Oak Creek Low Water Crossing Capstone

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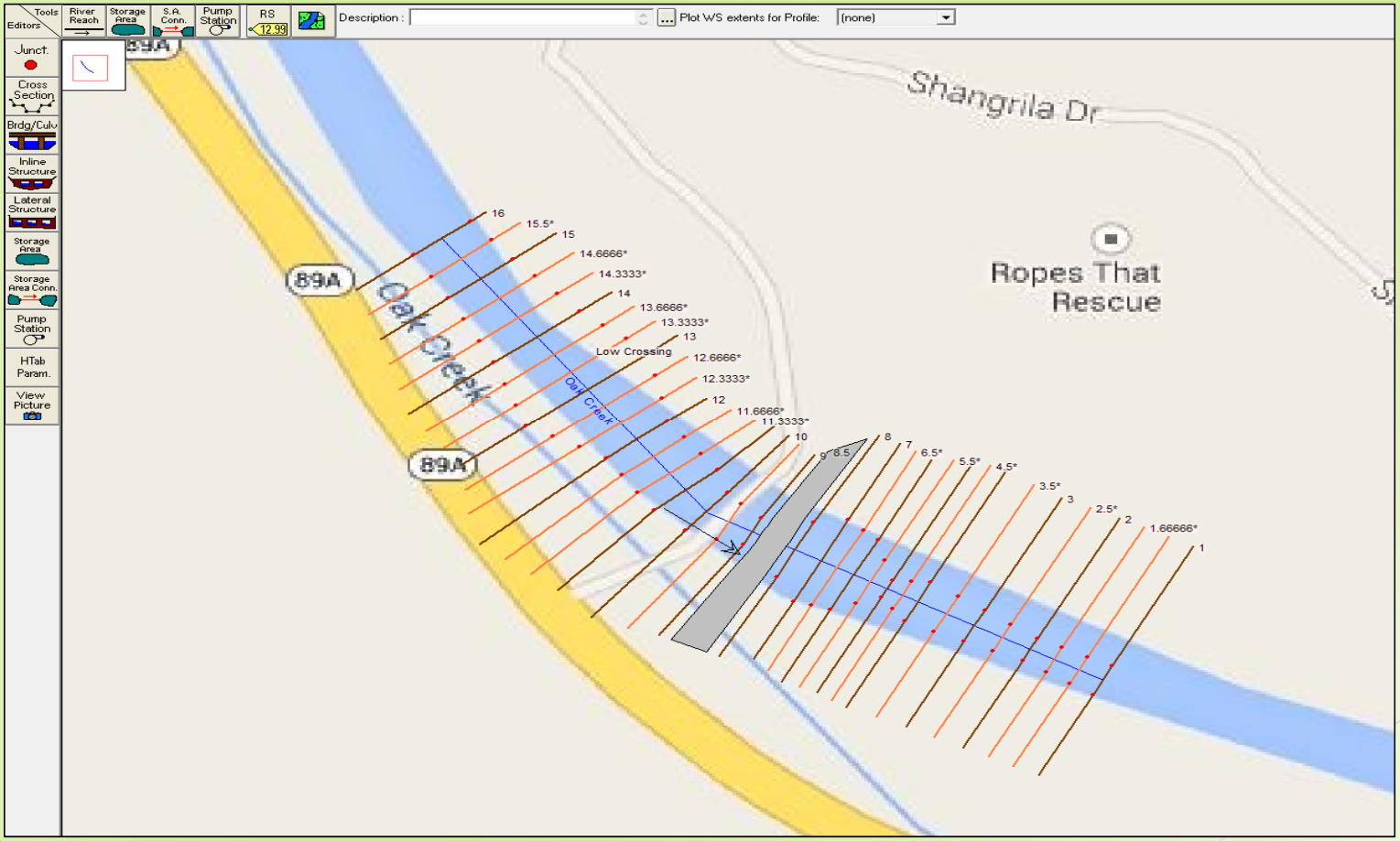
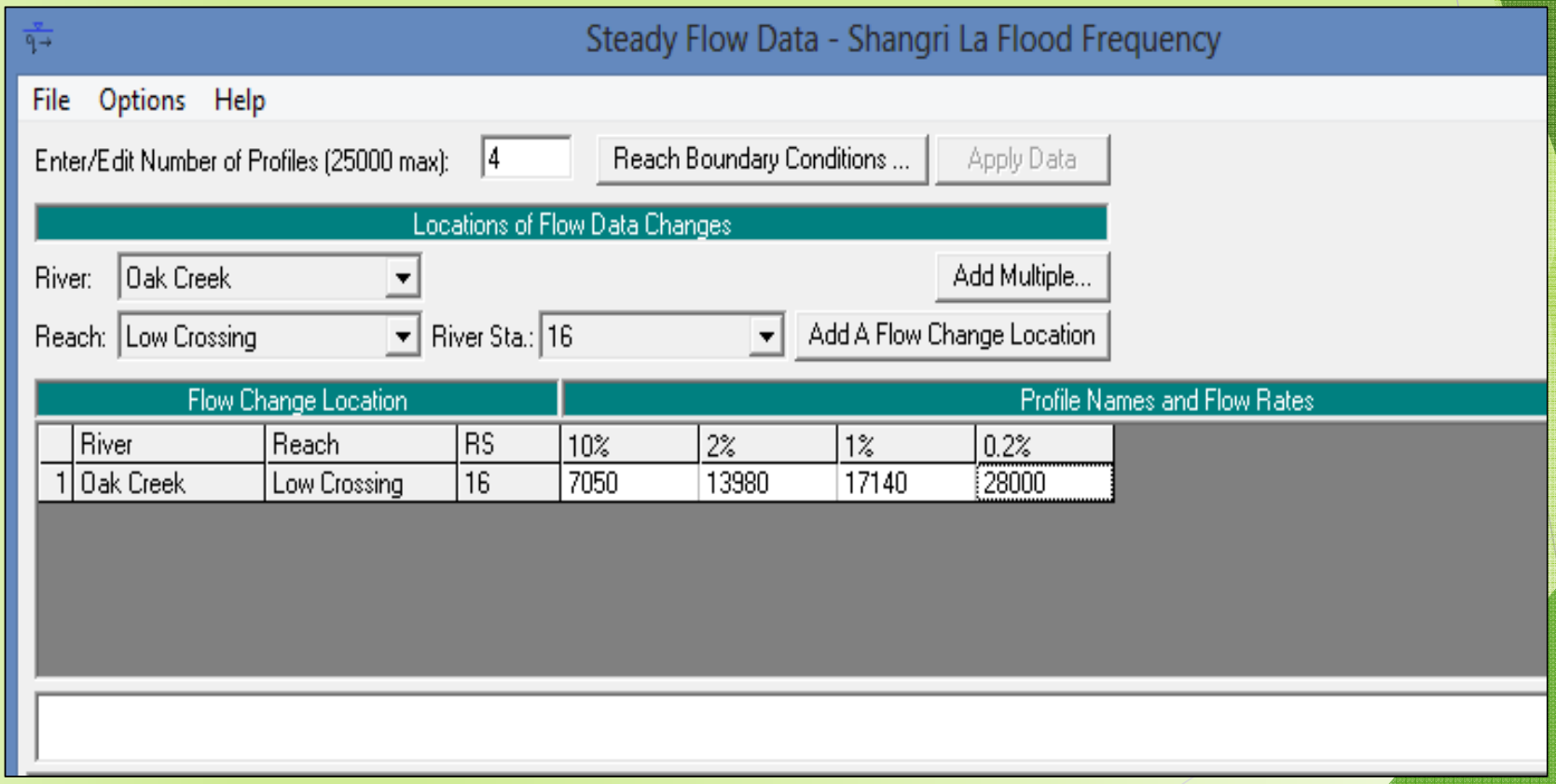
Gantt Chart Tasks

- ~~Research~~
- Modeling
  - ~~Land survey~~
  - ~~Project Survey~~
  - ~~USGS Data~~
  - ~~Gauge Data~~
  - HEC-RAS
- ~~Impacts~~
  - ~~Political~~
  - ~~Social~~
- Analysis
  - ~~Geomorphology~~
  - ~~AutoCAD~~
  - ~~Hydraflow Express~~
  - ~~Bentley Water Gems~~
  - ~~Culvert Master~~
  - ~~HEC-RAS~~
- Design
- Reports & Presentation
  - ~~50% Design Report~~

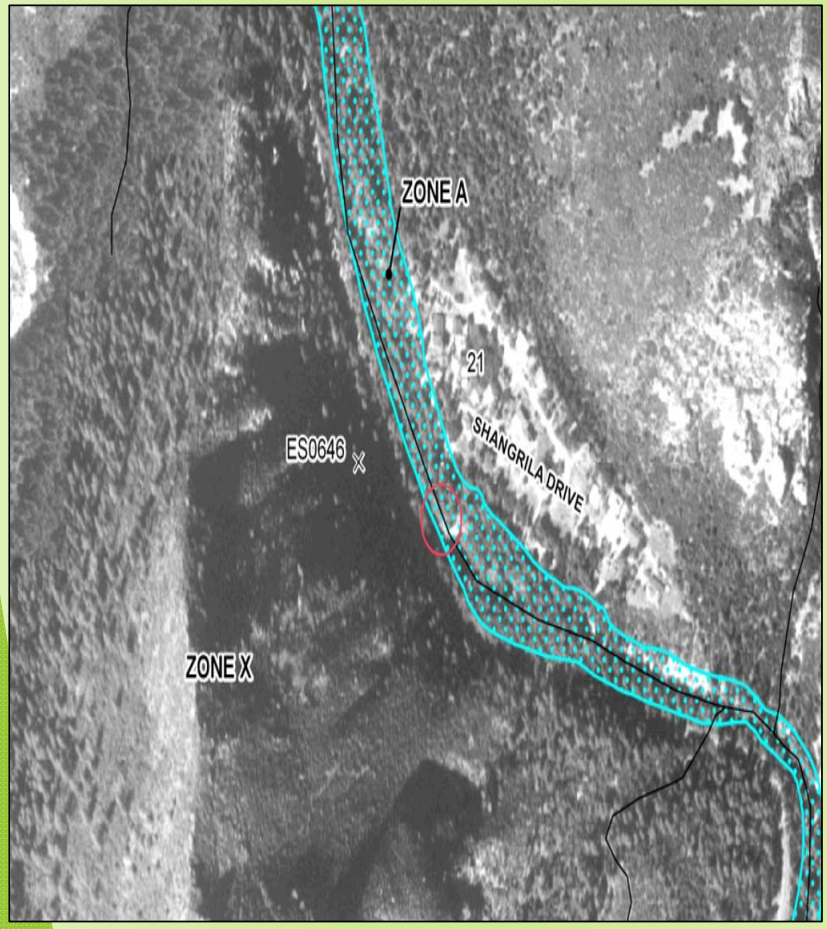
Geometric Data

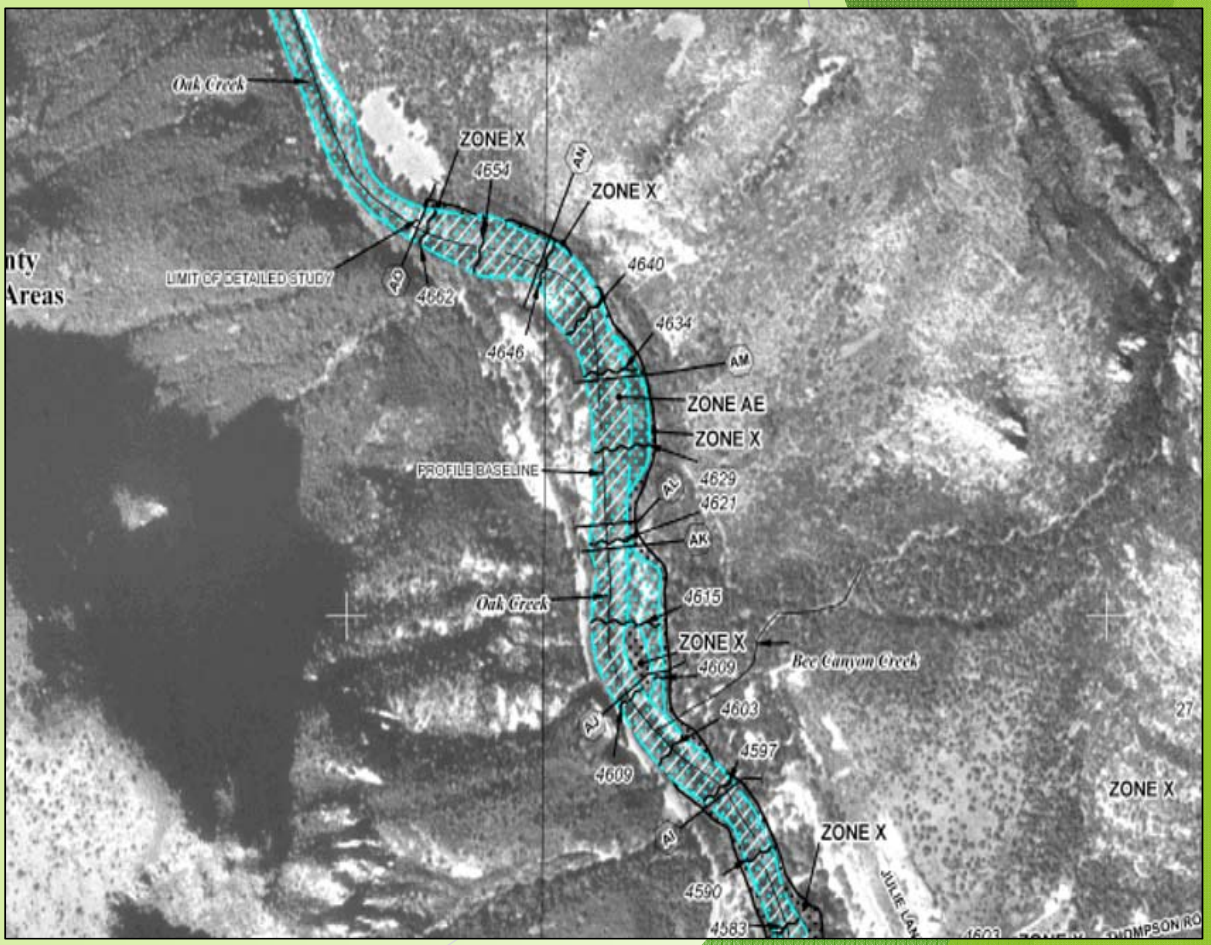


Steady Flow Data (CFS)

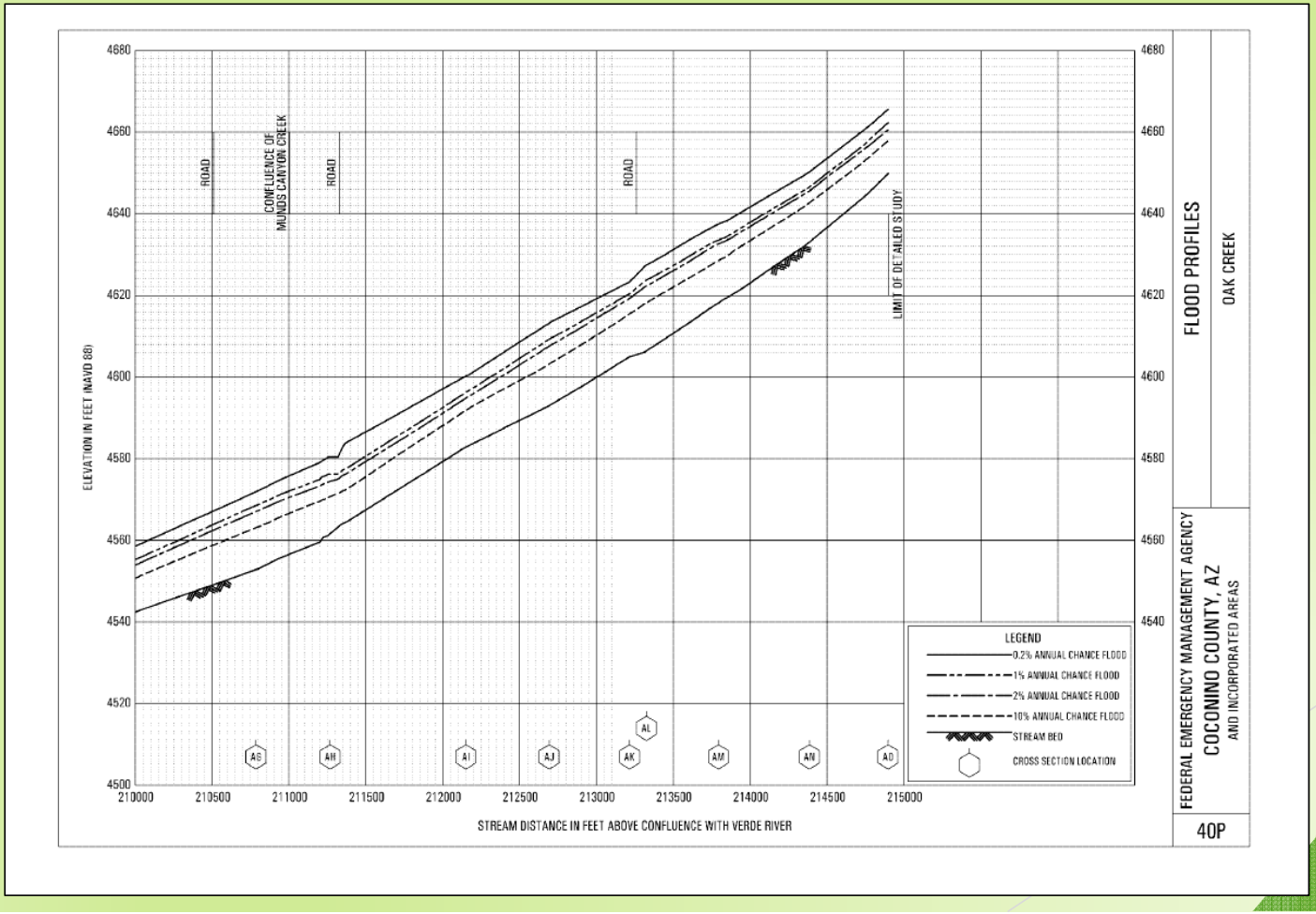


FEMA (Federal Emergency Management Agency)

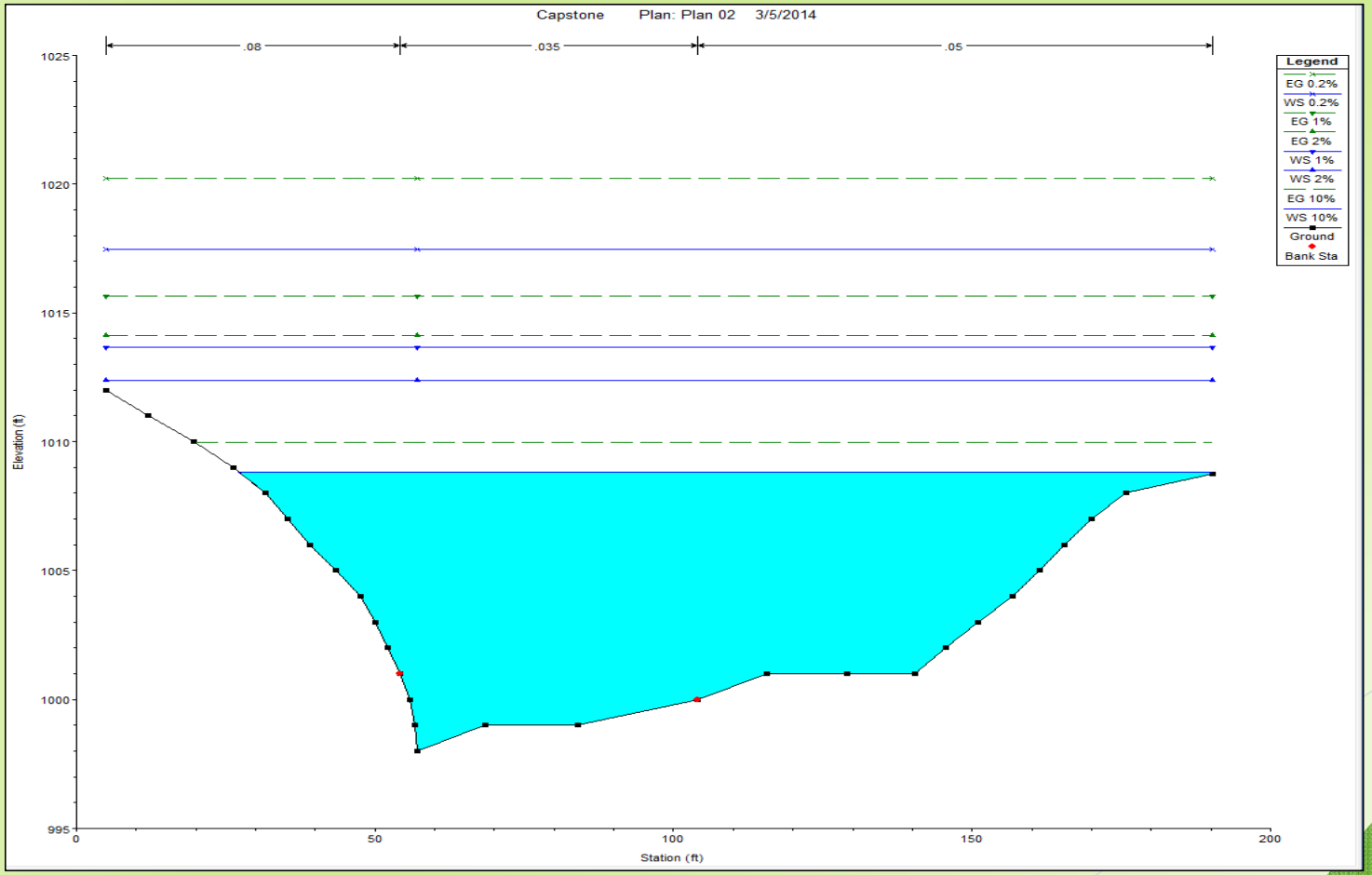




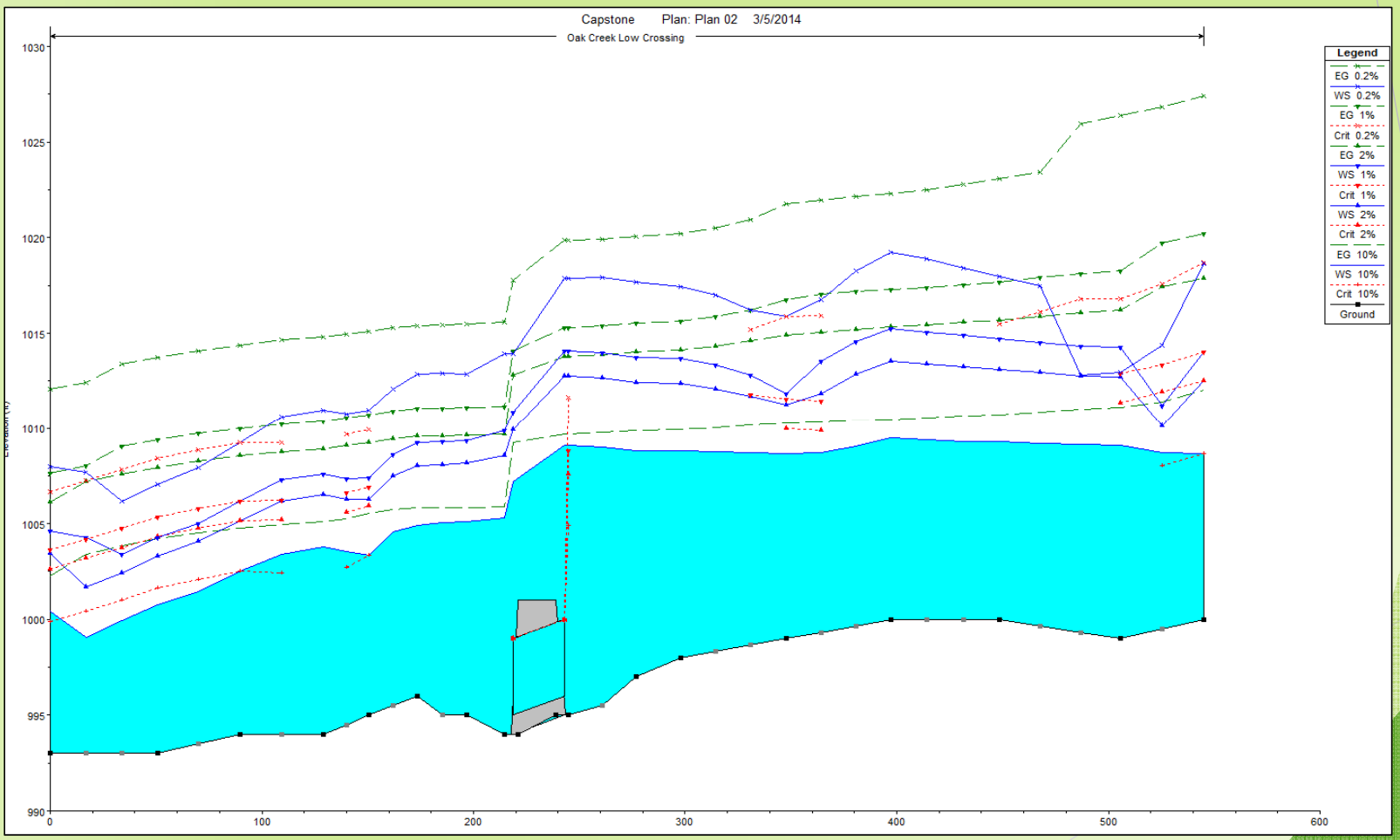
Flood Profiles



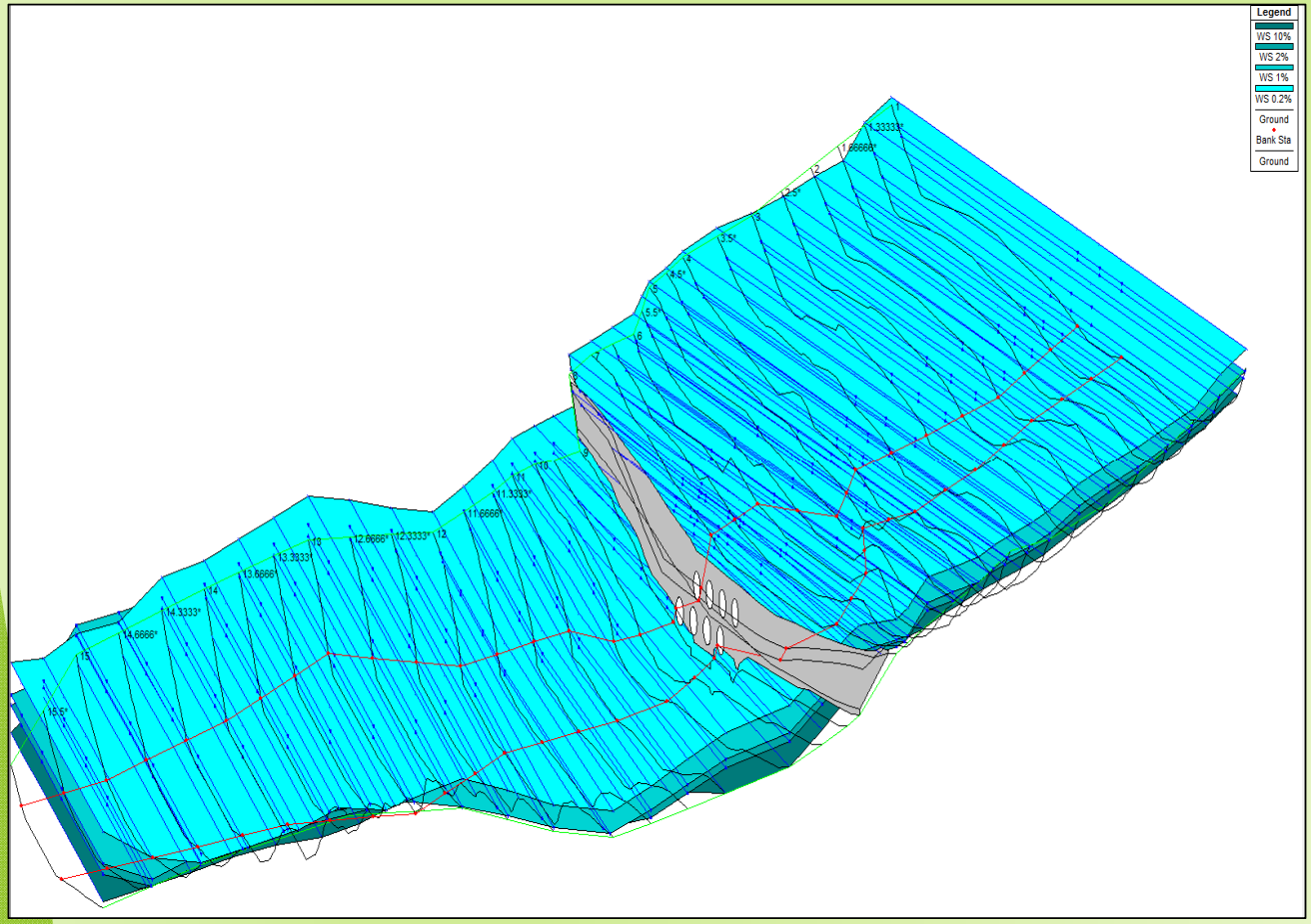
Cross Section (11)

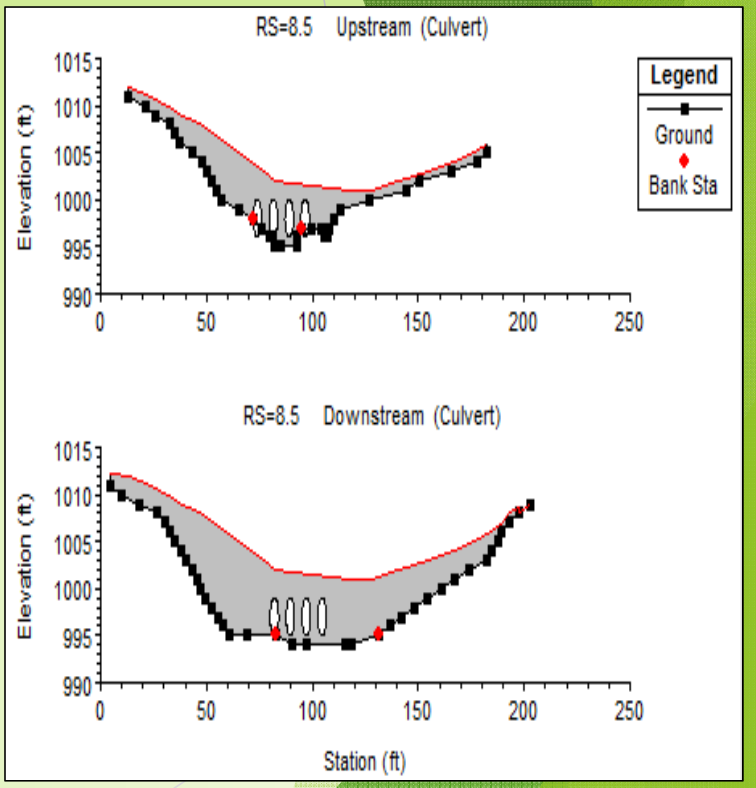


Full Reach

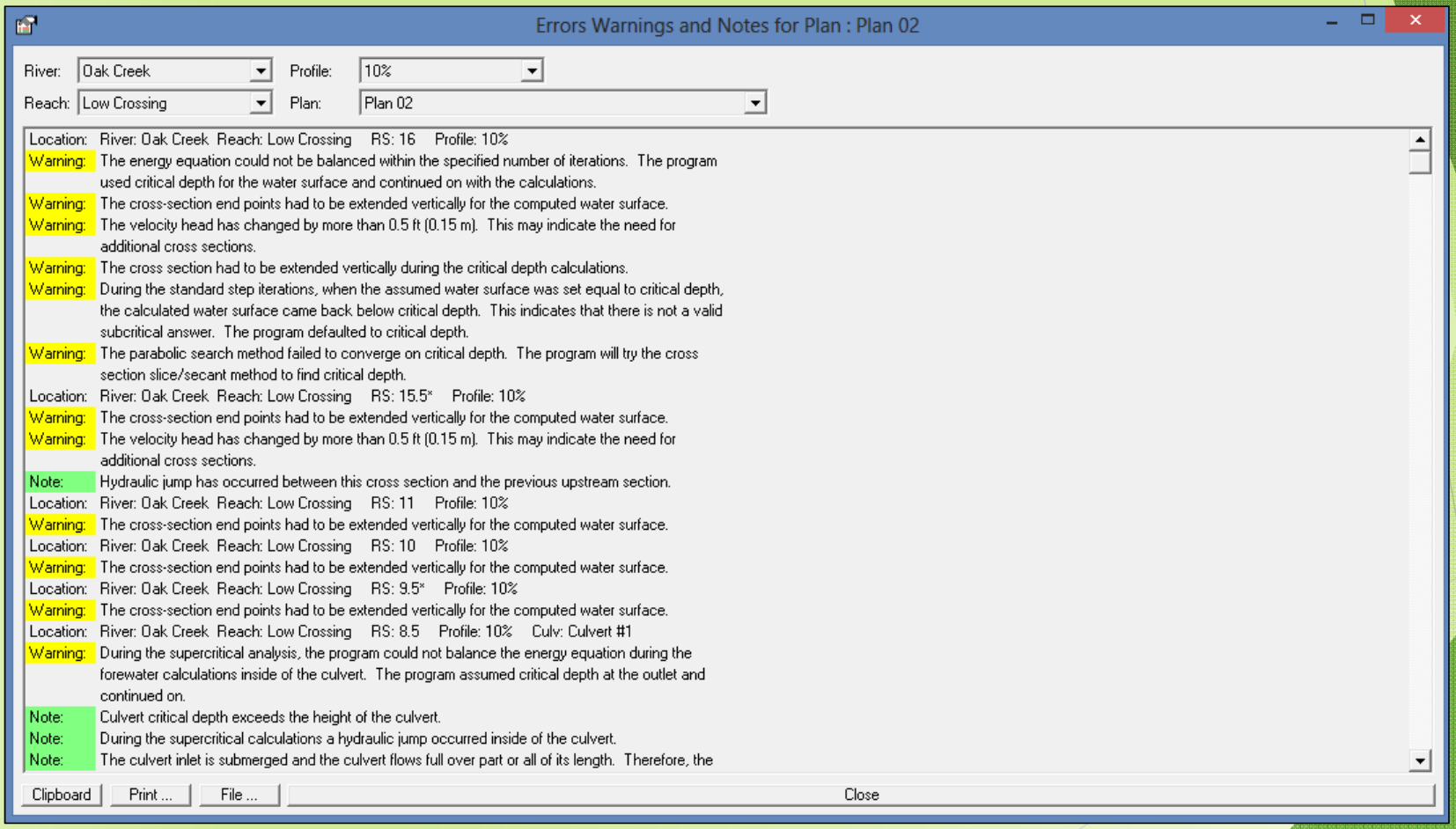

Capstone Plan: Plan 02 3/5/2014
Oak Creek Low Crossing
Legend
EG 0.2%
WS 0.2%
EG 1%
Crit 0.2%
EG 2%
WS 1%
Crit 1%
WS 2%
Crit 2%
EG 10%
WS 10%
Crit 10%
Ground
1030
1025
1020
1015
1010
1005
1000
995
990
0
100
200
300
400
500
600

3D View


Legend
WS 10%
WS 2%
WS 1%
WS 0.2%
Ground
Bank Sta
Ground


RS=8.5 Upstream (Culvert)
Legend
Ground
Bank Sta
Elevation (ft)
1015
1010
1005
1000
995
990
0
50
100
150
200
250
RS=8.5 Downstream (Culvert)
Elevation (ft)
Station (ft)

Errors


Errors Warnings and Notes for Plan : Plan 02
River: Oak Creek
Profile: 10%
Reach: Low Crossing
Plan: Plan 02
Location: River: Oak Creek Reach: Low Crossing RS: 16 Profile: 10%
Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
Location: River: Oak Creek Reach: Low Crossing RS: 15.5* Profile: 10%
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
Location: River: Oak Creek Reach: Low Crossing RS: 11 Profile: 10%
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Location: River: Oak Creek Reach: Low Crossing RS: 10 Profile: 10%
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Location: River: Oak Creek Reach: Low Crossing RS: 9.5* Profile: 10%
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Location: River: Oak Creek Reach: Low Crossing RS: 8.5 Profile: 10% Culv: Culvert #1
Warning: During the supercritical analysis, the program could not balance the energy equation during the forewater calculations inside of the culvert. The program assumed critical depth at the outlet and continued on.
Note: Culvert critical depth exceeds the height of the culvert.
Note: During the supercritical calculations a hydraulic jump occurred inside of the culvert.
Note: The culvert inlet is submerged and the culvert flows full over part or all of its length. Therefore, the
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Hours

Research	Army Corps	AZDEQ	ADOT	EPA	Forest Service	Game & Fish	Safety
73	9	10	9	9	6	23	7
Modeling	HEC-HMS	HEC-RAS	USGS DATA	Land Survey			
115	0	66	22	27			
Impact	Political	Social					
5	0	5					
Analysis	AutoCAD 3D	Culvert Master	Hydraflow Express	Bentley W. Gems	Documentation		
47.5	17	8	0	0	22.5		
Design	Structure	Pedestrian bridge	Armoring Exist.	Geotech			
0	0	0	0	0			
Class Meetings	**Professional Meetings**						
35	43						

Next Two Weeks

- Design
  - Structure
  - Armor Existing Structure
  - HEC-RAS

Questions?