

WSDOT 2023 Scour Training

5/30/2023 – 6/01/2023

Module 2: Scour Definitions (Luke Assink)

- **Q: Is there a list of possible local scour?**
 - Please refer to HEC-18 for types of local scour.
- **Q: If a lower flow creates the greatest scour, does the lower flow event become the design flow/check?**
 - No, it does not change what would be the scour design flood or scour check flood, please see WSDOT Hydraulics Manual for definitions. However, if a flow lower than the scour design flood or scour check flood results in the greatest scour, the resultant depth/elevation of scour should be used for the scour design flood and scour check flood and the corresponding flow should be noted in the text.
- **Q: On slide 7, Total Scour, LTD was shown measured from the water surface - would it not be from the thalweg?**
 - LTD is measured from the thalweg. Slide 7 is for a crossing where there is potential for lateral migration. Since there is potential for lateral migration, the LTD elevation (measured from the thalweg) is assumed to occur across the entire crossing.
- **Q: "Whichever is greater" refers to magnitude of scour, not discharge, correct? For both design and check flood slides.**
 - No. On slide 4 and 5, "whichever is greater" refers to whichever discharge is greater between the 500-yr flood or the 2080 100-yr projected flood.
- **Q: Is the design and check events a single flow event or all the flows up to that discharge? The definitions seemed to be specific to a certain discharge event whereas when we talk about total scour evaluation, we evaluate across the range of discharge events.**
 - Generally, for both design and check scour you can refer to chapter 2 of HEC 18; it refers to the maximum scour that can occur up to each of those discharge events, not just that flow. So, to clarify, to evaluate the worst-case total scour, it generally will require evaluating multiple flows and computing scour at key thresholds (i.e., an overtopping event, a point where the bridge goes into pressure flow, or other flows that may cause worse scour). Sometimes at higher flows, downstream controls can cause a backwater during and reduce the scour during higher discharge events.
- **Q: We found that adding the local scour in the total scour depth results in a very conservative result. Is it acceptable to only use the maximum local scour in the total scour depth?**
 - All scour components including local scour must be included in the total scour depth. However, local scour is not always additive, this depends on the site conditions. Use engineering judgement to identify where local scour is compounding and reference HEC 18.