



Oak Creek Low Water Crossing: Status Update

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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

▶ Website

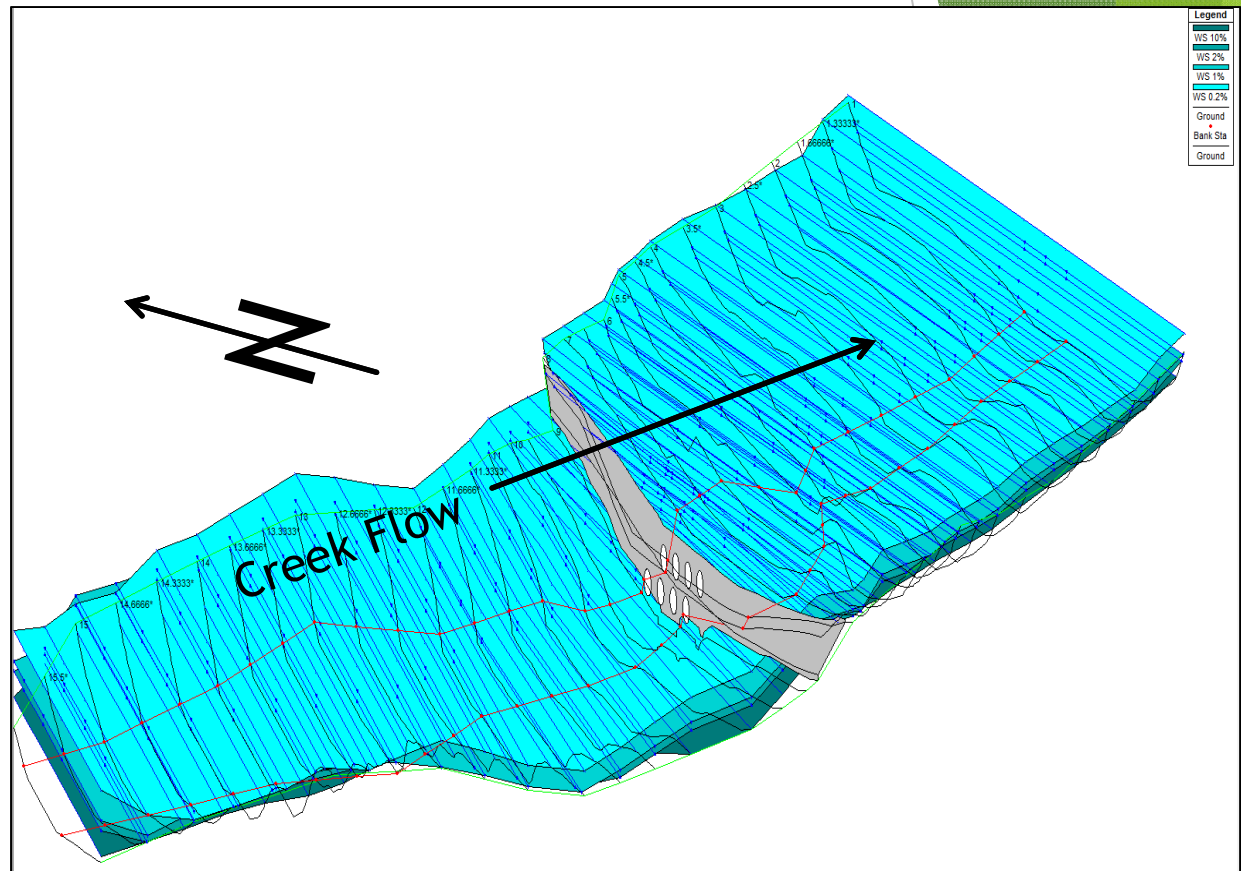
▶ UGRADS Presentation

~~▶ 50% Design Report~~

▶ Final Design Report

Last Two Weeks

- ▶ Design alternatives
- ▶ Finished HEC-RAS model
- ▶ Website



3D view in HEC-RAS

Next Two Weeks

- ▶ Design Alternatives
- ▶ Website
- ▶ Final Presentation
- ▶ Meeting with client this Saturday, 4/5
 - ▶ Present design alternatives and analyses

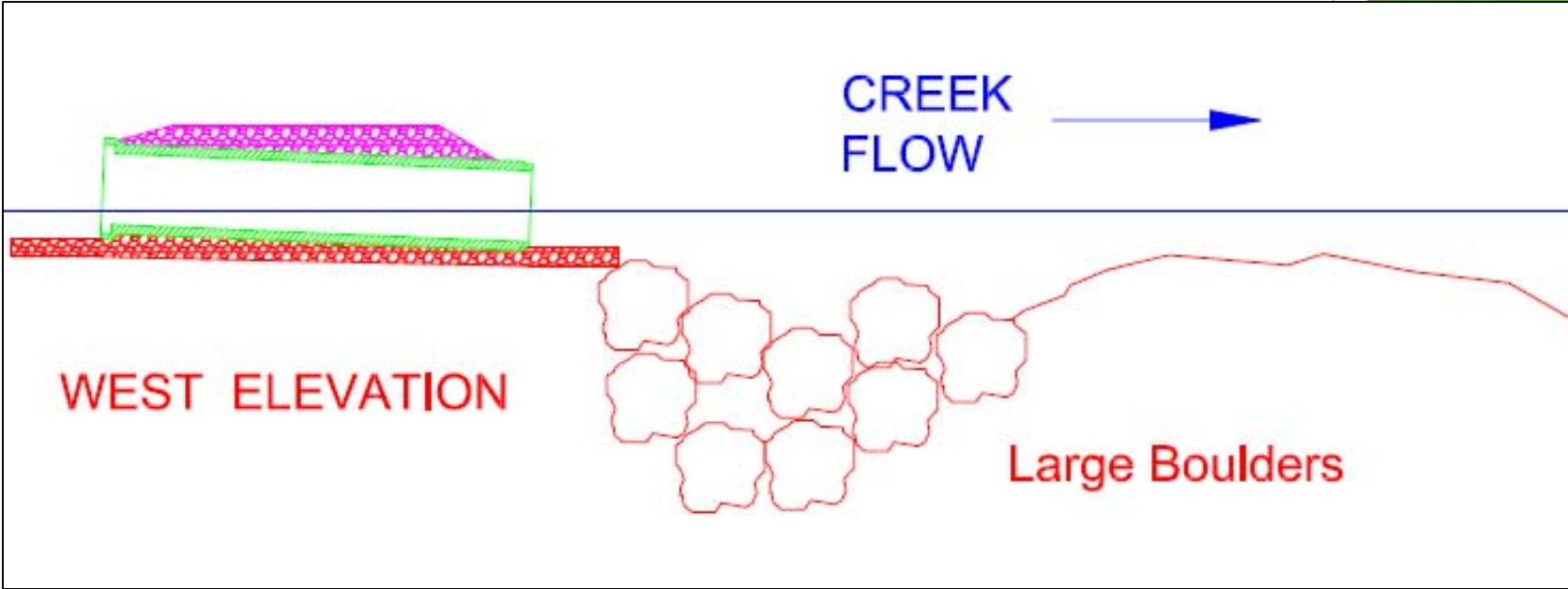


Design Alternatives (Armoring)

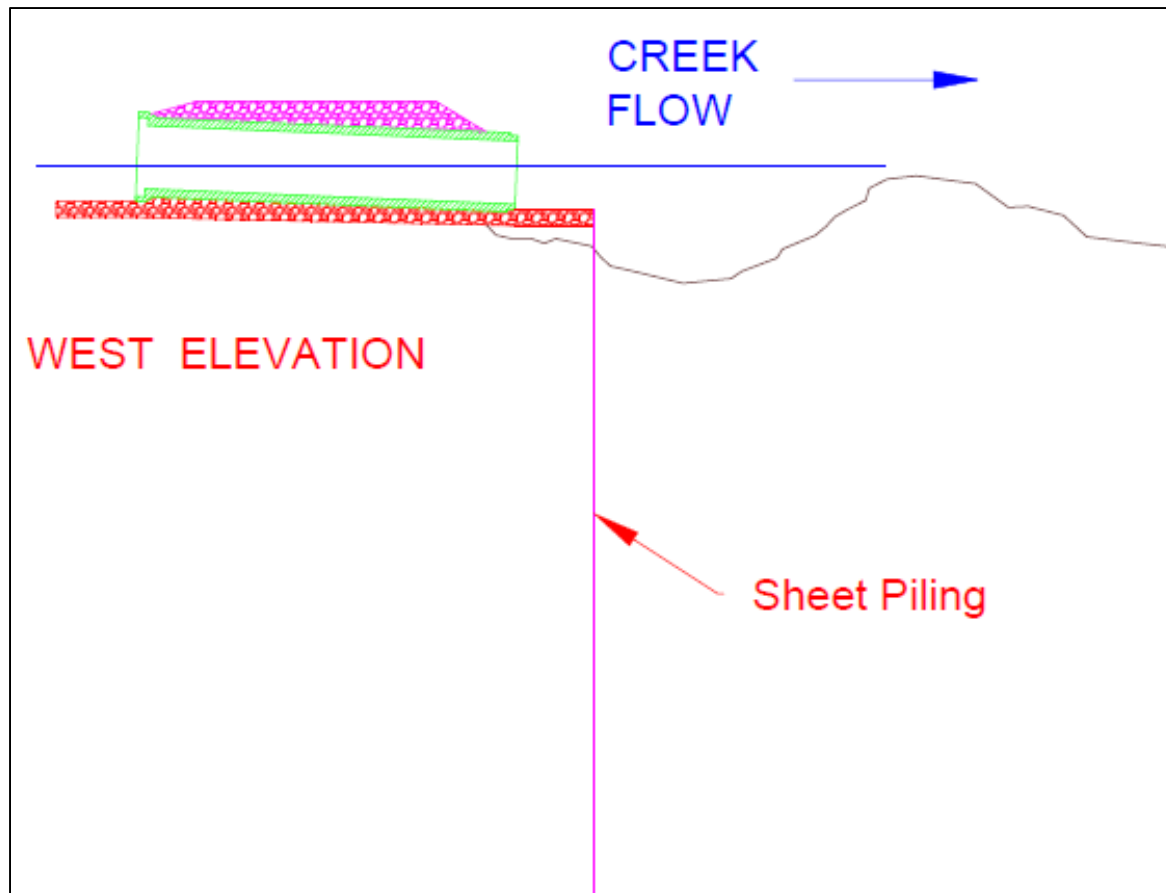
Current Crossing Armoring					
Parameters	Weight	Boulders	Sheet Pile	Gabion Baskets	Retaining Walls
Cost	0.2	5	3	5	1
Effectiveness	0.3	4	5	4	4
Aesthetics	0.05	2	1	2	2
Safety	0.15	4	3	3	4
Creek Impact	0.15	4	3	4	1
Lifespan	0.15	4	4	4	4
Total		4.1	3.65	3.95	2.85

Scoring: 1 - Lowest
5 - Highest

Design Alternatives (Armoring) Boulders

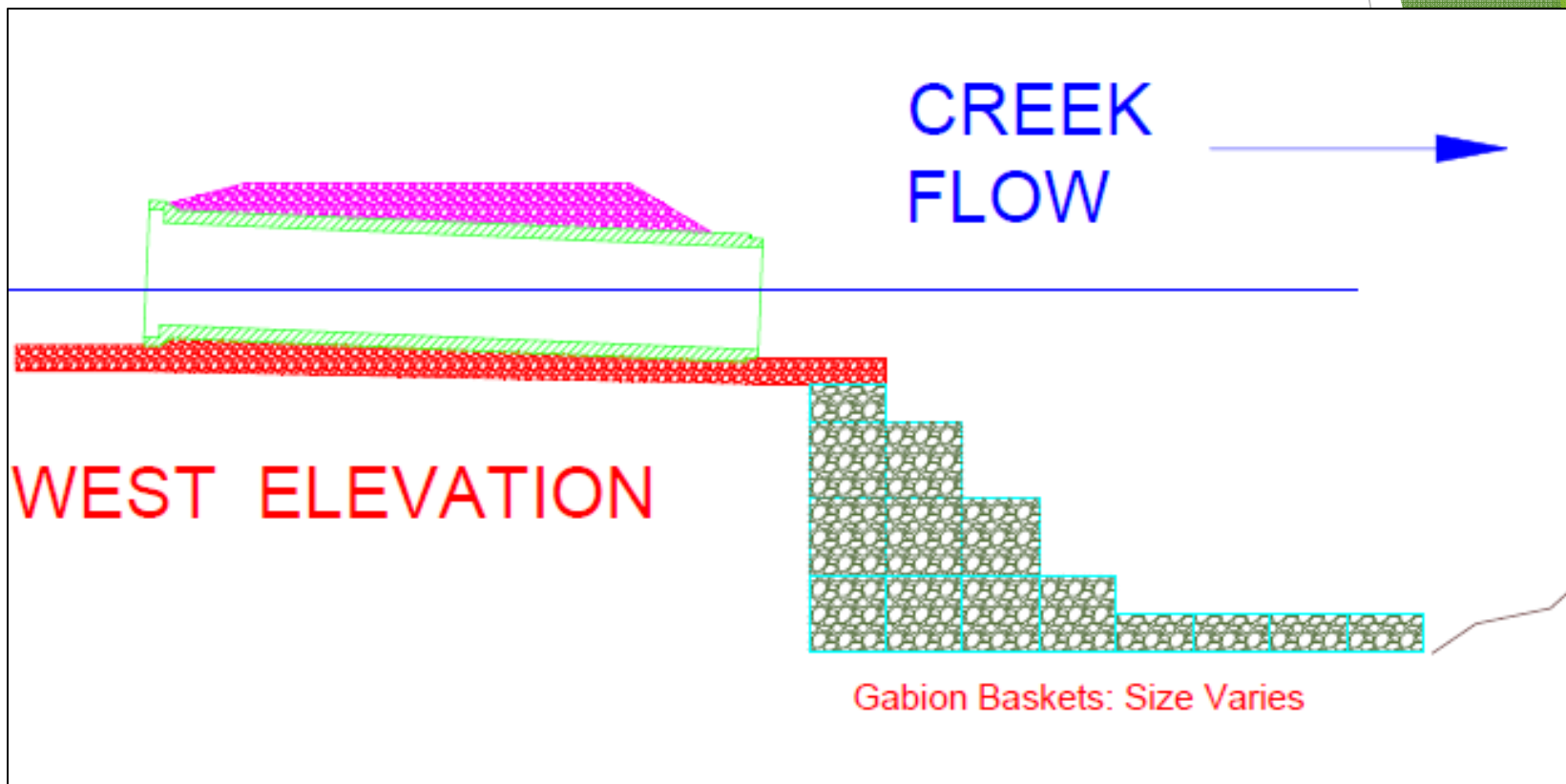


Design Alternatives (Armoring) Sheet Pile



Scour analysis will provide needed depth of sheet pile

Design Alternatives (Armoring) Gabion Baskets



Design Alternatives (Armoring)

Scour Equations

- ▶ Bureau of Reclamation
- ▶ Scour calculations for hydraulic structures across channels (Type D)
 - ▶ Schoklitsch
 - ▶ Veronese
 - ▶ Zimmerman and Maniak
- ▶ Purpose: to find the depth of scour which corresponds to the depth of sheet pile

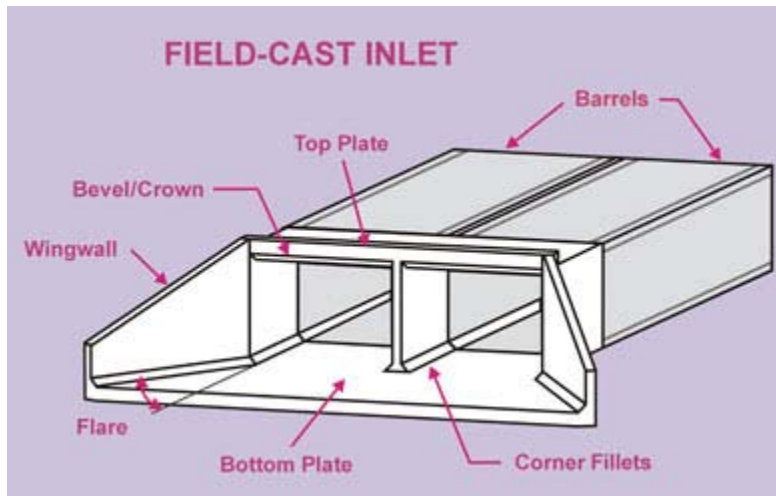
Design Alternatives (New)

New Crossing Design				
Parameters	Weight	Circular Culverts	Box Culverts	3-Sided Bridge
Cost	0.2			
Effectiveness	0.3			
Aesthetics	0.05			
Safety	0.15			
Creek Impact	0.15			
Lifespan	0.15			

Scoring: 1 - Lowest
5 - Highest

Design Alternatives (New)

Box Culverts:



<http://www.fhwa.dot.gov/publications/publicroads/05sep/07.cfm>

Circular Culverts:



Three Sided Bridge:



http://americanconcrete.com/commercial/box_culverts/3_sided_bridge.htm

Questions?