

WACR Bridge 501 – T.S. IRENE Emergency Repairs

1. Overview of Interesting and Challenging ER Project
2. Slide Show With More Detailed Photography and Geeky Engineering / Construction Photos

Tom Knight, PE

STANTEC CONSULTING

11/8/2012

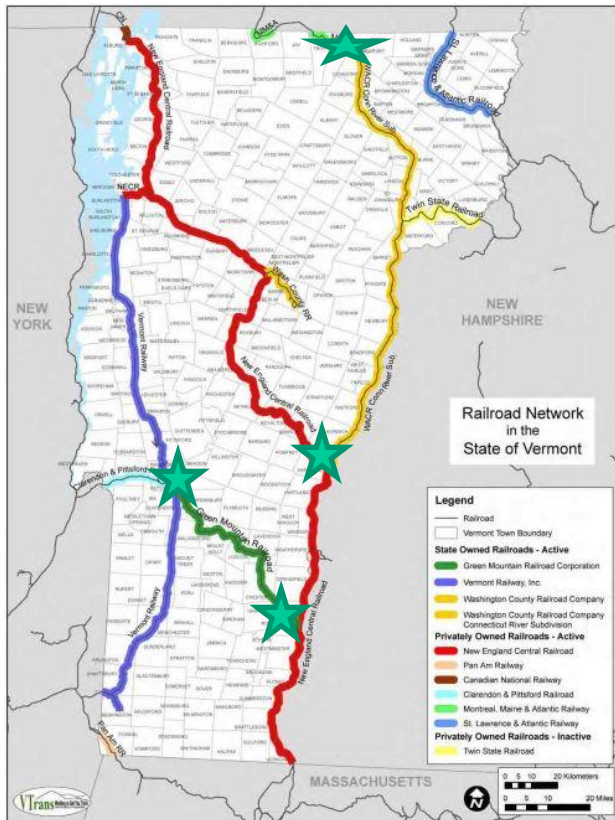
One Team. Infinite Solutions



Washington County Railroad (WACR)

Connecticut River Subdivision Bridge 501

Over the White River in Hartford, Vermont



- TS Irene August 28th
- August 31st VTrans Assembles a team of Rail Consultants to Help Assess Damage
- Preliminary Assessments Indicate Scour Damage to Bridge 501 is Severe.
- Vermont Agency of Transportation hires a general contractor and assigns Stantec to work with them to develop a strategy and design to stabilize the existing bridge
- Repair Work Including Crane Debris Removal, Crane Basket inspections and Access Road Work begins September 1st.

Heavy Debris Loading Resulted in the Severe Undermining of the South Pier



The pier settled nearly six feet and listed upstream nearly five feet. The middle span of the structure nearly slipped off the pier and into the river.



Who was involved?



Team Effort: VTrans Rail, Contractor Crane Service, Stantec, VHB, Trans-systems (PB), EIV, ECI, Vermont Rail Systems, Casco Bay Steel, DS Brown, SD Ireland, JP Carrera, Winterset, Hubb Drilling, Gravel Construction, Twin State Sand and Gravel, Anchor Bronze, ARMY CORP (WILDER DAM), M&K Commercial Diving.

What did Stantec Do?

Stantec collaborated with the Contractor and VTrans to Design and Implement the following:

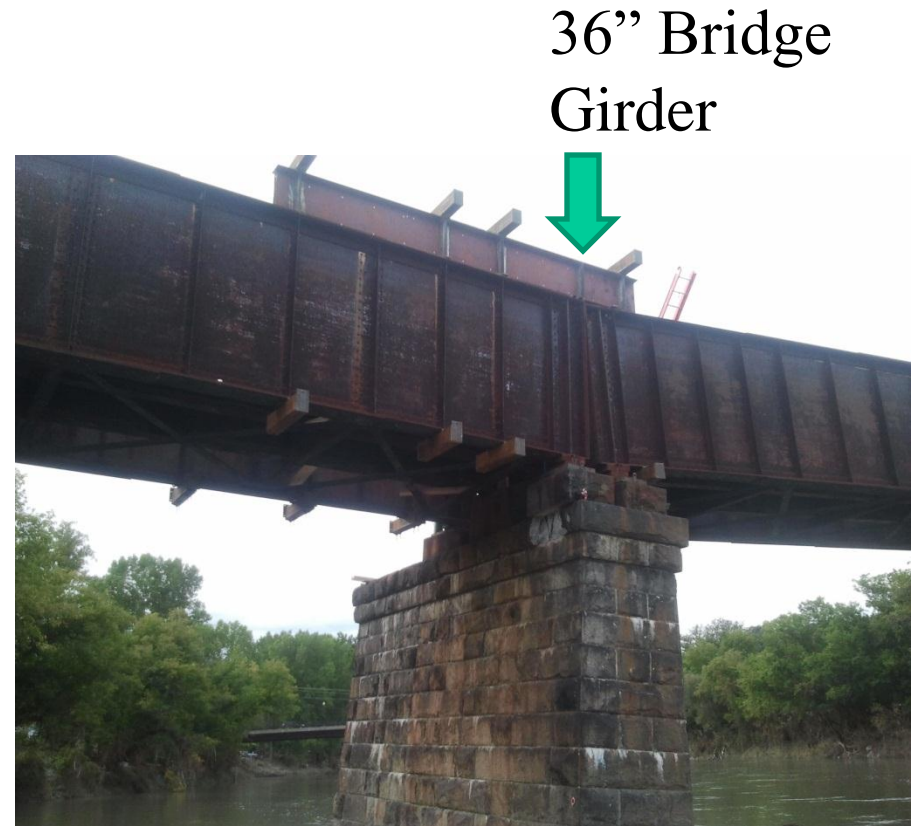
- 1. Temporary Stabilization**
- 2. Shoring and Retrofit for Trains**
- 3. Design of Replacement Pier**

Temporary Stabilization



Extended Bearing Pedestal

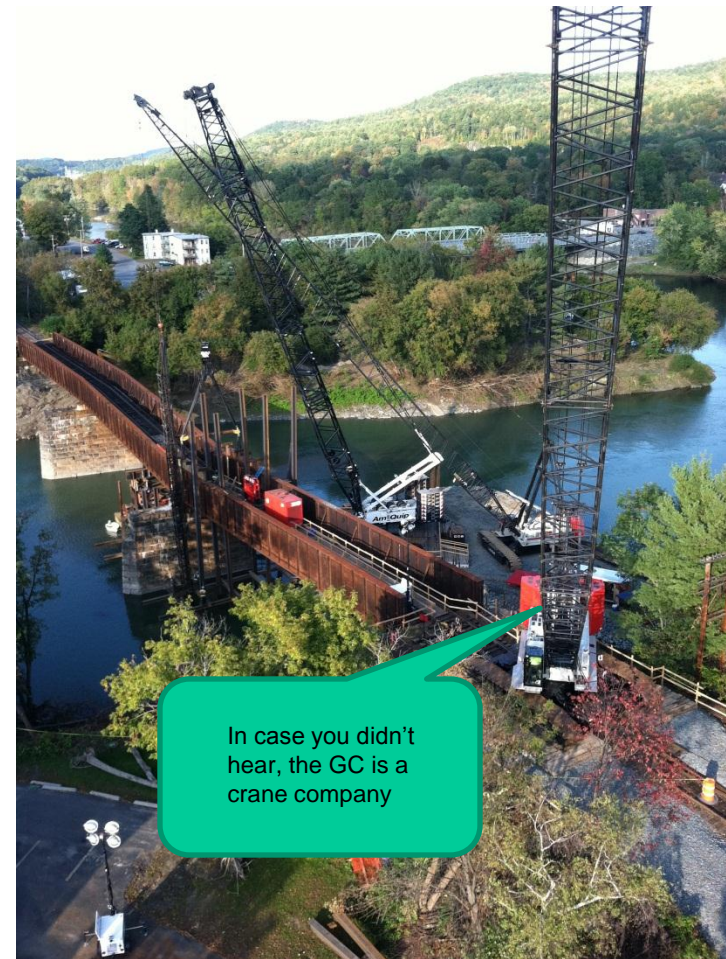
Temporary Stabilization



Splice Beams With Strongback

- Implementation: e.g. calling suppliers and working with available materials.

Temporary Stabilization / Begin Shoring and Retrofit



Backfill Scour Holes with Stone

ACCESS FOR WORK!!!!!!!!!!!!!!

Hold the Bridge for Pile Driving

Test Boring to Refine Shoring Design

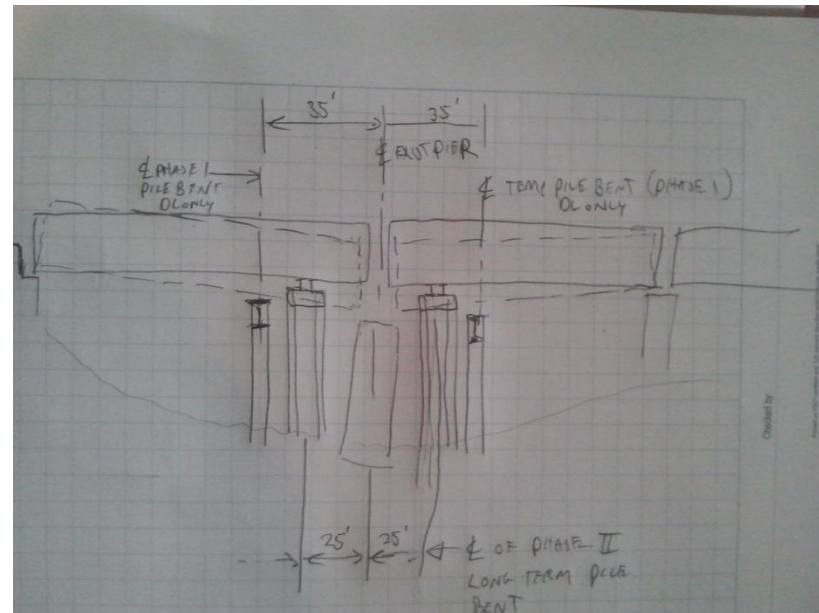
Shoring and Retrofit

Shoring Towers

- Must accommodate current and restored position
- Adjust design to avoid obstructions

Shored Bridge to Cantilever Over Damaged Pier

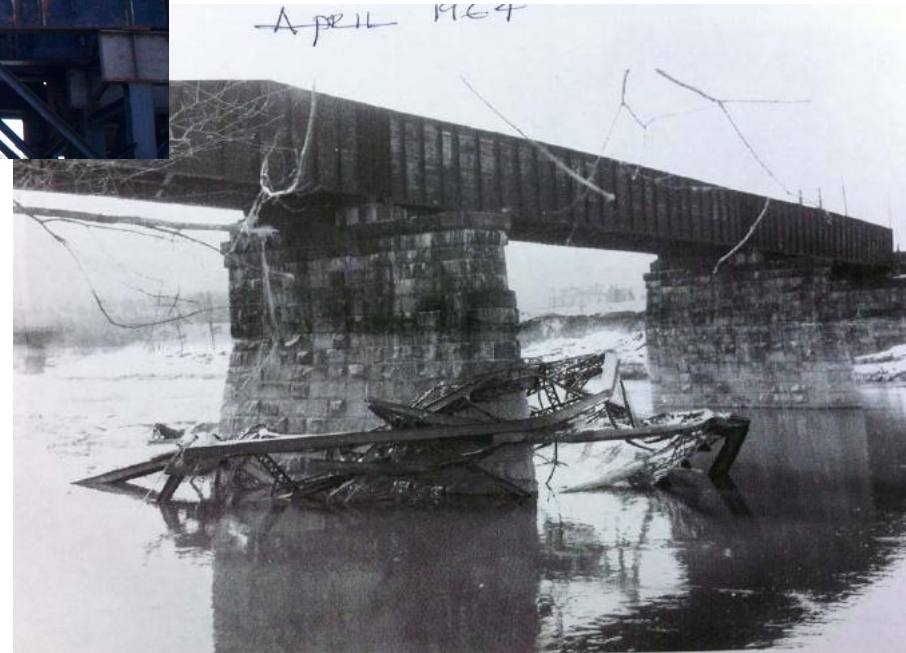
- Hinged Cantilever
- New Floor Beams



Shoring and Retrofit



- Must accommodate current and restored position



- Adjust design to avoid obstructions

Shoring and Retrofit



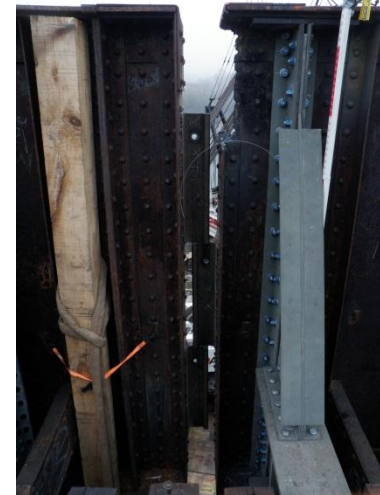
Shored Bridge to Cantilever Over Damaged Pier



Hinged Cantilever Trains Running 42 Days After Response



New Floor Beams – Easy Design, Tight Fab. Schedule (9/17-9/26) Required Increased coordination



Final Design / Permitting



Due to massive footprint of access and risk due to ice, the decision was made to proceed with replacement vs. pull out for winter



Final Design / Permitting



Precast Sandwich Beam Pier Cap (40 ton) – many details to coordinate

