California High-Speed Rail Authority

Palmdale to Burbank Project Section

PEPD RECORD SET ADDENDUM SR14A / E1A / E2A

Tunnel Plans

April 2024

CALIFORNIA High-Speed Rail Authority

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being or have been carried out by the State of California pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated July 23, 2019, and executed by the Federal Railroad Administration and the State of California.

GENERAL

DRAWING NO.	DESCRIPTION	SHEET NO.
TN-B0010	GENERAL. ALIGNMENT E1A/E2A/SR14A. INDEX OF DRAWINGS	
TN-B0014	GENERAL. ALIGNMENT E1A/E2A/SR14A. ABBREVIATIONS AND LEGEND	
TN-B0015	GENERAL. ALIGNMENT E1A/E2A/SR14A. FAULT KEY MAP	
TN-B0016	GENERAL. ALIGNMENT E1A/E2A/SR14A. GEOTECHNICAL RISKS AT PORTALS, IW AND ADITS	
TN-B0017	GENERAL. ALIGNMENT E1A/E2A/SR14A. SCHEMATIC LINEAR DIAGRAMS	

SR14A (CENTRAL SUBSECTION)

DRAWING NO.	DESCRIPTION	SHEET NO.
TN-B6001-14A	HIGH SPEED RAIL TUNNEL PLANS - KEY MAP	
TN-D4001-14A	PLAN STA 450+00.00 TO STA 500+00.00	
TN-D4002-14A	PLAN STA 500+00.00 TO STA 550+00.00	
TN-D4003-14A	PLAN STA 550+00.00 TO STA 600+00.00	
TN-D4004-14A	PLAN STA 600+00.00 TO STA 650+00.00	
TN-D4005-14A	PLAN STA 650+00.00 TO STA 700+00.00	
TN-D4006-14A	PLAN STA 700+00.00 TO STA 750+00.00	
TN-D4007-14A	PLAN STA 750+00.00 TO STA 800+00.00	
TN-D4008-14A	PLAN STA 800+00.00 TO STA 850+00.00	
TN-D4009-14A	PLAN STA 850+00.00 TO STA 900+00.00	
TN-D4010-14A	PLAN STA 900+00.00 TO STA 950+00.00	
TN-D4011-14A	PLAN STA 950+00.00 TO STA 1000+00.00	
TN-D4012-14A	PLAN STA 1000+00.00 TO STA 1050+00.00	
TN-D4013-14A	PLAN STA 1050+00.00 TO STA 1100+00.00	
TN-D4014-14A	PLAN STA 1100+00.00 TO STA 1150+00.00	
TN-D4015-14A	PLAN STA 1150+00.00 TO STA 1200+00.00	
TN-D4016-14A	PLAN STA 1211+00.00 TO STA 1261+00.00	
TN-D4017-14A	PLAN STA 1261+00.00 TO STA 1311+00.00	
TN-Y1001-14A	TUNNEL PROFILE. SOUTH BOUND TUNNEL STA 450+00.00 TO STA 550+00.00	
TN-Y1002-14A	TUNNEL PROFILE. SOUTH BOUND TUNNEL STA 550+00.00 TO STA 650+00.00	
TN-Y1003-14A	TUNNEL PROFILE. SOUTH BOUND TUNNEL STA 650+00.00 TO STA 750+00.00	
TN-Y1004-14A	TUNNEL PROFILE. SOUTH BOUND TUNNEL STA 750+00.00 TO STA 850+00.00	
TN-Y1005-14A	TUNNEL PROFILE. SOUTH BOUND TUNNEL STA 850+00.00 TO STA 950+00.00	
TN-Y1006-14A	TUNNEL PROFILE. SOUTH BOUND TUNNEL STA 950+00.00 TO STA 1050+00.00	
TN-Y1007-14A	TUNNEL PROFILE. SOUTH BOUND TUNNEL STA 1050+00.00 TO STA 1150+00.00	
TN-Y1008-14A	TUNNEL PROFILE. SOUTH BOUND TUNNEL STA 1150+00.00 TO STA 1261+00.00	
TN-Y1009-14A	TUNNEL PROFILE. SOUTH BOUND TUNNEL STA 1261+00.00 TO STA 1311+00.00	
TN-D7001-14A	PORTAL 1A PLAN AND PROFILE FOR CONSTRUCTION	
TN-D7002-14A	INTERMEDIATE WINDOW IWA	
TN-D7003-14A	PORTAL 2A PLAN AND PROFILE FOR CONSTRUCTION	
TN-D7004-14A	PORTAL 3A PLAN AND PROFILE FOR CONSTRUCTION	
TN-D7005-14A	PORTAL 4A PLAN AND PROFILE FOR CONSTRUCTION	

E1A/E2A (CENTRAL SUBSECTION)

DRAWING NO.	DESCRIPTION	SHEET NO.
TN-B6001-EA	HIGH SPEED RAIL TUNNEL PLANS. KEY MAP	
TN-D4001-EA	PLAN STA 440+00.00 TO STA 490+00.00	
TN-D4002-EA	PLAN STA 490+00.00 TO STA 540+00.00	
TN-D4003-EA	PLAN STA 540+00.00 TO STA 590+00.00	
TN-Y1001-EA	TUNNEL PROFILE. SOUTH BOUND TUNNEL STA 440+00.00 TO STA 540+00.00	
TN-Y1002-EA	TUNNEL PROFILE. SOUTH BOUND TUNNEL STA 540+00.00 TO STA 590+00.00	
TN-D7001-EA	PORTAL 1A PLAN AND PROFILE FOR CONSTRUCTION	
TN-D7002-EA	PORTAL 2A-3A PLAN AND PROFILE FOR CONSTRUCTION	

TYPICAL SECTIONS AND DETAILS

PORTAL FACILITIES AND TUNNEL GAUGES

DRAWING NO.	DESCRIPTION	SHEET NO.
TN-C0001	TYPICAL TUNNEL PORTAL FACILITIES. AT GRADE TWIN TUNNEL CONFIGURATION. PLAN	
TN-C0002	TYPICAL TUNNEL PORTAL FACILITIES. AT GRADE TWIN TUNNEL CONFIGURATION. ELEVATION	
TN-C0003	TYPICAL TUNNEL PORTAL FACILITIES. AT GRADE TWIN TUNNEL CONFIGURATION. LONG SECTION	
TN-C0004	COMPOSITE VEHICLE. STATIC AND DYNAMIC ENVELOPE. TANGENT TRACK	
TN-C0005	COMPOSITE VEHICLE. STATIC AND DYNAMIC ENVELOPE. SUPERELEVATED TRACK	
TN-C0006	COMPOSITE VEHICLE. FIXED EQUIPMENT ENVELOPE AND STRUCTURE GAUGE. TANGENT TRACK	
TN-C0007	COMPOSITE VEHICLE. FIXED EQUIPMENT ENVELOPE AND STRUCTURE GAUGE. SUPERELEVATED TRACK	

MINED TUNNELS IN ROCK

DRAWING NO.	DESCRIPTION	SHEET NO.
TN-C0100	MINED TWIN TUNNELS. TANGENT TRACK - CLEARANCE DIAGRAM	
TN-C0101	MINED TWIN TUNNELS. SUPERELEVATED TRACK - CLEARANCE DIAGRAM	
TN-C0102	MINED TWIN TUNNELS. TYPICAL CONSTRUCTION SEQUENCE AND SUPPORT MEASURES (1 of 3)	
TN-C0103	MINED TWIN TUNNELS. TYPICAL CONSTRUCTION SEQUENCE AND SUPPORT MEASURES (2 of 3)	
TN-C0104	MINED TWIN TUNNELS. TYPICAL CONSTRUCTION SEQUENCE AND SUPPORT MEASURES (3 of 3)	

TBM TUNNELS

DRAWING NO.	DESCRIPTION	SHEET NO.
TN-C0200	TBM BORED TWIN TUNNELS. CLEARANCE DIAGRAM - TANGENT TRACK	
TN-C0201	TBM BORED TWIN TUNNELS. CLEARANCE DIAGRAM - SUPERELEVATED TRACK	
TN-C0202	TBM BORED TWIN TUNNELS. ONE-PASS LINING GEOMETRY	

CROSS-PASSAGES FOR EMERGENCY EGRESS AND TECHNICAL EQUIPMENT

DRAWING NO.	DESCRIPTION	SHEET NO.
TN-C0401	TBM TUNNELS. TYPICAL CROSS PASSAGEWAY FOR EMERGENCY EGRESS OR TECHNICAL ROOMS. CROSS AND LONGITUDINAL SECTION GEOMETRY	
TN-C0402	TBM TUNNELS. TYPICAL CROSS PASSAGEWAY. SUPPORT MEASURES FOR MEDIUM ROCK QUALITY	
TN-C0403	TBM TUNNELS. TYPICAL CROSS PASSAGEWAY. SUPPORT MEASURES FOR POOR ROCK QUALITY	
TN-C0410	LIST OF EMERGENCY EGRESS CROSS-PASSAGES AND EXITS, TECHNICAL ROOMS, AND UNDERGROUND TRACTION POWER FACILITIES	

UNDERGROUND TRACTION POWER FACILITIES

DRAWING NO.	DESCRIPTION	SHEET NO.
TN-C0500	UNDERGROUND TRACTION POWER PARALLELING STATION (PS). TYPICAL GEOMETRY (1 of 2)	
TN-C0501	UNDERGROUND PARALLELING STATION (PS). TYPICAL GEOMETRY (2 of 2)	
TN-C0502	UNDERGROUND SWITCHING STATION (SWS). TYPICAL GEOMETRY (1 of 2). ELEVATION CROSS-SECTION	
TN-C0503	UNDERGROUND SWITCHING STATION (SWS). TYPICAL GEOMETRY (2 of 2). PLAN	

INTERMEDIATE WINDOWS/LAUNCHING SHAFTS

DRAWING NO.	DESCRIPTION	SHEET NO.
TN-C0810	ALIGNMENT SR14A. INTERMEDIATE WINDOW IWA (1 OF 2)	
TN-C0811	ALIGNMENT SR14A. INTERMEDIATE WINDOW IWA (2 OF 2)	

INTERMEDIATE WINDOWS/LAUNCHING SHAFTS

DRAWING NO.	DESCRIPTION	SHEET NO.
TN-C1110	ALIGNMENT E1A/E2A/SR14A. ARCH SHAPED CUT&COVER. TANGENT TRACK. CLEARANCE DIAGRAM	

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
GENERAL
INDEX OF DRAWINGS

CONTRACT NO. HSR14-42
DRAWING NO. TN-B0010
SCALE NO SCALE
SHEET NO.

A

ANF	ANGELES NATIONAL FOREST
APPROX	APPROXIMATE

B

BLVD	BOULEVARD
BAR	PRESSURE UNIT

C

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

E	EASTING, EAST
E.G.	FOR EXAMPLE
EQ	EARTHQUAKE
ET	EMERGENCY TELEPHONE
ETD	ENLARGED TUNNEL DIAMETER

F

FH	FIRE HYDRANT
FT	FEET
FWY	FREEWAY

G

GC	ONE OF THE TSI REFERENCE GAUGES, USED IN DEVELOPING CLEARANCES FOR THE CHSTP
GWP	GROUND WATER PRESSURE

H

HFZ	HAZARDOUS FAULT ZONE
HSR	HIGH SPEED RAIL
HWY	HIGHWAY

I

ID	INNER DIAMETER
IW	INTERMEDIATE WINDOW (FOR CONSTRUCTION PURPOSES ONLY)
I-210	I-210 FREEWAY

K

KG	KILOGRAM

L

L	FLOOD LIGHTS, LENGTH

M

M	METER
MI	MILE, MINED TUNNEL IN ROCK
MIN	MINIMUM
MPH	MILES PER HOUR

N

N	NORTHING, NORTH
NATM	NEW AUSTRIAN TUNNELING METHOD
NB	NORTH BOUND
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION

O

OCS	OVERHEAD CATENARY SYSTEM
OG	ORIGINAL GROUND

P

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

R	RADIUS
RC	REINFORCED CONCRETE
RD	ROAD
R/W, ROW	RIGHT OF WAY

S

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

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

U

USGS	U.S. GEOLOGICAL SURVEY
UPS	UNDERGROUND PARALLELING STATION

V

V	VIADUCT
VCP	VENTILATION CONTROL PANEL
VC	VERTICAL CURVE (ALIGNMENT RELATED)

W

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

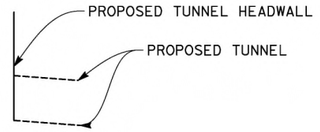
- PROPOSED PERMANENT ENVIRONMENTAL FOOTPRINT
- CONSTRUCTION STAGING AREA / PROPOSED TEMPORARY ENVIRONMENTAL FOOTPRINT
- FENCE LINE / HSR ROW
- LIMITS OF EMBANKMENT (FILL)
- LIMITS OF EXCAVATION (CUT)
- PROPOSED RETAINING WALL
- PROPOSED TUNNEL
- INCLINED DESCENDING GALLERY
- UNDERGROUND EASEMENT FOR 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)



REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET ADDENDUM SR14A/E1A/E2A

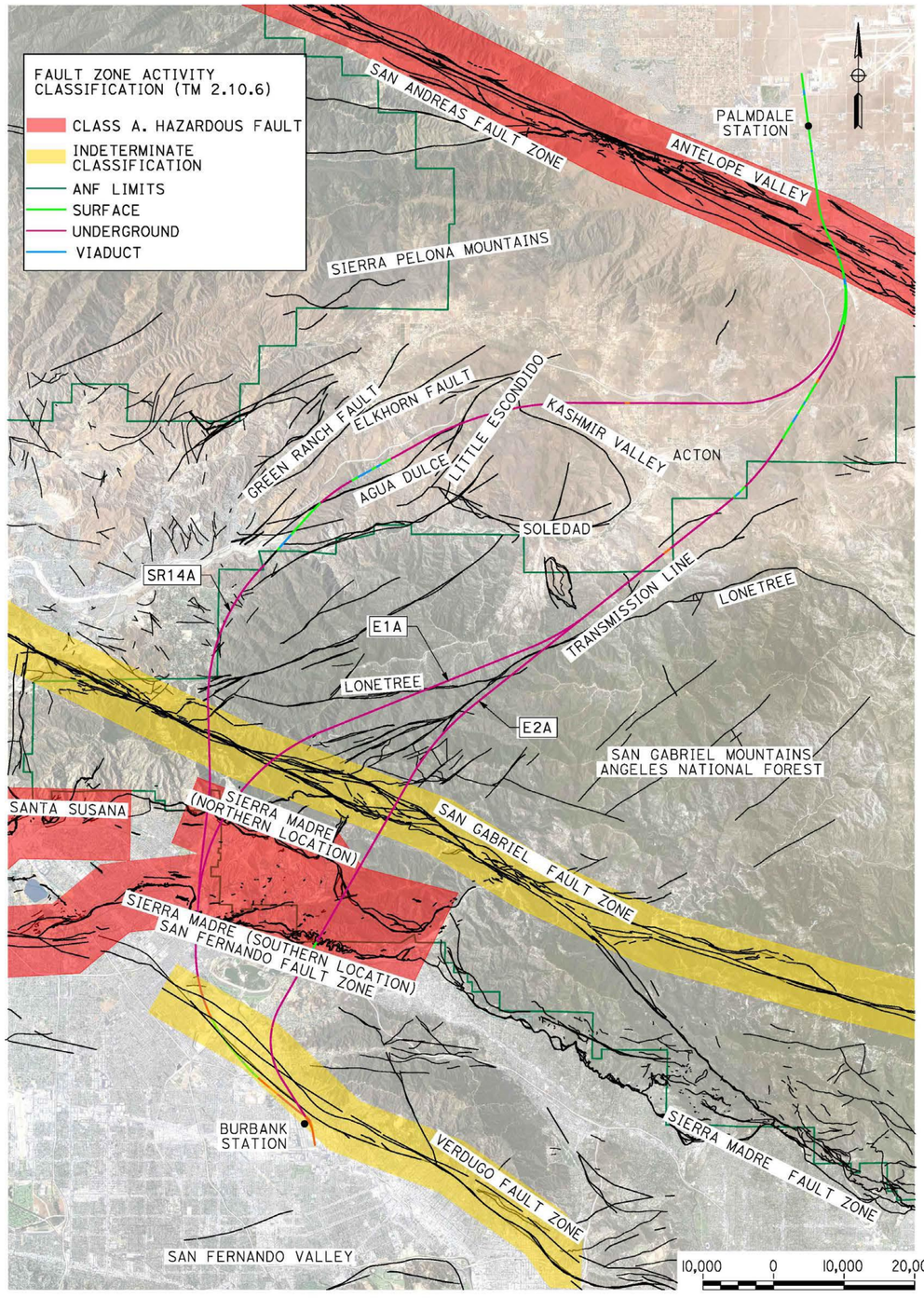
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

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.



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

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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.

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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NOT FOR CONSTRUCTION

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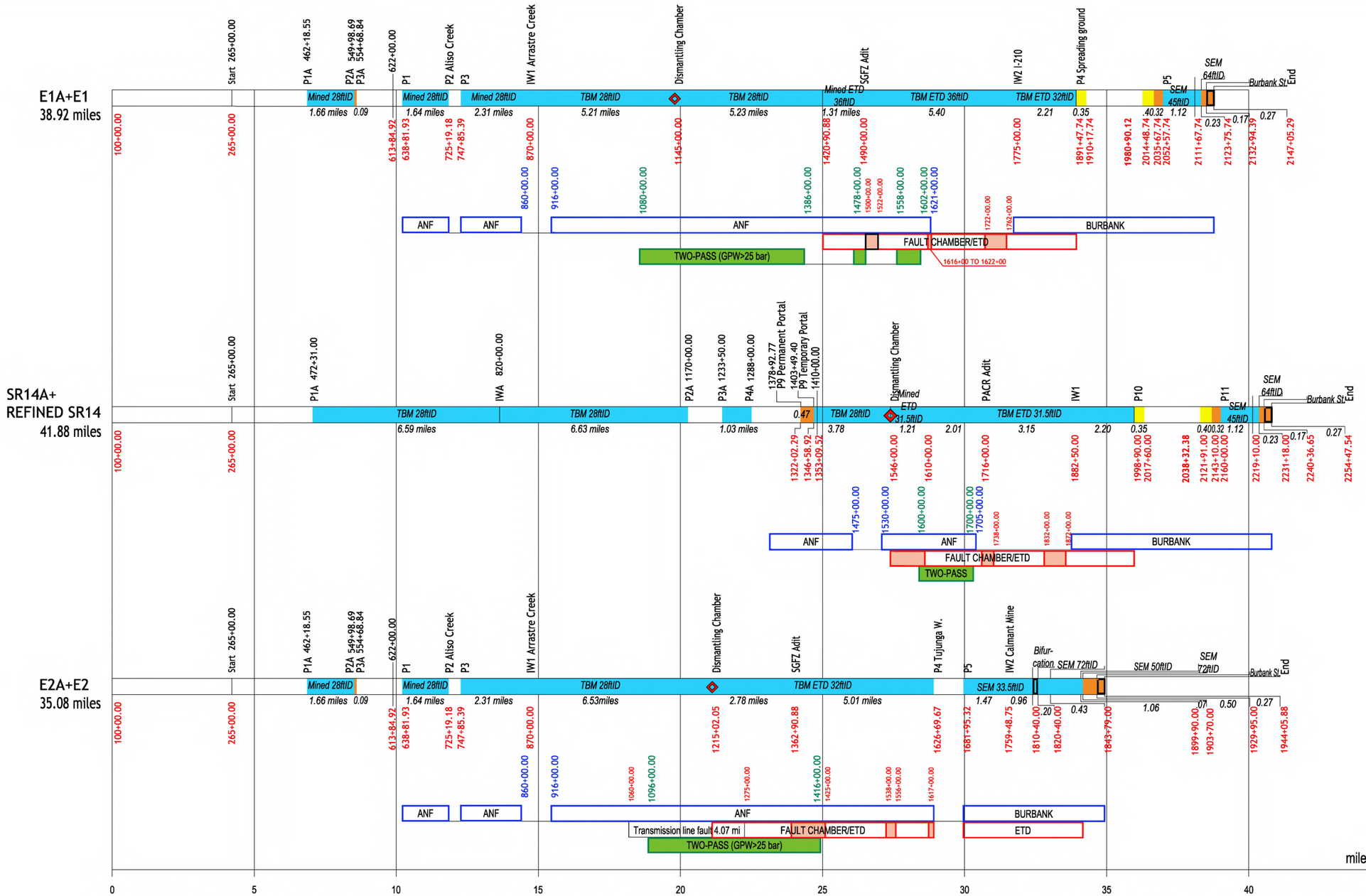
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E1A/E2A/SR14A
GENERAL
GEOTECHNICAL RISKS AT PORTALS, IW AND ADITS

CONTRACT NO. HSR14-42
DRAWING NO. TN-B0016
SCALE NO SCALE
SHEET NO.



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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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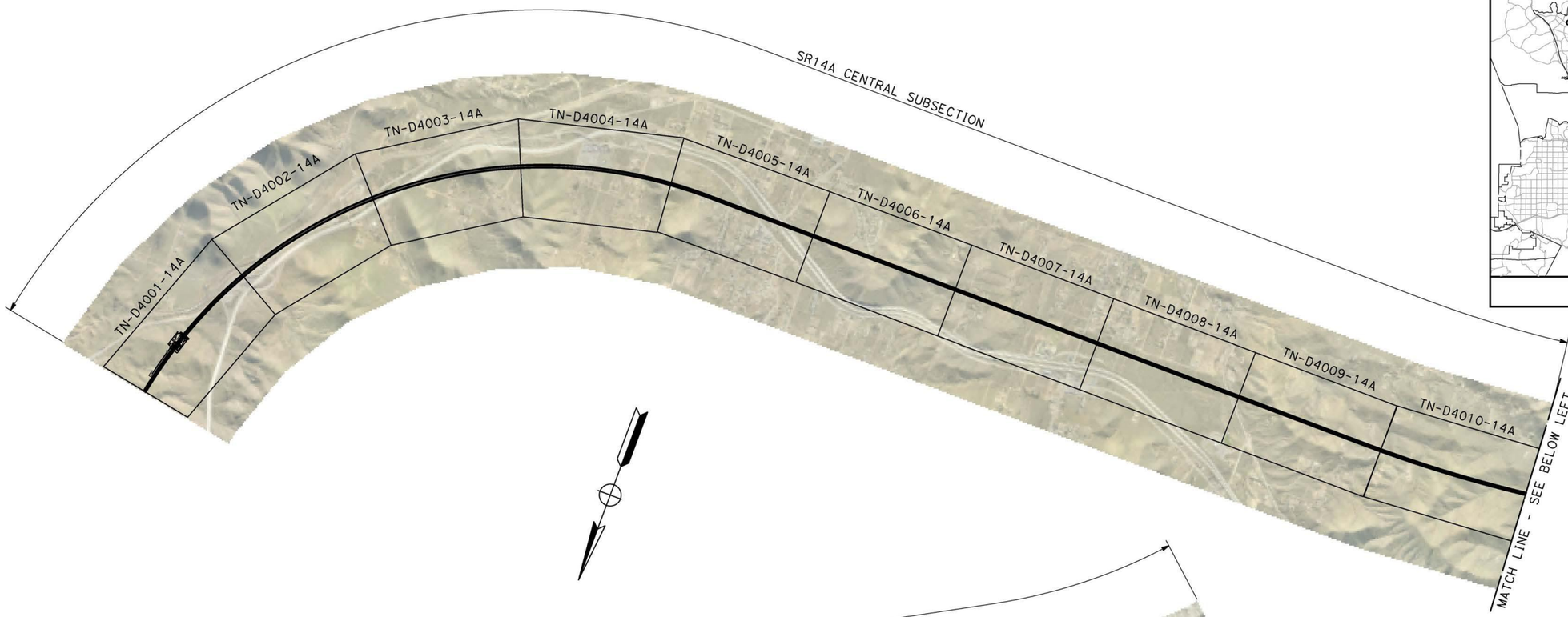

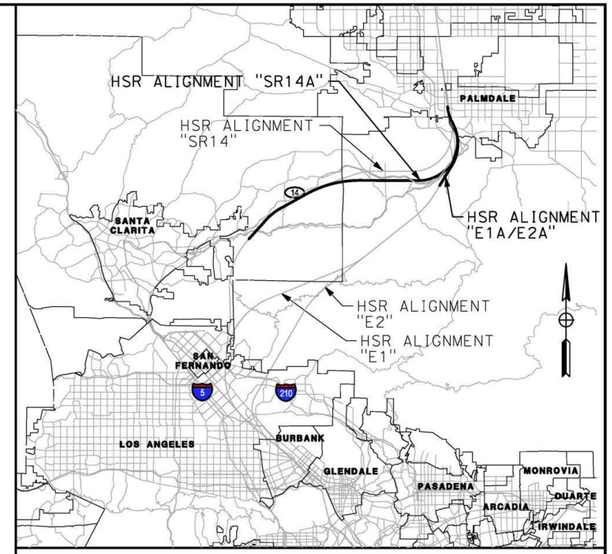

VICINITY MAP

2000 0 2000 4000

1"=2000'

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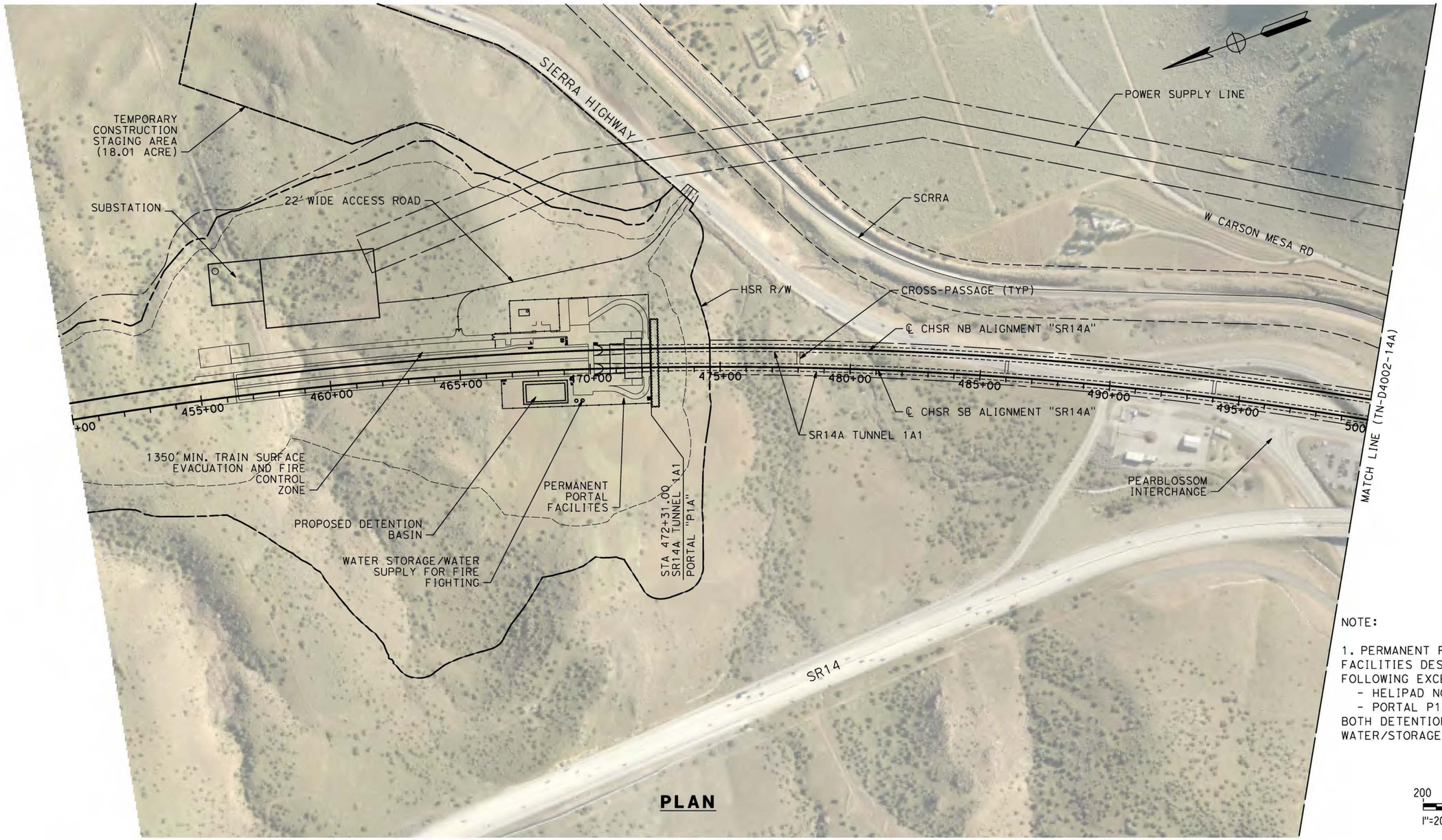
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

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

HIGH SPEED RAIL TUNNEL PLANS
KEY MAP

CONTRACT NO. 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

200 0 200 400
1"=200

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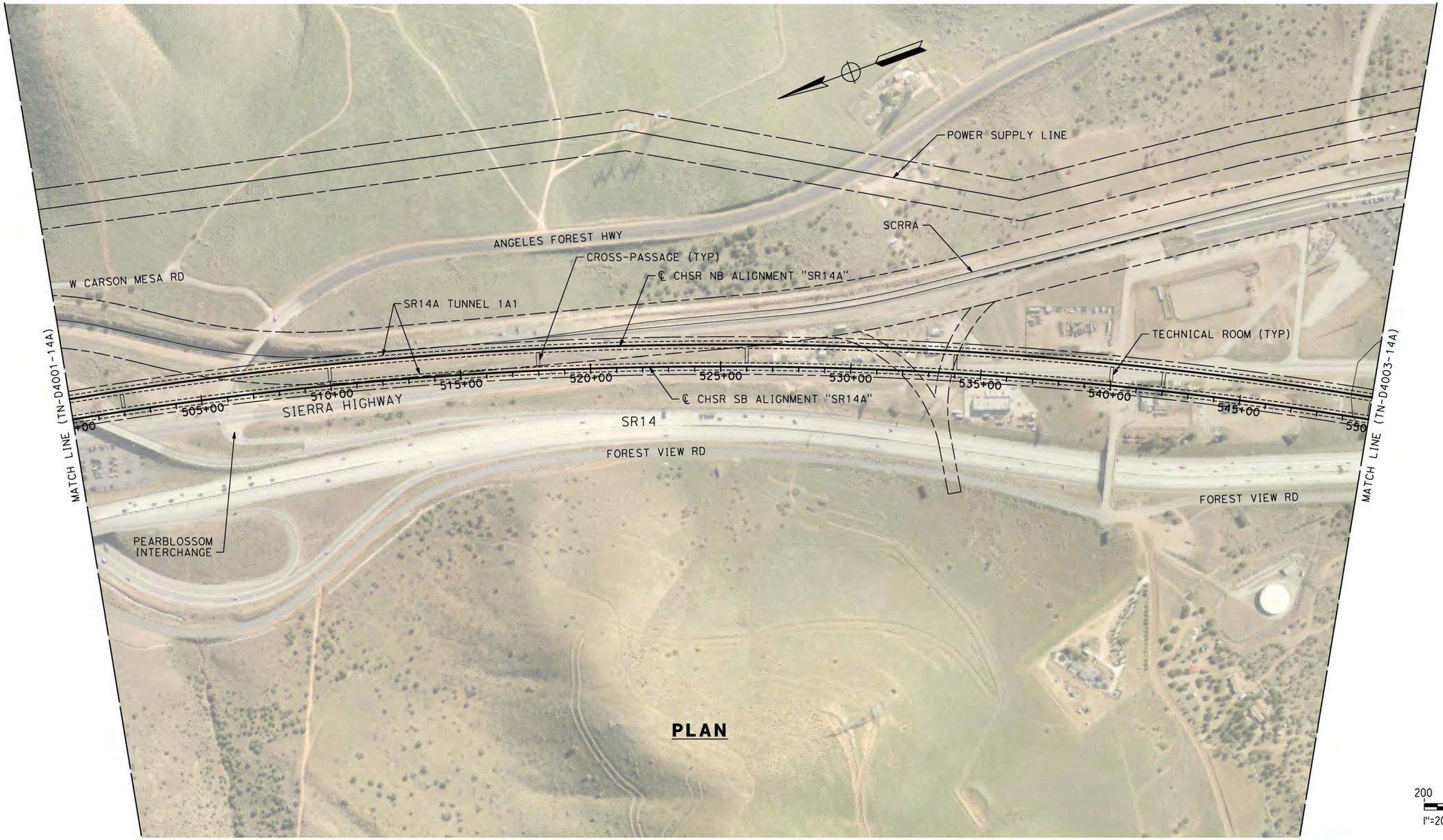
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

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



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IN CHARGE A.RELAÑO
DATE 02/26/2021

PEPD RECORD SET ADDENDUM SR14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

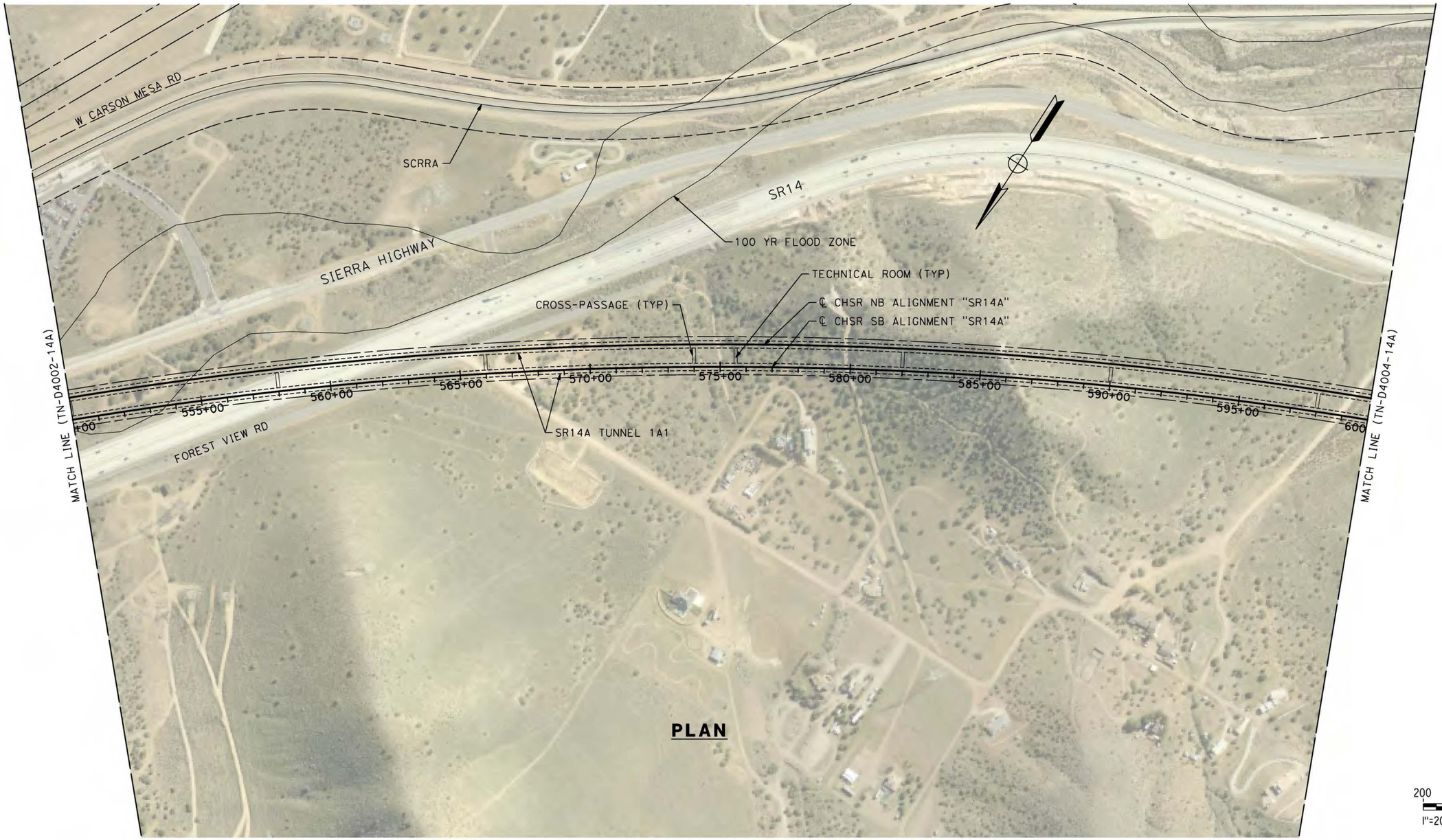
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

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



PLAN

200 0 200 400
1"=200

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM SR14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

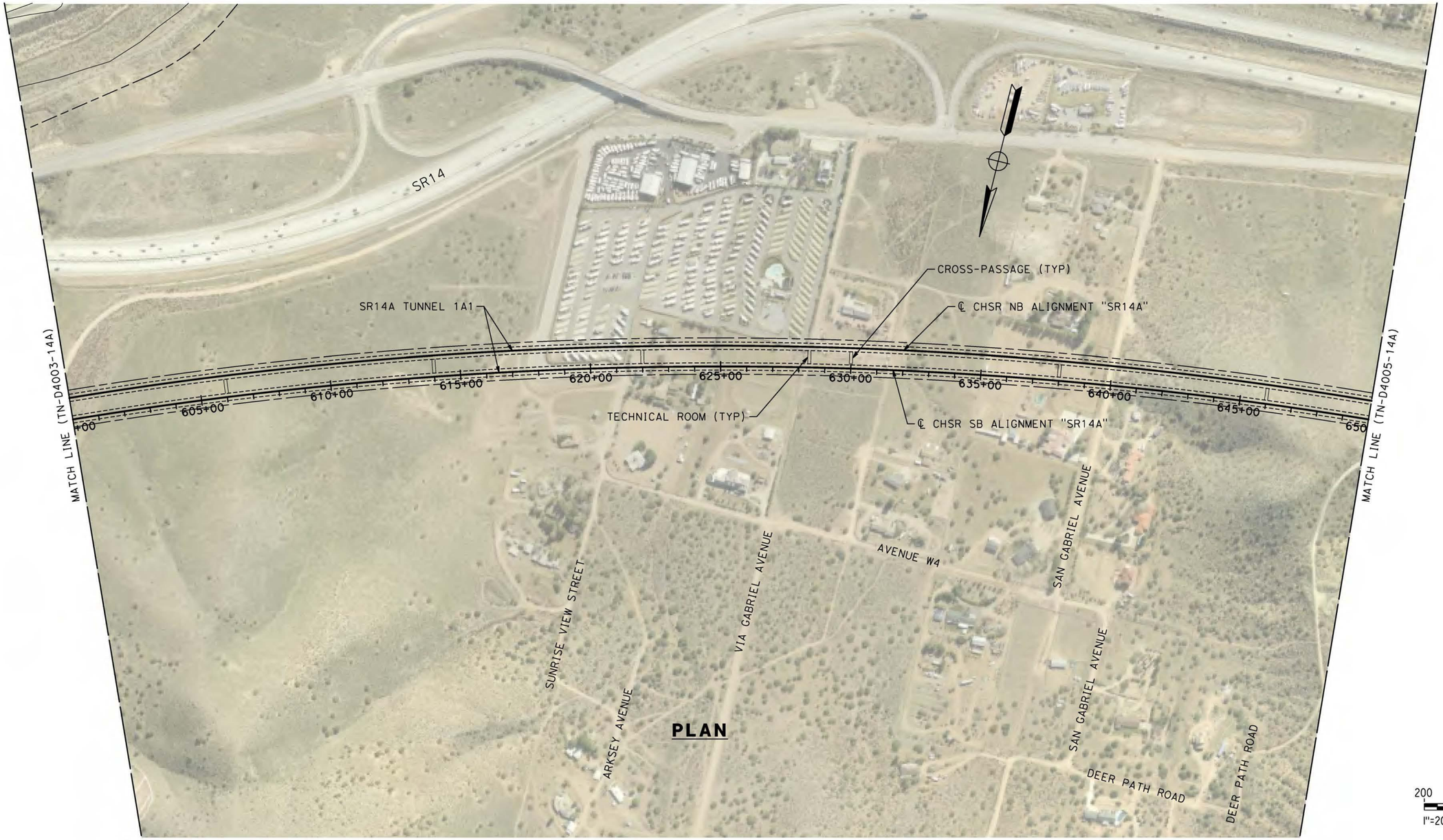
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

ALIGNMENT "SR14A"
PLAN
STA 550+00.00 TO STA 600+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4003-14A
SCALE AS SHOWN
SHEET NO.

TUNNEL 1A1



PLAN

200 0 200 400
1"=200

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM SR14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

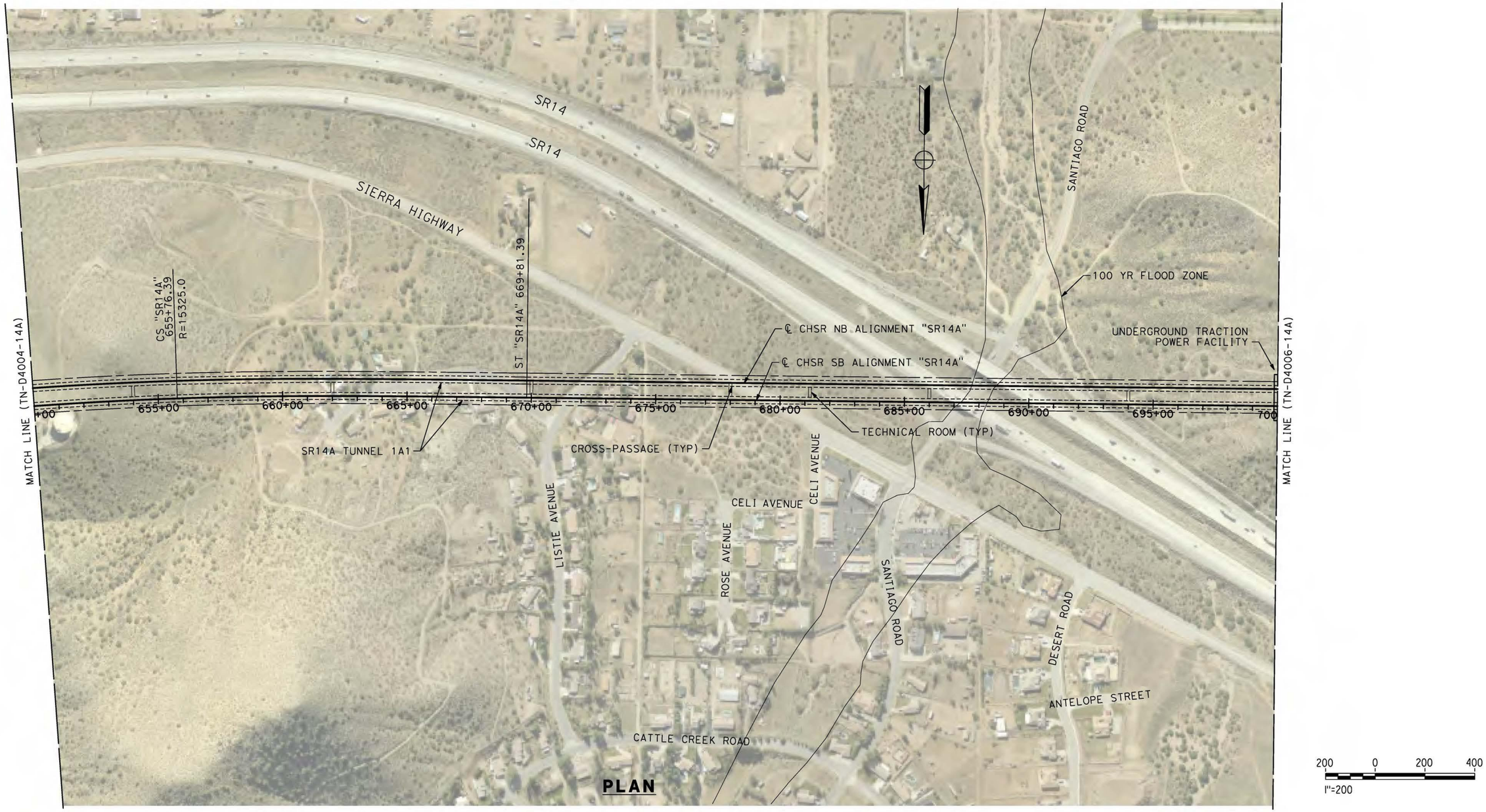
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

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

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4004-14A
SCALE AS SHOWN
SHEET NO.

TUNNEL 1A1



PLAN

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET ADDENDUM SR14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

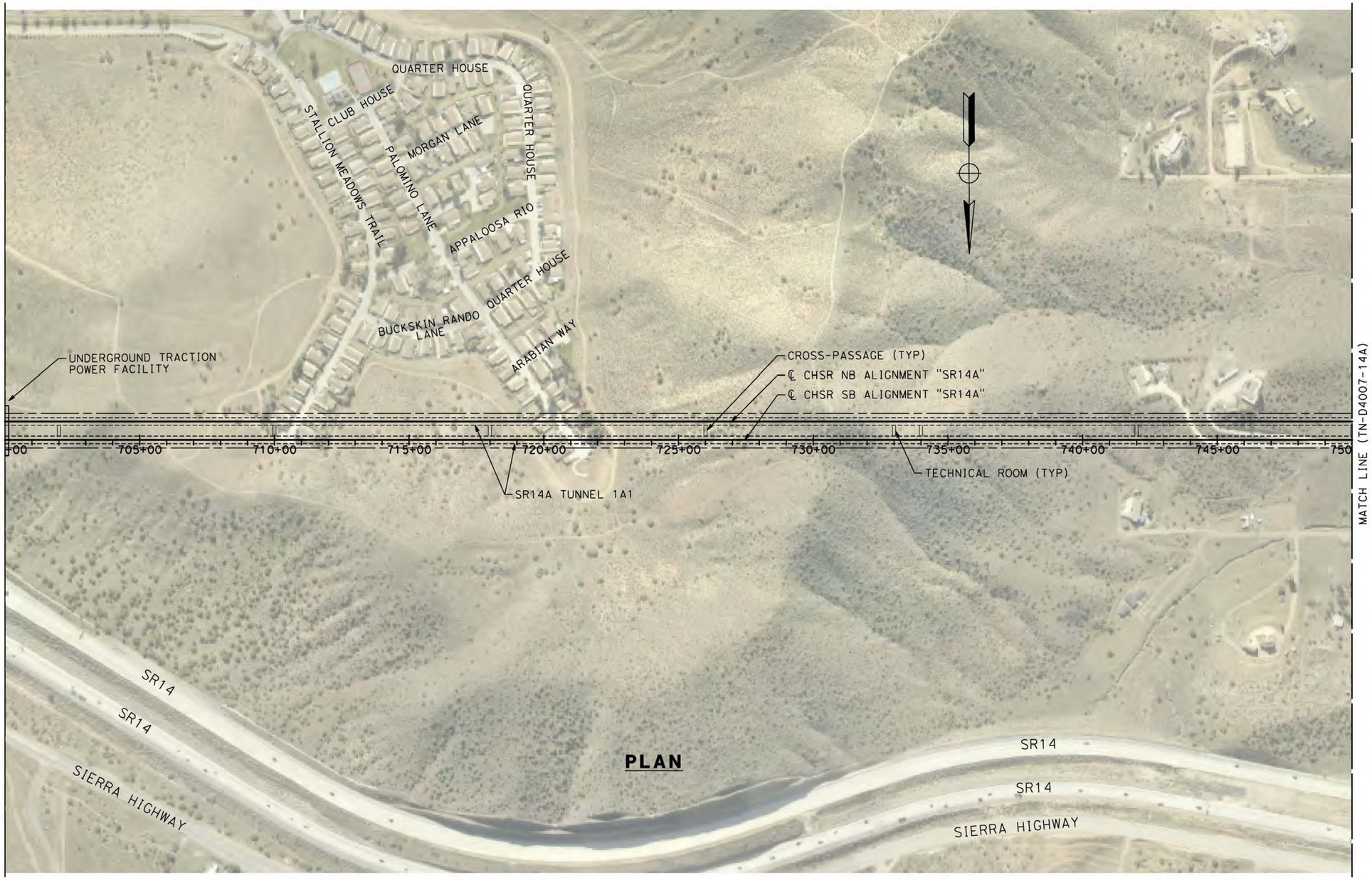
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

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



PLAN

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM SR14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

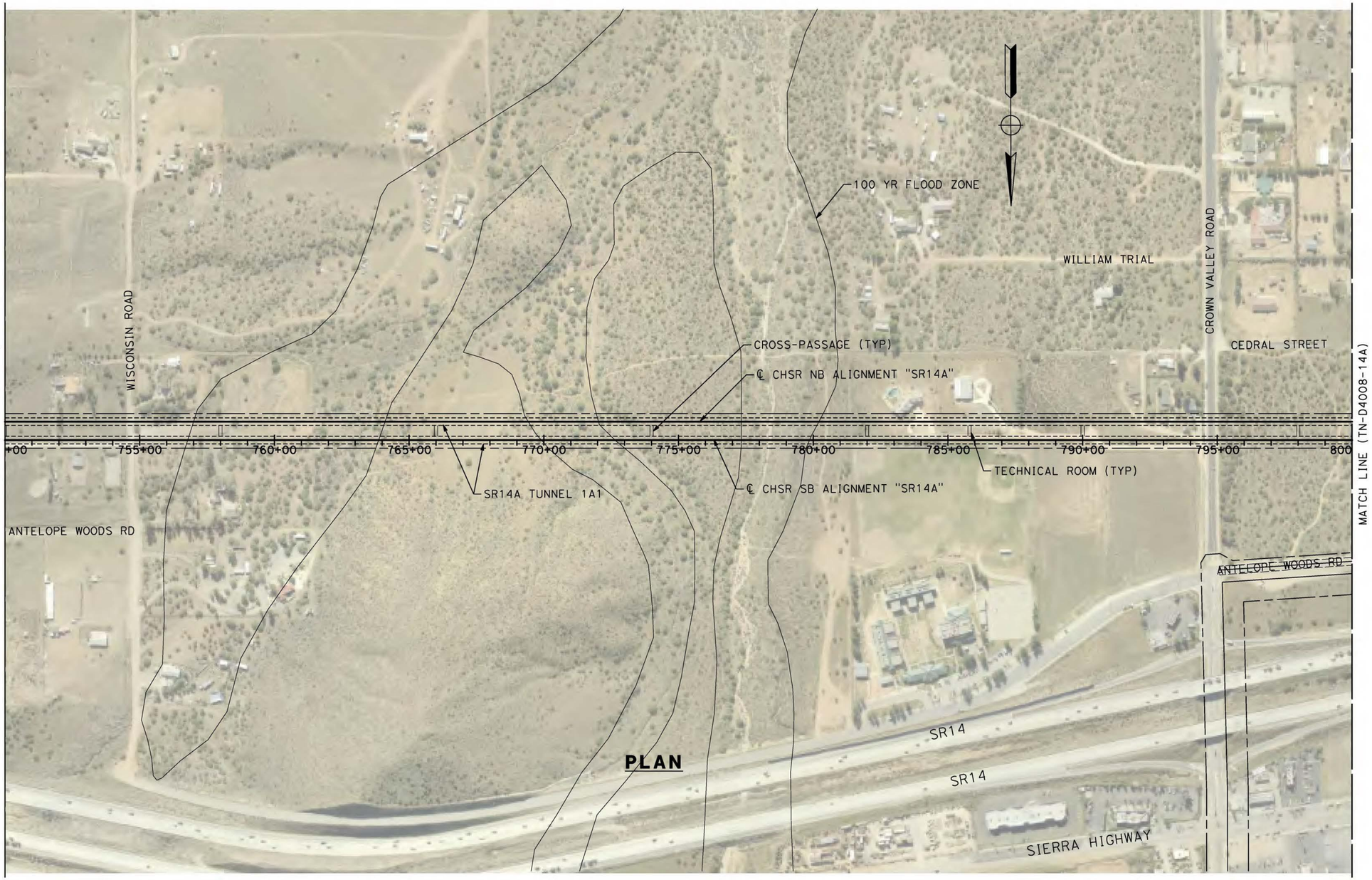
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

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

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4006-14A
SCALE AS SHOWN
SHEET NO.

TUNNEL 1A1



REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM SR14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

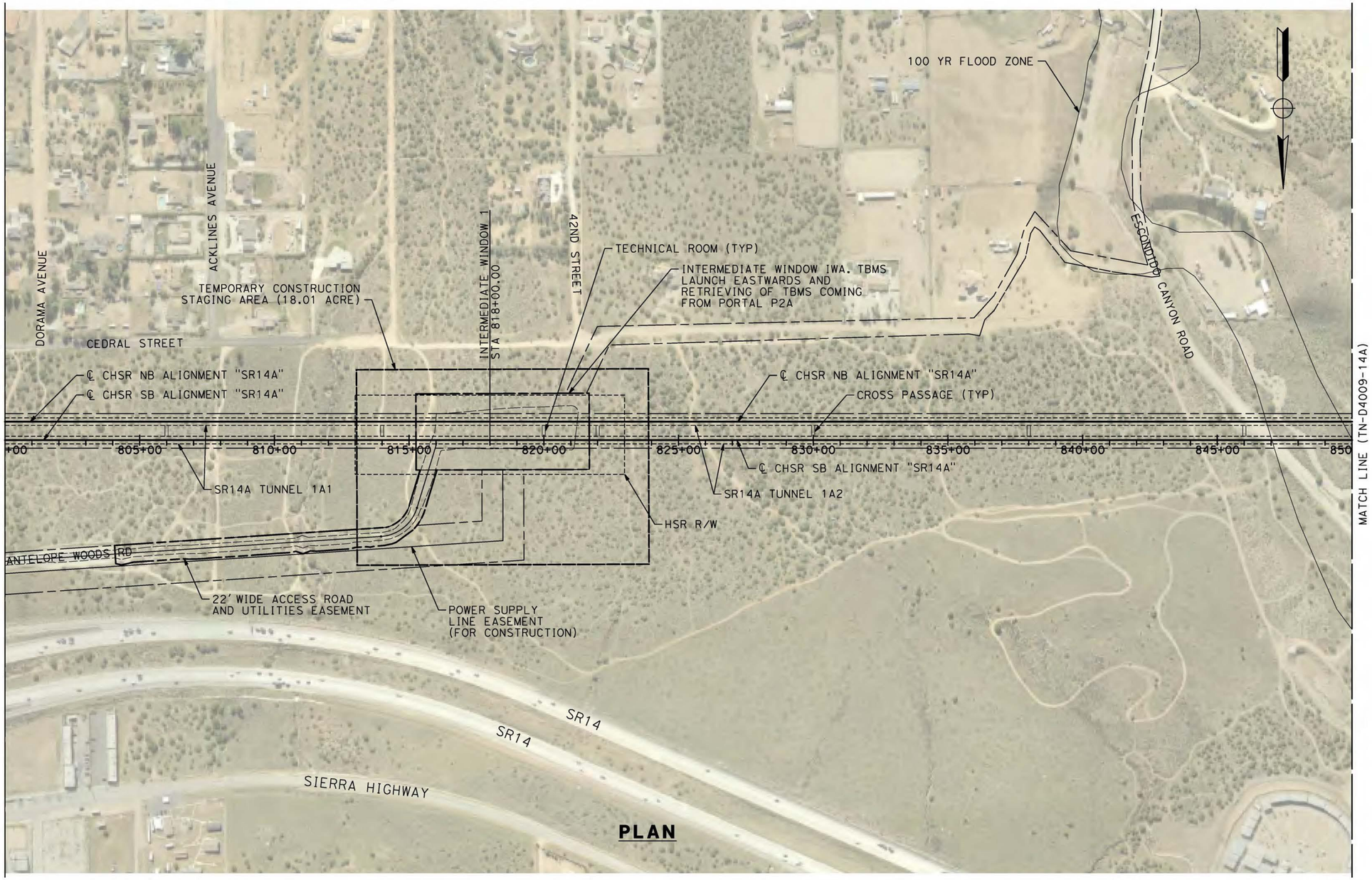
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

ALIGNMENT "SR14A"
PLAN
STA 750+00.00 TO STA 800+00.00

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

TUNNEL 1A1/1A2



PLAN

200 0 200 400
1"=200

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET ADDENDUM SR14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

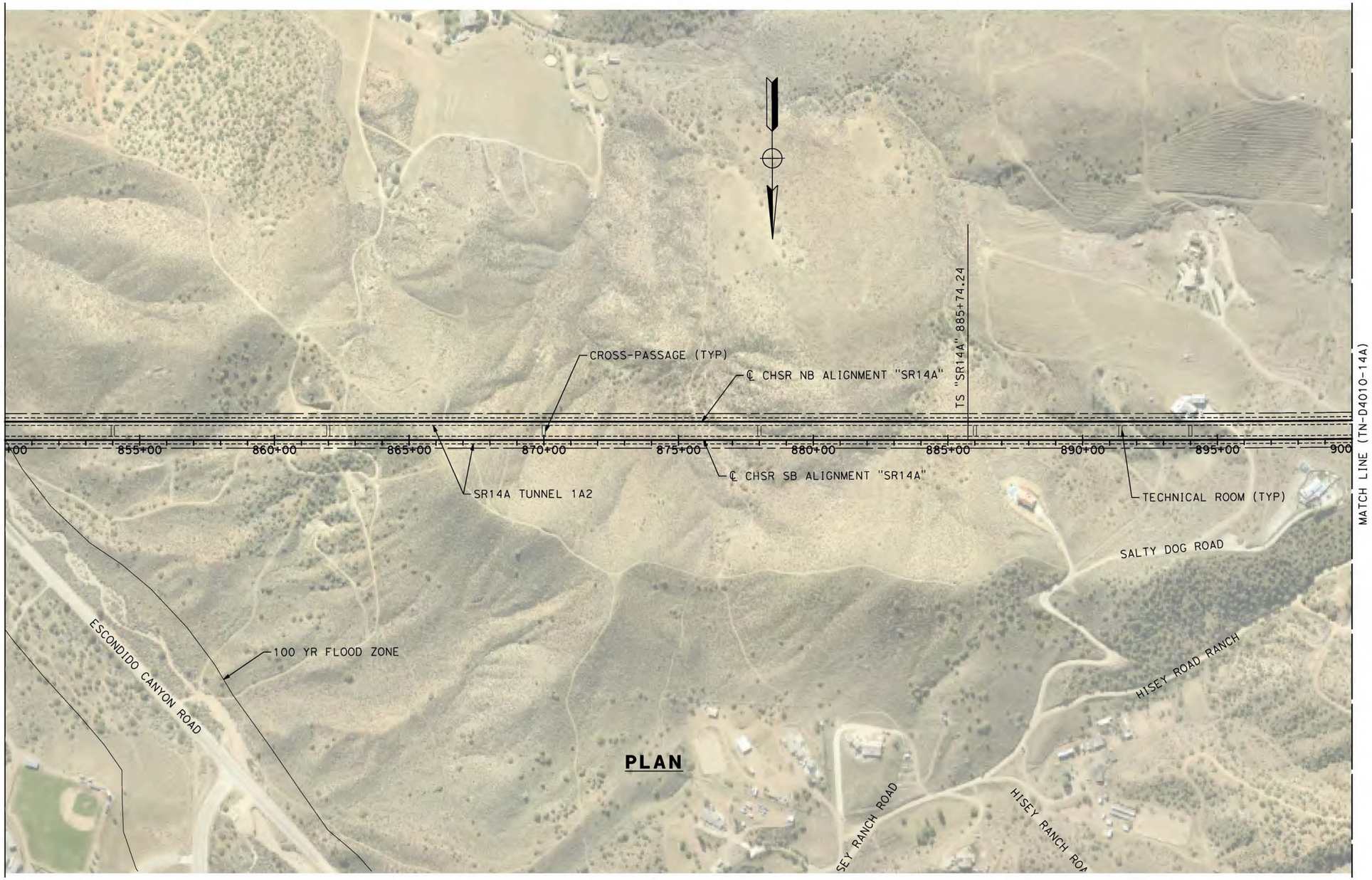
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

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

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4008-14A
SCALE AS SHOWN
SHEET NO.

TUNNEL 1A2



PLAN

200 0 200 400
1"=200

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM SR14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

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

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4009-14A
SCALE AS SHOWN
SHEET NO.

TUNNEL 1A2

PLAN

200 0 200 400
1"=200

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET ADDENDUM SR14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

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

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4010-14A
SCALE AS SHOWN
SHEET NO.

TUNNEL 1A2

PLAN

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM SR14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

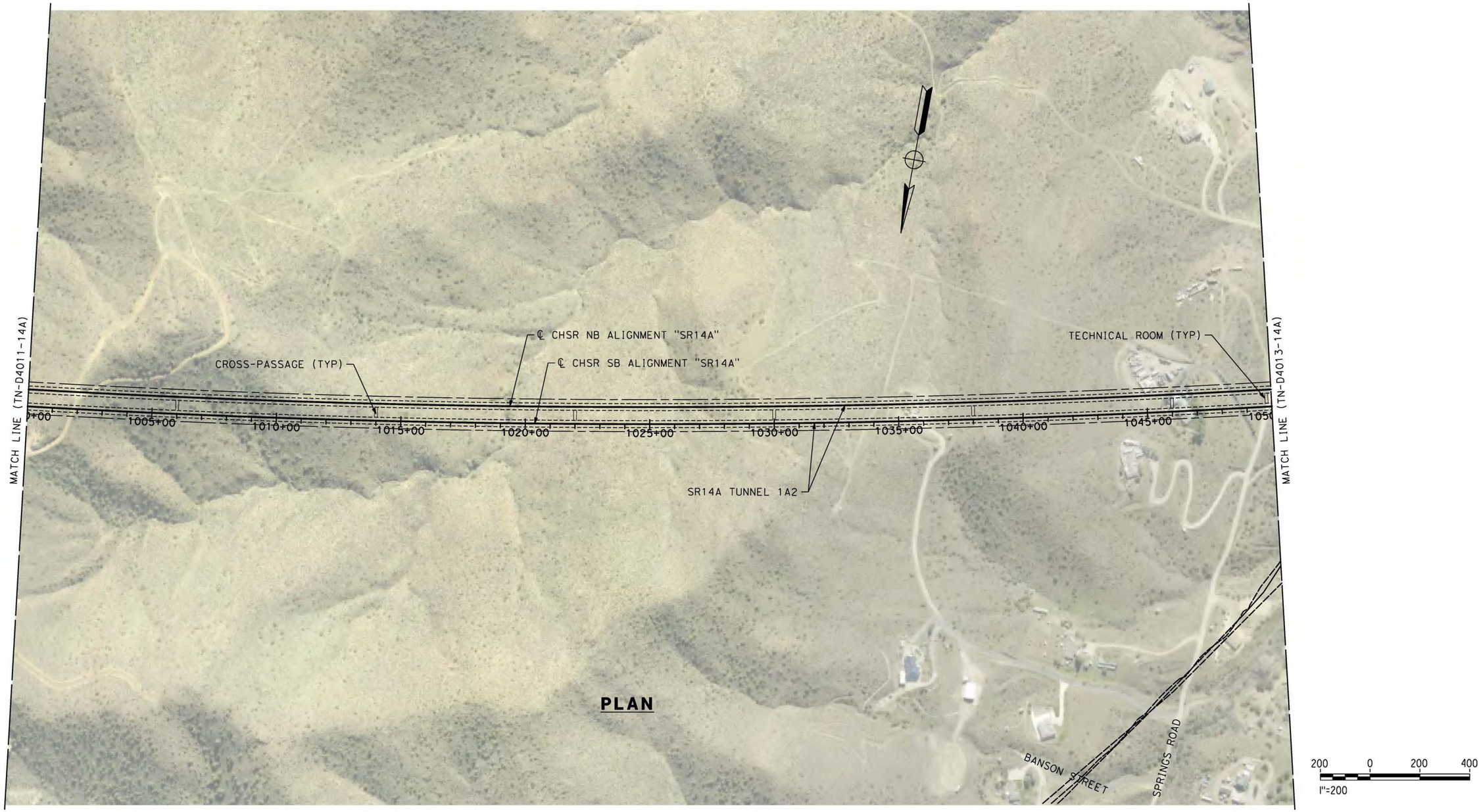
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

ALIGNMENT "SR14A"
PLAN
STA 950+00.00 TO STA 1000+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4011-14A
SCALE AS SHOWN
SHEET NO.

TUNNEL 1A2



PLAN

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET ADDENDUM SR14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

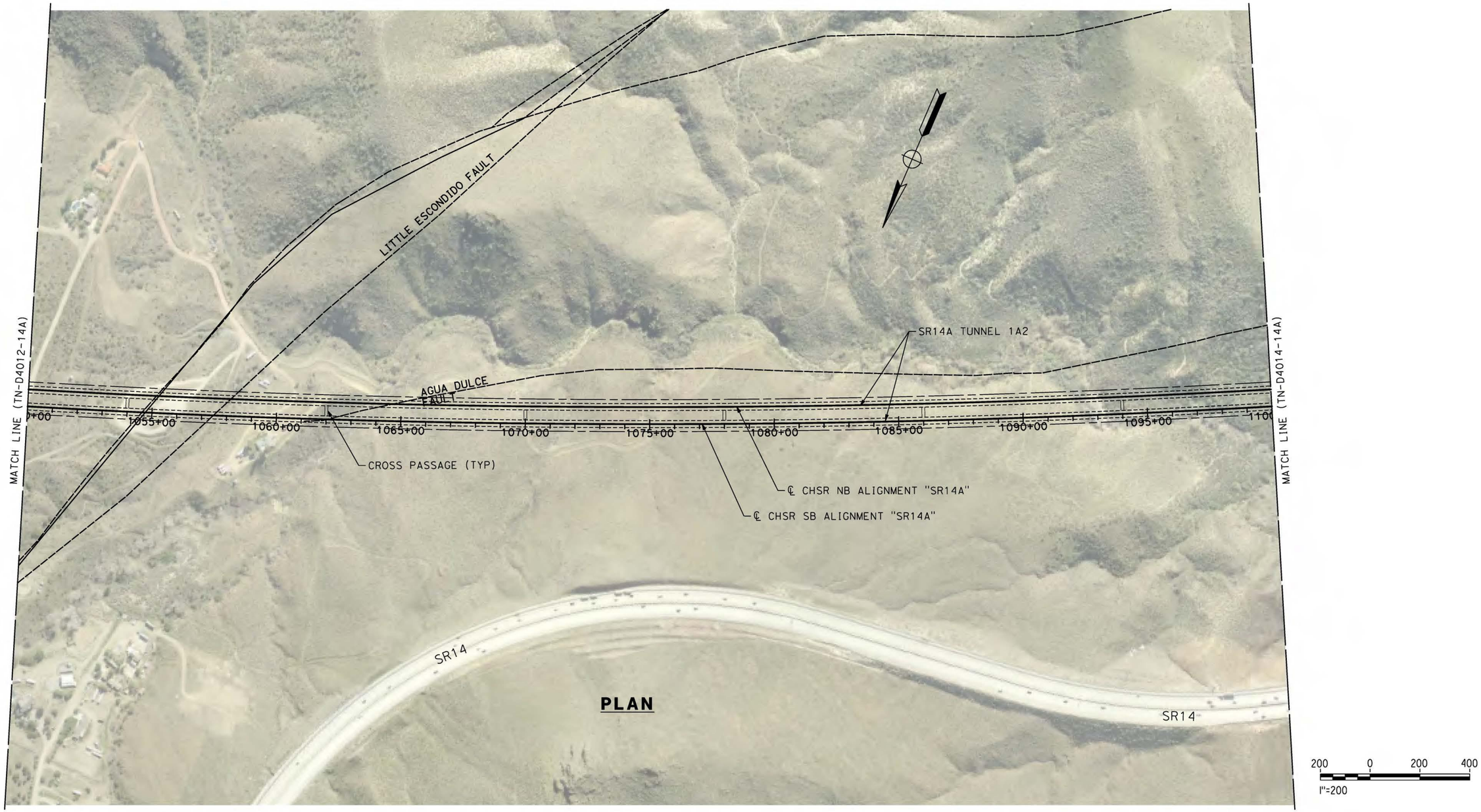
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

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

200 0 200 400
1"=200

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET ADDENDUM SR14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

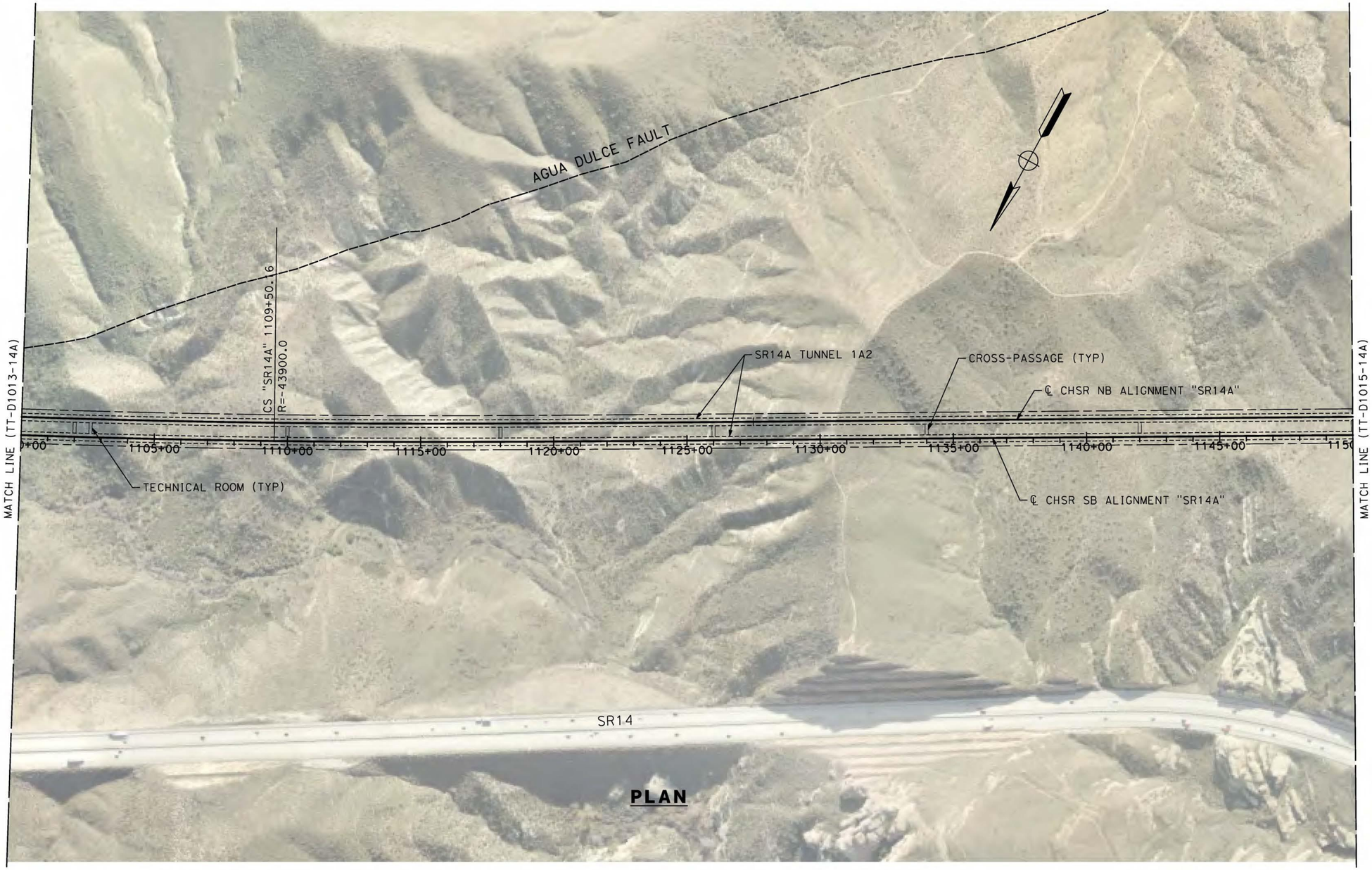
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

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.

TUNNEL 1A2



PLAN

200 0 200 400
1"=200

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET ADDENDUM SR14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

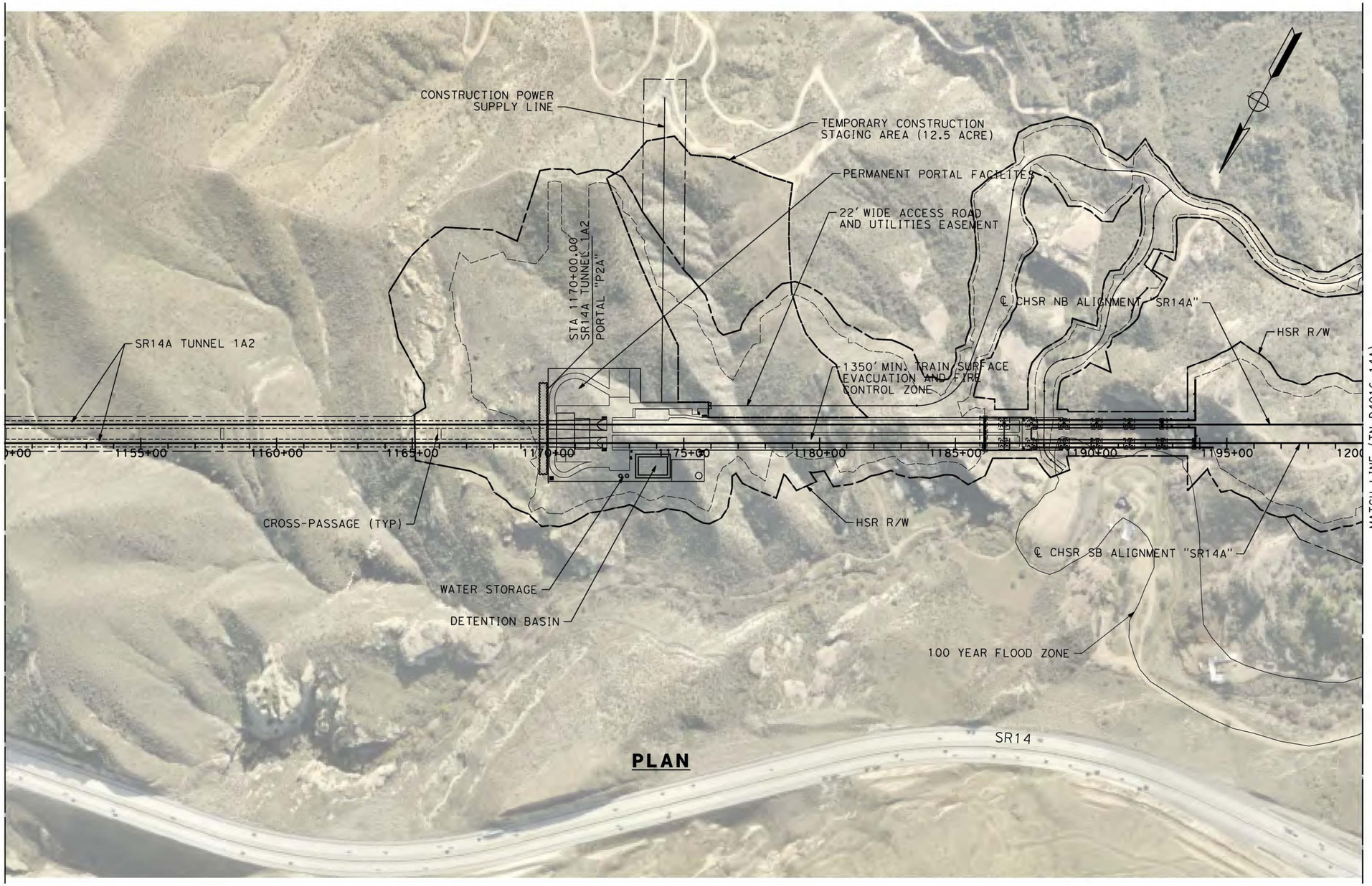
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

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



PLAN

200 0 200 400
1"=200

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 FJ.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

PEPD RECORD SET ADDENDUM SR14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

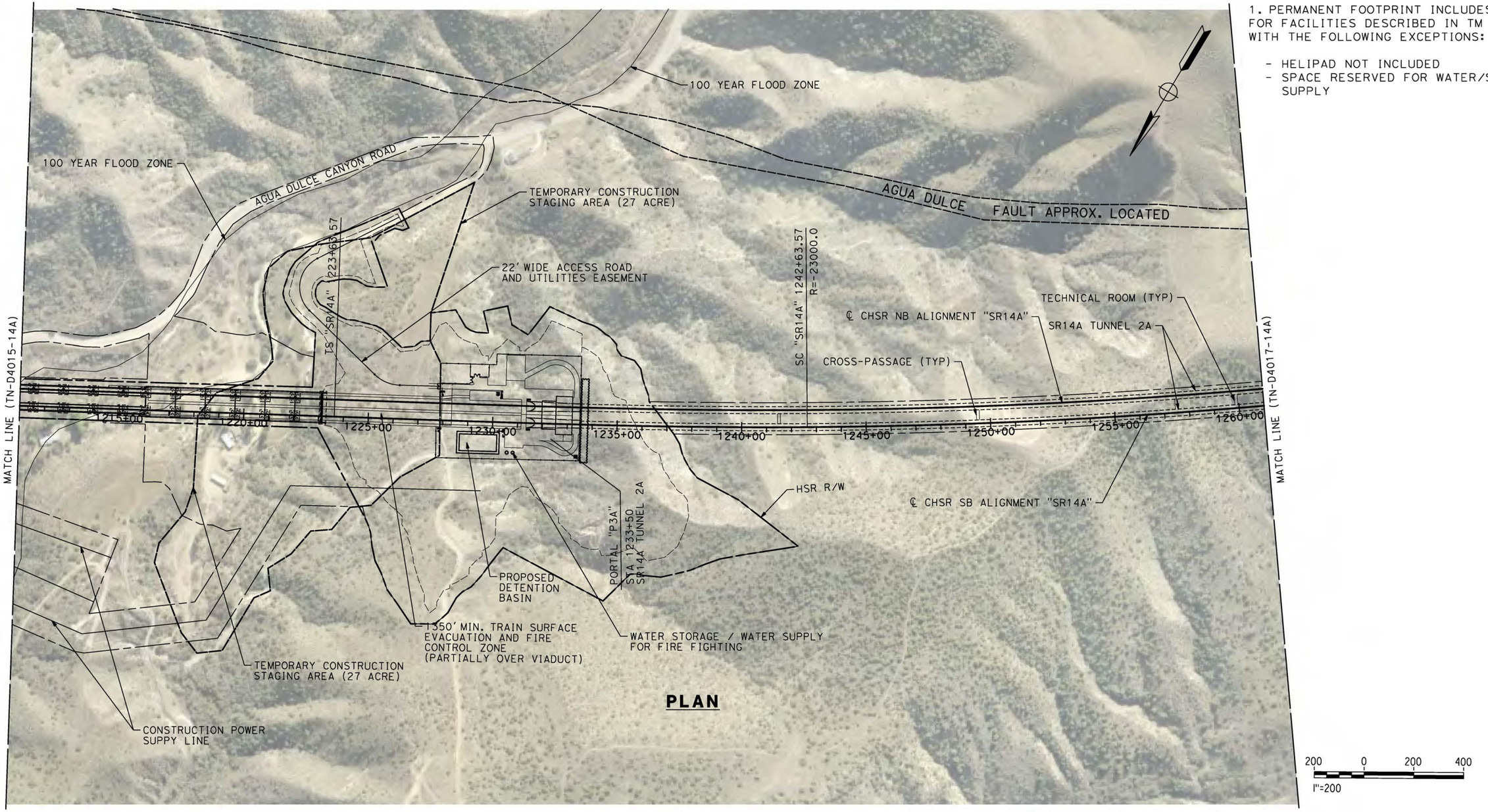
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

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



PLAN

200 0 200 400
1"=200

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
0205240					

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

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

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

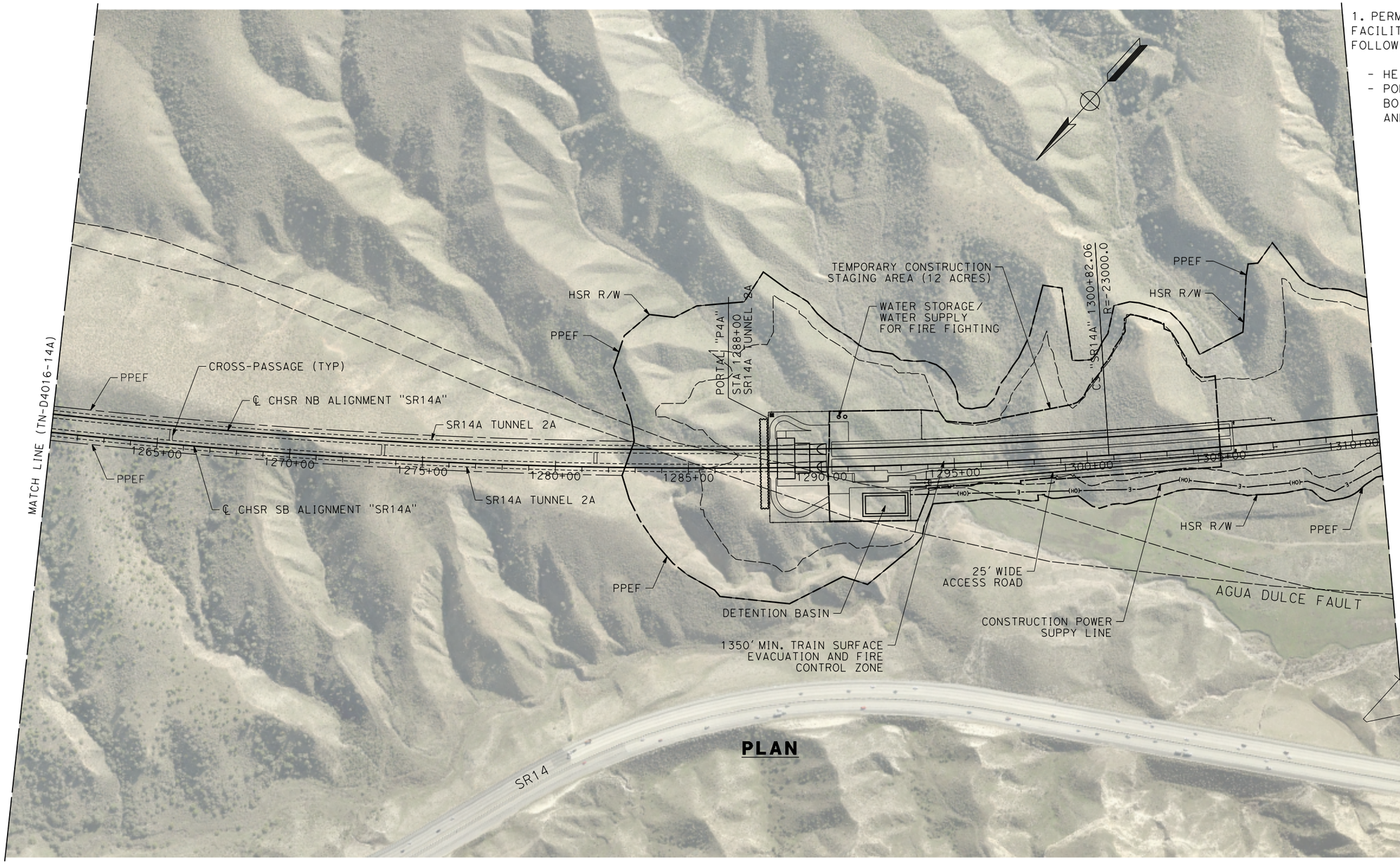
CONTRACT NO. HSR14-42
DRAWING NO. TN-D4016-14A
SCALE AS SHOWN
SHEET NO.

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

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET ADDENDUM SR14A/E1A/E2A

NOT FOR CONSTRUCTION

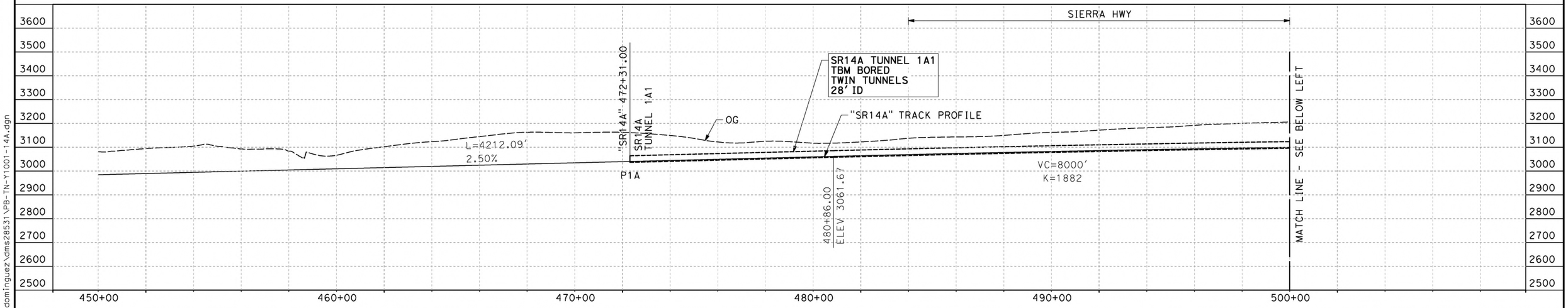
sener

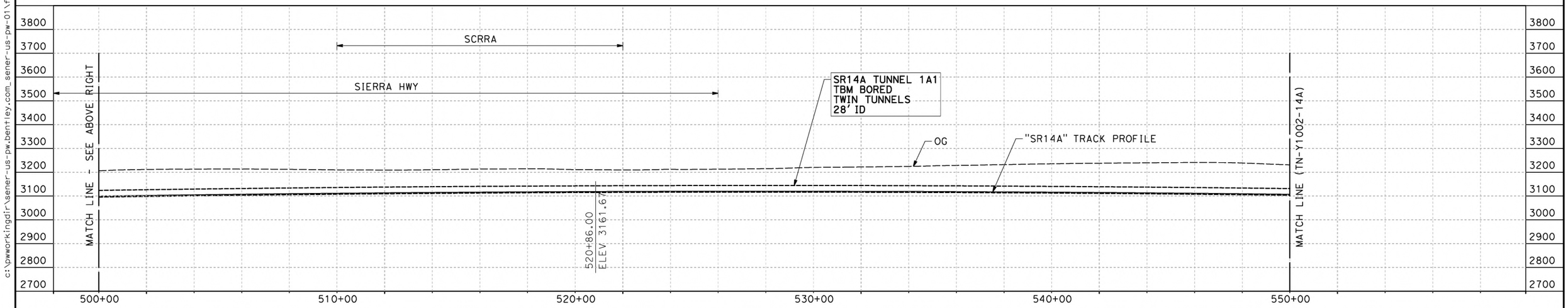
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

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.





200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

PROFILE

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

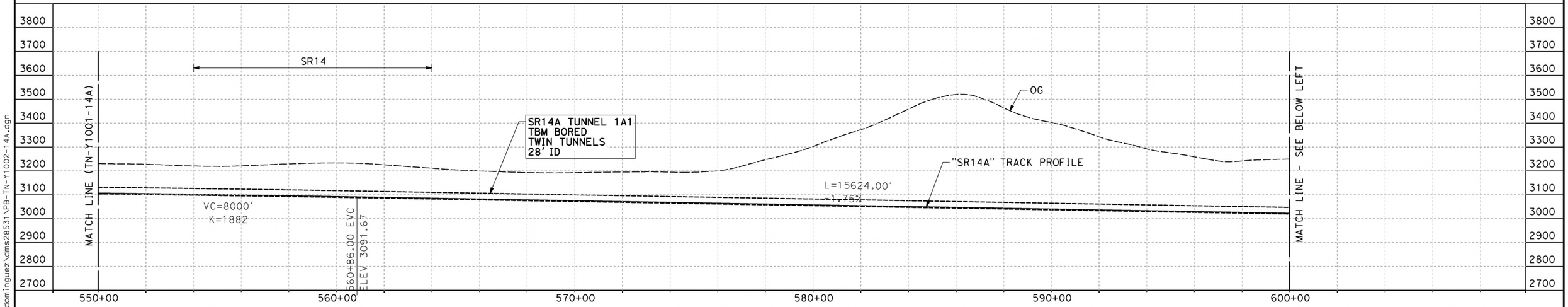
NOT FOR CONSTRUCTION

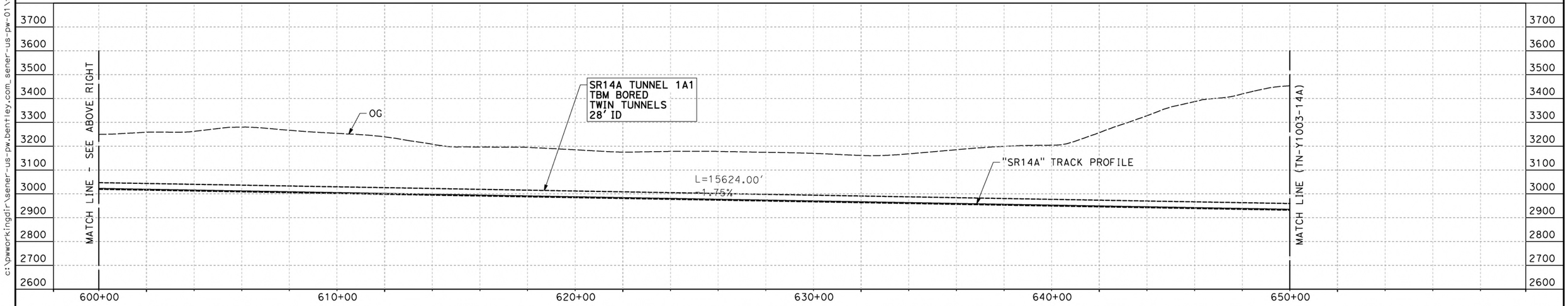
SENER

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

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
DRAWING NO. TN-Y1001-14A
SCALE AS SHOWN
SHEET NO.





200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

PROFILE

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

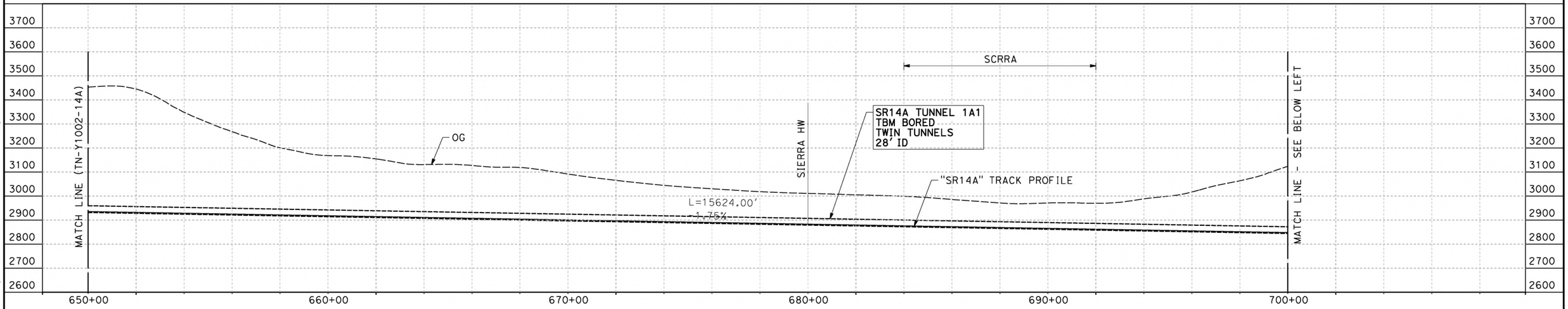
NOT FOR CONSTRUCTION

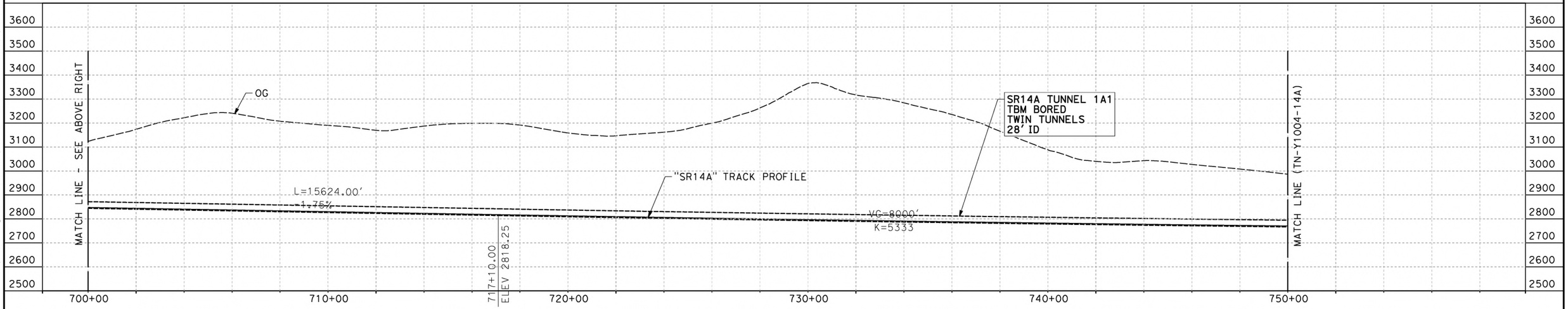
SENER

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

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
DRAWING NO. TN-Y1002-14A
SCALE AS SHOWN
SHEET NO.





200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

PROFILE

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

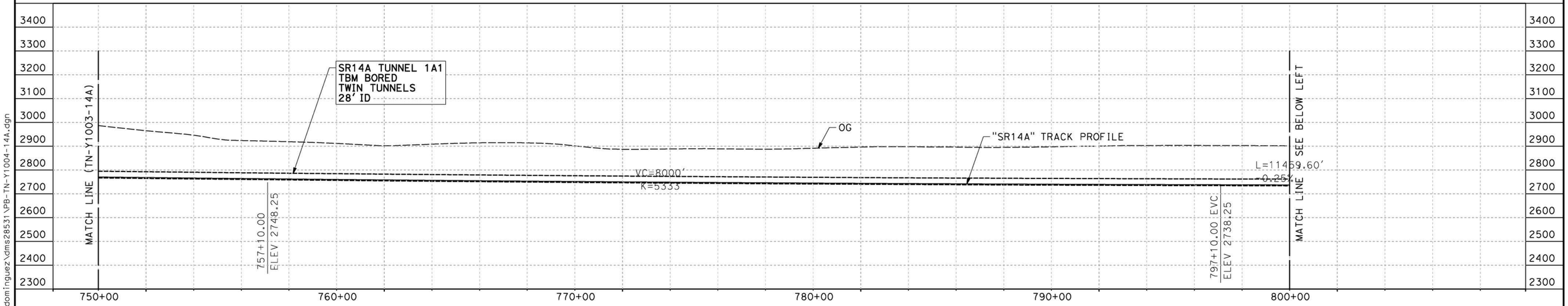
NOT FOR CONSTRUCTION

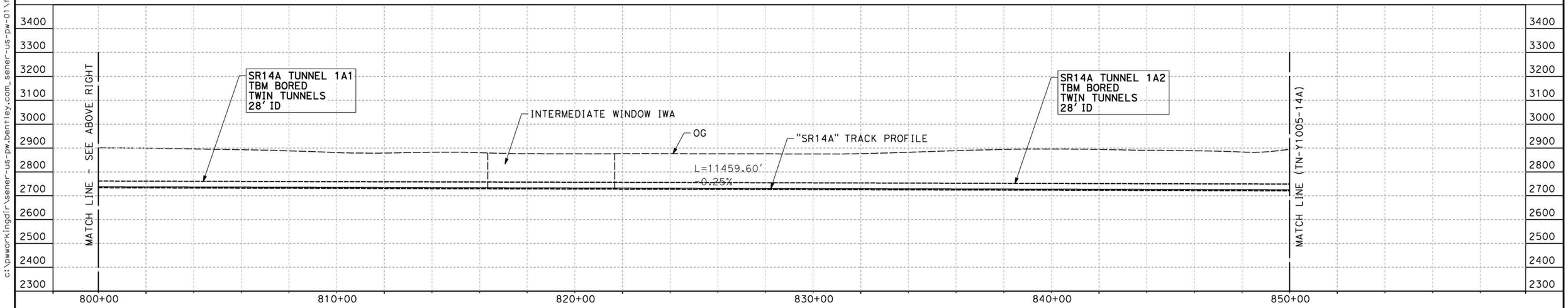
SENER

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "SR14A"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 650+00.00 TO STA 750+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1003-14A
SCALE AS SHOWN
SHEET NO.





200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

PROFILE

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

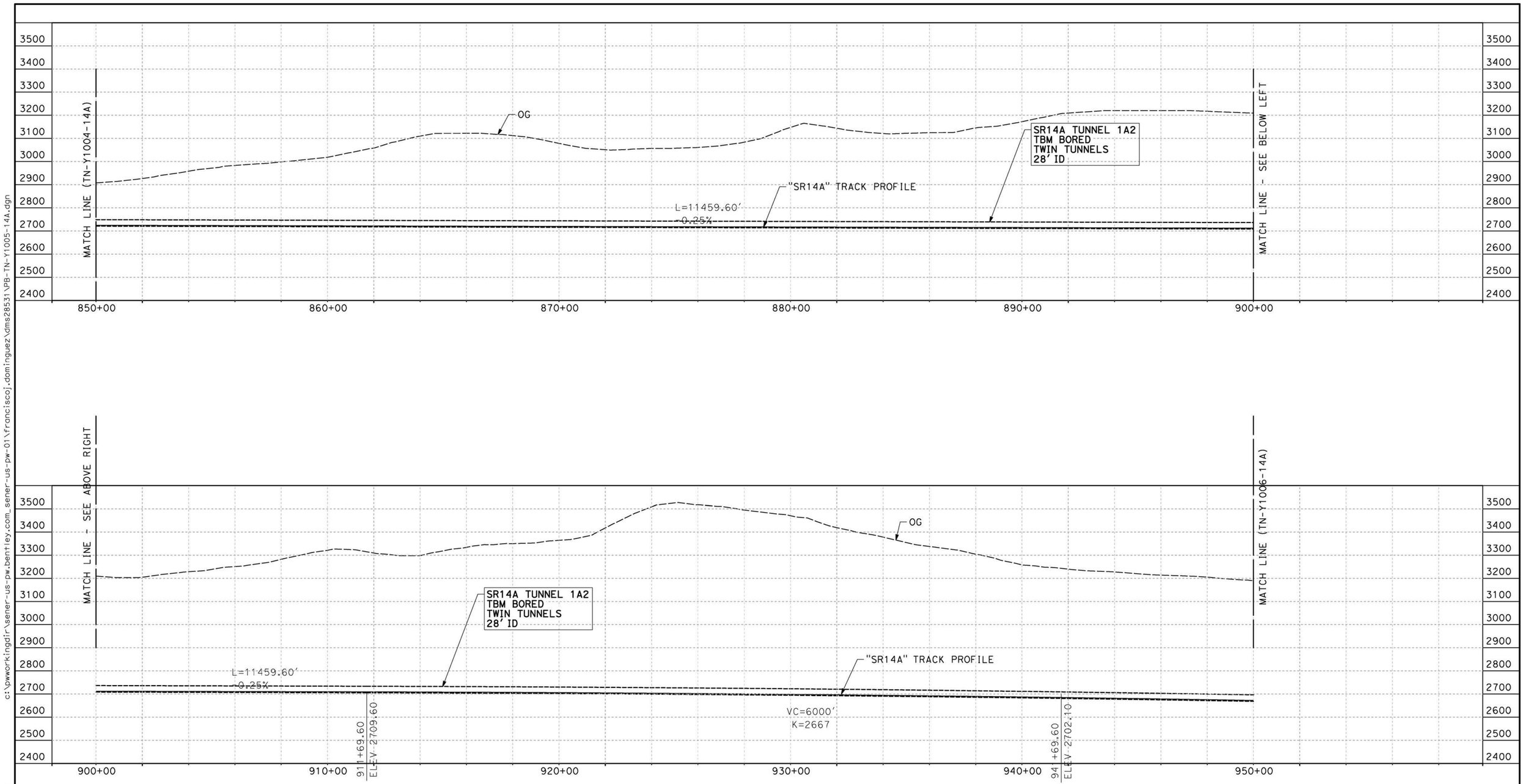
NOT FOR CONSTRUCTION

SENER

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "SR14A"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 750+00.00 TO STA 850+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1004-14A
SCALE AS SHOWN
SHEET NO.



200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

PROFILE

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

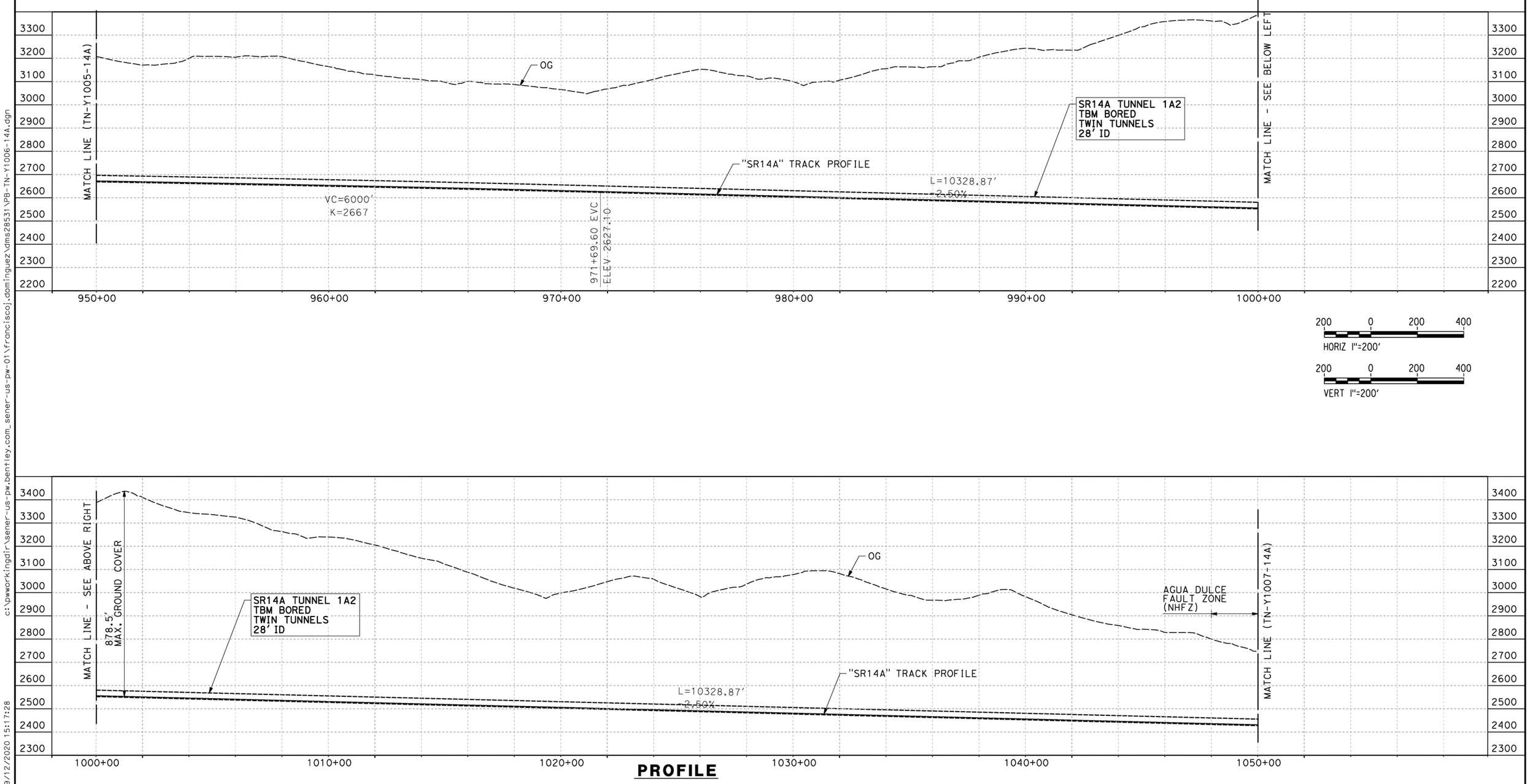
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

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
DRAWING NO. TN-Y1005-14A
SCALE AS SHOWN
SHEET NO.



PROFILE

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

NOT FOR CONSTRUCTION

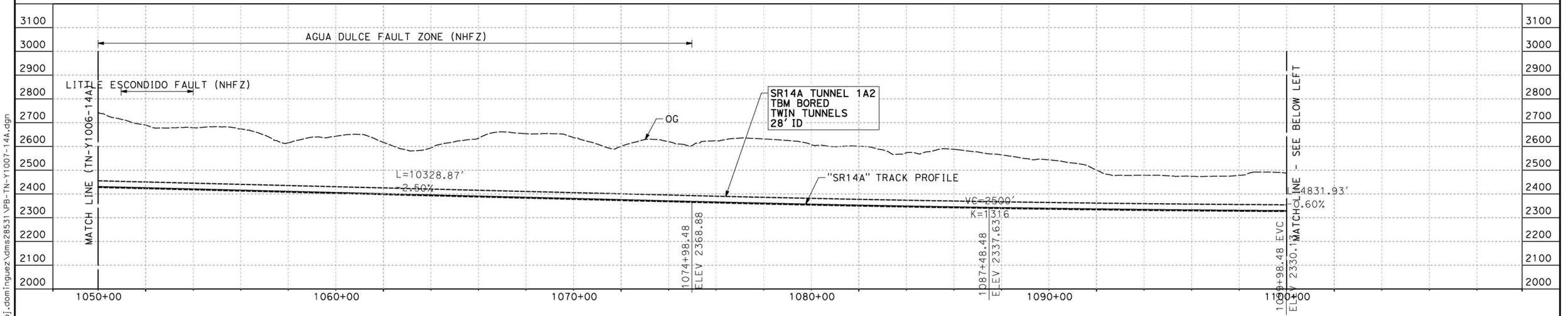
SENER

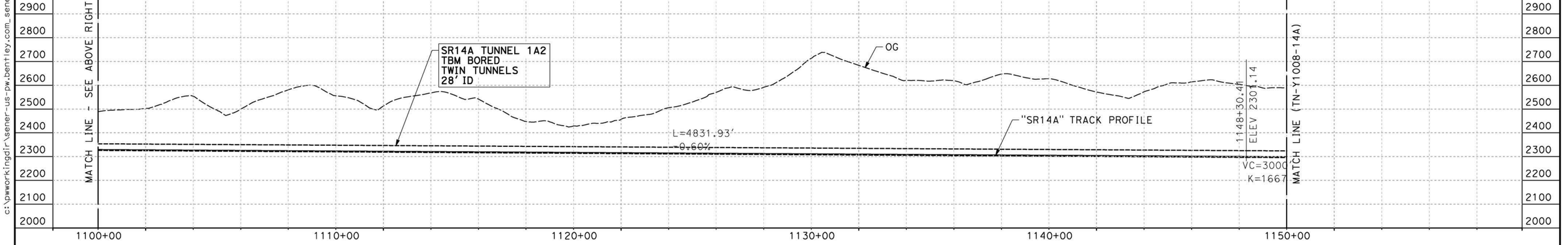
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

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
DRAWING NO. TN-Y1006-14A
SCALE AS SHOWN
SHEET NO.





200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

PROFILE

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

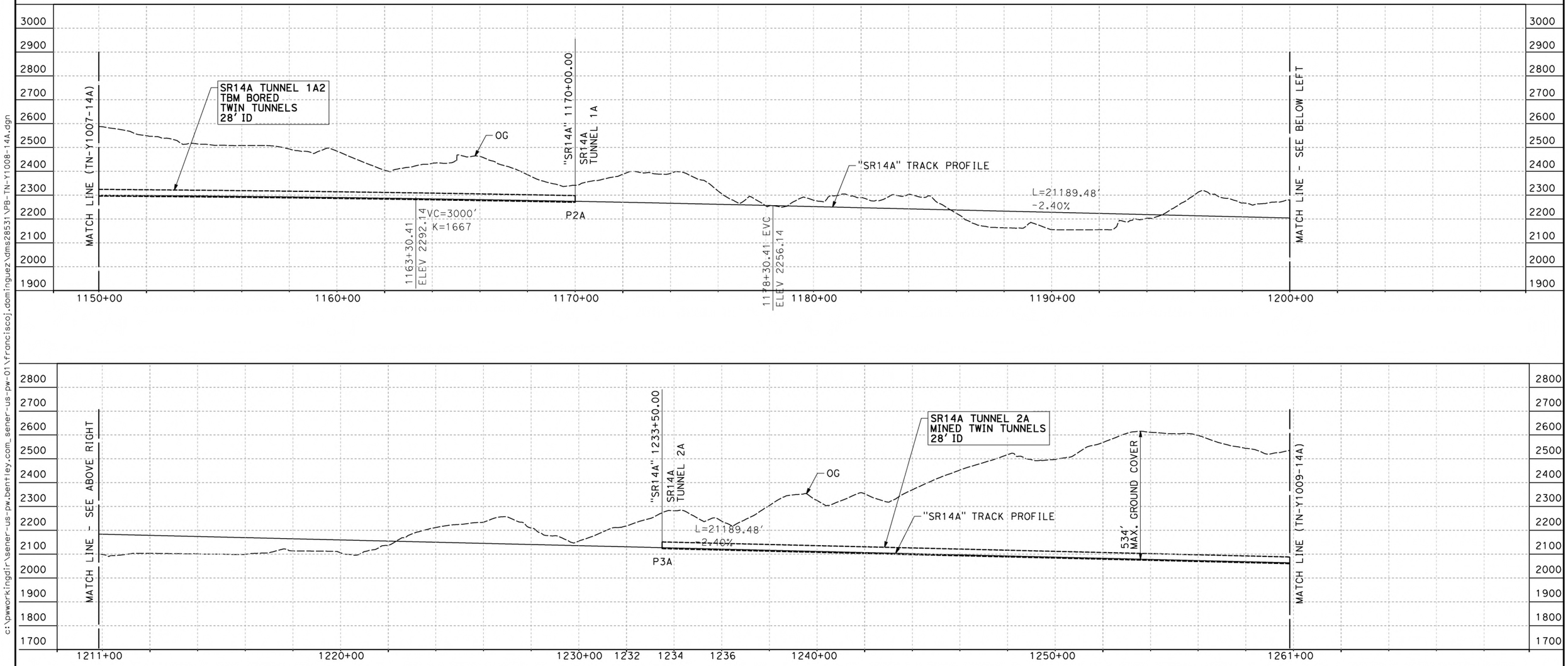
NOT FOR CONSTRUCTION

SENER

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

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
DRAWING NO. TN-Y1007-14A
SCALE AS SHOWN
SHEET NO.



200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

PROFILE

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

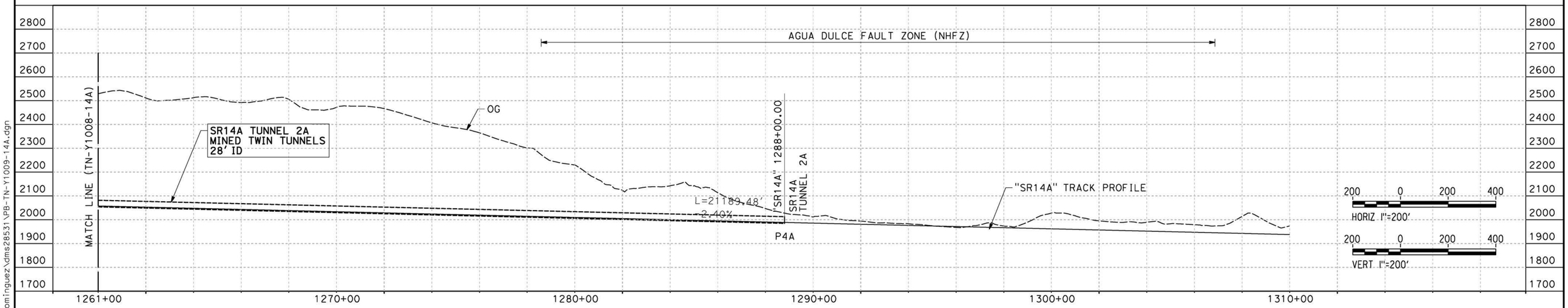
NOT FOR CONSTRUCTION

SENER

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
DRAWING NO. TN-Y1008-14A
SCALE AS SHOWN
SHEET NO.



PROFILE

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

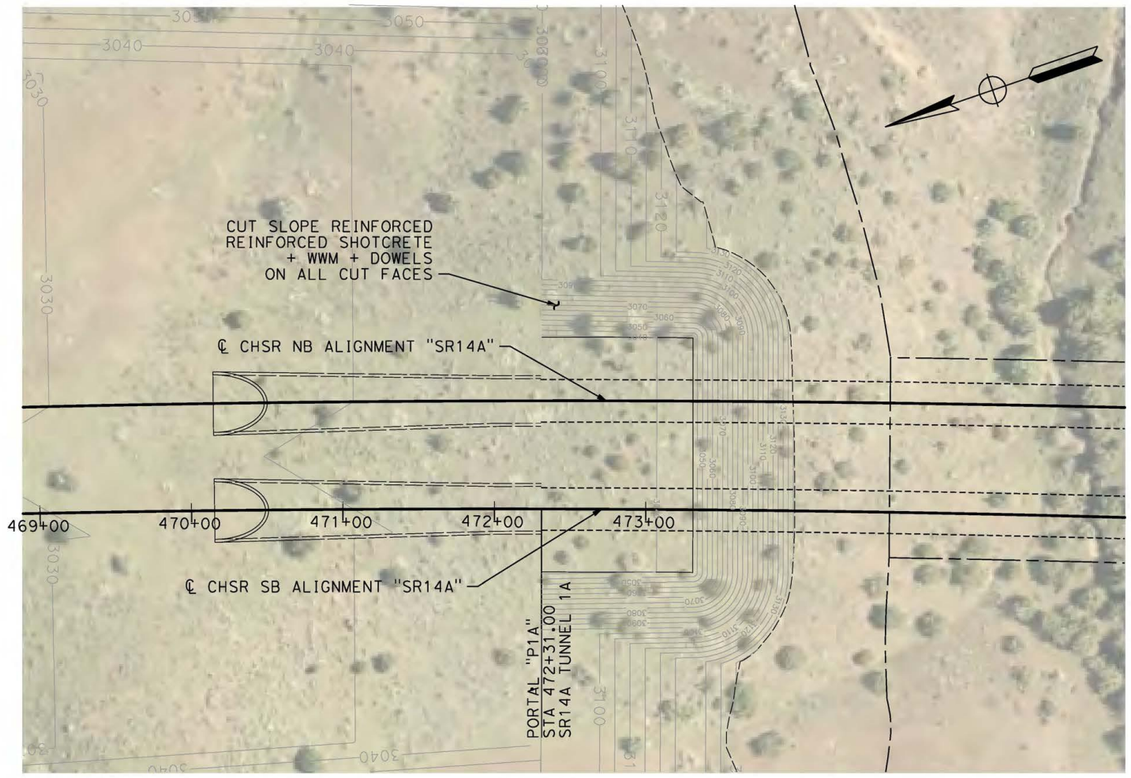
NOT FOR CONSTRUCTION

SENER

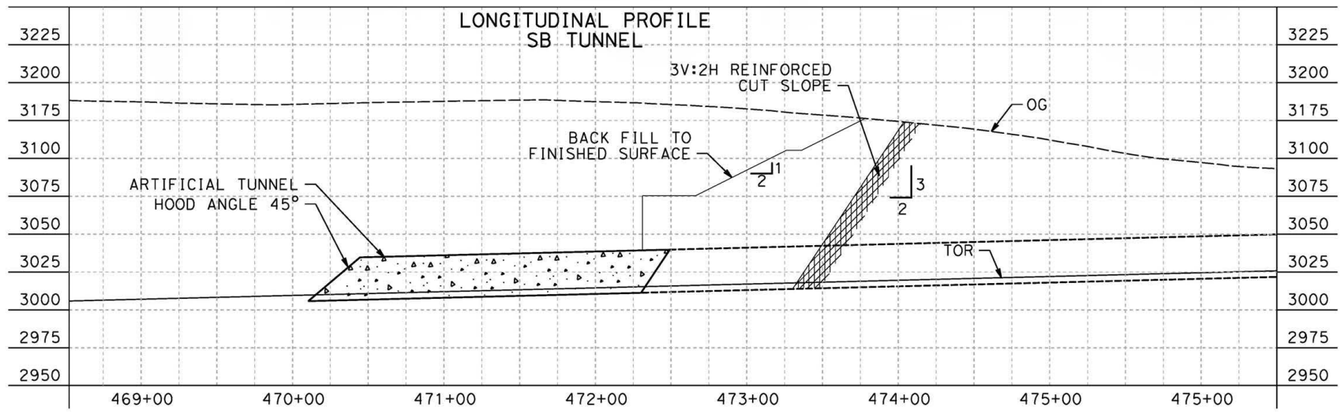
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "SR14"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1261+00.00 TO STA 1311+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1009-14A
SCALE AS SHOWN
SHEET NO.



PLAN



PROFILE

NOTE :

1. EXAMPLE OF ROCK CUT SLOPE REINFORCEMENT AT PORTAL MOUTH
   - 2 IN OF SHOTCRETE WITH STEEL FIBERS (50 KG/ M^3)
   - 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

50 0 50 100
HORIZ 1"=50'

50 0 50 100
VERT 1"=50'

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

NOT FOR CONSTRUCTION

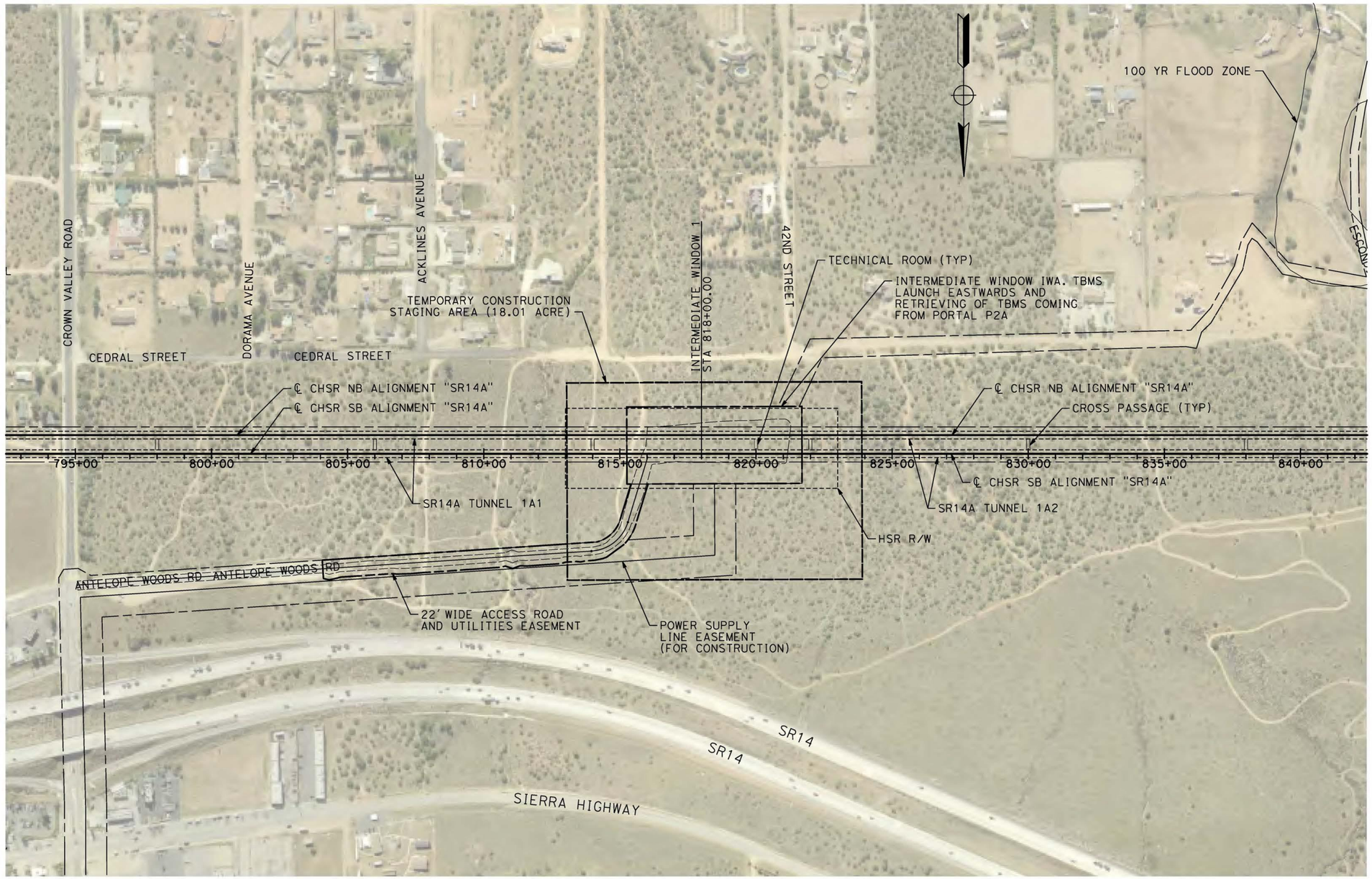
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

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.



200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

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

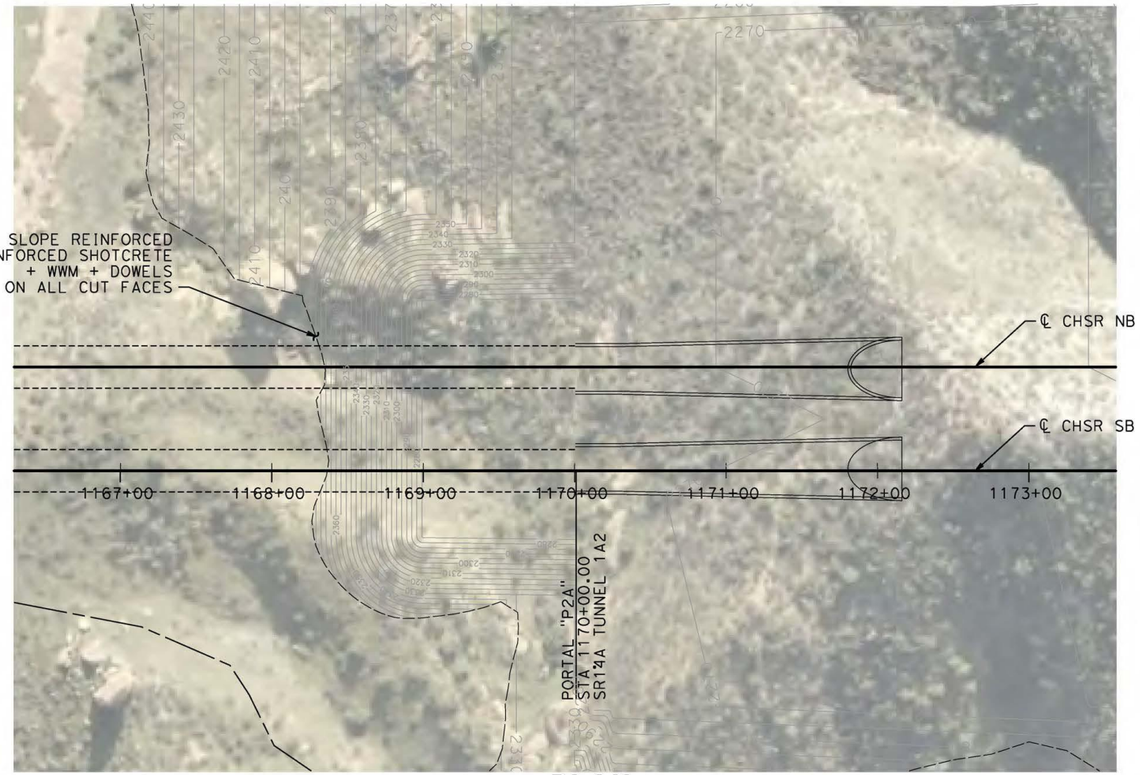
PEPD RECORD SET
ADDENDUM SR14A/E1A/E2A
NOT FOR CONSTRUCTION

SENER

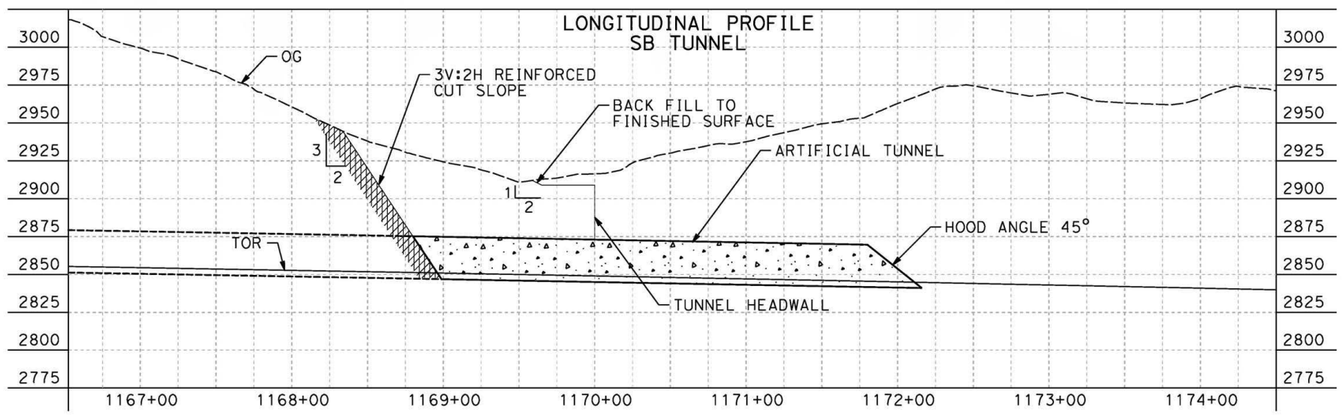
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "SR14A"
INTERMEDIATE WINDOW IWA
PLAN

CONTRACT NO. HSR14-42
DRAWING NO. TN-D7002-14A
SCALE AS SHOWN
SHEET NO.



PLAN



PROFILE

NOTE :

1. EXAMPLE OF ROCK CUT SLOPE REINFORCEMENT AT PORTAL MOUTH
   - 2 IN OF SHOTCRETE WITH STEEL FIBERS (50 KG/ M^3)
   - 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

50 0 50 100
HORIZ 1"=50'

50 0 50 100
VERT 1"=50'

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

NOT FOR CONSTRUCTION

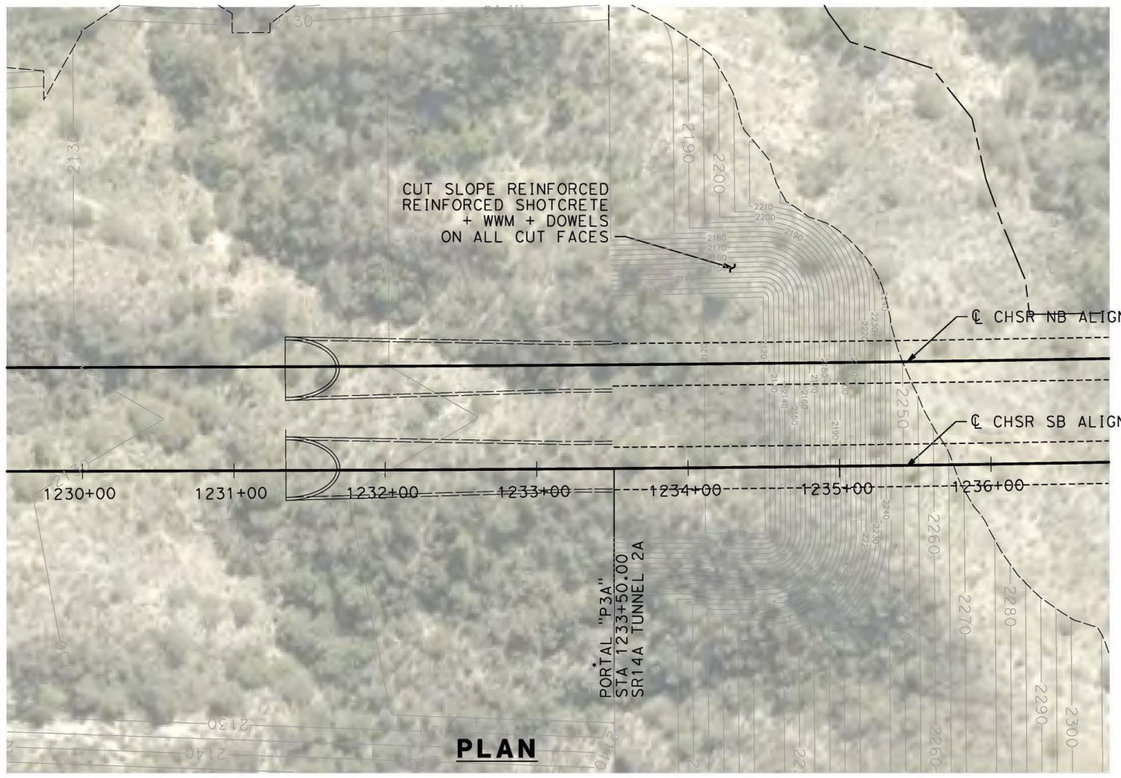
SENER

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

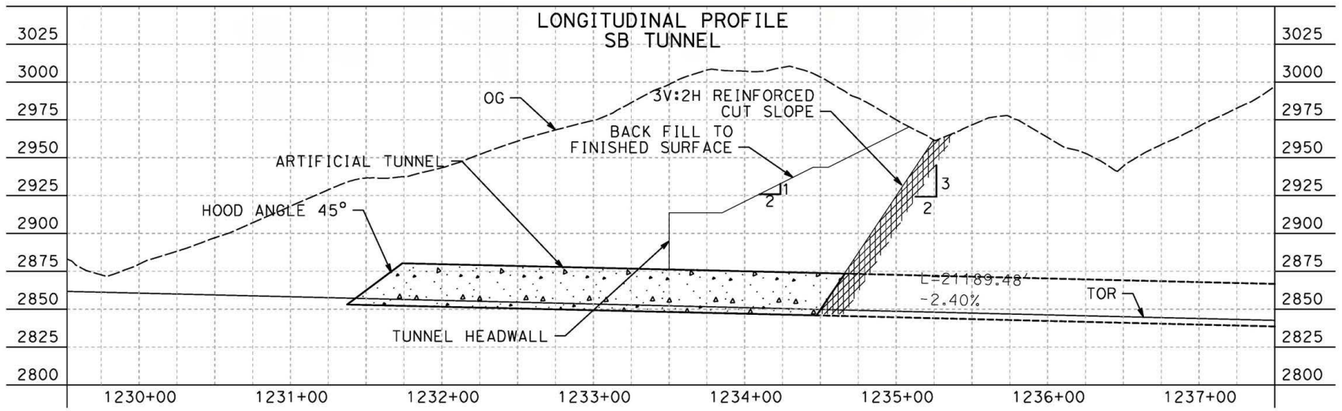
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "SR14A"

PORTAL 2A
PLAN AND PROFILE FOR CONSTRUCTION

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



PLAN



PROFILE

NOTE :

1. EXAMPLE OF ROCK CUT SLOPE REINFORCEMENT AT PORTAL MOUTH
   - 2 IN OF SHOTCRETE WITH STEEL FIBERS (50 KG/ M^3)
   - 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	80,179 CY
FILL VOLUME	69,802 CY
CUT SLOPE SURFACE	57,956 SQFT

50 0 50 100
HORIZ 1"=50'

50 0 50 100
VERT 1"=50'

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

NOT FOR CONSTRUCTION

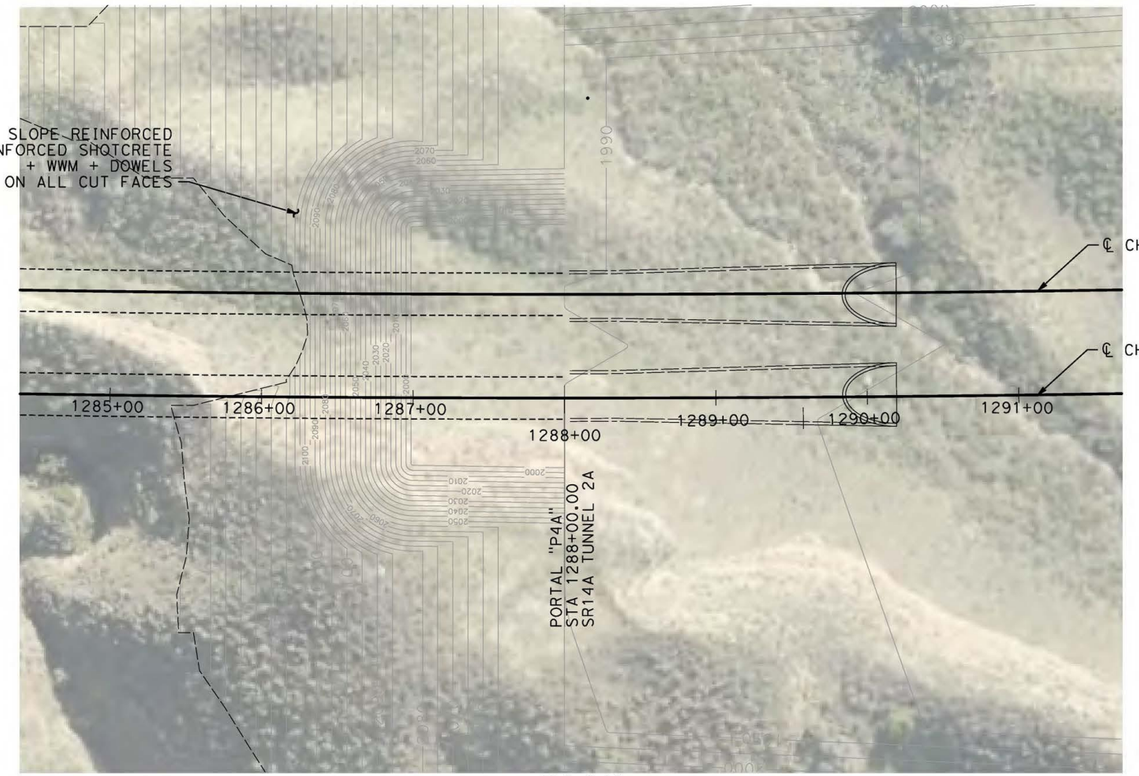
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

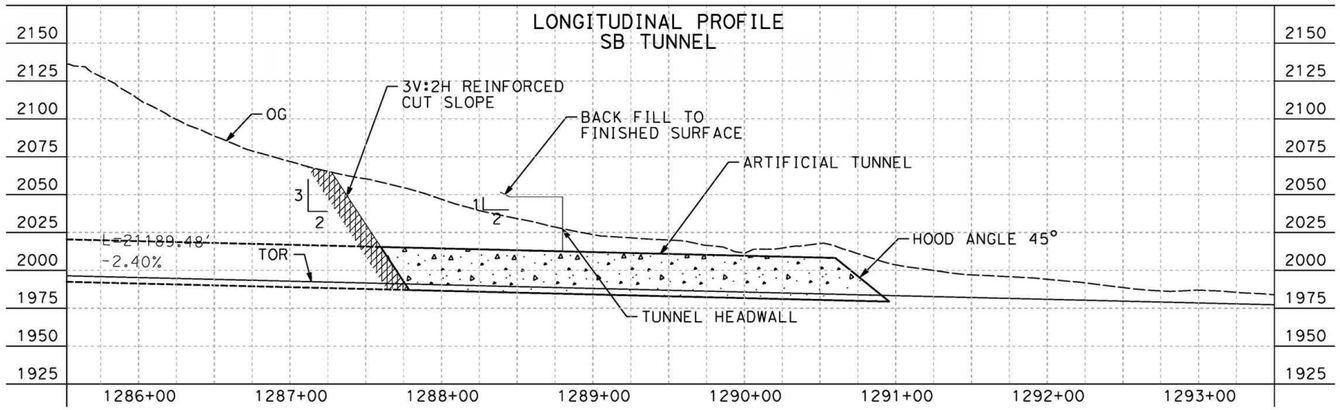
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "SR14A"

PORTAL 3A
PLAN AND PROFILE FOR CONSTRUCTION

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



PLAN

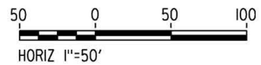


PROFILE

NOTE :

1. EXAMPLE OF ROCK CUT SLOPE REINFORCEMENT AT PORTAL MOUTH
   - 2 IN OF SHOTCRETE WITH STEEL FIBERS (50 KG/ M^3)
   - 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 FJ.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

PEPD RECORD SET
ADDENDUM SR14A/E1A/E2A

NOT FOR CONSTRUCTION

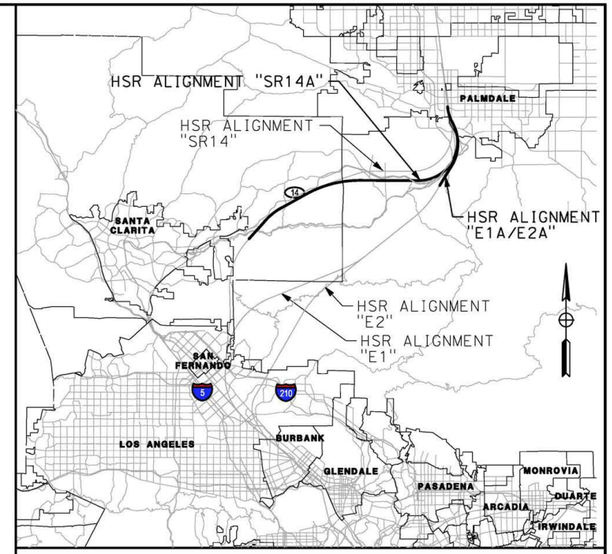
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

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

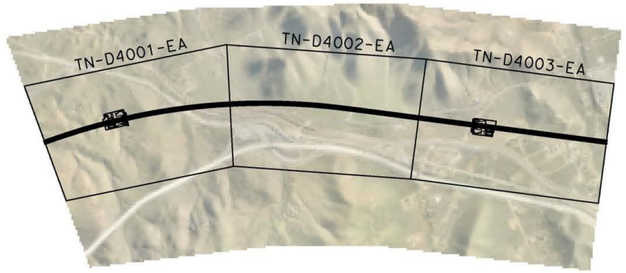
PORTAL 4A
PLAN AND PROFILE FOR CONSTRUCTION

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



VICINITY MAP

E1A/E2A CENTRAL SUBSECTION



2000 0 2000 4000
1"=2000'

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

NOT FOR CONSTRUCTION

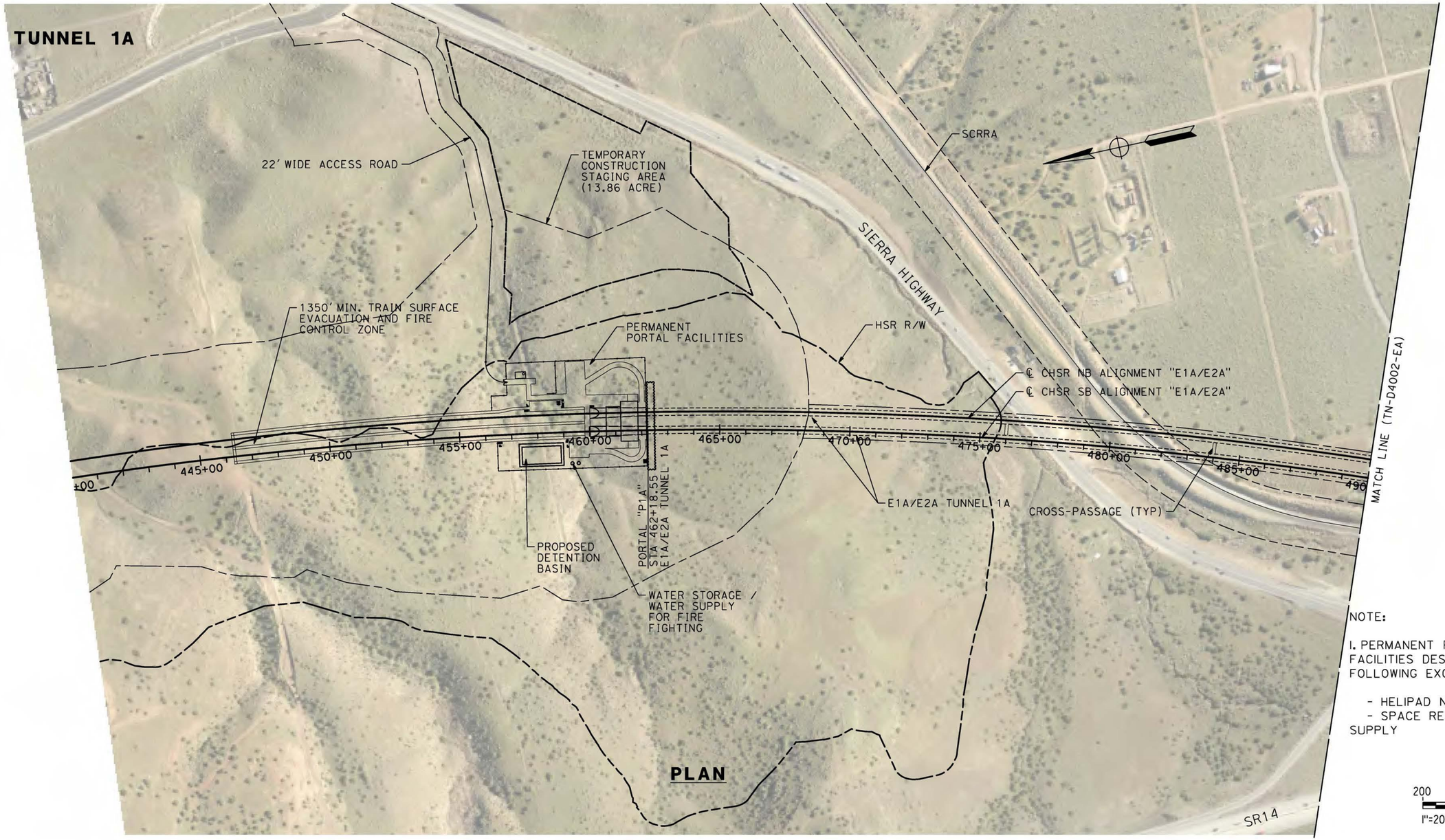
SENER

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

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

HIGH SPEED RAIL TUNNEL PLANS
KEY MAP

CONTRACT NO. HSR14-42
DRAWING NO. TN-B6001-EA
SCALE AS SHOWN
SHEET NO.



PLAN

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

200 0 200 400
1"=200

REV	DATE	BY	CHK	APP	DESCRIPTION

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

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

SENER

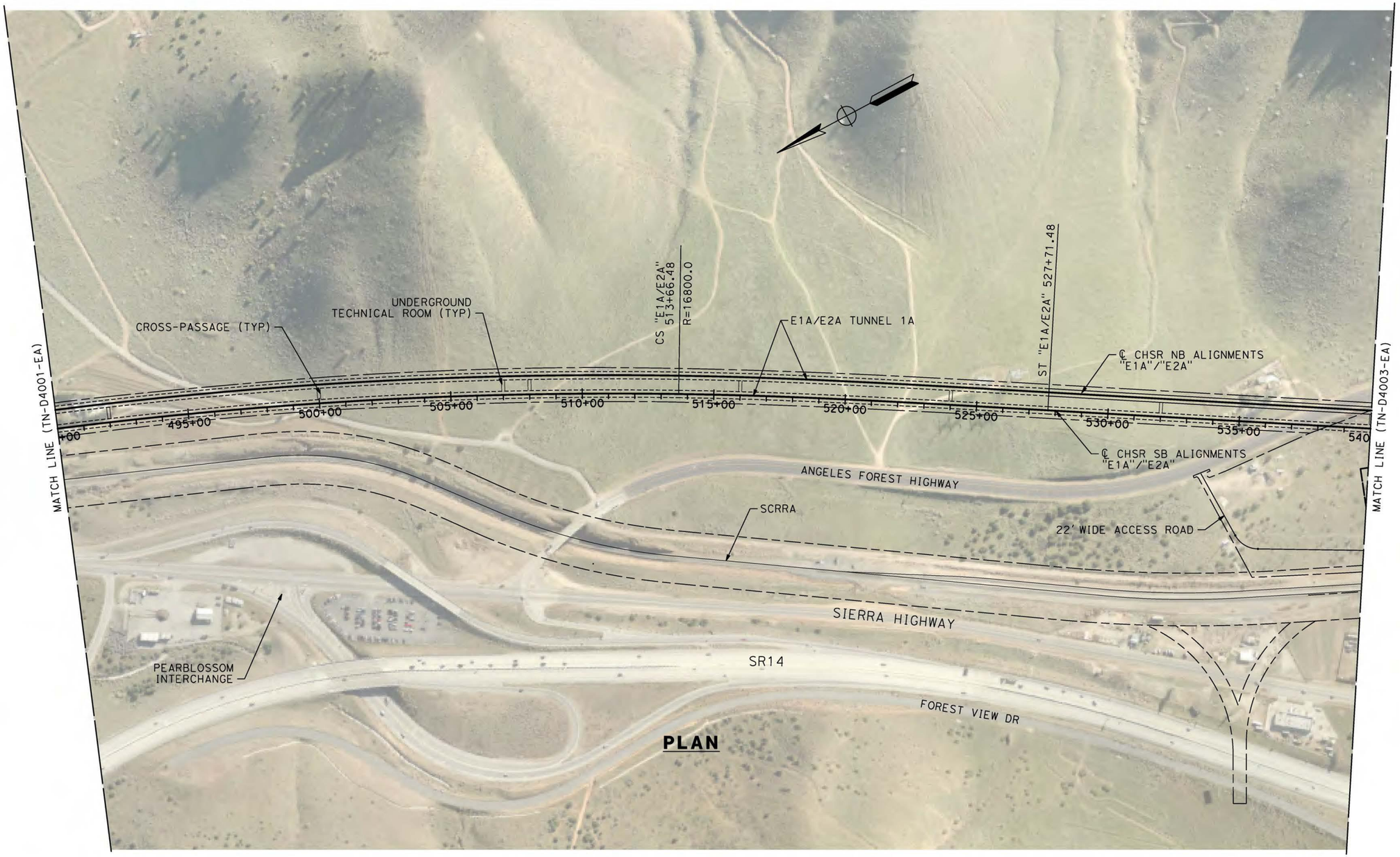
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

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

200 0 200 400
1"=200

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET ADDENDUM SR14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

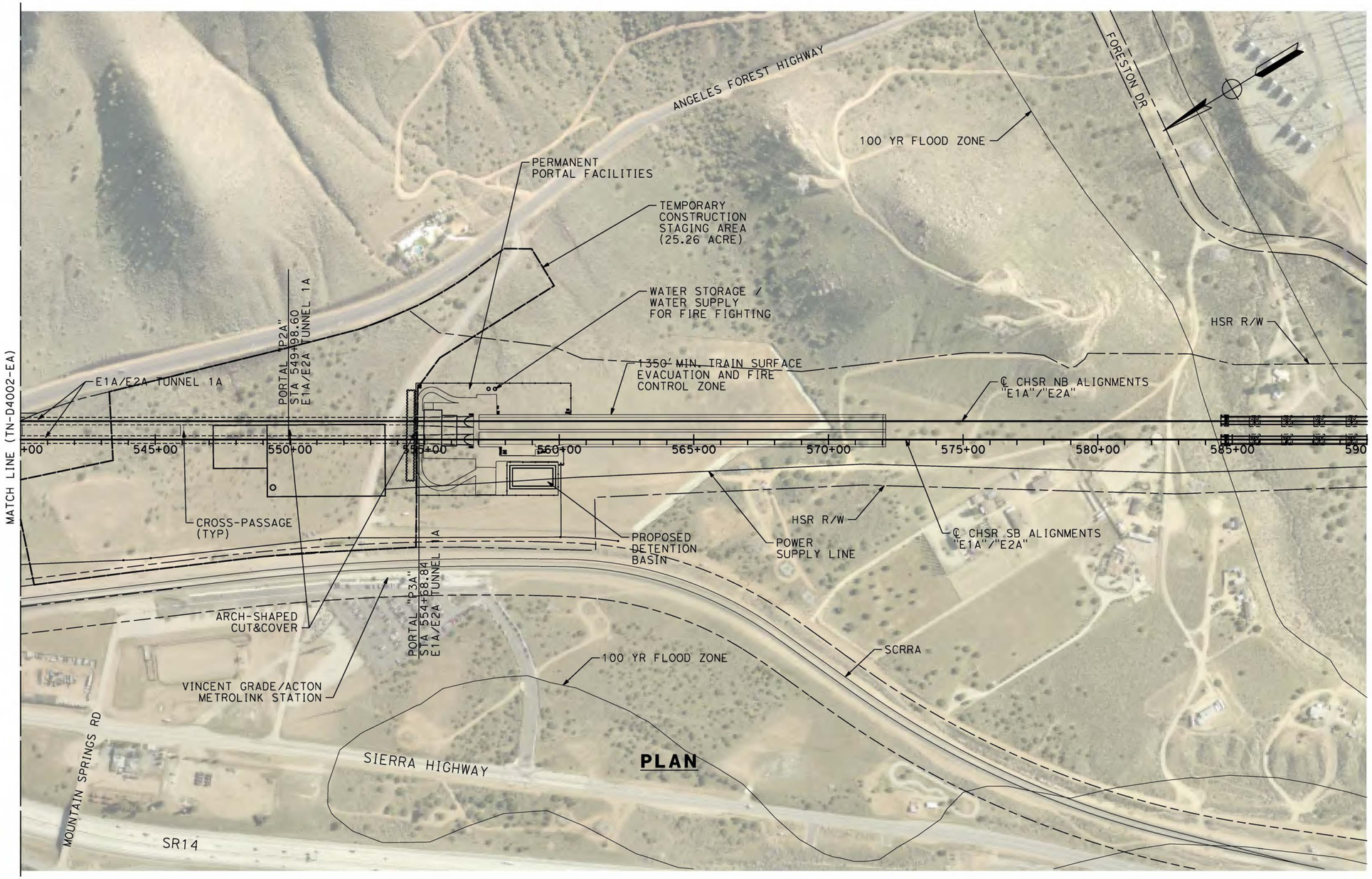
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

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



PLAN

200 0 200 400
1"=200

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 FJ.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

PEPD RECORD SET ADDENDUM SR14A/E1A/E2A

NOT FOR CONSTRUCTION

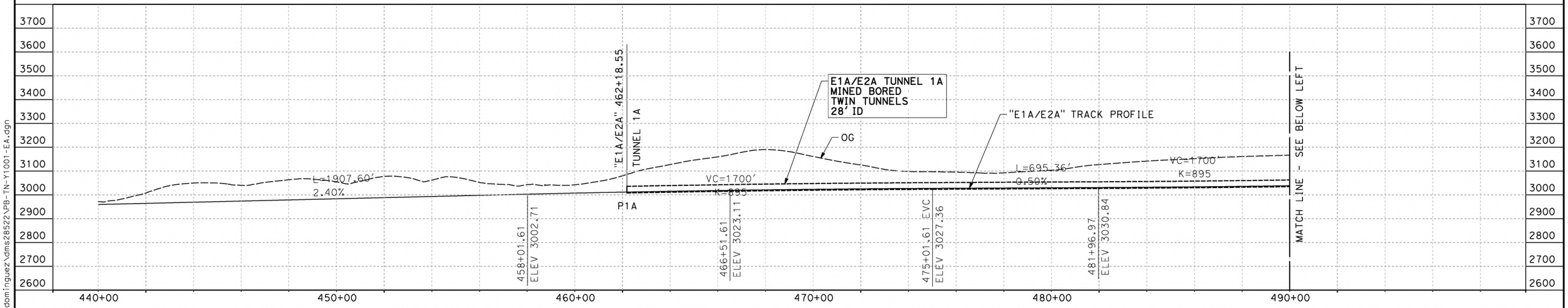
SENER

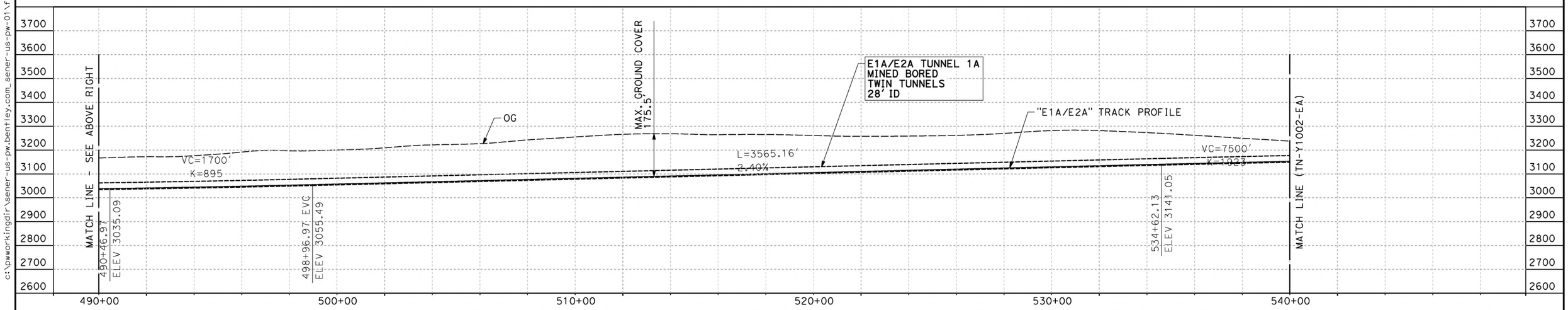
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

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.





200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

PROFILE

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

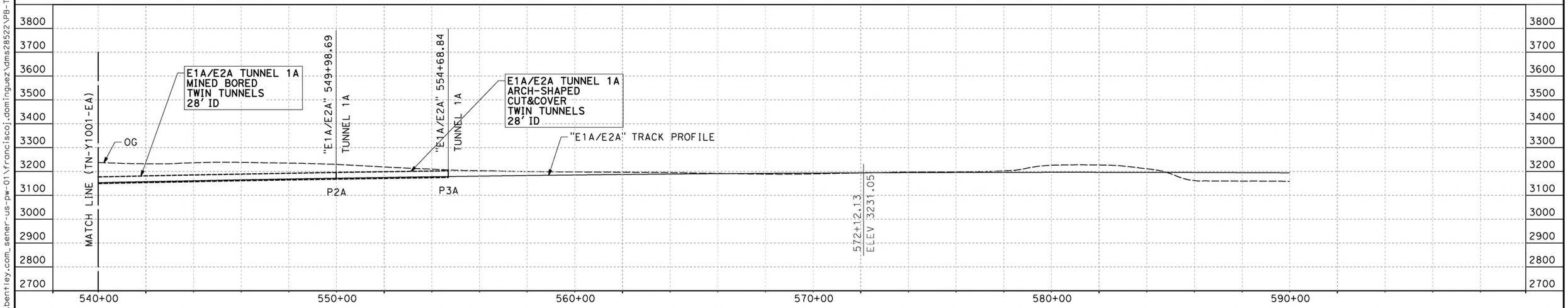
NOT FOR CONSTRUCTION

SENER

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

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.



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

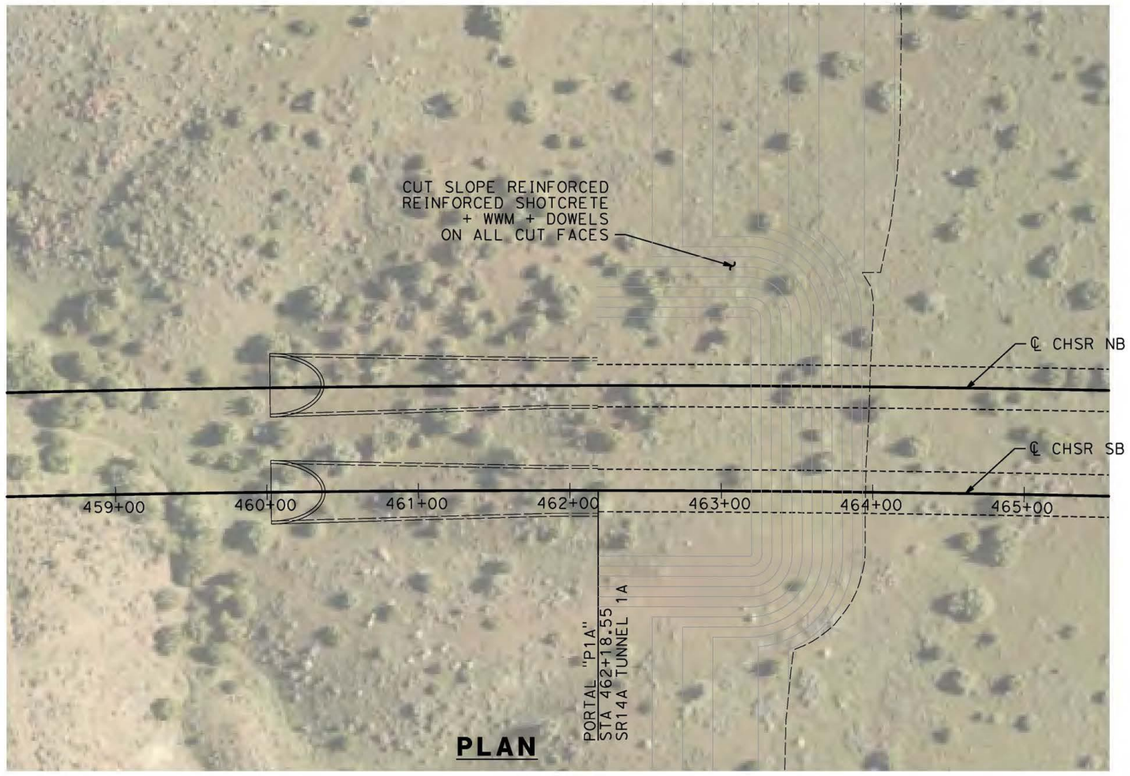
NOT FOR CONSTRUCTION

SENER

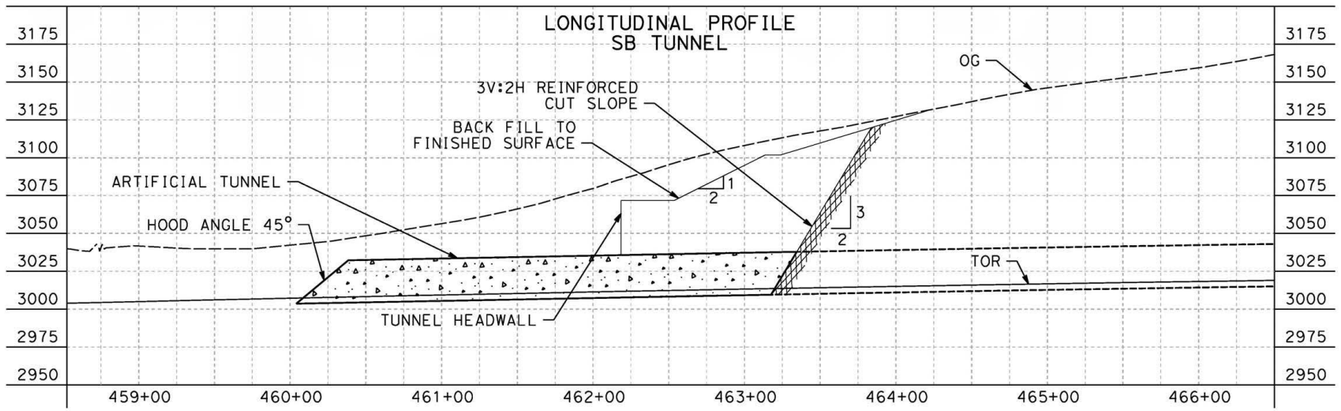
CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

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.



PLAN



PROFILE

NOTE :

1. EXAMPLE OF ROCK CUT SLOPE REINFORCEMENT AT PORTAL MOUTH
   - 2 IN OF SHOTCRETE WITH STEEL FIBERS (50 KG/ M^3)
   - 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

50 0 50 100
HORIZ 1"=50'

50 0 50 100
VERT 1"=50'

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

NOT FOR CONSTRUCTION

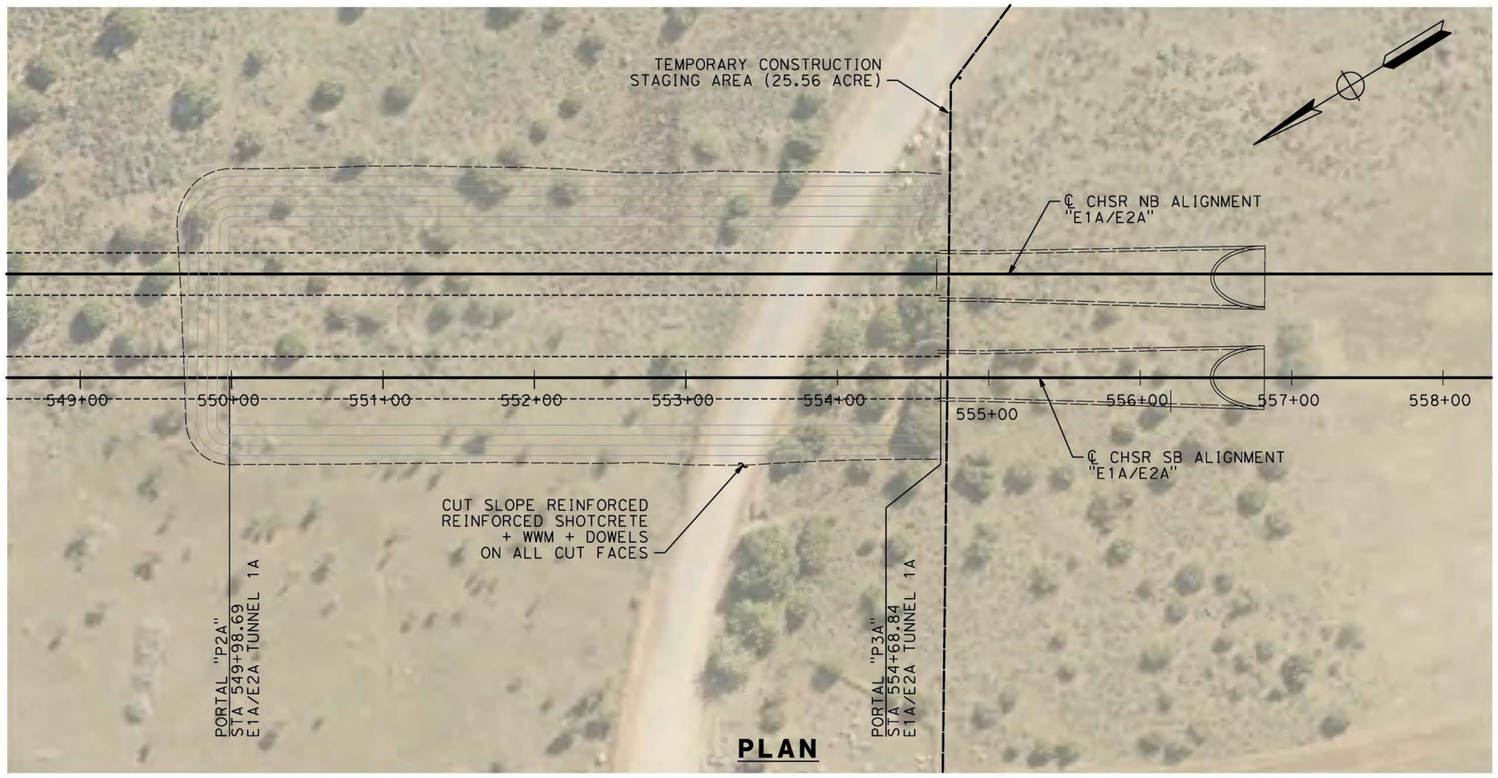
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

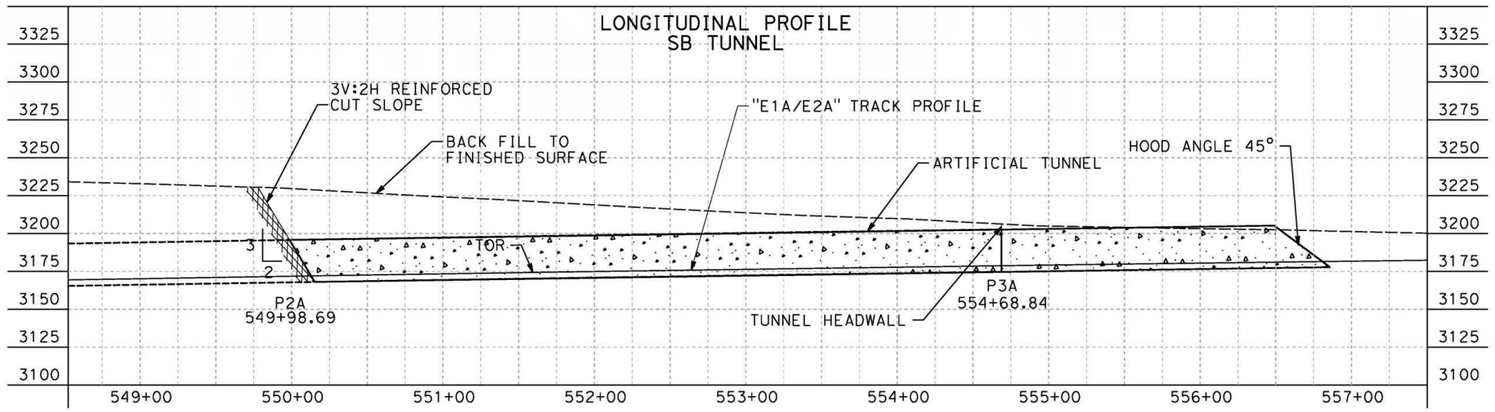
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1A/E2A"

PORTAL 1A
PLAN AND PROFILE FOR CONSTRUCTION

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



PLAN



PROFILE

NOTE :

1. EXAMPLE OF ROCK CUT SLOPE REINFORCEMENT AT PORTAL MOUTH
   - 2 IN OF SHOTCRETE WITH STEEL FIBERS (50 KG/ M^3)
   - 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	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 FJ.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

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

PORTAL 2A-3A
PLAN AND PROFILE FOR CONSTRUCTION

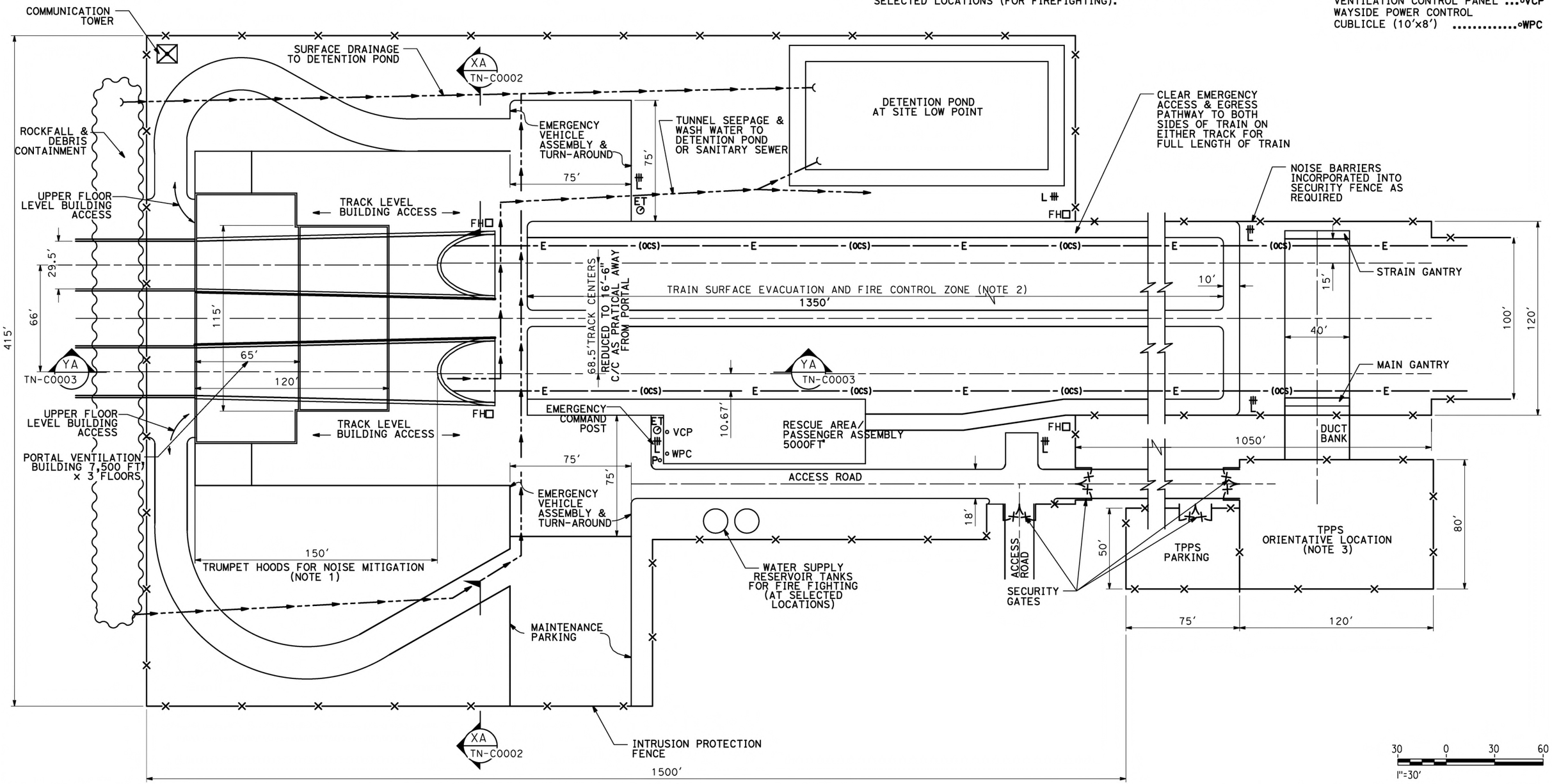
CONTRACT NO. HSR14-42
DRAWING NO. TN-D7002-EA
SCALE AS SHOWN
SHEET NO.

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 ... P
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 FJ.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

PEPD RECORD SET
ADDENDUM SR14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

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.

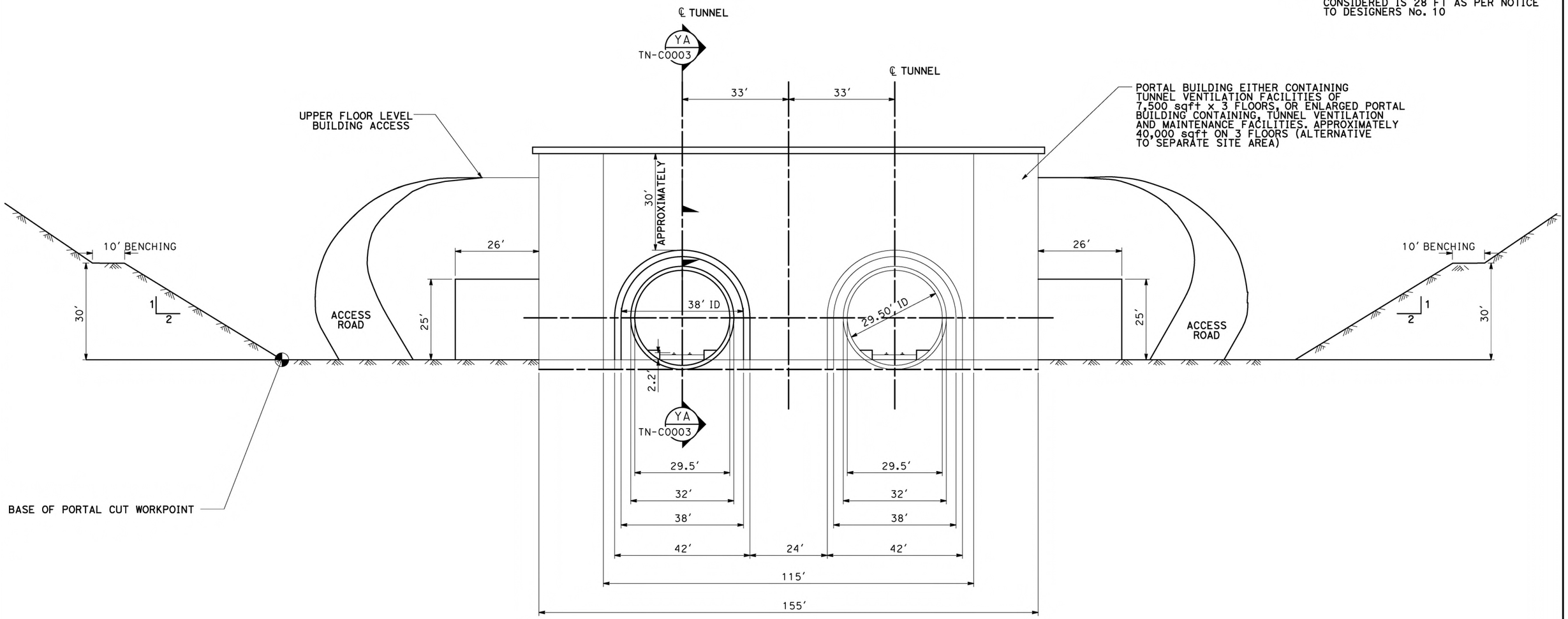
0205240

09/12/2020 16:23:30

c:\pwworkingdir\sener-us-pw.bentley.com_sener-us-pw-01\francisco.j.dominguez\dms28746\PB-TN-C0001.dgn

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 XA TN-C0002
SCALE 1"=15′

30 0 30 60
1"=30′

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM SR14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

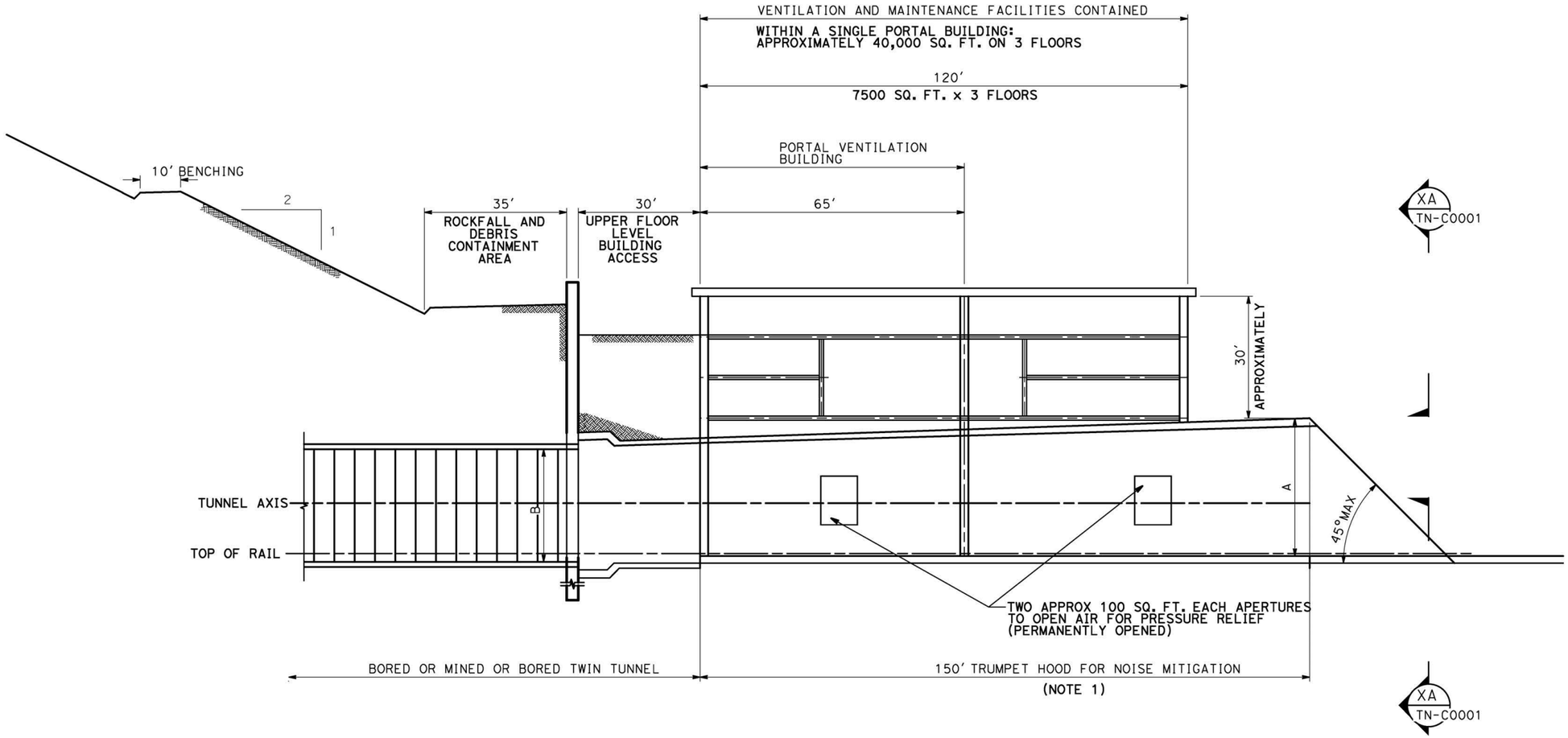
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

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.

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 YA TN-C0003
SCALE 1"=15'

15 0 15 30
1"=15'

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET ADDENDUM 8R14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

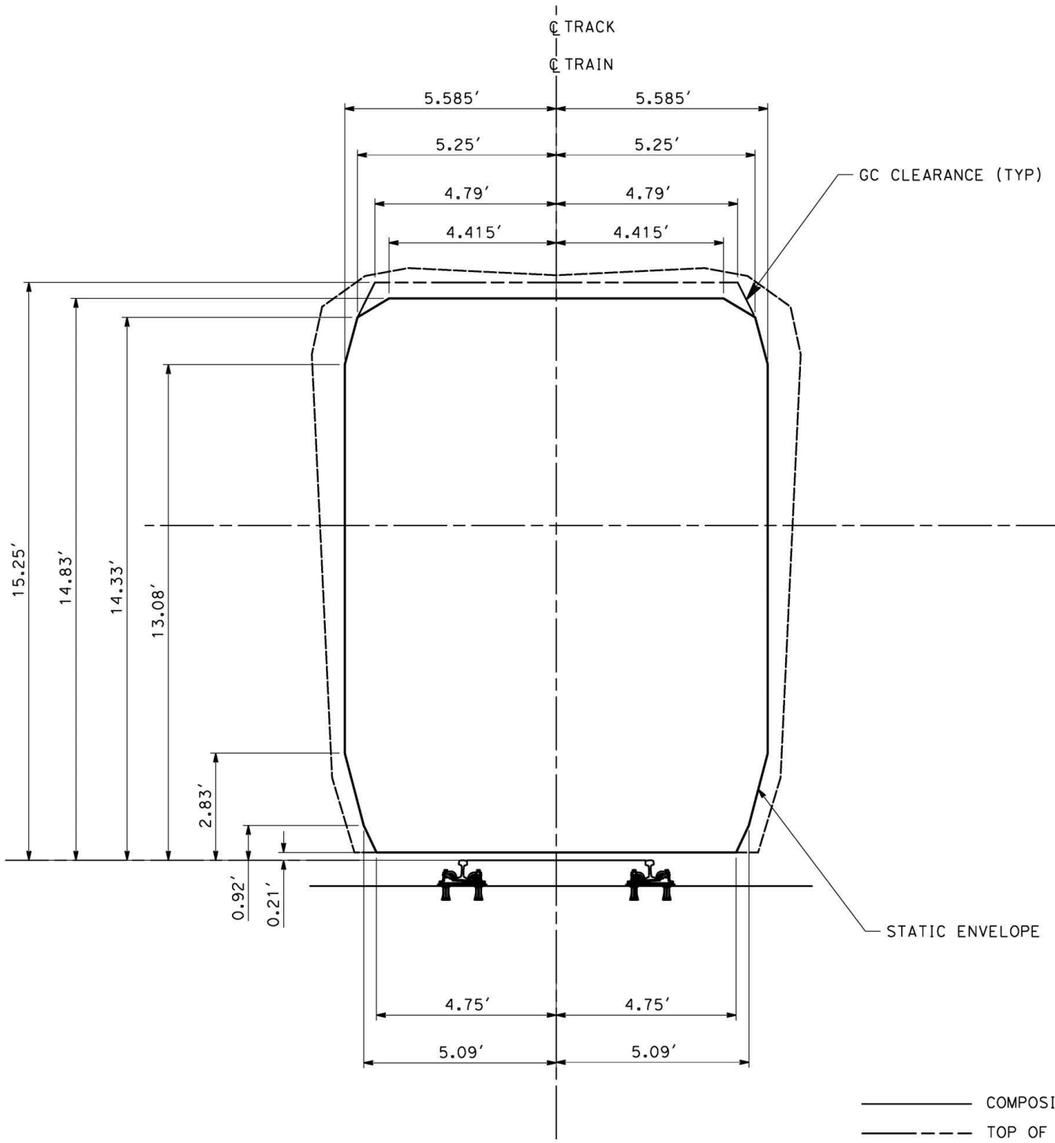
CALIFORNIA HIGH-SPEED RAIL PROJECT PALMDALE TO BURBANK

TYPICAL TUNNEL PORTAL FACILITIES AT GRADE
TWIN TUNNEL CONFIGURATION
LONG SECTION

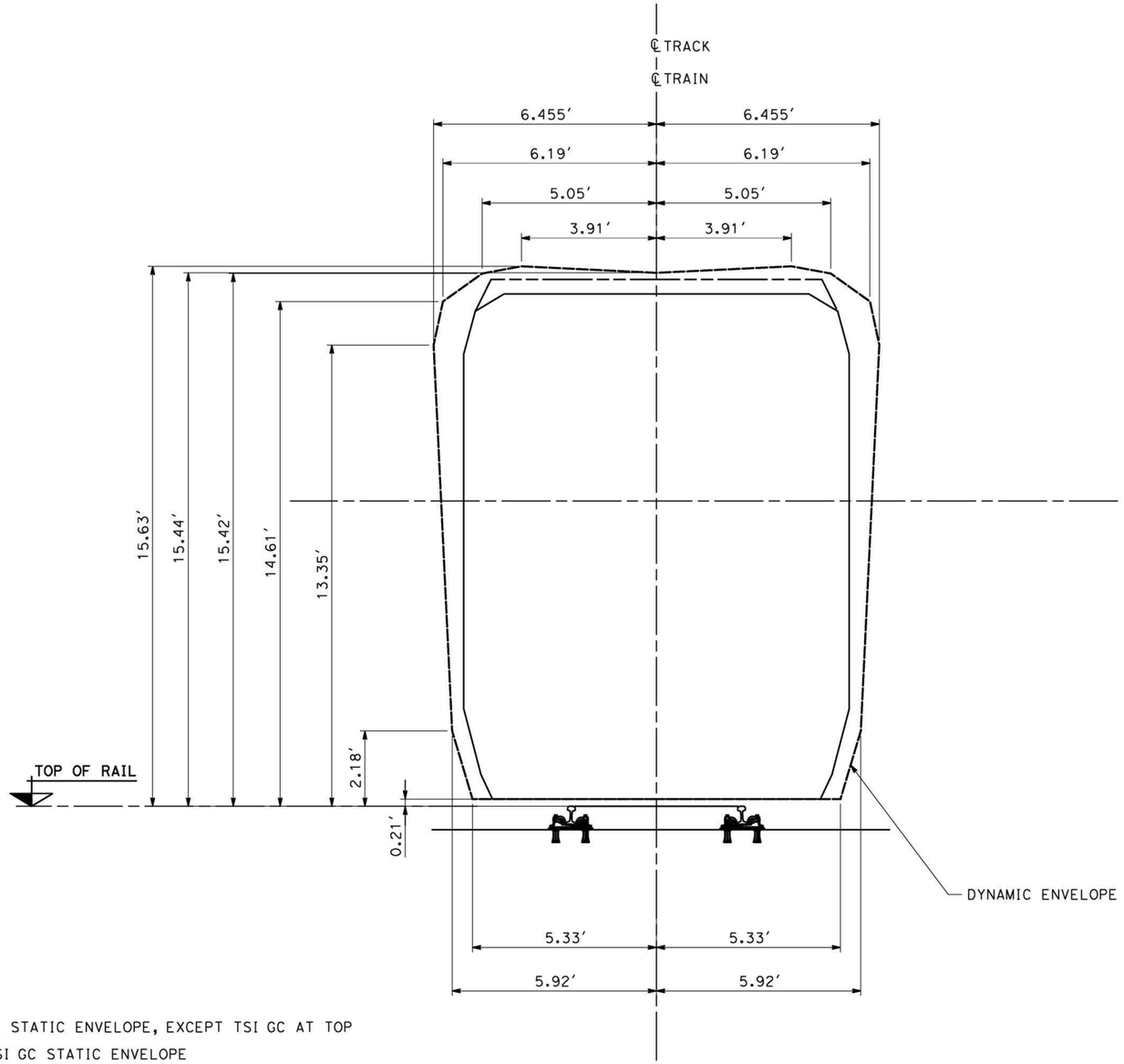
CONTRACT NO. HSR14-42
DRAWING NO. TN-C0003
SCALE AS SHOWN
SHEET NO.

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

2 0 2 4
1/2"=1'-0"

REV	DATE	BY	CHK	APP	DESCRIPTION
0205240					

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

PEPD RECORD SET ADDENDUM SR14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

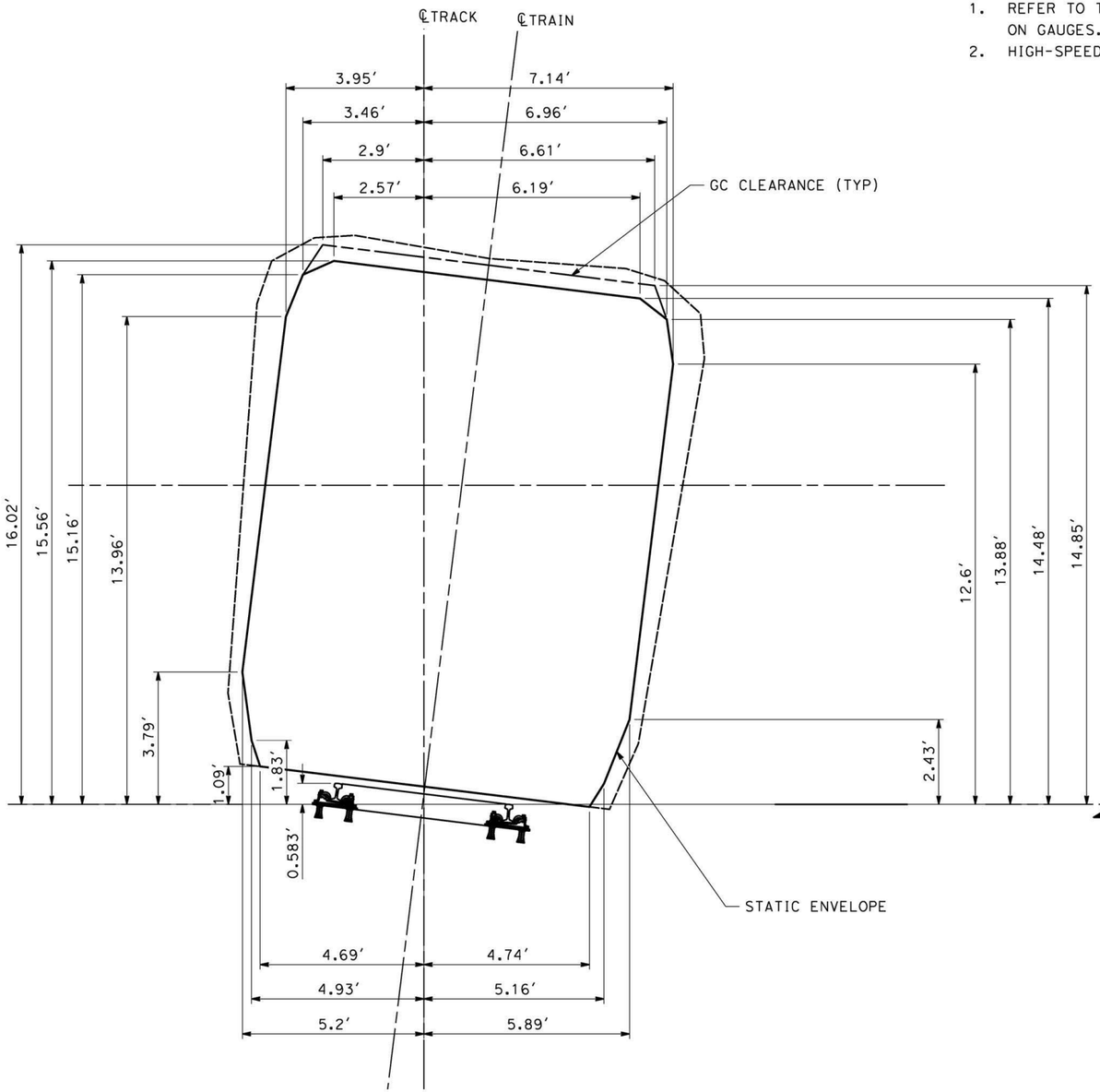
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

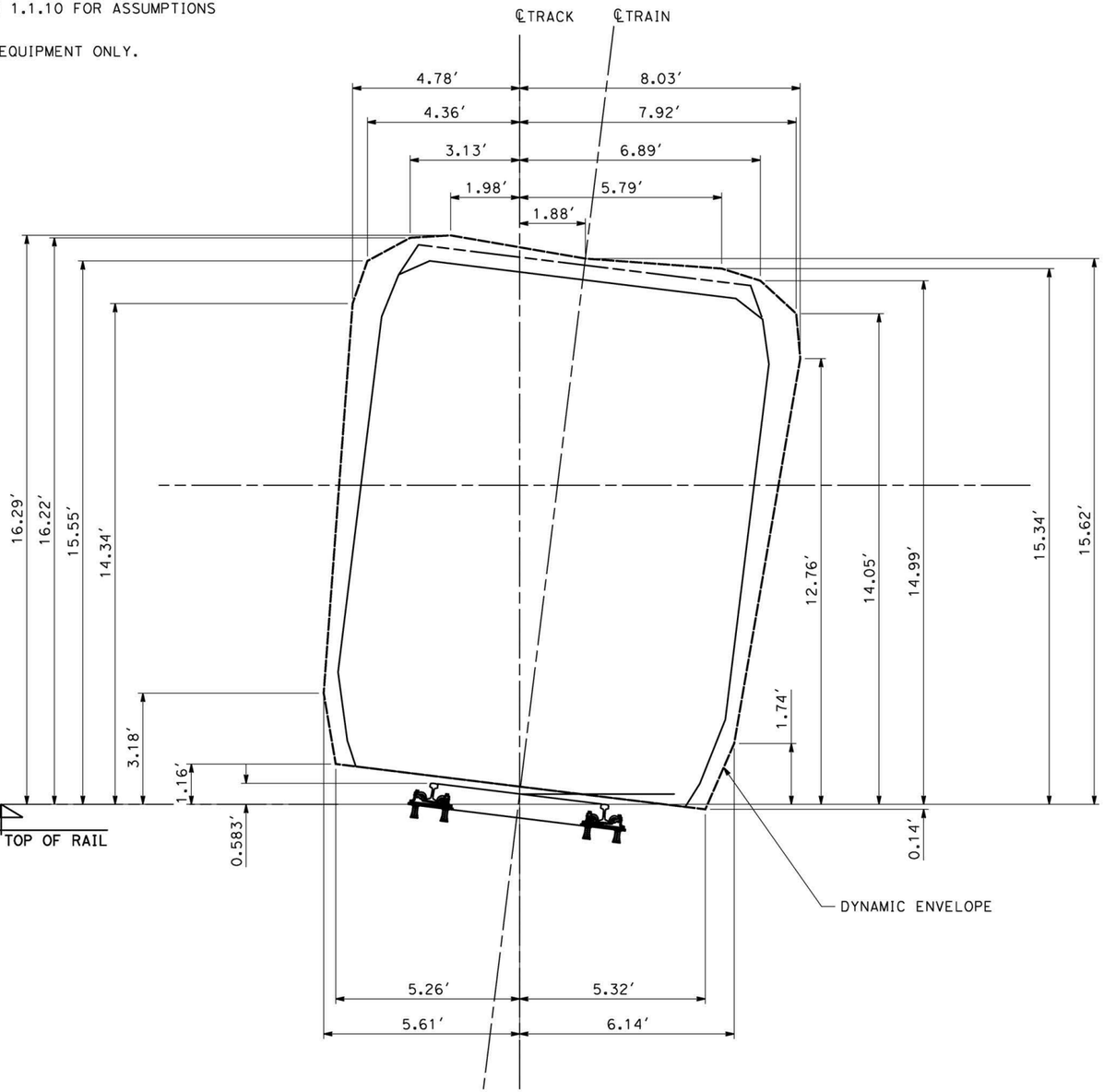
COMPOSITE VEHICLE
STATIC AND DYNAMIC ENVELOPE
TANGENT TRACK

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

NOTES OF ASSUMPTIONS:

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





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

COMPOSITE STATIC ENVELOPE

COMPOSITE DYNAMIC ENVELOPE

2 0 2 4
1/2"=1'-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET ADDENDUM SR14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

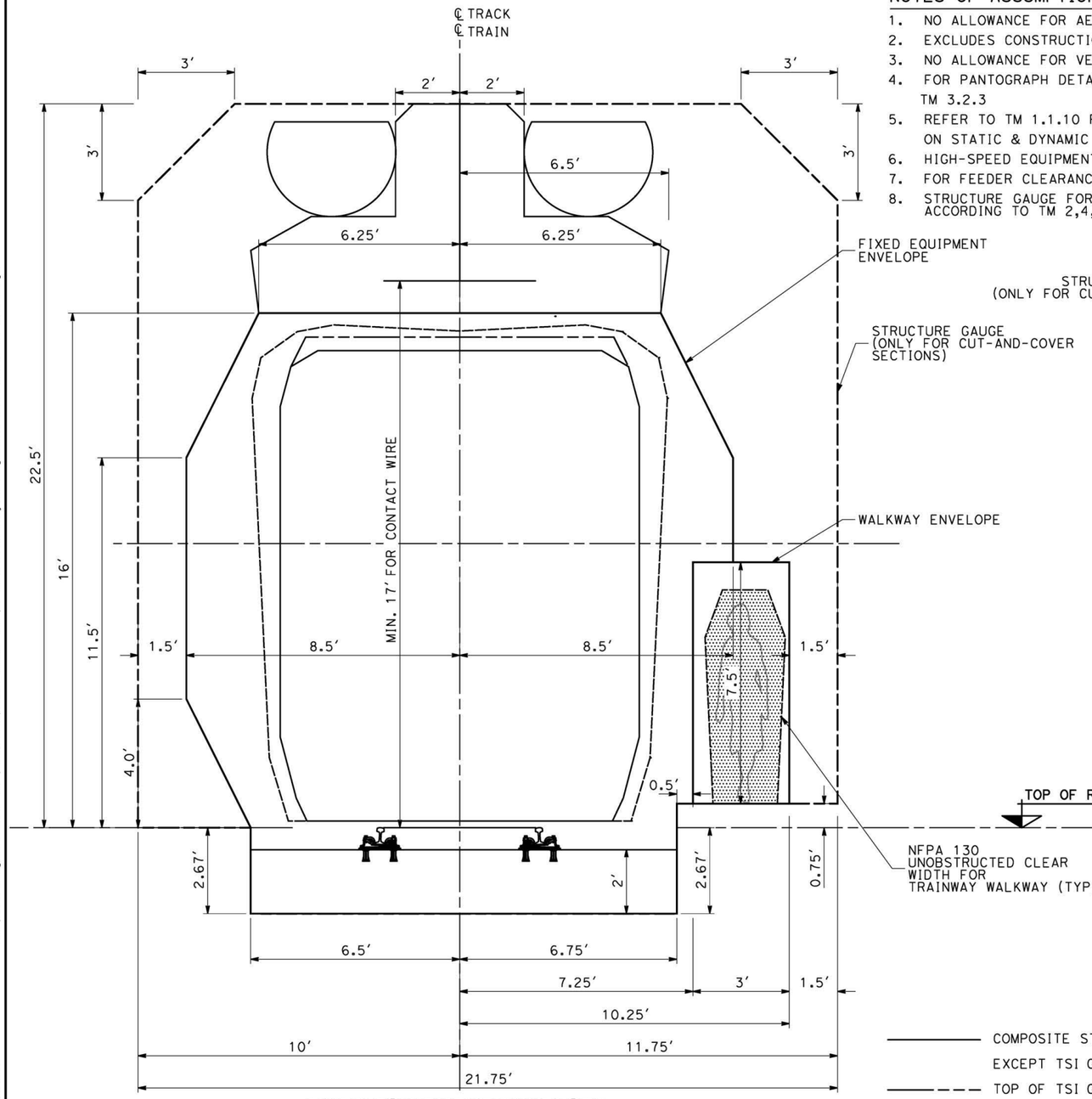
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

COMPOSITE VEHICLE
STATIC AND DYNAMIC ENVELOPE
SUPERELEVATED TRACK

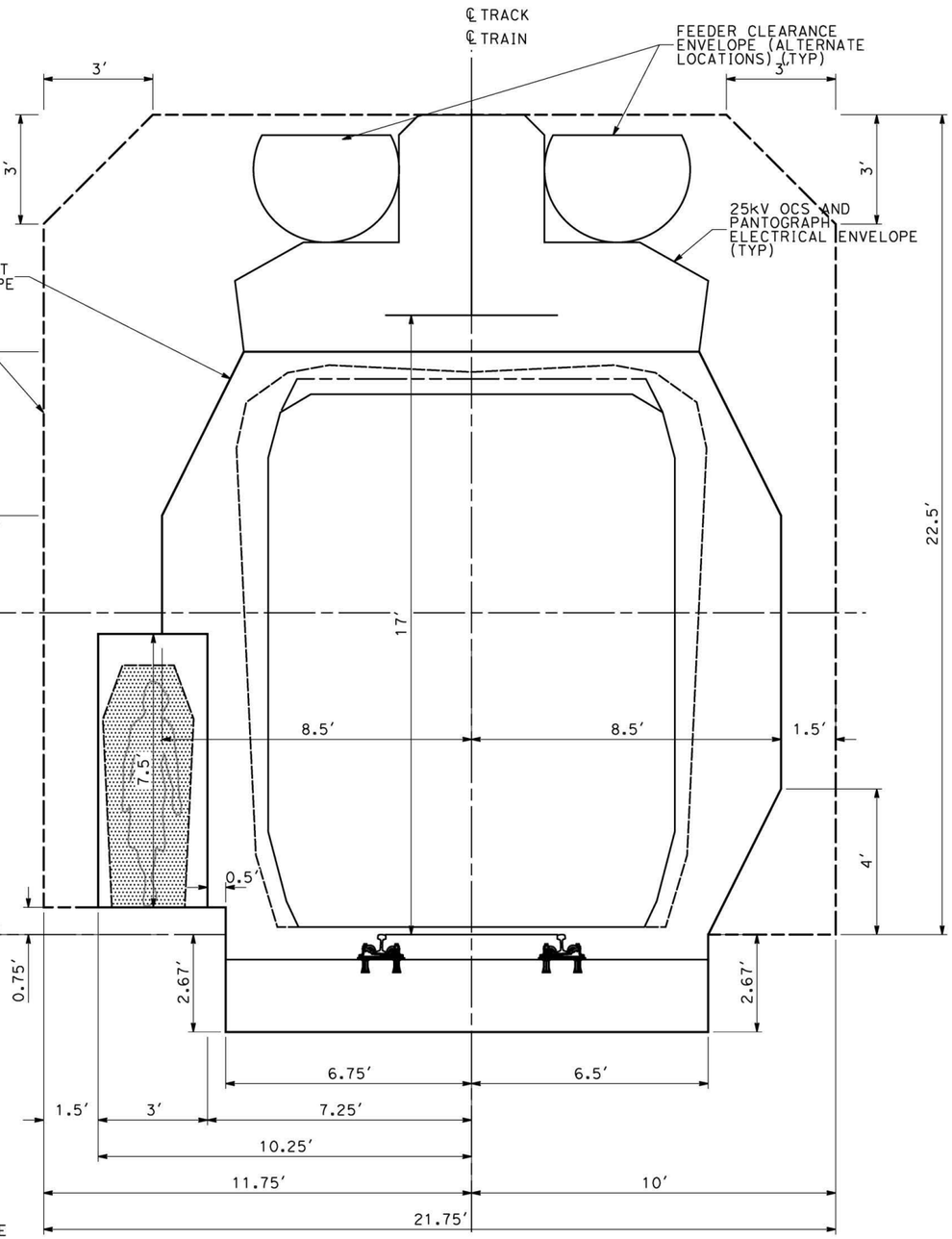
CONTRACT NO. HSR14-42
DRAWING NO. TN-C0005
SCALE AS SHOWN
SHEET NO.

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 AND STRUCTURE GAUGE TANGENT TRACK WALKWAY RIGHT SIDE



FIXED EQUIPMENT ENVELOPE AND STRUCTURE GAUGE TANGENT 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 C&C SECTIONS

2 0 2 4
1/2"=1'-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET ADDENDUM SR14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

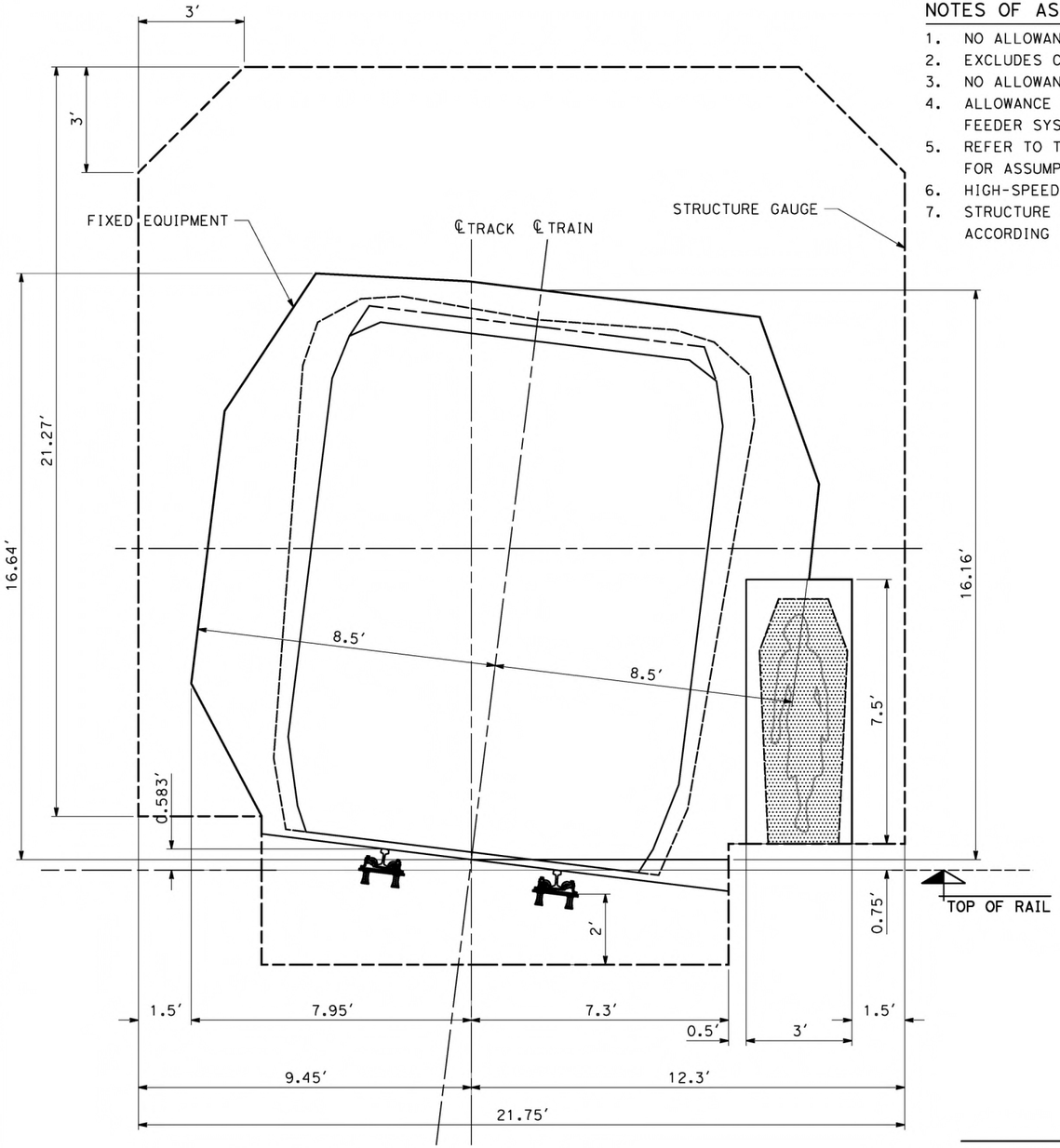
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

COMPOSITE VEHICLE
FIXED EQUIPMENT ENVELOPE AND STRUCTURE GAUGE
TANGENT TRACK

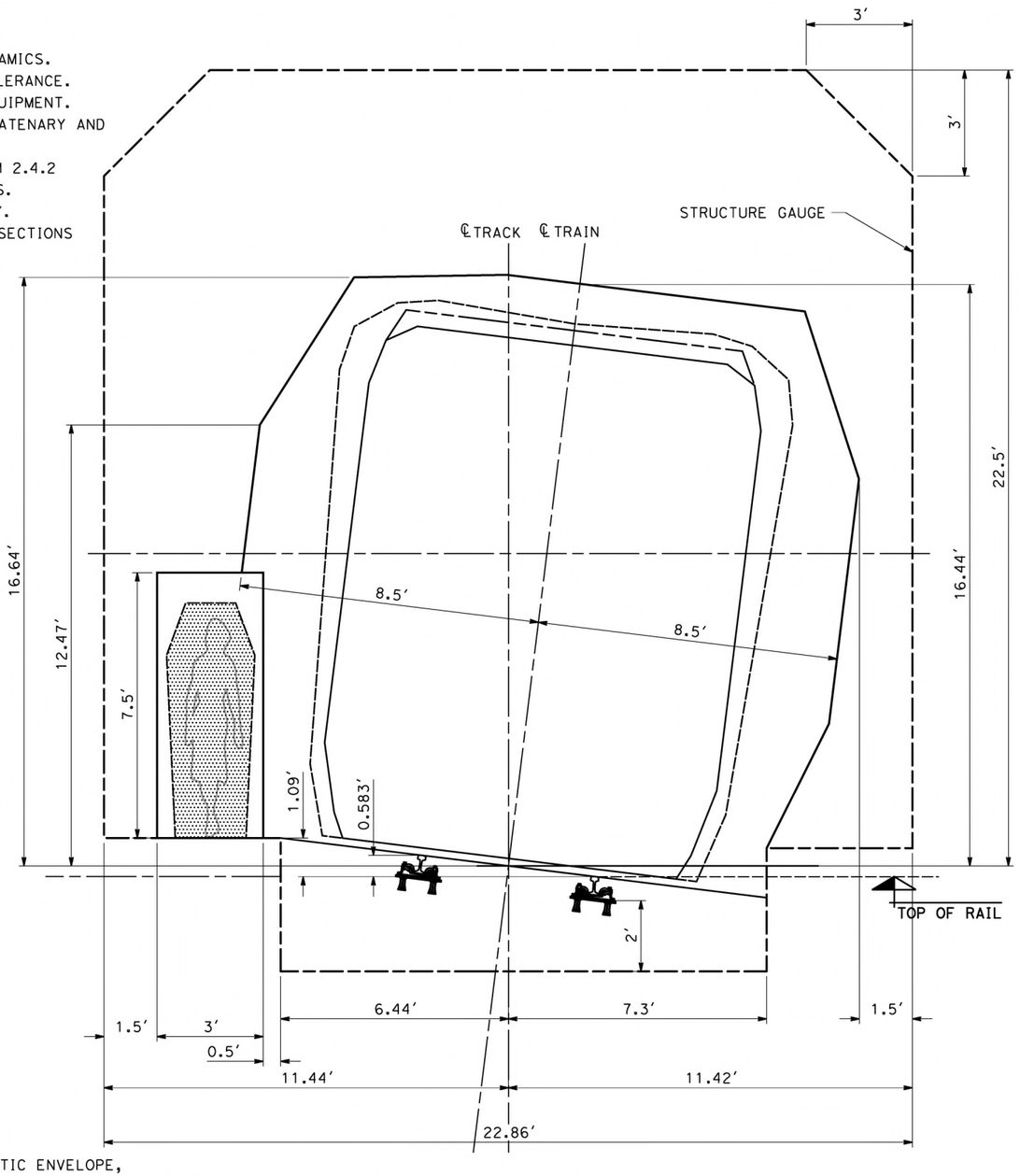
CONTRACT NO. HSR14-42
DRAWING NO. TN-C0006
SCALE AS SHOWN
SHEET NO.

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 RIGHT SIDE



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

2 0 2 4
1/2"=1'-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM 8R14A/E1A/E2A

NOT FOR CONSTRUCTION

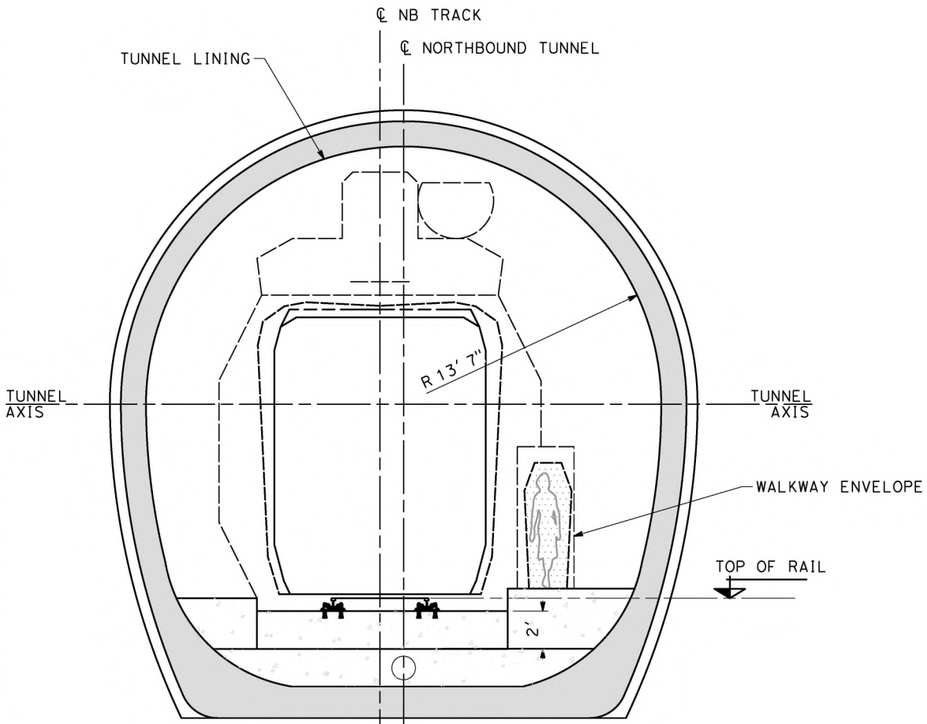
SENER

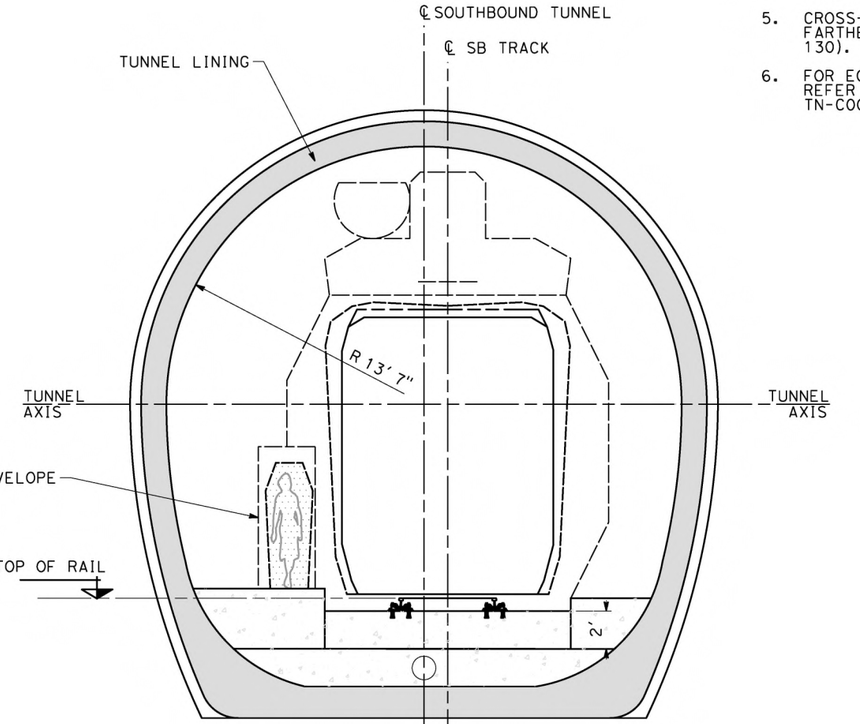
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

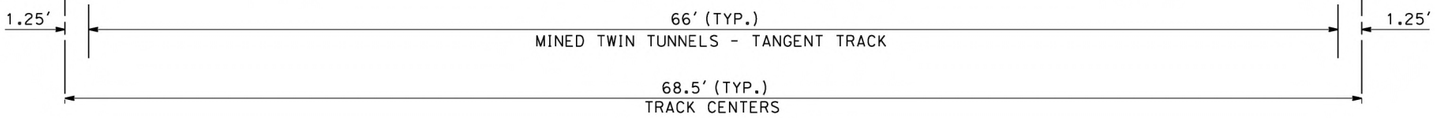
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

COMPOSITE VEHICLE
FIXED EQUIPMENT ENVELOPE AND STRUCTURE GAUGE
SUPERELEVATED TRACK

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







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.

TUNNEL TYPICAL SECTION MINED TWIN TUNNELS TANGENT TRACK

4 0 4 8
1"=4'-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET ADDENDUM SR14A/E1A/E2A

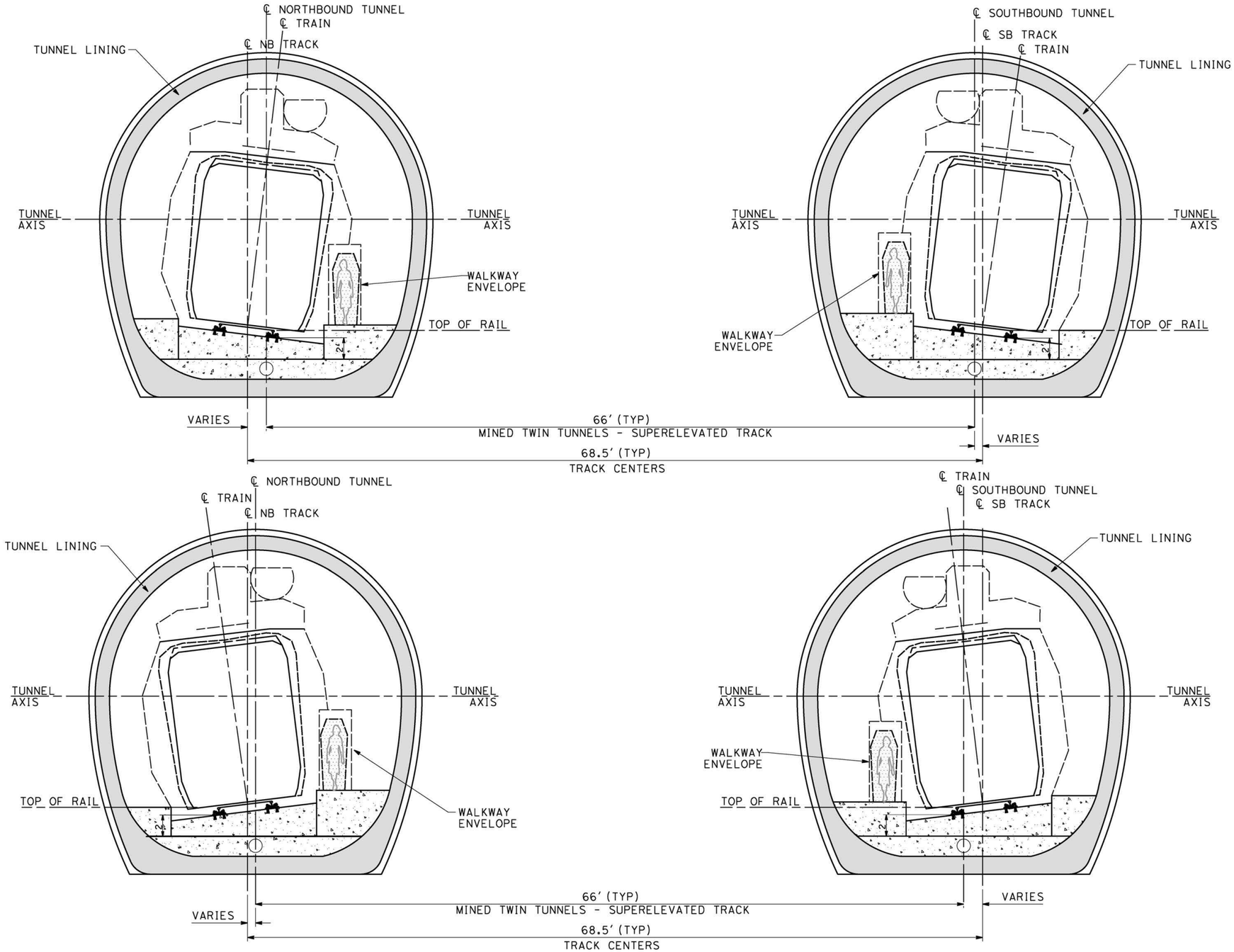
NOT FOR CONSTRUCTION

SENER

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.



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.

TUNNEL TYPICAL SECTION
MINED TWIN TUNNELS
SUPERELEVATED TRACK

5 0 5 10
1"=5'-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

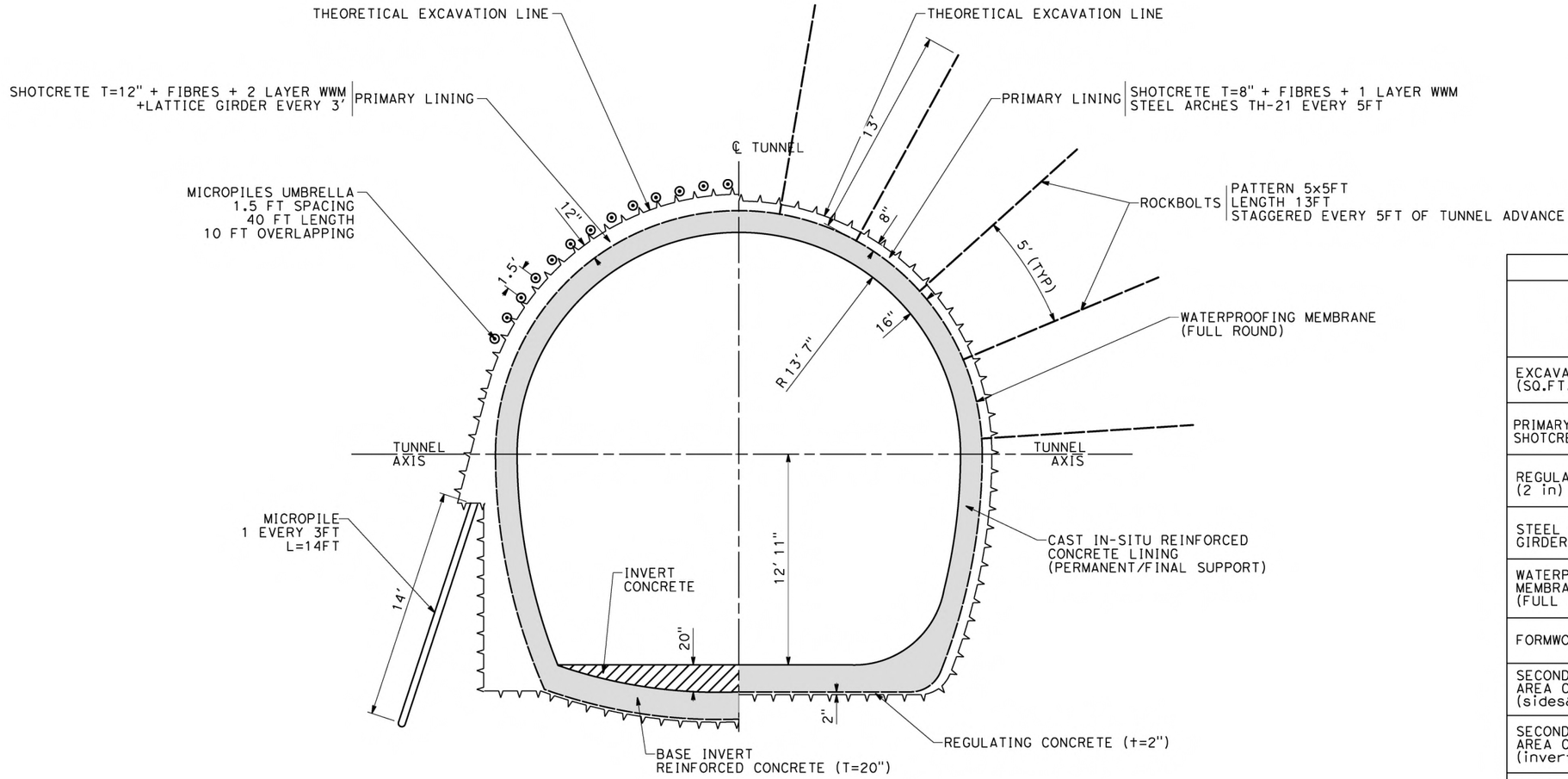
NOT FOR CONSTRUCTION

SENER

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.



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)

NOTES:

1. SUPPORT MEASURES SHOWN ARE ORIENTATIVE ONLY AND FOR PEPD COST ESTIMATION. THEY MUST BE CALCULATED WHEN DETAILED GEOTECHNICAL INFORMATION IS AVAILABLE.
2. 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
3. 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.

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

4 0 4 8
1"=4'-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

NOT FOR CONSTRUCTION

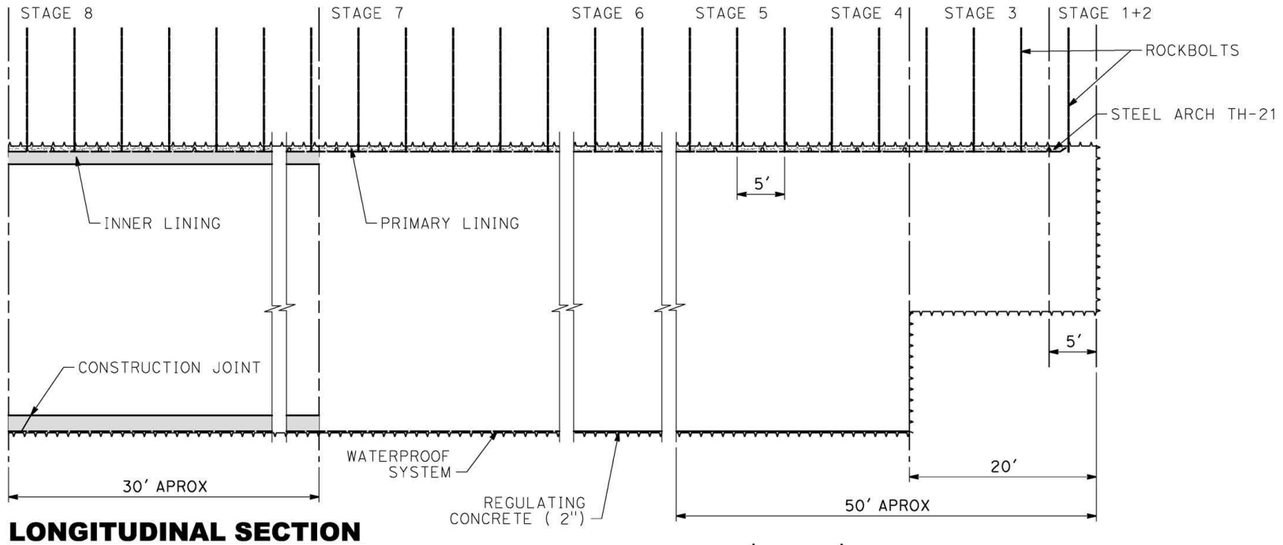
SENER

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.

MINED TWIN TUNNELS PRIMARY LINING FOR MEDIUM QUALITY ROCK



LONGITUDINAL SECTION

LEGEND:

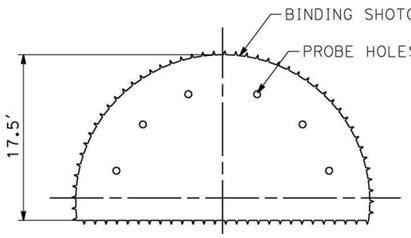
- NATM EXCAVATION
- STEEL ARCH TH-21
- REINFORCED SHOTCRETE PRIMARY LINING +1 LAYER WWM
- REINFORCED INNER / SECONDARY LINING

PRIMARY LINING (EXAMPLE ONLY, NOT ACTUAL DESIGN)							
DENOMINATION	RMR	SHOTCRETE THICKNESS (in)	STEEL ARCHES	FIBRES & WWM	ADVANCE LENGTH (FT)	ROCKBOLT PATTERN AND LENGTH (FT)	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		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

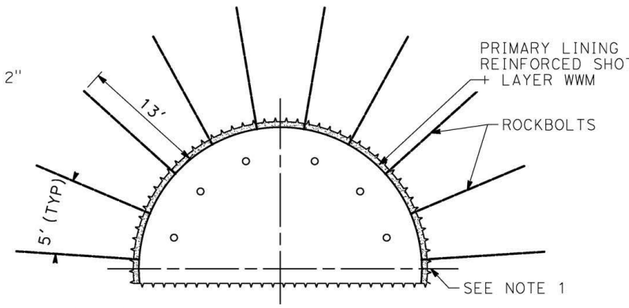
* SELF DRILLING BOLTS INSTEAD OF ROCKBOLTING IF RMR<35

NOTES:

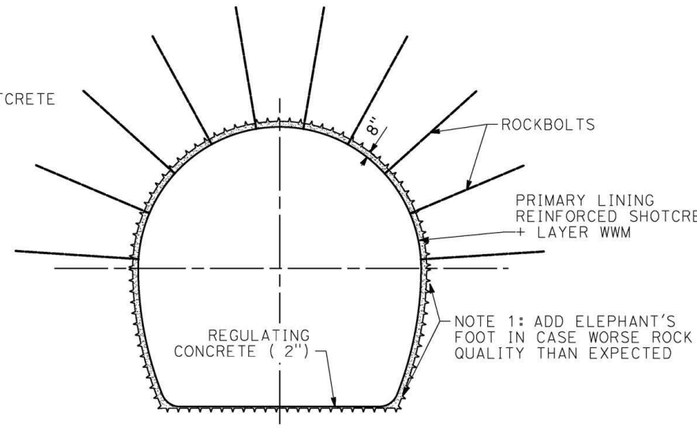
1. SUPPORT MEASURES SHOWN ARE ORIENTATIVE ONLY AND FOR PEPD COST ESTIMATION. THEY MUST BE CALCULATED WHEN DETAILED GEOTECHNICAL INFORMATION IS AVAILABLE.
2. POOR QUALITY ROCK CAN OCCUR AT PORTALS AND FAULT ZONES AMONG OTHER.
3. SQUEEZING GROUND CONDITIONS UNDER OVERBURDEN OF MORE THAN 300FT WILL REQUIRE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



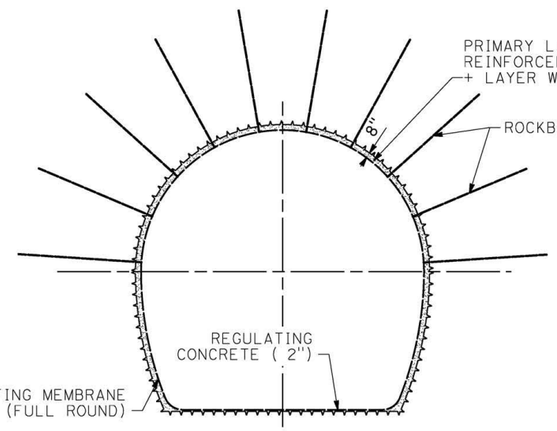
-STAGE 0: PROBE DRILLING
-STAGE 1: EXCAVATION OF TOP HEADING AND APPLICATION OF STABILIZATION LAYER OF SHOTCRETE.



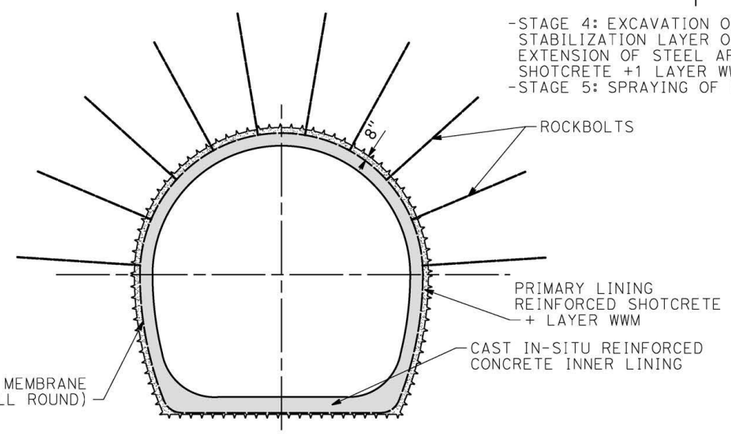
-STAGE 2: INSTALLATION OF STEEL ARCH AND ROCKBOLTING.
-STAGE 3: SPRAYING OF REINFORCED SHOTCRETE +1 LAYER WWM.



-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)

8 0 8 16
1"=8'-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET ADDENDUM 8R14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

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.

0205240

09/12/2020 16:26:10

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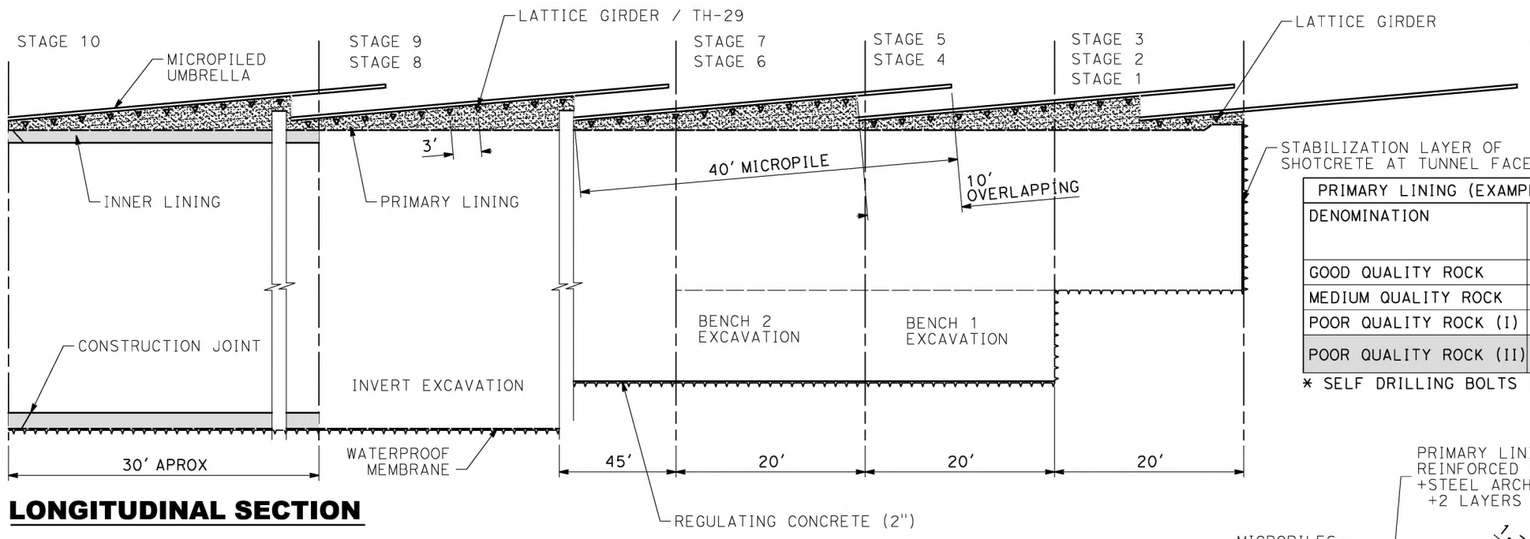
MINED TWIN TUNNELS PRIMARY LINING FOR POOR QUALITY ROCK (II)

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



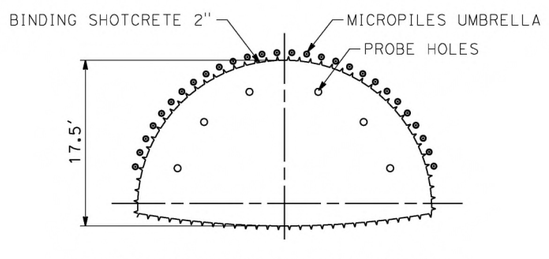
LONGITUDINAL SECTION

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		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

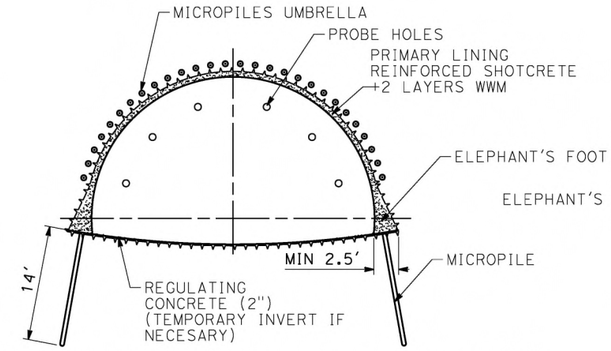
* SELF DRILLING BOLTS INSTEAD OF ROCKBOLTING IF RMR<35

NOTES:

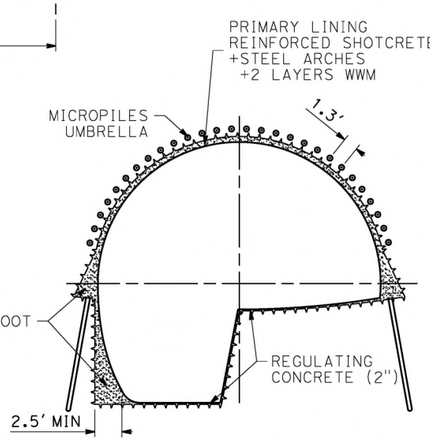
1. SUPPORT MEASURES SHOWN ARE ORIENTATIVE ONLY AND FOR PEPD COST ESTIMATION. THEY MUST BE CALCULATED WHEN DETAILED GEOTECHNICAL INFORMATION IS AVAILABLE.
2. POOR QUALITY ROCK CAN OCCUR AT PORTALS AND FAULT ZONES AMONG OTHER.
3. SQUEEZING GROUND CONDITIONS UNDER OVERBURDEN OF MORE THAN 300FT WILL REQUIRE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



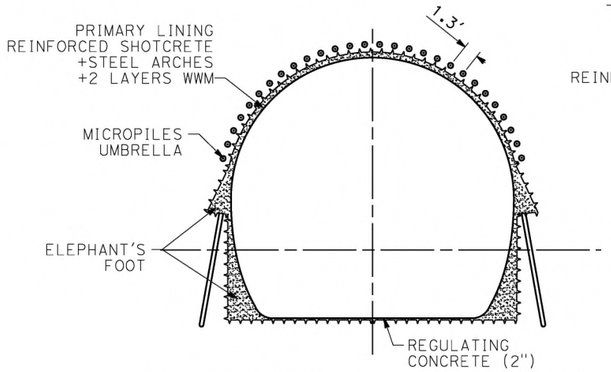
-STAGE 0: PROBE DRILLING AND MICROPILE UMBRELLA INSTALLATION.
-STAGE 1: EXCAVATION OF TOP HEADING AND APPLICATION OF STABILIZATION LAYER OF SHOTCRETE.



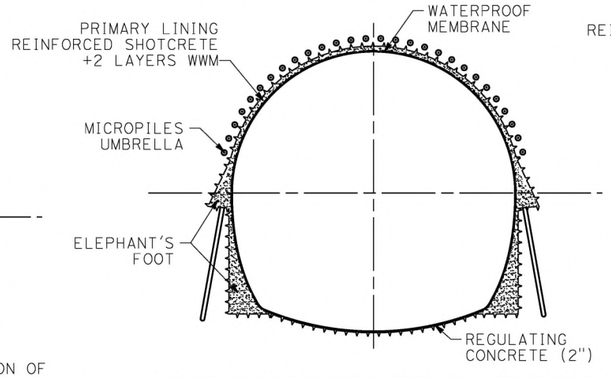
-STAGE 2: INSTALLATION OF LATTICE GIRDER + UNDERPINNING WITH MICROPILES.
-STAGE 3: SPRAYING OF REINFORCED SHOTCRETE +2 LAYERS WWM SPRAYING OF REGULATING CONCRETE.



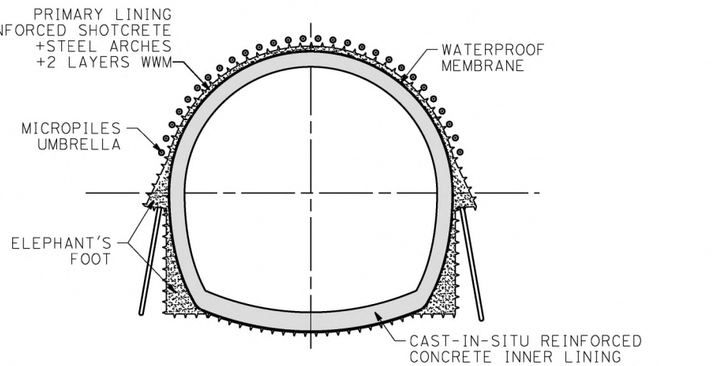
-STAGE 4: BENCH 1 EXCAVATION AND APPLICATION OF STABILIZATION LAYER OF SHOTCRETE.
-STAGE 5: EXTENSION OF LATTICE GIRDER AND SPRAYING OF REINFORCED SHOTCRETE ON THE LEFT SIDE. SPRAYING OF REGULATING CONCRETE.



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

8 0 8 16
1"=8'-0"

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 FJ.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

PEPD RECORD SET ADDENDUM SR14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

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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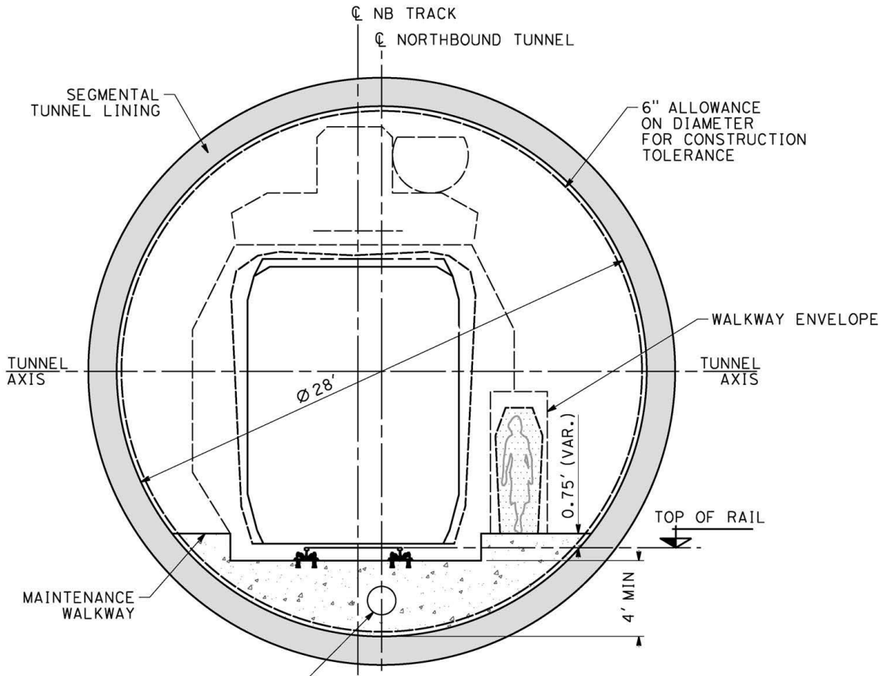
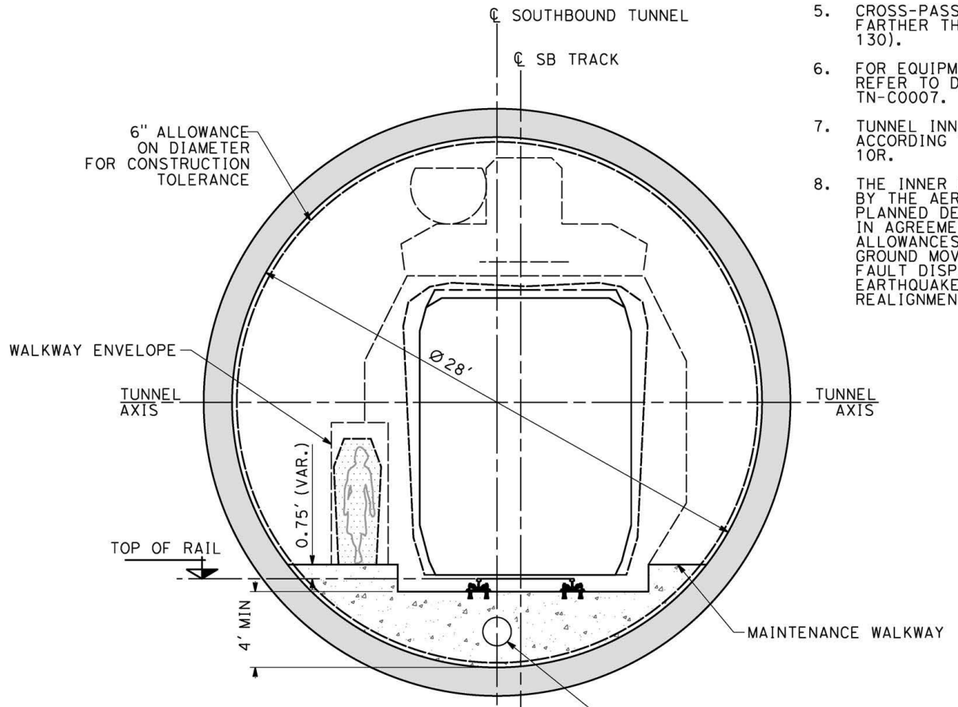




1.25′ — 66′ (TYP.) BORED TWIN TUNNELS - TANGENT TRACK — 1.25′

68.5′ (TYP.) TRACK CENTERS

TUNNEL TYPICAL SECTION
TBM TWIN TUNNELS
TANGENT 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.

4 0 4 8
1"=4'-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM SR14A/E1A/E2A

NOT FOR CONSTRUCTION

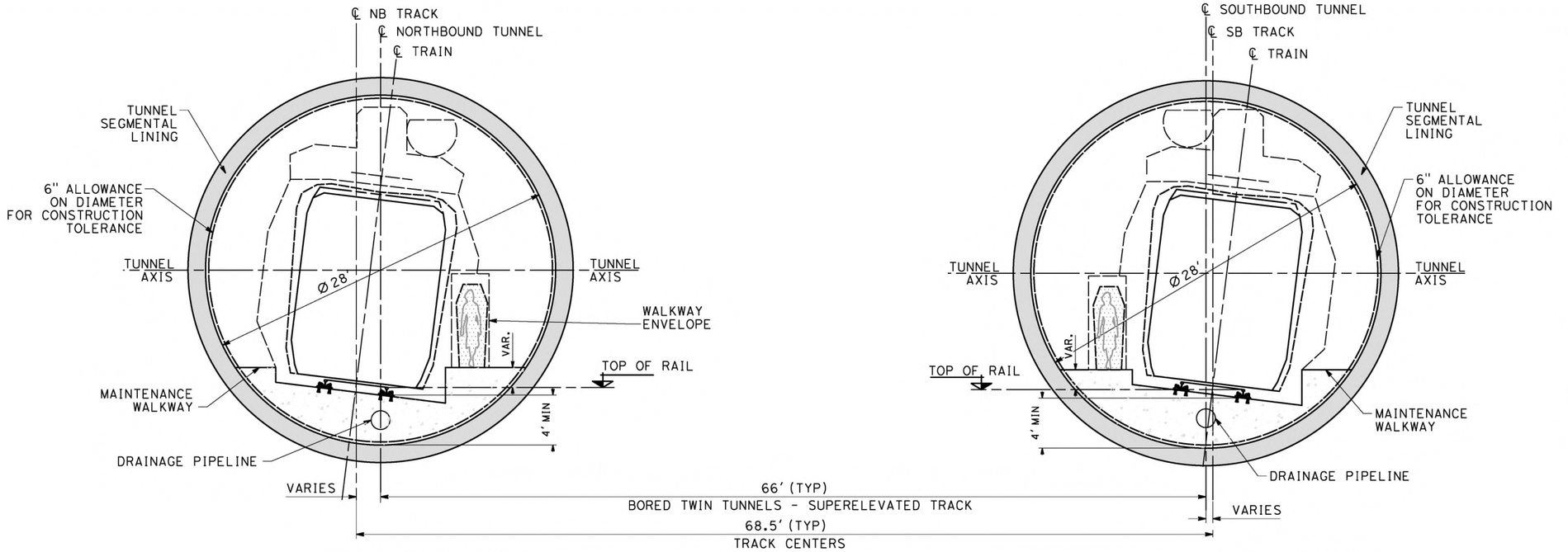
SENER

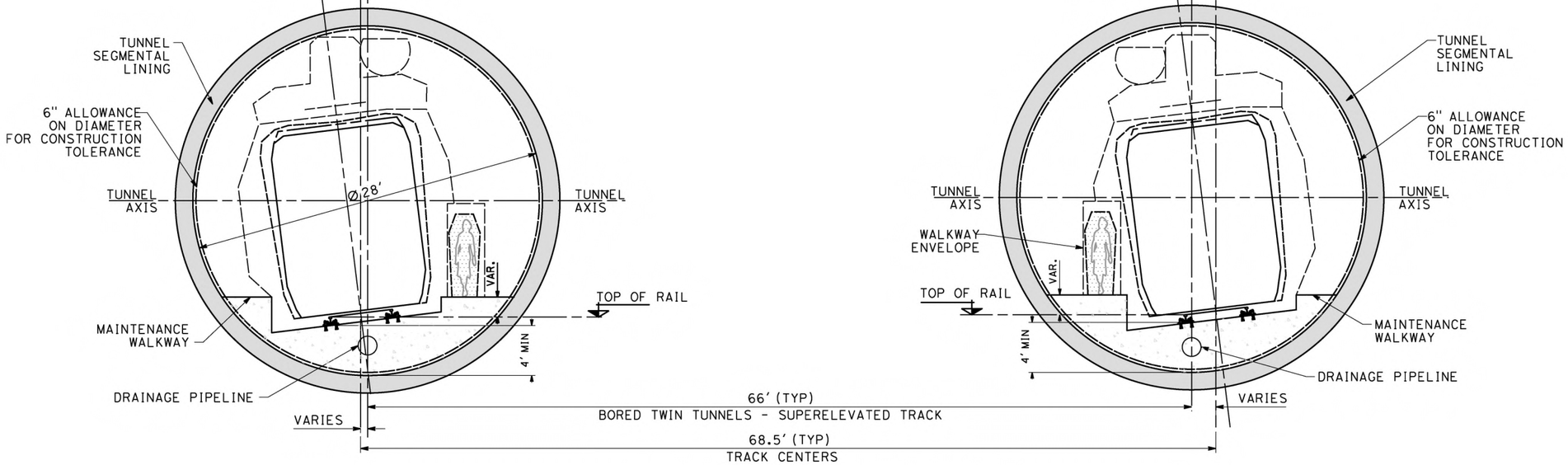
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

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.





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.

TUNNEL TYPICAL SECTION TBM TWIN TUNNELS SUPERELEVATED TRACK

5 0 5 10
1"=5'-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM 8R14A/E1A/E2A

NOT FOR CONSTRUCTION

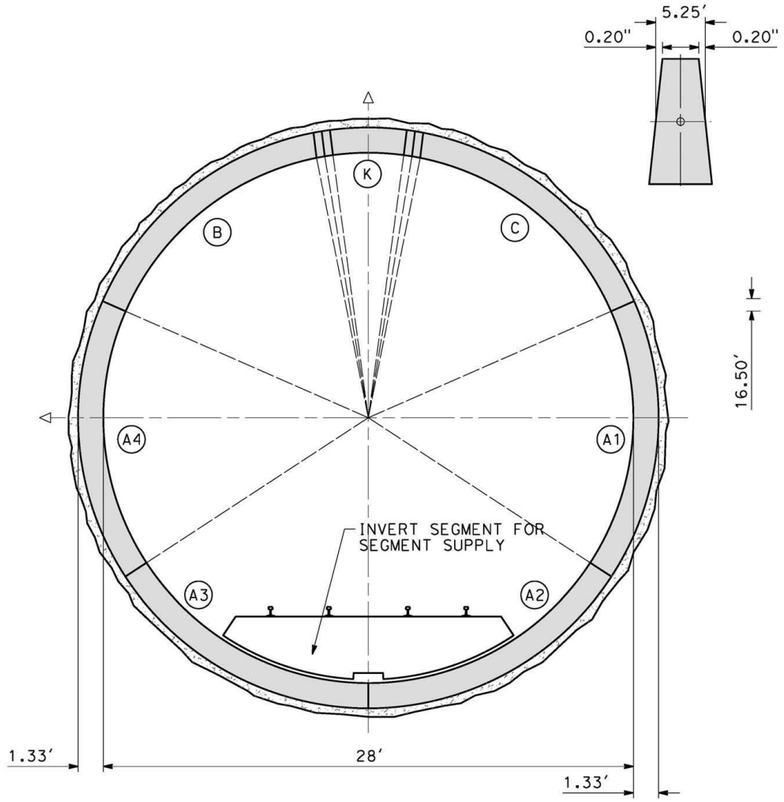
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

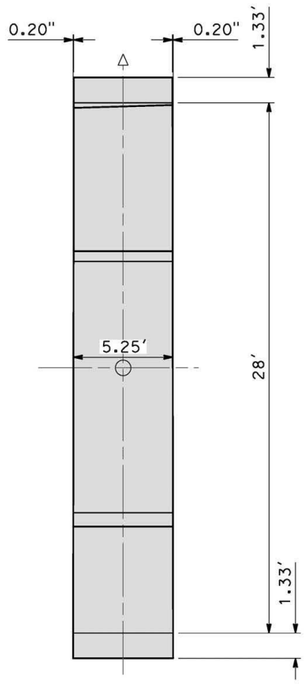
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

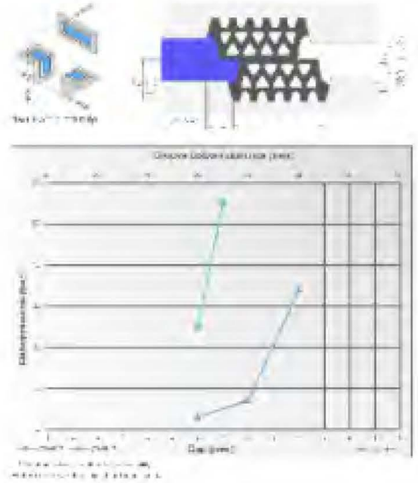
TBM BORED TWIN TUNNELS
CLEARANCE DIAGRAM - SUPERELEVATED TRACK

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



TUNNEL TYPE SECTION



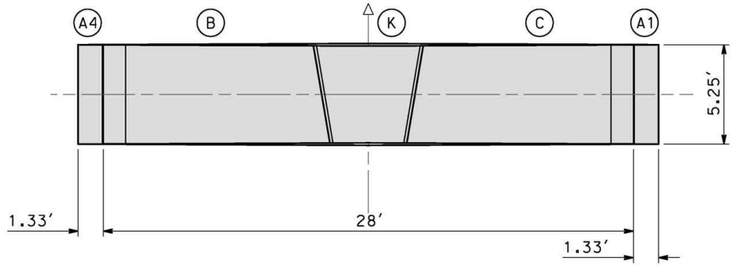


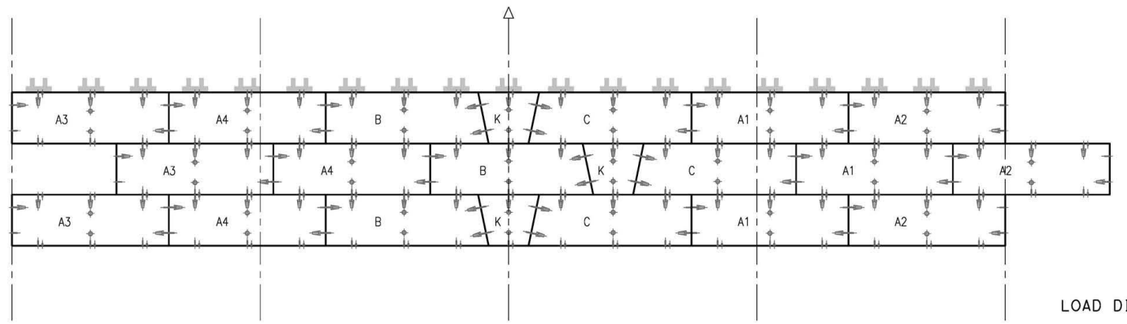
DISCLAIMER:

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

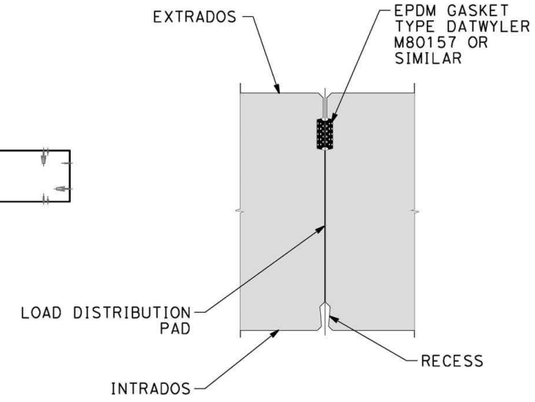
NOTES:

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 fC'= 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.





INTRADOS DEVELOPED VIEW



DETAIL AT RING JOINT (1 / –)

SCALE N.T.S.

4 0 4 8

1"=4'-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

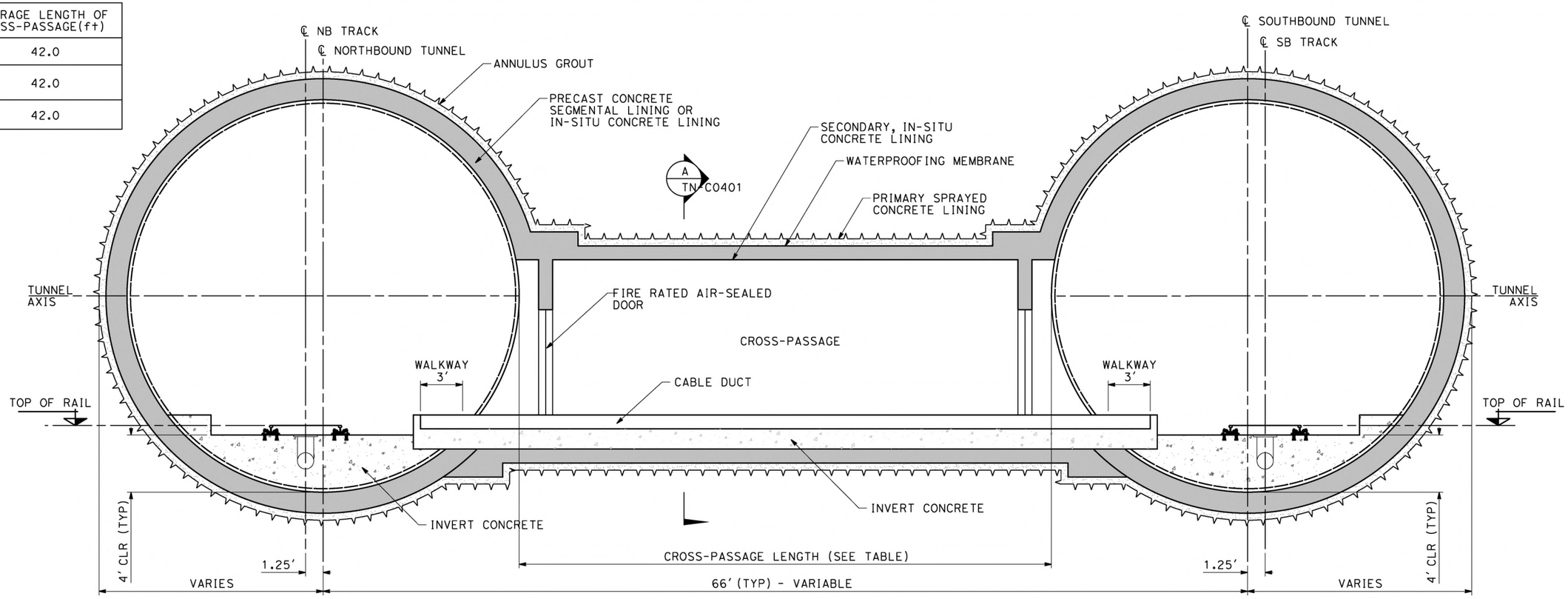
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

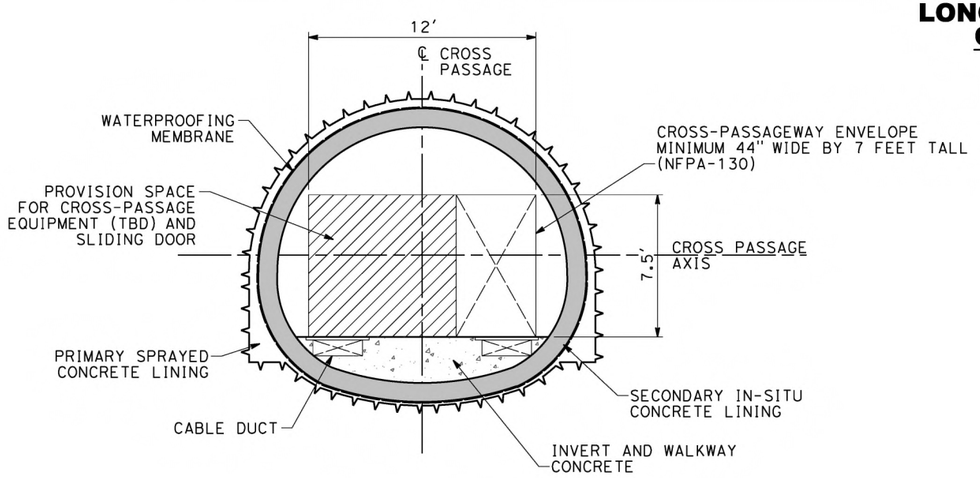
TBM BORED TWIN TUNNELS
ONE-PASS LINING GEOMETRY

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0202
SCALE AS SHOWN
SHEET NO.

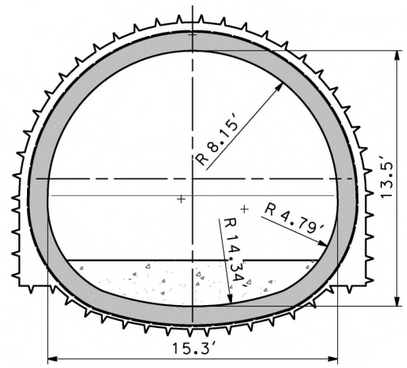
ALIGNMENT	AVERAGE LENGTH OF CROSS-PASSAGE(ft)
E1A	42.0
E2A	42.0
SR14A	42.0



LONGITUDINAL SECTION CROSS-PASSAGE



SECTION A TN-C0401
SPACEPROOFING



SECTION A TN-C0401
INNER GEOMETRY

NOTES:

1. CROSS-PASSAGES FOR EMERGENCY EGRESS SHALL NOT BE FURTHER THAN 800FT APART. NFPA-130 (6.3.1.6)
2. CROSS-PASSAGES FOR EMERGENCY EGRESS SHALL BE A MINIMUM OF 44" IN CLEAR WIDTH AND 7FT IN HEIGHT NFPA-130 (6.3.2.2)
3. 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.
4. CROSS-PASSAGES FOR TECHNICAL EQUIPMENT WILL HAVE THE SAME STRUCTURE AND DIMENSIONS BUT WILL BE LOCATED ELSEWHERE IN THE TUNNELS, ONE EVERY MILE APPROXIMATELY.

4 0 4 8
1"=4'-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET ADDENDUM SR14A/E1A/E2A

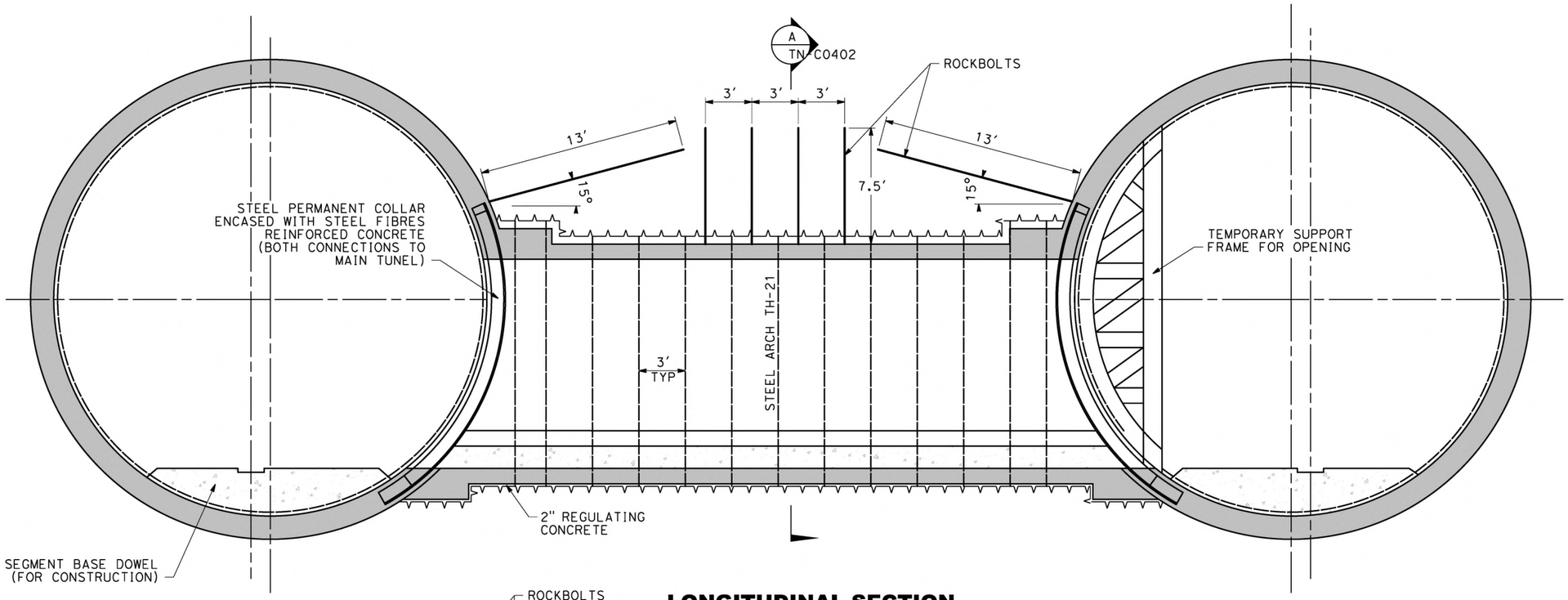
NOT FOR CONSTRUCTION

SENER

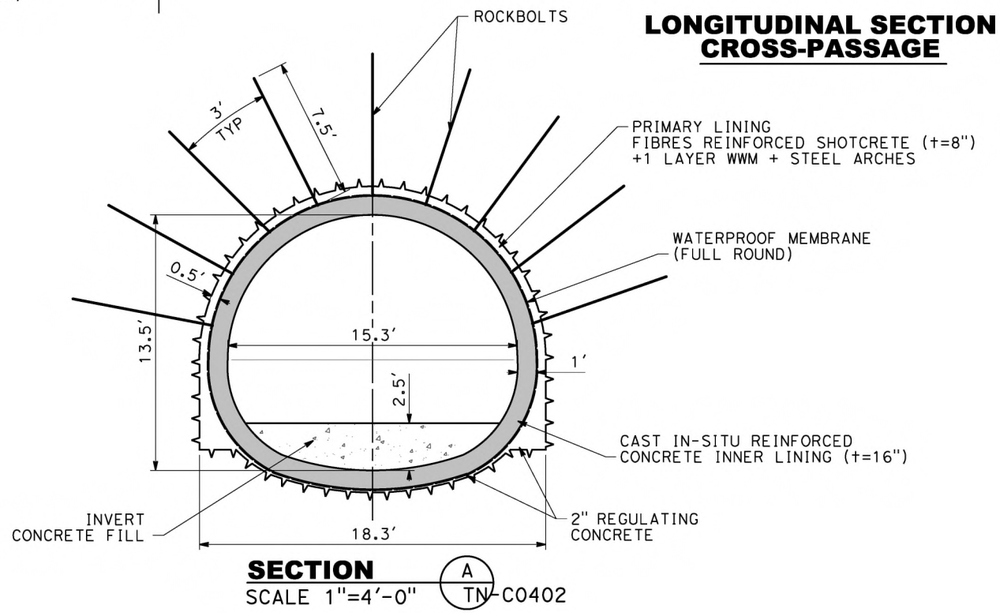
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

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.



LONGITUDINAL SECTION CROSS-PASSAGE



SECTION A TN-C0402

SCALE 1"=4'-0"

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&crown) (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:

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. THIS DRAWING IS NOT ACTUAL DESIGN. ITS ONLY PURPOSE IS TO BUILD UNIT PRICES AT PEPD LEVEL.

4 0 4 8
1"=4'-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

NOT FOR CONSTRUCTION

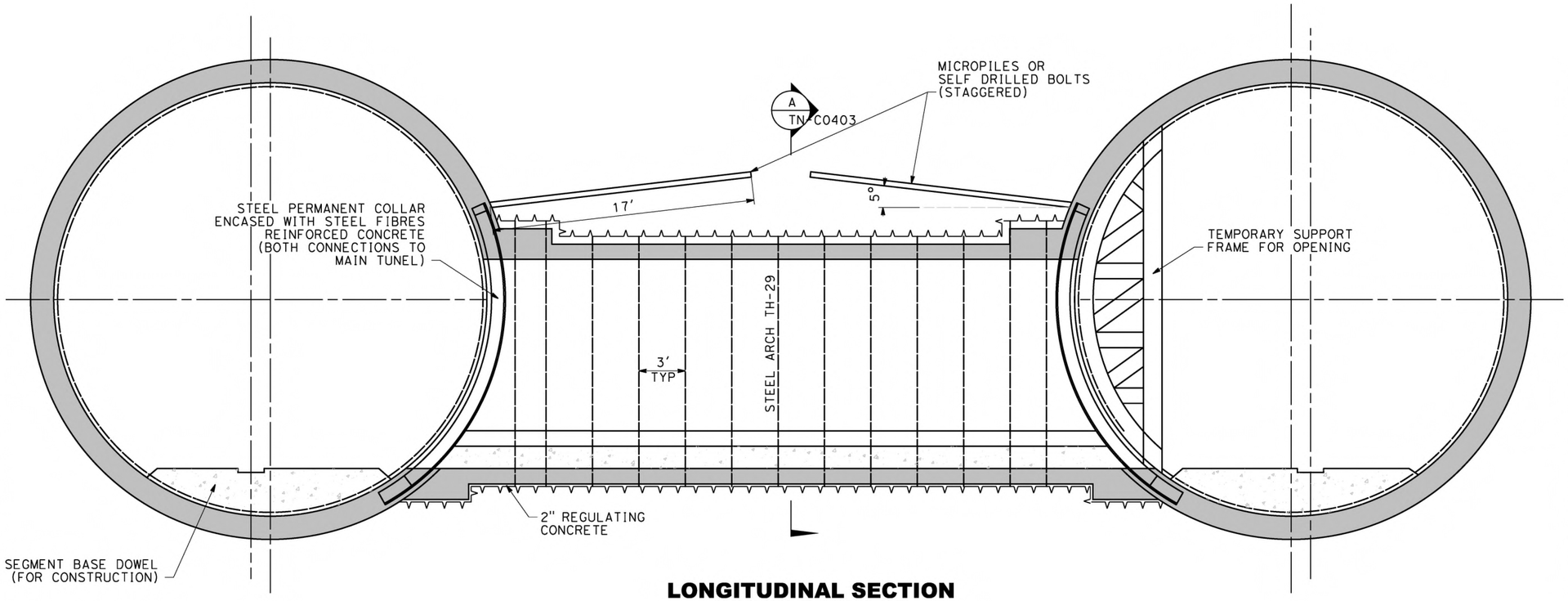
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

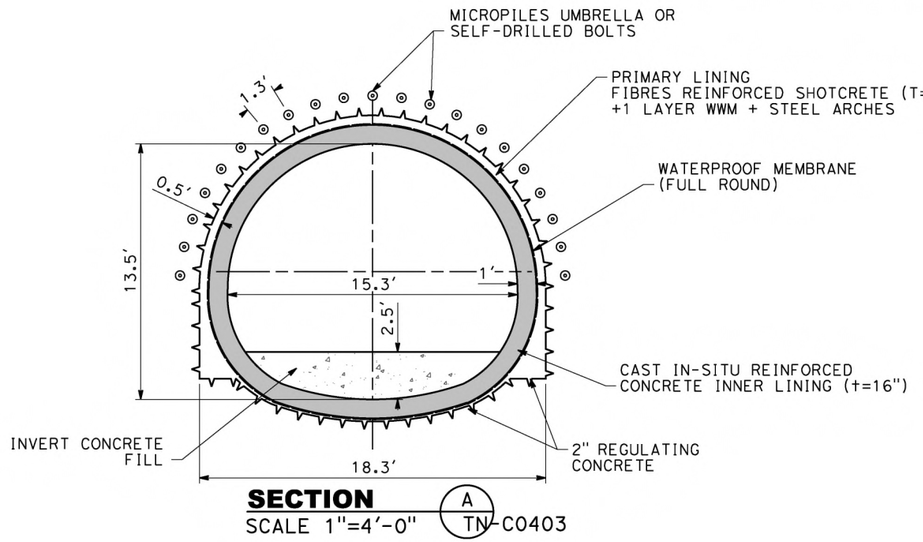
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
TBM TUNNELS
TYPICAL CROSS PASSAGEWAY
SUPPORT MEASURES FOR MEDIUM ROCK QUALITY

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



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

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&crown) (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

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.

4 0 4 8
1"=4'-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET ADDENDUM SR14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

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

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0403
SCALE AS SHOWN
SHEET NO.

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

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 E1A:

POWER STATION	STATION
TR 01A	507+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

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

UNDERGROUND TRACTION POWER STATIONS SR14A:

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

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:

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

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

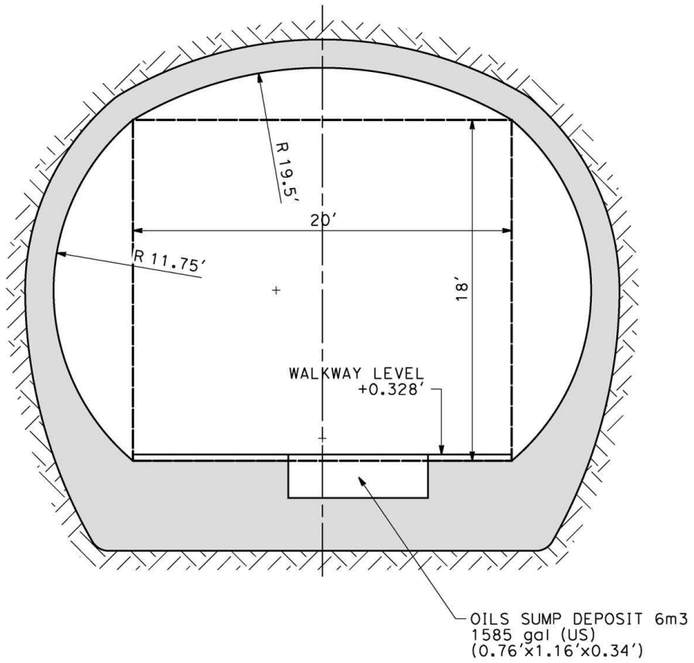
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

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

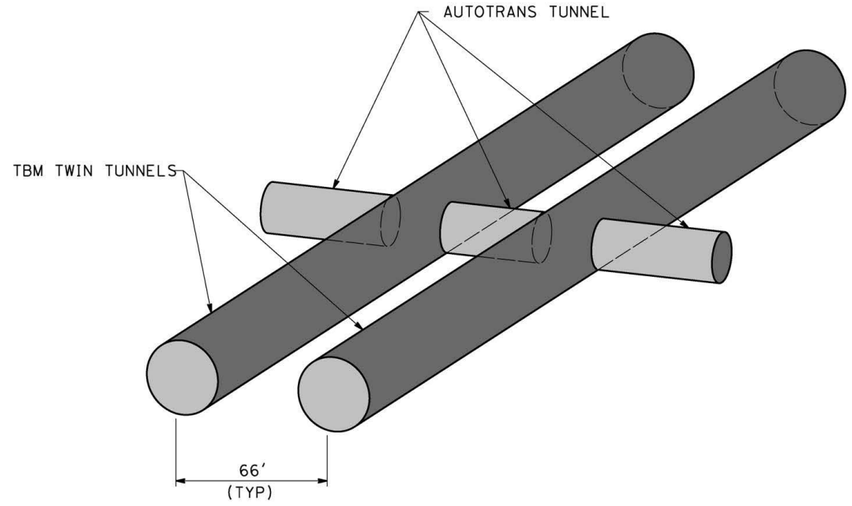
CONTRACT NO. HSR14-42
DRAWING NO. TN-C0410
SCALE NO SCALE
SHEET NO.

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 B
SCALE 1"=4' TN-C0500



GUIDANCE VIEW DETAIL
SCALE N.T.S.

4 0 4 8
1"=4'-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET ADDENDUM SR14A/E1A/E2A

NOT FOR CONSTRUCTION

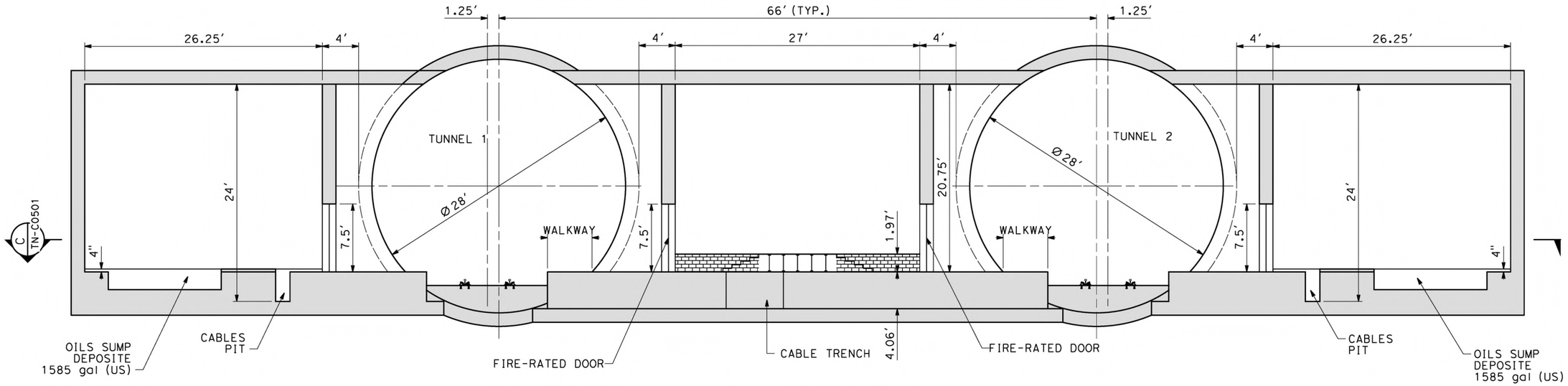
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

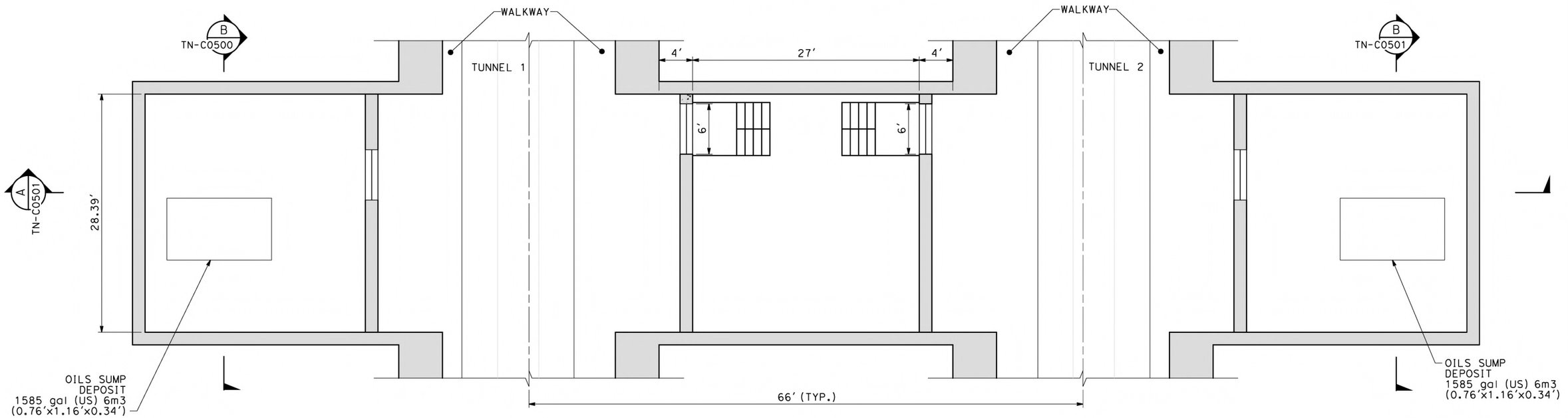
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

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

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



SECTION (A TN-C0501)
SCALE 1"=6'



PLAN PARALLELING STATION (C TN-C0501)
SCALE 1"=6'

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

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

NOT FOR CONSTRUCTION

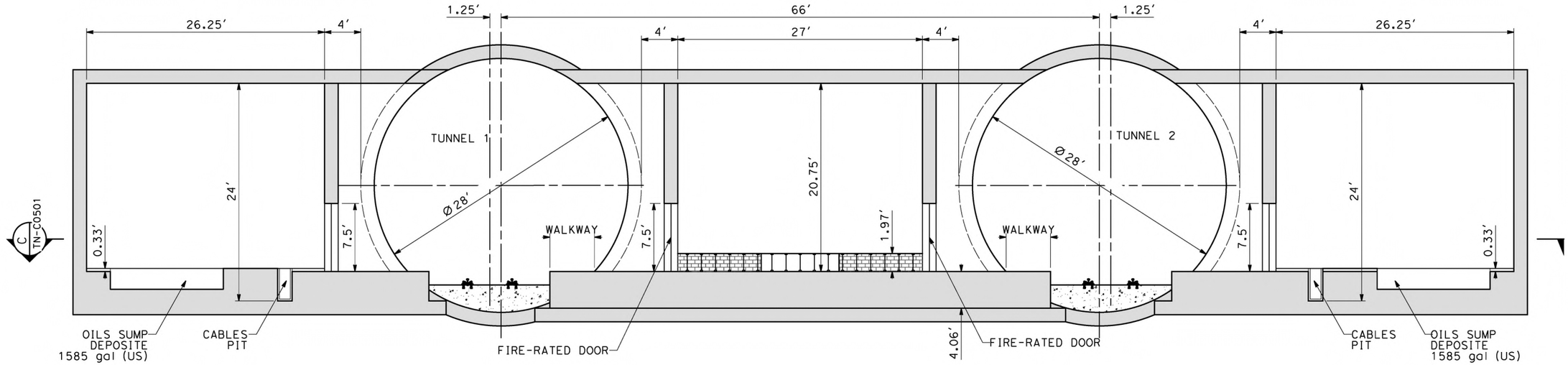
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

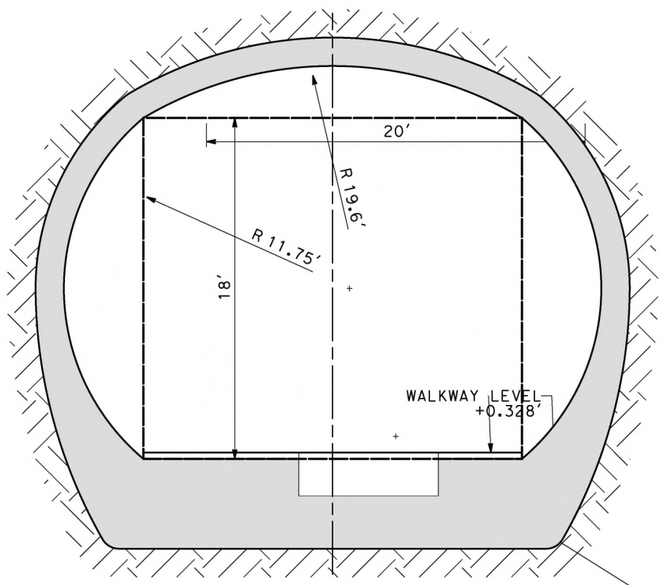
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

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

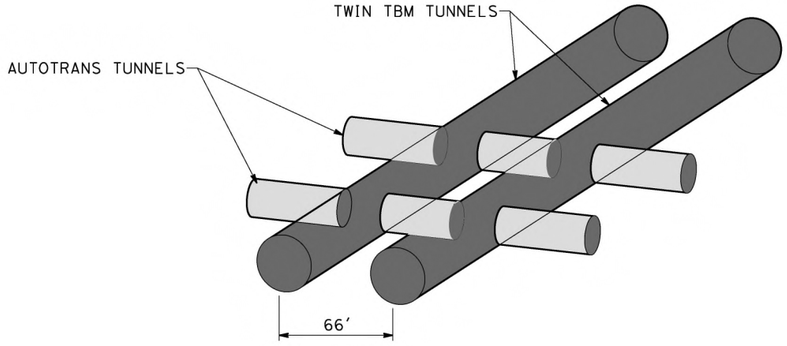
CONTRACT NO. HSR14-42
DRAWING NO. TN-C0501
SCALE AS SHOWN
SHEET NO.



SECTION A TN-C0502
SCALE 1"=6'



SECTION B TN-C0502
SCALE 1"=4'



GUIDANCE VIEW DETAIL
SCALE N.T.S.

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.

4 0 4 8
1"=4'-0"

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

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM SR14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

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.

B TN-C0502

A TN-C0502

31.39′

28.39′

6′

OILS SUMP DEPOSIT
1585 gal (US) 6m3
(0.76′x1.16′x0.34′)

31.39′

B TN-C0503

A TN-C0502

31.39′

28.39′

6′

OILS SUMP DEPOSIT
1585 gal (US) 6m3
(0.76′x1.16′x0.34′)

TUNNEL 1

6′

6′

66′

WALKWAY

4′ 27′ 4′

6′

6′

66′

TUNNEL 2

WALKWAY

B TN-C0502

6′

OILS SUMP DEPOSIT
1585 gal (US) 6m3
(0.76′x1.16′x0.34′)

B TN-C0502

6′

OILS SUMP DEPOSIT
1585 gal (US) 6m3
(0.76′x1.16′x0.34′)

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 FJ.DOMINGUEZ
CHECKED BY C.RECHEA
IN CHARGE A.RELAÑO
DATE 02/26/2021

PEPD RECORD SET
ADDENDUM
SR14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

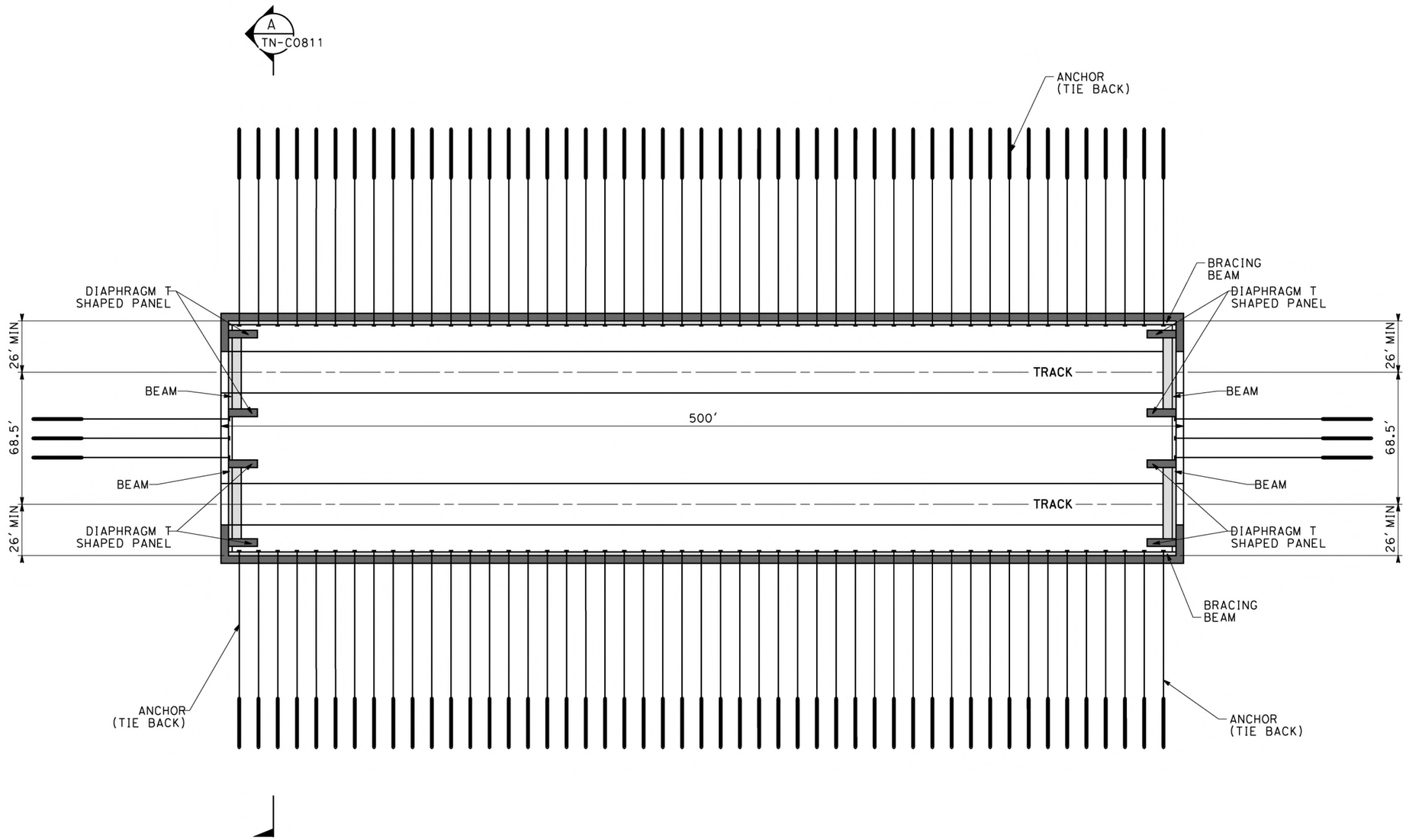
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

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

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

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.



PLAN

30 0 30 60
1"=30'

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET
ADDENDUM SR14A/E1A/E2A

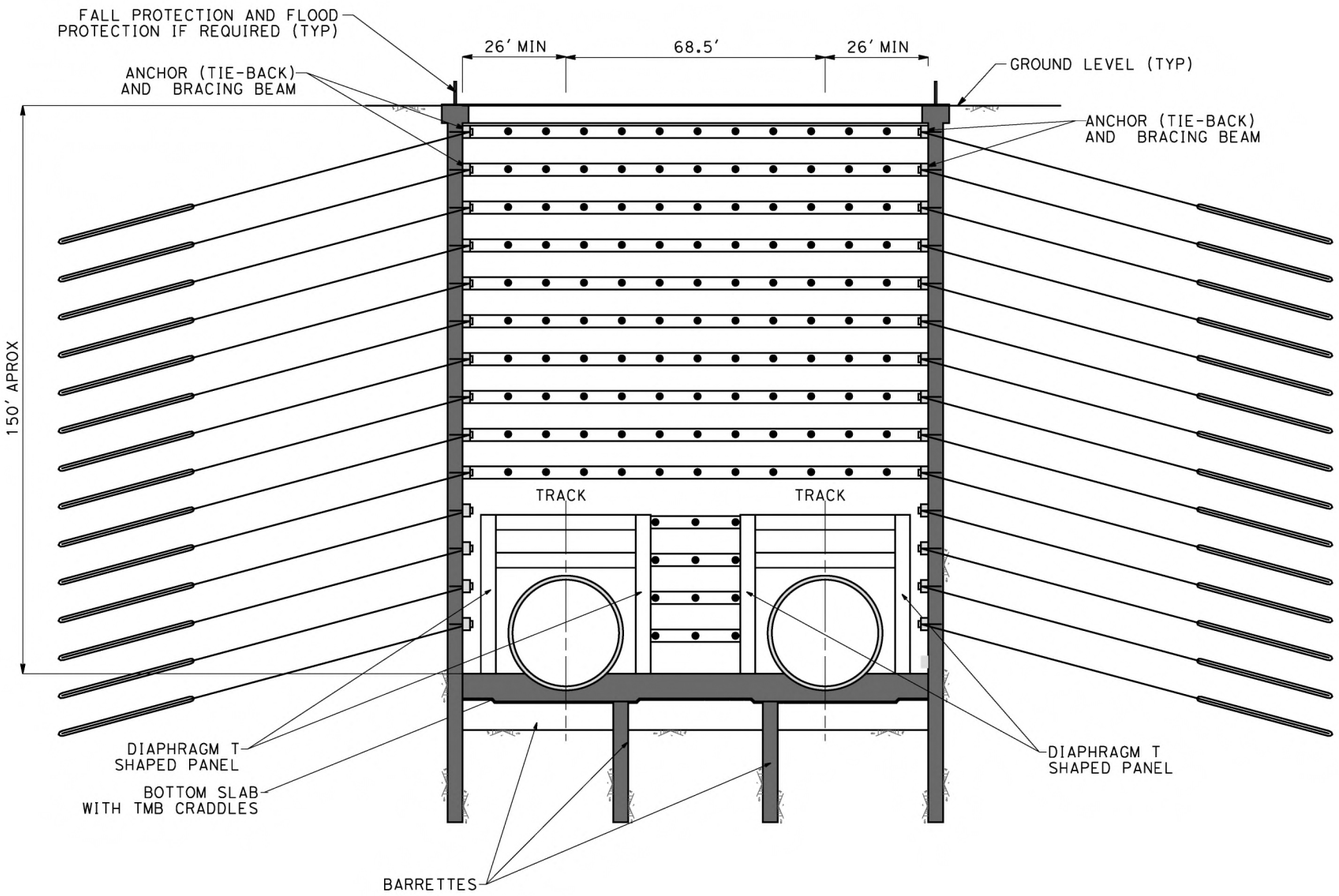
NOT FOR CONSTRUCTION

SENER

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.



TRANSVERSE SECTION (A / TN-C0811)

SCALE 1"=20'-0"

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 AVAIBLE.
4. GENERAL DIMENSIONS AND THICKNESSES ARE GIVEN WITH ORIENTATIVE PURPOSES ONLY.

20 0 20 40
1"=20'

REV	DATE	BY	CHK	APP	DESCRIPTION

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

PEPD RECORD SET ADDENDUM SR14A/E1A/E2A

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

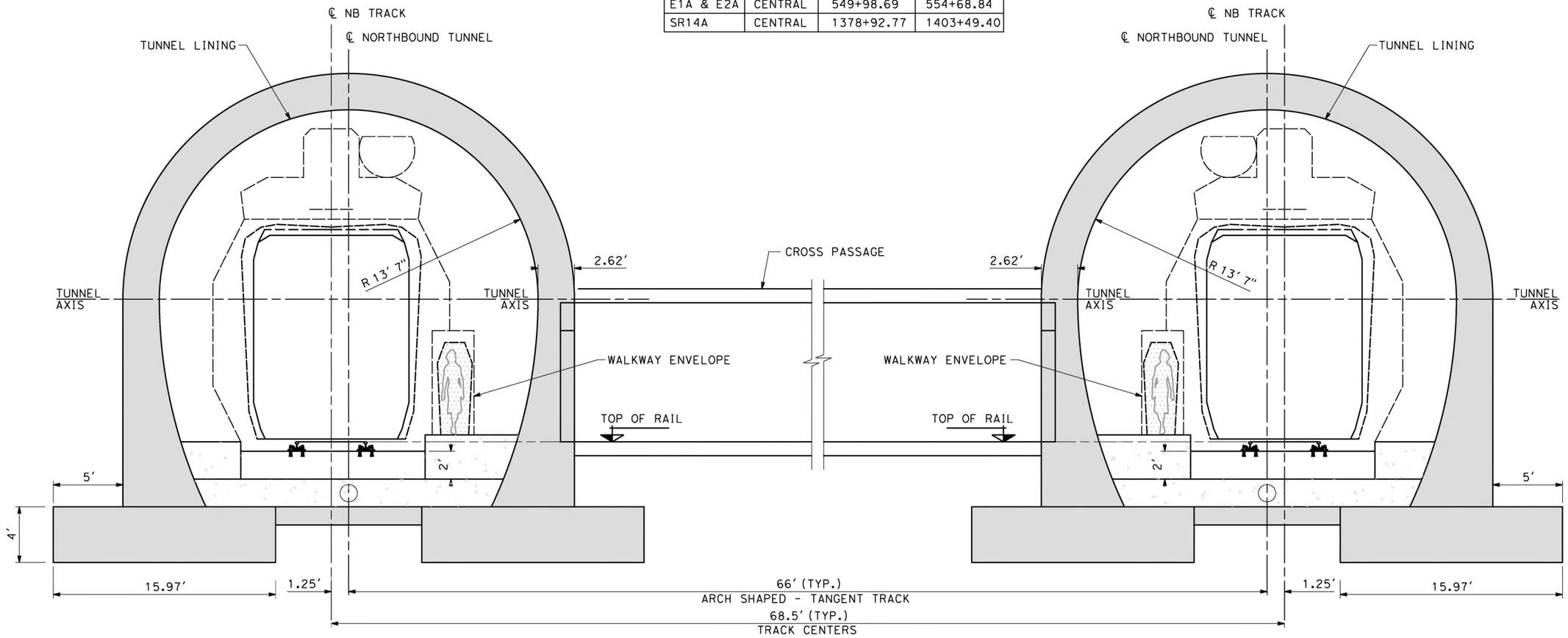
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT SR14A
INTERMEDIATE WINDOW IWA (2 OF 2)

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

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"

4 0 4 8
1"=4'-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

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

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

SENER

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.