Flood Zone 4

MARIN COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

ADVISORY BOARD MEETING
JULY 25, 2023
Agenda

• Approval of Meeting Minutes: April 25, 2023
• Evaluation of Channel Capacity Improvements at East and West Creek
• Greenwood Bay Condominium Seawall Project
• Open Time for Items Not on the Agenda
• Next Meeting
Item 1. Approval of Meeting Minutes

Recommended Action: Approve the minutes
Item 2. Evaluation of Channel Capacity Improvement Options

East and West Creek
Background

• In 2022 Geomorph used models developed by others (in 2007/2008 and 2017) with minor adaptations to generally evaluate effectiveness of potential flood risk reduction measures for East and West Creeks.

• The Advisory Board then directed District staff to develop costs for “design alternatives” for each creek, ranging from:
  ◦ Minimum Plan (i.e., repeat channel clearing and other maintenance measures similar to status quo) to
  ◦ Maximum Plan (e.g., heavy-equipment implemented channel enlargement combined with modification or replacement of certain key roadway and utility crossing infrastructure features).
Summary of Tasks

• Task 1 – survey channels at key locations for updating the existing conditions models

• Task 2 – use updated existing conditions models to evaluate effectiveness of modifying or replacing certain roadway and utility crossings

• Task 3 – use models to develop preliminary recommended “Minimum”, “Medium”, and “Maximum” Plans for both creeks
  ➢ These are being presented to the advisory board at this meeting
## East Creek Crossing Infrastructure

<table>
<thead>
<tr>
<th>Crossing</th>
<th>Stakeholder</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greenwood Cove Dr</td>
<td>County of Marin</td>
<td>Two 60” CMP culverts slip-lined with 52” HDPE plastic pipes all or part of the approx. 280-ft-long distance from the north edge of Greenwood Cove Drive to outfall in Richardson Bay</td>
</tr>
<tr>
<td>SR 131 (Tiburon Blvd)</td>
<td>Caltrans</td>
<td>Two approx. 120-ft-long 66” RCP culverts extending from the vertical concrete headwall at north edge of Tiburon Blvd to two 36” RCP risers between Tiburon Blvd and Greenwood Cove Drive</td>
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<tr>
<td>Grouted Rock Channel</td>
<td>Richardson Bay Sanitary District (RBSD)</td>
<td>Approx. 180-ft-long grouted rock rip-rap lined channel transitioning from the grouted section at the overhead sewer crossing downstream to the Tiburon Blvd culvert headwall</td>
</tr>
<tr>
<td>Sanitary Sewer Crossing</td>
<td>RBSD</td>
<td>Overhead sewer pipeline crossing with narrow, elevated grouted rock channel section (4.7’ invert)</td>
</tr>
<tr>
<td>Cecilia Way</td>
<td>Town of Tiburon</td>
<td>Approx. 30-ft-long 5’x10’ concrete box culvert (6.9’ culvert invert) with approx. 25-ft-long 10-ft-wide open concrete rectangular channel transition upstream and overhead sanitary sewer pipe crossing</td>
</tr>
</tbody>
</table>
Lower East Creek

Looking downstream to the original double-barrel 60” CMPs outfalling in Richardson Bay

January 19, 2023
Lower East Creek

Another view of the East Creek culvert outfalls in Richardson Bay. The original double-barrel 60” CMPs appear to have been slip-lined with 52” HDPE plastic pipe culverts

January 19, 2023
Lower East Creek

Looking downstream from right bank of the grouted rock channel to the vertical concrete headwall inlet to the State Route 131 66” RCP “double-barrel”

December 16, 2022
Lower East Creek

Looking downstream to Lower East Creek. The grouted rock-lined channel extends from the sanitary sewer crossing to the State Route 131 “double-barrel” culverts headwall seen in background of view.

December 16, 2022
Lower East Creek

Looking from left bank to right bank along the sanitary sewer crossing and narrow grouted rock channel with 4.7’ invert on the pipeline section

December 16, 2022
Upper East Creek

Looking downstream from inlet to the 10-ft-wide open concrete box culvert and overhead sanitary sewer pipe crossing to 5’x10’ Cecilia Way concrete box culvert downstream in background of view

August 3, 2022
Upper East Creek

Looking upstream to the outlet of Cecilia Way culvert. This is the maintained condition following sediment removal completed in October 2022.

*December 16, 2022*
Upper East Creek

Looking upstream to the outlet of culverts originating at or upstream from Karen Way. This is the maintained condition.

December 16, 2022
East Creek Minimum Plan

• Status Quo

• District continues current program of periodic as needed vegetation and sediment removal
  ➢ Accessible
  ➢ Permitted
  ➢ Similar to current Zone maintenance costs
  ➢ Benefits are not sustainable

*Preliminary estimate, for planning purposes only

$45k*
East Creek Medium Plan

• Extend sediment removal about 250 feet downstream of current permitted maintenance limit
  ➢ Challenging access
  ➢ Needs additional permits
  ➢ Increase in one-time expense, but may reduce ongoing maintenance cost
  ➢ Benefits are likely more sustainable

• Option to restore top of bank barrier along Leland Way

*Preliminary estimate, for planning purposes only

• $744k*
East Creek Maximum Plan

Medium plan plus potential crossing modifications at:
• Culverts under Tiburon Blvd and Greenwood Cove Dr
• Sanitary Sewer Crossing
• Cecilia Way Culvert

➢ Zone 4 only has right-of-way for the culverts under Greenwood Cove Dr

*Preliminary estimate, for planning purposes only
### Model-Computed 50-Year Water Surface Elevations at Floodprone Locations

(Red numbers indicate potential inundation.)

<table>
<thead>
<tr>
<th>Plan</th>
<th>Scenario</th>
<th>#1 Replace 52” Culverts</th>
<th>#2 Modify SS Xing &amp; Channel Inlet</th>
<th>#3 Replace Cecilia Way Culvert</th>
<th>50-yr WSE at Station 8+16’ (CS 17) (“Levee” 12.28) (ft)</th>
<th>50-yr WSE at Station 8+81’ (CS 18) (“Levee” 12.01) (ft)</th>
<th>50-yr WSE at Station 9+40’ (CS 19) (“Levee” 12.07) (ft)</th>
<th>50-yr WSE at Station 11+86’ (CS 23) (“Levee” 13.02) (ft)</th>
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<tbody>
<tr>
<td>28</td>
<td>New Exist Cond ¹</td>
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## West Creek Crossing Infrastructure

<table>
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<tbody>
<tr>
<td>SR 131 (Tiburon Blvd)</td>
<td>Caltrans</td>
<td>Two approx. 180-ft-long 60” CMP culverts extending from the vertical concrete headwall at north edge of Tiburon Blvd to constructed natural open channel downstream from Tiburon Blvd</td>
</tr>
<tr>
<td>Cecilia Way</td>
<td>Town of Tiburon</td>
<td>Approx. 50-ft-long 5.3’x11.4’ concrete box culvert (5.4’ culvert invert) with narrow natural channel transitioning into culvert inlet</td>
</tr>
</tbody>
</table>
Looking from left bank to outlet of two 60” CMP culverts (in foreground) outfalling to open natural channel downstream from Tiburon Boulevard

August 3, 2022
Lower West Creek

Looking upstream at the broken concrete rubble covered channel bed

August 17, 2022
Lower West Creek

Looking upstream to outlet of the Cecilia Way 5.3’x11.4’ concrete box culvert. Note there is about 2-3 ft of fine sediment deposited within the downstream part of the culvert but much less sediment deposited in the upstream part of the culvert.

August 17, 2022
Upper West Creek

Looking downstream to the grade-controlling channel-spanning concrete stormwater outfall forming a headcut-step

January 19, 2023
Upper West Creek

Looking downstream to the lightweight foreign rubble deposited upstream from the rubble covered channel bed downstream, and evidence of recent natural tendency channel bed downcutting limited by coarse foreign material on the bed.

August 17, 2022
Upper West Creek

Looking upstream to 46”-diameter eucalyptus. Tree was topped approximately 10 years ago. Model simulations show that removal of this tree reduces the computed 50-year flood water surface elevation by 0.4’

August 17, 2022
West Creek Minimum Plan

• Remove rock and broken concrete rubble from channel
  ➢ No tree removal
  ➢ Naturalize the creek
  ➢ Need additional permits

*Preliminary estimate, for planning purposes only

• $365k
West Creek Medium Plan

• Remove rock and broken concrete rubble from channel
• Remove concrete stormwater outfall
• Remove certain non-native in-channel trees and stumps
• Stabilize banks to enlarge channel where trees were removed
  ➢ Requires heavy equipment
  ➢ Requires environmental mitigation

*Preliminary estimate, for planning purposes only

• $1M+*
West Creek Maximum Plan

Medium plan plus potential crossing modifications at:
• Tiburon Blvd
• Cecilia Way

Zone 4 does not have the right-of-way to implement these infrastructure modification projects

*Preliminary estimate, for planning purposes only

• $7M+*
# Model-Computed 50-Year Water Surface Elevations at Floodprone Locations

*Red numbers indicate potential inundation.*

<table>
<thead>
<tr>
<th>Scenario</th>
<th>50-yr WSE at Station 5 + 54' (XS-23) (ft)</th>
<th>50-yr WSE at Station 8 + 19' (CS 59) (ft)</th>
<th>50-yr WSE at Station 10 + 40' (CS 66) (ft)</th>
<th>50-yr WSE at Station 11 + 03' (CS 68) (ft)</th>
<th>50-yr WSE at Station 12 + 23' (CS 72) (ft)</th>
<th>50-yr WSE at Station 13 + 28' (XS-6) (ft)</th>
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Item 3. Greenwood Bay Condominiums Seawall Project

The Greenwood Bay HOA will have an opportunity to share information about this project with the Advisory Board.
Item 4. Open Time

• Comments will be heard for items not on the agenda.
• Limited to three minutes per speaker.
• When written testimony is presented, it is not necessary to read the entire text; it will automatically become part of the minutes.
• All are expected to be polite and courteous, and refrain from questioning the character or motives of others. Please help create an atmosphere of respect.
Item 5. Next Meeting

October 24, 2023

Additional special meetings may be called if needed.