



**US Army Corps  
of Engineers.**  
Los Angeles District



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**BALLONA CREEK 4 LEVEE SYSTEM**  
**LOS ANGELES COUNTY, CALIFORNIA**  
**NLD SYSTEM ID # 3805010045**

**PERIODIC INSPECTION REPORT NO 1**  
**GENERALIZED EXECUTIVE SUMMARY**

**FINAL SYSTEM RATING: MINIMALLY ACCEPTABLE**  
**FINAL RATING DATE: DECEMBER 9, 2014**

PERIODIC INSPECTION REPORT PREPARED BY THE  
U.S. ARMY CORPS OF ENGINEERS, SAN FRANCISCO DISTRICT

SUBMITTED: NOVEMBER 2013  
INSPECTED: MARCH 19-21, 2013

## EXECUTIVE SUMMARY

This Executive Summary provides an introduction to the Ballona Creek 4 (BC4) Levee System Periodic Inspection Report No. 1, an overview of the system, a summary of the major findings of the periodic inspection, and the overall rating for the system.

### 1.1 Scope and Purpose of Periodic Inspections

The purpose of this levee system periodic inspection is to identify deficiencies that pose hazards to human life or property. The inspection is intended to identify the issues in order to facilitate future studies and associated repairs, as appropriate.

This assessment of the general condition of the levee system is based on available data and visual inspections. Detailed investigation and analysis involving hydrologic design, topographic mapping, subsurface investigations, testing, and detailed computational evaluations is beyond the scope of this levee system inspection.

### 1.2 System Summary

The BC4 Levee System is located in the City of Los Angeles in Los Angeles County, California. The levee length, as scoped, consisted of Segment 4a, maintained by the Los Angeles County Department of Public Works (LACDPW), and Segment 4b, maintained by the Corps of Engineers. During the inspection, it was found that all of Segment 4b and part of Segment 4a were channels with no levee prism. The total length of the system is approximately 2.63 miles, not including the channel reaches. The BC4 Levee System runs along the left bank of Ballona Creek between the Centinela Creek confluence at Station 118+10 to Overland Avenue at approximately Station 257+20. Figure 1 shows the extent of the levee system. Note that a levee does not exist along the reach upstream of the Overland Avenue, therefore, the upper reach of the original BC4a Segment and the BC4b Segment have been removed from the BC4 Levee System, and are thus not discussed in the main body of the periodic inspection report.

The BC4 Levee System downstream of Centinela Avenue bridge at Station 159+44.18 consists of a “soft” or earthen bottom trapezoidal channel with stone revetment on the lower part of the bank, and reinforced concrete revetment on the upper part of the bank where the levee had been raised. The bottom of the channel upstream of the Centinela Avenue bridge crossing is concrete. The BC4 Levee System transitions from a trapezoidal channel to a concrete U-wall channel with side slopes at the top of each bank between Station 301+50 and 304+00. It is a rectangular channel upstream from Station 304+00. According to the as-built drawings, the BC4 Levee System consists of 5 side drainage structures and 8 bridge crossings.

The BC4 Levee System, along with other similar works in the Los Angeles County Drainage Area (LACDA), was authorized initially by the Emergency Relief Act of 1935 to provide drainage and flood control. On 30 June 1937 it was transferred to the more comprehensive project adopted in the Flood Control Act of 22 June 1936. The Flood Control Acts approved 22 June 1936 and 15 May 1937, authorized the construction of reservoirs and channel improvements on the Los Angeles and San Gabriel rivers and Ballona Creek, and tributaries thereof. The Flood Control Act approved 18 August 1941, approved the general comprehensive plan for flood control and other purposes in the basins of these streams.

### 1.3 Summary of Major Deficiencies Found and Subsequent Repairs

The levee system was inspected on 19 through 21 March 2013. During the periodic inspection of the system, several deficiencies were noted for which remedial actions are required. The corroded corrugated metal pipe (CMP) at Station 213+00 just downstream of the Sawtelle Boulevard bridge was critically unacceptable. The Los Angeles County Department of Public Works (LACDPW) has since made repairs to:

- the 18-inch diameter CMP at Station 213+00 and the caved-in stone revetment just downhill of the pipe;
- the 30-inch diameter CMP at Station 223+50; and
- the 24-inch diameter CMP at Station 232+87.

These deficiencies and repairs are further discussed under item 9, Interior Drainage System checklist in Appendix III of the Periodic Inspection Report. Photos and e-mails documented completion of the repairs, and were provided by 11 September 2013.

Other major deficiencies that were noted during the periodic inspection of the project features are:

- non-compliant vegetation growth;
- encroachments that prevent proper inspection of the landside slope (e.g. fence) and/or negatively impact the integrity of the levee (e.g. culverts);
- unknown condition of the culvert penetrations (i.e. internal inspection has not been performed);
- elevations for the levee system have not been re-evaluated based on guidance provided in *ER 1110-2-8160*. The levee crest elevations could not be directly compared to the as-built elevations to assess settlement and capacity (with respect to top of system elevation);
- depression observed in the stone revetment near the downstream end of the levee system;
- crack longitudinal to the levee was observed approximately ¼ way up from the toe of the bank. The crack propagated through both wing walls of the drainage structure at approximately Station 227+70 and had a vertical offset of ¾" at Station 229+50; and
- spalling and cracking was observed in the reinforced concrete revetment on the waterside levee slope.

### 1.4 Overall Rating

The Levee Safety Out-Brief Meeting was held 23 July 2013. The BC4 Levee System is rated "Minimally Acceptable". A "Minimally Acceptable" system rating is defined as:

*One or more items are rated as Minimally Acceptable or one or more items are rated as Unacceptable and an engineering determination concludes that the Unacceptable items would not prevent the segment/ system from performing as intended during the next significant runoff event.*

The local sponsors will be notified of the overall rating of the levee system by letter with instructions to correct the "Unacceptable" rated items as soon as possible, not to exceed two years,

and to correct the “Minimally Acceptable” rated items so that they do not deteriorate further and become “Unacceptable”.

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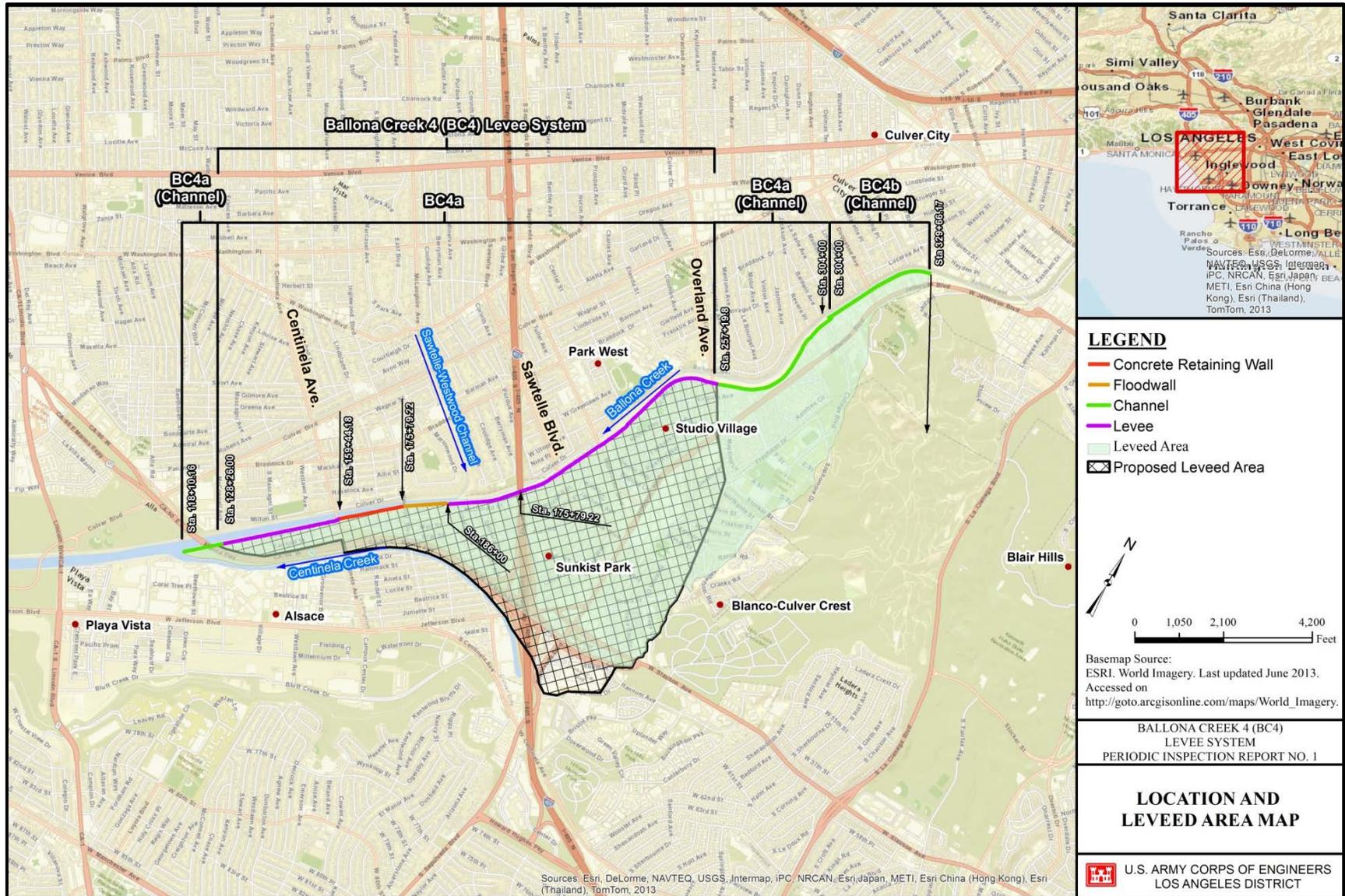


Figure 1: Ballona Creek 4 Levee System