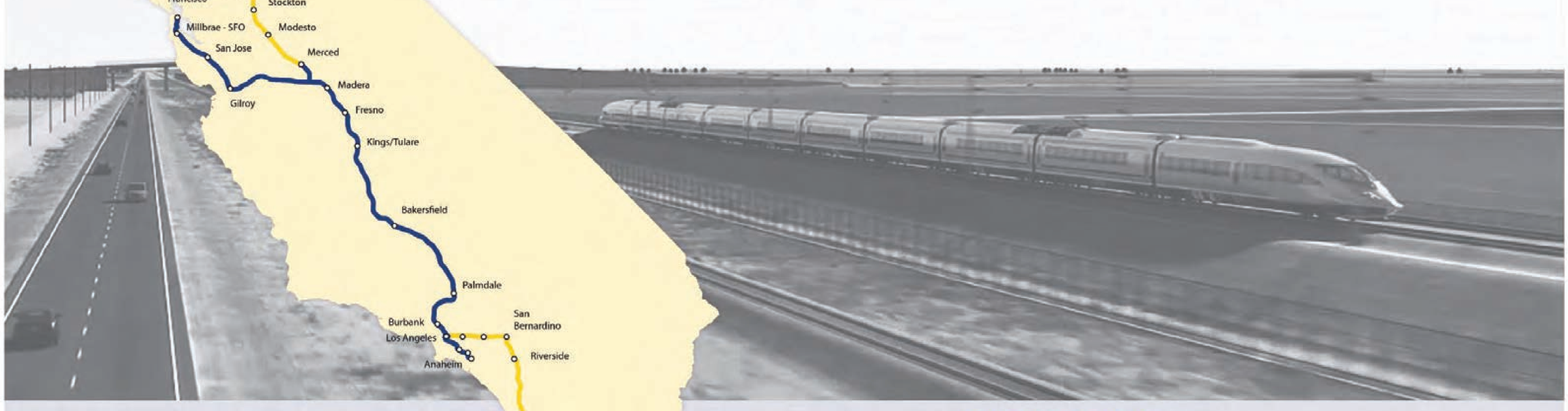
California High-Speed Rail Authority

Palmdale to Burbank Project Section

PEPD RECORD SET REV02

Tunnels Plans

April 2021



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
TN-B0001	GENERAL - INDEX OF DRAWINGS 1 OF 3
TN-B0002	GENERAL - INDEX OF DRAWINGS 2 OF 3
TN-B0003	GENERAL - INDEX OF DRAWINGS 3 OF 3
TN-B0004	ALIGNMENT REFINED SR14/E1/E2 - GENERAL - ABBREVIATIONS AND LEGEND
TN-B0005	ALIGNMENT REFINED SR14/E1/E2 - GENERAL - FAULT KEY MAP
TN-B0006	ALIGNMENT REFINED SR14/E1/E2 - GENERAL - GEOTECHNICAL RISKS AT PORTALS, IW AND ADITS
TN-B0007	ALIGNMENT REFINED SR14/E1/E2 - GENERAL - SCHEMATIC LINEAR DIAGRAMS

ALIGNMENT "REFINED SR14"

DRAWING NO.	DESCRIPTION
TN-B6001-S14	HIGH SPEED RAIL TUNNEL PLANS - KEY MAP 1 OF 2
TN-B6002-S14	HIGH SPEED RAIL TUNNEL PLANS - KEY MAP 2 OF 2
TN-D4001-S14	PLAN STA 368+00.00 TO STA 418+00.00
TN-D4002-S14	PLAN STA 418+00.00 TO STA 468+00.00
TN-D4003-S14	PLAN STA 468+00.00 TO STA 518+00.00
TN-D4004-S14	PLAN STA 518+00.00 TO STA 568+00.00
TN-D4005-S14	PLAN STA 568+00.00 TO STA 618+00.00
TN-D4006-S14	PLAN STA 618+00.00 TO STA 668+00.00
TN-D4007-S14	PLAN STA 668+00.00 TO STA 718+00.00
TN-D4008-S14	PLAN STA 718+00.00 TO STA 768+00.00
TN-D4009-S14	PLAN STA 768+00.00 TO STA 818+00.00
TN-D4010-S14	PLAN STA 818+00.00 TO STA 868+00.00
TN-D4011-S14	PLAN STA 868+00.00 TO STA 918+00.00
TN-D4012-S14	PLAN STA 918+00.00 TO STA 968+00.00
TN-D4013-S14	PLAN STA 968+00.00 TO STA 1018+00.00
TN-D4014-S14	PLAN STA 1018+00.00 TO STA 1068+00.00
TN-D4015-S14	PLAN STA 1068+00.00 TO STA 1118+00.00
TN-D4016-S14	PLAN STA 1118+00.00 TO STA 1168+00.00
TN-D4017-S14	PLAN STA 1168+00.00 TO STA 1218+00.00
TN-D4018-S14	PLAN STA 1218+00.00 TO STA 1268+00.00
TN-D4019-S14	PLAN STA 1268+00.00 TO STA 1318+00.00
TN-D4020-S14	PLAN STA 1318+00.00 TO STA 1368+00.00
TN-D4021-S14	PLAN STA 1368+00.00 TO STA 1418+00.00
TN-D4022-S14	PLAN STA 1418+00.00 TO STA 1468+00.00
TN-D4023-S14	PLAN STA 1468+00.00 TO STA 1518+00.00
TN-D4024-S14	PLAN STA 1518+00.00 TO STA 1568+00.00
TN-D4025-S14	PLAN STA 1568+00.00 TO STA 1618+00.00
TN-D4026-S14	PLAN STA 1618+00.00 TO STA 1668+00.00
TN-D4027-S14	PLAN STA 1668+00.00 TO STA 1718+00.00
TN-D4028-S14	PLAN STA 1718+00.00 TO STA 1768+00.00
TN-D4029-S14	PLAN STA 1768+00.00 TO STA 1818+00.00
TN-D4030-S14	PLAN STA 1818+00.00 TO STA 1868+00.00
TN-D4031-S14	PLAN STA 1868+00.00 TO STA 1918+00.00
TN-D4032-S14	PLAN STA 1918+00.00 TO STA 1968+00.00
TN-D4033-S14	PLAN STA 1968+00.00 TO STA 2018+00.00
TN-D4034-S14	PLAN STA 2018+00.00 TO STA 2068+00.00
TN-D4035-S14	PLAN STA 2068+00.00 TO STA 2118+00.00
TN-D4036-S14	PLAN STA 2118+00.00 TO STA 2168+00.00
TN-D4037-S14	PLAN STA 2168+00.00 TO STA 2224+76.26
TN-D4038-S14	PLAN STA 2224+76.26 TO STA 2254+47.54
TN-Y1001-S14	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 368+00.00 TO STA 468+00.00
TN-Y1002-S14	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 468+00.00 TO STA 568+00.00
TN-Y1003-S14	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 568+00.00 TO STA 668+00.00
TN-Y1004-S14	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 668+00.00 TO STA 768+00.00
TN-Y1005-S14	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 768+00.00 TO STA 868+00.00
TN-Y1006-S14	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 868+00.00 TO STA 968+00.00
TN-Y1007-S14	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 968+00.00 TO STA 1068+00.00
TN-Y1008-S14	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1068+00.00 TO STA 1168+00.00
TN-Y1009-S14	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1168+00.00 TO STA 1268+00.00
TN-Y1010-S14	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1268+00.00 TO STA 1368+00.00
TN-Y1011-S14	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1368+00.00 TO STA 1468+00.00
TN-Y1012-S14	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1468+00.00 TO STA 1568+00.00
TN-Y1013-S14	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1568+00.00 TO STA 1618+00.00
TN-Y1014-S14	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1618+00.00 TO STA 1668+00.00
TN-Y1015-S14	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1668+00.00 TO STA 1718+00.00
TN-Y1016-S14	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1718+00.00 TO STA 1818+00.00
TN-Y1017-S14	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1818+00.00 TO STA 1918+00.00
TN-Y1018-S14	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1918+00.00 TO STA 2018+00.00
TN-Y1019-S14	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 2018+00.00 TO STA 2118+00.00
TN-Y1020-S14	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 2118+00.00 TO STA 2224+76.26
TN-Y1021-S14	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 2224+76.26 TO STA 2254+47.54
TN-D7001-S14	PORTAL 1 PLAN AND PROFILE FOR CONSTRUCTION
TN-D7002-S14	PORTAL 2 PLAN AND PROFILE FOR CONSTRUCTION
TN-D7003-S14	PORTAL 3 PLAN AND PROFILE FOR CONSTRUCTION
TN-D7004-S14	PORTAL 4 PLAN AND PROFILE FOR CONSTRUCTION
TN-D7005-S14	PORTAL 5 PLAN AND PROFILE FOR CONSTRUCTION
TN-D7006-S14	PORTAL 6 PLAN AND PROFILE FOR CONSTRUCTION
TN-D7007-S14	PORTAL 7 PLAN AND PROFILE FOR CONSTRUCTION
TN-D7008-S14	PORTAL 8 PLAN AND PROFILE FOR CONSTRUCTION
TN-D7009-S14	PORTAL 9 PLAN AND PROFILE FOR CONSTRUCTION

ALIGNMENT "E1"

DRAWING NO.	DESCRIPTION
TN-B6001-E1	HIGH SPEED RAIL TUNNEL PLANS - KEY MAP 1 OF 3
TN-B6002-E1	HIGH SPEED RAIL TUNNEL PLANS - KEY MAP 2 OF 3
TN-B6003-E1	HIGH SPEED RAIL TUNNEL PLANS - KEY MAP 3 OF 3
TN-D4001-E1	PLAN STA 480+00.00 TO STA 540+00.00
TN-D4002-E1	PLAN STA 618+00.00 TO STA 668+00.00
TN-D4003-E1	PLAN STA 668+00.00 TO STA 718+00.00
TN-D4004-E1	PLAN STA 718+00.00 TO STA 768+00.00
TN-D4005-E1	PLAN STA 768+00.00 TO STA 818+00.00
TN-D4006-E1	PLAN STA 818+00.00 TO STA 868+00.00
TN-D4007-E1	PLAN STA 868+00.00 TO STA 918+00.00
TN-D4008-E1	PLAN STA 918+00.00 TO STA 968+00.00
TN-D4009-E1	PLAN STA 968+00.00 TO STA 1018+00.00
TN-D4010-E1	PLAN STA 1018+00.00 TO STA 1068+00.00
TN-D4011-E1	PLAN STA 1068+00.00 TO STA 1118+00.00
TN-D4012-E1	PLAN STA 1118+00.00 TO STA 1168+00.00
TN-D4013-E1	PLAN STA 1168+00.00 TO STA 1218+00.00
TN-D4014-E1	PLAN STA 1218+00.00 TO STA 1268+00.00
TN-D4015-E1	PLAN STA 1268+00.00 TO STA 1318+00.00
TN-D4016-E1	PLAN STA 1318+00.00 TO STA 1368+00.00
TN-D4017-E1	PLAN STA 1368+00.00 TO STA 1418+00.00
TN-D4018-E1	PLAN STA 1418+00.00 TO STA 1468+00.00
TN-D4019-E1	PLAN STA 1468+00.00 TO STA 1518+00.00
TN-D4020-E1	PLAN STA 1518+00.00 TO STA 1568+00.00
TN-D4021-E1	PLAN STA 1568+00.00 TO STA 1618+00.00
TN-D4022-E1	PLAN STA 1618+00.00 TO STA 1668+00.00
TN-D4023-E1	PLAN STA 1668+00.00 TO STA 1718+00.00
TN-D4024-E1	PLAN STA 1718+00.00 TO STA 1768+00.00
TN-D4025-E1	PLAN STA 1768+00.00 TO STA 1818+00.00
TN-D4026-E1	PLAN STA 1818+00.00 TO STA 1868+00.00
TN-D4027-E1	PLAN STA 1868+00.00 TO STA 1918+00.00
TN-D4028-E1	PLAN STA 1918+00.00 TO STA 1968+00.00
TN-D4029-E1	PLAN STA 1968+00.00 TO STA 2018+00.00
TN-D4030-E1	PLAN STA 2018+00.00 TO STA 2068+00.00
TN-D4031-E1	PLAN STA 2068+00.00 TO STA 2117+34.00
TN-D4032-E1	PLAN STA 2117+34.00 TO STA 2147+05.29
TN-Y1001-E1	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 480+00.00 TO STA 540+00.00
TN-Y1002-E1	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 618+00.00 TO STA 718+00.00
TN-Y1003-E1	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 718+00.00 TO STA 768+00.00
TN-Y1004-E1	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 768+00.00 TO STA 818+00.00
TN-Y1005-E1	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 818+00.00 TO STA 868+00.00
TN-Y1006-E1	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 868+00.00 TO STA 918+00.00
TN-Y1007-E1	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 918+00.00 TO STA 968+00.00
TN-Y1008-E1	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 968+00.00 TO STA 1018+00.00
TN-Y1009-E1	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1018+00.00 TO STA 1068+00.00
TN-Y1010-E1	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1068+00.00 TO STA 1118+00.00
TN-Y1011-E1	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1118+00.00 TO STA 1168+00.00
TN-Y1012-E1	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1168+00.00 TO STA 1218+00.00
TN-Y1013-E1	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1218+00.00 TO STA 1268+00.00
TN-Y1014-E1	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1268+00.00 TO STA 1318+00.00
TN-Y1015-E1	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1318+00.00 TO STA 1368+00.00
TN-Y1016-E1	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1368+00.00 TO STA 1418+00.00
TN-Y1017-E1	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1418+00.00 TO STA 1468+00.00
TN-Y1018-E1	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1468+00.00 TO STA 1518+00.00
TN-Y1019-E1	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1518+00.00 TO STA 1568+00.00
TN-Y1020-E1	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1568+00.00 TO STA 1618+00.00
TN-Y1021-E1	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1618+00.00 TO STA 1668+00.00
TN-Y1022-E1	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1668+00.00 TO STA 1718+00.00
TN-Y1023-E1	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1718+00.00 TO STA 1768+00.00
TN-Y1024-E1	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1768+00.00 TO STA 1818+00.00
TN-Y1025-E1	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1818+00.00 TO STA 1868+00.00
TN-Y1026-E1	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1868+00.00 TO STA 1918+00.00
TN-Y1027-E1	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1918+00.00 TO STA 1968+00.00
TN-Y1028-E1	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1968+00.00 TO STA 2018+00.00
TN-Y1029-E1	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 2018+00.00 TO STA 2068+00.00
TN-Y1030-E1	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 2068+00.00 TO STA 2117+34.00
TN-Y1031-E1	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 2117+34.00 TO STA 2147+05.29
TN-D7001-E1	PORTAL 1 PLAN AND PROFILE FOR CONSTRUCTION
TN-D7002-E1	PORTAL 2 PLAN AND PROFILE FOR CONSTRUCTION
TN-D7003-E1	PORTAL 3 PLAN AND PROFILE FOR CONSTRUCTION
TN-D5001-E1	PLAN INTERMEDIATE WINDOW 1
TN-D5002-E1	PLAN POTENTIAL ADIT LOCATIONS

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
GENERAL
INDEX OF DRAWINGS 1 OF 3

CONTRACT NO. HSR14-42
DRAWING NO. TN-B0001
SCALE NO SCALE
SHEET NO.

ALIGNMENT "E2"

DRAWING NO.	DESCRIPTION
TN-B6001-E2	HIGH SPEED RAIL TUNNEL PLANS - KEY MAP 1 OF 2
TN-B6002-E2	HIGH SPEED RAIL TUNNEL PLANS - KEY MAP 2 OF 2
TN-D4001-E2	PLAN STA 480+00.00 TO STA 540+00.00
TN-D4002-E2	PLAN STA 618+00.00 TO STA 668+00.00
TN-D4003-E2	PLAN STA 668+00.00 TO STA 718+00.00
TN-D4004-E2	PLAN STA 718+00.00 TO STA 768+00.00
TN-D4005-E2	PLAN STA 768+00.00 TO STA 818+00.00
TN-D4006-E2	PLAN STA 818+00.00 TO STA 868+00.00
TN-D4007-E2	PLAN STA 868+00.00 TO STA 918+00.00
TN-D4008-E2	PLAN STA 918+00.00 TO STA 968+00.00
TN-D4009-E2	PLAN STA 968+00.00 TO STA 1018+00.00
TN-D4010-E2	PLAN STA 1018+00.00 TO STA 1068+00.00
TN-D4011-E2	PLAN STA 1068+00.00 TO STA 1118+00.00
TN-D4012-E2	PLAN STA 1118+00.00 TO STA 1168+00.00
TN-D4013-E2	PLAN STA 1168+00.00 TO STA 1218+00.00
TN-D4014-E2	PLAN STA 1218+00.00 TO STA 1268+00.00
TN-D4015-E2	PLAN STA 1268+00.00 TO STA 1318+00.00
TN-D4016-E2	PLAN STA 1318+00.00 TO STA 1368+00.00
TN-D4017-E2	PLAN STA 1368+00.00 TO STA 1418+00.00
TN-D4018-E2	PLAN STA 1418+00.00 TO STA 1468+00.00
TN-D4019-E2	PLAN STA 1468+00.00 TO STA 1518+00.00
TN-D4020-E2	PLAN STA 1518+00.00 TO STA 1568+00.00
TN-D4021-E2	PLAN STA 1568+00.00 TO STA 1618+00.00
TN-D4022-E2	PLAN STA 1618+00.00 TO STA 1668+00.00
TN-D4023-E2	PLAN STA 1668+00.00 TO STA 1718+00.00
TN-D4024-E2	PLAN STA 1718+00.00 TO STA 1768+00.00
TN-D4025-E2	PLAN STA 1768+00.00 TO STA 1818+00.00
TN-D4026-E2	PLAN STA 1818+00.00 TO STA 1868+00.00
TN-D4027-E2	PLAN STA 1868+00.00 TO STA 1915+47.81
TN-D4028-E2	PLAN STA 1915+47.81 TO STA 1944+05.88
TN-Y1001-E2	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 480+00.00 TO STA 540+00.00
TN-Y1002-E2	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 618+00.00 TO STA 718+00.00
TN-Y1003-E2	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 718+00.00 TO STA 768+00.00
TN-Y1004-E2	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 768+00.00 TO STA 818+00.00
TN-Y1005-E2	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 818+00.00 TO STA 868+00.00
TN-Y1006-E2	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 868+00.00 TO STA 918+00.00
TN-Y1007-E2	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 918+00.00 TO STA 968+00.00
TN-Y1008-E2	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 968+00.00 TO STA 1018+00.00
TN-Y1009-E2	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1018+00.00 TO STA 1068+00.00
TN-Y1010-E2	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1068+00.00 TO STA 1118+00.00
TN-Y1011-E2	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1118+00.00 TO STA 1168+00.00
TN-Y1012-E2	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1168+00.00 TO STA 1218+00.00
TN-Y1013-E2	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1218+00.00 TO STA 1268+00.00
TN-Y1014-E2	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1268+00.00 TO STA 1318+00.00
TN-Y1015-E2	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1318+00.00 TO STA 1368+00.00
TN-Y1016-E2	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1368+00.00 TO STA 1418+00.00
TN-Y1017-E2	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1418+00.00 TO STA 1468+00.00
TN-Y1018-E2	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1468+00.00 TO STA 1518+00.00
TN-Y1019-E2	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1518+00.00 TO STA 1568+00.00
TN-Y1020-E2	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1568+00.00 TO STA 1618+00.00
TN-Y1021-E2	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1618+00.00 TO STA 1668+00.00
TN-Y1022-E2	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1668+00.00 TO STA 1718+00.00
TN-Y1023-E2	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1718+00.00 TO STA 1768+00.00
TN-Y1024-E2	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1768+00.00 TO STA 1818+00.00
TN-Y1025-E2	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1818+00.00 TO STA 1868+00.00
TN-Y1026-E2	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1868+00.00 TO STA 1915+47.81
TN-Y1027-E2	TUNNEL PROFILE - SOUTH BOUND TUNNEL - STA 1915+47.81 TO STA 1944+05.88
TN-D7001-E2	PORTAL 1 PLAN AND PROFILE FOR CONSTRUCTION
TN-D7002-E2	PORTAL 2 PLAN AND PROFILE FOR CONSTRUCTION
TN-D7003-E2	PORTAL 3 PLAN AND PROFILE FOR CONSTRUCTION
TN-D7004-E2	PORTAL 4 PLAN AND PROFILE FOR CONSTRUCTION
TN-D7005-E2	PORTAL 5 PLAN AND PROFILE FOR CONSTRUCTION
TN-D5001-E2	PLAN INTERMEDIATE WINDOW 1
TN-D5002-E2	PLAN POTENTIAL ADIT LOCATIONS

TYPICAL SECTIONS AND DETAILS

PORTAL FACILITIES AND TUNNEL GAUGES	
DRAWING NO.	DESCRIPTION
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
TN-C0100	MINED TWIN TUNNELS. TUNNEL TYPICAL SECTIONS AND DETAILS. CLEARANCE DIAGRAM - TANGENT TRACK
TN-C0101	MINED TWIN TUNNELS. TUNNEL TYPICAL SECTIONS AND DETAILS. CLEARANCE DIAGRAM - SUPERELEVATED TRACK
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
TN-C0200	TBM BORED TWIN TUNNELS. TUNNEL TYPICAL SECTIONS AND DETAILS. CLEARANCE DIAGRAM - TANGENT TRACK
TN-C0201	TBM BORED TWIN TUNNELS. TUNNEL TYPICAL SECTIONS AND DETAILS. CLEARANCE DIAGRAM - SUPERELEVATED TRACK
TN-C0202	TBM BORED TWIN TUNNELS. ONE-PASS LINING GEOMETRY
TN-C0203	TBM BORED TWIN TUNNELS. TWO-PASS LINING GEOMETRY

FAULT CHAMBER CONCEPT	
DRAWING NO.	DESCRIPTION
TN-C0300	FAULT CHAMBER. CONCEPT DESIGN FAULT CHAMBER. PLAN VIEW
TN-C0301	FAULT CHAMBER. CONCEPT DESIGN FAULT CHAMBER. CROSS-SECTION
TN-C0302	FAULT CHAMBER. CONCEPT DESIGN FAULT CHAMBER. DETAILS AND NOTES

CROSS-PASSAGES FOR EMERGENCY EGRESS AND TECHNICAL	
DRAWING NO.	DESCRIPTION
TN-C0400	EMERGENCY EGRESS CROSS-PASSAGES AND EXITS, TECHNICAL ROOMS AND UNDERGROUND TRACTION POWER FACILITIES
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-C0404	EMERGENCY EGRESS FOR SEM TUNNELS. CROSS AND LONGITUDINAL SECTION GEOMETRY

UNDERGROUND TRACTION POWER FACILITIES	
DRAWING NO.	DESCRIPTION
TN-C0500	UNDERGROUND TRACTION POWER PARALLELING STATION (PS).TYPICAL GEOMETRY (1 OF 2)
TN-C0501	UNDERGROUND TRACTION POWER 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

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

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CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
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SHEET NO.

TYPICAL SECTIONS AND DETAILS (CONT.)

ADITS AND DISSASSEMBLY CHAMBER	
DRAWING NO.	DESCRIPTION
TN-C0701	NOT USED
TN-C0700	ADIT FOR CONSTRUCTION. TYPICAL PLAN AND PROFILE
TN-C0702	ADIT FOR CONSTRUCTION. INCLINED DESCENDING GALLERY. TYPICAL CROSS-SECTION GEOMETRY.
TN-C0703	ADIT FOR CONSTRUCTION. INCLINED DESCENDING GALLERY. TYPICAL CONSTRUCTION SEQUENCE AND SUPPORT MEASURES (1 OF 3)
TN-C0704	ADIT FOR CONSTRUCTION. INCLINED DESCENDING GALLERY. TYPICAL CONSTRUCTION SEQUENCE AND SUPPORT MEASURES (2 OF 3)
TN-C0705	ADIT FOR CONSTRUCTION. INCLINED DESCENDING GALLERY. TYPICAL CONSTRUCTION SEQUENCE AND SUPPORT MEASURES (3 OF 3)
TN-C0706	ADIT FOR CONSTRUCTION. INCLINED DESCENDING GALLERY. PRE-EXCAVATION GROUTING SAMPLE SCHEME
TN-C0707	ADIT FOR CONSTRUCTION. CAVERN (TBM ASSEMBLY CHAMBER). PLAN
TN-C0708	ADIT FOR CONSTRUCTION. CAVERN (TBM ASSEMBLY CHAMBER). GEOMETRY OF THE CROSS SECTION
TN-C0709	ADIT FOR CONSTRUCTION. CAVERN (TBM ASSEMBLY CHAMBER). TYPICAL CONSTRUCTION SEQUENCE AND SUPPORT MEASURES (1 OF 3)
TN-C0710	ADIT FOR CONSTRUCTION. CAVERN (TBM ASSEMBLY CHAMBER). TYPICAL CONSTRUCTION SEQUENCE AND SUPPORT MEASURES (2 OF 3)
TN-C0711	ADIT FOR CONSTRUCTION. CAVERN (TBM ASSEMBLY CHAMBER). TYPICAL CONSTRUCTION SEQUENCE AND SUPPORT MEASURES (3 OF 3)
TN-C0712	ALIGNMENT E1. ADIT FOR CONSTRUCTION AND VENTILATION. INCLINED DESCENDING GALLERY. TYPICAL CROSS-SECTION GEOMETRY.
TN-C0713	ALIGNMENT E1. ADIT FOR CONSTRUCTION AND VENTILATION. INCLINED DESCENDING GALLERY. TYPICAL SUPPORT MEASURES
TN-C0714	ALIGNMENT E1. ADIT FOR CONSTRUCTION AND VENTILATION. INCLINED DESCENDING GALLERY. PRE-EXCAVATION GROUTING SAMPLE SCHEME
TN-C0715	UNDERGROUND TBM DISSASSEMBLY CHAMBER. (1 OF 2)
TN-C0716	UNDERGROUND TBM DISSASSEMBLY CHAMBER. (2 OF 2)

INTERMEDIATE WINDOWS/LAUNCHING SHAFTS	
DRAWING NO.	
TN-C0800	ALIGNMENT E1/E2. STA.870+00.00. INTERMEDIATE WINDOW AT ARRASTRE CANYON. TWIN SHAFT (1 of 2)
TN-C0801	ALIGNMENT E1/E2. STA.870+00.00. INTERMEDIATE WINDOW AT ARRASTRE CANYON. TWIN SHAFT (2 of 2)
TN-C0802	ALIGNMENT E1/REFINED SR14. STA. 1775+00.00 (E1) / 1882+50.00 (REFINED SR14). INTERMEDIATE WINDOW AT I-210 INTERSECTION. TWIN SHAFT (1 of 2)
TN-C0803	ALIGNMENT E1/REFINED SR14. STA. 1775+00.00 (E1) / 1882+50.00 (REFINED SR14). INTERMEDIATE WINDOW AT I-210 INTERSECTION. TWIN SHAFT (2 of 2)
TN-C0804	ALIGNMENT E1/REFINED SR14. TBM LAUNCHING TRENCH AT PORTAL 4 (E1)/10 (REFINED SR14). STA. 1891+47.74 (E1)/STA. 1998+90.00 (REFINED SR14) (1 of 2)
TN-C0805	ALIGNMENT E1/REFINED SR14. TBM LAUNCHING TRENCH AT PORTAL 4 (E1)/10 (REFINED SR14). STA. 1891+47.74 (E1)/STA. 1998+90.00 (REFINED SR14) (2 of 2)
TN-C0806	ALIGNMENT E2. INTERMEDIATE WINDOW 2. CONSTRUCTION AND SUPPORT. DETAIL 1
TN-C0807	ALIGNMENT E2. INTERMEDIATE WINDOW 2. CONSTRUCTION AND SUPPORT. DETAIL 2
TN-C0808	ALIGNMENT E2. TBM BORED TWIN TUNNELS. ALTERNATIVE ADIT AT 1460+83.00. LOCATION AND CROSS SECTION
TN-C0809	ALIGNMENT E2. TBM BORED TWIN TUNNELS. ALTERNATIVE ADIT AT 1460+83.00. PLAN AND DETAILS

TYPICAL SECTIONS AND DETAILS (CONT.)

SEM TUNNELS	
DRAWING NO.	
TN-C0900	ALIGNMENT E1/REFINED SR14. TUNNEL TYPICAL SECTION AND DETAILS. SEM SINGLE TUNNEL, 2 TRACKS. CLEARANCE DIAGRAM - TANGENT & SUPERELEVATED TRACK
TN-C0901	ALIGNMENT E1/REFINED SR14. TUNNEL TYPICAL SECTION AND DETAILS. SEM SINGLE TUNNEL, 2 TRACKS. CONSTRUCTION SEQUENCE AND SUPPORT MEASURES
TN-C0902	ALIGNMENT E1/REFINED SR14. TUNNEL TYPICAL SECTION AND DETAILS. SEM SINGLE TUNNEL, 2 TRACKS+REFUGE TRACK. CLEARANCE DIAGRAM - TANGENT & SUPERELEVATED TRACK
TN-C0903	ALIGNMENT E1/REFINED SR14. TUNNEL TYPICAL SECTION AND DETAILS. SEM SINGLE TUNNEL, 2 TRACKS+REFUGE TRACK. CONSTRUCTION SEQUENCE AND SUPPORT MEASURES
TN-C0904	ALIGNMENT E2. SEM TUNNELS. TWIN TUNNELS AND BIFURCATION. TYPICAL CROSS-SECTIONS
TN-C0905	ALIGNMENT E2. SEM SINGLE TUNNEL, 1 TRACK. CLEARANCE DIAGRAM - TANGENT TRACK
TN-C0906	ALIGNMENT E2. TUNNEL TYPICAL SECTION AND DETAILS. SEM SINGLE TUNNEL, 2 TRACKS ETD. CLEARANCE DIAGRAM - TANGENT TRACK
TN-C0907	ALIGNMENT E2. TUNNEL TYPICAL SECTION AND DETAILS. SEM SINGLE TUNNEL, 4 TRACKS ETD. CLEARANCE DIAGRAM - TANGENT TRACK
TN-C0908	ALIGNMENT E2. SEM TUNNELS IN BURBANK. PLAN LAYOUT AND SECTIONS
TN-C0909	ALIGNMENT E2. SEM TWIN TUNNELS. CONSTRUCTION SEQUENCE AND SUPPORT MEASURES
TN-C0910	ALIGNMENT E2. SEM TWIN TUNNELS AND BIFURCATION. CONSTRUCTION SEQUENCE AND SUPPORT MEASURES
TN-C0911	ALIGNMENT E2. SEM SINGLE TUNNEL, 2 TRACKS EDT. CONSTRUCTION SEQUENCE AND SUPPORT MEASURES
TN-C0912	ALIGNMENT E2. SEM SINGLE TUNNEL, 4 TANGENT TRACKS EDT. CONSTRUCTION SEQUENCE AND SUPPORT MEASURES

CUT-AND-COVER TUNNELS	
DRAWING NO.	
TN-C1100	ALIGNMENT E1/REFINED SR14. OPEN TRENCH 2 TRACKS. TYPICAL SECTION
TN-C1101	ALIGNMENT E1/REFINED SR14. OPEN TRENCH AT PORTAL 4 (E1)/10 (REFINED SR14), 2 TRACKS. TYPICAL SECTION
TN-C1102	ALIGNMENT E1/E2. TWIN BOX 1 TRACK. CUT-AND-COVER TUNNEL. TYPICAL SECTION
TN-C1103	ALIGNMENT E1/REFINED SR14. SINGLE CELL BOX 2 TRACKS. CUT-AND-COVER TUNNEL. TYPICAL SECTION
TN-C1104	ALIGNMENT E1/REFINED SR14. SINGLE CELL BOX 2 TRACKS + REFUGE TRACK. CUT-AND-COVER TUNNEL. TYPICAL SECTION
TN-C1105	ALIGNMENT E1/REFINED SR14. SINGLE CELL 4 TRACKS + REFUGE TRACK. CUT-AND-COVER TUNNEL. TYPICAL SECTION
TN-C1106	ALIGNMENT E1/REFINED SR14. SINGLE CELL 4 TRACKS. CUT-AND-COVER TUNNEL. TYPICAL SECTION
TN-C1107	ALIGNMENT E2. SINGLE CELL 4 TRACKS. CUT-AND-COVER TUNNEL. TYPICAL SECTION
TN-C1108	ALIGNMENT E2. SINGLE CELL 4 TRACKS + REFUGE TRACK. CUT-AND-COVER TUNNEL. TYPICAL SECTION
TN-C1109	ALIGNMENT E1/E2/REFINED SR14. BURBANK STATION PLATFORM. CUT-AND-COVER TUNNEL. TYPICAL SECTION

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CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
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SCALE NO SCALE
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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

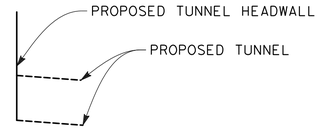
- PROPOSED PERMANENT ENVIRONMENTAL FOOTPRINT
- CONSTRUCTION STAGING AREA / PROPOSED TEMPORARY ENVIRONMENTAL FOOTPRINT
- FENCE LINE / HSR ROW
- LIMITS OF EMBANKMENT (FILL)
- LIMITS OF EXCAVATION (CUT)
- PROPOSED RETAINING WALL
- PROPOSED TUNNEL
- INCLINED DESCENDING GALLERY
- UNDERGROUND EASEMENT FOR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



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DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
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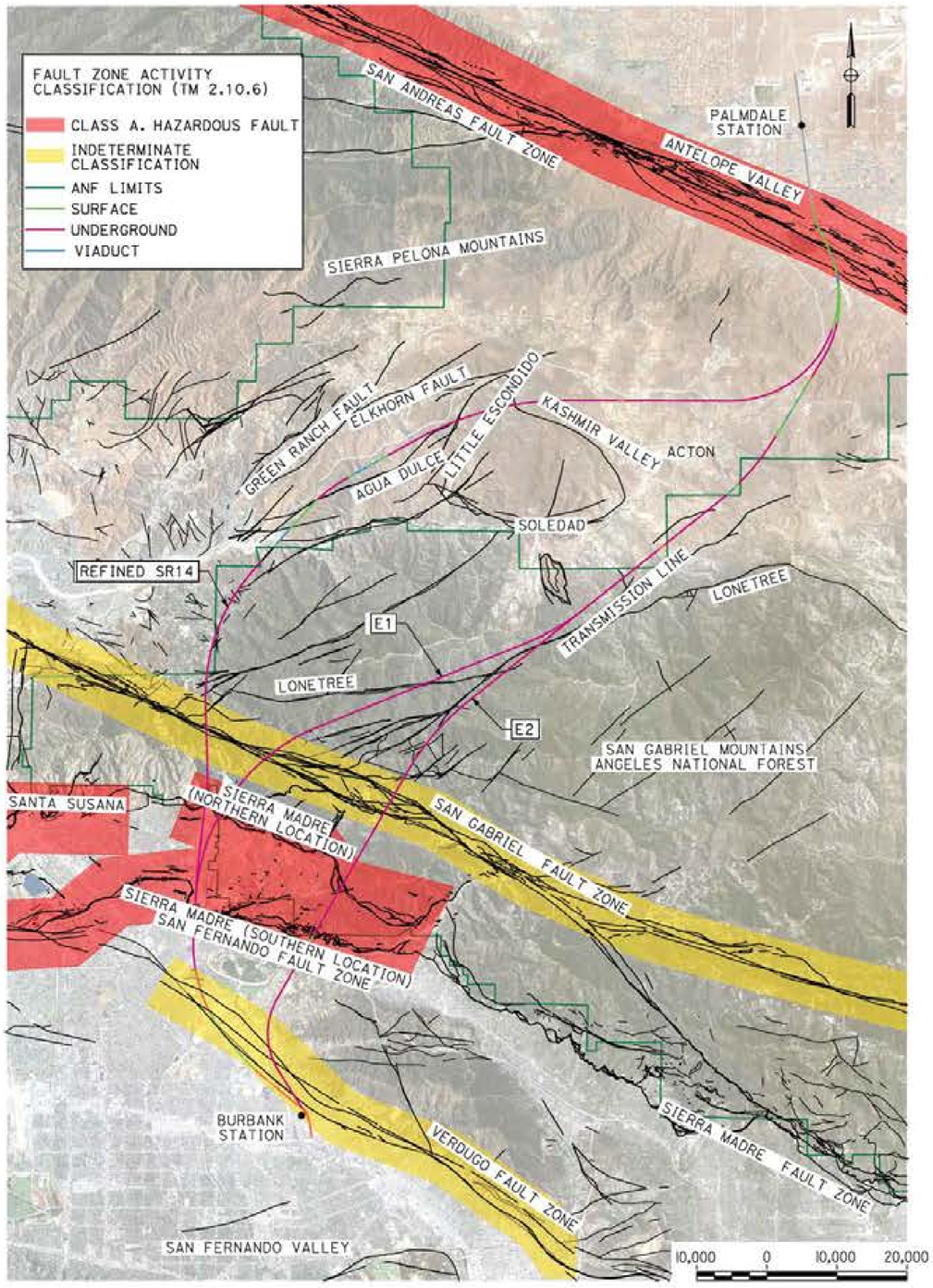
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT REFINED SR14/E1/E2
GENERAL
ABBREVIATIONS AND LEGEND

CONTRACT NO. HSR14-42
DRAWING NO. TN-B0004
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

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E. VELASCO
DRAWN BY: FJ. DOMINGUEZ
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IN CHARGE: A. RELAÑO
DATE: 04/30/2021

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CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
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GENERAL
FAULT KEY MAP

CONTRACT NO. HSR14-42
DRAWING NO. TN-B0005
SCALE AS SHOWN
SHEET NO.

GEOTECHNICAL RISKS AT PORTALS, INTERMEDIATE WINDOWS AND ADITS

ALIGNMENT	TUNNEL	TUNNEL CONFIGURATION	TUNNEL LENGTH (miles)	PORTAL/ADIT	STA.	PORTAL TYPE	COMMENTS	PARTIAL LENGTH (miles)	HAZARDOUS AND POTENTIALLY HAZARDOUS FAULT ZONES	CONSTRUCTION METHOD (ASSUMPTION)	LIST OF GEOTECHNICAL RISKS
E1	Tunnel 1	Twin tunnels, single track	1.63	P1	638+81.93	mountain portal		1.64		Mined	Hornblende diorite and older alluvium mixed face condition.
				P2	725+19.18	mountain portal	Aliso canyon				Potential slope instability during earthquakes.
	Tunnel 2	Twin tunnels, single track	21.65	P3	747+85.39	mountain portal	Aliso canyon	2.31		Mined	Existing Landslide in portal excavation. Excavation in hornblende diorite resulting in difficult excavation.
				IW1	870+00.00	"Binocular shaft 160 ft deep"	Arrastre canyon				Mount Lowe intrusive rocks, Diorite Gabbro resulting in difficult excavation.
					870+00.00			11.93	- San Gabriel - Sierra Madre North - Sierra Madre South-San Fernando	TBM	Mount Lowe intrusive rocks, Diorite Gabbro resulting in difficult excavation.
				Potential Adit @ San Gabriel fault zone	1500+00.00	Inclined descending gallery through San Gabriel fault zone. 4000 ft long					Sheared Granodiorite, and fault gouge zones. San Gabriel fault traces (Class A or B Hazardous fault), potential fault displacement. Groundwater pressures in excess of 18 bar.
				IW2	1775+00.00	"Binocular shaft 160 ft deep"	South of I-210	5.21			Potential Liquefaction, flooding potential; unconsolidated sand, gravel, boulder alluvium.
					1775+00.00			2.21			Potential Liquefaction, flooding potential; unconsolidated sand, gravel, boulder alluvium.
				P4	1891+47.74	"Open trench 57 ft deep"	Spreading grounds				Unconsolidated sand, gravel and boulder alluvium. Flooding potential.
	Tunnel 3	Single tunnel double track & cavern	1.35	P5	2052+57.74	C&C		1.35	- Verdugo	SEM	Verdugo fault
				Burbank station	2123+75.74	C&C	Entering Burbank station				Unconsolidated sand and gravel alluvium with cobbles up to 6 inches dimension. Potentially contaminated alluvium in the subsurface.
E2	Tunnel 1	Twin tunnels, single track	1.63	P1	638+81.93	mountain portal	Aliso canyon	1.64		Mined	Hornblende diorite and older alluvium mixed face condition.
				P2	725+19.18	mountain portal	Aliso canyon				Potential slope instability during earthquakes.
	Tunnel 2	Twin tunnels, single track	16.64	P3	747+85.39	mountain portal	Aliso canyon	2.31		TBM	Existing Landslide in portal excavation. Excavation in hornblende diorite resulting in difficult excavation.
				IW1	870+00.00	"Binocular shaft 160 ft deep"	Arrastre canyon				Mount Lowe intrusive rocks, Diorite Gabbro resulting in difficult excavation.
					870+00.00			14.33	- San Gabriel - Sierra Madre North - Sierra Madre South-San Fernando	TBM	Mount Lowe intrusive rocks, Diorite Gabbro resulting in difficult excavation.
				Potential Adit @ San Gabriel fault zone	1362+90.88	Inclined descending gallery through San Gabriel fault zone. 10800 ft long					Sheared Mendenhall Gneiss and granodiorite cut by multiple faults with gouge zones. San Gabriel fault traces (Class A or B Hazardous fault), potential fault displacement. Groundwater pressures in excess of 60 bar.
				P4	1626+69.67	mountain portal	Tujunga wash				Within the Sierra Madre fault (San Fernando segment), potential fault displacement during an earthquake. Slope insability, squeezing ground (sheared Modelo Fm.), variable groundwater conditions.
	Tunnel 3	Twin tunnels, binocular, single tunnel & cavern	1.46	P5	1681+95.32	mountain portal	Tujunga wash	1.47	- Verdugo	SEM	Modelo Formation slope instability. Potential cut slope instability in Modelo Formation.
				IW2	1759+48.75	Open trench	Stonehurst park, existing quarry				Potential slope instability during earthquakes. Unconsolidated alluvium .
				Burbank station	1903+70.00	Connection to underground Burbank station		2.73			Unconsolidated sand and gravel alluvium with cobbles up to 6 inches dimension. Potentially contaminated alluvium in the subsurface.
REFINED SR14	Tunnel 1	Twin tunnels, single track	7.31	P1	390+19.69	mountain portal	California aqueduct	7.32		TBM	Nadeau fault (Class A Hazardous, branch of San Andreas fault), potential fault displacement near portal.
				P2	776+45.73	mountain portal					Syenite bedrock resulting in difficult excavation and mixed face conditions with Older Alluvium. Groundwater and potential Liquefaction
	Tunnel 2	Twin tunnels, single track	3.13	P3	823+69.30	mountain portal		3.14		TBM	Syenite bedrock resulting in difficult excavation and mixed face conditions with Older Alluvium. Groundwater and potential Liquefaction
				P4	989+32.31	mountain portal					Interbedded sandstone and volcanic rocks. Adverse bedding for cut slopes. Little Escandido fault in the portal excavation.
	Tunnel 3	Twin tunnels, single track	0.51	P5	1070+82.32	mountain portal		0.51		Mined	Potential slope instability of bedrock during earthquakes.
				P6	1097+97.06	mountain portal					Potential slope instability of bedrock during earthquakes. Adverse bedding for cut slopes
	Tunnel 4	Twin tunnels, single track	0.90	P7	1178+11.38	mountain portal		0.91		Mined	Potential slope instability of bedrock during earthquakes. Adverse bedding for cut slopes
				P8	1226+03.76	mountain portal					Potential slope instability of bedrock during earthquakes. Adverse bedding for cut slopes. Near Agua Dulce fault.
	Tunnel 5	Twin tunnels, single track	12.35	P9	1346+58.92	mountain portal	Soledad canyon, Santa Clara river	10.15	- Sierra Madre North - Sierra Madre South-San Fernando	TBM	The alignment cuts deep 150 ft+ into the Lang Minute Man Missile site, which is a hardened steel reinforced concrete bunker installation. The bunker has to be removed in a deep cut. Liquefaction potential in alluvium. Potential cut slope instability.
				Potential Adit @ Pacoima reservoir	1715+00.00	Inclined descending gallery through San Gabriel fault zone. 4000 ft long					Excavation through the Hospital fault (Sierra Madre Fault Zone, north), Hazardous fault with displacent potential. Excavation within the Saugus Formation (loose sand and gravel) and unconsolidated sand, gravel, boulder alluvium. Refined SR14 Connector Cavern is located within the fault zone. Adit will be located in liquefiable alluvium.
				IW 1	1882+50.00	"Binocular shaft 160 ft deep"	South of I-210				Potential Liquefaction, flooding potential; unconsolidated sand, gravel, boulder alluvium.
					1882+50.00			2.20			Potential Liquefaction, flooding potential; unconsolidated sand, gravel, boulder alluvium.
				P10	1998+90.00	"Open trench 57 ft deep"	Spreading grounds				Unconsolidated sand, gravel and boulder alluvium.
	Tunnel 6	Single tunnel double track & cavern	1.35	P11	2160+00.00	C&C		1.35	- Verdugo	SEM	Unconsolidated sand and gravel alluvium with cobbles up to 6 inches dimension. Potentially contaminated alluvium in the subsurface.
				Burbank station	2231+18.00	C&C	Entering Burbank station				

NOTE:

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.

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

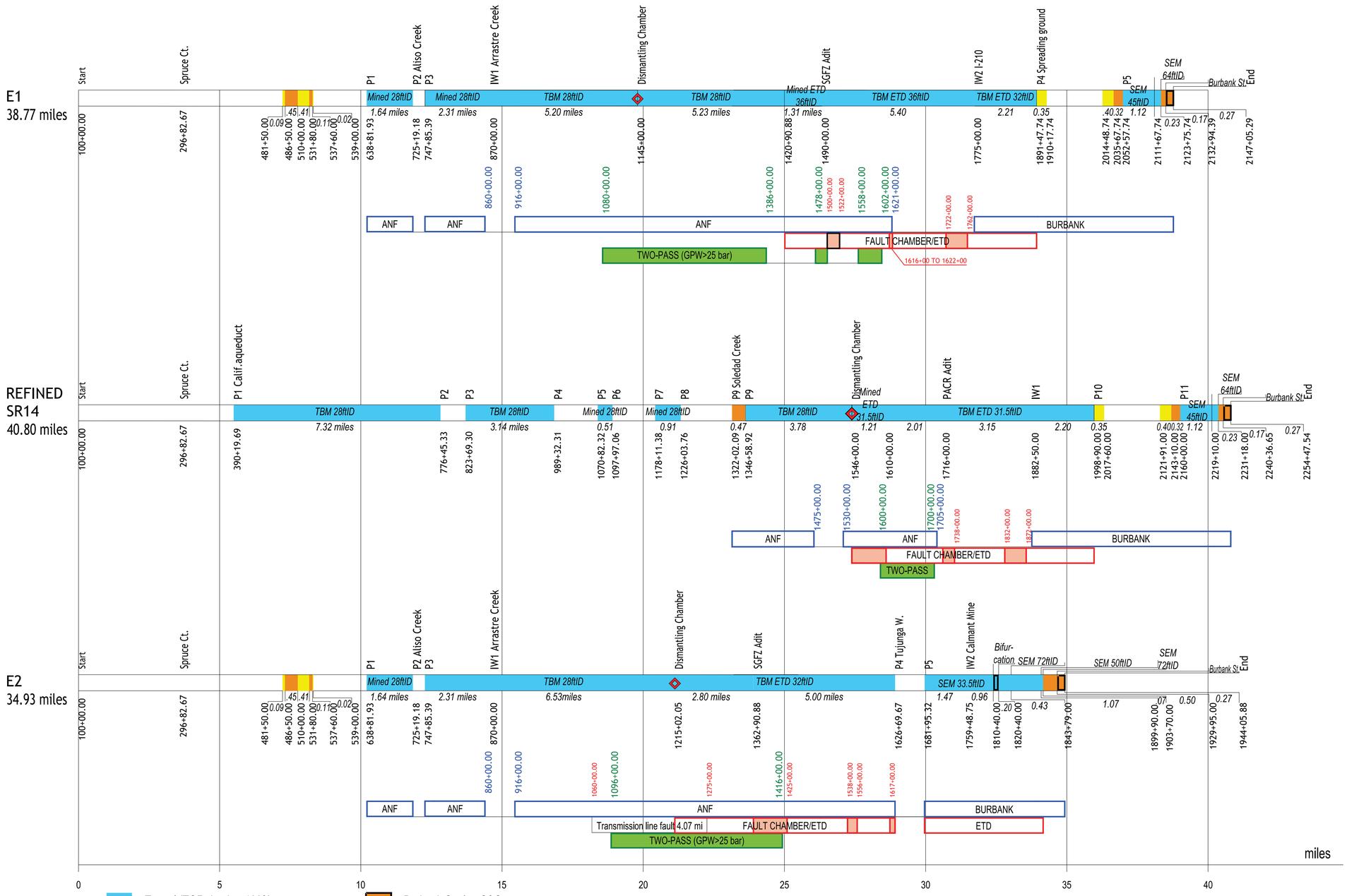
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT REFINED SR14/E1/E2
GENERAL
GEOTECHNICAL RISKS AT PORTALS, IW AND ADITS

CONTRACT NO. HSR14-42
DRAWING NO. TN-B0006
SCALE NO SCALE
SHEET NO.



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

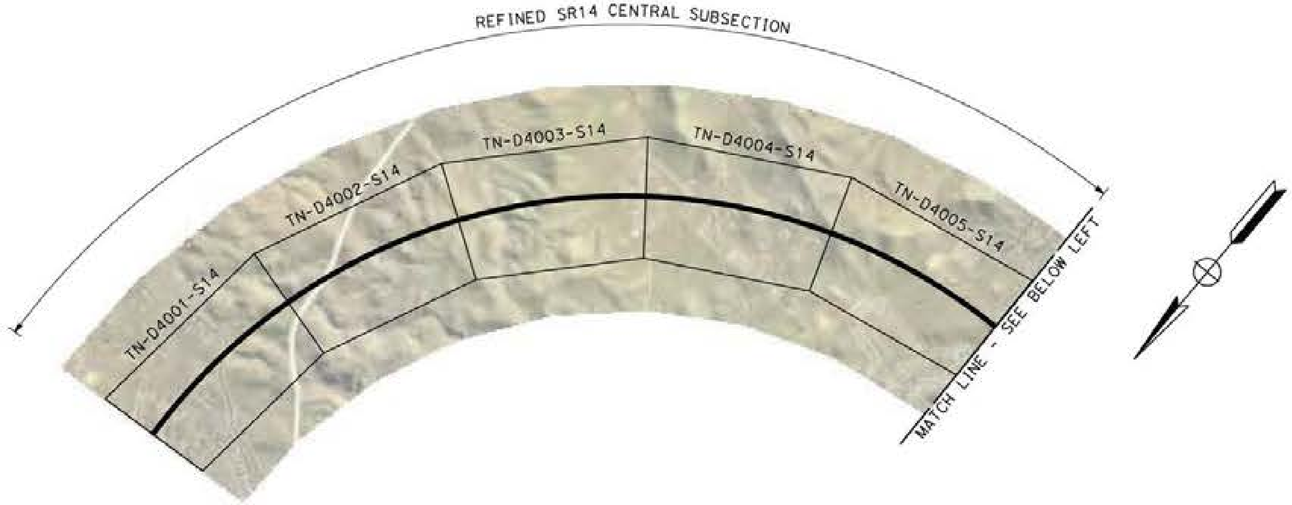
NOT FOR CONSTRUCTION

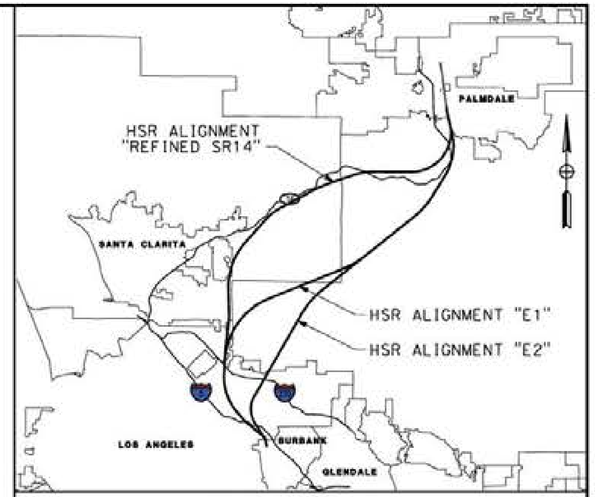
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

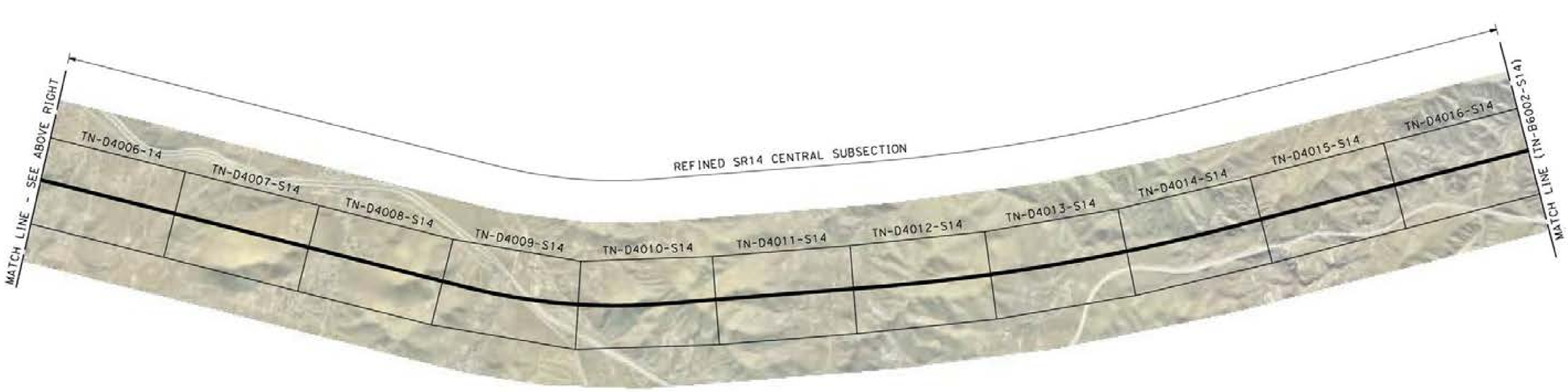
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT REFINED SR14/E1/E2
GENERAL
SCHEMATIC LINEAR DIAGRAMS

CONTRACT NO. HSR14-42
DRAWING NO. TN-B0007
SCALE AS SHOWN
SHEET NO.





VICINITY MAP



2000 0 2000 4000
1"=2000'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

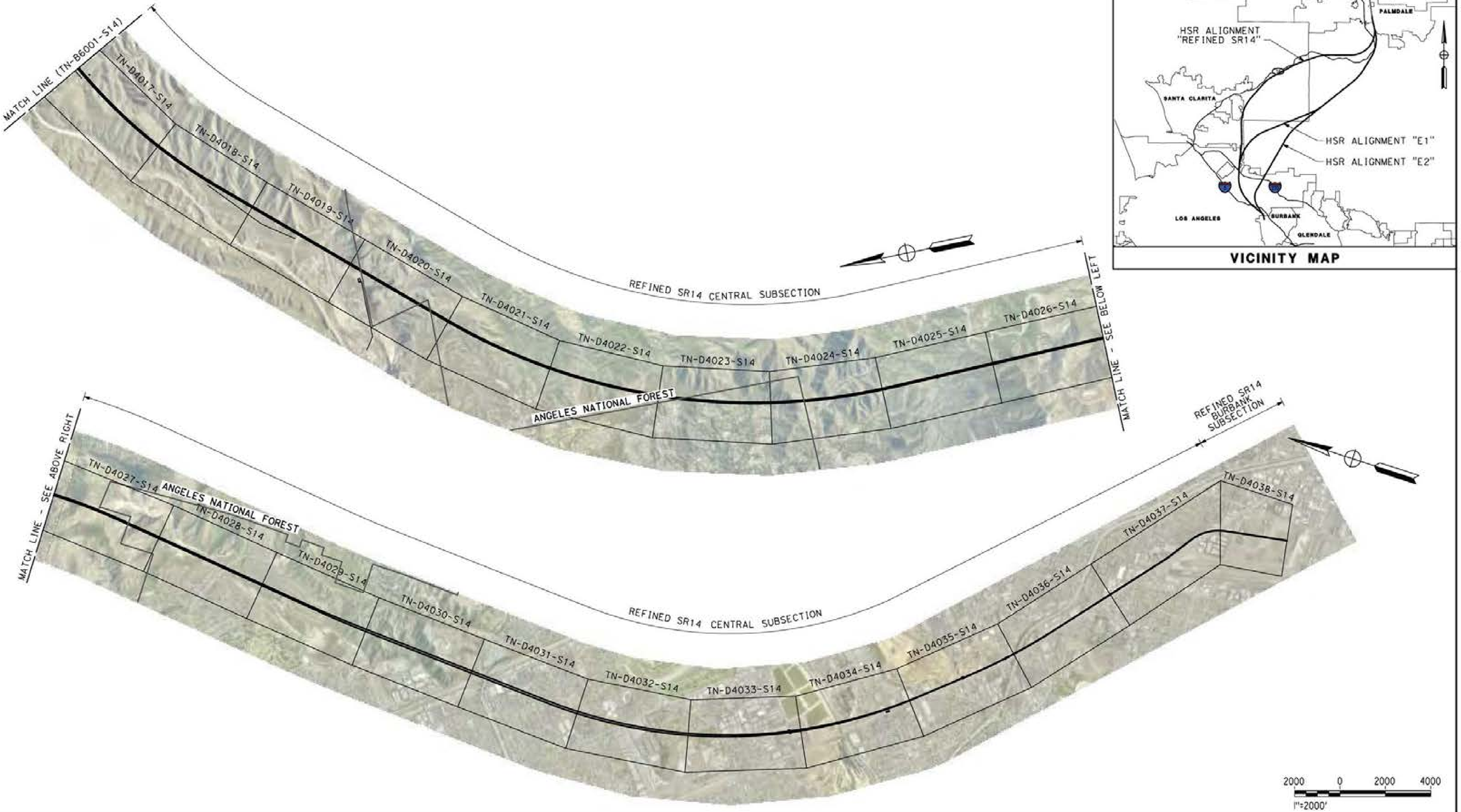
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

HIGH SPEED RAIL TUNNEL PLANS
KEY MAP 1 OF 2

CONTRACT NO. HSR14-42
DRAWING NO. TN-B6001-S14
SCALE AS SHOWN
SHEET NO.



VICINITY MAP

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E.VELASCO
DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W.GUO
IN CHARGE: A.RELAÑO
DATE: 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

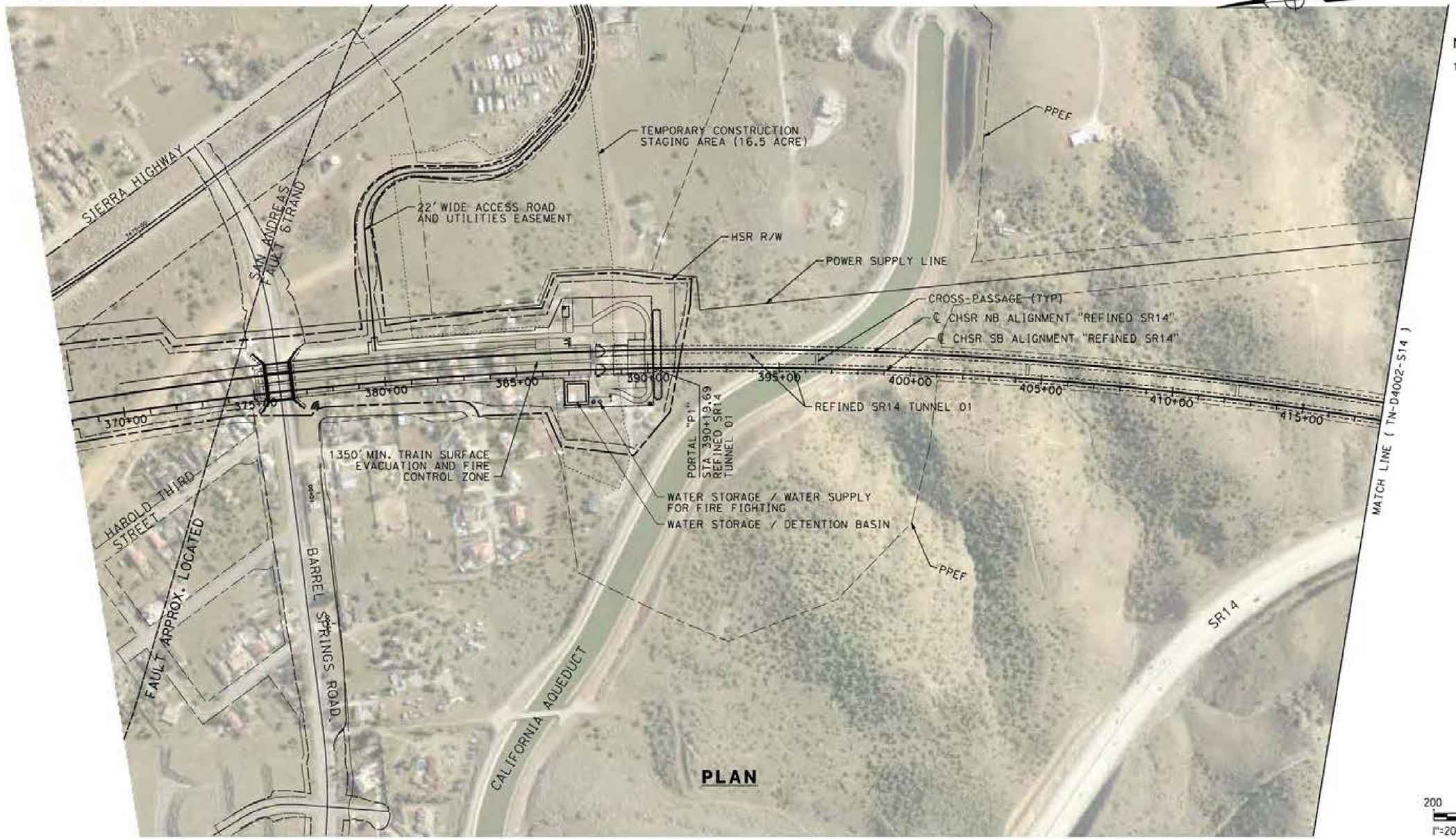
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

HIGH SPEED RAIL TUNNEL PLANS
KEY MAP 2 OF 2

CONTRACT NO. HSR14-42
DRAWING NO. TN-B6002-S14
SCALE AS SHOWN
SHEET NO.

TUNNEL 01
PORTAL P1



PLAN

200 0 200 400
1"=200'

NOTE:

1. PERMANENT PORTAL P1 FOOTPRINT INCLUDES SPACE FOR FACILITIES DESCRIBED IN TM 2.4.6 WITH THE FOLLOWING EXCEPTIONS:
   - HELIPAD NOT INCLUDED.
   - ADDED RESERVE OF SPACE FOR WATER STORAGE/ SUPPLY.
   - ADDED DETENTION POND (LOW POINT).

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

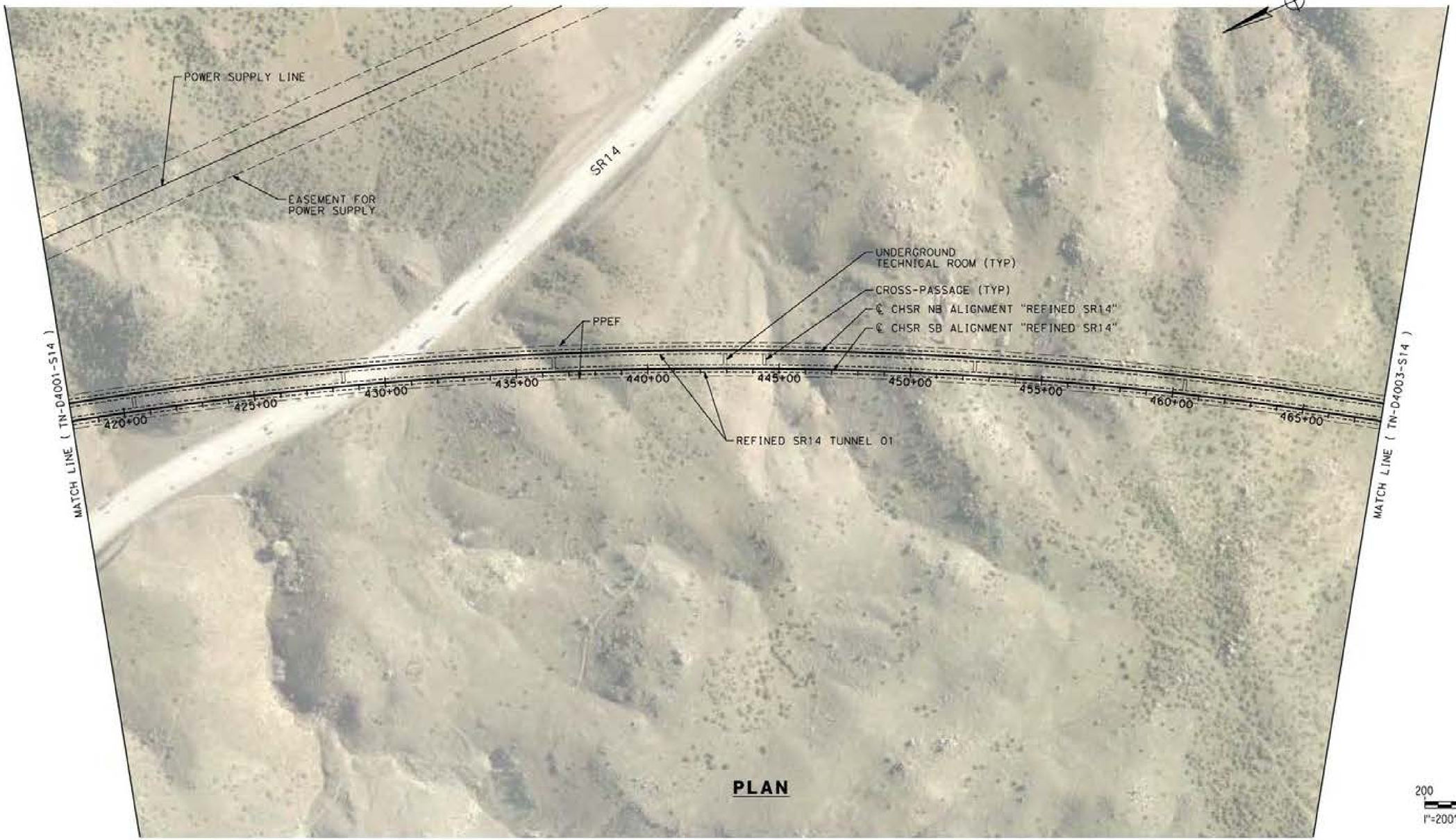
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 368+00.00 TO STA 418+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4001-S14
SCALE AS SHOWN
SHEET NO.

TUNNEL 01



PLAN

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

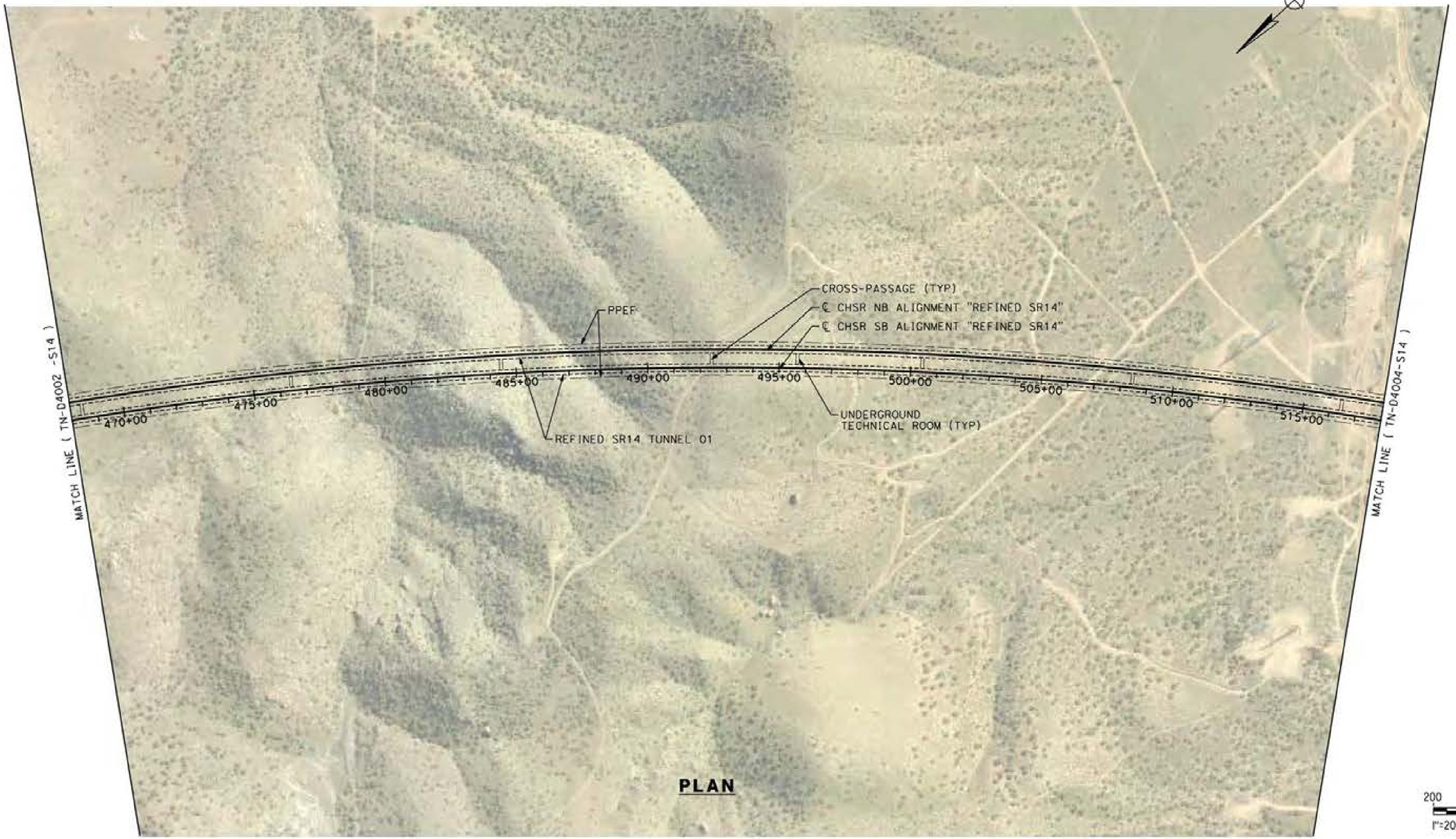
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 418+00.00 TO STA 468+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4002-S14
SCALE AS SHOWN
SHEET NO.

c:\pwworking\chsr\dms19430\PB-TN-D4002-S14.dgn
26/05/2021 19:01:15
0205510

TUNNEL 01



PLAN

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

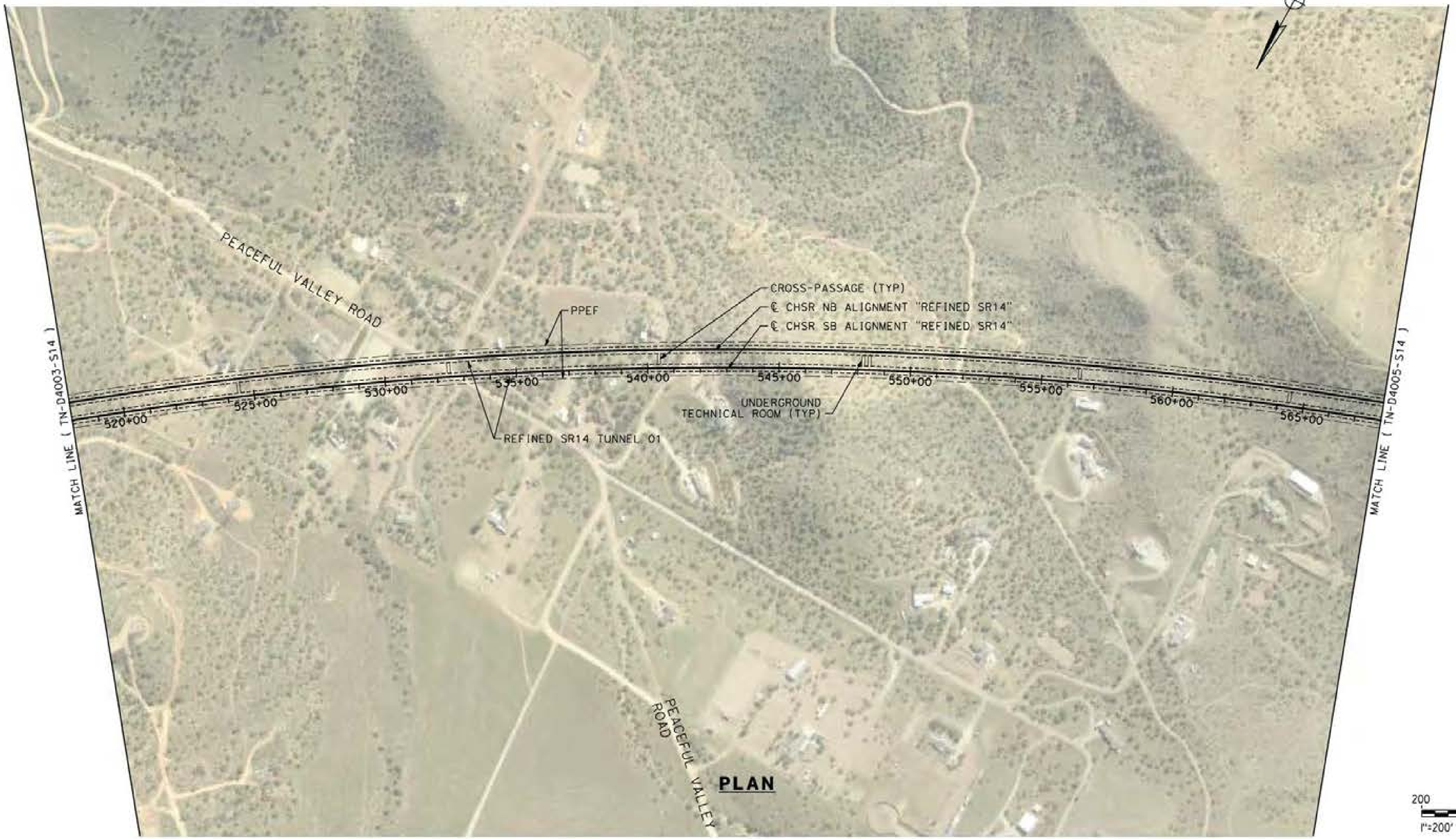
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 468+00.00 TO STA 518+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4003-S14
SCALE AS SHOWN
SHEET NO.

TUNNEL 01



PLAN

200 0 200 400
1"=200'

c:\pwworking\chsr\dms19430\PB-TN-D4004-S14.dgn
24/05/2021 20:05:28
0205510

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

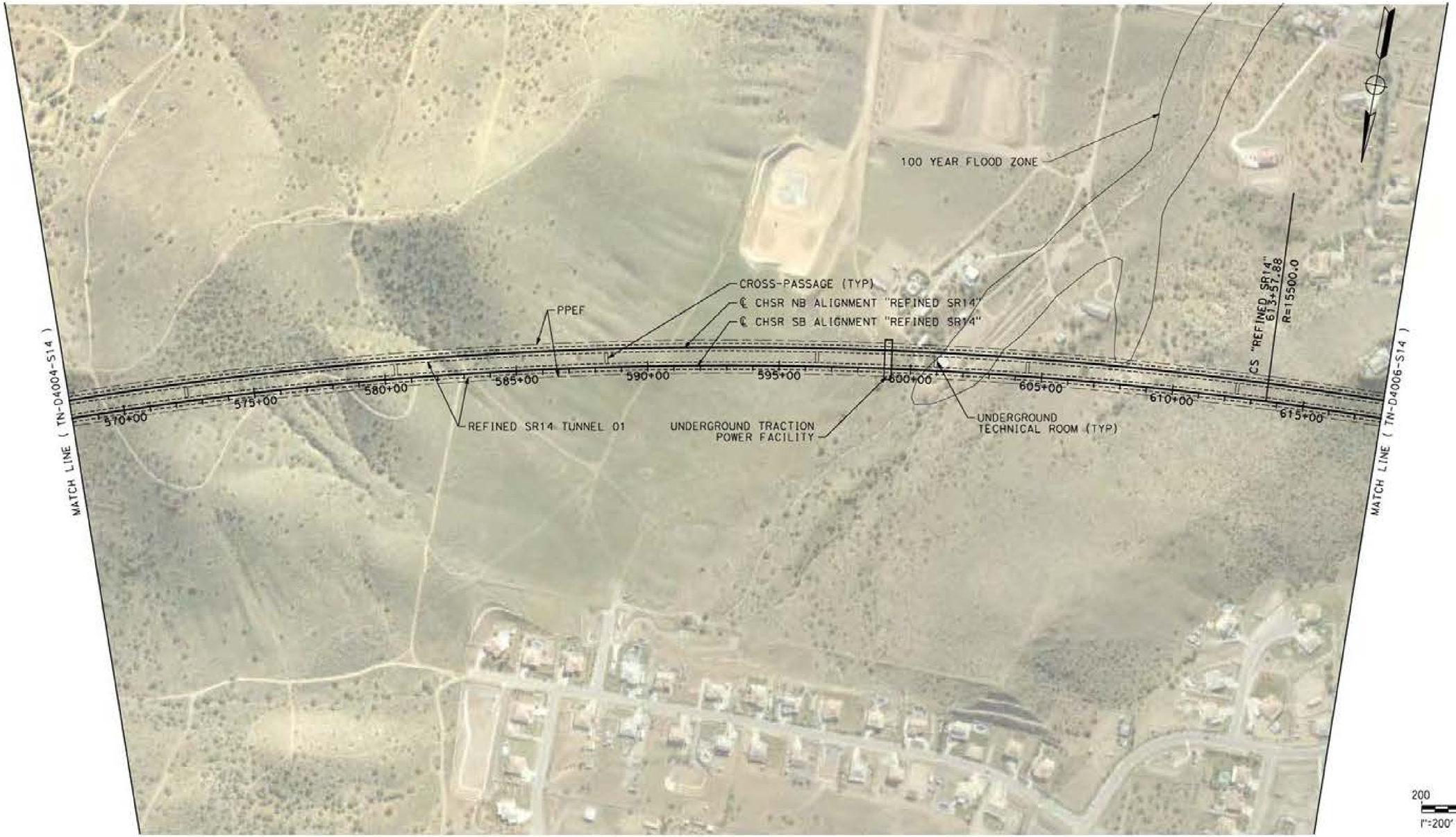
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 518+00.00 TO STA 568+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4004-S14
SCALE AS SHOWN
SHEET NO.

TUNNEL 01



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

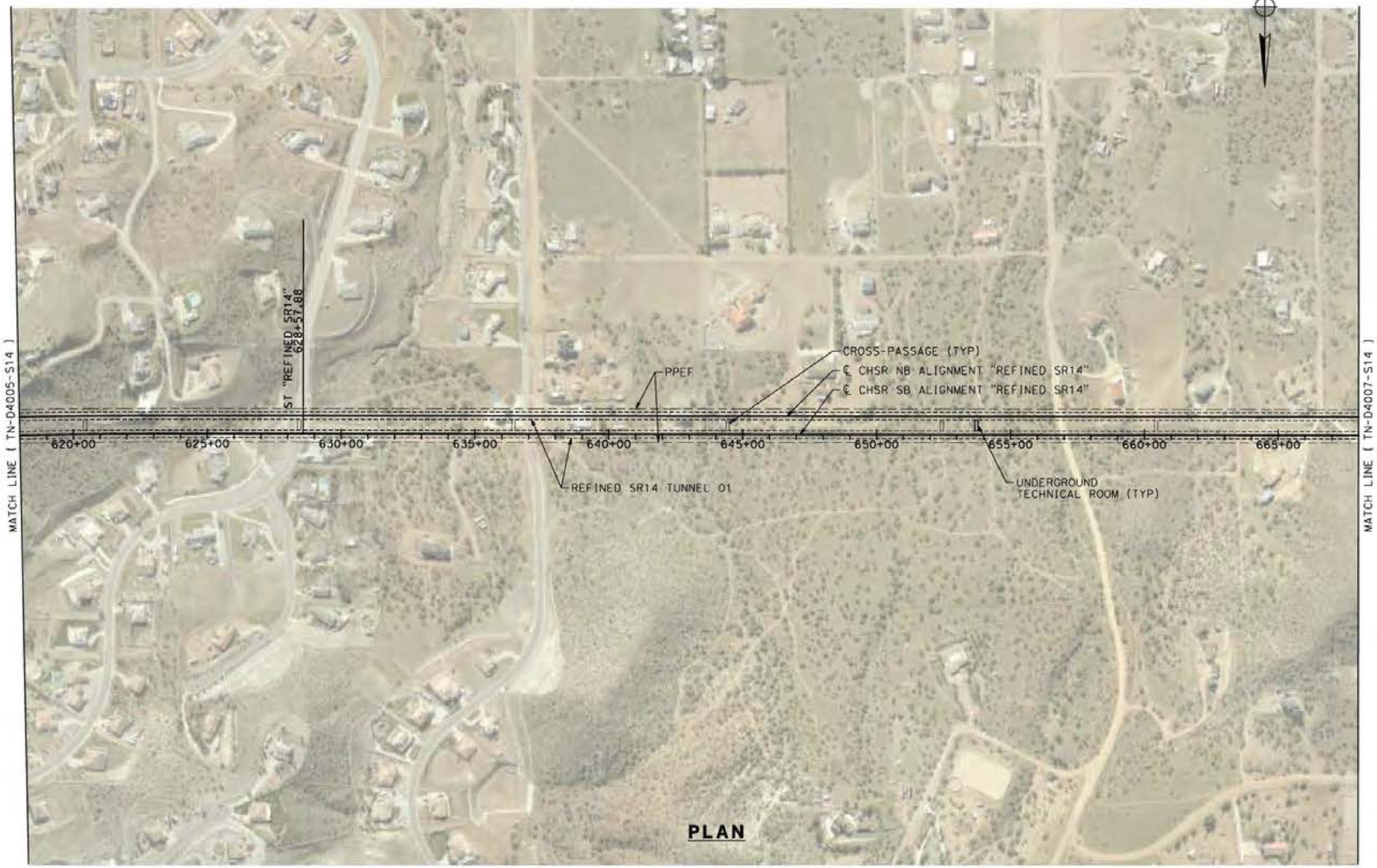
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 568+00.00 TO STA 618+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4005-S14
SCALE AS SHOWN
SHEET NO.

TUNNEL 01



PLAN

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

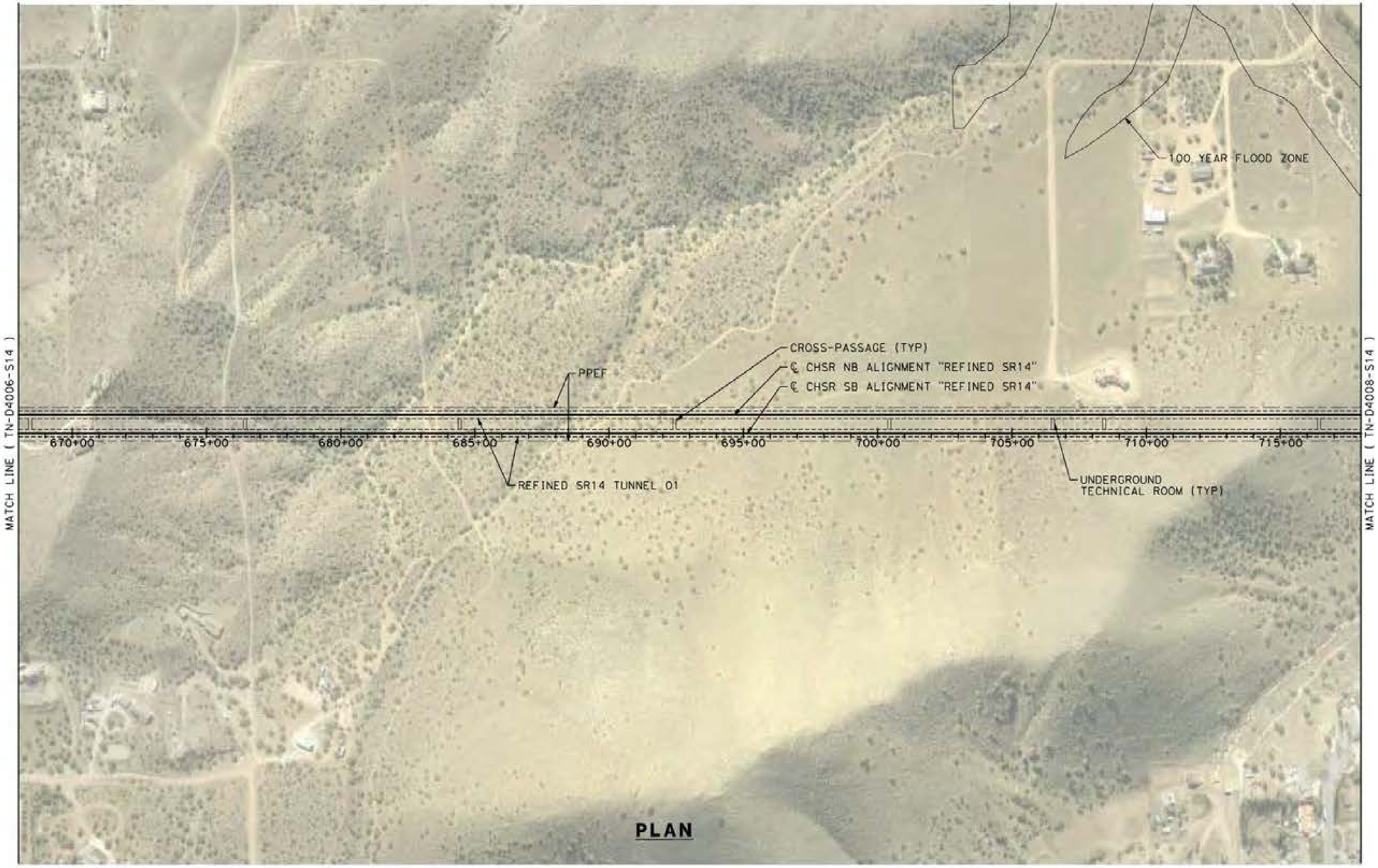
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 618+00.00 TO STA 668+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4006-S14
SCALE AS SHOWN
SHEET NO.

TUNNEL 01



PLAN

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

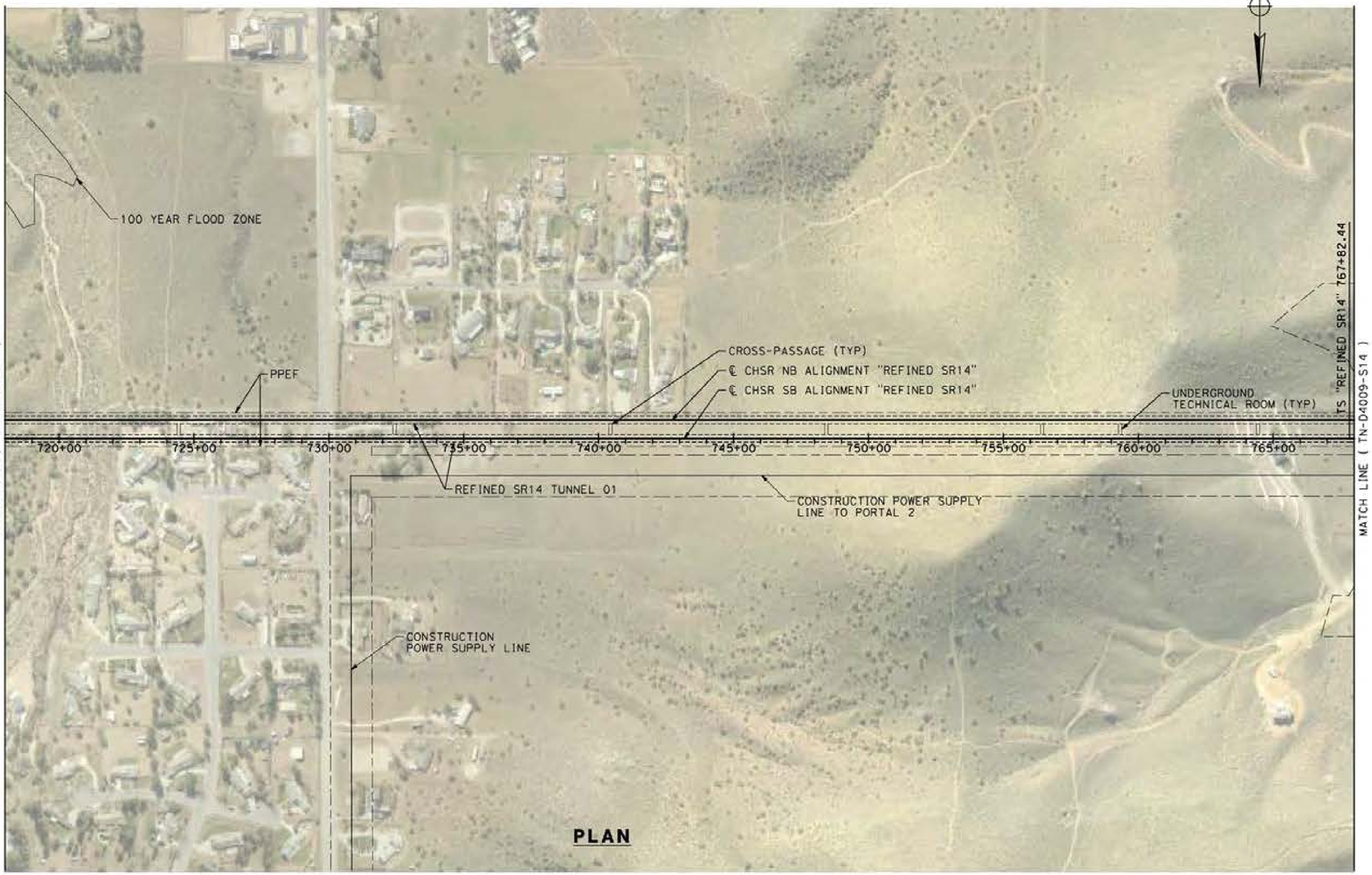
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 668+00.00 TO STA 718+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4007-S14
SCALE AS SHOWN
SHEET NO.

TUNNEL 01



PLAN

200 0 200 400
1"=200'

c:\pwworking\char\dms19430\VPB-TN-D4008-S14.dgn
24/05/2021 20:07:34
0205510

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

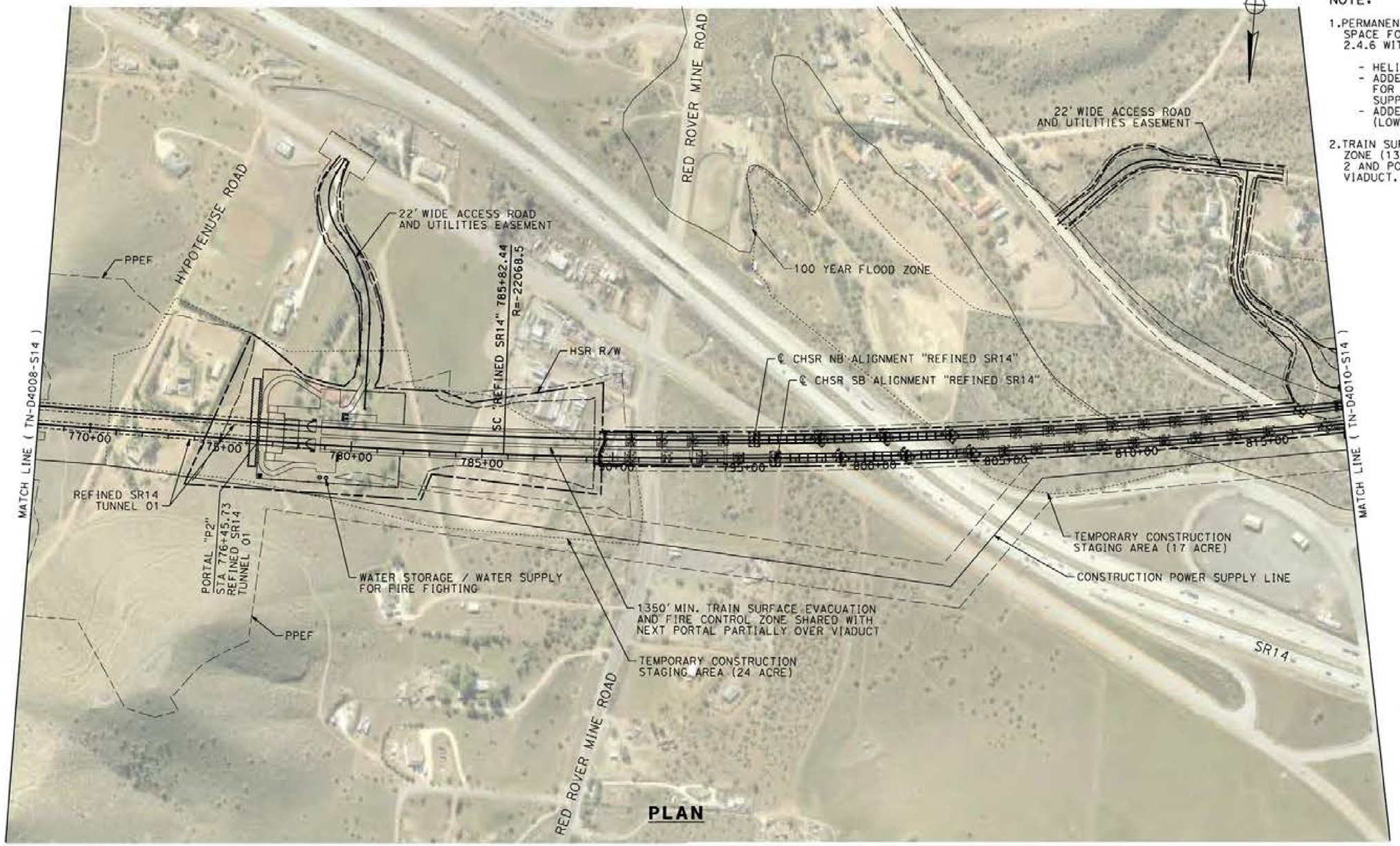
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 718+00.00 TO STA 768+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4008-S14
SCALE AS SHOWN
SHEET NO.

TUNNEL 01
PORTAL P2



PLAN

200 0 200 400
1"=200'

NOTE:

1. PERMANENT PORTAL P2 FOOTPRINT INCLUDES SPACE FOR FACILITIES DESCRIBED IN TM 2.4.6 WITH THE FOLLOWING EXCEPTIONS:
   - HELIPAD NOT INCLUDED
   - ADDED RESERVE OF SPACE FOR WATER STORAGE/ SUPPLY.
   - ADDED DETENTION POND (LOW POINT).
2. TRAIN SURFACE EVACUATION AND FIRE CONTROL ZONE (1350' LONG) IS SHARED BETWEEN PORTAL 2 AND PORTAL 3. PARTIALLY LOCATED OVER VIADUCT.

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

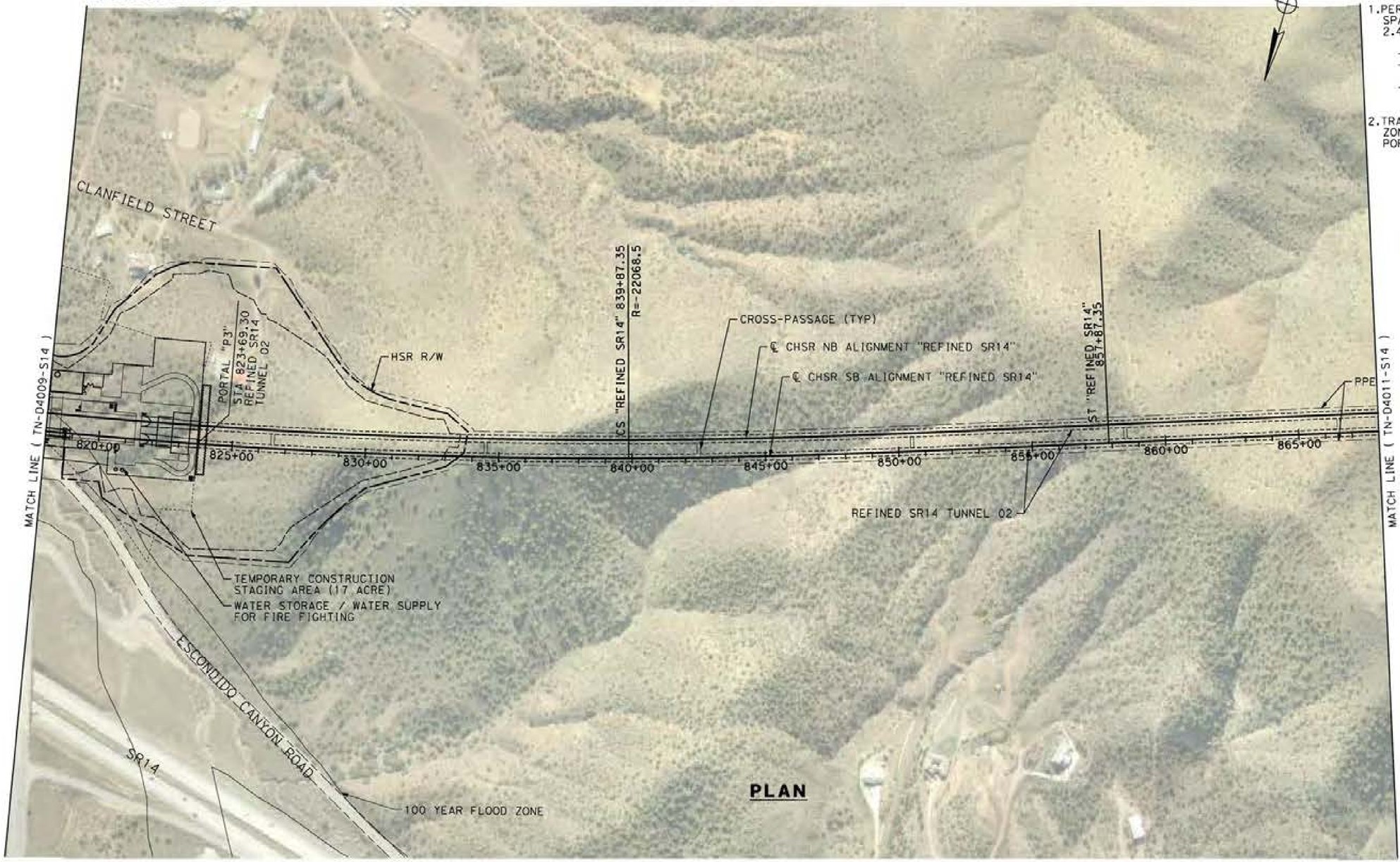
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 768+00.00 TO STA 818+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4009-S14
SCALE AS SHOWN
SHEET NO.

TUNNEL 02
PORTAL P3



PLAN

200 0 200 400
1"=200'

NOTE:

1. PERMANENT PORTAL P3 FOOTPRINT INCLUDES SPACE FOR FACILITIES DESCRIBED IN TM 2.4.6 WITH THE FOLLOWING EXCEPTIONS:
   - HELIPAD NOT INCLUDED.
   - INCLUDES SPACE FOR WATER STORAGE/ SUPPLY.
   - DOES NOT INCLUDE SPACE FOR DETENTION POND (THIS PORTAL IS A HIGH POINT).
2. TRAIN SURFACE EVACUATION AND FIRE CONTROL ZONE IS SHARED BETWEEN PORTAL 2 AND PORTAL 3. PARTIALLY LOCATED OVER VIADUCT.

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 818+00.00 TO STA 868+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4010-S14
SCALE AS SHOWN
SHEET NO.

TUNNEL 02

PLAN

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

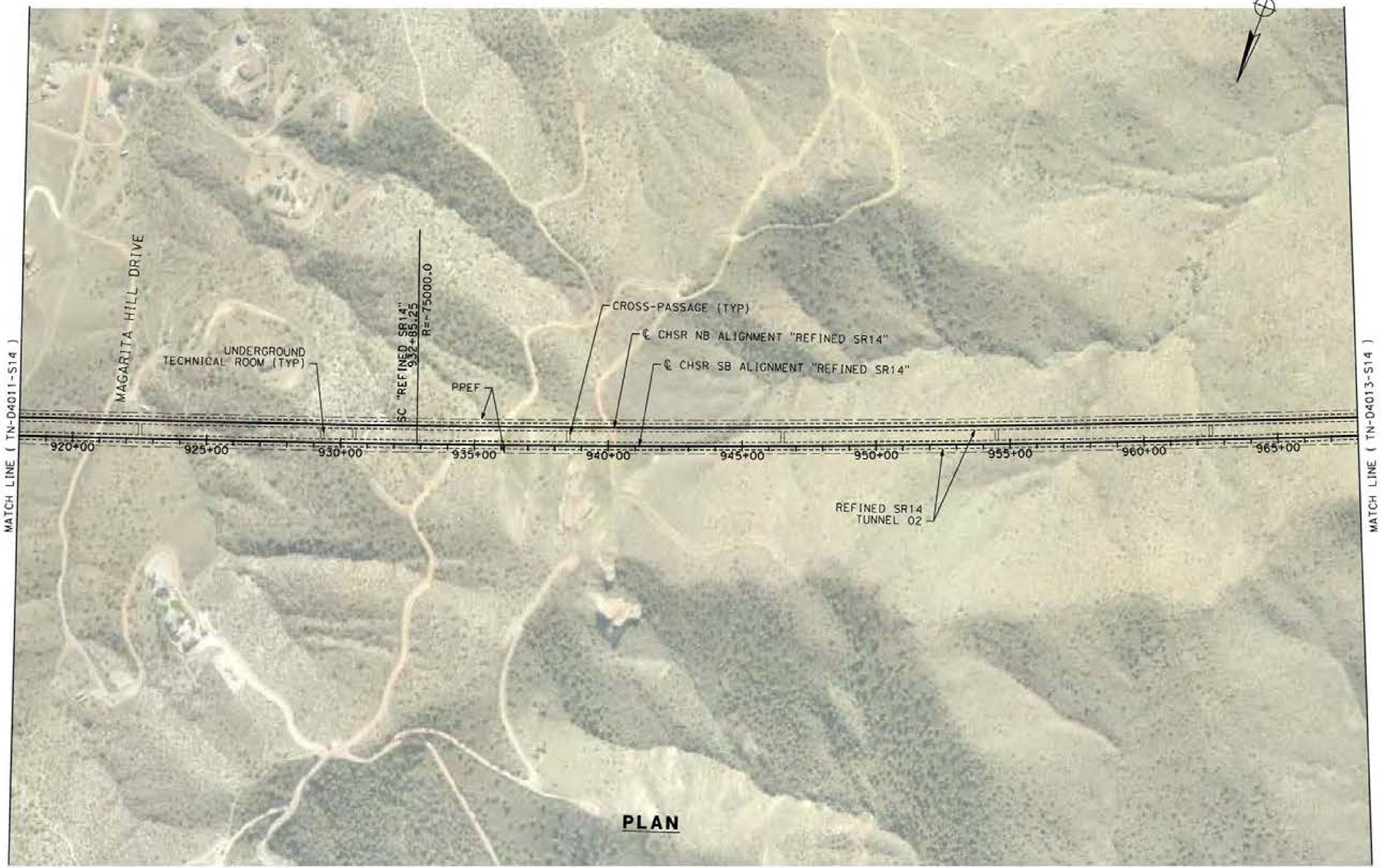
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 868+00.00 TO STA 918+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4011-S14
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

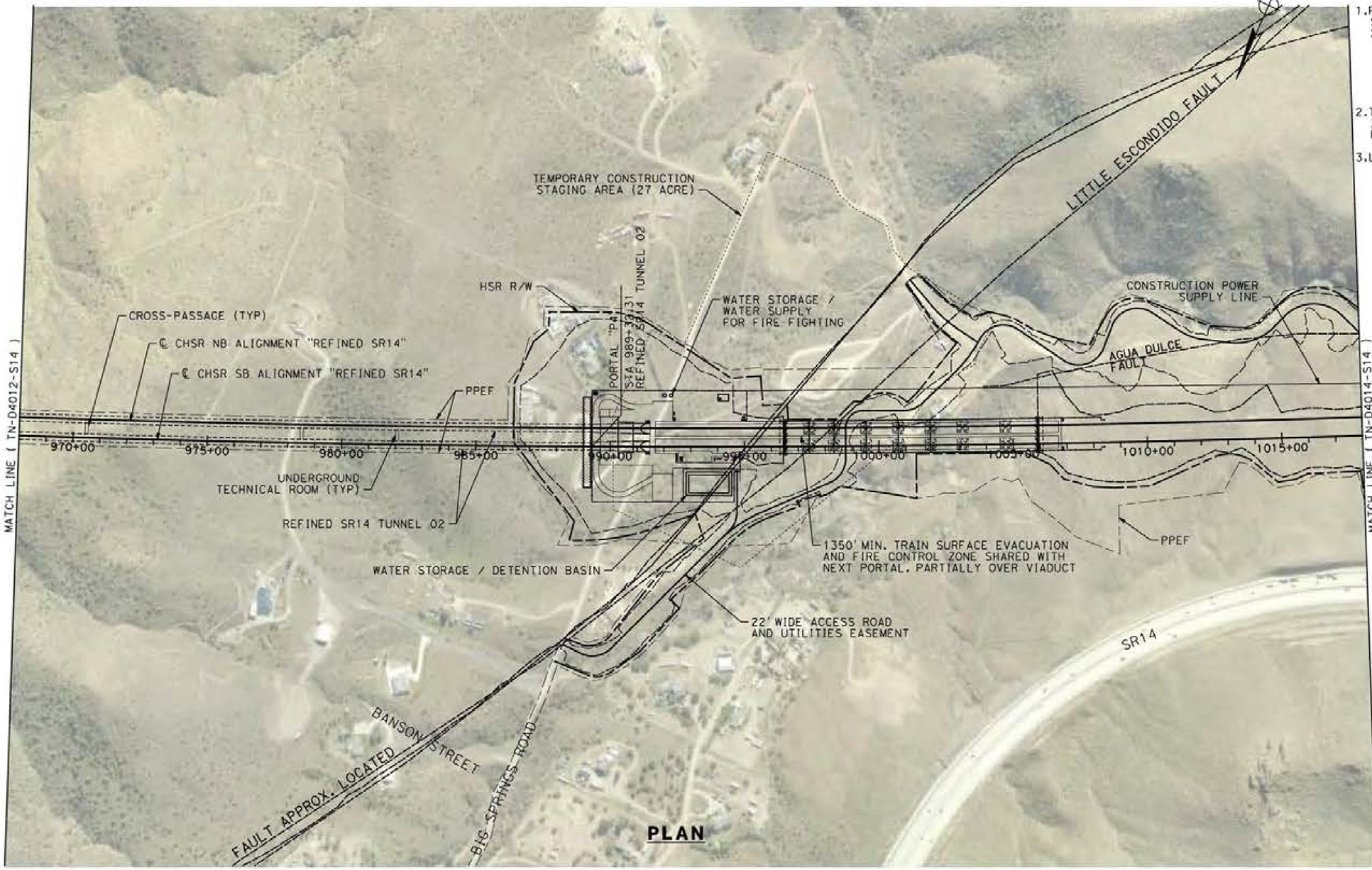
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 918+00.00 TO STA 968+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4012-S14
SCALE AS SHOWN
SHEET NO.

TUNNEL 02
PORTAL P4



PLAN

200 0 200 400
1"=200'

NOTE:

1. PERMANENT PORTAL P4 FOOTPRINT INCLUDES SPACE FOR FACILITIES DESCRIBED IN TM 2.4.6 WITH THE FOLLOWING EXCEPTIONS:
   - PORTAL P4 INCLUDES BOTH SPACE FOR DETENTION POND (LOW POINT), AND FOR WATER STORAGE/ SUPPLY.
   - HELIPAD NOT INCLUDED.
2. TRAIN SURFACE EVACUATION AND FIRE CONTROL ZONE IS SHARED BETWEEN PORTAL 4 AND PORTAL 5.
3. LATER CONSIDERATION CAN BE GIVEN TO MOVE THE TSEFCZ AWAY FROM THE FAULT ZONE. (TBD)

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

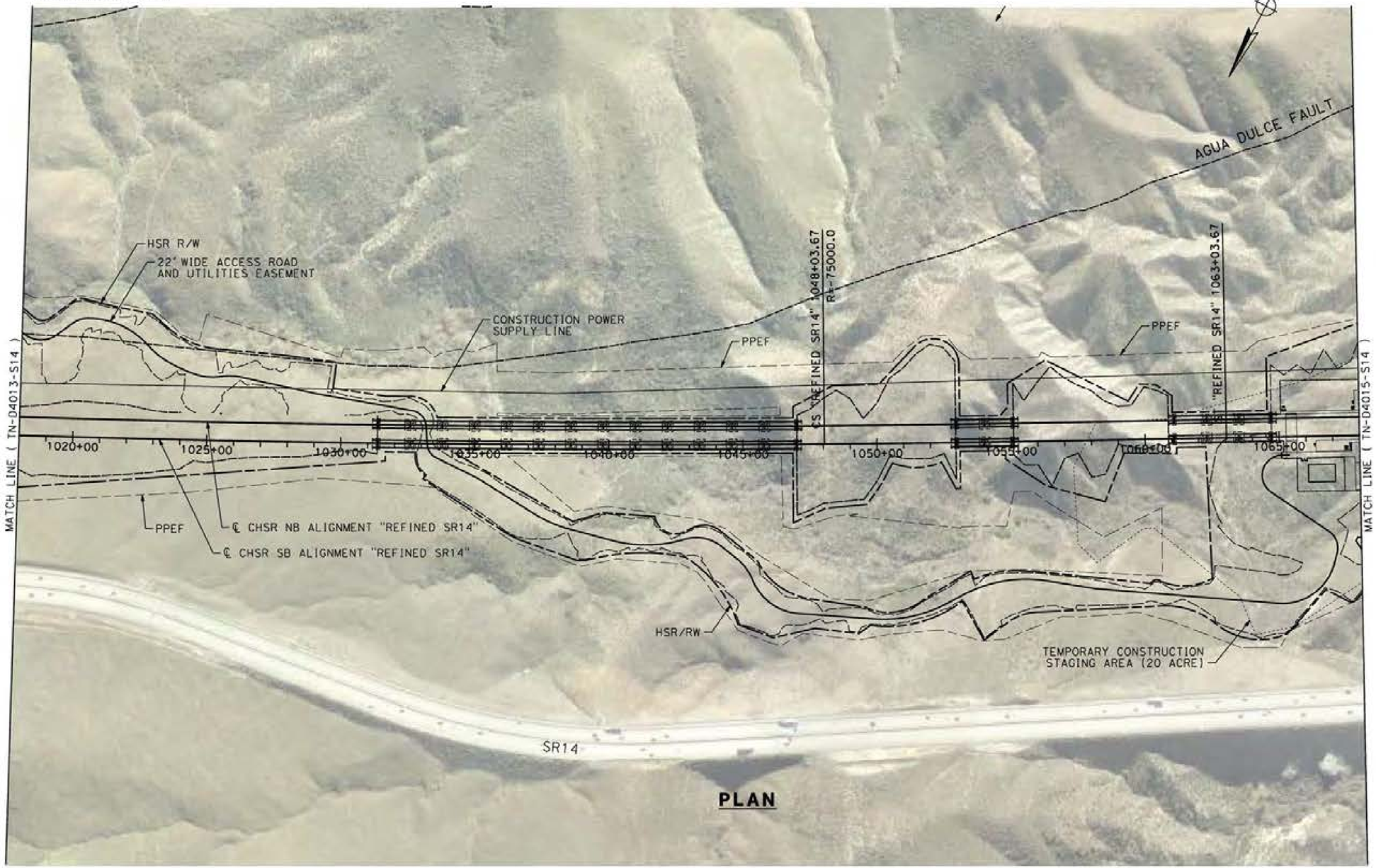
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 968+00.00 TO STA 1018+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4013-S14
SCALE AS SHOWN
SHEET NO.

TUNNEL 03
PORTAL P5



PLAN

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

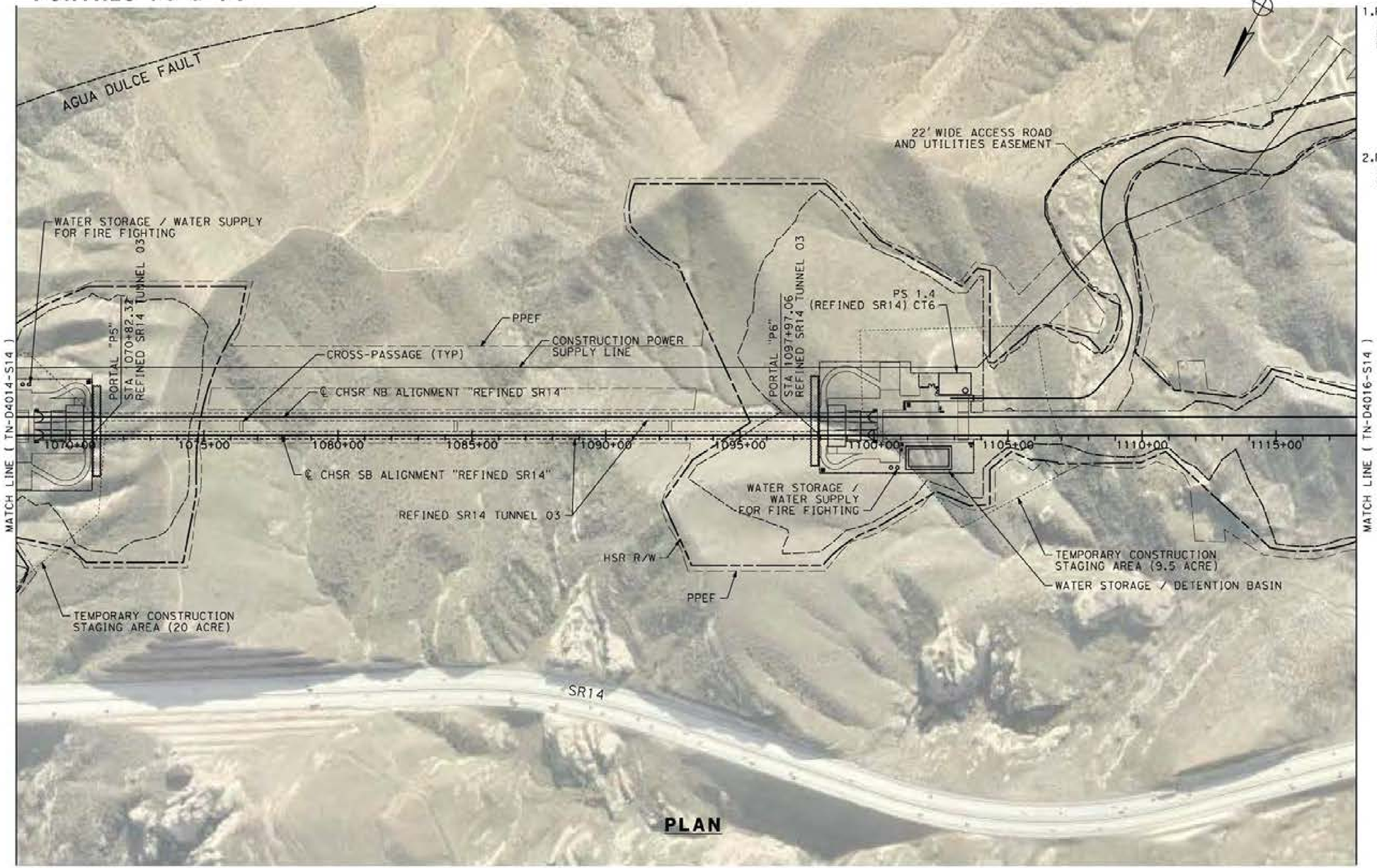
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 1018+00.00 TO STA 1068+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4014-S14
SCALE AS SHOWN
SHEET NO.

TUNNEL 03
PORTALS P5 & P6



PLAN

NOTE:

1. PERMANENT PORTAL P5 FOOTPRINT INCLUDES SPACE FOR FACILITIES DESCRIBED IN TM 2.4.6 WITH THE FOLLOWING EXCEPTIONS:
   - HELIPAD NOT INCLUDED.
   - ADDED RESERVE OF SPACE FOR WATER STORAGE/ SUPPLY.
   - DETENTION POND NOT INCLUDED (HIGH POINT).
   - TSEFCZ SHARED AND LOCATED NEXT TO PORTAL P4.
2. PERMANENT PORTAL P6 FOOTPRINT INCLUDE SPACE FOR FACILITIES DESCRIBED IN TM 2.4.6 WITH THE FOLLOWING EXCEPTIONS:
   - HELIPAD NOT INCLUDED.
   - DETENTION POND INCLUDED (LOW POINT).
   - TSEFCZ SHARED AND LOCATED NEXT TO PORTAL P7.
   - WATER SUPPLY/ STORAGE ADDED.

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

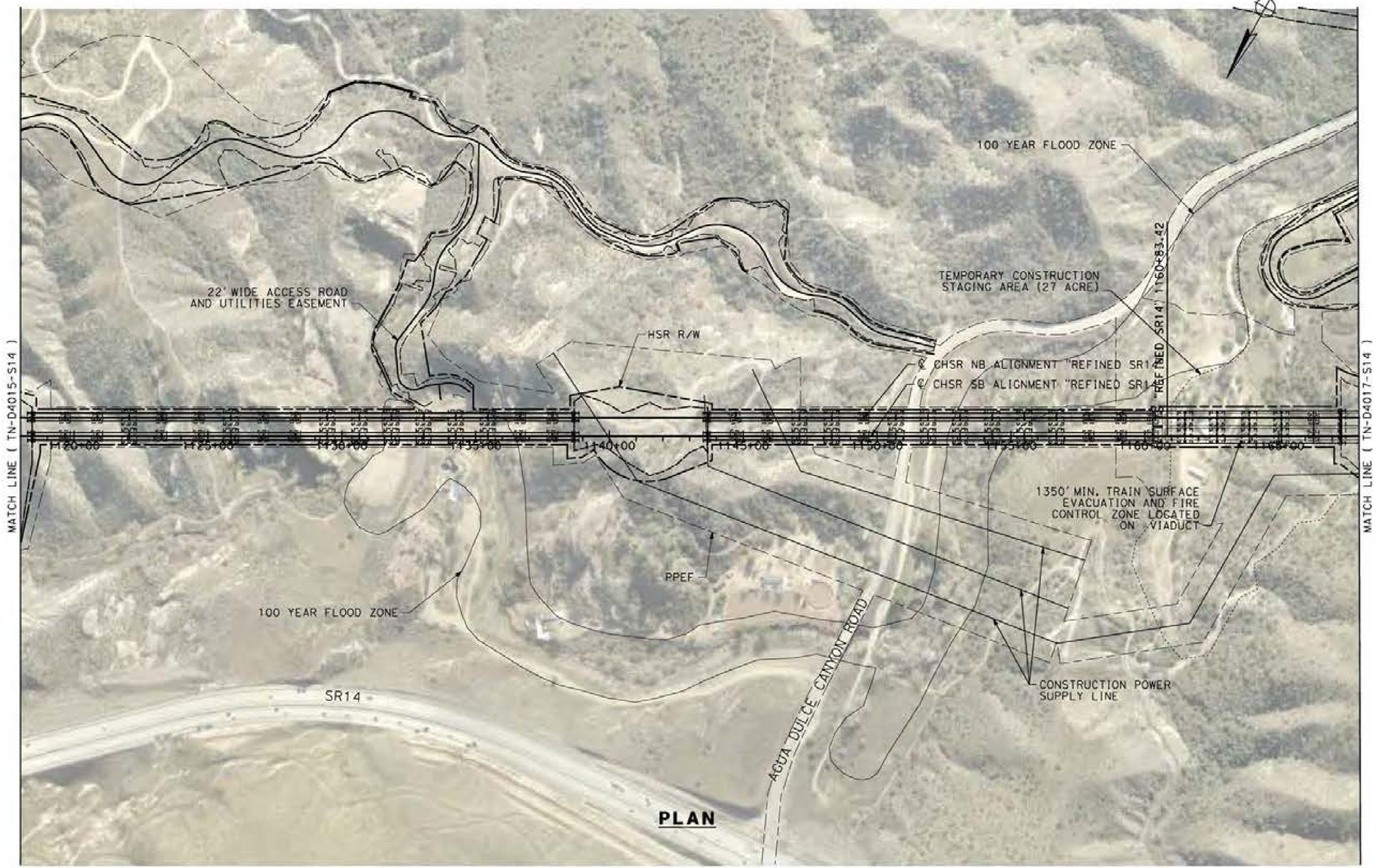
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 1068+00.00 TO STA 1118+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4015-S14
SCALE AS SHOWN
SHEET NO.



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

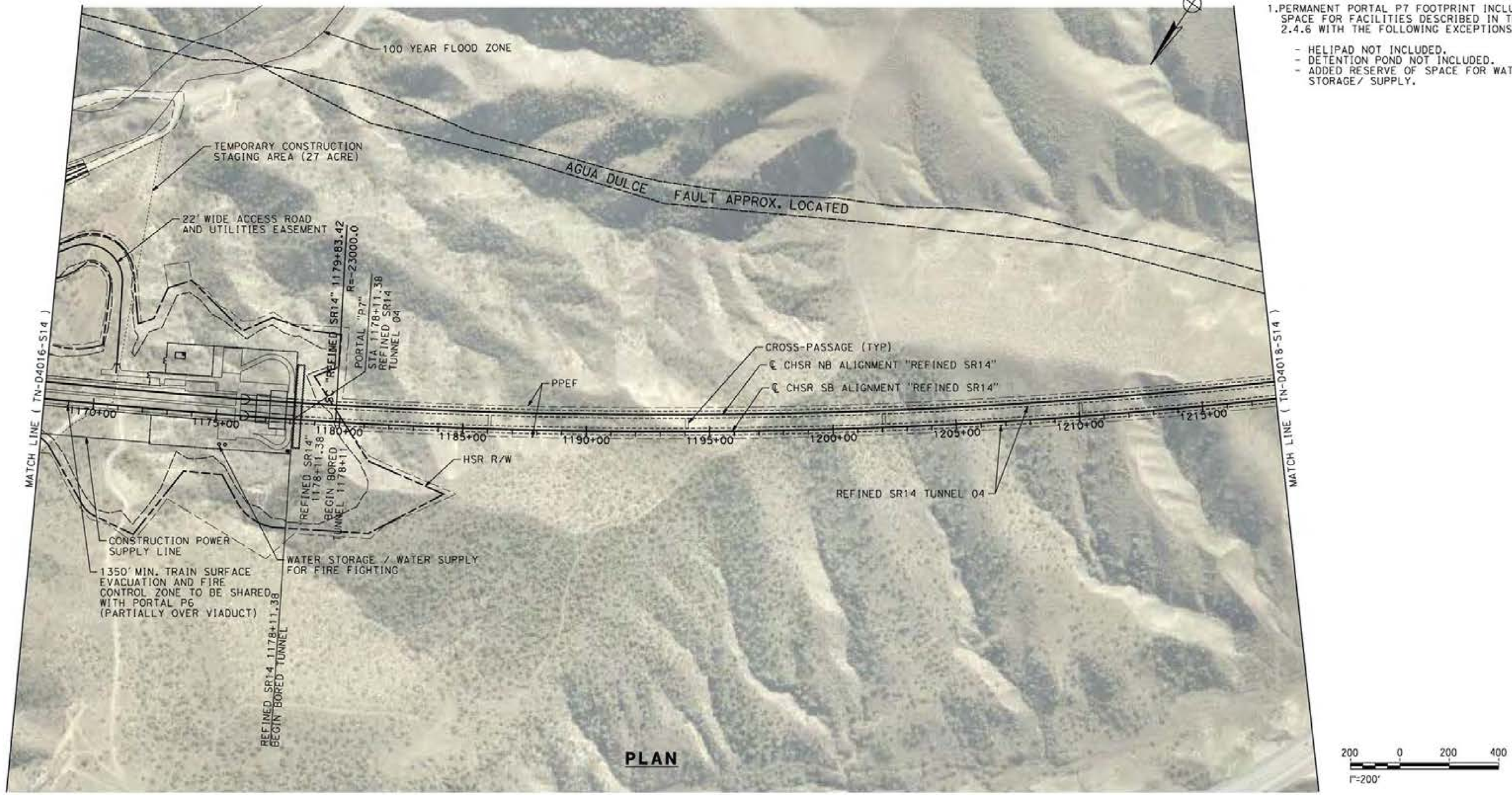
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 1118+00.00 TO STA 1168+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4016-S14
SCALE AS SHOWN
SHEET NO.

TUNNEL 04
PORTAL P7



PLAN

NOTE:

1. PERMANENT PORTAL P7 FOOTPRINT INCLUDES SPACE FOR FACILITIES DESCRIBED IN TM 2.4.6 WITH THE FOLLOWING EXCEPTIONS:
   - HELIPAD NOT INCLUDED.
   - DETENTION POND NOT INCLUDED.
   - ADDED RESERVE OF SPACE FOR WATER STORAGE/ SUPPLY.

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E.VELASCO
DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W.GUO
IN CHARGE: A.RELAÑO
DATE: 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

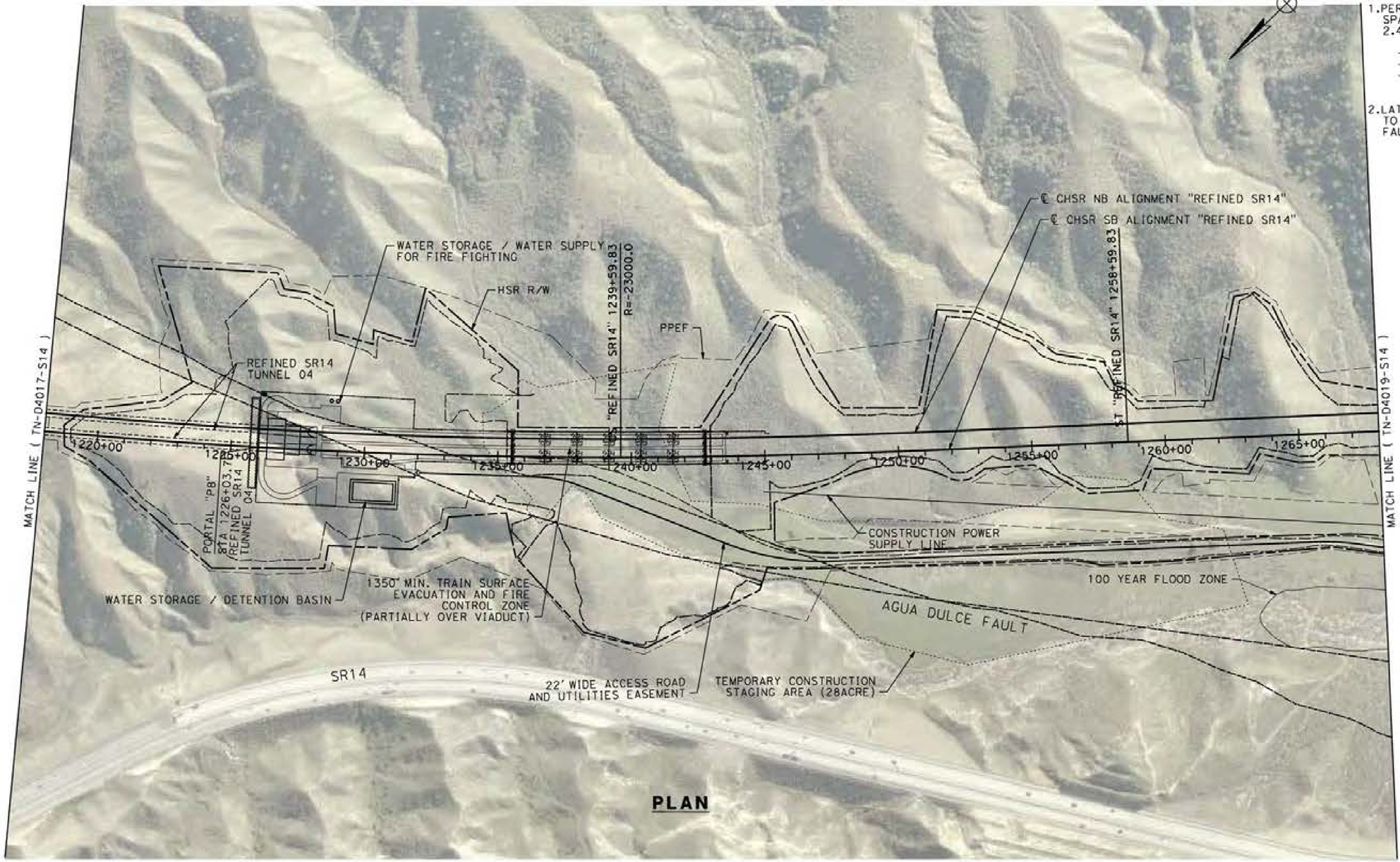
PLAN
STA 1168+00.00 TO STA 1218+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4017-S14
SCALE AS SHOWN
SHEET NO.

TUNNEL 04
PORTAL P8

NOTE:

1. PERMANENT PORTAL P8 FOOTPRINT INCLUDES SPACE FOR FACILITIES DESCRIBED IN TM 2.4.6 WITH THE FOLLOWING EXCEPTIONS:
   - HELIPAD NOT INCLUDED.
   - ADDED DETENTION POND (LOW POINT).
   - ADDED WATER STORAGE/ SUPPLY
2. LATER CONSIDERATION TO BE GIVEN TO MOVE THE TSEFCZ AWAY FROM THE FAULT ZONE. (TBD)



PLAN

200 0 200 2X
1"=400'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

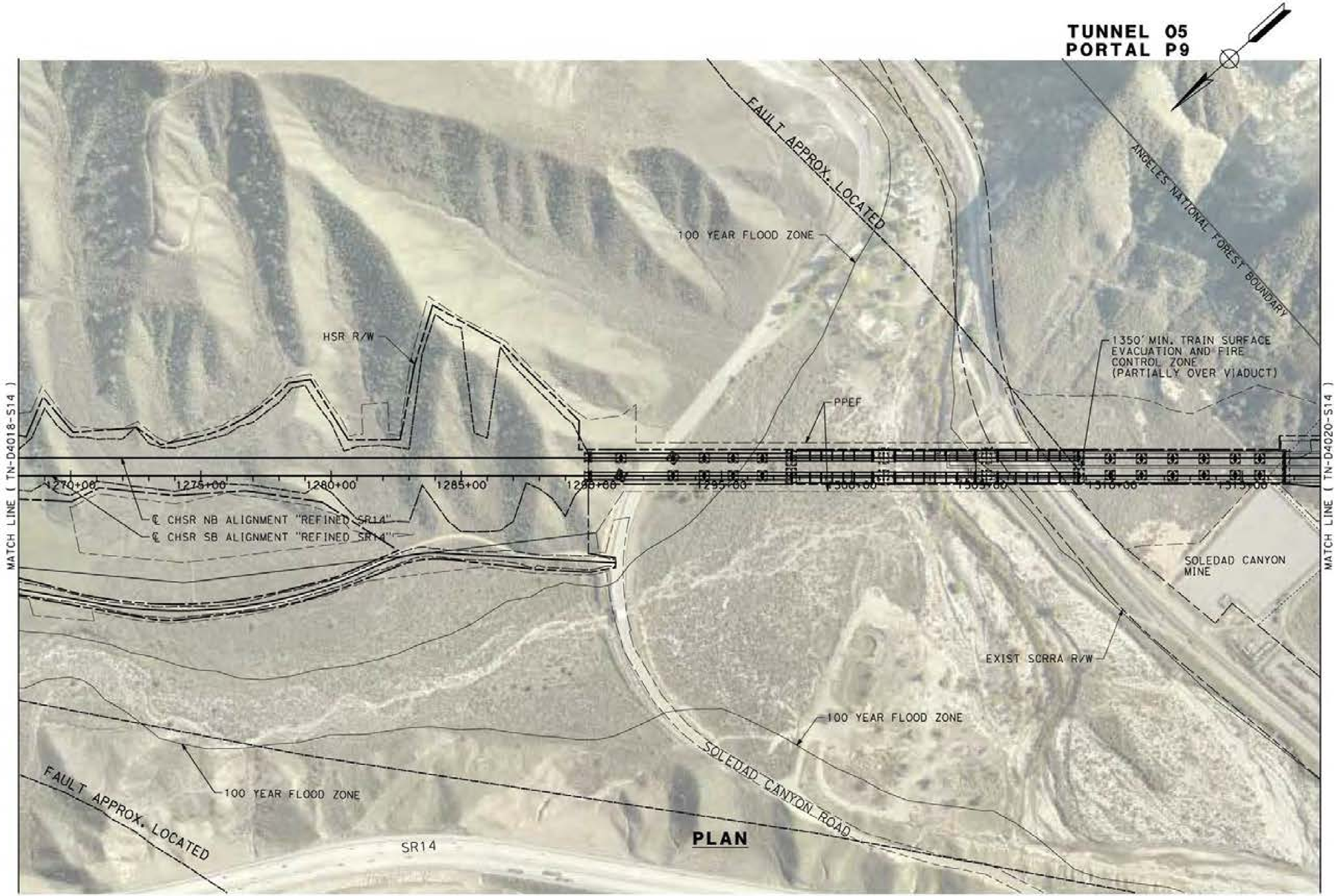
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 1218+00.00 TO STA 1268+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4018-S14
SCALE AS SHOWN
SHEET NO.



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 1268+00.00 TO STA 1318+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4019-S14
SCALE AS SHOWN
SHEET NO.

TUNNEL 05
PORTAL P9

NOTE:

1. THE ALIGNMENT CUTS DEEP 150 FT INTO THE LANG MINUTE MAN MISSILE SITE, WHICH IS A HARDENED STEEL REINFORCED CONCRETE BUNKER INSTALLATION THAT WILL HAVE TO BE DEMOLISHED.
2. PERMANENT PORTAL P9 FOOTPRINT INCLUDES SPACE FOR FACILITIES DESCRIBED IN TM 2.4.6 WITH THE FOLLOWING EXCEPTIONS:
   - HELIPAD NOT INCLUDED.
   - NO DETENTION POND (HIGH POINT).
   - ADDED WATER STORAGE/ SUPPLY.

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

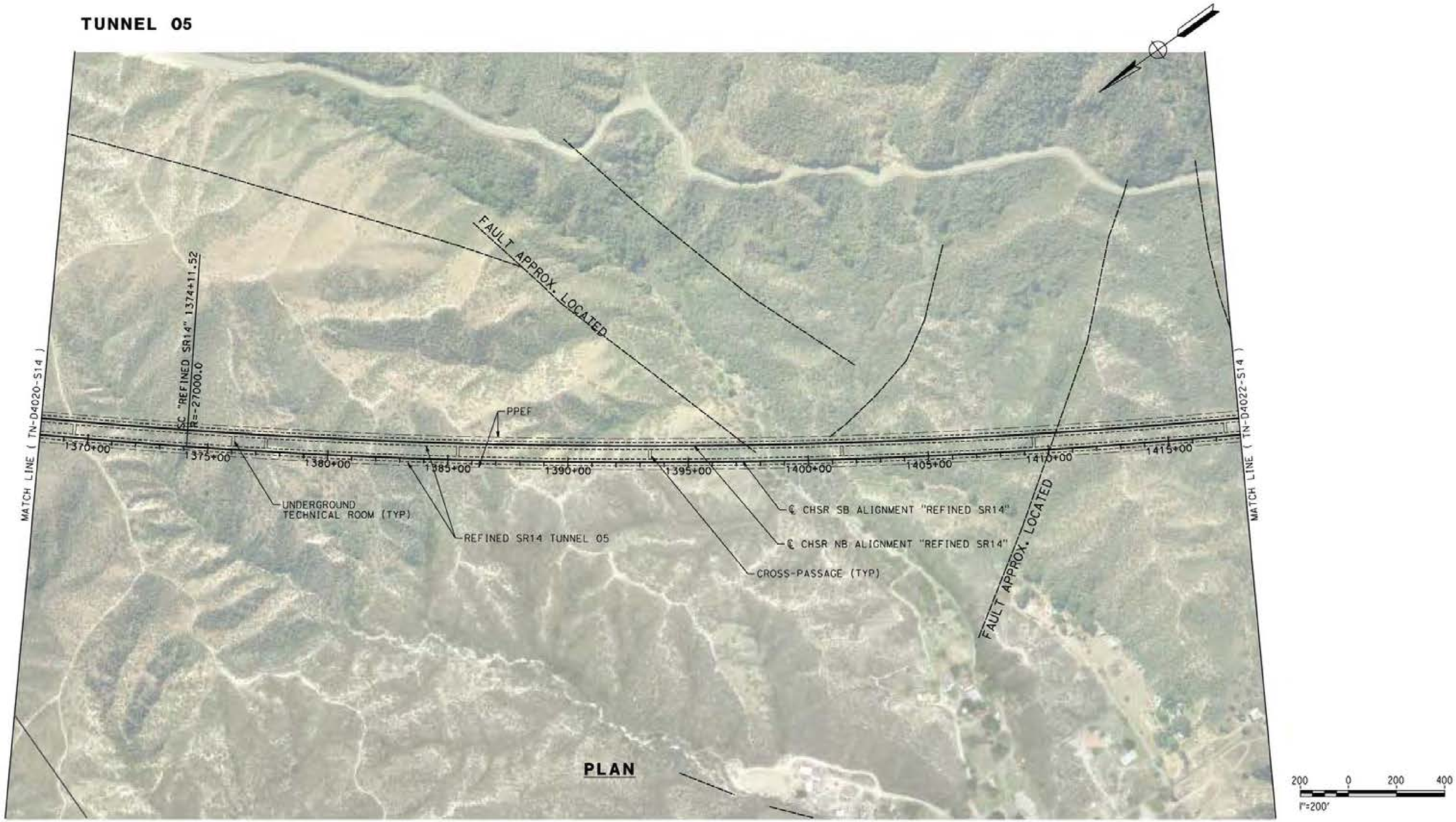
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 1318+00.00 TO STA 1368+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4020-S14
SCALE AS SHOWN
SHEET NO.

c:\dgnworking\vchar\dms19430\PB-TN-D4020-S14.dgn
24/05/2021 19:16:59
0205510

TUNNEL 05



PLAN

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

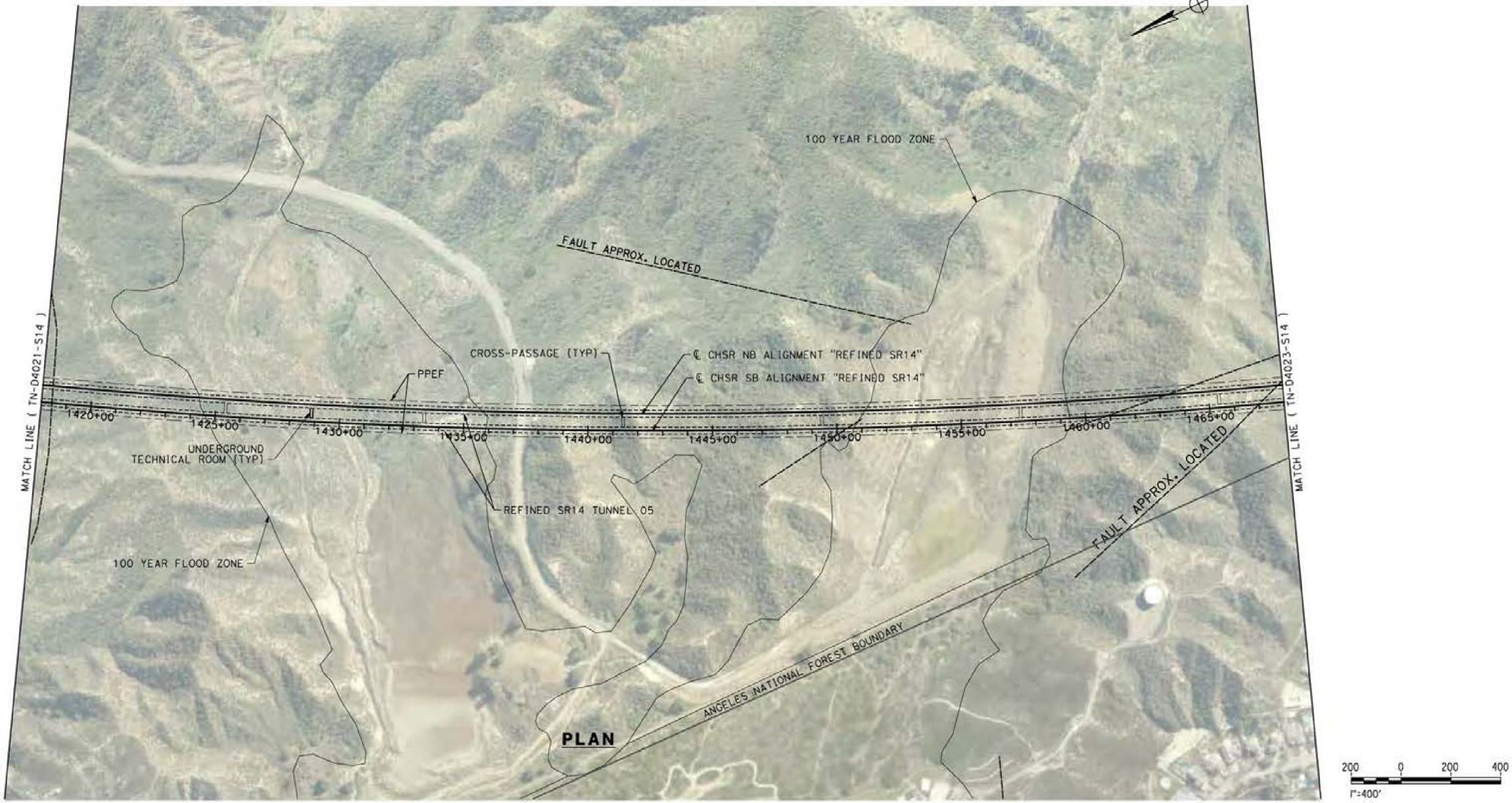
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 1368+00.00 TO STA 1418+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4021-S14
SCALE AS SHOWN
SHEET NO.

TUNNEL 05



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

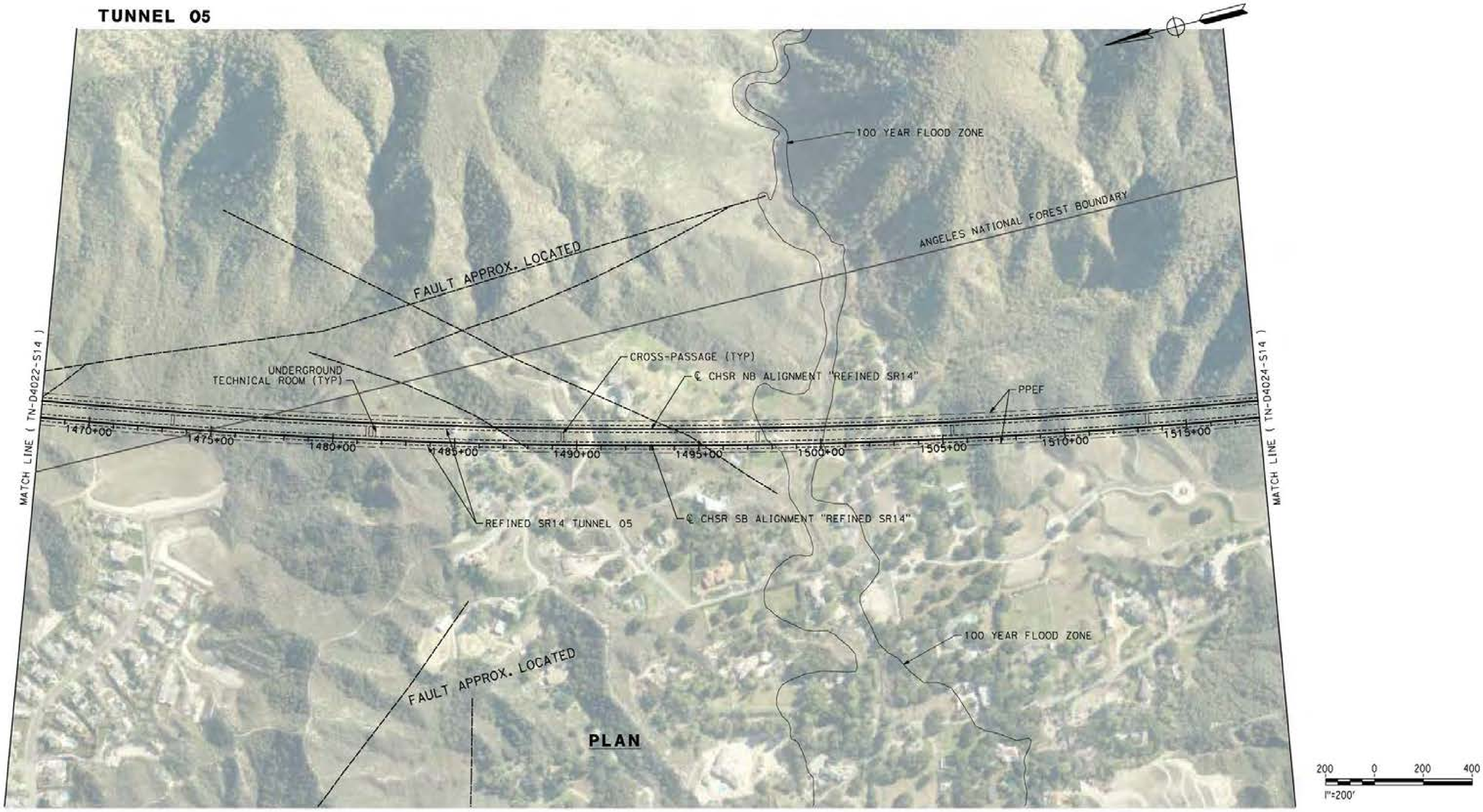
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 1418+00.00 TO STA 1468+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4022-S14
SCALE AS SHOWN
SHEET NO.

TUNNEL 05



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

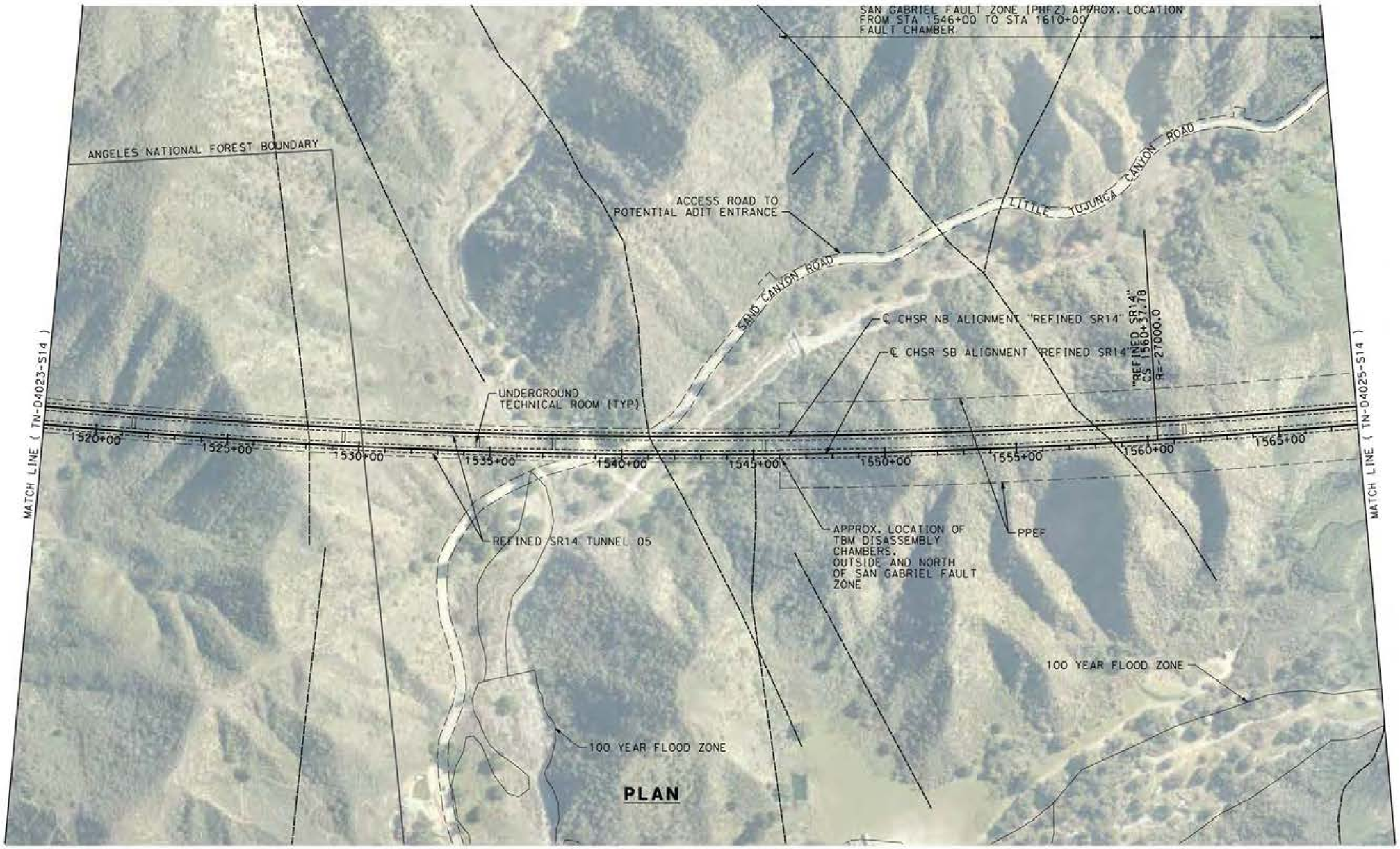
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 1468+00.00 TO STA 1518+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4023-S14
SCALE AS SHOWN
SHEET NO.

TUNNEL 05



PLAN

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

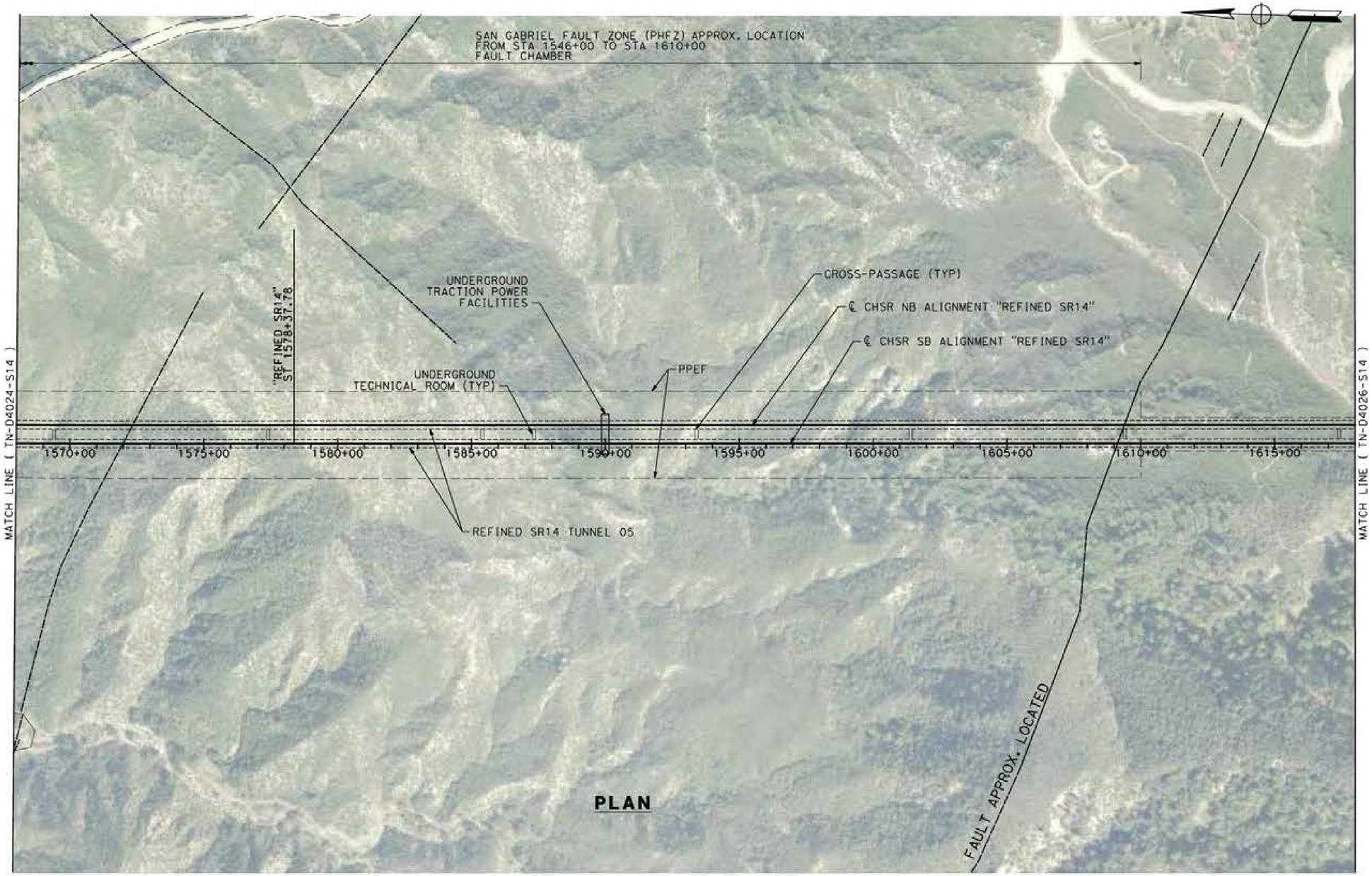
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 1518+00.00 TO STA 1568+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4024-S14
SCALE AS SHOWN
SHEET NO.

TUNNEL 05



PLAN

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 1568+00.00 TO STA 1618+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4025-S14
SCALE AS SHOWN
SHEET NO.

0205510

24/05/2021 19:21:11

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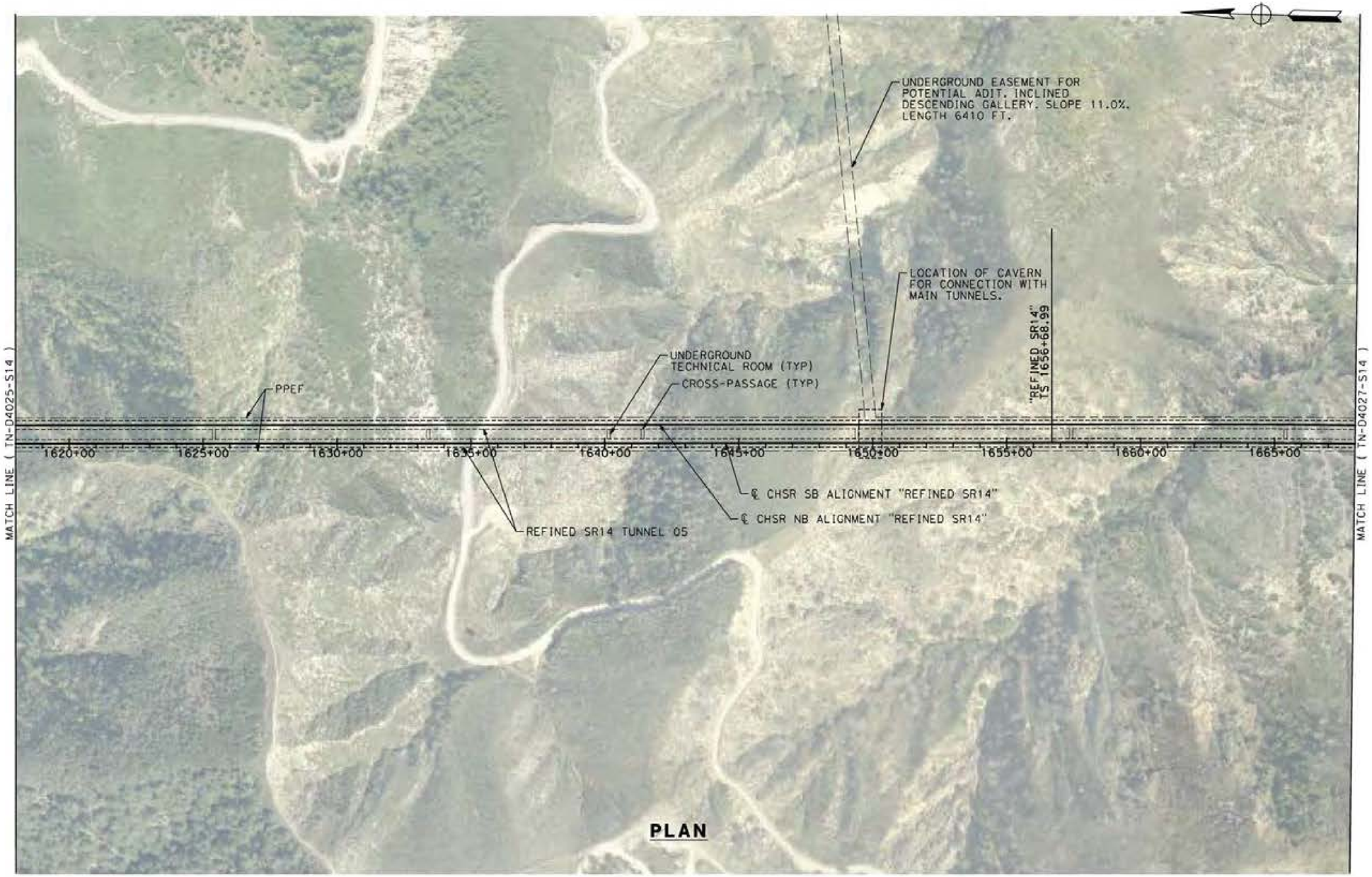
TUNNEL 05



PLAN

200 0 200 400
1"=200

NOTE:

1. LOCATION OF CAVERN SHOULD BE OUTSIDE FAULT ZONE, IN SOUND ROCK. VERIFICATION BOREHOLES NEEDED TO CONFIRM LOCATION.

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

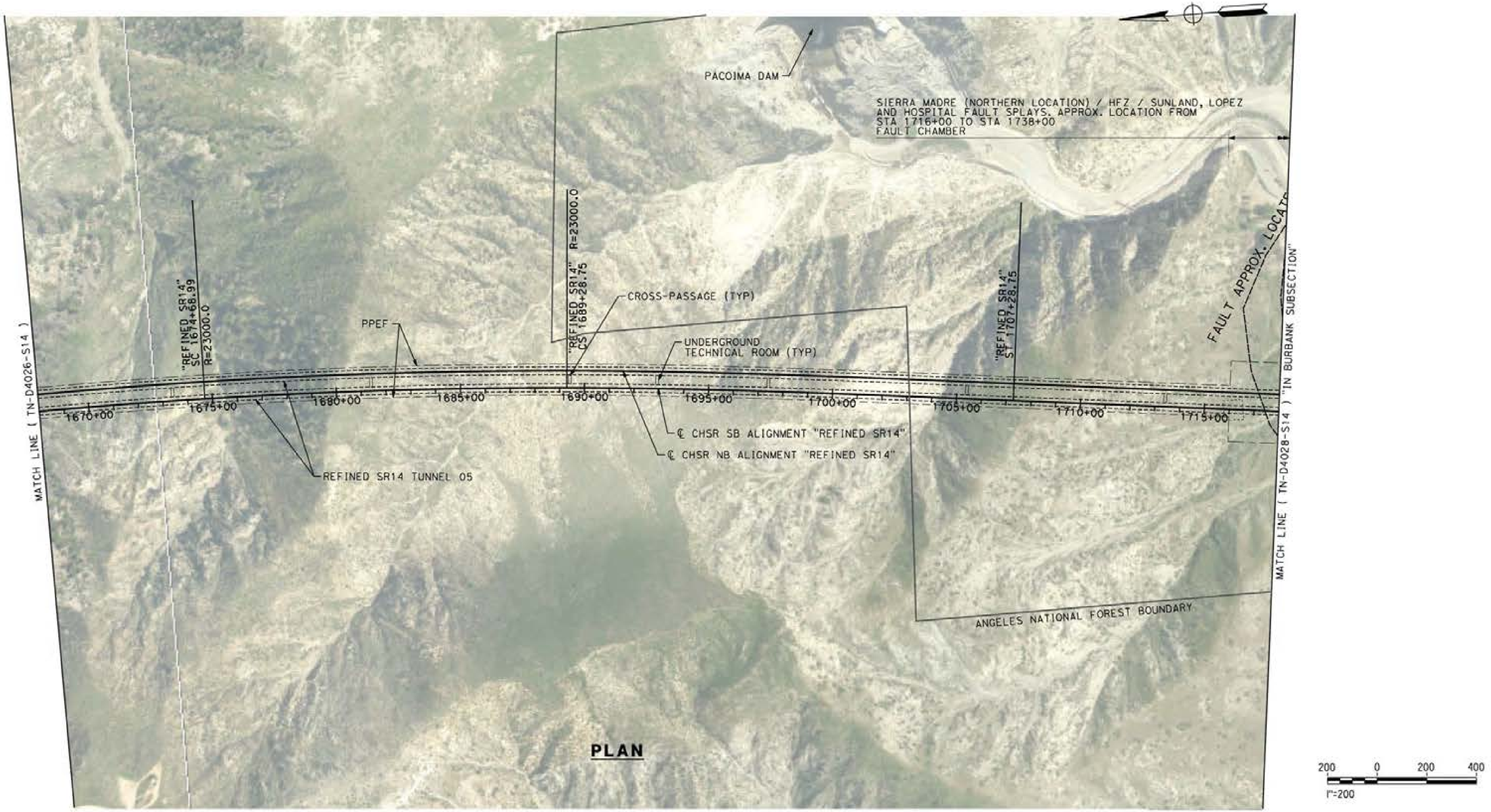
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 1618+00.00 TO STA 1668+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4026-S14
SCALE AS SHOWN
SHEET NO.

TUNNEL 05



PLAN

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 1668+00.00 TO STA 1718+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4027-S14
SCALE AS SHOWN
SHEET NO.

TUNNEL 05

200 0 200 400
1"=200

NOTE:

1. DEPICTED ADITS ARE POTENTIAL LOCATIONS SELECTED BECAUSE OF AVAILABLE SURFACE SPACE FOR CONSTRUCTION STAGING AREA, AND OPTIMAL SLOPE AND LENGTH OF THE DESCENDING GALLERY.
2. ADIT #1 AND ADIT #2 ARE OPTIONS TO CHOOSE FROM.
3. LOCATION OF CAVERN SHOULD BE OUTSIDE FAULT ZONE, IN SOUND ROCK. VERIFICATION BOREHOLES NEEDED TO CONFIRM LOCATION.

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 1718+00.00 TO STA 1768+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4028-S14
SCALE AS SHOWN
SHEET NO.

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0205510

TUNNEL 05

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

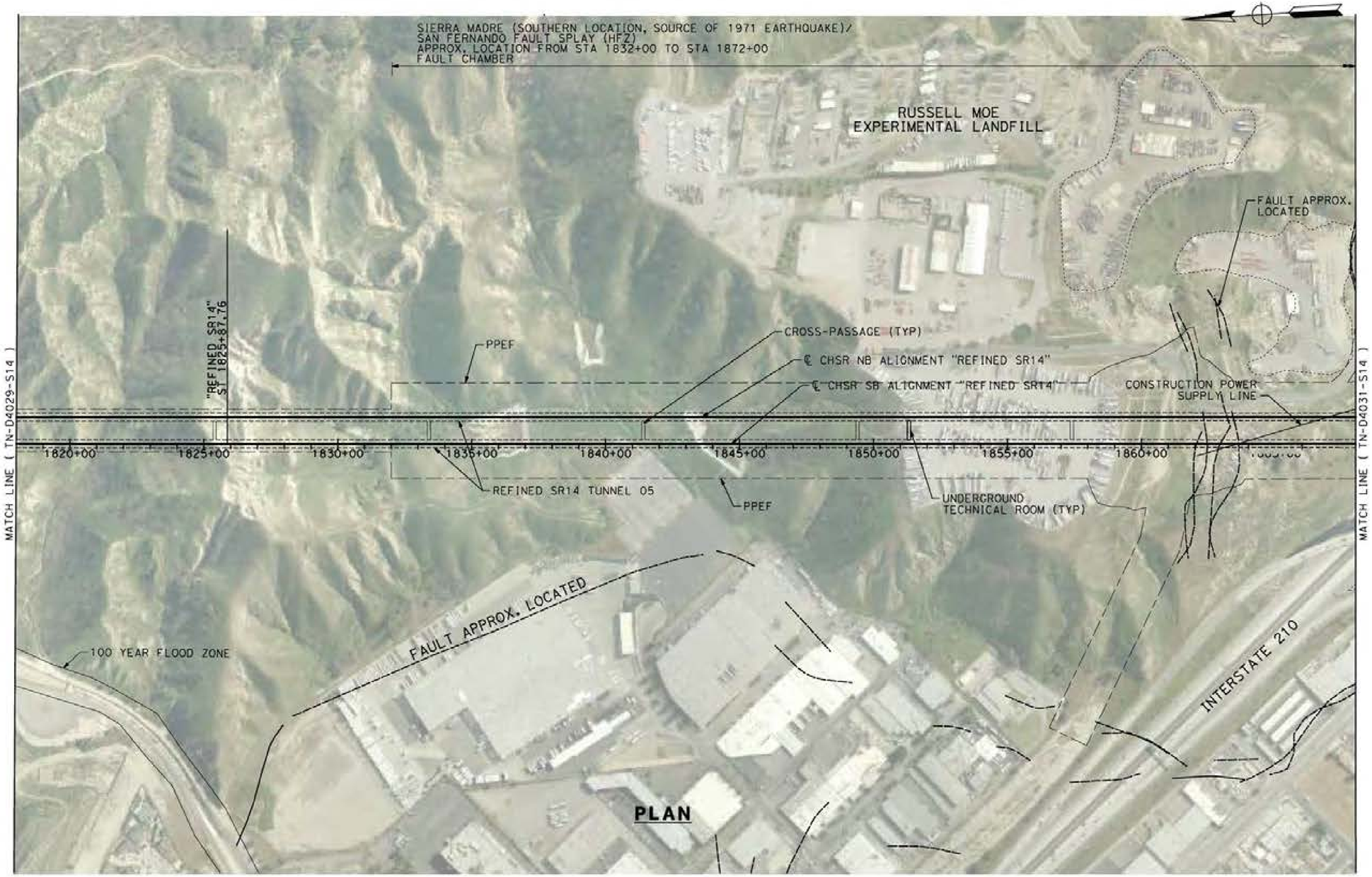
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 1768+00.00 TO STA 1818+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4029-S14
SCALE AS SHOWN
SHEET NO.

TUNNEL 05



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET
REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 1818+00.00 TO STA 1868+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4030-S14
SCALE AS SHOWN
SHEET NO.

0205510
24/05/2021 19:25:43
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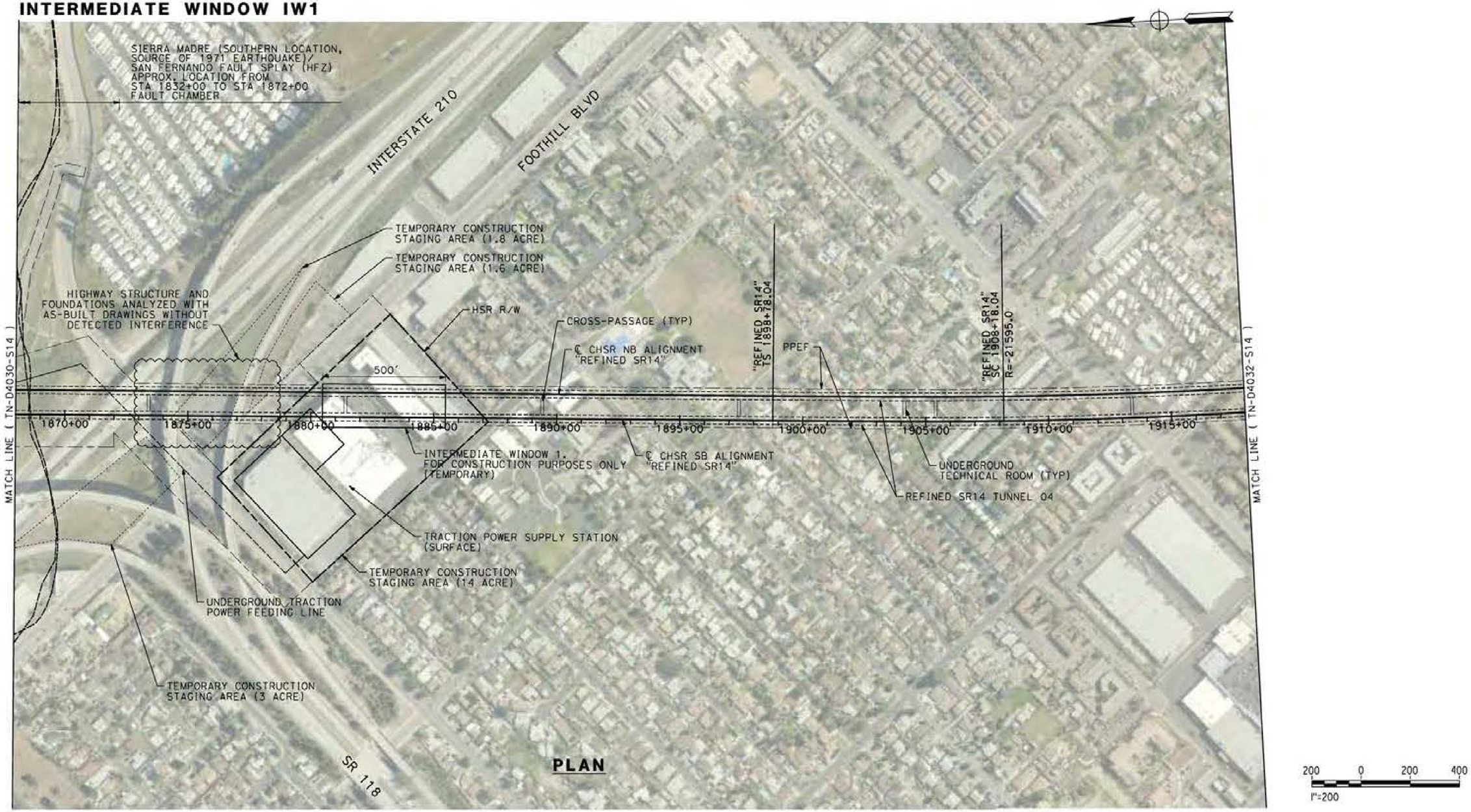
TUNNEL 05
INTERMEDIATE WINDOW IW1



PLAN

200 0 200 400
1"=200

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

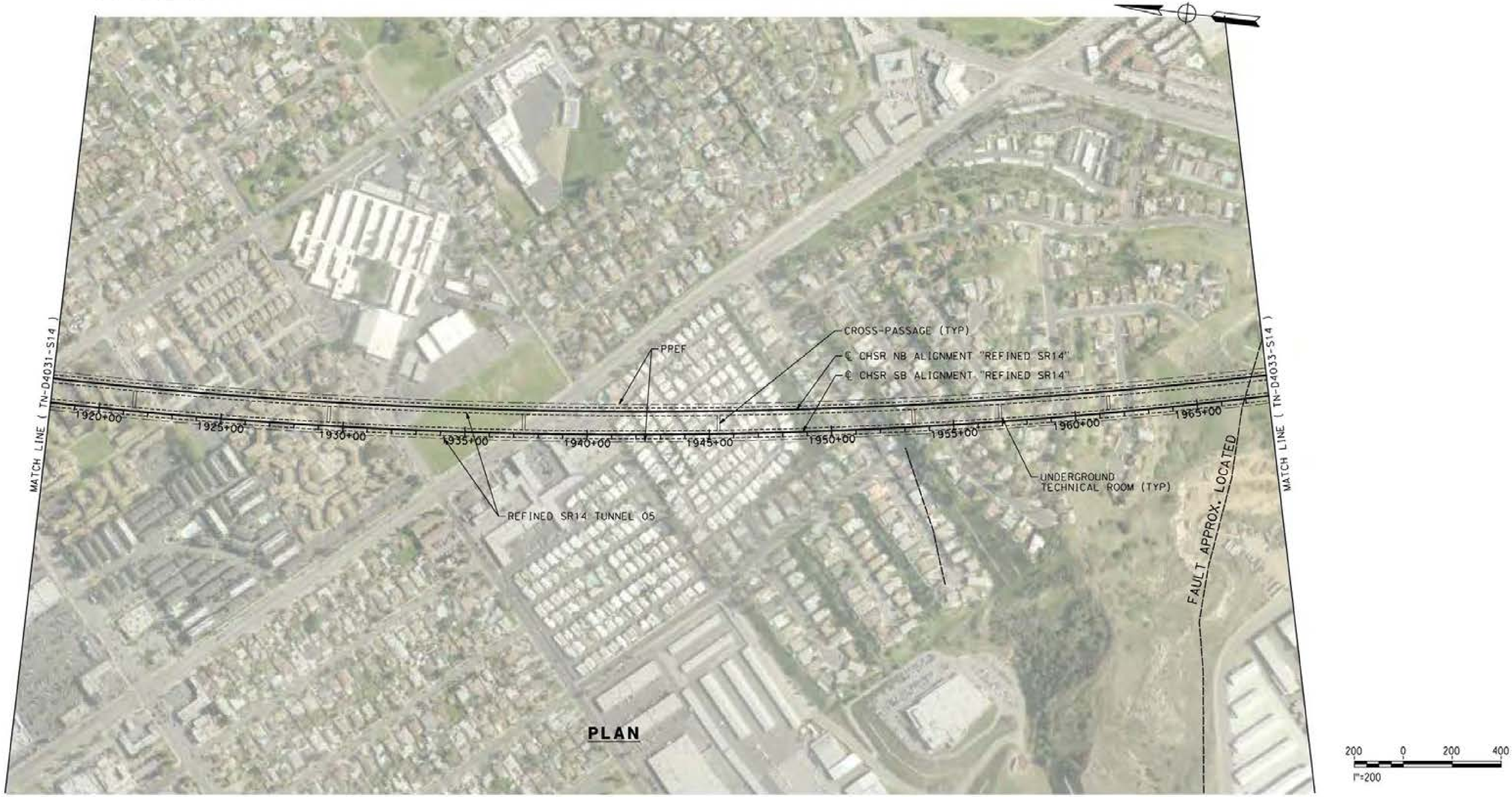
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 1868+00.00 TO STA 1918+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4031-S14
SCALE AS SHOWN
SHEET NO.

TUNNEL 05



PLAN

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

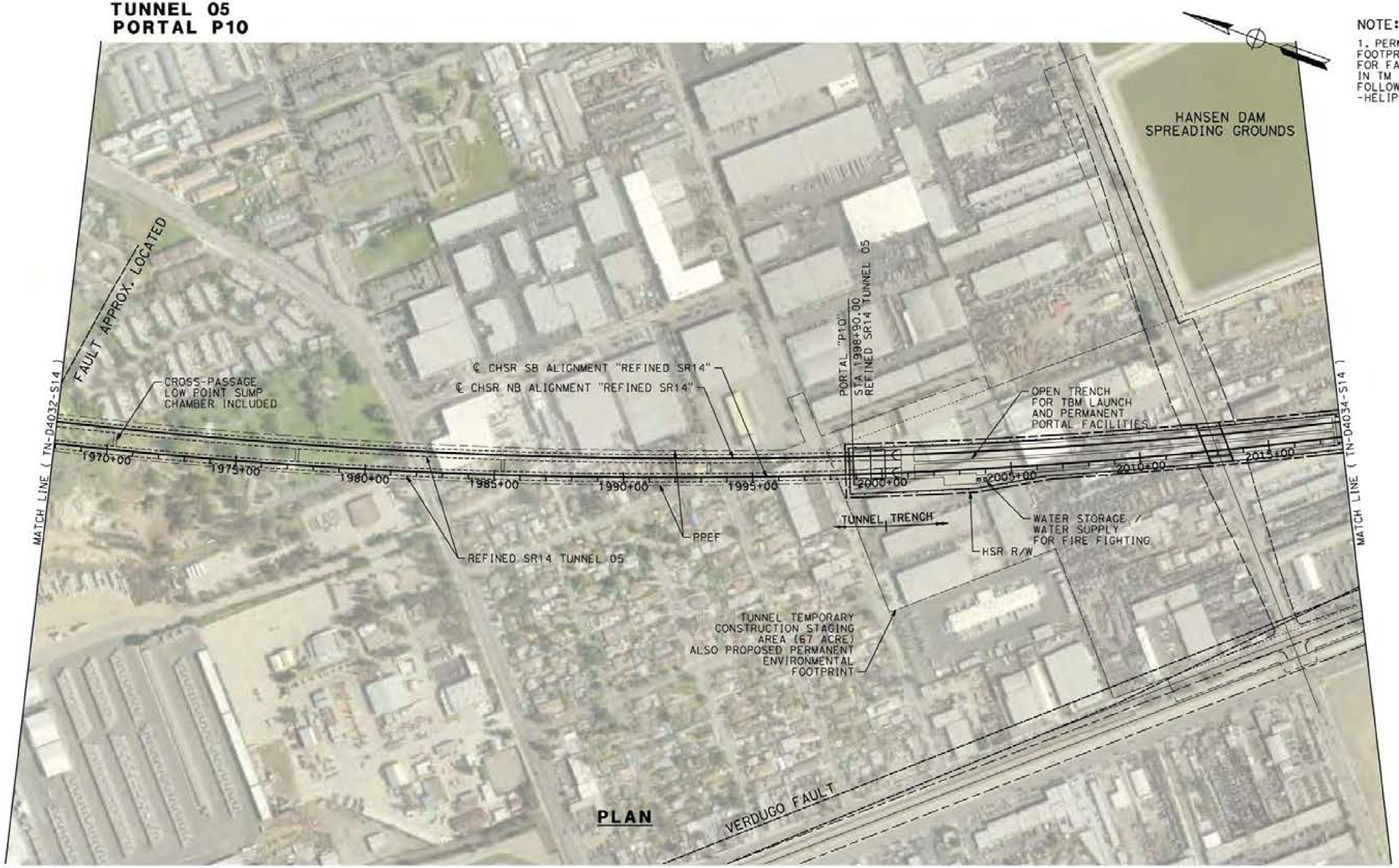
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 1918+00.00 TO STA 1968+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4032-S14
SCALE AS SHOWN
SHEET NO.

TUNNEL 05
PORTAL P10



PLAN

NOTE:

1. PERMANENT PORTAL P10 FOOTPRINT INCLUDES SPACE FOR FACILITIES DEPICTED IN TM 2.4.6 WITH THE FOLLOWING EXCEPTIONS:
   -HELIPAD NOT INCLUDED

200 0 200 400
1"=200

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET
REV 02

NOT FOR CONSTRUCTION

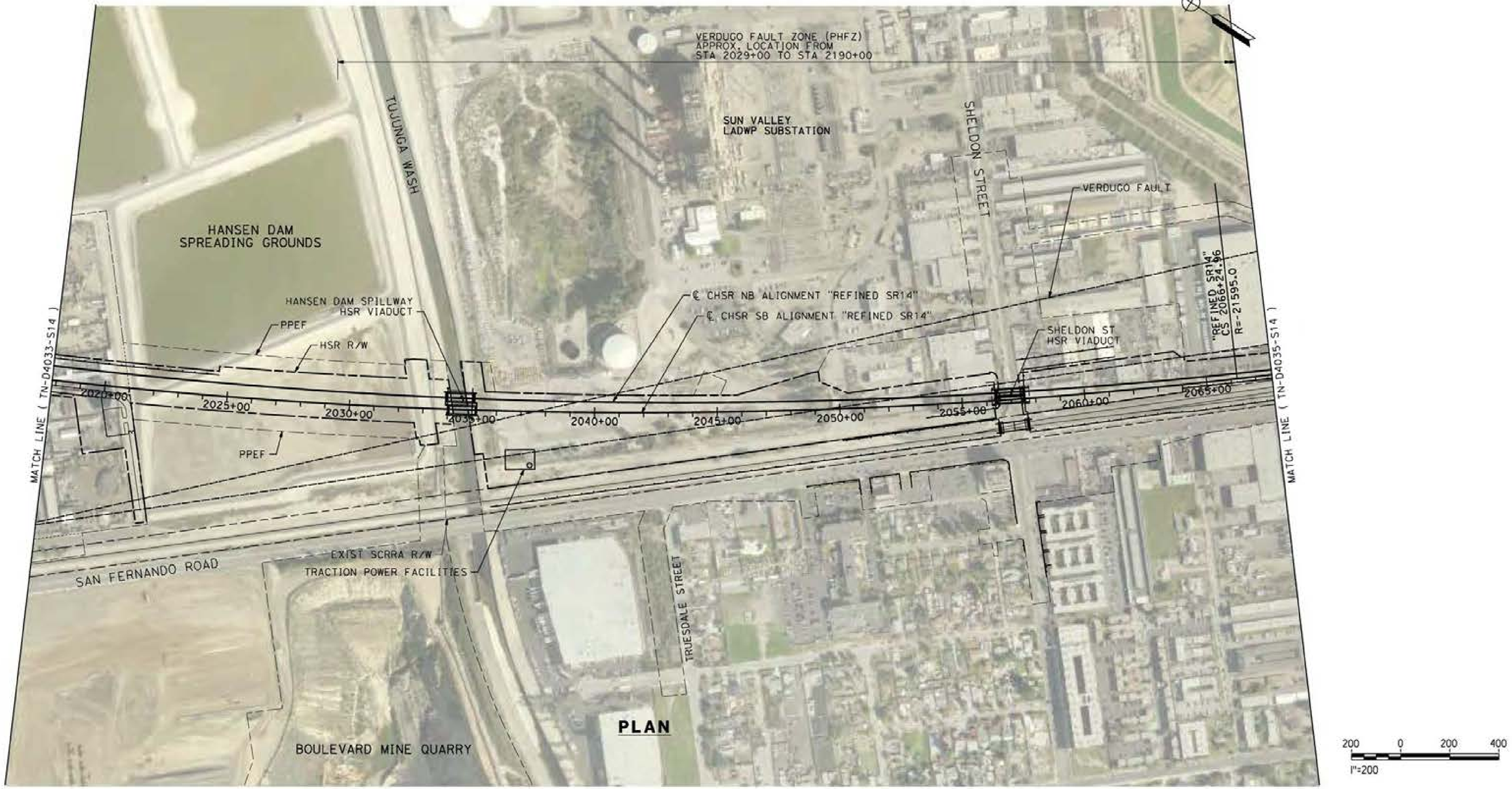
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 1968+00.00 TO STA 2018+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4033-S14
SCALE AS SHOWN
SHEET NO.



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET
REV 02

NOT FOR CONSTRUCTION

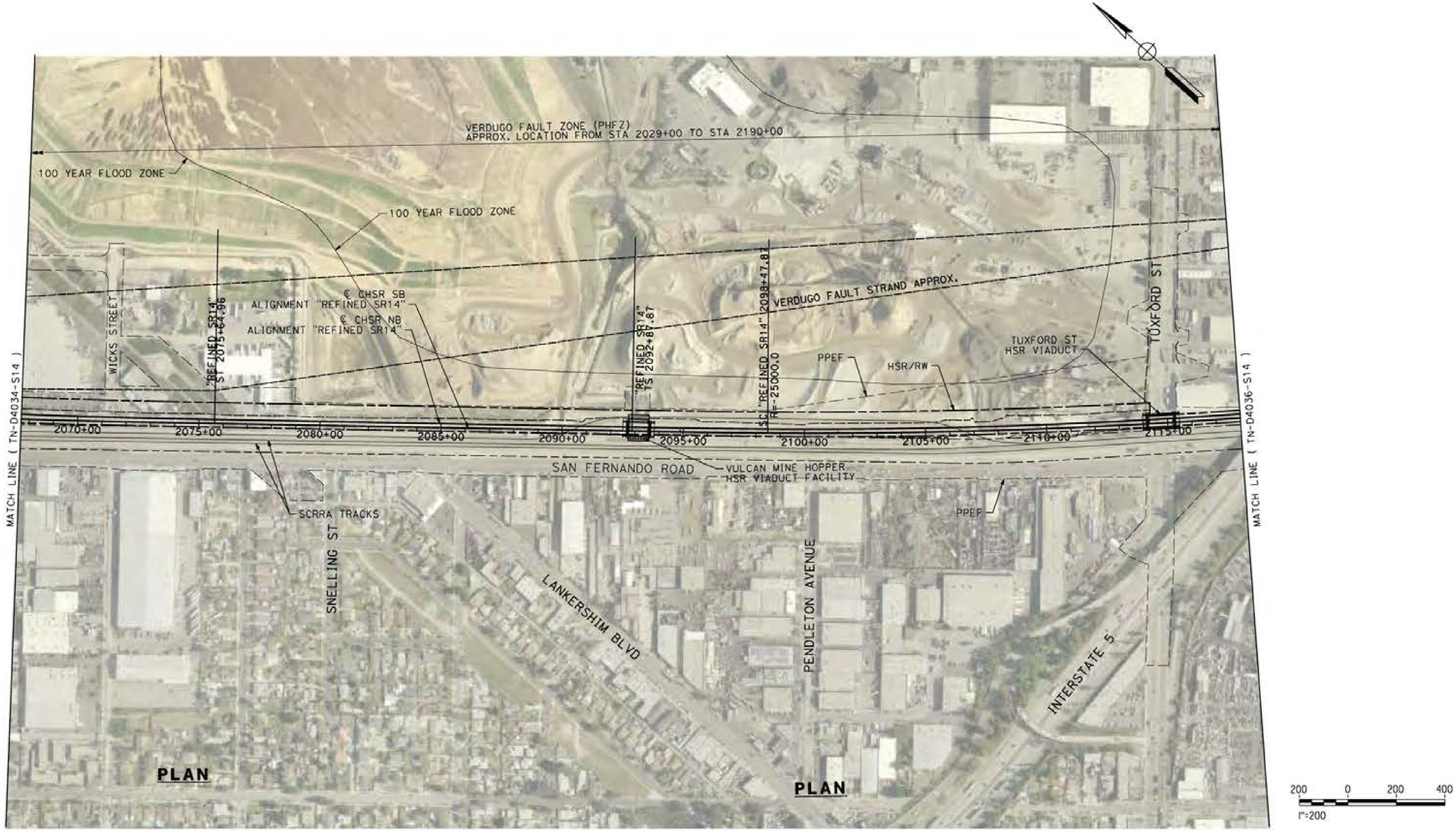
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 2018+00.00 TO STA 2068+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4034-S14
SCALE AS SHOWN
SHEET NO.



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 2068+00.00 TO STA 2118+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4035-S14
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 W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

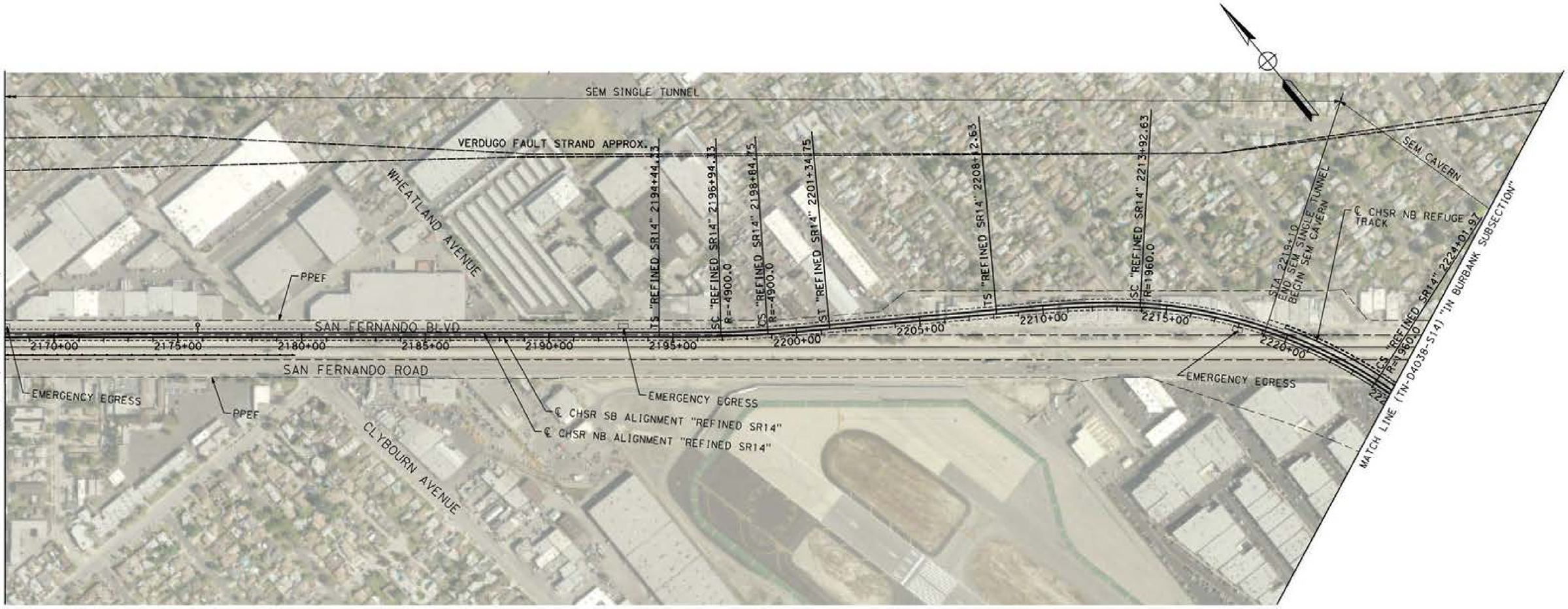
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 2118+00.00 TO STA 2168+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4036-S14
SCALE AS SHOWN
SHEET NO.



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

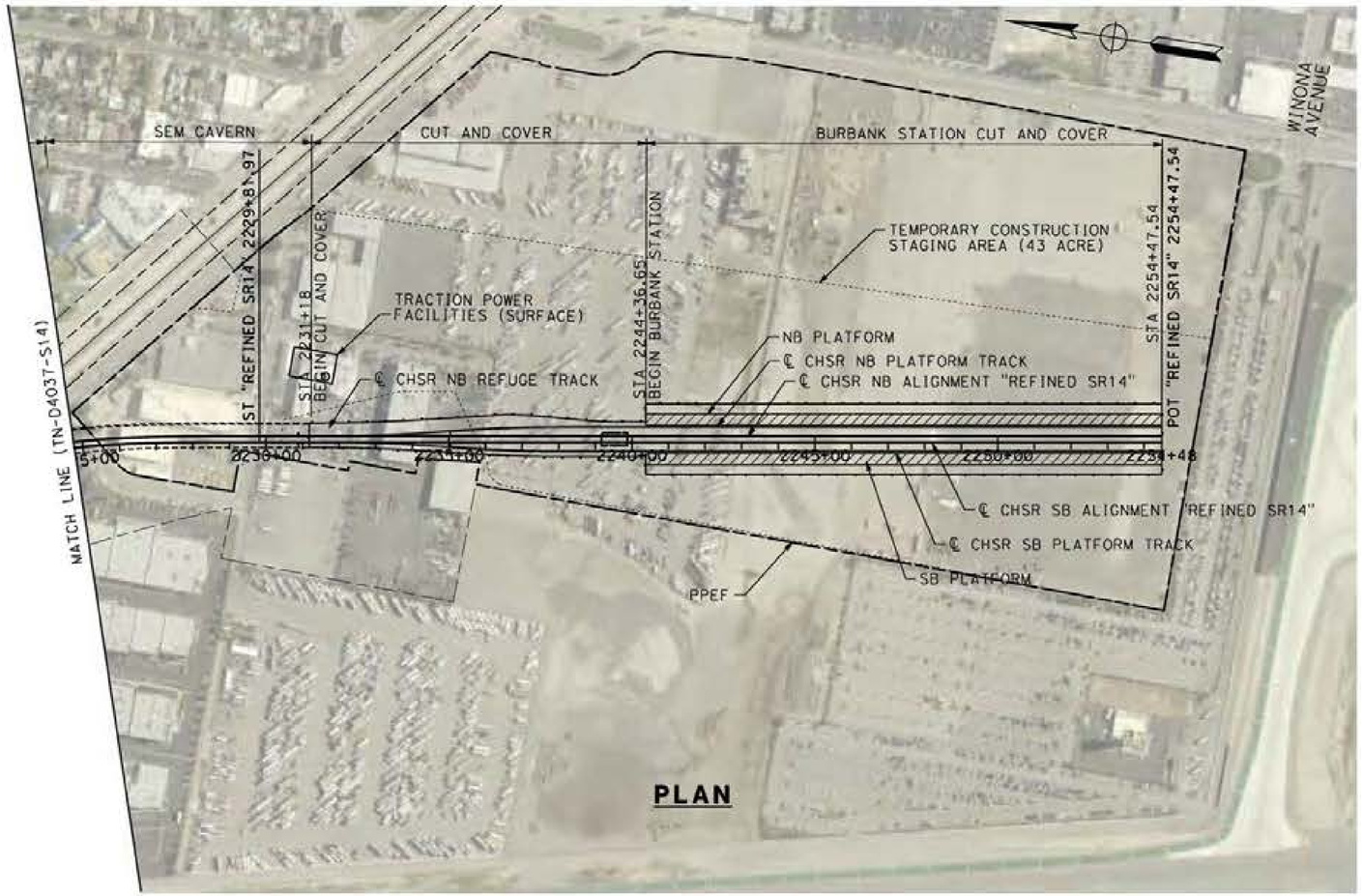
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 2168+00.00 TO STA 2224+76.26

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4037-S14
SCALE AS SHOWN
SHEET NO.



PLAN

200 0 200 400
1"=200

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

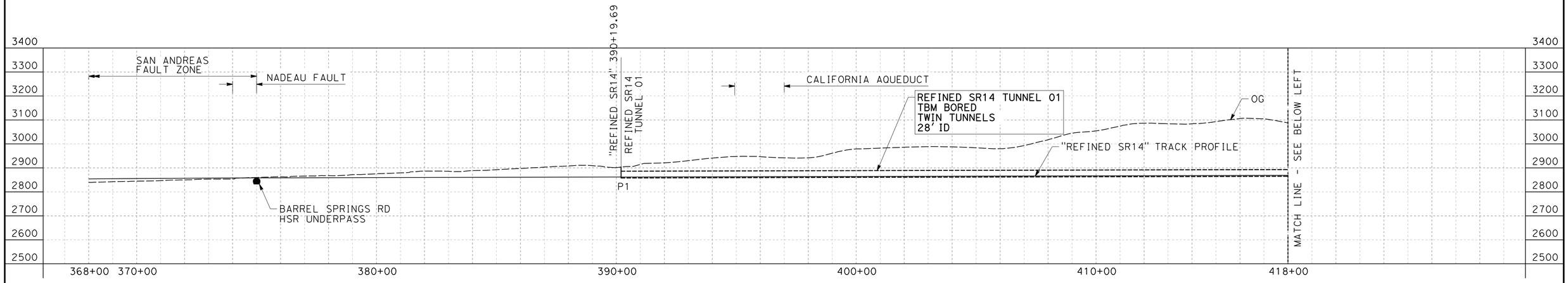
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

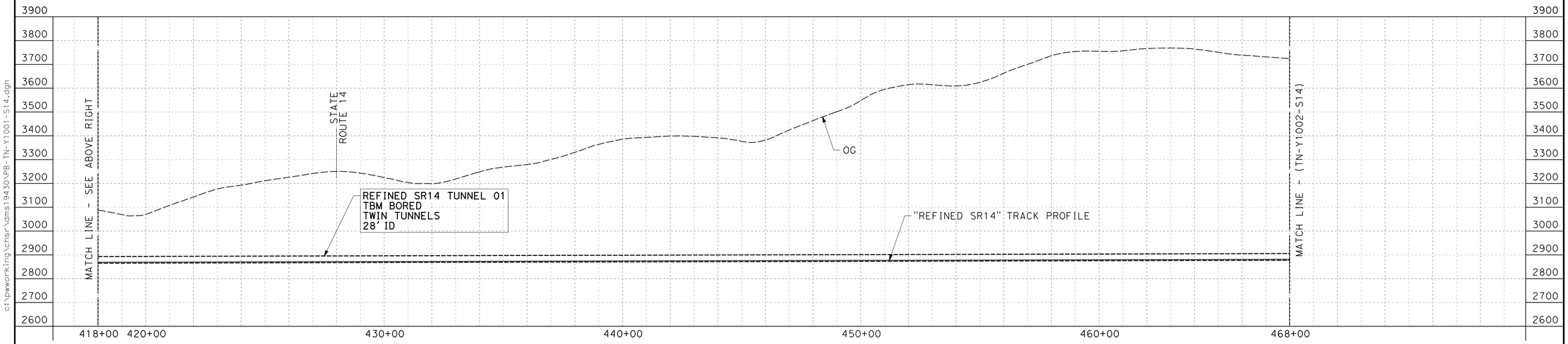
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PLAN
STA 2224+76.26 TO STA 2254+47.54

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4038-S14
SCALE AS SHOWN
SHEET NO.



PROFILE



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET
REV 02

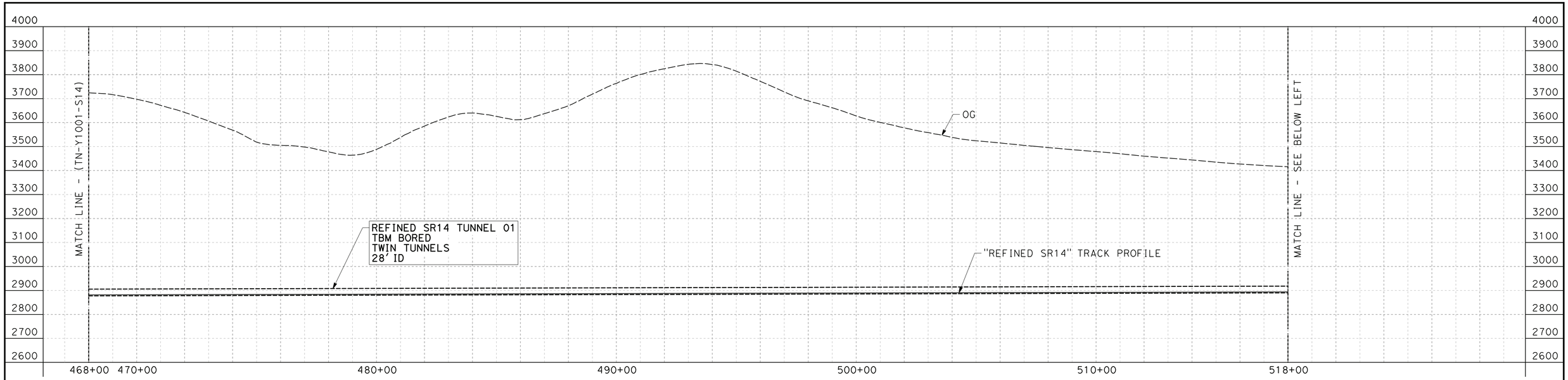
NOT FOR CONSTRUCTION

SENER

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 368+00.00 TO STA 468+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1001-S14
SCALE AS SHOWN
SHEET NO.



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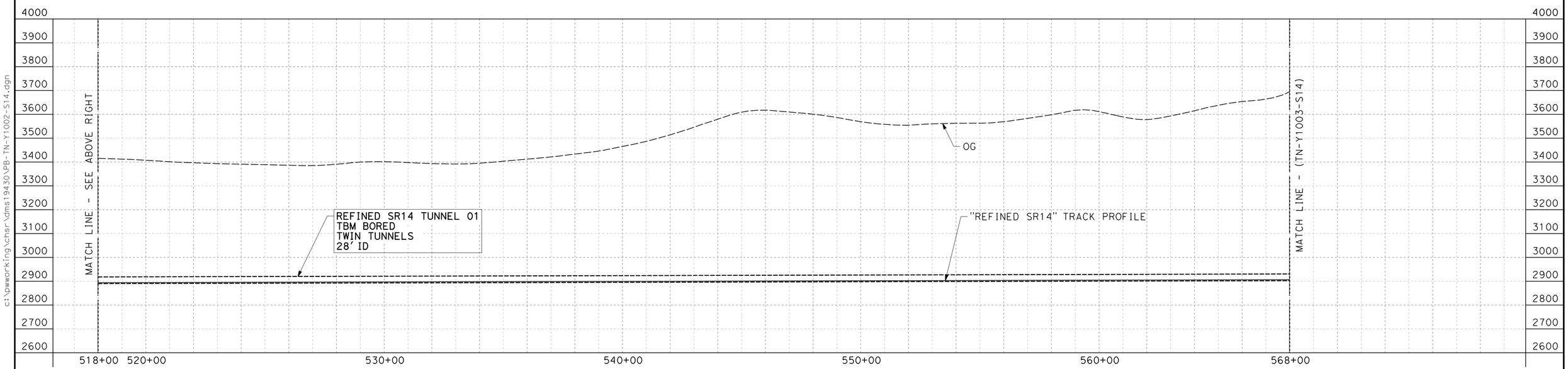

PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 468+00.00 TO STA 568+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1002-S14
SCALE AS SHOWN
SHEET NO.

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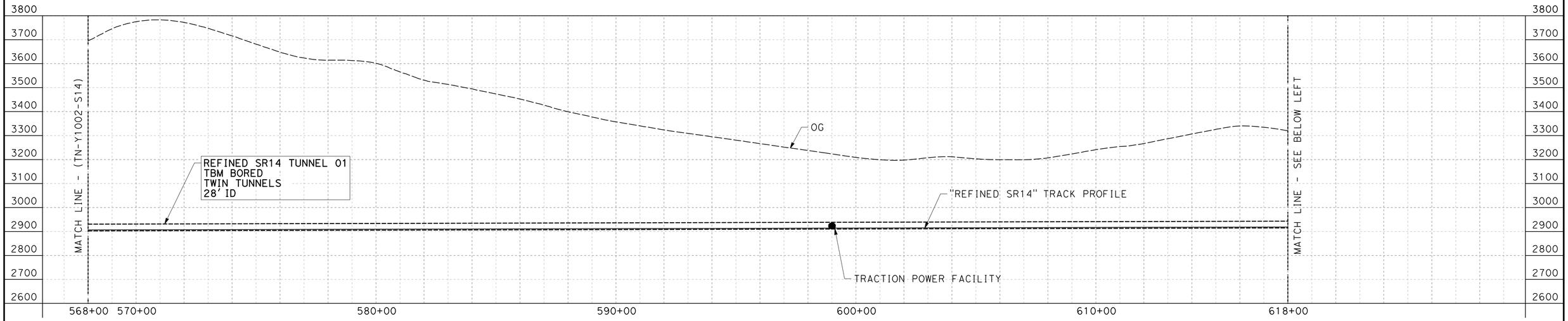
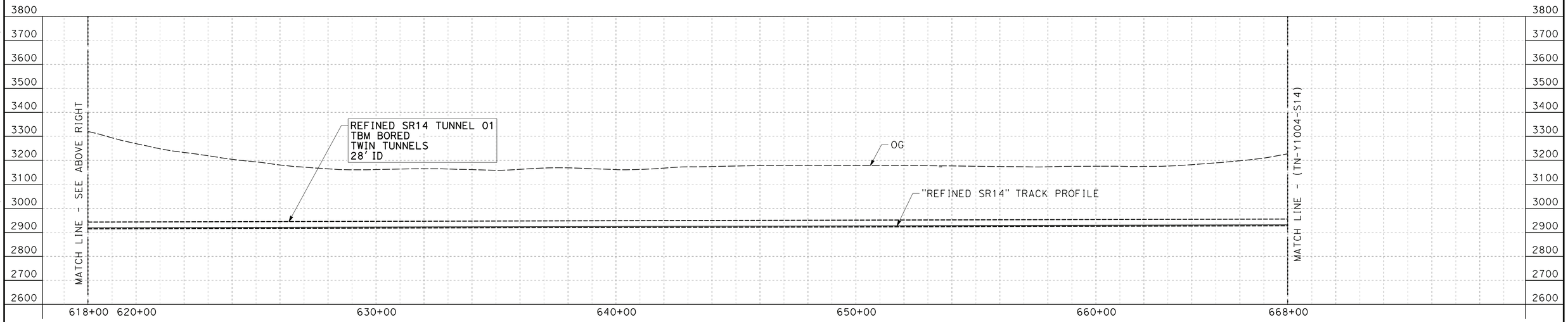


PROFILE



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

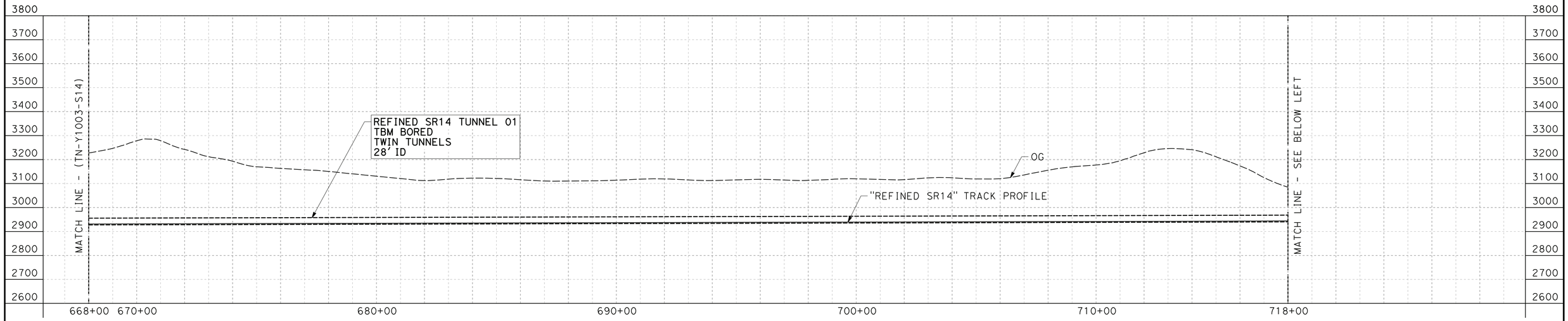
NOT FOR CONSTRUCTION

SENER

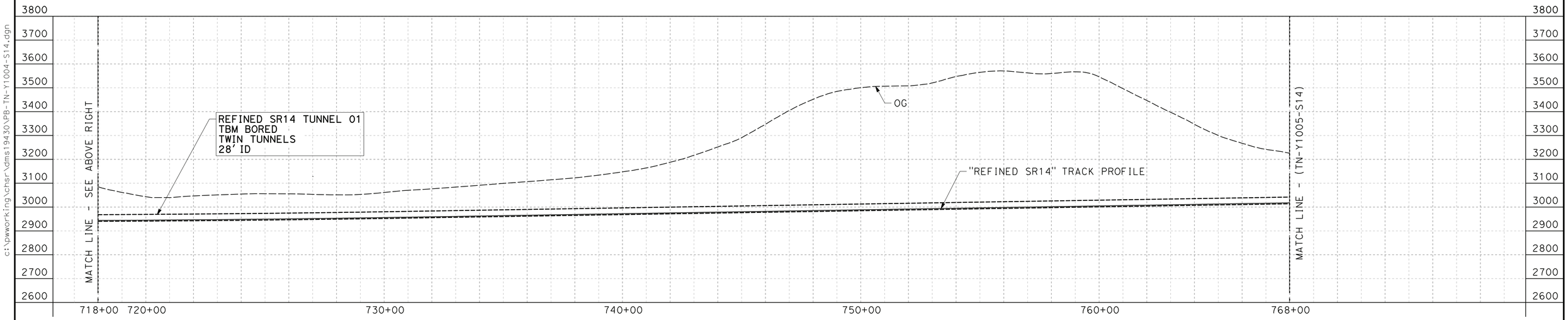
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 568+00.00 TO STA 668+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1003-S14
SCALE AS SHOWN
SHEET NO.



PROFILE



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

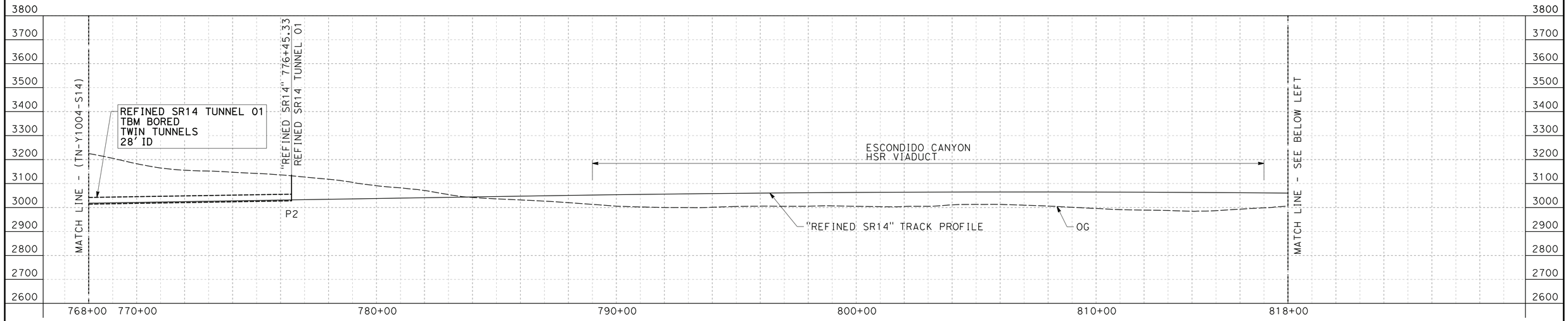
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 668+00.00 TO STA 768+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1004-S14
SCALE AS SHOWN
SHEET NO.



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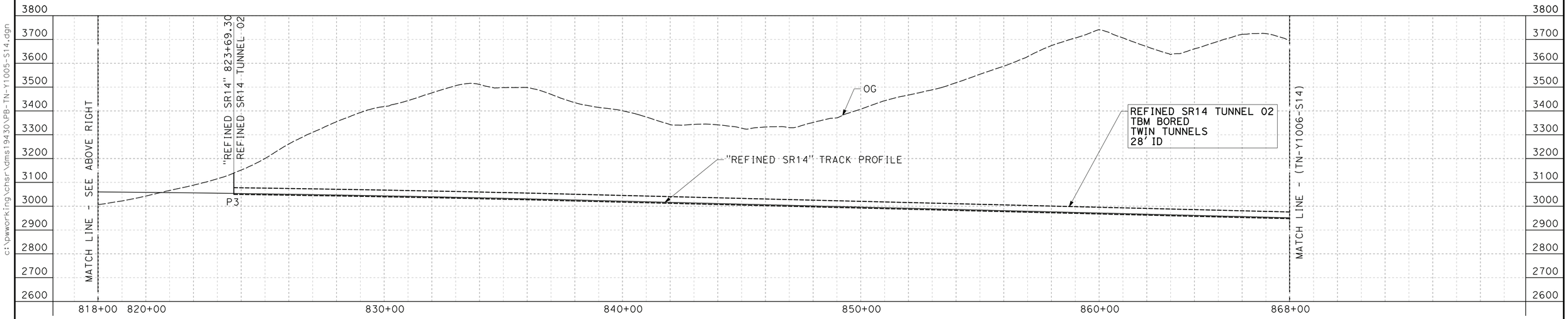

PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 768+00.00 TO STA 868+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1005-S14
SCALE AS SHOWN
SHEET NO.

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24/05/2021 19:38:52
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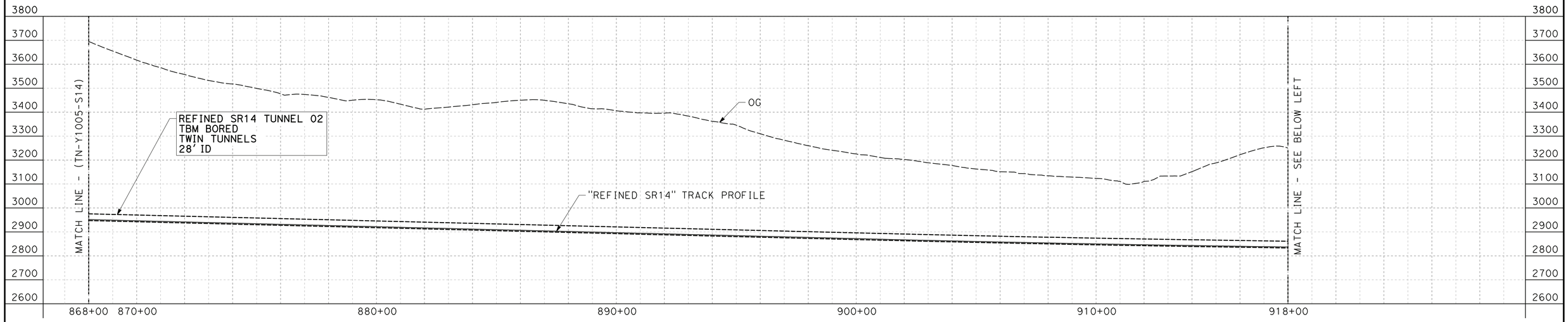
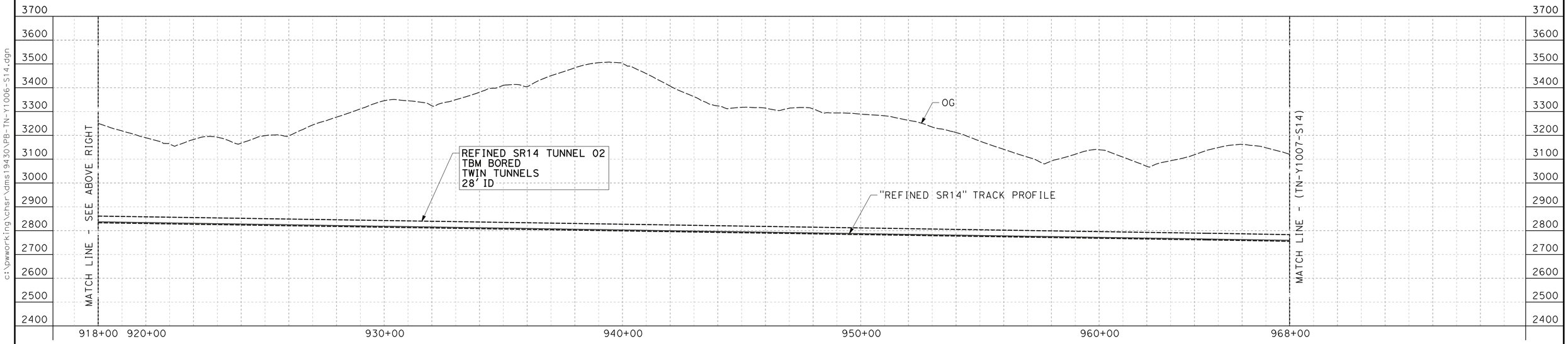


PROFILE



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
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REV	DATE	BY	CHK	APP	DESCRIPTION

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DATE 04/30/2021

PEPD RECORD SET REV 02

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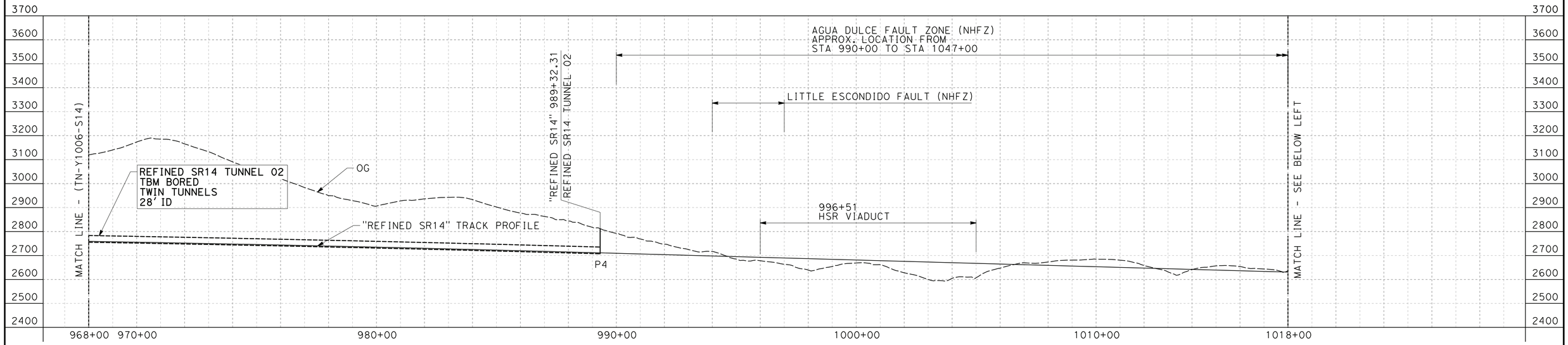
SENER

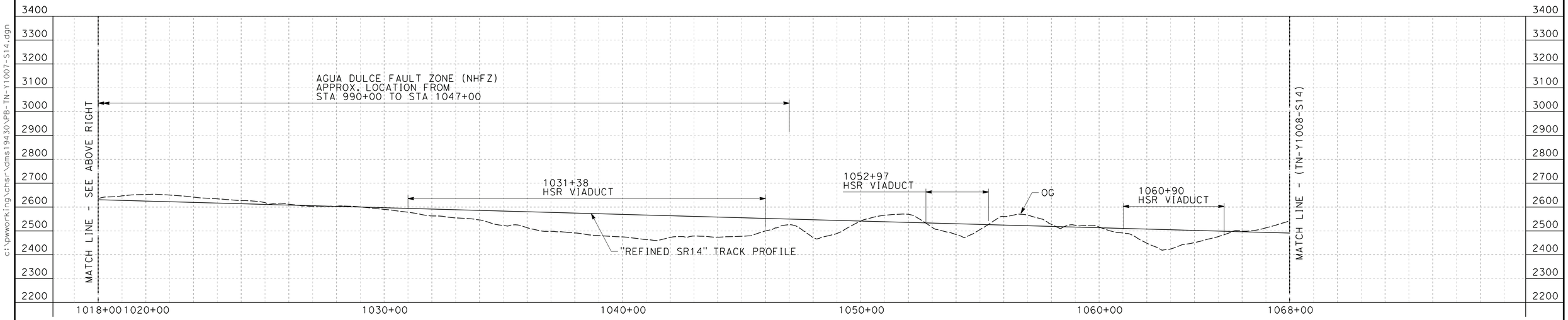
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 868+00.00 TO STA 968+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1006-S14
SCALE AS SHOWN
SHEET NO.



PROFILE



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

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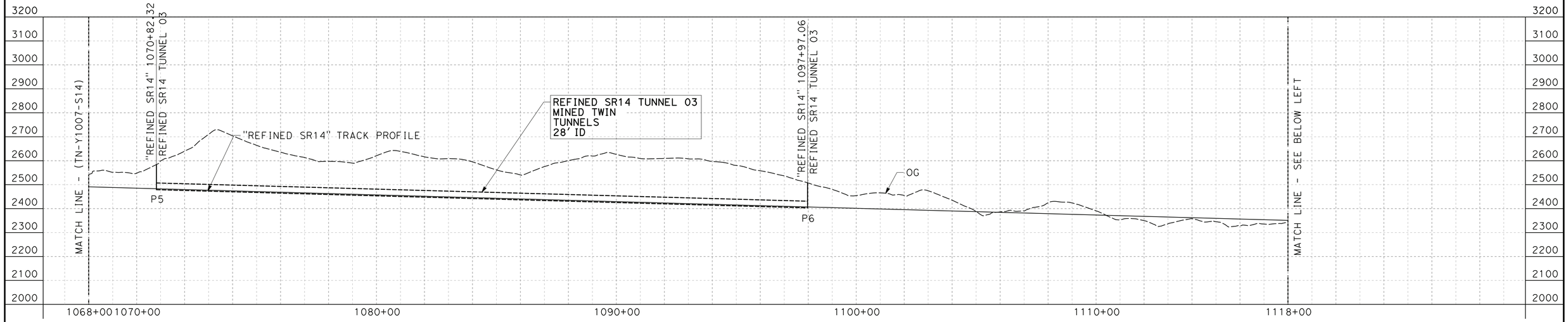
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 968+00.00 TO STA 1068+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1007-S14
SCALE AS SHOWN
SHEET NO.



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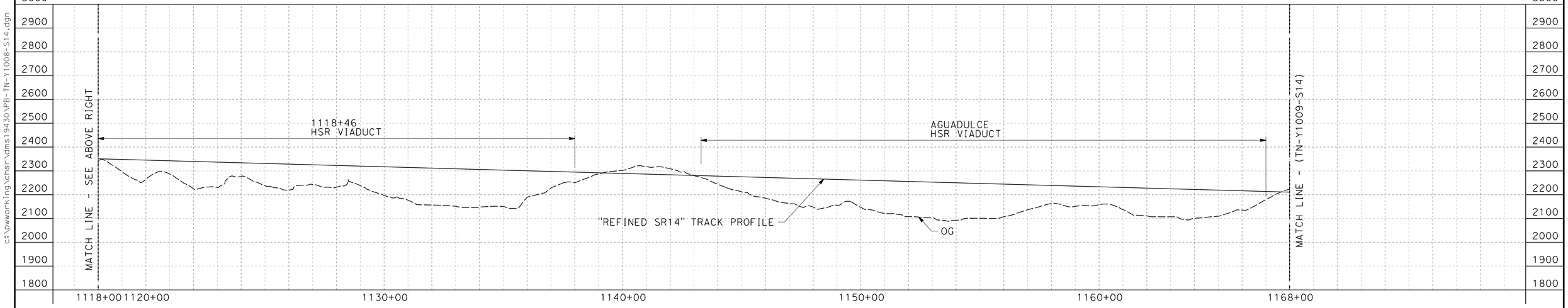

PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

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DATE 04/30/2021

PEPD RECORD SET
REV 02

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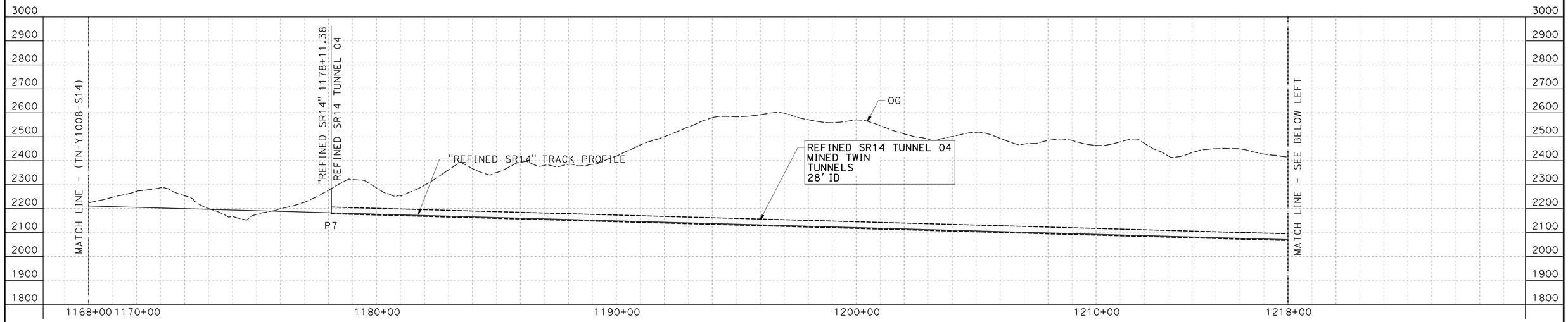
SENER

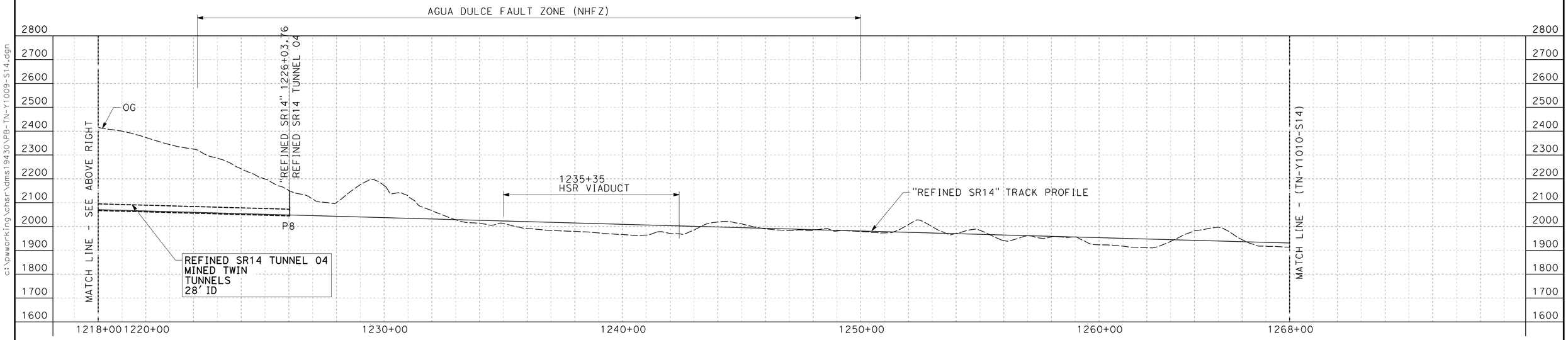
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1068+00.00 TO STA 1168+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1008-S14
SCALE AS SHOWN
SHEET NO.



PROFILE



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
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REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

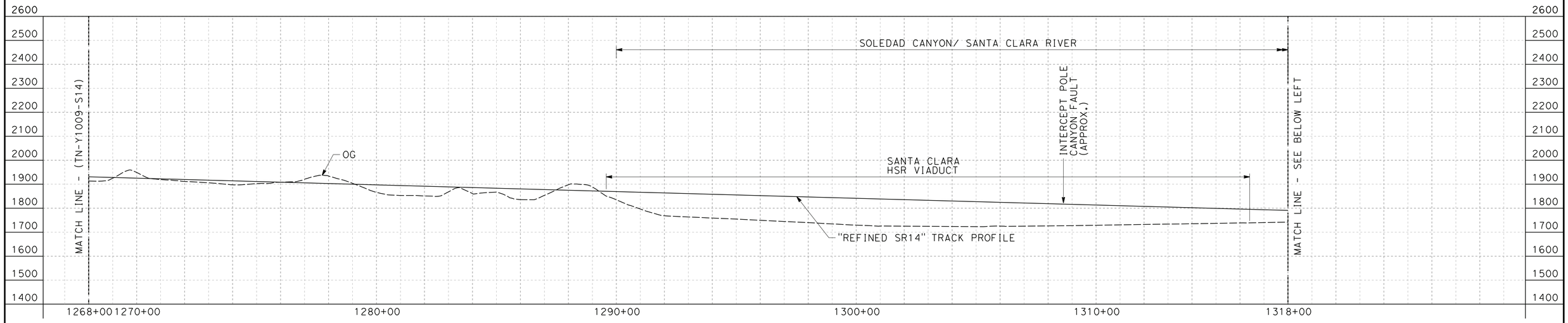
NOT FOR CONSTRUCTION

SENER

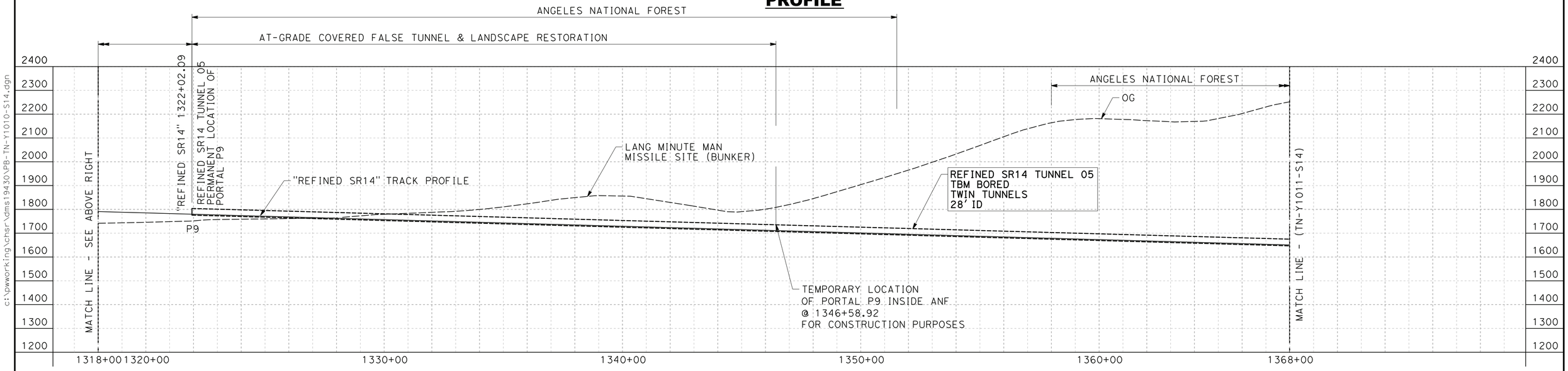
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1168+00.00 TO STA 1268+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1009-S14
SCALE AS SHOWN
SHEET NO.



PROFILE



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1268+00.00 TO STA 1368+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1010-S14
SCALE AS SHOWN
SHEET NO.

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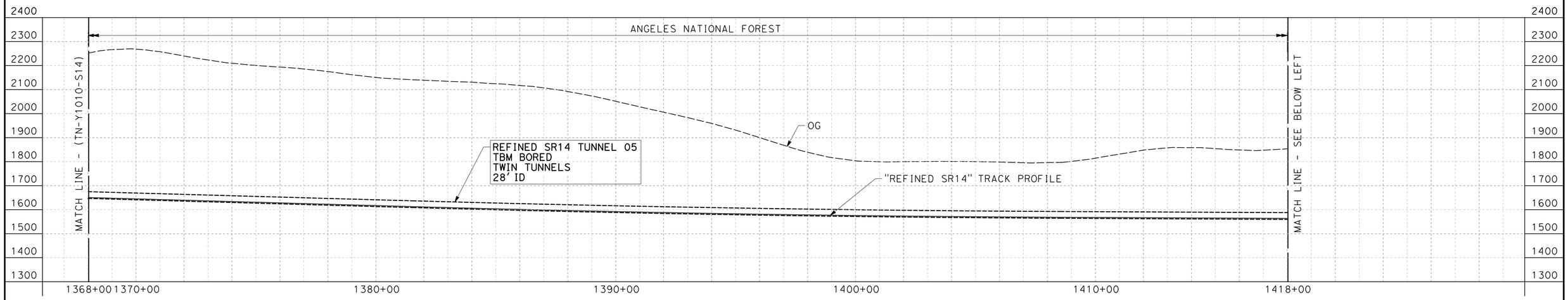

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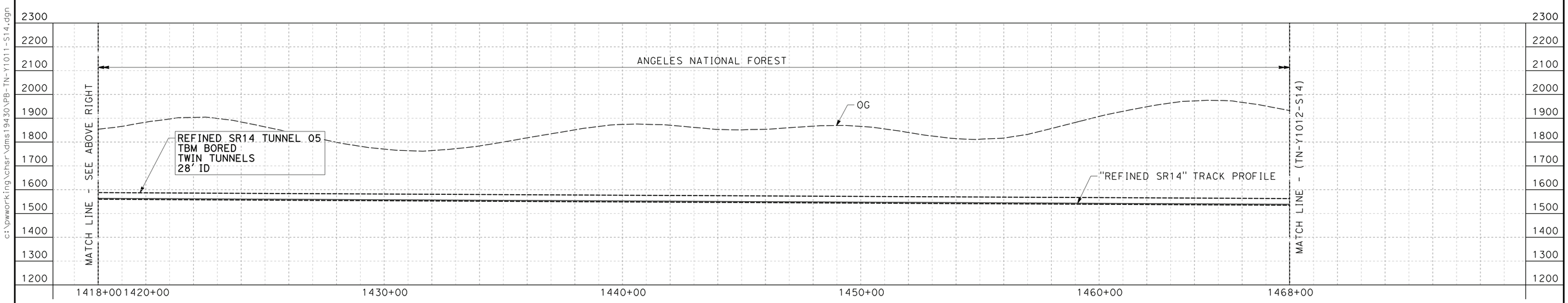

PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET
REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1368+00.00 TO STA 1468+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1011-S14
SCALE AS SHOWN
SHEET NO.

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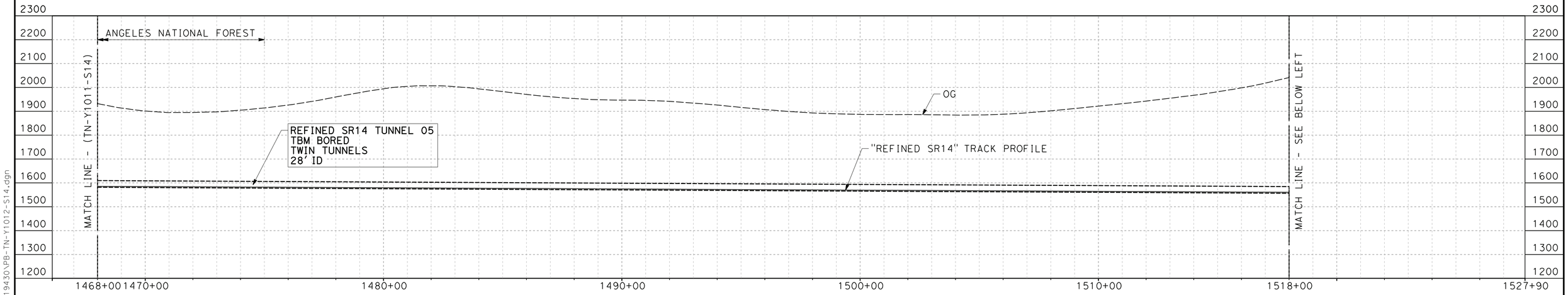
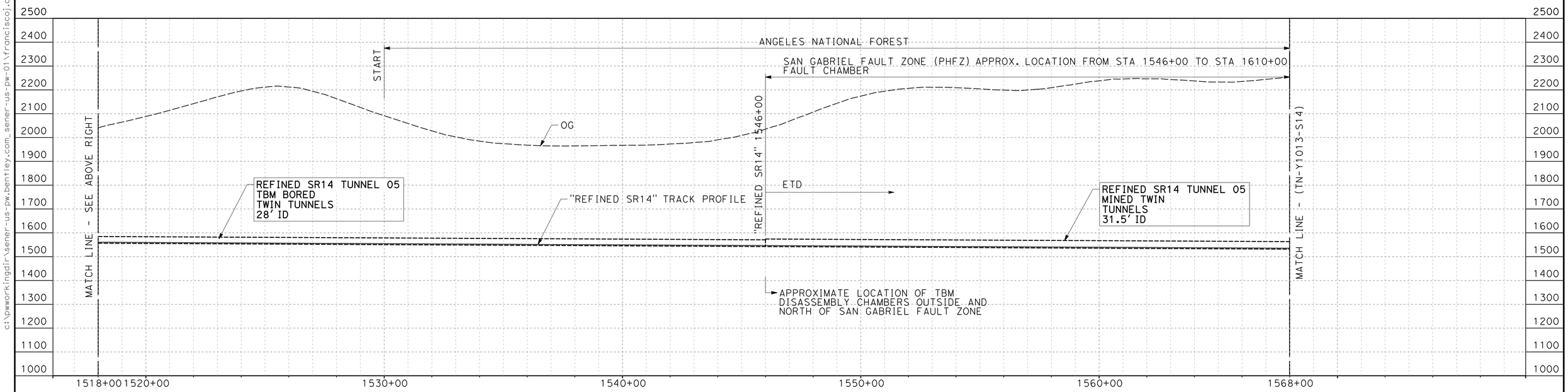


PROFILE



PROFILE

NOTE:

FAULT ZONES LIMITS APPROXIMATE ONLY

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 W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET
REV 02

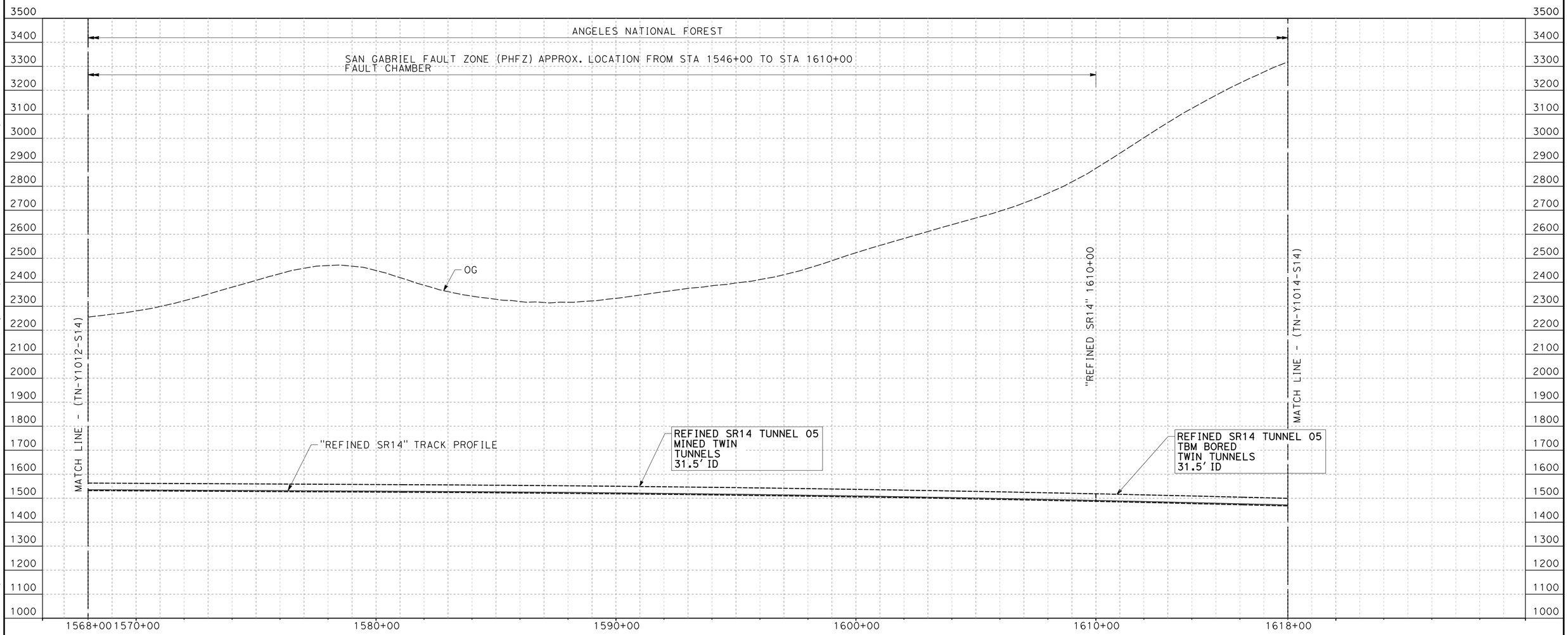
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1468+00.00 TO STA 1568+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1012-S14
SCALE AS SHOWN
SHEET NO.



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET
REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1568+00.00 TO STA 1618+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1013-S14
SCALE AS SHOWN
SHEET NO.

0205240

26/05/2021 12:30:09

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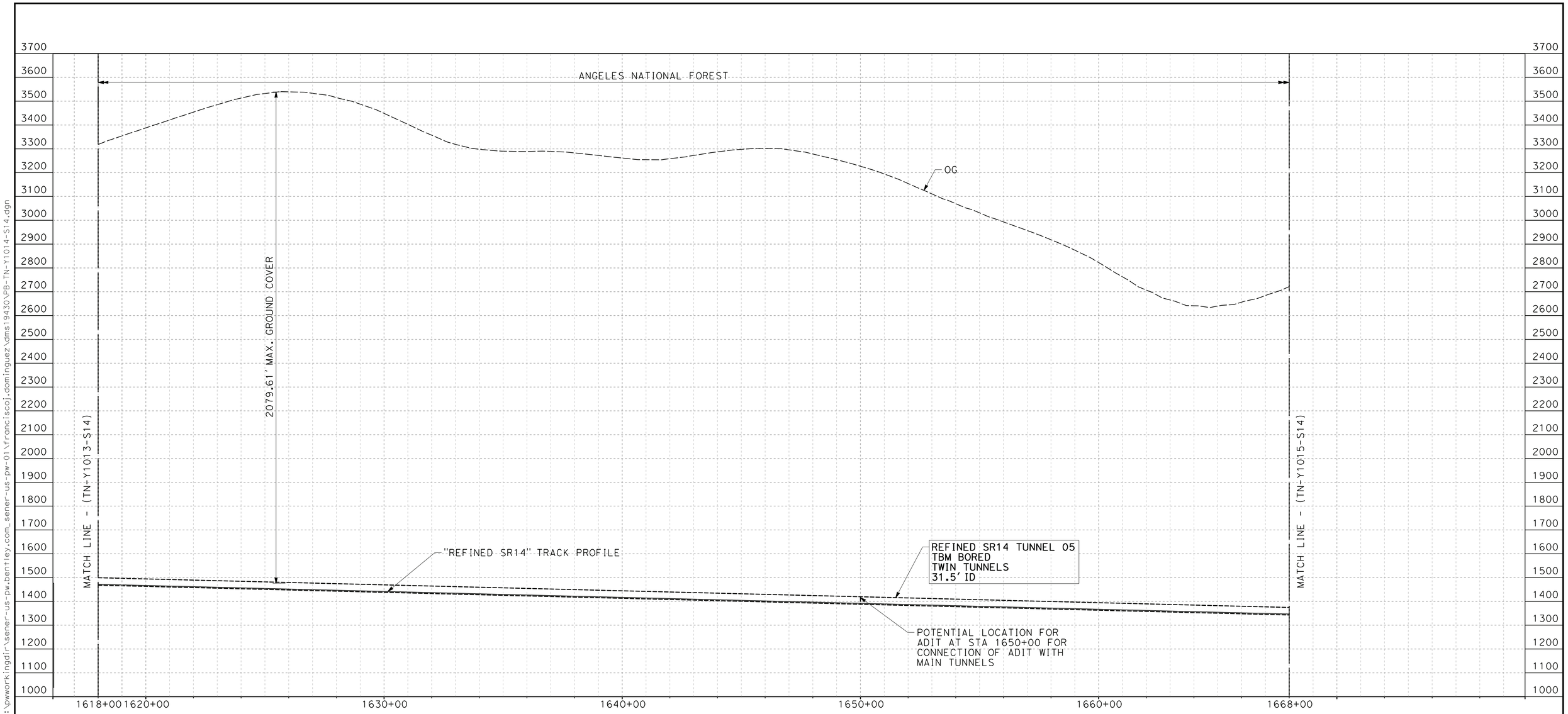


PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

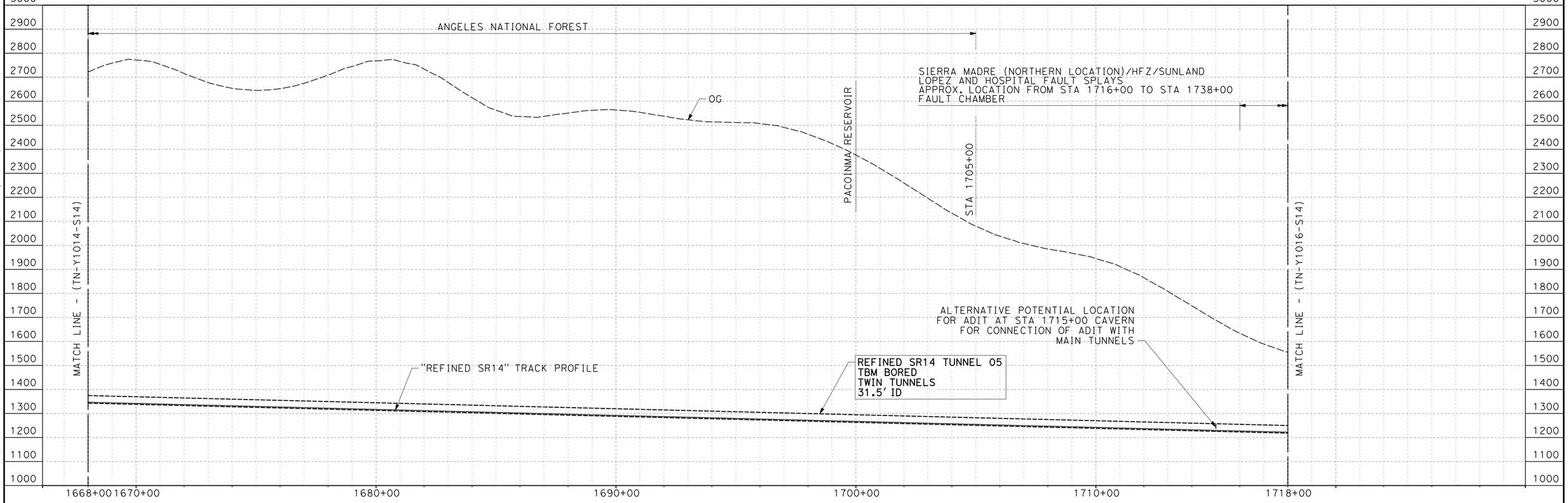
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1618+00.00 TO STA 1668+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1014-S14
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:

FAULT ZONES LIMITS APPROXIMATE ONLY

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
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DATE 04/30/2021

PEPD RECORD SET REV 02

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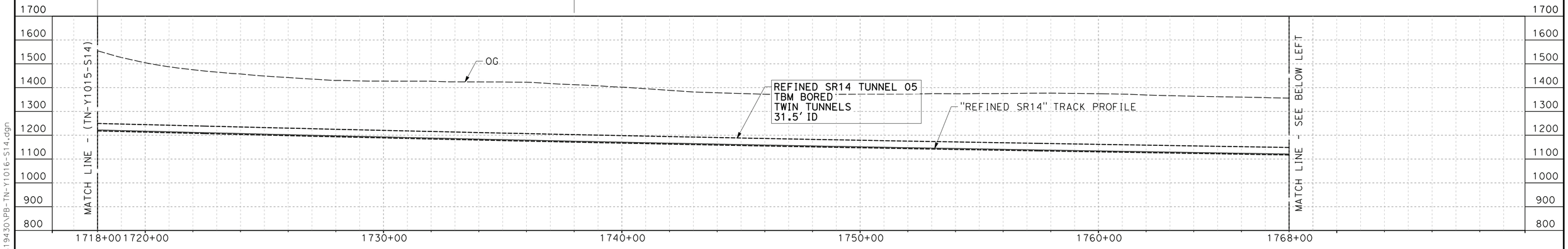
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1668+00.00 TO STA 1718+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1015-S14
SCALE AS SHOWN
SHEET NO.

SIERRA MADRE (NORTHERN LOCATION)/HFZ/SUNLAND
LOPEZ AND HOSPITAL FAULT SPLAYS
APPROX. LOCATION FROM STA 1716+00 TO STA 1738+00
FAULT CHAMBER



PROFILE

PROFILE

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

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 W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

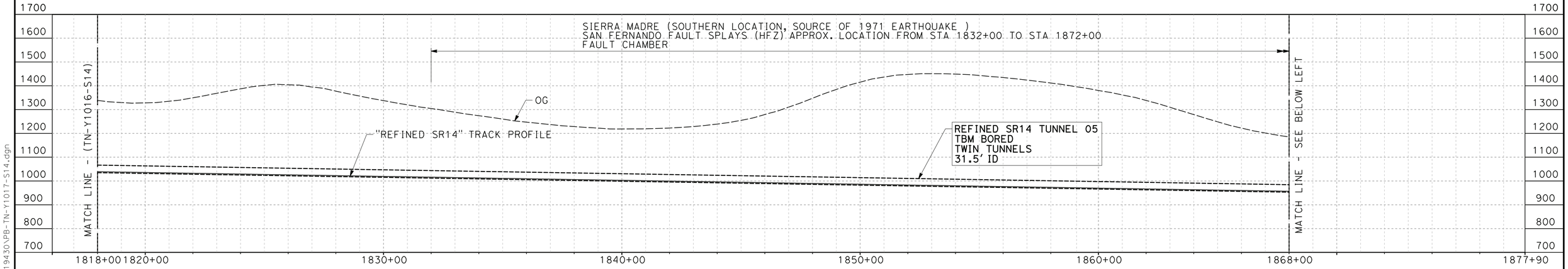
NOT FOR CONSTRUCTION

SENER

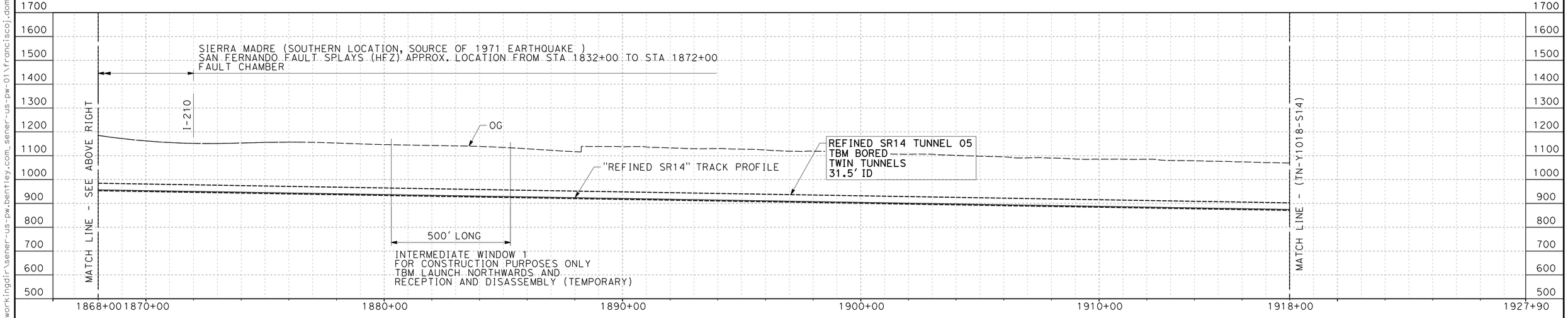
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1718+00.00 TO STA 1818+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1016-S14
SCALE AS SHOWN
SHEET NO.



PROFILE



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

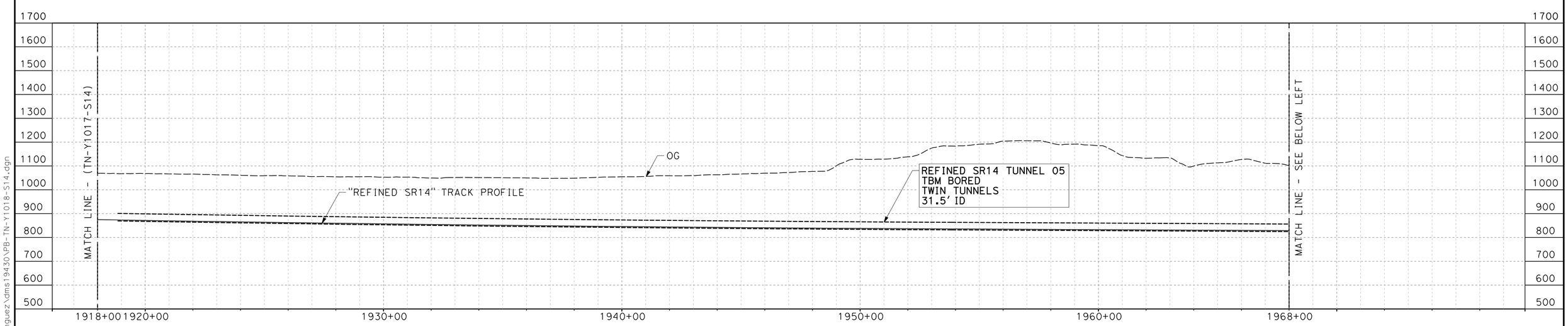
NOT FOR CONSTRUCTION

SENER

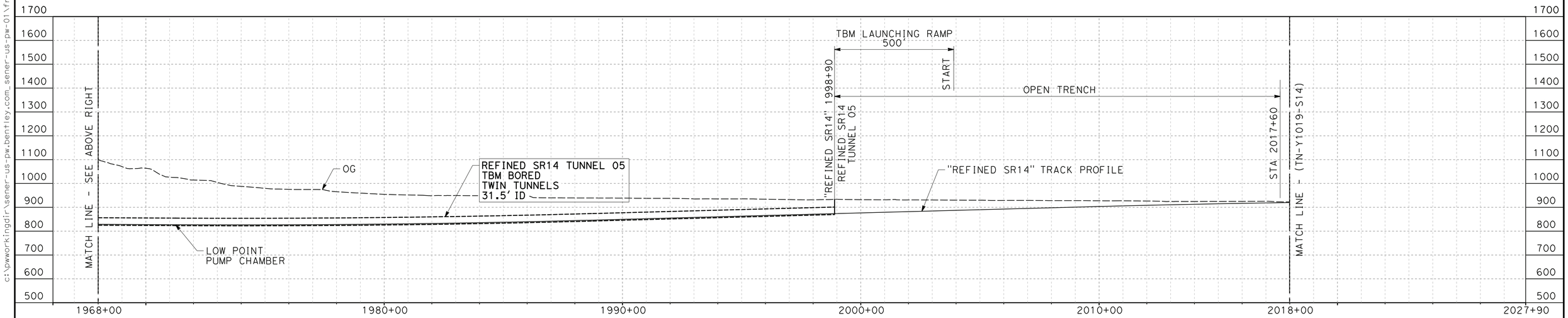
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1818+00.00 TO STA 1918+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1017-S14
SCALE AS SHOWN
SHEET NO.



PROFILE



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET
REV 02

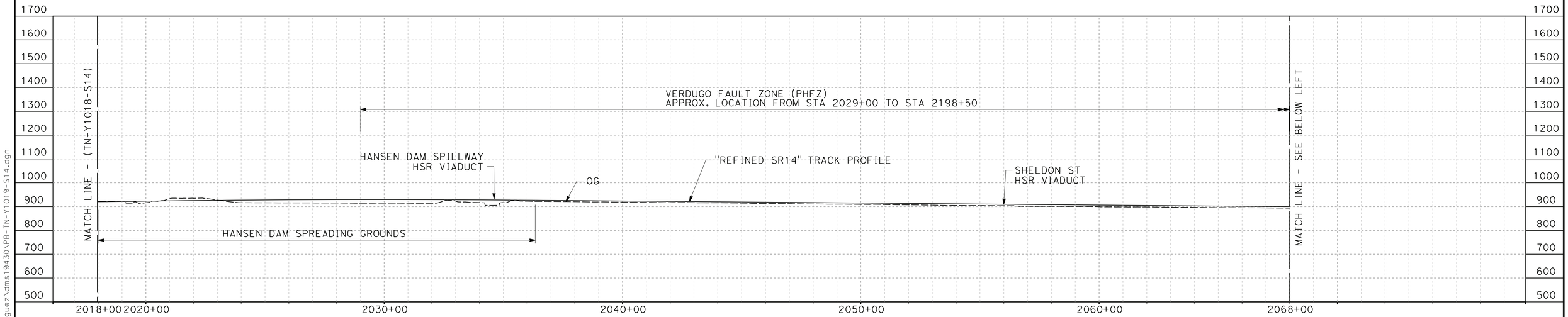
NOT FOR CONSTRUCTION

SENER

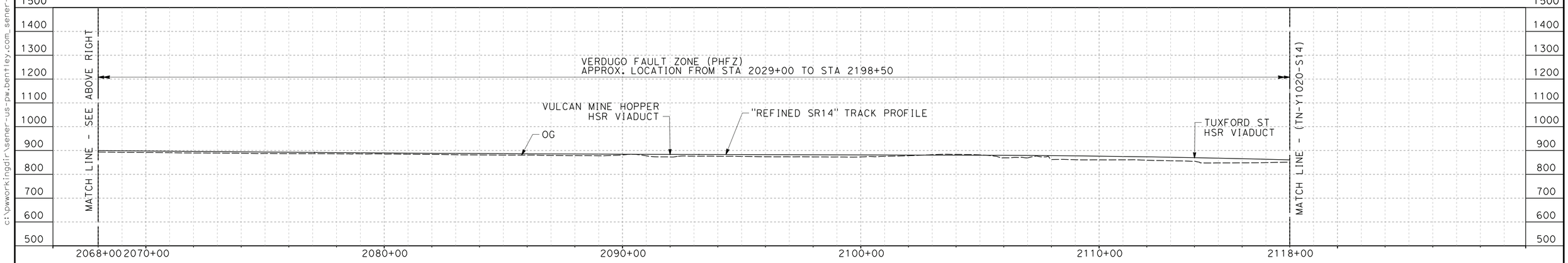
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1918+00.00 TO STA 2018+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1018-S14
SCALE AS SHOWN
SHEET NO.



PROFILE



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

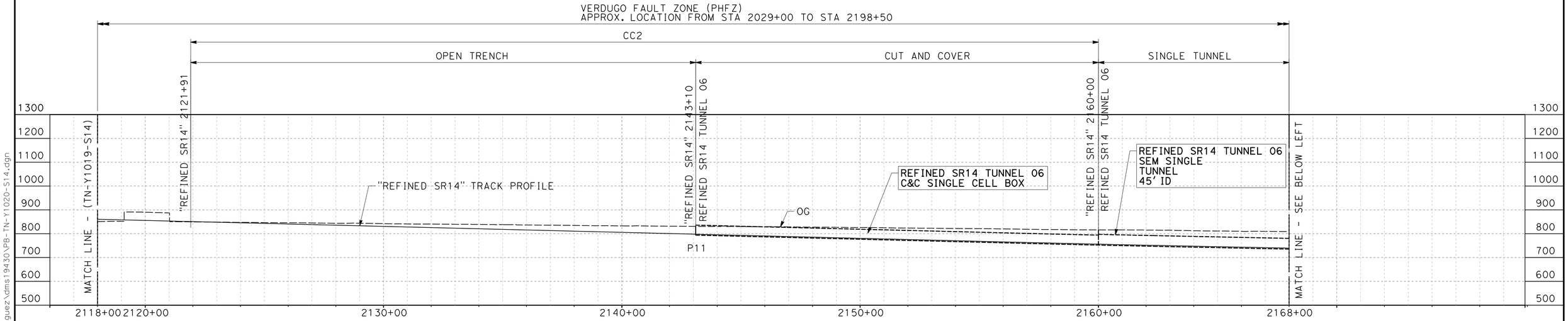
NOT FOR CONSTRUCTION

SENER

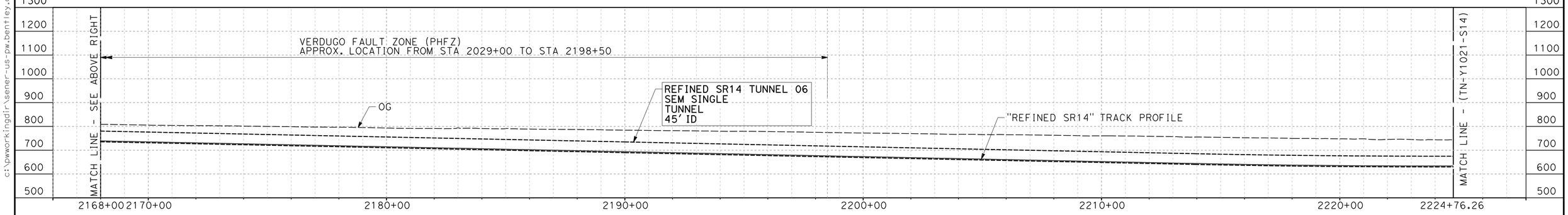
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 2018+00.00 TO STA 2118+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1019-S14
SCALE AS SHOWN
SHEET NO.



PROFILE



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

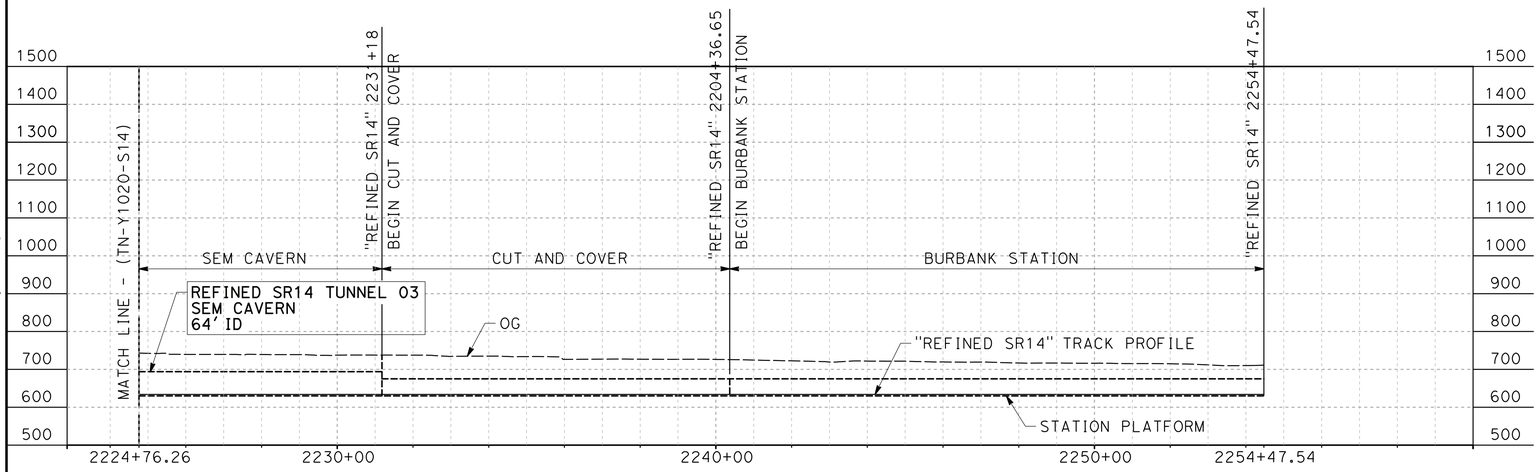
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 2118+00.00 TO STA 2224+76.26

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1020-S14
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:

FAULT ZONES LIMITS APPROXIMATE ONLY

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 W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET
REV 02

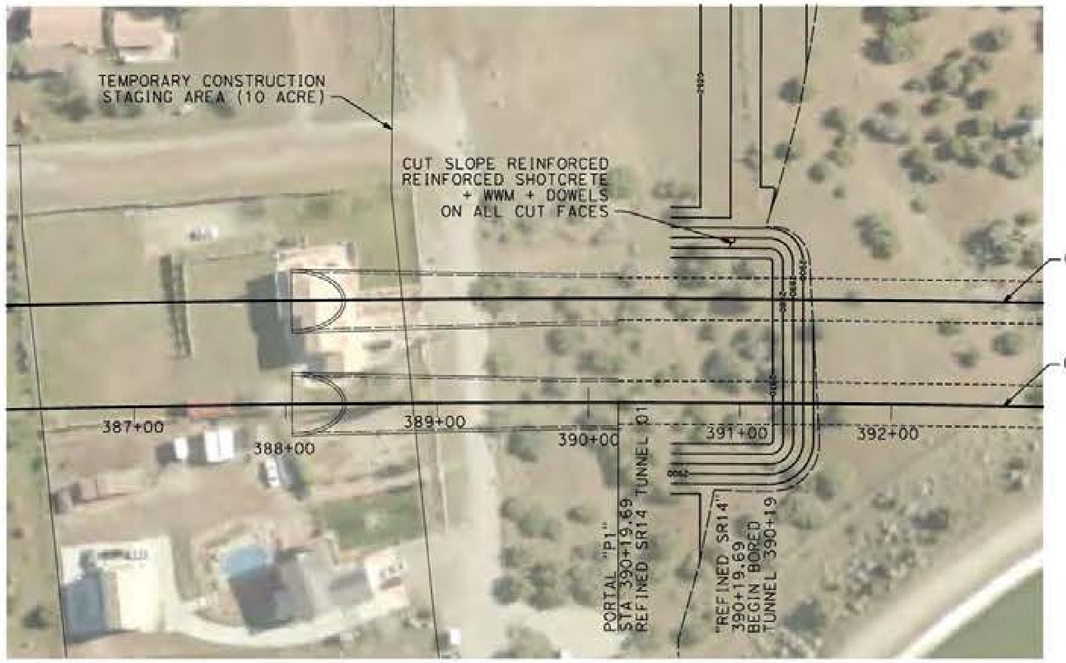
NOT FOR CONSTRUCTION

SENER

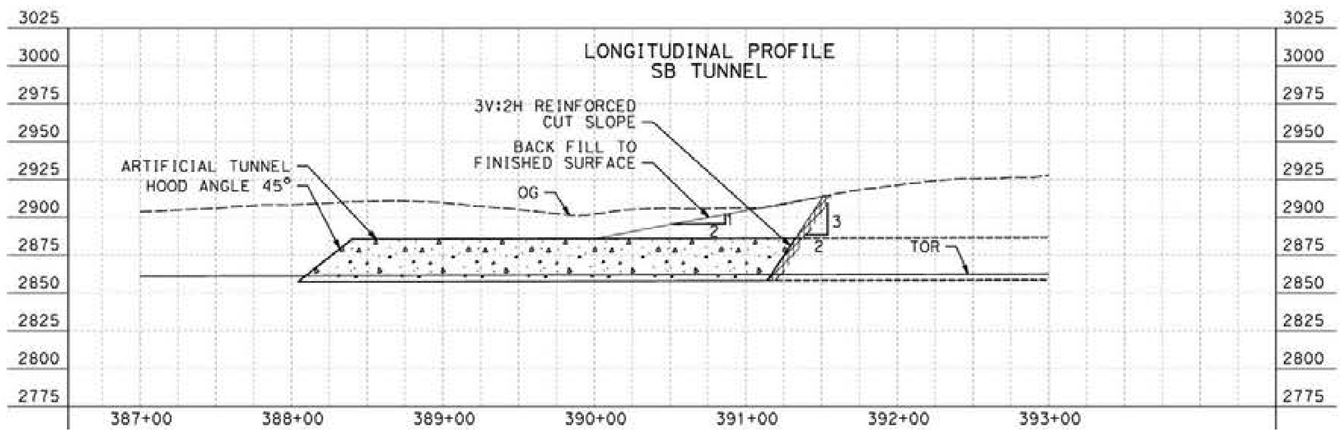
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 2224+76.26 TO 2254+47.54

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1021-S14
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/ M³)
   - WELDED WIRE MESH 6X6 - W4.0 X W4.0
   - 20FT LONG CEMENT GROUTED DOWELS ON 4' BY 4' PATTERN
   - WEEP AS DIRECTED
2. GEOTECHNICAL RISKS AND CONSTRUCTABILITY ISSUES SEE DRAWING TN-B0006
3. THE DRAWING SHOWS THE TEMPORARY PORTAL CUT PLAN AND LONG SECTION FOR CONSTRUCTION AT THE PORTAL MOUTH ALONG WITH TEMPORARY SUPPORT FOR THE PORTAL CUT SLOPE, AND THE FINISHED FILL.
4. THE DRAWING DOES NOT SHOW THE OVERALL GRADING (2H:1V) OF THE WIDER PORTAL AREA. THE EXTENT OF WHICH IS SHOWN ON THE GENERAL PLAN (SEE LIMITS OF EXCAVATION-CUT).

EXCAVATION VOLUME	5,838 CY
FILL VOLUME	3,020 CY
CUT SLOPE SURFACE	16,584 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 W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET
REV 02

NOT FOR CONSTRUCTION

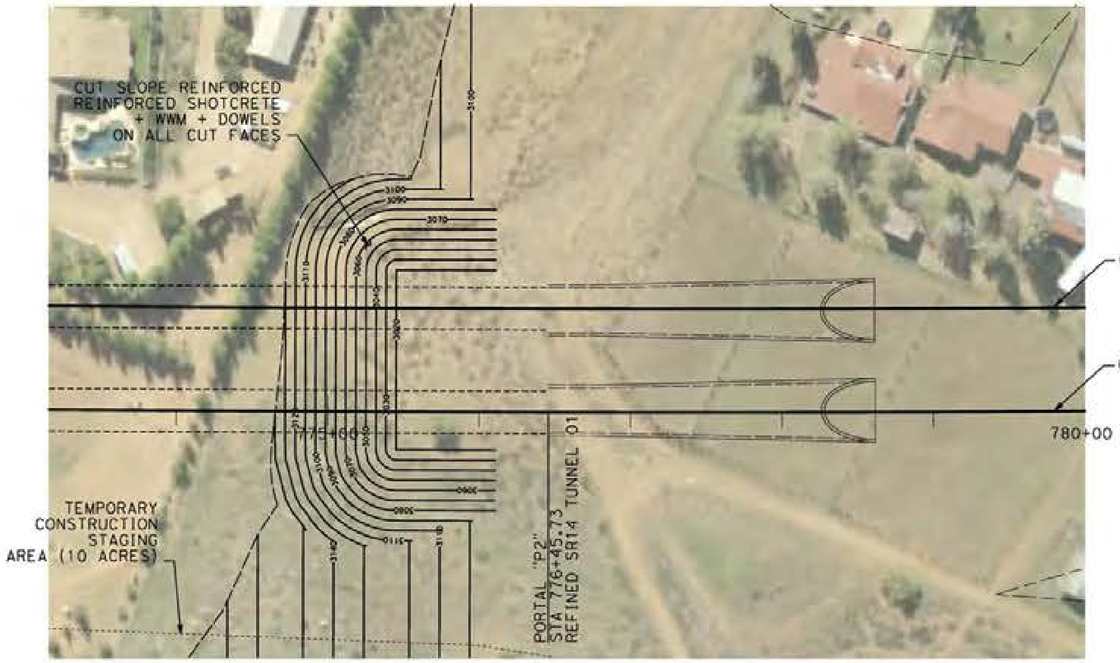
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

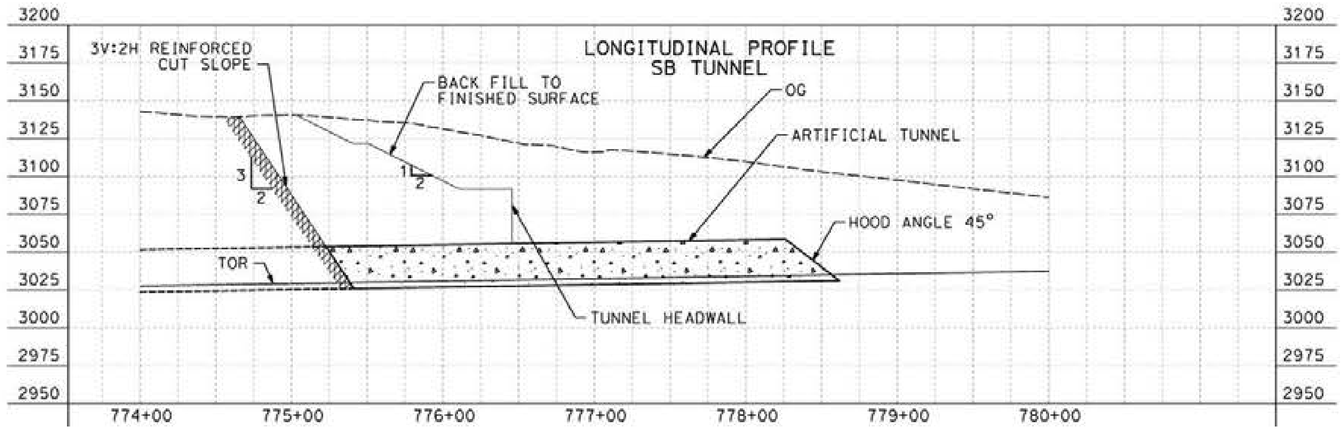
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PORTAL 1
PLAN AND PROFILE FOR CONSTRUCTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-D7001-S14
SCALE AS SHOWN
SHEET NO.



PLAN

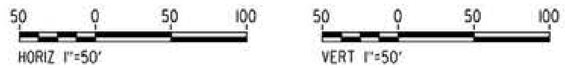


PROFILE

NOTE :

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

EXCAVATION VOLUME	51,717 CY
FILL VOLUME	31,892 CY
CUT SLOPE SURFACE	44,027 SQFT



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

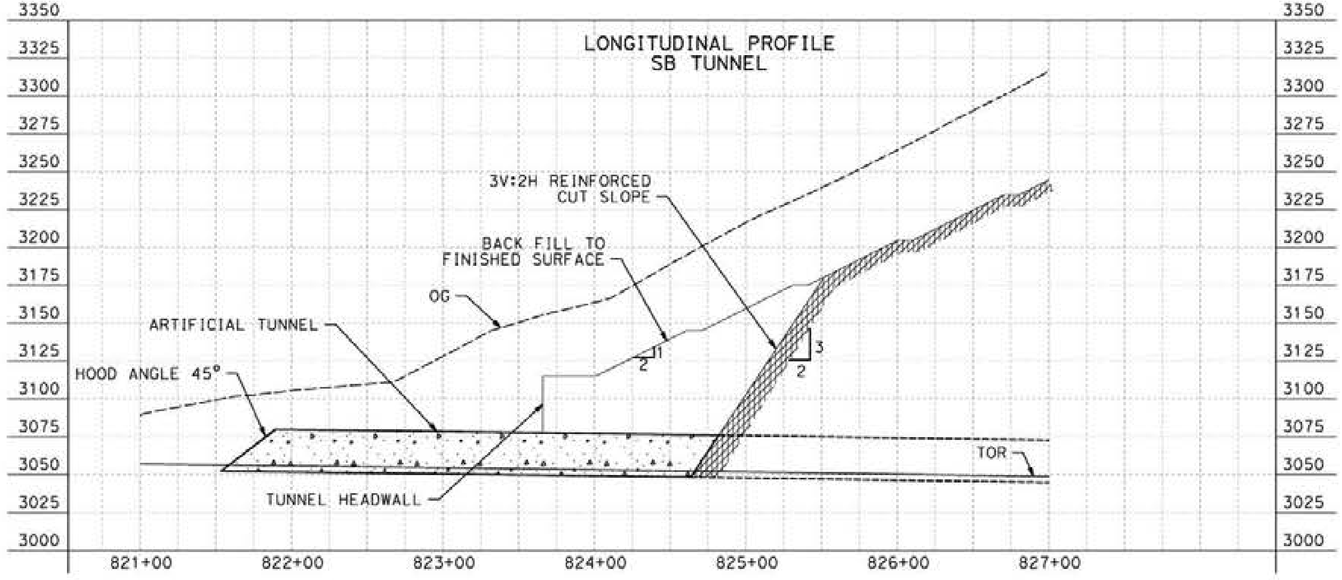
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PORTAL 2
PLAN AND PROFILE FOR CONSTRUCTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-D7002-S14
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/ M³)
   - WELDED WIRE MESH 6X6 - W4.0 X W4.0
   - 20FT LONG CEMENT GROUTED DOWELS ON 4' BY 4' PATTERN
   - WEEP AS DIRECTED
2. GEOTECHNICAL RISKS AND CONSTRUCTABILITY ISSUES SEE DRAWING TN-B0006
3. THE DRAWING SHOWS THE TEMPORARY PORTAL CUT PLAN AND LONG SECTION FOR CONSTRUCTION AT THE PORTAL MOUTH ALONG WITH TEMPORARY SUPPORT FOR THE PORTAL CUT SLOPE, AND THE FINISHED FILL.
4. THE DRAWING DOES NOT SHOW THE OVERALL GRADING (2H:1V) OF THE WIDER PORTAL AREA. THE EXTENT OF WHICH IS SHOWN ON THE GENERAL PLAN (SEE LIMITS OF EXCAVATION-CUT).

EXCAVATION VOLUME	124,484 CY
FILL VOLUME	38,550 CY
CUT SLOPE SURFACE	47,326 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 W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

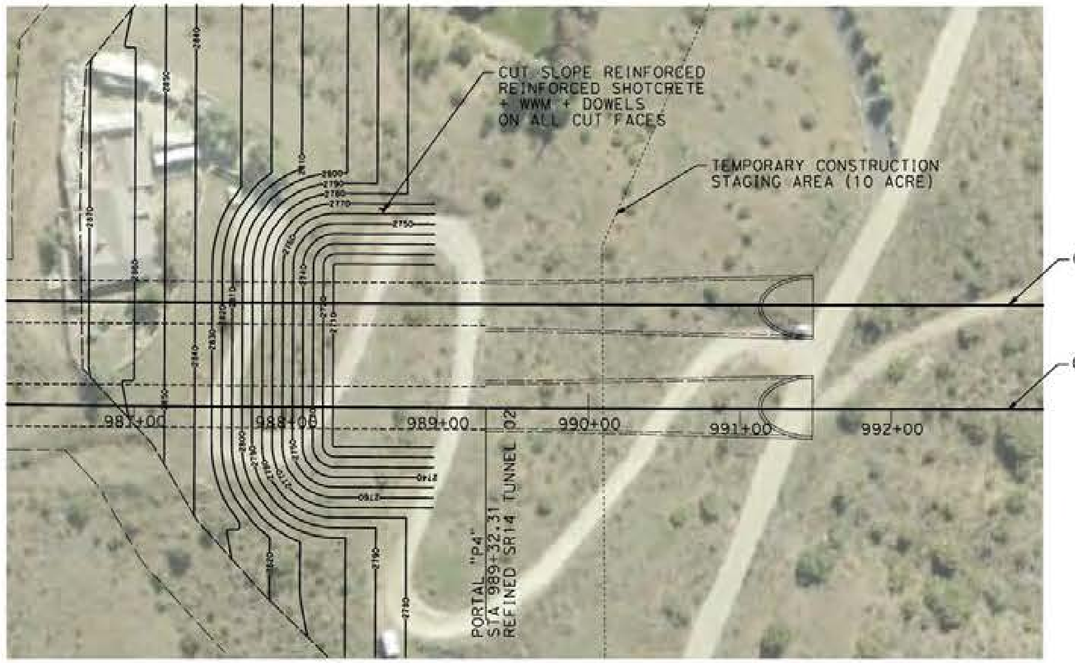
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

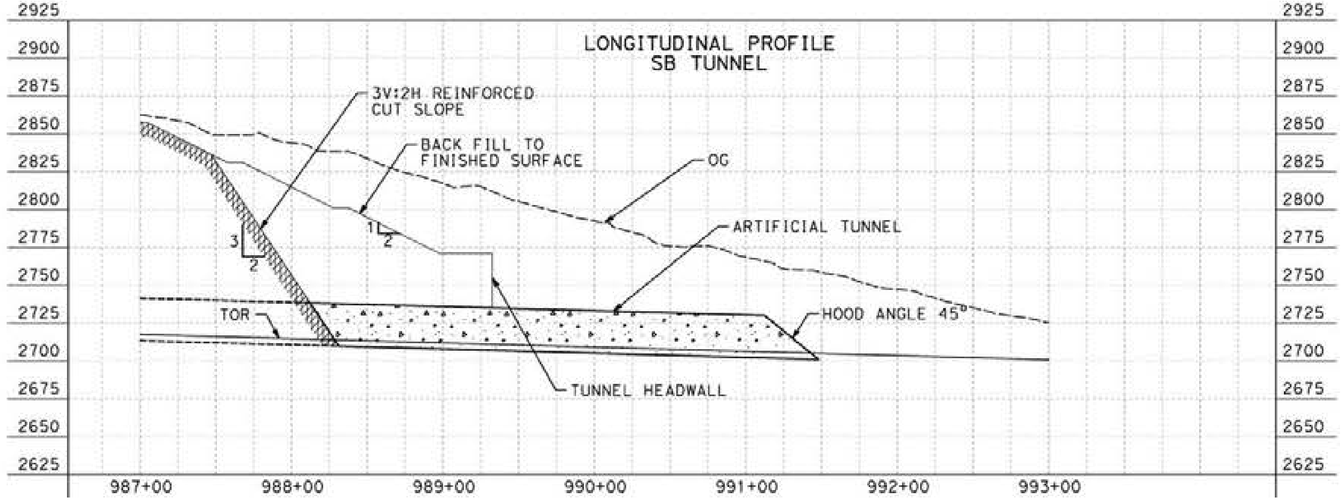
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PORTAL 3
PLAN AND PROFILE FOR CONSTRUCTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-D7003-S14
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/ M³)
   - WELDED WIRE MESH 6X6 - W4.0 X W4.0
   - 20FT LONG CEMENT GROUTED DOWELS ON 4' BY 4' PATTERN
   - WEEP AS DIRECTED
2. GEOTECHNICAL RISKS AND CONSTRUCTABILITY ISSUES SEE DRAWING TNB0006
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	79,290 CY
FILL VOLUME	38,548 CY
CUT SLOPE SURFACE	47,324 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 W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

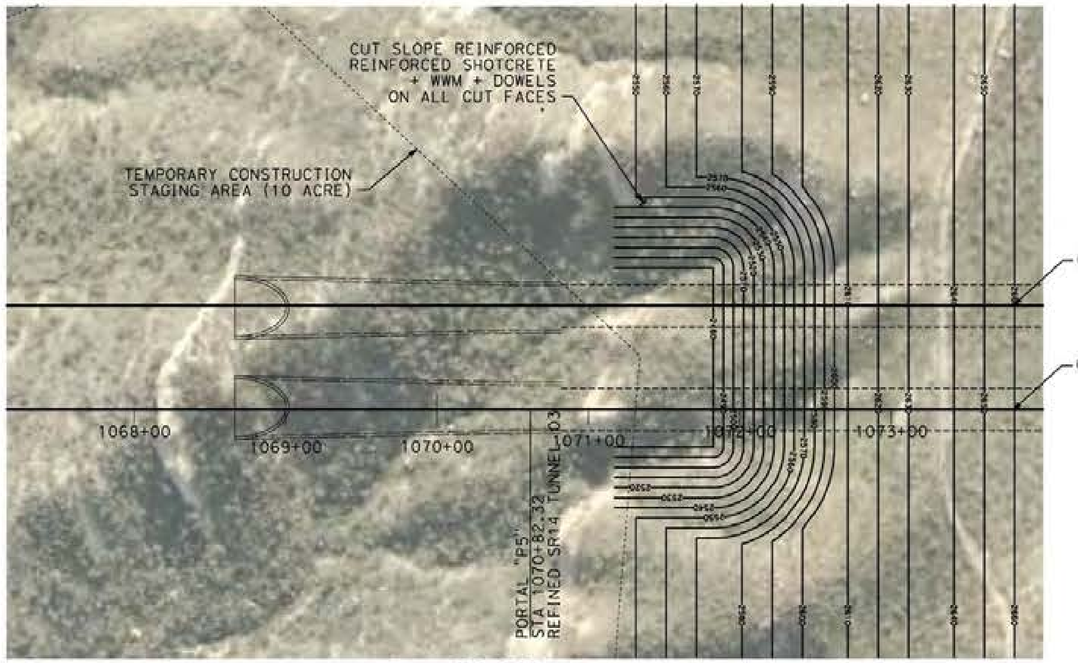
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

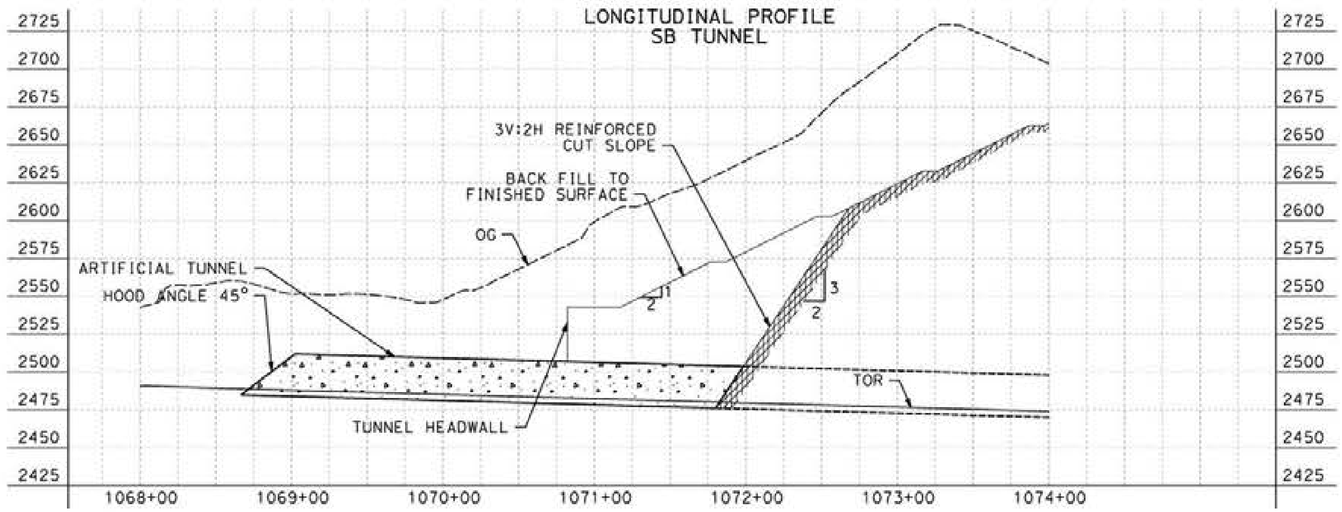
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PORTAL 4
PLAN AND PROFILE FOR CONSTRUCTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-D7004-S14
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/ M³)
   - WELDED WIRE MESH 6X6 - W4.0 X W4.0
   - 20FT LONG CEMENT GROUTED DOWELS ON 4' BY 4' PATTERN
   - WEEP AS DIRECTED
2. GEOTECHNICAL RISKS AND CONSTRUCTABILITY ISSUES SEE DRAWING TN-B0006
3. THE DRAWING SHOWS THE TEMPORARY PORTAL CUT PLAN AND LONG SECTION FOR CONSTRUCTION AT THE PORTAL MOUTH ALONG WITH TEMPORARY SUPPORT FOR THE PORTAL CUT SLOPE, AND THE FINISHED FILL.
4. THE DRAWING DOES NOT SHOW THE OVERALL GRADING (2H:1V) OF THE WIDER PORTAL AREA. THE EXTENT OF WHICH IS SHOWN ON THE GENERAL PLAN (SEE LIMITS OF EXCAVATION-CUT).

EXCAVATION VOLUME	179,596 CY
FILL VOLUME	38,549 CY
CUT SLOPE SURFACE	47,329 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 W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PORTAL 5
PLAN AND PROFILE FOR CONSTRUCTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-D7005-S14
SCALE AS SHOWN
SHEET NO.

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24/05/2021 19:35:26
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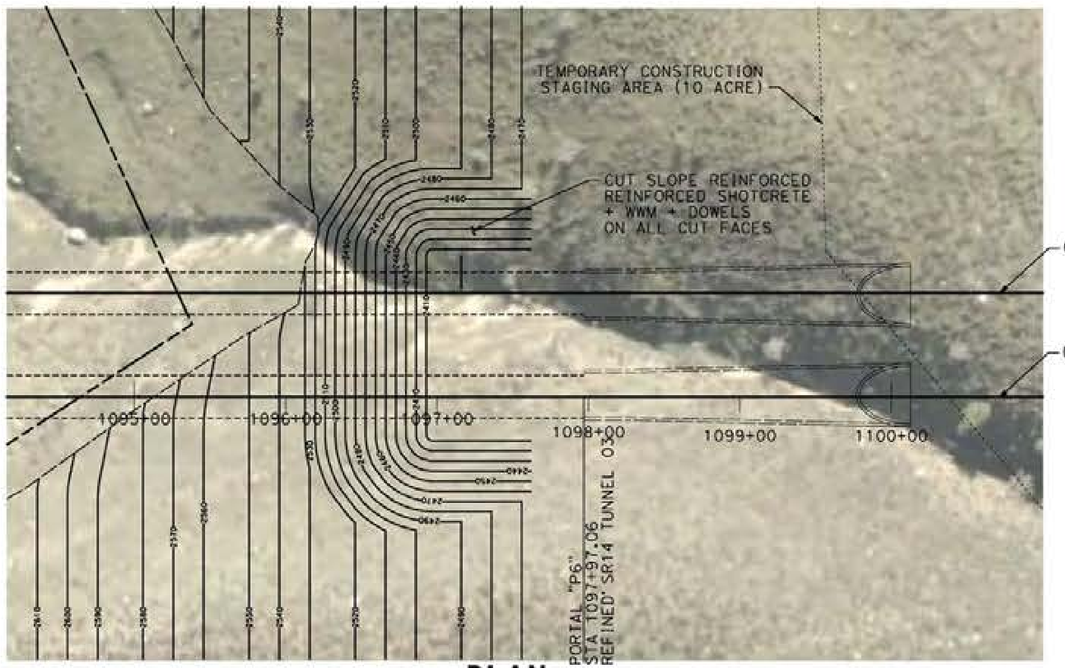
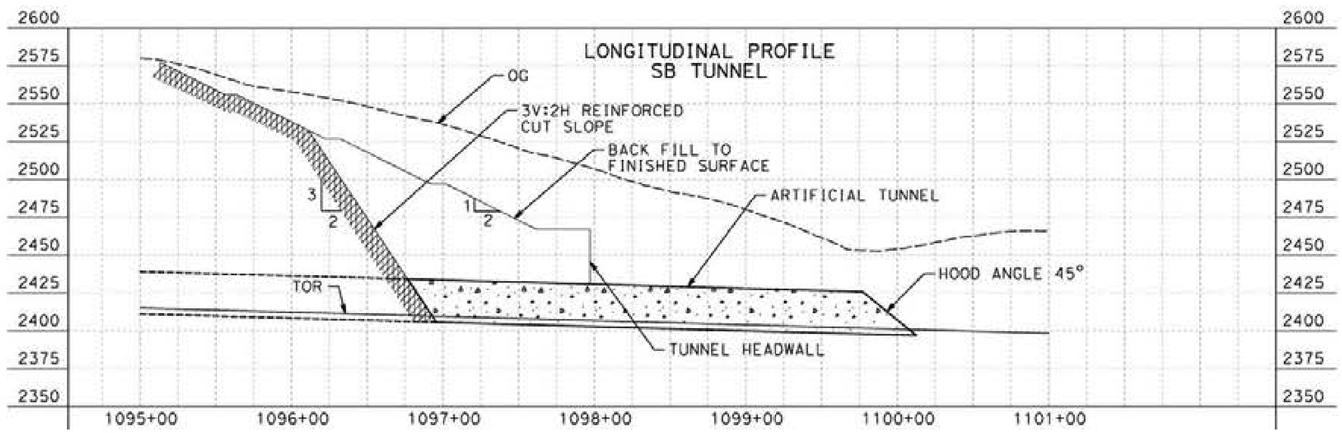


PLAN



PROFILE

NOTE :

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

EXCAVATION VOLUME	87,833 CY
FILL VOLUME	37,381 CY
CUT SLOPE SURFACE	47,040 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 W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PORTAL 6
PLAN AND PROFILE FOR CONSTRUCTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-D7006-S14
SCALE AS SHOWN
SHEET NO.

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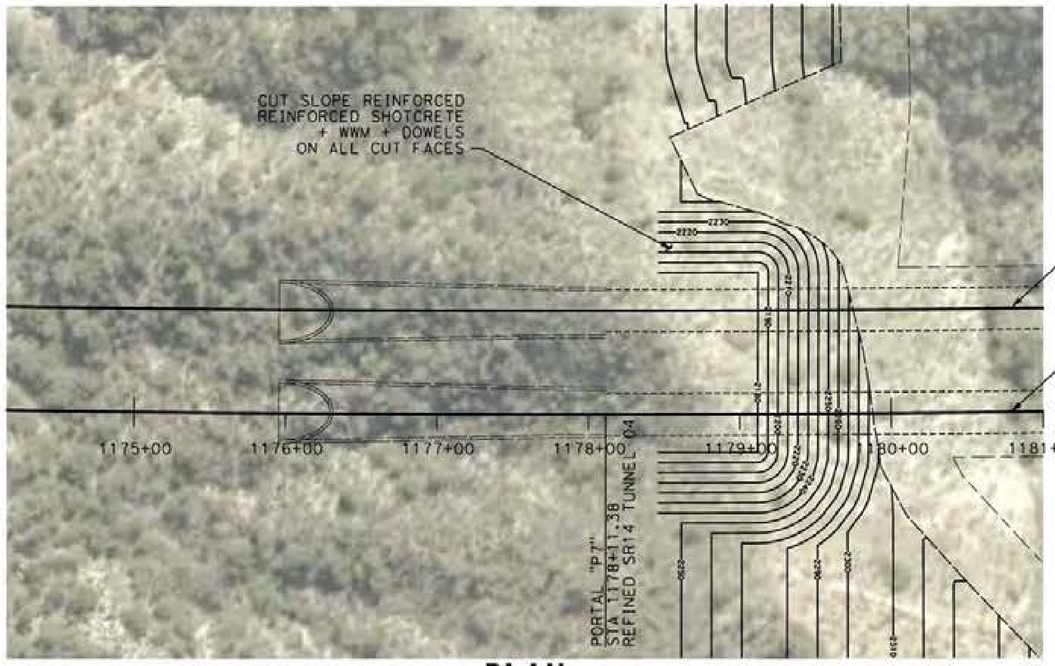
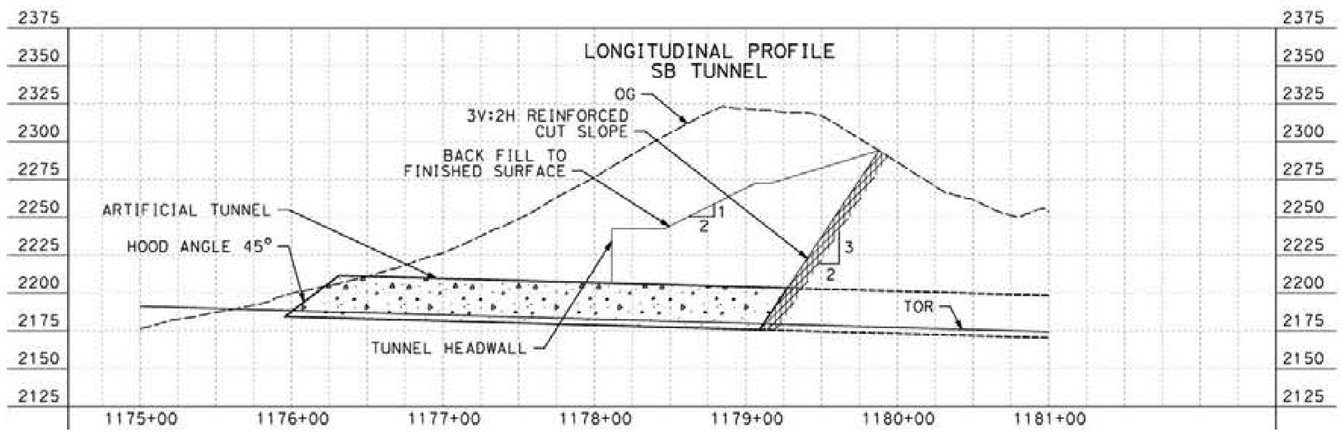


PLAN



PROFILE

NOTE :

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

EXCAVATION VOLUME	67,956 CY
FILL VOLUME	24,269 CY
CUT SLOPE SURFACE	37,503 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 W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET
REV 02

NOT FOR CONSTRUCTION

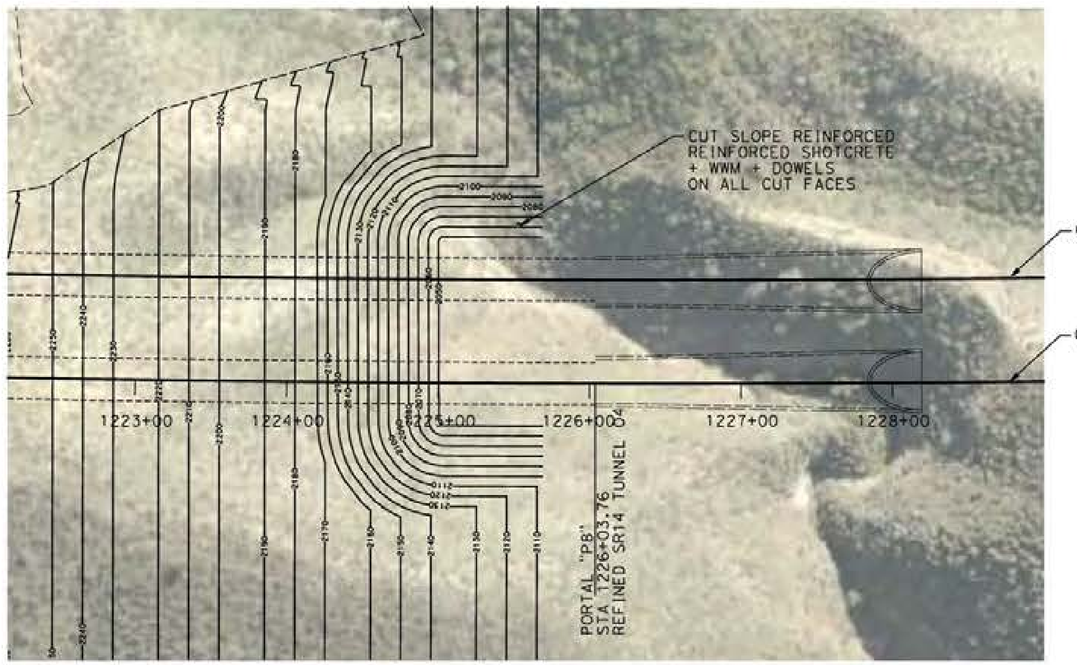
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

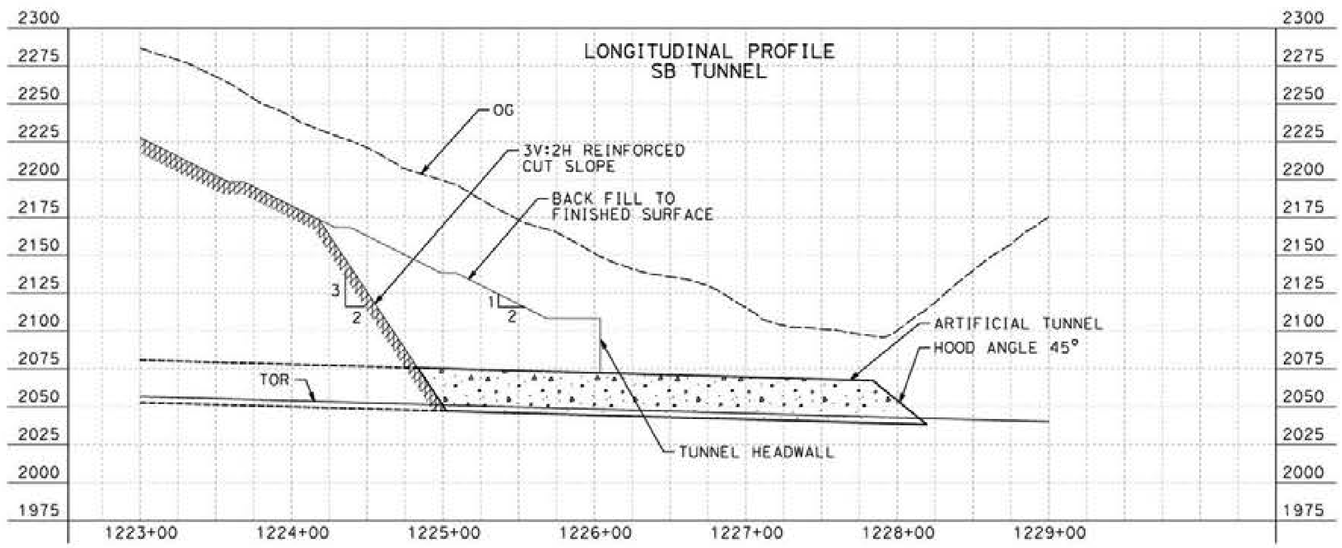
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PORTAL 7
PLAN AND PROFILE FOR CONSTRUCTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-D7007-S14
SCALE AS SHOWN
SHEET NO.



PLAN



PROFILE

NOTE :

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

EXCAVATION VOLUME	123,190 CY
FILL VOLUME	38,599 CY
CUT SLOPE SURFACE	47,381 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 W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PORTAL 8
PLAN AND PROFILE FOR CONSTRUCTION

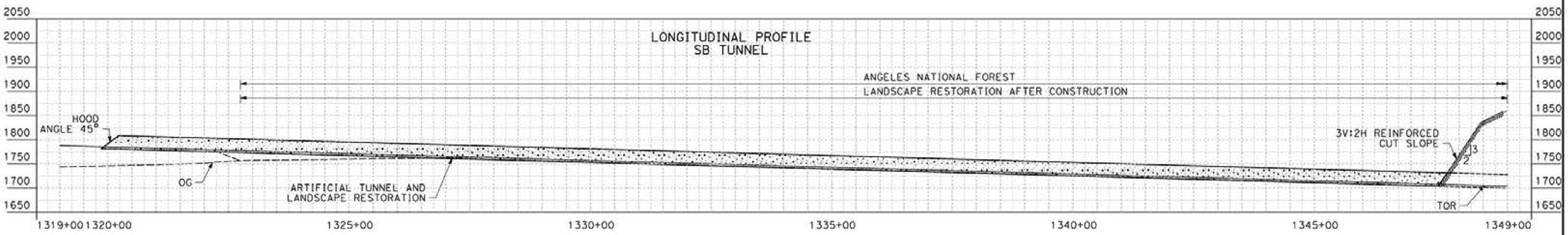
CONTRACT NO. HSR14-42
DRAWING NO. TN-D7008-S14
SCALE AS SHOWN
SHEET NO.

PLAN

NOTE :

1. EXAMPLE OF ROCK CUT SLOPE REINFORCEMENT AT PORTAL MOUTH
   - 2 IN OF SHOTCRETE WITH STEEL FIBERS (50 KG/ M)
   - 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	84,574 CY
FILL VOLUME	TBD
CUT SLOPE SURFACE	52,346 SQFT



PROFILE

100 0 100 200
HORIZ 1"=100'

100 0 100 200
VERT 1"=100'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "REFINED SR14"

PORTAL 9
PLAN AND PROFILE FOR CONSTRUCTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-D7009-S14
SCALE AS SHOWN
SHEET NO.

c:\pwworking\pchar\dms19436\PB-TN-D7009-S14.dgn
24/05/2021 19:37:06
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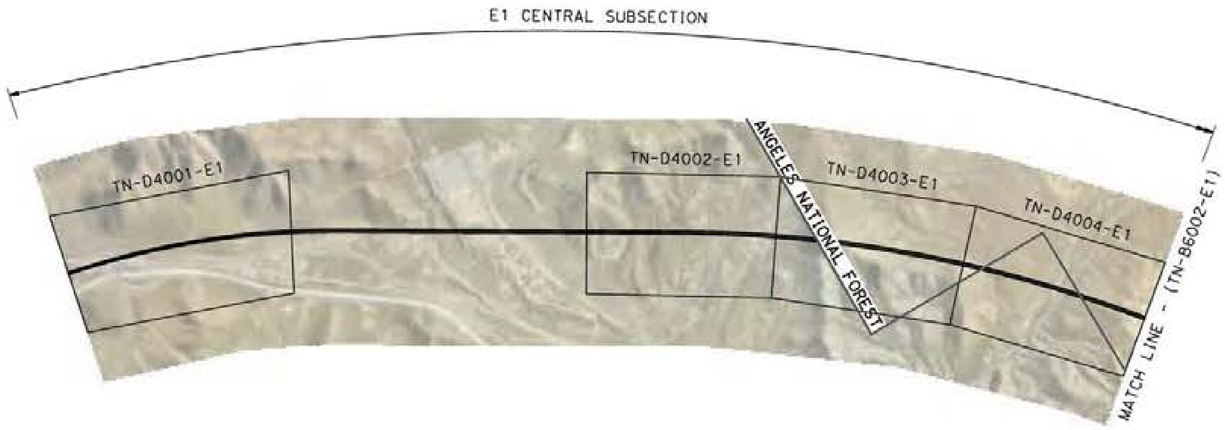

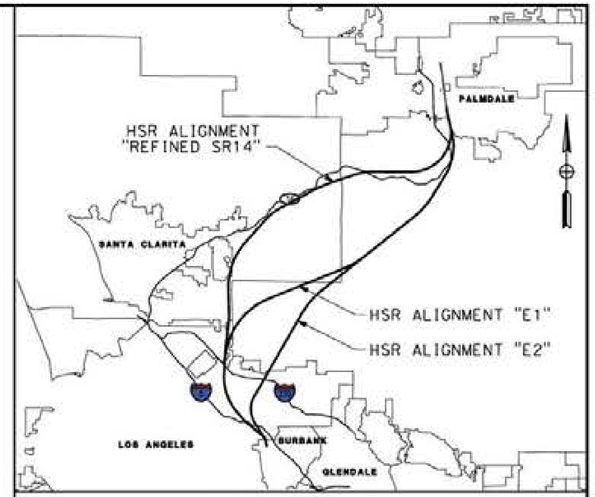

VICINITY MAP

2000 0 2000 4000
1"=2000'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

HIGH SPEED RAIL TUNNEL PLANS
KEY MAP 1 OF 3

CONTRACT NO. HSR14-42
DRAWING NO. TN-B6001-E1
SCALE AS SHOWN
SHEET NO.

0205510

25/05/2021 9:43:16

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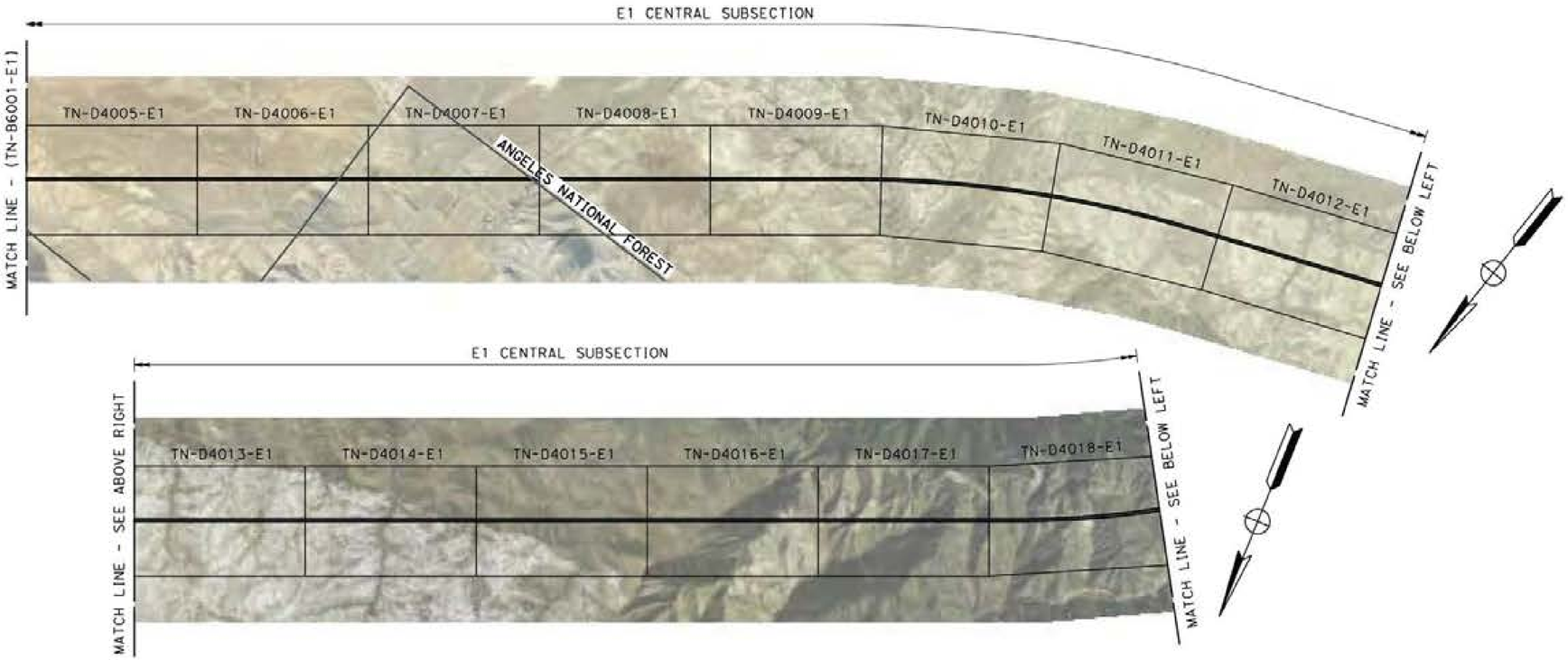

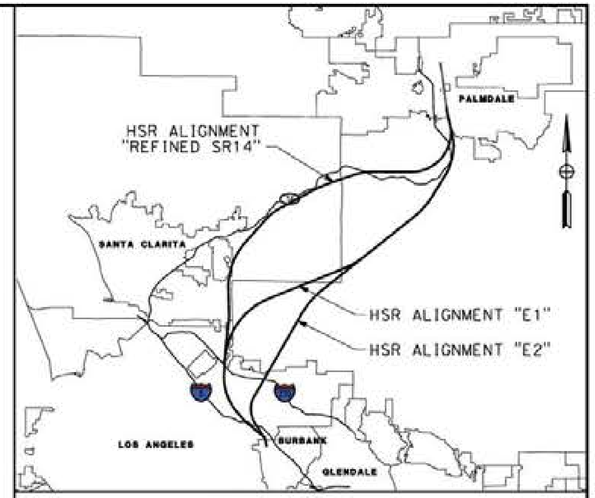

VICINITY MAP

2000 0 2000 4000
1"=2000'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

HIGH SPEED RAIL TUNNEL PLANS
KEY MAP 2 OF 3

CONTRACT NO. HSR14-42
DRAWING NO. TN-B6002-E1
SCALE AS SHOWN
SHEET NO.

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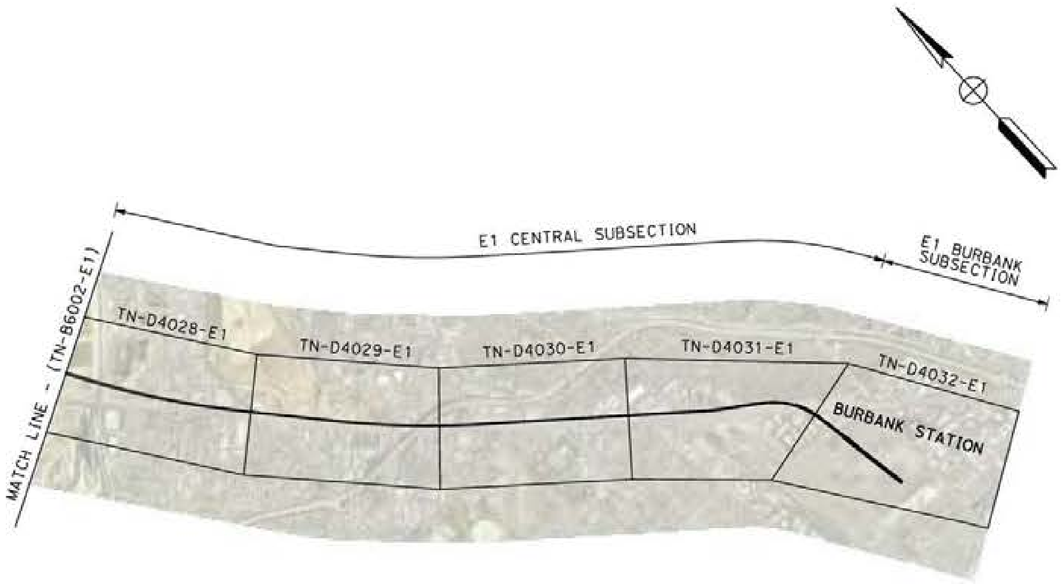
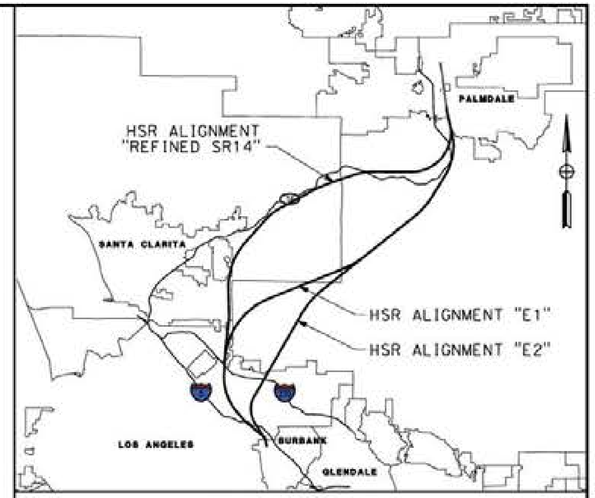




VICINITY MAP

2000 0 2000 4000
1"=2000'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

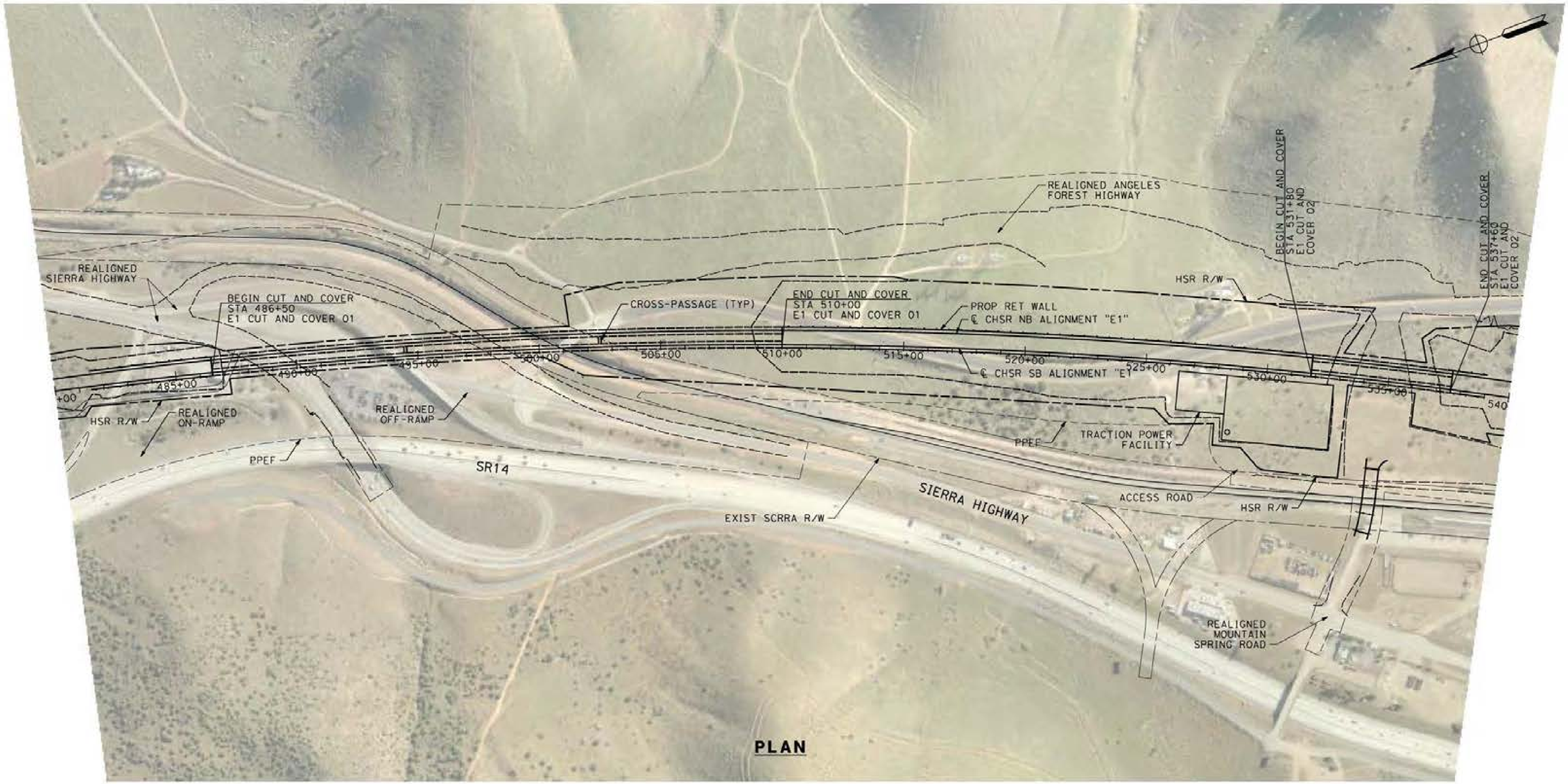
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

HIGH SPEED RAIL TUNNEL PLANS
KEY MAP 3 OF 3

CONTRACT NO. HSR14-42
DRAWING NO. TN-B6003-E1
SCALE AS SHOWN
SHEET NO.



PLAN

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

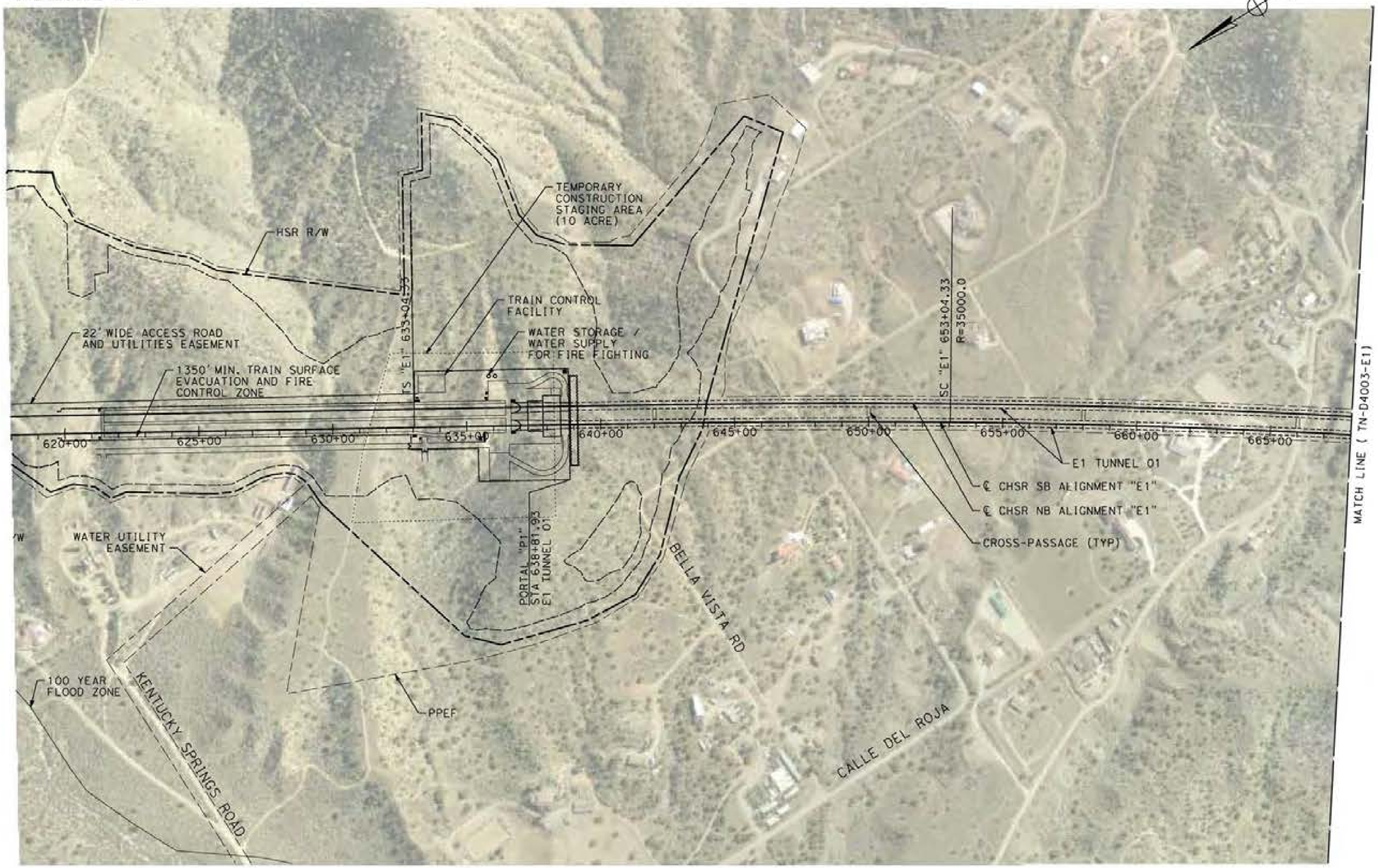
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 480+00.00 TO STA 540+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4001-E1
SCALE AS SHOWN
SHEET NO.

TUNNEL 01
PORTAL P1



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
   - DETENTION POND NOT INCLUDED. PORTAL P1 IS HIGH POINT.

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

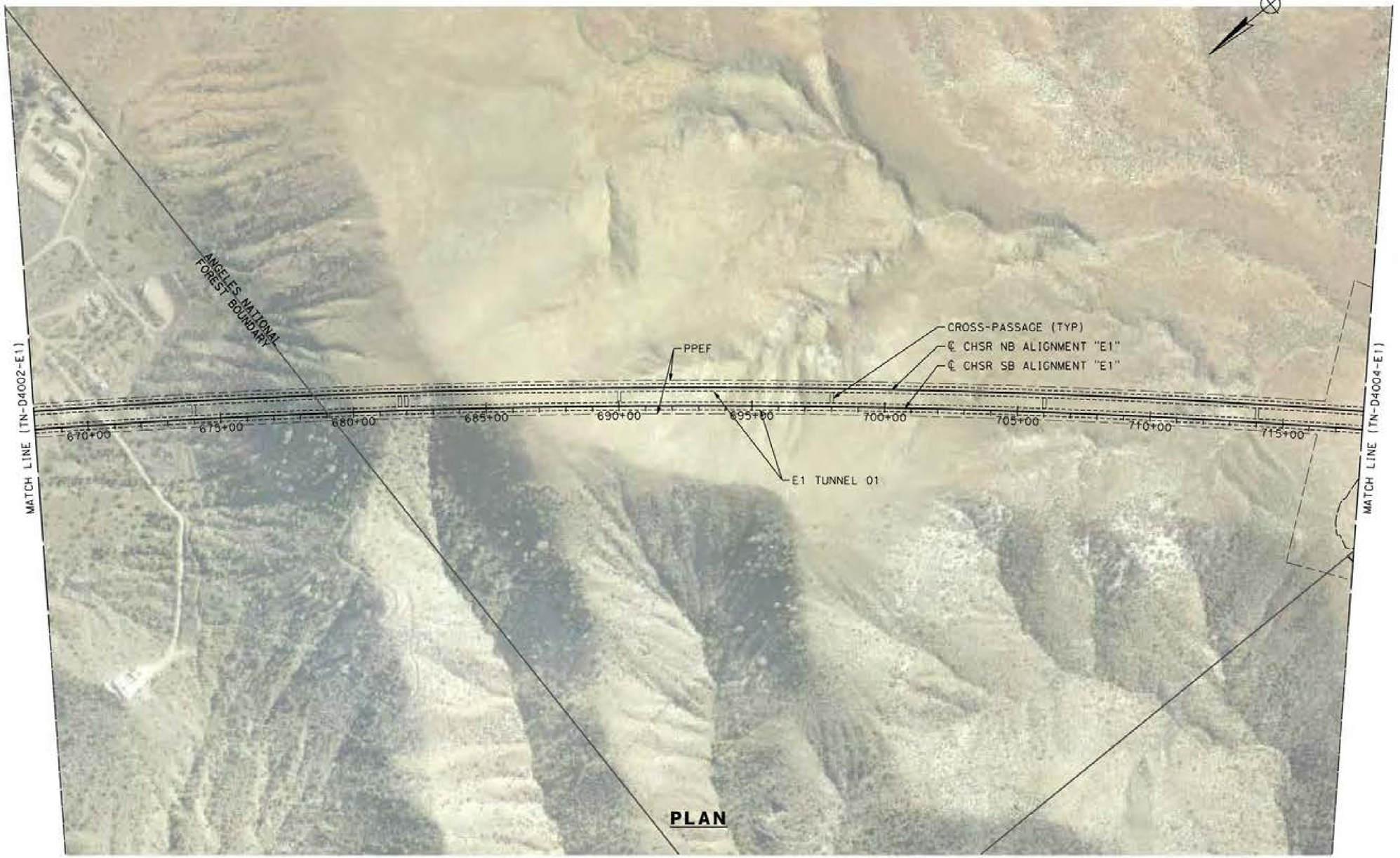
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 618+00.00 TO STA 668+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4002-E1
SCALE AS SHOWN
SHEET NO.

TUNNEL 01



PLAN

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

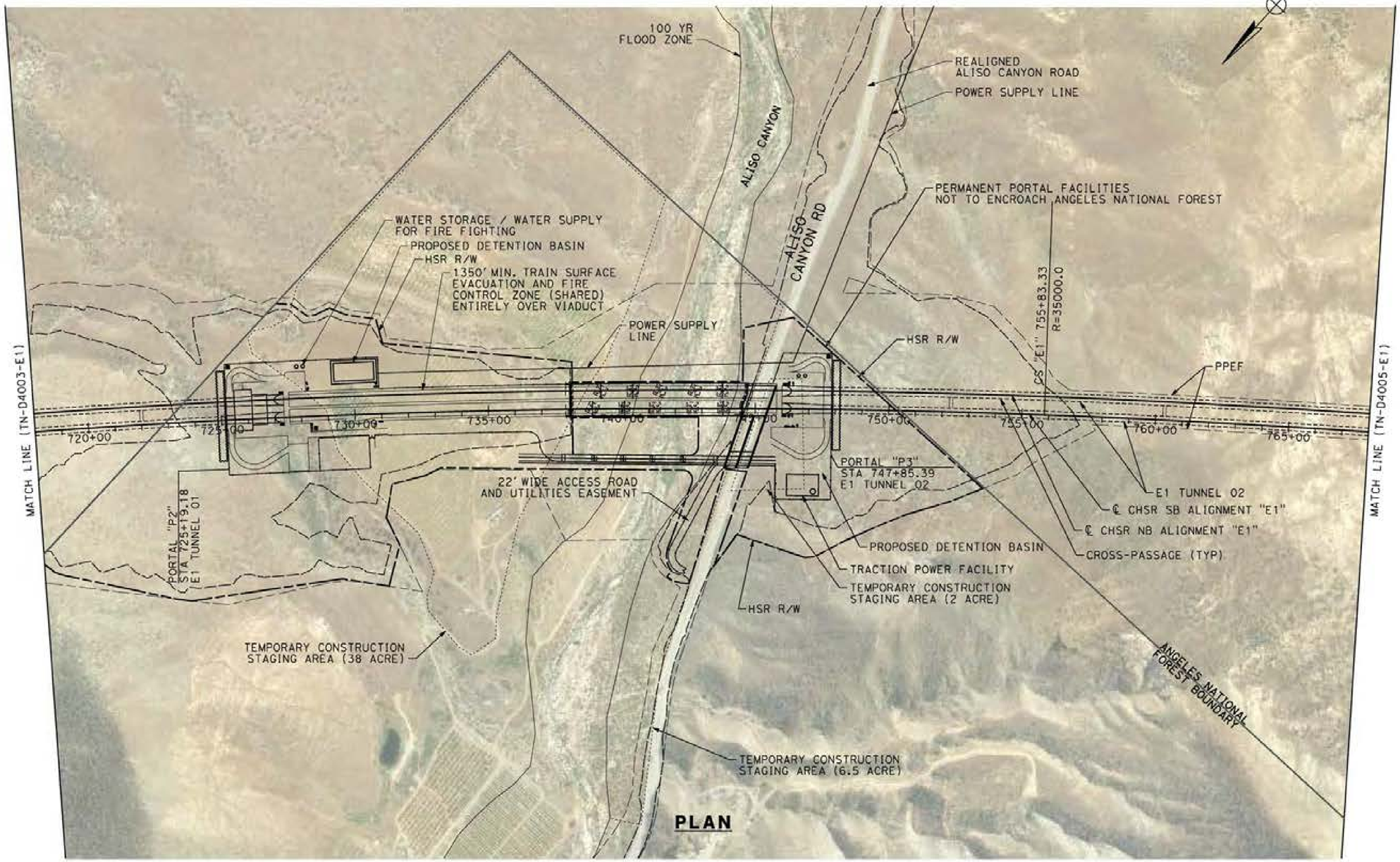
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 668+00.00 TO STA 718+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4003-E1
SCALE AS SHOWN
SHEET NO.

TUNNEL 01
PORTAL P2

TUNNEL 02
PORTAL P3



PLAN

200 0 200 400
1"=200'

NOTE:

1. TEMPORARY CONSTRUCTION STAGING AREAS (38 AND 6.5 ACRES) TO BE SHARED BETWEEN PORTALS.
2. TRAIN SURFACE EVACUATION AND FIRE CONTROL ZONE SHARED BETWEEN PORTALS.
3. PERMANENT FOOTPRINT INCLUDES SPACE FOR FACILITIES DESCRIBED IN TM 2.4.6 WITH THE FOLLOWING EXCEPTION:
   - HELIPAD NOT INLCUDED
   - PORTAL P2 INCLUDES SPACE FOR BOTH DETENTION POND (LOW POINT), AND WATER STORAGE / WATER SUPPLY FOR FIRE FIGHTING
   - PORTAL P3 INLCUDES SPACE FOR WATER STORAGE / WATER SUPPLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E.VELASCO
DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W.GUO
IN CHARGE: A.RELAÑO
DATE: 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

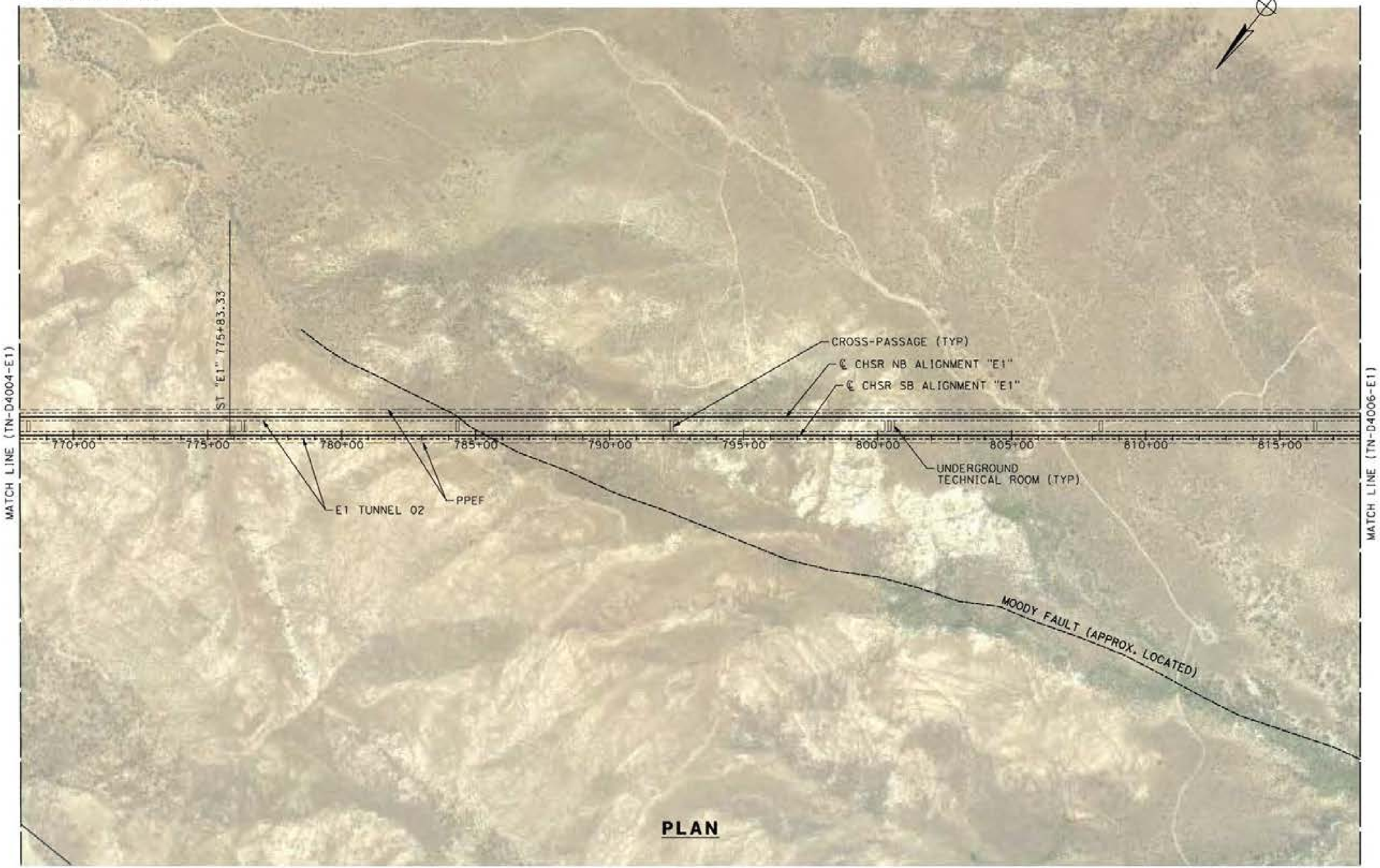
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 718+00.00 TO STA 768+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4004-E1
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

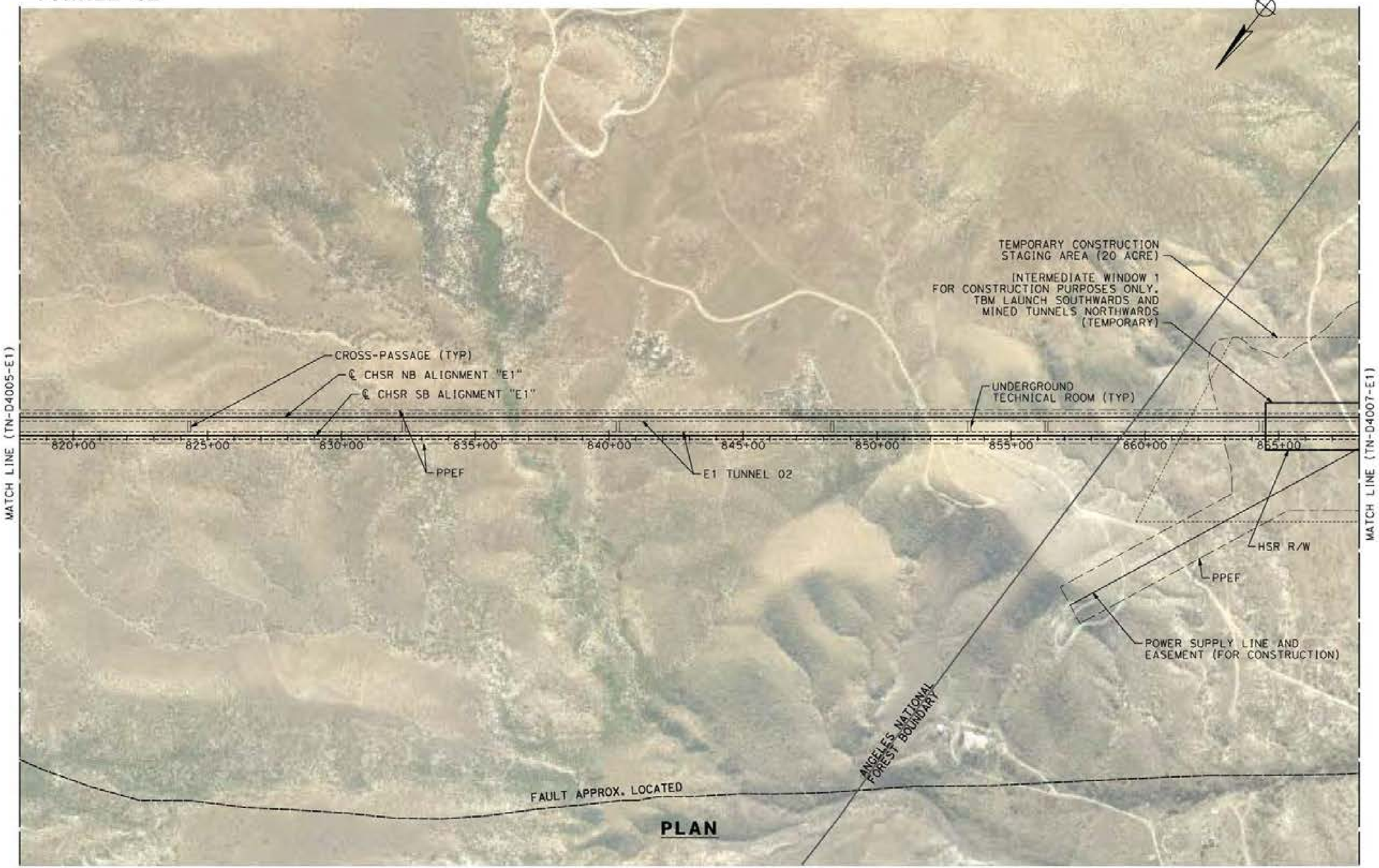
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 768+00.00 TO STA 818+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4005-E1
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E.VELASCO
DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W.GUO
IN CHARGE: A.RELAÑO
DATE: 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

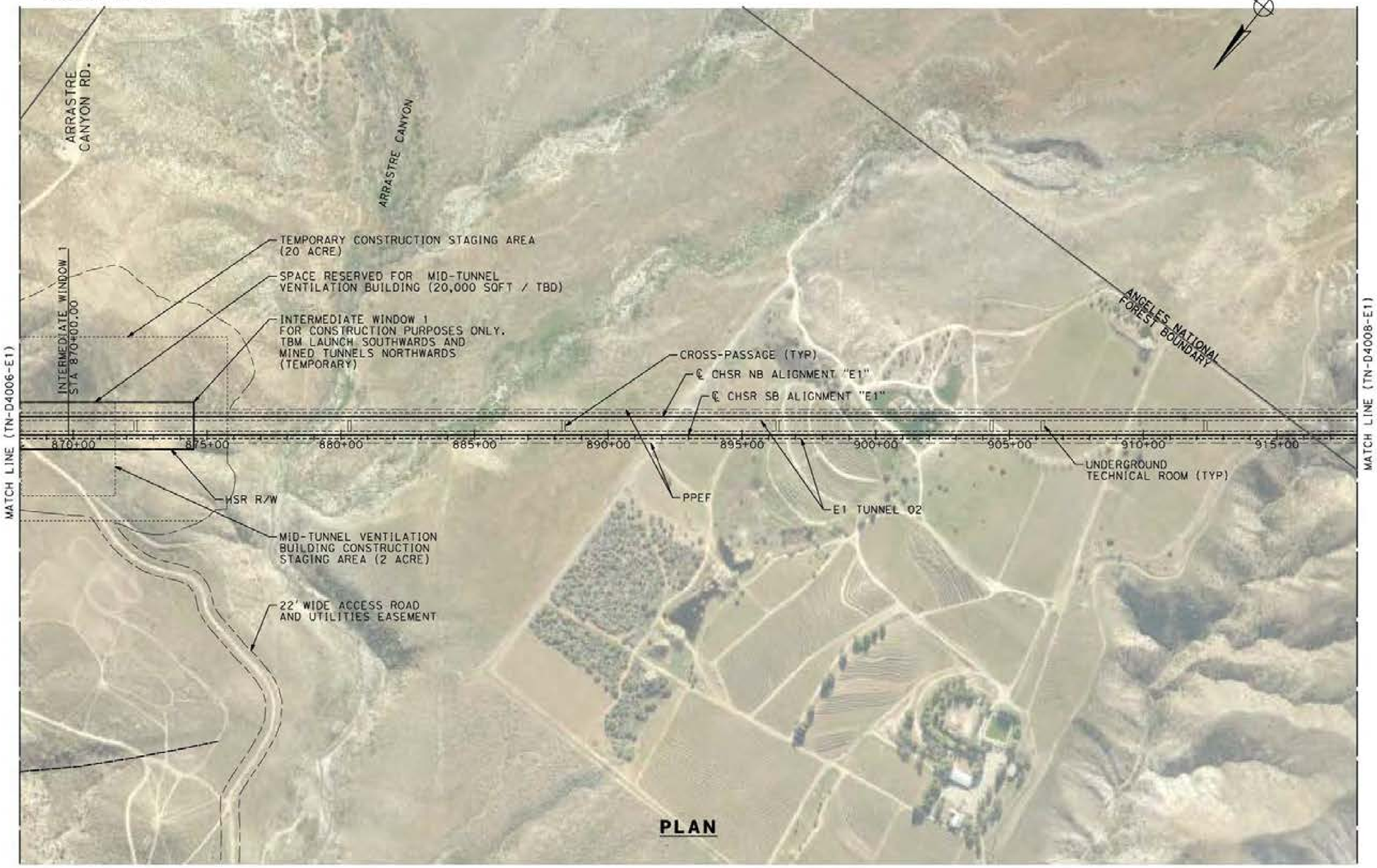
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 818+00.00 TO STA 868+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4006-E1
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

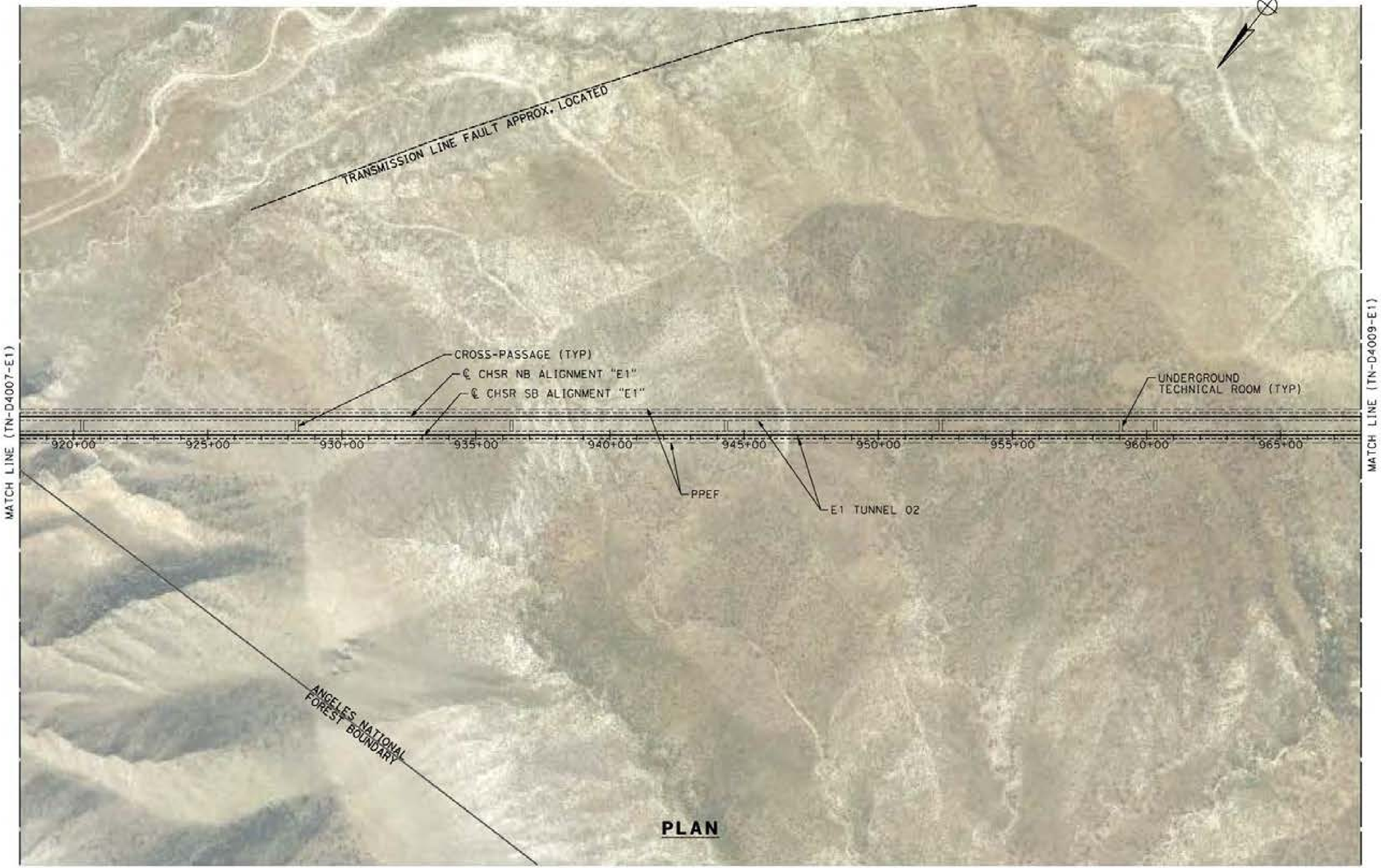
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 868+00.00 TO STA 918+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4007-E1
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

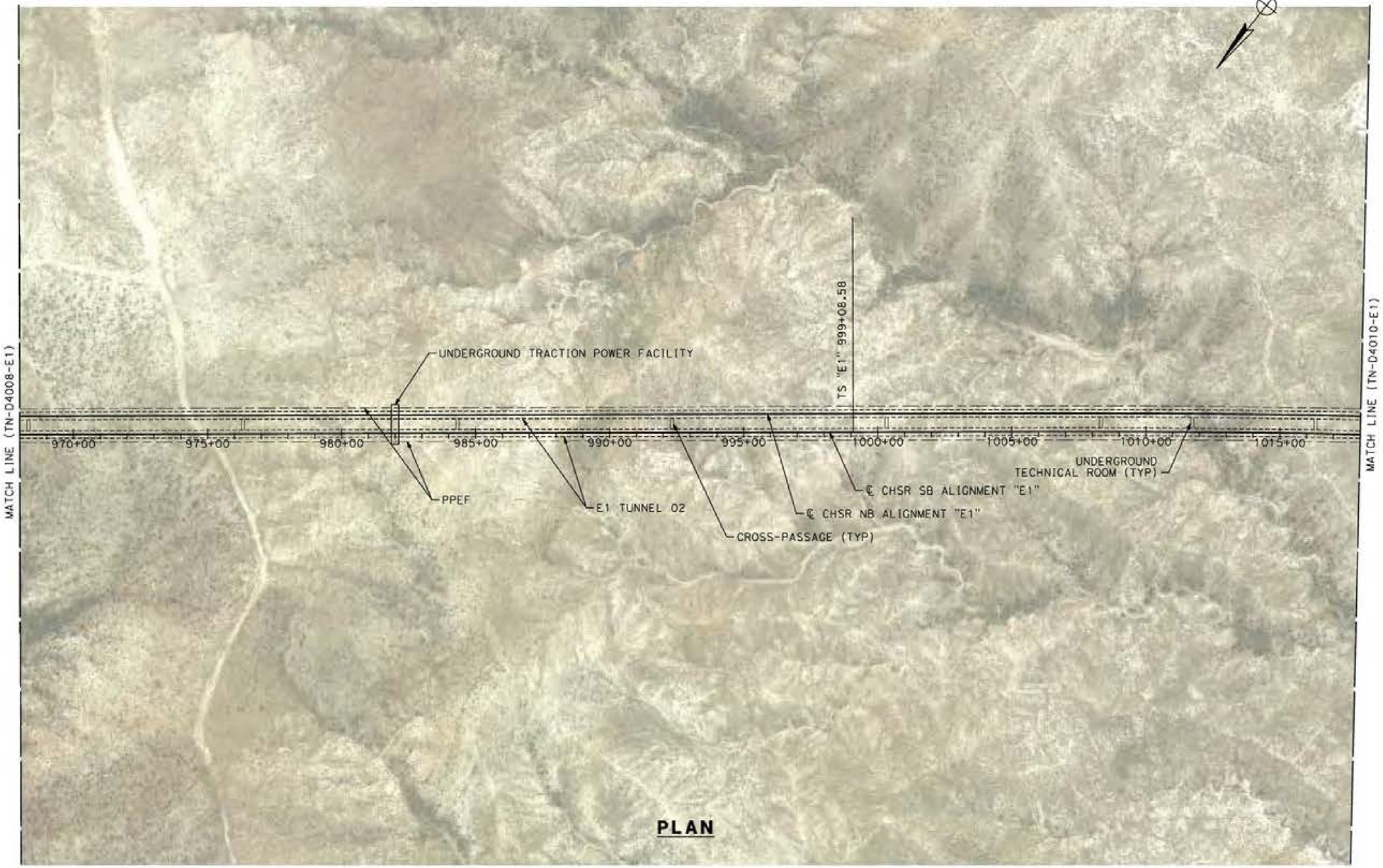
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 918+00.00 TO STA 968+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4008-E1
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

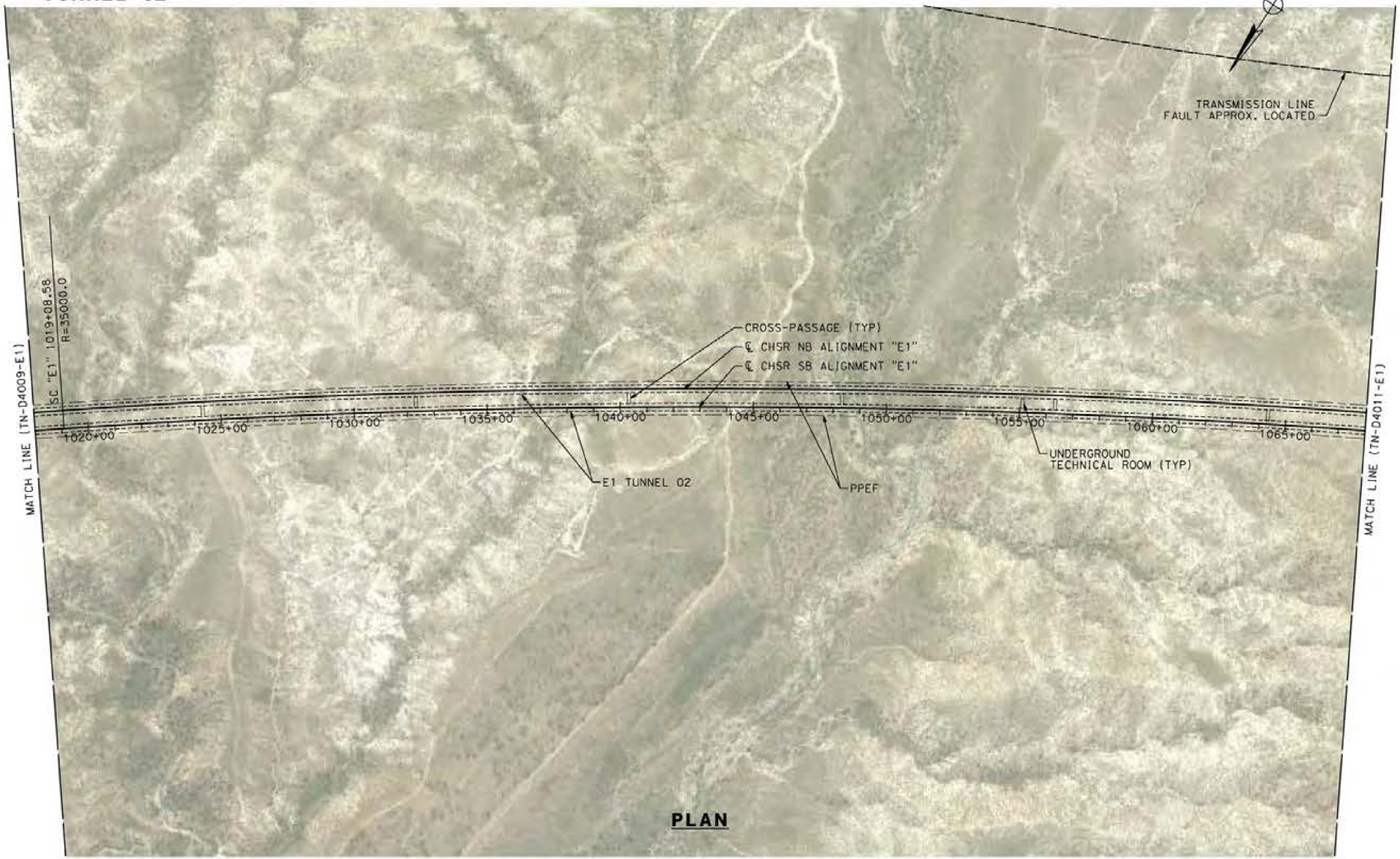
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 968+00.00 TO STA 1018+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4009-E1
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

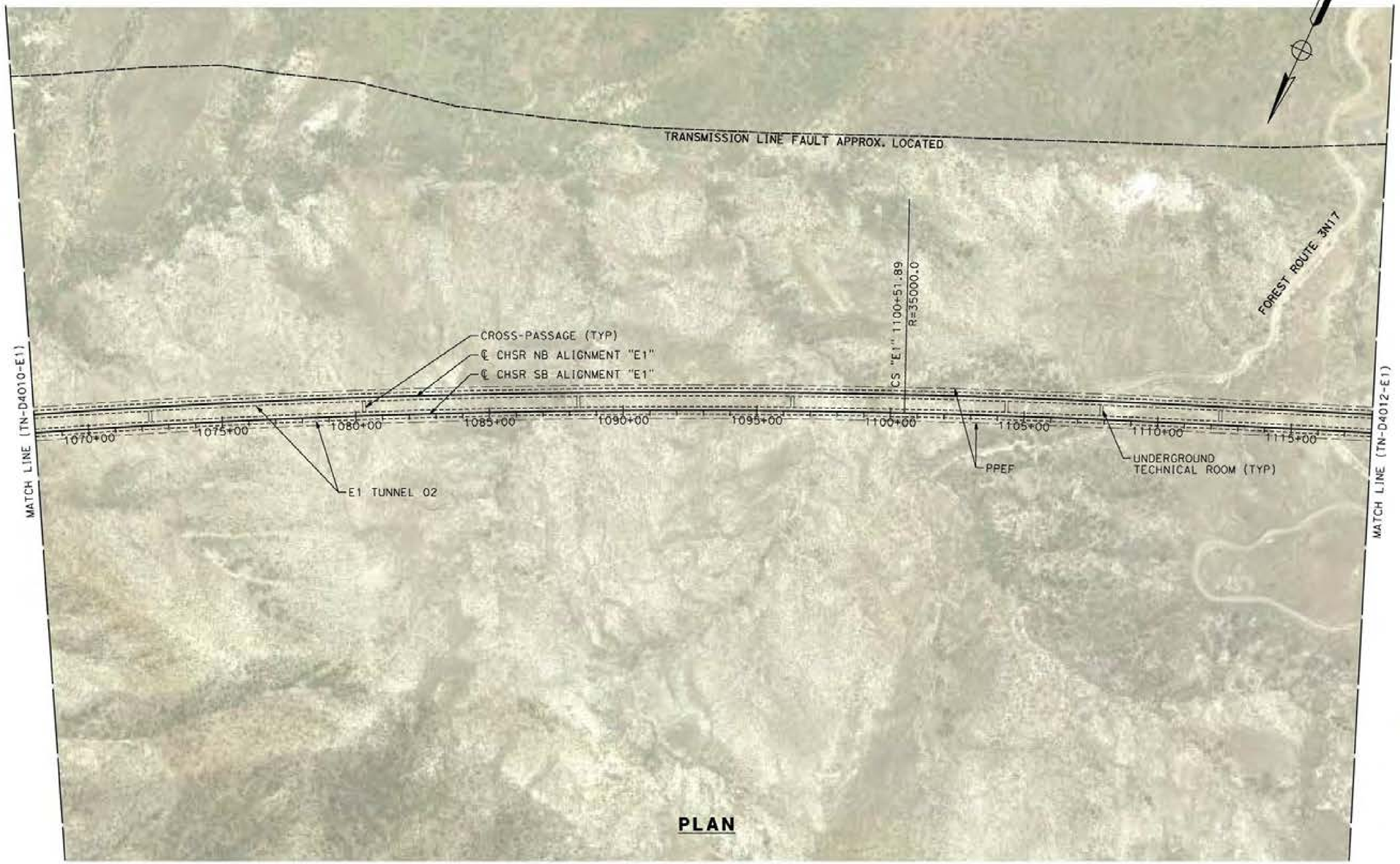
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 1018+00.00 TO STA 1068+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4010-E1
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

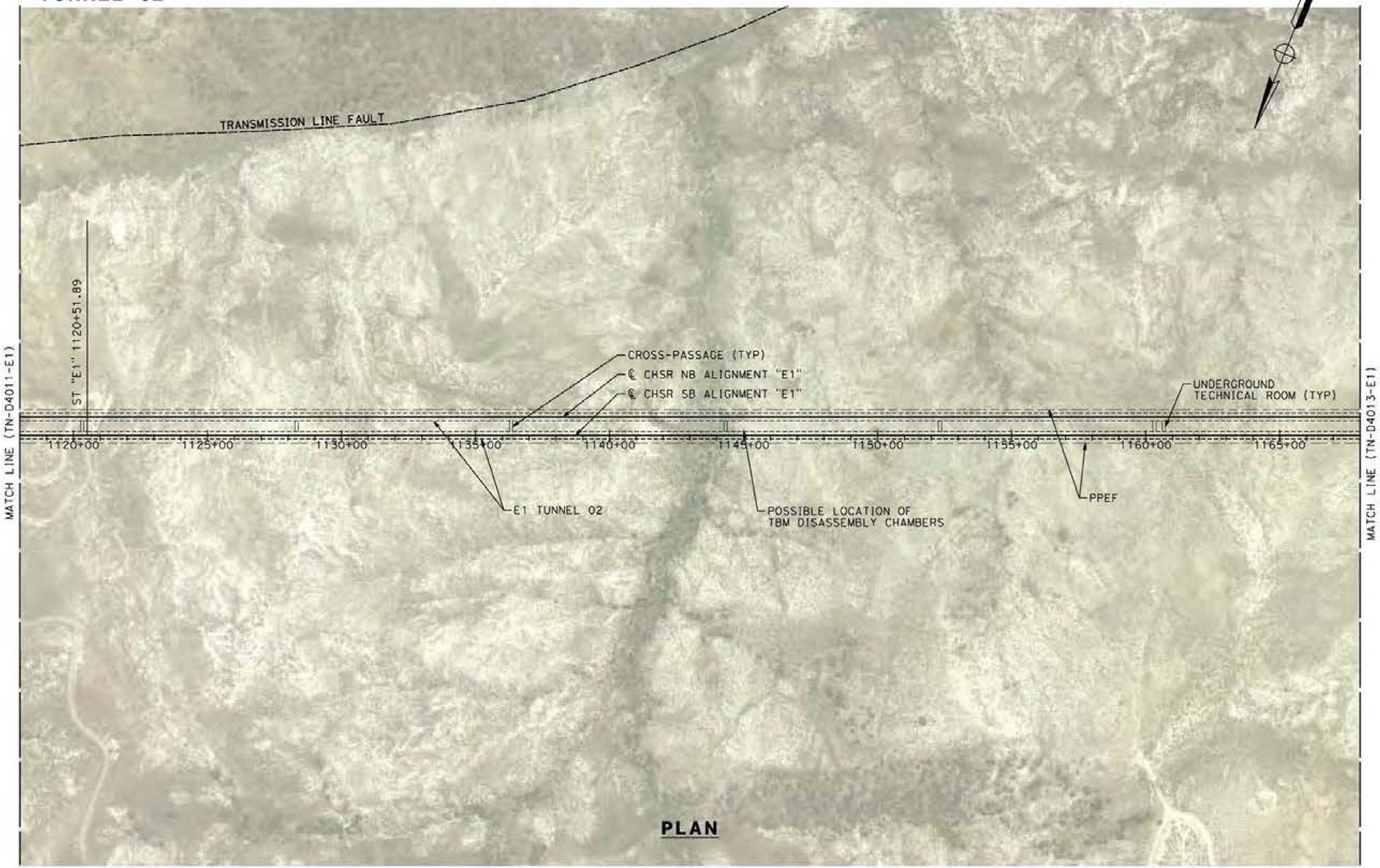
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 1068+00.00 TO STA 1118+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4011-E1
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

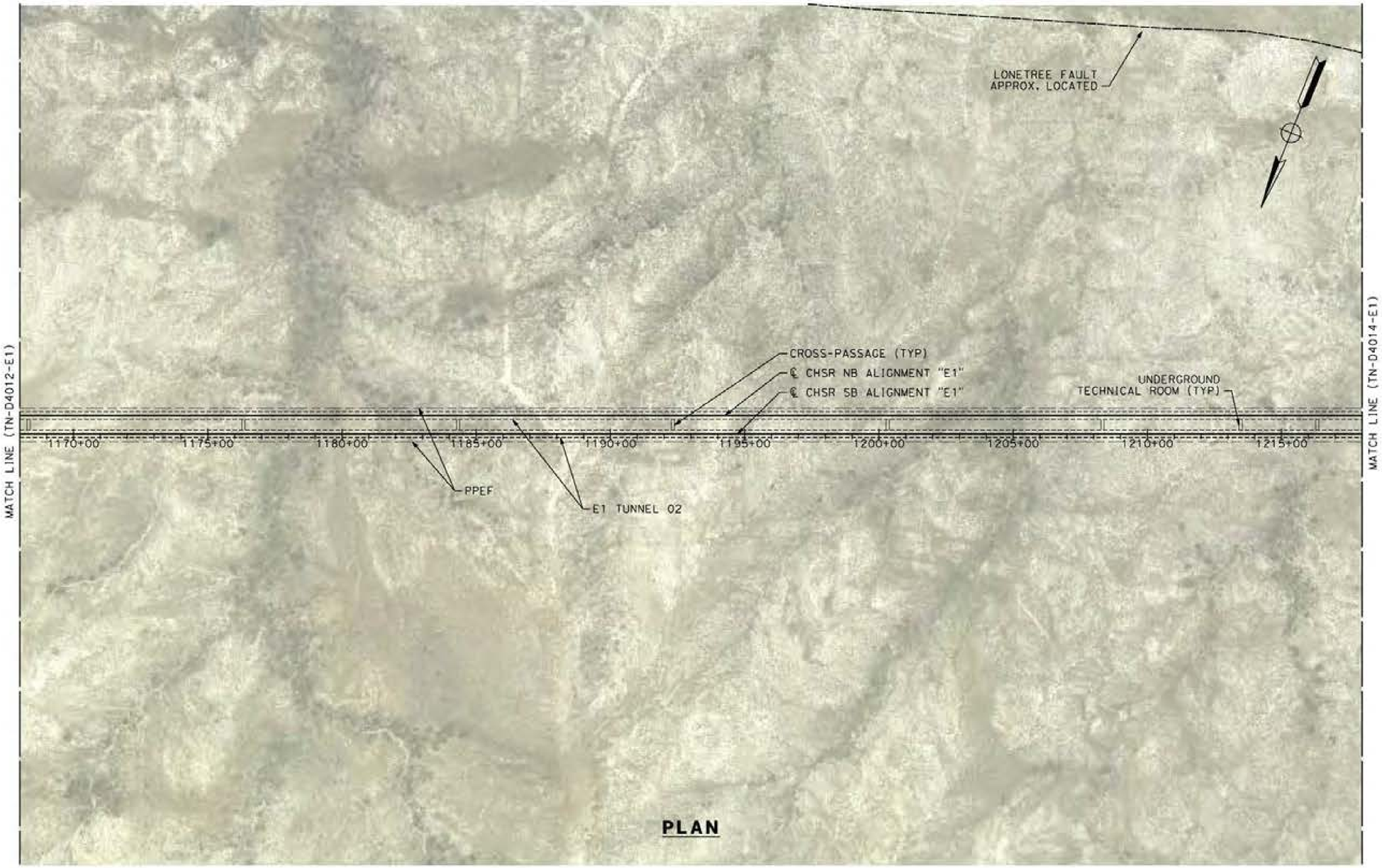
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 1118+00.00 TO STA 1168+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4012-E1
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

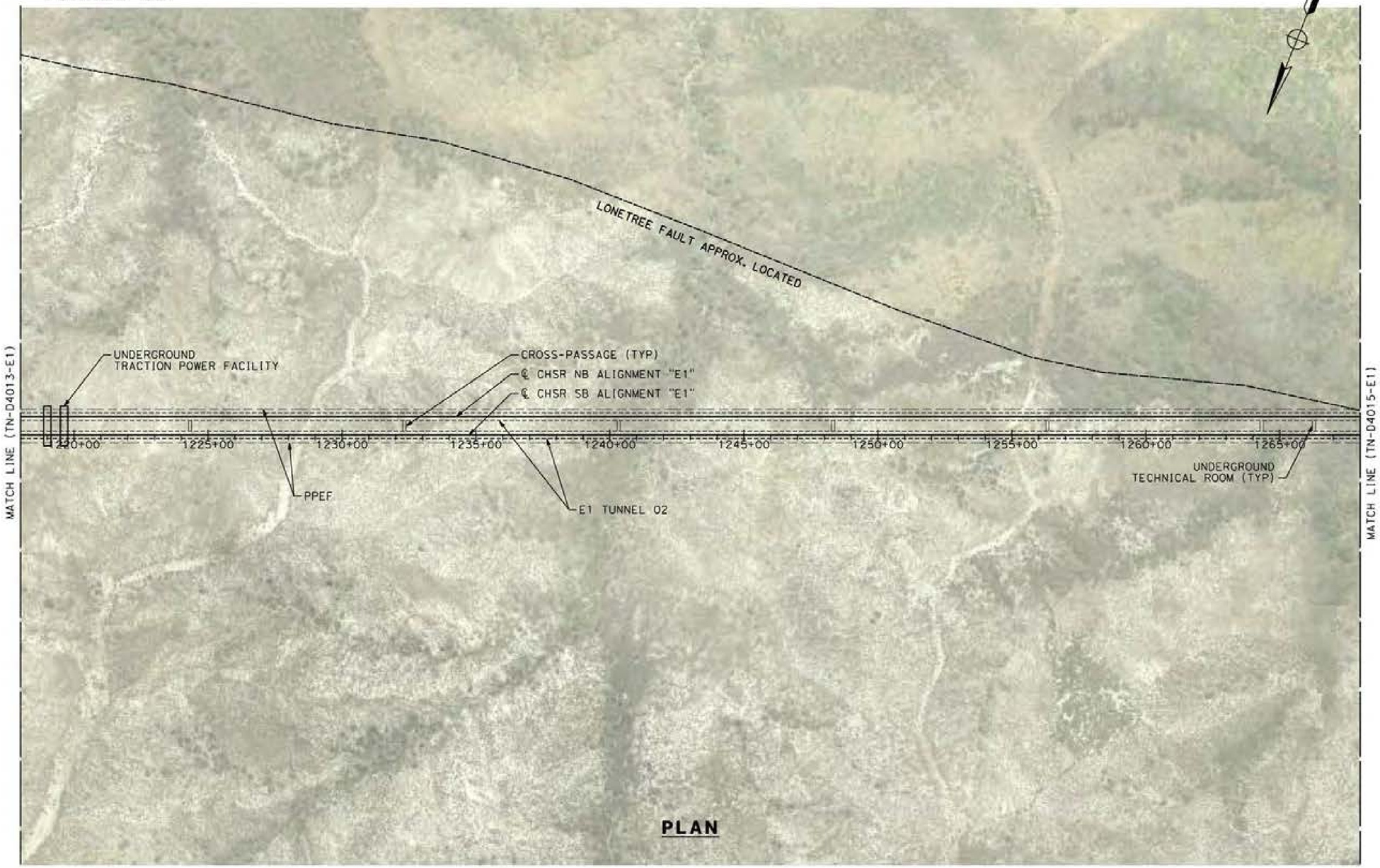
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 1168+00.00 TO STA 1218+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4013-E1
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET
REV 02

NOT FOR CONSTRUCTION

SENER

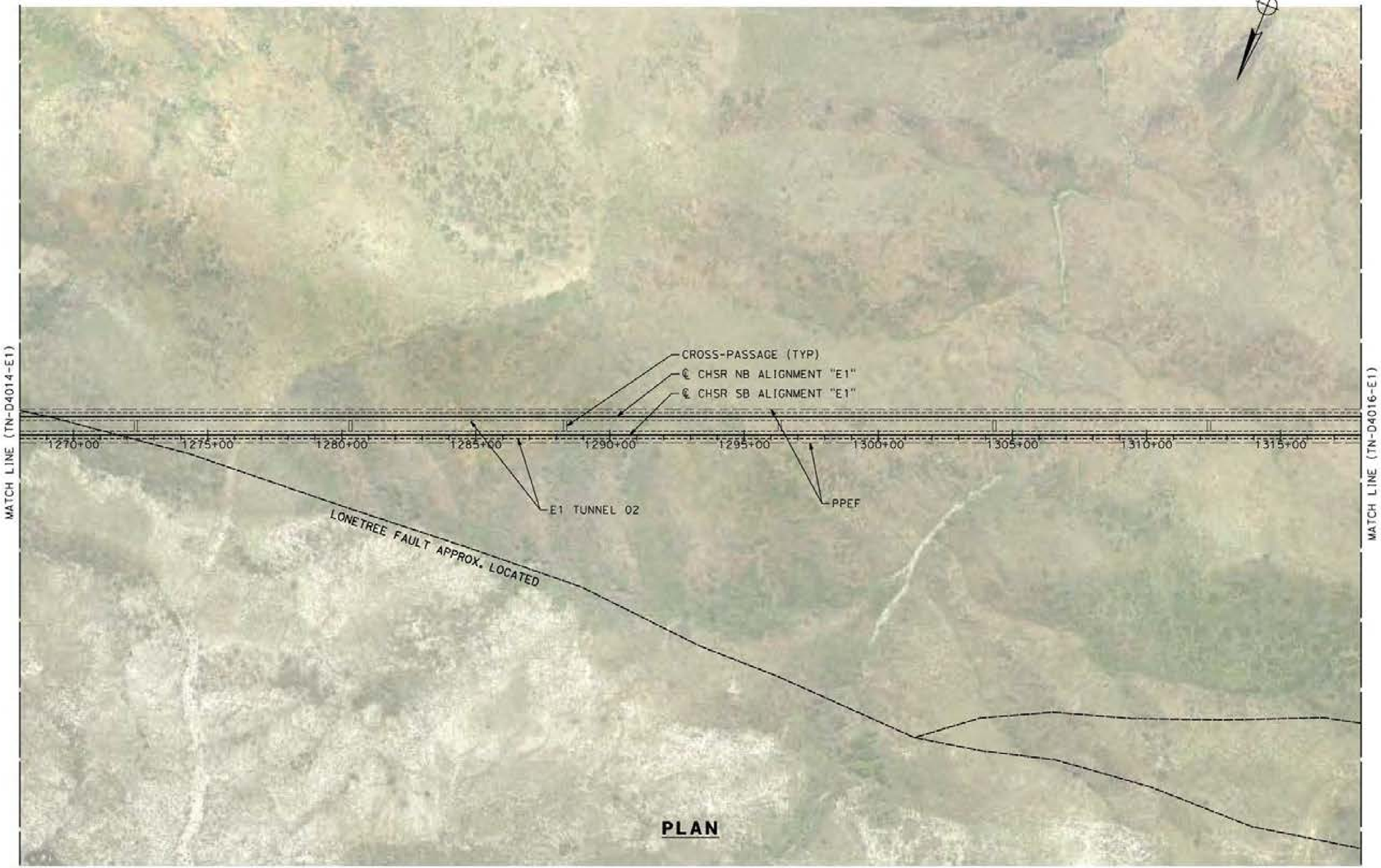
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 1218+00.00 TO STA 1268+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4014-E1
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

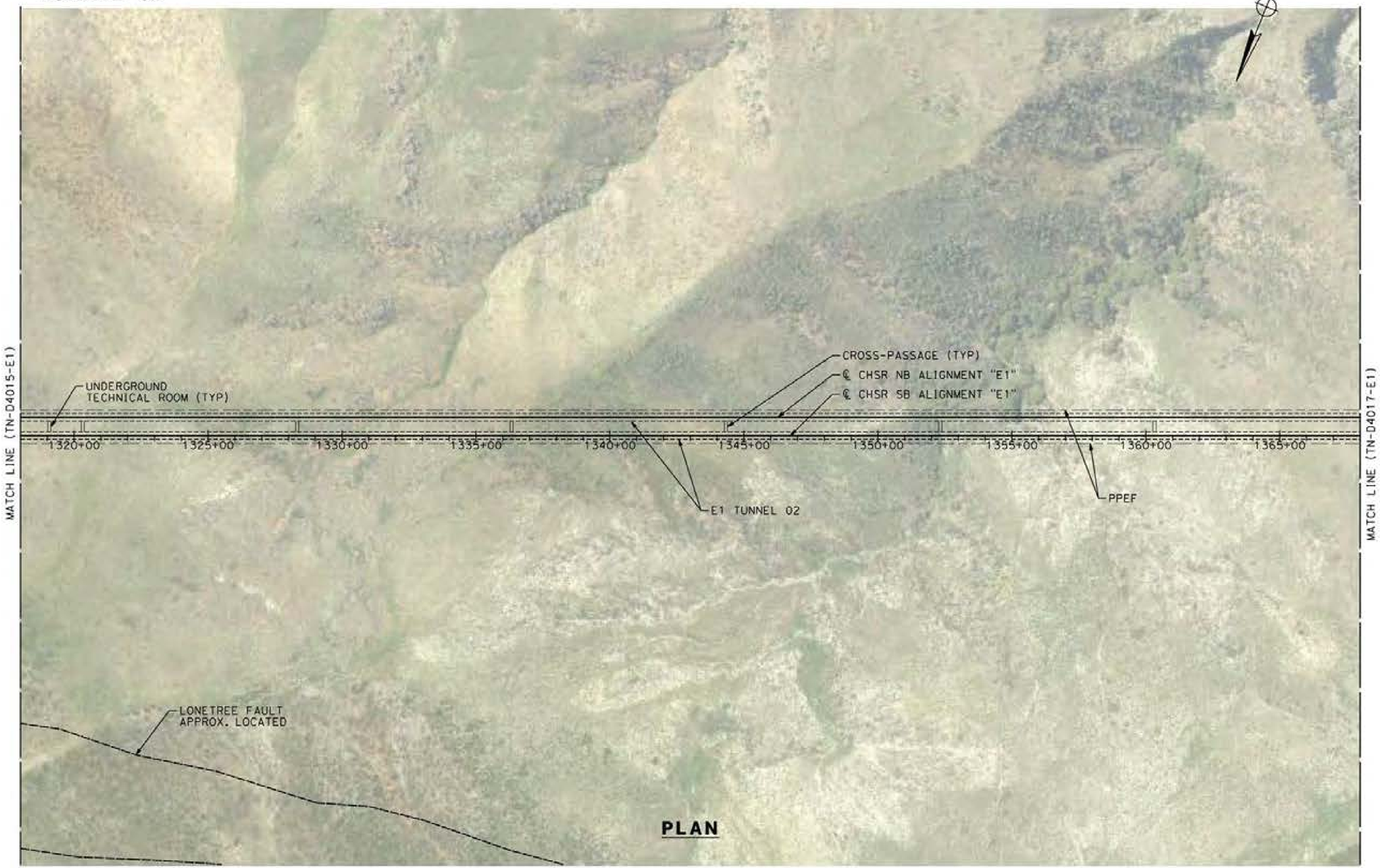
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 1268+00.00 TO STA 1318+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4015-E1
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

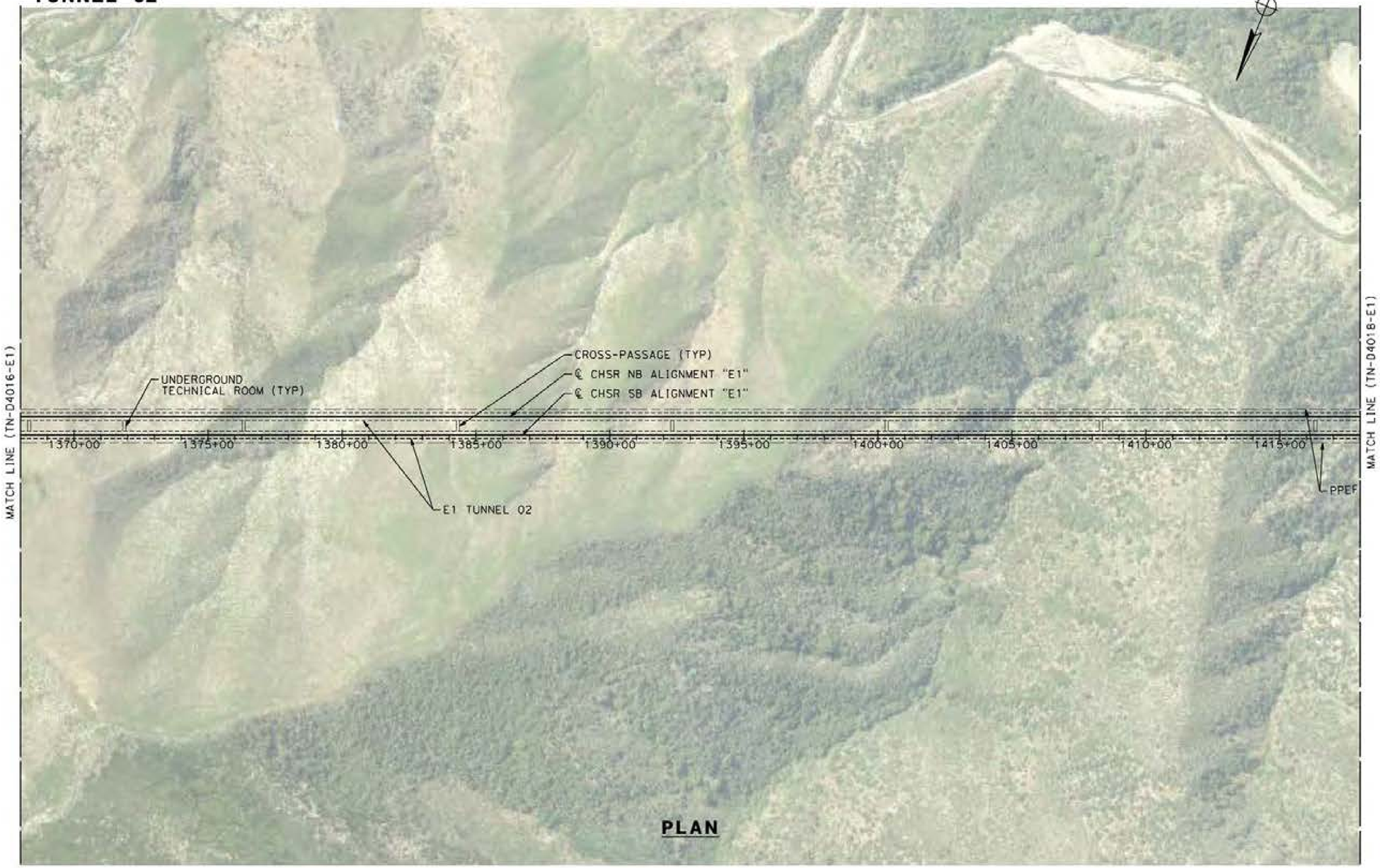
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 1318+00.00 TO STA 1368+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4016-E1
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1"=400'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

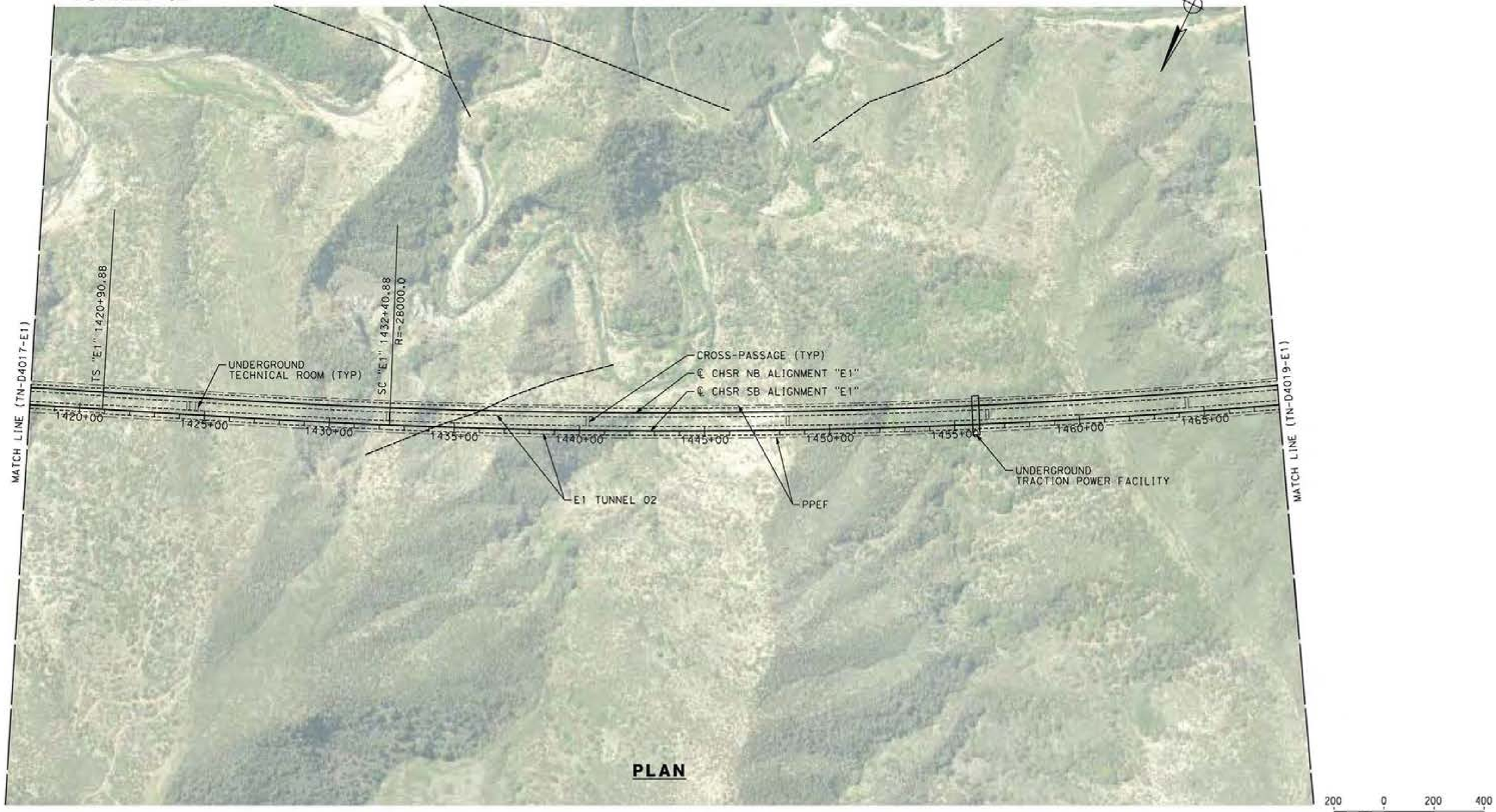
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 1368+00.00 TO STA 1418+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4017-E1
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

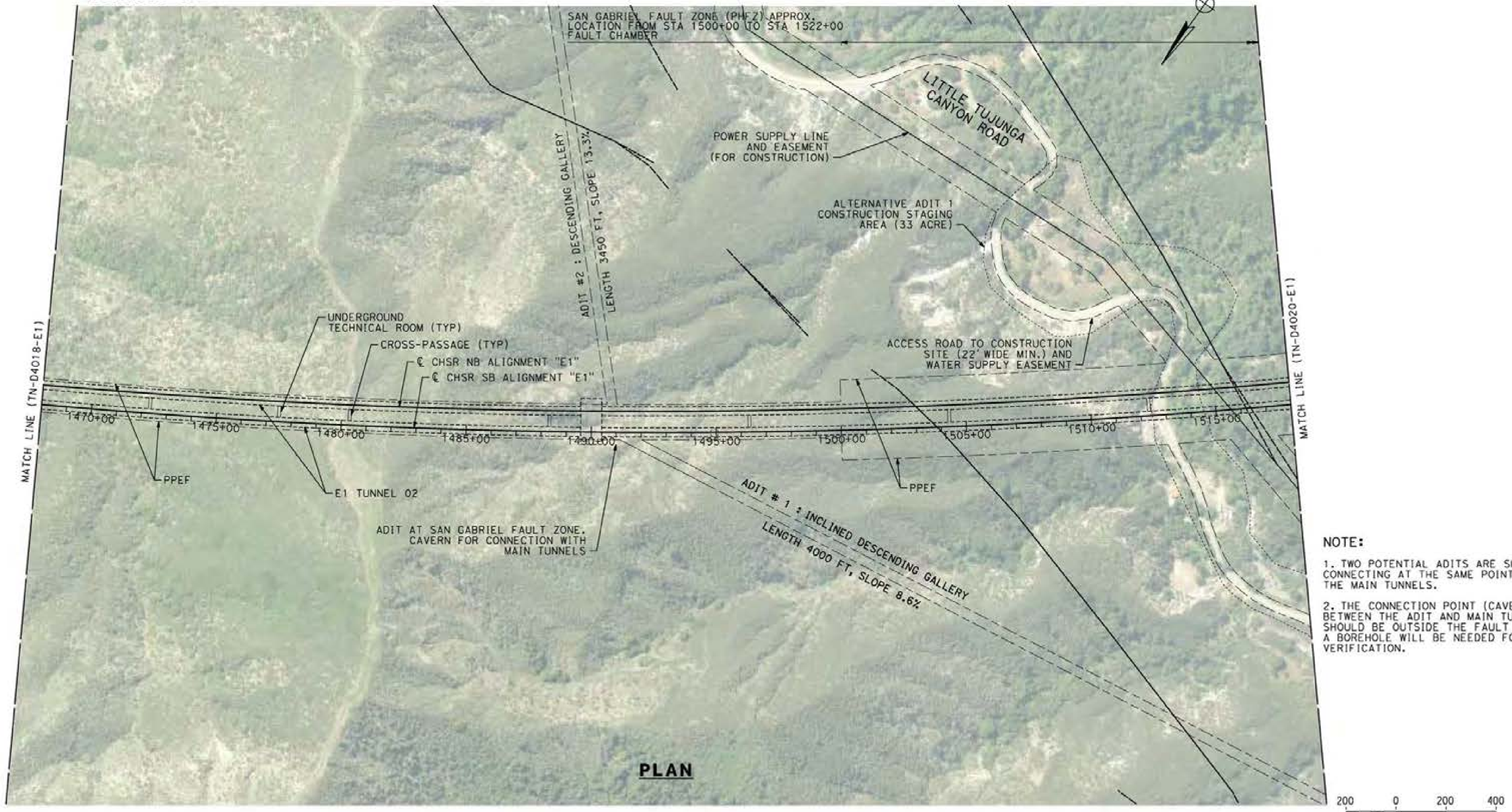
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 1418+00.00 TO STA 1468+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4018-E1
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

NOTE:

1. TWO POTENTIAL ADITS ARE SHOWN CONNECTING AT THE SAME POINT TO THE MAIN TUNNELS.

2. THE CONNECTION POINT (CAVERN) BETWEEN THE ADIT AND MAIN TUNNELS SHOULD BE OUTSIDE THE FAULT ZONE. A BOREHOLE WILL BE NEEDED FOR VERIFICATION.

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION
0205240					

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

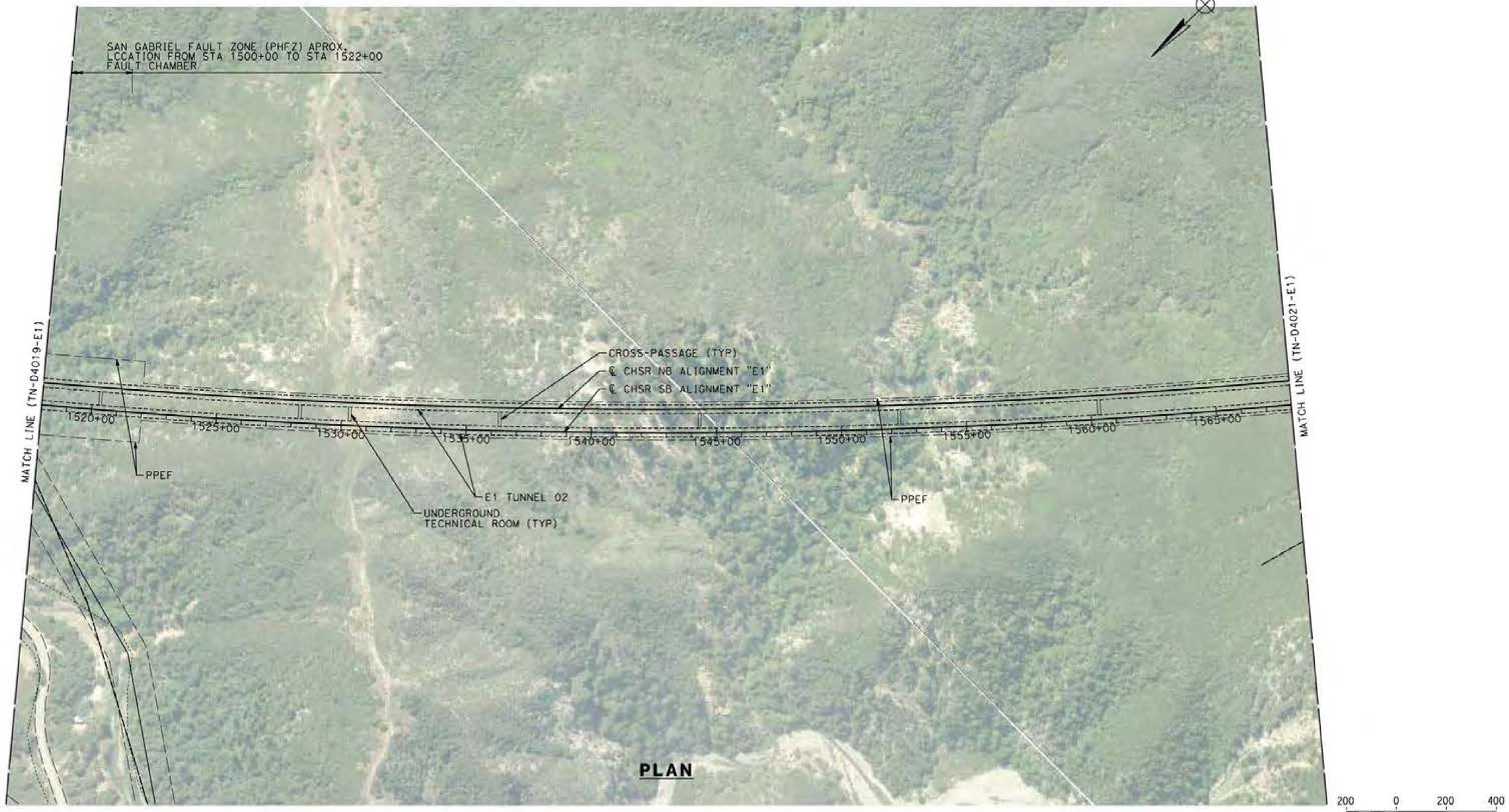
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 1468+00.00 TO STA 1518+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4019-E1
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1"=400'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

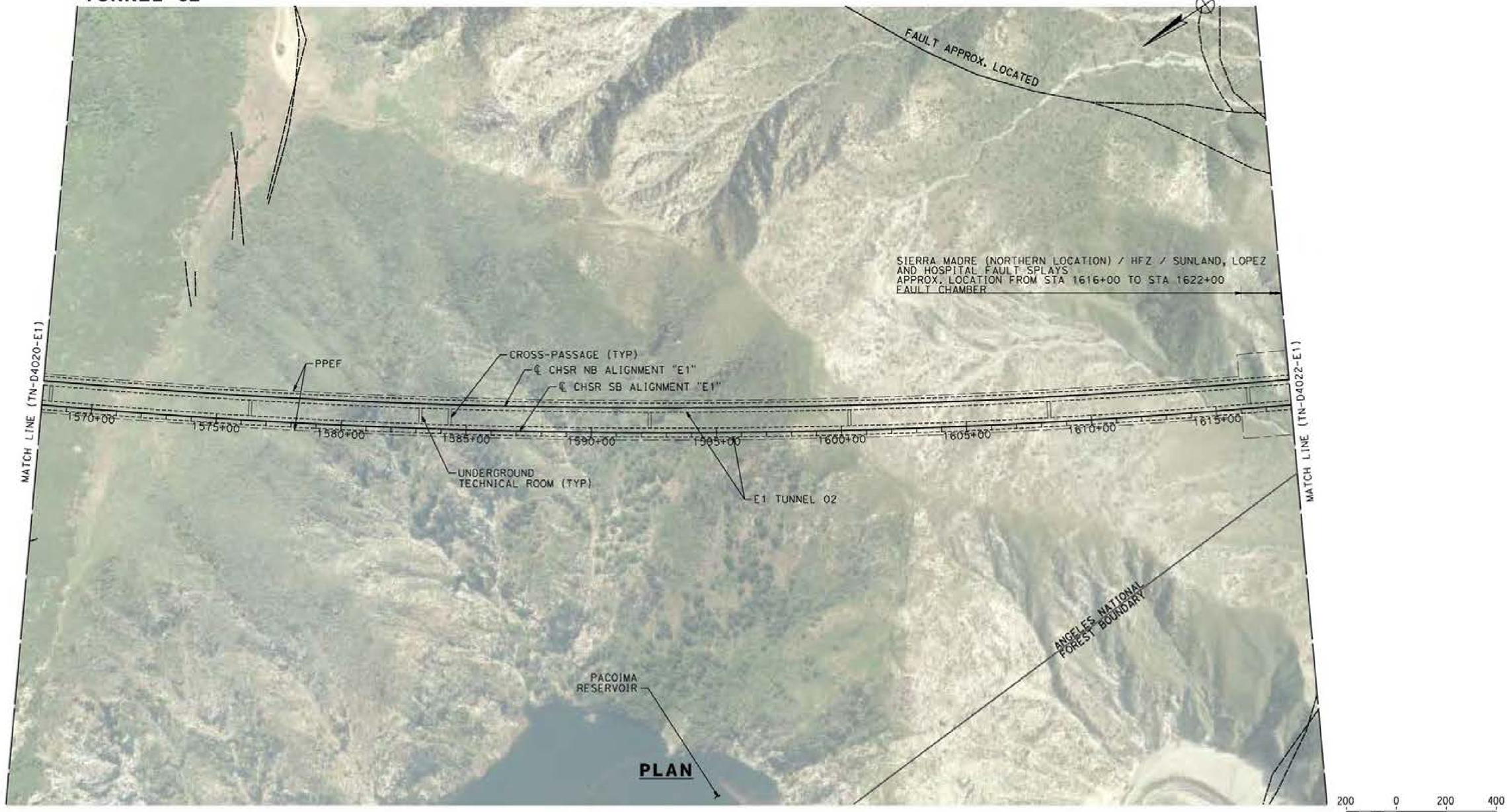
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 1518+00.00 TO STA 1568+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4020-E1
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

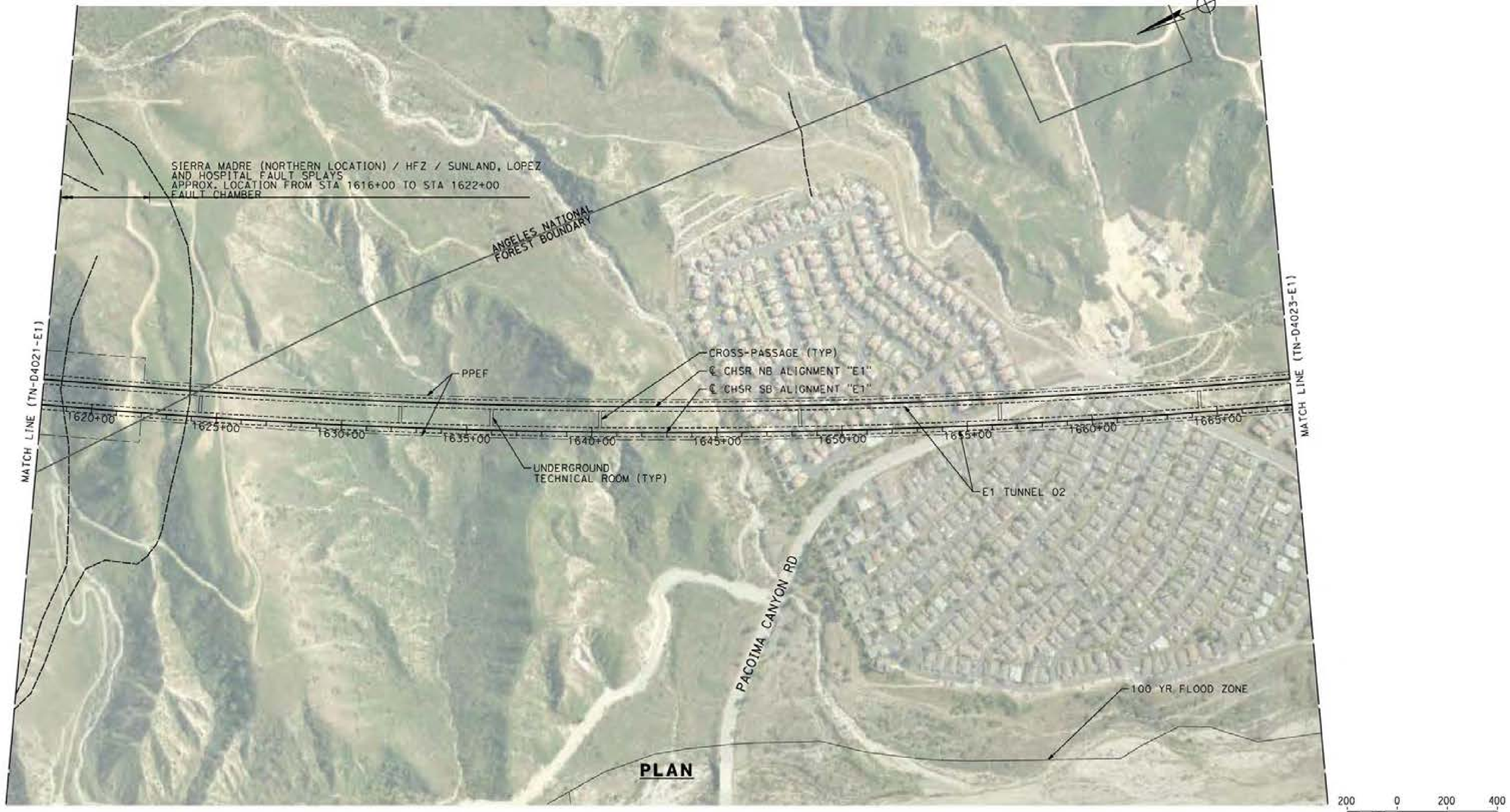
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 1568+00.00 TO STA 1618+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4021-E1
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 1618+00.00 TO STA 1668+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4022-E1
SCALE AS SHOWN
SHEET NO.

TUNNEL 02

PLAN

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

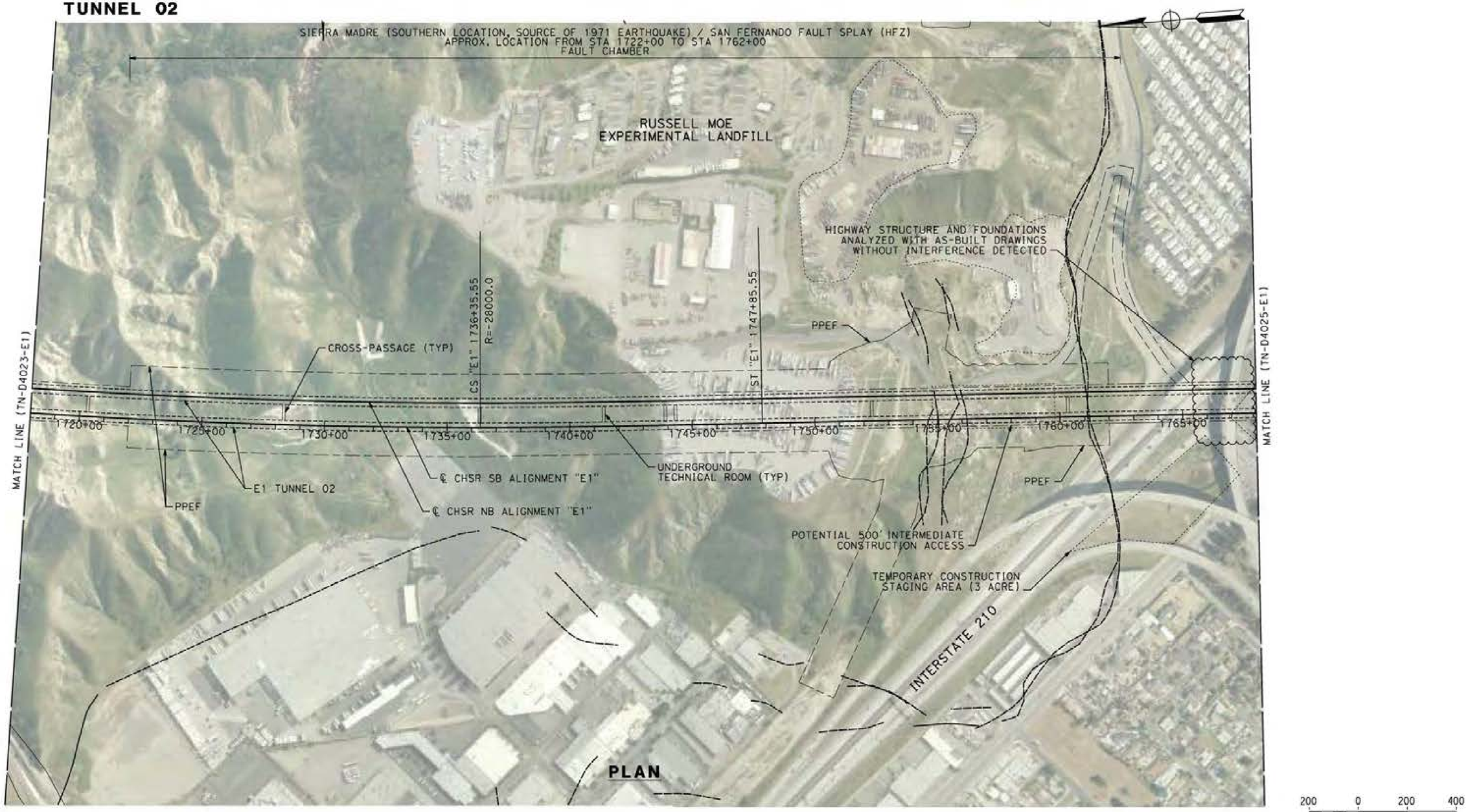
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 1668+00.00 TO STA 1718+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4023-E1
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E.VELASCO
DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W.GUO
IN CHARGE: A.RELAÑO
DATE: 04/30/2021

PEPD RECORD SET
REV 02

NOT FOR CONSTRUCTION

SENER

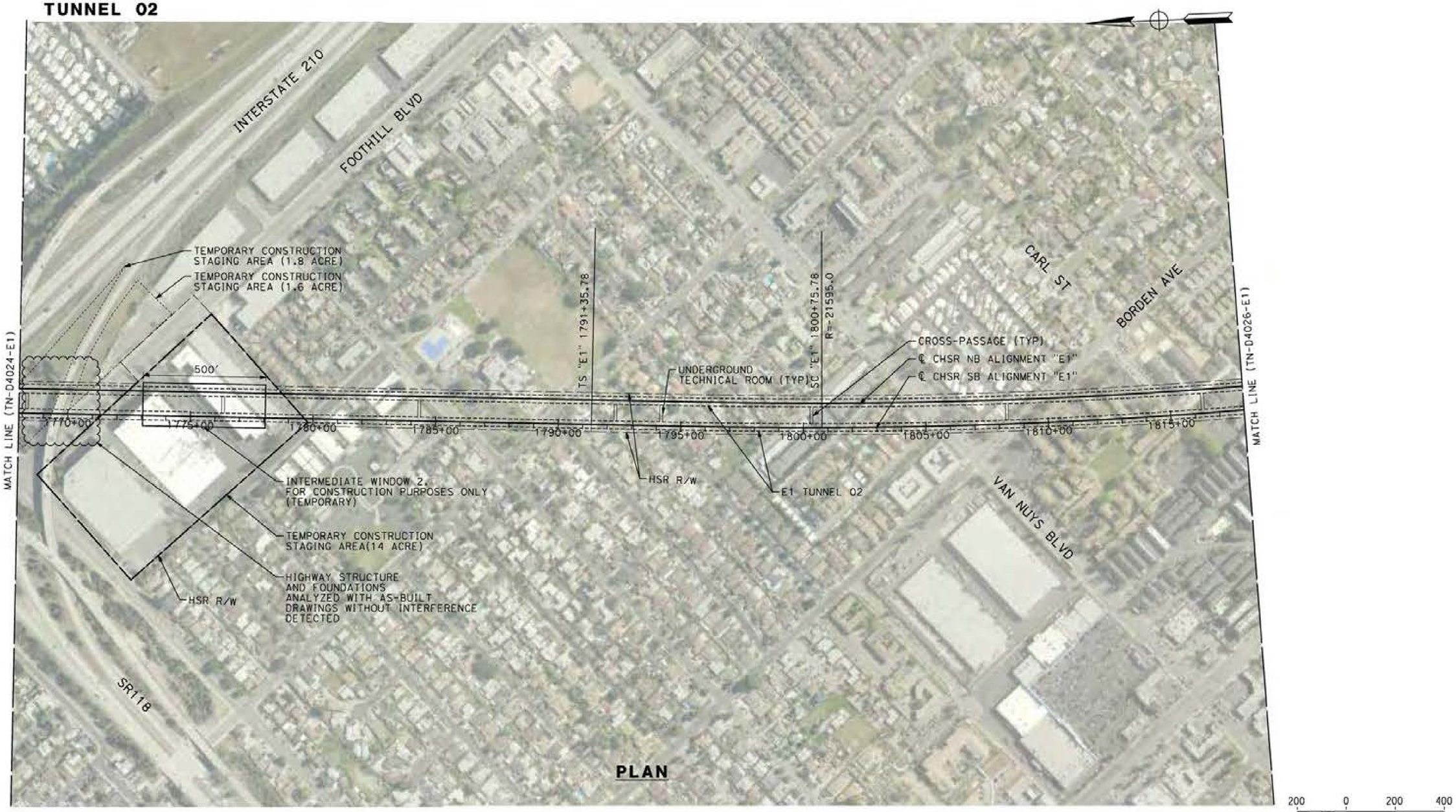
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 1718+00.00 TO STA 1768+00.00

CONTRACT NO.: HSR14-42
DRAWING NO.: TN-D4024-E1
SCALE: AS SHOWN
SHEET NO.:

TUNNEL 02



PLAN

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

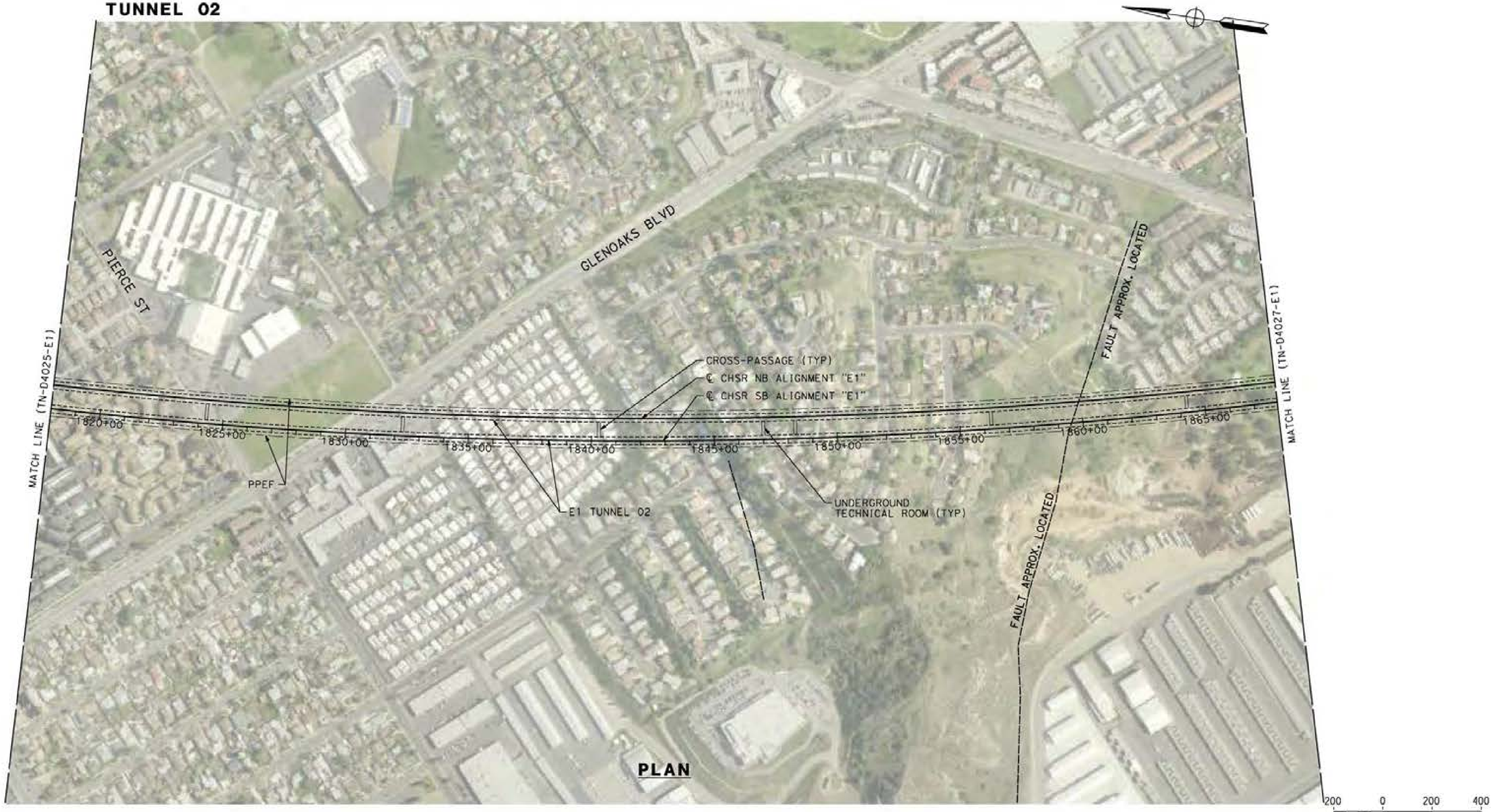
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 1768+00.00 TO STA 1818+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4025-E1
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET
REV 02

NOT FOR CONSTRUCTION

SENER

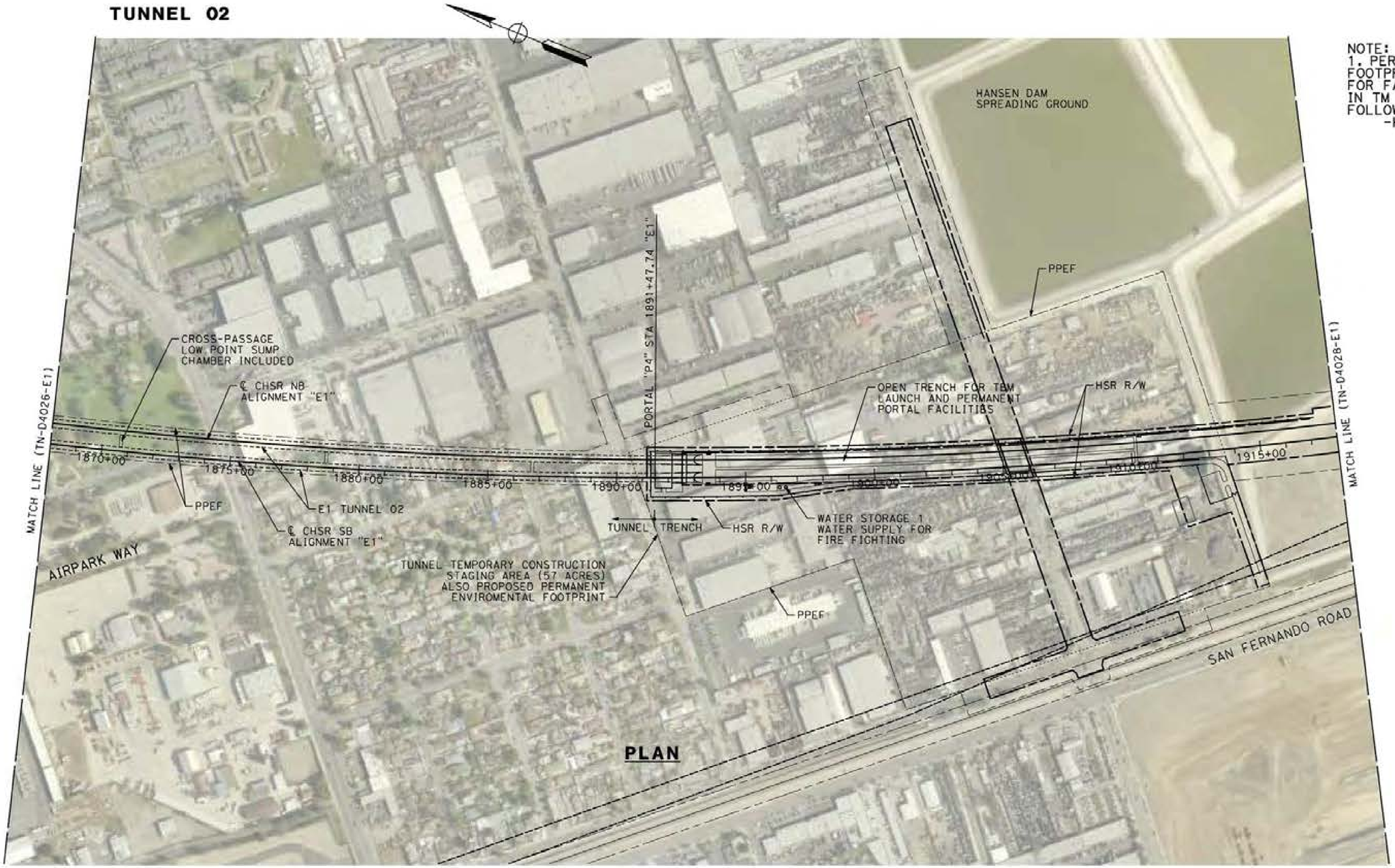
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 1818+00.00 TO STA 1868+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4026-E1
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1":200'

NOTE:
1. PERMANENT PORTAL P4 FOOTPRINT INCLUDE SPACE FOR FACILITIES DEPICTED IN TM 2.4.6. WITH THE FOLLOWING EXCEPTIONS:
-HELIPAD NOT INCLUDED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E.VELASCO
DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W.GUO
IN CHARGE: A.RELAÑO
DATE: 04/30/2021

PEPD RECORD SET
REV 02

NOT FOR CONSTRUCTION

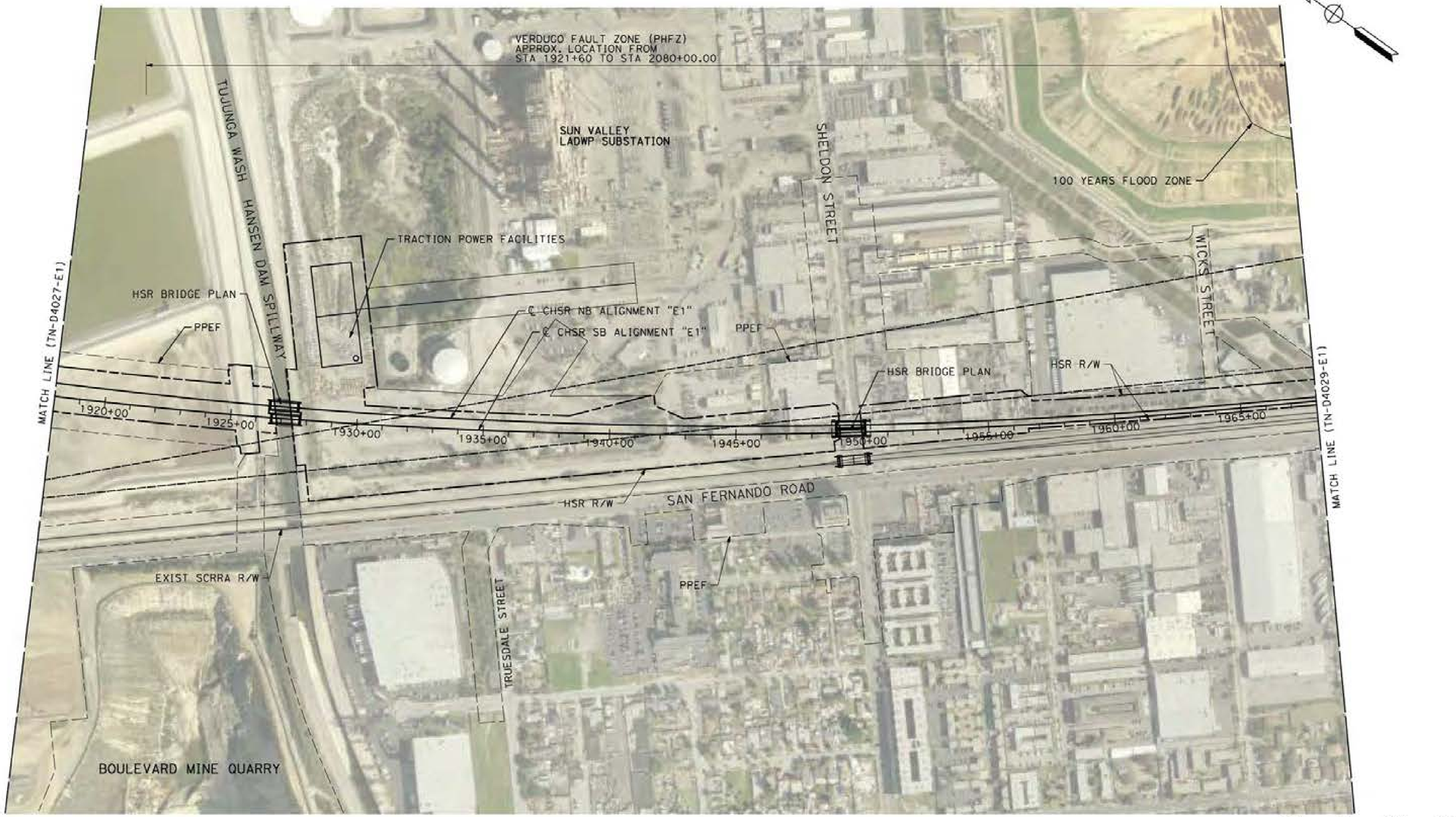
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 1868+00.00 TO STA 1918+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4027-E1
SCALE AS SHOWN
SHEET NO.



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E.VELASCO
DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W.GUO
IN CHARGE: A.RELAÑO
DATE: 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

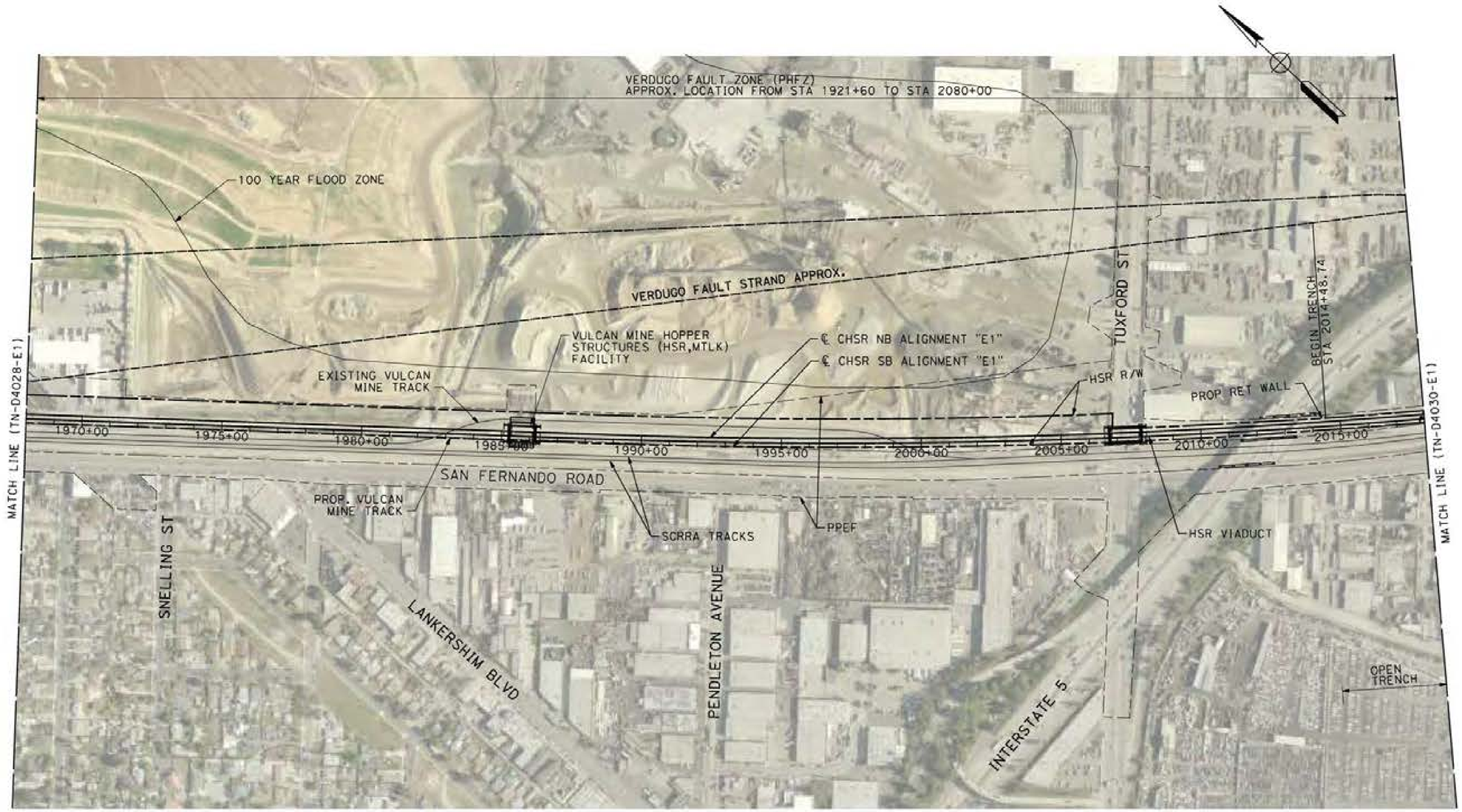
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 1918+00.00 TO STA 1968+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4028-E1
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 W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

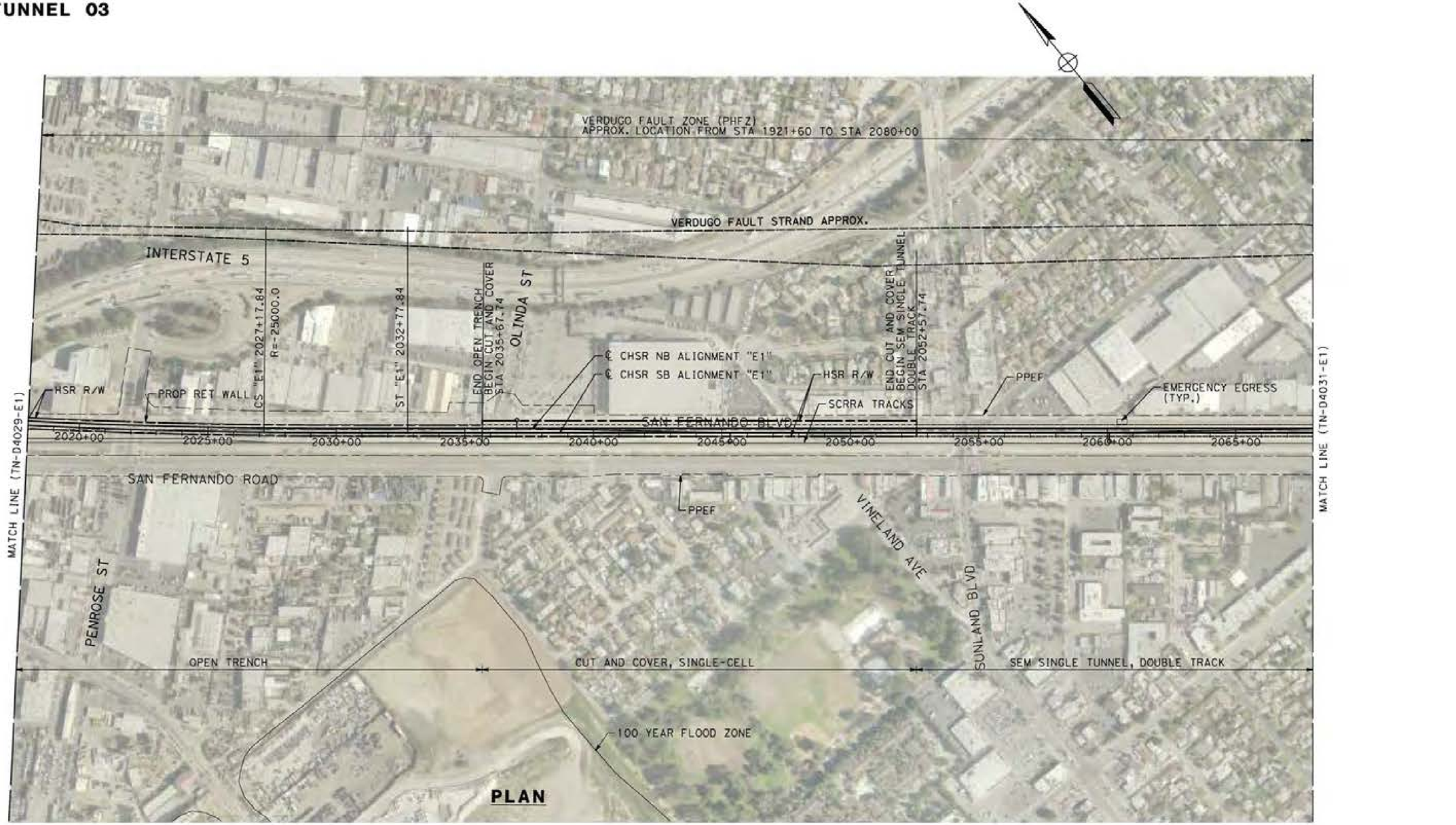
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 1968+00.00 TO STA 2018+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4029-E1
SCALE AS SHOWN
SHEET NO.

TUNNEL 03



PLAN

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

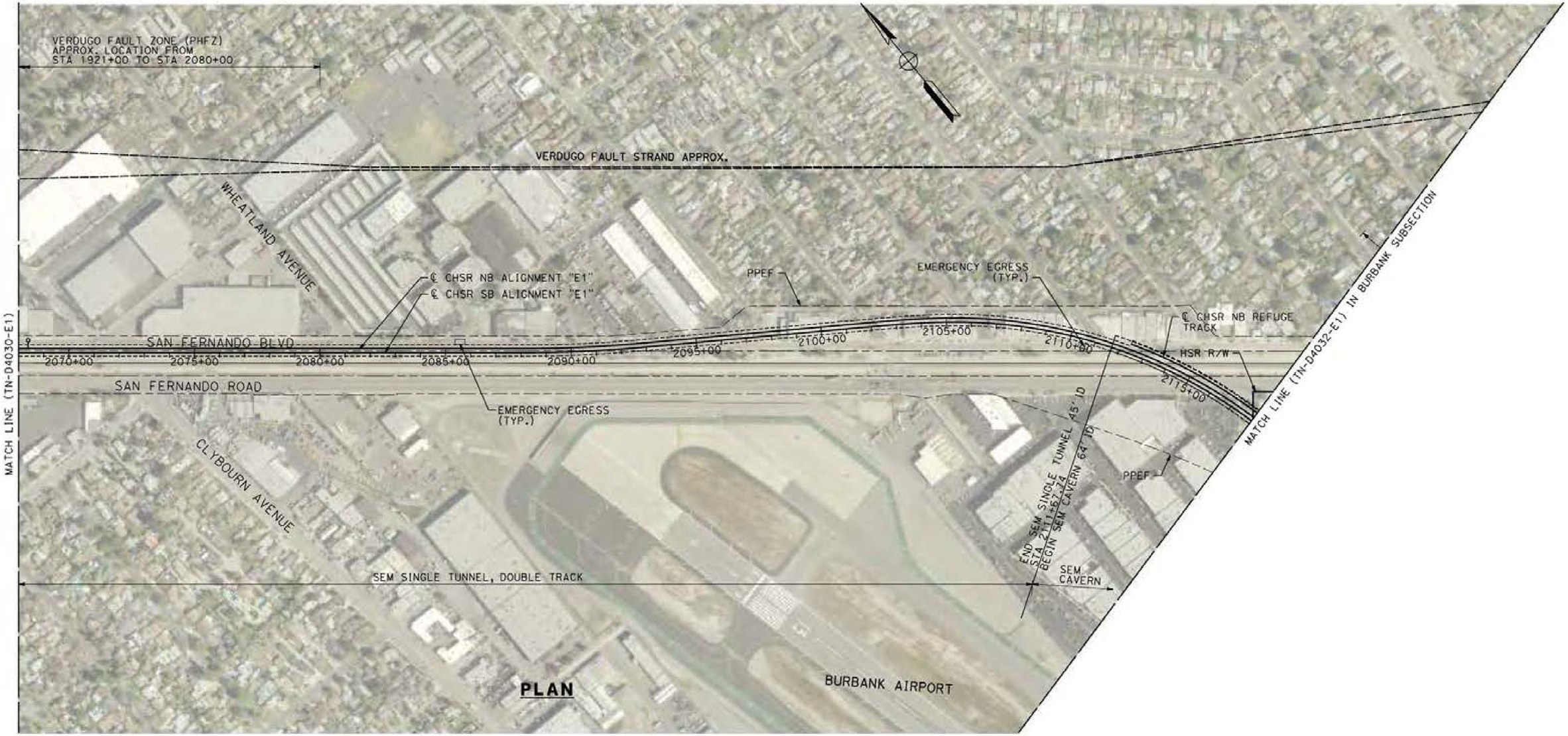
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 2018+00.00 TO STA 2068+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4030-E1
SCALE AS SHOWN
SHEET NO.

TUNNEL 03



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

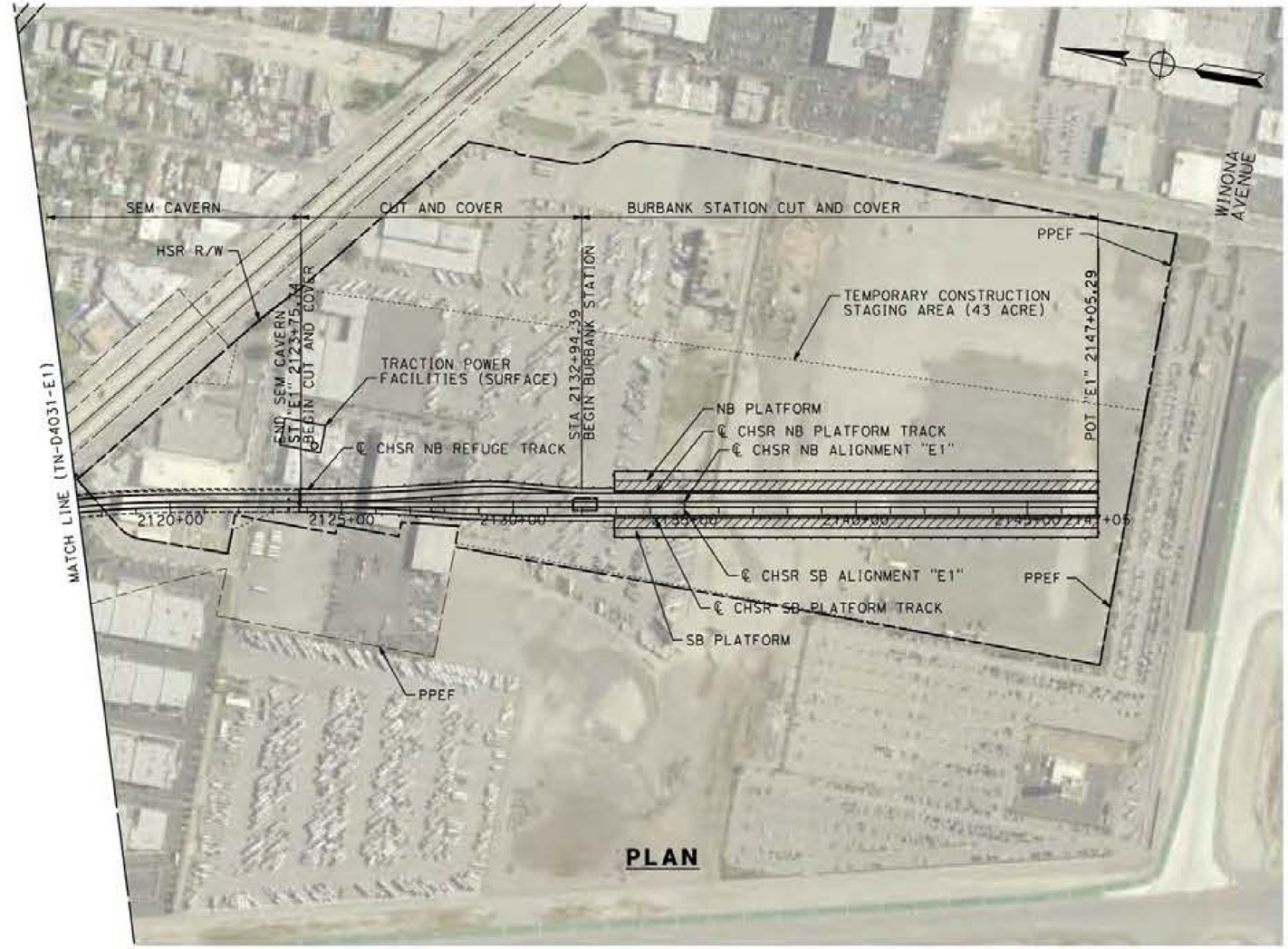
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 2068+00.00 TO STA 2117+34.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4031-E1
SCALE AS SHOWN
SHEET NO.

TUNNEL 03



PLAN

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

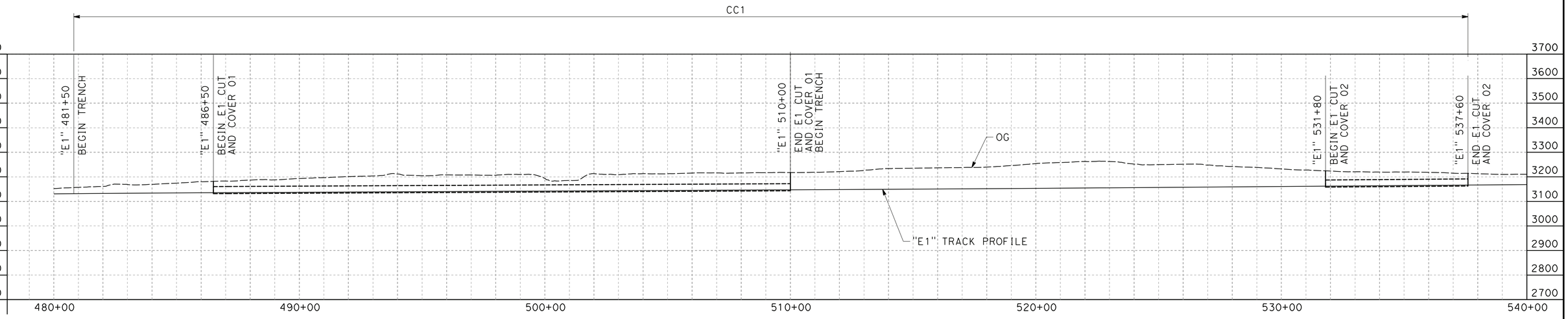
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
STA 2117+34.00 TO STA 2147+05.29

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4032-E1
SCALE AS SHOWN
SHEET NO.



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

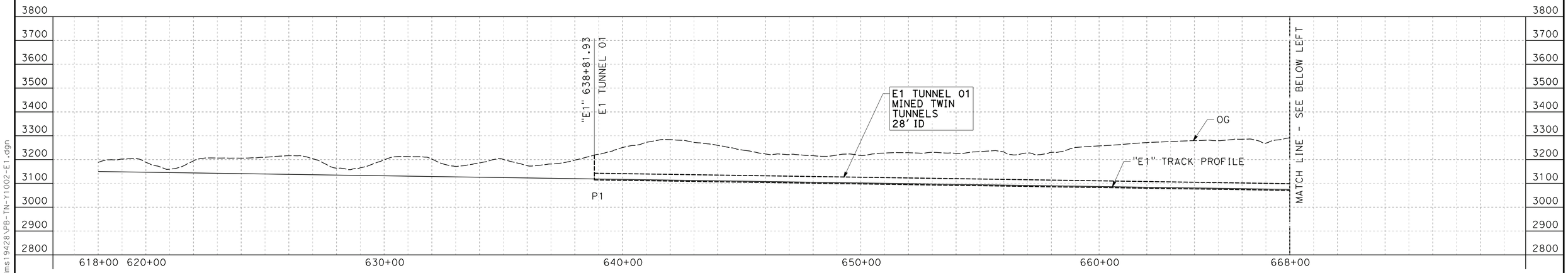
NOT FOR CONSTRUCTION

SENER

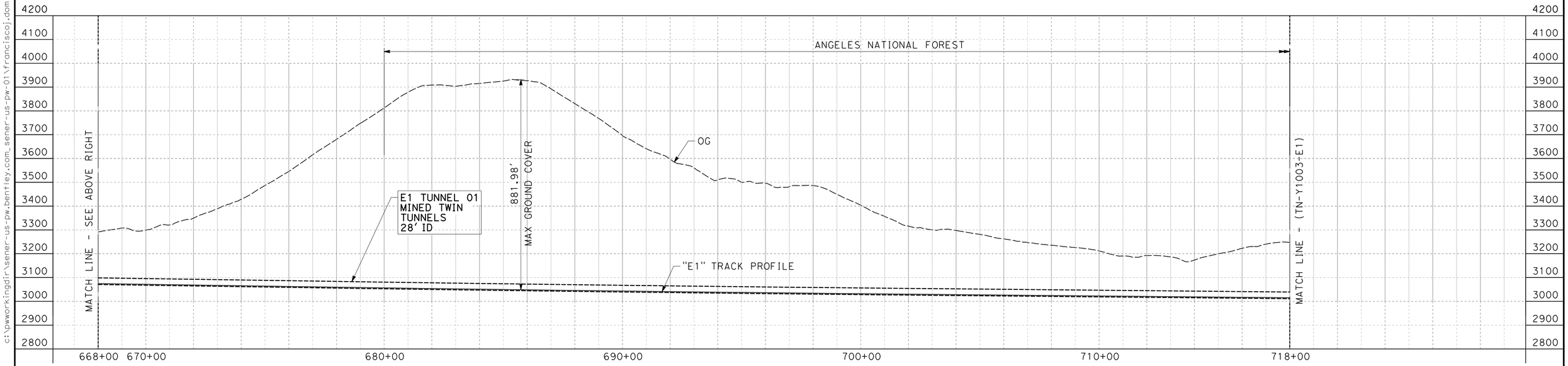
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 480+00.00 TO STA 540+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1001-E1
SCALE AS SHOWN
SHEET NO.



PROFILE



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

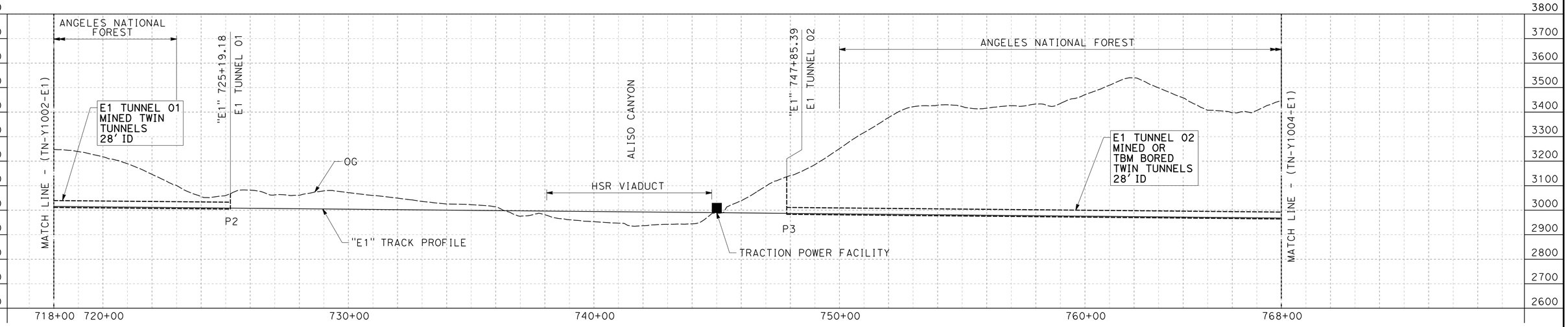
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 618+00.00 TO STA 718+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1002-E1
SCALE AS SHOWN
SHEET NO.



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET
REV 02

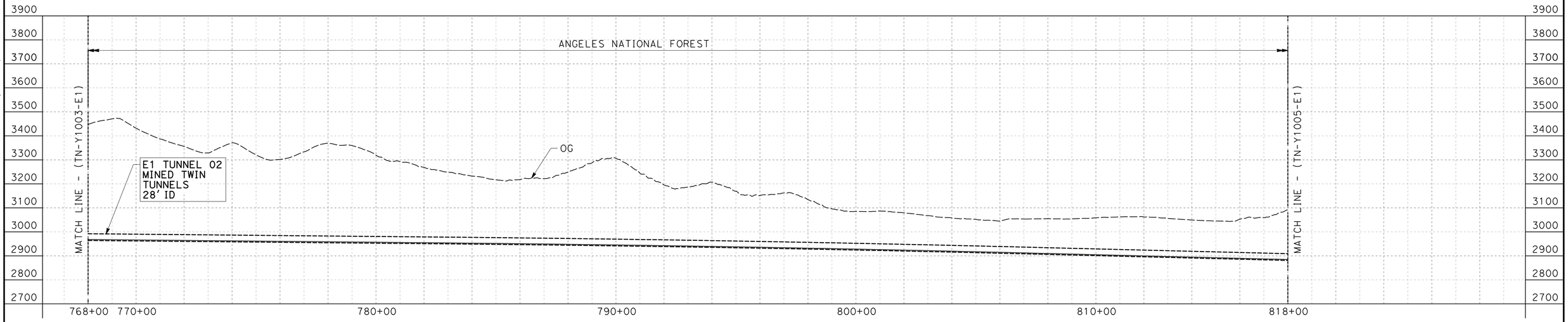
NOT FOR CONSTRUCTION

SENER

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 718+00.00 TO STA 768+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1003-E1
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

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 W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

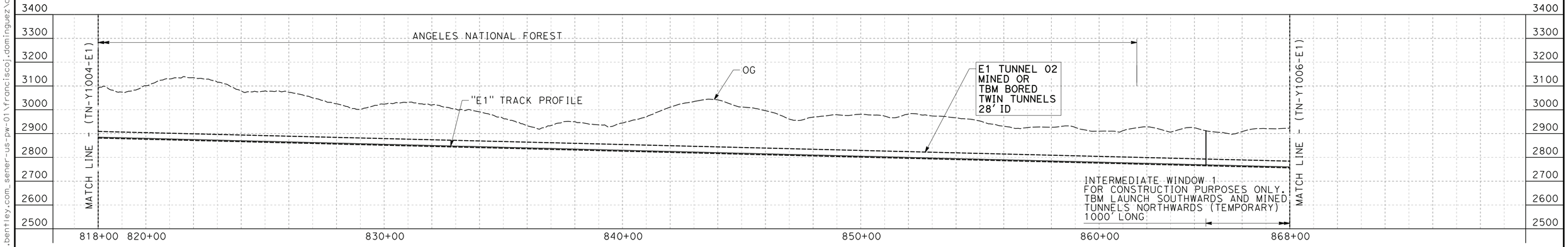
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 768+00.00 TO STA 818+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1004-E1
SCALE AS SHOWN
SHEET NO.



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

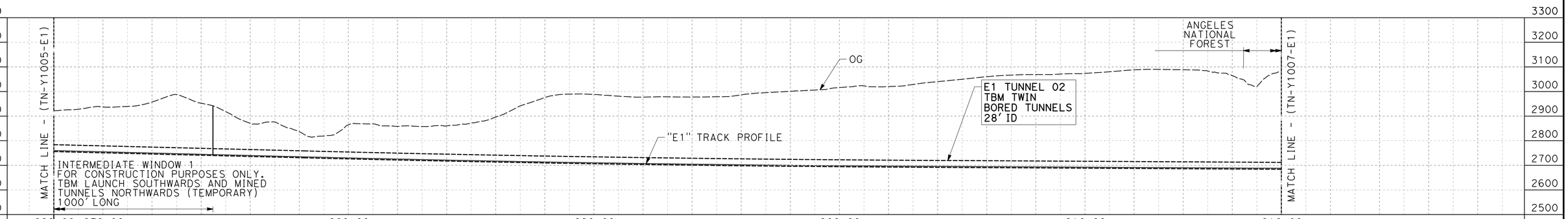
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

ALIGNMENT "E1"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 818+00.00 TO STA 868+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1005-E1
SCALE AS SHOWN
SHEET NO.



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
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DATE 04/30/2021

PEPD RECORD SET REV 02

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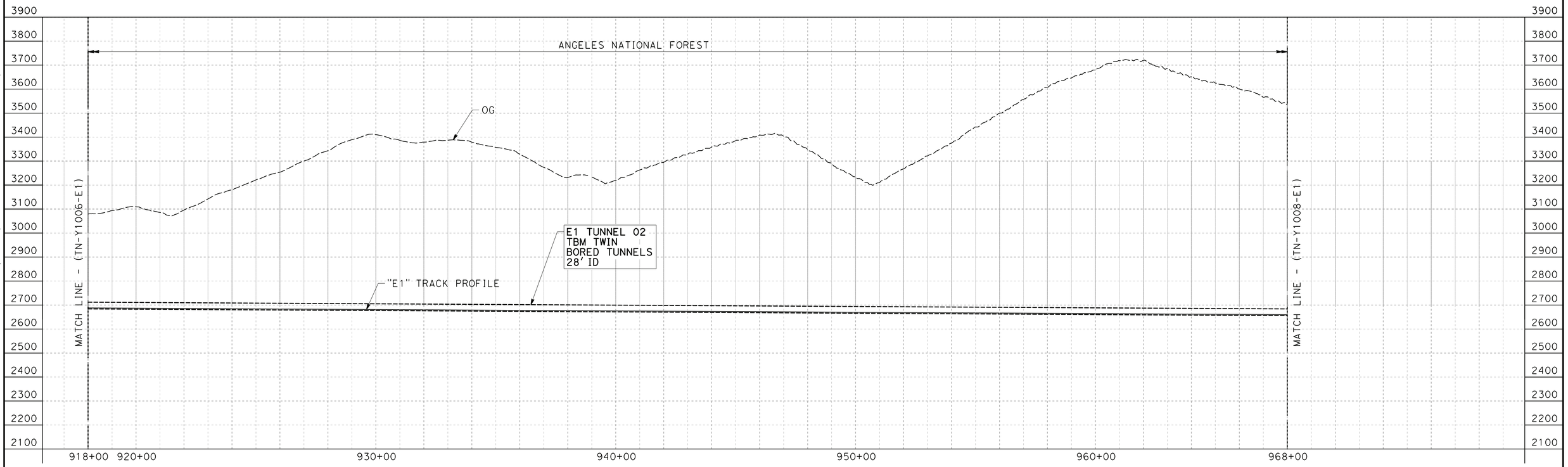
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 868+00.00 TO STA 918+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1006-E1
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:

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200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

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DATE 04/30/2021

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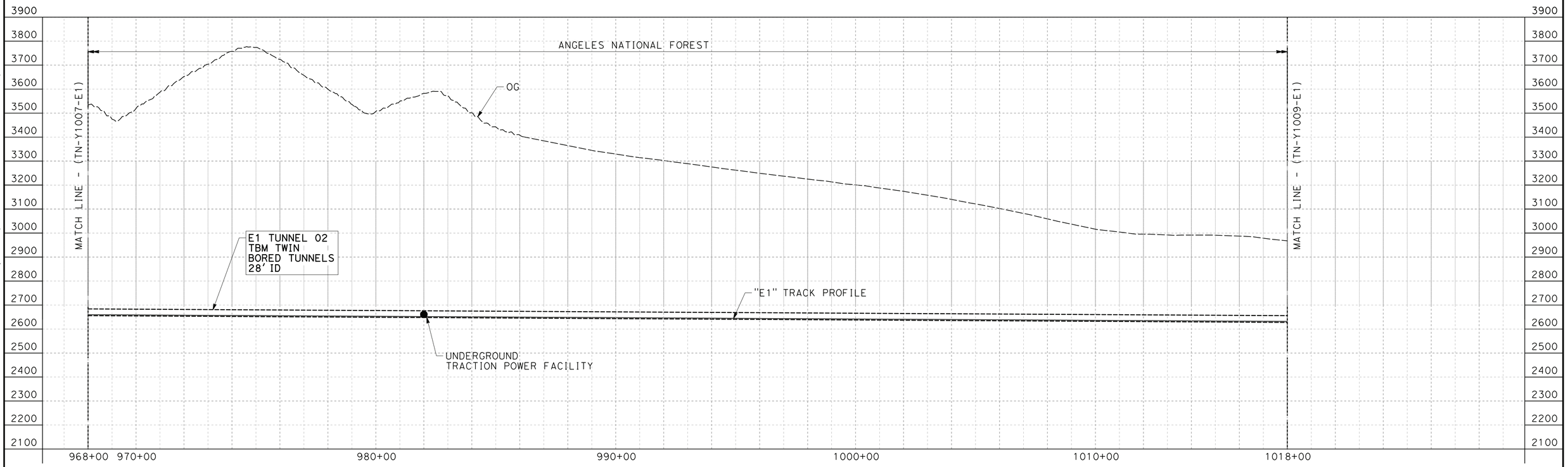
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 918+00.00 TO STA 968+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1007-E1
SCALE AS SHOWN
SHEET NO.



PROFILE

HORIZ 1"=200'

VERT 1"=200'

NOTE:

FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

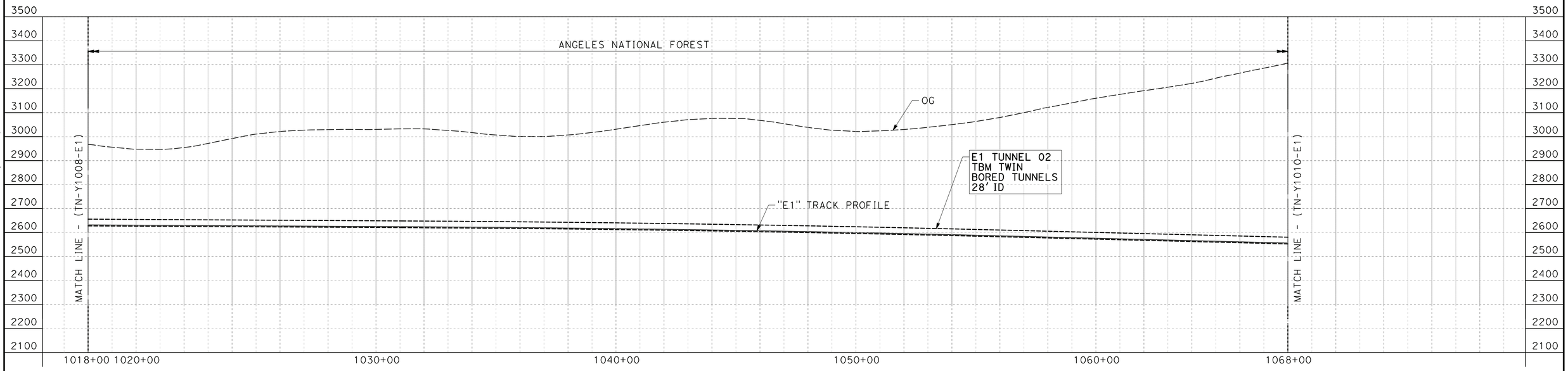
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 968+00.00 TO STA 1018+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1008-E1
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
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CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

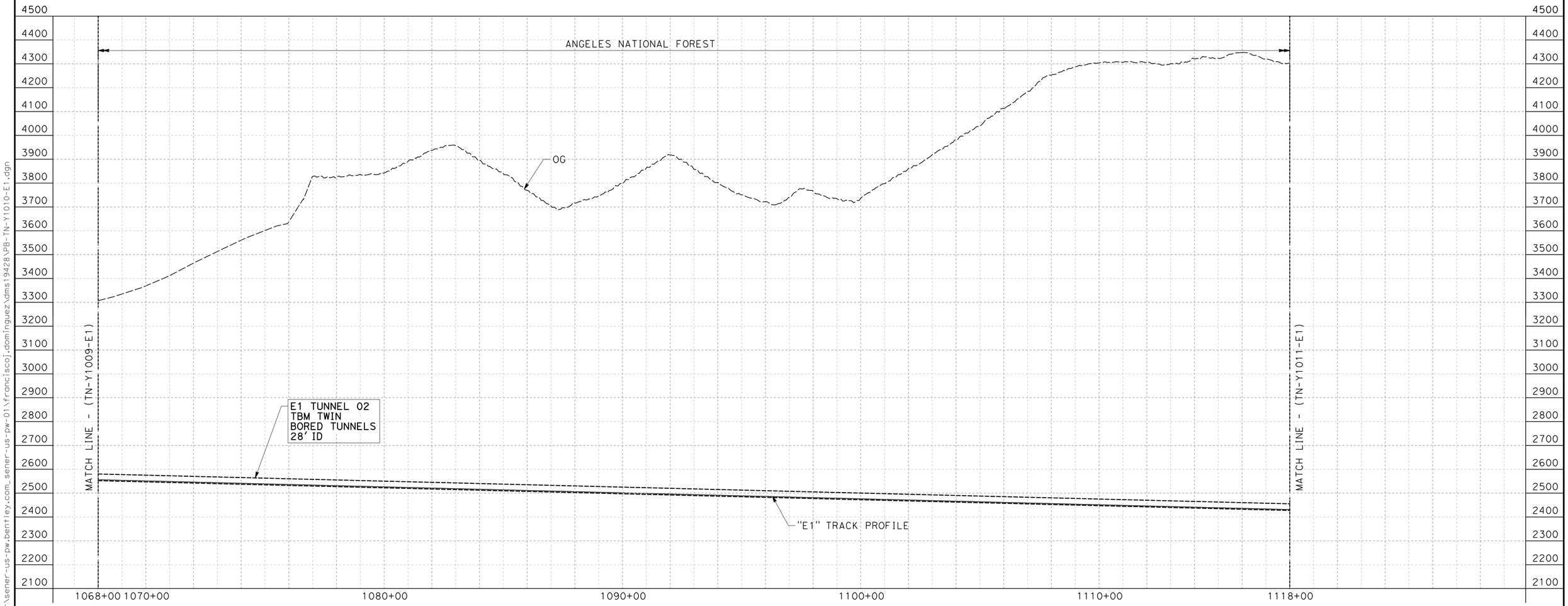
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1018+00.00 TO STA 1068+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1009-E1
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:

FAULT ZONES LIMITS APPROXIMATE ONLY

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
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CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET
REV 02

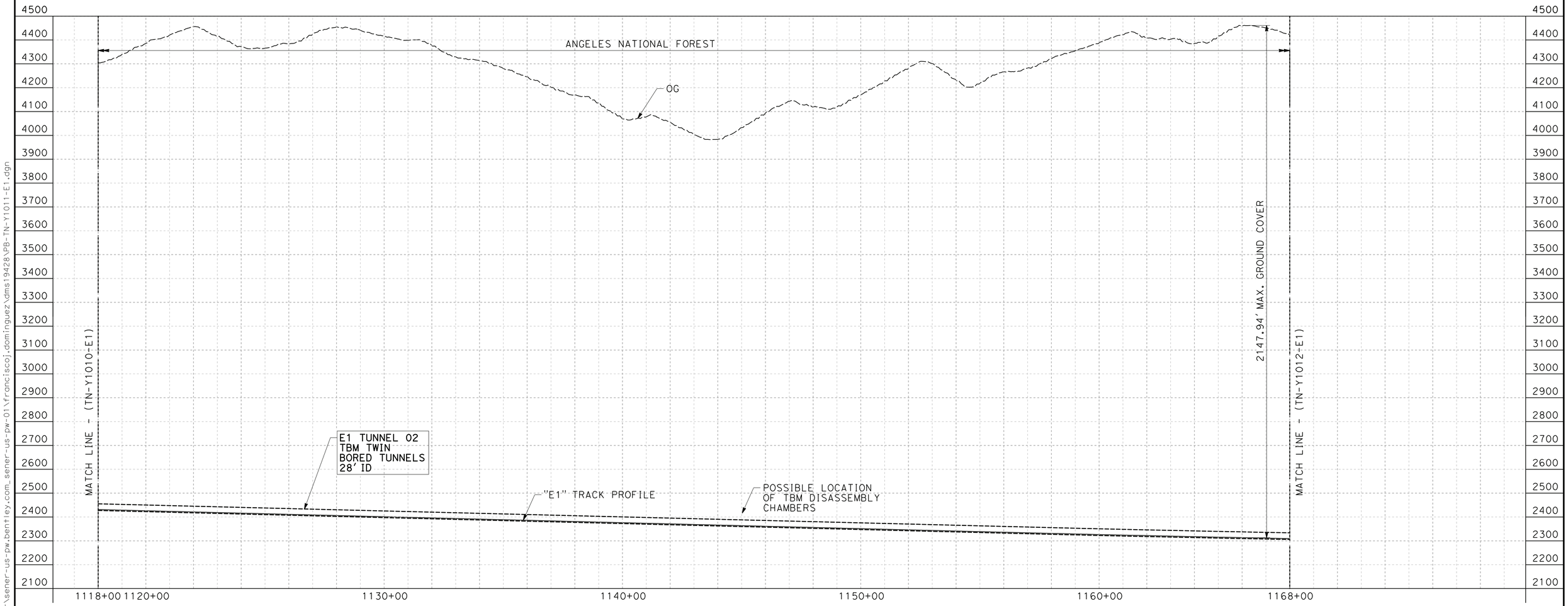
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1068+00.00 TO STA 1118+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1010-E1
SCALE AS SHOWN
SHEET NO.



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

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IN CHARGE A.RELAÑO
DATE 04/30/2021

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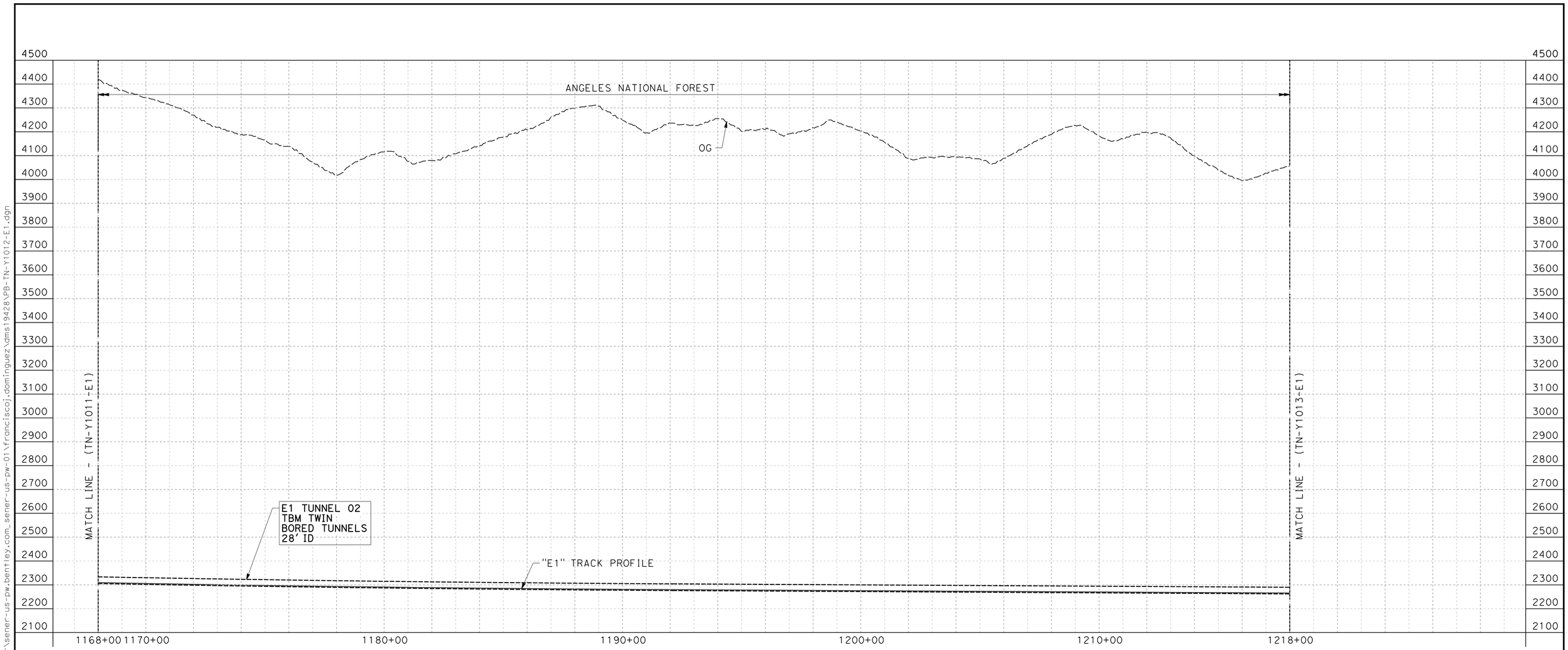
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1118+00.00 TO STA 1168+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1011-E1
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

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DATE 04/30/2021

PEPD RECORD SET REV 02

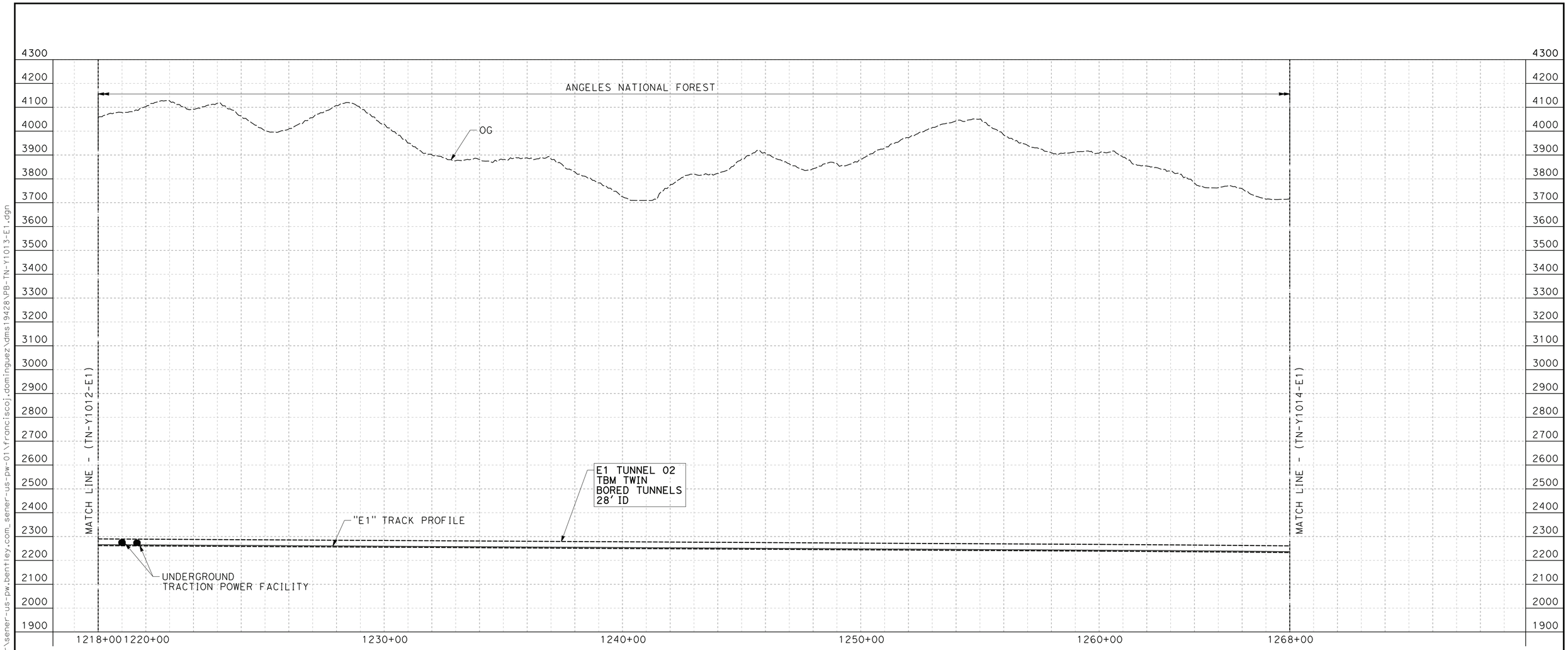
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1168+00.00 TO STA 1218+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1012-E1
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:

FAULT ZONES LIMITS APPROXIMATE ONLY

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

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DATE 04/30/2021

PEPD RECORD SET REV 02

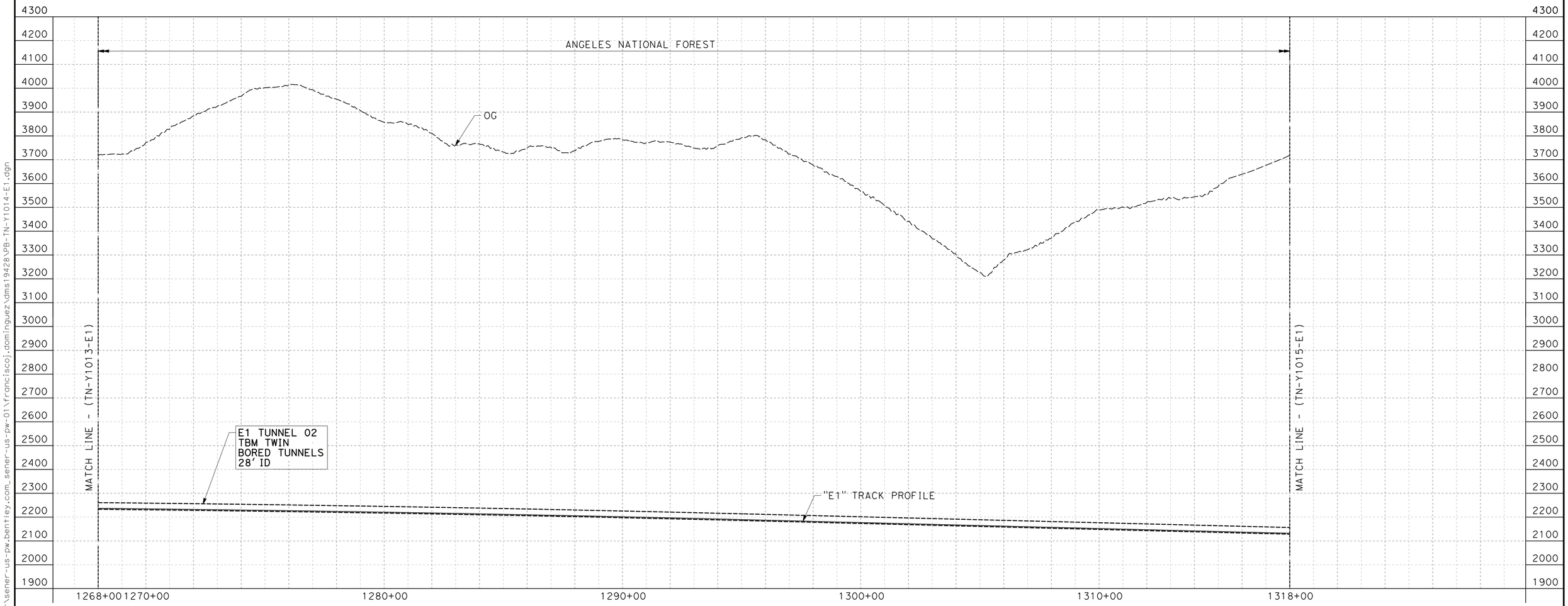
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1218+00.00 TO STA 1268+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1013-E1
SCALE AS SHOWN
SHEET NO.



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

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DATE 04/30/2021

PEPD RECORD SET REV 02

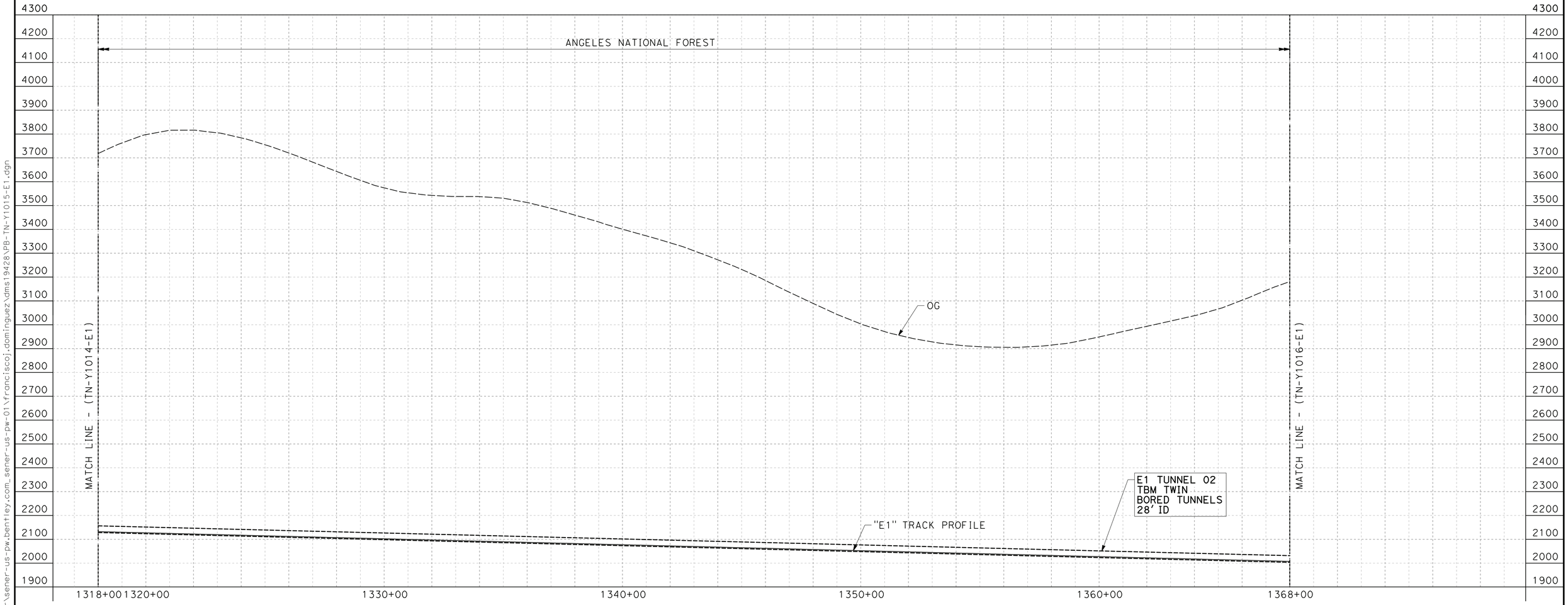
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1268+00.00 TO STA 1318+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1014-E1
SCALE AS SHOWN
SHEET NO.



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

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PEPD RECORD SET REV 02

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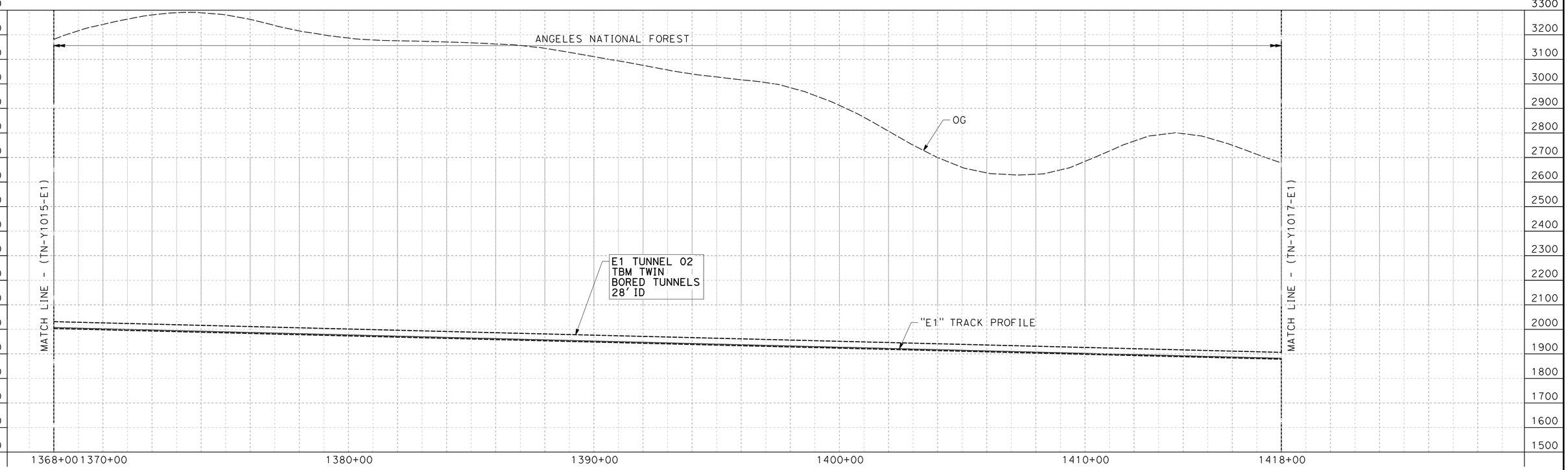
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1318+00.00 TO STA 1368+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1015-E1
SCALE AS SHOWN
SHEET NO.

0205240



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

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DATE 04/30/2021

PEPD RECORD SET REV 02

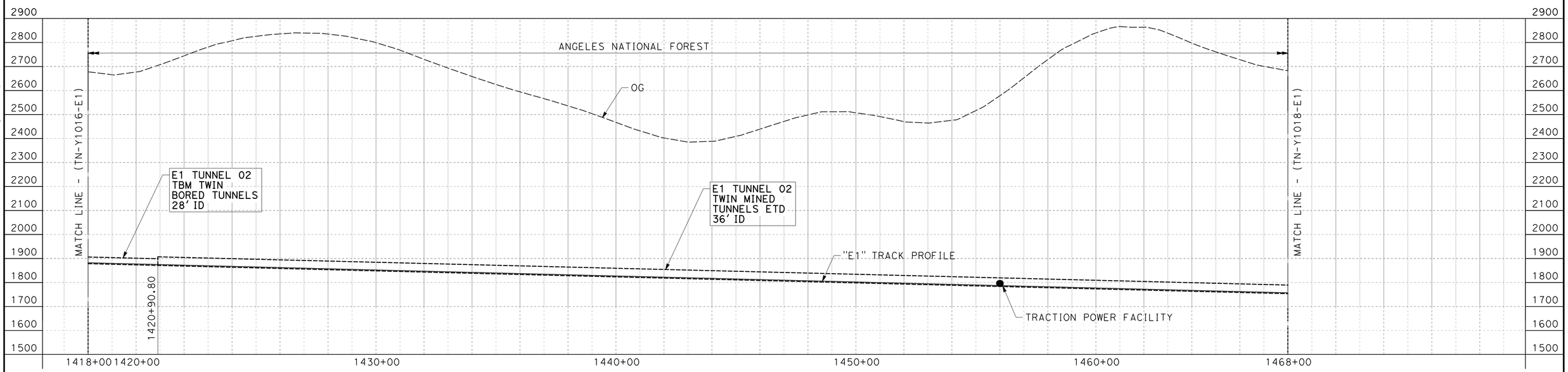
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1368+00.00 TO STA 1418+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1016-E1
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:

FAULT ZONES LIMITS APPROXIMATE ONLY

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
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DATE 04/30/2021

PEPD RECORD SET REV 02

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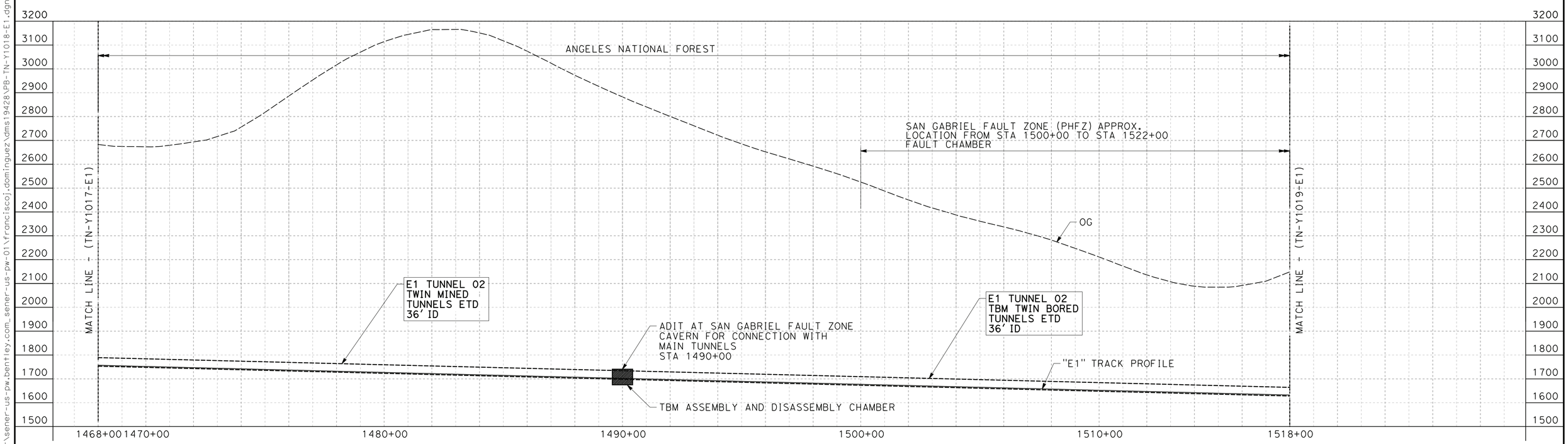
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1418+00.00 TO STA 1468+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1017-E1
SCALE AS SHOWN
SHEET NO.



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

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DATE 04/30/2021

PEPD RECORD SET REV 02

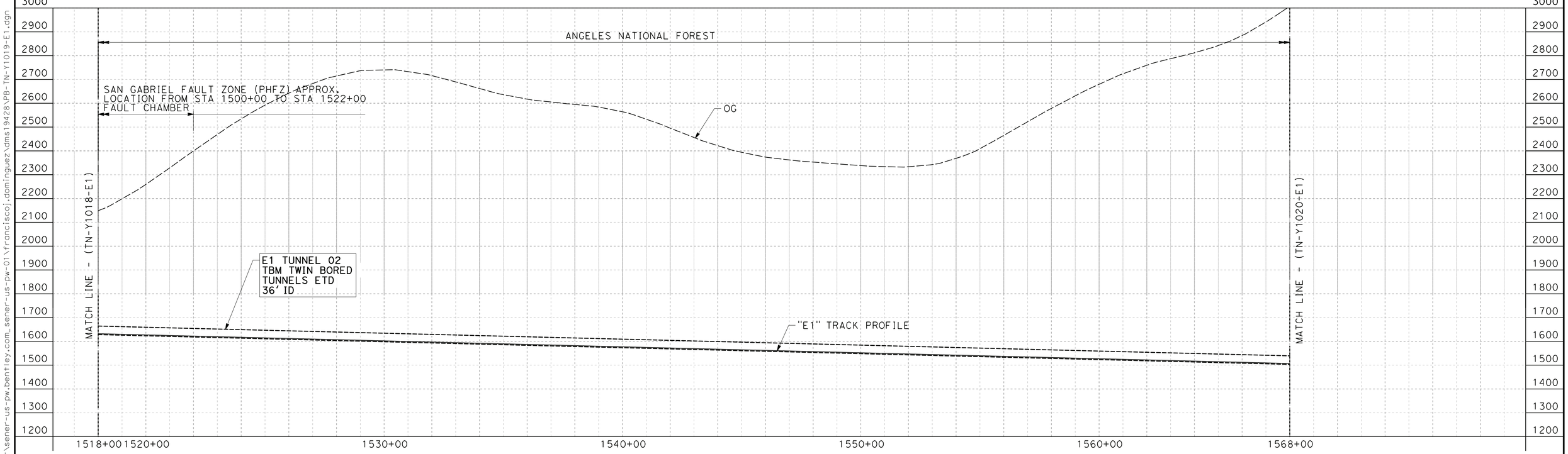
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1468+00.00 TO STA 1518+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1018-E1
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
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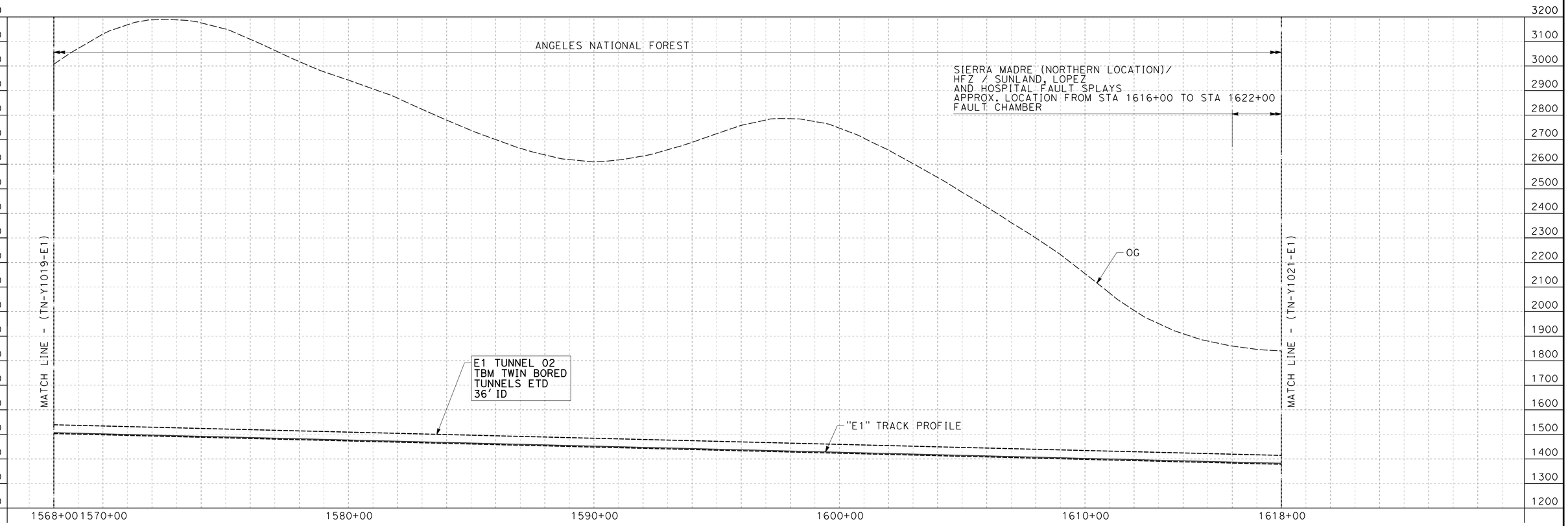
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1518+00.00 TO STA 1568+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1019-E1
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:
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200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

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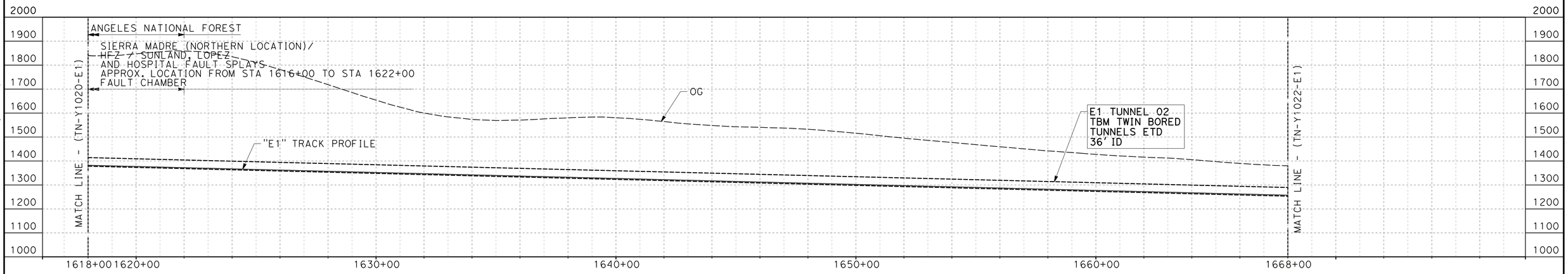
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1568+00.00 TO STA 1618+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1020-E1
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:

FAULT ZONES LIMITS APPROXIMATE ONLY

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

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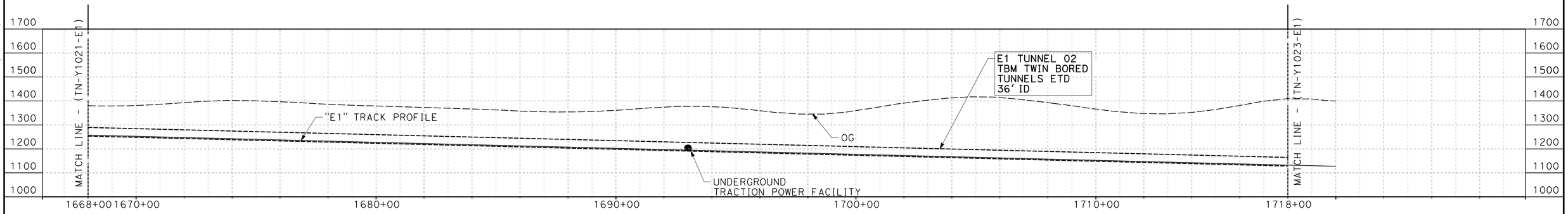
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1618+00.00 TO STA 1668+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1021-E1
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:

FAULT ZONES LIMITS APPROXIMATE ONLY

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 W.GUO
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DATE 04/30/2021

PEPD RECORD SET
REV 02

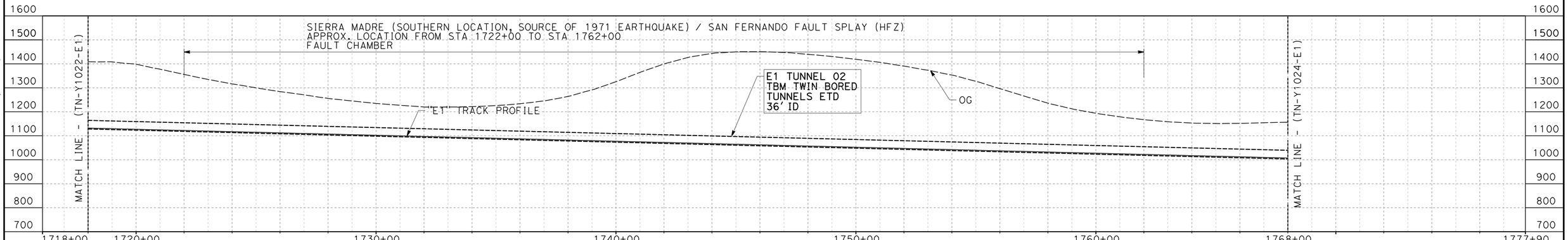
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1668+00.00 TO STA 1718+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1022-E1
SCALE AS SHOWN
SHEET NO.



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

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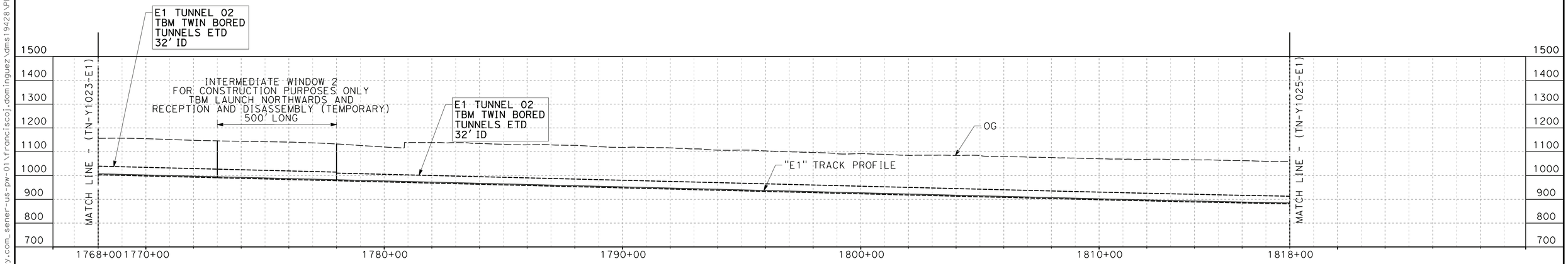
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1718+00.00 TO STA 1768+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1023-E1
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:

FAULT ZONES LIMITS APPROXIMATE ONLY

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 W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1768+00.00 TO STA 1818+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1024-E1
SCALE AS SHOWN
SHEET NO.

0205240

24/05/2021 20:15:09

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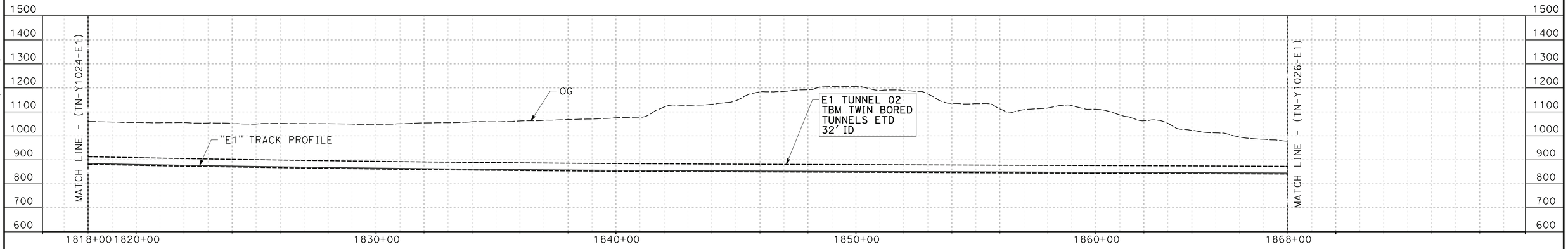


PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

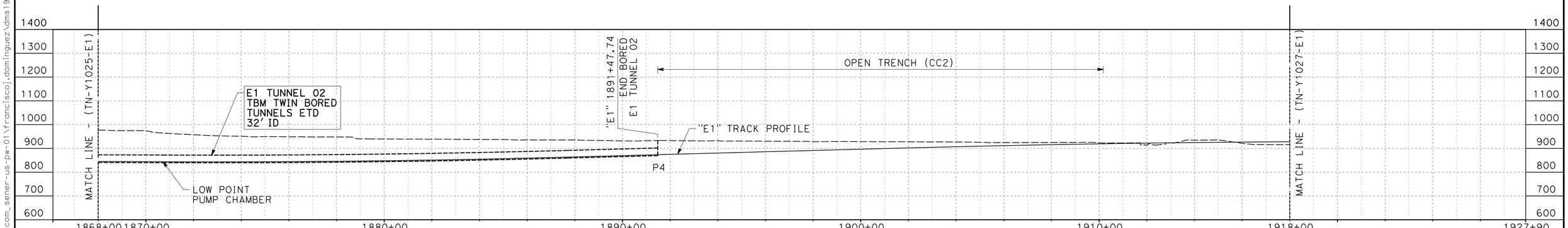
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1818+00.00 TO STA 1868+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1025-E1
SCALE AS SHOWN
SHEET NO.



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

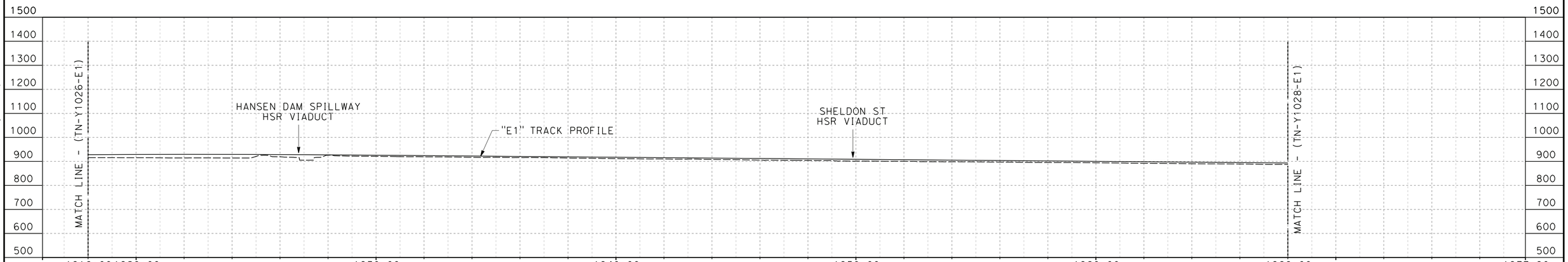
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1868+00.00 TO STA 1918+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1026-E1
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:

FAULT ZONES LIMITS APPROXIMATE ONLY

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 W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

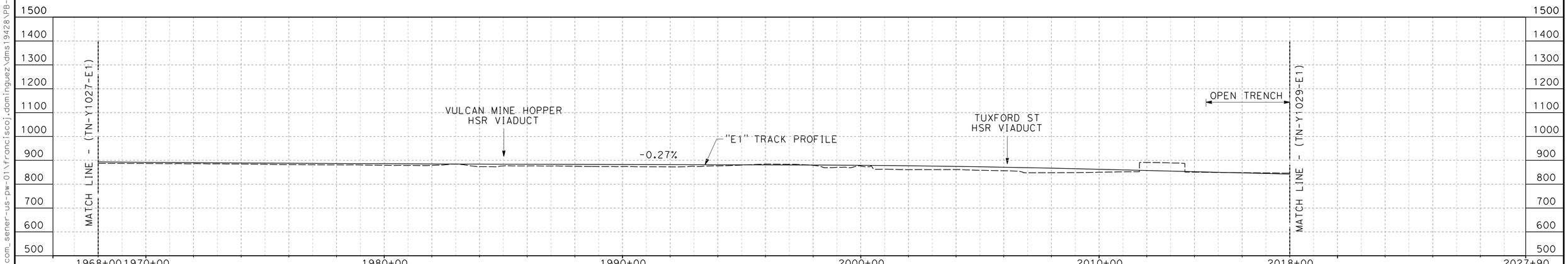
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1918+00.00 TO STA 1968+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1027-E1
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:

FAULT ZONES LIMITS APPROXIMATE ONLY

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 W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

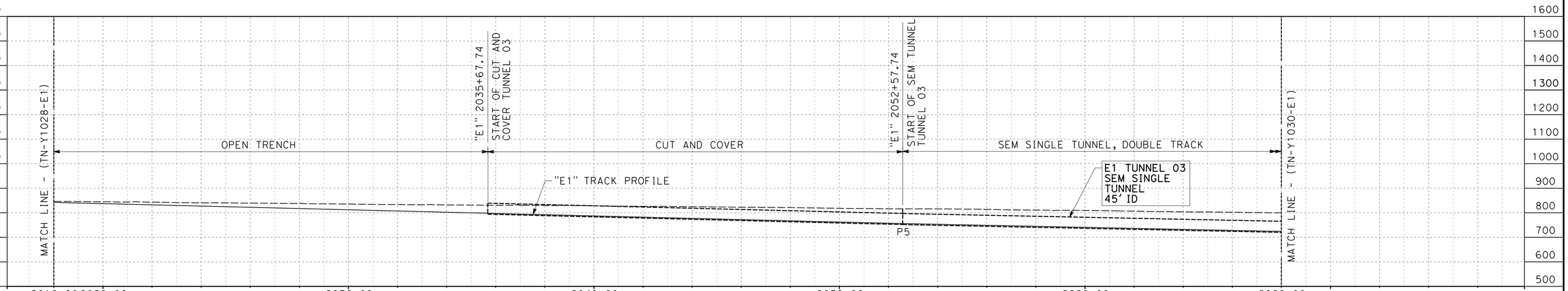
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1968+00.00 TO STA 2018+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1028-E1
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:

FAULT ZONES LIMITS APPROXIMATE ONLY

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 W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 2018+00.00 TO STA 2068+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1029-E1
SCALE AS SHOWN
SHEET NO.

0205240

24/05/2021 20:16:14

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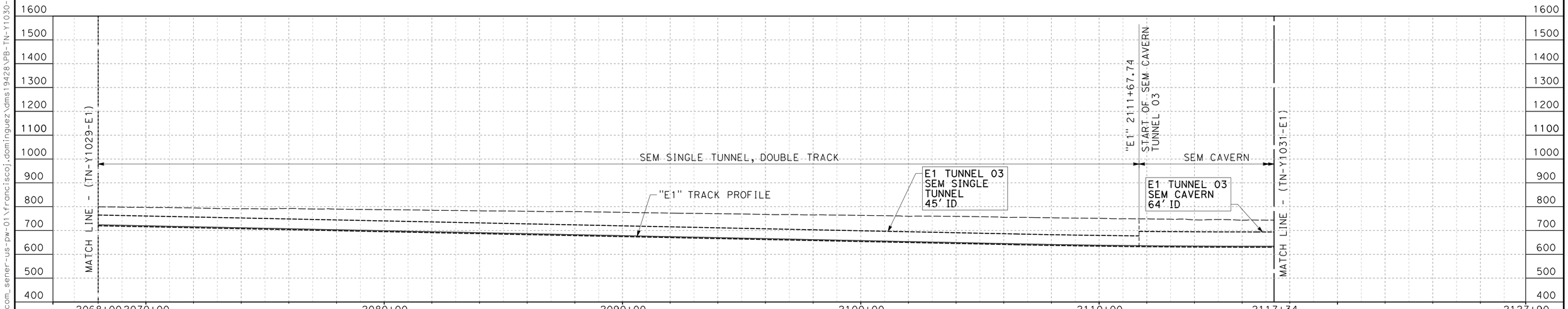


PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET
REV 02

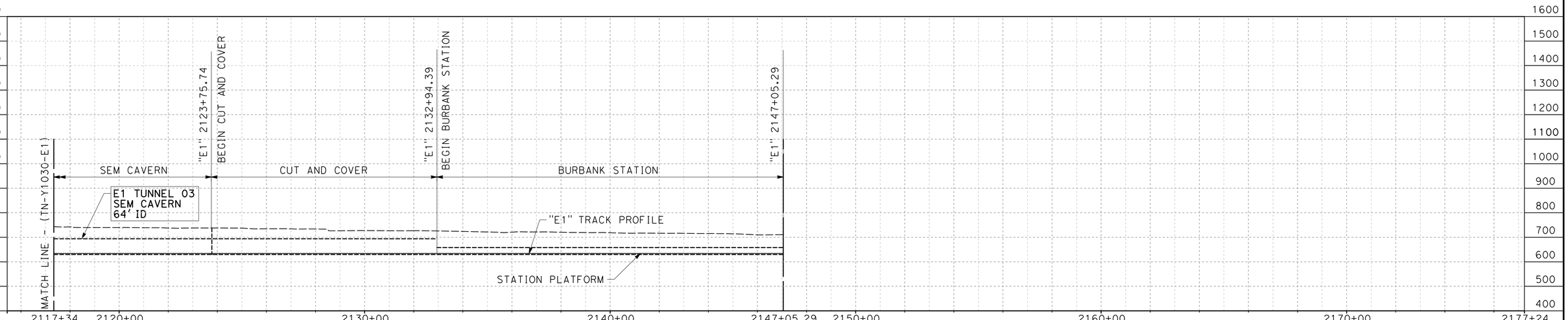
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 2068+00.00 TO STA 2117+34.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1030-E1
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:

FAULT ZONES LIMITS APPROXIMATE ONLY

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 W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 2117+34.00 TO 2147+05.29

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1031-E1
SCALE AS SHOWN
SHEET NO.

0205240

24/05/2021 20:16:40

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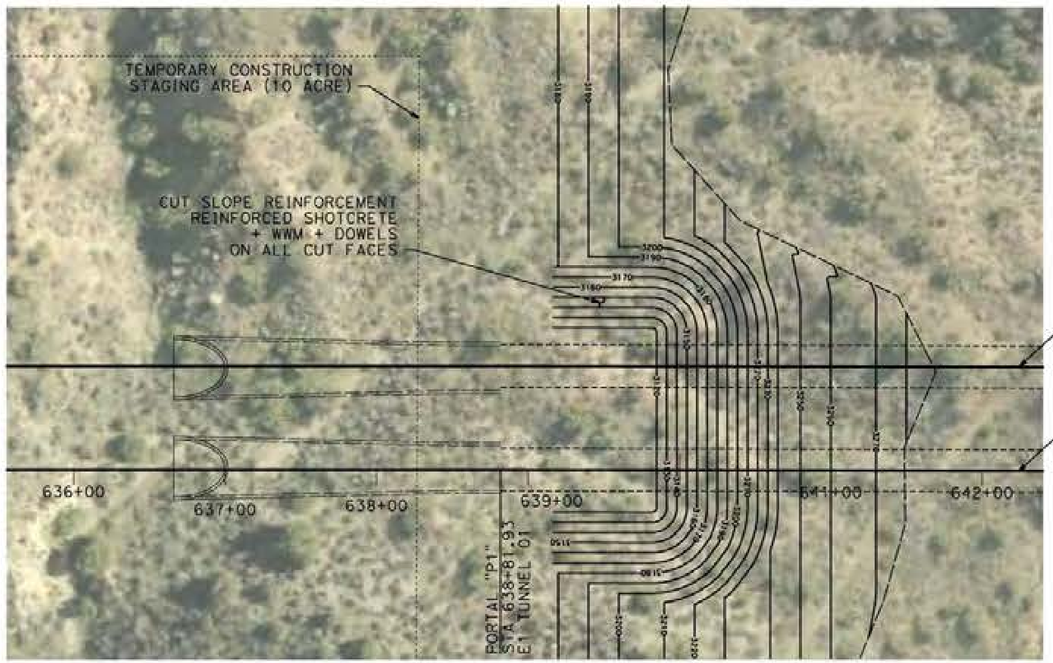
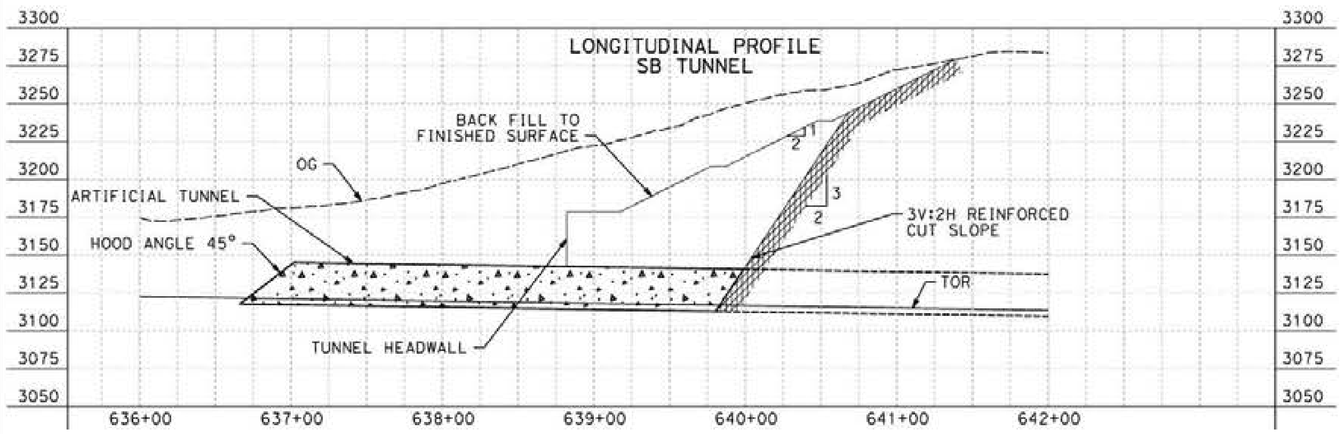


PLAN



PROFILE

NOTE :

1. EXAMPLE OF ROCK CUT SLOPE REINFORCEMENT AT PORTAL MOUTH
   - 2 IN OF SHOTCRETE WITH STEEL FIBERS (85 LBS/CUBIC YARD)
   - 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	71,369 CY
FILL VOLUME	38,134 CY
CUT SLOPE SURFACE	46,894 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 W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

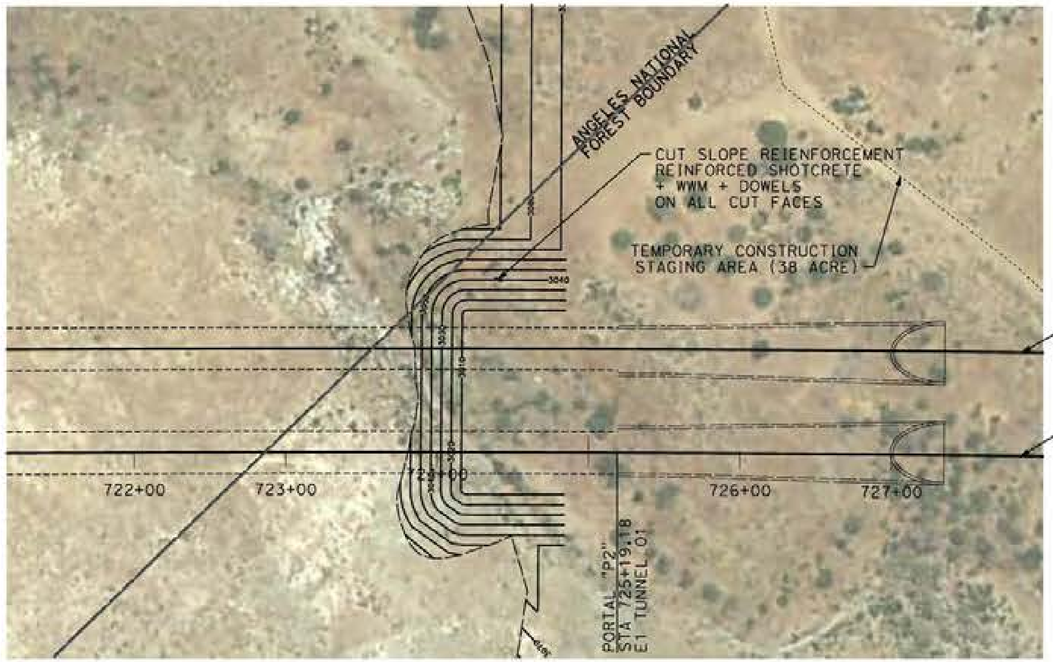
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

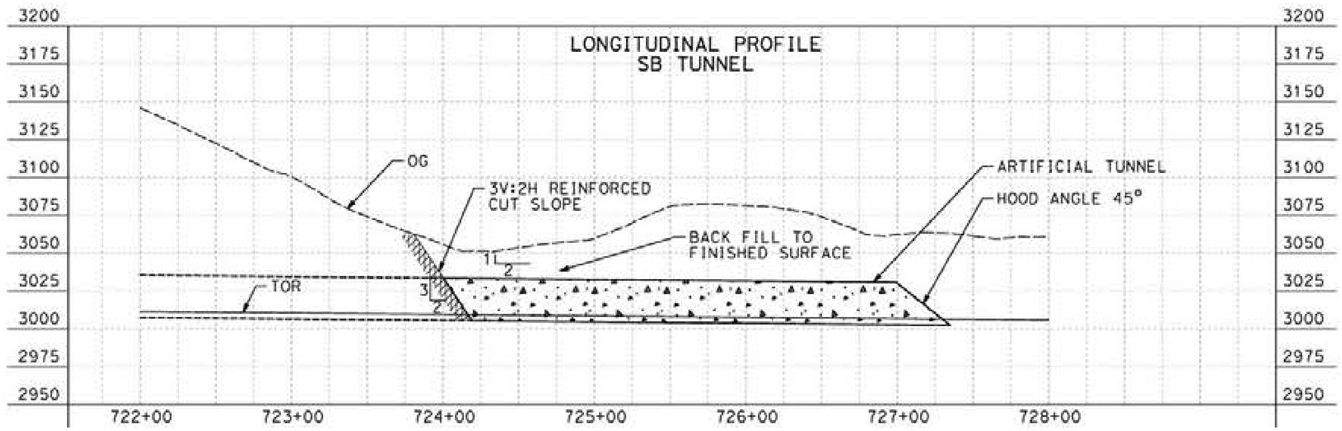
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PORTAL 1
PLAN AND PROFILE FOR CONSTRUCTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-D7001-E1
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 (85 LBS/CUBIC YARD)
   - 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	15,372 CY
FILL VOLUME	4,578 CY
CUT SLOPE SURFACE	24,497 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 W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

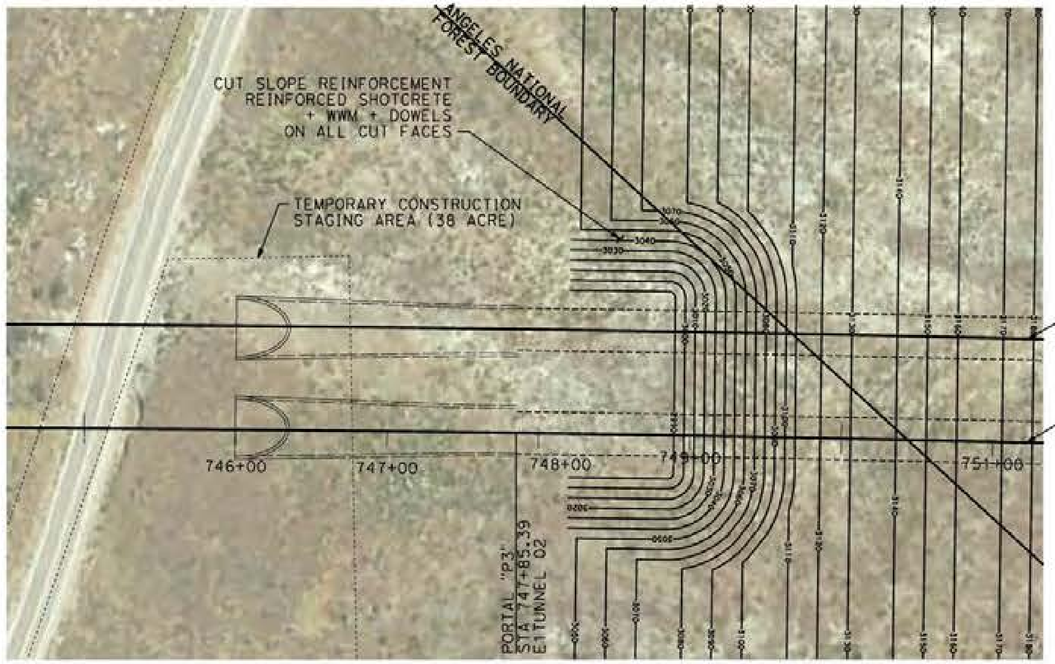
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

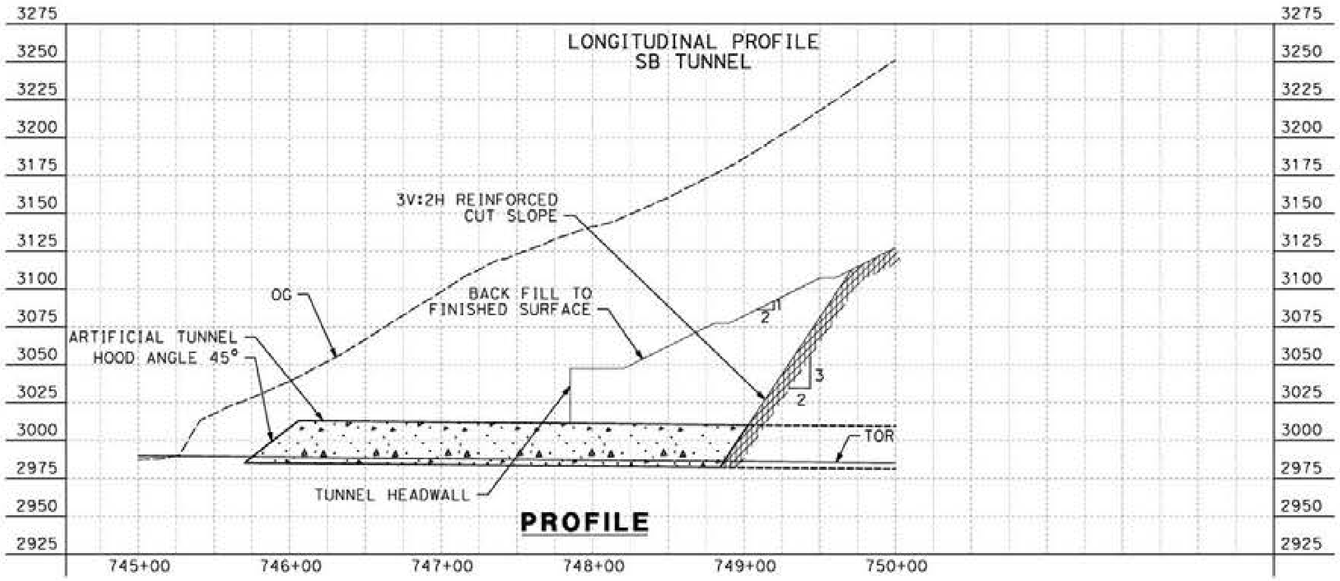
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PORTAL 2
PLAN AND PROFILE FOR CONSTRUCTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-D7002-E1
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 (85 LBS/CUBIC YARD)
   - 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	227,854 CY
FILL VOLUME	38,132 CY
CUT SLOPE SURFACE	46,894 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 W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PORTAL 3
PLAN AND PROFILE FOR CONSTRUCTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-D7003-E1
SCALE AS SHOWN
SHEET NO.

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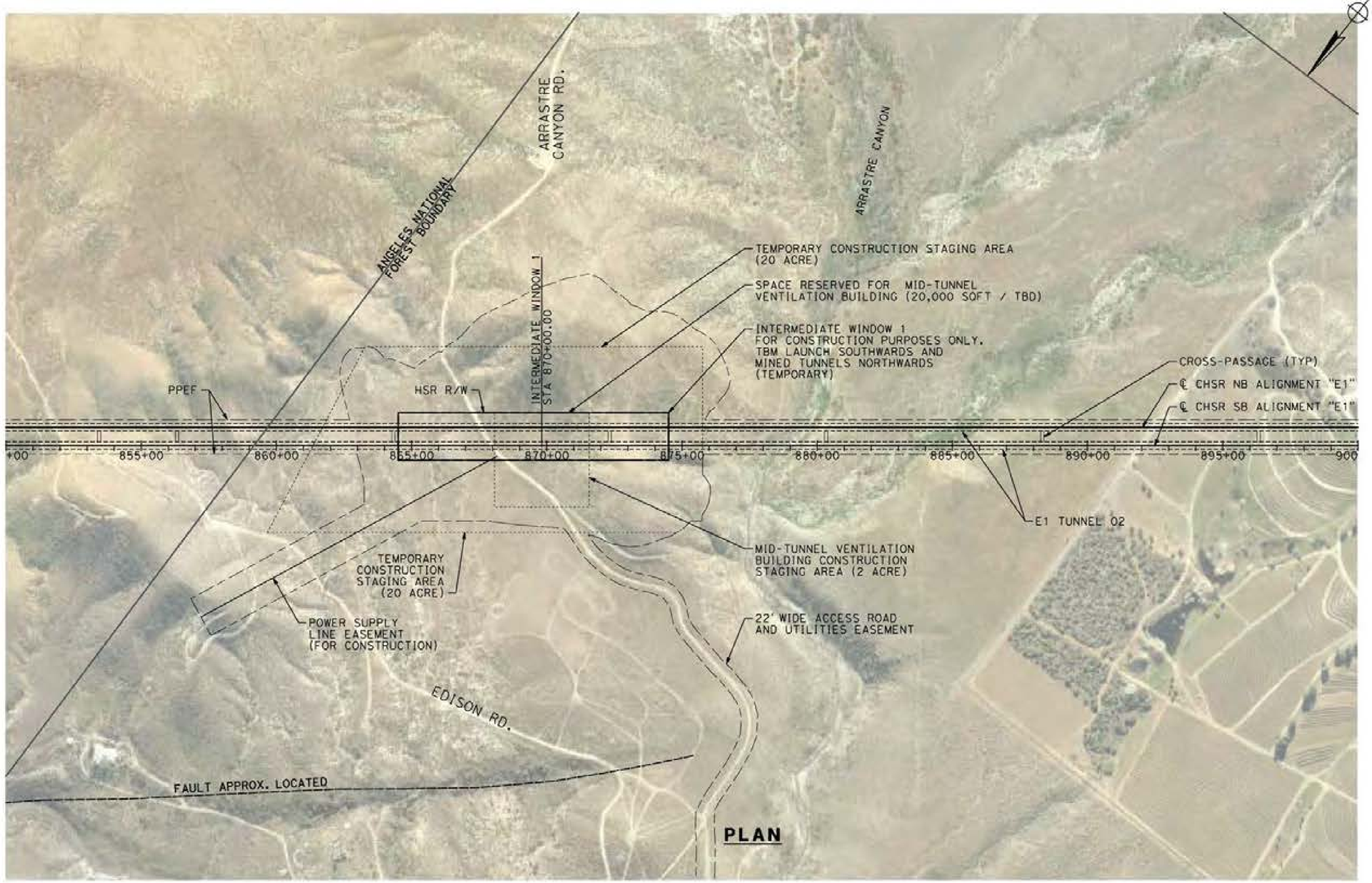

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REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

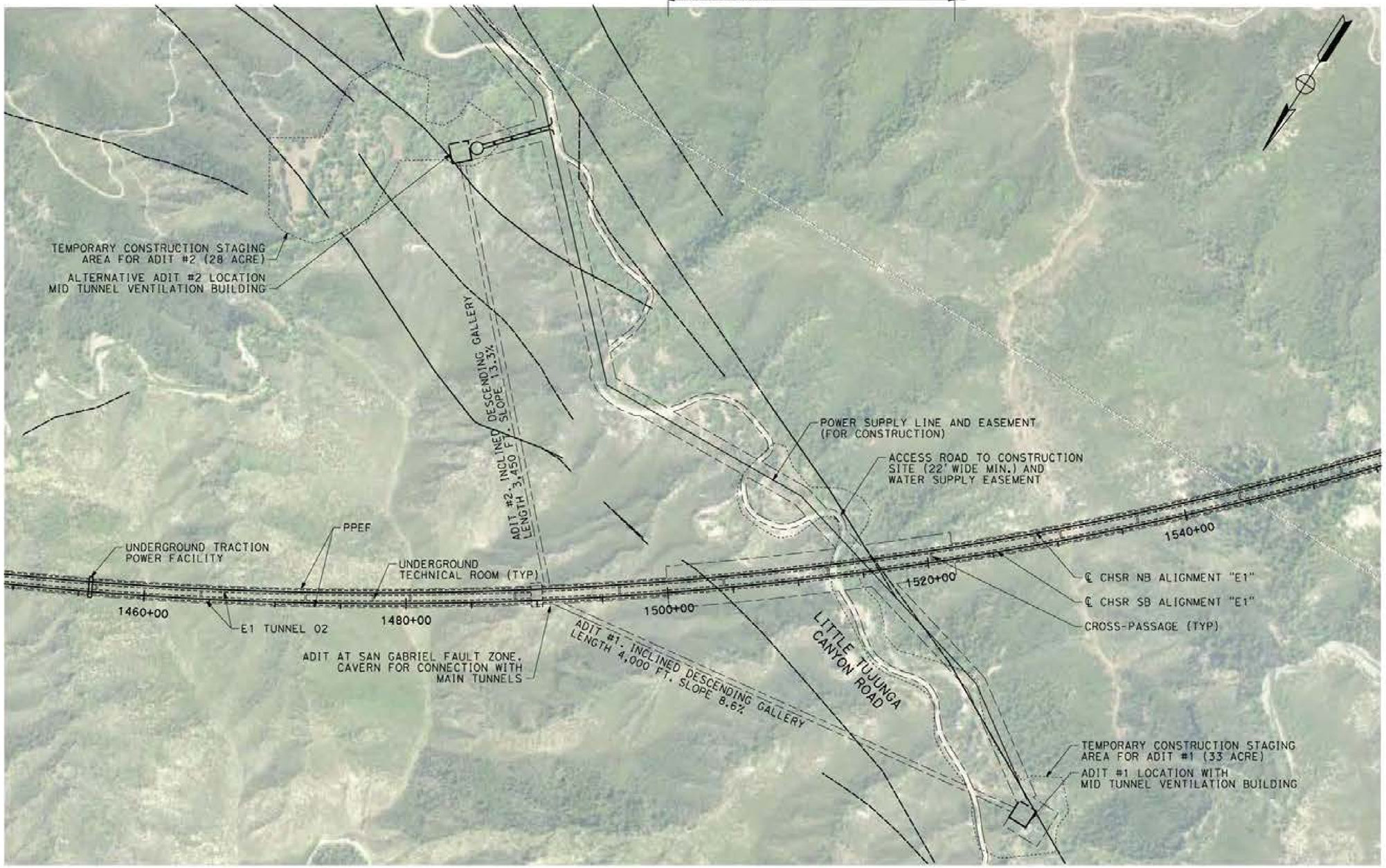
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
INTERMEDIATE WINDOW 1

CONTRACT NO. HSR14-42
DRAWING NO. TN-D5001-E1
SCALE AS SHOWN
SHEET NO.



NOTE:

1. ADIT #1 AND ADIT #2 ARE OPTIONS TO CHOOSE FROM.
2. LOCATION OF CAVERN SHOULD BE OUTSIDE FAULT ZONE, IN SOUND ROCK. VERIFICATION BOREHOLES NEEDED TO CONFIRM LOCATION.

400 0 400 800
1"=400'

PLAN

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E1"

PLAN
POTENTIAL ADIT LOCATIONS

CONTRACT NO. HSR14-42
DRAWING NO. TN-D5002-E1
SCALE AS SHOWN
SHEET NO.

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25/05/2021 9:56:05
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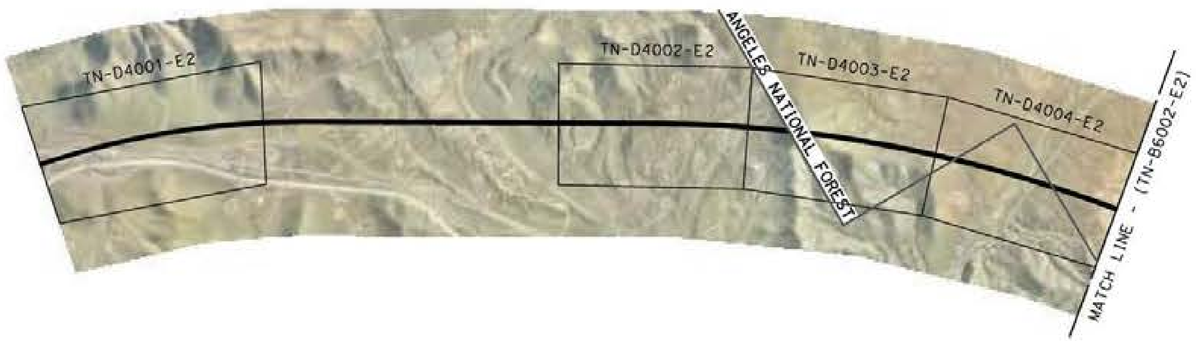
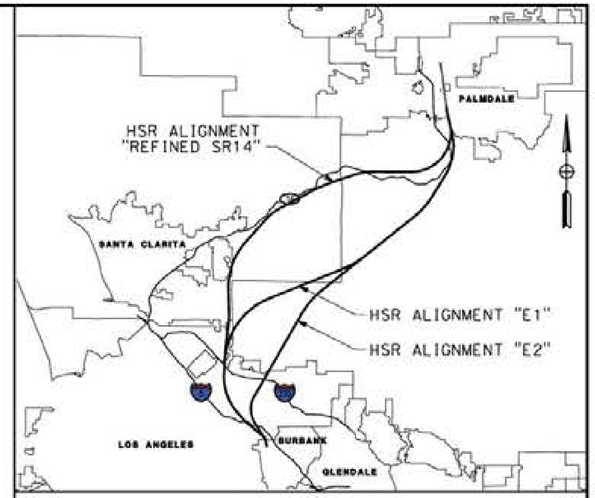




VICINITY MAP

2000 0 2000 4000
1"=2000'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E. VELASCO
DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W. GUO
IN CHARGE: A. RELAÑO
DATE: 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

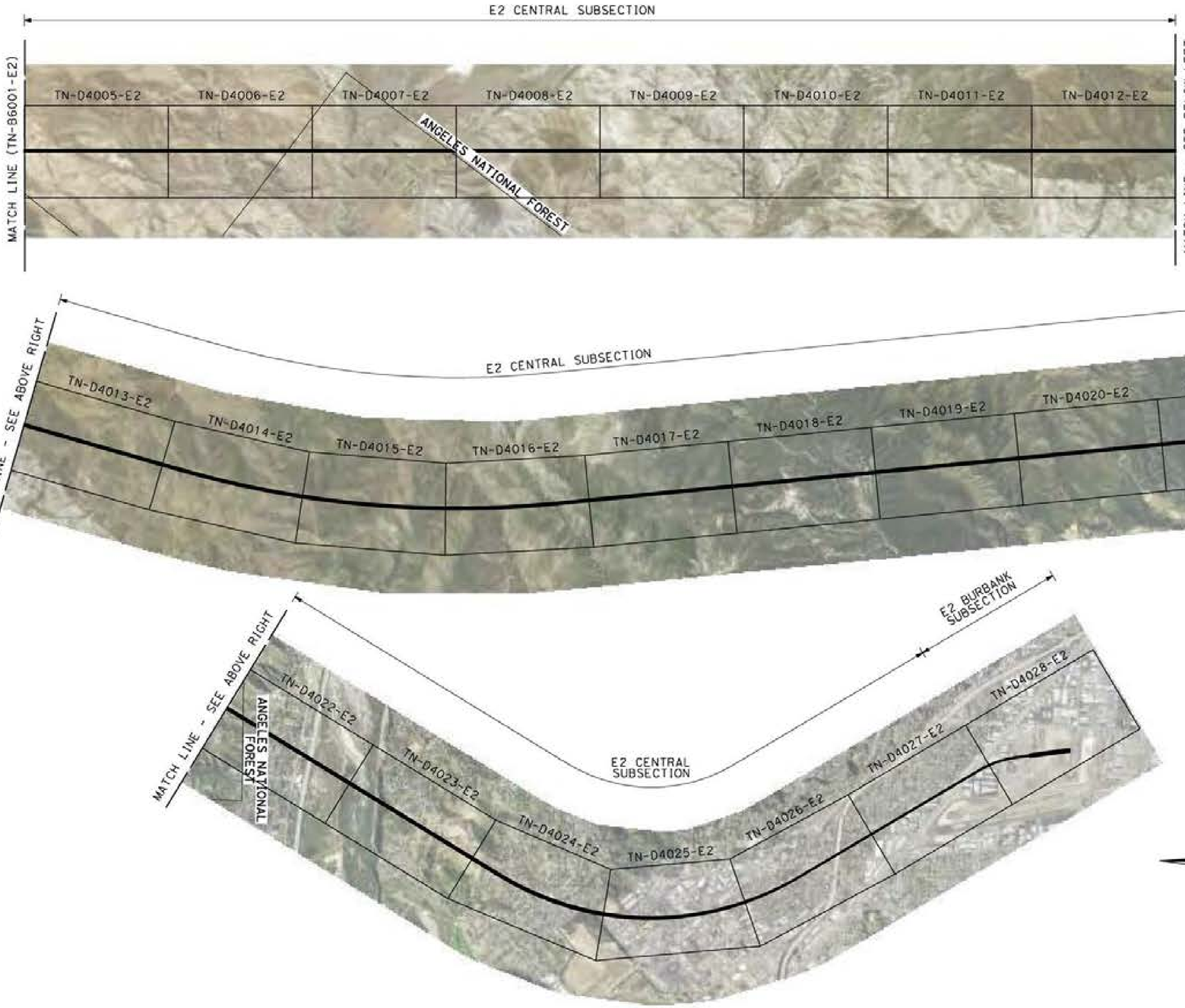
SENER

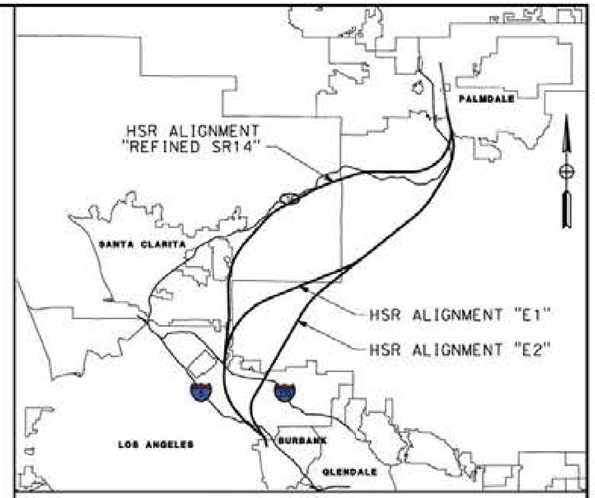
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

HIGH SPEED RAIL TUNNEL PLANS
KEY MAP 1 OF 2

CONTRACT NO. HSR14-42
DRAWING NO. TN-B6001-E2
SCALE AS SHOWN
SHEET NO.





VICINITY MAP

2000 0 2000 4000
1"=2000'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E. VELASCO
DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W. GUO
IN CHARGE: A. RELAÑO
DATE: 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

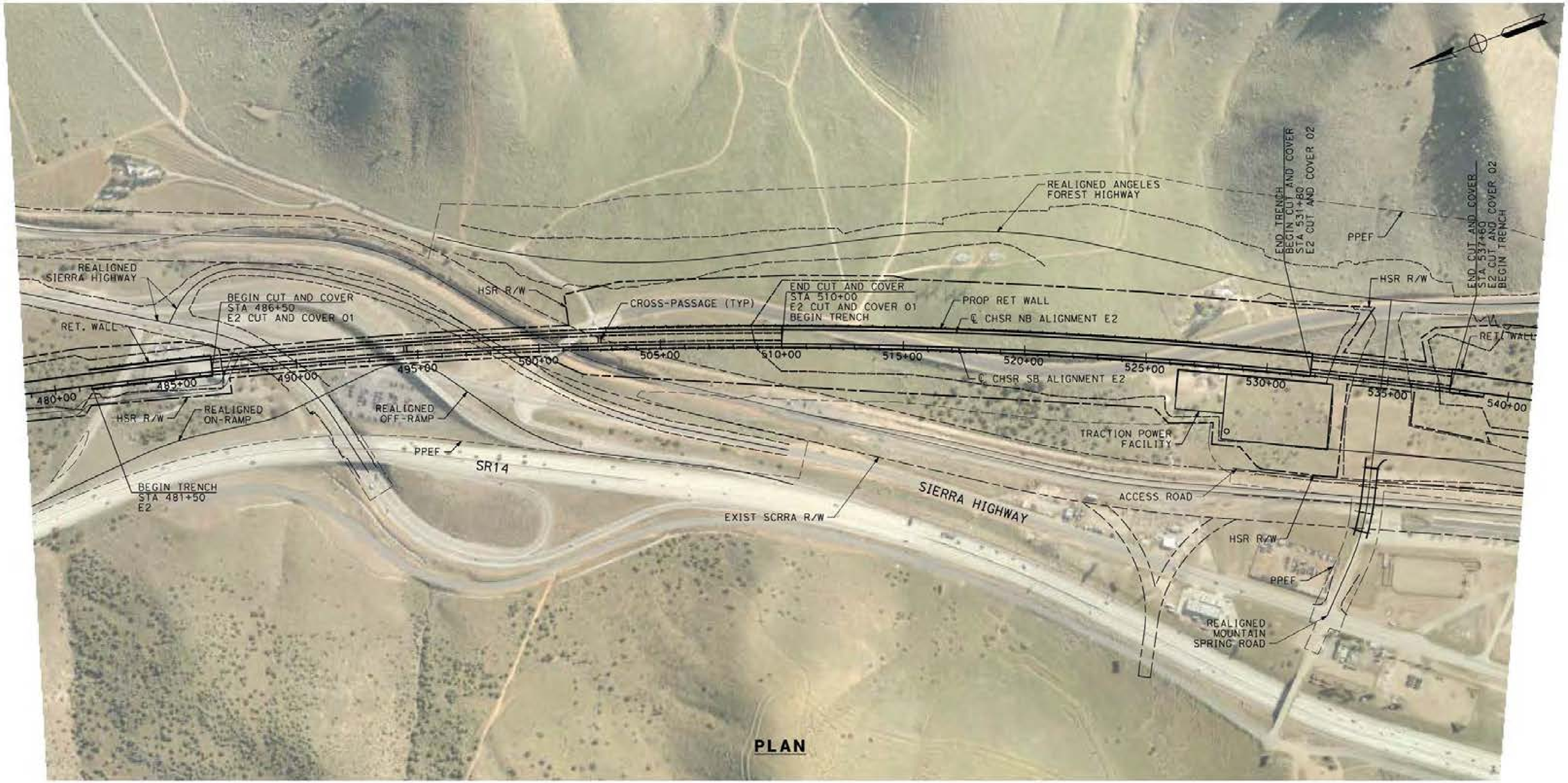
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"
KEY MAP
HIGH SPEED RAIL TUNNEL PLANS
KEY MAP 2 OF 2

CONTRACT NO. HSR14-42
DRAWING NO. TN-B6002-E2
SCALE AS SHOWN
SHEET NO.

cc1



PLAN

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

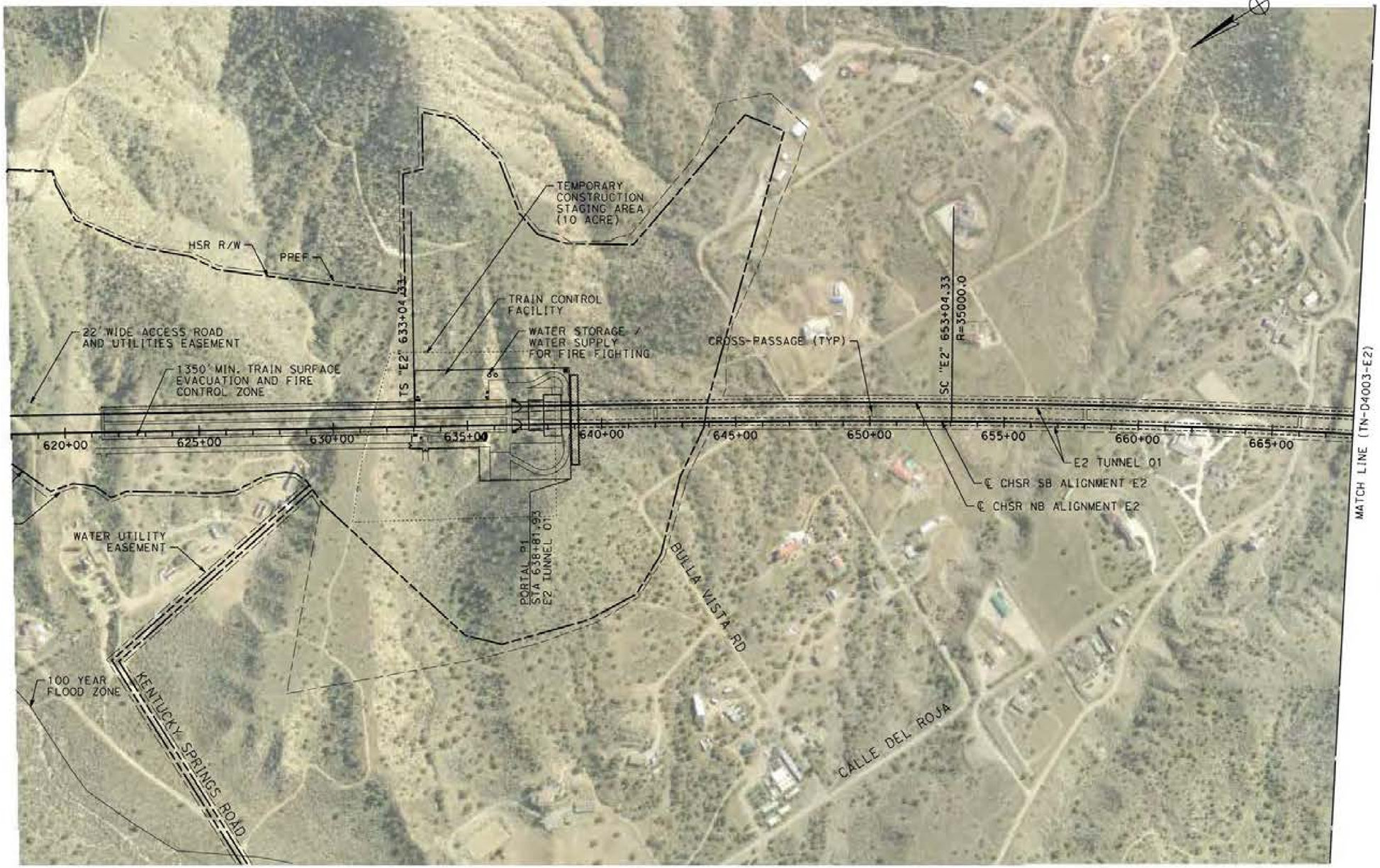
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PLAN
STA 480+00.00 TO STA 540+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4001-E2
SCALE AS SHOWN
SHEET NO.

TUNNEL 01
PORTAL P1



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
   - DETENTION POND NOT INCLUDED. PORTAL P1 IS HIGH POINT.

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E. VELASCO
DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W. GUO
IN CHARGE: A. RELAÑO
DATE: 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

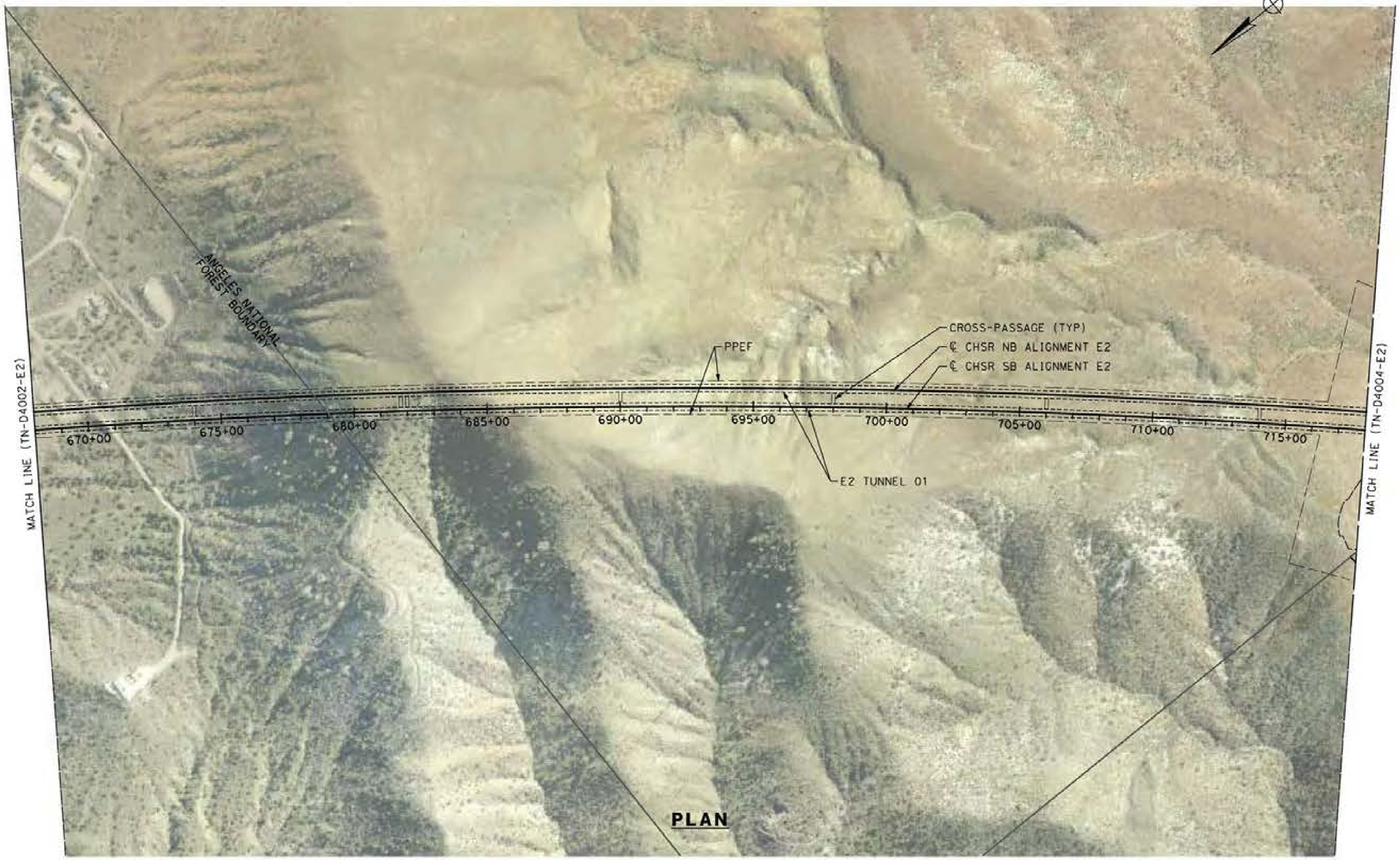
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PLAN
STA 618+00.00 TO STA 668+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4002-E2
SCALE AS SHOWN
SHEET NO.

TUNNEL 01



PLAN

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E. VELASCO
DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W. GUO
IN CHARGE: A. RELAÑO
DATE: 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

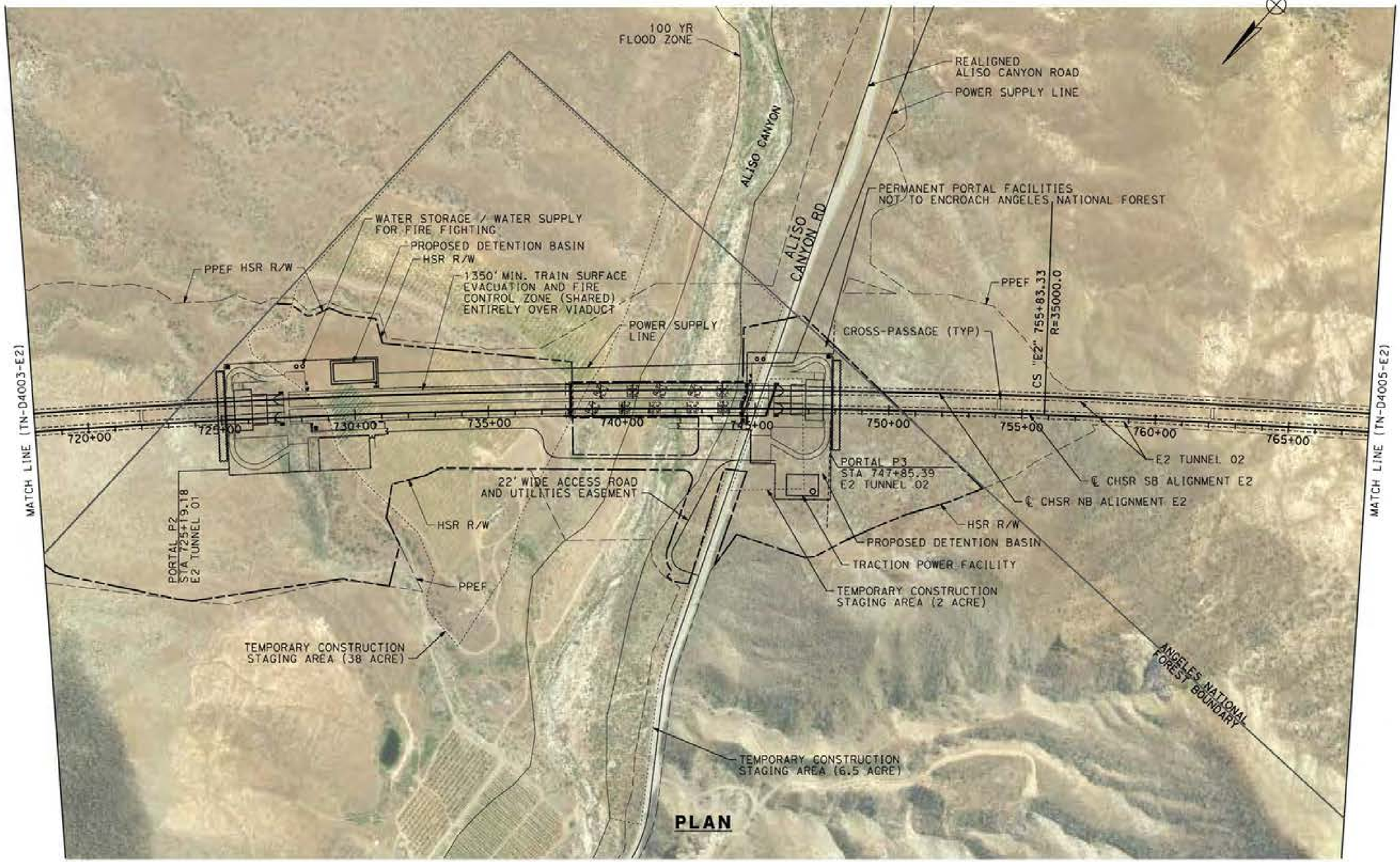
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PLAN
STA 668+00.00 TO STA 718+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4003-E2
SCALE AS SHOWN
SHEET NO.

TUNNEL 01
PORTAL P2

TUNNEL 02
PORTAL P3



PLAN

200 0 200 400
1"=200'

NOTE:

1. TEMPORARY CONSTRUCTION STAGING AREAS (38 AND 6.5 ACRES) TO BE SHARED BETWEEN PORTALS.
2. TRAIN SURFACE EVACUATION AND FIRE CONTROL ZONE SHARED BETWEEN PORTALS.
3. PERMANENT FOOTPRINT INCLUDES SPACE FOR FACILITIES DESCRIBED IN TM 2.4.6 WITH THE FOLLOWING EXCEPTION:
   - HELIPAD NOT INLCUDED
   - PORTAL P2 INCLUDES SPACE FOR BOTH DETENTION POND (LOW POINT), AND WATER STORAGE / WATER SUPPLY FOR FIRE FIGHTING
   - PORTAL P3 INLCUDES SPACE FOR WATER STORAGE / WATER SUPPLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E. VELASCO
DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W. GUO
IN CHARGE: A. RELAÑO
DATE: 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PLAN
STA 718+00.00 TO STA 768+00.00

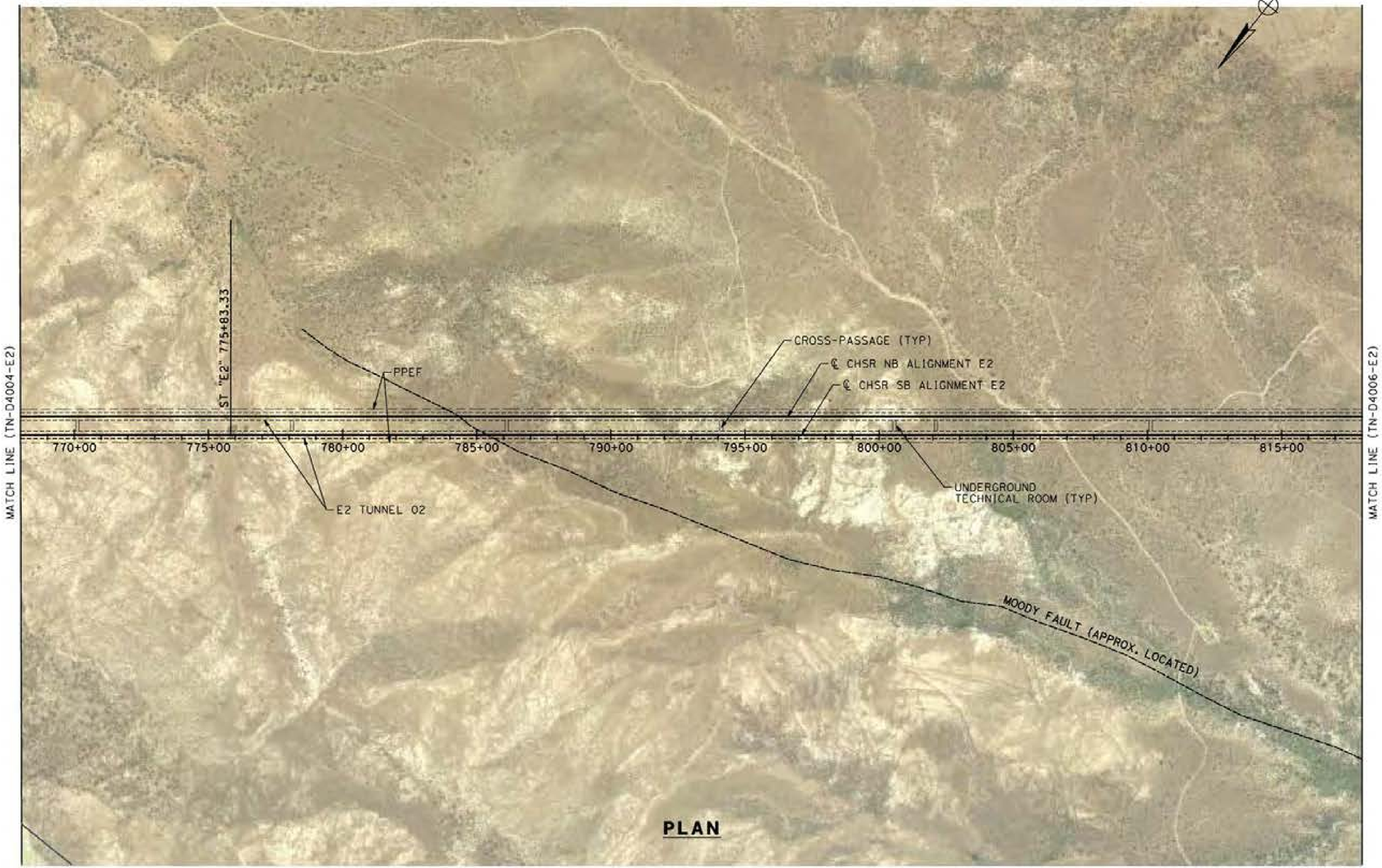
CONTRACT NO. HSR14-42
DRAWING NO. TN-D4004-E2
SCALE AS SHOWN
SHEET NO.

0205240

24/05/2021 21:27:36

c:\wwworkingdir\sener-us-pw.bentley.com_sener-us-pw-01\francisco].comínguez\dms19429\PB-TN-D4004-E2.dgn

TUNNEL 02



PLAN

200 0 200 400
1"=200

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E. VELASCO
DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W. GUO
IN CHARGE: A. RELAÑO
DATE: 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

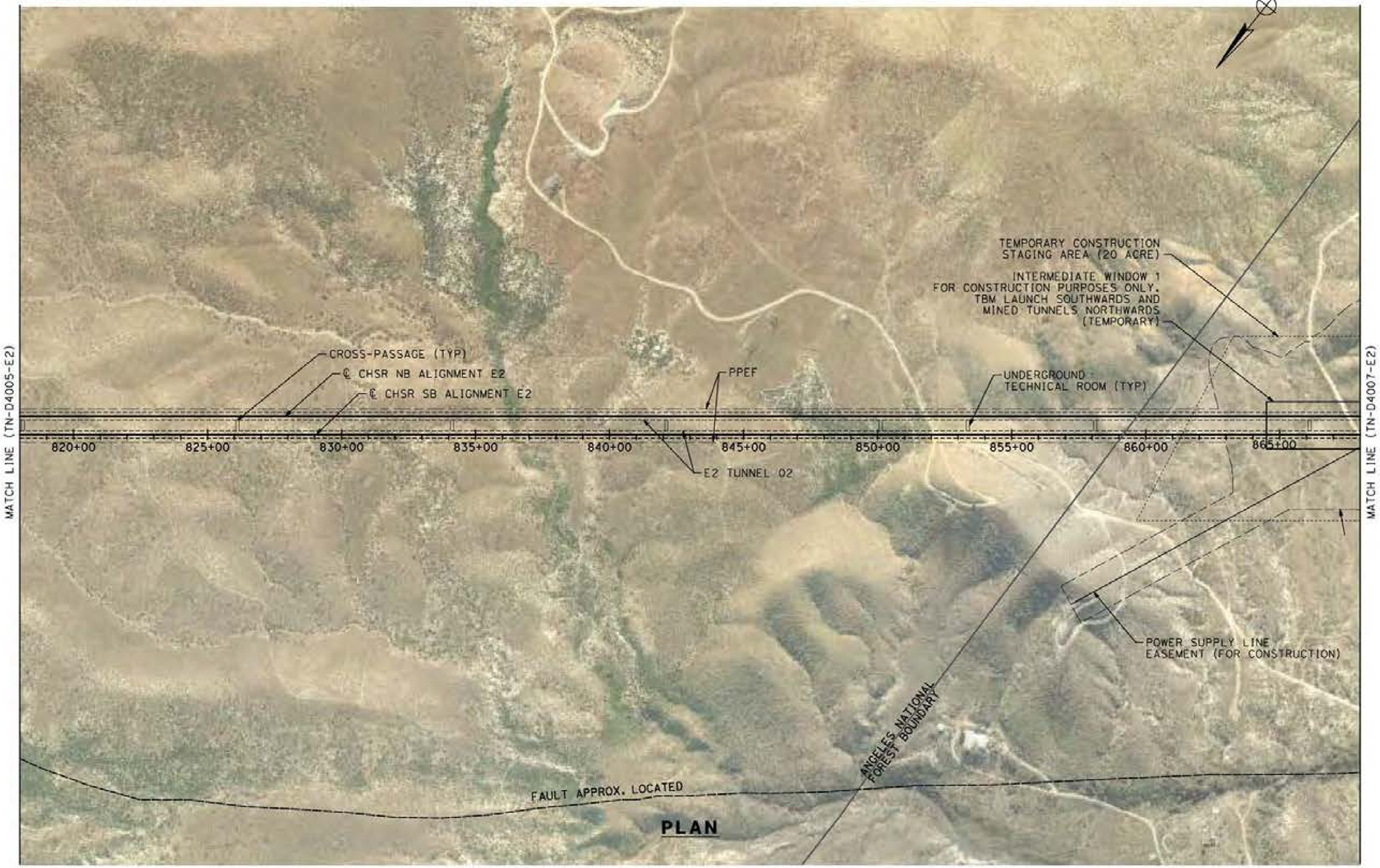
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PLAN
STA 768+00.00 TO STA 818+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4005-E2
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1"=200

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E. VELASCO
DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W. GUO
IN CHARGE: A. RELAÑO
DATE: 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

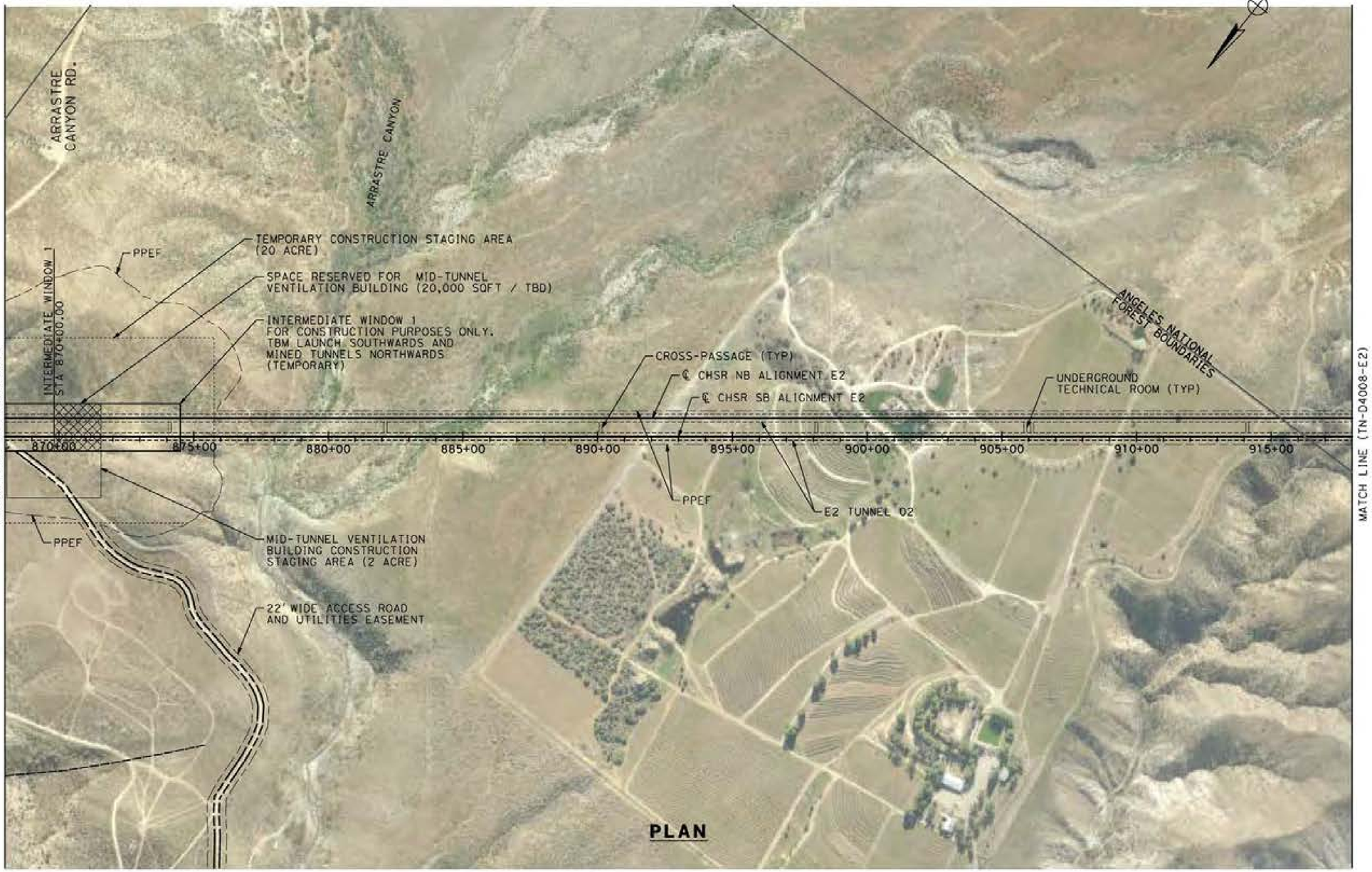
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PLAN
STA 818+00.00 TO STA 868+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4006-E2
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1"=200

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E. VELASCO
DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W. GUO
IN CHARGE: A. RELAÑO
DATE: 04/30/2021

PEPD RECORD SET
REV 02

NOT FOR CONSTRUCTION

SENER

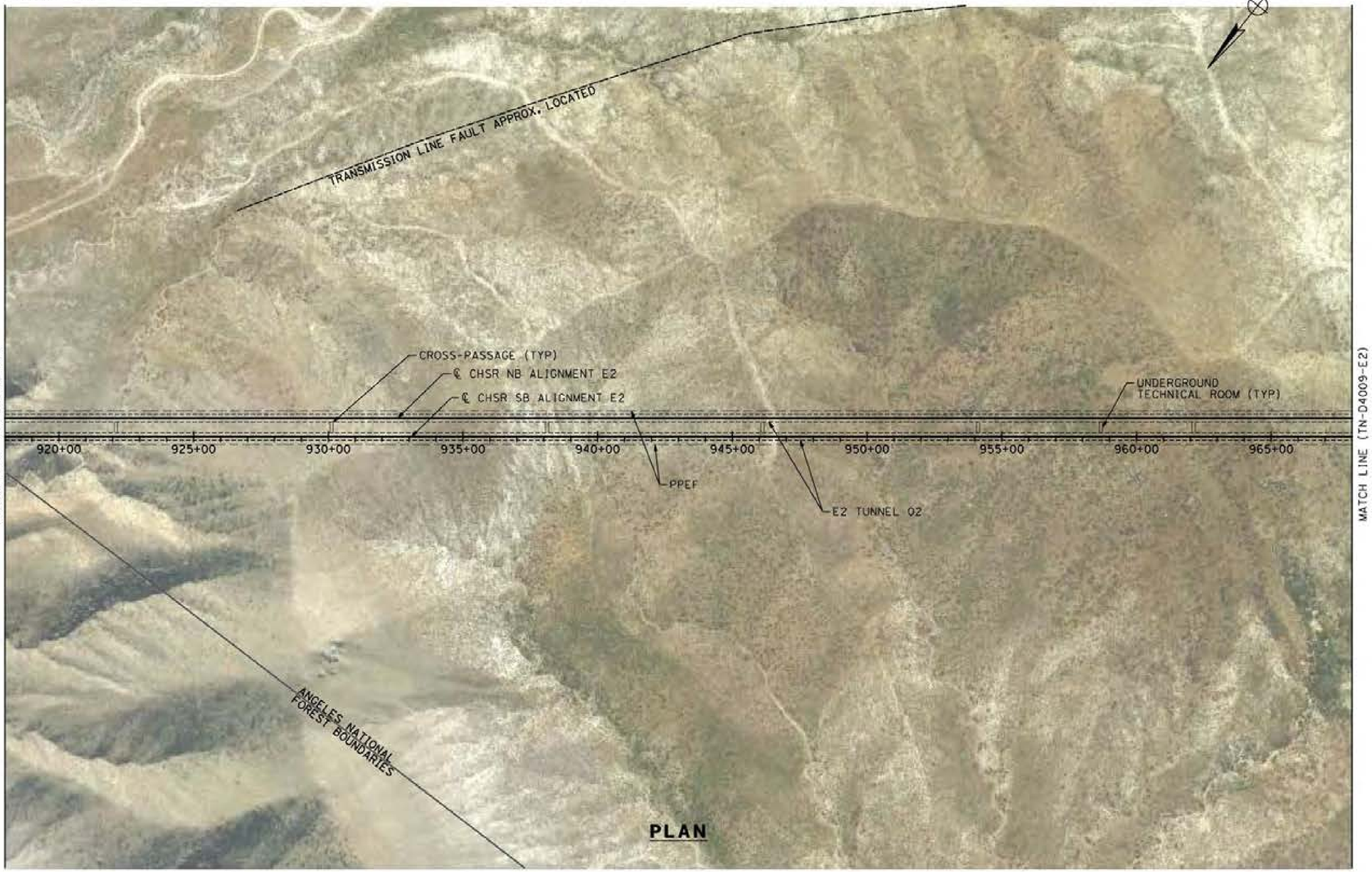
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PLAN
STA 868+00.00 TO STA 918+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4007-E2
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1"=200

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E. VELASCO
DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W. GUO
IN CHARGE: A. RELAÑO
DATE: 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

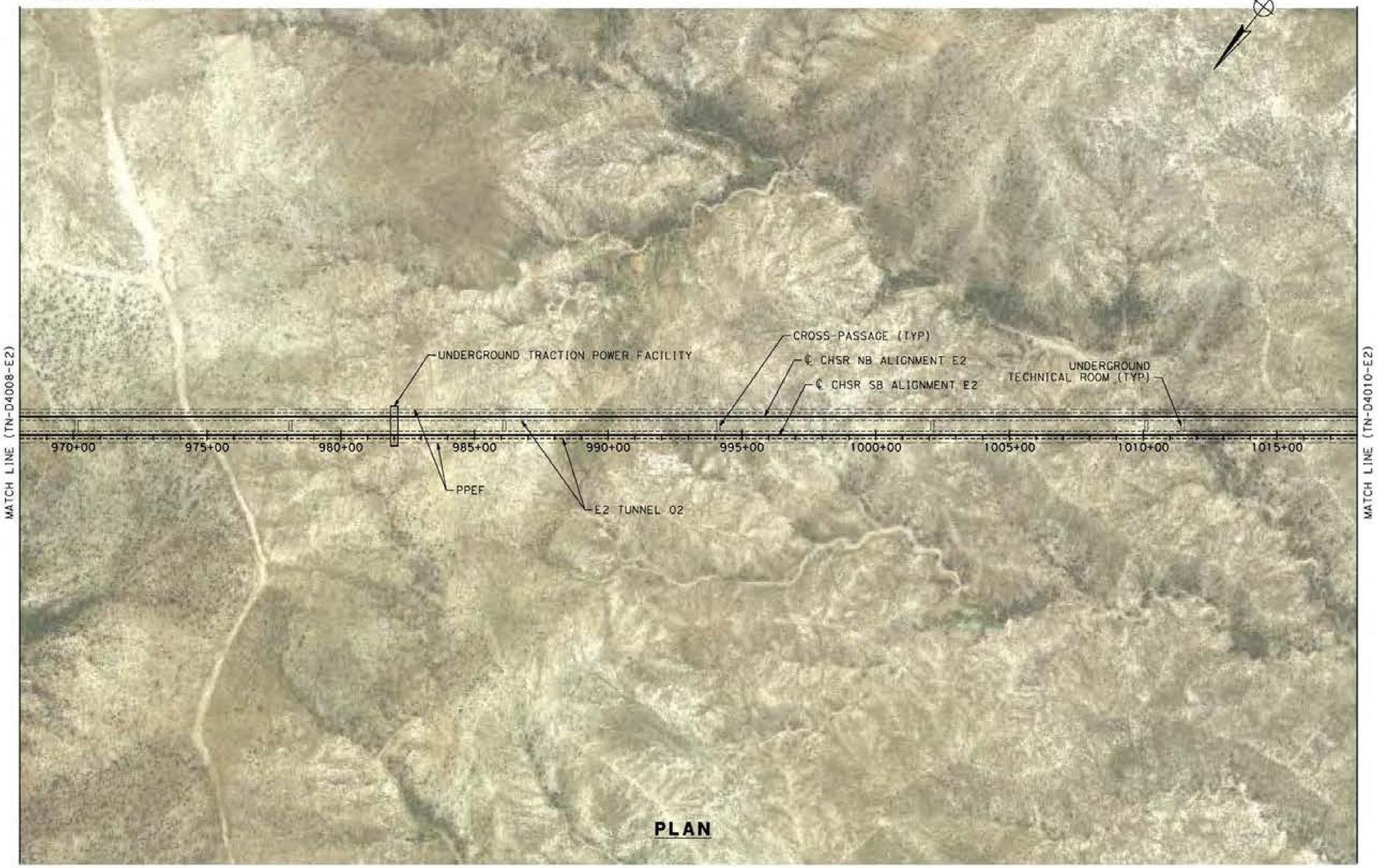
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PLAN
STA 918+00.00 TO STA 968+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4008-E2
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1"=200

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E. VELASCO
DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W. GUO
IN CHARGE: A. RELAÑO
DATE: 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

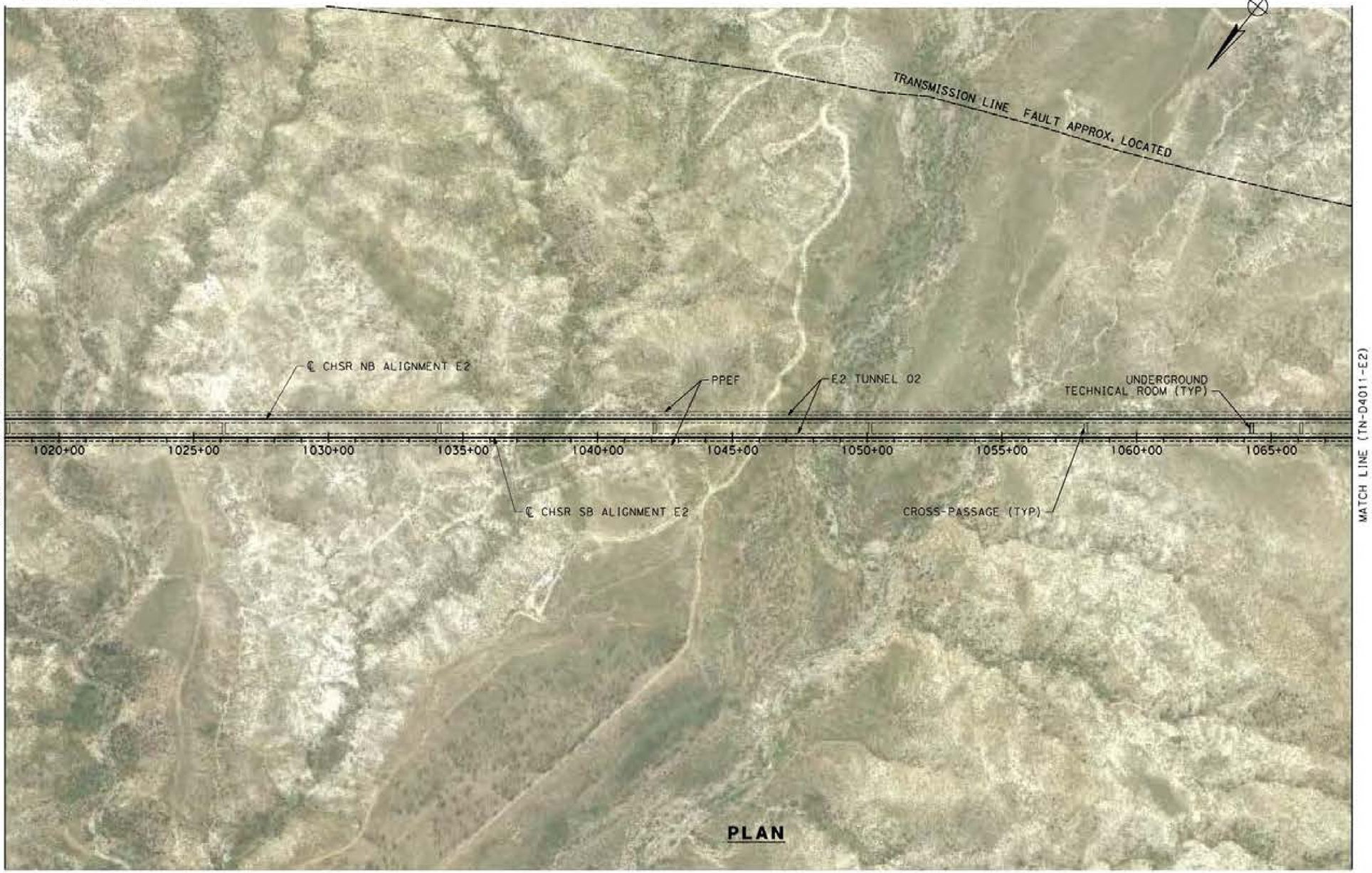
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PLAN
STA 968+00.00 TO STA 1018+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4009-E2
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1"=200

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

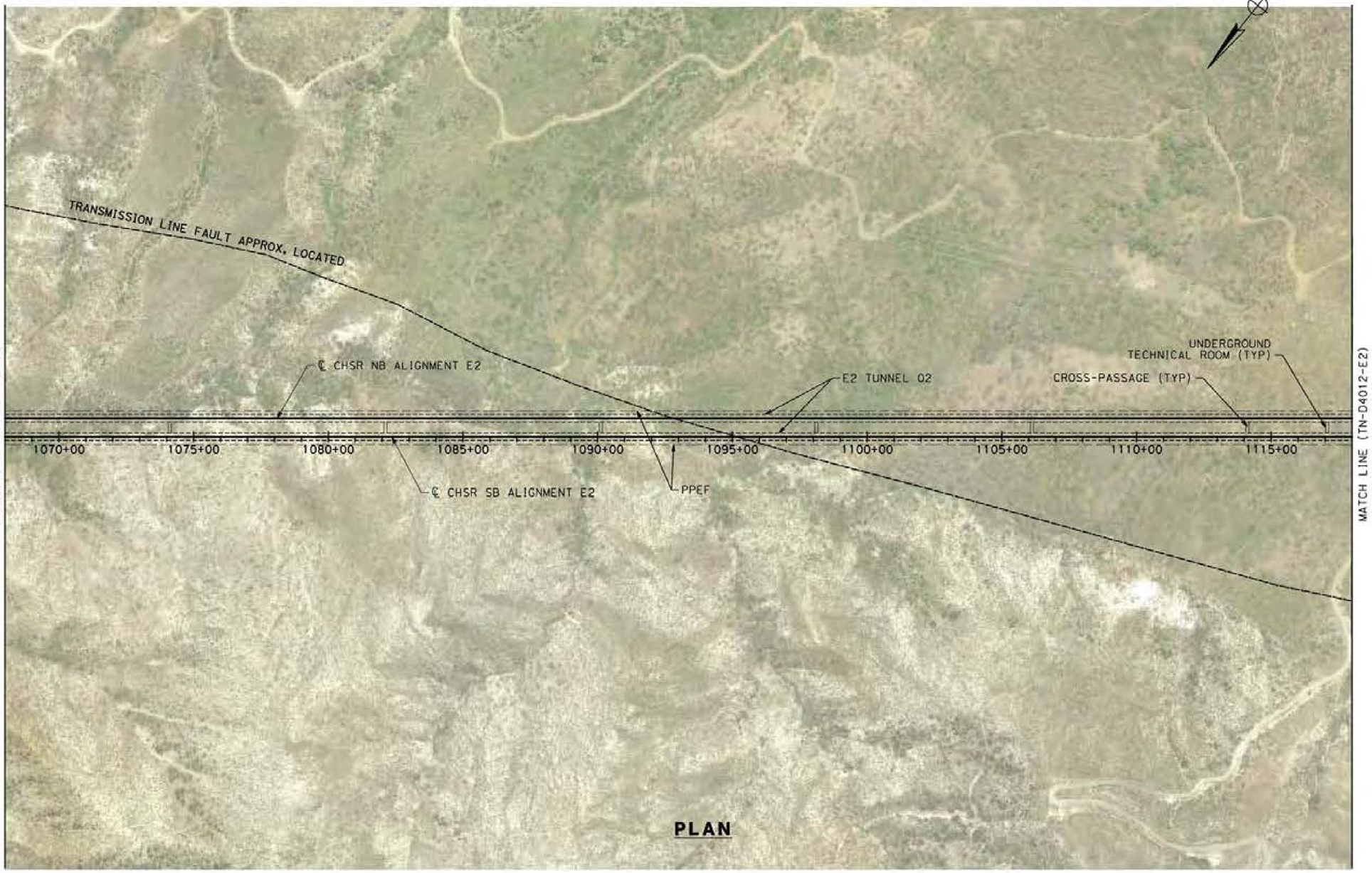
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PLAN
STA 1018+00.00 TO STA 1068+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4010-E2
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1"=200

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

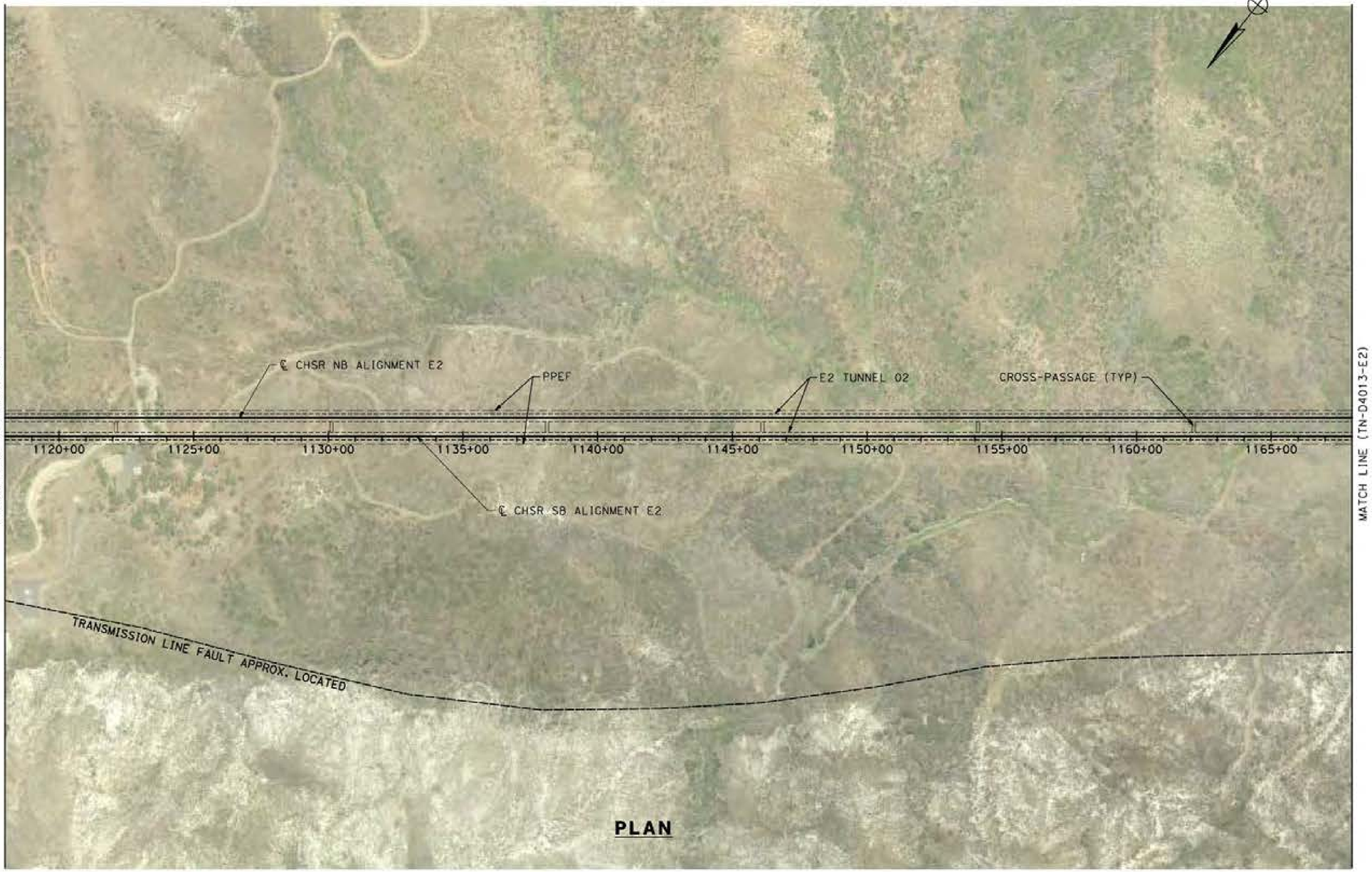
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PLAN
STA 1068+00.00 TO STA 1118+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4011-E2
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1"=200

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

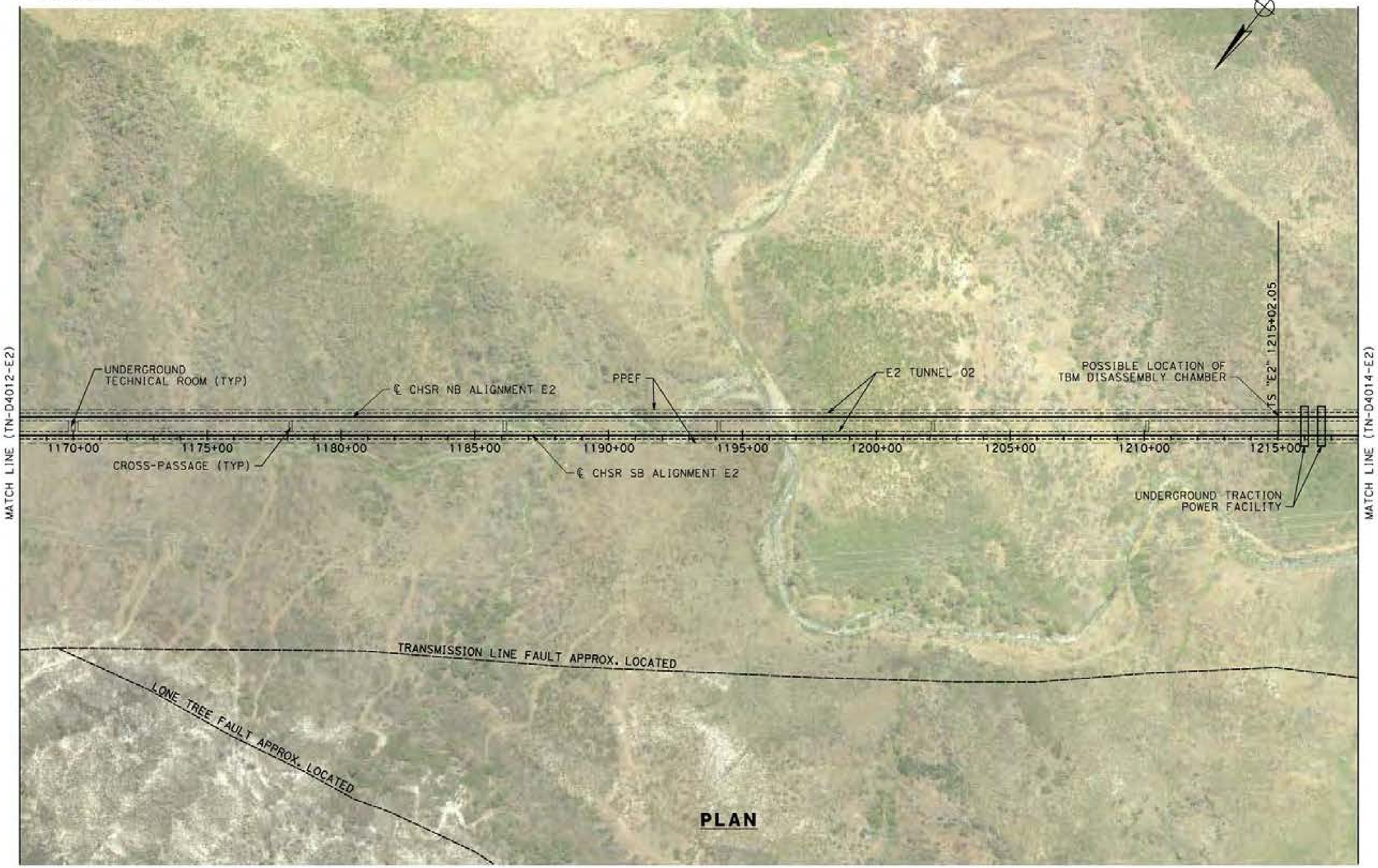
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PLAN
STA 1118+00.00 TO STA 1168+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4012-E2
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1"=200

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E. VELASCO
DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W. GUO
IN CHARGE: A. RELAÑO
DATE: 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

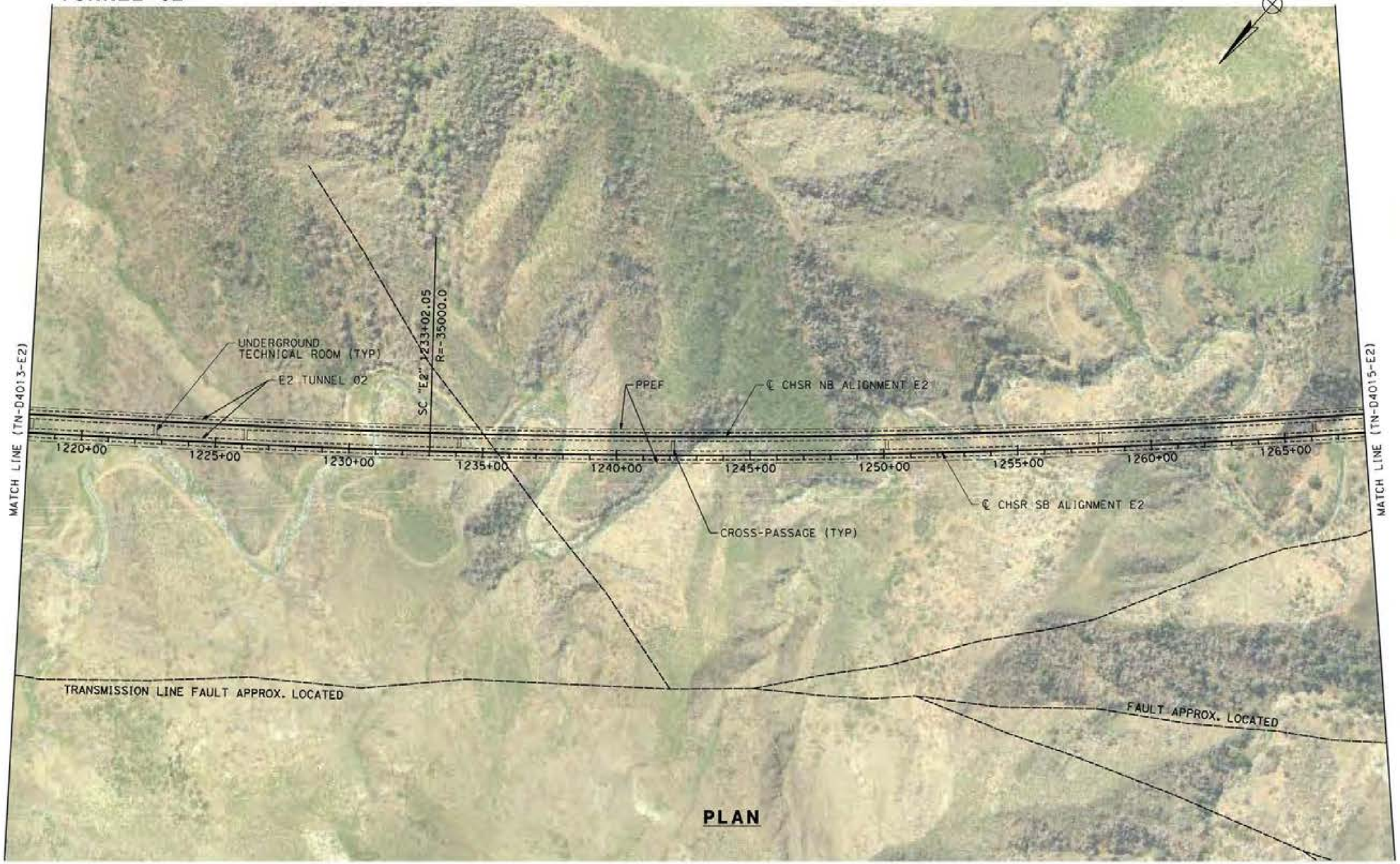
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PLAN
STA 1168+00.00 TO STA 1218+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4013-E2
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1"=200

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E. VELASCO
DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W. GUO
IN CHARGE: A. RELAÑO
DATE: 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

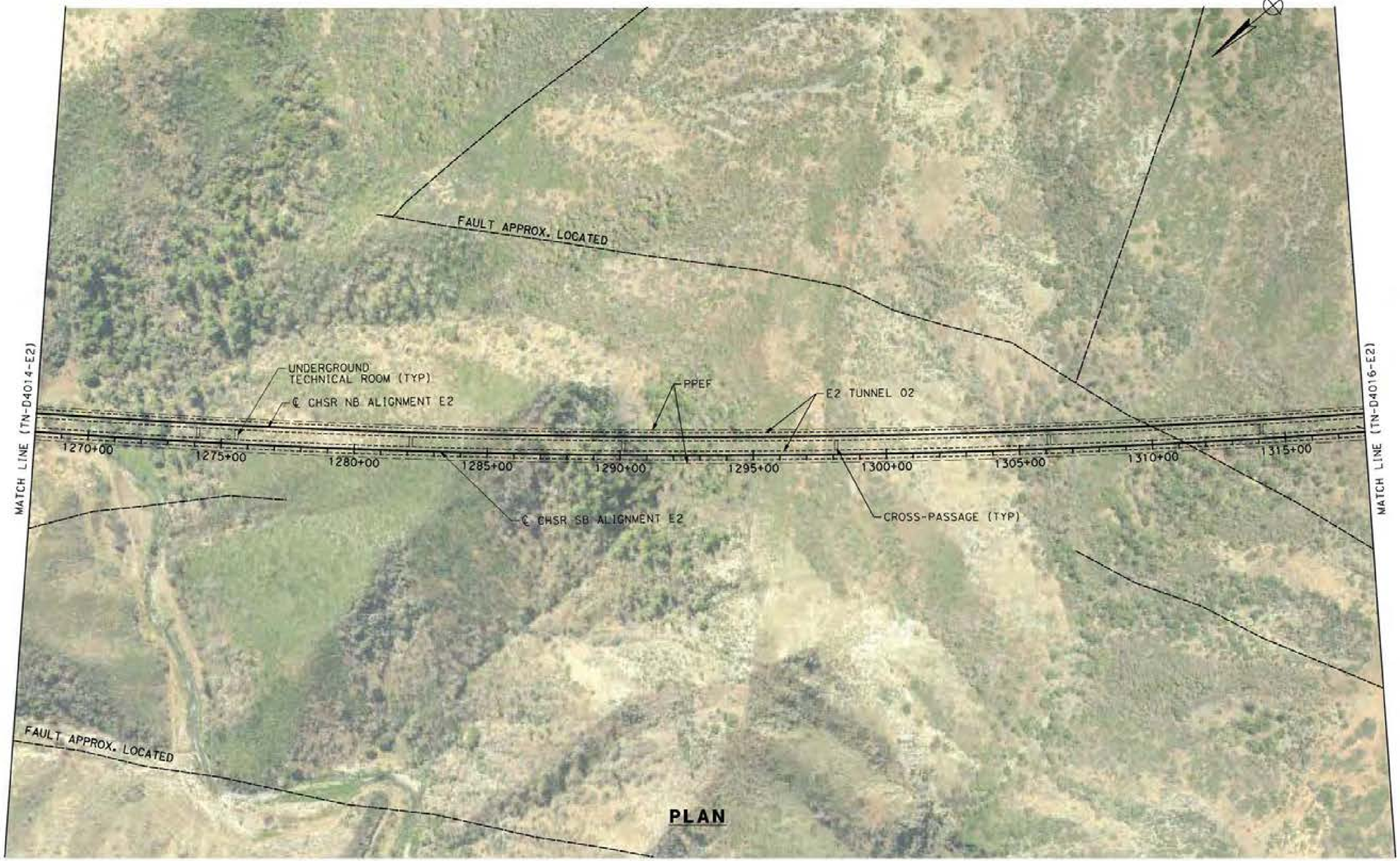
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PLAN
STA 1218+00.00 TO STA 1268+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4014-E2
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1"=200

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

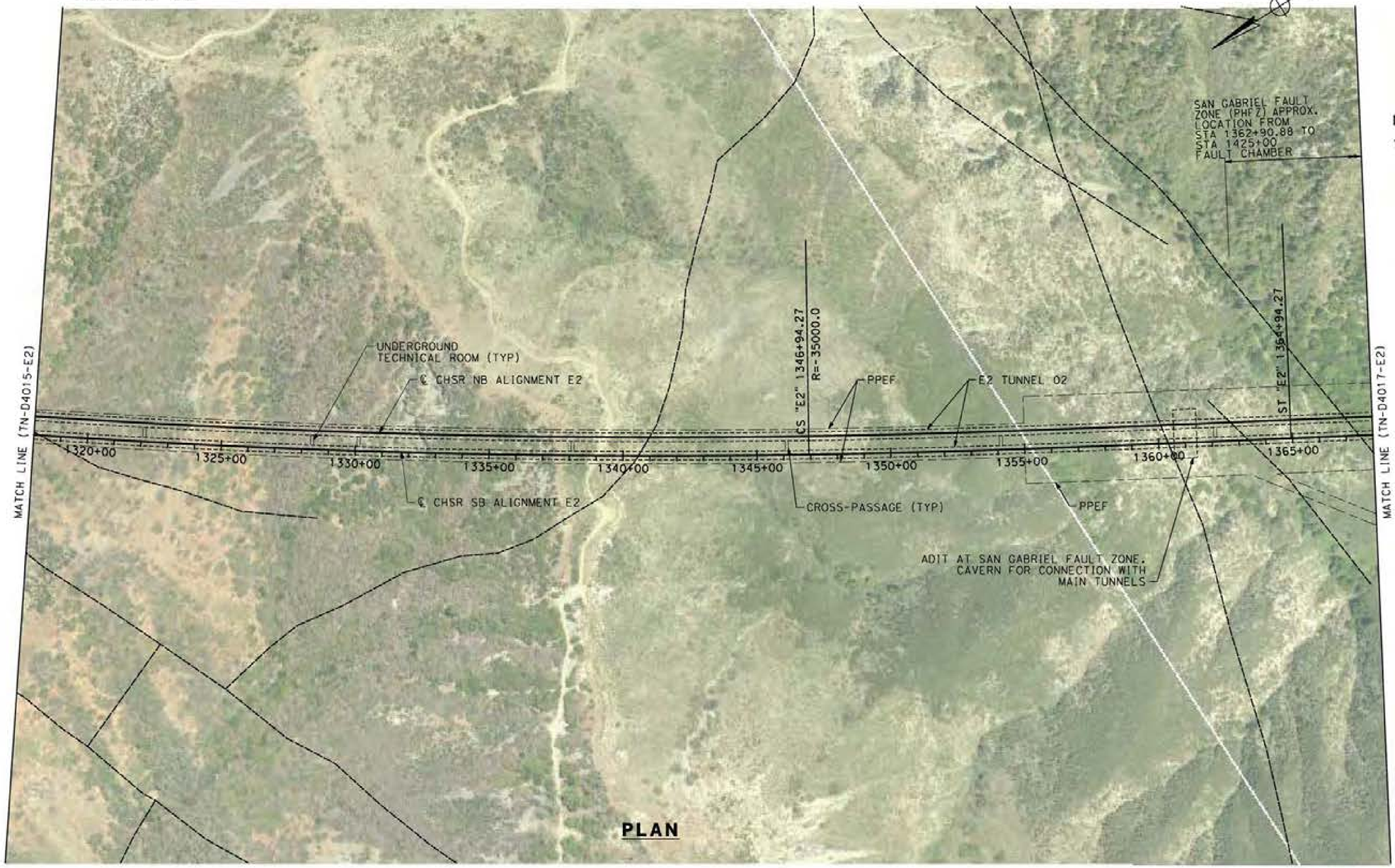
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PLAN
STA 1268+00.00 TO STA 1318+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4015-E2
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1"=200

NOTE:

1. LOCATION OF CAVERN SHOULD BE OUTSIDE FAULT ZONE, IN SOUND ROCK. VERIFICATION BOREHOLES NEEDED TO CONFIRM LOCATION.

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E. VELASCO
DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W. GUO
IN CHARGE: A. RELAÑO
DATE: 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

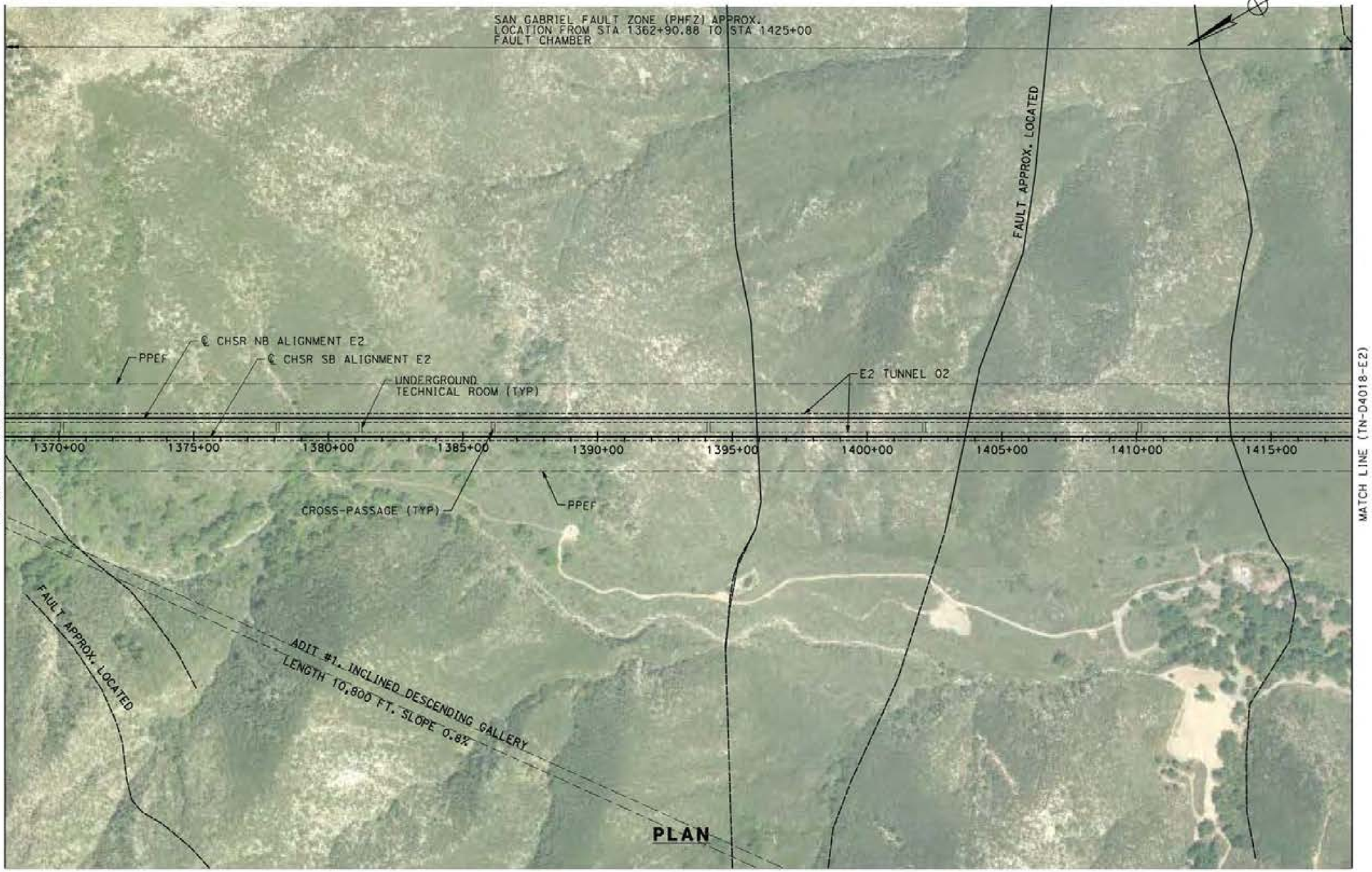
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PLAN
STA 1318+00.00 TO STA 1368+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4016-E2
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1"=200

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E. VELASCO
DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W. GUO
IN CHARGE: A. RELAÑO
DATE: 04/30/2021

PEPD RECORD SET
REV 02

NOT FOR CONSTRUCTION

SENER

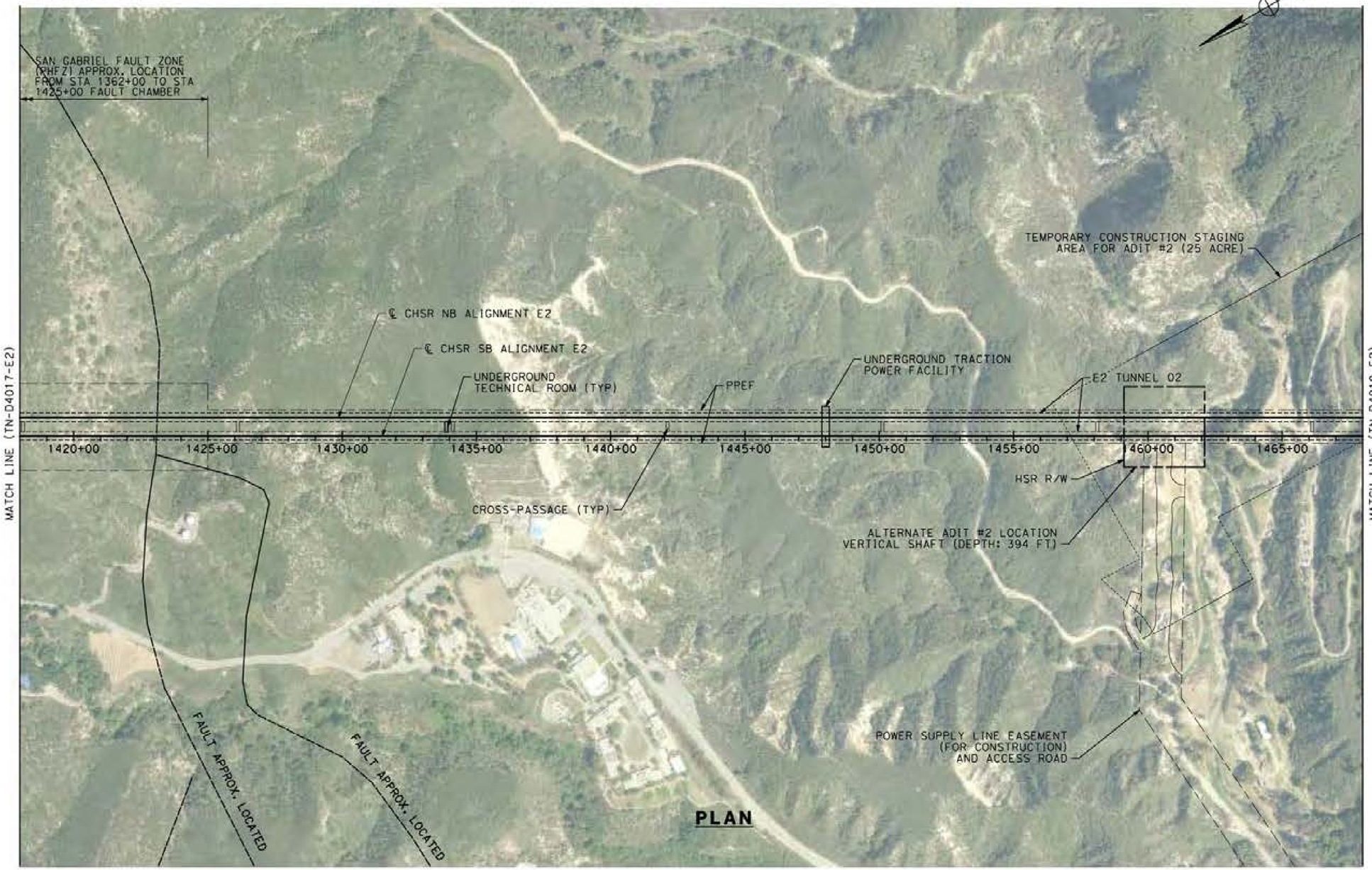
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PLAN
STA 1368+00.00 TO STA 1418+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4017-E2
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

NOTE:

1. REFER TO TN-D5002-E2 FOR PLAN VIEW OF POTENTIAL ADITS AT SAN GABRIEL FAULT ZONE

200 0 200 400
1"=200

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E. VELASCO
DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W. GUO
IN CHARGE: A. RELAÑO
DATE: 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

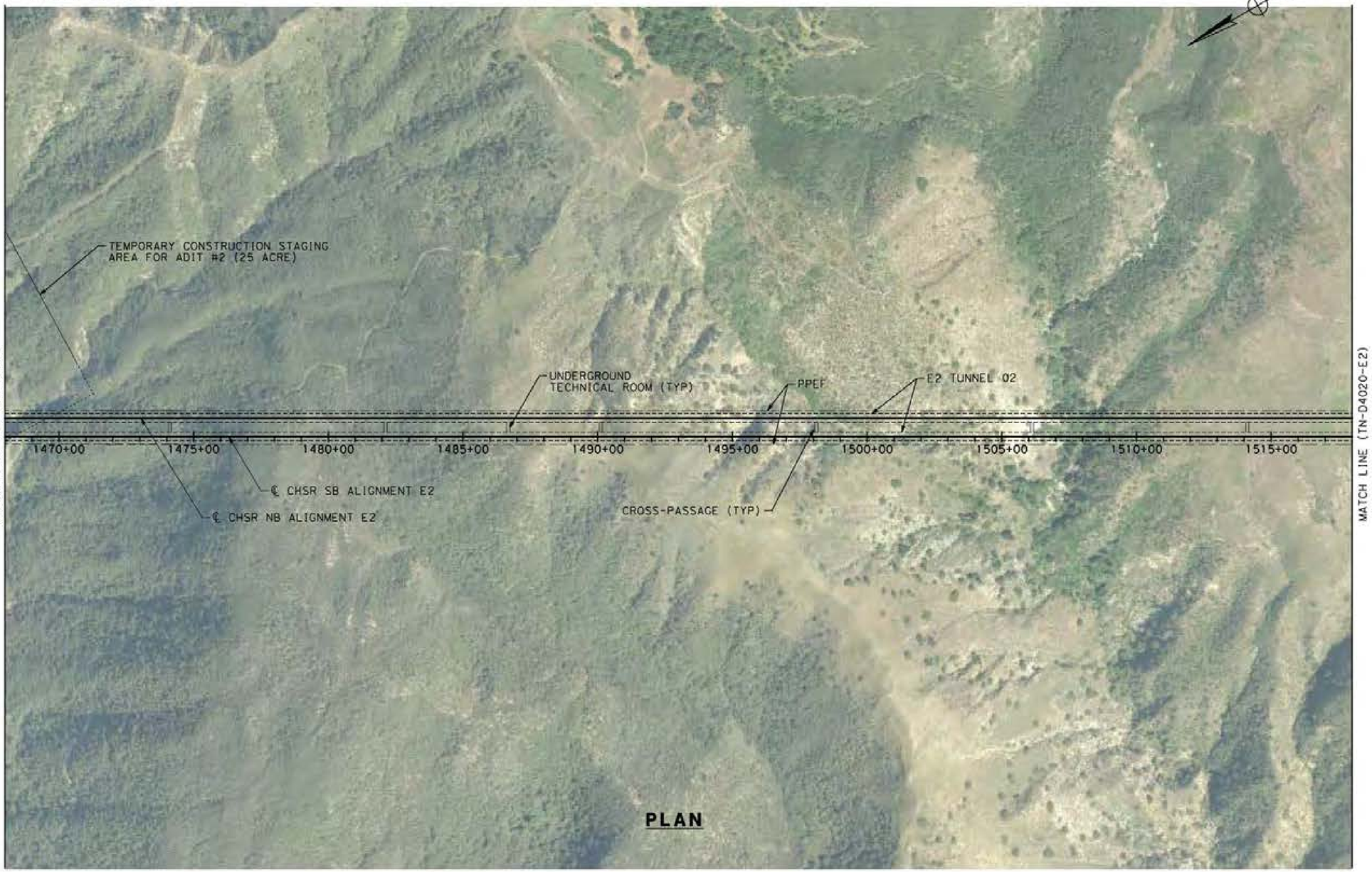
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PLAN
STA 1418+00.00 TO STA 1468+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4018-E2
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E. VELASCO
DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W. GUO
IN CHARGE: A. RELAÑO
DATE: 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

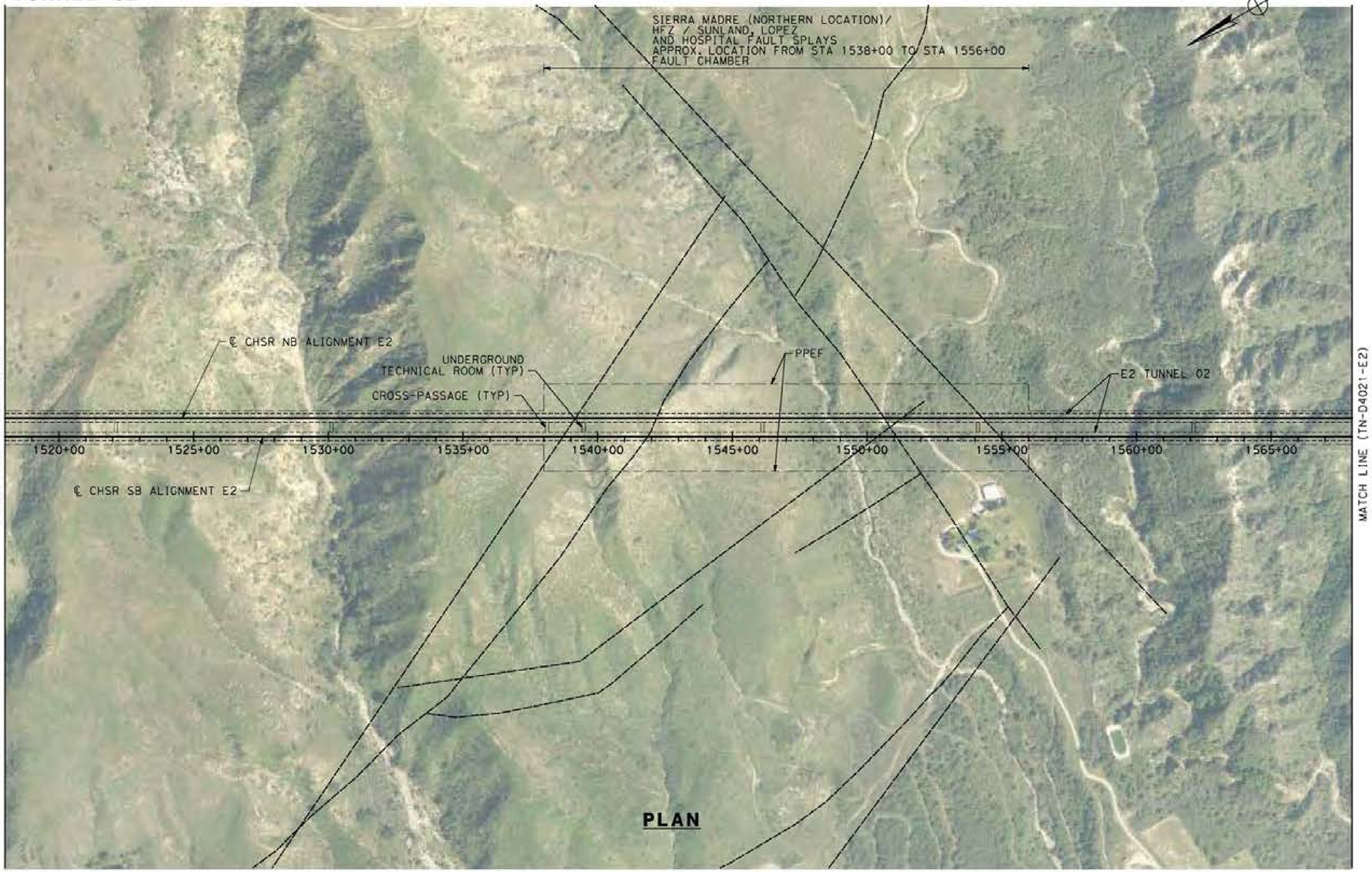
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PLAN
STA 1468+00.00 TO STA 1518+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4019-E2
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E. VELASCO
DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W. GUO
IN CHARGE: A. RELAÑO
DATE: 04/30/2021

PEPD RECORD SET
REV 02

NOT FOR CONSTRUCTION

SENER

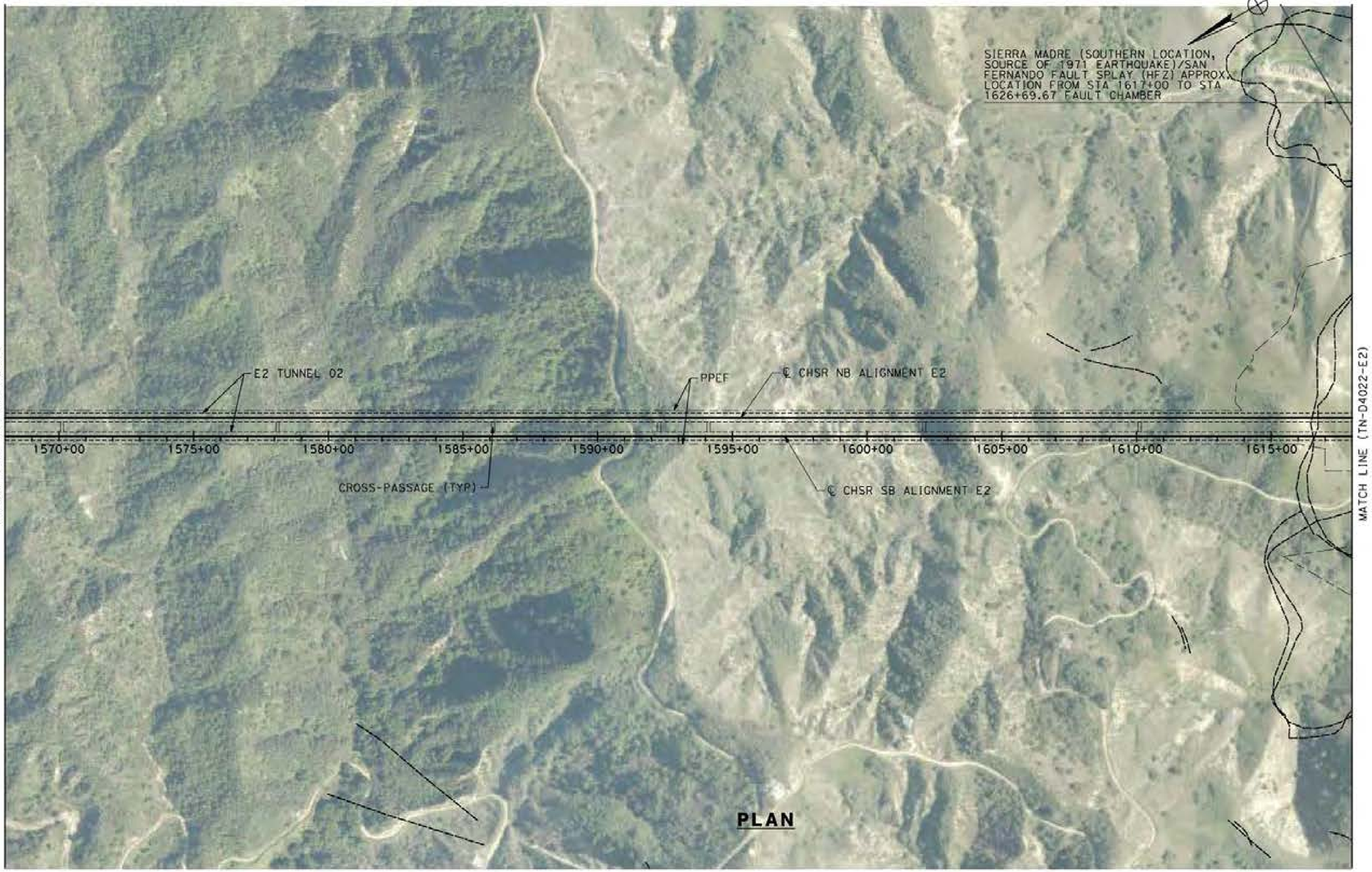
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PLAN
STA 1518+00.00 TO STA 1568+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4020-E2
SCALE AS SHOWN
SHEET NO.

TUNNEL 02



PLAN

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E. VELASCO
DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W. GUO
IN CHARGE: A. RELAÑO
DATE: 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

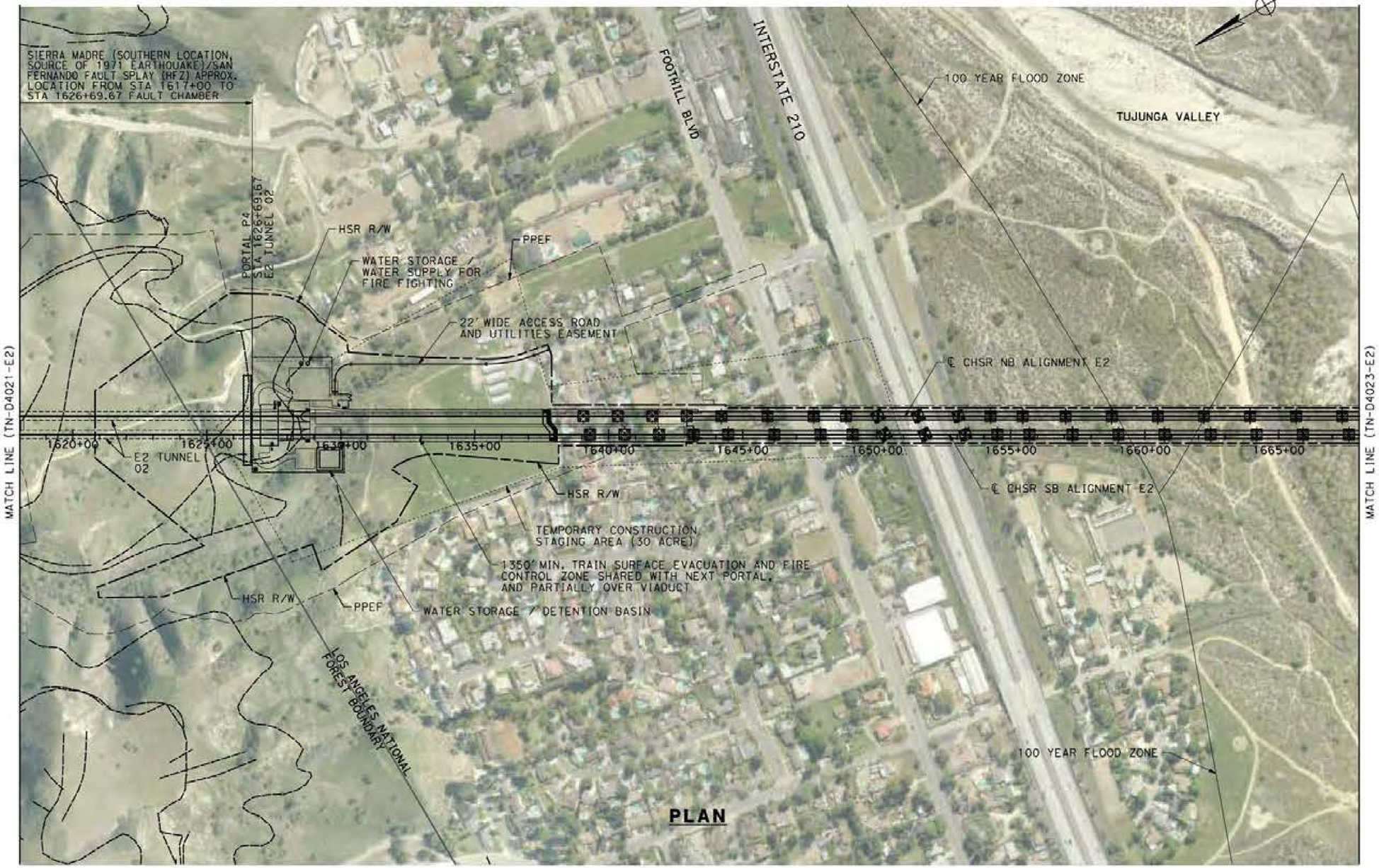
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PLAN
STA 1568+00.00 TO STA 1618+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4021-E2
SCALE AS SHOWN
SHEET NO.

TUNNEL 02
PORTAL P4



PLAN

NOTE:

1. TRAIN SURFACE EVACUATION AND FIRE CONTROL ZONE SHARED BETWEEN PORTALS 4 AND 5. PARTIALLY LOCATED OVER VIADUCT.
2. PERMANENT PORTAL FOOTPRINT INCLUDES SPACE FOR FACILITIES DESCRIBED IN TM 2.4.6. WITH THE FOLLOWING EXCEPTIONS
   - HELIPAD NOT INCLUDED
   - INCLUDES SPACE FOR BOTH DETENTION POND (LOW POINT), AND WATER STORAGE / WATER SUPPLY FOR FIRE FIGHTING.

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

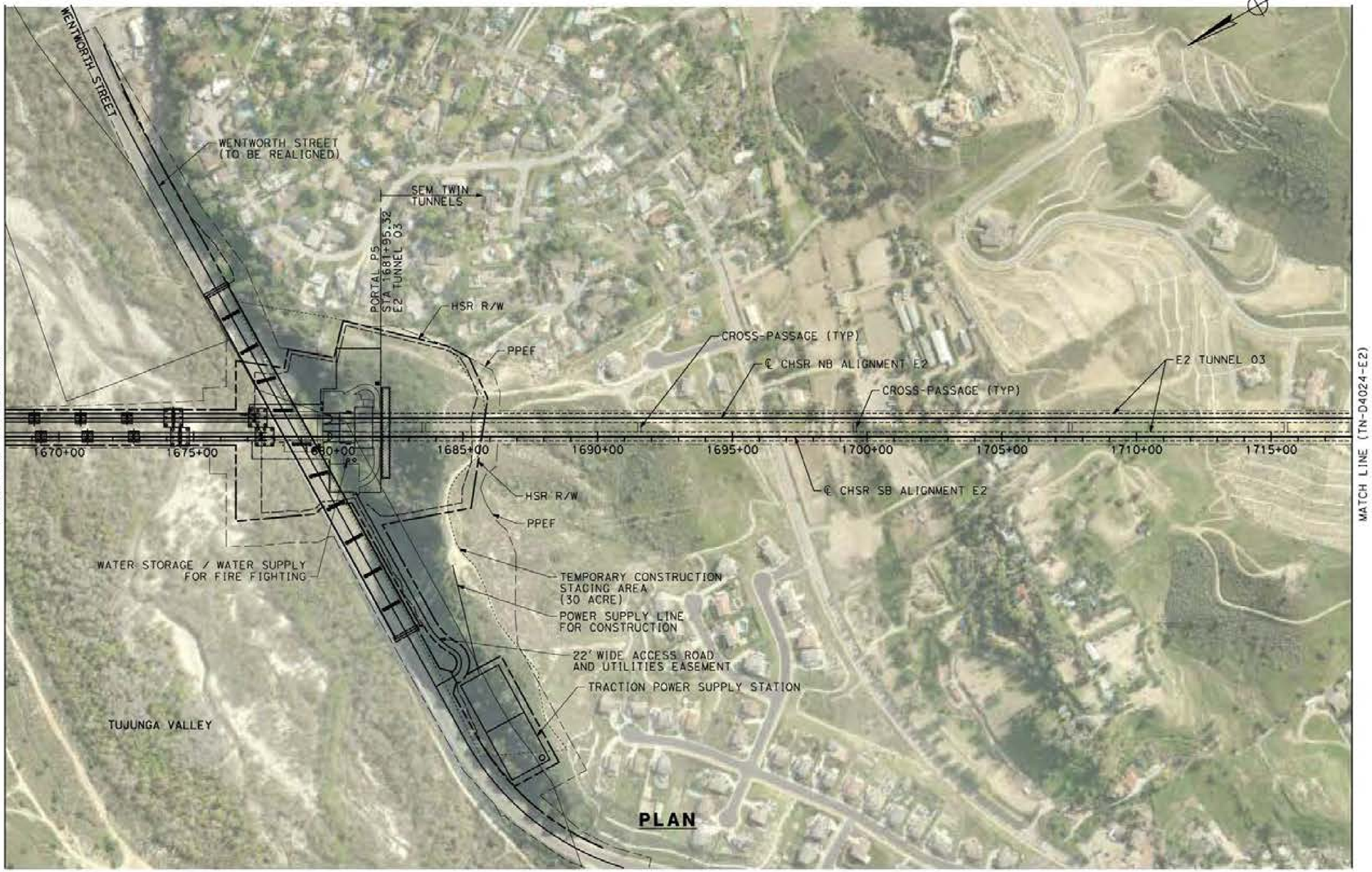
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PLAN
STA 1618+00.00 TO STA 1668+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4022-E2
SCALE AS SHOWN
SHEET NO.

TUNNEL 03
PORTAL P5



PLAN

NOTE:

1. TRAIN SURFACE EVACUATION AND FIRE CONTROL ZONE SHARED BETWEEN PORTALS 4 AND 5. PARTIALLY LOCATED OVER VIADUCT.
2. PERMANENT PORTAL FOOTPRINT INCLUDES SPACE FOR FACILITIES DESCRIBED IN TM 2.4.6. WITH THE FOLLOWING EXCEPTIONS
   - HELIPAD NOT INCLUDED
   - INCLUDES SPACE FOR FIRE FIGHTING WATER STORAGE/ SUPPLY
   - DOES NOT INCLUDE DETENTION POND. PORTAL P5 IS HIGH POINT.

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E. VELASCO
DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W. GUO
IN CHARGE: A. RELAÑO
DATE: 04/30/2021

PEPD RECORD SET
REV 02

NOT FOR CONSTRUCTION

SENER

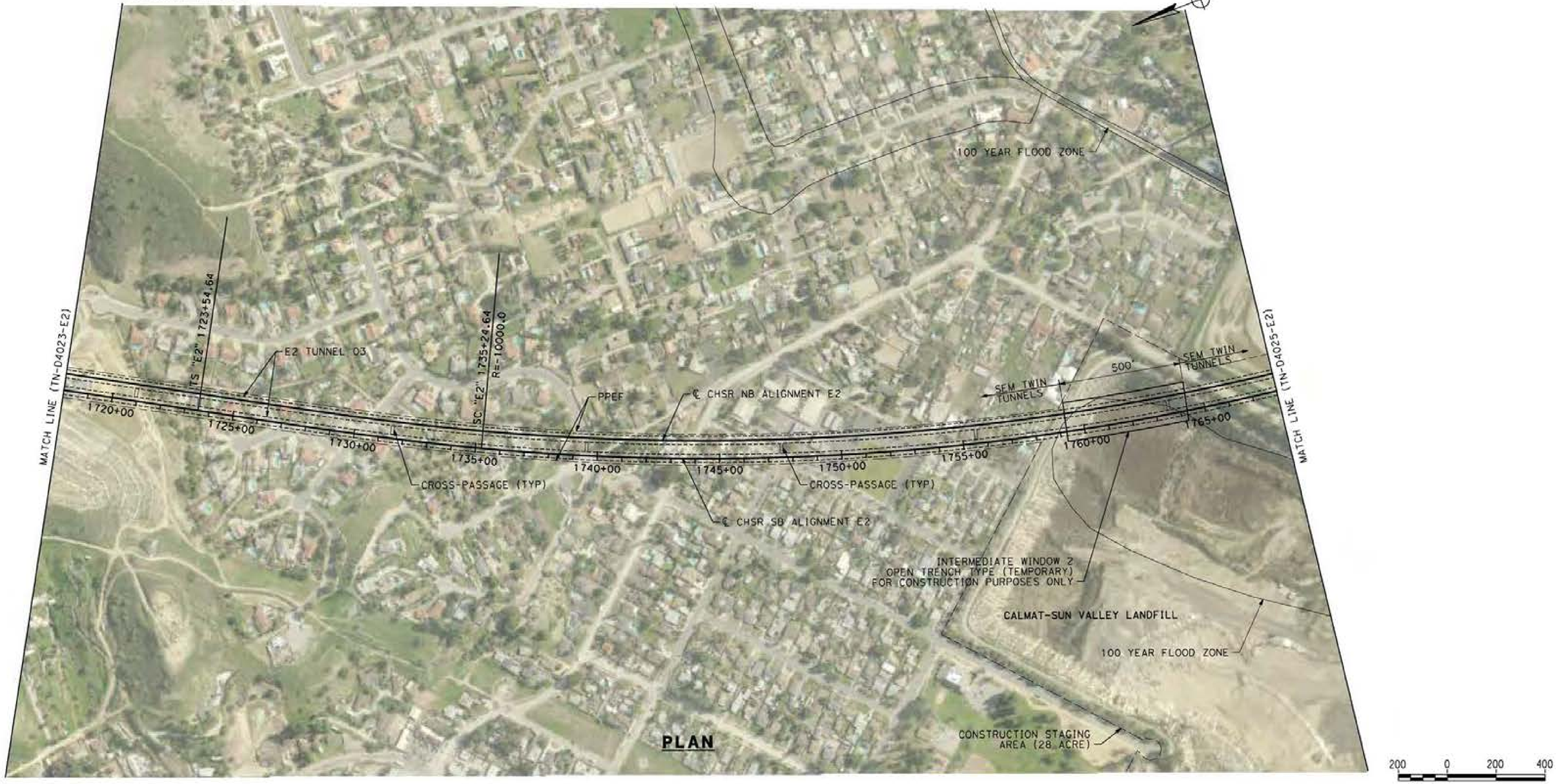
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PLAN
STA 1668+00.00 TO STA 1718+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4023-E2
SCALE AS SHOWN
SHEET NO.

TUNNEL 03



PLAN

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E. VELASCO
DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W. GUO
IN CHARGE: A. RELAÑO
DATE: 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

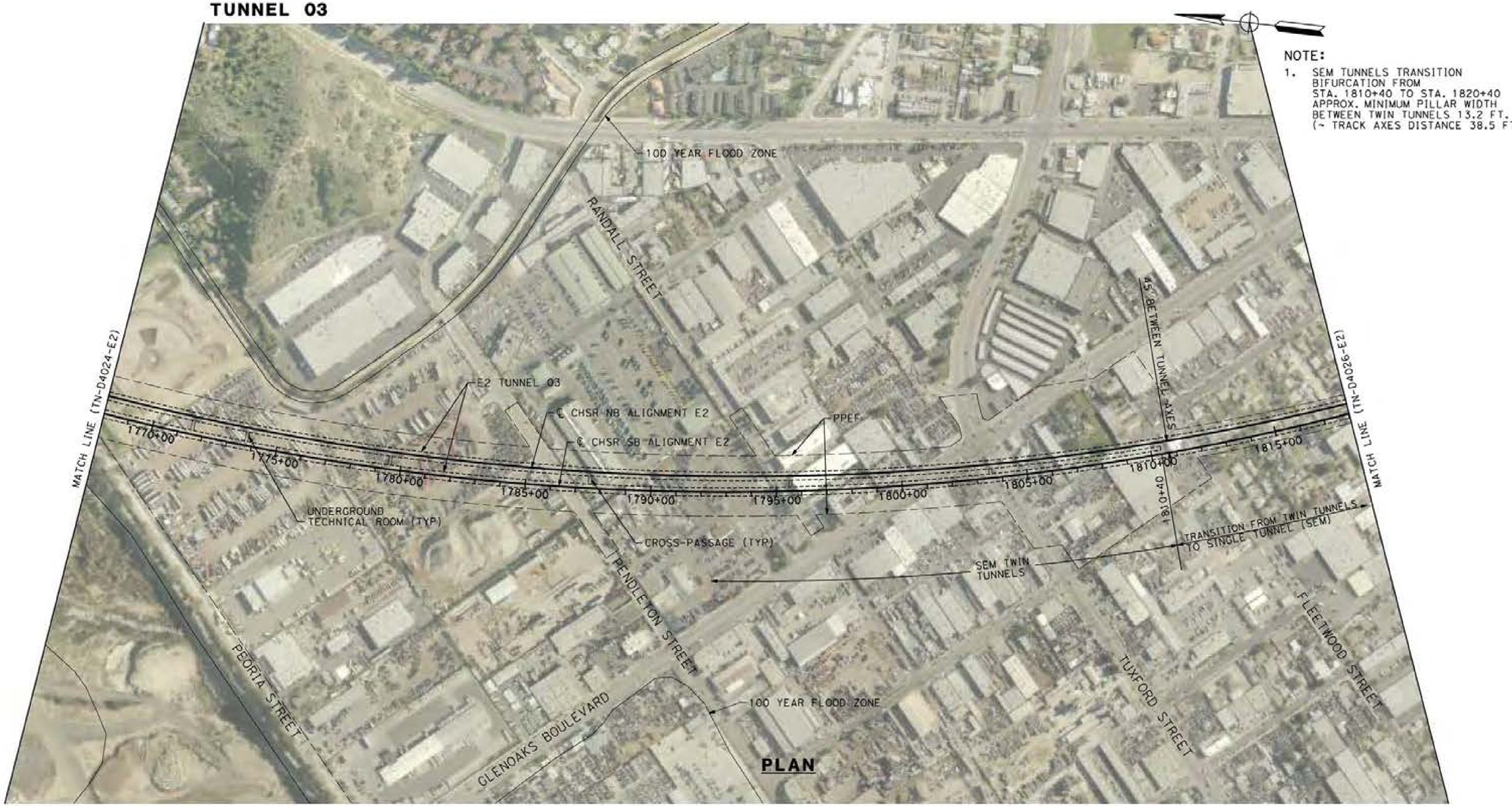
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PLAN
STA 1718+00.00 TO STA 1768+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4024-E2
SCALE AS SHOWN
SHEET NO.

TUNNEL 03



PLAN

NOTE:

1. SEM TUNNELS TRANSITION BIFURCATION FROM STA. 1810+40 TO STA. 1820+40 APPROX. MINIMUM PILLAR WIDTH BETWEEN TWIN TUNNELS 13.2 FT. (~ TRACK AXES DISTANCE 38.5 FT.)

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E. VELASCO
DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W. GUO
IN CHARGE: A. RELAÑO
DATE: 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

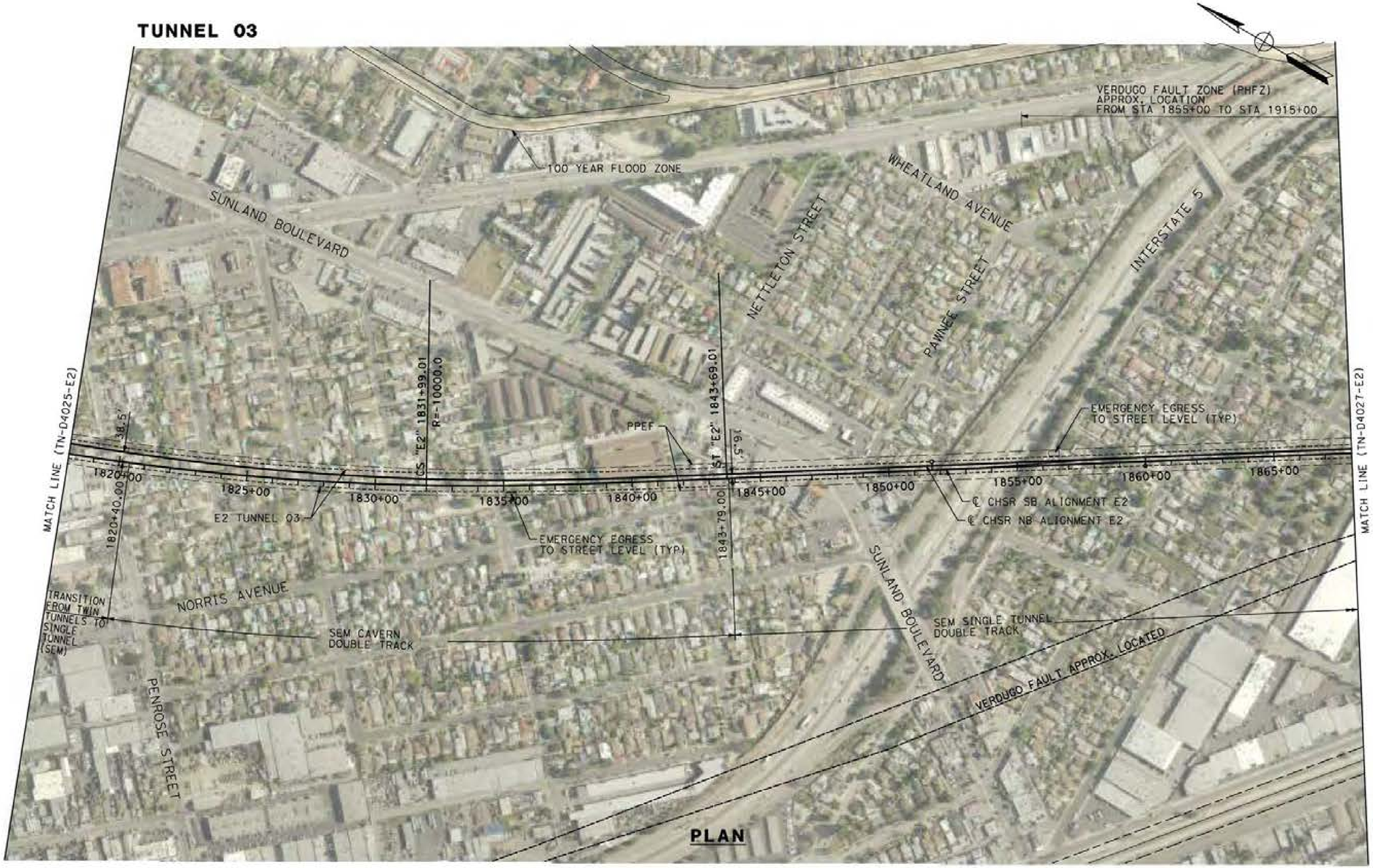
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PLAN
STA 1768+00.00 TO STA 1818+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4025-E2
SCALE AS SHOWN
SHEET NO.

TUNNEL 03



PLAN

NOTE:

1. SEM CAVERN FROM STA. 1820+40 TO STA. 1843+79 (~ TRACK AXES DISTANCE FROM 38.5 TO 16.5 FT.)

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

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DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W. GUO
IN CHARGE: A. RELAÑO
DATE: 04/30/2021

PEPD RECORD SET
REV 02

NOT FOR CONSTRUCTION

SENER

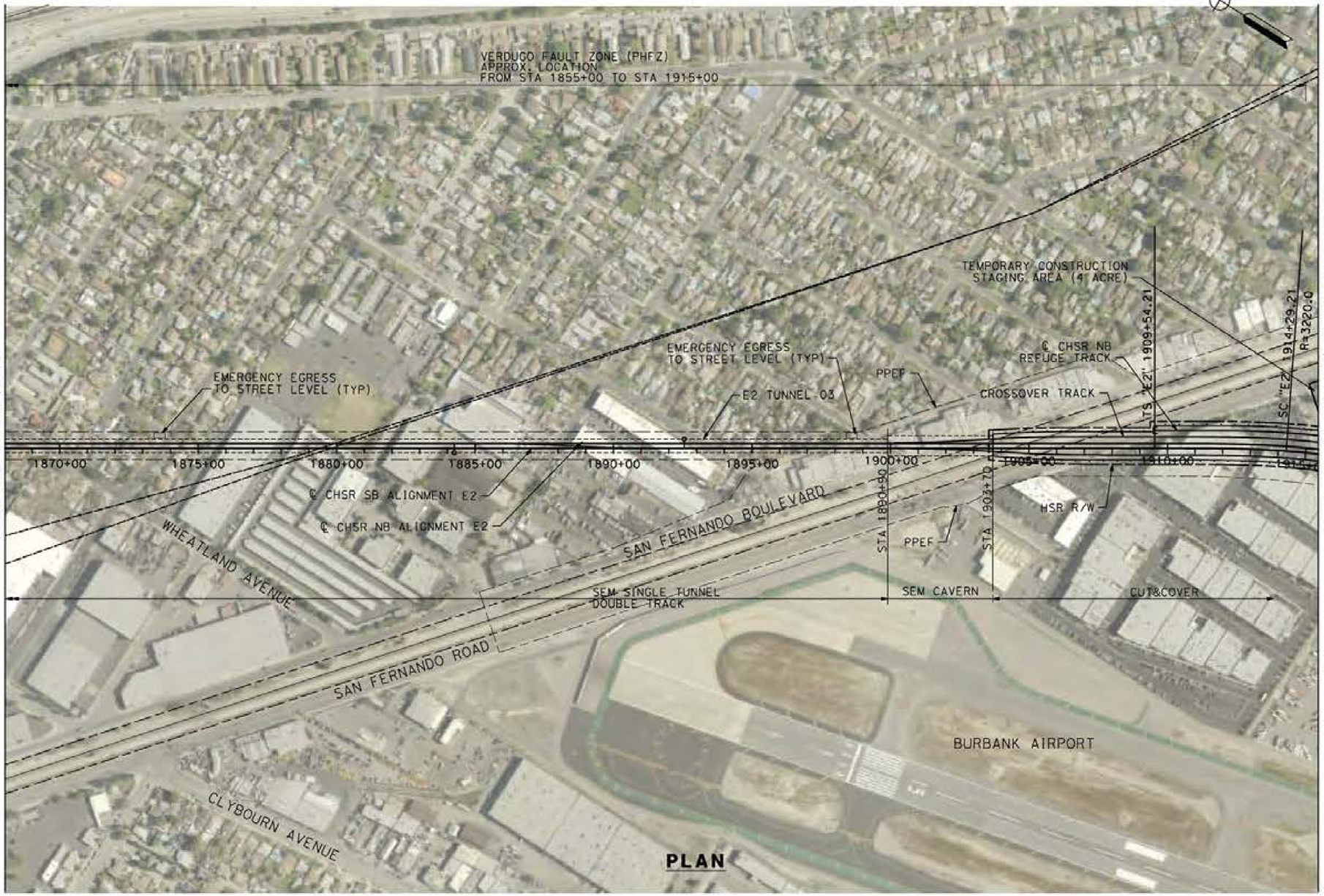
CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PLAN
STA 1818+00.00 TO STA 1868+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4026-E2
SCALE AS SHOWN
SHEET NO.

TUNNEL 03



PLAN

NOTE:

1. CONSTRUCTIVE PROCEDURE IS ASSUMED AS SEM TILL STA 1903+70 AND CUT AND COVER FROM STA 1903+70 TO STA 1944+05.88

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E. VELASCO
DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W. GUO
IN CHARGE: A. RELAÑO
DATE: 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PLAN
STA 1868+00.00 TO STA 1915+47.81

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4027-E2
SCALE AS SHOWN
SHEET NO.

TUNNEL 03

PLAN

MATCH LINE (TN-D4027-E2)

NOTE:

1. BURBANK STATION
   STARTS STA 1929+95.00
   ENDS STA 1944+05.88 APPROX.
   CONSTRUCTIVE PROCEDURE
   IS ASSUMED CUT AND COVER.

200 0 200 400
1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E. VELASCO
DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W. GUO
IN CHARGE: A. RELAÑO
DATE: 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

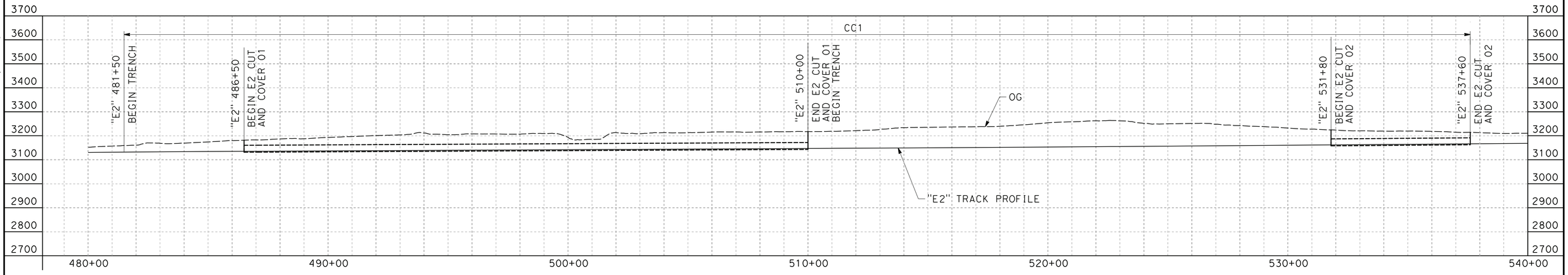
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PLAN
STA 1915+47.81 TO STA 1944+05.88

CONTRACT NO. HSR14-42
DRAWING NO. TN-D4028-E2
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:

FAULT ZONES LIMITS APPROXIMATE ONLY

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 W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

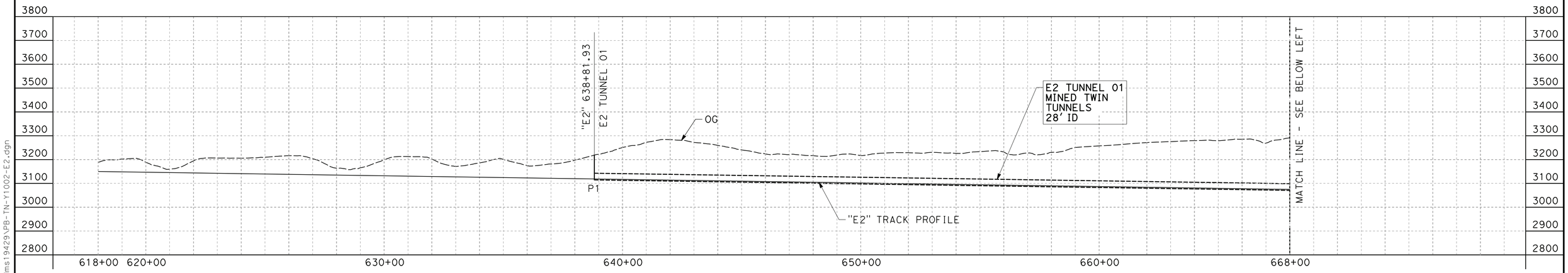
NOT FOR CONSTRUCTION

SENER

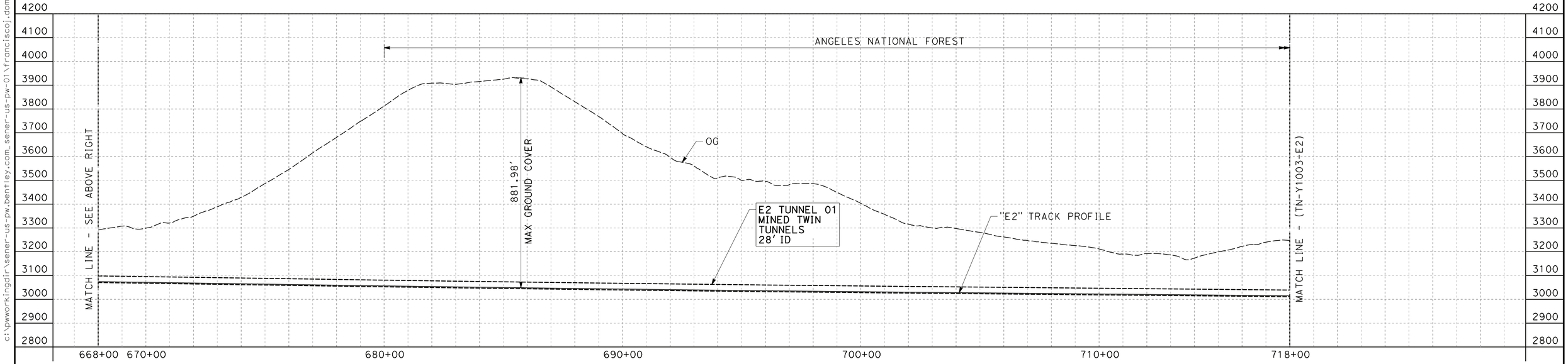
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 480+00.00 TO STA 540+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1001-E2
SCALE AS SHOWN
SHEET NO.



PROFILE



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

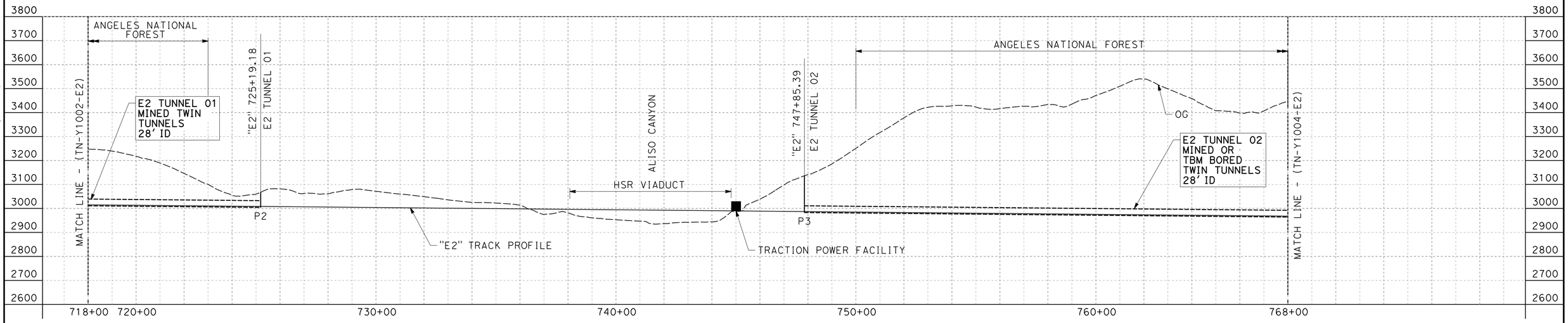
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 618+00.00 TO STA 718+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1002-E2
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

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CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

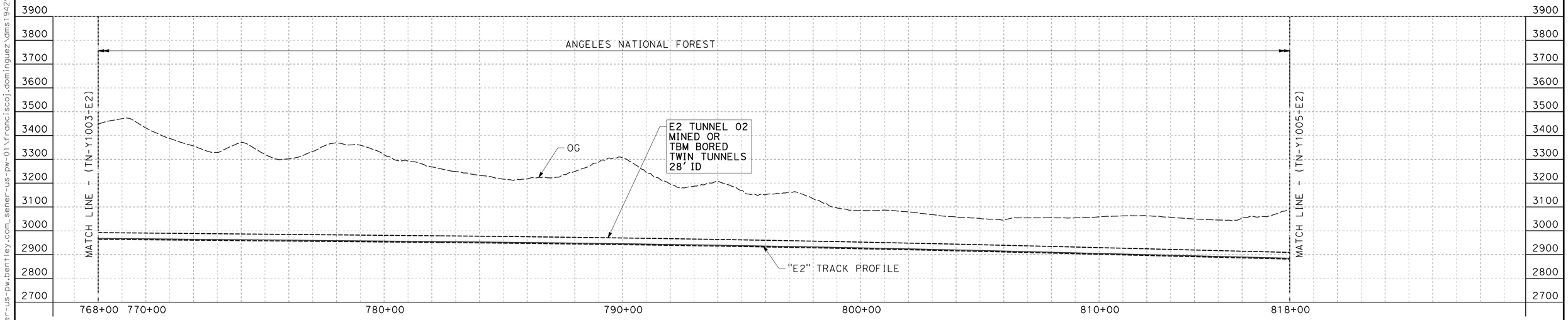
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 718+00.00 TO STA 768+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1003-E2
SCALE AS SHOWN
SHEET NO.



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

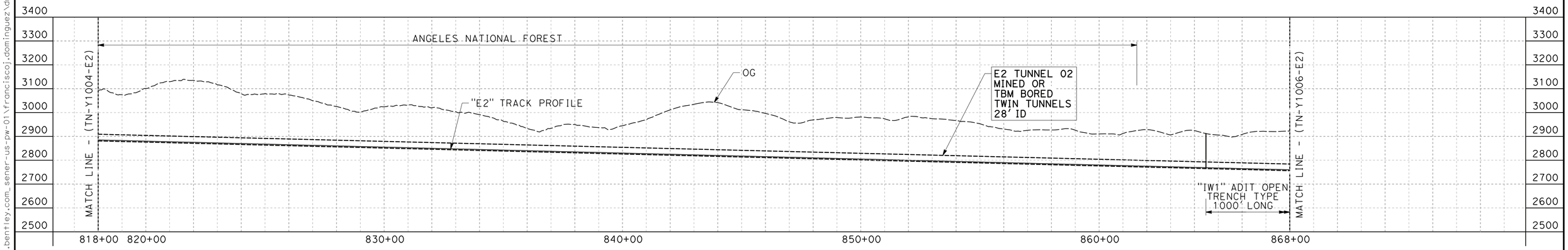
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 768+00.00 TO STA 818+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1004-E2
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:

FAULT ZONES LIMITS APPROXIMATE ONLY

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

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IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

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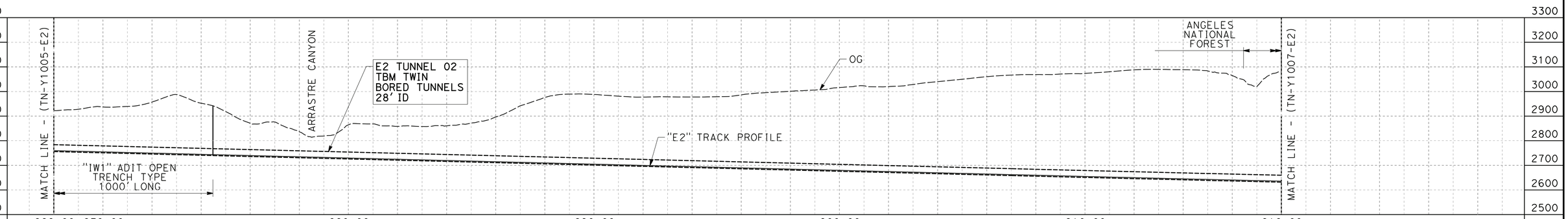
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 818+00.00 TO STA 868+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1005-E2
SCALE AS SHOWN
SHEET NO.



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

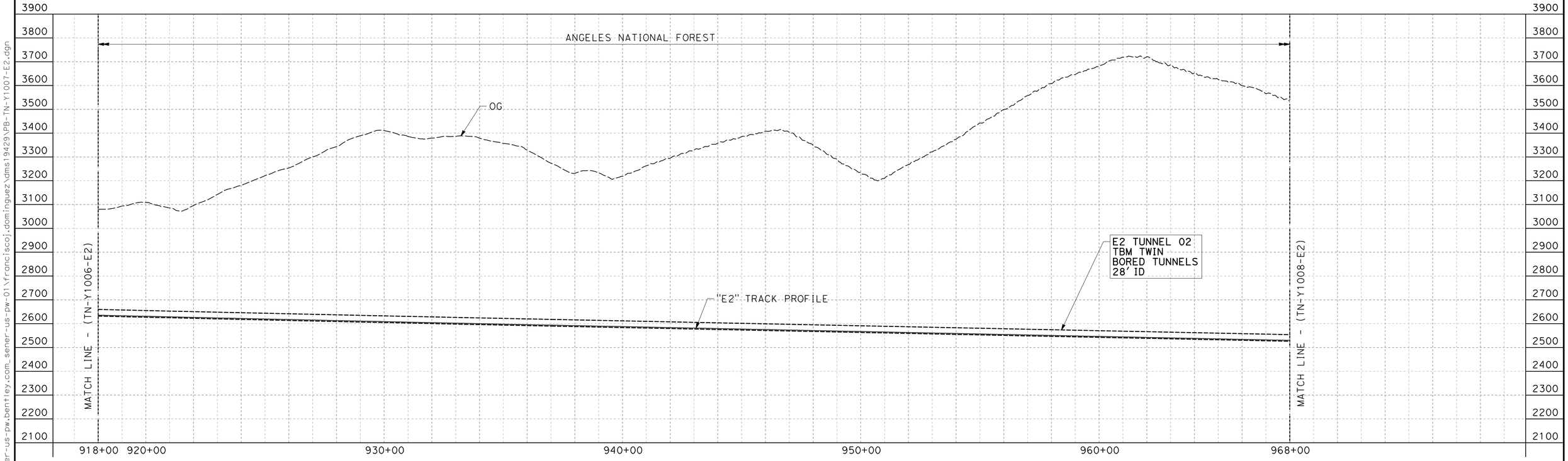
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 868+00.00 TO STA 918+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1006-E2
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:

FAULT ZONES LIMITS APPROXIMATE ONLY

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

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CHECKED BY W.GUO
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DATE 04/30/2021

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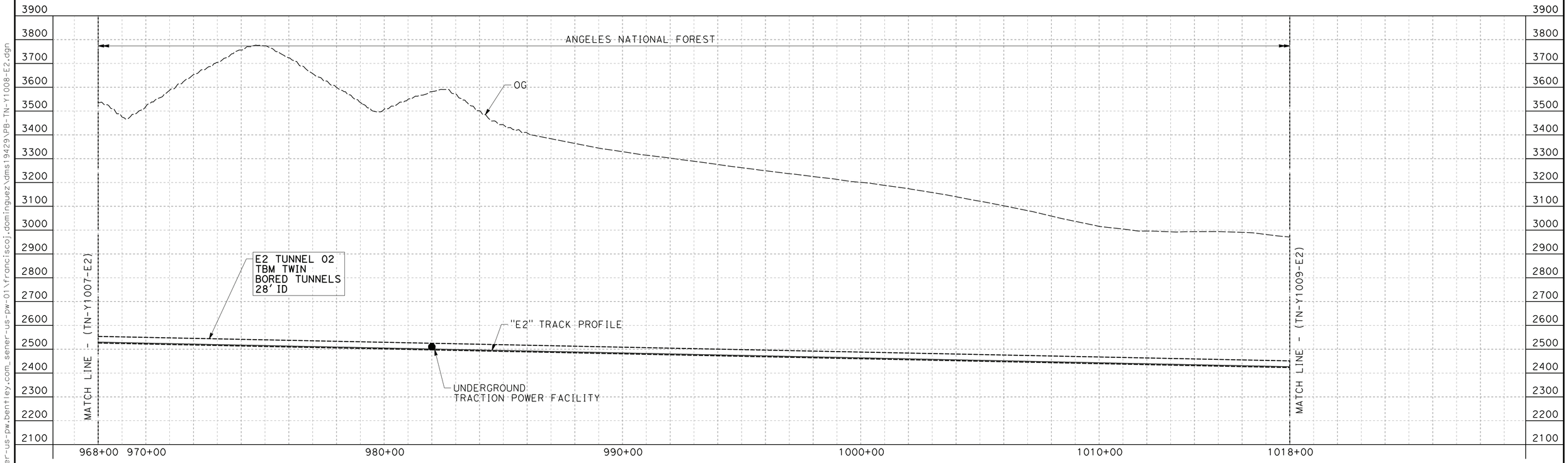
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 918+00.00 TO STA 968+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1007-E2
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
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IN CHARGE A.RELAÑO
DATE 04/30/2021

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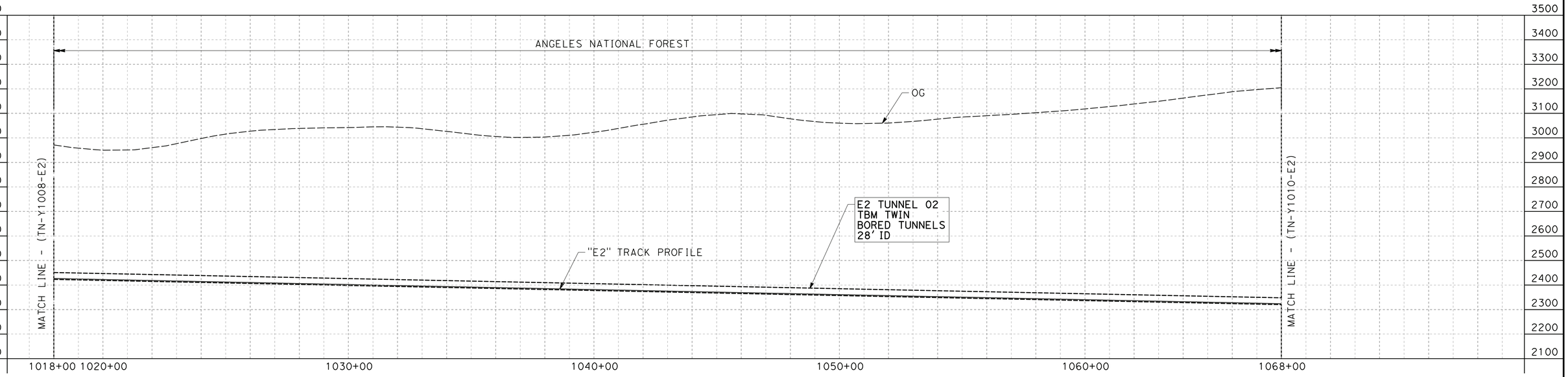
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 968+00.00 TO STA 1018+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1008-E2
SCALE AS SHOWN
SHEET NO.



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

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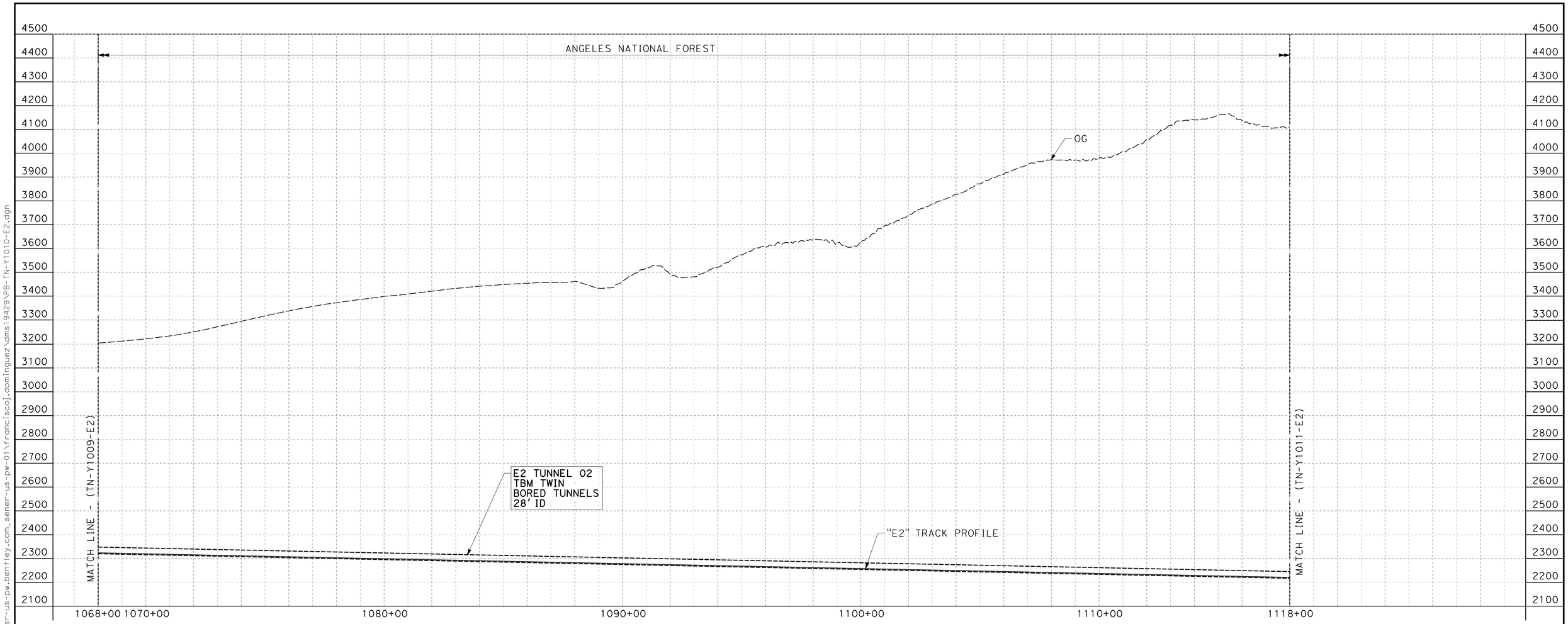
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1018+00.00 TO STA 1068+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1009-E2
SCALE AS SHOWN
SHEET NO.



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
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CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

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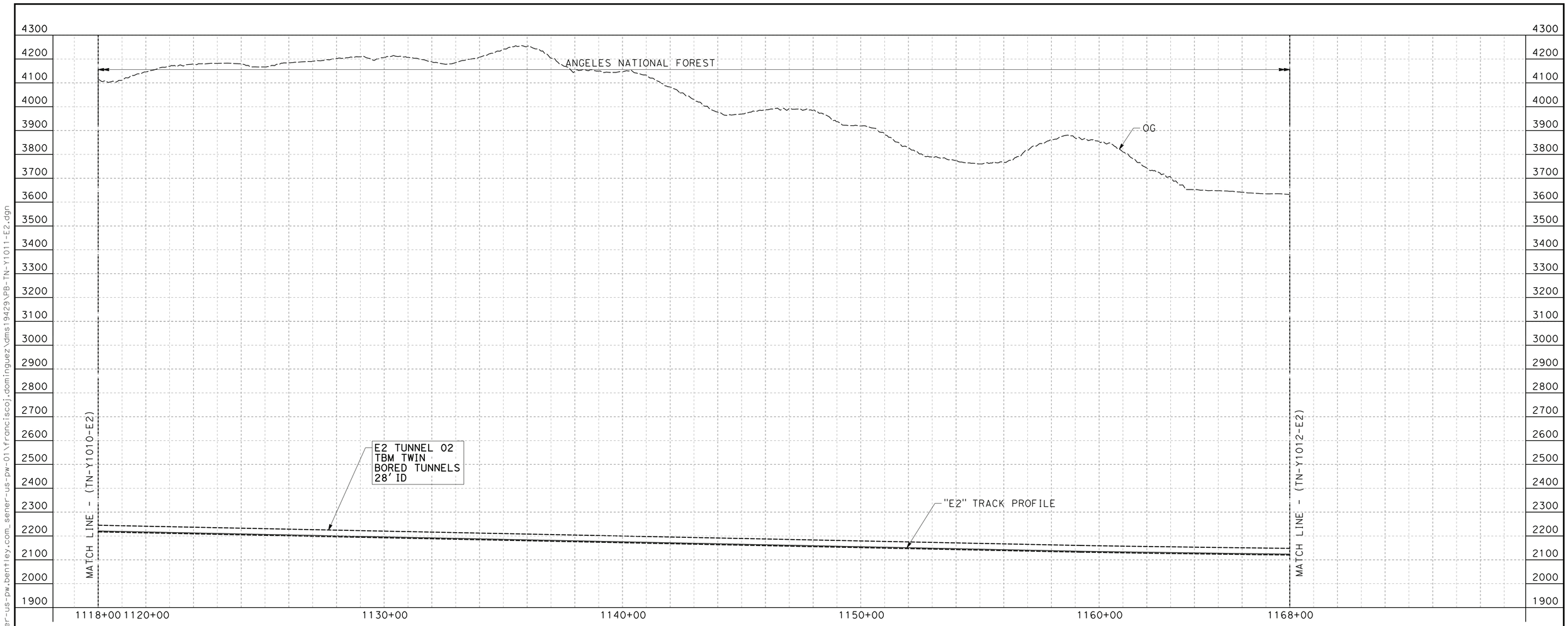
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1068+00.00 TO STA 1118+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1010-E2
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
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IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET
REV 02

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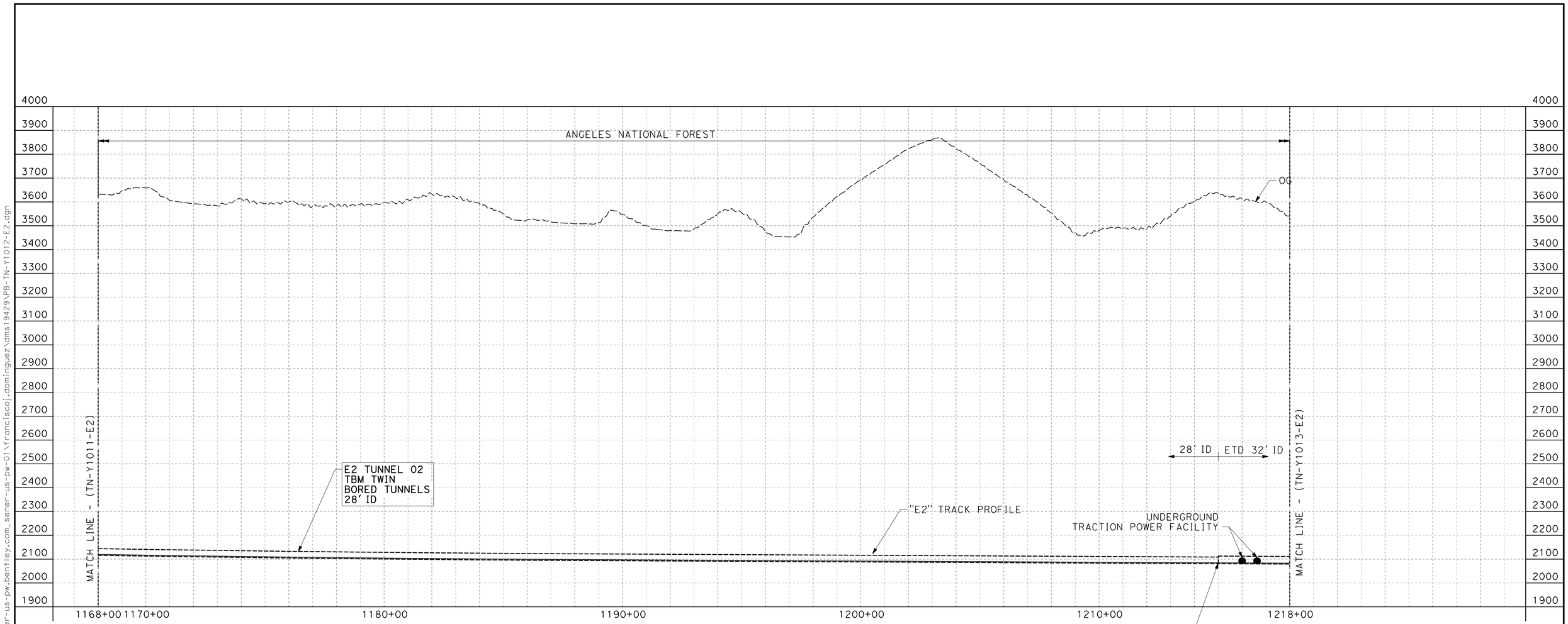
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1118+00.00 TO STA 1168+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1011-E2
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

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 W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

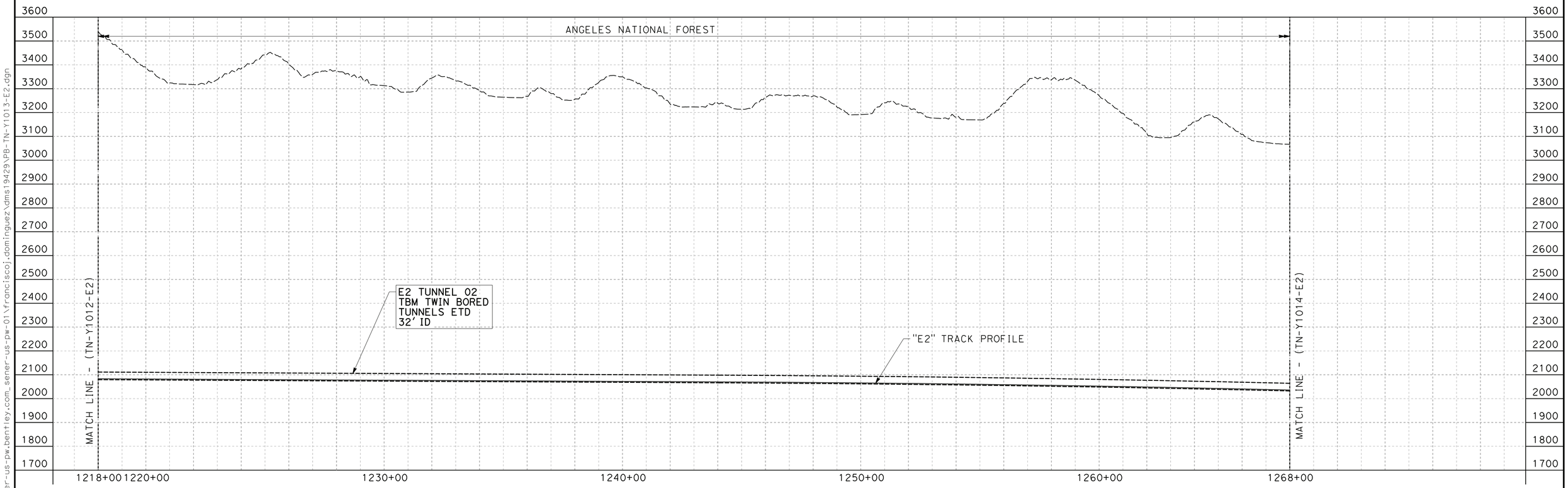
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1168+00.00 TO STA 1218+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1012-E2
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
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CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

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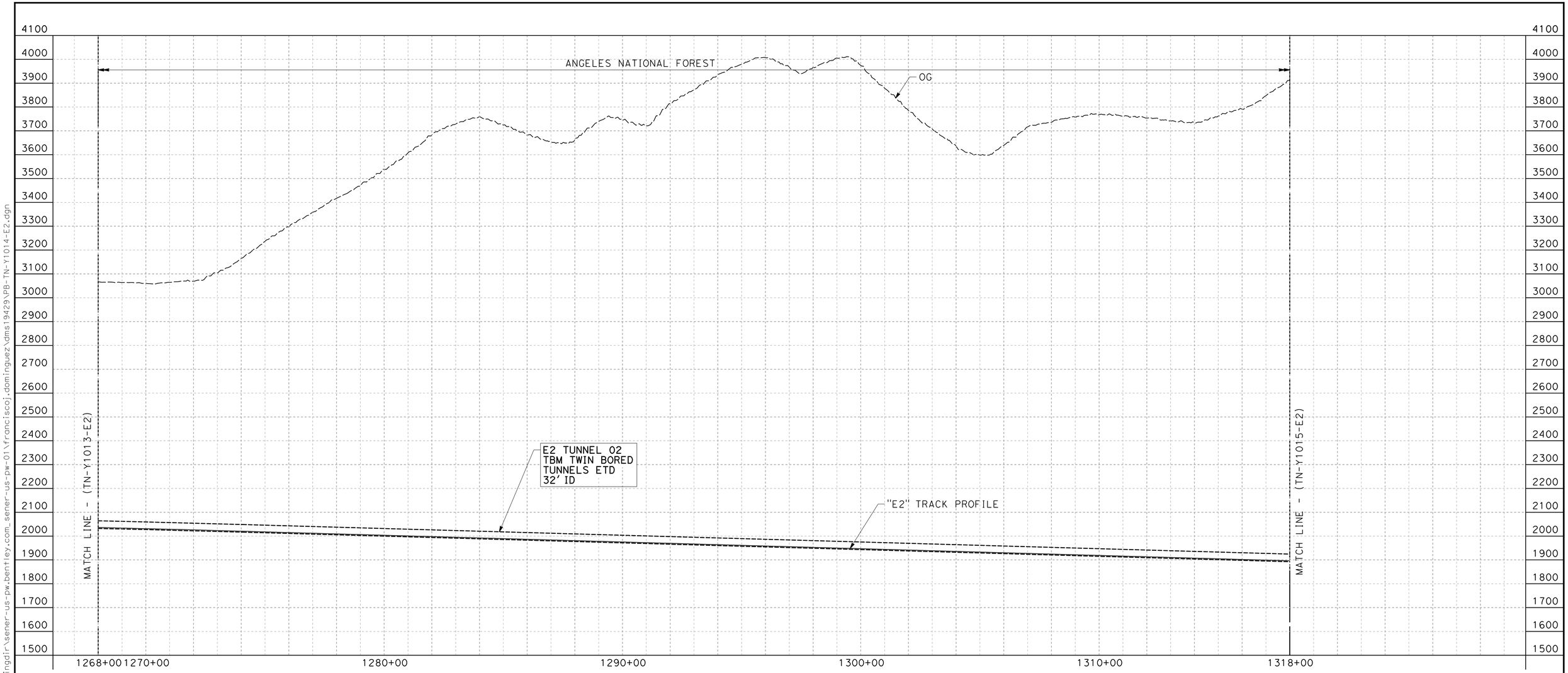
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1218+00.00 TO STA 1268+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1013-E2
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

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 W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

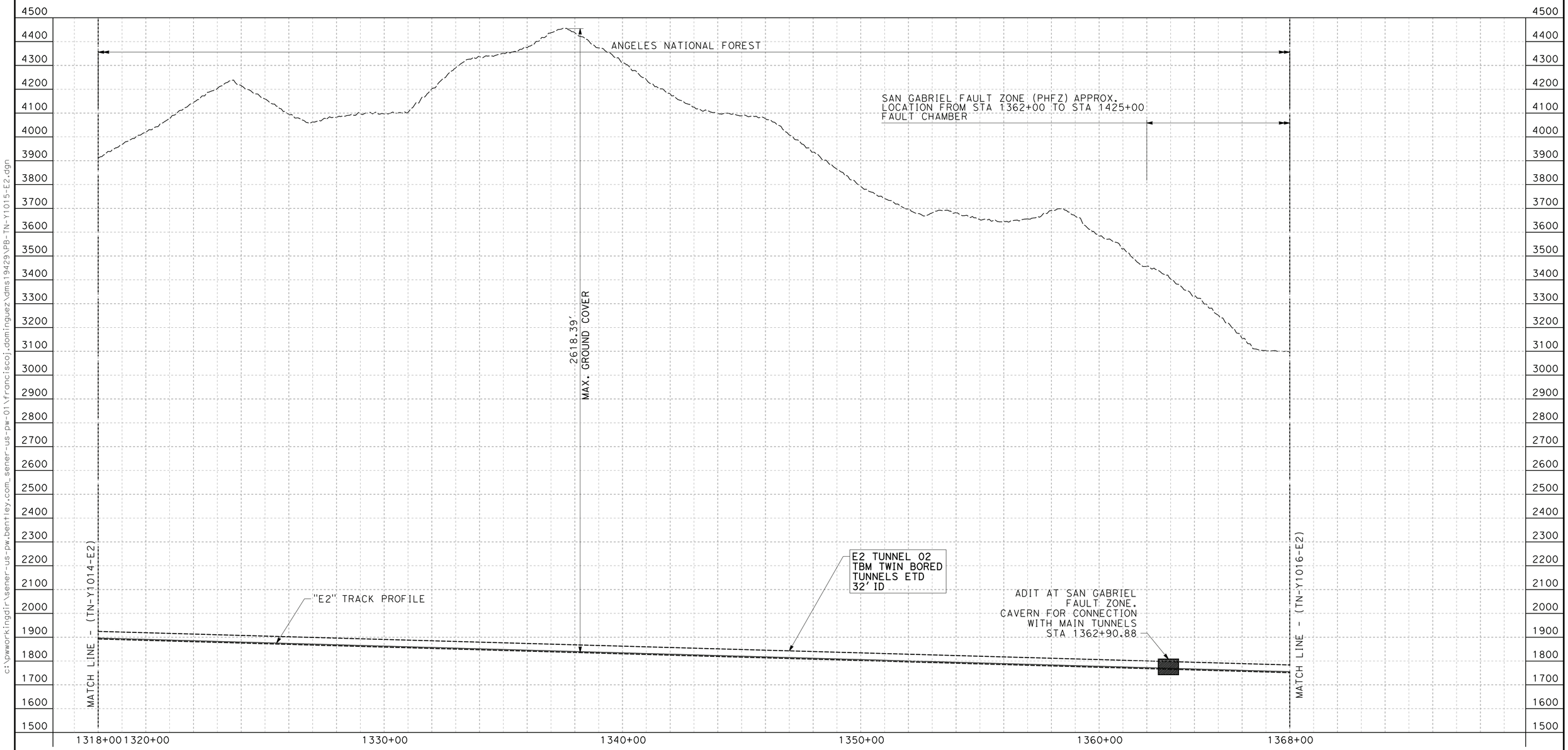
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1268+00.00 TO STA 1318+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1014-E2
SCALE AS SHOWN
SHEET NO.



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

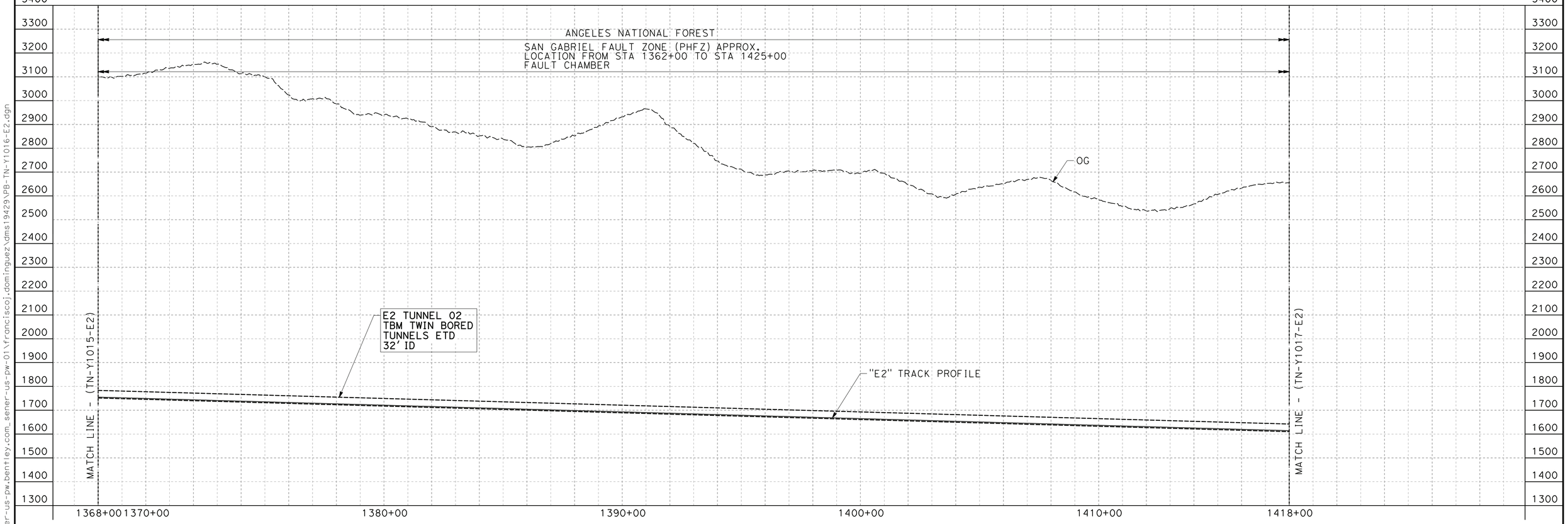
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1318+00.00 TO STA 1368+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1015-E2
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

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 W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET
REV 02

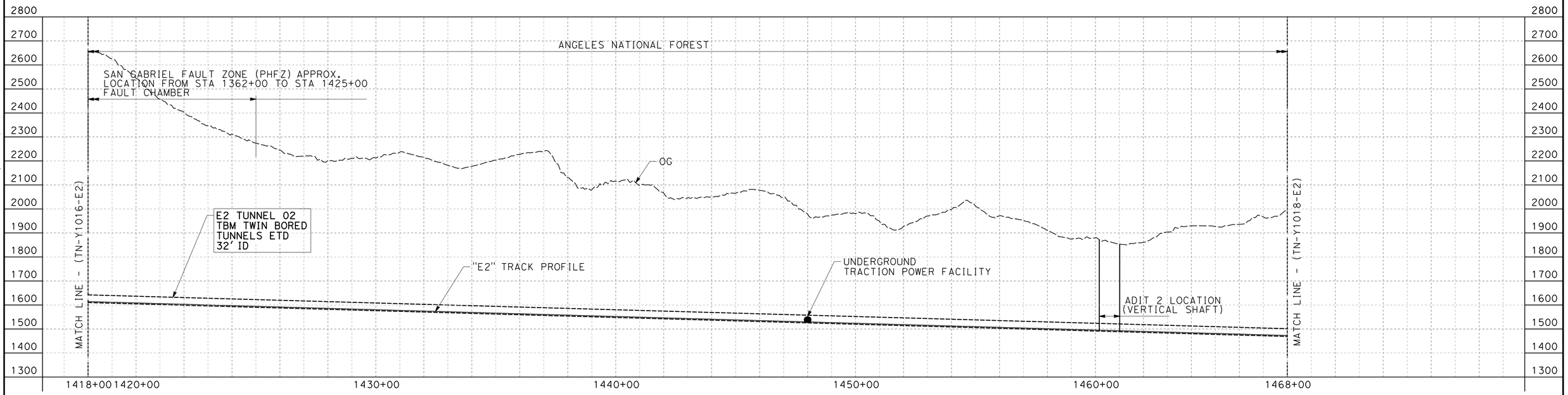
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1368+00.00 TO STA 1418+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1016-E2
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:

FAULT ZONES LIMITS APPROXIMATE ONLY

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 W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

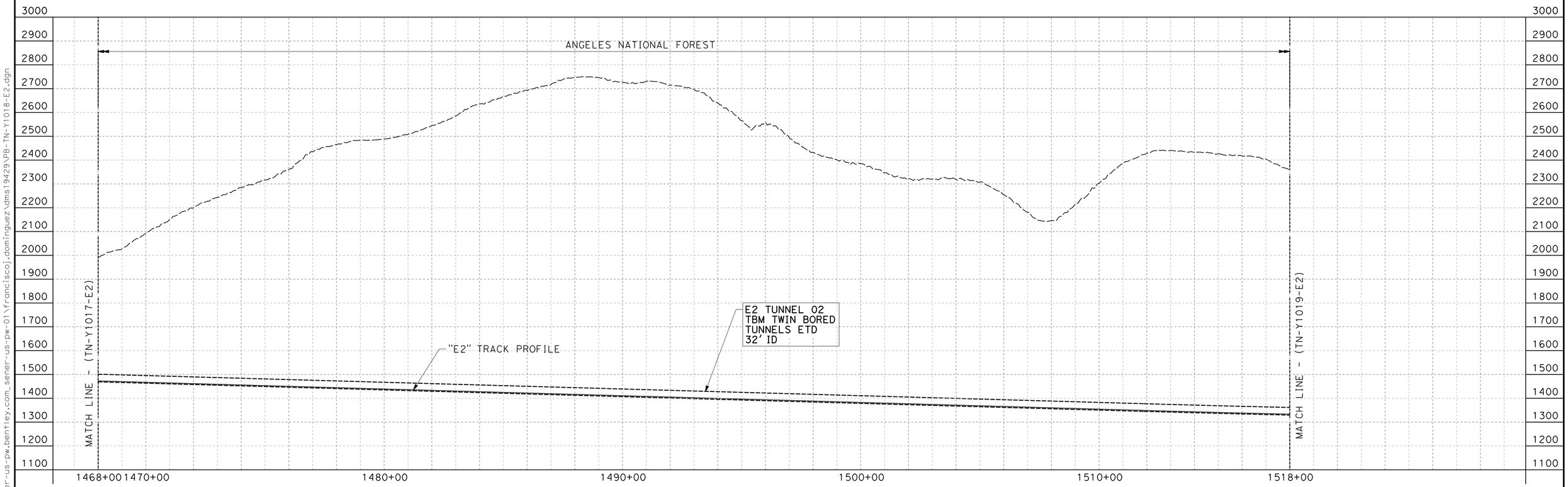
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1418+00.00 TO STA 1468+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1017-E2
SCALE AS SHOWN
SHEET NO.



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

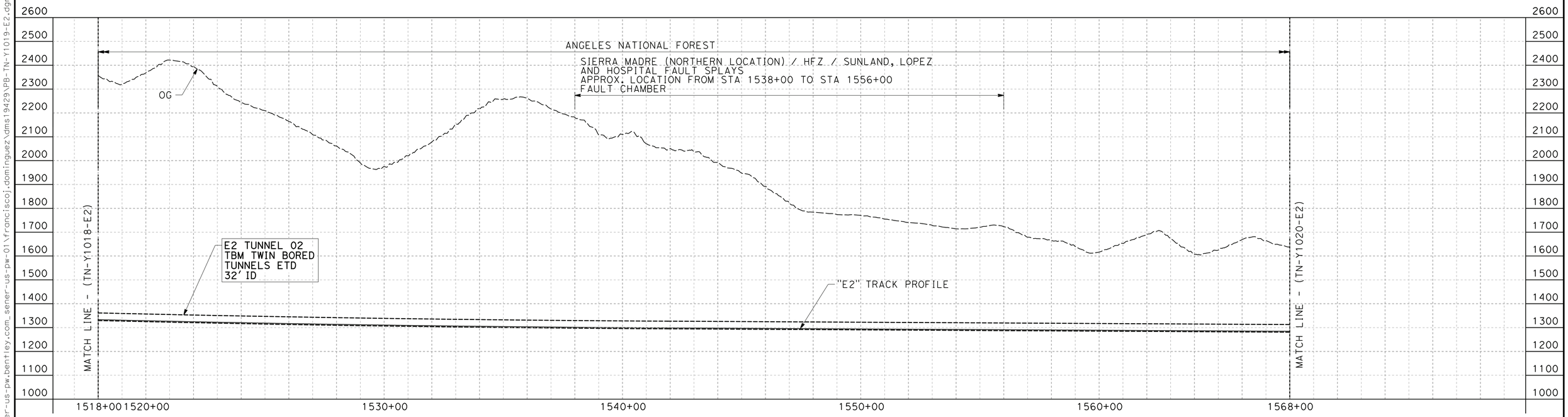
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1468+00.00 TO STA 1518+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1018-E2
SCALE AS SHOWN
SHEET NO.



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

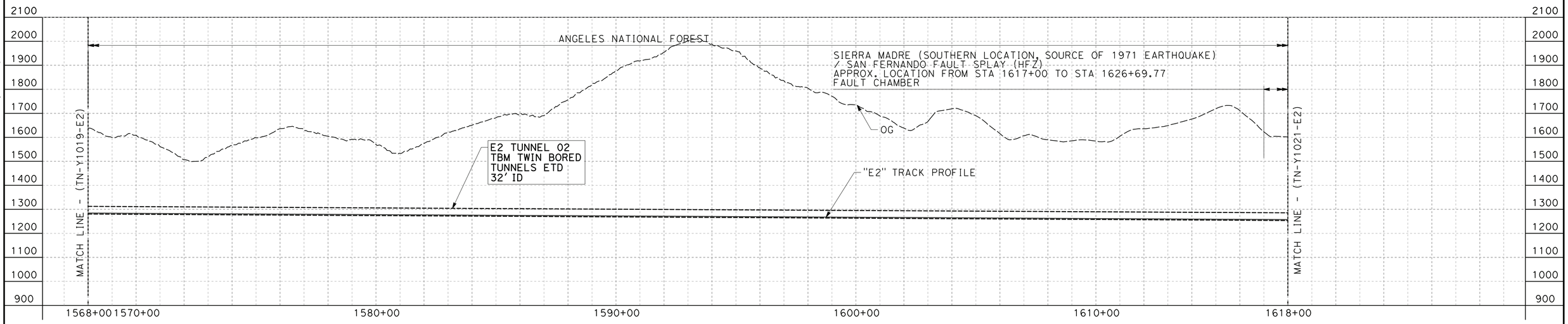
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1518+00.00 TO STA 1568+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1019-E2
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

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 W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

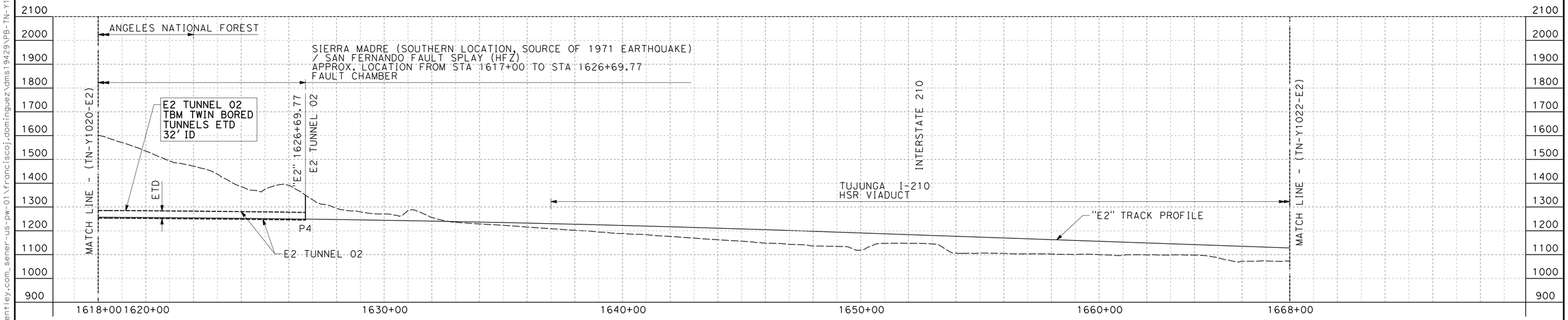
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1568+00.00 TO STA 1618+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1020-E2
SCALE AS SHOWN
SHEET NO.



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

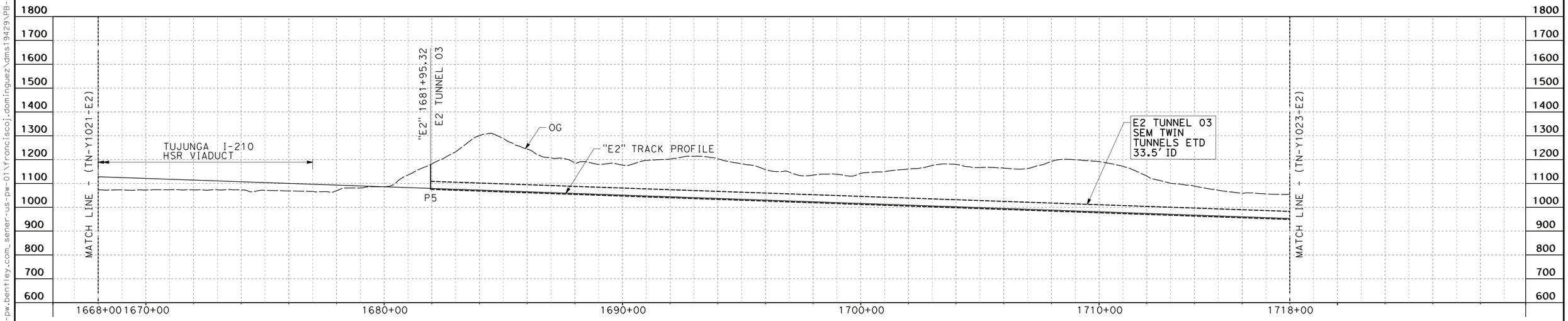
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1618+00.00 TO STA 1668+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1021-E2
SCALE AS SHOWN
SHEET NO.



PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1668+00.00 TO STA 1718+00.00

CONTRACT NO. HSR14-42
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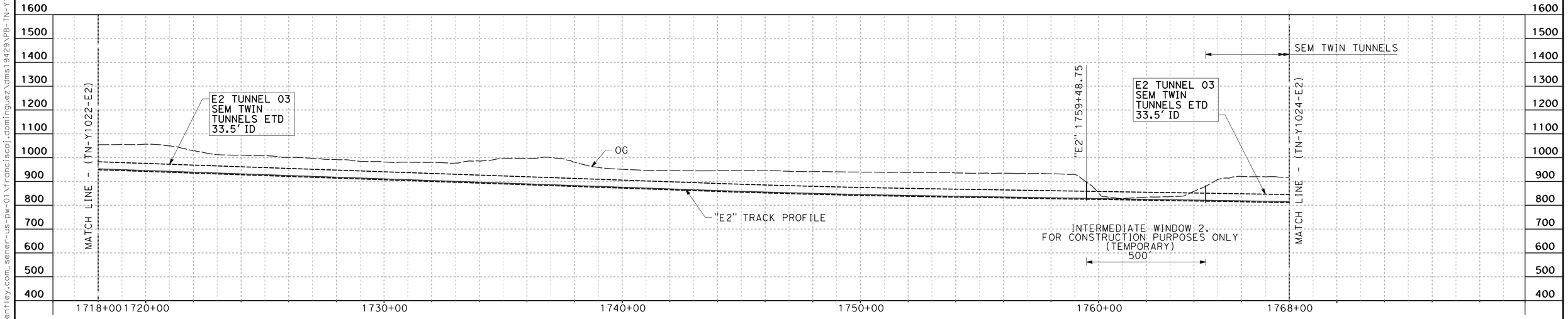
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:

FAULT ZONES LIMITS APPROXIMATE ONLY

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 W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1718+00.00 TO STA 1768+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1023-E2
SCALE AS SHOWN
SHEET NO.

0205240

24/05/2021 21:44:36

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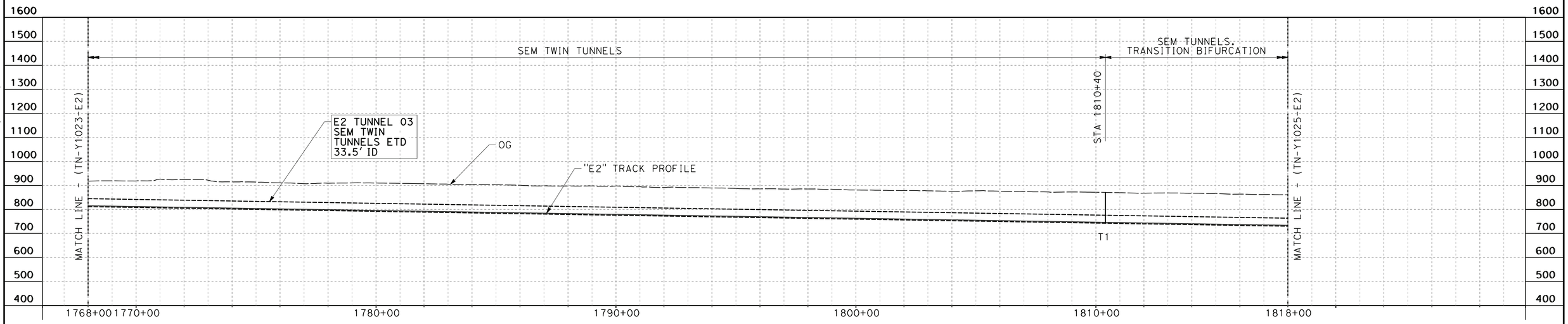


PROFILE

200 0 200 400
HORIZ 1"=200'

200 0 200 400
VERT 1"=200'

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

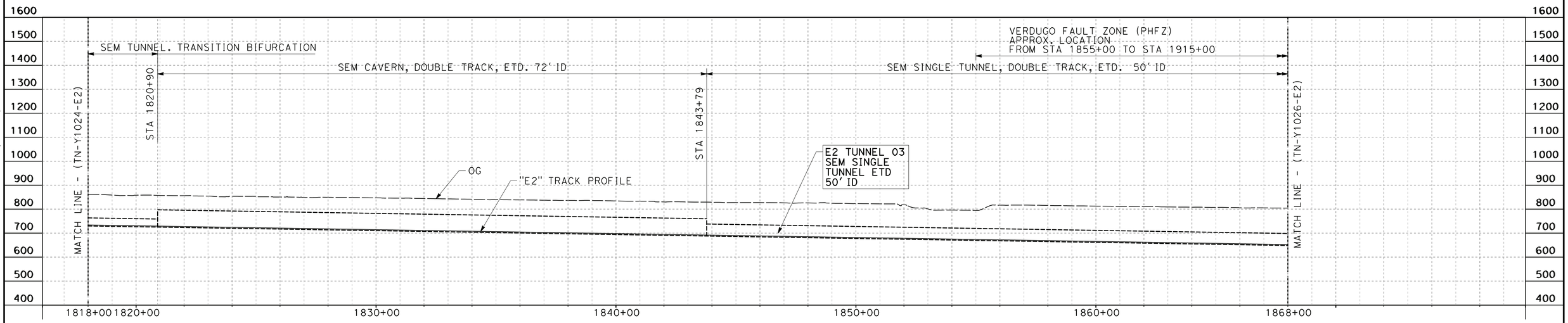
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1768+00.00 TO STA 1818+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1024-E2
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:

FAULT ZONES LIMITS APPROXIMATE ONLY

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 W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

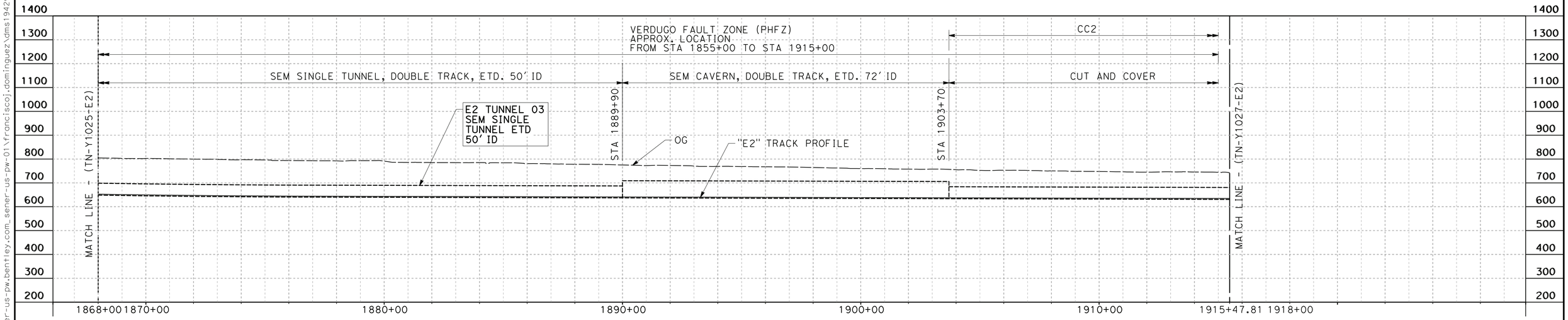
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1818+00.00 TO STA 1868+00.00

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1025-E2
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:
FAULT ZONES LIMITS APPROXIMATE ONLY

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 W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET
REV 02

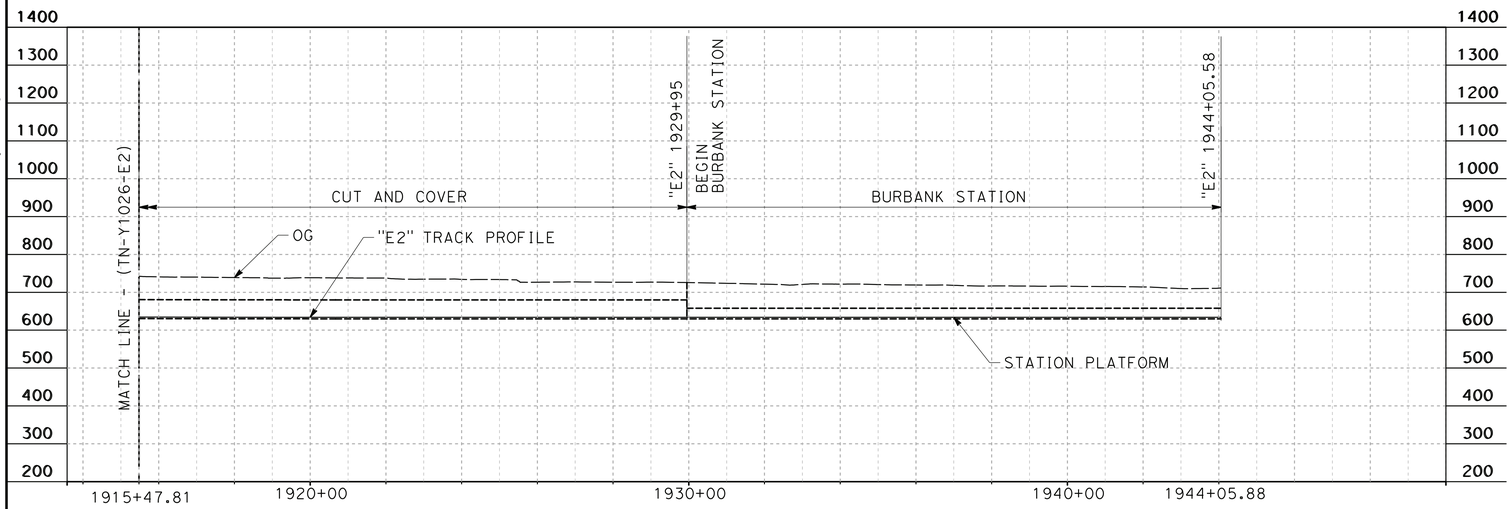
NOT FOR CONSTRUCTION

SENER

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1868+00.00 TO STA 1915+47.81

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1026-E2
SCALE AS SHOWN
SHEET NO.



PROFILE

NOTE:

FAULT ZONES LIMITS APPROXIMATE ONLY

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 W.GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"
TUNNEL PROFILE
SOUTH BOUND TUNNEL
STA 1915+47.81 TO 1944+05.88

CONTRACT NO. HSR14-42
DRAWING NO. TN-Y1027-E2
SCALE AS SHOWN
SHEET NO.

0205240

24/05/2021 21:45:34

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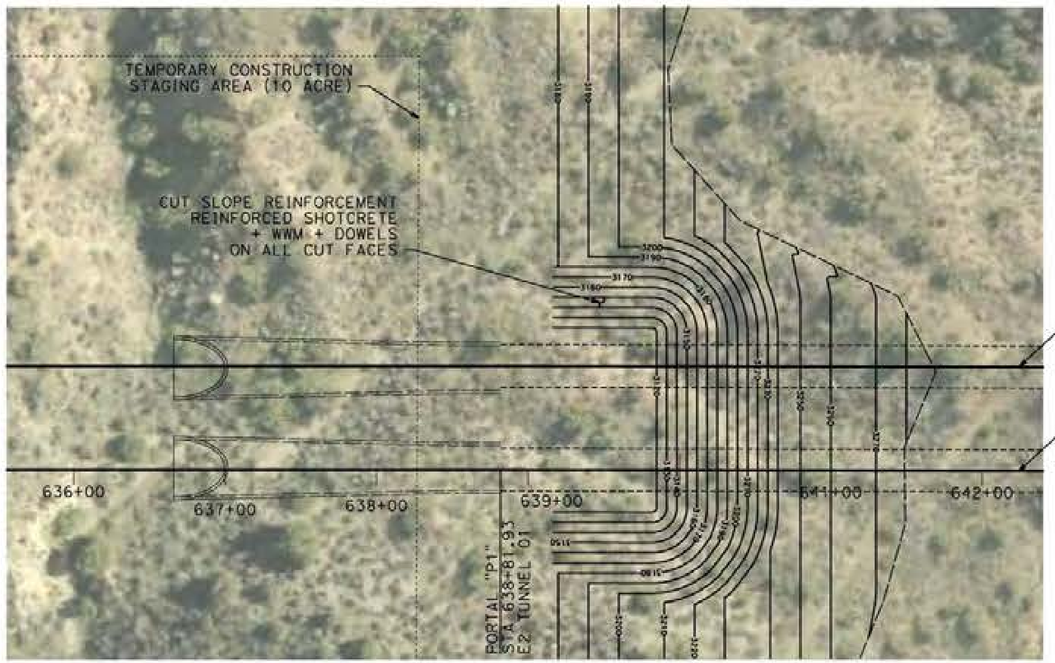
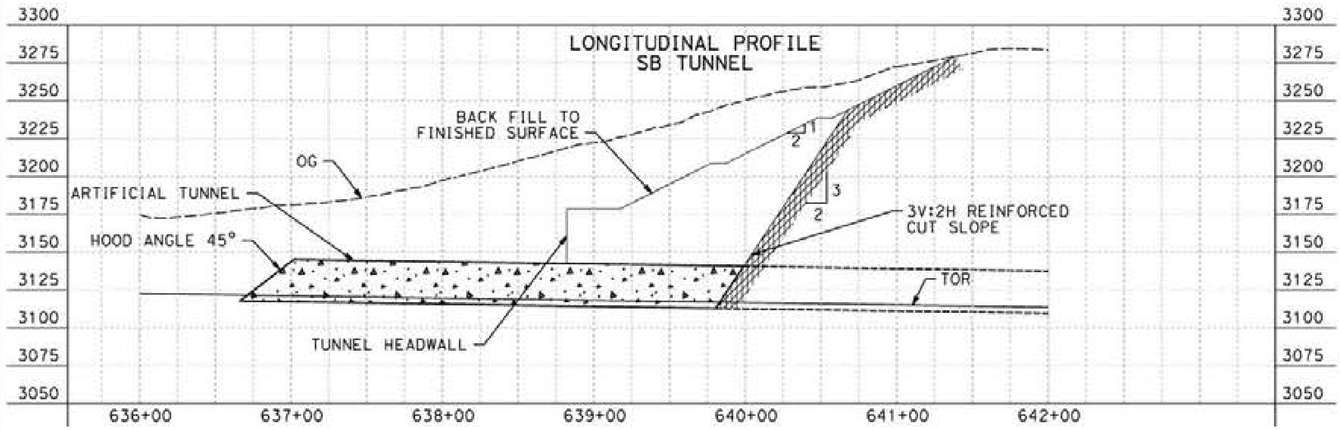


PLAN

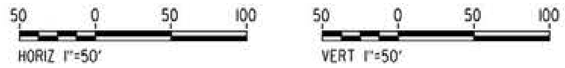


PROFILE

NOTE :

1. EXAMPLE OF ROCK CUT SLOPE REINFORCEMENT AT PORTAL MOUTH
   - 2 IN OF SHOTCRETE WITH STEEL FIBERS (85 LBS/CUBIC YARD)
   - 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	71,369 CY
FILL VOLUME	38,134 CY
CUT SLOPE SURFACE	46,894 SQFT



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

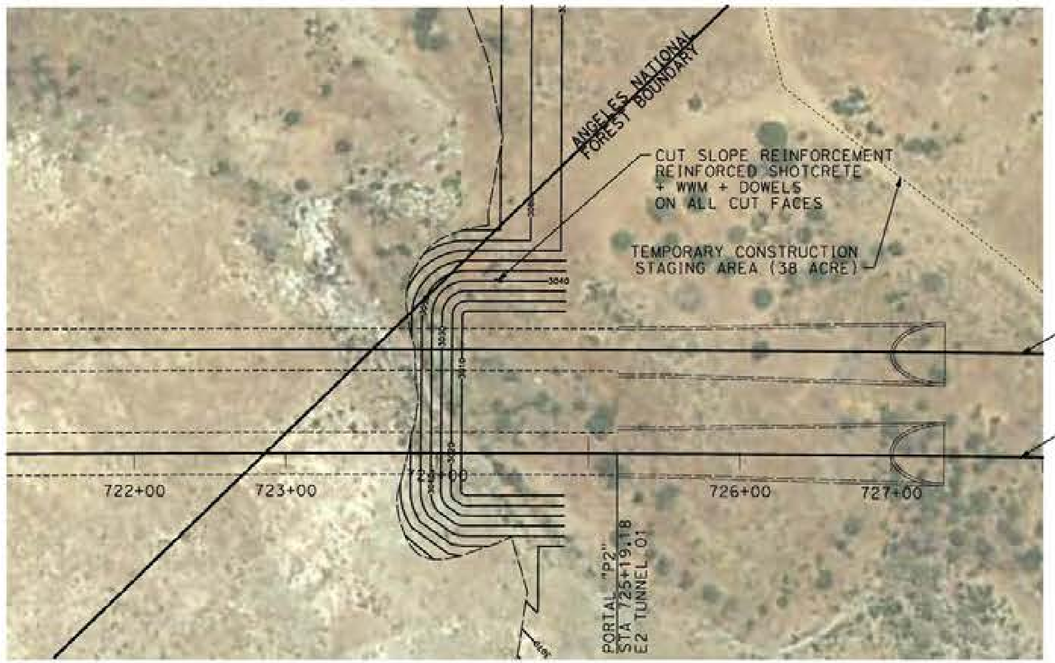
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

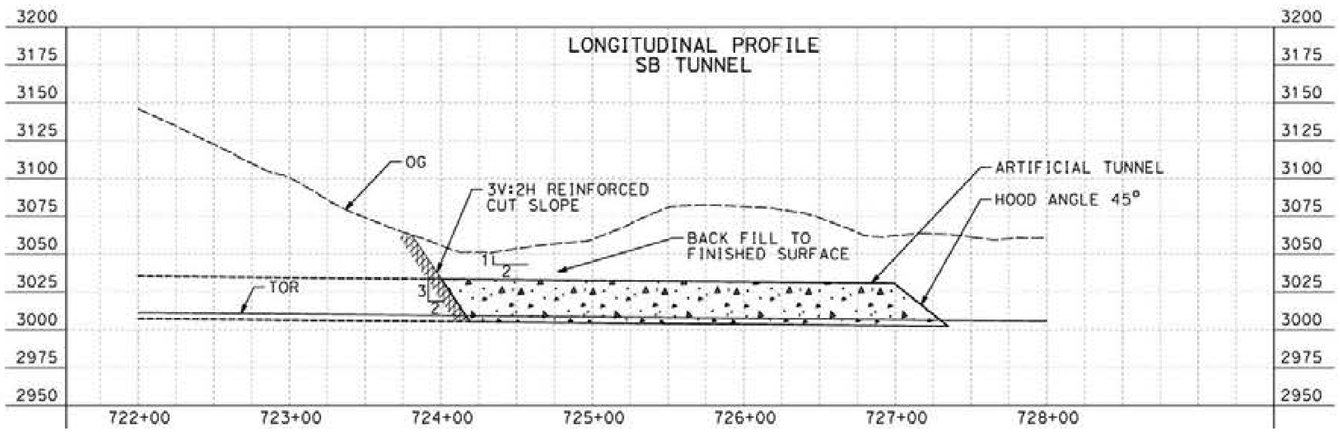
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PORTAL 1
PLAN AND PROFILE FOR CONSTRUCTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-D7001-E2
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 (85 LBS/CUBIC YARD)
   - 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	15,372 CY
FILL VOLUME	4,578 CY
CUT SLOPE SURFACE	24,497 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 W. GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

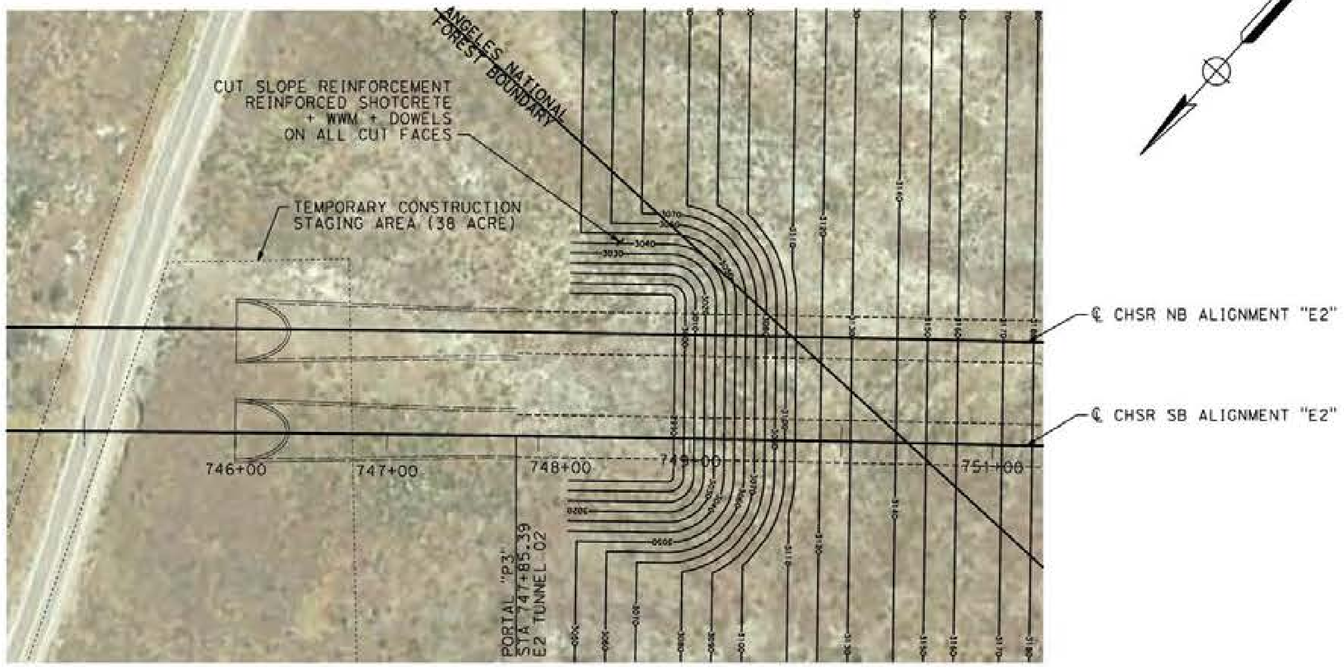
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

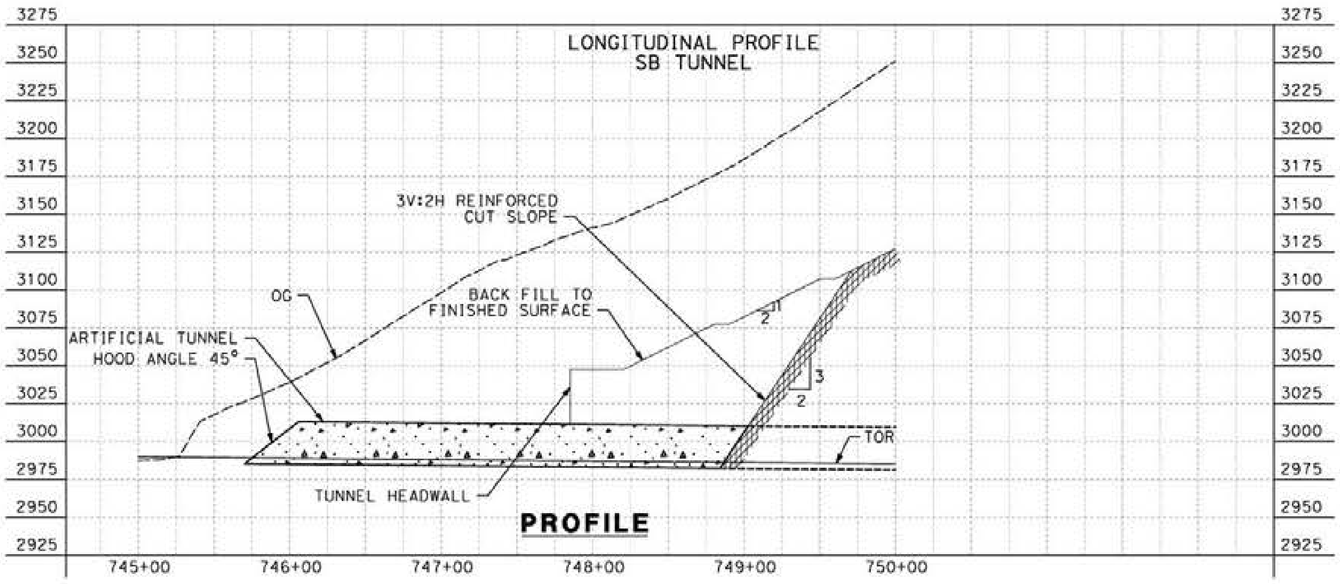
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PORTAL 2
PLAN AND PROFILE FOR CONSTRUCTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-D7002-E2
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 (85 LBS/CUBIC YARD)
   - 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	227,854 CY
FILL VOLUME	38,132 CY
CUT SLOPE SURFACE	46,894 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 W. GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

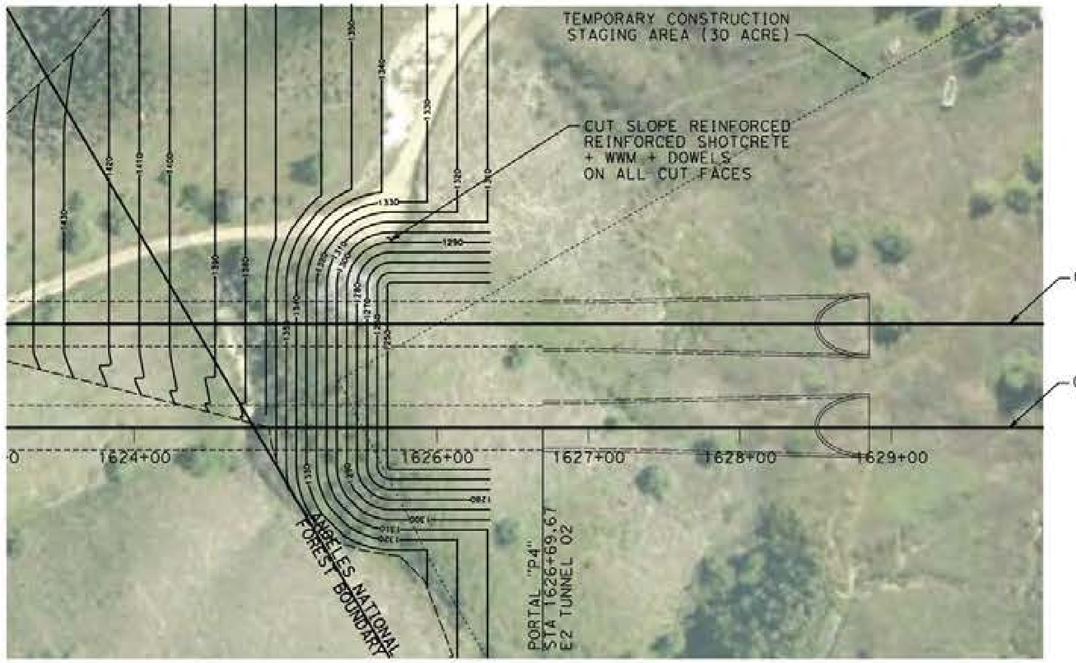
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

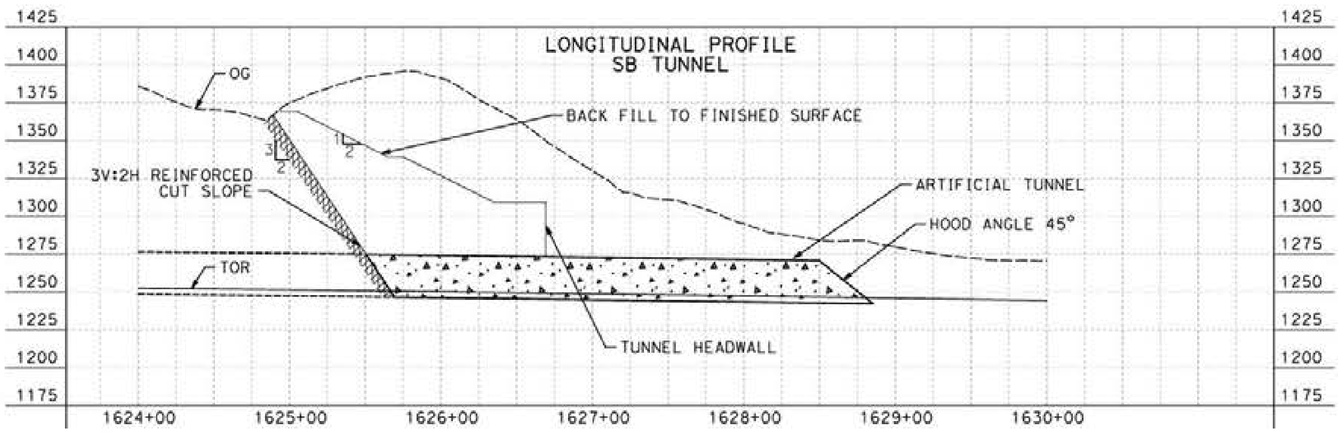
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PORTAL 3
PLAN AND PROFILE FOR CONSTRUCTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-D7003-E2
SCALE AS SHOWN
SHEET NO.



PLAN

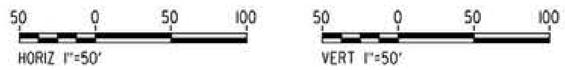


PROFILE

NOTE :

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

EXCAVATION VOLUME	107,156 CY
FILL VOLUME	35,966 CY
CUT SLOPE SURFACE	44,337 SQFT



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E.VELASCO
DRAWN BY FJ.DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

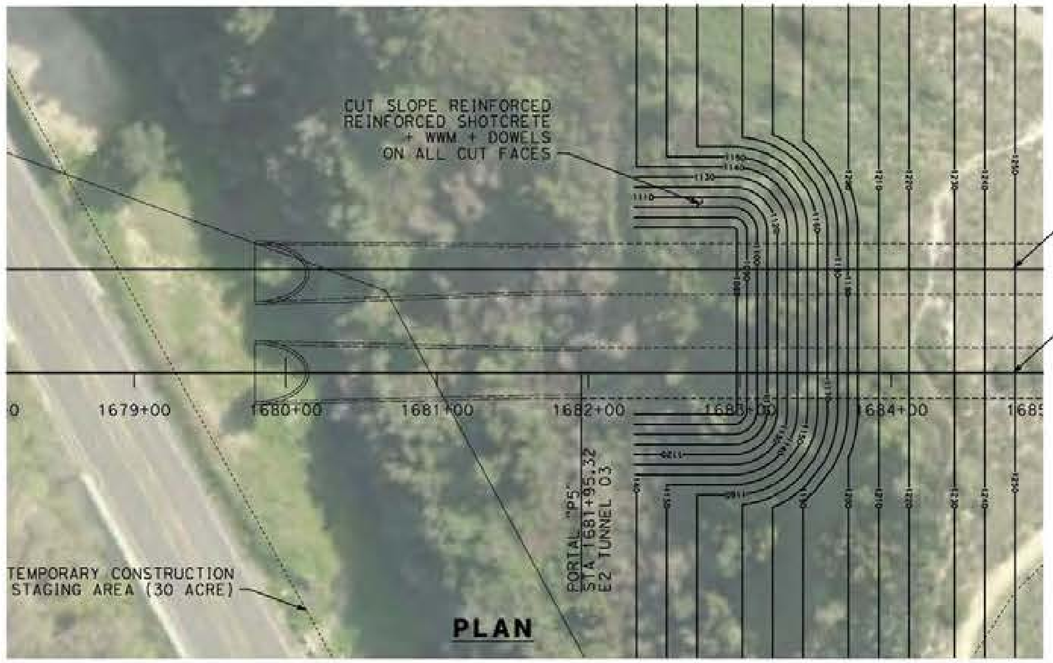
SENER

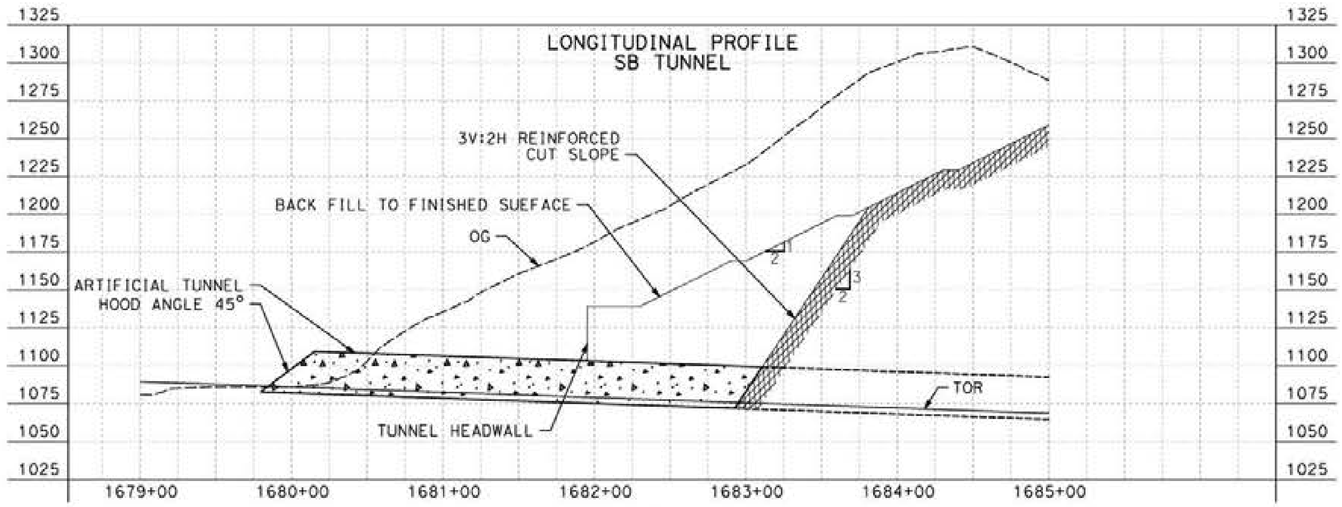
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PORTAL 4
PLAN AND PROFILE FOR CONSTRUCTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-D7004-E2
SCALE AS SHOWN
SHEET NO.





NOTE :

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

EXCAVATION VOLUME	158,191 CY
FILL VOLUME	38,549 CY
CUT SLOPE SURFACE	47,326 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 W. GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

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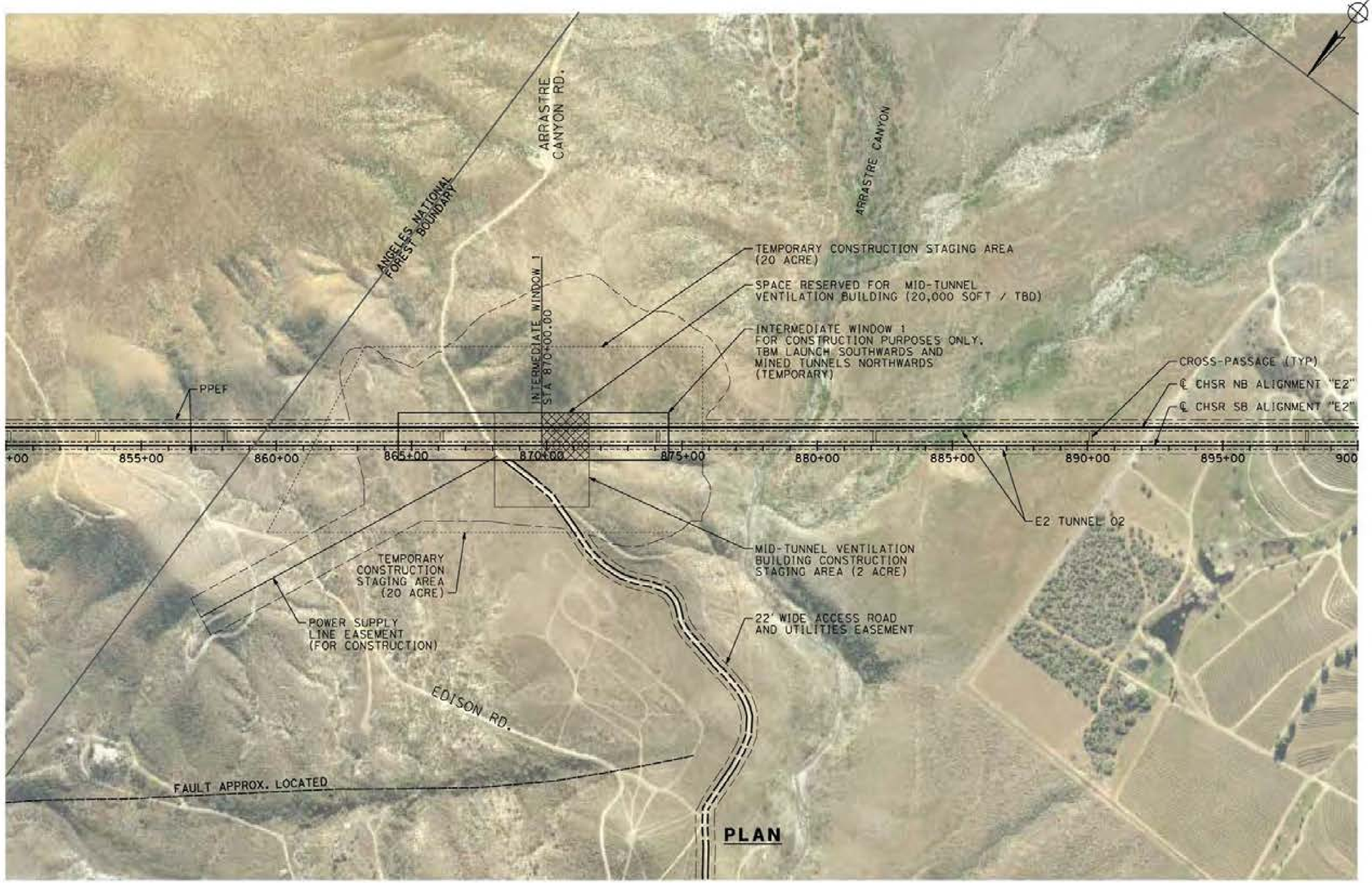
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PORTAL 5
PLAN AND PROFILE FOR CONSTRUCTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-D7005-E2
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 W. GUO
IN CHARGE A.RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

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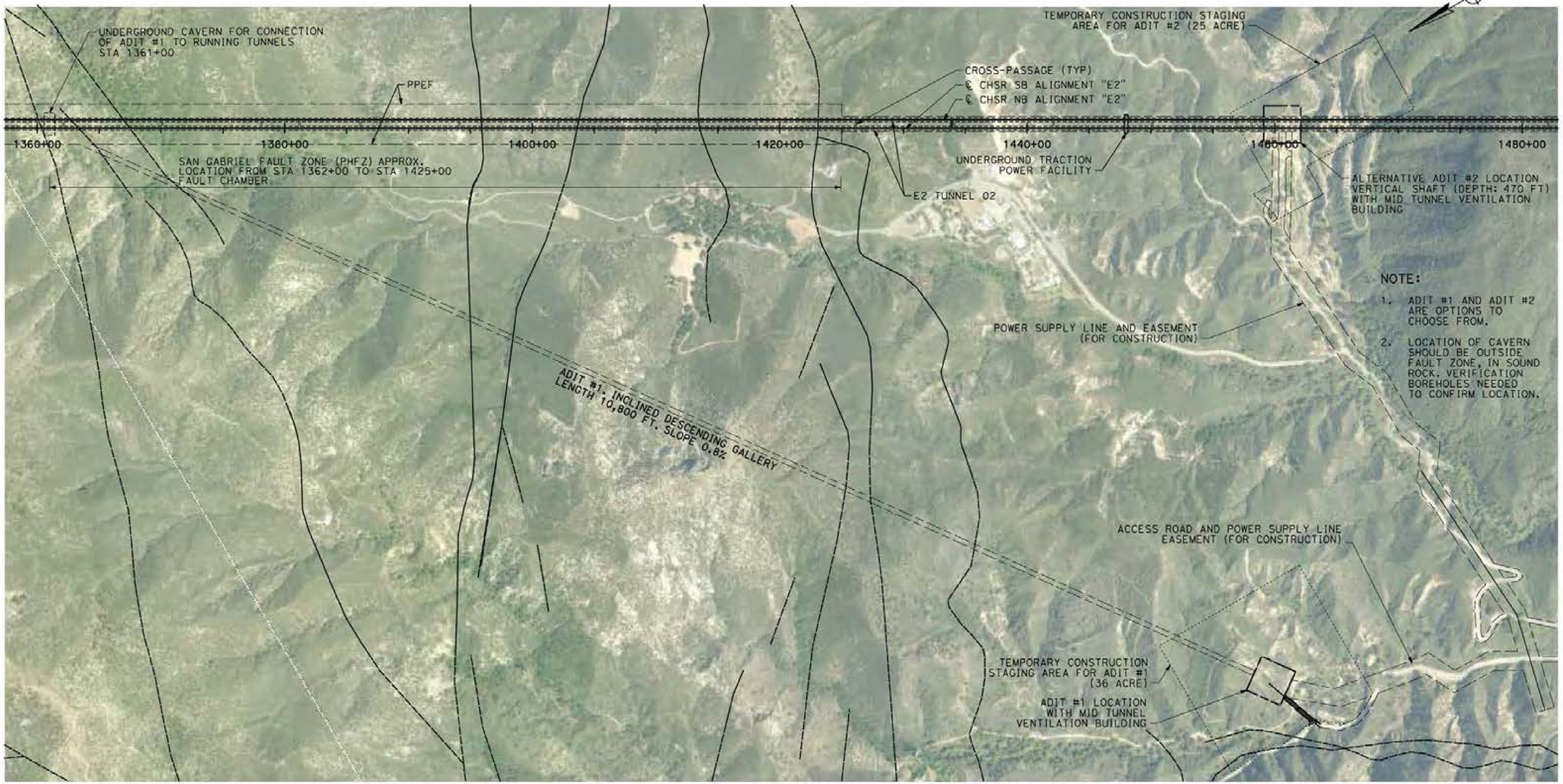
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PLAN
INTERMEDIATE WINDOW 1

CONTRACT NO. HSR14-42
DRAWING NO. TN-D5001-E2
SCALE AS SHOWN
SHEET NO.



NOTE:

1. ADIT #1 AND ADIT #2 ARE OPTIONS TO CHOOSE FROM.
2. LOCATION OF CAVERN SHOULD BE OUTSIDE FAULT ZONE, IN SOUND ROCK. VERIFICATION BOREHOLES NEEDED TO CONFIRM LOCATION.

PLAN

400 0 400 800
1"=400

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E.VELASCO
DRAWN BY: FJ.DOMINGUEZ
CHECKED BY: W. GUO
IN CHARGE: A.RELAÑO
DATE: 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

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CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT "E2"

PLAN
POTENTIAL ADIT LOCATIONS

CONTRACT NO. HSR14-42
DRAWING NO. TN-D5002-E2
SCALE AS SHOWN
SHEET NO.

0205240

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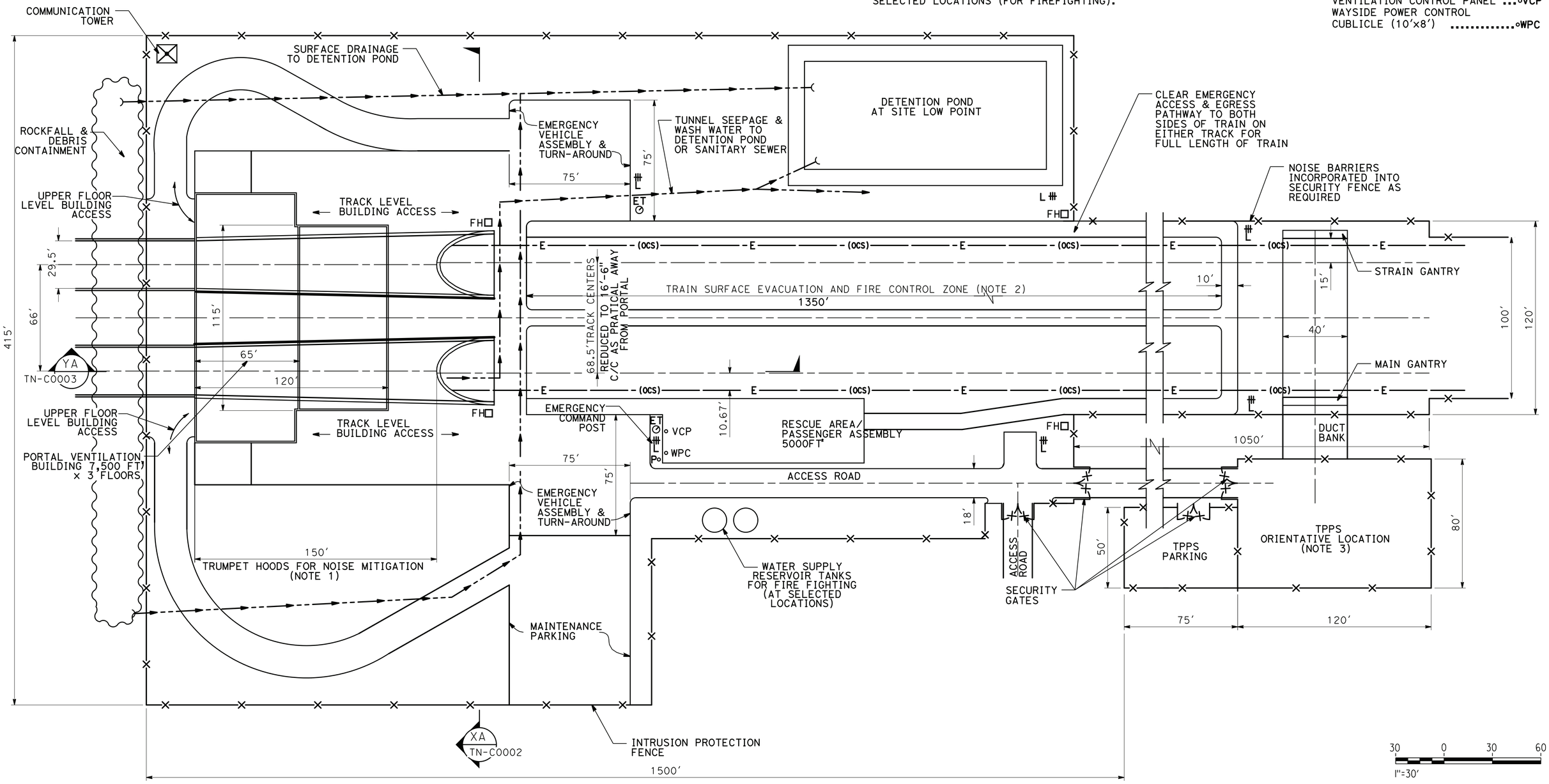
NOTES:

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′×8′) .....○WPC



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

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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

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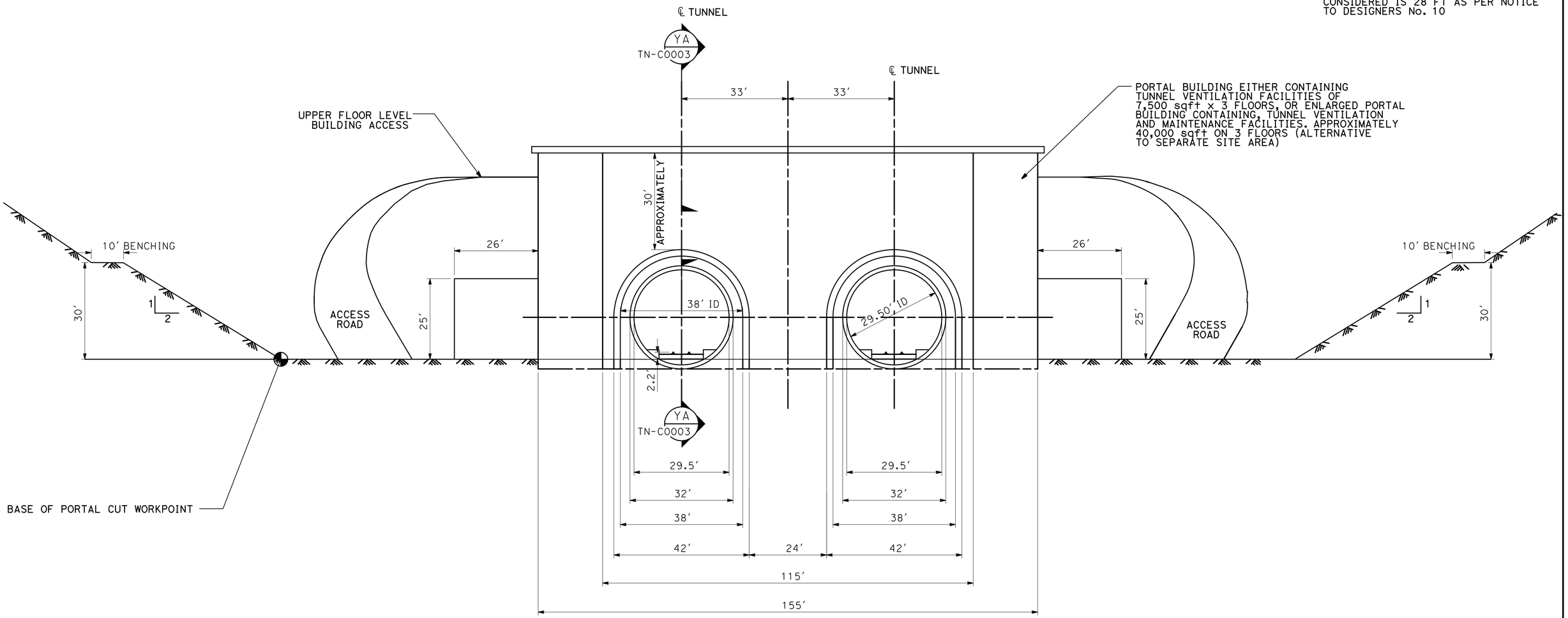
NOTES:

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



SECTION XA TN-C0002
SCALE 1"=15′

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

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CALIFORNIA HIGH-SPEED RAIL AUTHORITY

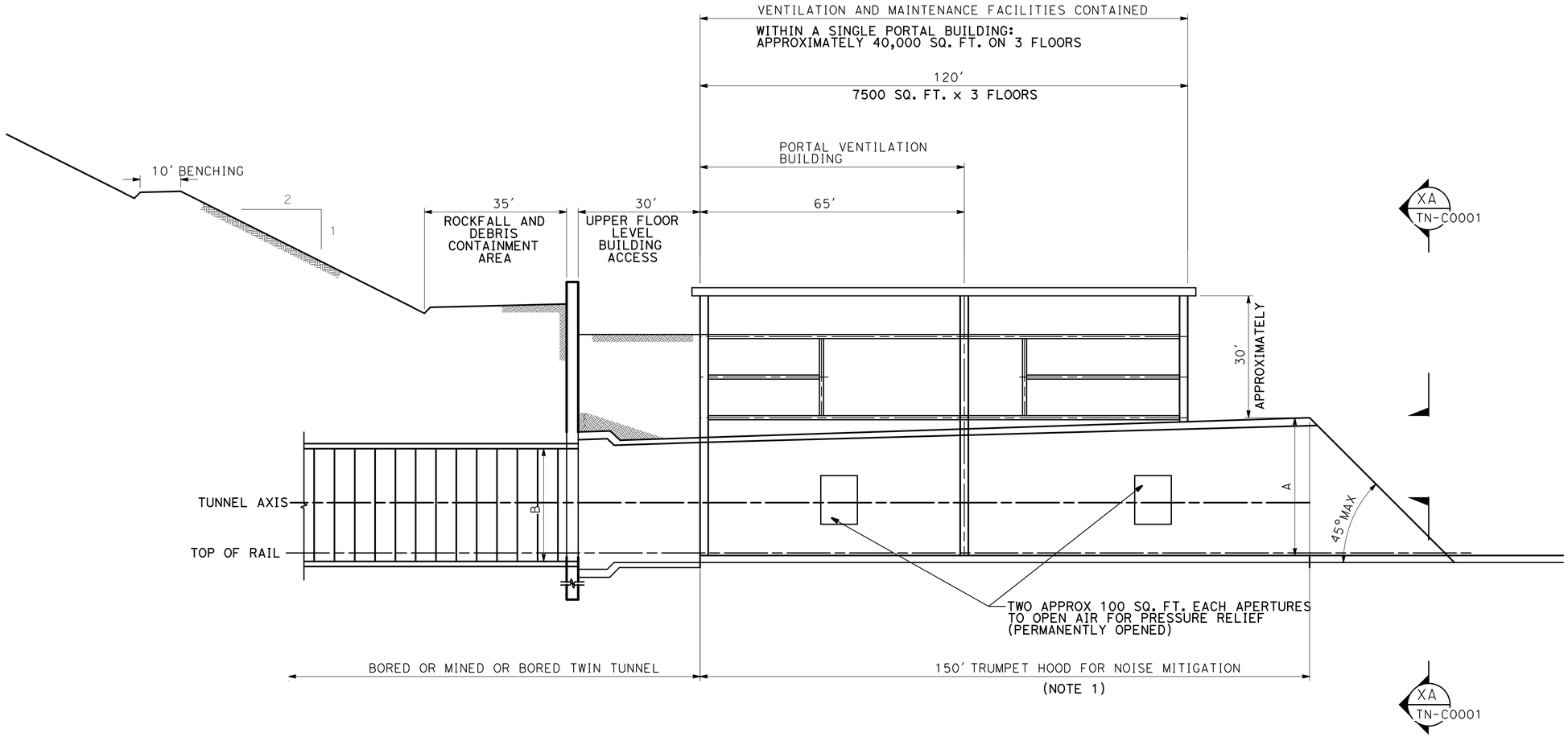
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

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 W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

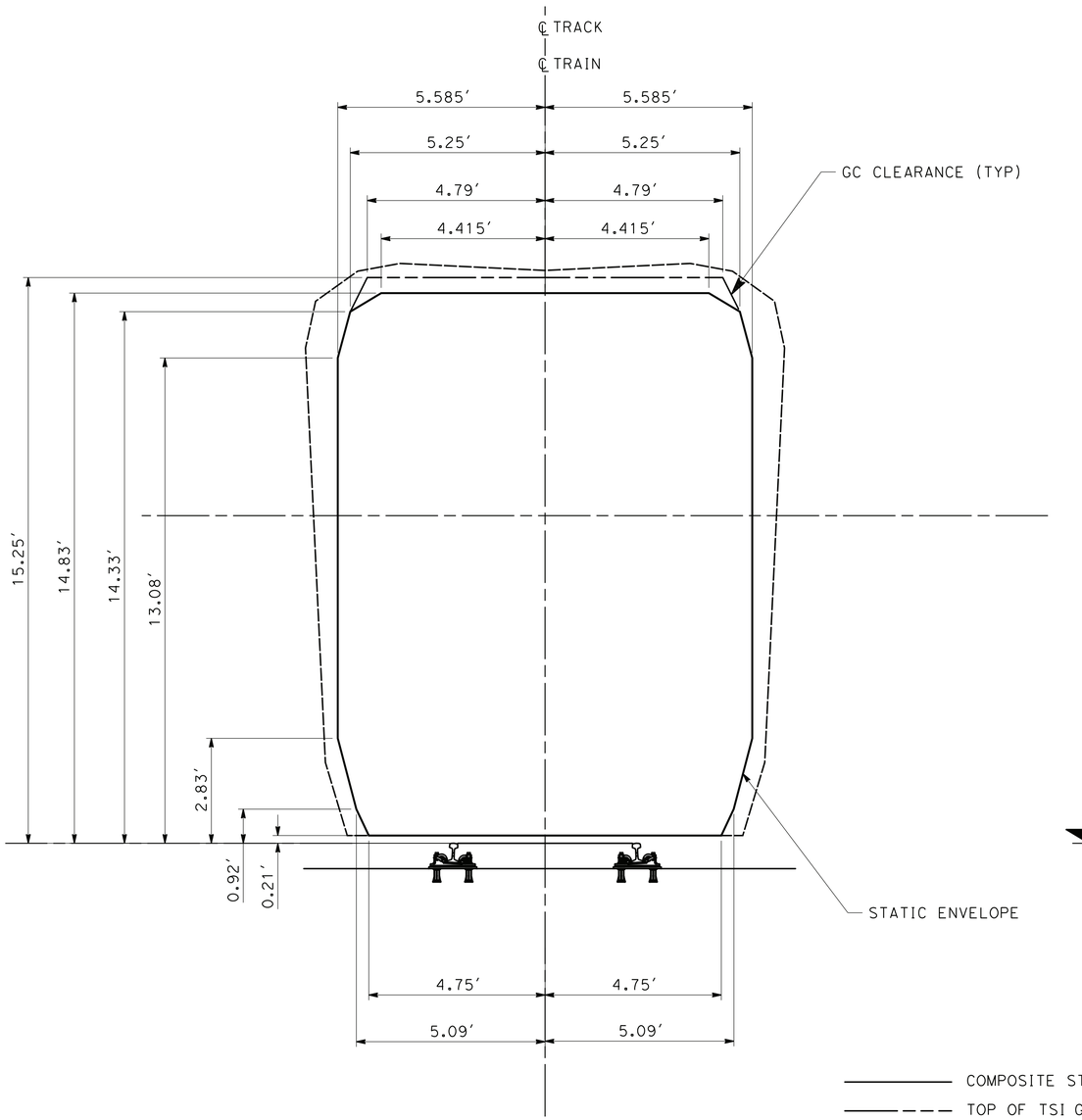
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

TYPICAL TUNNEL PORTAL FACILITIES AT GRADE
TWIN TUNNEL CONFIGURATION
LONG SECTION

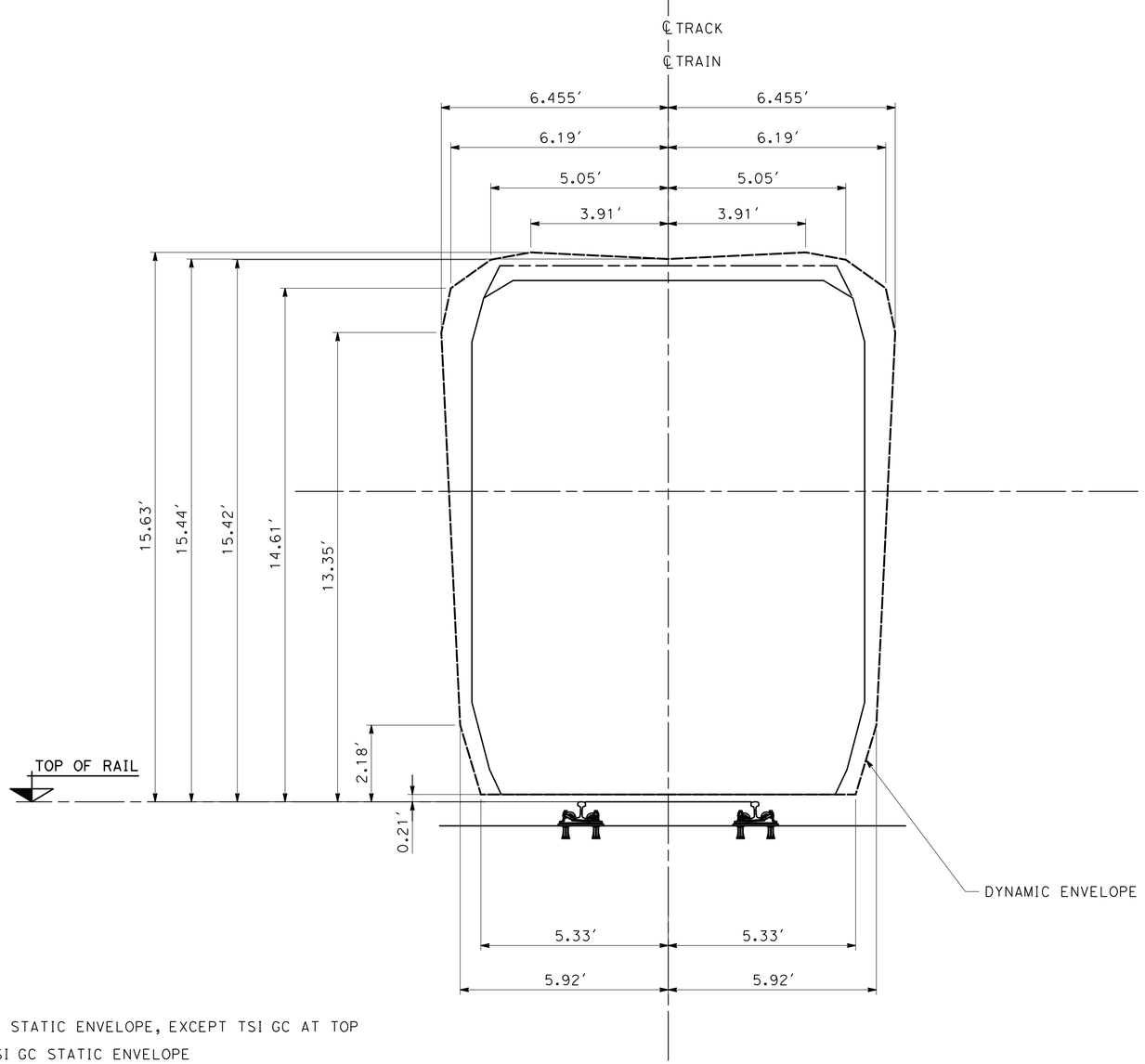
CONTRACT NO. HSR14-42
DRAWING NO. TN-C0003
SCALE AS SHOWN
SHEET NO.

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

DESIGNED BY: E. VELASCO
DRAWN BY: FJ. DOMINGUEZ
CHECKED BY: W. GUO
IN CHARGE: A. RELAÑO
DATE: 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

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CALIFORNIA HIGH-SPEED RAIL AUTHORITY

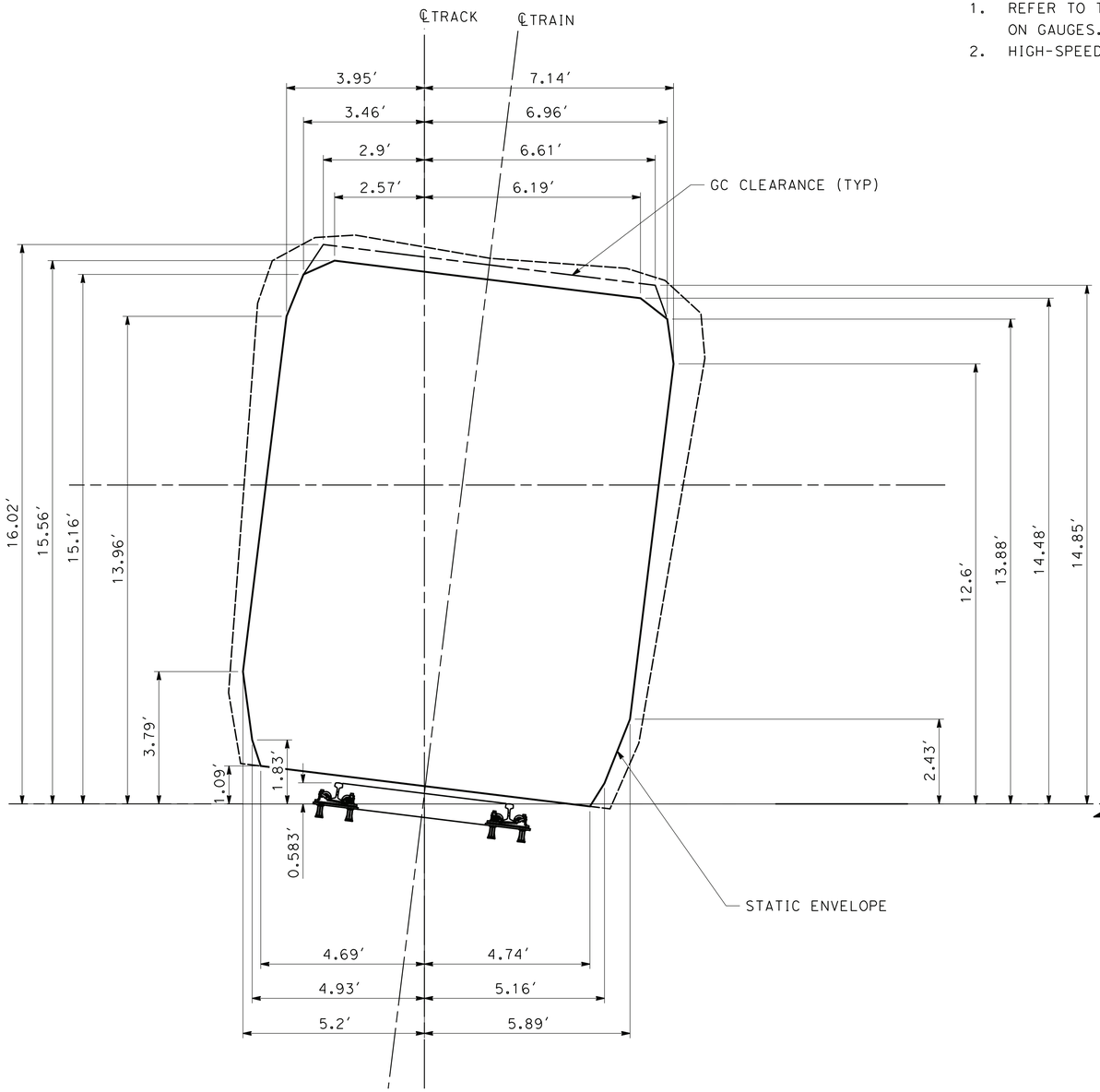
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

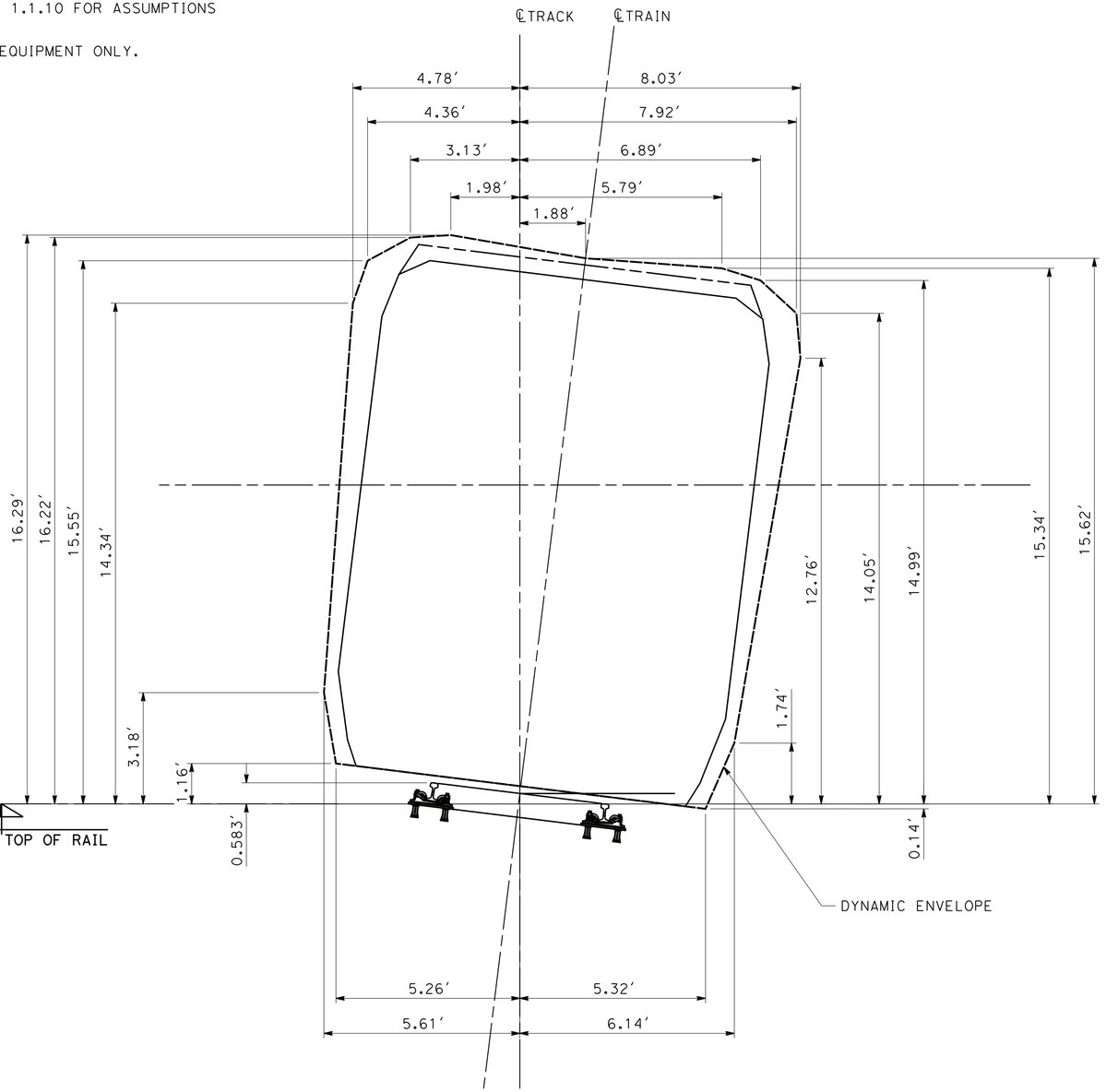
COMPOSITE VEHICLE
STATIC AND DYNAMIC ENVELOPE
TANGENT TRACK

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 W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

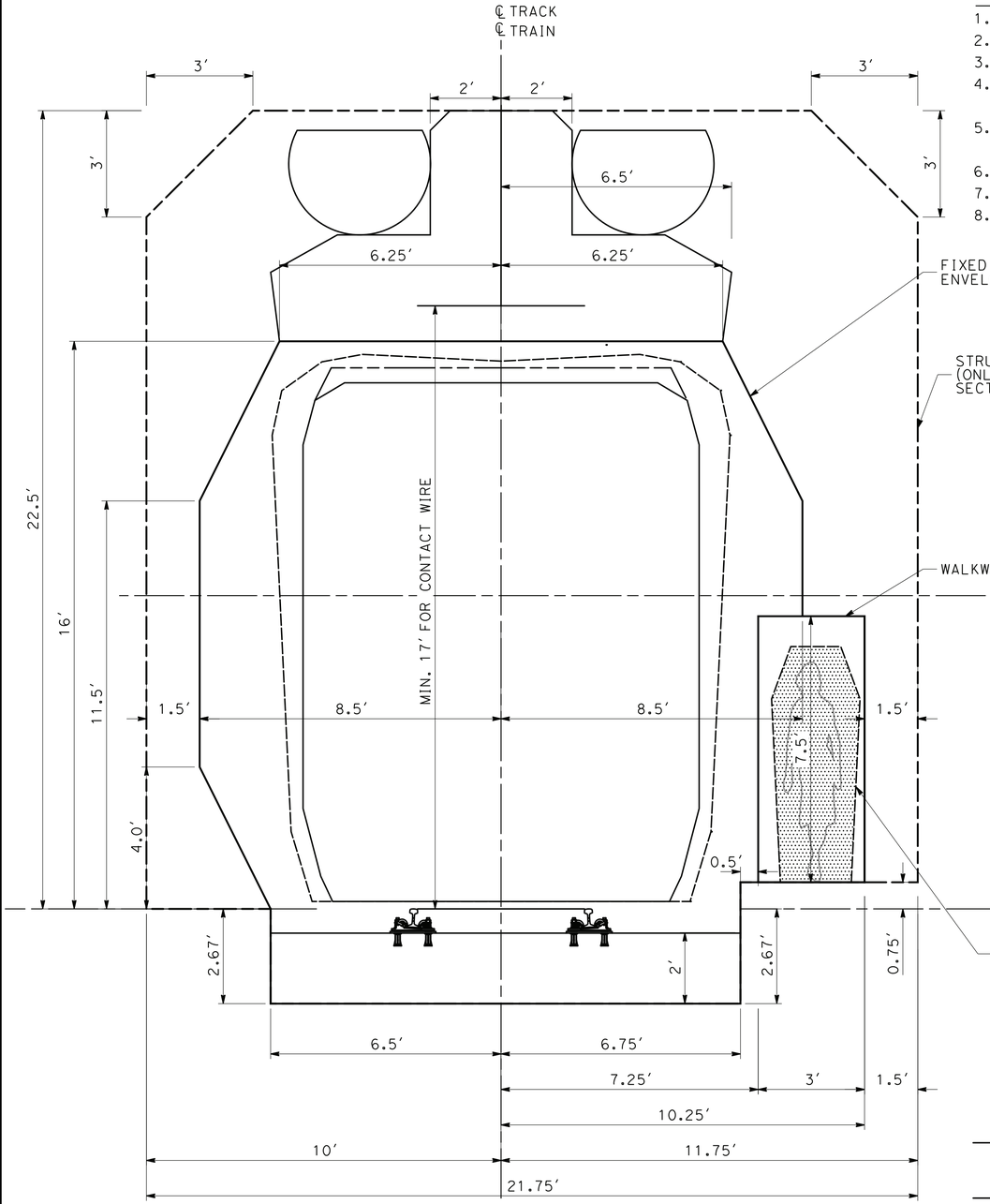
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

COMPOSITE VEHICLE
STATIC AND DYNAMIC ENVELOPE
SUPERELEVATED TRACK

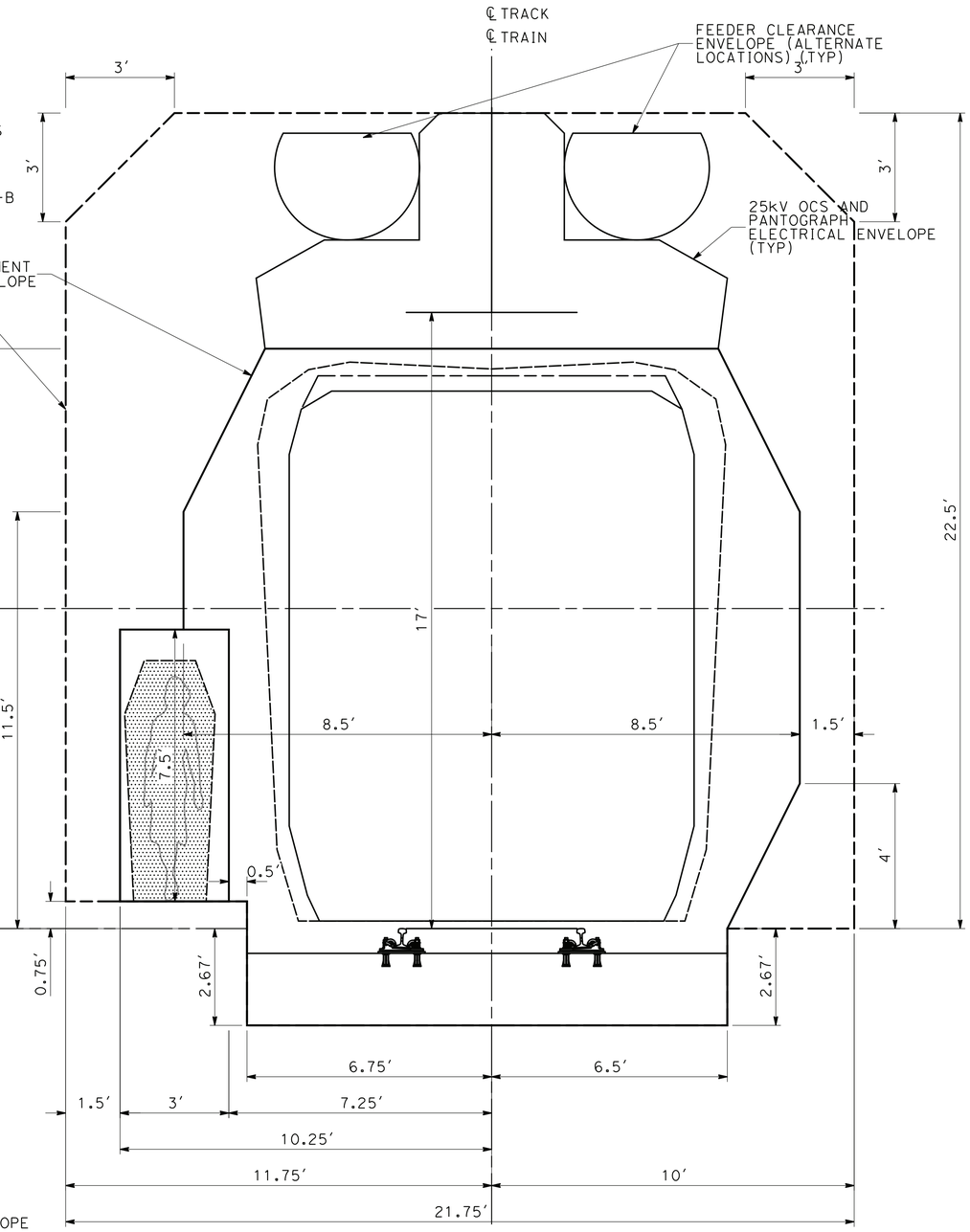
CONTRACT NO. HSR14-42
DRAWING NO. TN-C0005
SCALE AS SHOWN
SHEET NO.

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 W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

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CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT PALMDALE TO BURBANK

COMPOSITE VEHICLE
FIXED EQUIPMENT ENVELOPE AND STRUCTURE GAUGE
TANGENT TRACK

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

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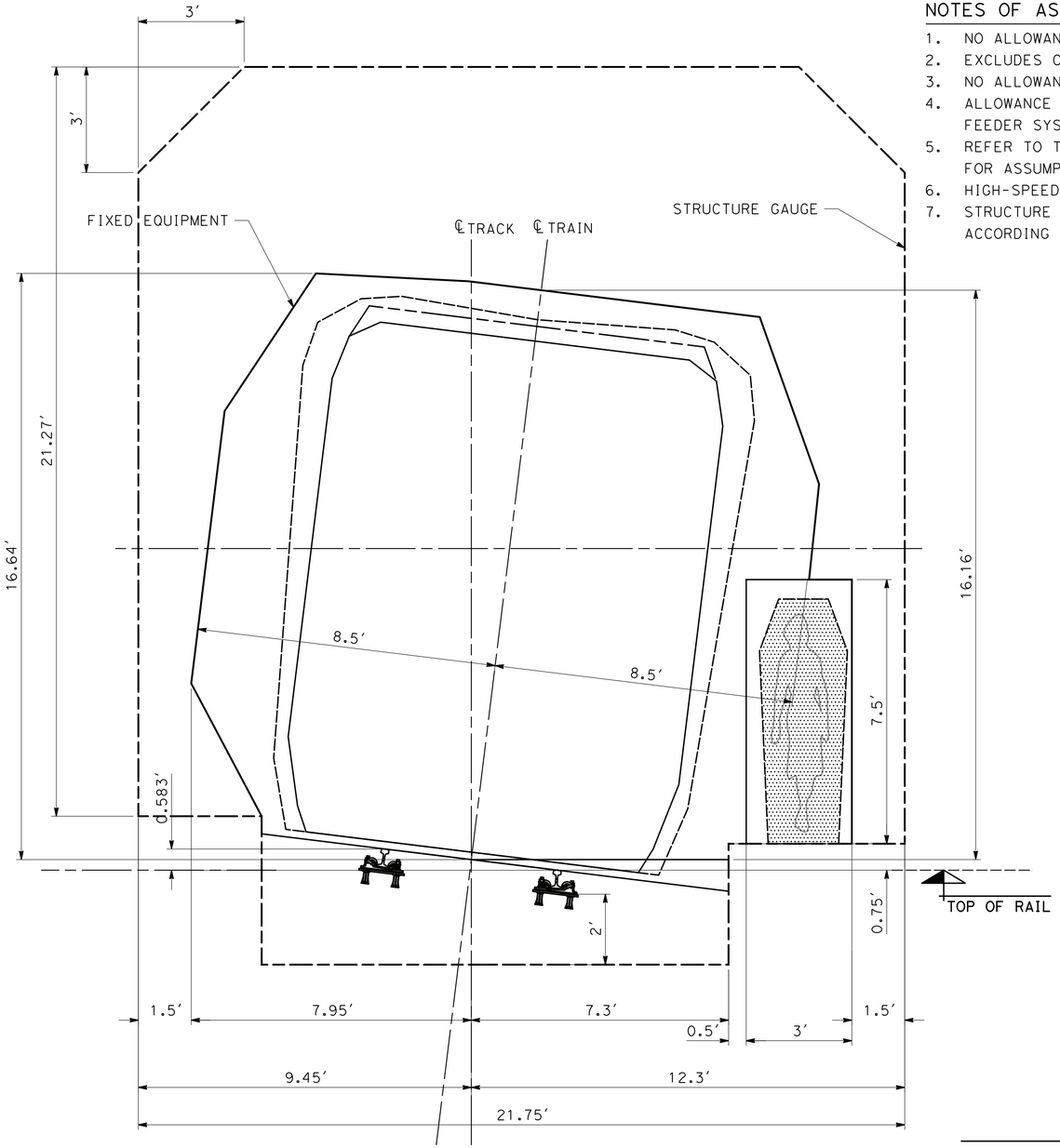
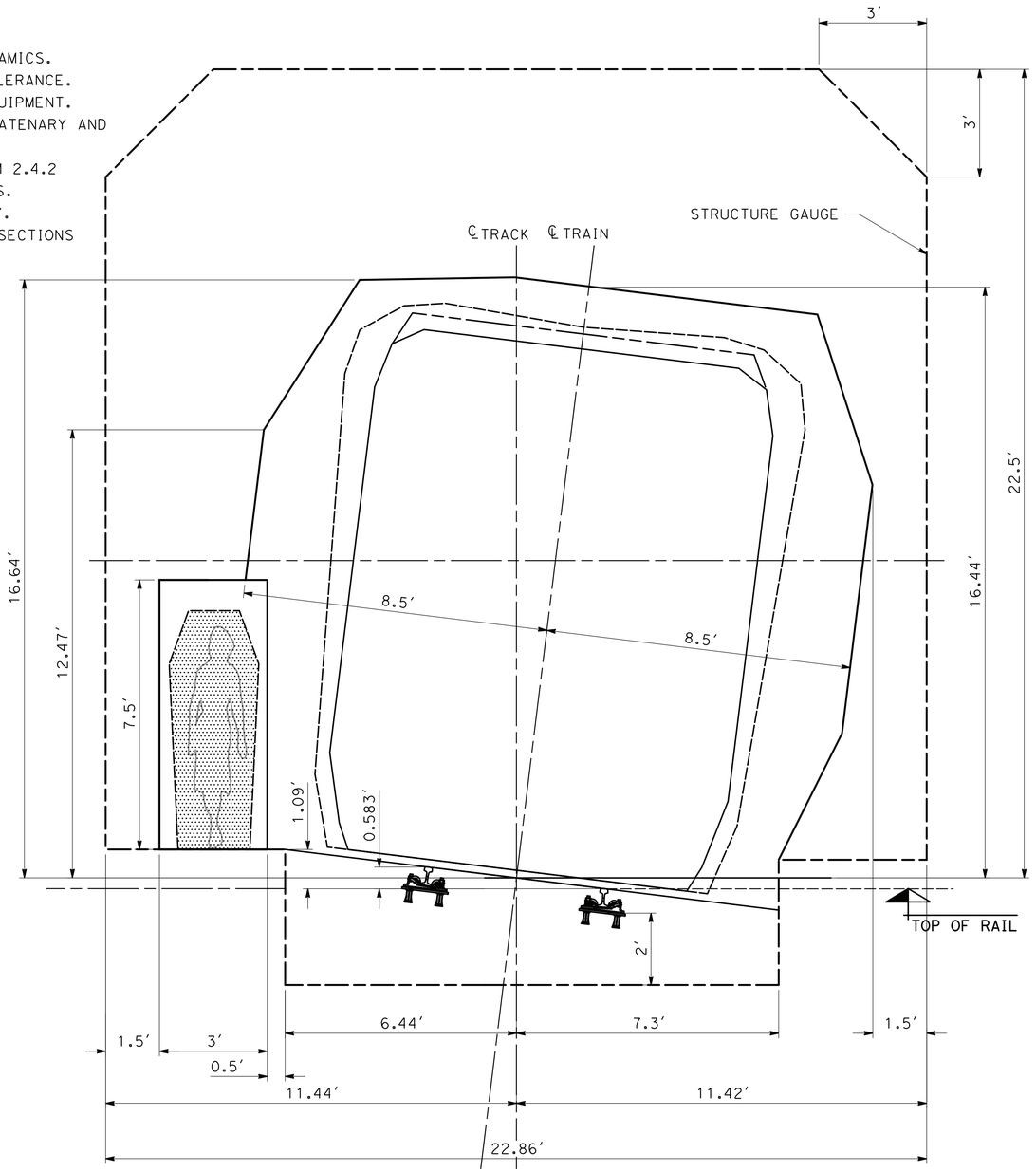
0205510

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 W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

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CALIFORNIA HIGH-SPEED RAIL AUTHORITY

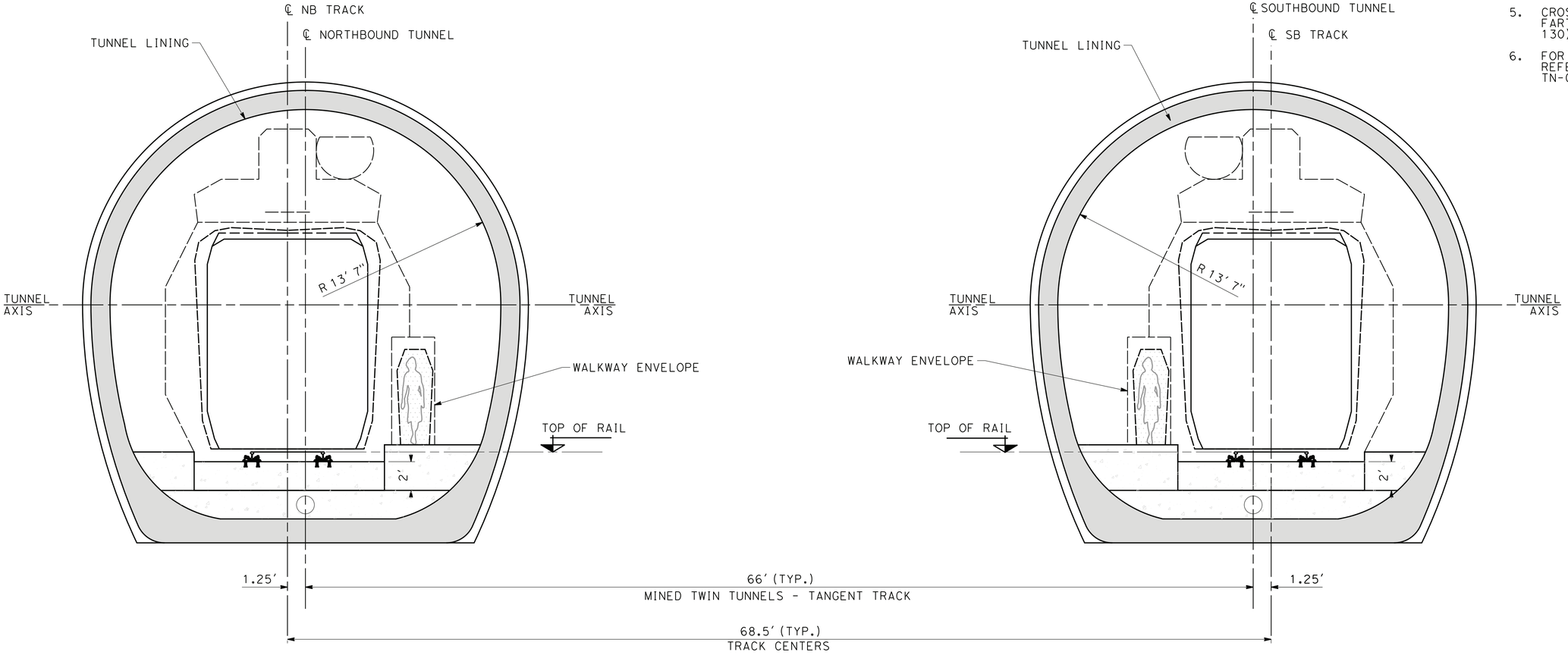
CALIFORNIA HIGH-SPEED RAIL PROJECT PALMDALE TO BURBANK

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 W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

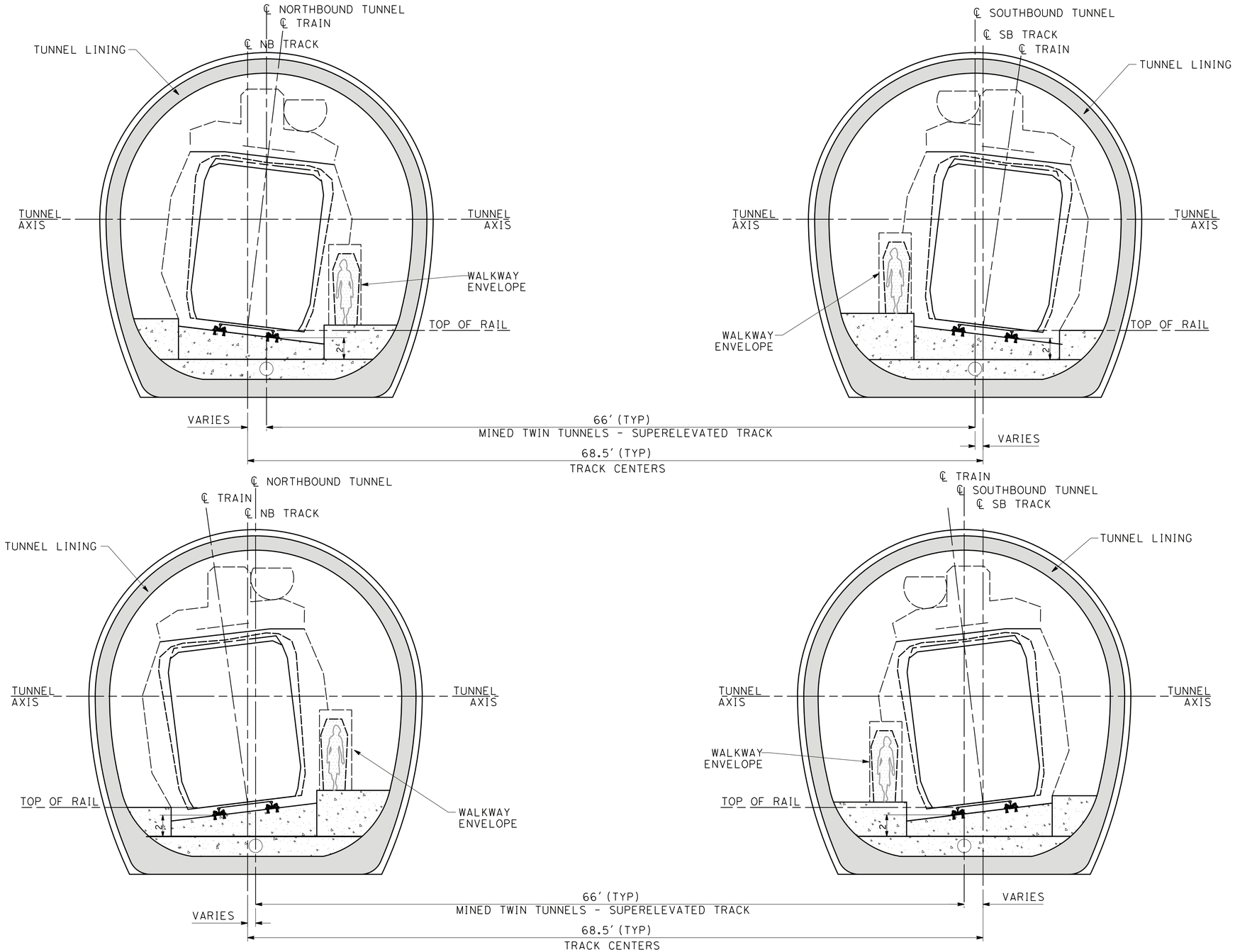
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
MINED TWIN TUNNELS
TUNNEL TYPICAL SECTIONS AND DETAILS
CLEARANCE DIAGRAM - TANGENT TRACK

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 W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

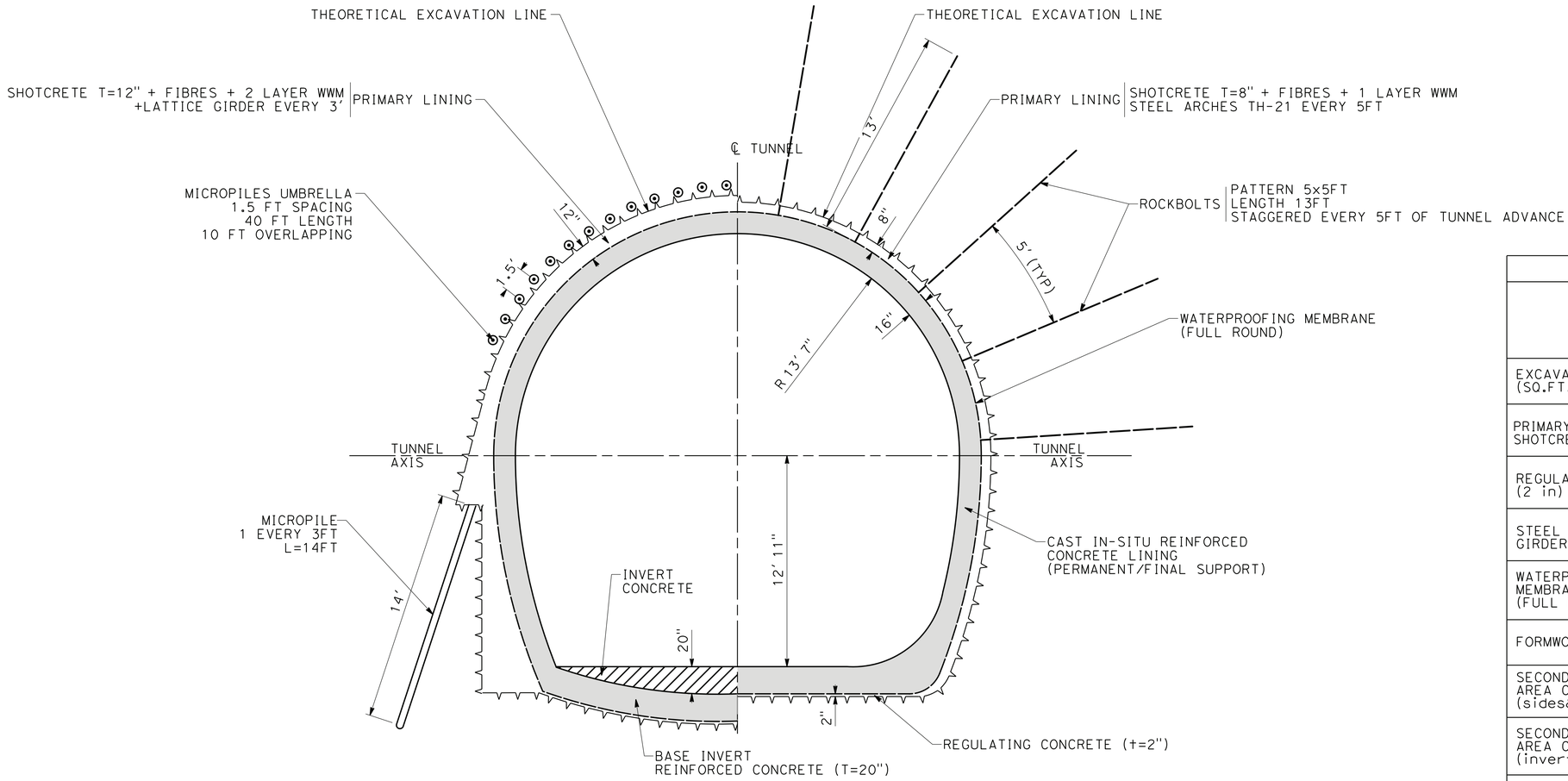
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
MINED TWIN TUNNELS
TUNNEL TYPICAL SECTIONS AND DETAILS
CLEARANCE DIAGRAM - SUPERELEVATED TRACK

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

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.



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

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

BASIC QUANTITIES PER FT OF TUNNEL

TWIN TUNNELS	PRIMARY LINING TYPE	
	MEDIUM QUALITY ROCK	POOR QUALITY ROCK (II)
EXCAVATION AREA (SQ.FT.)	806	900
PRIMARY LINING - SHOTCRETE AREA (SQ.FT.)	46	110
REGULATING CONCRETE (2 in) (SQ.FT.)	4	4
STEEL ARCH/LATTICE GIRDER (FT)	75/5=15	76/3=25.3
WATERPROOFING MEMBRANE (FT) (FULL ROUND)	100	105
FORMWORK (FT)	75	76
SECONDARY LINING AREA CONCRETE (sides&crown) (SQ.FT.)	98	98
SECONDARY LINING AREA CONCRETE (invert&slab) (SQ.FT.)	40	42
ROCKBOLTS (FT)	10x13/5=26	-
MICROPILES UMBRELLA (FT)	-	26x40/30=34.6
MICROPILES FOR ELEPHANT'S FOOOT (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 W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

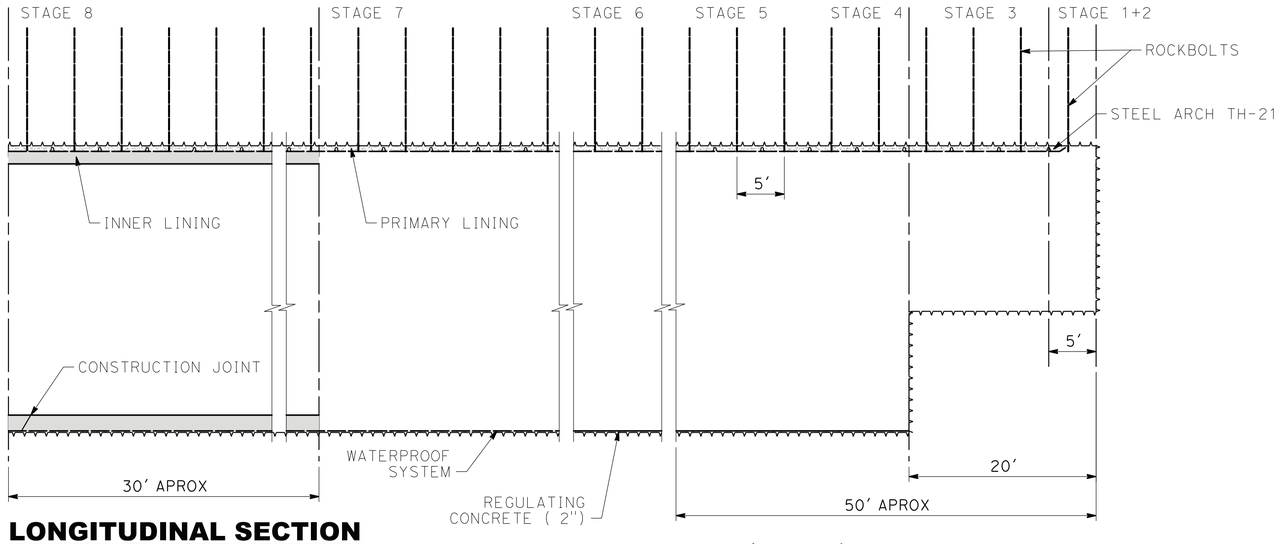
NOT FOR CONSTRUCTION

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.



LONGITUDINAL SECTION

MINED TWIN TUNNELS PRIMARY LINING FOR MEDIUM QUALITY ROCK

LEGEND:

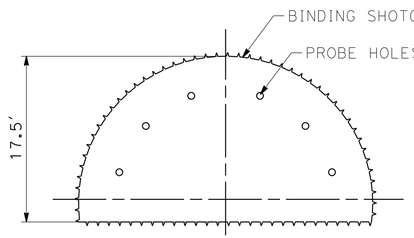
- NATM EXCAVATION
- STEEL ARCH TH-21
- REINFORCED SHOTCRETE PRIMARY LINING +1 LAYER WWM
- REINFORCED INNER / SECONDARY LINING

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

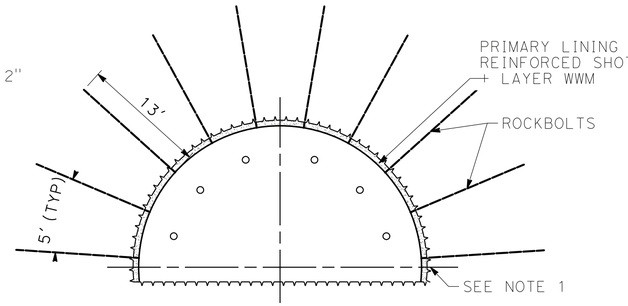
* SELF DRILLING BOLTS INSTEAD OF ROCKBOLTING IF RMR<35

NOTES:

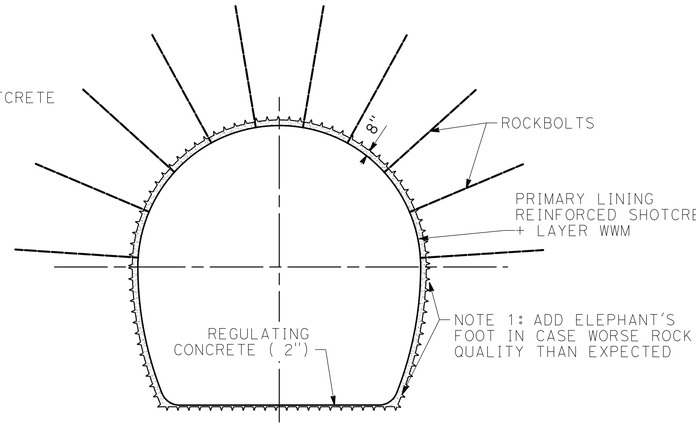
1. SUPPORT MEASURES SHOWN ARE ORIENTATIVE ONLY AND FOR PEPD COST ESTIMATION. THEY MUST BE CALCULATED WHEN DETAILED GEOTECHNICAL INFORMATION IS AVAILABLE.
2. POOR QUALITY ROCK CAN OCCUR AT PORTALS AND FAULT ZONES AMONG OTHER.
3. SQUEEZING GROUND CONDITIONS UNDER OVERBURDEN OF MORE THAN 300FT WILL REQUIRE 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.



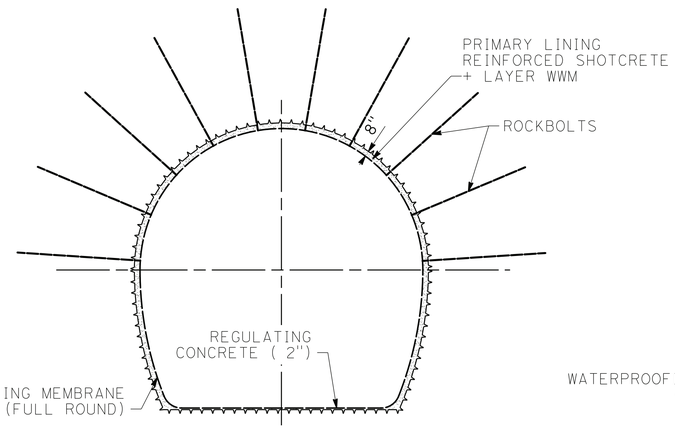
-STAGE 0: PROBE DRILLING
-STAGE 1: EXCAVATION OF TOP HEADING AND APPLICATION OF STABILIZATION LAYER OF SHOTCRETE.



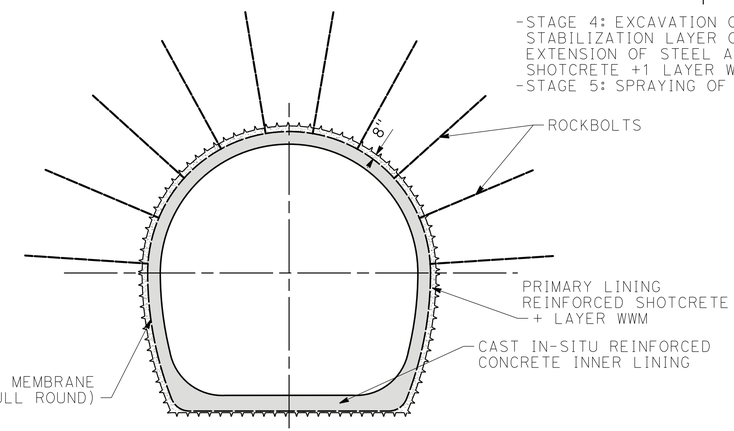
-STAGE 2: INSTALLATION OF STEEL ARCH AND ROCKBOLTING.
-STAGE 3: SPRAYING OF REINFORCED SHOTCRETE +1 LAYER WWM.



-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.

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

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

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

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.

0205510

24/05/2021 16:01:31

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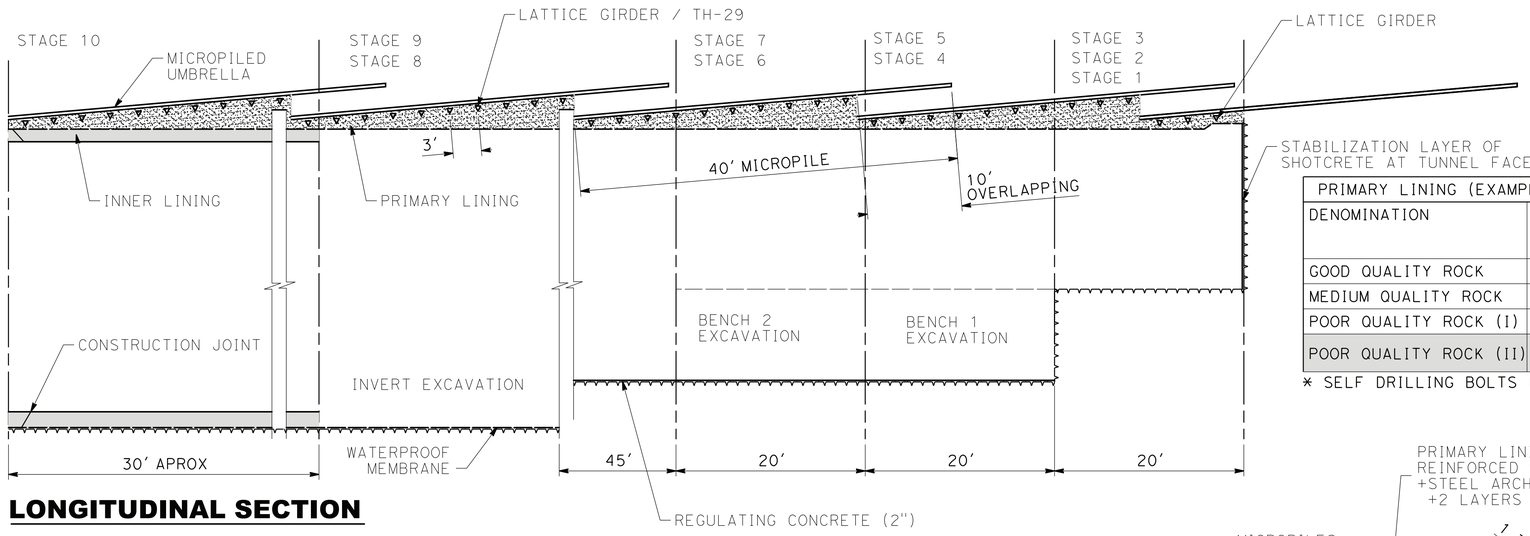
MINED TWIN TUNNELS PRIMARY LINING FOR POOR QUALITY ROCK (II)

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



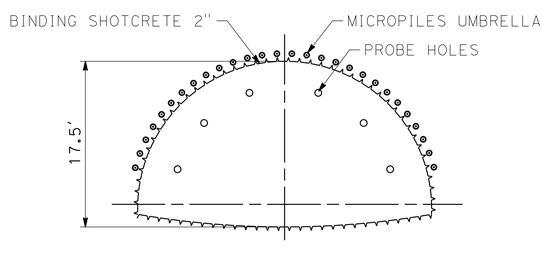
LONGITUDINAL SECTION

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

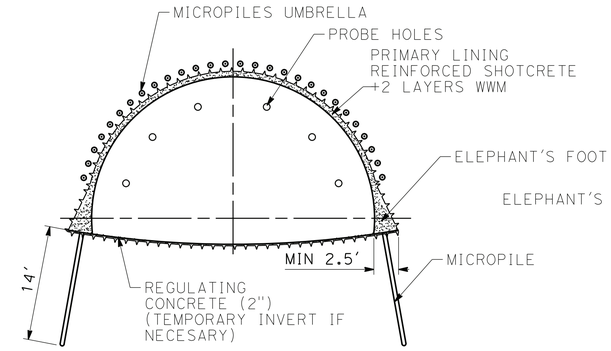
* SELF DRILLING BOLTS INSTEAD OF ROCKBOLTING IF RMR<35

NOTES:

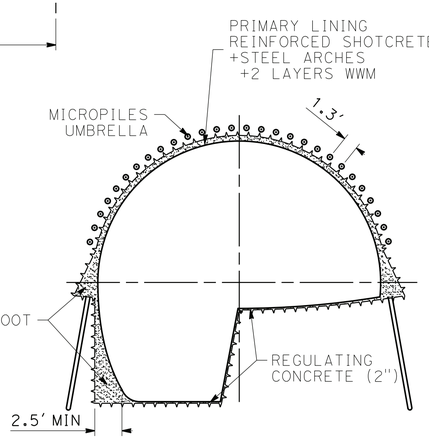
1. SUPPORT MEASURES SHOWN ARE ORIENTATIVE ONLY AND FOR PEPD COST ESTIMATION. THEY MUST BE CALCULATED WHEN DETAILED GEOTECHNICAL INFORMATION IS AVAILABLE.
2. POOR QUALITY ROCK CAN OCCUR AT PORTALS AND FAULT ZONES AMONG OTHER.
3. SQUEEZING GROUND CONDITIONS UNDER OVERBURDEN OF MORE THAN 300FT WILL REQUIRE 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.



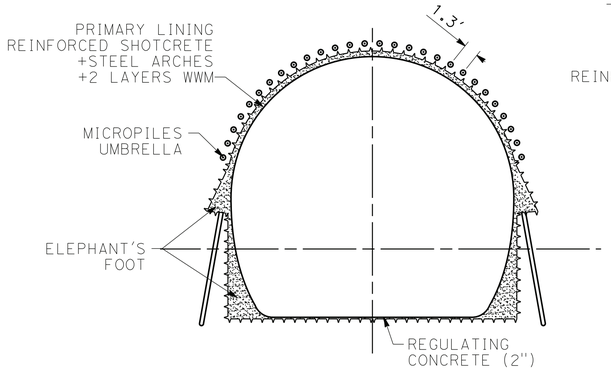
-STAGE 0: PROBE DRILLING AND MICROPILE UMBRELLA INSTALLATION.
-STAGE 1: EXCAVATION OF TOP HEADING AND APPLICATION OF STABILIZATION LAYER OF SHOTCRETE.



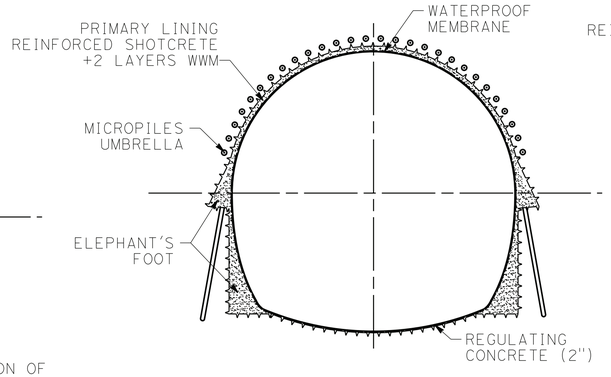
-STAGE 2: INSTALLATION OF LATTICE GIRDER + UNDERPINNING WITH MICROPILES.
-STAGE 3: SPRAYING OF REINFORCED SHOTCRETE +2 LAYERS WWM SPRAYING OF REGULATING CONCRETE.



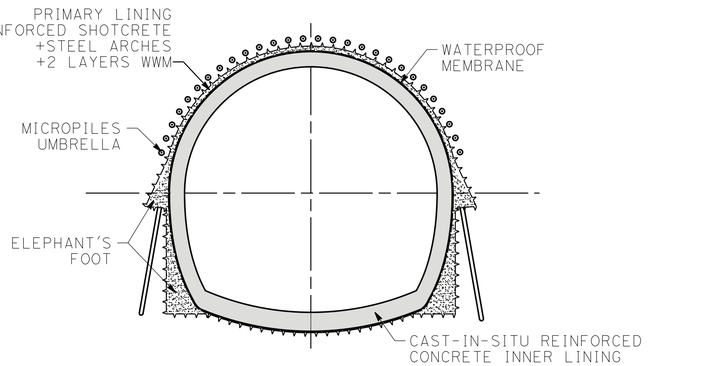
-STAGE 4: BENCH 1 EXCAVATION AND APPLICATION OF STABILIZATION LAYER OF SHOTCRETE.
-STAGE 5: EXTENSION OF LATTICE GIRDER AND SPRAYING OF REINFORCED SHOTCRETE ON THE LEFT SIDE. SPRAYING OF REGULATING CONCRETE.



-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 W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

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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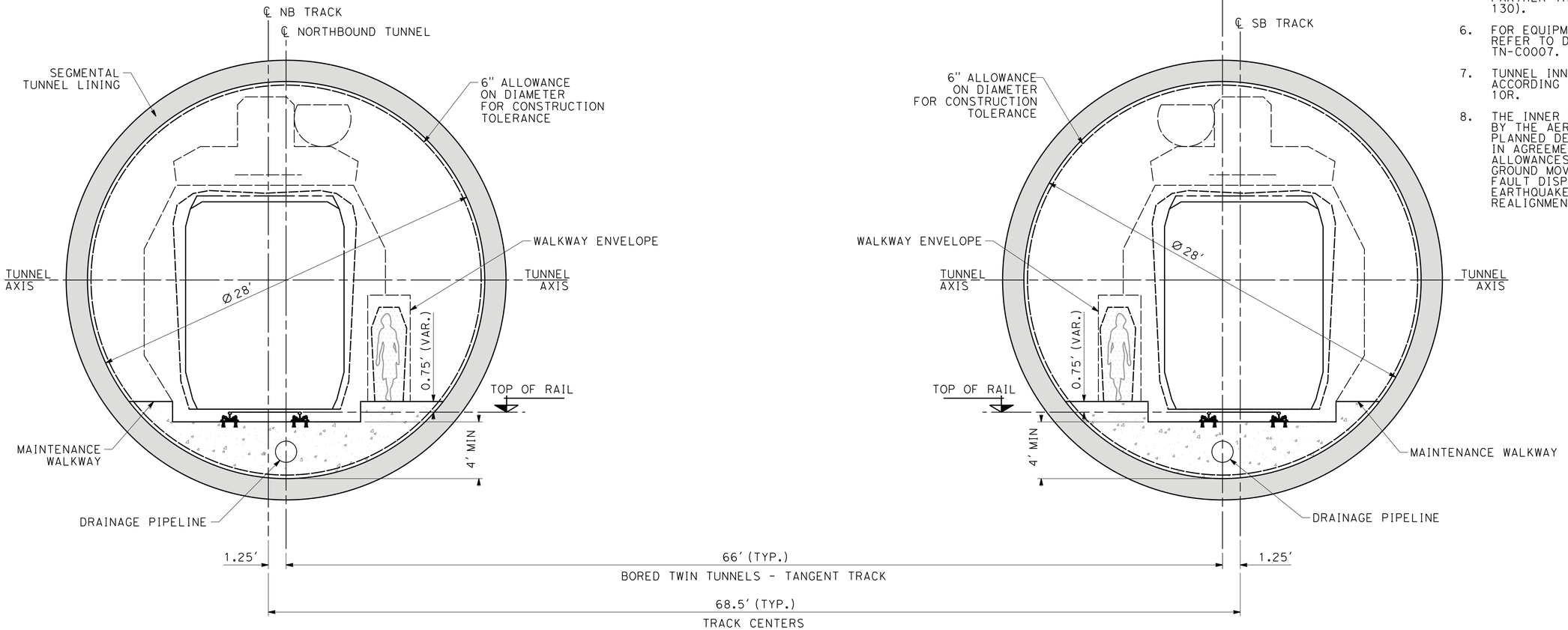


NOTES:

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
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 W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

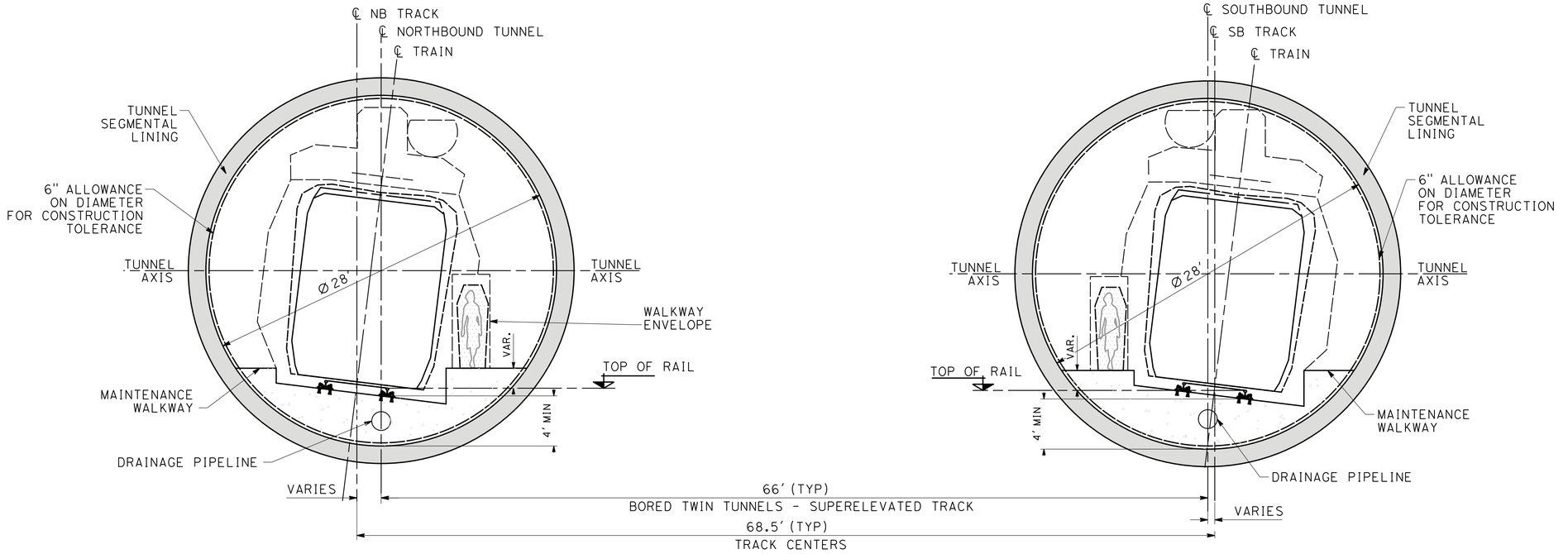
SENER

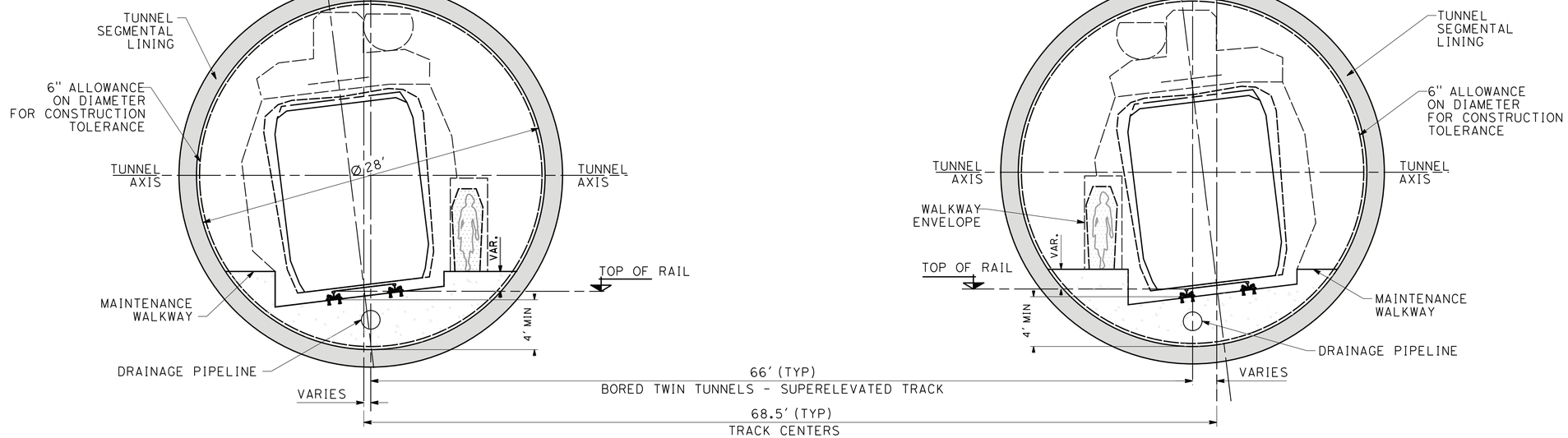
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

TBM BORED TWIN TUNNELS
TUNNEL TYPICAL SECTIONS AND DETAILS
CLEARANCE DIAGRAM - TANGENT TRACK

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 W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

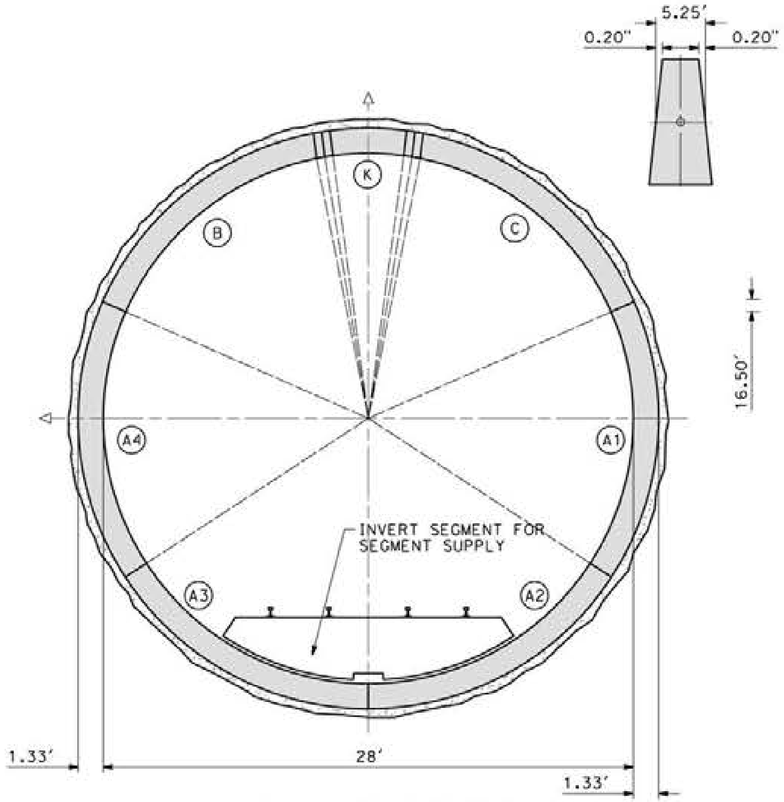
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

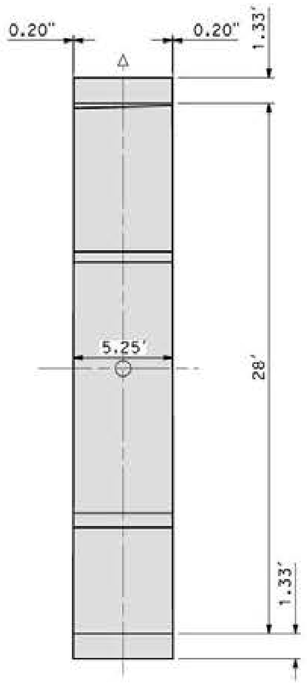
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

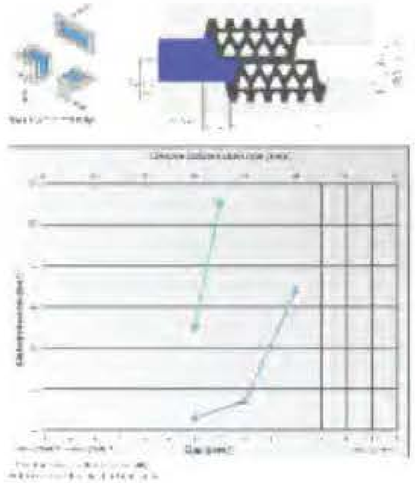
TBM BORED TWIN TUNNELS
TUNNEL TYPICAL SECTIONS AND DETAILS
CLEARANCE DIAGRAM - SUPERELEVATED TRACK

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



TUNNEL TYPE SECTION



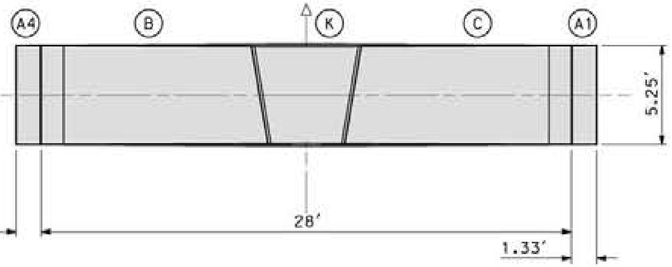


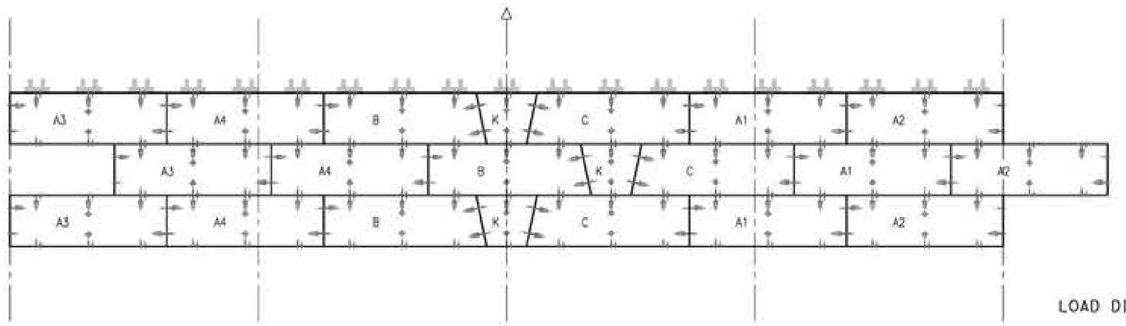
DISCLAIMER:

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

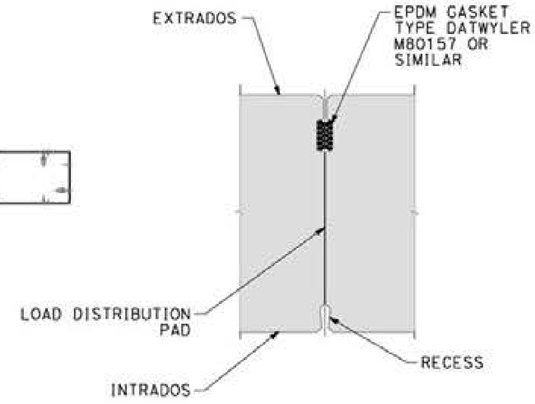
NOTES:

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 W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

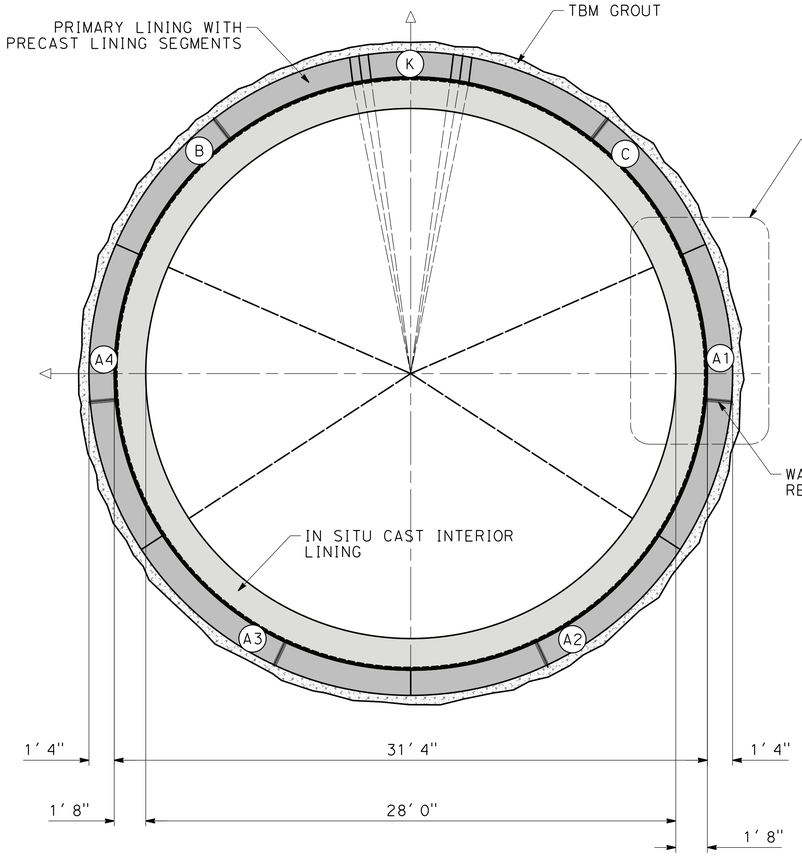
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

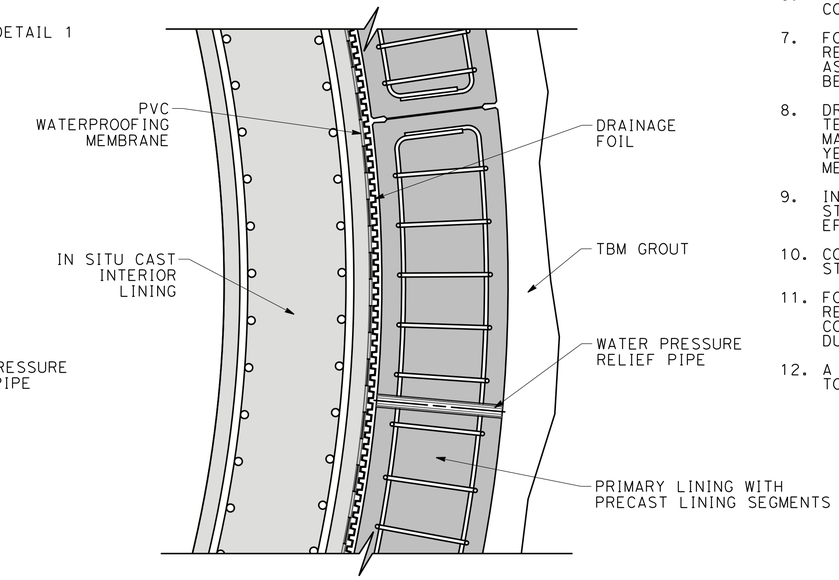
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

TBM BORED TWIN TUNNELS
ONE-PASS LINING GEOMETRY

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



TUNNEL TYPE SECTION (A)
SCALE 1"=4′-0"



DETAIL (1)
SCALE N.T.S.

DISCLAIMER:

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

NOTES:

1. THE DESIGN REPRESENTS THE TWO PASS LINING FOR THE TBM TUNNEL WITH WATER PRESSURE HIGHER THAN 25 bar AND LOWER THAN 50 bar.
2. PRIMARY LINING WITH TAPERED UNIVERSAL RING OF PRE MANUFACTURED SEGMENTS TO BE PLACED BY FOR TBM.
3. PRIMARY PRECAST LINING IS A TEMPORARY SUPPORT DESIGNED TO RESIST ALL LOADS DURING CONSTRUCTION AND UNTIL THE SECONDARY LINING IS COMPLETED.
4. TEMPORARY LINING SEGMENTS SHALL BE EQUIPPED WITH GROUTING INSERTS, GUIDING RODS, DOVELS, IDENTIFICATION MARKS AND ALL OTHER NECESSARY ITEMS REQUIRED FOR THE CONSTRUCTION AND A SMOOTH INTERIOR SURFACE READY FOR THE INSTALLATION OF THE DRAINAGE FOIL AND WATERPROOFING MEMBRANE.
5. PRIMARY LINING IS DRAINED WITH WATER PRESSURE RELIEF PIPES.
6. PRECAST SEGMENTS FOR PRIMARY LINING SHOULD HAVE MINIMUM COMPRESSION STRENGTH OF CONCRETE AT 28 DAYS fc'= 5000 psi
7. FOR THE PURPOSE OF COST ESTIMATION, THE NECESSARY QUANTITY OF REINFORCEMENT FOR THE PRIMARY LINING SEGMENTS CAN BE ASSUMED AS 6.5 pcf OF CONVENTIONAL REBAR, GRADE 60. THIS ASSUMPTION NEEDS TO BE VERIFIED DURING THE FINAL DESIGN STAGE.
8. DRAINAGE FOIL AND WATERPROOFING MEMBRANE TO BE INSTALLED BETWEEN TEMPORARY AND FINAL LINING. WATERPROOFING MEMBRANE SHALL RESIST MAXIMUM EXPECTED WATER PRESSURE DURING THE WHOLE DESIGN LIFE OF 100 YEARS WITHOUT SUFFERING ANY NEGATIVE IMPACTS DUE TO THE PRESENCE OF METHANE IN THE GROUND WATER.
9. INTERIOR, FINAL LINING TO BE DESIGNED AS WATER TIGHT CONCRETE STRUCTURE, WITH A MAXIMUM ALLOWABLE CRACK WIDTH OF 0.006 in. THE EFFECTS OF SHRINKAGE SHALL BE TAKEN INTO ACCOUNT.
10. CONCRETE FOR INTERIOR LINING SHOULD HAVE A MINIMUM COMPRESSION STRENGTH AT 28 DAYS OF fc'= 10000 psi.
11. FOR THE PURPOSE OF COST ESTIMATION, THE NECESSARY QUANTITY OF REINFORCEMENT FOR THE INTERIOR LINING CAN BE ASSUMED AS 9 pcf OF CONVENTIONAL REBAR, GRADE 60. THIS ASSUMPTION NEEDS TO BE VERIFIED DURING THE FINAL DESIGN STAGE.
12. A QUANTITY OF 0.125 pcf OF POLYPROPYLENE MICROFIBERS SHALL BE ADDED TO THE CONCRETE MIX TO REDUCE CONCRETE SPALLING IN CASE OF FIRE.

4 0 4 8
1"=4′-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

TBM BORED TWIN TUNNELS
TWO-PASS LINING GEOMETRY

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0203
SCALE AS SHOWN
SHEET NO.

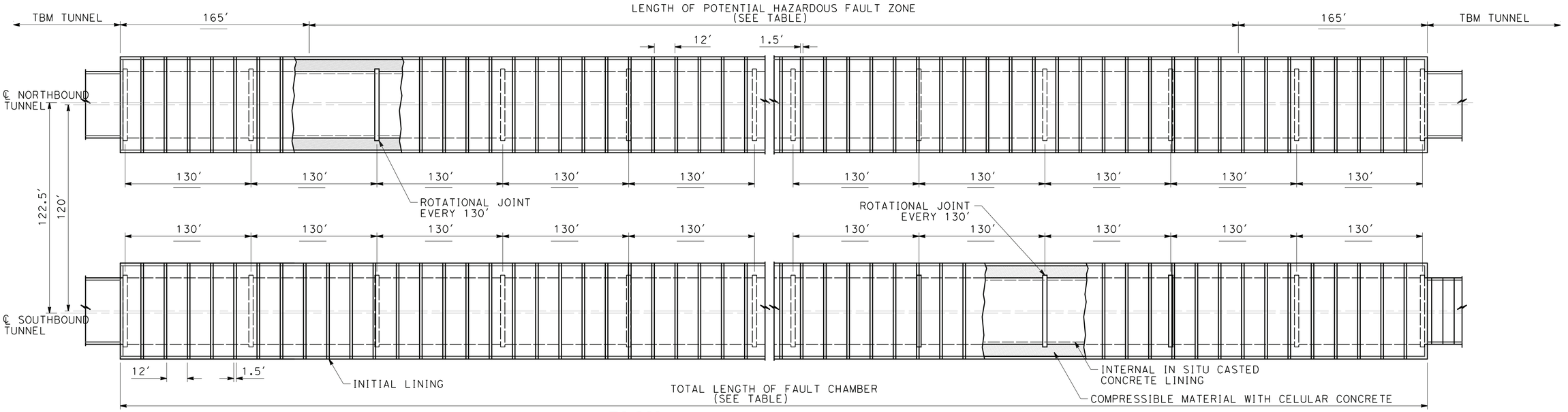


TABLE 2: AVAILABLE ADITS

FAULT CHAMBER	ALIGNMENT E1	ALIGNMENT E2	ALIGNMENT REFINED SR14
SIERRA MADRE NORTH	NO ADIT	NO ADIT	YES, ADIT (INCLINED GALLERY) TO BE CONSTRUCTED FROM THE AREA OF THE PACOIMA RESERVOIR
SIERRA MADRE SOUTH-SAN FERNANDO	YES, ADIT (VERTICAL, SHAFT), LOCATION NEAR CROSSING WITH HIGHWAY I-210	YES, ACCESS FROM PORTAL 4 LOCATED NEARBY	YES, ADIT (VERTICAL SHAFT), LOCATION NEAR CROSSING WITH HIGHWAY I-210
SAN GABRIEL	YES, ADIT (INCLINED GALLERY) NEAR OF THE SAN GABRIEL FAULT ZONE	YES, ADIT (INCLINED GALLERY) NEAR THE SAN GABRIEL FAULT ZONE OR VERTICAL SHAFT	NO ADIT

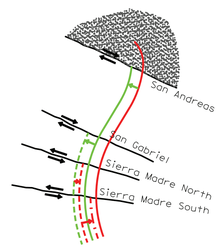
TABLE 1: APPROXIMATE DISPLACEMENT FOR HAZARDOUS AND POTENTIALLY HAZARDOUS FAULT ZONES AT TUNNEL ALIGNMENT INTERSECTIONS

NAME OF FAULT ZONE/FAULT SPLAY	FAULT STRIKE (AZIMUTH)	FAULT DIP	ALIGNMENTS CROSSED	APPROXIMATE INTERSECTION ANGLE BETWEEN FAULT ZONE AND ALIGNMENT	APPROXIMATE STATION INTERVAL AT INTERSECTION	ALIGNMENT WIDTH WITHIN AULT ZONE (FEET)	NUMBER OF SPLAYS IN FAULT ZONE	HORIZONTAL DISPLACEMENT (FEET)	HORIZONTAL-TO-VERTICAL SLIP COMPONENT RATIO	APPROXIMATE VERTICAL DISPLACEMENT (FEET)	DIRECTION OF HORIZONTAL DISPLACEMENT	DIRECTION OF VERTICAL DISPLACEMENT DURING EARTHQUAKE
SIERRA MADRE (NORTHERN LOCATION) /SUNLAN D, LOPEZ & HOSPITAL FAULT SPLAYS	295°	55°NE	REFINED SR-14	±90°	1716+00 TO 1738+00	2.2	2	3.6	1:1.5	5.4	LEFT-LATERAL	NORTH SIDE UP
			E1	±90°	1616+00 TO 1622+00	600	2	3.6		5.4		
			E2	±90°	1538+00 TO 1556+00	1.8	3	3.6		5.4		
SIERRA MADRE (SOUTHERN LOCATION, SOURCE OF 1971 EQ) /SAN FERNANDO FAULT SPLAY	295°	45°NE	REFINED SR-14	±90°	1832+00 TO 1872+00	4	>5	5.6	1:1.5	3.7	LEFT-LATERAL	NORTH SIDE UP
			E1	±90°	1722+00 TO 1762+00	4	>5	5.6		3.7		
			E2	±90°	1617+00 TO 1632+00	1.5	4	4.9		0.7		
SAN GABRIEL FAULT	295°	61°NE	REFINED SR-14	60°	1546+00 TO 1610+00	6.4	5	4.9	7:01	0.7	RIGHT-LATERAL	NORTH SIDE UP
			E1	50°-70°	1500+00 TO 1522+00	2.175	4	4.9		0.7		
			E2	±90°	1362+00 TO 1425+00	6.225	7	4.9		0.7		

PLAN

NOTES:

1. THIS DESIGN REPRESENTS THE CONCEPT FOR THE FAULT CHAMBERS TO BE DEVELOPED AT THE DETAILED DESIGN STAGE FOR THE POTENTIALLY HAZARDOUS FAULT ZONES AT THE SAN GABRIEL FAULT AND SIERRA MADRE FAULTS (NORTH AND SOUTH) FOR ALIGNMENTS E1, E2 AND REFINED SR14.
2. TABLE 1 SUMMARIZES THE ESTIMATED FAULT DISPLACEMENTS OF HAZARDOUS AND POTENTIALLY HAZARDOUS FAULTS THAT INTERSECT THE REFINED SR14, E1 AND E2 ALIGNMENTS BEING PROPOSED ALONG THE PALMDALE TO BURBANK PROJECT SECTION. THE INFORMATION PROVIDED IS SUMMARIZED FROM TWO CALIFORNIA HIGH SPEED RAIL (CHSR) PROJECT DOCUMENTS TM 2.10.6, "FAULT HAZARD ANALYSIS AND MITIGATION GUIDELINES," (13 MAY 2014), AND "ENGINEERING REPORT 15% DRAFT FAULT HAZARD EVALUATION REPORT9"(JUNE 2015). THE TABLE PROVIDES PRELIMINARY INFORMATION ON THE SAN GABRIEL AND SIERRA MADRE (NORTHERN AND SOUTHERN LOCATIONS) FAULT ZONES AT THEIR RESPECTIVE INTERSECTIONS WITH THE REFINED SR14, E1 AND E2 ALIGNMENTS. UNTIL THE RC IS ABLE TO CONDUCT SITE-SPECIFIC FIELD INVESTIGATIONS AT EACH OF THE FAULT INTERSECTIONS, SPECIFIC DESIGN RECOMMENDATIONS CANNOT BE MADE. THE DISPLACEMENT ESTIMATES SUMMARIZED HERE ARE BEING USED AS DEFAULT VALUES FOR FAULT DISPLACEMENTS FOR THE PEPD DESIGN LEVEL.
3. THE FAULT CHAMBER EXTENDS ACROSS THE FAULT ZONE PLUS A 165 ft LONG BUFFER ZONE AT EACH END.
4. THE TRACK GAUGE AND INTERIOR DIAMETER OF THE ADJACENT TBM TUNNELS AS WELL AS THE INTERIOR LINING OF THE FAULT CHAMBER SHALL BE OVERSIZED TO ALLOW THE ALIGNMENT RECOVERY AFTER THE EVENT OF FAULT DISPLACEMENT FOR A DESIGN SPEED OF 220 mph.
5. THE STRUCTURE OF THE FAULT CHAMBER SHALL BE DESIGNED TO MEET THE NON-COLLAPSE REQUIREMENT AT ANY MOMENT BEFORE, DURING AND AFTER THE EVENT OF FAULT DISPLACEMENT.



ASSUMPTIONS

- North American Plate is considered fixed, displacements are relative to this plate.
- For sake of simplification, the maximum displacement expected at each fault is considered at a single point of intersection with the HSR alignment (not distributed along a certain length of the alignment).

Original alignment
Displacement due to San Andres Fault
Displacement due to San Gabriel Fault
Displacement due to Sierra Madre North Fault
Displacement due to Sierra Madre South Fault

DISCLAIMER:

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

6. THE STRUCTURE OF THE FAULT CHAMBER SHALL ALLOW THE CONSTRUCTION OF THE CONNECTING TBM TUNNELS.
7. THE INTERIOR TUNNEL LINING SHALL BE PERMANENTLY WATER AND GAS TIGHT. WATER TIGHTNESS AFTER THE EVENT OF FAULT DISPLACEMENT SHALL BE ACHIEVED WITH MINIMUM REPAIR WORKS.
8. IN ORDER TO ACHIEVE THE PERFORMANCE REQUIREMENTS DESCRIBED ABOVE, THE STRUCTURE OF THE FAULT CHAMBER SHALL CONSIST OF THE FOLLOWING COMPONENTS:
   - PRIMARY LINING OF FAULT CHAMBER, CONSISTING OF STEEL FIBER REINFORCED SHOTCRETE LINING, ROCK BOLTS AND AN IN SITU CAST CONCRETE LINING DESIGNED TO FAIL IN A CONTROLLED MANNER DURING THE EVENT OF FAULT RUPTURE.
   - COMPRESSIBLE MATERIAL, CONSISTING OF CELLULAR CONCRETE.
   - INTERNAL LINING, CONSISTING OF AN IN SITU CASTED WATER TIGHT REINFORCED CONCRETE LINNER WITH FLEXIBLE JOINTS (FREE ROTATION) EVERY 130 ft. ALTERNATIVES WITH STEEL LINER OR TBM LINING SEGMENTS ARE FEASIBLE AND MIGHT BE APPLIED IF DESIGNED FOR COMPLIANCE WITH THE PERFORMANCE REQUIREMENTS.
9. AVAILABLE ADITS FOR THE CONSTRUCTION OF THE FAULT CHAMBERS ACCORDING TO TABLE 2.
10. FAULT CHAMBER SHALL BE EXCAVATED AS A MINED SECTION FROM THE ALLOWABLE ADITS OF AS A WIDENED SECTION OF THE PREVIOUSLY CONSTRUCTED TBM TUNNEL.
11. POOR ROCK QUALITY AND HIGH GROUNDWATER PRESSURE TO BE EXPECTED IN ALL FAULT ZONES.
12. LARGER TRACK SEPARATION BETWEEN THE TWO FAULT CHAMBERS OF THE NORTH AND SOUTH BOUND TUNNELS MIGHT BE REQUIRED AND SHALL BE ANALYZED AT A LATER STAGE OF DESIGN.

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
FAULT CHAMBER
CONCEPT DESIGN FAULT CHAMBER
PLAN VIEW

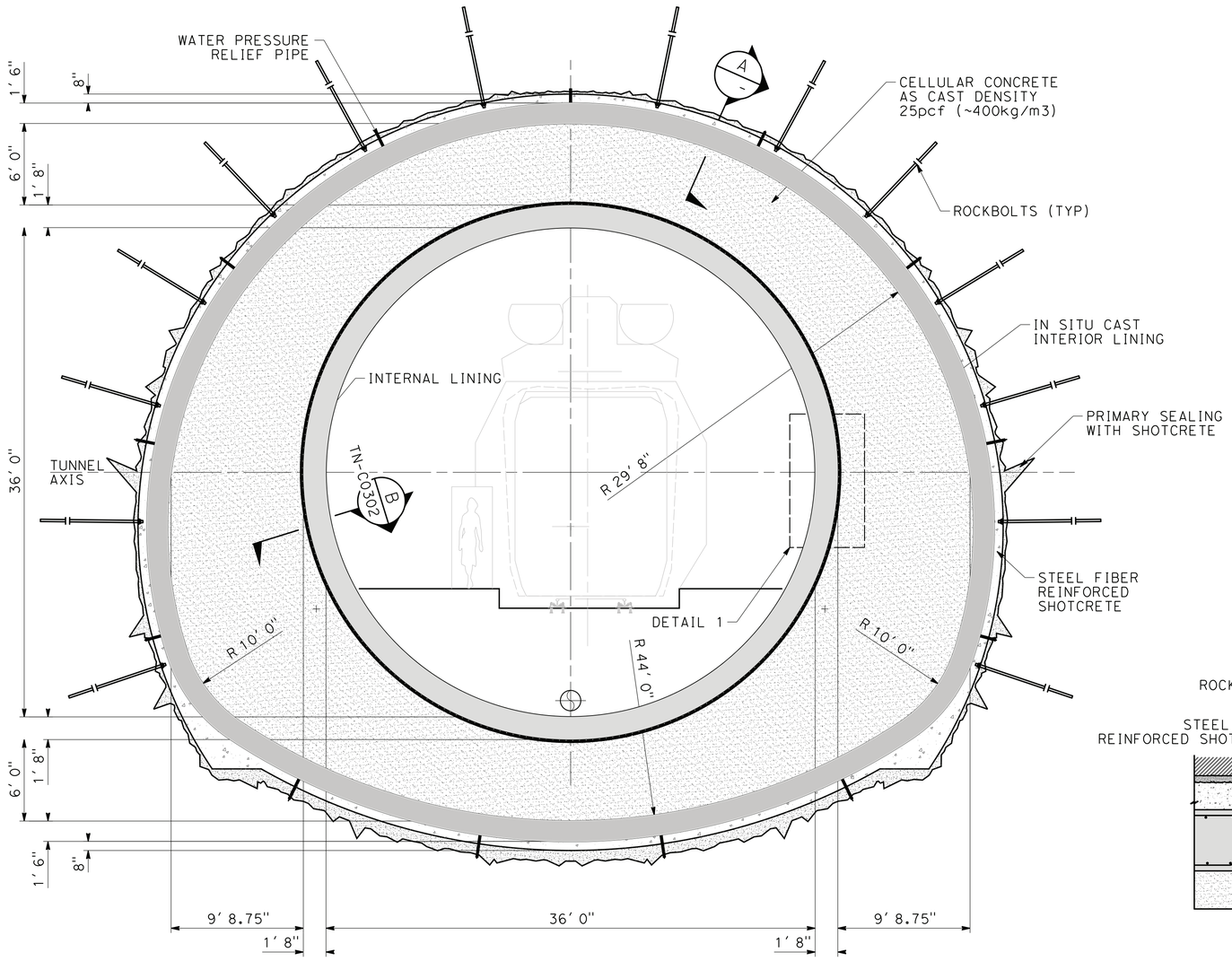
CONTRACT NO. HSR14-42
DRAWING NO. TN-C0300
SCALE AS SHOWN
SHEET NO.

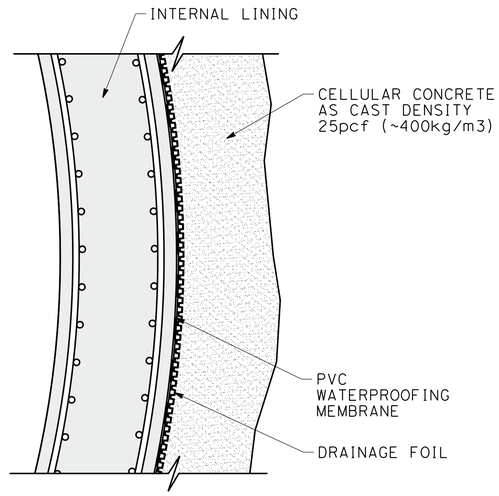
NOTES:

SEE NOTES IN DRAWING PB-TN-C0302

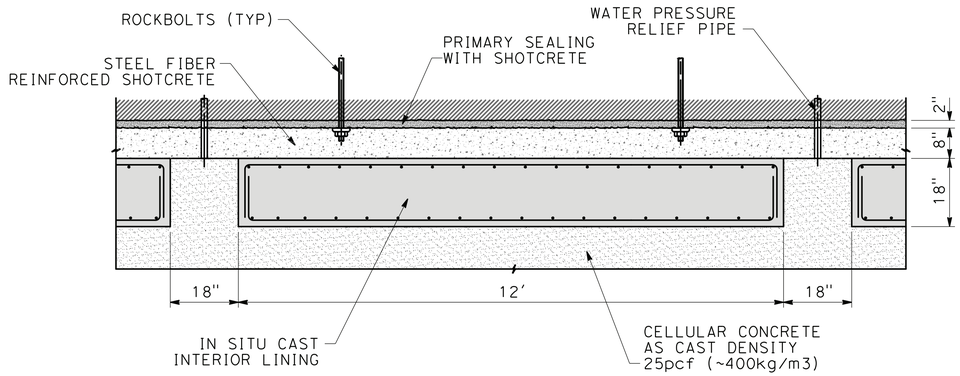
DISCLAIMER

THE DESIGN SHOWN IN THIS DRAWING CORRESPONDS TO THE CONCEPTUAL 15% STAGE OF DESIGN AND NEEDS TO BE DEVELOPED FURTHER TO BE VALID FOR CONSTRUCTION.





DETAIL 1
SCALE N.T.S.



SECTION A
SCALE N.T.S.

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

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

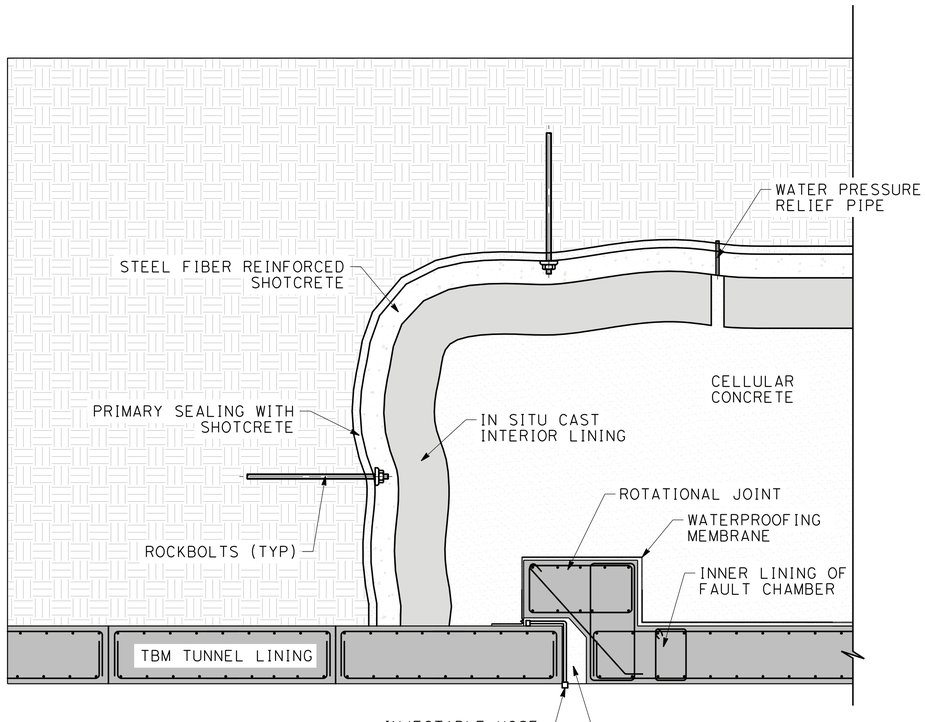
CALIFORNIA HIGH-SPEED RAIL PROJECT PALMDALE TO BURBANK

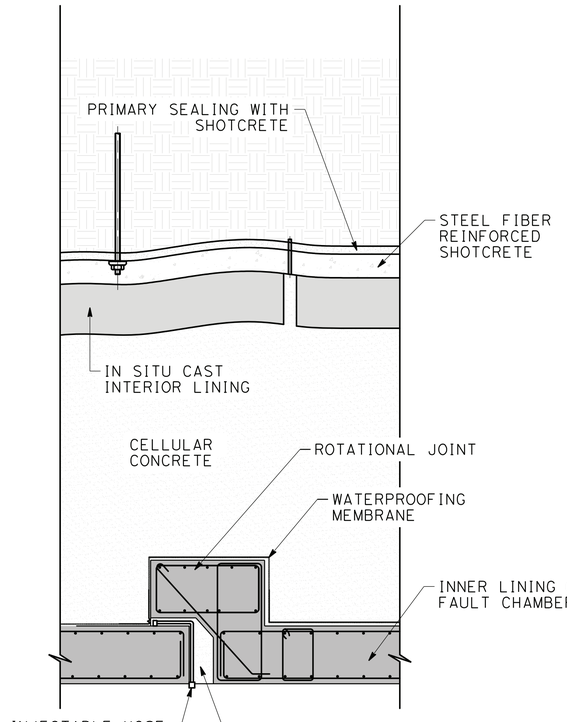
FAULT CHAMBER
CONCEPT DESIGN FAULT CHAMBER
CROSS-SECTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0301
SCALE AS SHOWN
SHEET NO.

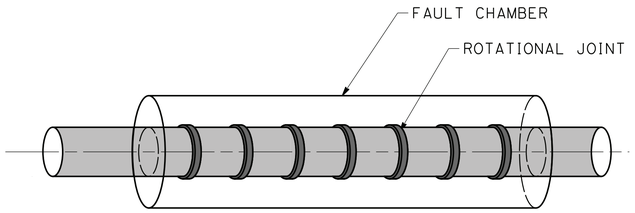
DISCLAIMER

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

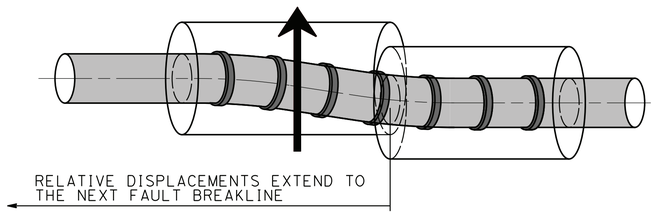




SECTION B TN-C0301
SCALE N.T.S.



INITIAL SITUATION



FINAL SITUATION

NOTES:

1. THIS DESIGN REPRESENTS THE CONCEPT FOR THE FAULT CHAMBERS TO BE DEVELOPED AT THE DETAILED DESIGN STAGE FOR THE POTENTIALLY HAZARDOUS FAULT ZONES AT THE SAN GABRIEL FAULT AND SIERRA MADRE FAULTS (NORTH AND SOUTH) FOR ALIGNMENTS E1, E2 AND SR14.
2. THE TRACK GAUGE AND INTERIOR DIAMETER OF THE ADJACENT TBM TUNNELS AS WELL AS THE INTERIOR LINING OF THE FAULT CHAMBER SHALL BE OVERSIZED TO ALLOW THE ALIGNMENT RECOVERY AFTER THE EVENT OF FAULT DISPLACEMENT FOR A DESIGN SPEED OF 220 mph.
3. THE STRUCTURE OF THE FAULT CHAMBER SHALL BE DESIGNED TO MEET THE NON COLLAPSE REQUIREMENT AT ANY MOMENT BEFORE, DURING AND AFTER THE EVENT OF FAULT DISPLACEMENT.
4. THE STRUCTURE OF THE FAULT CHAMBER SHALL ALLOW THE CONSTRUCTION OF THE CONNECTING TBM TUNNELS.
5. THE INTERIOR TUNNEL LINING SHALL BE PERMANENTLY WATER AND GAS TIGHT. WATER TIGHTNESS AFTER THE EVENT OF FAULT DISPLACEMENT SHALL BE ACHIEVED WITH MINIMUM REPAIR WORKS IN THE AREA OF THE JOINTS OF THE INTERIOR LINING.
6. IN ORDER TO ACHIEVE THE PERFORMANCE REQUIREMENTS DESCRIBED ABOVE, THE STRUCTURE OF THE FAULT CHAMBER SHALL CONSIST OF THE FOLLOWING COMPONENTS:

   -PRIMARY SEALING WITH SHOTCRETE
   -ROCKBOLTS TO GUARANTEE THE STABILITY OF THE EXCAVATION
   -STEEL FIBER REINFORCED SHOTCRETE LINING
   -IN SITU CAST CONCRETE LINING NON-CONTINOUS WITH SEISMIC JOINTS TO BE PLACED EVERY 12'
   -WATER PRESSURE RELIEF PIPES.
   -COMPRESSIBLE MATERIAL, CONSISTING OF CELLULAR CONCRETE WITH AN AS CAST DENSITY OF 25 pcf (~400 kg/m3)
   -INTERNAL LINING, CONSISTING OF AN IN SITU CASTED WATER TIGHT REINFORCED CONCRETE LINER WITH FLEXIBLE JOINTS (FREE ROTATION) EVERY 40 m. ALTERNATIVES WITH STEEL LINER OR TBM LINING SEGMENTS ARE FEASIBLE AND MIGHT BE APPLIED IF DESIGNED FOR FULL COMPLIANCE WITH THE PERFORMANCE REQUIREMENTS.

7. POOR ROCK QUALITY AND HIGH GROUNDWATER PRESSURE TO BE EXPECTED IN ALL FAULT ZONES.
8. DRAINAGE FOIL AND WATERPROOFING MEMBRANE TO BE INSTALLED AROUND INTERIOR LINING. WATERPROOFING MEMBRANE SHALL RESIST MAXIMUM EXPECTED WATER PRESSURE DURING THE WHOLE DESIGN LIFE OF 100 YEARS WITHOUT SUFFERING ANY NEGATIVE IMPACTS DUE TO THE PRESENCE OF METHANE IN THE GROUND WATER.
9. INTERIOR LINING TO BE DESIGNED AS WATER TIGHT CONCRETE STRUCTURE, WITH A MAXIMUM ALLOWABLE CRACK WIDTH OF 0.006 in. THE EFFECTS OF SHRINKAGE SHALL BE TAKEN INTO ACCOUNT.
10. RELIEF PIPES ARE PROPOSED TO REDUCE WATER PRESSURE OVER THE SHOTCRETE LINING AND THE IN SITU CAST INTERIOR LINING OF THE FAULT CHAMBER. THESE PIPES WILL NOT PRODUCE ANY WATER DRAINAGE AS THE INNER LINING OF THE FAULT CHAMBER IS DESIGNED AS A WATERTIGHT STRUCTURE AND THE POSSIBLE FLOW TO THE INTERIOR OF THE CHAMBER IS CONTROLLED BY THE PERMEABILITY OF THE CELLULAR CONCRETE.
11. CONCRETE FOR INTERIOR AND EXTERIOR IN SITU CAST LINING SHOULD HAVE A MINIMUM COMPRESSION STRENGTH AT 28 DAYS OF fc'= 10000 psi.
12. FOR THE PURPOSE OF PRELIMINARY COST ESTIMATION, THE NECESSARY QUANTITY OF REINFORCEMENT FOR THE EXTERIOR LINING CAN BE ASSUMED AS 9 pcf OF CONVENTIONAL REBAR, GRADE 60. THIS ASSUMPTION NEEDS TO BE VERIFIED DURING THE FINAL DESIGN STAGE.
13. FOR THE PURPOSE OF PRELIMINARY COST ESTIMATION, THE NECESSARY QUANTITY OF REINFORCEMENT FOR THE INTERIOR LINING CAN BE ASSUMED AS 9 pcf OF CONVENTIONAL REBAR, GRADE 60. THIS ASSUMPTION NEEDS TO BE VERIFIED DURING THE FINAL DESIGN STAGE.
14. A QUANTITY OF 0.125 pcf OF POLYPROPYLENE MICROFIBERS SHALL BE ADDED TO THE CONCRETE MIX OF THE INTERIOR LINING TO REDUCE CONCRETE SPALLING IN CASE OF FIRE.
15. FOR THE PURPOSE OF PRELIMINARY COST ESTIMATION THE OUTER LINING CAN BE ASSUMED AS FOLLOWS:

   -14 PERMANENT ROCK BOLTS PER RING; LENGTH 23 ft
   -SHOTCRETE SEALING 2"
   -SHOTCRETE LINING WITH A MINIMUM DEPTH OF 8", REINFORCED WITH 2.5 pcf OF STEEL FIBERS
   -DRAINAGE PIPES FOR RELIEF OF WATER PRESSURE.
   -THE NECESSARY QUANTITY OF REINFORCEMENT FOR THE EXTERIOR LINING CAN BE ASSUMED AS 9 pcf OF CONVENTIONAL REBAR, GRADE 60.
   -THE QUANTITIES FOR THE OUTER LINING ARE APPROXIMATE ONLY AND NEED TO BE CONFIRMED IN THE DETAILED DESIGN STAGE.

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

FAULT CHAMBER
CONCEPT DESIGN FAULT CHAMBER
DETAILS & NOTES

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0302
SCALE AS SHOWN
SHEET NO.

CROSS PASSAGES ALIGNMENT E1:

CROSS-PASSAGE	STATION
CP 01	642+00.683
CP 02	650+00.683
CP 03	658+00.683
CP 04	666+00.683
CP 05	674+00.683
CP 06	682+00.683
CP 07	690+00.683
CP 08	698+00.683
CP 09	706+00.683
CP 10	714+00.683
CP 11	722+00.683
CP 12	752+32.749
CP 13	760+32.749
CP 14	768+32.749
CP 15	776+32.749
CP 16	784+32.749
CP 17	792+32.749
CP 18	800+32.749
CP 19	808+32.749
CP 20	816+32.749
CP 21	824+32.749
CP 22	832+32.749
CP 23	840+32.749
CP 24	848+32.749
CP 25	856+32.749
CP 26	864+32.749
CP 27	872+32.749
CP 28	880+32.749
CP 29	888+32.749
CP 30	896+32.749
CP 31	904+32.749
CP 32	912+32.749
CP 33	920+32.749
CP 34	928+32.749
CP 35	936+32.749
CP 36	944+32.749
CP 37	952+32.749
CP 38	960+32.749
CP 39	968+32.749
CP 40	976+32.749
CP 41	984+32.749
CP 42	992+32.749
CP 43	1000+32.749
CP 44	1008+32.749
CP 45	1016+32.749
CP 46	1024+32.749
CP 47	1032+32.749
CP 48	1040+32.749
CP 49	1048+32.749
CP 50	1056+32.749
CP 51	1064+32.749
CP 52	1072+32.749
CP 53	1080+32.749
CP 54	1088+32.749
CP 55	1096+32.749
CP 56	1104+32.749
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CP 62	1152+32.749
CP 63	1160+32.749
CP 64	1168+32.749
CP 65	1176+32.749
CP 66	1184+32.749
CP 67	1192+32.749
CP 68	1200+32.749
CP 69	1208+32.749
CP 70	1216+32.749
CP 71	1224+32.749
CP 72	1232+32.749
CP 73	1240+32.749
CP 74	1248+32.749
CP 75	1256+32.749
CP 76	1264+32.749
CP 77	1272+32.749
CP 78	1280+32.749
CP 79	1288+32.749
CP 80	1296+32.749
CP 81	1304+32.749
CP 82	1312+32.749
CP 83	1320+32.749
CP 84	1328+32.749
CP 85	1336+32.749
CP 86	1344+32.749
CP 87	1352+32.749
CP 88	1360+32.749
CP 89	1368+32.749
CP 90	1376+32.749
CP 91	1384+32.749
CP 92	1392+32.749
CP 93	1400+32.749
CP 94	1408+32.749
CP 95	1416+32.749
CP 96	1424+32.749
CP 97	1432+32.749
CP 98	1440+32.749
CP 99	1448+32.749
CP 100	1456+32.749
CP 101	1464+32.749
CP 102	1472+32.749
CP 103	1480+32.749
CP 104	1488+32.749
CP 105	1496+32.749
CP 106	1504+32.749
CP 107	1512+32.749
CP 108	1520+32.749
CP 109	1528+32.749
CP 110	1536+32.749
CP 111	1544+32.749
CP 112	1552+32.749
CP 113	1560+32.749
CP 114	1568+32.749
CP 115	1576+32.749
CP 116	1584+32.749
CP 117	1592+32.749
CP 118	1600+32.749
CP 119	1608+32.749
CP 120	1616+32.749
CP 121	1624+32.749
CP 122	1632+32.749
CP 123	1640+32.749
CP 124	1648+32.749
CP 125	1656+32.749
CP 126	1664+32.749
CP 127	1672+32.749
CP 128	1680+32.749
CP 129	1688+32.749
CP 130	1696+32.749
CP 131	1704+32.749
CP 132	1712+32.749
CP 133	1720+32.749
CP 134	1728+32.749
CP 135	1736+32.749
CP 136	1744+32.749
CP 137	1752+32.749
CP 138	1760+32.749
CP 139	1768+32.749
CP 140	1776+32.749
CP 141	1784+32.749
CP 142	1792+32.749
CP 143	1800+32.749
CP 144	1808+32.749
CP 145	1816+32.749
CP 146	1824+32.749
CP 147	1832+32.749
CP 148	1840+32.749
CP 149	1848+32.749
CP 150	1856+32.749
CP 151	1864+32.749
CP 152	1870+71.700
CP 153	1878+71.700
CP 154	1886+71.700

UNDERGROUND TRACTION POWER STATIONS E1:

POWER STATION	STATION
PS 1.4	982+00.000
SS 1.0	1219+00.000
PS 2.1	1455+86.073
PS 2.2	1693+07.621

TECHNICAL ROOMS ALIGNMENT E1:

TECHNICAL ROOMS	STATION
TR 1	681+76.738
TR 2	800+56.749
TR 3	853+44.591
TR 4	906+24.591
TR 5	959+04.591
TR 6	1011+72.778
TR 7	1055+09.919
TR 8	1107+87.796
TR 9	1160+67.591
TR 10	1213+47.591
TR 11	1266+27.591
TR 12	1319+07.591
TR 13	1371+87.591
TR 14	1424+67.591
TR 15	1477+50.177
TR 16	1530+32.809
TR 17	1583+15.434
TR 18	1635+98.059
TR 19	1688+80.687
TR 20	1741+39.253
TR 21	1794+19.363
TR 22	1847+02.707

CROSS PASSAGES & TECHNICAL ROOMS C&C ALIGNMENT E1:

CROSS-PASSAGES & TECNICAL ROOM	STATION
C/C CP 01	494+50.000
C/C CP 02	502+50.000

CROSS PASSAGES ALIGNMENT E2:

CROSS-PASSAGE	STATION
CP 01	642+00.683
CP 02	650+00.683
CP 03	658+00.683
CP 04	666+00.683
CP 05	674+00.683
CP 06	682+00.683
CP 07	690+00.683
CP 08	698+00.683
CP 09	706+00.683
CP 10	714+00.683
CP 11	722+00.683
CP 12	754+11.786
CP 13	762+11.786
CP 14	770+11.786
CP 15	778+11.786
CP 16	786+11.786
CP 17	794+11.786
CP 18	802+11.786
CP 19	810+11.786
CP 20	818+11.786
CP 21	826+11.786
CP 22	834+11.786
CP 23	842+11.786
CP 24	850+11.786
CP 25	858+11.786
CP 26	866+11.786
CP 27	874+11.786
CP 28	882+11.786
CP 29	890+11.786
CP 30	898+11.786
CP 31	906+11.786
CP 32	914+11.786
CP 33	922+11.786
CP 34	930+11.786
CP 35	938+11.786
CP 36	946+11.786
CP 37	954+11.786
CP 38	962+11.786
CP 39	970+11.786
CP 40	978+11.786
CP 41	986+11.786
CP 42	994+11.786
CP 43	1002+11.786
CP 44	1010+11.786
CP 45	1018+11.786
CP 46	1026+11.786
CP 47	1034+11.786
CP 48	1042+11.786
CP 49	1050+11.786
CP 50	1058+11.786
CP 51	1066+11.786
CP 52	1074+11.786
CP 53	1082+11.786
CP 54	1090+11.786
CP 55	1098+11.786
CP 56	1106+11.786
CP 57	1114+11.786
CP 58	1122+11.786
CP 59	1130+11.786
CP 60	1138+11.786
CP 61	1146+11.786
CP 62	1154+11.786
CP 63	1162+11.786
CP 64	1170+11.786
CP 65	1178+11.786
CP 66	1186+11.786
CP 67	1194+11.786
CP 68	1202+11.786
CP 69	1210+11.786
CP 70	1218+11.786
CP 71	1226+11.786
CP 72	1234+11.786
CP 73	1242+11.786
CP 74	1250+11.786
CP 75	1258+11.786
CP 76	1266+11.786
CP 77	1274+11.786
CP 78	1282+11.786
CP 79	1290+11.786
CP 80	1298+11.786
CP 81	1306+11.786
CP 82	1314+11.786
CP 83	1322+11.786
CP 84	1330+11.786
CP 85	1338+11.786
CP 86	1346+11.786
CP 87	1354+11.786
CP 88	1362+11.786
CP 89	1370+11.786
CP 90	1378+11.786
CP 91	1386+11.786
CP 92	1394+11.786
CP 93	1402+11.786
CP 94	1410+11.786
CP 95	1418+11.786
CP 96	1426+11.786
CP 97	1434+11.786
CP 98	1442+11.786
CP 99	1450+11.786
CP 100	1458+11.786
CP 101	1466+11.786
CP 102	1474+11.786
CP 103	1482+11.786
CP 104	1490+11.786
CP 105	1498+11.786
CP 106	1506+11.786
CP 107	1514+11.786
CP 108	1522+11.786
CP 109	1530+11.786
CP 110	1538+11.786
CP 111	1546+11.786
CP 112	1554+11.786
CP 113	1562+11.786
CP 114	1570+11.786
CP 115	1578+11.786
CP 116	1586+11.786
CP 117	1594+11.786
CP 118	1602+11.786
CP 119	1610+11.786
CP 120	1618+11.786
CP 121	1683+54.465
CP 122	1691+54.465
CP 123	1699+54.465
CP 124	1707+54.465
CP 125	1715+54.465
CP 126	1723+54.465
CP 127	1731+54.465
CP 128	1739+54.465
CP 129	1747+54.465
CP 130	1755+54.465
CP 131	1763+54.465
CP 132	1771+54.465
CP 133	1779+54.465
CP 134	1787+54.465
CP 135	1795+54.465
CP 136	1803+54.465

UNDERGROUND TRACTION POWER STATIONS E2:

POWER STATION	STATION
PS 1.4	982+00.000
SS 1.0	1216+00.000
PS 2.1	1448+00.000

TECHNICAL ROOMS ALIGNMENT E2:

TECHNICAL ROOMS	STATION
TR 1	681+76.738
TR 2	800+56.749
TR 3	853+36.749
TR 4	905+87.789
TR 5	958+67.789
TR 6	1011+47.789
TR 7	1064+27.789
TR 8	1117+07.789
TR 9	1169+87.789
TR 10	1222+73.823
TR 11	1275+55.955
TR 12	1328+38.176
TR 13	1381+19.329
TR 14	1433+87.786
TR 15	1486+67.786
TR 16	1539+47.786
TR 17	1592+27.786
TR 18	1720+95.340
TR 19	1773+75.340

CROSS PASSAGES & TECHNICAL ROOMS C&C ALIGNMENT E2:

CROSS-PASSAGES & TECNICAL ROOM	STATION
C/C CP 01	494+50.000
C/C CP 02	502+50.000

CROSS PASSAGES ALIGNMENT REFINED SR14:

CROSS-PASSAGE	STATION
CP 01	396+43.455
CP 02	404+43.455
CP 03	412+43.455
CP 04	420+43.455
CP 05	428+43.455
CP 06	436+43.455
CP 07	444+43.455
CP 08	452+43.455
CP 09	460+43.455
CP 10	468+43.455
CP 11	476+43.455
CP 12	484+43.455
CP 13	492+43.455
CP 14	500+43.455
CP 15	508+43.455
CP 16	516+43.455
CP 17	524+43.455
CP 18	532+43.455
CP 19	540+43.455
CP 20	548+43.455
CP 21	556+43.455
CP 22	564+43.455
CP 23	572+43.455
CP 24	580+43.455
CP 25	588+43.455
CP 26	596+43.455
CP 27	604+43.455
CP 28	612+43.455
CP 29	620+43.455
CP 30	628+43.455
CP 31	636+43.455
CP 32	644+43.455
CP 33	652+43.455
CP 34	660+43.455
CP 35	668+43.455
CP 36	676+43.455
CP 37	684+43.455
CP 38	692+43.455
CP 39	700+43.455
CP 40	708+43.455
CP 41	716+43.455
CP 42	724+43.455
CP 43	732+43.455
CP 44	740+43.455
CP 45	748+43.455
CP 46	756+43.455
CP 47	764+43.455
CP 48	826+50.800
CP 49	834+50.800
CP 50	842+50.800
CP 51	850+50.800
CP 52	858+50.800
CP 53	866+50.800
CP 54	874+50.800
CP 55	882+50.800
CP 56	890+50.800
CP 57	898+50.800
CP 58	906+50.800
CP 59	914+50.800
CP 60	922+50.800
CP 61	930+50.800
CP 62	938+50.800
CP 63	946+50.800
CP 64	954+50.800
CP 65	962+50.800
CP 66	970+50.800
CP 67	978+50.800
CP 68	986+50.800
CP 69	1076+39.690
CP 70	1084+39.690
CP 71	1092+39.690
CP 72	1186+07.570
CP 73	1194+07.570
CP 74	1202+07.570
CP 75	1210+07.570
CP 76	1218+07.570
CP 77	1329+40.645
CP 78	1337+40.645
CP 79	1345+40.645
CP 80	1353+40.645
CP 81	1361+40.645
CP 82	1369+40.645
CP 83	1377+40.645
CP 84	1385+40.645
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CP 86	1401+40.645
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CP 102	1529+40.645
CP 103	1537+40.645
CP 104	1545+40.645
CP 105	1553+40.645
CP 106	1561+40.645
CP 107	1569+40.645
CP 108	1577+40.645
CP 109	1585+40.645
CP 110	1593+40.645
CP 111	1601+40.645
CP 112	1609+40.645
CP 113	1617+40.645
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CP 121	1681+40.645
CP 122	1689+40.645
CP 123	1697+40.645
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CP 125	1713+40.645
CP 126	1721+40.645
CP 127	1729+40.645
CP 128	1737+40.645
CP 129	1745+40.645
CP 130	1753+40.645
CP 131	1761+40.645
CP 132	1769+40.645
CP 133	1777+40.645
CP 134	1785+40.645
CP 135	1793+40.645
CP 136	1801+40.645
CP 137	1809+40.645
CP 138	1817+40.645
CP 139	1825+40.645
CP 140	1833+40.645
CP 141	1841+40.645
CP 142	1849+40.645
CP 143	1857+40.645
CP 144	1865+40.645
CP 145	1873+40.645
CP 146	1881+40.645
CP 147	1889+40.645
CP 148	1897+40.645
CP 149	1905+40.645
CP 150	1913+40.645
CP 151	1921+40.645
CP 152	1929+40.645
CP 153	1937+40.645
CP 154	1945+40.645
CP 155	1953+40.645
CP 156	1961+40.645
CP 157	1969+40.645
CP 158	1978+13.960
CP 159	1986+13.960
CP 160	1994+13.960

UNDERGROUND TRACTION POWER STATIONS REFINED SR14:

POWER STATION	STATION
PS 1.2	599+13.752
PS 2.1	1590+00.000

TECHNICAL ROOMS ALIGNMENT REFINED SR14:

TECHNICAL ROOMS	STATION
TR 1	442+94.624
TR 2	495+69.598
TR 3	548+19.585
TR 4	600+94.565
TR 5	653+72.667
TR 6	706+52.667
TR 7	759+32.667
TR 8	876+51.177
TR 9	929+31.239
TR 10	982+06.288
TR 11	1376+04.318
TR 12	1428+86.283
TR 13	1481+69.168
TR 14	1534+52.054
TR 15	1587+33.947
TR 16	1640+13.947
TR 17	1692+92.172
TR 18	1745+71.884
TR 19	1798+52.038
TR 20	1851+32.662
TR 21	1904+12.730
TR 22	1956+96.185

NOTES:

1. CROSS-PASSAGES FOR EMERGENCY EGRESS SHALL NOT BE FURTHER 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: W. GUO
IN CHARGE: A. RELAÑO
DATE: 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

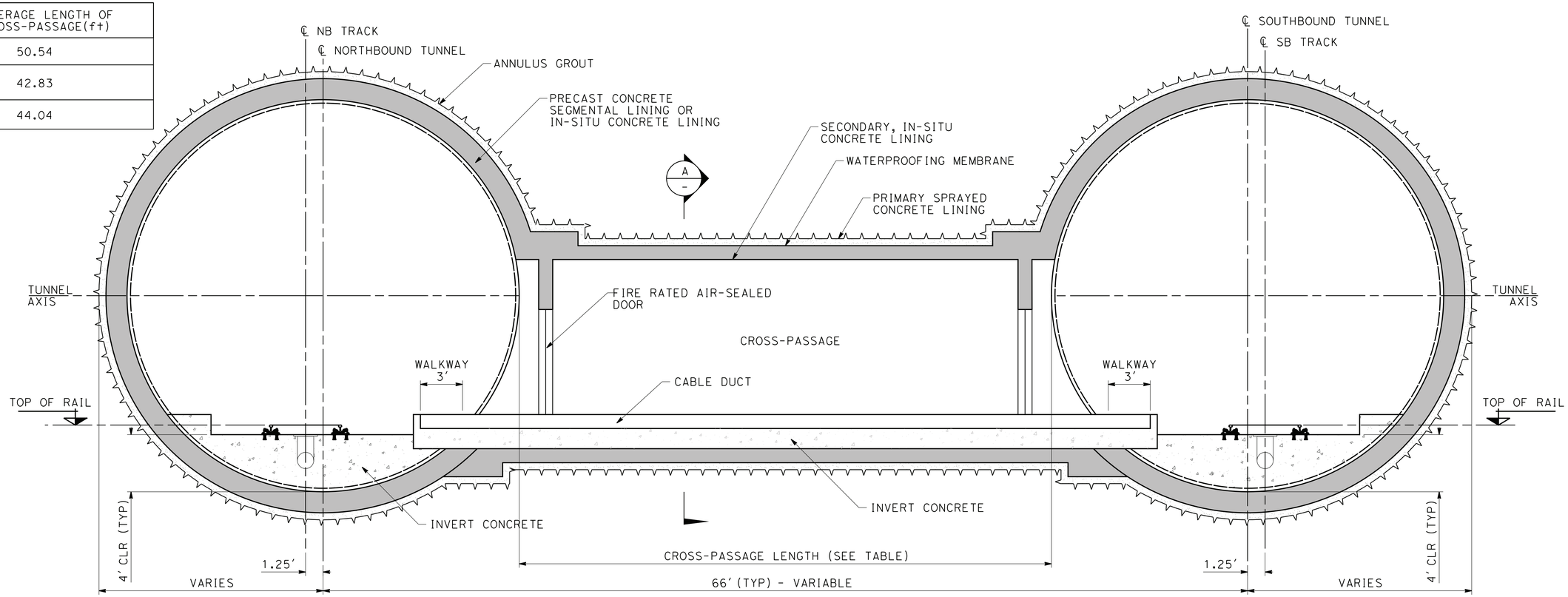
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

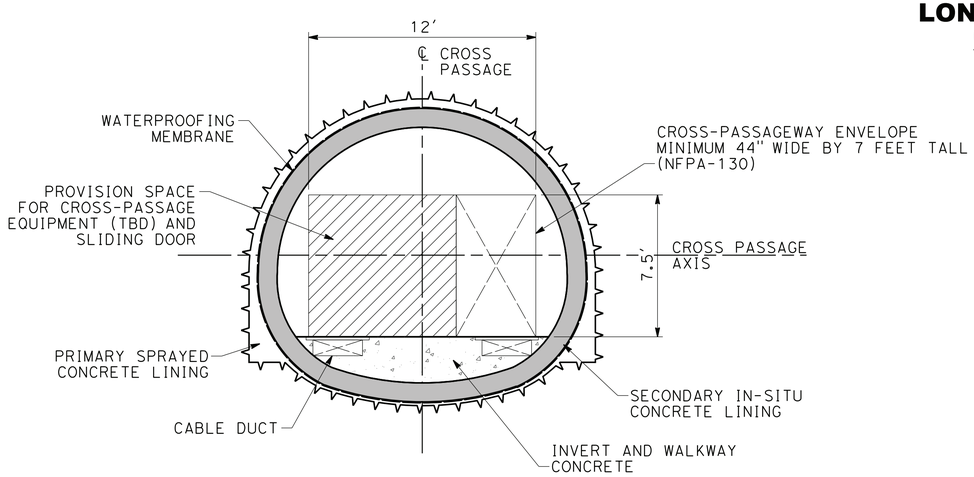
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
EMERGENCY EGRESS CROSS-PASSAGES AND EXITS, TECHNICAL ROOMS AND UNDERGROUND TRACTION POWER FACILITIES

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0400
SCALE NO SCALE
SHEET NO.

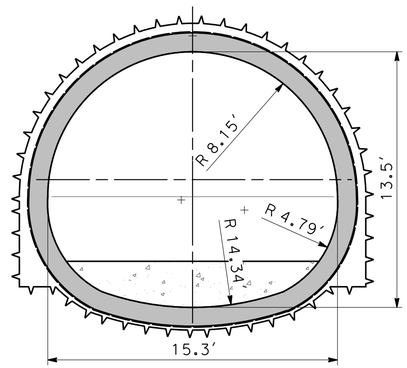
ALIGNMENT	AVERAGE LENGTH OF CROSS-PASSAGE(ft)
E1	50.54
E2	42.83
REFINED SR14	44.04



LONGITUDINAL SECTION CROSS-PASSAGE



SECTION A – SPACEPROOFING



SECTION A – 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 W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

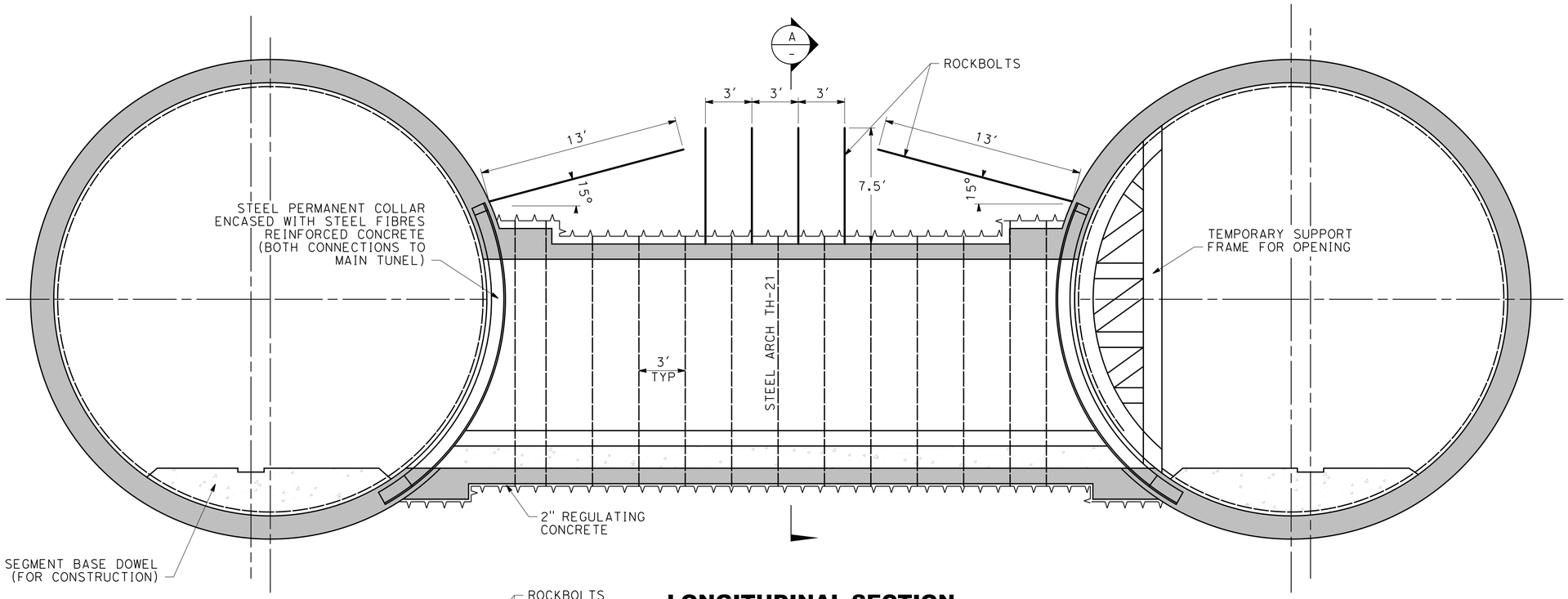
NOT FOR CONSTRUCTION

SENER

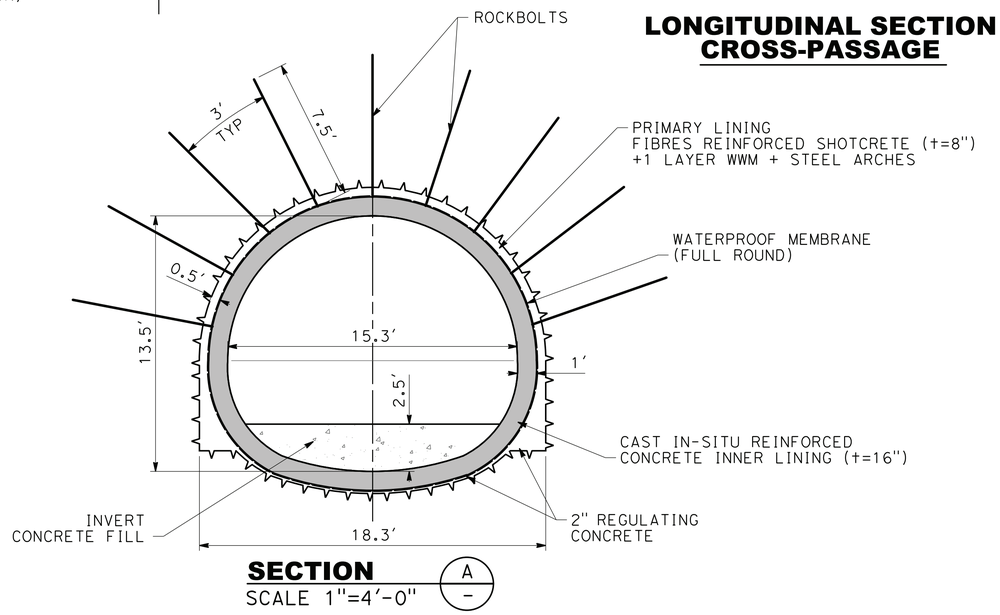
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
TMB 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 –

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 W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

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

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

0205510

24/05/2021 16:05:53

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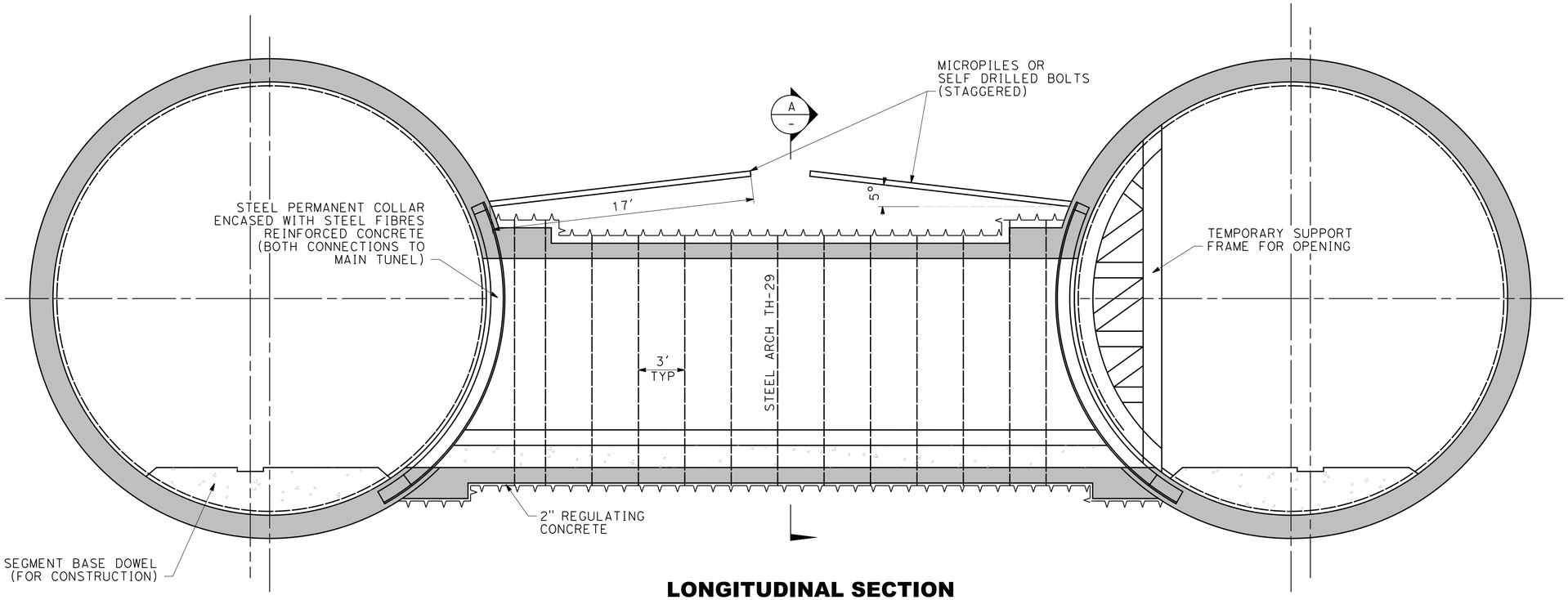
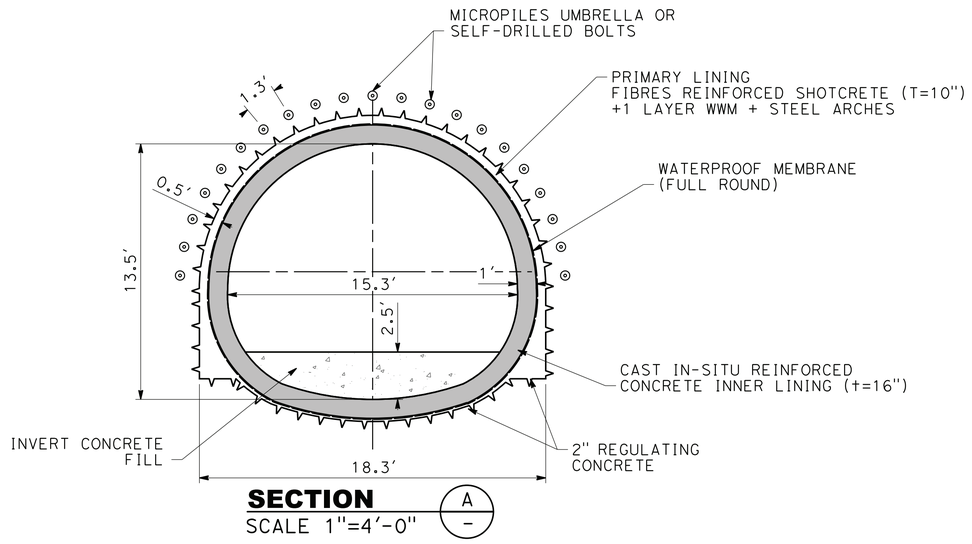
CROSS-PASSAGE PRIMARY LINING FOR POOR QUALITY ROCK



LONGITUDINAL SECTION
CROSS-PASSAGE



SECTION A – –
SCALE 1"=4'-0"

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 W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

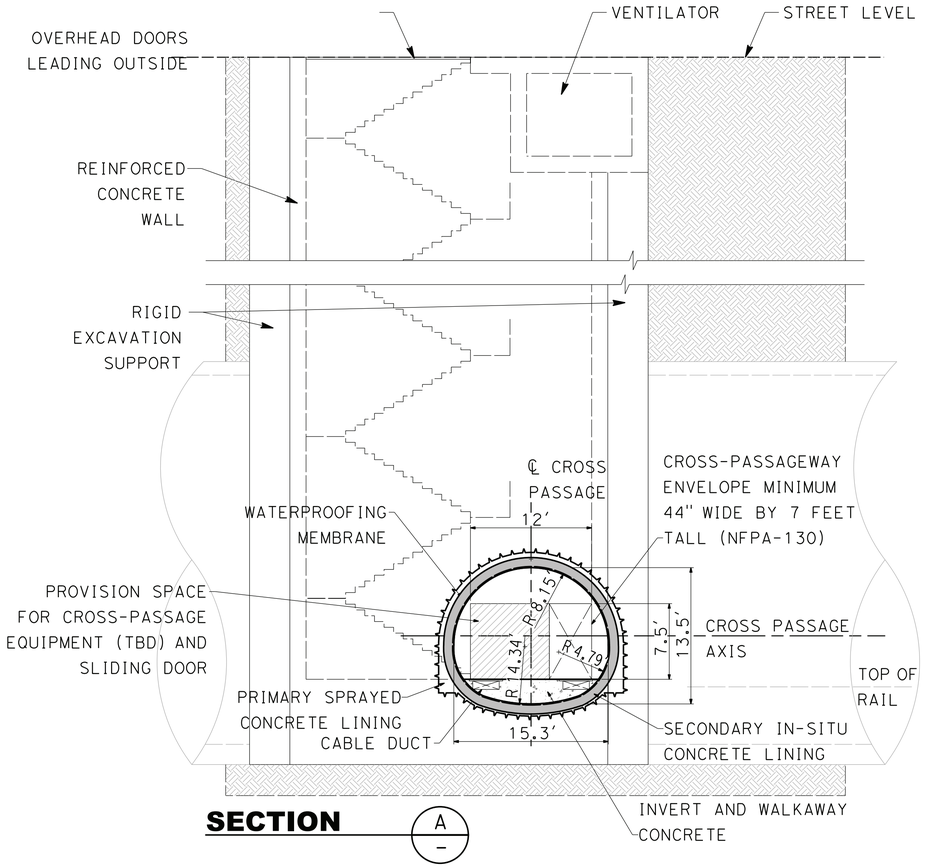
NOT FOR CONSTRUCTION

SENER

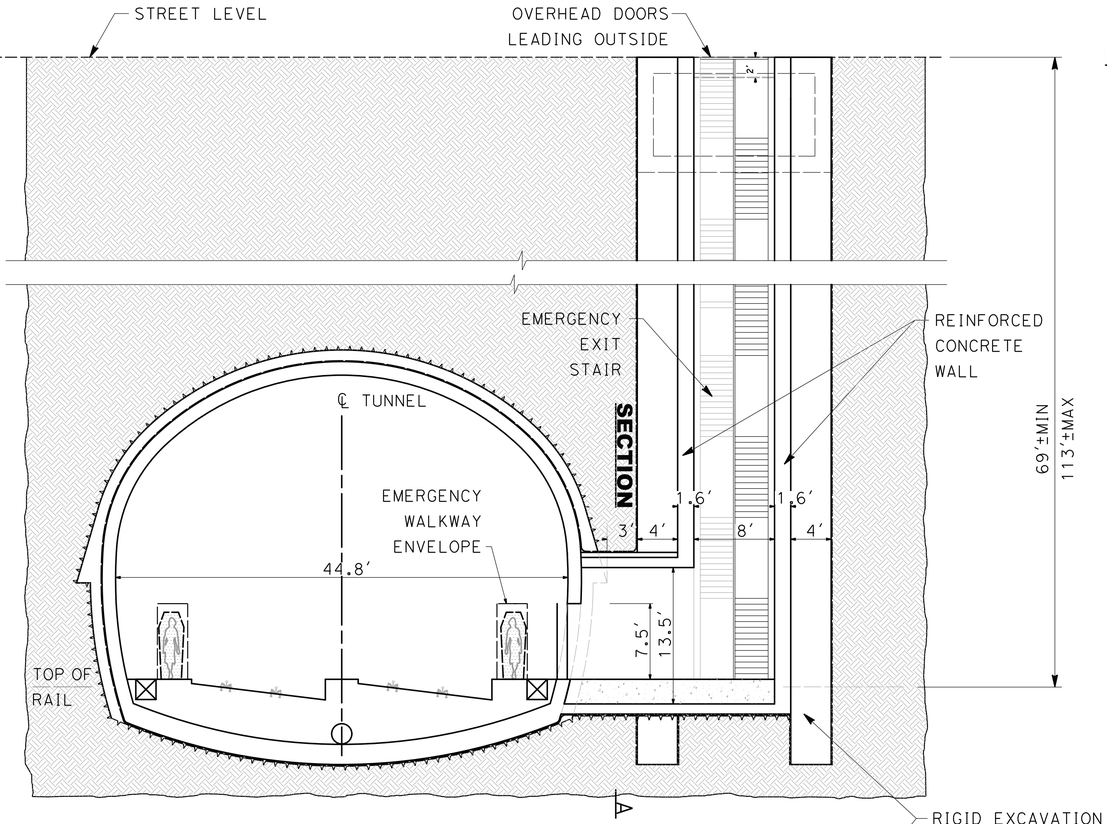
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

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

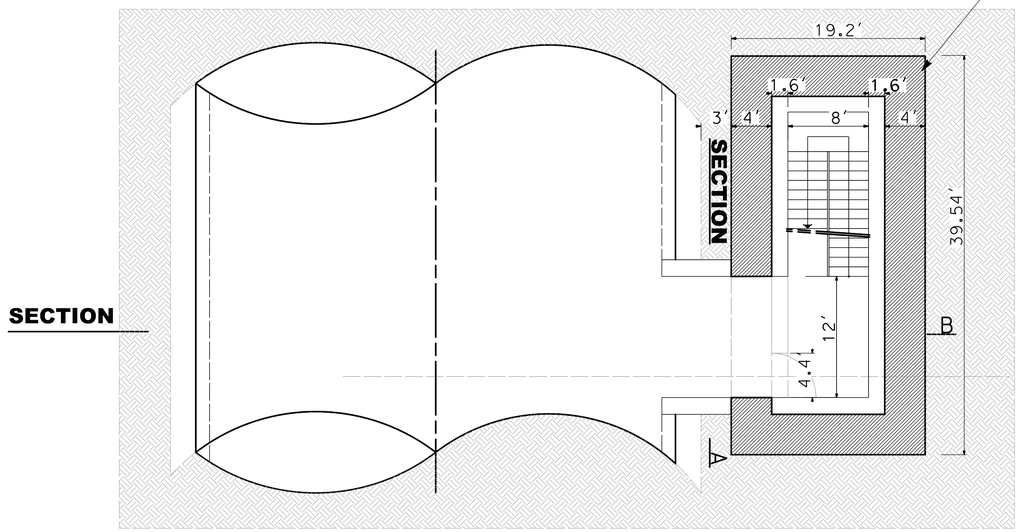
CONTRACT NO. HSR14-42
DRAWING NO. TN-C0403
SCALE AS SHOWN
SHEET NO.



SECTION A



SECTION



EMERGENCY EGRESS	STATIONING	SIDE
EE-01-E1	2060+57.75	LEFT
EE-02-E1	2085+57.75	LEFT
EE-03-E1	2110+57.75	RIGHT

EMERGENCY EGRESS	STATIONING	SIDE
EE-01-E2	1835+30.00	RIGHT
EE-02-E2	1856+45.00	LEFT
EE-03-E2	1873+60.00	LEFT
EE-04-E2	1898+50.00	LEFT

EMERGENCY EGRESS	STATIONING	SIDE
EE-01-SR14	2168+00.00	LEFT
EE-02-SR14	2193+00.00	LEFT
EE-03-SR14	2218+00.00	RIGHT

NOTES:

1. TYPES, LOCATIONS AND DIMENSIONS OF EXCAVATION SUPPORT NOT DESIGNED.
2. PERMANENT LINING ASSUMED WATERTIGHT/UNDRAINED IN PERMANENT CASE.
3. STRUCTURE COMPONENTS NOT DESIGNED. DRAWINGS NOT BASED ON ACTUAL DESIGN AND DEVELOPED FOR PRELIMINARY COST ESTIMATE.
4. TEMPORARY INTERNAL BRACING WILL BE ANTICIPATED FOR WALLS WITH AN EXPOSED HEIGHT GREATER THAN 20 FT.

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

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

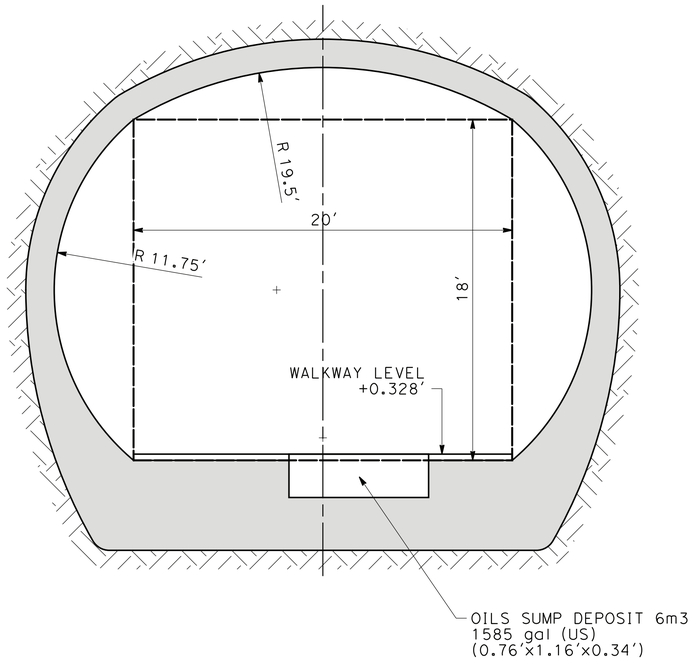
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
EMERGENCY EGRESS FOR SEM TUNNELS
CROSS AND LONGITUDINAL SECTION GEOMETRY

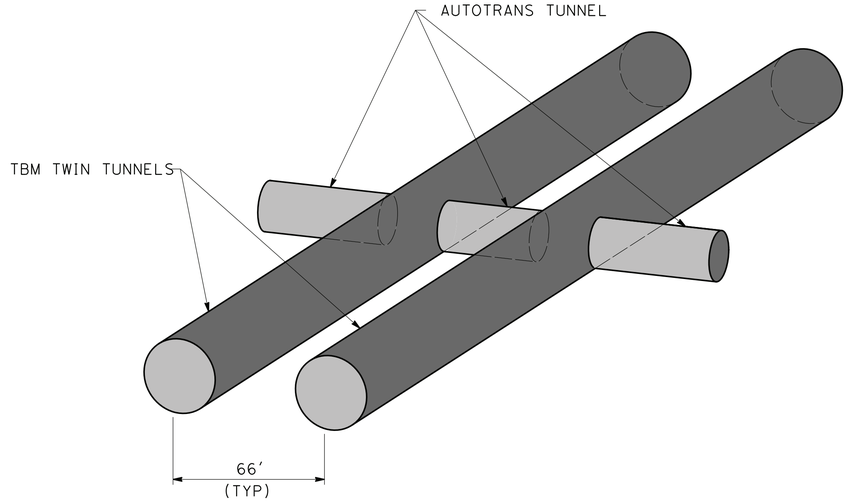
CONTRACT NO. HSR14-42
DRAWING NO. TN-C0404
SCALE AS SHOWN
SHEET NO.

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 TN-C0500
SCALE 1"=4'



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 W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

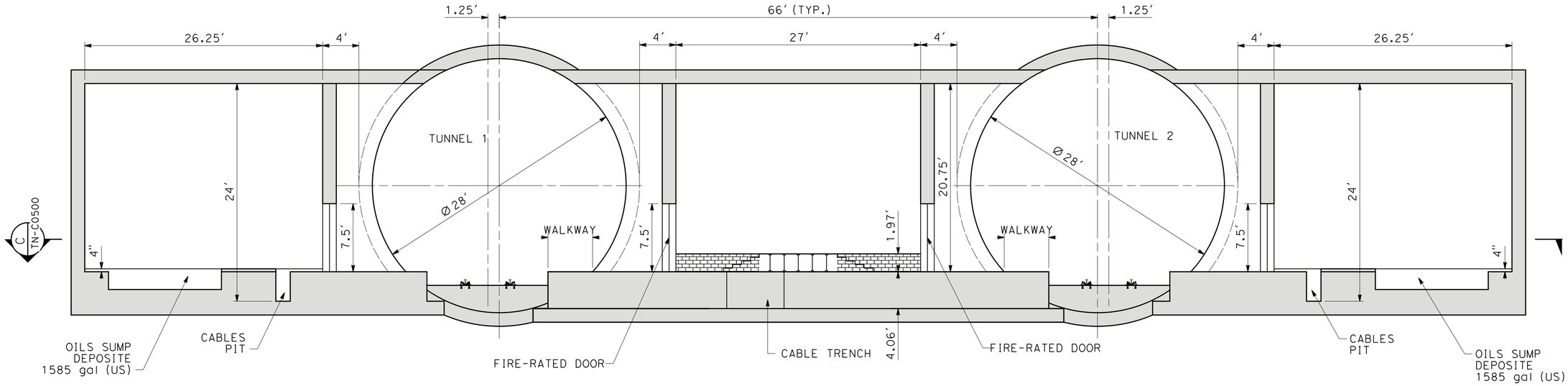
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

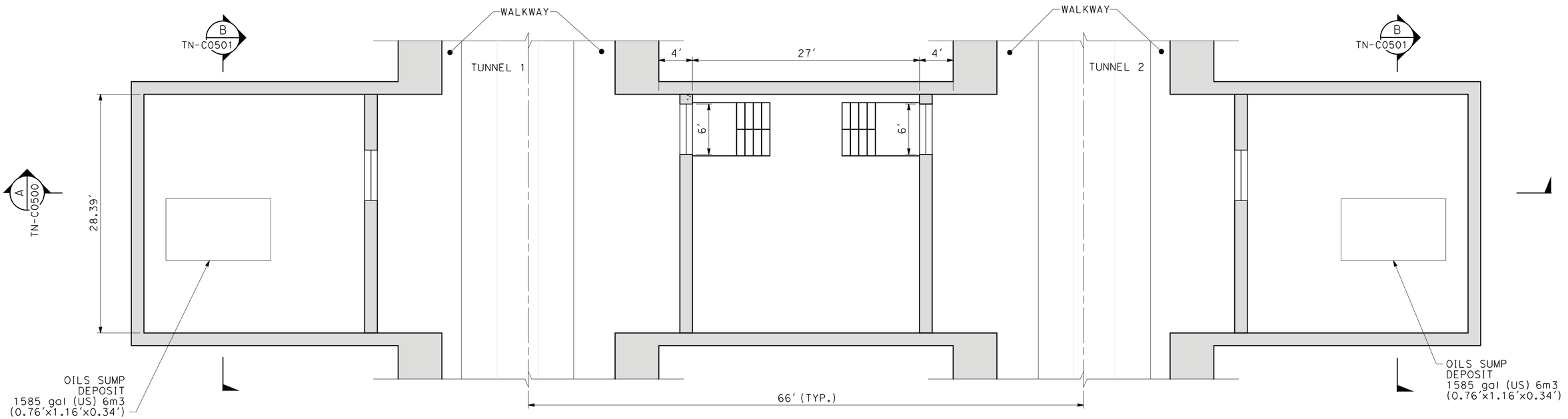
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

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-C0500)
SCALE 1"=6'



PLAN PARALLELING STATION (C TN-C0500)
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 W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

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 (2 of 2)

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

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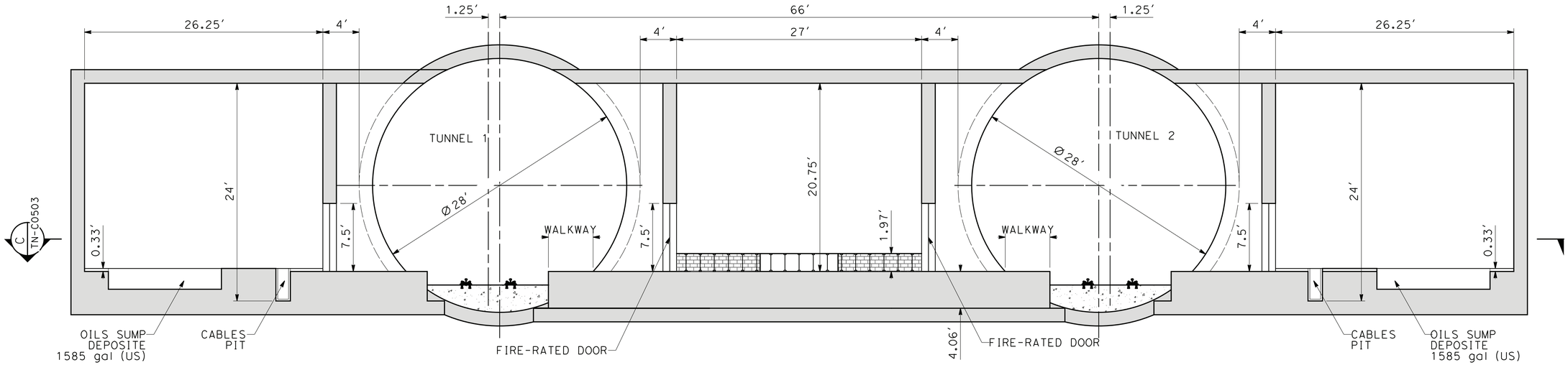
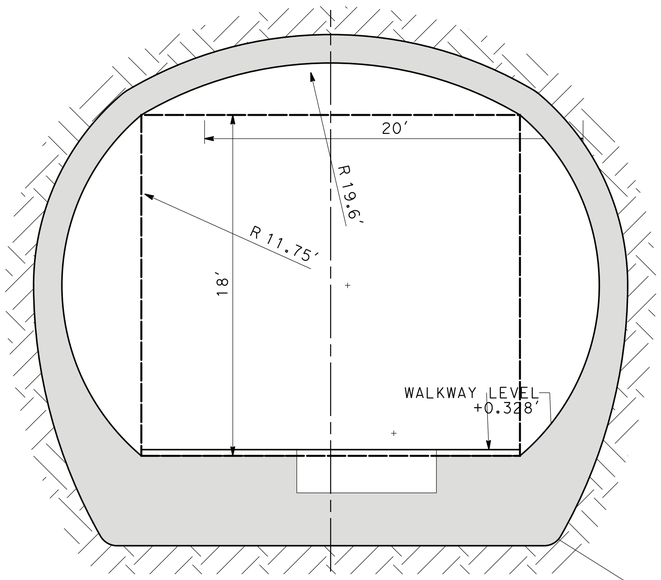
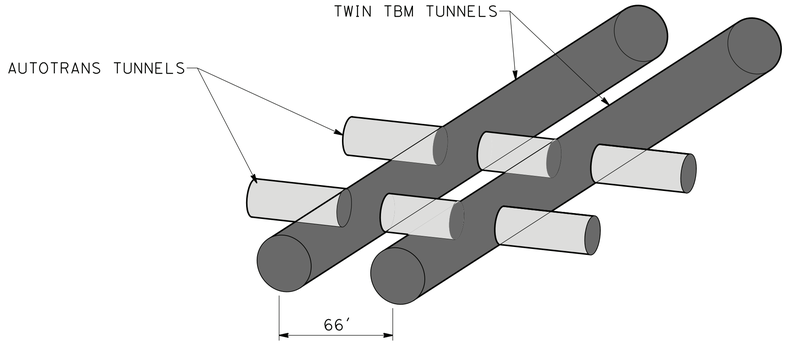


SECTION (A, TN-C0503)
SCALE 1"=6′



SECTION (B, TN-C0503)
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: W. GUO
IN CHARGE: A. RELAÑO
DATE: 04/30/2021

PEPD RECORD SET REV 02

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.

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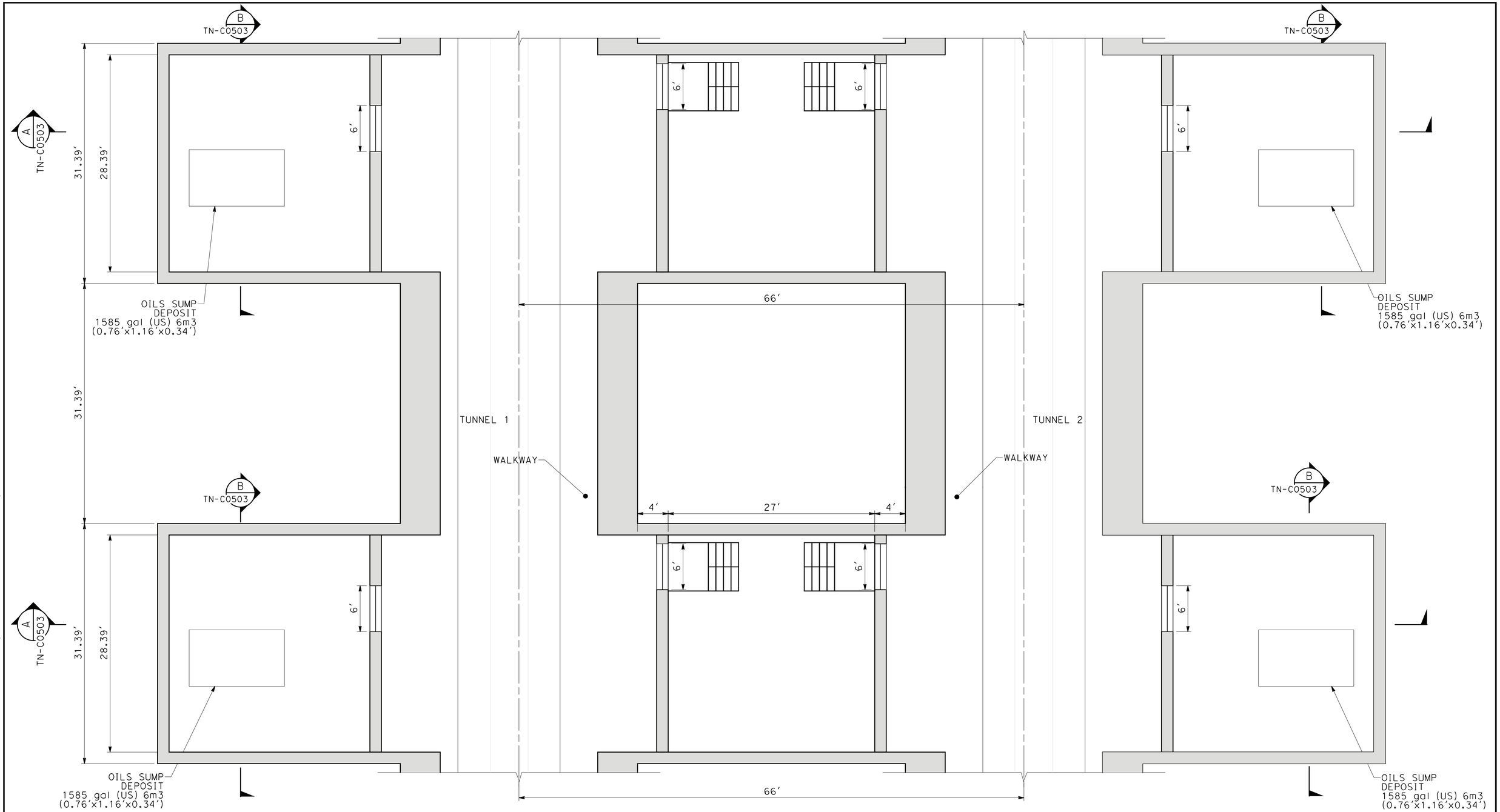

PLAN SWITCHING STATION

SCALE 1"=6′

C TN-C0502

6 0 6 12

1"=6′-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

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.

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0205510

PLAN

NOTES:

1. EXAMPLE SHOWN IS POTENTIAL ADIT #1 FOR ALIGNMENT E1.
2. SEE TABLE FOR ALL OPTIONAL ADITS.
3. ALL ADITS EXCEPT #2-E2 ARE INCLINED DESCENDING GALLERIES WITH MAXIMUM SLOPE OF 14%
4. ADIT OPTION #2 FOR E2 IS A 466 FT DEEP VERTICAL SHAFT.

ALIGNMENT	ADIT #	COMMENTS	ADIT ENTRANCE			ADIT		CONNECTING CAVERN			
			ELEV.(FT)	LATITUDE	LONGITUDE	LENGTH(FT)	SLOPE(%)	STA.	ELEV.(FT)	LATITUDE	LONGITUDE
E1	ADIT 1	ANF, SGFZ	2050	34°21'2.55"N	118°22'51.02"W	4,000	8.6%	1490+00	1702	34°21'8.22"N	118°22'4.38"W
	ADIT 2	ANF, SGFZ	2162	34°20'38.65"N	118°21'39.20"W	3,448	13.3%				
REFINED SR14	ADIT 1	ANF, SGFZ	2047	34°21'2.55"N	118°22'51.02"W	6,410	11.0%	1650+00	1366	34°20'54.66"N	118°24'6.61"W
	ADIT 2	PACOIMA DAM,OUTSIDE ANF	1438	34°19'30.56"N	118°24'16.65"W	2,044	11.0%	1715+00	1230	34°19'49.27"N	118°24'9.81"W
	ADIT 3	PACOIMA DAM,OUTSIDE ANF	1460	34°19'15.67"N	118°24'7.43"W	3,475	6.6%				
E2	ADIT 1	ANF, SGFZ	1800	34°19'28.65"N	118°20'12.69"W	10,800	0.8%	1362+00	1719	34°20'31.16"N	118°18'28.47"W
	ADIT 2	ANF, SOUTH OF SGFZ	1868	34°19'5.13"N	118°19'27.55"W	394	VERTICAL SHAFT	1460+83	1474	34°19'5.13"N	118°19'27.55"W

ANF: ANGELES NATIONAL FOREST
SGFZ: SAN GABRIEL FAULT ZONE

PROFILE

200 0 200 400
1"=200' HORIZ

200 0 200 400
1"=200' VERT

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

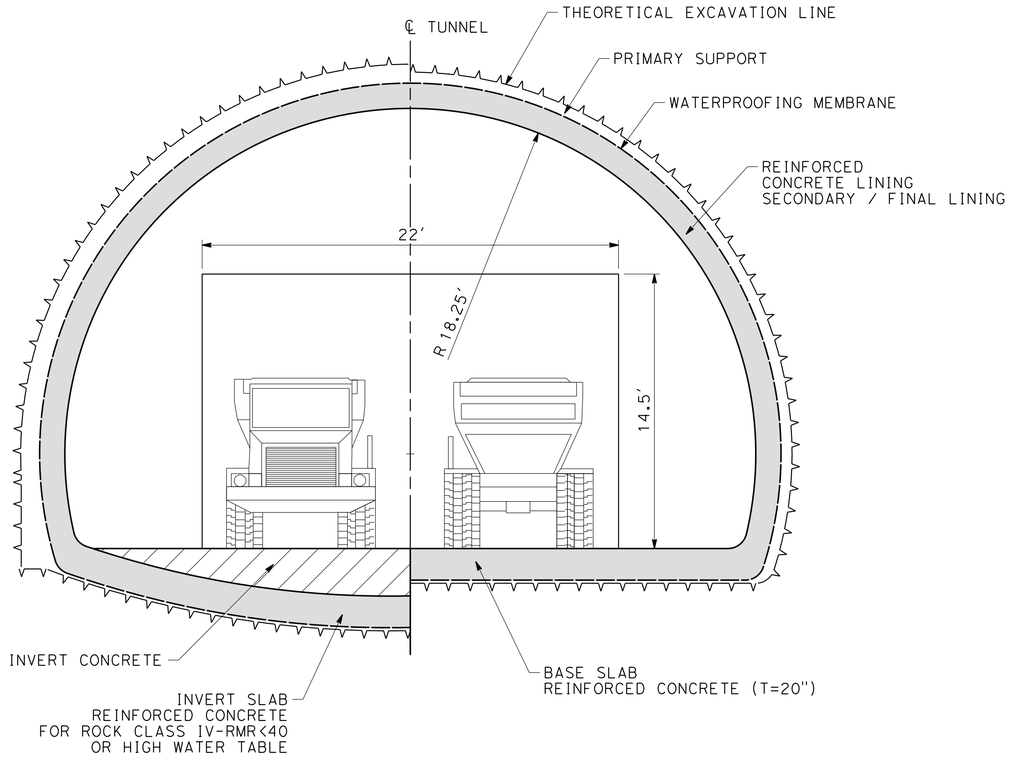
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ADIT FOR CONSTRUCTION
TYPICAL PLAN AND PROFILE

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0700
SCALE AS SHOWN
SHEET NO.

NOTES:

1. CALIFORNIA FIRE CODE 2016 CHAPTER 5. UNOBSTRUCTED WIDTH NO LESS THAN 22FT UNOBSTRUCTED VERTICAL CLEARANCE OF NO LESS THAN 14.5FT.
2. CLEARANCE FOR TWO TRUCKS OR DUMPERS TO PASS EACH OTHER, TWO VENTILATION DUCTS OF 5FT DIAMETER, WALKWAY, STACKED CONVEYOR BELT, AND WATER PIPES ON ONE SIDE.
3. CLEARANCE FOR TBM PARTS TO BE TRANSPORTED THROUGH THE ADIT.
4. 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. FOR PEPD DESIGN LEVEL IT WILL BE APPLIED TO POOR QUALITY ROCK AREAS.

FREE CROSS-SECTION 703 SQ.FT.
ADIT USED FOR CONSTRUCTION



TYPICAL CROSS SECTION

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

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

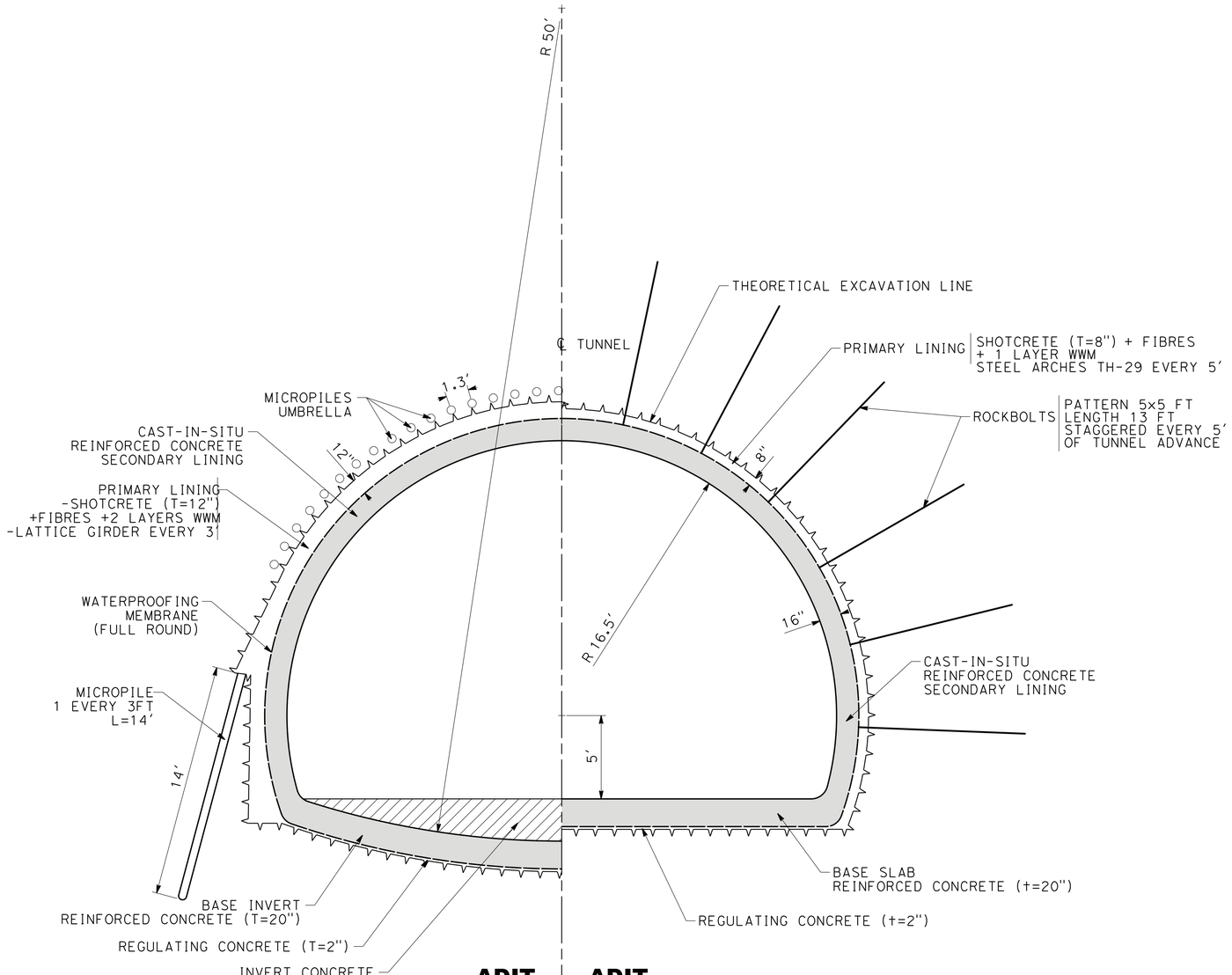
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ADIT FOR CONSTRUCTION
INCLINED DESCENDING GALLERY
TYPICAL CROSS-SECTION GEOMETRY

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0702
SCALE AS SHOWN
SHEET NO.



ADIT
TYPICAL GEOMETRY AND PRIMARY LINING FOR POOR QUALITY ROCK (RMR<30)

ADIT
TYPICAL GEOMETRY AND PRIMARY LINING FOR MEDIUM QUALITY ROCK RMR (40-50)

BASIC QUANTITIES PER FT OF TUNNEL		
ADIT	PRIMARY LINING TYPE	
	MEDIUM QUALITY ROCK	POOR QUALITY ROCK (II)
EXCAVATION AREA (SQ.FT.)	778	872
PRIMARY LINING AREA (SQ.FT.)	41	78
REGULATING CONCRETE (2 in) (SQ.FT.)	6	6
STEEL ARCH/LATTICE GIRDER (FT)	68/5=13.6	67.5/3=22.5
WATERPROOFING MEMBRANE (FT)	102	103
FORMWORK (FT)	61	61
SECONDARY LINING AREA CONCRETE (sides&crown) (SQ.FT.)	85	85
SECONDARY LINING AREA CONCRETE (invert/slab) (SQ.FT.)	56	56
MICROPILES UMBRELLA (FT)	-	44
ROCKBOLTS (FT)	31.2	-
MICROPILES AT ELEPHANT'S FOOT (FT)	-	9.5
INVERT CONCRETE (SQ.FT.)	-	52

NOTES:

1. THIS DRAWING IS NOT ACTUAL DESIGN. ITS PURPOSE IS TO BUILD UNIT PRICES AT PEPD LEVEL.
2. TYPICAL SUPPORT MEASURES AND INNER LINING THICKNESSES ARE GIVEN WITH ORIENTATIVE PURPOSES ONLY. ACTUAL DESIGN WILL REQUIRE RESULTS OF ADEQUATE GEOTECHNICAL INVESTIGATION.
3. THE SECTIONS SHOWN ON THIS DRAWING ARE ONLY APPLICABLE IN THE ROCK QUALITY CONDITIONS SHOWN.
4. 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. FOR THIS STAGE OF DESIGN IT WILL BE APPLIED ONLY TO POOR QUALITY ROCK AREAS.
5. TUNNELS DIMENSIONS ACCORDING TO USUAL MACHINERY USED IN MINED TUNNELS. THESE DIMENSIONS MUST BE ADJUSTED TO THE MACHINERY THAT WILL BE USED IN CONSTRUCTION.
6. 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.
7. ADIT SECTION MUST BE INCREASED IN A TELESCOPIC WAY TO ALLOW THE CONSTRUCTION OF THE CAVERN USING THE PROPOSED PHASES.A SKETCH IS SHOWN ON DRAWING TN-C0707

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

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ADIT FOR CONSTRUCTION
INCLINED DESCENDING GALLERY
TYPICAL CONSTRUCTION SEQUENCE
AND SUPPORT MEASURES (1 of 3)

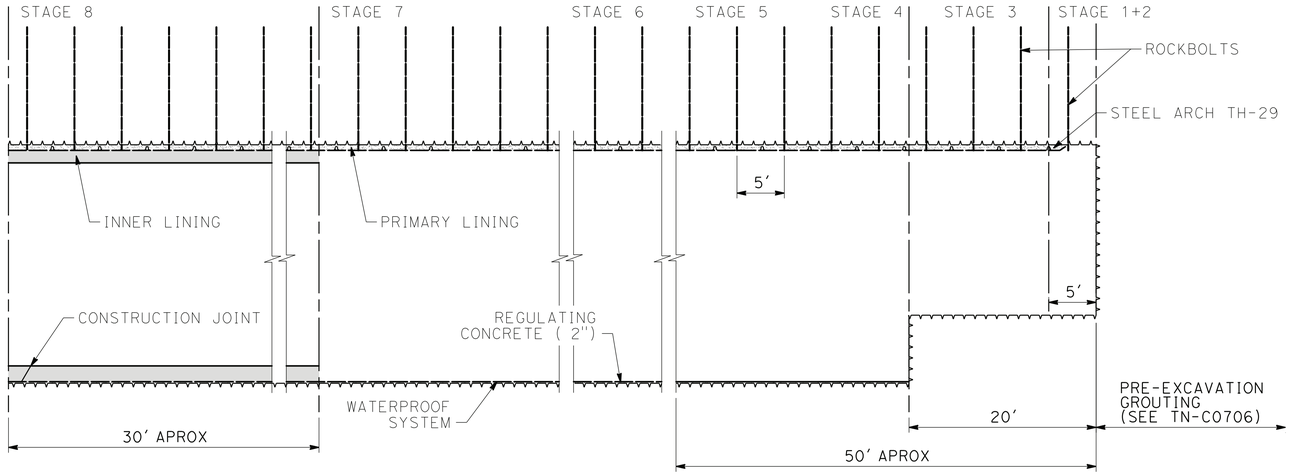
CONTRACT NO. HSR14-42
DRAWING NO. TN-C0703
SCALE AS SHOWN
SHEET NO.

INCLINED DESCENDING GALLERY PRIMARY LINING FOR MEDIUM QUALITY ROCK

LEGEND:

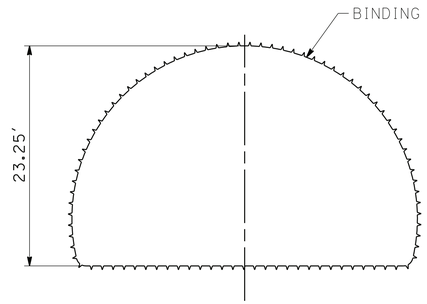
- NATM EXCAVATION
- STEEL ARCH TH-29
- REINFORCED SHOTCRETE PRIMARY LINING +1 LAYER WWM
- REINFORCED INNER / SECONDARY LINING

LONGITUDINAL SECTION

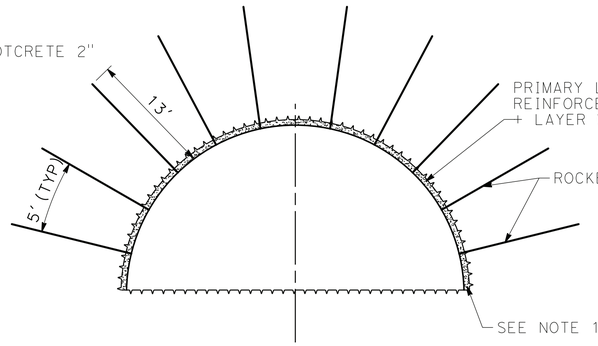


PRIMARY LINING (EXAMPLE ONLY, NOT ACTUAL DESIGN)							
DENOMINATION	RMR	SHOTCRETE THICKNESS (in)	STEEL ARCHES	FIBRES & WWM	ADVANCE LENGTH (ft)	ROCKBOLT PATTERN AND LENGTH (ft)	PIPE UMBRELLA
GOOD QUALITY ROCK	50-60	6	NO	FIBRES & 1 LAYER WWM	5 FULL FACE	5x5ft 13ft	-
MEDIUM QUALITY ROCK	40-50	8	TH-29		5 TOP HEADING	5x5ft 13ft	-
POOR QUALITY ROCK (I)	30-40	10	LATTICE GIRDER	FIBRES & 2 LAYERS WWM	3.5 TOP HEADING	3.5x3.5ft 15ft	*
POOR QUALITY ROCK (II)	<30	12			3 TOP HEADING	-	YES

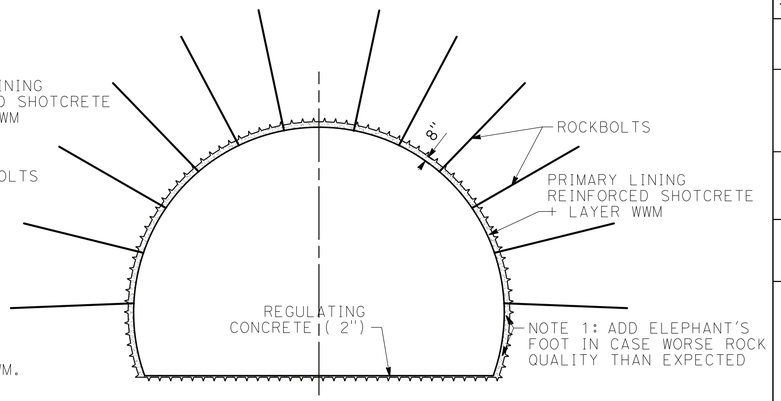
* SELF DRILLING BOLTS INSTEAD OF ROCKBOLTING IF RMR< 35



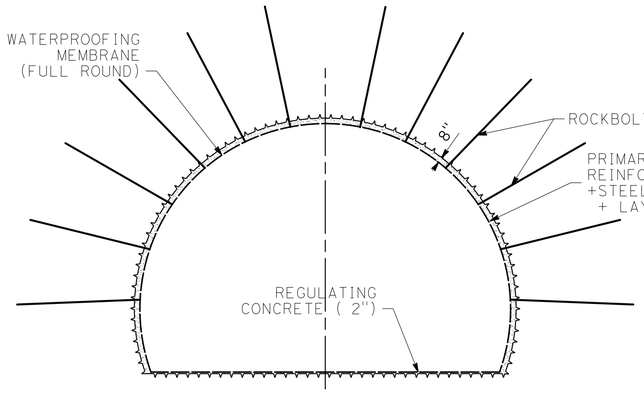
-STAGE 0: PRE-EXCAVATION GROUTING.
-STAGE 1: EXCAVATION OF TOP HEADING AND APPLICATION OF STABILIZATION LAYER OF SHOTCRETE.



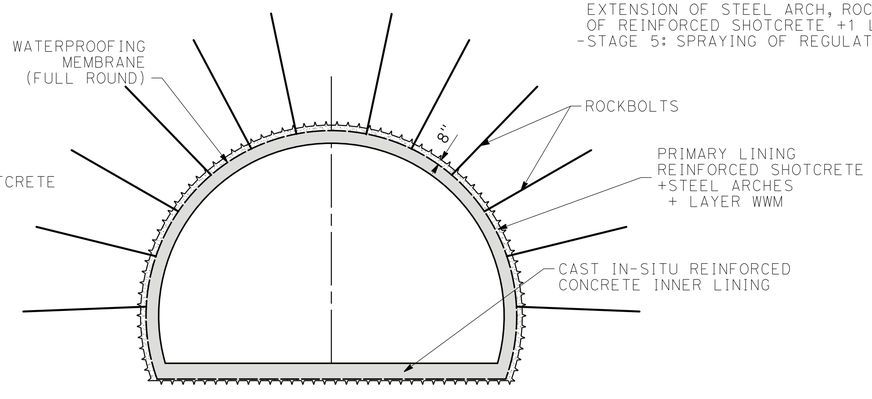
-STAGE 2: INSTALLATION OF STEEL ARCH AND ROCKBOLTING.
-STAGE 3: SPRAYING OF REINFORCED SHOTCRETE +1 LAYER WWM.



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



-STAGE 6: INSTALLATION OF WATERPROOFING MEMBRANE.



-STAGE 7: INSTALLATION OF INNER (SECONDARY) LINING.

STAGE	DESCRIPTION
0	-PRE-EXCAVATION GROUTING SEE DRAWING TN-C0706.
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, ROCKBOLTING AND SPRAYING OF REINFORCED SHOTCRETE + 1 LAYER WWM ON THE SIDES.
5	-SPRAYING OF REGULATING CONCRETE INVERT
6	-INSTALLATION OF WATERPROOFING MEMBRANE
7	-INSTALLATION OF INNER (SECONDARY) LINING -(FIRST, INNER; SECOND, SIDES AND CROWN)

NOTES:

1. SUPPORT MEASURES ESTIMATED ONLY FOR BUILDING UNIT PRICES AT PEPD LEVEL. 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.

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

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ADIT FOR CONSTRUCTION
INCLINED DESCENDING GALLERY
TYPICAL CONSTRUCTION SEQUENCE
AND SUPPORT MEASURES (2 of 3)

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0704
SCALE AS SHOWN
SHEET NO.

0205510

24/05/2021 16:13:47

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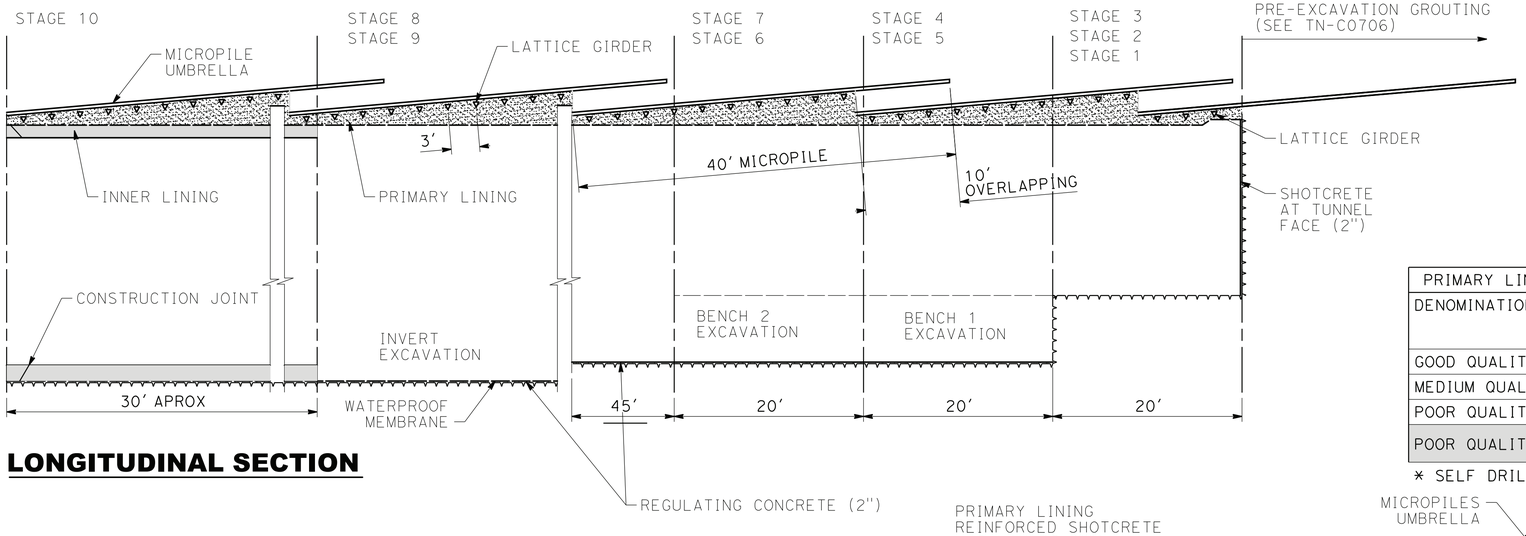


LONGITUDINAL SECTION

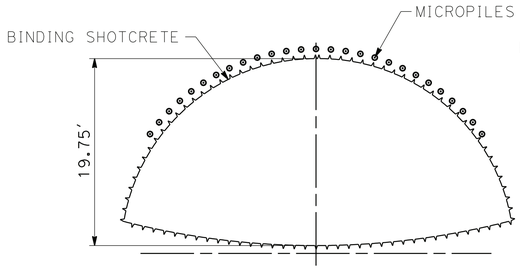
NOTES:

1. THIS DRAWING IS NOT ACTUAL DESIGN. ITS PURPOSE IS TO BUILD UNIT PRICES AT PEPD LEVEL.
2. TYPICAL SUPPORT MEASURES GIVEN WITH ORIENTATIVE PURPOSES ONLY. ACTUAL DESIGN WILL REQUIRE RESULTS OF GEOTECHNICAL INVESTIGATION.
3. POOR QUALITY ROCK CAN OCCUR AT PORTALS AND FAULT ZONES AMONG OTHER.
4. SQUEEZING GROUND CONDITIONS UNDER OVERBURDEN OF MORE THAN 500 FT WILL REQUIRE THE STUDY OF DIFFERENT MULTIPLE EXCAVATION AND LINING TECHNIQUES IN ORDER TO COPE WITH THE EXTREME CONDITIONS.
5. TUNNELS DIMENSIONS ACCORDING TO USUAL MACHINERY USED IN MINED TUNNELS. THESE DIMENSIONS MUST BE ADJUSTED TO THE MACHINERY THAT WILL BE USED IN CONSTRUCTION.
6. 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.

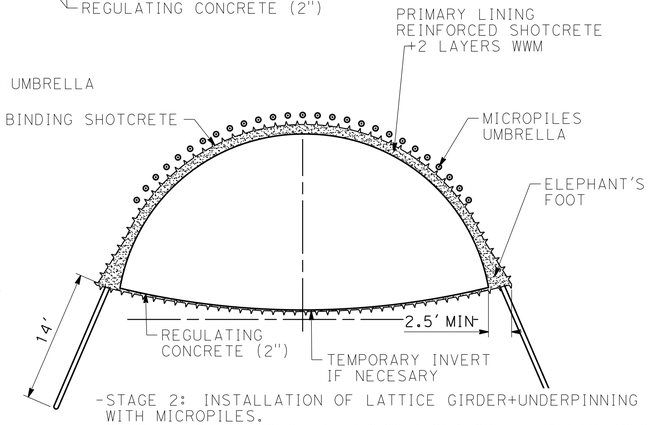
PRIMARY LINING (EXAMPLE ONLY, NOT ACTUAL DESIGN)							
DENOMINATION	RMR	SHOTCRETE THICKNESS (in)	STEEL ARCHES	FIBRES & WWM	ADVANCE LENGTH (ft)	ROCKBOLT PATTERN AND LENGTH (ft)	PIPE UMBRELLA
GOOD QUALITY ROCK	50-60	6	NO	FIBRES & 1 LAYER WWM	5 FULL FACE	5x5ft 13ft	-
MEDIUM QUALITY ROCK	40-50	8	TH-29		5 TOP HEADING	5x5ft 13ft	-
POOR QUALITY ROCK (I)	30-40	10	LATTICE GIRDER	FIBRES & 2 LAYERS WWM	3.5 TOP HEADING	3.5x3.5ft 15ft	*
POOR QUALITY ROCK (II)	<30	12			3 TOP HEADING	-	YES

* SELF DRILLING BOLTS INSTEAD OF ROCKBOLTING IF RMR< 35

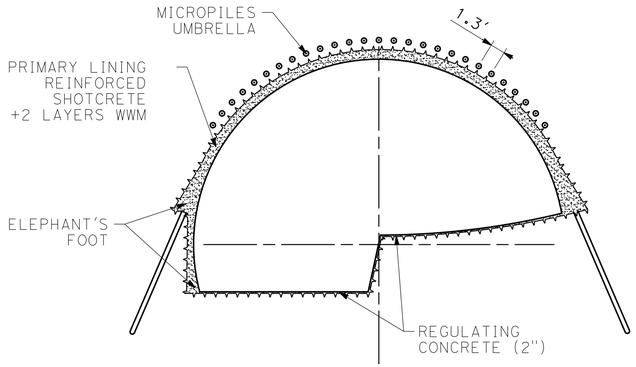
INCLINED DESCENDING GALLERY PRIMARY LINING FOR POOR QUALITY ROCK (II)



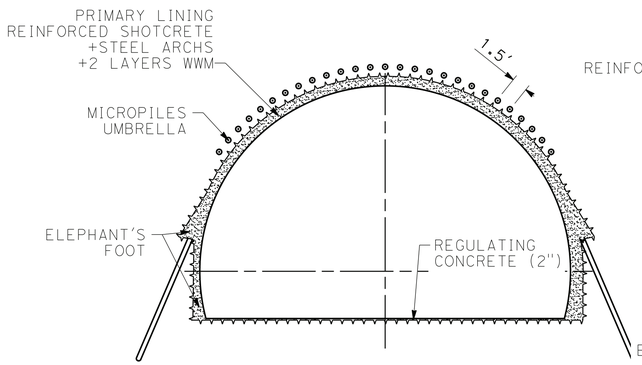
-STAGE 0: PRE-EXCAVATION GROUTING AND MICROPILE UMBRELLA INSTALLATION.
-STAGE 1: EXCAVATION OF TOP HEADING AND APPLICATION OF STABILIZATION LAYER OF SHOTCRETE.



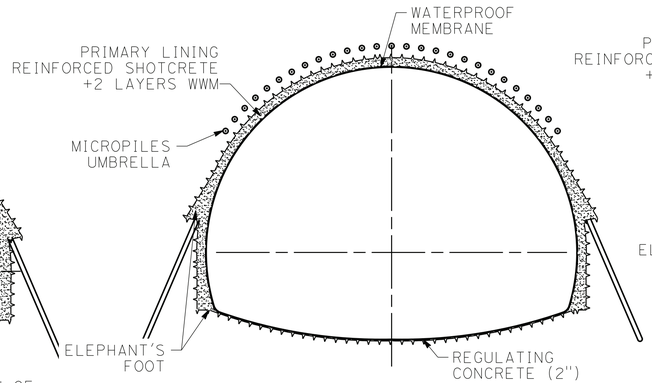
-STAGE 2: INSTALLATION OF LATTICE GIRDER+UNDERPINNING WITH MICROPILES.
-STAGE 3: SPRAYING OF REINFORCED SHOTCRETE +2 LAYERS WWM. SPRAYING OF REGULATING CONCRETE.



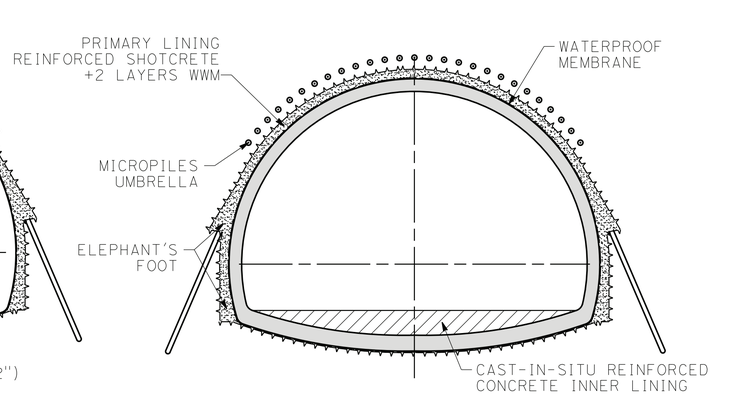
-STAGE 4: BENCH 1 EXCAVATION AND APPLICATION OF STABILIZATION LAYER OF SHOTCRETE.
-STAGE 5: EXTENSION OF LATTICE GIRDER AND SPRAYING REINFORCED SHOTCRETE ON THE LEFT SIDE. SPRAYING OR REGULATING CONCRETE.



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



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



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

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

LEGEND:

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

STAGE	DESCRIPTION
0	-PRE-EXCAVATION GROUTING SEE DRAWING TN-C0706 -MICROPILES UMBRELLA INSTALLATION (EVERY 30`)
1	-EXCAVATION OF TOP HEADING AND APPLICATION OF STABILIZATION LAYER OF SHOTCRETE.
2-3	-INSTALLATION OF LATTICE GIRDER +UNDERPINNING WITH MICROPILES. -SPRAYING OF REINFORCED SHOTCRETE +2 LAYERS OF WWM -SPRAYING OF REGULATING CONCRETE.
4/7	-BENCH 1 & 2 EXCAVATION. -EXTENSION LATTICE GIRDER AND SPRAYING OF REGULATING CONCRETE.
8	-EXCAVATION OF INVERT AND APPLICATION OF STABILIZATION LAYER OF SHOTCRETE. -SPRAYING OF REGULATING CONCRETE INVERT
9	-ADDITIONAL GROUTING OF FLOW ZONES FROM WITHIN TUNNEL IF NEEDED.
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 W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ADIT FOR CONSTRUCTION
INCLINED DESCENDING GALLERY
TYPICAL CONSTRUCTION SEQUENCE
AND SUPPORT MEASURES (3 of 3)

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0705
SCALE AS SHOWN
SHEET NO.

0205510

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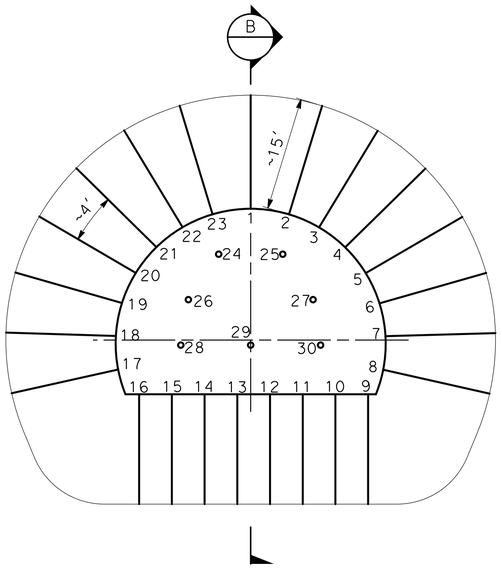
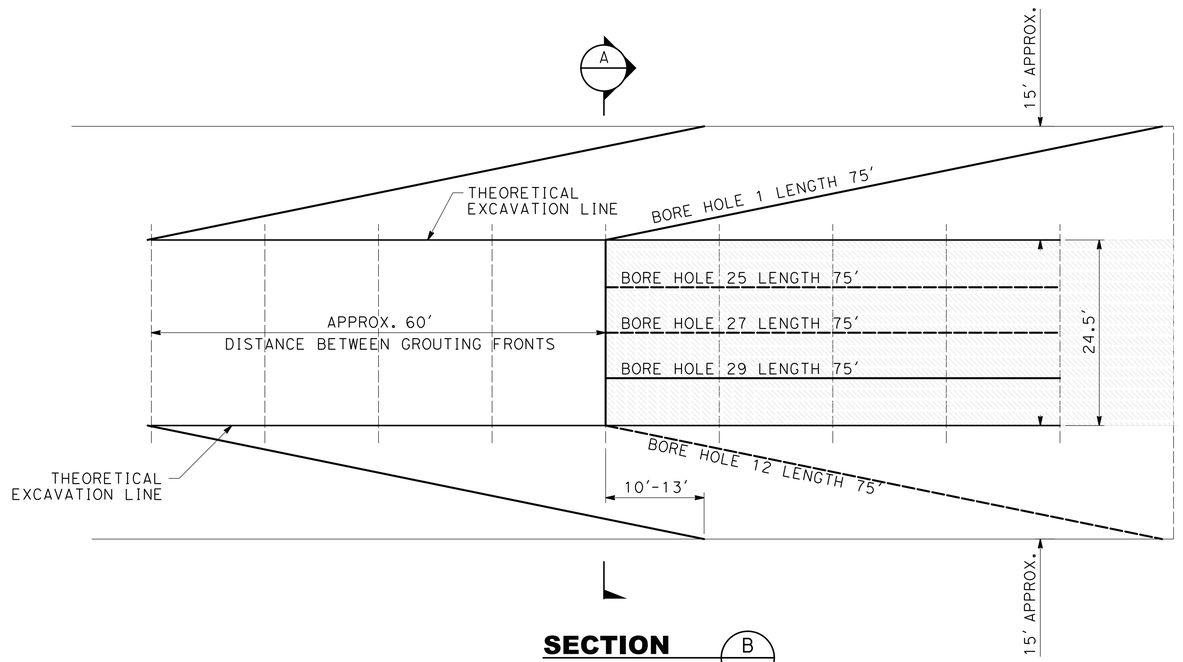


SECTION A
SCALE 1"=10'



SECTION B
SCALE 1"=10'

NOTES:

1. EXAMPLE ONLY OF TYPICAL PRE-EXCAVATION GROUTING FOR MINED TUNNEL (ADIT). SCHEME, AND LOCATIONS WHERE IT MUST APPLIED MUST BE CHECKED WHEN DETAILED GEOTECHNICAL INFORMATION IS AVAILABLE.
2. THE PRE-EXCAVATION GROUTING IS INTENDED FOR MINIMIZATION OF WATER INFILTRATION FROM THE SURFACE, AS A TEMPORARY MEASURE DURING CONSTRUCTION, TO PREVENT LOWERING OF THE GROUNDWATER TABLE.
3. THE PRE-EXCAVATION GROUTING METHODOLOGY AND INTENSITY TO BE DESIGNED WHEN APPROPIATE GEOTECHNICAL INFORMATION IS AVAILABLE.
4. WORKING PROCEDURE WILL CONSIST ON:
   1)SYSTEMATIC, CONTINUOUS AND OVERLAPPING PROBE DRILLING AHEAD OR THE EXCAVATION.
   2)PRE-EXCAVATION GROUTING SCHEME AND INTENSITY AS FUNCTION OF MEASURED LEAKAGE IN PROBE HOLES.
5. GROUT MIX CHARACTERISTICS TBD THROUGH A PROGRAMME OF GROUT MIX TRIALS. CEMENTITIOUS MATERIALS TO BE USED IN GROUT MIX TO COMPLY WITH ENVIRONMENTAL REQUIREMENTS.

10 0 10 20
1"=10'-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

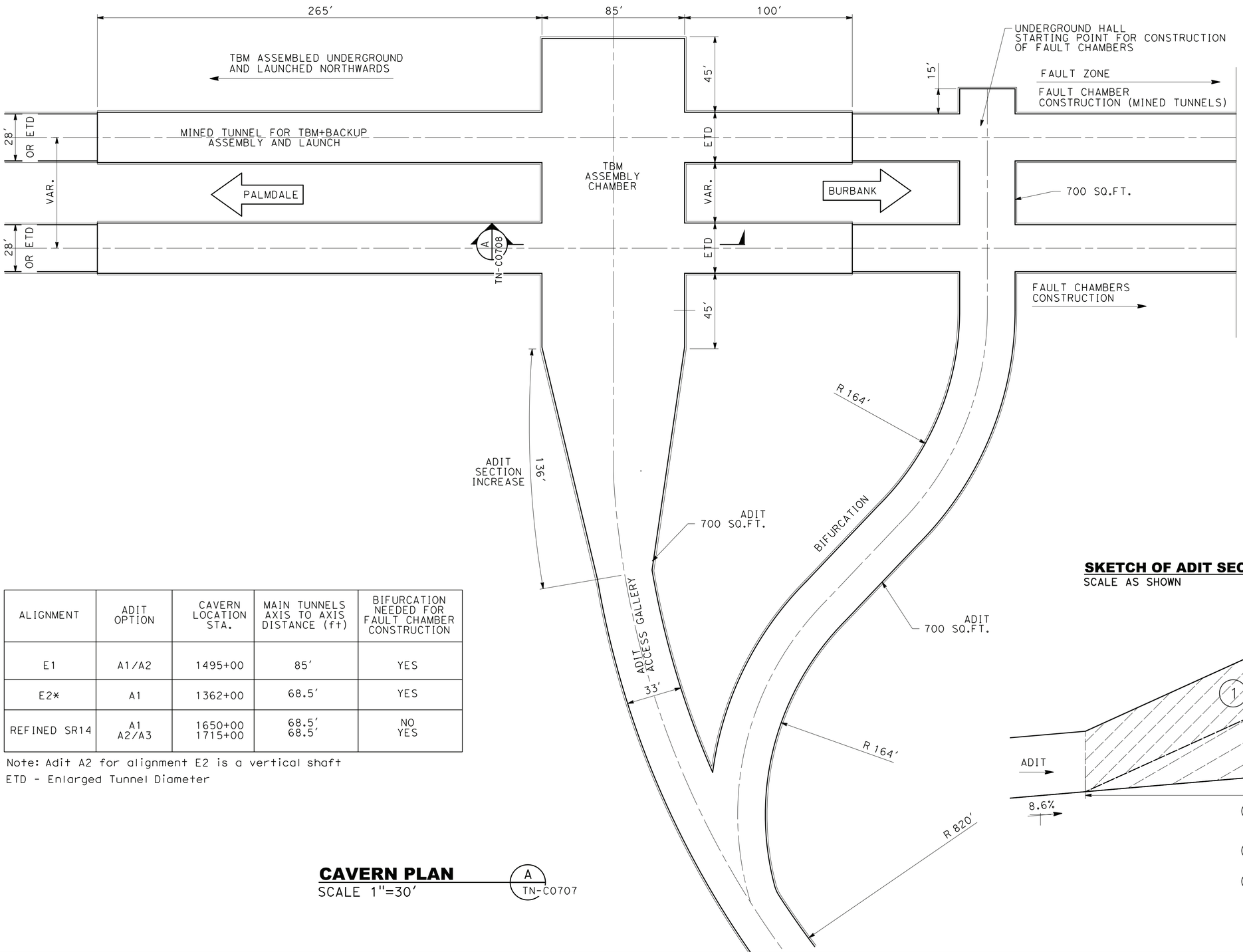
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ADIT FOR CONSTRUCTION
INCLINED DESCENDING GALLERY
PRE-EXCAVATION GROUTING SAMPLE SCHEME

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0706
SCALE AS SHOWN
SHEET NO.



NOTES:

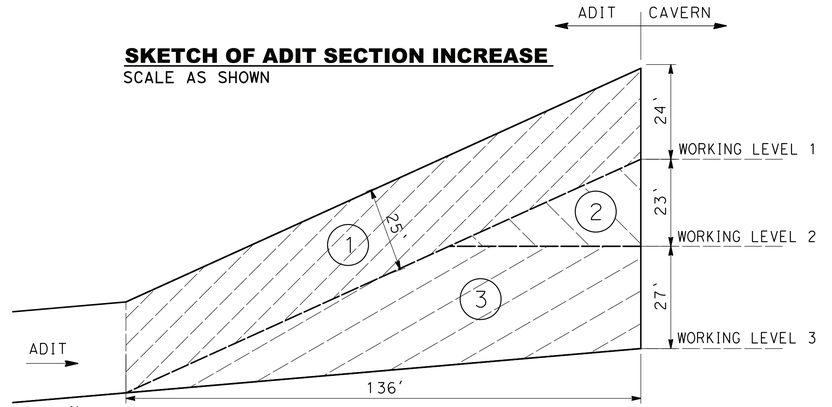
1. ADIT PLAN SHOWS A BIFURCATION TO ALLOW SIMULTANEOUS ASSEMBLY/ LAUNCH OF TBMs, AND MINED EXCAVATION OF FAULT ZONE, WITHOUT INTERFERENCE OF CONSTRUCTION ACTIVITIES.
2. THIS IS A CONCEPTUAL DRAWING.

ALIGNMENT	ADIT OPTION	CAVERN LOCATION STA.	MAIN TUNNELS AXIS TO AXIS DISTANCE (ft)	BIFURCATION NEEDED FOR FAULT CHAMBER CONSTRUCTION
E1	A1/A2	1495+00	85'	YES
E2*	A1	1362+00	68.5'	YES
REFINED SR14	A1 A2/A3	1650+00 1715+00	68.5' 68.5'	NO YES

* Note: Adit A2 for alignment E2 is a vertical shaft
ETD - Enlarged Tunnel Diameter

CAVERN PLAN (A TN-C0707)
SCALE 1"=30'

SKETCH OF ADIT SECTION INCREASE
SCALE AS SHOWN



1. FIRST PHASE OF EXCAVATION TO PROVIDE ACCESS TO THE UPPER PHASE OF THE CAVERN EXCAVATION (WORKING LEVEL 1)
2. SECOND PHASE OF EXCAVATION TO PROVIDE ACCESS TO WORKING LEVEL 2
3. THIRD PHASE OF EXCAVATION TO PROVIDE ACCESS TO WORKING LEVEL 3

25 0 25 50
1"=25'-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

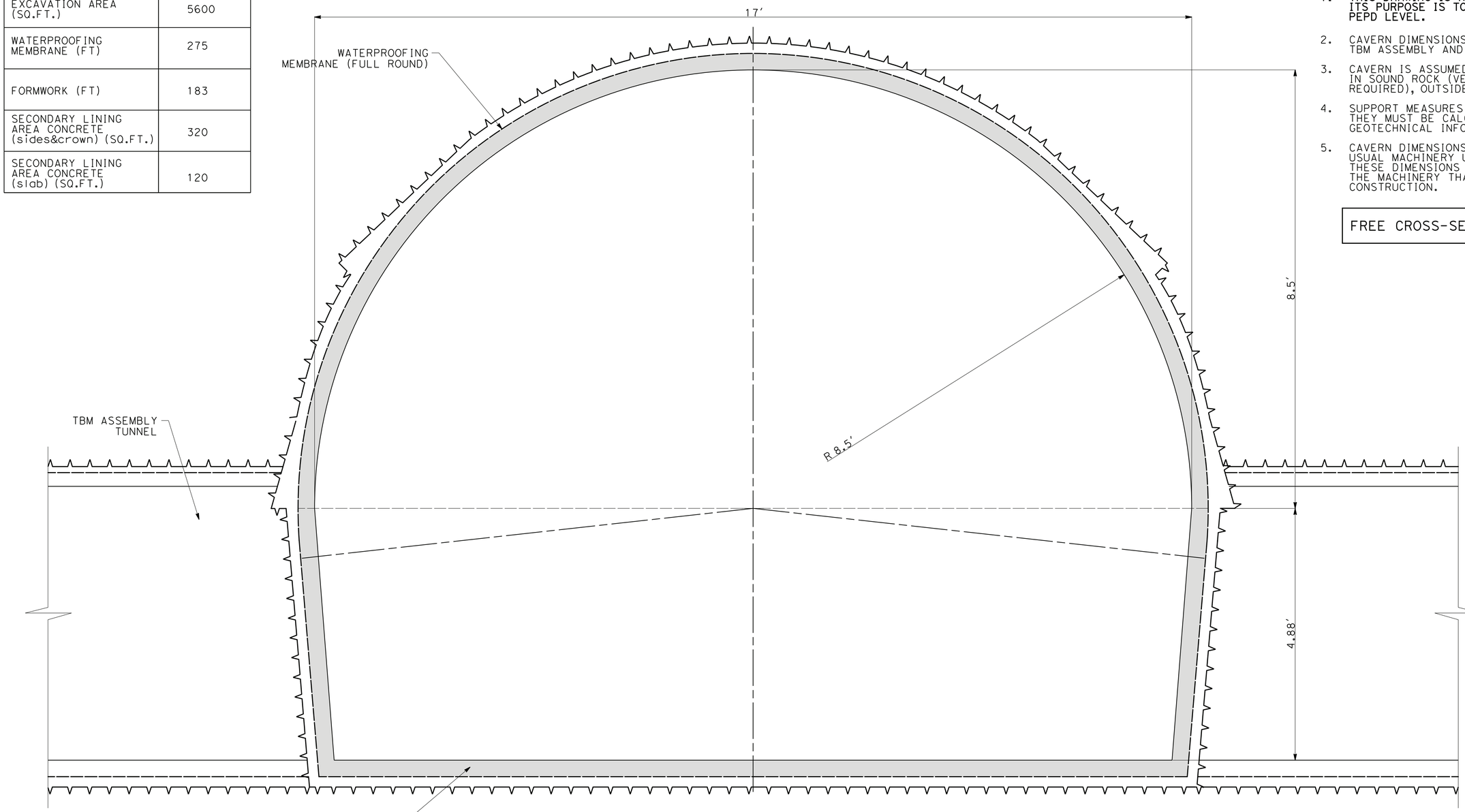
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ADIT FOR CONSTRUCTION
CAVERN (TBM ASSEMBLY CHAMBER)
PLAN

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0707
SCALE AS SHOWN
SHEET NO.

BASIC QUANTITIES FOR CAVERN (PER FT OF CAVERN MAIN AXIS)	
EXCAVATION AREA (SQ.FT.)	5600
WATERPROOFING MEMBRANE (FT)	275
FORMWORK (FT)	183
SECONDARY LINING AREA CONCRETE (sides&crown) (SQ.FT.)	320
SECONDARY LINING AREA CONCRETE (slab) (SQ.FT.)	120



SECTION A
SCALE 1"=5' TN-C00707

NOTES:

1. THIS DRAWING IS NOT AN ACTUAL DESIGN. ITS PURPOSE IS TO BUILD UNIT PRICES AT PEPD LEVEL.
2. CAVERN DIMENSIONS ARE INTENDED FOR TBM ASSEMBLY AND GANTRY CRANE.
3. CAVERN IS ASSUMED TO BE LOCATED IN SOUND ROCK (VERIFICATION BOREHOLES REQUIRED), OUTSIDE FAULT ZONES.
4. SUPPORT MEASURES ARE ONLY ORIENTATIVE. THEY MUST BE CALCULATED WHEN DETAILED GEOTECHNICAL INFORMATION IS AVAILABLE.
5. CAVERN DIMENSIONS ACCORDING TO USUAL MACHINERY USED IN MINED TUNNELS. THESE DIMENSIONS MUST BE ADJUSTED TO THE MACHINERY THAT WILL BE USED IN CONSTRUCTION.

FREE CROSS-SECTION 4865 SQ.FT.

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

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ADIT FOR CONSTRUCTION
CAVERN (TBM ASSEMBLY CHAMBER)
GEOMETRY OF THE CROSS SECTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0708
SCALE AS SHOWN
SHEET NO.

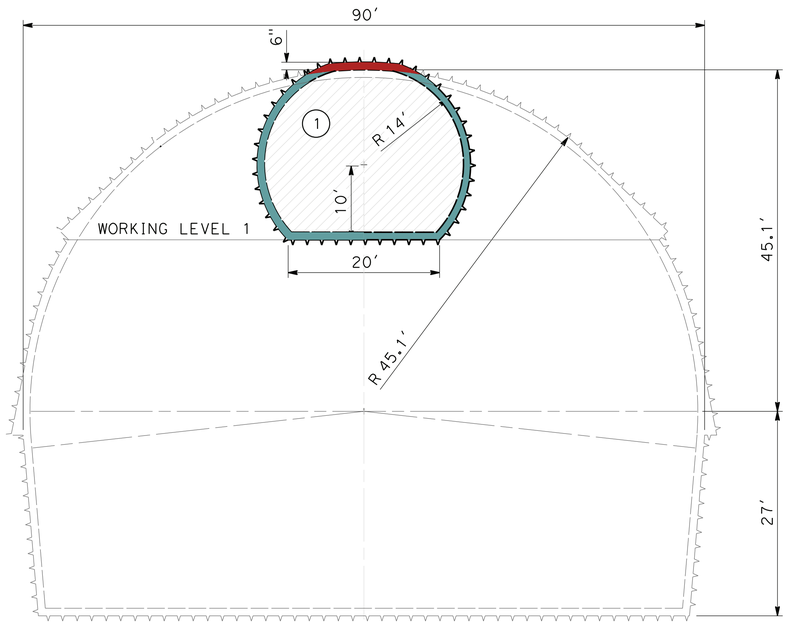
PHASE	SHOTCRETE THICKNESS(in)	STEEL ARCHES	FIBRES & WWM	ROCKBOLT PATTERN AND LENGTH (ft)	HEIGHT OF EXCAVATED SECTION	EXCAVATED CROSS SECTION AREA	PRIMARY LINING AREA (SQ FT)	REGULATING CONCRETE (SQ FT)	STEEL ARCH (FT)	ROCKBOLTS (FT)
1	6"	NO	FIBRES	-	6.4ft	500 SQ.FT.	17	-	-	-
2	12"	TH-36 EACH 3ft	FIBRES +1 LAYER WWM	L=20ft 3ft x 3ft	6.4ft	750 SQ.FT.	**	13	*	1EACH 9 SQ.FT.

*FOR TOTAL STEEL ARCH LENGTH, SEE DRAWING TN-C0710.

**TOTAL PRIMARY LINING AREA SHOWN ON PHASE 4 (TN-C0710).

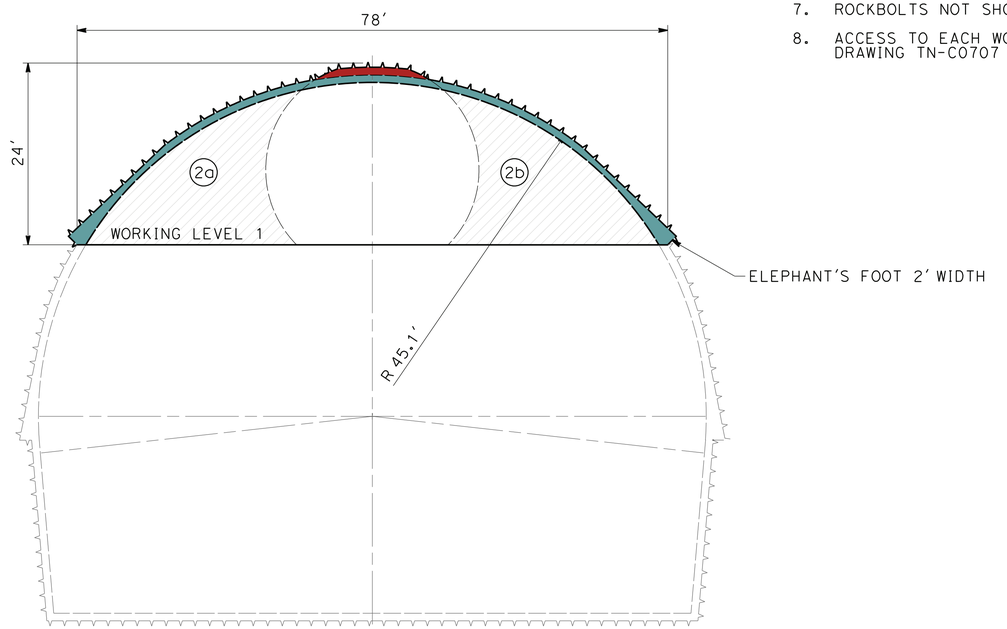
NOTES:

1. THIS DRAWING IS NOT AN ACTUAL DESIGN. ITS PURPOSE IS TO BUILD UNIT PRICES AT PEPD LEVEL.
2. CAVERN BUILT IN SOUND ROCK, OUTSIDE FAULT ZONES.
3. BOREHOLES TO BE DRILLED TO CONFIRM ADEQUATE LOCATION.
4. DRILL & BLAST AS EXCAVATION METHOD ASSUMED.
5. PHASES MUST BE EXCAVATED SEQUENTIALLY. THE MAXIMUM ADVANCE LENGTH MUST BE DEFINED ON DETAILED DESIGN WHEN COMPLETE GEOTECHNICAL INFORMATION IS AVAILABLE.
6. TUNNEL DIMENSIONS ACCORDING TO USUAL MACHINERY USED IN MINED TUNNELS. THESE DIMENSIONS MUST BE ADJUSTED TO THE MACHINERY THAT WILL BE USED IN CONSTRUCTION.
7. ROCKBOLTS NOT SHOWN ON DRAWINGS.
8. ACCESS TO EACH WORKING LEVEL SHOWN ON DRAWING TN-C0707



PHASE 1:

- **CALOTTE GALLERY EXCAVATION**
- **SUPPORT MEASURES AS DEFINED IN TABLE**
- **TEMPORARY FILLING MAY BE NEEDED TO RAISE WORKING LEVEL**



PHASE 2:

- **COMPLETE CALOTTE EXCAVATION**
- **SUPPORT MEASURES AS DEFINED IN TABLE**
- **TEMPORARY FILLING MAY BE NEEDED TO RAISE WORKING LEVEL**

10 0 10 20

1"=10'-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ADIT FOR CONSTRUCTION
CAVERN (TBM ASSEMBLY CHAMBER)
TYPICAL CONSTRUCTION SEQUENCE
AND SUPPORT MEASURES (1 of 3)

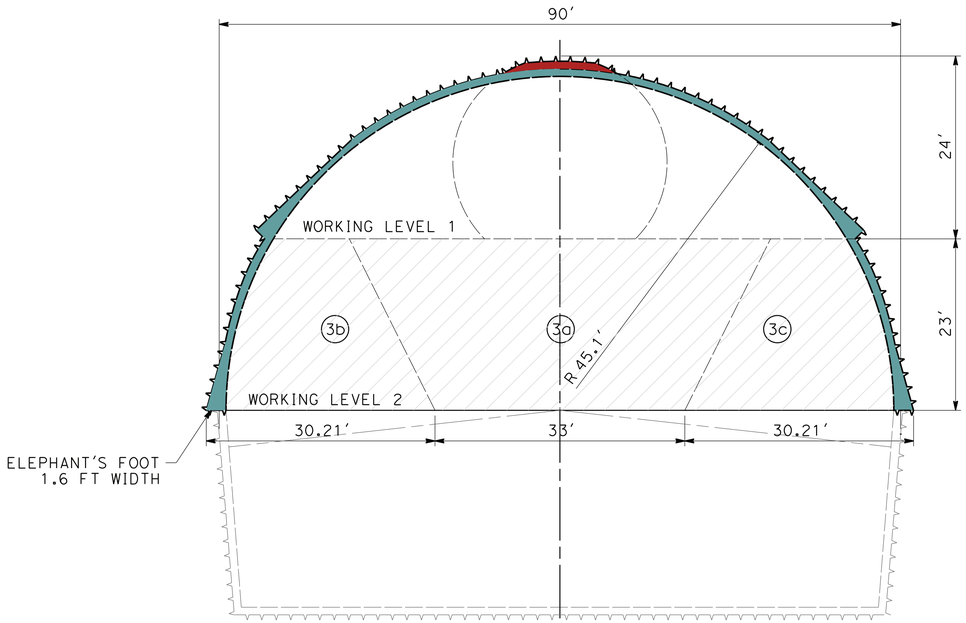
CONTRACT NO. HSR14-42
DRAWING NO. TN-C0709
SCALE AS SHOWN
SHEET NO.

PHASE	SHOTCRETE THICKNESS(in)	STEEL ARCHES	FIBRES & WWM	ROCKBOLT PATTERN AND LENGTH (ft)	HEIGHT OF EXCAVATED SECTION	EXCAVATED CROSS SECTION AREA	PRIMARY LINING AREA (SQ FT)	REGULATING CONCRETE (SQ FT)	STEEL ARCH (FT)	ROCKBOLTS (FT)
3	12"	TH-36 EACH 3ft	FIBRES +1 LAYER WWM	L=20ft 3ft x 3ft	6.4ft	1965 SQ.FT.	**	14.5	*	1EACH 9 SQ.FT.
4	12"	TH-36 EACH 3ft	FIBRES +1 LATER WWM	L=20ft 3ft x 3ft	7ft	2385 SQ.FT.	218	14	190/3=63.3	1EACH 9 SQ.FT.

*TOTAL STEEL ARCH LENGTH SHOWN ON PHASE 4
**TOTAL PRIMARY LINING AREA SHOWN ON PHASE 4.

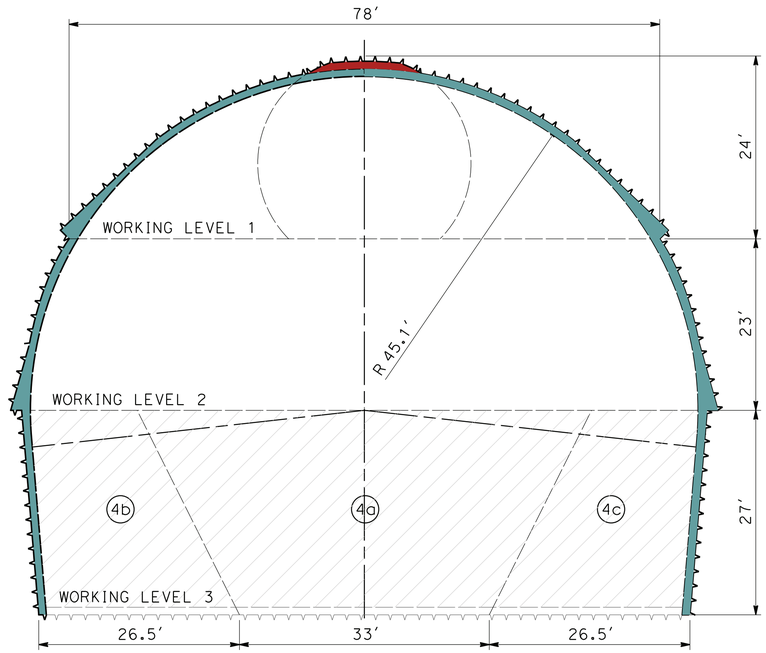
NOTE:

1. THIS DRAWING IS NOT AN ACTUAL DESIGN. ITS PURPOSE IS TO BUILD UNIT PRICES AT PEPD LEVEL.
2. CAVERN BUILT IN SOUND ROCK, OUTSIDE FAULT ZONES.
3. BOREHOLES TO BE DRILLED TO CONFIRM ADEQUATE LOCATION.
4. DRILL & BLAST AS EXCAVATION METHOD ASSUMED.
5. PHASES MUST BE EXCAVATED SEQUENTIALLY. THE MAXIMUM ADVANCE LENGTH MUST BE DEFINED ON DETAILED DESIGN WHEN COMPLETE GEOTECHNICAL INFORMATION IS AVAILABLE.
6. TUNNEL DIMENSIONS ACCORDING TO USUAL MACHINERY USED IN MINED TUNNELS. THESE DIMENSIONS MUST BE ADJUSTED TO THE MACHINERY THAT WILL BE USED IN CONSTRUCTION.
7. ROCKBOLTS NOT SHOWN ON DRAWINGS.
8. ACCESS TO EACH WORKING LEVEL SHOWN ON DRAWING TN-C0707



PHASE 3:

- EXCAVATION PHASE 3
- SUPPORT MEASURES AS DEFINED IN TABLE
- TEMPORARY FILLING MAY BE NEEDED TO RAISE WORKING LEVEL.



PHASE 4:

- EXCAVATION OF LAST PHASE
- SUPPORT MEASURES AS DEFINED IN TABLE
- TEMPORARY FILLING MAY BE NEEDED TO RAISE WORKING LEVEL.

10 0 10 20
1"=10'-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ADIT FOR CONSTRUCTION
CAVERN (TBM ASSEMBLY CHAMBER)
TYPICAL CONSTRUCTION SEQUENCE
AND SUPPORT MEASURES (2 of 3)

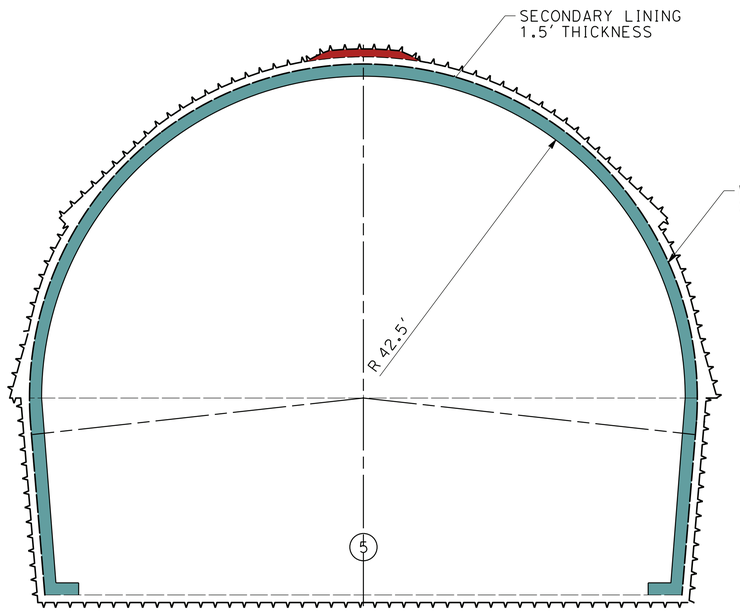
CONTRACT NO. HSR14-42
DRAWING NO. TN-C0710
SCALE AS SHOWN
SHEET NO.

PHASE	WATERPROOFING MEMBRANE (FT)	SECONDARY LINING (sides&crown) (SQ.FT.)	BASE SALAB (SQ.FT.)
5	275	320	-
6	275	320	120

* QUANTITIES SHOWN REFER TO THE ELEMENTS TO BE CONSTRUCTED IN PHASES 5 AND 6. FOR THE REST OF QUANTITIES SEE DRAWINGS TN-C0709 AND TN-C0710.

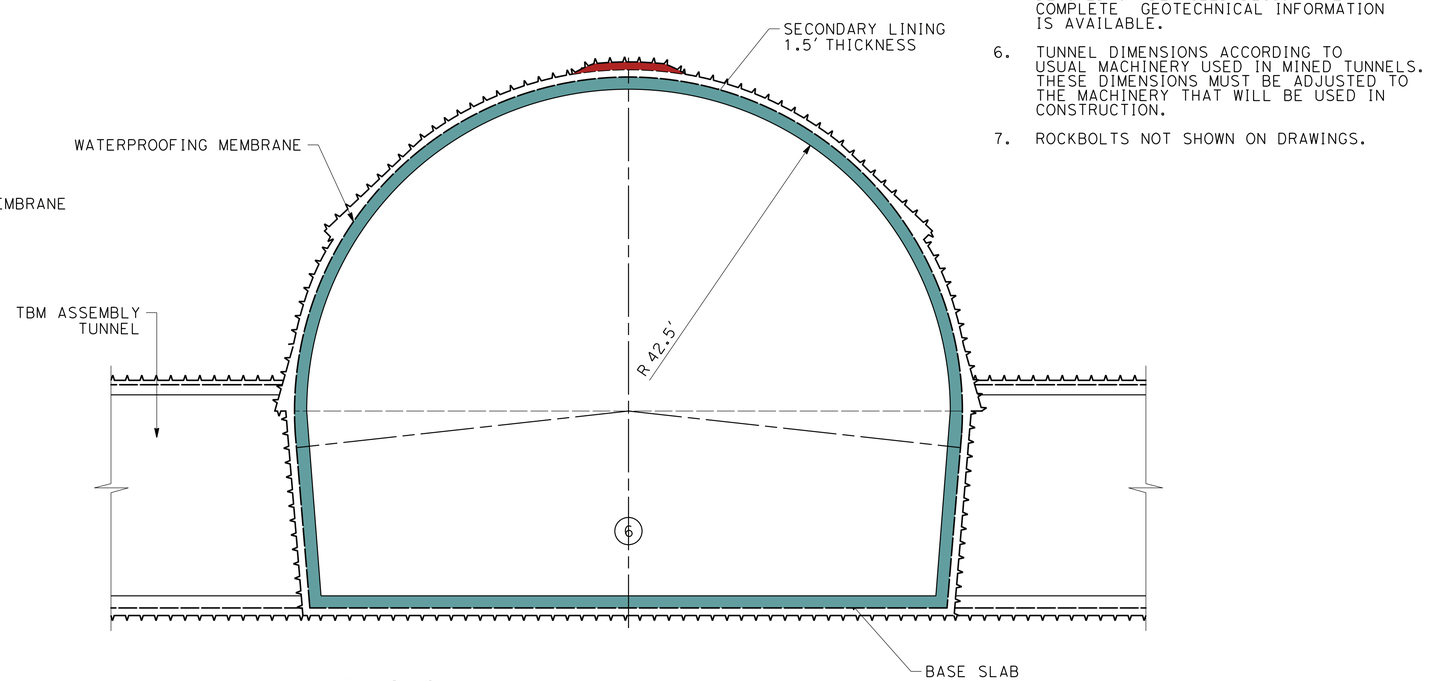
NOTES:

1. THIS DRAWING IS NOT AN ACTUAL DESIGN. ITS PURPOSE IS TO BUILD UNIT PRICES AT PEPD LEVEL.
2. CAVERN BUILT IN SOUND ROCK, OUTSIDE FAULT ZONES.
3. BOREHOLES TO BE DRILLED TO CONFIRM ADEQUATE LOCATION.
4. DRILL & BLAST AS EXCAVATION METHOD ASSUMED.
5. PHASES MUST BE EXCAVATED SEQUENTIALLY. THE MAXIMUM ADVANCE LENGTH MUST BE DEFINED ON DETAILED DESIGN WHEN COMPLETE GEOTECHNICAL INFORMATION IS AVAILABLE.
6. TUNNEL DIMENSIONS ACCORDING TO USUAL MACHINERY USED IN MINED TUNNELS. THESE DIMENSIONS MUST BE ADJUSTED TO THE MACHINERY THAT WILL BE USED IN CONSTRUCTION.
7. ROCKBOLTS NOT SHOWN ON DRAWINGS.



PHASE 5:

- **INSTALL WATERPROOFING MEMBRANE (EXCEPT JUNCTION ZONES WITH RUNNING TUNNELS)**
- **INSTALL REINFORCEMENT AROUND JUNCTIONS**
- **INSTALL SECONDARY LINING (SIDES AND CROWN), EXCEPT JUNCTION ZONES WITH RUNNING TUNNELS**



PHASE 6:

- **INSTALL BASE SLAB.**
- **START EXCAVATION OF TBM LAUNCHING TUNNELS.**
- **FOR TYPICAL EXCAVATION SEQUENCE, SUPPORT MEASURES AND QUANTITIES OF TBM LAUNCHING TUNNELS, FOLLOW TN-C0102 TO TN-C0104**

10 0 10 20
1"=10'-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

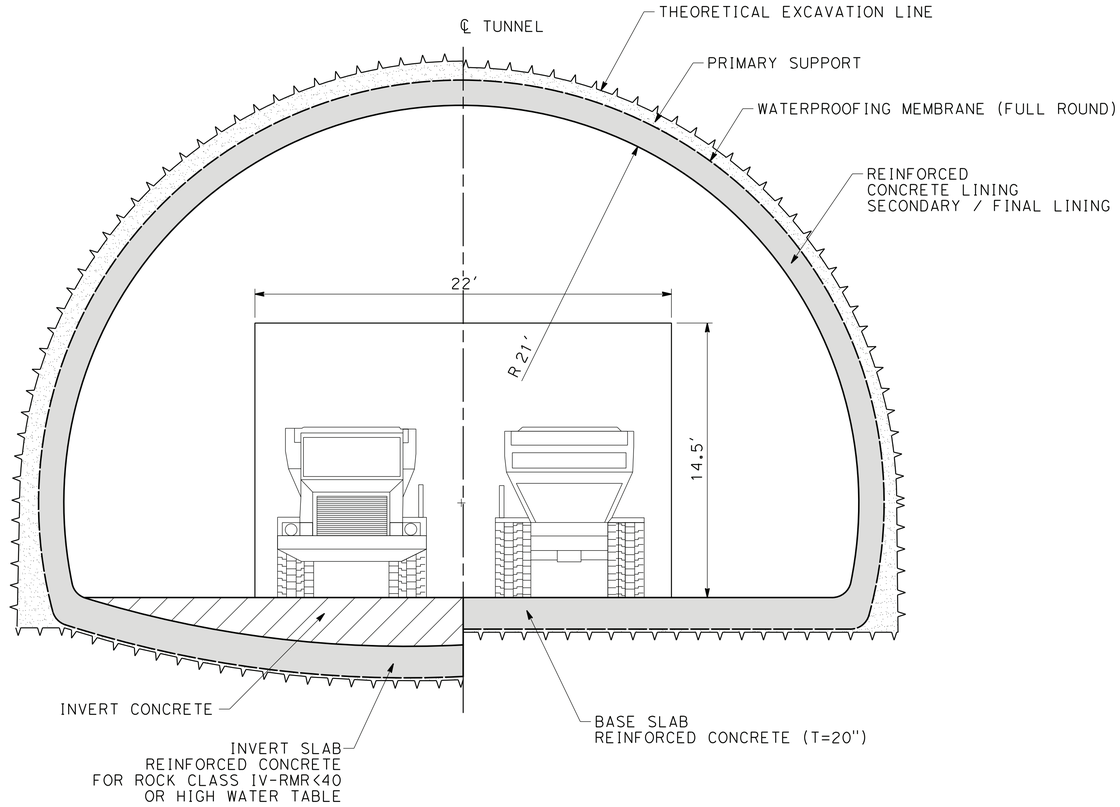
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ADIT FOR CONSTRUCTION
CAVERN (TBM ASSEMBLY CHAMBER)
TYPICAL CONSTRUCTION SEQUENCE
AND SUPPORT MEASURES (3 of 3)

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0711
SCALE AS SHOWN
SHEET NO.

NOTES:

1. CALIFORNIA FIRE CODE 2016 CHAPTER 5. UNOBSTRUCTED WIDTH NO LESS THAN 22FT UNOBSTRUCTED VERTICAL CLEARANCE OF NO LESS THAN 14.5FT.
2. CLEARANCE FOR TWO TRUCKS OR DUMPERS TO PASS EACH OTHER, TWO VENTILATION DUCTS OF 5FT DIAMETER, WALKWAY AND STACKED CONVEYOR BELT AND WATER PIPES ON ONE SIDE.
3. CLEARANCE FOR TBM PARTS TO BE TRANSPORTED THROUGH THE ADIT.
4. INVERT NECESARY 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. FOR THIS STAGE OF DESIGN IT WILL BE APPLIED ONLY TO POOR QUALITY ROCK AREAS.
5. ADIT FOR VENTILATION PURPOSES REQUIRES 900 SQ.FT. OF FREE CROSS-SECTION. (E1 ALIGNMENT REQUIRES INTERMEDIATE VENTILATION ADIT/SHAFT)

FREE CROSS-SECTION 900 SQ.FT.
ADIT USED FOR CONSTRUCTION AND VENTILATION (E1)



TYPICAL CROSS SECTION

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

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E1
ADIT FOR CONSTRUCTION AND VENTILATION
INCLINED DESCENDING GALLERY
TYPICAL CROSS-SECTION GEOMETRY

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0712
SCALE AS SHOWN
SHEET NO.

0205510

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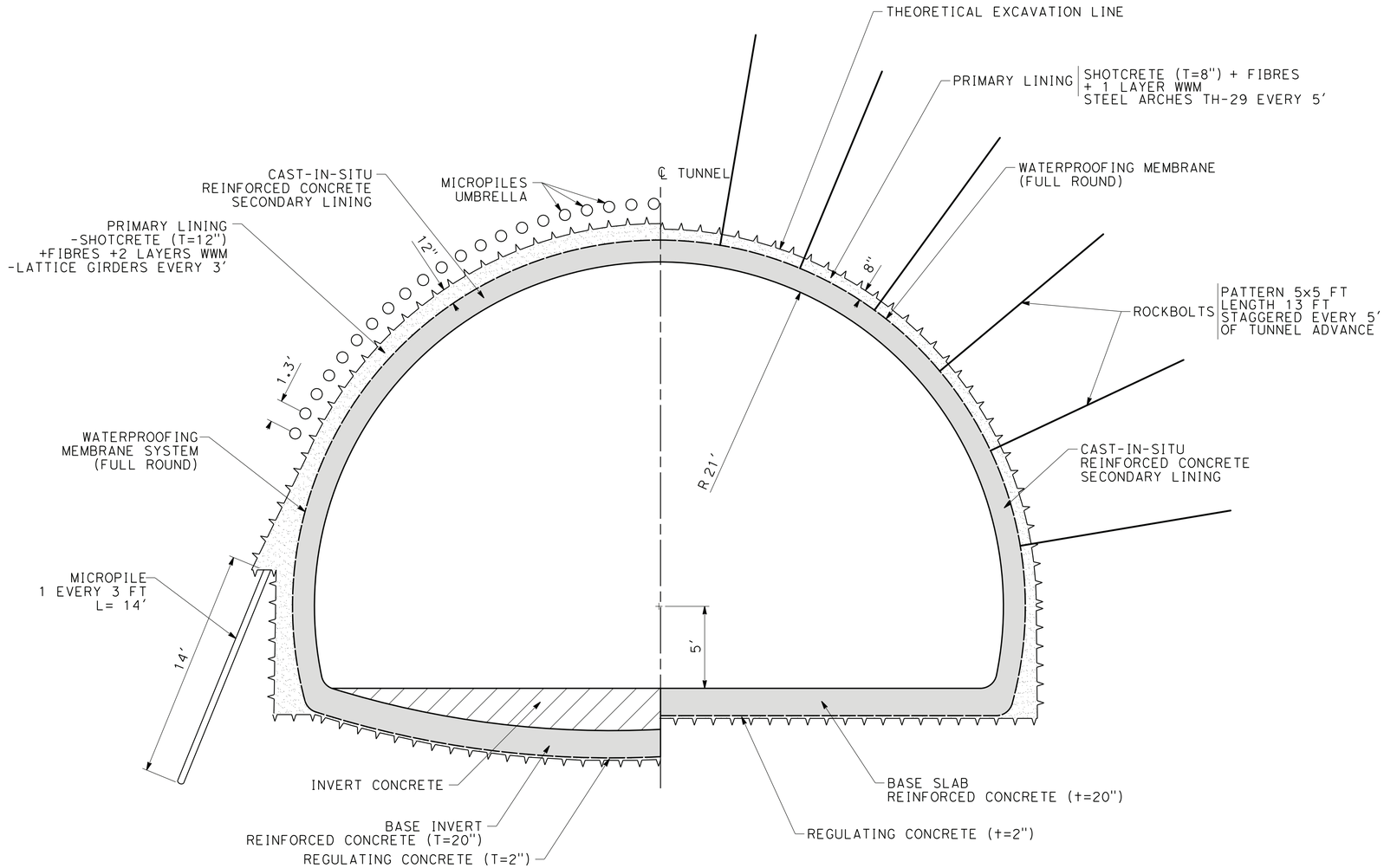

ADIT TYPICAL GEOMETRY AND PRIMARY LINING FOR POOR QUALITY ROCK (RMR<30)

ADIT TYPICAL GEOMETRY AND PRIMARY LINING FOR MEDIUM QUALITY ROCK RMR (40-50)

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

NOTES:

1. THIS DRAWING IS NOT AN ACTUAL DESIGN. ITS PURPOSE IS TO BUILD UNIT PRICES AT PEPD LEVEL.
2. TYPICAL SUPPORT MEASURES AND INNER LINING THICKNESSES ARE GIVEN WITH ORIENTATIVE PURPOSES ONLY. ACTUAL DESIGN WILL REQUIRE RESULTS OF ADEQUATE GEOTECHNICAL INVESTIGATION.
3. THE SECTIONS SHOWN ON THIS DRAWING ARE ONLY APPLICABLE IN THE ROCK QUALITY CONDITIONS SHOWN.
4. 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. FOR THIS STAGE OF DESIGN IT WILL BE APPLIED ONLY TO POOR QUALITY ROCK AREAS.
5. TUNNELS DIMENSIONS ACCORDING TO USUAL MACHINERY USED IN MINED TUNNELS. THESE DIMENSIONS MUST BE ADJUSTED TO THE MACHINERY THAT WILL BE USED IN CONSTRUCTION.
6. 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.

BASIC QUANTITIES PER FT OF TUNNEL

ADIT	PRIMARY LINING TYPE	
	MEDIUM QUALITY ROCK	POOR QUALITY ROCK (II)
EXCAVATION AREA (SQ.FT.)	1140	1266
PRIMARY LINING AREA (SQ.FT.)	61	100
REGULATING CONCRETE (2 in) (SQ.FT.)	8	7
STEEL ARCH/LATTICE GIRDER (FT)	82/5 =16.4	82/3=27.3
WATERPROOFING MEMBRANE (FT)	125	125
FORMWORK (FT)	75	75
SECONDARY LINING AREA CONCRETE (sides&crown) (SQ.FT.)	105	105
SECONDARY LINING AREA CONCRETE (invert/slab) (SQ.FT.)	71.3	72.5
ROCKBOLTS (FT)	12x13/5 =31.2	-
MICROPILES UMBRELLA (FT)	-	56
MICROPILES AT ELEPHANT'S FOOT (FT)	-	9.5
INVERT CONCRETE (SQ.FT.)	-	76

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E1
ADIT FOR CONSTRUCTION AND VENTILATION
INCLINED DESCENDING GALLERY
TYPICAL SUPPORT MEASURES

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0713
SCALE AS SHOWN
SHEET NO.

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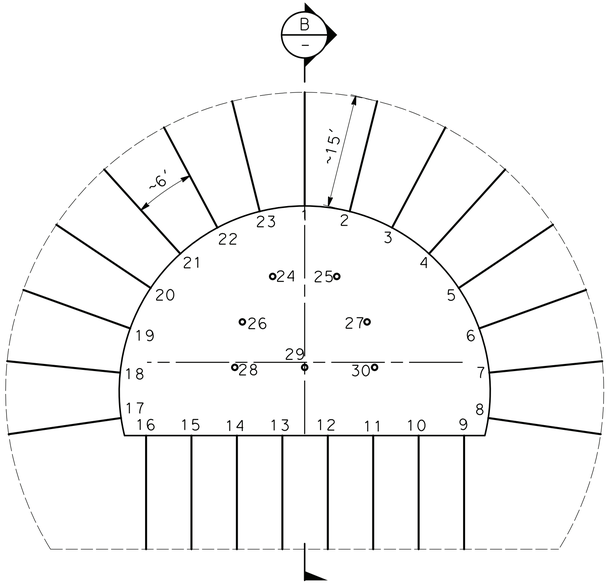
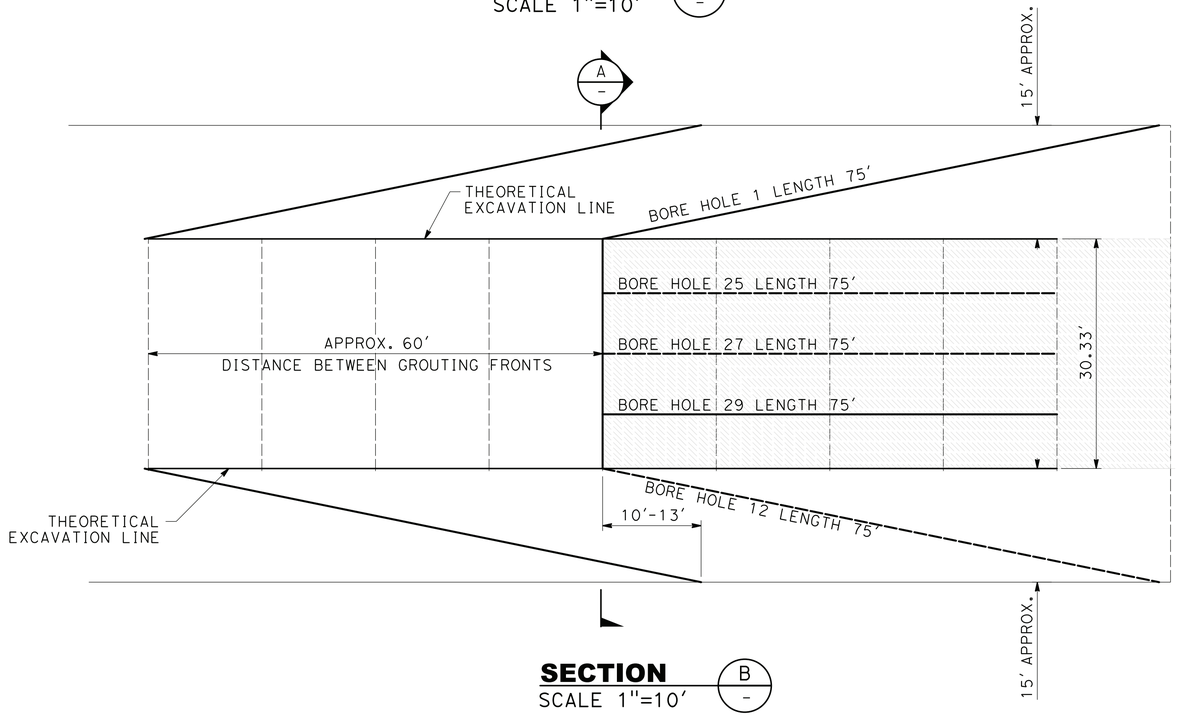


SECTION A / -
SCALE 1"=10'



SECTION B / -
SCALE 1"=10'

NOTES:

1. EXAMPLE ONLY OF TYPICAL PRE-EXCAVATION GROUTING FOR MINED TUNNEL (ADIT).
2. THE PRE-EXCAVATION GROUTING IS INTENDED FOR MINIMIZATION OF WATER INFILTRATION FROM THE SURFACE, AS A TEMPORARY MEASURE DURING CONSTRUCTION, TO PREVENT LOWERING OF THE GROUNDWATER TABLE.
3. THE PRE-EXCAVATION GROUTING METHODOLOGY AND INTENSITY TO BE DESIGNED WHEN APPROPIATE GEOTECHNICAL INFORMATION IS AVAILABLE.
4. WORKING PROCEDURE WILL CONSIST ON:
   1)SYSTEMATIC, CONTINUOUS AND OVERLAPPING PROBE DRILLING AHEAD OR THE EXCAVATION.
   2)PRE-EXCAVATION GROUTING SCHEME AND INTENSITY AS FUNCTION OF MEASURED LEAKAGE IN PROBE HOLES.
5. GROUT MIX CHARACTERISTICS TBD THROUGH A PROGRAMME OF GROUT MIX TRIALS. CEMENTITIOUS MATERIALS TO BE USED IN GROUT MIX TO COMPLY WITH ENVIRONMENTAL REQUIREMENTS.

10 0 10 20
1"=10'-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

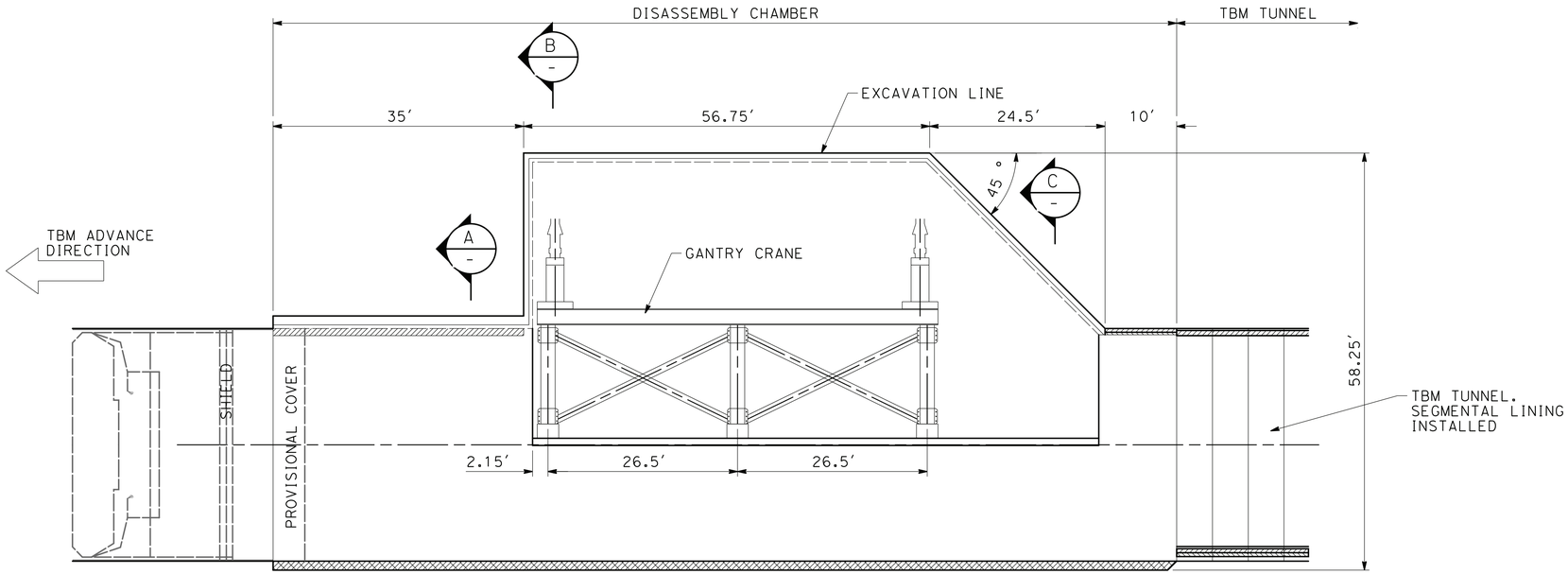
NOT FOR CONSTRUCTION

SENER

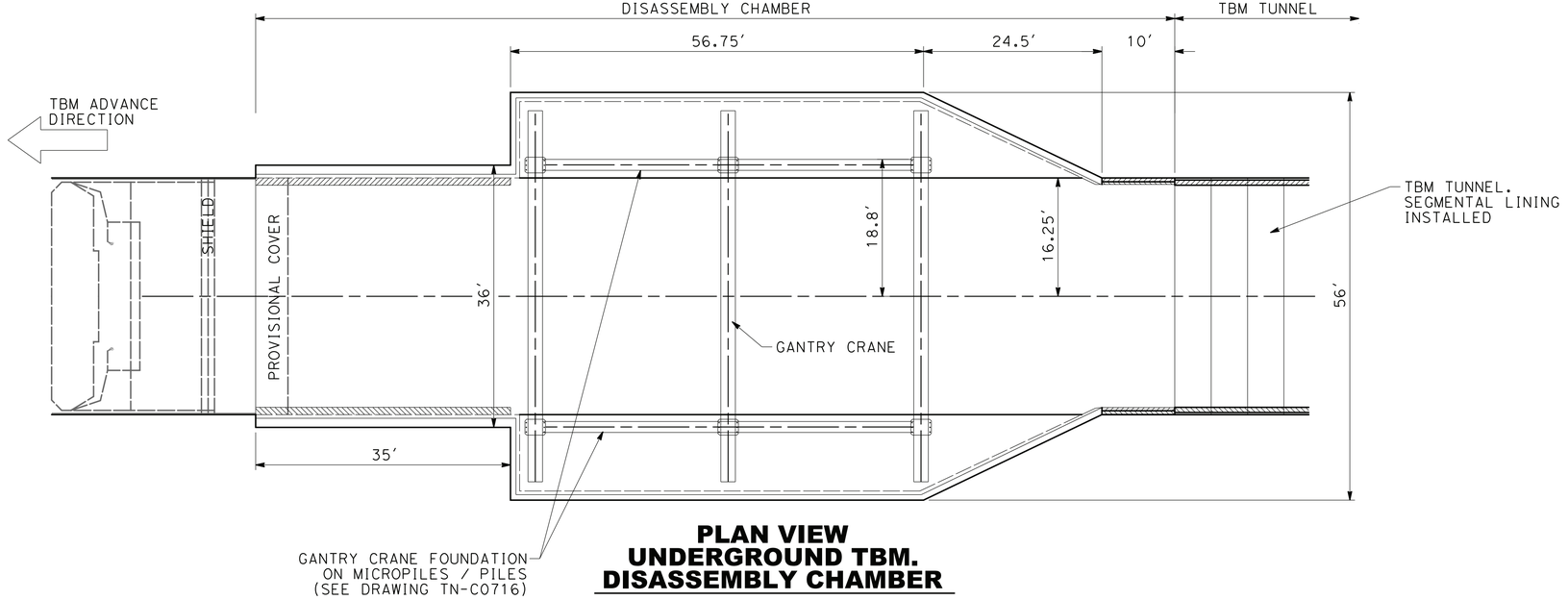
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E1
ADIT FOR CONSTRUCTION AND VENTILATION
INCLINED DESCENDING GALLERY
PRE-EXCAVATION GROUTING SAMPLE SCHEME

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0714
SCALE AS SHOWN
SHEET NO.



LONGITUDINAL VIEW UNDERGROUND TBM. DISASSEMBLY CHAMBER



PLAN VIEW UNDERGROUND TBM. DISASSEMBLY CHAMBER

CHAMBER GENERAL DIMENSIONS

128 FT LONG
~56 FT WIDE
~60 FT HIGH

NOTES:

1. AN UNDERGROUND CAVERN FOR TBM DISASSEMBLY IS EXPECTED FOR THE LONG TUNNEL UNDER ANF (ALL ALTERNATIVES).
2. CAVERN DIMENSIONS SHOULD FIT A GANTRY CRANE.
3. EXCAVATION METHOD, CONSTRUCTION SEQUENCE, SUPPORT MEASURES AND FINAL LINING TO BE DESIGNED WHEN APPROPIATE GEOTECHNICAL INFORMATION IS ACQUIRED AND SPACE REQUIREMENTS ARE ASESSED.
4. THIS IS ONLY A CONCEPTUAL DESIGN.

10 0 10 20
1"=10'-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

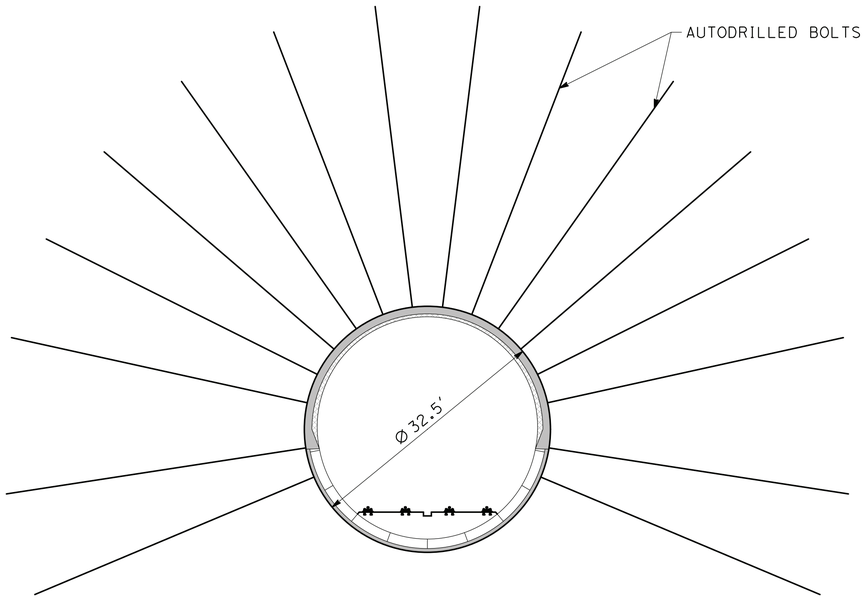
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

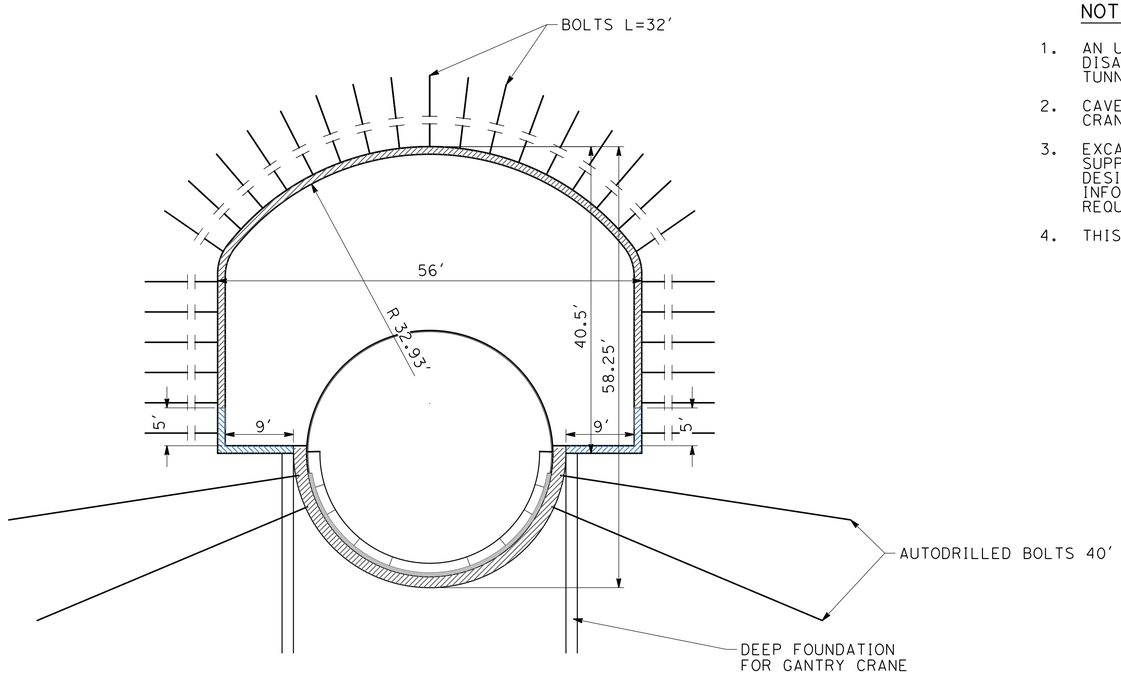
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

UNDERGROUND TBM DISSASSEMBLY CHAMBER
(1 of 2)

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0715
SCALE AS SHOWN
SHEET NO.



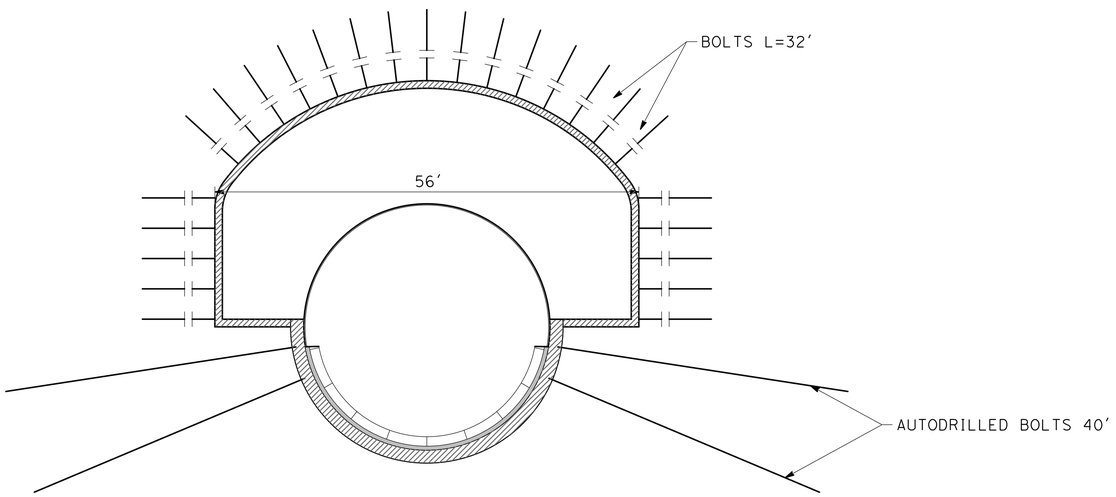
CROSS-SECTION A



CROSS-SECTION B

NOTES:

1. AN UNDERGROUND CAVERN FOR TBM DISASSEMBLY IS EXPECTED FOR THE LONG TUNNEL UNDER ANF (ALL ALTERNATIVES).
2. CAVERN DIMENSIONS SHOULD FIT A GANTRY CRANE.
3. EXCAVATION METHOD, CONSTRUCTION SEQUENCE, SUPPORT MEASURES AND FINAL LINING TO BE DESIGNED WHEN APPROPIATE GEOTECHNICAL INFORMATION IS ACQUIRED AND SPACE REQUIREMENTS ARE ASESSED.
4. THIS IS ONLY A CONCEPTUAL DESIGN.



CROSS-SECTION C
(TRANSITION)

10 0 10 20
1"=10'-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

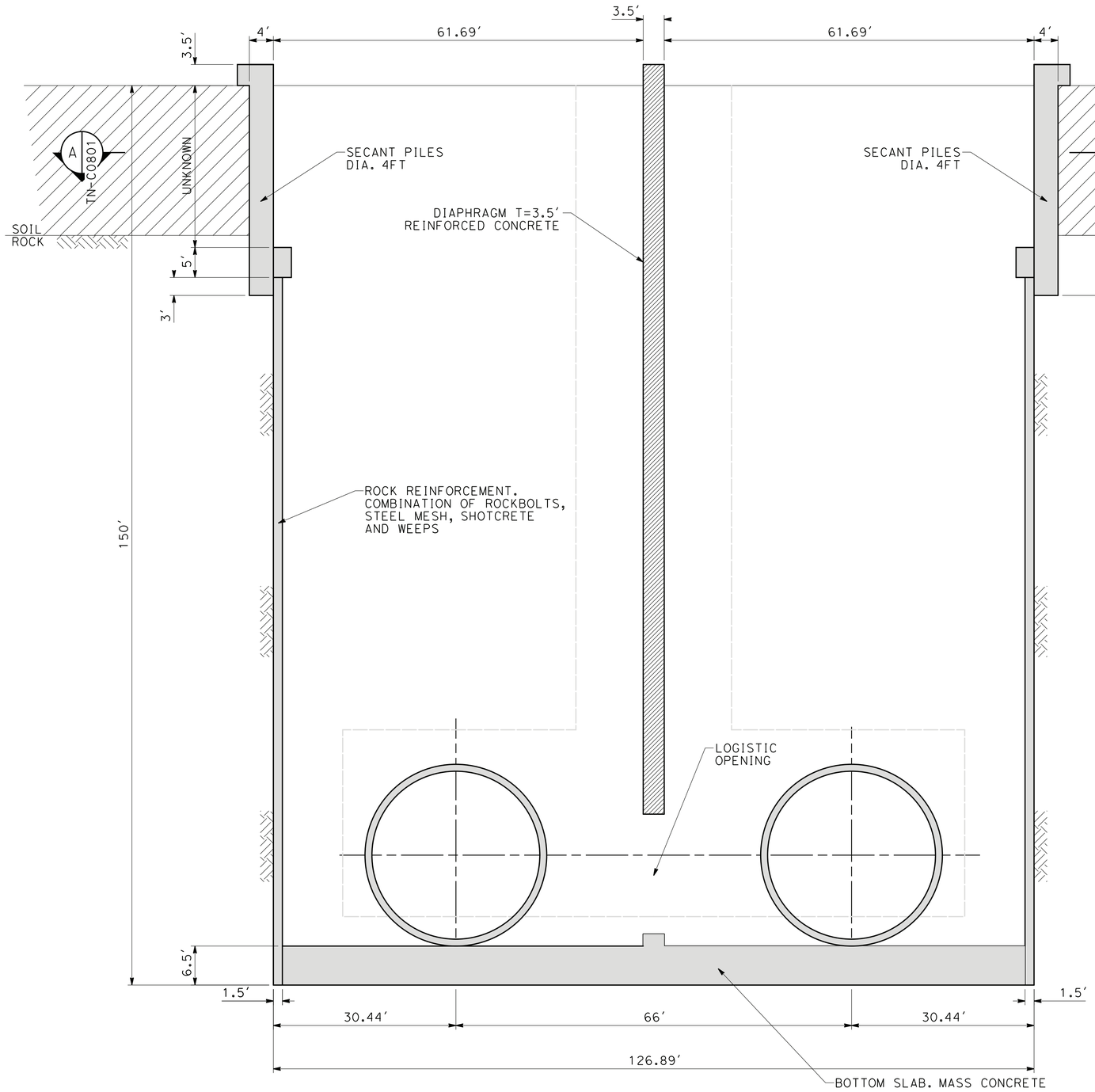
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

UNDERGROUND TBM DISSASSEMBLY CHAMBER
(2 of 2)

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0716
SCALE AS SHOWN
SHEET NO.



NOTES:

1. THIS DRAWING IS NOT ACTUAL DESIGN. ITS PURPOSE IS TO BUILD UNIT PRICES AT PEPD LEVEL.
2. THIS SHAFT IS INTENDED AS AN INTERMEDIATE ACCESS FOR CONSTRUCTION
3. THE CONSTRUCTION SHAFT IS INTENDED FOR ASSEMBLY AND LAUNCH OF TUNNEL BORING MACHINES (TBMs) SOUTHWARDS, AND FOR MINED TUNNELS NORTHWARDS.
4. THE SHAFT WILL HAVE AUXILIARY (MINED) TUNNELS TO ALLOW CONCURRENT TBM SHIELD AND BACKUP ASSEMBLY.
5. SHAFT STRUCTURAL THICKNESSES AND GENERAL DIMENSIONS ARE GIVEN WITH ORIENTATIVE PURPOSES ONLY. ACTUAL DESIGN WILL REQUIRE RESULTS OF GEOTECHNICAL INVESTIGATION AND ASESSMENT OF THE CONSTRUCTION LOGISTIC NEEDS.
6. THE SHAFT IS TO BE BACK FILLED AND CLOSED AFTER CONSTRUCTION IS COMPLETED.
7. SECANT PILES ARE INCLUDED TO TAKE INTO ACCOUNT THE POSSIBLE PRESENCE OF SOILS AND/OR VERY WEATHERED ROCK IN THE FIRST METERS OF THE EXCAVATION AS NO PRECISE GEOTEHNICAL INFORMATION IS AVAILABLE. IN SOUND ROCK, A COMBINATION OF ROCKBOLTS, MESH, SHOTCRETE AND WEEPS IS PROPOSED AS MAIN SUPPORT.

DOUBLE CIRCULAR SHAFT WITH CENTRAL DIAPHRAGM INTERMEDIATE WINDOW AT ARRASTRE CANYON. STA 870+00 TWIN SHAFT

SECTION B
SCALE 1"=10-0"

10 0 10 20
1"=10′-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

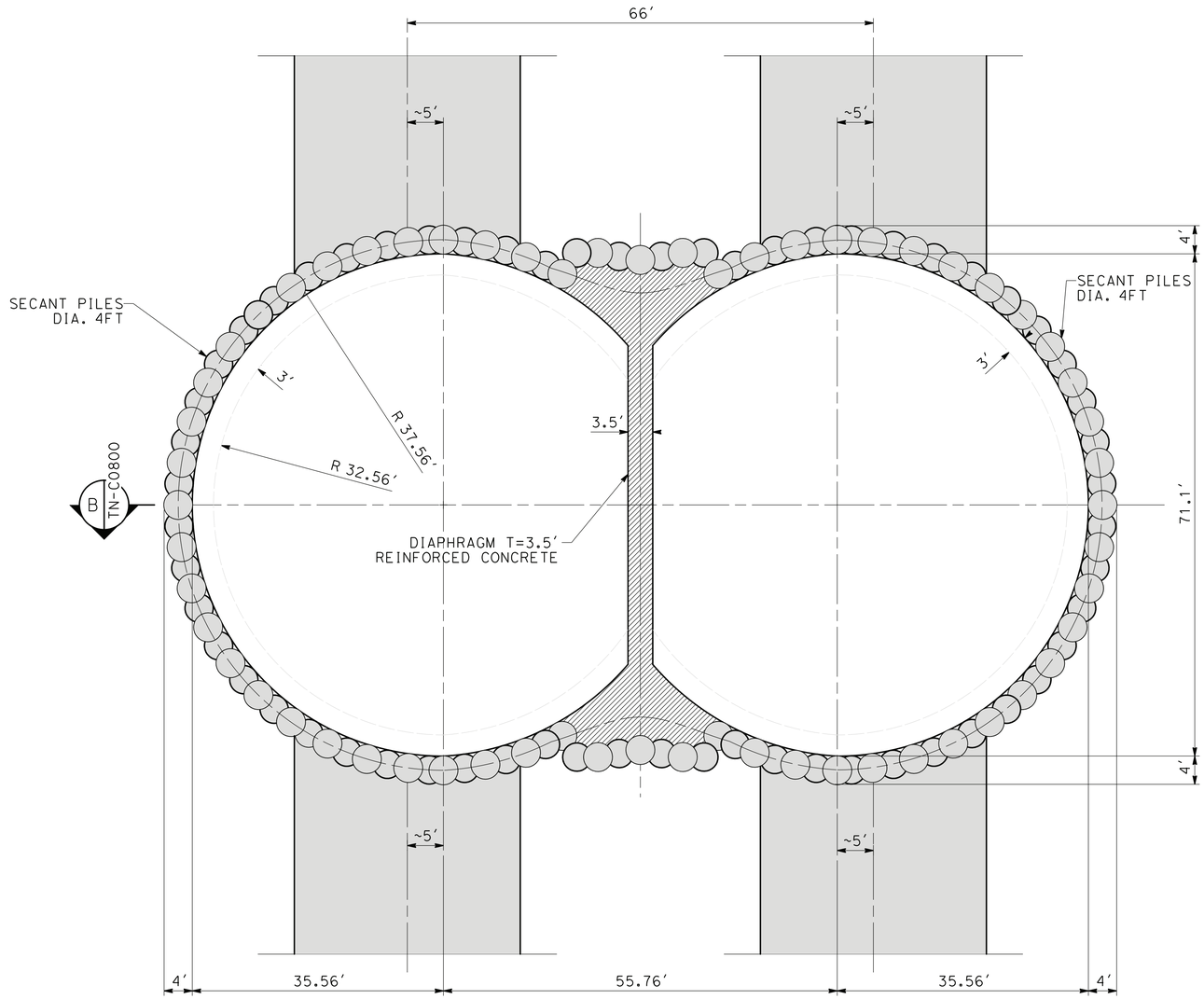
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E1/E2
STA.870+00.00
INTERMEDIATE WINDOW AT ARRASTRE CANYON
TWIN SHAFT (1 of 2)

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0800
SCALE AS SHOWN
SHEET NO.



NOTES:

1. THIS DRAWING IS NOT ACTUAL DESIGN. ITS PURPOSE IS TO BUILD UNIT PRICES AT PEPD LEVEL.
2. THIS SHAFT IS INTENDED AS AN INTERMEDIATE ACCESS FOR CONSTRUCTION
3. THE CONSTRUCTION SHAFT IS INTENDED FOR ASSEMBLY AND LAUNCH OF TUNNEL BORING MACHINES (TBMs) SOUTHWARDS, AND FOR MINED TUNNELS NORTHWARDS.
4. THE SHAFT WILL HAVE AUXILIARY (MINED) TUNNELS TO ALLOW CONCURRENT TBM SHIELD AND BACKUP ASSEMBLY.
5. SHAFT STRUCTURAL THICKNESSES AND GENERAL DIMENSIONS ARE GIVEN WITH ORIENTATIVE PURPOSES ONLY. ACTUAL DESIGN WILL REQUIRE RESULTS OF GEOTECHNICAL INVESTIGATION AND ASESSMENT OF THE CONSTRUCTION LOGISTIC NEEDS.
6. THE SHAFT IS TO BE BACK FILLED AND CLOSED AFTER CONSTRUCTION IS COMPLETED.
7. SECANT PILES ARE INCLUDED TO TAKE INTO ACCOUNT THE POSSIBLE PRESENCE OF SOILS AND/OR VERY WEATHERED ROCK IN THE FIRST METERS OF THE EXCAVATION AS NO PRECISE GEOTEHNICAL INFORMATION IS AVAILABLE. IN SOUND ROCK, A COMBINATION OF ROCKBOLTS, MESH, SHOTCRETE AND WEEPS IS PROPOSED AS MAIN SUPPORT.

DOUBLE CIRCULAR SHAFT WITH CENTRAL DIAPHRAGM INTERMEDIATE WINDOW AT ARRASTRE CANYON. STA 870+00 TWIN SHAFT

SECTION A
SCALE 1"=10-0"

10 0 10 20
1"=10′-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

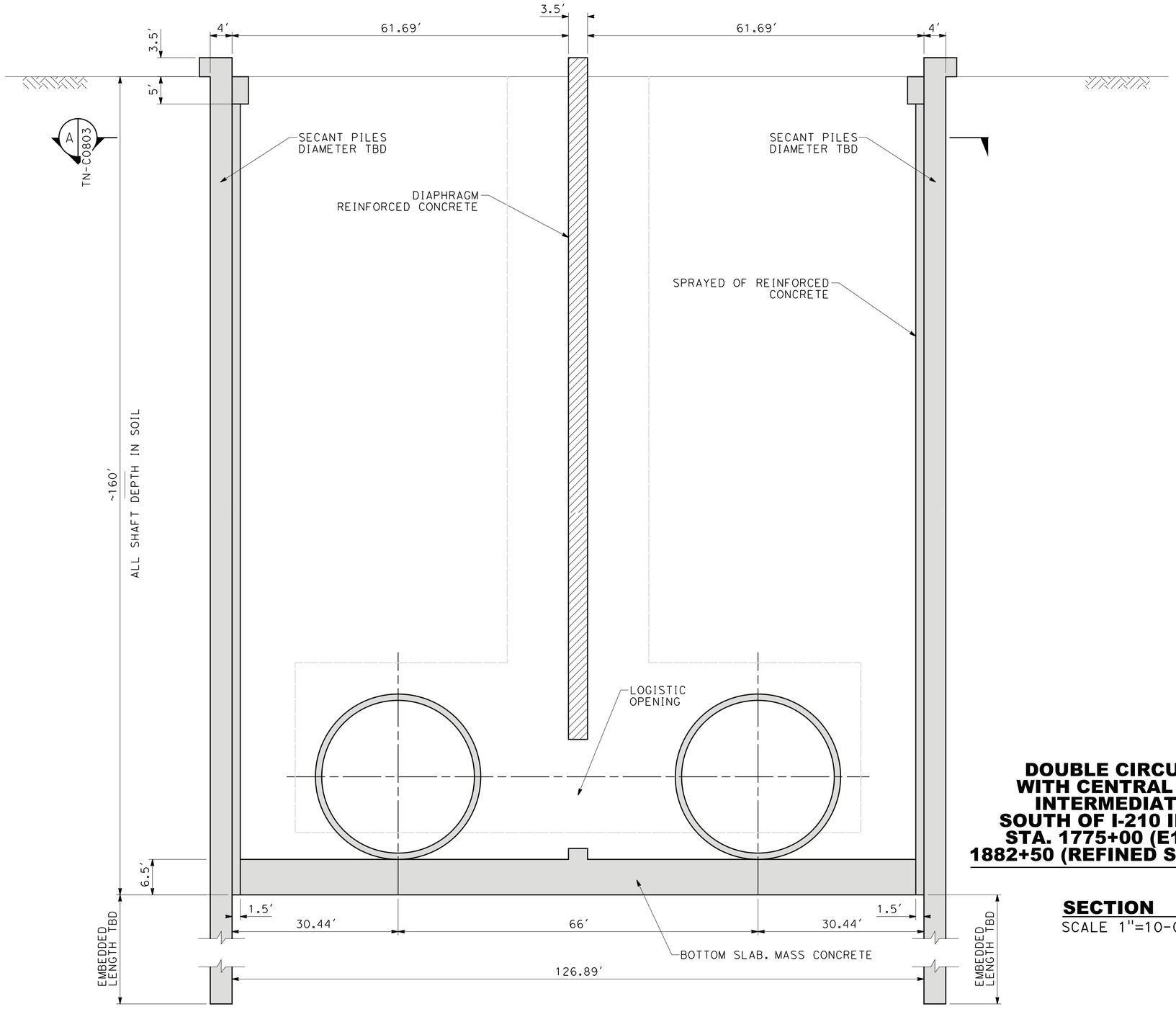
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E1/E2
STA.870+00.00
INTERMEDIATE WINDOW AT ARRASTRE CANYON
TWIN SHAFT (2 of 2)

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0801
SCALE AS SHOWN
SHEET NO.



NOTES:

1. **THIS DRAWING IS NOT ACTUAL DESIGN. ITS PURPOSE IS TO BUILD UNIT PRICES AT PEPD LEVEL.**
2. THIS SHAFT IS INTENDED AS AN INTERMEDIATE ACCESS FOR CONSTRUCTION
3. THE CONSTRUCTION SHAFT IS INTENDED FOR ASSEMBLY AND LAUNCH OF TUNNEL BORING MACHINES (TBMs) NORTHWARDS AND RECEIVING TBMs FROM SOUTH.
4. THE SHAFT WILL HAVE AUXILIARY (MINED) TUNNELS TO ALLOW CONCURRENT TBM SHIELD AND BACKUP ASSEMBLY.
5. SHAFT STRUCTURAL THICKNESSES AND GENERAL DIMENSIONS ARE GIVEN WITH ORIENTATIVE PURPOSES ONLY. ACTUAL DESIGN WILL REQUIRE RESULTS OF GEOTECHNICAL INVESTIGATION AND ASESSMENT OF THE CONSTRUCTION LOGISTIC NEEDS.
6. THE SHAFT IS TO BE BACK FILLED AND CLOSED AFTER CONSTRUCTION IS COMPLETED.

DOUBLE CIRCULAR SHAFT WITH CENTRAL DIAPHRAGM INTERMEDIATE WINDOW SOUTH OF I-210 INTERSECTION STA. 1775+00 (E1 ALIGMENT) / 1882+50 (REFINED SR14 ALIGNMENT)

SECTION B
SCALE 1"=10-0"

10 0 10 20
1"=10′-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

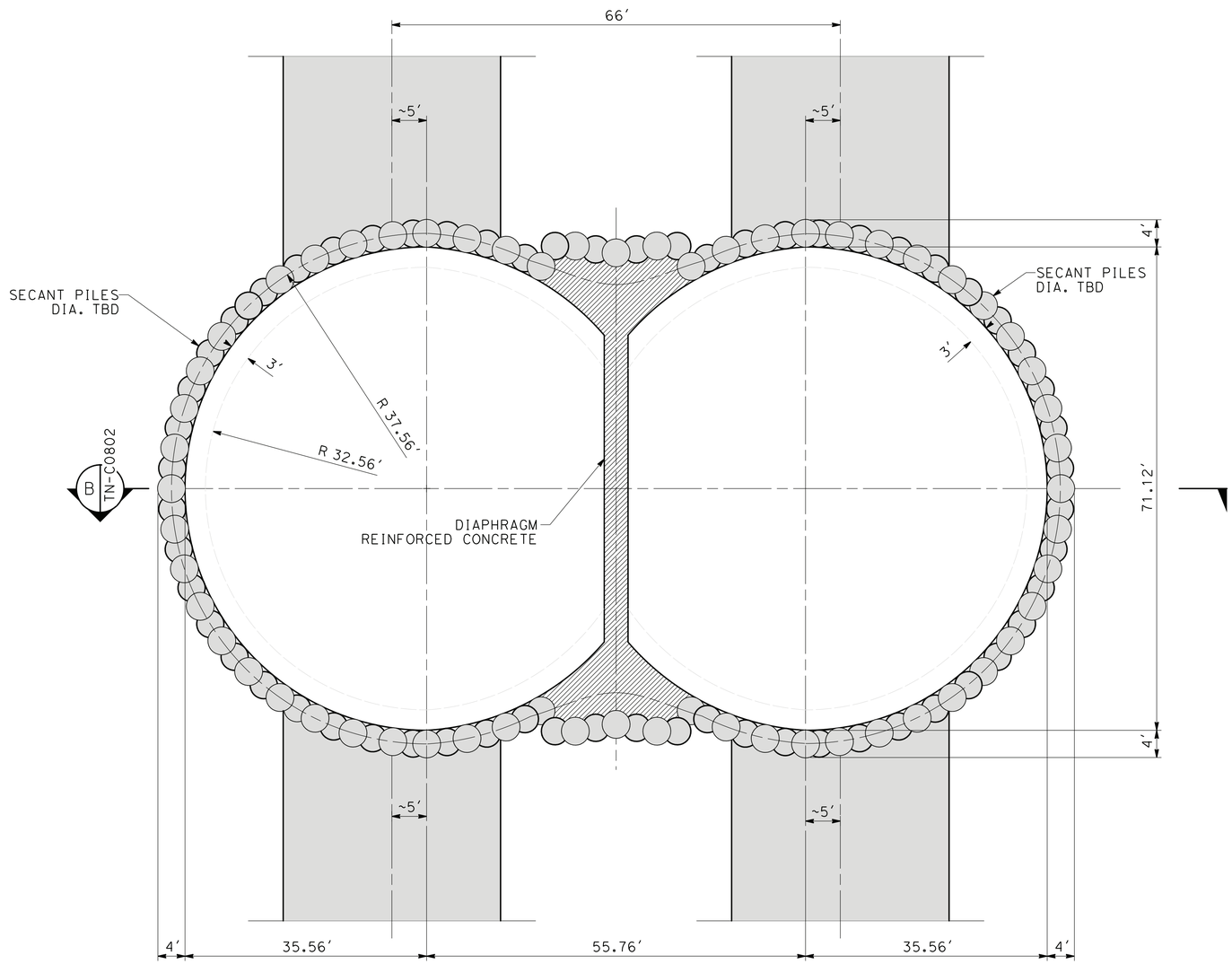
SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E1/REFINED SR14
STA. 1775+00.00 (E1) /1882+50.00 (REFINED SR14)
INTERMEDIATE WINDOW AT I-210 INTERSECTION
TWIN SHAFT (1 of 2)

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0802
SCALE AS SHOWN
SHEET NO.

0205240



DOUBLE CIRCULAR SHAFT WITH CENTRAL DIAPHRAGM INTERMEDIATE WINDOW SOUTH OF I-210 INTERSECTION STA. 1775+00 (ALIGNMENT E1) / 1882+50 (ALIGNMENT SR14)

SECTION A
SCALE 1"=10-0"

10 0 10 20
1"=10'-0"

NOTES:

1. **THIS DRAWING IS NOT ACTUAL DESIGN. ITS PURPOSE IS TO BUILD UNIT PRICES AT PEPD LEVEL.**
2. THIS SHAFT IS INTENDED AS AN INTERMEDIATE ACCESS FOR CONSTRUCTION
3. THE CONSTRUCTION SHAFT IS INTENDED FOR ASSEMBLY AND LAUNCH OF TUNNEL BORING MACHINES (TBMs) NORTHWARDS AND RECEIVING TBMs FROM SOUTH.
4. THE SHAFT WILL HAVE AUXILIARY (MINED) TUNNELS TO ALLOW CONCURRENT TBM SHIELD AND BACKUP ASSEMBLY.
5. SHAFT STRUCTURAL THICKNESSES AND GENERAL DIMENSIONS ARE GIVEN WITH ORIENTATIVE PURPOSES ONLY. ACTUAL DESIGN WILL REQUIRE RESULTS OF GEOTECHNICAL INVESTIGATION AND ASESSMENT OF THE CONSTRUCTION LOGISTIC NEEDS.
6. THE SHAFT IS TO BE BACK FILLED AND CLOSED AFTER CONSTRUCTION IS COMPLETED.

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

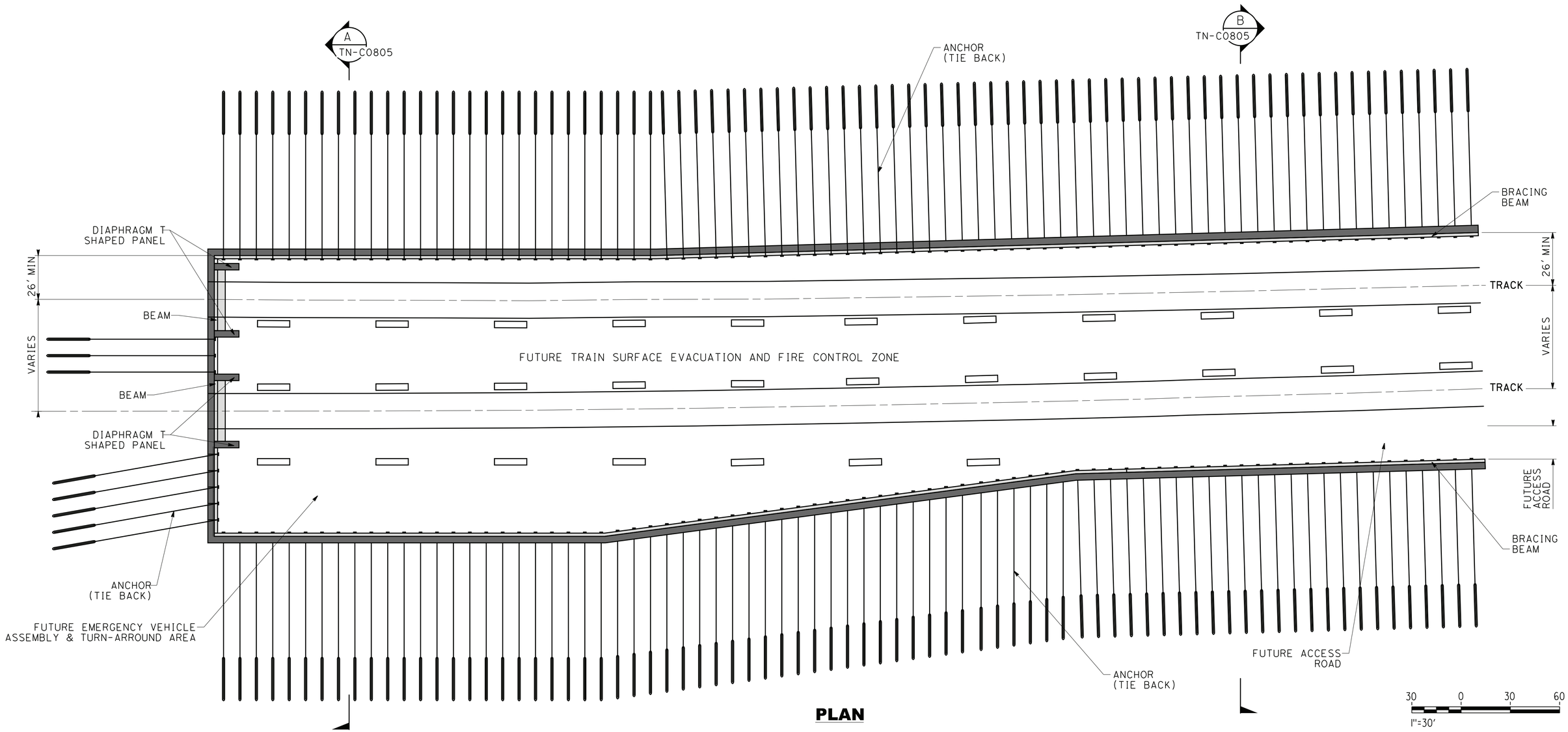
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E1/REFINED SR14
STA. 1775+00.00 (E1) /1882+50.00 (REFINED SR14)
INTERMEDIATE WINDOW AT I-210 INTERSECTION
TWIN SHAFT (2 of 2)

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0803
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.
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

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E. VELASCO
DRAWN BY: FJ. DOMINGUEZ
CHECKED BY: W. GUO
IN CHARGE: A. RELAÑO
DATE: 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK

ALIGNMENT E1/REFINED SR14
TBM LAUNCHING TRENCH AT PORTAL 4 (E1)/10 (REFINED SR14)
STA. 1891+47.74 (E1)/STA. 1998+90.00 (REFINED SR14) (1 of 2)

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0804
SCALE AS SHOWN
SHEET NO.

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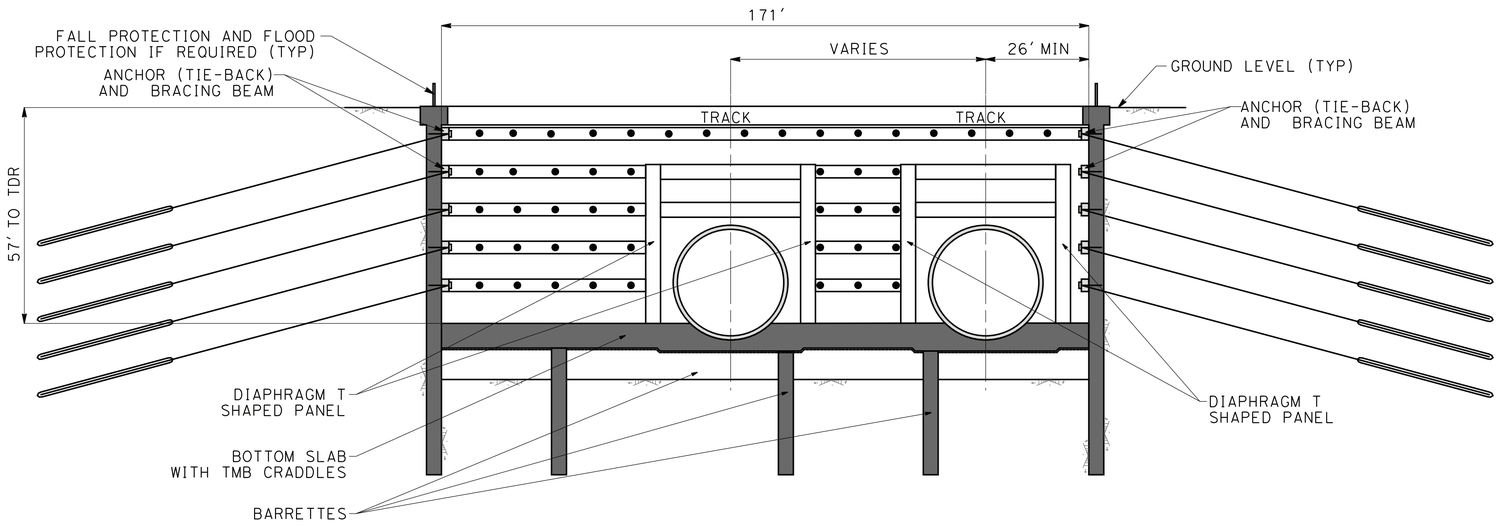
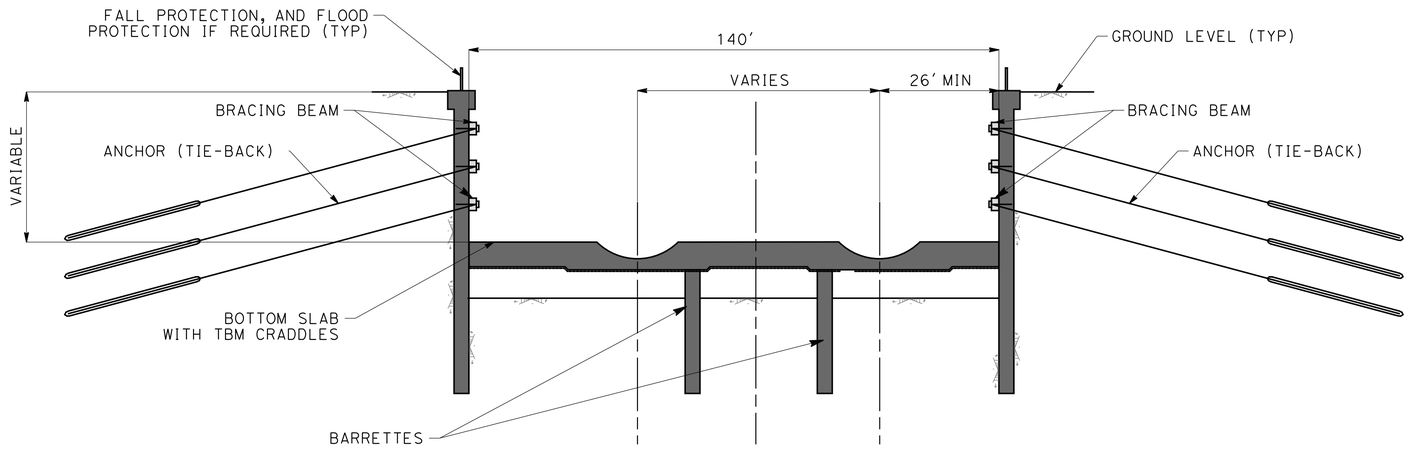


TRANSVERSE SECTION A
SCALE 1"=20'-0"



TRANSVERSE SECTION B
SCALE 1"=20'-0"

20 0 20 40
1"=20'

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.

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

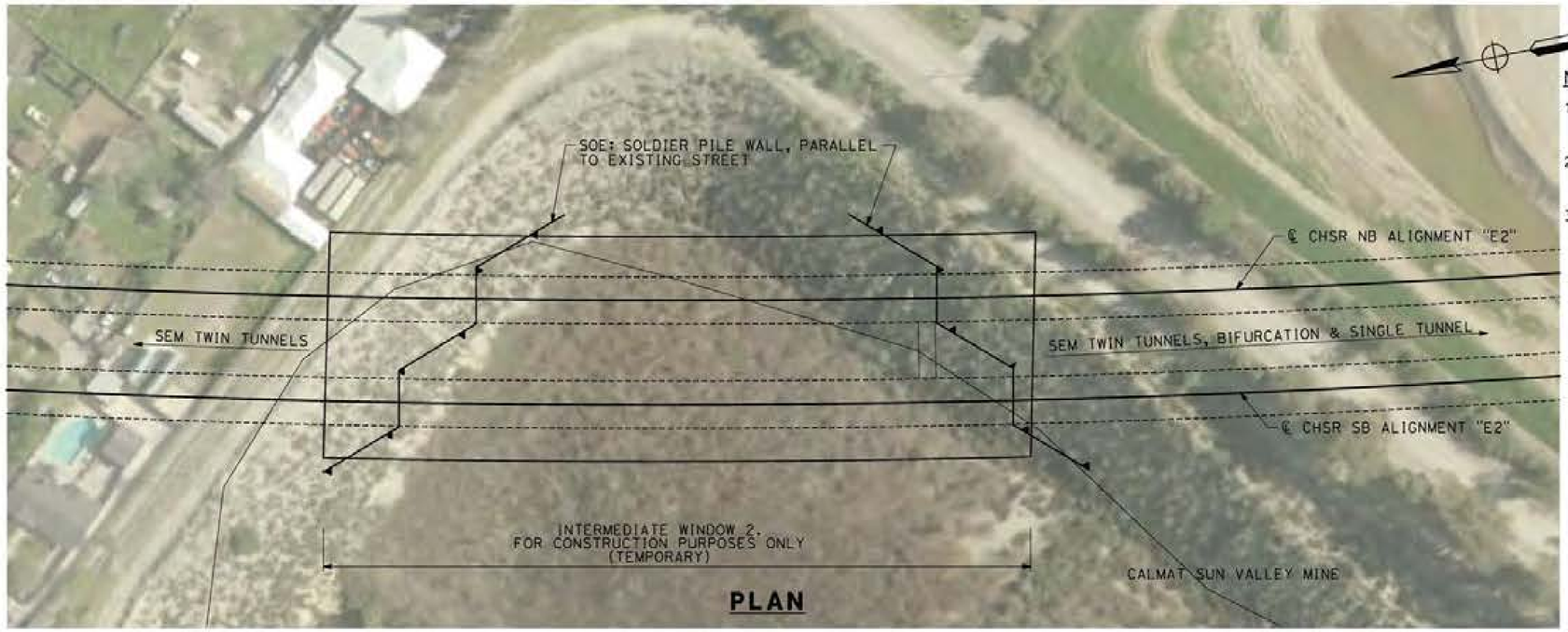
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E1/REFINED SR14
TBM LAUNCHING TRENCH AT PORTAL 4 (E1)/10 (REFINED SR14)
STA. 1891+47.74 (E1)/STA. 1998+90.00 (REFINED SR14) (2 of 2)

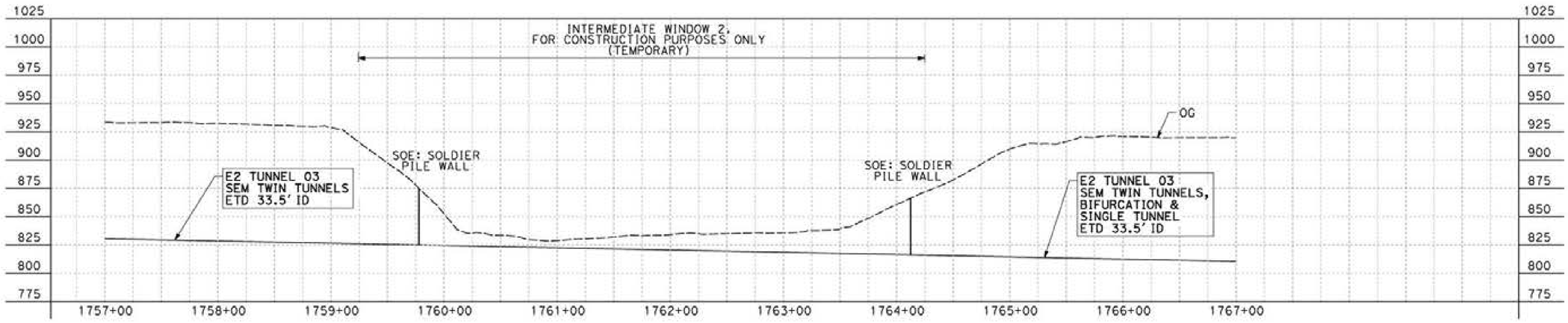
CONTRACT NO. HSR14-42
DRAWING NO. TN-C0805
SCALE AS SHOWN
SHEET NO.



PLAN

NOTES:

1. THIS IW IS FORESEEN AS A DOUBLE PORTAL FOR SEM TUNNELS: TWIN TUNNELS NORTHWARDS, AND TWIN TUNNELS, BIFURCATION & SINGLE TUNNEL SOUTHWARDS.
2. THE CHOSEN LOCATION IS THE CALMAT SUN VALLEY MINE, WHICH IS AT PRESENT EXCAVATED AT THE TUNNELS TOR DEPTH, APPROXIMATELY.
3. THE SOE (SUPPORT OF EXCAVATION) FOR THE TUNNELS COULD BE DONE IN TWO ALTERNATIVE WAYS:
   - CONSTRUCTION METHOD 1: SOLDIER PILE WALL WITH TIEBACKS, PARALLEL TO THE EXISTING STREETS.
   - CONSTRUCTION METHOD 2: SOIL NAILING WALL, PERPENDICULAR TO THE ALIGNMENT.



PROFILE

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: W. GUO
IN CHARGE: A. RELAÑO
DATE: 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E2
INTERMEDIATE WINDOW 2
CONSTRUCTION AND SUPPORT
DETAIL 1

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0806
SCALE AS SHOWN
SHEET NO.

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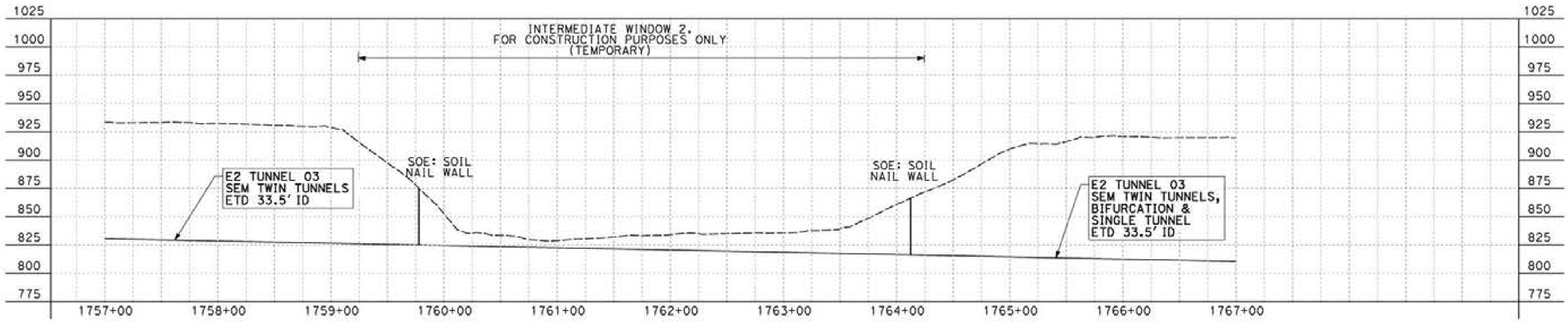
PLAN

NOTES:

1. THIS IW IS FORESEEN AS A DOUBLE PORTAL FOR SEM TUNNELS: TWIN TUNNELS NORTHWARDS, AND TWIN TUNNELS, BIFURCATION & SINGLE TUNNEL SOUTHWARDS.
2. THE CHOSEN LOCATION IS THE CALMAT SUN VALLEY MINE, WHICH IS AT PRESENT EXCAVATED AT THE TUNNELS TOR DEPTH, APPROXIMATELY.
3. THE SOE (SUPPORT OF EXCAVATION) FOR THE TUNNELS COULD BE DONE IN TWO ALTERNATIVE WAYS:
   - CONSTRUCTION METHOD 1: SOLDIER PILE WALL WITH TIEBACKS, PARALLEL TO THE EXISTING STREETS.
   - CONSTRUCTION METHOD 2: SOIL NAILING WALL, PERPENDICULAR TO THE ALIGNMENT.



PROFILE

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 W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E2
INTERMEDIATE WINDOW 2
CONSTRUCTION AND SUPPORT
DETAIL 2

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0807
SCALE AS SHOWN
SHEET NO.

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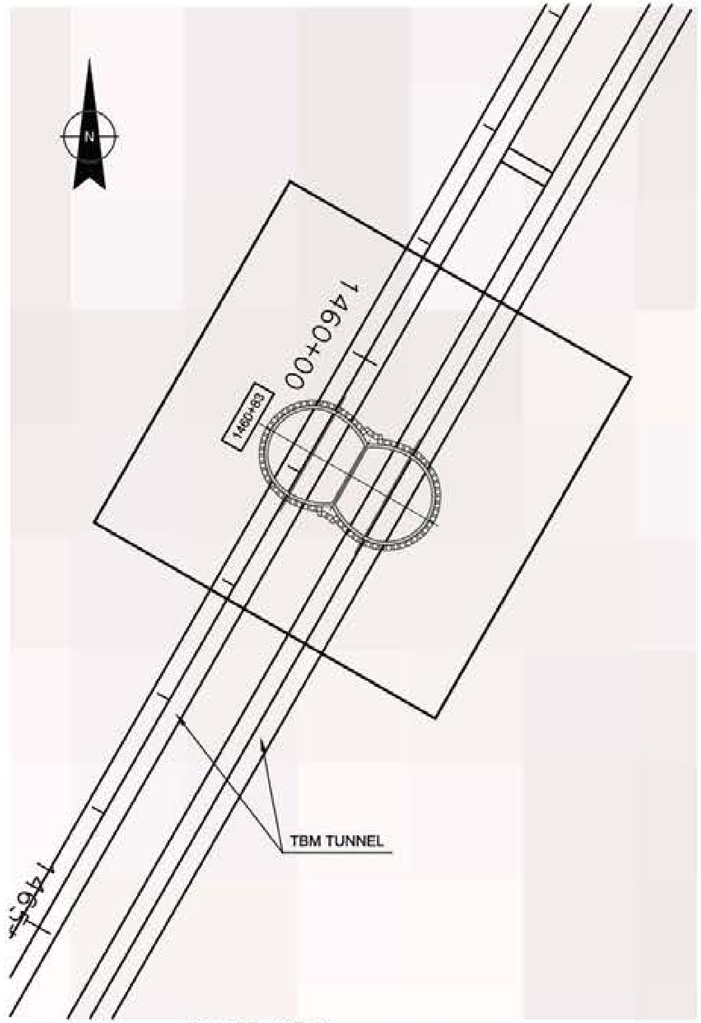
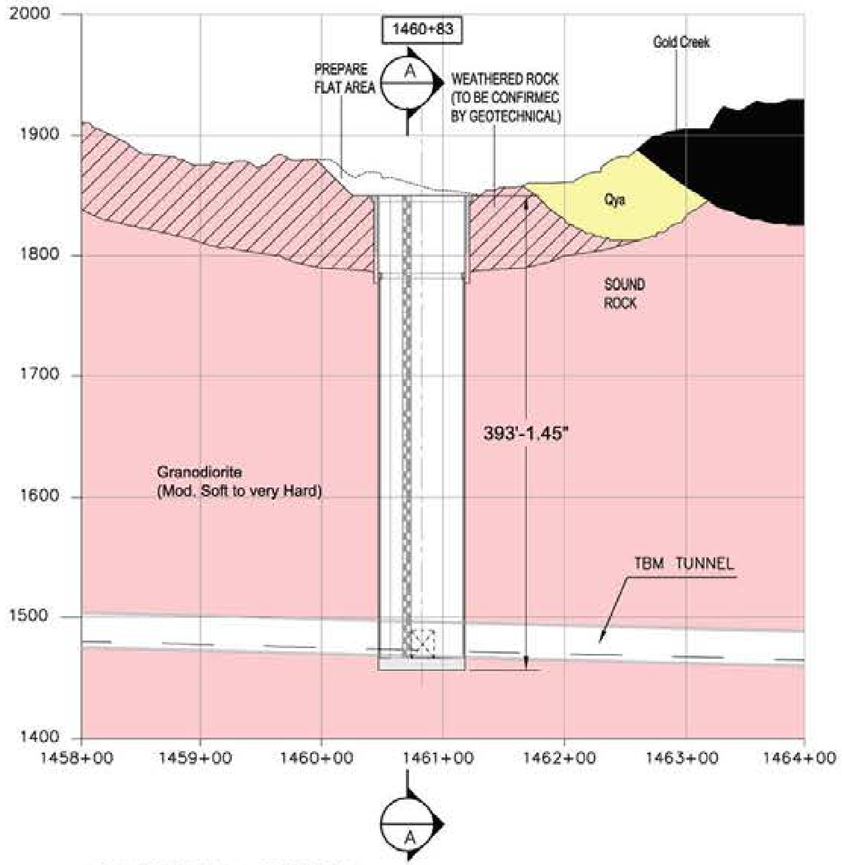
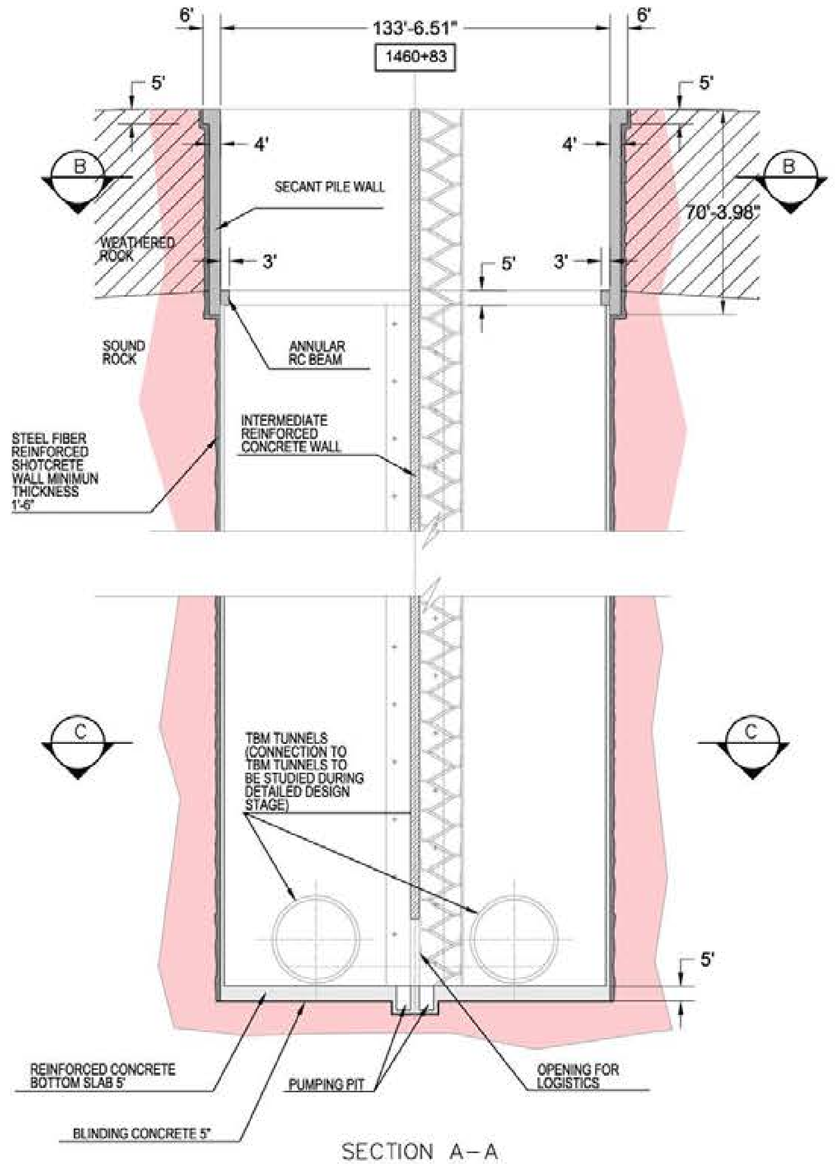


PLANT VIEW



LONGITUDINAL SECTION



SECTION A–A

FOR SECTION B–B AND SECTION C–C SEE DRAWING TN-C0809

DISCLAIMER:

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

NOTES:

1. THIS DESIGN REPRESENTS THE CONCEPT FOR THE ALTERNATIVE ADIT 2 AT 1460+82 FOR ALIGNMENT E2.
2. ALL DIMENSIONS ARE INDICATIVE ONLY AND NEED TO BE CHECKED IN THE DETAILED DESIGN TO GUARANTEE STRUCTURAL SAFETY.
3. THE VERTICAL SHAFT IS AN ALTERNATIVE DESIGN TO THE ADIT CONSTRUCTED WITH AN INCLINED GALLERY.
4. THE STRUCTURE OF THE SHAFT SHALL BE DESIGNED FOR THE FOLLOWING PURPOSES:
   A. MINE AND BUILT SGFZ FAULT CHAMBER NORTHWARDS
   B. RECEIVE AND DISMANTLE TBMS FROM THE SOUTHERN DIRECTION
5. THE STRUCTURE OF THE SHAFT SHALL BE DESIGNED TO ALLOW THE INSTALLATION OF A CRANE WITH ENOUGH CAPACITY FOR THE NEEDS OF THE CONSTRUCTOR.
6. THE SHAFT SHALL BE COMPLETELY REFILLED AFTER THE TUNNEL WORKS HAVE BEEN CONCLUDED. ALL CONCRETE ELEMENTS BETWEEN THE SURFACE LEVEL AND A DEPTH OF 10 ft SHALL BE DEMOLISHED AND REMOVED.
7. THE DESIGN IS BASED ON THE EXPECTED FAVORABLE GROUND CONDITIONS WITH MODERATELY SOFT TO VERY HARD GRANODIORITE WITH LOW HYDRAULIC CONDUCTIVITY.
8. THE STRUCTURE OF THE SHAFT IS DESIGNED WITH THE FOLLOWING COMPONENTS:
   - SECANT PILE WALL FORMING A BINOCULAR SHAPE.
   - ANNULAR RC BEAMS AT THE TOP AND BASE OF THE SECANT PILE WALL.
   - BINOCULAR STEEL FIBER REINFORCED SHOTCRETE LINING DOWN TO THE BOTTOM OF EXCAVATION.
   - WATER PRESSURE RELIEF PIPES SHALL BE INSTALLED TO REDUCE THE WATER PRESSURE ON THE SHOTCRETE LINING.
   - INTERMEDIATE RC WALL IN THE CENTER OF THE SHAFT.
   - ROCK BOLTS FOR ANCHORAGE OF INTERMEDIATE WALL.
   - BOTTOM SLAB AND ALL OTHER NECESSARY ELEMENTS TO ALLOW THE TBM BREAK -IN AND THE EXCAVATION AND CONSTRUCTION OF THE FAULT CHAMBER.
   - PUMPING PITS.
   - ACCESS STAIRS AND ELEVATOR
9. SECANT PILES ARE INCLUDED TO TAKE INTO ACCOUNT THE POSSIBLE PRESENCE OF SOILS AND/OR VERY WEATHERED ROCK IN THE FIRST METERS OF THE EXCAVATION AS NO PRECISE GEOTECHNICAL INFORMATION IS AVAILABLE. IN SOUND ROCK, A COMBINATION OF ROCKBOLTS, MESH, SHOTCRETE AND WEEPS IS PROPOSED AS MAIN SUPPORT.
10. CONTACT BETWEEN WEATHERED AND SOUND ROCK IS SUPPOSED. IT MUST BE CONFIRMED BY GEOTECHNICAL INVESTIGATION.

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: E. VELASCO
DRAWN BY: FJ. DOMINGUEZ
CHECKED BY: W. GUO
IN CHARGE: A. RELAÑO
DATE: 04/30/2021

PEPD RECORD SET REV 02

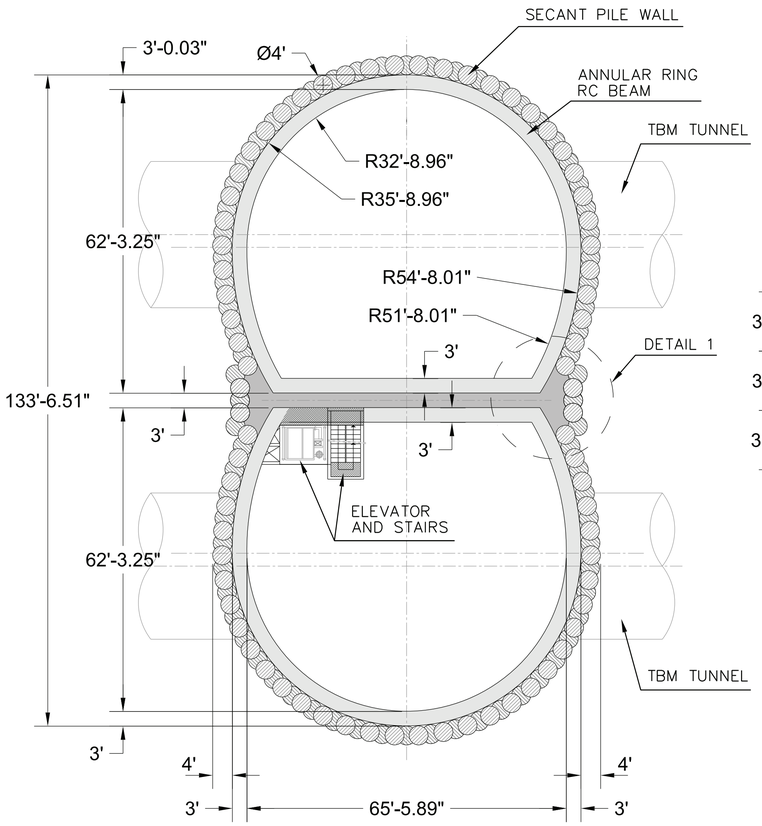
NOT FOR CONSTRUCTION

SENER

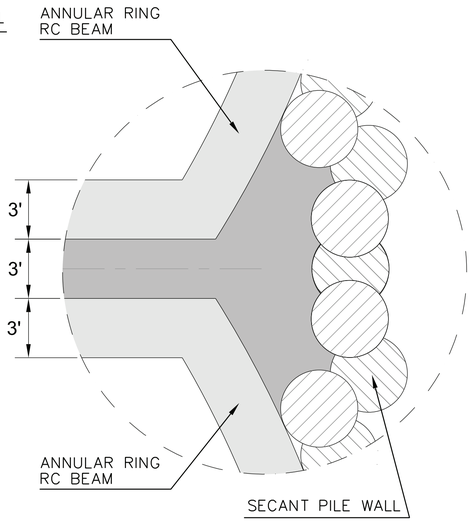
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E2
TBM BORED TWIN TUNNELS
ALTERNATIVE ADIT AT 1460+83.00
LOCATION AND CROSS SECTION

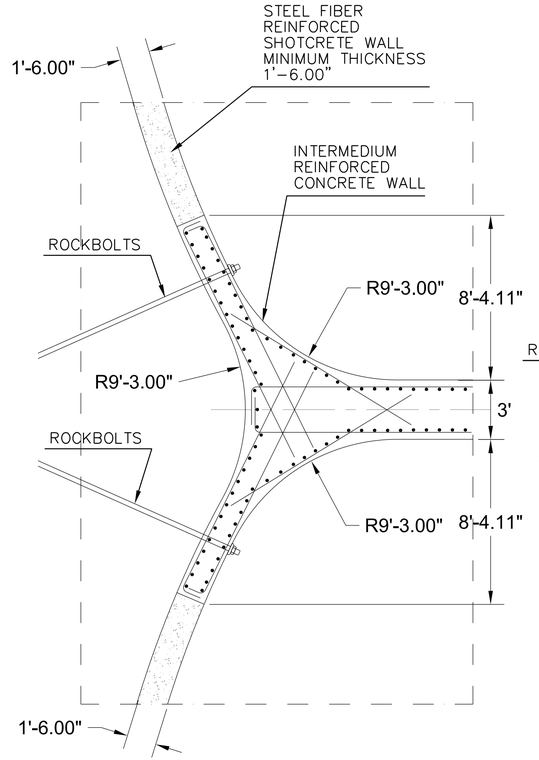
CONTRACT NO. HSR14-42
DRAWING NO. TN-C0808
SCALE AS SHOWN
SHEET NO.



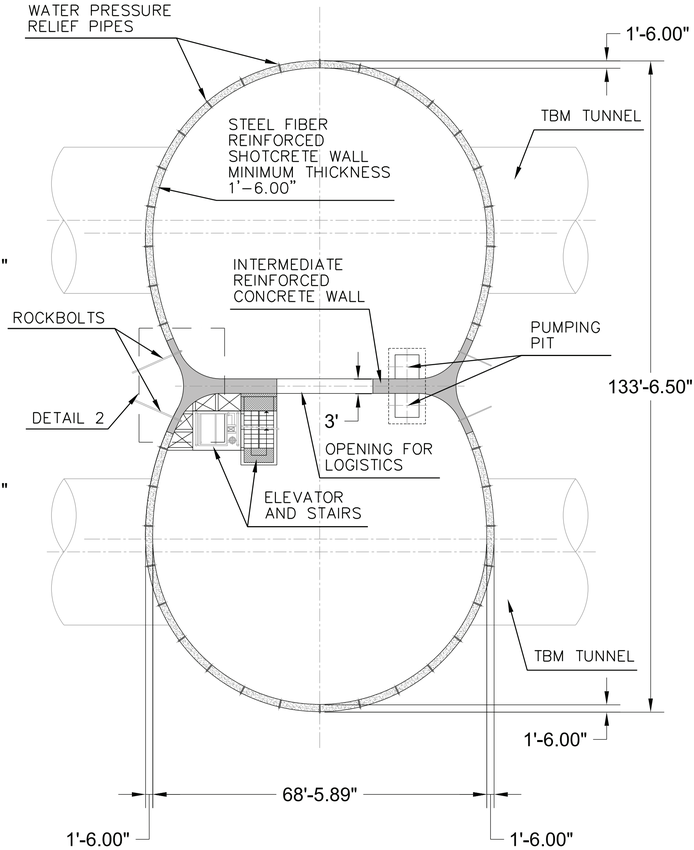
SECTION B–B



DETAIL 1



DETAIL 2



SECTION C–C

DISCLAIMER:

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

NOTES:

1. THIS DESIGN REPRESENTS THE CONCEPT FOR THE ALTERNATIVE ADIT 2 AT 1460+82 FOR ALIGNMENT E2.
2. ALL DIMENSIONS ARE INDICATIVE ONLY AND NEED TO BE CHECKED IN THE DETAILED DESIGN TO GUARANTEE STRUCTURAL SAFETY.
3. THE VERTICAL SHAFT IS AN ALTERNATIVE DESIGN TO THE ADIT CONSTRUCTED WITH AN INCLINED GALLERY.
4. THE STRUCTURE OF THE SHAFT SHALL BE DESIGNED FOR THE FOLLOWING PURPOSES:
   A. MINE AND BUILT SGFZ FAULT CHAMBER NORTHWARDS
   B. RECEIVE AND DISMANTLE TBMS FROM THE SOUTHERN DIRECTION
5. THE STRUCTURE OF THE SHAFT SHALL BE DESIGNED TO ALLOW THE INSTALLATION OF A CRANE WITH ENOUGH CAPACITY FOR THE NEEDS OF THE CONSTRUCTOR.
6. THE SHAFT SHALL BE COMPLETELY REFILLED AFTER THE TUNNEL WORKS HAVE BEEN CONCLUDED. ALL CONCRETE ELEMENTS BETWEEN THE SURFACE LEVEL AND A DEPTH OF 10 ft SHALL BE DEMOLISHED AND REMOVED.
7. THE DESIGN IS BASED ON THE EXPECTED FAVORABLE GROUND CONDITIONS WITH MODERATELY SOFT TO VERY HARD GRANODIORITE WITH LOW HYDRAULIC CONDUCTIVITY.
8. THE STRUCTURE OF THE SHAFT IS DESIGNED WITH THE FOLLOWING COMPONENTS:
   - SECANT PILE WALL FORMING A BINOCULAR SHAPE.
   - ANNULAR RC BEAMS AT THE TOP AND BASE OF THE SECANT PILE WALL.
   - BINOCULAR STEEL FIBER REINFORCED SHOTCRETE LINING DOWN TO THE BOTTOM OF EXCAVATION.
   - WATER PRESSURE RELIEF PIPES SHALL BE INSTALLED TO REDUCE THE WATER PRESSURE ON THE SHOTCRETE LINING.
   - INTERMEDIATE RC WALL IN THE CENTER OF THE SHAFT.
   - ROCK BOLTS FOR ANCHORAGE OF INTERMEDIATE WALL.
   - BOTTOM SLAB AND ALL OTHER NECESSARY ELEMENTS TO ALLOW THE TBM BREAK -IN AND THE EXCAVATION AND CONSTRUCTION OF THE FAULT CHAMBER.
   - PUMPING PITS.
   - ACCESS STAIRS AND ELEVATOR
9. SECANT PILES ARE INCLUDED TO TAKE INTO ACCOUNT THE POSSIBLE PRESENCE OF SOILS AND/OR VERY WEATHERED ROCK IN THE FIRST METERS OF THE EXCAVATION AS NO PRECISE GEOTECHNICAL INFORMATION IS AVAILABLE. IN SOUND ROCK, A COMBINATION OF ROCKBOLTS, MESH, SHOTCRETE AND WEEPS IS PROPOSED AS MAIN SUPPORT.
10. CONTACT BETWEEN WEATHERED AND SOUND ROCK IS SUPPOSED. IT MUST BE CONFIRMED BY GEOTECHNICAL INVESTIGATION.

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

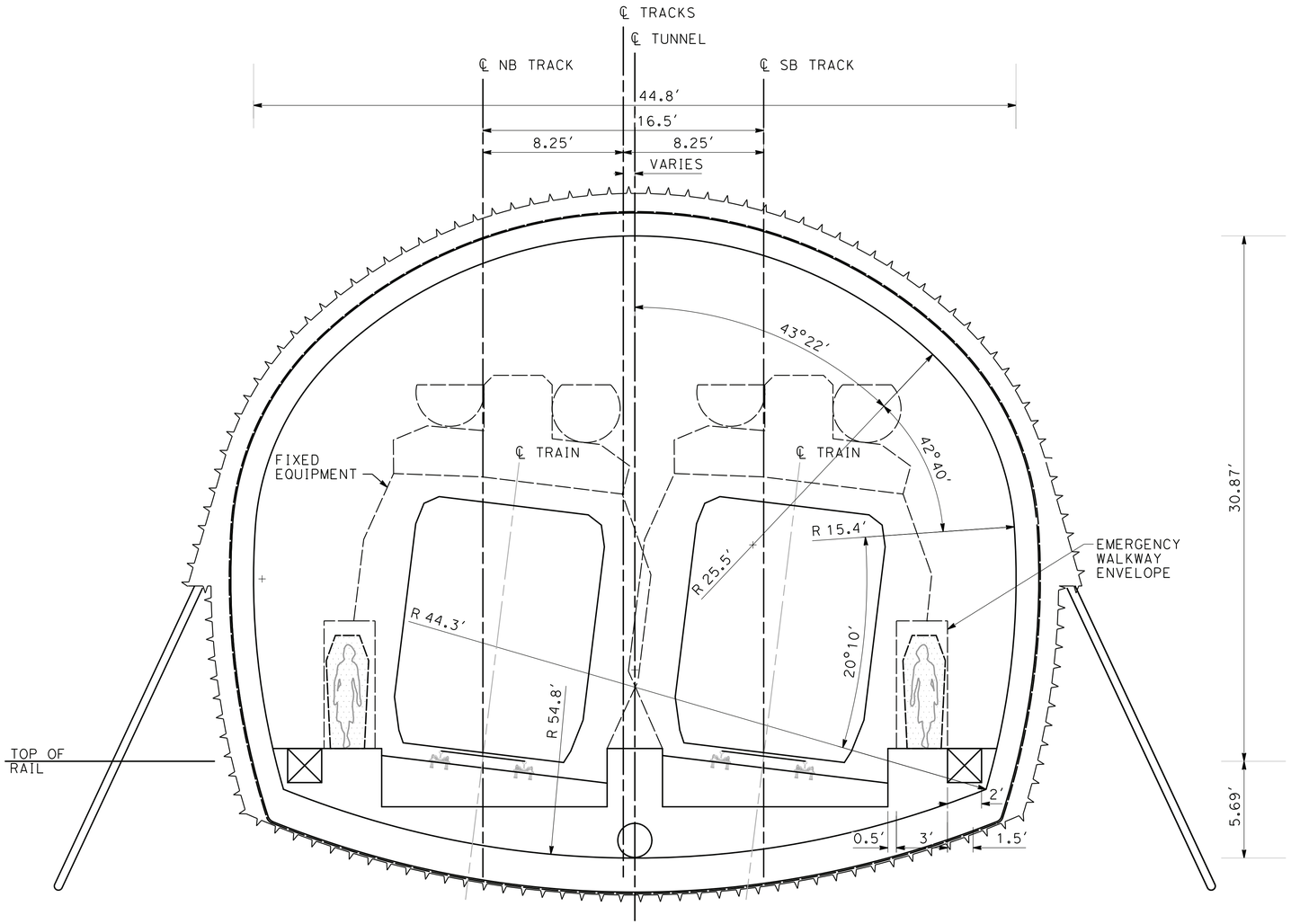
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E2
TBM BORED TWIN TUNNELS
ALTERNATIVE ADIT AT 1460+83.00
PLAN AND DETAILS

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0809
SCALE AS SHOWN
SHEET NO.



NOTES:

1. SINGLE MINED TUNNEL, DOUBLE TRACK IS AN OPTION FOR SHORT TUNNELS AT BURBANK AREA.
2. EXCAVATION, GROUND SUPPORT, DRAINAGE, TUNNEL LINING AND WATER AND GAS TIGHTNESS PROVISIONS TBD.
3. FOR EQUIPMENT STRUCTURE GAUGES, REFER TO DRAWINGS TN-C0004 TO TN-C0007.
4. SPACE PROOFING REQUIRES FARTHER STUDY TO EVALUATE DYNAMIC AIRFLOW/PRESSURE LEVELS UNDER HIGH SPEED OPERATING CONDITIONS, AND TO FARTHER DEFINE SPACE ALLOTED FOR STRUCTURES, EQUIPMENT, DRAINAGE AND EGRESS.
5. EMERGENCY EGRESS SHALL NOT BE FARTHER THAN 2500 FT APART (NFPA 130).
6. CROSS-SECTION SHOWN HAS A FREE TUNNEL CROSS-SECTIONAL AREA OF 1195 SQ FT, COMPLIANT WITH THE MINIMUM AREA OF 2x595 SQ FT REQUIRED FOR 220 MPH DESIGN SPEED AND TUNNEL LENGTH FROM 0.6 TO 22 MILES (REF. TN 2.42-C). OTHER TUNNEL LENGTH REQUIRES A DIFFERENT MINIMUM FREE CROSS-SECTIONAL AREA.
7. SPACE PROOFING REQUIRES FARTHER STUDY TO EVALUATE DYNAMIC AIRFLOW/PRESSURE LEVELS UNDER HIGH SPEED OPERATING CONDITIONS, AND TO FARTHER DEFINE SPACE ALLOTED FOR STRUCTURES, EQUIPMENT, DRAINAGE AND EGRESS.

ALIGNMENT E1 / REFINED SR14
SEM SINGLE TUNNEL
2 TRACKS

TUNNEL TYPICAL SECTION
SEM SINGLE TUNNEL
TANGENT AND SUPERELEVATED TRACK

4 0 4 8
1"=4′-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E1/REFINED SR14
TUNNEL TYPICAL SECTION AND DETAILS
SEM SINGLE TUNNEL, 2 TRACKS
CLEARANCE DIAGRAM - TANGENT AND SUPERELEVATED TRACK

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0900
SCALE AS SHOWN
SHEET NO.

BASIC QUANTITIES PER FT OF TUNNEL	
SEM SINGLE TUNNEL	PRIMARY LINING TYPE
	SEM SINGLE TUNNEL
EXCAVATION AREA (SQ.FT.)	1725.4
TUNNEL PRIMARY LINING AREA (SQ.FT.)	135.3
REGULATING CONCRETE (2 in) (SQ.FT.) (INVERT)	7.3
LATTICE GIRDER (FT)	103.6/3=34.6
WATER & GAS PROOFING MEMBRANE (FT)	145.3
FORMWORK (FT)	93
SECONDARY LINING AREA CONCRETE (sides&crown) (SQ.FT.)	125.6
SECONDARY LINING AREA CONCRETE (invert) (SQ.FT.)	89.2
MICROPILES CANOPY (FT)	62.6
MICROPILES FOR ELEPHANT'S FOOT (FT)	19x2/3=13
PHASE 1 PRIMARY LINING (SQ.FT.)	31.8
PHASE 1 LATTICE GIRDER (FT)	25.6/3=8.5
PHASE 1 AND 2 (SQ.FT.) REGULATING CONCRETE	7.9

PRIMARY LINING (EXAMPLE ONLY, NOT ACTUAL DESIGN)					
DENOMINATION	SHOTCRETE THICKNESS (in)	STEEL ARCHES	FIBRES & WWM	ADVANCE LENGTH (ft)	PIPE CANOPY
*SOIL CONDITIONS	14	LATTICE GIRDER EVERY 3'	FIBRES & 2 LAYERS WWM	3' TOP HEADING AND PHASE1 6' BENCH	YES

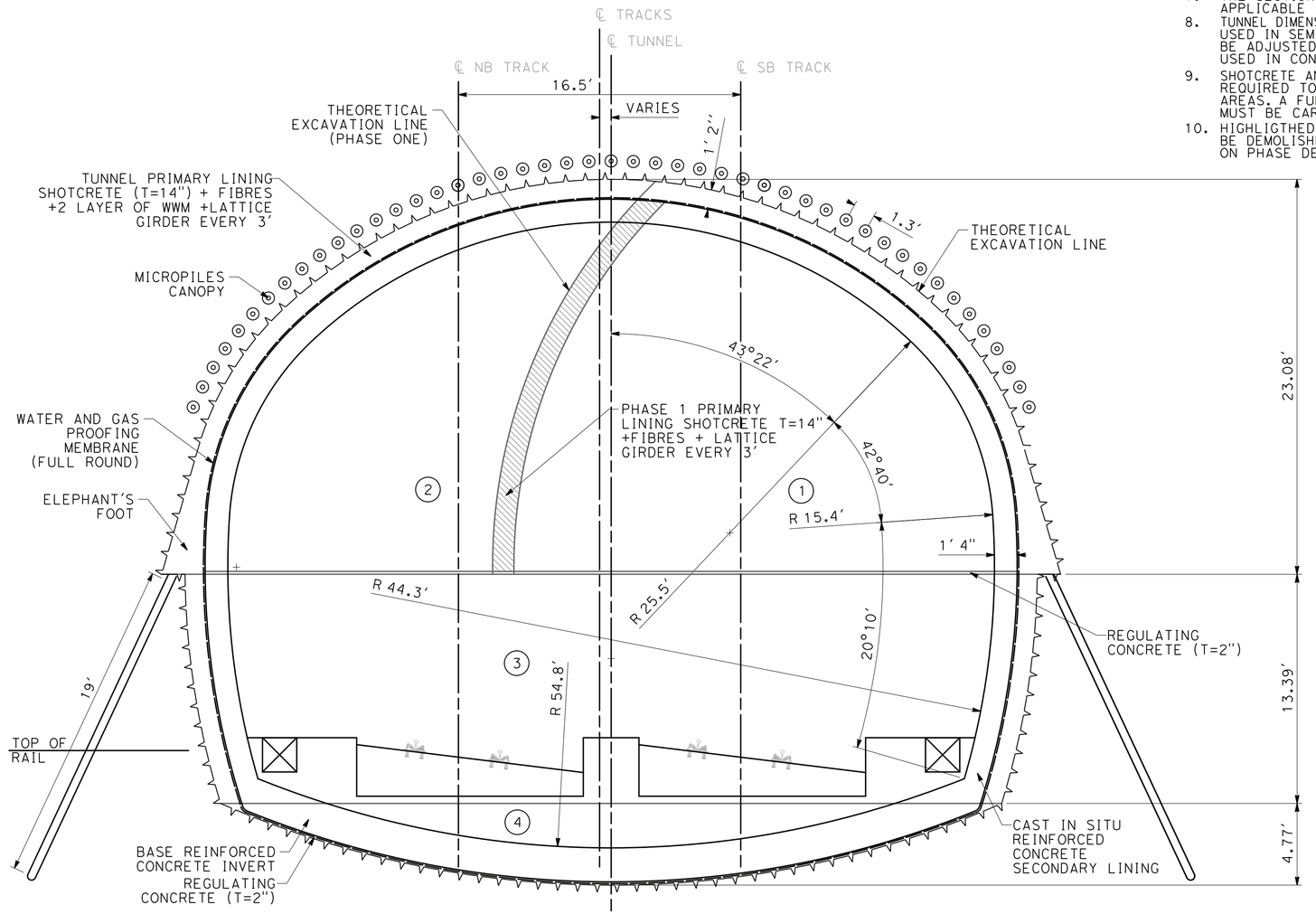
*FINE-MEDIUM GRAIN SAND WITH SILT DENSE TO VERY DENSE. NO GROUNDWATER EXPECTED.

NOTES:

1. SINGLE SEM TUNNEL, DOUBLE TRACK IS AN OPTION FOR SHORT TUNNELS AT BURBANK AREA.
2. THIS DRAWING IS NOT ACTUAL DESIGN. ITS PURPOSE IS TO BUILD UNIT PRICES AT PEPD LEVEL.
3. EXCAVATION, GROUND SUPPORT, DRAINAGE, TUNNEL LINING AND WATER AND GAS TIGHTNESS PROVISIONS TBD.
4. TYPICAL SUPPORT MEASURES AND INNER LINING THICKNESSES ARE GIVEN WITH ORIENTATIVE PURPOSES ONLY. ACTUAL DESIGN WILL REQUIRE RESULTS OF ADEQUATE GEOTECHNICAL INVESTIGATION.
5. EXCAVATION SEQUENCE AND PHASE (INCLUDING A POSSIBLE SUBDIVISION OF THE TOP HEADING) MUST BE REVISITED WHEN ADEQUATE GEOTECHNICAL INFORMATION IS AVAILABLE.
6. ADDITIONAL GROUND TREATMENT IN LIEU OF GROUND IMPROVEMENT MIGHT BE ADDED WHEN ADDITIONAL GEOTECHNICAL INFORMATION IS AVAILABLE AND EXPECTED GROUND CONDITIONS MAKES IT NECCESARY TO ACHIEVE SAFE EXCAVATION CONDITIONS.
7. THE SECTION SHOWN ON THIS DRAWING IS ONLY APPLICABLE IN THE GROUND CONDITIONS SHOWN.
8. TUNNEL DIMENSIONS ACCORDING TO USUAL MACHINERY USED IN SEM TUNNELS. THESE DIMENSIONS MUST BE ADJUSTED TO THE MACHINERY THAT WILL BE USED IN CONSTRUCTION.
9. 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.
10. HIGHLIGTHED AREAS OF THIS SUPPORT HAVE TO BE DEMOLISHED DURING CONSTRUCTION AS SHOWN ON PHASE DESCRIPTION TABLE.

PHASE	DESCRIPTION
0	-MICROPILES CANOPY INSTALLATION (EVERY 30`)
1	-EXCAVATION OF PHASE 1 AND APPLICATION OF STABILIZATION LAYER OF SHOTCRETE. -INSTALLATION OF PHASE 1 LATTICE GIRDERS. -INSTALLATION OF PHASE 1 UNDERPINNING AT RIGHT TUNNEL SIDE. -SPRAYING OF REINFORCING SHOTCRETE + 2 LAYERS OF WWM AND SPRAYING OF REGULATING CONCRETE.
2	-EXCAVATION OF PHASE 2 AND APPLICATION OF STABILIZATION LAYER OF SHOTCRETE. -DEMOLITION OF PHASE 1 TEMPORAL SUPPORT AND INSTALLATION OF PHASE 2 LATTICE GIRDERS BY JOINING THE LATTICE GIDERS PLACED IN PHASES 1 AND 2. -INSTALLATION OF PHASE 2 UNDERPINNING AT LEFT TUNNEL SIDE. -SPRAYING OF REINFORCING SHOTCRETE + 2 LAYERS OF WWM & SPRAYING OF REGULATING CONCRETE.
3	-EXCAVATION OF PHASE 3 AND APPLICATION OF STABILIZATION LAYER OF SHOTCRETE. -EXTENSION OF LATTICE GIRDERS AT BOTH TUNNEL SIDES. -SPRAYING OF REINFORCING SHOTCRETE + 2 LAYERS OF WWM & SPRAYING OF REGULATING CONCRETE.
4	-EXCAVATION OF PHASE 4.
5	-INSTALLATION OF WATER AND GAS PROOFING MEMBRANE.
6	-INSTALLATION OF INNER (SECONDARY) LINING. (FIRST INVERT; SECOND SIDES & CROWN)

*NOTE: DISTANCE BETWEEN EXCAVATION PHASES TO BE DEFINED.



ALIGNMENT E1 / REFINED SR14
SEM SINGLE TUNNEL
2 TRACKS

TUNNEL TYPICAL SECTION SEM SINGLE TUNNEL TANGENT & SUPERELEVATED TRACK

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

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

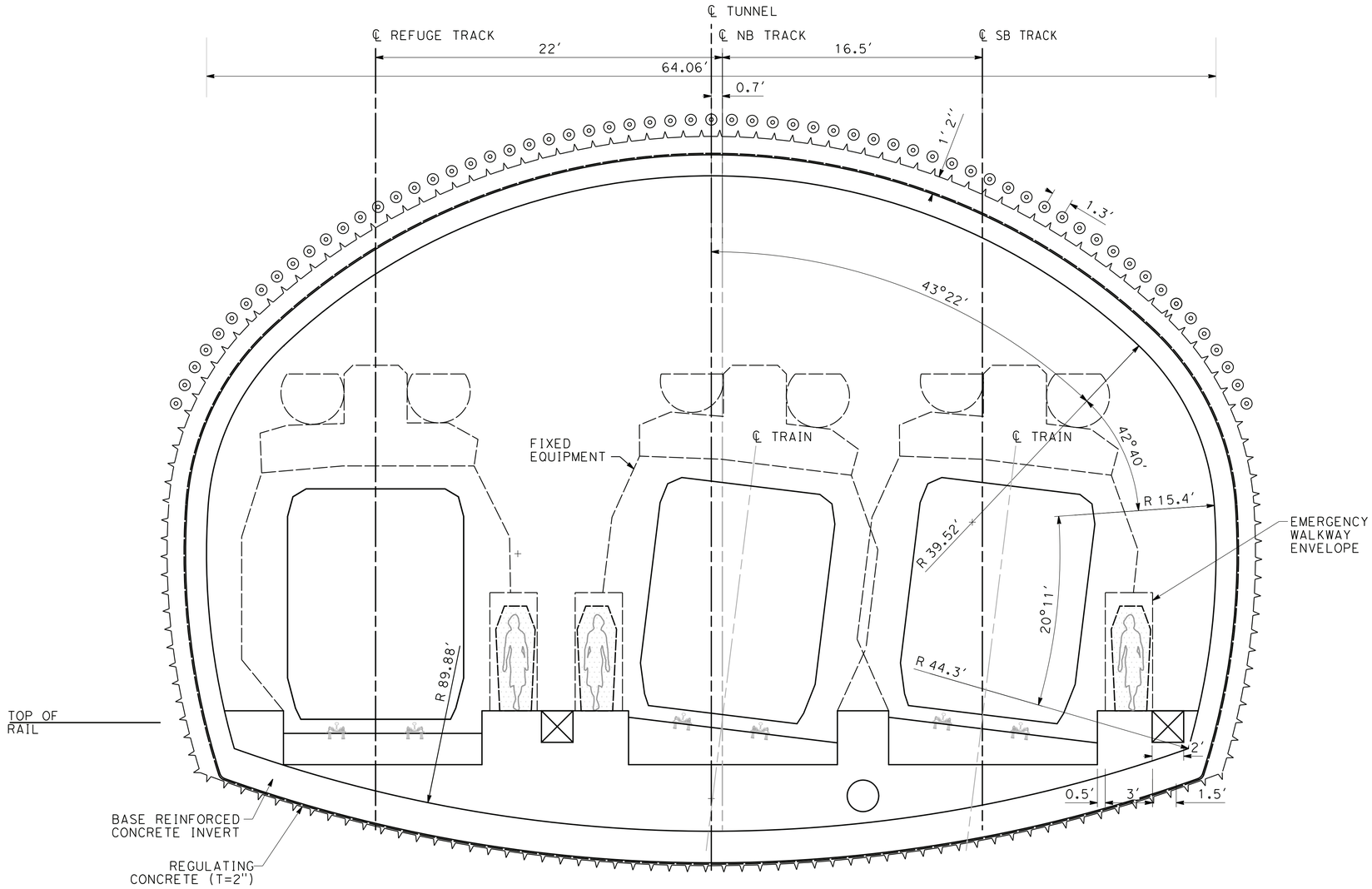
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E1/REFINED SR14
TUNNEL TYPICAL SECTION AND DETAILS
SEM SINGLE TUNNEL, 2 TRACKS
CONSTRUCTION SEQUENCE AND SUPPORT MEASURES

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0901
SCALE AS SHOWN
SHEET NO.



NOTES:

1. SINGLE MINED TUNNEL, DOUBLE TRACK IS AN OPTION FOR SHORT TUNNELS AT BURBANK AREA.
2. EXCAVATION, GROUND SUPPORT, DRAINAGE, TUNNEL LINING AND WATER AND GAS TIGHTNESS PROVISIONS TBD.
3. FOR EQUIPMENT STRUCTURE GAUGES, REFER TO DRAWINGS TN-C0004 TO TN-C0007.
4. SPACE PROOFING REQUIRES FARTHER STUDY TO EVALUATE DYNAMIC AIRFLOW/PRESSURE LEVELS UNDER HIGH SPEED OPERATING CONDITIONS, AND TO FARTHER DEFINE SPACE ALLOTED FOR STRUCTURES, EQUIPMENT, DRAINAGE AND EGRESS.
5. EMERGENCY EGRESS SHALL NOT BE FARTHER THAN 2500 FT APART (NFPA 130).
6. CROSS-SECTION SHOWN HAS A FREE TUNNEL CROSS-SECTIONAL AREA OF 1195 SQ FT, COMPLIANT WITH THE MINIMUM AREA OF 2x595 SQ FT REQUIRED FOR 220 MPH DESIGN SPEED AND TUNNEL LENGTH FROM 0.6 TO 22 MILES (REF. TN 2.42-C). OTHER TUNNEL LENGTH REQUIRES A DIFFERENT MINIMUM FREE CROSS-SECTIONAL AREA.
7. SPACE PROOFING REQUIRES FARTHER STUDY TO EVALUATE DYNAMIC AIRFLOW/PRESSURE LEVELS UNDER HIGH SPEED OPERATING CONDITIONS, AND TO FARTHER DEFINE SPACE ALLOTED FOR STRUCTURES, EQUIPMENT, DRAINAGE AND EGRESS.

ALIGNMENT E1 / REFINED SR14
SEM SINGLE TUNNEL
2 TRACKS + REFUGE TRACK

TUNNEL TYPICAL SECTION SEM SINGLE TUNNEL (2 TRACKS + REFUGE TRACK) TANGENT & SUPERELEVATED TRACK

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

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E1/REFINED SR14
TUNNEL TYPICAL SECTION AND DETAILS
SEM SINGLE TUNNEL, 2 TRACKS + REFUGE TRACK
CLEARANCE DIAGRAM - TANGENT AND SUPERELEVATED TRACK

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0902
SCALE AS SHOWN
SHEET NO.

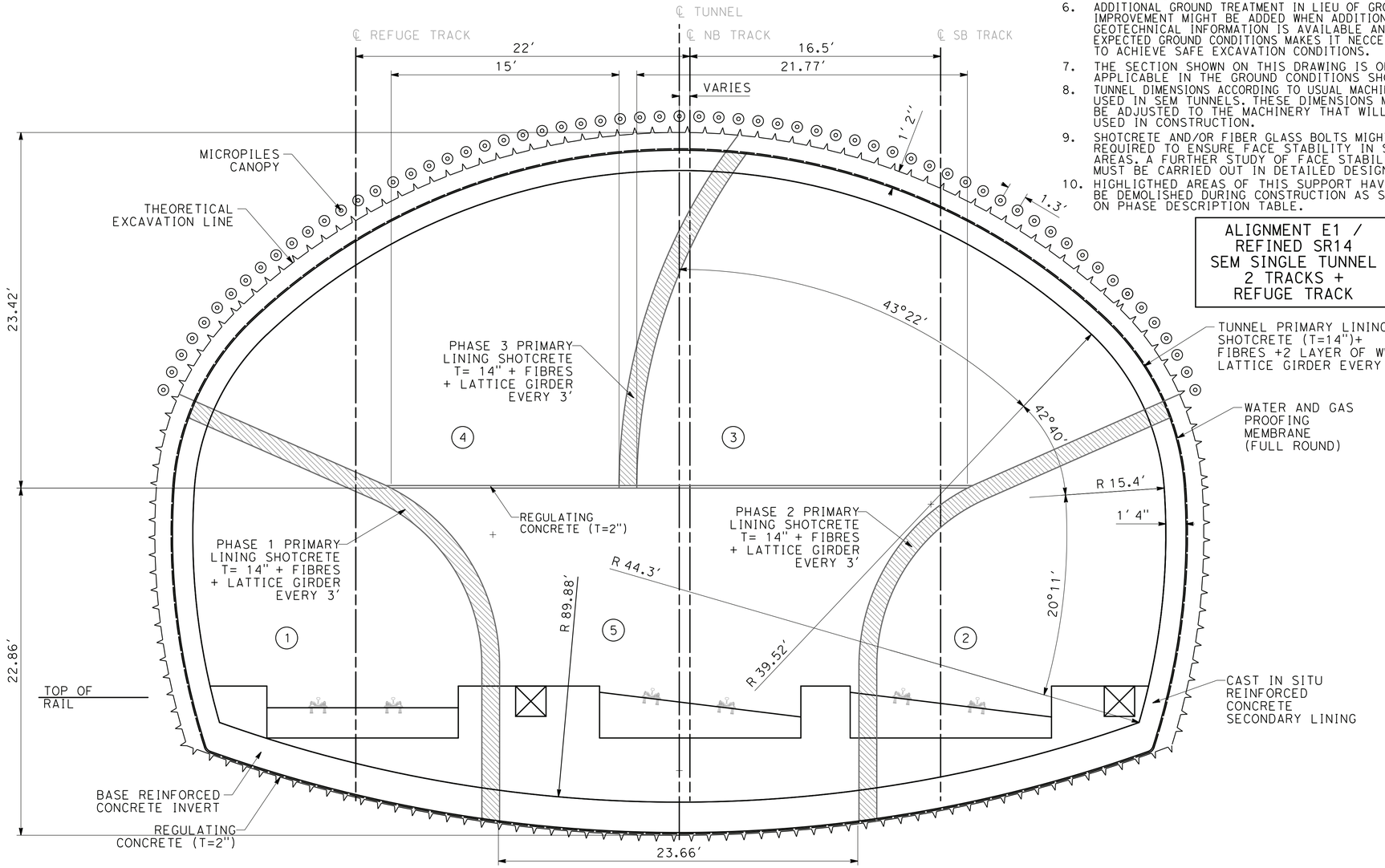
BASIC QUANTITIES PER FT OF TUNNEL	
SEM SINGLE TUNNEL	PRIMARY LINING TYPE
	SEM SINGLE TUNNEL
EXCAVATION AREA (SQ.FT.)	2641.3
TUNNEL PRIMARY LINING AREA (SQ.FT.)	155.7
REGULATING CONCRETE (2 in) (SQ.FT.) (INVERT)	10.6
LATTICE GIRDER (FT)	125/3=41.7
WATER & GAS PROOFING MEMBRANE (FT)	185.9
FORMWORK (FT)	114
SECONDARY LINING AREA CONCRETE (sides&crown) (SQ.FT.)	154
SECONDARY LINING AREA CONCRETE (invert) (SQ.FT.)	128.5
MICROPILES CANOPY (FT)	83.8
PHASE 1, 2 ,3 PRIMARY LINING (SQ.FT.)	116.4
PHASE 1, 2, 3 LATTICE GIRDER (FT)	105.1/3=35
PHASE 3 AND 4 (SQ.FT.) REGULATING CONCRETE	6.4

PRIMARY LINING (EXAMPLE ONLY, NOT ACTUAL DESIGN)					
DENOMINATION	SHOTCRETE THICKNESS (in)	STEEL ARCHES	REINFORCEMENT	ADVANCE LENGTH (ft)	PIPE CANOPY
*SOIL CONDITIONS	14	LATTICE GIRDER EVERY 3'	FIBRES & 2 LAYERS WWM	3' TOP HEADING AND PHASE1 6' BENCH	YES

*FINE-MEDIUM GRAIN SAND WITH SILT DENSE TO VERY DENSE. NO GROUNDWATER EXPECTED.

PHASE	DESCRIPTION
0	-MICROPILES CANOPY INSTALLATION (EVERY 30`)
1&2	-EXCAVATION OF PHASES 1 AND 2, AND APPLICATION OF A STABILIZATION LAYER OF SHOTCRETE. -INSTALLATION OF LATTICE GIRDERS OF PHASES 1 AND 2. -SPRAYING OF REINFORCING SHOTCRETE + 2 LAYERS OF WWM. -INSTALLATION OF WATER AND GAS PROOFING MEMBRANE. -INSTALLATION OF INNER LINING (SECONDARY). FIRST INVERT AND SECOND SIDE.
3	-EXCAVATION OF PHASE 3 AND APPLICATION OF A STABILIZATION LAYER OF SHOTCRETE. -INSTALLATION OF LATTICE GIRDERS OF PHASE 3. -SPRAYING OF REINFORCING SHOTCRETE + 2 LAYERS OF WWM. -INSTALLATION OF WATER AND GAS PROOFING MEMBRANE. -INSTALLATION OF INNER LINING (SECONDARY). FIRST INVERT AND SECOND SIDE.
4	-EXCAVATION OF PHASE 4, AND APPLICATION OF A STABILIZATION LAYER OF SHOTCRETE. -DEMOLITION OF TEMPORAL SUPPORT OF PHASE 3 AND INSTALLATION OF LATTICE GIRDERS OF PHASE 4. -SPRAYING OF REINFORCING SHOTCRETE + 2 LAYERS OF WWM. -DEMOLITION OF THE UPPER PART OF TEMPORAL SUPPORT OF PHASES 1 AND 2 -INSTALLATION OF WATER AND GAS PROOFING MEMBRANE. -INSTALLATION OF INNER LINING (SECONDARY) IN CROWN (PHASES 3 AND 4).
5	-EXCAVATION OF PHASE 5. -DEMOLITION OF THE UPPER PART OF TEMPORAL SUPPORT OF PHASES 1 AND 2 -INSTALLATION OF WATER AND GAS PROOFING MEMBRANE. -INSTALLATION OF INNER LINING (SECONDARY) IN INVERT.

*NOTE: DISTANCE BETWEEN EXCAVATION PHASES TO BE DEFINED.



TUNNEL TYPICAL SECTION SEM SINGLE TUNNEL (2 TRACKS + REFUGE TRACK) FOR TANGENT & SUPERELEVATED TRACK

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

NOTES:

1. SINGLE SEM TUNNEL, DOUBLE TRACK IS AN OPTION FOR SHORT TUNNELS AT BURBANK AREA.
2. THIS DRAWING IS NOT ACTUAL DESIGN. ITS PURPOSE IS TO BUILD UNIT PRICES AT PEPD LEVEL.
3. EXCAVATION, GROUND SUPPORT, DRAINAGE, TUNNEL LINING AND WATER AND GAS TIGHTNESS PROVISIONS TBD.
4. TYPICAL SUPPORT MEASURES AND INNER LINING THICKNESSES ARE GIVEN WITH ORIENTATIVE PURPOSES ONLY. ACTUAL DESIGN WILL REQUIRE RESULTS OF ADEQUATE GEOTECHNICAL INVESTIGATION.
5. EXCAVATION SEQUENCE AND PHASE (INCLUDING A POSSIBLE SUBDIVISION OF THE TOP HEADING) MUST BE REVISITED WHEN ADEQUATE GEOTECHNICAL INFORMATION IS AVAILABLE.
6. ADDITIONAL GROUND TREATMENT IN LIEU OF GROUND IMPROVEMENT MIGHT BE ADDED WHEN ADDITIONAL GEOTECHNICAL INFORMATION IS AVAILABLE AND EXPECTED GROUND CONDITIONS MAKES IT NECCESARY TO ACHIEVE SAFE EXCAVATION CONDITIONS.
7. THE SECTION SHOWN ON THIS DRAWING IS ONLY APPLICABLE IN THE GROUND CONDITIONS SHOWN.
8. TUNNEL DIMENSIONS ACCORDING TO USUAL MACHINERY USED IN SEM TUNNELS. THESE DIMENSIONS MUST BE ADJUSTED TO THE MACHINERY THAT WILL BE USED IN CONSTRUCTION.
9. 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.
10. HIGHLIGTHED AREAS OF THIS SUPPORT HAVE TO BE DEMOLISHED DURING CONSTRUCTION AS SHOWN ON PHASE DESCRIPTION TABLE.

ALIGNMENT E1 / REFINED SR14
SEM SINGLE TUNNEL
2 TRACKS + REFUGE TRACK

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E1/REFINED SR14
SEM SINGLE TUNNEL, 2 TRACKS + REFUGE TRACK
CONSTRUCTION SEQUENCE AND SUPPORT MEASURES

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0903
SCALE AS SHOWN
SHEET NO.

0205510

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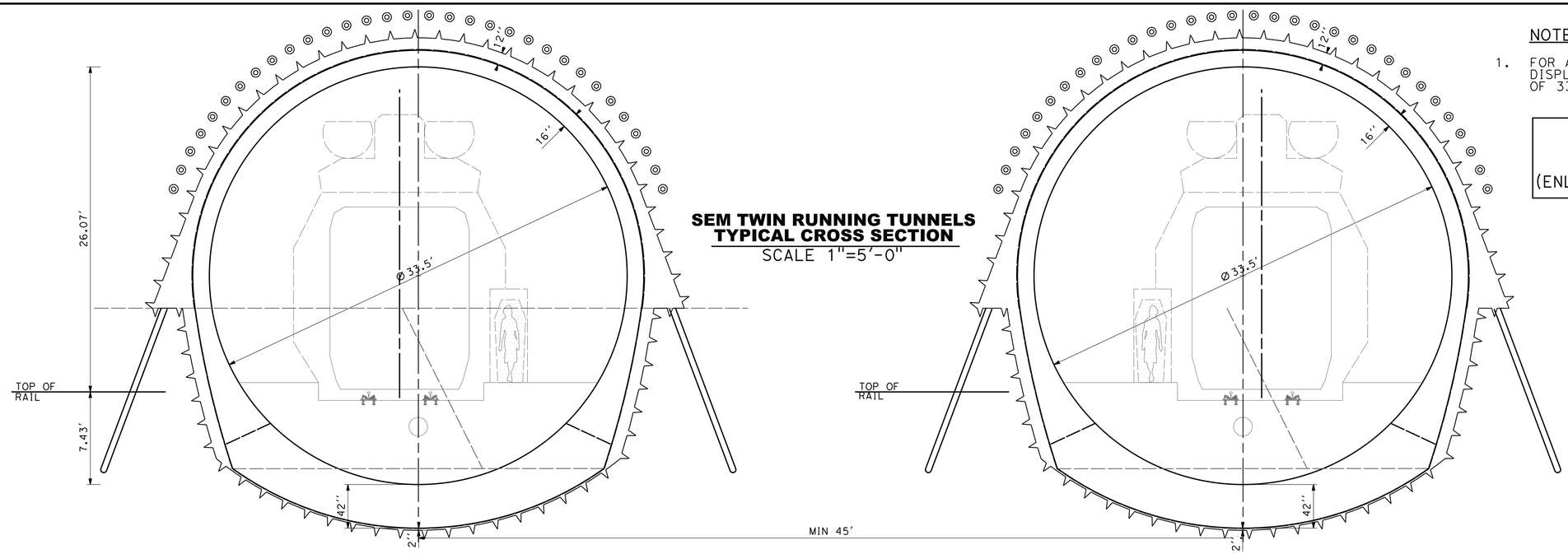
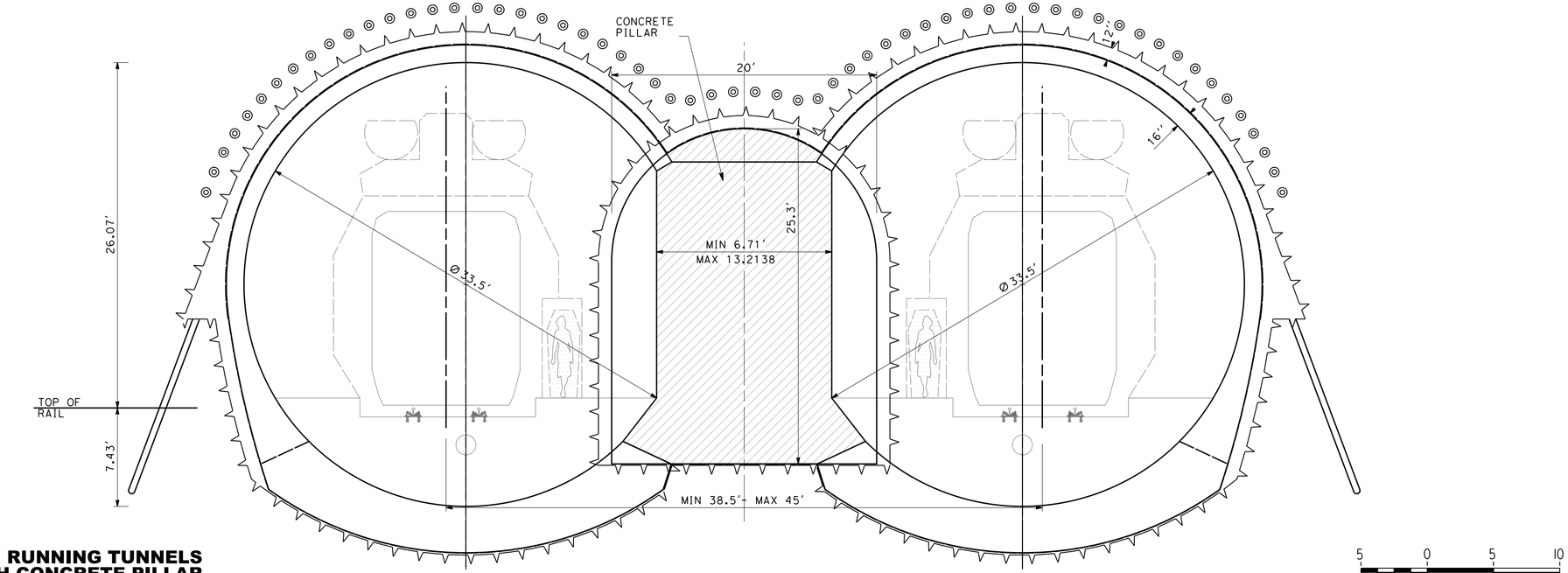


SEM TWIN RUNNING TUNNELS
TYPICAL CROSS SECTION
SCALE 1"=5'-0"

NOTES:

1. FOR ALIGNMENT E2, TRACK REALIGNMENT DUE TO FAULT DISPLACEMENT REQUIRES AND ENLARGED TUNNEL DIAMETER OF 33.5 FT OVER THE NOMINAL 28 FT.

ALIGNMENT 2
SEM TWIN TUNNELS
& BIFURCATION ETD
(ENLARGED TUNNEL DIAMETER)



SEM RUNNING TUNNELS
WITH CONCRETE PILLAR
TYPICAL CROSS-SECTION
SCALE 1"=5'-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E2
SEM TUNNELS
TWIN TUNNELS AND BIFURCATION
TYPICAL CROSS SECTIONS

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0904
SCALE AS SHOWN
SHEET NO.

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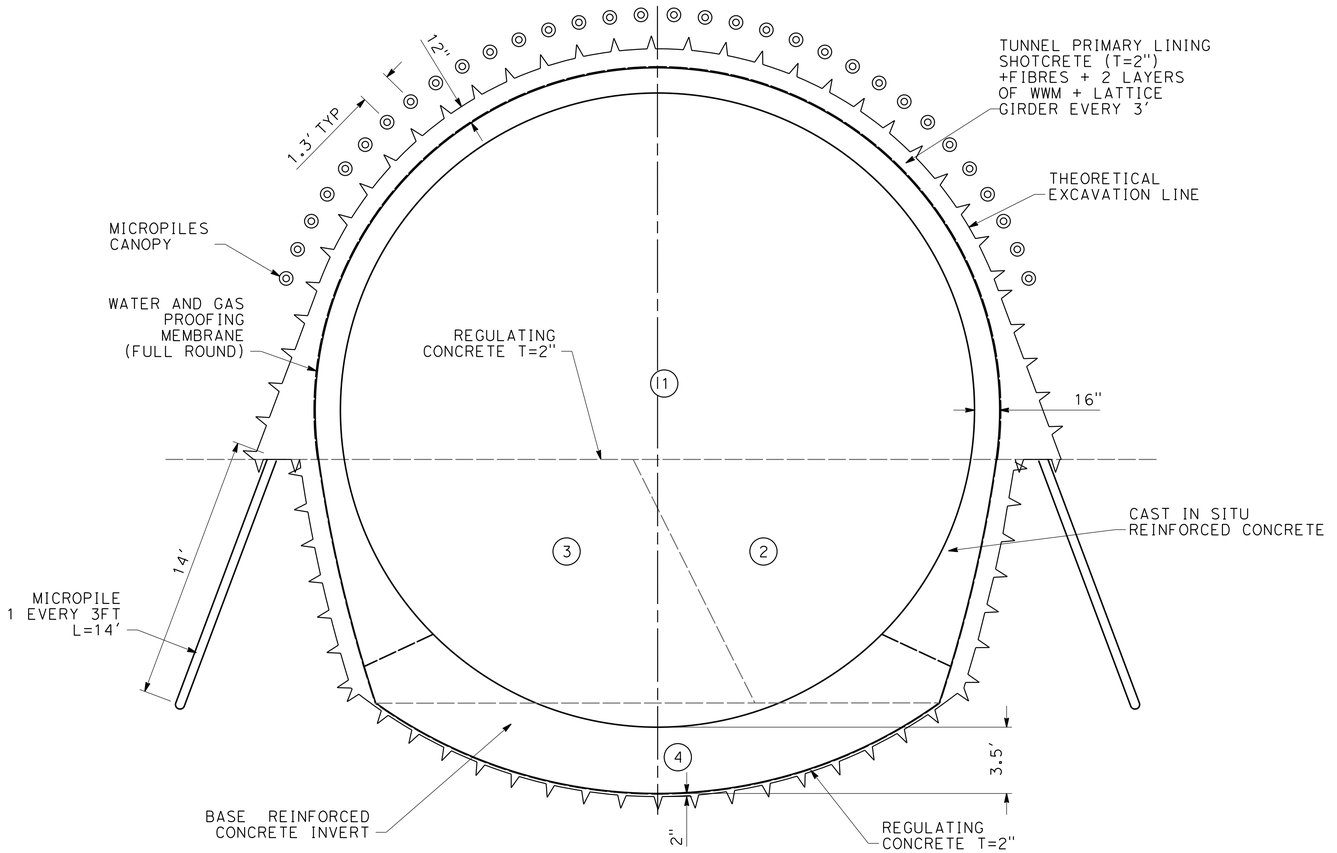
BASIC QUANTITIES PER FT OF TUNNEL	
SEM TWIN TUNNELS	PRIMARY LINING TYPE
	SOIL QUALITY *
EXCAVATION AREA (SQ.FT.)	1241
PRIMARY LINING AREA (SQ.FT.)	105
REGULATING CONCRETE (2 in) (SQ.FT.)	6
LATTICE GIRDER (FT)	90/3=30
WATER & GAS PROOFING MEMBRANE (FT)	110
FORMWORK (FT)	79
SECONDARY LINING AREA CONCRETE (sides&crown) (SQ.FT.)	128
SECONDARY LINING AREA CONCRETE (invert) (SQ.FT.)	121
MICROPILES UMBRELLA (FT)	43
MICROPILES FOR ELEPHANT'S FOOT (FT)	9.5

PHASE	DESCRIPTION
1	-MICROPILES CANOPY INSTALLATION (EVERY 30`) -EXCAVATION OF TOP HEADING AND APPLICATION OF STABILIZATION LAYER OF SHOTCRETE. -INSTALLATION OF UNDERPINNING AND LATTICE GIRDER. -SPRAYING REINFORCED SHOTCRETE +2 LAYERS WWM. SPRAYING OF REGULATING CONCRETE.
2/3	-BENCH 2/3 EXCAVATION. APPLICATION OF STABILIZATION SHOTCRETE -EXTENSION OF LATTICE GIRDER AND SPRAYING OF REINFORCED SHOTCRETE + 2 LAYERS OF WWM.
4	-EXCAVATION OF INVERT -SPRAYING OF REGULATING CONCRETE INVERT
5	-INSTALLATION OF WATER AND GAS PROOFING MEMBRANE
6	-INSTALLATION OF INNER (SECONDARY) LINING (FIRST, INNER; SECOND, SIDES AND CROWN

PRIMARY LINING (EXAMPLE ONLY, NOT ACTUAL DESIGN)						
DENOMINATION	SHOTCRETE THICKNESS (in)	STEEL ARCHES	FIBRES & WWM	ADVANCE LENGTH (ft)	ROCKBOLT PATTERN AND LENGTH (ft)	PIPE UMBRELLA
*SOIL QUALITY	12	LATTICE GIRDER	FIBRES & 2 LAYERS WWM	3' TOP HEADING AND BENCH	-	YES

* FINE-MEDIUM GRAIN SAND WITH SILT. DENSE TO VERY DENSE.
NO GROUNDWATER EXPECTED.



SEM TWIN RUNNING TUNNELS TYPICAL GEOMETRY AND PRIMARY LINING

NOTES:

1. TWIN SEM TUNNELS ARE AND OPTION FOR TUNNELS IN BURBANK AREA (ONLY E2 ALIGNMENT)
2. **THIS DRAWING IS NOT AN ACTUAL DESIGN. ITS PURPOSE IS TO BUILD UNIT PRICES AT PEPD LEVEL.**
3. EXCAVATION, GROUND SUPPORT, PILLAR WIDTH, DRAINAGE, TUNNEL LINING AND WATER AND GAS TIGHTNESS PROVISIONS TBD.
4. TYPICAL SUPPORT MEASURES AND INNER LINING THICKNESSES ARE GIVEN WITH ORIENTATIVE PURPOSES ONLY. ACTUAL DESIGN WILL REQUIRE RESULTS OF ADEQUATE GEOTECHNICAL INVESTIGATION.
5. EXCAVATION SEQUENCE AND PHASE (INCLUDING A POSSIBLE SUBDIVISION OF THE TOP HEADING) MUST BE REVISITED WHEN ADEQUATE GEOTECHNICAL INFORMATION IS AVAILABLE.
6. ADDITIONAL GROUND TREATMEN IN LIEU OF GROUND IMPROVEMENT MIGHT BE ADDED WHEN ADDITIONAL GEOTECHNICAL INFORMATION IS AVAILABLE AND EXPECTED GROUND CONDITIONS MAKES IT NECCESARY TO ACHIEVE SAFE EXCAVATION CONDITIONS.
7. THE SECTIONS SHOWN ON THIS DRAWING ARE ONLY APPLICABLE IN THE SOIL QUALITY CONDITIONS SHOWN.
8. TUNNELS DIMENSIONS ACCORDING TO USUAL MACHINERY USED IN MINED TUNNELS THESE DIMENSIONS MUST BE ADJUSTED TO THE MACHINERY THAT WILL BE USED IN CONSTRUCTION.
9. 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 W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E2
SEM SINGLE TUNNEL, 1 TRACK
CLEARANCE DIAGRAM - TANGENT TRACK

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0905
SCALE AS SHOWN
SHEET NO.

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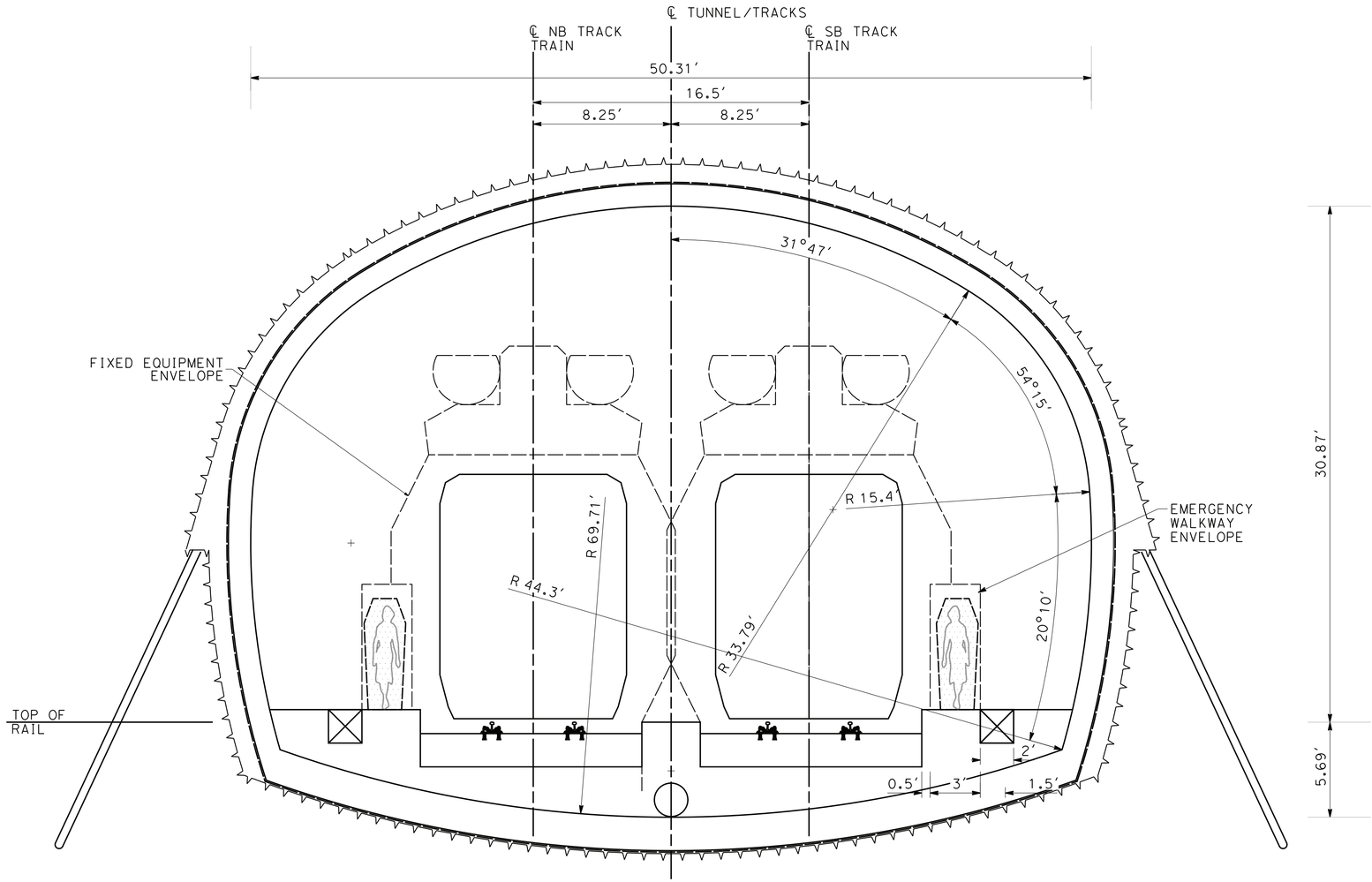
24/05/2021 16:23:35
0205510

NOTES:

1. SINGLE MINED TUNNEL, DOUBLE TRACK IS AN OPTION FOR SHORT TUNNELS AT BURBANK AREA.
2. EXCAVATION, GROUND SUPPORT, DRAINAGE, TUNNEL LINING AND WATER AND GAS TIGHTNESS PROVISIONS TBD.
3. FOR EQUIPMENT STRUCTURE GAUGES, REFER TO DRAWINGS TN-C0004 TO TN-C0007.
4. SPACE PROOFING REQUIRES FARTHER STUDY TO EVALUATE DYNAMIC AIRFLOW/PRESSURE LEVELS UNDER HIGH SPEED OPERATING CONDITIONS, AND TO FARTHER DEFINE SPACE ALLOTED FOR STRUCTURES, EQUIPMENT, DRAINAGE AND EGRESS.
5. EMERGENCY EGRESS SHALL NOT BE FARTHER THAN 2500 FT APART (NFPA 130).
6. CROSS-SECTION SHOWN HAS A FREE TUNNEL CROSS-SECTIONAL AREA OF 1358 SQ FT, COMPLIANT WITH THE MINIMUM AREA OF 2x595 SQ FT REQUIRED FOR 220 MPH DESIGN SPEED AND TUNNEL LENGTH FROM 0.6 TO 22 MILES (REF. TN 2.42-C). OTHER TUNNEL LENGTH REQUIRES A DIFFERENT MINIMUM FREE CROSS-SECTIONAL AREA.
7. SPACE PROOFING REQUIRES FARTHER STUDY TO EVALUATE DYNAMIC AIRFLOW/PRESSURE LEVELS UNDER HIGH SPEED OPERATING CONDITIONS, AND TO FARTHER DEFINE SPACE ALLOTED FOR STRUCTURES, EQUIPMENT, DRAINAGE AND EGRESS.

ALIGNMENT E2
SEM SINGLE TUNNEL
2 TRACKS
ETD (Enlarged
Tunnel Diameter)



TUNNEL TYPICAL SECTION
SEM SINGLE TUNNEL
TANGENT ETD

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

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET
REV 02

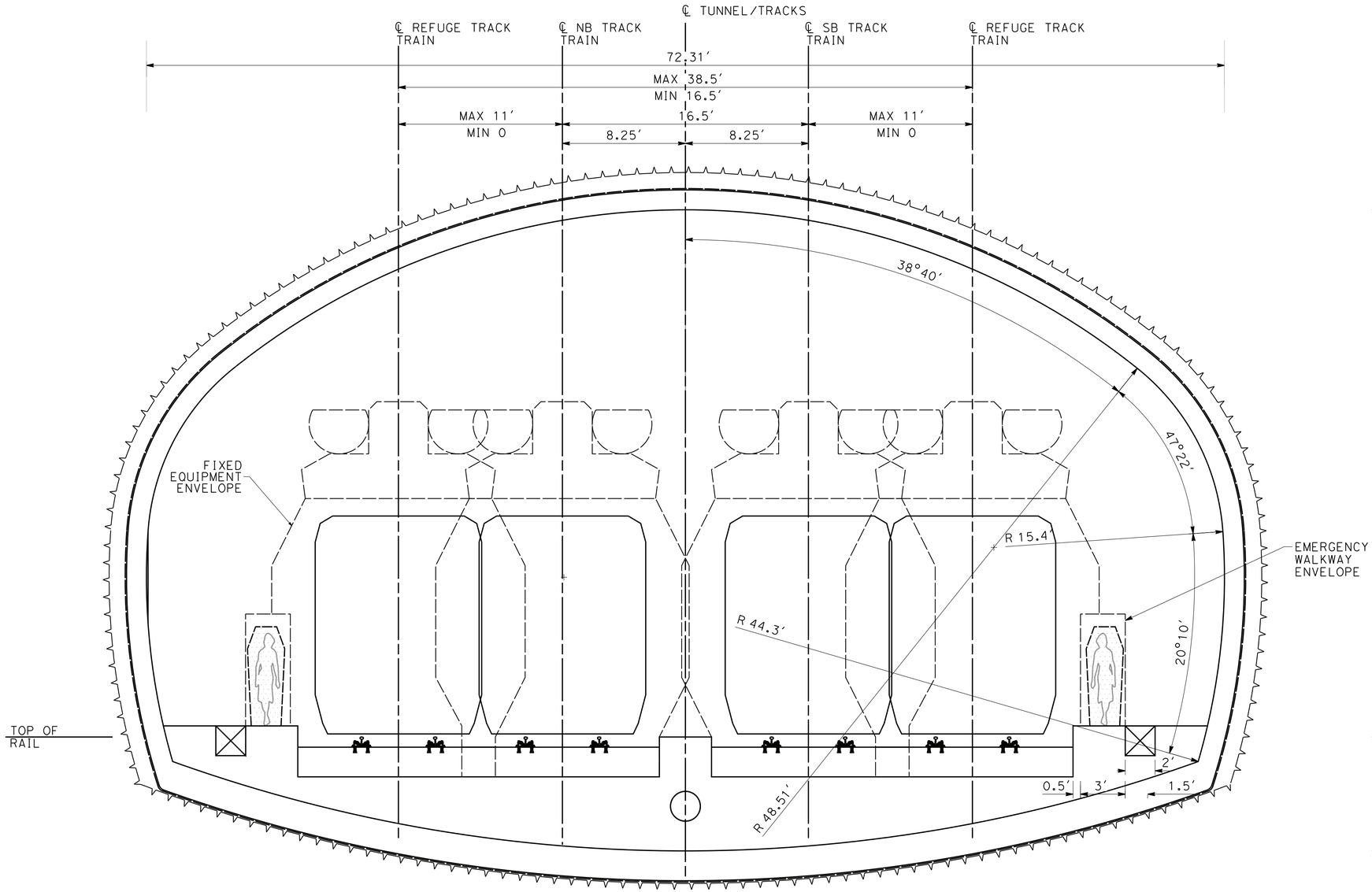
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E2
TUNNEL TYPICAL SECTION AND DETAILS
SEM SINGLE TUNNEL, 2 TRACKS ETD
CLEARANCE DIAGRAM - TANGENT TRACK

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0906
SCALE AS SHOWN
SHEET NO.



NOTES:

1. SINGLE MINED TUNNEL, DOUBLE TRACK IS AN OPTION FOR SHORT TUNNELS AT BURBANK AREA.
2. EXCAVATION, GROUND SUPPORT, DRAINAGE, TUNNEL LINING AND WATER AND GAS TIGHTNESS PROVISIONS TBD.
3. FOR EQUIPMENT STRUCTURE GAUGES, REFER TO DRAWINGS TN-C0004 TO TN-C0007.
4. SPACE PROOFING REQUIRES FARTHER STUDY TO EVALUATE DYNAMIC AIRFLOW/PRESSURE LEVELS UNDER HIGH SPEED OPERATING CONDITIONS, AND TO FARTHER DEFINE SPACE ALLOTED FOR STRUCTURES, EQUIPMENT, DRAINAGE AND EGRESS.
5. EMERGENCY EGRESS SHALL NOT BE FARTHER THAN 2500 FT APART (NFPA 130).
6. CROSS-SECTION SHOWN HAS A FREE TUNNEL CROSS-SECTIONAL AREA OF 1358 SQ FT, COMPLIANT WITH THE MINIMUM AREA OF 2x595 SQ FT REQUIRED FOR 220 MPH DESIGN SPEED AND TUNNEL LENGTH FROM 0.6 TO 22 MILES (REF. TN 2.42-C). OTHER TUNNEL LENGTH REQUIRES A DIFFERENT MINIMUM FREE CROSS-SECTIONAL AREA.
7. SPACE PROOFING REQUIRES FARTHER STUDY TO EVALUATE DYNAMIC AIRFLOW/PRESSURE LEVELS UNDER HIGH SPEED OPERATING CONDITIONS, AND TO FARTHER DEFINE SPACE ALLOTED FOR STRUCTURES, EQUIPMENT, DRAINAGE AND EGRESS.

ALIGNMENT E2
SEM SINGLE TUNNEL
4 TANGENT TRACKS
ETD

TUNNEL TYPICAL SECTION
SEM SINGLE TUNNEL (4 TANGENT TRACKS)
ETD

4 0 4 8
1"=4′-0"

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

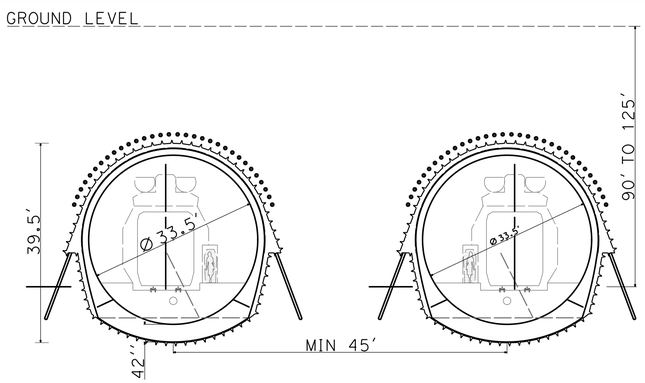
NOT FOR CONSTRUCTION

SENER

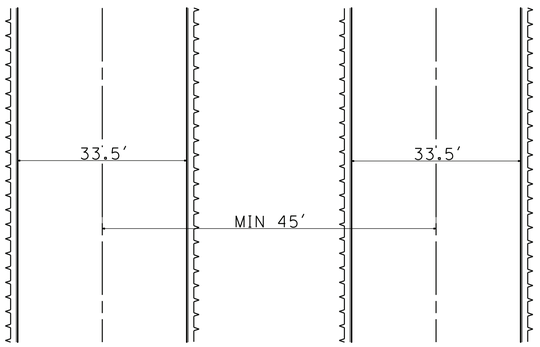
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E2
TUNNEL TYPICAL SECTION AND DETAILS
SEM SINGLE TUNNEL, 4 TRACKS ETD
CLEARANCE DIAGRAM - TANGENT TRACK

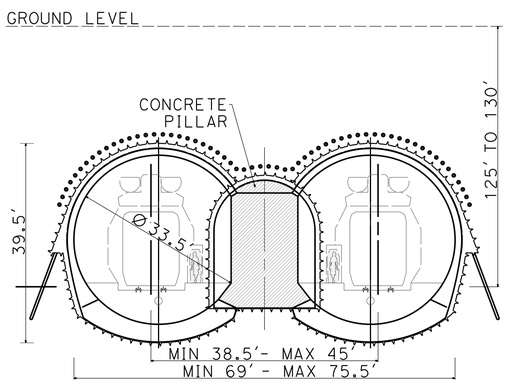
CONTRACT NO. HSR14-42
DRAWING NO. TN-C0907
SCALE AS SHOWN
SHEET NO.



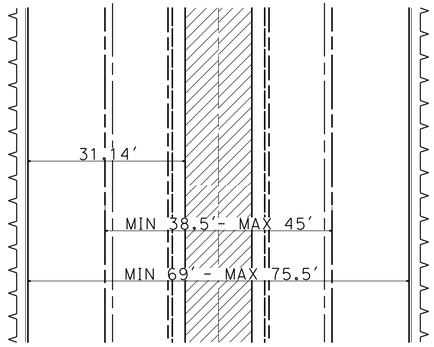
SECTION A
SCALE 1"=15'-0"



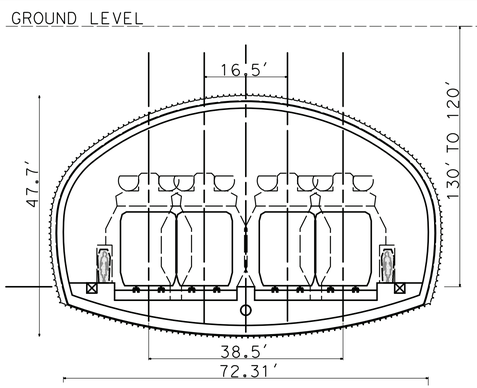
LAYOUT A
SCALE 1"=15'-0"



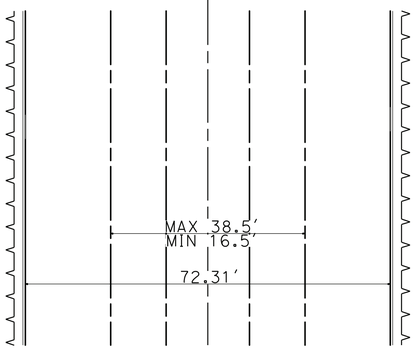
SECTION B
SCALE 1"=15'-0"



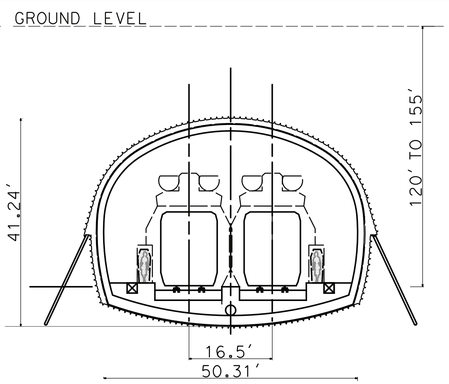
LAYOUT B
SCALE 1"=15'-0"



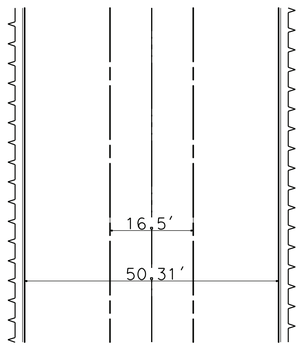
SECTION C
SCALE 1"=15'-0"



LAYOUT C
SCALE 1"=15'-0"



SECTION D
SCALE 1"=15'-0"

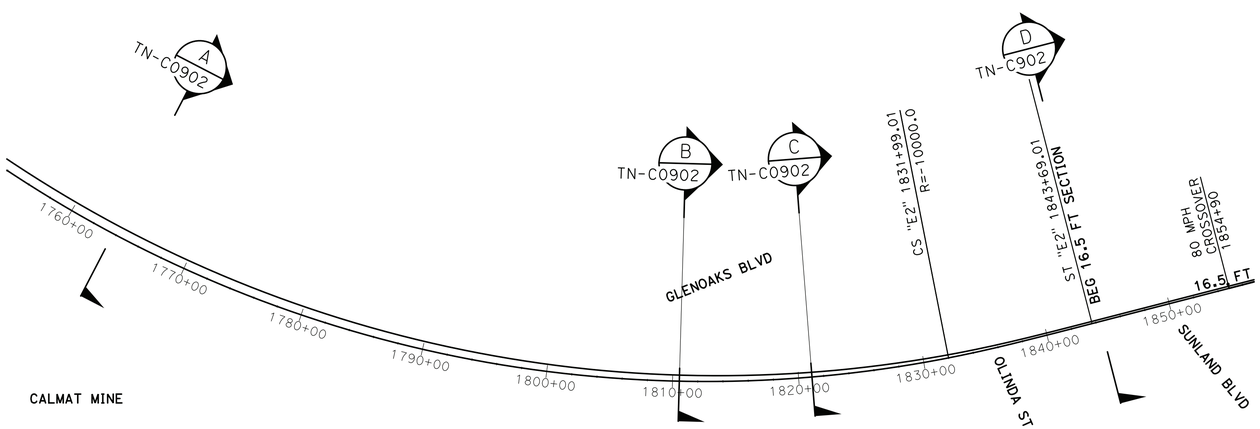


LAYOUT D
SCALE 1"=15'-0"

NOTES:

1. SEM TUNNELS TRANSITION BIFURCATION FROM STA. 1810+40 TO STA 1820+90 APPROX.
2. MINIMUM GROUND PILLAR WIDTH BETWEEN TUNNELS 16.5 FT TO 26 FT. OTHERWISE INCLUDE CONCRETE PILLAR.
3. FOR WIDTH BETWEEN TUNNELS' AXIS FROM 16.5' TO 38.5' IT WILL BE USED SECTION C. WHEN WIDTH IS REDUCED TO 16.5' SECTION D WILL APPLY.

ALIGNMENT E2
TRANSITION FROM SEM TWIN TUNNELS TO SEM SINGLE TUNNEL



TUNNEL	STATION
SEM TWIN RUNNING TUNNELS (A)	FROM 1764+48.75 TO 1810+40
SEM RUNNING TUNNELS WITH CONCRETE PILLAR (B)	FROM 1810+40 TO 1820+900
SEM SINGLE TUNNEL (2 TANGENT TRACKS SEPARATED FROM 16.5' TO 38.5') (C)	FROM 1820+90 TO 1843+79
SEM SINGLE TUNNEL TANGENT ETD (D)	FROM 1843+79 TO 1899+90

PLAN
SCALE 1"=300'-0"

15 0 15 30
1"=15'-0"

300 0 300 600
1"=300'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

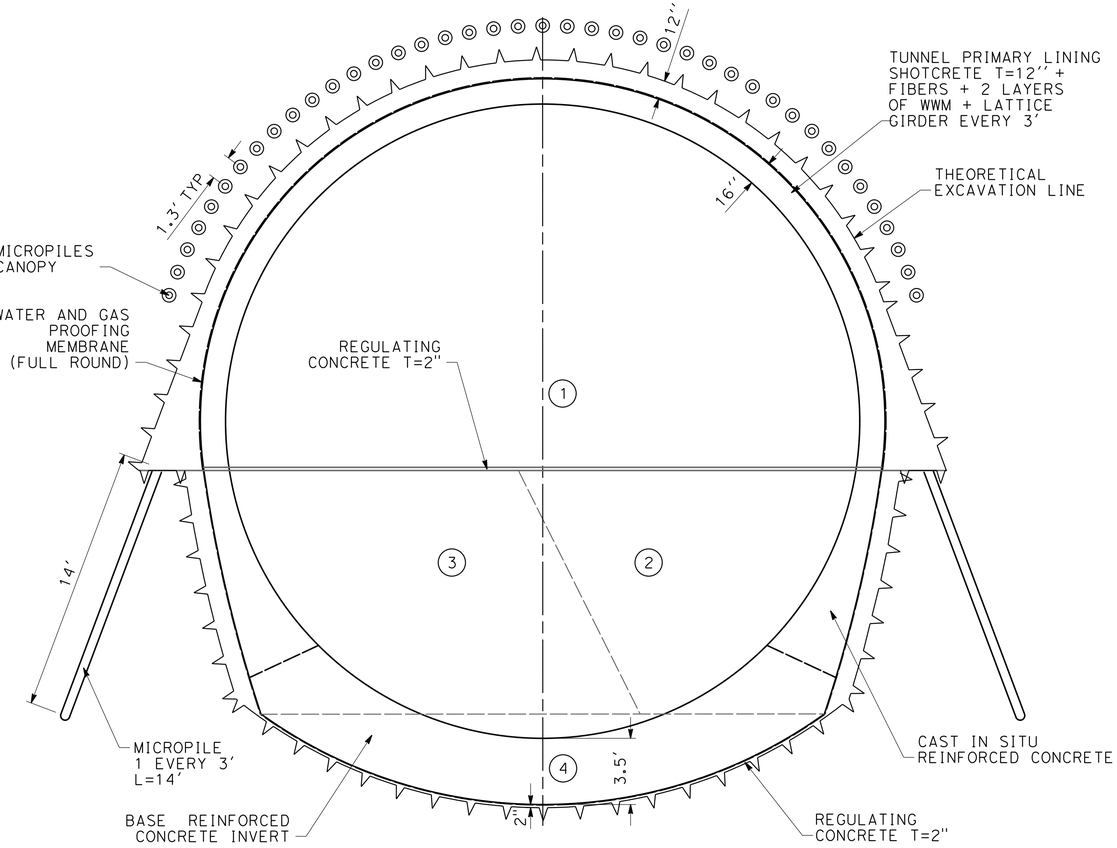
CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E2
SEM TUNNELS IN BURBANK
PLAN LAYOUT AND SECTIONS

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0908
SCALE AS SHOWN
SHEET NO.

BASIC QUANTITIES PER FT OF TUNNEL	
SEM TWIN TUNNELS	PRIMARY LINING TYPE
	SOIL QUALITY *
EXCAVATION AREA (SQ.FT.)	1241
PRIMARY LINING AREA (SQ.FT.)	105
REGULATING CONCRETE (2 in) (SQ.FT.)	6
LATTICE GIRDER (FT)	90/3=30
WATER & GAS PROOFING MEMBRANE (FT)	120
FORMWORK (FT)	79
SECONDARY LINING AREA CONCRETE (sides&crown) (SQ.FT.)	128
SECONDARY LINING AREA CONCRETE (invert) (SQ.FT.)	121
MICROPILES CANOPY (FT)	55
MICROPILES FOR ELEPHANT'S FOOT (FT)	9.5

PRIMARY LINING (EXAMPLE ONLY, NOT ACTUAL DESIGN)					
DENOMINATION	SHOTCRETE THICKNESS (in)	STEEL ARCHES	REINFORCEMENT	ADVANCE LENGTH (ft)	PIPE CANOPY
*SOIL CONDITIONS	12	LATTICE GIRDER EVERY 3'	FIBRES & 2 LAYERS WWM	3' TOP HEADING AND PHASE1 6' BENCH	YES

*FINE-MEDIUM GRAIN SAND WITH SILT DENSE TO VERY DENSE. NO GROUNDWATER EXPECTED.



PHASE	DESCRIPTION
1	-MICROPILES CANOPY INSTALLATION (EVERY 30`) -EXCAVATION OF TOP HEADING AND APPLICATION OF STABILIZATION LAYER OF SHOTCRETE. -INSTALLATION OF LATTICE GIRDER. -SPRAYING REINFORCED SHOTCRETE +2 LAYERS WWM. SPRAYING OF REGULATING CONCRETE. -UNDERPINNING OF ELEPHANT'S FOOT.
2/3	-BENCH 2/3 EXCAVATION. APPLICATION OF STABILIZATION SHOTCRETE -EXTENSION OF LATTICE GIRDER AND SPRAYING OF REINFORCED SHOTCRETE + 2 LAYERS OF WWM.
4	-EXCAVATION OF INVERT -SPRAYING OF REGULATING CONCRETE INVERT
5	-INSTALLATION OF WATER AND GAS PROOFING MEMBRANE
6	-INSTALLATION OF INNER (SECONDARY) LINING (FIRST, INVERT; SECOND, SIDES AND CROWN

NOTES:

1. TWIN SEM TUNNELS ARE AND OPTION FOR TUNNELS IN BURBANK AREA (ONLY E2 ALIGNMENT)
2. THIS DRAWING IS NOT AN ACTUAL DESIGN. ITS PURPOSE IS TO BUILD UNIT PRICES AT PEPD LEVEL.
3. EXCAVATION, GROUND SUPPORT, DRAINAGE, TUNNEL LINING AND WATER AND GAS TIGHTNESS PROVISIONS TBD.
4. TYPICAL SUPPORT MEASURES AND INNER LINING THICKNESS ARE GIVEN WITH ORIENTATIVE PURPOSES ONLY. ACTUAL DESIGN WILL REQUIRE RESULTS OF ADEQUATE GEOTECHNICAL INVESTIGATION.
5. EXCAVATION SEQUENCE AND PHASE (INCLUDING A POSSIBLE SUBDIVISION OF THE TOP HEADING) MUST BE REVISITED WHEN ADEQUATE GEOTECHNICAL INFORMATION IS AVAILABLE.
6. ADDITIONAL GROUND TREATMENT IN LIEU OF GROUND IMPROVEMENT MIGHT BE ADDED WHEN ADDITIONAL GEOTECHNICAL INFORMATION IS AVAILABLE AND EXPECTED GROUND CONDITIONS MAKES IT NECCESARY TO ACHIEVEN SAFE EXCAVATION CONDITIONS.
7. THE SECTION SHOWN ON THIS DRAWING IS ONLY APPLICABLE IN THE SOIL QUALITY CONDITIONS INDICATED.
8. TUNNELS DIMENSIONS ACCORDING TO USUAL MACHINERY USED IN MINED TUNNELS THESE DIMENSIONS MUST BE ADJUSTED TO THE MACHINERY THAT WILL BE USED IN CONSTRUCTION.
9. 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.

SEM TWIN RUNNING TUNNELS TYPICAL GEOMETRY AND PRIMARY LINING

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

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E2
SEM TWIN TUNNELS
CONSTRUCTION SEQUENCE AND SUPPORT MEASURES

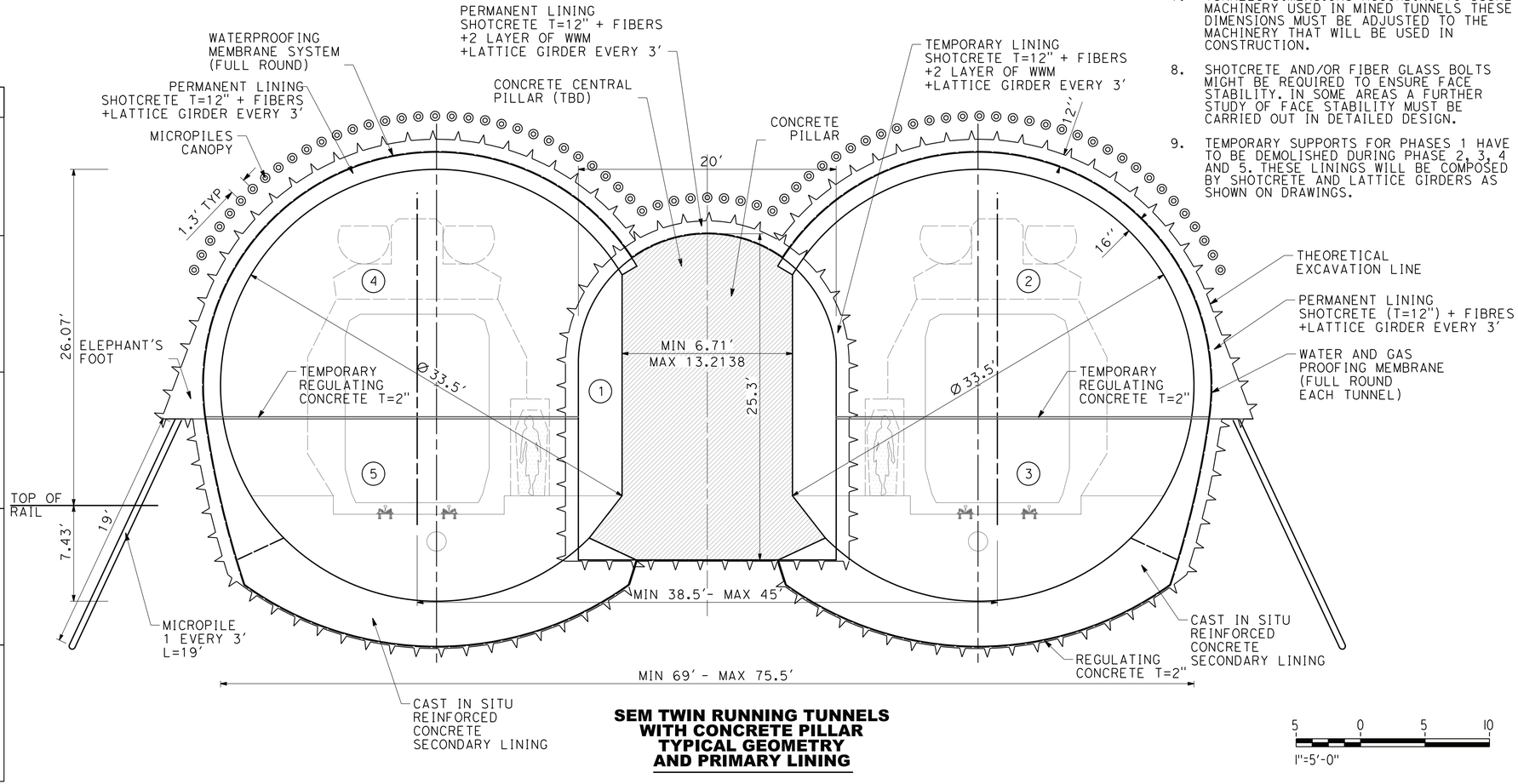
CONTRACT NO. HSR14-42
DRAWING NO. TN-C0909
SCALE AS SHOWN
SHEET NO.

BASIC QUANTITIES PER FT OF TUNNEL	
SEM TWIN TUNNELS WITH CENTRAL PILLAR	PRIMARY LINING TYPE
	SOIL QUALITY *
	MIN./MAX. VALUE
EXCAVATION AREA (SQ.FT.)	2460 / 2625
PRIMARY LINING AREA (SQ.FT.)	144 / 152
REGULATING CONCRETE (2 in) (SQ.FT.)	20.6 / 22.3
TEMPORARY LATTICE GIRDER (FT) (per tunnel)	27.6(x2/3)= 6.9 / 24.9(x2/3)= 7.4
WATER & GAS PROOFING MEMBRANE (FT)	200.8/215.8
FORMWORK (FT) (per tunnel)	78.1 (x2)
SECONDARY LINING AREA CONCRETE (per tunnel) (SQ.FT.)	209.8 (x2)
CONCRETE PILLAR (SQ.FT.)	176.7 / 333.2
DEFINITIVE LATTICE GIRDER (FT)	128.5/3=42.8 / 137/3=45.7
MICROPILES FOR ELEPHANT'S FOOT (FT)	13
TEMPORARY SHOTCRETE LINING (SQ.FT.)	28 (x2) / 25.3 (x2)
MICROPILES CANOPY (FT)	89 / 97

PRIMARY LINING (EXAMPLE ONLY, NOT ACTUAL DESIGN)					
DENOMINATION	SHOTCRETE THICKNESS (in)	STEEL ARCHES	REINFORCEMENT	ADVANCE LENGTH (ft)	PIPE CANOPY
*SOIL CONDITIONS	12	LATTICE GIRDER EVERY 3'	FIBRES & 2 LAYERS WWM	3' TOP HEADING AND PHASE1 6' BENCH	YES

*FINE-MEDIUM GRAIN SAND WITH SILT DENSE TO VERY DENSE. NO GROUNDWATER EXPECTED.

PHASE	DESCRIPTION
1	-MICROPILES CANOPY INSTALLATION (EVERY 30') FOR PHASE 1 -EXCAVATION OF PHASE 1 AND APPLICATION OF A STABILIZATION LAYER OF SHOTCRETE. -INSTALLATION OF TEMPORAL LATTICE GIRDERS OF PHASE 1. -SPRAYING OF REINFORCING SHOTCRETE + 2 LAYERS OF WWM. -INSTALLATION OF CONCRETE PILLAR.
2	-MICROPILES CANOPY INSTALLATION (EVERY 30') FOR PHASE 2 -EXCAVATION OF PHASE 2 AND APPLICATION OF A STABILIZATION LAYER OF SHOTCRETE. -PARTIAL DEMOLITION OF PHASE 1 TEMPORAL SUPPORT. -INSTALLATION OF UNDERPINNING AND DEFINITVE LATTICE GIRDERS OF PHASE 2. -SPRAYING OF REINFORCING SHOTCRETE + 2 LAYERS OF WWM.
3	-EXCAVATION OF PHASE 3, AND APPLICATION OF A STABILIZATION LAYER OF SHOTCRETE. -INSTALLATION OF LATTICE GIRDERS OF PHASE 3. -SPRAYING OF REINFORCING SHOTCRETE + 2 LAYERS OF WWM. -INSTALLATION OF WATER AND GAS PROOFING MEMBRANE. -INSTALLATION OF INNER LINING (SECONDARY). FIRST INVERT AND SECOND SIDE AND CROWN.
4	-MICROPILES CANOPY INSTALLATION (EVERY 30') FOR PHASE 4 -EXCAVATION OF PHASE 4 AND APPLICATION OF A STABILIZATION LAYER OF SHOTCRETE. -PARTIAL DEMOLITION OF PHASE 1 TEMPORAL SUPPORT. -INSTALLATION OF UNDERPINNING AND DEFINITVE LATTICE GIRDERS OF PHASE 4. -SPRAYING OF REINFORCING SHOTCRETE + 2 LAYERS OF WWM.
5	-EXCAVATION OF PHASE 5, AND APPLICATION OF A STABILIZATION LAYER OF SHOTCRETE. -INSTALLATION OF LATTICE GIRDERS OF PHASE 5. -SPRAYING OF REINFORCING SHOTCRETE + 2 LAYERS OF WWM. -INSTALLATION OF WATER AND GAS PROOFING MEMBRANE -INSTALLATION OF INNER LINING (SECONDARY). FIRST INVERT AND SECOND SIDE AND CROWN.



SEM TWIN RUNNING TUNNELS WITH CONCRETE PILLAR TYPICAL GEOMETRY AND PRIMARY LINING

1"=5'-0"

NOTES:

1. TWIN SEM TUNNELS ARE AND OPTION FOR TUNNELS IN BURBANK AREA (ONLY E2 ALIGNMENT)
2. THIS DRAWING IS NOT AN ACTUAL DESIGN. ITS PURPOSE IS TO BUILD UNIT PRICES AT PEPD LEVEL.
3. TYPICAL SUPPORT MEASURES AND INNER LINING THICKNESSES ARE GIVEN WITH ORIENTATIVE PURPOSES ONLY. ACTUAL DESIGN WILL REQUIRE RESULTS OF ADEQUATE GEOTECHNICAL INVESTIGATION.
4. THE SECTIONS SHOWN ON THIS DRAWING ARE ONLY APPLICABLE IN THE SOIL CONDITIONS SHOWN.
5. EXCAVATION SEQUENCE AND PHASES (INCLUDING A POSSIBLE SUBDIVISION OF THE TOP HEADING) MUST BE REVISITED WHEN ADEQUATE GEOTECHNICAL INFORMATION IS AVAILABLE.
6. ADDITIONAL GROUND TREATMENT IN LIEU OF GROUND IMPROVEMENT MIGHT BE ADDED WHEN ADDITIONAL GEOTECHNICAL INFORMATION IS AVAILABLE AND EXPECTED GROUND CONDITIONS MAKES IT NECCESARY TO ACHIEVE SAFE EXCAVATION CONDITIONS.
7. TUNNELS DIMENSIONS ACCORDING TO USUAL MACHINERY USED IN MINED TUNNELS THESE DIMENSIONS MUST BE ADJUSTED TO THE MACHINERY THAT WILL BE USED IN CONSTRUCTION.
8. 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.
9. TEMPORARY SUPPORTS FOR PHASES 1 HAVE TO BE DEMOLISHED DURING PHASE 2, 3, 4 AND 5. THESE LININGS WILL BE COMPOSED BY SHOTCRETE AND LATTICE GIRDERS AS SHOWN ON DRAWINGS.

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E2
SEM TWIN TUNNELS AND BIFURCATION
CONSTRUCTION SEQUENCE AND SUPPORT MEASURES

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0910
SCALE AS SHOWN
SHEET NO.

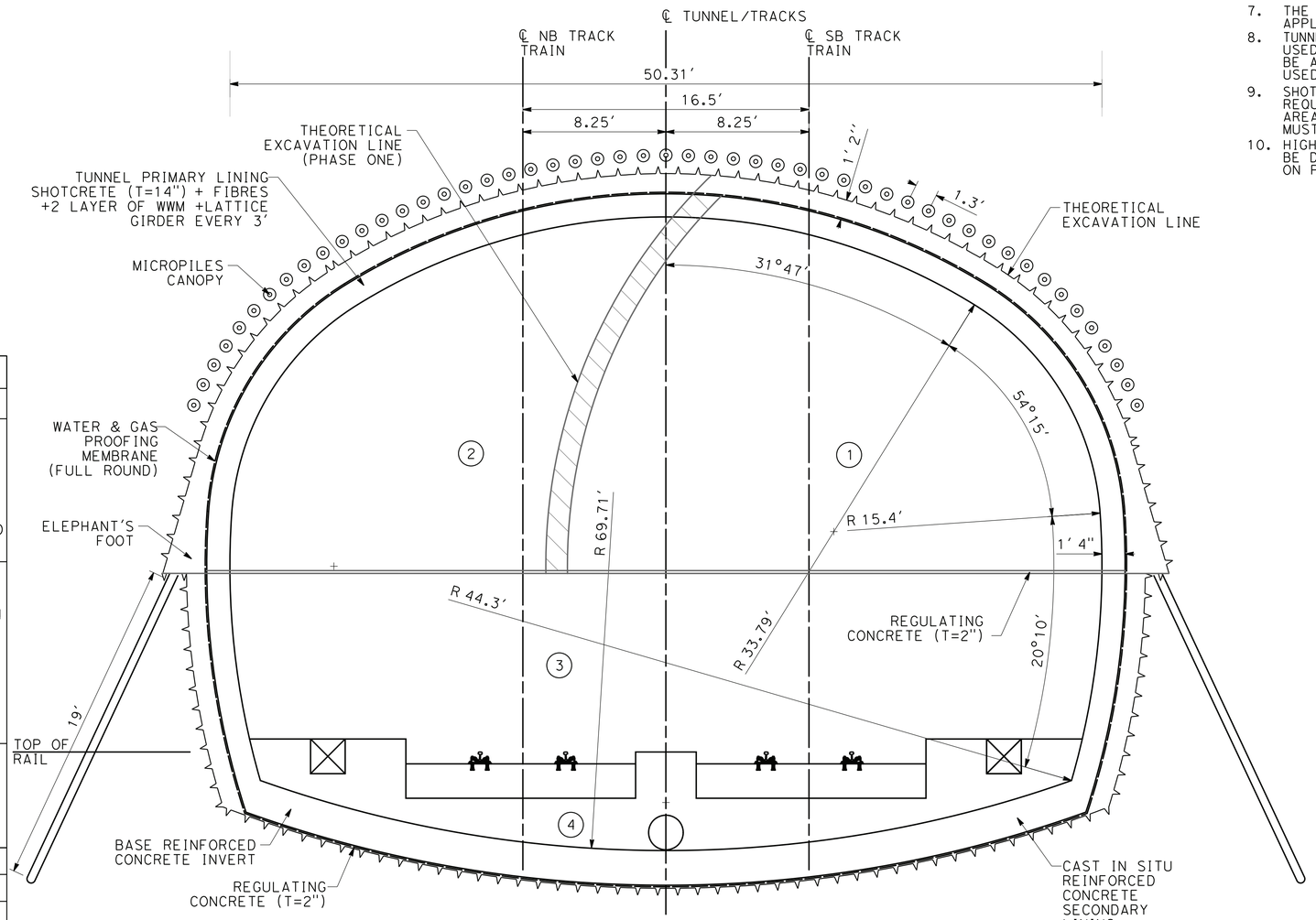
BASIC QUANTITIES PER FT OF TUNNEL	
SEM SINGLE TUNNEL	PRIMARY LINING TYPE
	SEM SINGLE TUNNEL
EXCAVATION AREA (SQ.FT.)	1932.5
TUNNEL PRIMARY LINING AREA (SQ.FT.)	141.8
REGULATING CONCRETE (2 in) (SQ.FT.) (INVERT)	9.4
LATTICE GIRDER (FT)	161/3=53.7
WATER & GAS PROOFING MEMBRANE (FT)	155.8
FORMWORK (FT)	98
SECONDARY LINING AREA CONCRETE (sides&crown) (SQ.FT.)	132.5
SECONDARY LINING AREA CONCRETE (invert) (SQ.FT.)	100.5
MICROPILES CANOPY (FT)	68
MICROPILES FOR ELEPHANT'S FOOT (FT)	19x2/3=13
PHASE 1 PRIMARY LINING (SQ.FT.)	31.8
PHASE 1 LATTICE GIRDER (FT)	25.6/3=8.5
PHASE 1 AND 2 (SQ.FT.) REGULATING CONCRETE	8.7

PRIMARY LINING (EXAMPLE ONLY, NOT ACTUAL DESIGN)					
DENOMINATION	SHOTCRETE THICKNESS (in)	STEEL ARCHES	FIBRES & WWM	ADVANCE LENGTH (ft)	PIPE CANOPY
*SOIL CONDITIONS	14	LATTICE GIRDER EVERY 3'	FIBRES & 2 LAYERS WWM	3' TOP HEADING AND PHASE1 6' BENCH	YES

*FINE-MEDIUM GRAIN SAND WITH SILT DENSE TO VERY DENSE. NO GROUNDWATER EXPECTED.

PHASE	DESCRIPTION
0	-MICROPILES CANOPY INSTALLATION (EVERY 30`)
1	-EXCAVATION OF PHASE 1 AND APPLICATION OF STABILIZATION LAYER OF SHOTCRETE. -INSTALLATION OF PHASE 1 LATTICE GIRDERS. -INSTALLATION OF PHASE 1 UNDERPINNING AT RIGHT TUNNEL SIDE. -SPRAYING OF REINFORCING SHOTCRETE + 2 LAYERS OF WWM AND SPRAYING OF REGULATING CONCRETE.
2	-EXCAVATION OF PHASE 2 AND APPLICATION OF STABILIZATION LAYER OF SHOTCRETE. -DEMOLITION OF PHASE 1 TEMPORAL SUPPORT AND INSTALLATION OF PHASE 2 LATTICE GIRDERS BY JOINING THE LATTICE GIDERS PLACED IN PHASES 1 AND 2. -INSTALLATION OF PHASE 2 UNDERPINNING AT LEFT TUNNEL SIDE. -SPRAYING OF REINFORCING SHOTCRETE + 2 LAYERS OF WWM & SPRAYING OF REGULATING CONCRETE.
3	-EXCAVATION OF PHASE 3 AND APPLICATION OF STABILIZATION LAYER OF SHOTCRETE. -EXTENSION OF LATTICE GIRDERS AT BOTH TUNNEL SIDES. -SPRAYING OF REINFORCING SHOTCRETE + 2 LAYERS OF WWM & SPRAYING OF REGULATING CONCRETE.
4	-EXCAVATION OF PHASE 4.
5	-INSTALLATION OF WATER AND GAS PROOFING MEMBRANE.
6	-INSTALLATION OF INNER (SECONDARY) LINING. (FIRST INVERT; SECOND SIDES & CROWN)

*NOTE: DISTANCE BETWEEN EXCAVATION PHASES TO BE DEFINED.



E2 ALIGNMENT
SEM SINGLE TUNNEL
2 TRACKS
ETD (Enlarged Tunnel Diameter)

TUNNEL TYPICAL SECTION SEM SINGLE TUNNEL TANGENT ETD

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

NOTES:

1. SINGLE SEM TUNNEL, DOUBLE TRACK IS AN OPTION FOR SHORT TUNNELS AT BURBANK AREA.
2. THIS DRAWING IS NOT ACTUAL DESIGN. ITS PURPOSE IS TO BUILD UNIT PRICES AT PEPD LEVEL.
3. EXCAVATION, GROUND SUPPORT, DRAINAGE, TUNNEL LINING AND WATER AND GAS TIGHTNESS PROVISIONS TBD.
4. TYPICAL SUPPORT MEASURES AND INNER LINING THICKNESSES ARE GIVEN WITH ORIENTATIVE PURPOSES ONLY. ACTUAL DESIGN WILL REQUIRE RESULTS OF ADEQUATE GEOTECHNICAL INVESTIGATION.
5. EXCAVATION SEQUENCE AND PHASE (INCLUDING A POSSIBLE SUBDIVISION OF THE TOP HEADING) MUST BE REVISITED WHEN ADEQUATE GEOTECHNICAL INFORMATION IS AVAILABLE.
6. ADDITIONAL GROUND TREATMENT IN LIEU OF GROUND IMPROVEMENT MIGHT BE ADDED WHEN ADDITIONAL GEOTECHNICAL INFORMATION IS AVAILABLE AND EXPECTED GROUND CONDITIONS MAKES IT NECCESARY TO ACHIEVE SAFE EXCAVATION CONDITIONS.
7. THE SECTION SHOWN ON THIS DRAWING IS ONLY APPLICABLE IN THE GROUND CONDITIONS SHOWN.
8. TUNNEL DIMENSIONS ACCORDING TO USUAL MACHINERY USED IN SEM TUNNELS. THESE DIMENSIONS MUST BE ADJUSTED TO THE MACHINERY THAT WILL BE USED IN CONSTRUCTION.
9. 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.
10. HIGHLIGTHED AREAS OF THIS SUPPORT HAVE TO BE DEMOLISHED DURING CONSTRUCTION AS SHOWN ON PHASE DESCRIPTION TABLE.

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E2
SEM SINGLE TUNNEL, 2 TRACKS ETD
CONSTRUCTION SEQUENCE AND SUPPORT MEASURES

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0911
SCALE AS SHOWN
SHEET NO.

0205510

24/05/2021 16:25:34

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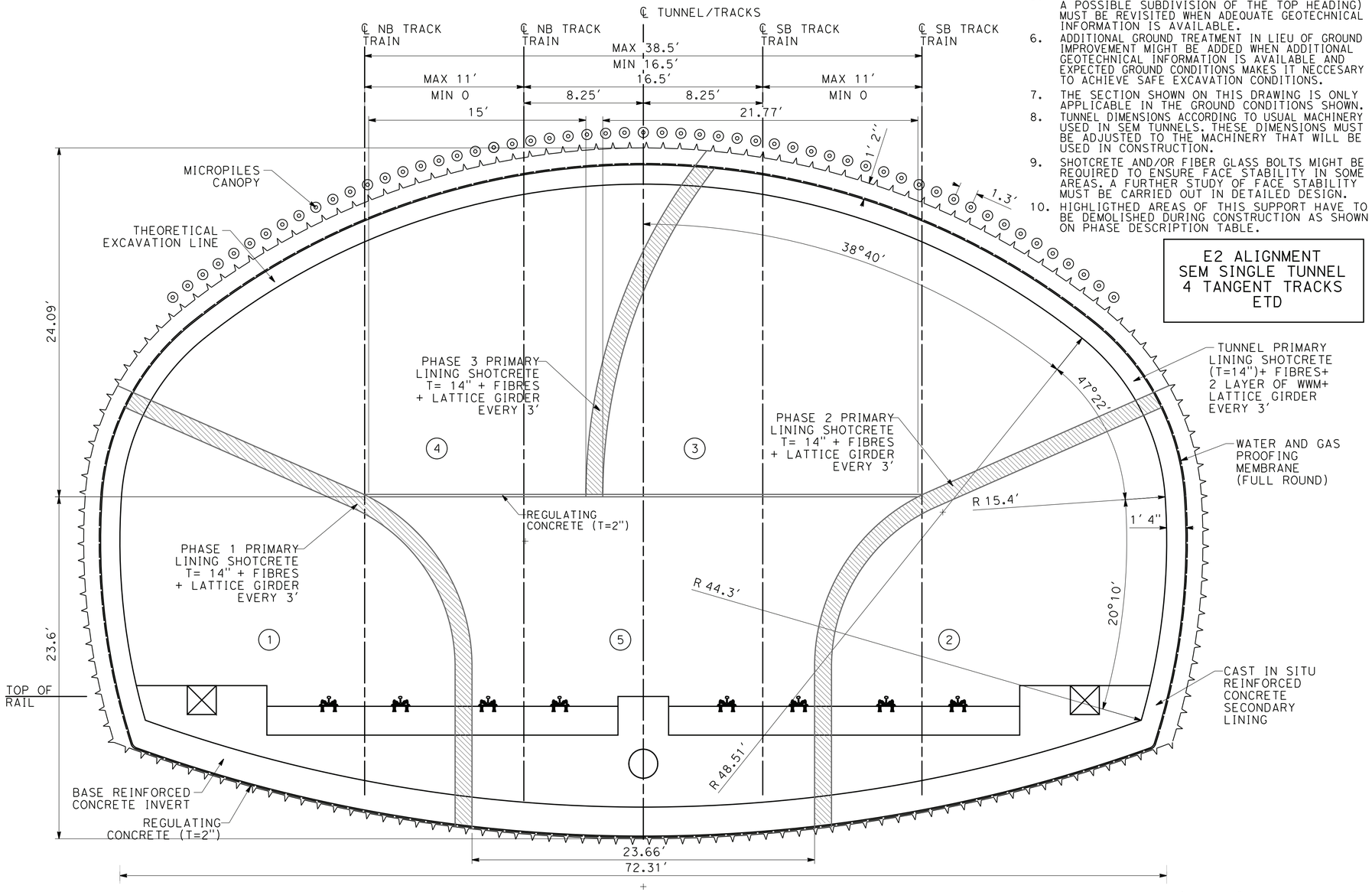
BASIC QUANTITIES PER FT OF TUNNEL	
SEM SINGLE TUNNEL	PRIMARY LINING TYPE
	SEM SINGLE TUNNEL
EXCAVATION AREA (SQ.FT.)	3043.5
TUNNEL PRIMARY LINING AREA (SQ.FT.)	166.8
REGULATING CONCRETE (2 in) (SQ.FT.) (INVERT)	13.5
LATTICE GIRDER (FT)	133.1/3=44.4
WATER & GAS PROOFING MEMBRANE (FT)	202.5
FORMWORK (FT)	122.1
SECONDARY LINING AREA CONCRETE (sides&crown) (SQ.FT.)	165
SECONDARY LINING AREA CONCRETE (invert) (SQ.FT.)	145.4
MICROPILES CANOPY (FT)	73
PHASE 1, 2 ,3 PRIMARY LINING (SQ.FT.)	127.7
PHASE 1, 2, 3 LATTICE GIRDER (FT)	115/3=38.3
PHASE 3 AND 4 (SQ.FT.) REGULATING CONCRETE	6.4

PRIMARY LINING (EXAMPLE ONLY, NOT ACTUAL DESIGN)					
DENOMINATION	SHOTCRETE THICKNESS (in)	STEEL ARCHES	REINFORCEMENT	ADVANCE LENGTH (ft)	PIPE CANOPY
*SOIL CONDITIONS	14	LATTICE GIRDER EVERY 3'	FIBRES & 2 LAYERS WWM	3' TOP HEADING AND PHASE1 6' BENCH	YES

*FINE-MEDIUM GRAIN SAND WITH SILT DENSE TO VERY DENSE. NO GROUNDWATER EXPECTED.

PHASE	DESCRIPTION
0	-MICROPILES CANOPY INSTALLATION (EVERY 30`)
1&2	-EXCAVATION OF PHASES 1 AND 2, AND APPLICATION OF A STABILIZATION LAYER OF SHOTCRETE. -INSTALLATION OF LATTICE GIRDERS OF PHASES 1 AND 2. -SPRAYING OF REINFORCING SHOTCRETE + 2 LAYERS OF WWM. -INSTALLATION OF WATER AND GAS PROOFING MEMBRANE. -INSTALLATION OF INNER LINING (SECONDARY). FIRST INVERT AND SECOND SIDE.
3	-EXCAVATION OF PHASE 3 AND APPLICATION OF A STABILIZATION LAYER OF SHOTCRETE. -INSTALLATION OF LATTICE GIRDERS OF PHASE 3. -SPRAYING OF REINFORCING SHOTCRETE + 2 LAYERS OF WWM. -INSTALLATION OF WATER AND GAS PROOFING MEMBRANE. -INSTALLATION OF INNER LINING (SECONDARY). FIRST INVERT AND SECOND SIDE.
4	-EXCAVATION OF PHASE 4, AND APPLICATION OF A STABILIZATION LAYER OF SHOTCRETE. -DEMOLITION OF TEMPORAL SUPPORT OF PHASE 3 AND INSTALLATION OF LATTICE GIRDERS OF PHASE 4. -SPRAYING OF REINFORCING SHOTCRETE + 2 LAYERS OF WWM. -DEMOLITION OF THE UPPER PART OF TEMPORAL SUPPORT OF PHASES 1 AND 2 -INSTALLATION OF WATER AND GAS PROOFING MEMBRANE. -INSTALLATION OF INNER LINING (SECONDARY) IN CROWN (PHASES 3 AND 4).
5	-EXCAVATION OF PHASE 5. -DEMOLITION OF THE UPPER PART OF TEMPORAL SUPPORT OF PHASES 1 AND 2 -INSTALLATION OF WATER AND GAS PROOFING MEMBRANE. -INSTALLATION OF INNER LINING (SECONDARY) IN INVERT.

*NOTE: DISTANCE BETWEEN EXCAVATION PHASES TO BE DEFINED.



TUNNEL TYPICAL SECTION SEM SINGLE TUNNEL ETD (2 TANGENT TRACKS SEPARATED FROM 16.5' TO 38.5')

NOTES:

1. SINGLE SEM TUNNEL, DOUBLE TRACK IS AN OPTION FOR SHORT TUNNELS AT BURBANK AREA.
2. THIS DRAWING IS NOT ACTUAL DESIGN. ITS PURPOSE IS TO BUILD UNIT PRICES AT PEPD LEVEL.
3. EXCAVATION, GROUND SUPPORT, DRAINAGE, TUNNEL LINING AND WATER AND GAS TIGHTNESS PROVISIONS TBD.
4. TYPICAL SUPPORT MEASURES AND INNER LINING THICKNESSES ARE GIVEN WITH ORIENTATIVE PURPOSES ONLY. ACTUAL DESIGN WILL REQUIRE RESULTS OF ADEQUATE GEOTECHNICAL INVESTIGATION.
5. EXCAVATION SEQUENCE AND PHASE (INCLUDING A POSSIBLE SUBDIVISION OF THE TOP HEADING) MUST BE REVISITED WHEN ADEQUATE GEOTECHNICAL INFORMATION IS AVAILABLE.
6. ADDITIONAL GROUND TREATMENT IN LIEU OF GROUND IMPROVEMENT MIGHT BE ADDED WHEN ADDITIONAL GEOTECHNICAL INFORMATION IS AVAILABLE AND EXPECTED GROUND CONDITIONS MAKES IT NECCESARY TO ACHIEVE SAFE EXCAVATION CONDITIONS.
7. THE SECTION SHOWN ON THIS DRAWING IS ONLY APPLICABLE IN THE GROUND CONDITIONS SHOWN.
8. TUNNEL DIMENSIONS ACCORDING TO USUAL MACHINERY USED IN SEM TUNNELS. THESE DIMENSIONS MUST BE ADJUSTED TO THE MACHINERY THAT WILL BE USED IN CONSTRUCTION.
9. 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.
10. HIGHLIGTHED AREAS OF THIS SUPPORT HAVE TO BE DEMOLISHED DURING CONSTRUCTION AS SHOWN ON PHASE DESCRIPTION TABLE.

E2 ALIGNMENT
SEM SINGLE TUNNEL
4 TANGENT TRACKS
ETD

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E2
SEM SINGLE TUNNEL, 4 TANGENT TRACKS ETD
CONSTRUCTION SEQUENCE AND SUPPORT MEASURES

CONTRACT NO. HSR14-42
DRAWING NO. TN-C0912
SCALE AS SHOWN
SHEET NO.

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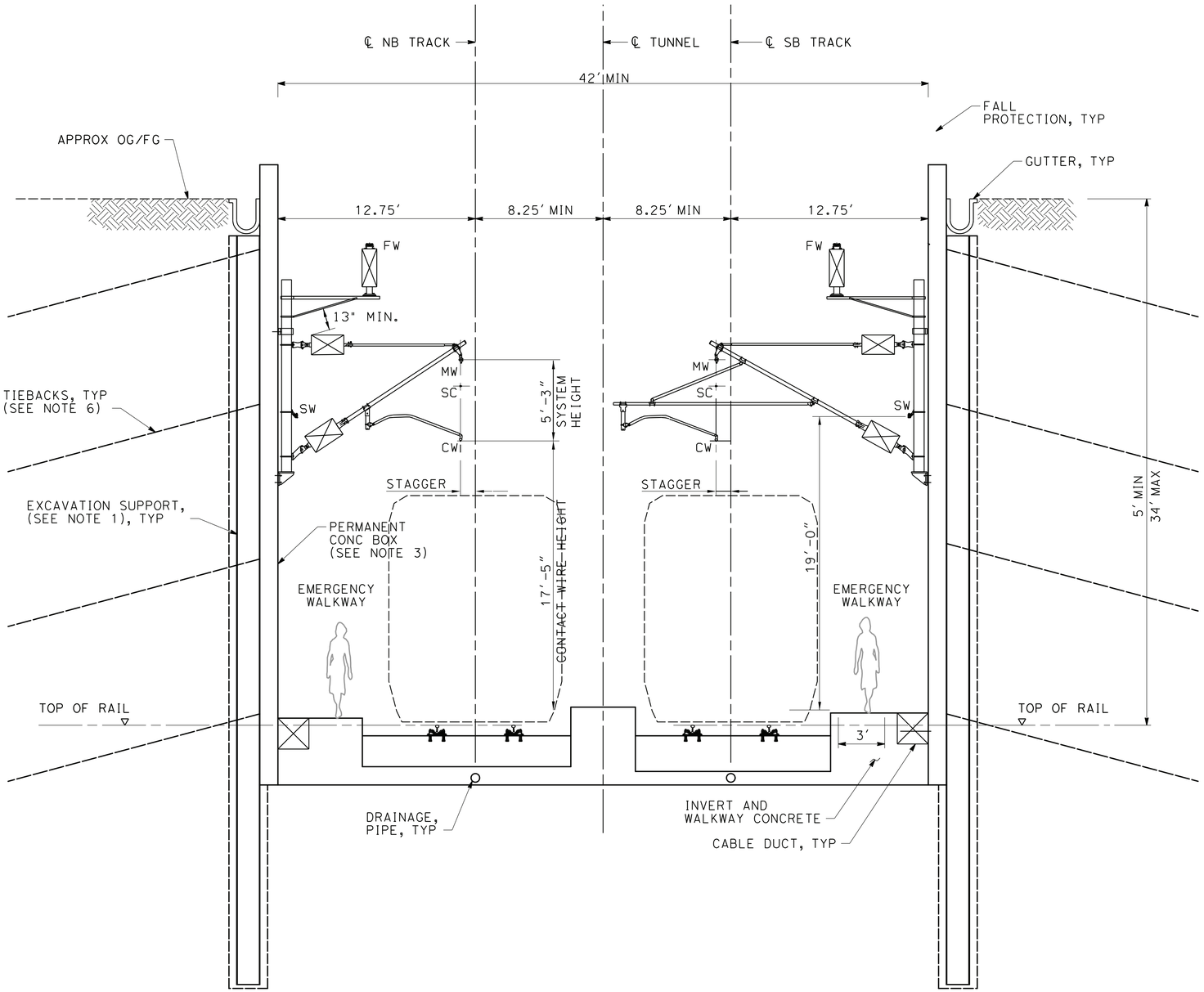

TYPICAL SECTION

NOTES:

1. TYPES, LOCATIONS AND DIMENSIONS OF EXCAVATION SUPPORT NOT DESIGNED.
2. PERMANENT LINING ASSUMED WATERTIGHT/UNDRAINED IN PERMANENT CASE.
3. STRUCTURE COMPONENTS ARE NOT DESIGNED. DRAWINGS NOT BASED ON ACTUAL DESIGN AND ARE DEVELOPED FOR PRELIMINARY COST ESTIMATE.
4. TRACK, GUTTER, CABLE DUCTS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
5. EQUIPMENT AND STRUCTURE GAUGES NOT SHOWN. REFER TO DRAWINGS TN-C0006 AND TN-C0007 FOR FIXED EQUIPMENT ENVELOPE AND STRUCTURE GAUGE.
6. TIEBACKS OR GROUND ANCHORS ARE ANTICIPATED FOR WALLS WITH AN EXPOSED HEIGHT GREATER THAN 20 FT. CANTILEVER SOLDIER PILE WALLS ARE ANTICIPATED FOR WALLS WITH AN EXPOSED HEIGHT LESS THAN 20 FT.
7. TYPICAL SECTION ON THIS SHEET IS APPLICABLE AT THE FOLLOWING LOCATIONS:

ALIGNMENT	SUB-SECTION	BEGIN STA	END STA	
E1 & E2	CENTRAL	481+50	486+50	*
E1 & E2	CENTRAL	510+00	531+80	*
E1 & E2	CENTRAL	537+60	539+00	*
E1	CENTRAL	2014+48.74	2035+67.74	
REFINED SR14	CENTRAL	2121+91	2143+10	

* AN OPEN CUT EXCAVATION WILL BE REQUIRED TO A MAXIMUM VERTICAL CUT OF 30 FT.

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

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E1/REFINED SR14
OPEN TRENCH 2 TRACKS
TYPICAL SECTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-C1100
SCALE AS SHOWN
SHEET NO.

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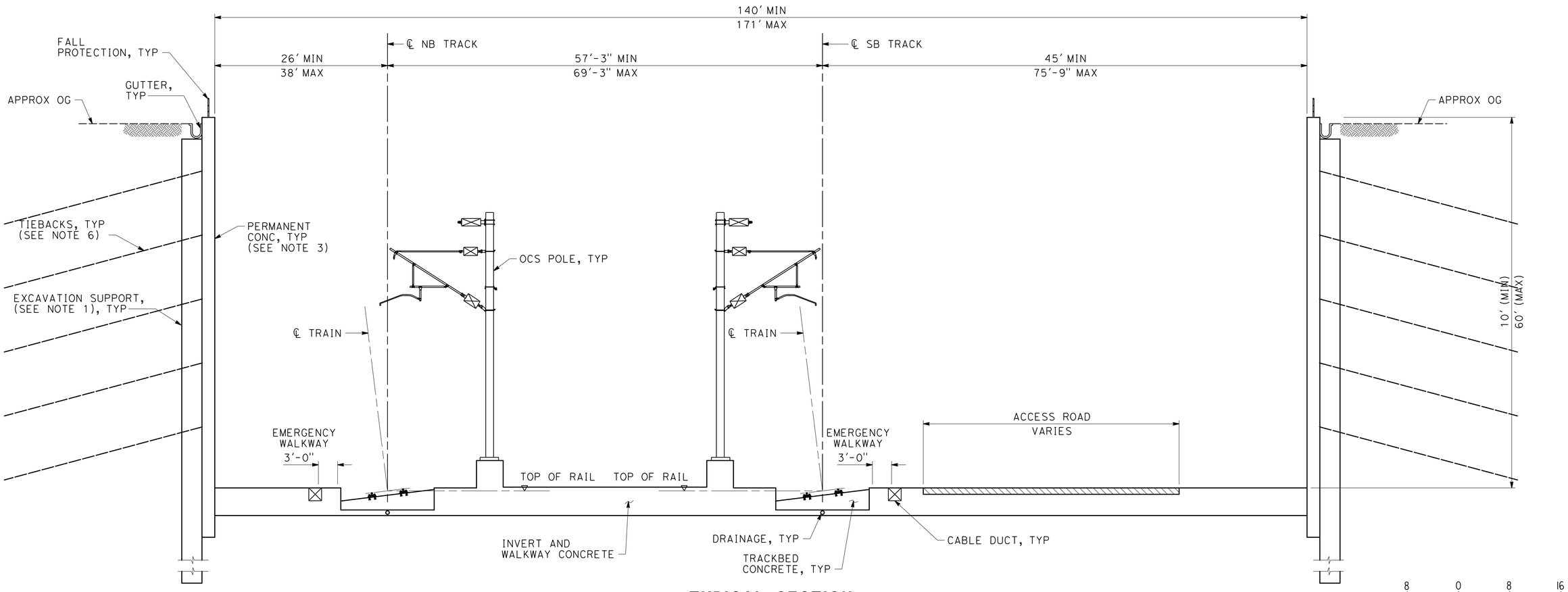
NOTES:

1. TYPES, LOCATIONS AND DIMENSIONS OF EXCAVATION SUPPORT NOT DESIGNED.
2. PERMANENT LINING ASSUMED WATERTIGHT/UNDRAINED IN PERMANENT CASE.
3. STRUCTURE COMPONENTS ARE NOT DESIGNED. DRAWINGS NOT BASED ON ACTUAL DESIGN AND ARE DEVELOPED FOR PRELIMINARY COST ESTIMATE.
4. TRACK, GUTTER, CABLE DUCTS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
5. EQUIPMENT AND STRUCTURE GAUGES NOT SHOWN. REFER TO DRAWINGS TN-C0006 AND TN-C0007 FOR FIXED EQUIPMENT ENVELOPE AND STRUCTURE GAUGE.
6. TIEBACKS OR GROUND ANCHORS ARE ANTICIPATED FOR WALLS WITH AN EXPOSED HEIGHT GREATER THAN 20 FT.



TYPICAL SECTION

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

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E1/REFINED SR14
OPEN TRENCH AT PORTAL 4 (E1)/10 (REFINED SR14), 2 TRACKS
TYPICAL SECTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-C1101
SCALE AS SHOWN
SHEET NO.

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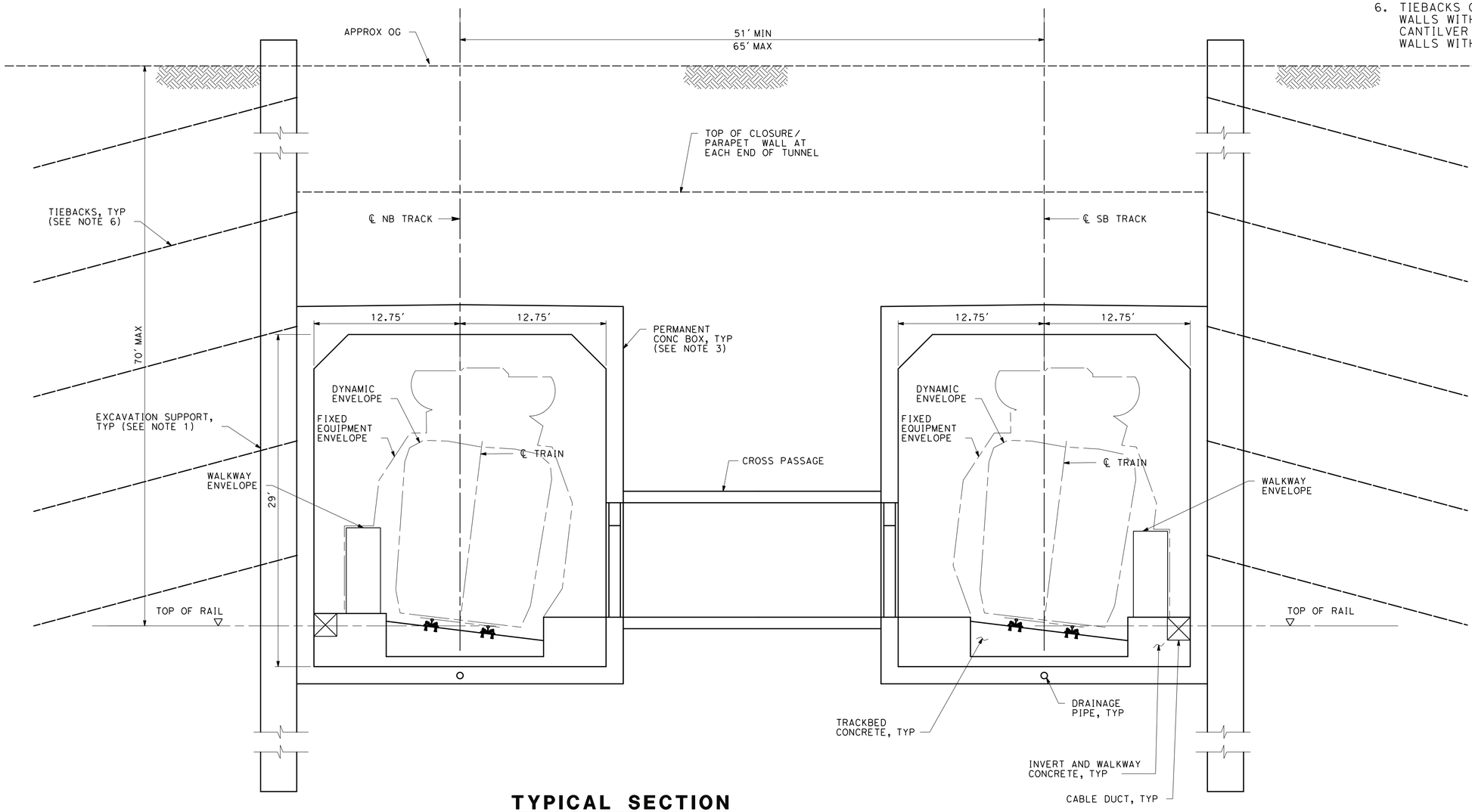
NOTES:

1. TYPES, LOCATIONS AND DIMENSIONS OF EXCAVATION SUPPORT NOT DESIGNED.
2. PERMANENT LINING ASSUMED WATERTIGHT/UNDRAINED IN PERMANENT CASE.
3. STRUCTURE COMPONENTS ARE NOT DESIGNED. DRAWINGS NOT BASED ON ACTUAL DESIGN AND ARE DEVELOPED FOR PRELIMINARY COST ESTIMATE.
4. TRACK, CABLE DUCTS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
5. EQUIPMENT AND STRUCTURE GAUGES NOT SHOWN. REFER TO DRAWINGS TN-C0006 AND TN-C0007 FOR FIXED EQUIPMENT ENVELOPE AND STRUCTURE GAUGE.
6. TIEBACKS OR GROUND ANCHORS ARE ANTICIPATED FOR WALLS WITH AN EXPOSED HEIGHT GRATER THAN 20 FT. CANTILVER SOLDIER PILE WALLS ARE ANTICIPATED FOR WALLS WITH AN EXPOSED HEIGHT LESS THAN 20 FT.
7. TYPICAL SECTION ON THIS SHEET IS APPLICABLE AT THE FOLLOWING LOCATIONS:

ALIG.	SUB-SECT.	BEGIN STA	END STA
E1&E2	CENTRAL	486+50	510+00
E1&E2	CENTRAL	531+80	537+60



TYPICAL SECTION

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

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E1/E2
TWIN BOX 1 TRACK
CUT-AND-COVER TUNNEL
TYPICAL SECTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-C1102
SCALE AS SHOWN
SHEET NO.

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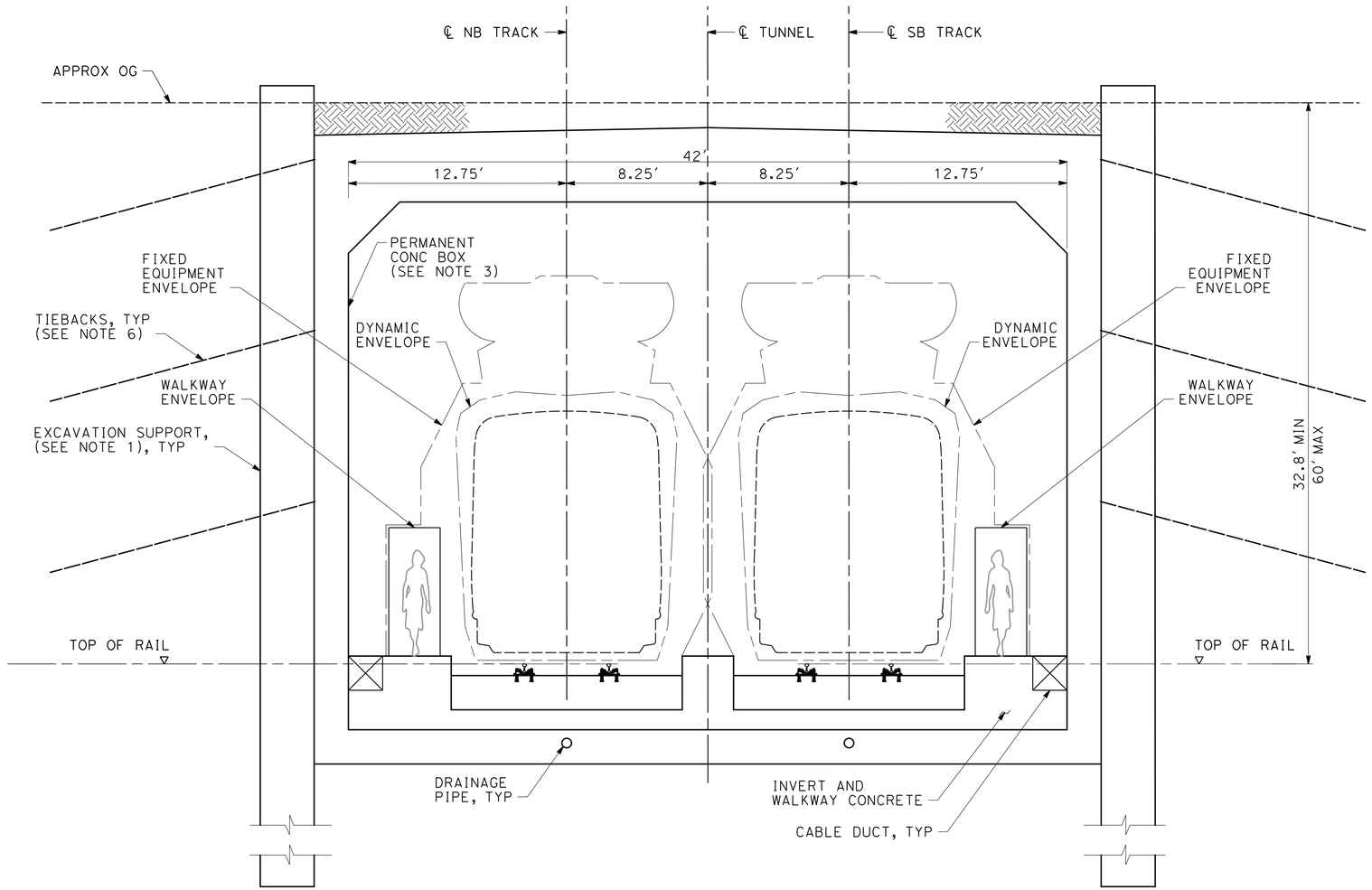


TYPICAL SECTION
C&C 2 TRACKS TANGENT

NOTES:

1. TYPES, LOCATIONS AND DIMENSIONS OF EXCAVATION SUPPORT NOT DESIGNED.
2. PERMANENT LINING ASSUMED WATERTIGHT/UNDRAINED IN PERMANENT CASE.
3. STRUCTURE COMPONENTS ARE NOT DESIGNED. DRAWINGS NOT BASED ON ACTUAL DESIGN AND ARE DEVELOPED FOR PRELIMINARY COST ESTIMATE.
4. TRACK, CABLE DUCTS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
5. EQUIPMENT AND STRUCTURE GAUGES NOT SHOWN. REFER TO DRAWINGS TN-C0006 AND TN-C0007 FOR FIXED EQUIPMENT ENVELOPE AND STRUCTURE GAUGE.
6. TIEBACKS OR GROUND ANCHORS ARE ANTICIPATED FOR WALLS WITH AN EXPOSED HEIGHT GREATER THAN 20 FT. TEMPORARY INTERNAL BRACING MIGHT BE USED IF PREFERRED. CANTILVER SOLDIER PILE WALLS ARE ANTICIPATED FOR WALLS WITH AN EXPOSED HEIGHT LESS THAN 20 FT.
7. RIGID EXCAVATION SUPPORT SYSTEM IS ANTICIPATED FOR VERTICAL EXCAVATION HIGHER THAN 70 FT. SUITABLE RIGID EXCAVATION SUPPORT SYSTEMS SUCH AS SLURRY WALLS OR TANGENT SECANT WALLS ARE ANTICIPATED FOR THIS TYPICAL SECTION.
8. TYPICAL SECTION ON THIS SHEET IS APPLICABLE AT THE FOLLOWING LOCATIONS:

ALIGNMENT	SUB-SECTION	BEGIN STA	END STA
E1	CENTRAL	2035+67.74	2052+57.74
REFINED SR14	CENTRAL	2143+10.00	2160+00.00

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

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

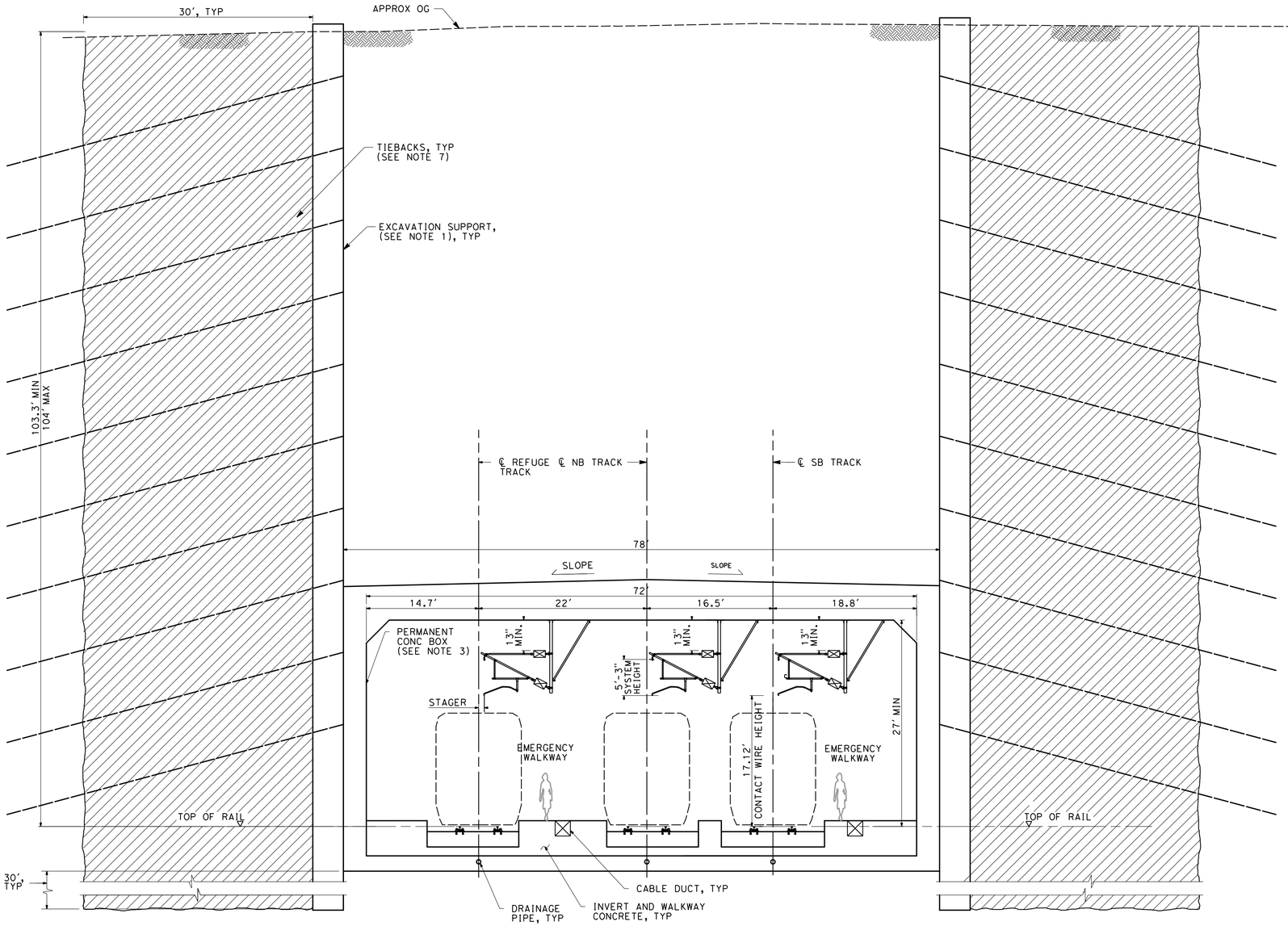
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E1/REFINED SR14
SINGLE CELL BOX 2 TRACKS
CUT-AND-COVER TUNNEL
TYPICAL SECTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-C1103
SCALE AS SHOWN
SHEET NO.



TYPICAL SECTION - 2 TRACKS + REFUGE TRACK

NOTES:

1. TYPES, LOCATIONS AND DIMENSIONS OF EXCAVATION SUPPORT NOT DESIGNED. RIGID EXCAVATION SUPPORTS WITH TIEBACKS AND TEMPORARY INTERNAL BRACING ANTICIPATED.
2. PERMANENT LINING ASSUMED WATERTIGHT/UNDRAINED IN PERMANENT CASE.
3. STRUCTURE COMPONENTS ARE NOT DESIGNED. DRAWINGS NOT BASED ON ACTUAL DESIGN AND ARE DEVELOPED FOR PRELIMINARY COST ESTIMATE.
4. TRACK, OPENINGS, PLATFORM, STATION LAYOUT, CABLE DUCTS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
5. EQUIPMENT AND STRUCTURE GAUGES NOT SHOWN. REFER TO DRAWINGS TN-C0006 AND TN-C0007 FOR FIXED EQUIPMENT ENVELOPE AND STRUCTURE GAUGE.
6. GROUND IMPROVEMENT ANTICIPATED IN THIS AREA. LIMITS OF GROUND IMPROVEMENT TO BE DETERMINED AFTER GEOTECHNICAL INVESTIGATIONS ARE COMPLETED.
7. TIEBACKS OR GROUND ANCHORS ARE ANTICIPATED FOR WALLS WITH AN EXPOSED HEIGHT GREATER THAN 20 FT. CANTILEVER SOLDIER PILE WALLS ARE ANTICIPATED FOR WALLS WITH AN EXPOSED HEIGHT LESS THAN 20 FT.
8. TYPICAL SECTION ON THIS SHEET IS APPLICABLE AT THE FOLLOWING LOCATIONS:

ALIGNMENT	SUB-SECTION	BEGIN STA	END STA
E1	BURBANK	2123+75.74	2124+34.74
REFINED SR14	BURBANK	2231+18.00	2231+77.00

CONSTRUCTION SEQUENCE:

STAGE	DESCRIPTION
0	INSTALL MOVEMENT MONITORING SYSTEMS
1	INSTALL GROUND IMPROVEMENT
2*	INSTALL RIGID EXCAVATION SUPPORT SYSTEMS USING HEAVILY REINFORCED SLURRY WALLS
3A	EXCAVATE IN LIFTS FROM ORIGINAL GROUND
3B	DEWATER AS NEEDED
3C	INSTALL TIEBACKS AND/OR TEMPORARY INTERNAL BRACING AS REQUIRED FOR THE SYSTEM STABILITY
4	REPEAT STAGE 3 TO BOTTOM OF STATION/TUNNEL GRADE SLAB
5	CONSTRUCT BOTTOM GRADE SLAB AND TIE IN TO THE EXCAVATION SUPPORT AS A PERMANENT BRACING SYSTEM
6	CONSTRUCT THE INTERIOR OF THE STATION/TUNNEL (INTERIOR WALLS, SLABS...)
7	CONSTRUCT STATION/TUNNEL ROOF SLAB AND TIE IN TO THE EXCAVATION SUPPORT SYSTEM AS PERMANENT BRACING SYSTEM
8	WATERPROOF THE ROOF SLAB, BACKFILL AND RESTORE THE GROUND

* SLURRY WALLS ARE ONE TYPE OF COMMON RIGID EXCAVATION SUPPORT SYSTEM. OTHER SUITABLE RIGID EXCAVATION SUPPORT SYSTEMS SUCH AS TANGENT/SECANT PILES MIGHT BE CONSIDERED FOR THIS LOCATION. HEAVY REINFORCEMENT WILL BE REQUIRED.

LEGEND:

GROUND IMPROVEMENT ZONE (SEE NOTE 6)

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

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E1/REFINED SR14
SINGLE CELL BOX 2 TRACKS + REFUGE TRACK
CUT-AND-COVER TUNNEL
TYPICAL SECTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-C1104
SCALE AS SHOWN
SHEET NO.

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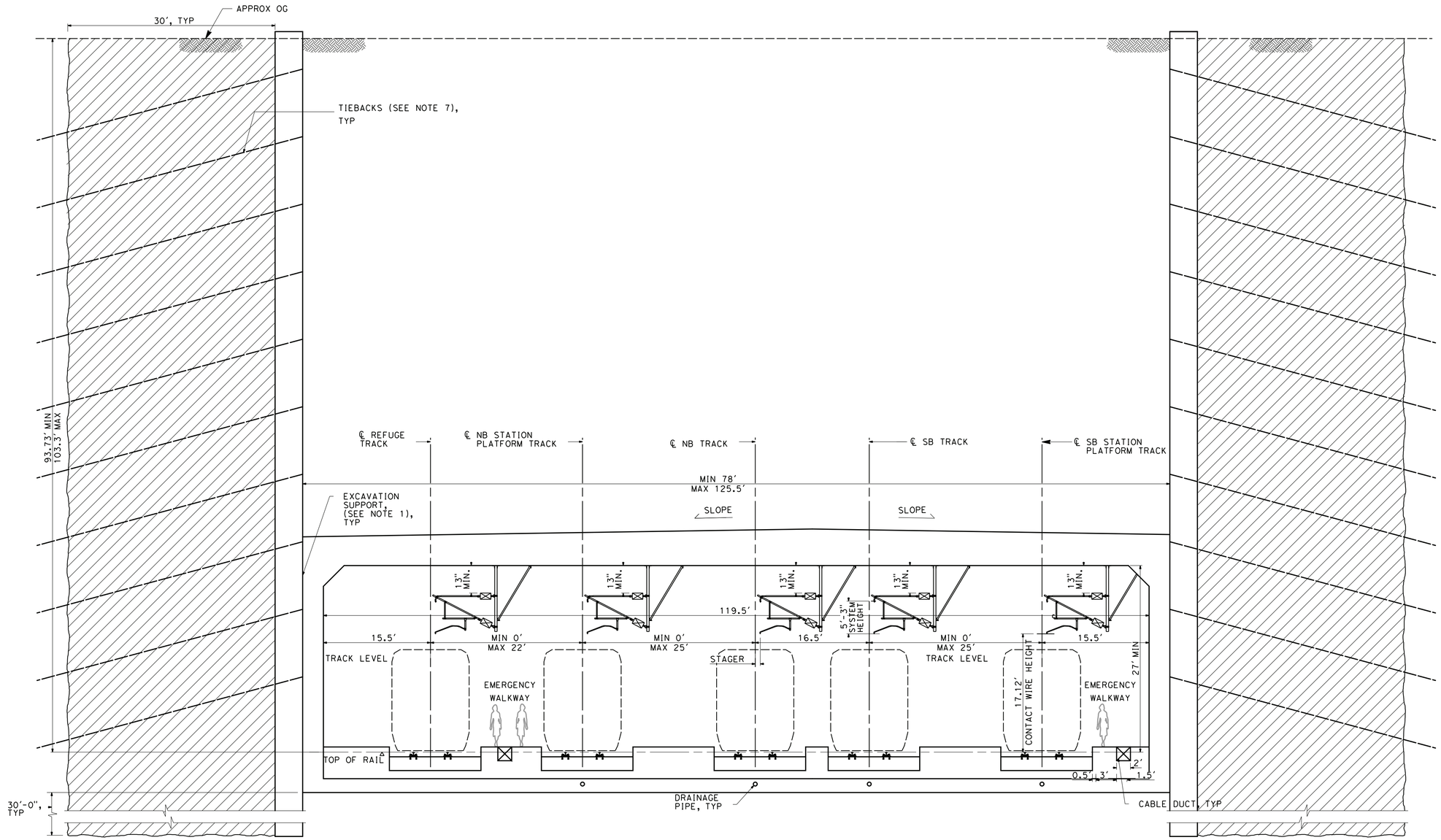

LEGEND:

GROUND IMPROVEMENT ZONE (SEE NOTE 6)

NOTES:

1. TYPES, LOCATIONS AND DIMENSIONS OF EXCAVATION SUPPORT NOT DESIGNED. RIGID EXCAVATION SUPPORTS WITH TIEBACKS AND TEMPORARY INTERNAL BRACING ANTICIPATED.
2. PERMANENT LINING ASSUMED WATERTIGHT/ UNDRAINED IN PERMANENT CASE.
3. STRUCTURE COMPONENTS ARE NOT DESIGNED. DRAWINGS NOT BASED ON ACTUAL DESIGN AND ARE DEVELOPED FOR PRELIMINARY COST ESTIMATE.
4. TRACK, OPENINGS, PLATFORM, STATION LAYOUT, CABLE DUCTS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
5. EQUIPMENT AND STRUCTURE GAUGES NOT SHOWN. REFER TO DRAWINGS TN-C0006 AND TN-C0007 FOR FIXED EQUIPMENT ENVELOPE AND STRUCTURE GAUGE.
6. GROUND IMPROVEMENT ANTICIPATED IN THIS AREA. LIMITS OF GROUND IMPROVEMENT TO BE DETERMINED AFTER GEOTECHNICAL INVESTIGATIONS ARE COMPLETED.
7. TIEBACKS OR GROUND ANCHORS ARE ANTICIPATED FOR WALLS WITH AN EXPOSED HEIGHT GREATER THAN 20 FT. CANTILEVER SOLDIER PILE WALLS ARE ANTICIPATED FOR WALLS WITH AN EXPOSED HEIGHT LESS THAN 20 FT.
8. TYPICAL SECTION ON THIS SHEET IS APPLICABLE AT THE FOLLOWING LOCATIONS:

ALIGNMENT	SUB-SECTION	BEGIN STA	END STA
E1	BURBANK	2124+34.74	2132+19.39
REFINED SR14	BURBANK	2231+77.00	2239+61.65

CONSTRUCTION SEQUENCE:

STAGE	DESCRIPTION
0	INSTALL MOVEMENT MONITORING SYSTEMS
1	INSTALL GROUND IMPROVEMENT
2*	INSTALL RIGID EXCAVATION SUPPORT SYSTEMS USING HEAVILY REINFORCED SLURRY WALLS
3A	EXCAVATE IN LIFTS FROM ORIGINAL GROUND
3B	DEWATER AS NEEDED
3C	INSTALL TIEBACKS AND/OR TEMPORARY INTERNAL BRACING AS REQUIRED FOR THE SYSTEM STABILITY
4	REPEAT STAGE 3 TO BOTTOM OF STATION/ TUNNEL GRADE SLAB
5	CONSTRUCT BOTTOM GRADE SLAB AND TIE IN TO THE EXCAVATION SUPPORT AS A PERMANENT BRACING SYSTEM
6	CONSTRUCT THE INTERIOR OF THE STATION/ TUNNEL (INTERIOR WALLS, SLABS...)
7	CONSTRUCT STATION/TUNNEL ROOF SLAB AND TIE IN TO THE EXCAVATION SUPPORT SYSTEM AS PERMANENT BRACING SYSTEM
8	WATERPROOF THE ROOF SLAB, BACKFILL AND RESTORE THE GROUND

* SLURRY WALLS ARE ONE TYPE OF COMMON RIGID EXCAVATION SUPPORT SYSTEM. OTHER SUITABLE RIGID EXCAVATION SUPPORT SYSTEMS SUCH AS TANGENT/SECANT PILES MIGHT BE CONSIDERED FOR THIS LOCATION. HEAVY REINFORCEMENT WILL BE REQUIRED.

CUT & COVER - 4 TRACKS + REFUGE TRACK

10 0 10 20

1"=10'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E1/REFINED SR14
SINGLE CELL 4 TRACKS + REFUGE TRACK
CUT-AND-COVER TUNNEL
TYPICAL SECTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-C1105
SCALE AS SHOWN
SHEET NO.

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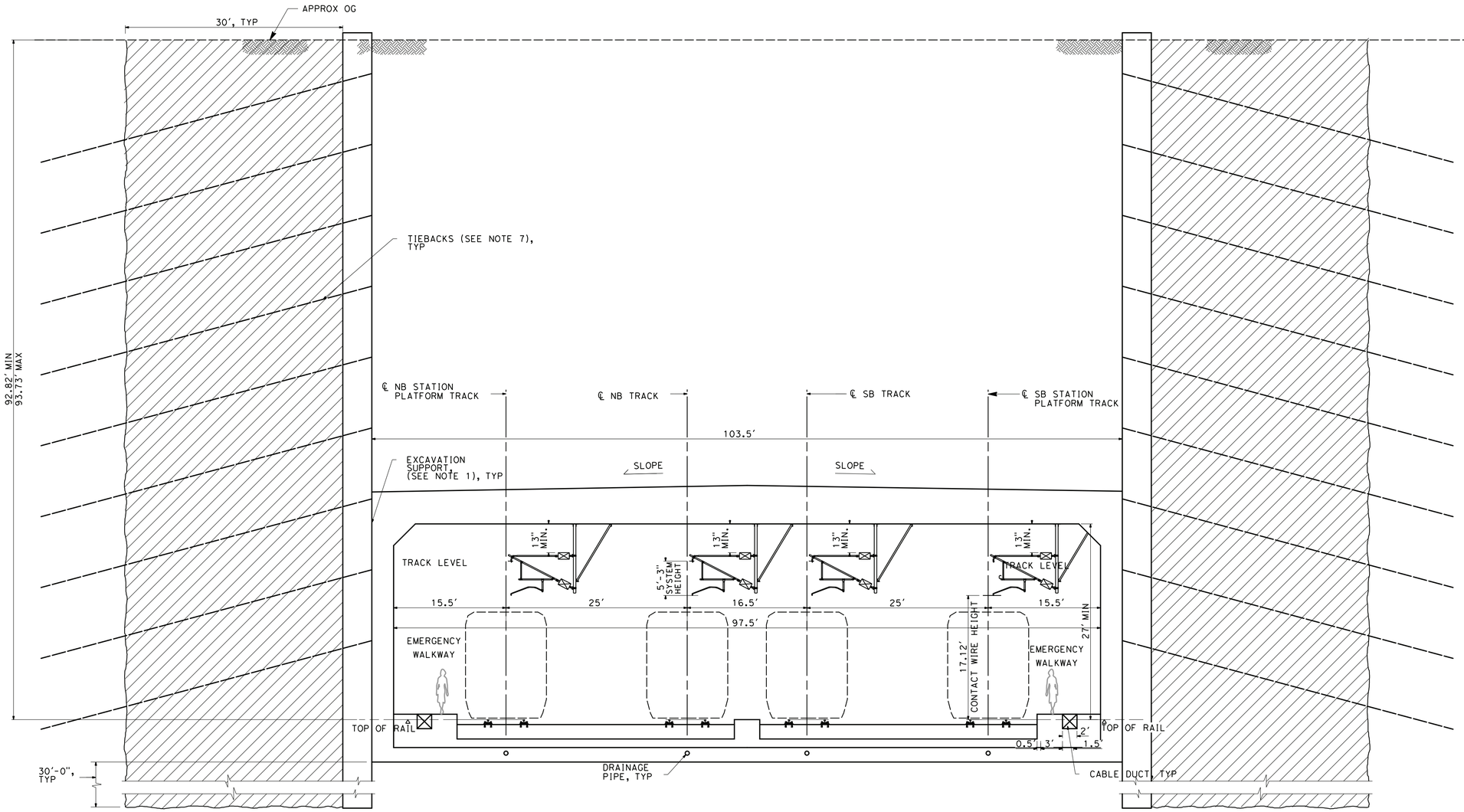


LEGEND:

▨ GROUND IMPROVEMENT ZONE

NOTES:

1. TYPES, LOCATIONS AND DIMENSIONS OF EXCAVATION SUPPORT NOT DESIGNED. RIGID EXCAVATION SUPPORTS WITH TIEBACKS AND TEMPORARY INTERNAL BRACING ANTICIPATED.
2. PERMANENT LINING ASSUMED WATERTIGHT/ UNDRAINED IN PERMANENT CASE.
3. STRUCTURE COMPONENTS ARE NOT DESIGNED. DRAWINGS NOT BASED ON ACTUAL DESIGN AND ARE DEVELOPED FOR PRELIMINARY COST ESTIMATE.
4. TRACK, OPENINGS, PLATFORM, STATION LAYOUT, CABLE DUCTS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
5. EQUIPMENT AND STRUCTURE GAUGES NOT SHOWN. REFER TO DRAWINGS TN-C0006 AND TN-C0007 FOR FIXED EQUIPMENT ENVELOPE AND STRUCTURE GAUGE.
6. GROUND IMPROVEMENT ANTICIPATED IN THIS AREA. LIMITS OF GROUND IMPROVEMENT TO BE DETERMINED AFTER GEOTECHNICAL INVESTIGATIONS ARE COMPLETED.
7. TIEBACKS OR GROUND ANCHORS ARE ANTICIPATED FOR WALLS WITH AN EXPOSED HEIGHT GREATER THAN 20 FT. CANTILEVER SOLDIER PILE WALLS ARE ANTICIPATED FOR WALLS WITH AN EXPOSED HEIGHT LESS THAN 20 FT.
8. TYPICAL SECTION ON THIS SHEET IS APPLICABLE AT THE FOLLOWING LOCATIONS:

ALIGNMENT	SUB-SECTION	BEGIN STA	END STA
E1	BURBANK	2132+19.39	2132+94.39
REFINED SR14	BURBANK	2239+61.65	2240+36.65

CONSTRUCTION SEQUENCE:

STAGE	DESCRIPTION
0	INSTALL MOVEMENT MONITORING SYSTEMS
1	INSTALL GROUND IMPROVEMENT
2*	INSTALL RIGID EXCAVATION SUPPORT SYSTEMS USING HEAVILY REINFORCED SLURRY WALLS
3A	EXCAVATE IN LIFTS FROM ORIGINAL GROUND
3B	DEWATER AS NEEDED
3C	INSTALL TIEBACKS AND/OR TEMPORARY INTERNAL BRACING AS REQUIRED FOR THE SYSTEM STABILITY
4	REPEAT STAGE 3 TO BOTTOM OF STATION/ TUNNEL GRADE SLAB
5	CONSTRUCT BOTTOM GRADE SLAB AND TIE IN TO THE EXCAVATION SUPPORT AS A PERMANENT BRACING SYSTEM
6	CONSTRUCT THE INTERIOR OF THE STATION/ TUNNEL (INTERIOR WALLS, SLABS...)
7	CONSTRUCT STATION/TUNNEL ROOF SLAB AND TIE IN TO THE EXCAVATION SUPPORT SYSTEM AS PERMANENT BRACING SYSTEM
8	WATERPROOF THE ROOF SLAB, BACKFILL AND RESTORE THE GROUND

* SLURRY WALLS ARE ONE TYPE OF COMMON RIGID EXCAVATION SUPPORT SYSTEM. OTHER SUITABLE RIGID EXCAVATION SUPPORT SYSTEMS SUCH AS TANGENT/SECANT PILES MIGHT BE CONSIDERED FOR THIS LOCATION. HEAVY REINFORCEMENT WILL BE REQUIRED.

CUT & COVER - 4 TRACKS

10 0 10 20

1"=10'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

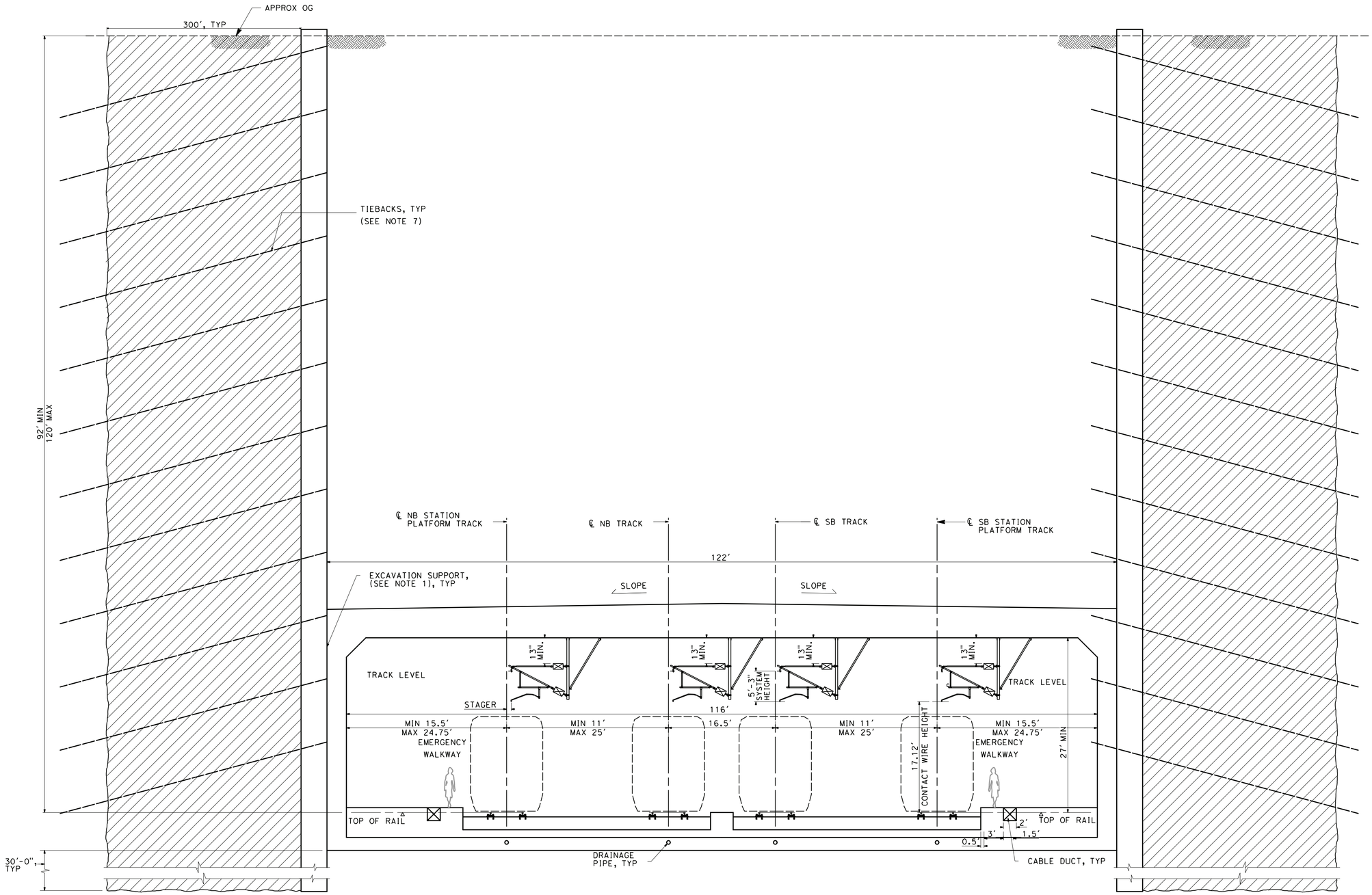
NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E1/REFINED SR14
SINGLE CELL 4 TRACKS
CUT-AND-COVER TUNNEL
TYPICAL SECTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-C1106
SCALE AS SHOWN
SHEET NO.



CUT & COVER - 4 TRACKS

NOTES:

1. TYPES, LOCATIONS AND DIMENSIONS OF EXCAVATION SUPPORT NOT DESIGNED. RIGID EXCAVATION SUPPORTS WITH TIEBACKS AND TEMPORARY INTERNAL BRACING ANTICIPATED.
2. PERMANENT LINING ASSUMED WATERTIGHT/ UNDRAINED IN PERMANENT CASE.
3. STRUCTURE COMPONENTS ARE NOT DESIGNED. DRAWINGS NOT BASED ON ACTUAL DESIGN AND ARE DEVELOPED FOR PRELIMINARY COST ESTIMATE.
4. TRACK, OPENINGS, PLATFORM, STATION LAYOUT, CABLE DUCTS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
5. EQUIPMENT AND STRUCTURE GAUGES NOT SHOWN. REFER TO DRAWINGS TN-C0006 AND TN-C0007 FOR FIXED EQUIPMENT ENVELOPE AND STRUCTURE GAUGE.
6. GROUND IMPROVEMENT ANTICIPATED IN THIS AREA. LIMITS OF GROUND IMPROVEMENT TO BE DETERMINED AFTER GEOTECHNICAL INVESTIGATIONS ARE COMPLETED.
7. TIEBACKS OR GROUND ANCHORS ARE ANTICIPATED FOR WALLS WITH AN EXPOSED HEIGHT GREATER THAN 20 FT. CANTILEVER SOLDIER PILE WALLS ARE ANTICIPATED FOR WALLS WITH AN EXPOSED HEIGHT LESS THAN 20 FT.
8. TYPICAL SECTION ON THIS SHEET IS APPLICABLE AT THE FOLLOWING LOCATIONS:

ALIGNMENT	SUB-SECTION	BEGIN STA	END STA
E2	CENTRAL	1903+70.00	1909+25.00
E2	BURBANK	1928+65.00	1929+95.00

CONSTRUCTION SEQUENCE:

STAGE	DESCRIPTION
0	INSTALL MOVEMENT MONITORING SYSTEMS
1	INSTALL GROUND IMPROVEMENT
2*	INSTALL RIGID EXCAVATION SUPPORT SYSTEMS USING HEAVILY REINFORCED SLURRY WALLS
3A	EXCAVATE IN LIFTS FROM ORIGINAL GROUND
3B	DEWATER AS NEEDED
3C	INSTALL TIEBACKS AND/OR TEMPORARY INTERNAL BRACING AS REQUIRED FOR THE SYSTEM STABILITY
4	REPEAT STAGE 3 TO BOTTOM OF STATION/ TUNNEL GRADE SLAB
5	CONSTRUCT BOTTOM GRADE SLAB AND TIE IN TO THE EXCAVATION SUPPORT AS A PERMANENT BRACING SYSTEM
6	CONSTRUCT THE INTERIOR OF THE STATION/ TUNNEL (INTERIOR WALLS, SLABS...)
7	CONSTRUCT STATION/TUNNEL ROOF SLAB AND TIE IN TO THE EXCAVATION SUPPORT SYSTEM AS PERMANENT BRACING SYSTEM
8	WATERPROOF THE ROOF SLAB, BACKFILL AND RESTORE THE GROUND

* SLURRY WALLS ARE ONE TYPE OF COMMON RIGID EXCAVATION SUPPORT SYSTEM. OTHER SUITABLE RIGID EXCAVATION SUPPORT SYSTEMS SUCH AS TANGENT/SECANT PILES MIGHT BE CONSIDERED FOR THIS LOCATION. HEAVY REINFORCEMENT WILL BE REQUIRED.

10 0 10 20
1"=10'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E2
SINGLE CELL 4 TRACKS
CUT-AND-COVER TUNNEL
TYPICAL SECTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-C1107
SCALE AS SHOWN
SHEET NO.

0205510

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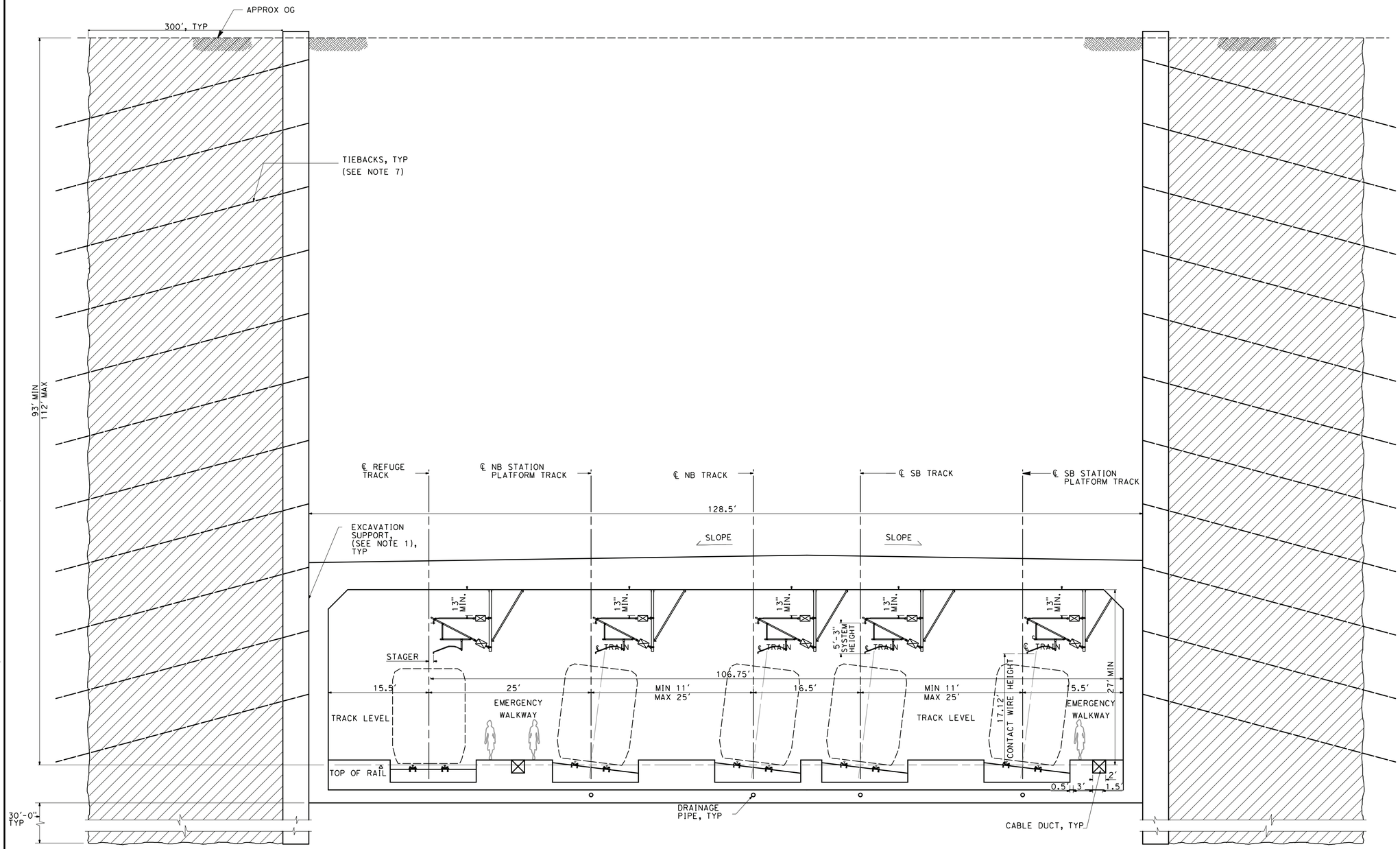


LEGEND:

GROUND IMPROVEMENT ZONE (SEE NOTE 6)

NOTES:

1. TYPES, LOCATIONS AND DIMENSIONS OF EXCAVATION SUPPORT NOT DESIGNED. RIGID EXCAVATION SUPPORTS WITH TIEBACKS AND TEMPORARY INTERNAL BRACING ANTICIPATED.
2. PERMANENT LINING ASSUMED WATERTIGHT/ UNDRAINED IN PERMANENT CASE.
3. STRUCTURE COMPONENTS ARE NOT DESIGNED. DRAWINGS NOT BASED ON ACTUAL DESIGN AND ARE DEVELOPED FOR PRELIMINARY COST ESTIMATE.
4. TRACK, OPENINGS, PLATFORM, STATION LAYOUT, CABLE DUCTS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
5. EQUIPMENT AND STRUCTURE GAUGES NOT SHOWN. REFER TO DRAWINGS TN-C0006 AND TN-C0007 FOR FIXED EQUIPMENT ENVELOPE AND STRUCTURE GAUGE.
6. GROUND IMPROVEMENT ANTICIPATED IN THIS AREA. LIMITS OF GROUND IMPROVEMENT TO BE DETERMINED AFTER GEOTECHNICAL INVESTIGATIONS ARE COMPLETED.
7. TIEBACKS OR GROUND ANCHORS ARE ANTICIPATED FOR WALLS WITH AN EXPOSED HEIGHT GREATER THAN 20 FT. CANTILEVER SOLDIER PILE WALLS ARE ANTICIPATED FOR WALLS WITH AN EXPOSED HEIGHT LESS THAN 20 FT.
8. TYPICAL SECTION ON THIS SHEET IS APPLICABLE AT THE FOLLOWING LOCATIONS:

ALIGNMENT	SUB-SECTION	BEGIN STA	END STA
E2	CENTRAL	1909+25.00	1915+47.81
E2	BURBANK	1915+47.81	1928+65.00

CONSTRUCTION SEQUENCE:

STAGE	DESCRIPTION
0	INSTALL MOVEMENT MONITORING SYSTEMS
1	INSTALL GROUND IMPROVEMENT
2 *	INSTALL RIGID EXCAVATION SUPPORT SYSTEMS USING HEAVILY REINFORCED SLURRY WALLS
3A	EXCAVATE IN LIFTS FROM ORIGINAL GROUND
3B	DEWATER AS NEEDED
3C	INSTALL TIEBACKS AND/OR TEMPORARY INTERNAL BRACING AS REQUIRED FOR THE SYSTEM STABILITY
4	REPEAT STAGE 3 TO BOTTOM OF STATION/ TUNNEL GRADE SLAB
5	CONSTRUCT BOTTOM GRADE SLAB AND TIE IN TO THE EXCAVATION SUPPORT AS A PERMANENT BRACING SYSTEM
6	CONSTRUCT THE INTERIOR OF THE STATION/ TUNNEL (INTERIOR WALLS, SLABS...)
7	CONSTRUCT STATION/TUNNEL ROOF SLAB AND TIE IN TO THE EXCAVATION SUPPORT SYSTEM AS PERMANENT BRACING SYSTEM
8	WATERPROOF THE ROOF SLAB, BACKFILL AND RESTORE THE GROUND

* SLURRY WALLS ARE ONE TYPE OF COMMON RIGID EXCAVATION SUPPORT SYSTEM. OTHER SUITABLE RIGID EXCAVATION SUPPORT SYSTEMS SUCH AS TANGENT/SECANT PILES MIGHT BE CONSIDERED FOR THIS LOCATION. HEAVY REINFORCEMENT WILL BE REQUIRED.

10 0 10 20

1"=10'

CUT & COVER - 4 TRACKS + REFUGE TRACK

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E2
SINGLE CELL 4 TRACKS + REFUGE TRACK
CUT-AND-COVER TUNNEL
TYPICAL SECTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-C1108
SCALE AS SHOWN
SHEET NO.

NOTES:

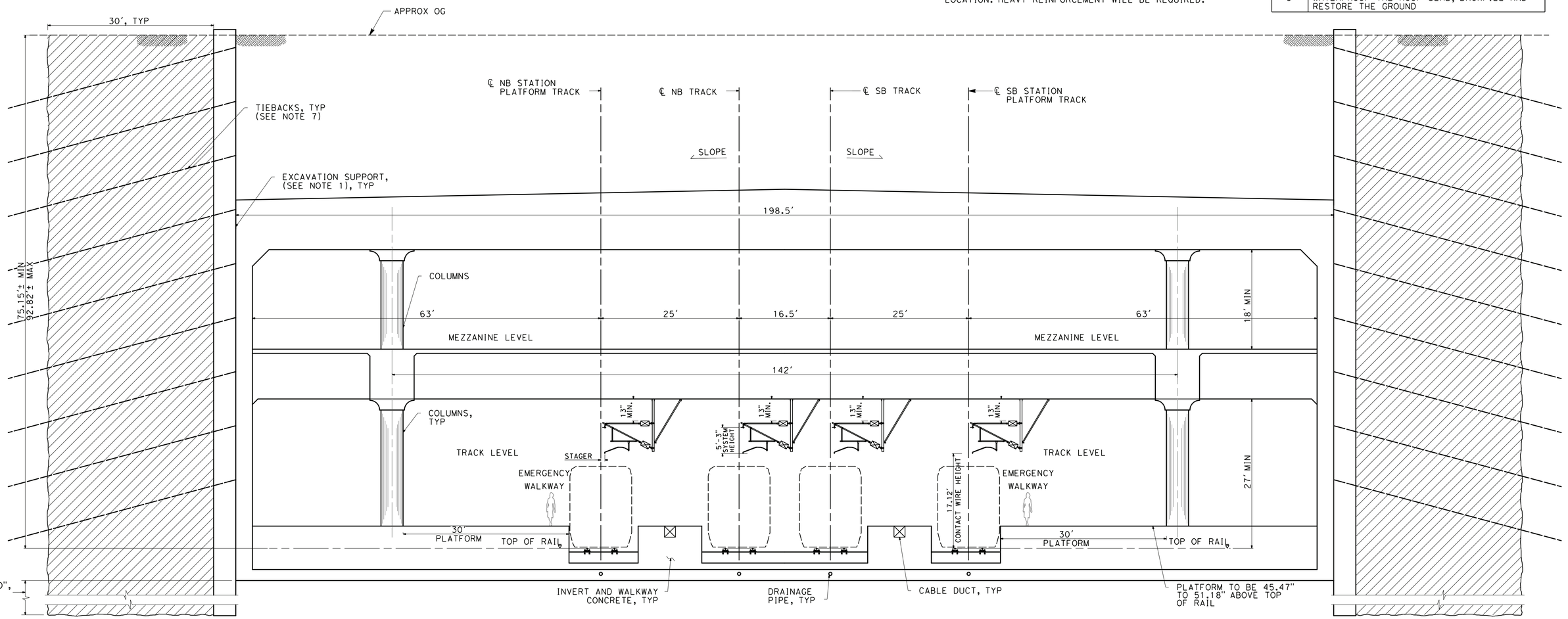
1. TYPES, LOCATIONS AND DIMENSIONS OF EXCAVATION SUPPORT NOT DESIGNED. RIGID EXCAVATION SUPPORTS WITH TIEBACKS AND TEMPORARY INTERNAL BRACING ANTICIPATED.
2. PERMANENT LINING ASSUMED WATERTIGHT/ UNDRAINED IN PERMANENT CASE.
3. STRUCTURE COMPONENTS ARE NOT DESIGNED. DRAWINGS NOT BASED ON ACTUAL DESIGN AND ARE DEVELOPED FOR PRELIMINARY COST ESTIMATE.
4. TRACK, OPENINGS, PLATFORM, STATION LAYOUT, CABLE DUCTS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
5. EQUIPMENT AND STRUCTURE GAUGES NOT SHOWN. REFER TO DRAWINGS TN-C0006 AND TN-C0007 FOR FIXED EQUIPMENT ENVELOPE AND STRUCTURE GAUGE.
6. GROUND IMPROVEMENT ANTICIPATED IN THIS AREA. LIMITS OF GROUND IMPROVEMENT TO BE DETERMINED AFTER GEOTECHNICAL INVESTIGATIONS ARE COMPLETED.
7. TIEBACKS OR GROUND ANCHORS ARE ANTICIPATED FOR WALLS WITH AN EXPOSED HEIGHT GREATER THAN 20 FT. CANTILEVER SOLDIER PILE WALLS ARE ANTICIPATED FOR WALLS WITH AN EXPOSED HEIGHT LESS THAN 20 FT.
8. TYPICAL SECTION ON THIS SHEET IS APPLICABLE AT THE FOLLOWING LOCATIONS:

ALIGNMENT	SUB-SECTION	BEGIN STA	END STA
E1	BURBANK	2132+94.39	2147+05.29
E2	BURBANK	1929+95.00	1944+05.88
REFINED SR14	BURBANK	2240+36.65	2254+47.54

* SLURRY WALLS ARE ONE TYPE OF COMMON RIGID EXCAVATION SUPPORT SYSTEM. OTHER SUITABLE RIGID EXCAVATION SUPPORT SYSTEMS SUCH AS TANGENT/ SECANT PILES MIGHT BE CONSIDERED FOR THIS LOCATION. HEAVY REINFORCEMENT WILL BE REQUIRED.

CONSTRUCTION SEQUENCE:

STAGE	DESCRIPTION
0	INSTALL MOVEMENT MONITORING SYSTEMS
1	INSTALL GROUND IMPROVEMENT
2	INSTALL RIGID EXCAVATION SUPPORT SYSTEMS USING HEAVILY REINFORCED SLURRY WALLS
3A	EXCAVATE IN LIFTS FROM ORIGINAL GROUND
3B	DEWATER AS NEEDED
3C	INSTALL TIEBACKS AND/OR TEMPORARY INTERNAL BRACING AS REQUIRED FOR THE SYSTEM STABILITY
4	REPEAT STAGE 3 TO BOTTOM OF STATION/ TUNNEL GRADE SLAB
5	CONSTRUCT BOTTOM GRADE SLAB AND TIE IN TO THE EXCAVATION SUPPORT AS A PERMANENT BRACING SYSTEM
6	CONSTRUCT THE INTERIOR OF THE STATION/ TUNNEL (INTERIOR WALLS, SLABS...)
7	CONSTRUCT STATION/TUNNEL ROOF SLAB AND TIE IN TO THE EXCAVATION SUPPORT SYSTEM AS PERMANENT BRACING SYSTEM
8	WATERPROOF THE ROOF SLAB, BACKFILL AND RESTORE THE GROUND



LEGEND:

▨ GROUND IMPROVEMENT ZONE

TYPICAL SECTION - 4 TRACKS

10 0 10 20

1"=10'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY E. VELASCO
DRAWN BY FJ. DOMINGUEZ
CHECKED BY W. GUO
IN CHARGE A. RELAÑO
DATE 04/30/2021

PEPD RECORD SET REV 02

NOT FOR CONSTRUCTION

SENER

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED RAIL PROJECT
PALMDALE TO BURBANK
ALIGNMENT E1/E2/REFINED SR14
BURBANK STATION PLATFORM
CUT-AND-COVER TUNNEL
TYPICAL SECTION

CONTRACT NO. HSR14-42
DRAWING NO. TN-C1109
SCALE AS SHOWN
SHEET NO.