**GENERAL NOTES**

A. Utility locations to be determined.

B. For details not noted on plan and elevation sheets, see typical section sheets for track structures.

C. Grade elevations shown are at top of rail.

D. All columns are normal to the station line unless otherwise shown.

E. Refer to track alignment drawings for curve and tangent information.

F. Not all piles are shown.

G. Pile sizes and lengths to be determined.

H. Superstructure consists of precast concrete girders unless otherwise noted.

I. Bearings articulation for PC girder spans are fixed-roller at opposing span ends unless otherwise noted.

J. Refer to track alignment drawings for limits of retaining walls, unless otherwise shown.
SECTION A
SCALE: 1/8"=1'-0"

NOTES:
1. PROPOSED 4" CHSR WATERLINE.
2. STRUCTURES SHORTER THAN 1000 FEET SUPPORT BALLASTED TRACKS. THE DISTANCE BETWEEN TOP OF RAIL AND TOP OF DECK IN BALLASTED TRACK STRUCTURES WILL BE SLIGHTLY HIGHER AND BETWEEN 2'-6" AND 3'-0".

STA 18466+50 TO STA 18467+45 (REFINED CCNM DESIGN OPTION)
STA 18474+05 TO STA 18475+65 (REFINED CCNM DESIGN OPTION)
STA 18478+13 TO STA 18479+19 (REFINED CCNM DESIGN OPTION)
STA 18597+24 TO STA 18603+56 (REFINED CCNM DESIGN OPTION)

SECTION A-2
SCALE: 1/8"=1'-0"

NOTES:
1. PROPOSED 4" CHSR WATERLINE.
2. STRUCTURES SHORTER THAN 1000 FEET SUPPORT BALLASTED TRACKS. THE DISTANCE BETWEEN TOP OF RAIL AND TOP OF DECK IN BALLASTED TRACK STRUCTURES WILL BE SLIGHTLY HIGHER AND BETWEEN 2'-6" AND 3'-0".

STA 18597+24 TO STA 18603+56 (REFINED CCNM DESIGN OPTION)
NOTE 1
TO BE DETERMINED

PILE CAP WITH FOUR CIDH PILES
PILE DIAMETER AND LENGTH
TO BE DETERMINED

NO. 2

DRAWN BY

NOTES:
1. MINIMUM SEAT WIDTH OF STRADDLE BENT SHALL BE EQUAL TO COLUMN SIZE PLUS 2 FT.
2. PROPOSED 4" CSRR WATERLINE.

SECTION B
SCALE: 1\(\text{"} = 1'-0"\)

STA 18845+79 TO STA 18842+19 [REFINED CCNM DESIGN OPTION]
STA 18870+19 [REFINED CCNM DESIGN OPTION]
STA 18877+29 [REFINED CCNM DESIGN OPTION]

CALIFORNIA HIGH-SPEED RAIL PROJECT
BAKERSFIELD TO PALMDALE
REFINED CCNM DESIGN OPTION
TRACK STRUCTURES
TYPICAL SECTIONS
SHEET 2 OF 6

CONSTRUCTION
NOT FOR SUBMITTAL

WARNING: THIS DRAWING IS NOT FOR CONSTRUCTION
SECTION C
SCALE: 1/16"=1'-0"

STA 18876+29 TO STA 18883+29 (REFINED CONM DESIGN OPTION)
SECTION D
SCALE: 1/8" = 1'-0"

STA 19102+97 SB (REFINED CCNM DESIGN OPTION) TO STA 19097+59.69 SB (ALT 1,2,3,5)
STA 19104+73 NB (REFINED CCNM DESIGN OPTION) TO STA 19097+68.69 NB (ALT 1,2,3,5)

NOTES:
1. STRUCTURES SHORTER THAN 1000 FEET SUPPORT BALLASTED TRACKS. THE DISTANCE BETWEEN TOP OF RAIL AND TOP OF DECK IN BALLASTED TRACK STRUCTURES WILL BE SLIGHTLY HIGHER AND BETWEEN 2'-6" AND 3'-0".
2. PROPOSED 4" CHSR WATERLINE.
SECTION E

Scales: ½"=1'-0"

STA 19097+53 TO STA 19102+97 SB (REFINED CCNM DESIGN OPTION)
STA 19099+22 TO STA 19104+69 NB (REFINED CCNM DESIGN OPTION)

NOTES:
1. GIRDER SIDE SLOPE VARIES DEPENDING ON STRUCTURE DEPTH AT SUPPORT.
2. STRUCTURES SHORTER THAN 1000 FEET SUPPORT BALLASTER TRACKS. THE TOP OF RAIL IN BALLASTER TRACKS WILL BE SLIGHTLY HIGHER AND BETWEEN ½'-6" AND 1'-0''.
3. PROPOSED 4" CHSR WATERLINE.
SECTION J
SCALE: 1/8"=1'-0"

ELEVATED UTILITY CROSSINGS

NOTE:
FOR LOCATIONS OF CROSSINGS SEE SY-O SHEETS.
TOP OF RAIL "CHSR SB" ALIGNMENT "RFND CCNM"

TOTAL LENGTH = 1015'-0" (MEASURED ALONG "CHSR SB" ALIGNMENT "RFND CCNM")

PROFILE

SCALE 1"= 40'

NOTE:
1. RECORD RIGHT-OF-WAY IS NOT CORRECT IN RELATION TO THE LOCATION OF RAILROAD TRACKS.

PLAN

SCALE 1"= 40'

 OSError: Could not open the library 'pyside2-uic' for application 'yihong.wang@tylin.com'; ABORTING.
TOP OF RAIL "CHSR SB" ALIGNMENT "RFND CCNM"

ELEVATION
SCALE 1"= 40'

PLAN
SCALE 1"= 40'

DESIGNED BY R. GOLCHOOBIA
DRAWN BY Y. WANG
CHECKED BY R. BARTON
IN CHARGE G. CAMPBELL
DATE 01/24/2020

CALIFORNIA HIGH-SPEED RAIL PROJECT
BAKERSFIELD TO PALMDALE
RENIRED CCNM DESIGN OPTION
TRACT STRUCTURES
VIADUCT STATION 18838+59 TO 18884+25
PLAN AND ELEVATION

TOP OF RAIL "CHSR SB" ALIGNMENT "RFND CCNM"

TOTAL LENGTH = 4566'-0" (MEASURED ALONG "CHSR SB" ALIGNMENT "RFND CCNM")

DATUM ELEV 3290.00

BENT 2 APPROX OG
BENT 3
BENT 4
BENT 5

BARKERSFIELD TO PALMDALE

CALTRANS R/W
PROP CHSR R/W
TRANSITION SLAB
PARAPET
TOP OF RAIL
TOP OF DECK

LIMITS OF TENACHAPI CREEK FLOODPLAIN
LIMITS OF FUTURE SR-58 CORRIDOR

TOP OF DECK
TOP OF RAIL
TRANSITION SLAB

CALTRANS R/W
PROP CHSR R/W

DATUM ELEV 3290.00

ELEV 2813.48 18618+51.10 EVC
ELEV 3881.61 19000+21.42 BVC

PLAN
SCALE 1"= 40'

ELEVATION
SCALE 1"= 40'

SCALE 1"= 40'

NOT FOR CONSTRUCTION

PLOT DATE 2/10/2020
PLOT TIME 9:48:52 PM
PROJECT NO. HSR13-44
DRAWING NO. ST-J1306

CONTRACT NO. HSR13-44
DRAWING NO. ST-J1306

CALIFORNIA HIGH-SPEED RAIL PROJECT
BAKERSFIELD TO PALMDALE
RENIRED CCNM DESIGN OPTION
TRACT STRUCTURES
VIADUCT STATION 18838+59 TO 18884+25
PLAN AND ELEVATION

REFINED CCNM DESIGN OPTION
TRACK STRUCTURES
VIADUCT STATION 18838+59 TO 18884+25
PLAN AND ELEVATION

CALIFORNIA HIGH-SPEED RAIL PROJECT
BAKERSFIELD TO PALMDALE
RENIRED CCNM DESIGN OPTION
TRACT STRUCTURES
VIADUCT STATION 18838+59 TO 18884+25
PLAN AND ELEVATION

CALIFORNIA HIGH-SPEED RAIL PROJECT
BAKERSFIELD TO PALMDALE
RENIRED CCNM DESIGN OPTION
TRACT STRUCTURES
VIADUCT STATION 18838+59 TO 18884+25
PLAN AND ELEVATION
TOP OF RAIL "CHSR SB" ALIGNMENT "RFND CCNM"

TOTAL LENGTH = 4566'-0"
(MEASURED ALONG "CHSR SB" ALIGNMENT "RFND CCNM")

EDGE OF DECK
PROP CHSR R/W
CALTRANS R/W
TOP OF RAIL
TOP OF DECK
PARAPET
BENT 13
BENT 14
BENT 15
BENT 16
BENT 17
BENT 18
BENT 19
BENT 20

SCALE 1"=40'

ELEVATION
SCALE 1"=40'

TOP OF RAIL "CHSR NB" ALIGNMENT "RFND CCNM"

LIMITS OF FUTURE
SR-58 CORRIDOR
LIMITS OF TEHACHAPI CREEK
Floodplain

PLAN
SCALE 1"=40'

CALIFORNIA HIGH-SPEED RAIL PROJECT
BAKERSFIELD TO PALMDALE

REFINED CCNM DESIGN OPTION
TRACK STRUCTURES
VIADUCT STATION 18838+59 TO 18884+25
PLAN AND ELEVATION

DESIGNED BY
R. GOLCHOOBIAN
DRAWN BY
Y. WANG
CHECKED BY
R. BARTON
IN CHARGE
G. CAMPBELL

DATE
01/24/2020

RECORD
PEPD SUBMITTAL
NOT FOR CONSTRUCTION
TOP OF RAIL "CHSR SB" ALIGNMENT "RFND CCNM"

TOTAL LENGTH = 4566'-0"

ELEVATION
SCALE 1"= 40'

PLAN
SCALE 1"= 40'

CALIFORNIA HIGH-SPEED RAIL PROJECT
BAKERSFIELD TO PALMDALE
REFINED CCNM DESIGN OPTION
TRACK STRUCTURES
VIADUCT STATION 18838+59 TO 18884+25
PLAN AND ELEVATION

DESIGNED BY
R. GOLCHOOBIAN
DRAWN BY
Y. WANG
CHECKED BY
R. BARTON
IN CHARGE
G. CAMPBELL
DATE
01/24/2020

RECORD
PEPD
SUBMITTAL
NOT FOR
CONSTRUCTION

1/20/2020 9:48:27 PM
Projects\701206.00_CHSRBP\00 CADD\CCNM Option D\Sheets\ST\BP-ST-J1311

CALIFORNIA HIGH-SPEED RAIL PROJECT
CONTRACT NO.
HSR13-44
DRAWING NO.
ST-J1311
SCALE
AS SHOWN
SHEET NO.
DATE
CHK
APP
REV
DESCRIPTION

18879400 18880400 18884000 18886600 18887400
1
2
3
4
5
6
18880400 DATUM ELEV 3420.00 ELEV 2813.48 ELEV 3881.61
18800400 18854000 18854200 18855400 18855440 18855480 18855540
1
2
3
4
5
6
7
18879400 18880400 18884000 18886600 18887400
1
2
3
4
5
6
7

EXIST ROAD UPRR R/W
CALTRANS R/W

EDGE OF DECK
CIDH PILE (TYP)
PROP CHSR R/W

ST-B3103

BENT 36
APPROX 0G
BENT 38
ABUT 39
TRANSITION SLAB
TOP OF DECK
TOP OF RAIL
PARAPET

TOP OF DECK
TOP OF RAIL
PARAPET

ELEV 3557.10
18884+25.00
"RFND CCNM"
ALIGNMENT
"• CHSR SB"
STA 18884+25
EB

ELEV 3543.78
18879+49.00
"RFND CCNM"
ALIGNMENT
"• CHSR SB"
STA 18879+49

ELEV 2813.48
18880+00
DATE
01/24/2020

TOP OF RAIL "CHSR SB" ALIGNMENT "RFND CCNM"

( Measured along CHSR SB alignment "RFND CCNM"
BALANCED CANTILEVER SEGMENTAL

SCALE 1"= 40' SCALE APPLICABLE FOR FULL SIZE ONLY

TOP OF RAIL "CHSR SB" ALIGNMENT "RFND CCNM"

TOTAL LENGTH = 4566'-0"

TOP OF RAIL "CHSR SB" ALIGNMENT "RFND CCNM"

TOTAL LENGTH = 4566'-0"

TOP OF RAIL "CHSR SB" ALIGNMENT "RFND CCNM"

TOTAL LENGTH = 4566'-0"

TOP OF RAIL "CHSR SB" ALIGNMENT "RFND CCNM"

TOTAL LENGTH = 4566'-0"

TOP OF RAIL "CHSR SB" ALIGNMENT "RFND CCNM"

TOTAL LENGTH = 4566'-0"

TOP OF RAIL "CHSR SB" ALIGNMENT "RFND CCNM"

TOTAL LENGTH = 4566'-0"

TOP OF RAIL "CHSR SB" ALIGNMENT "RFND CCNM"

TOTAL LENGTH = 4566'-0"

TOP OF RAIL "CHSR SB" ALIGNMENT "RFND CCNM"

TOTAL LENGTH = 4566'-0"

TOP OF RAIL "CHSR SB" ALIGNMENT "RFND CCNM"

TOTAL LENGTH = 4566'-0"
TOP OF RAIL "C CHSR SB" ALIGNMENT "RFND CCNM"

TOTAL LENGTH = 970'-0" (MEASURED ALONG "C CHSR SB" ALIGNMENT "RFND CCNM" AND "SB CHSR C")

BALANCED CANTILEVER SEGMENTAL

ELEVATION

SCALE 1"= 40'

PLAN

SCALE 1"= 40'

CALIFORNIA HIGH-SPEED RAIL PROJECT
BAKERSFIELD TO PALMDALE

REMARKS: CCNM DESIGN OPTION

TRACK STRUCTURES
SOUTH VIADUCT STA 19097+53 TO 19097+39.69 ALT 1,2,3,5

PLAN AND ELEVATION

DESIGNED BY
R. GOLCHOOBIAN

DRAWN BY
Y. WANG

CHECKED BY
R. BARTON

IN CHARGE
G. CAMPBELL

DATE
01/24/2020

SCALE
AS SHOWN

SHEET NO.
ST-J1312

NOT FOR CONSTRUCTION
REFINED CCNM DESIGN OPTION
TRACK STRUCTURES
NORTH VIADUCT STA 19099+22 TO 19097+68.69 ALT 1,2,3,5
PLAN AND ELEVATION

TOTAL LENGTH = 830'-0" (MEASURED ALONG "CHSR NB" ALIGNMENT "RFND CCNM" AND "NB CHSR")

ELEVATION
SCALE 1" = 40'

PLAN
SCALE 1" = 40'

CALIFORNIA HIGH-SPEED RAIL PROJECT
BAKERSFIELD TO PALMDALE
REFINED CCNM DESIGN OPTION
TRACK STRUCTURES
NORTH VIADUCT STA 19099+22 TO 19097+68.69 ALT 1,2,3,5 PLAN AND ELEVATION

DESIGNED BY
R. GOLCHOOBIAN
DRAWN BY
Y. WANG
CHECKED BY
R. BARTON
IN CHARGE
G. CAMPBELL

DATE
01/24/2020

CALIFORNIA HIGH-SPEED RAIL PROJECT
CONTRACT NO.
HSR13-44
DRAWING NO.
ST-J1313
SCALE
AS SHOWN
SHEET NO.

RECORD
PEPD
SUBMITTAL

NOT FOR
CONSTRUCTION

TOP OF RAIL "CHSR NB" ALIGNMENT "RFND CCNM"
NO SCALE

TOP OF DECK
TOP OF RAIL
EDGE OF DECK
TOP OF PARAPET
EDGE OF DECK
BALANCED CANTILEVER SEGMENTAL

DATUM ELEV 3950.00

TOTAL LENGTH = 830'-0" (MEASURED ALONG "CHSR NB" ALIGNMENT "RFND CCNM" AND "NB CHSR")

ELEVATION
SCALE 1" = 40'

PLAN
SCALE 1" = 40'

CALIFORNIA HIGH-SPEED RAIL PROJECT
CONTRACT NO.
HSR13-44
DRAWING NO.
ST-J1313
SCALE
AS SHOWN
SHEET NO.

NOTES:

1. FOR STRUCTURAL DIMENSIONS
   SEE STRUCTURAL CROSS SECTIONS

2. TRACKFORM SHOWN IS INDICATIVE

3. SUPERELEVATION IS NOT SHOWN.
   THE AMOUNT OF APPLIED SUPERELEVATION IS SHOWN IN THE CURVE TABLES

4. SECTION IS REPRESENTATIVE;
   DOES NOT ACCURATELY PORTRAY TRACK PROFILE RELATIVE TO EXISTING GROUND.

SECTION B

STA 18815+57.13 PARALLELING STATION (RFND CCNM )
STA 19060+35.00 SUBSTATION (RFND CCNM )
NOTES:

1. FOR STRUCTURAL DIMENSIONS
   SEE STRUCTURAL CROSS SECTIONS

2. TRACKFORM SHOWN IS INDICATIVE

3. SUPERELEVATION IS NOT SHOWN;
   THE AMOUNT OF APPLIED
   SUPERELEVATION IS SHOWN IN THE
   CURVE TABLES

4. SECTION IS REPRESENTATIVE;
   DOES NOT ACCURATELY PORTRAY
   TRACK PROFILE RELATIVE TO
   EXISTING GROUND.

SECTION C

STA 18575+96.67 PARALLELING STATION (RFND CCNM)
NOTES:
1. SEE ALT 1,2,3,5 FOR SRW #2 STA 18555+00.
2. SEE ALT 1,2,3,5 FOR PS #4 STA 19238+00.
3. SEE “ALT 1,2,3,5” FOR PS #5 STA 19238+00.
4. SEE “ALT 1,2,3,5” FOR SS #15 STA 19060+00.
5. SEE “ALT 1,2,3,5” FOR SS #15 STA 19060+00.
6. SEE “ALT 1,2,3,5” FOR PS #4 STA 19238+00.
7. SEE “ALT 1,2,3,5” FOR SS #15 STA 19060+00.
8. SEE “ALT 1,2,3,5” FOR PS #4 STA 19238+00.
9. SEE “ALT 1,2,3,5” FOR SS #15 STA 19060+00.
10. SEE “ALT 1,2,3,5” FOR PS #4 STA 19238+00.
11. SEE “ALT 1,2,3,5” FOR SS #15 STA 19060+00.
12. SEE “ALT 1,2,3,5” FOR PS #4 STA 19238+00.
13. SEE “ALT 1,2,3,5” FOR SS #15 STA 19060+00.
14. SEE “ALT 1,2,3,5” FOR PS #4 STA 19238+00.
15. SEE “ALT 1,2,3,5” FOR SS #15 STA 19060+00.
16. SEE “ALT 1,2,3,5” FOR PS #4 STA 19238+00.
17. SEE “ALT 1,2,3,5” FOR SS #15 STA 19060+00.
18. SEE “ALT 1,2,3,5” FOR PS #4 STA 19238+00.
19. SEE “ALT 1,2,3,5” FOR SS #15 STA 19060+00.
20. SEE “ALT 1,2,3,5” FOR PS #4 STA 19238+00.
21. SEE “ALT 1,2,3,5” FOR SS #15 STA 19060+00.
22. SEE “ALT 1,2,3,5” FOR PS #4 STA 19238+00.
23. SEE “ALT 1,2,3,5” FOR SS #15 STA 19060+00.
24. SEE “ALT 1,2,3,5” FOR PS #4 STA 19238+00.
25. SEE “ALT 1,2,3,5” FOR SS #15 STA 19060+00.
26. SEE “ALT 1,2,3,5” FOR PS #4 STA 19238+00.
27. SEE “ALT 1,2,3,5” FOR SS #15 STA 19060+00.
28. SEE “ALT 1,2,3,5” FOR PS #4 STA 19238+00.
29. SEE “ALT 1,2,3,5” FOR SS #15 STA 19060+00.
30. SEE “ALT 1,2,3,5” FOR PS #4 STA 19238+00.
31. SEE “ALT 1,2,3,5” FOR SS #15 STA 19060+00.
32. SEE “ALT 1,2,3,5” FOR PS #4 STA 19238+00.
33. SEE “ALT 1,2,3,5” FOR SS #15 STA 19060+00.
34. SEE “ALT 1,2,3,5” FOR PS #4 STA 19238+00.
35. SEE “ALT 1,2,3,5” FOR SS #15 STA 19060+00.
36. SEE “ALT 1,2,3,5” FOR PS #4 STA 19238+00.
NOTES:
1. THIS IS A TYPICAL LAYOUT AND THE ORIENTATION OF THE STATION WITH RESPECT TO TRACK, LOCATION OF UTILITY SUPPLY CIRCUITS, EQUIPMENT, AND ROAD ACCESS TO BE DETERMINED ON A SITE-BY-SITE BASIS.
2. THE MAIN GANTRY POSITION SHALL BE PARALLEL AND ADJACENT TO THE TRACK.
3. THERE WILL BE A STRAIN GANTRY LOCATED WITHIN THE RAILROAD R/W, PARALLEL TO AND ON THE OPPOSITE SIDE OF THE TRACK WITH FOOTPRINTS EXACTLY EQUAL TO THAT OF THE MAIN GANTRY.
4. IF THE TPF IS LOCATED AWAY FROM THE TRACK, THE MAIN GANTRY WILL BE LOCATED WITHIN THE RAILROAD R/W, PARALLEL TO AND TOWARDS TPF SIDE OF THE TRACK, IN THIS CASE AN ADDITIONAL 40' RIDE STRIP OF LAND WILL BE REQUIRED FROM THE TPF TO THE RAILROAD R/W FOR LAYING UNDERGROUND DUCT BANKS AND MANHOLES.
5. THE COMMUNICATION EQUIPMENT ROOM SHALL HOUSE COMMUNICATION INTERFACE EQUIPMENT FOR SCADA SYSTEM AND OTHER WAYSIDE COMMUNICATION EQUIPMENT.
6. THE GANTRIES SHALL BE 40' HIGH.
7. THIS LAYOUT IS PER TM 3.1.1.3-A AND SHOWN HERE FOR REFERENCE AND COMPLETENESS.
NOTES:
1. THIS IS A TYPICAL LAYOUT AND THE ORIENTATION OF THE STATION WITH RESPECT TO TRACK, LOCATION OF UTILITY SUPPLY CIRCUITS, EQUIPMENT, AND ROAD ACCESS TO BE DETERMINED ON A SITE-BY-SITE BASIS.
2. THE MAIN GANTRY POSITION SHALL BE PARALLEL AND ADJACENT TO THE TRACK.
3. THERE WILL BE A STRAIN GANTRY LOCATED WITHIN THE RAILROAD R/W, PARALLEL TO AND ON THE OPPOSITE SIDE OF THE TRACK WITH FOOTPRINTS EXACTLY EQUAL TO THAT OF THE MAIN GANTRY.
5. THE COMMUNICATION EQUIPMENT ROOM SHALL HOUSE COMMUNICATION INTERFACE EQUIPMENT FOR SCADA SYSTEM AND OTHER R/W SIDE COMMUNICATION EQUIPMENT.
6. THE GANTRIES SHALL BE 40' HIGH.
7. THIS LAYOUT IS PER TM 3.1.1.3-D AND SHOWN HERE FOR REFERENCE AND COMPLETENESS.
1. Proposed track grade through phase break is 1.47%
NOTES:
1. TP (Tunnel Portal) Sites have radio antennas.
2. TP (Tunnel Portal) Site 18566+93 uses antenna from PS#2.
3. See "ALT 1,2,3,5" for ATC-D STA 17980+00.
4. See "ALT 1,2,3,5" for ATC-E STA 19185+00.
5. See "ALT 1,2,3,5" for TP STA 18208+05.
6. See "ALT 1,2,3,5" for TP STA 19290+87.

DESIGNED BY
A. CARSON
DRAWN BY
A. CARSON
CHECKED BY
D. HOLMAN
IN CHARGE
G. CAMPBELL
DATE
01/24/2020
RECORD
PEPD
SUBMITTAL
NOT FOR
CONSTRUCTION
TUNNEL LEGEND

PLAN

- SECTION NUMBER
- DRAWING NUMBER
- CURVE DATA (ALIGNMENTS, ROADWAYS)
- CURVE DATA (STRUCTURES)
- LINE DATA (ALIGNMENTS, ROADWAYS)
- NORTH ARROW
- PROPOSED RIGHT OF WAY
- PROPOSED TEMPORARY ENVIRONMENTAL FOOTPRINT (TEPF)
- PROPOSED PERMANENT ENVIRONMENTAL FOOTPRINT (PEPF)
- EXISTING RIGHT OF WAY
- LIMITS OF EXCAVATION (CUT)
- LIMITS OF EMBANKMENT (FILL)
- ?  ?  ?  FAULT ZONE
- EXISTING RETAINING WALL
- PROPOSED RETAINING WALL
- TRACK CROSSING PANEL

PROFILE

- ORIGINAL GROUND
- PROPOSED CHSR ELEVATION
- STRUCTURAL CLEARANCE ENVIRONMENT
- 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.

UTILITIES

- EXISTING ELECTRICAL TRANSMISSION
- EXISTING ELECTRICAL TRANSMISSION TOWER
- EXISTING STORM DRAIN
- EXISTING GAS LINE

CALIFORNIA HIGH-SPEED RAIL PROJECT
BAKERSFIELD TO PALMDALE
REFINED CCNM DESIGN OPTION
TUNNEL LEGEND

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CONTRACT NO. HSR13-44
DRAWING NO. TN-B0201
SCALE NO SCALE
SHEET NO.

DATE 01/24/2020
CHK
APP
REV

DESCRIPTION

PROJECT NO. PEPD
SUBMITTAL NOT FOR CONSTRUCTION

1/24/2020 11:11:05 AM

Projects\701206.00_CHSRBP\00 CADD\CCNM Option D\Sheets\TN\TN-B0201.dgn
REFINED CCNM DESIGN OPTION

TUNNEL PROFILE - TUNNEL 5

STA 18520+00 TO STA 18570+00

PPEF (TYPICAL)

SLIDING DOORWAY

EMERGENCY EGRESS

STA 18524+76

BEGIN TUNNEL

STA 18566+93

END TUNNEL

BUILDING VENTILATION PORTAL

BUILDING VENTILATION PORTAL

TRACK PROFILE "RFND CCNM"

TUNNEL #5 "RFND CCNM"

DRILL AND BLAST TUNNEL CONSTRUCTION

STATION 0

200

200

400

1"=200' HOR

0

100

100

200

1"=100' VERT

VC=2000'

K=2309

18552+10.03 EVC

ELEV 2676.50

2

.8

0

%

18532+10.03 BVC

ELEV 2629.19

CALIFORNIA HIGH-SPEED RAIL PROJECT

BAKERSFIELD TO PALMDALE

RENOV CCN DESIGN OPTION

TUNNEL PROFILE - TUNNEL 5

STA 18520400 TO STA 18570400

DESIGNED BY Z. SKOVAJSOVA

DRAWN BY K. BUNGER

CHECKED BY R. KUNDU

IN CHARGE J. MORRISON

DATE 01/24/2020

RECORD PEPE

SUBMITTAL NOT FOR CONSTRUCTION

CONTRACT NO. HSR13-44

DRAWING NO. TN-C1102

SCALE AS SHOWN

SHEET NO. TN-C1102
NOTES:
1. FAULT ZONE LOCATIONS ARE APPROXIMATE, TO BE CONFIRMED.
2. FOR PROFILE INFORMATION SEE SHEET TN-C1101.
3. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00.
4. TUNNEL 4 WILL BE CONSTRUCTED BY CUT AND COVER METHODS BETWEEN STATION 18362+50 TO 18368+50.
NOTES:

1. Fault zone locations are approximate, to be confirmed.
2. For profile information see sheet TN-C1101.
3. Proposed 4" water line parallels alignment from station 18034+00 to 19591+00.
4. Tunnel 4 will be constructed by cut and cover methods between station 18362+50 to 18368+50.
NOTES:
1. FAULT ZONE LOCATIONS ARE APPROXIMATE, TO BE CONFIRMED.
2. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00.
3. TUNNEL 4 WILL BE CONSTRUCTED BY CUT AND COVER METHODS BETWEEN STATION 18362+50 TO 18368+50
NOTES:
1. FAULT ZONE LOCATIONS ARE APPROXIMATE, TO BE CONFIRMED.
2. FOR PROFILE INFORMATION SEE SHEET TN-C1102.
3. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 18591+00.
NOTES:
1. Fault zone locations are approximate, to be confirmed.
2. For profile information see Sheet TN-C1102.
3. Proposed 4" water line parallels alignment from Station 18034+00 to 19591+00.

DESIGNED BY
Z. SKOVAJSOVA

DRAWN BY
K. BUNGER

CHECKED BY
R. KUNDU

IN CHARGE
J. MORRISON

DATE
01/24/2020

RECORD
PEPD

SUBMITTAL
NOT FOR
CONSTRUCTION

CALIFORNIA HIGH-SPEED RAIL PROJECT
BAKERSFIELD TO PALMDALE
REFINED CCNM DESIGN OPTION
TUNNEL 5
STA 18525+00 TO STA 18575+00

SCALE
AS SHOWN

SHEET NO.
DRAWING NO.
CONTRACT NO.

01/24/2020

COWI

Tylin International

California High-Speed Rail Authority

knbr_cowi

1/21/2020
1:14:25 AM

Projects\701206.00_CHSRBP\00 CADD\CCNM Option D\Sheets\TN\TN-C4405.dgn

BAKERSFIELD TO PALMDALE
NOTES:

1. FAULT ZONE LOCATIONS ARE APPROXIMATE, TO BE CONFIRMED.
2. FOR PROFILE INFORMATION SEE SHEET TN-C1103.
3. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00.
NOTES:
1. FAULT ZONE LOCATIONS ARE APPROXIMATE, TO BE CONFIRMED.
2. FOR PROFILE INFORMATION SEE SHEET TN-C1104.
3. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00.
NOTES:

1. FAULT ZONE LOCATIONS ARE APPROXIMATE, TO BE CONFIRMED.
2. FOR PROFILE INFORMATION SEE SHEET TN-C1105.
3. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00.

CALEIFORNIA HIGH-SPEED RAIL PROJECT
BAKERSFIELD TO PALMDALE
REFINED CCNM DESIGN OPTION
TUNNEL 6
STA 18675+00 TO STA 18725+00

DRAWN BY
K. BUNGER
CHECKED BY
R. KUNDU
IN CHARGE
J. MORRISON
DATE
01/24/2020

SCALE APPLICABLE FOR FULL SIZE ONLY
NOTES:
1. FAULT ZONE LOCATIONS ARE APPROXIMATE, TO BE CONFIRMED.
2. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00.

PROP CHSR R/W
PTEF
PPEF
PROP CHSR R/W
PROPOSED 4" WATER LINE, SEE NOTE 2
NOTES:
1. FAULT ZONE LOCATIONS ARE APPROXIMATE, TO BE CONFIRMED.
2. FOR PROFILE INFORMATION SEE SHEET TN-C1106.
3. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00.
NOTES:
1. FAULT ZONE LOCATIONS ARE APPROXIMATE, TO BE CONFIRMED.
2. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00.
GENERAL NOTES:

1. DRILL AND BLAST METHOD IS IDENTIFIED FOR THE 15% IN-PROGRESS DESIGN OF DOUBLE TRACK TUNNEL FOR TRACK 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 ALLOCATED 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.

TANGENT TRACK

SUPER ELEVATED TRACK

CALIFORNIA HIGH-SPEED RAIL PROJECT
BAKERSFIELD TO PALMDALE
REFINED CORR DESIGN OPTION
TUNNEL DRILL AND BLAST METHOD
SINGLE TUNNEL CLEARANCE DIAGRAM

Designed by: Z. SKOVAJSOVA
Drawn by: K. BUNGER
Checked by: R. KUNDU
In Charge: J. MORRISON

Date: 01/24/2020

Revised: 01/21/2020
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 WATER-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. 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.
GENERAL NOTES:

1. TEMPORARY SLOPE AND BENCH GEOMETRIES SHOWN ARE BASED ON GUIDANCE PROVIDED IN TM 3.6.2.
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 WATERPROOFNESS PROVISIONS WILL BE OPTIMIZED BASED ON SITE
   INVESTIGATION RESULTS AND CUT AND COVER-SPECIFIC DESIGN WORK.
5. CENTER DIVIDING WALL SHALL CONFORM TO NFPA 130 AND HAVE A 2 HOUR FIRE RATING.
6. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 1054+00 TO 1959+00.

DATE

CHECKED BY

DESIGNED BY

DRAWN BY

IN CHARGE

01/24/2020

RECORD

CONTRACT NO.

DRAWING NO.

SCALE

SHEET NO.

CALIFORNIA HIGH-SPEED RAIL PROJECT

BAKERSFIELD TO PALMDALE

REFINED CONN DESIGN OPTION

TUNNEL CUT AND COVER BOX

CLEARANCE DIAGRAM - TANGENT TRACK

FINAL TUNNEL (TYP)

WATER PROOF MEMBRANE /
COMPOSITE DRAINAGE MAT

TOP OF RAIL

FLS/ART FAN

CENTER DIVIDING WALL

NEGATIVE FEEDER WIRE

TUNNEL CENTERLINE

FINAL GROUND SURFACE VARIES

ROCK

ROCK

EMERGENCY WALKWAY

TUNNEL SYSTEMS-CABLE

CHANNEL (TYPICAL)

TUNNEL SYSTEMS DRAINAGE (TYPICAL)

TEMPORARY EXCAVATED
ROCK SLOPE

PROPOSED 4" CHSR DRAINAGE (TYPICAL)

TEMPORARY GROUNDWATER DRAINAGE (TYPICAL)

CENTERLINE TUNNEL

CENTERLINE TRACK

EMERGENCY WALKWAY

TUNNEL SYSTEMS-CABLE

CHANNEL (TYPICAL)

TUNNEL SYSTEMS DRAINAGE (TYPICAL)

FINAL TUNNEL (TYP)

FEEDER WIRE

NEGATIVE CHANNEL (TYPICAL)

TUNNEL SYSTEMS-CABLE

WATER PROOF MEMBRANE/
COMPOSITE DRAINAGE MAT

TEMPORARY DRAINAGE (TYPICAL)

EXCAVATED TEMPORARY ROCK SLOPE

17' (TO CONTACT WIRE)

8'-7"
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 EQUIPMENT.
4. EXCAVATION, GROUND SUPPORT, LINING AND WATERPROOFNESS PROVISIONS WILL BE OPTIMIZED BASED ON SITE INVESTIGATION RESULTS AND CUT AND COVER-SPECIFIC DESIGN WORK.
5. CENTER DIVIDING WALL SHALL CONFORM TO NFPA 101 AND HAVE A 2-HOUR FIRE RATING.
6. PROPOSED 4" WATER LINE PARALLELS ALIGNMENT FROM STATION 18034+00 TO 19591+00.
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 WATER 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 DEFINE 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.
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.
REFINED CCNM DESIGN OPTION

TWIN TUNNEL DRILL AND BLAST METHOD

INITIAL SUPPORT

SOUTH BOUND

NORTH BOUND

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 TESCHAFF Fault ZONE FROM STA 18930+70 TO STA 18940+84.

2. EXCAVATION, GROUND SUPPORT, PILLAR WIDTH, LINING THICKNESS AND WATERPROOFNESS 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 REFINISH 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 COMBINATION OF TOP HEADING AND BENCH WITH SIDE SLASH, SPLICES, AND FACE SUPPORT AS REQUIRED. CLASS IV MAY REQUIRE A CHANGE IN EXCAVATION METHOD TO AN SEM CONSTRUCTION ALTERNATIVE.
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, SITED IN HARD ROCK UNITS.

2. EXCAVATION, GROUND SUPPORT, PILLAR WIDTH, LINING THICKNESS AND WATER/TIGHTNESS 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. 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.
GENERAL NOTES:

1. OPEN TBM METHODS ARE ADOPTED FOR THE 15% IN-PROGRESS DESIGN OF THE LONGER (GREATER THAN 1 MILE) SINGLE TRACK 7, 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 ALLOCATED 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.
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, 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 REFINING SPACE ALLOCATED FOR STRUCTURES, EQUIPMENT, AND EGRESS.
4. PILLAR WIDTH BETWEEN TUNNELS TO BE ONE TUNNEL DIAMETER OR MORE BASED ON GUIDANCE IN TM 2416.