Matilija Dam Ecosystem Restoration Project

Levees
Casitas Springs, Live Oak Acres, Meiners Oaks

Presenter: Ike Pace

October 1, 2020
Purpose

• To determine levee improvements needed to mitigate for the increased flood risk of Matilija Dam removal
  • Alternative development and selection
  • Develop construction cost estimates

• Bring levees into conformance with FEMA NFIP requirements
Scope of Services

- Meetings and Management
- Technical Studies
  - Topographic Mapping
  - River Hydraulics
  - Sediment Transport and Scour Analysis
  - Interior Drainage
  - Geotechnical Investigations and Analysis
- Alternatives Analysis
  - Concept Alternatives
  - Preferred Alternative Design Plans
  - Cost Estimates
  - Economic Analysis
  - CEQA Support

Blue Text Refers to:
Casitas Springs Levee Only
Levee Locations

• Meiners Oaks Levee
  • New Levee
  • Left Bank of River
  • 4,480 ft (0.85 mi) Long

• Live Oak Acres Levee
  • Existing Levee
  • Right Bank of River
  • 5,635 ft (1.07 mi) Long

• Casitas Springs Levee
  • Existing Levee
  • Left Bank of River
  • 5,877 ft (1.11 mi) Long
Casitas Springs Levee

Alternative Alignments

Legend

- Align A (Current Existing Alignment)
- Align B
- Align C (Under Evaluation)
Casitas Springs Levee

ALIGNMENT C

• Pros
  • Reduced Permanent and Temporary Impacts in the River
  • Restores Connectivity between Wetlands and River
  • Potentially Less Mitigation Required
  • Opportunity for Trail along Levee

• Cons
  • Relocation of Portion of Mobile Home Park
  • Requires ROW from City of Ventura and Mobile Home Park
  • Potentially Additional Earthwork and Material
Casitas Springs Levee

<table>
<thead>
<tr>
<th>Alternative / Alignment</th>
<th>Description</th>
<th>Benefit</th>
<th>Challenges/Constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>1.5H:1V Soil Cement</td>
<td>Smaller impact area. Prevents burrowing through protection.</td>
<td>Ensuring soil mixture and strength. Doesn’t meet standard USACE levee geometry requirements.</td>
</tr>
<tr>
<td>1B</td>
<td>1.5H:1V Soil Cement</td>
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</tr>
<tr>
<td>3A</td>
<td>2H:1V Grouted Stone</td>
<td>Prevents burrowing through protection. Can reuse acceptable existing rock</td>
<td>Larger impact area.</td>
</tr>
<tr>
<td>4A</td>
<td>1.5H:1V Grouted Stone</td>
<td>Prevents burrowing through protection. Can reuse acceptable existing rock</td>
<td>Would need full grout penetration and thick toe. Doesn’t meet standard USACE levee geometry requirements.</td>
</tr>
<tr>
<td>4B</td>
<td>1.5H:1V Grouted Stone</td>
<td>Prevents burrowing through protection. Can reuse acceptable existing rock</td>
<td>Would need full grout penetration and thick toe. Doesn’t meet standard USACE levee geometry requirements.</td>
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Note: Material costs and impacts are currently being evaluated for Alignment C.
Live Oak Acres Levee

Alt 1

Alt 2

Legend
- System Name: Live Oak Acres Levee System
Live Oak Acres Levee

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<tr>
<td>1</td>
<td>1.5H:1V Grouted Stone</td>
<td>Prevents burrowing through protection.</td>
<td>Would likely need full root penetration and thick toe to meet stability requirements. Doesn't meet standard USACE levee geometry requirements.</td>
</tr>
<tr>
<td>2</td>
<td>2H:1V Grouted Stone</td>
<td>Prevents burrowing through protection.</td>
<td>Larger impact area.</td>
</tr>
</tbody>
</table>
Meiners Oaks Levee

Alt 1

Alt 2

Alt 3

Alt 4

Robles Diversion

Legend
System Name
Meiners Oaks Levee System
# Meiners Oaks Levee

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<td>2H:1V Grouted Stone</td>
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<tr>
<td><strong>3</strong></td>
<td>1.5H:1V Soil Cement</td>
<td>Smaller impact area. Prevents burrowing through protection.</td>
<td>Ensuring soil mixture and strength. Doesn’t meet standard USACE levee geometry requirements.</td>
</tr>
<tr>
<td>4</td>
<td>1.5H:1V Soil Cement and Floodwall Combination</td>
<td>Smaller impact area. Prevents burrowing through protection.</td>
<td>Ensuring soil mixture and strength. Doesn’t meet standard USACE levee geometry requirements.</td>
</tr>
</tbody>
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### Meiners Oaks Levee Alternatives Qualitative Comparison

- **Lowest Cost, Smallest Impact Area**
  - Alt 4
  - Alt 3

- **Highest Cost, Largest Impact Area**
  - Alt 1
  - Alt 2

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**Estimated Construction Impact Area**

**Estimated Construction Cost**
Landslide Improvements

Landslide Improvement A
Continuation of Riverside Material onto Crown and Landside

Landslide Improvement B
Grouted Stone on Landside Slope

Landslide Improvement C
Wire Mesh

Landslide Improvement D
Raptor Perch/Owl Box
Questions