INTRODUCTIONS
KEVIN THOMPSON, CFM | CITY OF EL CAMPO, TEXAS
CINDY ENGELHARDT, PE, CFM | HALFF ASSOCIATES, INC.
ASHLEY LOWRIE, PE, CFM | HALFF ASSOCIATES, INC.

OVERVIEW
THE HISTORY
- How did we get here?
ANALYZING ALTERNATIVES
- Determining a flood mitigation solution
FINAL PRODUCT
- Construction & Current Condition
2004 Flood - Cemetery near Hwy 71/US 59 Loop in El Campo, TX

TIMELINE

ANALYZING
ALTERNATIVES

WHAT IS THE SOLUTION?
ORIGINAL SOLUTION | CHANNEL IMPROVEMENTS

ORIGINAL SOLUTION | IMPACTED STRUCTURES

CHALLENGES

ORIGINAL PROJECT
- $3.6 Million
  - 90% FEMA funded
  - 5% El Campo Cash
  - 5% Wharton County In-Kind
  - Project
  - ~1,000 feet of channel improvements

ADVANCED INFORMATION
- Field Survey
- Environmental
- Project Design
- Hydrologic and Hydraulic Analysis

CHALLENGES
- Mitigate Downstream Rise
- Low-Overtop Elevation
**FINAL SOLUTION**

**PROJECT**
- Channel improvements
  - 2 miles
  - 1.3M cubic yards
- Detention Pond
  - 55 acre pond
  - 540 acre-feet of storage
GRANT AMENDMENT | 2016-2018

PROJECT EXTENT CHANGES
- New Field Survey
- Updated Hydrology and Hydraulics
- Updated Benefit Cost Analysis
- Expanded Environmental Assessment
- New Project Design
- Property Acquisition

UPDATED GRANT
- $7 Million
  - 90% FEMA funded
  - 5% El Campo Cash
  - 5% Wharton County In-Kind (channel preparation and construction roadway)

PROJECT BENEFITS

RISK REDUCTION THROUGH EL CAMPO

<table>
<thead>
<tr>
<th>Flood Recurrence</th>
<th>Pre-Project Inundated Structures</th>
<th>Post-Project Inundated Structures</th>
<th>Structures Removed</th>
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<tbody>
<tr>
<td>10-year</td>
<td>16</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>30-year</td>
<td>32</td>
<td>18</td>
<td>16</td>
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<tr>
<td>100-year</td>
<td>90</td>
<td>58</td>
<td>32</td>
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<tr>
<td>500-year</td>
<td>264</td>
<td>270</td>
<td>75</td>
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BENEFIT COST ANALYSIS

<table>
<thead>
<tr>
<th>Category</th>
<th>Dollars</th>
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<tbody>
<tr>
<td>Total Project Benefits</td>
<td>$8,015,726</td>
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<tr>
<td>Excess of Total Project Cost</td>
<td>$7,907,751</td>
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<tr>
<td>Benefit Cost Ratio</td>
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</tr>
</tbody>
</table>

FLOOD RISK REDUCTION | REVISED / POST-PROJECT FLOODPLAIN
CONSTRUCTION | RAIN DELAYS

TROPICAL STORM BETA
- September 20-22, 2020
- ~5.5 inches in 24-hours
- ~5-year event

NEW YEARS SHOWERS
- December 30-31, 2020
- ~7.3 inches in 24-hours
- ~10-year event

SPRING SHOWERS
- April 30 – May 2, 2021
- ~7 inches in 72-hours
- ~5-year event

POST CONSTRUCTION | RECENT STORM EVENTS
QUESTIONS?

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Thanks for listening!