Walpole – Charlestown 14747
Reconstruction of NH Route 12
Public Informational Meeting 6-8-16

New Hampshire DOT
Department of Transportation

Existing Conditions and Need for the Project

- The existing pavement is 24 feet wide with no shoulders, pedestrians and bicyclists must use the roadway
- 50 MPH Design and Posted Speed Limit
- The 2013 Average Daily Traffic is 6320 vehicles
- Southern roadway embankments show signs of failure
- Pavement shows signs of deterioration
- Accident history associated with lack of shoulders, need for updated guardrail in some areas and appropriate safety zone between the roadway and river/railroad.
- Geometric Constraints (River, Railroad, NH Route 12A Bridge)
- Areas of substandard drainage

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NH Route 12

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Originally Proposed Design

- Alternatives Considered during the Design Process:
  - No Build
  - Western Alignment Shift (Alternative 2)
  - Eastern Alignment Shift (Alternative 3)
  - Eastern Bypass (Alternative 4)
  - Online Alignment with Retaining Walls (Alternative 5)
  - Hybrid, Northern Segment Westward Shift (Alt 3-2-2)
  - NH Route 12/12A Intersection Reconfiguration (Alt 3-2-2A & Alt 3-2-3A)
- Rationale used for the selection of Alternative 3-2-3
  - Avoids impacts to the river in the southern and northern segments
  - Avoids costly impacts to a steep slope located east of the railroad in the middle section
  - Avoids extensive impacts to surrounding properties
  - Estimated construction cost approximately $15 million to $20 million

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Design and Construction Challenges Associated with the Selected Alternative (3-2-3)

- Design Coordination with the Railroad
- Geotechnical Issues – Blasting next to active railroad (6 - 8 trains a day)
- Construction Phasing
- Mildly Contaminated Materials – Railroad Ballast
- Construction Duration (min of 4 years)
- Cost - $33 + Million (Department's Program cannot support the cost of this project as designed).

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Proposed Design Constraints

- No impacts to the railroad tracks.
- No impacts to the NH Route 12A Bridge.
- No impacts to archaeological area No. 10.
- Minimize traffic impacts.
- Consider Utility relocations.

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Features Investigated for the Proposed Design

- Minimum westerly shift of the roadway to support constructability.
- Minimize traffic impacts.
- Maintain the existing railroad drainage.
- Construction Costs.
- Two riverside design features were investigated:
  - Armored Slopes with Surface Vegetation
  - Retaining Walls

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Proposed Alternative Design

- Western Alignment Shift (Alternative 2)
- Minimizes impacts to the railroad (encroachment only), no impacts to the railroad tracks.
- Minimizes overall volume of blasting and the release of nitrates into the environment.
- Avoids a pre-split rock cut and tree clearing east of the railroad tracks.
- Minimizes the construction duration (2 years).
- Eliminates impacts to the Fall Mountain State Forest.
- Minimizes construction costs.

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Construction Costs

Estimated Construction Costs				
Southern Segment		Northern Segment		Estimated Total Project Cost
Alternative 3-2-3	$22,696,000	Current Design	$10,010,000	$32,706,000
Alignment w/o Impacts to the RR (Retaining Wall)	$15,610,000	Alignment w/o Impacts to the RR (Retaining Wall)	$12,242,000	$27,852,000
Alignment w/o Impacts to the RR (Armored Riverbank)	$9,837,000	Alignment w/o Impacts to the RR (Armored Riverbank)	$7,192,000	$17,029,000

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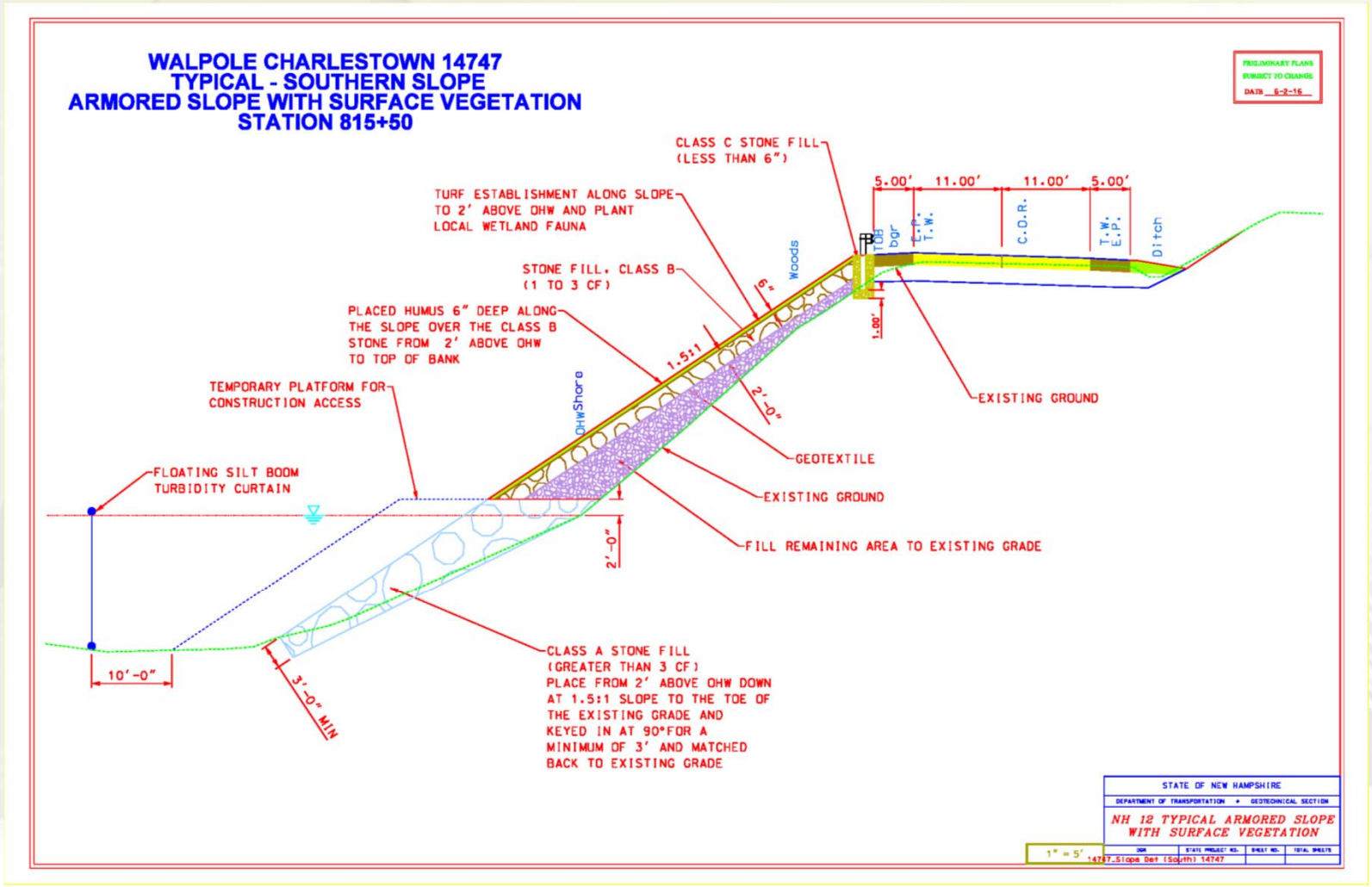
Proposed Armored Slopes with Surface Vegetation - Southern Typical



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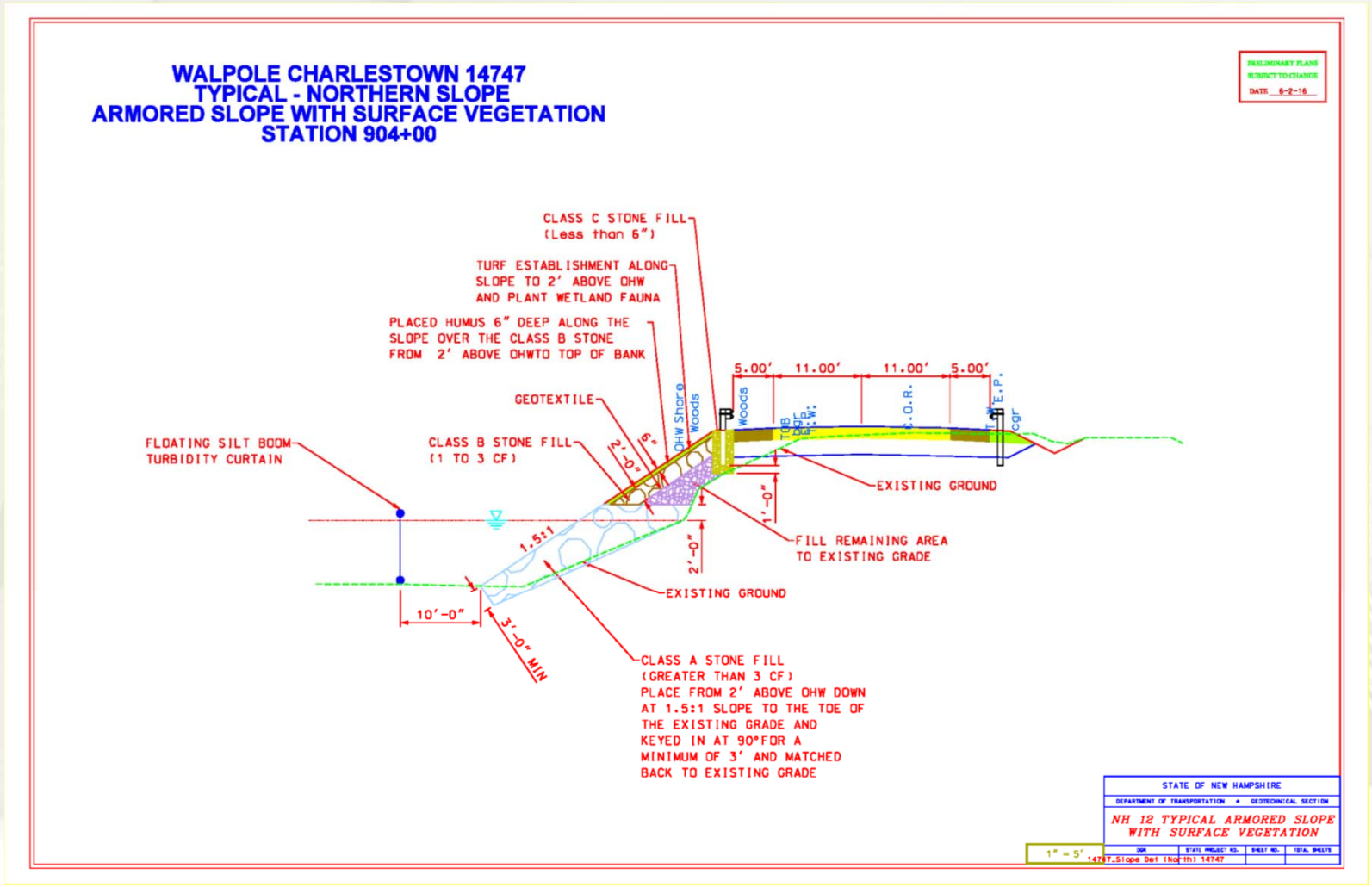
Proposed Armored Slopes with Surface Vegetation - Northern Typical



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Advantages of Armored Slopes with Surface Vegetation.

- Can be designed to allow for quick reestablishment of the riparian buffer.
- Stabilizes the riverbank slope against failure.
- Provides more natural views from the Connecticut River.
- Provides habitat for wildlife.
- Prevents future impacts to the slopes for retaining wall maintenance and repair.
- Lowest estimated construction cost.

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Example of Armored Slopes with Surface Vegetation

NH Route 63 – Chesterfield (Spofford Lake)

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Example of Armored Slopes with Surface Vegetation

I-93 Southbound at Exit 2
South of Brookdale Road
in Salem, N.H.

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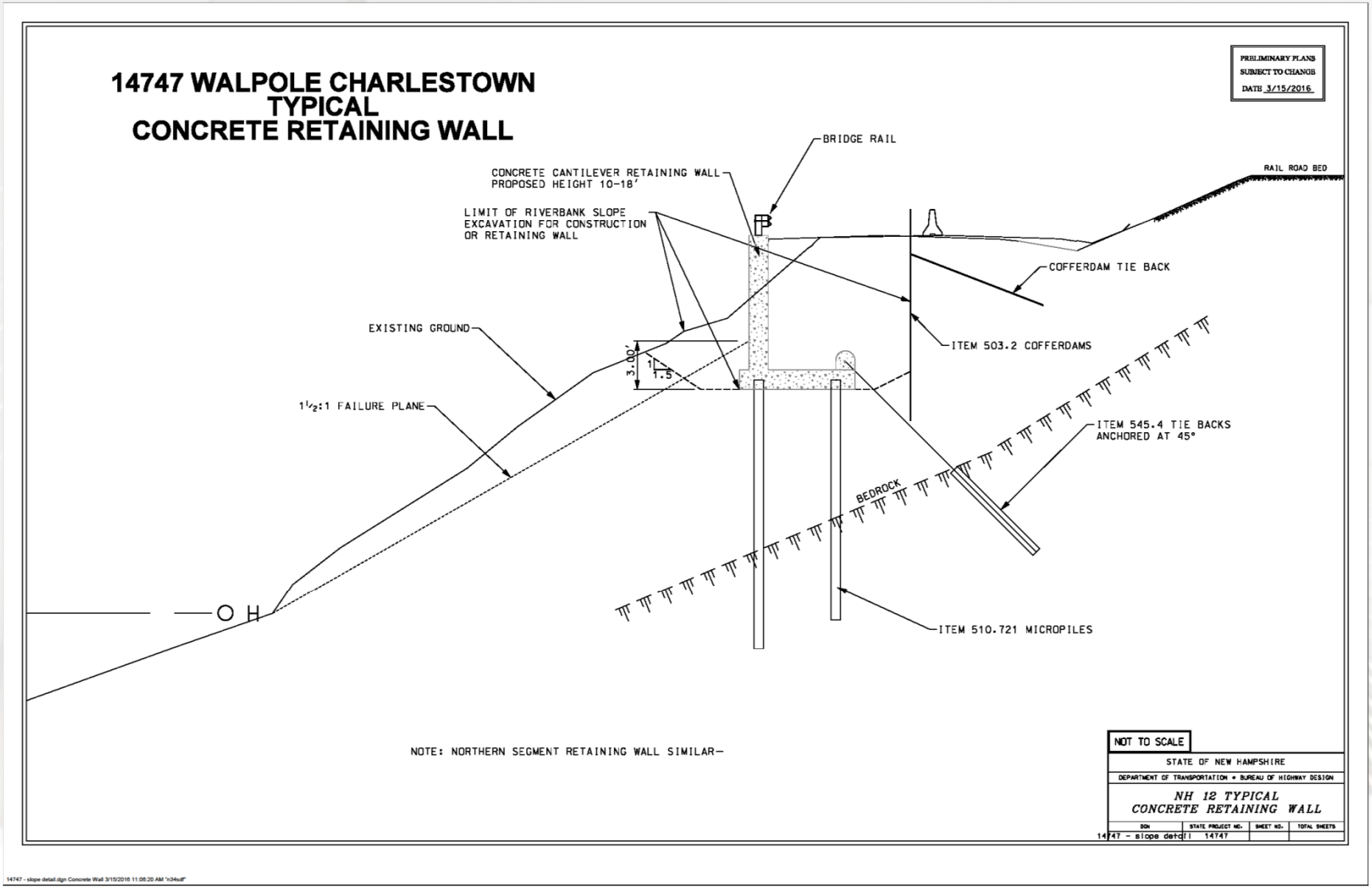
Proposed Retaining Wall Typical



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Retaining Wall Disadvantages

- Greater duration for construction and impacts to traffic.
- Significant increase in construction cost compared to the armored slope with surface vegetation option.
- Potential failure of the existing 1:1 slope (southern segment) below the wall before, during and after construction.
- Need for future maintenance and replacement.
- Vandalism/graffiti.
- Prevents wildlife passage.
- Aesthetics.

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Example of Retaining Wall

I-293 – Manchester (Merrimack River)

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Recommendation: Armored Slope with Surface Vegetation Design

- Stabilizes the Existing Riverbank Slopes
- Eliminates Future Impacts to the Riverbank Slopes due to Retaining Wall Maintenance/Repair
- Balances Environmental Impacts
- Minimizes Impacts to the Traveling Public
- Minimizes Construction Duration
- Minimizes Construction Costs ($10 to $16 Million less than other options)

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Preliminary Impacts for Proposed Armored Slope with Surface Vegetation Design

- 2.5 AC of ACOE jurisdictional wetland impacts
- 3.4 AC of NHDES jurisdictional bank impacts
- A Hydrologic and Hydraulic study is required. Impacts are anticipated to be negligible.

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