San Simon Dam Break Study

The Second Status Update

CENE 486C

Jinyang Lu

Brendan Garrison

Bowei Zeng

Mike Gallio

BRIEF PROJECT INTRODUCTION

NORTHERN ARIZONA UNIVERSITY

- San Simon Barrier Dam
- Southeast Arizona near the city of Safford
- Scale: 300 ft x 50 ft x 27 ft
- Slope: 35°
- Flood control and sediment control
- Bureau of Land Management (BLM)

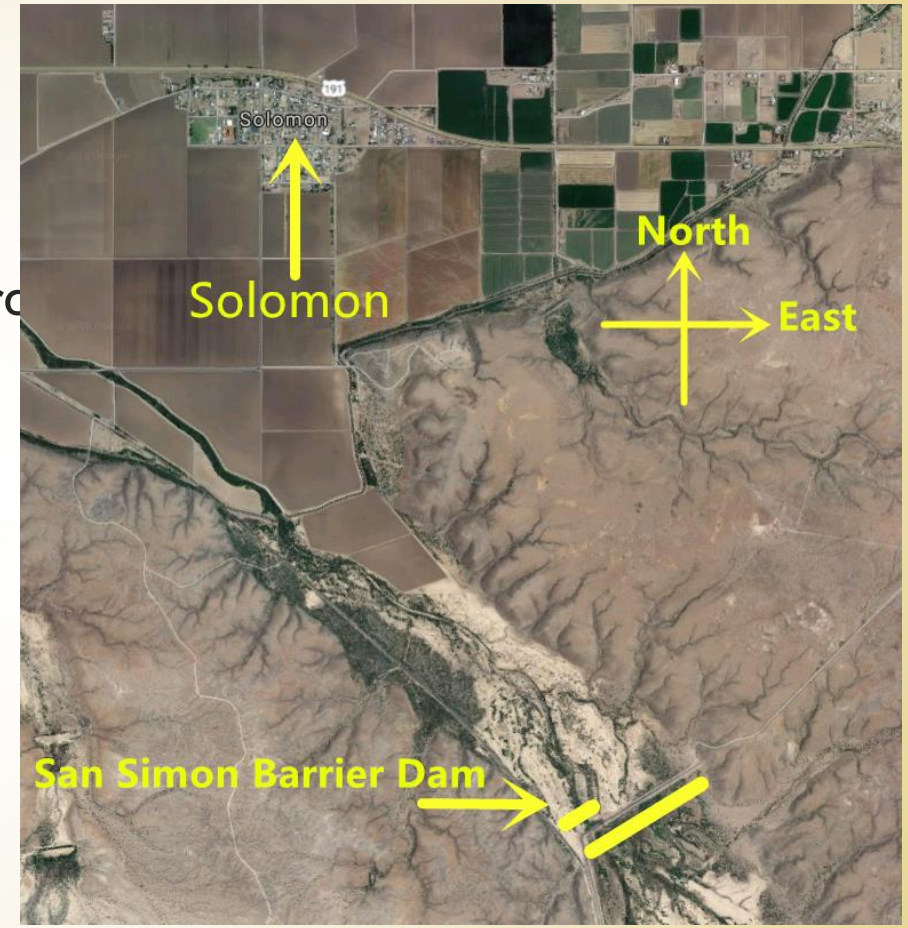

Figure 1: Location of San Simon Barrier Dam [1]

SCHEDULE

Table 1: Schedule of Project

Task #	Task	Original		Actual	
		Start	Finish	Start	Finish
2	Hydrology	1/22/2018	1/26/2018	1/19/2018	2/13/2018
3	Hydraulic Analysis	1/27/2018	3/30/2018	2/15/2018	
3.1	Geometric Parameters	1/29/2018	1/30/2018	1/25/2018	
3.2	Routing and Reservoir Effect	1/31/2018	2/2/2018	1/31/2018	
3.3	Dam Breach Failure Method	2/8/2018	2/15/2018		
3.4	Peak Flow Estimation	2/16/2018	2/20/2018	2/16/2018	

HYDRAULIC ANALYSIS AND PEAK FLOW ESTIMATION

NORTHERN ARIZONA UNIVERSITY

Table 2: 1931-2004 Stream Peak Flow From USGS [2] --- John Garrison

	Date and Year	Stream Peak Flow(cfs)
Max	Aug. 30, 1957	86500
Min	Aug. 13, 2001	11
Average		19362
Selected	Aug. 30, 1957	86500

Description: Required 500 years flow.

No flow data from client.

Suggestion from Technical Advisor.

HYDRAULIC ANALYSIS AND PEAK FLOW ESTIMATION

Table 3: Manning's Roughness Coefficient Selection [3]

Material	Number
Concrete (Cement) - finished	0.012
Floodplains - light brush	0.050
Floodplains - pasture, farmland	0.035

- Manning's Equation: $V = \frac{1.486}{n} R^{2/3} S^{1/2}$ [4]
- Continuity Equation: $Q = VA$ [5]

  Q = Flow Rate, (ft^3/s)

  v = Velocity, (ft/s)

  A = cross-section area(ft^2)

  n = Manning's Roughness Coefficient

  R = Hydraulic Radius, (ft)

  S = Channel Slope, (ft/ft)

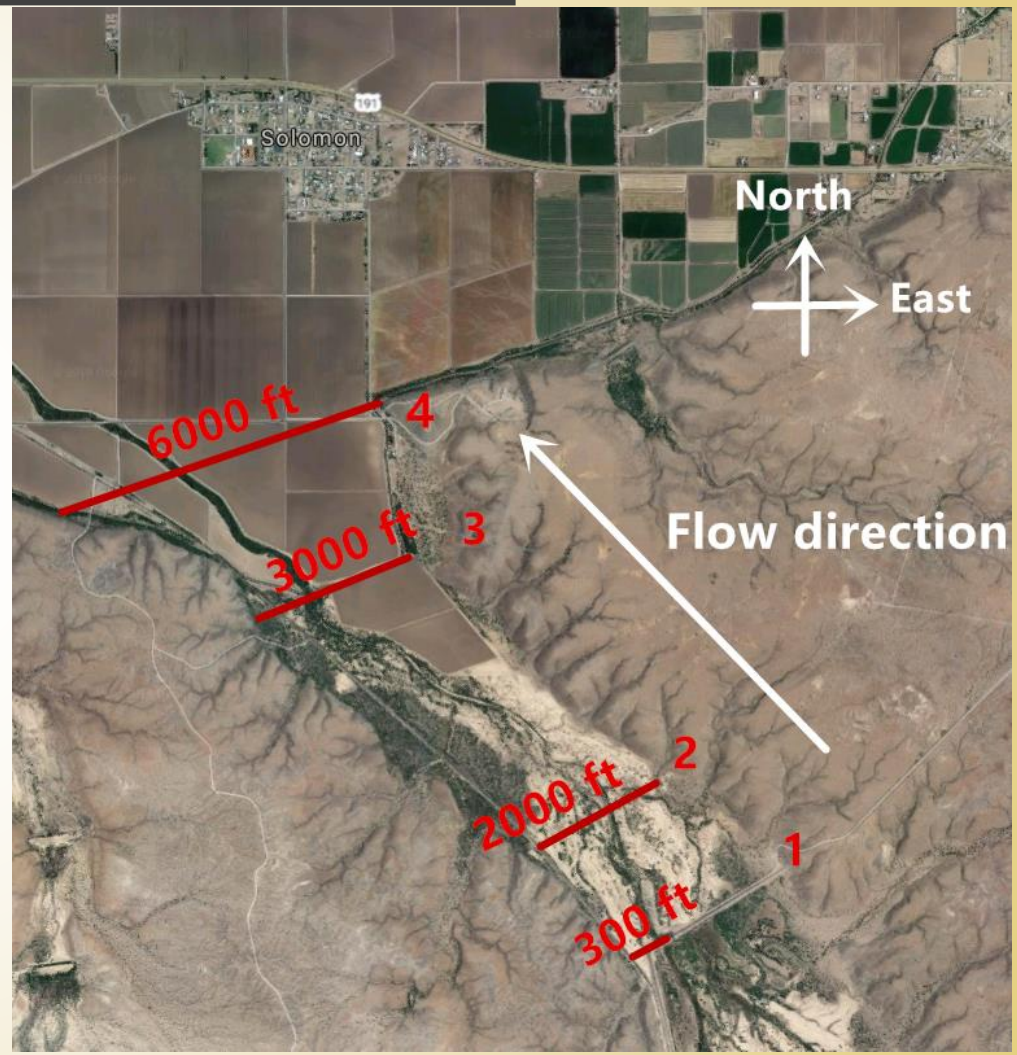

Figure 2: Cross-section selection

RESULTS OF HYDRAULIC ANALYSIS AND PEAK FLOW ESTIMATION

NORTHERN ARIZONA UNIVERSITY

Table 5: Results of water depth

Cross-section #	Slope	Water Depth
1	0.52	2.1
2	0.01	5.9
3	0.01	2.8
4	0.01	2.2

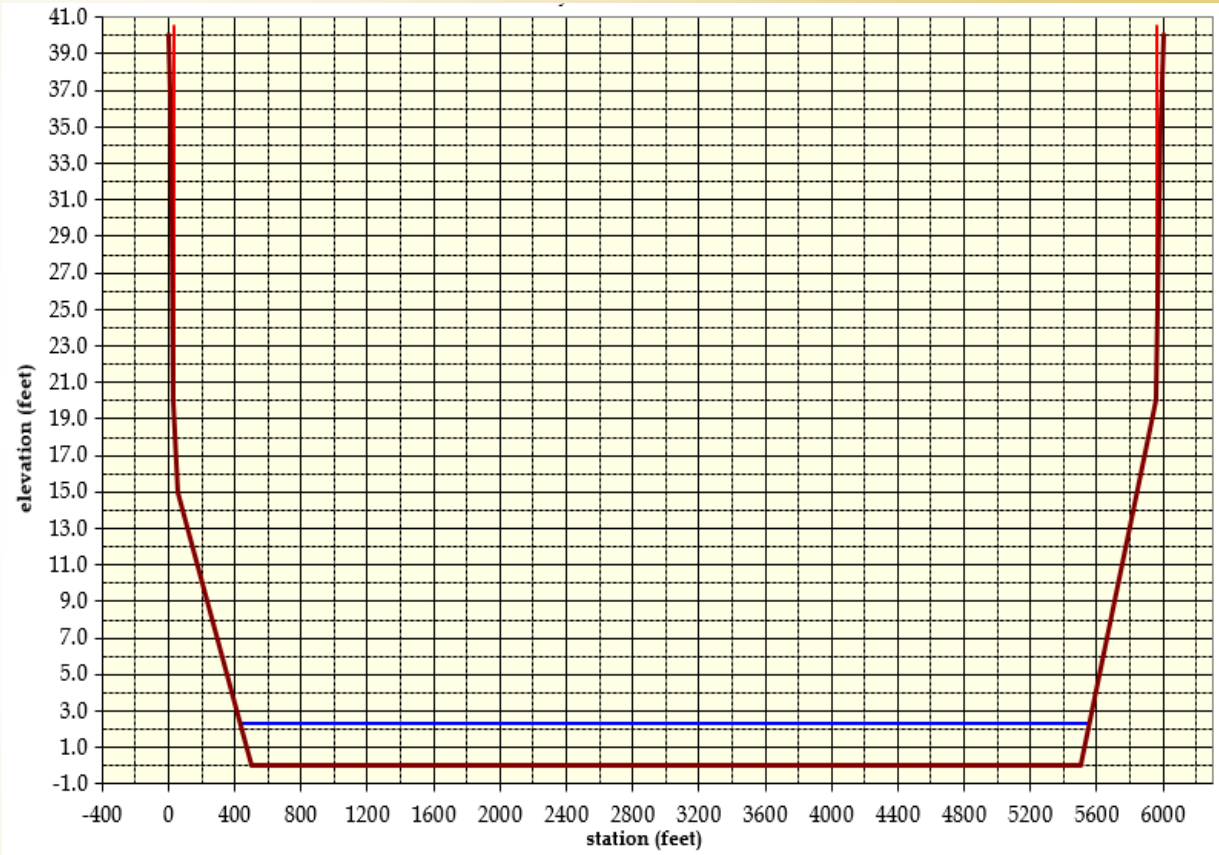

Figure 6: Result of cross-section 4

REFERENCES

- [1] *Google.com*, 2018. [Online]. Available: https://www.google.com/maps/place/Safford,+AZ/@32.7973682,-109.6232473,5673m/data=!3m1!1e3!4m5!3m4!1s0x86d7f6fc89bf058f:0xeb719602820d6e8b!8m2!3d32.8339546!4d-109.70758?authuser=1. [Accessed: 20- Feb- 2018].
- [2]"USGS Surface Water for USA: Peak Streamflow", Nwis.waterdata.usgs.gov, 2018. [Online]. Available: https://nwis.waterdata.usgs.gov/usa/nwis/peak. [Accessed: 20- Feb- 2018].
- [3]"Manning's Roughness Coefficients", Engineeringtoolbox.com, 2018. [Online]. Available: https://www.engineeringtoolbox.com/mannings-roughness-d_799.html. [Accessed: 20- Feb- 2018].
- [4]"Manning's Equation", Fsl.orst.edu, 2018. [Online]. Available: http://www.fsl.orst.edu/geowater/FX3/help/8_Hydraulic_Reference/Manning_s_Equation.htm. [Accessed: 20- Feb- 2018].
- [5]"Continuity Equation", Fsl.orst.edu, 2018. [Online]. Available: http://www.fsl.orst.edu/geowater/FX3/help/8_Hydraulic_Reference/Continuity_Equation.htm. [Accessed: 20- Feb- 2018].

Thanks

Question ?