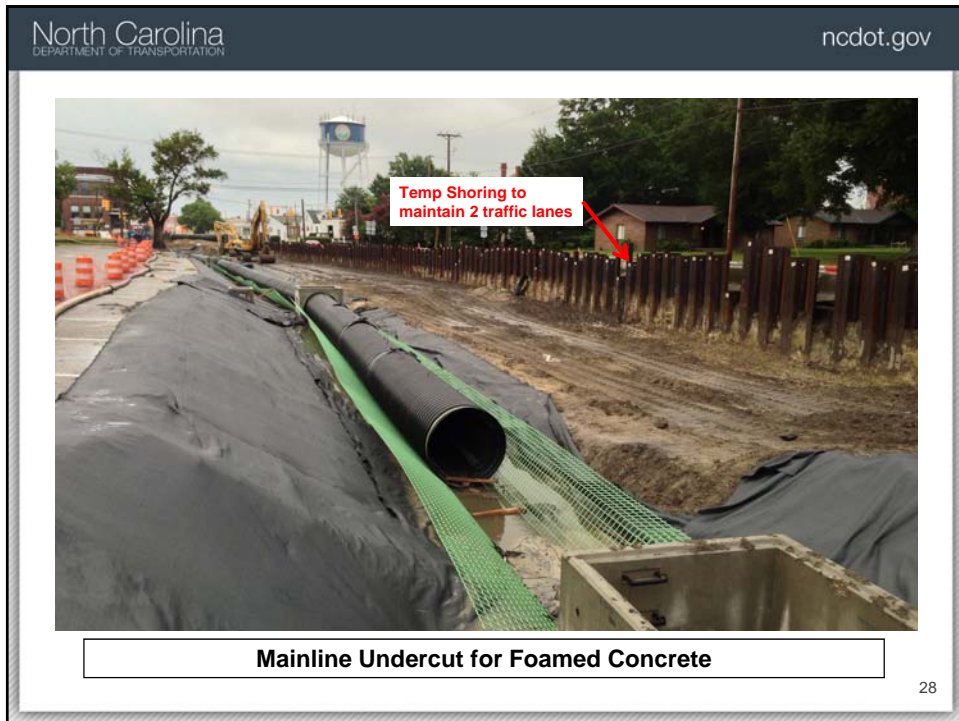
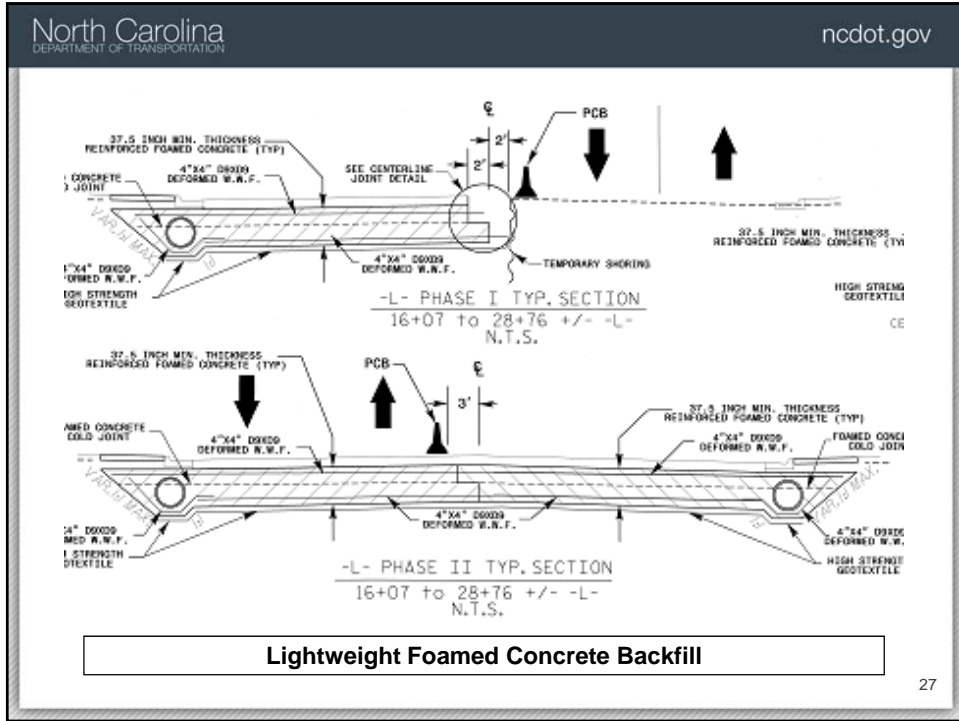
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-Y- Line Undercut for Foamed Concrete

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-Y- Line Foamed Concrete Placement

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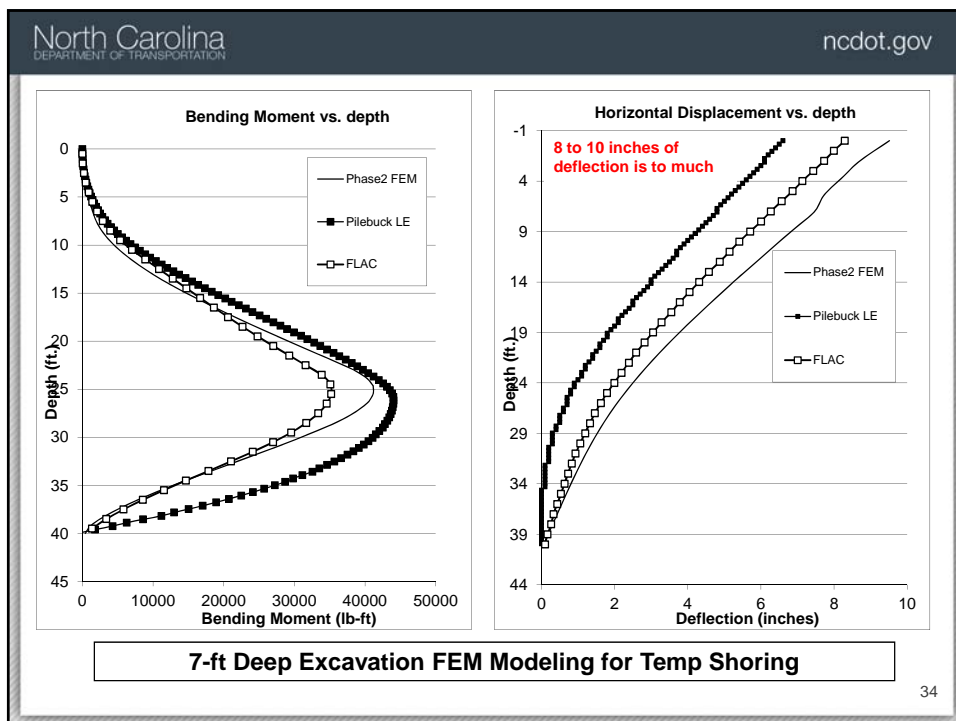
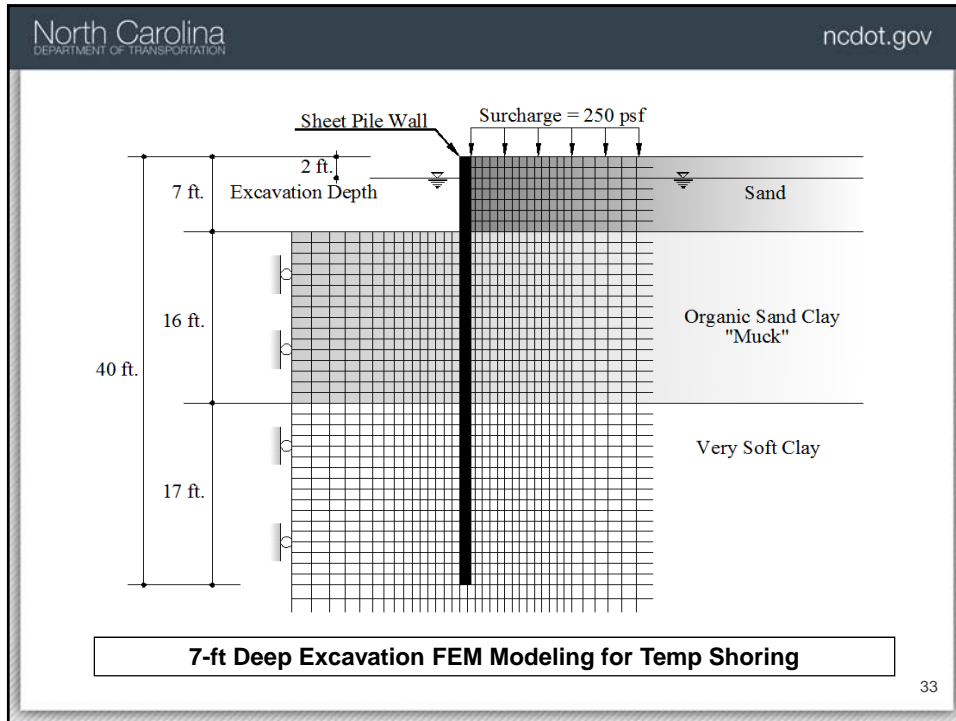
-Y- Line Foamed Concrete Placement

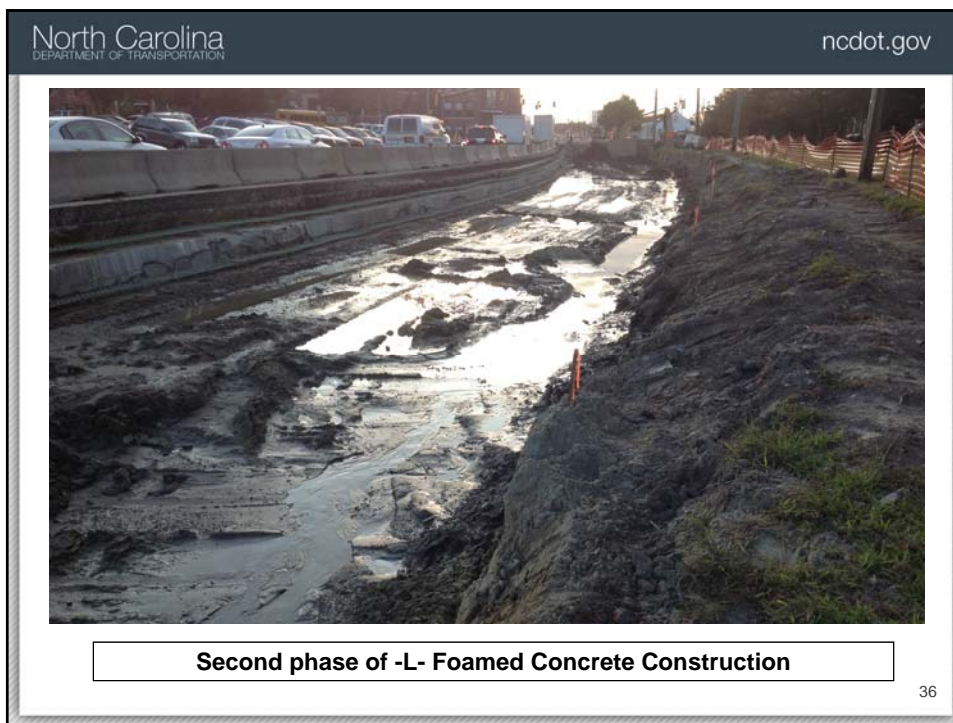
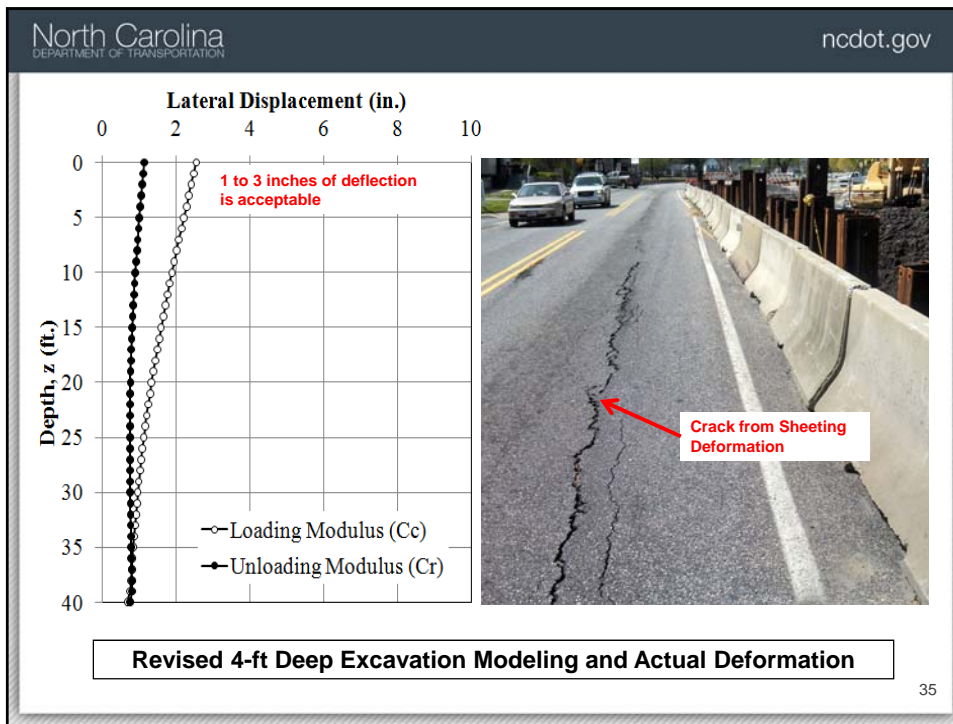
31

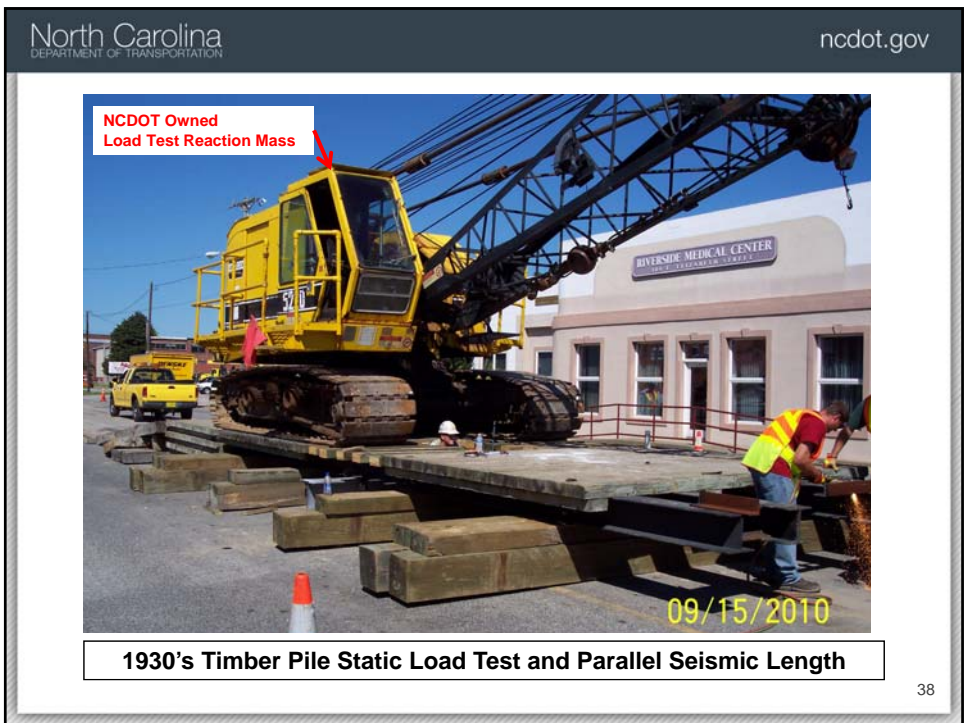
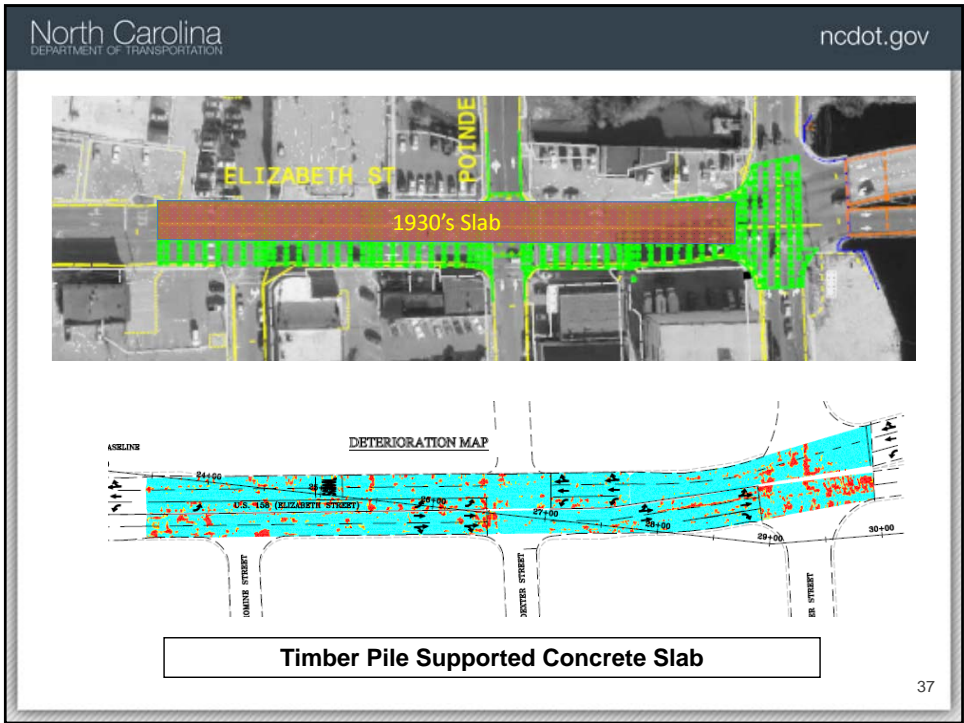


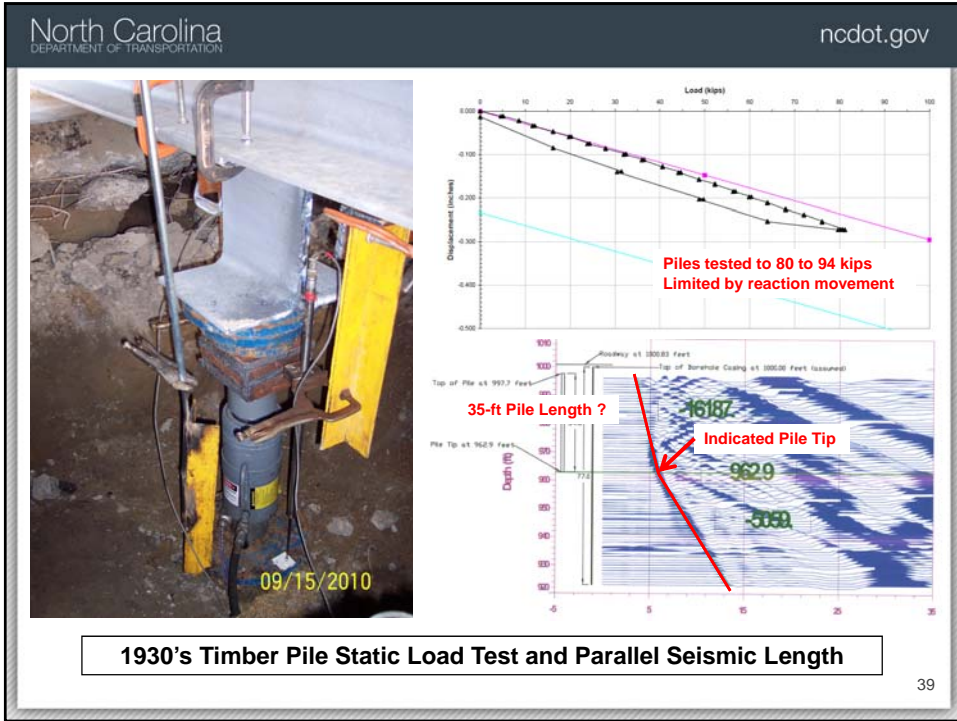
-Y- Line Foamed Concrete Placement

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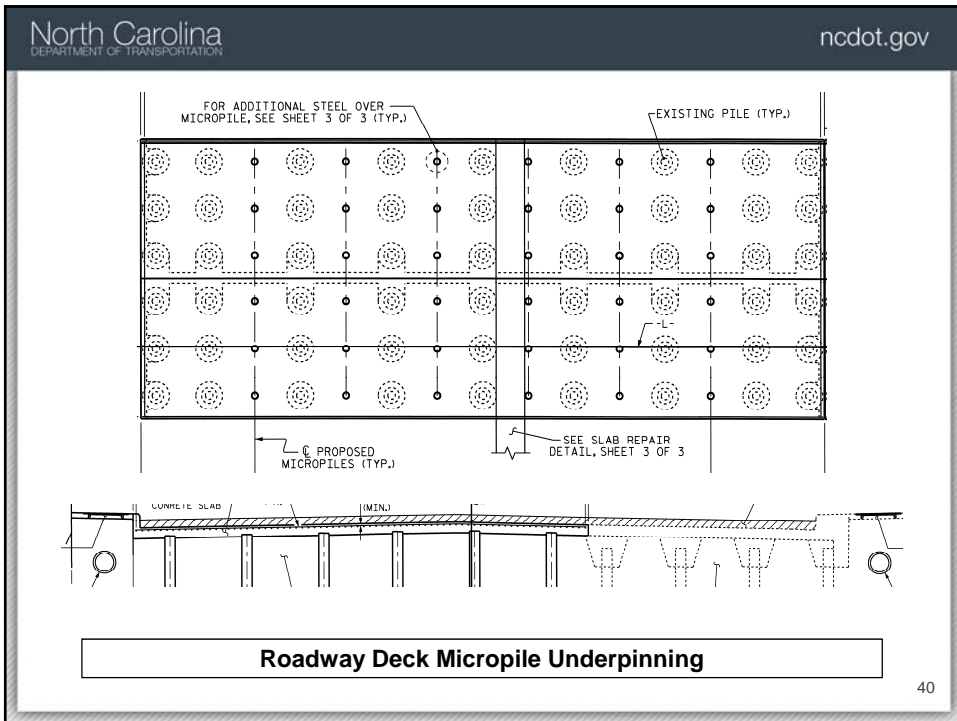




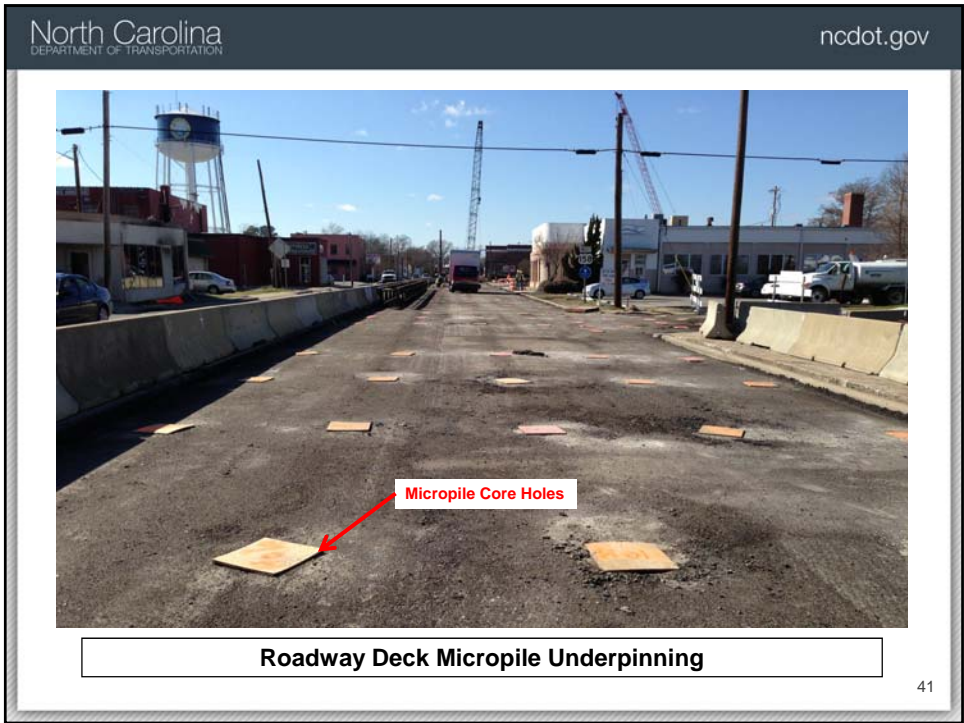




1930's Timber Pile Static Load Test and Parallel Seismic Length



Roadway Deck Micropile Underpinning





2nd Micropile Drilling Technique, Bar Insertion after Grouting

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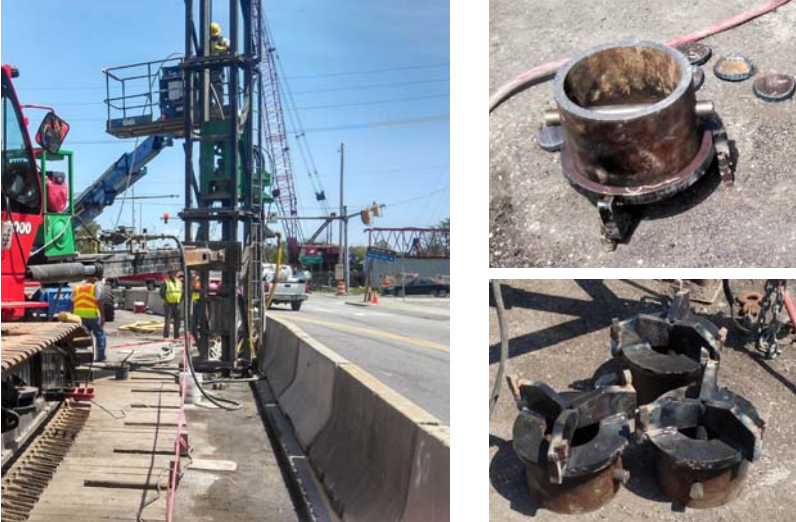


3rd Micropile Drilling Technique, Insert bar through Drill Head

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3rd Drilling Technique, Micropile Bar Insertion and Drop Off Bit

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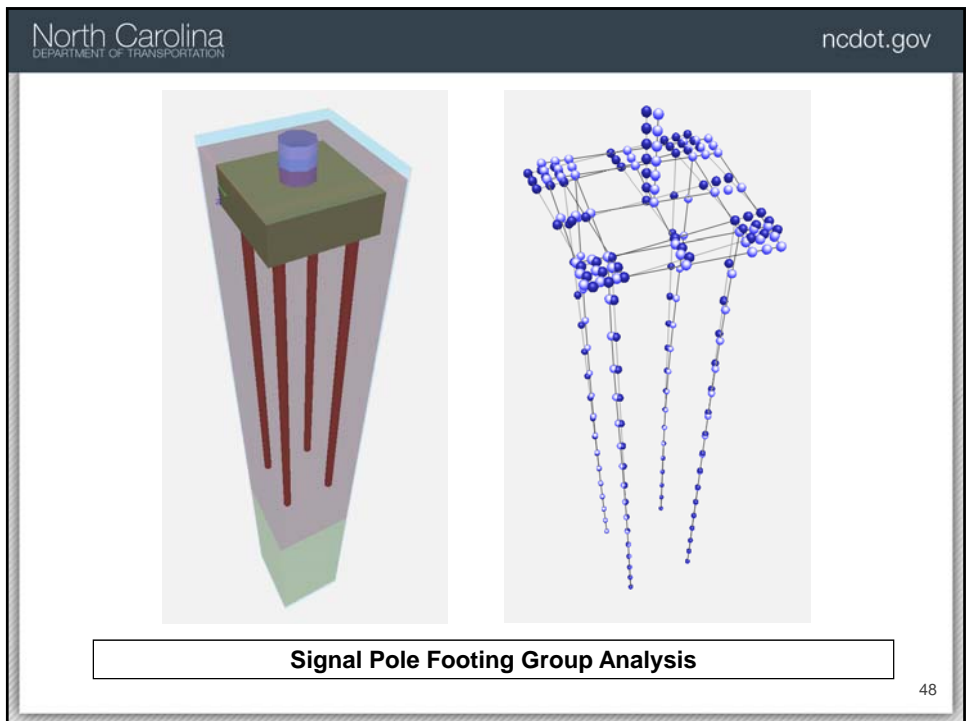
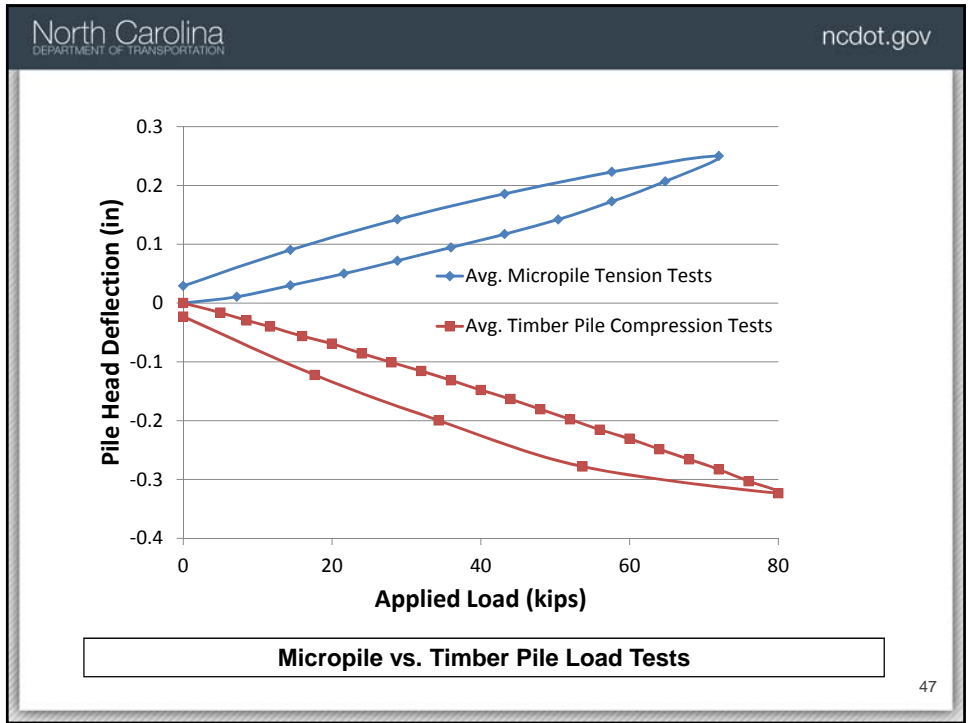
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Roadway Deck Micropile Underpinning

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Signal Pole Footing Micropile Casings

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Signal Pole Footing Micropile Casings

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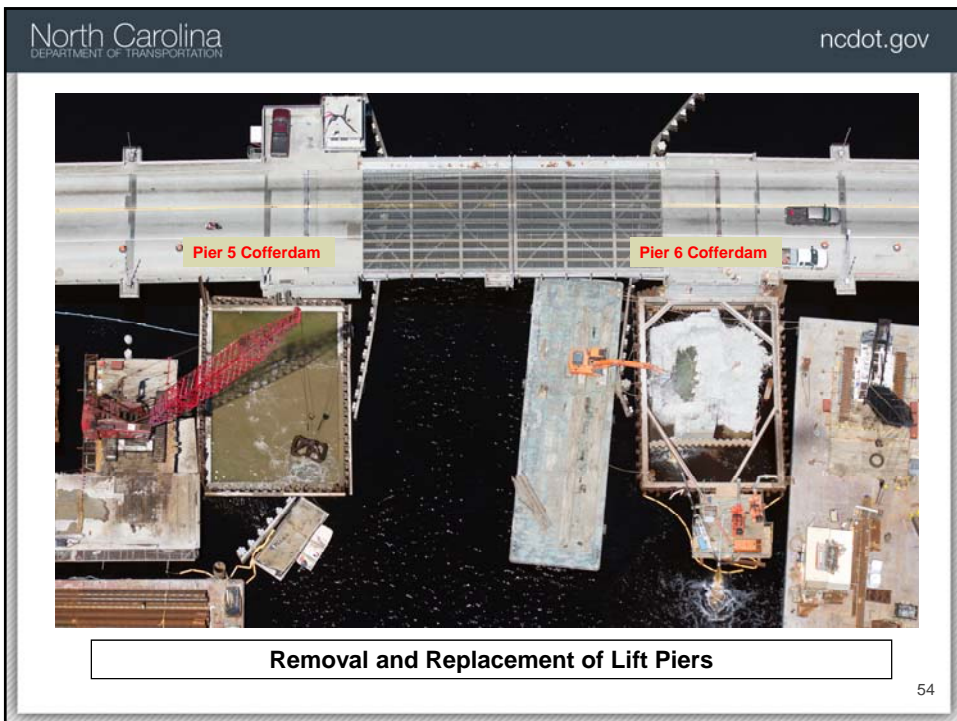
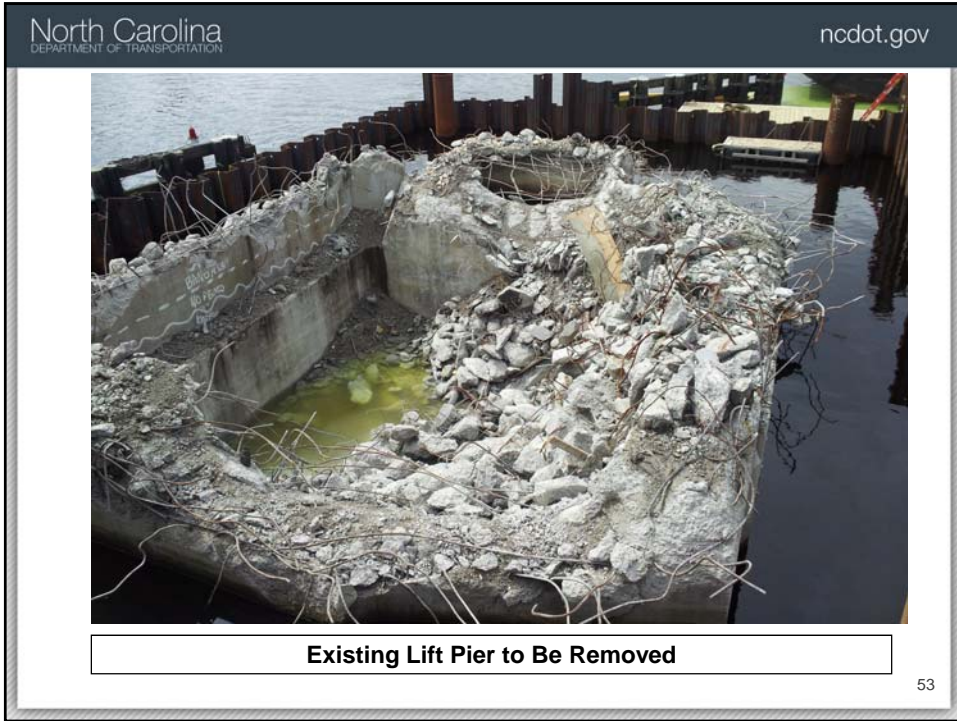
Permanent Vibration Monitoring Station

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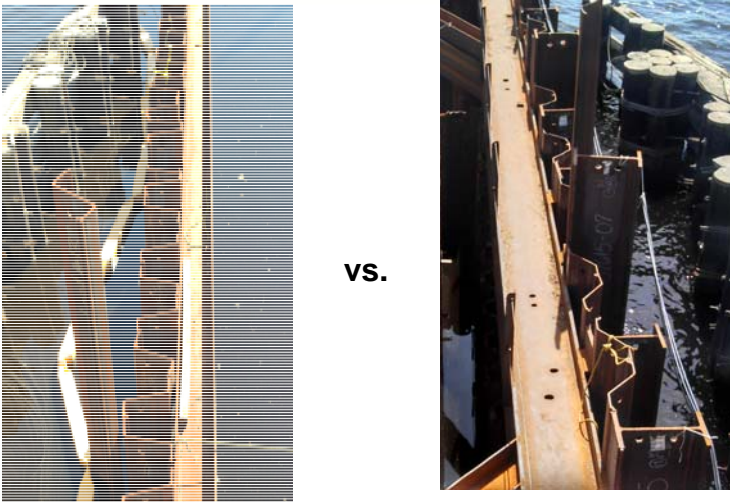
Removal and Replacement of 1930's Bascule Lift Piers

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The image shows two side-by-side photographs of cofferdam construction. The left photograph, labeled 'Pier 5 Cofferdam', shows a vertical view of a steel structure with a ladder and some equipment inside. The right photograph, labeled 'Pier 6 Cofferdam', shows a similar structure but with a different internal arrangement, including what looks like a platform or walkway. The text 'vs.' is centered between the two images.


Pier 5 Cofferdam vs. **Pier 6 Cofferdam**

Cofferdam Wall Construction

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The photograph shows a large-scale construction site for pier removal. A yellow excavator with a hydraulic breaker attachment is positioned in a body of water, surrounded by steel sheet piling. A concrete pier structure is visible in the background. A large steel beam with a circular opening is in the foreground. The scene is an 'early attempt' at the removal process.

Early Attempt at Existing Pier Removal

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Drop Weight for Breaking Existing Pier and Seal

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Shredded Old Timber Pile Tops?

Pier 5 Existing Pier and Seal Removal

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Pier 6 Existing Footing and Seal Removal

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Pier 5 Permanent Foundation

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Pier 5 Permanent Foundation

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Questions ?

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