



Design Problem No. 4

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Midwest Roadside Safety Facility

Design Problem No. 4

- TH 4 criteria
 - Rural 2-lane undivided highway
 - 12' lanes
 - 10' shoulders (2' bit., 8' aggr.)
 - ADT = 2,100
 - Design speed = 60 mph
 - Posted speed = 55 mph

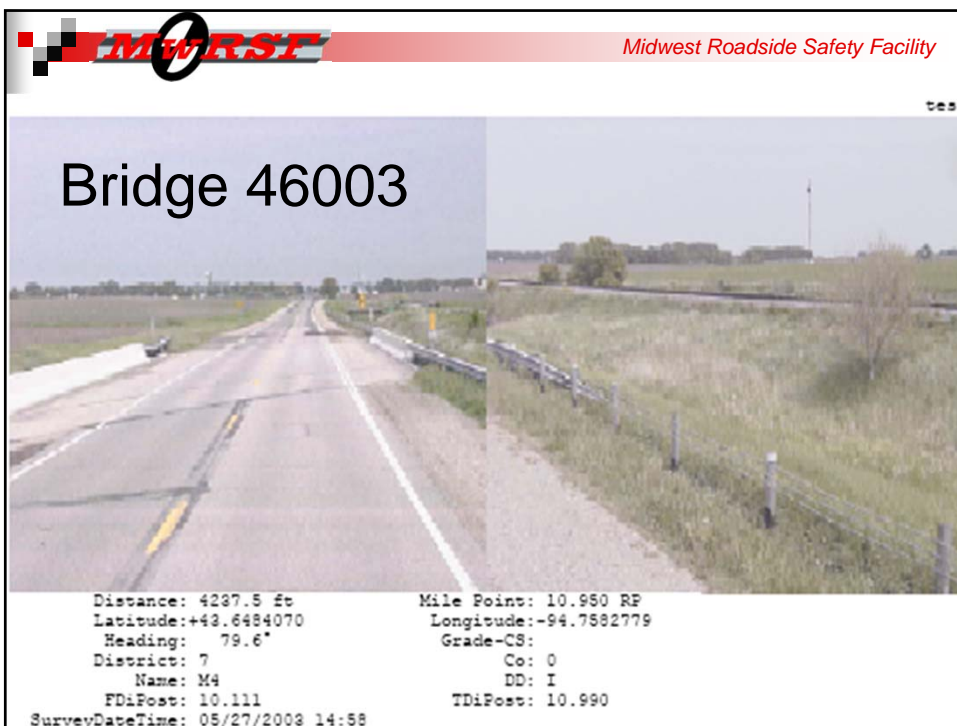


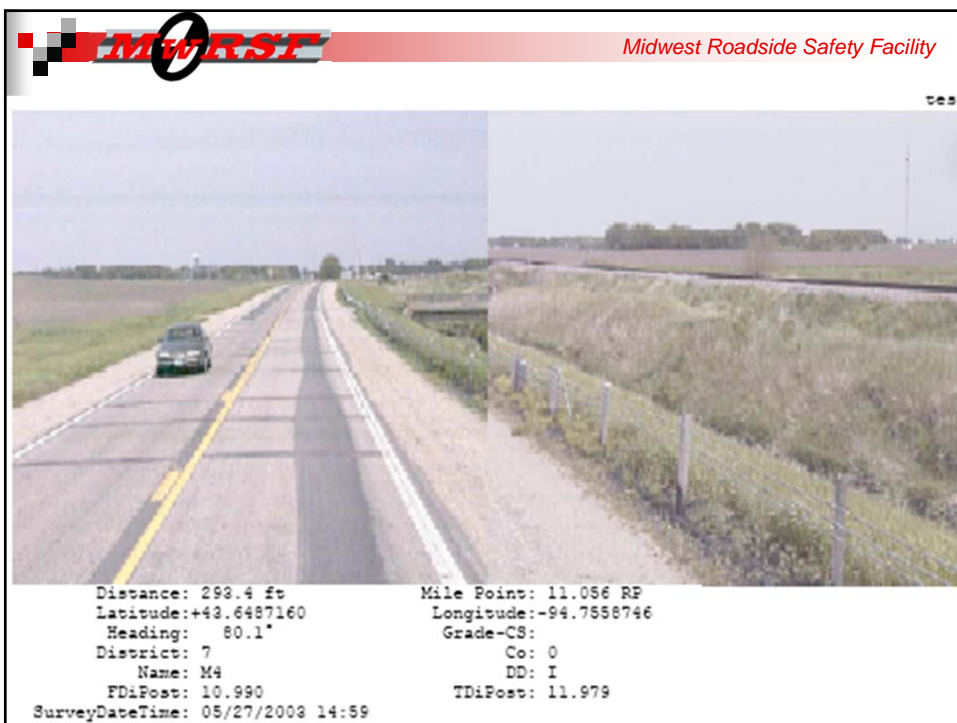
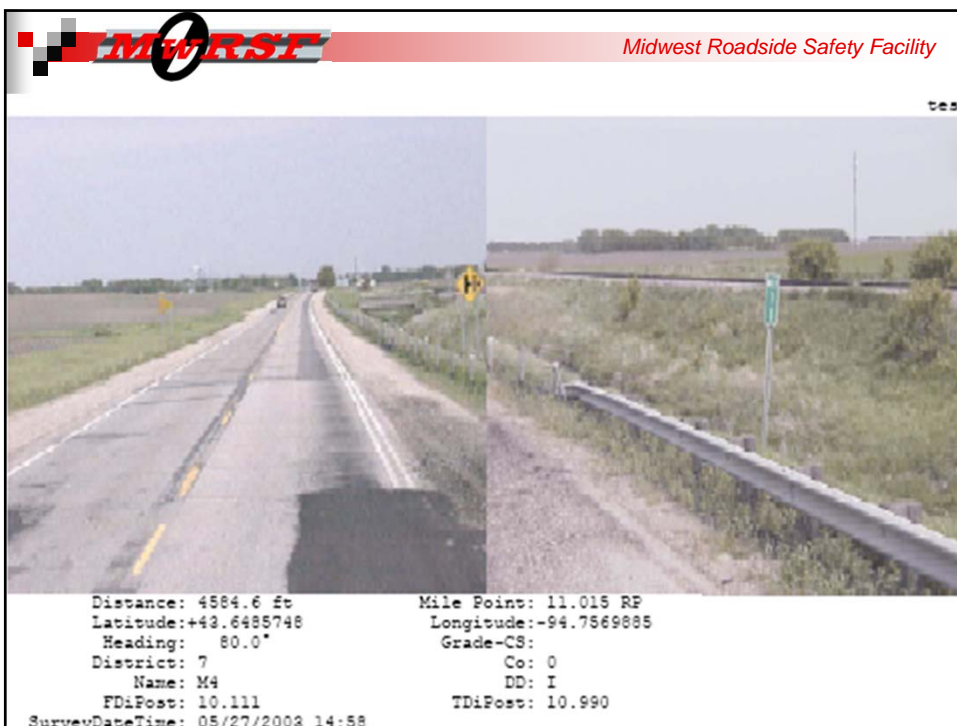
Design Problem No. 4 (Continued)

- Resurfacing scheduled for 2005
 - 3" mill & 3" overlay
- Guardrail upgrades
 - West of bridge 46003 are straightforward
 - Between bridges 46003 and 932 are less clear



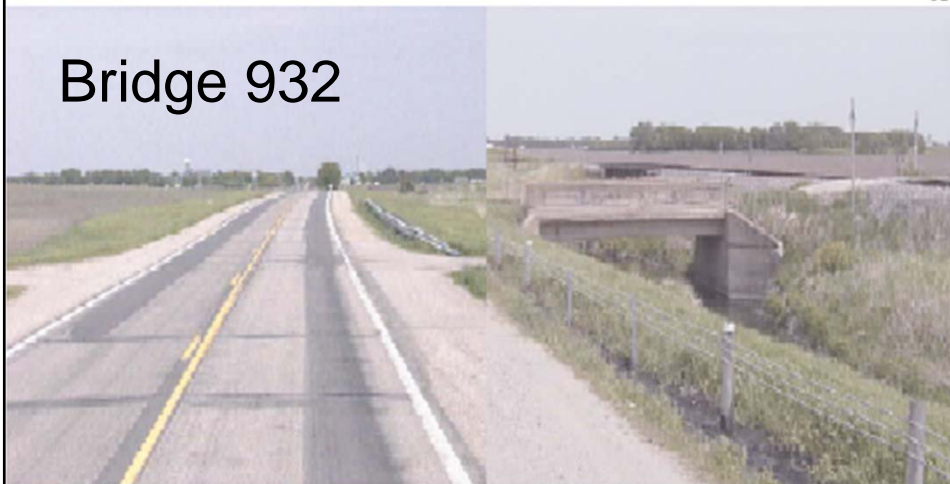
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Latitude: +43.6483803	Longitude: -94.7584696
Heading: 79.3°	Grade-CS:
District: 7	Co: 0
Name: M4	DD: I
FDiPost: 10.111	TDiPost: 10.990
SurveyDateTime: 05/27/2003 14:58	







Bridge 932



Distance: 541.7 ft	Mile Point: 11.103 RP
Latitude: +43.6488342	Longitude: -94.7549515
Heading: 79.5°	Grade-CS:
District: 7	Co: 0
Name: M4	DD: I
FDiPost: 10.990	TDiPost: 11.979

SurveyDateTime: 05/27/2003 14:59



Distance: 688.3 ft	Mile Point: 11.130 RP
Latitude: +43.6488991	Longitude: -94.7544098
Heading: 81.1°	Grade-CS:
District: 7	Co: 0
Name: M4	DD: I
FDiPost: 10.990	TDiPost: 11.979

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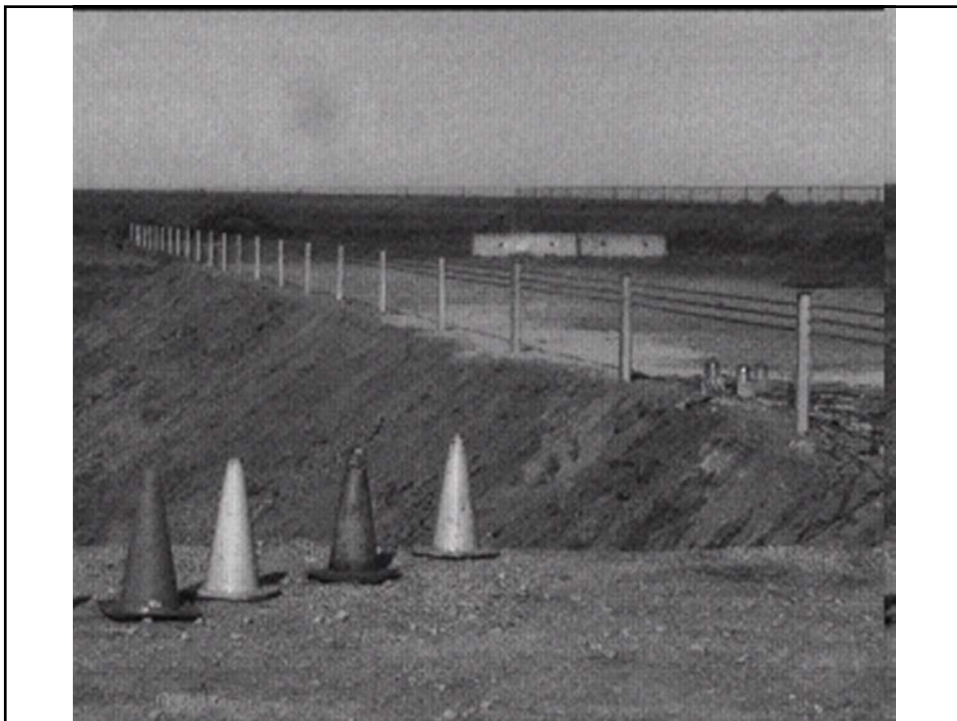


Design Problem No. 4 (Continued)

- Existing guardrail
 - 3-cable guardrail
 - Protects deep ditch adjacent to highway
 - 2:1 slope
- What type of guardrail would work best between bridges 46003 and 932?

3-Cable Guardrail on 1.5:1 Slope







Computer Simulation Results

- Reduced post spacing to 4'
 - Increased lateral stiffness
 - Reduced lateral barrier deflections
- Increased barrier offset to 4' from breakpoint
 - Limited vehicle penetration on slope
 - Reduced vehicle c.g. drop



Design Problem No. 4 Conclusions

- Cable guardrail not acceptable within 1' of 1.5:1 slope
- For steep slopes use 4' post spacing and install barrier at least 3' from slope breakpoint
- Rounding slope breakpoint will improve barrier performance