



Minnesota Action Plans

Minnesota Department of
Transportation

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Action Plans Written For:

- O – Stable Action Required
 - Bridge stable for computed scour.
 - History of erosion or scour that needs to be checked or has been repaired.
 - Potential for lateral migration or bed lowering.
 - Action Plan recommended to insure “required action” is preformed.
- P – Stable Due to Protection
 - Protection has been installed due to observed or computed scour.
 - Action plan recommended to monitor protection effectiveness.

Action Plans Written For:

R – Critical Monitor

- Bridge is scour critical according to scour computations or observed scour.
- Action Plan required.

U – Critical Protection Required

- Bridge is scour critical according to scour computations or observed scour.
- Plans to install protection are in the works.
- Action Plan required.
- Monitoring required until protection installation is completed.

What's in an Action Plan?

- ✓ Bridge Location
- ✓ Scour Code
- ✓ Signatures
- ✓ History (optional)
- ✓ Recommended Action
 - Monitoring Plan
 - Bridge Closure Plan
 - Countermeasure Plan

Monitoring Plan

- Start
- Frequency
- Procedure
- Action
- Foundation and Critical Scour Elevations
- Traffic Control Needs
- Notification

Monitoring Sign

Bridge 6502 TH 32 over South Branch Wild Rice River



Monitoring

- ☞ Monitoring by District personnel
 - Regular Inspections
 - Flood Monitoring
 - Local Staff and Equipment
- ☞ Monitoring by Bridge Hydraulics staff
 - Boat – river surveys
- ☞ USGS contract
- ☞ Make contacts and make sure Action Plans are being used by District Bridge Inspectors.

Measurement Options



District 7 Bridge Inspection Equipment



Fixed Monitoring Equipment Experiences



Boat Surveys

- Boat with dual 50 HP motors
- Fathometer
- GPS
- Laptop
- ADCP (Acoustic Doppler)
- Boat Safety Equipment and Training



Bridge Closure Plan

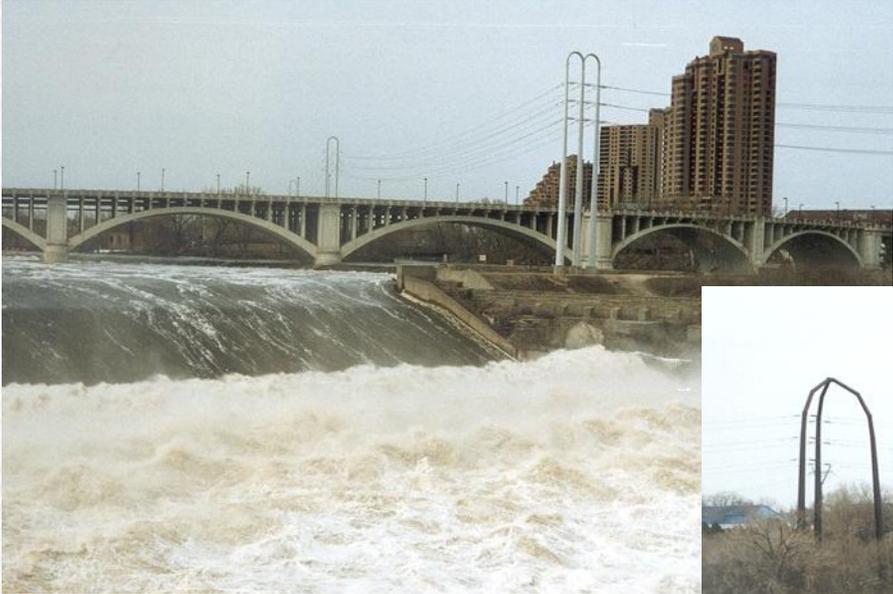
- Action
- Notification
- Detour Route

Countermeasure Plan

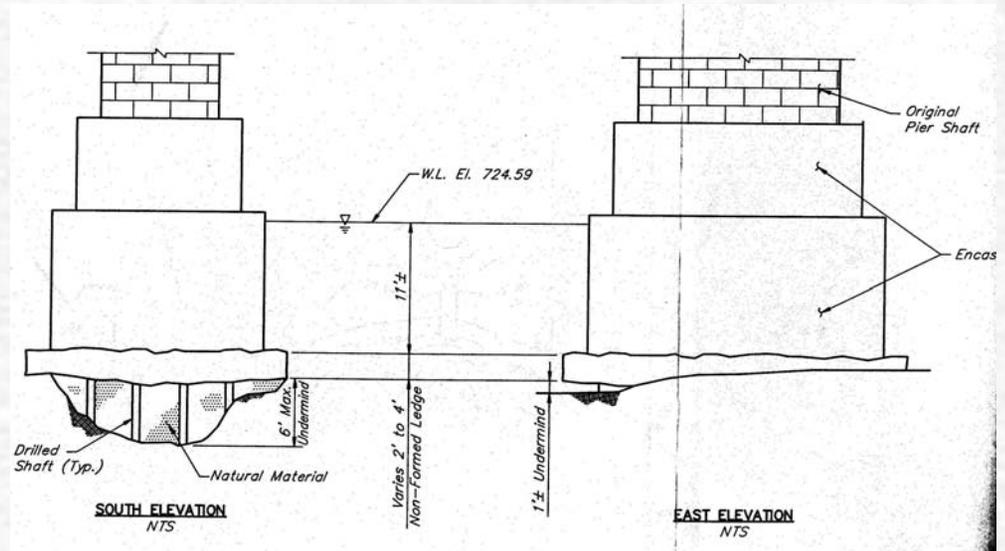
Countermeasures Installed

- Stone Arch Bridge Riprap Installation
- Cable Concrete Installation

Historic Stone Arch Bridge



Piers Undermined Protection Required



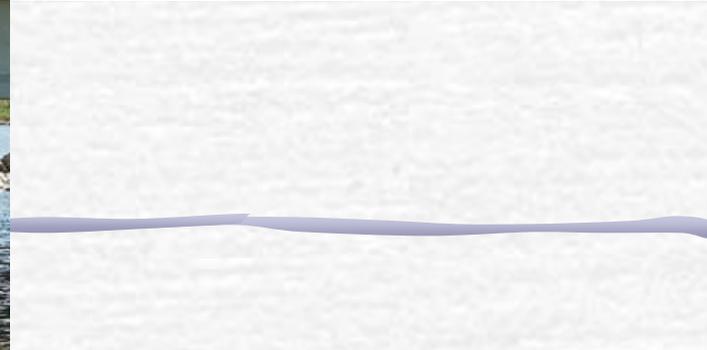
Stone Arch Riprap Installation



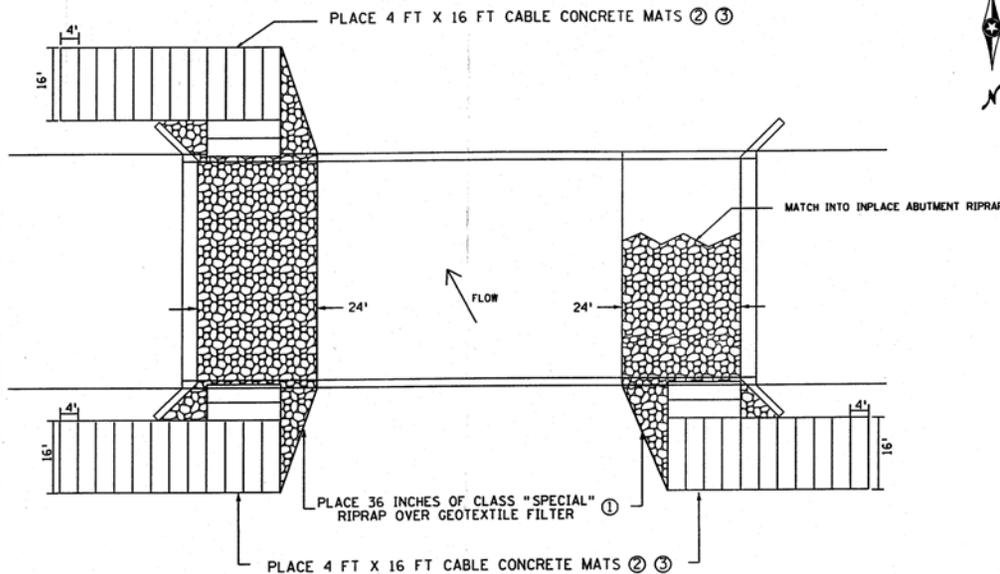
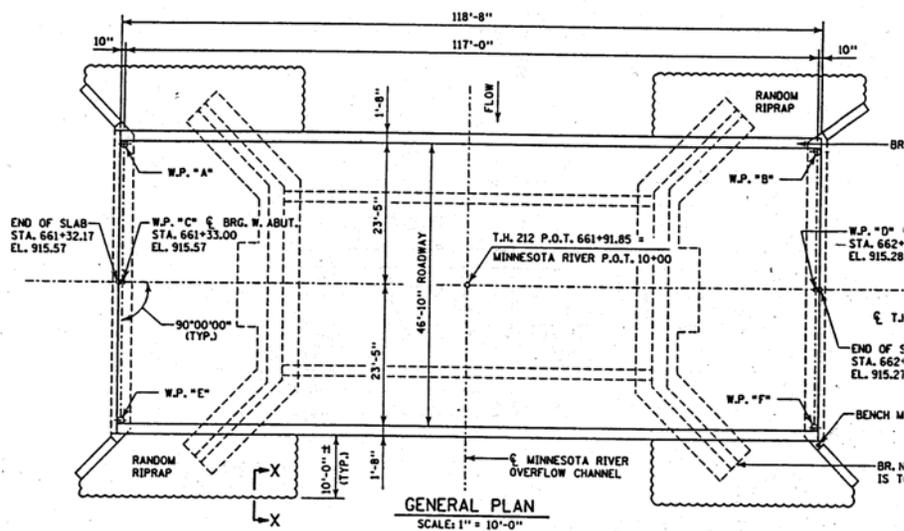
Bridge 87015

TH 212 over Minnesota River

Overflow Abutment Fill and Approach Panel Lost



Bridge 87015 Protection Design



Bridge 87015 Protection Installation



Action Plan Update

- ☞ Periodically review each Action Plan.
- ☞ Update based on new information.
 - Revise Codes
 - Revise Actions
- ☞ Make contacts and make sure Action Plans are being used by District Bridge Inspectors.

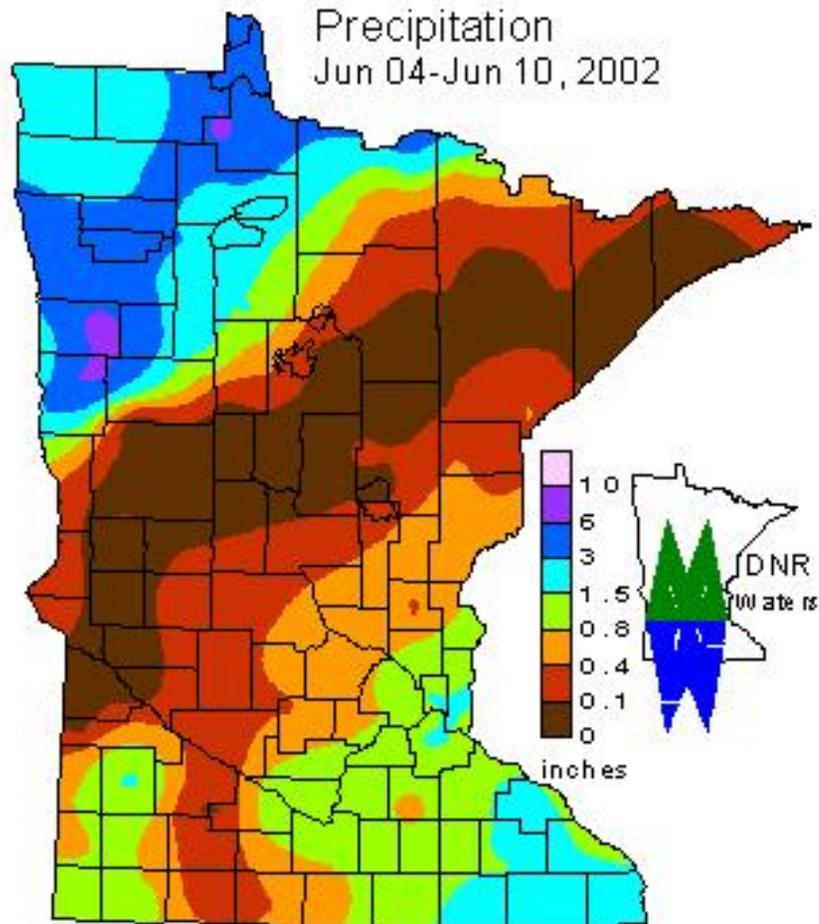
Action Plans in Action

Wild Rice River 2002 Floods

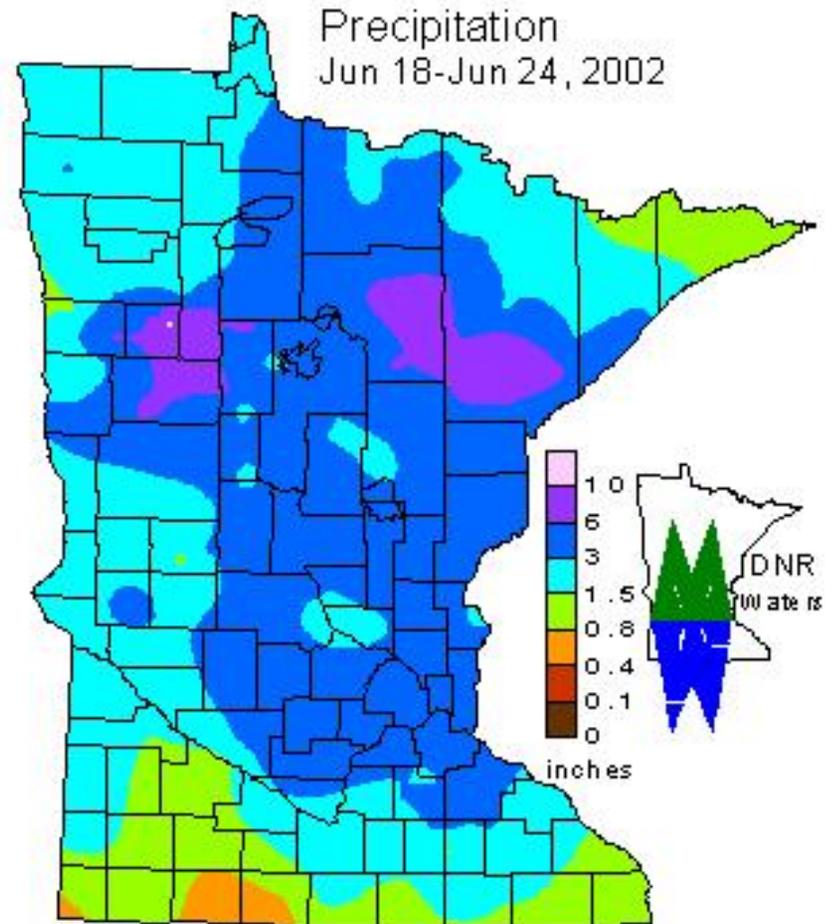
- ☞ Rainfall
- ☞ Watershed Flooding
- ☞ Culvert
- ☞ Bridges
 - 54001
 - 54002
 - 9019
 - 6477 (SIRCOS)

2002 Rainfall Maps

June 9-10 and June 22



State Climatology Office, 06-10-2002

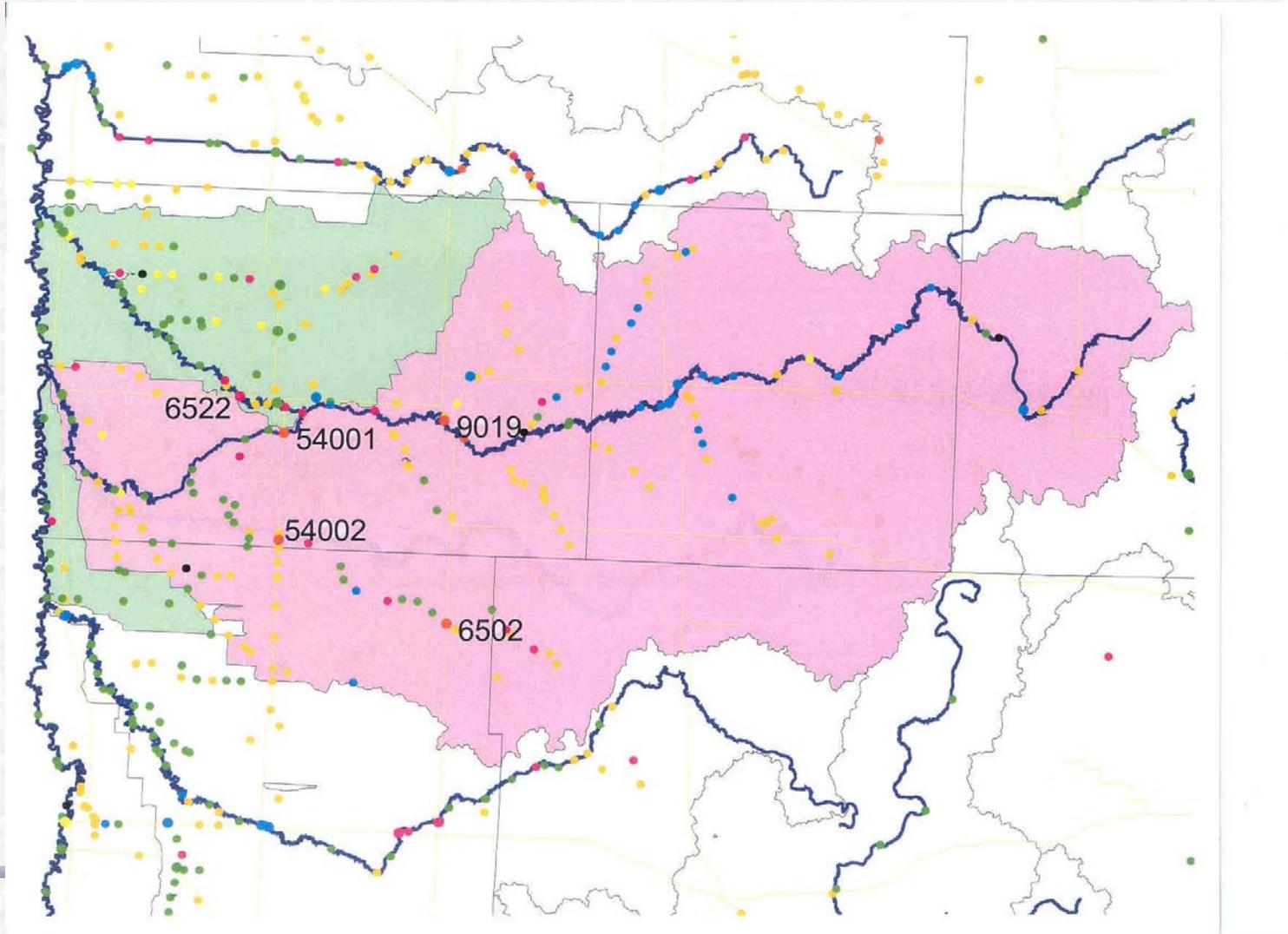


State Climatology Office, 06-24-2002

General Flooding



Wild Rice River Bridges and Culverts





Culvert East of Ada



Bridge 54001

TH 9 Over Wild Rice River





Bridge 54001





Bridge 54002

TH 9 over South
Branch Wild Rice River





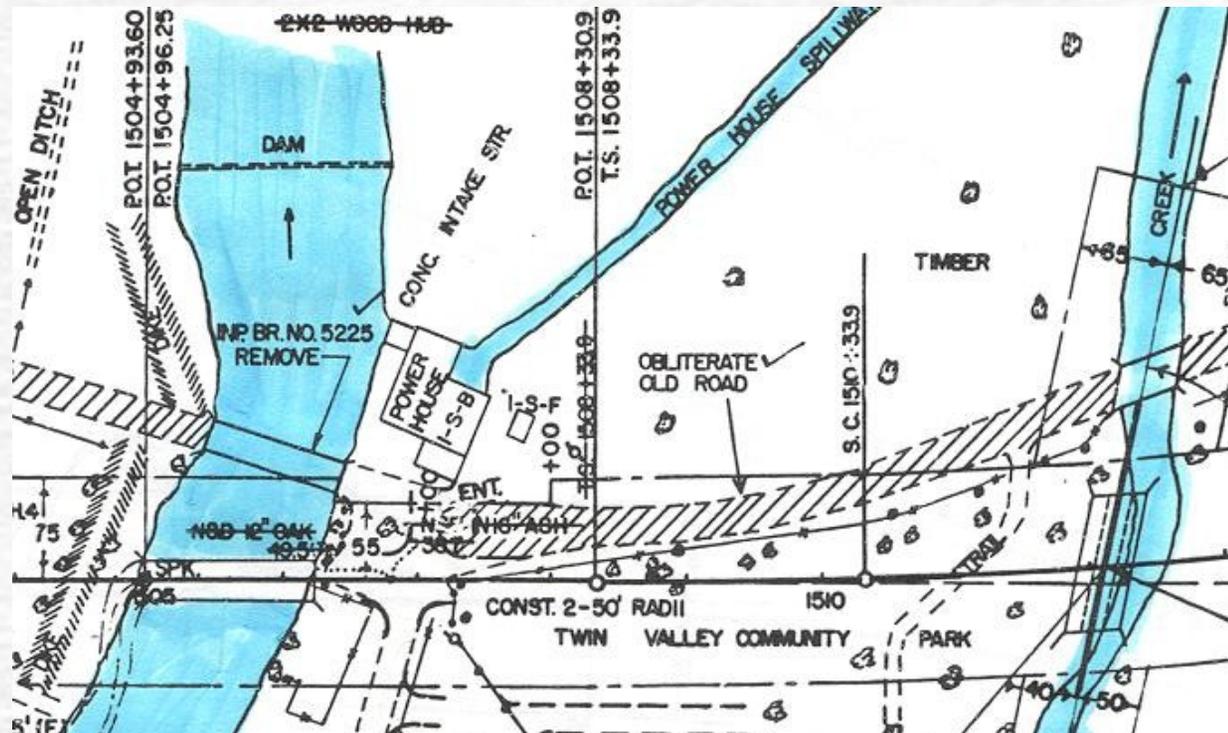
Bridge 54002



Bridge 9019

TH 32 over Wild Rice River

- Built 1956
- 2 Span Bridge
- Riprap added before, during and after flood event.
- Long term plan ???

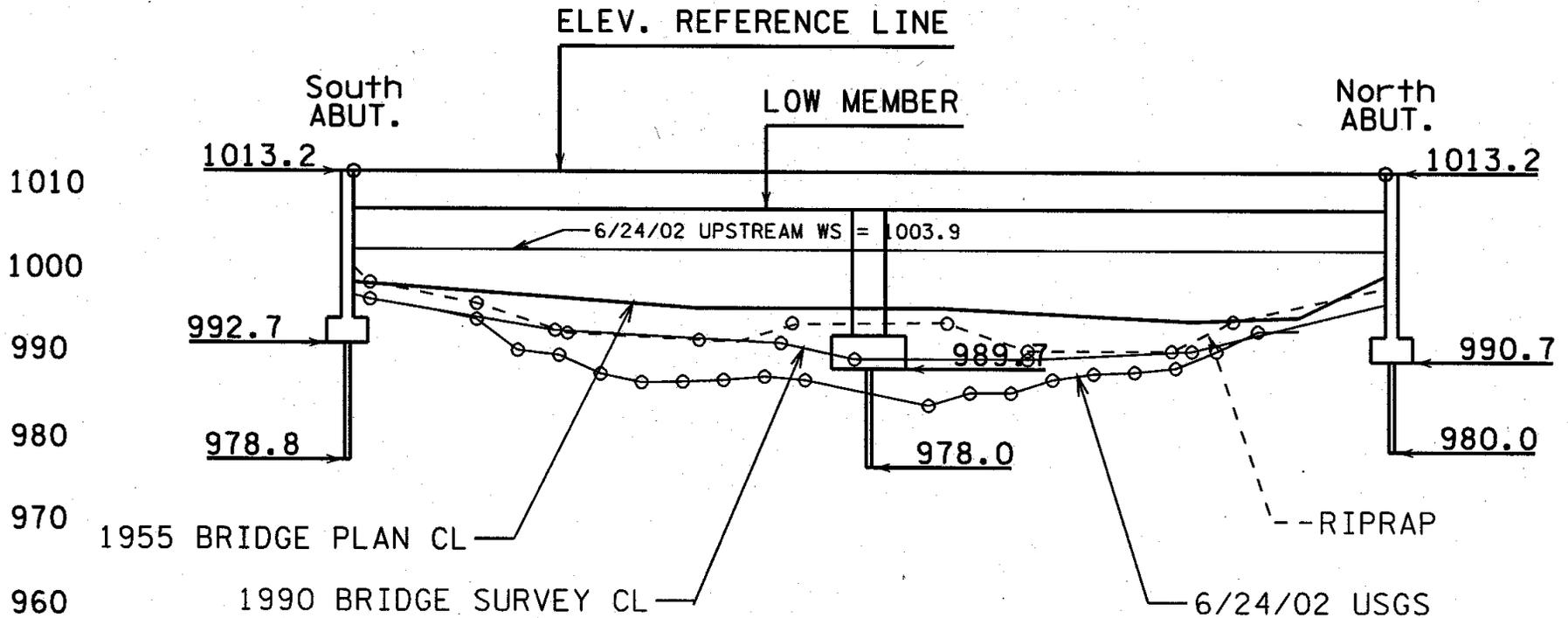


Bridge 9019 Channel Rerouted



Bridge 9019

Measured Cross-section



Bridge 9019

during June 2002
flood



Bridge 9019 Protection Installed



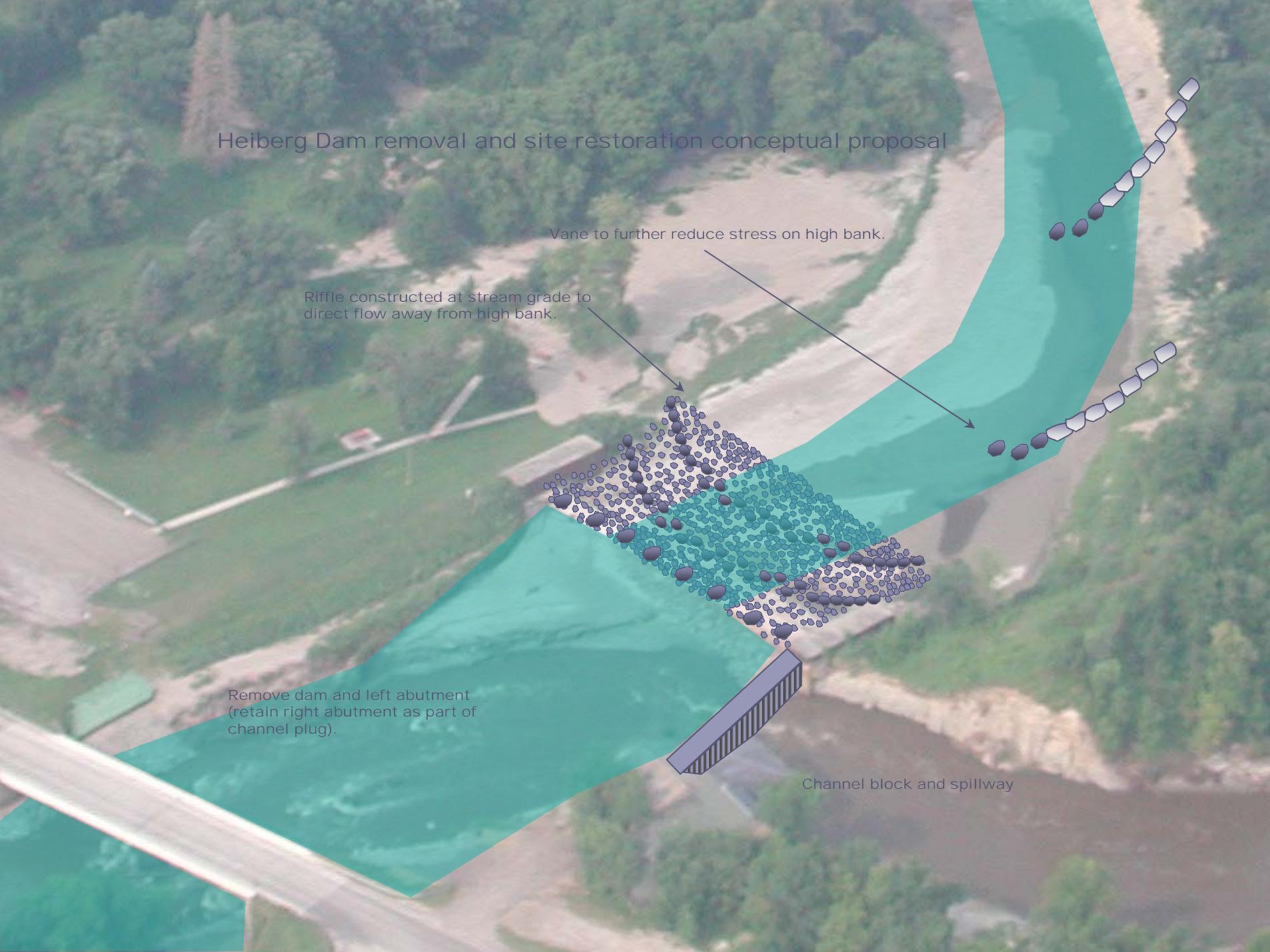
Heiberg Dam removal and site restoration conceptual proposal

Vane to further reduce stress on high bank.

Riffle constructed at stream grade to direct flow away from high bank.

Remove dam and left abutment (retain right abutment as part of channel plug).

Channel block and spillway



Bridge 9019 Downstream Heilberg Dam



Bridge 6477

TH 75 over Wild Rice River

Flood 4/18/1997 Backwater of Red River

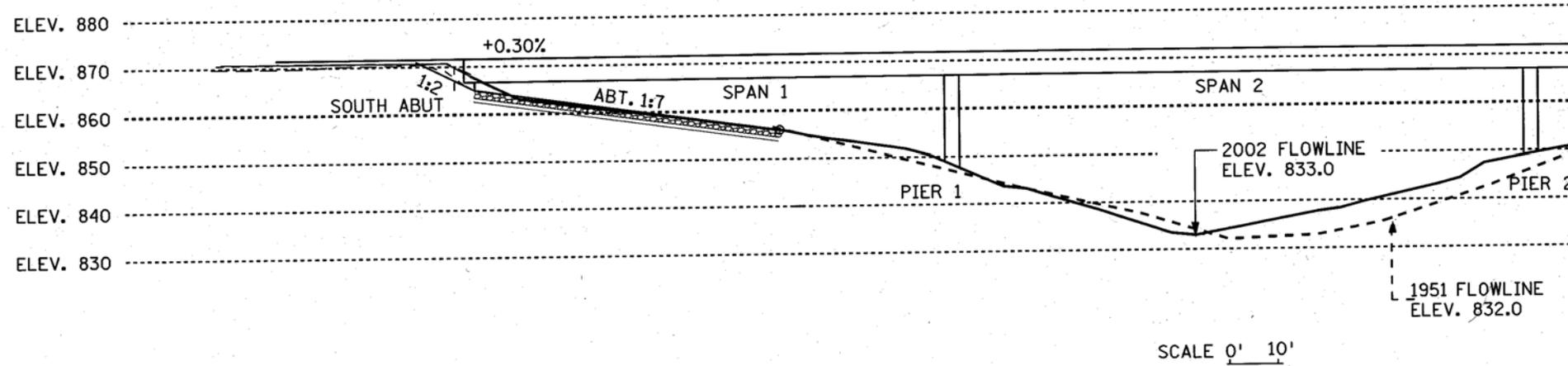


Bridge 6477

Flood 6/2002 over 500-year event

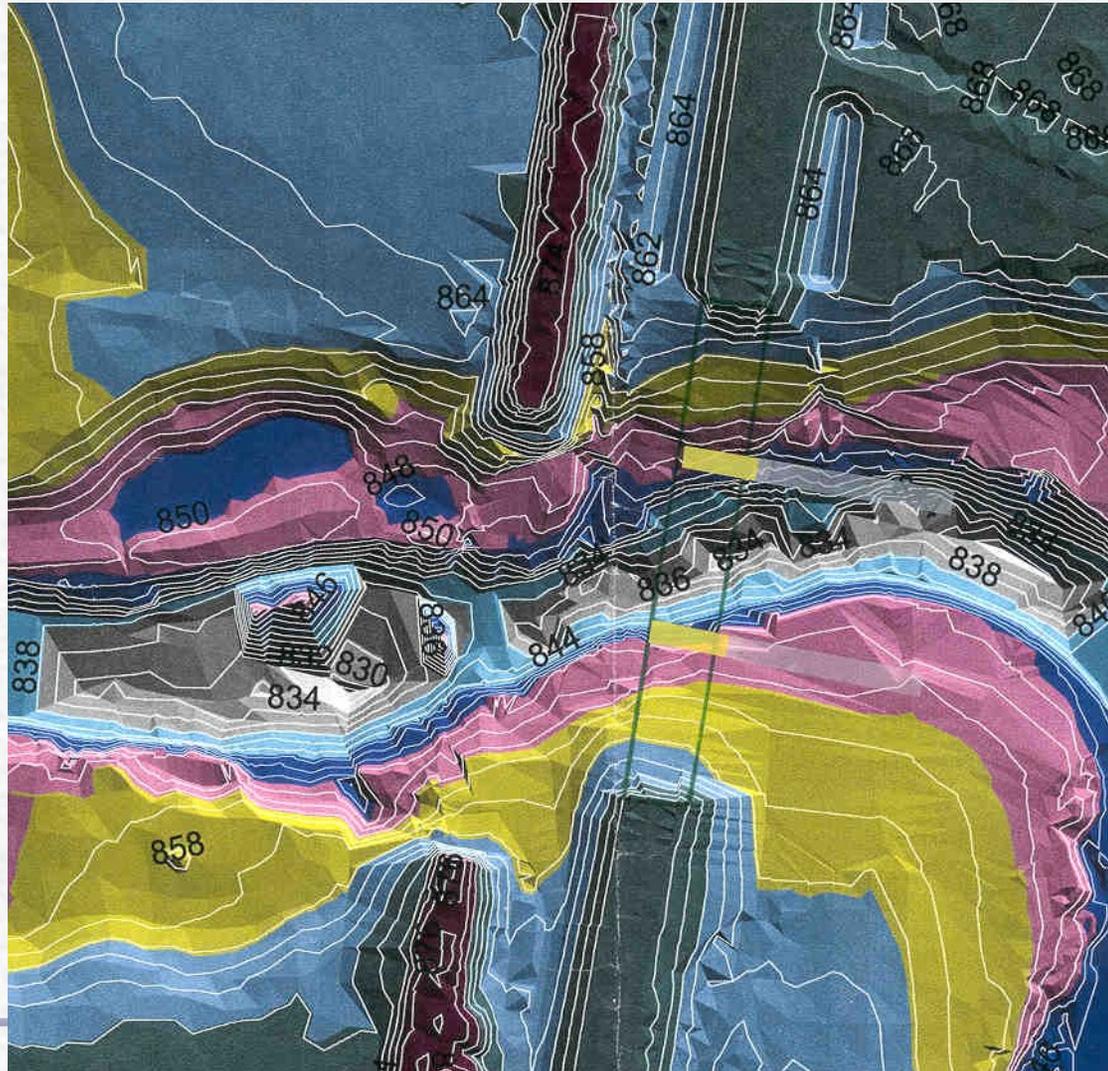


Bridge 6477 Measurements



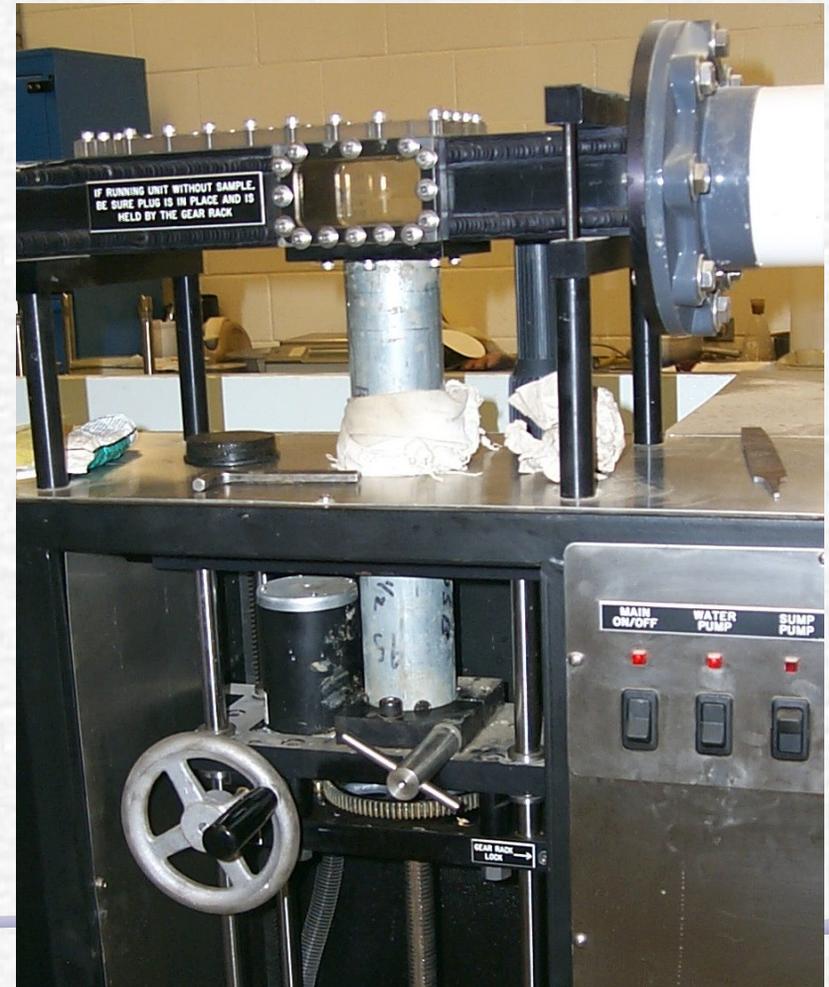
Bridge 6477

River Sounding Plot



SIRCOS

Scour Rate In Cohesive Soils



The image features a light blue background with a fine, woven texture. At the top and bottom, there are decorative horizontal bands of wavy, dark blue lines. The text "Thank you" is centered in the middle of the page in a dark purple, serif font.

Thank you