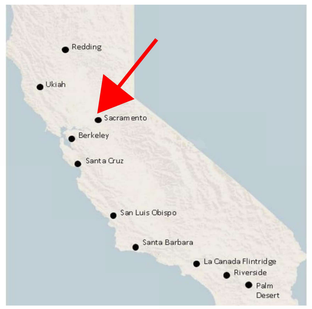
# CITRUS HEIGHTS EROSION CONTROL

**TEAM: DILLION DRAPER, LOGAN ANDERSON, CJ PIERCE**
**UTAH VALLEY UNIVERSITY**
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## Executive Summary

Three bridges in Citrus Heights, CA area exhibiting premature degradation of their erosion control devices. The purpose of this project is to evaluate existing conditions and design new erosion control measures. The scope included hydraulic modeling, report writing, initial design, and creation of construction documents.

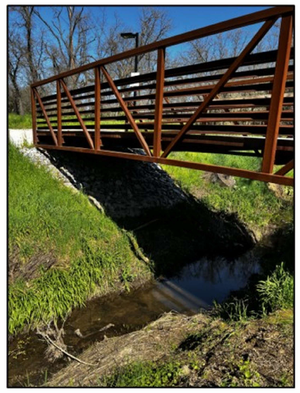
## Location & Existing Conditions





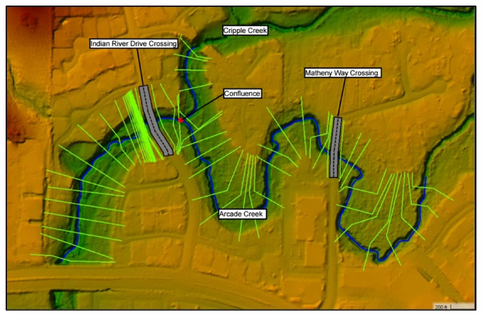
Indian River Drive


Matheny Way


Arcade-Cripple Trail

## Methodology

1) Hydraulic Modeling




2) Alternative Development

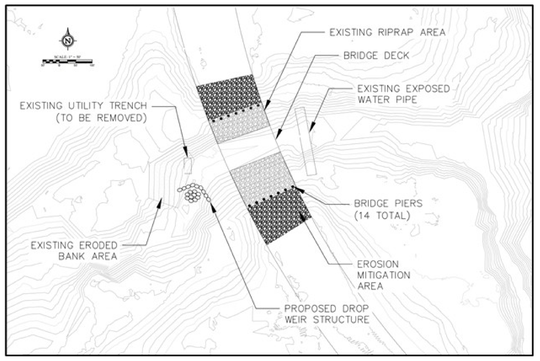
| Evaluation Criteria | Alternative A: 15" Rip Rap | Alternative B: 12" Grouted Rip Rap | Alternative C: Articulated Concrete Block Mats |
|---|---|---|---|
| Public Safety Weight (5) | 20 | 20 | 20 |
| Public Health Weight (4) | 12 | 8 | 12 |
| Public Welfare Weight (3) | 9 | 9 | 9 |
| Environmental Weight (5) | 20 | 10 | 15 |
| Sustainability Weight (4) | 12 | 8 | 12 |
| Economic Weight (5) | 20 | 20 | 10 |
| Societal Weight (3) | 9 | 9 | 9 |
| Cultural Weight (3) | 9 | 9 | 9 |
| Additional Consideration – Resistance to Tampering / Vandalism Weight (4) | 16 | 16 | 12 |
| Additional Consideration – Constructability & Site Impact Weight (4) | 12 | 8 | 8 |
| Additional Consideration – Adaptability / Future Changes Weight (3) | 12 | 3 | 12 |
| Total Scores | **151** | **120** | **128** |

3) Design & Documentation

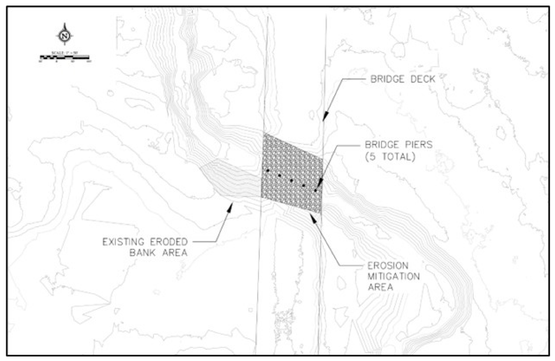
> Construction Drawings
> Project Specifications
> Cost Estimate

## Alternative Selection

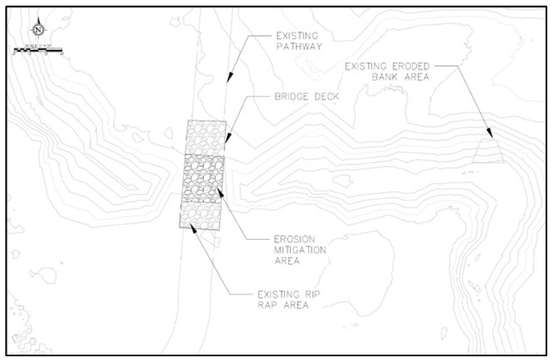
1) Indian River Drive




2) Matheny Way




3) Arcade-Cripple Creek Trail




## Construction Considerations

Some things to keep in mind during construction include:

> Small construction access points
> Traffic control
> Environmental protection
> Flash Flooding
> Seasonal flow fluctuations

## Expected Benefits

> Reduced erosion risk
> Channel stability
> Protection of human health
> Lower long-time maintenance expectations

## Conclusion

Our project accomplished all goals set forth from the beginning. 15" Rip-Rap will protect the bridges from erosion at high flow events. This will benefit the community by keeping bridges safe to use by travelers and help bring down site maintenance cost by city workers.