FIRE & FLOODS

RECOVERING FROM CALIFORNIA’S NEW NORMAL

THE PANEL

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OUR PRESENTATION

1. The Setting
2. The Repair
3. The Permits
4. The FEMA Factor
5. Lessons Learned
6. Questions/Discussion

"Beauty Beyond the Disaster" by Li Liu

THE SETTING
FIRE + RAIN
BACKGROUND + TIMELINE OF EVENTS

- Big Sur, Monterey County
- Rocky Creek flows down canyon
- Project site 3 miles inland from Highway 1
PALO COLORADO CANYON
REMOTE LOCATION

PALO COLORADO CANYON
ESTABLISHED COMMUNITY
2016 SOBERANES FIRE

CALFIRE photo, August 7, 2016

Water taken from nearby lake to fight fire, kcra.com

“Big Sur Volcano” by Peter Nichols
2016 SOBERANES FIRE

Before After
Brandon Creek
Rocky Creek

2016 SOBERANES FIRE

Before After
Project Site
Brandon Creek
Rocky Creek
2016-2017 WINTER STORMS / ATMOSPHERIC RIVERS

2016-2017 WINTER STORMS
2016-2017 WINTER STORMS
THE REPAIR
DESIGNING A SOLUTION
THE DAMAGE

Rocky Creek Culvert (upstream side)
THE DAMAGE

Palo Colorado Road
DYNAMIC SITE CONDITIONS

Palo Colorado Road Slope Repair Site (where diverted creeks converged and crossed roadway)

DESIGN APPROACH
ROAD MAP

- Meet with Permitting Agencies
- Engage Design Team
- Present Design Alternatives
- Submit 30% Design & Cost Estimate
- Develop 80% Design
- Develop 100% Design

Coordinate with Permitting Agencies

Coordinate with FEMA + Cal OES
DESIGN SOLUTIONS
PRIORITIZE ALTERNATIVES FOR ROCKY CREEK

Alternatives Considered:

1. Pipe Culvert
   Restore: Existing Condition (replace in kind)

2. Bridge on Slab

3. Metal Arch Culvert

4. Box Culvert

INTEGRATED APPROACH
PRODUCING FINAL DESIGN PLANS

Final Design
CONSTRUCTABILITY

ROCKY CREEK ARCH CULVERT – 80% VS. 100% DESIGN

<table>
<thead>
<tr>
<th>Design</th>
<th>Footing Type</th>
<th>Excavation Amount (CY)</th>
<th>Excavation Depth (ft)</th>
<th>Excavation Width (ft)</th>
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<tbody>
<tr>
<td>80%</td>
<td>Spread Footing</td>
<td>10,000</td>
<td>32</td>
<td>34</td>
</tr>
<tr>
<td>100%</td>
<td>&quot;U-Shaped&quot; Footing</td>
<td>8,000</td>
<td>28-32</td>
<td>24</td>
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THE PERMITS

STRATEGIES + CHALLENGES
Site Characteristics
• Rocky Creek = perennial
• Brandon Creek = intermittent
• Dominated by coast redwood
• Steelhead and California red-legged frog habitat

The Fire and Flood Factor
• Highly disturbed site conditions
• Substantial sediment deposits
• Emergency repair actions

ENVIRONMENTAL CONTEXT

PERMITS + AUTHORIZATIONS

- USACE – Nationwide Permit
- RWQCB – Water Quality Certification
- CDFW – Streambed Alteration Agreement
- Coastal Development Permit
- ESA Section 7 Consultation
- NHPA Section 106 Consultation
EARLY AGENCY COORDINATION

Early Outreach Goals

- Jurisdictional Delineation
- Project Design Buy-In
- Identify Preferred Mitigation

COLLABORATIVE ALTERNATIVES ANALYSIS

- Bridge
  - Environmental agency preference
  - Cost-prohibitive

- Arch Culvert
  - Proposed Project
  - Constructible and fundable
  - Natural bottom
  - Minimizes cut and fill

- Box Culvert
  - Cost-effective
  - Difficult to construct
  - Concrete bottom
THE FEMA FACTOR

FEDERAL, STATE, COUNTY, COMMUNITY RESPONSE
Eligibility Criteria
• Direct result of declared disaster
• Located within the designated disaster area
• Must be the legal responsibility of the applicant

THE FEMA FACTOR
MONTEREY COUNTY IS ELIGIBLE

Eligible Work (Categories A-G)
• Emergency Work
  A. Debris removal
  B. Emergency protective measures
• Permanent Work
  C. Roads & Bridges
  D. Water Control Facilities
  E. Buildings & Equipment
  F. Utilities
  G. Parks & Recreation Facilities

THE FEMA FACTOR
THE PROJECT IS ELIGIBLE
THE PUBLIC ASSISTANCE PROCESS

Disaster Event → Preliminary Damage Assessment → PDA → Governor’s Request → Declaration → Application’s Briefing → Submission of Request → Kick-off Meeting → Formulation of Projects (PW) → Project Review → Approval → Funding → Recipient → Close Out

THE FEMA FACTOR

CHALLENGE #1 REPLACE OR IMPROVE?

Repair or Replacement Projects – FEMA pays
- Restore to pre-disaster design, function and capacity
- Possibly upgrade necessary to meet the requirements of reasonable codes and standards

Improved Projects – County pays
- Improve above/beyond pre-disaster condition

<table>
<thead>
<tr>
<th>Agency</th>
<th>Reimbursement</th>
<th>Cost</th>
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<tr>
<td>FEMA</td>
<td>75%</td>
<td>$3.75M</td>
</tr>
<tr>
<td>State</td>
<td>18.5%</td>
<td>$925K</td>
</tr>
<tr>
<td>County</td>
<td>6.5%</td>
<td>$325K</td>
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</table>

*Based on estimated construction cost of $5M
THE FEMA FACTOR

CHALLENGE #2 OTHER DISASTERS

Hurricane Harvey, Houston (August 2017)

Hurricane Maria, Puerto Rico (September 2017)

Hurricane Irma and Jose, Florida (September 2017)

THE FEMA FACTOR

CHALLENGES

FEMA Staff Deployed to Other Disasters (July-December 2017)

Construction Complete October 31, 2018

EHP = FEMA Environmental and Historic Preservation
IT’S A GO!

DIVERTING THE CREEK
SUCCESS!

LESSONS LEARNED

**DESIGN**
- Involvement during emergency repairs
- Collaboration
  - Engineering
  - Environmental
  - Regulatory Agencies
- FEMA
- Documentation

**ENVIRONMENTAL**
- Early technical input involving all permitting agencies
  - USACE
  - RWQCB
  - CDFW
- Verify wetland delineation early
- Documentation

**FEMA**
- Understanding the process and what’s allowed
- Regulatory agency involvement for “Codes & Standards” justification
- Documentation
AFTER THE BIG SUR FIRE & FLOOD

REMOTE LOCATION  2016 SOBERANES FIRE  2016-2017 WINTER STORMS  DAMAGE/REPAIR

THANK YOU
QUESTIONS/DISCUSSION