

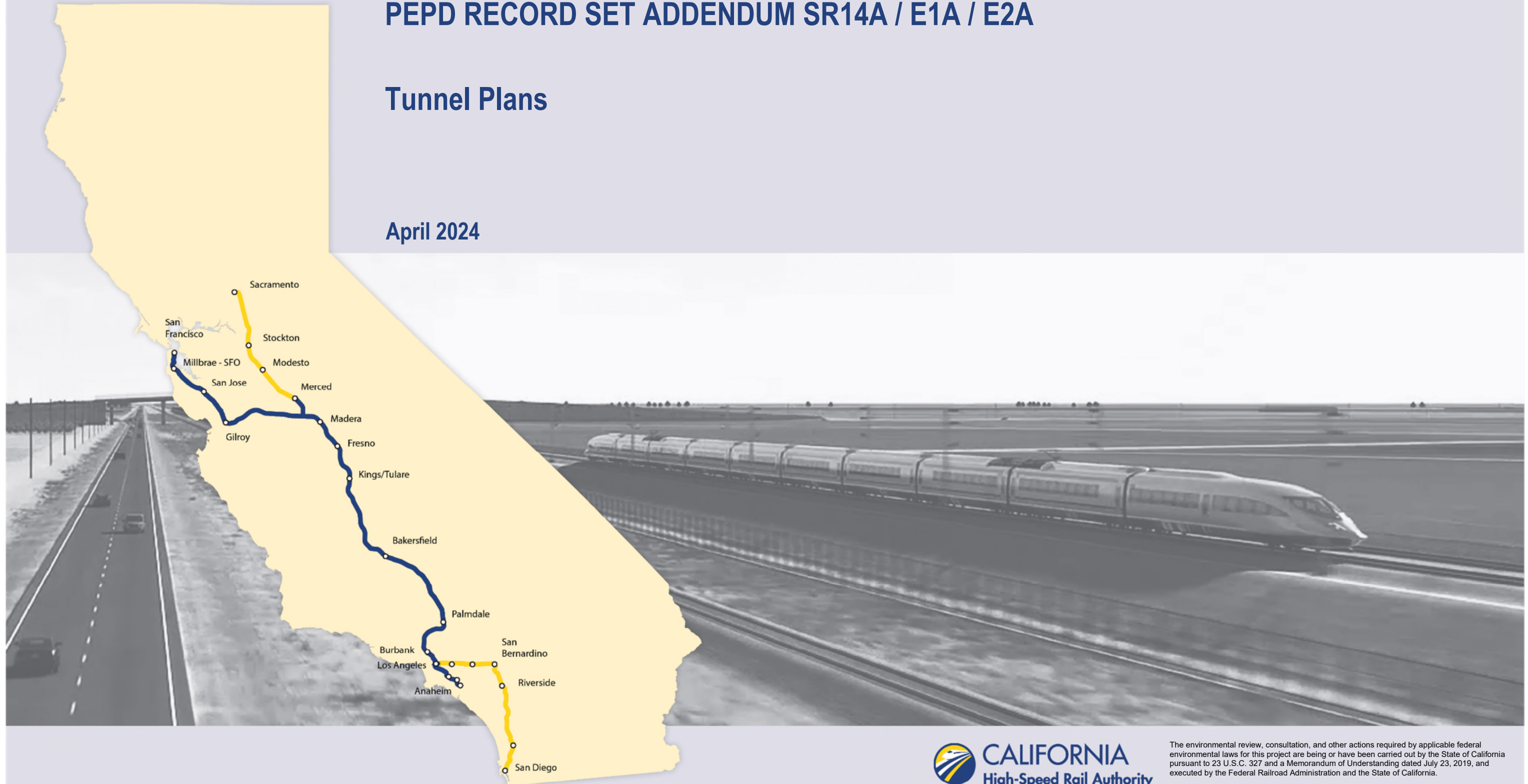
California High-Speed Rail Authority



Palmdale to Burbank Project Section

PEPD RECORD SET ADDENDUM SR14A / E1A / E2A

Tunnel Plans

April 2024



						DESIGNED BY E.VELASCO	PEPD RECORD SET ADDENDUM SR14A/E1A/E2A NOT FOR CONSTRUCTION			CALIFORNIA HIGH-SPEED RAIL PROJECT PALMDALE TO BURBANK GENERAL INDEX OF DRAWINGS	CONTRACT NO. HSR14-42
					DRAWN BY F.J.DOMINGUEZ	DRAWING NO. TN-B0010					
					CHECKED BY C.RECHEA	SCALE NO SCALE					
					IN CHARGE A.RELAÑO	SHEET NO.					
REV	DATE	BY	CHK	APP	DESCRIPTION	DATE 02/26/2021					

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ANF	ANGELES NATIONAL FOREST
APPROX	APPROXIMATE
BLVD	BOULEVARD
BAR	PRESSURE UNIT
C	CANYON
CHSR	CALIFORNIA HIGH-SPEED RAIL
CHSTP	CALIFORNIA HIGH-SPEED TRAIN PROJECT
CL	CENTER LINE
C&C	CUT-AND-COVER
CGS	CALIFORNIA GEOLOGICAL SURVEY
CP	CROSS-PASSAGE, FOR EMERGENCY EGRESS
CT	COMMUNICATION TOWER
E	EASTING, EAST
E.G.	FOR EXAMPLE
EQ	EARTHQUAKE
ET	EMERGENCY TELEPHONE
ETD	ENLARGED TUNNEL DIAMETER
FH	FIRE HYDRANT
FT	FEET
FWY	FREEWAY
GC	ONE OF THE TSI REFERENCE GAUGES, USED IN DEVELOPING CLEARANCES FOR THE CHSTP
GWP	GROUND WATER PRESSURE
HFZ	HAZARDOUS FAULT ZONE
HSR	HIGH SPEED RAIL
HWY	HIGHWAY
ID	INNER DIAMETER
IW	INTERMEDIATE WINDOW (FOR CONSTRUCTION PURPOSES ONLY)
I-210	I-210 FREEWAY
KG	KILOGRAM
L	FLOOD LIGHTS, LENGTH
M	METER
MI	MILE, MINED TUNNEL IN ROCK
MIN	MINIMUM
MPH	MILES PER HOUR

		N	NORTHING, NORTH
NATM	NEW AUSTRIAN TUNNELING METHOD		
NB	NORTH BOUND		
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION		
OCS	OVERHEAD CATENARY SYSTEM		
OG	ORIGINAL GROUND		
P	TUNNEL PORTAL WITH PERMANENT FACILITIES		
PERM.	PERMANENT		
PROP.	PROPOSED		
PHFZ	POTENTIALLY HAZARDOUS FAULT ZONE		
POT	POINT OF TANGENT (ALIGNMENT RELATED)		
PS	TRACTION POWER PARALLELLING STATION		
R	RADIUS		
RC	REINFORCED CONCRETE		
RD	ROAD		
R/W, ROW	RIGHT OF WAY		
S	SOUTH		
SB	SOUTH BOUND		
SEM	SEQUENTIAL EXCAVATION METHOD		
SQFT	SQUARE FEET		
SS	TRACTION POWER SUBSTATION		
ST	STREET, SINGLE TUNNEL		
STA	STATION		
SGFZ	SAN GABRIEL FAULT ZONE		
SCRRA	SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY		
T, +	THICKNESS		
TBD	TO BE DECIDED		
TBM	TUNNEL BORING MACHINE		
TCSA	TEMPORARY CONSTRUCTION STAGING AREA FOR TUNNELS		
TH-21, TH-29	STEEL ARCHES IN OMEGA PROFILE. FOR GROUND SUPPORT IN MINED/SEM TUNNELS		
TM	TECHNICAL MEMORANDUM		
TOR	TOP OF RAIL		
TPPS	TRACTION POWER PARALLELLING STATION		
TR	CROSS-PASSAGE, FOR TECHNICAL EQUIPMENT		
TSEFZ, TSEFCZ	TRAIN SURFACE EVACUATION AND FIRE CONTROL ZONE		
TSI	THE EUROPEAN UNION'S (EU) TECHNICAL SPECIFICATIONS FOR INTEROPERABILITY		
TYP	TYPICAL		
USGS	U.S. GEOLOGICAL SURVEY		
UPS	UNDERGROUND PARALLELING STATION		

V	VIADUCT
VCP	VENTILATION CONTROL PANEL
VC	VERTICAL CURVE (ALIGNMENT RELATED)
WPC	WAYSIDE POWER CONTROL CUBICLE
W	WASH
WWM	WELDED WIRE MESH

GENERAL NOTES

1. STRUCTURE DIMENSIONS ARE INDICATIVE. TO BE CONFIRMED.
2. TUNNEL DIMENSIONS ARE INDICATIVE. TO BE CONFIRMED.
3. TUNNEL SURFACE FACILITIES ARE INDICATIVE. TO BE CONFIRMED.
4. RAILWAY INSTALLATIONS ARE INDICATIVE. TO BE CONFIRMED.
5. FINAL SLOPES TO BE DEFINED AT A LATER STAGE, WHEN THE GEOTECHNICAL STUDY IS AVAILABLE.
6. FAULTS AND EXTENT OF FAULT ZONES SHOWN ARE ONLY ORIENTATIVE AND, ARE SUBJECT TO CHANGE, SOURCE: FAULT - USGS QUATERNARY FAULT AND FOLD DATABASE AND CGS GEOLOGIC MAP DATA BASES
FAULT ZONE ACTIVITY CLASSIFICACION - CHSR 15% DRAFT FAULT HAZARD EVALUATION REPORT, 2015.
7. ALL DIMENSIONS ARE IN FEET UNLESS NOTED OTHERWISE.
8. TWIN TUNNELS CROSS-PASSAGES DISTRIBUTED ALONG ALIGNMENTS: CP FOR EMERGENCY EGRESS, EVERY 800 FT. CP FOR TECHNICALROOMS, EVERY MILE.
9. STA 296+82.67 (SPRUCE CT) IS THE NORTHERN LIMIT OF THE PALMDALE-BURBANK ENVIRONMENTAL DOCUMENT. NORTH OF THIS POINT REFER TO BAKERSFIELD-PALMDALE ENVIRONMENTAL DOCUMENT. DESIGN FEATURES BETWEEN STA 265+00.00 AND STA 296+82.67 (SPRUCE CT) SHOWN FOR REFERENCE ONLY.

LEGEND

PLAN

	PROPOSED PERMANENT ENVIRONMENTAL FOOTPRINT
	CONSTRUCTION STAGING AREA / PROPOSED TEMPORARY ENVIRONMENTAL FOOTPRINT
	FENCE LINE / HSR ROW
	LIMITS OF EMBANKMENT (FILL)
	LIMITS OF EXCAVATION (CUT)
	PROPOSED RETAINING WALL
	PROPOSED TUNNEL
	INCLINED DESCENDING GALLERY
	UNDERGROUND EASEMENT FOR EMERGENCY/RESCUE STATION
	TRACTION POWER FACILITY
	100 YEAR FLOOD ZONE
	ANGELES NATIONAL FOREST BOUNDARY
CONTROL LINE EXAMPLE "A" LINE	
255+00	260+00
	265+00

PROFILE

	PROPOSED TRACK ELEVATION (SB TRACK)
	ORIGINAL GROUND (OG)
	PROPOSED TUNNEL HEADWALL PROPOSED TUNNEL

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY	E.VELASCO
DRAWN BY	F.J.DOMINGUEZ
CHECKED BY	C.RECHEA
IN CHARGE	A.RELAÑO
DATE	02/26/2021

PEPD RECORD SET
ADDENDUM
SR14A/ E1A/ E2A
NOT FOR CONSTRUCTION



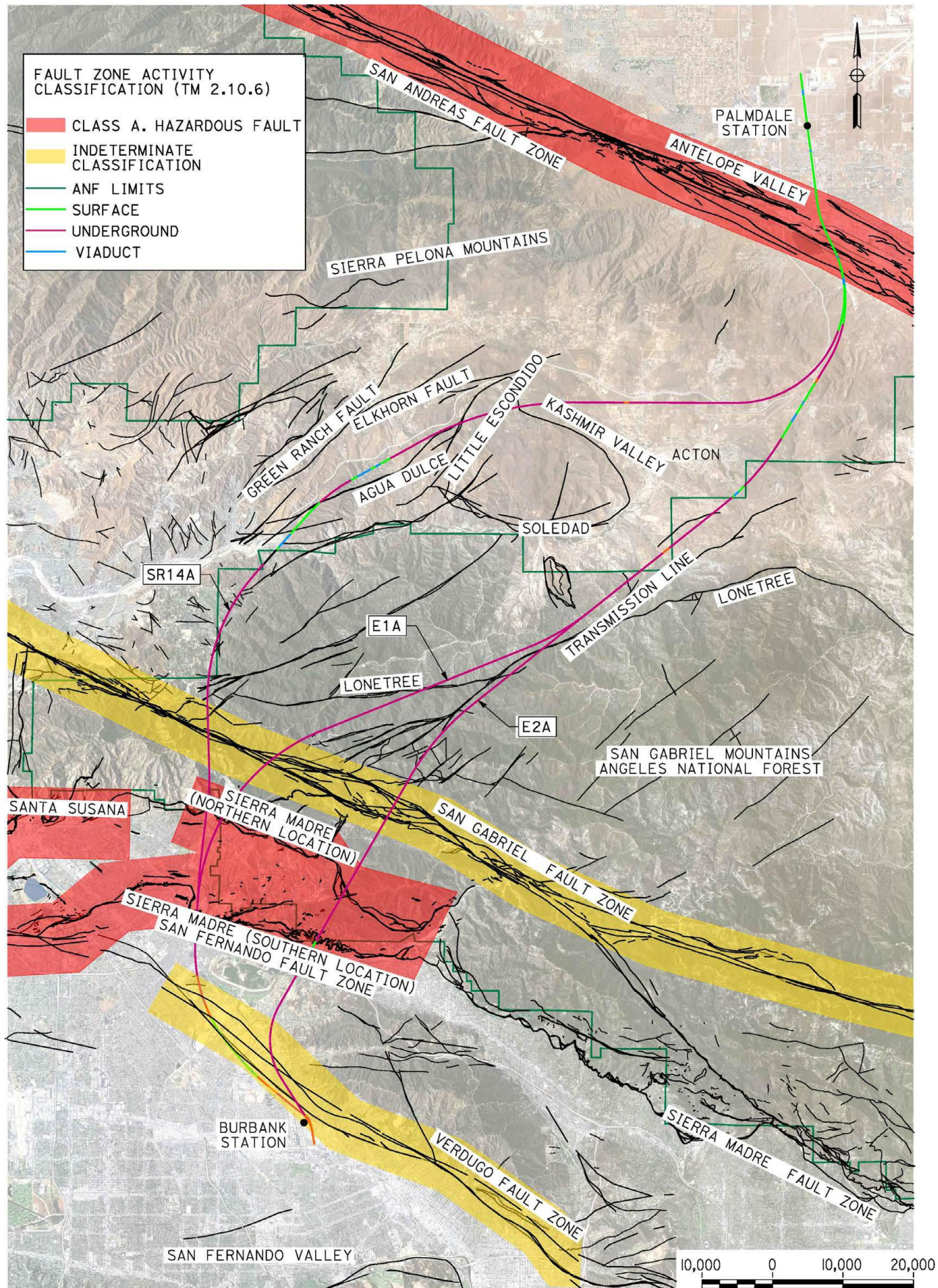
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E1A/E2A/SR14A
GENERAL
ABBREVIATIONS AND LEGEND

CONTRACT NO.	HSR14-42
DRAWING NO.	TN-B0014
SCALE	NO SCALE
SHEET NO.	

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NOTE:

PRELIMINARY DRAFT/SUBJECT TO CHANGE

SOURCE:

FAULTS - USGS QUATERNARY FAULT AND FOLD DATABASE AND CGS GEOLOGIC MAP DATABASES
FAULT SCREENING REPORT - PALMDALE TO BURBANK SEGMENT. SEISMIC SPECIALIST TEAM -
FAULT DISPLACEMENT. DRAFT. MAY 2017

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

PEPD RECORD SET
ADDENDUM
SR14A/ E1A/ E2A

NOT FOR
CONSTRUCTION



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E1A/E2A/SR14A
GENERAL
FAULT KEY MAP

CONTRACT NO. HSR14-42
DRAWING NO. TN-B0015
SCALE AS SHOWN
SHEET NO.

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NOTE:

P: Portal

IW: Adit/Intermediate window (temporary, only for construction)

Numbering of tunnels done from the Operational point of view, not from the construction method p.o.v

GEOTECHNICAL RISKS AT PORTALS, INTERMEDIATE WINDOWS AND ADITS

ALIGNMENT	TUNNEL	TUNNEL CONFIGURATION	TUNNEL LENGTH (miles)	PORTAL/ADIT	STA.	PORTAL TYPE	GEOTECHNICAL RISKS	GROUNDWATER DEPTH (FEET)
E1A/E2A	Tunnel 1A	Twin tunnels, single track	1.66	P1A	462+18.55	Mountain portal	Portal is located within area mapped as Vasquez Formation andesite and basalt. Rock Excavations may require heavy ripping or blasting. Portal may require retaining walls and rockfall protection in addition to rock cuts.	~80
				P2A	549+68.84	Mountain portal	Portal is located within area mapped as alluvium. This portal will likely require constructing permanent retaining walls and will require further evaluation of the potential for liquefaction.	~50
				P3A	554+68.84	Arch-shaped Cut&Cover Tunnel		
SR14A	Tunnel 1A	Twin tunnels, single track	13.21	P1A	725+19.18	Mountain portal	Portal is located within area mapped as older alluvium. The older alluvium overlies Syenite. Syenite depth unknown due to its uplift by nearby San Andreas fault splay (Nadeau fault)	~50
				IWA	870+00.00	"Open trench 160 ft deep"	Shaft is located in young alluvium and older alluvium approximately 250 feet thick filling an alluvial basin underlying Acton. Groundwater head over the bottom of the shaft excavation is estimated to be 120 to 130 feet.	~70
				P2A	1681+95.32	Mountain portal	Vasquez Formation conglomerate and siltstone with bedding structures dipping less than 45 degrees to the west. West-facing excavations may daylight bedding. Rock Excavations may require ripping or blasting. Portal may require retaining walls, slope reinforcing and rockfall protection in addition to rock cuts.	Unkown, possibly deep
	Tunnel 2A	Twin tunnels, single track	1.03	P3A	1233+50.00	Mountain portal	Vasquez Formation sedimentary rocks with bedding structures dipping less than 45 degrees to the northwest. West-facing excavations may daylight bedding. Rock Excavations may require ripping or blasting. Portal may require retaining walls, slope reinforcing and rockfall protection in addition to rock cuts.	Unkown, possibly deep
				P4A	1288+00.00	Mountain portal	Interbedded layers of conglomerate, siltstone, sandstone, belonging to Vasquez Formation. The layers are dipping out-of-slope at the portal face. Slopes are mapped as potential seismically-induced landslide area. The Little Escondido and Agua Dulce faults are present at the portal. Rock Excavations may require ripping or blasting. Portal may require retaining walls, slope reinforcing and rockfall protection in addition to rock cuts.	Unkown, possibly deep

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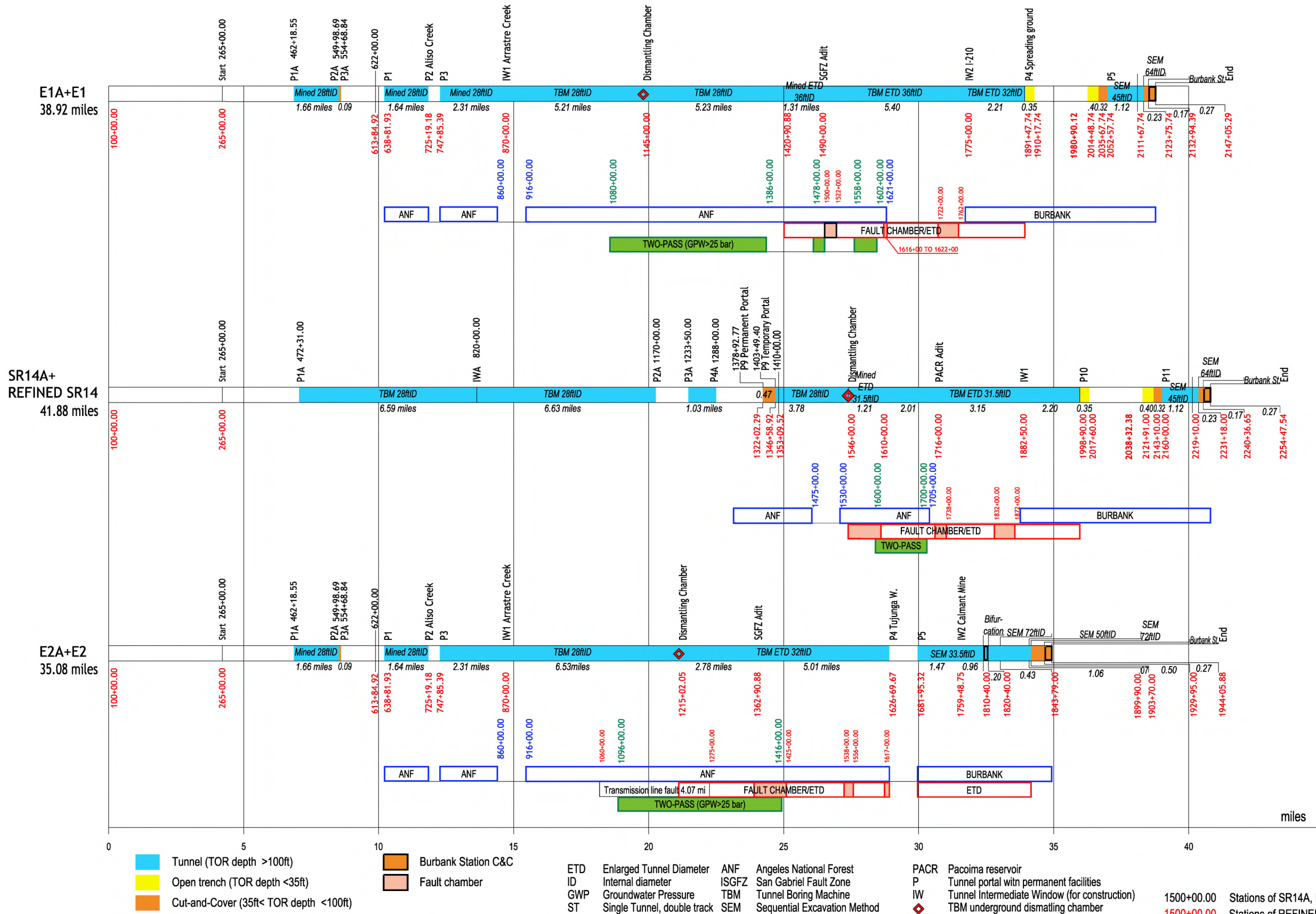
DESIGNED BY E.VELASCO
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CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

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NOT FOR CONSTRUCTION



CALIFORNIA HIGH-SPEED RAIL PROJECT PALMDALE TO BURBANK ALIGNMENT E1A/E2A/SR14A GENERAL GEOTECHNICAL RISKS AT PORTALS, IW AND ADITS
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CONTRACT NO. HSR14-42
DRAWING NO. TN-B0016
SCALE NO SCALE
SHEET NO.



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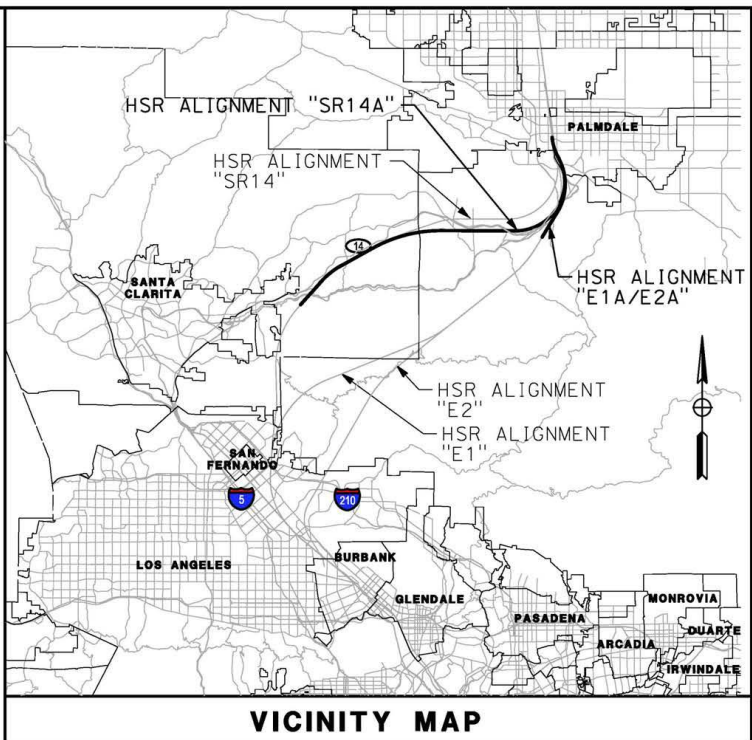
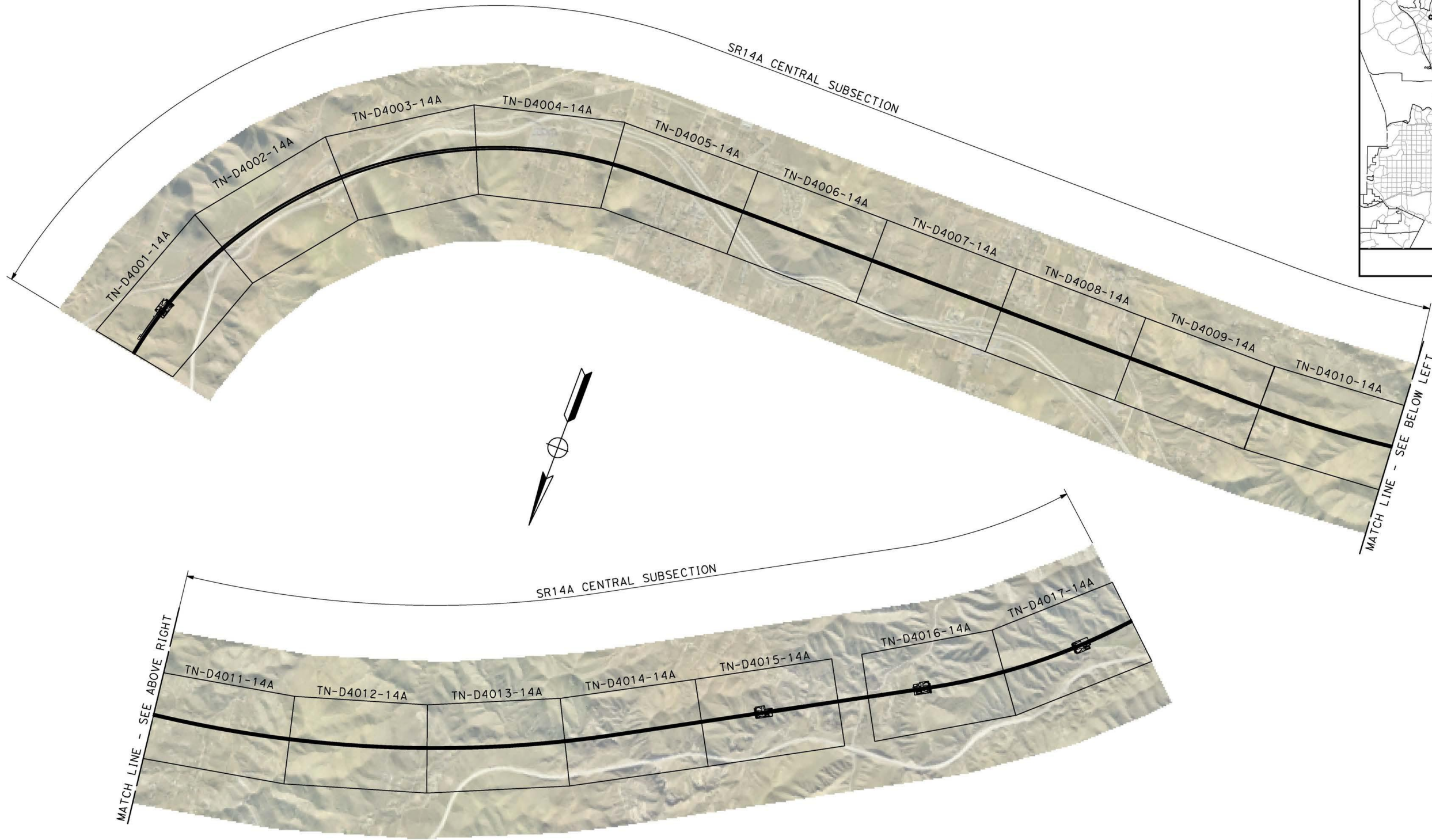
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IN CHARGE A.RELAÑO
DATE 02/26/2021

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NOT FOR CONSTRUCTION



CALIFORNIA HIGH-SPEED RAIL PROJECT PALMDALE TO BURBANK ALIGNMENT E1A/E2A/SR14A GENERAL SCHEMATIC LINEAR DIAGRAMS	CONTRACT NO. HSR14-42 DRAWING NO. TN-B0017 SCALE NO SCALE SHEET NO.
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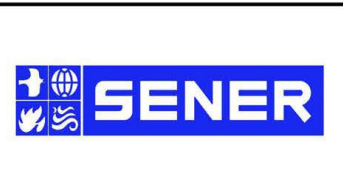


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IN CHARGE
A.RELAÑO
DATE
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**PEPD RECORD SET
ADDENDUM
SR14A/ E1A/ E2A**

**NOT FOR
CONSTRUCTION**

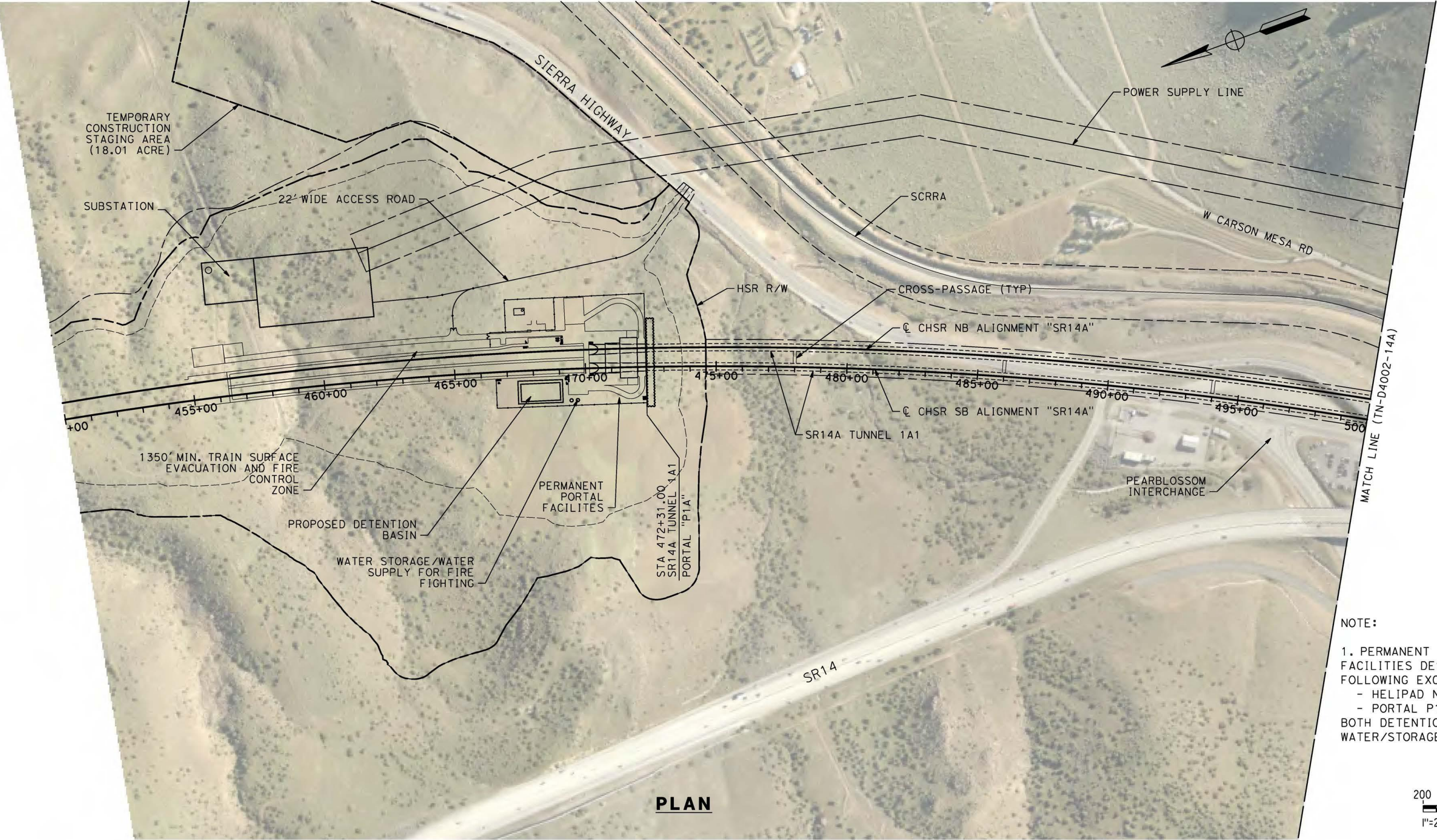


**CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK**
ALIGNMENT "SR14A"

HIGH SPEED RAIL TUNNEL PLANS
KEY MAP

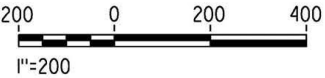
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HSR14-42
DRAWING NO.
TN-B6001-14A
SCALE
AS SHOWN
SHEET NO.

TUNNEL 1A1



PLAN

NOTE:
1. PERMANENT FOOTPRINT INCLUDES SPACE FOR FACILITIES DESCRIBED IN TM 2.4.6, WITH THE FOLLOWING EXCEPTIONS:
- HELIPAD NOT INCLUDED
- PORTAL P1A INCLUDES SPACE RESERVED FOR BOTH DETENTION POND/BASIN (LOW POINT) AND WATER/STORAGE SUPPLY



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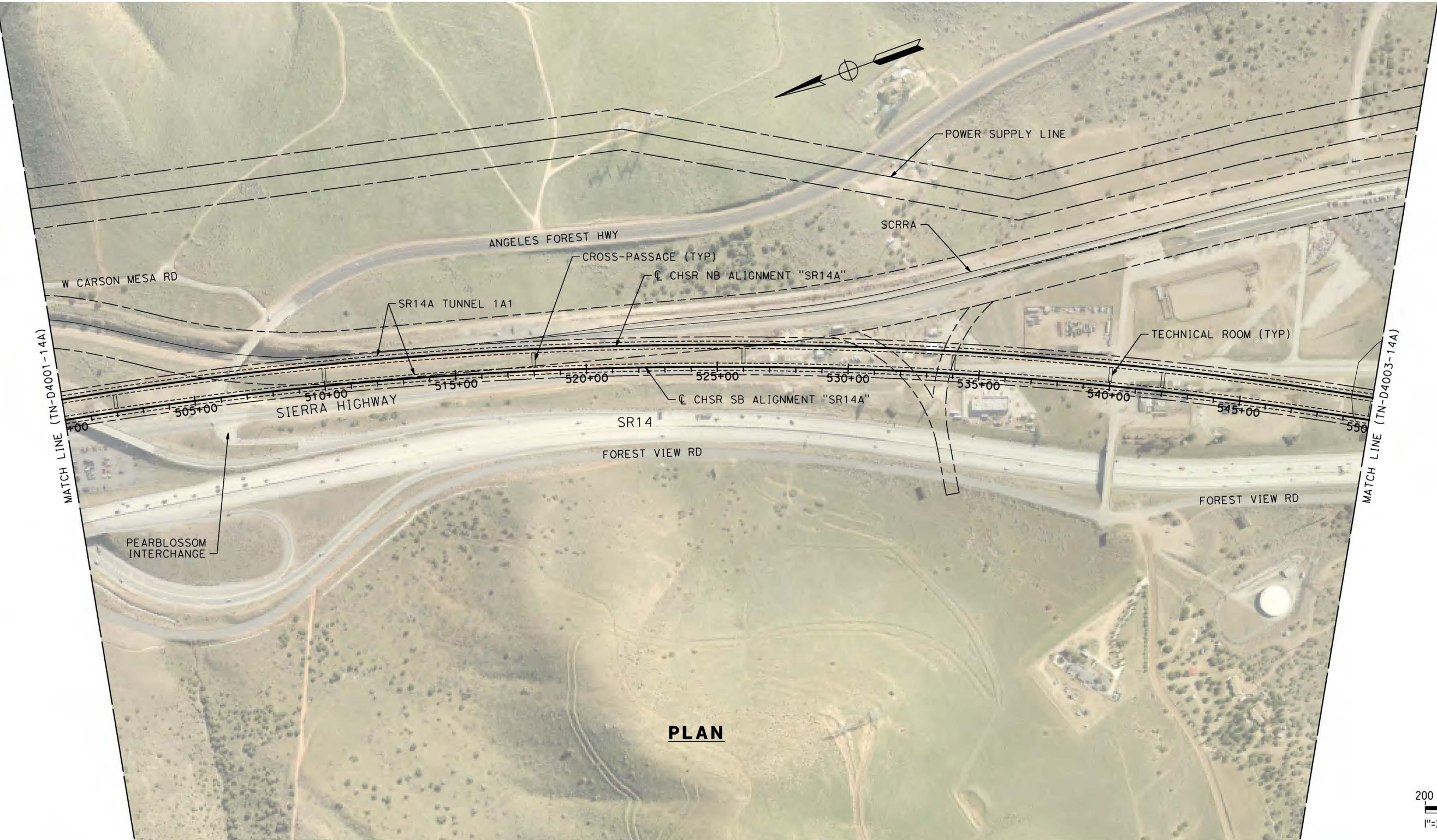
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IN CHARGE A.RELAÑO
DATE 02/26/2021

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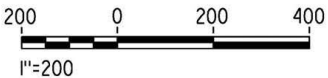


CALIFORNIA HIGH-SPEED RAIL PROJECT PALMDALE TO BURBANK
ALIGNMENT "SR14A" PLAN STA 450+00.00 TO STA 500+00.00
CONTRACT NO. HSR14-42
DRAWING NO. TN-D4001-14A
SCALE AS SHOWN
SHEET NO.

TUNNEL 1A1



PLAN



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DATE 02/26/2021

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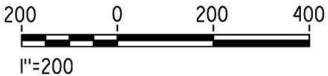


CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

ALIGNMENT "SR14A"
PLAN
STA 500+00.00 TO STA 550+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4002-14A
SCALE AS SHOWN
SHEET NO.

TUNNEL 1A1



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CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

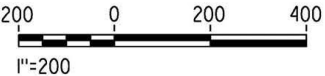
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PLAN
STA 550+00.00 TO STA 600+00.00

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TUNNEL 1A1



PLAN



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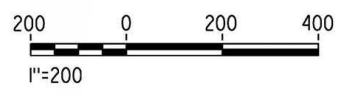
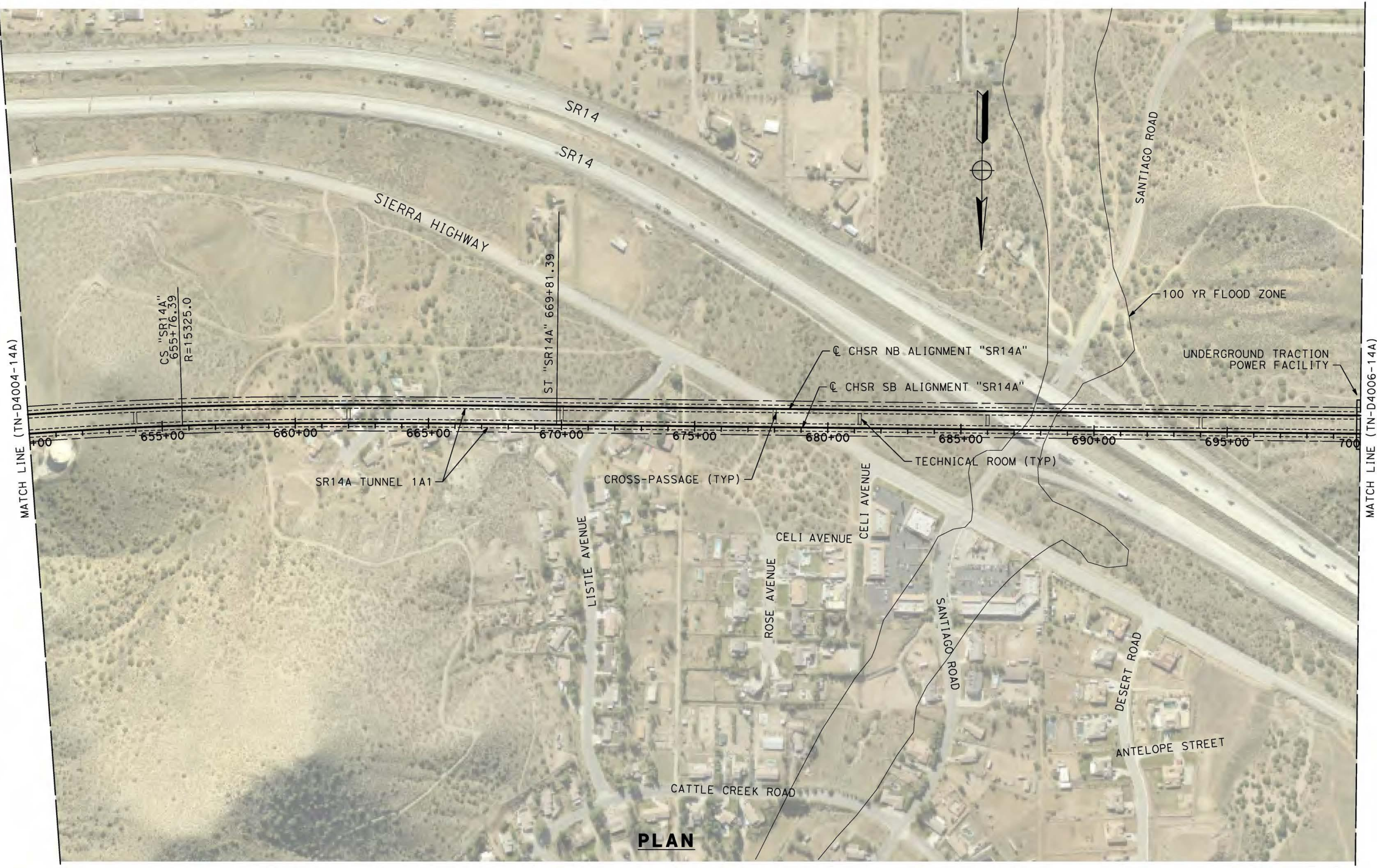
CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

ALIGNMENT "SR14A"
PLAN
STA 600+00.00 TO STA 650+00.00

CONTRACT NO. HSR14-42
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SHEET NO.

TUNNEL 1A1



PLAN

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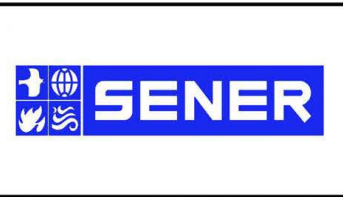
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SR14A/ E1A/ E2A**

**NOT FOR
CONSTRUCTION**



**CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK**

ALIGNMENT "SR14A"
PLAN
STA 650+00.00 TO STA 700+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4005-14A
SCALE AS SHOWN
SHEET NO.

TUNNEL 1A1



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CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

ALIGNMENT "SR14A"
PLAN
STA 700+00.00 TO STA 750+00.00

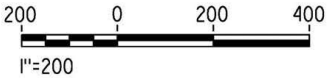
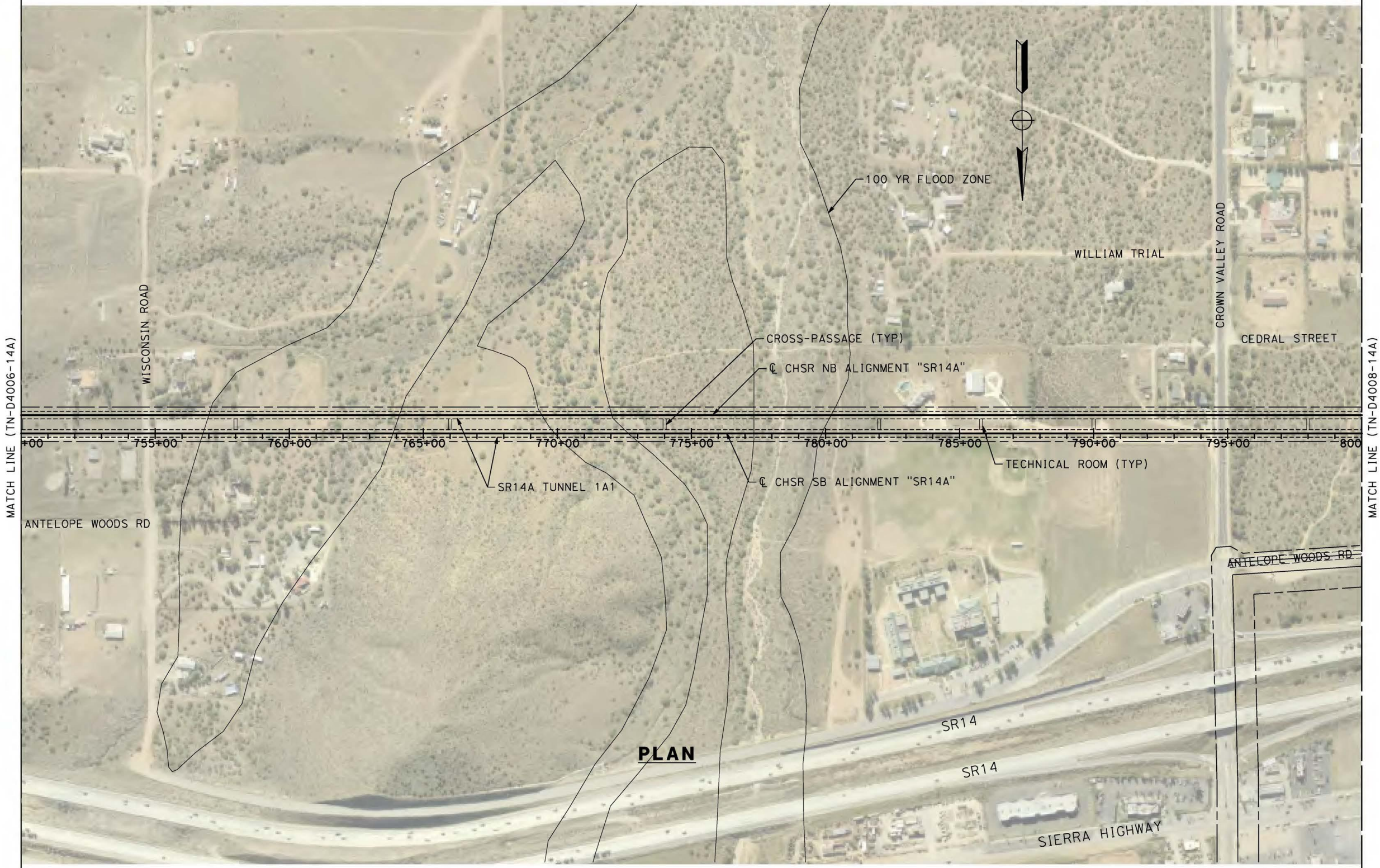
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TUNNEL 1A1



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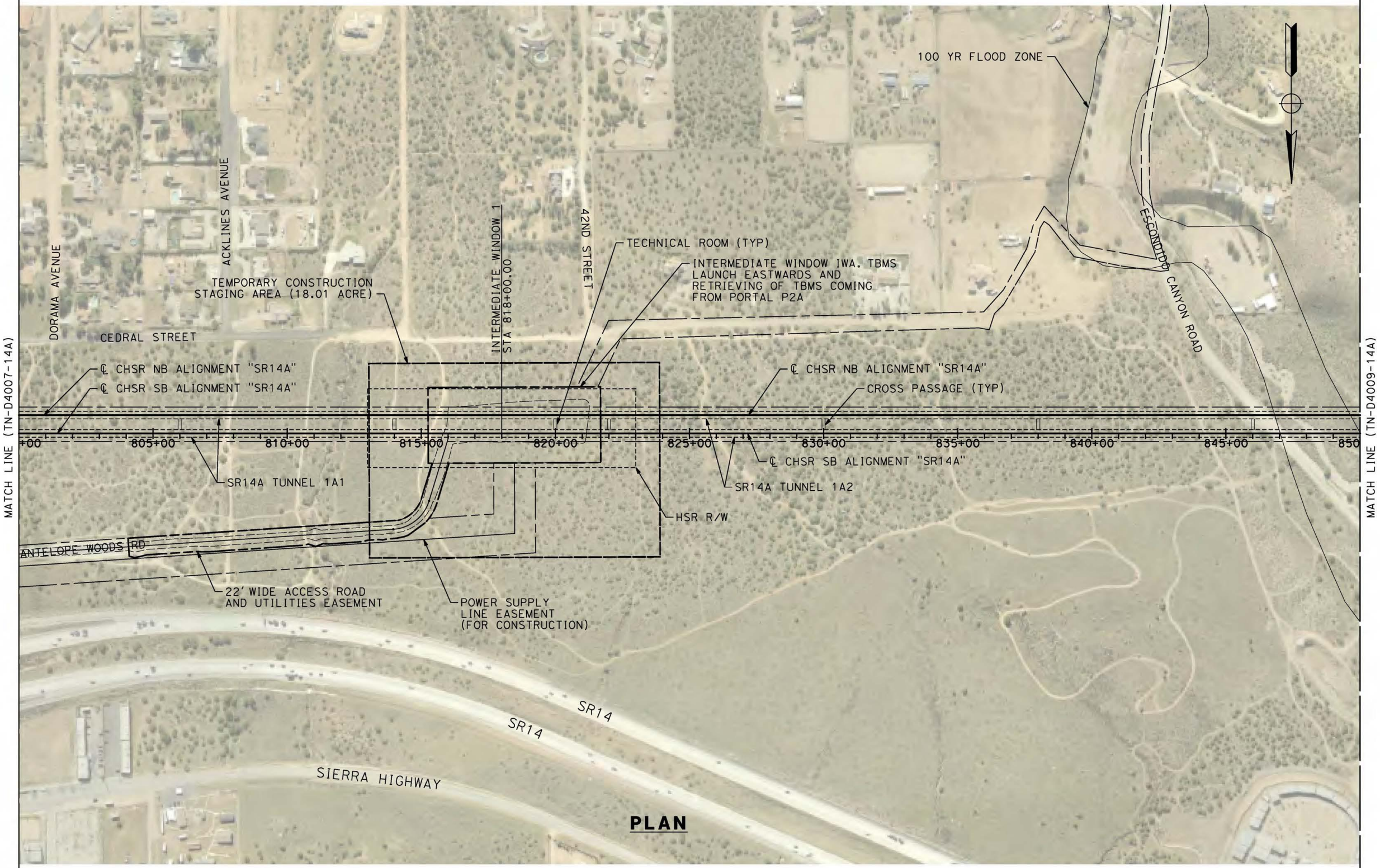


CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

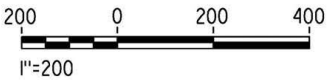
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CONTRACT NO. HSR14-42
DRAWING NO. TN-D4007-14A
SCALE AS SHOWN
SHEET NO.

TUNNEL 1A1/1A2



PLAN



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CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

ALIGNMENT "SR14A"
PLAN
STA 800+00.00 TO STA 850+00.00

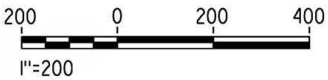
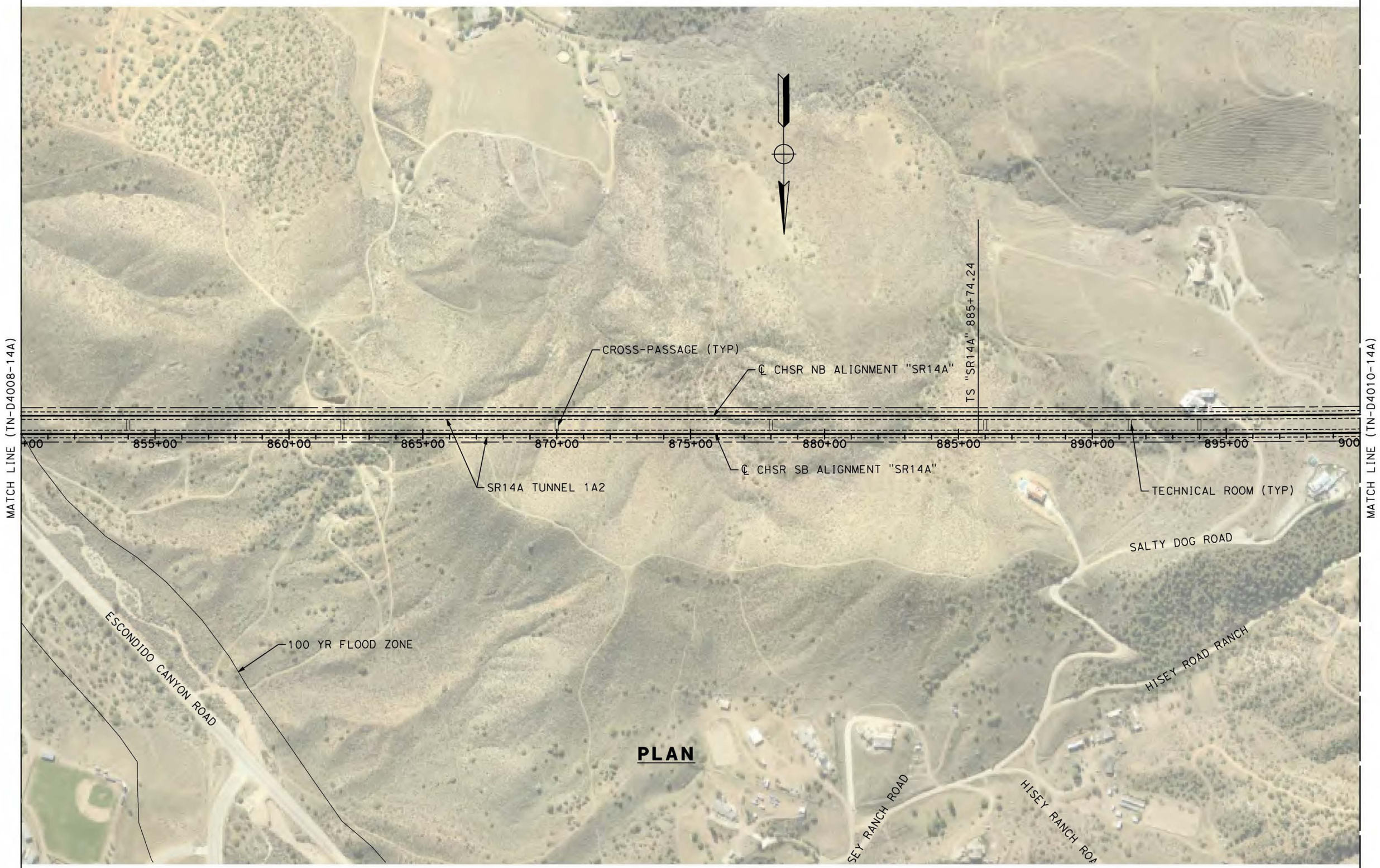
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DRAWING NO. TN-D4008-14A
SCALE AS SHOWN
SHEET NO.

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09/12/2020 15:11:25

0205240

TUNNEL 1A2



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

PEPD RECORD SET ADDENDUM SR14A/ E1A/ E2A
NOT FOR CONSTRUCTION



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

**CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK**

ALIGNMENT "SR14A"
PLAN
STA 850+00.00 TO STA 900+00.00

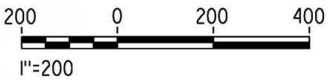
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09/12/2020 15:11:45

0205240

TUNNEL 1A2



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

PEPD RECORD SET ADDENDUM SR14A/ E1A/ E2A
NOT FOR CONSTRUCTION



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

ALIGNMENT "SR14A"
PLAN
STA 900+00.00 TO STA 950+00.00

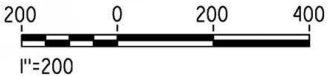
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SCALE AS SHOWN
SHEET NO.

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09/12/2020 15:12:07

0205240

TUNNEL 1A2



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

PEPD RECORD SET ADDENDUM SR14A/ E1A/ E2A
NOT FOR CONSTRUCTION



CALIFORNIA HIGH-SPEED RAIL PROJECT PALMDALE TO BURBANK
ALIGNMENT "SR14A" PLAN STA 950+00.00 TO STA 1000+00.00

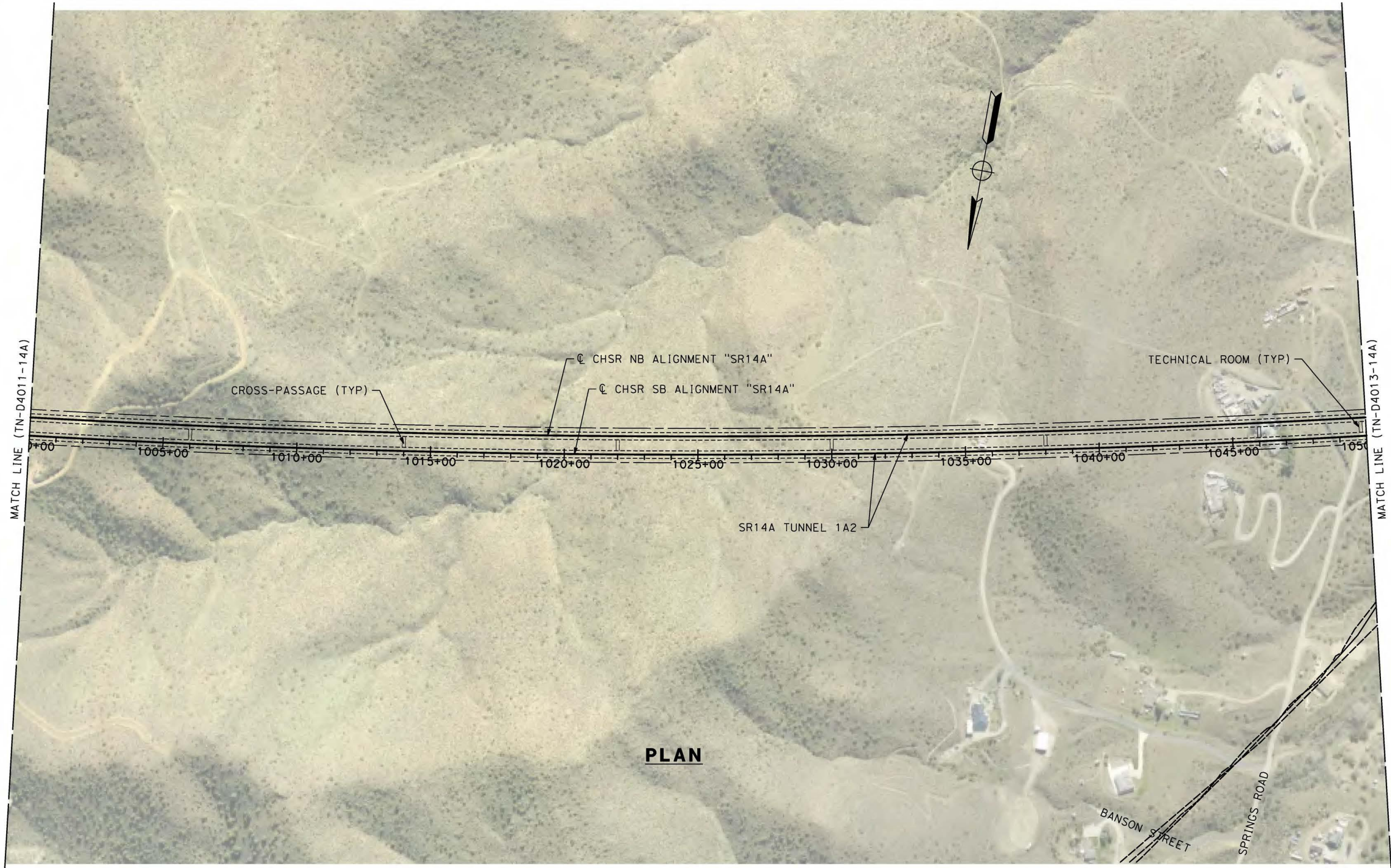
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DRAWING NO. TN-D4011-14A
SCALE AS SHOWN
SHEET NO.

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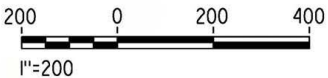
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0205240

TUNNEL 1A2



PLAN



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
E.VELASCO
DRAWN BY
F.J.DOMINGUEZ
CHECKED BY
C.RECHEA
IN CHARGE
A.RELAÑO
DATE
02/26/2021

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

NOT FOR
CONSTRUCTION



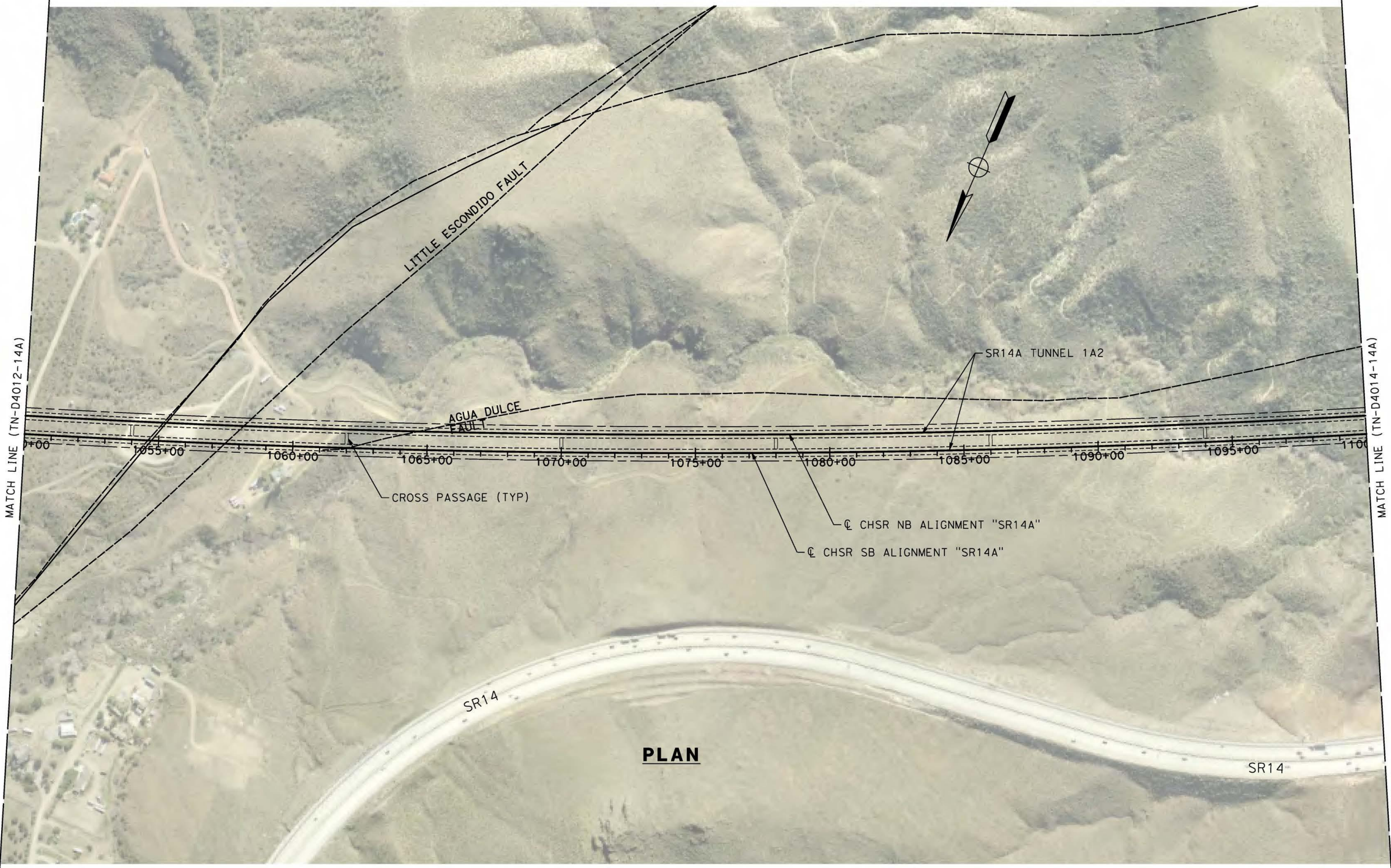
CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

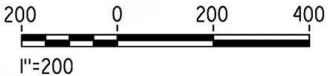
ALIGNMENT "SR14A"
PLAN
STA 1000+00.00 TO STA 1050+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4012-14A
SCALE AS SHOWN
SHEET NO.

TUNNEL 1A2



PLAN



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0205240

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

PEPD RECORD SET ADDENDUM SR14A/E1A/E2A
NOT FOR CONSTRUCTION



CALIFORNIA HIGH-SPEED RAIL PROJECT PALMDALE TO BURBANK
ALIGNMENT "SR14A" PLAN STA 1050+00.00 TO STA 1100+00.00

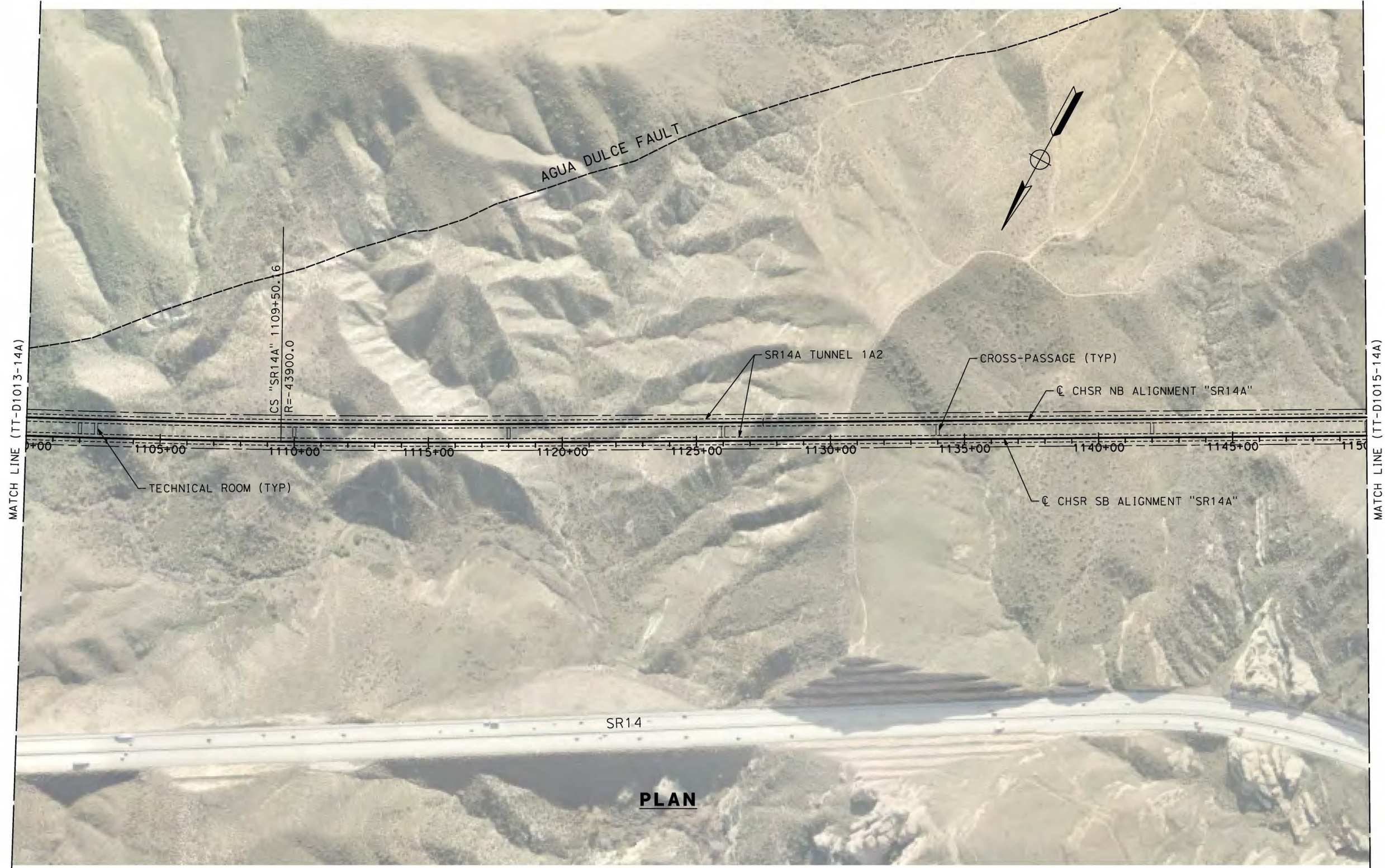
CONTRACT NO. HSR14-42
DRAWING NO. TN-D4013-14A
SCALE AS SHOWN
SHEET NO.

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09/12/2020 15:13:13

0205240

TUNNEL 1A2



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

NOT FOR
CONSTRUCTION



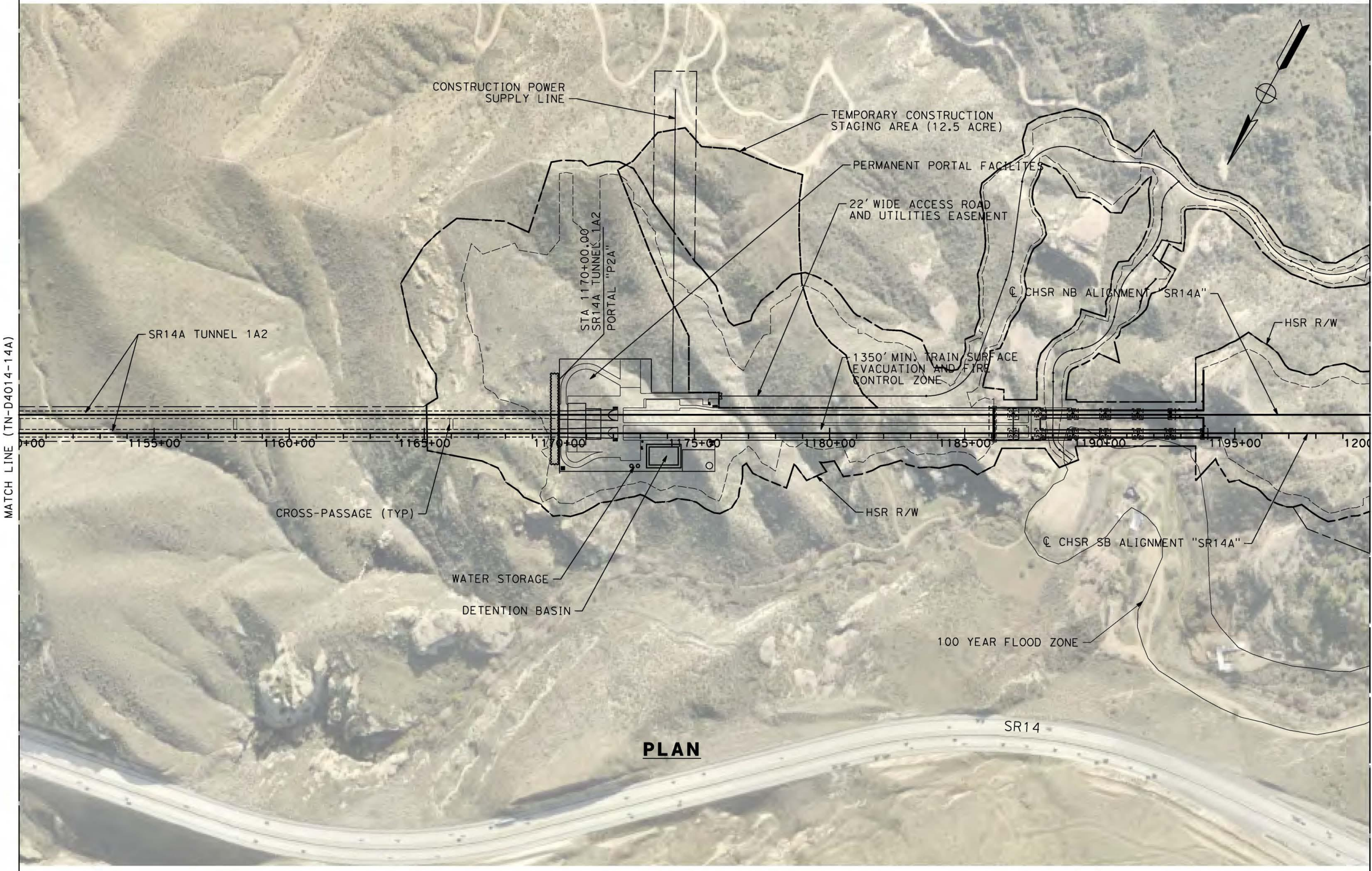
**CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK**

ALIGNMENT "SR14A"
PLAN
STA 1100+00.00 TO STA 1150+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4014-14A
SCALE AS SHOWN
SHEET NO.

TUNNEL 1A2

- NOTE:
1. PERMANENT FOOTPRINT INCLUDES SPACE FOR FACILITIES DESCRIBED IN TM 2.4.6, WITH THE FOLLOWING EXCEPTIONS:
- HELIPAD NOT INCLUDED
 - SPACE RESERVED FOR WATER/STORAGE SUPPLY



PLAN

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09/12/2020 15:13:37

0205240

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

PEPD RECORD SET ADDENDUM SR14A/E1A/E2A
NOT FOR CONSTRUCTION



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

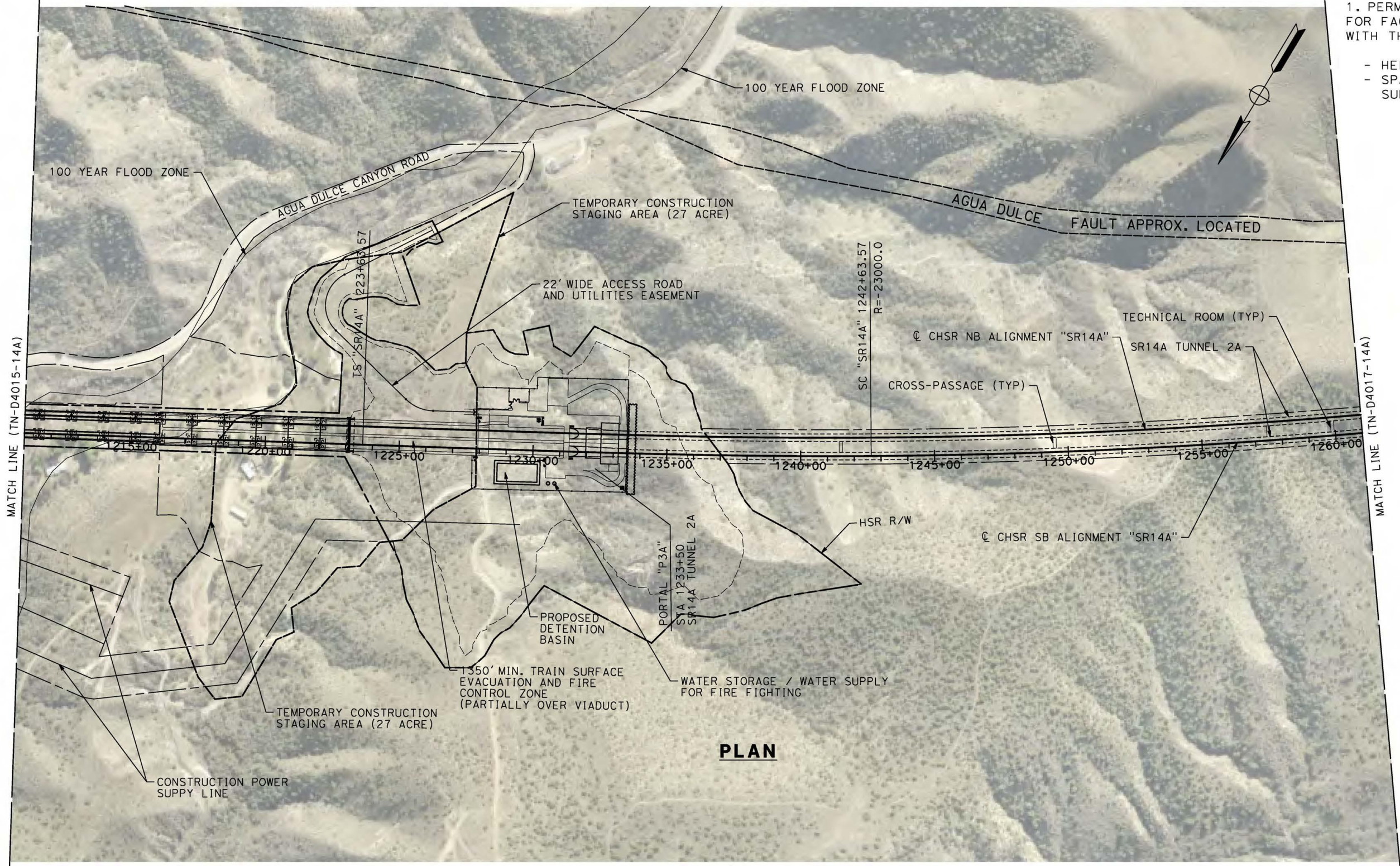
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

ALIGNMENT "SR14A"
PLAN
STA 1150+00.00 TO STA 1200+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4015-14A
SCALE AS SHOWN
SHEET NO.

TUNNEL 2A

- NOTE:
- 1. PERMANENT FOOTPRINT INCLUDES SPACE FOR FACILITIES DESCRIBED IN TM 2.4.6, WITH THE FOLLOWING EXCEPTIONS:
 - HELIPAD NOT INCLUDED
 - SPACE RESERVED FOR WATER/STORAGE SUPPLY



PLAN

09/12/2020 15:13:59 c:\pwworkingdir\sener-us-pw-bentley.com_sener-us-pw-01\franciscoj.dominguez\dms28531\PB-TN-D4016-14A.dgn

0205240

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

PEPD RECORD SET ADDENDUM SR14A/E1A/E2A
NOT FOR CONSTRUCTION



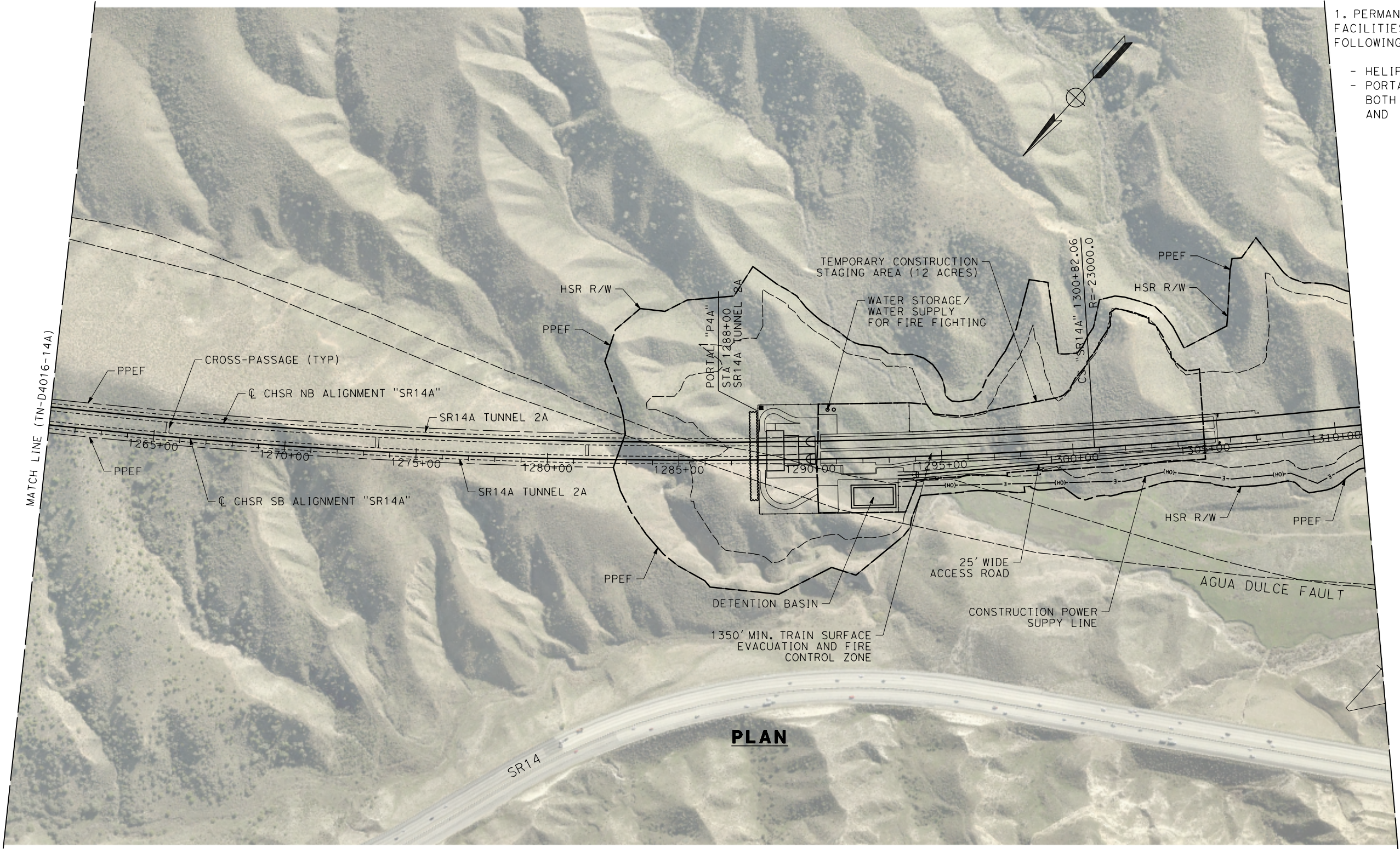
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

ALIGNMENT "SR14A"
PLAN
STA 1211+00.00 TO STA 1261+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4016-14A
SCALE AS SHOWN
SHEET NO.

TUNNEL 2A

- NOTE:
- 1. PERMANENT FOOTPRINT INCLUDES SPACE FOR FACILITIES DESCRIBED IN TM 2.4.6, WITH THE FOLLOWING EXCEPTIONS:
 - HELIPAD NOT INCLUDED
 - PORTAL P4A INCLUDES SPACE RESERVED FOR BOTH DETENTION POND/BASIN (LOW POINT) AND WATER/STORAGE SUPPLY



PLAN

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REV	DATE	BY	CHK	APP	DESCRIPTION

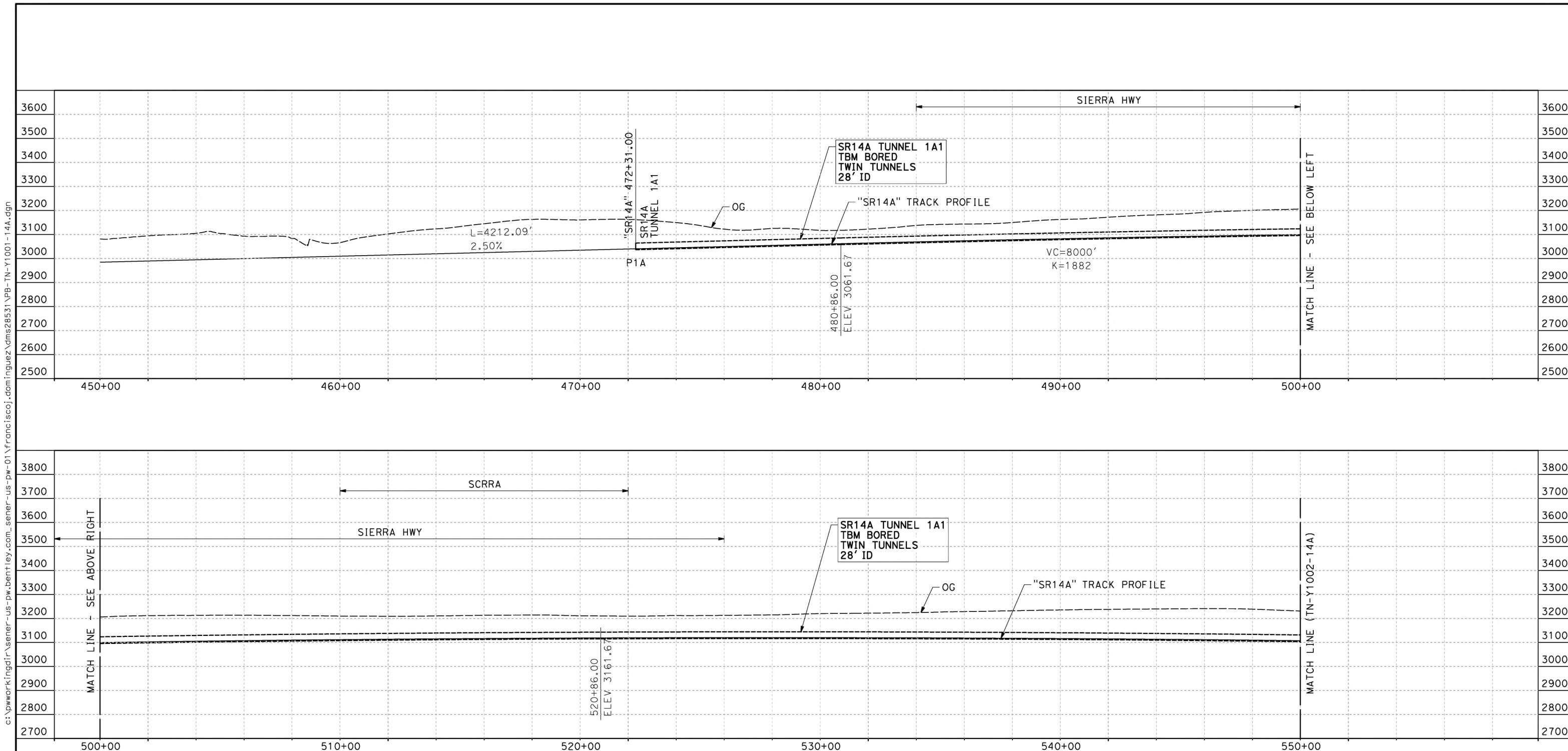
DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELANO
DATE 10/31/2023

PEPD RECORD SET ADDENDUM SR14A/E1A/E2A
NOT FOR CONSTRUCTION

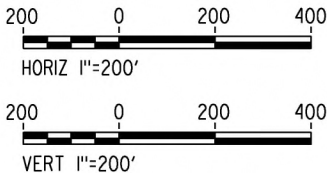




CALIFORNIA HIGH-SPEED RAIL PROJECT PALMDALE TO BURBANK
ALIGNMENT "SR14A" PLAN STA 1261+00.00 TO STA 1311+00.00

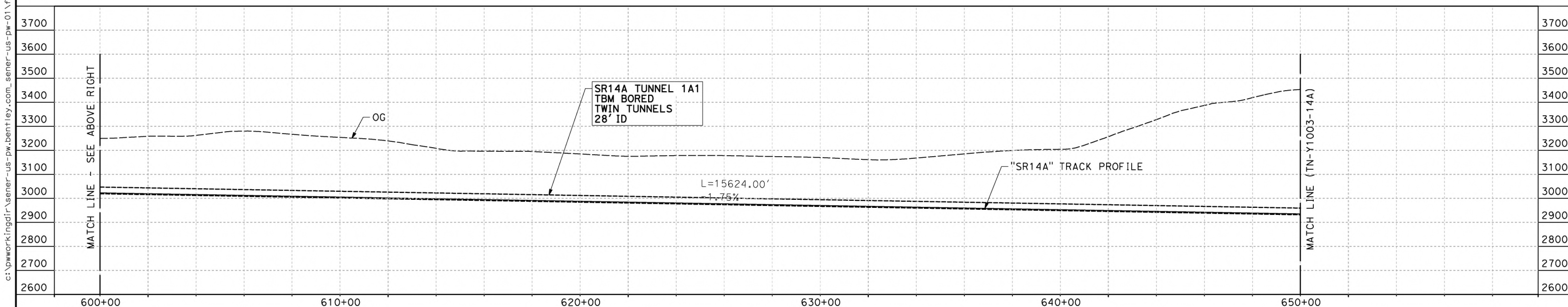
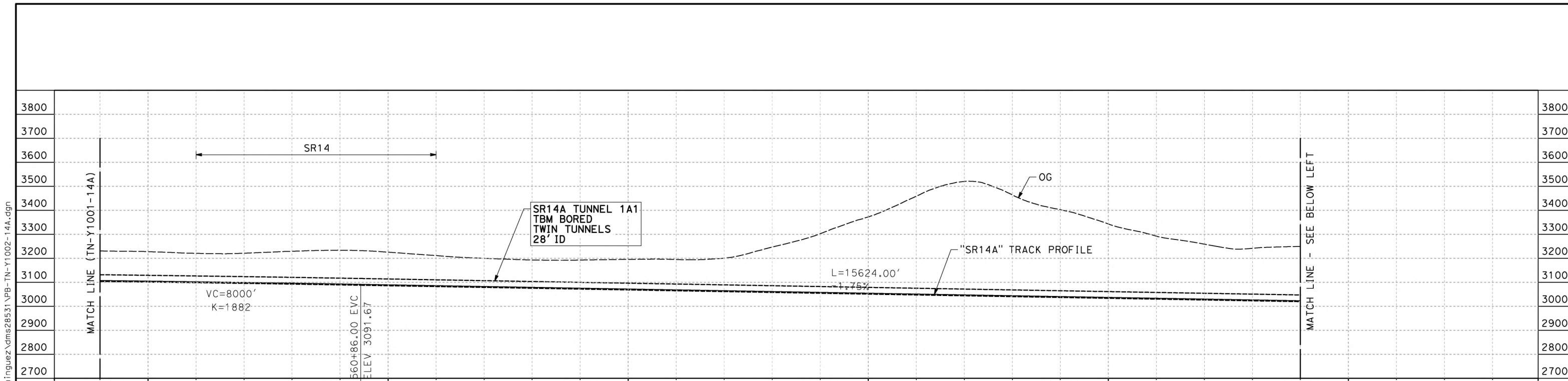
CONTRACT NO. HSR14-42
DRAWING NO. TN-D4017-14A
SCALE AS SHOWN
SHEET NO.



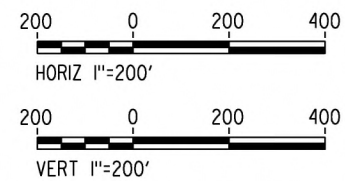
PROFILE



						DESIGNED BY E.VELASCO	PEPD RECORD SET ADDENDUM SR14A/ E1A/ E2A NOT FOR CONSTRUCTION			CALIFORNIA HIGH-SPEED RAIL PROJECT PALMDALE TO BURBANK ALIGNMENT "SR14A" TUNNEL PROFILE SOUTH BOUND TUNNEL STA 450+00.00 TO STA 550+00.00	CONTRACT NO. HSR14-42
						DRAWN BY F.J.DOMINGUEZ					DRAWING NO. TN-Y1001-14A
						CHECKED BY C.RECHEA					SCALE AS SHOWN
						IN CHARGE A.RELAÑO					SHEET NO.
0205240	REV	DATE	BY	CHK	APP	DESCRIPTION	DATE 02/26/2021				

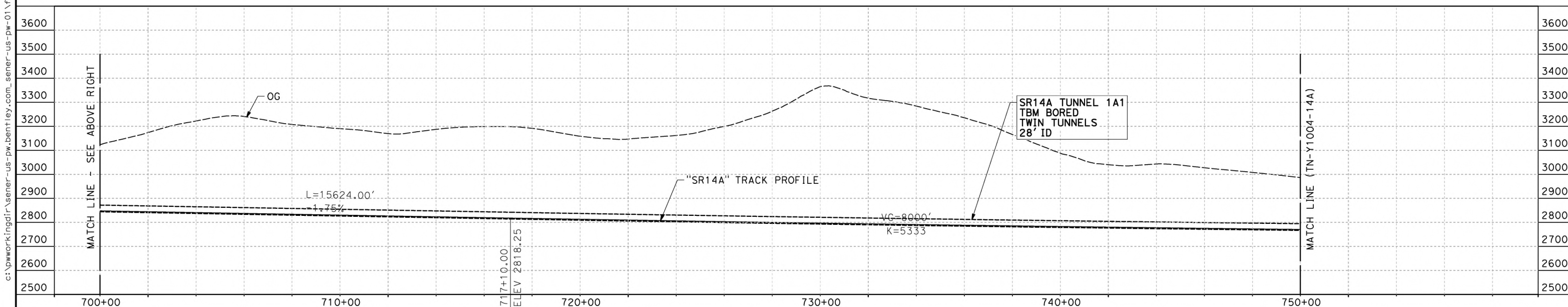
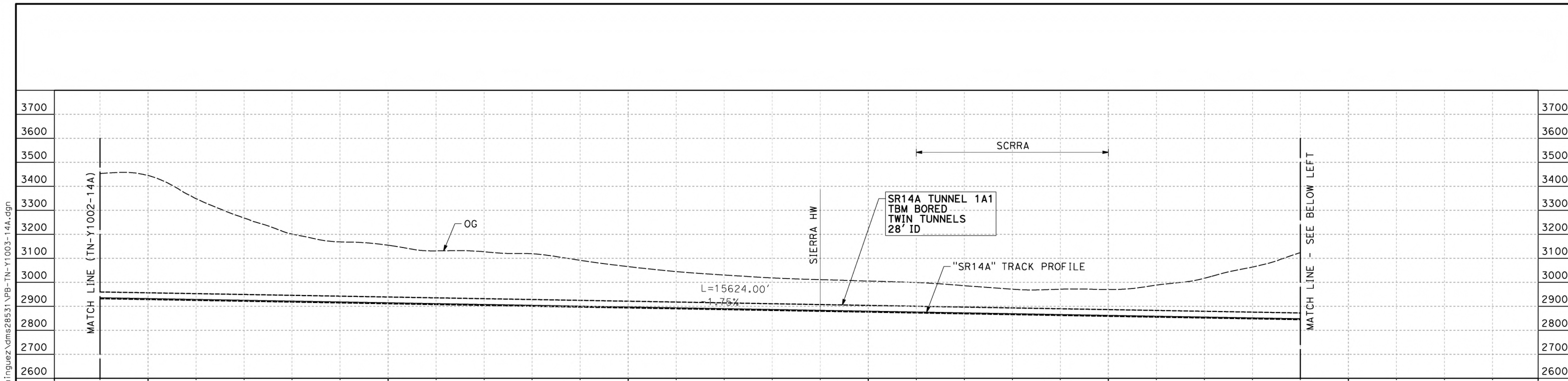


PROFILE

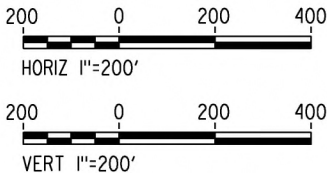


0205240

						DESIGNED BY E.VELASCO	PEPD RECORD SET ADDENDUM SR14A/ E1A/ E2A NOT FOR CONSTRUCTION			CALIFORNIA HIGH-SPEED RAIL PROJECT PALMDALE TO BURBANK ALIGNMENT "SR14A" TUNNEL PROFILE SOUTH BOUND TUNNEL STA 550+00.00 TO STA 650+00.00	CONTRACT NO. HSR14-42
						DRAWN BY F.J.DOMINGUEZ					DRAWING NO. TN-Y1002-14A
						CHECKED BY C.RECHEA					SCALE AS SHOWN
						IN CHARGE A.RELAÑO					SHEET NO.
REV	DATE	BY	CHK	APP	DESCRIPTION	DATE 02/26/2021					

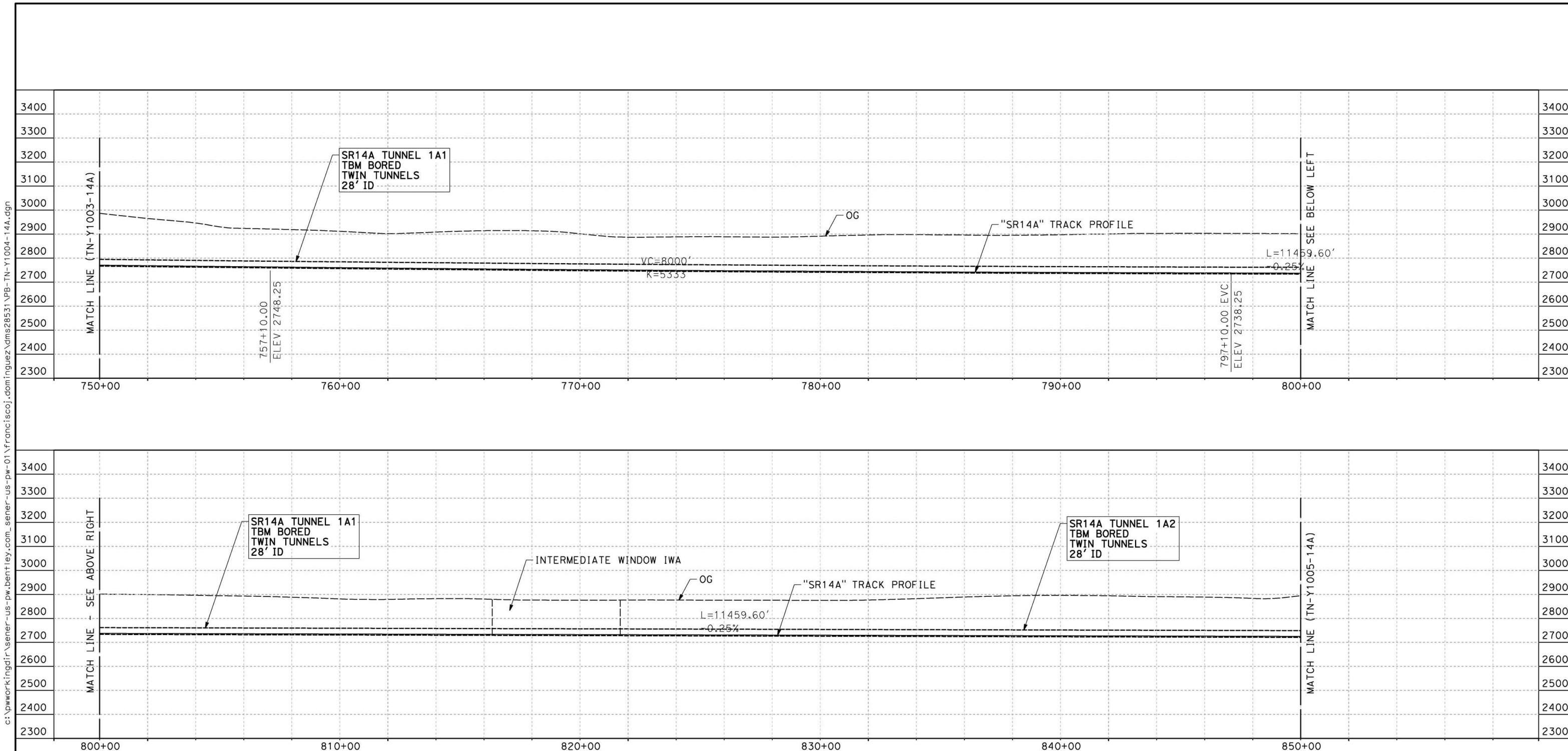


PROFILE

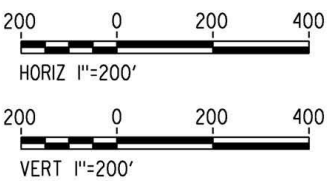


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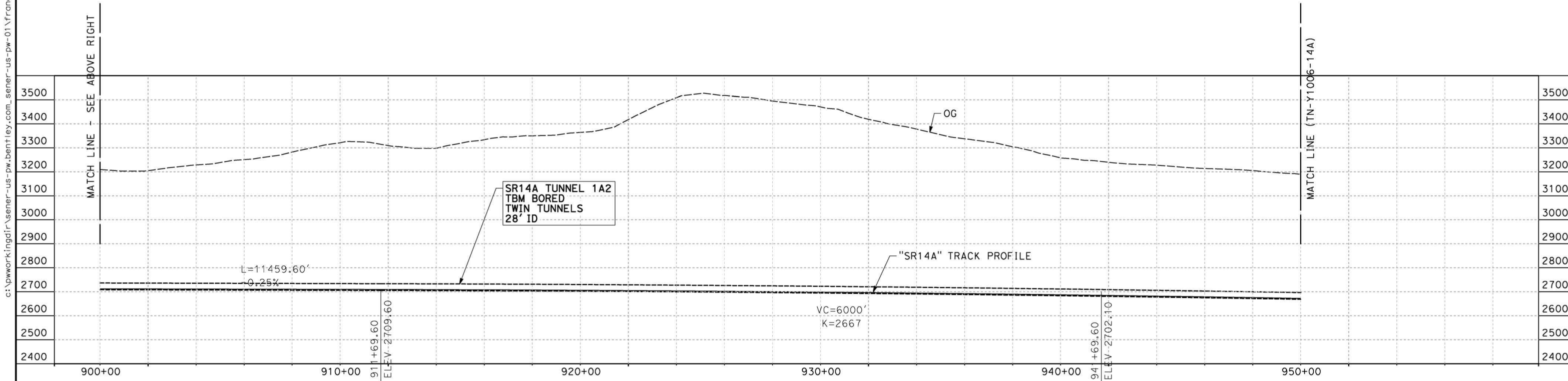
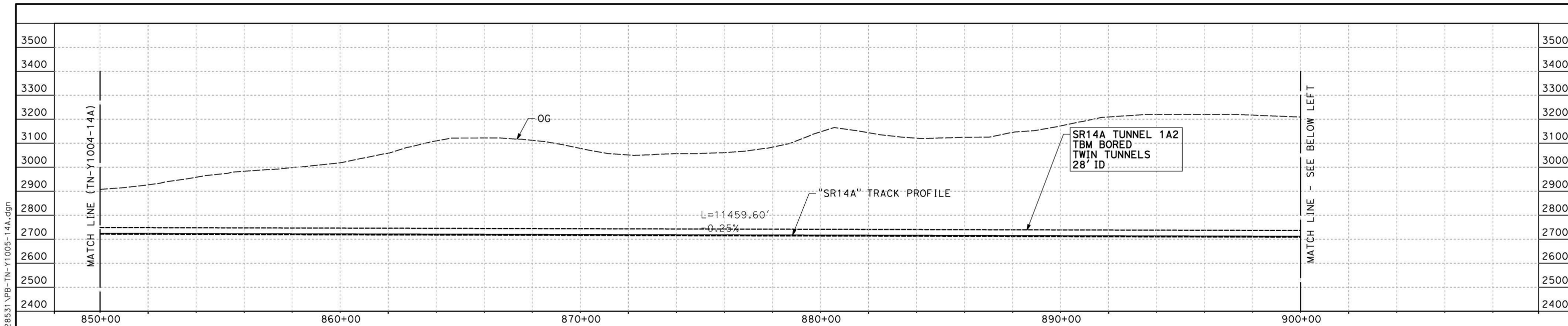


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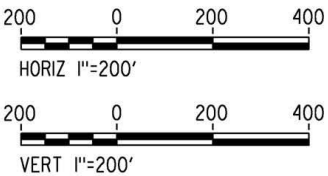


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						DRAWN BY F.J.DOMINGUEZ					DRAWING NO. TN-Y1004-14A
						CHECKED BY C.RECHEA					SCALE AS SHOWN
						IN CHARGE A.RELAÑO					SHEET NO.
REV	DATE	BY	CHK	APP	DESCRIPTION	DATE 02/26/2021					

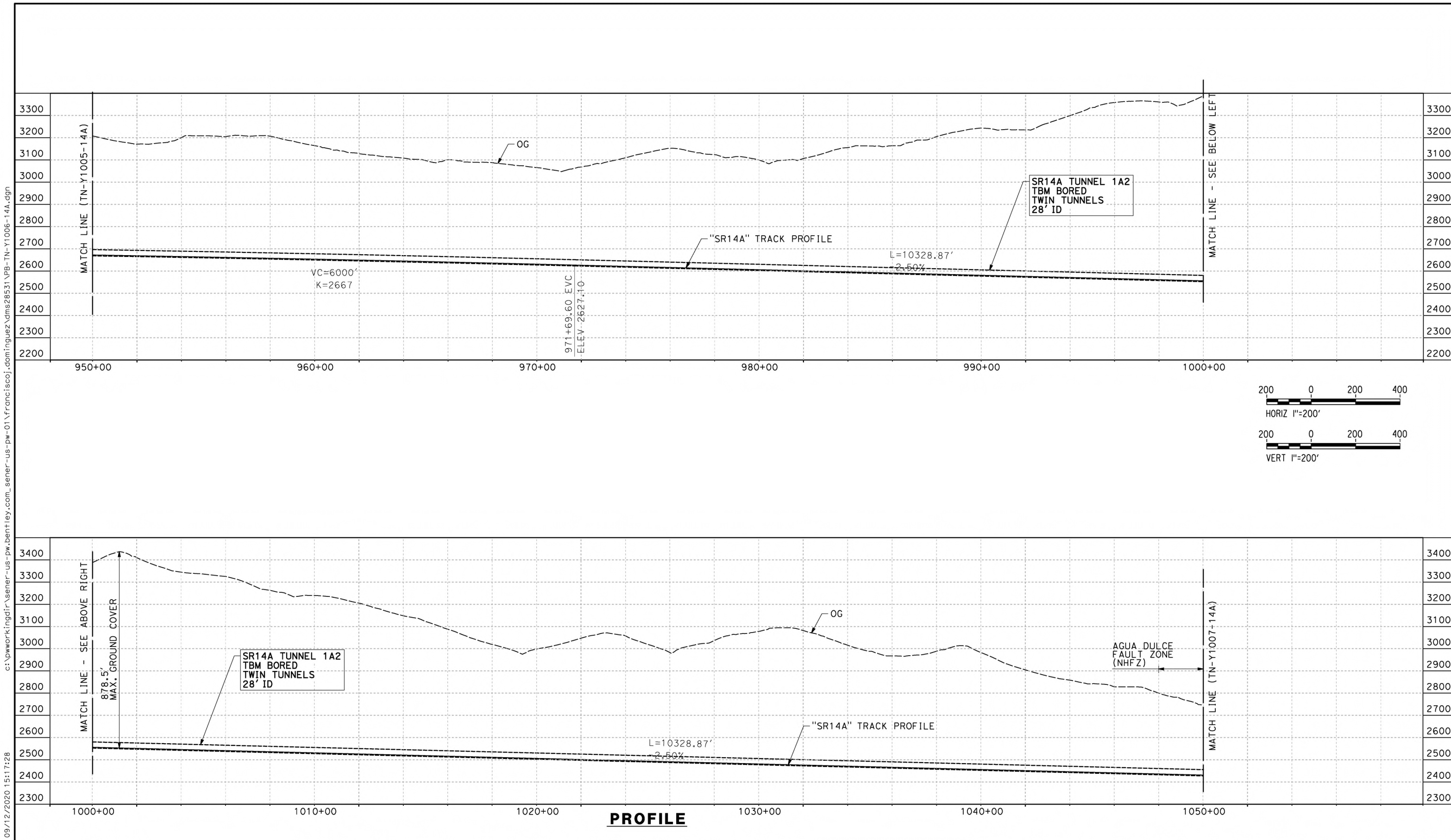


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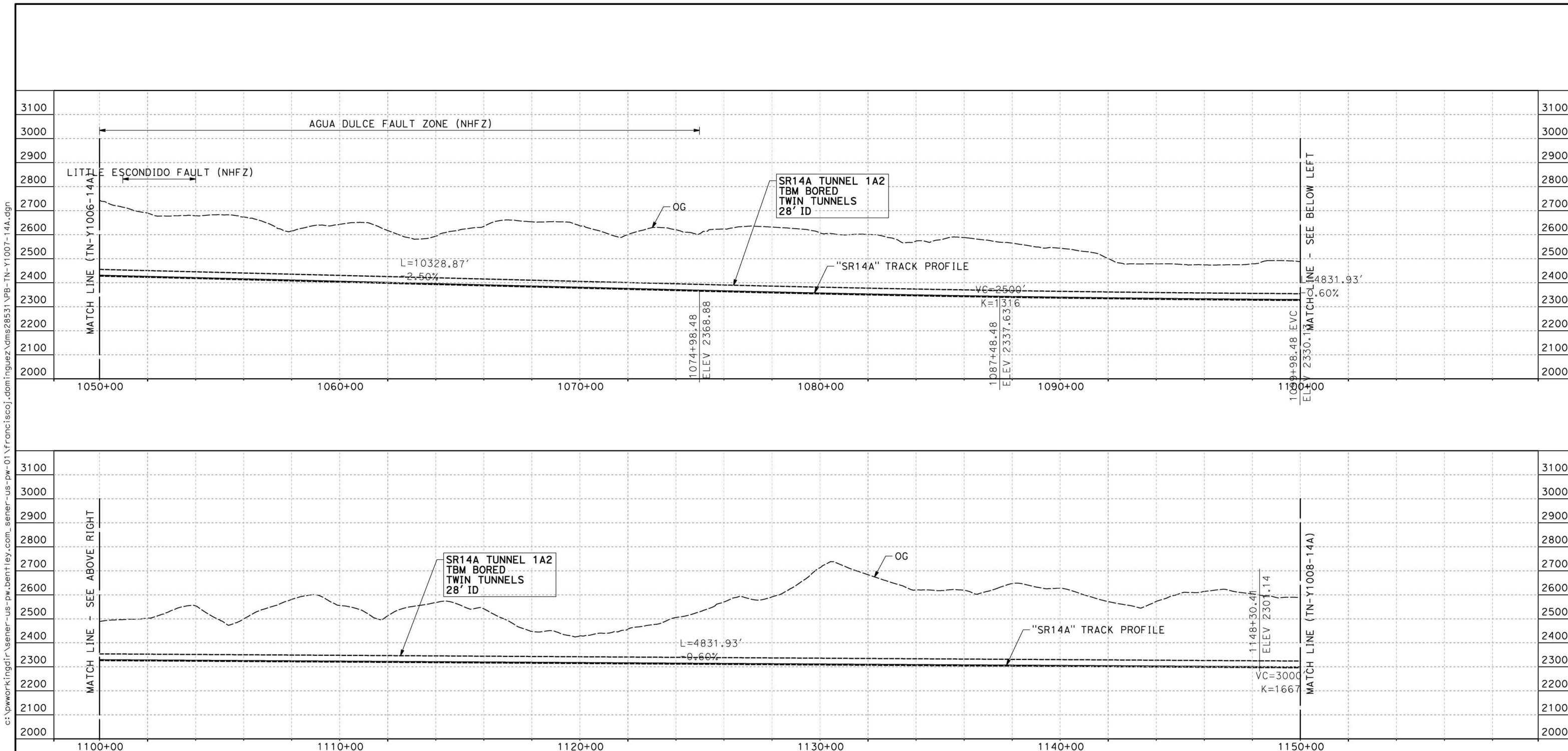
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						DESIGNED BY E.VELASCO	PEPD RECORD SET ADDENDUM SR14A/ E1A/ E2A NOT FOR CONSTRUCTION			CALIFORNIA HIGH-SPEED RAIL PROJECT PALMDALE TO BURBANK ALIGNMENT "SR14A" TUNNEL PROFILE SOUTH BOUND TUNNEL STA 850+00.00 TO STA 950+00.00	CONTRACT NO. HSR14-42
						DRAWN BY F.J.DOMINGUEZ					DRAWING NO. TN-Y1005-14A
						CHECKED BY C.RECHEA					SCALE AS SHOWN
						IN CHARGE A.RELAÑO					SHEET NO.
REV	DATE	BY	CHK	APP	DESCRIPTION	DATE 02/26/2021					

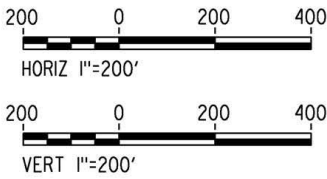


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							DESIGNED BY E.VELASCO	PEPD RECORD SET ADDENDUM SR14A/ E1A/ E2A NOT FOR CONSTRUCTION			CALIFORNIA HIGH-SPEED RAIL PROJECT PALMDALE TO BURBANK ALIGNMENT "SR14A" TUNNEL PROFILE SOUTH BOUND TUNNEL STA 950+00.00 TO STA 1050+00.00	CONTRACT NO. HSR14-42
						DRAWN BY F.J.DOMINGUEZ	DRAWING NO. TN-Y1006-14A					
						CHECKED BY C.RECHEA	SCALE AS SHOWN					
						IN CHARGE A.RELAÑO	SHEET NO.					
REV	DATE	BY	CHK	APP	DESCRIPTION	DATE 02/26/2021						



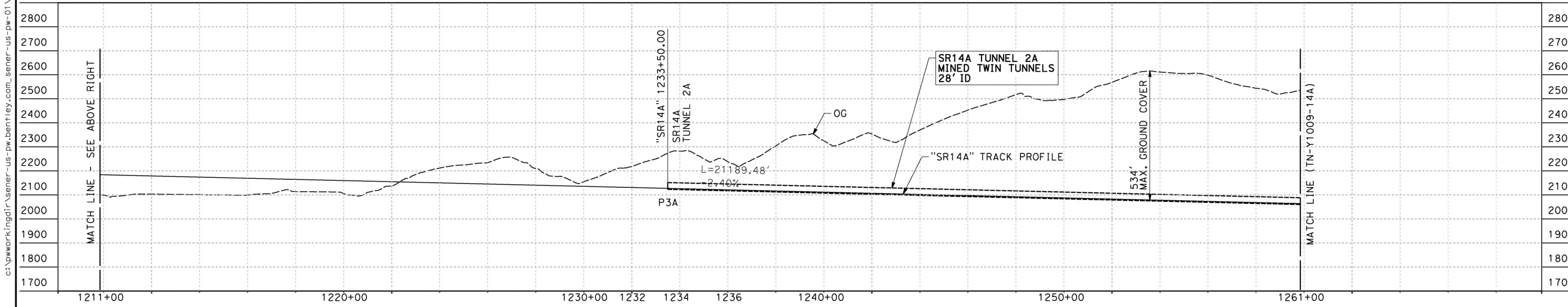
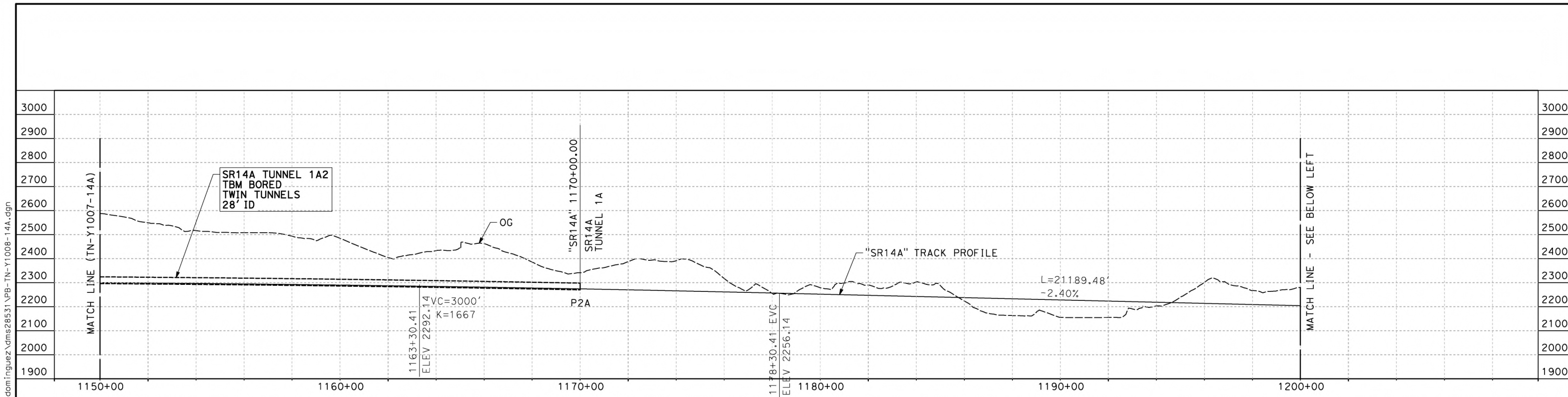
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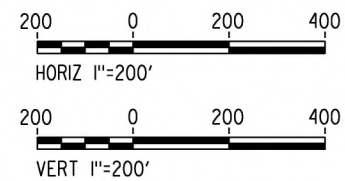
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						DESIGNED BY E.VELASCO	PEPD RECORD SET ADDENDUM SR14A/ E1A/ E2A NOT FOR CONSTRUCTION			CALIFORNIA HIGH-SPEED RAIL PROJECT PALMDALE TO BURBANK ALIGNMENT "SR14A" TUNNEL PROFILE SOUTH BOUND TUNNEL STA 1050+00.00 TO STA 1150+00.00	CONTRACT NO. HSR14-42
						DRAWN BY F.J.DOMINGUEZ					DRAWING NO. TN-Y1007-14A
						CHECKED BY C.RECHEA					SCALE AS SHOWN
						IN CHARGE A.RELAÑO					SHEET NO.
						DATE 02/26/2021					
REV	DATE	BY	CHK	APP	DESCRIPTION						

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PROFILE



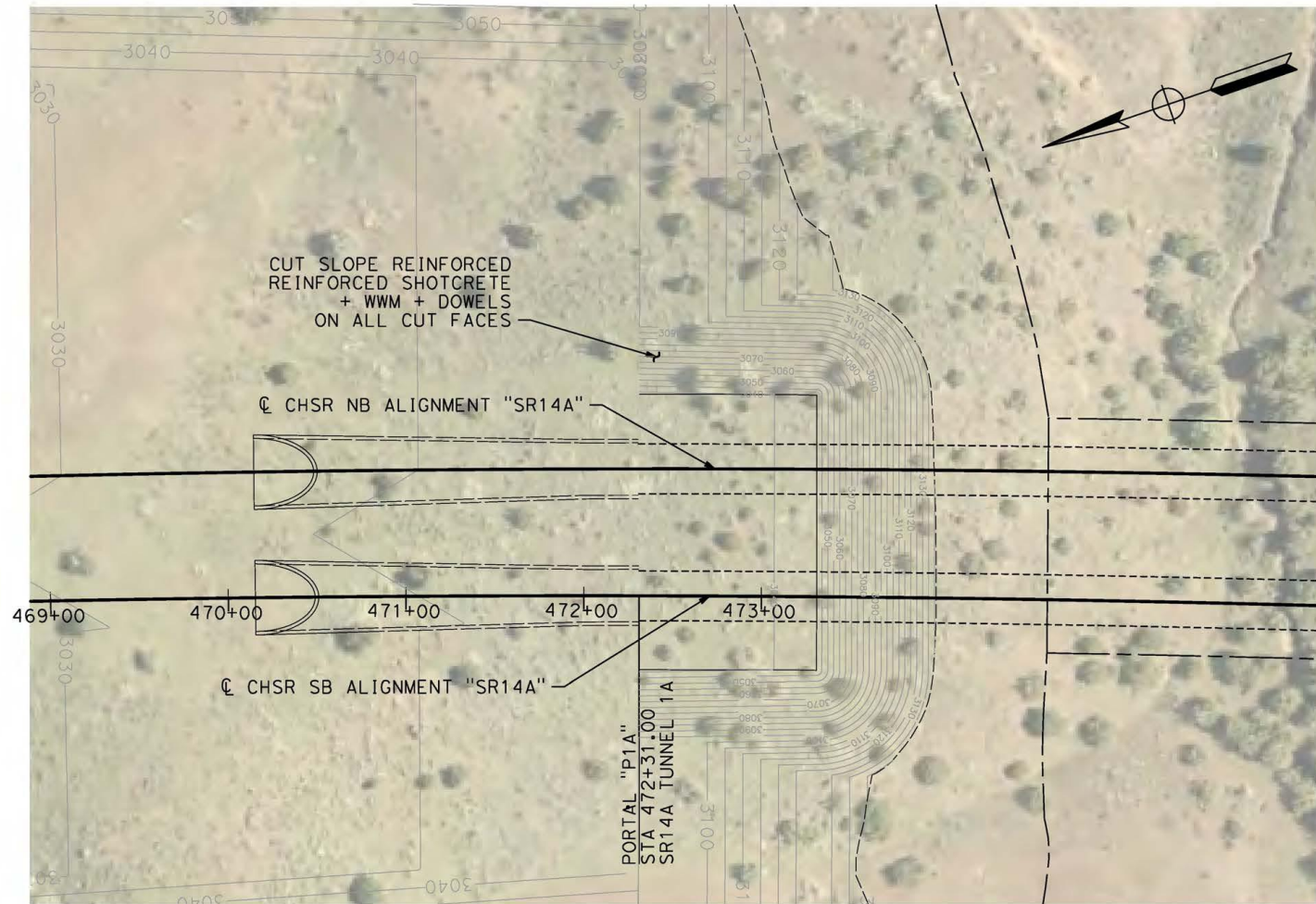
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						DESIGNED BY E.VELASCO	PEPD RECORD SET ADDENDUM SR14A/ E1A/ E2A NOT FOR CONSTRUCTION			CALIFORNIA HIGH-SPEED RAIL AUTHORITY	CALIFORNIA HIGH-SPEED RAIL PROJECT PALMDALE TO BURBANK ALIGNMENT "SR14A" TUNNEL PROFILE SOUTH BOUND TUNNEL STA 1150+00.00 TO STA 1261+00.00	CONTRACT NO. HSR14-42
						DRAWN BY F.J.DOMINGUEZ						DRAWING NO. TN-Y1008-14A
						CHECKED BY C.RECHEA						SCALE AS SHOWN
						IN CHARGE A.RELAÑO						SHEET NO.
REV	DATE	BY	CHK	APP	DESCRIPTION	DATE 02/26/2021						

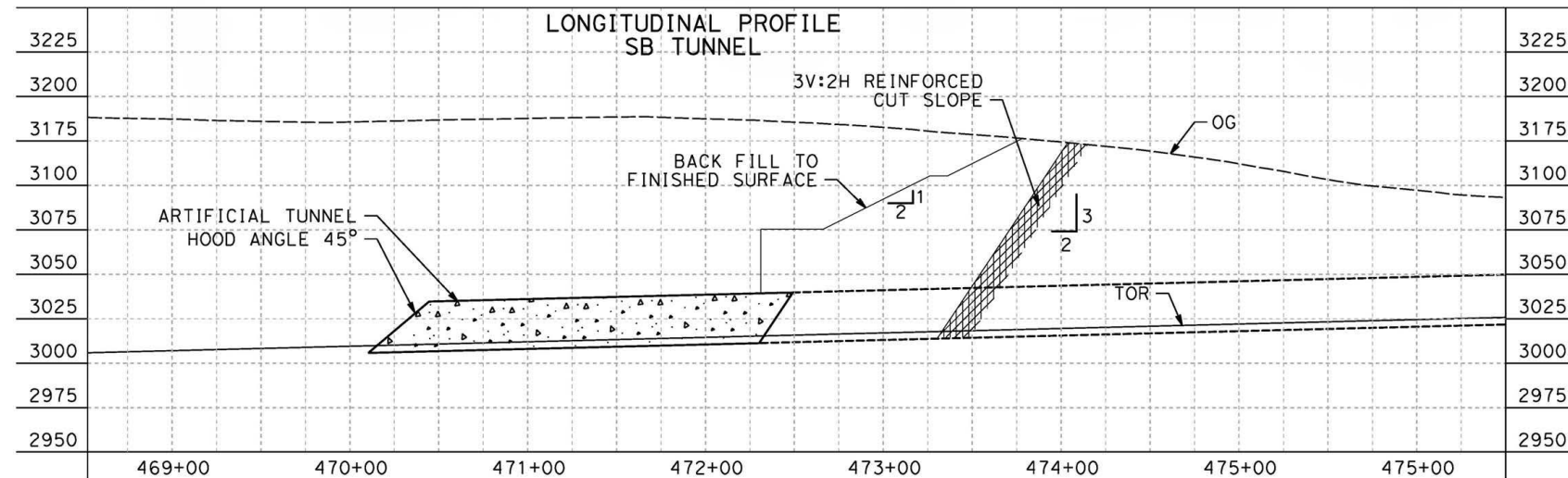
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PLAN

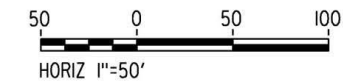


PROFILE

NOTE :

1. EXAMPLE OF ROCK CUT SLOPE REINFORCEMENT AT PORTAL MOUTH
- 2 IN OF SHOTCRETE WITH STEEL FIBERS (50 KG/ M³)
- WELDED WIRE MESH 6X6 - W4.0 X W4.0
- 20FT LONG CEMENT GROUTED DOWELS ON 4' BY 4' PATTERN
- WEEP AS DIRECTED
2. GEOTECHNICAL RISKS AND CONSTRUCTABILITY ISSUES
SEE DRAWING TN-B0006
3. THE DRAWING SHOWS THE TEMPORARY PORTAL CUT PLAN AND LONG SECTION FOR CONSTRUCTION AT THE PORTAL MOUTH ALONG WITH TEMPORARY SUPPORT FOR THE PORTAL CUT SLOPE, AND THE FINISHED FILL.
4. THE DRAWING DOES NOT SHOW THE OVERALL GRADING (2H:1V) OF THE WIDER PORTAL AREA. THE EXTENT OF WHICH IS SHOWN ON THE GENERAL PLAN (SEE LIMITS OF EXCAVATION-CUT).

EXCAVATION VOLUME	77,749 CY
FILL VOLUME	54,150 CY
CUT SLOPE SURFACE	46,793 SQFT



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

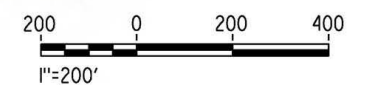
PEPD RECORD SET ADDENDUM SR14A/ E1A/ E2A
NOT FOR CONSTRUCTION



CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "SR14A"

PORTAL 1A
PLAN AND PROFILE FOR CONSTRUCTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-D7001-14A
SCALE AS SHOWN
SHEET NO.

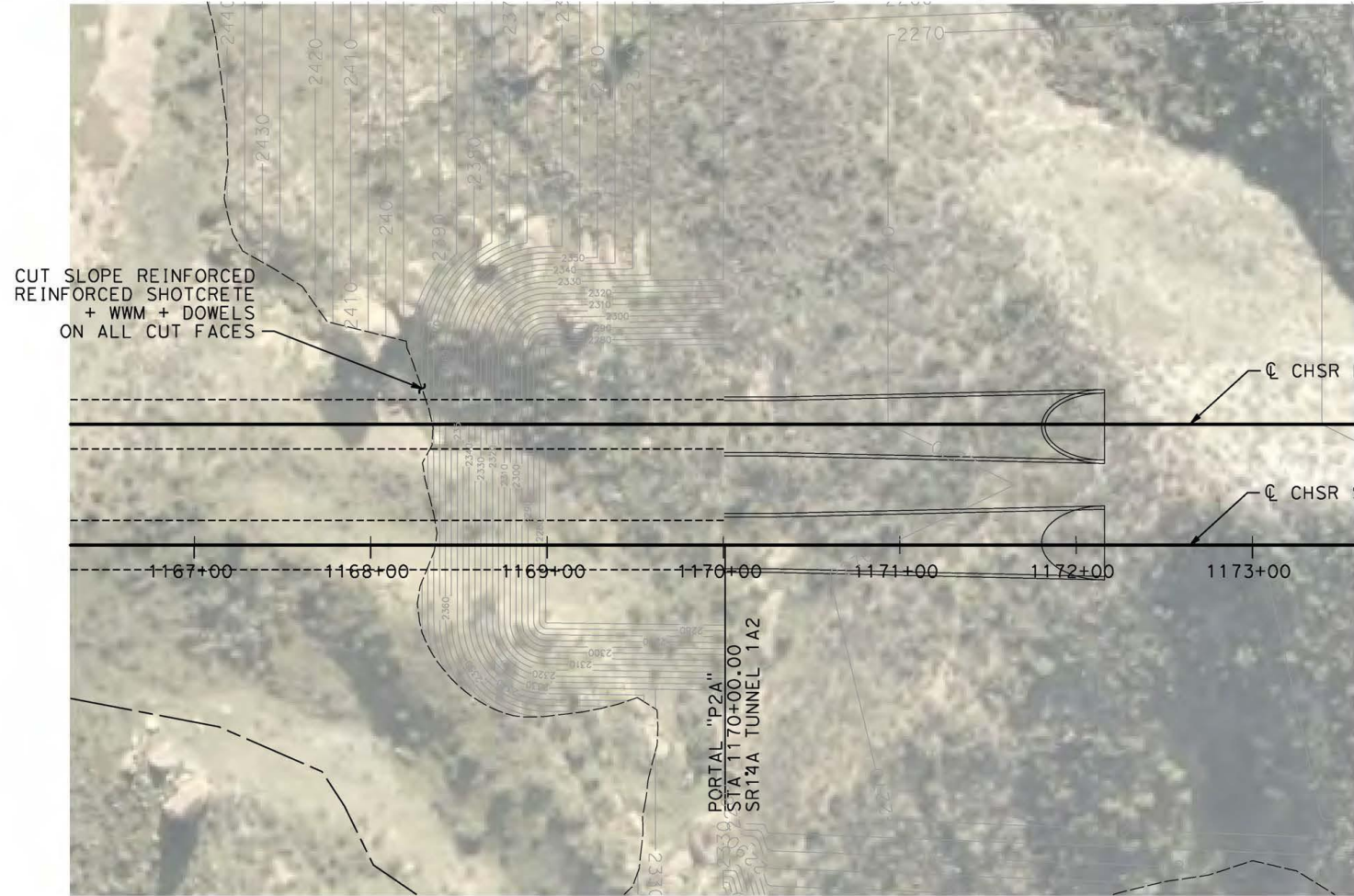


						DESIGNED BY E.VELASCO	PEPD RECORD SET ADDENDUM SR14A/E1A/E2A NOT FOR CONSTRUCTION			CALIFORNIA HIGH-SPEED RAIL PROJECT PALMDALE TO BURBANK ALIGNMENT "SR14A" INTERMEDIATE WINDOW IWA PLAN	CONTRACT NO. HSR14-42
						DRAWN BY F.J.DOMINGUEZ					DRAWING NO. TN-D7002-14A
						CHECKED BY C.RECHEA					SCALE AS SHOWN
						IN CHARGE A.RELAÑO					SHEET NO.
						DATE 02/26/2021					
REV	DATE	BY	CHK	APP	DESCRIPTION						

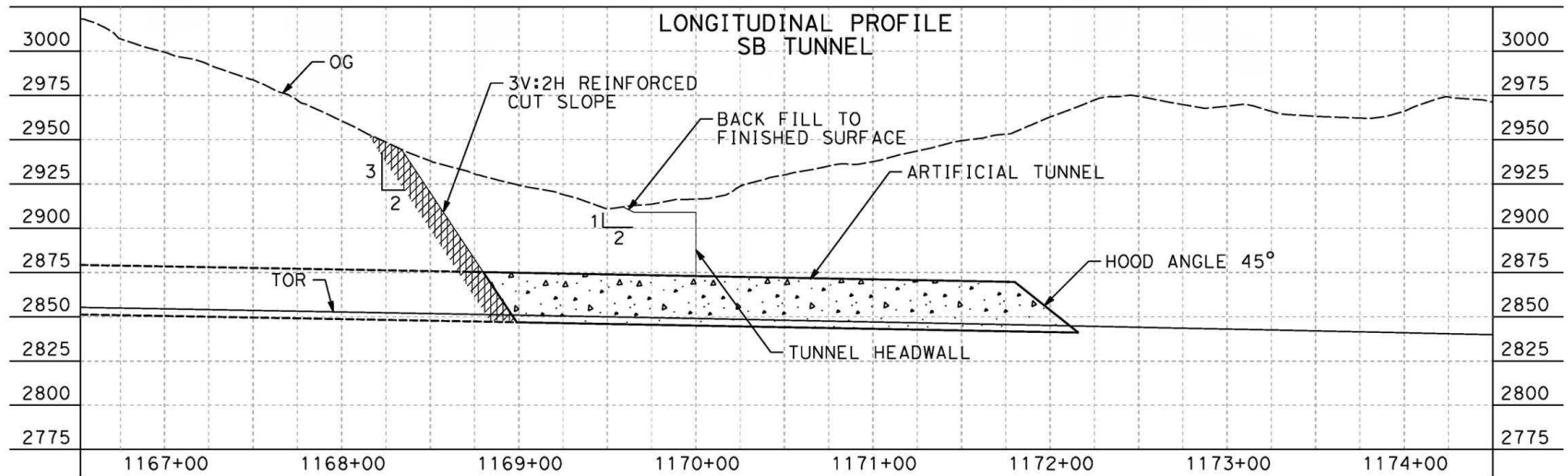
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PLAN



PROFILE

NOTE :

1. EXAMPLE OF ROCK CUT SLOPE REINFORCEMENT AT PORTAL MOUTH
- 2 IN OF SHOTCRETE WITH STEEL FIBERS (50 KG/ M³)
- WELDED WIRE MESH 6X6 - W4.0 X W4.0
- 20FT LONG CEMENT GROUTED DOWELS ON 4' BY 4' PATTERN
- WEEP AS DIRECTED
2. GEOTECHNICAL RISKS AND CONSTRUCTABILITY ISSUES
SEE DRAWING TN-B0006
3. THE DRAWING SHOWS THE TEMPORARY PORTAL CUT PLAN AND LONG SECTION FOR CONSTRUCTION AT THE PORTAL MOUTH ALONG WITH TEMPORARY SUPPORT FOR THE PORTAL CUT SLOPE, AND THE FINISHED FILL.
4. THE DRAWING DOES NOT SHOW THE OVERALL GRADING (2H:1V) OF THE WIDER PORTAL AREA. THE EXTENT OF WHICH IS SHOWN ON THE GENERAL PLAN (SEE LIMITS OF EXCAVATION-CUT).

EXCAVATION VOLUME	65,546 CY
FILL VOLUME	45,533 CY
CUT SLOPE SURFACE	50,552 SQFT



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

PEPD RECORD SET ADDENDUM SR14A/ E1A/ E2A
NOT FOR CONSTRUCTION



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "SR14A"

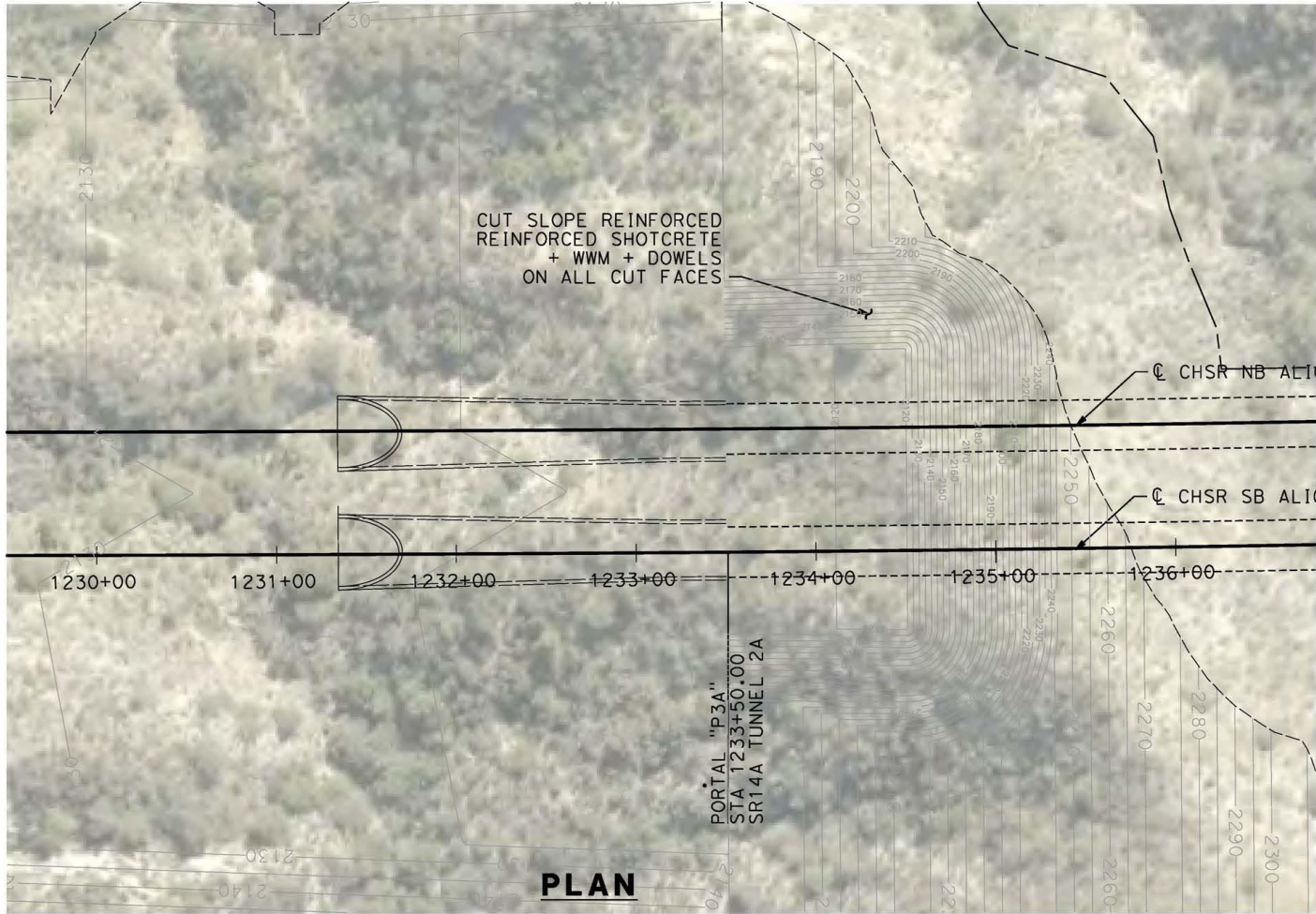
PORTAL 2A
PLAN AND PROFILE FOR CONSTRUCTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-D7003-14A
SCALE AS SHOWN
SHEET NO.

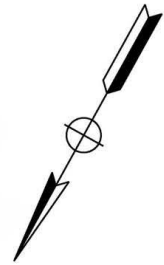
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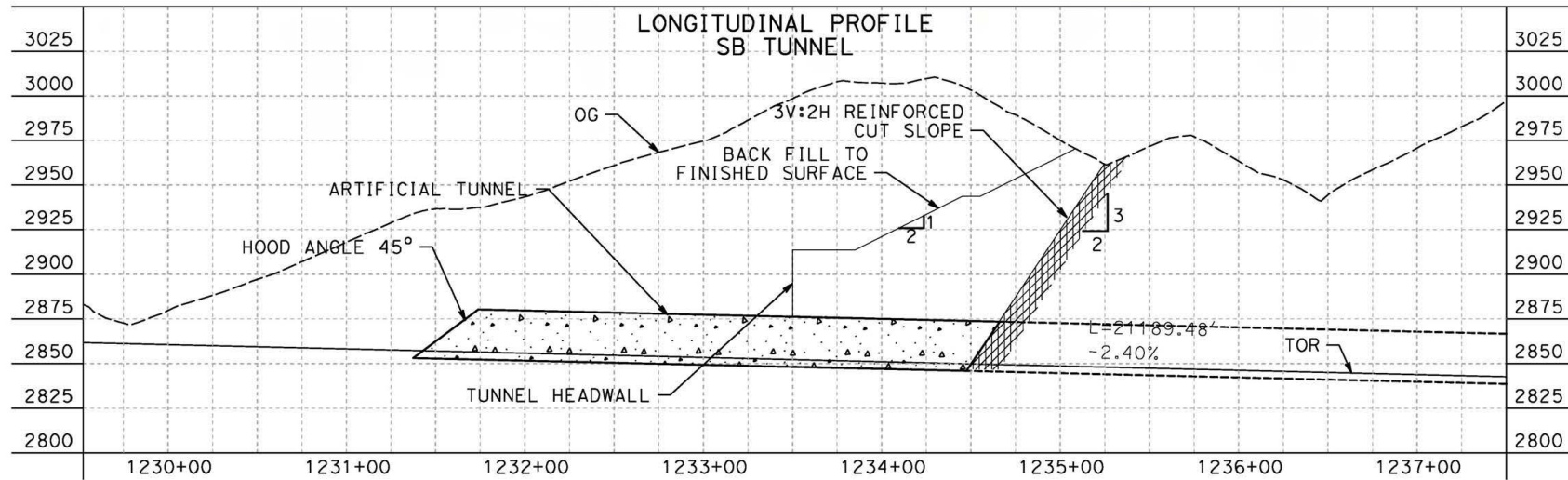
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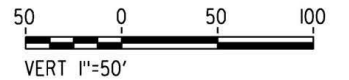
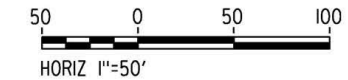
NOTE :

1. EXAMPLE OF ROCK CUT SLOPE REINFORCEMENT AT PORTAL MOUTH
- 2 IN OF SHOTCRETE WITH STEEL FIBERS (50 KG/ M³)
- WELDED WIRE MESH 6X6 - W4.0 X W4.0
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4. THE DRAWING DOES NOT SHOW THE OVERALL GRADING (2H:1V) OF THE WIDER PORTAL AREA. THE EXTENT OF WHICH IS SHOWN ON THE GENERAL PLAN (SEE LIMITS OF EXCAVATION-CUT).

EXCAVATION VOLUME	80,179 CY
FILL VOLUME	69,802 CY
CUT SLOPE SURFACE	57,956 SQFT



PROFILE



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

**PEPD RECORD SET
ADDENDUM
SR14A/ E1A/ E2A**

**NOT FOR
CONSTRUCTION**



**CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK**
ALIGNMENT "SR14A"

PORTAL 3A
PLAN AND PROFILE FOR CONSTRUCTION

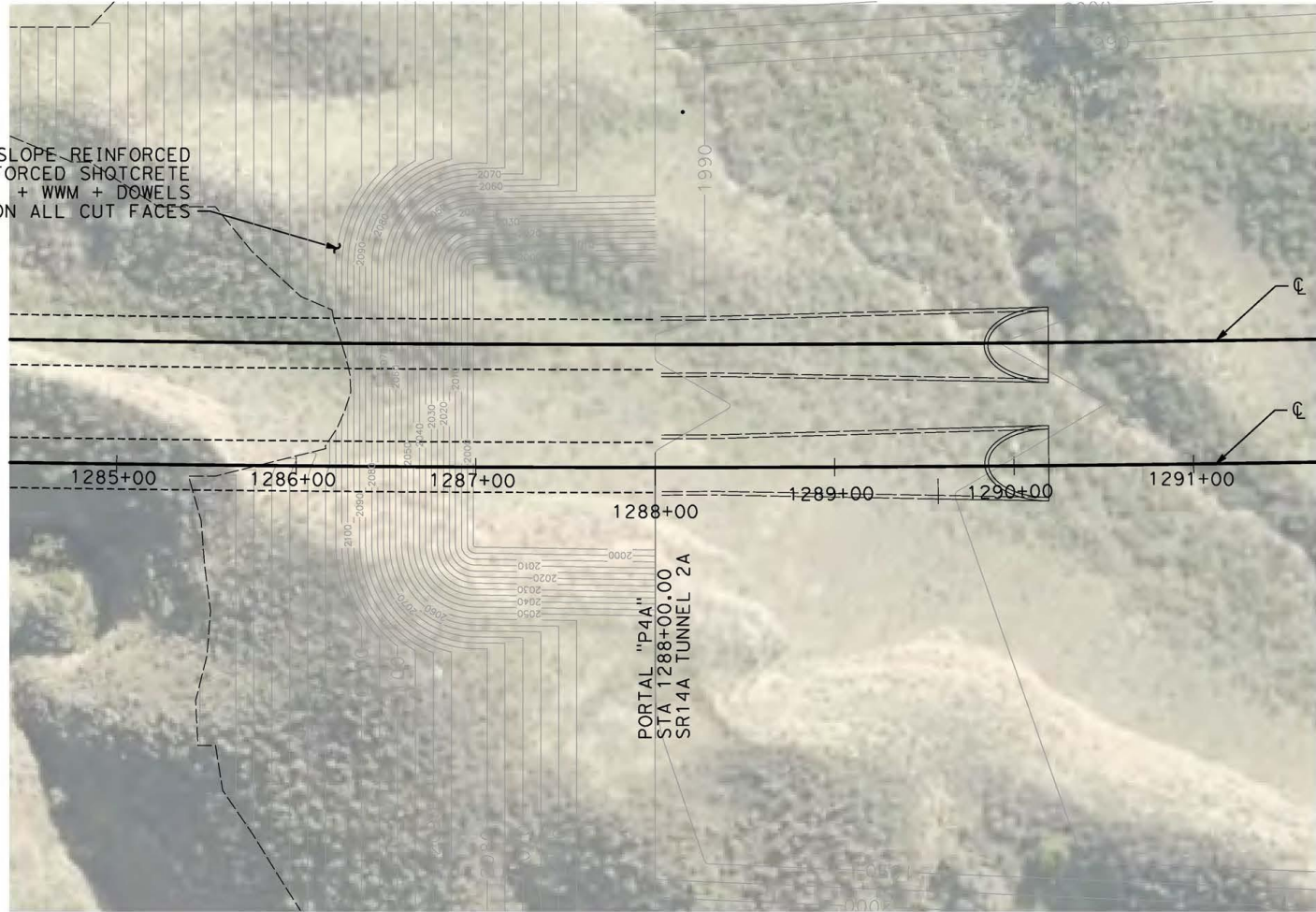
CONTRACT NO. HSR14-42
DRAWING NO. TN-D7004-14A
SCALE AS SHOWN
SHEET NO.

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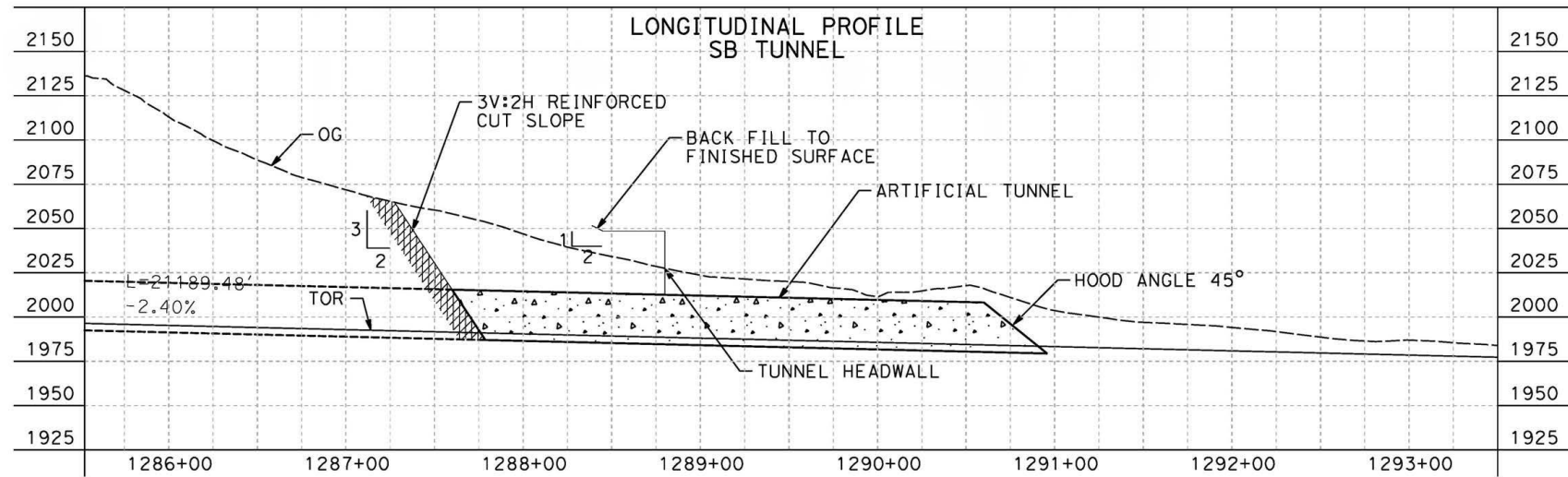
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0205240

CUT SLOPE REINFORCED
REINFORCED SHOTCRETE
+ WWM + DOWELS
ON ALL CUT FACES



PLAN

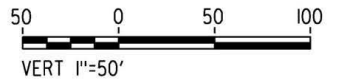


PROFILE

NOTE :

1. EXAMPLE OF ROCK CUT SLOPE REINFORCEMENT AT PORTAL MOUTH
- 2 IN OF SHOTCRETE WITH STEEL FIBERS (50 KG/ M³)
- WELDED WIRE MESH 6X6 - W4.0 X W4.0
- 20FT LONG CEMENT GROUTED DOWELS ON 4' BY 4' PATTERN
- WEEP AS DIRECTED
2. GEOTECHNICAL RISKS AND CONSTRUCTABILITY ISSUES
SEE DRAWING TN-B0006
3. THE DRAWING SHOWS THE TEMPORARY PORTAL CUT PLAN AND LONG SECTION FOR CONSTRUCTION AT THE PORTAL MOUTH ALONG WITH TEMPORARY SUPPORT FOR THE PORTAL CUT SLOPE, AND THE FINISHED FILL.
4. THE DRAWING DOES NOT SHOW THE OVERALL GRADING (2H:1V) OF THE WIDER PORTAL AREA. THE EXTENT OF WHICH IS SHOWN ON THE GENERAL PLAN (SEE LIMITS OF EXCAVATION-CUT).

EXCAVATION VOLUME	56,116 CY
FILL VOLUME	34,529 CY
CUT SLOPE SURFACE	51,422 SQFT



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

PEPD RECORD SET
ADDENDUM
SR14A/ E1A/ E2A

NOT FOR
CONSTRUCTION



CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "SR14A"

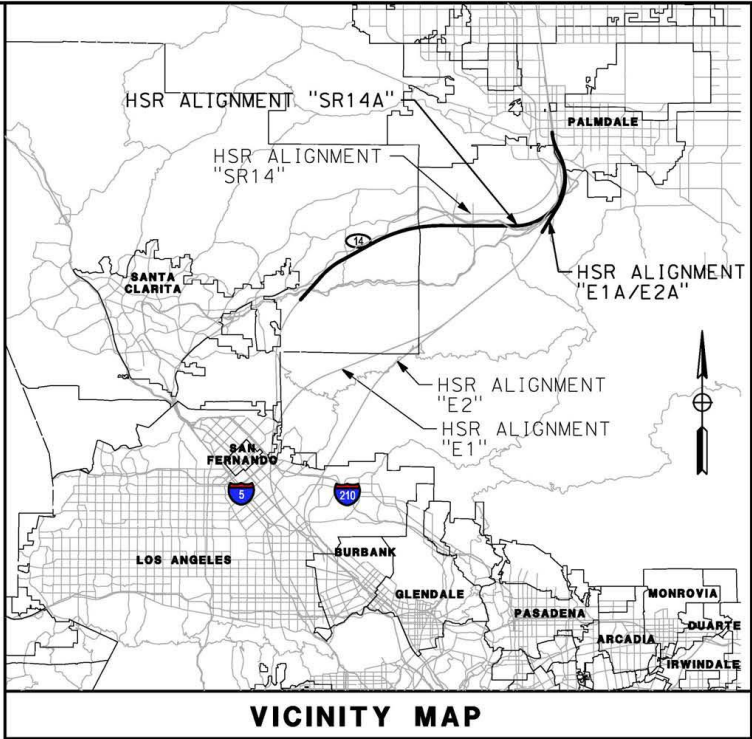
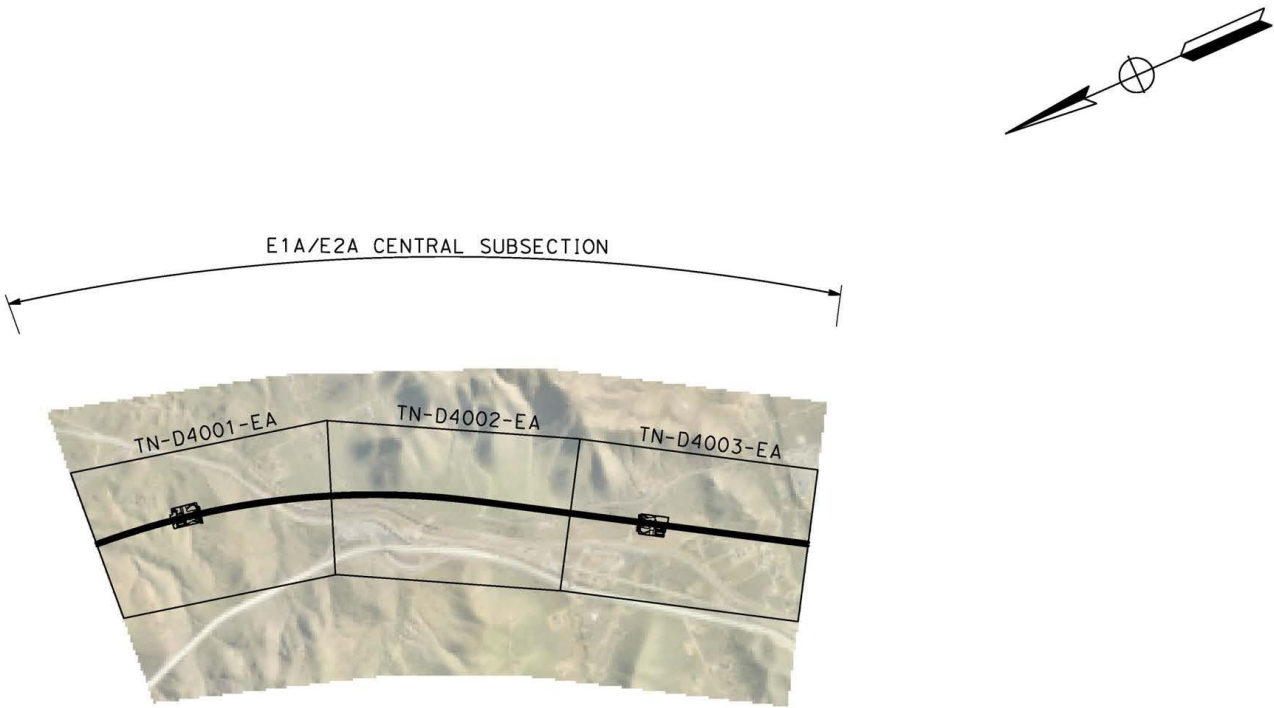
PORTAL 4A
PLAN AND PROFILE FOR CONSTRUCTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-D7005-14A
SCALE AS SHOWN
SHEET NO.

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05/02/2021 12:06:25

0205240



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

PEPD RECORD SET ADDENDUM SR14A/ E1A/ E2A
NOT FOR CONSTRUCTION



CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1A/E2A"

HIGH SPEED RAIL TUNNEL PLANS
KEY MAP

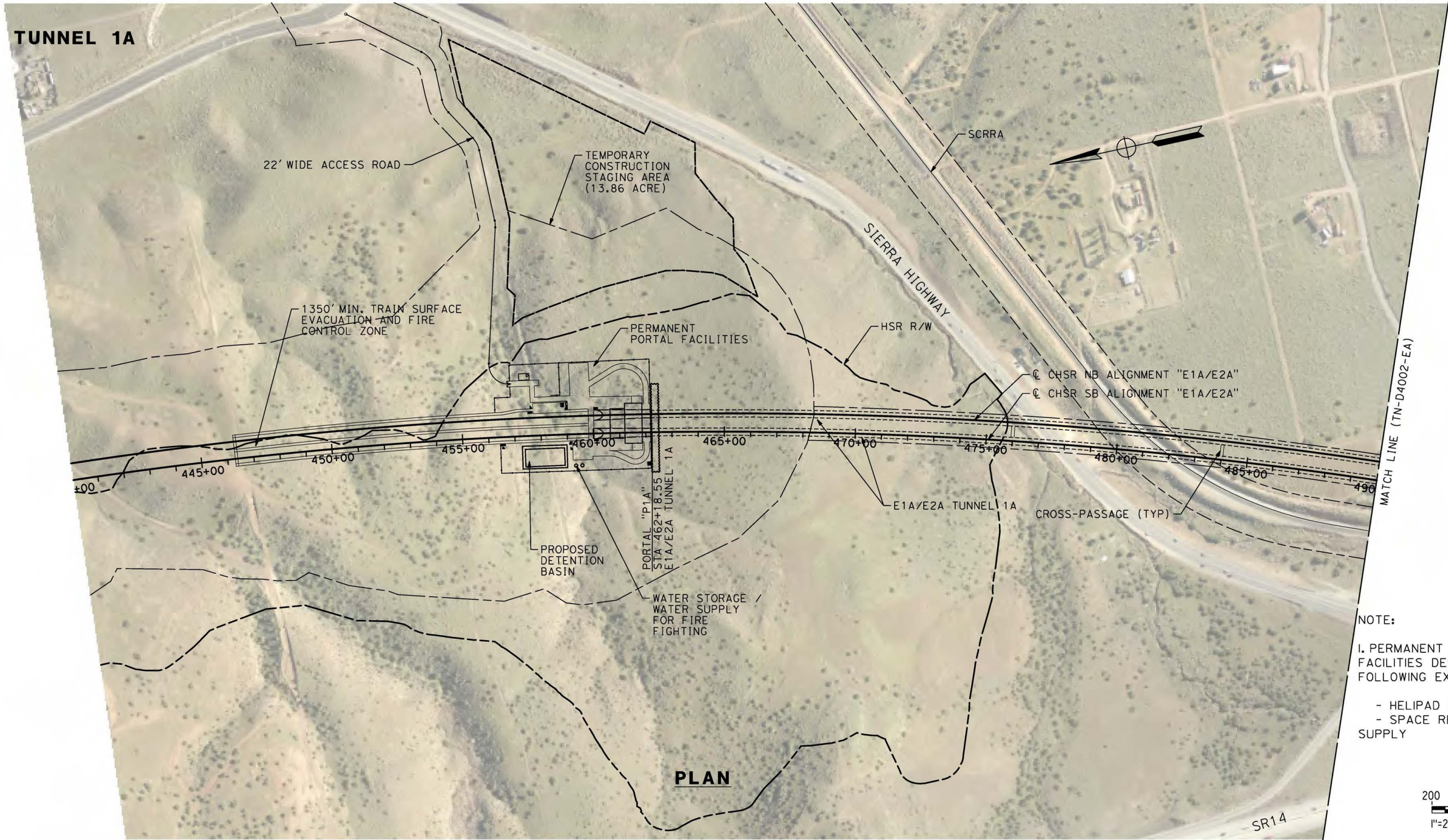
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DRAWING NO. TN-B6001-EA
SCALE AS SHOWN
SHEET NO.

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09/12/2020 16:44:51

0205240

TUNNEL 1A



NOTE:

1. PERMANENT FOOTPRINT INCLUDES SPACE FOR FACILITIES DESCRIBED IN TM 2.4.6, WITH THE FOLLOWING EXCEPTIONS:

- HELIPAD NOT INCLUDED
- SPACE RESERVED FOR WATER/STORAGE SUPPLY



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

**PEPD RECORD SET
ADDENDUM
SR14A/ E1A/ E2A**

**NOT FOR
CONSTRUCTION**



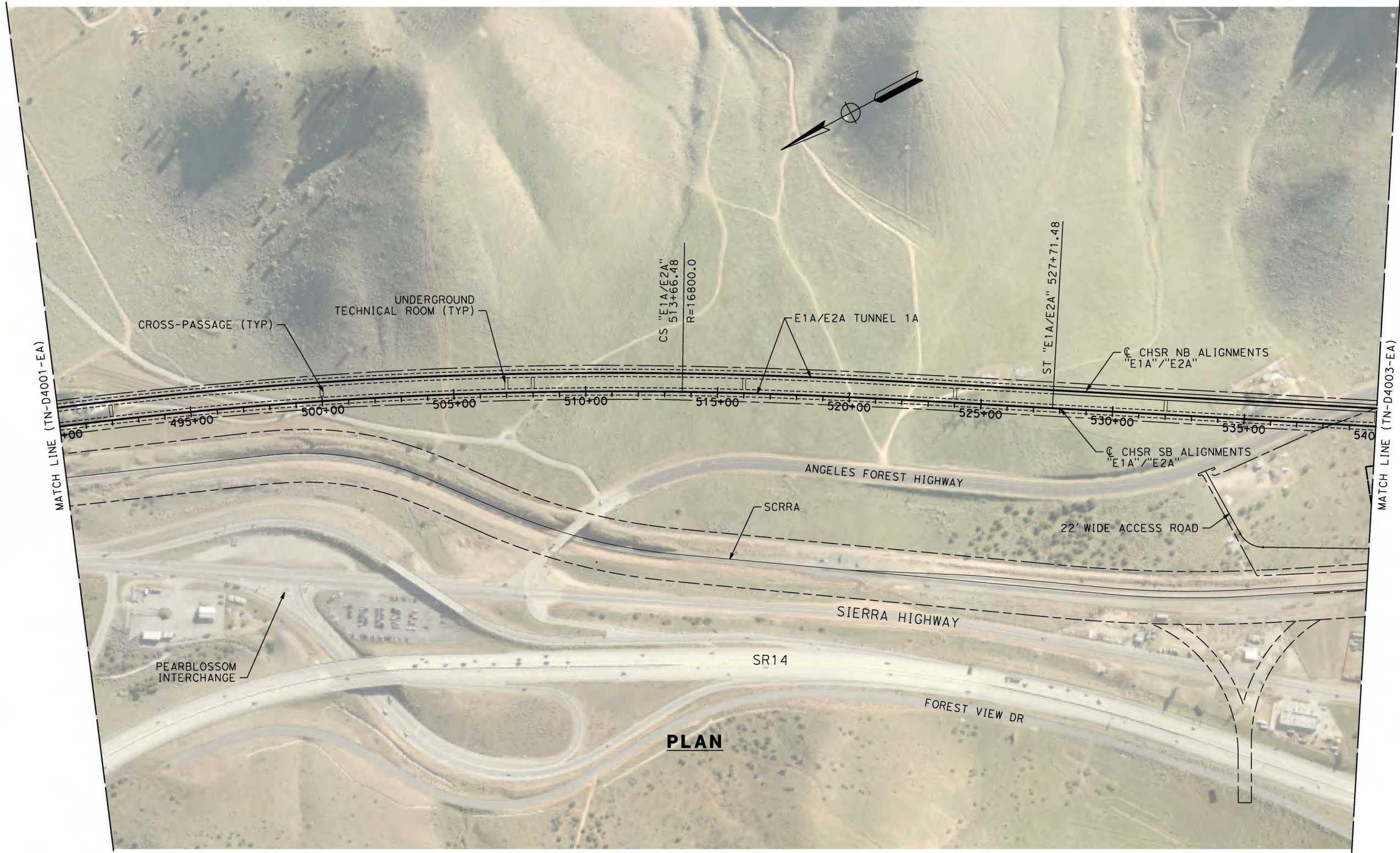
CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT PALMDALE TO BURBANK

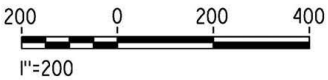
ALIGNMENT "E1A/E2A"
PLAN
STA 440+00.00 TO STA 490+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4001-EA
SCALE AS SHOWN
SHEET NO.

TUNNEL 1A



PLAN



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0205240

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

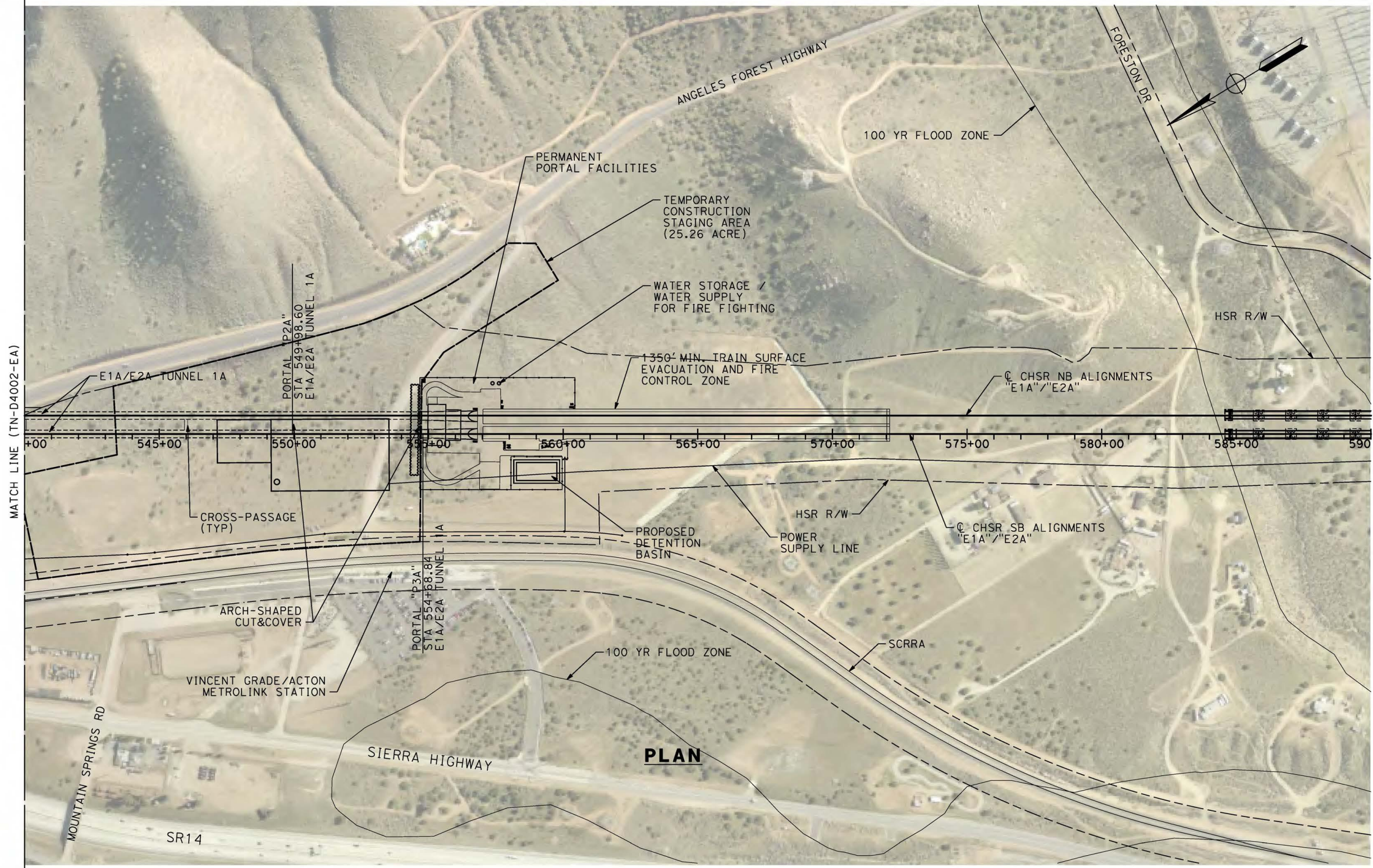
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NOT FOR CONSTRUCTION



CALIFORNIA HIGH-SPEED RAIL PROJECT PALMDALE TO BURBANK
ALIGNMENT "E1A/E2A" PLAN STA 490+00.00 TO STA 540+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4002-EA
SCALE AS SHOWN
SHEET NO.

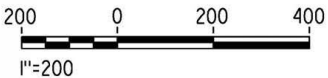
TUNNEL 1A



NOTE:

1. PERMANENT FOOTPRINT INCLUDES SPACE FOR FACILITIES DESCRIBED IN TM 2.4.6, WITH THE FOLLOWING EXCEPTIONS:

- HELIPAD NOT INCLUDED
- SPACE RESERVED FOR WATER/STORAGE SUPPLY



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09/12/2020 15:44:11

0205240

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

PEPD RECORD SET
ADDENDUM
SR14A/ E1A/ E2A

NOT FOR
CONSTRUCTION



CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

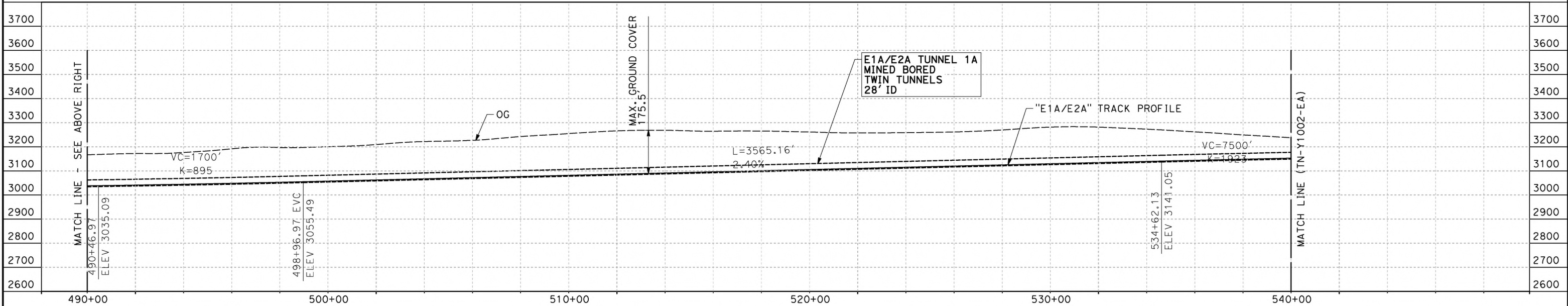
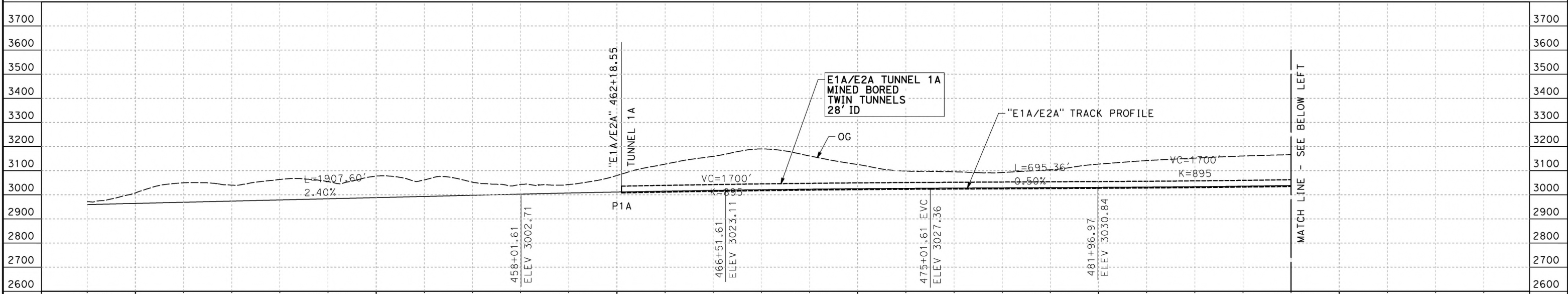
ALIGNMENT "E1A/E2A"
PLAN
STA 540+00.00 TO STA 590+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4003-EA
SCALE AS SHOWN
SHEET NO.

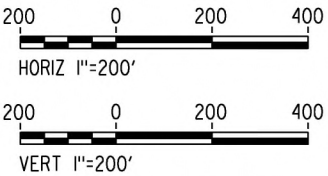
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09/12/2020 15:45:07

0205240



PROFILE



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

PEPD RECORD SET ADDENDUM SR14A/ E1A/ E2A
NOT FOR CONSTRUCTION

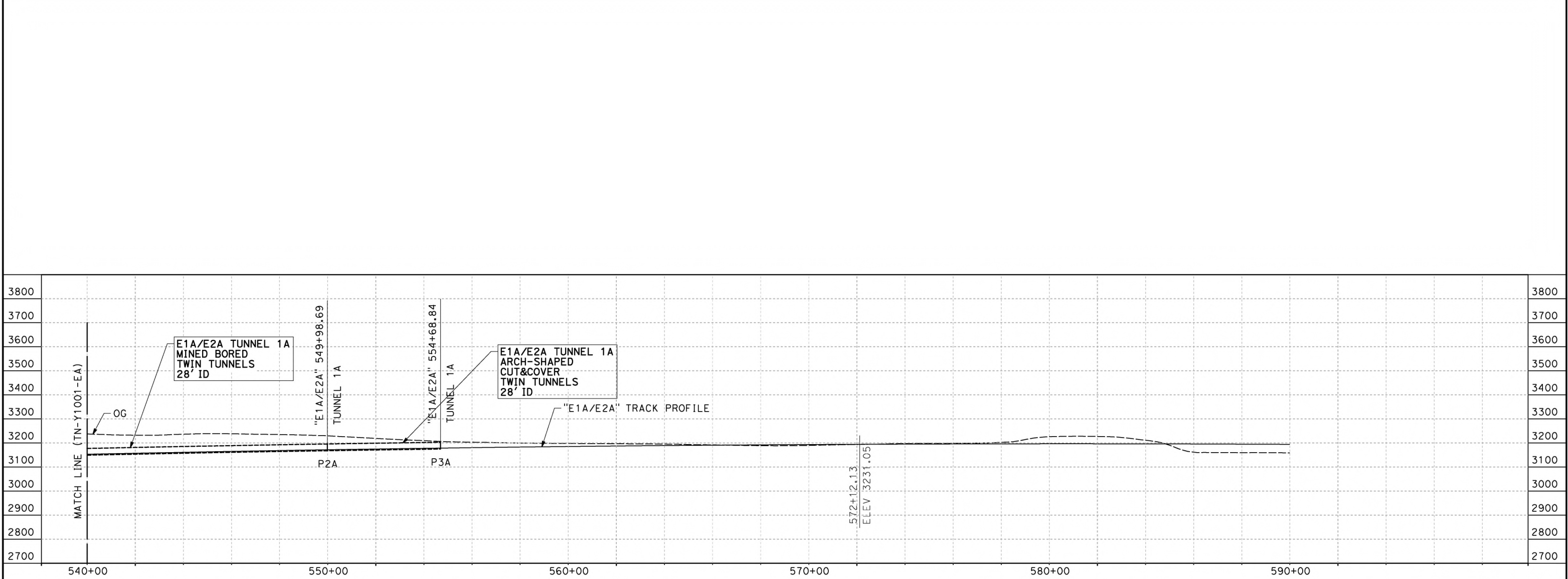


CALIFORNIA HIGH-SPEED RAIL PROJECT PALMDALE TO BURBANK ALIGNMENT "E1A"/"E2A" TUNNEL PROFILE SOUTH BOUND TUNNEL STA 440+00.00 TO STA 540+00.00	CONTRACT NO. HSR14-42 DRAWING NO. TN-Y1001-EA SCALE AS SHOWN SHEET NO.
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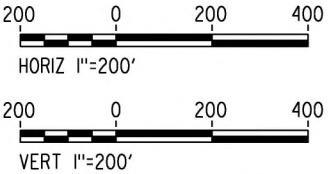
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09/12/2020 15:45:21

0205240



PROFILE



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

PEPD RECORD SET
ADDENDUM
SR14A/ E1A/ E2A

NOT FOR
CONSTRUCTION



CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1A" / "E2A"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 540+00.00 TO STA 590+00.00

CONTRACT NO.
HSR14-42

DRAWING NO.
TN-Y1002-EA

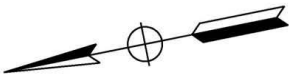
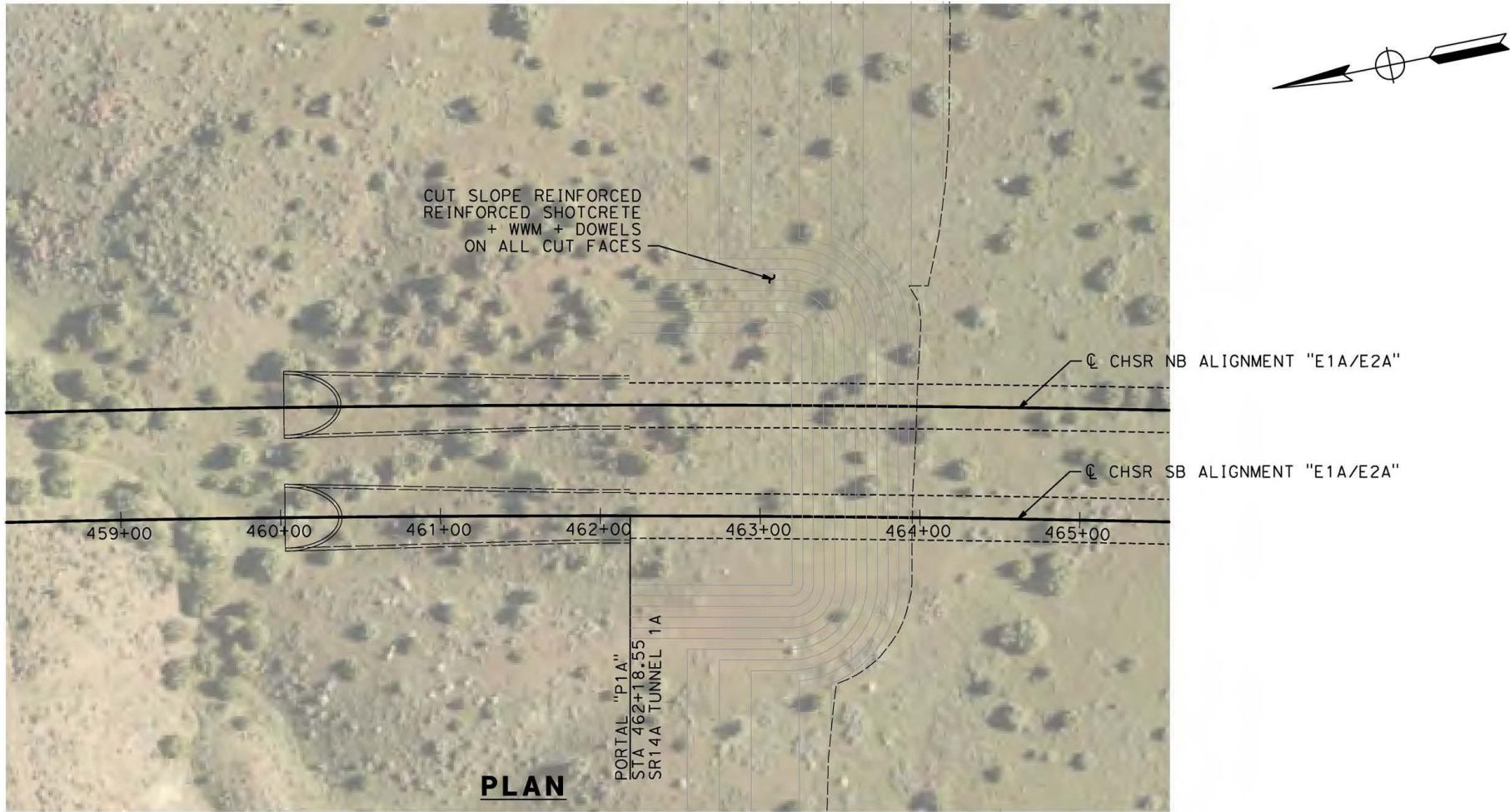
SCALE
AS SHOWN

SHEET NO.

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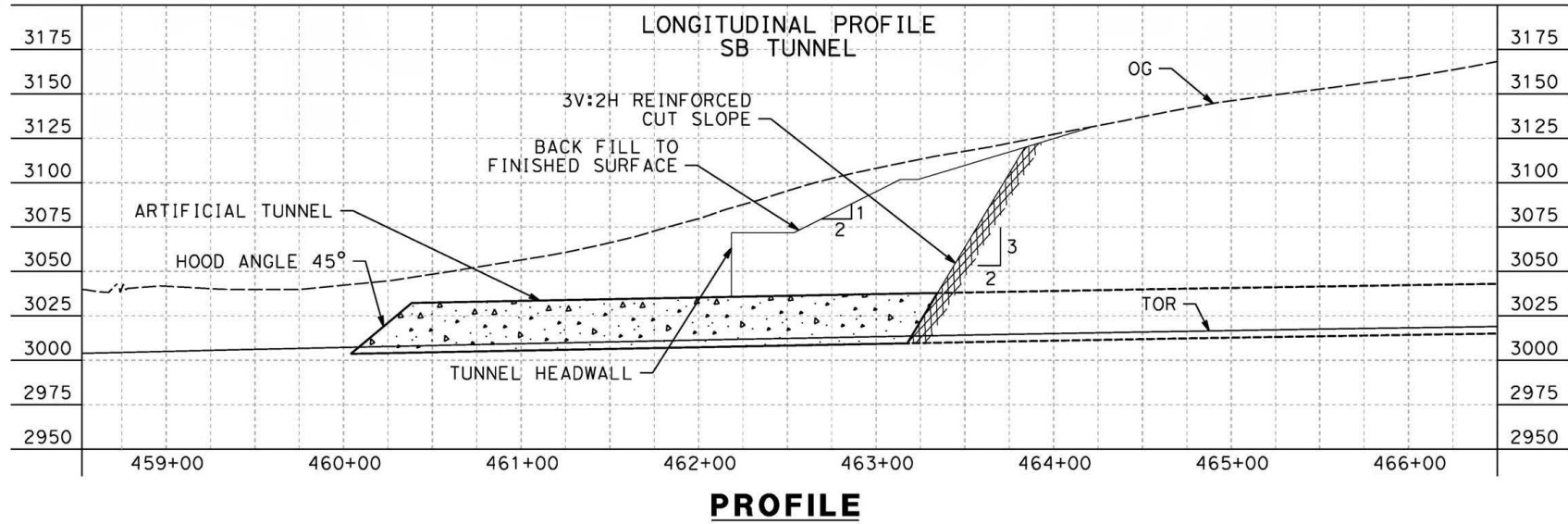
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0205240



- NOTE :
1. EXAMPLE OF ROCK CUT SLOPE REINFORCEMENT AT PORTAL MOUTH
- 2 IN OF SHOTCRETE WITH STEEL FIBERS (50 KG/ M³)
- WELDED WIRE MESH 6X6 - W4.0 X W4.0
- 20FT LONG CEMENT GROUTED DOWELS ON 4' BY 4' PATTERN
- WEEP AS DIRECTED
 2. GEOTECHNICAL RISKS AND CONSTRUCTABILITY ISSUES
SEE DRAWING TN-B0006
 3. THE DRAWING SHOWS THE TEMPORARY PORTAL CUT PLAN
AND LONG SECTION FOR CONSTRUCTION AT THE PORTAL
MOUTH ALONG WITH TEMPORARY SUPPORT FOR THE PORTAL
CUT SLOPE, AND THE FINISHED FILL.
 4. THE DRAWING DOES NOT SHOW THE OVERALL GRADING (2H:1V)
OF THE WIDER PORTAL AREA. THE EXTENT OF WHICH IS SHOWN
ON THE GENERAL PLAN (SEE LIMITS OF EXCAVATION-CUT).

EXCAVATION VOLUME	73,320 CY
FILL VOLUME	50,555 CY
CUT SLOPE SURFACE	37,642 SQFT



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
E.VELASCO

DRAWN BY
F.J.DOMINGUEZ

CHECKED BY
C.RECHEA

IN CHARGE
A.RELAÑO

DATE
02/26/2021

**PEPD RECORD SET
ADDENDUM
SR14A/ E1A/ E2A**

**NOT FOR
CONSTRUCTION**



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

**CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK**

ALIGNMENT "E1A/E2A"

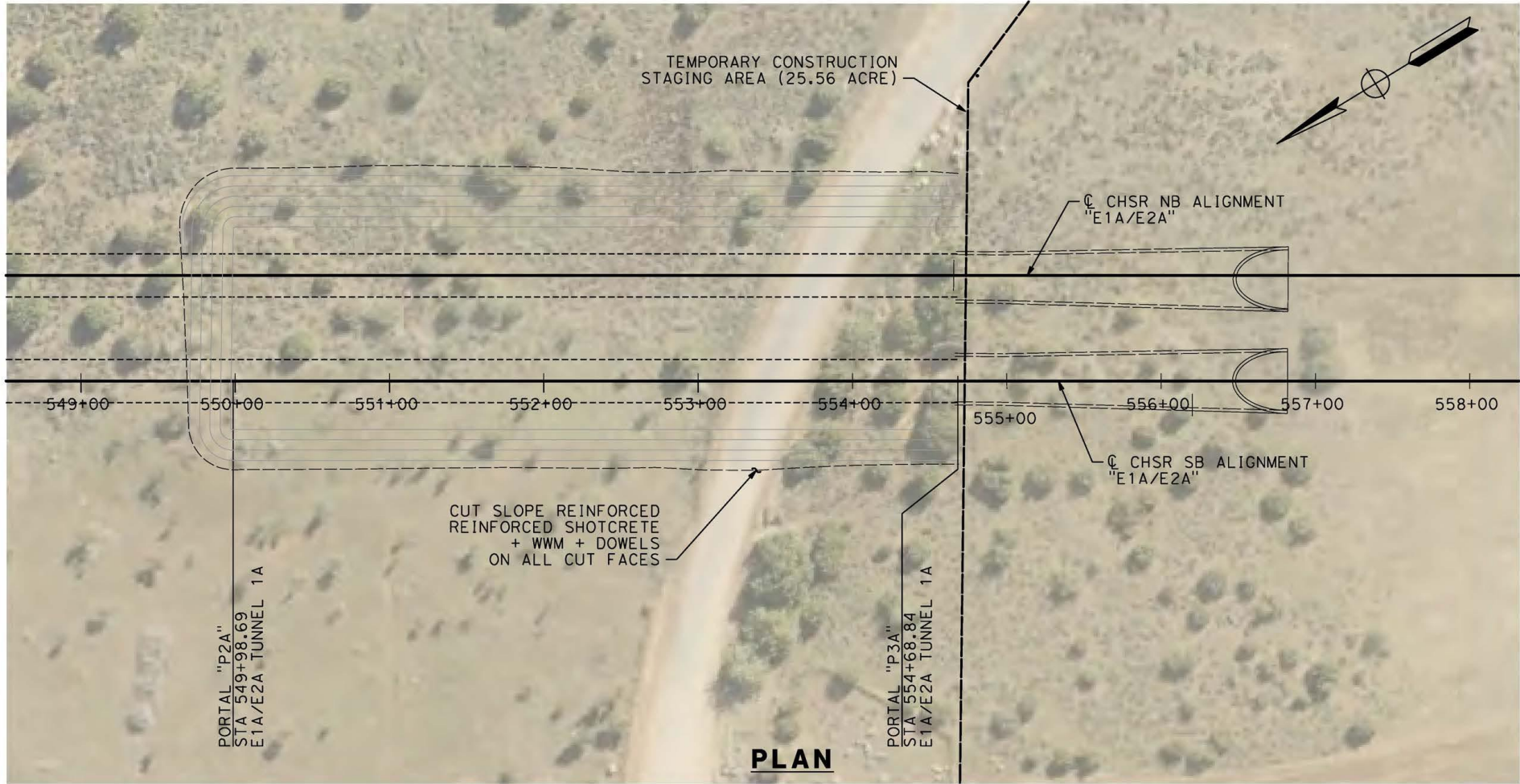
PORTAL 1A
PLAN AND PROFILE FOR CONSTRUCTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-D7001-EA
SCALE AS SHOWN
SHEET NO.

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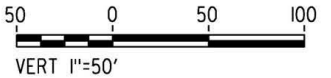
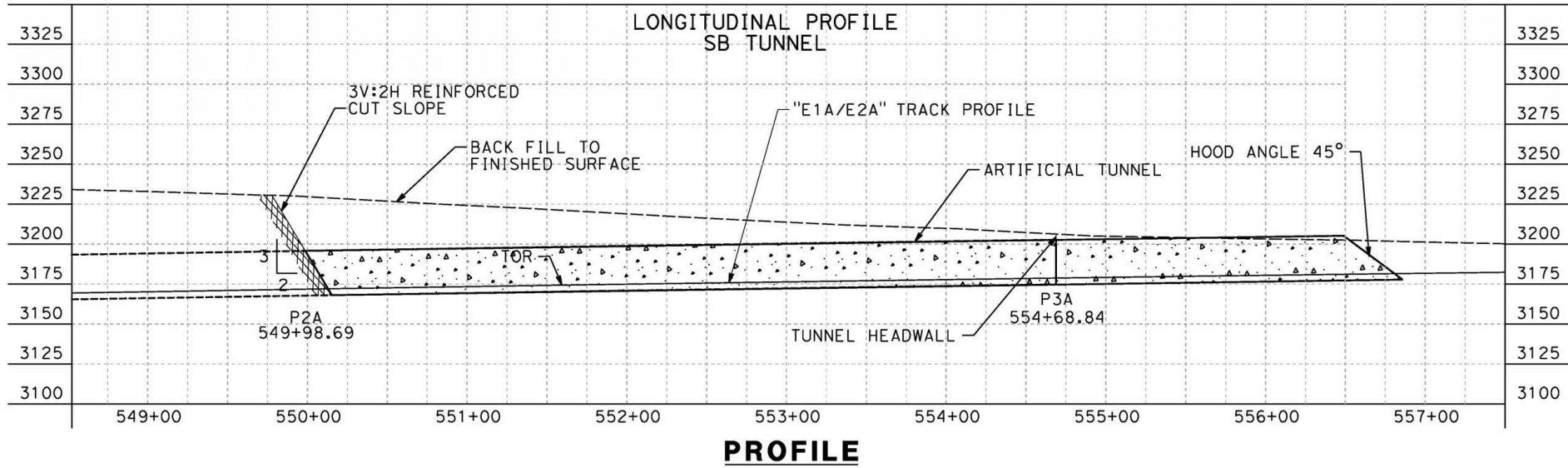
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NOTE :

- EXAMPLE OF ROCK CUT SLOPE REINFORCEMENT AT PORTAL MOUTH
- 2 IN OF SHOTCRETE WITH STEEL FIBERS (50 KG/ M³)
- WELDED WIRE MESH 6X6 - W4.0 X W4.0
- 20FT LONG CEMENT GROUTED DOWELS ON 4' BY 4' PATTERN
- WEEP AS DIRECTED
- GEOTECHNICAL RISKS AND CONSTRUCTABILITY ISSUES
SEE DRAWING TN-B0006
- THE DRAWING SHOWS THE TEMPORARY PORTAL CUT PLAN AND LONG SECTION FOR CONSTRUCTION AT THE PORTAL MOUTH ALONG WITH TEMPORARY SUPPORT FOR THE PORTAL CUT SLOPE, AND THE FINISHED FILL.
- THE DRAWING DOES NOT SHOW THE OVERALL GRADING (2H:1V) OF THE WIDER PORTAL AREA. THE EXTENT OF WHICH IS SHOWN ON THE GENERAL PLAN (SEE LIMITS OF EXCAVATION-CUT).

EXCAVATION VOLUME	445,170 CY
FILL VOLUME	309,713 CY
CUT SLOPE SURFACE	12,376 SQFT



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
E.VELASCO

DRAWN BY
F.J.DOMINGUEZ

CHECKED BY
C.RECHEA

IN CHARGE
A.RELAÑO

DATE
02/26/2021

**PEPD RECORD SET
ADDENDUM
SR14A/ E1A/ E2A**

**NOT FOR
CONSTRUCTION**



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

**CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK**
ALIGNMENT "E1A/E2A"

PORTAL 2A-3A
PLAN AND PROFILE FOR CONSTRUCTION

CONTRACT NO.
HSR14-42

DRAWING NO.
TN-D7002-EA

SCALE
AS SHOWN

SHEET NO.

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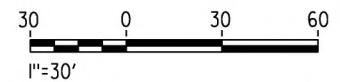
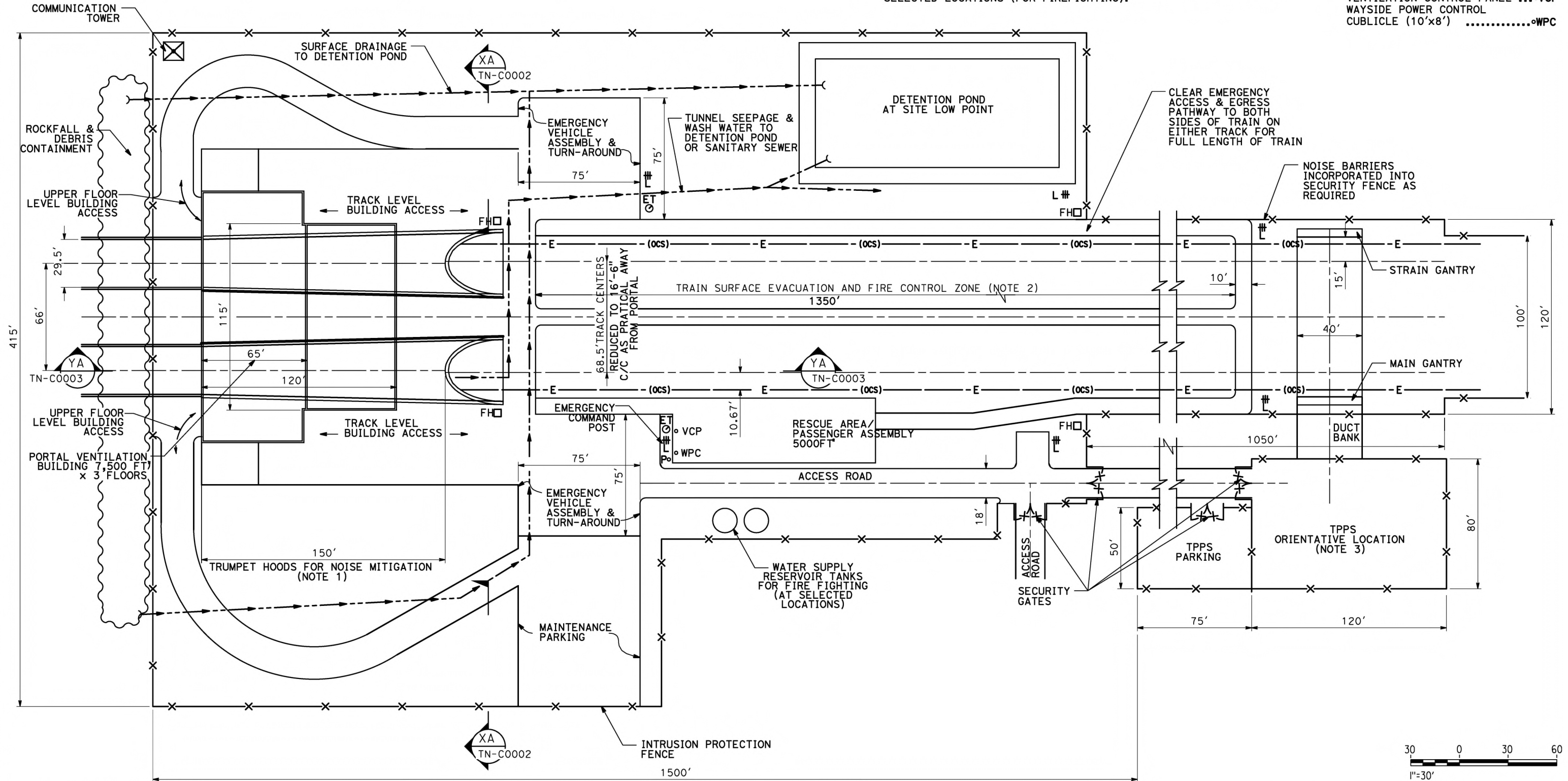
0205240

NOTES:

1. ADDITIONAL PROVISION OF SPACE OF 150' HAS BEEN ADDED TO PLAN DRAWINGS TO STAGGER PORTAL ENTRANCES IN ORDER TO PREVENT SMOKE RE-CIRCULATION IN CASE OF TUNNEL FIRE, AND FOR TUNNEL CLIMATE CONDITIONS.
2. TSEFCZ AT SELECTED PORTALS ONLY. MAY BE SHARED BETWEEN CLOSE PORTALS.
3. TPPS AND PARKING AT SELECTED PORTALS ONLY.
4. DIMENSIONS AS PER TM 2.4.6.
5. ADDITIONAL SPACE FOR WATER SUPPLY RESERVOIR TANKS ADDED AT SELECTED LOCATIONS (FOR FIREFIGHTING).

LEGEND:

EMERGENCY TELEPHONE ET
FLOOD LIGHTS L #
FIRE HYDRANT FH
OVERHEAD CATENARY ---E--- (ocs)
OCS POWER CUT-OFF SWITCH ... Po
TP PARALLELING STATION TPPS*
VENTILATION CONTROL PANEL ...VCP
WAYSIDE POWER CONTROL CUBICLE (10'x8')WPC



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
E.VELASCO
DRAWN BY
F.J.DOMINGUEZ
CHECKED BY
C.RECHEA
IN CHARGE
A.RELAÑO
DATE
02/26/2021

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

NOT FOR
CONSTRUCTION



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
TYPICAL TUNNEL PORTAL FACILITIES AT GRADE
TWIN TUNNEL CONFIGURATION
PLAN

CONTRACT NO.
HSR14-42
DRAWING NO.
TN-C0001
SCALE
AS SHOWN
SHEET NO.

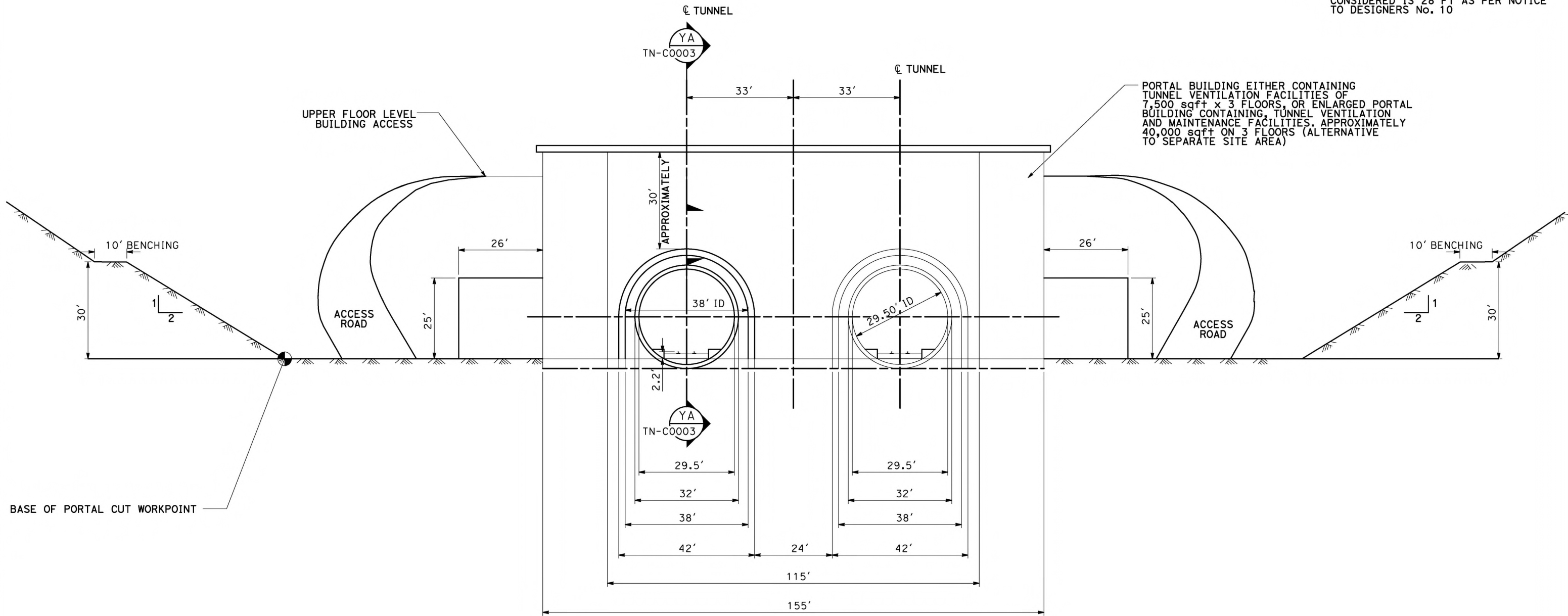
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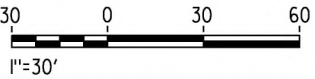
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NOTES:

1. DIMENSIONS AS PER TM 2.4.6.
2. TUNNEL INNER DIAMETER TO BE CONSIDERED IS 28 FT AS PER NOTICE TO DESIGNERS No. 10



SECTION
SCALE 1"=15' XA
TN-C0002



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

**PEPD RECORD SET
ADDENDUM
SR14A/ E1A/ E2A**

**NOT FOR
CONSTRUCTION**



**CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK**

TYPICAL TUNNEL PORTAL FACILITIES
AT GRADE TWIN TUNNEL
CONFIGURATION
ELEVATION

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0002
SCALE AS SHOWN
SHEET NO.

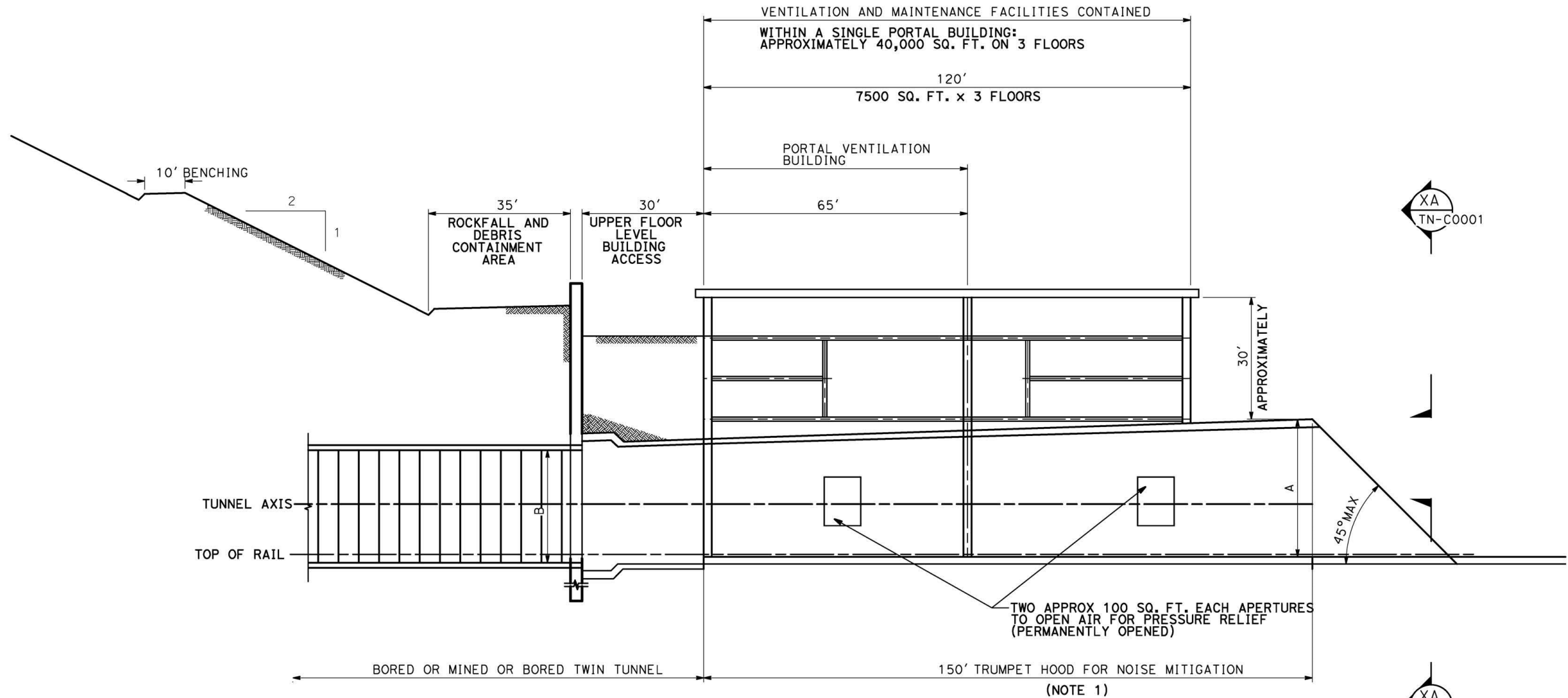
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09/12/2020 16:24:13

0205240

NOTES:

1. ADDITIONAL PROVISION OF SPACE OF 150' HAS BEEN ADDED IN PLAN DRAWINGS TO STAGGER PORTAL ENTRANCES TO PREVENT SMOKE RE-CIRCULATION IN CASE OF TUNNEL FIRE, AND FOR TUNNEL CLIMATE CONDITIONS.
2. FREE AREA (A)=150% OF FREE AREA (B).
3. VENTILATION AND AERODYNAMICS TBD.
4. DIMENSIONS AS PER TM 2.4.6.



SECTION
SCALE 1"=15'

YA
TN-C0003



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
E.VELASCO
DRAWN BY
F.J.DOMINGUEZ
CHECKED BY
C.RECHEA
IN CHARGE
A.RELAÑO
DATE
02/26/2021

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

NOT FOR
CONSTRUCTION



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

**CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK**

TYPICAL TUNNEL PORTAL FACILITIES AT GRADE
TWIN TUNNEL CONFIGURATION
LONG SECTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0003
SCALE AS SHOWN
SHEET NO.

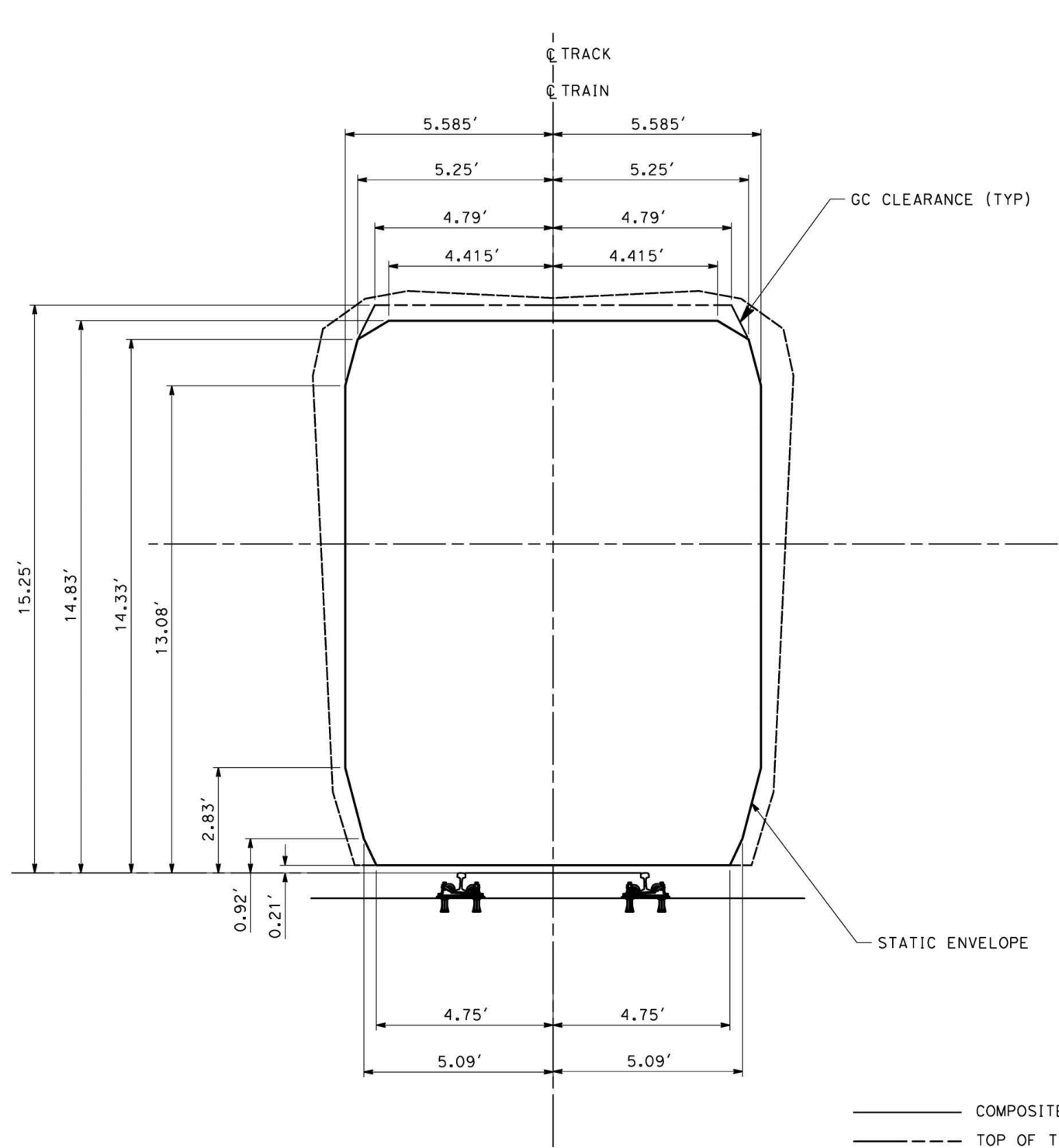
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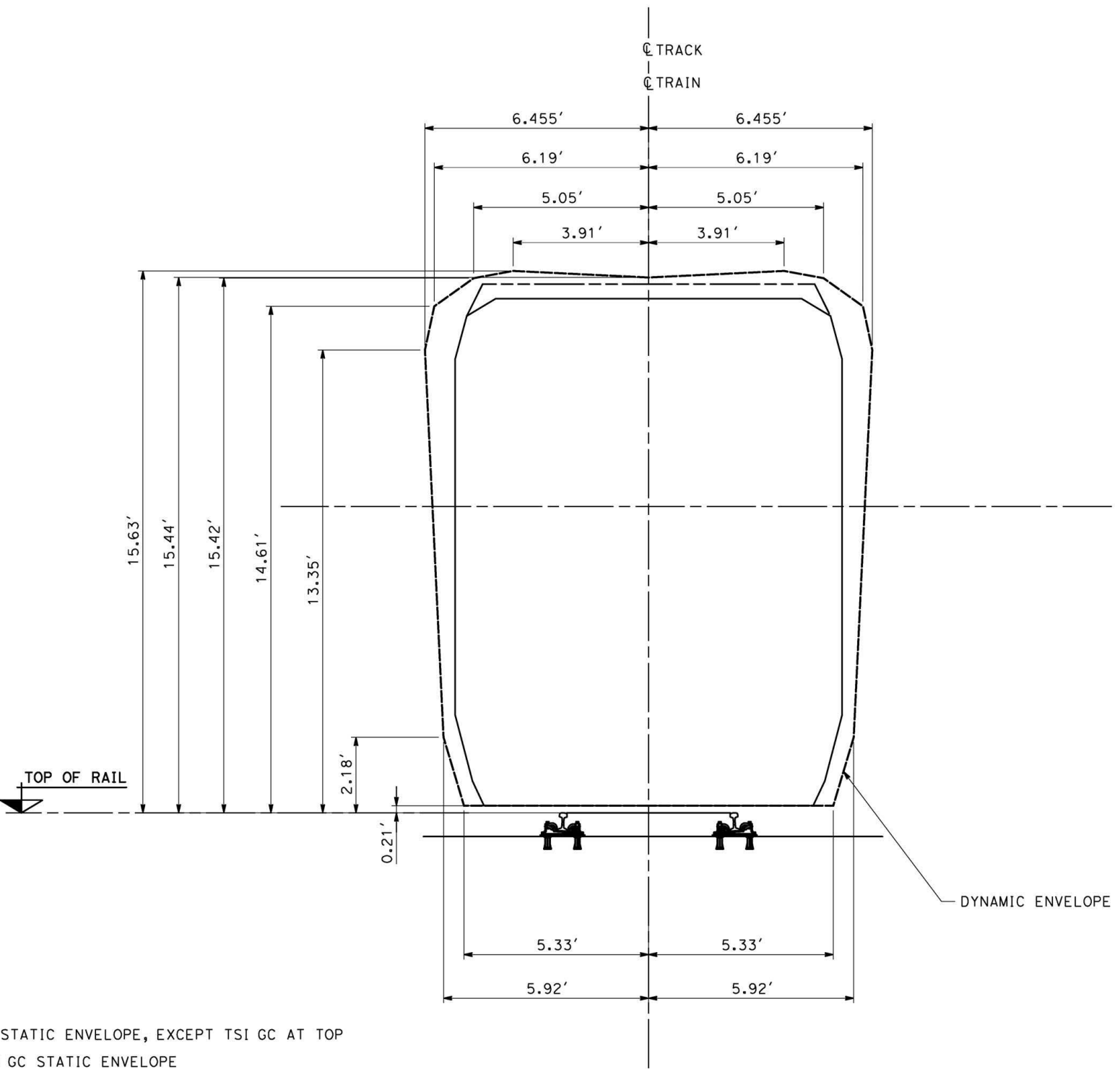
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NOTES OF ASSUMPTIONS:

1. REFER TO TM 1.1.10 FOR ASSUMPTIONS ON GAUGES.
2. HIGH-SPEED EQUIPMENT ONLY.

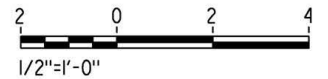


COMPOSITE STATIC ENVELOPE



COMPOSITE DYNAMIC ENVELOPE

———— COMPOSITE STATIC ENVELOPE, EXCEPT TSI GC AT TOP
----- TOP OF TSI GC STATIC ENVELOPE
----- COMPOSITE DYNAMIC ENVELOPE



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
E.VELASCO
DRAWN BY
F.J.DOMINGUEZ
CHECKED BY
C.RECHEA
IN CHARGE
A.RELAÑO
DATE
02/26/2021

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

NOT FOR
CONSTRUCTION



CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

COMPOSITE VEHICLE
STATIC AND DYNAMIC ENVELOPE
TANGENT TRACK

CONTRACT NO.
HSR14-42
DRAWING NO.
TN-C0004
SCALE
AS SHOWN
SHEET NO.

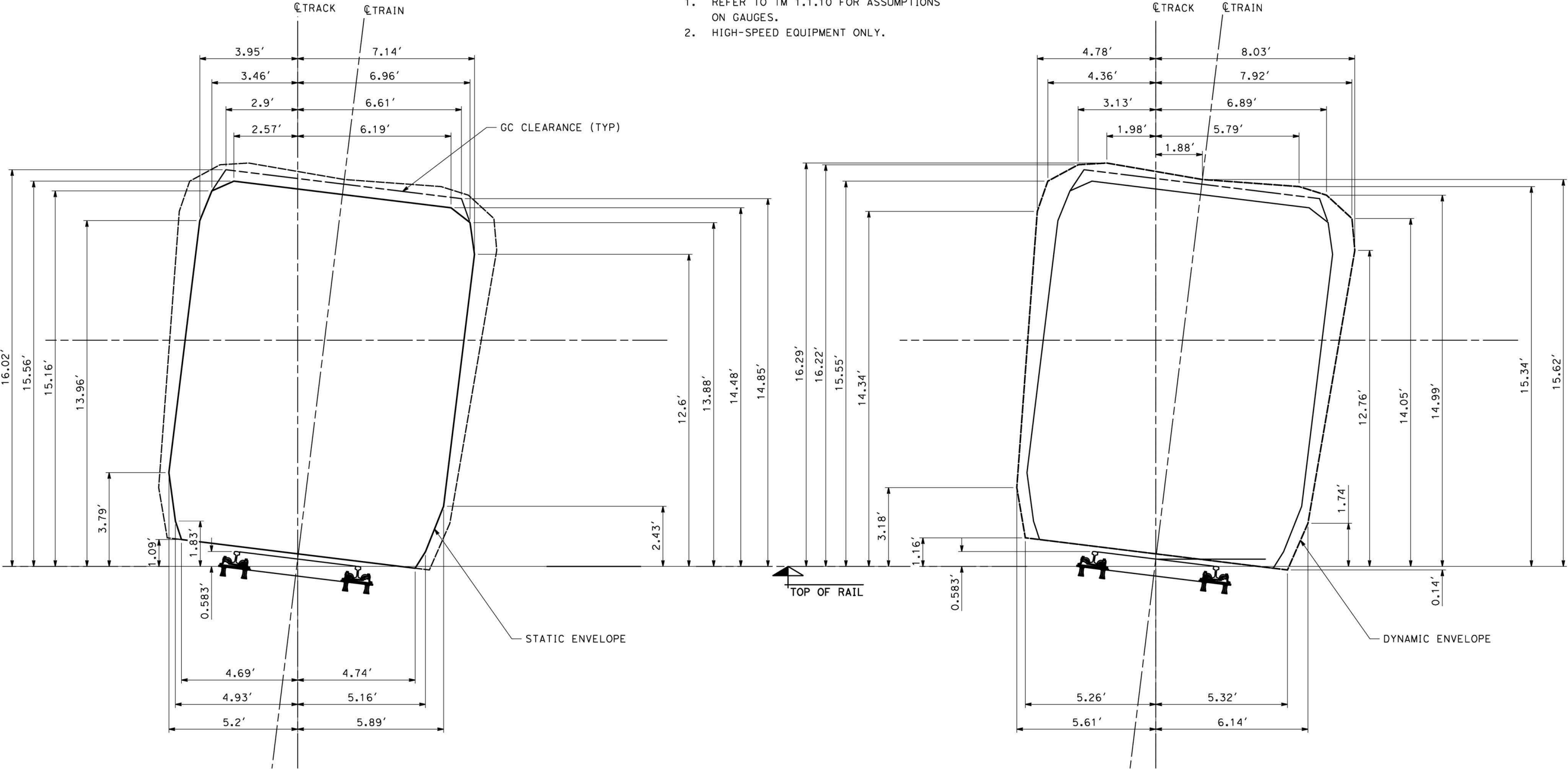
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09/12/2020 16:24:47

0205240

NOTES OF ASSUMPTIONS:

1. REFER TO TM 1.1.10 FOR ASSUMPTIONS ON GAUGES.
2. HIGH-SPEED EQUIPMENT ONLY.



COMPOSITE STATIC ENVELOPE

COMPOSITE DYNAMIC ENVELOPE

- COMPOSITE STATIC ENVELOPE, EXCEPT TSI GC AT TOP
- TOP OF TSI GC STATIC ENVELOPE
- COMPOSITE DYNAMIC ENVELOPE



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

NOT FOR
CONSTRUCTION



CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

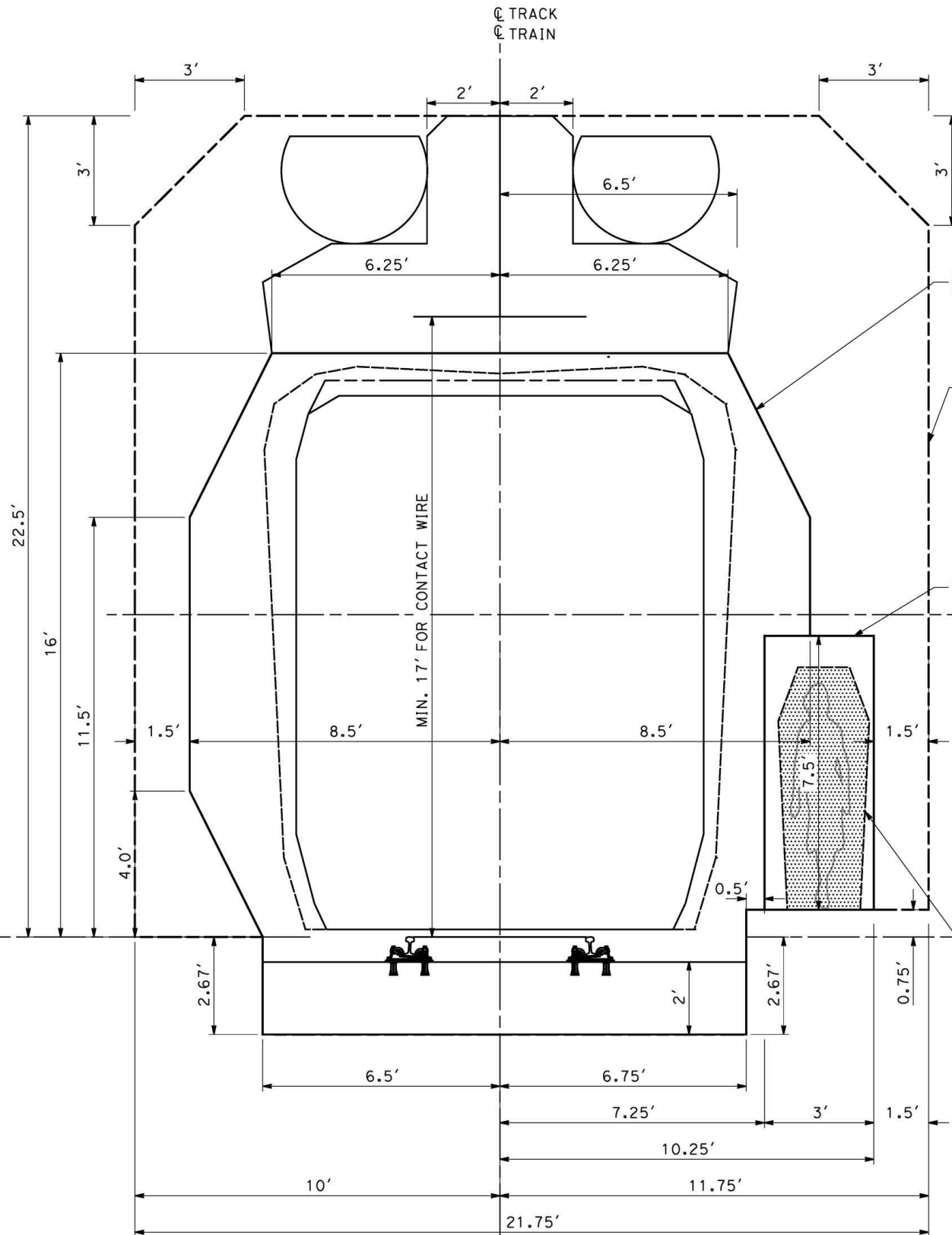
COMPOSITE VEHICLE
STATIC AND DYNAMIC ENVELOPE
SUPERELEVATED TRACK

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0005
SCALE AS SHOWN
SHEET NO.

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**FIXED EQUIPMENT ENVELOPE
AND STRUCTURE GAUGE
TANGENT TRACK
WALKWAY RIGHT SIDE**

NOTES OF ASSUMPTIONS:

1. NO ALLOWANCE FOR AERODYNAMICS.
2. EXCLUDES CONSTRUCTION TOLERANCE.
3. NO ALLOWANCE FOR VENT EQUIPMENT.
4. FOR PANTOGRAPH DETAILS, REFER TO TM 3.2.3
5. REFER TO TM 1.1.10 FOR ASSUMPTIONS ON STATIC & DYNAMIC GAUGES.
6. HIGH-SPEED EQUIPMENT ONLY.
7. FOR FEEDER CLEARANCE SEE TM 3.2.2-B
8. STRUCTURE GAUGE FOR C&C SECTIONS ACCORDING TO TM 2,4,2-E

FIXED EQUIPMENT ENVELOPE

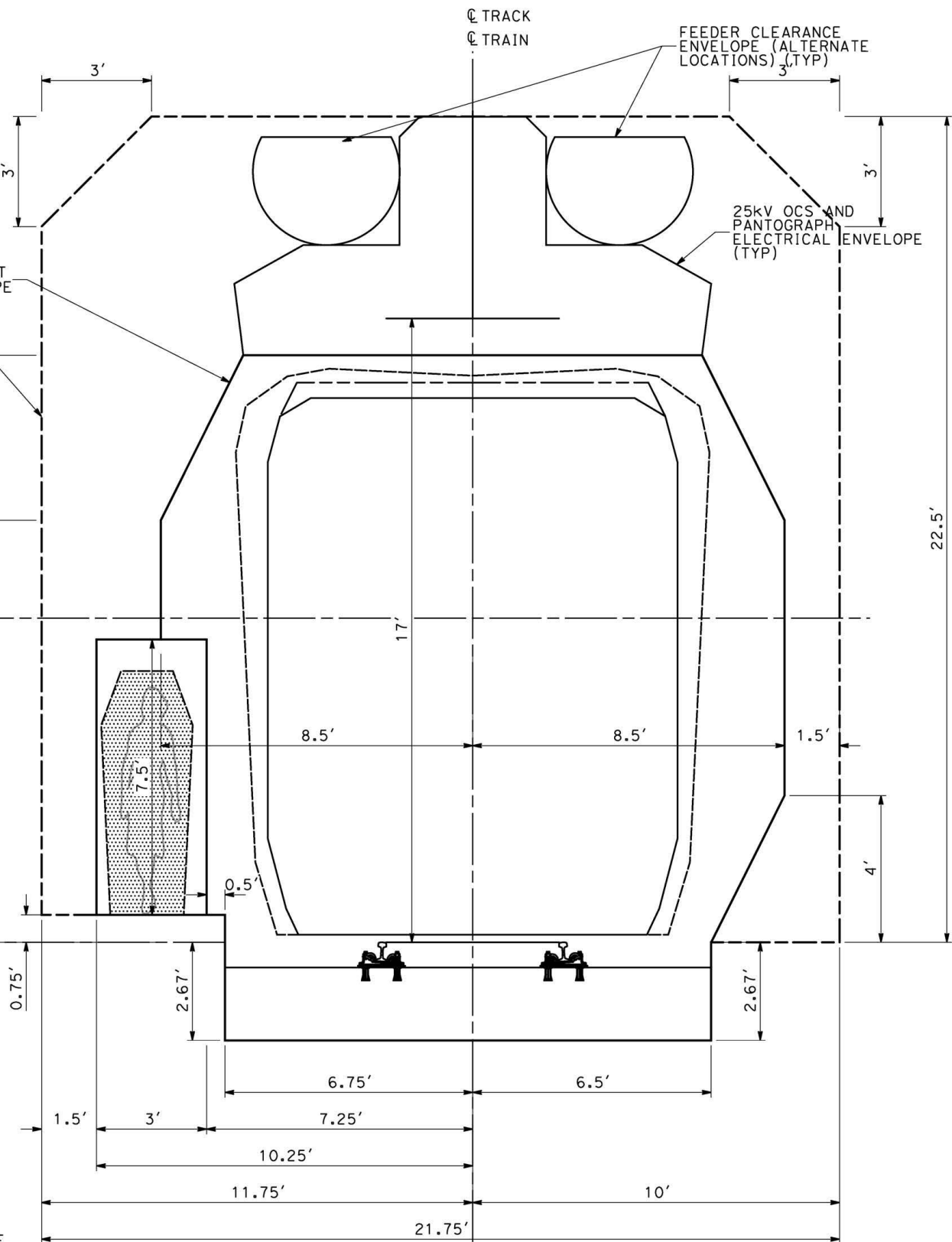
STRUCTURE GAUGE
(ONLY FOR CUT-AND-COVER SECTIONS)

STRUCTURE GAUGE
(ONLY FOR CUT-AND-COVER SECTIONS)

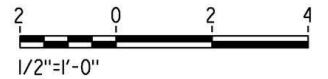
WALKWAY ENVELOPE

NFPA 130
UNOBSTRUCTED CLEAR
WIDTH FOR
TRAINWAY WALKWAY (TYP)

- COMPOSITE STATIC ENVELOPE, EXCEPT TSI GC AT TOP
- - - TOP OF TSI GC STATIC ENVELOPE
- - - - COMPOSITE DYNAMIC ENVELOPE
- FIXED EQUIPMENT ENVELOPE
- - - - STRUCTURE GAUGE FOR C&C SECTIONS



**FIXED EQUIPMENT ENVELOPE
AND STRUCTURE GAUGE
TANGENT TRACK
WALKWAY LEFT SIDE**



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

**PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A**

**NOT FOR
CONSTRUCTION**



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

**CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK**

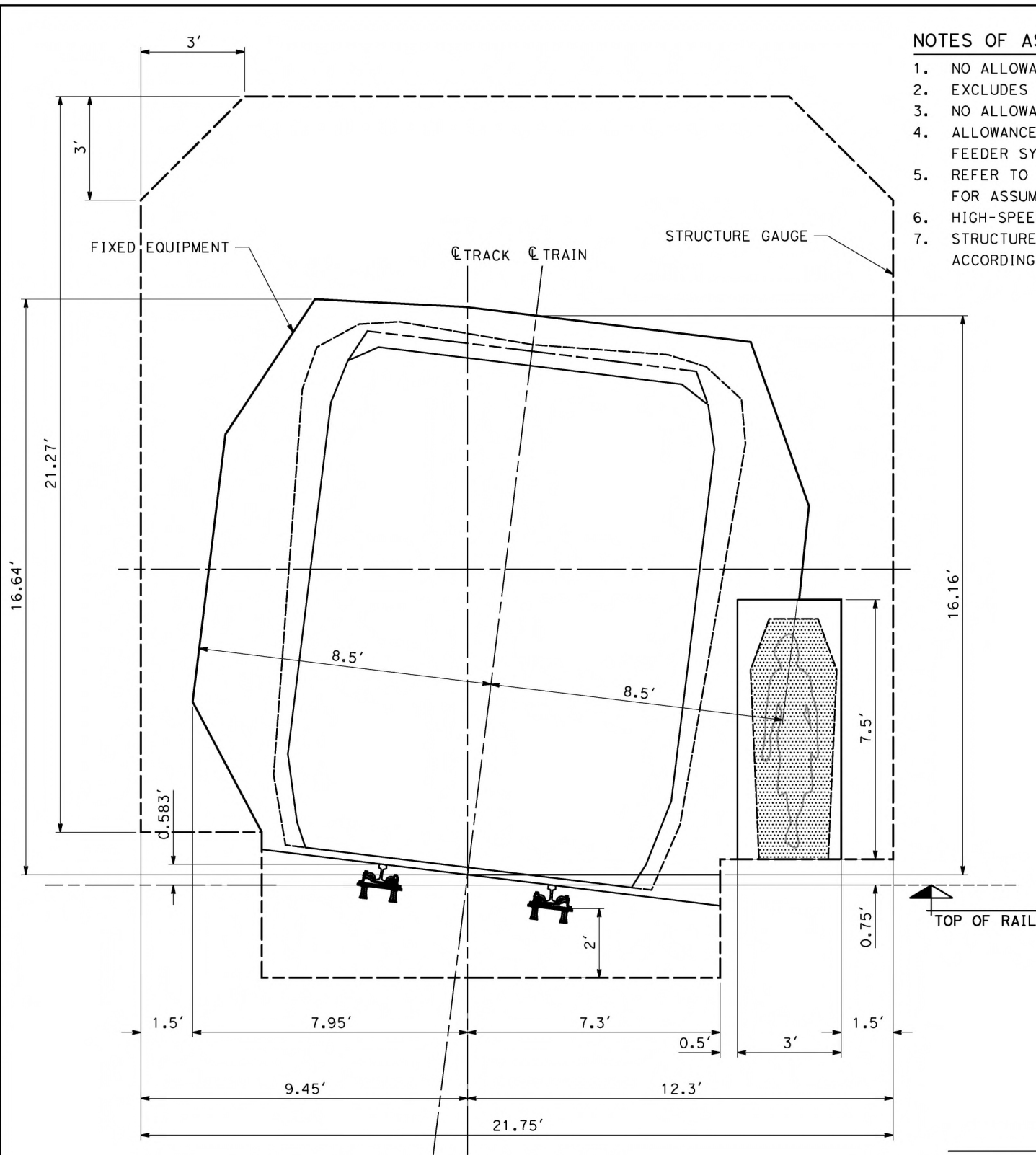
COMPOSITE VEHICLE
FIXED EQUIPMENT ENVELOPE AND STRUCTURE GAUGE
TANGENT TRACK

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0006
SCALE AS SHOWN
SHEET NO.

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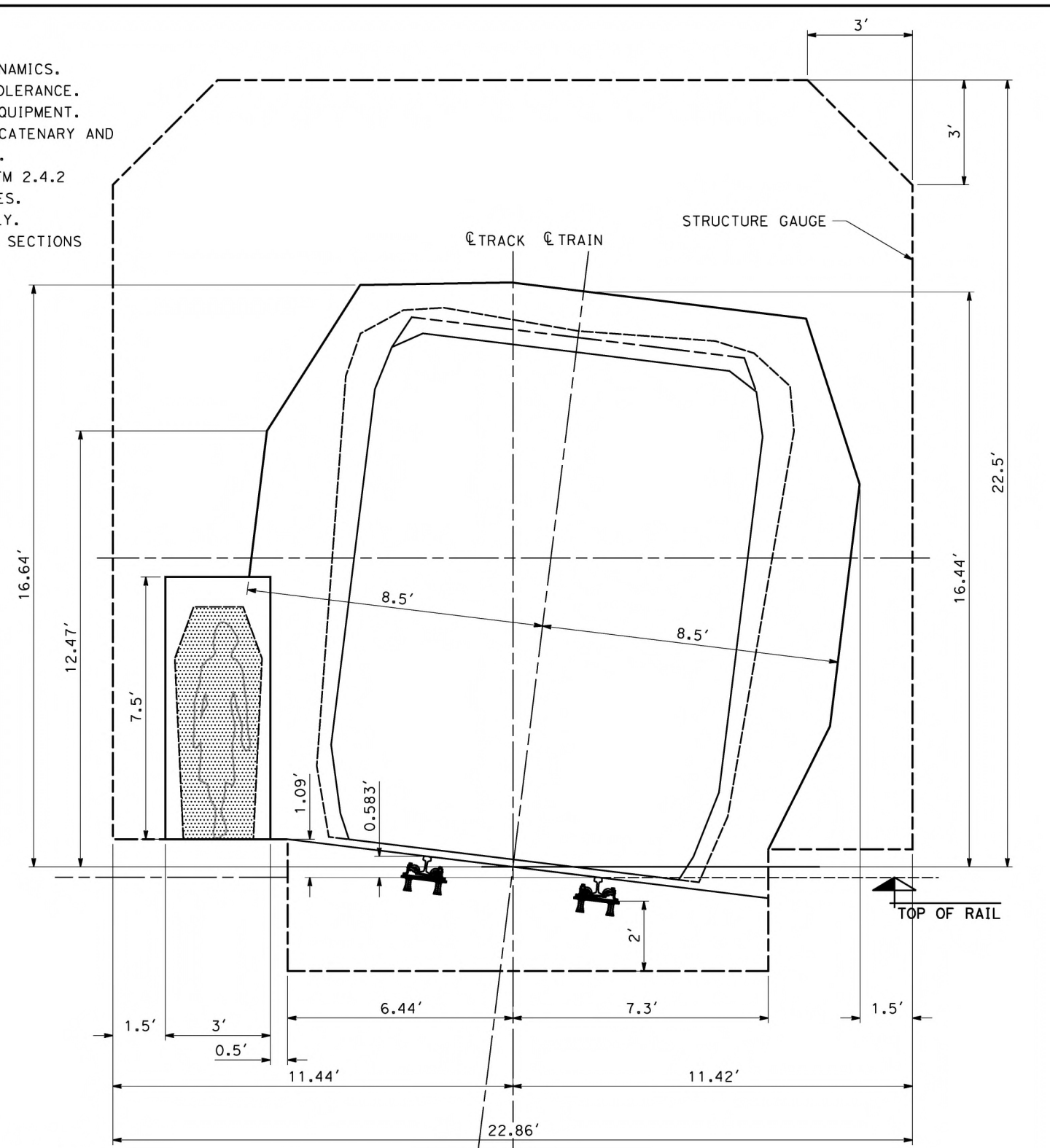
0205240



**FIXED EQUIPMENT ENVELOPE
AND STRUCTURE GAUGE
SUPERELEVATED TRACK
WALKWAY RIGHT SIDE**

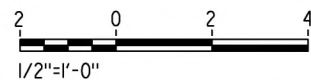
NOTES OF ASSUMPTIONS:

1. NO ALLOWANCE FOR AERODYNAMICS.
2. EXCLUDES CONSTRUCTION TOLERANCE.
3. NO ALLOWANCE FOR VENT EQUIPMENT.
4. ALLOWANCE FOR OVERHEAD CATENARY AND FEEDER SYSTEM NOT SHOWN.
5. REFER TO TM 1.1.10 AND TM 2.4.2 FOR ASSUMPTIONS ON GAUGES.
6. HIGH-SPEED EQUIPMENT ONLY.
7. STRUCTURE GAUGE FOR C&C SECTIONS ACCORDING TO TM 2.4.2-E



**FIXED EQUIPMENT ENVELOPE
AND STRUCTURE GAUGE
SUPERELEVATED TRACK
WALKWAY LEFT SIDE**

- COMPOSITE STATIC ENVELOPE, EXCEPT TSI GC AT TOP
- TOP OF TSI GC STATIC ENVELOPE
- COMPOSITE DYNAMIC ENVELOPE
- FIXED EQUIPMENT ENVELOPE
- STRUCTURE GAUGE FOR CUT AND COVER SECTIONS



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

**PEPD RECORD SET
ADDENDUM
SR14A/ E1A/ E2A**

**NOT FOR
CONSTRUCTION**



**CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK**

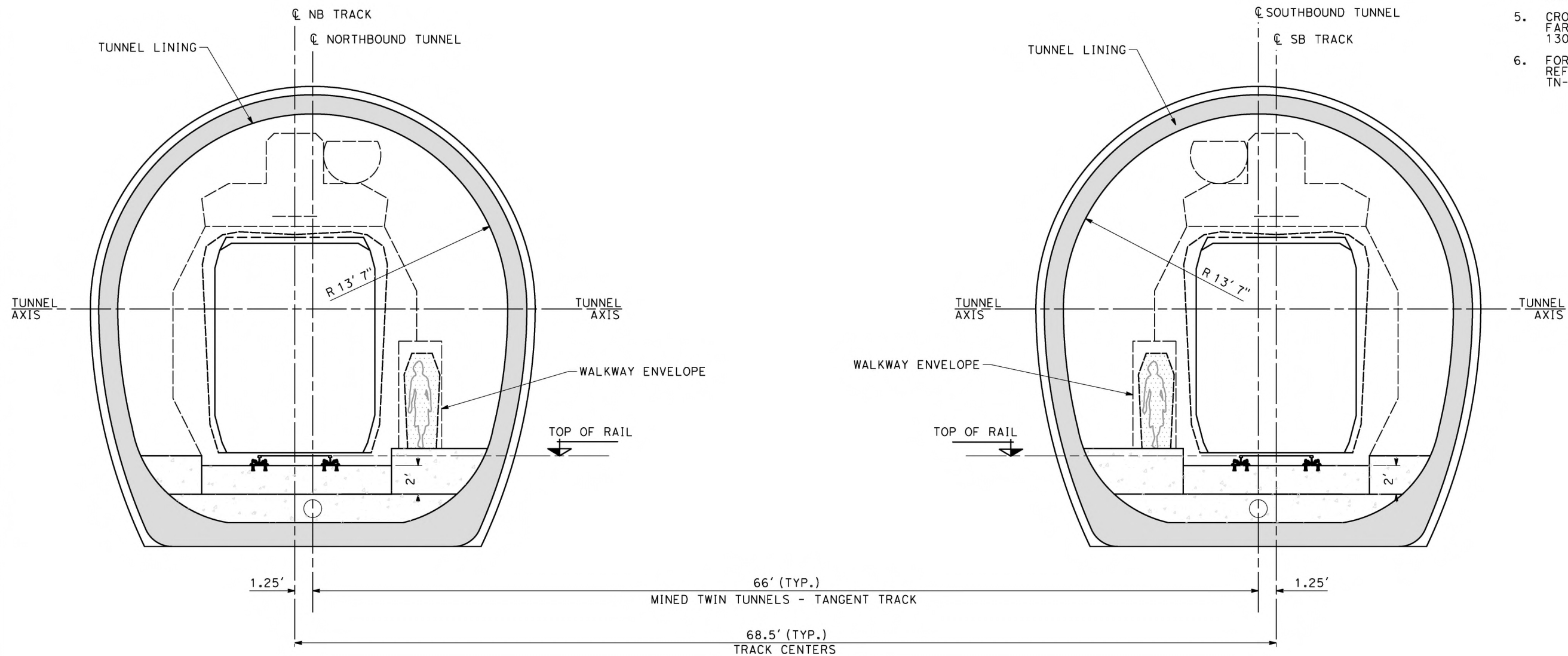
COMPOSITE VEHICLE
FIXED EQUIPMENT ENVELOPE AND STRUCTURE GAUGE
SUPERELEVATED TRACK

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0007
SCALE AS SHOWN
SHEET NO.

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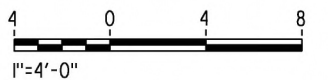
0205240



**TUNNEL TYPICAL SECTION
MINED TWIN TUNNELS
TANGENT TRACK**

NOTES:

1. MINED TWIN TUNNELS ARE AN OPTION FOR SHORT TUNNELS LOCATED BETWEEN ANF AND PALMDALE.
2. EXCAVATION, GROUND SUPPORT, PILLAR WIDTH, DRAINAGE, TUNNEL LINING DESIGN AND WATER AND GAS TIGHTNESS PROVISIONS TBD.
3. PILLAR WIDTH BETWEEN TUNNELS TO BE ONE TUNNEL DIAMETER OR MORE BASED ON GUIDANCE IN TM 2.4.6.
4. SPACE PROOFING REQUIRES FURTHER STUDY TO EVALUATE DYNAMIC AIRFLOW/PRESSURE LEVELS UNDER HIGH-SPEED OPERATING CONDITIONS, AND TO FURTHER DEFINE SPACE ALLOTTED FOR STRUCTURES, EQUIPMENT AND EGRESS.
5. CROSS-PASSAGEWAYS SHALL NOT BE FARTHER THAN 800 FT APART (NFPA 130).
6. FOR EQUIPMENT STRUCTURE GAUGES, REFER TO DRAWINGS TN-C0004 TO TN-C0007.



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

**PEPD RECORD SET
ADDENDUM
SR14A/ E1A/ E2A**

**NOT FOR
CONSTRUCTION**



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

**CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK**

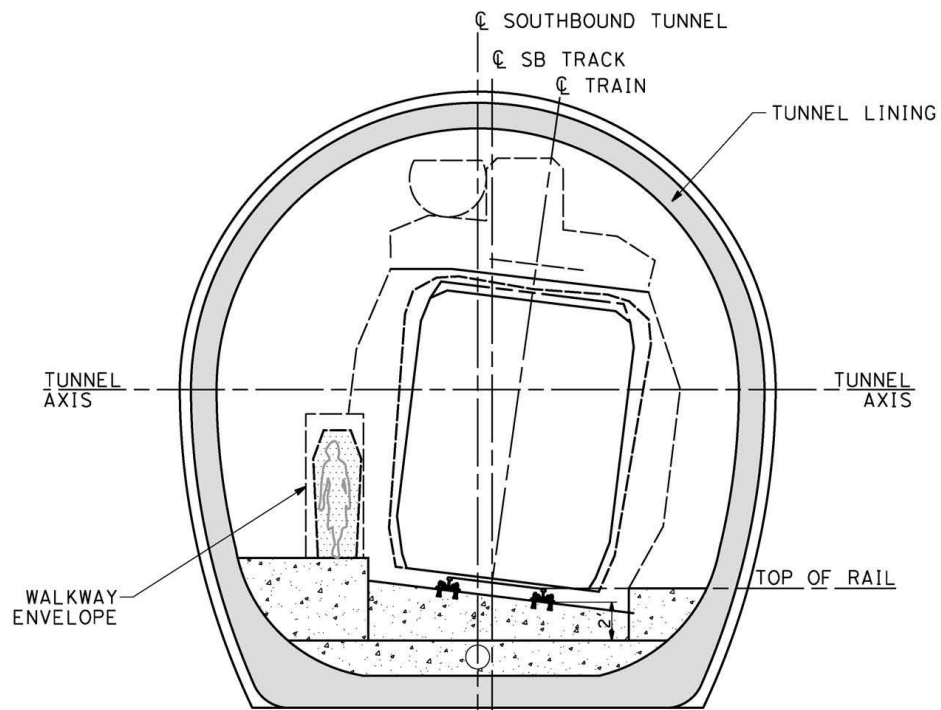
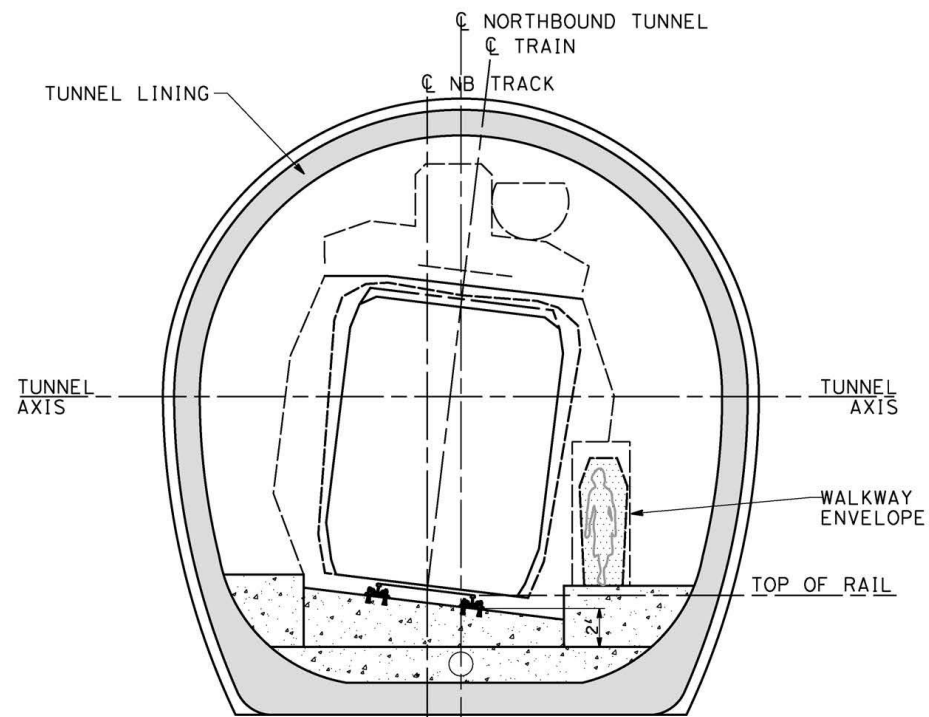
MINED TWIN TUNNELS
TANGENT TRACK
CLEARANCE DIAGRAM

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0100
SCALE AS SHOWN
SHEET NO.

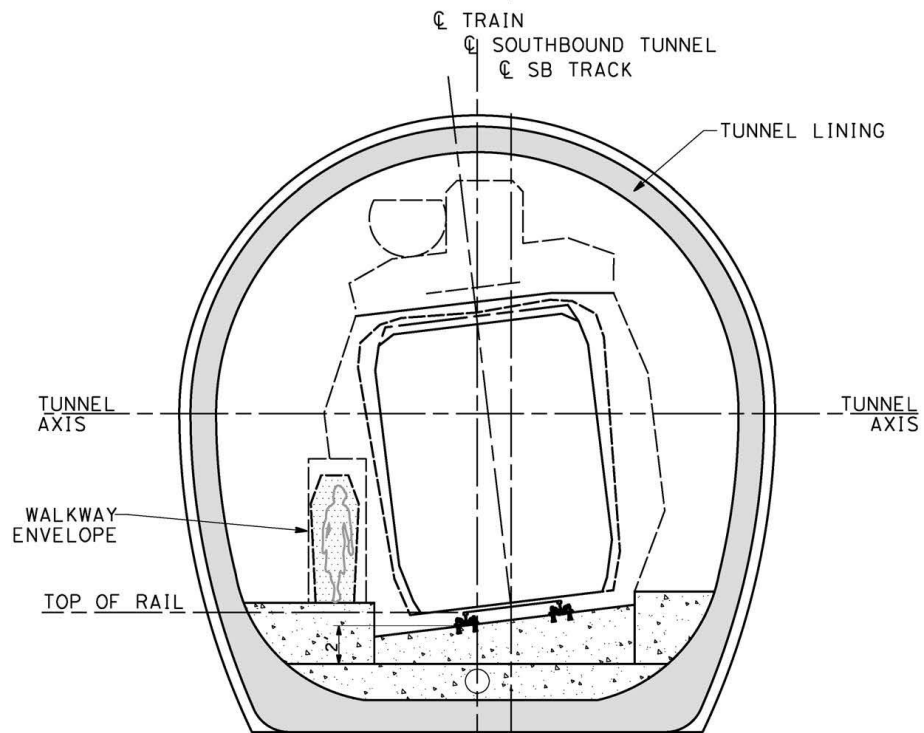
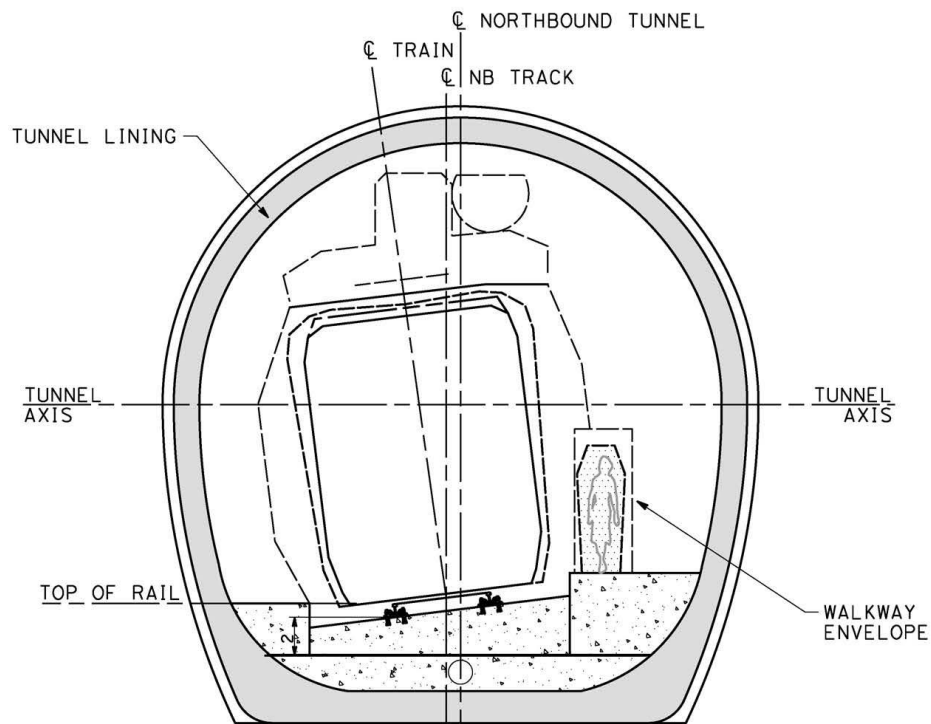
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66' (TYP)
MINED TWIN TUNNELS - SUPERELEVATED TRACK
68.5' (TYP)
TRACK CENTERS

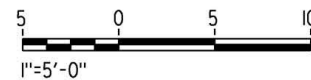


66' (TYP)
MINED TWIN TUNNELS - SUPERELEVATED TRACK
68.5' (TYP)
TRACK CENTERS

**TUNNEL TYPICAL SECTION
MINED TWIN TUNNELS
SUPERELEVATED TRACK**

NOTES:

1. MINED TWIN TUNNELS ARE AN OPTION FOR SHORT TUNNELS LOCATED BETWEEN ANF AND PALMDALE.
2. EXCAVATION, GROUND SUPPORT, PILLAR WIDTH, DRAINAGE, TUNNEL LINING DESIGN AND WATER AND GAS TIGHTNESS PROVISIONS TBD.
3. PILLAR WIDTH BETWEEN TUNNELS TO BE ONE TUNNEL DIAMETER OR MORE BASED ON GUIDANCE IN TM 2.4.6.
4. SPACE PROOFING REQUIRES FURTHER STUDY TO EVALUATE DYNAMIC AIRFLOW/PRESSURE LEVELS UNDER HIGH-SPEED OPERATING CONDITIONS, AND TO FURTHER DEFINE SPACE ALLOTTED FOR STRUCTURES, EQUIPMENT AND EGRESS.
5. CROSS-PASSAGEWAYS SHALL NOT BE FARTHER THAN 800 FT APART (NFPA 130).
6. FOR EQUIPMENT STRUCTURE GAUGES, REFER TO DRAWINGS TN-C0004 TO TN-C0007.



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
E.VELASCO
DRAWN BY
F.J.DOMINGUEZ
CHECKED BY
C.RECHEA
IN CHARGE
A.RELAÑO
DATE
02/26/2021

**PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A**

**NOT FOR
CONSTRUCTION**



**CALIFORNIA
HIGH-SPEED RAIL AUTHORITY**

**CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK**
MINED TWIN TUNNELS
SUPERELEVATED TRACK
CLEARANCE DIAGRAM

CONTRACT NO.
HSR14-42
DRAWING NO.
TN-C0101
SCALE
AS SHOWN
SHEET NO.

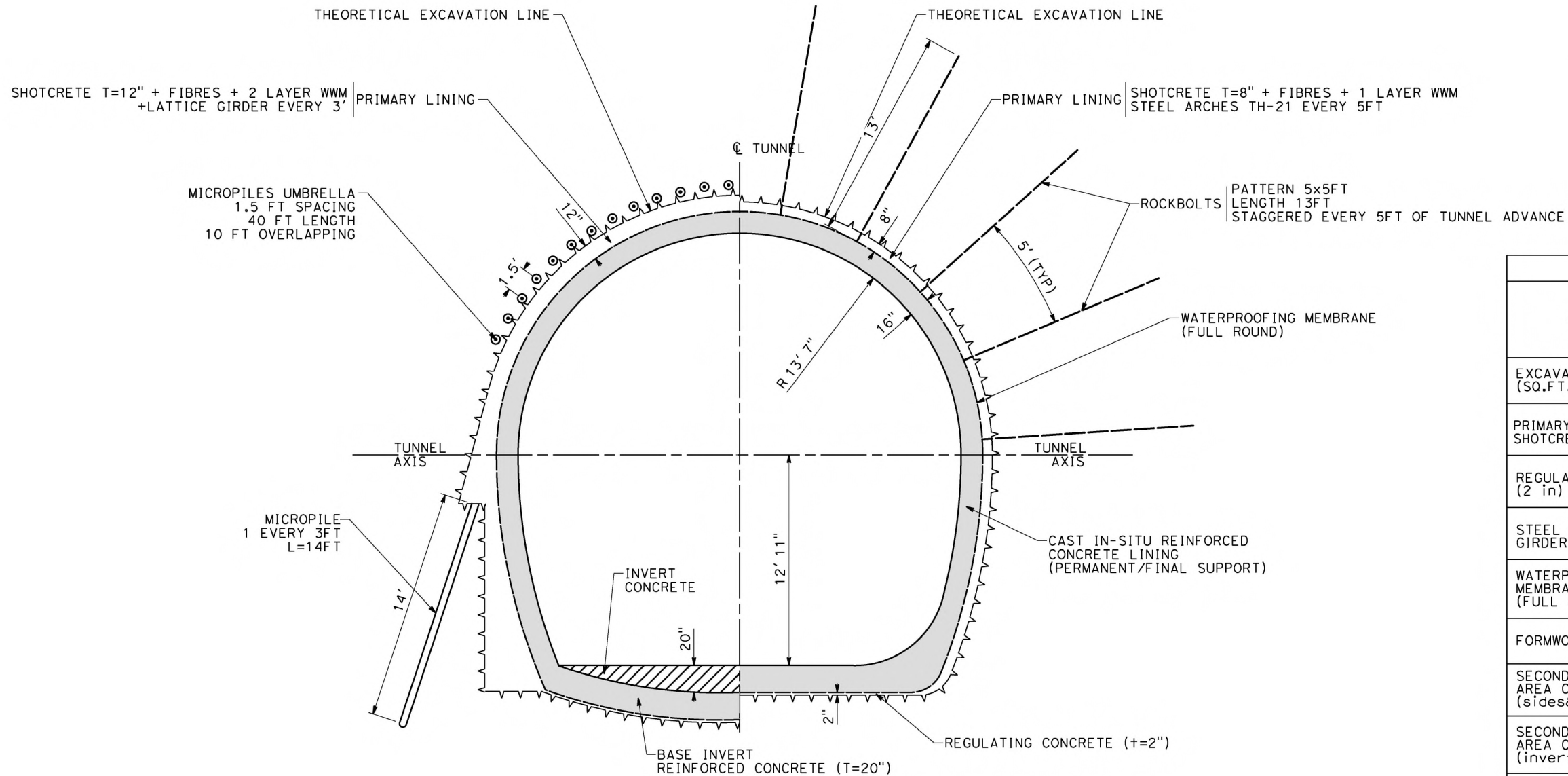
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NOTES:

- SUPPORT MEASURES SHOWN ARE ORIENTATIVE ONLY AND FOR PEPD COST ESTIMATION. THEY MUST BE CALCULATED WHEN DETAILED GEOTECHNICAL INFORMATION IS AVAILABLE.
- THE SECTIONS SHOWN ON THIS DRAWING ARE ONLY APPLICABLE IN THE ROCK QUALITY CONDITIONS SHOWN. OTHER POSSIBLE SCENARIOS ARE INCLUDED IN TABLES ON DRAWINGS TN-C0704 AND TN-C0705
- BASE INVERT NECESSARY IN CASE OF RMR<40 OR IN PRESENCE OF HIGH WATER TABLE. THE EXACT LOCATION OF THE AREAS WHERE IT WILL HAVE TO BE APPLIED MUST BE FORESEEN WHEN DETAILED GEOTECHNICAL INFORMATION IS AVAILABLE.



**MINED TWIN TUNNELS
TYPICAL GEOMETRY
PRIMARY LINING TYPE FOR
POOR QUALITY ROCK (RMR <30)**

**MINED TWIN TUNNELS
TYPICAL GEOMETRY
PRIMARY LINING TYPE FOR
MEDIUM QUALITY ROCK (RMR 40-50)**

BASIC QUANTITIES PER FT OF TUNNEL		
TWIN TUNNELS	PRIMARY LINING TYPE	
	MEDIUM QUALITY ROCK	POOR QUALITY ROCK (II)
EXCAVATION AREA (SQ.FT.)	806	900
PRIMARY LINING - SHOTCRETE AREA (SQ.FT.)	46	110
REGULATING CONCRETE (2 in) (SQ.FT.)	4	4
STEEL ARCH/LATTICE GIRDER (FT)	75/5=15	76/3=25.3
WATERPROOFING MEMBRANE (FT) (FULL ROUND)	100	105
FORMWORK (FT)	75	76
SECONDARY LINING AREA CONCRETE (sides&crown) (SQ.FT.)	98	98
SECONDARY LINING AREA CONCRETE (invert&slab) (SQ.FT.)	40	42
ROCKBOLTS (FT)	10x13/5=26	-
MICROPILES UMBRELLA (FT)	-	26x40/30=34.6
MICROPILES FOR ELEPHANT'S FOOT (FT)	-	28/3=9.3
INVERT CONCRETE (SQ.FT.)	-	26.7



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

**PEPD RECORD SET
ADDENDUM
SR14A/ E1A/ E2A**

**NOT FOR
CONSTRUCTION**



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

**CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK**

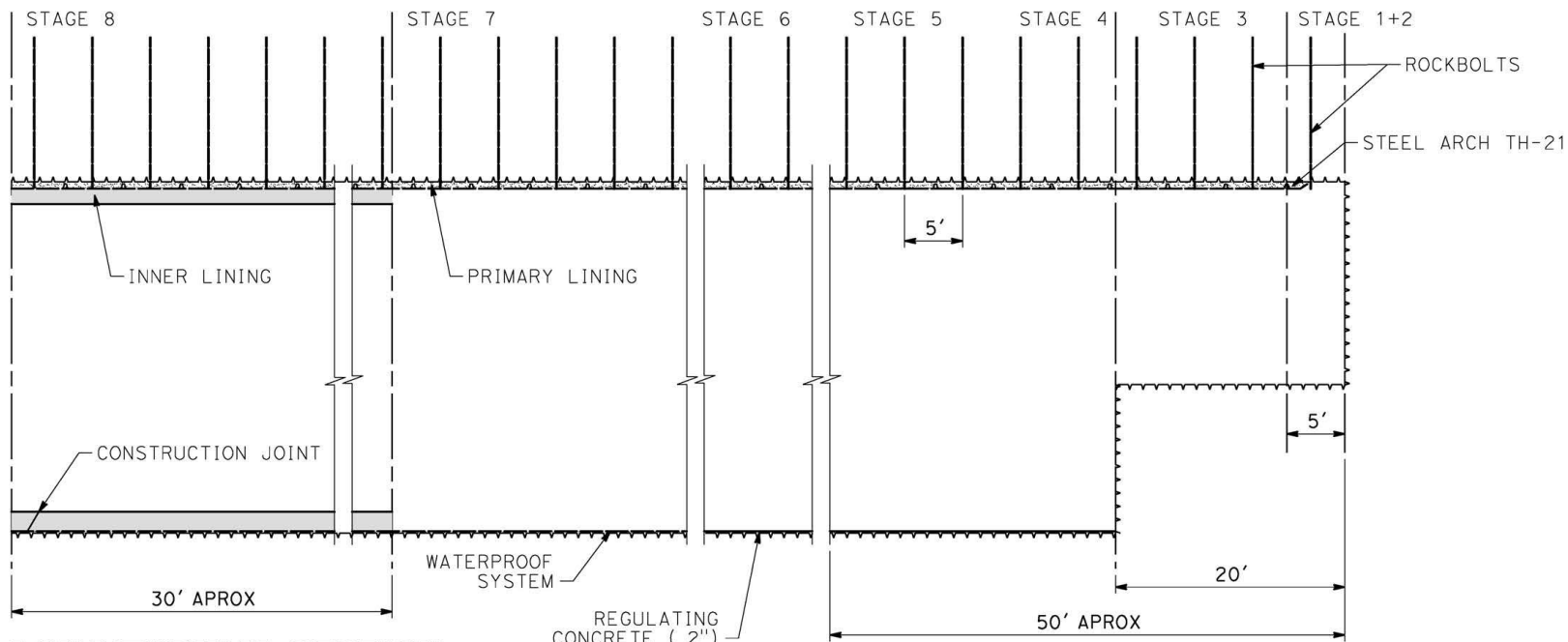
MINED TWIN TUNNELS
TYPICAL CONSTRUCTION SEQUENCE AND SUPPORT MEASURES
(1 of 3)

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0102
SCALE AS SHOWN
SHEET NO.

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LONGITUDINAL SECTION

LEGEND:

	NATM EXCAVATION
	STEEL ARCH TH-21
	REINFORCED SHOTCRETE PRIMARY LINING +1 LAYER WWM
	REINFORCED INNER / SECONDARY LINING

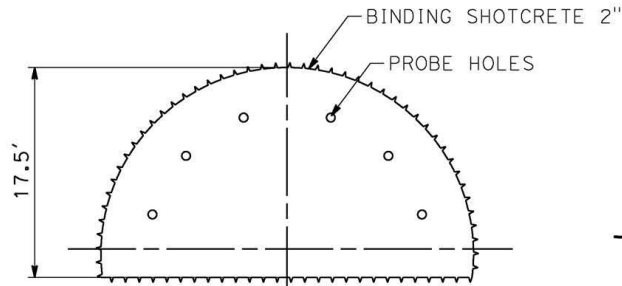
**MINED TWIN TUNNELS
PRIMARY LINING FOR
MEDIUM QUALITY ROCK**

PRIMARY LINING (EXAMPLE ONLY, NOT ACTUAL DESIGN)								
DENOMINATION	RMR	SHOTCRETE THICKNESS (in)	STEEL ARCHES	FIBRES & WWM	ADVANCE LENGTH (FT)	ROCKBOLT PATTERN AND LENGTH (FT)	PIPE UMBRELLA	
GOOD QUALITY ROCK	50-60	6	NO	FIBRES & 1 LAYER WWM	5 FULL FACE	5x5FT 13FT	-	
MEDIUM QUALITY ROCK	40-50	8	TH-21	FIBRES & 1 LAYER WWM	5 TOP HEADING	5x5FT 13FT	-	
POOR QUALITY ROCK (I)	30-40	10	TH-29	FIBRES & 2 LAYERS WWM	3.5 TOP HEADING	3.5x3.5FT 15FT	*	
POOR QUALITY ROCK (II)	<30	12	LATTICE GIRDER		3 TOP HEADING	-	YES	

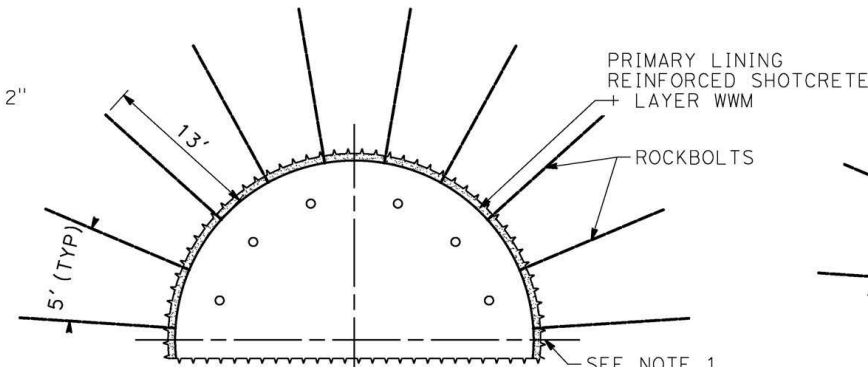
* SELF DRILLING BOLTS INSTEAD OF ROCKBOLTING IF RMR<35

NOTES:

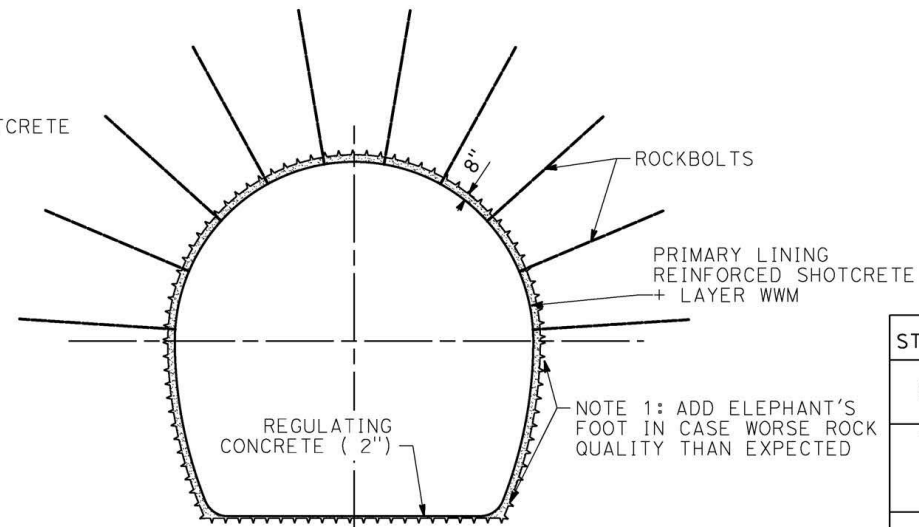
- SUPPORT MEASURES SHOWN ARE ORIENTATIVE ONLY AND FOR PEPD COST ESTIMATION. THEY MUST BE CALCULATED WHEN DETAILED GEOTECHNICAL INFORMATION IS AVAILABLE.
- POOR QUALITY ROCK CAN OCCUR AT PORTALS AND FAULT ZONES AMONG OTHER.
- SQUEEZING GROUND CONDITIONS UNDER OVERBURDEN OF MORE THAN 300FT WILL REQUIRE THE STUDY OF DIFFERENT MULTIPLE EXCAVATION AND LINING TECHNIQUES IN ORDER TO COPE WITH THE EXTREME CONDITIONS.
- TUNNELS DIMENSIONS ACCORDING TO USUAL MACHINERY USED IN MINED TUNNELS. THESE DIMENSIONS MUST BE ADJUSTED TO THE MACHINERY THAT WILL BE USED IN CONSTRUCTION.



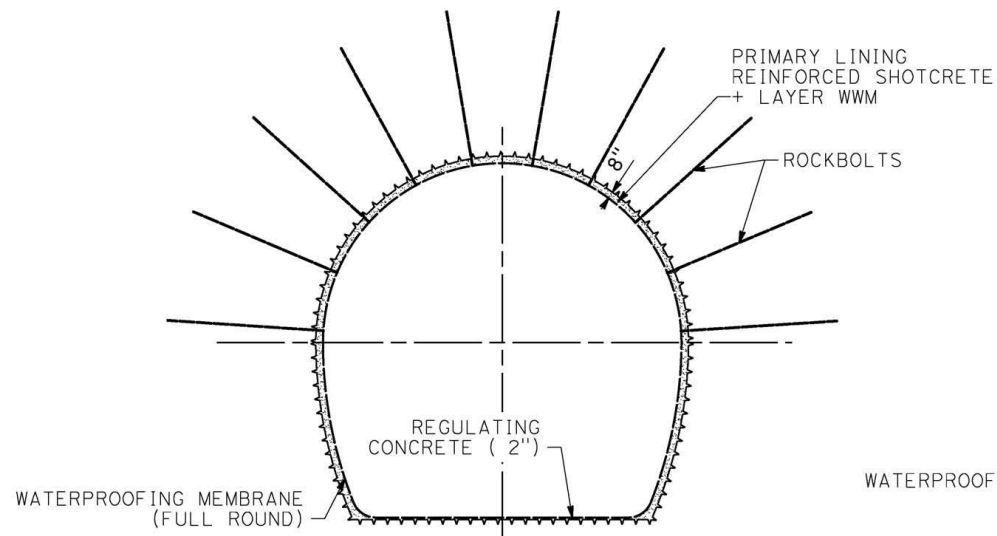
- STAGE 0: PROBE DRILLING
- STAGE 1: EXCAVATION OF TOP HEADING AND APPLICATION OF STABILIZATION LAYER OF SHOTCRETE.



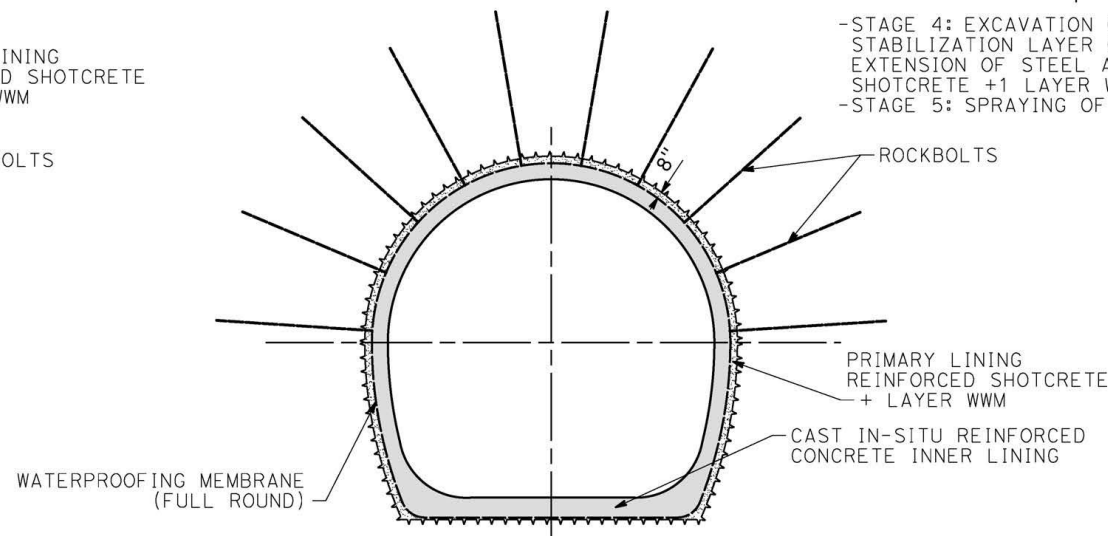
- STAGE 2: INSTALLATION OF STEEL ARCH AND ROCKBOLTING.
- STAGE 3: SPRAYING OF REINFORCED SHOTCRETE +1 LAYER WWM.



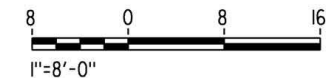
- STAGE 4: EXCAVATION OF THE BENCH AND APPLICATION OF STABILIZATION LAYER OF SHOTCRETE. EXTENSION OF STEEL ARCH AND SPRAYING OF REINFORCED SHOTCRETE +1 LAYER WWM ON THE SIDES.
- STAGE 5: SPRAYING OF REGULATING CONCRETE-INVERT.



- STAGE 6: GROUTING OF FLOW ZONES FROM WITHIN TUNNEL.
- STAGE 7: INSTALLATION OF WATERPROOFING MEMBRANE.



- STAGE 8: INSTALLATION OF INNER (SECONDARY) LINING.



STAGE	DESCRIPTION
0	-PROBE DRILLING TO ESTIMATE WATER INGRESS
1	-EXCAVATION OF TOP HEADING AND APPLICATION OF STABILIZATION LAYER OF SHOTCRETE.
2	-INSTALLATION OF STEEL ARCH. -ROCKBOLTING.
3	-SPRAYING OF REINFORCED SHOTCRETE +1 LAYER WWM.
4	-EXCAVATION OF THE BENCH AND APPLICATION OF STABILIZATION LAYER OF SHOTCRETE. -EXTENSION OF STEEL ARCH AND SPRAYING OF REINFORCED SHOTCRETE + 1 LAYER WWM ON THE SIDES.
5	-SPRAYING OF REGULATING CONCRETE INVERT
6	-GROUTING OF FLOW ZONES FROM WITHIN TUNNEL.
7	-INSTALLATION OF WATERPROOFING MEMBRANE
8	-INSTALLATION OF INNER (SECONDARY) LINING -(FIRST, INNER; SECOND, SIDES AND CROWN)

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

**PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A**

**NOT FOR
CONSTRUCTION**



**CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK**

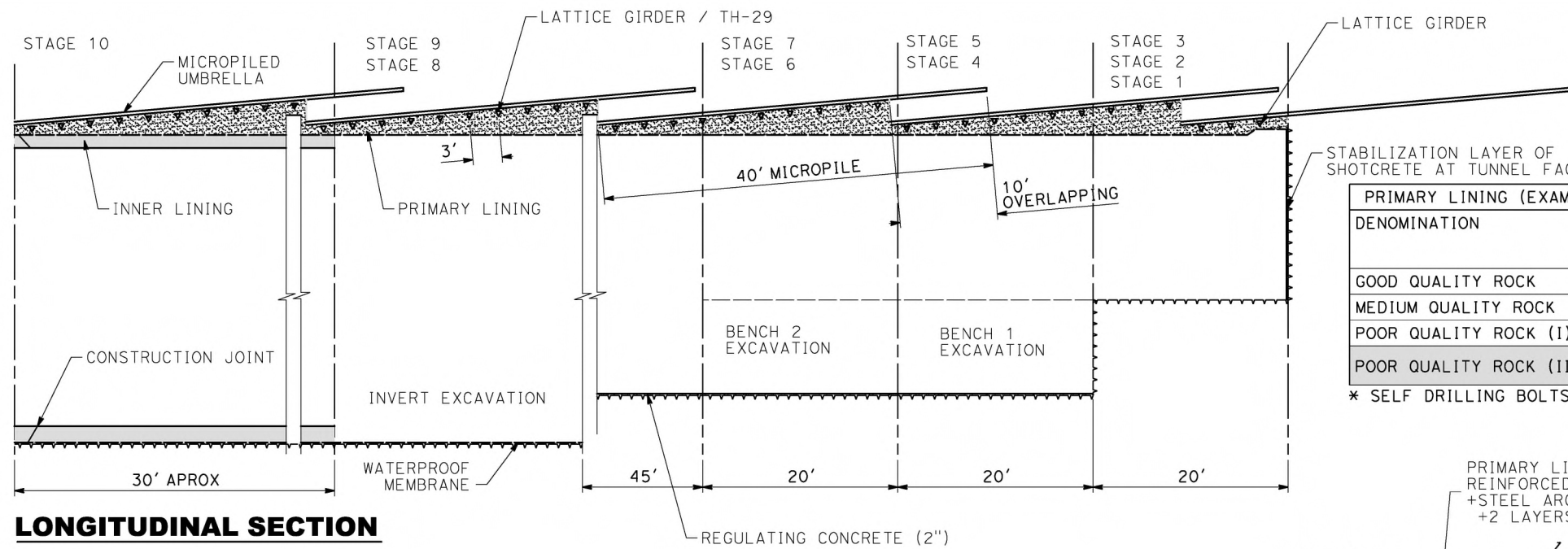
MINED TWIN TUNNELS
TYPICAL CONSTRUCTION SEQUENCE AND SUPPORT MEASURES
(2 of 3)

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0103
SCALE AS SHOWN
SHEET NO.

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MINED TWIN TUNNELS PRIMARY LINING FOR POOR QUALITY ROCK (II)

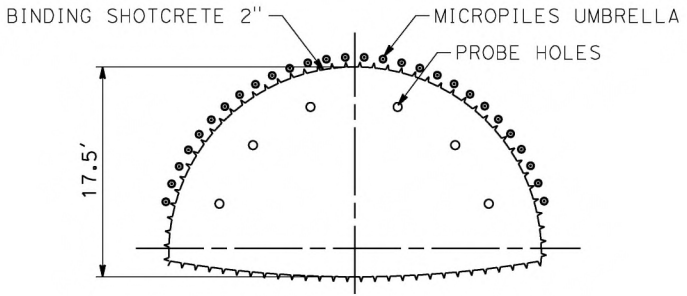
LEGEND:	
	NATM EXCAVATION
	LATTICE GIRDER
	REINFORCED SHOTCRETE PRIMARY LINING +2 LAYERS WWM
	REINFORCED INNER / SECONDARY LINING

PRIMARY LINING (EXAMPLE ONLY, NOT ACTUAL DESIGN)						
DENOMINATION	RMR	SHOTCRETE THICKNESS (in)	STEEL ARCHES	FIBRES & WWM	ADVANCE LENGTH (FT)	ROCKBOLT PATTERN AND LENGTH (FT)
GOOD QUALITY ROCK	50-60	6	NO	FIBRES & 1 LAYER WWM	5 FULL FACE	5x5FT 13FT
MEDIUM QUALITY ROCK	40-50	8	TH-21	FIBRES & 1 LAYER WWM	5 TOP HEADING	5x5FT 13FT
POOR QUALITY ROCK (I)	30-40	10	TH-29	FIBRES & 2 LAYERS WWM	3.5 TOP HEADING	3.5x3.5FT 15FT
POOR QUALITY ROCK (II)	<30	12	LATTICE GIRDER	FIBRES & 2 LAYERS WWM	3 TOP HEADING	-

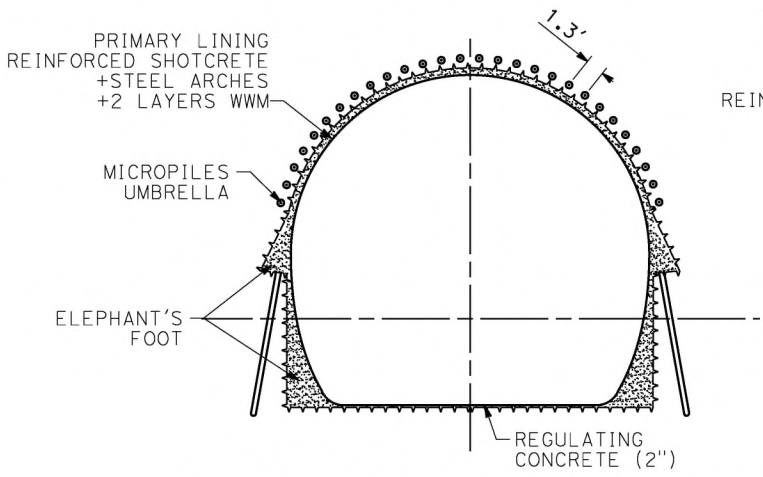
* SELF DRILLING BOLTS INSTEAD OF ROCKBOLTING IF RMR<35

NOTES:

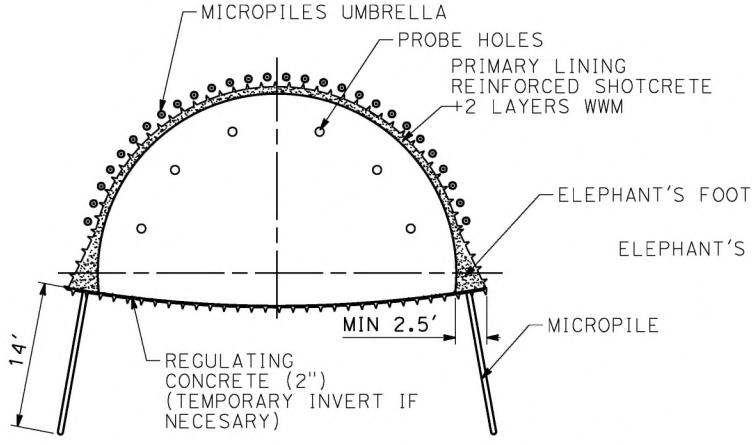
- SUPPORT MEASURES SHOWN ARE ORIENTATIVE ONLY AND FOR PEPPD COST ESTIMATION. THEY MUST BE CALCULATED WHEN DETAILED GEOTECHNICAL INFORMATION IS AVAILABLE.
- POOR QUALITY ROCK CAN OCCUR AT PORTALS AND FAULT ZONES AMONG OTHER.
- SQUEEZING GROUND CONDITIONS UNDER OVERBURDEN OF MORE THAN 300FT WILL REQUIRE THE STUDY OF DIFFERENT MULTIPLE EXCAVATION AND LINING TECHNIQUES IN ORDER TO COPE WITH THE EXTREME CONDITIONS.
- TUNNELS DIMENSIONS ACCORDING TO USUAL MACHINERY USED IN MINED TUNNELS THESE DIMENSIONS MUST BE ADJUSTED TO THE MACHINERY THAT WILL BE USED IN CONSTRUCTION.
- SHOTCRETE AND/OR FIBER GLASS BOLTS MIGHT BE REQUIRED TO ENSURE FACE STABILITY. STUDY OF FACE STABILITY MUST BE CARRIED OUT IN DETAILED DESIGN.



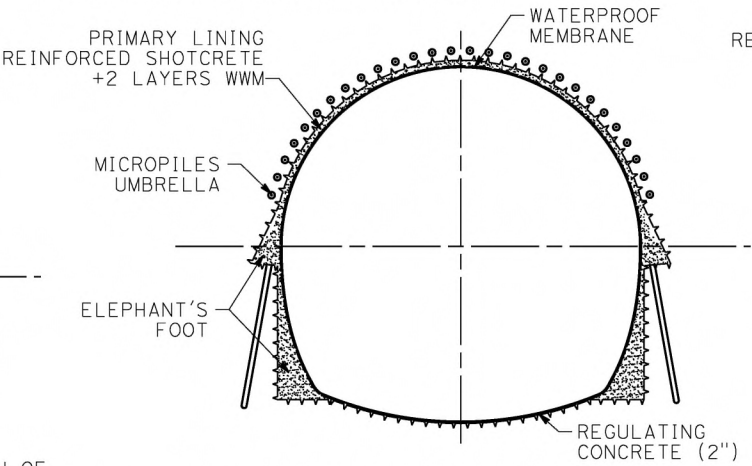
- STAGE 0: PROBE DRILLING AND MICROPILE UMBRELLA INSTALLATION.
- STAGE 1: EXCAVATION OF TOP HEADING AND APPLICATION OF STABILIZATION LAYER OF SHOTCRETE.



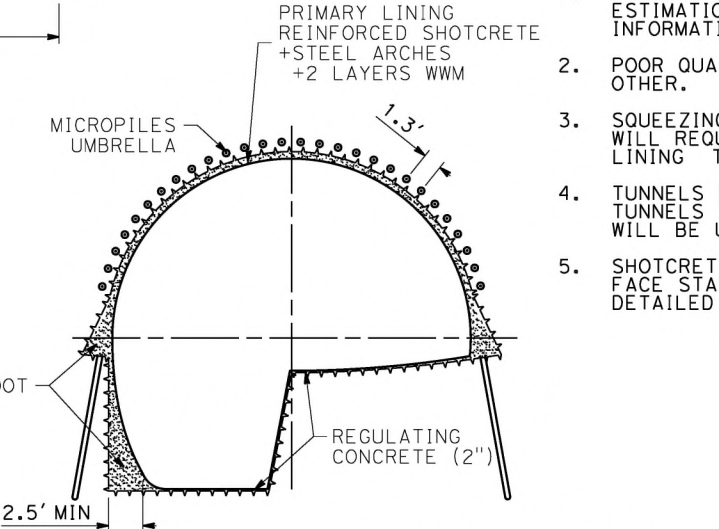
- STAGE 6: BENCH 2 EXCAVATION AND APPLICATION OF STABILIZATION LAYER OF SHOTCRETE.
- STAGE 7: EXTENSION OF LATTICE GIRDER AND SPRAYING OF REINFORCED SHOTCRETE ON THE RIGHT SIDE. SPRAYING OF REGULATING CONCRETE.



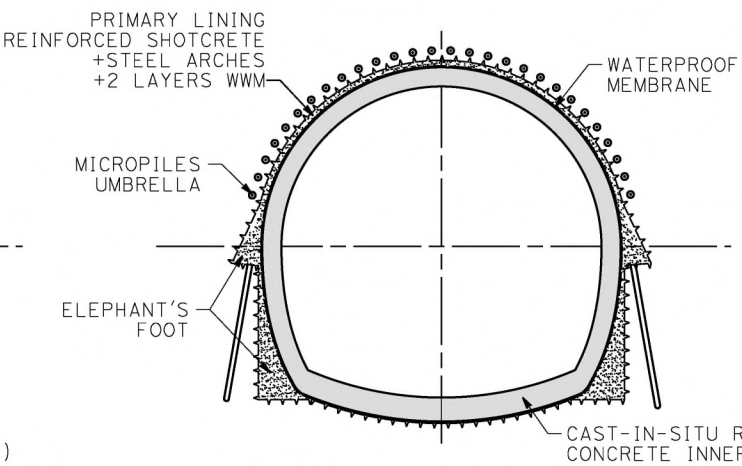
- STAGE 2: INSTALLATION OF LATTICE GIRDER + UNDERPINNING WITH MICROPILES.
- STAGE 3: SPRAYING OF REINFORCED SHOTCRETE +2 LAYERS WWM SPRAYING OF REGULATING CONCRETE.



- STAGE 8: INVERT EXCAVATION AND APPLICATION OF STABILIZATION LAYER OF CONCRETE
- STAGE 9: GROUTING OF FLOW ZONES FROM WITHIN THE TUNNEL.
- STAGE 10: INSTALLATION OF WATERPROOFING MEMBRANE.



- STAGE 4: BENCH 1 EXCAVATION AND APPLICATION OF STABILIZATION LAYER OF SHOTCRETE.
- STAGE 5: EXTENSION OF LATTICE GIRDER AND SPRAYING OF REINFORCED SHOTCRETE ON THE LEFT SIDE. SPRAYING OF REGULATING CONCRETE.



- STAGE 11: INSTALLATION OF INNER (SECONDARY) LINING.



STAGE	DESCRIPTION
0	-PROBE DRILLING TO ESTIMATE WATER INGRESS -MICROPILE UMBRELLA INSTALLATION (EVERY 30FT)
1	-EXCAVATION OF TOP HEADING AND APPLICATION OF STABILIZATION LAYER OF SHOTCRETE.
2	-INSTALLATION OF LATTICE GIRDER + UNDERPINNING WITH MICROPILES.
3	-SPRAYING OF REINFORCED SHOTCRETE +2 LAYERS WWM.
4/6	-EXCAVATION OF INVERT AND APPLICATION OF STABILIZATION LAYER OF SHOTCRETE. -EXTENSION OF LATTICE GIRDER AND SPRAYING OF REINFORCED SHOTCRETE + 1 LAYER WWM ON THE SIDES.
5/8	-SPRAYING OF REGULATING CONCRETE INVERT
9	-GROUTING OF FLOW ZONES FROM WITHIN TUNNEL.
10	-INSTALLATION OF WATERPROOFING MEMBRANE
11	-INSTALLATION OF INNER (SECONDARY) LINING -(FIRST, INNER; SECOND, SIDES AND CROWN)

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

PEPPD RECORD SET
ADDENDUM
SR14A/ E1A/ E2A

NOT FOR
CONSTRUCTION



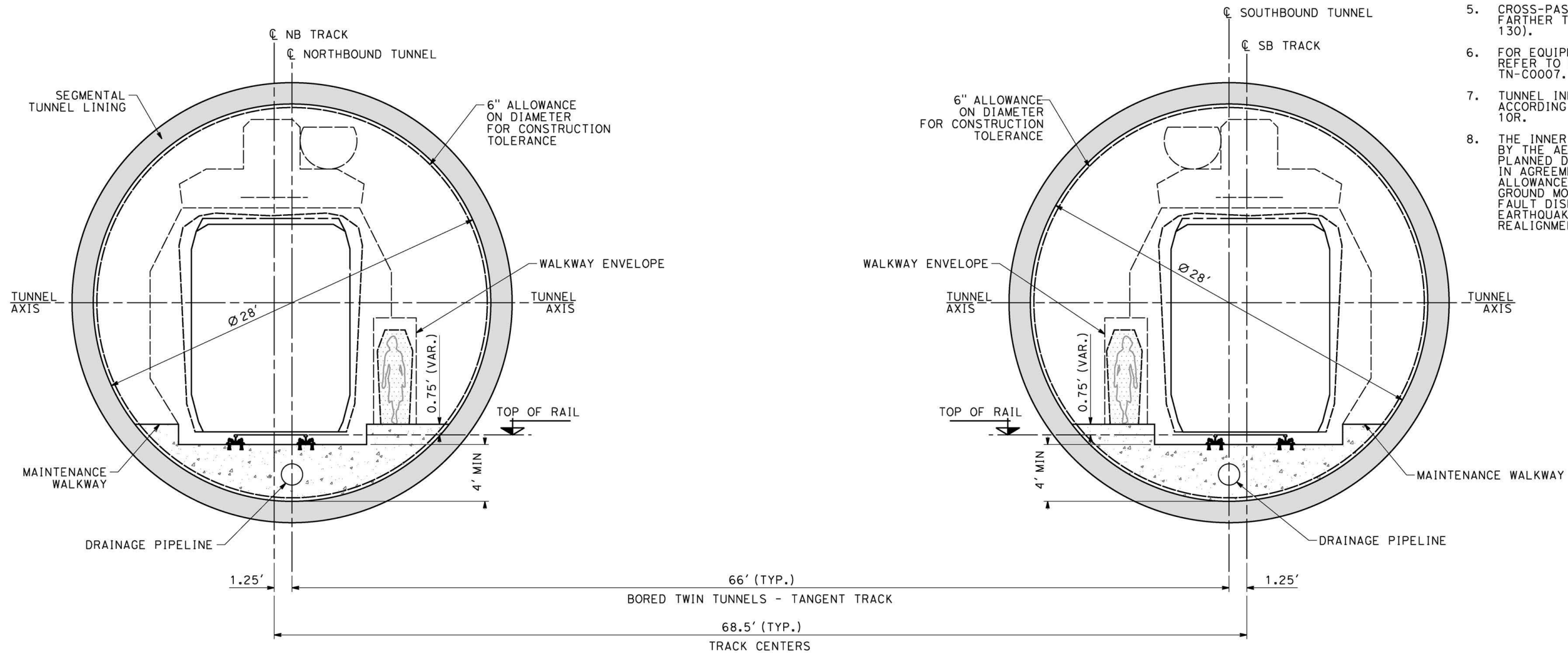
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
MINED TWIN TUNNELS
TYPICAL CONSTRUCTION SEQUENCE AND SUPPORT MEASURES
(3 of 3)

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0104
SCALE AS SHOWN
SHEET NO.

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NOTES:

1. TBM CONSTRUCTION METHOD IDENTIFIED FOR TUNNELS LONGER THAN 3 MILES.
2. EXCAVATION, GROUND SUPPORT, PILLAR WIDTH, DRAINAGE, TUNNEL LINING DESIGN AND WATER AND GAS TIGHTNESS PROVISIONS TBD.
3. PILLAR WIDTH BETWEEN TUNNELS TO BE ONE TUNNEL DIAMETER OR MORE BASED ON GUIDANCE IN TM 2.4.6.
4. SPACE PROOFING REQUIRES FURTHER STUDY TO EVALUATE DYNAMIC AIRFLOW/PRESSURE LEVELS UNDER HIGH-SPEED OPERATING CONDITIONS, AND TO FURTHER DEFINE SPACE ALLOTTED FOR STRUCTURES, EQUIPMENT, DRAINAGE AND EGRESS.
5. CROSS-PASSAGEWAYS SHALL NOT BE FARTHER THAN 800 FT APART (NFPA 130).
6. FOR EQUIPMENT STRUCTURE GAUGES, REFER TO DRAWINGS TN-C0004 TO TN-C0007.
7. TUNNEL INNER DIAMETER SHOWN IS 28FT, ACCORDING TO NOTICE TO DESIGNERS No. 10R.
8. THE INNER DIAMETER WILL BE COVERED BY THE AERODYNAMIC CRITERIA FOR THE PLANNED DESIGN SPEEDS FOR EACH TUNNEL, IN AGREEMENT TO TM 2.4.2, AND ALLOWANCES FOR POST-CONSTRUCTION GROUND MOVEMENTS DUE TO PERMANENT FAULT DISPLACEMENT, TO ALLOW FOR POST-EARTHQUAKE CLEAR PASSAGE AND TRACK REALIGNMENT.



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
E.VELASCO
DRAWN BY
F.J.DOMINGUEZ
CHECKED BY
C.RECHEA
IN CHARGE
A.RELAÑO
DATE
02/26/2021

**PEPD RECORD SET
ADDENDUM
SR14A/ E1A/ E2A**

**NOT FOR
CONSTRUCTION**



**CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK**

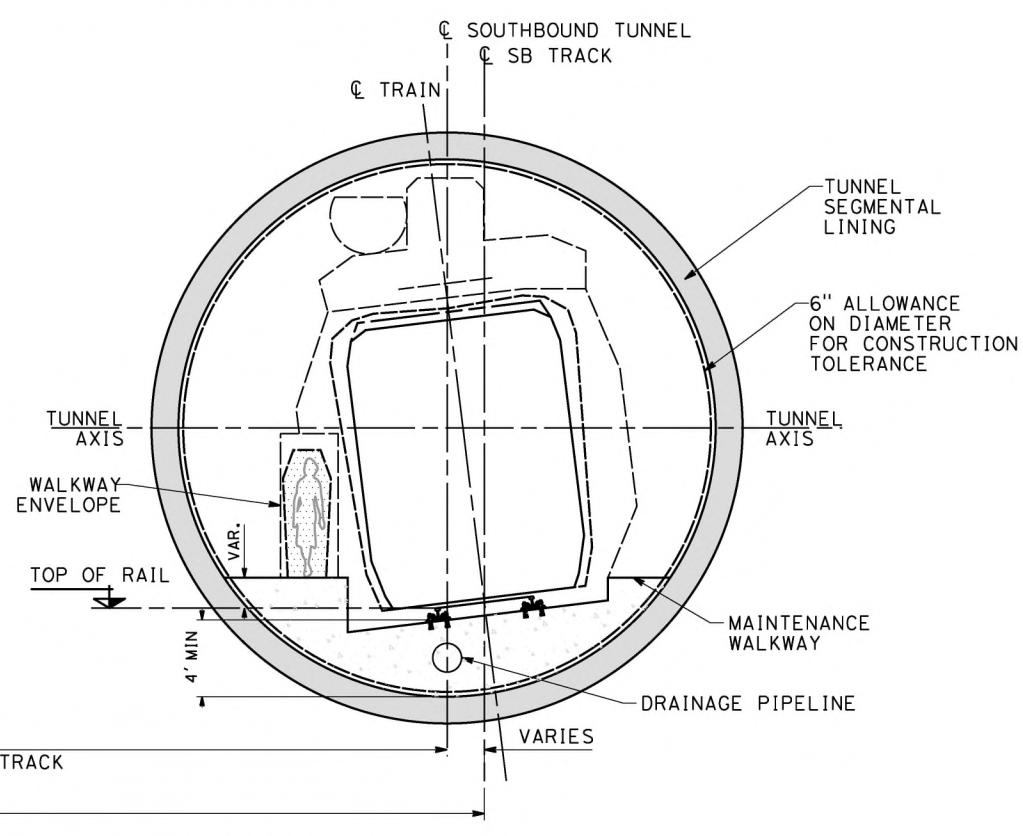
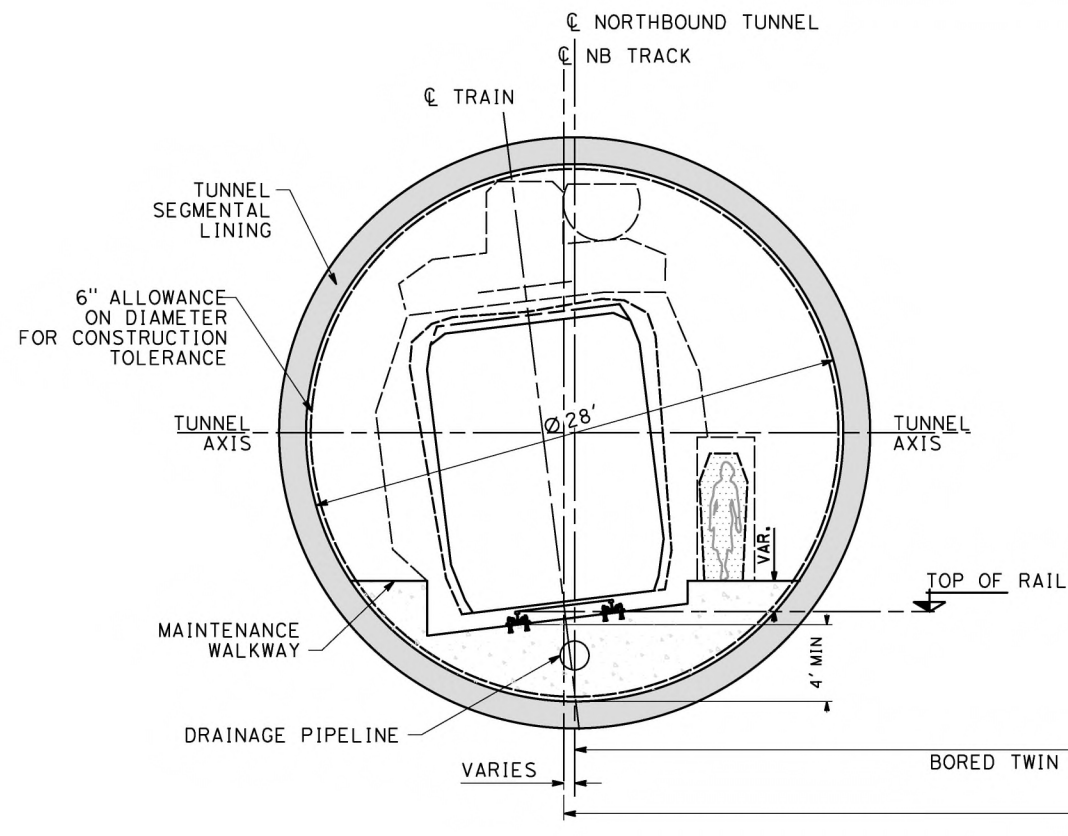
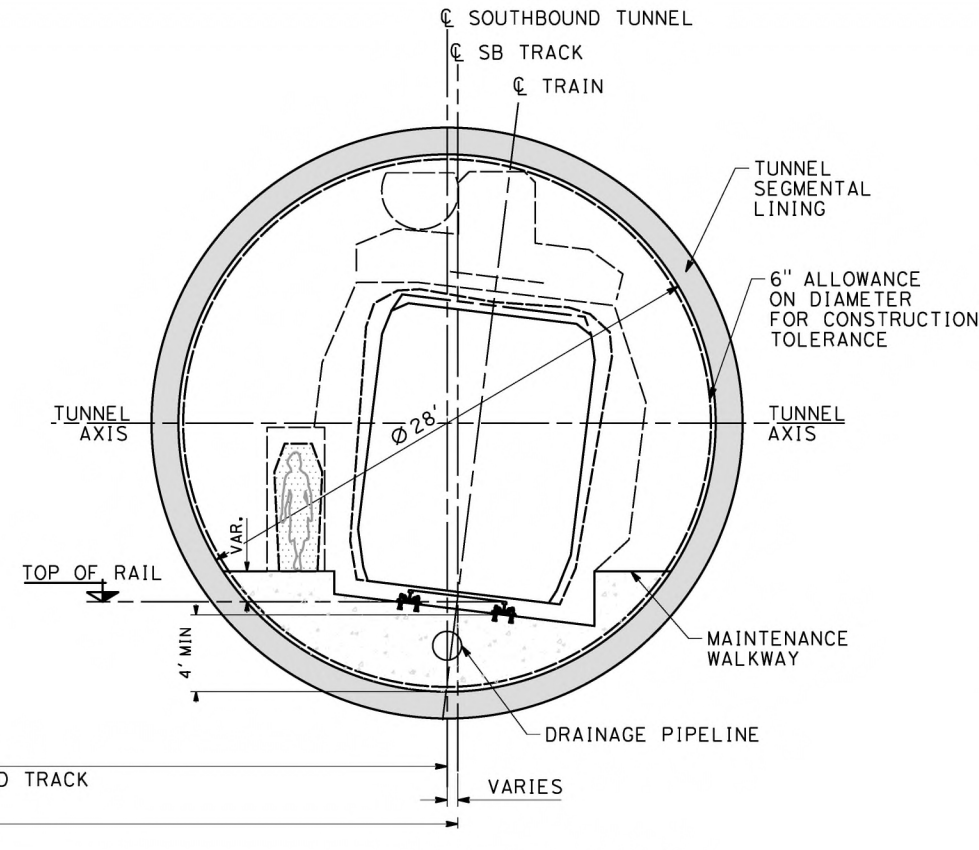
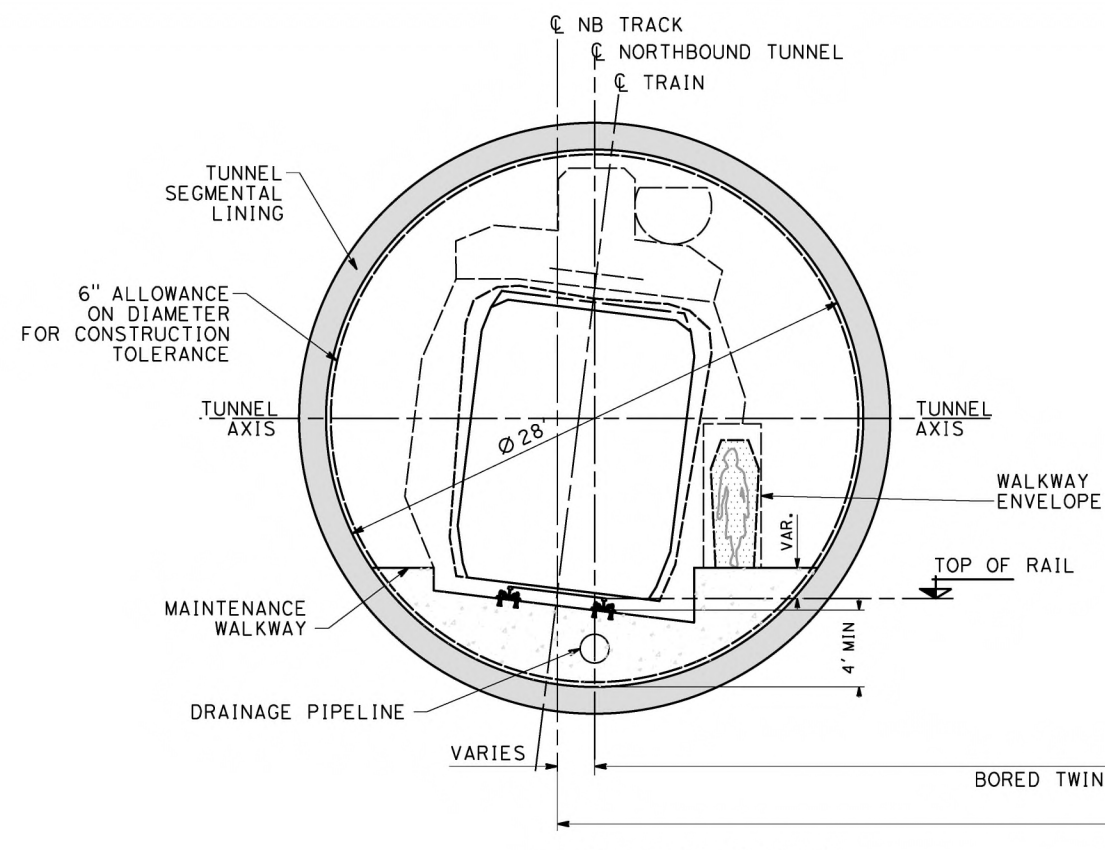
TBM BORED TWIN TUNNELS
CLEARANCE DIAGRAM-TANGENT TRAK

CONTRACT NO.
HSR14-42
DRAWING NO.
TN-C0200
SCALE
AS SHOWN
SHEET NO.

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**TUNNEL TYPICAL SECTION
TBM TWIN TUNNELS
SUPERELEVATED TRACK**

NOTES:

1. TBM CONSTRUCTION METHOD IDENTIFIED FOR TUNNELS LONGER THAN 3 MILES.
2. EXCAVATION, GROUND SUPPORT, PILLAR WIDTH, DRAINAGE, TUNNEL LINING DESIGN AND WATER AND GAS TIGHTNESS PROVISIONS TBD.
3. PILLAR WIDTH BETWEEN TUNNELS TO BE ONE TUNNEL DIAMETER OR MORE BASED ON GUIDANCE IN TM 2.4.6
4. SPACE PROOFING REQUIRES FURTHER STUDY TO EVALUATE DYNAMIC AIRFLOW/PRESSURE LEVELS UNDER HIGH-SPEED OPERATING CONDITIONS, AND TO FURTHER DEFINE SPACE ALLOTTED FOR STRUCTURES, EQUIPMENT, DRAINAGE AND EGRESS.
5. CROSS-PASSAGEWAYS SHALL NOT BE FARTHER THAN 800 FT APART (NFPA 130).
6. FOR EQUIPMENT STRUCTURE GAUGES, REFER TO DRAWINGS TN-C0004 TO TN-C0007.
7. TUNNEL INNER DIAMETER SHOWN IS 28FT, ACCORDING TO NOTICE TO DESIGNERS No. 10R.
8. THE INNER DIAMETER WILL BE GOVERNED BY THE AERODYNAMIC CRITERIA FOR THE PLANNED DESIGN SPEEDS FOR EACH TUNNEL, IN AGREEMENT TO TM 2.4.2, AND ALLOWANCES FOR POST-CONSTRUCTION GROUND MOVEMENTS DUE TO PERMANENT FAULT DISPLACEMENT, TO ALLOW FOR POST-EARTHQUAKE CLEAR PASSAGE AND TRACK REALIGNMENT.



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

NOT FOR
CONSTRUCTION



**CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK**

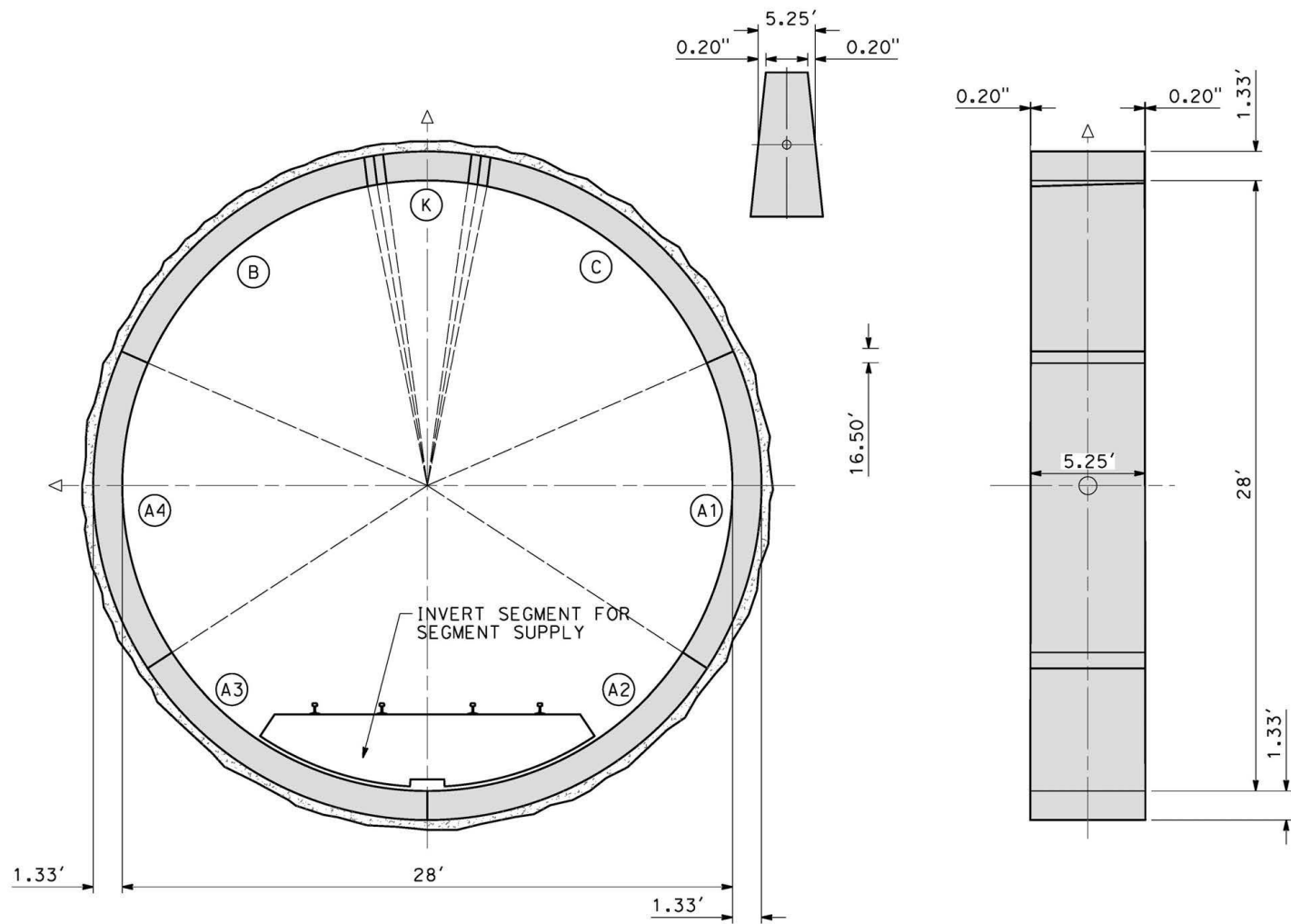
TBM BORED TWIN TUNNELS
CLEARANCE DIAGRAM - SUPERELEVATED TRACK

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0201
SCALE AS SHOWN
SHEET NO.

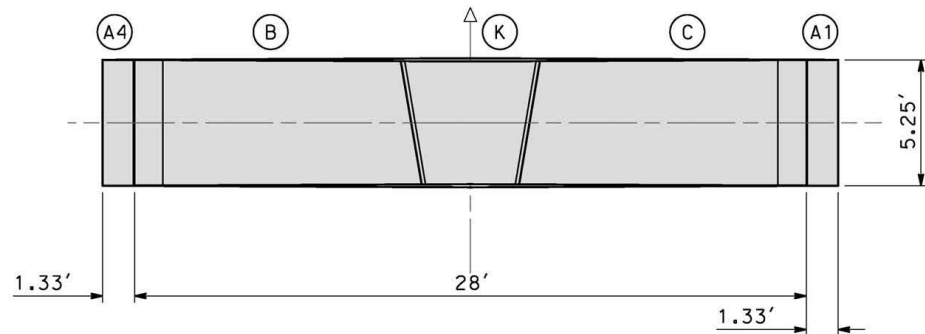
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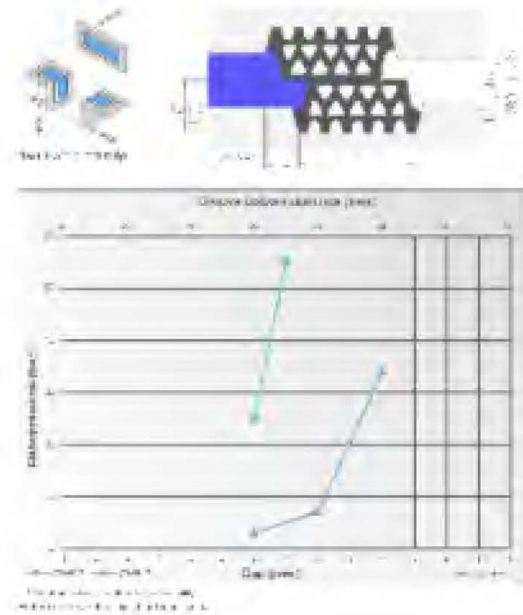
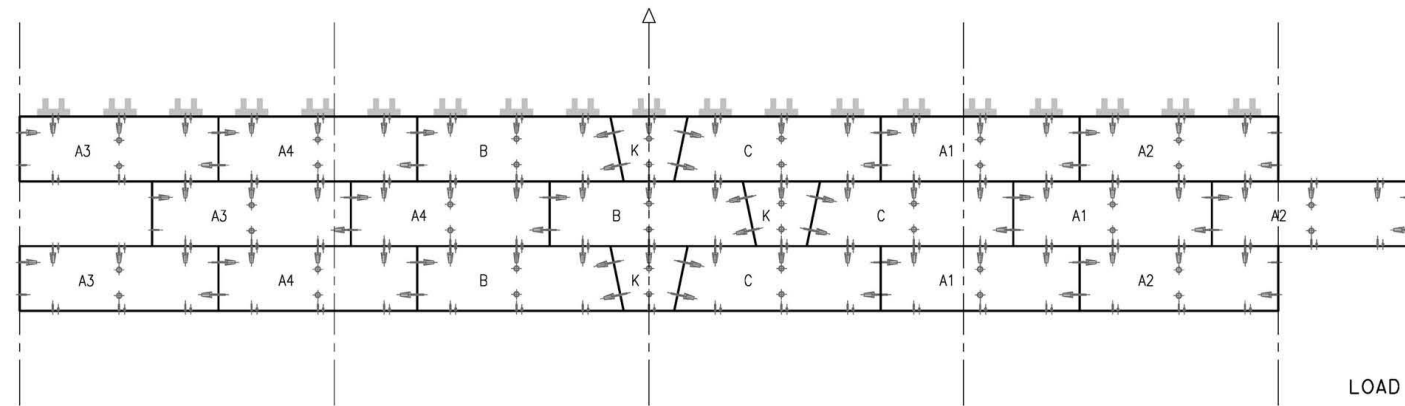
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TUNNEL TYPE SECTION



INTRADOS DEVELOPED VIEW

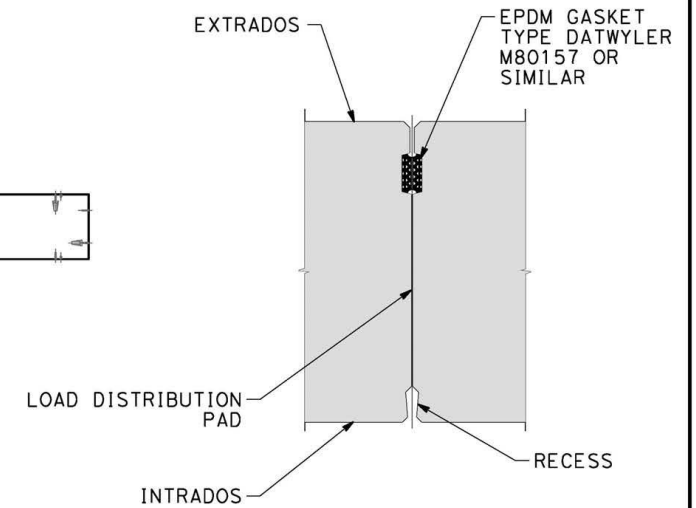


DISCLAIMER:

THE DESIGN SHOWN IN THIS DRAWING CORRESPONDS TO THE CONCEPTUAL PEPD OF DESIGN AND NEEDS TO BE DEVELOPED FURTHER TO BE VALIR FOR CONSTRUCTION

NOTES:

1. THE DESIGN REPRESENTS THE ONE PASS LINING FOR THE TBM TUNNEL WITH WATER PRESSURE BELOW 25 bar (=362.5943 psi).
2. TAPERED UNIVERSAL RING WITH PRE MANUFACTURED SEGMENTS TO BE PLACED BY FOR TBM.
3. THE LINING SEGMENTS SHALL BE EQUIPPED WITH A WATER TIGHT GASKET ABLE TO PREVENT THE ENTRY OF WATER FOR THE MAXIMUM EXPECTED WATER PRESSURE WITH A SAFETY FACTOR OF 2.0.
4. ALL RINGS AND SEGMENTS SHALL BE EQUIPPED WITH BOLTS. BOLTS MAY BE TEMPORARY EXCEPT WHERE PERMANENTLY REQUIRED TO GUARANTEE THE PRECOMPRESSION OF THE GASKETS.
5. LINING SEGMENTS SHALL FURTHER BE EQUIPPED WITH GROUTING INSERTS, GUIDING RODS, PACKERS, DOVELS, IDENTIFICATION MARKS AND ALL OTHER NECESSARY ITEMS TO ACHIEVE A HIGH QUALITY TUNNEL LINING.
6. MINIMUM COMPRESSION STRENGTH OF CONCRETE AT 28 DAYS $f_c' = 8000$ psi
7. THE CONCRETE MIX SHALL BE CHEMICAL RESISTANT AGAINST THE LOCAL GROUND AND GROUNDWATER CONDITIONS.
8. A QUANTITY OF 0.125 pcf OF POLYPROPYLENE MICROFIBERS SHALL BE ADDED TO THE CONCRETE MIX TO REDUCE CONCRETE SPALLING IN CASE OF FIRE.
9. FOR THE PURPOSE OF COST ESTIMATION, THE NECESSARY QUANTITY OF REINFORCEMENT FOR THE LINING SEGMENTS CAN BE ASSUMED AS 8 pcf OF CONVENTIONAL REBAR, GRADE 60. THIS ASSUMPTION NEEDS TO BE VERIFIED DURING THE FINAL DESIGN STAGE.



DETAIL AT RING JOINT
SCALE N.T.S.



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

**PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A**

**NOT FOR
CONSTRUCTION**



**CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK**

TBM BORED TWIN TUNNELS
ONE-PASS LINING GEOMETRY

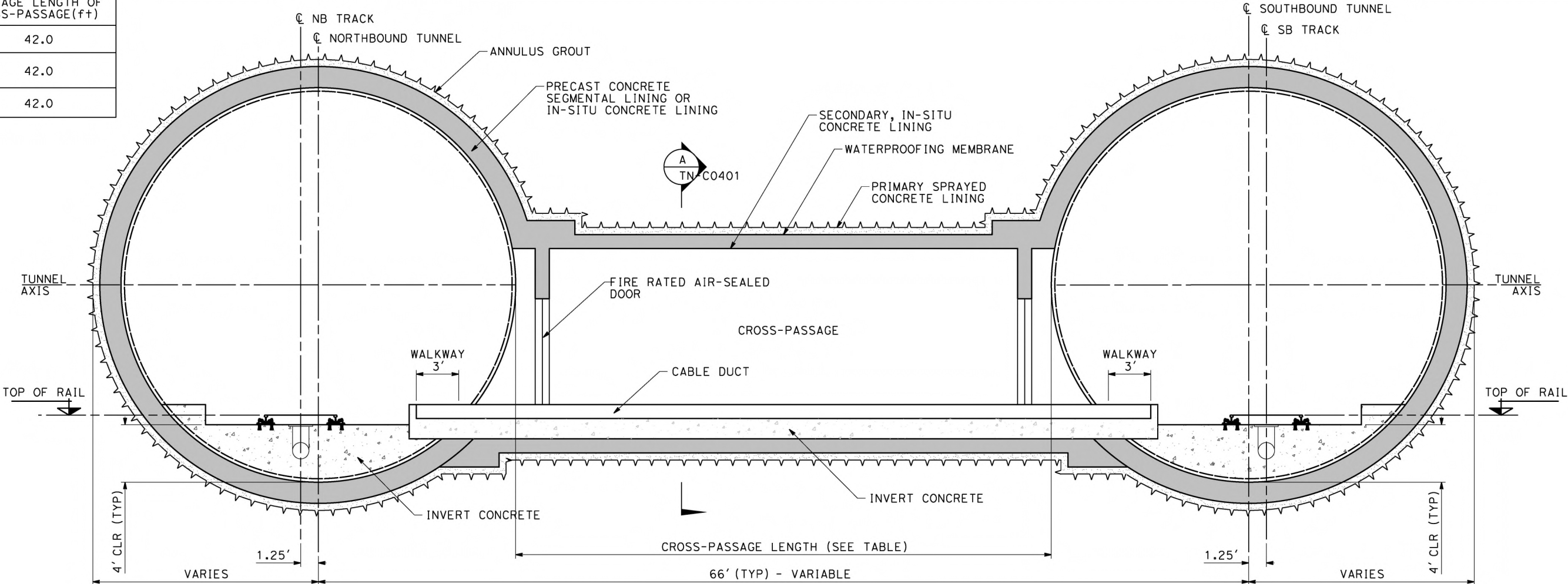
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DRAWING NO. TN-C0202
SCALE AS SHOWN
SHEET NO.

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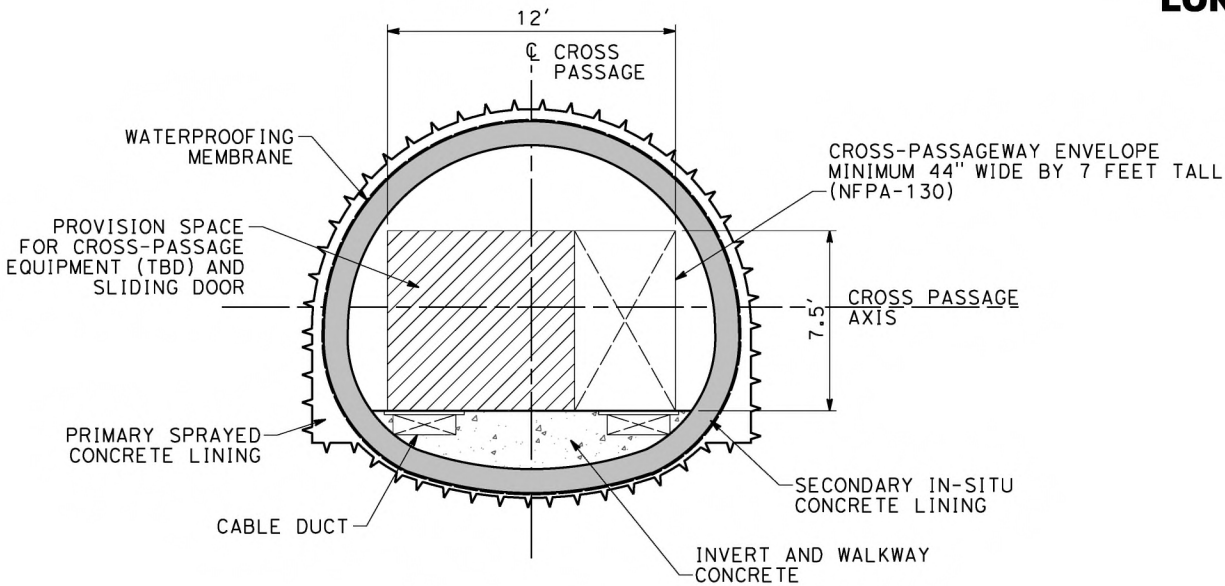
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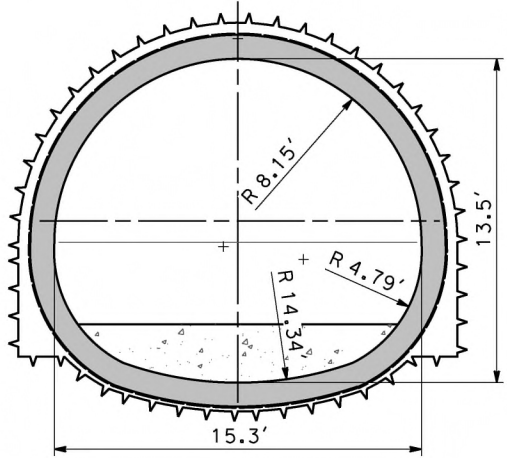
ALIGNMENT	AVERAGE LENGTH OF CROSS-PASSAGE(ft)
E1A	42.0
E2A	42.0
SR14A	42.0



LONGITUDINAL SECTION
CROSS-PASSAGE



SECTION A
SPACEPROOFING TN-C0401



SECTION A
INNER GEOMETRY TN-C0401

- NOTES:
- CROSS-PASSAGES FOR EMERGENCY EGRESS SHALL NOT BE FURTHER THAN 800FT APART. NFPA-130 (6.3.1.6)
 - CROSS-PASSAGES FOR EMERGENCY EGRESS SHALL BE A MINIMUM OF 44" IN CLEAR WIDTH AND 7FT IN HEIGHT NFPA-130 (6.3.2.2)
 - CROSS-PASSAGES FOR EMERGENCY EGRESS EQUIPMENT TBD. EQUIPMENT IN CROSS-PASSAGES WILL COMPLY WITH NFPA-130 (6.3.1.7)
a) THE USE OF CROSS-PASSAGES FOR THE INSTALLATION OF NON-COMBUSTIBLE EQUIPMENT IS ALLOWED.
b) INSTALLED EQUIPMENT DOES NOT INTRUDE INTO THE REQUIRED CLEAR WIDTH OF THE CROSS-PASSAGE.
 - CROSS-PASSAGES FOR TECHNICAL EQUIPMENT WILL HAVE THE SAME STRUCTURE AND DIMENSIONS BUT WILL BE LOCATED ELSEWHERE IN THE TUNNELS, ONE EVERY MILE APPROXIMATELY.



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
E.VELASCO
DRAWN BY
F.J.DOMINGUEZ
CHECKED BY
C.RECHEA
IN CHARGE
A.RELAÑO
DATE
02/26/2021

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

NOT FOR
CONSTRUCTION



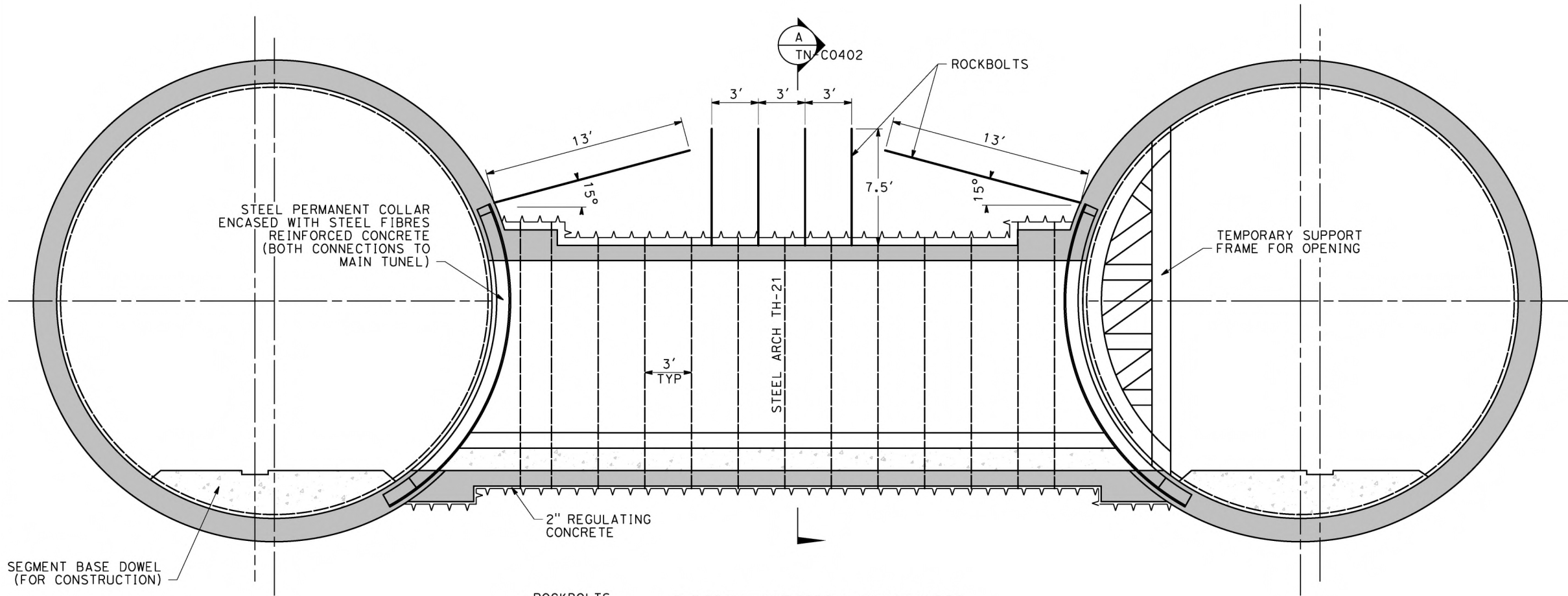
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
TBM TUNNELS
TYPICAL CROSS PASSAGEWAY
FOR EMERGENCY EGRESS OR TECHNICAL ROOMS
CROSS AND LONGITUDINAL SECTION GEOMETRY

CONTRACT NO.
HSR14-42
DRAWING NO.
TN-C0401
SCALE
AS SHOWN
SHEET NO.

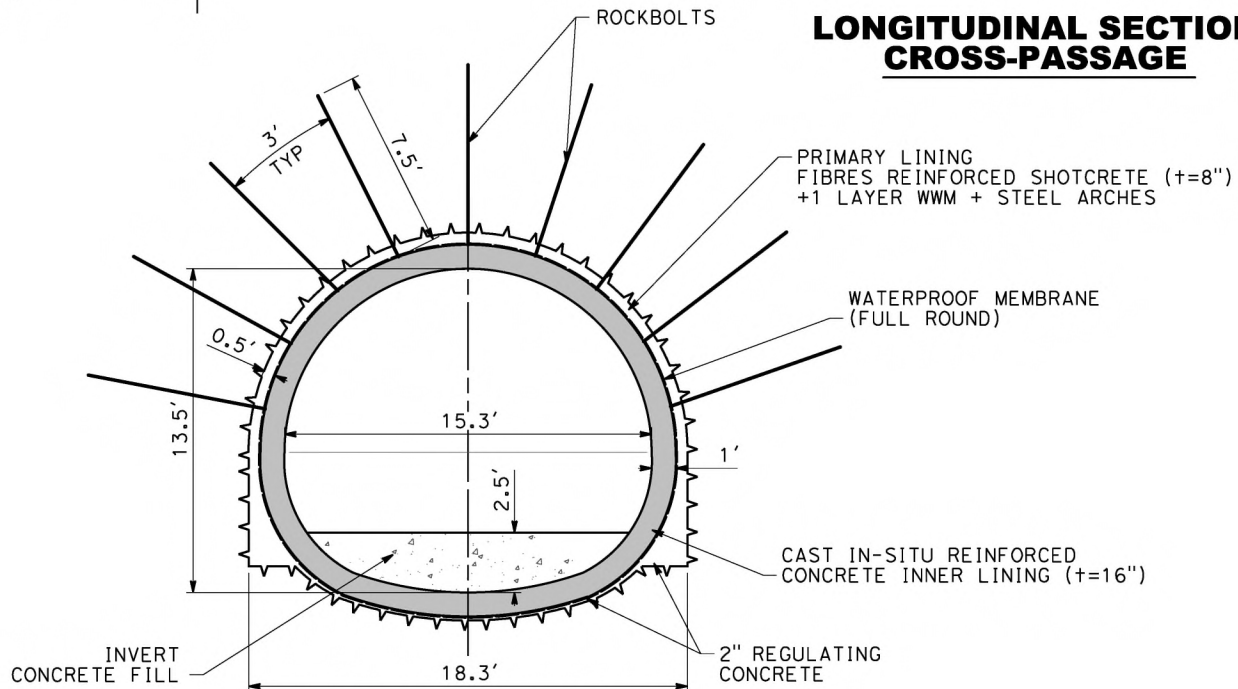
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SEGMENT BASE DOWEL
(FOR CONSTRUCTION)



SECTION

SCALE 1"=4'-0"

A

TN-C0402

LONGITUDINAL SECTION CROSS-PASSAGE

CROSS-PASSAGE PRIMARY LINING FOR MEDIUM QUALITY ROCK

BASIC QUANTITIES PER FT OF CROSS-PASSEGE	
CROSS PASSAGE	PRIMARY LINING TYPE
	MEDIUM QUALITY ROCK
EXCAVATION AREA (SQ.FT.)	242
PRIMARY LINING AREA (SQ.FT.)	26
REGULATING CONCRETE (2 in) (SQ.FT.)	5
STEEL ARCH (FT)	34.5/3=11.5'
WATERPROOFING MEMBRANE (FT)	52
FORMWORK (FT)	30
SECONDARY LINING AREA CONCRETE (sides&corn) (SQ.FT.)	32
SECONDARY LINING (INVERT) (SQ.FT.)	13
INVERT CONCRETE FILL (SQ.FT.)	25
ROCKBOLTS (TOTAL LENGTH PER C.P.[FT])	655*
STEEL PERMANENT COLLAR (lbs)	5550lbs (x2)

* FOR A 46FT LONG (AVERAGE) CP

PRIMARY LINING (EXAMPLE ONLY, NOT ACTUAL DESIGN)							
DENOMINATION	RMR	SHOTCRETE THICKNESS (in)	STEEL ARCHES	FIBRES & WWM	ADVANCE LENGTH (ft)	ROCKBOLT PATTERN AND LENGTH (ft)	PIPE UMBRELLA
GOOD QUALITY ROCK	>50	6	NO	FIBRES	9' FULL FACE	4.5'x4.5' 7.5ft	-
MEDIUM QUALITY ROCK	35-50	8	TH-21, EACH 3'	FIBRES & 1 LAYER WWM	6' FULL FACE	3x3ft 7.5ft	-
POOR QUALITY ROCK E.G. FAULT ZONES	<35	10	TH-29, EACH 3'	FIBRES & 2 LAYERS WWM	3' TOP HEADING	3x3ft 7.5ft	*

* IN CASE GROUND IS SOIL TYPE, INSTEAD OF ROCKBOLTS

NOTES:

- TYPICAL SUPPORT MEASURES GIVEN WITH ORIENTATIVE PURPOSES ONLY. ACTUAL DESIGN WILL REQUIRE RESULTS OF GEOTECHNICAL INVESTIGATION.
- SQUEEZING GROUND CONDITIONS UNDER OVERBURDEN OF MORE THAN 300 FT WILL REQUIRE THE STUDY OF DIFFERENT EXCAVATION AND LINING TECHNIQUES IN ORDER TO COPE WITH THE EXTREME CONDITIONS.
- THIS DRAWING IS NOT ACTUAL DESIGN. ITS ONLY PURPOSE IS TO BUILD UNIT PRICES AT PECD LEVEL.



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

NOT FOR
CONSTRUCTION

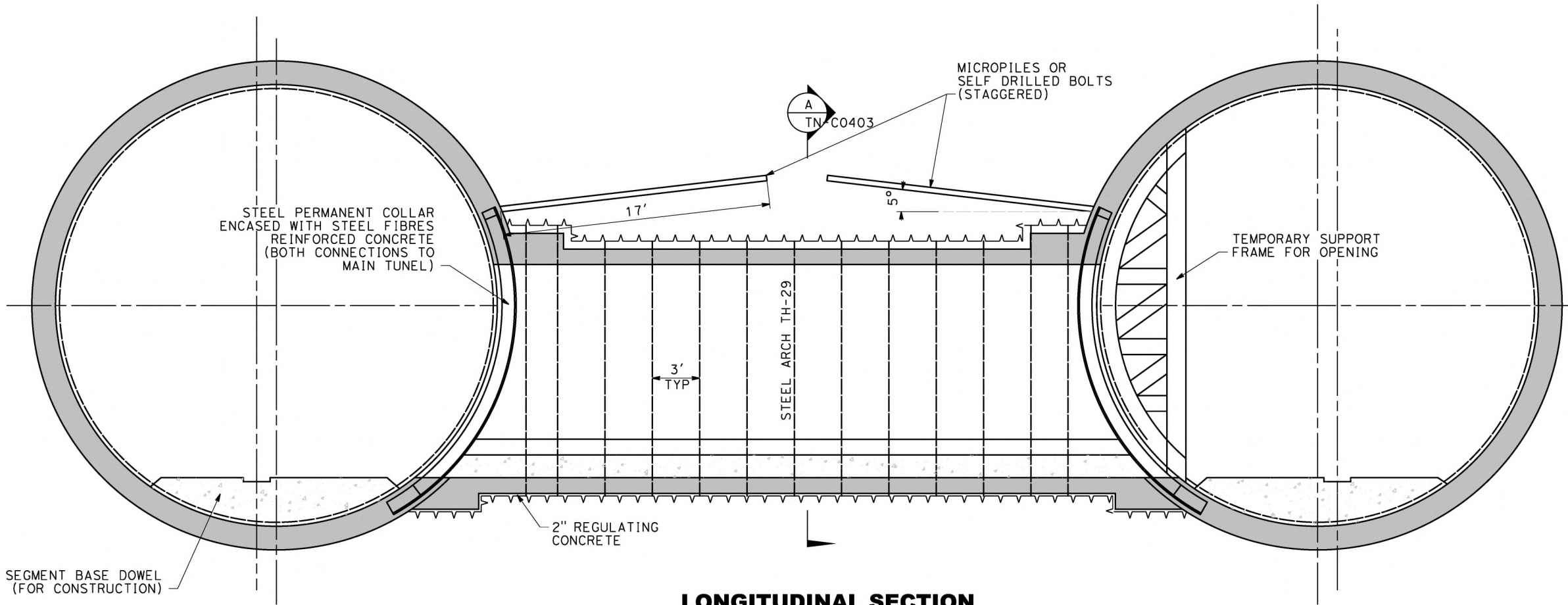


CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
TBM TUNNELS
TYPICAL CROSS PASSAGEWAY
SUPPORT MEASURES FOR MEDIUM ROCK QUALITY

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0402
SCALE AS SHOWN
SHEET NO.

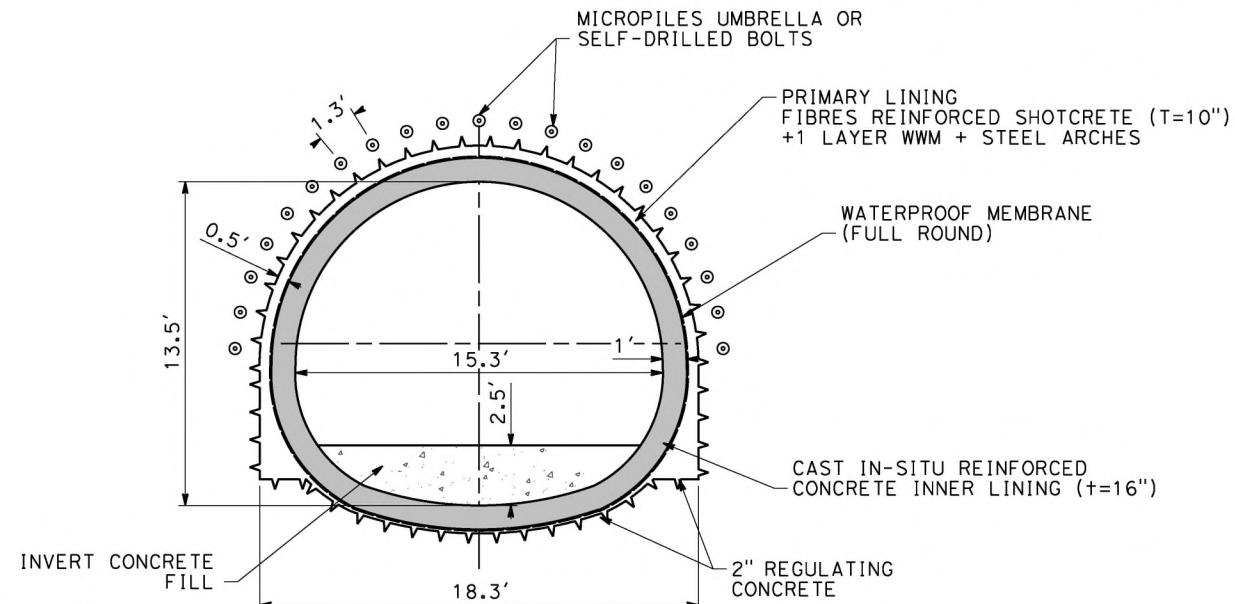
CROSS-PASSAGE
PRIMARY LINING FOR
POOR QUALITY ROCK



LONGITUDINAL SECTION
CROSS-PASSAGE

BASIC QUANTITIES PER FT OF CROSS-PASSAGE	
CROSS-PASSAGE	PRIMARY LINING TYPE
	III POOR QUALITY ROCK
EXCAVATION AREA (SQ.FT.)	242
PRIMARY LINING AREA (SQ.FT.)	26
REGULATING CONCRETE (2 in) (SQ.FT.)	5
STEEL ARCH (FT)	34.5/3=11.5
WATERPROOFING MEMBRANE (FT)	52
FORMWORK (FT)	30
SECONDARY LINING AREA CONCRETE (sides&crow) (SQ.FT.)	32
SECONDARY LINING (INVERT) (SQ.FT.)	13
INVERT CONCRETE FILL (SLAB) (SQ.FT.)	25
MICROPILES (TOTAL LENGTH PER C.P. [FT])	924*
STEEL PERMANENT COLLAR (lbs)	5550lbs(x2)

*FOR A 46FT LONG (AVERAGE) CP



SECTION
SCALE 1"=4'-0" A
TN-C0403

PRIMARY LINING (EXAMPLE ONLY, NOT ACTUAL DESIGN)

DENOMINATION	RMR	SHOTCRETE THICKNESS (in)	STEEL ARCHES	FIBRES & WWM	ADVANCE LENGTH (ft)	ROCKBOLT PATTERN AND LENGTH (ft)	PIPE UMBRELLA
GOOD QUALITY ROCK	>50	6	NO	FIBRES	9' FULL FACE	4.5'x4.5' 7.5ft	-
MEDIUM QUALITY ROCK	35-50	8	TH-21 EACH 3'	FIBRES & 1 LAYER WWM	6' FULL FACE	3x4.5/3x3ft 7.5ft	-
POOR QUALITY ROCK E.G. FAULT ZONES	<35	10	TH-29 EACH 3'	FIBRES & 2 LAYERS WWM	3' TOP HEADING	3x3ft 7.5ft	YES

NOTES:

1. TYPICAL SUPPORT MEASURES GIVEN WITH ORIENTATIVE PURPOSES ONLY. ACTUAL DESIGN WILL REQUIRE RESULTS OF GEOTECHNICAL INVESTIGATION.
2. SQUEEZING GROUND CONDITIONS UNDER OVERBURDEN OF MORE THAN 300 FT WILL REQUIRE THE STUDY OF DIFFERENT EXCAVATION AND LINING TECHNIQUES IN ORDER TO COPE WITH THE EXTREME CONDITIONS.
3. EXCAVATION COULD BE DIVIDED IN TOP HEADING AND BENCH IF GEOTECHNICAL CONDITIONS ARE WORSE THAN EXPECTED. FINAL DESIGN WILL BE PROVIDED ONCE THE GEOTECHNICAL INFORMATION IS COMPLETE.
4. THIS DRAWING IS NOT ACTUAL DESIGN. ITS ONLY PURPOSE IS TO BUILD UNIT PRICES AT PEPD LEVEL.
5. SHOTCRETE AND/OR FIBER GLASS BOLTS MIGHT BE REQUIRED TO ENSURE FACE STABILITY IN SOME AREAS. A FURTHER STUDY OF FACE STABILITY MUST BE CARRIED OUT IN DETAILED DESIGN.



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REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

PEPD RECORD SET ADDENDUM SR14A/ E1A/ E2A
NOT FOR CONSTRUCTION



CALIFORNIA HIGH-SPEED RAIL PROJECT PALMDALE TO BURBANK TBM TUNNELS TYPICAL CROSS PASSAGEWAY SUPPORT MEASURES FOR POOR ROCK QUALITY
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CONTRACT NO. HSR14-42
DRAWING NO. TN-C0403
SCALE AS SHOWN
SHEET NO.

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CROSS PASSAGES ALIGNMENT E1A:

CROSS-PASSAGE	STATION
CP 01A	468+00.00
CP 02A	476+00.00
CP 03A	484+00.00
CP 04A	492+00.00
CP 05A	500+00.00
CP 06A	508+00.00
CP 07A	516+00.00
CP 08A	524+00.00
CP 09A	532+00.00
CP 10A	540+00.00
CP 11A	548+00.00

TECHNICAL ROOMS E1A:

POWER STATION	STATION
TR 01A	507+00.00

CROSS PASSAGES ALIGNMENT E2A:

CROSS-PASSAGE	STATION
CP 01A	468+00.00
CP 02A	476+00.00
CP 03A	484+00.00
CP 04A	492+00.00
CP 05A	500+00.00
CP 06A	508+00.00
CP 07A	516+00.00
CP 08A	524+00.00
CP 09A	532+00.00
CP 10A	540+00.00
CP 11A	548+00.00

TECHNICAL ROOMS E2A:

POWER STATION	STATION
TR 01A	507+00.00

CROSS PASSAGES ALIGNMENT SR14A:

CROSS-PASSAGE	STATION
CP 01A	478+00.00
CP 02A	486+00.00
CP 03A	494+00.00
CP 04A	502+00.00
CP 05A	510+00.00
CP 06A	518+00.00
CP 07A	526+00.00
CP 08A	534+00.00
CP 09A	542+00.00
CP 10A	550+00.00
CP 11A	558+00.00
CP 12A	566+00.00
CP 13A	574+00.00
CP 14A	582+00.00
CP 15A	590+00.00
CP 16A	598+00.00
CP 17A	606+00.00
CP 18A	614+00.00
CP 19A	622+00.00
CP 20A	630+00.00
CP 21A	638+00.00
CP 22A	646+00.00
CP 23A	654+00.00
CP 24A	662+00.00
CP 25A	670+00.00
CP 26A	678+00.00
CP 27A	686+00.00
CP 28A	694+00.00
CP 29A	702+00.00
CP 30A	710+00.00
CP 31A	718+00.00
CP 32A	726+00.00
CP 33A	734+00.00
CP 34A	742+00.00
CP 35A	750+00.00
CP 36A	758+00.00
CP 37A	766+00.00
CP 38A	774+00.00
CP 39A	782+00.00
CP 40A	790+00.00
CP 41A	798+00.00
CP 42A	806+00.00
CP 43A	814+00.00
CP 44A	822+00.00
CP 45A	830+00.00
CP 46A	838+00.00

UNDERGROUND TRACTION POWER STATIONS SR14A:

POWER STATION	STATION
PS 2	700+00.00
PS 3	940+00.00

CROSS PASSAGES ALIGNMENT SR14A:

CROSS-PASSAGE	STATION
CP 47A	846+00.00
CP 48A	854+00.00
CP 49A	862+00.00
CP 50A	870+00.00
CP 51A	878+00.00
CP 52A	886+00.00
CP 53A	894+00.00
CP 54A	902+00.00
CP 55A	910+00.00
CP 56A	918+00.00
CP 57A	926+00.00
CP 58A	934+00.00
CP 60A	942+00.00
CP 60A	950+00.00
CP 61A	958+00.00
CP 62A	966+00.00
CP 63A	974+00.00
CP 64A	990+00.00
CP 65A	998+00.00
CP 66A	1006+00.00
CP 67A	1014+00.00
CP 68A	1022+00.00
CP 69A	1030+00.00
CP 70A	1038+00.00
CP 71A	1046+00.00
CP 72A	1054+00.00
CP 73A	1062+00.00
CP 74A	1070+00.00
CP 75A	1078+00.00
CP 76A	1086+00.00
CP 77A	1094+00.00
CP 78A	1102+00.00
CP 79A	1110+00.00
CP 80A	1118+00.00
CP 81A	1126+00.00
CP 82A	1134+00.00
CP 83A	1142+00.00
CP 84A	1150+00.00
CP 85A	1158+00.00
CP 86A	1166+00.00
CP 87A	1241+50.00
CP 88A	1249+50.00
CP 89A	1257+50.00
CP 90A	1265+50.00
CP 91A	1273+50.00
CP 92A	1281+50.00

TECHNICAL ROOMS SR14A:

POWER STATION	STATION
TR 01A	540+00.00
TR 02A	575+60.00
TR 03A	628+40.00
TR 04A	681+20.00
TR 05A	733+00.00
TR 06A	785+80.00
TR 07A	820+00.00
TR 08A	891+40.00
TR 09A	944+20.00
TR 10A	997+00.00
TR 11A	1049+80.00
TR 12A	1102+60.00
TR 13A	1259+90.000

NOTES:

- CROSS-PASSAGES FOR EMERGENCY EGRESS SHALL NOT BE FARTHER THAN 800FT APART. NFPA-130 (6.3.1.6)
- TECHNICAL ROOMS EVERY MILE.

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY	E.VELASCO
DRAWN BY	F.J.DOMINGUEZ
CHECKED BY	C.RECHEA
IN CHARGE	A.RELAÑO
DATE	02/26/2021

PEPD RECORD SET
ADDENDUM
SR14A/ E1A/ E2A
NOT FOR CONSTRUCTION



CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
LIST OF EMERGENCY EGRESS CROSS-PASSAGES AND EXITS, TECHNICAL ROOMS AND UNDERGROUND TRACTION POWER FACILITIES

CONTRACT NO.	HSR14-42
DRAWING NO.	TN-C0410
SCALE	NO SCALE
SHEET NO.	

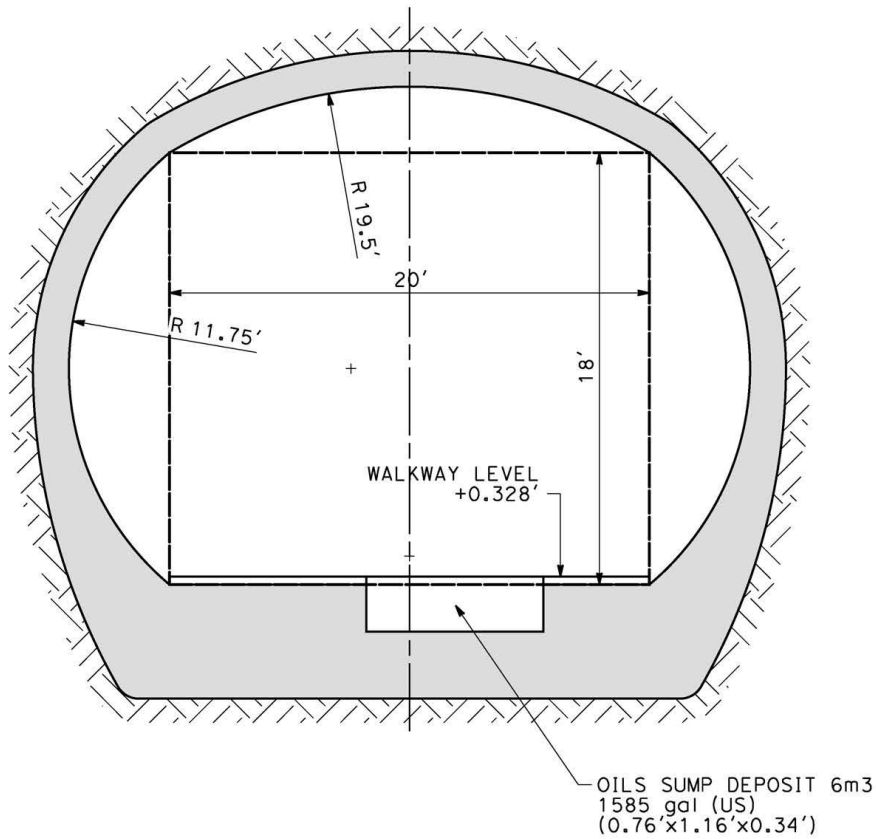
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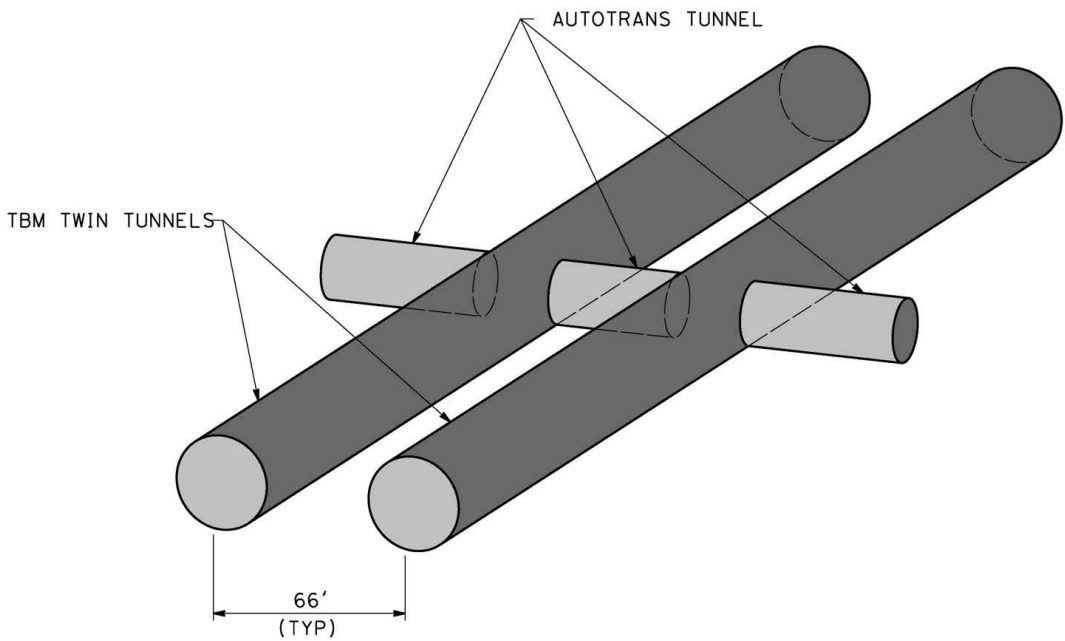
0205240

NOTES:

1. CONSTRUCTION PROCEDURES AND SUPPORT MEASURES SIMILAR TO CROSS-PASSAGES (TN-C0402, TN-C0403)
2. DRAWINGS TN-C0500 AND TN-C0501 ARE INTENDED TO FOR SPACE PROOFING ONLY.
3. THE DESIGN OF THE STRUCTURE REQUIRES RESULTS OF GEOTECHNICAL INVESTIGATION



SECTION
SCALE 1"=4' **B**
TN-C0500



GUIDANCE VIEW DETAIL
SCALE N.T.S.



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

**PEPD RECORD SET
ADDENDUM
SR14A/ E1A/ E2A**

**NOT FOR
CONSTRUCTION**



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

**CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK**

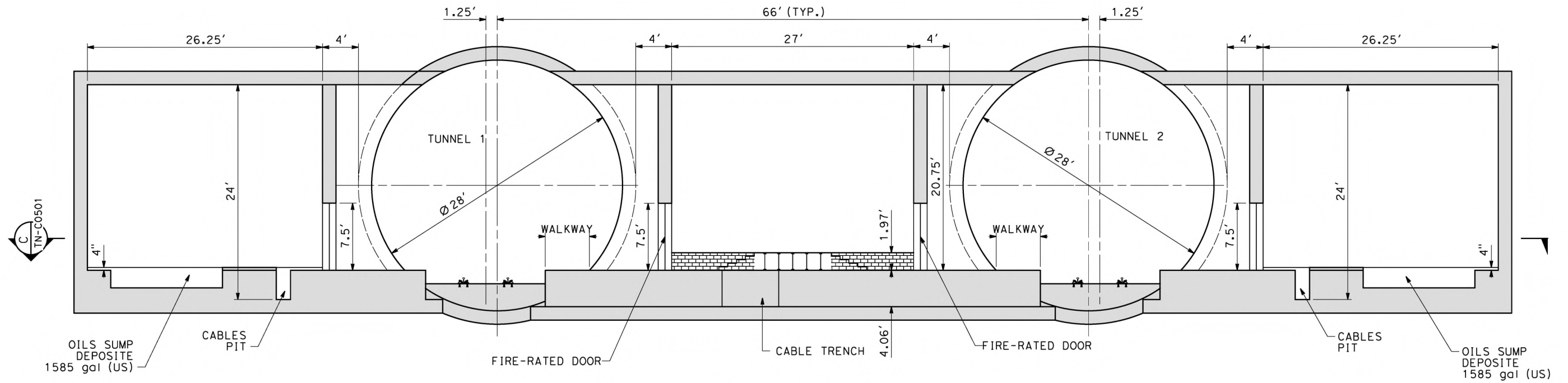
UNDERGROUND TRACTION POWER PARALLELING STATION (PS)
TYPICAL GEOMETRY (1 OF 2)

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0500
SCALE AS SHOWN
SHEET NO.

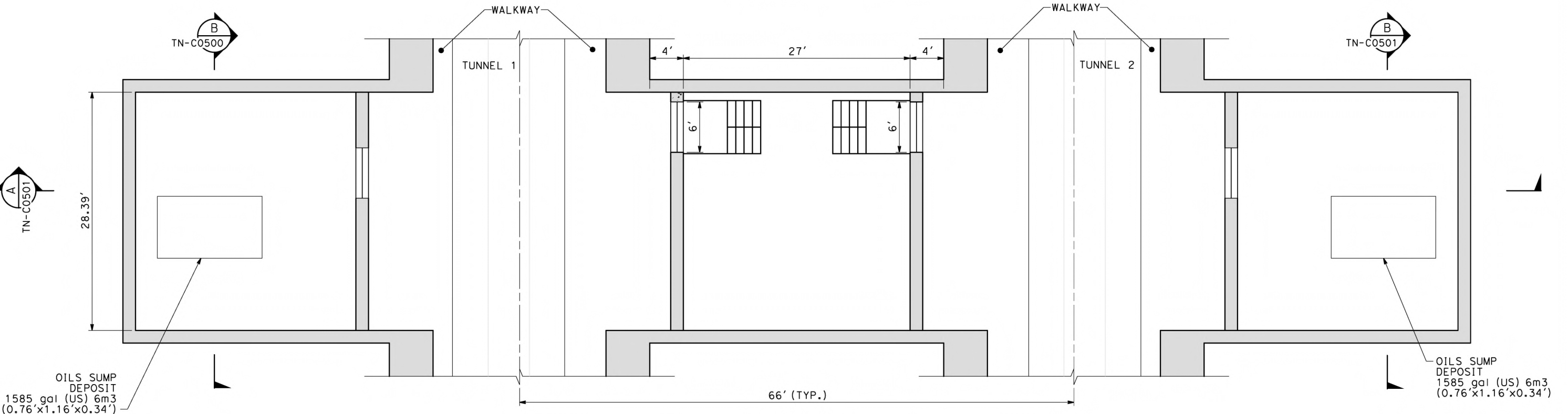
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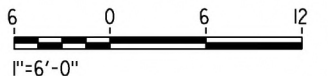
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SECTION
SCALE 1"=6'



PLAN PARALLELING STATION
SCALE 1"=6'



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
E. VELASCO
DRAWN BY
F.J. DOMINGUEZ
CHECKED BY
C. RECHEA
IN CHARGE
A. RELANO
DATE
02/26/2021

**PEPD RECORD SET
ADDENDUM
SR14A/ E1A/ E2A**

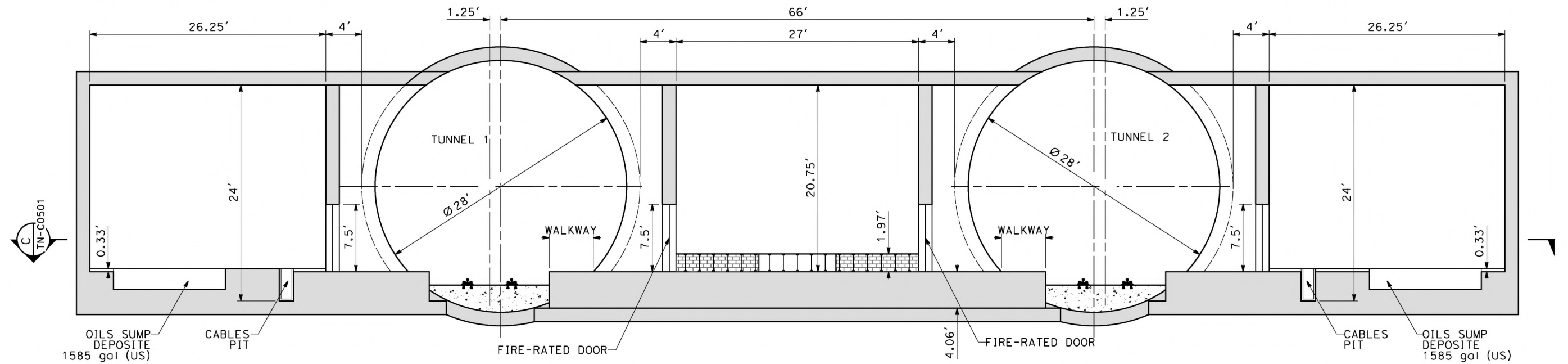
**NOT FOR
CONSTRUCTION**



**CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK**

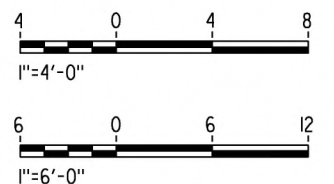
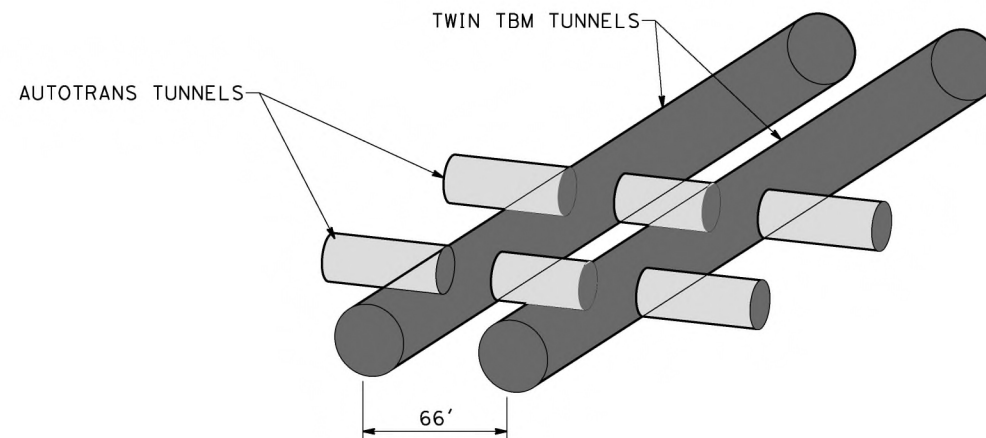
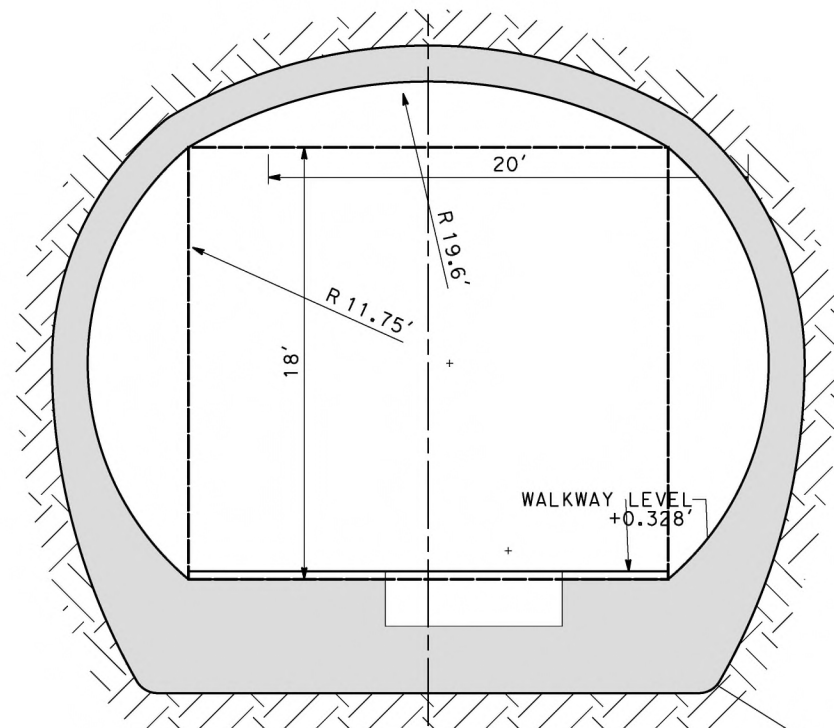
UNDERGROUND PARALLELING STATION (PS)
TYPICAL GEOMETRY (2 of 2)

CONTRACT NO.
HSR14-42
DRAWING NO.
TN-C0501
SCALE
AS SHOWN
SHEET NO.



NOTES:

1. CONSTRUCTION PROCEDURES AND SUPPORT MEASURES SIMILAR TO CROSS PASSAGES (TN-C0402, TN-C0403)
2. DRAWINGS TN-C0502 AND TN-C0503 ARE INTENDED FOR SPACEPROOFING ONLY.
3. THE DESIGN OF THE STRUCTURE WILL REQUIRE RESULTS OF GEOTECHNICAL INVESTIGATION.



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY F.J. DOMINGUEZ
CHECKED BY C. RECHEA
IN CHARGE A. RELANO
DATE 02/26/2021

PEPD RECORD SET
ADDENDUM
SR14A/ E1A/ E2A

NOT FOR
CONSTRUCTION



CALIFORNIA HIGH-SPEED RAIL PROJECT PALMDALE TO BURBANK

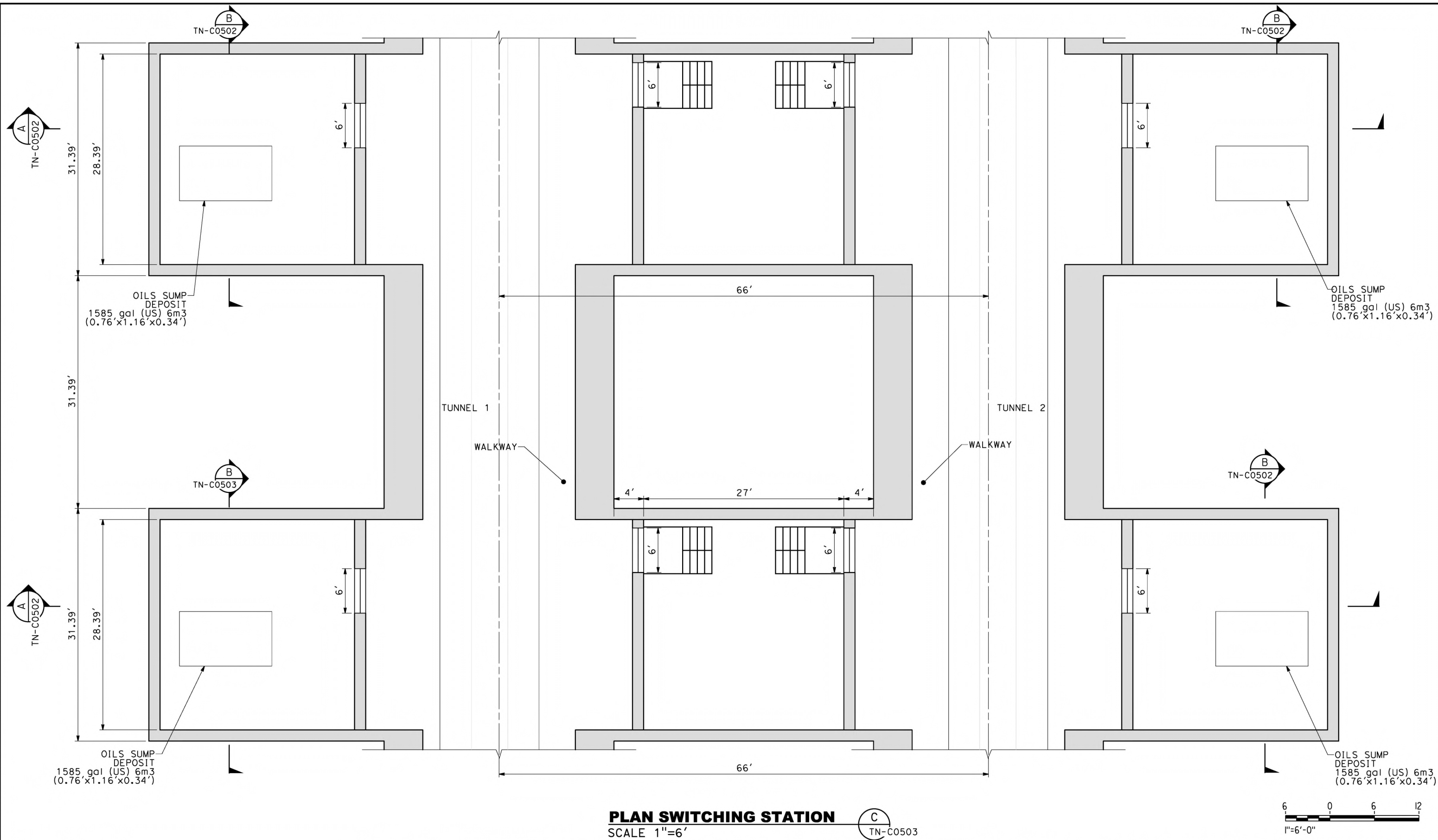
UNDERGROUND SWITCHING STATION (SWS)
TYPICAL GEOMETRY (1 of 2)
ELEVATION CROSS-SECTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0502
SCALE AS SHOWN
SHEET NO.

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PLAN SWITCHING STATION
SCALE 1"=6'

C
TN-C0503

6 0 6 12
1"=6'-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
E.VELASCO
DRAWN BY
F.J.DOMINGUEZ
CHECKED BY
C.RECHEA
IN CHARGE
A.RELAÑO
DATE
02/26/2021

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

NOT FOR
CONSTRUCTION



CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

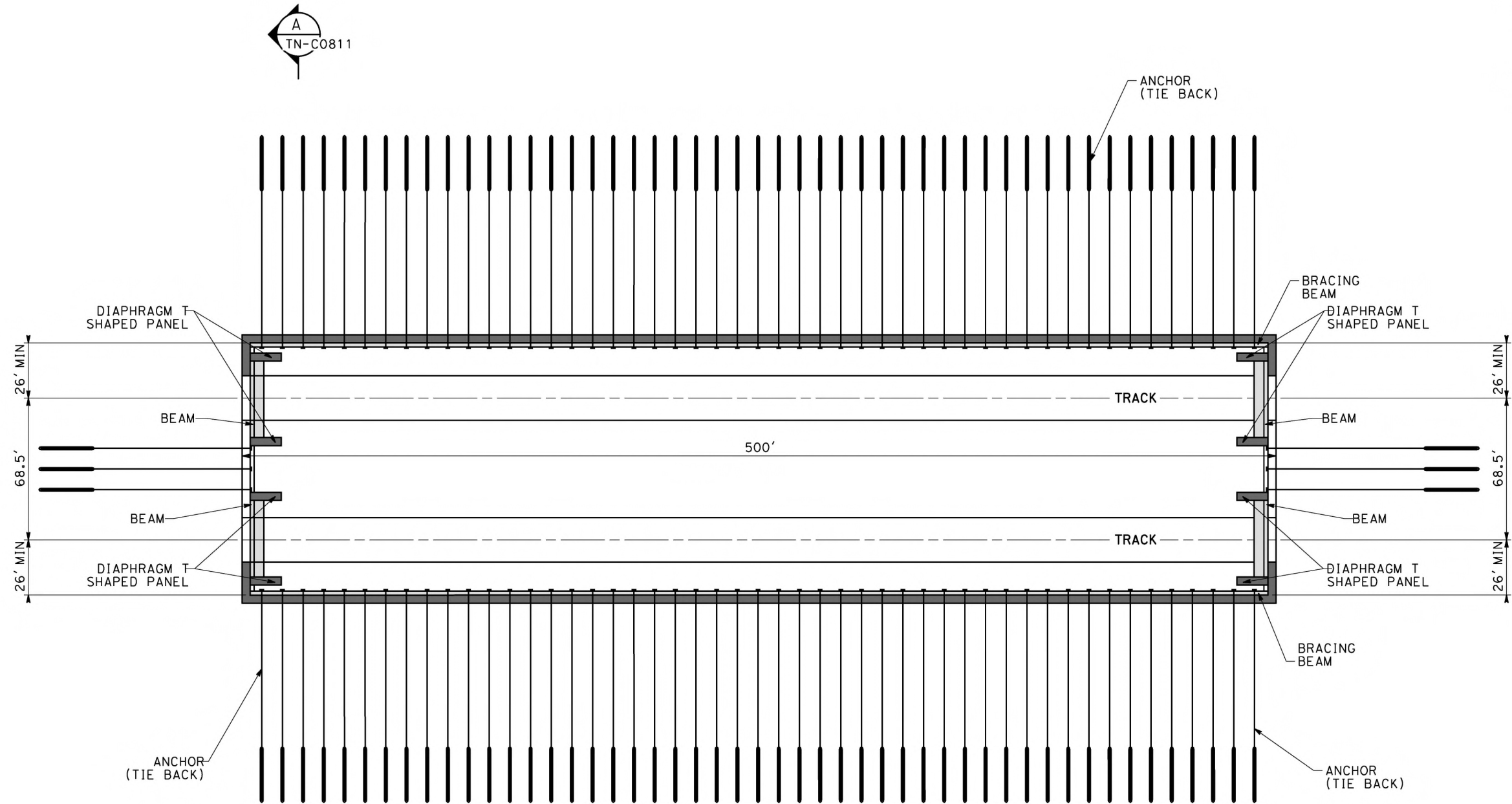
UNDERGROUND SWITCHING STATION (SWS)
TYPICAL GEOMETRY (2 of 2)
PLAN

CONTRACT NO.
HSR14-42
DRAWING NO.
TN-C0503
SCALE
AS SHOWN
SHEET NO.

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PLAN

NOTES:

1. THIS DRAWING IS CONCEPTUAL AND NOT AN ACTUAL DESIGN. ITS PURPOSE IS TO BE A GUIDE TO BUILD UNIT PRICES AT PEPD LEVEL.
2. THE CONSTRUCTION TRENCH IS INTENDED FOR ASSEMBLY AND LAUNCH OF TUNNEL BORING MACHINES NORTHWARDS. AND RECEPTION OF TBM COMING FROM THE SOUTH.
3. THE DESIGN OF THIS SOE TO BE DONE AT A MORE ADVANCED STAGE OF DESIGN, WHEN SPECIFIC GEOTECHNICAL INFORMATION, SEISMIC DESIGN CRITERIA AND SITE RESPONSE ANALYSIS ARE AVAILABLE.
4. GENERAL DIMENSIONS AND THICKNESSES ARE GIVEN WITH ORIENTATIVE PURPOSES ONLY.



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

PEPD RECORD SET ADDENDUM SR14A/ E1A/ E2A
NOT FOR CONSTRUCTION



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

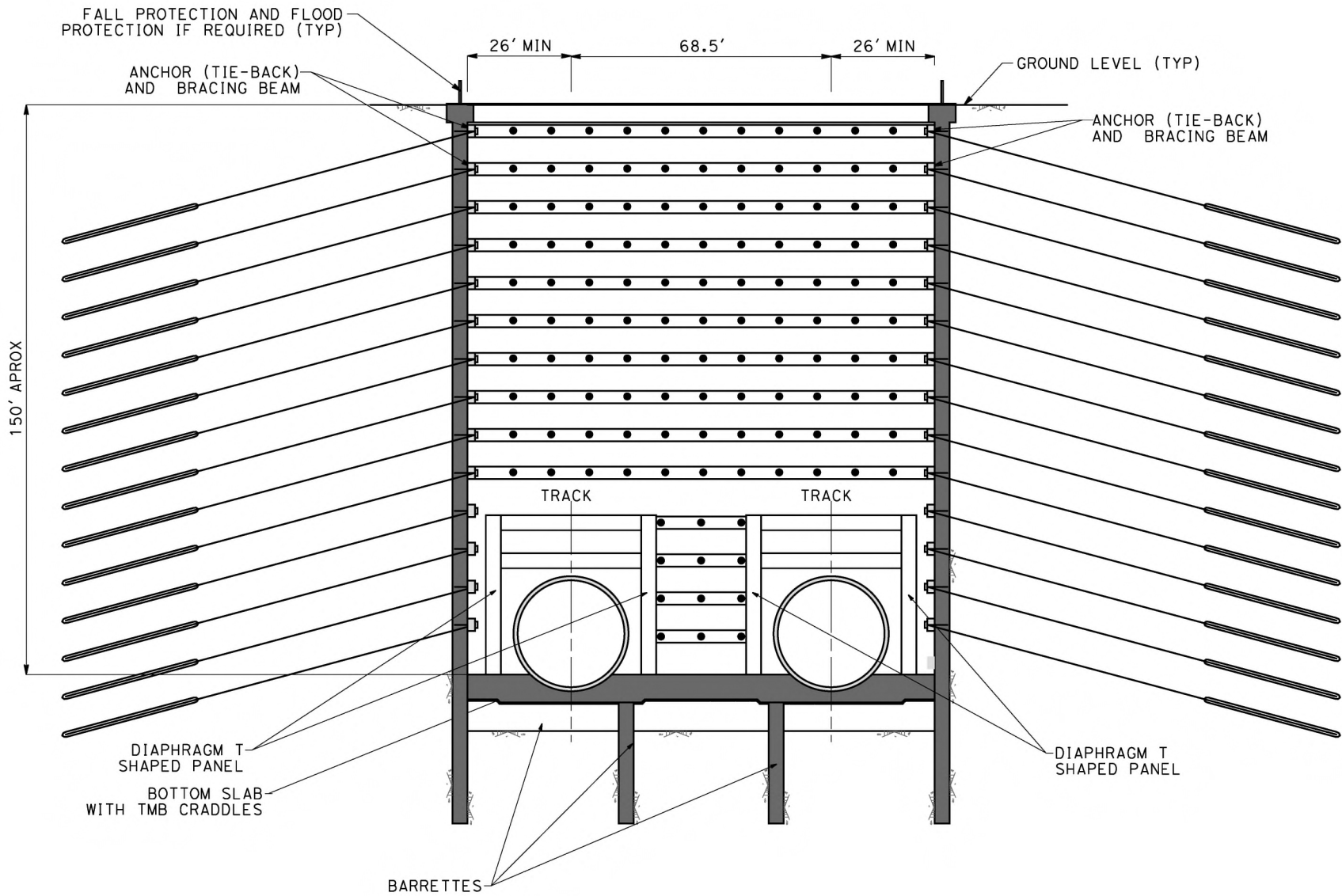
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT SR14A
INTERMEDIATE WINDOW IWA (1 OF 2)

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0810
SCALE AS SHOWN
SHEET NO.

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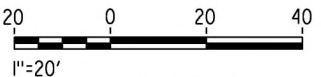
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TRANSVERSE SECTION A
SCALE 1"=20'-0" TN-C0811

NOTES:

1. THIS DRAWING IS CONCEPTUAL AND NOT AN ACTUAL DESIGN. ITS PURPOSE IS TO BE A GUIDE TO BUILD UNIT PRICES AT PEPD LEVEL.
2. THE CONSTRUCTION TRENCH IS INTENDED FOR ASSEMBLY AND LAUNCH OF TUNNEL BORING MACHINES NORTHWARDS.
3. THE DESIGN OF THIS SOE TO BE DONE AT A MORE ADVANCED STAGE OF DESIGN, WHEN SPECIFIC GEOTECHNICAL INFORMATION, SEISMIC DESIGN CRITERIA AND SITE RESPONSE ANALYSIS ARE AVAILBLE.
4. GENERAL DIMENSIONS AND THICKNESSES ARE GIVEN WITH ORIENTATIVE PURPOSES ONLY.



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

**PEPD RECORD SET
ADDENDUM
SR14A/ E1A/ E2A**

**NOT FOR
CONSTRUCTION**



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

**CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK**

ALIGNMENT SR14A
INTERMEDIATE WINDOW IWA (2 OF 2)

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0811
SCALE AS SHOWN
SHEET NO.

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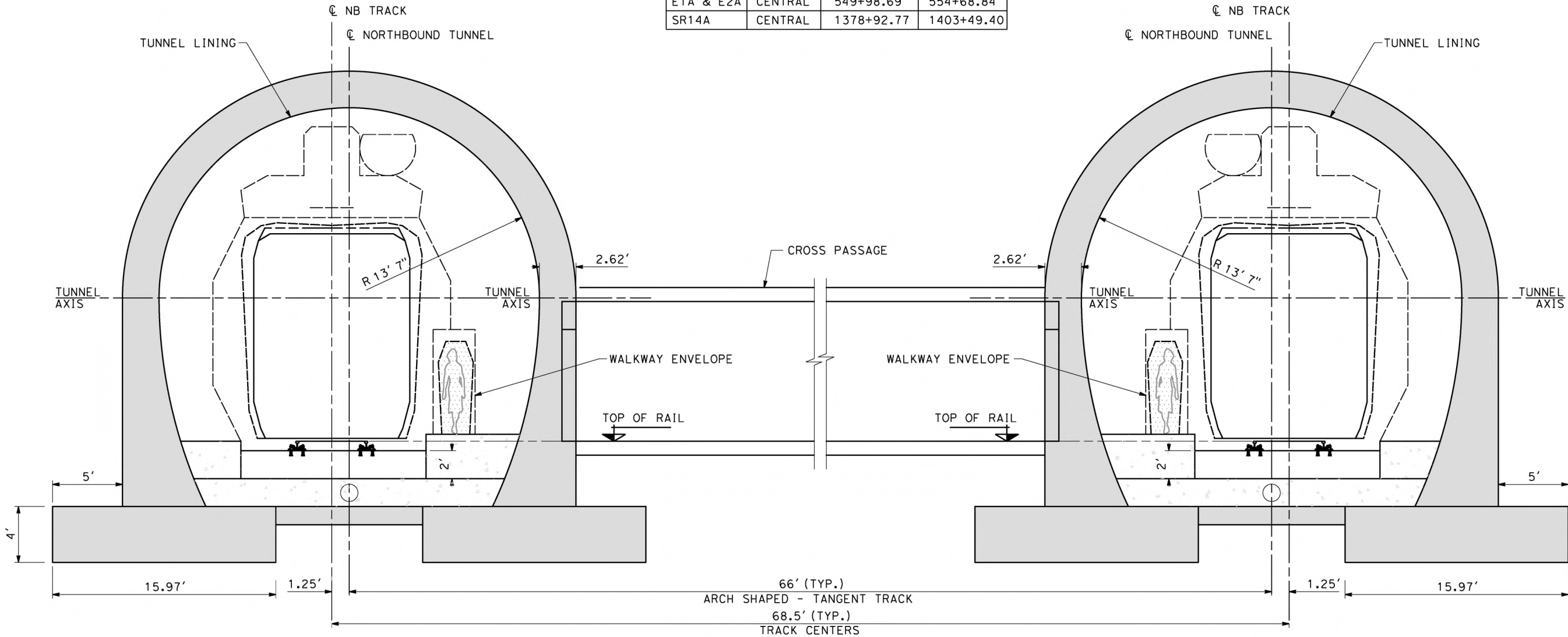
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NOTES:

1. PERMANENT LINING ASSUMED WATERTIGHT/UNDRAINED IN PERMANENT CASE.
2. STRUCTURE COMPONENTS ARE NOT DESIGNED. DRAWINGS NOT BASED ON ACTUAL DESIGN AND ARE DEVELOPED FOR PRELIMINARY COST ESTIMATE.
3. TRACK, CABLE DUCTS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
4. EQUIPMENT AND STRUCTURE GAUGES NOT SHOWN. REFER TO DRAWINGS TN-C0006 AND TN-C0007 FOR FIXED EQUIPMENT ENVELOPE AND STRUCTURE GAUGE.
5. TYPICAL SECTION ON THIS SHEET IS APPLICABLE AT THE FOLLOWING LOCATIONS:

ALIG.	SUB-SECT.	BEGIN STA	END STA
E1A & E2A	CENTRAL	549+98.69	554+68.84
SR14A	CENTRAL	1378+92.77	1403+49.40



TUNNEL TYPICAL SECTION
ARCH-SHAPED CUT & COVER
TWIN TUNNEL 28"



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY F.J.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

PEPD RECORD SET ADDENDUM SR14A/ E1A/ E2A
NOT FOR CONSTRUCTION



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E1A/E2A/SR14A
ARCH SHAPED CUT & COVER
TANGENT TRACK
CLEARANCE DIAGRAM

CONTRACT NO. HSR14-42
DRAWING NO. TN-C1110
SCALE AS SHOWN
SHEET NO.