

Services Provided
*Floodplain Modeling
Services*

Date of Completion
April 2015

Client
BW2 Engineers, Inc.

Project Designer
*Jeff Thomas, PE,
CFM*

Project Manager
*Jeff Thomas, PE,
CFM*

Cottonwood Creek Trail, City of Allen, Texas

AZ&B provided floodplain modeling services for the construction of the Cottonwood Creek Trail in the City of Allen, Texas. AZ&B served as a civil engineering subconsultant to BW2 Engineers, Inc. (BW2). This project consisted of a 0.60-mile long, 10-foot wide concrete multi-use trail running from the existing end of the trail near Llano Drive along the western edge of the Cottonwood Creek floodplain, under U.S. 75 to Allen Station Park. The project also included a proposed prefabricated steel truss bridge over Cottonwood Creek in a FEMA Zone 'AE' (detailed study) floodplain.

AZ&B performed the following tasks for BW2 on this trail project:

- ✓ Obtained the effective FIS HEC-RAS model for Cottonwood Creek from FEMA.
- ✓ Prepared a corrected effective model for Cottonwood Creek at the proposed bridge site. Several topographic errors were noted in the FIS model that affected its accuracy. These were corrected using field topographical survey data and aerial NCTCOG contours.
- ✓ Assembled an existing condition HEC-RAS model with new cross-sections at the proposed bridge site. These cross-sections were a composite of field survey data for the stream channel and aerial topo for the floodplain overbank areas.
- ✓ The proposed bridge was sized iteratively based on spanning the existing floodway at a minimum and ensuring there was no rise in the 100-year WSEL outside of City-owned floodplain property. AZ&B determined a 105-foot long bridge would meet these basic criteria. Additionally, the bridge needed to be elevated above the 100-year WSEL to prevent damage to the structure.
- ✓ To minimize fill in the floodplain, a "perched" bridge was used. This resulted in some loss of valley storage. AZ&B located and generated a rough grading plan for an area of compensatory excavation in the west overbank that ensured no net loss of valley storage for Cottonwood Creek.
- ✓ Prepared a Hydraulic Report for BW2 summarizing our modeling methodology, results and bridge design recommendations.
- ✓ Submitted our report and supporting models to the City for review by their Floodplain Administrator (FPA). Responded to the FPA's concerns and revised the models and report accordingly. Submitted the Floodplain Development Permit to the FPA on behalf of the Parks Department and obtained approval for the project.



