

California High-Speed Train Project



Request for Proposal for Design-Build Services

RFP No.: HSR 11-16
Directive Drawings

Revision No.	Date	Description
0	01 Mar 12	Initial Release, R0

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GENERAL		
TYPE	DRAWING NO.	DRAWING TITLE
DD	DD-GE-001	GENERAL DIRECTIVE NOTES, CIVIL
DD	DD-GE-002	GENERAL DIRECTIVE NOTES, TRACK
DD	DD-GE-003	GENERAL DIRECTIVE NOTES, STRUCTURAL
DD	DD-GE-100	ACRONYMS AND ABBREVIATIONS 1
DD	DD-GE-101	ACRONYMS AND ABBREVIATIONS 2
DD	DD-GE-102	ACRONYMS AND ABBREVIATIONS 3
DD	DD-GE-103	ACRONYMS AND ABBREVIATIONS 4
DD	DD-GE-104	ACRONYMS AND ABBREVIATIONS 5
DD	DD-GE-110	SYMBOLS 1
DD	DD-GE-111	SYMBOLS 2

CIVIL		
TYPE	DRAWING NO.	DRAWING TITLE
DD	DD-CV-001	TYPICAL CROSS SECTION, TWO TRACK NON-BALLASTED, EMBANKMENT
DD	DD-CV-002	TYPICAL CROSS SECTION, TWO TRACK NON-BALLASTED, OPEN CUT
DD	DD-CV-003	TYPICAL CROSS SECTION, TWO TRACK NON-BALLASTED, RETAINED FILL
DD	DD-CV-004	TYPICAL CROSS SECTION, ONE TRACK NON-BALLASTED, EMBANKMENT AND OPEN CUT
DD	DD-CV-005	TYPICAL CROSS SECTION, FOUR TRACK NON-BALLASTED, EMBANKMENT
DD	DD-CV-006	FENCE AND GATE DETAILS
DD	DD-CV-007	FENCE AND GATE LOCATIONS
DD	DD-CV-008	FENCING ON GRADE SEPARATED STRUCTURES
DD	DD-CV-009	FENCE AT CULVERT CROSSINGS
DD	DD-CV-010	MINIMUM CLEARANCE, GRADE SEPARATED STRUCTURES
DD	DD-CV-011	ACCESS ROADS AND DRIVEWAYS

DRAINAGE		
TYPE	DRAWING NO.	DRAWING TITLE
DD	DD-CD-001	NON-BALLASTED AERIAL STRUCTURE, BRIDGE DECK DRAINAGE SYSTEM
DD	DD-CD-002	AERIAL STRUCTURE, BEGIN AND END BRIDGE DRAINAGE SYSTEM
DD	DD-CD-003	AT-GRADE TRACK, DRAINAGE SYSTEM
DD	DD-CD-004	AT-GRADE STATION PLATFORM, DRAINAGE SYSTEM
DD	DD-CD-005	AERIAL STRUCTURE BRIDGE DECK, DRAINAGE INLET DETAIL

UTILITY		
TYPE	DRAWING NO.	DRAWING TITLE
DD	DD-UT-001	UTILITY CROSSING CLEARANCES, AT GRADE
DD	DD-UT-002	UTILITY CROSSING CLEARANCES, RETAINED CUT TRENCH
DD	DD-UT-004	UTILITY CROSSING CLEARANCES, TRENCH
DD	DD-UT-004	UTILITY CROSSING CLEARANCES, CUT AND COVER TUNNELS

INTRUSION PROTECTION		
TYPE	DRAWING NO.	DRAWING TITLE
DD	DD-IP-001	EARTHWORK BERM, RAILROAD ADJACENT TO HST
DD	DD-IP-002	BARRIERS IN SHARED CORRIDOR
DD	DD-IP-003	HST PIER PROTECTION, IN RAILROAD RIGHT-OF-WAY
DD	DD-IP-004	IN SHARED AND ADJACENT CORRIDOR, AT-GRADE
DD	DD-IP-005	AT-GRADE BERM OR DITCH ON HST GUIDEWAY, RAILROAD ADJACENT TO HST
DD	DD-IP-006	HST PIER PROTECTION, IN HIGHWAY/ROADWAY RIGHT-OF-WAY
DD	DD-IP-007	HST TRENCH AND RETAINING WALL PROTECTION
DD	DD-IP-008	ADJACENT TO HIGHWAY/ROADWAY

STRUCTURE		
TYPE	DRAWING NO.	DRAWING TITLE
DD	DD-ST-001	AERIAL STRUCTURE, TWO TRACK NON-BALLASTED, TYPICAL CONFIGURATION ON TOP OF DECK
DD	DD-ST-002	AERIAL STRUCTURE, ONE TRACK NON-BALLASTED, TYPICAL CONFIGURATION ON TOP OF DECK
DD	DD-ST-003	AERIAL STRUCTURE, TYPICAL CABLE TROUGH DETAILS
DD	DD-ST-004	AERIAL STRUCTURE, CABLE TROUGH DETAILS, AT OCS POLE
DD	DD-ST-005	AERIAL STRUCTURE, CONCRETE PARAPET
DD	DD-ST-006	AERIAL STRUCTURE, TYPICAL SPAN, SHEAR KEY DETAILS
DD	DD-ST-007	AERIAL STRUCTURE, TYPICAL SPAN, EXPANSION JOINT DETAILS
DD	DD-ST-008	AERIAL STRUCTURE, EMERGENCY EXIT STAIRWAY DETAILS 1
DD	DD-ST-009	AERIAL STRUCTURE, EMERGENCY EXIT STAIRWAY DETAILS 2
DD	DD-ST-010	TYPICAL CROSS SECTION, TWO TRACK TRENCH, OUTSIDE WALKWAY
DD	DD-ST-011	CABLE TROUGH DETAILS, TRENCH / CUT AND COVER TUNNEL
DD	DD-ST-012	CABLE TROUGH LAYOUT TRANSITION AREAS
DD	DD-ST-013	TYPICAL CABLE TROUGH DETAILS, EMBANKMENT/CUT
DD	DD-ST-014	RETAINING WALL, LAYOUT AND DETAILS

SYSTEM OVERALL		
TYPE	DRAWING NO.	DRAWING TITLE
DD	DD-SY-010	TYPICAL CIVIL ACCOMMODATIONS, SYSTEM SITES

TRACTION POWER		
TYPE	DRAWING NO.	DRAWING TITLE
DD	DD-TP-N101	TYPICAL 25KV DUCT BANK DETAILS
DD	DD-TP-N111	TYPICAL 25KV MANHOLE DETAILS

OVERHEAD CONTACT SYSTEM		
TYPE	DRAWING NO.	DRAWING TITLE
DD	DD-OC-2046	TYPICAL GROUNDING AND BONDING ARRANGEMENT, GRADE SEPARATED STRUCTURE, 220 MPH SEGMENT
DD	DD-OC-2047	TYPICAL GROUNDING AND BONDING ARRANGEMENT, AERIAL STRUCTURE, 220 MPH SEGMENT
DD	DD-OC-2048	TYPICAL GROUNDING AND BONDING ARRANGEMENT, CUT AND COVER TUNNEL, 220 MPH SEGMENT
DD	DD-OC-2049	GROUNDING AND BONDING ARRANGEMENT, OPEN TRENCH, 220 MPH SEGMENT

COMMUNICATIONS		
DRAWING TYPE	DRAWING NO.	DRAWING TITLE
DD	DD-CO-G021	TYPICAL CROSS SECTION, SYSTEMS LOW-VOLTAGE, CONDUIT DUCT BANK,
DD	DD-CO-G022	TYPICAL CROSS SECTION, SYSTEMS LOW-VOLTAGE, UNDER TRACK CONDUIT DUCT BANK, AT-GRADE
DD	DD-CO-G023	TYPICAL SYSTEMS LOW-VOLTAGE, UNDERGROUND CONDUIT DUCT BANK INSTALLATIONS, AT TRENCH SECTIONS
DD	DD-CO-G024	TYPICAL SYSTEMS LOW-VOLTAGE, UNDERGROUND CONDUIT DUCT BANK INSTALLATIONS, AT TRENCH SECTIONS

DIRECTIVE DRAWINGS

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY R. MINCIO
DRAWN BY V. HUANTE
CHECKED BY H. NGUYEN
IN CHARGE J. CHIRCO
DATE 03/01/2012



**PARSONS
BRINCKERHOFF**



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
SIERRA SUBDIVISION

DIRECTIVE DRAWINGS
CONTRACT PACKAGE 1
SHEET INDEX

CONTRACT NO.
DRAWING NO. INDEX-1 CP1
SCALE NO SCALE
SHEET NO.

03/08/2012 RFP HSR 11-16

California High-Speed Train Project



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General

CIVIL DIRECTIVE NOTES

A. GENERAL SITE NOTES

1. FIELD VERIFY ALL EXISTING SITE CONDITIONS PRIOR TO THE COMMENCEMENT OF WORK AND REPORT ANY DISCREPANCIES TO THE AUTHORITY'S REPRESENTATIVE.
2. ALL CONSTRUCTION ACTIVITIES AFFECTING THIRD PARTY FACILITIES SHALL BE COORDINATED WITH THE PROPER JURISDICTION AUTHORITY.
3. FOR ABBREVIATIONS, SEE GENERAL DIRECTIVE DRAWINGS.
4. FOR SYMBOLS, SEE GENERAL DIRECTIVE DRAWINGS.
5. "ORIGINAL GROUND" SHOWN ON CROSS SECTIONS REFERS TO THE APPROXIMATE EXISTING GROUND LINE AT THE DESIGNATED CENTERLINE, BASELINE, LAYOUT LINE OR SECTION LINE.
6. ALL WORK SHALL CONFORM TO ALL LOCAL, STATE AND FEDERAL CODES AND ORDINANCES IN EFFECT.
7. PROVIDE AND MAINTAIN PROPER BARRICADES, RAILINGS, GUARDS, FLAGGING, LIGHTING, OR OTHER DEVICES NECESSARY FOR THE PROTECTION OF LIFE AND PROPERTY.
8. VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING MATERIALS.

B. GRADING

1. DO NOT PERFORM ANY GRADING OPERATION SO AS TO CAUSE FALLING ROCKS, SOIL OR DEBRIS IN ANY FORM TO FALL, SLIDE OR FLOW ONTO ADJOINING PROPERTIES, STREETS OR NATURAL WATERCOURSES. SHOULD SUCH VIOLATION OCCUR THE CONTRACTOR MAY BE CITED AND THE CONTRACTOR SHALL IMMEDIATELY MAKE ALL REMEDIAL ACTIONS NECESSARY.
2. KEEP THE PROJECT AREA AND SURROUNDING AREA FREE FROM DUST NUISANCE.
3. PROVISIONS SHALL BE MADE TO PREVENT SURFACE WATERS FROM DAMAGING THE CUT FACE OF AN EXCAVATION OR THE SLOPED SURFACES OF A FILL. FURTHERMORE, PROVISIONS SHALL BE MADE TO PREVENT SEDIMENT-LADEN RUNOFF FROM LEAVING THE SITE.
4. THE LIMITS OF THE AREA TO BE GRADED SHALL BE FLAGGED BEFORE THE COMMENCEMENT OF THE GRADING WORK.
5. ALL GRADING OPERATIONS SHALL BE PERFORMED IN CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE WATER POLLUTION CONTROL AND WATER QUALITY STANDARDS CONTAINED IN THE LATEST CALTRANS STORM WATER QUALITY HANDBOOKS.

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03/08/2012 RFP HSR 11-16

DIRECTIVE DRAWINGS

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
S. MILITELLO
 DRAWN BY
R. MINCIO
 CHECKED BY
H. NGUYEN
 IN CHARGE
J. CHIRCO
 DATE
03/01/2012



CALIFORNIA HIGH-SPEED TRAIN PROJECT
GENERAL DIRECTIVE
 GENERAL DIRECTIVE NOTES
 CIVIL

CONTRACT NO.
DRAWING NO. DD-GE-001
SCALE NO SCALE
SHEET NO.

TRACK DIRECTIVE NOTES

1. THE GENERAL BASIS FOR TRACK STANDARDS AND MATERIALS SHALL BE THE AREMA MANUAL.
2. TRACK AND TRACK COMPONENTS SHALL BE DESIGNED AND FABRICATED TO PERFORM UNDER THE PREVAILING AND EXTREME CLIMATIC AND ENVIRONMENTAL CONDITIONS OCCURRING WITHIN THE GEOGRAPHIC EXTENT OF THE SYSTEM.
3. THE PROFILE GRADE LINE IS CARRIED ON THE TOP OF LOW RAIL THROUGH HORIZONTAL CURVES AND SPIRALS FOR THE DESIGNATED TRACK.
4. THE LENGTHS OF TRACK IS BASED ON CENTER OF TRACK ALIGNMENT.
5. UNLESS SEPARATE TRACK PROFILES ARE GIVEN, TRACK PARALLEL TO THE DESIGNATED TRACK ARE AT THE SAME TOP OF RAIL ELEVATIONS PROJECTED ON EITHER PERPENDICULAR OR RADIAL LINES FROM THE DESIGNATED TRACK CENTERLINES.
6. BALLASTED TRACKS ARE GENERALLY PREFERRED FOR YARD TRACKS. DESIGNERS SHALL FOLLOW THE REQUIREMENTS ASSOCIATED WITH CONSTRUCTION OF BALLASTED TRACK IN THE CALIFORNIA HIGH SPEED TRAIN DESIGN MANUAL.

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03/08/2012 RFP HSR 11-16

DIRECTIVE DRAWINGS

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
S. MILITELLO
 DRAWN BY
R. MINCIO
 CHECKED BY
H. NGUYEN
 IN CHARGE
J. CHIRCO
 DATE
03/01/2012



CALIFORNIA HIGH-SPEED TRAIN PROJECT
GENERAL DIRECTIVE

 GENERAL DIRECTIVE NOTES
 TRACK

CONTRACT NO.
DRAWING NO. DD-GE-002
SCALE NO SCALE
SHEET NO.

STRUCTURAL DIRECTIVE NOTES:

A. SPECIFICATIONS FOR DESIGN AND CONSTRUCTION

1. CONSTRUCTION SPECIFICATION SHALL BE THE DESIGN-BUILD STANDARD SPECIFICATION, CALIFORNIA HIGH SPEED TRAIN.
2. THE STRUCTURAL DESIGN OF STRUCTURES SUPPORTING HIGH SPEED TRAINS SHALL BE BASED ON THE REQUIREMENTS OF THE CALIFORNIA HIGH SPEED TRAIN AUTHORITY.
3. DESIGN CRITERIA FOR HIGHWAY BRIDGES SHALL BE THE CALIFORNIA BRIDGE DESIGN SPECIFICATION. FOR HIGHWAY BRIDGES PASSING OVER THE HIGH SPEED TRAIN THE BRIDGE DESIGN SPECIFICATION SHALL BE SUPPLEMENTED BY THE CALIFORNIA HIGH SPEED TRAIN REQUIREMENTS FOR SEISMIC DESIGN.
4. DESIGN CRITERIA FOR RAILROAD STRUCTURES NOT SUPPORTING HIGH SPEED TRAINS SHALL BE THE AMERICAN RAILWAY ENGINEERING AND MAINTENANCE-OF-WAY ASSOCIATION (AREMA) MANUAL FOR RAILWAY ENGINEERING (APRIL 2008). FOR RAILROAD BRIDGES PASSING OVER THE HIGH SPEED TRAIN THE BRIDGE DESIGN SPECIFICATION SHALL BE SUPPLEMENTED BY THE CALIFORNIA HIGH SPEED TRAIN REQUIREMENTS FOR SEISMIC DESIGN.

B. DESIGN METHOD

1. DESIGN SHALL BE PERFORMED TO THE LOAD AND RESISTANCE FACTOR (LRFD) DESIGN METHOD.
2. THE DESIGN OF PRESTRESSING AND PARTIAL PRESTRESSING SHALL CONFORM TO THE REQUIREMENTS OF SUBSECTION 5.9 OF AASHTO LRFD WITH CALTRANS AMENDMENTS WITH THE FOLLOWING EXCEPTION: NET TENSION STRESSES ARE NOT ALLOWED IN THE PRECOMPRESSED TENSILE ZONE AFTER ALL LOSSES HAVE OCCURRED.

C. GENERAL

1. FOR ACRONYMS AND ABBREVIATIONS SEE DRAWING DD-GE-100 THROUGH DD-GE-104.
2. ALL STRUCTURAL DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE SPECIFICATIONS AND ALL OTHER DRAWINGS RELATED TO THE WORK.
3. EMBEDDED ITEMS SUCH AS PIPES, INSERTS, SLEEVES AND CONDUITS, AND ANY RECESSES, NICHE OR OPENINGS REQUIRED FOR UTILITY, ARCHITECTURAL, MECHANICAL AND ELECTRICAL INSTALLATIONS ARE NOT SHOWN ON THE STRUCTURAL DRAWINGS. CONTRACTOR SHALL REFER TO THE UTILITY, ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS FOR THE LOCATIONS AND DETAILS OF THESE ITEMS. CONTRACTOR SHALL REVIEW AND APPROVE ALL PENETRATIONS PRIOR TO CONSTRUCTION. PENETRATIONS WHICH LOCAL THICKENING OF CONCRETE OR STEEL MEMBERS AND /OR SUPPLEMENTAL REINFORCING SHALL BE SHOWN ON THE STRUCTURAL DRAWINGS.
4. THE VERTICAL CONTROL OF ALL TRACK STRUCTURES IS BASED ON THE TOP OF LOW RAIL ELEVATION IN SUPERELEVATED STRUCTURES.

5. CONTRACTORS ATTENTION IS DIRECTED TO THE AREAS OF SAG VERTICAL CURVES. IN SUCH AREAS CAUTION SHOULD BE EXERCISED THAT THE DIMENSION TO THE INVERT OF CONCRETE OF GUIDEWAY IS NEVER LESS THAN THAT SHOWN FOR INVERT DETAILS.

7. ALL CONSTRUCTION JOINTS IN EARTH RETAINING STRUCTURES AND IN STRUCTURES BELOW THE FINISH GRADE SHALL CONTAIN CONTINUOUS WATERSTOPS, AND SHALL HAVE REINFORCEMENT CONTINUOUS ACROSS ALL JOINTS. HYDROSWELLING STRIPS SHALL BE INSTALLED ON ALL JOINT SURFACES WHICH WILL BE EXPOSED TO EARTH.

8. ALL WATERSTOPS SHALL BE INSTALLED SECURELY IN ACCORDANCE WITH THE SPECIFICATIONS. THE WATERSTOPS SHALL BE PLACED CONTINUOUSLY THROUGHOUT THE LENGTH OF THE CONSTRUCTION JOINT. LAPPING OF WATERSTOPS SHALL NOT BE PERMITTED. SPlicing SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.

9. UNLESS INDICATED OTHERWISE, CONCRETE SURFACES LEADING TO DRAINS SHALL BE SLOPED A MINIMUM OF 1/8 INCH PER FOOT TOWARD THE DRAIN AND THE ADJACENT SURFACES WARPED AS REQUIRED TO SATISFY AN ADEQUATE DRAINAGE FLOW.

D. MATERIAL PROPERTIES

1. CONCRETE 28 DAY COMPRESSIVE STRENGTH (MINIMUM)
 - a) DRILLED SHAFTS: $f'c=4,000$ PSI
 - b) PRECAST-PRESTRESSED PILES: $f'c=6,000$ PSI
 - c) FORMED CAST-IN-PLACE STRUCTURAL CONCRETE: $f'c=5,000$ PSI
 - d) PRECAST GIRDERS OR SEGMENTS OF GIRDERS: $f'c=6,000$ PSI
 - e) UNLESS NOTED OTHERWISE ON THE DRAWINGS, OR SPECIFIED, MINIMUM STRUCTURAL CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 4,000 PSI.
 - f) ALL EXPOSED CONCRETE EDGES AND CORNERS SHALL BE CHAMFERED WITH A 3/4 INCH, 45 DEGREE CHAMFER UNLESS NOTED OTHERWISE.
2. REINFORCING STEEL SHALL CONFORM TO THE SPECIFICATIONS OF ASTM A 706 GRADE 60.
3. PRESTRESSING STEEL
 - a) STRAND: ASTM A416/AASHTO M203, GRADE 270, LOW RELAXATION
 FRICTION COEFFICIENT: 0.25
 WOBBLE COEFFICIENT: 0.0002 PER FT
 ANCHOR SET: 0.375"
 APPARENT MODULUS: 28,500 KSI
 MINIMUM JACKING STRESS: 216 KSI (80% ULTIMATE)
 MAXIMUM ANCHORING STRESS: 189 KSI (70% ULTIMATE)
 MAXIMUM STRESS AFTER ANCHOR SET: 202 KSI (75% ULTIMATE)
 STRAND DIAMETER: 0.6" (AREA=0.216 SQ IN)

b) POST TENSIONING BARS: ASTM A722/AASHTO M275, GRADE 150, TYPE II
 ANCHOR SET: 0.0625"
 APPARENT MODULUS: 30,000 KSI
 MAXIMUM JACKING STRESS: 113 KSI
 MAXIMUM ANCHORING STRESS: 105 KSI
 MAXIMUM STRESS AFTER LOSSES: 96 KSI

4. STRUCTURAL STEEL SHAPES SHALL CONFORM TO ASTM A6 WITH A YIELD STRENGTH OF $F_y = 50$ KSI UNLESS NOTED OTHERWISE. THE FOLLOWING MATERIAL PROPERTIES SHALL APPLY:

- d) WIDE FLANGE SHAPES: ASTM A992
- b) M-SHAPES, S-SHAPES, HP SHAPES: ASTM A572
- c) ANGLES, CHANNELS: ASTM A572
- d) RECTANGULAR AND SQUARE HSS: ASTM A500 GR B (46 KSI)
- e) ROUND HSS: ASTM A500 GR B (42 KSI)
- f) STEEL PIPE: ASTM A53 GR B (35 KSI)
- g) PLATES, BARS: ASTM A36 (36 KSI)
- h) BOLTS: ASTM A325
- i) NUTS: ASTM A563
- j) WASHERS: ASTM F436

5. STEEL FABRICATIONS

- a) WELDING OF BUILT UP MEMBERS AND STEEL FABRICATIONS SHALL COMPLY WITH AASHTO/AWS D 1.5
- b) WELDING OF HSS SECTIONS AND PIPES SHALL COMPLY WITH AWS D 1.1
- c) MISCELLANEOUS STEEL ITEMS SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION UNLESS COMPLETELY EMBEDDED IN CONCRETE AND UNLESS NOTED OTHERWISE.

6. FASTENERS

- a) ALL HIGH STRENGTH BOLTS NUTS AND WASHERS SHALL BE ZINC COATED
- b) ALL BOLTED CONNECTIONS SHALL COMPLY WITH RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS (RCSC) "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS".
- c) ALL BOLTS ARE ASTM A325 HIGH STRENGTH SLIP CRITICAL WITH THREADS EXCLUDED FROM THE SHEAR PLANE

E. CONCRETE COVER

- UNLESS OTHERWISE NOTED, MINIMUM CONCRETE COVER SHALL BE:
- a) DRILLED SHAFTS: 6"
 - b) PIERS, COLUMNS, WALLS, BENT CAPS: 2"
 - c) FOOTINGS AND CONCRETE CAST AGAINST EARTH: 3"

- d) SUPERSTRUCTURE (CAST-IN-PLACE, PRECAST) TOP OF DECK: 2.5"
- e) SUPERSTRUCTURE (CAST-IN-PLACE, PRECAST) EXTERIOR SURFACES: 2"
- f) SUPERSTRUCTURE (CAST-IN-PLACE, PRECAST) INTERIOR SURFACES: 1.5"
- g) CONCRETE SURFACES NOT EXPOSED TO WEATHER, SOIL OR WATER: PRINCIPAL REINFORCEMENT: 2" STIRRUPS, TIES AND SPIRALS: 1.5"

F. SEISMIC LOADING AND DESIGN

THERE ARE TWO LEVELS OF DESIGN EARTHQUAKES:

1. MAXIMUM CONSIDERED EARTHQUAKE (MCE): GROUND MOTIONS CORRESPONDING TO GREATER OF (1) A PROBABILISTIC SPECTRUM BASED UPON A 10% PROBABILITY OF EXCEEDANCE IN 100 YEARS (i.e., A RETURN PERIOD OF 950 YEARS) AND (2) A DETERMINISTIC SPECTRUM BASED UPON THE LARGEST MEDIAN RESPONSE RESULTING FROM THE MAXIMUM RUPTURE (CORRESPONDING TO M_w) OF ANY FAULT IN THE VICINITY OF THE STRUCTURE.
2. OPERATING BASIS EARTHQUAKE (OBE): GROUND MOTIONS CORRESPONDING TO A PROBABILISTIC SPECTRUM BASED UPON AN 86% PROBABILITY OF EXCEEDANCE IN 100 YEARS (i.e., A RETURN PERIOD OF 50 YEARS).

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03/08/2012 RFP HSR 11-16

DIRECTIVE DRAWINGS

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY S. MILITELLO
DRAWN BY R. MINCIO
CHECKED BY H. NGUYEN
IN CHARGE J. CHIRCO
DATE 03/01/2012



CALIFORNIA HIGH-SPEED TRAIN PROJECT
GENERAL DIRECTIVE
 GENERAL DIRECTIVE NOTES
 STRUCTURAL

CONTRACT NO.
DRAWING NO. DD-GE-003
SCALE NO SCALE
SHEET NO.

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AT
ARCHITECTURAL AND ENGINEERING
AT-GRADE
AVERAGE ANNUAL DAILY TRAFFIC
AGGREGATE BASE,
ANCHOR BOLT
ASBESTOS BONDED BITUMINOUS COATED
AIR-BLOWN MORTAR
ABANDON
ABUTMENT
ABOVE
ALTERNATING CURRENT,
ASPHALT CONCRETE
ASPHALT CONCRETE BASE
AD DISTRIBUTION PANEL MAIN BREAKER
ACCESS CONTROL ROOM
ACOUSTICAL
ASBESTOS CEMENT PIPE
ALUMINUM CONDUCTOR STEEL REINFORCED
AREA DRAIN
ADJACENT,
ADJUST,
ADJUSTABLE
ADDED DEAD LOAD
AC DISTRIBUTION PANEL
AVERAGE DAILY TRAFFIC
AERIAL EARTH (GROUND) CONDUCTOR
AUTOMATED EXTERNAL DEFIBRILLATOR
AUTOMATIC FARE COLLECTION
ALTERNATIVE FLARED END SECTION
AERIAL GROUND WIRE
AHEAD
ALUMINUM
ALIGNMENT
ALTERNATE
TIME FROM MIDNIGHT TO NOON
ANCHOR
ANNUNCIATOR
AMBIENT NOISE SENSOR
ALTERNATIVE PIPE
ALTERNATIVE PIPE CULVERT
AREA OF POTENTIAL EFFECTS
ALQUIST-PRIOLO EARTHQUAKE FAULT ZONE
APPLICATION PROGRAMMING INTERFACE
APPROXIMATE
ALTERNATIVE PIPE UNDERDRAIN
ACCESS RESTRICTION
ARCHITECTURAL
ACCELERATION RESPONSE SPECTRUM
AGGREGATE SUBBASE
ASPHALT
ALUMINUM SPIRAL RIB PIPE
ASSEMBLY
AUTOTRANSFORMER,
AUTOMATIC TENSION
AUTOMATIC TRAIN CONTROL
ADMINISTRATIVE TELEPHONE
ALONG TRACK MOVEMENT
AUTOMATIC TRAIN OPERATION
AUTOMATIC TRAIN PROTECTION
ASPHALT TREATED PERMEABLE BASE
ASPHALT TREATED PERMEABLE MATERIAL
ABOVE TOP OF RAIL
AUTOMATIC TRAIN SUPERVISION,
AUTOTENSIONED SYSTEM
AUXILIARY
AVENUE
AVERAGE
AUTOMATIC VEHICLE LOCATION
AMERICAN WIRE GAUGE
AMERICAN WELDING SOCIETY

B

B/SPAN
BAGR
BAR
BAT
BB
B-B
BC

BODY SPAN
BRIDGE APPROACH GUARD RAILING
BARRIER
BATTERY
BEGINNING OF BRIDGE
BACK-TO-BACK
BOLT CIRCLE

BCR
BD
BDA
BDD
BDP
BDS
BEC
BEG
BFA
BIL
BITUM
BK
BKF
BKR
BL
BLDG
BLKG
BLM
BLST
BLVD
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BND
BOC
BOCC
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BOW
BR
BRG
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BRT
BS
BSC
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BTM
BTS
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BWLAN
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BEGIN CURB RETURN
BOARD
BI-DIRECTIONAL AMPLIFIER,
BRIDGE DESIGN AIDS (CALTRANS)
BRIDGE DESIGN DETAILS (CALTRANS)
BRIDGE DESIGN PRACTICE (CALTRANS)
BRIDGE DESIGN SPECIFICATIONS (CALTRANS)
BURIED EARTH (GROUND) CONDUCTOR
BEGIN
BY PASS FEEDER ANCHOR
BASIC IMPULSE INSULATION LEVEL
BITUMINOUS
BACK
BACKFILL
BREAKER
BASE LINE
BUILDING
BLOCKING
BRIDGE-LOG MILE
BALLAST
BOULEVARD
BEAM,
BENCH MARK
BACKBONE NETWORK
BOUND
BOTTOM OF CURB
BACK-UP OPERATIONAL CONTROL CENTER
BOTTOM OF SLOPE
BOTTOM
BOTTOM OF WALL
BRIDGE
BEARING
BRACKET
BROADBAND RADIO SYSTEM
BUS RAPID TRANSIT
BODY SPAN WIRE
BASE STATION CONTROLLER
BUS TIE
BOTTOM
BASE TRANSCIEVER STATION
BRITISH THERMAL UNIT
BETWEEN
BARBED WIRE,
BALANCE WEIGHT
BALANCE WEIGHT ANCHOR
BROADBAND WIRELESS LOCAL AREA NETWORK
BRONZE

C

C
CA
CAA
CAB
CADD
CAH
CAI
CALP
CANT
CAP
CAPA
CAS
CAT
CATF
CATP
CB
CBC
CBDM
CBTC
CBW

CLOSE,
CONTACT,
CONTROL
CERTIFICATION ACCEPTANCE
CABLE ANCHOR ASSEMBLY
CABINET
COMPUTER-AIDED DESIGN AND DRAFTING
CONTROLLED ACCESS HIGHWAY
CUSTOMER ASSISTANCE INTERCOM
CORRUGATED ALUMINUM PIPE
CANTILEVER
CAPACITY,
CAPACITOR,
CORRUGATED ALUMINUM PIPE
CORRUGATED ALUMINUM PIPE ARCH
CONSTRUCTION AREA SIGN
CATEGORY,
CATEGORY SPECIFICATION FOR
TWISTED PAIR CABLING,
CATENARY
CATENARY FOUNDATION
CATENARY POLE
CATCH BASIN,
CIRCUIT BREAKER
CONCRETE BARRIER
CALIFORNIA BUILDING CODE
CALIFORNIA DEPARTMENT OF TRANSPORTATION -
BRIDGE DESIGN MANUAL
COMMUNICATIONS BASED TRAIN CONTROL
CONCRETE BLOCK WALL

C-C
CCF
CCO
CCR
CCS
CCTV
CCVT
CDC
CEC
CEG
CEM
CER
CFR
C&G
CG
CGS
CHNL
CI
CIC
CIDH
CIF
CIP
C-I-P
CIPCP
CIS
CISS
CJ
CJP
CKT
CL
CL2
CL-6
CLG
CLK
CLKG
CLO
CLR
CM
CMP
CMU
CNTR
CO
COL
COMM
CONC
COND
CONN
CONST
CONT
CONTR
COORD
CORR
CP
CPH
CPT
CPU
CR
CRC
CRCP
CRSP
CRZ
CS
CSA
CSP
CSPA
CT
CTB
CTD
CTPB
CTPM
CTR
CTS
CTSK
CTVT

CENTER LINE TO CENTER LINE
CENTRAL CONTROL FACILITY
CONTRACT CHANGE ORDER
CALIFORNIA CODE OF REGULATIONS
CALIFORNIA COORDINATE SYSTEM
CLOSED CIRCUIT TELEVISION
COUPLING CAPACITOR VOLTAGE TRANSFORMER
CALIFORNIA HIGH-SPEED TRAIN DESIGN CRITERIA
CALIFORNIA ELECTRIC CODE
CERTIFIED ENGINEERING GEOLOGIST
CEMENT
COMMUNICATIONS EQUIPMENT ROOM
CODE OF FEDERAL REGULATIONS
CURB & GUTTER
CENTER OF GRAVITY
CALIFORNIA GEOLOGICAL SURVEY
CHANNEL
CAST IRON
COMMUNICATIONS INTERFACE CABINET
CAST-IN-DRILLED-HOLE
COMMON INTERMEDIATE FORMAT
CAST IRON PIPE
CAST-IN-PLACE
CAST-IN-PLACE CONCRETE PIPE
CUSTOMER INFORMATION SIGN
CAST-IN-STEEL-SHELL
CONSTRUCTION JOINT
COMPLETE JOINT PENETRATION
CIRCUIT
CLASS
CLASS 2
CHAIN LINK FENCE (6 FT)
CEILING
CHAIN LINK
CAULKING
CLOSET
CLEAR,
CLEARANCE
CONTROL MODULE,
CORRUGATED METAL
CORRUGATED METAL PIPE
CONCRETE MASONRY UNIT
COUNTER
CLEANOUT,
COUNTY
COLUMN
COMMUNICATIONS
CONCRETE
CONDUIT
CONNECTOR,
CONNECTION
CONSTRUCT,
CONSTRUCTION
CONTINUOUS,
CONTINUATION
CONTRACTOR
COORDINATE
CORRIDOR
CONTROL POINT
CALIFORNIA PERMIT HANDBOOK
CONE PENETRATION TEST,
CONTROL POWER TRANSFORMER
CENTRAL PROCESSING UNIT
CREEK,
CONDUIT RISER
COMBINED RELAY AND CONTROL PANEL
CONTINUOUS REINFORCED CONCRETE PAVEMENT
CONCRETED ROCK SLOPE PROTECTION
CLEAR RECOVERY ZONE
CONTROL SWITCH
CONSTRUCTION STAGING AREA
CORRUGATED STEEL PIPE
CORRUGATED STEEL PIPE ARCH
CERAMIC TILE,
COURT,
CURRENT TRANSFORMER/TRANSDUCER
CEMENT TREATED BASE
COATED
CEMENT TREATED PERMEABLE BASE
CEMENT TREATED PERMEABLE MATERIAL
CENTER
COMMUNICATIONS TRANSMISSION SYSTEM
COUNTERSUNK
COMBINED CURRENT TRANSFORMER AND
VOLTAGE TRANSFORMER

CTW
CU
CULV
CV
CVR
CW
CWA
CWH
CWR
CWT
D
DB
DBE
DBL
DC
DCMB
DCP
DD
DE
DEL
DEMO
DEPT
DET
DF
DGA
DHV
DI
DIAG
DIAPH
DIFF
DIM
DIN
DIR
DISC
DISP
DIST
DISTR
DST
DMBB
DN
DNS
DO
DPDT
DR
DS
DSC
DSCW
DSG
DSHA
DST
DTBB
DTM
DTX
DVR
DWG
DWY
DXO

D

DEPTH
DESIGN-BUILD
DESIGN BASIS EARTHQUAKE
DOUBLE
DIRECT CURRENT
Dc DISTRIBUTION PANEL MAIN BREAKER
Dc DISTRIBUTION PANEL
DOWNDRAIN,
DEVICE DRIVER
DEAD END
DELINEATOR
DEMOLISH
DEPARTMENT
DETOUR
DIRECT FIXATION,
DRINKING FOUNTAIN
DOWN GUY ANCHOR
DESIGN HOURLY VOLUME
DRAINAGE INLET
DIAGONAL
DIAPHRAGM
DIFFERENTIAL
DIMENSION
DROP INLET
DIRECTION
DISCONNECT
DISPENSER
DISTANCE
DISTRIBUTION
DISTRICT
DOUBLE METAL BEAM BARRIER
DOWN
DOMAIN NAME SYSTEM
DOOR OPENING
DOUBLE-POLE DOUBLE-THROW
DRIVE
DOWNSPOUT,
DISCONNECT SWITCH
DIFFERING SITE CONDITIONS
DIRECT SUSPENSION CONTACT WIRE
DISCONNECT SWITCH GROUP
DETERMINISTIC SEISMIC HAZARD ANALYSIS
DISTRICT
DOUBLE THRIE BEAM BARRIER
DIGITAL TERRAIN MODEL
DOWNTOWN EXTENSION (CALTRAIN)
DIGITAL VIDEO RECORDERS
DRAWING
DRIVEWAY
DOUBLE CROSSOVER

E

E
EA
EB
EC
ECR
EE
EF
EGS
EHS
EI

DIRECTIVE DRAWINGS

2/29/2012 11:07:31 AM CAHSRP.TBL CHSR_half_black.plt T:\13259B Calif High Speed Rail\CAADD\Directive Drawings\General DD\DD-GE-100.dgn

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY R. MINCIO
DRAWN BY V. HUANTE
CHECKED BY S. MILITELLO
IN CHARGE J. CHIRCO
DATE 03/01/2012



CALIFORNIA HIGH-SPEED TRAIN PROJECT DIRECTIVE DRAWING

ACRONYMS AND ABBREVIATIONS 1

CONTRACT NO.
DRAWING NO. DD-GE-100
SCALE NO SCALE
SHEET NO.

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E CONTINUED

EIRENE EUROPEAN INTEGRATED RADIO ENHANCED NETWORK
 EJ EXPANSION JOINT
 E-LAN ETHERNET LAN
 ELAST ELASTOMERIC
 ELEC ELECTRICAL,
 ELECTRIC,
 ELECTRIC
 ELECTROLIER
 ELEV ELEVATION
 ELOCK ELECTRONIC LOCK
 EMB EMBANKMENT
 EMC ELECTROMAGNETIC COMPATIBILITY
 EMER EMERGENCY
 EMF ELECTROMAGNETIC FIELD
 EMI ELECTRO MAGNETIC INTERFERENCE
 EMS ELEMENT MANAGEMENT SYSTEM
 EMU ELECTRIC MULTIPLE UNIT
 ENCL ENCLOSURE
 ENGR ENGINEER,
 ENGINEERING
 END OF BRIDGE
 EOB EDGE OF DECK
 EOD EDGE OF DECK
 EOS ELECTRICAL OPERATED SWITCH
 EOW END OF WALL
 EP EDGE OF PAVEMENT
 EPBM EARTH PRESSURE BALANCING MACHINE
 EPR ETHYLENE PROPYLENE RUBBER
 EQ EQUAL,
 EQUILATERAL
 EQN EQUATION
 EQUIP EQUIPMENT
 ERTMS EUROPEAN RAIL TRAFFIC MANAGEMENT SYSTEM
 ES EDGE OF SHOULDER,
 EXTRA STRENGTH,
 ELECTRICAL SECTION
 ENVIRONMENTALLY SENSITIVE AREA
 ESA ESCALATOR
 ESC EMERGENCY SHOWER / EYE WASH
 ESEW EASEMENT
 ESMT EUROPEAN TRAIN CONTROL SYSTEM
 ETCS EMERGENCY TELEPHONE
 ETEL EMERGENCY TRIP SYSTEM
 ETS EDGE OF TRAVELED WAY
 ETW UNBALANCED SUPERELEVATION
 EU EACH WAY,
 EW ENDWALL
 EXC EXCAVATION
 EXIST EXISTING
 EXP EXPANSION
 EXWY EXPRESSWAY
 EXPO EXPOSED
 EXT EXTERIOR

F

F/F FACE TO FACE
 F&C FRAME AND COVER
 F&G FRAME AND GRATE
 FA FIRE ALARM
 FACP FIRE ALARM CONTROL PANEL
 FAS FIRE ALARM SYSTEM
 FB FLAT BAR,
 FLOOR BEAM,
 FEEDER BREAKER
 FBO FURNISHED BY OTHERS
 FC FARE COLLECTION
 FD FLOOR DRAIN
 FDC FIRE DEPARTMENT CONNECTION
 FDN FOUNDATION
 FDP FIBER DISTRIBUTION PANEL
 FDU FIBER DISTRIBUTION UNIT
 FDR FEEDER
 FE FIRE EXTINGUISHER
 FES FLARED END SECTION
 FF FILTER FABRIC
 FFJ FULL FEEDING JUMPER
 FG FINISHED GRADE
 FH FIRE HYDRANT
 FHC FIRE HOSE CABINET
 FID FIRE INITIATING DEVICE
 FIG FIGURE
 FIN FINISH
 FIRM FLOOD INSURANCE RATE MAPS
 FJ FEEDER JUMPER
 FL FLOW LINE

F CONTINUED

FLB FLOOR BEAM
 FLH FLAT HEAD
 FLR FLOOR
 FNA FIRE NOTIFICATION APPLIANCE
 FO FIBER OPTIC
 FOC FIBER OPTIC CABLE,
 FACE OF CURB
 FOCN FIBER OPTIC CABLING NETWORK
 FOE FACE OF CONCRETE
 FOF FACE OF FINISH
 FOP FACE OF POLE
 FOS FACE OF STUDS,
 FACTOR OF SAFETY
 FP FULL PENETRATION
 FPLM FULL SPAN PRECAST LAUNCHING
 FPRF FIREPROOF
 FPS FRAMES PER SECOND
 FR FRAME
 FS FINISHED SURFACE
 FTEL FIRE TELEPHONE
 FTG FOOTING
 FTP FILE TRANSFER PROTOCOL
 FTW FIXED END TAIL WIRE
 FUT FUTURE
 FW FEEDER WIRE
 FWY FREEWAY

G

G1 ENTRANCE GRADE
 G2 EXIT GRADE
 G/L GROUND LINE
 GALV GALVANIZED
 GBR GEOTECHNICAL BASELINE REPORT
 GBR-B GEOTECHNICAL BASELINE REPORT FOR
 BIDDING
 GBR-C GEOTECHNICAL BASELINE REPORT FOR
 CONSTRUCTION
 GCL GRADING CONTROL LINE
 GD GRADE
 GDR GEOTECHNICAL DATA REPORT
 GHS GALVANIZED HIGH STRENGTH
 GIGE GIGABIT ETHERNET
 GIS GAS INSULATED SWITCH,
 GEOGRAPHIC INFORMATION SYSTEM
 GL GLASS
 GMA GROUND MOTION ANALYSIS
 GND GROUND
 GO-95 PUC GENERAL ORDER 95
 GP GRADING PLANE
 GPS GLOBAL POSITIONING SYSTEM
 GR GUARDRAIL,
 GROUND ROD
 GRP GLASS REINFORCED PLASTIC ROD
 GRS GALVANIZED RIGID STEEL
 GRX GRADE CROSSING
 GSHA GEOLOGIC AND SEISMIC HAZARDS
 ANALYSIS
 GSP GALVANIZED STEEL PIPE
 GT GENERAL INFORMATION
 GTGM GEOTECHNICAL TECHNICAL GUIDANCE
 MANUAL (FHWA)
 GUTTER
 GUY WIRE
 GYP GYPSUM
 GYPBD GYPSUM BOARD

H

H/SPAN HEADSPAN
 HAZ HAZARDOUS
 HB HARDNESS BRINELL,
 HOSE BIBB
 HC HANDICAP
 HD HARD DRAWN,
 HORIZONTAL DRAIN
 HDG HOT DIP GALVANIZED
 HDPE HIGH DENSITY POLYETHYLENE
 HDWE HARDWARE
 HDWL HEADWALL
 HEX HEXAGONAL
 HH HANDHOLE,
 HEAD HARDENED
 HI HIGH

H CONTINUED

HI-RAIL HIGHWAY TO RAILROAD VEHICLE
 HM HOLLOW METAL
 HMA HOT MIXED ASPHALT
 HMI HUMAN MACHINE INTERFACE
 HOR HORIZONTAL
 HO HAND OPERATED
 HOV HIGH-OCCUPANCY VEHICLE
 HP HIGH POINT,
 HINGE POINT
 HP&R HIGHWAY PLANTING AND RESTORATION
 HPS HIGH PERFORMANCE STEEL
 HR HANDRAIL,
 HRL HIGH RAIL LEVEL
 HS HIGH STRENGTH
 HSR HIGH-SPEED RAIL
 HST HIGH-SPEED TRAIN
 HT HIGH TEMPERATURE
 HTR HEATER
 HV HIGH VOLTAGE
 HVAC HEATING VENTILATION AND AIR CONDITIONING
 HW HIGH WATER
 HWM HIGH WATER MARK
 HWY HIGHWAY

I

I/O INPUT/OUTPUT
 IB IMPEDANCE BOND
 IBC INTERNATIONAL BUILDING CODE
 IF INSIDE FACE
 IIMP INTEGRATED INFORMATION MANAGEMENT PLATFORM
 IJ INSULATED JOINT
 IJP INSULATED JOINT PLUG
 INSUL INSULATION
 INSR INSULATOR
 INST INSTANTANEOUS
 INT INTERIOR
 Inter-LATA INTER-LOCAL ACCESS AND TRANSPORT
 AREA
 INV INVERT
 IR INSIDE RADIUS
 IRR IN-RUNNING
 IRRIGATION
 I&S IRON AND STEEL
 I/S IN-SPAN
 I/SJ IN-SPAN JUMPER

H

J JUMPER
 JAN JANITOR
 JB JUNCTION BOX
 JCT JUNCTION
 JP JOINT POLE
 JT(S) JOINT(S)

L

LA LANDSCAPE ARCHITECT,
 LIGHTNING ARRESTER
 LAM LAMINATE
 LAN LOCAL AREA NETWORK
 LAT LATITUDE
 LAUS LOS ANGELES UNION STATION
 LAV LAVATORY
 LC LANDSCAPE CONTRACTOR
 LCB LEAN CONCRETE BASE
 LCX LOWER-LEVEL DESIGN BASIS EARTHQUAKE
 LDBE LEAKY COAXIAL RADIO CABLE
 LED LIGHT EMITTING DIODE
 LF LINEAR FEET
 LG LONG
 LGT LIGHT,
 LIGHTING
 LH LEFT-HAND
 LKR LOCKER
 LL LIGHT LOADING
 LLT LAST LONG TIE
 LN LANE
 LO LOCKOUT

L CONTINUED

LOC LOCATION
 LOL LAYOUT LINE
 LONG LONGITUDE,
 LONGITUDINAL
 LOS LEVEL OF SERVICE
 LOTB LOGS OF TEST BORINGS
 LP LOW POINT,
 LOW PROFILE
 LPL LIGHT POLE
 LR LOW RAIL
 LRFD LOAD AND RESISTANCE FACTOR DESIGN
 LRT LIGHT RAIL TRANSIT
 LRV LIGHT RAIL VEHICLE
 LS LANDSCAPING,
 LUMP SUM
 LT LEFT
 LV LOW VOLTAGE
 LVL LEVEL
 LWP LOWER WORKING POINT
 LVT LOW VIBRATION TRACK

M

M MEDIUM LOADING
 M.DET MOTION DETECTION
 MAINT MAINTENANCE
 MAT MATERIAL
 MAX MAXIMUM
 MB METAL BEAM
 MBB METAL BEAM BARRIER
 MBGR METAL BEAM GUARD RAILING
 MCC MAINTENANCE CONTROL CENTER
 MCE MAXIMUM CONSIDERED EARTHQUAKE
 MCR MASTER CONTROL ROOM
 MDS MOBILE DATA SYSTEM
 MECH MECHANICAL
 MED MEDIAN
 MEM MEMBRANE
 MESSGR MESSENGER WIRE
 MET METAL
 MFR MANUFACTURER
 MH MANHOLE
 MHHW MEAN HIGHEST HIGH WATER
 MI MILD IRON
 MIN MINIMUM
 MISC MISCELLANEOUS
 MKR MARKER
 ML MAIN LINE
 MLLW MEAN LOWER LOW WATER
 MMSIS MAINTENANCE MANAGEMENT INFORMATION SYSTEM
 MO MASONRY OPENING
 MOC MOTOR OPERATED CONTRACTOR
 MOD MODIFIED,
 MODIFY
 MODC MOTOR OPERATED DISCONNECT SWITCH
 MOE MAINTENANCE OF EQUIPMENT
 MOI MAINTENANCE OF INFRASTRUCTURE
 MON MONUMENT
 MOP MOTOR OPERATED
 MOS MANUALLY OPERATED SWITCH
 MOV METAL-OXIDE VARISTOR
 MOW MAINTENANCE OF WAY
 MP MILEPOST
 MPA MIDPOINT ANCHOR
 MPLS MULTI-PROTOCOL LABEL SWITCHING
 MR MOVEMENT RATING
 MSE MECHANICALLY STABILIZED EMBANKMENT
 MSF MAINTENANCE AND STORAGE FACILITY
 MSL MEAN SEA LEVEL
 MT-1 CALTRAIN MAINLINE TRACK
 MT-2 CALTRAIN MAINLINE TRACK
 MTD MEMO TO DESIGNERS (CALTRANS),
 MOUNTED
 MUL MULLION
 MUTCD MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES
 MVC MINIMUM VERTICLE CLEARANCE
 MW MESSENGER WIRE

DIRECTIVE DRAWINGS

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03/08/2012 RFP HSR 11-16

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
R. MINCIO
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V. HUANTE
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S. MILITELLO
 IN CHARGE
J. CHIRCO
 DATE
03/01/2012



**CALIFORNIA HIGH-SPEED TRAIN PROJECT
 DIRECTIVE DRAWING**

ACRONYMS AND ABBREVIATIONS 2

CONTRACT NO.
DRAWING NO. DD-GE-101
SCALE NO SCALE
SHEET NO.

N

P CONTINUED

R CONTINUED

S

N NORTH,
NEW
N/A NOT APPLICABLE
NAAQS NATIONAL AMBIENT AIR QUALITY STANDARDS
NAC NOISE ABATEMENT CRITERIA
NAVD NORTH AMERICAN VERTICAL DATUM
NB NORTHBOUND
NBR NONBRIDGING
NBSSR NOISE BARRIER SCOPE SUMMARY REPORT
NC NORMALLY CLOSED
NCL NO COLLAPSE PERFORMANCE LEVEL
NDP NONLINEAR DYNAMIC PROCEDURE
NEC NATIONAL ELECTRICAL CODE
NEG NEGATIVE
NESC NATIONAL ELECTRICAL SAFETY CODE
NEUT NEUTRAL
NF NEGATIVE FEEDER,
NEAR FACE
NFPA NATIONAL FIRE PROTECTION ASSOCIATION
NGVD NATIONAL GEODETIC VERTICAL DATUM
NIC NOT IN CONTRACT
NMS NETWORK MANAGEMENT SYSTEM
NO. NUMBER
NO NORMALLY OPEN
NOM NOMINAL
NP NETWORK PORT
NPRM NOTICE OF PROPOSED RULE MAKING
NPS NOMINAL PIPE SIZE
NR NOT REGISTERED
NS NOT SUPPORTED
NSR NOT SUPPORTED OR REGISTERED
NT NETWORK
NTP NETWORK TIME PROTOCOL,
NOTICE TO PROCEED
NTS NETWORK TIME SERVER,
NOT TO SCALE

PF POWER FACTOR
PFDHA PROBABILISTIC FAULT DISPLACEMENT
PG HAZARD ANALYSIS
PH PROFILE GRADE
PHF PHASE
PID POTHOLE
PJP PASSENGER INFORMATION DISPLAY
PL POINT OF INTERSECTION TURNOUT
PLM PARTIAL JOINT PENETRATION
PLAS PLATE
PLAS PLASTIC LAMINATE
PLC PLASTER
PLYWD PROGRAMMABLE LOGIC CONTROLLER
PM PLYWOOD
PMS POST MILE,
TIME FROM NOON TO MIDNIGHT
PN PAVEMENT MANAGEMENT SYSTEM
PNL PAVING NOTCH
PNT PANEL
PO POINT
POC PULL OFF
POE POINT OF CONNECTION
POS POSITIVE
POTS PLAIN ORDINARY TELEPHONE SERVICE
PP PLASTIC PIPE,
POWER POLE
PPL PREFORMED PERMEABLE LINER
PPP PERFORATED PLASTIC PIPE
PR PAIR
PRI PRIMARY RATE INTERFACE (ISDN SERVICE)
PROP PROPOSED
PS PARALLELING STATION,
PRESTRESSED
PSP PERFORATED STEEL PIPE,
PRODUCT SAFETY PLAN
PSTN PUBLIC SWITCHING TELEPHONE NETWORK
PSTTWS PUBLIC SAFETY TRENCH AND
TUNNEL WIRELESS SYSTEM

RECT RECTANGULAR
RE RUNNING EDGE OF RAIL
REF REFERENCE
REINF REINFORCED,
REINFORCEMENT,
REINFORCING
REL RELOCATE,
RELOCATED
REPL REPLACEMENT
REQD REQUIRED
RESIL RESILIENT
RET RETAINING
REV REVISED,
REVISION
RF RADIO FREQUENCY
RFI REQUEST FOR INFORMATION
RGS RIGID GALVANIZED STEEL
RH RIGHT-HAND
R-M ROAD-MIXED
RM RESTRICTED MANUAL,
ROOM
RO ROUGH OPENING
RP RADIUS POINT,
REFERENCE POINT
RR RAILROAD,
RRR RUNNING RAIL
RRR RESTURFACING,
RESTORATION,
REHABILITATION (3R)
RRS RESURFACING,
RESTORATION,
REHABILITATION, (4R)
RRX RAILROAD GRADE CROSSING
RSIA RAIL SAFETY IMPROVEMENT ACT (2008)
RSP ROCK SLOPE PROTECTION
RT RESILIENT TILE,
RIGHT
RTE ROUTE
RTU REMOTE TERMINAL UNIT
RW RETAINING WALL
RWL RAIN WATER LEADER
RWY RAILWAY

SIG SIGNAL
SIM SIMILAR
SLAN PASSENGER STATION LOCAL AREA NETWORK
SM SELECTED MATERIAL
SMF SOLID MANGANESE FROG,
SINGLE MODE FIBER
SND SANITARY NAPKIN DISPENSER
SNF SWING NOSE FROG
SNR SANITARY NAPKIN RECEPTACLE
SNTP SIMPLE NETWORK TIME PROTOCOL
SP SPARE
SPC SPECIAL
SPEC SPECIFICATION
SPKR SPEAKER
SPL SAFETY PERFORMANCE LEVEL
SPS SMALL PART STEELWORK
SPST SINGLE POLE SINGLE THROW
SPT STANDARD PENETRATION TEST
SOP SETOUT POINT
SQ SQUARE
SR SYSTEM REQUIREMENT,
STATE ROUTE
SRRA SAFETY ROADSIDE REST AREA
SRSS SQUARE ROOT OF SUM OF SQUARES
S/SPAN STEADY SPAN
SS SLOPE STAKE,
SUB STATION
SSK SERVICE SINK
SSCOM SEISMIC SAFETY COMMISSION,
SSI SOIL STRUCTURE INTERACTION
SSPA STRUCTURAL STEEL PLATE ARCH
SSPP STRUCTURAL STEEL PLATE PIPE
SSPPA STRUCTURAL STEEL PLATE PIPE ARCH
SSRP STEEL SPIRAL RIB PIPE
SST STAINLESS STEEL
SSW STEADY SPAN WIRE
SSWR SANITARY SEWER
S4S SURFACE 4 SIDES
ST STREET
STA STATION,
STATIONING
STBB SINGLE THRIE BEAM BARRIER
STD STANDARD
STC SINGLE TRACK CANTILEVER
STIFF STIFFENER
STL STEEL
STOR STORAGE
STP SHIELDED TWISTED PAIR CABLE
STR STRUCTURAL,
STRUCTURE
STS SPIRAL TANGENT SPIRAL
STW STATIC WIRE
SUB SUBSTATION
SUPV SUPERVISORY
SURF SURFACING
SUSP SUSPENDED
SWK SIDEWALK
SW SOUND WALL,
SOFTWARE
SWA SINGLE WIRE ANCHOR
SWAT SINGLE WIRE AUTO TENSIONED
SWFT SINGLE WIRE-FIXED TERMINATION
SWG SWITCHEAR
SWT SWITCH
SWPPP STORM WATER POLLUTION PREVENTION PLAN
SWR SEWER
SWS SWITCHING STATION
SYM SYMMETRICAL

O

O&M OPERATIONS AND MAINTENANCE
OA OVERALL
OBLR OBLITERATE
OC ON CENTER,
OVERCROSSING
OCC OPERATIONS CONTROL CENTER
OCS OVERHEAD CONTACT SYSTEM
OD OUTSIDE DIAMETER
OF OUTSIDE FACE
OFF OFFSET
OG ORIGINAL GROUND
OH OVERHEAD
OL OVERLAP
O-O OUT TO OUT
OOR OUT-OF-RUNNING (NONRIDING CONTACT WIRE)
OP OVERPASS
OPL OPERABILITY PERFORMANCE LEVEL
OPNG OPENING
OPP OPPOSITE
ORS OPERATIONS RADIO SYSTEM
OSP OUTSIDE PLANT
OVERTEMP OVERTEMPERATURE

PSU POWER SUPPLY UNIT
PTC POTENTIAL TRANSFORMER
PTD/R POSITIVE TRAIN CONTROL
PTEL PAPER TOWEL DISPENSER & RECEPTACLE
PTM PASSENGER ASSISTANCE TELEPHONE
PTT PARKING TICKET MACHINE
PTZ PUSH TO TALK
PTZ PAN-TILT-ZOOM
PUE PUBLIC UTILITY EASEMENT
PVC POLYVINYL CHLORIDE
PVMT PAVEMENT
PWR POWER

S

S SOUTH,
SLOPE
SAE STRUCTURE APPROACH EMBANKMENT
SALV SALVAGE
SAPP STRUCTURAL ALUMINUM PLATE PIPE
SB SOUTHBOUND
SC SWITCH CABLE
SCADA SUPERVISORY CONTROL AND DATA
ACQUISITION
SCAT SIMPLE CATENARY-AUTO TENSION
SCB SUBSTATION CONTROL BUILDING
SCC STATION CONTROL CENTER
SCD SEAT COVER DISPENSER
SCFT SIMPLE CATENARY-FIXED TENSION
SCHD SCHEDULE
SCN SECURITY CLASSIFICATION NUMBERS
SCPE SEISMIC CAPACITY AND PERFORMANCE
EVALUATION
SCSP SLOTTED CORRUGATED STEEL PIPE
SD SOAP DISPENSER,
STORM DRAIN
SDB SYSTEM DUCT BANK
SDC SEISMIC DESIGN CRITERIA
SDOF SINGLE DEGREE OF FREEDOM
SE SUPER ELEVATED
SECTLEG SECTIONALIZING
SECT SECTION
SEP SEPARATION
SERV SERVICE
SF SPRING FROG
SG SUBGRADE
SHA SEISMIC HAZARDS ANALYSIS
SHLD SHOULDER
SHS STATE HIGHWAY SYSTEM
SHT SHEET
SI SITE INVESTIGATION,
SECTION INSULATOR

T

T TREAD
T&B TOP AND BOTTOM
TAN TANGENT
TASAS TRAFFIC ACCIDENT SURVEILLANCE
ANALYSIS SYSTEM
TBD TO BE DETERMINED
TBM TUNNEL BORING MACHINE
TC TRACK CENTER,
TRAIN CONTROL
TCB TRAFFIC CONTROL BOX
TCC TRAIN CONTROL AND COMMUNICATIONS
TCCR TRAIN CONTROL AND COMMUNICATIONS ROOM

P

P/L PROPERTY LINE
PA PUBLIC ADDRESS
PACIS PUBIC ADDRESS / CUSTOMER INFORMATION SYSTEM
PAN PANTOGRAPH
PAP PERFORATED ALUMINUM PIPE
PB PULL BOX
PBX PRIVATE BRANCH EXCHANGE
PC PRECAST CONCRETE
PCC PORTLAND CEMENT CONCRETE
PCP PERFORATED CONCRETE PIPE,
PRESTRESSED CONCRETE PIPE
PCPT PIEZOCONE PENETROMETER TEST
PE PORCELAIN ENAMEL
PED PEDESTRIAN
PEER PACIFIC EARTHQUAKE ENGINEER RESEARCH
PERF PERFORATED
PERM PERMEABLE
PET POTENTIAL EQUALIZING JUMPER

Q

QOS QUALITY OF SERVICE
QT QUARRY TILE
QTY QUANTITY

R

R RADIUS,
RED
R/A ROCK ANCHOR
R/W, ROW RIGHT OF WAY
R&D REMOVE AND DISPOSE
R&S REMOVE AND SALVAGE
RA REMOTE ANNUNCIATOR
RAID REDUNDANT ARRAY OF INDEPENDENT DISKS
RB RESILIENT BASE
RBM RAILBOUND MANGANESE FROG
RC REGIONAL CONSULTANT,
REINFORCED CONCRETE
RCA REINFORCED CONCRETE ARCH
RCB REINFORCED CONCRETE BOX
RCC REGIONAL CONTROL CENTER
RCE REGISTERED CIVIL ENGINEER
RCP REINFORCED CONCRETE PIPE
RCPA REINFORCED CONCRETE PIPE ARCH
RD ROAD,
ROOF DRAIN
RDWY ROADWAY
REBAR CONCRETE REINFORCING BAR

DIRECTIVE DRAWINGS

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03/08/2012 RFP HSR 11-16

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY R. MINCIO
DRAWN BY V. HUANTE
CHECKED BY S. MILITELLO
IN CHARGE J. CHIRCO
DATE 03/01/2012



CALIFORNIA HIGH-SPEED TRAIN PROJECT
DIRECTIVE DRAWING

ACRONYMS AND ABBREVIATIONS 3

CONTRACT NO.
DRAWING NO. DD-GE-102
SCALE NO SCALE
SHEET NO.

T CONTINUED

V

TRACK GEOMETRY - HORIZONTAL

UNITS OF MEASUREMENT

TCCT TRACK CIRCUIT
TCE TEMPORARY CONSTRUCTION EASEMENT
TCP/IP TRANSMISSION CONTROL PROTOCOL/
INTERNET PROTOCOL
TCR TRANSMISSION COMMUNICATIONS ROOM
TD TRENCH DRAIN,
TIME DELAY
TDA TIRE DERIVED AGGREGATE
TDD TELECOMMUNICATIONS DEVICE FOR THE DEAF
TDM TIME DIVISION MULTIPLEXING
TEL TELEPHONE
TEMP TEMPORARY
TERM TERMINATION
TES TRACTION ELECTRIFICATION SYSTEM
TESC TEMPORARY EROSION AND SETTLEMENT CONTROL
TETEL TRAIN EMERGENCY TELEPHONE/SPEAKERPHONE
TFE TETRAFLOROETHYLENE
TG TOP OF GRADE
THK THICK
TIS TELEPHONE AND INTERCOM SYSTEM
TL TENSION LENGTH
TM TECHNICAL MEMORANDUM
TMP TEMPERATURE
TO TURNOUT,
TELECOM OUTLET
TOC TOP OF CURB
TOG TOP OF GRATE
TOL TOLERANCE
TOLR TOP OF LOW RAIL
TOF TOP OF FOUNDATION
TOFG TOP OF FINISH GRADE
TOP TOP OF PAVEMENT
TOR TOP OF RAIL
TOS TOP OF SLOPE
TOT TOP OF TIE,
TOTAL
TOW TOP OF WALL
TP TELEPHONE POLE,
TRACTION POWER
TPB TREATED PERMEABLE BASE
TPD TOILET PAPER DISPENSER
TPF TRACTION POWER FACILITY
TPM TREATED PERMEABLE MATERIAL
TPS TRACTION POWER SUPPLY SYSTEM
TPSS TRACTION POWER SUBSTATION
TRANS TRANSVERSE
TRSN TRANSITION
TRK TRACK
TS TRAFFIC SIGNAL
TUBULAR STEEL
TSI TECHNICAL SPECIFICATIONS FOR
INTEROPERABILITY
TSM TRAFFIC SYSTEMS MANAGEMENT
TSMP TRAFFIC SYSTEMS MANAGEMENT PLAN
TTC TWO TRACK CANTILEVER
TTEL TRAIN EMERGENCY SPEAKERPHONE
TV TELEVISION
TVM(S) TICKET VENDING MACHINE(S)
TW TIE WIRE
TYP TYPICAL

V DESIGN SPEED,
VALVE
VAC VOLTS ALTERNATING CURRENT
VAR VARIABLE,
VARIES,
VOLT-AMPERE REACTIVE
VCAT VIRTUAL CONCATENATION
VCP VITRIFIED CLAY PIPE
VCT VINYL COMPOSITION TILE
VDC VOLT DC
VE VALUE ENGINEERING
VERT VERTICAL
VEST VESTIBULE
VIA VIADUCT
VLAN VIRTUAL LOCAL AREA NETWORK
VMS VARIABLE MESSAGE SIGN,
VARIABLE MESSAGE SYSTEM,
VOLTAGE SWITCH
VOL VOLTAGE TRANSFORMER/TRANSUCER

BC BEGIN HORIZONTAL CURVE
CC COMPOUND CURVE
CS POINT OF CHANGE FROM CIRCULAR CURVE TO SPIRAL
K1 TANGENT DISTANCE PF SHIFT PC
REFERENCE TO THE TS
K2 TANGENT DISTANCE PF SHIFT PT
REFERENCE TO THE ST
Lc LENGTH OF CIRCULAR CURVE
Ls1 LENGTH OF SPIRAL
Ls2 LENGTH OF SPIRAL FROM TS TO SC
LSc LENGTH OF SPIRAL FROM CS TO ST
LVC LENGTH OF COMPOUND SPIRAL FROM CS TO SC
p1 OFFSET FROM INITIAL TANGENT TO PC OF THE SHIFTED
CIRCLE OF SPIRALIZED CURVE
p2 OFFSET FROM INITIAL TANGENT TO PT OF THE SHIFTED
CIRCLE OF SPIRALIZED CURVE
PC POINT OF CURVATURE
PCC POINT OF COMPOUND CURVE
PF POINT OF FROG
PI POINT OF INTERSECTION
PITO POINT OF INTERSECTION TURNOUT
POC POINT ON HORIZONTAL CURVE
POE POINT OF ENDING
POS POINT ON SPIRAL,
POVC POINT ON VERTICAL CURVE
POVT POINT ON VERTICAL TANGENT
PRC POINT OF REVERSE CURVE
PRVC POINT OF REVERSE VERTICAL CURVE
PS POINT OF SWITCH
PT POINT OF TANGENT
SC POINT OF CHANGE FROM SPIRAL TO
CIRCULAR CURVE
SPO POINT ON ORIGIN OF COMPOUND SPIRAL
SS POINT OF CHANGE BETWEEN SPIRALS
SSC SPIRAL TO SPIRAL POINT OF CURVATURE
ST POINT OF CHANGE FROM SPIRAL TO TANGENT
TC POINT OF CHANGE FROM TANGENT TO CURVE
TS POINT OF CHANGE FROM TANGENT TO SPIRAL
Ts1 TANGENT DISTANCE FROM TS TO PI
Ts2 TANGENT DISTANCE FROM ST TO PI
Xs1 TANGENT OFFSET AT THE SC
Xs2 TANGENT OFFSET AT THE CS
Ys1 TANGENT DISTANCE AT THE SC
Ys2 TANGENT DISTANCE AT THE CS
Δ TOTAL CENTRAL ANGLE OF THE SPIRALIZED CURVE
Δc CENTRAL ANGLE OF CIRCULAR CURVE (Lc) FROM
SC TO CS
Δc1 CENTRAL ANGLE OF FIRST CIRCULAR CURVE OF
COMPOUND CURVATURE
Δc2 CENTRAL ANGLE OF SECOND CIRCULAR CURVE OF
COMPOUND CURVATURE
θs1 CENTRAL ANGLE OF SPIRAL LENGTH Ls1 OR SPIRAL
ANGLE OF FIRST SPIRAL IN SPIRALIZED CURVE
θs2 CENTRAL ANGLE OF SPIRAL LENGTH Ls2 OR SPIRAL
ANGLE OF SECOND SPIRAL IN SPIRALIZED CURVE
θsc CENTRAL ANGLE OF COMPOUND SPIRAL OR COMPOUND
SPIRAL ANGLE FROM CS TO SC

Ac ACRES
AMP AMPERES
CAL CALIPER
CF CUBIC FEET
CP CANDLE POWER
CY CUBIC YARD
dB DECIBEL
DEG DEGREE
DIA DIAMETER
Ea ACTUAL SUPERELEVATION
F FARENHEIT
FT FOOT,
FEET
g ACCELERATION DUE TO GRAVITY
GA GAUGE
GAL GALLON
GB GIGABYTE
GBPS GIGABITS PER SECOND
GHZ GIGAHERTZ
HOUR HOUR
H HEIGHT
Hz HERTZ
ID INSIDE DIAMETER
IN INCHES
IR INSIDE RADIUS
K KIPS (1000 POUNDS)
KCMIL THOUSAND CIRCULAR MILS
KHz KILOHERTZ
KSF KIPS PER SQAURE FOOT
KSI KIPS PER SQUARE INCH
kV KILOVOLTS
kVA KILOVOLT-AMPERE
KVAR KILOVOLT-AMPERE REACTIVE
KW KILOWATT
KWH/D KILOWATT HOUR / DEMAND
L LENGTH
LB POUNDS
LB/FT POUNDS PER FOOT
LF LINEAR FEET
m METER
MBPS MEGA-BITS PER SECOND
MCM THOUSAND CIRCULAR MILS
MHz MEGAHERTZ
mm MILLIMETER
MPH MILES PER HOUR
MVA MEGAVOLT-AMPERE
MW MEGA WATT
OD OUTSIDE DIAMETER
PSF POUNDS PER SQUARE FOOT
PSI POUNDS PER SQUARE INCH
PSIG POUNDS PER SQUARE INCH GAUGE
SEC SECOND
SF SQUARE FEET
SY SQUARE YARD
TF TRACK FEET
VA VOLTS
VAC VOLT-AMPERE
Y YARDS
YR(S) YEAR(S)

W

W WEST,
WIDTH
W/ WITH
W/O WITHOUT
WA WORK AREA
WB WESTBOUND
WC WATER CLOSET
WCS WIRELESS COMMUNICATIONS SYSTEM
WD WOOD
WLAN WIRELESS LOCAL AREA NETWORK
WM WIRE MESH
WP WORK POINT,
WOOD POLE
WPF WATERPROOF
WPC WAYSIDE POWER CUBICLES
WR WIRE RUN
WRT WITH RESPECT TO
WS WATER SURFACE,
WORK STATION
WSP WELDED STEEL PIPE
WT WEIGHT
WV WATER VALVE
WW WINGWALL,
WALKWAY
WWF WELDED WIRE FABRIC
WWLOL WINGWALL LAYOUT LINE
WWM WELDED WIRE MESH

Xs1 TANGENT OFFSET AT THE SC
Xs2 TANGENT OFFSET AT THE CS
Ys1 TANGENT DISTANCE AT THE SC
Ys2 TANGENT DISTANCE AT THE CS
Δ TOTAL CENTRAL ANGLE OF THE SPIRALIZED CURVE
Δc CENTRAL ANGLE OF CIRCULAR CURVE (Lc) FROM
SC TO CS
Δc1 CENTRAL ANGLE OF FIRST CIRCULAR CURVE OF
COMPOUND CURVATURE
Δc2 CENTRAL ANGLE OF SECOND CIRCULAR CURVE OF
COMPOUND CURVATURE
θs1 CENTRAL ANGLE OF SPIRAL LENGTH Ls1 OR SPIRAL
ANGLE OF FIRST SPIRAL IN SPIRALIZED CURVE
θs2 CENTRAL ANGLE OF SPIRAL LENGTH Ls2 OR SPIRAL
ANGLE OF SECOND SPIRAL IN SPIRALIZED CURVE
θsc CENTRAL ANGLE OF COMPOUND SPIRAL OR COMPOUND
SPIRAL ANGLE FROM CS TO SC

X

X/CAT CROSS CANTENARY
X/SPAN CROSS SPAN
XD TRANSUCER
XFMR TRANSFORMER
XO CROSSOVER
XO ST CROSSOVER SPRING TENSIONER
XSEC CROSS SECTION
XING CROSSING
XMITER TRANSMITTER

TRACK GEOMETRY - VERTICAL

BVC BEGIN VERTICAL CURVE
Ea SUPERELEVATION IN INCHES
EVC END VERTICAL CURVE
PCVC POINT OF COMPOUND VERTICAL CURVE
POVC POINT OF VERTICAL INTERSECTION
POVT POINT ON VERTICAL CURVE
PVI POINT ON VERTICAL TANGENT
U UNBALANCED SUPERELEVATION IN INCHES
VC VERTICAL CURVE
VPI VERTICAL POINT OF INTERSECTION

U

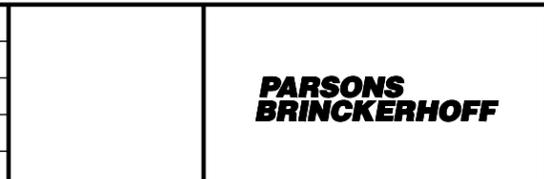
U/S UNDERSIDE
UB UTILITY BOX
UC UNDERCROSSING
UD UNDERDRAIN
UG UNDERGROUND,
UNDER GRADE
UGB UNDERGRADE BRIDGE
UI USER INTERFACE
UNF UNFINISHED
UNINS UNINSULATED
UON UNLESS OTHERWISE NOTED
UP UNDERPASS
UPS UNINTERRUPTIBLE POWER SUPPLY
UR URINAL
UrEDAS URGENT EARTHQUAKE DETECTION AND
ALARM SYSTEM
USCS UNITED SOIL CLASSIFICATION SYSTEM
UTIL UTILITY
UTP UNSHIELDED TWISTED PAIR
UWP UPPER WORKING POINT

DIRECTIVE DRAWINGS

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REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
R. MINCIO
DRAWN BY
V. HUANTE
CHECKED BY
S. MILITELLO
IN CHARGE
J. CHIRCO
DATE
03/01/2012



CALIFORNIA HIGH-SPEED TRAIN PROJECT
DIRECTIVE DRAWING
ACRONYMS AND ABBREVIATIONS 4

CONTRACT NO.	
DRAWING NO.	DD-GE-103
SCALE	NO SCALE
SHEET NO.	

03/08/2012 RFP HSR 11-16

AGENCIES/ORGANIZATIONS

SEGMENT/COUNTY CODES AND SUBDIVISIONS

AAR ASSOCIATION OF AMERICAN RAILROADS
 AASHTO AMERICAN ASSOCIATION OF STATE HIGHWAY TRANSPORTATION OFFICIALS
 ACI AMERICAN CONCRETE INSTITUTE
 AISC AMERICAN INSTITUTE OF STEEL CONSTRUCTION
 AMTRAK NATIONAL RAILROAD PASSENGER CORPORATION
 ANI AUTOMATIC NUMBER IDENTIFICATION
 ANSI AMERICAN NATIONAL STANDARDS INSTITUTE
 ANSS ADVANCED NATIONAL SEISMIC SYSTEM
 APWA AMERICAN PUBLIC WORKS ASSOCIATION
 AREA AMERICAN RAILWAY ENGINEERING ASSOCIATION
 AREMA AMERICAN RAILWAY ENGINEERING AND MAINTENANCE-OF-WAY ASSOCIATION
 ASCE AMERICAN SOCIETY OF CIVIL ENGINEERS
 ASTM ASTM INTERNATIONAL, AMERICAN SOCIETY OF TESTING & MATERIALS
 ATC APPLIED TECHNOLOGY COUNCIL
 AWS AMERICAN WELDING SOCIETY
 BART BAY AREA RAPID TRANSIT DISTRICT
 BDA BRIDGE DESIGN AIDS (CALTRANS)
 BDD BRIDGE DESIGN DETAILS (CALTRANS)
 BDP BRIDGE DESIGN PRACTICE (CALTRANS)
 BDS BRIDGE DESIGN SPECIFICATIONS (CALTRANS)
 BNSF BURLINGTON NORTHERN SANTA FE RAILWAY
 CALNET CALIFORNIA INTEGRATED TELECOMMUNICATIONS NETWORK
 CEQA CALIFORNIA ENVIRONMENTAL QUALITY ACT
 CHD COUNTY HEALTH DEPARTMENT
 CHP CALIFORNIA DEPARTMENT OF HIGHWAY PATROL (STATE)
 CHST CALIFORNIA HIGH-SPEED TRAIN
 CHSTP CALIFORNIA HIGH-SPEED TRAIN PROJECT
 CIWMB CALIFORNIA INTEGRATED WASTE MANAGEMENT BOARD (STATE)
 CRR COMMUTER RAIL PROGRAM (STATE)
 DOD DEPARTMENT OF DEFENSE (FEDERAL)
 DOT DEPARTMENT OF TRANSPORTATION (FEDERAL)
 FEMA FEDERAL EMERGENCY MANAGEMENT AGENCY
 FHWA FEDERAL HIGHWAY ADMINISTRATION
 FMFCD FRESNO METROPOLITAN FLOOD CONTROL DISTRICT
 FRA FEDERAL RAILROAD ADMINISTRATION
 FSTIP FEDERAL STATEWIDE TRANSPORTATION IMPROVEMENT PROGRAM
 FTA FEDERAL TRANSIT ADMINISTRATION
 IEEE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS
 ISO INTERNATIONAL ORGANIZATION FOR STANDARDIZATION
 LADWP LOS ANGELES DEPARTMENT OF WATER AND POWER
 LAUS LOS ANGELES UNION STATION
 LTC LOCAL TRANSPORTATION COMMISSION
 MUTCD MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES
 NEMA NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
 NENA NATIONAL EMERGENCY NUMBER ASSOCIATION
 NFPA NATIONAL FIRE PROTECTION ASSOCIATION
 NIST NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
 PEER PACIFIC EARTHQUAKE ENGINEER RESEARCH
 PG&E PACIFIC GAS & ELECTRIC COMPANY
 PUC PUBLIC UTILITIES COMMISSION (STATE)
 RWQCB REGIONAL WATER QUALITY CONTROL BOARD (STATE)
 SDG&E SAN DIEGO GAS & ELECTRIC COMPANY
 SDNR SAN DIEGO NORTHERN RAILWAY
 SAVE SOCIETY OF AMERICAN VALUE ENGINEERS
 SHOPP STATE HIGHWAY OPERATION AND PROTECTION PROGRAM (FORMERLY HSOPP)
 SHPO STATE HISTORIC PRESERVATION OFFICER (STATE)
 SJRRA SAN JOAQUIN REGIONAL RAIL AUTHORITY
 SMUD SACRAMENTO MUNICIPAL UTILITY DISTRICT
 SPTC SOUTHERN PACIFIC TRANSPORTATION COMPANY
 SSORC SAFETY AND SECURITY OVERSIGHT AND REVIEW COMMITTEE
 SVBX SILICON VALLEY BERRYESSA EXTENSION
 SVRT SILICON VALLEY RAPID TRANSIT
 UPRR UNION PACIFIC RAILROAD
 US UNITED STATES
 USCE UNITED STATES (ARMY) CORPS OF ENGINEERS
 USCG UNITED STATES COAST GUARD
 USCS UNITED SOIL CLASSIFICATION SYSTEM
 VTA VALLEY TRANSPORTATION AUTHORITY (OF SANTA CLARA COUNTY)

A-J ALTAMONT PASS
 B-P BAKERSFIELD TO PALMDALE
 F-B FRESNO TO BAKERSFIELD
 F-J SAN FRANCISCO TO SAN JOSE
 J-M SAN JOSE TO MERCED
 L-D LOS ANGELES TO SAN DIEGO
 L-O LOS ANGELES TO ANAHEIM
 M-F MERCED TO FRESNO
 P-L PALMDALE TO LOS ANGELES

 B BAY SUBDIVISION
 C CAPITAL SUBDIVISION
 D DESERT SUBDIVISION
 J SAN JACINTO SUBDIVISION
 P PACHECO SUBDIVISION
 S SIERRA SUBDIVISION
 T TONGVA SUBDIVISION

 ALA ALAMEDA
 ALP ALPINE
 AMA AMADOR
 BUT BUTTE
 CAL CALAVERAS
 CC CONTRA COSTA
 COL COLUSA
 DN DEL NORTE
 ED EL DORADO
 FRE FRESNO
 GLE GLENN
 HUM HUMBOLDT
 IMP IMPERIAL
 INY INYO
 KER KERN
 KIN KINGS
 LA LOS ANGELES
 LAK LAKE
 LAS LASSEN
 MAD MADERA
 MEN MENDOCINO
 MER MERCED
 MNO MONO
 MOD MODOC
 MON MONTEREY
 MPA MARIPOSA
 MRN MARIN
 NAP NAPA
 NEV NEVADA
 ORA ORANGE
 PLA PLACER
 PLU PLUMAS
 RIV RIVERSIDE
 SAC SACRAMENTO
 SB SANTA BARBARA
 SBD SAN BERNADINO
 SBT SAN BENITO
 SCL SANTA CLARA
 SCR SANTA CRUZ
 SD SAN DIEGO
 SF SAN FRANCISCO
 SHA SHASTA
 SIE SIERRA
 SIS SISKIYOU
 SJ SAN JOAQUIN
 SLO SAN LUIS OBISPO
 SM SAN MATEO
 SOL SOLANO
 SON SONOMA
 STA STANISLAUS
 SUT SUTTER
 TEH TEHAMA
 TRI TRINITY
 TUL TULARE
 TUO TUOLUMNE
 VEN VENTURA
 YOL YOLO
 YUB YUBA

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03/08/2012 RFP HSR 11-16

DIRECTIVE DRAWINGS

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY R. MINCIO
DRAWN BY V. HUANTE
CHECKED BY S. MILITELLO
IN CHARGE J. CHIRCO
DATE 03/01/2012



CALIFORNIA HIGH-SPEED TRAIN PROJECT
DIRECTIVE DRAWING
 ACRONYMS AND ABBREVIATIONS 5

CONTRACT NO.
DRAWING NO. DD-GE-104
SCALE NO SCALE
SHEET NO.

TRACK

CIVIL

CIVIL CONTINUED

CIVIL CONTINUED

EXISTING FREIGHT/PASSENGER TRACK	
HST TRACK	
BALLAST	
BUMPER/BUMPING POST	
CONCRETE	
DERAIL-DENOTES DERAIL DIRECTION AND LOCATION OF SWITCH MACHINE (LEFT-HAND SHOWN)	
DOUBLE CROSSOVER	
EARTH	
FRICTION BUFFER	
INSULATED JOINT	
INSULATED JOINT LOCATIONS-BOTH RAIL	
INSULATED JOINT LOCATIONS-LEFT RAIL	
INSULATED JOINT LOCATIONS-RIGHT RAIL	
POINT OF CURVATURE	
POINT OF SWITCH-DENOTES SWITCH MACHINE LOCATION	
PREPARED SUBGRADE	
RAIL LUBRICATOR-DIRECTION OF TRAVEL, (DT), TWO RAIL LUBRICATORS SHOWN	
SINGLE CROSSOVER (LEFT-HAND SHOWN)	
SPECIAL RAIL	
STANDARD BOLTED JOINT	
STANDARD RAIL	
SUB BALLAST	
TURNOUT (RIGHT-HAND SHOWN)	
WELDED JOINT	
CONTROL POINT (CP)	
WALKWAY ENVELOPE	

AGGREGATE BASE	
ASPHALT CONCRETE	
BEGIN OR END PLATFORM	
BIKE STAND	
BREAK LINE	
BORINGS (EXISTING)	
CENTERLINE	
CENTERLINE TEXT SYMBOL	
CLEAN OUT	
COLUMN, BENT	
CONCRETE	
CONCRETE BARRIER	
CONTOUR LINE	
CONTROL PANEL	
CONTROL POINT OR STREET INTERSECTION POINT	
COORDINATE GRID CROSSHAIR	
CURB WITH GUTTER (CURB-LIP, FLOW LINE, BACK-TOP OF CURB)	
CURVE NUMBER	
CURVE NUMBER (TRACK GEOMETRY)	
TANGENT NUMBER	
DITCH FLOW LINE	
DOUBLE THRIE BEAM BARRIER	
DROP INLET	
ROUND DROP INLET	
DETENTION BASIN	
EARTHWORK LIMITS	

ELEVATIONS	
ELEVATION (EXISTING)	
ELECTROLIER, ELECTROLIER ON POLE	
EXISTING GUARD RAILING	
EXISTING WALL	
FENCE	
FIRE HYDRANT	
GRADED/LANDSCAPED AREA	
GAS METER	
GAS VALVE	
GUARD POST	
GUARD RAIL	
GRAVEL OR DIRT ROAD	
GUY WIRE	
HIGH MASS LIGHTING	
HORIZONTAL & VERTICAL CONTROL MONUMENT	
HORIZONTAL CONTROL MONUMENT	
ICV	
MAIL BOX	
MANHOLE	
MATCH LINE	
NEW ASPHALTIC CONCRETE	
NEW GUARD RAILING	
NEWS STAND	
NORTH ARROW	
ORIGINAL GROUND	

PARKING METER	
POINT OF INTERSECTION	
POINT OF INTERSECTION SYMBOL	
POINT OF VERTICAL INTERSECTION	
POWER POLE	
RETAINING WALL	
RIVER, STREAMS, AND CREEKS	
SECTION DESIGNATION (LETTER) DRAWING NO. ON WHICH SECTION AND DETAIL APPEARS	
SECTION OR DETAIL TITLE	
SPOT ELEVATION	
TILDE (TERMINATOR)	
STATION EQUATION	
STREET LIGHT	
STREET LIGHT POWER POLE	
STREET LIGHT TRAFFIC SIGNAL	
STREET SIGN	
STRUCTURE CLEARANCE ENVELOPE	
SUPER AXIS OF ROTATION	
TELEPHONE BOOTH	
TELEPHONE POLE	
TEMPORARY RAILING (TYPE K)	
TIRE DERIVED AGGREGATE	
TRACK ALIGNMENT CENTER LINE	
TRAFFIC PANEL	
TRAFFIC SIGNAL	
TRANSMISSION TOWER	
TREE	
UTILITY POLE	

SECTION
SCALE 1"=1'-0"

DIRECTIVE DRAWINGS

2/3/2012 10:25:52 AM CAHSR.TBL CHSR_half_black.plt T:\13259B_Calif_High_Speed_Rail\CADD\Directive Drawings\General DD\DD-GE-110.dgn mincio

03/08/2012 RFP HSR 11-16

DESIGNED BY R. MINCIO
DRAWN BY V. HUANTE
CHECKED BY S. MILITELLO
IN CHARGE J. CHIRCO
DATE 06/30/11

INTERNAL DRAFT



CALIFORNIA HIGH-SPEED TRAIN PROJECT
STANDARD DRAWING

SYMBOLS 1

CONTRACT NO. 13259
DRAWING NO. DD-GE-110
SCALE NO SCALE
SHEET NO.

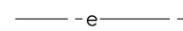
CIVIL CONTINUED

UNDERGROUND UTILITIES

POLE AND WIRES



EXIST ELECTRICAL



POLE WITH WIRES AND ANCHOR



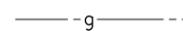
EXIST FIBER OPTIC



VALVE



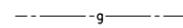
EXIST GASOLINE



VENT



EXIST NATURAL GAS



VERTICAL CONTROL MONUMENT



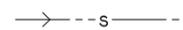
EXIST OIL



WALL



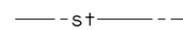
EXIST SEWER



WALL ON BARRIER



EXIST STEAM



WATER EDGE, LAKE, POND, SWAMP



EXIST STORM DRAIN



WATER METER



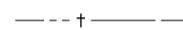
EXIST TELEMETER CABLE



WELL



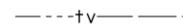
EXIST TELEPHONE



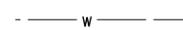
YARD BOX ELECTRICAL



EXIST TELEVISION



EXIST WATER

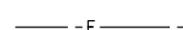


RIGHT-OF-WAY

PROPOSED RIGHT-OF-WAY



NEW ELECTRICAL



EXISTING EASEMENT



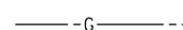
NEW FIBER OPTIC



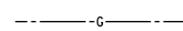
PROPOSED TEMPORARY CONSTRUCTION EASEMENT



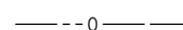
NEW GASOLINE



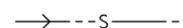
NEW NATURAL GAS



NEW OIL



NEW SEWER



NEW STEAM



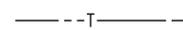
NEW STORM DRAIN



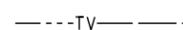
NEW TELEMETER CABLE



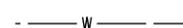
NEW TELEPHONE



NEW TELEVISION

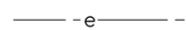


NEW WATER



AERIAL UTILITIES

EXIST ELECTRICAL



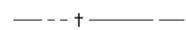
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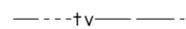
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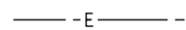
EXIST TELEPHONE



EXIST TELEVISION



NEW ELECTRICAL



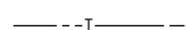
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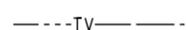
NEW TELEMETER CABLE



NEW TELEPHONE



NEW TELEVISION



DIRECTIVE DRAWINGS

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
S. MILITELLO
DRAWN BY
T. DOUNG
CHECKED BY
J. CIRCO
IN CHARGE
K. JONG
DATE
10/28/10



CALIFORNIA HIGH-SPEED TRAIN PROJECT
STANDARD DRAWING

SYMBOLS 2

CONTRACT NO. 13259
DRAWING NO. DD-GE-111
SCALE NO SCALE
SHEET NO.

T:\13259B_Calif_High_Speed_Rail\CADD\Directive Drawings\General DD\DD-GE-111.dgn

03/08/2012 RFP HSR 11-16

California High-Speed Train Project



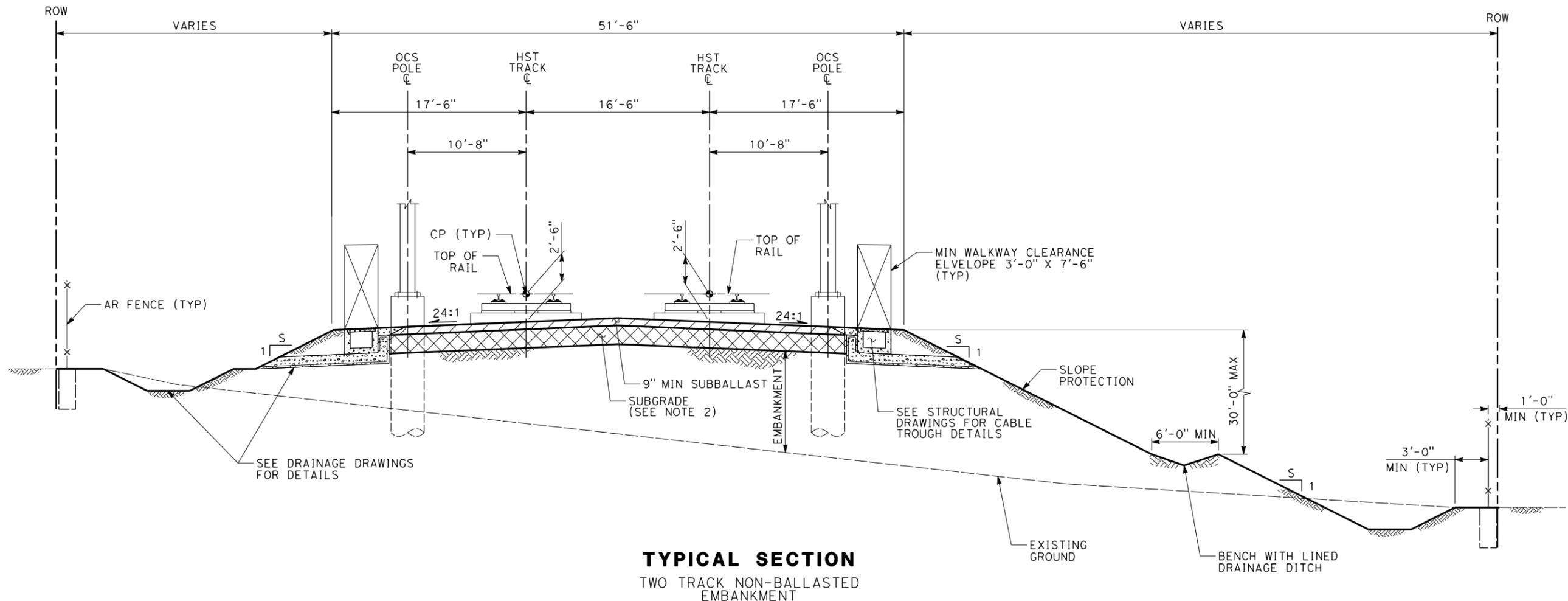
Request for Proposal for Design-Build Services

RFP No.: HSR 11-16
Directive Drawings

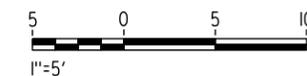
Civil

NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. SUBGRADE THICKNESS SHALL BE DETERMINED BASED ON THE EXISTING GROUND CONDITION.
3. THE CONTROL POINT (CP) SHALL BE 2'-6" ABOVE THE TOP OF SUBBALLAST.



TYPICAL SECTION
TWO TRACK NON-BALLASTED
EMBANKMENT



DIRECTIVE DRAWINGS

2/29/2012 5:20:36 PM CAHSRP.tbl CHSR_half_black.plt T:\13259B Calif High Speed Rail\CADD\Directive Drawings\Civil DD\DD-CV-001.dgn

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
D. MANITI
DRAWN BY
V. HUANTE
CHECKED BY
G. HARRIS
IN CHARGE
J. CHIRCO
DATE
03/01/2012



CALIFORNIA HIGH-SPEED TRAIN PROJECT
CIVIL DIRECTIVE

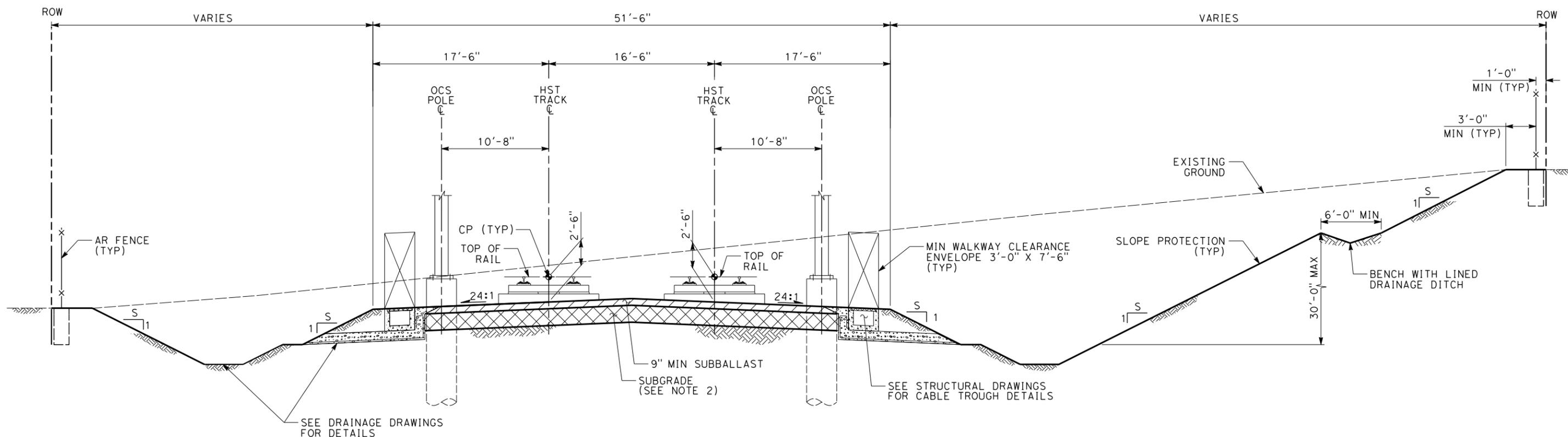
TYPICAL CROSS SECTION
TWO TRACK NON-BALLASTED
EMBANKMENT

CONTRACT NO.
DRAWING NO.
DD-CV-001
SCALE
AS SHOWN
SHEET NO.

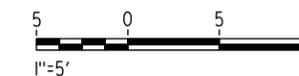
03/08/2012 RFP HSR 11-16

NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. SUBGRADE THICKNESS SHALL BE DETERMINED BASED ON THE EXISTING GROUND CONDITION.
3. THE CONTROL POINT (CP) SHALL BE 2'-6" ABOVE THE TOP OF SUBBALLAST.



TYPICAL SECTION
TWO TRACK NON-BALLASTED
OPEN CUT



DIRECTIVE DRAWINGS

T:\13259B Calif High Speed Rail\CAADD\Directive Drawings\Civil DD\DD-CV-002.dgn

03/08/2012 RFP HSR 11-16

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
D. MANITI
DRAWN BY
V. HUANTE
CHECKED BY
G. HARRIS
IN CHARGE
J. CHIRCO
DATE
03/01/2012



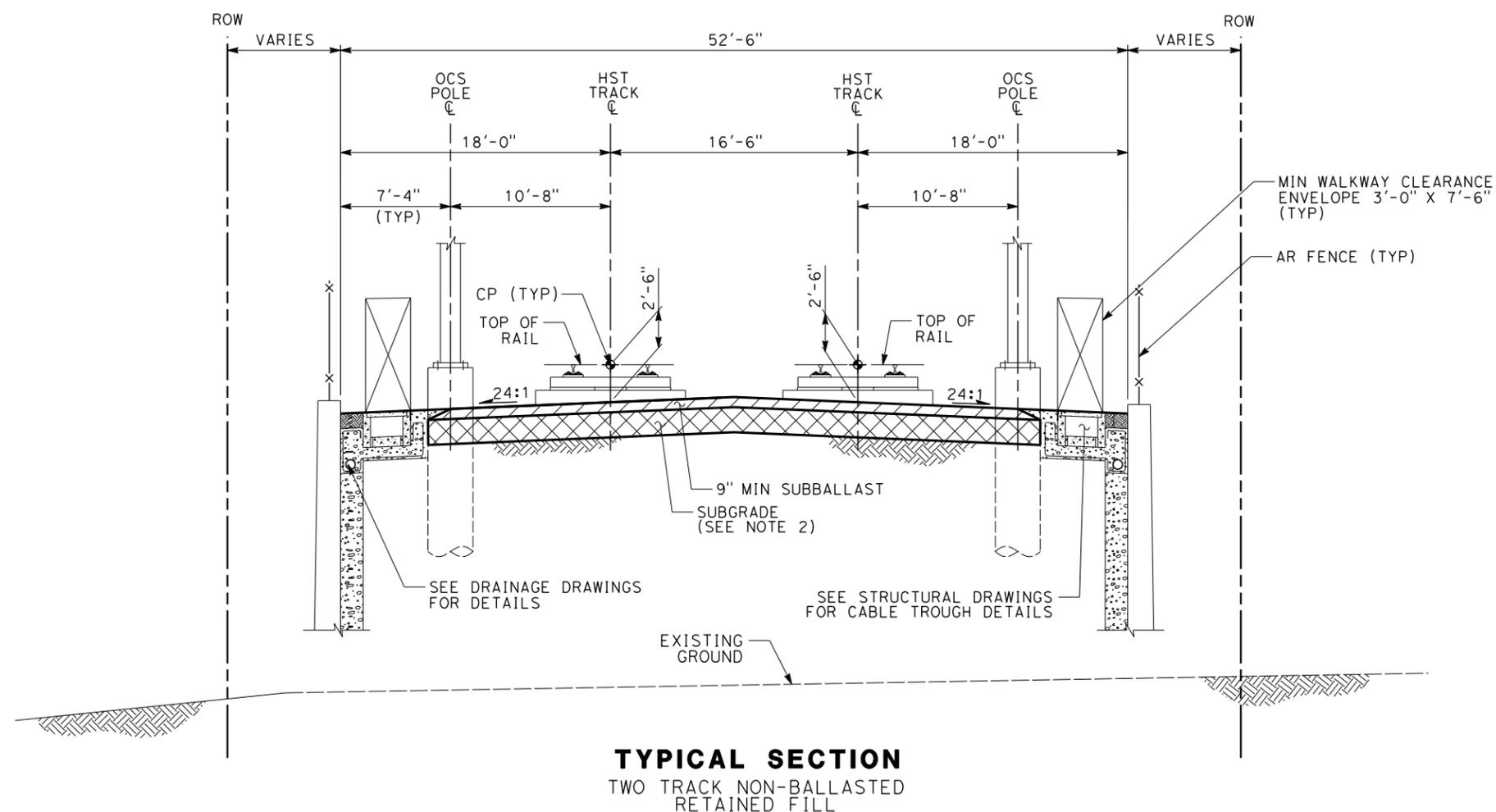
CALIFORNIA HIGH-SPEED TRAIN PROJECT
CIVIL DIRECTIVE

TYPICAL CROSS SECTION
TWO TRACK NON-BALLASTED
OPEN CUT

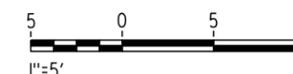
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DRAWING NO.
DD-CV-002
SCALE
AS SHOWN
SHEET NO.

NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. SUBGRADE THICKNESS SHALL BE DETERMINED BASED ON THE EXISTING GROUND CONDITION.
3. THE CONTROL POINT (CP) SHALL BE 2'-6" ABOVE THE TOP OF SUBBALLAST.



TYPICAL SECTION
TWO TRACK NON-BALLASTED
RETAINED FILL



DIRECTIVE DRAWINGS

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03/08/2012 RFP HSR 11-16

REV	DATE	BY	CHK	APP	DESCRIPTION

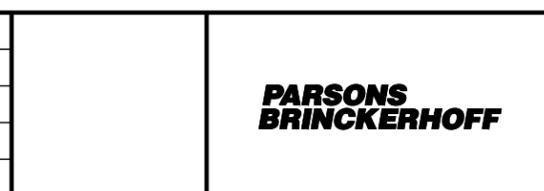
DESIGNED BY
D. MANITI

DRAWN BY
V. HUANTE

CHECKED BY
G. HARRIS

IN CHARGE
J. CHIRCO

DATE
03/01/2012



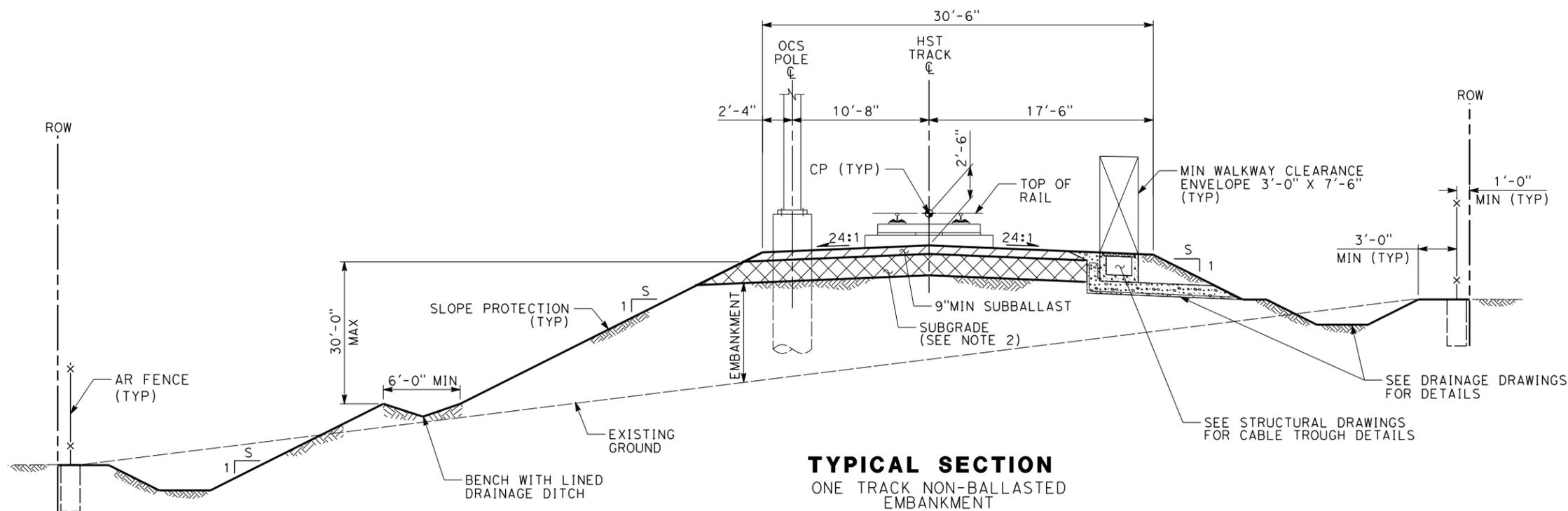
CALIFORNIA HIGH-SPEED TRAIN PROJECT
CIVIL DIRECTIVE

TYPICAL CROSS SECTION
TWO TRACK NON-BALLASTED
RETAINED FILL

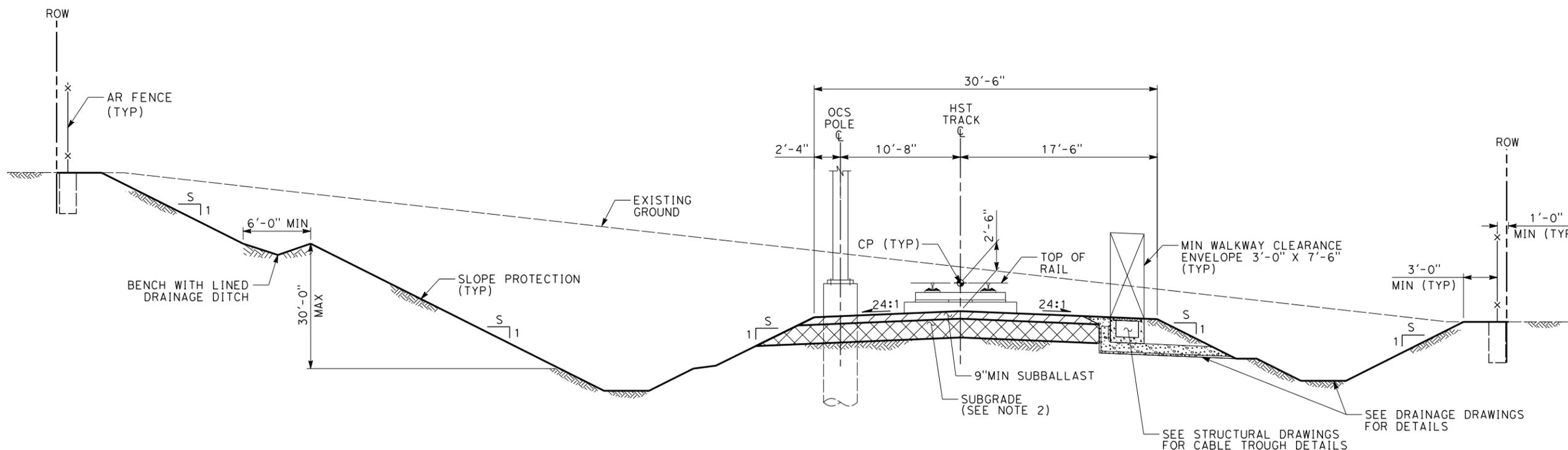
CONTRACT NO.
DRAWING NO. DD-CV-003
SCALE AS SHOWN
SHEET NO.

NOTES:

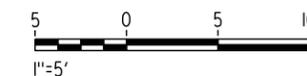
1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. SUBGRADE THICKNESS SHALL BE DETERMINED BASED ON THE EXISTING GROUND CONDITION.
3. THE CONTROL POINT (CP) SHALL BE 2'-6" ABOVE THE TOP OF SUBBALLAST.



TYPICAL SECTION
ONE TRACK NON-BALLASTED
EMBANKMENT



TYPICAL SECTION
ONE TRACK NON-BALLASTED
OPEN CUT



DIRECTIVE DRAWINGS

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REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
D. MANITI
DRAWN BY
V. HUANTE
CHECKED BY
G. HARRIS
IN CHARGE
J. CHIRCO
DATE
03/01/2012



CALIFORNIA HIGH-SPEED TRAIN PROJECT
CIVIL DIRECTIVE

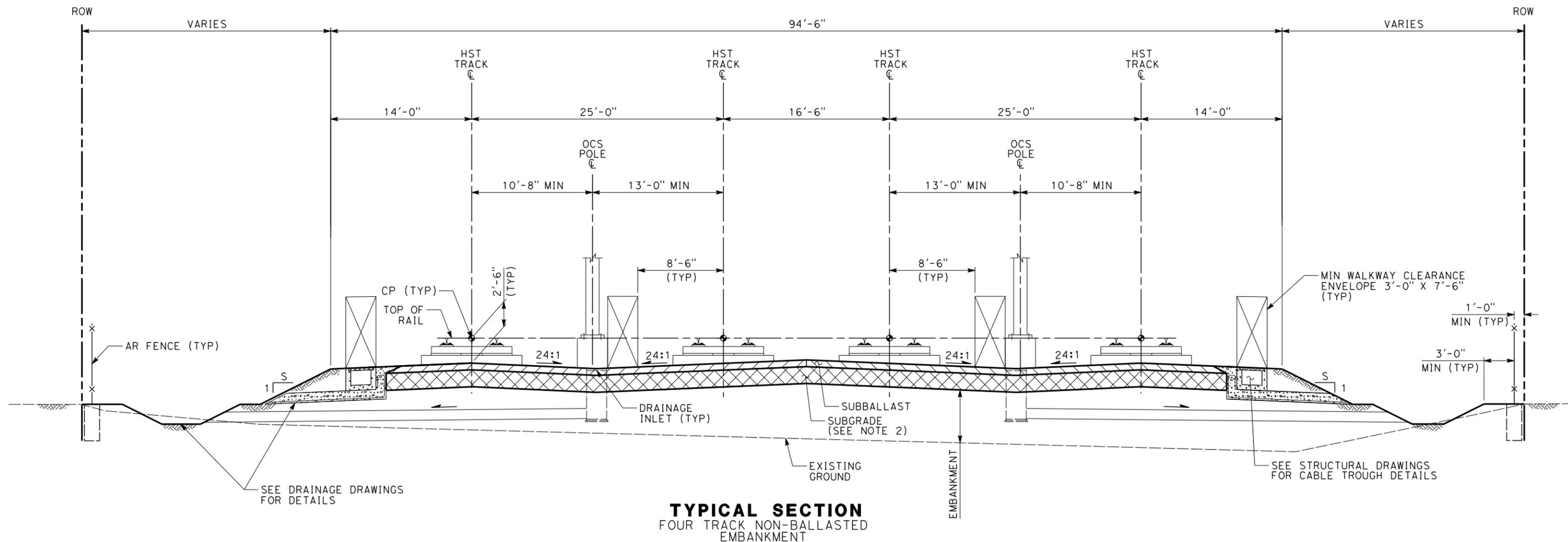
TYPICAL CROSS SECTION
ONE TRACK NON-BALLASTED
EMBANKMENT AND OPEN CUT

CONTRACT NO.
DRAWING NO.
DD-CV-004
SCALE
AS SHOWN
SHEET NO.

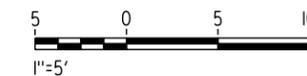
03/08/2012 RFP HSR 11-16

NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. SUBGRADE THICKNESS SHALL BE DETERMINED BASED ON THE EXISTING GROUND CONDITION.
3. THE CONTROL POINT (CP) SHALL BE 2'-6" ABOVE THE TOP OF SUBBALLAST.



TYPICAL SECTION
FOUR TRACK NON-BALLASTED
EMBANKMENT



DIRECTIVE DRAWINGS

T:\13259B Calif High Speed Rail\CADD\Directive Drawings\Civil DD\DD-CV-005.dgn

03/08/2012 RFP HSR 11-16

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
D. MANITI
DRAWN BY
V. HUANTE
CHECKED BY
G. HARRIS
IN CHARGE
J. CHIRCO
DATE
03/01/2012



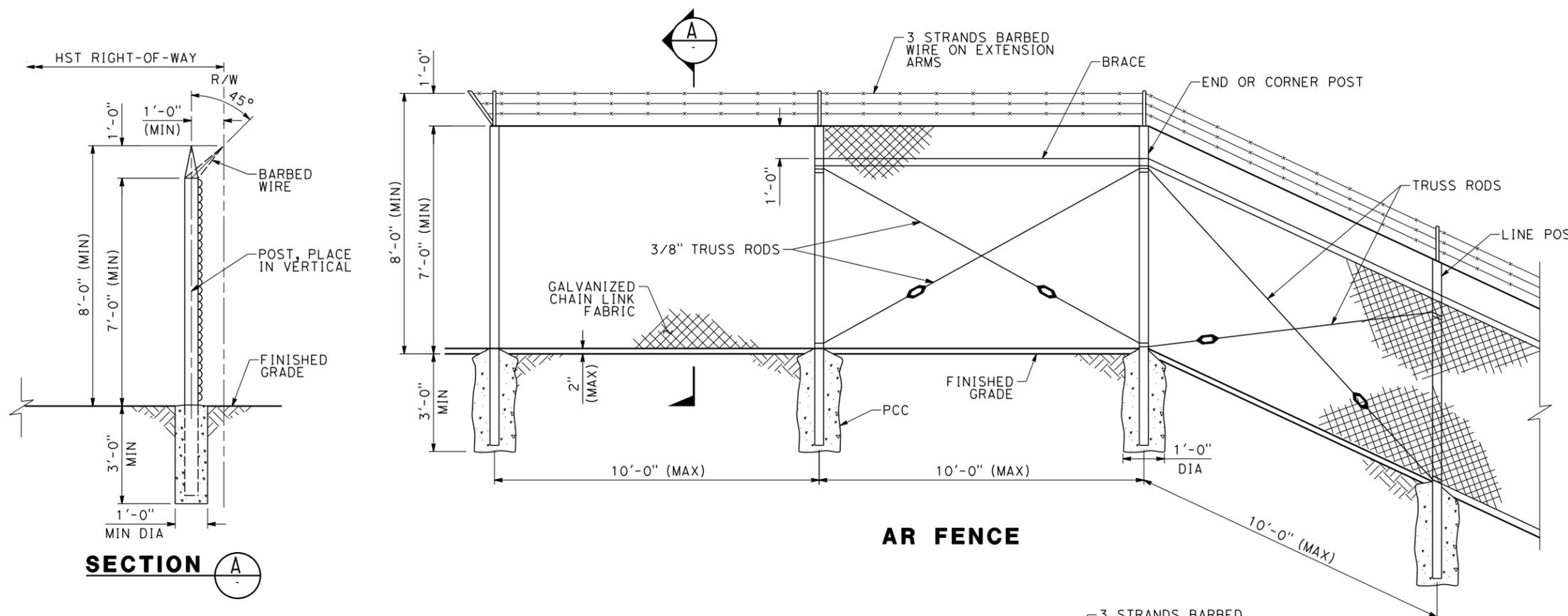
CALIFORNIA HIGH-SPEED TRAIN PROJECT
CIVIL DIRECTIVE

TYPICAL CROSS SECTION
FOUR TRACK NON-BALLASTED
EMBANKMENT

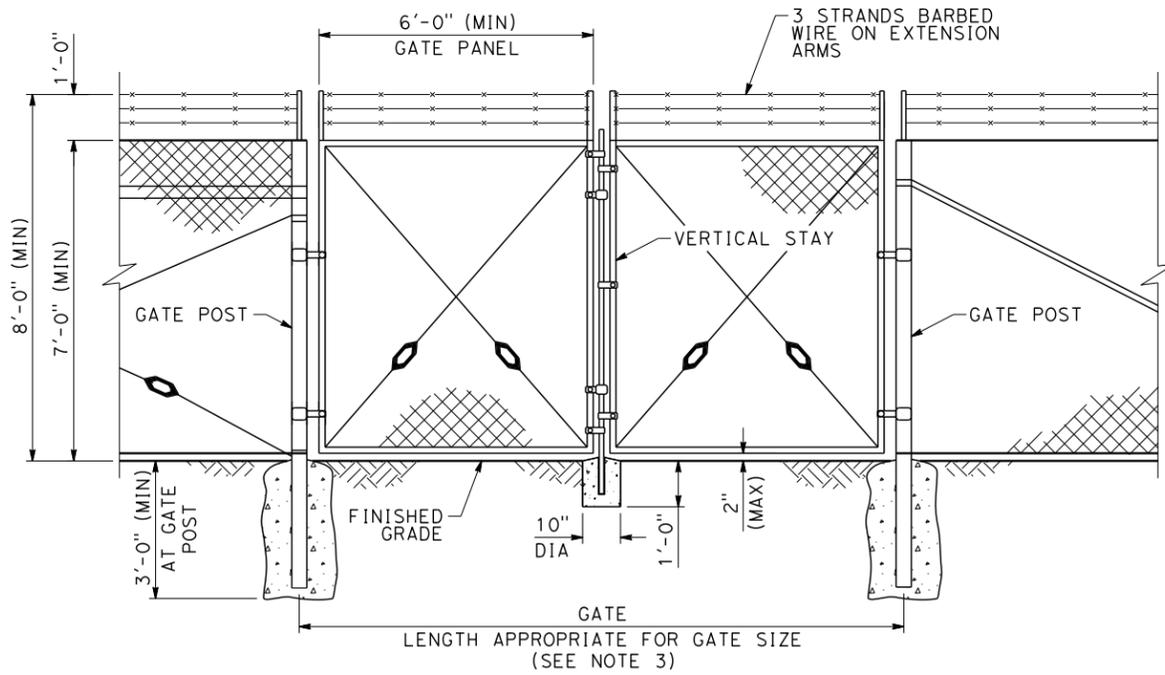
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DRAWING NO.
DD-CV-005
SCALE
AS SHOWN
SHEET NO.

NOTES:

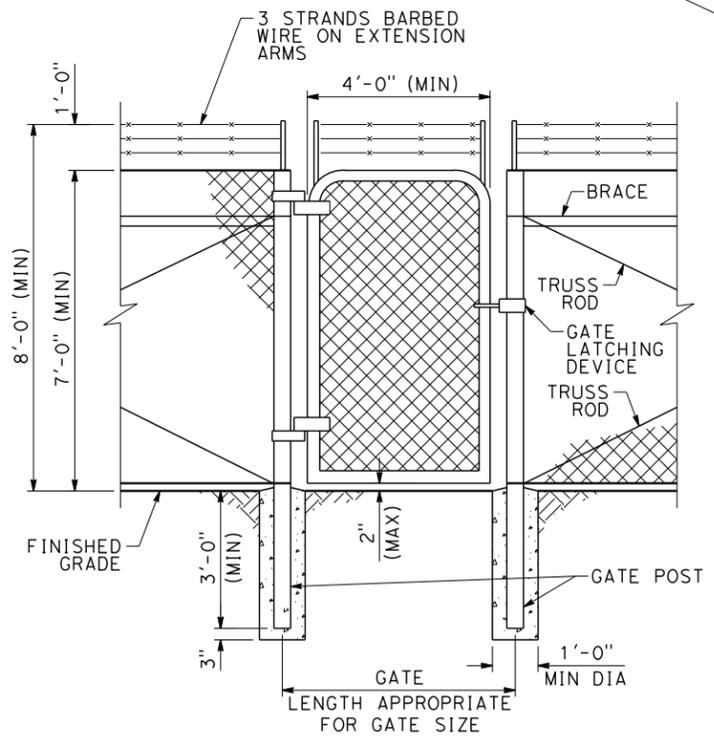
1. ALL PERMANENT FENCING AND GATES SHALL BE BONDED, GROUNDED AND INSULATED TO PREVENT ELECTRIC SHOCK
2. ACCESS RESTRICTIONS (AR) FENCING SHALL BE 8 FEET HIGH MINIMUM (AS SHOWN HERE). ACCESS DETERRING (AD) FENCING (NOT SHOWN) SHALL BE 6 FEET HIGH, WITH NO BARBED WIRE
3. GATES FOR VEHICULAR ACCESS (DRIVING GATES) SHALL BE SIZED IN COORDINATION WITH EMERGENCY RESPONDERS AND MAINTENANCE EQUIPMENT. IF NO OTHER INFORMATION IS AVAILABLE THESE GATES SHOULD HAVE A MINIMUM WIDTH OF TWELVE (12) FEET.
4. GATES CAN EITHER BE SWINGING OR SLIDING TYPE. VEHICULAR ACCESS SWINGING GATES SHALL BE A PAIR AND SHALL BE HINGED FROM THE INSIDE. PROVISIONS SHALL BE MADE FOR SWINGING GATES TO SWING NOT LESS THAN 90 DEGREES AWAY FROM THE HST FACILITIES.
5. THIS DRAWING DEPICTS MINIMUM STANDARDS FOR RIGHT-OF-WAY FENCING AND GATE. ALTERNATIVE FENCE TYPE OF EQUIVALENT OR ENHANCED KIND MAY BE ALLOWED UPON APPROVAL OF THE AUTHORITY.



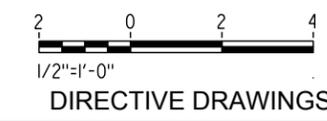
AR FENCE



VEHICLE ACCESS GATE ALONG AR FENCE



PEDESTRIAN ACCESS GATE ALONG AR FENCE



DIRECTIVE DRAWINGS

2/29/2012 5:20:42 PM CAHSRP.tbl CHSR_half_black.plt T:\13259B Calif High Speed Rail\CADD\Directive Drawings\Civil DD\DD-CV-006.dgn

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
M. ACOSTA
DRAWN BY
D. SO
CHECKED BY
S. MILITELLO
IN CHARGE
J. CHIRCO
DATE
03/01/2012



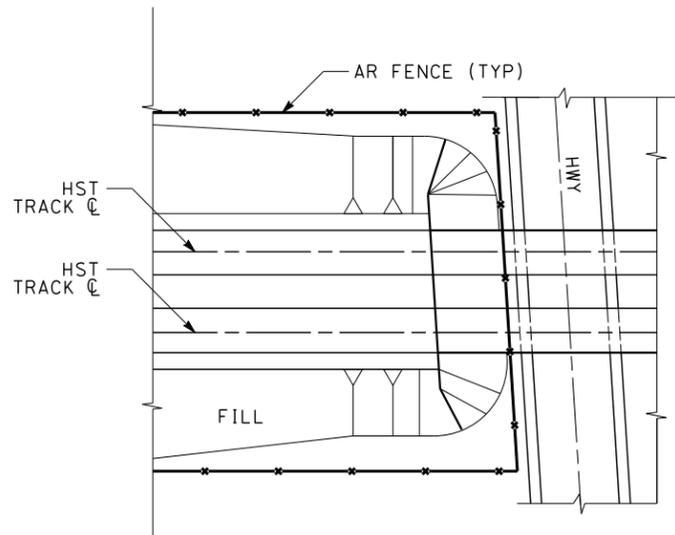
CALIFORNIA HIGH-SPEED TRAIN PROJECT
CIVIL DIRECTIVE
FENCE AND GATE DETAILS

CONTRACT NO.
DRAWING NO.
DD-CV-006
SCALE
AS SHOWN
SHEET NO.

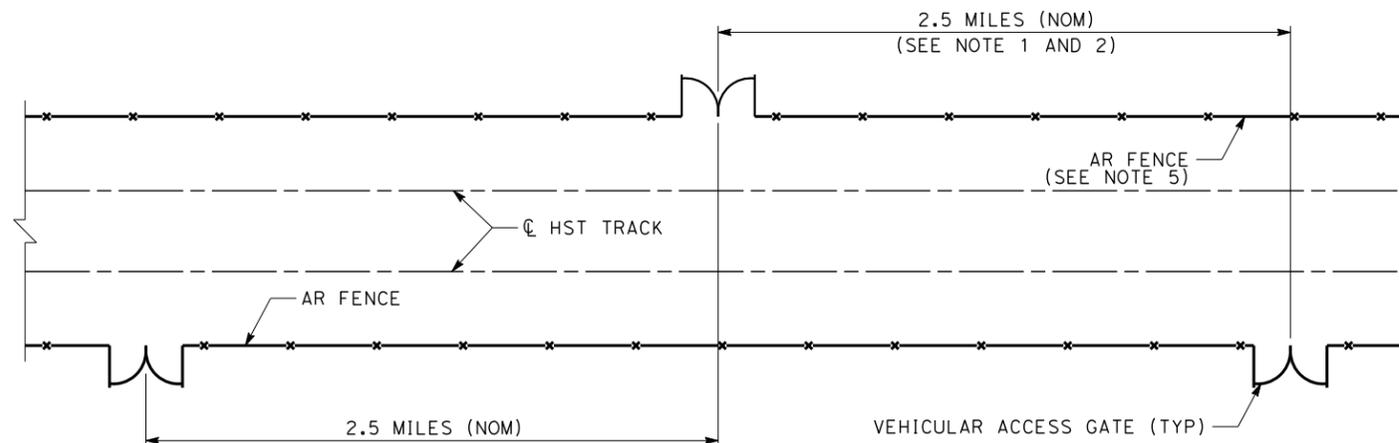
03/08/2012 RFP HSR 11-16

NOTES:

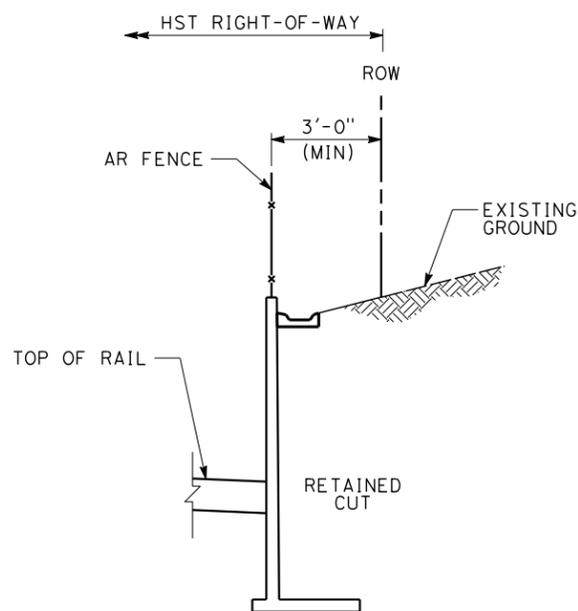
1. LOCATION OF GATES ALONG RIGHT-OF-WAY FENCING MAY REQUIRE COORDINATION WITH THE LOCAL FIRE PROTECTION AGENCY AND EMERGENCY RESPONDERS.
2. IN GENERAL VEHICULAR ACCESS GATE ALONG AT-GRADE TRACKWAY, SHALL BE LOCATED NOMINALLY AT 2.5 MILE INTERVALS AND COORDINATED WITH THE LOCATION OF HST WAYSIDE FACILITIES.
3. GATE LOCATIONS ALONG FENCING WITHIN FREEWAY RIGHT-OF-WAY REQUIRE CALTRANS APPROVAL.
4. VEHICULAR ACCESS GATES SHALL BE PROVIDED IN CONJUNCTION WITH EITHER ACCESS ROADS OR AT LOCATIONS WHERE EXISTING ROADS MAKE IT PRACTICABLE FOR MAINTENANCE AND EMERGENCY VEHICLE TO ACCESS THE TRACKWAY.
5. FOR ADDITIONAL DETAILS SEE CIVIL DRAWING "FENCE AND GATE DETAILS".



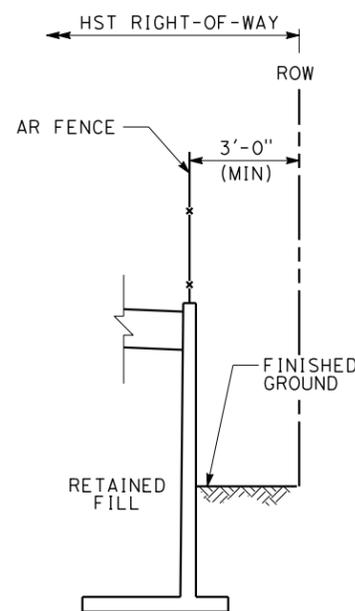
FENCE LOCATION AT HST ABUTMENT



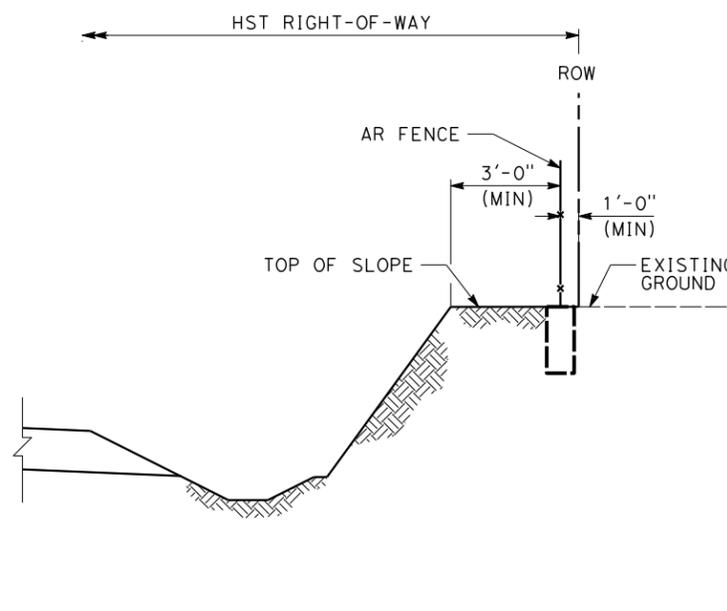
GATE LOCATIONS ALONG HST TRACKWAY AT GRADE



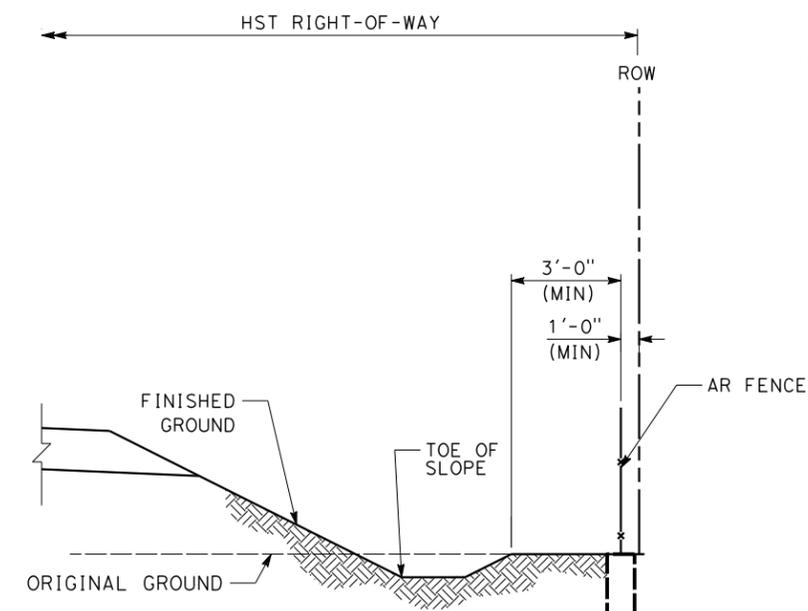
FENCE LOCATION ALONG HST TRACKWAY RETAINED CUT SECTION



FENCE LOCATION ALONG HST TRACKWAY RETAINED FILL SECTION



FENCE LOCATION ALONG HST TRACKWAY OPEN CUT SECTION



FENCE LOCATION ALONG HST TRACKWAY EMBANKMENT SECTION

DIRECTIVE DRAWINGS

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REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY M. ACOSTA
DRAWN BY D. SO
CHECKED BY S. MILITELLO
IN CHARGE J. CHIRCO
DATE 03/01/2012



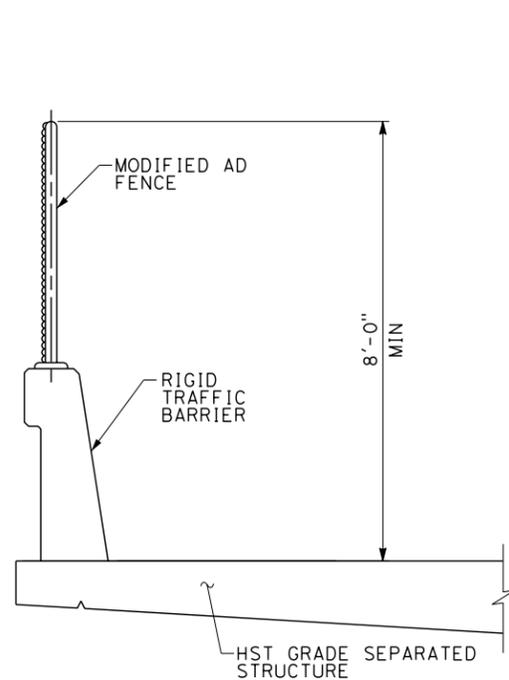
CALIFORNIA HIGH-SPEED TRAIN PROJECT
CIVIL DIRECTIVE
 FENCE AND GATE LOCATIONS

CONTRACT NO.
DRAWING NO. DD-CV-007
SCALE NO SCALE
SHEET NO.

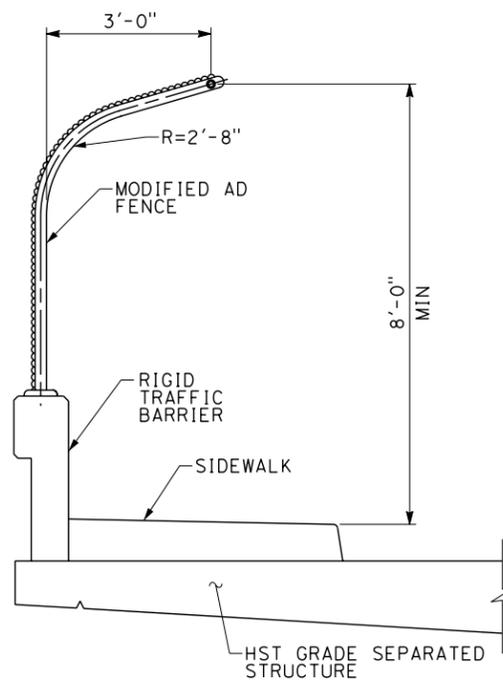
03/08/2012 RFP HSR 11-16

NOTES:

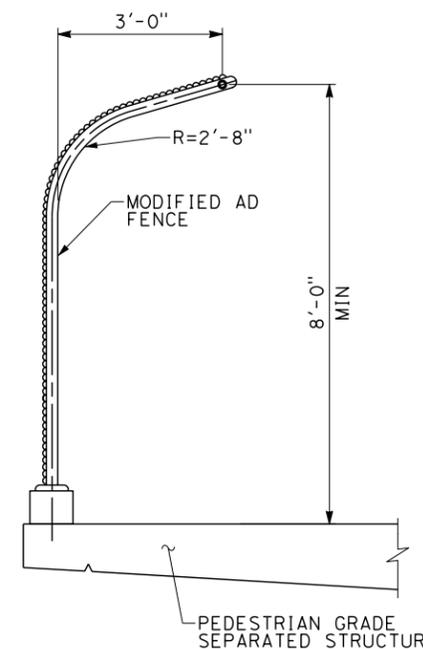
1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. FOR SOLID PLATE REQUIREMENT, SEE OVERHEAD CONTACT SYSTEM AND TRACTION POWER RETURN SYSTEM CHAPTER OF THE DESIGN CRITERIA.
3. EXTEND SOLID PLATE 30 FEET FROM CENTERLINE OF OUTERMOST TRACK.



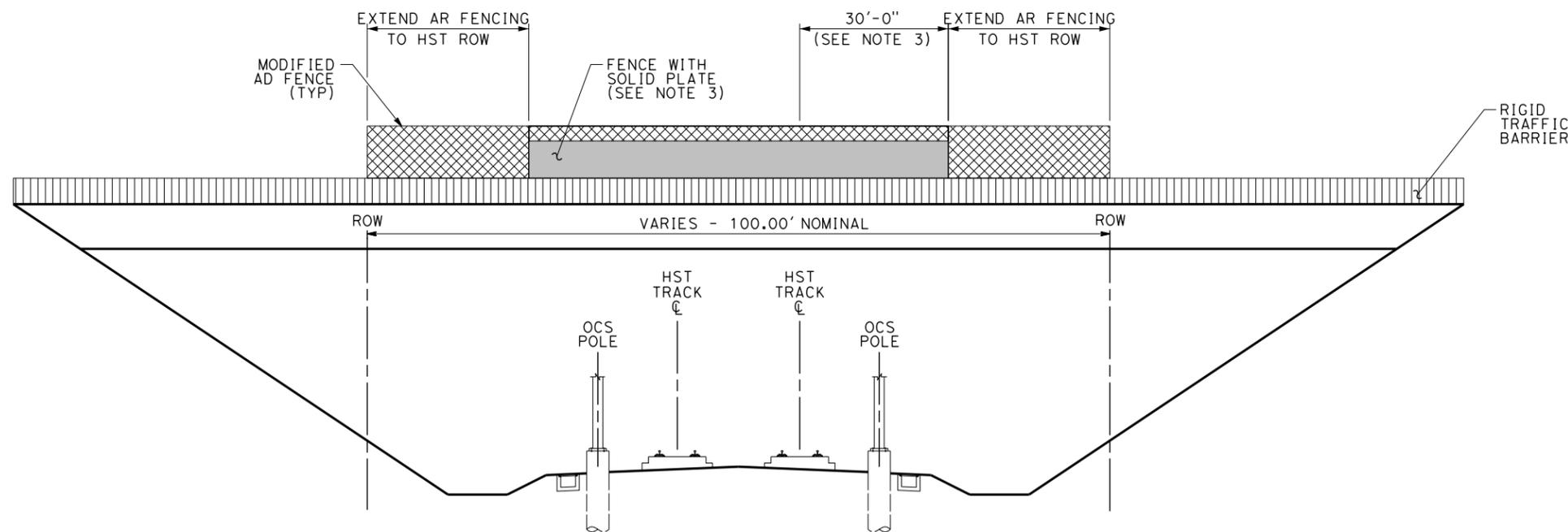
CROSS SECTION
FENCE AT GRADE SEPARATED STRUCTURES
WITHOUT SIDEWALK



CROSS SECTION
FENCE AT GRADE SEPARATED STRUCTURES
WITH SIDEWALK



CROSS SECTION
FENCE AT PEDESTRIAN
GRADE SEPARATED STRUCTURE

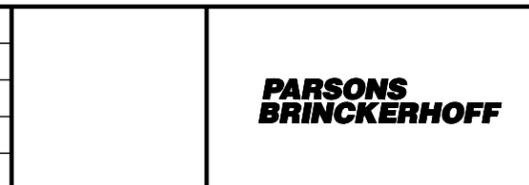


UNDERPASS STRUCTURE ELEVATION

DIRECTIVE DRAWINGS

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY M. ACOSTA
DRAWN BY D. SO
CHECKED BY S. MILITELLO
IN CHARGE J. CHIRCO
DATE 03/01/2012



CALIFORNIA HIGH-SPEED TRAIN PROJECT
CIVIL DIRECTIVE
FENCING ON GRADE SEPARATED STRUCTURES

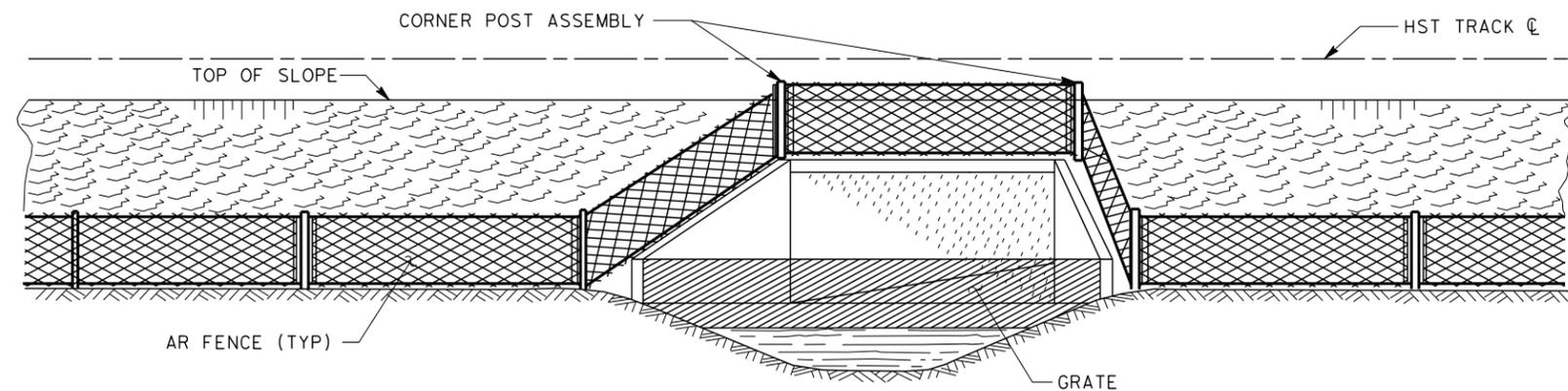
CONTRACT NO.
DRAWING NO. DD-CV-008
SCALE NO SCALE
SHEET NO.

T:\V13259B_Calif_High_Speed_Rail\CADD\Directive Drawings\Civil_DD\DD-CV-008.dgn
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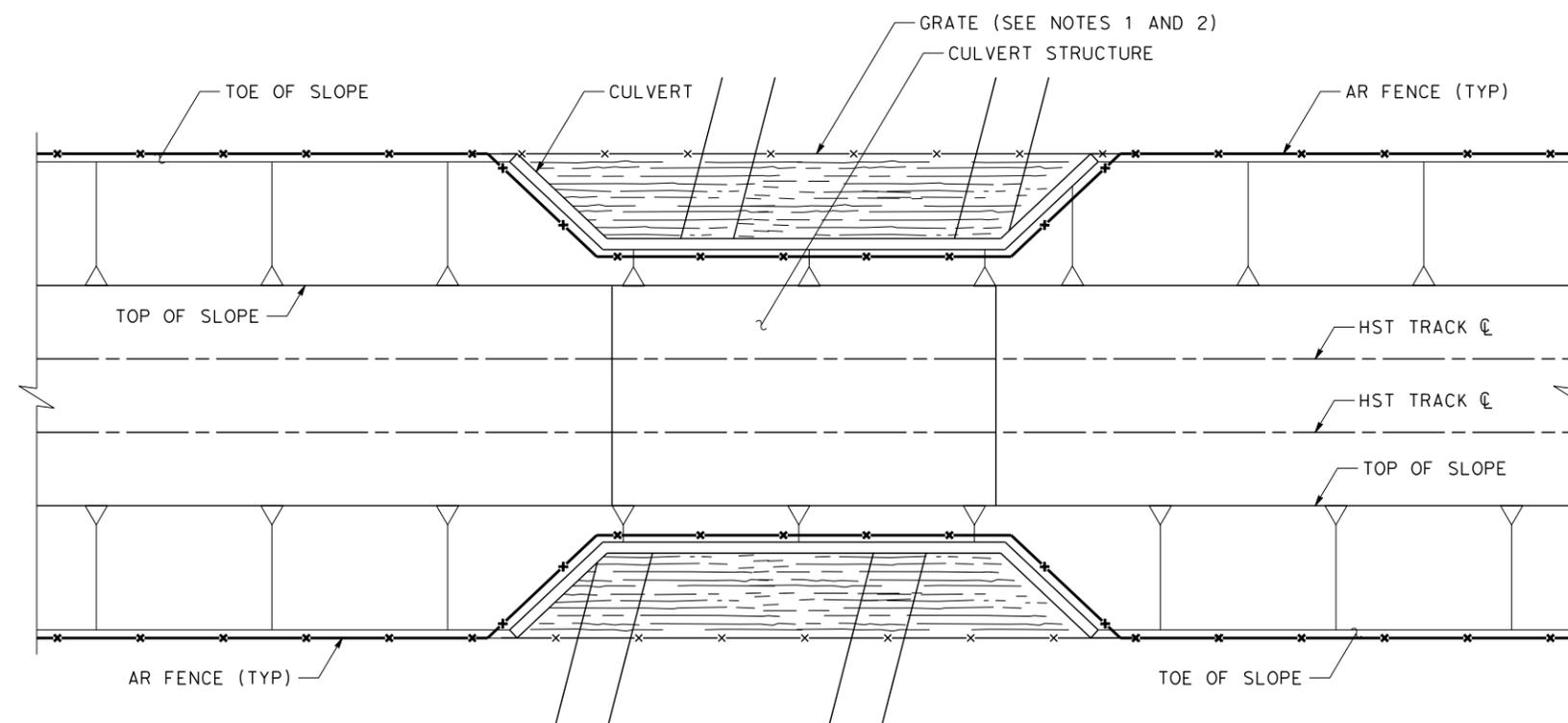
03/08/2012 RFP HSR 11-16

NOTES:

1. GRATES SHALL BE INSTALLED UPSTREAM AND DOWNSTREAM OF CULVERT HEADWALLS.
2. GRATES SHALL HAVE BARS SPACED 6 INCHES APART AND SHALL BE DESIGNED TO WITHSTAND MAXIMUM IMPACT FROM LARGEST EXPECTED FLOATING DEBRIS.
3. GRATE INSTALLATION SHALL BE COORDINATED WITH THE HYDRAULIC ENGINEER TO ENSURE PRESERVATION OF THE CULVERT FLOW CAPACITY.



ELEVATION



PLAN

DIRECTIVE DRAWINGS

2/29/2012 5:20:46 PM CAHSR.tbl CHSR_half_black.plt T:\13259B Calif High Speed Rail\CADD\Directive Drawings\Civil DD\DD-CV-009.dgn

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
M. ACOSTA
DRAWN BY
D. SO
CHECKED BY
S. MILITELLO
IN CHARGE
J. CHIRCO
DATE
03/01/2012



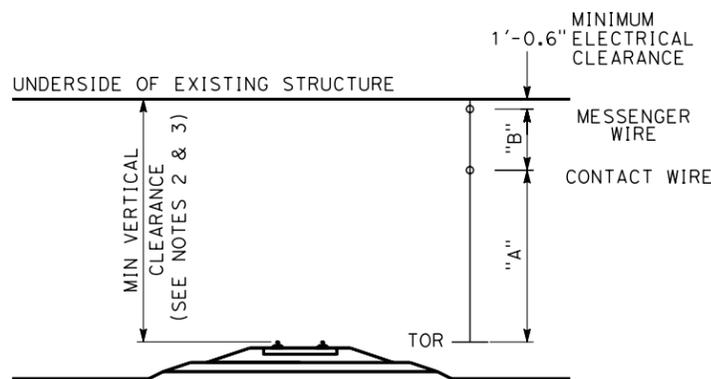
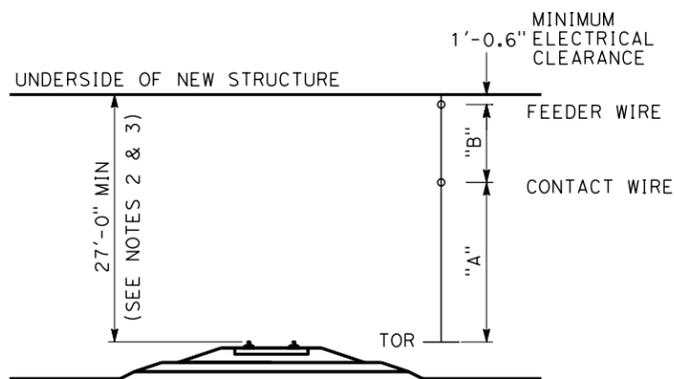
**CALIFORNIA HIGH-SPEED TRAIN PROJECT
CIVIL DIRECTIVE**
FENCE AT CULVERT CROSSINGS

CONTRACT NO.
DRAWING NO.
DD-CV-009
SCALE
NO SCALE
SHEET NO.

03/08/2012 RFP HSR 11-16

NOTES:

1. TOLERANCES ARE NOT ADDITIVE FOR INCREMENTAL DISTANCES.
2. DEFINED CLEARANCES ASSUMES GRADE SEPARATED STRUCTURE LENGTH ALONG TRACK IS NO MORE THAN 160 FEET FOR HST TRACK OVER 125 MPH. THE OCS SHALL BE FREE RUNNING UNDER GRADE SEPARATED STRUCTURES WITH NO SUPPORTS. STRUCTURES WIDER THAN 160' REQUIRE FURTHER ENGINEER APPROVAL.
3. AT LOCATIONS WHERE SUPERELEVATION IS PRESENT, VERTICAL CLEARANCES SHALL BE MEASURED FROM THE HIGH RAIL.
4. AT LOCAL ROADWAYS, 15 FEET MINIMUM VERTICAL CLEARANCE SHOULD BE DISCUSSED WITH LOCAL AGENCY FOR CONCURRENCE.
5. PROTECTIVE STRUCTURE IS REQUIRED IF SIDE CLEARANCE IS LESS THAN 25 FEET.
6. RIGID TRAFFIC BARRIER MAY BE REQUIRED IF SIDE CLEARANCE IS LESS THAN 30 FEET.
7. SEE APPLICABLE LOCAL DESIGN CRITERIA FOR SIDE CLEARANCE.



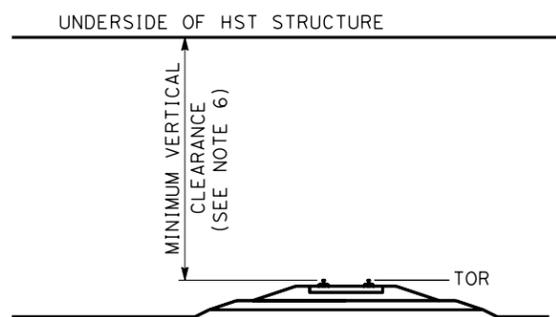
NEW STRUCTURE OVER HST TRACKS

	HEIGHT "A"	HEIGHT "B"	MIN VERTICAL CLEARANCE
DEDICATED HST TRACK	17'-5"	8'-3.5"	27'-0"
SHARED USE TRACK	18'-9"	7'-0.5"	27'-0"

EXISTING STRUCTURE OVER HST TRACKS

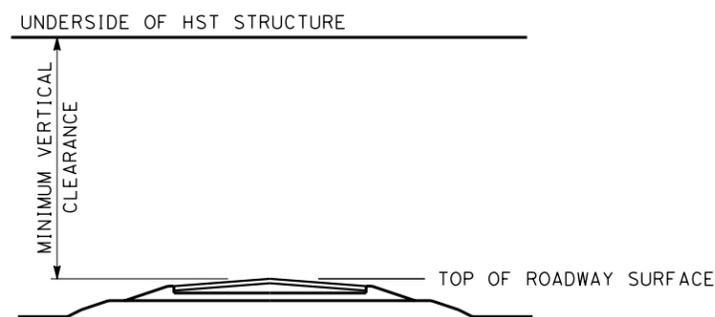
	HEIGHT "A"	HEIGHT "B"	MIN VERTICAL CLEARANCE
DEDICATED HST TRACK	17'-5"	8'-3.5"	27'-0"
DEDICATED HST TRACK (V ≤ 125 MPH)	17'-5"	5'-3"	24'-0"*
SHARED USE TRACK	18'-9"	4'-0"	24'-6"*

* SEE NOTE 2



NEW HST STRUCTURE OVER TRACK

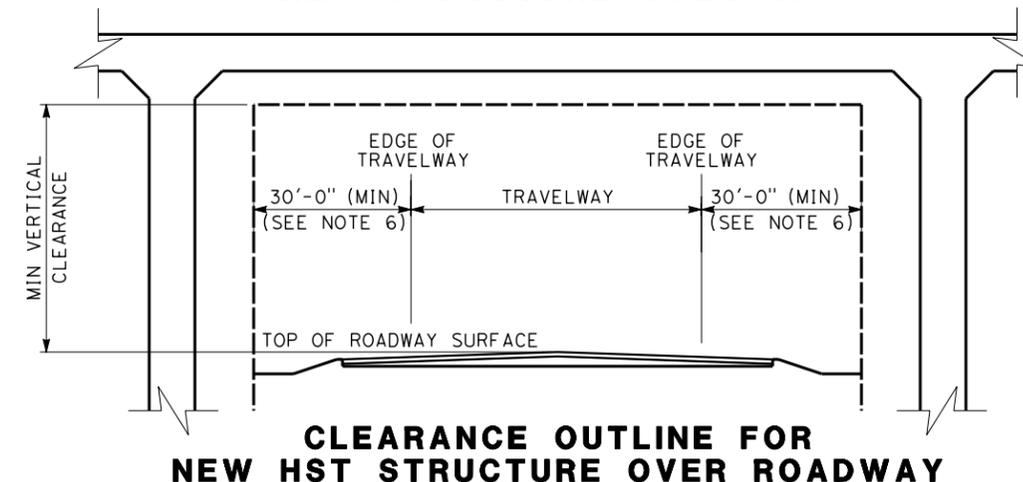
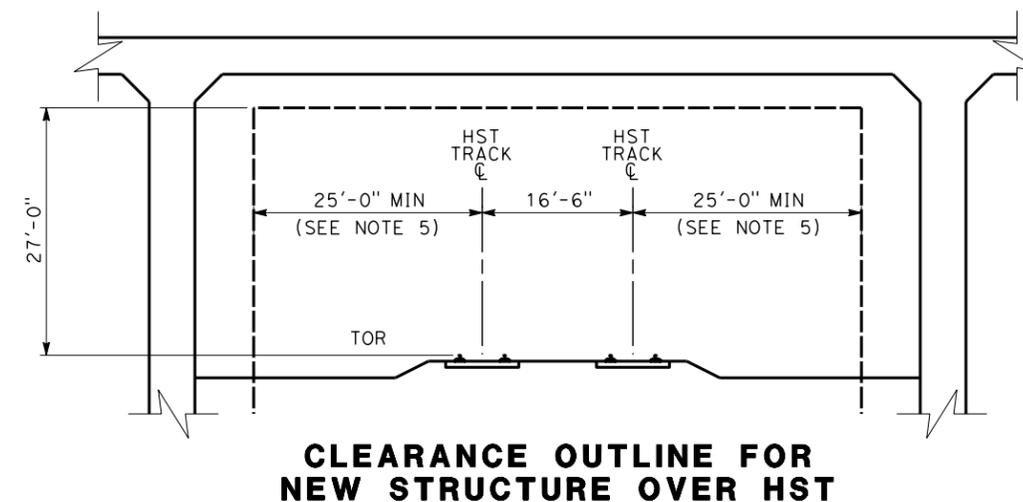
	MIN VERTICAL CLEARANCE
FREIGHT TRACKS	
BNSF	23'-4"
UPRR	23'-0"
NON-FREIGHT TRACKS	
METROLINK	24'-0"
CALTRAIN	24'-6"



NEW HST STRUCTURE OVER ROADWAY

	MIN VERTICAL CLEARANCE
FREEWAY/EXPRESSWAY	16'-6"
LOCAL ROADWAY	15'-0" *
EXTRA LEGAL LOAD NETWORK(ELLN)	20'-3"

* SEE NOTE 4



MIN SIDE CLEARANCE
 FREEWAY/EXPRESSWAY 30'-0"
 OTHER SEE NOTE 7

DIRECTIVE DRAWINGS

3/7/2012 10:21:48 AM CAHSR.TBL CHSR_half_black.plt T:\13259B Calif High Speed Rail\CAADD\Directive Drawings\Civil DD\DD-CV-010.dgn

03/08/2012 RFP HSR 11-16

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY S. MILITELLO
DRAWN BY V. HUANTE
CHECKED BY H. NGUYEN
IN CHARGE J. CIRCO
DATE 03/01/2012



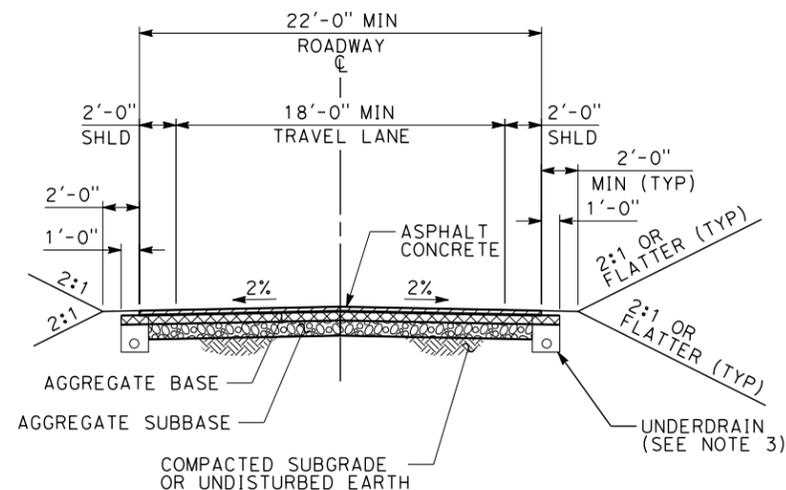
**CALIFORNIA HIGH-SPEED TRAIN PROJECT
 CIVIL DIRECTIVE**

MINIMUM CLEARANCE
 GRADE SEPARATED STRUCTURES

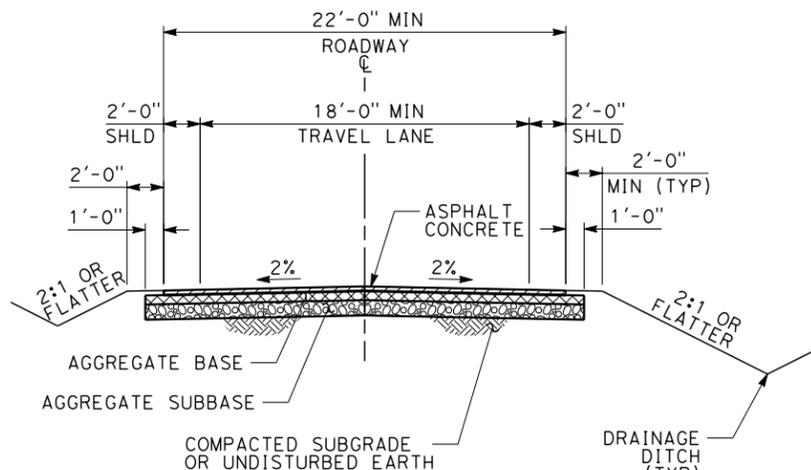
CONTRACT NO.
DRAWING NO. DD-CV-010
SCALE NO SCALE
SHEET NO.

NOTES:

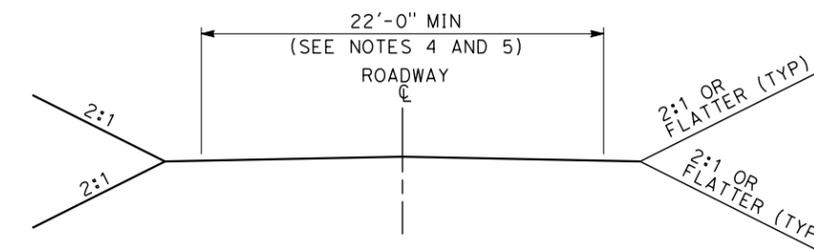
1. AUTHORITY ROADWAYS REFER TO ACCESS ROADS AND SERVICE ROADS.
2. UNPAVED ROADWAYS CAN BE USED AS TEMPORARY ACCESS TO SITES.
3. REFER TO CALTRANS STANDARD PLANS FOR:
 - A) CURBS AND DRIVEWAYS (A87A)
 - B) UNDERDRAINS (D102)
4. IF FIRE HYDRANT IS LOCATED ON ROAD, MINIMUM ROADWAY WIDTH SHALL BE 26 FEET.
5. TWO-WAY SERVICE ROADS SHALL BE 24 FEET WIDE WITH NO SHOULDERS.
6. COMPACT SUBGRADE TO 95% COMPACTION.



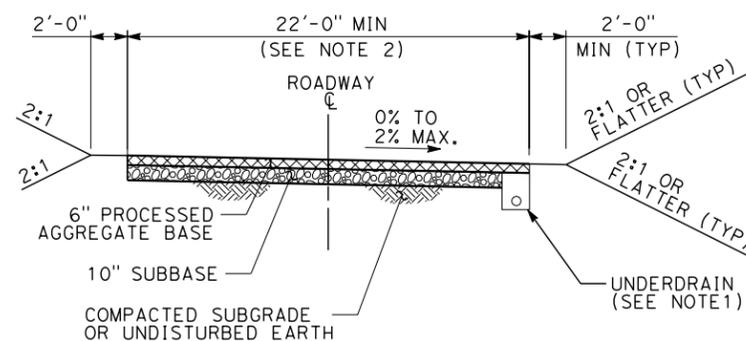
TYPICAL 22 FT ROADWAY SECTION-PAVED
CLOSED DRAINAGE



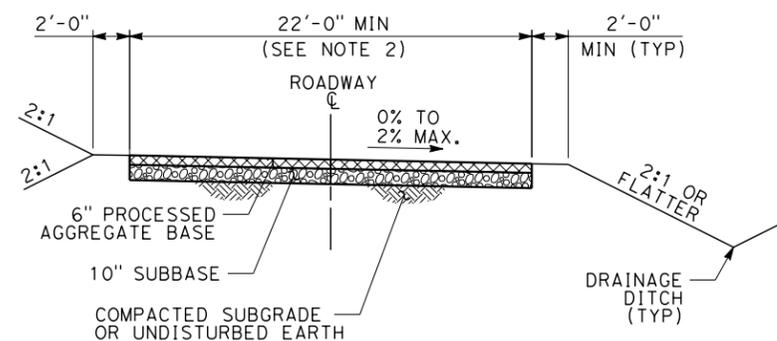
TYPICAL 22 FT ROADWAY SECTION-PAVED
OPEN DRAINAGE



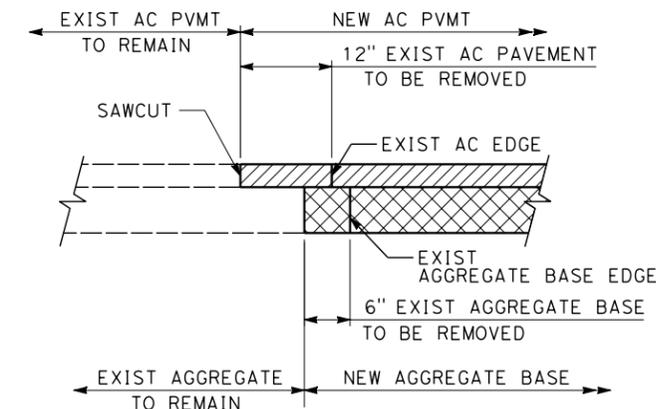
AUTHORITY ROADWAYS WIDTH



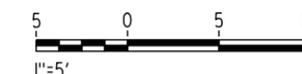
TYPICAL 22 FT ROADWAY SECTION-UNPAVED
CLOSED DRAINAGE



TYPICAL 22 FT ROADWAY SECTION-UNPAVED
OPEN DRAINAGE



PAVEMENT CONNECTION DETAIL
SCALE: 1"=1'-0"



DIRECTIVE DRAWINGS

2/29/2012 8:25:19 AM CAHSR.tbl CHSR_half_black.plt T:\13259B Calif High Speed Rail\CADD\Directive Drawings\Civil DD\DD-CV-011.dgn

03/08/2012 RFP HSR 11-16

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DESIGNED BY
S. MILITELLO
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V. HUANTE
CHECKED BY
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IN CHARGE
J. CHIRCO
DATE
03/01/2012



CALIFORNIA HIGH-SPEED TRAIN PROJECT
CIVIL DIRECTIVE

AUTHORITY ROADWAYS

CONTRACT NO.
DRAWING NO.
DD-CV-011
SCALE
AS SHOWN
SHEET NO.

California High-Speed Train Project



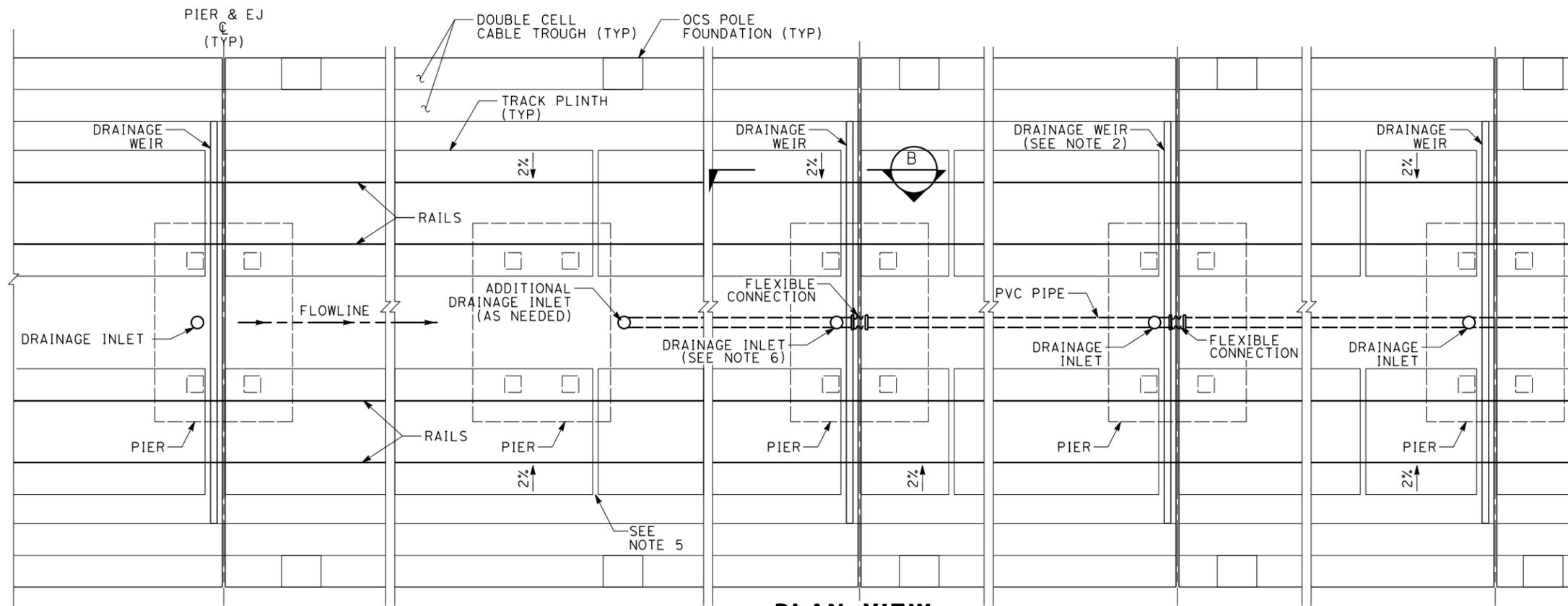
Request for Proposal for Design-Build Services

RFP No.: HSR 11-16
Directive Drawings

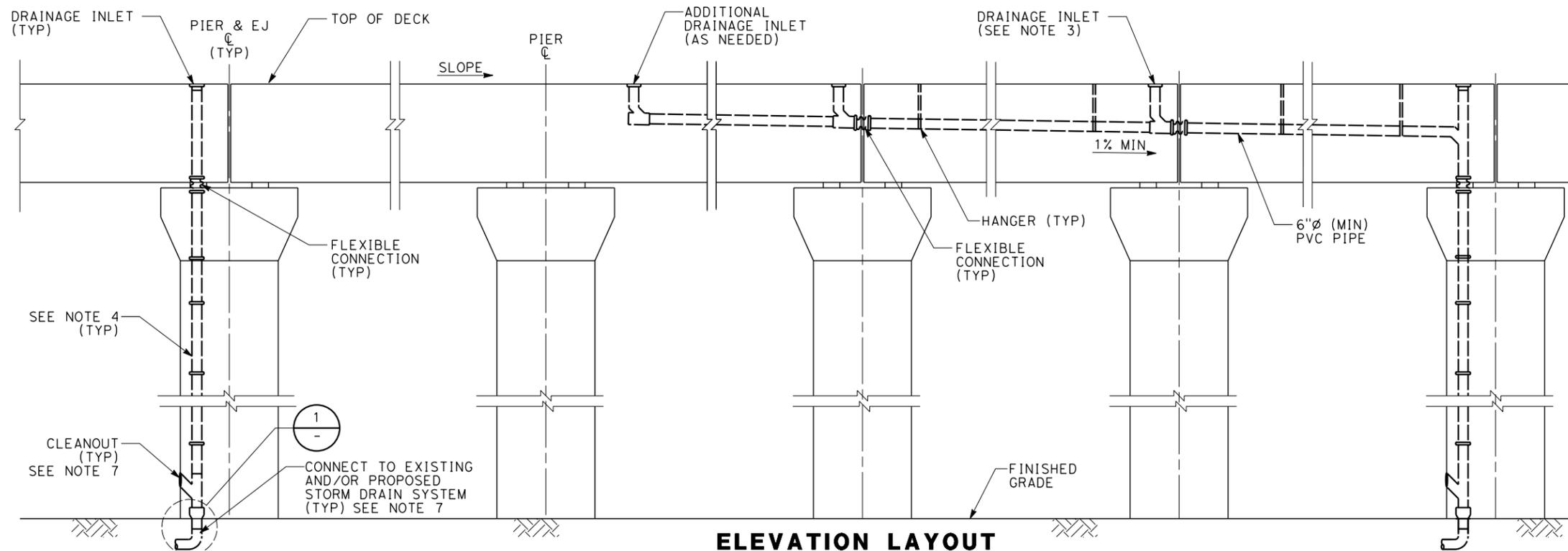
Drainage

NOTES:

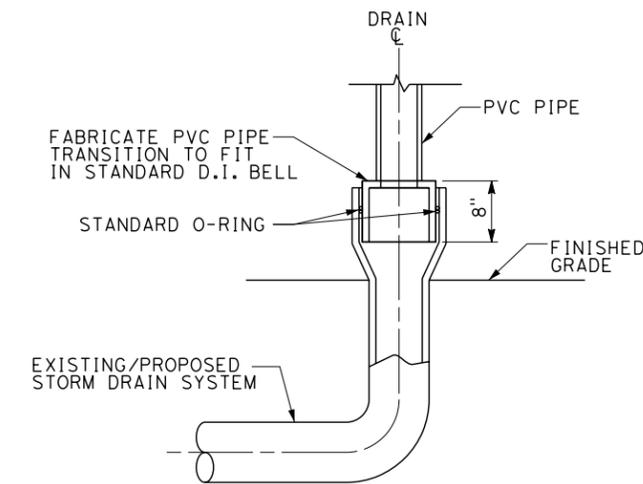
1. TRACK, SYSTEMS AND STRUCTURES ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. WEIR AND INLET SHALL BE PROVIDED UPSTREAM OF EVERY EXPANSION JOINT, SEE "NON-BALLASTED AERIAL STRUCTURE DECK DRAINAGE SYSTEM" FOR EXPANSION JOINT DETAILS.
3. IF DOWNSPOUT IS NOT FEASIBLE AT EXPANSION JOINT, COLUMN CONNECTED STORM WATER MAY BE CONVEYED THROUGH PVC PIPE, USING FLEXIBLE CONNECTIONS AT EXPANSION JOINTS, UNTIL DOWNSPOUT CAN BE CONNECTED TO EXISTING/ PROPOSED STORM DRAIN SYSTEM.
4. PROVIDE MINIMUM 1-6" GAP BETWEEN PVC PIPE AND INTERIOR COLUMN WALL.
5. PROVIDE A 5-INCH WIDE GAP IN TRACK PLINTH, 20 FEET ON CENTER AND ONE JUST UPSTREAM OF THE WEIR, SEE DETAIL.
6. REFER TO DRAINAGE DRAWING "AERIAL STRUCTURE BRIDGE DECK DRAINAGE INLET DETAIL" FOR DRAINAGE INLET DETAIL.
7. CLEANOUTS AND PIPE PENETRATIONS FROM THE COLUMNS SHALL BE OUTSIDE OF THE PLASTIC HINGE



PLAN VIEW

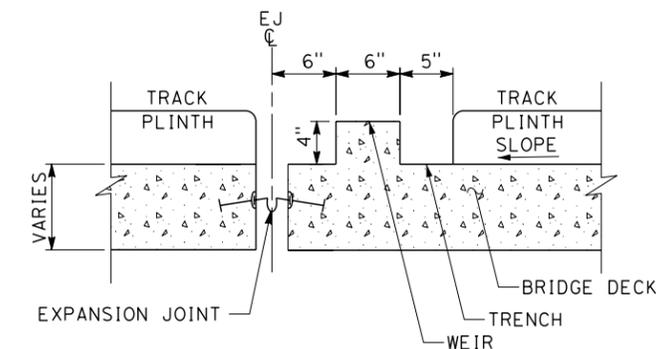


ELEVATION LAYOUT



TRANSITION DETAIL 1

NO SCALE



SECTION B

NO SCALE

DIRECTIVE DRAWINGS

2/29/2012 8:27:20 AM CAHSRP.tbl CHSR_half_black.plt T:\13259B Calif High Speed Rail\CAADD\Directive Drawings\Drainage DD\DD-CD-001.dgn

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DESIGNED BY
K. SISTLA
DRAWN BY
V. HUANTE
CHECKED BY
A. ABTAHI
IN CHARGE
J. CHIRCO
DATE
03/01/2012



**CALIFORNIA HIGH-SPEED TRAIN PROJECT
DRAINAGE DIRECTIVE**

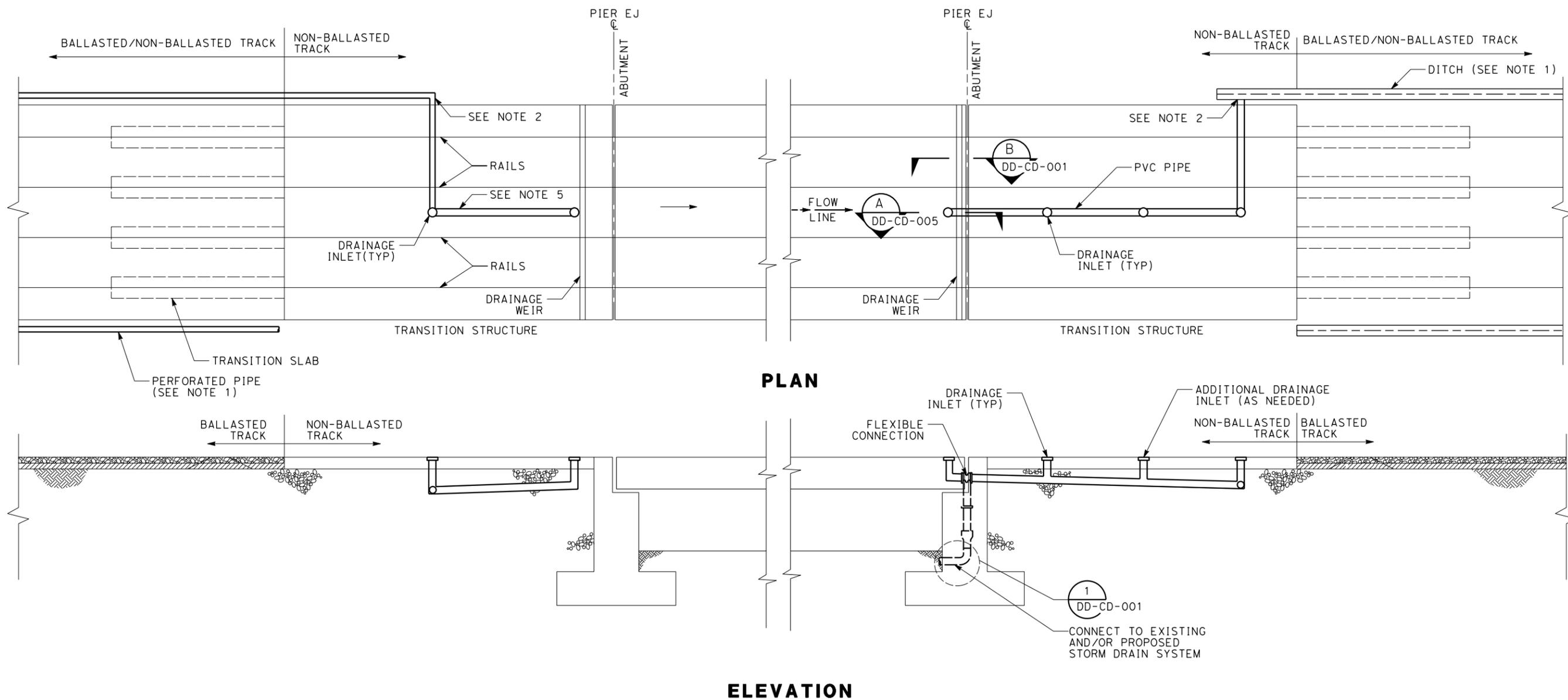
NON-BALLASTED AERIAL STRUCTURE
DECK DRAINAGE SYSTEM

CONTRACT NO.
DRAWING NO.
DD-CD-001
SCALE
NO SCALE
SHEET NO.

03/08/2012 RFP HSR 11-16

NOTES:

1. TRACK AND STRUCTURES ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. PERFORATED UNDERDRAIN DRAINAGE SYSTEM OR TRACKSIDE DITCHES. SEE "TRACK DRAIN/UNDERDRAIN CLEANOUT AND RISER DETAILS" AND "DITCH DETAILS" FOR DRAINAGE SYSTEM DETAILS.
3. STORM DRAIN SYSTEM CONNECTS TO AN UNDERGROUND SYSTEM OR TRACKSIDE DITCHES.
4. INLET AND WIER REQUIRED UPSTREAM OF ALL EXPANSION JOINTS. FOR MULTIPLE SPAN BRIDGES WITH INTERMEDIATE EXPANSION JOINTS, SEE "NON-BALLASTED AERIAL STRUCTURE DECK DRAINAGE SYSTEM".
5. STORM DRAIN INLET MAY DISCHARGE TO OVERSIDE DRAIN ON THE EMBANKMENT.



03/08/2012 RFP HSR 11-16

DIRECTIVE DRAWINGS

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K. SISTLA
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A. ABTAHI
IN CHARGE
J. CHIRCO
DATE
03/01/2012



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DRAINAGE DIRECTIVE**

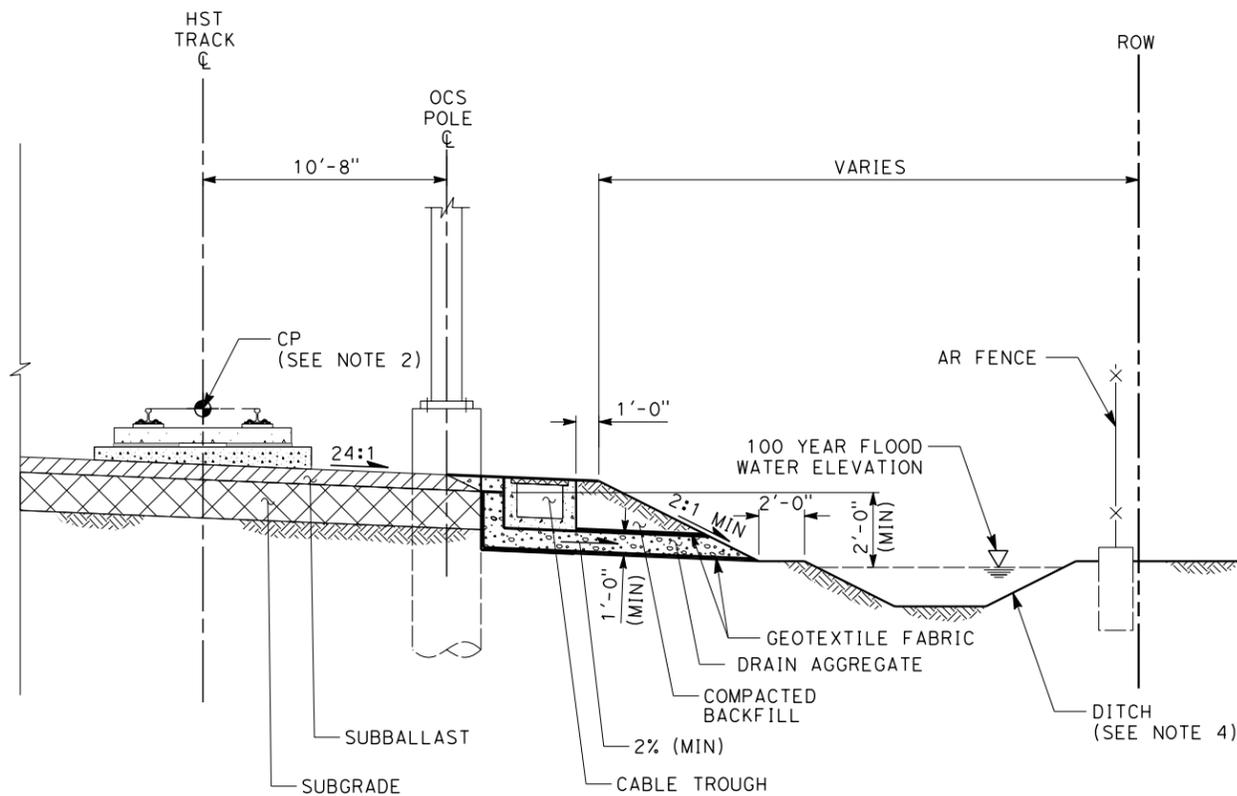
AERIAL STRUCTURE
BEGIN AND END BRIDGE DRAINAGE SYSTEM

CONTRACT NO.
DRAWING NO.
DD-CD-002
SCALE
NO SCALE
SHEET NO.

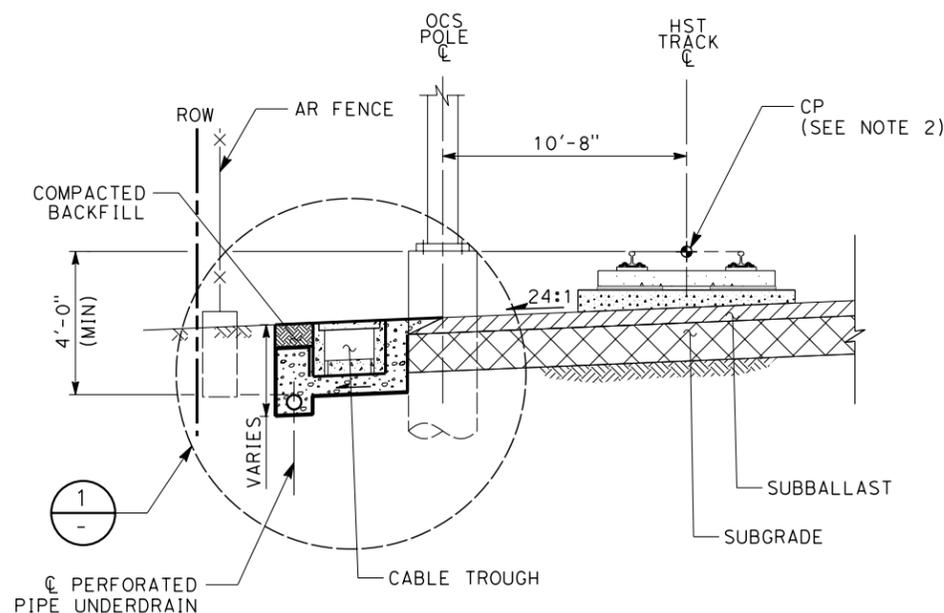
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NOTES:

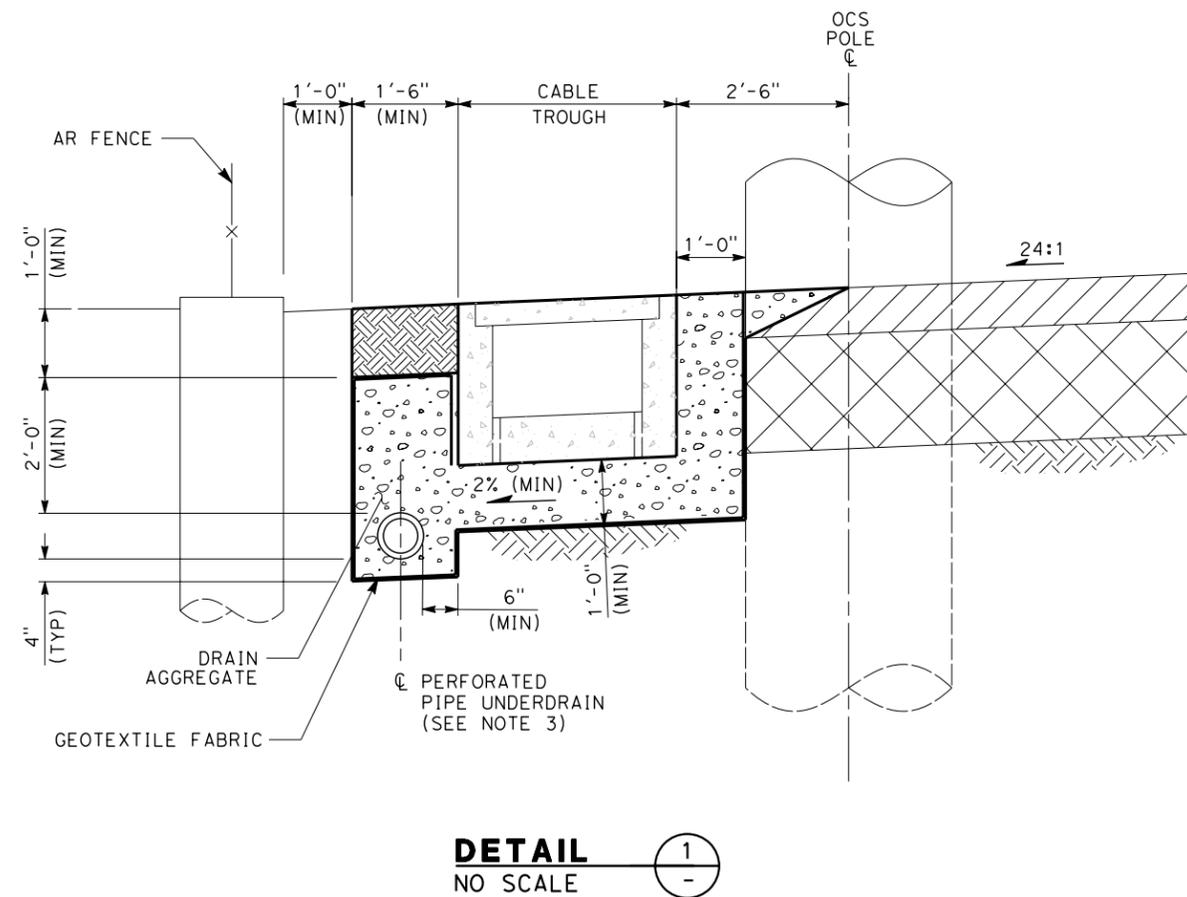
1. TRACK AND SYSTEMS ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. THE CONTROL POINT (CP) IS THE INTERSECTION OF THE CENTERLINE OF TRACK AND THE TOP OF THE RAIL, FOR SUPERELEVATED TRACK SECTIONS THE CP IS THE INTERSECTION OF THE CENTERLINE OF THE TRACK AND THE TOP OF THE LOW RAIL.
3. TRACK DRAINAGE SYSTEM SHALL BE CONNECTED AND DISCHARGE TO THE LOCAL STORM DRAIN SYSTEM.
4. REFER TO DRAINAGE DRAWING "DITCH DETAILS".



**TYPICAL SECTION
AT GRADE TRACK OPEN DRAINAGE SYSTEM**



**TYPICAL SECTION
AT GRADE TRACK CLOSED DRAINAGE SYSTEM**



**DETAIL
NO SCALE**

03/08/2012 RFP HSR 11-16

DIRECTIVE DRAWINGS

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K. SISTLA
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IN CHARGE
J. CHIRCO
DATE
03/01/2012



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DRAINAGE DIRECTIVE**

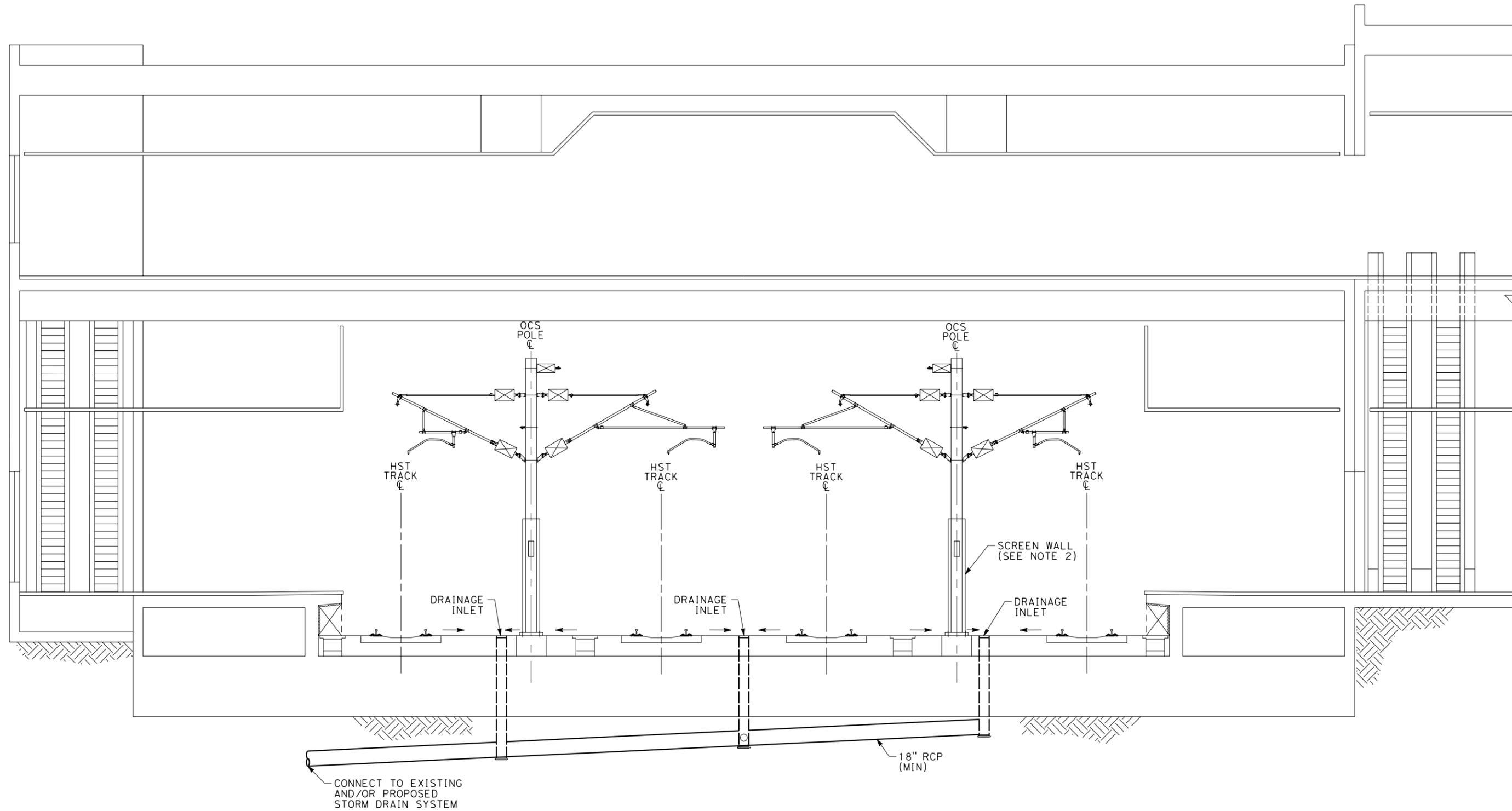
AT-GRADE TRACK
DRAINAGE SYSTEM

CONTRACT NO.
DRAWING NO. DD-CD-003
SCALE NO SCALE
SHEET NO.

2/29/2012 8:27:26 AM CAHSRP.tbl CHSR_half_black.plt T:\13259B_Calif_High_Speed_Rail\CADD\Directive Drawings\Drainage_DD\DD-CD-003.dgn huante

NOTES:

1. TRACK, SYSTEMS AND STRUCTURES ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. PROVIDE DRAIN SLOTS UNDER SCREEN WALL FOR DRAINAGE. INLETS SHALL BE AT THE LOW POINT AND UNDER THE SCREEN WALL.



03/08/2012 RFP HSR 11-16

DIRECTIVE DRAWINGS

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K. SISTLA
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A. ABTAHI
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DATE
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DRAINAGE DIRECTIVE**

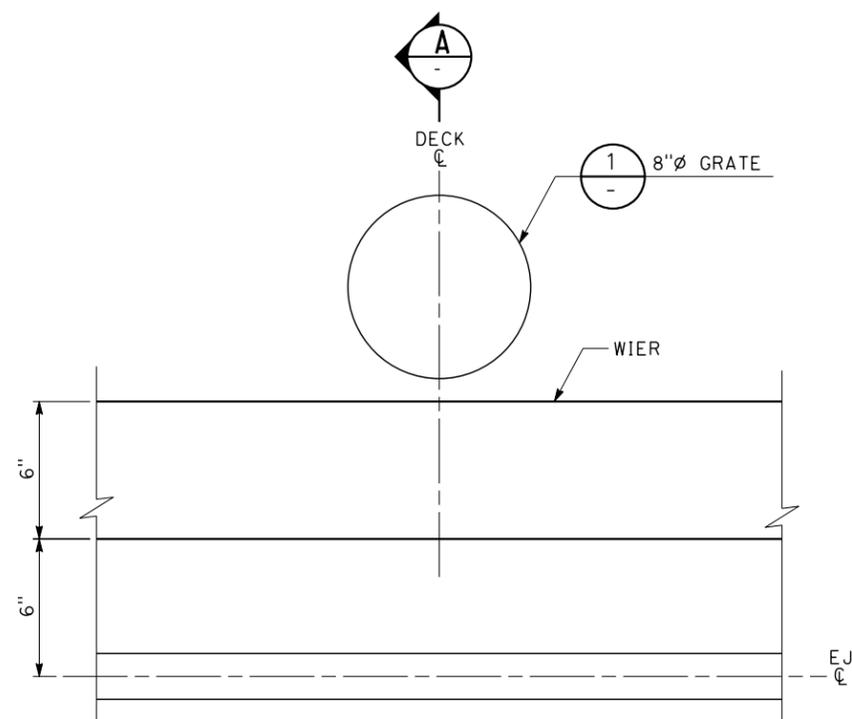
AT-GRADE STATION PLATFORM
DRAINAGE SYSTEM

CONTRACT NO.
DRAWING NO. DD-CD-004
SCALE NO SCALE
SHEET NO.

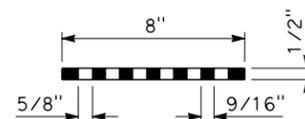
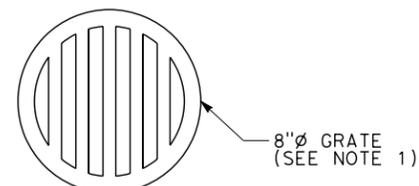
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NOTES:

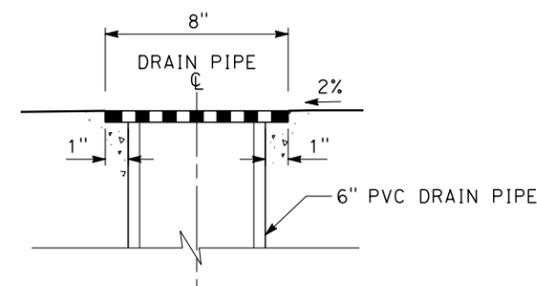
1. DRAIN GRATES SHALL BE SECURELY CONNECTED TO THE INLET.



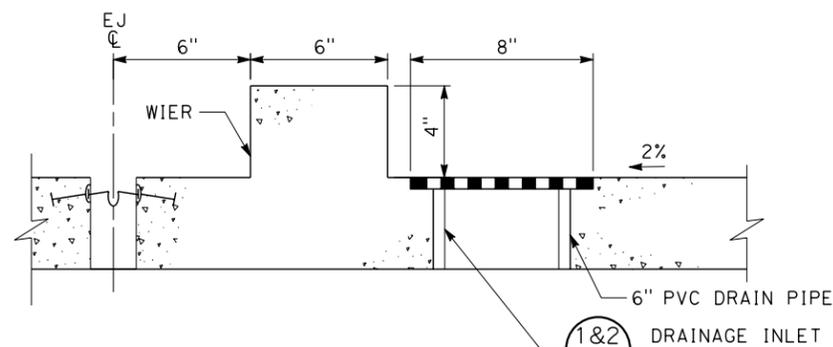
PLAN
DRAINAGE INLET ON AERIAL STRUCTURE DECK
NO SCALE



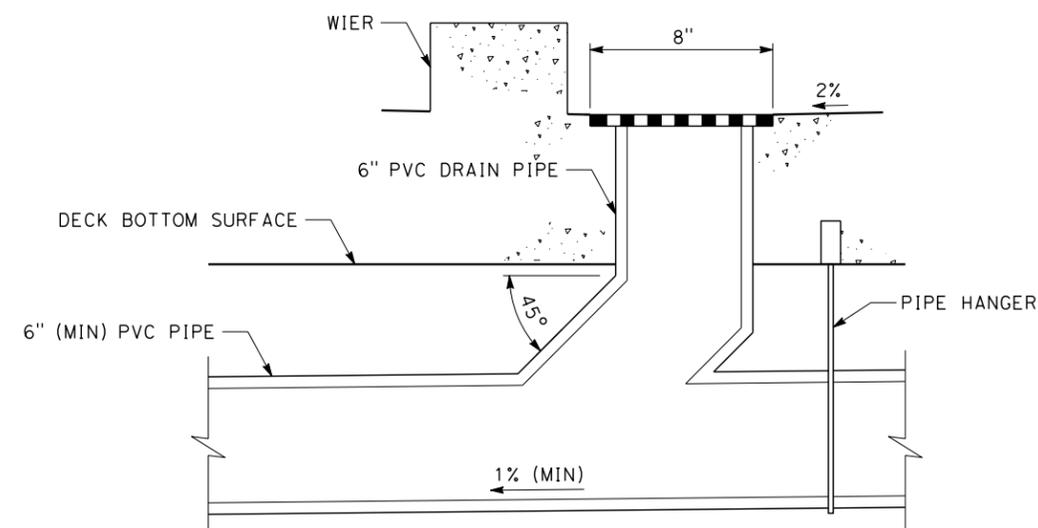
DETAIL 1
NO SCALE



DETAIL 2
VERTICAL INLET
NO SCALE



SECTION A-A
NO SCALE



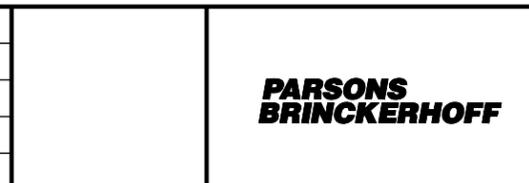
DETAIL 3
45° ANGLE INLET
NO SCALE

DIRECTIVE DRAWINGS

2/29/2012 8:27:31 AM CAHSR.tbl CHSR_half_black.plt T:\3259B Calif High Speed Rail\CADD\Directive Drawings\Drainage DD\DD-CD-005.dgn

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K. SISTLA
DRAWN BY
T. DOUNG
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J. CHIRCO
DATE
03/01/2012



CALIFORNIA HIGH-SPEED TRAIN PROJECT
DRAINAGE DIRECTIVE
AERIAL STRUCTURE BRIDGE DECK
DRAINAGE INLET DETAIL

CONTRACT NO.
DRAWING NO.
DD-CD-005
SCALE
NO SCALE
SHEET NO.

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California High-Speed Train Project



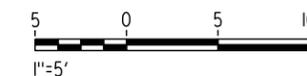
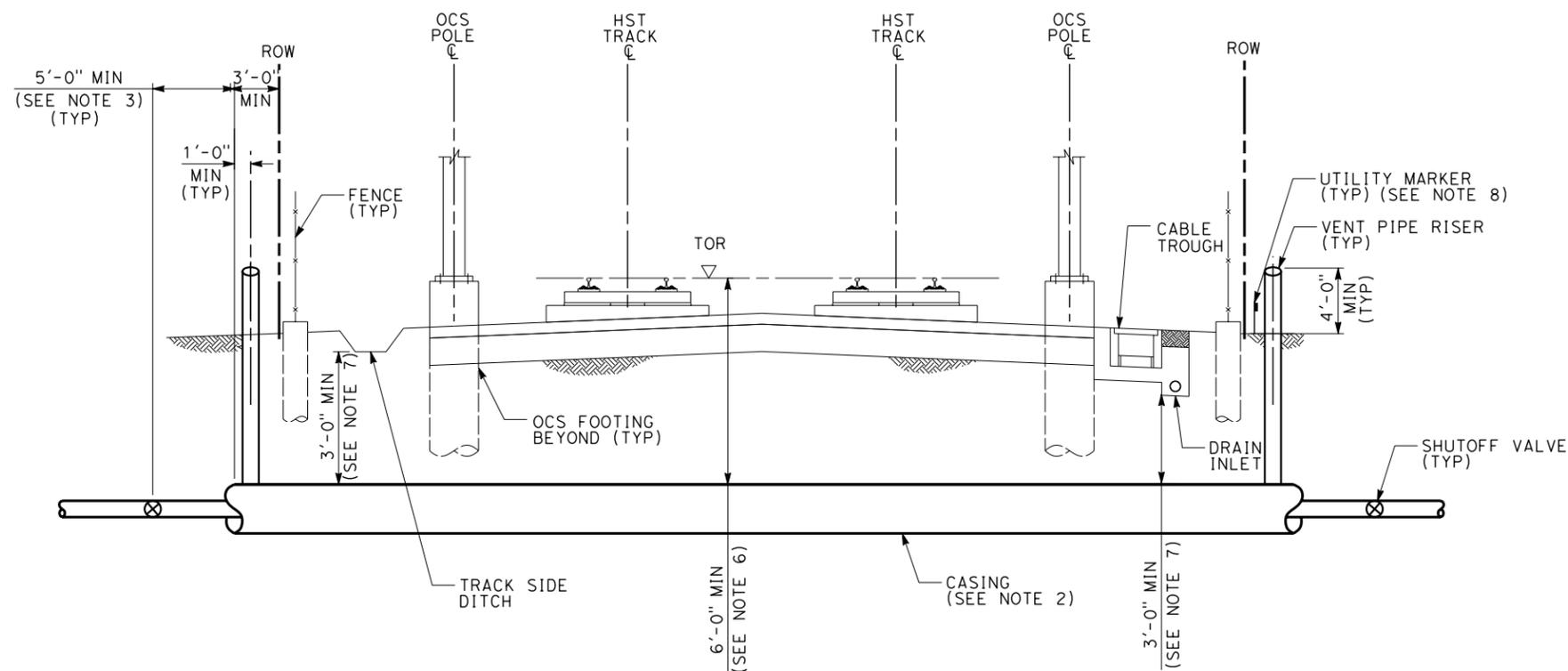
Request for Proposal for Design-Build Services

RFP No.: HSR 11-16
Directive Drawings

Utility

NOTES:

1. TRACK, SYSTEMS, DRAINAGE, AND STRUCTURES ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. FOR ADDITIONAL REQUIREMENTS, SEE AREMA MANUAL.
3. SHUTOFF VALVE MUST BE ACCESSIBLE FROM OUTSIDE THE RIGHT OF WAY. IT MAY NOT BE REQUIRED ON BOTH SIDES.
4. THE CASING SHALL CONTINUE 3 FEET BEYOND THE RIGHT OF WAY.
5. TRANSVERSE UTILITIES SHALL BE LOCATED AWAY FROM MANHOLES, OCS FOOTINGS, AND OTHER HSR SUBSURFACE ELEMENTS.
6. MINIMUM CLEARANCE FOR GAS TRANSMISSION PIPELINE CROSSING SHALL BE 10'-6" BELOW TOP OF RAIL.
7. MINIMUM CLEARANCE FOR UNDERGROUND WIRE LINE CROSSING, OVER 750 VOLTS, SHALL BE 4'-0" AND FOR GAS TRANSMISSION PIPELINE CROSSING SHALL BE 6'-0" BELOW DRAINAGE FACILITIES.
8. UTILITY MARKER TO INDICATE LOCATION OF UTILITY CROSSING AT RIGHT-OF-WAY.



DIRECTIVE DRAWINGS

2/23/2012 8:52:52 AM CAHSRP.TBL CHSR_half_black.plt T:\3259B Calif High Speed Rail\CADD\Directive Drawings\Utilities-DD\DD-UT-001.dgn

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A. ABTAHI
DRAWN BY
H. NGUYEN
CHECKED BY
S. MILITELLO
IN CHARGE
J. CHIRCO
DATE
03/01/2012



CALIFORNIA HIGH-SPEED TRAIN PROJECT
UTILITIES DIRECTIVE

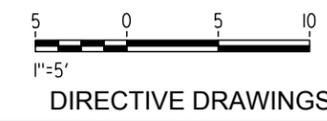
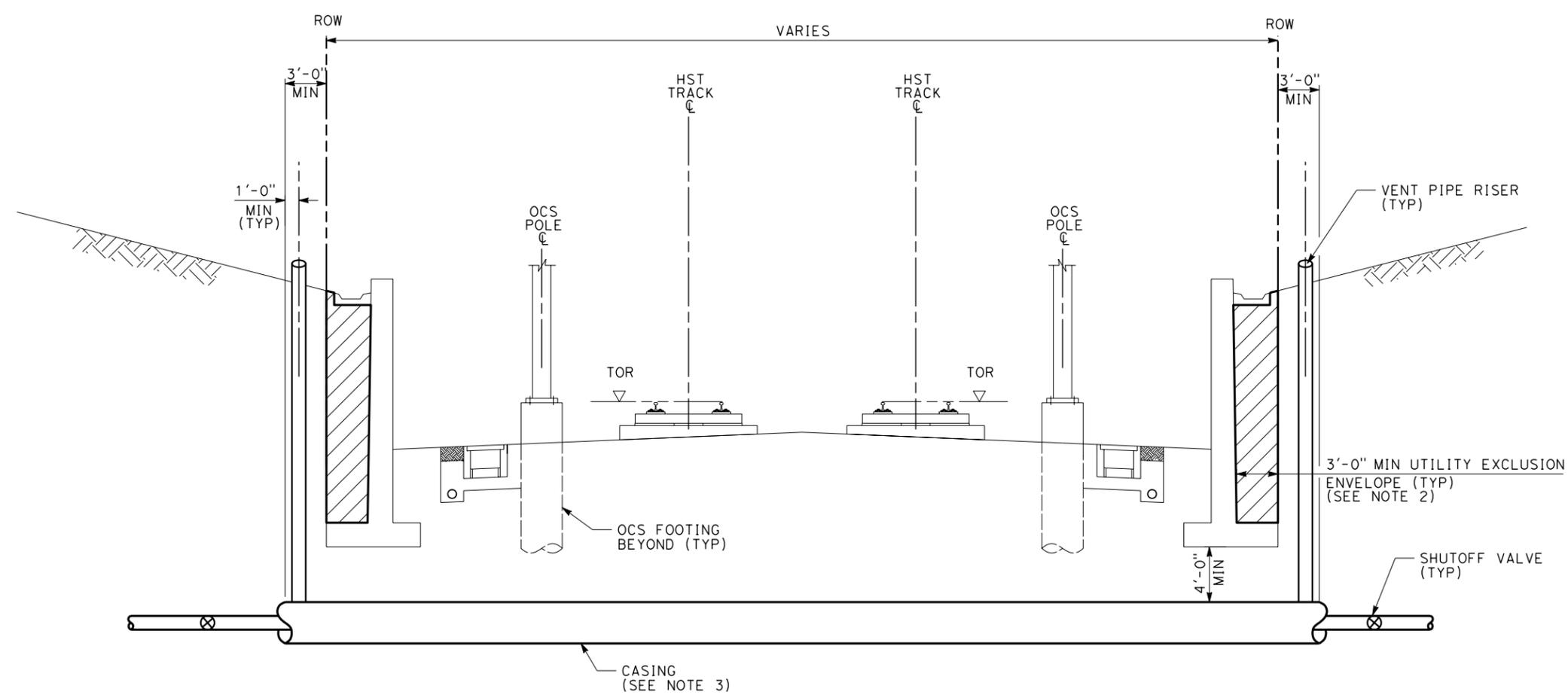
UTILITY CROSSING CLEARANCES
AT GRADE

CONTRACT NO.
DRAWING NO. DD-UT-001
SCALE AS SHOWN
SHEET NO.

03/08/2012 RFP HSR 11-16

NOTES:

1. TRACK, SYSTEMS, DRAINAGE, AND STRUCTURES ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. NO UTILITIES ABOVE THE WALL FOOTINGS.
3. FOR ADDITIONAL REQUIREMENTS, SEE AREMA MANUAL.
4. TRANSVERSE UTILITIES SHALL BE LOCATED AWAY FROM MANHOLES, OCS FOOTINGS, AND OTHER HSR SUBSURFACE ELEMENTS.



2/22/2012 10:14:32 AM CAHSRP.TBL CHSR_half_black.plt T:\3259B Calif High Speed Rail\CADD\Directive Drawings\Utilities-DD-DD-UT-002.dgn

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A. ABTAHI
DRAWN BY
D. SO
CHECKED BY
S. MILITELLO
IN CHARGE
J. CHIRCO
DATE
03/01/2012

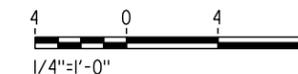
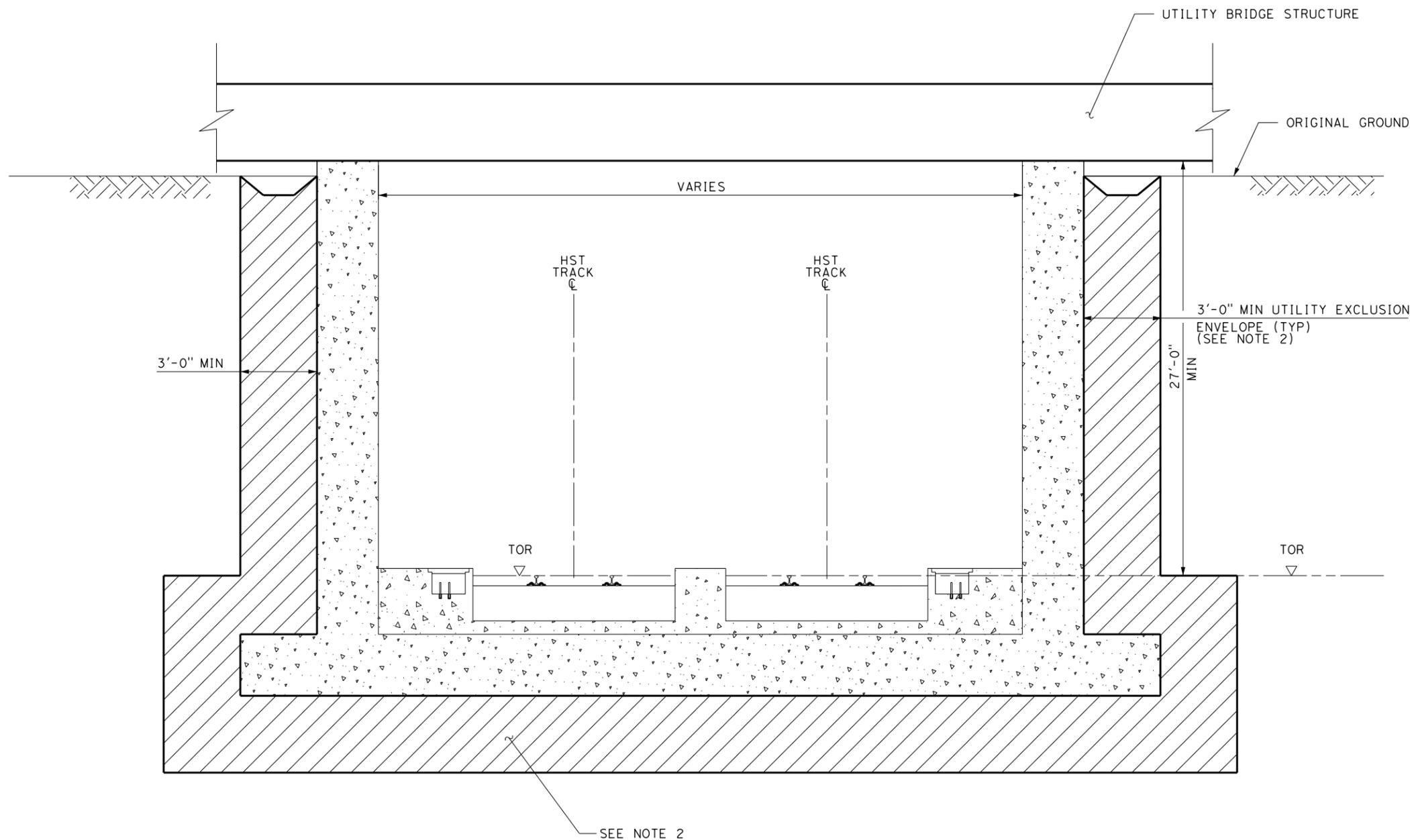


CALIFORNIA HIGH-SPEED TRAIN PROJECT
UTILITIES DIRECTIVE
UTILITIES CROSSING CLEARANCES
RETAINED CUT TRENCH

CONTRACT NO.
DRAWING NO.
DD-UT-002
SCALE
AS SHOWN
SHEET NO.

NOTE:

1. TRACK, SYSTEMS, DRAINAGE, AND STRUCTURES ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. NO UTILITIES ABOVE THE WALL FOOTINGS AND TRENCH DEEPER THAN 8'-0" FROM ORIGINAL GROUND.



DIRECTIVE DRAWINGS

2/17/2012 1:17:55 PM CAHSRP.TBL CHSR_half_black.plt T:\13259B Calif High Speed Rail\CADD\Directive Drawings\Utilities-DD-DD-UT-003.dgn

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A. ABTAHI
DRAWN BY
V. HUANTE
CHECKED BY
S. MILITELLO
IN CHARGE
J. CHIRCO
DATE
03/01/2012



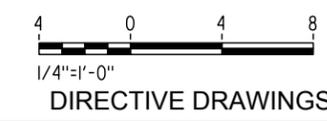
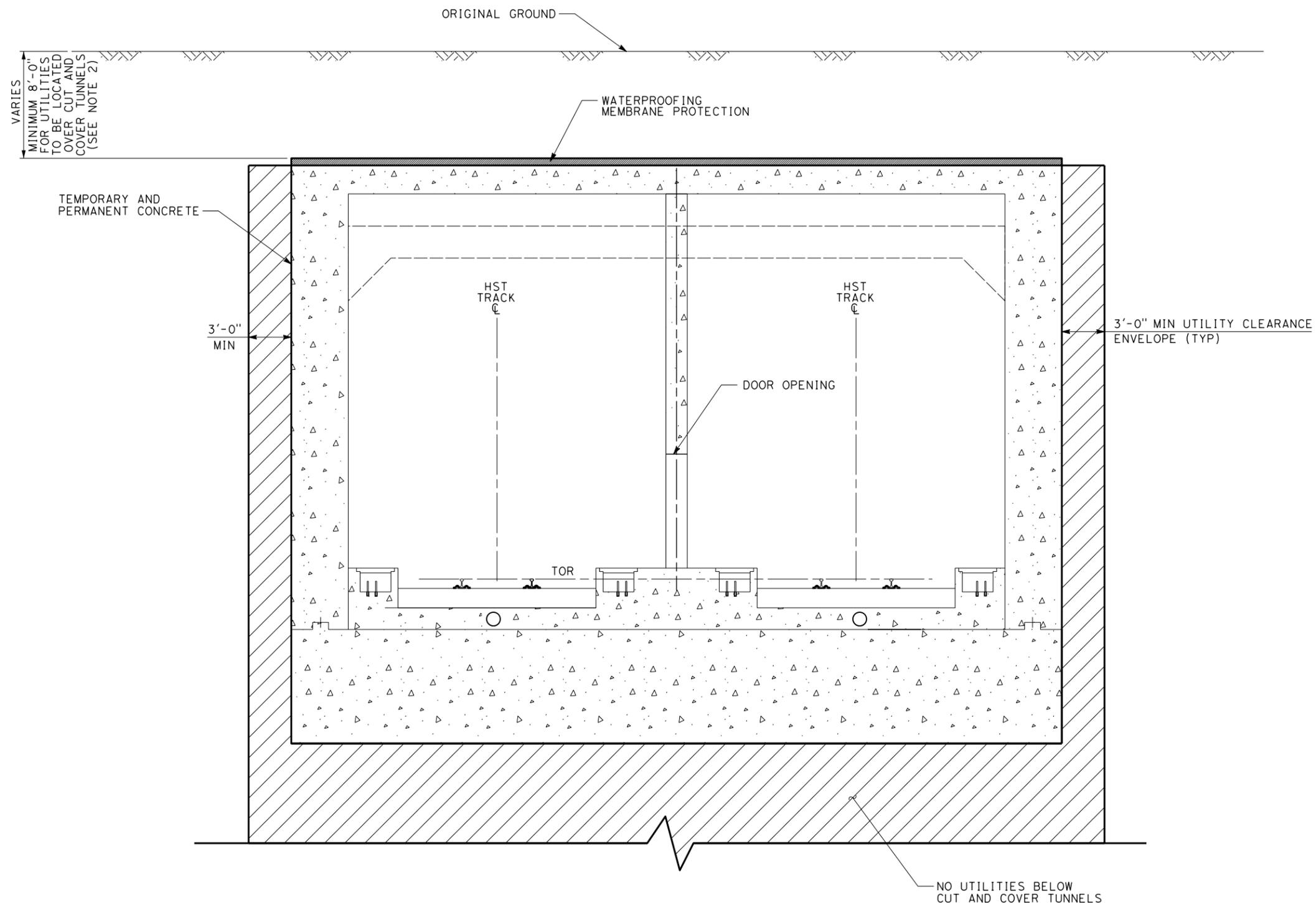
CALIFORNIA HIGH-SPEED TRAIN PROJECT
UTILITIES DIRECTIVE
UTILITY CROSSING CLEARANCES
TRENCH

CONTRACT NO.
DRAWING NO.
DD-UT-003
SCALE
AS SHOWN
SHEET NO.

03/08/2012 RFP HSR 11-16

NOTES:

1. TRACK, SYSTEMS, DRAINAGE AND STRUCTURES ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. BOTTOM OF UTILITY PIPE OR CASING SHALL BE A MINIMUM OF 12 INCHES ABOVE THE WATERPROOFING MEMBRANE.



DIRECTIVE DRAWINGS

2/17/2012 10:05:37 AM CAHSRP.TBL CHSR_half_black.plt T:\3259B Calif High Speed Rail\CADD\Directive Drawings\Utilities-DD\DD-UT-004.dgn

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IN CHARGE
J. CHIRCO
DATE
03/01/2012



CALIFORNIA HIGH-SPEED TRAIN PROJECT
UTILITIES DIRECTIVE
UTILITY CROSSING CLEARANCES
CUT AND COVER TUNNELS

CONTRACT NO.
DRAWING NO.
DD-UT-004
SCALE
AS SHOWN
SHEET NO.

03/08/2012 RFP HSR 11-16

California High-Speed Train Project



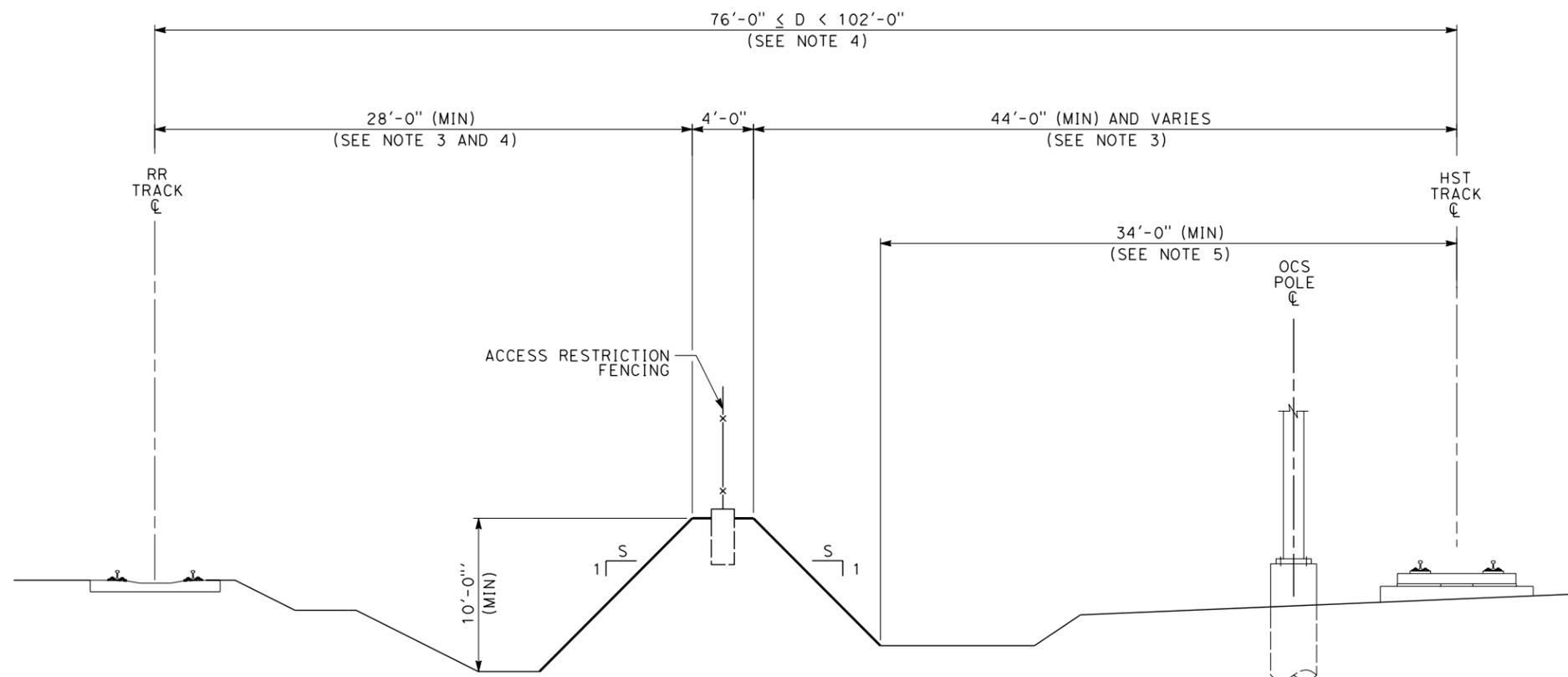
Request for Proposal for Design-Build Services

RFP No.: HSR 11-16
Directive Drawings

Intrusion Protection

NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. SIDE SLOPES DETERMINED THROUGH SLOPE STABILITY ANALYSIS. FOR COMMON EARTH MATERIAL ONLY, USE 2:1 SIDE SLOPES.
3. MINIMUM DISTANCE IS BASED ON S=1.
4. OFFSET TO TRACK AND LOCATION OF INTRUSION PROTECTION BARRIER WITHIN CONVENTIONAL RAILROAD RIGHT-OF-WAY REQUIRES APPROVAL FROM THE RAILROAD.
5. MINIMUM DISTANCE TO BERM INCLUDES SPACE FOR DRAINAGE DITCH BETWEEN THE BERM AND TRACK BED TOE OF SLOPE.



EARTHWORK BERM

DIRECTIVE DRAWINGS

T:\3259B Calif High Speed Rail\CADD\Directive Drawings\Intrusion Protection DD\DD-IP-001.dgn
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 2/29/2012 4:44:56 PM

REV	DATE	BY	CHK	APP	DESCRIPTION

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A. ABTAHI
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T. DOUNG
 CHECKED BY
H. NGUYEN
 IN CHARGE
J. CHIRCO
 DATE
03/01/2012



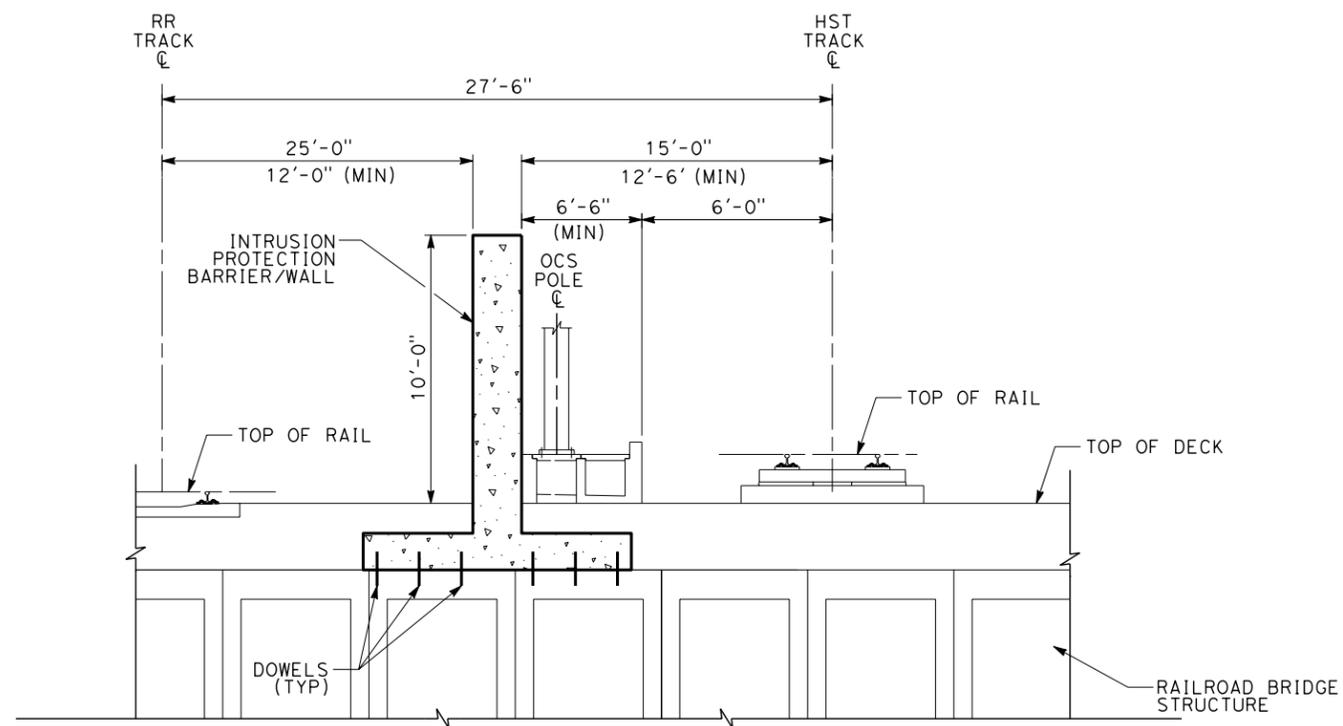
CALIFORNIA HIGH-SPEED TRAIN PROJECT
INTRUSION PROTECTION DIRECTIVE
 EARTHWORK BERM
 RAILROAD ADJACENT TO HST

CONTRACT NO.
DRAWING NO. DD-IP-001
SCALE NO SCALE
SHEET NO.

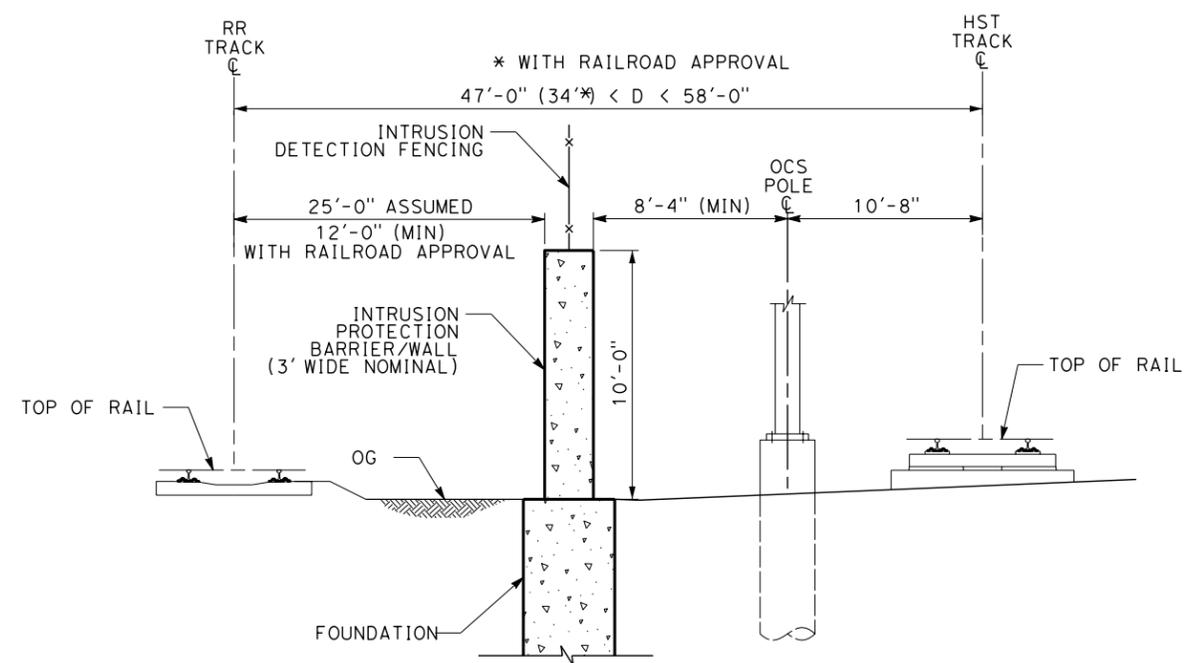
03/08/2012 RFP HSR 11-16

NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.



ELEVATED SHARED CORRIDOR



AT-GRADE SHARED CORRIDOR

03/08/2012 RFP HSR 11-16

DIRECTIVE DRAWINGS

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
A. ABTAHI
DRAWN BY
T. DOUNG
CHECKED BY
H. NGUYEN
IN CHARGE
J. CHIRCO
DATE
03/01/2012

**PARSONS
BRINCKERHOFF**



**CALIFORNIA HIGH-SPEED TRAIN PROJECT
INTRUSION PROTECTION DIRECTIVE**

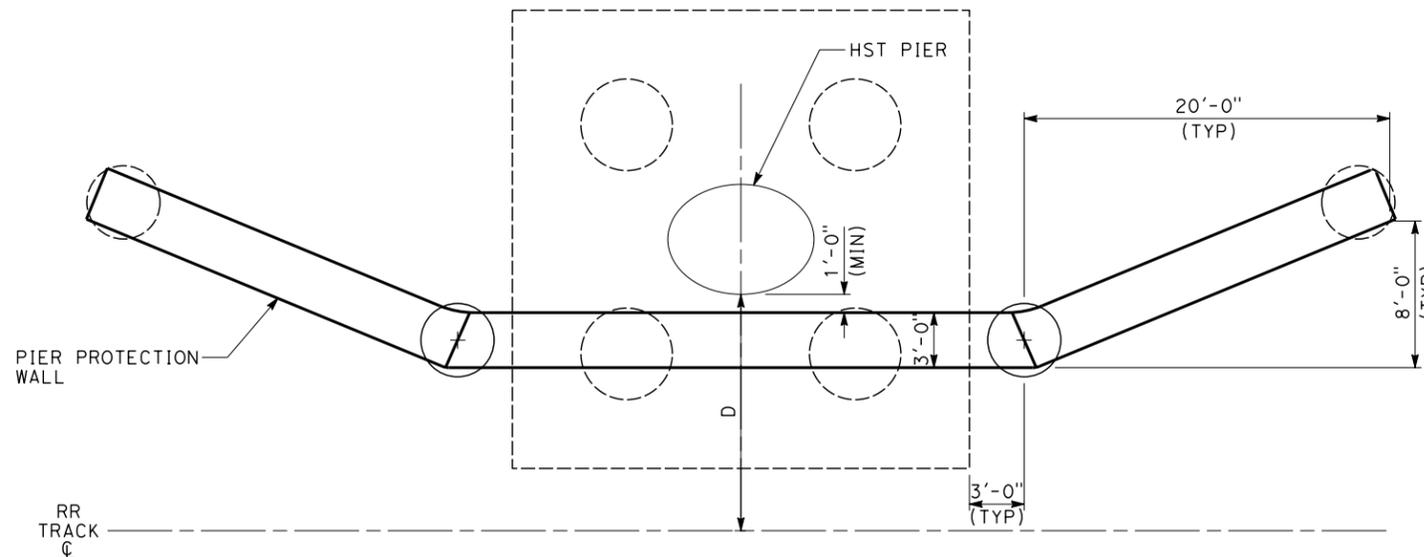
BARRIERS IN SHARED CORRIDOR

CONTRACT NO.
DRAWING NO. DD-IP-002
SCALE NO SCALE
SHEET NO.

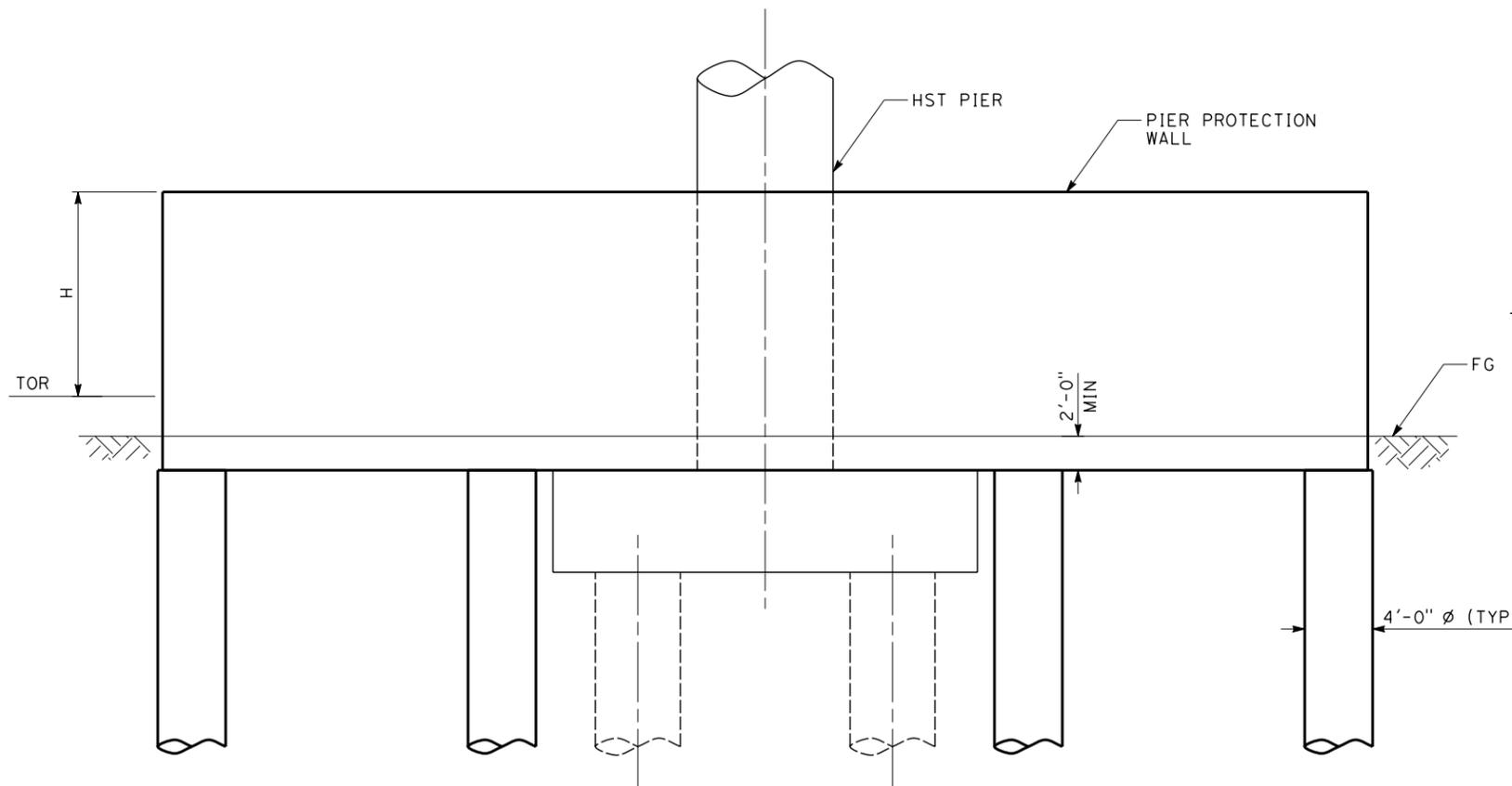
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NOTES:

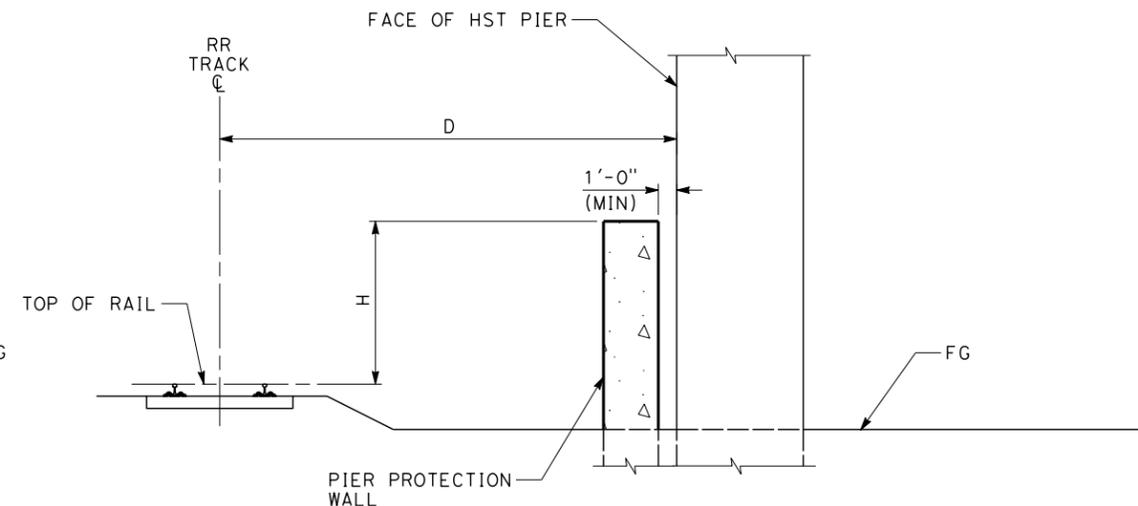
1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. PIER PROTECTION WALL MAY BE REQUIRED IF CLEARANCE FROM FACE OF HST STRUCTURE TO NEAREST RR TRACK CENTERLINE IS LESS THAN 25 FEET.
3. LOCATION WHERE BARRIER IS REQUIRED SHALL BE DETERMINED THROUGH SITE SPECIFIC HAZARD ANALYSES.



PLAN

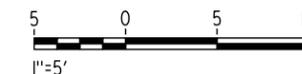


ELEVATION



HST STRUCTURE PIER - PROTECTION WALL

CLEARANCE (D)	WALL HEIGHT ABOVE TOP OF RAIL (H)
≥ 25 FT	N/A
12 FT - 25 FT	6 FT
≤ 12 FT	12 FT



DIRECTIVE DRAWINGS

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2/29/2012 4:46:51 PM CAHSR.TBL CHSR_half_black.plt

03/08/2012 RFP HSR 11-16

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
A. ABTAHI
DRAWN BY
T. DOUNG
CHECKED BY
H. NGUYEN
IN CHARGE
J. CHIRCO
DATE
03/01/2012



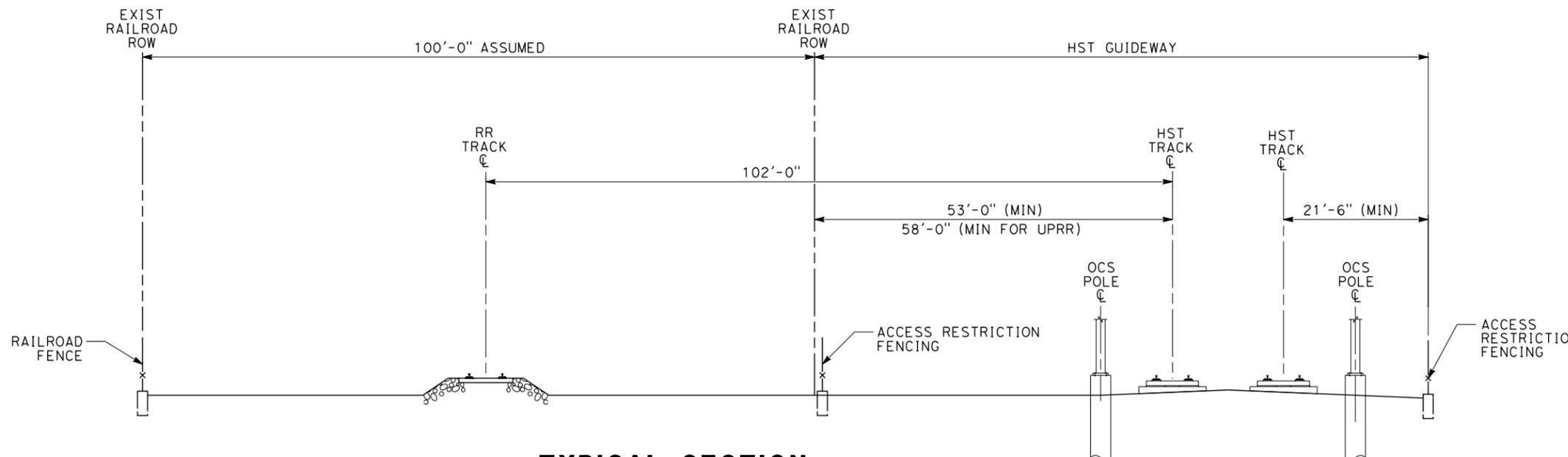
**CALIFORNIA HIGH-SPEED TRAIN PROJECT
INTRUSION PROTECTION DIRECTIVE**

HST PIER PROTECTION
IN RAILROAD RIGHT OF WAY

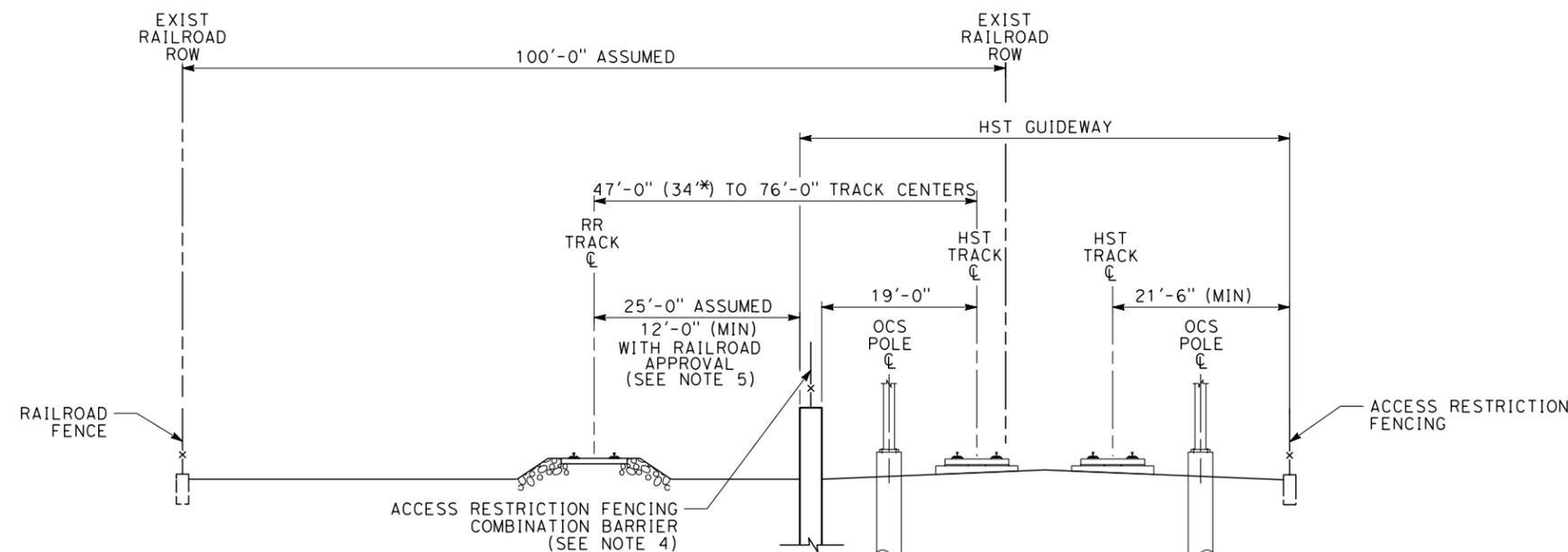
CONTRACT NO.
DRAWING NO.
DD-IP-003
SCALE
AS SHOWN
SHEET NO.

NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. RIGHT-OF-WAY REQUIRED FOR THE HIGH-SPEED RAIL GUIDEWAY WILL DEPEND UPON CONDITIONS ALONG THE ALIGNMENT, INCLUDING TERRAIN, CUT/FILL SLOPES, RETAINING STRUCTURES, AND REQUIRED ACCESS.
3. ASSUMES RAILROAD CENTERLINE IS 50 FEET FROM EXISTING RAILROAD RIGHT-OF-WAY.
4. AR FENCE COMBINATION BARRIER SHALL BE INSTALLED INSIDE AUTHORITY RIGHT-OF-WAY.
5. OFFSET TO TRACK AND LOCATION OF INTRUSION PROTECTION BARRIER WITHIN CONVENTIONAL RAILROAD RIGHT-OF-WAY REQUIRES APPROVAL FROM THE RAILROAD.



TYPICAL SECTION
ADJACENT CORRIDOR
NO INTRUSION PROTECTION REQUIRED



* WITH RAILROAD APPROVAL

TYPICAL SECTION
IN SHARED CORRIDOR
INTRUSION PROTECTION - CONCRETE BARRIER

DIRECTIVE DRAWINGS

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
A. ABTAHI
DRAWN BY
T. DOUNG
CHECKED BY
H. NGUYEN
IN CHARGE
J. CHIRCO
DATE
03/01/2012



CALIFORNIA HIGH-SPEED TRAIN PROJECT
INTRUSION PROTECTION DIRECTIVE

IN SHARED AND ADJACENT CORRIDOR
AT-GRADE

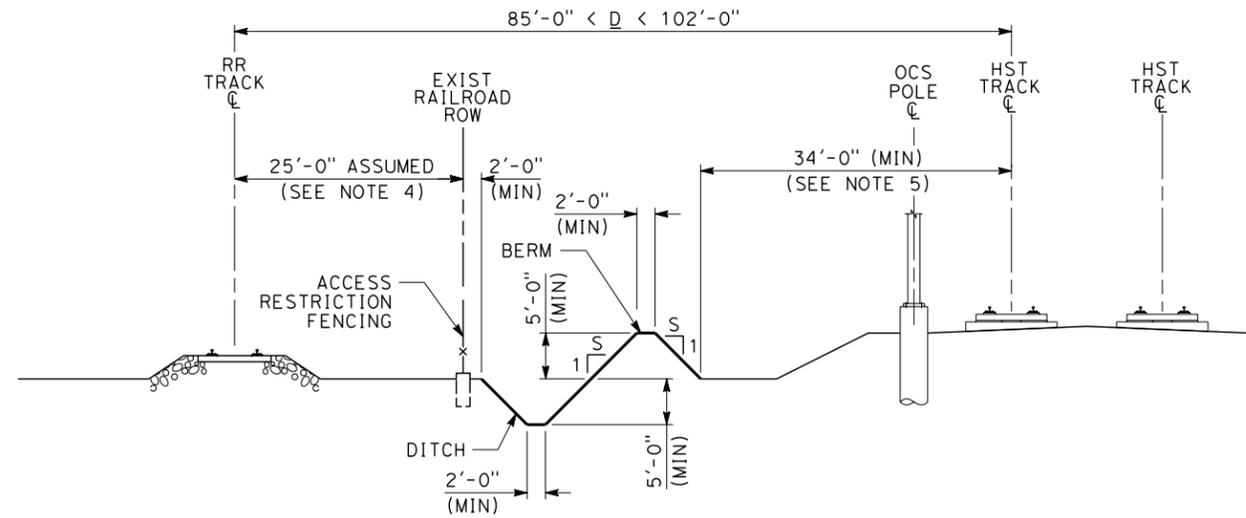
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DRAWING NO. DD-IP-004
SCALE NO SCALE
SHEET NO.

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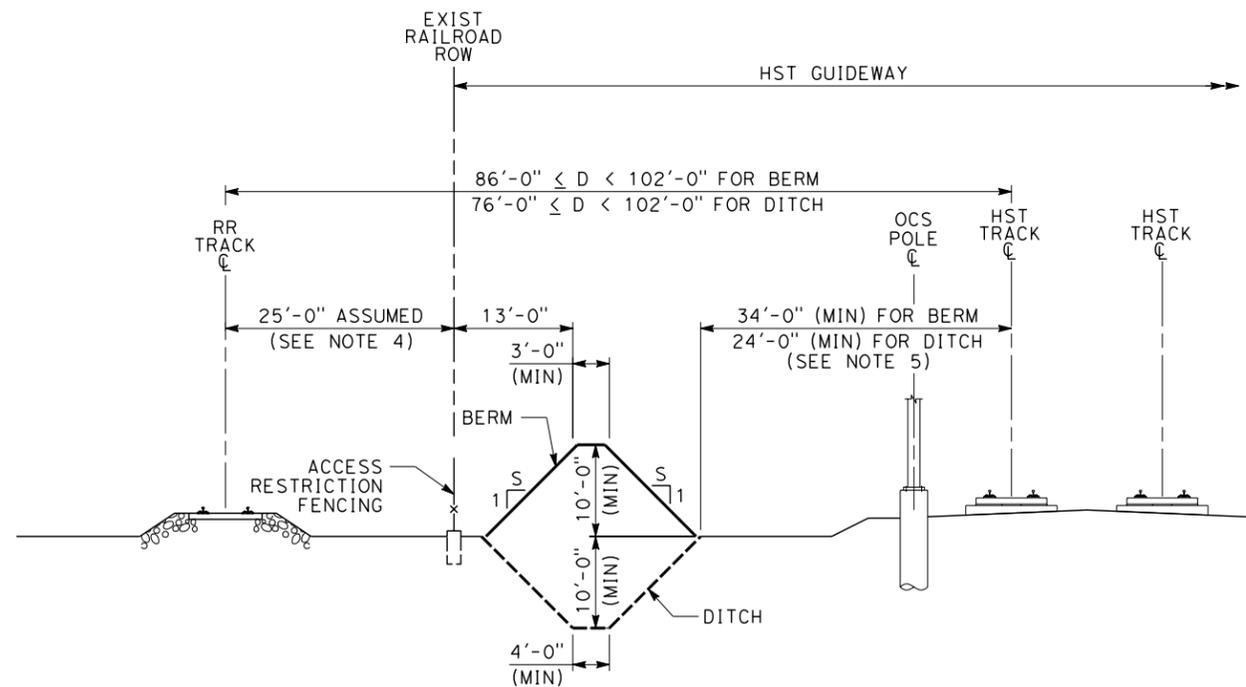
03/08/2012 RFP HSR 11-16

NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. SIDE SLOPES (S/1) DETERMINED THROUGH SLOPE STABILITY ANALYSIS. FOR COMMON EARTH MATERIAL ONLY, USE 2:1 SIDE SLOPES.
3. MINIMUM DISTANCE IS BASED ON S=1.
4. OFFSET TO TRACK AND LOCATION OF INTRUSION PROTECTION BARRIER WITHIN CONVENTIONAL RAILROAD RIGHT-OF-WAY REQUIRES APPROVAL FROM THE RAILROAD.
5. MINIMUM DISTANCE TO BERM INCLUDES SPACE FOR DRAINAGE DITCH BETWEEN THE BERM AND TRACK BED TOE OF SLOPE.



TYPICAL SECTION
EARTHEN BERM AND DITCH



TYPICAL SECTION
EARTHEN BERM OR DITCH

DIRECTIVE DRAWINGS

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
A. ABTAHI
DRAWN BY
T. DOUNG
CHECKED BY
H. NGUYEN
IN CHARGE
J. CHIRCO
DATE
03/01/2012



CALIFORNIA HIGH-SPEED TRAIN PROJECT
INTRUSION PROTECTION DIRECTIVE
AT-GRADE BERM OR DITCH ON HST GUIDEWAY
RAILROAD ADJACENT TO HST

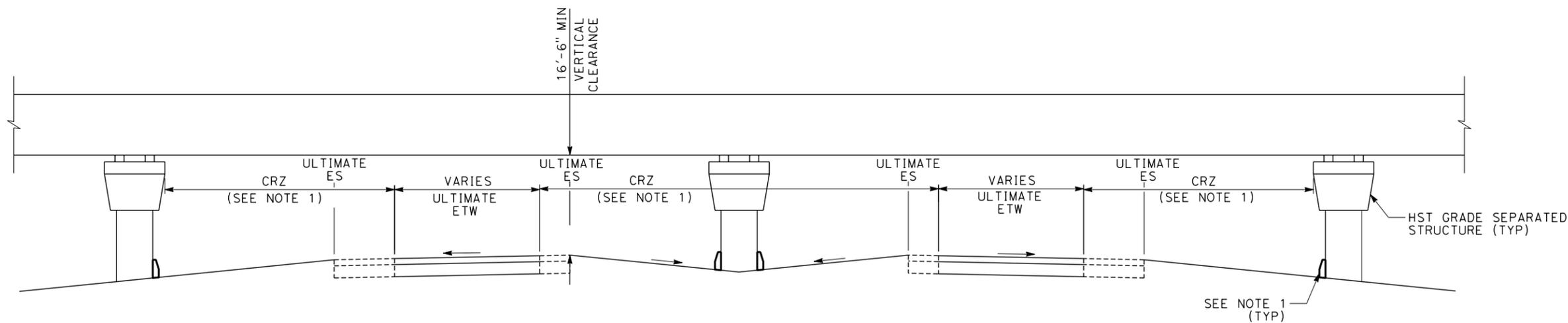
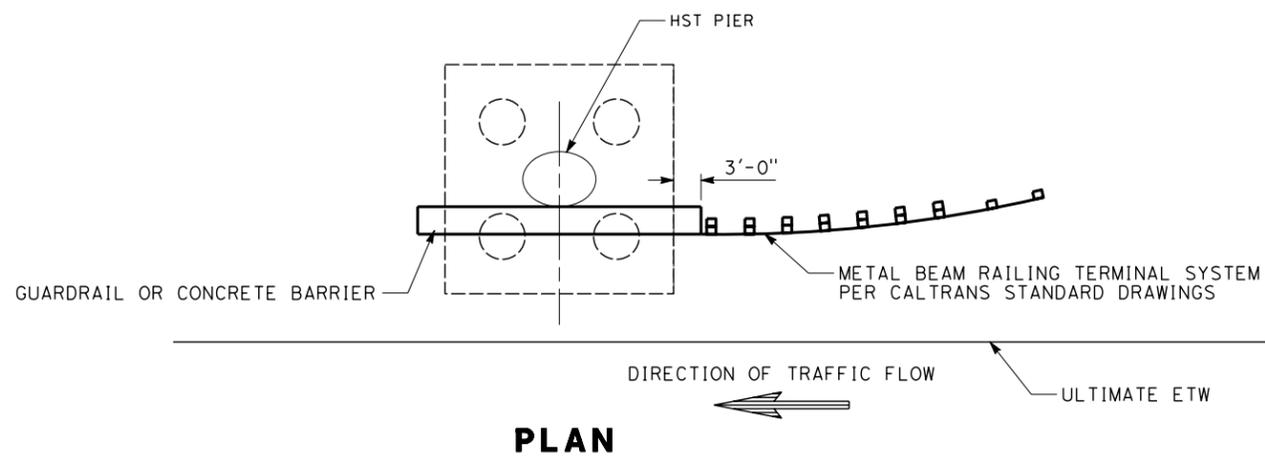
CONTRACT NO.
DRAWING NO. DD-IP-005
SCALE NO SCALE
SHEET NO.

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03/08/2012 RFP HSR 11-16

NOTES:

1. METAL BEAM GUARDRAIL OR CONCRETE BARRIER MAY BE REQUIRED AT HST FIXED OBJECT IF THE DISTANCE FROM ULTIMATE ETW TO HST FIXED OBJECT IS LESS THAN 30 FEET. REFER TO CHAPTER 7 OF CALTRANS TRAFFIC MANUAL. IF METAL BEAM GUARDRAIL IS USED, IT SHALL BE 3 FEET FROM FACE OF PIER. REFER TO CALTRANS STANDARD PLAN NSP A77C5 FOR VEGETATION CONTROL.



HST GRADE SEPARATED STRUCTURE OVER HIGHWAY/ROADWAY WITH MEDIAN

DIRECTIVE DRAWINGS

T:\V13259B Calif High Speed Rail\CADD\Directive Drawings\Intrusion Protection DD\DD-IP-006.dgn

03/08/2012 RFP HSR 11-16

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
A. ABTAHI
DRAWN BY
T. DOUNG
CHECKED BY
H. NGUYEN
IN CHARGE
J. CHIRCO
DATE
03/01/2012



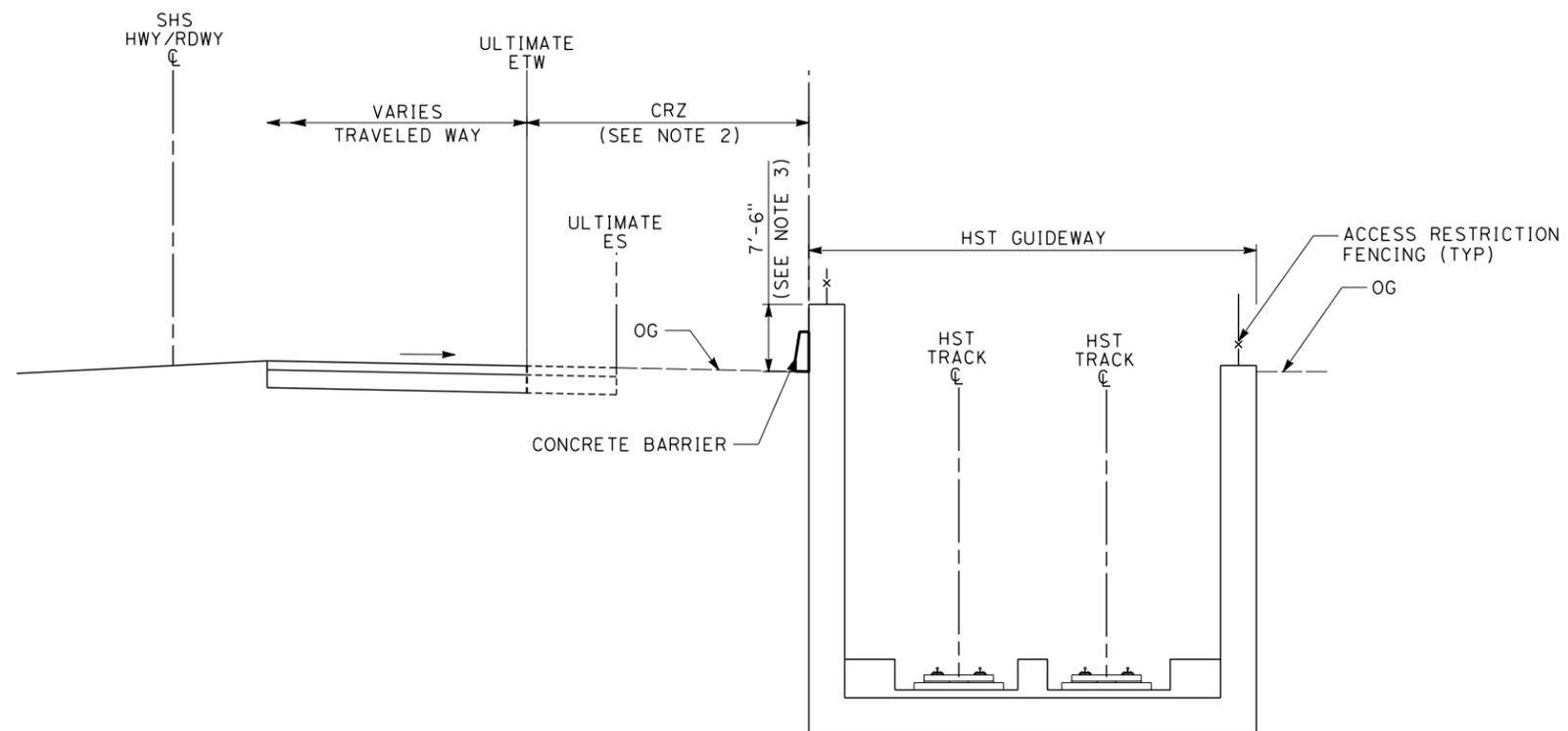
**CALIFORNIA HIGH-SPEED TRAIN PROJECT
INTRUSION PROTECTION DIRECTIVE**

HST PIER PROTECTION
IN HIGHWAY/ROADWAY RIGHT-OF-WAY

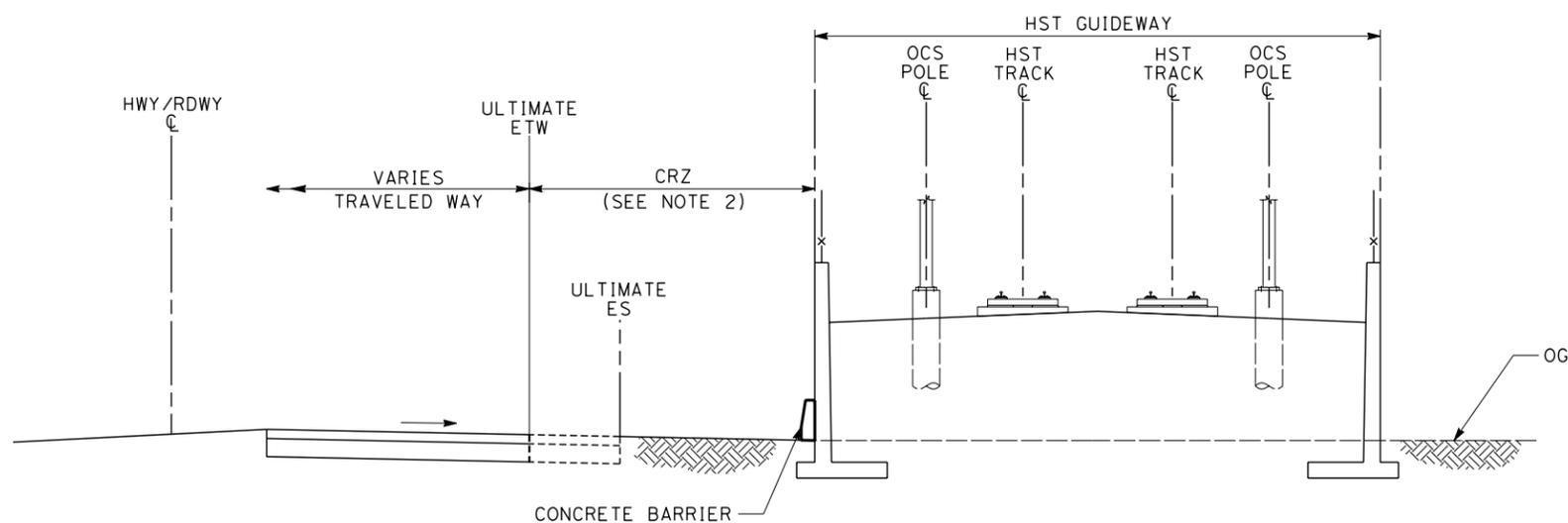
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SCALE NO SCALE
SHEET NO.

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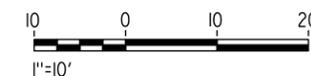
1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. SAFETY SHAPE BARRIER SHALL BE INCLUDED IN CONSTRUCTION OF THE WALL IF THE HST WALL IS LESS THAN 52 FEET FROM THE ULTIMATE ETW.
3. FHWA RECOMMENDS 7.5 FEET VERTICAL BARRIER TO CONTAIN HIGH CENTER OF GRAVITY CARGO TRUCKS WITHIN HIGHWAY RIGHT-OF-WAY.



HIGHWAY/ROADWAY AT GRADE ADJACENT TO HST TRENCH



HIGHWAY/ROADWAY AT GRADE ADJACENT TO HST RETAINED FILL



DIRECTIVE DRAWINGS

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03/08/2012 RFP HSR 11-16

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
A. ABTAHI
DRAWN BY
T. DOUNG
CHECKED BY
H. NGUYEN
IN CHARGE
J. CHIRCO
DATE
03/01/2012

**PARSONS
BRINCKERHOFF**



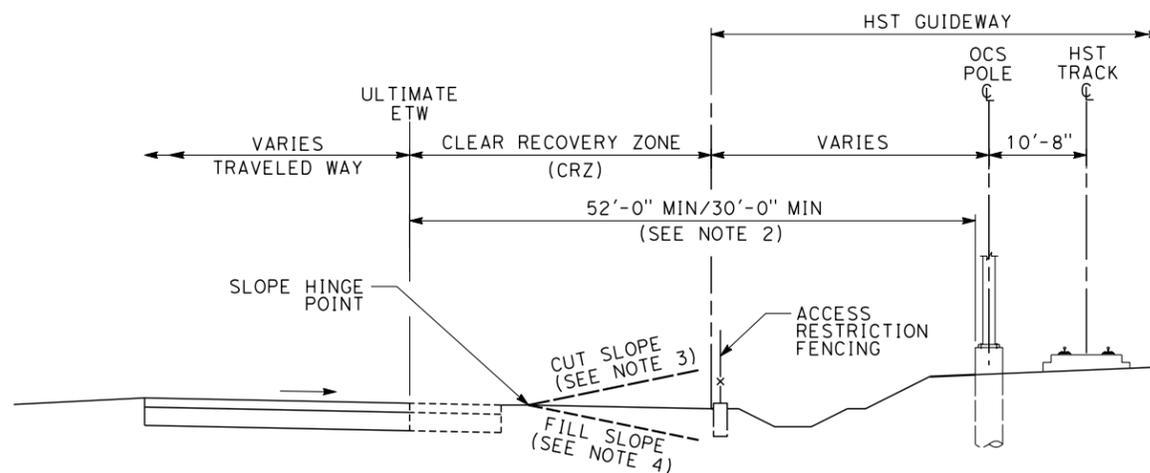
**CALIFORNIA HIGH-SPEED TRAIN PROJECT
INTRUSION PROTECTION DIRECTIVE**

HST TRENCH AND RETAINING WALL PROTECTION

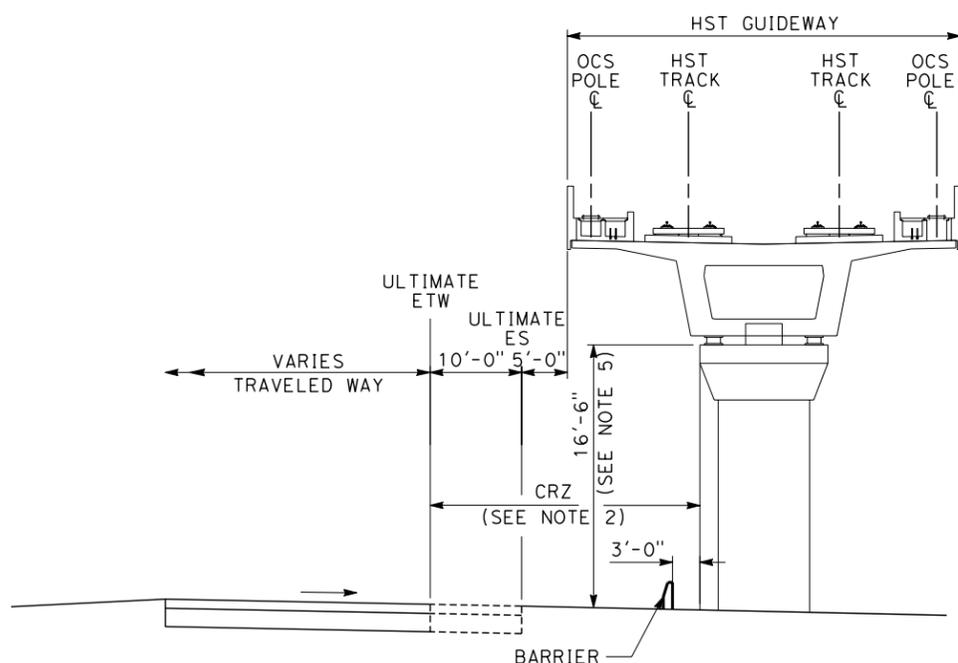
CONTRACT NO.
DRAWING NO.
DD-IP-007
SCALE
AS SHOWN
SHEET NO.

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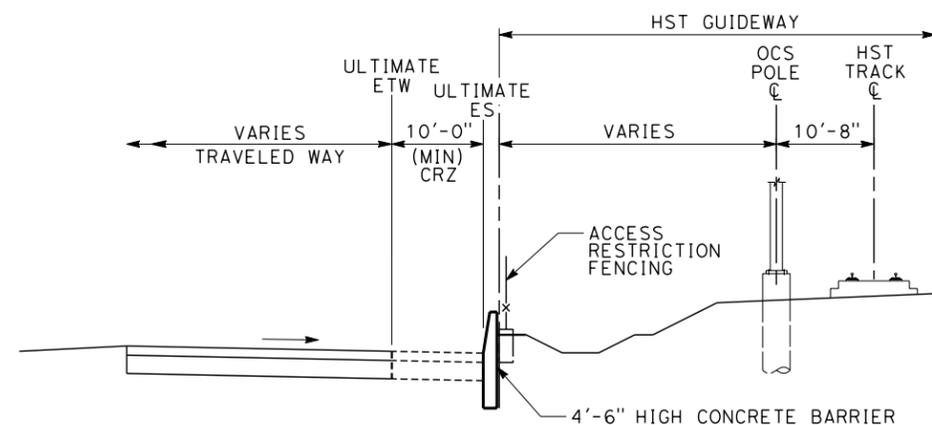
1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. WHEN HST CORRIDOR IS CONSTRUCTED LONGITUDINALLY TO A FREEWAY, EXPRESSWAY, OR HIGHWAY, METAL BEAM GUARDRAIL OR CONCRETE BARRIER MAY BE REQUIRED AT HST FIXED OBJECT IF THE DISTANCE FROM ULTIMATE ETW TO HST AERIAL STRUCTURE COLUMN, OR ANY HST FIXED OBJECT, IS LESS THAN 52 FEET. IF HST CORRIDOR IS NOT LONGITUDINAL TO A FREEWAY, EXPRESSWAY, OR HIGHWAY, THE CLEARANCE REQUIREMENT TO A HST FIXED OBJECT IS 30 FEET. REFER TO CALTRANS HDM CHAPTER 3 AND CALTRANS TRAFFIC MANUAL CHAPTER 7.
3. IF HEIGHT DIFFERENTIAL AT ROADWAY CUT SLOPE HINGE POINT AND HST ROW FENCE IS GREATER THE 4 FEET, NO GUARDRAIL IS REQUIRED. A 4 FEET HEIGHT DIFFERENTIAL IN A 4:1 CUT SLOPE PROVIDES A GREATER EFFECTIVE SIDE SLOPE THAN A 7.5 FEET VERTICAL BARRIER RECOMMENDED BY THE FHWA.
4. IF THE HEIGHT DIFFERENTIAL AT ROADWAY FILL HINGE POINT AND HSR ROW FENCE WITH A 2:1 SLOPE IS GREATER THAN 10 FT, GUARDRAIL WILL BE REQUIRED AT ROADWAY FILL HINGE POINT (REFER TO CHAPTER 7 OF CALTRANS TRAFFIC MANUAL, FIGURE 7-1 FOR RECOMMENDED PLACEMENT OF GUARDRAIL ALONG EMBANKMENT.
5. IF THE VERTICAL CLEARANCE BETWEEN THE RECOVERY AREA AND THE HST STRUCTURE BENT CAP IS LESS THAN 16.5 FEET, METAL BEAM GUARDRAIL OR CONCRETE BARRIER WILL BE REQUIRED 3 FEET FROM ULTIMATE HIGHWAY EDGE OF SHOULDER.



HST AT GRADE ADJACENT TO HIGHWAY/ROADWAY



HST AERIAL STRUCTURE ADJACENT TO HIGHWAY/ROADWAY



HST AT GRADE ADJACENT TO HIGHWAY/ROADWAY WITH 10 FEET CLEAR RECOVERY ZONE (CRZ)

DIRECTIVE DRAWINGS

2/29/2012 4:50:26 PM CAHSRP.TBL CHSR_half_black.plt T:\13259B Calif High Speed Rail\CADD\Directive Drawings\Intrusion Protection DD\DD-IP-008.dgn

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ABTAHI
DRAWN BY T. DOUNG
CHECKED BY H. NGUYEN
IN CHARGE J. CHIRCO
DATE 03/01/2012



CALIFORNIA HIGH-SPEED TRAIN PROJECT
INTRUSION PROTECTION DIRECTIVE
 ADJACENT TO HIGHWAY/ROADWAY

CONTRACT NO.
DRAWING NO. DD-IP-008
SCALE NO SCALE
SHEET NO.

03/08/2012 RFP HSR 11-16

California High-Speed Train Project



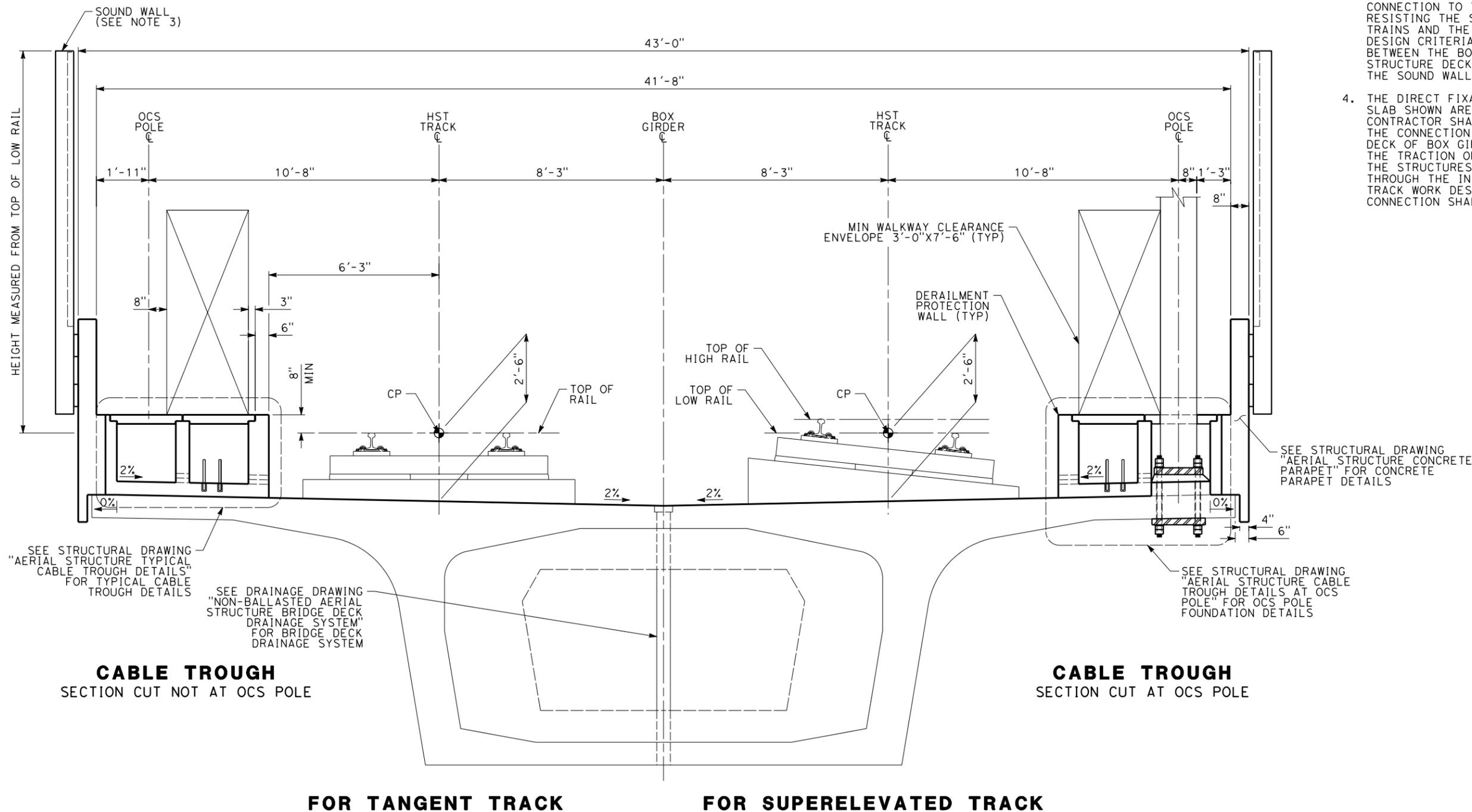
Request for Proposal for Design-Build Services

RFP No.: HSR 11-16
Directive Drawings

Structural

NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. ON CURVED ALIGNMENT, THE RELATIVE DIMENSIONS BETWEEN BRIDGE DECK AND BOX GIRDER SHALL BE ADJUSTED PROPERLY. IF A STRAIGHT DECK EDGE IS SELECTED, THE WIDER DECK WIDTH MAY BE REQUIRED.
3. THE HEIGHT OF THE SOUND WALL SHALL BE DETERMINED BASED ON RESULTS FROM THE NOISE ATTENUATION STUDY. THE SOUND WALL ITSELF AND ITS CONNECTION TO THE STRUCTURE SHALL BE CAPABLE OF RESISTING THE SLIPSTREAM EFFECTS FROM PASSING TRAINS AND THE WIND LOADS AS DESCRIBED IN THE DESIGN CRITERIA. NO GAP SHALL BE PERMITTED BETWEEN THE BOTTOM OF SOUND WALL AND THE STRUCTURE DECK, NOR ANY VERTICAL GAPS BETWEEN THE SOUND WALL PANELS.
4. THE DIRECT FIXATION RAIL SYSTEM AND THE TRACK SLAB SHOWN ARE FOR ILLUSTRATION ONLY. THE CONTRACTOR SHALL CONSIDER IN THEIR DESIGN THAT THE CONNECTION BETWEEN THE TRACK SLAB AND TOP DECK OF BOX GIRDER IS CAPABLE OF TRANSFERRING THE TRACTION OR BRAKING FORCES AS DESCRIBED IN THE STRUCTURES CHAPTER OF THE DESIGN CRITERIA THROUGH THE INTERFACE COORDINATION WITH THE TRACK WORK DESIGNER. ANY EMBEDDED ITEMS OF THIS CONNECTION SHALL BE INSTALLED BY THE CONTRACTOR.



T:\13259B Calif High Speed Rail\CADD\Directive Drawings\Structures_DD-DD-ST-001.dgn
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03/08/2012 RFP HSR 11-16

REV	DATE	BY	CHK	APP	DESCRIPTION

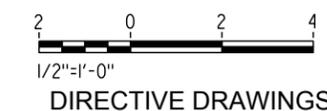
DESIGNED BY
P. LIN
 DRAWN BY
J. GO
 CHECKED BY
K. PUGASAP
 IN CHARGE
J. CHIRCO
 DATE
03/01/2012



CALIFORNIA HIGH-SPEED TRAIN PROJECT
STRUCTURAL DIRECTIVE

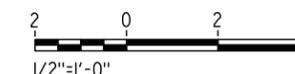
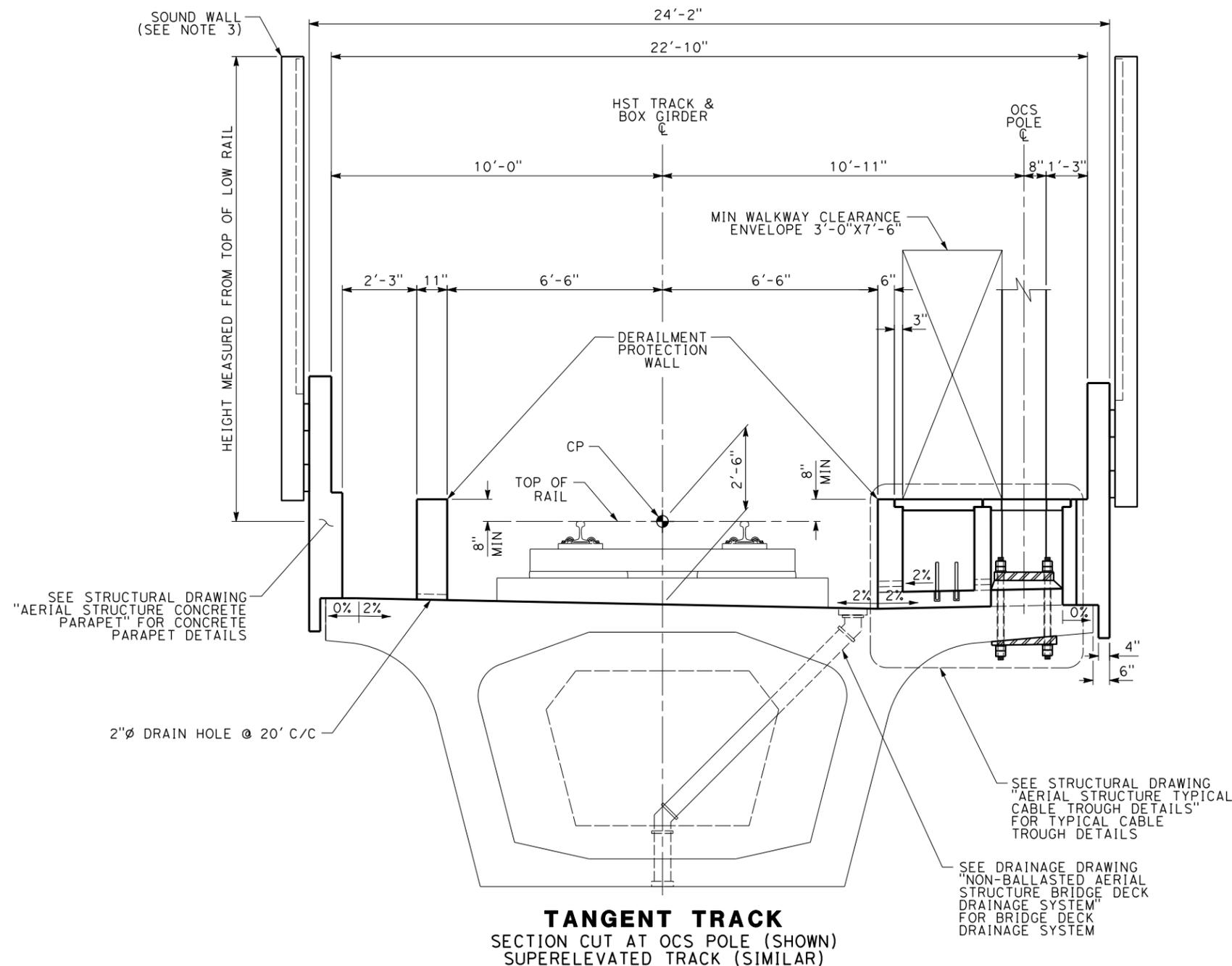
 AERIAL STRUCTURE
 TWO TRACK NON-BALLASTED
 TYPICAL CONFIGURATION ON TOP OF DECK

CONTRACT NO.
DRAWING NO. DD-ST-001
SCALE AS SHOWN
SHEET NO.



NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. ON CURVED ALIGNMENT, THE RELATIVE DIMENSIONS BETWEEN BRIDGE DECK AND BOX GIRDER SHALL BE ADJUSTED PROPERLY. IF A STRAIGHT DECK EDGE IS SELECTED, THE WIDER DECK WIDTH MAY BE REQUIRED.
3. THE HEIGHT OF THE SOUND WALL SHALL BE DETERMINED BASED ON RESULTS FROM THE NOISE ATTENUATION STUDY. THE SOUND WALL ITSELF AND ITS ATTENUATION TO THE STRUCTURE SHALL BE CAPABLE OF RESISTING THE SLIPSTREAM EFFECTS FROM PASSING TRAINS AND THE WIND LOADS AS DESCRIBED IN THE DESIGN CRITERIA. NO GAP SHALL BE PERMITTED BETWEEN THE BOTTOM OF SOUND WALL AND THE STRUCTURE DECK, NOR ANY VERTICAL GAPS BETWEEN THE SOUND WALL PANELS.
4. THE DIRECT FIXATION RAIL SYSTEM AND THE TRACK SLAB SHOWN ARE FOR ILLUSTRATION ONLY. THE CONTRACTOR SHALL CONSIDER IN THEIR DESIGN THAT THE CONNECTION BETWEEN THE TRACK SLAB AND TOP DECK OF BOX GIRDER IS CAPABLE OF TRANSFERRING THE TRACTION OR BRAKING FORCES AS DESCRIBED IN THE STRUCTURES CHAPTER OF THE DESIGN CRITERIA THROUGH THE INTERFACE COORDINATION WITH THE TRACK WORK DESIGNER. ANY EMBEDDED ITEMS OF THIS CONNECTION SHALL BE INSTALLED BY THE CONTRACTOR.



DIRECTIVE DRAWINGS

T:\13259B Calif High Speed Rail\CAADD\Directive Drawings\Structures DD-DD-ST-002.dgn

03/08/2012 RFP HSR 11-16

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY P. LIN
DRAWN BY J. GO
CHECKED BY K. PUGASAP
IN CHARGE J. CHIRCO
DATE 03/01/2012



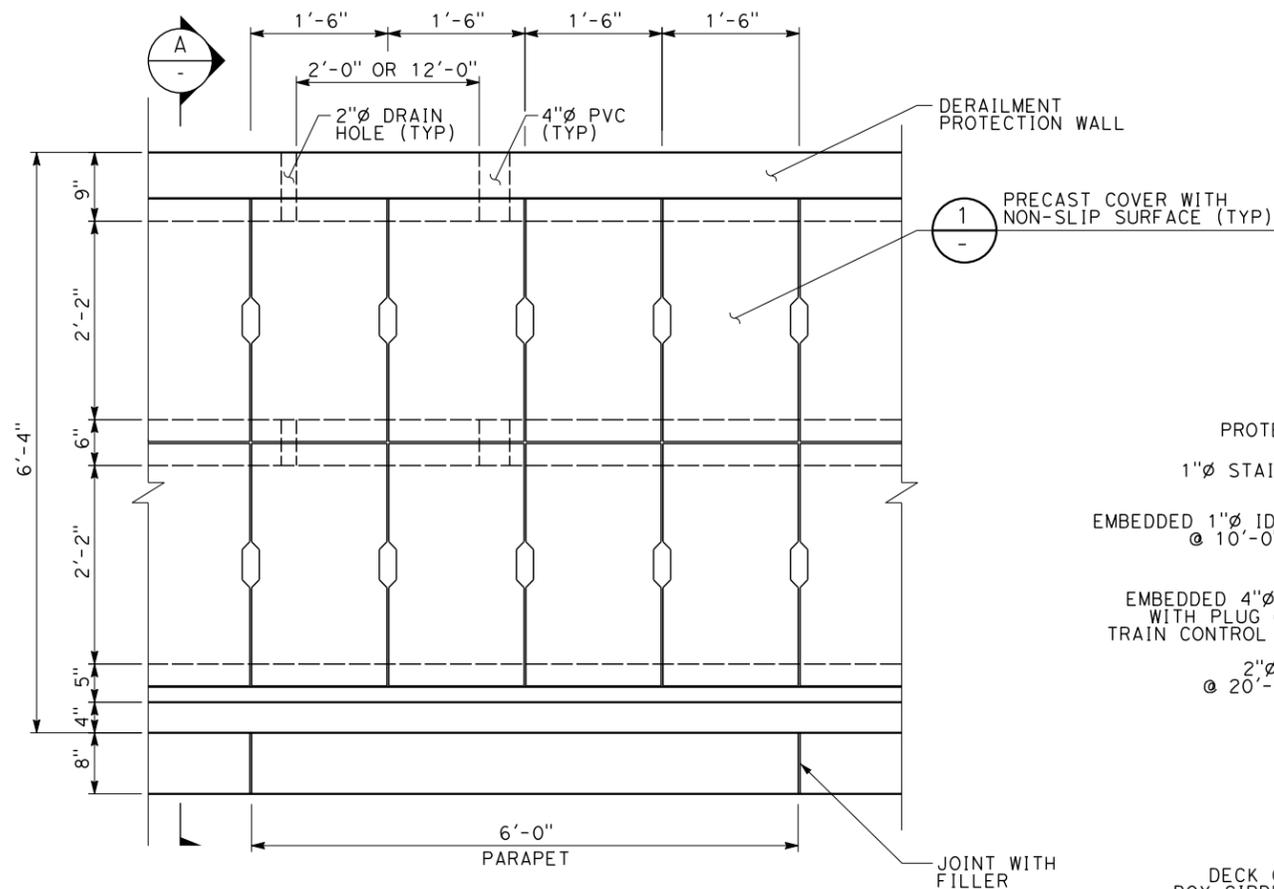
CALIFORNIA HIGH-SPEED TRAIN PROJECT
STRUCTURAL DIRECTIVE

AERIAL STRUCTURE
ONE TRACK NON-BALLASTED
TYPICAL CONFIGURATION ON TOP OF DECK

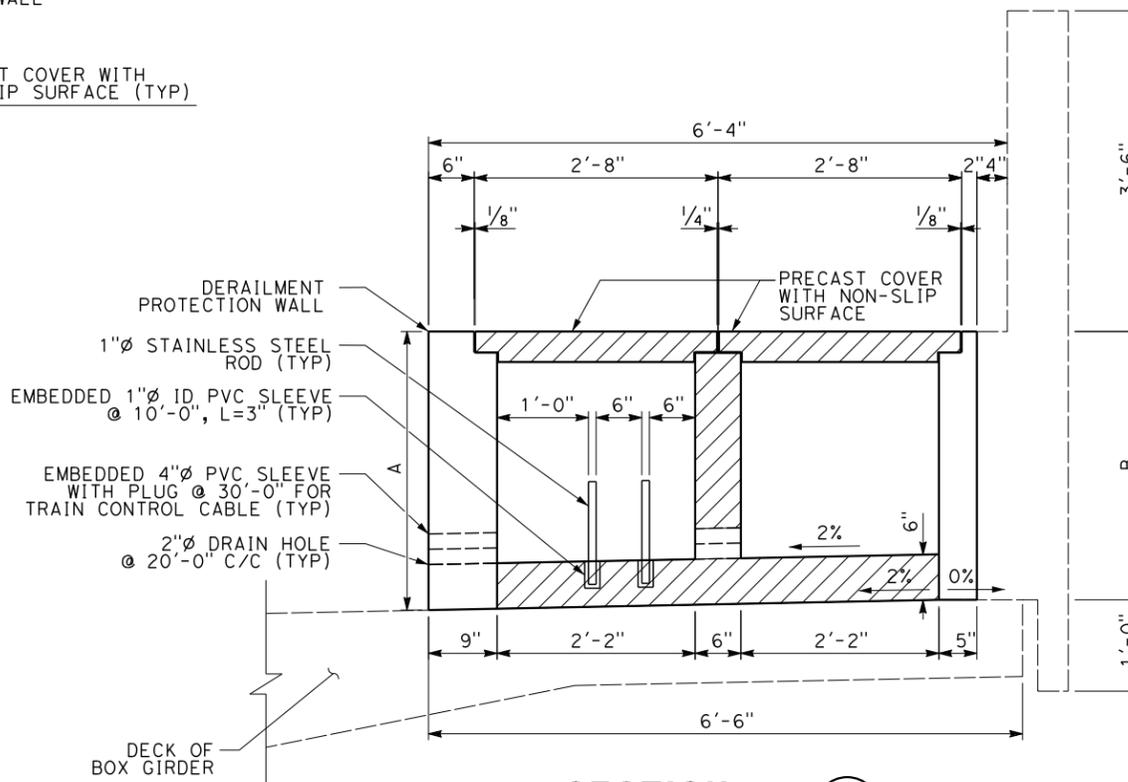
CONTRACT NO.
DRAWING NO. DD-ST-002
SCALE AS SHOWN
SHEET NO.

NOTES:

1. THE CABLE TROUGH DETAIL IS FOR STANDARD TWO TRACK. FOR CABLE TROUGH INFORMATION IN SPECIAL TRACK AREA, THE CONTRACTOR SHALL COORDINATE WITH THE INTERFACED TRACK WORK DESIGNER FOR DETAILED INFORMATION.

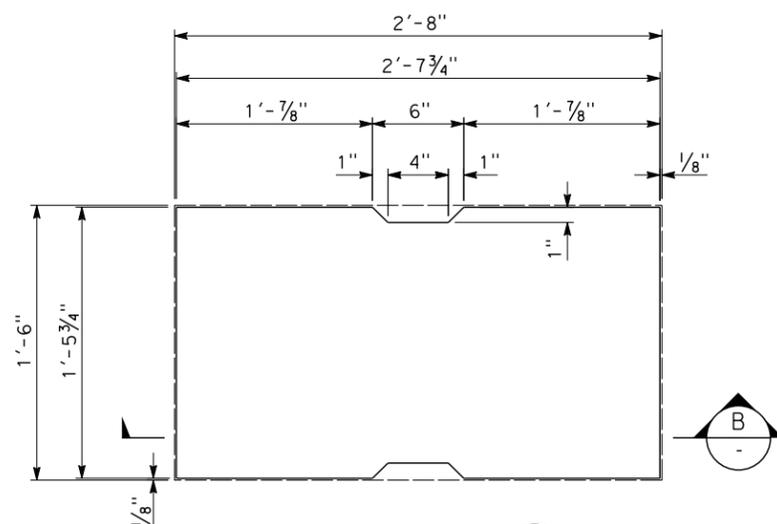


CABLE TROUGH PLAN
SCALE: 1"=1'-0"

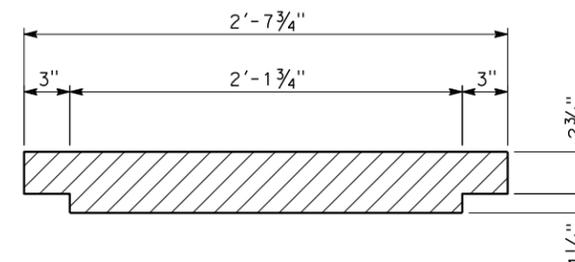


SECTION A
SCALE: 1"=1'-0"

	DOUBLE TRACK	SINGLE TRACK
A	3'-1/2"	3'-3 3/16"
B	2'-11 1/8"	3'-2 1/4"



DETAIL 1
SCALE: 1/2"=1'-0"



SECTION B
SCALE: 1/2"=1'-0"

DIRECTIVE DRAWINGS

2/29/2012 5:20:53 PM CAHSRP.tbl CHSR_half_black.plt T:\3259B Calif High Speed Rail\CADD\Directive Drawings\Structures_DD\DD-ST-003.dgn

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
P. LIN
DRAWN BY
J. GO
CHECKED BY
K. PUGASAP
IN CHARGE
J. CHIRCO
DATE
03/01/2012

PARSONS BRINCKERHOFF



**CALIFORNIA HIGH-SPEED TRAIN PROJECT
STRUCTURAL DIRECTIVE**

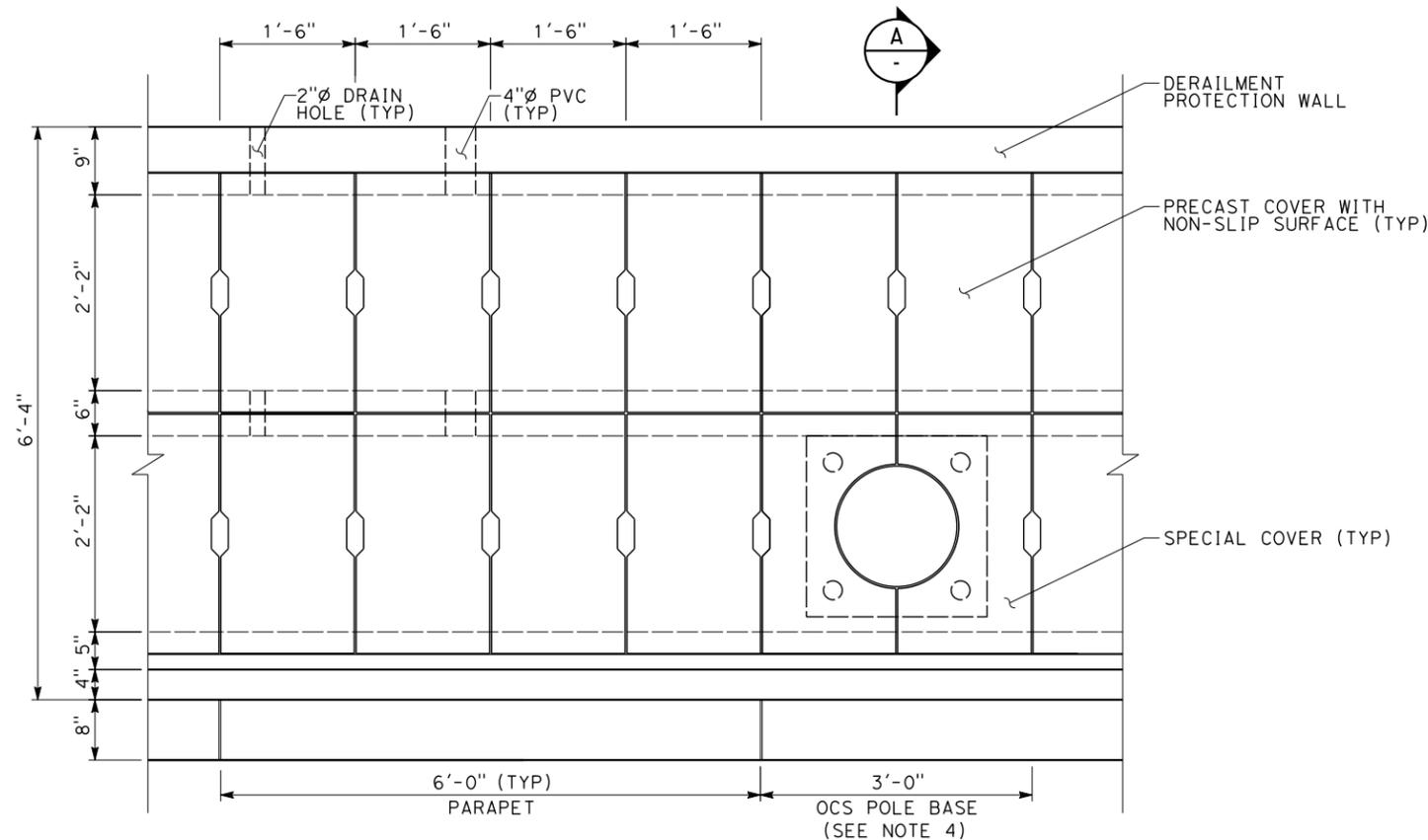
AERIAL STRUCTURE
TYPICAL CABLE TROUGH DETAILS

CONTRACT NO.
DRAWING NO.
DD-ST-003
SCALE
AS SHOWN
SHEET NO.

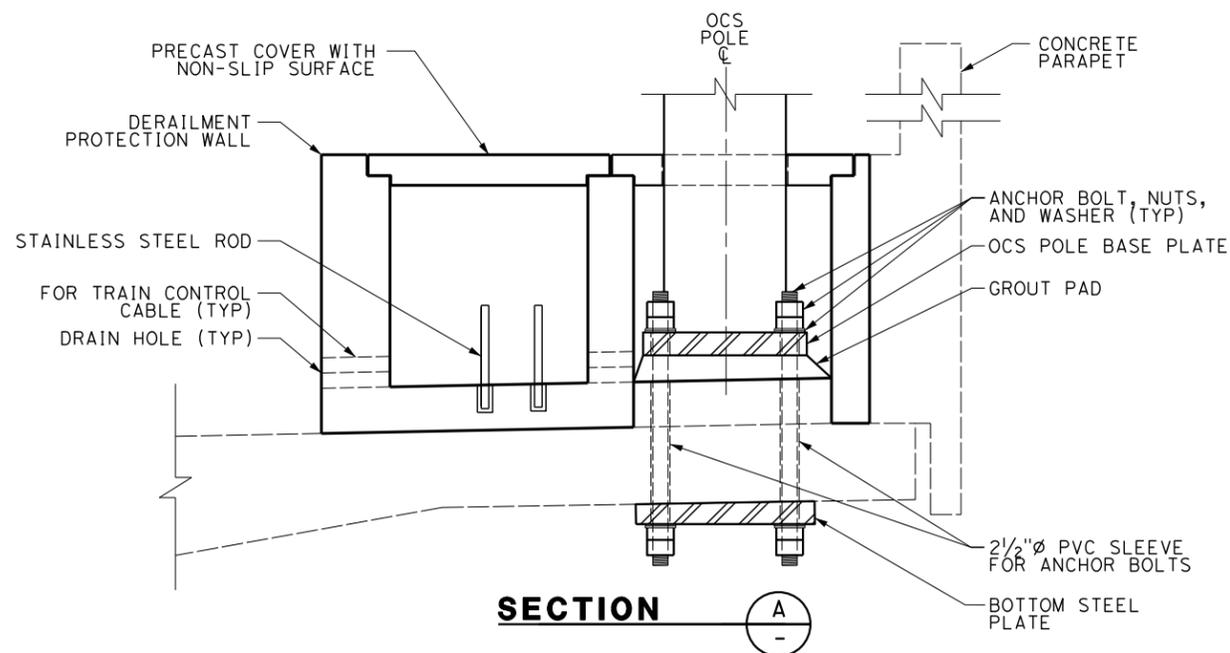
03/08/2012 RFP HSR 11-16

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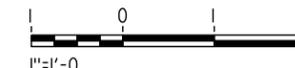
1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. FOR PRECAST COVER DETAIL, SEE DRAWING "AERIAL STRUCTURE TYPICAL CABLE TROUGH DETAILS".
3. SEE STRUCTURAL DRAWING "AERIAL STRUCTURE TYPICAL CABLE TROUGH DETAILS" FOR DIMENSIONS NOT SHOWN.
4. OCS POLE, ANCHOR BOLT ASSEMBLIES, BASE PLATES, AND GROUT PAD FOR OCS POLE FOUNDATION ARE SHOWN FOR ILLUSTRATION ONLY. THE LOCATION OF EMBEDDED PVC SLEEVES AND LOADS FOR DESIGN OF OCS POLE FOUNDATION SHALL CONFORM TO THE REQUIREMENTS IN THE STRUCTURAL CHAPTER OF THE DESIGN CRITERIA.



CABLE TROUGH AT OCS POLE PLAN



SECTION



DIRECTIVE DRAWINGS

2/29/2012 5:20:54 PM CAHSRP.tbl CHSR_half_black.plt T:\13259B Calif High Speed Rail\CADD\Directive Drawings\Structures DD\DD-ST-004.dgn

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
P. LIN
DRAWN BY
J. GO
CHECKED BY
K. PUGASAP
IN CHARGE
J. CHIRCO
DATE
03/01/2012



**CALIFORNIA HIGH-SPEED TRAIN PROJECT
STRUCTURAL DIRECTIVE**

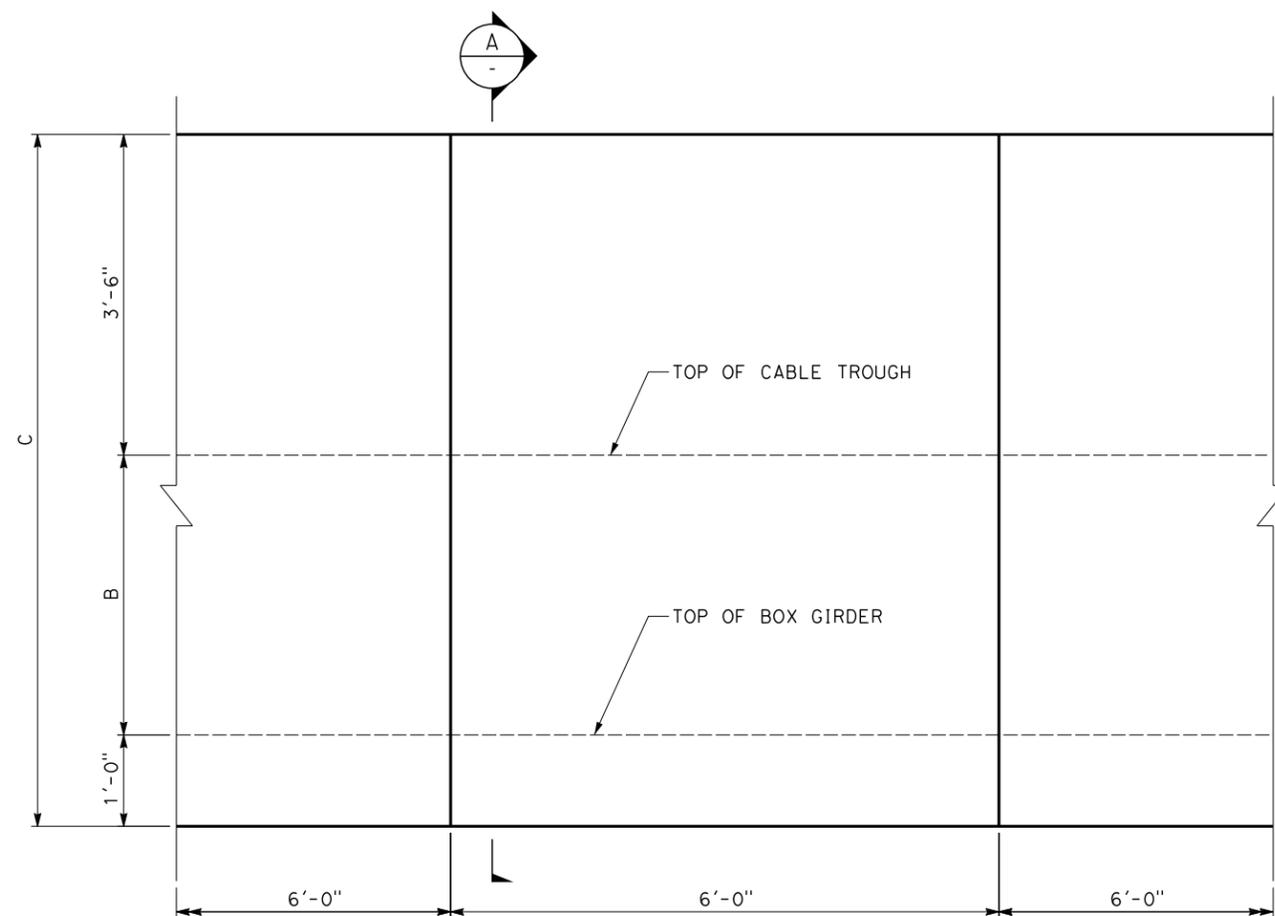
AERIAL STRUCTURE
CABLE TROUGH DETAILS
AT OCS POLE

CONTRACT NO.
DRAWING NO.
DD-ST-004
SCALE
AS SHOWN
SHEET NO.

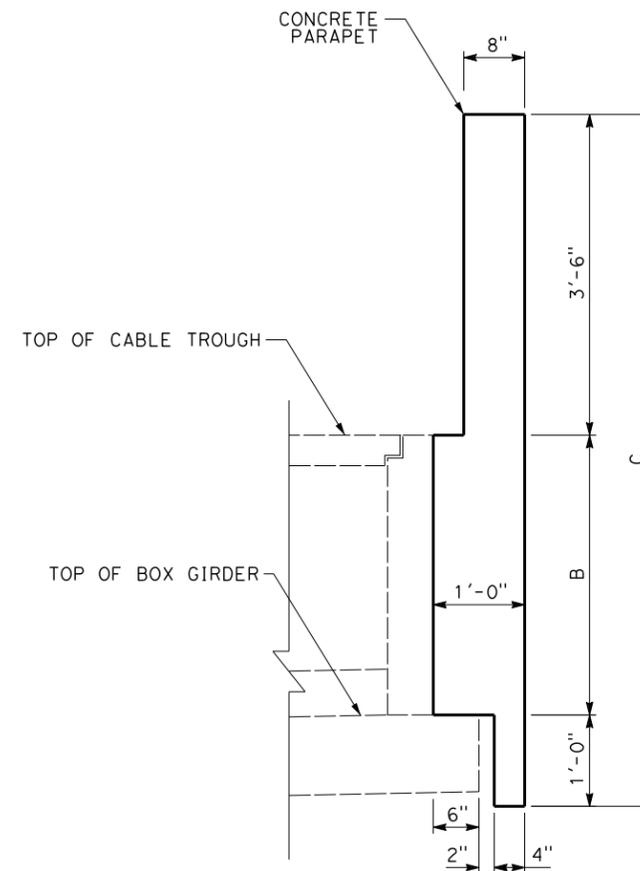
03/08/2012 RFP HSR 11-16

NOTES:

1. PARAPETS SHALL BE PROVIDED ALONG EDGES OF AERIAL STRUCTURES, BRIDGES, AND HST GRADE SEPARATIONS.
2. PARAPETS SHALL BE DESIGNED FOR WIND LOADS, SLIPSTREAM EFFECTS, AND OTHER LOADS REQUIRED IN THE STRUCTURES CHAPTER OF THE DESIGN CRITERIA.
3. PARAPETS SHALL BE DESIGNED TO ACCOMMODATE FUTURE INSTALLATION OF SOUND WALLS.

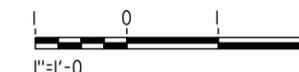


CONCRETE PARAPET
ELEVATION VIEW



SECTION A-A

	DOUBLE TRACK	SINGLE TRACK
B	2'-11 1/8"	3'-2 1/4"
C	7'-5 5/8"	7'-8 1/4"



DIRECTIVE DRAWINGS

T:\13259B Calif High Speed Rail\CADD\Directive Drawings\Structures DD\DD-ST-005.dgn

03/08/2012 RFP HSR 11-16

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
P. LIN
DRAWN BY
J. GO
CHECKED BY
K. PUGASAP
IN CHARGE
J. CHIRCO
DATE
03/01/2012



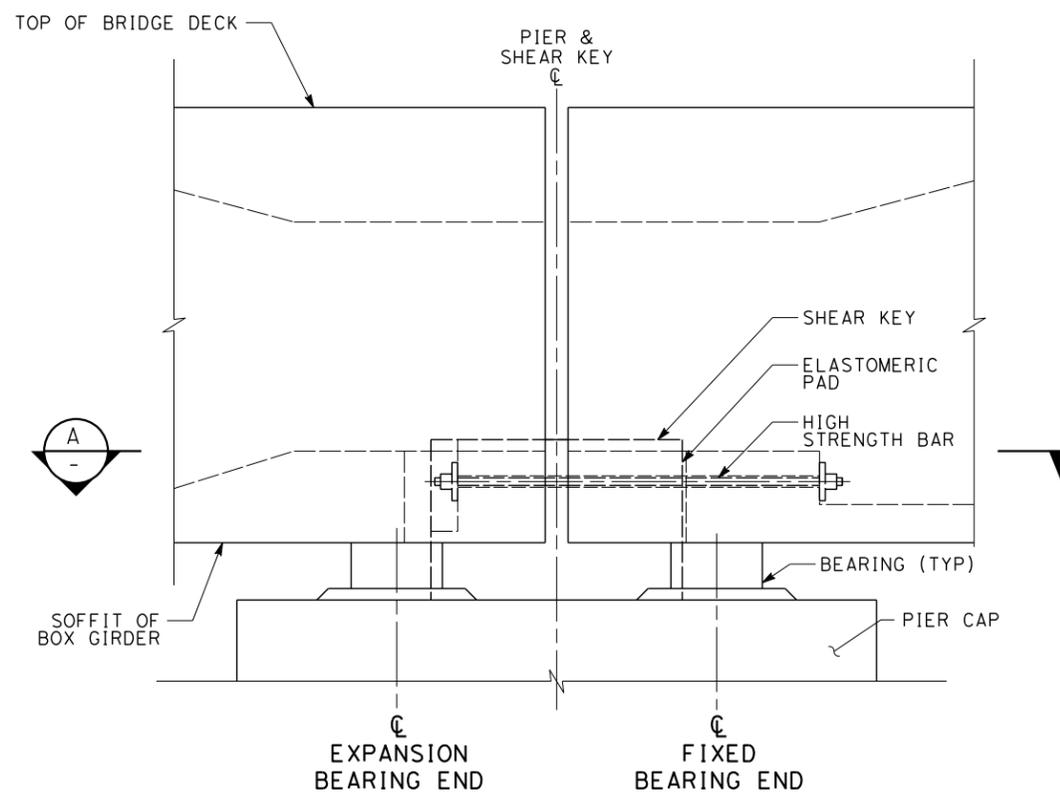
CALIFORNIA HIGH-SPEED TRAIN PROJECT
STRUCTURAL DIRECTIVE

AERIAL STRUCTURE
CONCRETE PARAPET

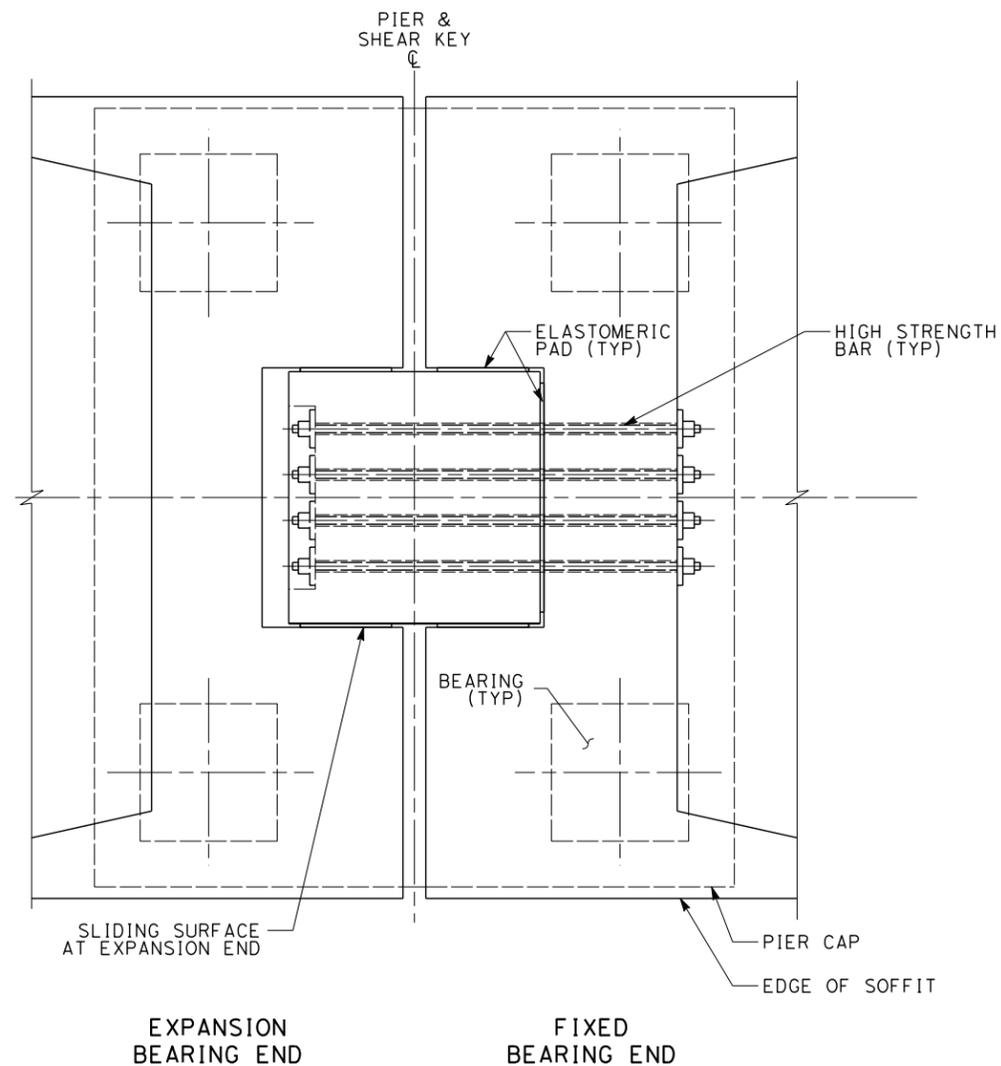
CONTRACT NO.
DRAWING NO.
DD-ST-005
SCALE
AS SHOWN
SHEET NO.

NOTES:

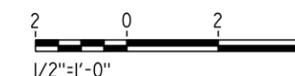
1. THE SHEAR KEY DETAILS SHOWN ARE FOR ILLUSTRATION ONLY. THE CONTRACTOR SHALL DEVELOP A SHEAR KEY SYSTEM THAT CONFORMS TO THE REQUIREMENTS IN THE STRUCTURES CHAPTER OF THE DESIGN CRITERIA.
2. BEARINGS SHALL BE EASILY ACCESSIBLE FOR INSPECTION AND MAINTENANCE. BEARINGS SHALL BE ADJUSTABLE AND REPLACEABLE AT ANYTIME DURING THE LIFE OF STRUCTURES WITHOUT INTERFERENCE TO NORMAL TRAIN OPERATIONS.
3. THE PROCEDURES FOR BEARING REPLACEMENT, INCLUDING THE LOCATIONS OF JACKS AND THE ALLOWED JACKING FORCES SHALL BE SPECIFIED ON THE DRAWINGS.



ELEVATION
 CONCRETE PARAPET NOT SHOWN



SECTION
 1/2" = 1'-0"



DIRECTIVE DRAWINGS

T:\13259B Calif High Speed Rail\CADD\Directive Drawings\Structures DD\DD-ST-006.dgn
 CAHSR.tbl
 CHSR_half_black.plt
 2/29/2012 5:20:56 PM
 mincio

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY P. LIN
DRAWN BY J. GO
CHECKED BY K. PUGASAP
IN CHARGE J. CHIRCO
DATE 03/01/2012



CALIFORNIA HIGH-SPEED TRAIN PROJECT
STRUCTURAL DIRECTIVE

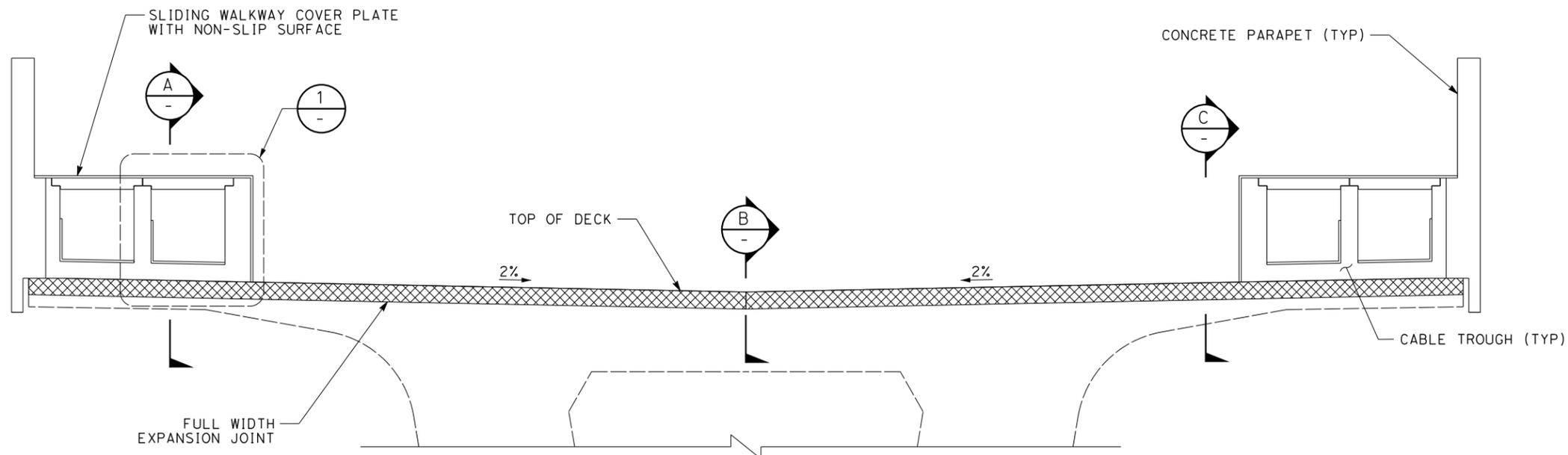
AERIAL STRUCTURE
 TYPICAL SPAN
 SHEAR KEY DETAILS

CONTRACT NO.
DRAWING NO. DD-ST-006
SCALE AS SHOWN
SHEET NO.

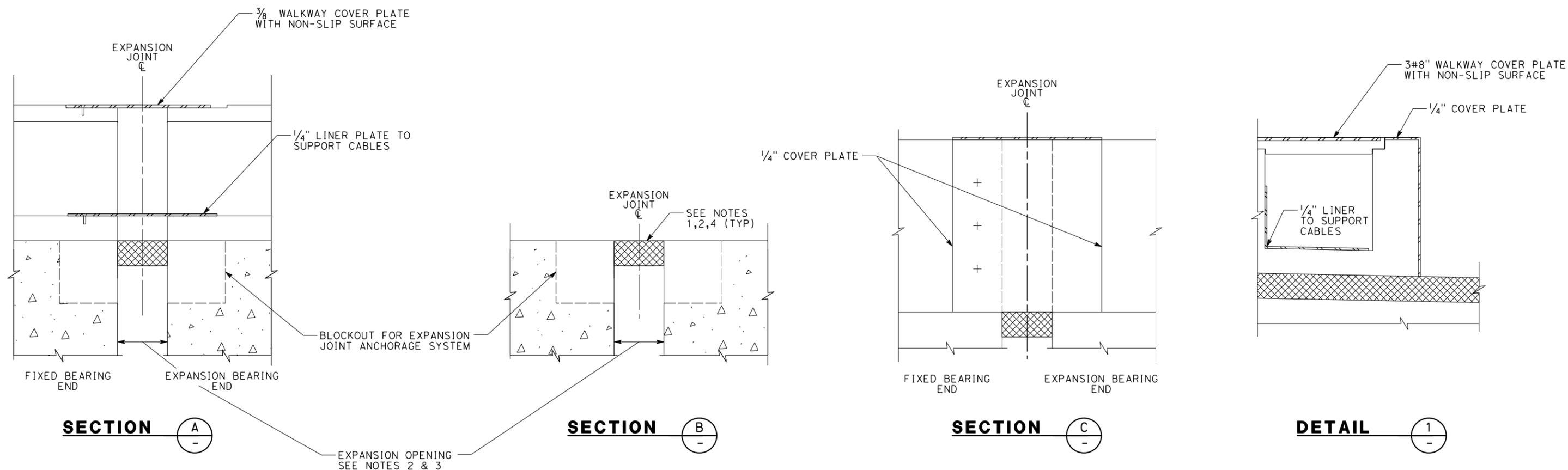
03/08/2012 RFP HSR 11-16

NOTES:

1. THE EXPANSION JOINT DETAILS SHOWN ARE FOR ILLUSTRATION ONLY. THE CONTRACTOR SHALL DEVELOP AN EXPANSION JOINT SYSTEM THAT CONFORMS TO THE REQUIREMENTS IN THE STRUCTURES CHAPTER OF THE DESIGN CRITERIA.
2. THE EXPANSION OPENING BETWEEN THE ENDS OF BRIDGE DECK AND ABUTMENT SHALL ACCOMMODATE THE MOVEMENT RANGE AS SPECIFIED.
3. EXPANSION JOINTS SHALL BE EASILY ACCESSIBLE FOR INSPECTION AND MAINTENANCE. EXPANSION JOINTS SHALL BE REPLACEABLE AT ANYTIME DURING THE LIFE OF STRUCTURES WITHOUT INTERFERENCE TO NORMAL TRAIN OPERATIONS.
4. THE EXPANSION JOINT SHALL BE WATERTIGHT.
5. ALL STRUCTURAL STEEL PLATES SHALL BE GALVANIZED.



EXPANSION JOINT SECTION



SECTION A

SECTION B

SECTION C

DETAIL 1

DIRECTIVE DRAWINGS

2/29/2012 5:20:57 PM CAHSR.tbl CHSR_half_black.plt T:\13259B Calif High Speed Rail\CADD\Directive Drawings\Structures DD\DD-ST-007.dgn

REV	DATE	BY	CHK	APP	DESCRIPTION

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DRAWN BY J. GO
CHECKED BY K. PUGASAP
IN CHARGE J. CHIRCO
DATE 03/01/2012



**CALIFORNIA HIGH-SPEED TRAIN PROJECT
STRUCTURAL DIRECTIVE**

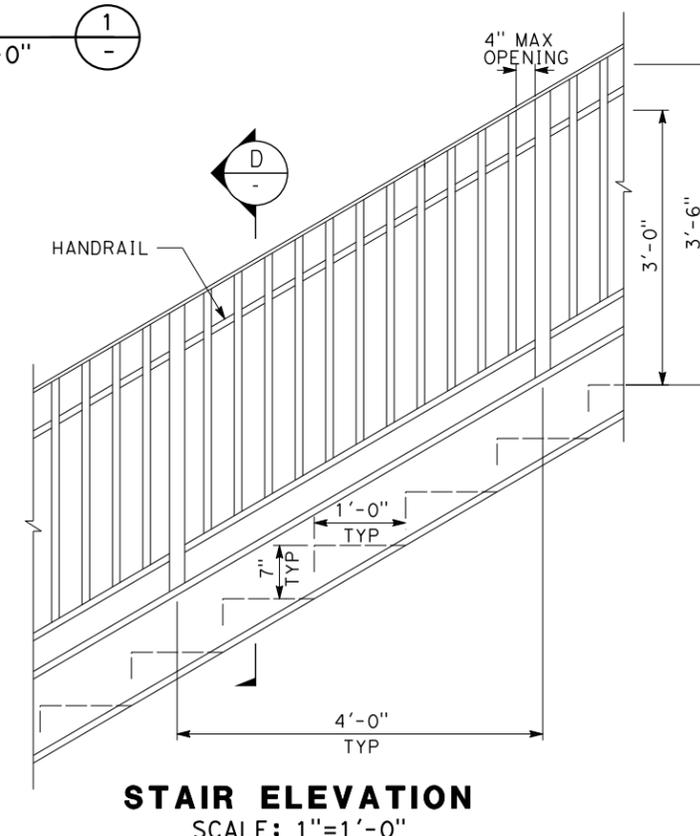
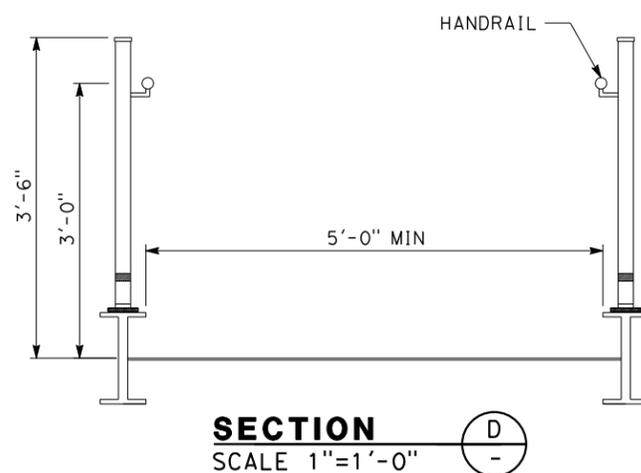
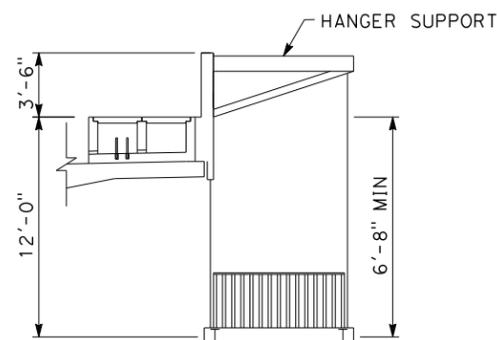
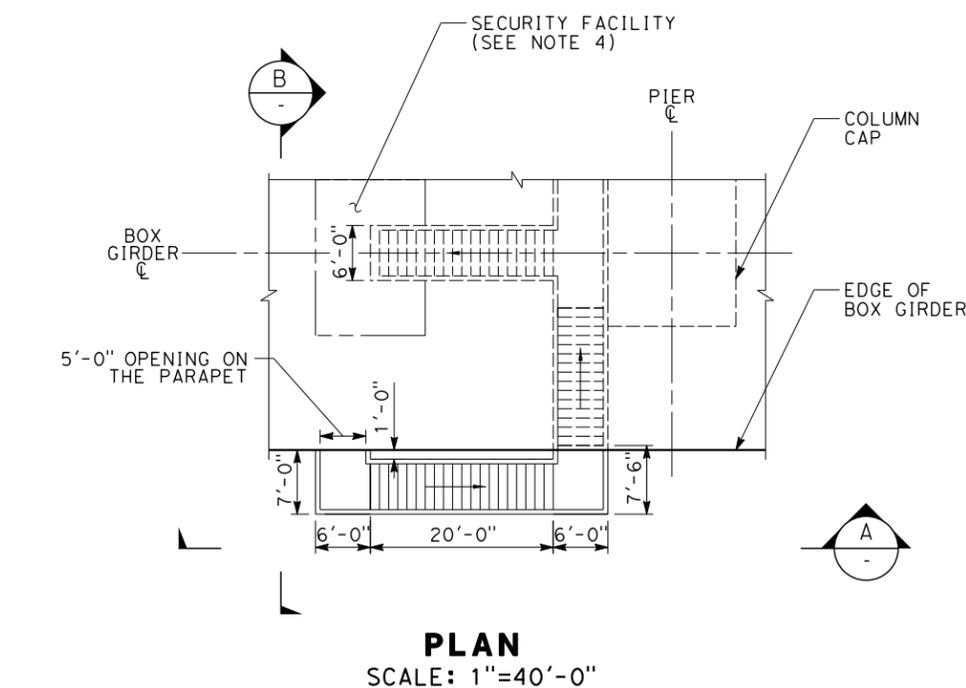
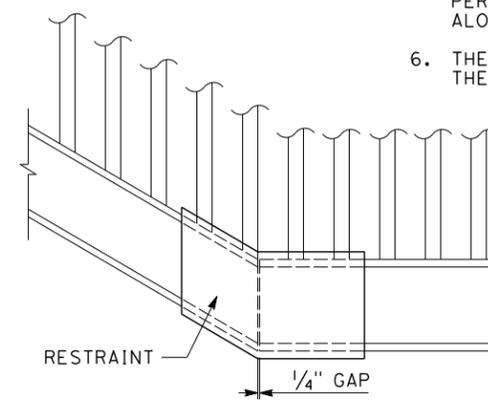
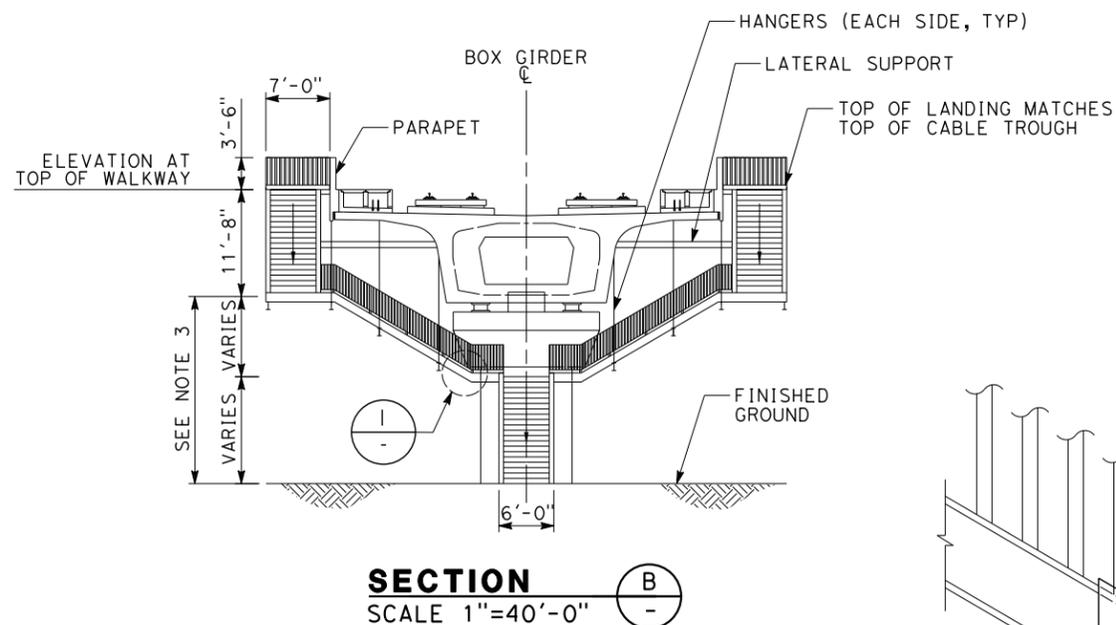
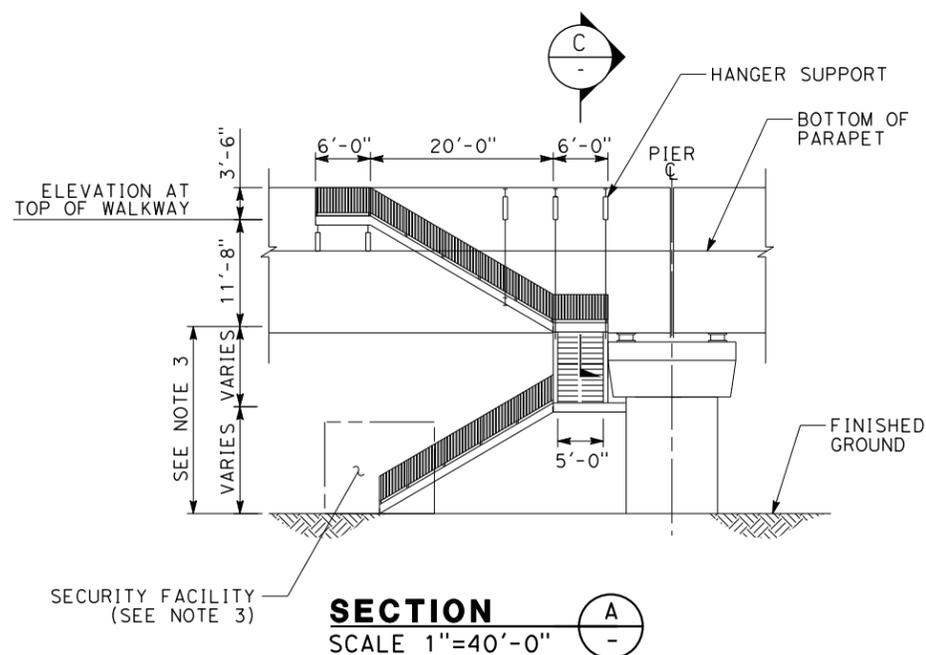
AERIAL STRUCTURE
TYPICAL SPAN
EXPANSION JOINT DETAILS

CONTRACT NO.
DRAWING NO. DD-ST-007
SCALE NO SCALE
SHEET NO.

03/08/2012 RFP HSR 11-16

NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. THE STAIRWAY STRUCTURAL SYSTEM SHOWN IS FOR ILLUSTRATION ONLY. THE CONTRACTOR MAY DESIGN AN EQUIVALENT STAIRWAY SYSTEM TO FIT THE SITE CONDITION.
3. WHERE VERTICAL DISTANCE BETWEEN LANDING EXCEEDS 12'-0", INTERMEDIATE LANDINGS MUST BE PROVIDED.
4. THE SECURITY FACILITY SHALL HAVE SOLID WALLS AND A ROOF (AT LEAST 10 FEET HIGH) WITH A GATE AT FINISHED GROUND ELEVATION.
5. THE ACCESS ROAD FROM THE GATE OF SECURITY FACILITY TO THE LOCAL ROAD SHALL BE PROVIDED. THE CONTRACTOR SHALL COORDINATE WITH THE PERTINENT AUTHORITIES FOR REQUIRED EASEMENT ALONG THE AERIAL STRUCTURES.
6. THE CONTRACTOR SHALL CONSIDER THE LOADS DUE TO THE STAIRWAY IN THE DESIGN OF AERIAL STRUCTURES.



03/08/2012 RFP HSR 11-16

DIRECTIVE DRAWINGS

2/29/2012 5:20:58 PM CAHSRP.tbl CHSR_half_black.plt T:\13259B Calif High Speed Rail\CAADD\Directive Drawings\Structures DD\DD-ST-008.dgn

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY P. LIN
DRAWN BY J. GO
CHECKED BY K. PUGASAP
IN CHARGE J. CHIRCO
DATE 03/01/2012



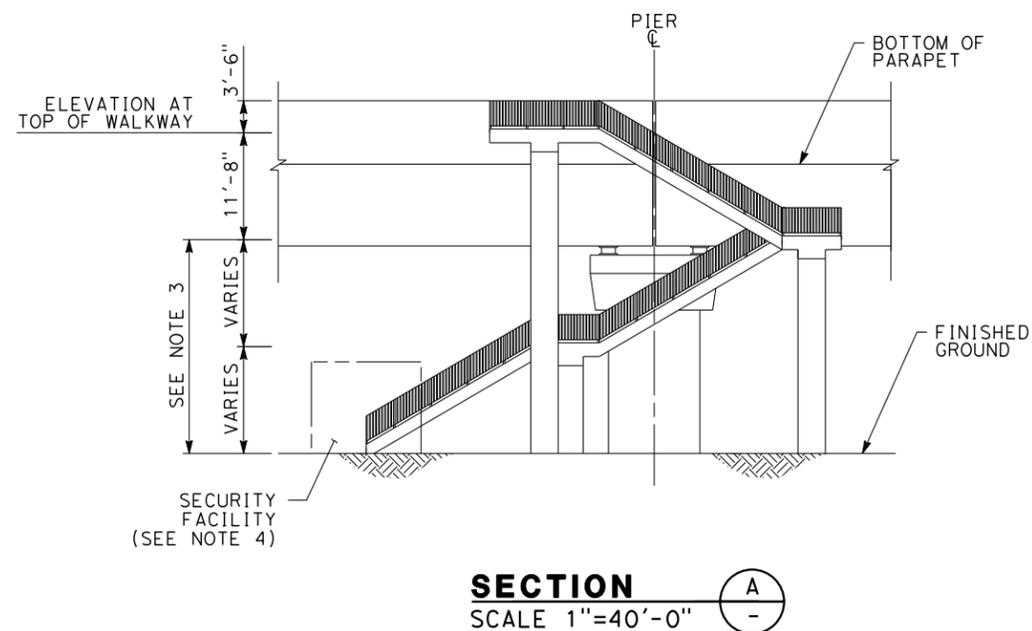
**CALIFORNIA HIGH-SPEED TRAIN PROJECT
STRUCTURAL DIRECTIVE**

AERIAL STRUCTURE
EMERGENCY EXIT STAIRWAY DETAILS 1

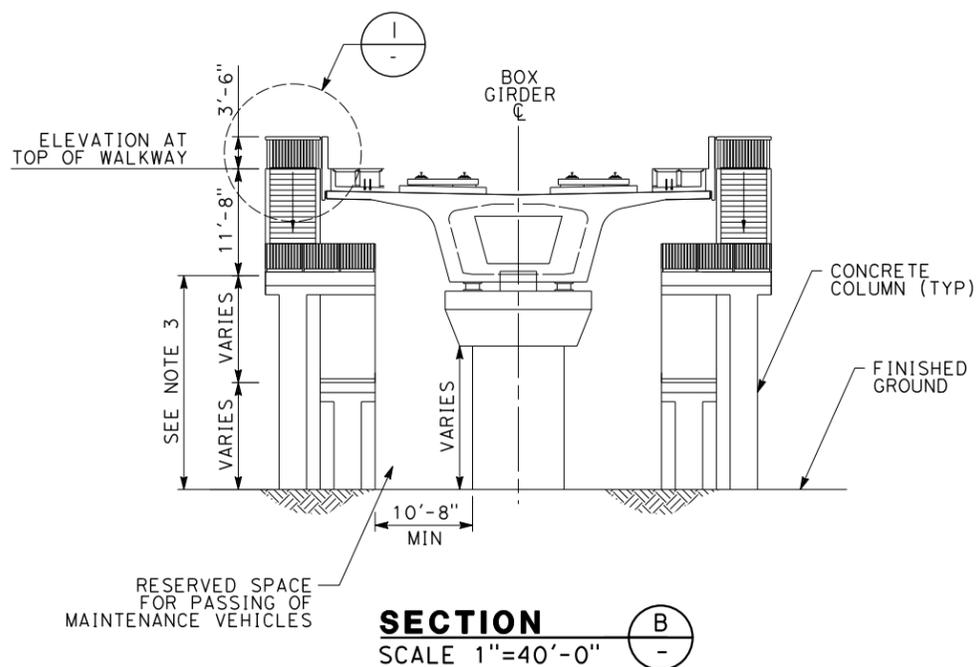
CONTRACT NO.
DRAWING NO. DD-ST-008
SCALE AS SHOWN
SHEET NO.

NOTES:

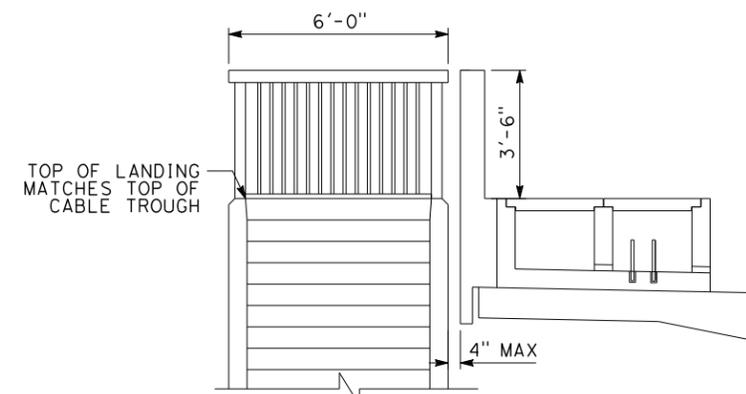
1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. THE STAIRWAY STRUCTURAL SYSTEM SHOWN IS FOR ILLUSTRATION ONLY. THE CONTRACTOR MAY DESIGN AN EQUIVALENT STAIRWAY SYSTEM TO FIT THE SITE CONDITION.
3. WHERE VERTICAL DISTANCE BETWEEN LANDING EXCEEDS 12'-0", INTERMEDIATE LANDINGS SHALL BE PROVIDED.
4. THE SECURITY FACILITY SHALL HAVE SOLID WALLS AND A ROOF (AT LEAST 10 FEET HIGH) WITH A GATE AT FINISHED GROUND ELEVATION.
5. THE ACCESS ROAD FROM THE GATE OF SECURITY FACILITY TO THE LOCAL ROAD SHALL BE PROVIDED. THE CONTRACTOR SHALL COORDINATE WITH THE PERTINENT AUTHORITIES FOR REQUIRED EASEMENT ALONG THE AERIAL STRUCTURES.
6. THE CONTRACTOR SHALL CONSIDER THE LOADS DUE TO THE STAIRWAY IN THE DESIGN OF AERIAL STRUCTURES.



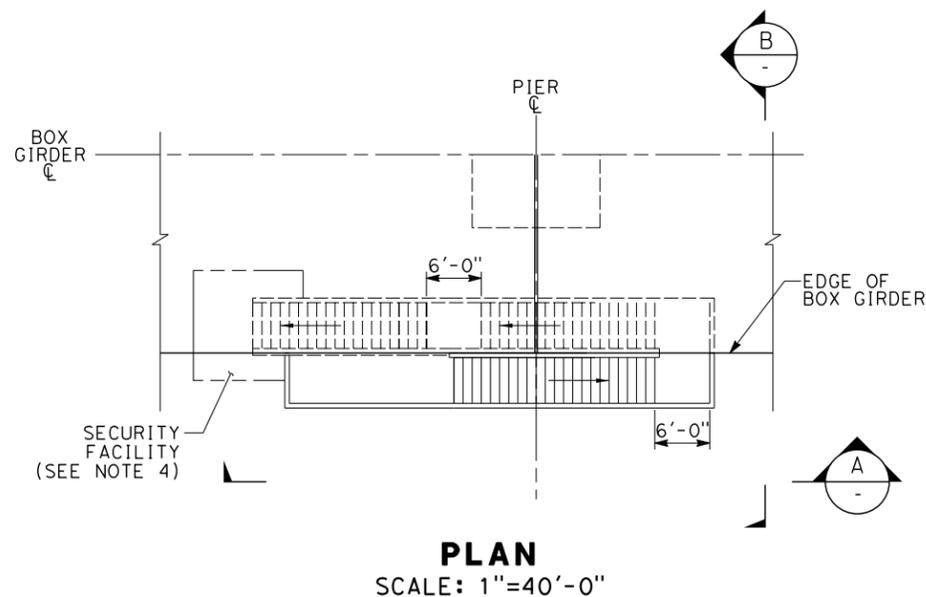
SECTION A
SCALE 1"=40'-0"



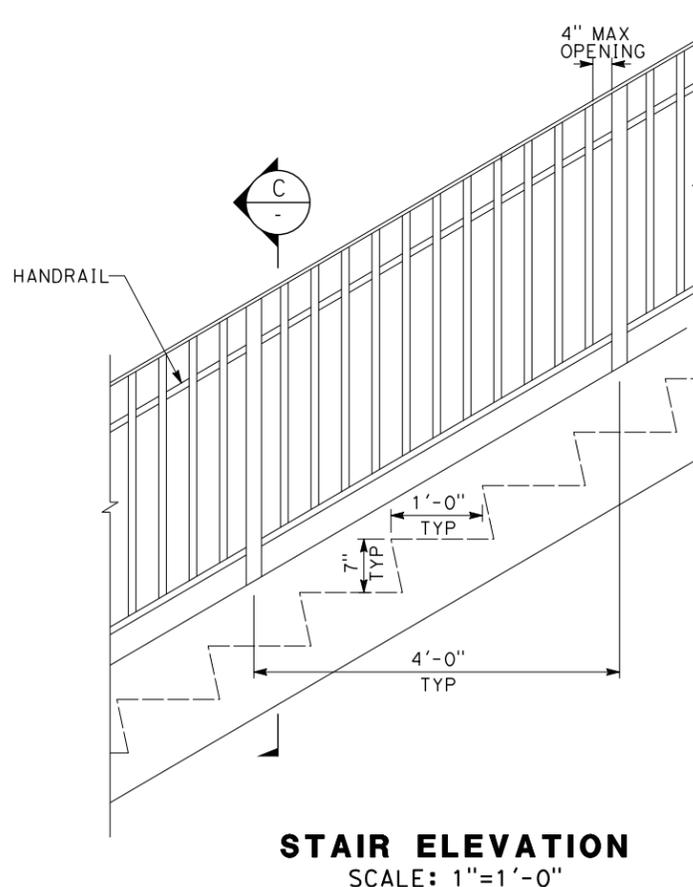
SECTION B
SCALE 1"=40'-0"



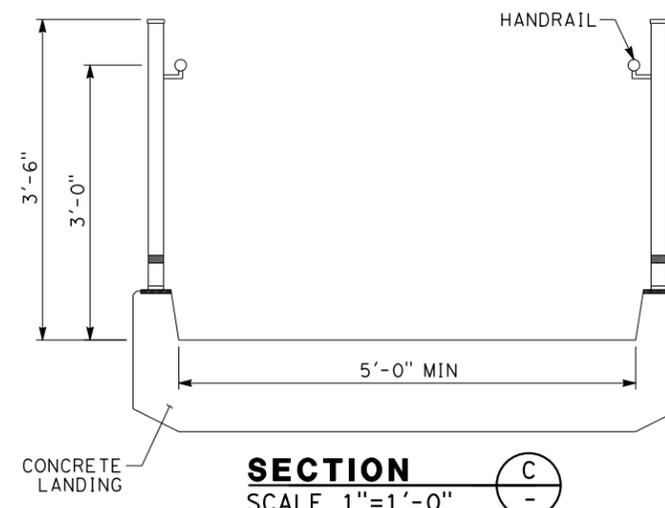
DETAIL 1
SCALE 1"=4'-0"



PLAN
SCALE: 1"=40'-0"



STAIR ELEVATION
SCALE: 1"=1'-0"



SECTION C
SCALE 1"=1'-0"

DIRECTIVE DRAWINGS

2/29/2012 5:21:00 PM CAHSRP.tbl CHSR_half_black.plt T:\13259B Calif High Speed Rail\CAADD\Directive Drawings\Structures DD-DD-ST-009.dgn

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY P. LIN
DRAWN BY J. GO
CHECKED BY K. PUGASAP
IN CHARGE J. CHIRCO
DATE 03/01/2012



CALIFORNIA HIGH-SPEED TRAIN PROJECT
STRUCTURAL DIRECTIVE

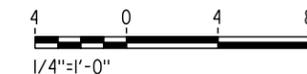
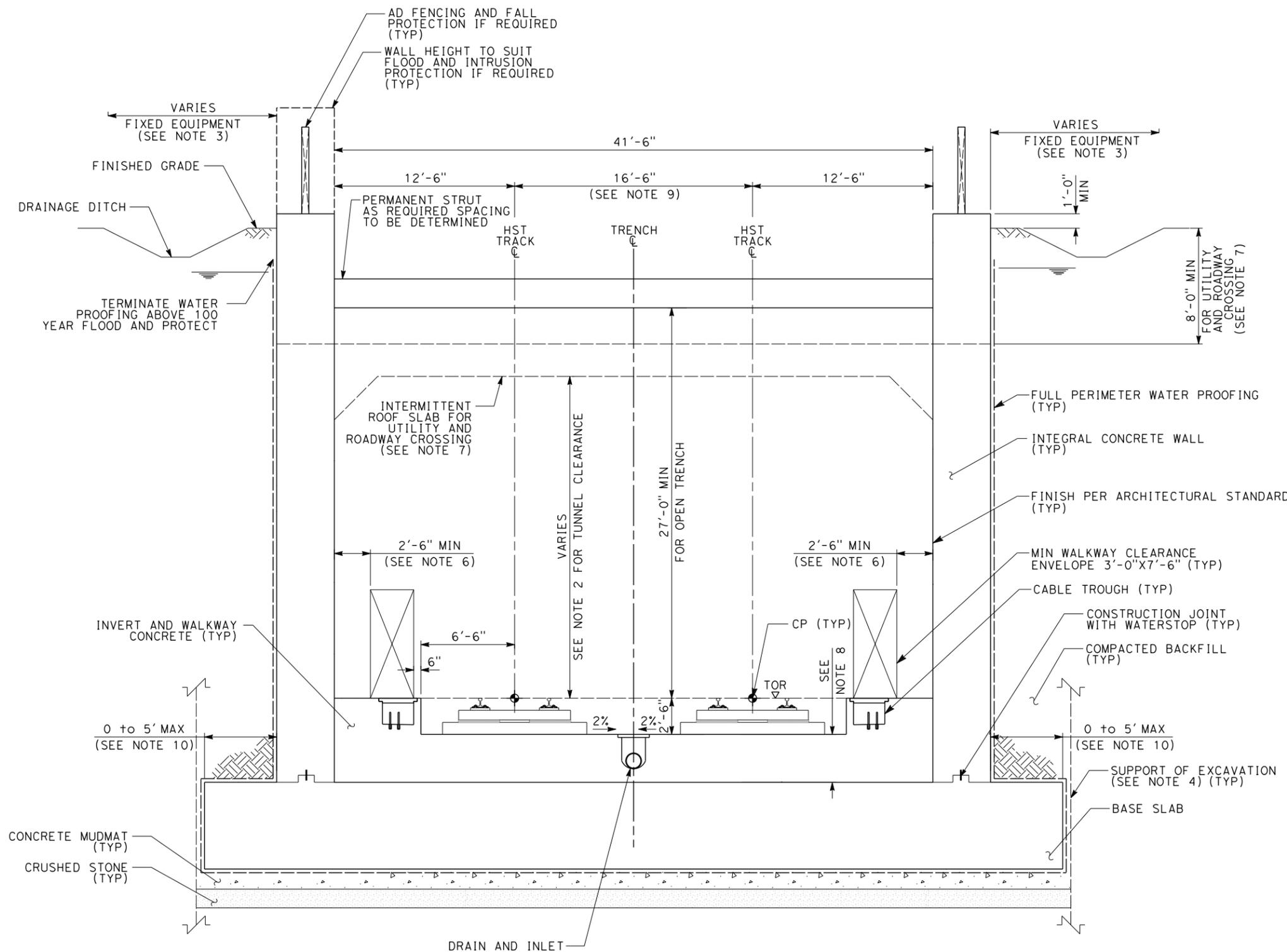
AERIAL STRUCTURE
EMERGENCY EXIT STAIRWAY DETAILS 2

CONTRACT NO.
DRAWING NO. DD-ST-009
SCALE AS SHOWN
SHEET NO.

03/08/2012 RFP HSR 11-16

NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. SEE BASIC TUNNEL CONFIGURATION DIRECTIVE DRAWINGS FOR MINIMUM CLEARANCE REQUIREMENTS.
3. TYPES, LOCATIONS AND DIMENSIONS OF NICHES AND/OR ENLARGEMENTS FOR EMERGENCY VENTILATION, IF REQUIRED, NOT DESIGNED.
4. TYPES, LOCATIONS AND DIMENSIONS OF TEMPORARY SUPPORT AND/OR GROUND TREATMENT NOT SHOWN.
5. STRUCTURAL COMPONENTS ARE NOT DESIGNED.
6. PROVIDE A MIN OF 2'-6" AS AN ALLOWANCE FOR FIXED EQUIPMENT.
7. FOR UTILITY AND ROADWAY CROSSINGS, INTERMITTENT ROOF SLAB SHALL BE PROVIDED AND BACKFILLED TO SUIT.
8. DEPTH TO BE DETERMINED BASED ON DRAINAGE DESIGN.
9. DIMENSION SHOWN BASED ON TANGENT TRACK. INCREASE WIDTH AS REQUIRED FOR CURVATURE.
10. WIDTH AS REQUIRED FOR RESISTANCE TO UPLIFT.



DIRECTIVE DRAWINGS

2/29/2012 5:21:01 PM CAHSR.tbl CHSR_half_black.plt T:\13259B Calif High Speed Rail\CADD\Directive Drawings\Structures\DD-DD-ST-010.dgn

REV	DATE	BY	CHK	APP	DESCRIPTION

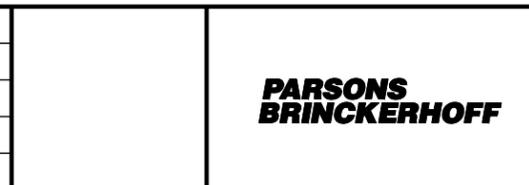
DESIGNED BY
B. VALENTI

DRAWN BY
J. VILLA

CHECKED BY
P. LIN

IN CHARGE
J. CHIRCO

DATE
03/01/2012



CALIFORNIA HIGH-SPEED TRAIN PROJECT

STRUCTURAL DIRECTIVE

TYPICAL CROSS SECTION
TWO TRACK TRENCH
OUTSIDE WALKWAY

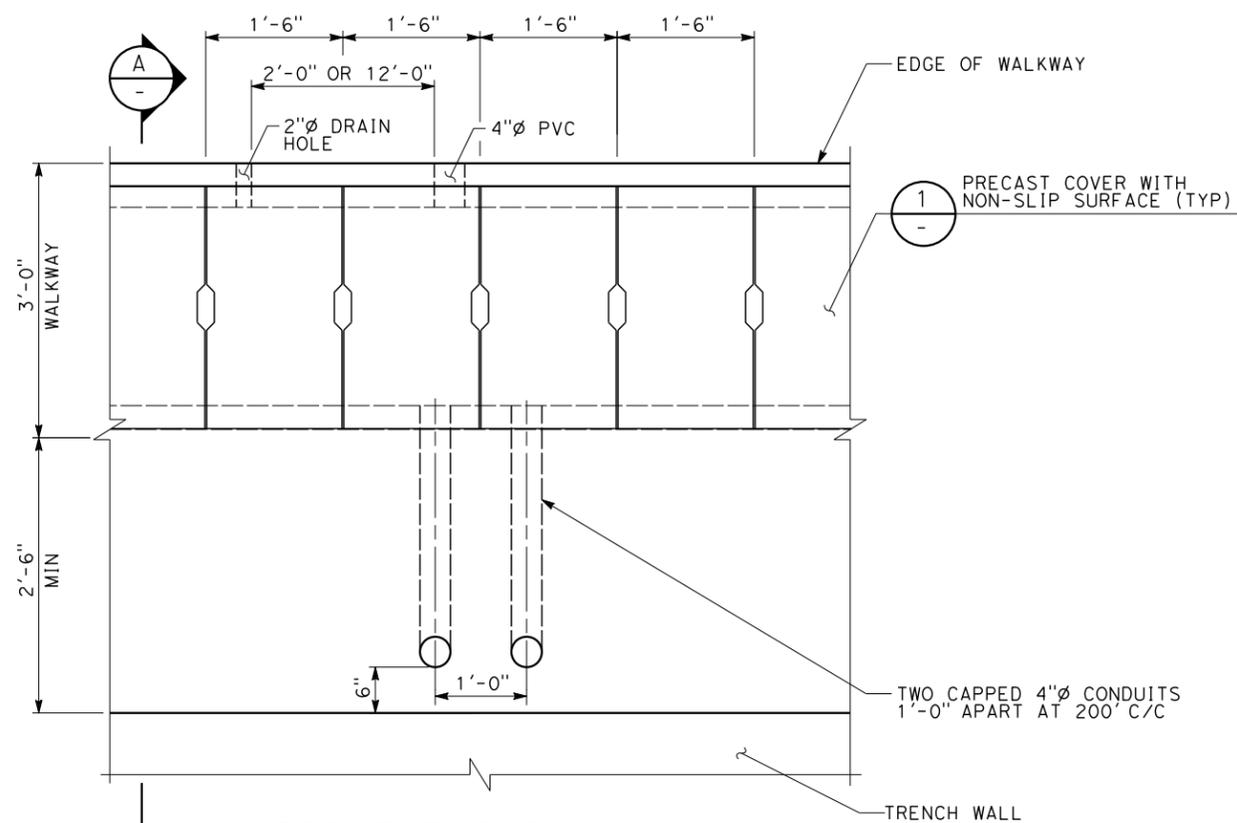
CONTRACT NO.

DRAWING NO.
DD-ST-010

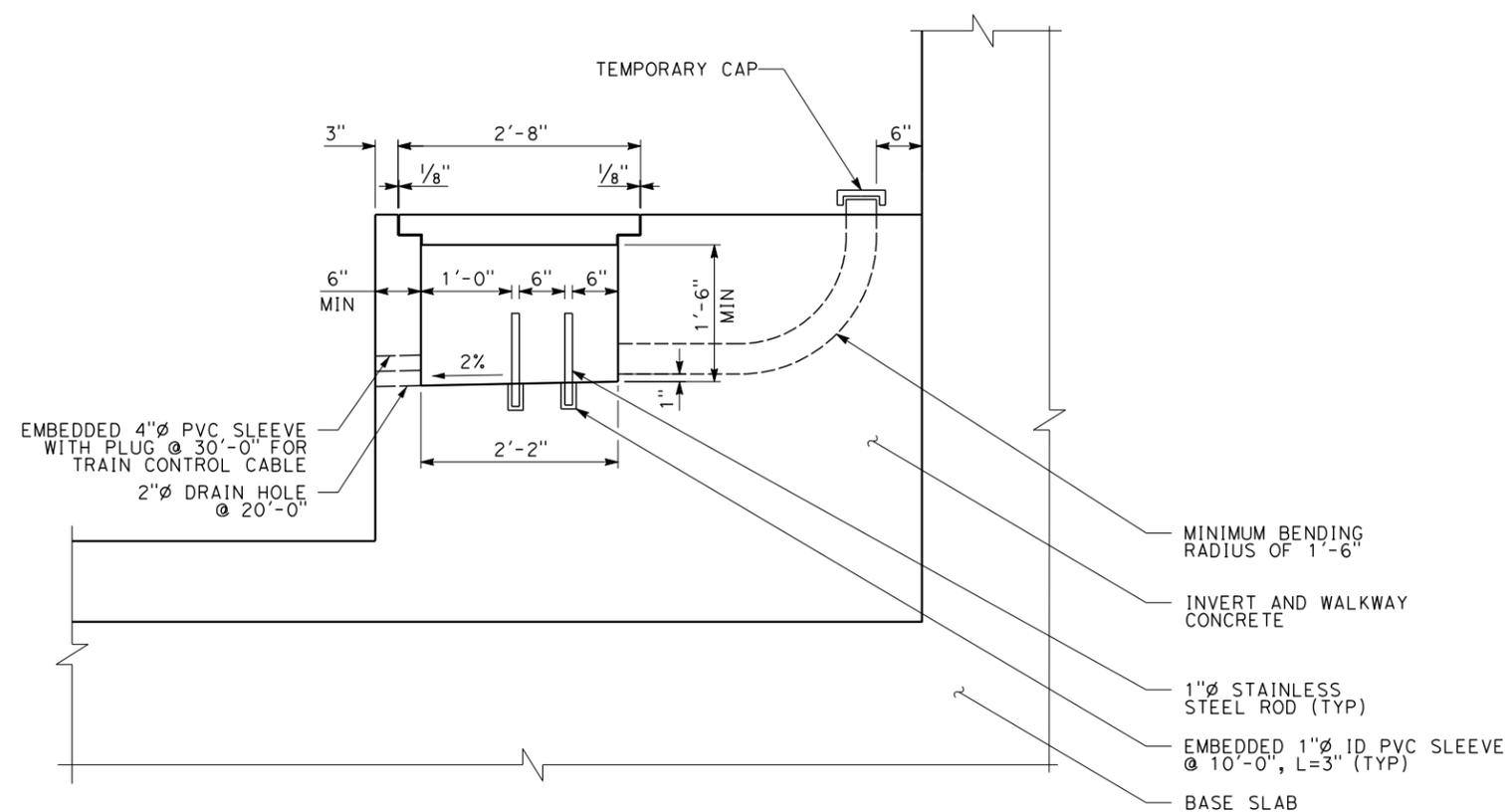
SCALE
AS SHOWN

SHEET NO.

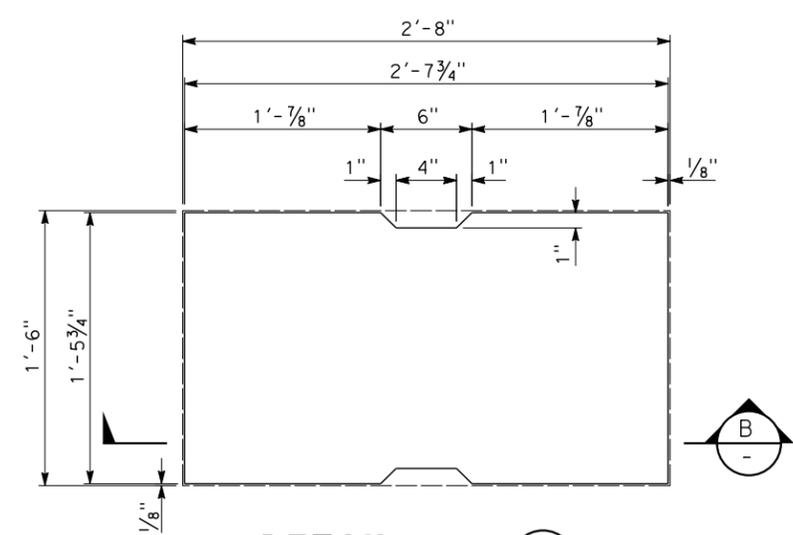
03/08/2012 RFP HSR 11-16



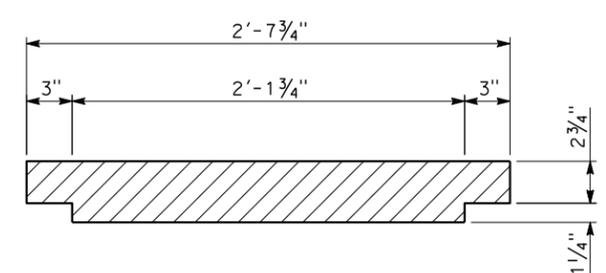
CABLE TROUGH PLAN AND CONDUIT DETAIL
SCALE: 1"=1'-0"



SECTION A
SCALE: 1"=1'-0"



DETAIL 1
SCALE: 1/2"=1'-0"



SECTION B
SCALE: 1/2"=1'-0"

03/08/2012 RFP HSR 11-16

2/29/2012 5:21:02 PM CAHSR.tbl CHSR_half_black.plt T:\3259B Calif High Speed Rail\CADD\Directive Drawings\Structures DD\DD-ST-011.dgn

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
B. VALENTI
DRAWN BY
T. DOUNG
CHECKED BY
P. LIN
IN CHARGE
J. CHIRCO
DATE
03/01/2012



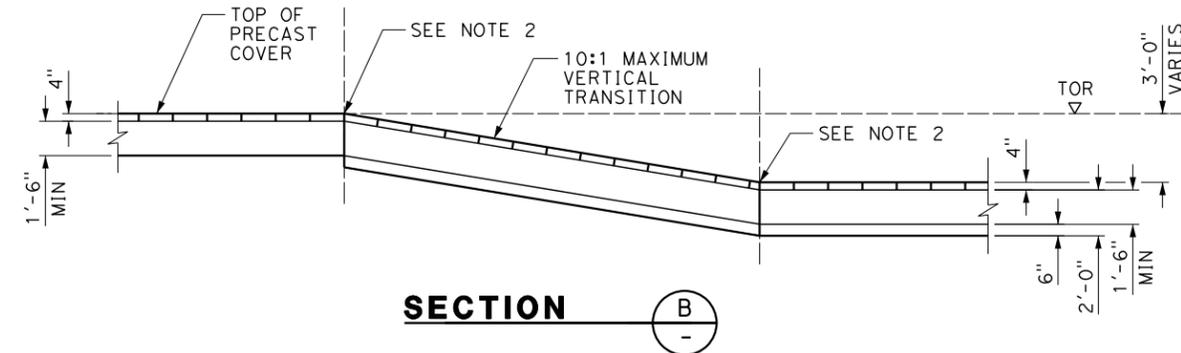
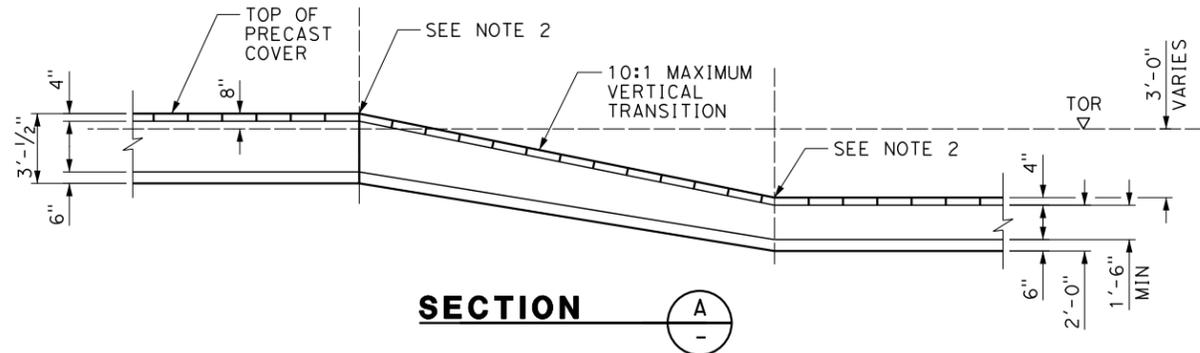
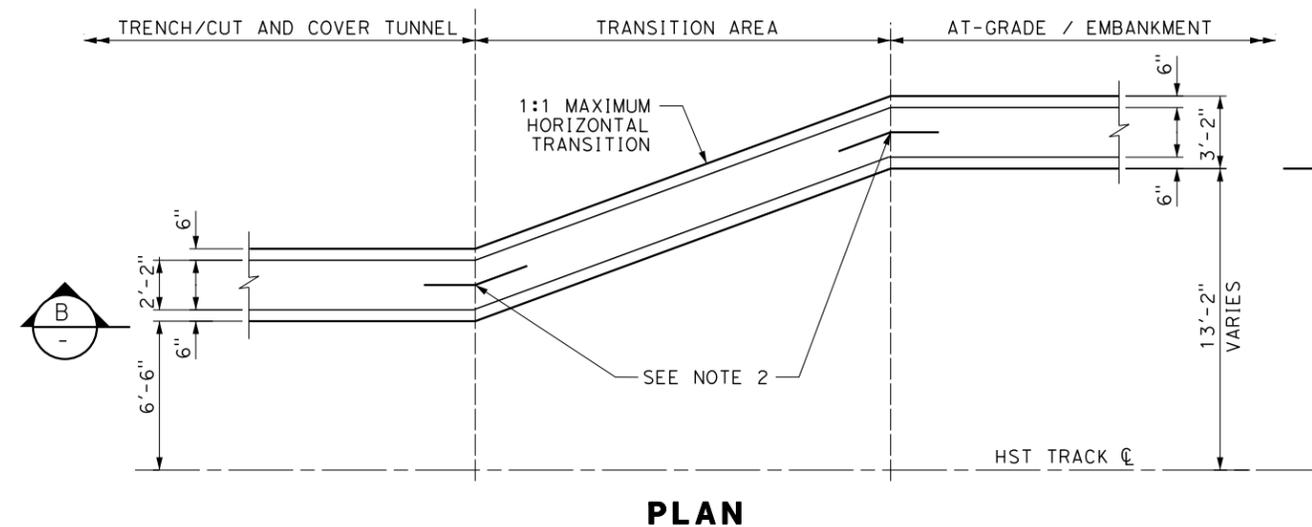
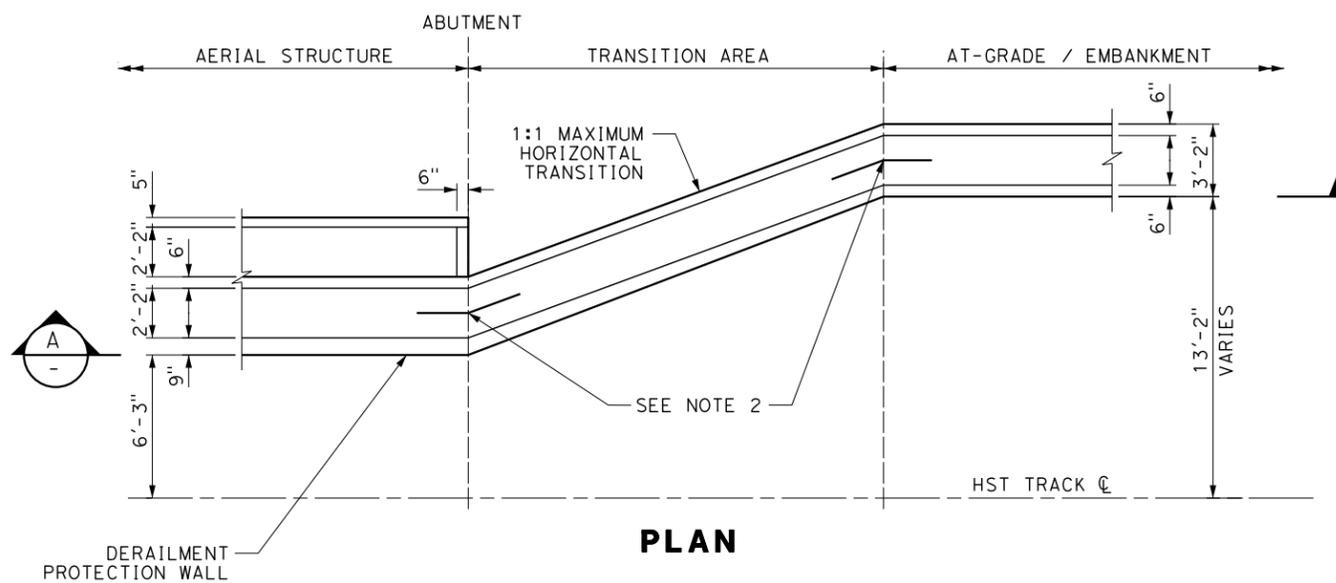
CALIFORNIA HIGH-SPEED TRAIN PROJECT
STRUCTURAL DIRECTIVE
CABLE TROUGH DETAILS
TRENCH/CUT AND COVER TUNNEL

CONTRACT NO.
DRAWING NO.
DD-ST-011
SCALE
AS SHOWN
SHEET NO.

DIRECTIVE DRAWINGS

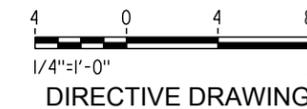
NOTES:

1. BOTH HORIZONTAL AND VERTICAL TRANSITION OF THE CABLE TROUGH SHALL OCCUR WITHIN THE LONGITUDINAL STRUCTURAL TRANSITION ZONE.
2. SPECIAL TRANSITION TROUGH AND COVER WILL BE REQUIRED AT ANGLE POINTS. MAXIMIZE EXTENT OF STANDARD PIECES.



AERIAL STRUCTURE TO AT-GRADE/EMBANKMENT

TRENCH/CUT AND COVER TUNNEL TO AT-GRADE/EMBANKMENT



2/29/2012 5:21:03 PM CAHSR.tbl CHSR_half_black.plt T:\13259B Calif High Speed Rail\CAADD\Directive Drawings\Structures_DD\DD-ST-012.dgn

REV	DATE	BY	CHK	APP	DESCRIPTION

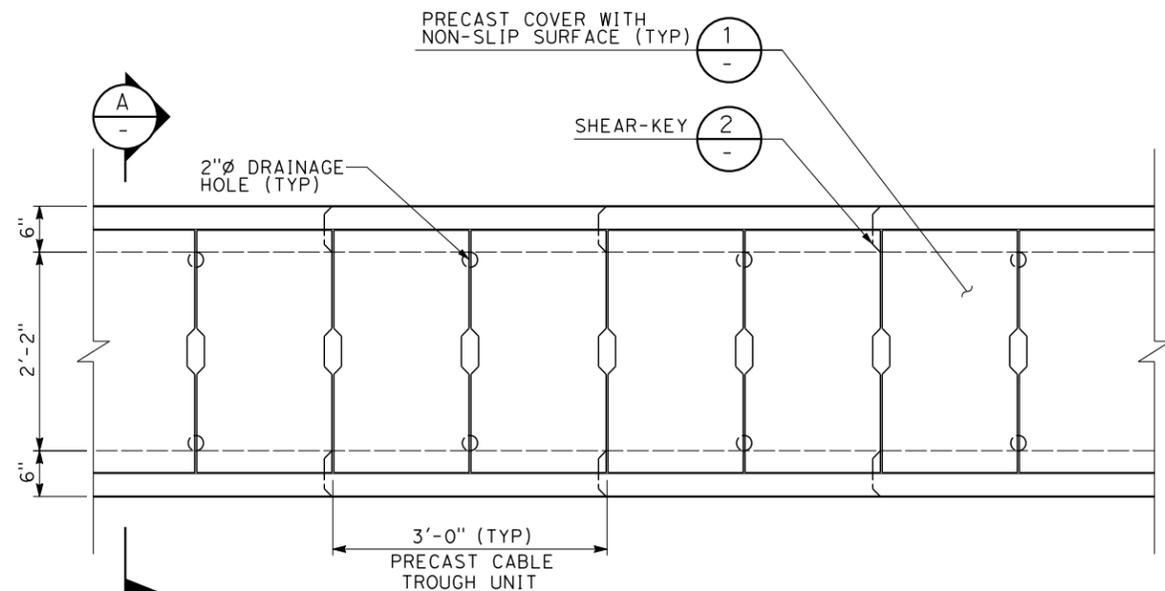
DESIGNED BY
P. LIN
DRAWN BY
J. GO
CHECKED BY
B. VALENTI
IN CHARGE
J. CHIRCO
DATE
03/01/2012



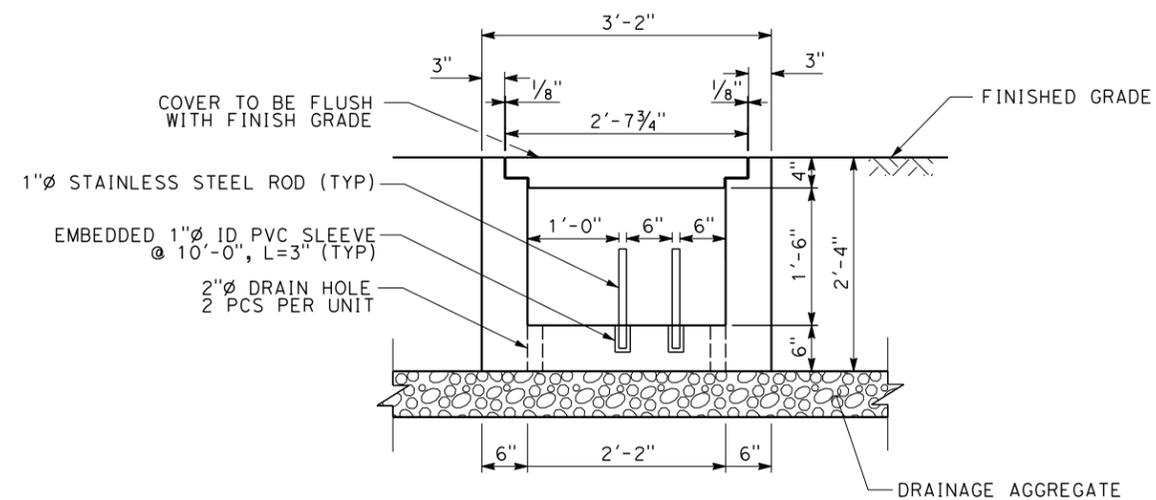
**CALIFORNIA HIGH-SPEED TRAIN PROJECT
STRUCTURAL DIRECTIVE**
CABLE TROUGH LAYOUT TRANSITION AREAS

CONTRACT NO.
DRAWING NO.
DD-ST-012
SCALE
AS SHOWN
SHEET NO.

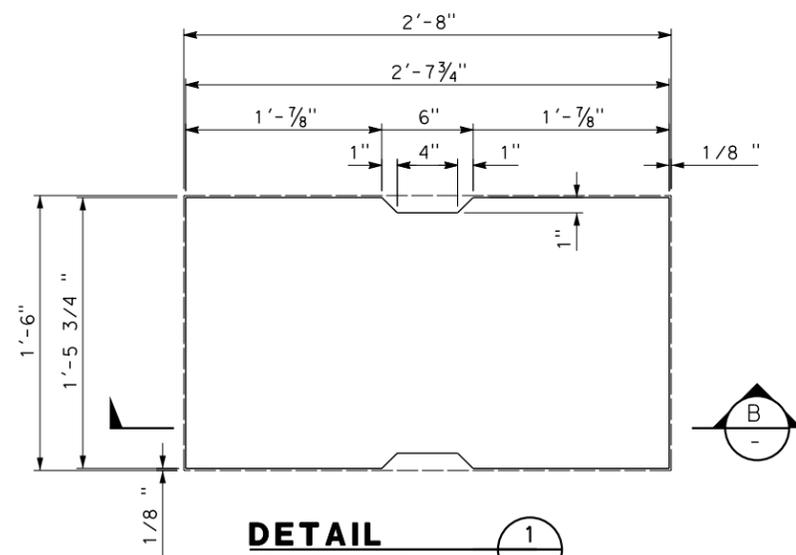
03/08/2012 RFP HSR 11-16



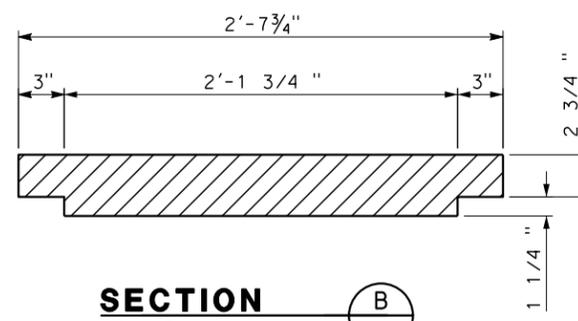
PRECAST CABLE TROUGH PLAN
SCALE: 1"=1'-0"



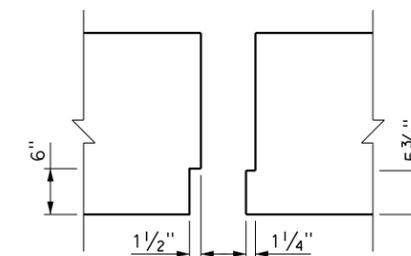
SECTION A-A
SCALE: 1"=1'-0"



DETAIL 1
SCALE: 1/2"=1'-0"



SECTION B-B
SCALE: 1/2"=1'-0"



DETAIL 2
SCALE: 1"=1'-0"

2/29/2012 5:21:04 PM CAHSRP.tbl CHSR_half_black.plt T:\3259B Calif High Speed Rail\CADD\Directive Drawings\Structures DD\DD-ST-013.dgn

03/08/2012 RFP HSR 11-16

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY B. VALENTI
DRAWN BY T. DOUNG
CHECKED BY P. LIN
IN CHARGE J. CHIRCO
DATE 03/01/2012



CALIFORNIA HIGH-SPEED TRAIN PROJECT
STRUCTURAL DIRECTIVE

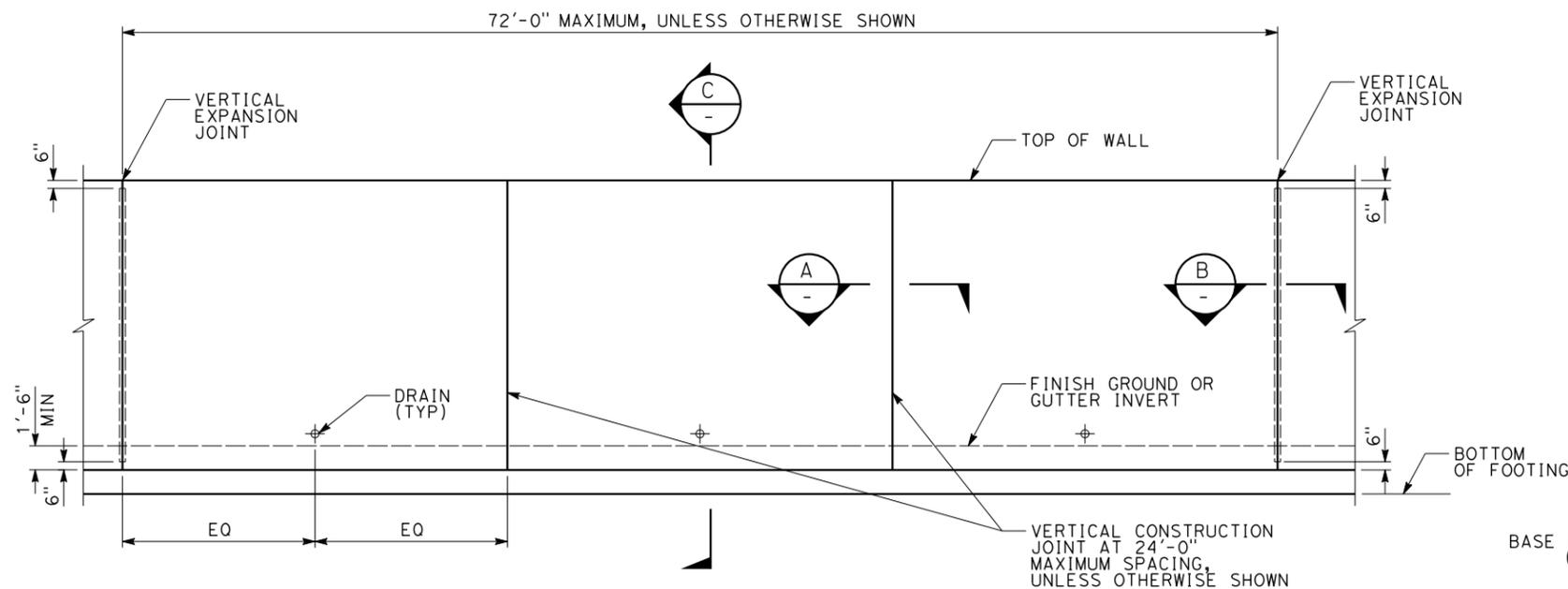
TYPICAL CABLE TROUGH DETAILS
EMBANKMENT/CUT

CONTRACT NO.
DRAWING NO. DD-ST-013
SCALE AS SHOWN
SHEET NO.

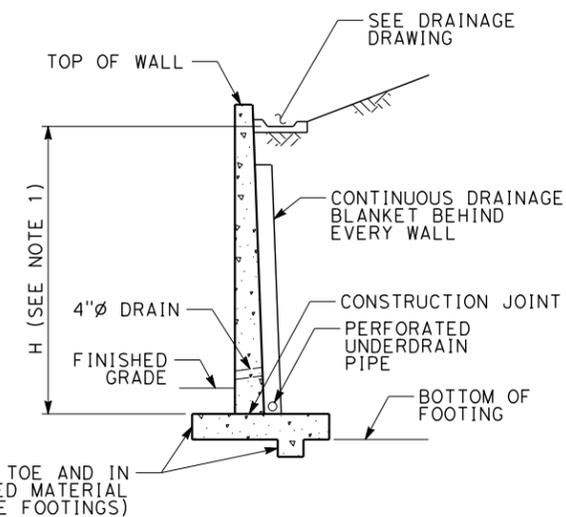
DIRECTIVE DRAWINGS

NOTE:

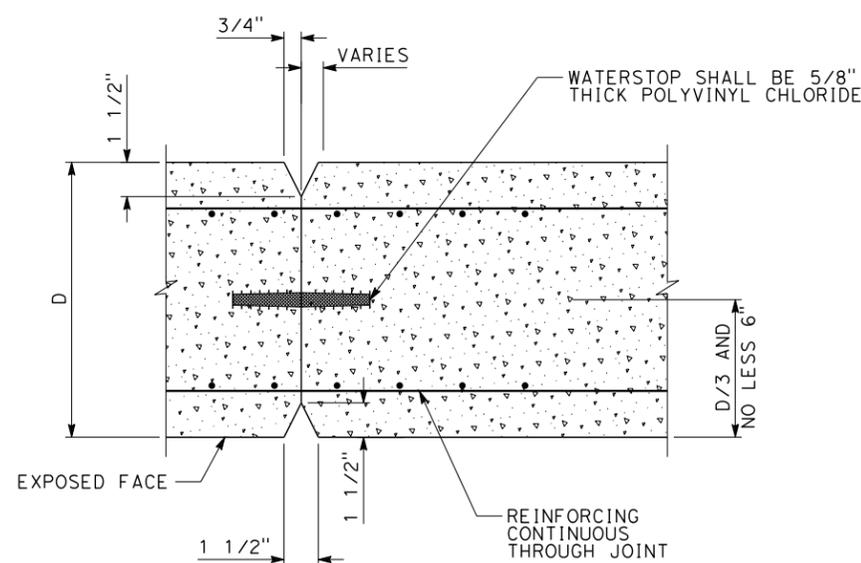
1. ELEVATION OF TOP OF WALL AND BOTTOM OF FOOTING SHALL BE AS SHOWN ON OTHER CONTRACT DRAWINGS, VALUES OF H ARE DESIGN HEIGHTS ONLY.



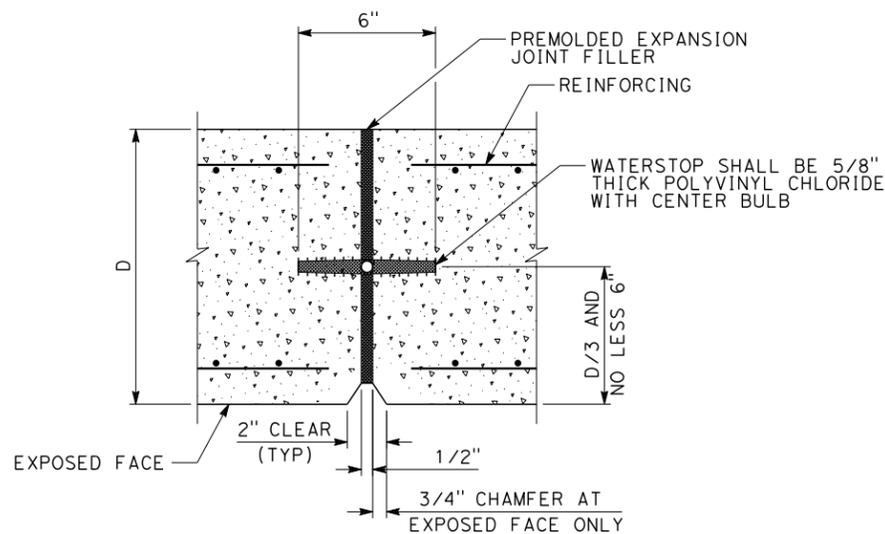
RETAINING WALL ELEVATION (B)



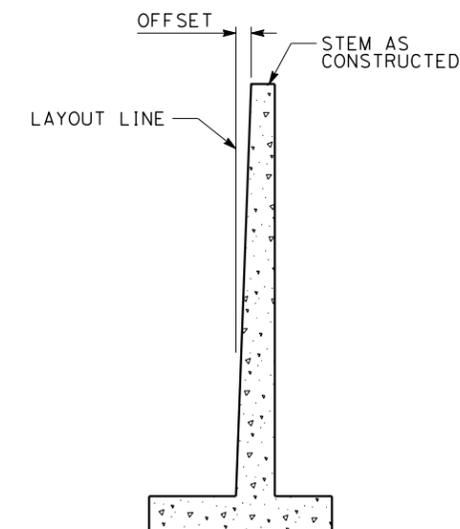
TYPICAL EXPANSION JOINT (C)



TYPICAL CONSTRUCTION JOINT (A)



TYPICAL EXPANSION JOINT (B)



H (FEET)	OFFSET (INCHES)
4	3/8
6	1/2
8	3/4
10	7/8
12	1 1/8
14	1 1/4
16	1 1/2
18	1 5/8
20	1 7/8
22	2
24	2 1/4
26	2 3/8
28	2 5/8

WALL OFFSET VALUES

DIRECTIVE DRAWINGS

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
B. VALENTI
DRAWN BY
V. HUANTE
CHECKED BY
P. LIN
IN CHARGE
J. CHIRCO
DATE
03/01/2012

**PARSONS
BRINCKERHOFF**



**CALIFORNIA HIGH-SPEED TRAIN PROJECT
STRUCTURAL DIRECTIVE**

RETAINING WALL
LAYOUT AND DETAILS

CONTRACT NO.
DRAWING NO.
DD-ST-014
SCALE
NO SCALE
SHEET NO.

California High-Speed Train Project



Request for Proposal for Design-Build Services

RFP No.: HSR 11-16
Directive Drawings

Systems

NOTES:

1. SYSTEM SITES INCLUDE TRACTION POWER FACILITIES, TRAIN CONTROL HOUSES, STANDALONE RADIO SITES.
2. SYSTEM SITE ALTERNATIVES MAY BE ACROSS ROW OR ON SAME SIDE. PROVIDE LOW-VOLTAGE AND 25KV DUCT BANK PER REQUIREMENTS FOR EACH SYSTEMS SITE ALTERNATIVE.
3. ACCESS ROADS AND ACCESS GATES ARE SHOWN FOR INFORMATION ONLY. CONSULT CIVIL DESIGN CRITERIA AND PRELIMINARY DESIGN PLANS FOR REQUIREMENTS AND DETAILS.
4. SEE TRACTION POWER AND COMMUNICATIONS DRAWINGS FOR DUCTBANK, MANHOLE CROSS SECTIONS, DETAILS AND ELEVATIONS.
5. FOR NUMBERS OF CONDUITS SEE COMMUNICATION DESIGN CRITERIA AND DRAWING "TYPICAL CROSS SECTION SYSTEMS LOW-VOLTAGE CONDUIT DUCTBANK".
6. INTERMEDIATE MANHOLES TO BE INCLUDED BASED UPON APPLICABLE STANDARDS, REGULATIONS AND CODES.

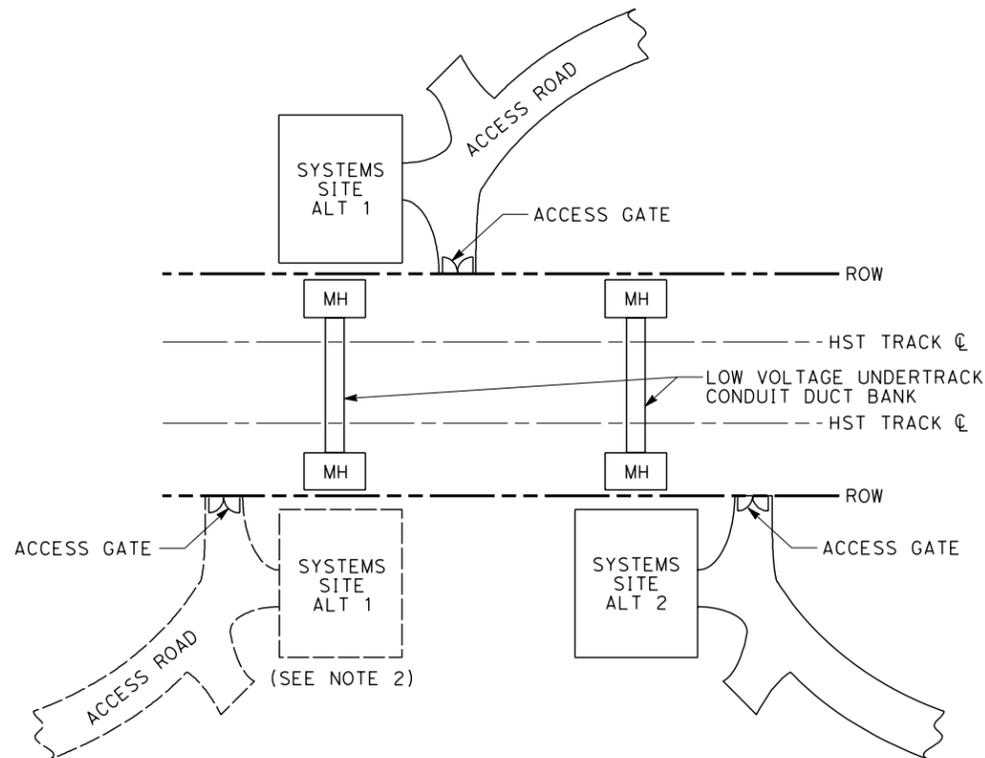


DIAGRAM A

AT-GRADE LOW-VOLTAGE UNDERTRACK CONDUIT DUCTBANK, ACCESS ROADS AND GATES AT ALTERNATIVE SYSTEMS SITES

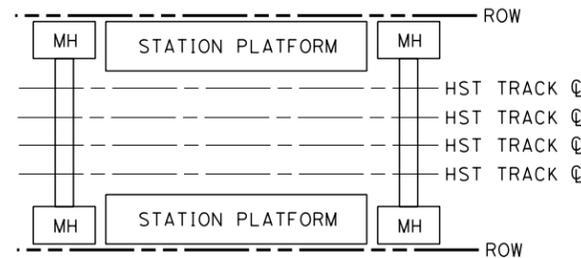


DIAGRAM B

LOW-VOLTAGE UNDERTRACK DUCT BANK AT STATION PLATFORMS

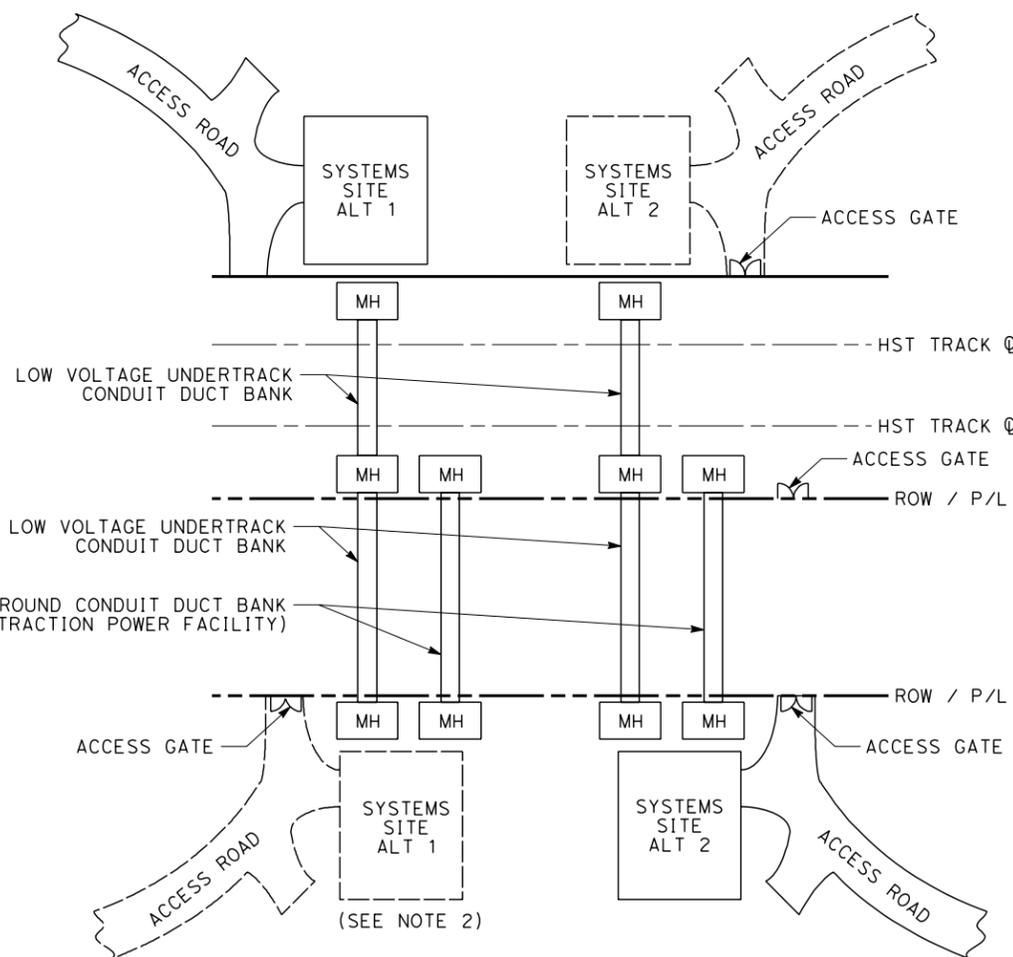


DIAGRAM C

AT-GRADE LOW-VOLTAGE UNDERTRACK AND UNDERGROUND CONDUIT DUCT BANK, 25KV UNDERGROUND CONDUIT DUCT BANK, ACCESS ROADS AND GATES AT ALTERNATIVE SYSTEMS SITES LOCATED AWAY FROM HSR ROW

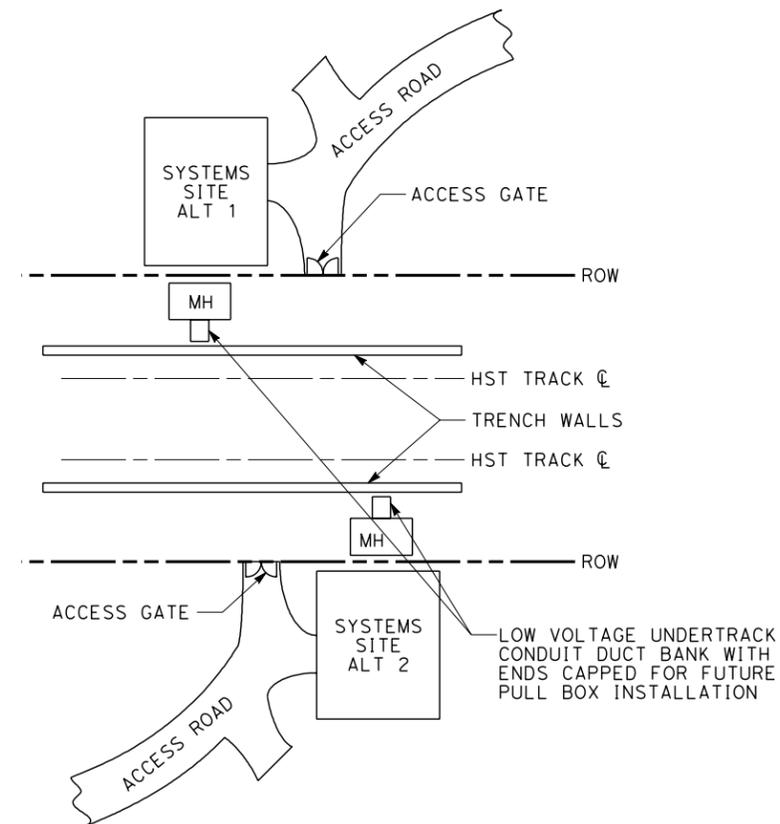


DIAGRAM D

TRENCH LOW-VOLTAGE UNDERTRACK CONDUIT DUCT BANK AND ACCESS ROADS AND GATES AT ALTERNATIVE SYSTEMS SITES

DIRECTIVE DRAWINGS

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REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY B. BANKS
DRAWN BY T. DOUNG
CHECKED BY C. DALOIA
IN CHARGE R. SCHMEDES
DATE 03/01/2012



CALIFORNIA HIGH-SPEED TRAIN PROJECT
SYSTEMS DIRECTIVE
 TYPICAL CIVIL ACCOMMODATIONS
 SYSTEM SITES

CONTRACT NO.
DRAWING NO. DD-SY-010
SCALE NO SCALE
SHEET NO.

03/08/2012 RFP HSR 11-16

California High-Speed Train Project



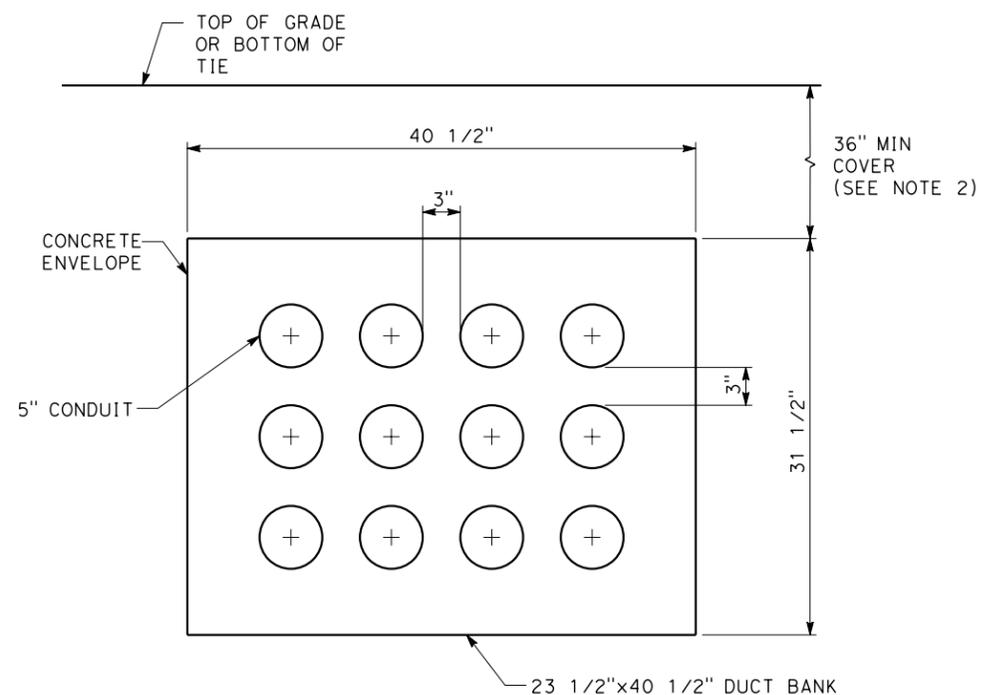
Request for Proposal for Design-Build Services

RFP No.: HSR 11-16
Directive Drawings

Traction Power

NOTES:

1. THIS DRAWING SHOWS TYPICAL DUCT BANK DETAILS FOR 5" CONDUIT FOR ILLUSTRATION PURPOSES ONLY. DESIGN THE DUCT BANK TO SITE AND EQUIPMENT SPECIFIC REQUIREMENTS CONFORMING TO RELEVANT CODES, SPECIFICATIONS AND DESIGN CRITERIA.
2. A 36" MINIMUM COVER SHALL BE MAINTAINED FROM TOP OF GRADE TO TOP OF DUCT BANK, WHEN NOT GOING UNDER RAILROAD TRACK, AND A MINIMUM 5'-6" UNDER RAILROAD TRACKS FROM THE BOTTOM OF TIE.



3x4-WAY DUCT BANK (1)
NO SCALE

03/08/2012 RFP HSR 11-16

DIRECTIVE DRAWINGS

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REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
V. SIBAL
DRAWN BY
V. HUANTE
CHECKED BY
M. PAZ
IN CHARGE
R. SCHMEDES
DATE
03/01/2012

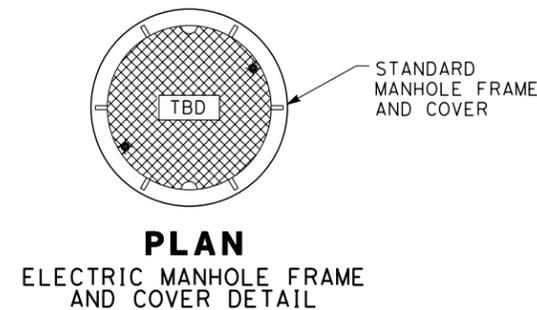
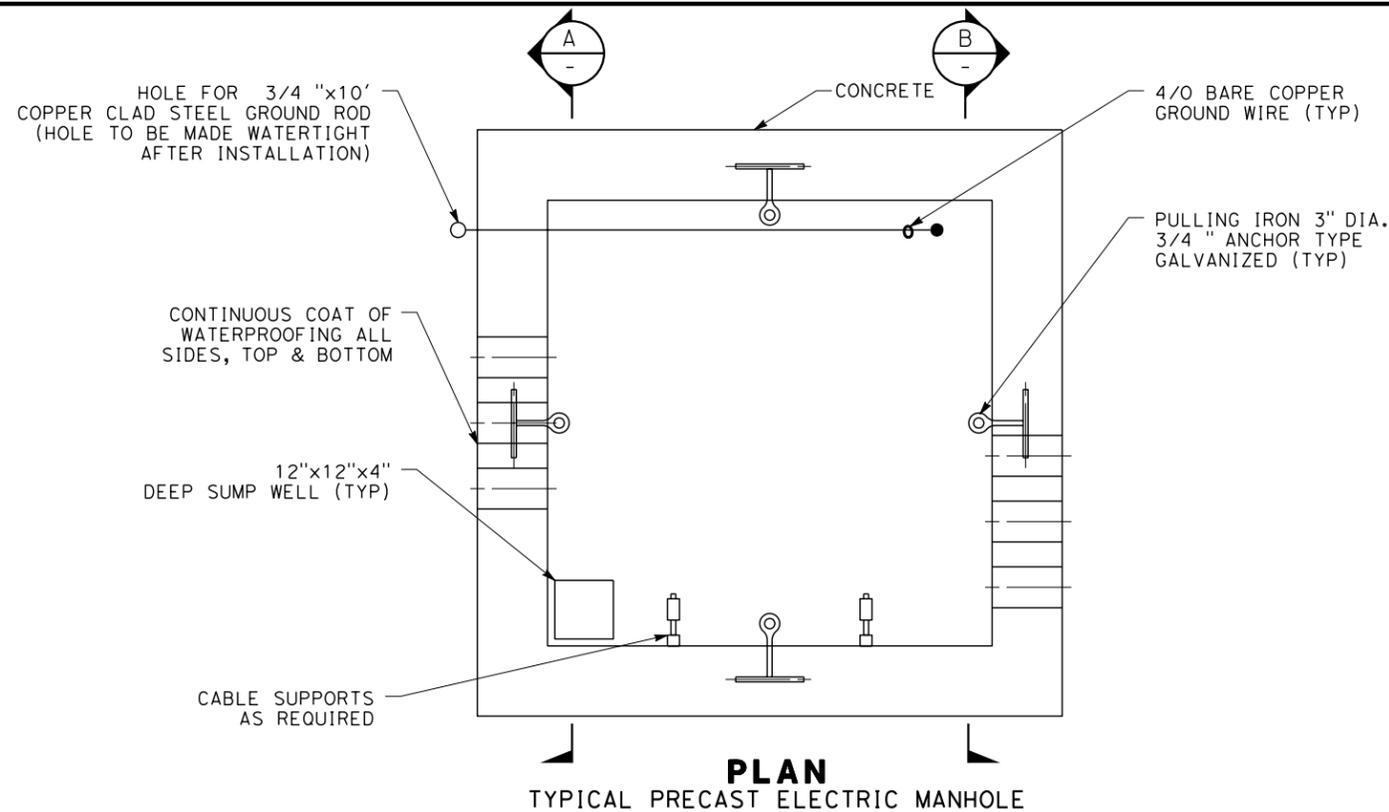
**PARSONS
BRINCKERHOFF**



**CALIFORNIA HIGH-SPEED TRAIN PROJECT
TRACTION POWER DIRECTIVE**

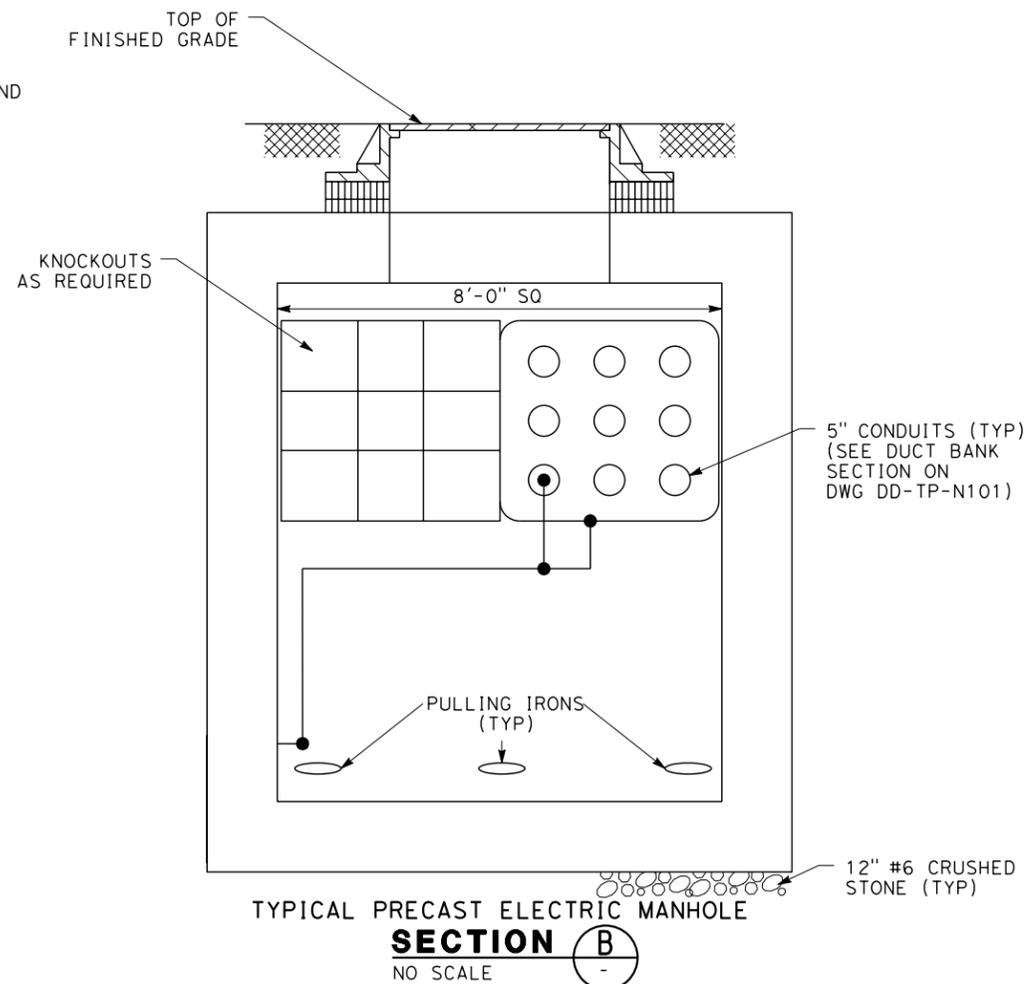
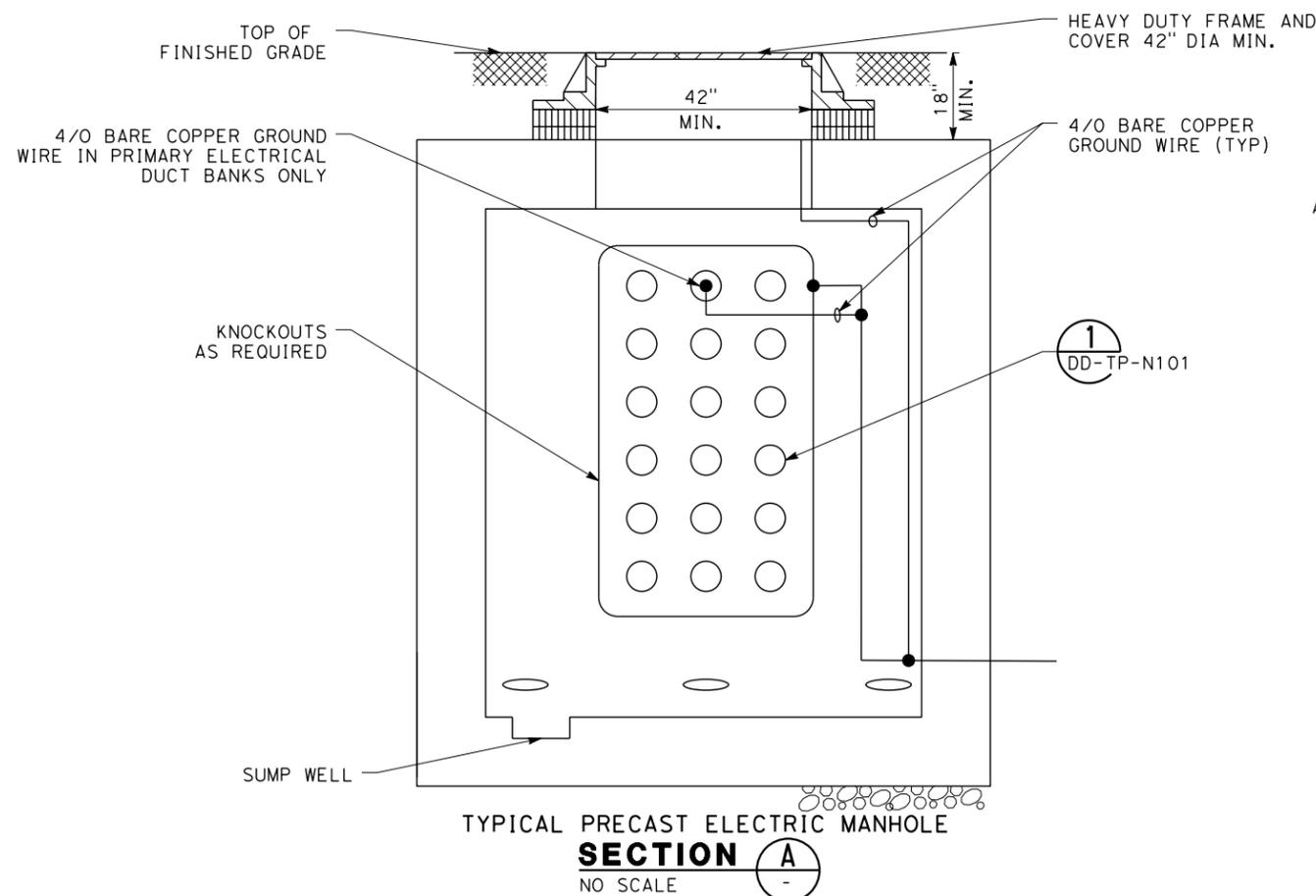
TYPICAL 25KV DUCT BANK DETAIL

CONTRACT NO.
DRAWING NO.
DD-TP-N101
SCALE
NO SCALE
SHEET NO.



NOTES:

1. THIS DRAWING SHOWS TYPICAL DUCT BANK KNOCKOUTS IN A PRECAST MANHOLE. EXACT DETAILS TO BE WORKED OUT AT DETAILED DESIGN LEVEL.
2. ALL TRACTION POWER MANHOLES SHALL BE TYPICALLY 8'-0" L X 8'-0" W X 9'-0" DEEP (INSIDE DIMENSIONS) AND BE WATERTIGHT WITH SILICON SEALING COMPOUND, OR APPROVED EQUAL.
3. THE MANHOLE FRAME SHALL BE GROUTED TO THE ROOF SLAB.
4. THICKNESS OF MANHOLE WALL SHALL BE 8" MINIMUM.
5. APPROVED CABLE RACK ARMS TO BE INSTALLED TO ACCOMMODATE CABLE, MINIMUM 2 RACKS PER WALL (TYP).
6. PULLING HOOKS TO BE GALVANIZED STEEL, SUPPLIED AND CAST INTO WALLS BY PRECASTER. ANCHORED BEHIND REINFORCEMENT, QUANTITY AND LOCATION TO SUIT.
7. CONNECT ALL METALLIC PARTS, FRAME, PULLING HOOKS, ETC., TO THE TRACTION POWER FACILITY GROUND GRID OR GROUND ROD.
8. PROVIDE FOR CONNECTION TO A PORTABLE PUMP TO REMOVE ACCUMULATED WATER FROM THE MANHOLE OR OTHER SITE SPECIFIC DRAINAGE SYSTEM.

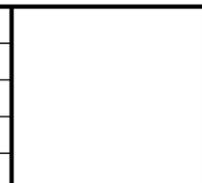


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03/08/2012 RFP HSR 11-16

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V. SIBAL
DRAWN BY
V. HUANTE
CHECKED BY
M. PAZ
IN CHARGE
R. SCHMEDES
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03/01/2012



CALIFORNIA HIGH-SPEED TRAIN PROJECT
TRACTION POWER DIRECTIVE

TYPICAL 25KV MANHOLE DETAILS

CONTRACT NO.
DRAWING NO. DD-TP-N111
SCALE NO SCALE
SHEET NO.

DIRECTIVE DRAWINGS

California High-Speed Train Project



**Request for Proposal
for Design-Build Services**

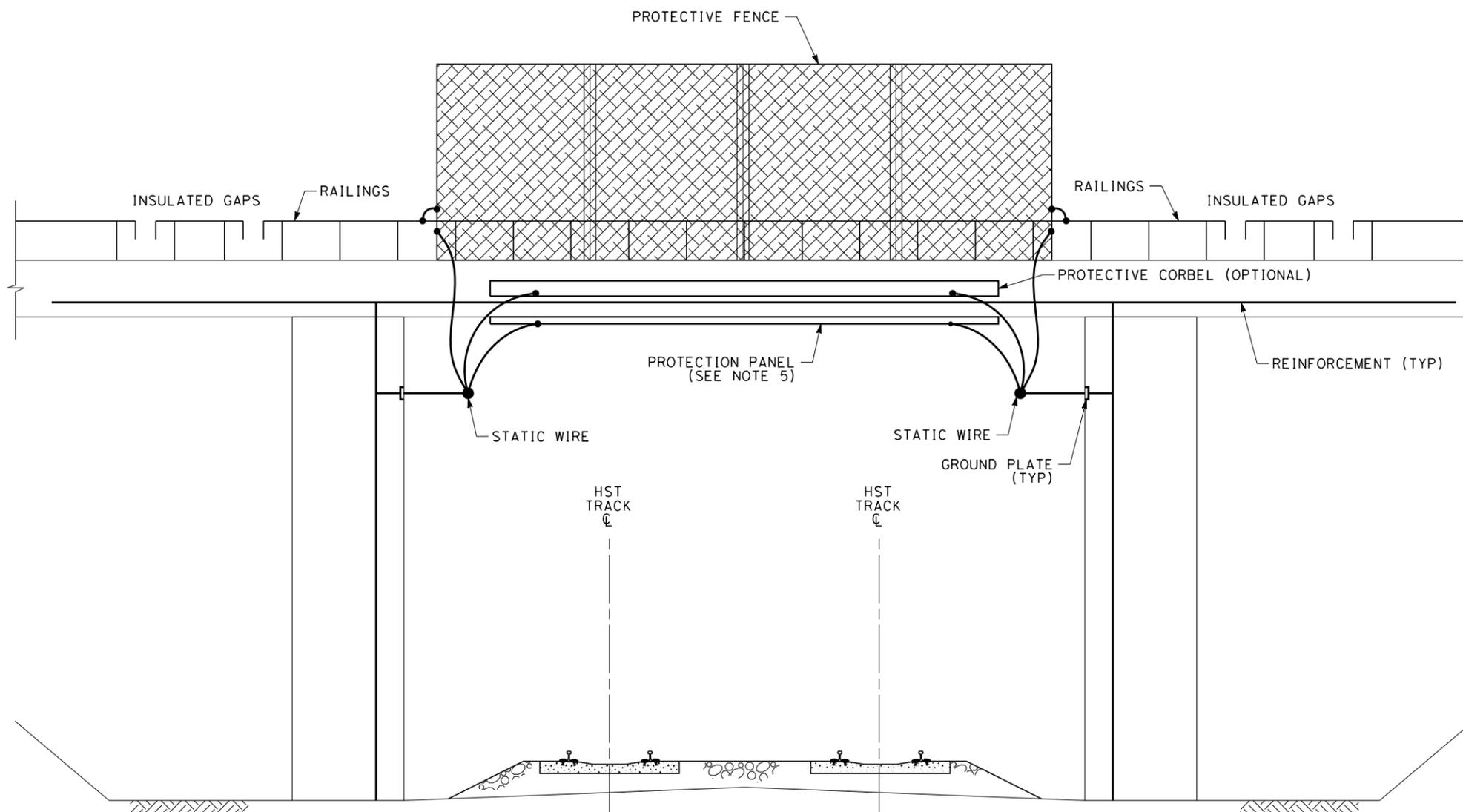
RFP No.: HSR 11-16

Directive Drawings

Overhead Contact System

NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. SMALL METALLIC ITEMS, SUCH AS RAILING, FENCE ETC, BEYOND THE STEP AND TOUCH POTENTIAL LIMIT NEED NOT BE GROUNDED. THE STEP AND TOUCH POTENTIAL EXISTS WITHIN 8' OF A STANDING TRAIN, 8' FROM ANY ELECTRICALLY CONTINUOUS BONDED FENCE, OR 8' FROM ANY METALLIC ITEM BONDED TO STATIC WIRE.
3. GROUNDING DETAILS DESIGN SHALL BE COORDINATED WITH OVERPASS STRUCTURE DESIGNER.
4. OVERHEAD BRIDGE GROUNDING AND BONDING DETAILS SHOWN IN DRAWING ARE GENERIC IN NATURE. THE FINAL DESIGNER SHALL PROVIDE DETAIL ASSEMBLIES AND COMPONENTS THAT MEET THE REQUIREMENT.
5. GALVANIZED STEEL STRIP OR ANGLE SECTION SHALL BE INSTALLED ABOVE THE OVERHEAD LINE AT EACH BRIDGE FACE, IF THE BRIDGE SOFFIT IS WITHIN THE PANTOGRAPH ZONE. WHEN THE VERTICAL CLEARANCE BETWEEN OCS CONDUCTORS AND CONCRETE OVERPASSES IS LESS THAN 3 FEET, PROTECTION PANELS (FLASH PLATES) SHALL BE INSTALLED ABOVE THE OCS, ATTACHED TO THE UNDERSIDE OF THE STRUCTURE, AND INTERCONNECTED TO THE STATIC WIRE AT NOT LESS THAN TWO LOCATIONS.



TYPICAL GRADE SEPARATED STRUCTURE GROUNDING AND BONDING

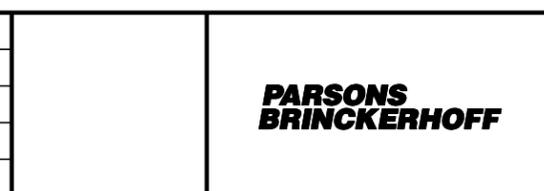
DIRECTIVE DRAWINGS

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03/08/2012 RFP HSR 11-16

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DESIGNED BY
J. LAU
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T. DOUNG
CHECKED BY
M. HSIAO
IN CHARGE
R. SCHEDES
DATE
03/01/12



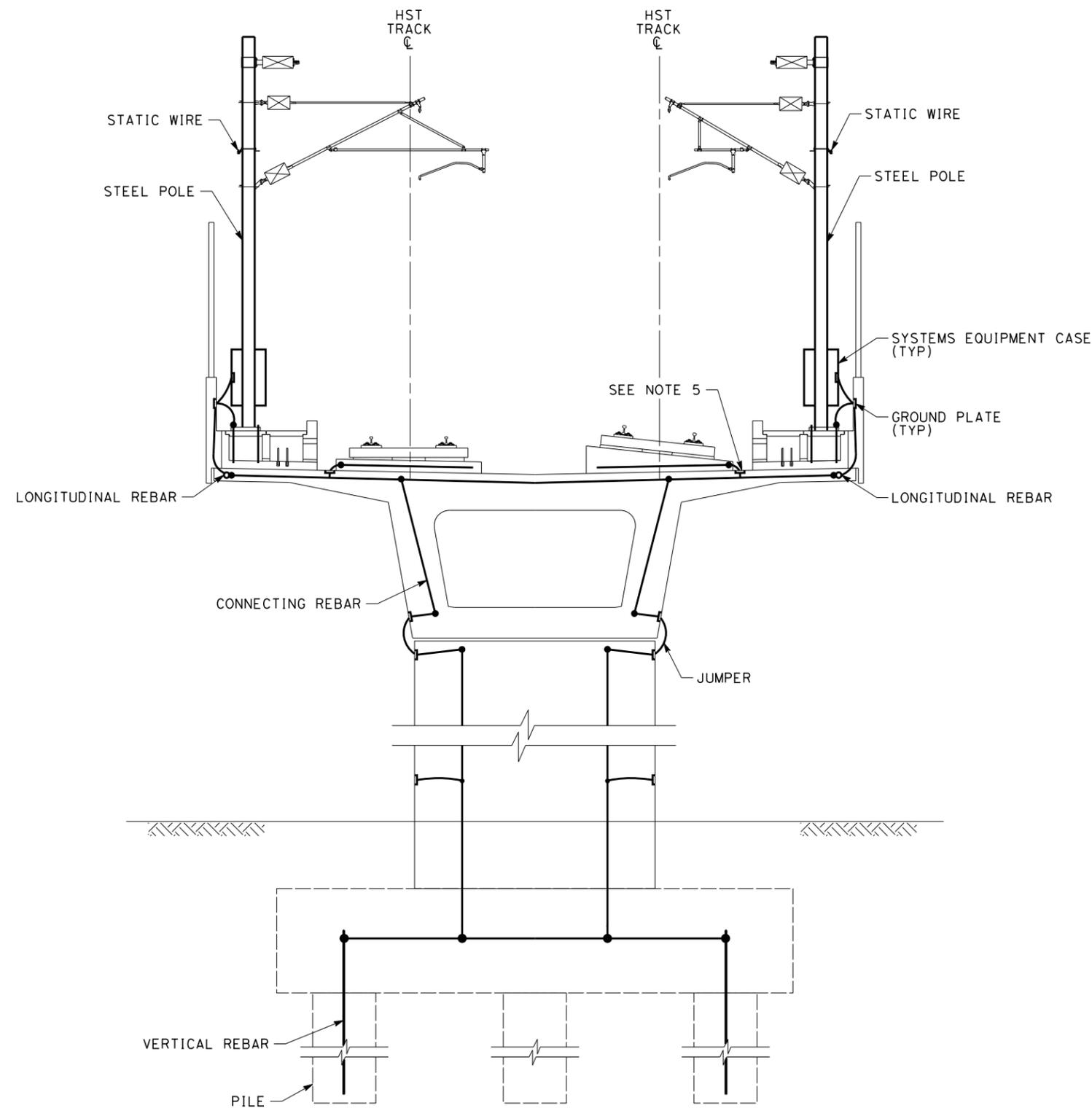
**CALIFORNIA HIGH-SPEED TRAIN PROJECT
OVERHEAD CONTACT SYSTEM DIRECTIVE**

TYPICAL GROUNDING AND BONDING ARRANGEMENT
GRADE SEPARATED STRUCTURE
220 MPH SEGMENT

CONTRACT NO.	
DRAWING NO.	DD-OC-2046
SCALE	NO SCALE
SHEET NO.	

NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. GROUNDING AND BONDING DETAIL DESIGN SHALL BE COORDINATED WITH AERIAL STRUCTURE DESIGNER.
3. THE GROUNDING AND BONDING FOR THE EMERGENCY WALKWAY AREA AND OTHER PUBLICLY ACCESSIBLE AREAS SHALL BE DESIGNED TO AVOID INADMISSIBLE TOUCH AND STEP VOLTAGES AND ALSO MEET THE SIGNALING OPERATION REQUIREMENTS.
4. FOR LOCATIONS OF THE GROUND PLATES, SEE GROUNDING AND BONDING DESIGN CRITERIA FOR DETAIL.
5. THE GROUND PLATES ON THE AERIAL STRUCTURE SLAB SHALL BE PLACED BETWEEN THE EDGE OF THE TRACK SLAB AND DERAILMENT WALL.
6. THE GROUND PLATE SHALL BE NO LESS THAN 6"x6" IN DIMENSION.



**TYPICAL OCS GROUNDING AND BONDING
AT AERIAL STRUCTURE**

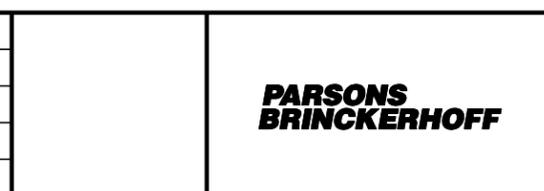
DIRECTIVE DRAWINGS

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03/08/2012 RFP HSR 11-16

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DESIGNED BY
J. LAU
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M. HSIAO
IN CHARGE
R. SCHMEDES
DATE
03/01/12



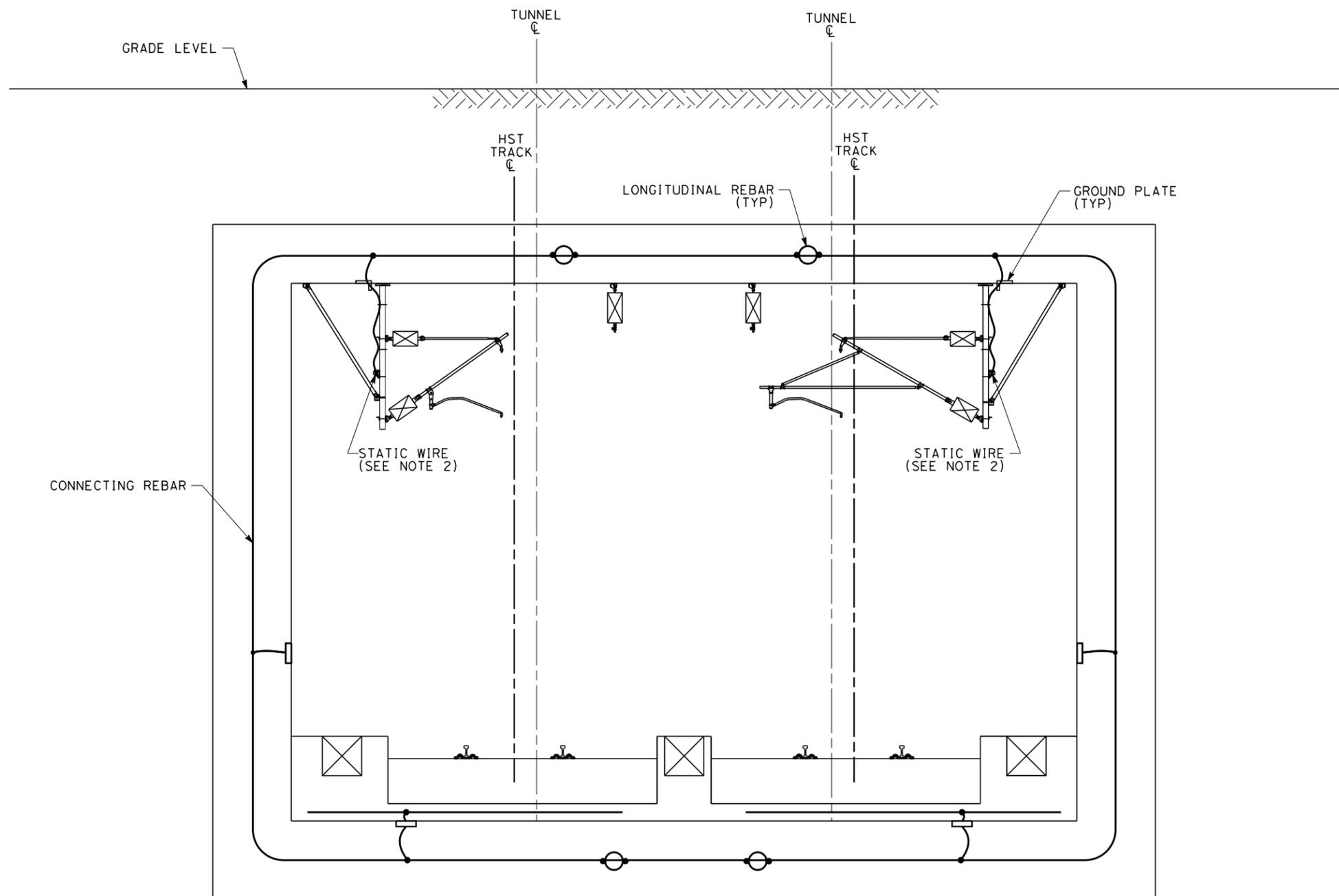
**CALIFORNIA HIGH-SPEED TRAIN PROJECT
OVERHEAD CONTACT SYSTEM DIRECTIVE**

TYPICAL GROUNDING AND BONDING ARRANGEMENT
AERIAL STRUCTURE
220 MPH SEGMENT

CONTRACT NO.	
DRAWING NO.	DD-OC-2047
SCALE	NO SCALE
SHEET NO.	

NOTES:

1. GROUNDING AND BONDING DETAILS DESIGN SHALL BE COORDINATED WITH CIVIL DESIGNER.
2. EACH STATIC WIRE SHALL BE BONDED TO THE TUNNEL REBAR WITH THE ADEQUATE INTERVAL TO MEET THE STEP AND TOUCH POTENTIAL SAFETY REQUIREMENTS, BUT NOT LESS THAN TWO CONNECTIONS PER STRUCTURE.
3. THE GROUND PLATE SHALL BE NO LESS THAN 6"x6" IN DIMENSION.
4. FOR REQUIRED LOCATIONS OF THE GROUND PLATES, SEE GROUNDING AND BONDING DESIGN CRITERIA FOR DETAIL.



TYPICAL GROUNDING AND BONDING ARRANGEMENT
(IN CUT AND COVER TUNNEL)

DIRECTIVE DRAWINGS

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DESIGNED BY
J. LAU
 DRAWN BY
T. DOUNG
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M. HSIAO
 IN CHARGE
R. SCHEDES
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03/01/12



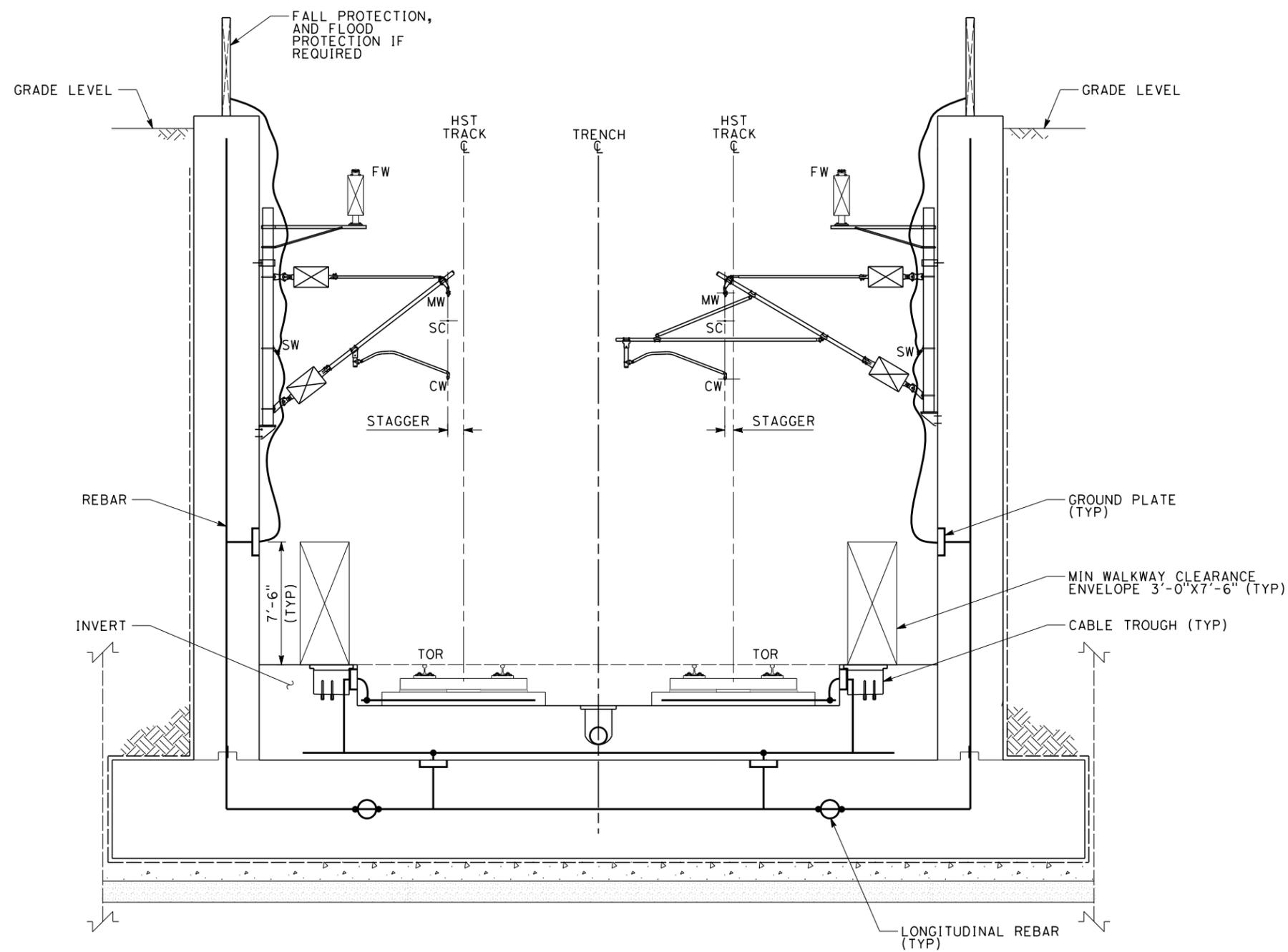
CALIFORNIA HIGH-SPEED TRAIN PROJECT
OVERHEAD CONTACT SYSTEM DIRECTIVE
 TYPICAL GROUNDING AND BONDING ARRANGEMENT
 CUT AND COVER TUNNEL
 220 MPH SEGMENT

CONTRACT NO.	
DRAWING NO.	DD-OC-2048
SCALE	NO SCALE
SHEET NO.	

03/08/2012 RFP HSR 11-16

NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. THE CROSSOVER OVERLAP CATENARIES HAVE TO BE SEPARATED BY A TYPICAL AIR GAP OF 18", EVEN WHEN OUT OF RUNNING CONTACT WIRE CROSSES THE OTHER CATENARY TO THE ANCHOR.
3. THE DESIGN OF CROSSOVER OVERLAP SHALL ENSURE COMPLIANT TRAINS MOVING SMOOTHLY FROM MAINLINE TRACK CATENARY THROUGH THE CROSSOVER TRACK CATENARY AND BACK TO MAINLINE TRACK CATENARY TO CLEAR OF THE PANTOGRAPH ENVELOPE.
4. THE GROUND PLATE SHALL BE NO LESS THAN 6"x6" IN DIMENSION



**TYPICAL OCS SUPPORT STRUCTURES
OPEN TRENCH ON TANGENT TRACKS
WITH CENTER WALKWAY**

DIRECTIVE DRAWINGS

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REV	DATE	BY	CHK	APP	DESCRIPTION

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J. LAU
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T. DOUNG
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M. HSIAO
 IN CHARGE
R. SCHMEDES
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**CALIFORNIA HIGH-SPEED TRAIN PROJECT
OVERHEAD CONTACT SYSTEM DIRECTIVE**

 GROUNDING AND BONDING ARRANGEMENT
 OPEN TRENCH
 220 MPH SEGMENT

CONTRACT NO.	
DRAWING NO.	DD-OC-2049
SCALE	NO SCALE
SHEET NO.	

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California High-Speed Train Project



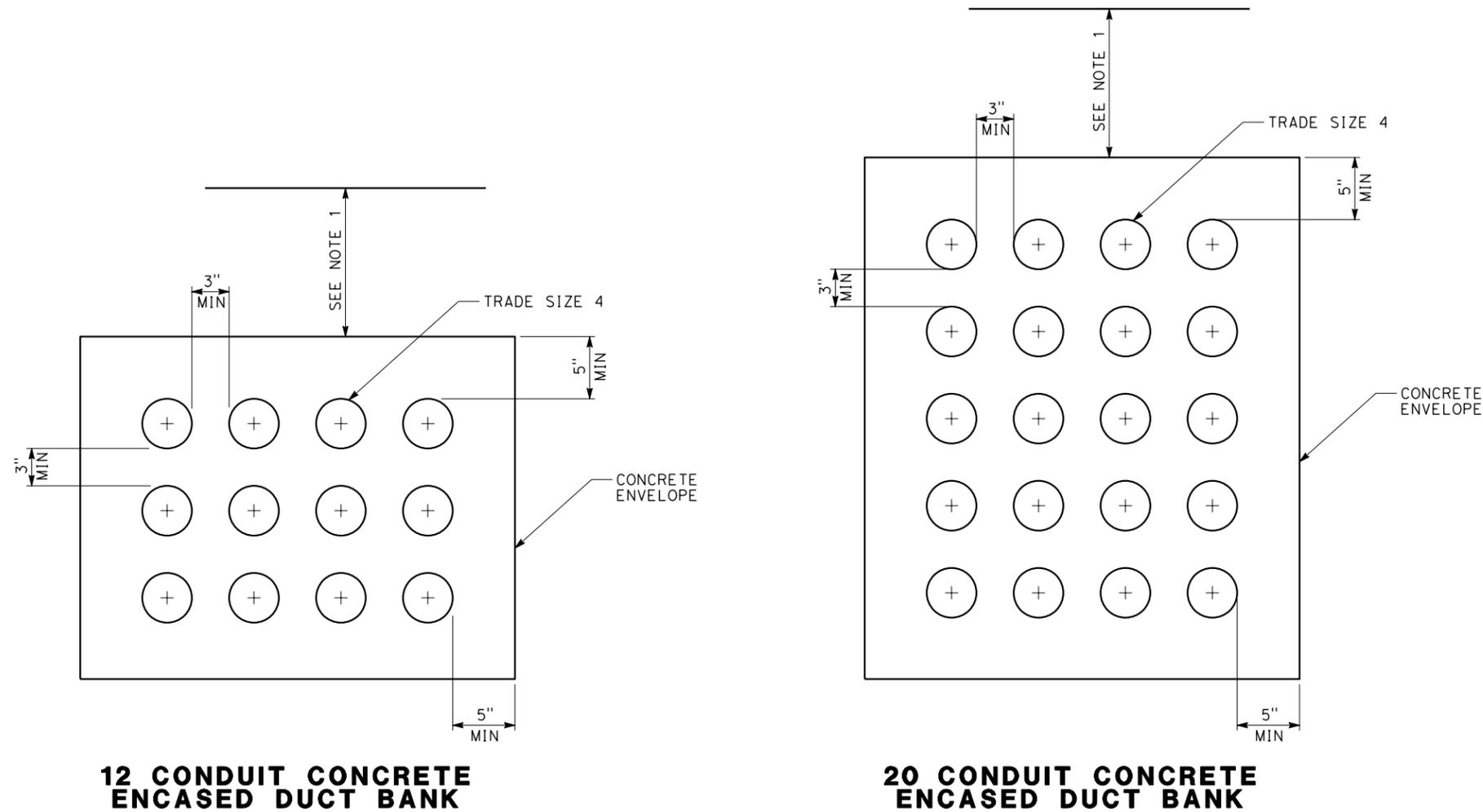
Request for Proposal for Design-Build Services

**RFP No.: HSR 11-16
Directive Drawings**

Communications

NOTES:

1. CONCRETE ENCASED DUCT BANK TO BE PLACED A MINIMUM 6' BELOW TOP OF RAIL AND MINIMUM 3' BELOW GRADE WHEN NO RAIL IS PRESENT.
2. LOW VOLTAGE DUCT BANK TO BE LOCATED PER THE CRITERIA LISTED IN THE COMMUNICATIONS DESIGN CRITERIA CHAPTER.



12 CONDUIT CONCRETE ENCASED DUCT BANK

20 CONDUIT CONCRETE ENCASED DUCT BANK

03/08/2012 RFP HSR 11-16

DIRECTIVE DRAWINGS

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY B. BANKS
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CHECKED BY C. DALOIA
IN CHARGE R. SCHMEDES
DATE 03/01/2012



**CALIFORNIA HIGH-SPEED TRAIN PROJECT
COMMUNICATIONS DIRECTIVE**

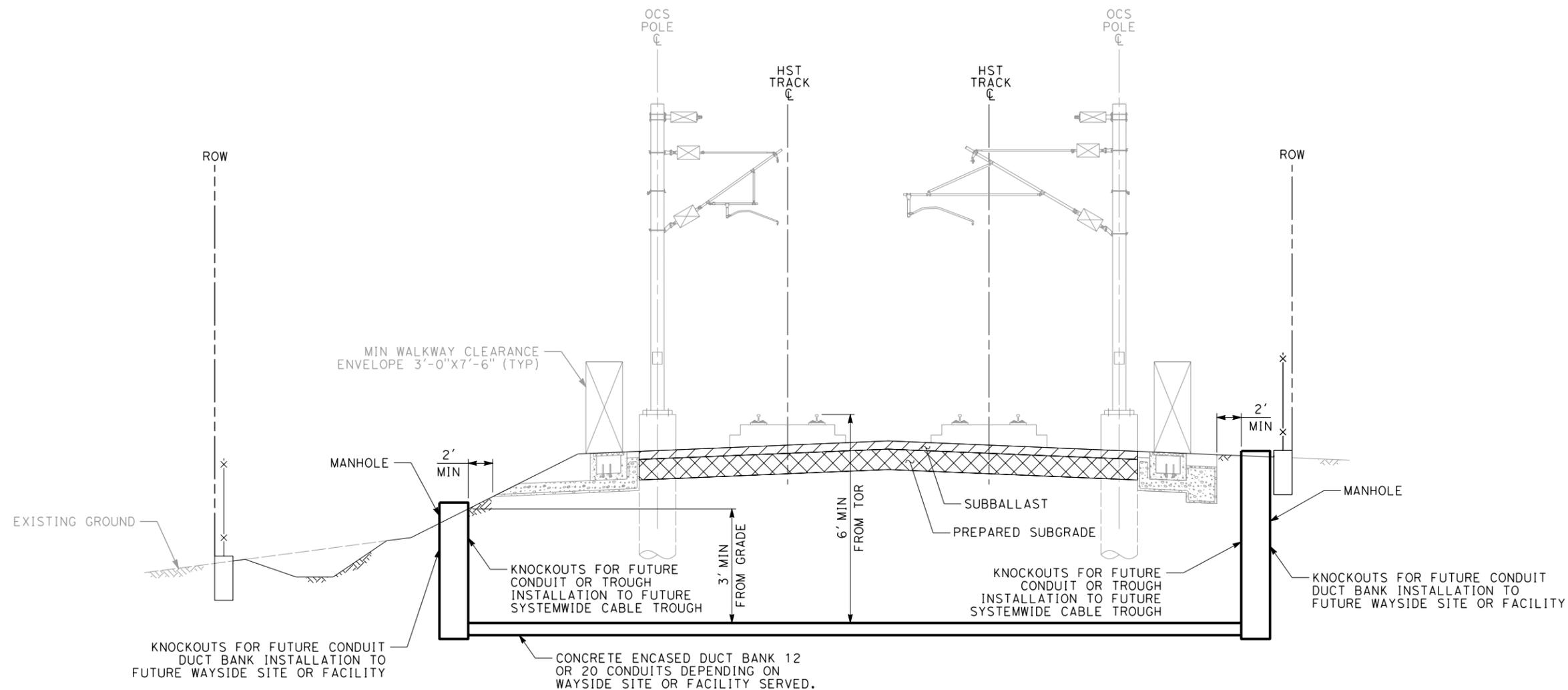
TYPICAL CROSS SECTION
SYSTEMS LOW-VOLTAGE
CONDUIT DUCT BANK

CONTRACT NO.
DRAWING NO. DD-CO-G021
SCALE NO SCALE
SHEET NO.

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NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. TOP OF MANHOLE STRUCTURE SHALL NOMINALLY BE 2" ABOVE GRADE.



03/08/2012 RFP HSR 11-16

DIRECTIVE DRAWINGS

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DATE 03/01/2012



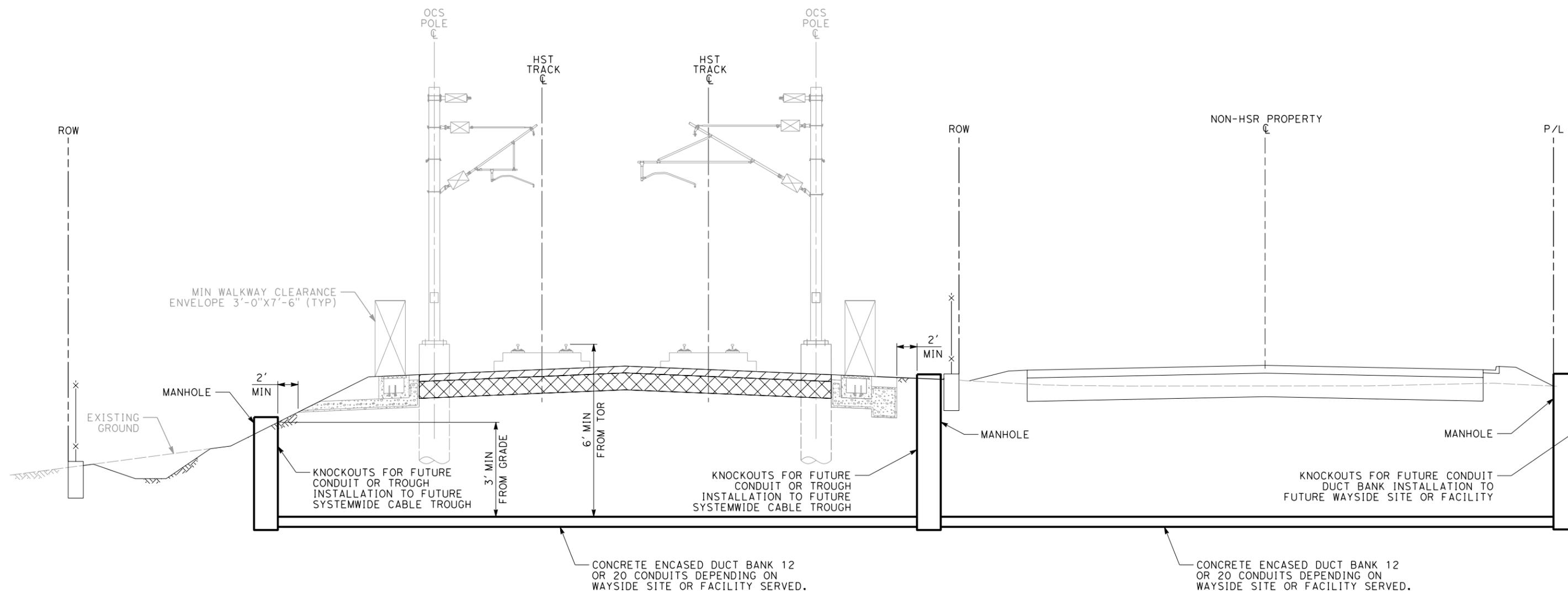
CALIFORNIA HIGH-SPEED TRAIN PROJECT
COMMUNICATIONS DIRECTIVE
 TYPICAL CROSS SECTION
 SYSTEMS LOW-VOLTAGE
 UNDERTRACK CONDUIT CONDUIT DUCT BANK
 AT-GRADE

CONTRACT NO.
DRAWING NO. DD-CO-G022
SCALE NO SCALE
SHEET NO.

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NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. TOP OF MANHOLE STRUCTURE SHALL NOMINALLY BE 2" ABOVE GRADE.



03/08/2012 RFP HSR 11-16

DIRECTIVE DRAWINGS

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DESIGNED BY
B. BANKS

DRAWN BY
V. HUANTE

CHECKED BY
C. DALOIA

IN CHARGE
R. SCHEDES

DATE
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CALIFORNIA HIGH-SPEED TRAIN PROJECT

COMMUNICATIONS DIRECTIVE

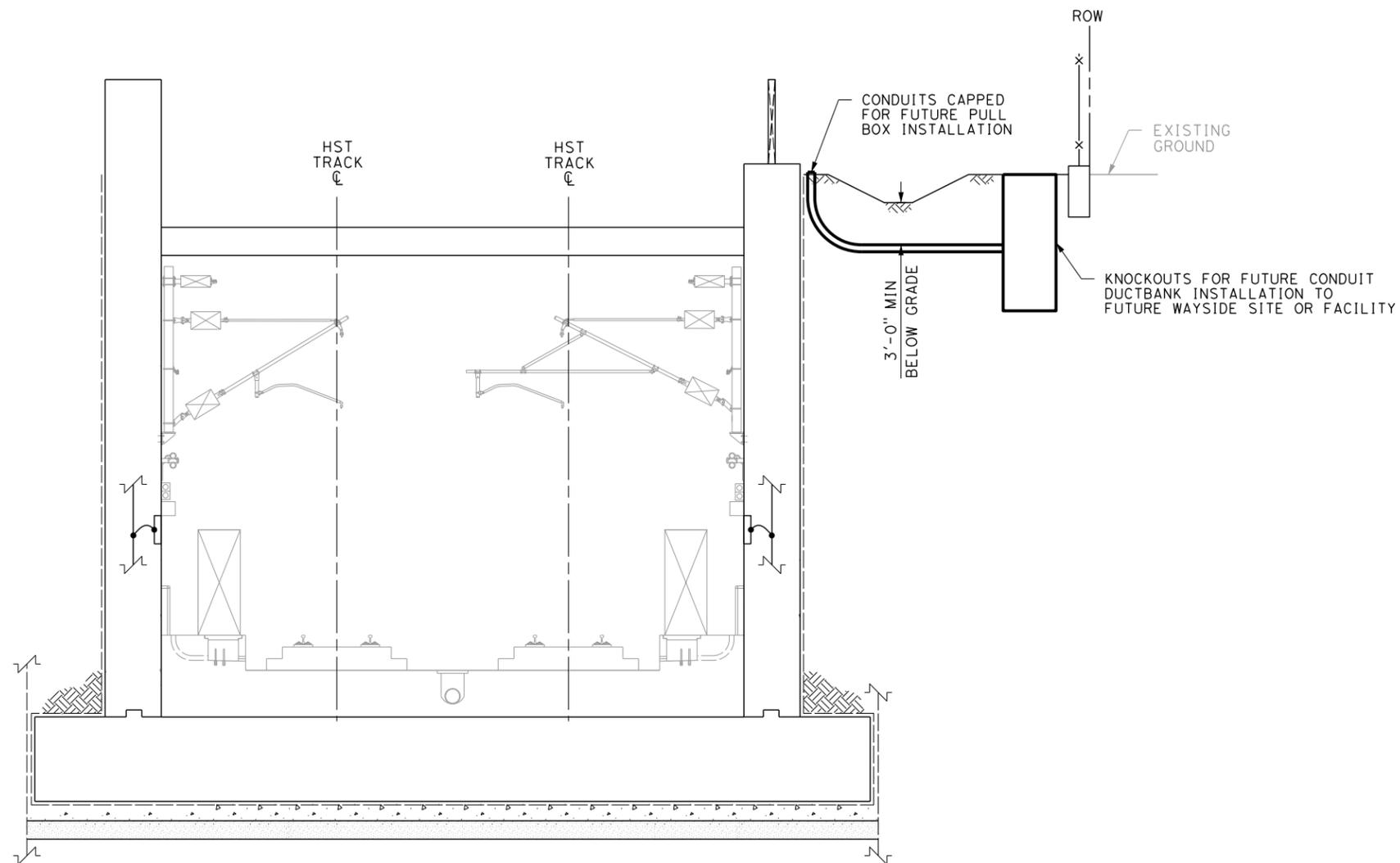
TYPICAL CROSS SECTION
SYSTEMS LOW-VOLTAGE
UNDER TRACK/UNDERGROUND CONDUIT DUCT BANK
AT-GRADE

CONTRACT NO.
DRAWING NO. DD-CO-G023
SCALE NO SCALE
SHEET NO.

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NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. MANHOLE AND CONDUIT TO BE PLACED ON SIDE OF WAYSIDE LOCATION.
3. TOP OF MANHOLE STRUCTURE SHALL NOMINALLY BE 2" ABOVE GRADE.



TYPICAL TRENCH SECTION

DIRECTIVE DRAWINGS

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B. BANKS
 DRAWN BY
V. HUANTE
 CHECKED BY
C. DALOIA
 IN CHARGE
R. SCHEDES
 DATE
03/01/2012



CALIFORNIA HIGH-SPEED TRAIN PROJECT
COMMUNICATIONS DIRECTIVE
 TYPICAL CROSS SECTIONS
 SYSTEMS LOW-VOLTAGE
 UNDERGROUND CONDUIT DUCT BANK INSTALLATIONS
 TWO TRACK TRENCH

CONTRACT NO.
DRAWING NO. DD-CO-G024
SCALE NO SCALE
SHEET NO.

03/08/2012 RFP HSR 11-16