

STATE HIGHWAY 340 BRIDGES H-02-GC AND H-02-S OVER THE COLORADO RIVER, COLORADO

Bridges H-02-GC and H-02-S are located in Mesa County on State Highway 340 ML where the highway crosses the Colorado River. Figure 1 shows Bridges H-02-GC and H-02-S over the Colorado River.

Hydrau-Tech, Inc. began the POA study of Bridges H-02-GC and H-02-S by collecting information on the site and structure in question, including hydrologic characteristics of the site, GIS information and original bridge construction plans. Using these parameters, regional regression equations result in a 500-year flood discharge of 83,321 cfs (cubic feet per second). After completing a survey of the reach upstream and downstream of the structure and sediment size analysis, a HEC-RAS hydraulic model was developed. This model was used to estimate the hydraulic conditions during the 500-year flow including: discharge distributions, velocity distributions, and water surface profiles. Figure 2 shows the water surface profile produced by the HEC-RAS hydraulic model. Figure 3 shows the reach geometry plot produced by HEC-RAS.

Using the results from hydraulic modeling, theoretical scour estimates were calculated with FHWA's HEC-18 scour equations. Updated AutoCAD drawings were produced with adjusted datum elevations and theoretical scour lines in order to determine the stability of the structure under the scour conditions created by flooding. Figure 4 shows a completed theoretical scour plot using AutoCAD showing foundation elevations and potential scour.



Figure 1. Bridge H-02-GC and H-02-S over the Colorado River

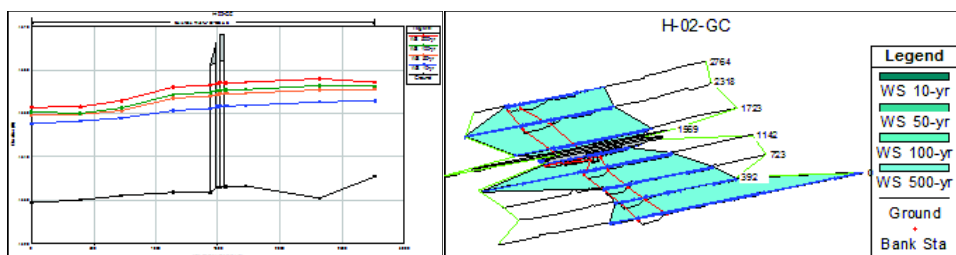


Figure 2 (Left). Water surface profile showing the 10, 50, 100 and 500-year flows
Figure 3 (Right). 3D Plot of the reach around structures H-02-GC and H-02-S

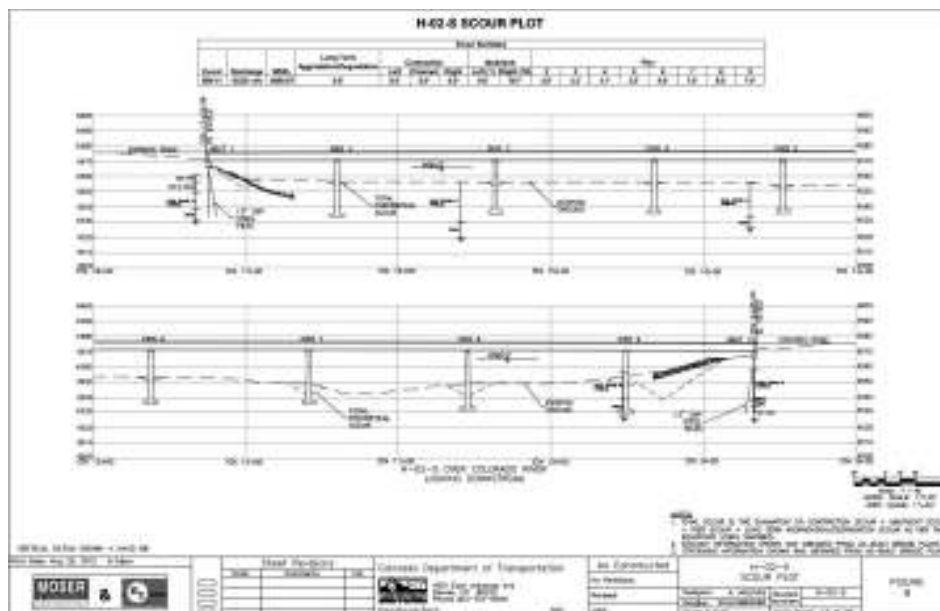


Figure 4. Scour plot generated in AutoCAD showing bridge geometry, foundation elevations, sediment boring hole results and theoretical scour