

Photograph 4 in Attachment A.

Although a full geotechnical and structural evaluation has not been performed, we can offer the following general observations about the bulkhead wall at Lower Castaways:

- The wall and its concrete cap appear to be displaying significant signs of wear and structural distress. In particular, the wall shows horizontal cracking along its tallest section, at a height that seems to correspond to where outward bending may be emerging.
- The relatively large cracking and spalling evident in the wall and cap at locations B and C may imply a combination of age (weathering over time) and stress effects (cracking in response to applied forces).

Based on these observations, we believe that this wall is reaching, or has reached, the end of its usable service life. Although we did not see evidence that the wall is in incipient danger of failure or collapse, the wall appears unstable and it may be further significantly weakened if an earthquake were to occur. We do not consider it to be a reliable structure for site use and development..

The City's plans for this wall would be dependent on plans for the adjoining land space. If the area remains vacant, unoccupied, and off-limits to the public, then the City should continue to monitor the wall visually on an annual basis to see if there is evidence of the cracks growing. The City should recognize that damage could occur during an earthquake.

If the City wishes instead to use or improve the parcel, then we recommend designing and installing a new wall. A reasonable and potentially cost-effective option would be to install a new wall face in front of the old one and fill in (grout) the space between. General order-of-magnitude cost for a new sheetpile wall installed in this fashion would likely range from approximately \$500,000 to \$1 million.

ATTACHMENT A
PHOTOGRAPHS



Photograph 1. Northern stretch of wall, showing horizontal cracking on the face.



Photograph 2. Cracking in wall cap.



Photograph 3. Spalling and cracking at wall outer corner.



Photograph 4. Southern stretch of wall.

FIGURE



SOURCE: Aerial image from Google Earth.
HORIZONTAL DATUM: California State Plane Zone 6,
NAD83, U.S. Feet.

