

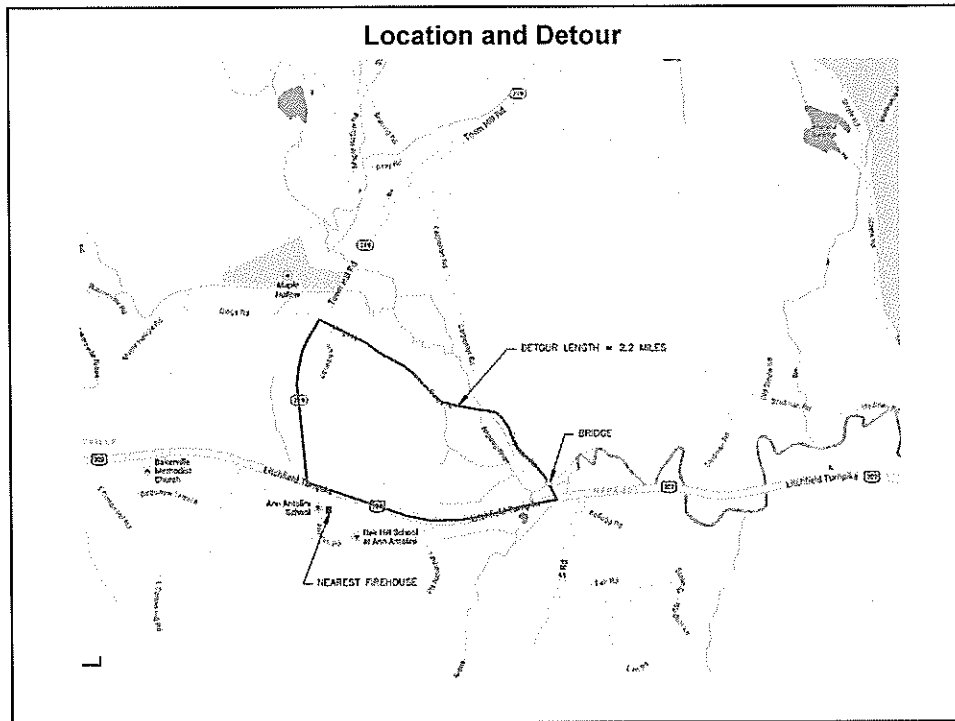
Town of New Hartford  
Carpenter Road Bridge  
Over Nepaug River



**Technical Presentation**

**David N. Battista, P.E.**  
**Lenard Engineering, Inc.**

*November 19, 2013*



## Routine Inspection – January 2013

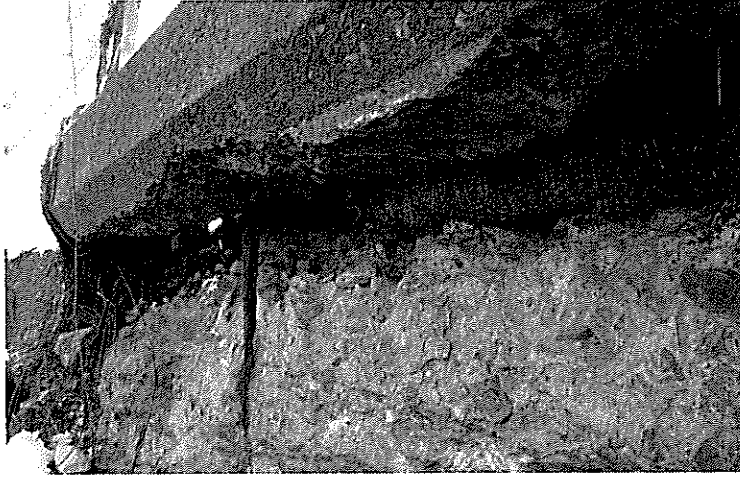
- Poor, potentially unsafe condition
- Failing, inadequate bridge railings
- Structural deterioration of bridge deck
- Abutments: Fair to good condition
- Scour hole observed just downstream
- Soil loss observed (behind abutments)
- Narrow width (1.5 lanes)
- Subject to chronic flooding
- Explained options for improvements
- Recommended temporary safety measures



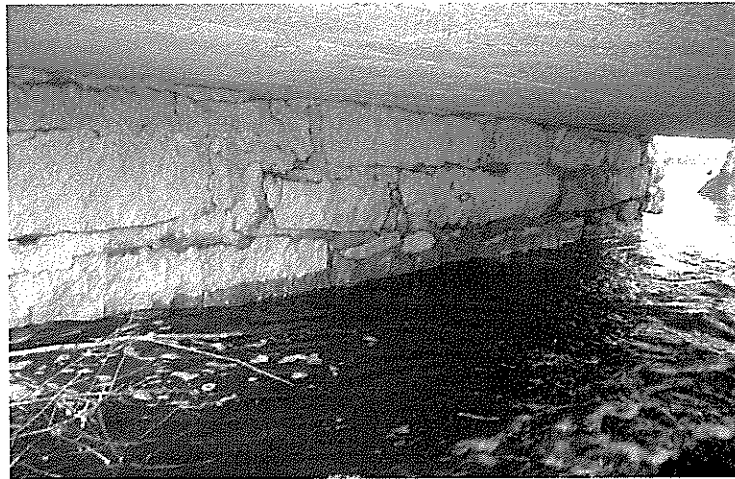
January 2013



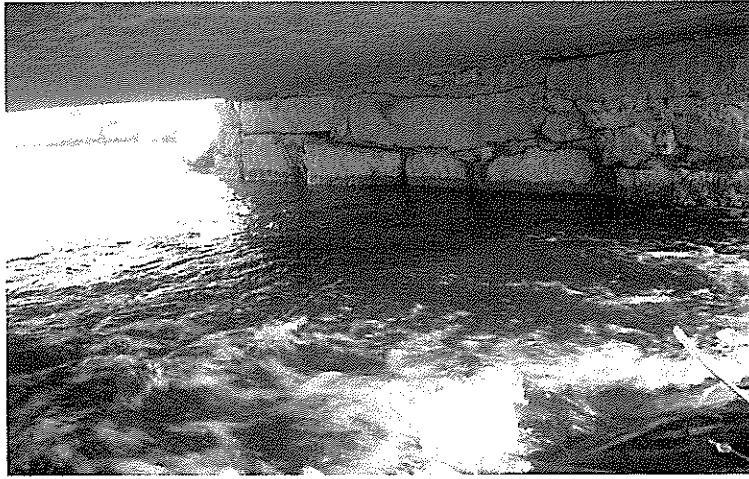
January 2013



January 2013



January 2013



January 2013



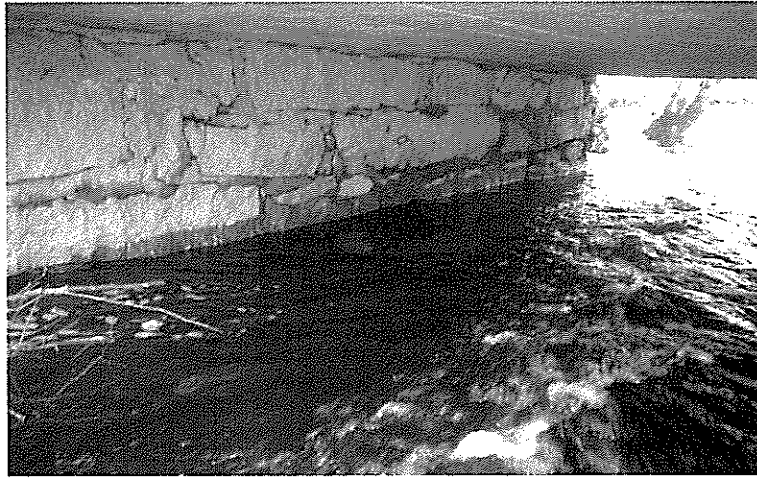
January 2013

## Cost Evaluation – March 2013

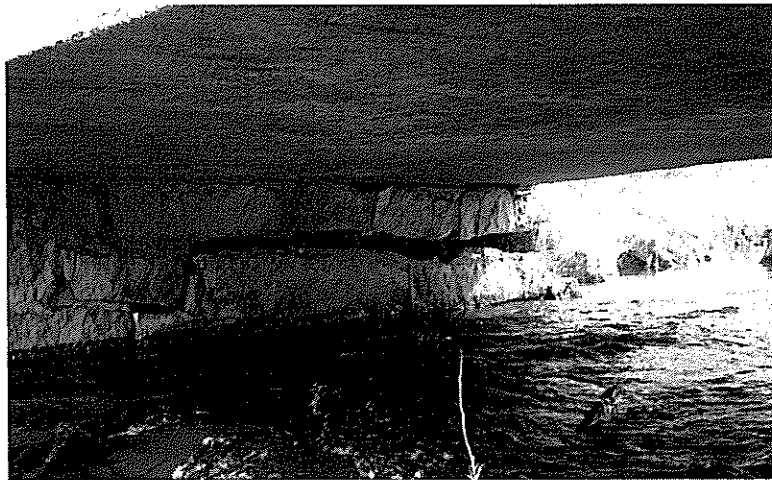
- Steel Bridge Deck Kit (\$204,000) 40 Years
- Box Culvert (\$582,000) 75 Years
- Integral Bridge (\$656,000) 75 Years
- Con Span Concrete Arch (\$849,000) 75 Years

## Modest Flood – March 12, 2013

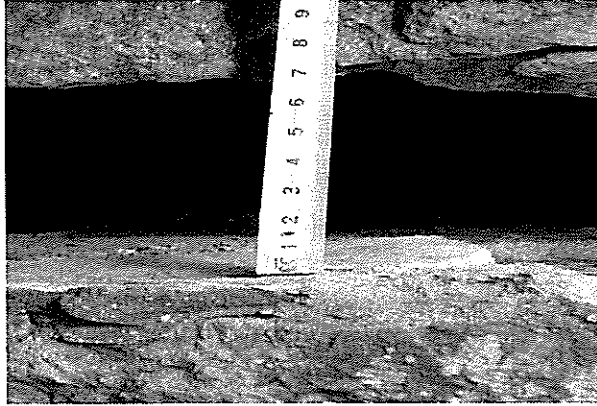
- Sink holes formed on backfill sides of the abutments
- Northerly abutment dropped 7 inches
- Problem discovered March 18<sup>th</sup> by Town Road Crew



January 2013



March 2013



March 2013



Post-storm damage





Current condition – November 2013

## Decision to Close Road

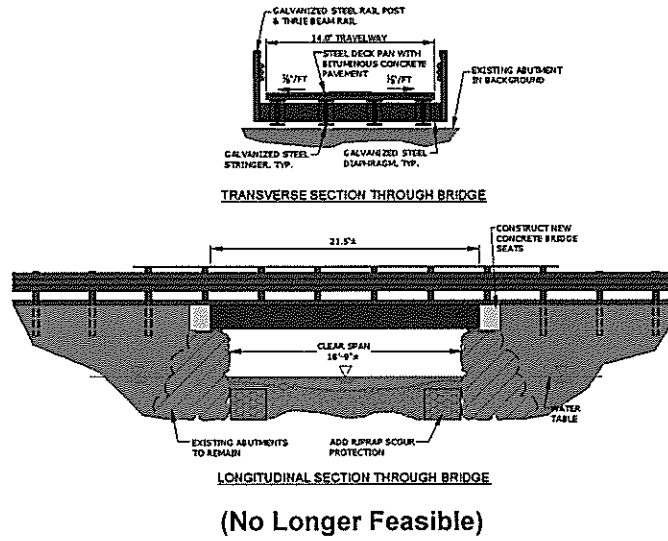
- Following discovery of problems, LEI inspected bridge March 18<sup>th</sup>
- Issued immediate verbal recommendation to close bridge
- Written recommendation to close bridge issued March 25<sup>th</sup>

## Progress – Spring and Summer 2013

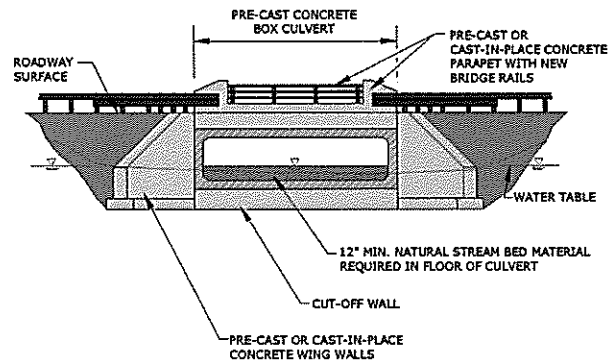
- Notified Board of Selectmen and Board of Finance
- Obtained preliminary funding during budget process
- Topographic survey
- Wetland delineation
- Soil borings/geotechnical investigation
- Initiated environmental review (Pearl Shelled Mussel, et. al.)
- Added structure to State's List of Municipal Bridges
- Began work on hydraulic analysis
- Evaluated cul-de-sac & footbridge alternative

## Summary of Alternatives

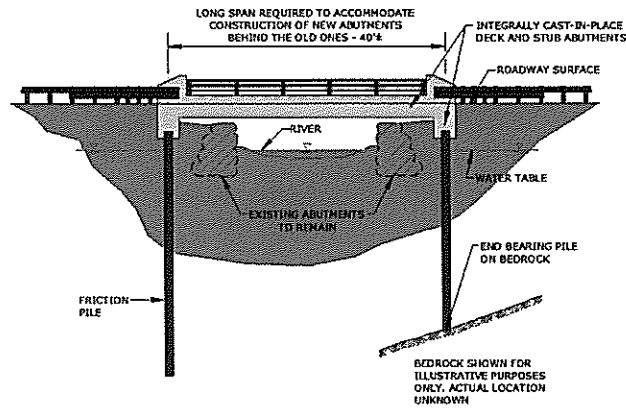
## Alternative No. 1 – Steel bridge deck kit



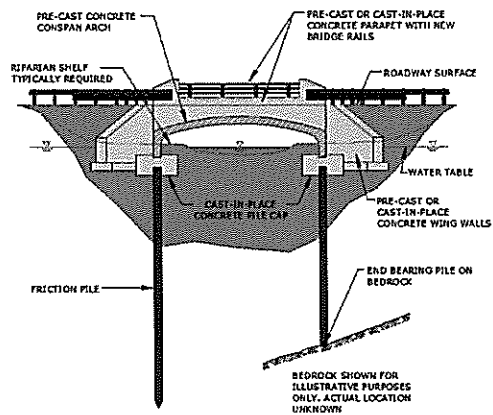
## Alternative No. 2 – Concrete Box Culvert



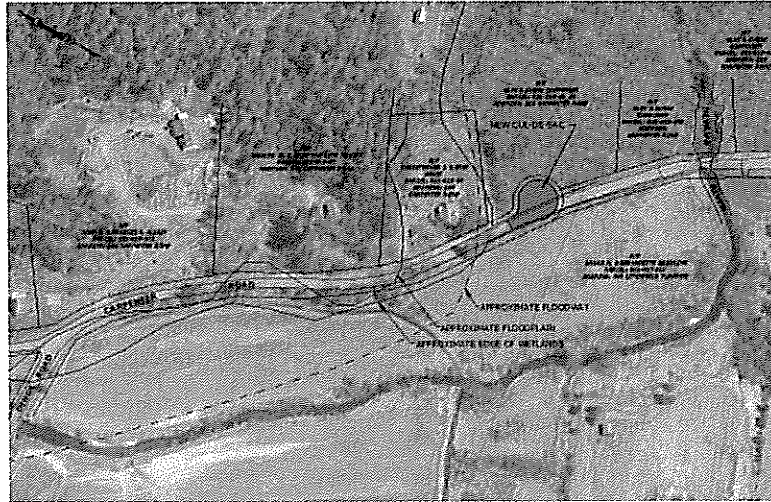
## Alternative No. 3 – Integral Concrete Bridge



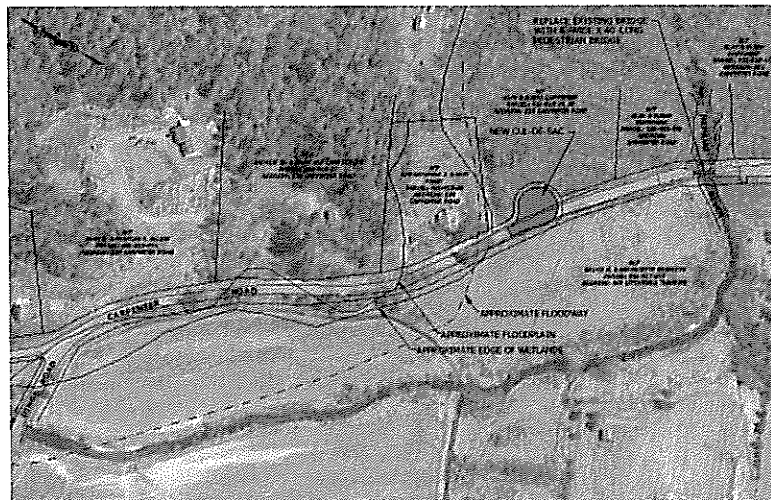
## Alternative No. 4 – Concrete ConSpan Arch



## Alternative No. 5 – Remove Bridge Permanently



## Alternative No. 6 – Remove highway bridge; Build foot bridge



# Comparison of Alternatives

Comparison of Alternatives - Carpenter Road Bridge over Nepaug River						
<i>Note: All matrix values are rounded to the nearest \$1,000.</i>						
	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
	New Prefabricated Steel Bridge With	New Pre-Cast Concrete Box Culvert	New Integral Concrete Bridge	New Pre-Cast Concrete ConSpan Arch	Cul-de-sac No Foot Bridge	Cul-de-sac with Footbridge
Number of Traffic Lanes	One	Two	Two	Two	Zero	Two
Risk of Scour Damage / Possible Failure	Moderate	Low	Low	Low	N/A	Low
Life Expectancy	45 Years <sup>1)</sup>	75 Years	75 Years	75 Years	Indefinite	60 Years
Preliminary Engineering Services (Design, Permitting, & Bidding)	\$ 26,000	\$ 48,000	\$ 66,000	\$ 66,000	\$ 30,000	\$ 54,000
Construction Cost	\$ 132,000	\$ 397,000	\$ 492,000	\$ 601,000	\$ 162,000	\$ 272,000
Estimating Contingency (Allowance: 20% of Construction Cost)	\$ 26,000	\$ 79,000	\$ 98,000	\$ 116,000	\$ 30,000	\$ 54,000
Operating Contingency (Allowance: 10% of Construction Cost)	\$ 13,000	\$ 40,000	\$ 49,000	\$ 60,000	\$ 16,000	\$ 27,000
Construction Engineering Services (Allowance: 10% of Construction Cost + Contingencies)	\$ 17,000	\$ 62,000	\$ 86,000	\$ 76,000	\$ 20,000	\$ 35,000
Material Testing Allowance (Allowance varies, depending on type of construction)	\$ 4,000	\$ 18,000	\$ 22,000	\$ 19,000	\$ 5,000	\$ 9,000
<b>Budget Recommendation:</b>	<b>\$ 218,000</b>	<b>\$ 624,000</b>	<b>\$ 704,000</b>	<b>\$ 916,000</b>	<b>\$ 262,000</b>	<b>\$ 491,000</b>

1) Alternative No. 1 eliminated due to failure of existing abutment.

2) State and federal land-use regulators prefer open-bottom structures (Alternatives #3, #4) to box culverts (Alternative #2). The Town could expedite the permit process by selecting Alternative #3 or #5 over Alternative #2, despite the higher cost.

## Recommendations

- Replace the existing bridge with a modern structure

-or-

- Eliminate the bridge and construct a cul-de-sac

## Replace the Bridge

- Pursue Alternative No. 2 – Box Culvert with regulatory agencies
- Fall back on Alternative No. 3 – Integral Concrete Bridge if required by regulatory agencies
- Anticipate project expenditure of \$704,000
- Pursue Local Bridge Program Funding (47.48% Grant) *(Now in process.)*
- Local Bridge Funding for Fiscal Year 2013-2014 already committed to other projects
- Local Bridge Funding for Fiscal Year 2014-2015 has not been allocated by the Connecticut Legislature
- Town Meeting approval required

## Eliminate the Bridge

- Remove the existing bridge, fortify the area of removal
- Build a cul-de-sac on North side
- Property acquisition required
- Anticipate complications during the permit process (new cul-de-sac will be located in a regulatory floodway)
- Anticipate a minimum project cost of \$252,000 (excludes cost of property acquisition)
- Alternate: Add Footbridge – Additional cost of at least \$200,000
- Connecticut Local Bridge Program funding (if available) may apply to certain bridge removal costs
- Town Meeting approval required

## Permits and Authorizations Required

- Planning Commission Approval per CGS 8-24
- Wetland Commission Approval
- U.S. Army Corps of Engineers (CT PGP or Individual Permit)
- CT DEEP Section 401 Water Quality Certificate
- CT DEEP IWRD Diversion Permit (Possible)

## Will bridge replacement cure chronic flooding problems?

- No!
- There will be no change in the depth or frequency of flooding
- Cost to correct chronic flooding will run in the millions of dollars



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Number of Traffic Lanes	One	Two	Two	Two	Zero	Two
Risk of Scour Damage / Possible Failure	Moderate	Low	Low	Low	N/A	Low
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