

Background

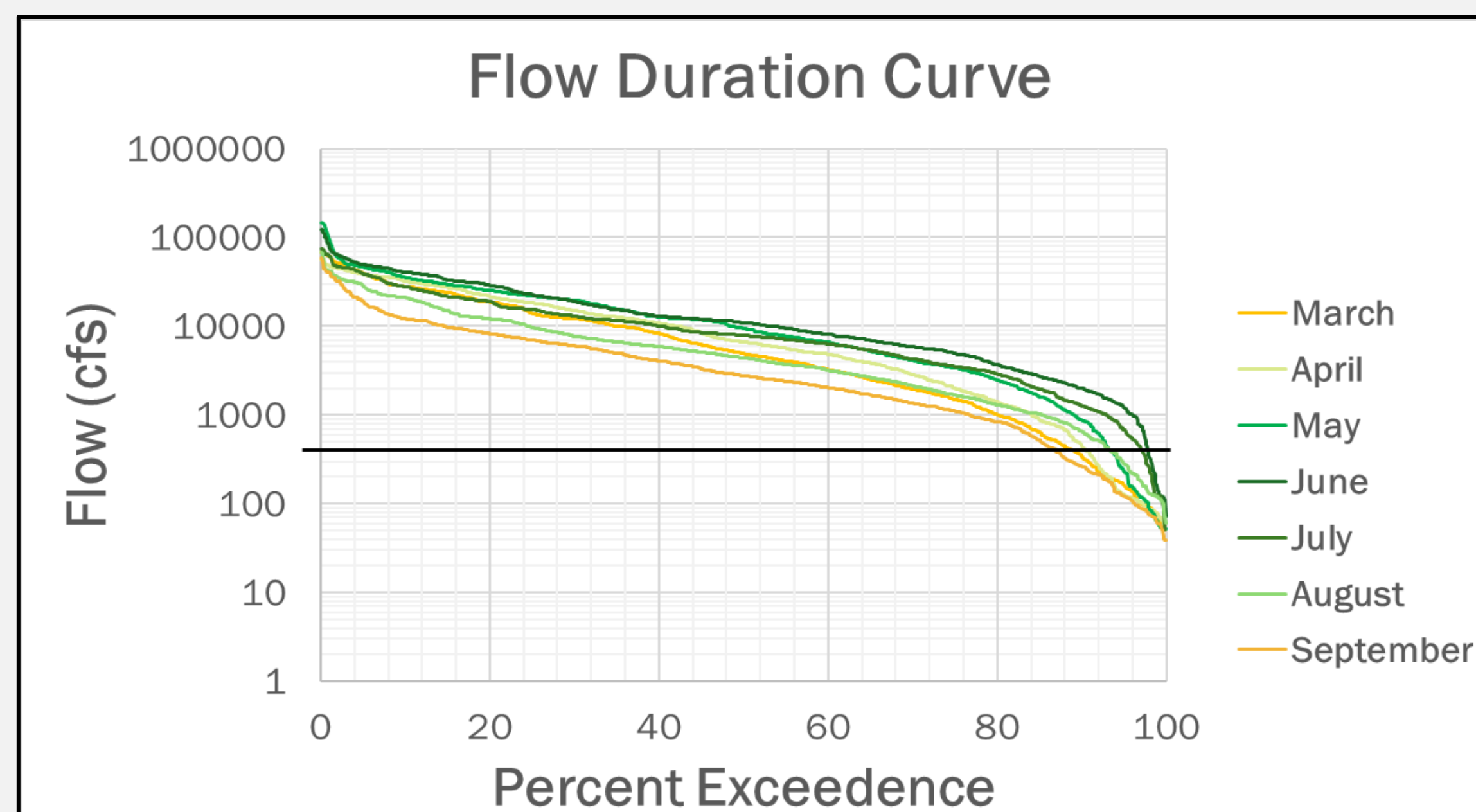
- Zink Dam is an aging low-head dam on the Arkansas River in Tulsa, Oklahoma
- Rehabilitation includes a new recreational whitewater feature along the east bank
- The project focuses on designing the first wave for surfers and kayakers
- Wave created using hydraulic jump powered by dam head

Project Objectives

- Estimate available flows in the Arkansas River
- Develop hydraulic models for the first hydraulic jump
- Develop structural calculations for the necessary structures

Hydrology

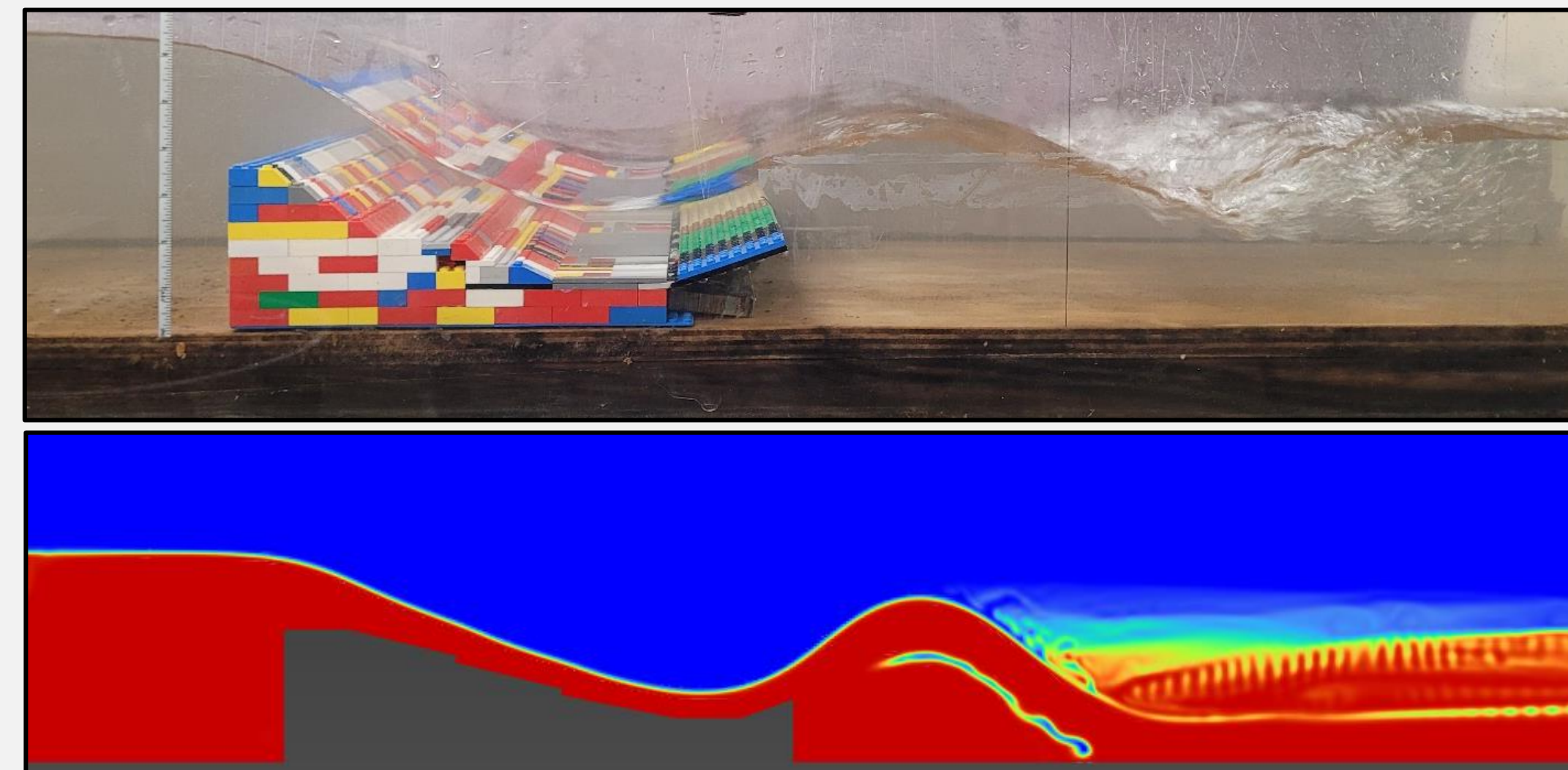
Flow Duration Curve created with daily flow data collected from USGS from 1982 to 2019



Design Outcomes:

- Operational season March – September
- 400 cfs of inflow during operational season

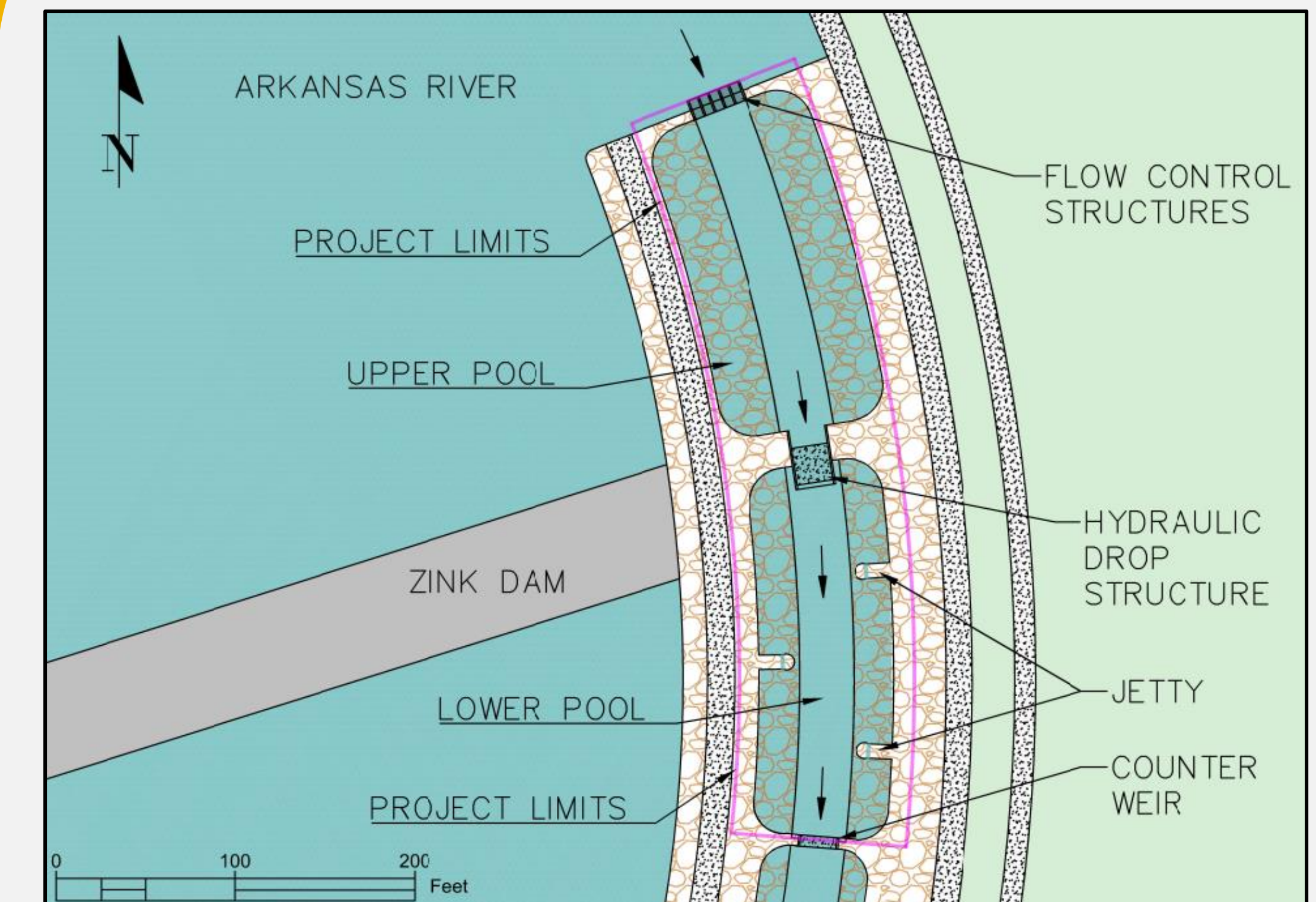
Hydraulics



Physical and Computational Hydraulic Models were created to understand ideal conditions needed to produce a surfable wave. With the designed drop structure, the ideal conditions are:

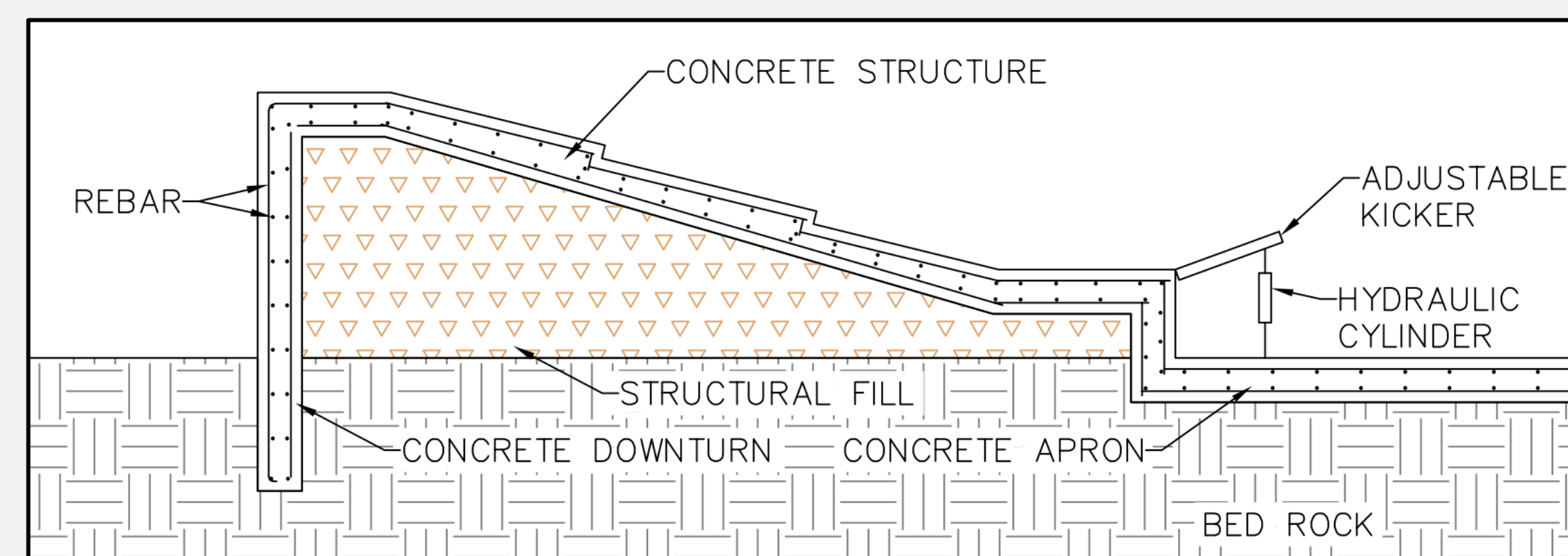
- Hydraulic Drop: 2 ft
- Tailwater Elevation: 6.5 ft

Site Layout



- 200-ft long pools
- Trapezoidal cross-section with 3:1 side slope
- Jetties in lower pool to allow easy access in and out of feature

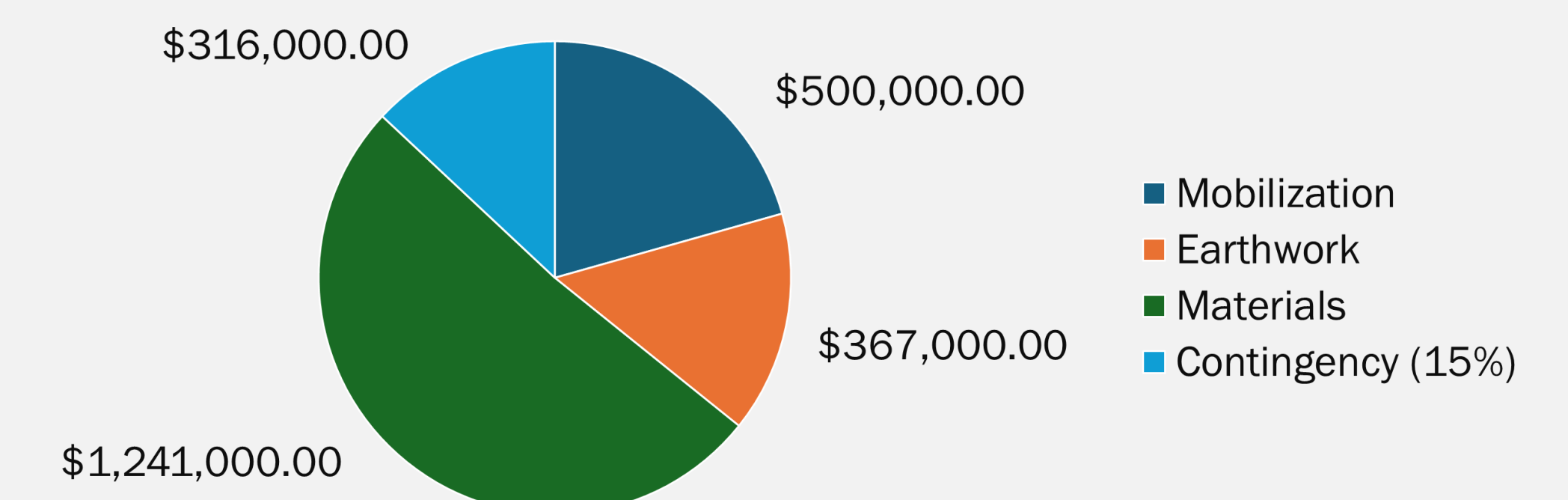
Structures



- #5 Rebar spaced 12-in on center with 3-in cover
- 12-in thick concrete slab
- 5000 psi concrete
- 3-ft deep concrete turndown
- 20-ft long concrete apron

Cost Estimate

Total Cost = \$2.4 Million



Acknowledgements

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