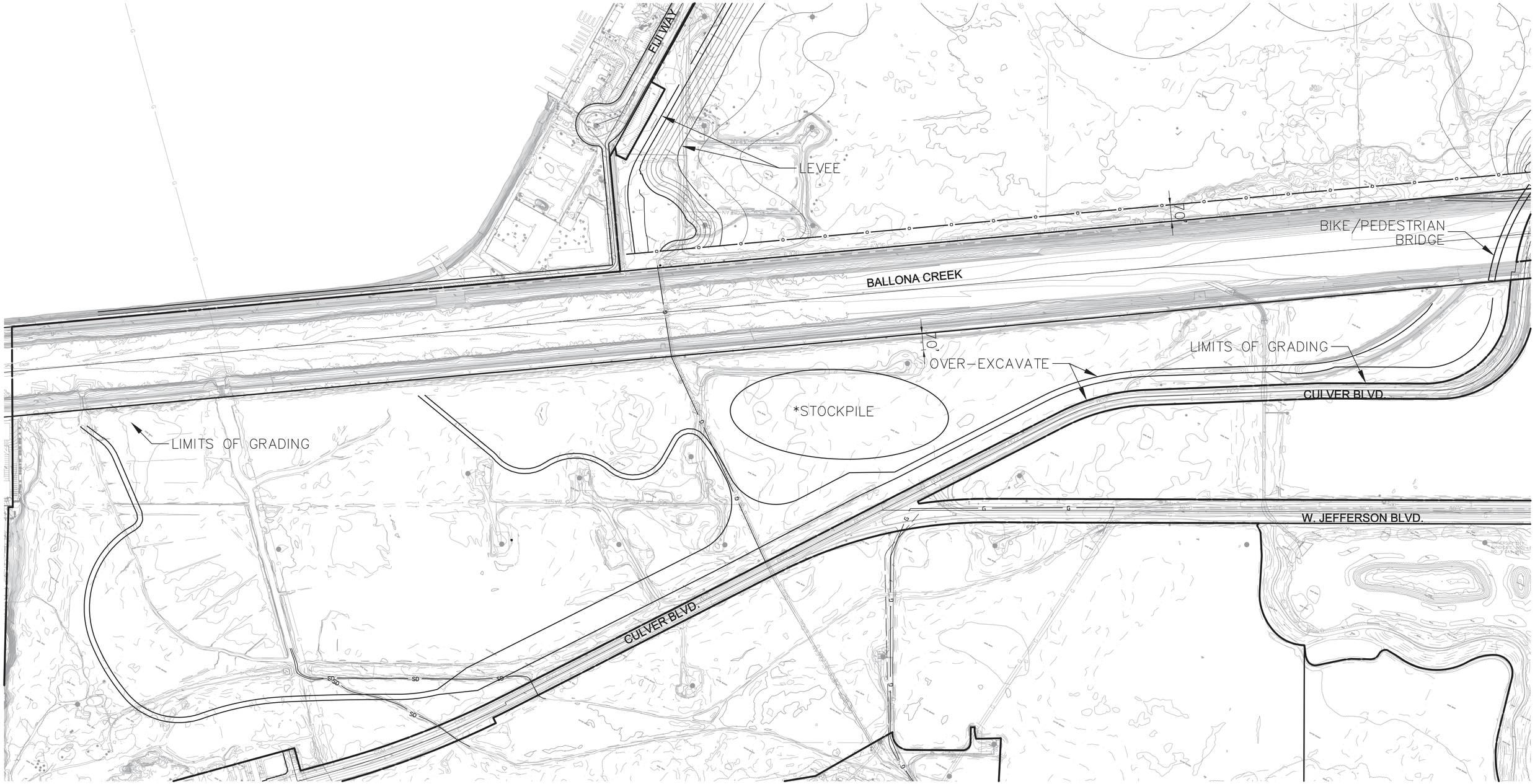

LEGEND

LIMITS OF GRADING

NOTE:

*STOCKPILE LOCATION TO BE DETERMINED

200' 100' 0' 200' 400'

GRAPHIC SCALE

Note: For reduced sized prints, original scale is in inches

REVIEWED LAND DEVELOPMENT DIVISION

BY _____

SUBDIVISION PLAN CHECKING SECTION DATE

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REGISTERED PROFESSIONAL ENGINEER MICHAEL J. O'BRIEN No. C48944 Exp. 09-30-14 CIVIL STATE OF CALIFORNIA

PROJECT ENGINEER DATE

AREA "B" NORTH
OVER-EXCAVATE LEVEE AND STOCKPILE

T.G.: PAGE

CONSTRUCTION SEQUENCING #14
EXHIBIT

COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS

PLANS PREPARED BY:

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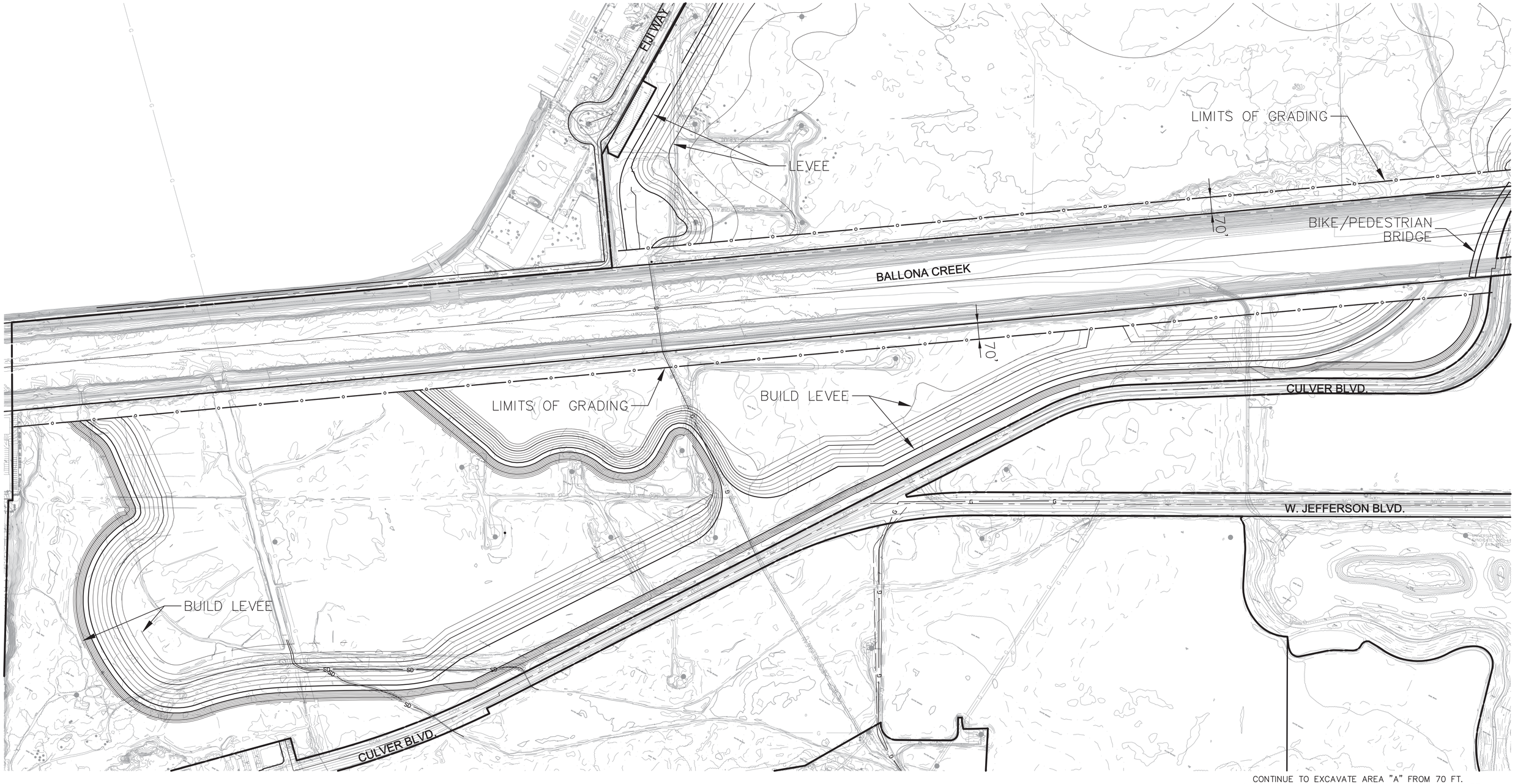
BALLONA WETLANDS ECOLOGICAL RESERVE

SHEET 14 OF 32

B1-1501



LEGEND

——— o ——— LIMITS OF GRADING

NOTE: IF 12A OCCURS AND WELLS ARE TO REMAIN, GRADING AS SHOWN. IF 12B OCCURS AND WELLS ARE REMOVED, AREA AROUND WELLS MAY BE GRADED.

CONTINUE TO EXCAVATE AREA "A" FROM 70 FT.
MOVE DIRT ACROSS BIKE BRIDGE & BUILD SOUTH LEVEE

CONSTRUCT AREA "B" LEVEE

T.G.: PAGE

200' 100' 0' 200' 400'

GRAPHIC SCALE

Note: For reduced sized prints, original scale is in inches

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BY _____ SUBDIVISION PLAN CHECKING SECTION DATE

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REGISTERED PROFESSIONAL ENGINEER
MICHAEL J. CHEHAK
No. C48944
Exp. 09-30-14
CIVIL
STATE OF CALIFORNIA

PROJECT ENGINEER DATE

CONSTRUCTION SEQUENCING #15 EXHIBIT

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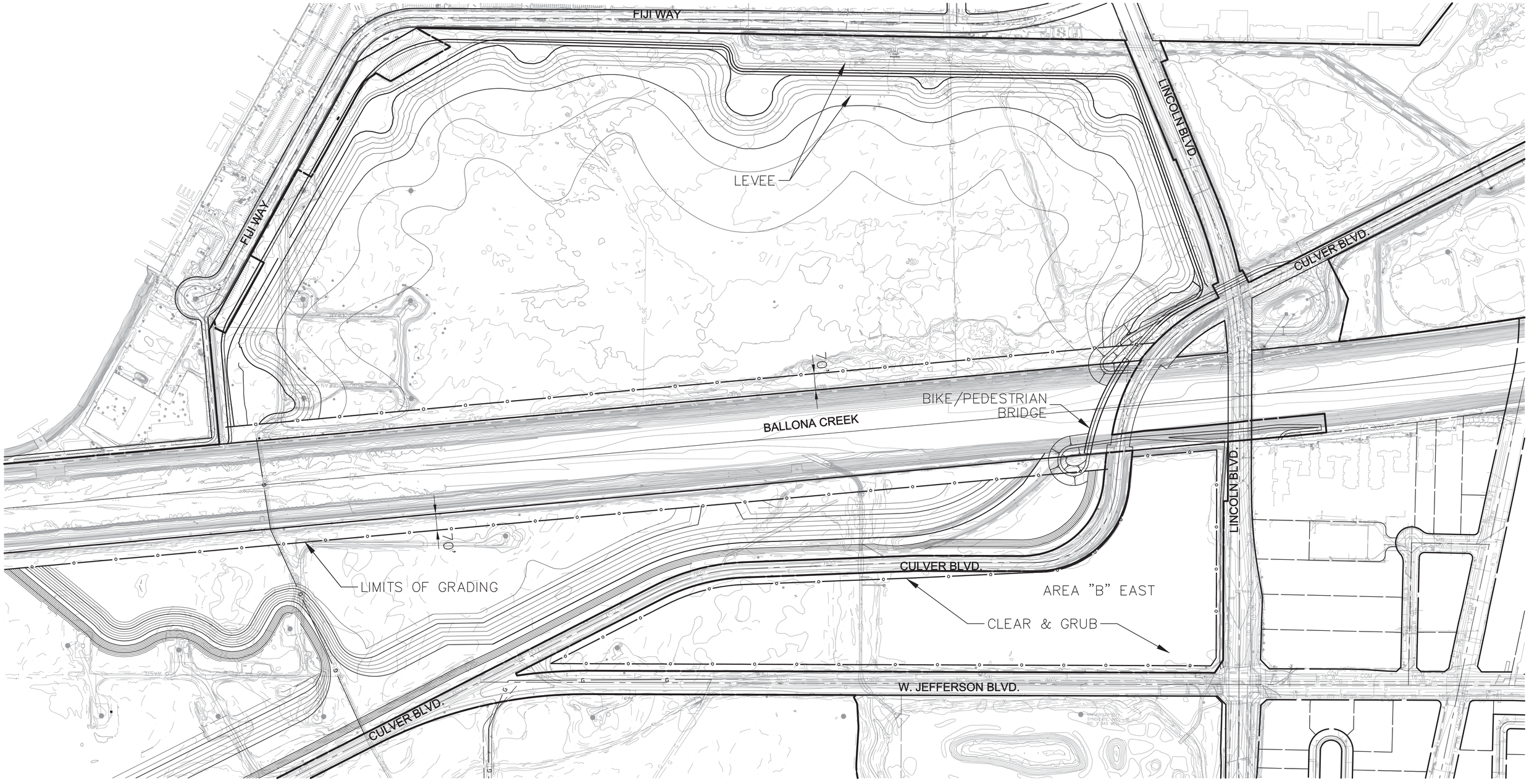
BALLONA WETLANDS ECOLOGICAL RESERVE

SHEET 15 OF 32

B1-1502



LEGEND

LIMITS OF GRADING

CLEAR & GRUB AREA "B" EAST

T.G.: PAGE

200' 100' 0' 200' 400'

GRAPHIC SCALE

Note: For reduced sized prints, original scale is in inches

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BY _____ SUBDIVISION PLAN CHECKING SECTION DATE

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CONSTRUCTION SEQUENCING #16 EXHIBIT

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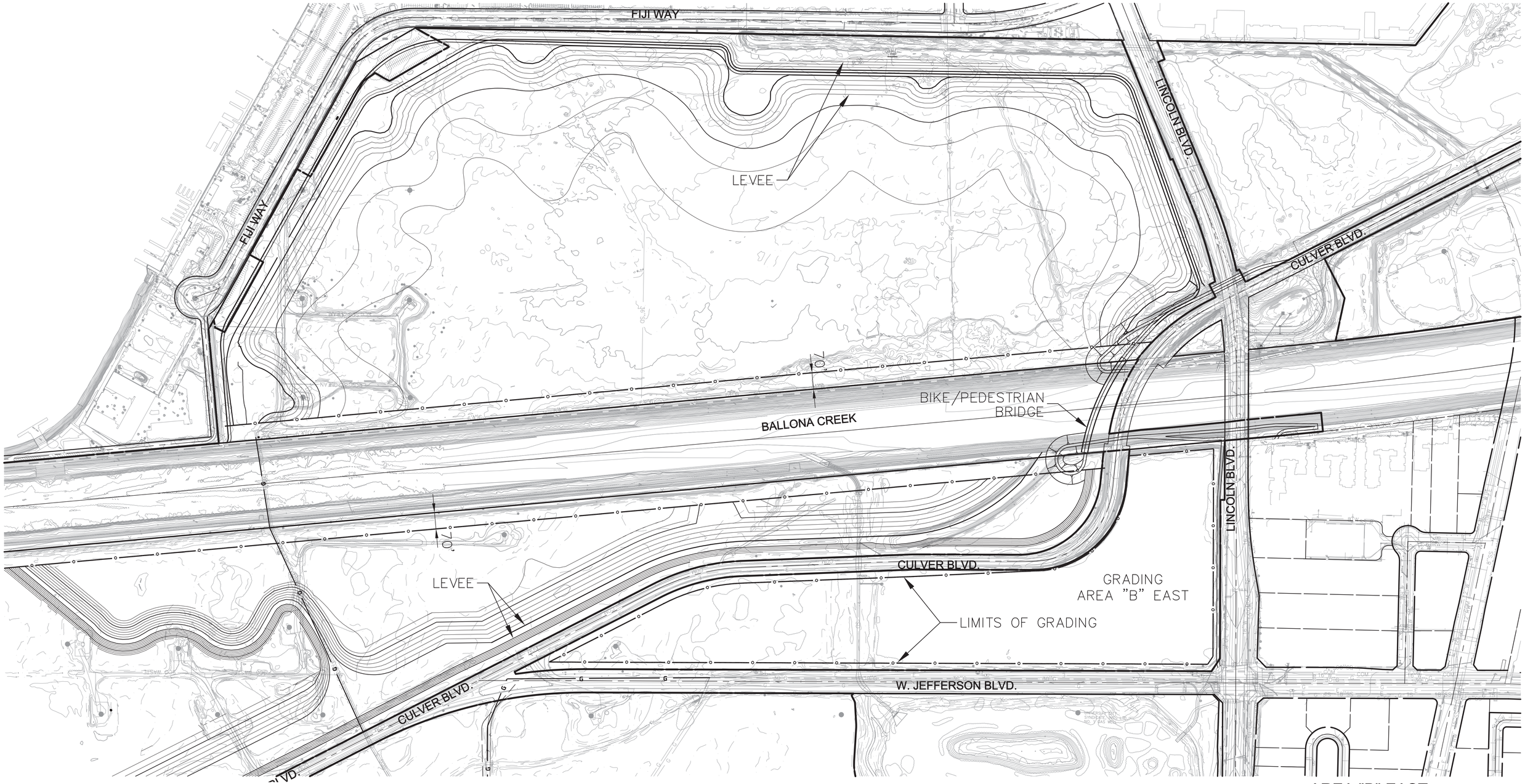
BALLONA WETLANDS ECOLOGICAL RESERVE

SHEET 16 OF 32

B1-1503



LEGEND

LIMITS OF GRADING

AREA "B" EAST GRADING

T.G.: PAGE

200' 100' 0' 200' 400'

GRAPHIC SCALE

Note: For reduced sized prints, original scale is in inches

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STATE OF CALIFORNIA

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CONSTRUCTION SEQUENCING #17
EXHIBIT

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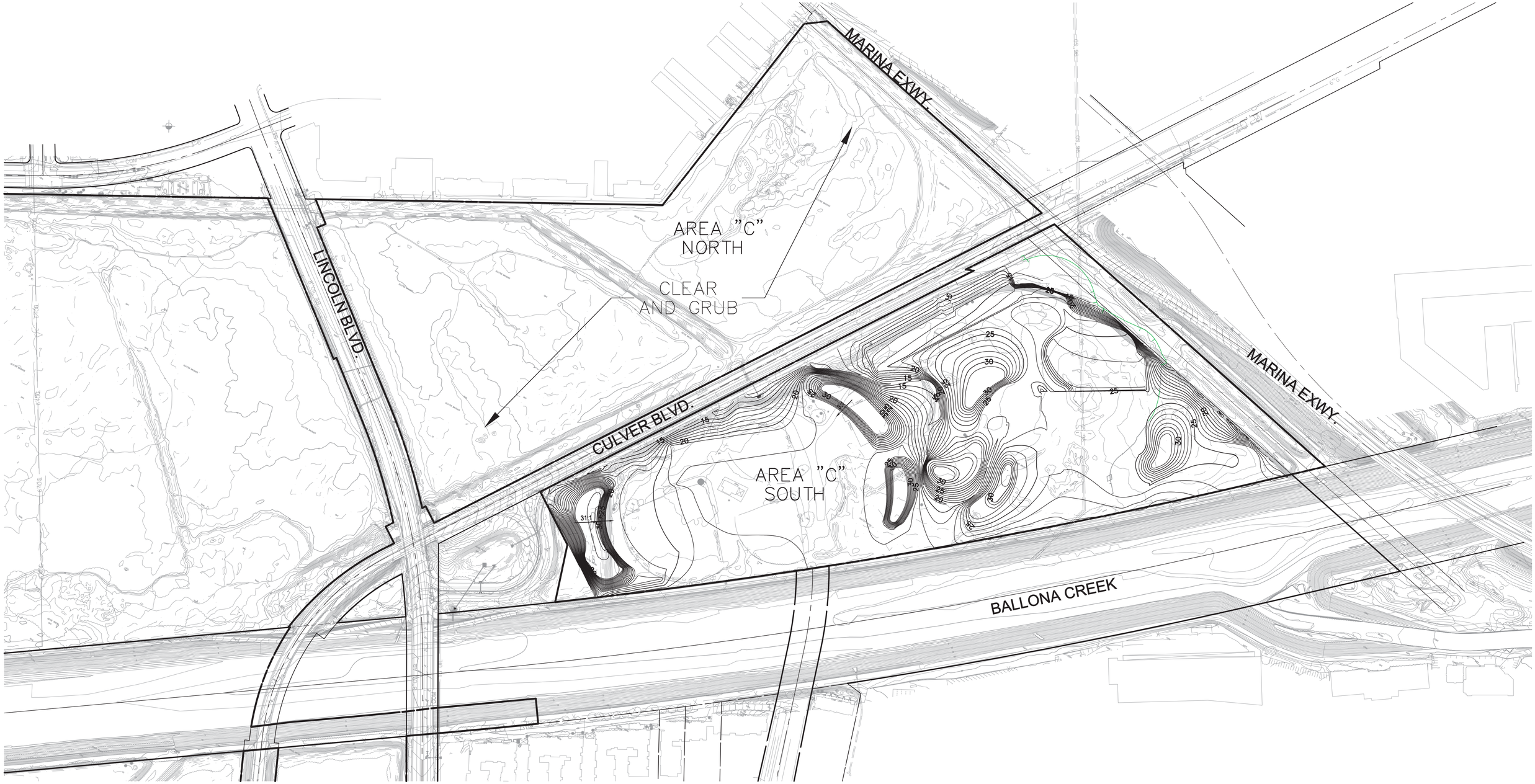
BALLONA WETLANDS ECOLOGICAL RESERVE

SHEET 17 OF 32

B1-1504



CLEAR AND GRUB AREA "C" NORTH

T.G.: PAGE

CONSTRUCTION SEQUENCING #18 EXHIBIT

COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS

GRAPHIC SCALE
200' 100' 0' 200' 400'
Note: For reduced sized prints, original scale is in inches

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MICHAEL J. CHEHAK
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Exp. 09-30-14
CIVIL
STATE OF CALIFORNIA

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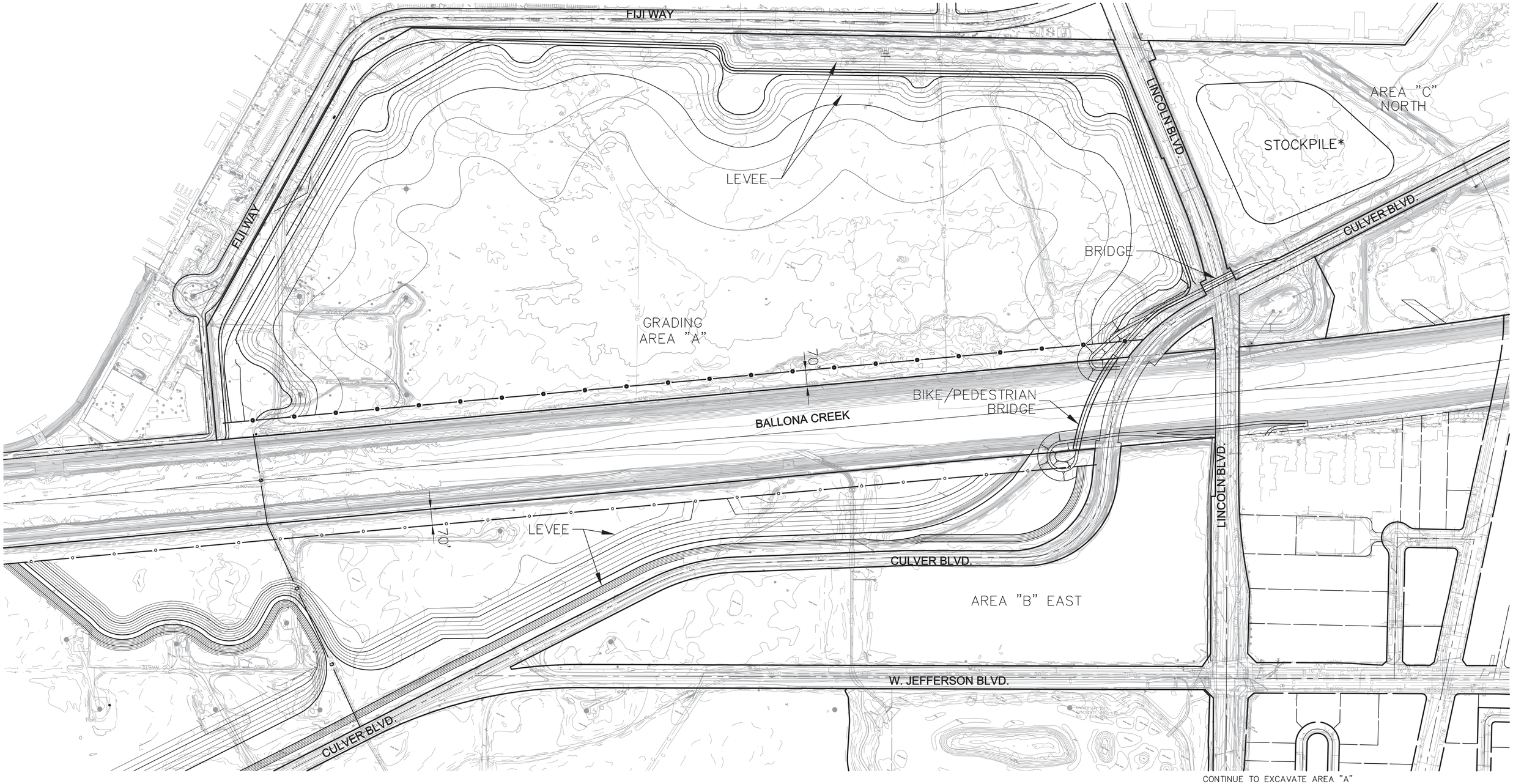
BALLONA WETLANDS ECOLOGICAL RESERVE

SHEET 18 OF 32

B1-1505



LEGEND

——— o ——— LIMITS OF GRADING

*SPECIFIC GRADING TO BE DETERMINED

CONTINUE TO EXCAVATE AREA "A"
MOVE DIRT ACROSS TEMPORARY BRIDGE TO AREA "C" NORTH

AREA "A" GRADING AND EXPORT TO AREA "C" NORTH

T.G.: PAGE

200' 100' 0' 200' 400'
GRAPHIC SCALE
Note: For reduced sized prints, original scale is in inches

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MICHAEL J. O'BRIAN
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CONSTRUCTION SEQUENCING #19
EXHIBIT

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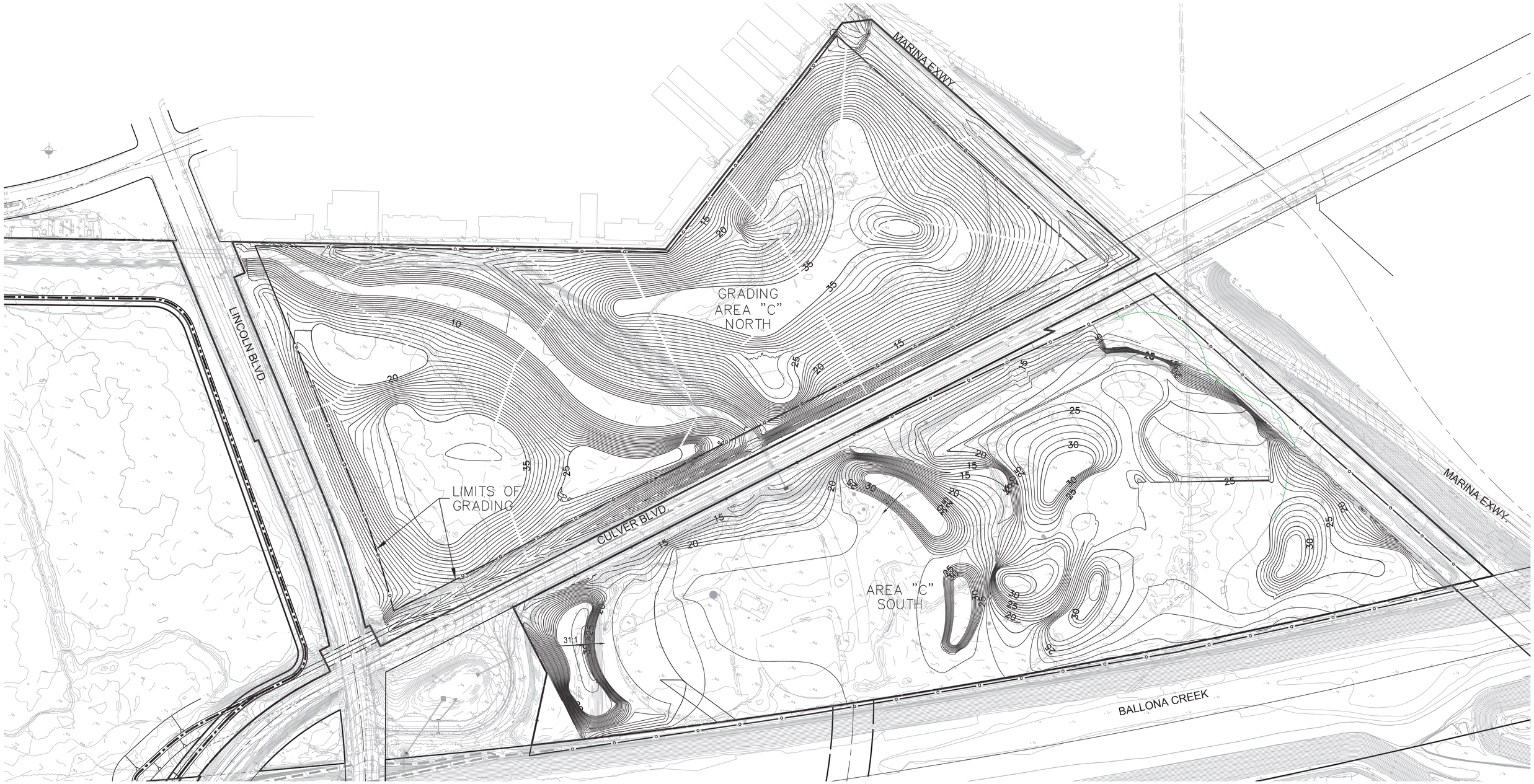
BALLONA WETLANDS ECOLOGICAL RESERVE | SHEET 19 OF 32

B1-1506



LEGEND

LIMITS OF GRADING

NOTE: GRADING TO BE DETERMINED

120' 60' 0' 120' 240'

GRAPHIC SCALE

Note: For reduced sized prints, original scale is in inches

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REGISTERED PROFESSIONAL ENGINEER
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No. C48944
Exp. 09-30-14
CIVIL
STATE OF CALIFORNIA

PROJECT ENGINEER DATE

FINISH GRADING FOR UPLANDS AREA "C" NORTH

T.G.: PAGE

CONSTRUCTION SEQUENCING #20 EXHIBIT

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BALLONA WETLANDS ECOLOGICAL RESERVE

B1-1507

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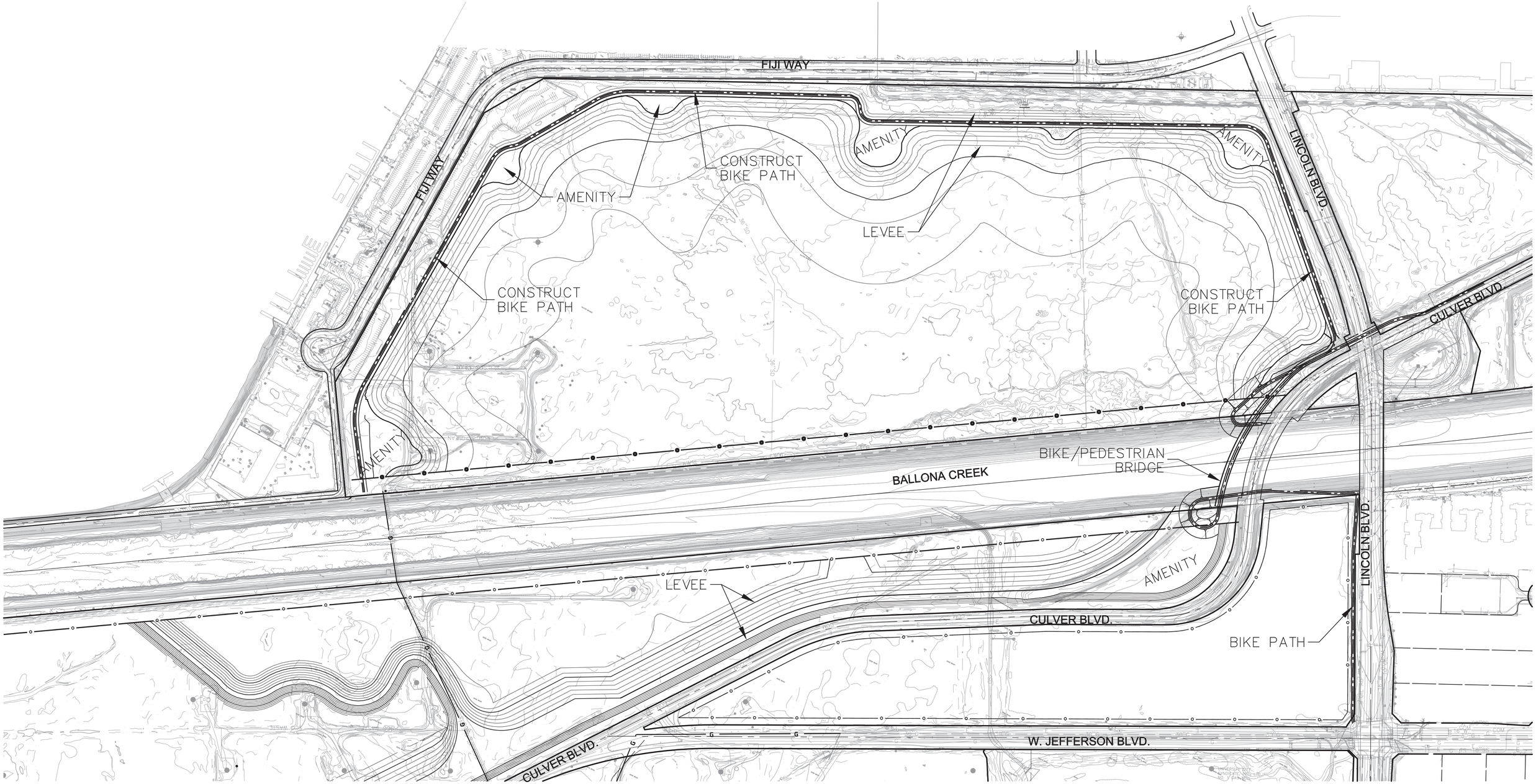

LEGEND

EXISTING BIKE PATH/LANE

PROPOSED BIKE PATH

BIKE PATH, PEDESTRIAN WALK, AND AMENITIES

T.G.: PAGE

200' 100' 0' 200' 400'

GRAPHIC SCALE

Note: For reduced sized prints, original scale is in inches

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No. C48944
Exp. 09-30-14
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STATE OF CALIFORNIA

PROJECT ENGINEER DATE

CONSTRUCTION SEQUENCING #21
EXHIBIT

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BALLONA WETLANDS ECOLOGICAL RESERVE

SHEET 21 OF 32

B1-1508

BALLONA CREEK

REMOVE EXISTING
PIPE & OUTLET

CULVER BLVD.

CONSTRUCT
OUTLET

BOX CULVERT

W. JEFFERSON BLVD.

BOX CULVERT

CULVER BLVD.

AREA "B"
BOX CULVERTS

T.G.: PAGE

150' 75' 0' 150' 300'

GRAPHIC SCALE

Note: For reduced sized prints, original scale is in inches

REVIEWED LAND DEVELOPMENT DIVISION

BY _____

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STATE OF CALIFORNIA

PROJECT ENGINEER DATE

CONSTRUCTION SEQUENCING #22
EXHIBIT

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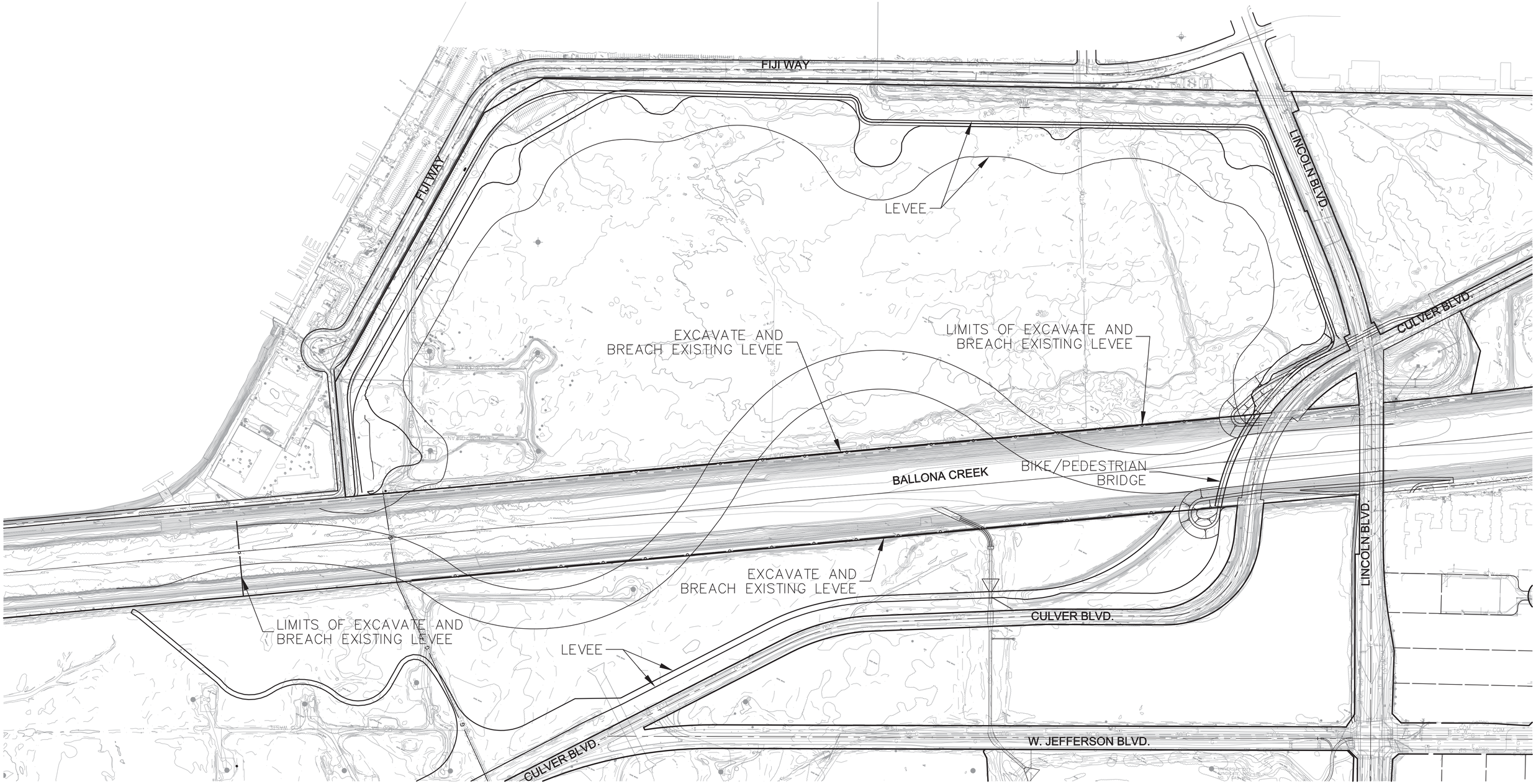
BALLONA WETLANDS ECOLOGICAL RESERVE

SHEET 22 OF 32

B1-1509



LEGEND

LIMITS OF EXCAVATION

AREA "A AND AREA "B" NORTH
EXCAVATE AND BREACH EXISTING LEVEES

T.G.: PAGE

200' 100' 0' 200' 400'

GRAPHIC SCALE

Note: For reduced sized prints, original scale is in inches

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MICHAEL J. ORSHAN
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Exp. 09-30-14
CIVIL
STATE OF CALIFORNIA

PROJECT ENGINEER DATE

CONSTRUCTION SEQUENCING #23
EXHIBIT

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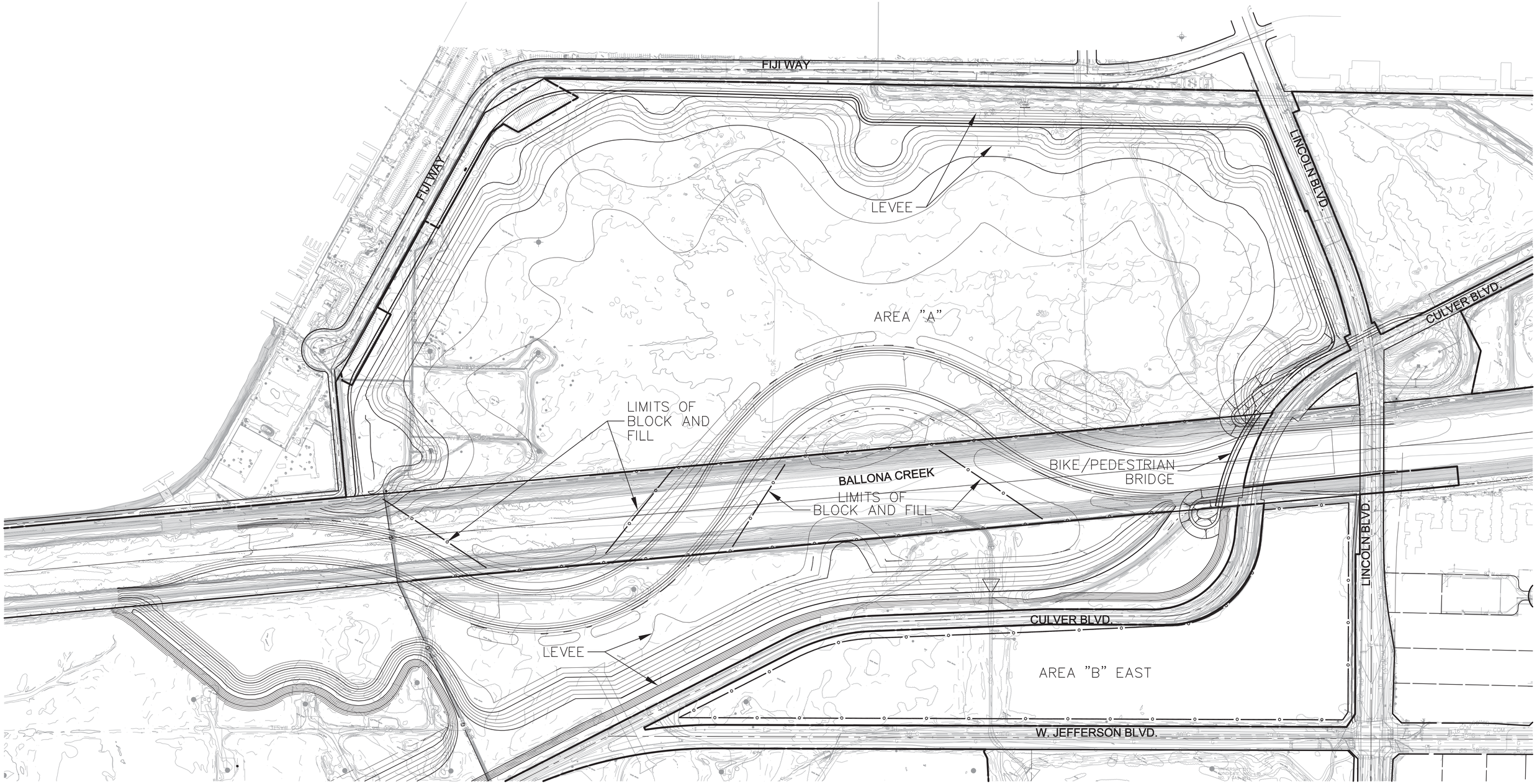
BALLONA WETLANDS ECOLOGICAL RESERVE

SHEET 23 OF 32

B1-1510



LEGEND

LIMITS OF GRADING

AREA "A" AND AREA "B" NORTH BLOCK AND FILL EXISTING LEVEES

T.G.: PAGE

CONSTRUCTION SEQUENCING #24 EXHIBIT

COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS

200' 100' 0' 200' 400'

GRAPHIC SCALE

Note: For reduced sized prints, original scale is in inches

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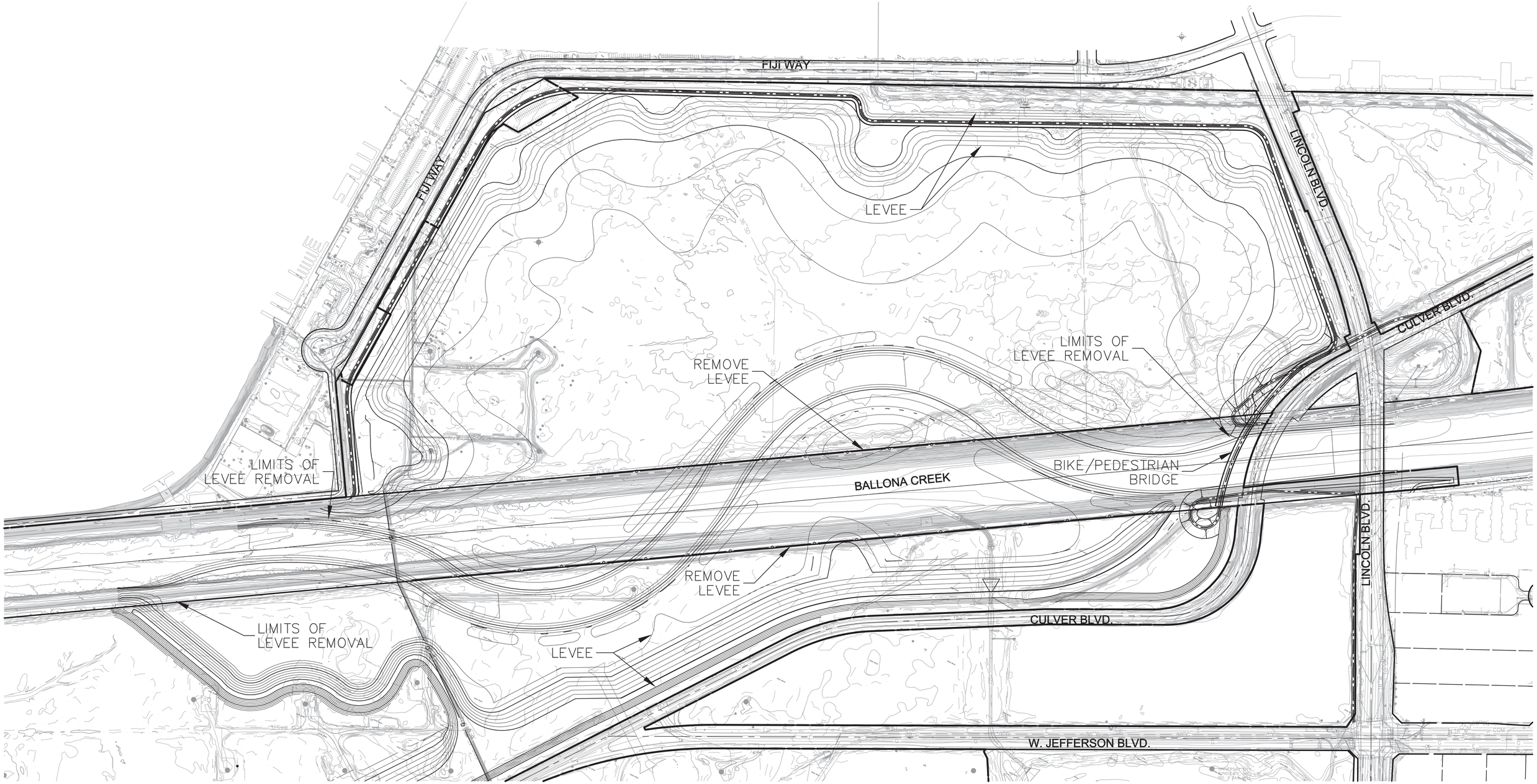
BALLONA WETLANDS ECOLOGICAL RESERVE

SHEET 24 OF 32

B1-1511



AREA "A" AND AREA "B" NORTH
REMOVE EXISTING LEVEES

T.G.: PAGE

CONSTRUCTION SEQUENCING #25
EXHIBIT

COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS

200' 100' 0' 200' 400'

GRAPHIC SCALE

Note: For reduced sized prints, original scale is in inches

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STATE OF CALIFORNIA

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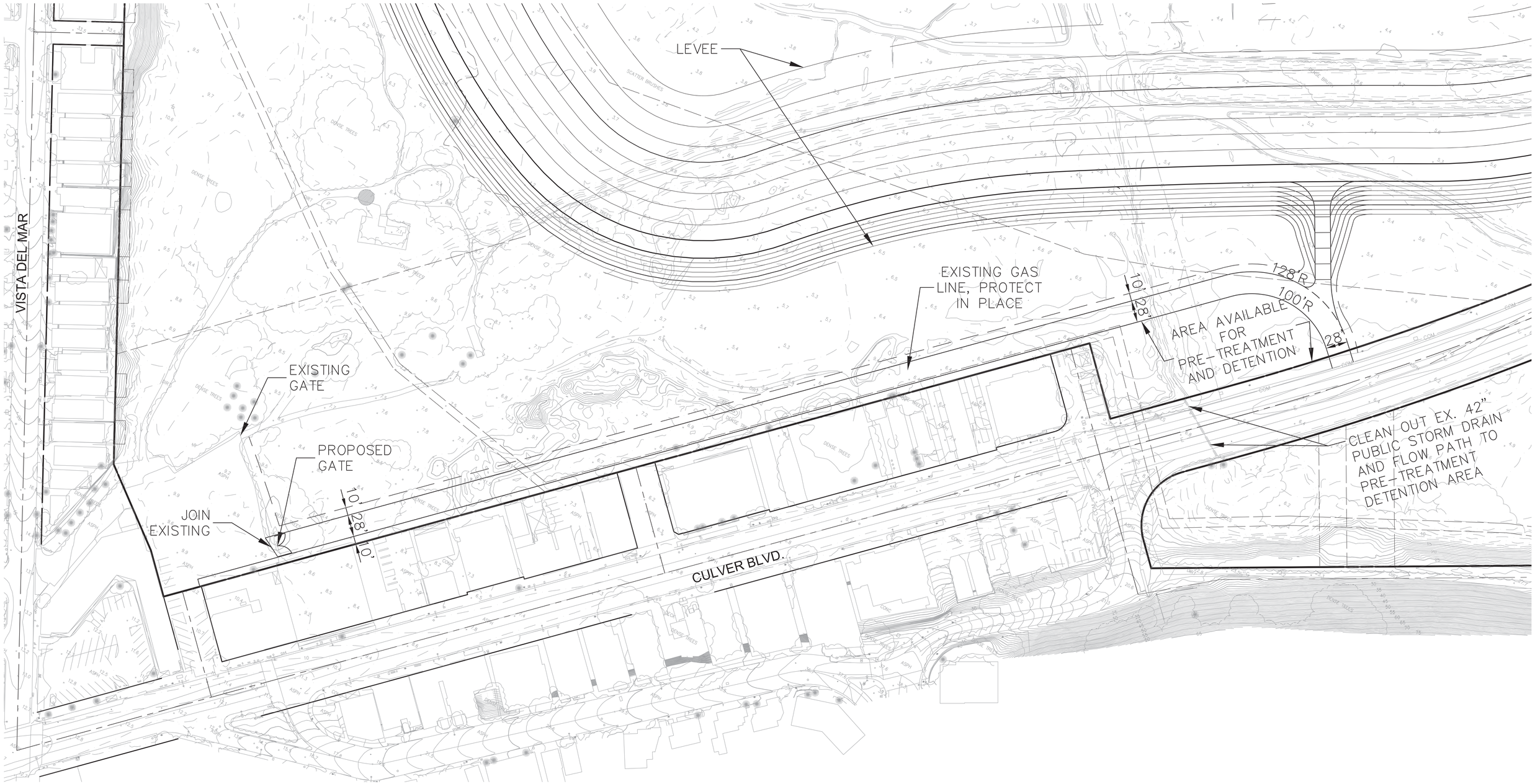
BALLONA WETLANDS ECOLOGICAL RESERVE

SHEET 25 OF 32

B1-1512



AREA "B" WEST
FIRE ACCESS ROAD

T.G.: PAGE

CONSTRUCTION SEQUENCING #26 EXHIBIT

60' 30' 0' 60' 120'

GRAPHIC SCALE

Note: For reduced sized prints, original scale is in inches

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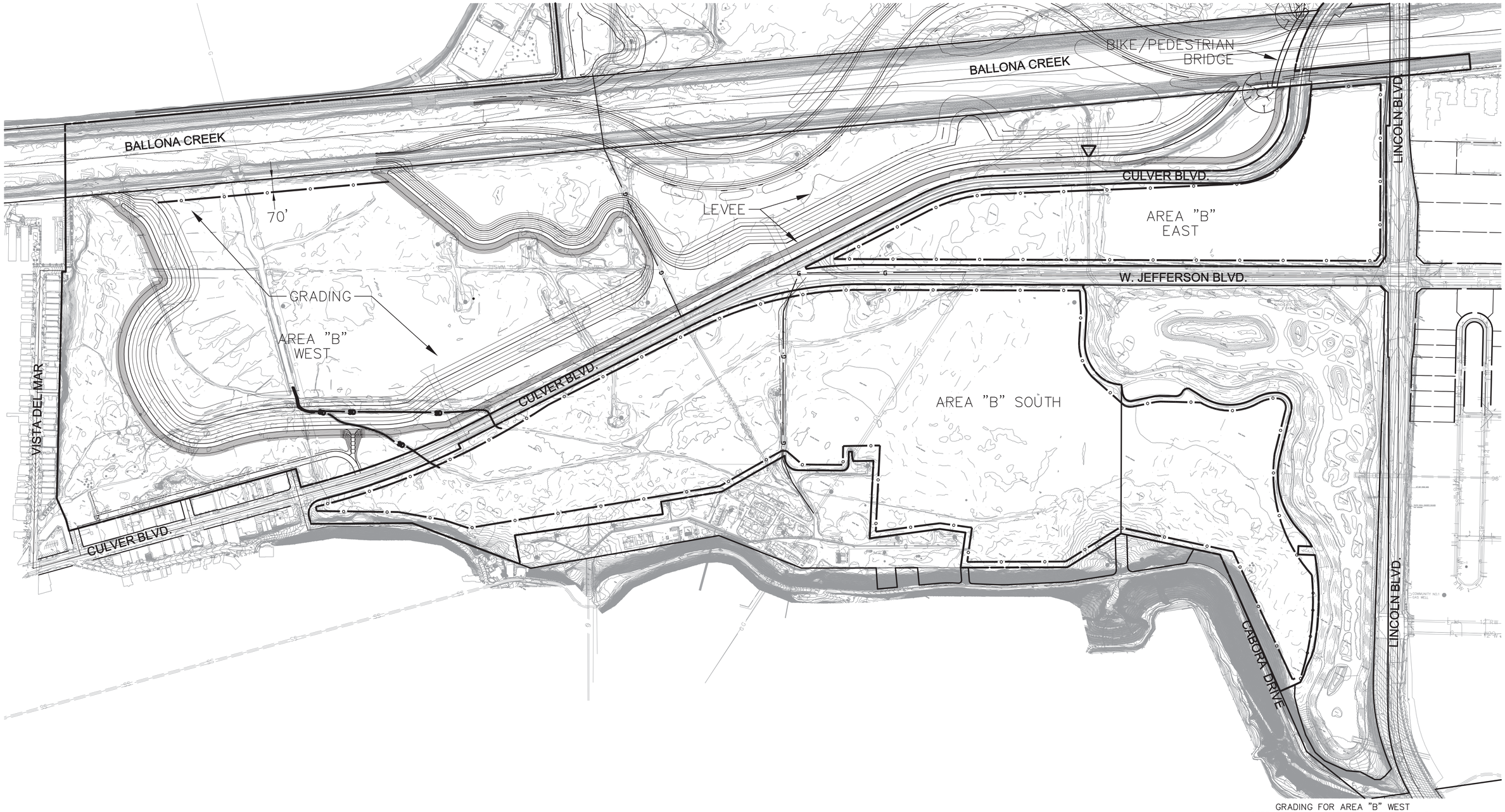
BALLONA WETLANDS ECOLOGICAL RESERVE

SHEET 26 OF 32

B1-1513



GRADING FOR AREA "B" WEST
AFTER AREA "A" HABITAT IS ESTABLISHED

AREA "B" WEST GRADING

T.G.: PAGE

LEGEND

LIMITS OF GRADING

NOTE: IF 12A OCCURS AND WELLS ARE TO REMAIN, GRADING AS SHOWN. IF 12B OCCURS AND WELLS ARE REMOVED, GRADING AROUND WELLS WILL OCCUR

250' 125' 0' 250' 500'

GRAPHIC SCALE

Note: For reduced sized prints, original scale is in inches

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CONSTRUCTION SEQUENCING #27 EXHIBIT

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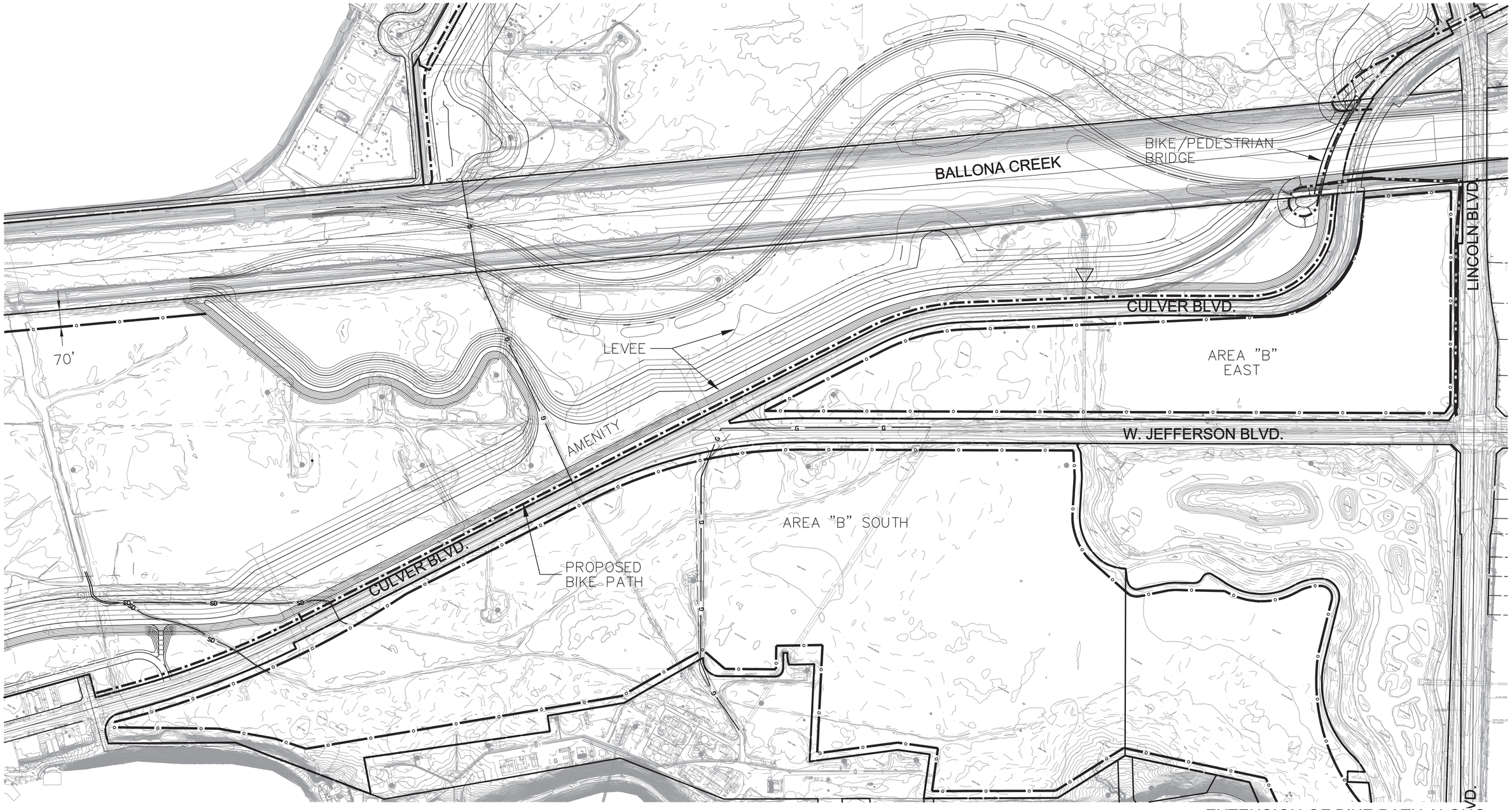
BALLONA WETLANDS ECOLOGICAL RESERVE

SHEET 27 OF 32

B1-1514



EXTENSION OF BIKE PATH ALONG SOUTH LEVEE TO PLAYA DEL REY

T.G.: PAGE

LEGEND

LIMITS OF GRADING

PROPOSED BIKE PATH

NOTE: BIKE PATH ALONG SOUTH LEVEE IS NEW AND CONNECTS THE EXISTING LEVEE TO PACIFIC AVE BRIDGE AND PLAYA DEL REY STREET SYSTEM AT CULVER AND VISTA DEL MAR

250' 125' 0' 250' 500'

GRAPHIC SCALE

Note: For reduced sized prints, original scale is in inches

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STATE OF CALIFORNIA

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CONSTRUCTION SEQUENCING #28 EXHIBIT

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BALLONA WETLANDS ECOLOGICAL RESERVE

SHEET 28 OF 32

B1-1515

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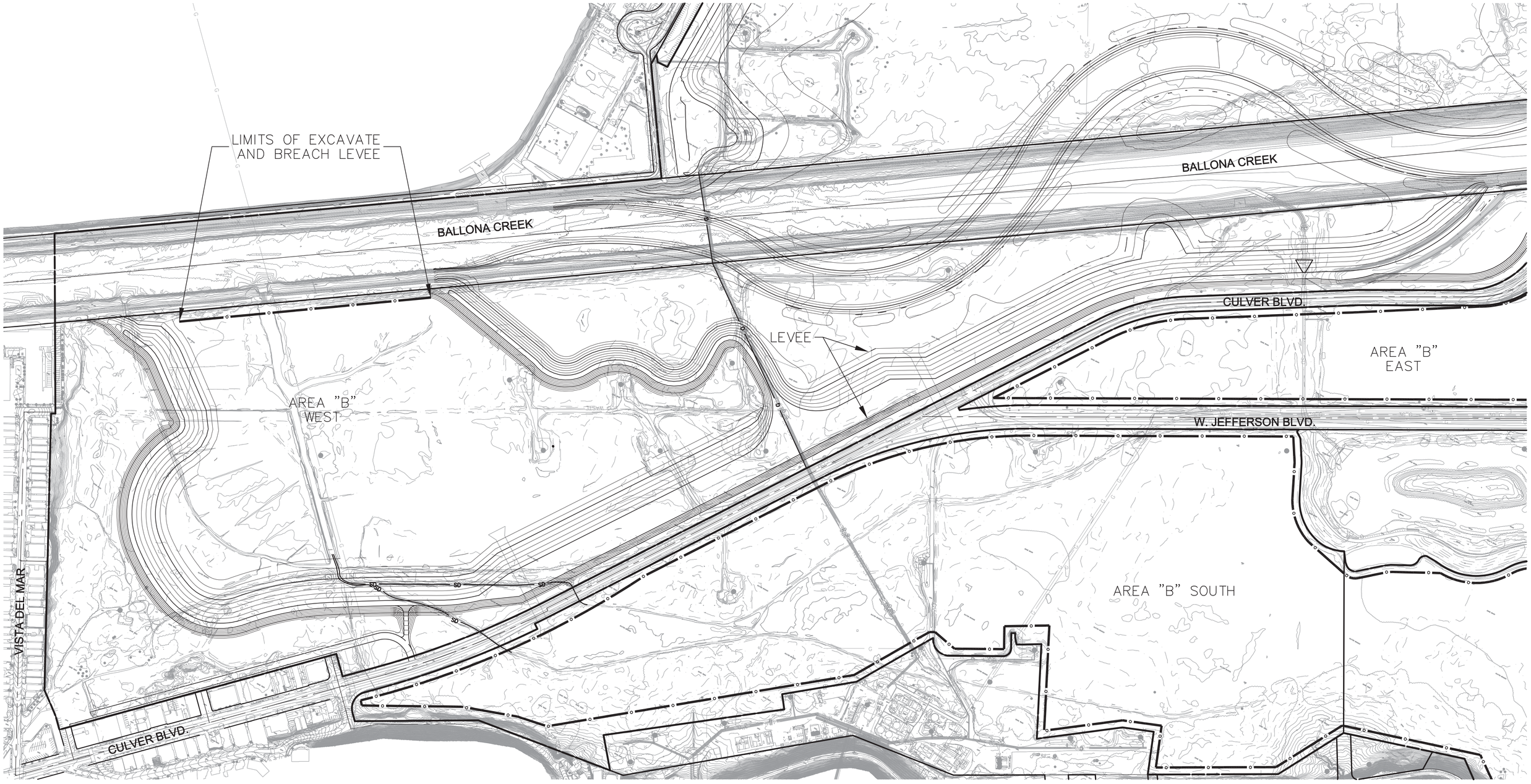

LEGEND

LIMITS OF GRADING

AREA "B" WEST
EXCAVATE AND BREACH EXISTING LEVEES

T.G.: PAGE

200' 100' 0' 200' 400'

GRAPHIC SCALE

Note: For reduced sized prints, original scale is in inches

REVIEWED LAND DEVELOPMENT DIVISION

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No. C48944
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CONSTRUCTION SEQUENCING #29
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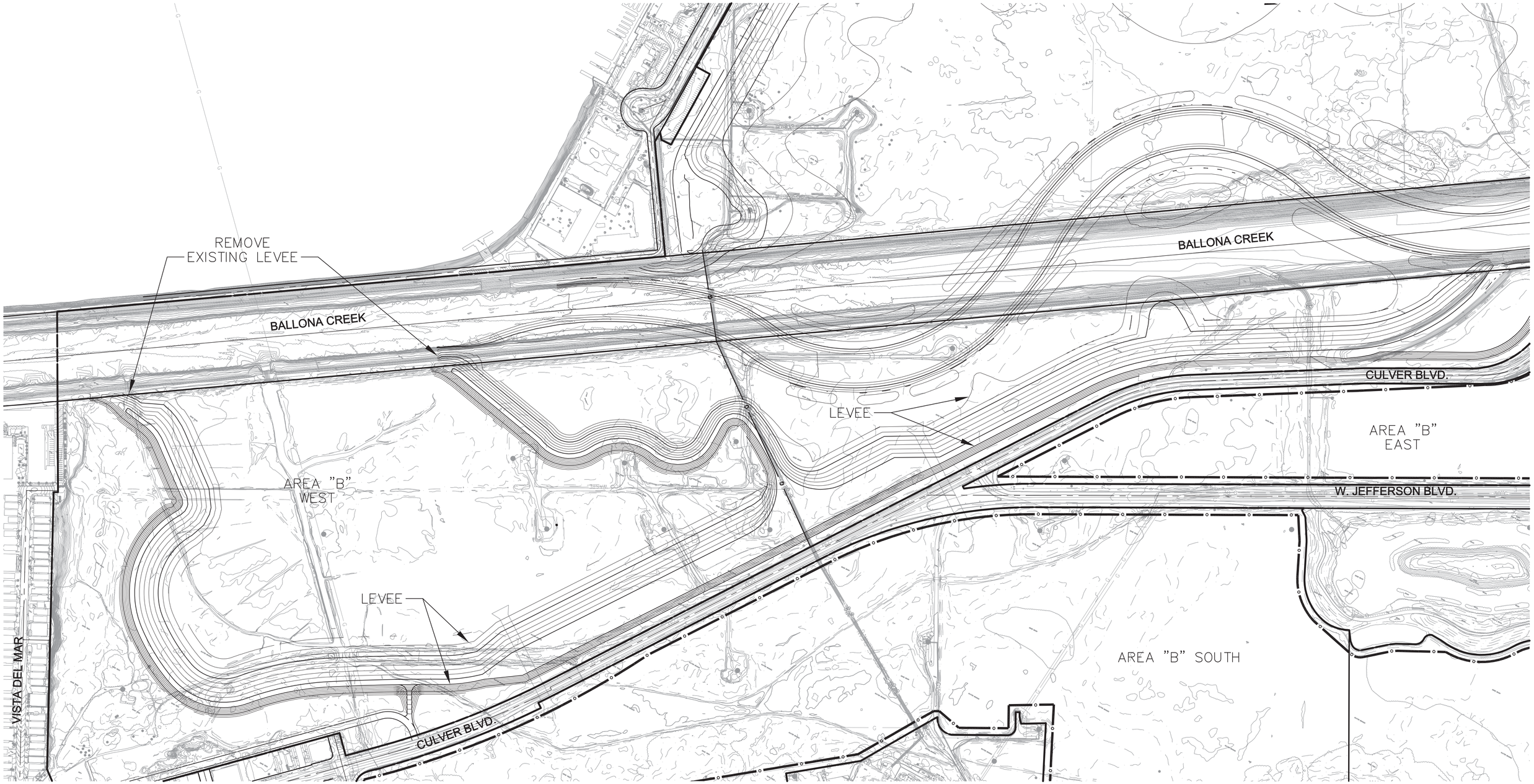
BALLONA WETLANDS ECOLOGICAL RESERVE

SHEET 29 OF 32

B1-1516



LEGEND

——— o ——— LIMITS OF GRADING

AREA "B" WEST
REMOVE EXISTING LEVEES

T.G.: PAGE

200' 100' 0' 200' 400'

GRAPHIC SCALE

Note: For reduced sized prints, original scale is in inches

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CONSTRUCTION SEQUENCING #30
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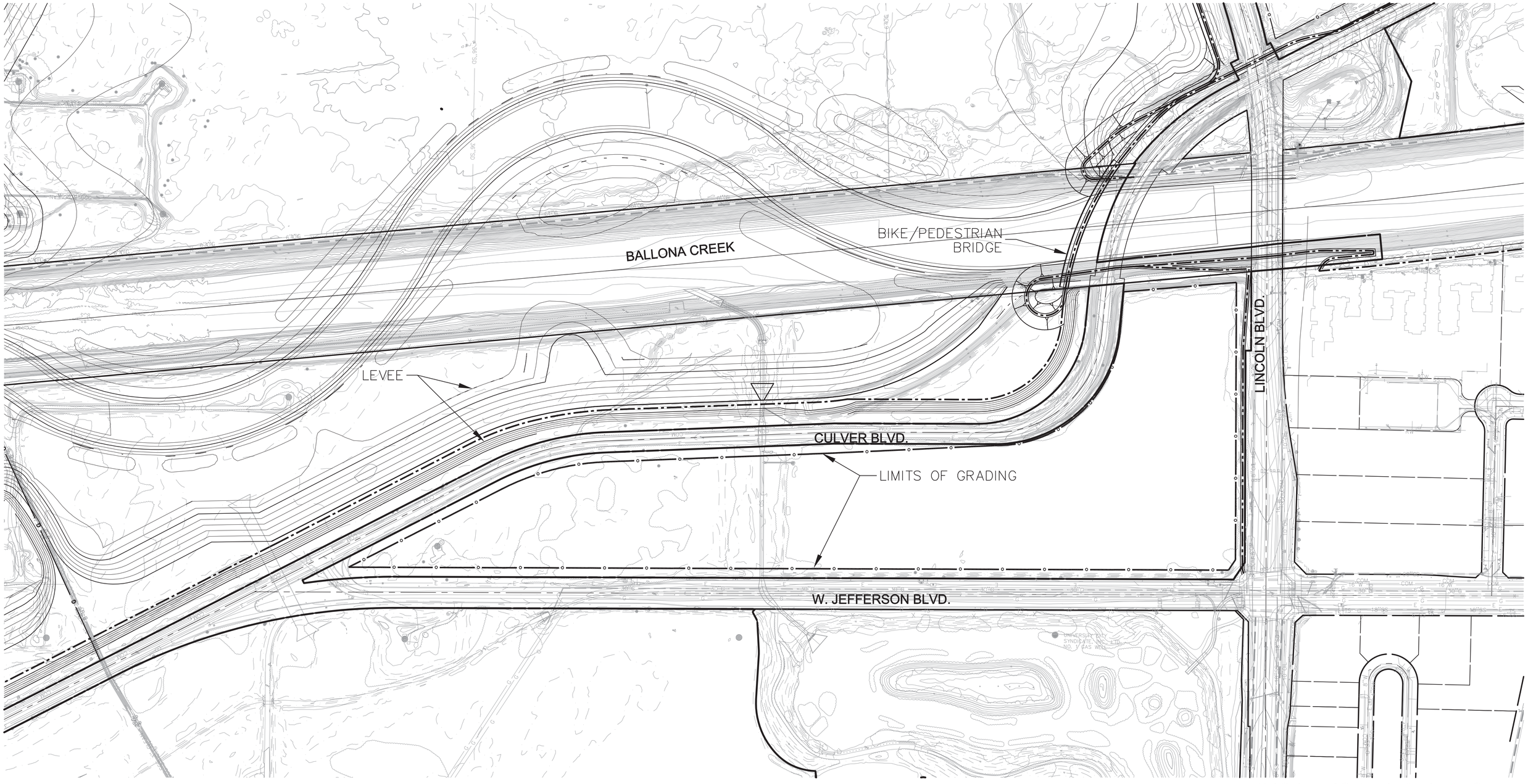
BALLONA WETLANDS ECOLOGICAL RESERVE

SHEET 30 OF 32

B1-1517



LEGEND

LIMITS OF GRADING

NOTE: IF REQUIRED, EXPORT EXCESS SOIL FROM AREA "B" WEST TO AREA "B" EAST

150' 100' 0' 200' 300'

GRAPHIC SCALE

Note: For reduced sized prints, original scale is in inches

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BY _____

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MICHAEL J. ORGMAN
No. C48944
Exp. 09-30-14
CIVIL
STATE OF CALIFORNIA

PROJECT ENGINEER DATE

EXPORT FROM AREA "B" WEST TO AREA "B" EAST

T.G.: PAGE

CONSTRUCTION SEQUENCING #31 EXHIBIT

COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS

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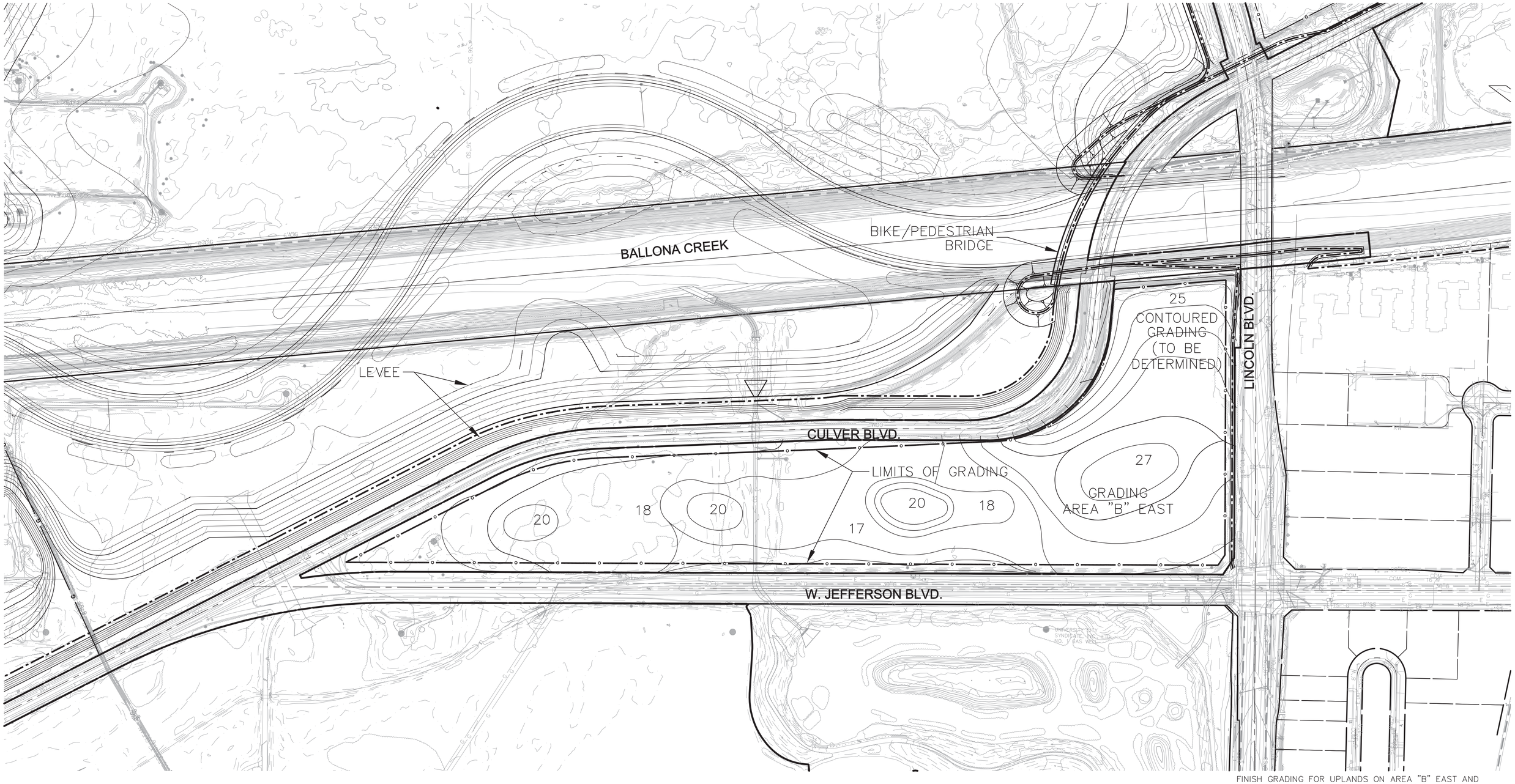
BALLONA WETLANDS ECOLOGICAL RESERVE

SHEET 31 OF 32

B1-1518



LEGEND

LIMITS OF GRADING

150' 100' 0' 200' 300'

GRAPHIC SCALE

Note: For reduced sized prints, original scale is in inches

REVIEWED LAND DEVELOPMENT DIVISION

BY _____

SUBDIVISION PLAN CHECKING SECTION DATE

NO.	REVISION	REVISED BY	APPROVED BY	DATE

REGISTERED PROFESSIONAL ENGINEER
MICHAEL J. ORGHAM
No. C48944
Exp. 09-30-14
CIVIL
STATE OF CALIFORNIA

PROJECT ENGINEER DATE

FINISH GRADING FOR UPLANDS ON AREA "B" EAST AND CONSTRUCT OPTIONAL BIKE PATH UNDER LINCOLN BLVD. BRIDGE

FINISH GRADING FOR UPLANDS

T.G.: PAGE

CONSTRUCTION SEQUENCING #32 EXHIBIT

COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS

PLANS PREPARED BY:

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BALLONA WETLANDS ECOLOGICAL RESERVE

SHEET 32 OF 32

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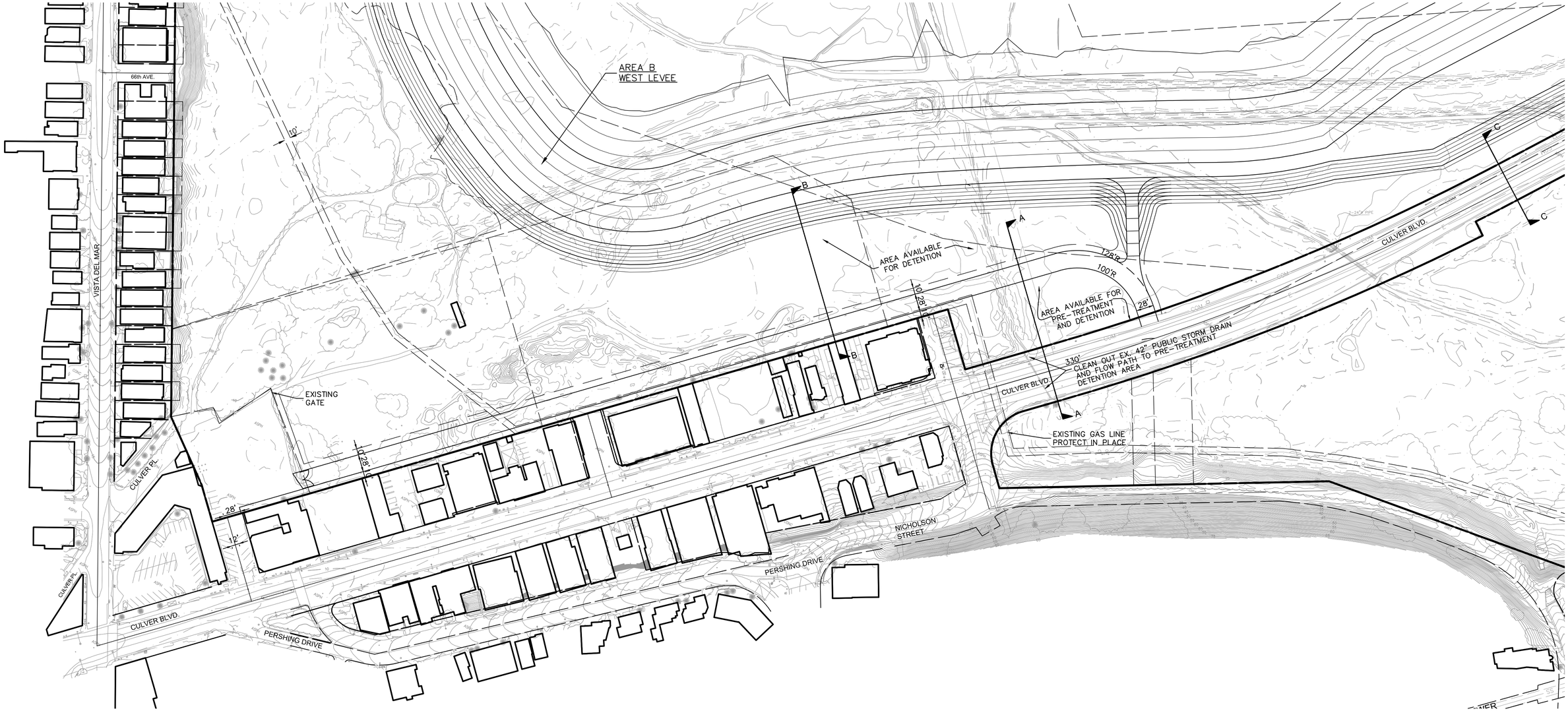
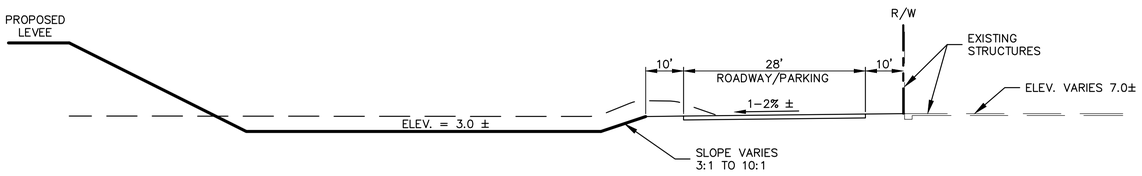
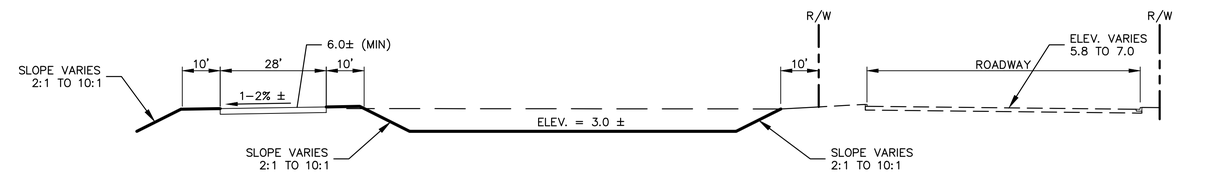
Appendix L
Miscellaneous Civil

APPENDIX - MISCELLANEOUS CIVIL EXHIBITS	
Drawing Number	**Exhibit Title**
BR031	Culver Blvd Stormwater Management & Fire Access Exhibit
BR033	Levee Ends Geometric & Structural Protection Exhibit
BR037	Area C Proposed Grading Exhibit
BR038	Area B Triangle Proposed Grading Exhibit
BR039	Existing Fresh Water Marsh Oulet Structure Exhibit
BR040	Storm Drain Piping Layout Exhibit
BR055	Jurisdictional Boundary Exhibit
BR048	Ballona Water Control Structures Discussion
BR049	Ballona West Area B Water Quality Discussion
BR050	Pedestrian Bridge Structural Narrative
BR051	Ballona Temporary Bridge Structural Narrative

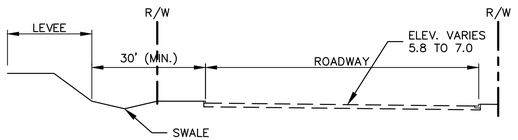




SECTION B-B
NTS



SECTION A-A
NTS



SECTION C-C
NTS

80' 40' 0' 80' 160'

GRAPHIC SCALE

Note: For reduced sized prints, original scale is in inches

REVIEWED LAND DEVELOPMENT DIVISION

BY _____

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No. C48944
Exp. 09-30-14
CIVIL
STATE OF CALIFORNIA

PROJECT ENGINEER DATE

T.G.: PAGE

CULVER BLVD STORMWATER MANAGEMENT AND FIRE ACCESS EXHIBIT

COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS

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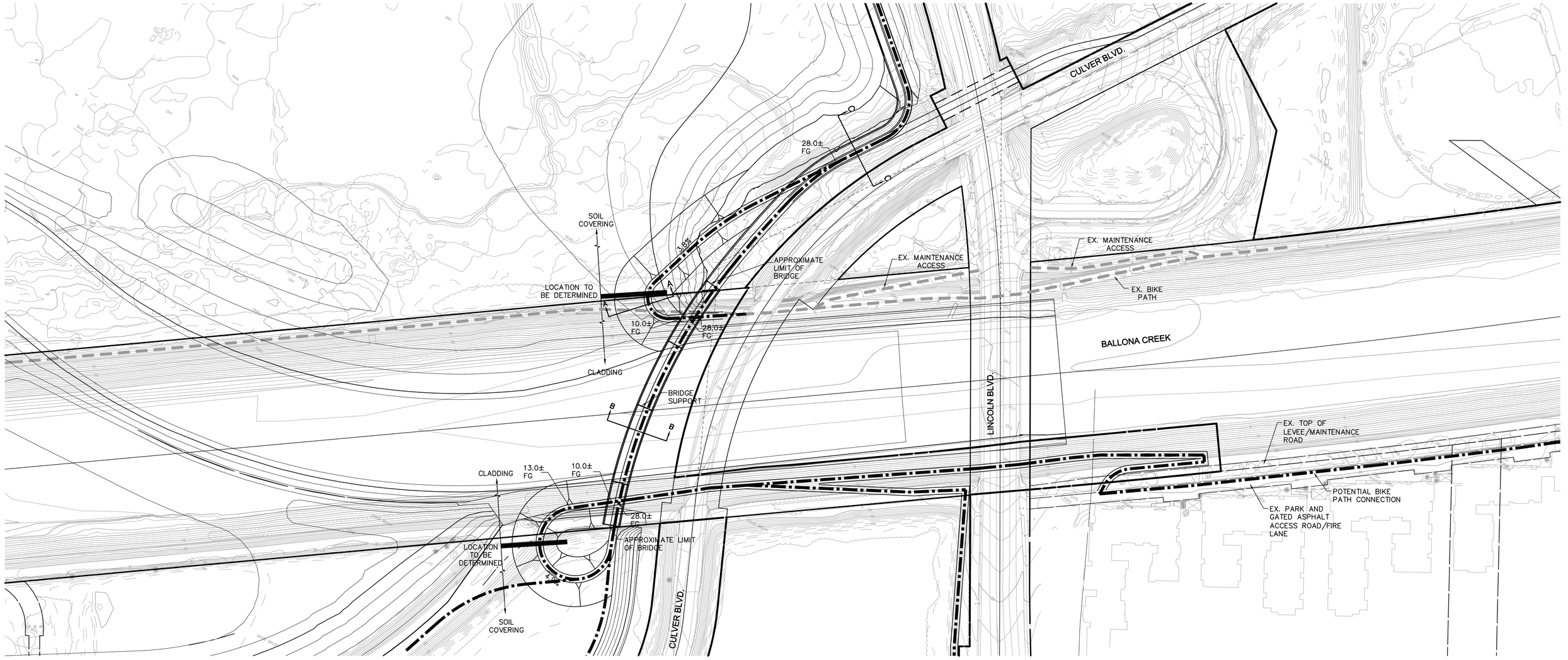
BALLONA WETLANDS ECOLOGICAL RESERVE | SHEET OF

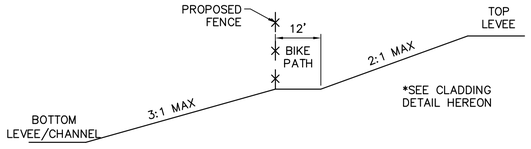
B1-1523

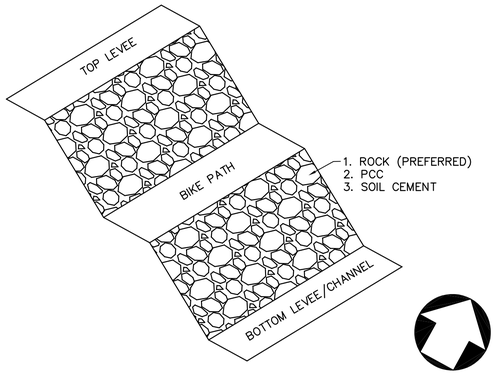


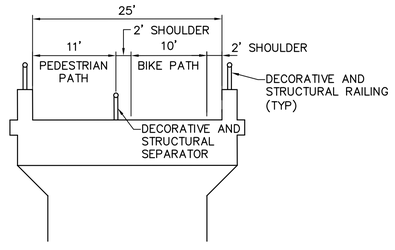
LEGEND

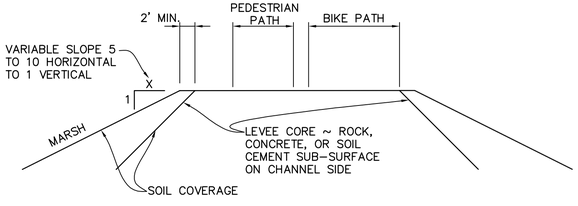
EXISTING BIKE PATH/LANE

PROPOSED BIKE PATH









80' 40' 0' 80' 160'

GRAPHIC SCALE

Note: For reduced sized prints, original scale is in inches

REVIEWED LAND DEVELOPMENT DIVISION

BY _____

SUBDIVISION PLAN CHECKING SECTION DATE

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REGISTERED PROFESSIONAL ENGINEER MICHAEL J. CREWS No. C48944 Exp. 09-30-14 CIVIL STATE OF CALIFORNIA

PROJECT ENGINEER DATE

T.G.: PAGE

GEOMETRIC AND STRUCTURAL LEVEE ENDS EXHIBIT

COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS

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BALLONA WETLANDS ECOLOGICAL RESERVE | SHEET OF

B1-1524

T.G.: PAGE

AREA "C" PROPOSED GRADING EXHIBIT

COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS

120' 60' 0' 120' 240'

GRAPHIC SCALE

Note: For reduced sized prints, original scale is in inches

NO.	REVISION	REVISED BY	APPROVED BY	DATE

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BY _____

SUBDIVISION PLAN CHECKING SECTION DATE

REGISTERED PROFESSIONAL ENGINEER
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PROJECT ENGINEER DATE

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BALLONA WETLANDS ECOLOGICAL RESERVE

SHEET OF

B1-1525

T.G.: PAGE

GRAPHIC SCALE
120' 60' 0' 120' 240'
Note: For reduced sized prints, original scale is in inches

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SUBDIVISION PLAN CHECKING SECTION DATE

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REGISTERED PROFESSIONAL ENGINEER
MICHAEL J. ORDWAY
No. C48944
Exp. 09-30-14
CIVIL
STATE OF CALIFORNIA

PROJECT ENGINEER DATE

AREA "B" EAST
PROPOSED GRADING

COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS

PLANS PREPARED BY:
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BALLONA WETLANDS ECOLOGICAL RESERVE | SHEET OF

B1-1526

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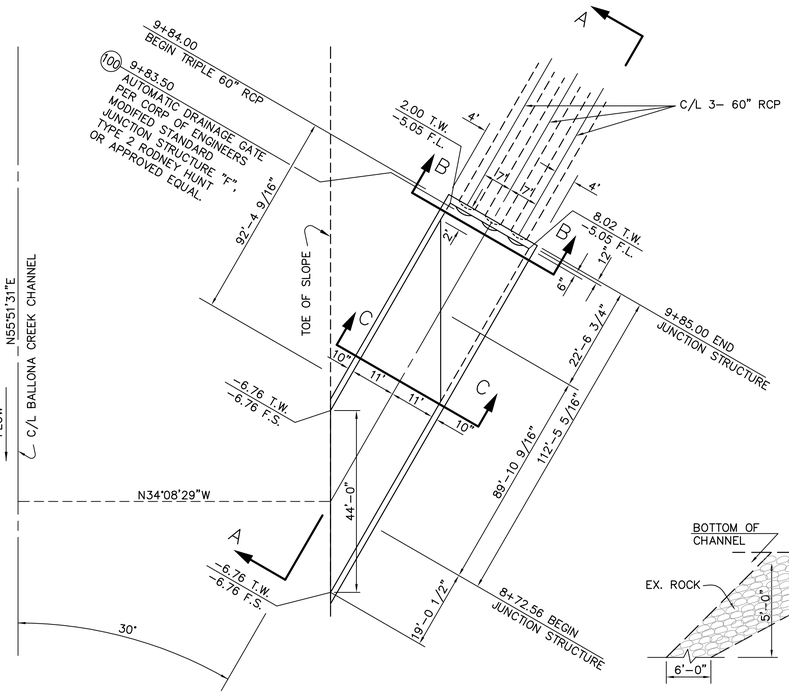
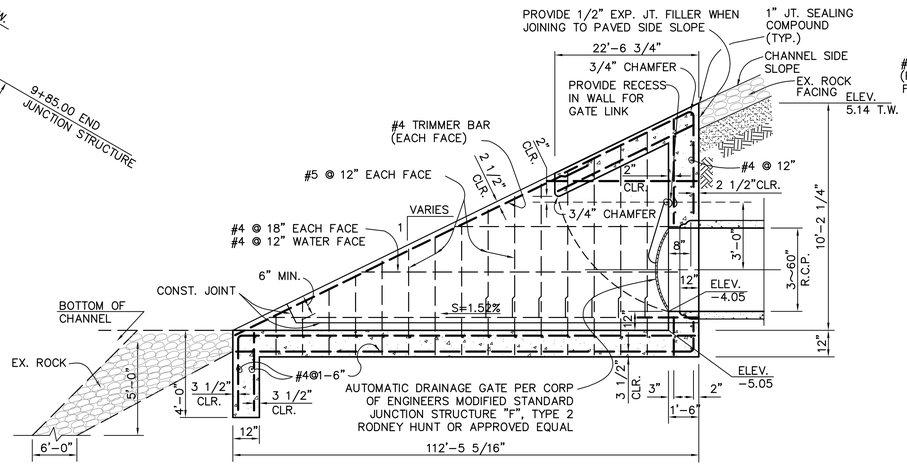


PLAN
NOT TO SCALE



SECTION A–A
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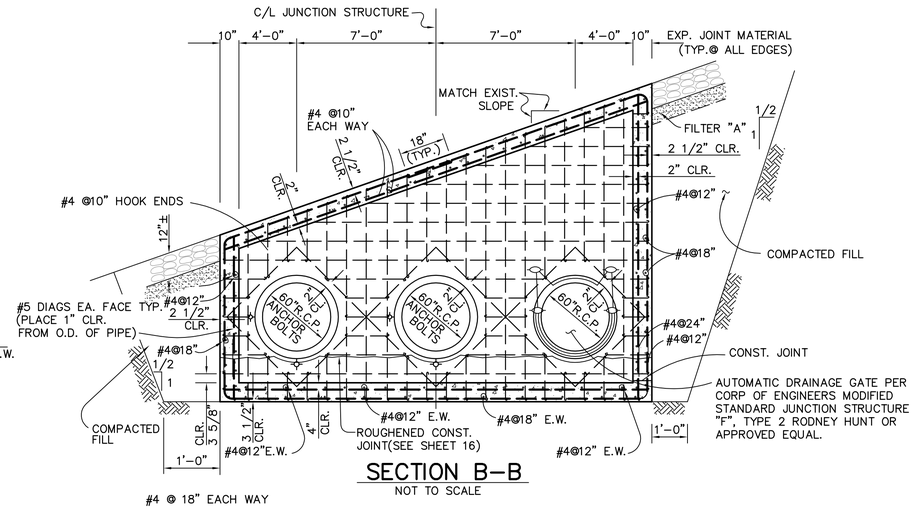

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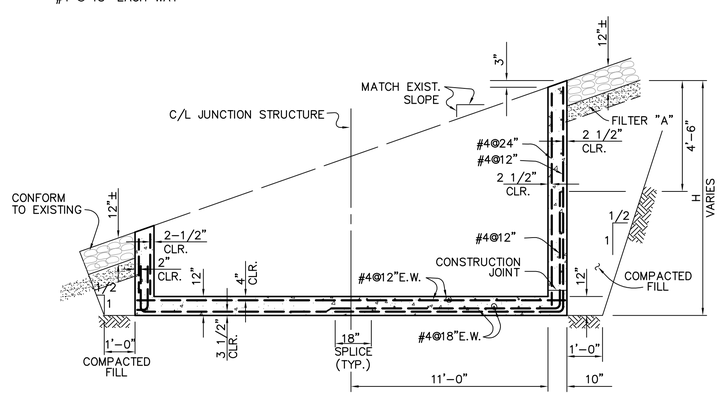

SECTION C–C
NOT TO SCALE

MARINE ENVIRONMENT – USE SPECIAL CONCRETE PER SHEET 14, NOTE 1D.

JUNCTION STRUCTURE (WITH FLAP GATES)

FRESHWATER WETLAND OUTLET DRAIN–CONNECT TO BALLONA CREEK CHANNEL
MODIFIED CORPS OF ENGINEERS
STANDARD JUNCTION STRUCTURE – "F"

NOTES

1. ELEVATIONS BASED ON NGVD
2. THIS STRUCTURAL CONCEPT WILL BE CONSTRUCTED TO REPLACE IN KIND THE FRESHWATER MARSH OUTLET
3. TIDAL GATES WILL BE CONSTRUCTED AS SELF–REGULATING OR ADJUSTABLE

T.G.: PAGE

NO.	REVISION	REVISED BY	APPROVED BY	DATE

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REGISTERED PROFESSIONAL ENGINEER
MICHAEL J. CREHAN
No. C48944
Exp. 09-30-14
CIVIL
STATE OF CALIFORNIA

PROJECT ENGINEER DATE

EXISTING FRESHWATER MARSH OUTLET STRUCTURE

COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS

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BALLONA WETLANDS ECOLOGICAL RESERVE | SHEET OF

B1-1527

300' 150' 0' 300' 600'

GRAPHIC SCALE

Note: For reduced sized prints, original scale is in inches

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MICHAEL J. CREHAN
No. C48944
Exp. 09-30-14
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STATE OF CALIFORNIA

PROJECT ENGINEER DATE

T.G.: PAGE

STORM DRAIN PIPING LAYOUT

COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS

PLANS PREPARED BY:

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BALLONA WETLANDS ECOLOGICAL RESERVE

SHEET OF

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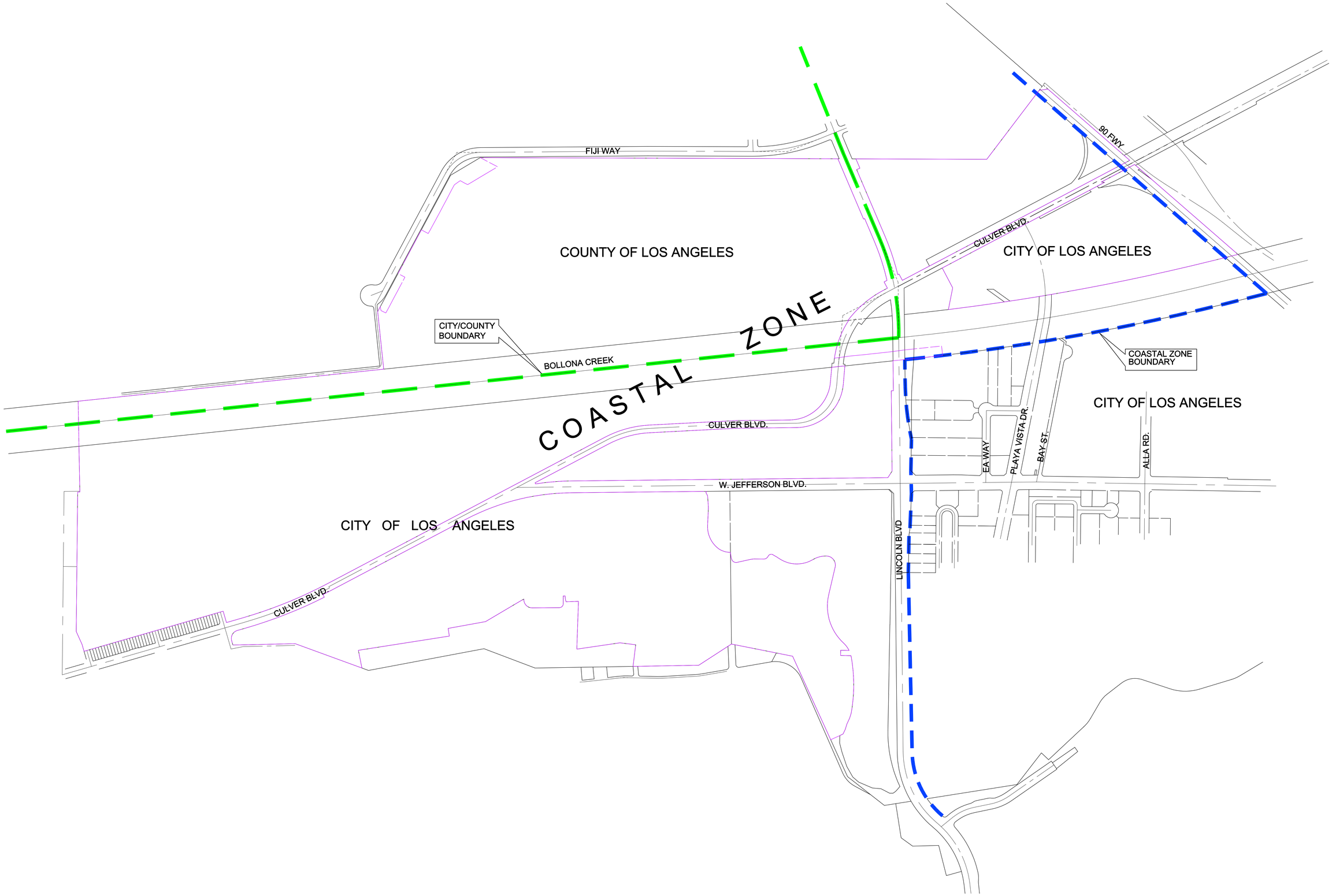


LEGEND

- CITY/COUNTY BOUNDARY
- COASTAL ZONE BOUNDARY
- PROJECT BOUNDARY

CALIFORNIA COASTAL CONSERVANCY

300' 150' 0' 300' 600'

GRAPHIC SCALE

Note: For reduced sized prints, original scale is in inches

B1-1529

Jurisdictional Boundary Exhibit

PSOMAS

DATE: 01-31-2013 REVISED ON:
JOB No:1CCC010100

SHEET 1 OF 1
BR055

Water Control Structures Description

EXISTING CONDITIONS

There are three existing “Gate” structures within the project boundaries along the Ballona Creek that will be affected by the project. Two are toward the west end of Area B to allow muted and controlled tidal action into the small flow channels within Area B. Close scrutiny of these tide gates is maintained to avoid flooding of very low-lying development areas at the south-west corner of Area B, and of Culver and Jefferson Boulevards. A third gate structure is at the end of the main outlet culvert from the Freshwater Marsh. This structure contains a series of three, 60-inch diameter outlet pipes with flap gates. Tidal action occurs through this structure, but is precluded from entering the Freshwater Marsh by an internal structural weir within the Freshwater Marsh. The flap gates allow storm flows to be conveyed from the Freshwater Marsh to the Ballona Creek for minor storm events, and to close during large storm events for flood protection upstream of the Freshwater Marsh.

PROPOSED CONDITIONS

With the removal of the existing levees, all three of these gate structures will be removed. The area between the new levees will continue to enjoy full tidal action. The project goal is to expand that full tidal action south of the new southerly levee into the remainder of Area B (less the Freshwater Marsh) as much as possible without increasing the risk of flooding. The function of the outlet from the Freshwater Marsh will remain as it is in the existing condition, with construction of a new gate structure that will generally mirror the function and design of the existing structure, simply relocated to the new southerly levee alignment. Two new gate structures will be added through the southerly levee and extend under Culver Boulevard to South Area B to replace the two tidal gates. There are a couple of options for the type of gate used, and a number of geometric configurations to control the amount of tidal action.

The two types are self-regulating tide gates and adjustable gates, either manually or automatically adjusted. Generally self-regulating tide gates, when properly designed and installed, are preferable due to lower cost, maintenance, and reliability. However, adjustable gates can be designed for a wider range of use and could more easily accommodate future sea level rise. There are advantages for each type which will be reviewed with final design.

In order to control flow rates and flooding risk, he sizing and configuration of the gate structure can be configured in a number of ways. The general intent would be to allow greater volumes to pass in one direction than another. For example, we could provide one or two pipes with flap gates to control flow rates and volumes only for rising tides into Area B. And, we could provide three pipes, or larger diameter pipes for receding tides allowing a greater relative volume and flow rate out of Area B. Another example would be to have adjustable gates on both ends of a pipe with different settings for flows to accomplish the same flood protection goal.

West Area B Water Quality Description

EXISTING CONDITIONS

At the southwest corner of Area B is a developed commercial area fronting Culver Boulevard. This development is at a very low elevation in some cases below 6.0. This is a low point of Culver Boulevard and has historically had flooding problems at, and adjacent to, the intersection of Culver Boulevard and Nicholson. There are a number of storm drains in the area with the primary collection drain for flows from the Westchester Bluffs area conveyed westerly of the intersection toward the ocean. This drain is under sized for larger storm flow events. This was recognized and an overflow drain in Nicholson exists to convey the excess overflow to the north outletting on the north side of Culver Boulevard at the intersection. There is a small ditch that routes this overflow runoff into Area B to one of the small tidally influenced ditches in the area. Due to tidal action, the capacity of this overflow ditch and the surrounding area that is available for storm water storage is sometimes exceeded causing flooding of Culver and a few of the adjacent properties.

PROPOSED DRAINAGE CONDITIONS

With the construction of the proposed levees, tidal influence in this area will be eliminated. However storage volume for the excess overflow drainage will also be eliminated. Therefore, replacement storm water storage volume will be provided by creating a low area to approximately elevation 4.0 between the commercial properties and the proposed levee. This storage basin will be sized to accommodate the overflow volume as well as the local drainage in the area. A public storm drain pipe from a downstream drain system can be extended to dewater this area if desired, or storage volume could be provided to fully contain the overflow. This basin will also function as a water quality treatment measure to address the minor increase in pollutant load from the proposed paved fire access road behind the commercial properties, as well as a portion of the runoff from the existing paved area of Culver Boulevard. Other areas of Culver Boulevard further east will drain to a shallow roadway shoulder ditch provided to keep stormwater runoff away from the paved area, as well as provide an infiltration and treatment function for the roadway.

Ballona Wetlands Restoration Project

Pedestrian/Bike Bridge

Structural System

Overview

The proposed pedestrian/bike bridge will have a dual objective. It can be used as a vehicular bridge for H20 loading trucks during construction to facilitate the Earth Transportation and then it will be used as a pedestrian/bike bridge at its final objective. This bridge will span approximately somewhere between 380' & 400', at the location chosen next to the (E) Culver Blvd bridge. See Photo 1. See also preliminary layout by Psomas attached here under Fig. A.

Photo 1. Culver Bridge

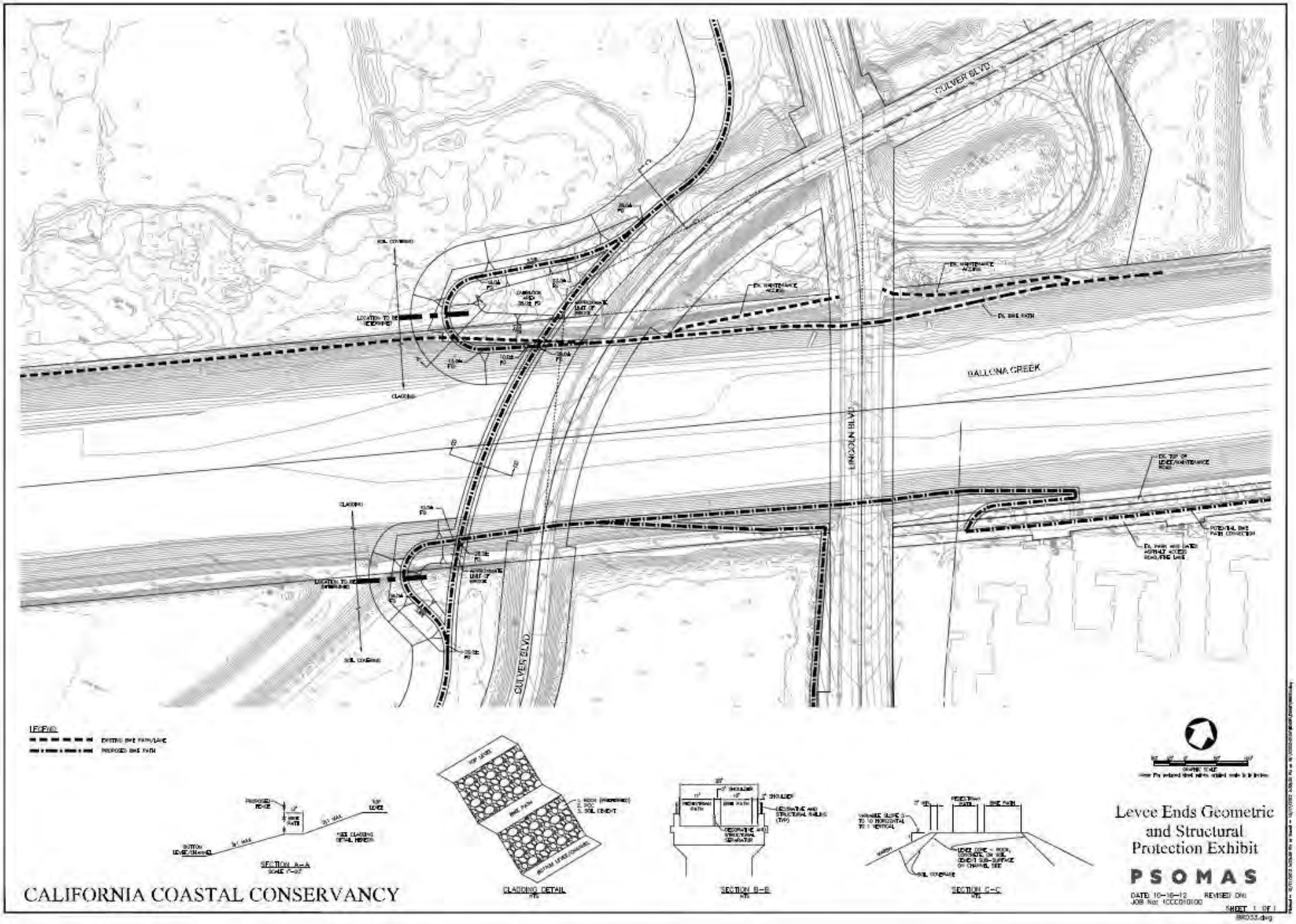


Fig. 1: PRELIMINARY PEDESTRIAN/BIKE BRIDGE

A.1 Description, Proposed Material and Advantages of the Structural System

The proposed structural system for the bridge uses steel for the superstructure and concrete for the foundation piers system.

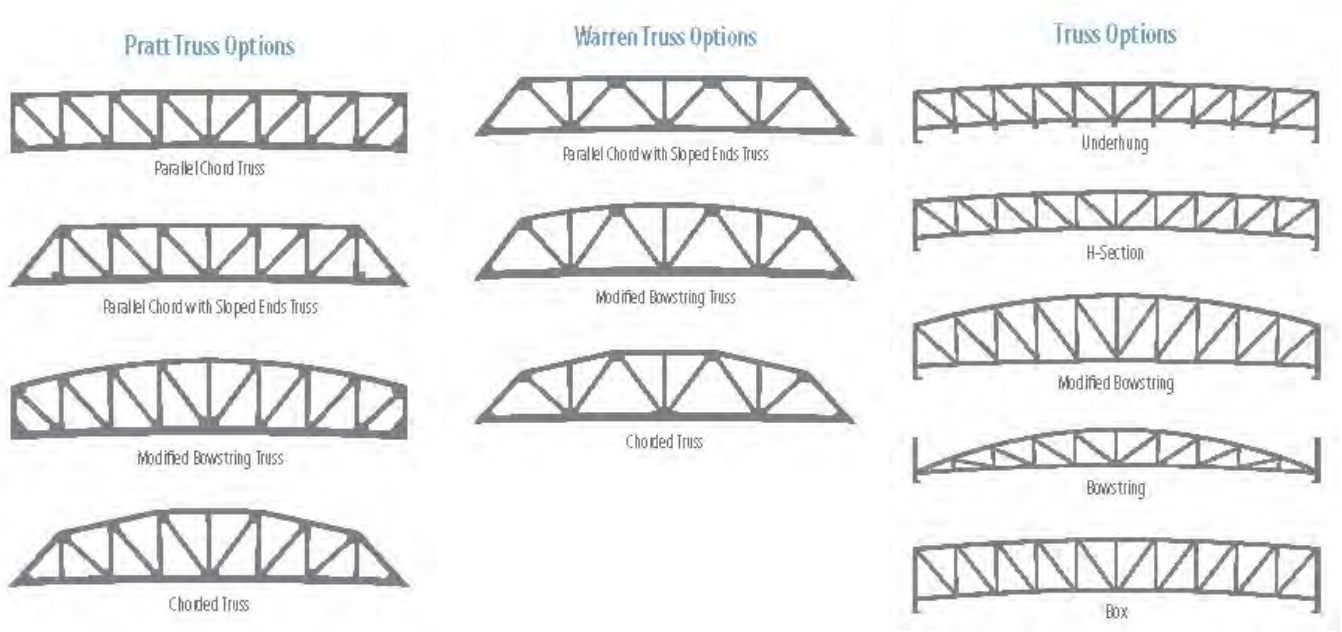
The clear advantage of our structural steel system starts from the weight reduction compared to a purely concrete structural system.

Having to design our structural system for reduced weight will permit us to use also reduced code design forces allowing us to reduce the size of the structural members as well as their foundation, providing a more economical design.

Using structural steel bridges also allows us to play with different configurations to explore the best option from both a structural and aesthetic standpoint.

From the initial geotechnical findings the North & South edges of the Ballona Creek do not seem to be adequate to provide structural support if the bridge is a simple span, therefore there is the need to have interior foundation piers. Our first option is to have a four span bridge.

Some of the possible structural configurations between piers are shown below:



All of the truss options shown above are preferred on Regions of High Seismicity as is a concern at our site.

To illustrate some of the Pedestrian/Bike bridges built based on these configurations, see photos below.

B.1 Design Criteria

Basic Design Criteria shall follow the codes and standards from:

- US Army Corps of Engineers (USACE)
- Los Angeles County Department of Public Works (LA County DPW)

Ballona Wetlands Restoration Project

Temporarily Bridge Across Lincoln Between Areas A & C

Structural System

Overview

Earth movements between areas A & C will be required. A possibility to build a bridge using the (E) concrete piers can be studied. See (E) concrete piers on Photo 2.

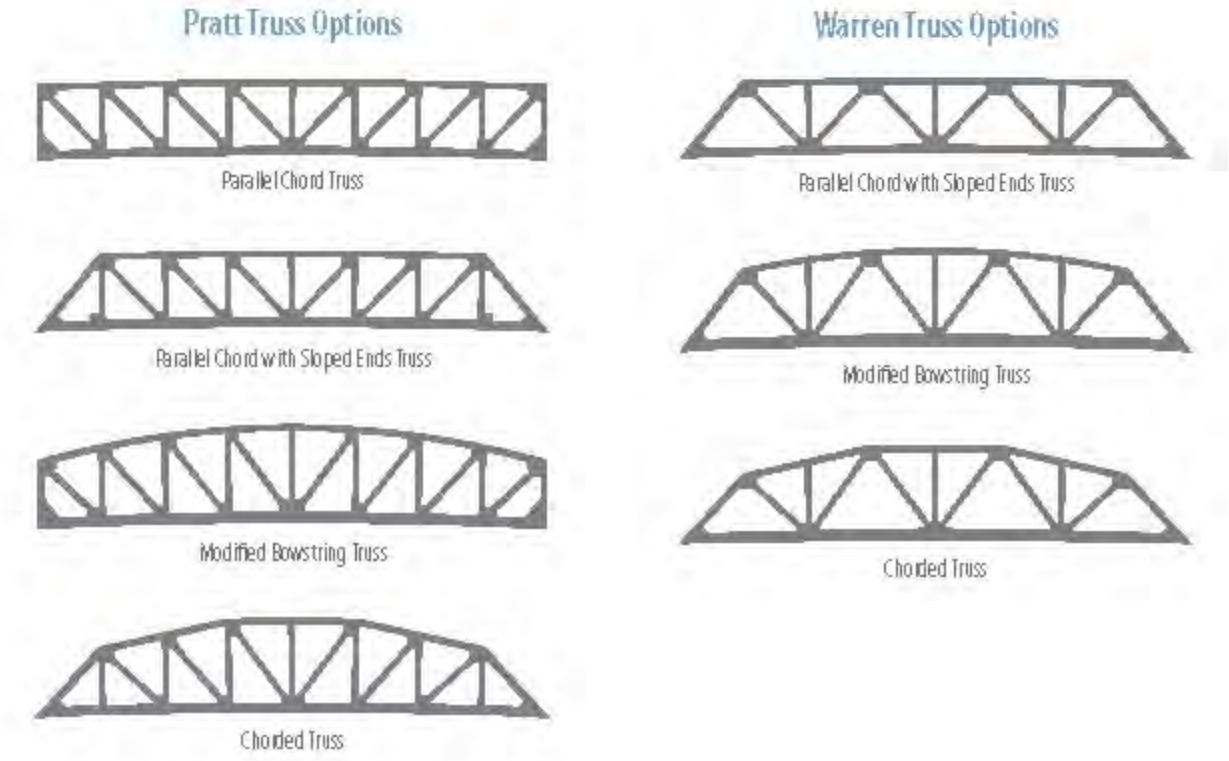
Photo 2: (E) concrete piers between areas A & C.

A.1 Description, Proposed Material and Advantages of the Structural System

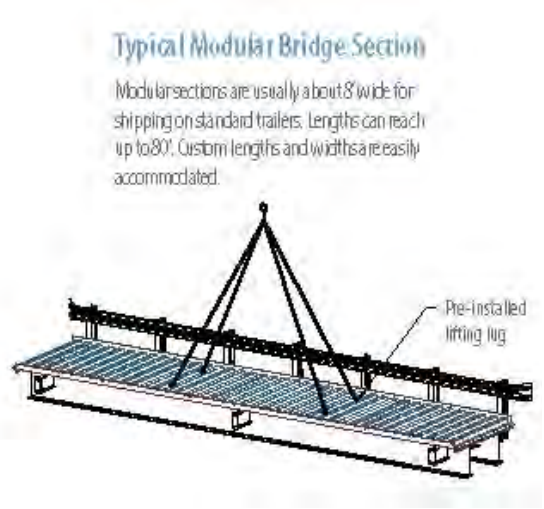
A temporarily bridge across Lincoln and between areas A & C can greatly increase the productivity during construction speeding up the earth movement between areas A & C. This could also contribute to have better logistics & access during construction.

In order to assess this possibility a further structural detailed evaluation of the (E) concrete piers is needed. Based on the findings of this detailed structural evaluation a temporarily bridge with a capacity limited to the capacity of the (E) piers can be build.

Some of the possible structural configurations are shown below:



A temporarily bridge can be a new designed bridge or a prefabricated bridge. See below for some samples:



B.1 Design Criteria

Basic Design Criteria shall follow the codes and standards from:

- US Army Corps of Engineers (USACE)
- Los Angeles County Department of Public Works (LA County DPW)