

CALIFORNIA HIGH-SPEED TRAIN TUNNELS

RECORD SET PEPD DESIGN SUBMISSION

Bakersfield to Palmdale Tunnels

October 2017



CALIFORNIA
High-Speed Rail Authority



GENERAL SHEETS

DRAWING No.	DRAWING DESCRIPTION	SHEET No.
TN-B0001	COVER SHEET	
TN-B0002	DRAWING INDEX SHEET	
TN-B0003	GENERAL ABBREVIATIONS AND LEGENDS - SHEET 1 OF 4	
TN-B0004	GENERAL ABBREVIATIONS AND LEGENDS - SHEET 2 OF 4	
TN-B0005	GENERAL ABBREVIATIONS AND LEGENDS - SHEET 3 OF 4	
TN-B0006	GENERAL ABBREVIATIONS AND LEGENDS - SHEET 4 OF 4	
TN-B0007	KEY PLAN - ALT 1 ALIGNMENT TUNNELS	
TN-B0008	KEY PLAN - ALT 2 ALIGNMENT TUNNELS	

PLAN SHEETS - ALIGNMENTS 1, 2, 3, 5

DRAWING No.	DRAWING DESCRIPTION	SHEET No.
TN-C4003	ALIGNMENT "ALT 1, 2, 3, 5" - STA 18015+00 TO 18075+00	
TN-C4004	ALIGNMENT "ALT 1, 2, 3, 5" - STA 18103+00 TO 18163+00	
TN-C4005	ALIGNMENT "ALT 1, 2, 3, 5" - STA 18171+00 TO 18231+00	
TN-C4006	ALIGNMENT "ALT 1, 2, 3, 5" - STA 18338+00 TO 18398+00	
TN-C4007	ALIGNMENT "ALT 1, 2, 3, 5" - STA 18398+00 TO 18458+00	
TN-C4008	ALIGNMENT "ALT 1, 2, 3, 5" - STA 18505+00 TO 18566+00	
TN-C4009	ALIGNMENT "ALT 1, 2, 3, 5" - STA 18566+00 TO 18630+00	
TN-C4010	ALIGNMENT "ALT 1, 2, 3, 5" - STA 18630+00 TO 18690+00	
TN-C4011	ALIGNMENT "ALT 1, 2, 3, 5" - STA 18911+00 TO 18971+00	
TN-C4012	ALIGNMENT "ALT 1, 2, 3, 5" - STA 18971+00 TO 19031+00	
TN-C4013	ALIGNMENT "ALT 1, 2, 5" - STA 19275+00 TO 19335+00	
TN-C4014	ALIGNMENT "ALT 1, 2, 5" - STA 19335+00 TO 19395+00	
TN-C4015	ALIGNMENT "ALT 1, 2, 5" - STA 19395+00 TO 19455+00	
TN-C4016	ALIGNMENT "ALT 1, 2, 5" - STA 19469+00 TO 19529+00	
TN-C4017	ALIGNMENT "ALT 1, 2, 5" - STA 19529+00 TO 19585+00	
TN-C4018	ALIGNMENT "ALT 1, 2, 5" - STA 19585+00 TO 19645+00	
TN-C4103	ALIGNMENT "ALT3" - STA 19273+00 TO 19333+00	
TN-C4104	ALIGNMENT "ALT3" - STA 19333+00 TO 19393+00	
TN-C4105	ALIGNMENT "ALT3" - STA 19393+00 TO 19453+00	
TN-C4106	ALIGNMENT "ALT3" - STA 19463+00 TO 19523+00	
TN-C4107	ALIGNMENT "ALT3" - STA 19523+00 TO 19583+00	
TN-C4108	ALIGNMENT "ALT3" - STA 19583+00 TO 19633+00	
TN-C4109	ALIGNMENT "ALT3" - STA 19633+00 TO 19683+00	
TN-C4110	ALIGNMENT "ALT3" - STA 19683+00 TO 19733+00	
TN-C4201	ALTERNATIVE 5 - PEDESTRIAN UNDERPASS - LAYOUT	

PROFILE SHEETS

DRAWING No.	DRAWING DESCRIPTION	SHEET No.
TN-Y1001	TUNNEL PROFILES - "ALT 1, 2, 3, 5" - TUNNELS 1 AND 2	
TN-Y1002	TUNNEL PROFILES - "ALT 1, 2, 3, 5" - TUNNELS 3 AND 4	
TN-Y1003	TUNNEL PROFILES - "ALT 1, 2, 3, 5" - TUNNELS 4 AND 5	
TN-Y1004	TUNNEL PROFILES - "ALT 1, 2, 3, 5" - TUNNEL 6	
TN-Y1005	TUNNEL PROFILES - "ALT 1, 2, 3, 5" - TUNNEL 7	
TN-Y1006	TUNNEL PROFILES - "ALT 1, 2, 5" - TUNNEL 8	
TN-Y1007	TUNNEL PROFILES - "ALT 1, 2, 5" - TUNNELS 8 AND 9	
TN-Y1008	TUNNEL PROFILES - "ALT 1, 2, 5" - TUNNEL 9	
TN-Y1101	TUNNEL PROFILES - "ALT3" - TUNNEL 8	
TN-Y1102	TUNNEL PROFILES - "ALT3" - TUNNELS 8 AND 9	
TN-Y1103	TUNNEL PROFILES - "ALT3" - TUNNEL 9	
TN-Y1104	TUNNEL PROFILES - "ALT3" - TUNNEL 9	
TN-Y1201	UNDERPASS PROFILE - TYPICAL PEDESTRIAN UNDERPASS	

SECTIONS AND DETAILS SHEETS

DRAWING No.	DRAWING DESCRIPTION	SHEET No.
TN-B-0001	TUNNEL SEQUENTIAL EXCAVATION METHOD SINGLE TUNNEL CLEARANCE DIAGRAM - TANGENT TRACK	
TN-B-0002	TUNNEL SEQUENTIAL EXCAVATION METHOD EXCAVATION SEQUENCE INITIAL SUPPORT	
TN-B-0003	TUNNEL DRILL AND BLAST METHOD SINGLE TUNNEL CLEARANCE DIAGRAM	
TN-B-0004	TUNNEL DRILL AND BLAST METHOD SINGLE TUNNEL INITIAL SUPPORT	
TN-B-0005	TUNNEL DRILL AND BLAST METHOD, TWIN TUNNELS CLEARANCE DIAGRAM - TANGENT TRACK	
TN-B-0006	TUNNEL DRILL AND BLAST METHOD, TWIN TUNNELS CLEARANCE DIAGRAM - SUPER ELEVATED TRACK	
TN-B-0007	TUNNEL DRILL AND BLAST METHOD, TWIN TUNNELS INITIAL SUPPORT	
TN-B-0008	TUNNEL TWIN TBM BORED TUNNELS CLEARANCE DIAGRAM - TANGENT TRACK	
TN-B-0009	TUNNEL TWIN TBM BORED TUNNELS CLEARANCE DIAGRAM - SUPER ELEVATED TRACK	
TN-B-0010	TUNNEL TWIN TBM BORED TUNNELS INITIAL SUPPORT	
TN-B-0011	TUNNEL CUT AND COVER BOX (HABITAT RESTORATION) CLEARANCE DIAGRAM - TANGENT TRACK	
TN-B-0012	TUNNEL CUT AND COVER BOX (HABITAT RESTORATION) CLEARANCE DIAGRAM - SUPER ELEVATED TRACK	
TN-B-0013	TUNNEL CUT AND COVER BOX TWIN TUNNEL SINGLE TRACK CLEARANCE DIAGRAM - TANGENT TRACK	
TN-B-0014	TUNNEL CUT AND COVER BOX TWIN TUNNEL SINGLE TRACK CLEARANCE DIAGRAM - SUPER ELEVATED TRACK	
TN-B-0015	TUNNEL EMERGENCY CROSS PASSAGE	
TN-B-0016	TYPICAL TRANSVERSE SECTION PORTAL FACILITIES FOR SINGLE TUNNEL CONFIGURATION	
TN-B-0017	TYPICAL TRANSVERSE SECTION PORTAL FACILITIES FOR TWIN TUNNEL CONFIGURATION	
TN-B-0018	TYPICAL TUNNEL PORTAL FACILITIES PLAN SINGLE TUNNEL CONFIGURATION	
TN-B-0019	TYPICAL TUNNEL PORTAL FACILITIES PLAN TWIN TUNNEL CONFIGURATION	
TN-B-0020	TYPICAL TUNNEL PORTAL FACILITIES PLAN AT GRADE TWIN TUNNEL CONFIGURATION	
TN-B-0021	TYPICAL TUNNEL PORTAL FACILITIES PLAN AT GRADE SINGLE TUNNEL CONFIGURATION	
TN-B-0022	TUNNEL CUT AND COVER BOX PEDESTRIAN UNDERPASS - SECTION VIEW	



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REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. CARROLL
DRAWN BY J. FOUCH
CHECKED BY G. ERICKSON
IN CHARGE J. MORRISON
DATE 10/31/2017

**RECORD
PEPD
SUBMITTAL**

**NOT FOR
CONSTRUCTION**



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

GENERAL

CONTRACT NO. HSR13-44
DRAWING NO. TN-B0002
SCALE AS SHOWN
SHEET NO.

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A

AB AGGREGATE BASE
 ABBC ASBESTOS BONDED BITUMINOUS COATED
 ABM AIR-BLOWN MORTAR
 ABN ABANDON
 ABUT ABUTMENT
 AC ASPHALT CONCRETE
 ACB ASPHALT CONCRETE BASE
 ACP ASBESTOS CEMENT PIPE
 ADL ADDED DEAD LOAD
 ADJ ADJUST
 AFES ALTERNATIVE FLARED END SECTION
 AHD AHEAD
 ALT ALTERNATE
 AM TIME FROM MIDNIGHT TO NOON
 AP ALTERNATIVE PIPE
 APC ALTERNATIVE PIPE CULVERT
 APPROX APPROXIMATE
 APU ALTERNATIVE PIPE UNDERDRAIN
 ARS ACCELERATION RESPONSE SPECTRUM
 AR ACCESS RESTRICTION
 AS AGGREGATE SUBBASE
 ASRP ALUMINUM SPIRAL RIB PIPE
 ASSY ASSEMBLY
 ATPB ASPHALT TREATED PERMEABLE BASE
 ATPM ASPHALT TREATED PERMEABLE MATERIAL
 AVE AVENUE
 AVG AVERAGE
 @ AT

B

BAGR BRIDGE APPROACH GUARD RAILING
 BB BEGINNING OF BRIDGE
 BC BEGIN HORIZONTAL CURVE
 BCC BALANCED CANTILEVER CONSTRUCTION
 BCR BEGIN CURB RETURN
 BEG BEGIN
 BFFSA BAKERSFIELD F STREET STATION ALIGNMENT
 BIT CTD BITUMINOUS COATED
 BK BACK
 BKF BACKFILL
 BLDG BUILDING
 BLM BRIDGE-LOG MILE
 BLVD BOULEVARD
 BM BENCH MARK
 BND BOUND
 BNSF BURLINGTON NORTH & SANTA FE
 BOT BOTTOM
 BR BRIDGE
 BRG BEARING
 BTU BRITISH THERMAL UNIT
 BVC BEGIN VERTICAL CURVE
 BW BARBED WIRE

C

CAA CABLE ANCHOR ASSEMBLY
 CAP CORRUGATED ALUMINUM PIPE
 CAPA CORRUGATED ALUMINUM PIPE ARCH
 CAS CONSTRUCTION AREA SIGN
 CB CONCRETE BARRIER
 CBW CONCRETE BLOCK WALL
 C-C CENTER TO CENTER
 CHSRA CALIFORNIA HIGH SPEED RAIL AUTHORITY
 CHST CALIFORNIA HIGH SPEED TRAIN
 CHSR CALIFORNIA HIGH SPEED RAIL
 CG CENTER OF GRAVITY
 CHNL CHANNEL
 CI CAST IRON
 CIDH CAST-IN-DRILLED-HOLE
 CIP,C-I-P CAST-IN-PLACE, CAST IRON PIPE
 CIPCP CAST IN PLACE CONCRETE PIPE
 CISS CAST-IN-STEEL-SHELL
 CJP COMPLETE JOINT PENETRATION
 CL CENTERLINE, CLASS
 CL2 CLASS 2
 CL-6 CHAIN LINK FENCE (6 FT)
 CLR CLEAR, CLEARANCE
 CM CORRUGATED METAL
 CMP CORRUGATED METAL PIPE
 CO COUNTY
 COL COLUMN
 CONC CONCRETE
 COND CONDUIT
 CONN CONNECTOR
 CONST CONSTRUCT, CONSTRUCTION
 CONT CONTINUOUS
 COORD COORDINATE
 CP CANDLEPOWER
 CR CREEK
 CRCP CONTINUOUS REINFORCED CONCRETE PAVEMENT
 CRSP CONCRETED ROCK SLOPE PROTECTION
 CS CURVE TO SPIRAL
 CSP CORRUGATED STEEL PIPE
 CSPA CORRUGATED STEEL PIPE ARCH
 CTB CEMENT TREATED BASE
 CTPB CEMENT TREATED PERMEABLE BASE
 CTPM CEMENT TREATED PERMEABLE MATERIAL
 CTRS CENTERS
 CVFPB CENTRAL VALLEY FLOOD PROTECTION BOARD
 CULV CULVERT
 C CENTERLINE

D

D DEPTH
 DD DOWNDRAIN, DIRECTIVE DRILLING
 DBL DOUBLE
 DEG DEGREE
 DEL DELINEATOR
 DET DETAIL, DETOUR
 DF DOUGLAS FIR
 DI DRAINAGE INLET, DROP INLET
 DIA DIAMETER
 DIAPH DIAPHRAGM
 DIST DISTANCE, DISTRICT
 DMBB DOUBLE METAL BEAM BARRIER
 DR DRIVE
 DTBB DOUBLE THRIE BEAM BARRIER
 DWP DEPARTMENT OF WATER AND POWER
 DWY DRIVEWAY

E

E EAST, EASTING
 EA ACTUAL SUPERELEVATION
 EU UNBALANCED SUPERELEVATION
 EASE EASEMENT
 EB END OF BRIDGE, EASTBOUND
 EC END HORIZONTAL CURVE
 ECR END CURB RETURN
 ED EDGE DRAIN
 EDC EDGE DRAIN CLEANOUT
 EDO EDGE DRAIN OUTLET
 EDV EDGE DRAIN VENT
 ELEC ELECTROLIER
 ELECT ELECTRIC
 ELEV ELEVATION
 EMB EMBANKMENT
 ENGR ENGINEER
 EOD EDGE OF DECK
 EP EDGE OF PAVEMENT
 EQ EQUATION, EQUAL
 ES EDGE OF SHOULDER
 ETW EDGE OF TRAVELED WAY
 EVC END VERTICAL CURVE
 EW ENDWALL
 EXC EXCAVATION
 EXIST, EX. EXISTING
 EXP EXPANSION
 EXP JT EXPANSION JOINT
 EXWY EXPRESSWAY
 EXT EXTERIOR

F

F & C FRAME AND COVER
 F & G FRAME AND GRATE
 FB FLOOR BEAM
 F-B FRESNO TO BAKERSFIELD
 FDN FOUNDATION
 FEBT FACING EASTBOUND TRAFFIC
 FES FLARED END SECTION
 FF FILTER FABRIC
 FG FINISHED GRADE
 FH FIRE HYDRANT
 FIG FIGURE
 FL FLOW LINE
 FNBT FACING NORTHBOUND TRAFFIC
 FOC FACE OF CONCRETE
 FR RD FRONTAGE ROAD
 FS FAR SIDE, FINISHED SURFACE
 FSBT FACING SOUTHBOUND TRAFFIC
 FT FOOT, FEET
 FTG FOOTING
 FWBT FACING WESTBOUND TRAFFIC
 FWY FREEWAY
 FPLM FULL SPAN PRECAST LAUNCHING METHOD

G

G ACCELERATION DUE TO GRAVITY
 GA GAGE
 GALV GALVANIZED
 GP GRADING PLANE
 GR GUARD RAILING
 GSP GALVANIZED STEEL PIPE
 GTR GUTTER

H

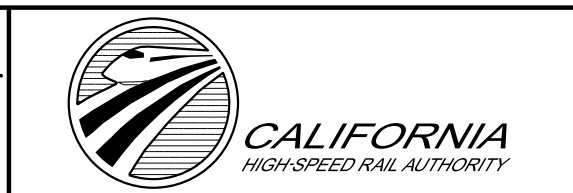
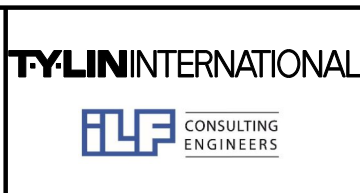
H HEIGHT
 HR HOUR
 HD HORIZONTAL DRAIN
 HDWL HEADWALL
 HEX HD HEXAGONAL HEAD
 HMA HOT MIXED ASPHALT
 HORIZ HORIZONTAL
 HP HINGE POINT, HORSEPOWER
 HPS HIGH PERFORMANCE STEEL
 HS HIGH STRENGTH
 HST HIGH SPEED TRAIN
 HSR HIGH SPEED RAIL
 HW HEADWALL, HIGH WATER
 HWM HIGH WATER MARK
 HWY HIGHWAY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
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 DRAWN BY
J. FOUCH
 CHECKED BY
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 IN CHARGE
J. MORRISON
 DATE
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**CALIFORNIA HIGH-SPEED RAIL PROJECT
 BAKERSFIELD TO PALMDALE**

GENERAL
 ABBREVIATIONS AND LEGEND
 SHEET 1 OF 4

CONTRACT NO.
HSR13-44
 DRAWING NO.
TN-B0003
 SCALE
AS SHOWN
 SHEET NO.

I

IB IMPORTED BORROW
 ID INSIDE DIAMETER
 IF INSIDE FACE
 IN INCH, INCHES
 INT INTERIOR
 INV INVERT
 IRR IRRIGATION

J

JCT JUNCTION
 JP JOINT POLE
 JPCP JOINTED PLAIN CONCRETE PAVEMENT
 JS JUNCTION STRUCTURE
 JT JOINT

K

K DISTANCE TO ACHIEVE 1% GRADE CHANGE

L

L LENGTH
 LAT LATITUDE
 LCB LEAN CONCRETE BASE
 LN LANE
 LOC LOCATION
 LOL LAYOUT LINE
 LONG LONGITUDE
 LONGIT LONGITUDINAL
 LS LENGTH OF SPIRAL
 LC LENGTH OF CURVE
 LT LEFT

M

MAINT MAINTENANCE
 MAX MAXIMUM
 MB METAL BEAM
 MBB METAL BEAM BARRIER
 MBGR METAL BEAM GUARD RAILING
 MED MEDIAN
 MH MANHOLE
 MIN MINIMUM
 MISC MISCELLANEOUS
 MISC I & S MISCELLANEOUS IRON AND STEEL
 MKR MARKER
 M/L MAIN LINE (RAILWAY)
 MOD MODIFIED, MODIFY
 MON MONUMENT
 MOIF MAINTENANCE OF INFRASTRUCTURE FACILITY
 MOIS MAINTENANCE OF INFRASTRUCTURE SIDING
 MP METAL PLATE
 MPGR METAL PLATE GUARD RAILING
 MPH MILES PER HOUR

M CONTINUED

MR MOVEMENT RATING
 MSE MECHANICALLY STABILIZED EARTH
 MTL MATERIAL
 MSS MOVING SCAFFOLDING SYSTEM

N

N NORTH, NORTHING
 NB NORTHBOUND
 NO. NUMBER (MUST HAVE PERIOD)
 NOS. NUMBERS (MUST HAVE PERIOD)
 NPS NOMINAL PIPE SIZE
 NS NEAR SIDE
 NTS NOT TO SCALE
 N/A NOT APPLICABLE

O

OBLR OBLITERATE
 OC OVERCROSSING
 OCS OVERHEAD CONTACT SYSTEM
 OD OUTSIDE DIAMETER
 OF OUTSIDE FACE
 OG ORIGINAL GROUND
 OGAC OPEN GRADED ASPHALT CONCRETE
 OH OVERHEAD
 O-O OUT TO OUT
 OPP OPPOSITE

P

P PAGE
 PAP PERFORATED ALUMINUM PIPE
 PB PULL BOX
 PC POINT OF CURVATURE, PRECAST
 PCC POINT OF COMPOUND CURVE, PORTLAND CEMENT CONCRETE
 PCP PERFORATED CONCRETE PIPE, PRESTRESSED CONCRETE PIPE
 PCVC POINT OF COMPOUND VERTICAL CURVE
 PED PEDESTRIAN
 PED OC PEDESTRIAN OVERCROSSING
 PED UC PEDESTRIAN UNDERCROSSING
 PERM MTL PERMEABLE MATERIAL
 PG PROFILE GRADE
 PI POINT OF INTERSECTION
 PJP PARTIAL JOINT PENETRATION
 PL PLATE
 P/L PROPERTY LINE
 PM POST MILE, TIME FROM NOON TO MIDNIGHT
 PN PAVING NOTCH
 POB POINT OF BEGINNING
 POC POINT OF HORIZONTAL CURVE

P CONTINUED

POE POINT OF ENDING
 POT POINT OF TANGENT
 POVC POINT OF VERTICAL CURVE
 PP PIPE PILE, PLASTIC PIPE, POWER POLE
 PPEF PROPOSED PERMANENT ENVIRONMENTAL FOOTPRINT
 PPL PREFORMED PERMEABLE LINER
 PPP PERFORATED PLASTIC PIPE
 PRC POINT OF REVERSE CURVE
 PRF PAVEMENT REINFORCING FABRIC
 PRVC POINT OF REVERSE VERTICAL CURVE
 PS&E PLANS, SPECIFICATIONS AND ESTIMATES
 PS, P/S PRESTRESSED, PARALLEL STATION
 PSP PERFORATED STEEL PIPE
 PT POINT OF TANGENCY
 PTEF PROPOSED TEMPORARY ENVIRONMENTAL FOOTPRINT
 PVC POLYVINYL CHLORIDE
 PVI POINT OF VERTICAL INTERSECTION
 PVMT PAVEMENT
 PVP MAINTENANCE VEHICLE PULLOUT

Q

QTY QUANTITY

R

R RADIUS
 R & D REMOVE AND DISPOSE
 R & S REMOVE AND SALVAGE
 R/C RATE OF CHANGE
 RCA REINFORCED CONCRETE ARCH
 RCB REINFORCED CONCRETE BOX
 RCP REINFORCED CONCRETE PIPE
 RCPA REINFORCED CONCRETE PIPE ARCH
 RD ROAD
 REINF REINFORCED, REINFORCEMENT, REINFORCING
 REL RELOCATE
 REPL REPLACEMENT
 RET RETAINING
 REV REVISED
 RDWY ROADWAY
 RM ROAD-MIXED
 RP RADIUS POINT, REFERENCE POINT
 RR RAILROAD
 RSP ROCK SLOPE PROTECTION
 RT RIGHT
 RTE ROUTE
 RW REDWOOD, RETAINING WALL
 R/W RIGHT OF WAY
 RWY RAILWAY

S

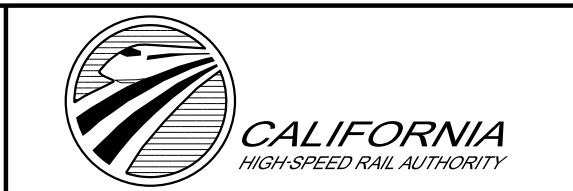
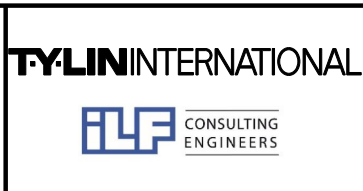
S SOUTH, SUPPLEMENT
 SAE STRUCTURE APPROACH EMBANKMENT
 SALV SALVAGE
 SAPP STRUCTURAL ALUMINUM PLATE PIPE
 SB SOUTHBOUND
 SC SPIRAL TO CURVE
 SCSP SLOTTED CORRUGATED STEEL PIPE
 SD STORM DRAIN
 SEC SECOND
 SECT SECTION
 SEP SEPARATION
 SG SUBGRADE
 SHLD SHOULDER
 SHT SHEET
 SIM SIMILAR
 S STATION LINE
 SM SELECTED MATERIAL
 SPEC SPECIAL, SPECIFICATIONS
 SPP SLOTTED PLASTIC PIPE
 SS SLOPE STAKE, SPIRAL TO SPIRAL, SWITCHING STATION
 SSBM STRAP AND SADDLE BRACKET METHOD
 SSD STRUCTURAL SECTION DRAIN
 SSPA STRUCTURAL STEEL PLATE ARCH
 SSPP STRUCTURAL STEEL PLATE PIPE
 SSPPA STRUCTURAL STEEL PLATE PIPE ARCH
 SSRP STEEL SPIRAL RIB PIPE
 SR STATE ROUTE
 ST STREET, SPIRAL TO TANGENT
 STA STATION
 STBB SINGLE THRIE BEAM BARRIER
 STD STANDARD
 STR STRUCTURE
 SRS STAND ALONE RADIO SITE
 SURF SURFACING
 SW SIDEWALK, SOUND WALL
 SWR SEWER
 SWS SWITCHING STATION
 SYM SYMMETRICAL
 S4S SURFACE 4 SIDES
 SJVR SAN JOAQUIN VALLEY RAILROAD

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GENERAL
 ABBREVIATIONS AND LEGEND
 SHEET 2 OF 4

CONTRACT NO.
HSR13-44
 DRAWING NO.
TN-B0004
 SCALE
AS SHOWN
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T

T SEMI-TANGENT
 TAB TABLET
 TAN TANGENT
 TBB THRIE BEAM BARRIER
 TBR TIMBER
 TC TOP OF CURB, TANGENT TO CURVE
 TCB TRAFFIC CONTROL BOX
 TEL TELEPHONE
 TEMP TEMPORARY
 TG TOP OF GRADE
 TM TECHNICAL MEMORANDUM
 TOT TOTAL
 TP TELEPHONE POLE
 TPB TREATED PERMEABLE BASE
 TPM TREATED PERMEABLE MATERIAL
 TPSS TRACTION POWER SUPPLY STATION
 TRANS TRANSITION, TRANSVERSE
 TS TRAFFIC SIGNAL, TUBULAR STEEL,
 TANGENT TO SPIRAL
 TSMF TERMINAL STORAGE AND MAINTENANCE FACILITY
 TOR TOP OF RAIL
 TYP TYPICAL

U

UC UNDERCROSSING
 UD UNDERDRAIN
 UON UNLESS OTHERWISE NOTED
 UP UNDERPASS
 UPRR UNION PACIFIC RAILROAD
 USFWS UNITED STATES FISH AND WILDLIFE SERVICE

V

V VALVE, DESIGN SPEED
 VAR VARIABLE
 VC VERTICAL CURVE
 VCP VITRIFIED CLAY PIPE
 VERT VERTICAL
 VIA VIADUCT
 VOL VOLUME

W

W WEST
 WB WIDTH
 WH WESTBOUND
 WH WEEP HOLE
 WM WIRE MESH
 WS WATER SURFACE
 WSP WELDED STEEL PIPE
 WT WEIGHT
 WV WATER VALVE
 WW WINGWALL
 WWL WINGWALL LAYOUT LINE
 W/ WITH

X

X SEC CROSS SECTION
 XING CROSSING

Y

YR YEAR
 YRS YEARS

Z

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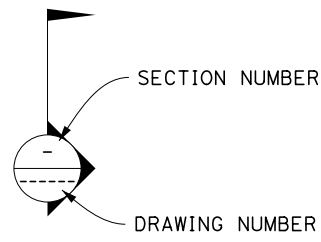








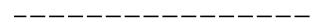










**CALIFORNIA HIGH-SPEED RAIL PROJECT
 BAKERSFIELD TO PALMDALE**

GENERAL
 ABBREVIATIONS AND LEGEND
 SHEET 3 OF 4

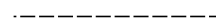

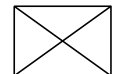
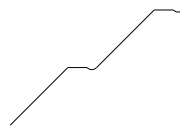
CONTRACT NO.
 HSR13-44
 DRAWING NO.
 TN-B0005
 SCALE
 AS SHOWN
 SHEET NO.

LEGEND:

PLAN

- 
 -  CURVE DATA (ALIGNMENTS,ROADWAYS)
 -  CURVE DATA (STRUCTURES)
 -  LINE DATA (ALIGNMENTS,ROADWAYS)
 -  NORTH ARROW
 -  PROPOSED RIGHT OF WAY
 -  PROPOSED TEMPORARY ENVIRONMENTAL FOOTPRINT (PTEF)
 -  PROPOSED PERMANENT ENVIRONMENTAL FOOTPRINT (PEF)
 -  EXISTING RIGHT OF WAY
 -  LIMITS OF EXCAVATION (CUT)
 -  LIMITS OF EMBANKMENT (FILL)
 -  FAULT ZONE
 -  EXISTING RETAINING WALL
 -  PROPOSED RETAINING WALL
 -  TUNNEL EXCAVATION LIMITS
 -  TRACK CROSSING PANEL
- UTILITIES**
-  EXISTING ELECTRICAL TRANSMISSION
 -  EXISTING ELECTRICAL TRANSMISSION TOWER
 -  EXISTING STORM DRAIN
 -  EXISTING GAS LINE

PROFILE

-  ORIGINAL GROUND
-  PROPOSED CHSR ELEVATION
-  STRUCTURAL CLEARANCE ENVELOPE
-  FACE EXCAVATION (CUT AND BENCH)

GENERAL NOTES

1. ROADWAY IMPROVEMENTS NOT PART OF THIS SET.
2. FOR PROPOSED RETAINING WALL SEE SHEET SERIES ST-G.

Projects\701206_00_CHSRBP\00_CADD\Sheet Files\TNBP-TN-B0006.dgn

11/6/2017 11:36:27 AM

OJC:ARIVEGA

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. CARROLL

DRAWN BY
J. FOUCH

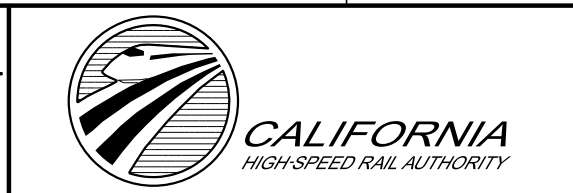
CHECKED BY
G. ERICKSON

IN CHARGE
J. MORRISON

DATE
10/31/2017

**RECORD
PEPD
SUBMITTAL**

**NOT FOR
CONSTRUCTION**

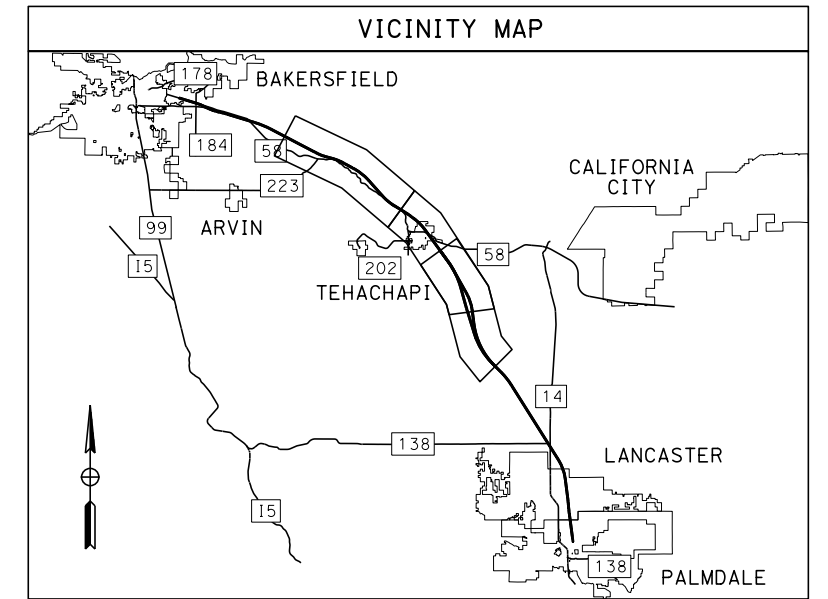
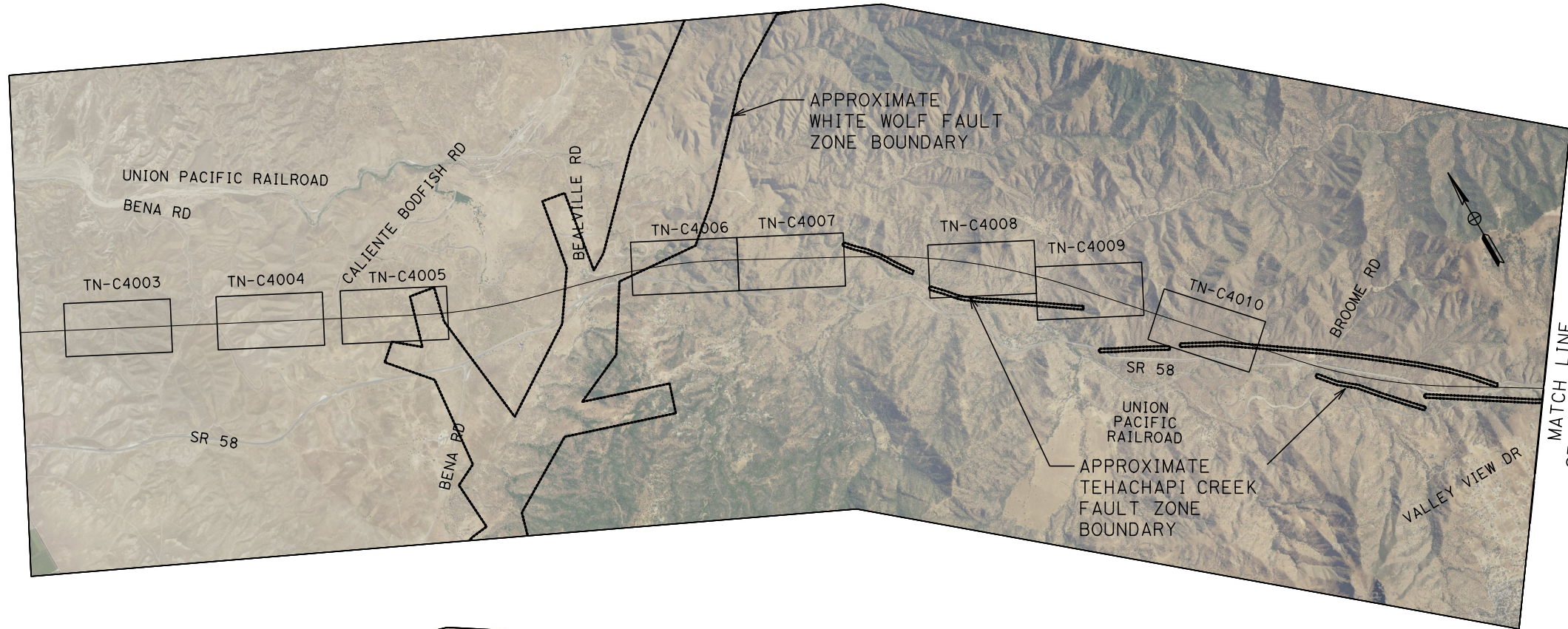


**CALIFORNIA HIGH-SPEED RAIL PROJECT
BAKERSFIELD TO PALMDALE**

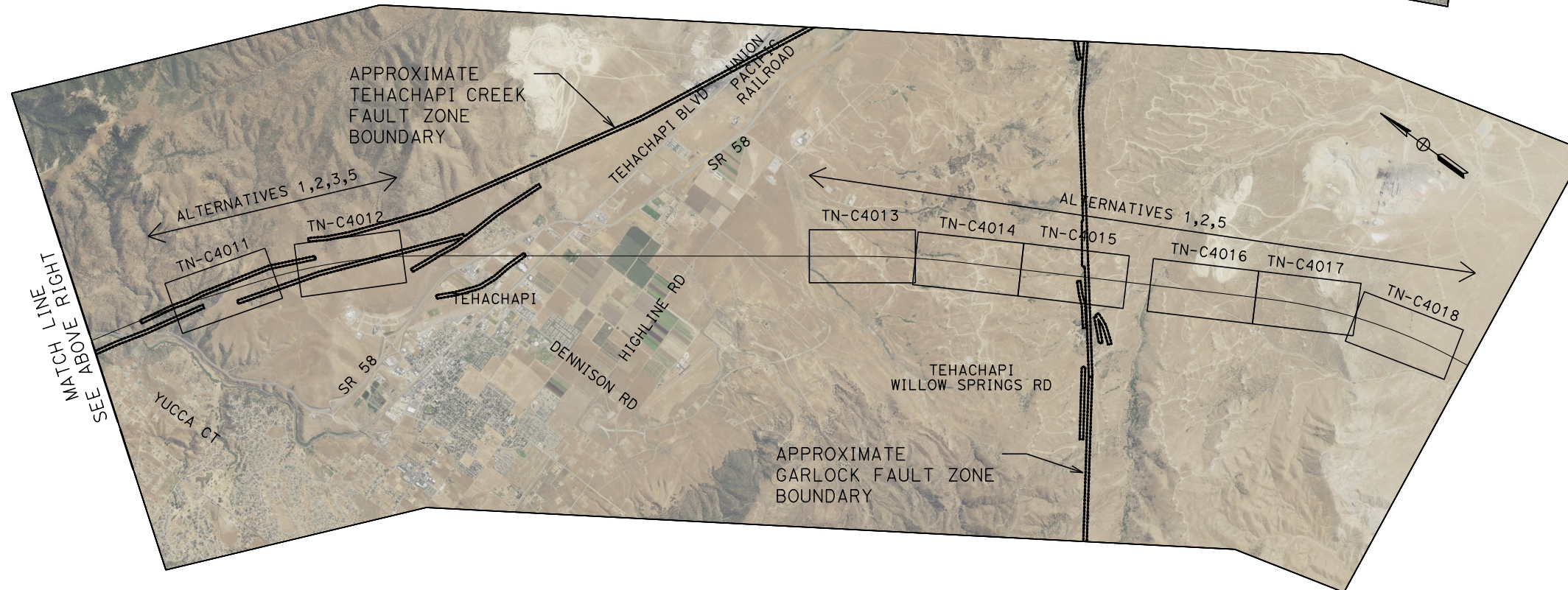
GENERAL
ABBREVIATIONS AND LEGEND
SHEET 4 OF 4

CONTRACT NO. HSR13-44	DRAWING NO. TT-B0006
SCALE AS SHOWN	
SHEET NO.	

ALIGNMENT "ALTERNATIVES 1,2,3,5"



MATCH LINE
SEE BELOW LEFT



MATCH LINE
SEE ABOVE LEFT

Projects\701206_00_CHSRBP\00_CADD\Sheet Files\TN\Key Map\Sheet_BP-TN-B0007.dgn

11/6/2017 1:58:20 PM

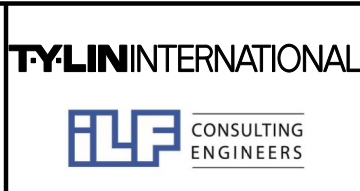
OIC:ARTIVEGA

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. CARROLL
DRAWN BY
J. FOUCH
CHECKED BY
G. ERICKSON
IN CHARGE
J. MORRISON
DATE
10/31/2017

**RECORD
PEPD
SUBMITTAL**

**NOT FOR
CONSTRUCTION**

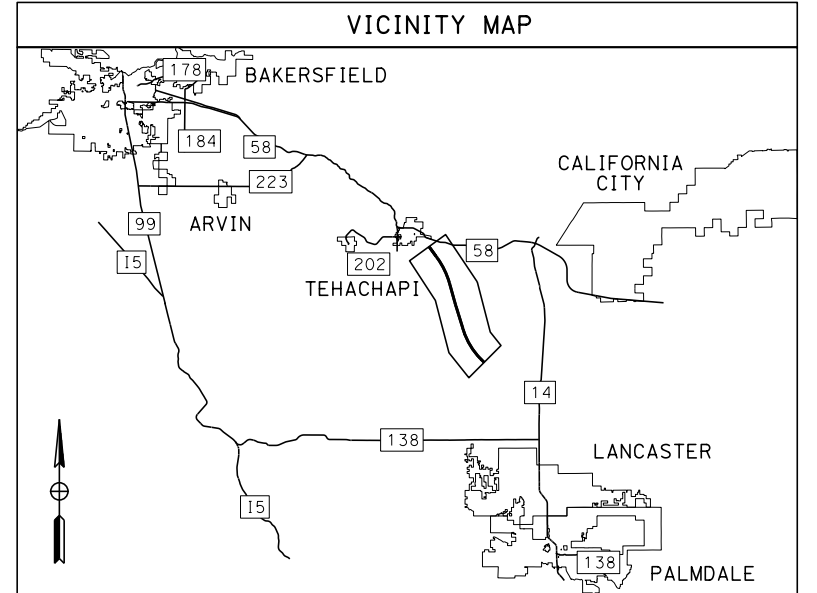
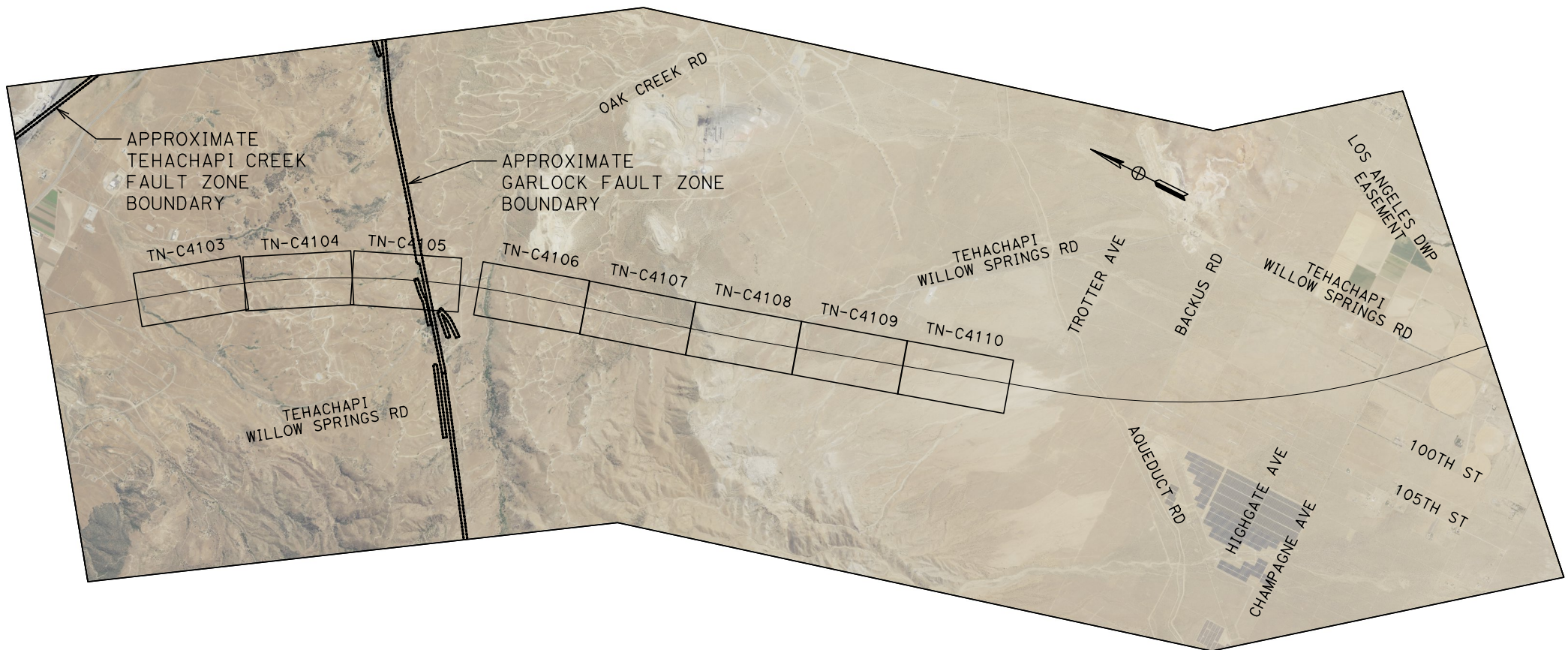


**CALIFORNIA HIGH-SPEED RAIL PROJECT
BAKERSFIELD TO PALMDALE**

KEY MAP- ALT 1,2,3,5 ALIGNMENT TUNNELS

CONTRACT NO.
HSR13-44
DRAWING NO.
TN-B0007
SCALE
AS SHOWN
SHEET NO.

ALIGNMENT "ALTERNATIVE 3"

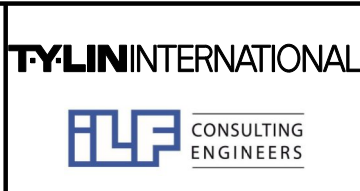


REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. CARROLL
DRAWN BY
J. FOUCH
CHECKED BY
G. ERICKSON
IN CHARGE
J. MORRISON
DATE
10/31/2017

**RECORD
PEPD
SUBMITTAL**

**NOT FOR
CONSTRUCTION**



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

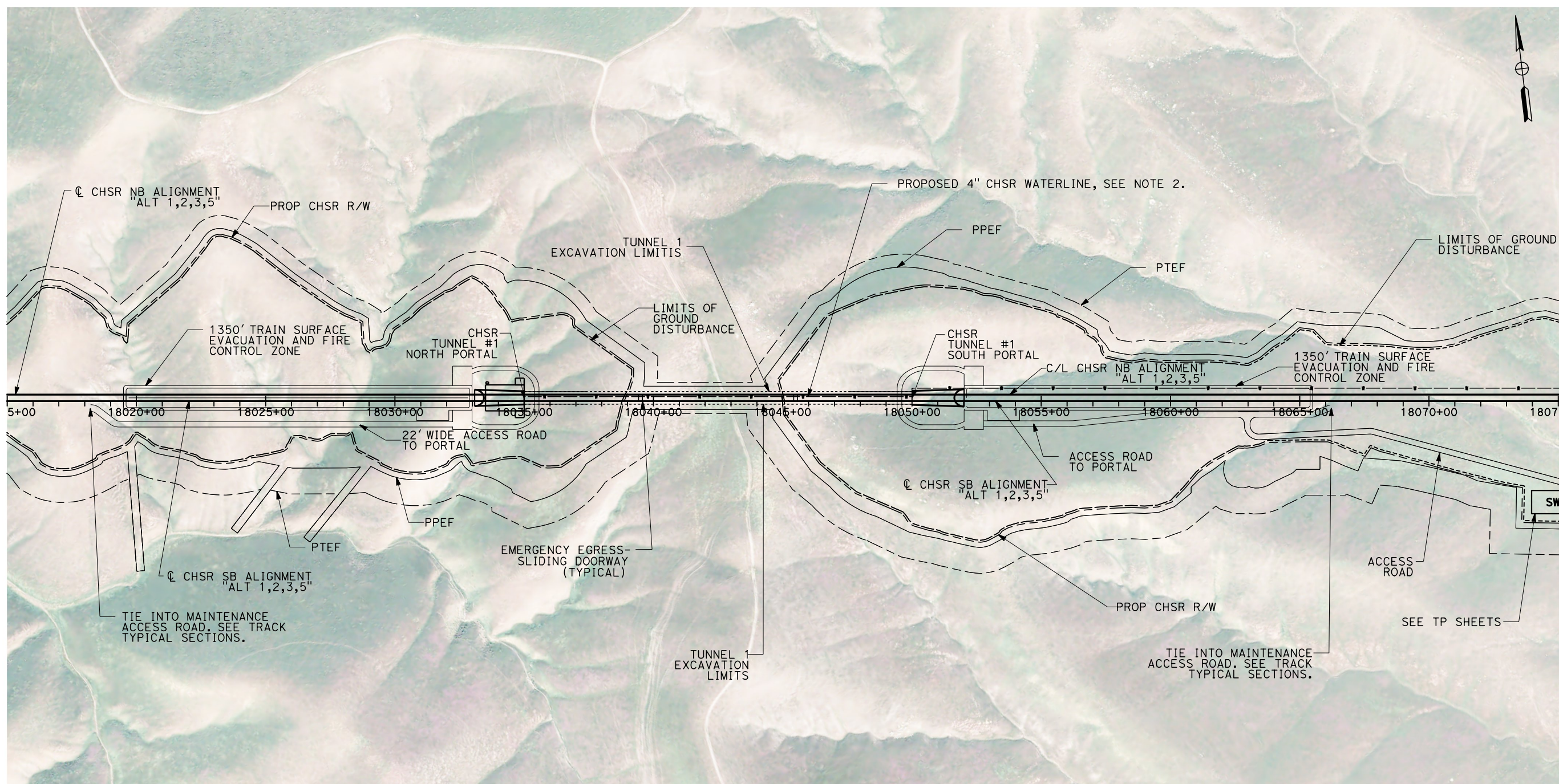
KEY MAP- ALT 3 ALIGNMENT TUNNELS

CONTRACT NO.
HSR13-44
DRAWING NO.
TN-B0008
SCALE
AS Shown
SHEET NO.

Projects\701206.00_CHSRBP\00_CADD\Sheet Files\TN\BP-TN-C4003.dgn

11/6/2017 11:43:53 AM

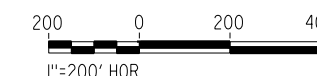
11/6/2017



GENERAL NOTES:

- FOR PROFILE INFORMATION, SEE SHEET TN-Y1001
- PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00

PLAN

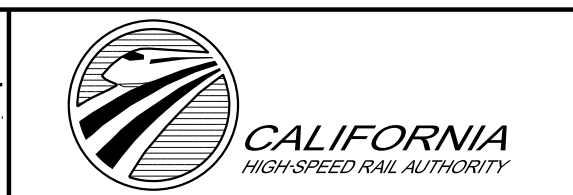


REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. CARROLL
DRAWN BY J. FOUCH
CHECKED BY G. ERICKSON
IN CHARGE J. MORRISON
DATE 10/31/2017

**RECORD
PEPD
SUBMITTAL**

**NOT FOR
CONSTRUCTION**



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

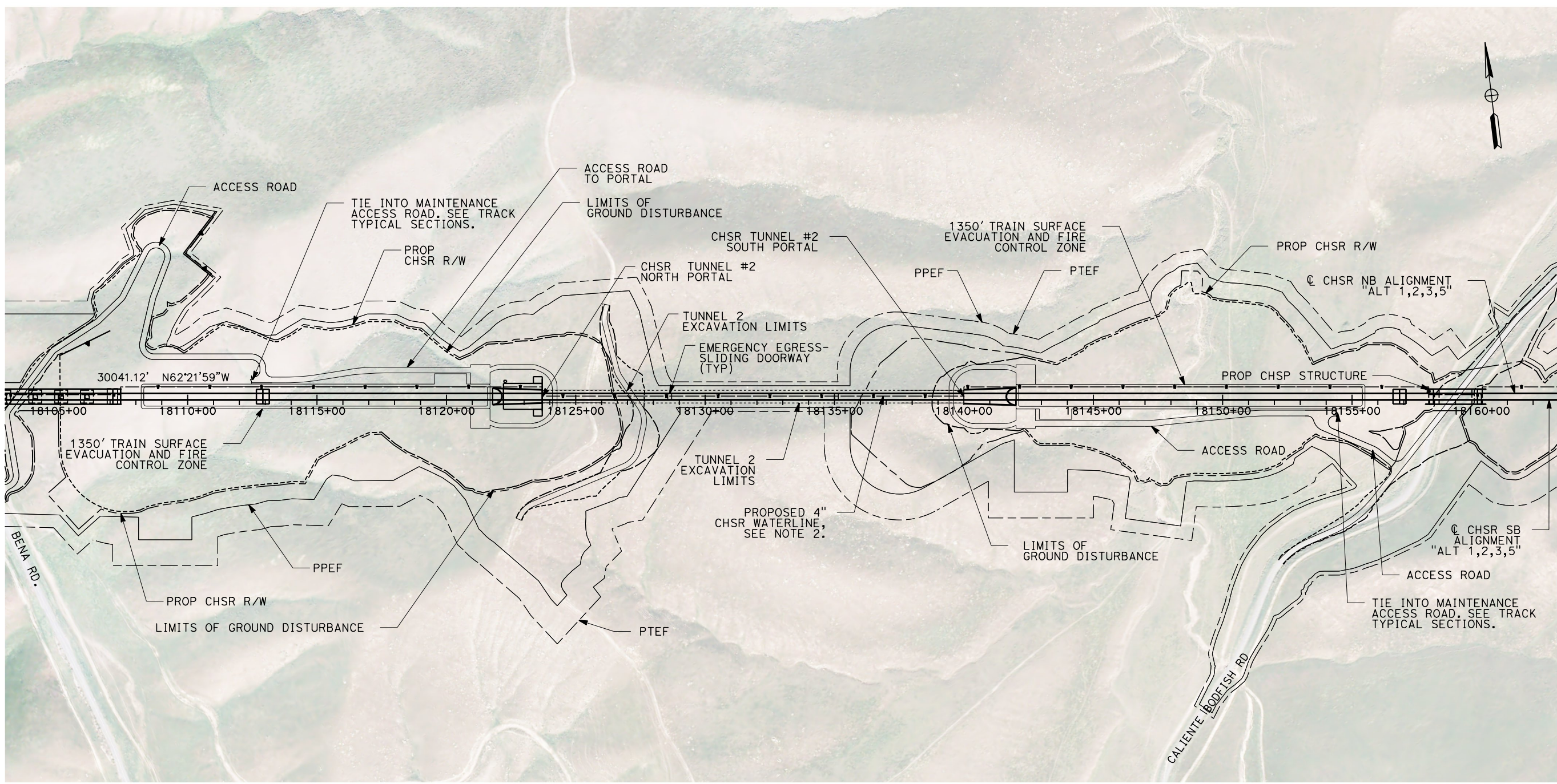
ALT 1,2,3,5 ALIGNMENT
TUNNEL 1 - NORTH AND SOUTH PORTAL
STATION 18015+00 TO 18075+00

CONTRACT NO. HSR13-44
DRAWING NO. TN-C4003
SCALE AS SHOWN
SHEET NO.

Projects\701206.00_CHSRBP\00_CADD\Sheet Files\TN\BP-TN-C4004.dgn

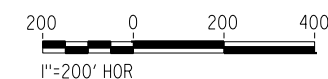
11/6/2017 11:41:28 AM

11/6/2017



GENERAL NOTES:

1. FOR PROFILE INFORMATION SEE SHEET TN-Y1001
2. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00



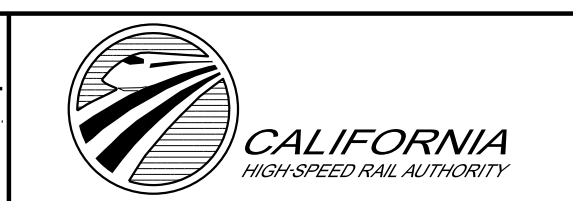
PLAN

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. CARROLL
DRAWN BY J. FOUCH
CHECKED BY G. ERICKSON
IN CHARGE J. MORRISON
DATE 10/31/2017

**RECORD
PEPD
SUBMITTAL**

**NOT FOR
CONSTRUCTION**



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

ALT 1,2,3,5 ALIGNMENT
TUNNEL 2 - NORTH AND SOUTH PORTAL
STATION 18103+00 TO 18163+00

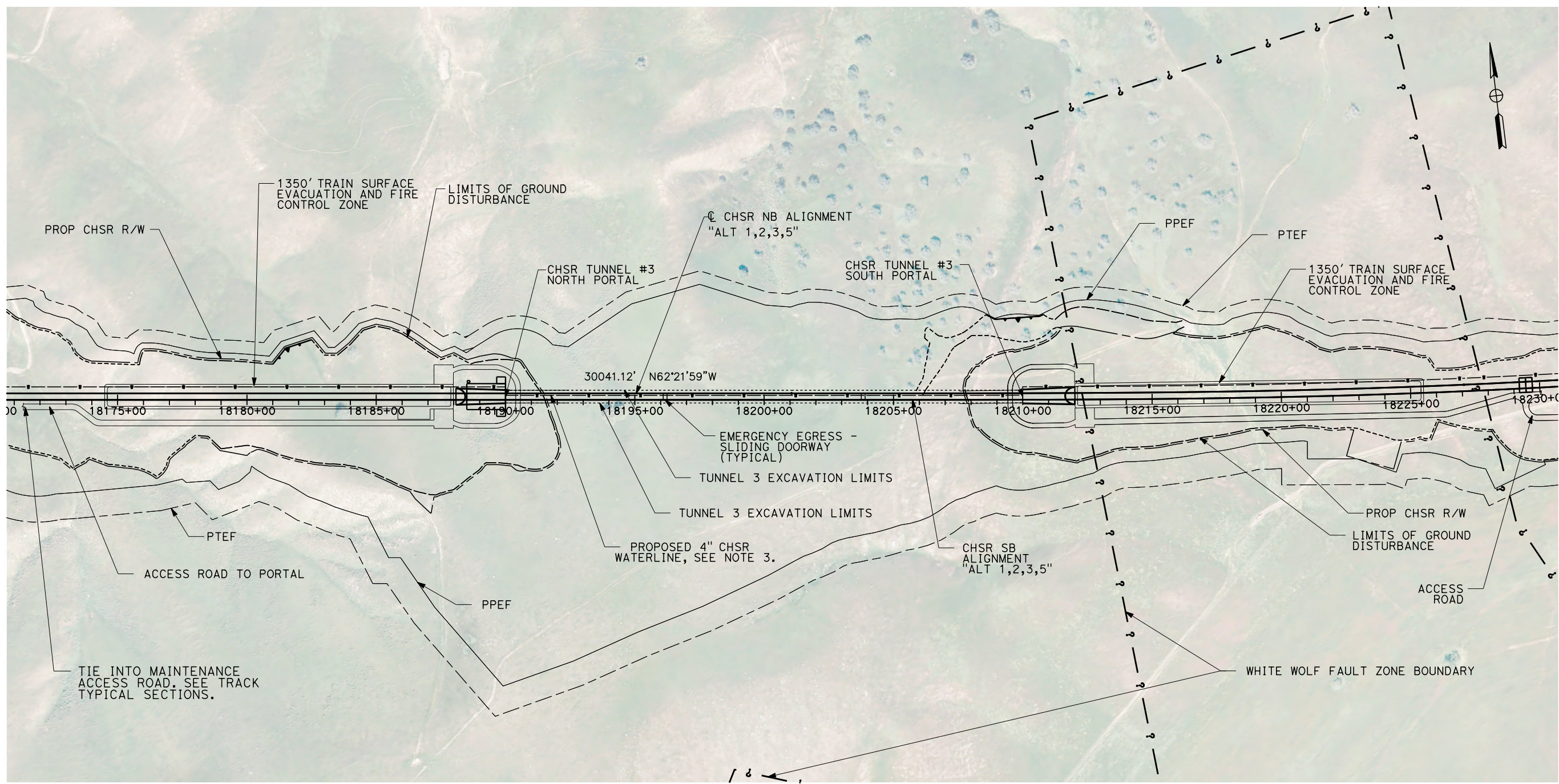
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DRAWING NO. TN-C4004
SCALE AS SHOWN
SHEET NO.

OIC:ARTIVEGA

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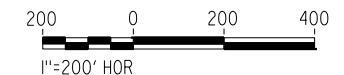
11/6/2017 11:38:35 AM

11/6/2017



GENERAL NOTES:

1. FAULT ZONE LOCATIONS ARE APPROXIMATE, TO BE CONFIRMED.
2. FOR PROFILE INFORMATION SEE SHEET TN-Y1002
3. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00



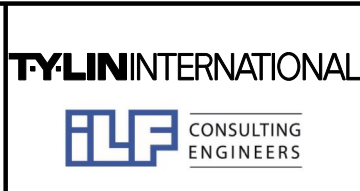
PLAN

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. CARROLL
DRAWN BY
J. FOUCH
CHECKED BY
G. ERICKSON
IN CHARGE
J. MORRISON
DATE
10/31/2017

**RECORD
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SUBMITTAL**

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CONSTRUCTION**



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

ALT 1,2,3,5 ALIGNMENT TUNNEL 3
NORTH AND SOUTH PORTAL
STATION 18171+00 TO 18231+00

CONTRACT NO.
HSR13-44

DRAWING NO.
TN-C4005

SCALE
AS SHOWN

SHEET NO.

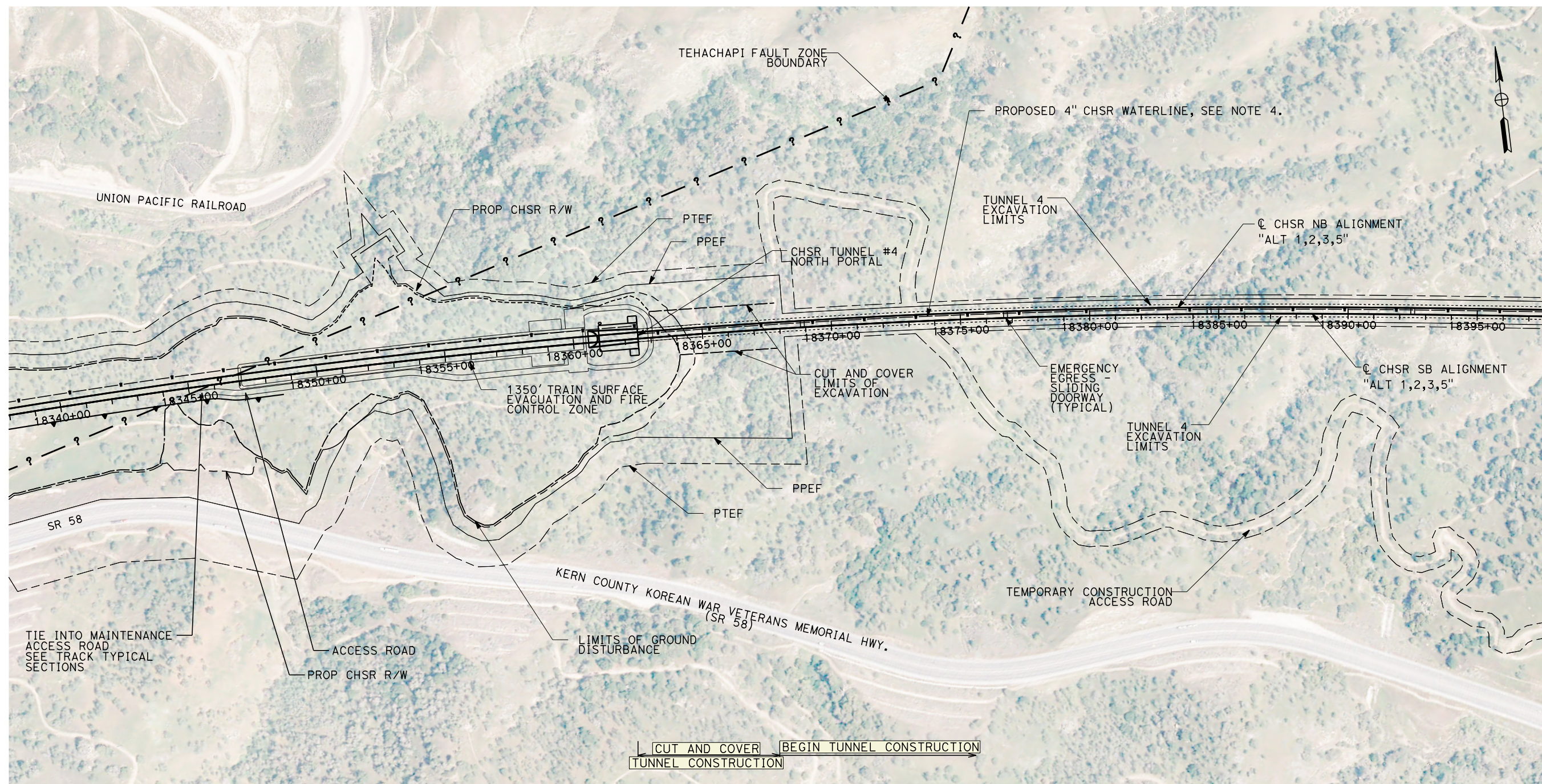
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11/6/2017

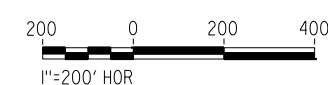
OIC:ARTIVEGA



MATCH LINE STA 18398+00
SEE SHEET TN-C4007

GENERAL NOTES:

1. FAULT ZONE LOCATIONS ARE APPROXIMATE, TO BE CONFIRMED.
2. FOR PROFILE INFORMATION SEE SHEETS TN-Y1002, TN-Y1003
3. TUNNEL 4 WILL BE CONSTRUCTED BY CUT AND COVER METHODS BETWEEN STATION 18362+50 TO 18368+00
4. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00



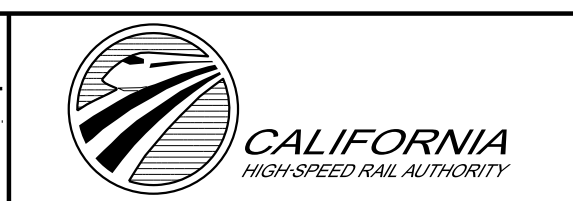
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REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. CARROLL
DRAWN BY
J. FOUCH
CHECKED BY
G. ERICKSON
IN CHARGE
J. MORRISON
DATE
10/31/2017

**RECORD
PEPD
SUBMITTAL**

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CONSTRUCTION**



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

ALT 1,2,3,5 ALIGNMENT
TUNNEL 4 - NORTH PORTAL
STATION 18338+00 TO 18398+00

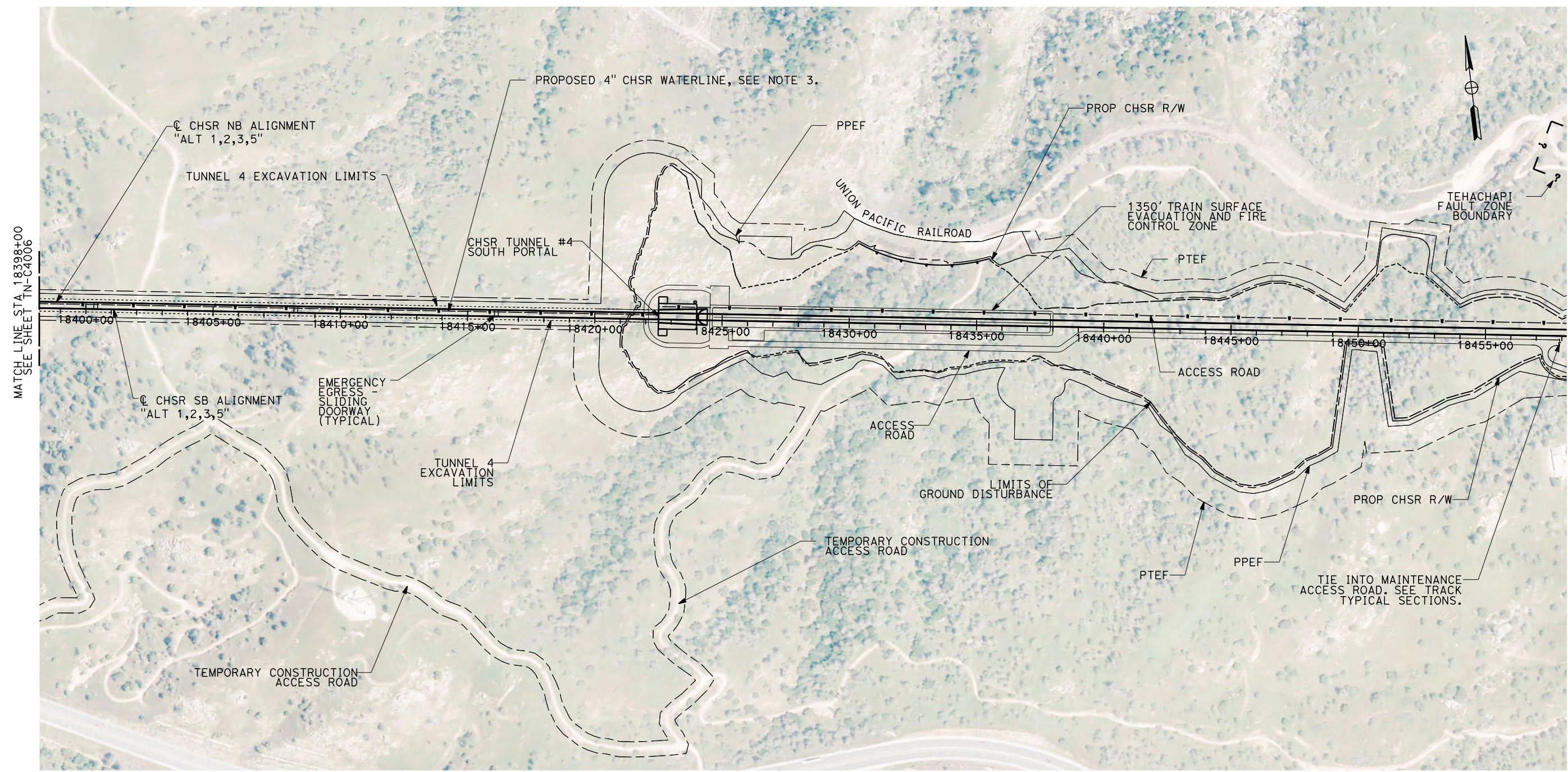
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DRAWING NO.
TN-C4006
SCALE
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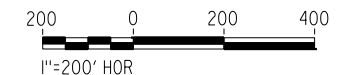
11/6/2017

OIC:ARTIVEGA



GENERAL NOTES:

1. FAULT ZONE LOCATIONS ARE APPROXIMATE, TO BE CONFIRMED.
2. FOR PROFILE INFORMATION SEE SHEET TN-Y1003
3. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00



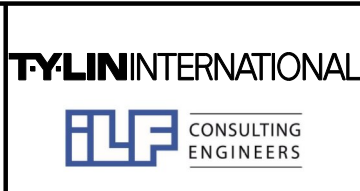
PLAN

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. CARROLL
DRAWN BY J. FOUCH
CHECKED BY G. ERICKSON
IN CHARGE J. MORRISON
DATE 10/31/2017

**RECORD
PEPD
SUBMITTAL**

**NOT FOR
CONSTRUCTION**



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

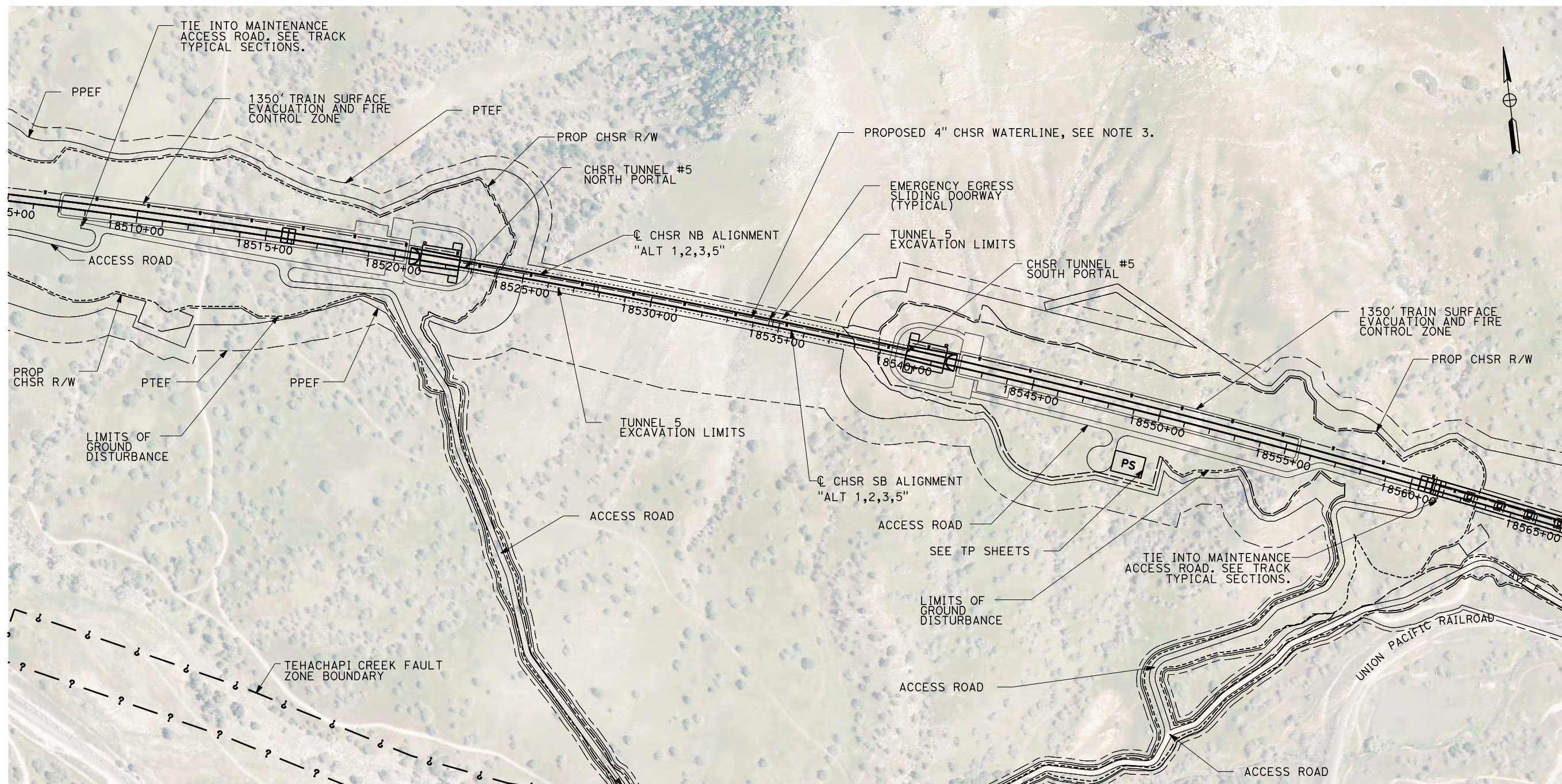
ALT 1,2,3,5 ALIGNMENT
TUNNEL 4 - SOUTH PORTAL
STATION 18398+00 TO 18458+00

CONTRACT NO. HSR13-44
DRAWING NO. TN-C4007
SCALE AS SHOWN
SHEET NO.

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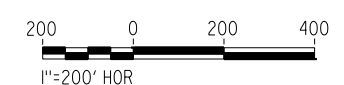
11/6/2017



GENERAL NOTES:

1. FAULT ZONE LOCATIONS ARE APPROXIMATE, TO BE CONFIRMED.
2. FOR PROFILE INFORMATION SEE SHEET TN-Y1003
3. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00

PLAN

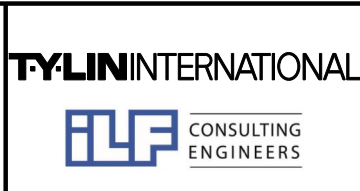


REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. CARROLL
DRAWN BY J. FOUCH
CHECKED BY G. ERICKSON
IN CHARGE J. MORRISON
DATE 10/31/2017

**RECORD
PEPD
SUBMITTAL**

**NOT FOR
CONSTRUCTION**



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

ALT 1,2,3,5 ALIGNMENT
TUNNEL 5 - NORTH AND SOUTH PORTALS
STATION 18505+00 TO 18566+00

CONTRACT NO. HSR13-44
DRAWING NO. TN-C4008
SCALE AS SHOWN
SHEET NO.

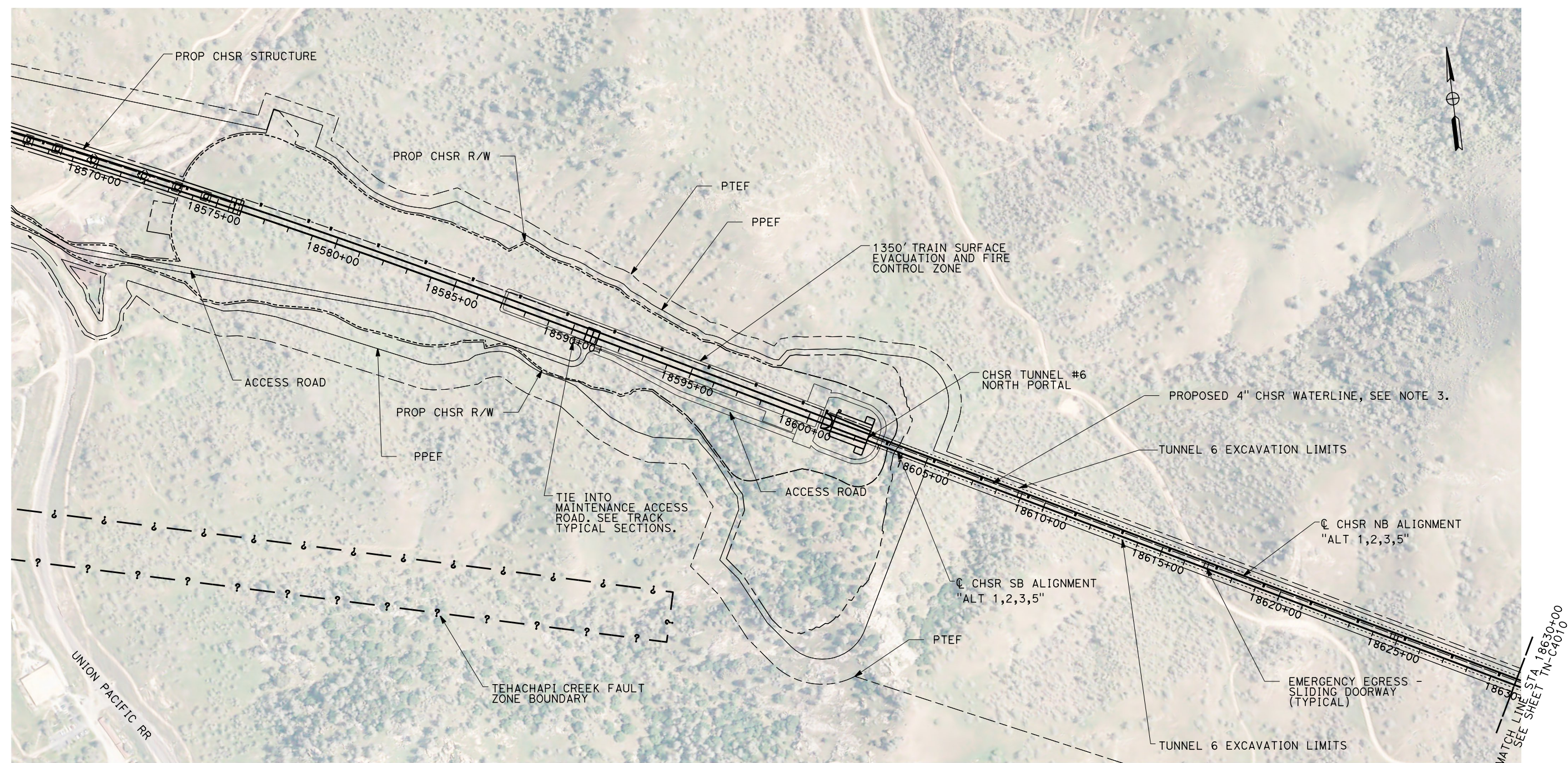
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11/6/2017

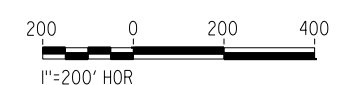
OIC:ARIVEGA



GENERAL NOTES:

1. FAULT ZONE LOCATIONS ARE APPROXIMATE, TO BE CONFIRMED.
2. FOR PROFILE INFORMATION SEE SHEET TN-Y1004
3. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00

PLAN

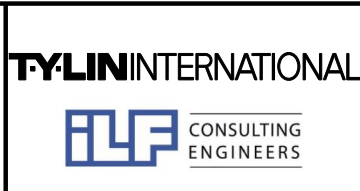


REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. CARROLL
DRAWN BY J. FOUCH
CHECKED BY G. ERICKSON
IN CHARGE J. MORRISON
DATE 10/31/2017

**RECORD
PEPD
SUBMITTAL**

**NOT FOR
CONSTRUCTION**



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

ALT 1,2,3,5 ALIGNMENT
TUNNEL 6 - NORTH PORTAL
STATION 18566+00 TO 18630+00

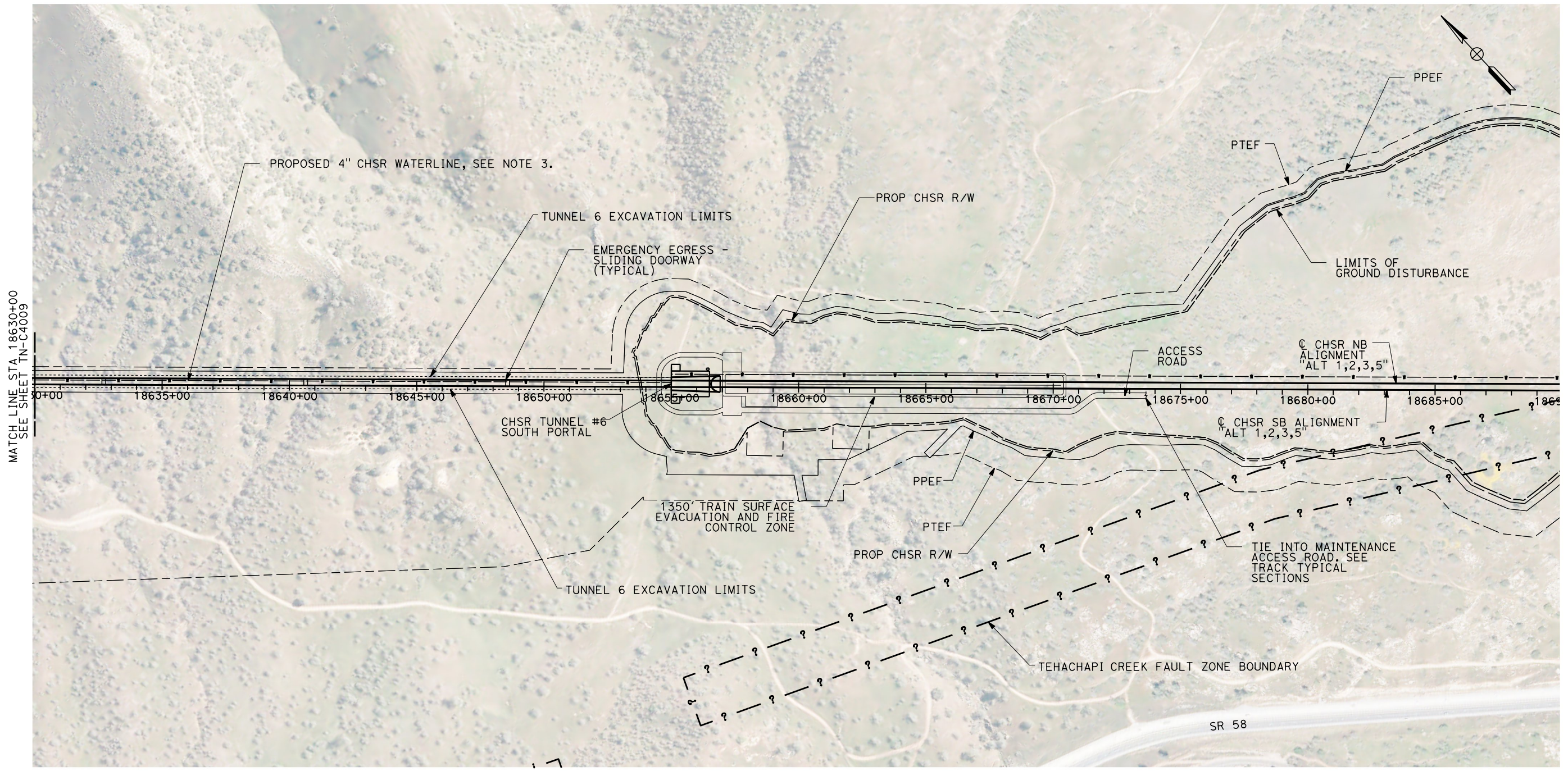
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11/6/2017 11:34:57 AM

11/6/2017

OIC:ARTIVEGA



GENERAL NOTES:

1. FAULT ZONE LOCATIONS ARE APPROXIMATE, TO BE CONFIRMED.
2. FOR PROFILE INFORMATION SEE SHEET TN-Y1004
3. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00

PLAN



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. CARROLL
DRAWN BY J. FOUCH
CHECKED BY G. ERICKSON
IN CHARGE J. MORRISON
DATE 10/31/2017

**RECORD
PEPD
SUBMITTAL**

**NOT FOR
CONSTRUCTION**



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

ALT 1,2,3,5 ALIGNMENT
TUNNEL 6 - SOUTH PORTAL
STATION 18630+00 TO 18690+00

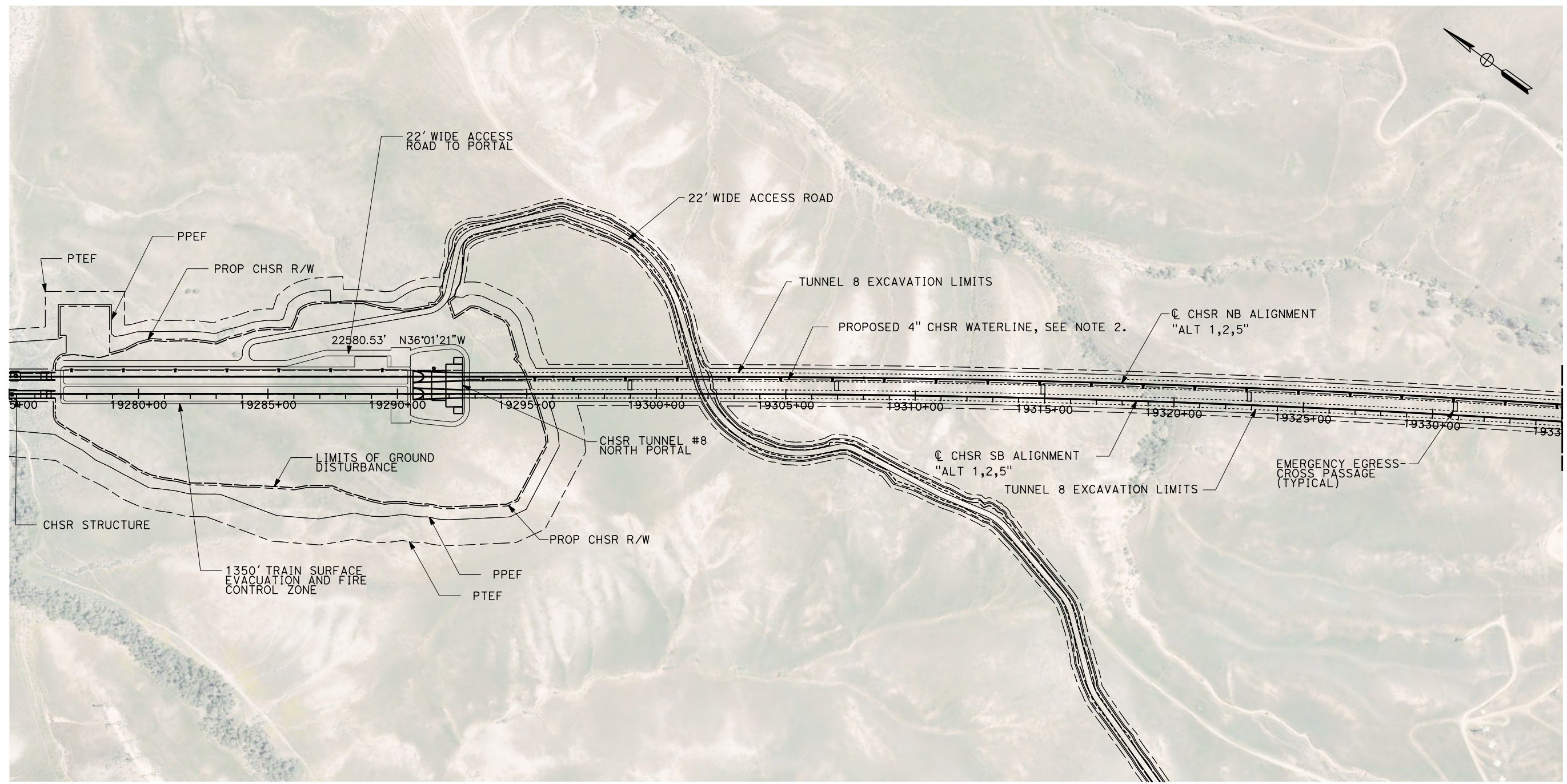
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SCALE AS SHOWN
SHEET NO.

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11/6/2017 11:34:53 AM

11/6/2017

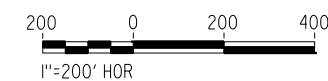
OIC:ARIVERA



MATCH LINE STA 19335+00
SEE SHEET TN-C4014

GENERAL NOTES:

1. FOR PROFILE INFORMATION SEE SHEET TN-Y1006
2. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00



PLAN

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. CARROLL
DRAWN BY J. FOUCH
CHECKED BY G. ERICKSON
IN CHARGE J. MORRISON
DATE 10/31/2017

**RECORD
PEPD
SUBMITTAL**

**NOT FOR
CONSTRUCTION**



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

ALT 1,2,5 ALIGNMENT
TUNNEL 8 - NORTH PORTAL
STATION 19275+00 TO 19335+00

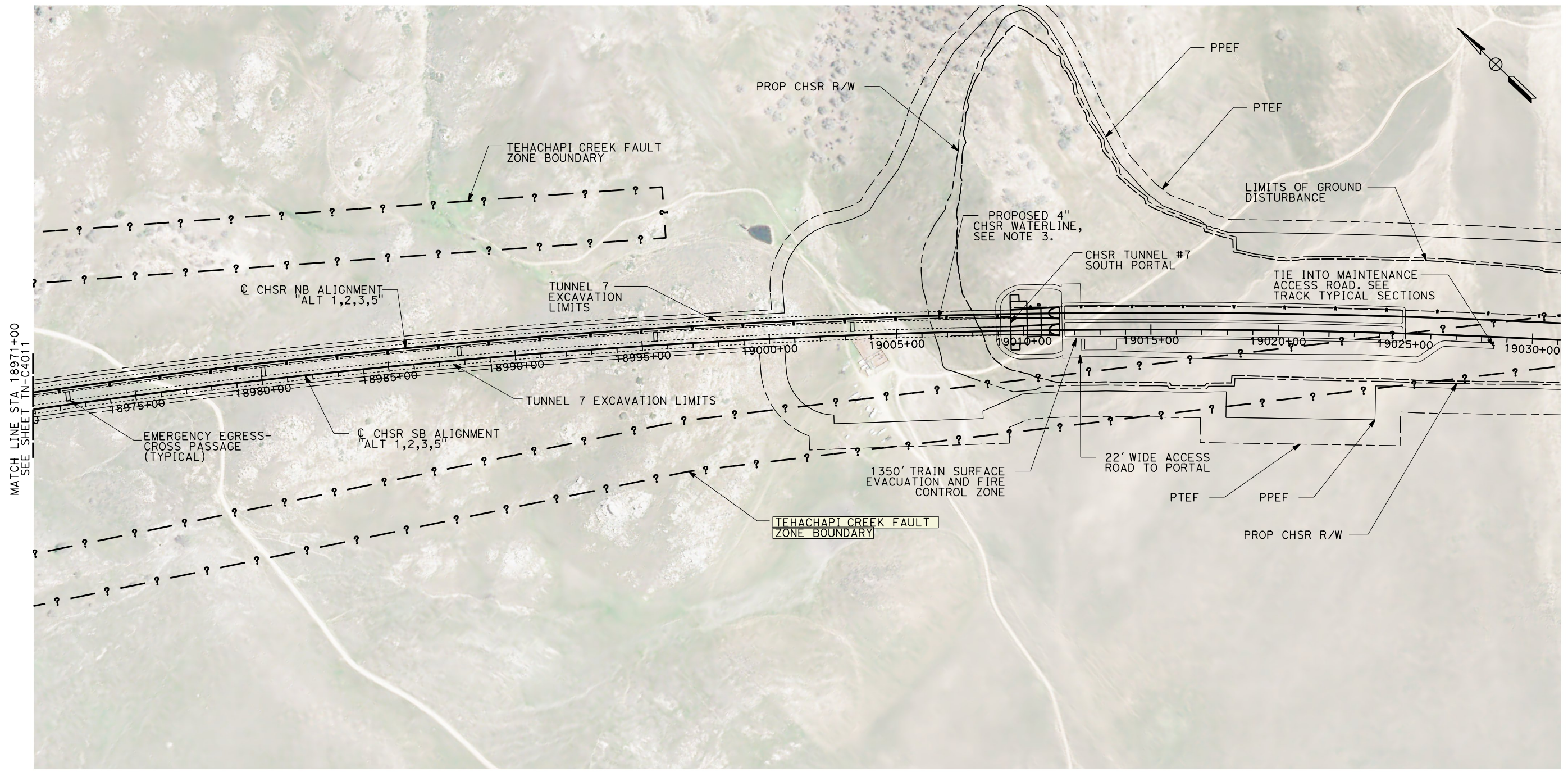
CONTRACT NO. HSR13-44
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SCALE AS SHOWN
SHEET NO.

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11/6/2017 11:34:14 AM

11/6/2017

OIC:ARTIVEGA



GENERAL NOTES:

1. FAULT ZONE LOCATIONS ARE APPROXIMATE, TO BE CONFIRMED.
2. FOR PROFILE INFORMATION SEE SHEET TN-Y1005
3. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00



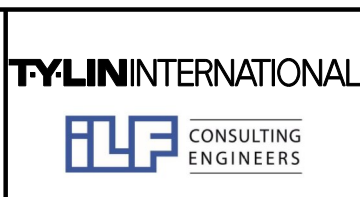
PLAN

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. CARROLL
DRAWN BY J. FOUCH
CHECKED BY G. ERICKSON
IN CHARGE J. MORRISON
DATE 10/31/2017

**RECORD
PEPD
SUBMITTAL**

**NOT FOR
CONSTRUCTION**



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

ALT 1,2,3,5 ALIGNMENT
TUNNEL 7 - SOUTH PORTAL
STATION 18971+00 TO 19031+00

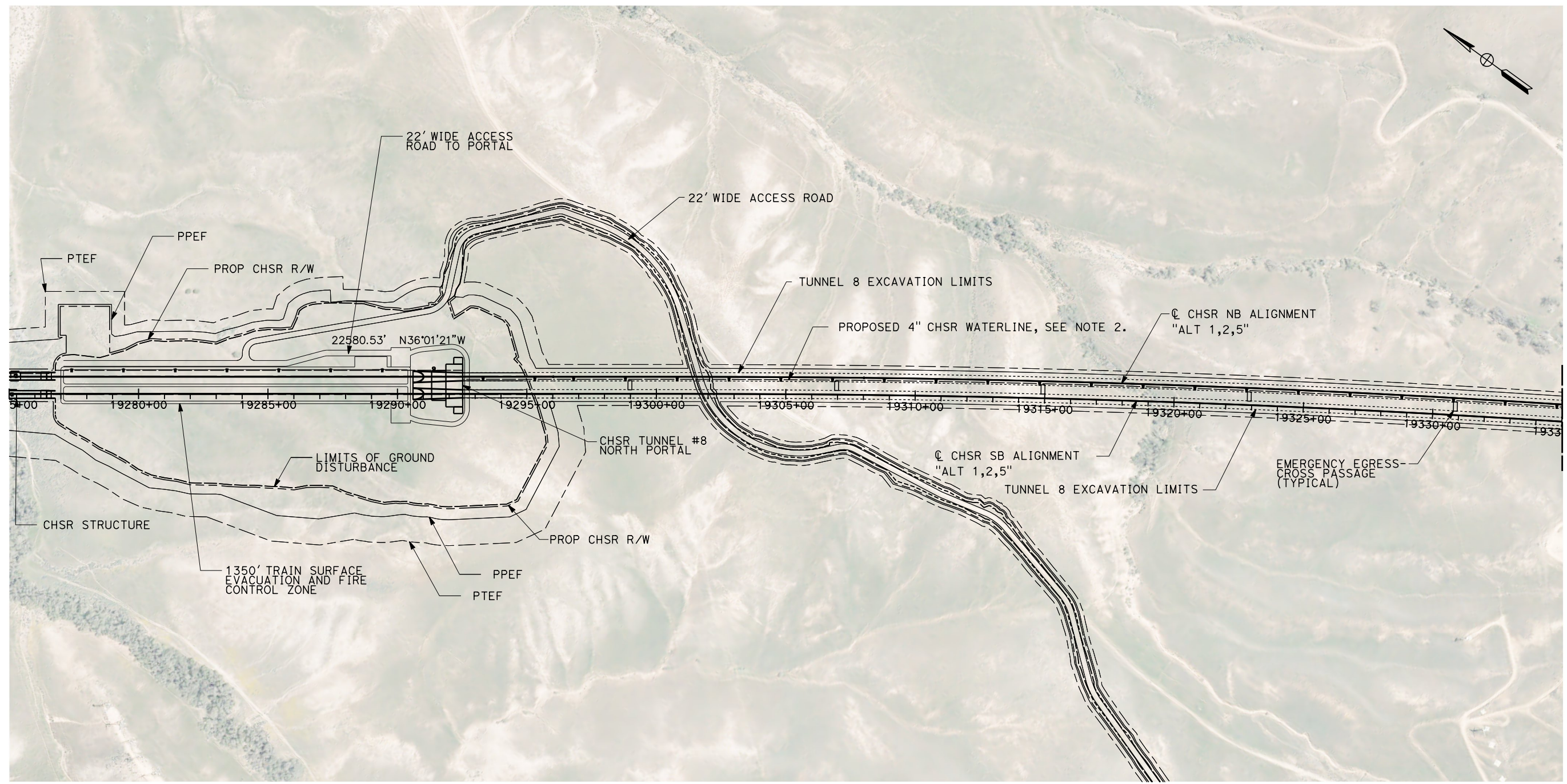
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DRAWING NO. TN-C4012
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SHEET NO.

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11/6/2017

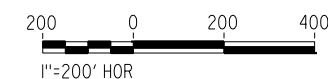
OIC:ARTIVEGA



MATCH LINE STA. 19335+00
SEE SHEET TN-C4014

GENERAL NOTES:

- 1. FOR PROFILE INFORMATION SEE SHEET TN-Y1006
- 2. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00



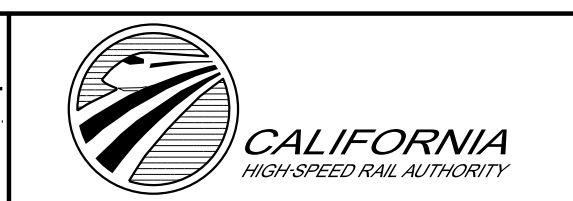
PLAN

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. CARROLL
DRAWN BY J. FOUCH
CHECKED BY G. ERICKSON
IN CHARGE J. MORRISON
DATE 10/31/2017

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CONSTRUCTION**



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

ALT 1,2,5 ALIGNMENT
TUNNEL 8 - NORTH PORTAL
STATION 19275+00 TO 19335+00

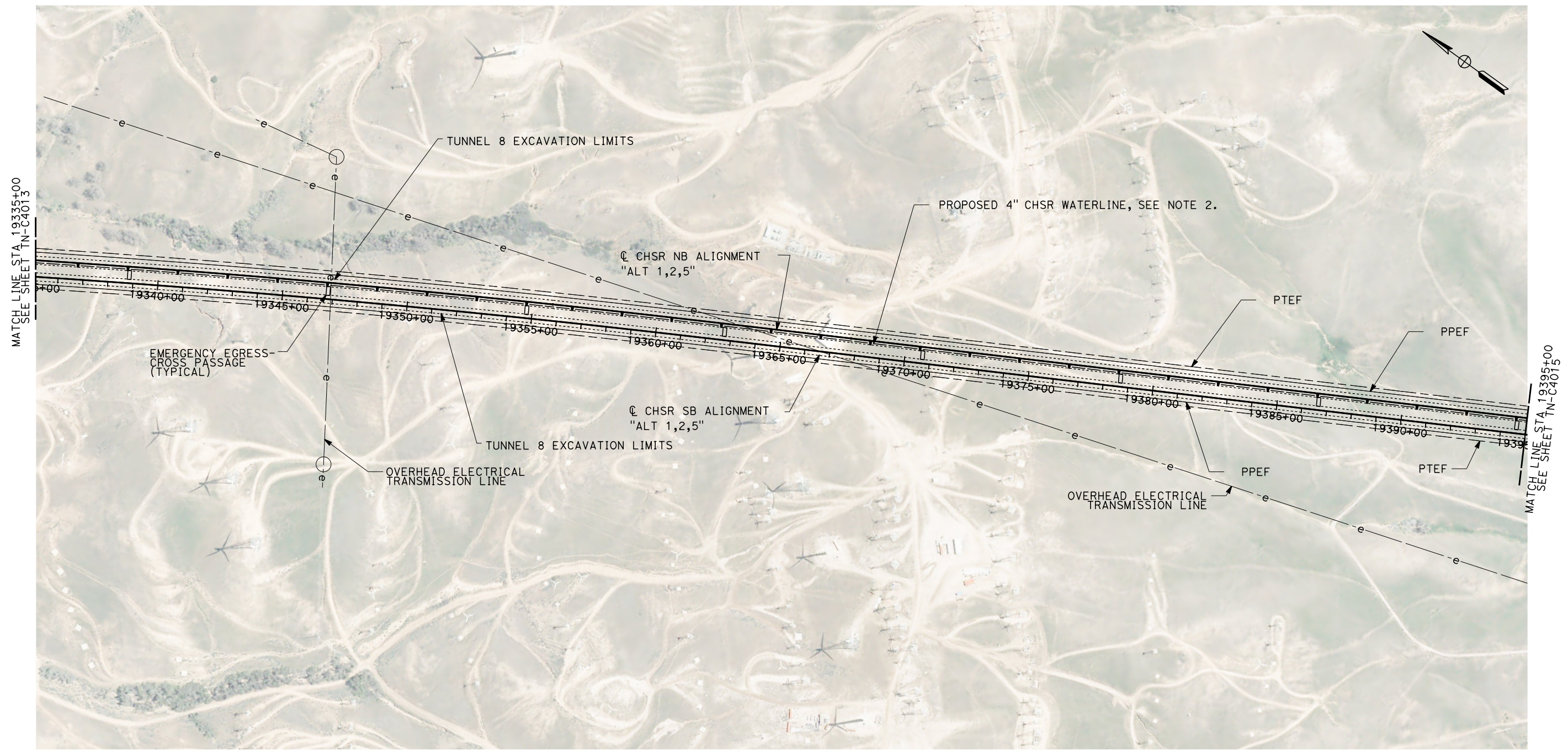
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DRAWING NO. TN-C4013
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11/6/2017 11:42:59 AM

11/6/2017

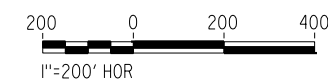
OIC:ARTIVEGA



GENERAL NOTES:

1. FOR PROFILE INFORMATION SEE SHEETS TN-Y1006 AND TN-Y1007
2. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00

PLAN

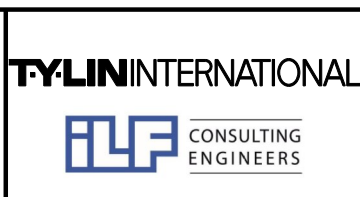


REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. CARROLL
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IN CHARGE J. MORRISON
DATE 10/31/2017

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

ALT 1,2,5 ALIGNMENT TUNNEL 8
STATION 19335+00 TO 19395+00

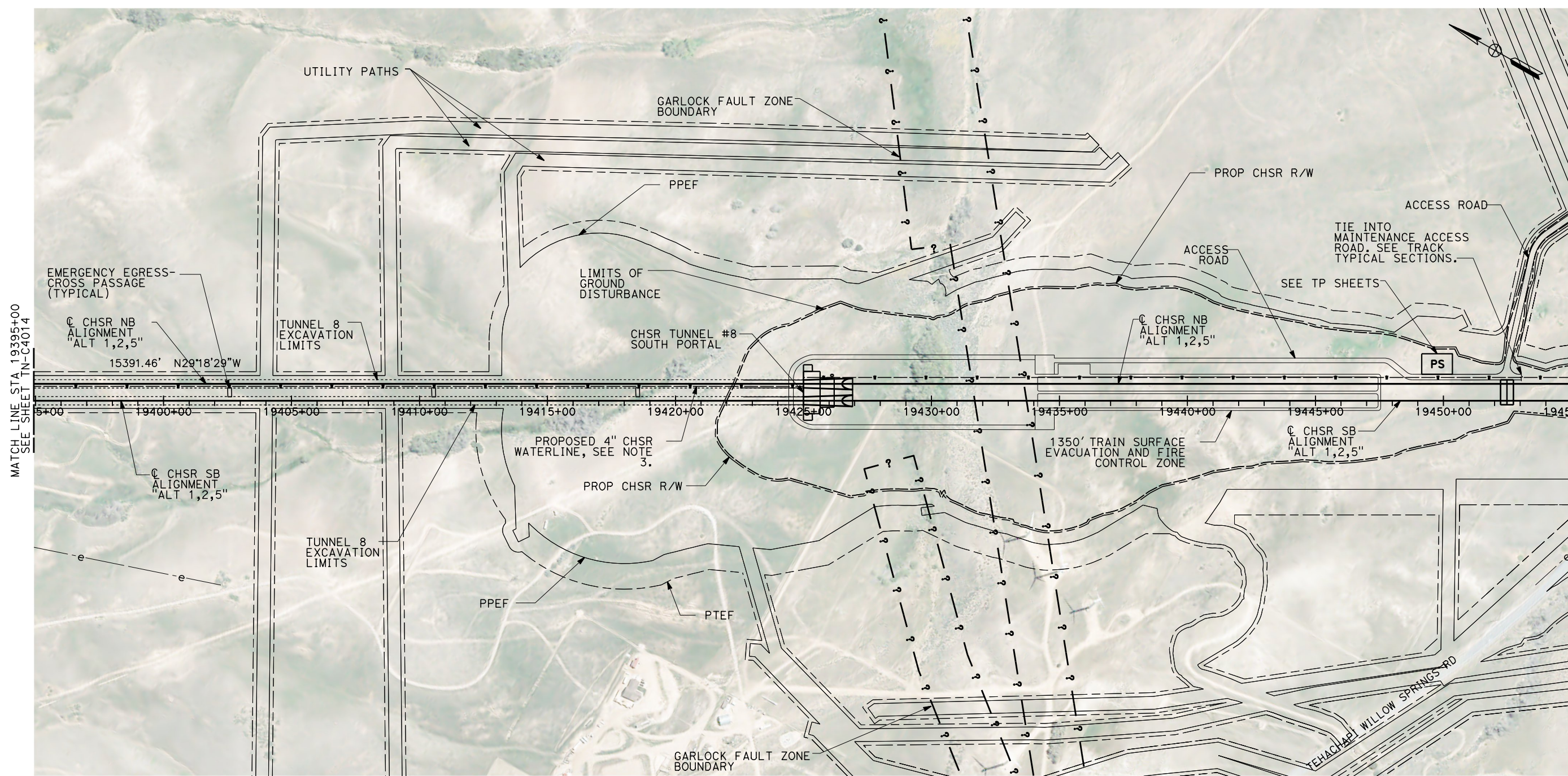
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11/6/2017 11:43:01 AM

11/6/2017

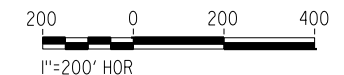
OIC:ARTIVEGA



GENERAL NOTES:

1. FAULT ZONE LOCATIONS ARE APPROXIMATE, TO BE CONFIRMED.
2. FOR PROFILE INFORMATION SEE SHEET TN-Y1007
3. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00

PLAN

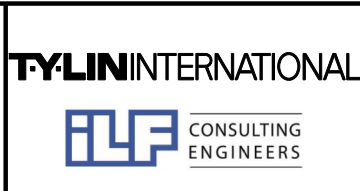


REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. CARROLL
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IN CHARGE J. MORRISON
DATE 10/31/2017

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

ALT 1,2,5 ALIGNMENT
TUNNEL 8 - SOUTH PORTAL
STATION 19395+00 TO 19455+00

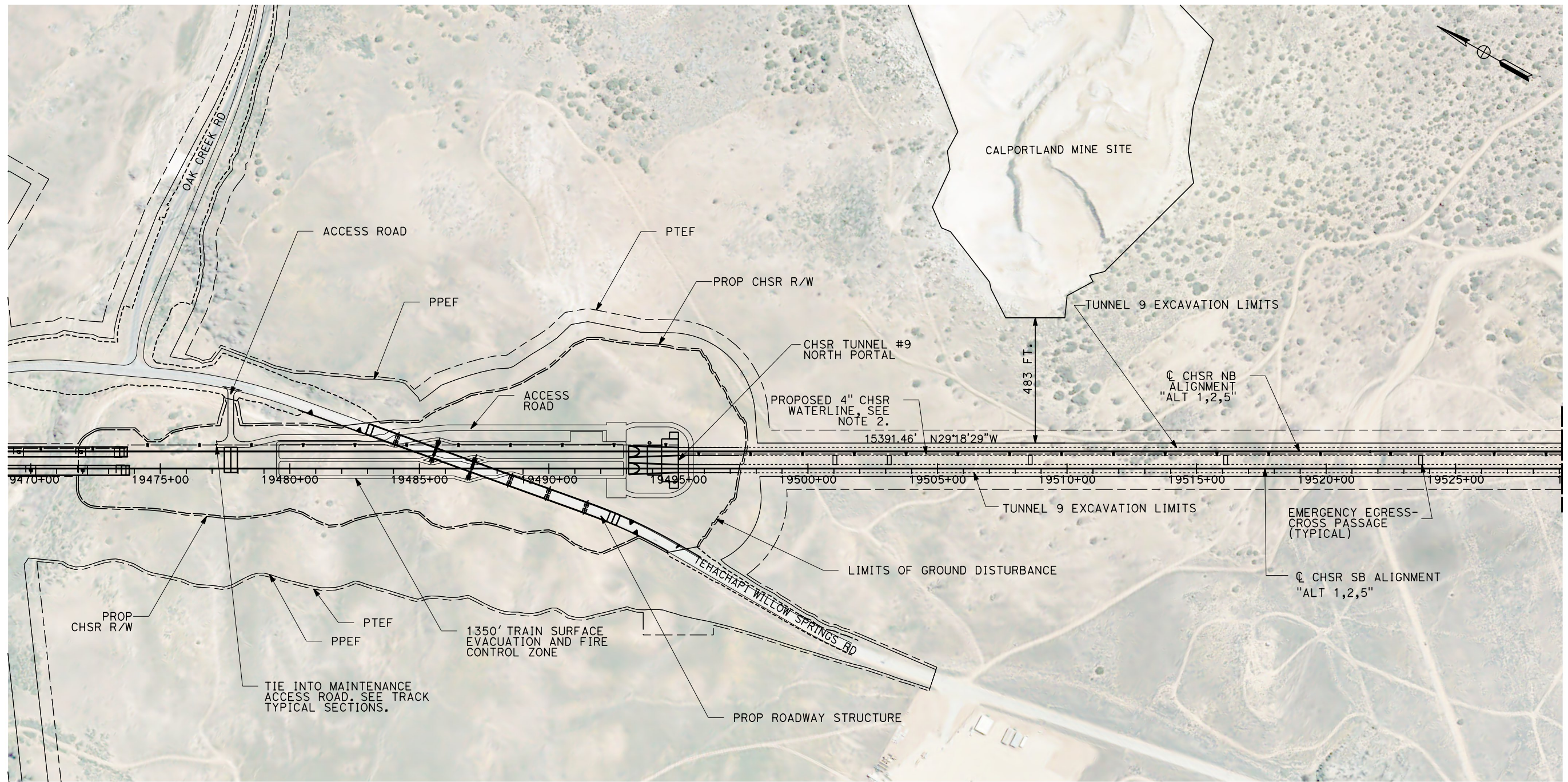
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11/7/2017

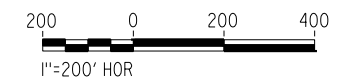
01C-ARTIVEGA



MATCH LINE STA 19529+00
SEE SHEET TN-C4017

GENERAL NOTES:

1. FOR PROFILE INFORMATION SEE SHEETS TN-Y1007 AND TN-Y1008
2. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00



PLAN

REV	DATE	BY	CHK	APP	DESCRIPTION

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

ALT 1,2,5 ALIGNMENT
TUNNEL 9 - NORTH PORTAL
STATION 19469+00 TO 19529+00

CONTRACT NO. HSR13-44
DRAWING NO. TN-C4016
SCALE AS SHOWN
SHEET NO.

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11/6/2017

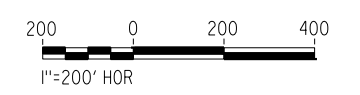
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GENERAL NOTES:

- 1. FOR PROFILE INFORMATION SEE SHEET TN-Y1008
- 2. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00

PLAN

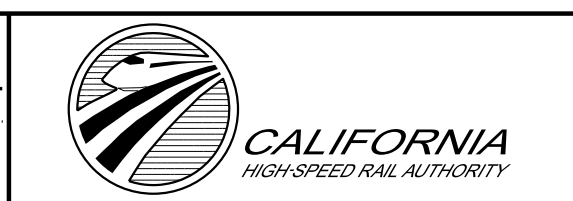


REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. CARROLL
DRAWN BY J. FOUCH
CHECKED BY G. ERICKSON
IN CHARGE J. MORRISON
DATE 10/31/2017

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SUBMITTAL**

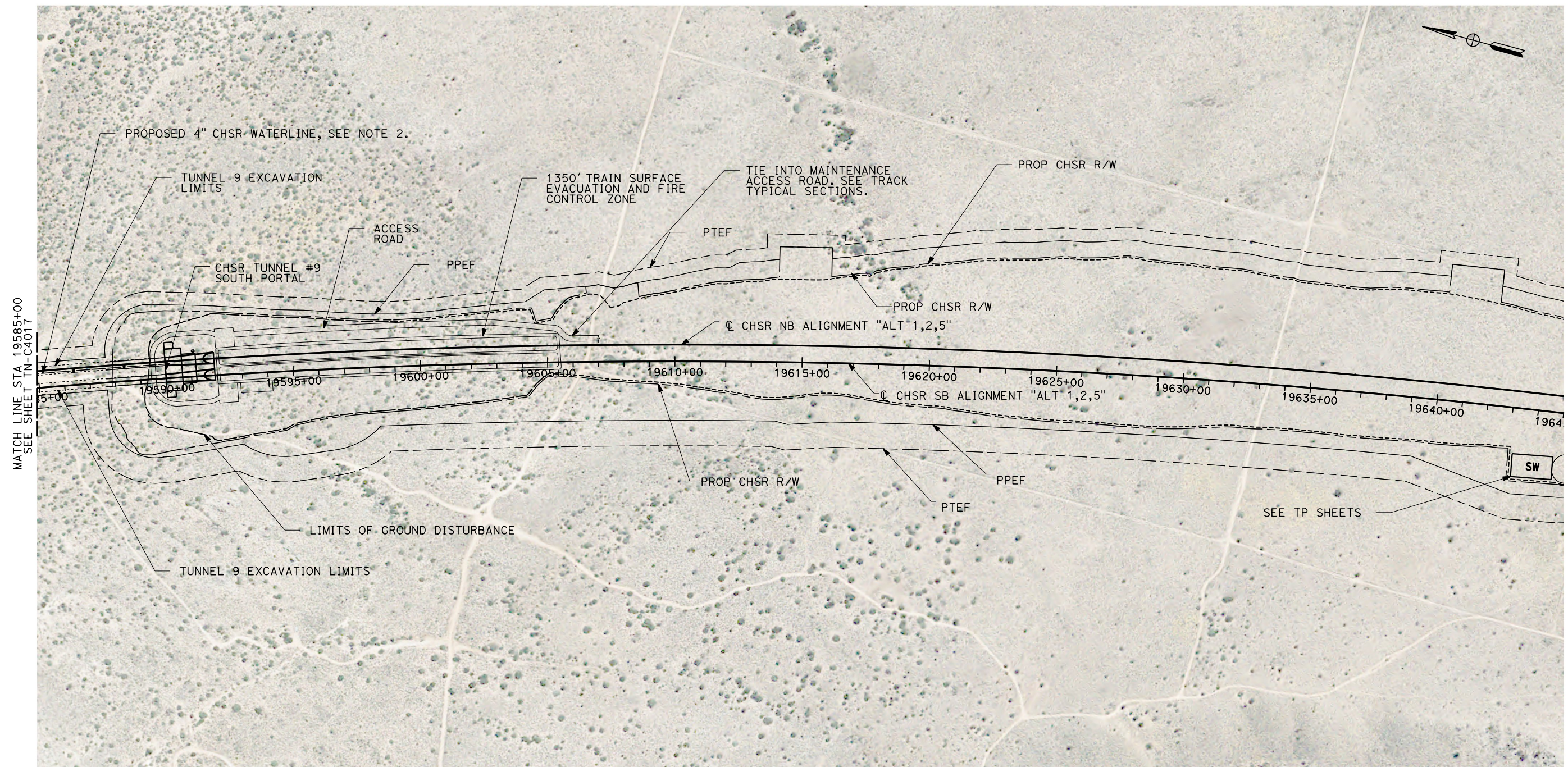
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CONSTRUCTION**



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

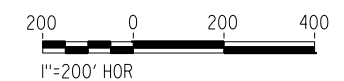
ALT 1,2,5 ALIGNMENT TUNNEL 9
STATION 19529+00 TO 19585+00

CONTRACT NO. HSR13-44
DRAWING NO. TN-C4017
SCALE AS SHOWN
SHEET NO.



GENERAL NOTES:

1. FOR PROFILE INFORMATION SEE SHEET TN-Y1008
2. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00



PLAN

REV	DATE	BY	CHK	APP	DESCRIPTION

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CHECKED BY G. ERICKSON
IN CHARGE J. MORRISON
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SUBMITTAL**

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CONSTRUCTION**



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

ALT 1,2,5 ALIGNMENT
TUNNEL 9 - SOUTH PORTAL
STATION 19585+00 TO 19645+00

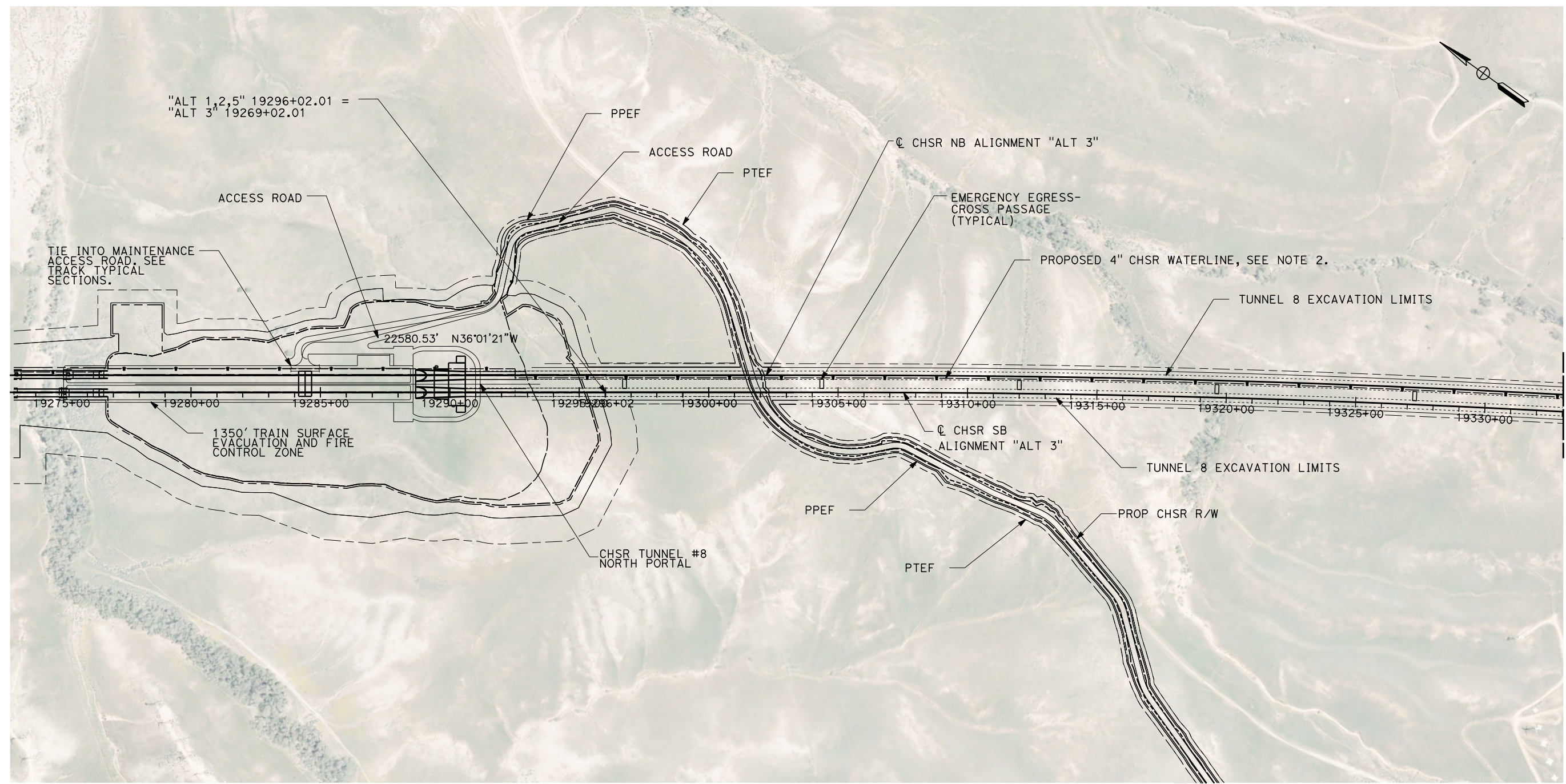
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11/6/2017

OIC:ARTIVEGA

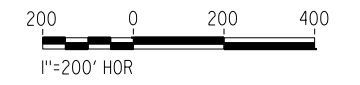


MATCH LINE STA 19333+00
SEE SHEET TN-C4104

GENERAL NOTES:

1. FOR PROFILE INFORMATION SEE SHEET TN-Y1101
2. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00

PLAN

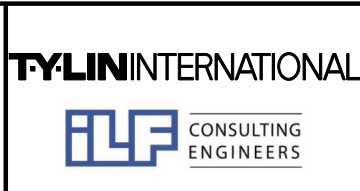


REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. CARROLL
DRAWN BY
J. FOUCH
CHECKED BY
G. ERICKSON
IN CHARGE
J. MORRISON
DATE
10/31/2017

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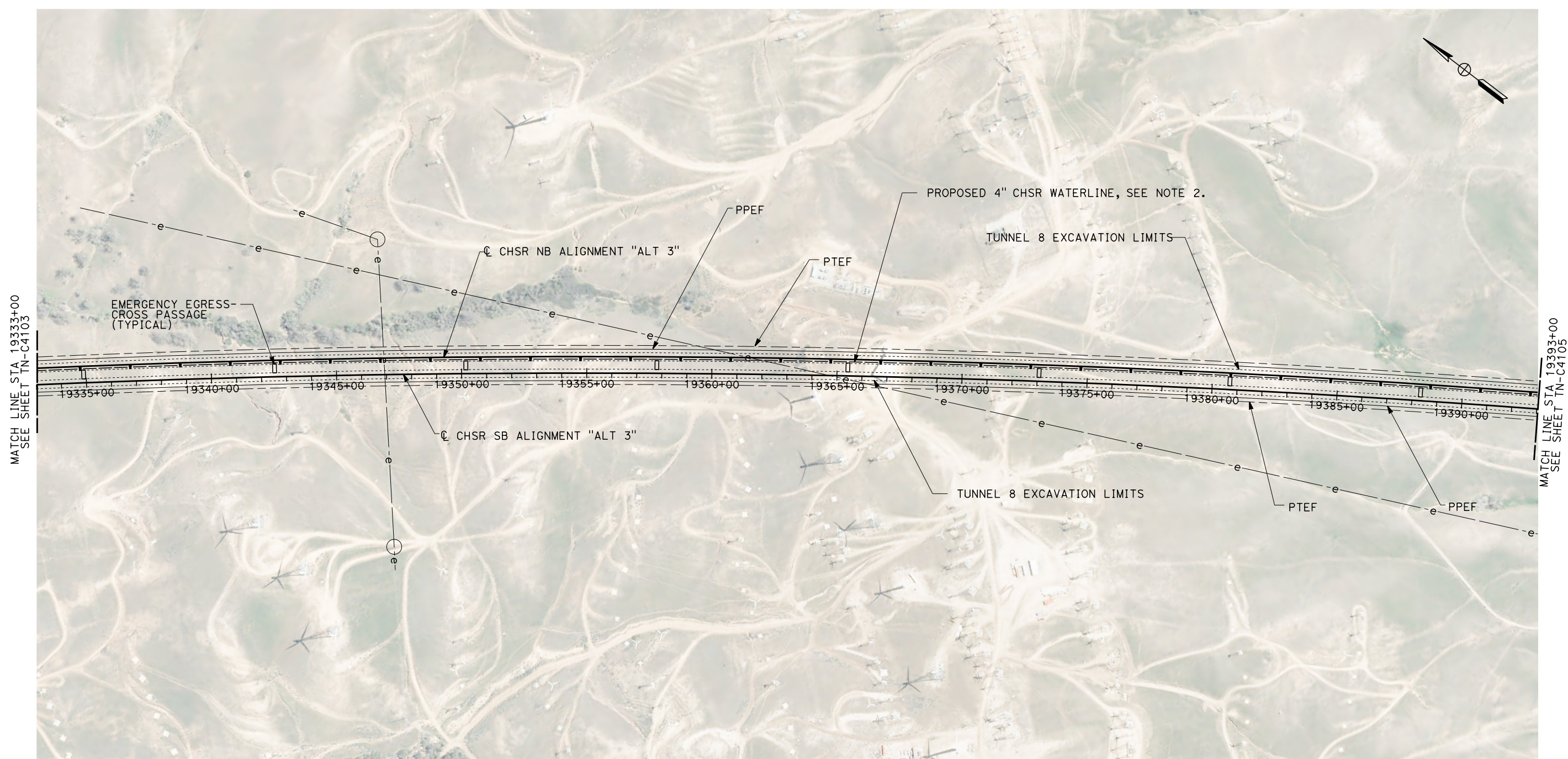
**NOT FOR
CONSTRUCTION**



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

ALT 3 ALIGNMENT
TUNNEL 8 - NORTH PORTAL
STATION 19273+00 TO 19333+00

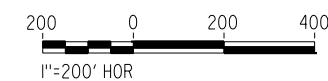
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DRAWING NO.
TN-C4103
SCALE
AS SHOWN
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GENERAL NOTES:

1. FOR PROFILE INFORMATION SEE SHEETS TN-Y1101 AND TN-Y1102
2. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00

PLAN

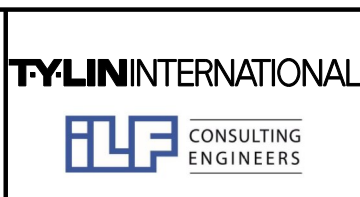


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CALIFORNIA HIGH-SPEED RAIL PROJECT
BAKERSFIELD TO PALMDALE
 ALT 3 ALIGNMENT TUNNEL 8
 STATION 19333+00 TO 19393+00

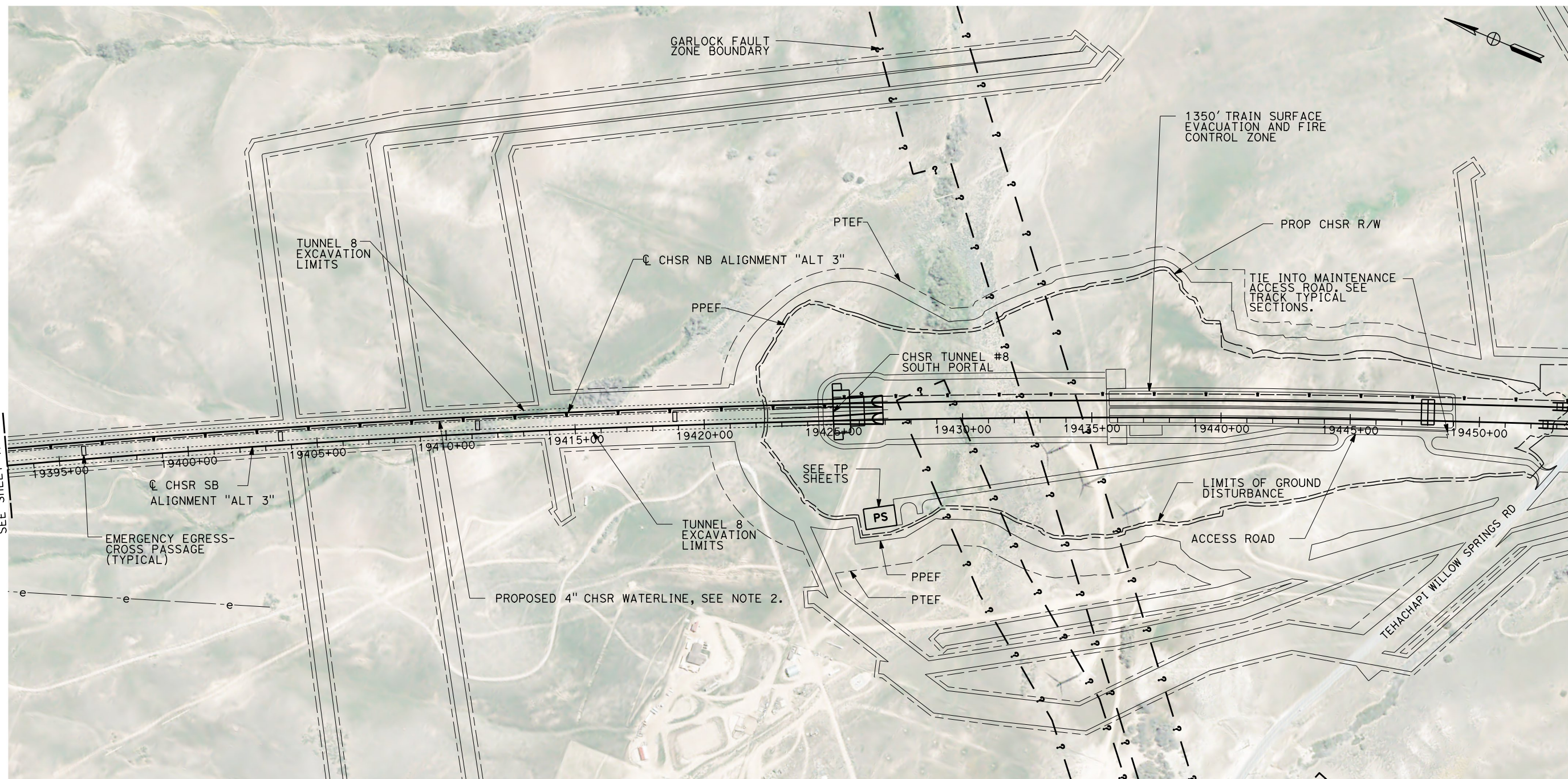
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11/6/2017

OIC:ARTIVEGA

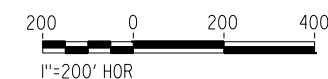


MATCH LINE STA 19393+00
SEE SHEET TN-C4104

GENERAL NOTES:

1. FOR PROFILE INFORMATION SEE SHEET TN-Y1102
2. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00

PLAN



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DATE 10/31/2017

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

ALT 3 ALIGNMENT
TUNNEL 8 - SOUTH PORTAL
STATION 19393+00 TO 19453+00

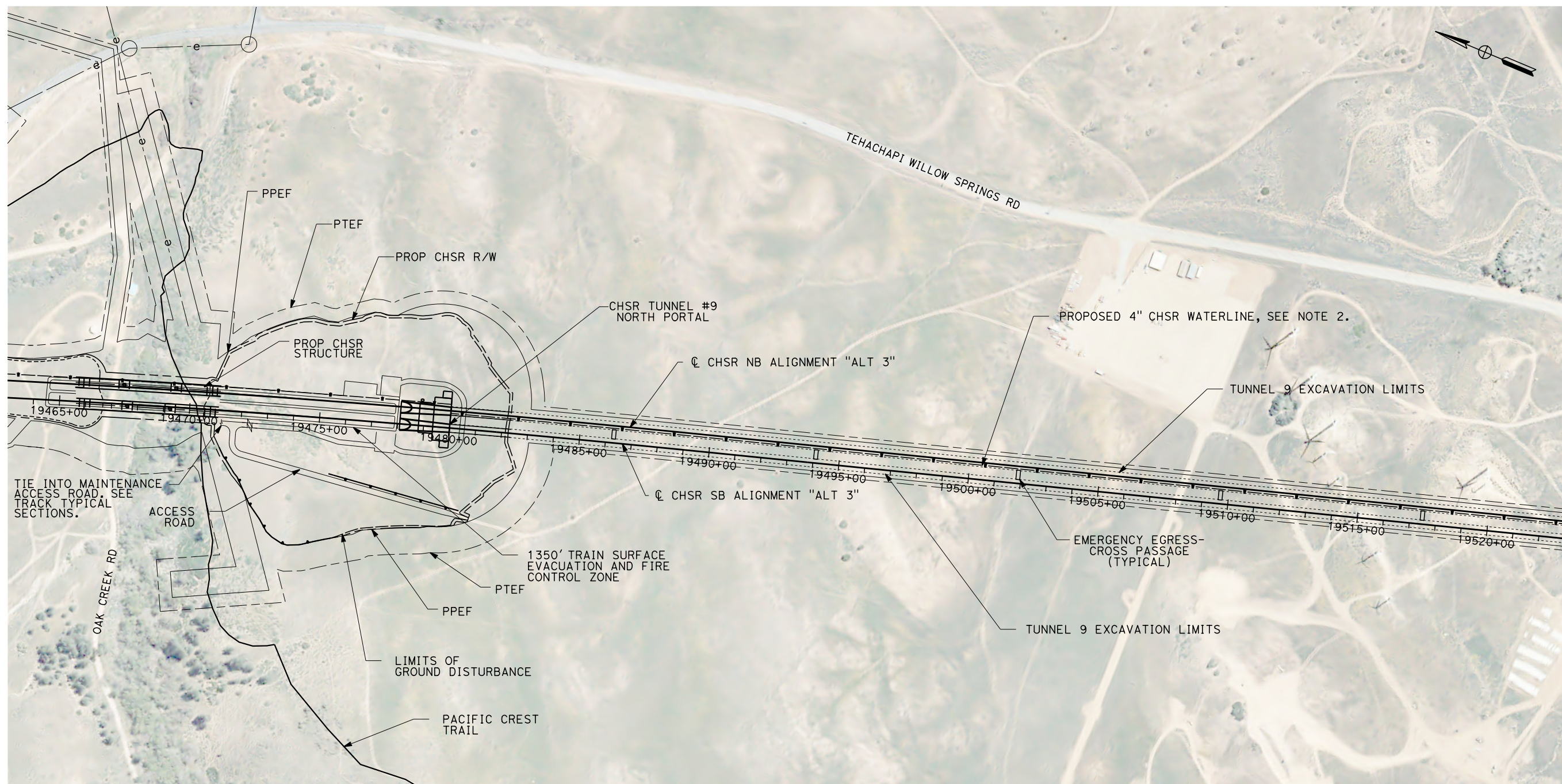
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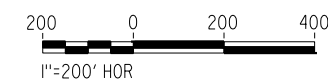
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MATCH LINE STA 19523+00
SEE SHEET TN-C4107

GENERAL NOTES:

1. FOR PROFILE INFORMATION SEE SHEET TN-Y1102
2. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19687+50



PLAN

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DATE
10/31/2017

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

ALT 3 ALIGNMENT
TUNNEL 9 - NORTH PORTAL
STATION 19463+00 TO 19523+00

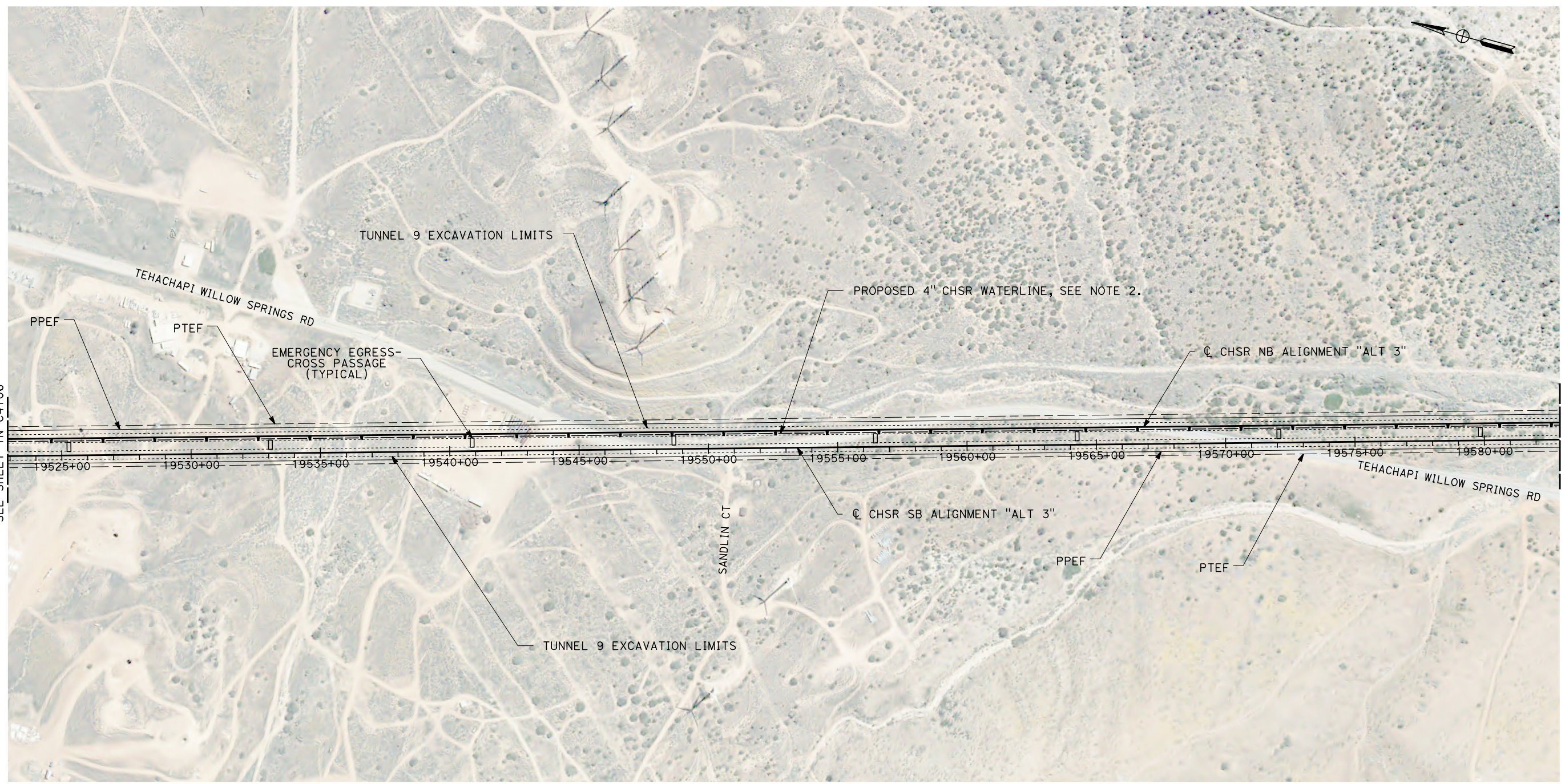
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DRAWING NO.
TN-C4106
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11/6/2017 11:37:02 AM

11/6/2017

OIC:ARTIVEGA



GENERAL NOTES:

- 1. FOR PROFILE INFORMATION SEE SHEET TN-Y1103
- 2. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19687+50

PLAN

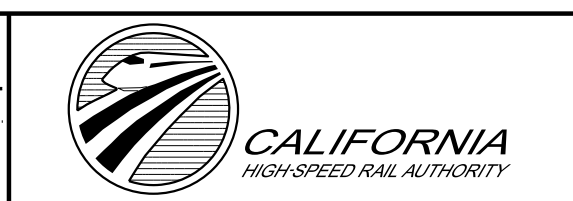


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DATE 10/31/2017

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CALIFORNIA HIGH-SPEED RAIL PROJECT
BAKERSFIELD TO PALMDALE
 ALT 3 ALIGNMENT TUNNEL 9
 STATION 19523+00 TO 19583+00

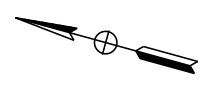
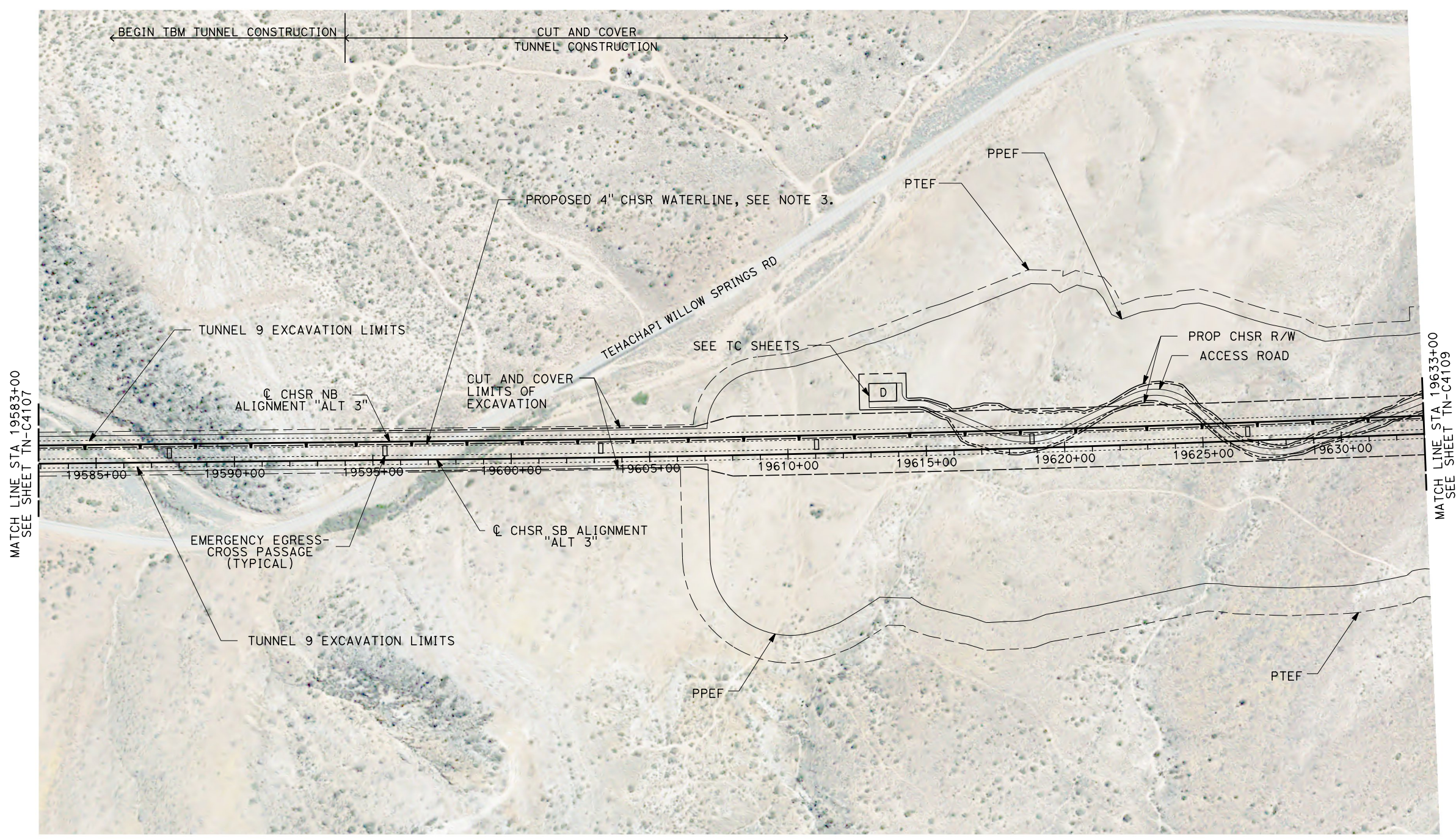
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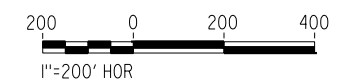
11/6/2017

OIC:ARTIVEGA



GENERAL NOTES:

1. FOR PROFILE INFORMATION SEE SHEET TN-Y1104
2. THE TUNNEL WILL BE EXCAVATED BY CUT AND COVER METHODS BETWEEN STATION 19594+00 TO 19687+50
3. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19687+50



PLAN

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CHECKED BY G. ERICKSON
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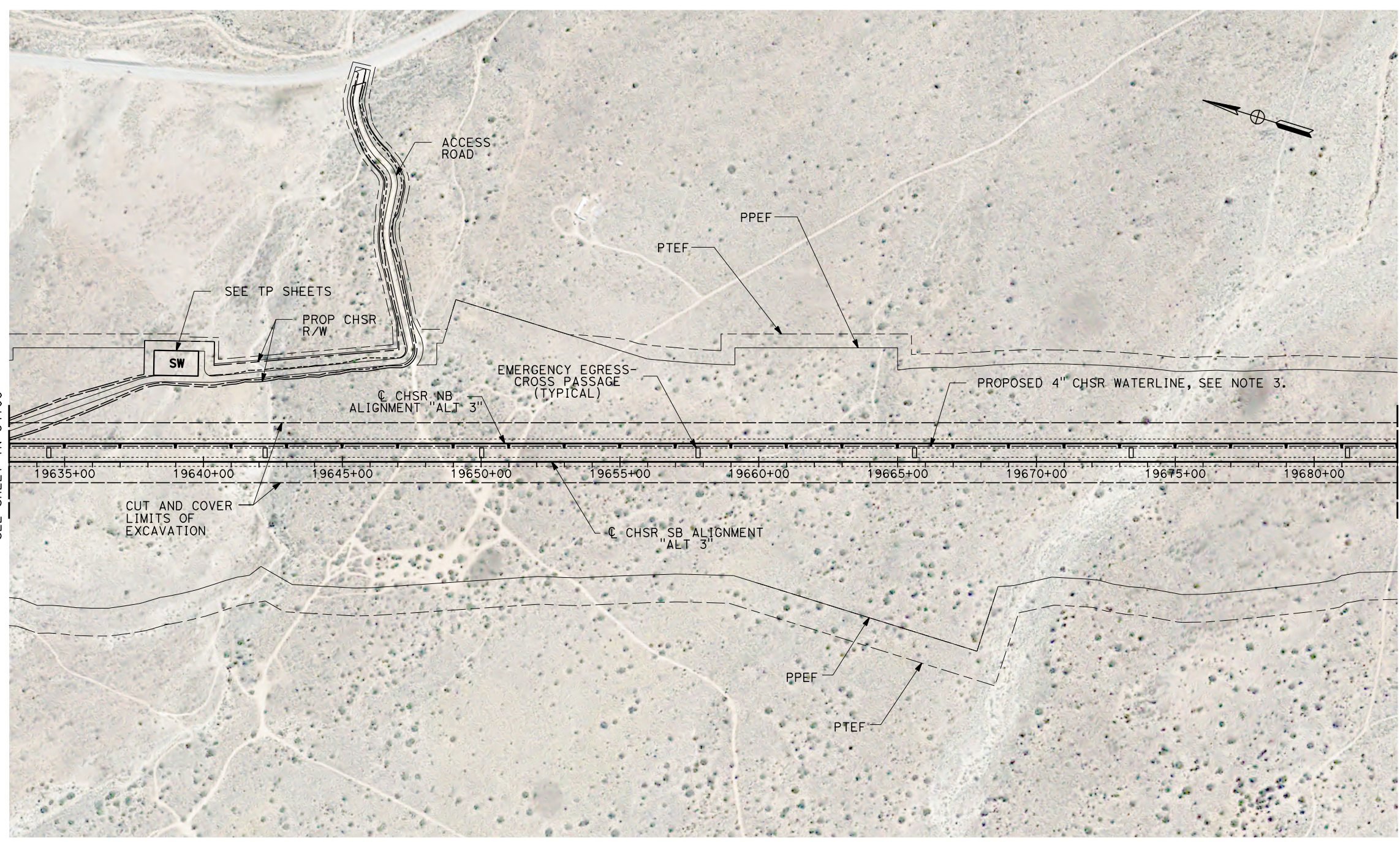
**NOT FOR
CONSTRUCTION**



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

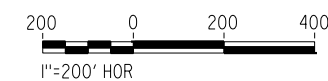
ALT 3 ALIGNMENT
TUNNEL 9
STATION 19583+00 TO 19633+00

CONTRACT NO. HSR13-44
DRAWING NO. TN-C4108
SCALE AS SHOWN
SHEET NO.



GENERAL NOTES:

1. FOR PROFILE INFORMATION SEE SHEET TN-Y1103
2. THE TUNNEL WILL BE EXCAVATED BY CUT AND COVER METHODS BETWEEN STATION 19594+00 TO 19687+50
3. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19687+50



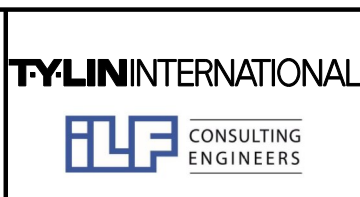
PLAN

REV	DATE	BY	CHK	APP	DESCRIPTION

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IN CHARGE J. MORRISON
DATE 10/31/2017

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CALIFORNIA HIGH-SPEED RAIL PROJECT
BAKERSFIELD TO PALMDALE
 ALT 3 ALIGNMENT
 TUNNEL 9
 STATION 19633+00 TO 19683+00

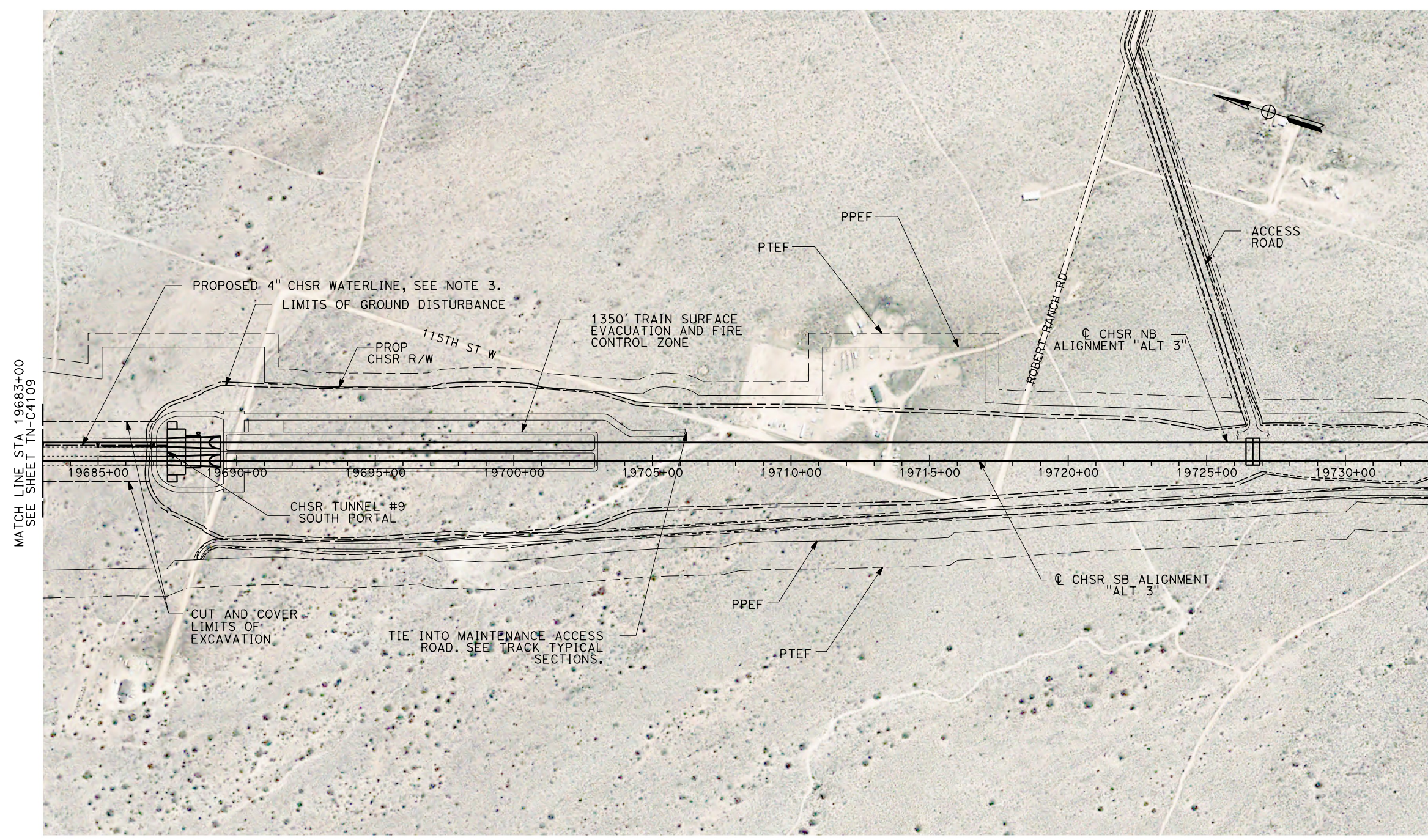
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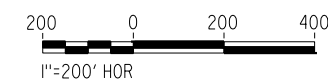
11/6/2017

OIC:ARTIVEGA



GENERAL NOTES:

1. FOR PROFILE INFORMATION SEE SHEET TN-Y1104
2. THE TUNNEL WILL BE EXCAVATED BY CUT AND COVER METHODS BETWEEN STATION 19594+00 TO 19687+50
3. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19687+50



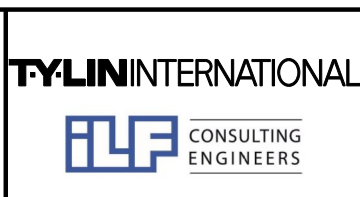
PLAN

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DATE 10/31/2017

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CONSTRUCTION**



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

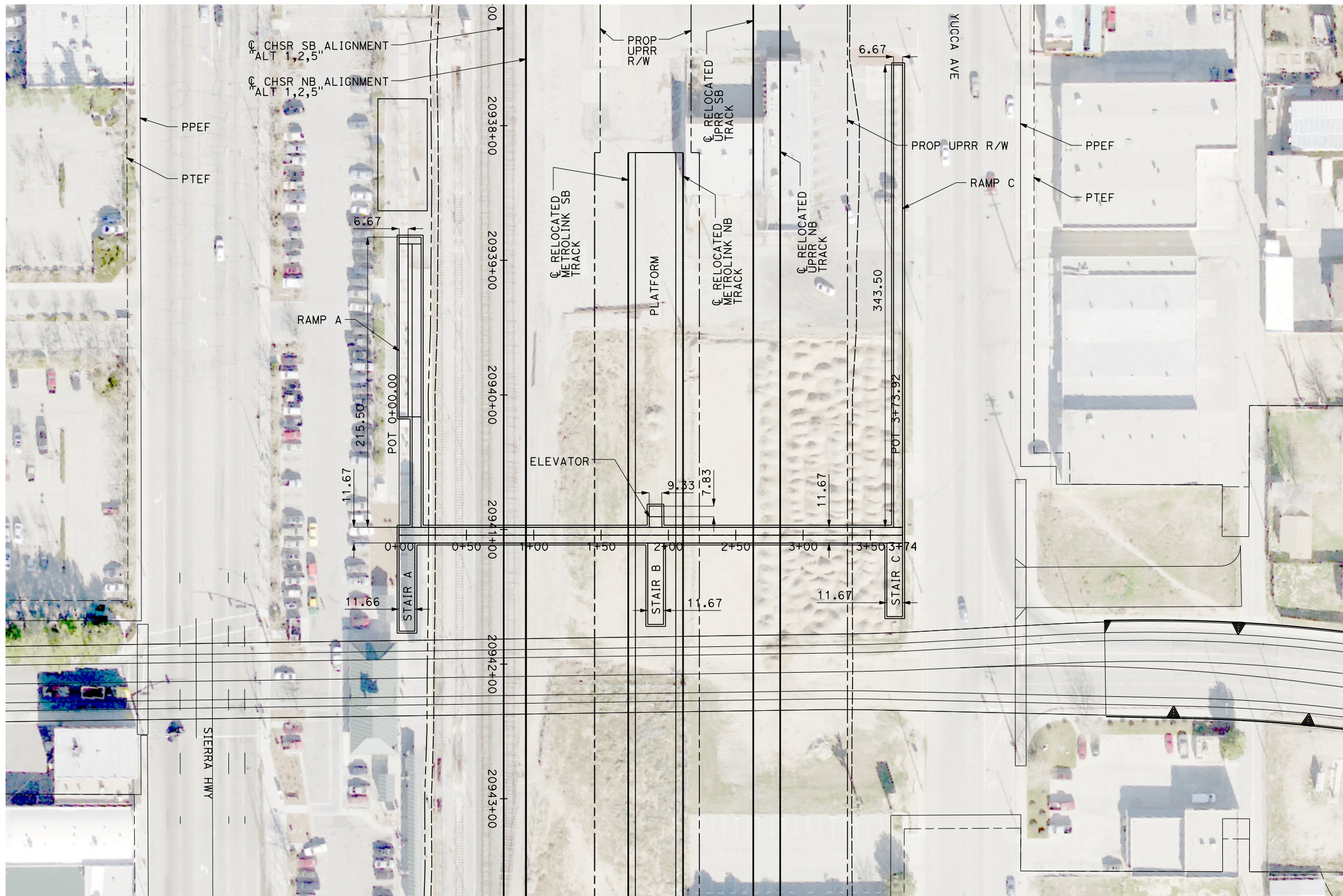
ALT 3 ALIGNMENT
TUNNEL 9 - SOUTH PORTAL
STATION 19683+00 TO 19733+00

CONTRACT NO. HSR13-44
DRAWING NO. TN-C4110
SCALE AS SHOWN
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Projects\701206.00_CHSRBP\00_CADD\Sheet_Files\TN\BP-TN-C4201.dgn

11/16/2017 11:36:56 AM

11/16/2017



PLAN

REV	DATE	BY	CHK	APP	DESCRIPTION

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DRAWN BY
J. FOUCH
CHECKED BY
G. ERICKSON
IN CHARGE
J. MORRISON
DATE
10/31/2017

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

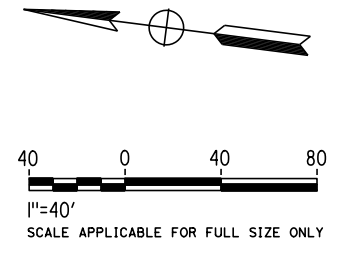
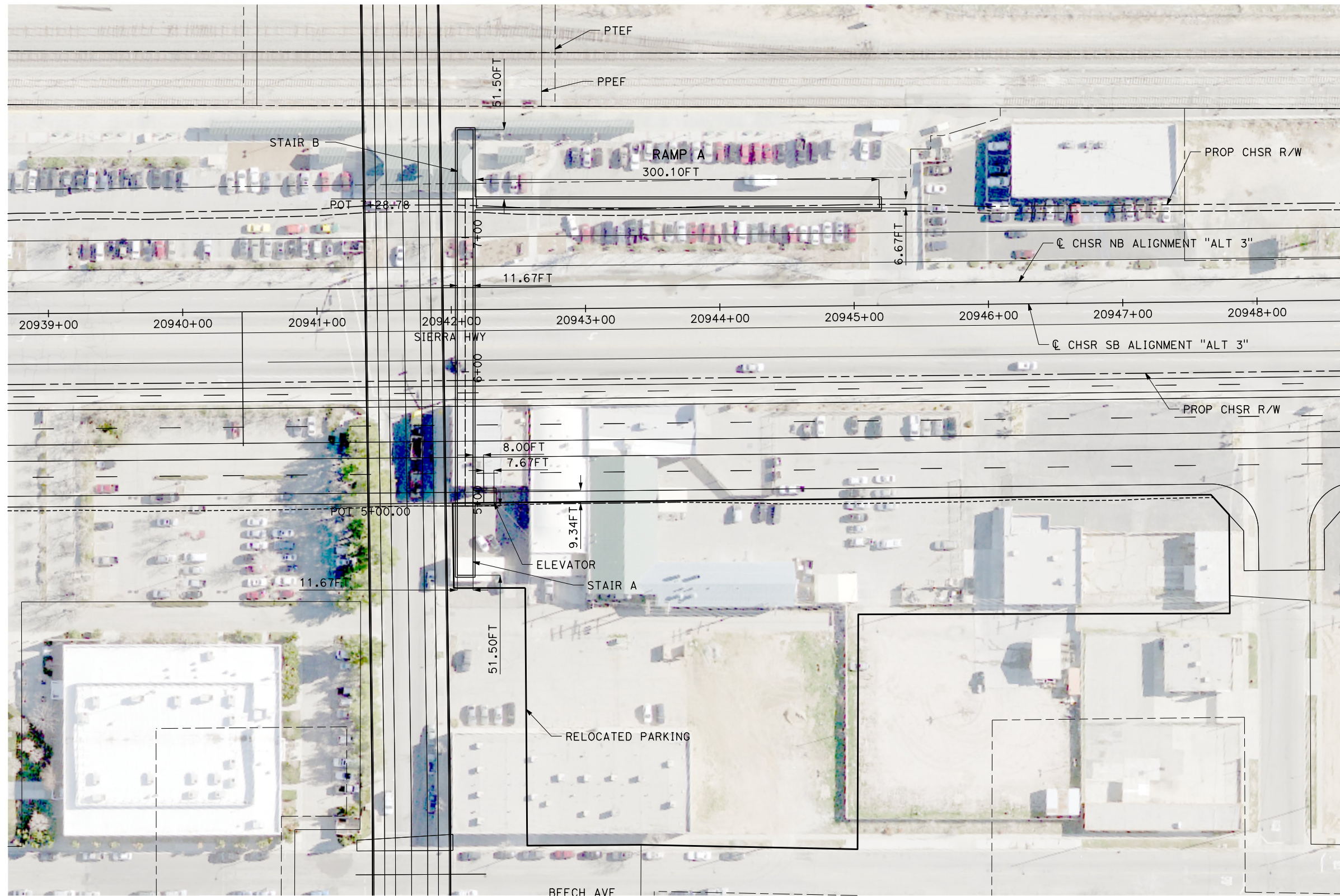
ALTERNATIVE 1,2,3
TYPICAL UNDERPASS LAYOUT

CONTRACT NO.
HSR13-44
DRAWING NO.
TN-C4201
SCALE
AS SHOWN
SHEET NO.

Projects\701206.00_CHSRBP\00_CADD\Sheet_Files\TNBP-TN-C4202

11/6/2017 11:41:47 AM

11/6/2017



PLAN

REV	DATE	BY	CHK	APP	DESCRIPTION

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DRAWN BY
J. FOUCH
CHECKED BY
G. ERICKSON
IN CHARGE
J. MORRISON
DATE
10/31/2017

**RECORD
PEPD
SUBMITTAL**

**NOT FOR
CONSTRUCTION**



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

ALTERNATIVE 1,2,3
TYPICAL UNDERPASS LAYOUT

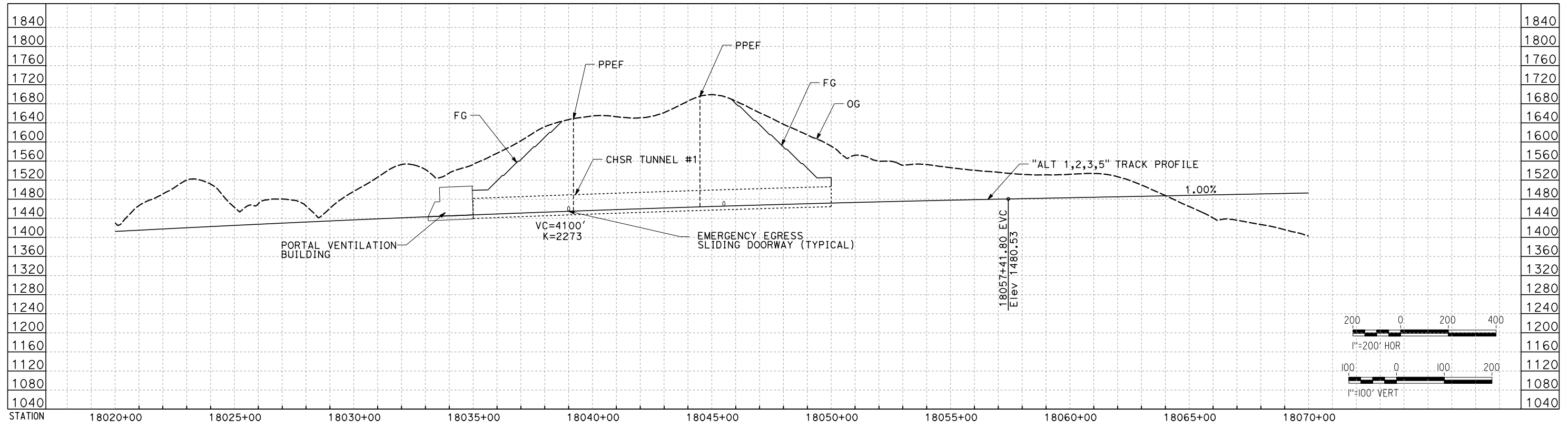
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DRAWING NO.
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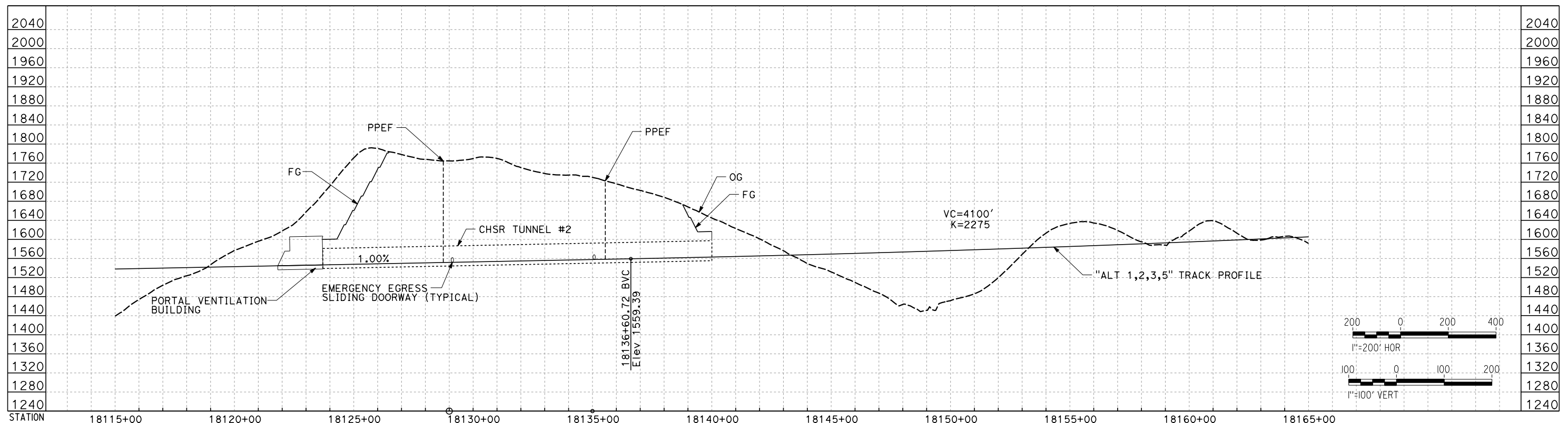
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11/6/2017

OIC:ARIVEGA



TUNNEL 1



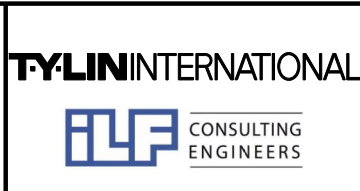
TUNNEL 2

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. CARROLL
DRAWN BY
J. FOUCH
CHECKED BY
G. ERICKSON
IN CHARGE
J. MORRISON
DATE
10/31/2017

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PEPD
SUBMITTAL**

**NOT FOR
CONSTRUCTION**



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

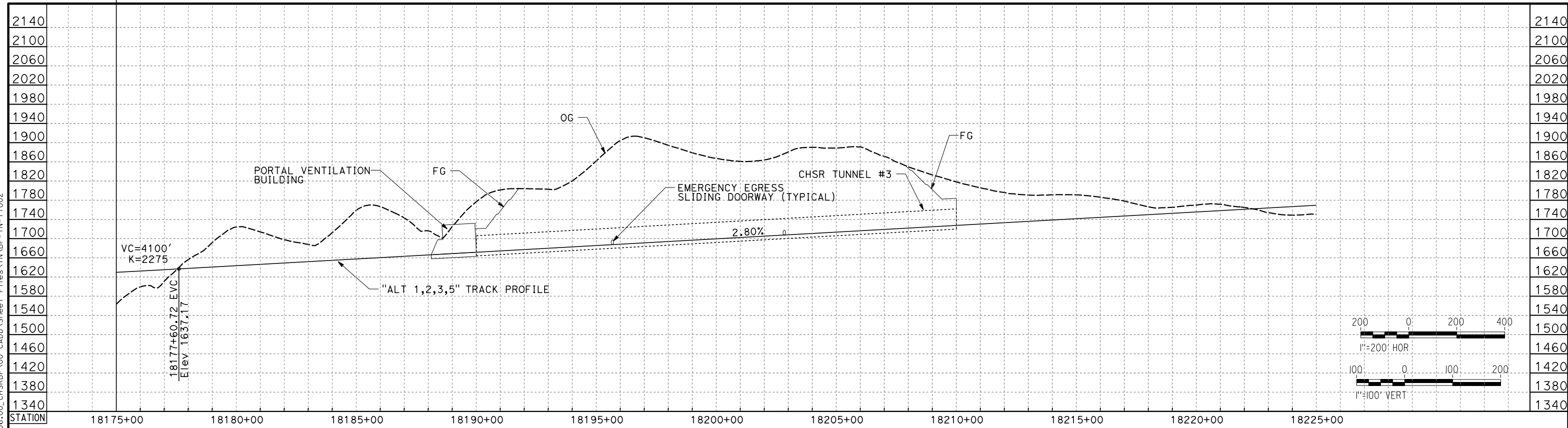
ALT 1,2,3,5
TUNNEL PROFILES
TUNNEL 1 AND TUNNEL 2

CONTRACT NO.
HSR13-44
DRAWING NO.
TN-Y1001
SCALE
AS SHOWN
SHEET NO.

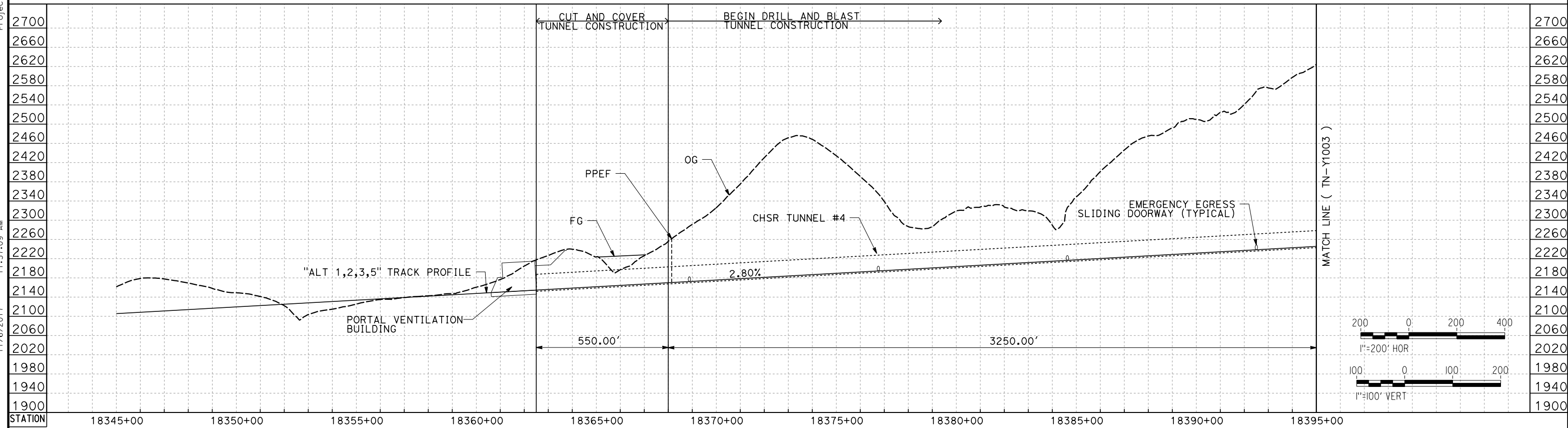
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11/6/2017 11:37:09 AM

OIC:ARivera



TUNNEL 3



TUNNEL 4

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. CARROLL
DRAWN BY
J. FOUCH
CHECKED BY
G. ERICKSON
IN CHARGE
J. MORRISON
DATE
10/31/2017

**RECORD
PEPD
SUBMITTAL**

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CONSTRUCTION**



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

ALT 1,2,3,5
TUNNEL PROFILES
TUNNEL 3 AND TUNNEL 4

CONTRACT NO.
HSR13-44

DRAWING NO.
TN-Y1002

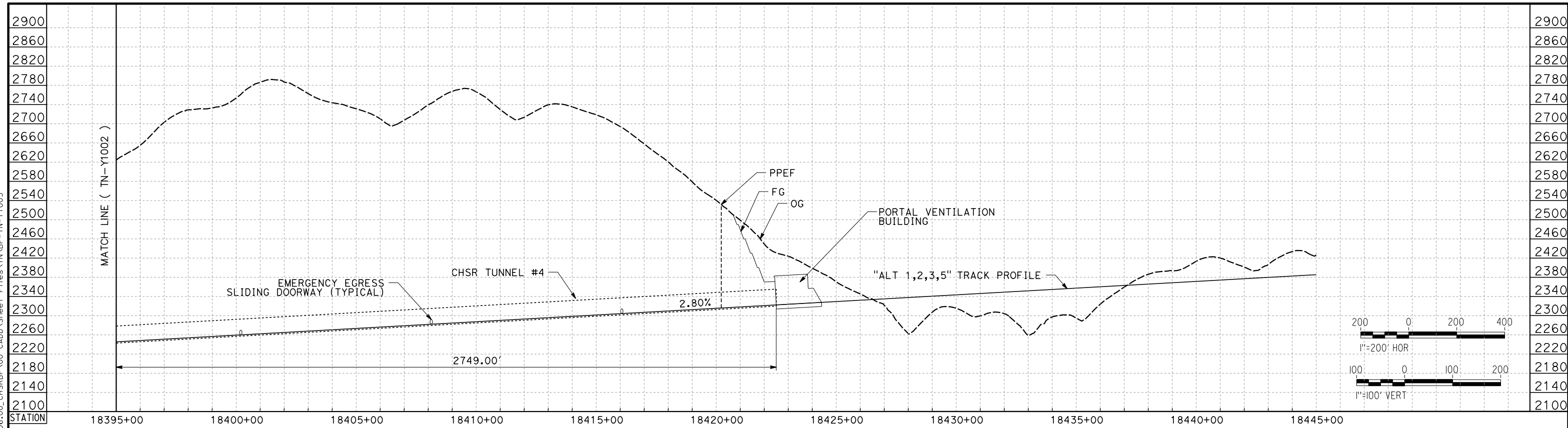
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AS SHOWN

SHEET NO.

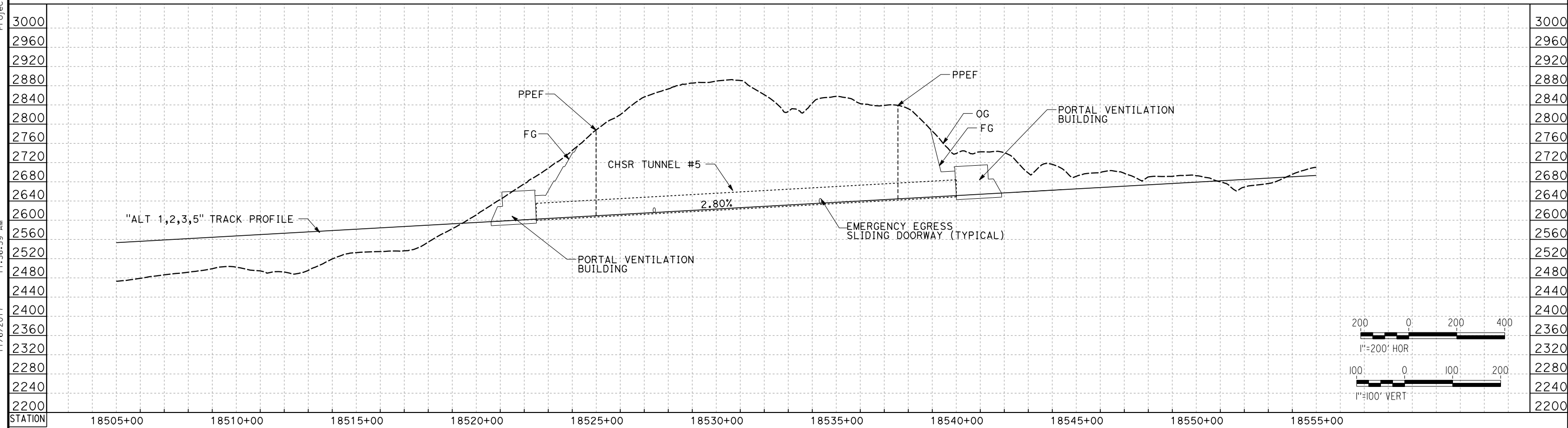
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11/6/2017 11:36:59 AM

OIC:ARivera



TUNNEL 4



TUNNEL 5

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. CARROLL

DRAWN BY
J. FOUCH

CHECKED BY
G. ERICKSON

IN CHARGE
J. MORRISON

DATE
10/31/2017

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PEPD
SUBMITTAL**

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

ALT 1,2,3,5
TUNNEL PROFILES
TUNNEL 4 AND TUNNEL 5

CONTRACT NO.
HSR13-44

DRAWING NO.
TN-Y1003

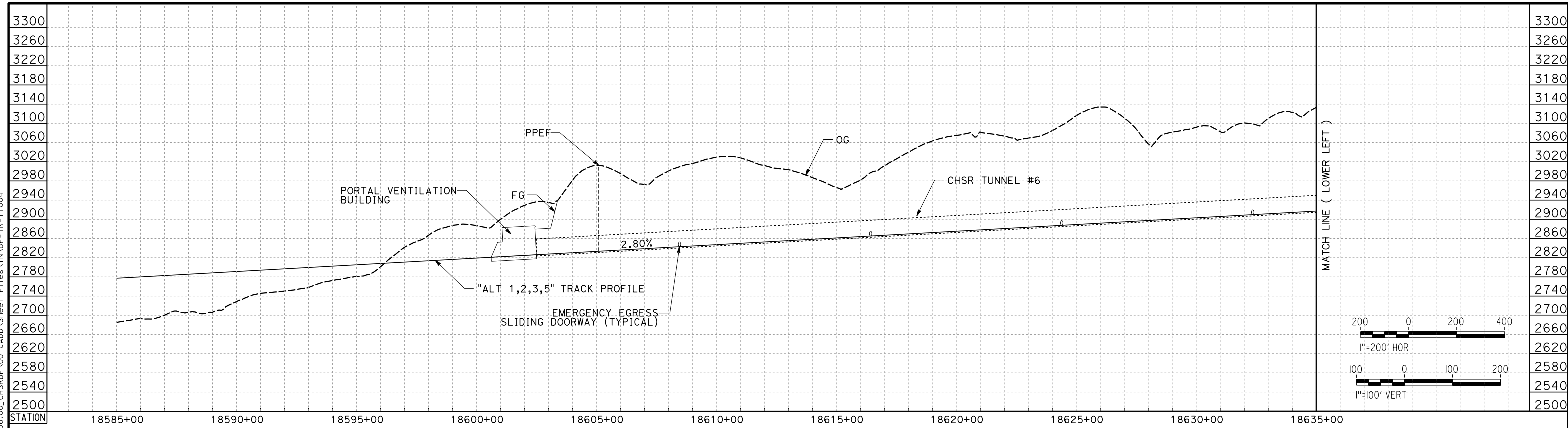
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AS SHOWN

SHEET NO.

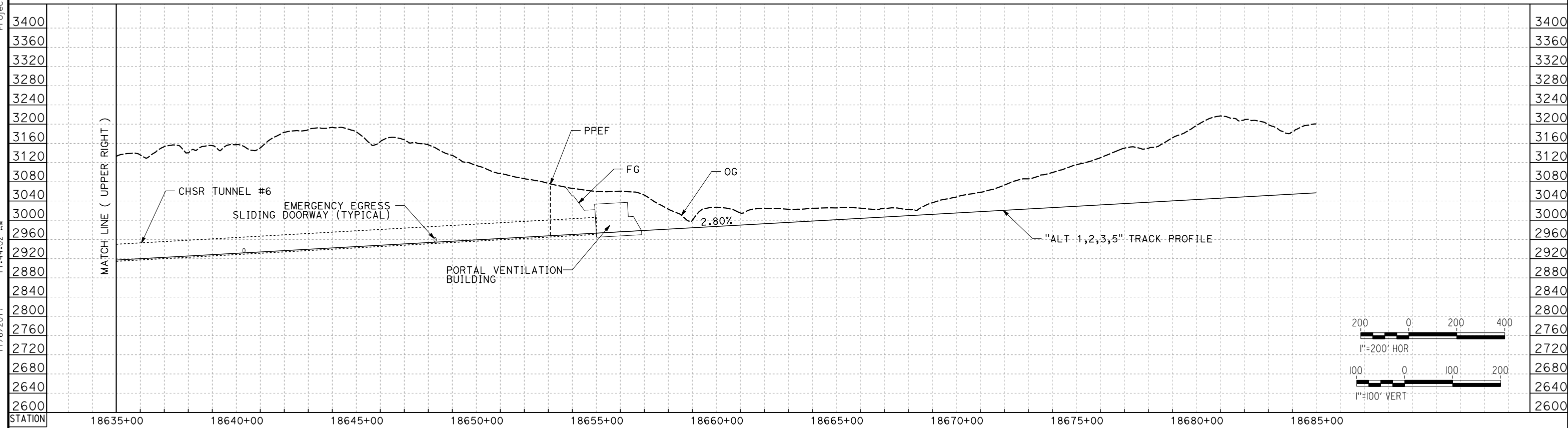
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11/6/2017 11:44:02 AM

OIC:ARivera



TUNNEL 6



TUNNEL 6

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. CARROLL
DRAWN BY
J. FOUCH
CHECKED BY
G. ERICKSON
IN CHARGE
J. MORRISON
DATE
10/31/2017

**RECORD
PEPD
SUBMITTAL**

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CONSTRUCTION**

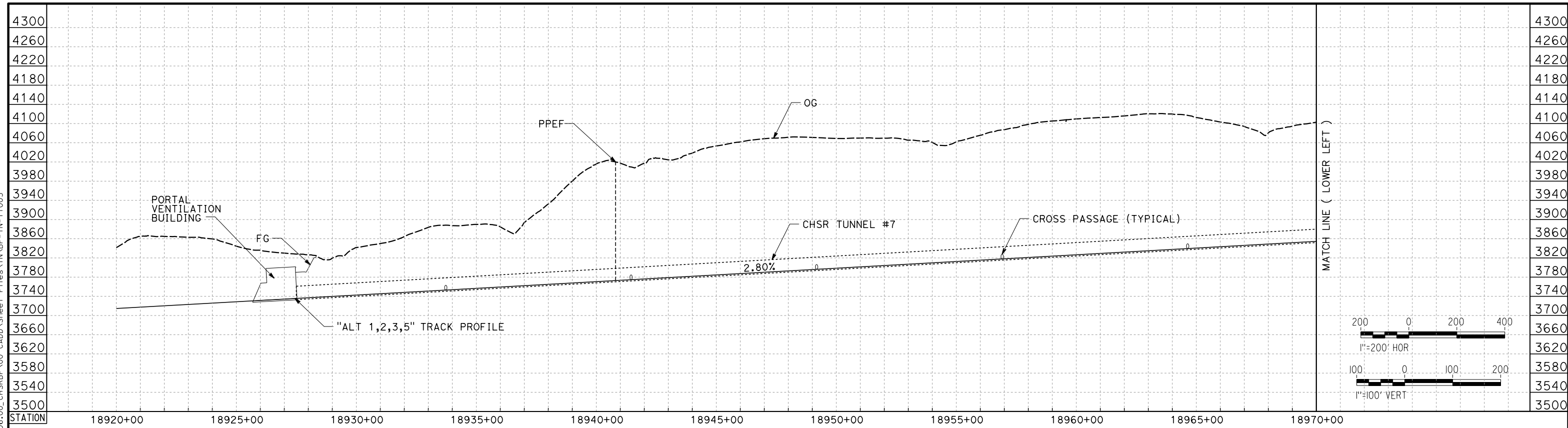


**CALIFORNIA HIGH-SPEED RAIL PROJECT
BAKERSFIELD TO PALMDALE**

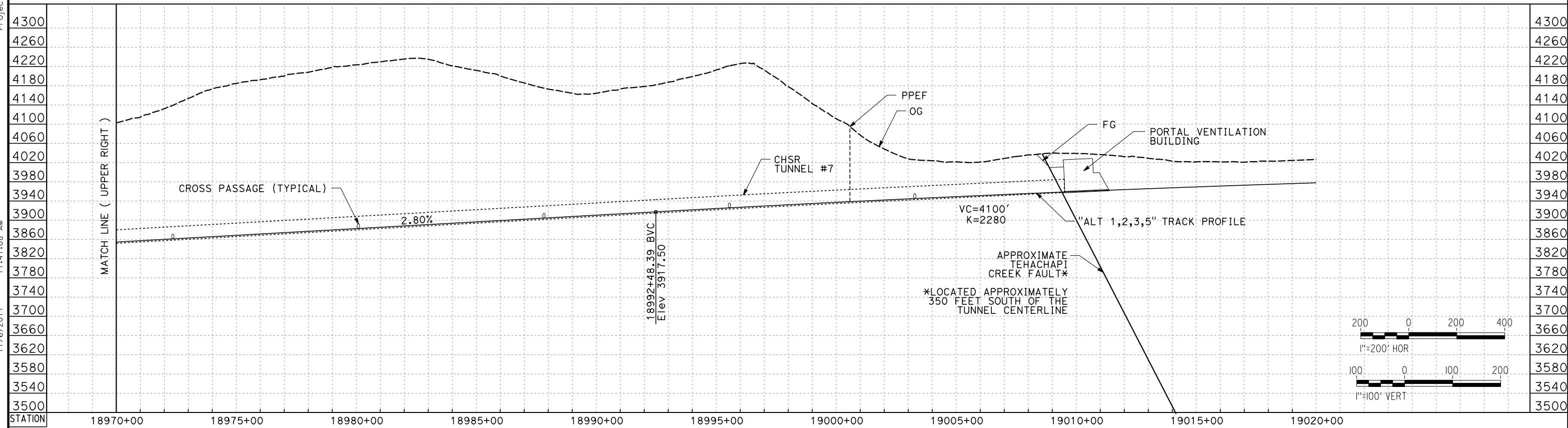
ALT 1,2,3,5
TUNNEL PROFILES
TUNNEL 6

CONTRACT NO.
HSR13-44
DRAWING NO.
TN-Y1004
SCALE
AS SHOWN
SHEET NO.

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 OIC:ARIVEGA



TUNNEL 7



TUNNEL 7

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. CARROLL
 DRAWN BY
J. FOUCH
 CHECKED BY
G. ERICKSON
 IN CHARGE
J. MORRISON
 DATE
10/31/2017

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

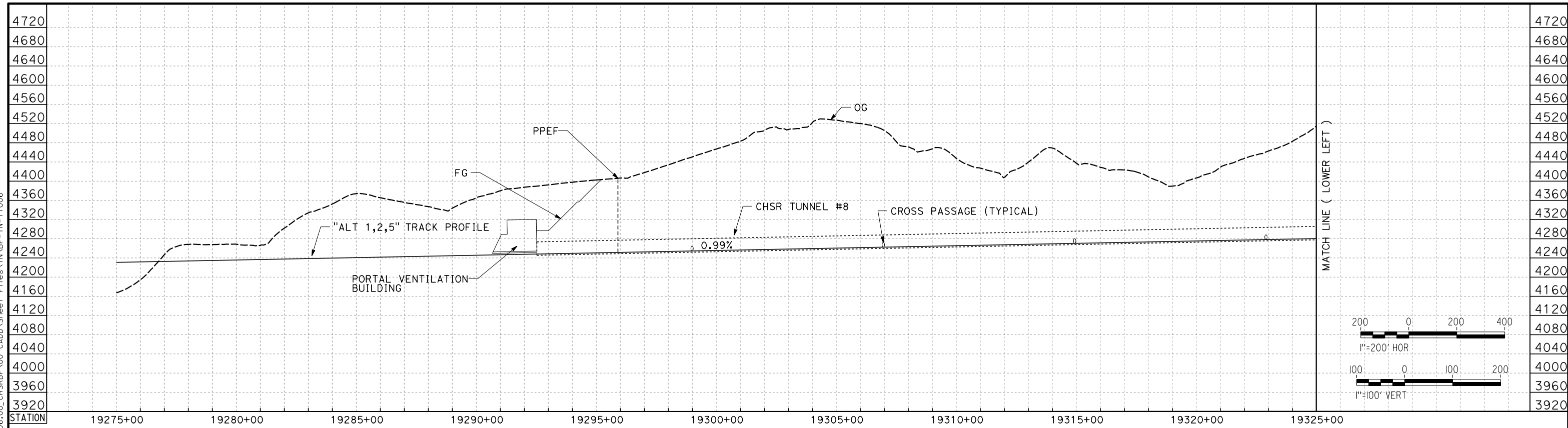
 ALT 1,2,3,5
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 TUNNEL 7

CONTRACT NO.
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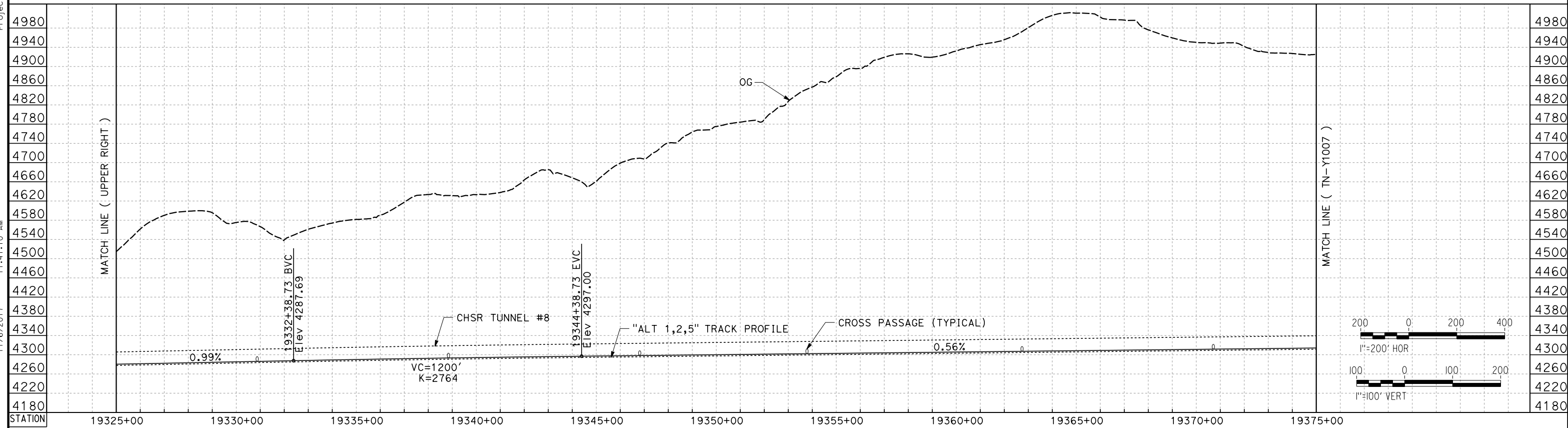
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OIC:ARivega



TUNNEL 8



TUNNEL 8

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. CARROLL
DRAWN BY
J. FOUCH
CHECKED BY
G. ERICKSON
IN CHARGE
J. MORRISON
DATE
10/31/2017

**RECORD
PEPD
SUBMITTAL**

**NOT FOR
CONSTRUCTION**

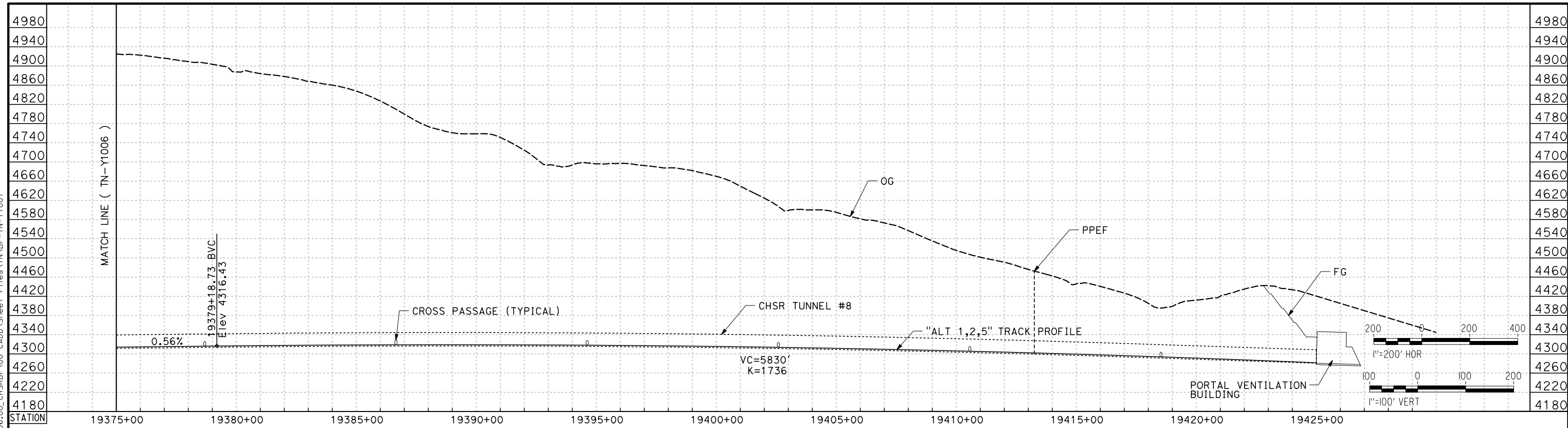


**CALIFORNIA HIGH-SPEED RAIL PROJECT
BAKERSFIELD TO PALMDALE**

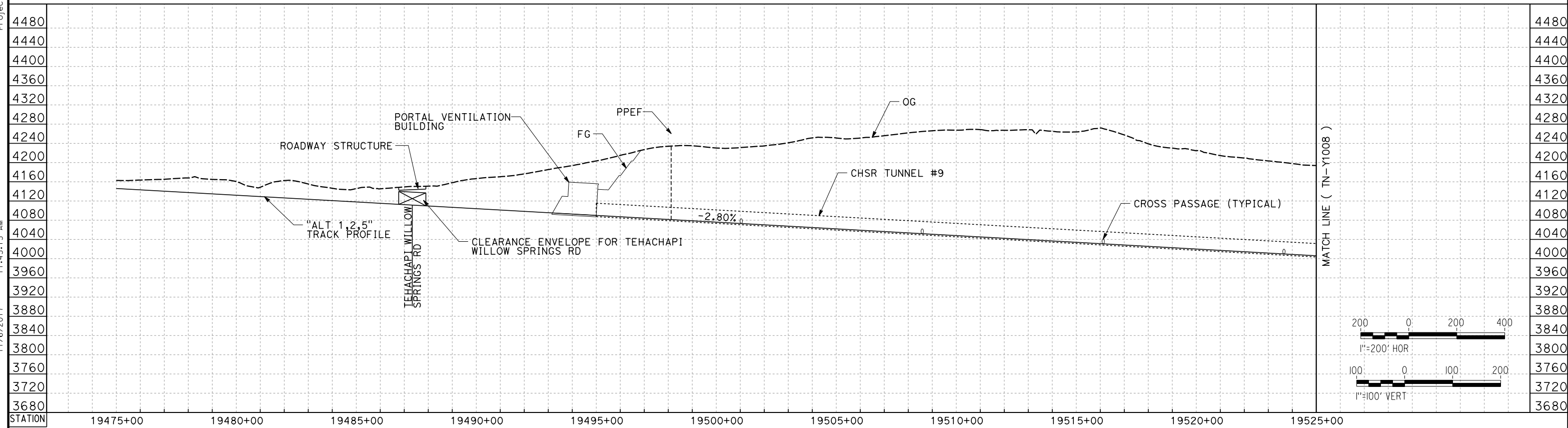
ALT 1,2,5
TUNNEL PROFILES
TUNNEL 8

CONTRACT NO.
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DRAWING NO.
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SCALE
AS SHOWN
SHEET NO.

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 OIC:ARIVERA



TUNNEL 8



TUNNEL 9

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. CARROLL
 DRAWN BY
J. FOUCH
 CHECKED BY
G. ERICKSON
 IN CHARGE
J. MORRISON
 DATE
10/31/2017

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

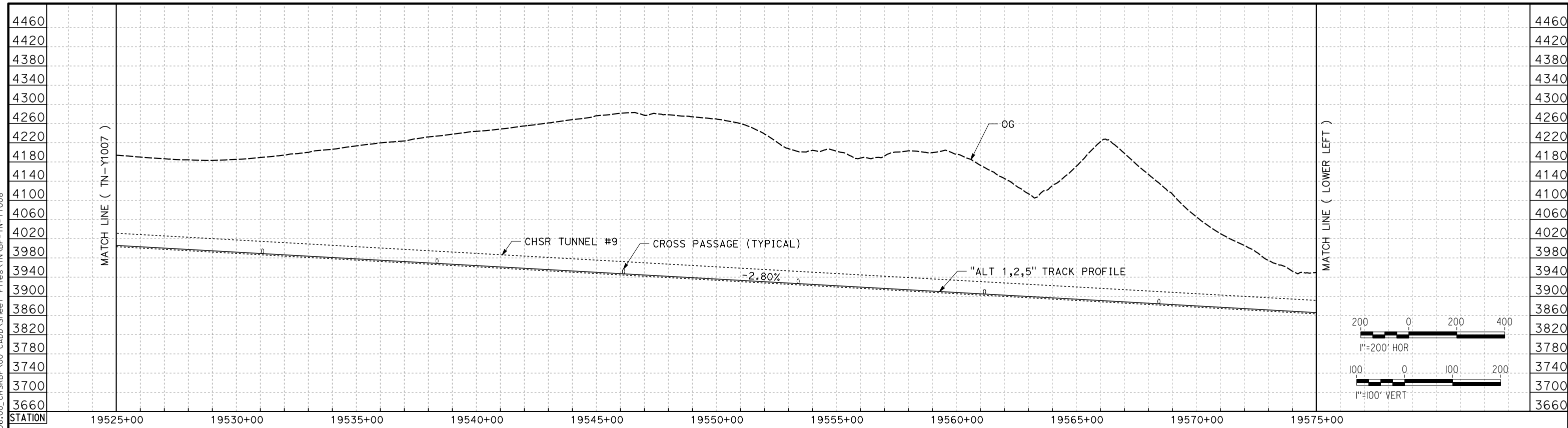
 ALT 1,2,5
 TUNNEL PROFILES
 TUNNEL 8 AND TUNNEL 9

CONTRACT NO.
HSR13-44
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AS SHOWN
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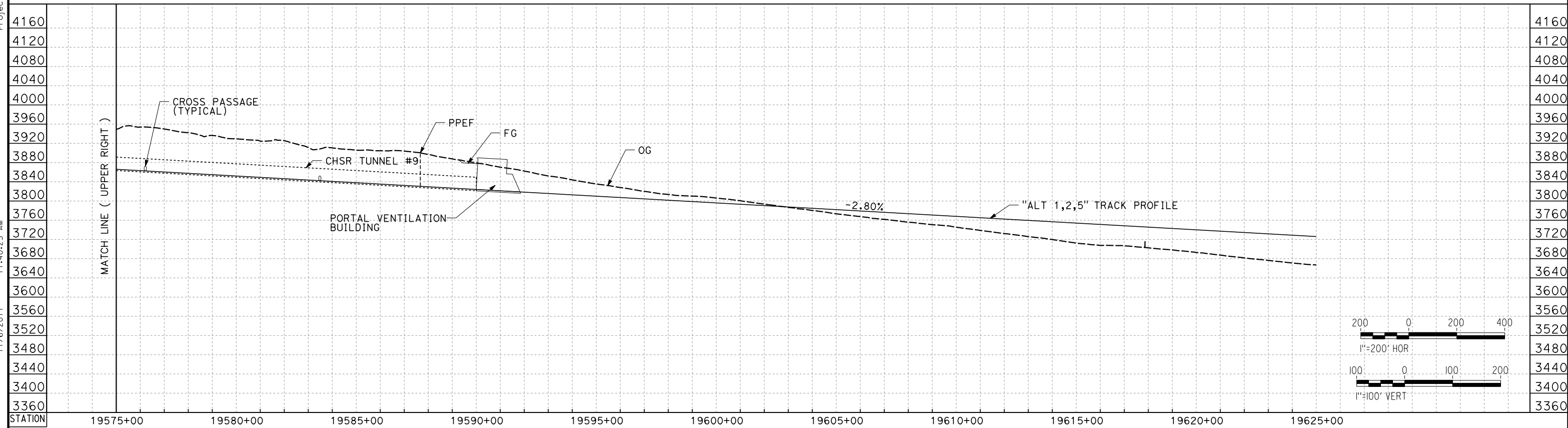
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OIC:ARivera



TUNNEL 9



TUNNEL 9

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. CARROLL
DRAWN BY
J. FOUCH
CHECKED BY
G. ERICKSON
IN CHARGE
J. MORRISON
DATE
10/31/2017

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CONSTRUCTION**



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

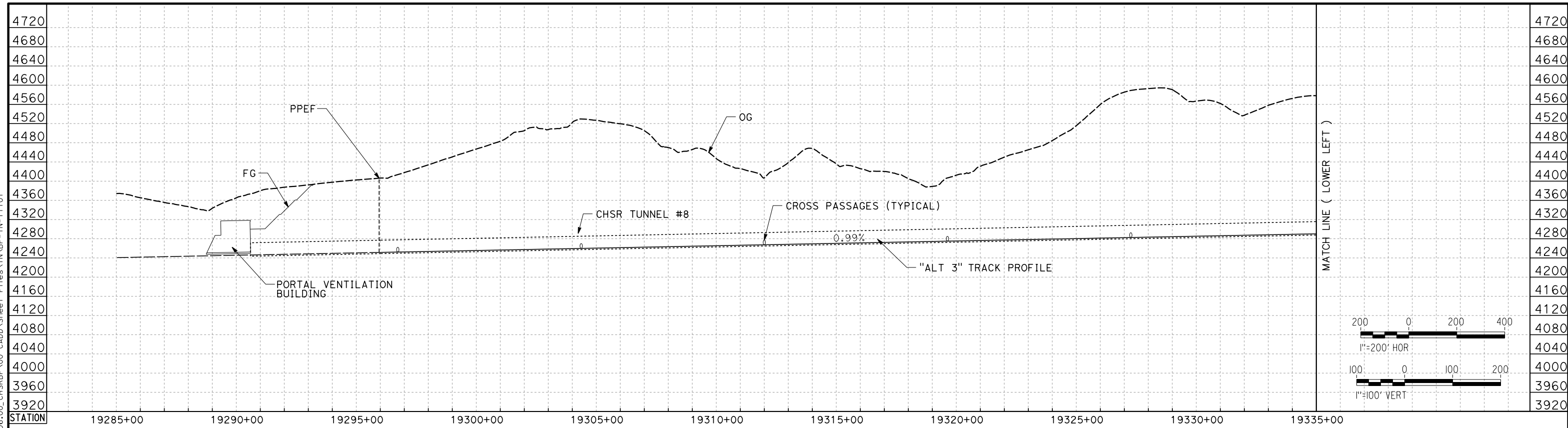
ALT 1,2,5
TUNNEL PROFILES
TUNNEL 9

CONTRACT NO.
HSR13-44
DRAWING NO.
TN-Y1008
SCALE
AS SHOWN
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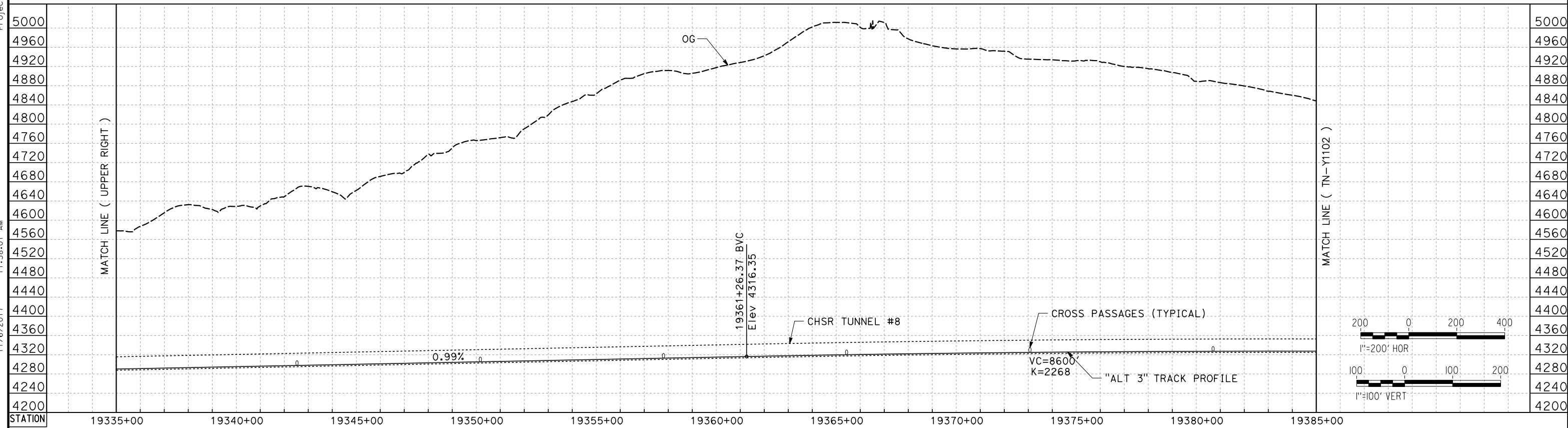
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TUNNEL 8



TUNNEL 8

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. CARROLL
DRAWN BY
J. FOUCH
CHECKED BY
G. ERICKSON
IN CHARGE
J. MORRISON
DATE
10/31/2017

**RECORD
PEPD
SUBMITTAL**

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CONSTRUCTION**



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

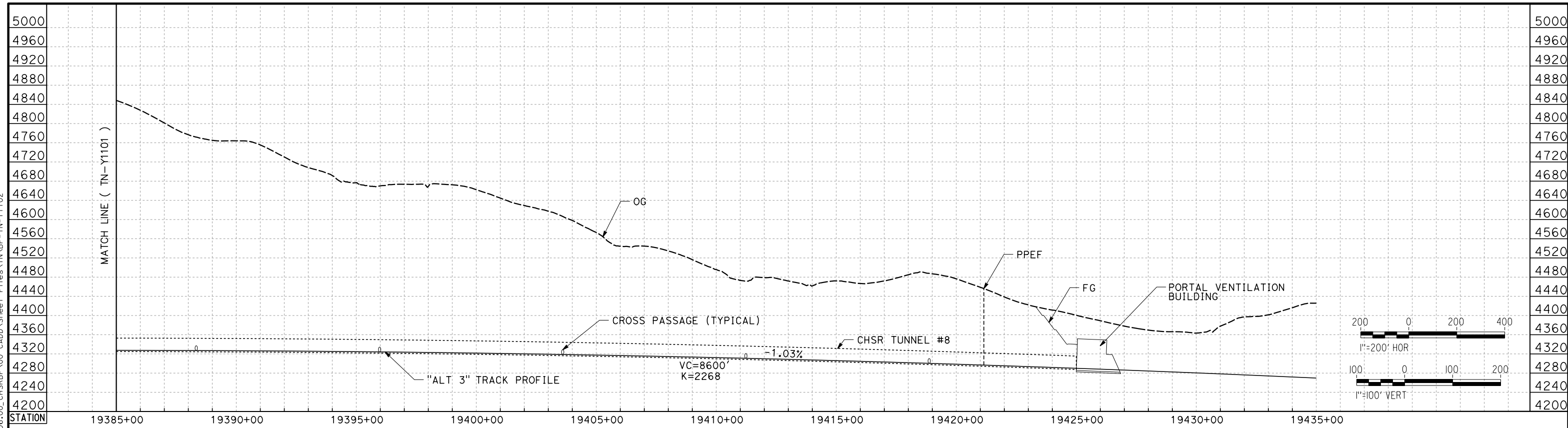
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TUNNEL 8

CONTRACT NO.
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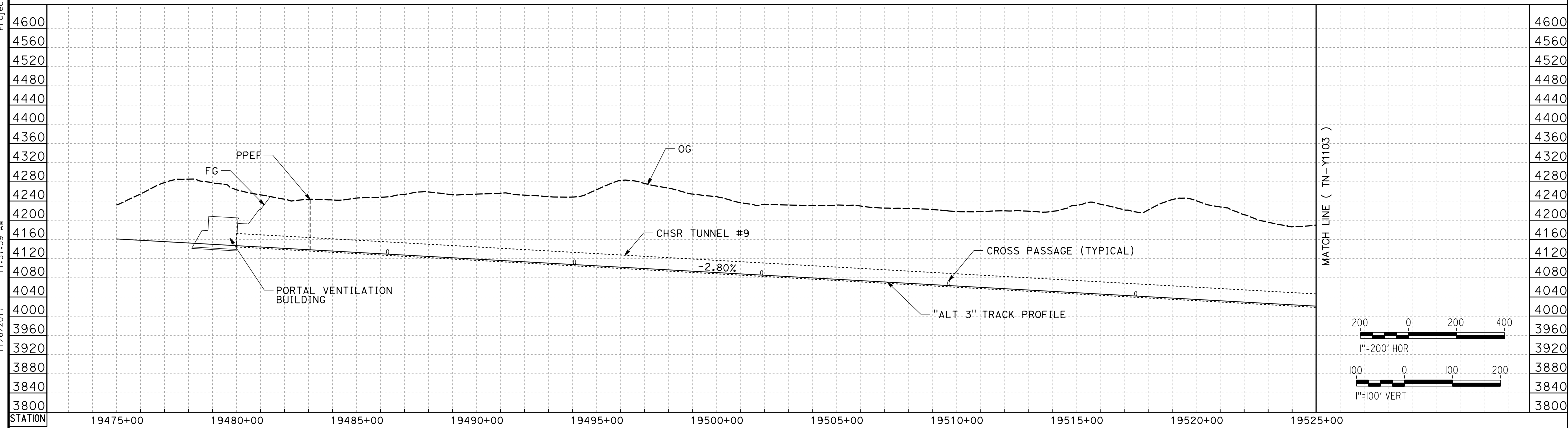
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OIC:ARivega



TUNNEL 8



TUNNEL 9

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. CARROLL
DRAWN BY
J. FOUCH
CHECKED BY
G. ERICKSON
IN CHARGE
J. MORRISON
DATE
10/31/2017

**RECORD
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SUBMITTAL**

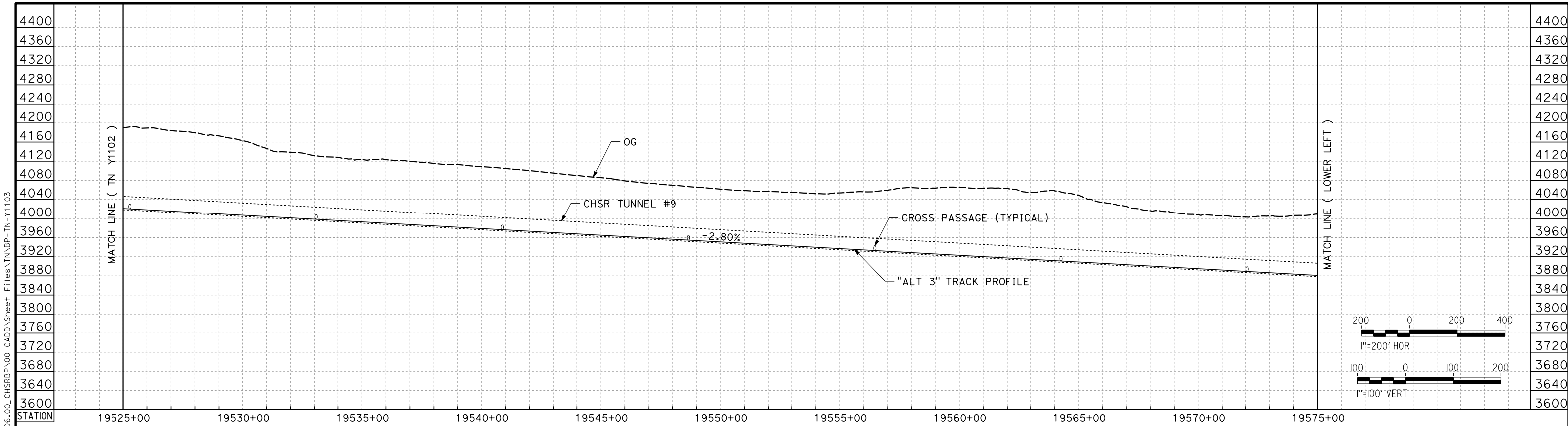
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CONSTRUCTION**



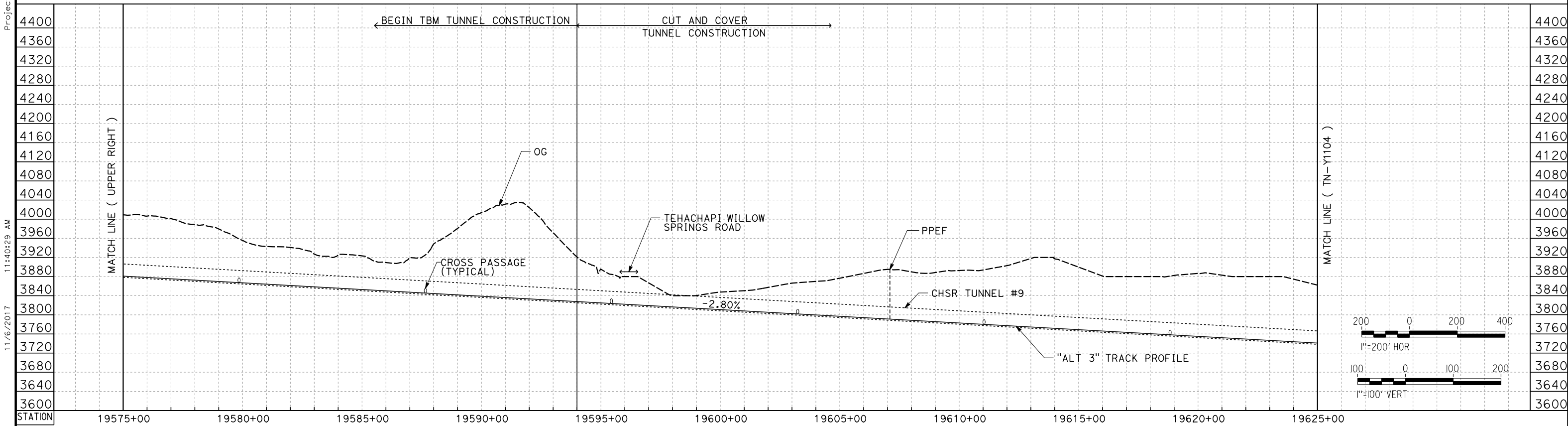
**CALIFORNIA HIGH-SPEED RAIL PROJECT
BAKERSFIELD TO PALMDALE**

ALT 3
TUNNEL PROFILES
TUNNEL 8 AND TUNNEL 9

CONTRACT NO.
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SCALE
AS SHOWN
SHEET NO.



TUNNEL 9



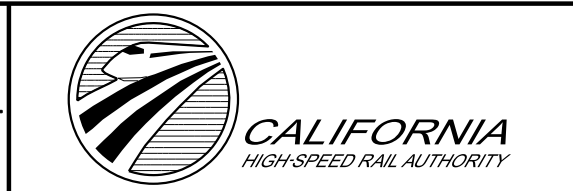
TUNNEL 9

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. CARROLL
DRAWN BY
J. FOUCH
CHECKED BY
G. ERICKSON
IN CHARGE
J. MORRISON
DATE
10/31/2017

**RECORD
PEPD
SUBMITTAL**

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CONSTRUCTION**



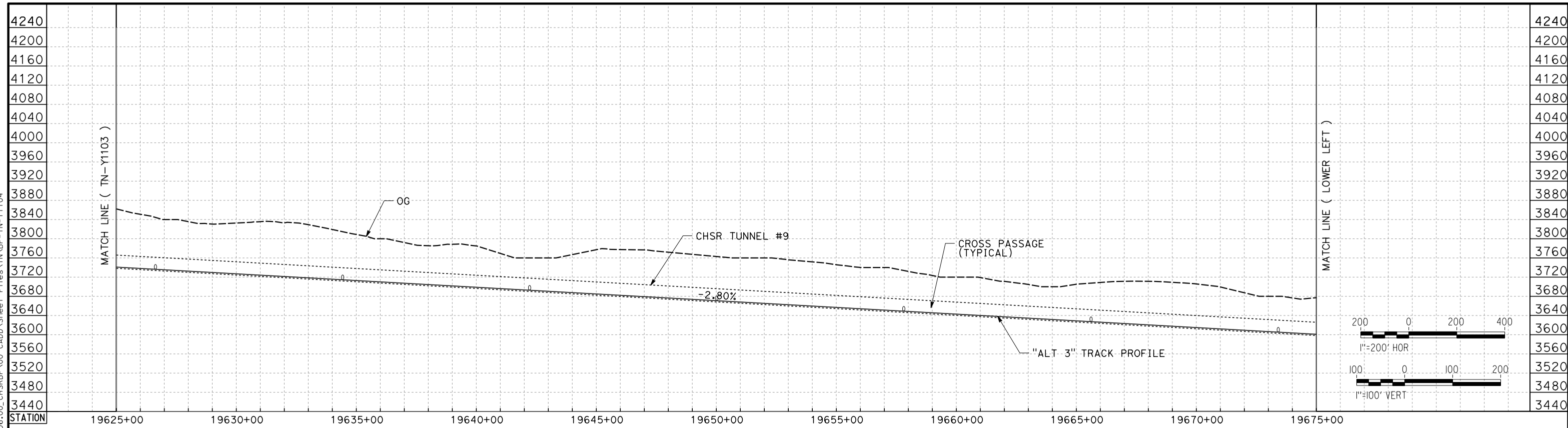
**CALIFORNIA HIGH-SPEED RAIL PROJECT
BAKERSFIELD TO PALMDALE**

ALT 3
TUNNEL PROFILES
TUNNEL 9

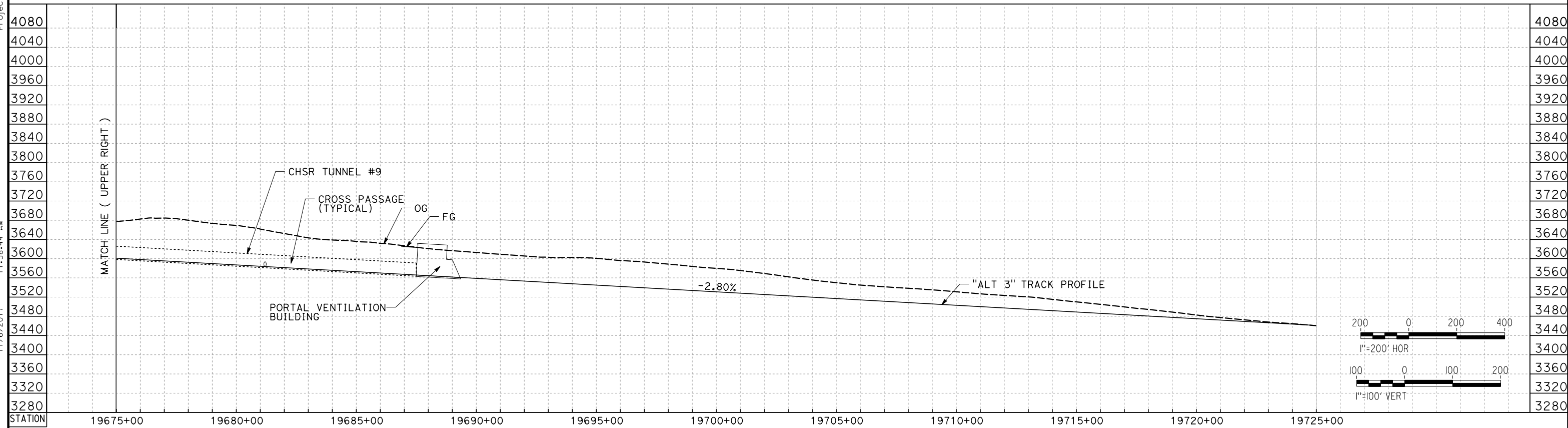
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SCALE
AS SHOWN
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 OIC:ARIVEGA



TUNNEL 9



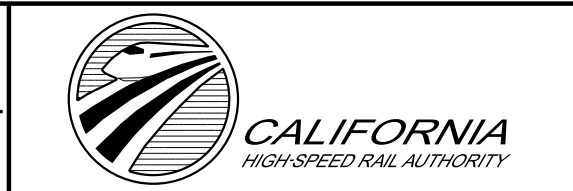
TUNNEL 9

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. CARROLL
 DRAWN BY
J. FOUCH
 CHECKED BY
G. ERICKSON
 IN CHARGE
J. MORRISON
 DATE
10/31/2017

**RECORD
 PECD
 SUBMITTAL**

**NOT FOR
 CONSTRUCTION**

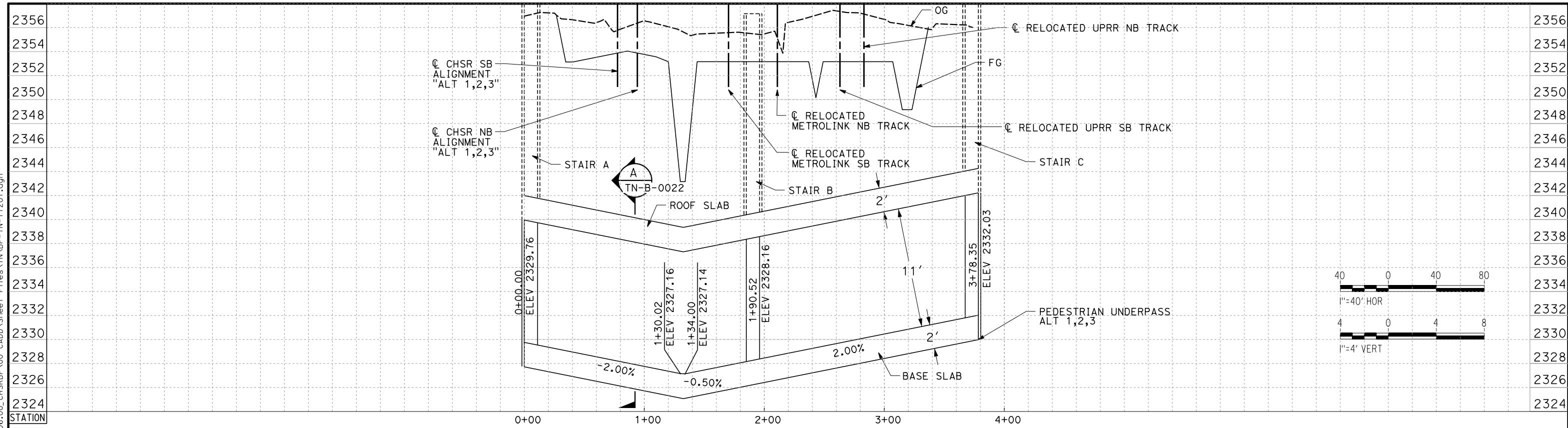


**CALIFORNIA HIGH-SPEED RAIL PROJECT
 BAKERSFIELD TO PALMDALE**

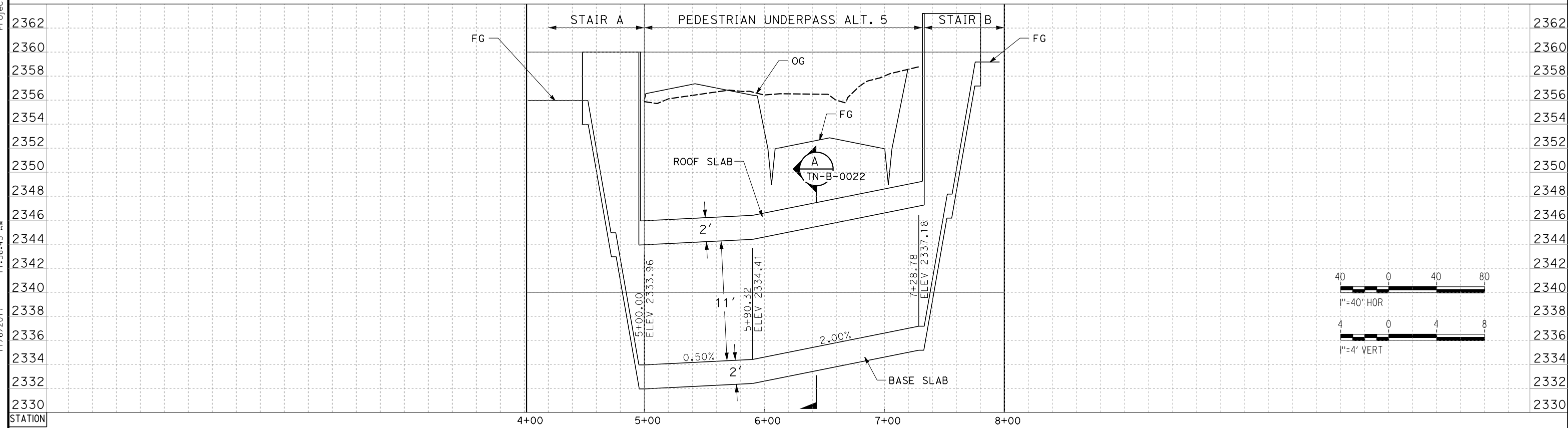
 ALT 3
 TUNNEL PROFILES
 TUNNEL 9

CONTRACT NO.
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 OIC:ARivega



PEDESTRIAN UNDERPASS ALT. 1,2,3



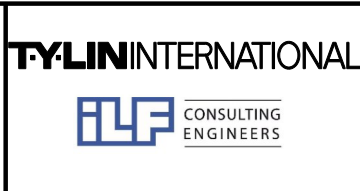
PEDESTRIAN UNDERPASS ALT. 5

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. CARROLL
 DRAWN BY
J. FOUCH
 CHECKED BY
G. ERICKSON
 IN CHARGE
J. MORRISON
 DATE
10/31/2017

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 SUBMITTAL**

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

 PROFILE VIEW
 TYPICAL UNDERPASS PROFILE

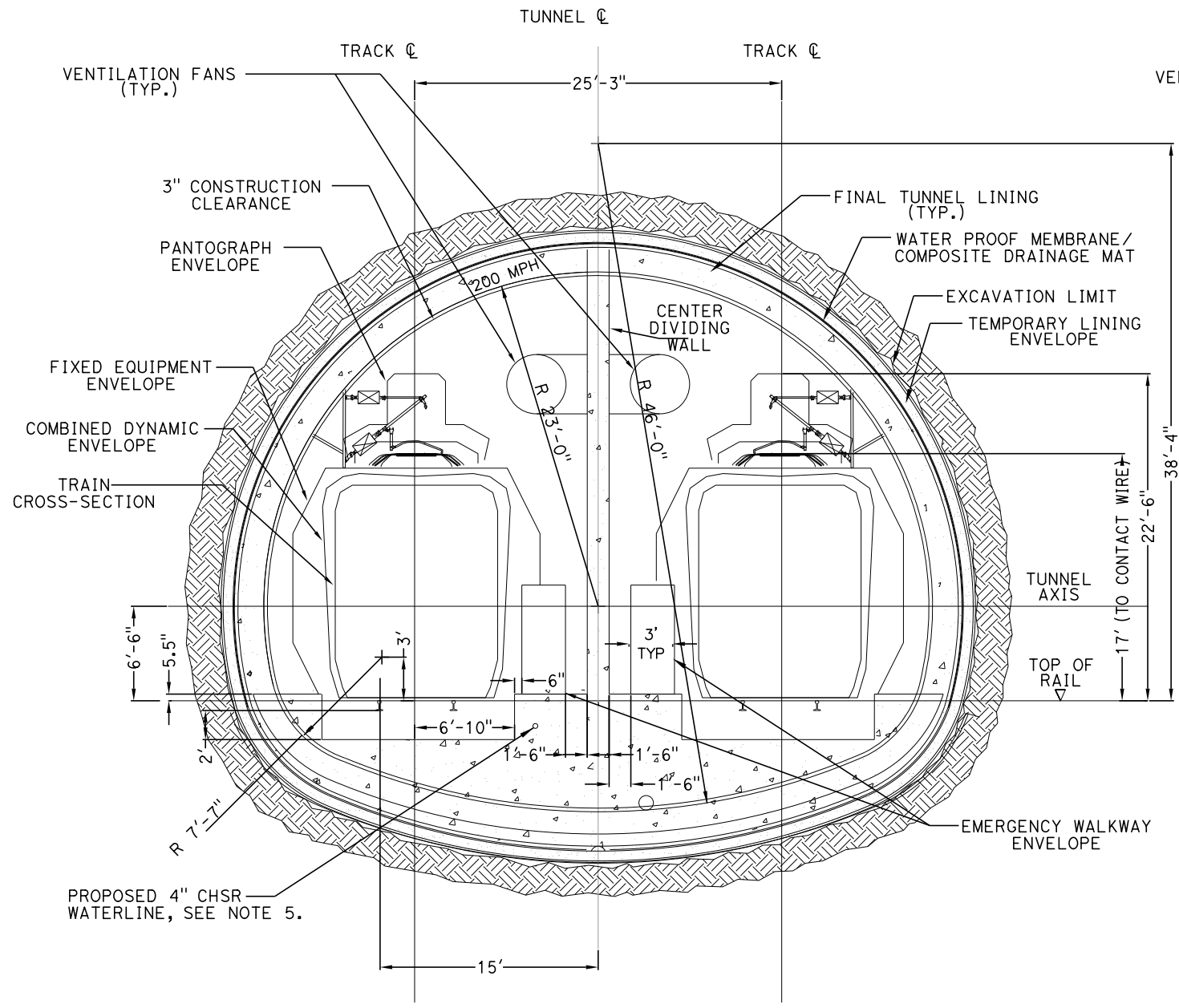
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HSR13-44
 DRAWING NO.
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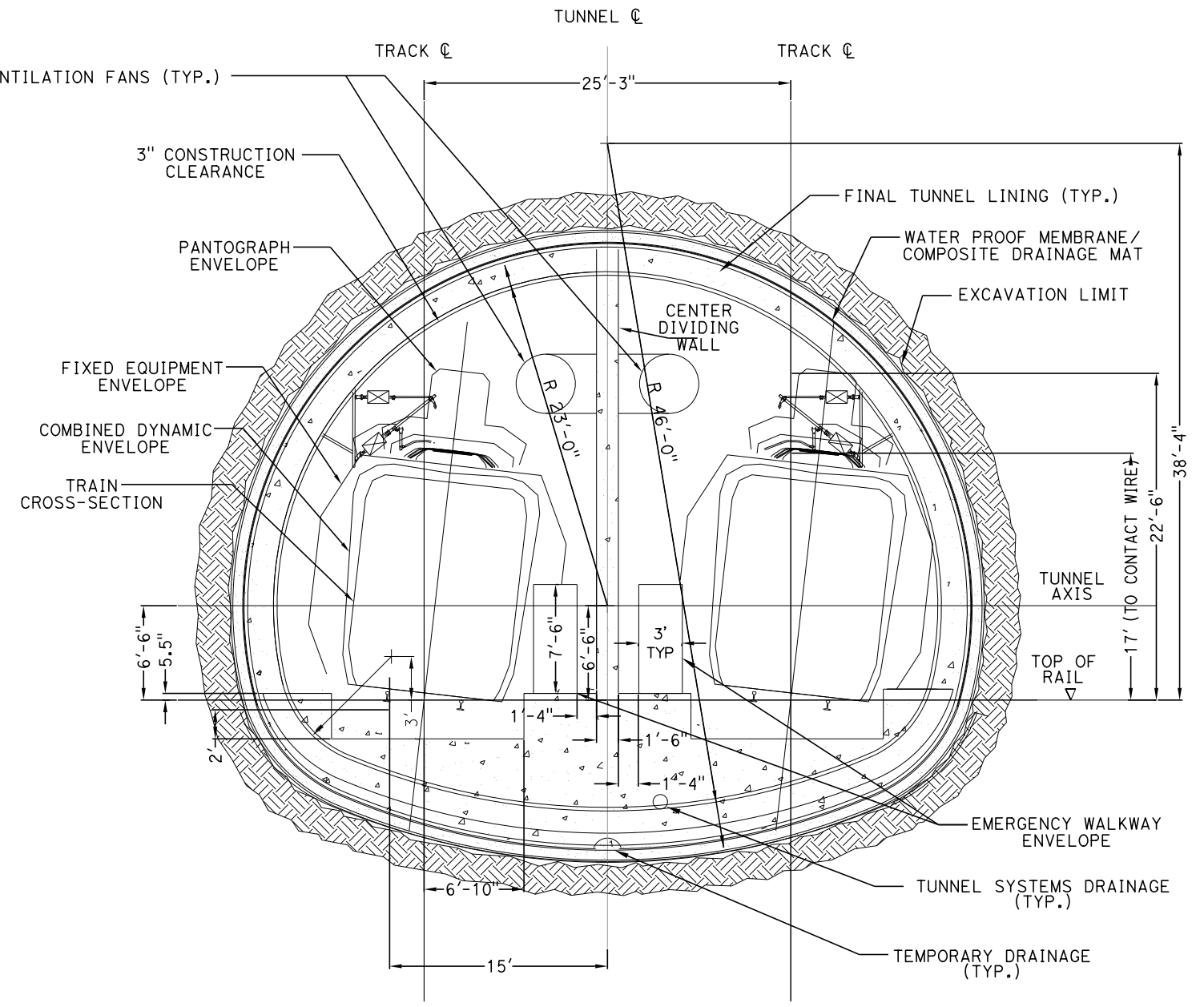
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11/6/2017

OIC:ARTIVEGA



TANGENT TRACK



SUPER ELEVATED TRACK

GENERAL NOTES:

1. SEQUENTIAL EXCAVATION METHODS ARE ADOPTED FOR THE 15% IN-PROGRESS DESIGN OF DOUBLE-TRACK, TUNNEL 1, 2 & 3, SITED IN FANGLOMERATE.
2. EXCAVATION, GROUND SUPPORT, LINING THICKNESS, WATERTIGHTNESS AND GAS-TIGHTNESS PROVISIONS WILL BE OPTIMIZED BASED ON SITE INVESTIGATION RESULTS AND TUNNEL-SPECIFIC DESIGN WORK.
3. TYPICAL CROSS-SECTION REQUIRES FURTHER STUDY TO EVALUATE DYNAMIC AIRFLOW/PRESSURE LEVELS UNDER HIGH SPEED OPERATING CONDITIONS, AND TO FURTHER REFINE SPACE ALLOTTED FOR STRUCTURES, EQUIPMENT, AND EGRESS.
4. CENTER DIVIDING WALL SHALL CONFORM TO NFPA 130 AND HAVE A 2 HOUR FIRE RATING.
5. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. CARROLL
DRAWN BY
J. FOUCH
CHECKED BY
G. ERICKSON
IN CHARGE
J. MORRISON
DATE
10/31/2017

**RECORD
PEPD
SUBMITTAL**

**NOT FOR
CONSTRUCTION**



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

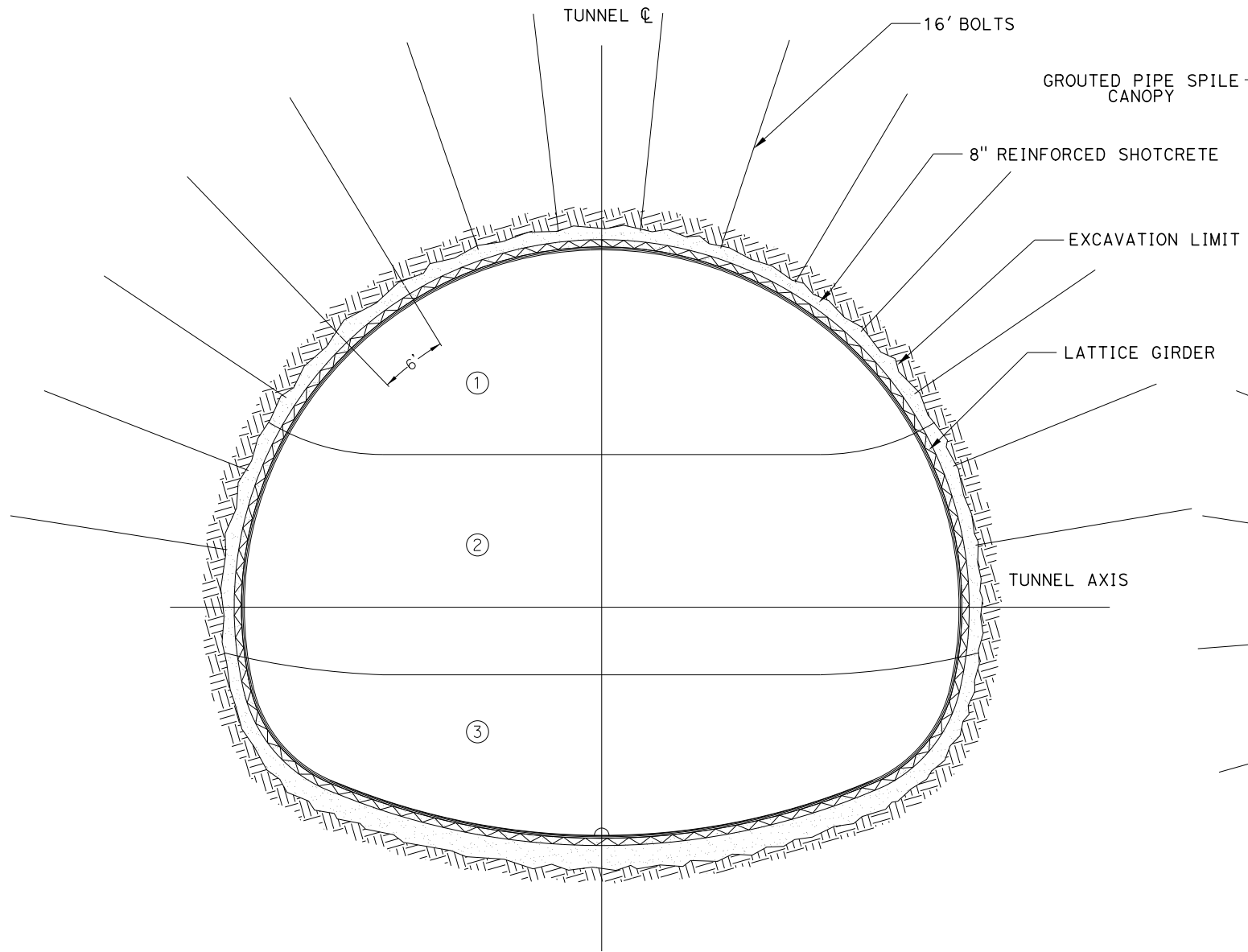
TUNNEL SEQUENTIAL EXCAVATION METHOD
SINGLE TUNNEL CLEARANCE DIAGRAM
TANGENT TRACK

CONTRACT NO.
HSR13-44

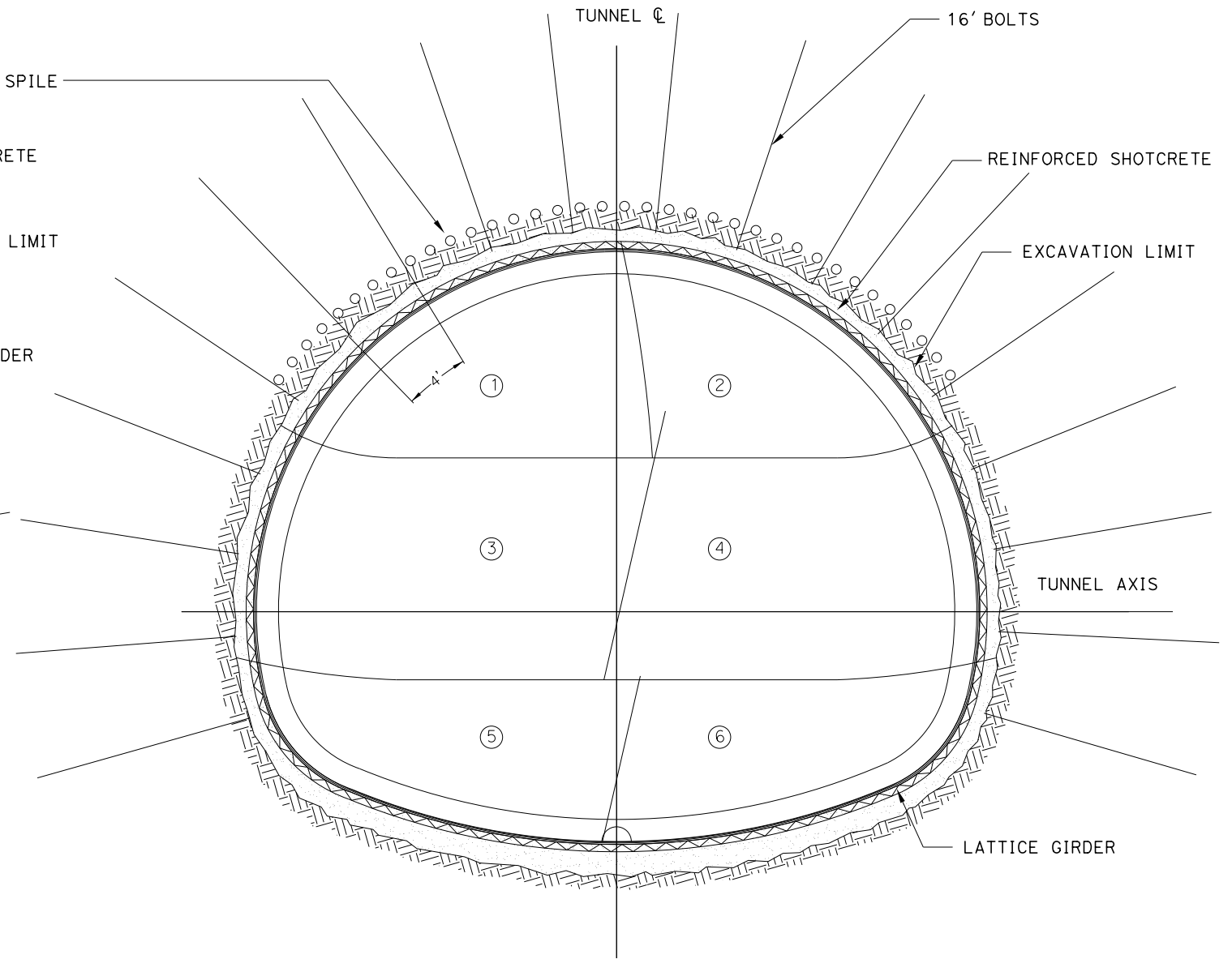
DRAWING NO.
TN-B-0001

SCALE
AS SHOWN

SHEET NO.



SEM (STABLE GROUND)



SEM (BLOCKY OR SEAMY GROUND)

GENERAL NOTES:

1. SEQUENTIAL EXCAVATION METHODS IS IDENTIFIED FOR THE 15% IN-PROGRESS DESIGN OF DOUBLE-TRACK TUNNEL FOR TUNNEL 1, 2 & 3, SITED IN FANGLOMERATES.
2. EXCAVATION, GROUND SUPPORT, LINING THICKNESS, WATERTIGHTNESS AND GASTIGHTNESS PROVISIONS WILL BE OPTIMIZED BASED ON SITE INVESTIGATION RESULTS AND TUNNEL-SPECIFIC DESIGN WORK.
3. TYPICAL CROSS-SECTION REQUIRES FURTHER STUDY TO EVALUATE DYNAMIC AIRFLOW/PRESSURE LEVELS UNDER HIGH SPEED OPERATING CONDITIONS, AND TO FURTHER REFINE SPACE ALLOTTED FOR STRUCTURES, EQUIPMENT, AND EGRESS.
4. SEM IN BLOCKY OR SEAMY GROUND WILL REQUIRE FACE SUPPORT INCLUDING SHOTCRETE AND FACE DOWELS. SUPPORT OF TEMPORARY SIDEWALLS WILL BE SHOWN IN THE NEXT DESIGN STAGE.

*BLOCKY OR SEAMY GROUND MAY INCLUDE SEM TOOL BOX ITEMS, PROBE DRILLING, FLASHCRETE, FACE DOWELS, FACE WEDGES, SPILLING-FOREPOLING AND PRE-EXCAVATED GROUTING.

SEM IN STABLE GROUND - FACE SUPPORT AS REQUIRED FOR SEM IN STABLE GROUND



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. CARROLL
DRAWN BY
J. FOUCH
CHECKED BY
G. ERICKSON
IN CHARGE
J. MORRISON
DATE
10/31/2017

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SUBMITTAL**

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

TUNNEL SEQUENTIAL EXCAVATION METHOD
EXCAVATION SEQUENCE
INITIAL SUPPORT

CONTRACT NO.
HSR13-44

DRAWING NO.
TN-B-0002

SCALE
AS SHOWN

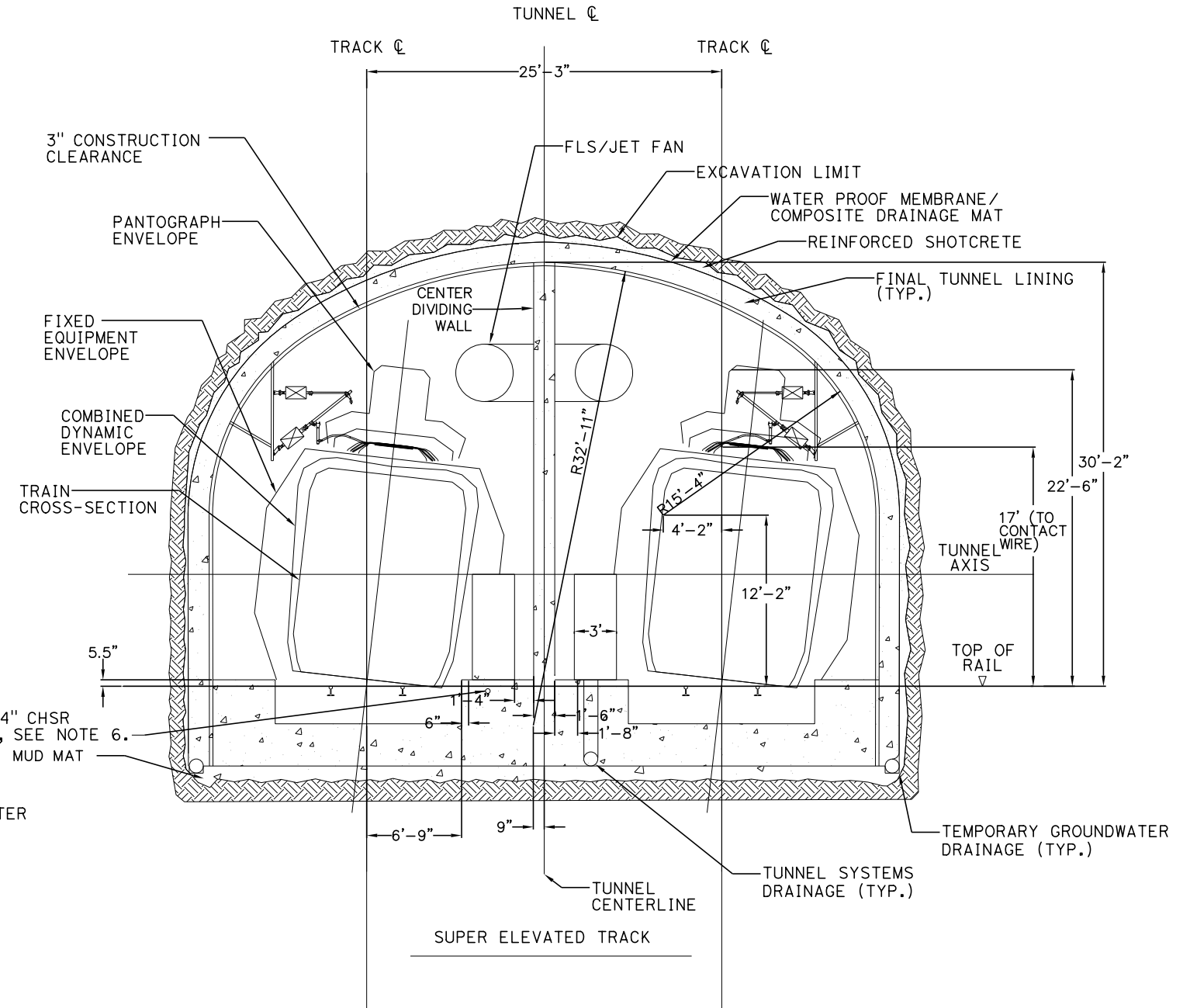
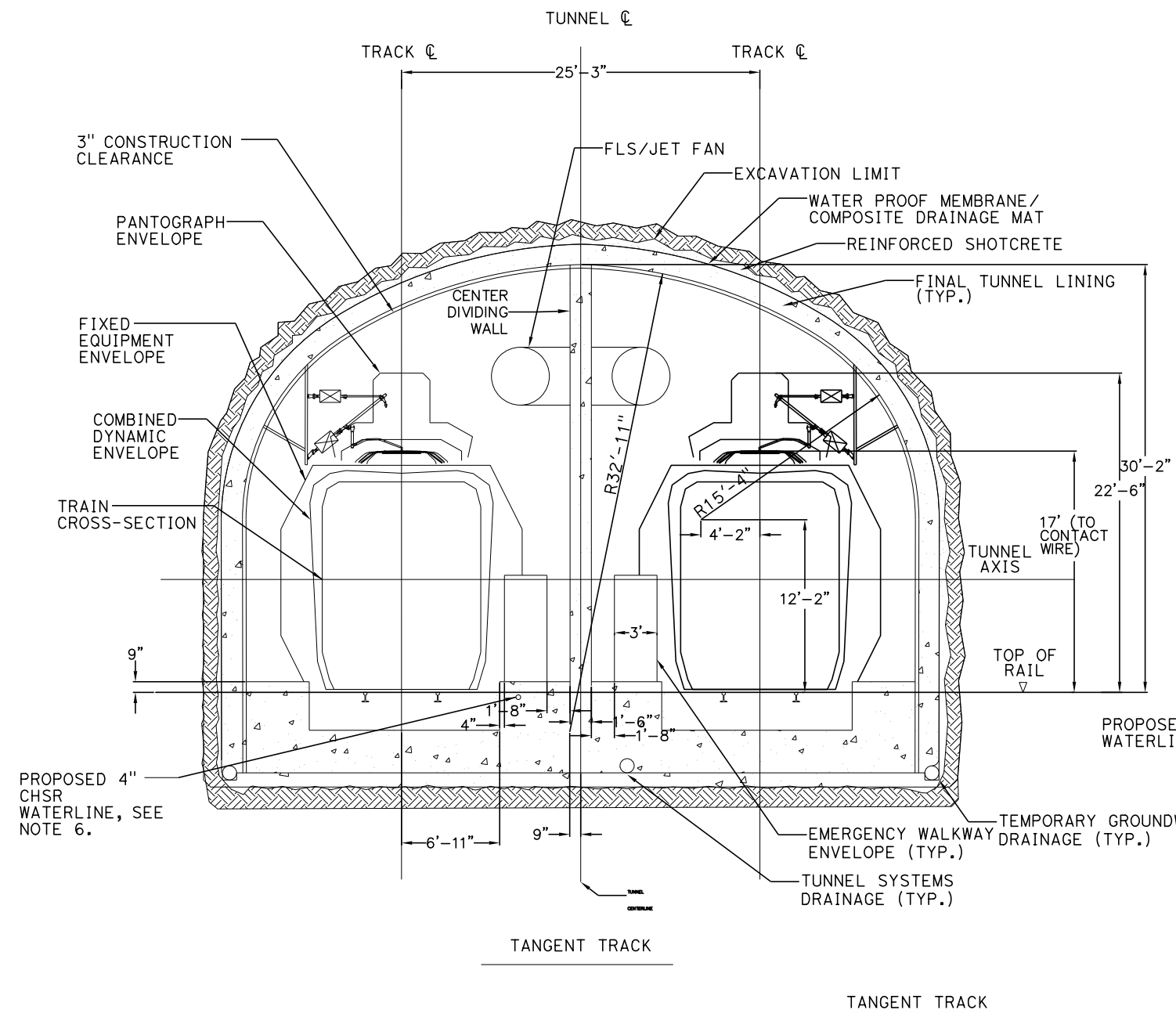
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11/6/2017 11:31:30 AM

11/6/2017

01C-ARTIVEGA



GENERAL NOTES

1. DRILL AND BLAST METHOD IS IDENTIFIED FOR THE 15% IN-PROGRESS DESIGN OF DOUBLE TRACK TUNNEL FOR TUNNEL 4, 5 AND 6 IN HARD ROCK UNITS.
2. EXCAVATION, GROUND SUPPORT, LINING THICKNESS AND WATERTIGHTNESS PROVISIONS WILL BE OPTIMIZED BASED ON SITE INVESTIGATION RESULTS AND TUNNEL-SPECIFIC DESIGN WORK.
3. TYPICAL CROSS-SECTION REQUIRES FURTHER STUDY TO EVALUATE DYNAMIC AIRFLOW/PRESSURE LEVELS UNDER HIGH SPEED OPERATING CONDITIONS, AND TO FURTHER REFINE SPACE ALLOTTED FOR STRUCTURES, EQUIPMENT, AND EGRESS.
4. CENTER DIVIDING WALL SHALL CONFORM TO NFPA 130 AND HAVE A 2 HOUR FIRE RATING.
5. THE COMPOSITE VEHICLE STATIC AND DYNAMIC ENVELOPES SHOWN FOLLOW TM1.1.10-A AND C
6. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. CARROLL
DRAWN BY
J. FOUCH
CHECKED BY
G. ERICKSON
IN CHARGE
J. MORRISON
DATE
10/31/2017

**RECORD
PEPD
SUBMITTAL**

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CONSTRUCTION**



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

TUNNEL DRILL AND BLAST METHOD
SINGLE TUNNEL
CLEARANCE DIAGRAM

CONTRACT NO.
HSR13-44

DRAWING NO.
TN-B-0003

SCALE
AS SHOWN

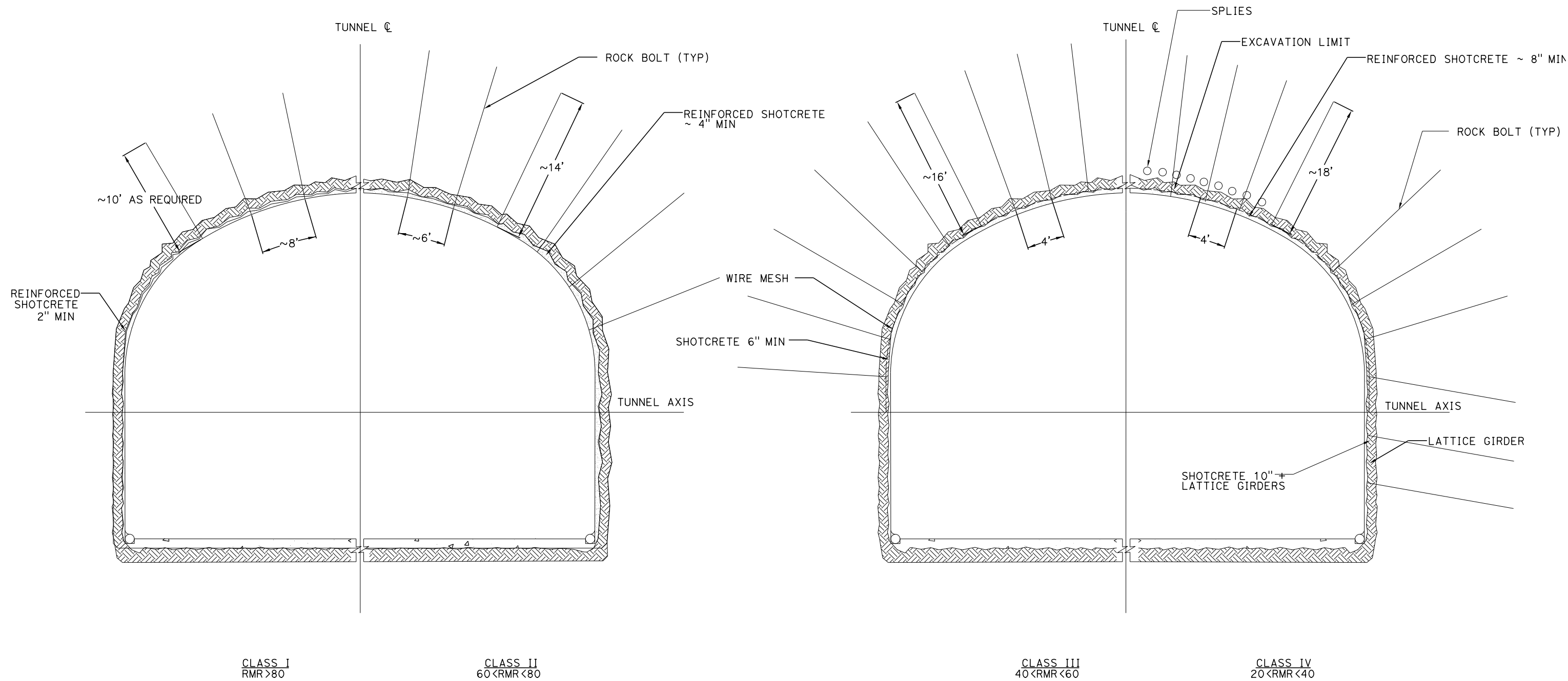
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11/31/16 AM

11/6/2017

OIC:ARTIVEGA



GENERAL NOTES:

1. A DRILL AND BLAST OPTION IS IDENTIFIED FOR THE 15% IN-PROGRESS DESIGN OF TWIN, SINGLE TRACK TUNNELS FOR TUNNEL 4, 5 AND 6 IN HARD ROCK UNITS.
2. EXCAVATION, GROUND SUPPORT, LINING THICKNESS AND WATERTIGHTNESS PROVISIONS WILL BE OPTIMIZED BASED ON SITE INVESTIGATION RESULTS AND TUNNEL-SPECIFIC DESIGN WORK.
3. TYPICAL CROSS-SECTION REQUIRES FURTHER STUDY TO EVALUATE DYNAMIC AIRFLOW/PRESSURE LEVELS UNDER HIGH SPEED OPERATING CONDITIONS, AND TO FURTHER REFINE SPACE ALLOTTED FOR STRUCTURES, EQUIPMENT, AND EGRESS.
4. CLASS I AND II MAY BE EXCAVATED FULL FACE. CLASS III MAY REQUIRE HEADING AND BENCH EXCAVATION WITH FACE SUPPORT AS REQUIRED. CLASS IV MAY REQUIRE TOP HEADING AND BENCH WITH SIDE SLASH, SPILES, AND FACE SUPPORT AS NEEDED. CLASS IV MAY REQUIRE A CHANGE IN EXCAVATION METHOD TO AN SEM CONSTRUCTION ALTERNATIVE.
5. THE COMPOSITE VEHICLE STATIC AND DYNAMIC ENVELOPES SHOWN FOLLOW TM1.1.10-A AND C



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. CARROLL
DRAWN BY
J. FOUCH
CHECKED BY
G. ERICKSON
IN CHARGE
J. MORRISON
DATE
10/31/2017

**RECORD
PEPD
SUBMITTAL**

**NOT FOR
CONSTRUCTION**



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

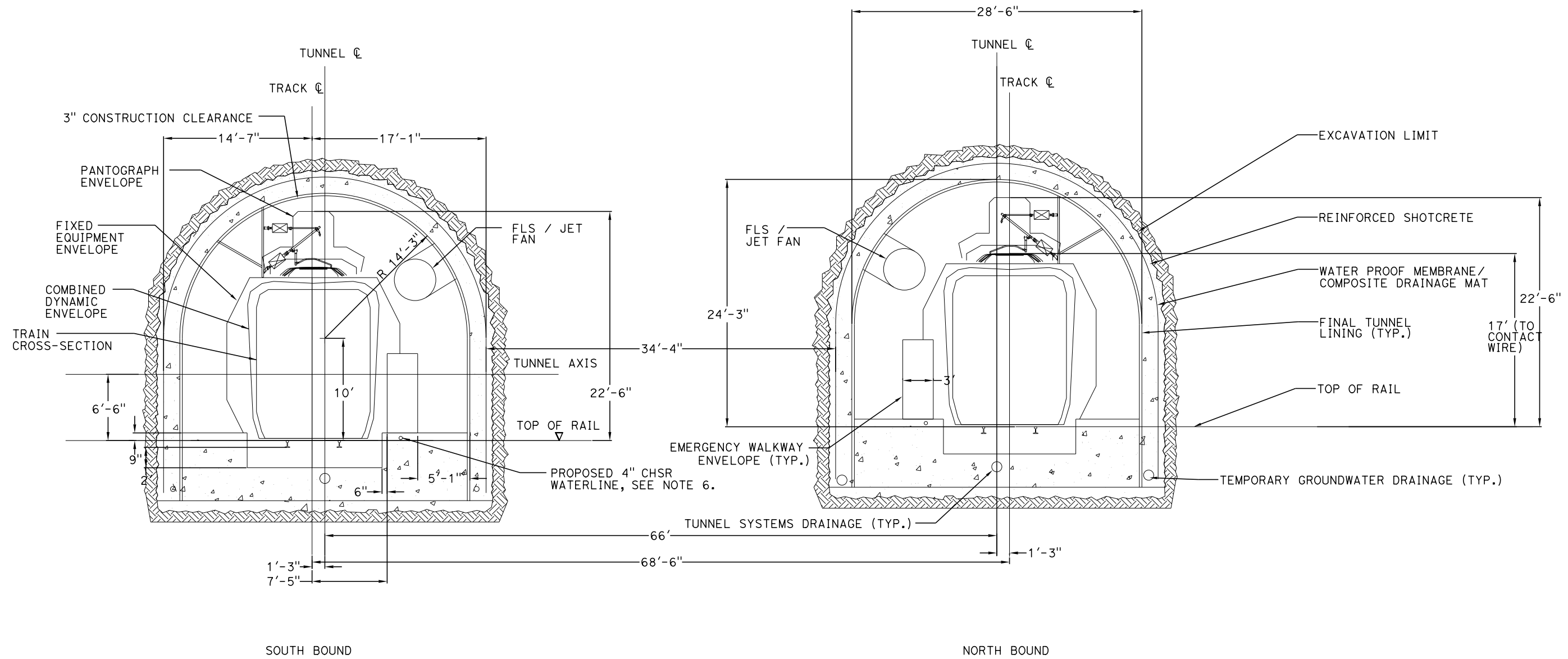
TUNNEL DRILL AND BLAST METHOD
SINGLE TUNNEL
INITIAL SUPPORT

CONTRACT NO.
HSR13-44

DRAWING NO.
TN-B-0004

SCALE
AS SHOWN

SHEET NO.



GENERAL NOTES:

1. A DRILL AND BLAST OPTION IS IDENTIFIED FOR THE 15% IN-PROGRESS DESIGN OF TWIN, SINGLE TRACK TUNNELS FOR TUNNEL 7 THROUGH THE TEHACHAPI FAULT ZONE.
2. EXCAVATION, GROUND SUPPORT, PILLAR WIDTH, LINING THICKNESS AND WATERTIGHTNESS PROVISIONS WILL BE OPTIMIZED BASED ON SITE INVESTIGATION RESULTS AND TUNNEL-SPECIFIC DESIGN WORK.
3. TYPICAL CROSS-SECTION REQUIRES FURTHER STUDY TO EVALUATE DYNAMIC AIRFLOW/PRESSURE LEVELS UNDER HIGH SPEED OPERATING CONDITIONS, AND TO FURTHER REFINE SPACE ALLOTTED FOR STRUCTURES, EQUIPMENT, AND EGRESS.
4. PILLAR WIDTH BETWEEN TUNNELS TO BE ONE TUNNEL DIAMETER OR MORE BASED ON GUIDANCE IN TM 2.4.6
5. THE COMPOSITE VEHICLE STATIC AND DYNAMIC ENVELOPES SHOWN FOLLOW TM 1.1.10-A AND C
6. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. CARROLL

DRAWN BY
J. FOUCH

CHECKED BY
G. ERICKSON

IN CHARGE
J. MORRISON

DATE
10/31/2017

**RECORD
PEPD
SUBMITTAL**

**NOT FOR
CONSTRUCTION**



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

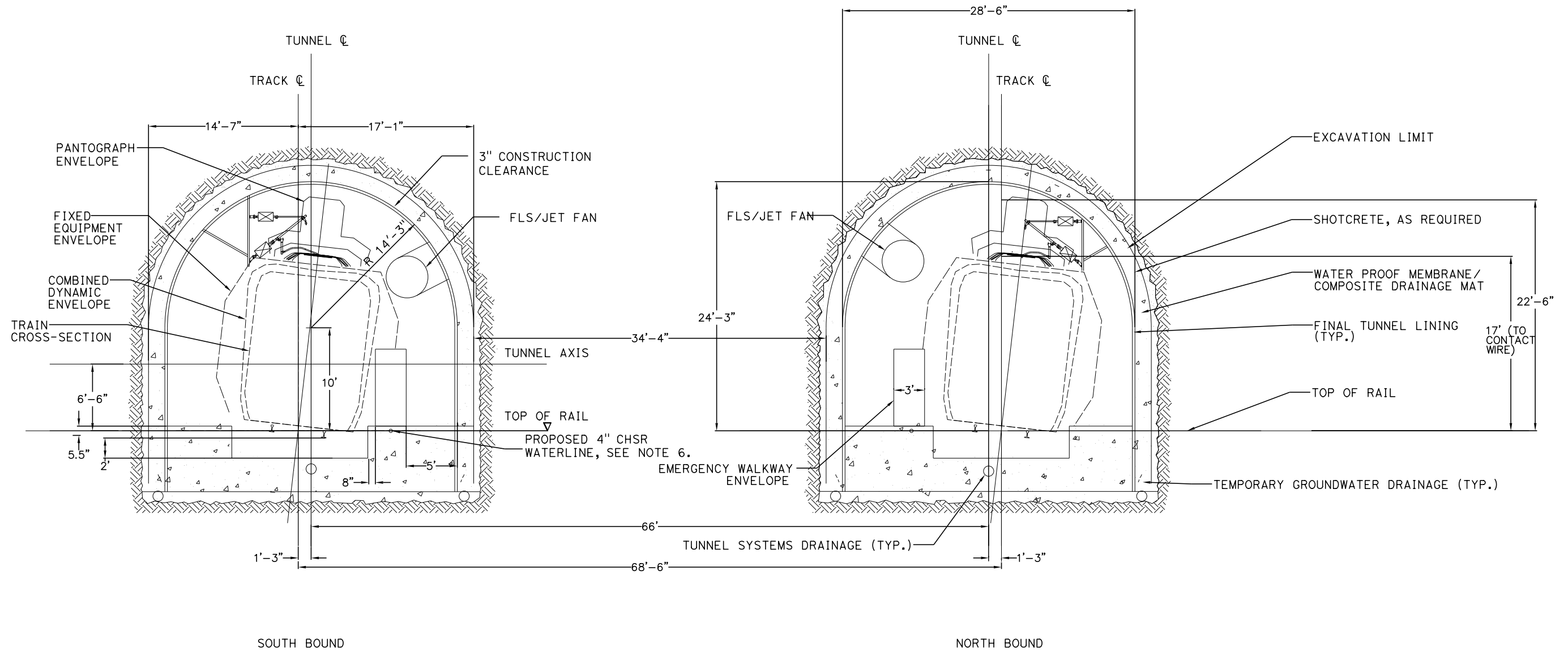
TUNNEL DRILL AND BLAST METHOD
TWIN TUNNELS - CLEARANCE DIAGRAM
TANGENT TRACK

CONTRACT NO.
HSR13-44

DRAWING NO.
TN-B-0005

SCALE
AS SHOWN

SHEET NO.



GENERAL NOTES:

1. A DRILL AND BLAST OPTION IS IDENTIFIED FOR THE 15% IN-PROGRESS DESIGN OF TWIN, SINGLE TRACK TUNNELS FOR TUNNEL 7 THROUGH THE TEHACHAPI FAULT ZONE.
2. EXCAVATION, GROUND SUPPORT, PILLAR WIDTH, LINING THICKNESS AND WATERTIGHTNESS PROVISIONS WILL BE OPTIMIZED BASED ON SITE INVESTIGATION RESULTS AND TUNNEL-SPECIFIC DESIGN WORK.
3. TYPICAL CROSS-SECTION REQUIRES FURTHER STUDY TO EVALUATE DYNAMIC AIRFLOW/PRESSURE LEVELS UNDER HIGH SPEED OPERATING CONDITIONS, AND TO FURTHER REFINE SPACE ALLOTTED FOR STRUCTURES, EQUIPMENT, AND EGRESS.
4. PILLAR WIDTH BETWEEN TUNNELS TO BE ONE TUNNEL DIAMETER OR MORE BASED ON GUIDANCE IN TM 2.4.6
5. THE COMPOSITE VEHICLE STATIC AND DYNAMIC ENVELOPES SHOWN FOLLOW TM 1.1.10-A AND C
6. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. CARROLL
DRAWN BY J. FOUCH
CHECKED BY G. ERICKSON
IN CHARGE J. MORRISON
DATE 10/31/2017

**RECORD
PEPD
SUBMITTAL**

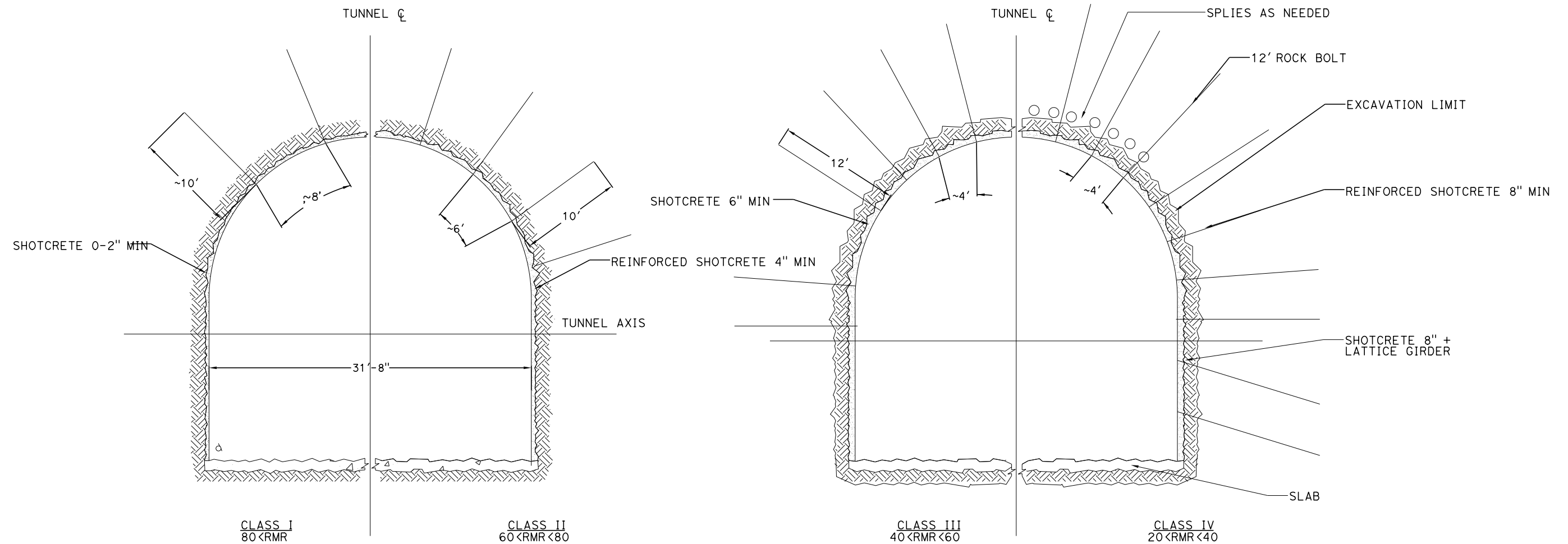
**NOT FOR
CONSTRUCTION**



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

TUNNEL DRILL AND BLAST METHOD
SINGLE TUNNEL
INITIAL SUPPORT

CONTRACT NO. HSR13-44
DRAWING NO. TN-B-0006
SCALE AS SHOWN
SHEET NO.



GENERAL NOTES:

1. DRILL AND BLAST OPTION IS IDENTIFIED FOR THE 15% IN-PROGRESS DESIGN OF TWIN, SINGLE TRACK TUNNELS FOR TUNNEL 7 THROUGH THE TEHACHAPI FAULT ZONE.
2. EXCAVATION, GROUND SUPPORT, PILLAR WIDTH, LINING THICKNESS AND WATERTIGHTNESS PROVISIONS WILL BE OPTIMIZED BASED ON SITE INVESTIGATION RESULTS AND TUNNEL-SPECIFIC DESIGN WORK.
3. TYPICAL CROSS-SECTION REQUIRES FURTHER STUDY TO EVALUATE DYNAMIC AIRFLOW/PRESSURE LEVELS UNDER HIGH SPEED OPERATING CONDITIONS, AND TO FURTHER REFINE SPACE ALLOTTED FOR STRUCTURES, EQUIPMENT, AND EGRESS.
4. PILLAR WIDTH BETWEEN TUNNELS TO BE ONE TUNNEL DIAMETER OR MORE BASED ON GUIDANCE IN TM 2.4.6
5. CLASSES I AND II MAY BE EXCAVATED FULL FACE. CLASS III MAY REQUIRE HEADING AND BENCH EXCAVATION WITH FACE SUPPORT AS REQUIRED. CLASS IV MAY REQUIRE TOP HEADING AND BENCH WITH SIDE SLASH, SPILES, AND FACE SUPPORT AS NEEDED. CLASS IV MAY REQUIRE A CHANGE IN EXCAVATION METHOD TO AN SEM CONSTRUCTION ALTERNATIVE.

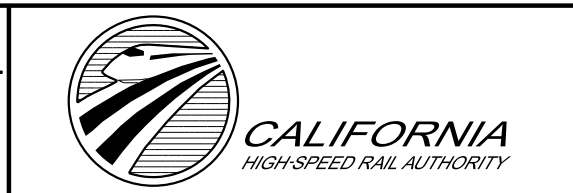


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10/31/2017

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PEPD
SUBMITTAL**

**NOT FOR
CONSTRUCTION**



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

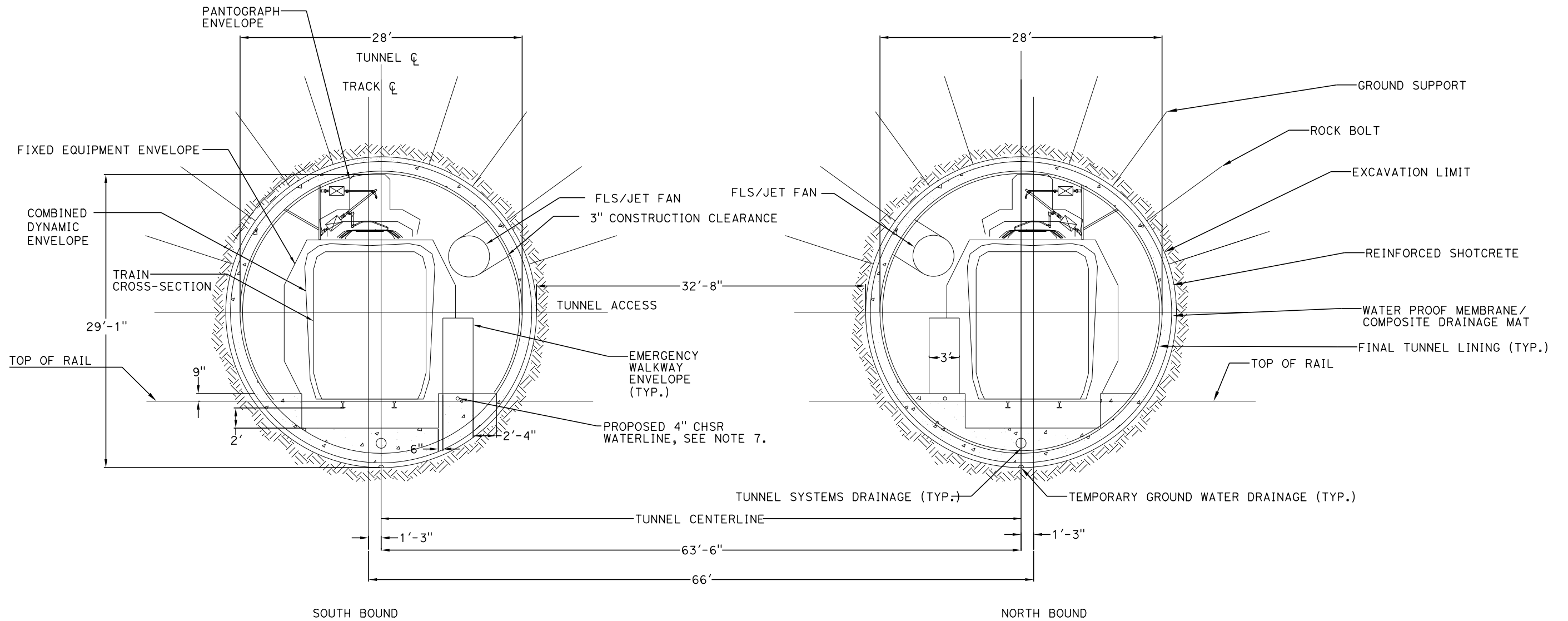
TUNNEL DRILL AND BLAST METHOD
TWIN TUNNELS
INITIAL SUPPORT

CONTRACT NO.
HSR13-44

DRAWING NO.
TN-B-0007

SCALE
AS SHOWN

SHEET NO.



GENERAL NOTES:

1. OPEN TBM METHODS ARE ADOPTED FOR THE 15% IN-PROGRESS DESIGN OF THE LONGER (GREATER THAN 1 MILE) TWIN, SINGLE TRACK 7, 8 & 9, SITED IN HARD ROCK UNITS.
2. EXCAVATION, GROUND SUPPORT, PILLAR WIDTH, LINING THICKNESS AND WATERTIGHTNESS PROVISIONS WILL BE OPTIMIZED BASED ON SITE INVESTIGATION RESULT AND TUNNEL SPECIFIC DESIGN WORK
3. TYPICAL CROSS-SECTION REQUIRES FURTHER STUDY TO EVALUATE DYNAMIC AIRFLOW/PRESSURE LEVELS UNDER HIGH SPEED OPERATING CONDITIONS, AND TO FURTHER REFINE SPACE ALLOTTED FOR STRUCTURES, EQUIPMENT, AND EGRESS.
4. PILLAR WIDTH BETWEEN TUNNELS TO BE ONE TUNNEL DIAMETER OR MORE BASED ON GUIDANCE IN TM 2.4.6
5. A DUAL DRAINAGE SYSTEM WILL BE USED IN TUNNEL 8 AT INVERT GRADIENTS OF LESS THAN 0.25% AND GREATER THAN -0.25%.
6. THE COMPOSITE VEHICLE STATIC AND DYNAMIC ENVELOPES SHOWN FOLLOW TM 1.1.10-A AND C
7. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00



REV	DATE	BY	CHK	APP	DESCRIPTION

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CHECKED BY
G. ERICKSON
IN CHARGE
J. MORRISON
DATE
10/31/2017

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SUBMITTAL**

**NOT FOR
CONSTRUCTION**



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

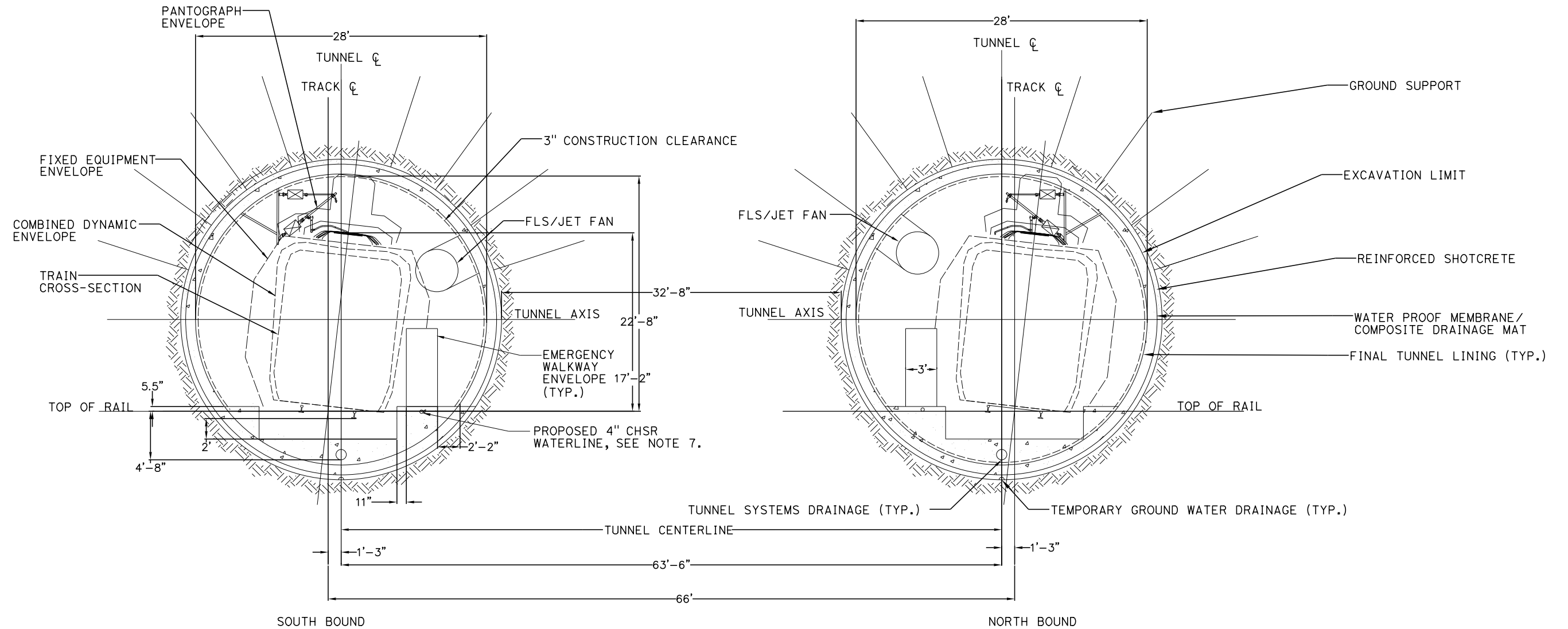
TUNNEL TWIN TBM BORED TUNNELS
CLEARANCE DIAGRAM
TANGENT TRACK

CONTRACT NO.
HSR13-44

DRAWING NO.
TN-B-0008

SCALE
AS SHOWN

SHEET NO.



GENERAL NOTES:

1. OPEN TBM METHODS ARE ADOPTED FOR THE 15% IN-PROGRESS DESIGN OF THE LONGER (GREATER THAN 1 MILE) TWIN, SINGLE TRACK 7, 8 & 9, SITED IN HARD ROCK UNITS.
2. EXCAVATION, GROUND SUPPORT, PILLAR WIDTH, LINING THICKNESS AND WATERTIGHTNESS PROVISIONS WILL BE OPTIMIZED BASED ON SITE INVESTIGATION RESULT AND TUNNEL SPECIFIC DESIGN WORK
3. TYPICAL CROSS-SECTION REQUIRES FURTHER STUDY TO EVALUATE DYNAMIC AIRFLOW/PRESSURE LEVELS UNDER HIGH SPEED OPERATING CONDITIONS, AND TO FURTHER REFINE SPACE ALLOTTED FOR STRUCTURES, EQUIPMENT, AND EGRESS.
4. PILLAR WIDTH BETWEEN TUNNELS TO BE ONE TUNNEL DIAMETER OR MORE BASED ON GUIDANCE IN TM 2.4.6
5. A DUAL DRAINAGE SYSTEM WILL BE USED IN TUNNEL 8 AT INVERT GRADIENTS OF LESS THAN 0.25% AND GREATER THAN -0.25%.
6. THE COMPOSITE VEHICLE STATIC AND DYNAMIC ENVELOPES SHOWN FOLLOW TM 1.1.10-A AND C
7. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00

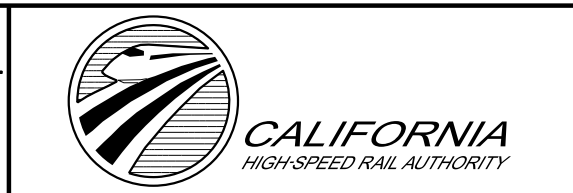


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J. FOUCH
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G. ERICKSON
IN CHARGE
J. MORRISON
DATE
10/31/2017

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SUBMITTAL**

**NOT FOR
CONSTRUCTION**



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

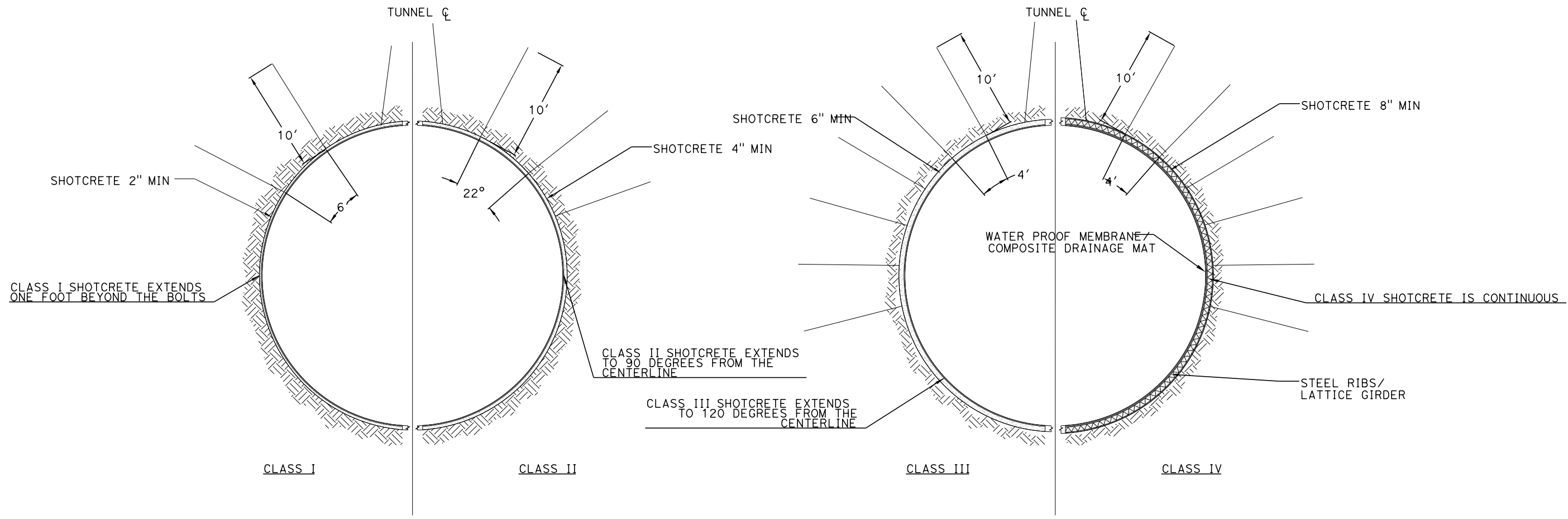
TUNNEL TWIN TBM BORED TUNNELS
CLEARANCE DIAGRAM
SUPER ELEVATED TRACK

CONTRACT NO.
HSR13-44

DRAWING NO.
TN-B-0009

SCALE
AS SHOWN

SHEET NO.



GENERAL NOTES:

1. OPEN TBM METHODS ARE ADOPTED FOR THE 15% IN-PROGRESS DESIGN OF THE LONGER (GREATER THAN 1 MILE) TWIN, SINGLE TRACK 7, 8 & 9, SITED IN HARD ROCK UNITS.
2. EXCAVATION, GROUND SUPPORT, PILLAR WIDTH, LINING THICKNESS AND WATERTIGHTNESS PROVISIONS WILL BE OPTIMIZED BASED ON SITE INVESTIGATION RESULT AND TUNNEL SPECIFIC DESIGN WORK
3. TYPICAL CROSS-SECTION REQUIRES FURTHER STUDY TO EVALUATE DYNAMIC AIRFLOW/PRESSURE LEVELS UNDER HIGH SPEED OPERATING CONDITIONS, AND TO FURTHER REFINE SPACE ALLOTTED FOR STRUCTURES, EQUIPMENT, AND EGRESS.
4. PILLAR WIDTH BETWEEN TUNNELS TO BE ONE TUNNEL DIAMETER OR MORE BASED ON GUIDANCE IN TM 2.4.6
5. A DUAL DRAINAGE SYSTEM WILL BE USED IN TUNNEL 8 AT INVERT GRADIENTS OF LESS THAN 0.25% AND GREATER THAN -0.25%.



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IN CHARGE
J. MORRISON
DATE
10/31/2017

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PEPD
SUBMITTAL**

**NOT FOR
CONSTRUCTION**



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

TUNNEL TWIN TBM BORED TUNNELS
INITIAL SUPPORT

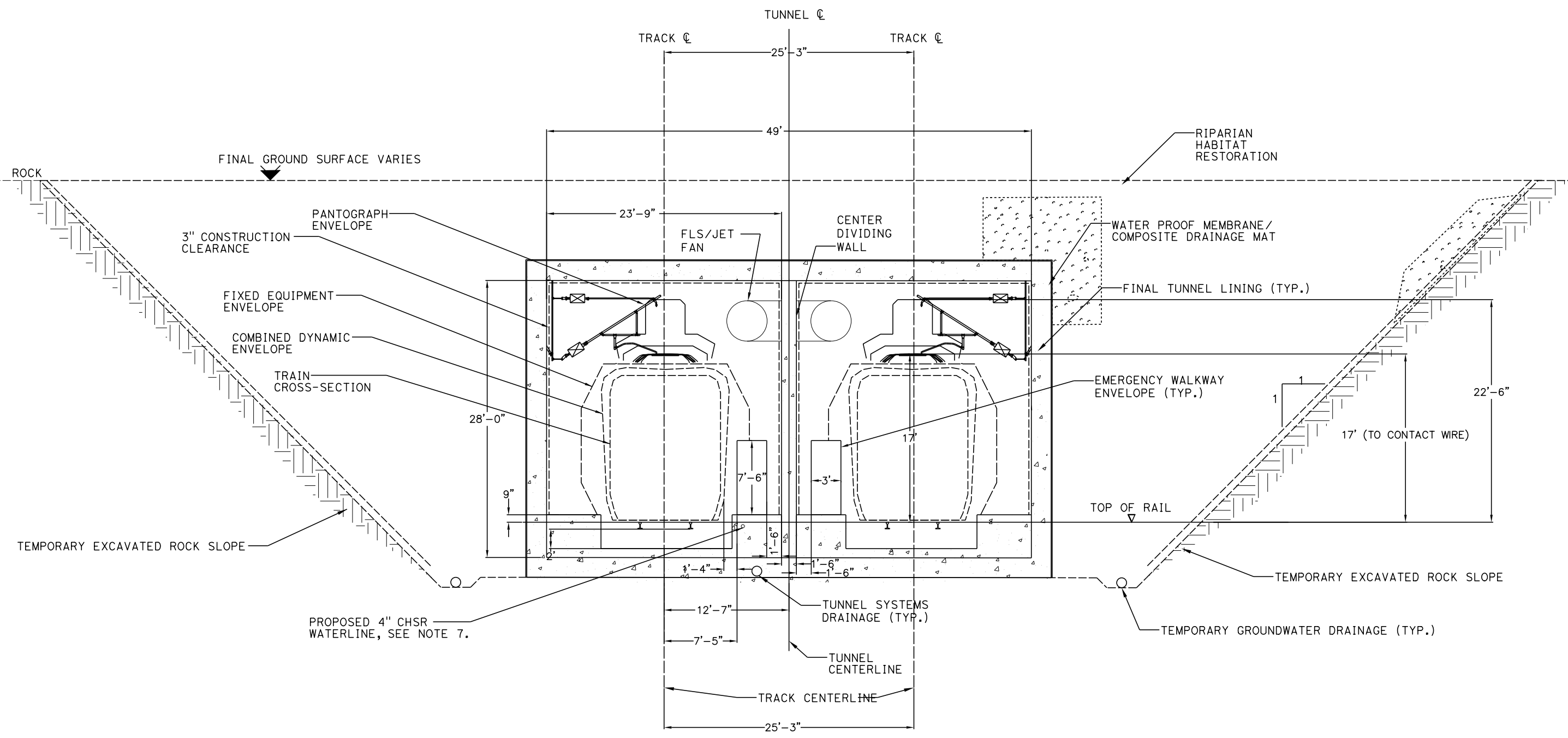
CONTRACT NO.
HSR13-44
DRAWING NO.
TN-B-0010
SCALE
AS SHOWN
SHEET NO.

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11/6/2017 11:34:05 AM

11/6/2017

OIC:ARTIVEGA



GENERAL NOTES:

1. TEMPORARY SLOPE AND BENCH GEOMETRIES SHOWN ARE BASED ON GUIDANCE PROVIDED IN TM 2.6.7
2. SLOPE PROTECTION, DRAINAGE, STRUCTURAL DIMENSIONS, AND STABILIZATION PROVISIONS WILL BE DEVELOPED BASED ON SITE INVESTIGATION RESULTS AND SLOPE-SPECIFIC DESIGN WORK.
3. TYPICAL CROSS-SECTION REQUIRES FURTHER STUDY TO EVALUATE DYNAMIC AIRFLOW/PRESSURE LEVELS UNDER HIGH SPEED OPERATING CONDITIONS, AND TO FURTHER REFINE SPACE ALLOTTED FOR STRUCTURES, EQUIPMENT, AND EGRESS.
4. EXCAVATION, GROUND SUPPORT, LINING AND WATERTIGHTNESS PROVISIONS WILL BE OPTIMIZED BASED ON SITE INVESTIGATION RESULTS AND CUT AND COVER-SPECIFIC DESIGN WORK.
5. CUT AND COVER BOX TYPICAL SECTION TO BE USED AT TUNNEL 4 AND 9, STATIONS 18362+50 TO 18368+00 AND 19594+00 TO 19687+50
6. CENTER DIVIDING WALL SHALL CONFORM TO NFPA 130 AND HAVE A 2 HOUR FIRE RATING.
7. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19687+50.



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. CARROLL
DRAWN BY
J. FOUCH
CHECKED BY
G. ERICKSON
IN CHARGE
J. MORRISON
DATE
10/31/2017

**RECORD
PEPD
SUBMITTAL**

**NOT FOR
CONSTRUCTION**



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

TUNNEL CUT AND COVER BOX
(HABITAT RESTORATION)
CLEARANCE DIAGRAM - TANGENT TRACK

CONTRACT NO.
HSR13-44

DRAWING NO.
TN-B-0011

SCALE
AS SHOWN

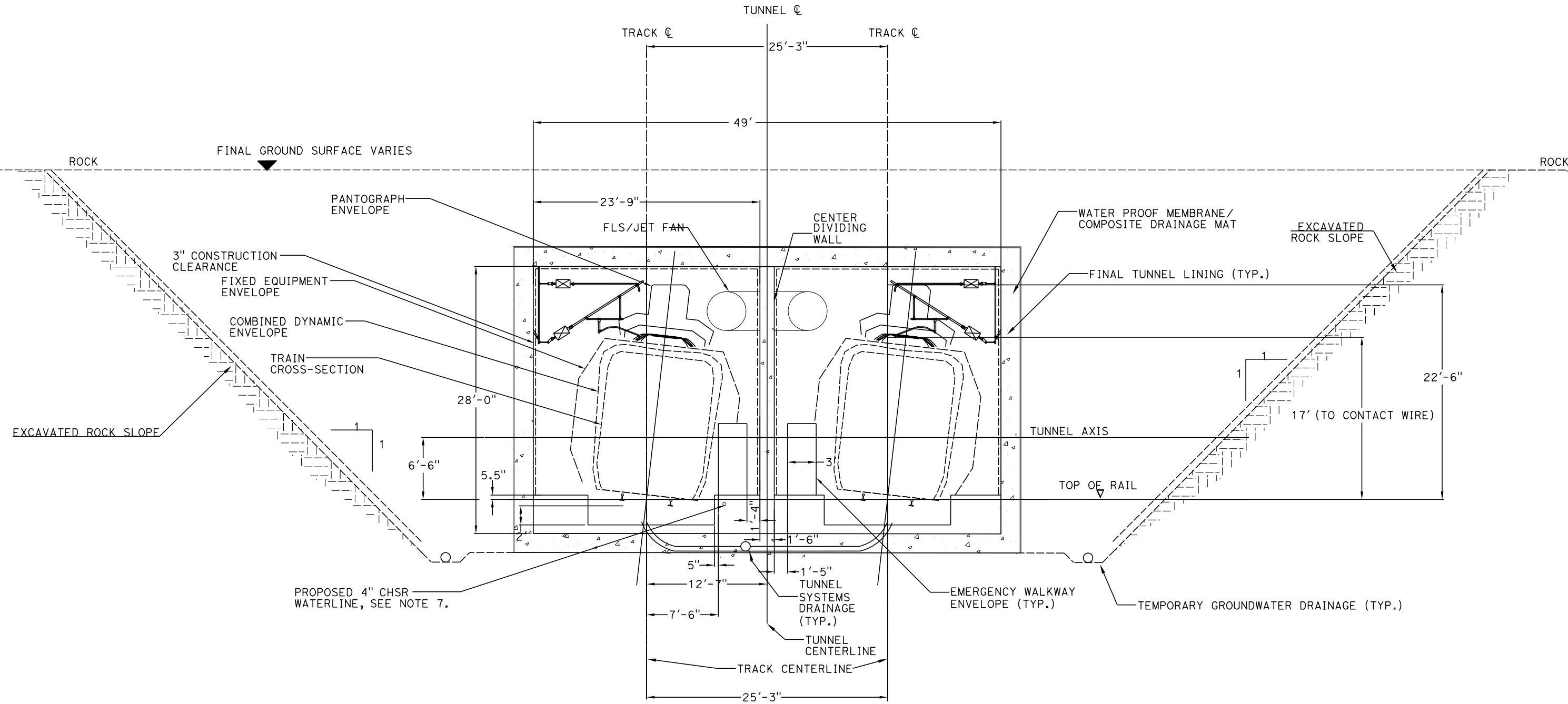
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11/6/2017

OIC:ARTIVEGA



GENERAL NOTES:

1. TEMPORARY SLOPE AND BENCH GEOMETRIES SHOWN ARE BASED ON GUIDANCE PROVIDED IN TM 2.6.7
2. SLOPE PROTECTION, DRAINAGE, STRUCTURAL DIMENSIONS, AND STABILIZATION PROVISIONS WILL BE DEVELOPED BASED ON SITE INVESTIGATION RESULTS AND SLOPE-SPECIFIC DESIGN WORK.
3. TYPICAL CROSS-SECTION REQUIRES FURTHER STUDY TO EVALUATE DYNAMIC AIRFLOW/PRESSURE LEVELS UNDER HIGH SPEED OPERATING CONDITIONS, AND TO FURTHER REFINE SPACE ALLOTTED FOR STRUCTURES, EQUIPMENT, AND EGRESS.
4. EXCAVATION, GROUND SUPPORT, LINING AND WATERTIGHTNESS PROVISIONS WILL BE OPTIMIZED BASED ON SITE INVESTIGATION RESULTS AND CUT AND COVER-SPECIFIC DESIGN WORK.
5. CUT AND COVER BOX TYPICAL SECTION TO BE USED AT TUNNEL 4 AND 9, STATIONS 18362+50 TO 18368+00 AND 19594+00 TO 19610+00
6. CENTER DIVIDING WALL SHALL CONFORM TO NFPA 101 AND HAVE A 2 HOUR FIRE RATING.
7. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. CARROLL
DRAWN BY
J. FOUCH
CHECKED BY
G. ERICKSON
IN CHARGE
J. MORRISON
DATE
10/31/2017

**RECORD
PEPD
SUBMITTAL**

**NOT FOR
CONSTRUCTION**



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

TUNNEL CUT AND COVER BOX
(HABITAT RESTORATION)
CLEARANCE DIAGRAM - SUPER ELEVATED TRACK

CONTRACT NO.
HSR13-44

DRAWING NO.
TN-B-0012

SCALE
AS SHOWN

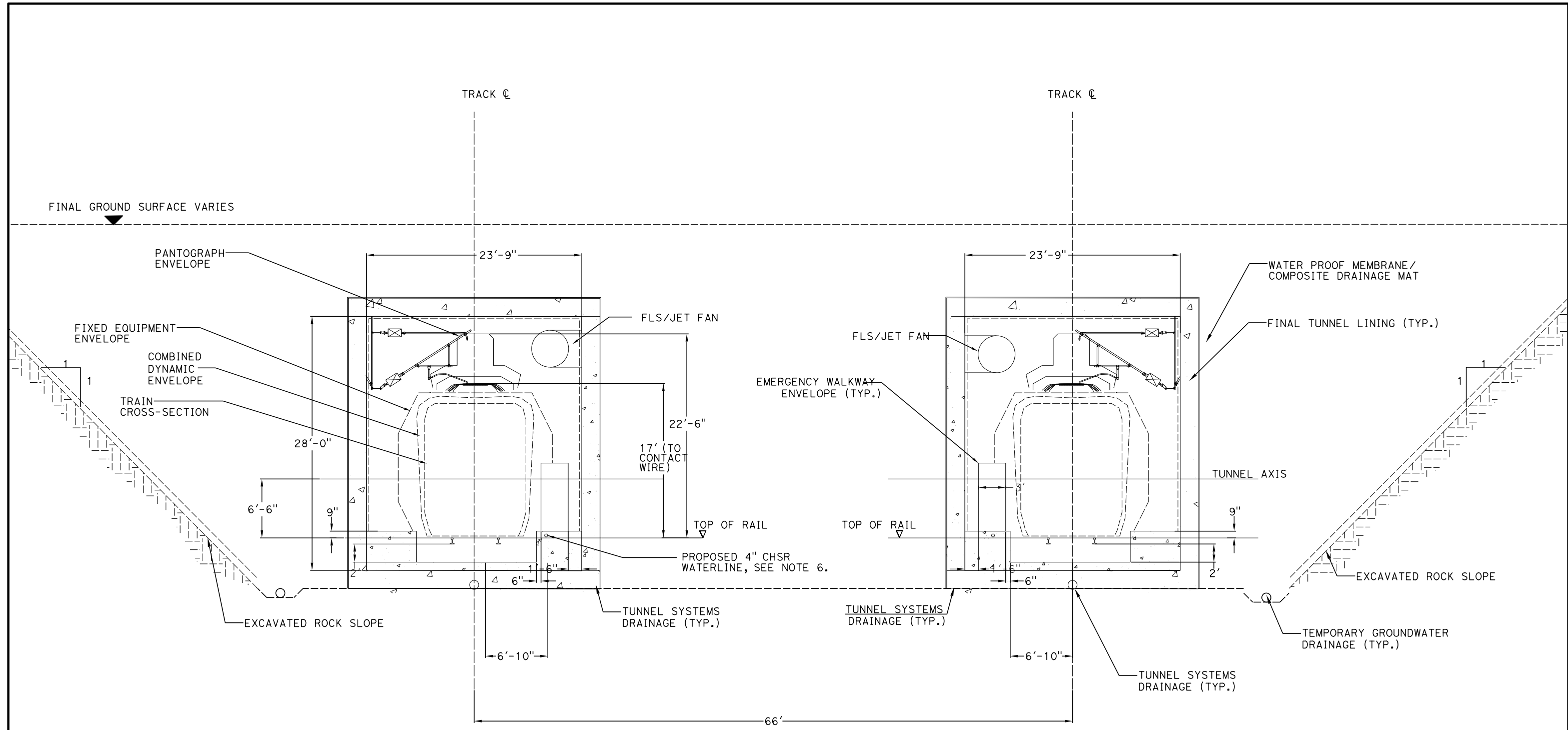
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11/6/2017 11:35:37 AM

11/6/2017

OIC:ARTIVEGA



GENERAL NOTES:

1. TEMPORARY SLOPE AND BENCH GEOMETRIES SHOWN ARE BASED ON GUIDANCE PROVIDED IN TM 2.6.7
2. SLOPE PROTECTION, DRAINAGE, STRUCTURAL DIMENSIONS, AND STABILIZATION PROVISIONS WILL BE DEVELOPED BASED ON SITE INVESTIGATION RESULTS AND SLOPE-SPECIFIC DESIGN WORK.
3. TYPICAL CROSS-SECTION REQUIRES FURTHER STUDY TO EVALUATE DYNAMIC AIRFLOW/PRESSURE LEVELS UNDER HIGH SPEED OPERATING CONDITIONS, AND TO FURTHER REFINE SPACE ALLOTTED FOR STRUCTURES, EQUIPMENT, AND EGRESS.
4. EXCAVATION, GROUND SUPPORT, LINING AND WATERTIGHTNESS PROVISIONS WILL BE OPTIMIZED BASED ON SITE INVESTIGATION RESULTS AND CUT AND COVER-SPECIFIC DESIGN WORK.
5. CUT AND COVER BOX TYPICAL SECTION TO BE USED AT TUNNEL 4 AND 9, STATIONS 18362+50 TO 18368+00 AND 19594+00 TO 19610+00
6. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. CARROLL
DRAWN BY
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CHECKED BY
G. ERICKSON
IN CHARGE
J. MORRISON
DATE
10/31/2017

**RECORD
PEPD
SUBMITTAL**

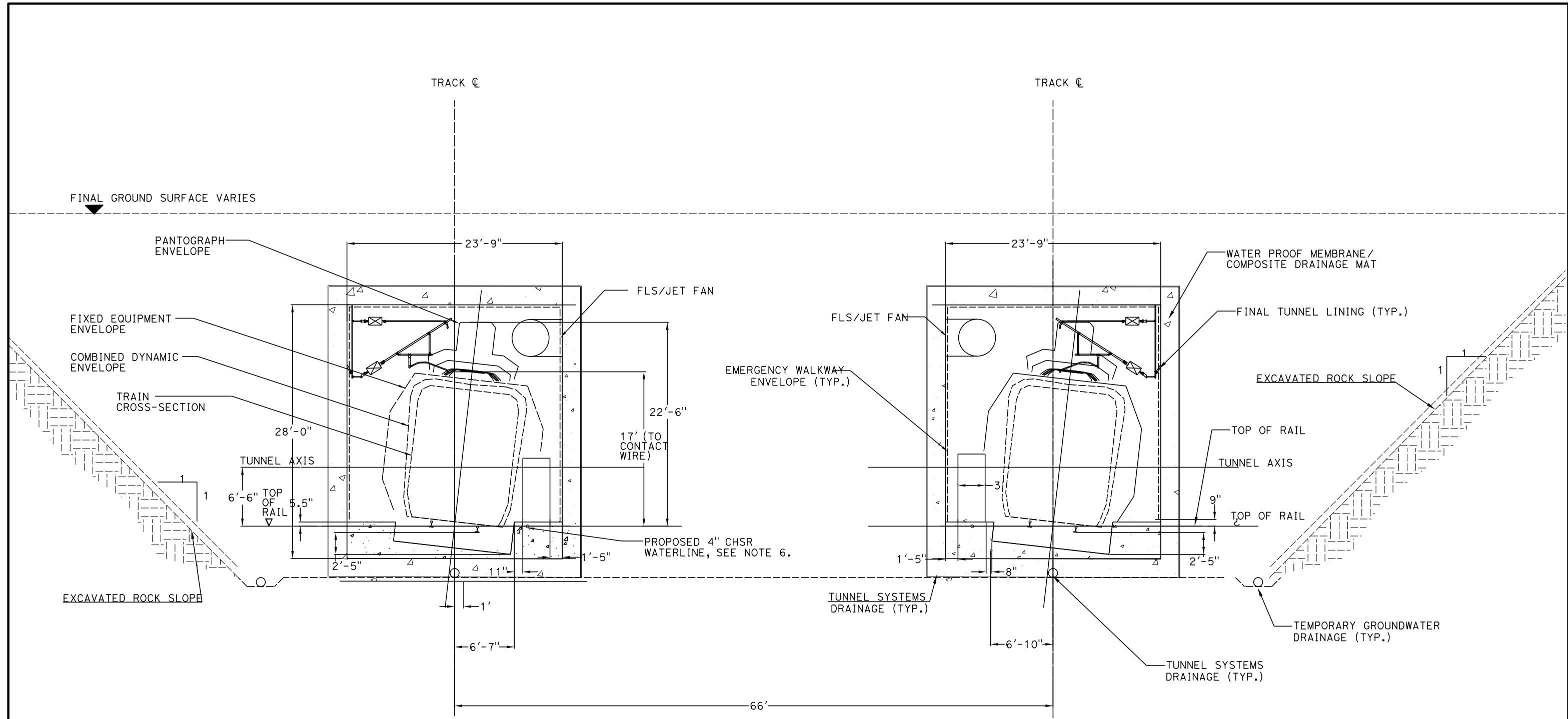
**NOT FOR
CONSTRUCTION**



CALIFORNIA HIGH-SPEED RAIL PROJECT
BAKERSFIELD TO PALMDALE

TUNNEL CUT AND COVER BOX
TWIN TUNNEL SINGLE TRACK
CLEARANCE DIAGRAM - TANGENT TRACK

CONTRACT NO.
HSR13-44
DRAWING NO.
TN-B-0013
SCALE
AS SHOWN
SHEET NO.



GENERAL NOTES:

1. TEMPORARY SLOPE AND BENCH GEOMETRIES SHOWN ARE BASED ON GUIDANCE PROVIDED IN TM 2.6.7
2. SLOPE PROTECTION, DRAINAGE, STRUCTURAL DIMENSIONS, AND STABILIZATION PROVISIONS WILL BE DEVELOPED BASED ON SITE INVESTIGATION RESULTS AND SLOPE-SPECIFIC DESIGN WORK.
3. TYPICAL CROSS-SECTION REQUIRES FURTHER STUDY TO EVALUATE DYNAMIC AIRFLOW/PRESSURE LEVELS UNDER HIGH SPEED OPERATING CONDITIONS, AND TO FURTHER REFINE SPACE ALLOTTED FOR STRUCTURES, EQUIPMENT, AND EGRESS.
4. EXCAVATION, GROUND SUPPORT, LINING AND WATERTIGHTNESS PROVISIONS WILL BE OPTIMIZED BASED ON SITE INVESTIGATION RESULTS AND CUT AND COVER-SPECIFIC DESIGN WORK.
5. CUT AND COVER BOX TYPICAL SECTION TO BE USED AT TUNNEL 4 AND 9, STATIONS 18362+50 TO 18368+00 AND 19594+00 TO 19610+00
6. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. CARROLL
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IN CHARGE J. MORRISON
DATE 10/31/2017

**RECORD
PEPD
SUBMITTAL**

**NOT FOR
CONSTRUCTION**



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

TUNNEL CUT AND COVER BOX
TWIN TUNNEL SINGLE TRACK
CLEARANCE DIAGRAM - SUPER ELEVATED TRACK

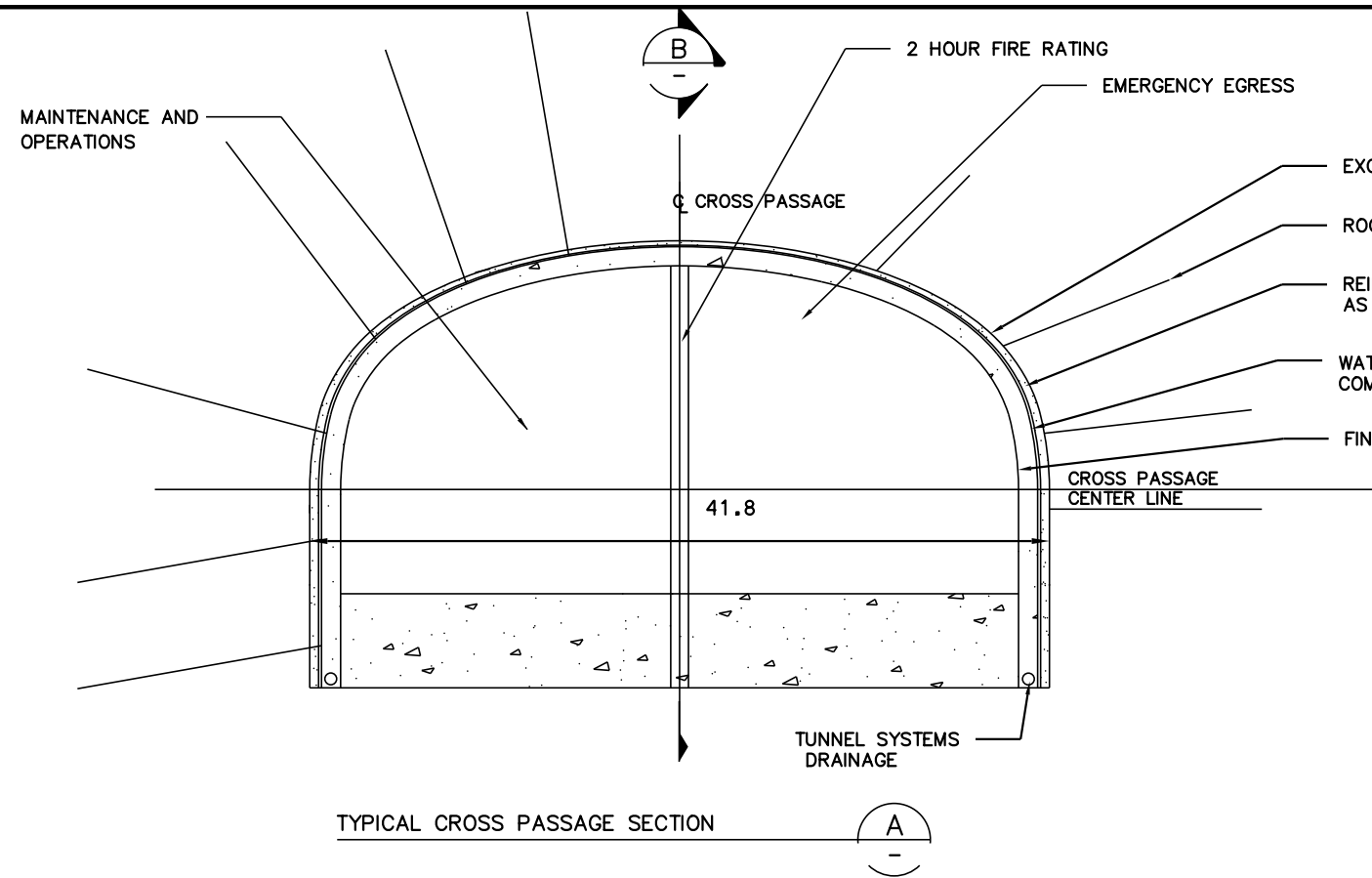
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DRAWING NO. TN-B-0014
SCALE AS SHOWN
SHEET NO.

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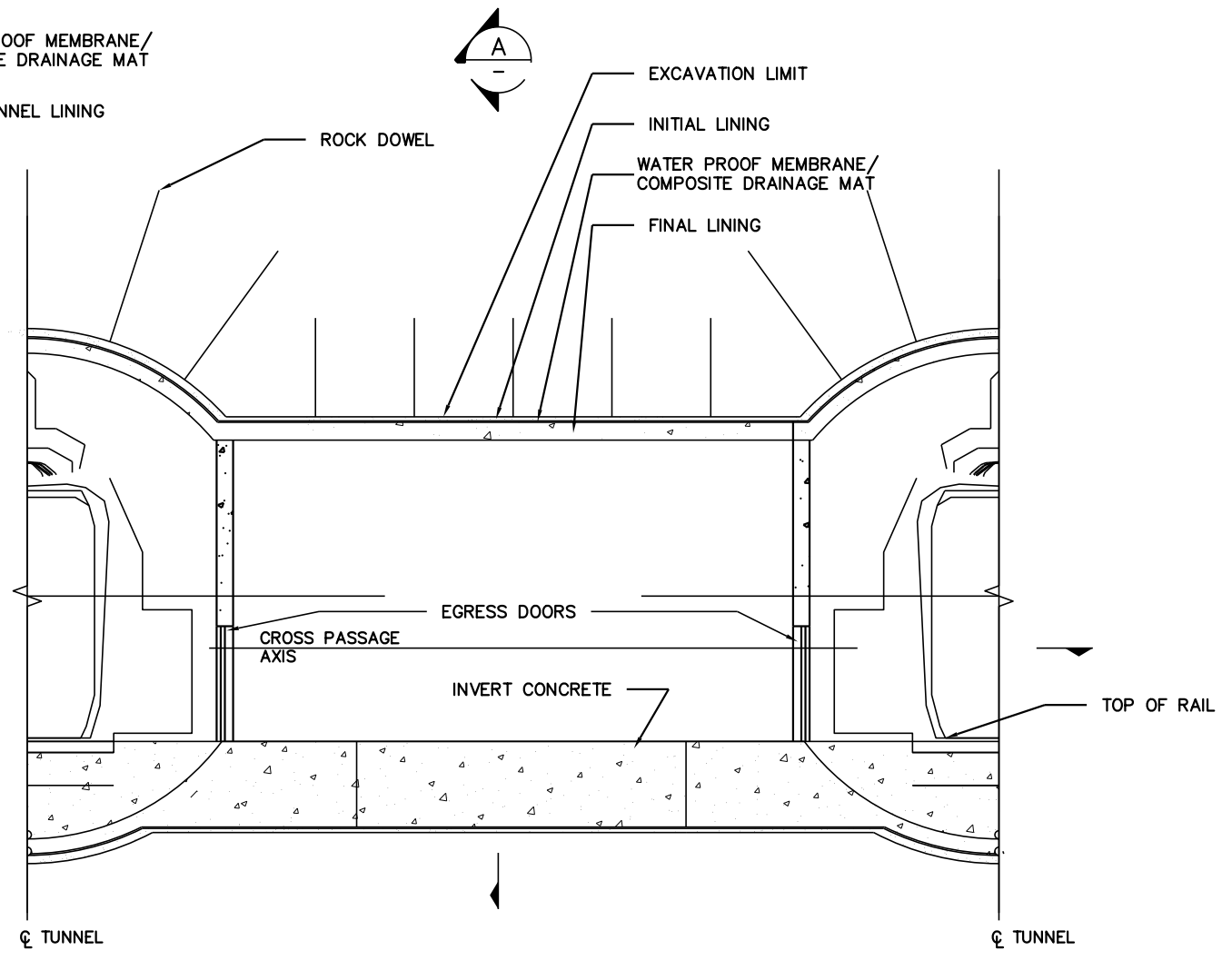
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11/6/2017

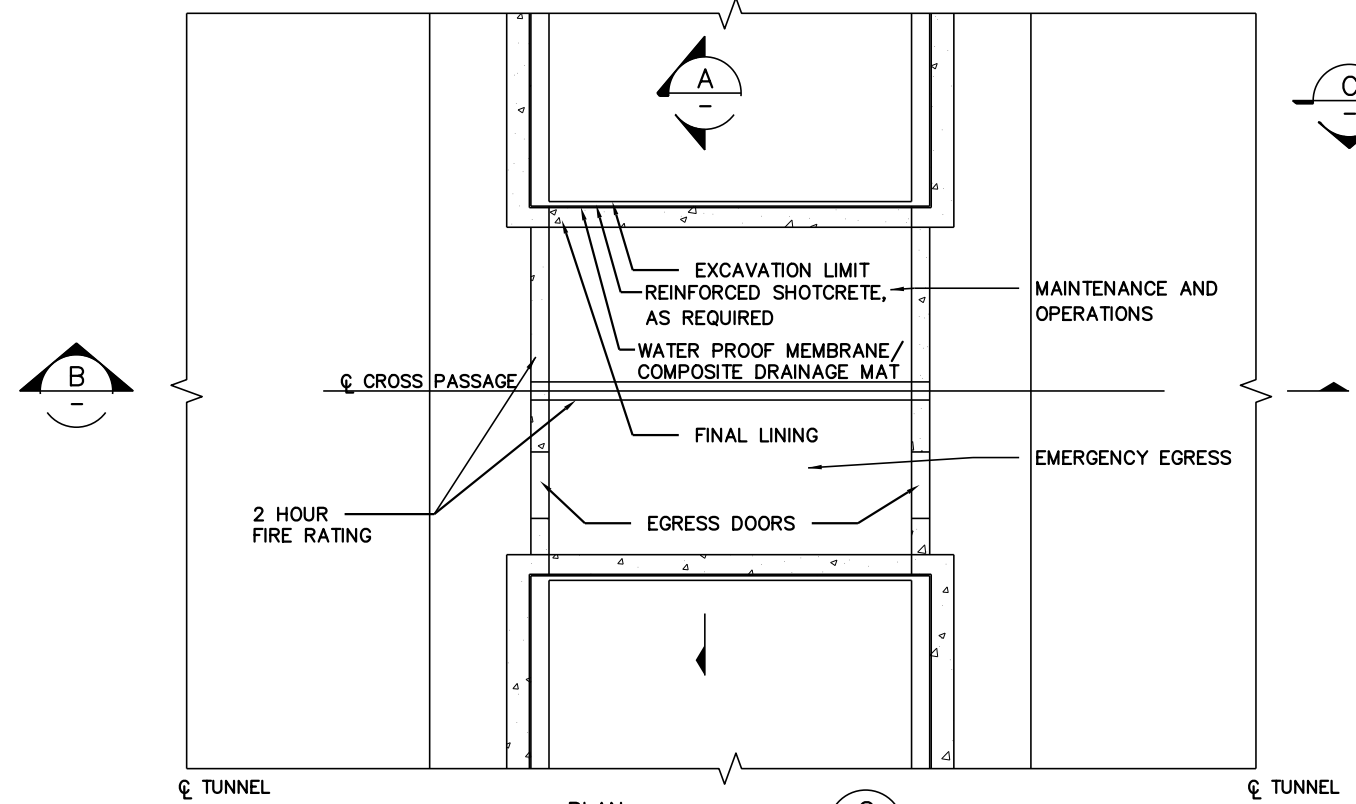
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TYPICAL CROSS PASSAGE SECTION



TYPICAL CROSS PASSAGE SECTION



PLAN
SCALE: NOT TO SCALE



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
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DRAWN BY
J. FOUCH
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IN CHARGE
J. MORRISON
DATE
10/31/2017

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SUBMITTAL**

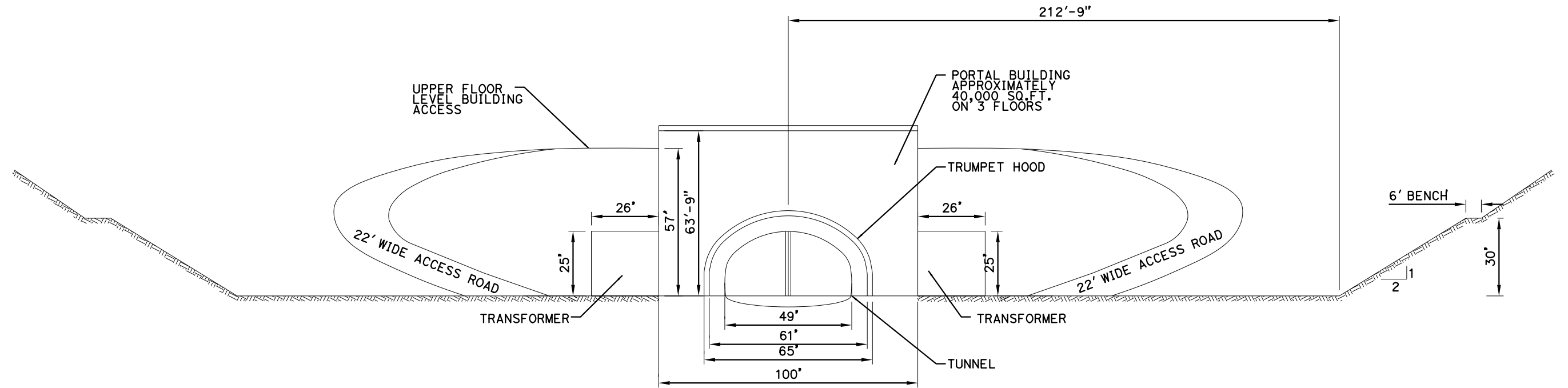
**NOT FOR
CONSTRUCTION**



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

TUNNEL EMERGENCY CROSS PASSAGE

CONTRACT NO.
HSR13-44
DRAWING NO.
TN-B-0015
SCALE
AS SHOWN
SHEET NO.



SECTION X (B)
TN-B-0018

GENERAL NOTES:

1. TRANSFORMERS, IF REQUIRED TO BE LOCATED OUTSIDE BUILDING, WITH NO STRUCTURES ABOVE TRANSFORMER. CLEAR SPACE INCLUDES ELECTRICAL CLEARANCE.
2. PERMANENT SLOPE PROTECTION, DRAINAGE AND STABILIZATION PROVISIONS WILL BE DEVELOPED BASED ON SITE INVESTIGATION RESULTS AND SLOPE-SPECIFIC DESIGN WORK.
3. LOW COVER TUNNELING OPTIONS TO BE EVALUATED AT EACH PORTAL.
4. PORTAL LAYOUTS WERE DEVELOPED FOLLOWING TM 2.4.6 HIGH SPEED TRAIN TUNNEL PORTAL FACILITIES



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IN CHARGE J. MORRISON
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**RECORD
PEPD
SUBMITTAL**

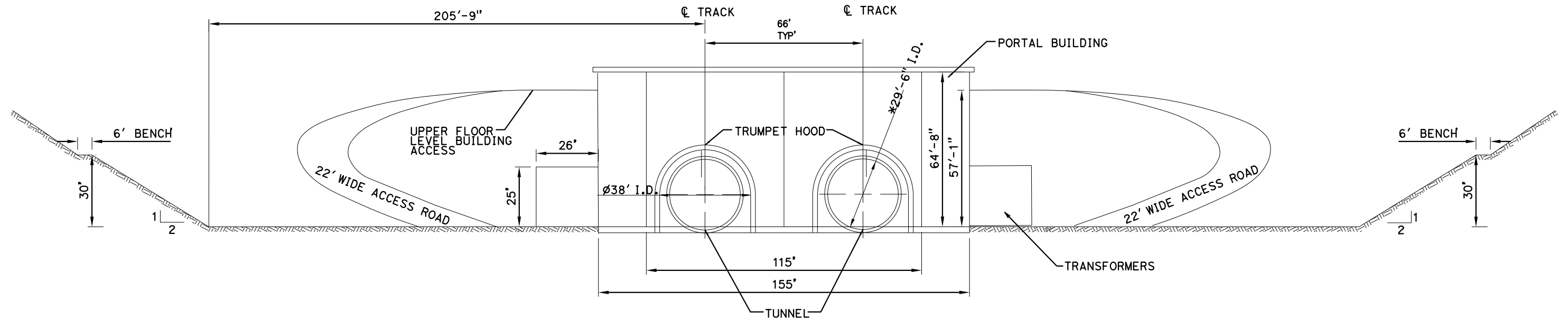
**NOT FOR
CONSTRUCTION**



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

TYPICAL TRANSVERSE SECTION
PORTAL FACILITIES
FOR SINGLE TUNNEL CONFIGURATION

CONTRACT NO. HSR13-44
DRAWING NO. TN-B-0016
SCALE AS SHOWN
SHEET NO.



SECTION X
TN-B-0019



GENERAL NOTES:

1. TRANSFORMERS, IF REQUIRED TO BE LOCATED OUTSIDE BUILDING, WITH NO STRUCTURES ABOVE TRANSFORMER. CLEAR SPACE INCLUDES ELECTRICAL CLEARANCE.
2. PERMANENT SLOPE PROTECTION, DRAINAGE AND STABILIZATION PROVISIONS WILL BE DEVELOPED BASED ON SITE INVESTIGATION RESULTS AND SLOPE-SPECIFIC DESIGN WORK.
3. LOW COVER TUNNELING OPTIONS TO BE EVALUATED AT EACH PORTAL.
4. PORTAL LAYOUTS WERE DEVELOPED FOLLOWING TM 2.4.6 HIGH SPEED TRAIN TUNNEL PORTAL FACILITIES



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. CARROLL
DRAWN BY J. FOUCH
CHECKED BY G. ERICKSON
IN CHARGE J. MORRISON
DATE 10/31/2017

**RECORD
PEPD
SUBMITTAL**

**NOT FOR
CONSTRUCTION**



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

TYPICAL TRANSVERSE SECTION
PORTAL FACILITIES
FOR TWIN TUNNEL CONFIGURATION

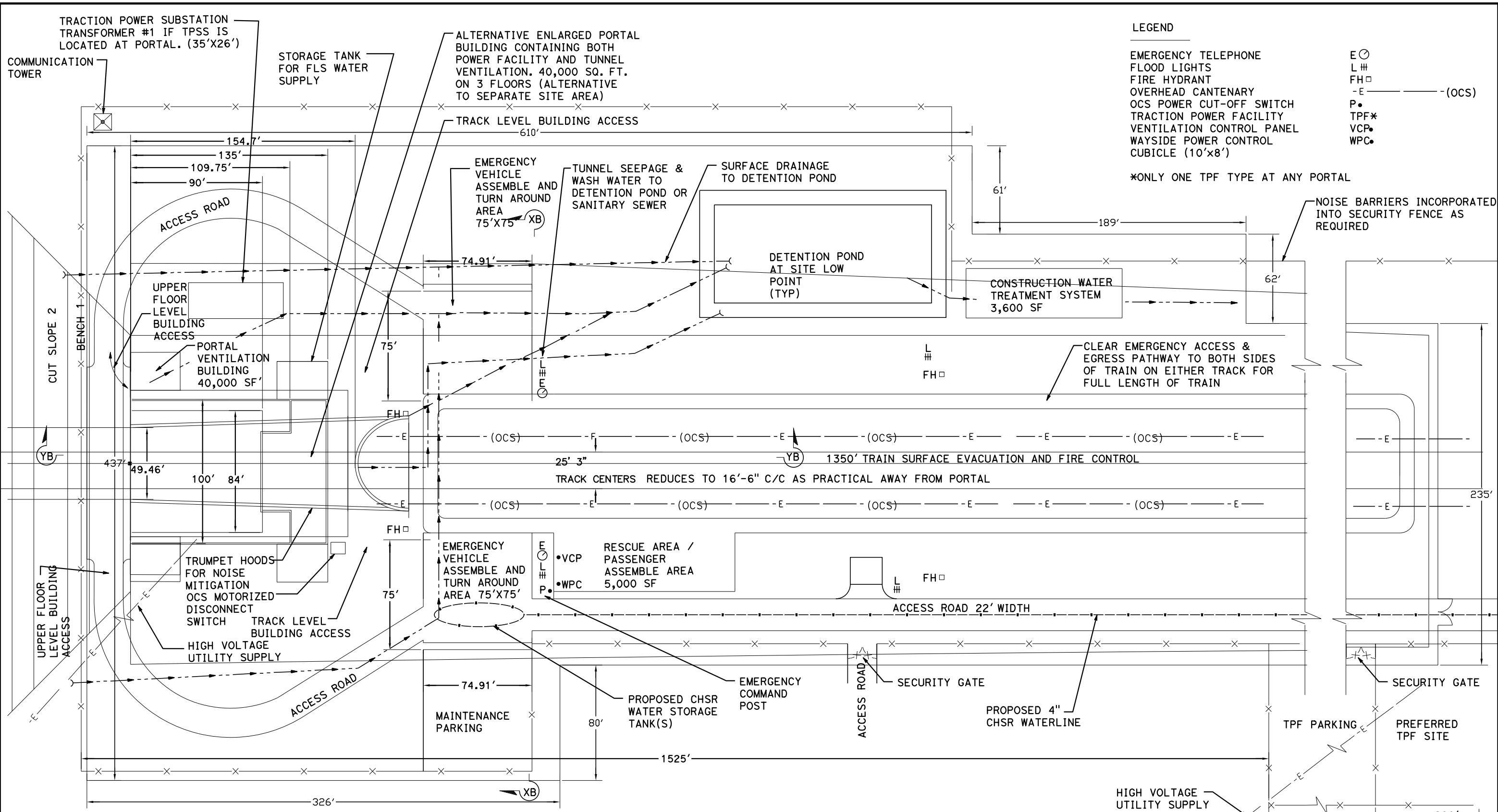
CONTRACT NO. HSR13-44
DRAWING NO. TN-B-0017
SCALE AS SHOWN
SHEET NO.

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11/6/2017

OIC:ARTIVEGA



LEGEND

EMERGENCY TELEPHONE
 FLOOD LIGHTS
 FIRE HYDRANT
 OVERHEAD CANTENARY
 OCS POWER CUT-OFF SWITCH
 TRACTION POWER FACILITY
 VENTILATION CONTROL PANEL
 WAYSIDE POWER CONTROL CUBICLE (10'x8')

E ⊙
 L #
 FH □
 -E
 P ●
 TPF*
 VCP ●
 WPC ●

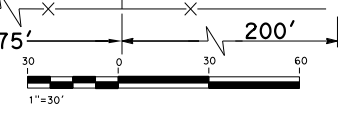
*(ONLY ONE TPF TYPE AT ANY PORTAL)

NOISE BARRIERS INCORPORATED INTO SECURITY FENCE AS REQUIRED

CLEAR EMERGENCY ACCESS & EGRESS PATHWAY TO BOTH SIDES OF TRAIN ON EITHER TRACK FOR FULL LENGTH OF TRAIN

GENERAL NOTES:

1. PORTAL LAYOUTS WERE DEVELOPED FOLLOWING TM 2.4.6 HIGH SPEED TRAIN PORTAL FACILITIES



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CHECKED BY
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J. MORRISON

DATE
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CALIFORNIA HIGH-SPEED RAIL PROJECT
BAKERSFIELD TO PALMDALE

TYPICAL TUNNEL PORTAL FACILITIES PLAN
 SINGLE TUNNEL CONFIGURATION

CONTRACT NO.
HSR13-44

DRAWING NO.
TN-B-0018

SCALE
AS SHOWN

SHEET NO.

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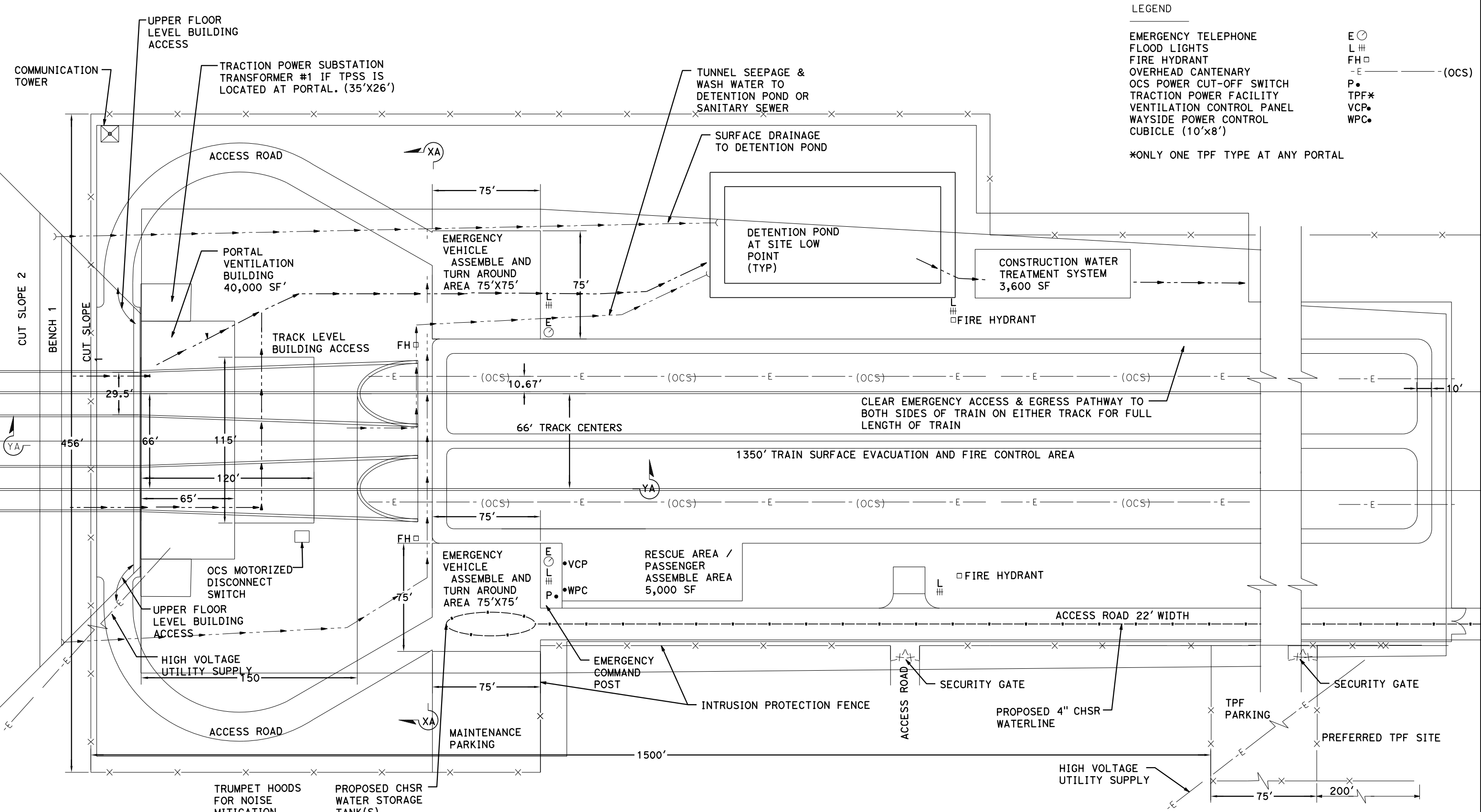
11/6/2017

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LEGEND

EMERGENCY TELEPHONE	E ○
FLOOD LIGHTS	L #
FIRE HYDRANT	FH □
OVERHEAD CANTENARY	-E - - - - (OCS)
OCS POWER CUT-OFF SWITCH	P ●
TRACTION POWER FACILITY	TPF*
VENTILATION CONTROL PANEL	VCP ●
WAYSIDE POWER CONTROL	WPC ●
CUBICLE (10'x8')	

*ONLY ONE TPF TYPE AT ANY PORTAL



GENERAL NOTES:

1. PORTAL LAYOUTS WERE DEVELOPED FOLLOWING TM 2.4.6 HIGH SPEED TRAIN PORTAL FACILITIES

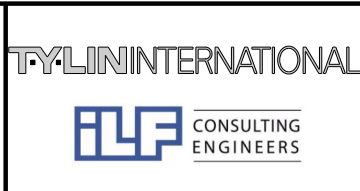


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CONSTRUCTION**



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

TYPICAL TUNNEL PORTAL FACILITIES PLAN
TWIN TUNNEL CONFIGURATION

CONTRACT NO.
HSR13-44

DRAWING NO.
TN-B-0019

SCALE
AS SHOWN

SHEET NO.

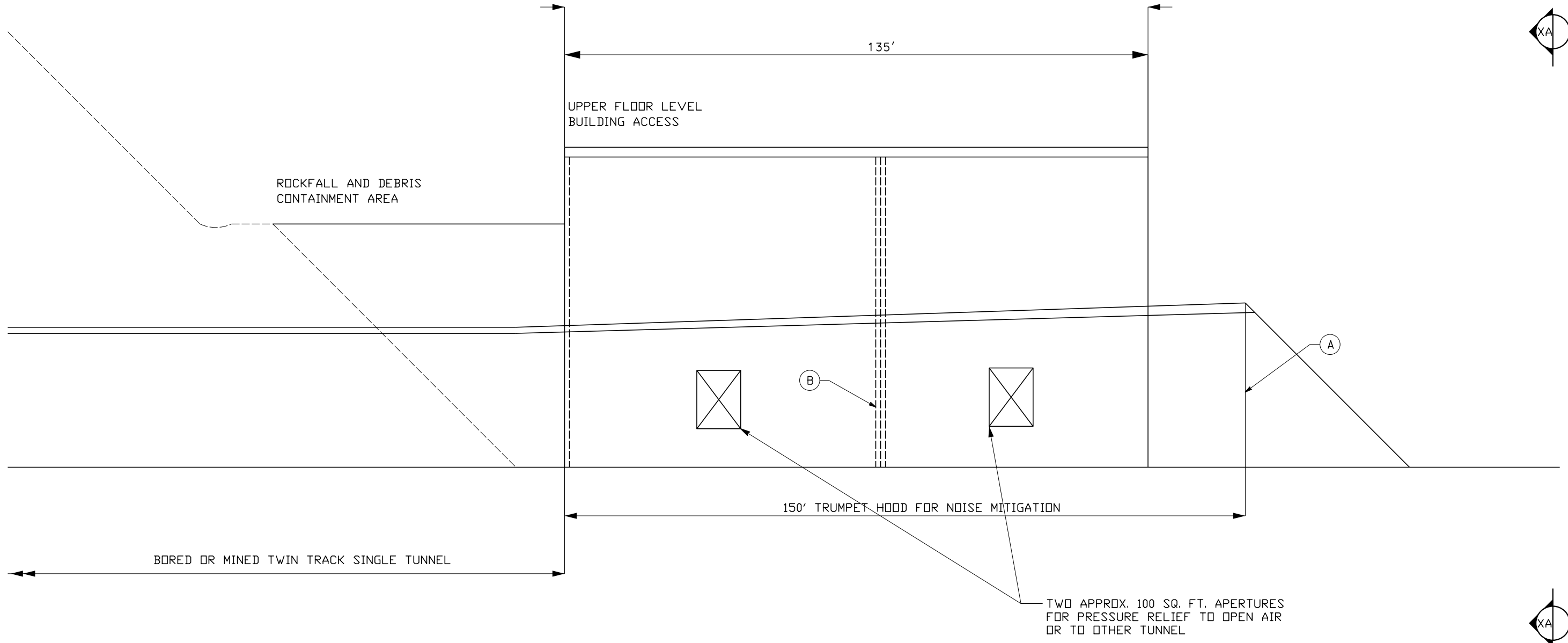
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11/6/2017

01C-ARTIVEGA

TRACTION POWER, VENTILATION AND MAINTENANCE FACILITIES CONTAINED WITHIN A SINGLE PORTAL BUILDING, APPROXIMATELY 40,000 FT² ON 3 FLOORS (SEE NOTE 2)



SECTION Y
TN-B-0019

GENERAL NOTES:

- 1. FREE AREA CSA (A) = 150% OF FREE AREA CSA (B)
- 2. FLOOR AREA EXCLUDES TRACTION POWER TRANSFORMERS WHICH ARE LOCATED OUTSIDE THE BUILDING.



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

TYPICAL TUNNEL PORTAL FACILITIES PLAN
AT GRADE TWIN TUNNEL CONFIGURATION
LONG SECTION

CONTRACT NO.
HSR13-44

DRAWING NO.
TN-B-0020

SCALE
AS SHOWN

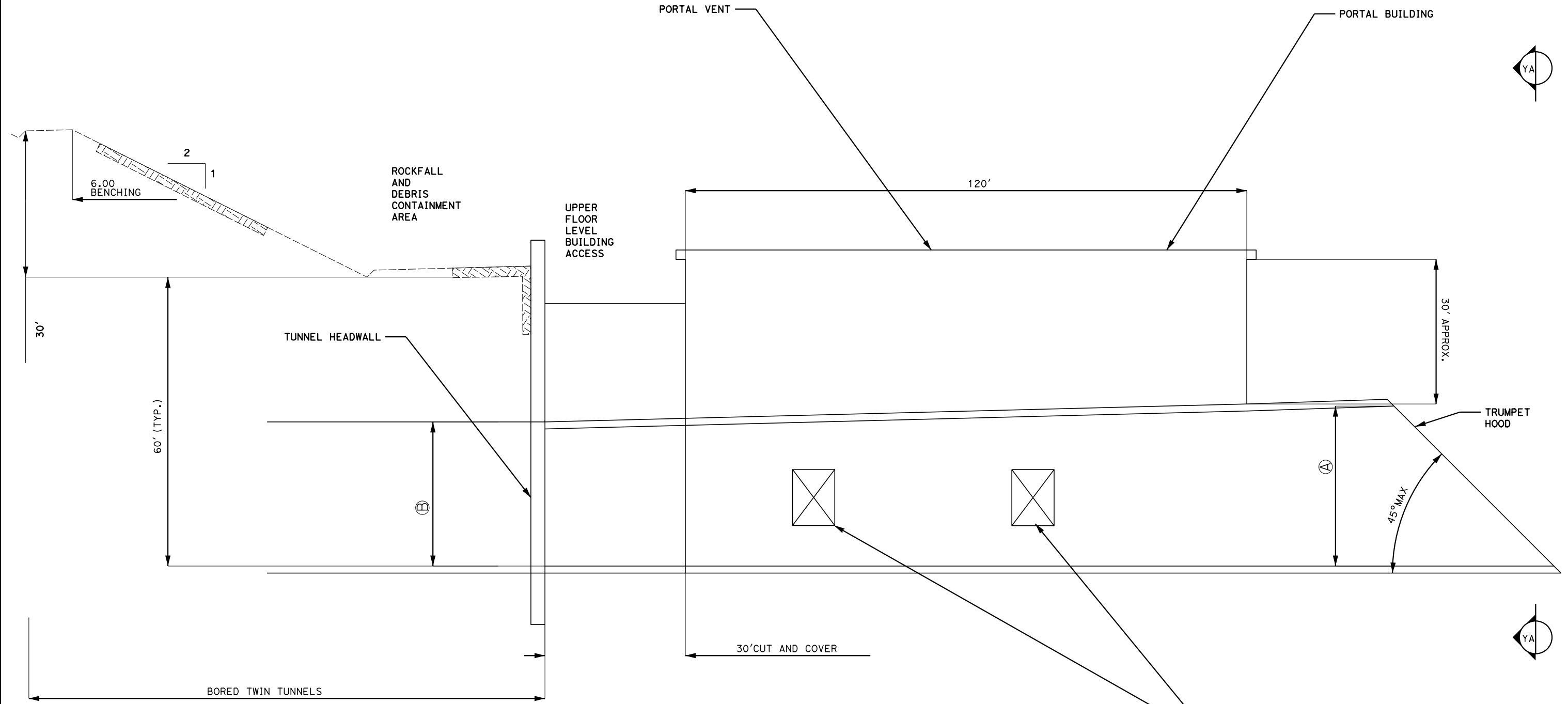
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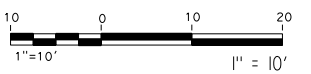


SECTION Y
TN-B-0018

TWO APPROX. 100 SQ. FT. APERTURES FOR PRESSURE RELIEF TO OPEN AIR OR TO OTHER TUNNEL

GENERAL NOTES:

- 1. FREE AREA CSA ④ = 150% OF FREE AREA CSA ②
- 2. FLOOR AREA EXCLUDES TRACTION POWER TRANSFORMERS WHICH ARE LOCATED OUTSIDE THE BUILDING.



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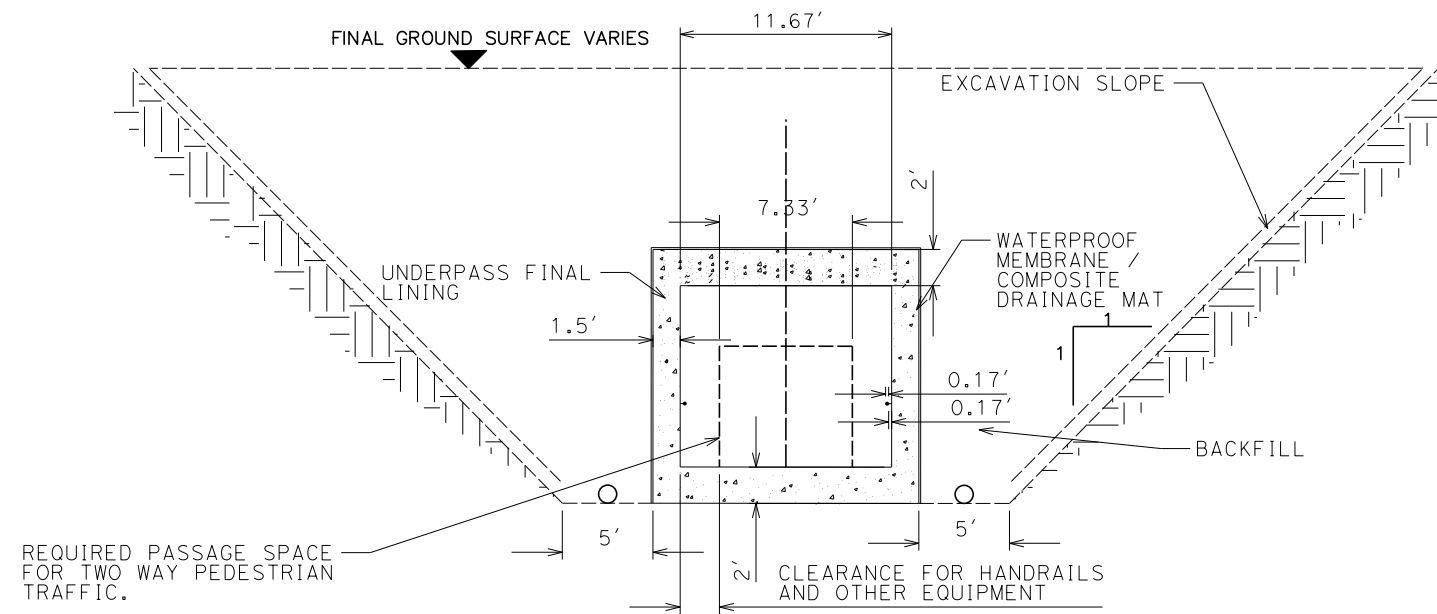
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CONSTRUCTION**



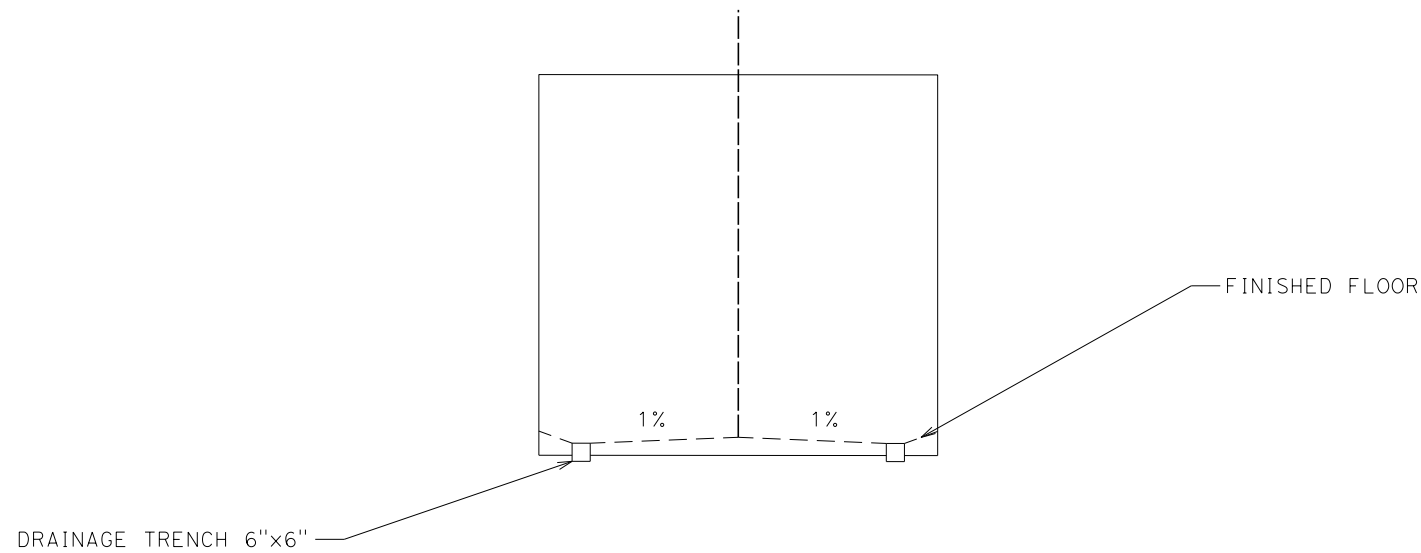
CALIFORNIA HIGH-SPEED RAIL PROJECT
BAKERSFIELD TO PALMDALE
TYPICAL TUNNEL PORTAL FACILITIES PLAN
AT GRADE SINGLE TUNNEL CONFIGURATION
LONG SECTION

CONTRACT NO.
HSR13-44
DRAWING NO.
TN-B-0021
SCALE
AS SHOWN
SHEET NO.



PEDESTRIAN UNDERPASS

1" = 5'-0"



FLOOR DETAIL

NOT TO SCALE



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CHECKED BY
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IN CHARGE
J. MORRISON

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

TUNNEL CUT AND COVER BOX
PEDESTRIAN UNDERPASS

CONTRACT NO.
HSR13-44

DRAWING NO.
TN-B-0022

SCALE
AS SHOWN

SHEET NO.