Leighton Consulting, Inc.
A LEIGHTON GROUP COMPANY

February 5, 2021

Project No. 12450.001

To: North County Transit District
c/o Jacobs Project Management Co.
401 B Street, Suite 1560
San Diego, California 92101

Subject: Geotechnical Review of Proposed Security Fencing – Del Mar Bluffs, Del Mar, California

Reference: Leighton, 2020, Geotechnical Design Report (30% Design), Del Mar Bluffs Stabilization, Project 5, (Milepost 244.1 to Milepost 245.7), Project No 11860.008, Dated September 11, 2020

SANDAG/NCTD, 2015, Engineering Standard Drawings, R.O.W. Fence Details (Chain Link), Drawing No. ESD-5106, dated October 8, 2015

WSP, 2020, Conceptual Fencing Plan, Del Mar Study Area, Trespasser Risk Reduction Study, dated June 30, 2020

In accordance with your request, we performed geotechnical review of the proposed security fencing along the Del Mar Bluffs in Del Mar, California between approximately Mile Post 244.1 and Mile Post 245.7 along the Los Angeles to San Diego section of the LOSSAN rail corridor. The purpose of our geotechnical review was to evaluate the potential adverse effects that the proposed security fencing may have on the overall stability of the bluffs and/or the trackbed support of the railroad.

As background, the coastal bluffs supporting the rail alignment in this project area have a history of landslides, surficial failures and the bluffs are subject to ongoing erosion and bluff retreat (Leighton, 2020). Over the last 20 years several significant stabilization and drainage measures have been constructed to

preserve trackbed support in priority areas along this alignment. As part of these stabilization and drainage improvements, Leighton has performed several subsurface explorations and field observations over the years and has a through understanding or the bluff geology and the episodic bluff retreat.

In summary, the proposed security fencing will be located on both the sides of the alignment (i.e., east and west of the railroad track), as shown on the attached Exhibit – A, Conceptual Fencing Plan for the Del Mar Study Area (WSP, 2020). Consistent with the Engineering Standard Drawings, the fence will be 6-foot high with a chain link fabric and supported by posts at an approximate spacing of 10 feet on center. In addition, several 16-foot wide access gates are also being proposed at various locations. The foundations for the fence posts will be a 9- to 12-inch diameter by 36-inch deep excavation backfilled with Portland Cement Concrete (PCC). The foundations for the 16-foot wide access gate posts will be a 24-inch diameter by 36-inch deep excavation backfilled with PCC (SANDAG/NCTD, 2015).

Based on our review of the conceptual fencing plan and the standard fencing details and our geotechnical experience of the Del Mar Bluffs, it is our professional opinion that the proposed security fence with small diameter foundations backfilled with PCC will not impact the stability of the bluffs or the trackbed support, nor promote additional erosion/bluff retreat. However, we recommend that the any proposed fence or gate posts locations west of the railroad be evaluated for potential conflict with existing shear pins and/or associated tiebacks.

It should also be noted that in general the Del Mar Bluff Stabilization measures (Shear Pin Stabilization) throughout this area are performing as anticipated and providing global stability for the trackbed. However, there is a relatively high risk to the general public and to safety of the beach users along the toe of the bluffs, and that failures overtime are a natural process for the bluff retreat, nevertheless the proposed fencing will not promote additional bluff retreat as discussed above. In addition, any proposed fencing located west of the Shear Pin Stabilization may eventually be impacted by the natural process of bluff retreat.

If you have any questions, please contact this office. We appreciate this opportunity to be of service.

Respectfully submitted,

LEIGHTON CONSULTING, INC.

Robert C. Stroh, CEG 2099
Associate Engineering Geologist

William D. Olson, RCE 45283
Associate Engineer

Attachments: Exhibit - A, Conceptual Fencing Plan
Exhibit - B, R.O.W. Fence Details (Chain Link)

Distribution: (1) Digital Copy

Leighton

Exhibit A

Del Mar Study Area

Note: The recommended fence locations are based on an assessment of risk and high-level engineering feasibility. They were developed at a conceptual level using Google Earth and other digital tools. Any fencing or other improvements will require further engineering evaluation and design.

Exhibit - A

Del Mar Study Area

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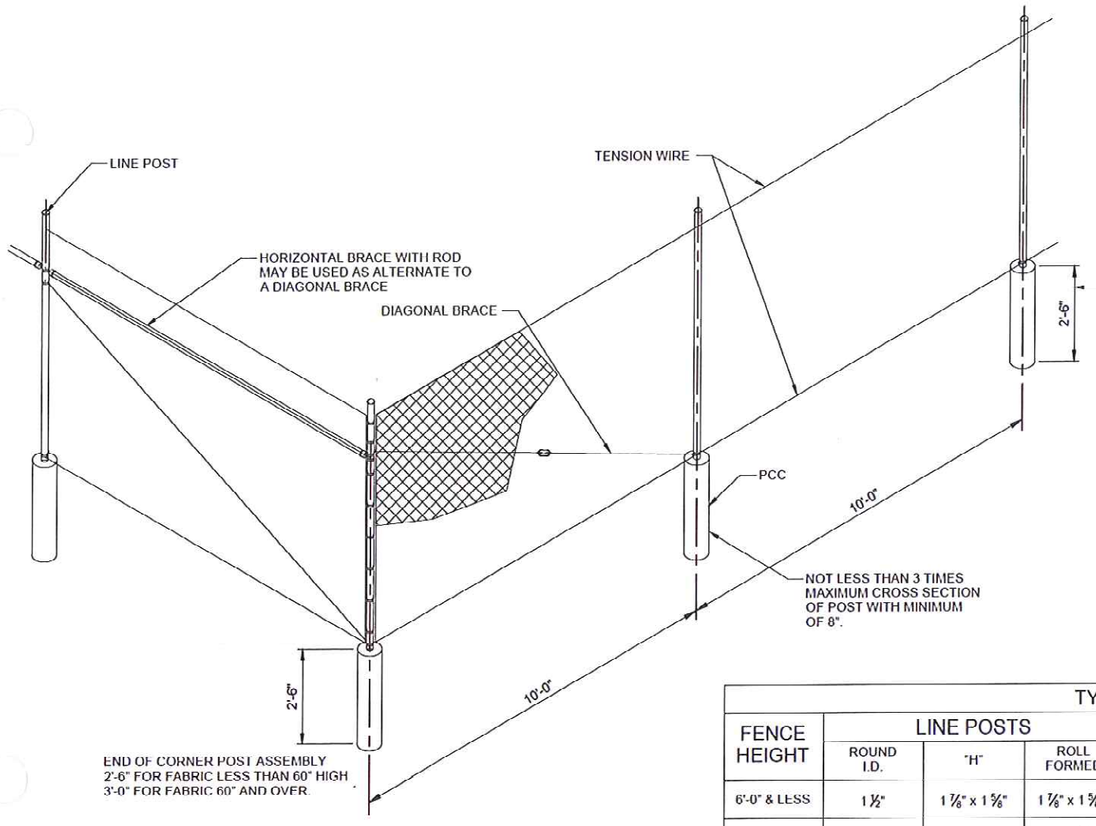
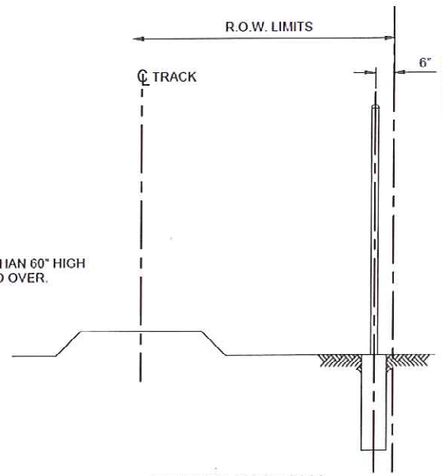
Exhibit B





FENCE LOCATION
SCALE: NONE

NOTES:

1. THE TABLE BELOW SHOWS EXAMPLE OF POST AND BRACE SECTIONS WHICH MAY COMPLY WITH THE SPECIFICATIONS.
2. SECTIONS SHOWN IN THE TABLES MUST ALSO COMPLY WITH THE STRENGTH REQUIREMENTS AND OTHER PROVISIONS OF THE SPECIFICATIONS.
3. OTHER SECTIONS WHICH COMPLY WITH THE STRENGTH REQUIREMENTS AND OTHER PROVISIONS OF THE SPECIFICATIONS MAY BE USED ON APPROVAL OF SANDAG DIRECTOR OF ENGINEERING.
4. OPTIONS EXERCISED SHALL BE UNIFORM ON ANY ONE PROJECT.
5. DIMENSIONS SHOWN ARE NOMINAL.
6. WIRE GAGE TO BE 11 GA. OR 9 GA. AS DETERMINED BY FIELD CONDITIONS.
7. FOR ADDITIONAL INFORMATION REFER TO SANDAG/NCTD STANDARD SPECIFICATIONS GENERAL PROVISIONS SECTION 80, RIGHT OF WAY AND TRAFFIC CONTROL FACILITIES - FENCING.
8. FENCE POSTS SHALL BE SET IN CONCRETE FOOTINGS INTO SUITABLE SOIL CONFORMING TO THE DETAILS SHOWN ON THIS DRAWING AND CROWNED AT THE TOP TO SHED WATER.
9. PORTLAND CEMENT CONCRETE FOR METAL POST FOOTINGS AND FOR DEADMEN SHALL BE PRODUCED FROM COMMERCIAL QUALITY AGGREGATES AND CEMENT AND SHALL CONTAIN NOT LESS THAN 275KG OF CEMENT PER CUBIC METER.

FABRIC TYPES:

TYPE CL-4 = 48" FABRIC.
TYPE CL-6 = 72" FABRIC.

TYPICAL MEMBER DIMENSIONING (SEE NOTES)

FENCE HEIGHT	LINE POSTS			END, LATCH & CORNER POSTS			BRACES			
	ROUND I.D.	"H"	ROLL FORMED	ROUND I.D.	ROLL FORMED		ROUND I.D.	"H"	ROLL FORMED	
6'-0" & LESS	1 ½"	1 7/8" x 1 5/8"	1 7/8" x 1 5/8"	2"	3 ½" x 3 ½"	2" x 1 ¾"	1 ¼"	1 ½" x 1 5/16"	1 5/8" x 1 ¼"	1 ¾" x 1 ¼"
OVER 6'-0"	2"	2 ¼" x 2"	2" x 1 ¾"	2 ½"	3 ½" x 3 ½"	2 ½" x 2 ½"	1 ¼"	1 ½" x 1 5/16"	1 5/8" x 1 ¼"	1 ¾" x 1 ¼"

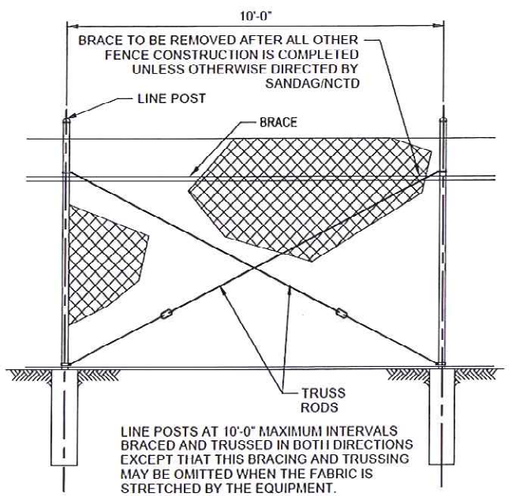
GATE POST 6'-0" AND LESS

GATE WIDTHS	NOMINAL I.D.	WEIGHT PER FT.
UP THRU 6'	2"	4.95
OVER 6' THRU 12'	4"	10.79
OVER 12' TO 18'	5"	14.62
OVER 18' TO 24' MAX.	6"	18.97

GATE POST OVER 6'-0"

GATE WIDTHS	NOMINAL I.D.	WEIGHT PER FT.
UP THRU 6'	3"	7.58
OVER 6' THRU 12'	5"	14.62
OVER 12' TO 18'	6"	18.97
OVER 18' TO 24' MAX.	8"	28.55

ABOVE POST DIMENSIONS AND WEIGHTS ARE MINIMUMS. LARGER SIZES MAY BE USED ON APPROVAL OF SANDAG.



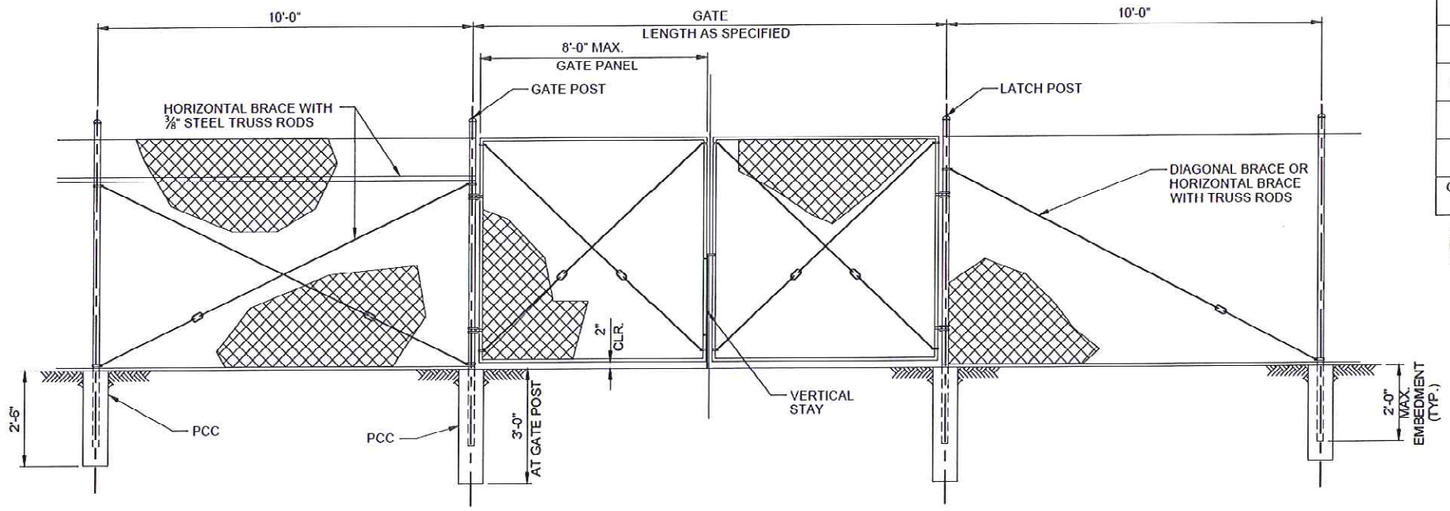


Exhibit - B

REVISIONS					DRAWN	CHECKED	RECOMMENDED	DATE
REV.	DATE	DESCRIPTION	DES.	ENG.	RAIL PROS	B. SMITH	B.SCHMITH	10/08/15

DESIGNER PE STAMP

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ENGINEERING STANDARD DRAWINGS

R.O.W. FENCE DETAILS (CHAIN LINK)

DRAWING NO. ESD-5106
DRAWING SHEET NO. 1 OF 1
SCALE: NONE
CONTRACT SHEET NO.