

MEMORANDUM

То:	Chris Miller, City of Newport Beach	Date:	August 12, 2013
From:	Michael Whelan, P.E., Anchor QEA, L.P.		
Re:	Observations of Overall Conditions of Existing Bulkhead at Lower Castaways,		
	Newport Beach, California		

This memorandum presents a summary of our observations of overall bulkhead conditions at the Lower Castaways lot in Newport Beach, California.

We observed the wall while walking the site at a relatively low tidal stage on July 25, 2013. The wall length is approximately 300 feet and is comprised of 6-foot-wide concrete panels with thin vertical seams between each panel. The wall face height is approximately 12 feet along its northern stretch, and gradually tapers down to approximately 5 feet at its southern end, following a general trend of the upland land elevation dropping very gradually toward the south. A reinforced concrete cap runs along the top of the bulkhead wall. We did not see any "weep holes" in the wall panels (intended to allow water to flow out from behind the wall, rather than building up behind it and imposing additional pressures). Land behind the wall is vacant and used only for occasional City of Newport Beach (City) storage and staging purposes. The bulkhead itself is not accessible to the public, and the shoreline is reachable only from the water.

We made the following general observations about the wall condition:

- The northern stretch of wall (labeled "A" on Figure 1) features one or more cracks running horizontally about 3 feet above the mudline in front of the wall. These cracks may reflect forces related to bending. See Photograph 1 in Attachment A.
- At the area labeled "B" on Figure 1, the wall cap is cracked horizontally. See Photograph 2 in Attachment A.
- There appears to be extensive concrete spalling at the outer corner of the wall angle (labeled "C" on Figure 1). See Photograph 3 in Attachment A.
- The southern stretch of wall (labeled "D" on Figure 1) is shorter (5 feet high) and generally shows less indication of wear and damage than the other locations. See

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



Aug 12, 2013 8:37am ghowell

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



Figure 1 Site Plan Castaways Bulkhead Newport Beach, CA

