Q500 Scour Policy

Crystal Weaver
Hydraulics Manager, INDOT

March 11, 2014
Agenda

- Background
- Previous standards
- Determination methods
Background

- Released in Feb. 2014 as Design Memo 14-02.
- Adds to IDM Ch 202-3.03.
- Adds additional guidance for determining Q500 for scour.
Previous Standards

- Formerly, Q500 estimated by multiplying Q100 by 1.7.
- Very conservative for Indiana.
- Increases foundation costs.
Determination Methods

- Discharge from FEMA Flood Insurance Study.
  - Should take precedence.
Determination Methods

- **Derived from coordinated discharge.**
  - Use Coordinated Discharge to find 10%, 4%, 2% and 1% EP for a drainage area.
  - Plot on a semi-log graph, with discharge on y-axis and inverse of return interval on x-axis.
  - Fit a straight line between the points, and use the equation to find a value at 0.002 (0.2%).
Determination Methods

\[ y = -434.2 \ln(x) + 701 \]
Determination Methods

- Use a multiplier of the 1% Annual EP.
  - Varies by region, based on watersheds.
  - Available as a printed map and a GIS shape file.
  - Ranges from 1.3 to 1.4 across state.
Determination Methods
Conclusion

- IDM Ch 202-3.03
- Don’t use 1.7 as a multiplier!
- Three options for estimating Q500.
- Seriously, don’t use 1.7 as a multiplier!
Questions?