

# Transportation Commission

## Bridge Scour Design Considerations

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# Scour

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- **Engineering term for the erosion of soil at bridges due to flowing water.**
  - **Most common cause of bridge failure.**
  - **Consists of degradation, contraction scour, and local scour at abutments and piers**
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# Schoharie Creek Bridge

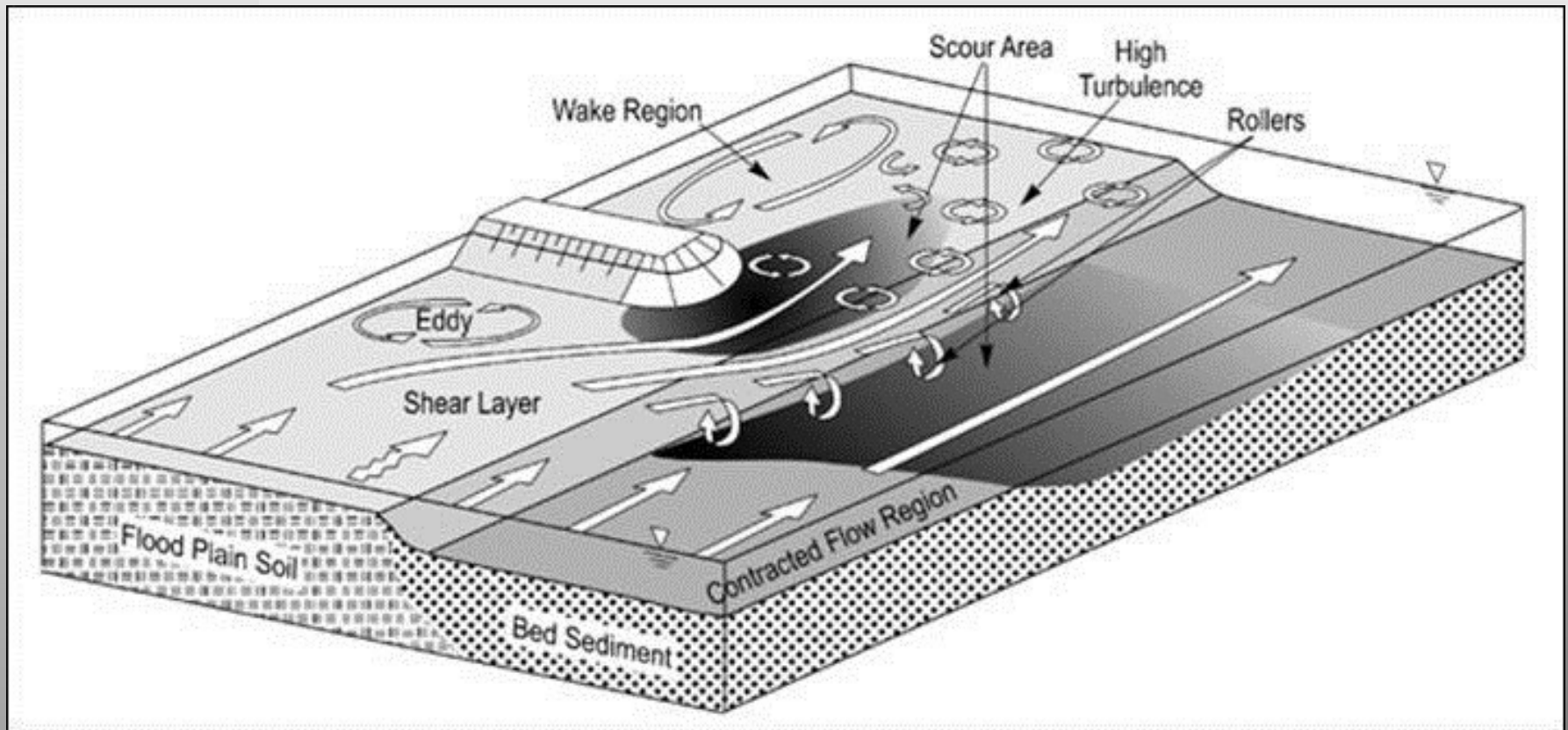
- **Collapsed April 5, 1987 due to bridge scour killing ten people.**
- **Prompted improvement in bridge design.**



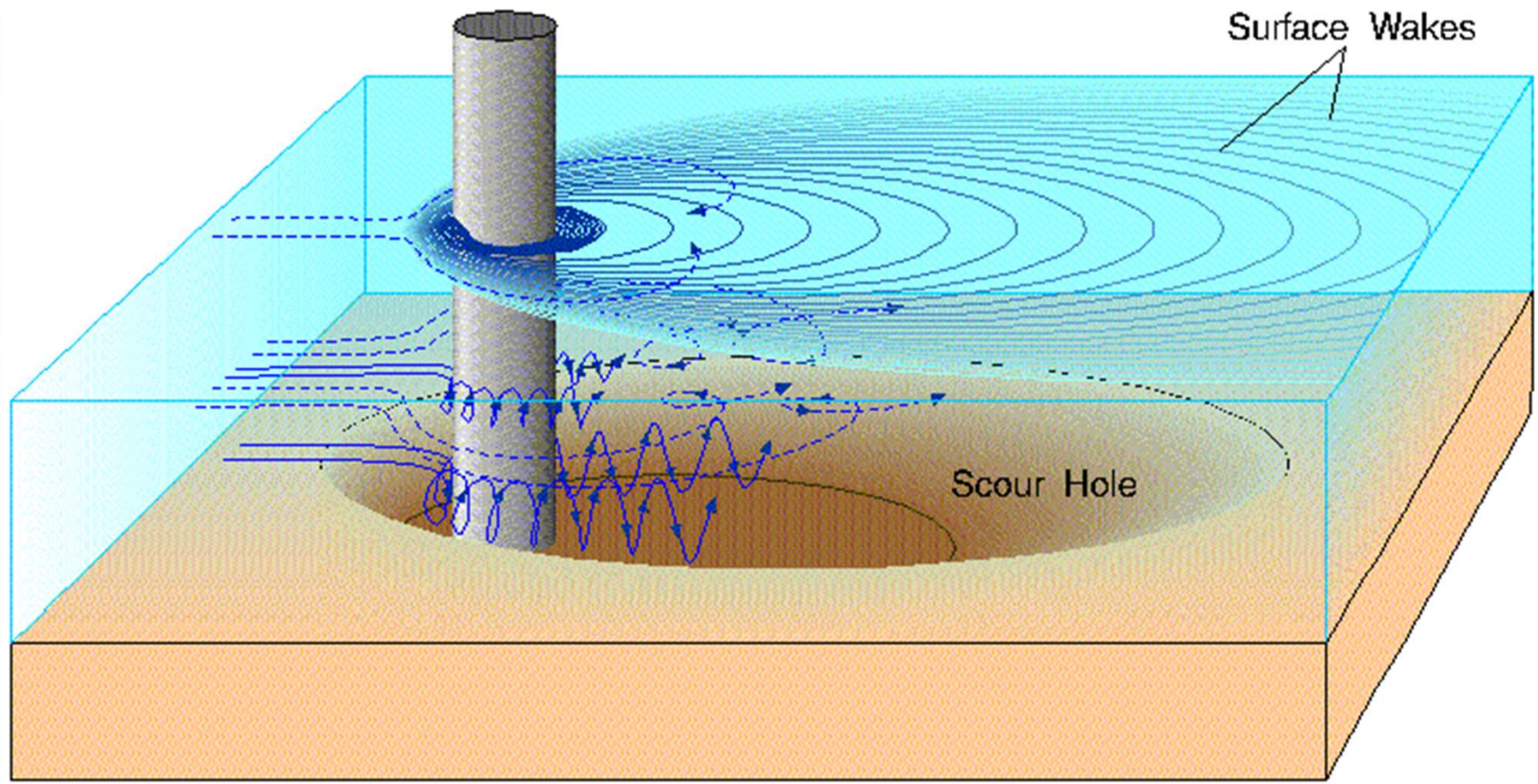
# I-29 over The Big Sioux River



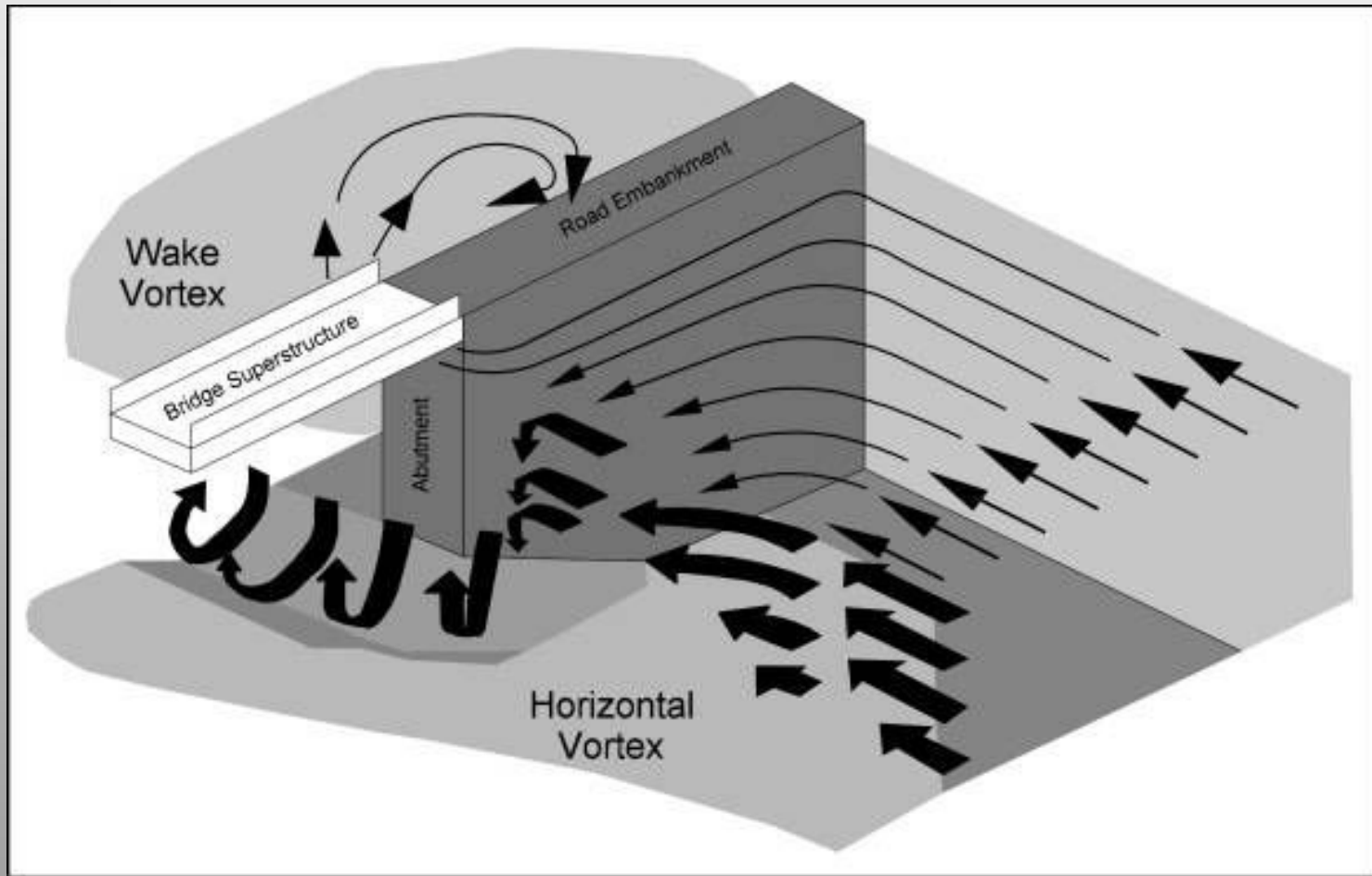
# Contraction Scour



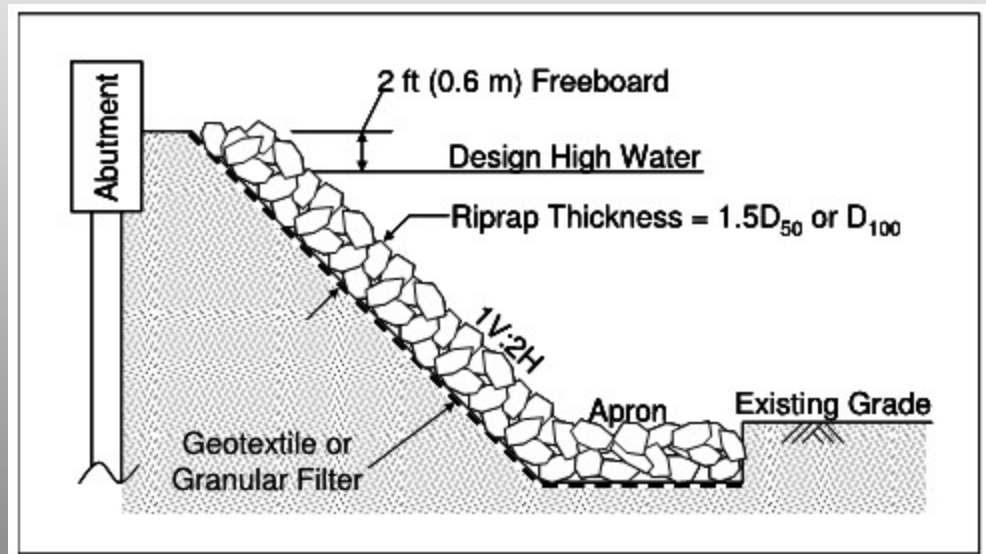
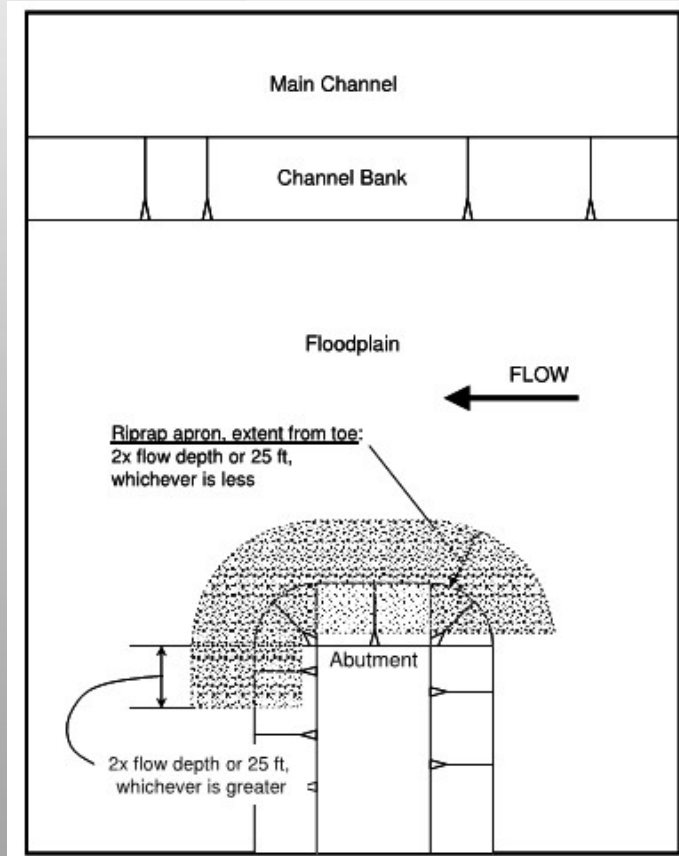
# Local Pier Scour



# Local Abutment Scour



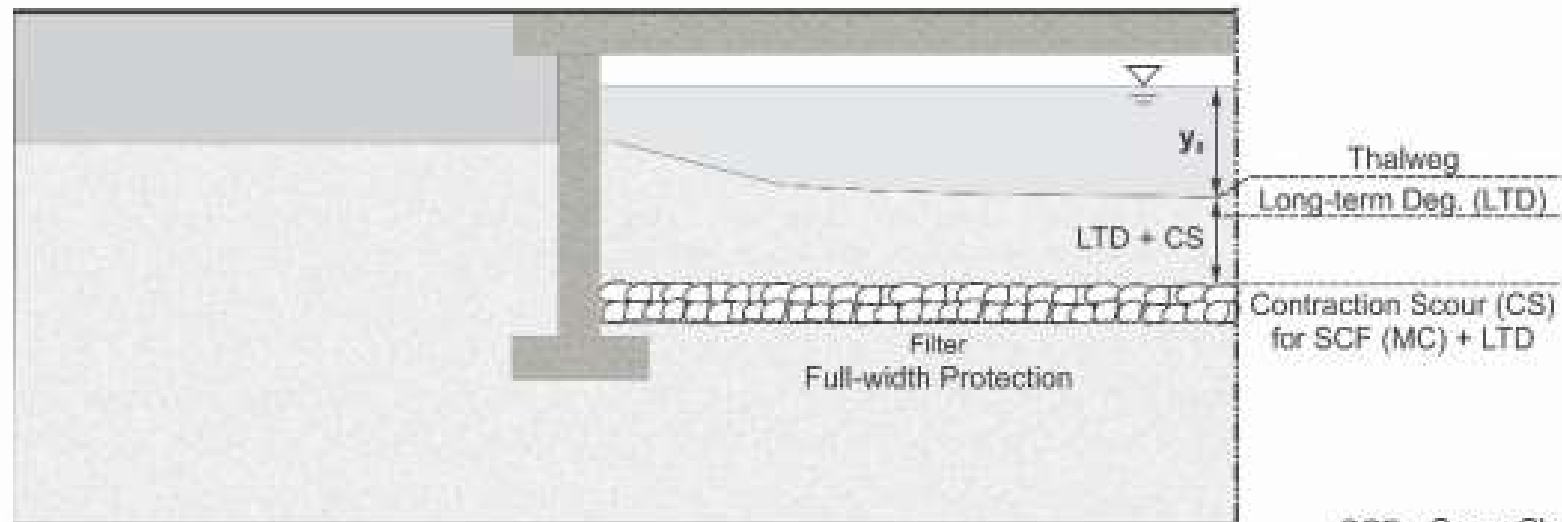
# Current Abutment Scour Protection Recommendations





# Revised Abutment Protection Recommendations

- **Countersink apron below long-term degradation plus contraction scour**



A-A Cross Section

SCF = Scour Check Flood  
LTD = Long Term Deg.  
 $y_0$  = Flow depth in the  
bridge opening in MC  
MC = Main Channel

# Possible Implications to the South Dakota Bridge Network

- **Some structures no impact**
- **Increased depth of countermeasures**
- **Increased structure length**
- **Increased substructure depth**

Questions?

**Thank You**