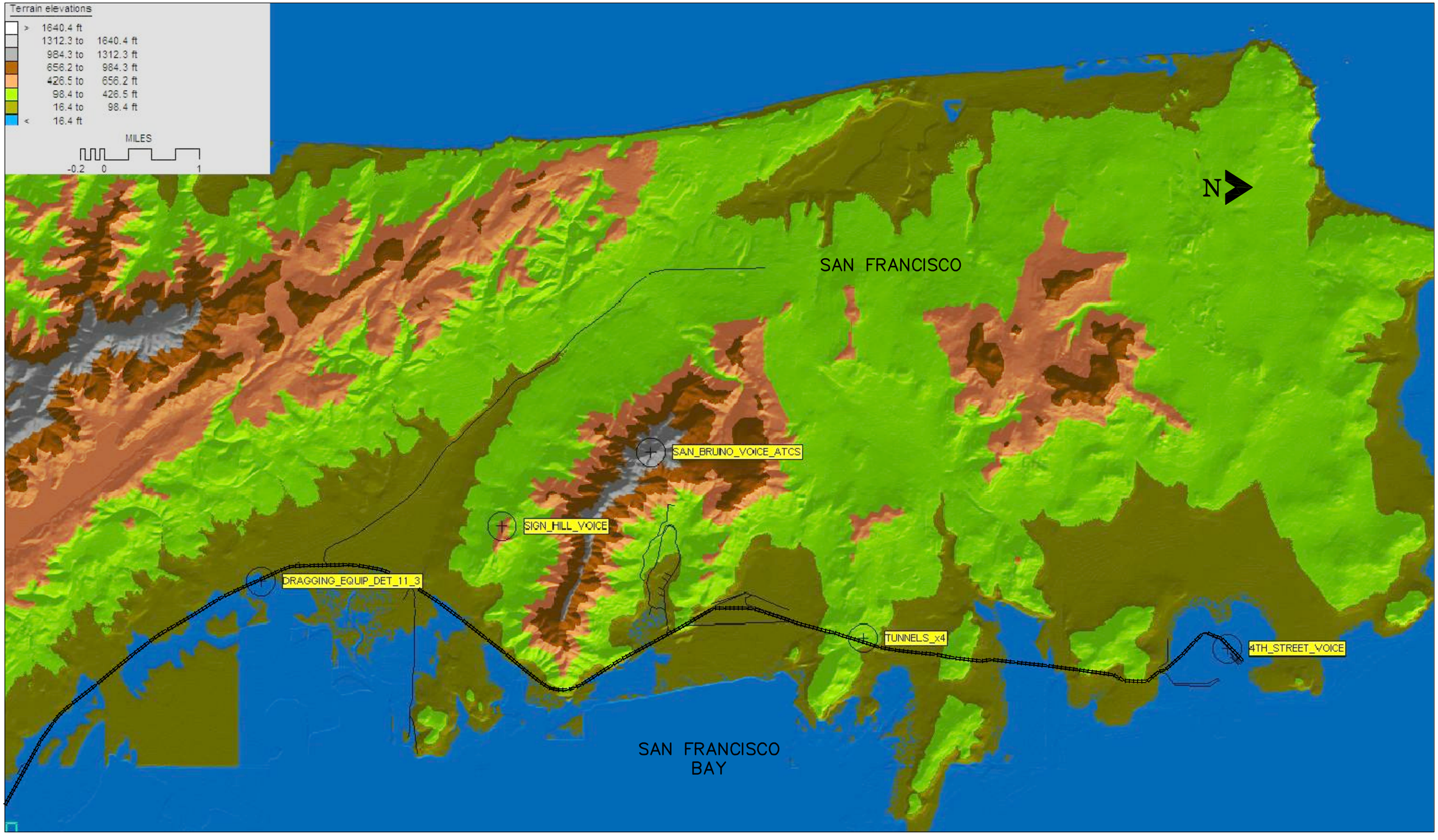


REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

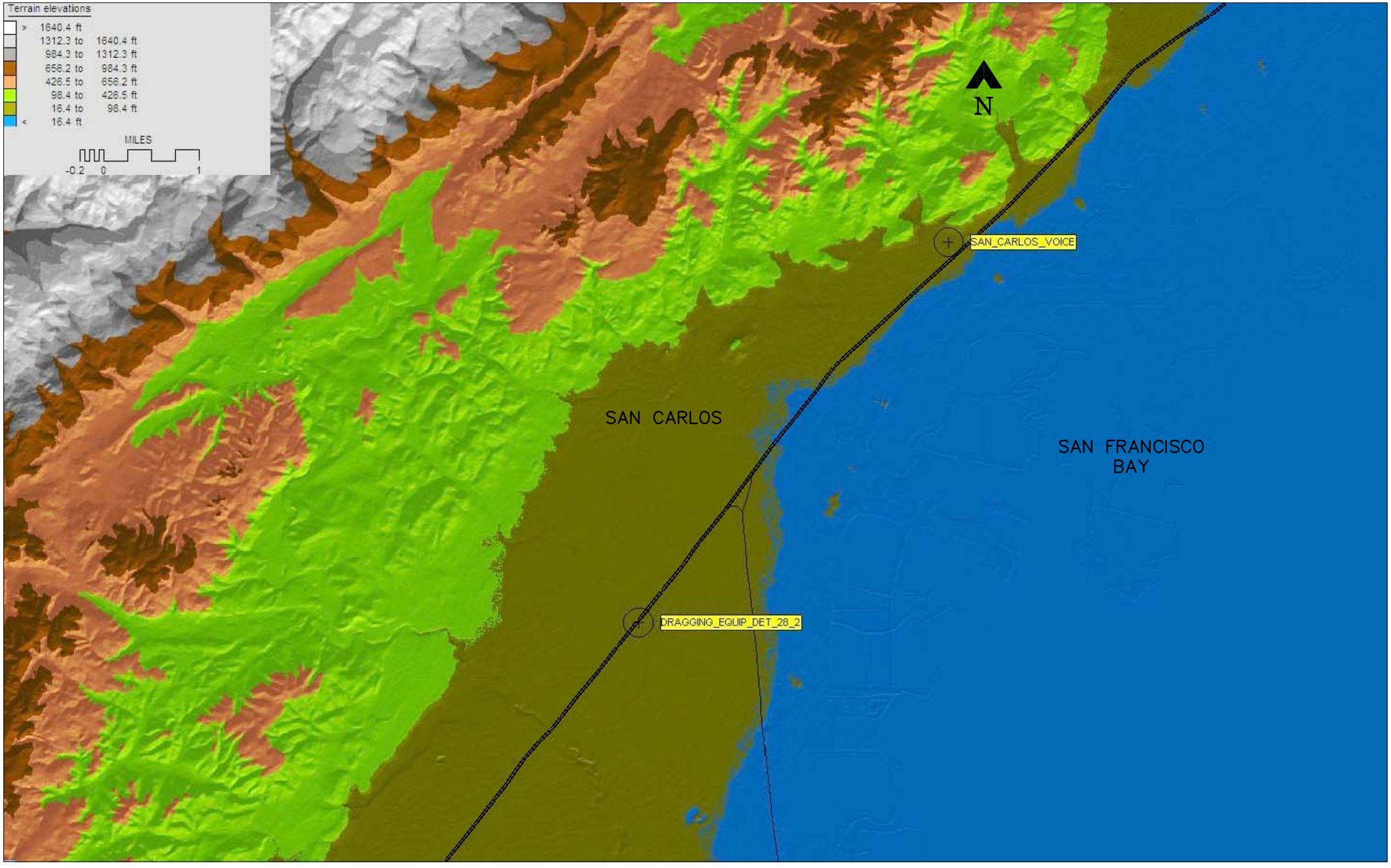
TRAIN CONTROL COMMUNICATION
VOICE RADIO – BASE STATION
VOICE AND ATCS BASE STATIONS
DED TRANSMITTERS: MP00.0–MP14.0

CADD FILE NAME: SD–6001

REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD–6001



REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

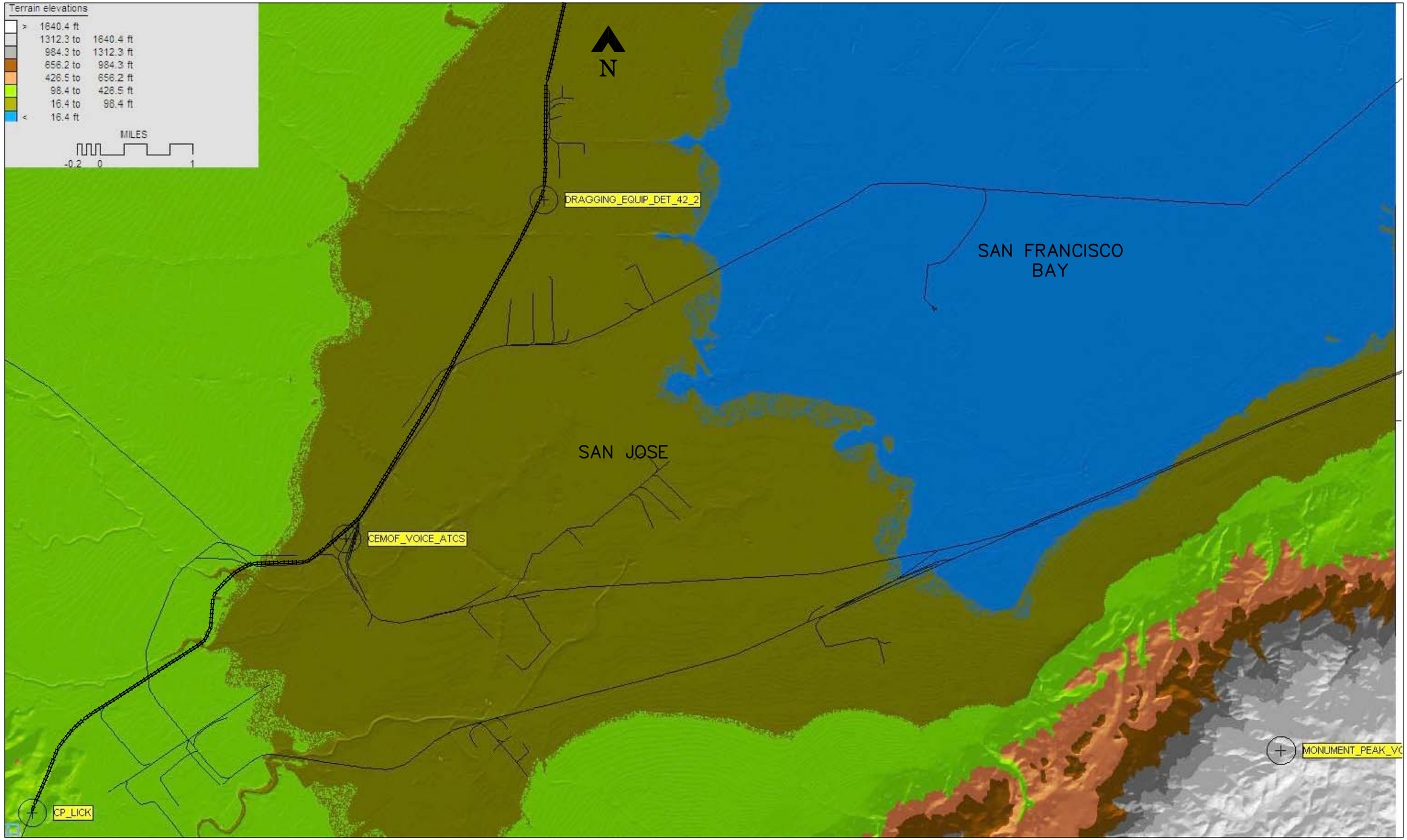
TRAIN CONTROL COMMUNICATION
VOICE RADIO – BASE STATION
VOICE AND ATCS BASE STATIONS
DED TRANSMITTERS: MP17.0–MP31.0

CADD FILE NAME: SD–6002

REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD–6002



REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

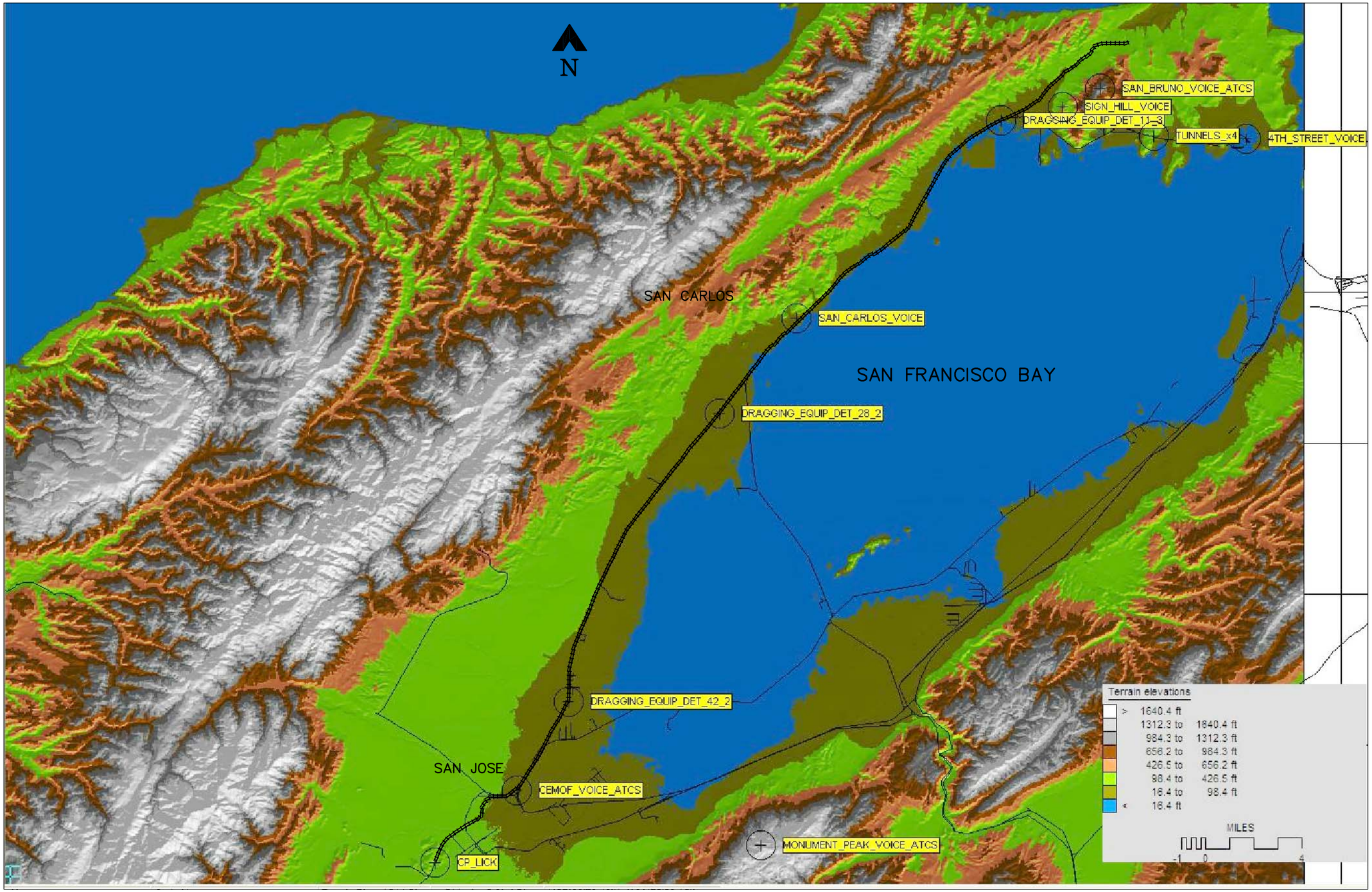
TRAIN CONTROL COMMUNICATION
VOICE RADIO – BASE STATION
VOICE AND ATCS BASE STATIONS
DED TRANSMITTERS: MP40.0–CP LICK

CADD FILE NAME: SD–6003

REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD–6003



REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

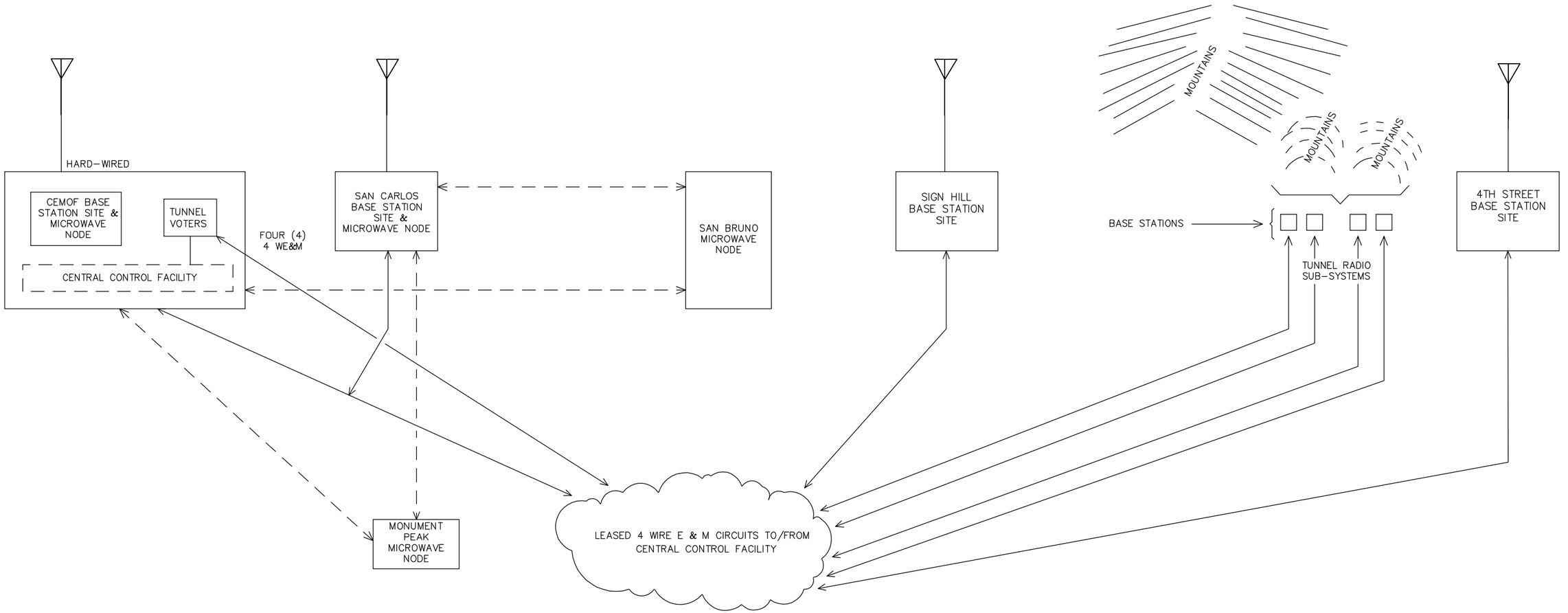
TRAIN CONTROL COMMUNICATION
VOICE RADIO – BASE STATION
EXISTING BASE STATIONS,
DED AND CORRIDOR TERRAIN

CADD FILE NAME: SD-6004

REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD-6004



LEGEND

LEASED 4 WIRE ANALOG TELEPHONE CIRCUITS

MICROWAVE RADIO NETWORK

REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

TRAIN CONTROL COMMUNICATION
VOICE RADIO – EXISTING SYSTEM
EXISTING SYSTEM
BLOCK DIAGRAM

CADD FILE NAME: SD–6050

REV:

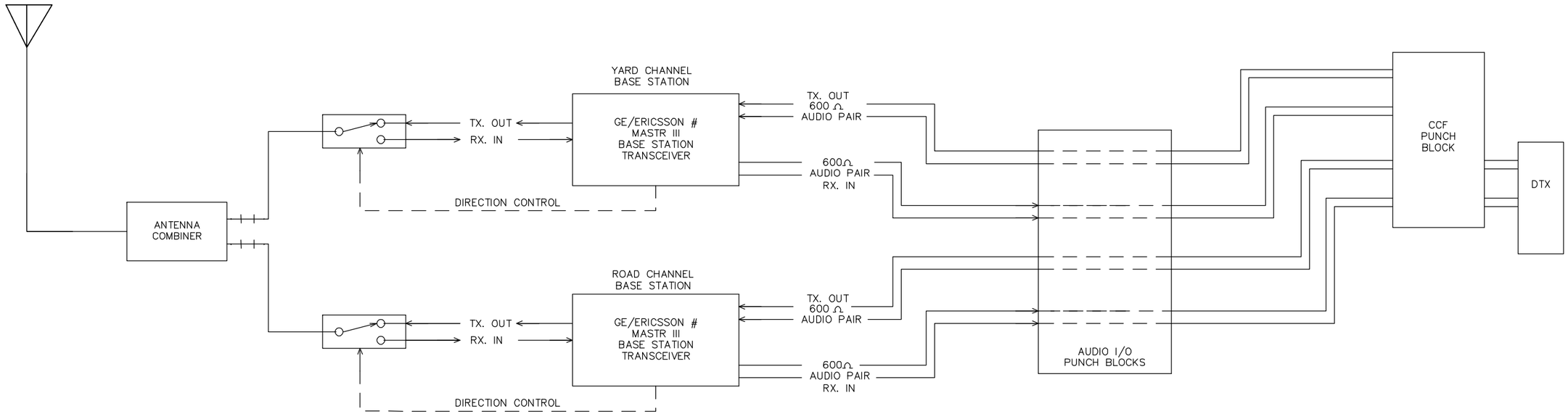
EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD–6050

NOTES:

1. LOCATION : N37 19' 44.6" / W 122 54' 1.5", ELEVATION (TERRAIN & TOWER): 130'
2. ANTENNA AZIMUTH: 334° / 154° (DUAL YAGI ANTENNAS ORIENTED 180° WRT EACH OTHER)
3. DRAWING DEPICTS THE COAXIAL RELAYS CONFIGURED TO SUPPORT BASE STATION TRANSMIT OPERATIONS



REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

TRAIN CONTROL COMMUNICATION
VOICE RADIO – EXISTING SYSTEM
EXISTING SYSTEM
SAN JOSE BASE STATION

CADD FILE NAME: SD-6051

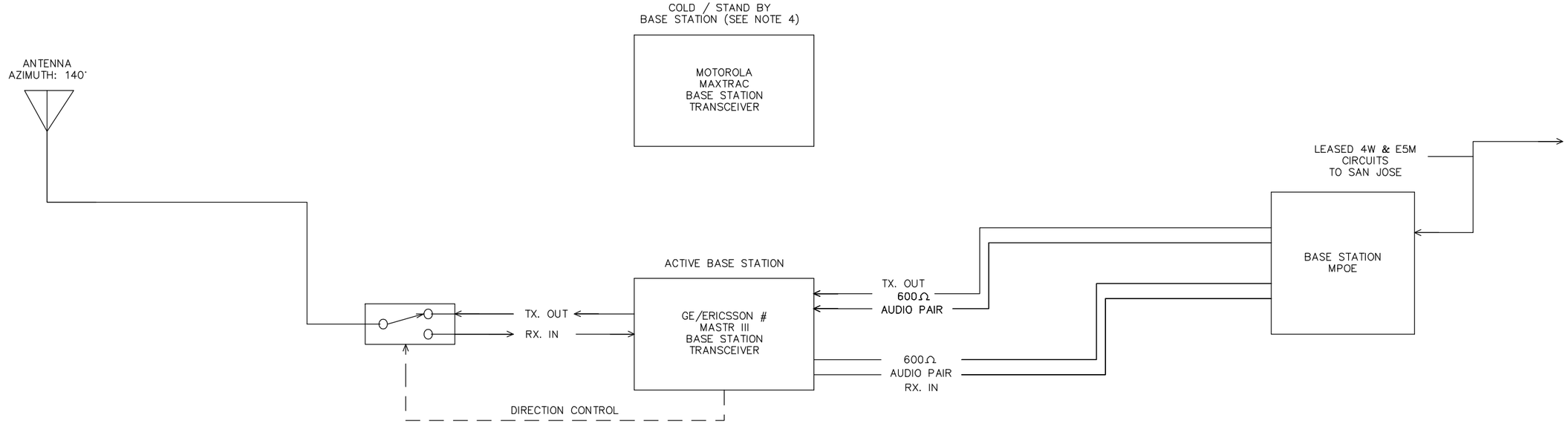
REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD-6051

NOTES:

1. LOCATION: N37°30'23.4"/W122°15'43.1", ELEVATION (TERRAIN & TOWER): 99'
2. ANTENNA AZIMUTH: 140° (DIRECTIONAL: YAGI)
3. DRAWING DEPICTS THE COAXIAL RELAYS CONFIGURED TO SUPPORT BASE STATION TRANSMIT OPERATIONS
4. THE COLD / STANDBY BASE STATION IS PROGRAMMED TO THE SAME OPERATING FREQUENCIES & CONFIGURED IDENTICAL TO THE ACTIVE BASE STATION, HOWEVER ITS POWER SWITCH IS SET TO OFF



REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP	DESCRIPTION

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

TRAIN CONTROL COMMUNICATION
VOICE RADIO – EXISTING SYSTEM
EXISTING SYSTEM
SAN CARLOS BASE STATION

CADD FILE NAME: SD-6052

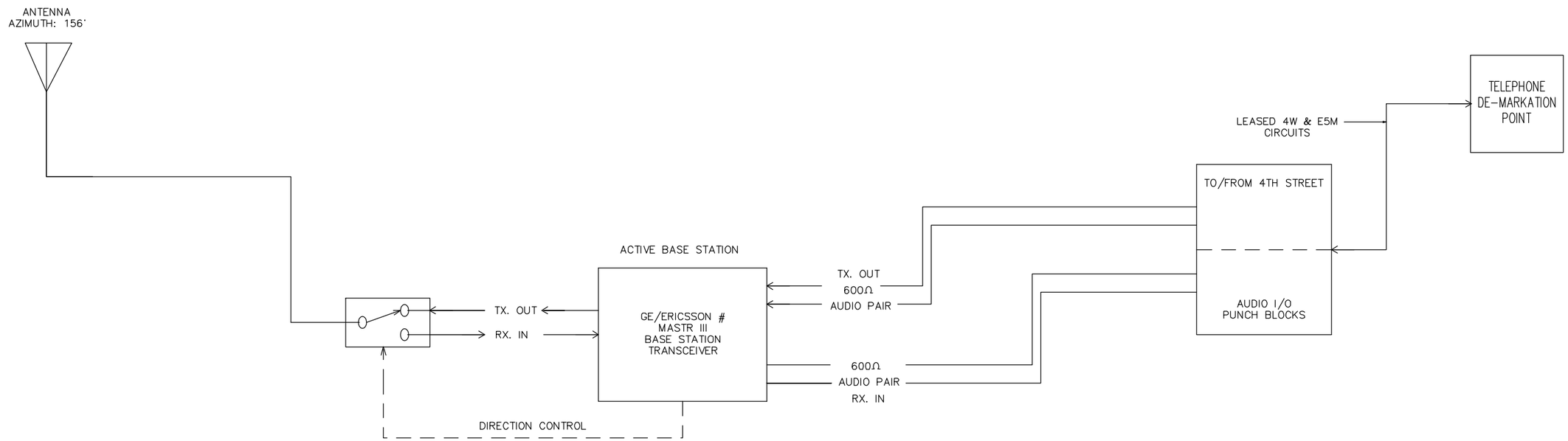
REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD-6052

NOTES:

1. LOCATION : N37° 39' 53.8" / W122° 25' 14.1", ELEVATION (TERRAIN & TOWER): 576'
2. ANTENNA AZIMUTH: 156" (DIRECTIONAL: YAGI)
3. DRAWING DEPICTS THE COAXIAL RELAYS CONFIGURED TO SUPPORT BASE STATION TRANSMIT OPERATIONS
4. THE COLD / STANDBY BASE STATION IS PROGRAMMED TO THE SAME OPERATING FREQUENCIES & CONFIGURED IDENTICAL TO THE ACTIVE BASE STATION, HOWEVER ITS POWER SWITCH IS SET TO OFF



REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain®

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

TRAIN CONTROL COMMUNICATION
VOICE RADIO – EXISTING SYSTEM
EXISTING SYSTEM
SIGN HILL BASE STATION

CADD FILE NAME: SD-6053

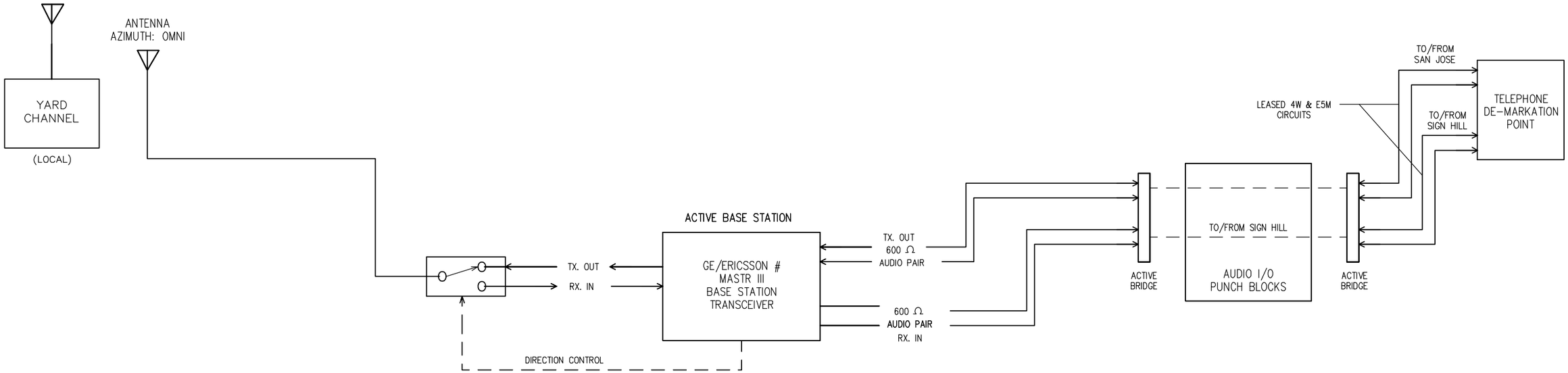
REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD-6053

NOTES:

1. LOCATION : N37° 46' 28.8" / W122° 23' 50.2", ELEVATION (TERRAIN & TOWER): 65'
2. ANTENNA AZIMUTH: (OMNI DIRECTIONAL)
3. DRAWING DEPICTS THE COAXIAL RELAYS CONFIGURED TO SUPPORT BASE STATION TRANSMIT OPERATIONS



REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

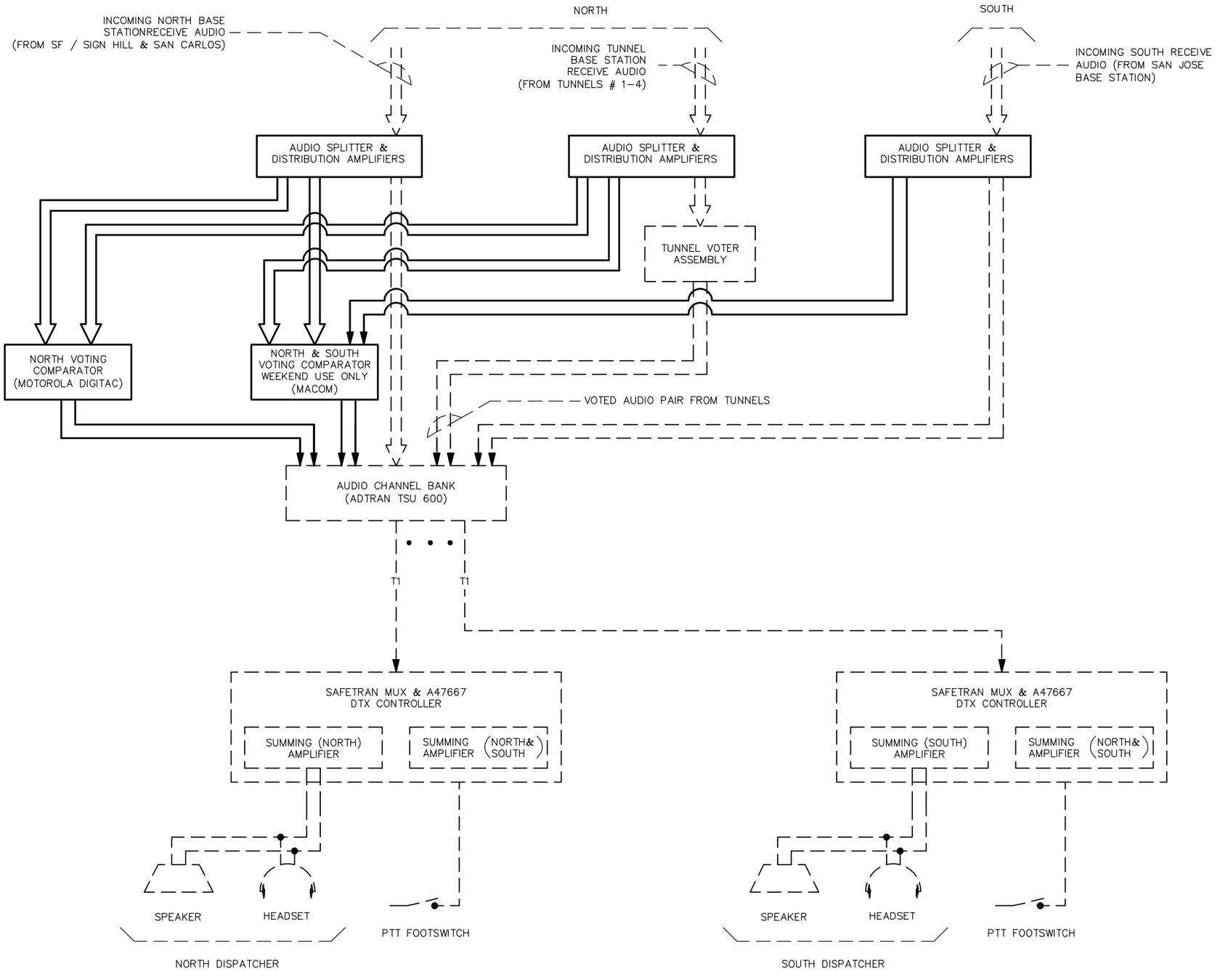
TRAIN CONTROL COMMUNICATION
VOICE RADIO – EXISTING SYSTEM
EXISTING SYSTEM
4TH STREET BASE STATION

CADD FILE NAME: SD-6054

REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD-6054



REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP	DESCRIPTION

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

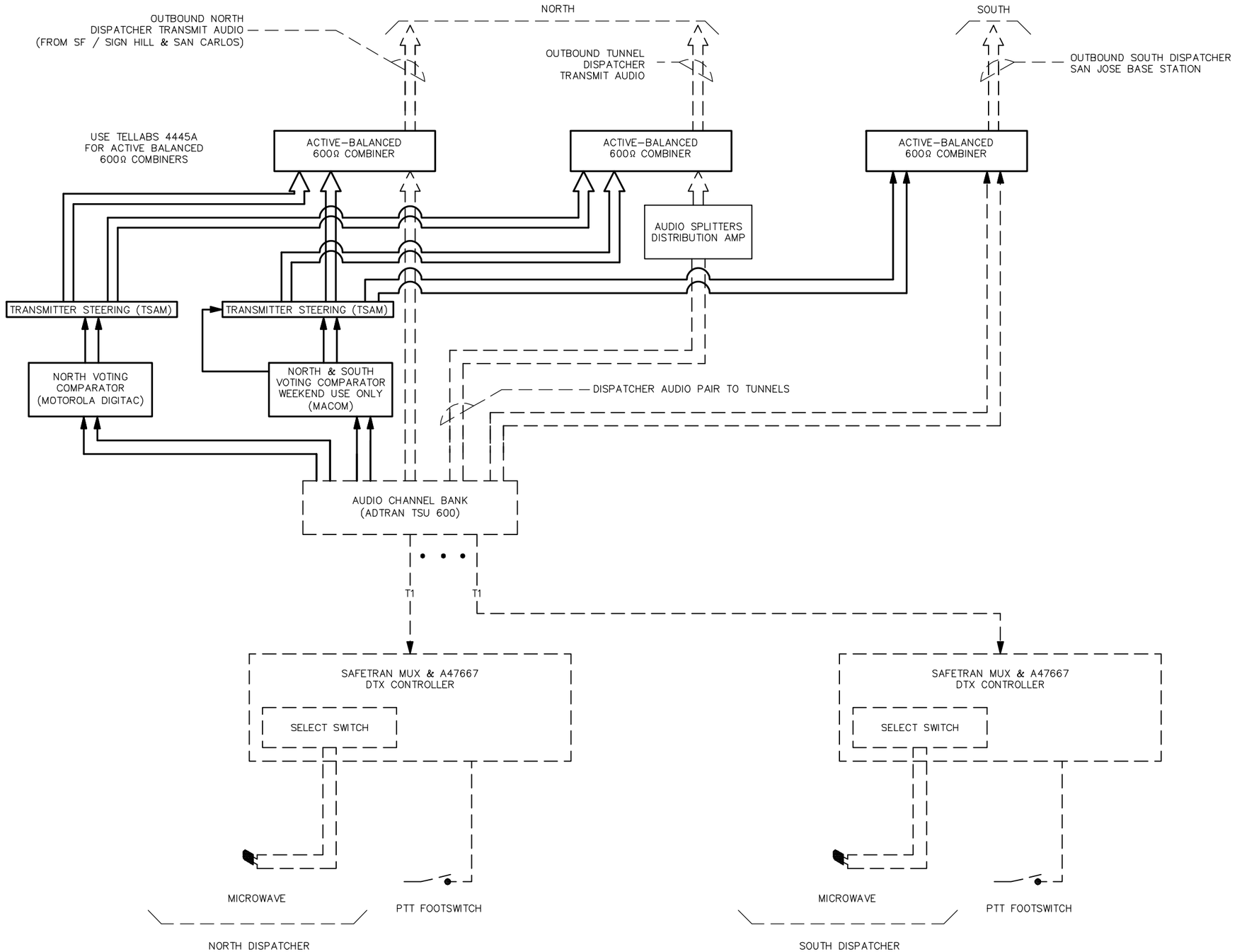
TRAIN CONTROL COMMUNICATION
VOICE RADIO – CCF INTERFACE
ROAD CHANNEL INTERFACE
AT CCF RECEIVING PATH

CADD FILE NAME: SD–6101

REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD–6101



REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP	DESCRIPTION

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

TRAIN CONTROL COMMUNICATION VOICE RADIO – CCF INTERFACE ROAD CHANNEL INTERFACE AT CCF TRANSMITTING PATH

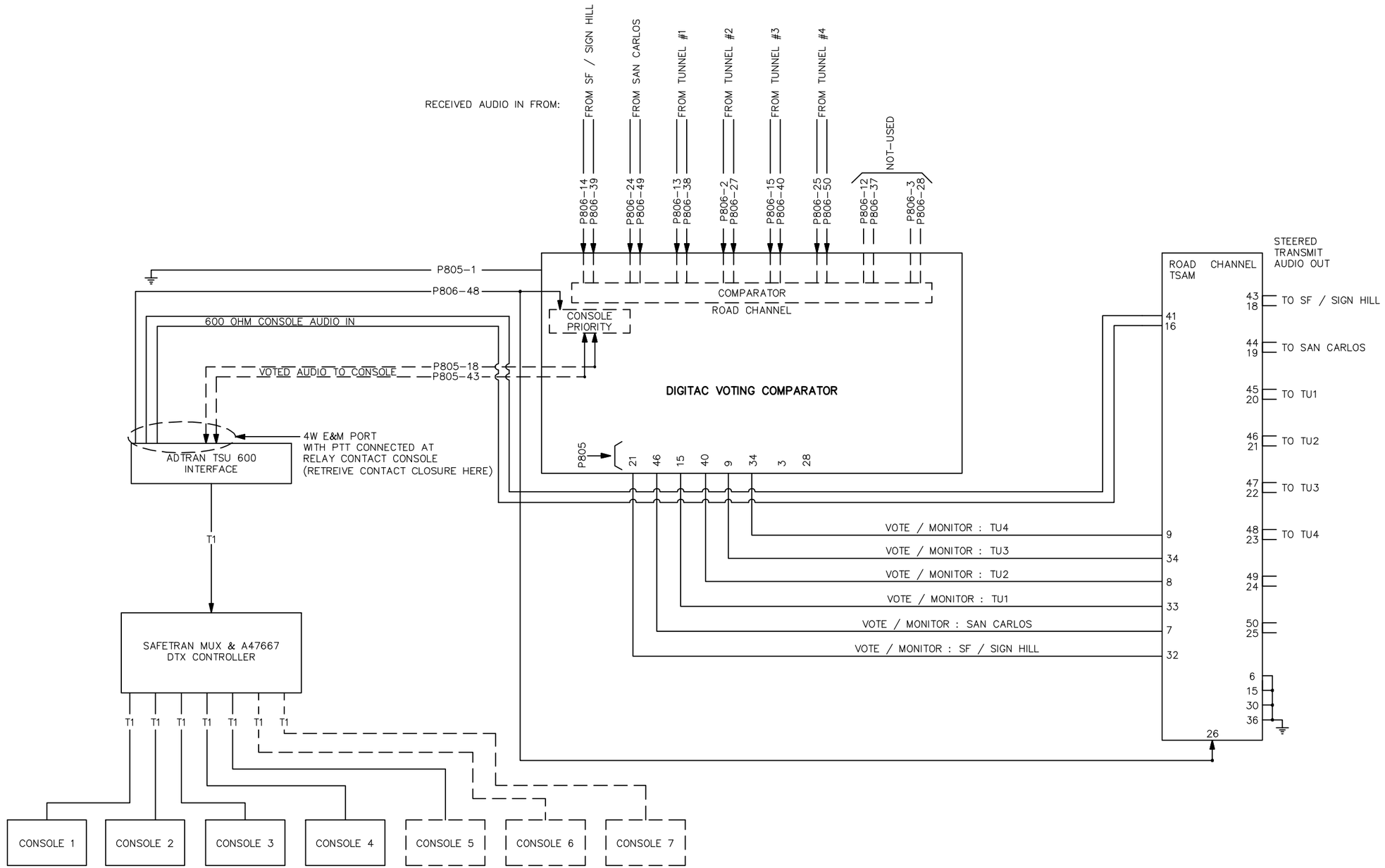
CADD FILE NAME: SD–6102

REV:

EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD–6102



REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP	DESCRIPTION

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

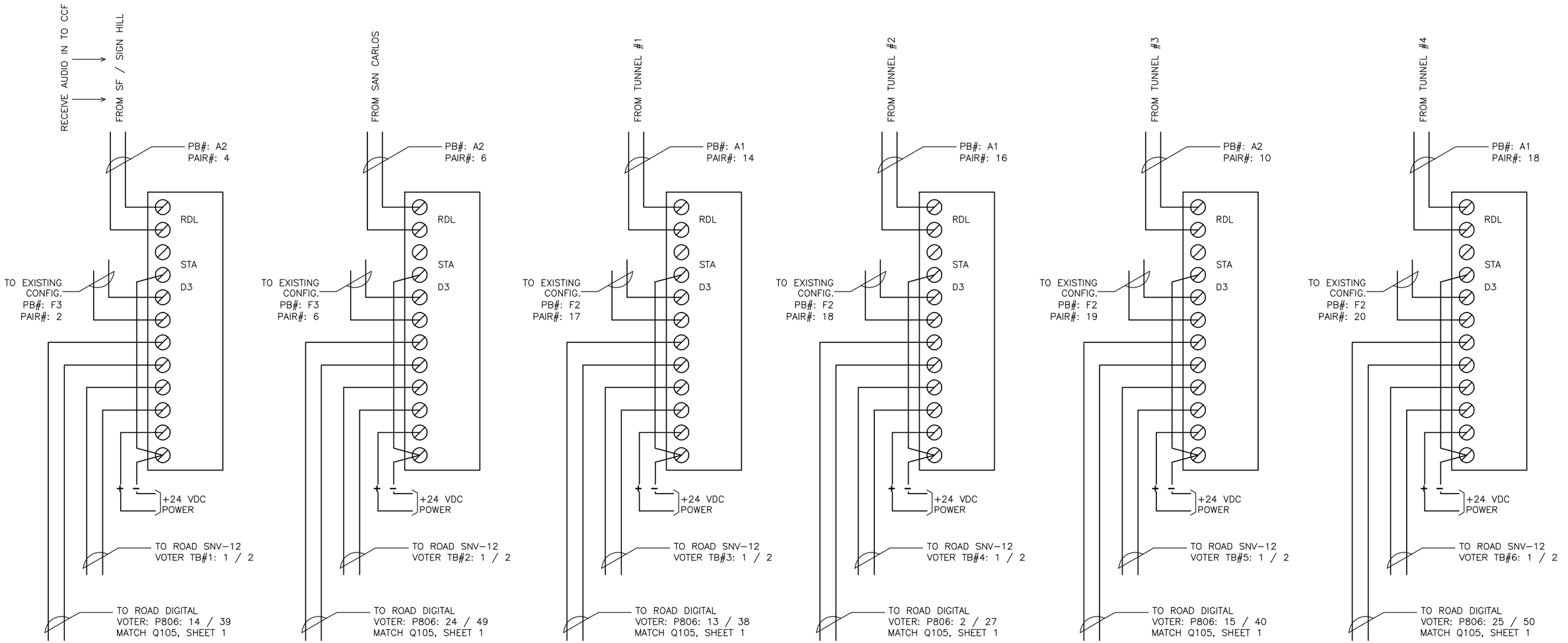
TRAIN CONTROL COMMUNICATION
VOICE RADIO – CCF INTERFACE
ROAD CHANNEL VOTING AND STEERING
INTERFACE AT CCF
SHEET 1 OF 3

CADD FILE NAME: SD-6103

REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD-6103



REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

TRAIN CONTROL COMMUNICATION
VOICE RADIO – CCF INTERFACE
ROAD CHANNEL VOTING AND STEERING
INTERFACE AT CCF
SHEET 2 OF 3

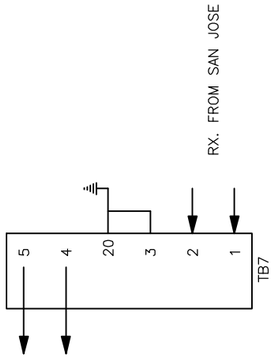
CADD FILE NAME: SD-6104

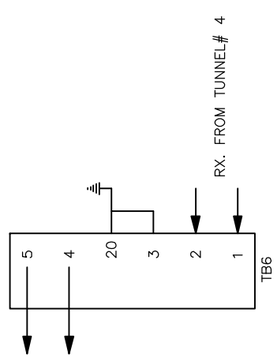
REV: | EDITION: FOURTH

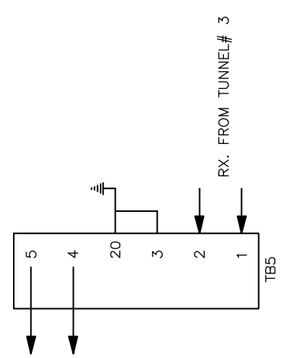
TRAIN CONTROL

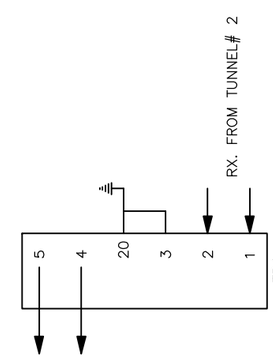
STANDARD DRAWING NO.: SD-6104

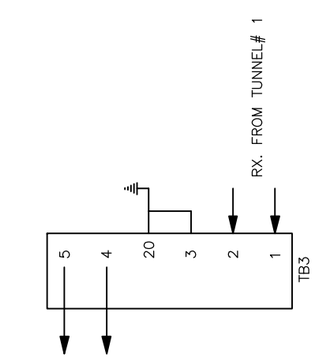
ROAD RADIO WEEKEND VOTER CONFIGURATION

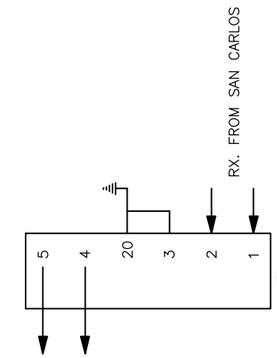


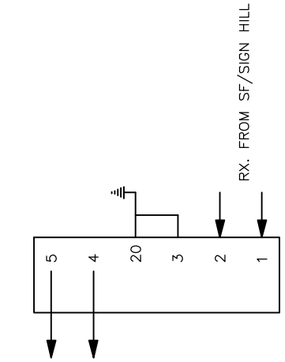


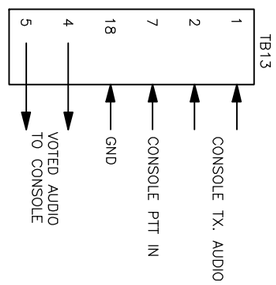












NOTES:

1. THIS CONFIGURATION IS USED FOR OPERATIONS ON WEEKENDS ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

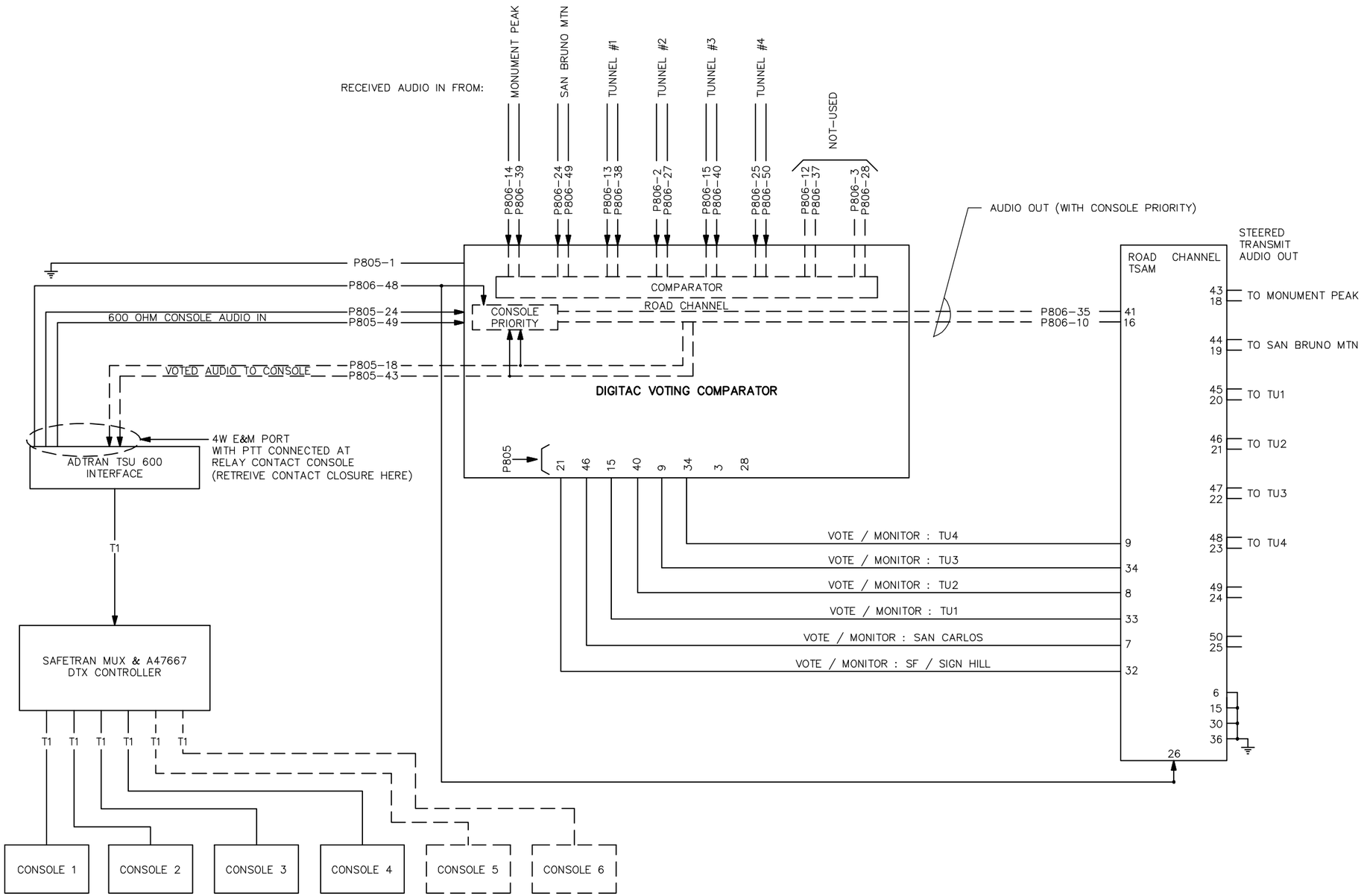
TRAIN CONTROL COMMUNICATION
VOICE RADIO – CCF INTERFACE
ROAD CHANNEL VOTING AND STEERING
INTERFACE AT CCF
SHEET 3 OF 3

CADD FILE NAME: SD-6105

REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD-6105



REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP	DESCRIPTION

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

TRAIN CONTROL COMMUNICATION VOICE RADIO – MAINTENANCE CHANNEL MAINTENANCE CHANNEL VOTING AND STEERING INTERFACE AT CCF

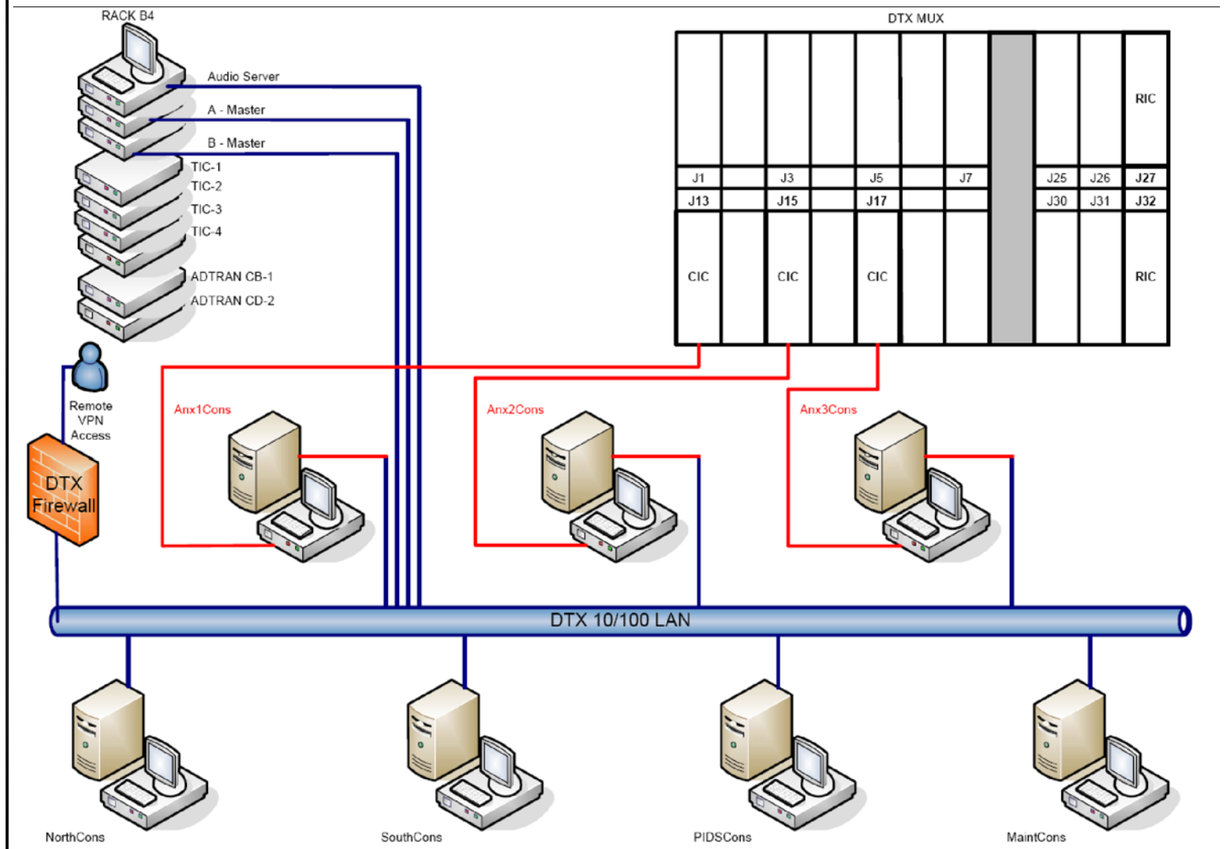
CADD FILE NAME: SD-6151

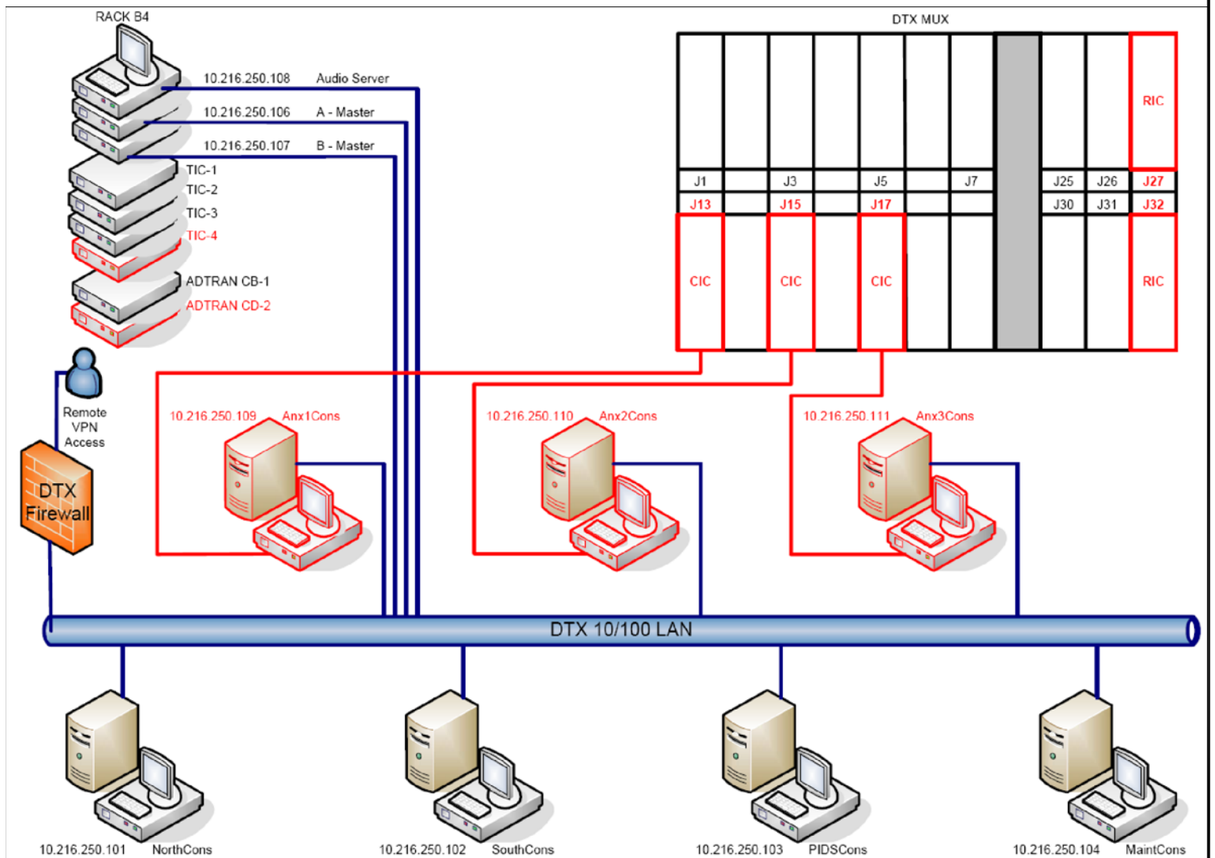
REV:

EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD-6151





REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

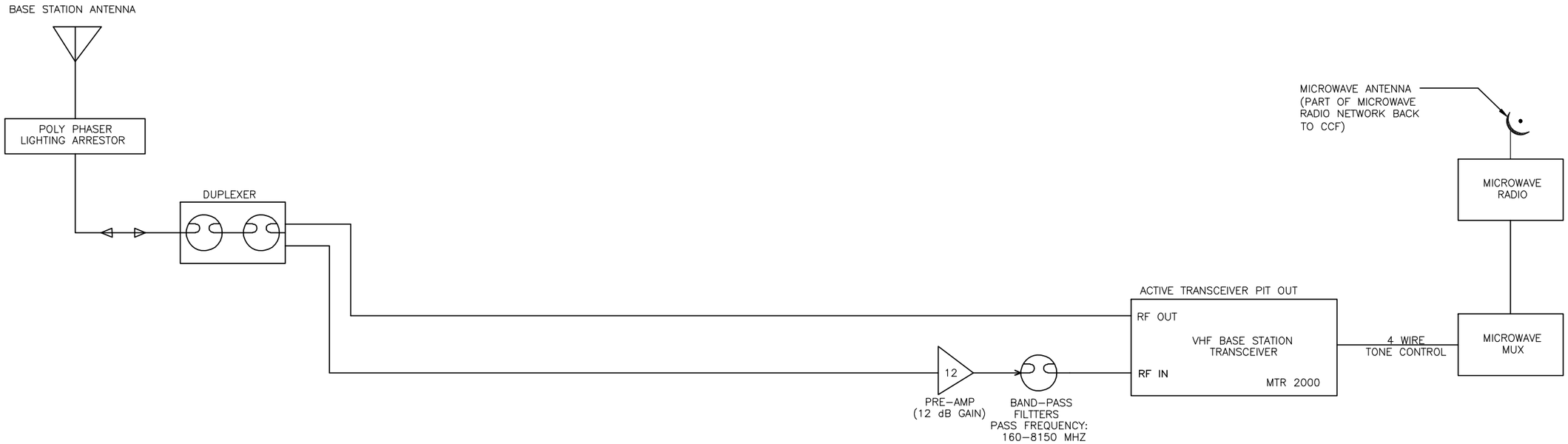
TRAIN CONTROL COMMUNICATION
VOICE RADIO – MAINTENANCE CHANNEL
DTX, LAN AND IP ADDRESS
AT CCF

CADD FILE NAME: SD-6152

REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD-6152



REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP	DESCRIPTION

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

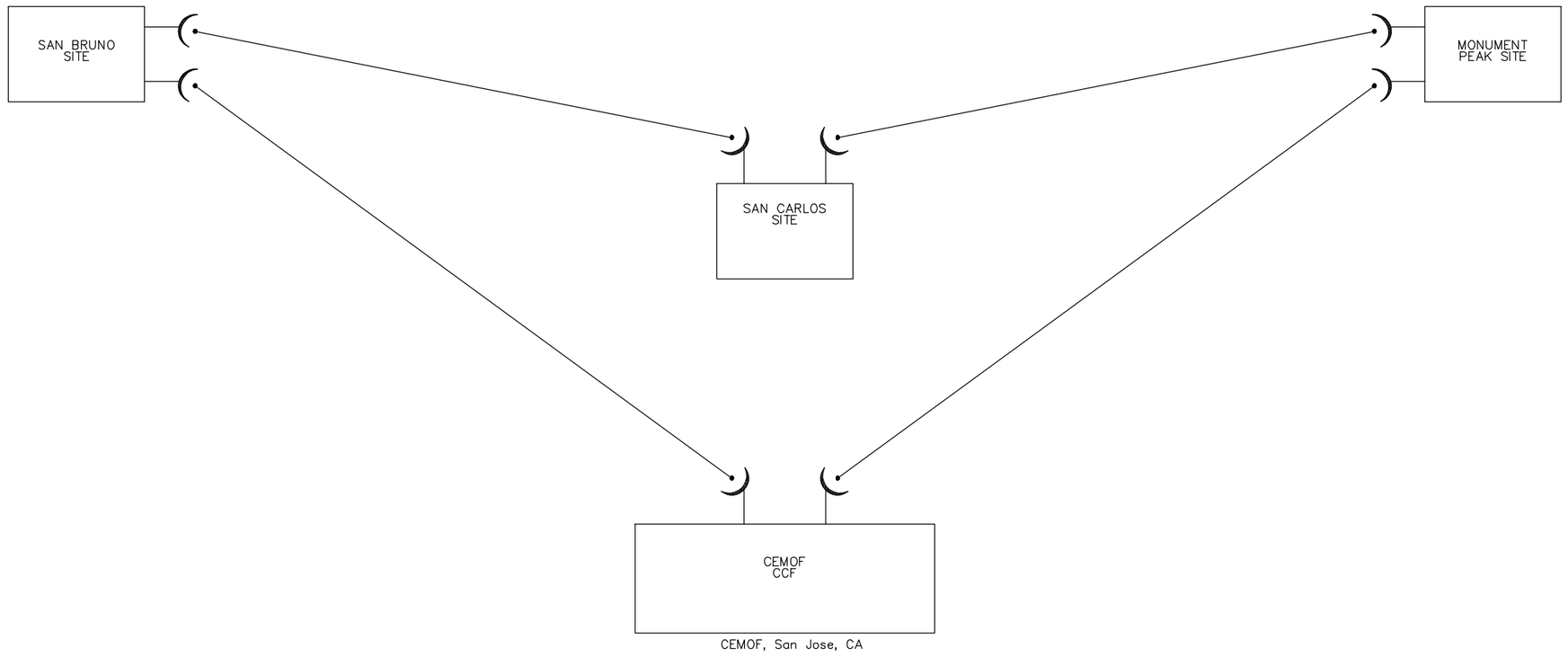
TRAIN CONTROL COMMUNICATION
VOICE RADIO – MAINTENANCE CHANNEL
MAINTENANCE CHANNEL BASE STATION
TYPICAL OF MOUNTAIN TOPS

CADD FILE NAME: SD–6153

REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD–6153



CEMOF, San Jose, CA

REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

TRAIN CONTROL COMMUNICATION
VOICE RADIO – MICROWAVE NETWORK

MICROWAVE NETWORK ARCHITECTURE

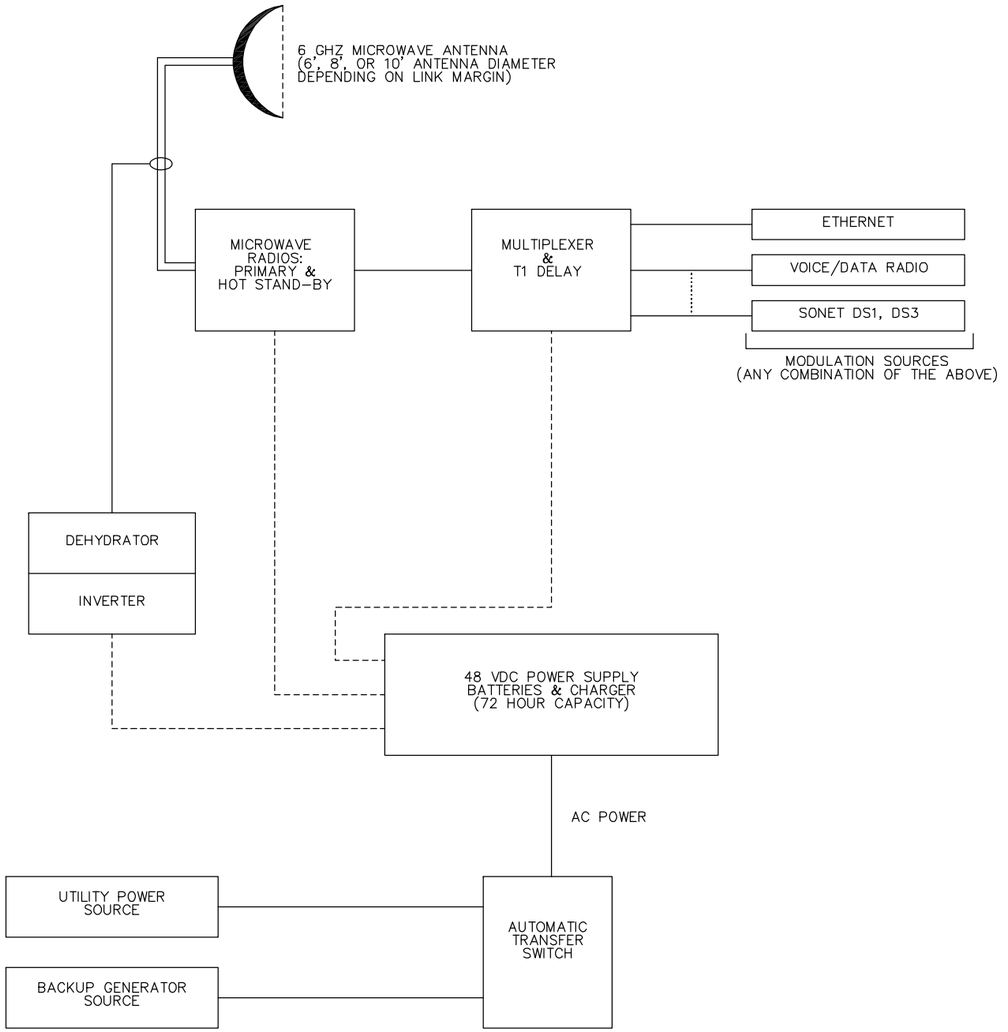
CADD FILE NAME: SD-6201

REV:

EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD-6201



REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP	DESCRIPTION

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

TRAIN CONTROL COMMUNICATION
VOICE RADIO – MICROWAVE NETWORK

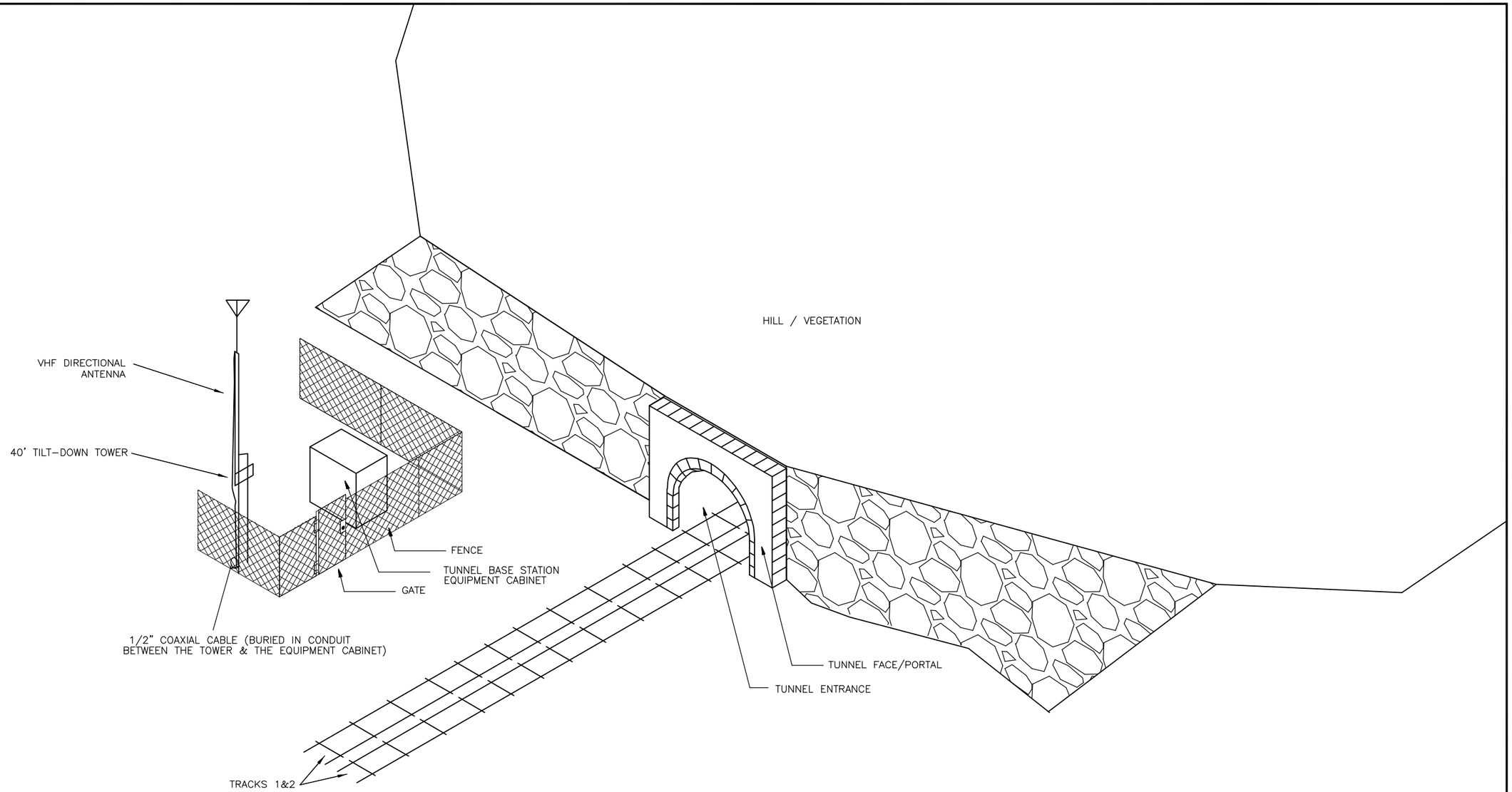
MICROWAVE RADIO SITE DESIGN

CADD FILE NAME: SD-6202

REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD-6202



REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

TRAIN CONTROL COMMUNICATION
VOICE RADIO – TUNNEL RADIO SITES

TYPICAL TUNNEL

CADD FILE NAME: SD-6301

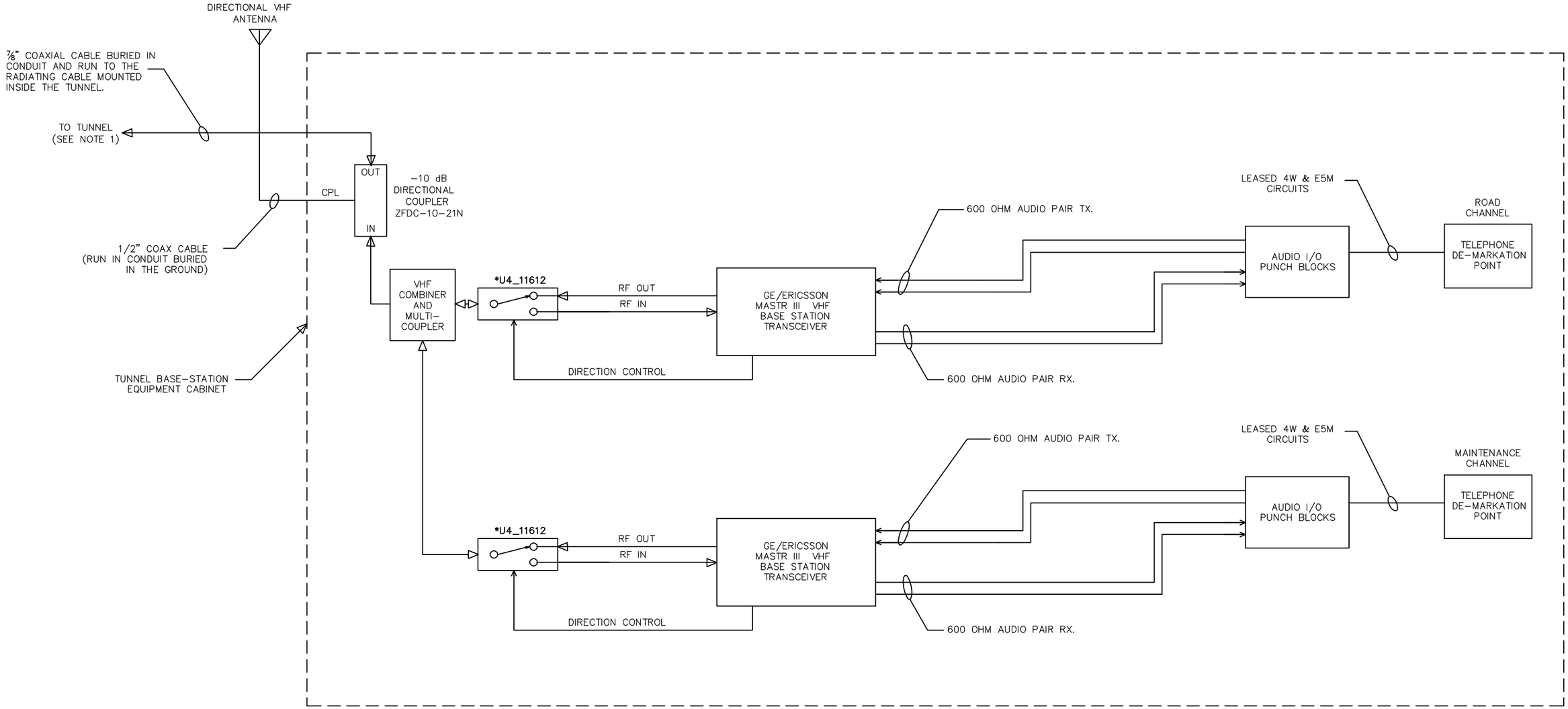
REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD-6301

NOTES:

1. A SINGLE 7/8" RADIATING CABLE IS INSTALLED ON THE ROOF OF EACH TUNNEL



REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

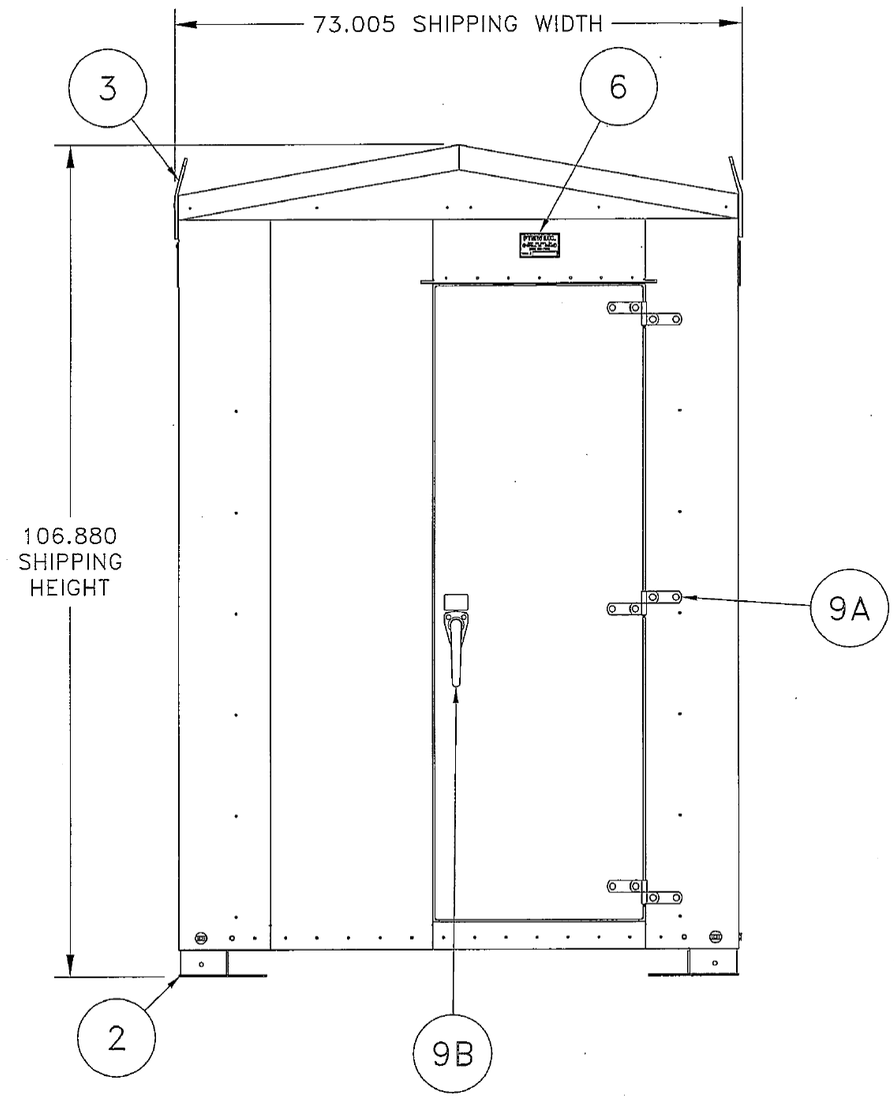
TRAIN CONTROL COMMUNICATION
VOICE RADIO – TUNNEL RADIO SITES
TUNNEL VOICE RADIO
BASE STATIONS CONFIGURATION

CADD FILE NAME: SD−6302

REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD−6302



GENERAL NOTES OF MATERIALS AND PROCEDURES

(SEE REFERENCE ON SHEET 1 THROUGH 3)

EXTERIOR FEATURES (1 THROUGH 8):

1. HOUSE CONSTRUCTED OF ALUMINUM WITH PVC PEEL COAT TO PROTECT EXTERIOR SURFACE DURING MANUFACTURING (PEEL COAT REMOVED PRIOR TO SHIPPING TO CUSTOMER) FOR WALLS DOORS AND ROOF. FLOOR CONSTRUCTED OF MILL FINISH ALUMINUM
2. ENCLOSURE EQUIPPED WITH INNER WALL TYPE FOUNDATIONS CONSTRUCTED OF GALVANIZED STEEL MINIMUM 60" LONG WITH 12" SQUARE FOOTING PLATE AND ADJUSTABLE FROM 36" TO 52" IN 1" INCREMENTS
3. ENCLOSURE EQUIPPED WITH LIFTING LUGS LOCATED AT THE FOUR REINFORCED ROOF CORNERS
4. INTAKE AND EXHAUST VENTS LOCATED AT GABLE ENDS OF ROOF WITH REUSABLE FILTERS
5. ALL EXTERIOR SEAMS SEALED WITH GRAY SILICONE CAULK
6. MANUFACTURER'S NAME PLATE WITH SERIAL NUMBER LOCATED ABOVE THE FRONT DOOR
7. AERIAL CABLE ENTRIES PROVIDED AS SHOWN
8. FOUR GROUNDING PIGTAILS LOCATED BELOW THE FLOOR

DOORS (9):

9. DOORS TO INCLUDE THE FOLLOWING:

A. VANDAL RESISTANT BOLT ON STAINLESS STEEL HINGES WITH GREASE FILLING

B. HEAVY DUTY THREE PAINT LOCKING SYSTEM WITH EXTERIOR HANDLE THAT WILL ACCEPT A STANDARD RAILROAD PADLOCK

C. PROP ROD TO HOLD DOOR OPEN AT 90 AND 160 DEGREES

D. EPDM EXTRUDED RUBBER GASKET PROVIDING A WEATHER TIGHT SEAL

INTERIOR FEATURES:

10. WALLS INSULATED WITH 1" RIGID INSULATION AND 2" IN THE DOORS. CEILING INSULATED WITH 2" .030 CLASS A WHITE PLASTIC LAMINATED INSULATION
11. WALLS COVERED WITH ¾" PLYWOOD WITH 0.030" CLASS A WHITE PLASTIC LAMINATE BETWEEN THE KEYWAYS
12. FLOOR COVERED WITH ½" RIGID INSULATION, 7/16" OSB PLYWOOD AND ⅛" RUBBER MATTING
13. WIRE CHASE IS A PURCHASED OPEN LADDER STYLE MODULAR ALUMINUM ASSEMBLY
14. TWO 24-1/4" X 84-1/8" ALUMINUM RACKS PROVIDED WITH #12-24 TAPPED HOLES ON E.I.A. UNIVERSAL SPACING
15. SIX 4-5/8" DIAMETER CABLE ENTRY HOLES PROVIDED WITH SHIPPING COVER PLATES

ELECTRICAL:

16. ALL SUPPLIED ELECTRICAL COMPONENTS TO BE UL LISTED. ALL POWER CIRCUITS TO BE RUN IN CONDUIT AND SECURED TO HOUSE STRUCTURE. ELECTRICAL SYSTEM TO INCLUDE THE FOLLOWING ITEMS INSTALLED BY THE MANUFACTURER:

A. (1 EACH) 100A 12 SPACE MAIN CIRCUIT BREAKER LOAD CENTER (SQUARE D #Q0112M100)

B. (1 EACH) 15A LIGHT SWITCH

C. (1 EACH) 15A DUPLEX RECEPTACLE

D. (1 EACH) 4" 2 BULB FLOURESCENT LIGHT FIXTURE (T-8) WITH LAMPS, SHATTER GUARDS AND TUBE LOCKS

E. (1 EACH) 110V VENTILATION FAN 292 CFM

F. (1 EACH) 110V 30° TO 110° RANGE THERMOSTAT

G. (6' LONG) LENGTH OF 2" EMT CONDUIT FOR POWER ENTRY

H. (1 EACH) 120 / 240 VOLT SURGE PROTECTOR (ERICO # EPD120/240TDFL)

SHIP LOOSE ITEMS:

17. THE FOLLOWING ITEMS SHIP LOOSE WITH HOUSE:

A. (1 EACH) 3 FOOT LENGTH OF 2" LIQUID TIGHT CONDUIT WITH 2" EMT COMPRESSION CONNECTOR, 2" STRAIGHT CONNECTOR, 2" NPT COUPLING AND PLASTIC CAP

B. (6 EACH) 24" LENGTHS OF 4" SCH 40 PVC CONDUIT WITH COUPLINGS, LOCK RINGS AND PLASTIC BUSHINGS

REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

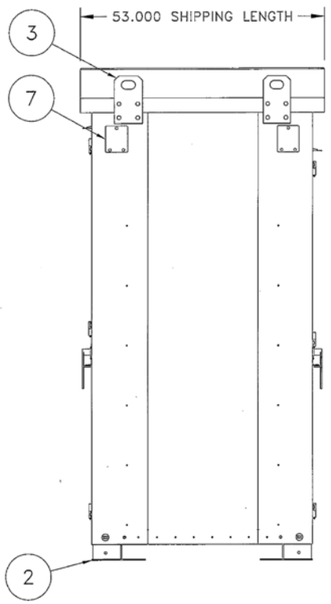
TRAIN CONTROL COMMUNICATION
VOICE RADIO – TUNNEL RADIO SITES
TUNNEL RADIO CABINET
SHEET 1 OF 3

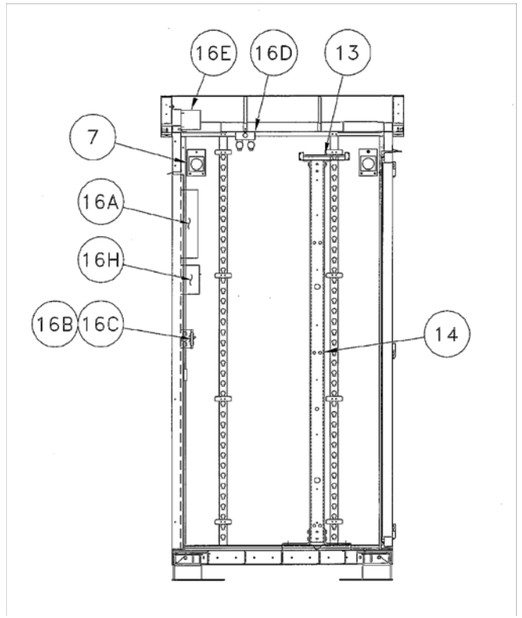
CADD FILE NAME: SD-6303

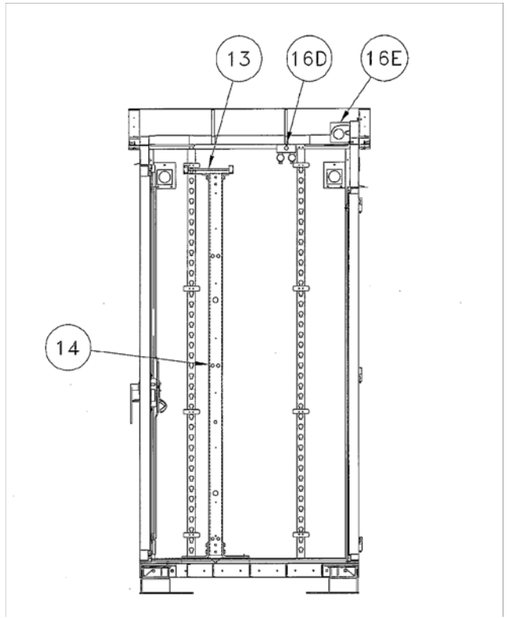
REV: | EDITION: FOURTH

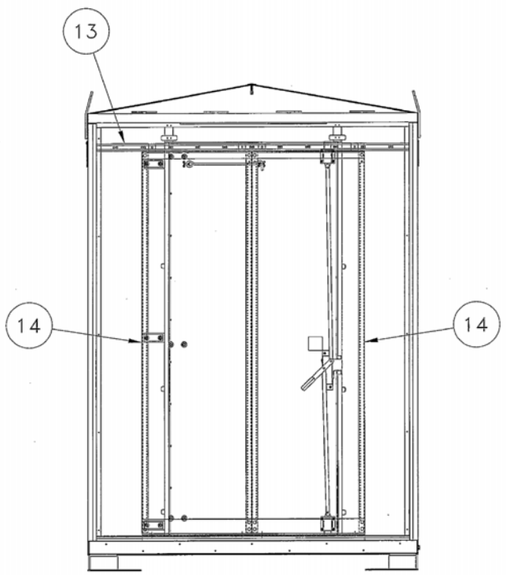
TRAIN CONTROL

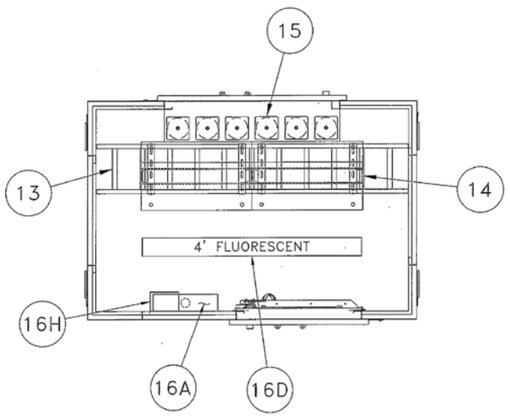
STANDARD DRAWING NO.: SD-6303

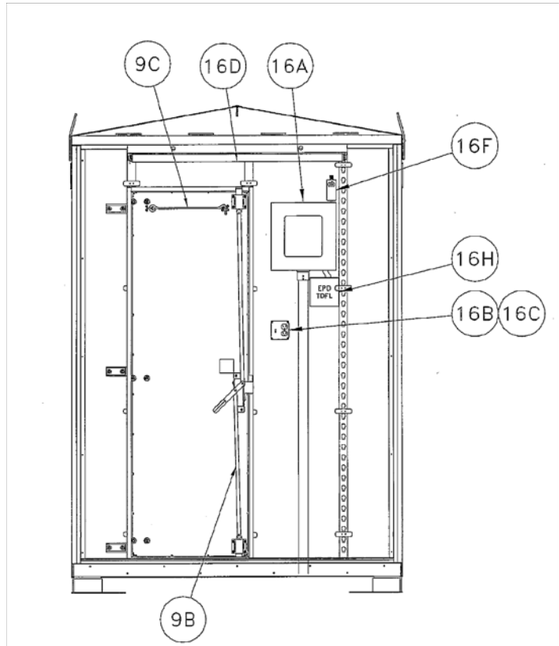












REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

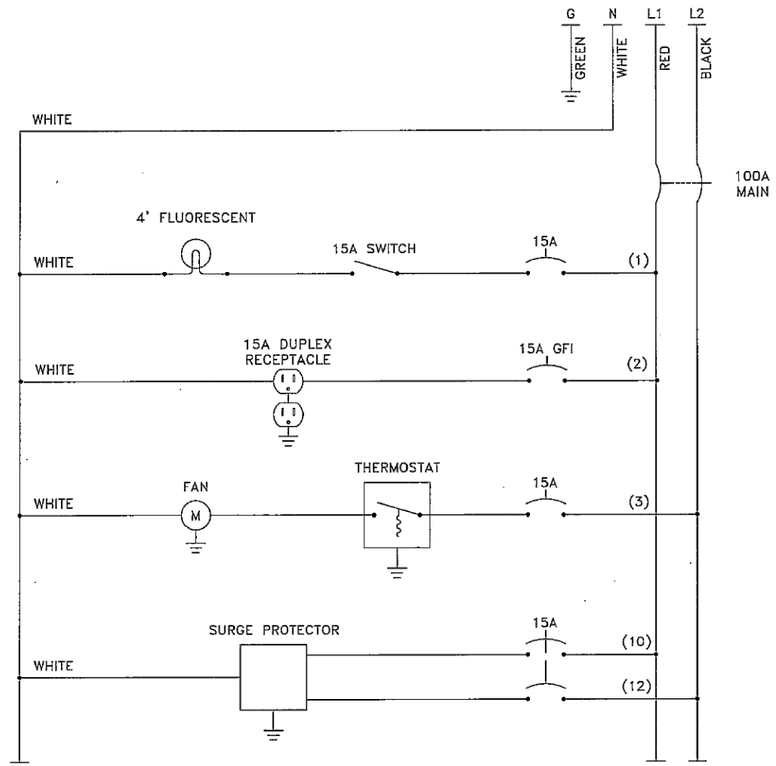
TRAIN CONTROL COMMUNICATION
VOICE RADIO – TUNNEL RADIO SITES
TUNNEL RADIO CABINET
SHEET 2 OF 3

CADD FILE NAME: SD-6304

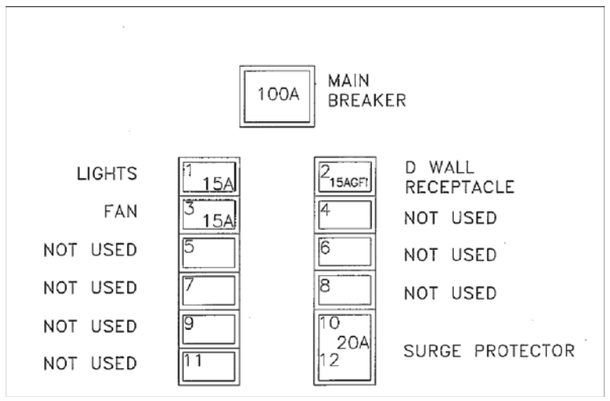
REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD-6304



ELECTRICAL SCHEMATIC



PART NAME	ALUMINUM RELAY RACK	PART No.	ARR-1272-NF & ARR-1272-BT ARR-1294 NF & ARR-1294-BT

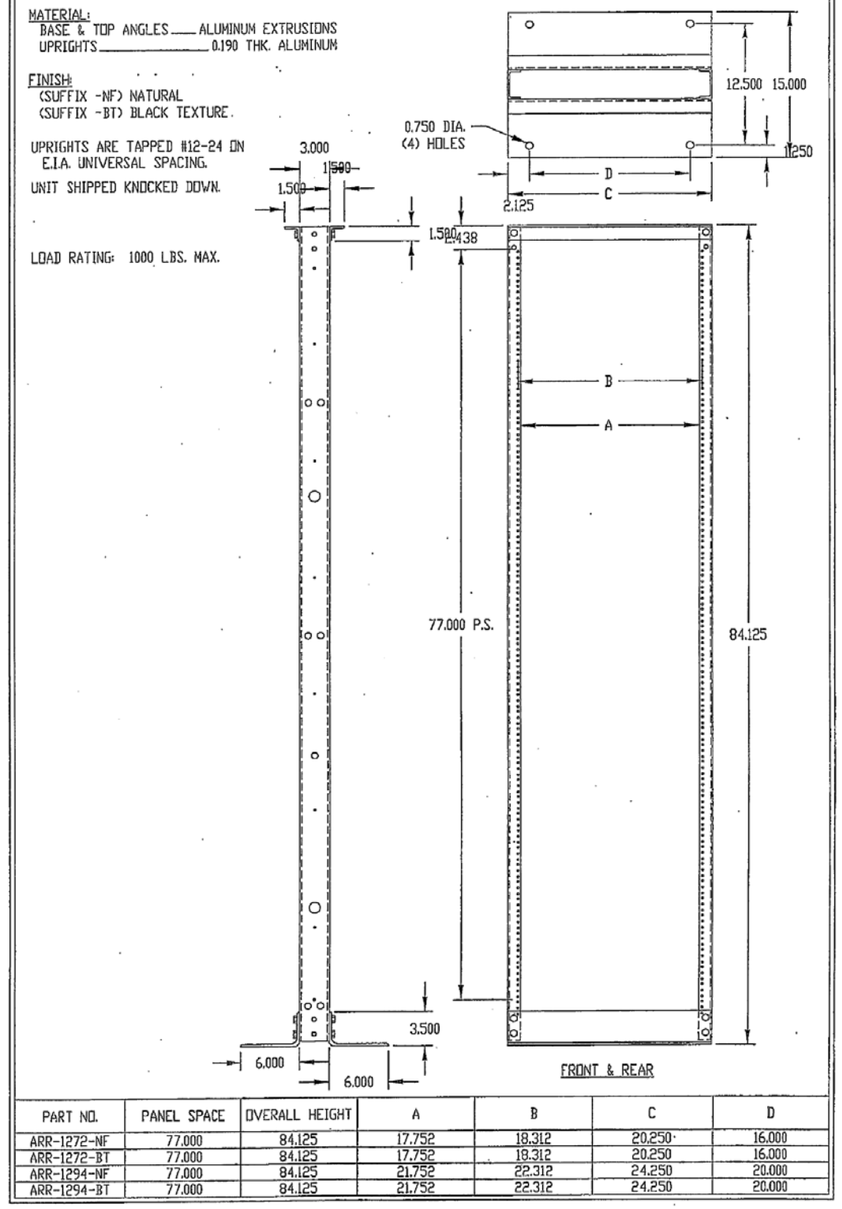
MATERIAL:
BASE & TOP ANGLES ___ ALUMINUM EXTRUSIONS
UPRIGHTS _____ 0.190 THK. ALUMINUM

FINISH:
(SUFFIX -NF) NATURAL
(SUFFIX -BT) BLACK TEXTURE.

UPRIGHTS ARE TAPPED #12-24 ON E.I.A. UNIVERSAL SPACING.

UNIT SHIPPED KNOCKED DOWN.

LOAD RATING: 1000 LBS. MAX.



PART NO.	PANEL SPACE	OVERALL HEIGHT	A	B	C	D
ARR-1272-NF	77.000	84.125	17.752	18.312	20.250	16.000
ARR-1272-BT	77.000	84.125	17.752	18.312	20.250	16.000
ARR-1294-NF	77.000	84.125	21.752	22.312	24.250	20.000
ARR-1294-BT	77.000	84.125	21.752	22.312	24.250	20.000

REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

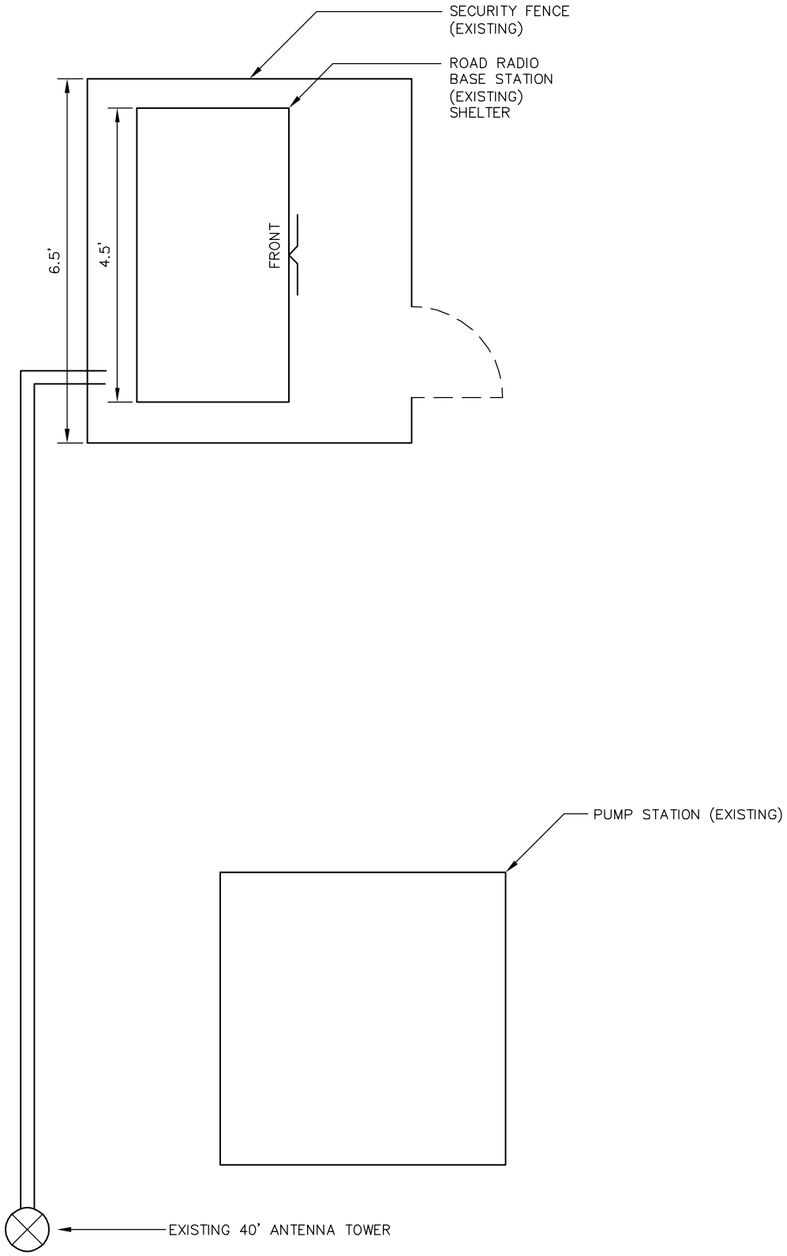
TRAIN CONTROL COMMUNICATION
VOICE RADIO – TUNNEL RADIO SITES
TUNNEL RADIO CABINET
SHEET 3 OF 3

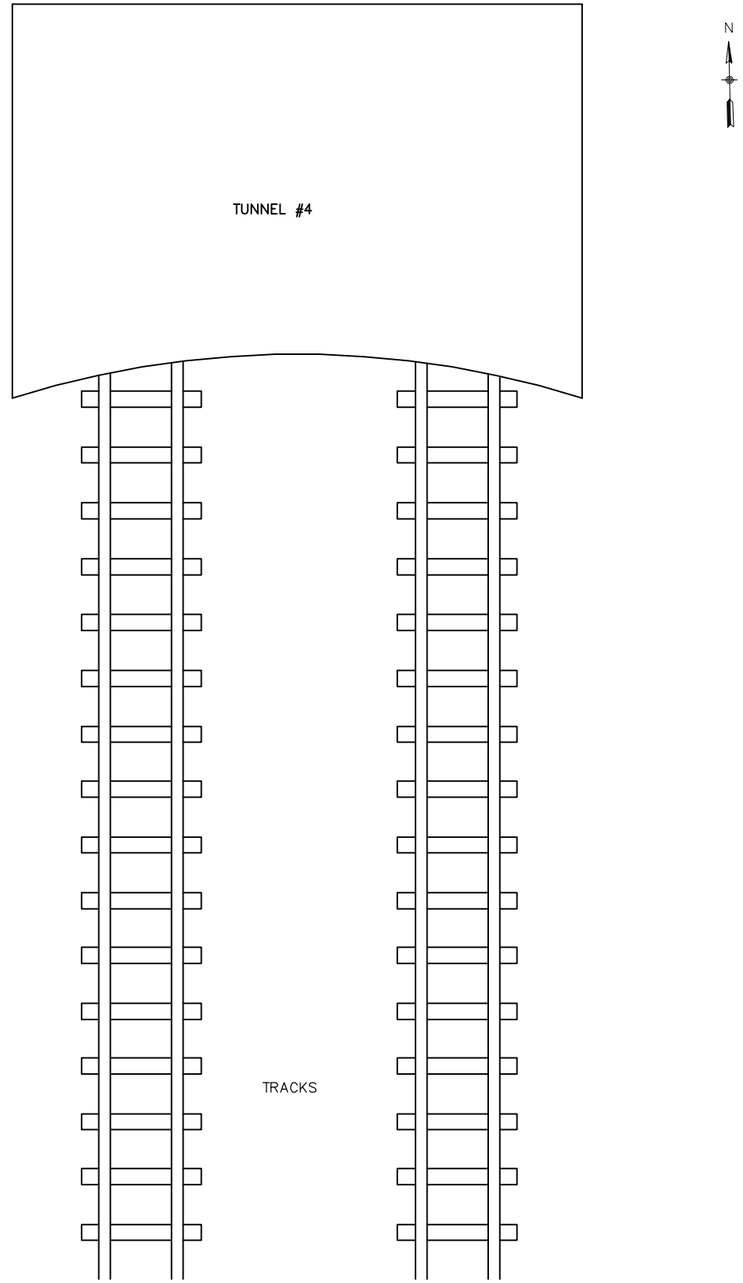
CADD FILE NAME: SD-6305

REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD-6305





REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain®

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

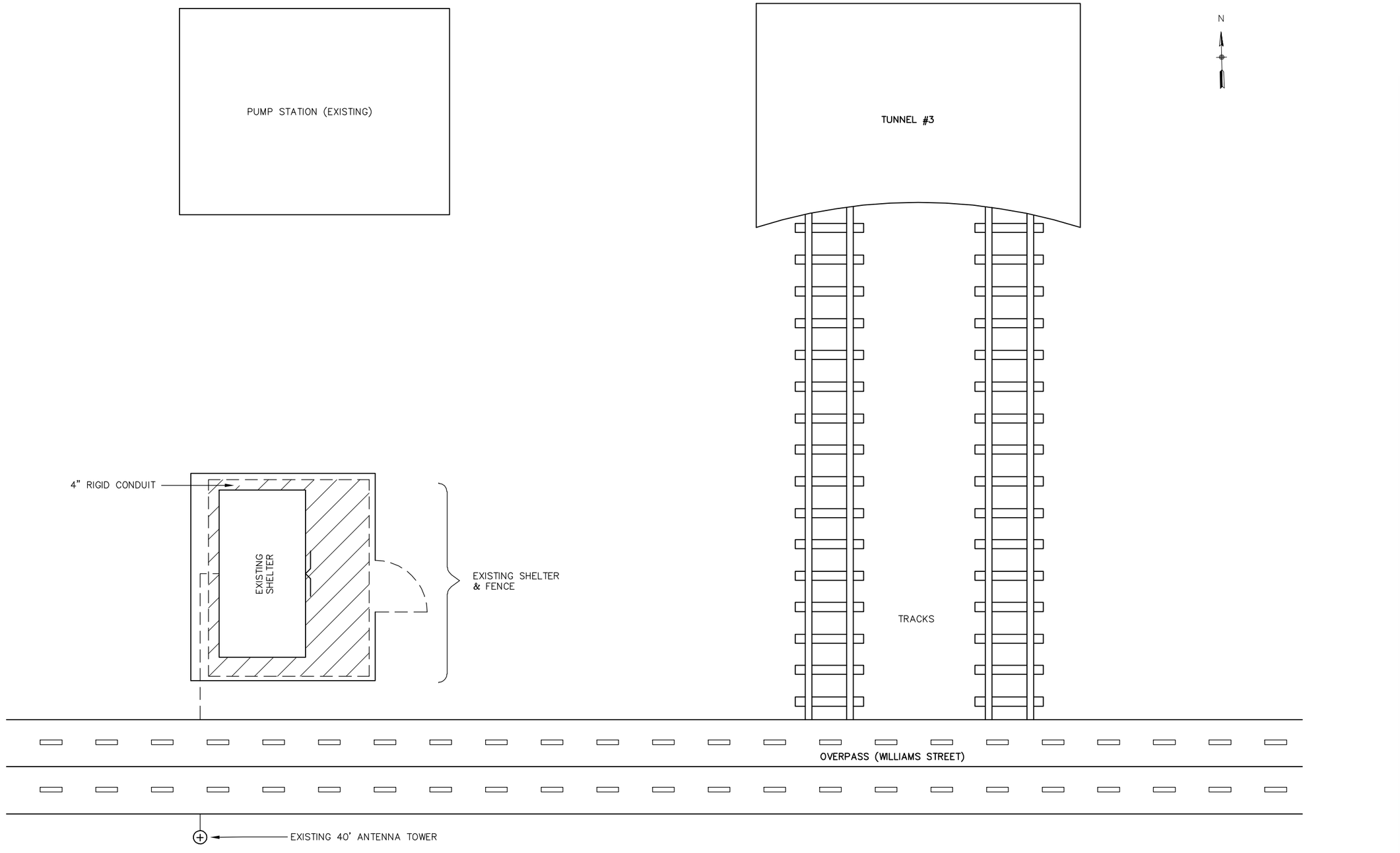
TRAIN CONTROL COMMUNICATION
VOICE RADIO – TUNNEL RADIO SITES
TUNNEL 4
PLAN VIEW

CADD FILE NAME: SD-6306

REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD-6306



REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

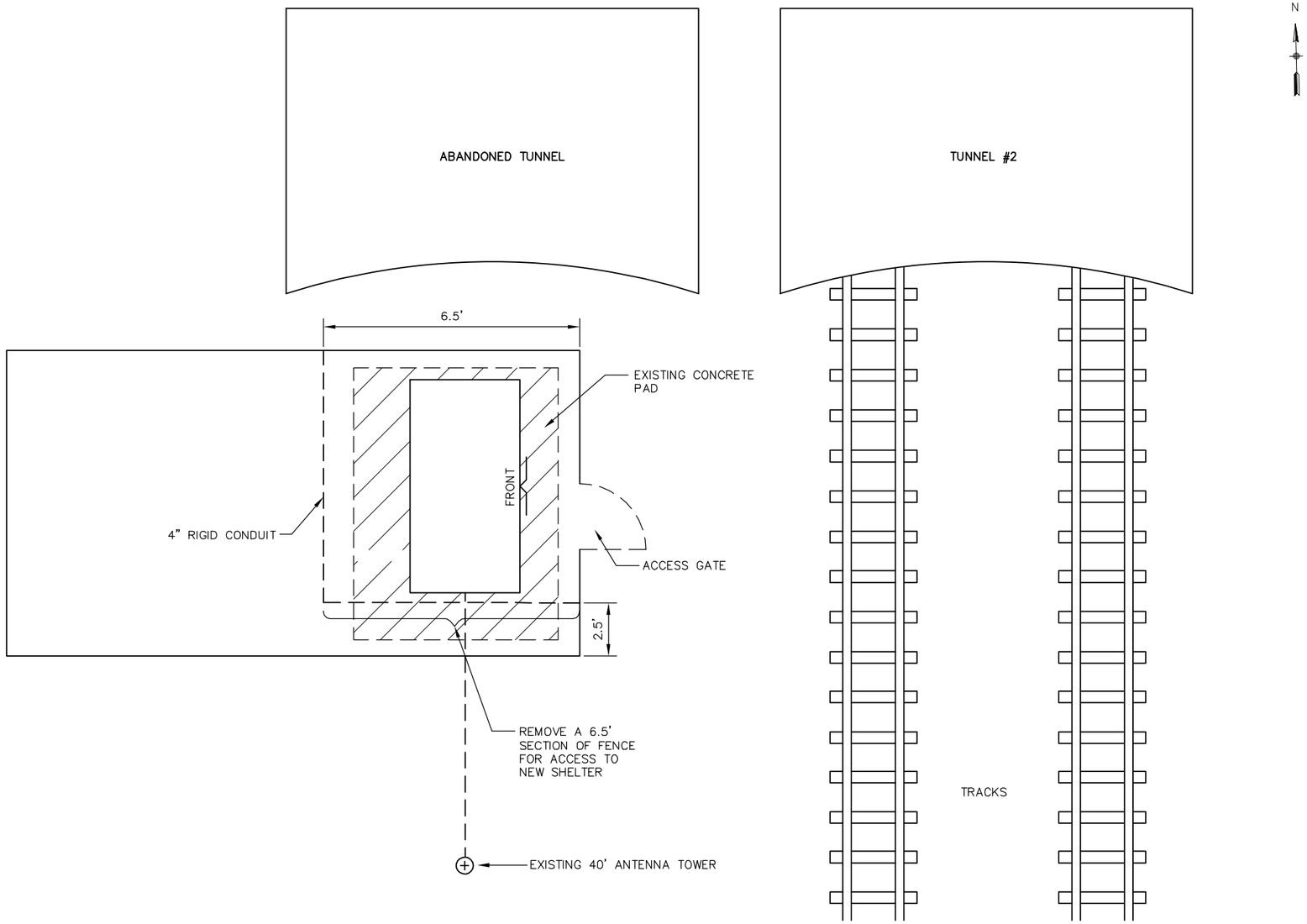
TRAIN CONTROL COMMUNICATION
VOICE RADIO – TUNNEL RADIO SITES
TUNNEL 3
PLAN VIEW AND DETAILS

CADD FILE NAME: SD-6307

REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD-6307



REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

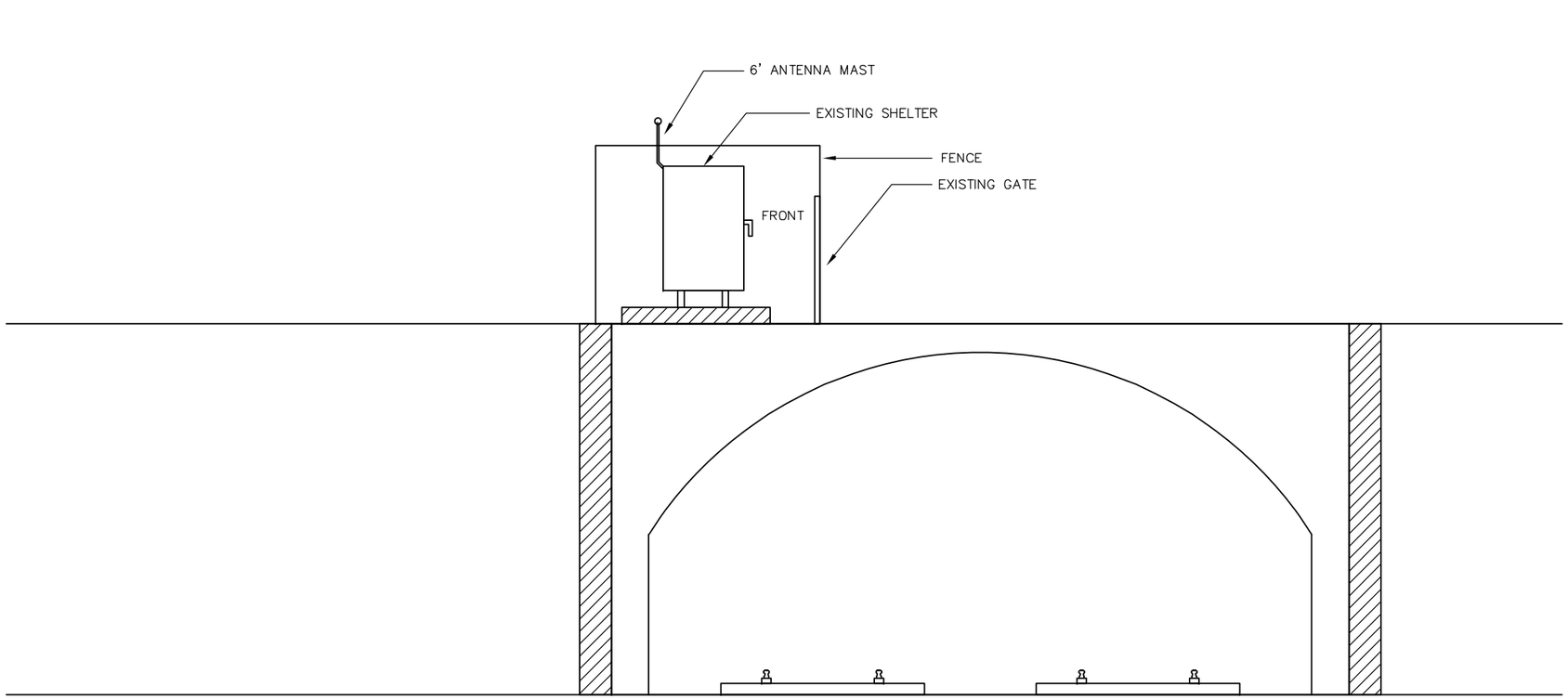
TRAIN CONTROL COMMUNICATION
VOICE RADIO – TUNNEL RADIO SITES
TUNNEL 2
PLAN VIEW AND DETAILS

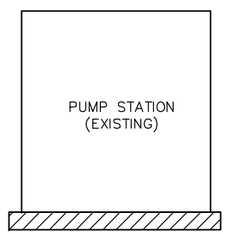
CADD FILE NAME: SD-6308

REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD-6308





REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

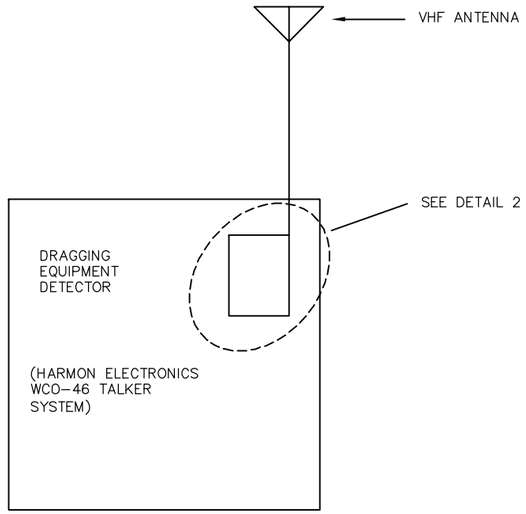
TRAIN CONTROL COMMUNICATION
VOICE RADIO – TUNNEL RADIO SITES
TUNNEL 1
ELEVATION VIEW

CADD FILE NAME: SD-6309

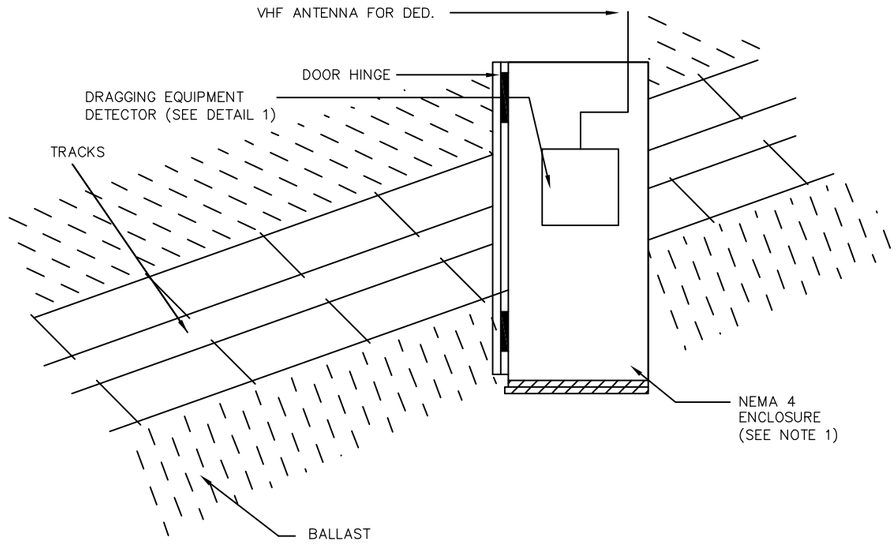
REV: | EDITION: FOURTH

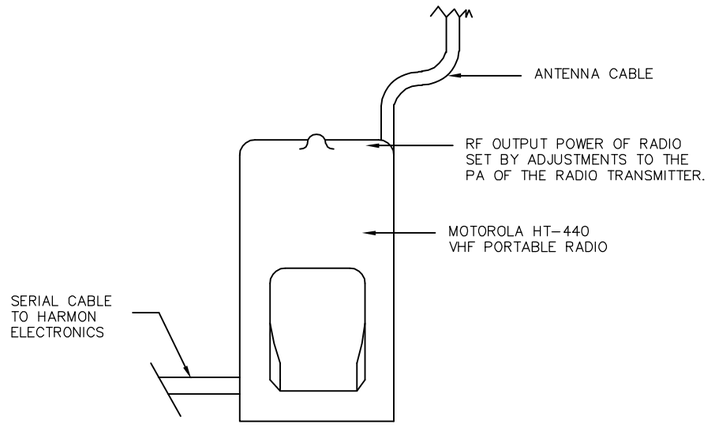
TRAIN CONTROL

STANDARD DRAWING NO.: SD-6309



DETAIL 1





DETAIL 2

NOTE:

1. THE TRANSMIT POWER OF EACH DED SHALL BE REDUCED TO AN ERP (DEPENDENT ON THE TERRAIN IN THE IMMEDIATE VICINITY OF THE DED) THAT WILL RESTRICT RADIO COVERAGE TO PROVIDE A RECEIVE INTENSITY OF -109 dbm WITHIN A +/- 3 MILE REGION OF TRACK.
2. DED SHALL ALSO BE RECEIVED BY THE NEAREST BASE STATION SITE, SO IMPROVEMENT ARE SIMULTANEOUSLY REQUIRED TO THE BASE STATION RF FRONT END

REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain®

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

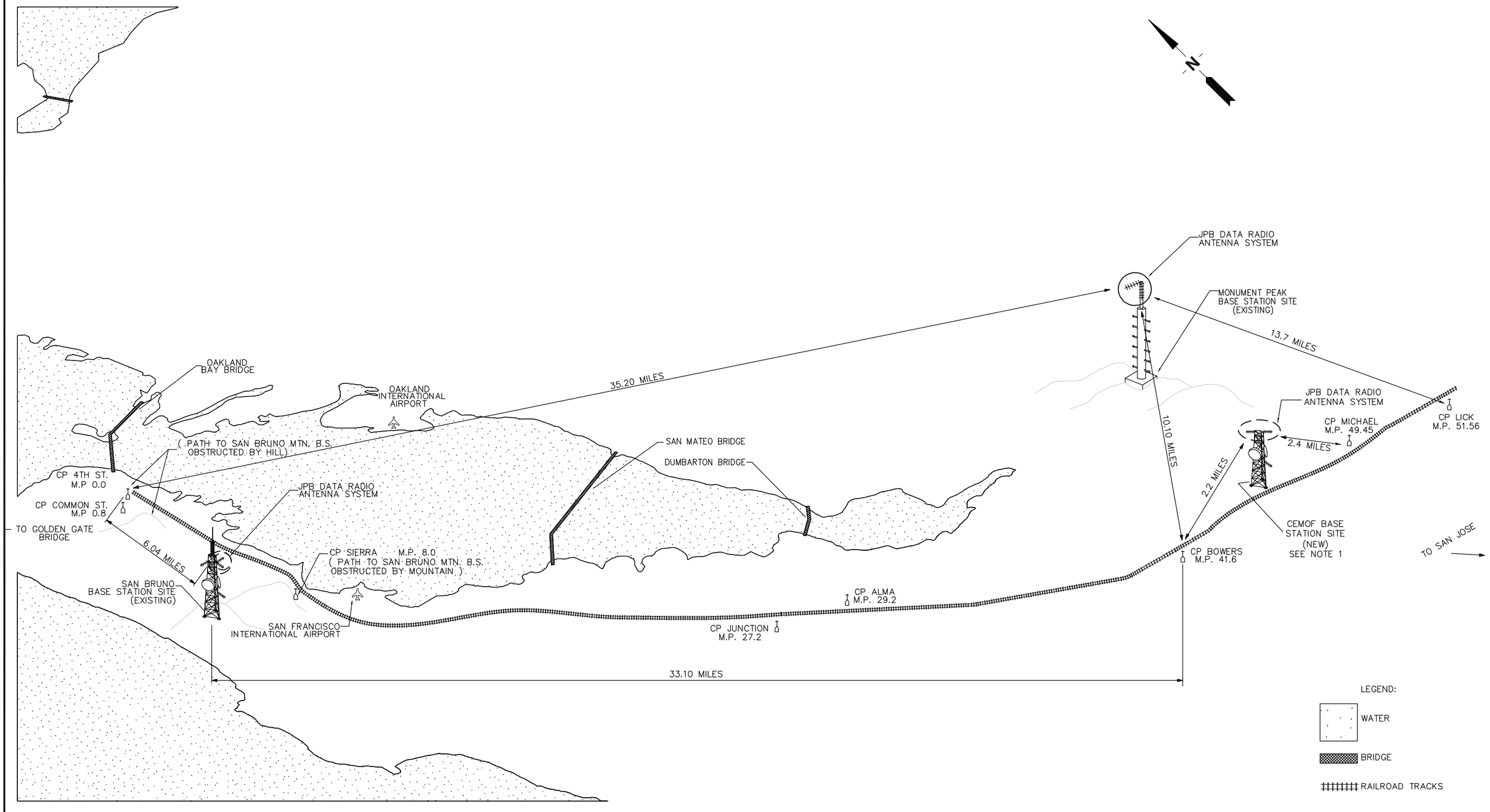
TRAIN CONTROL COMMUNICATION
VOICE RADIO – DED SITES
TYPICAL DRAGGING
EQUIPMENT DETECTOR

CADD FILE NAME: SD-6351

REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD-6351



NOTE:

1. AT CEMOF SITE, THERE IS AN EXISTING ANTENNA TOWER AND COMMUNICATION HOUSE THAT SHALL BE USED TO SUPPORT THE NEW ATCS BASE STATION INSTALLATION. TOWER SHALL BE EXTENDED BY 20' PER THE CONTRACT DRAWINGS.

REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP	DESCRIPTION

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

TRAIN CONTROL COMMUNICATION
ATCS (DATA) RADIO SYSTEM
RADIO BASE STATION SITES
AND CONTROL POINTS

CADD FILE NAME: SD-6500

REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD-6500

TO
SAN
FRANCISCO

CP 4TH ST.
N 37° 46' 28.8"
W 122° 23' 50.2"
ELEV. WRT MSL: 65 FT.
M.P. 0.0

CP COMMON ST.
N 37° 46' 9.6"
W 122° 23' 54.7"
ELEV. WRT MSL: 0 FT.
M.P. 0.8

CP ARMY
N 37° 45' 3.4"
W 122° 23' 35.2"
ELEV. WRT MSL: 28 FT.
M.P. 2.3

CP TUNNEL
N 37° 42' 38.6"
W 122° 24' 8.2"
ELEV. WRT MSL: 34 FT.
M.P. 5.0

CP GENEVA
N 37° 42' 13.6"
W 122° 24' 7.9"
ELEV. WRT MSL: 12 FT.
M.P. 5.5

CP BRISBANE
N 37° 40' 58.0"
W 122° 23' 43.0"
ELEV. WRT MSL: 20 FT.
M.P. 7.0

CP SIERRA
N 37° 40' 0.5"
W 122° 23' 39.2"
ELEV. WRT MSL: 40 FT.
M.P. 8.1

SAN FRANCISCO
INTERNATIONAL AIRPORT

TO
SAN JOSE

CP CENTER
N 37° 36' 33.2"
W 122° 23' 47.7"
ELEV. WRT MSL: 22 FT.
M.P. 12.8

CP BART
N 37° 35' 56.0"
W 122° 23' 9.1"
ELEV. WRT MSL: 24 FT.
M.P. 13.7

CP TROUSDALE
N 37° 35' 41.1"
W 122° 22' 48.0"
ELEV. WRT MSL: 21 FT.
M.P. 14.2

LEGEND:

WATER

BRIDGE

RAILROAD TRACKS

REFERENCE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

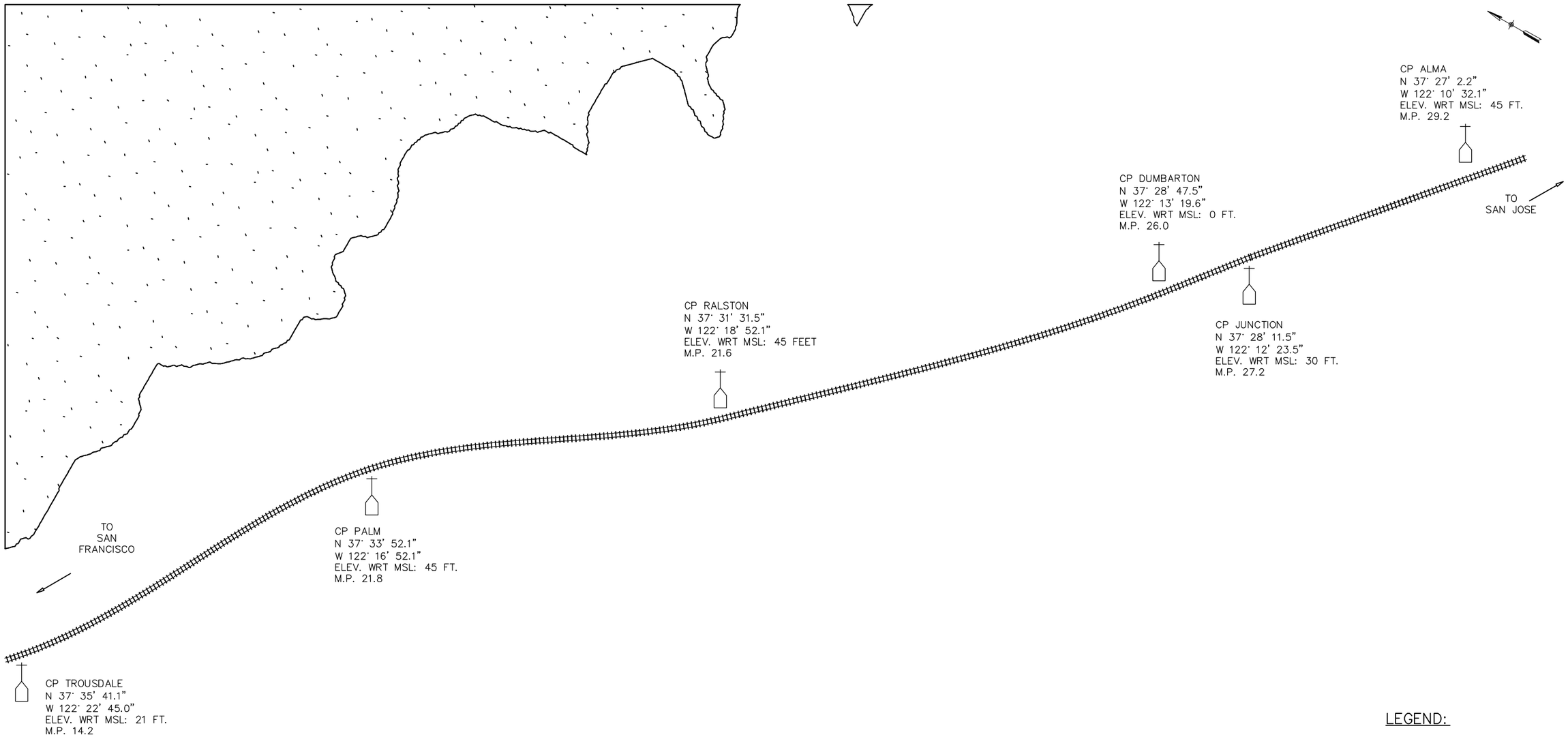
TRAIN CONTROL COMMUNICATION
ATCS (DATA) RADIO SYSTEM
SINGLE LINE DRAWING
CP 4TH STREET TO CP TROUSDALE

CADD FILE NAME: SD-6501

REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD-6501



LEGEND:

WATER

BRIDGE

RAILROAD TRACKS

REFERENCE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

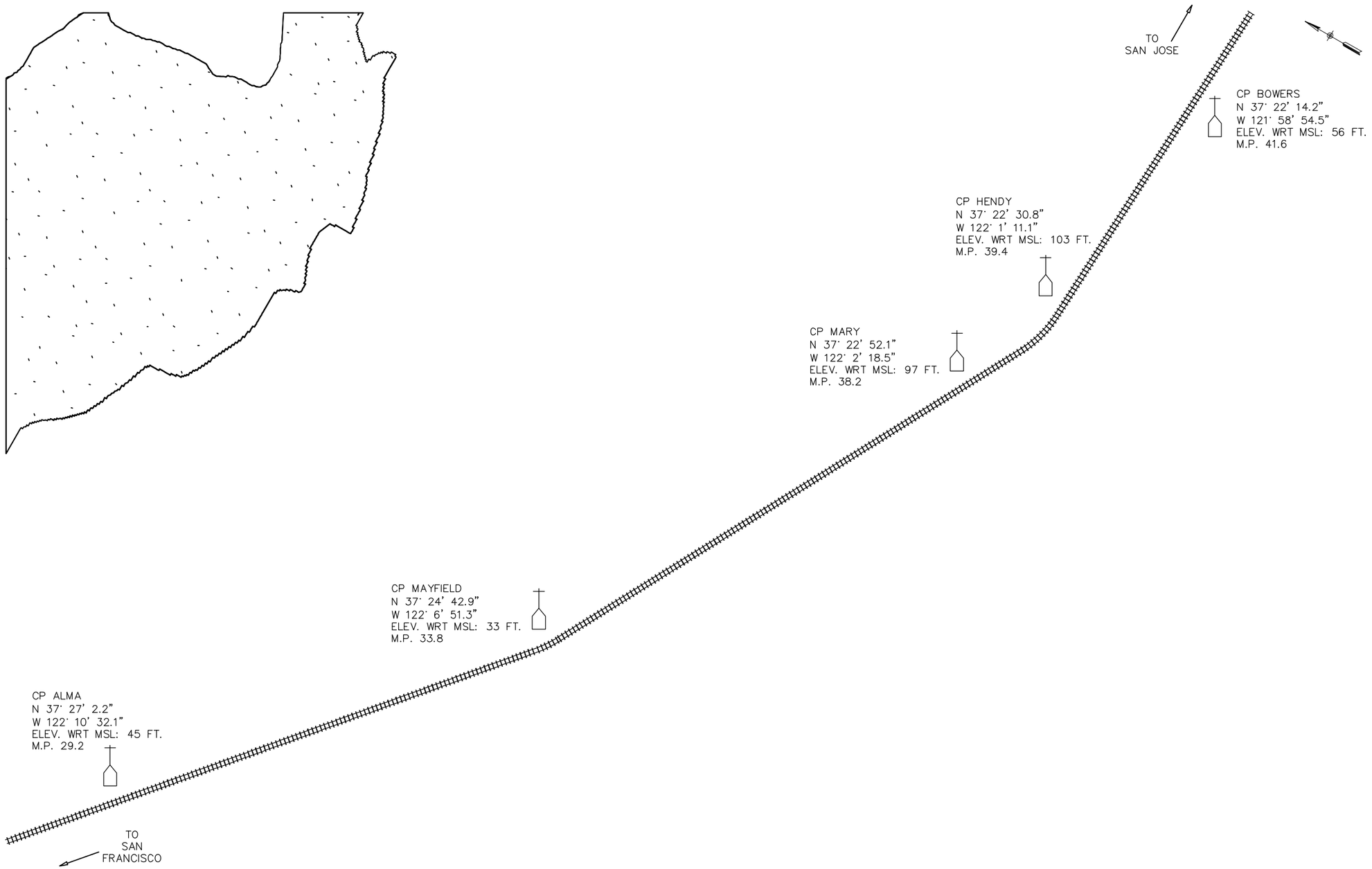
TRAIN CONTROL COMMUNICATION
ATCS (DATA) RADIO SYSTEM
SINGLE LINE DRAWING
CP TROUSDALE TO CP ALMA

CADD FILE NAME: SD-6502

REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD-6502



LEGEND:

WATER

BRIDGE

RAILROAD TRACKS

REFERENCE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

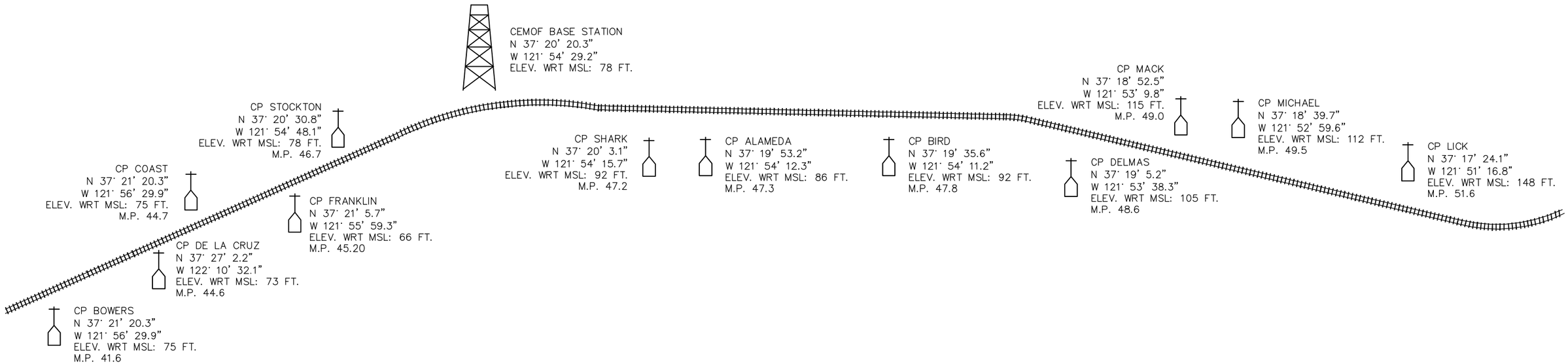
TRAIN CONTROL COMMUNICATION
ATCS (DATA) RADIO SYSTEM
SINGLE LINE DRAWING
CP ALMA TO CP BOWERS

CADD FILE NAME: SD-6503

REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD-6503



LEGEND:

WATER

BRIDGE

RAILROAD TRACKS

REFERENCE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP	DESCRIPTION

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

TRAIN CONTROL COMMUNICATION
ATCS (DATA) RADIO SYSTEM
SINGLE LINE DRAWING
CP BOWERS TO CP LICK

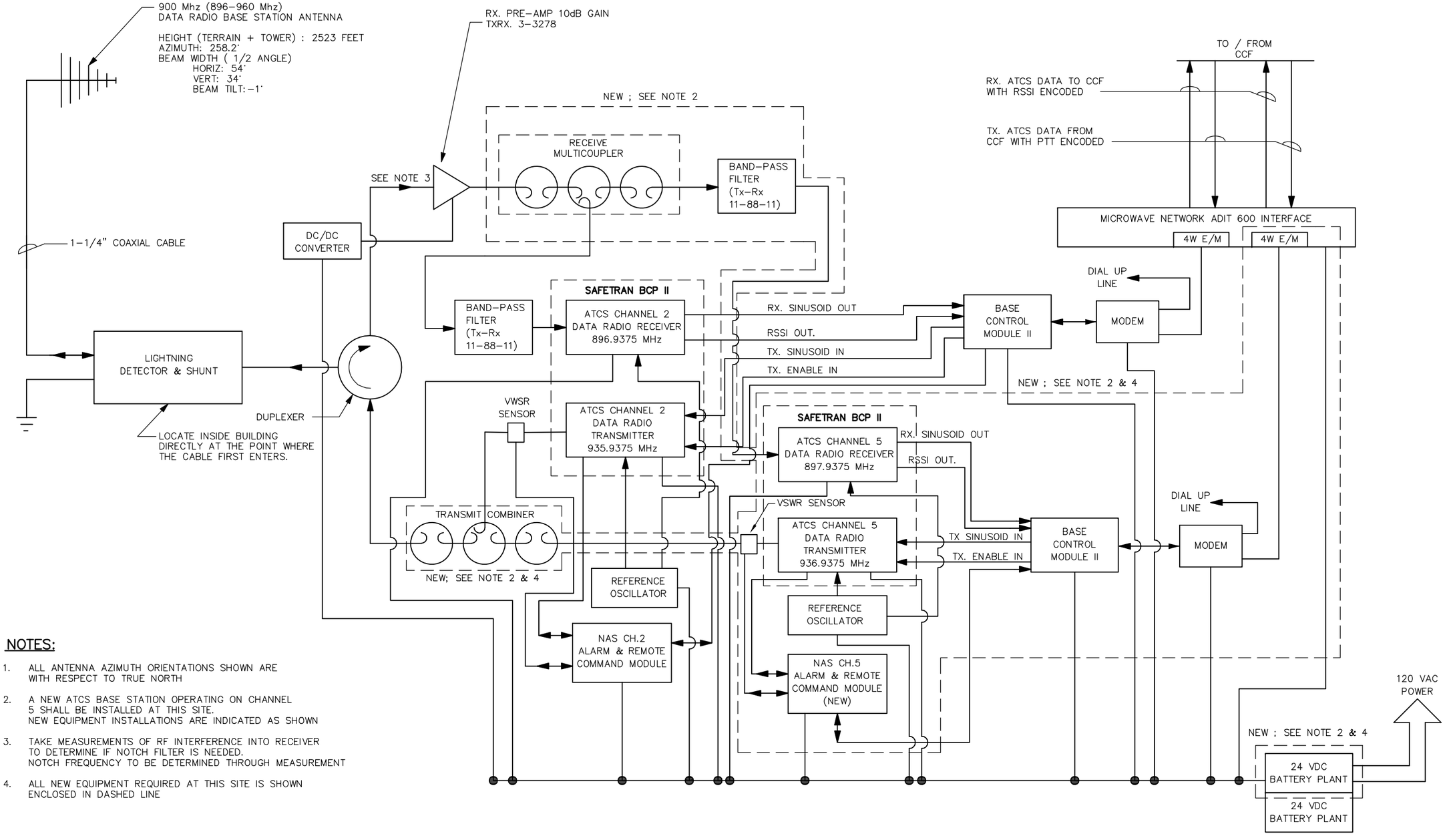
CADD FILE NAME: SD-6504

REV:

EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD-6504



NOTES:

1. ALL ANTENNA AZIMUTH ORIENTATIONS SHOWN ARE WITH RESPECT TO TRUE NORTH
2. A NEW ATCS BASE STATION OPERATING ON CHANNEL 5 SHALL BE INSTALLED AT THIS SITE. NEW EQUIPMENT INSTALLATIONS ARE INDICATED AS SHOWN
3. TAKE MEASUREMENTS OF RF INTERFERENCE INTO RECEIVER TO DETERMINE IF NOTCH FILTER IS NEEDED. NOTCH FREQUENCY TO BE DETERMINED THROUGH MEASUREMENT
4. ALL NEW EQUIPMENT REQUIRED AT THIS SITE IS SHOWN ENCLOSED IN DASHED LINE

REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

TRAIN CONTROL COMMUNICATION
ATCS (DATA) RADIO SYSTEM
BLOCK DIAGRAM, CHANNELS 2 AND 5
MONUMENT PEAK BASE STATION

CADD FILE NAME: SD–6600

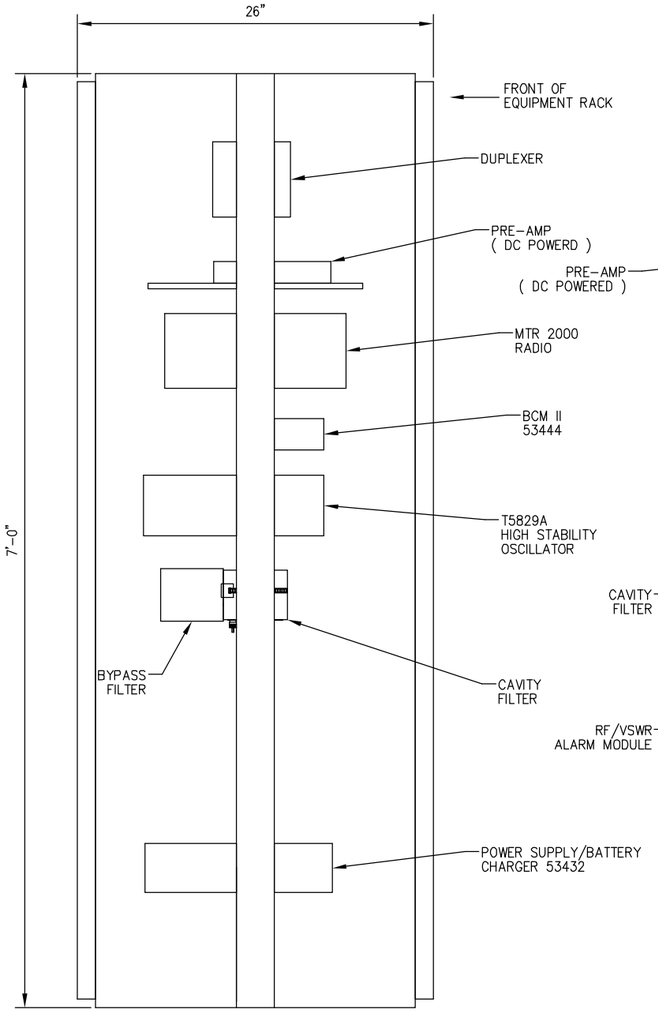
REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD–6600

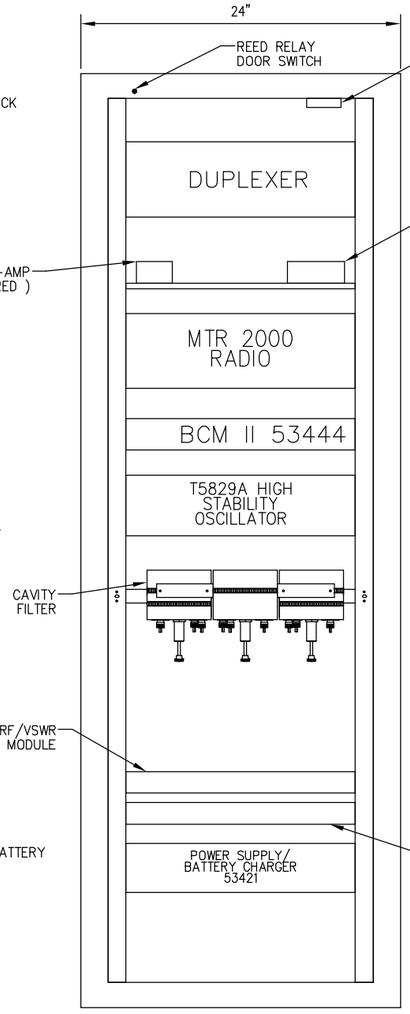
NOTE:

FRONT AND REAR ELEVATIONS SHOW RACK WITH DOORS REMOVED



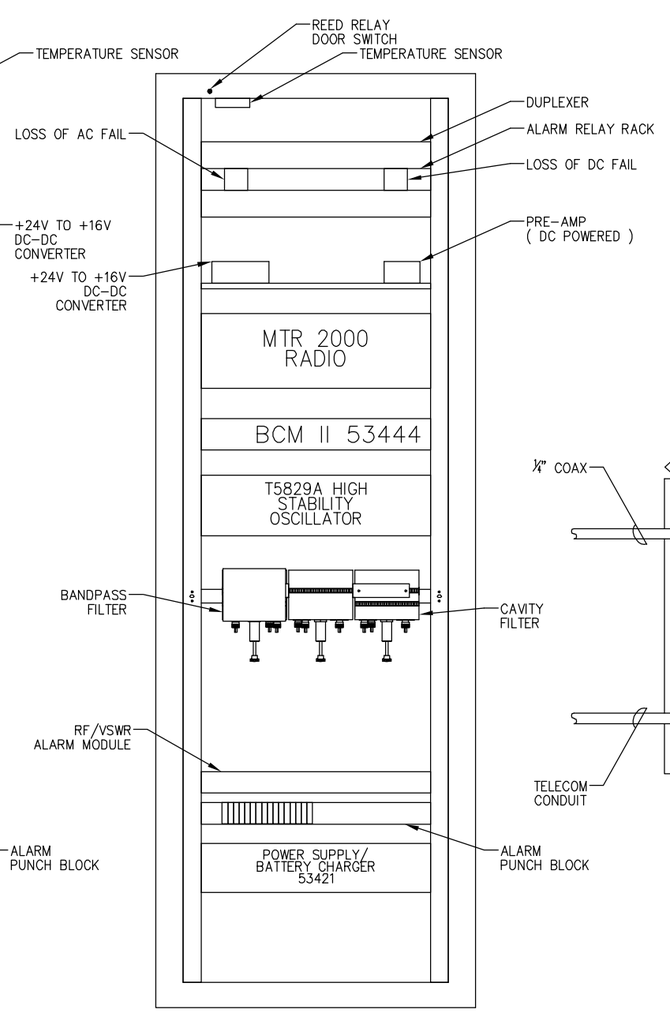
EQUIPMENT RACK
SIDE ELEVATION VIEW

NOT TO SCALE



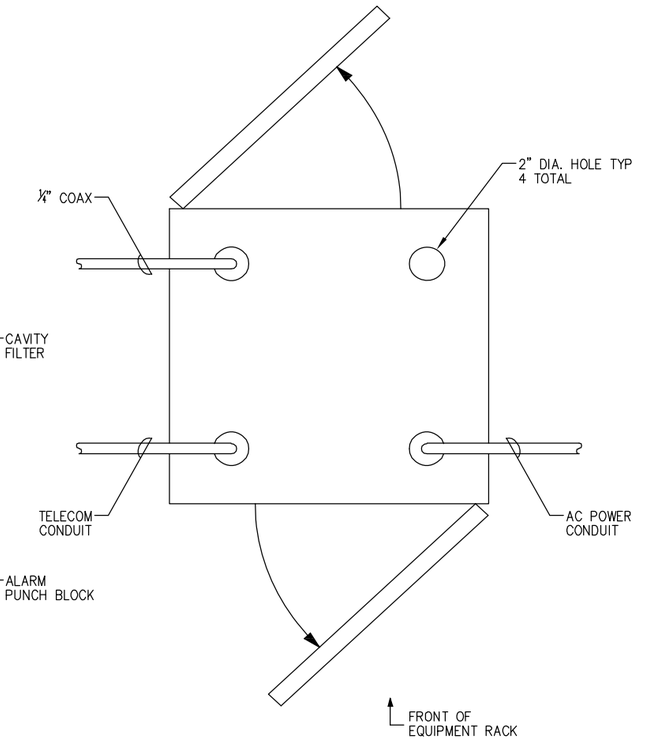
EQUIPMENT RACK
FRONT ELEVATION VIEW

NOT TO SCALE



EQUIPMENT RACK
REAR ELEVATION VIEW

NOT TO SCALE



EQUIPMENT RACK
TOP ELEVATION VIEW

NOT TO SCALE

REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP	DESCRIPTION

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

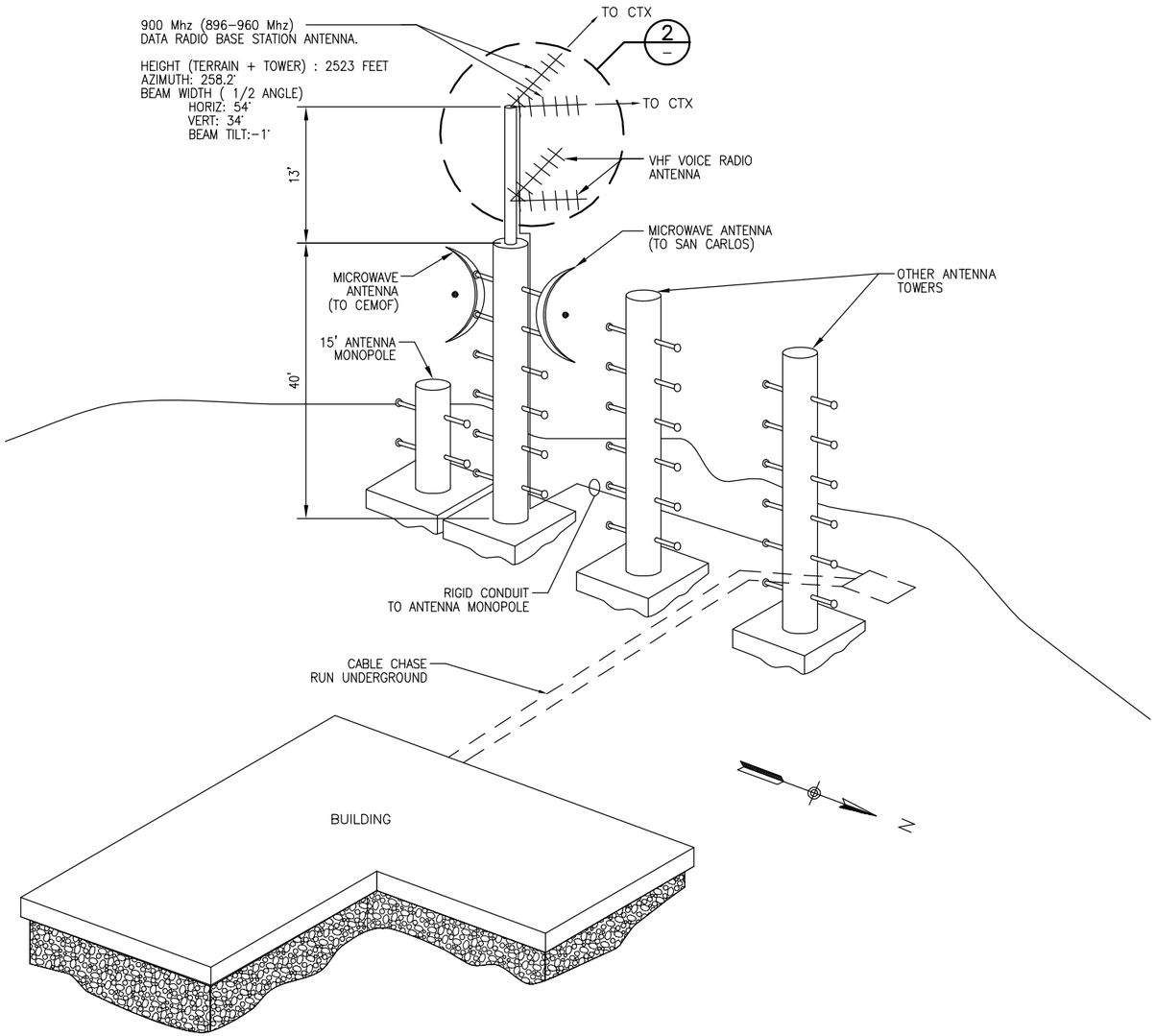
TRAIN CONTROL COMMUNICATION
ATCS (DATA) RADIO SYSTEM
MONUMENT PEAK BASE STATION
EQUIPMENT RACK

CADD FILE NAME: SD-6601

REV: | EDITION: FOURTH

TRAIN CONTROL

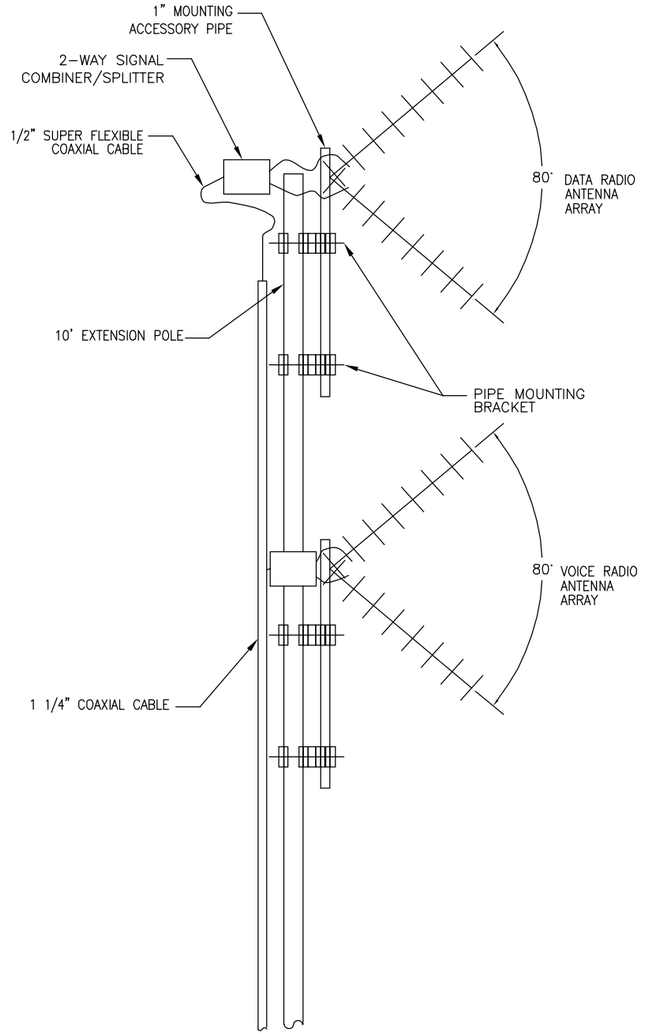
STANDARD DRAWING NO.: SD-6601



MONUMENT PEAK BASE STATION SITE PLAN

PLAN

SCALE: NOT TO SCALE



RADIO ANTENNA INSTALLATION DETAIL

2 – DETAIL

SCALE: NTS

REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

TRAIN CONTROL COMMUNICATION
ATCS (DATA) RADIO SYSTEM
MONUMENT PEAK BASE STATION
ANTENNA TOWER AND MOUNTING DETAIL

CADD FILE NAME: SD–6602

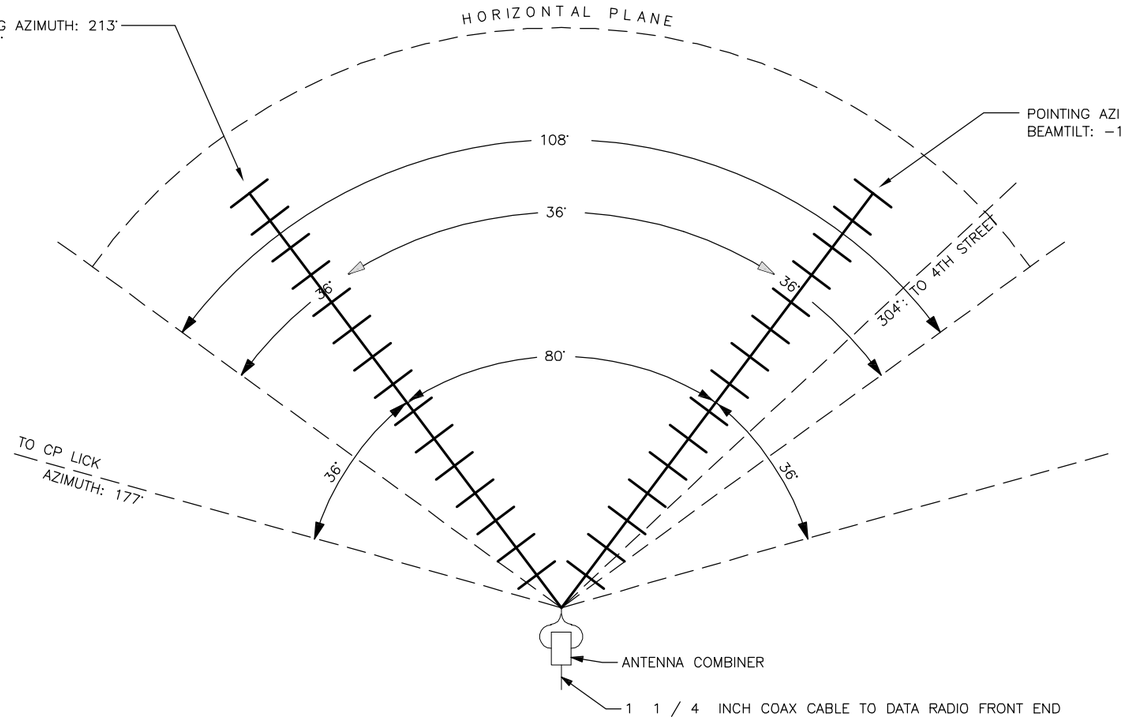
REV: | EDITION: FOURTH

TRAIN CONTROL

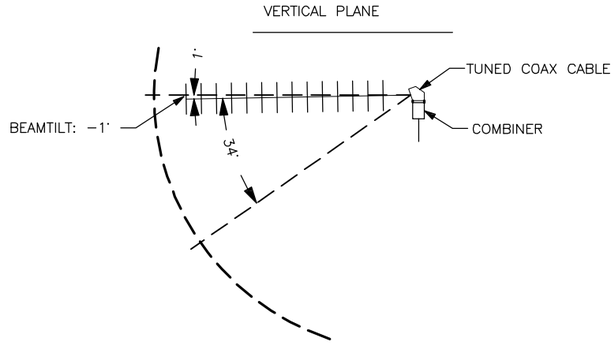
STANDARD DRAWING NO.: SD–6602

Manufacturer Mfg. Part Number	MAXRAD MYA93012
896–960 MHz Yagi/Corner Reflector Antenna	
Antenna Type:	12 – ELEMENT YAGI
DESCRIPTION:	12 ELEMENT YAGI. 11 dB DIRECTIONAL GAIN. SOLID ELEMENTS MOUNTED THROUGH BOOM FOR LONG LIFE. ALSO AVAILABLE WITH A DURABLE BLACK FINISH.
ELECTRICAL SPECIFICATIONS General Frequency (MHz): Bandwidth @ rated VSWR (MHz) Specific Frequency: see below	 806–960 80
Gain (dBd): Gain (dBi):	11 13, 15
Horizontal Beamwidth (degrees): Vertical Beamwidth (degrees):	36 DEG. 34 DEG.
Front to Back Ratio (dB): Maximum Power Input (W): VSWR @ 50 ohms:	20 dB 150 WATTS 1.5:1
Polarization: Lightning Protection:	VERT./HORIZ. DC GROUND
MECHANICAL SPECIFICATIONS Size (HxWxD): Weight (Lbs):	 4' 2
Rated Wind Velocity (MPH): Wind Load, Flat Plate (Ft2): Lateral Thrust (Lbs): Bending Moment (ft Lbs):	125 0.27 16.6 23.3

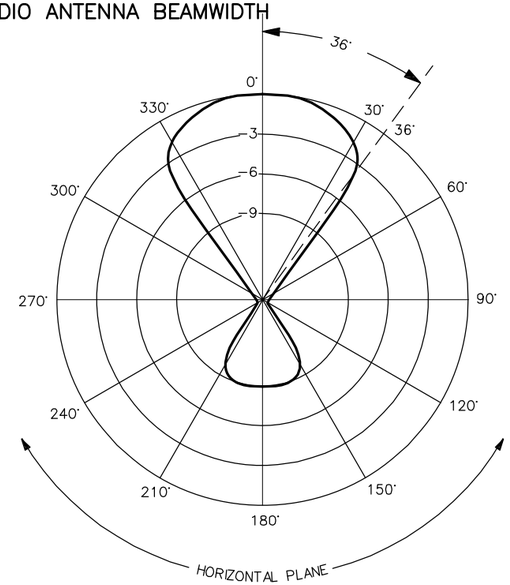
DATA RADIO BASE STATION ANTENNA
SINGLE ANTENNA SPECIFICATIONS



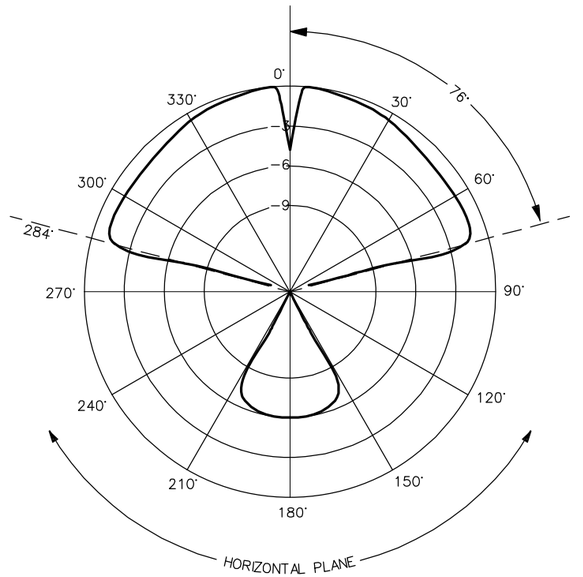
DESIGN OF CALTRAIN DATA RADIO ANTENNA BEAMWIDTH



NOTE: THE 34° ANGLE REPRESENTS
THE VERTICAL BEAM WIDTH



SINGLE ANTENNA; VERTICALLY POLARIZED



2 ANTENNA PHASED ARRAY; VERTICALLY POLARIZED

NOTES:

1. 0dB REFERENCE ON SINGLE ANTENNA PATTERN CORRESPONDS TO 13dBi GAIN.
2. 0dB REFERENCE ON PHASED ARRAY PATTERN CORRESPONDS TO 15dBi GAIN.
3. ANTENNA POINTING AZIMUTHS ARE WITH RESPECT TO TRUE NORTH.

REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

TRAIN CONTROL COMMUNICATION
ATCS (DATA) RADIO SYSTEM
MONUMENT PEAK BASE STATION
ATCS ANTENNA ARRAY DETAILS

CADD FILE NAME: SD–6603

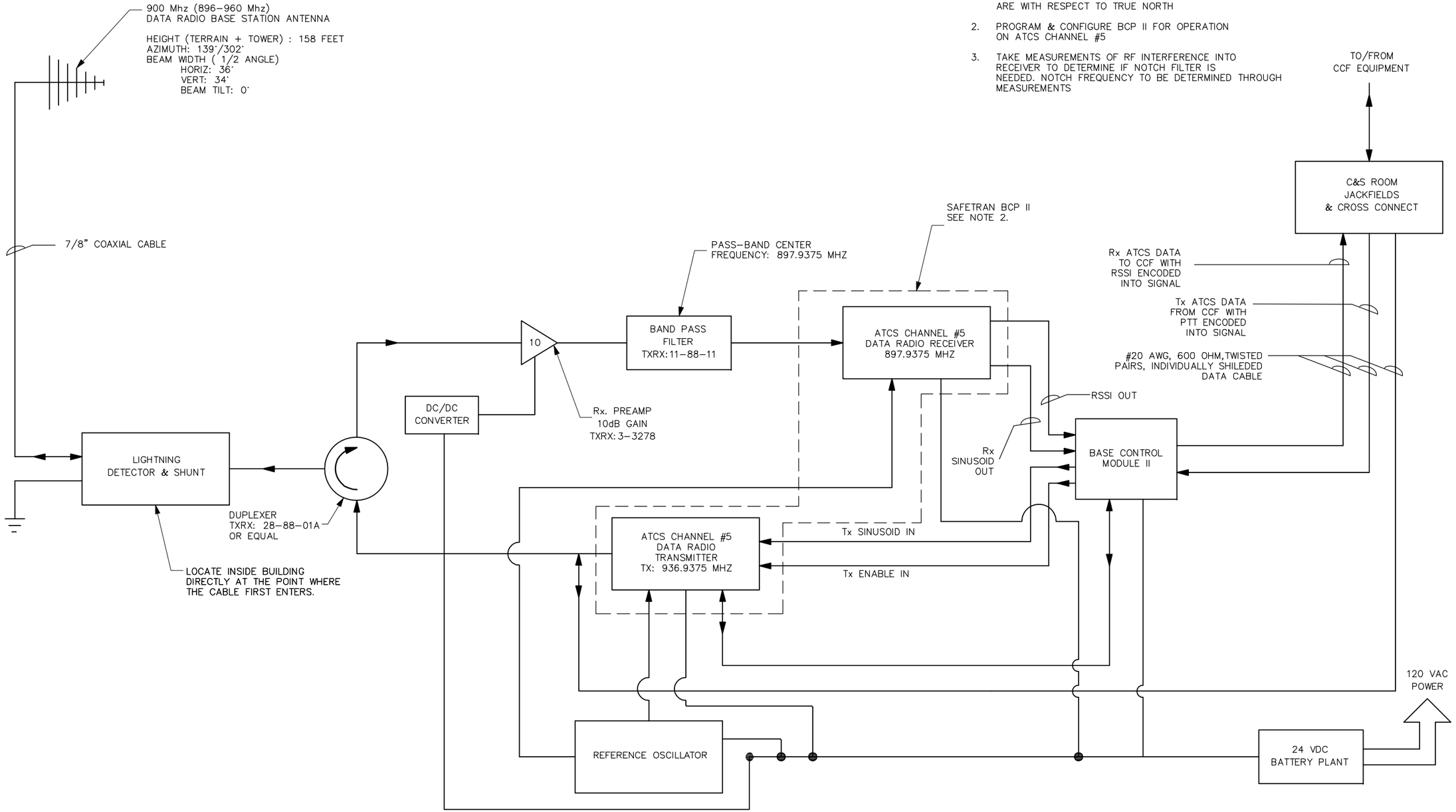
REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD–6603

NOTE:

1. ALL ANTENNA AZIMUTH ORIENTATIONS SHOWN ARE WITH RESPECT TO TRUE NORTH
2. PROGRAM & CONFIGURE BCP II FOR OPERATION ON ATCS CHANNEL #5
3. TAKE MEASUREMENTS OF RF INTERFERENCE INTO RECEIVER TO DETERMINE IF NOTCH FILTER IS NEEDED. NOTCH FREQUENCY TO BE DETERMINED THROUGH MEASUREMENTS



REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

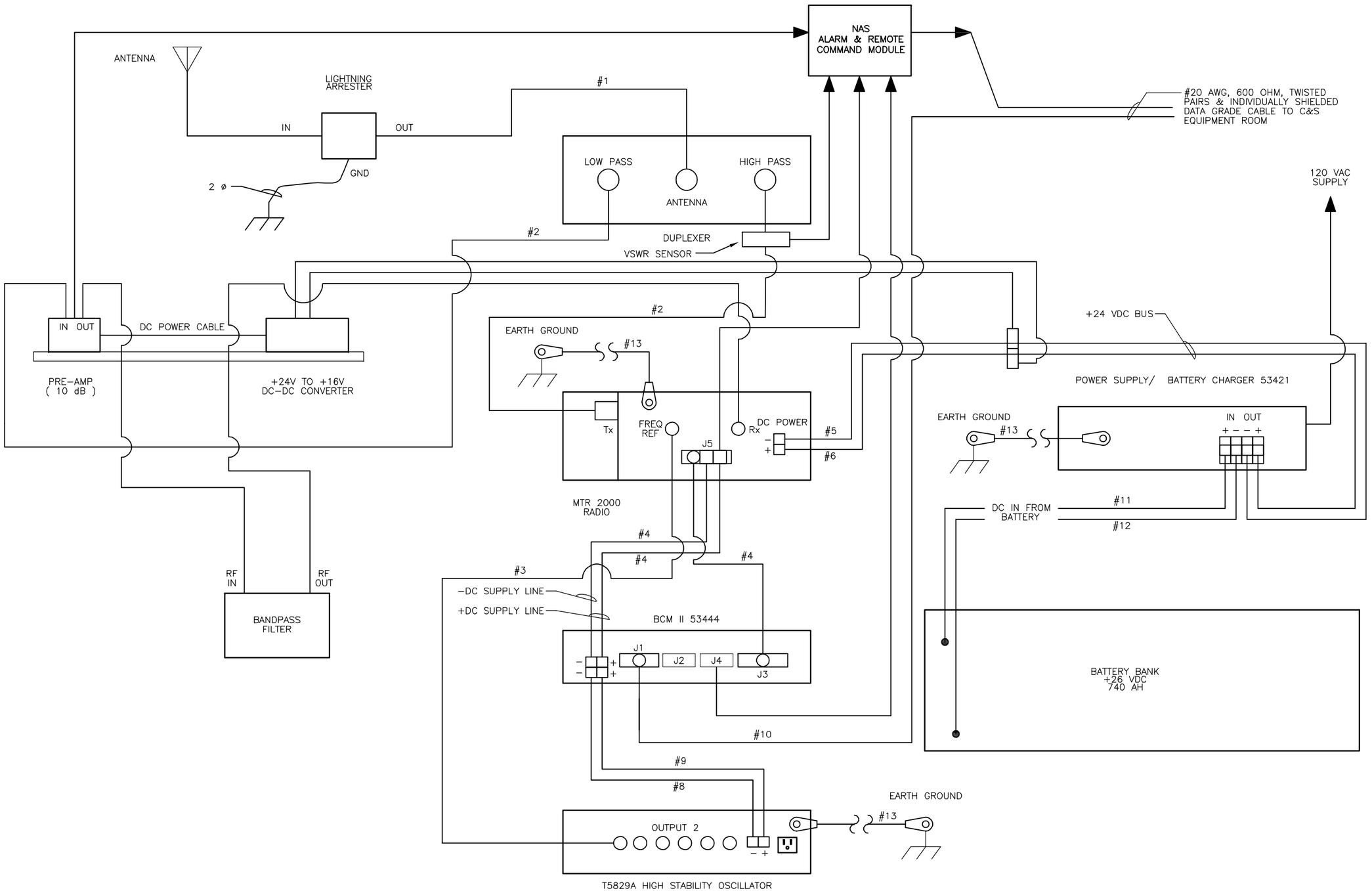
TRAIN CONTROL COMMUNICATION
ATCS (DATA) RADIO SYSTEM
CEMOF BASE STATION
BLOCK DIAGRAM OF ATCS DATA RADIO

CADD FILE NAME: SD–6604

REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD–6604



REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP	DESCRIPTION

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

TRAIN CONTROL COMMUNICATION
ATCS (DATA) RADIO SYSTEM
CEMOF BASE STATION
DATA RADIO INSTALLATION DETAILS

CADD FILE NAME: SD-6605

REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD-6605

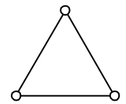
ACCORDING TO ANSI/EIA-222-F 1996

90 mph/78 + 1/2" RADIAL ICE W/ (3 second gust) PER OBC AND IBC				
	CaAa	FLAT PLATE AREA	WEIGHT	ELEVATION
NO ICE	40.0 SQ.FT	22.22 SQ.FT	1200 LBS	60.0 FT
1/2 ICE	49.5 SQ.FT	27.50 SQ.FT	1600 LBS	60.0 FT
NO ICE	71.5 SQ.FT	39.72 SQ.FT	900 LBS	60 FT TO 30 FT
1/2 ICE	87.0 SQ.FT	48.33 SQ.FT	1700 LBS	60 FT TO 30 FT
(1) – 7/8 COAX ELEVATION 0 FT TO 60 FT				
CLIMBING LADDER ELEVATION 0 FT TO 40 FT				

70 mph/51 mph + 1/2" RADIAL ICE (FASTEST MPH) PER EIA-222-F				
	CaAa	FLAT PLATE AREA	WEIGHT	ELEVATION
NO ICE	42.0 SQ.FT	23.33 SQ.FT	1200 LBS	60.0 FT
1/2 ICE	52.0 SQ.FT	28.89 SQ.FT	1600 LBS	60.0 FT
NO ICE	76.5 SQ.FT	42.50 SQ.FT	900 LBS	60 FT TO 30 FT
1/2 ICE	93.0 SQ.FT	51.67 SQ.FT	1700 LBS	60 FT TO 30 FT
(1) – 7/8 COAX ELEVATION 0 FT TO 60 FT				
CLIMBING LADDER ELEVATION 0 FT TO 40 FT				

LEGS	2.375" X 0.154"	1.9" X 0.145"	2.0 X 10 GA	*	ASTM
DIAGONALS	L1 3/4 X 1 3/4 X 1/8	L1 1/2 X 1 1/2 X 1/8	L1 3/4 X 1 3/4 X 1/8	A36	
GIRTS	L1 3/4 X 1 3/4 X 1/8	L1 1/2 X 1 1/2 X 1/8	L1 1/4 X 1 1/4 X 1/8		
BRACE BOLTS	(1) – 5/8" DIA		– SHOP WELDED –	A307 GRADE B	
SPLICE BOLTS		(4) – 1/2" DIA	92) – 1/2" DIA		
ANCHOR BOLTS		(4) – 3/4" DIA (C1018 THREADED ROD)			

* PIPE LEGS 42 KSI MIN YIELD
10GA TUBE LEGS 30KSI MIN YIELD

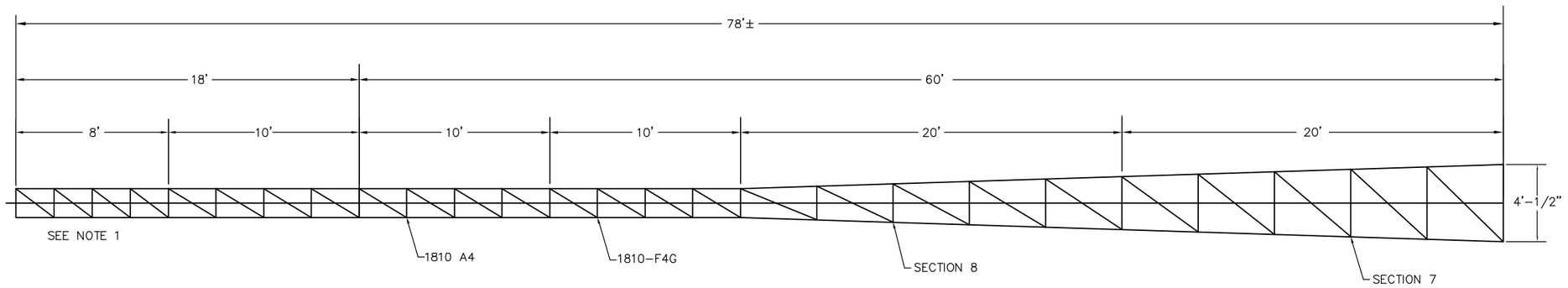


INTERIOR BRACING
(NOT REQUIRED)

FOUNDATION REACTIONS:

TOTAL MOMENT: 90.7 FT-KIPS
TOTAL SHEAR: 4 KIPS
TOTAL DOWNLOAD: 3 KIPS

NEW TOWER SHALL BE ENGINEER APPROVED EQUAL OR BETTER THAN TOWER SHOWN HERE



REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

TRAIN CONTROL COMMUNICATION
ATCS (DATA) RADIO SYSTEM
CEMOF BASE STATION
TOWER EXTENSION DETAILS

CADD FILE NAME: SD-6606

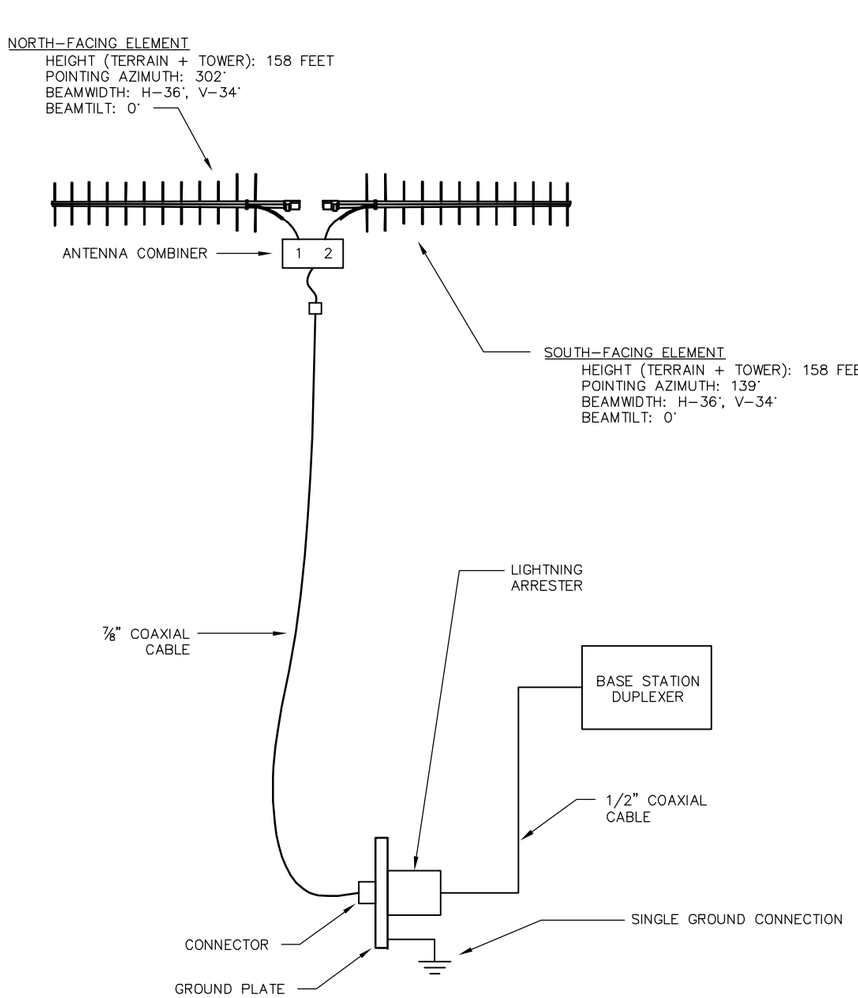
REV: | EDITION: FOURTH

TRAIN CONTROL

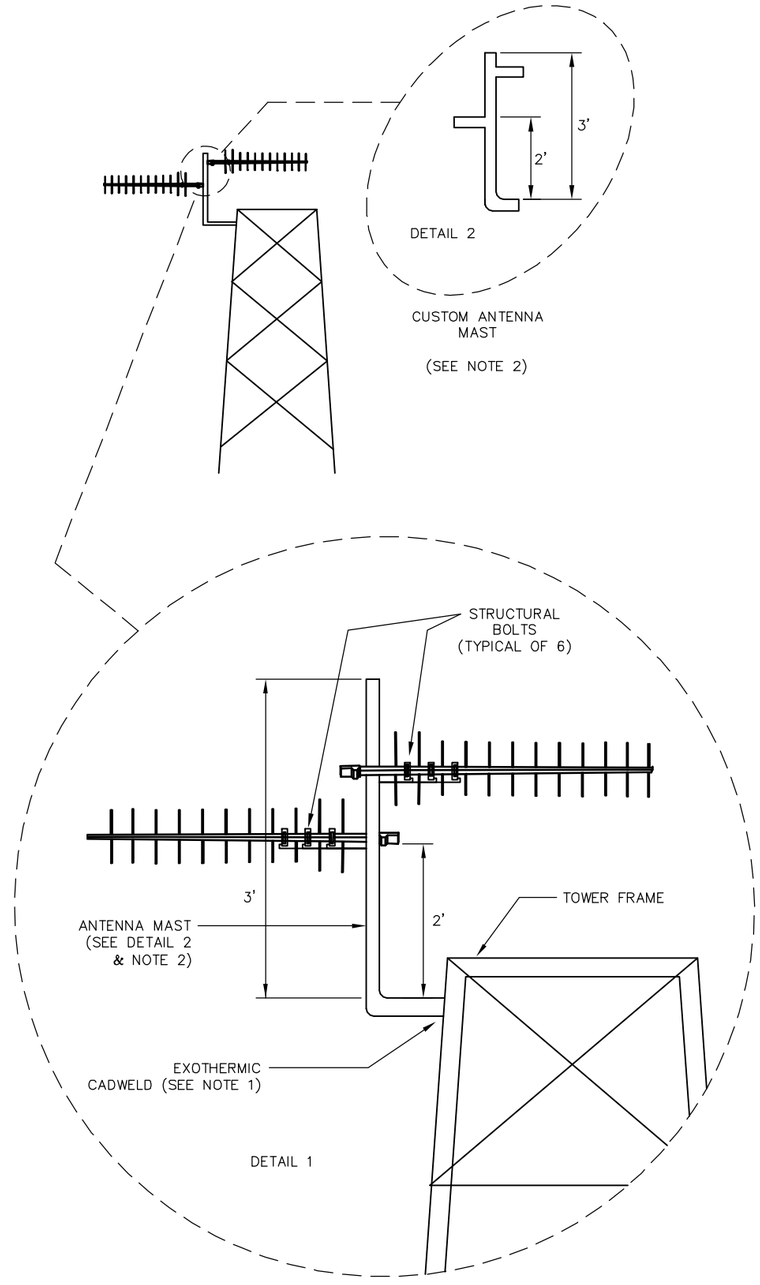
STANDARD DRAWING NO.: SD-6606

Manufacturer Mfg. Part Number	MAXRAD MYA93012
896–960 MHz Yagi/Corner Reflector Antenna	
Antenna Type:	12 – ELEMENT YAGI
DESCRIPTION:	12 ELEMENT YAGI. 11 dB DIRECTIONAL GAIN. SOLID ELEMENTS MOUNTED THROUGH BOOM FOR LONG LIFE. ALSO AVAILABLE WITH A DURABLE BLACK FINISH.
ELECTRICAL SPECIFICATIONS: General Frequency (MHz): Bandwidth @ rated VSWR (MHz) Specific Frequency: see below	 806–960 80
Gain (dBd): Gain (dBi):	11 13, 15
Horizontal Beamwidth (degrees): Vertical Beamwidth (degrees):	36 DEG. 34 DEG.
Front to Back Ratio (dB): Maximum Power Input (W): VSWR @ 50 ohms:	20 dB 150 WATTS 1.5:1
Polarization: Lightning Protection:	VERT./HORIZ. DC GROUND
MECHANICAL SPECIFICATIONS: Size (HxWxD): Weight (Lbs):	 4' 2
Rated Wind Velocity (MPH): Wind Load, Flat Plate (Ft2): Lateral Thrust (Lbs): Bending Moment (ft Lbs):	125 0.27 16.6 23.3

DATA RADIO BASE STATION ANTENNA
SINGLE ANTENNA SPECIFICATIONS



SINGLE LINE DRAWING OF
ANTENNA SYSTEM



ANTENNA MOUNTING
(SEE NOTE 1)

NOTES:

1. ANTENNA MASTS SHALL USE AN 'EXOTHERMIC' CADWELD TO THE TOWER FRAME. THIS CADWELD SHALL POSSESS THE STRENGTH TO MEET THE STRUCTURAL AND WIND LOADING REQUIREMENTS OF THE TECHNICAL SPECIFICATION. THE CONTRACTOR'S REGISTERED CIVIL/STRUCTURAL ENGINEER SHALL DETERMINE THE APPROPRIATE EXOTHERMIC AND STRUCTURAL WELD AND SUBMIT THE CALCULATIONS TO CALTRAIN FOR REVIEW AND APPROVAL.
2. A CUSTOM ANTENNA MAST IS REQUIRED. MAST SHALL BE OF AN EXCELLENT CONDUCTOR. ANTENNA SHALL BE GROUNDED THROUGH THE MAST AND TOWER TO GROUND. CONTRACTOR SHALL USE THIS CONFIGURATION OR ENGINEER APPROVED EQUAL.
3. ANTENNA POINTING AZIMUTHS ARE WITH RESPECT TO TRUE NORTH.

REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

PENINSULA CORRIDOR JOINT POWERS BOARD

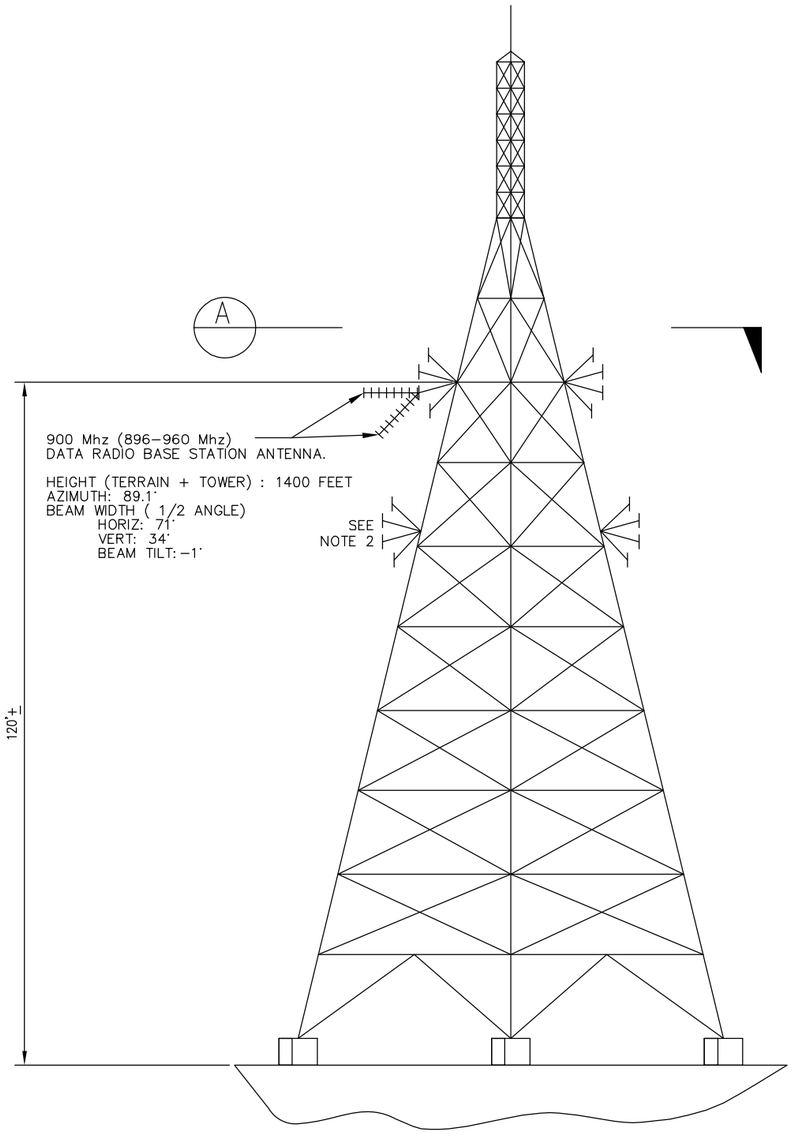
APPROVED BY:
Bin Zhang
DEPUTY DIRECTOR, ENGINEERING

Caltrain
1250 San Carlos Avenue
San Carlos, CA 94070

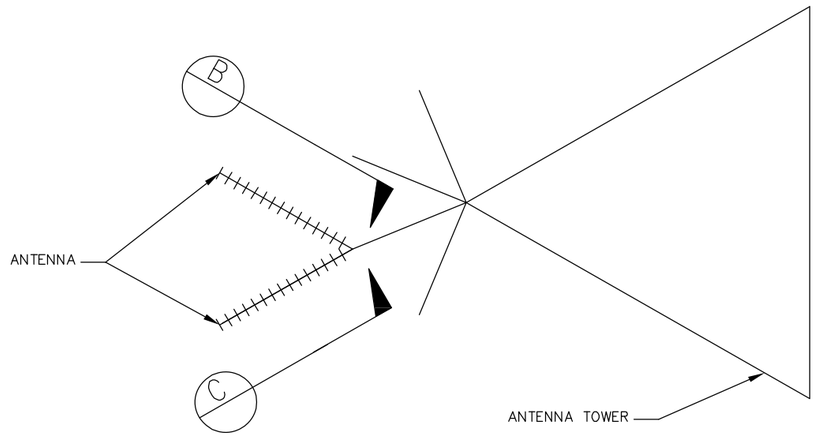
STANDARD DRAWINGS

TRAIN CONTROL COMMUNICATION
ATCS (DATA) RADIO SYSTEM
CEMOF BASE STATION
TOWER INSTALLATION DETAILS

CADD FILE NAME: SD–6607
REV: | EDITION: FOURTH
TRAIN CONTROL
STANDARD DRAWING NO.: SD–6607



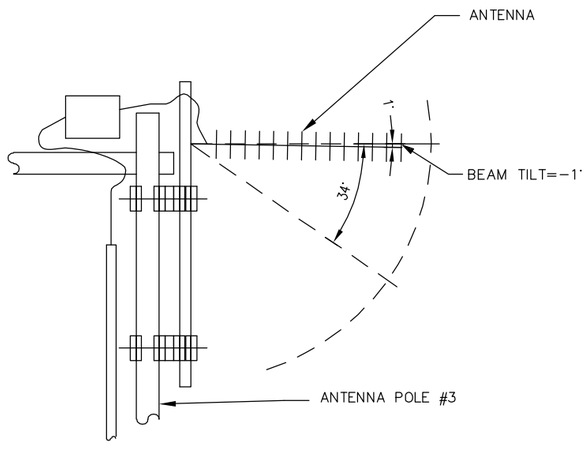
SAN BRUNO MOUNTAIN BASE STATION
ANTENNA TOWER
NOT TO SCALE



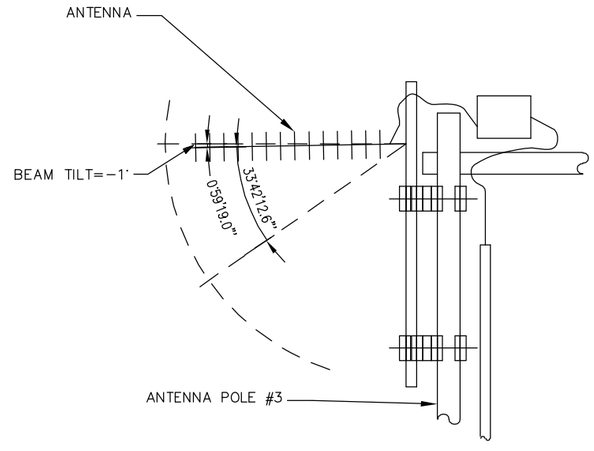
ANTENNA PLAN VIEW A
NOT TO SCALE

NOTE:

ALL ANTENNA AZIMUTH ORIENTATIONS SHOWN ARE WITH RESPECT TO TRUE NORTH.



ANTENNA #1 ELEVATION VIEW B
NOT TO SCALE



ANTENNA #2 ELEVATION VIEW C
NOT TO SCALE

REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

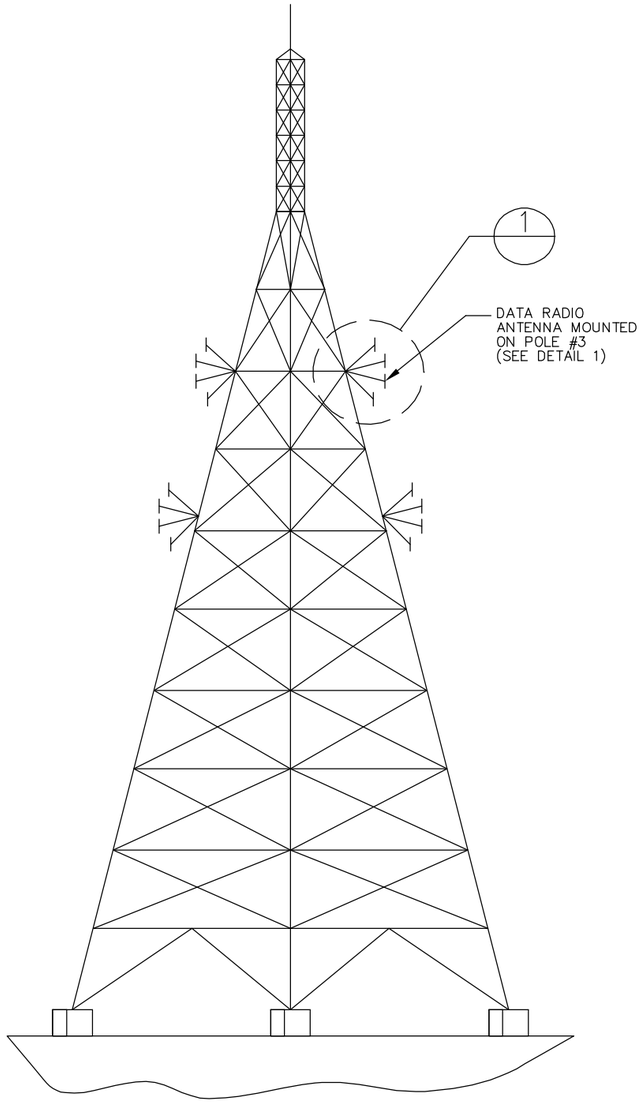
TRAIN CONTROL COMMUNICATION
ATCS (DATA) RADIO SYSTEM
SAN BRUNO MOUNTAIN
BASE STATION SITE
ANTENNA DETAILS

CADD FILE NAME: SD–6608

REV: | EDITION: FOURTH

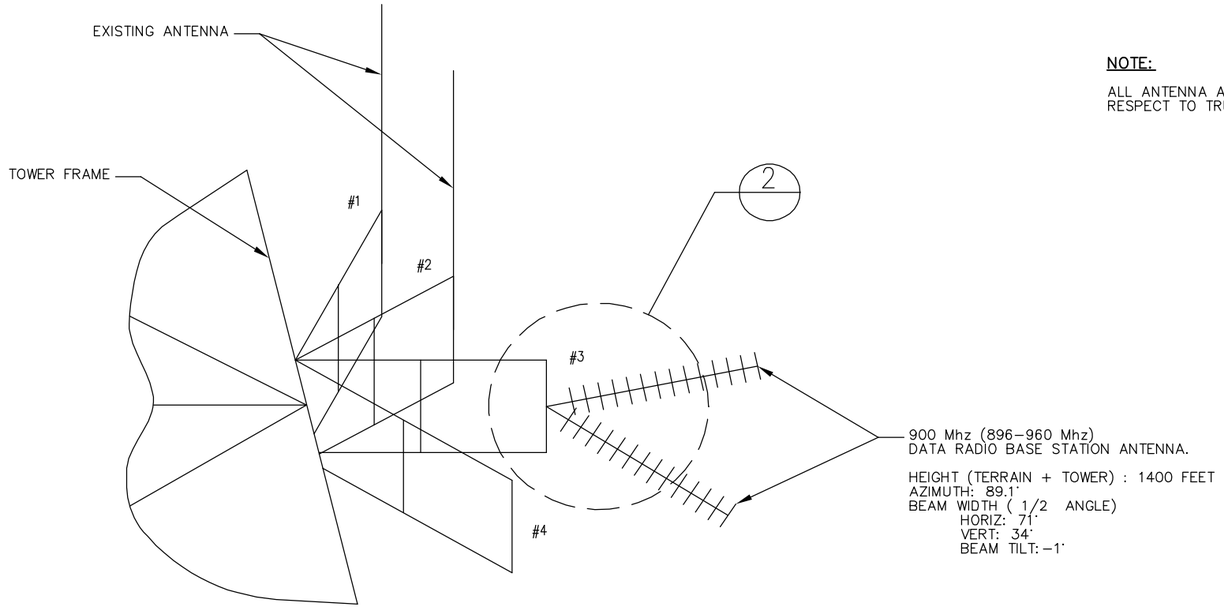
TRAIN CONTROL

STANDARD DRAWING NO.: SD–6608



SAN BRUNO MOUNTAIN BASE STATION
ANTENNA TOWER

NOT TO SCALE

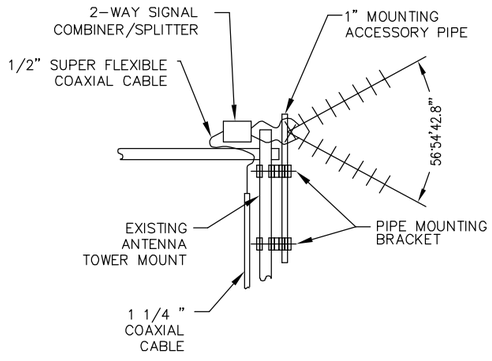


RADIO ANTENNA DETAIL 1

NOT TO SCALE

NOTE:

ALL ANTENNA AZIMUTH ORIENTATIONS SHOWN ARE WITH RESPECT TO TRUE NORTH.



RADIO ANTENNA
INSTALLATION DETAIL 2

NOT TO SCALE

REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

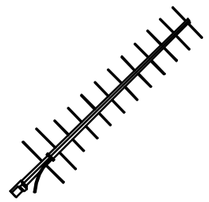
TRAIN CONTROL COMMUNICATION
ATCS (DATA) RADIO SYSTEM
SAN BRUNO MOUNTAIN
BASE STATION SITE
ANTENNA TOWER DETAILS

CADD FILE NAME: SD–6609

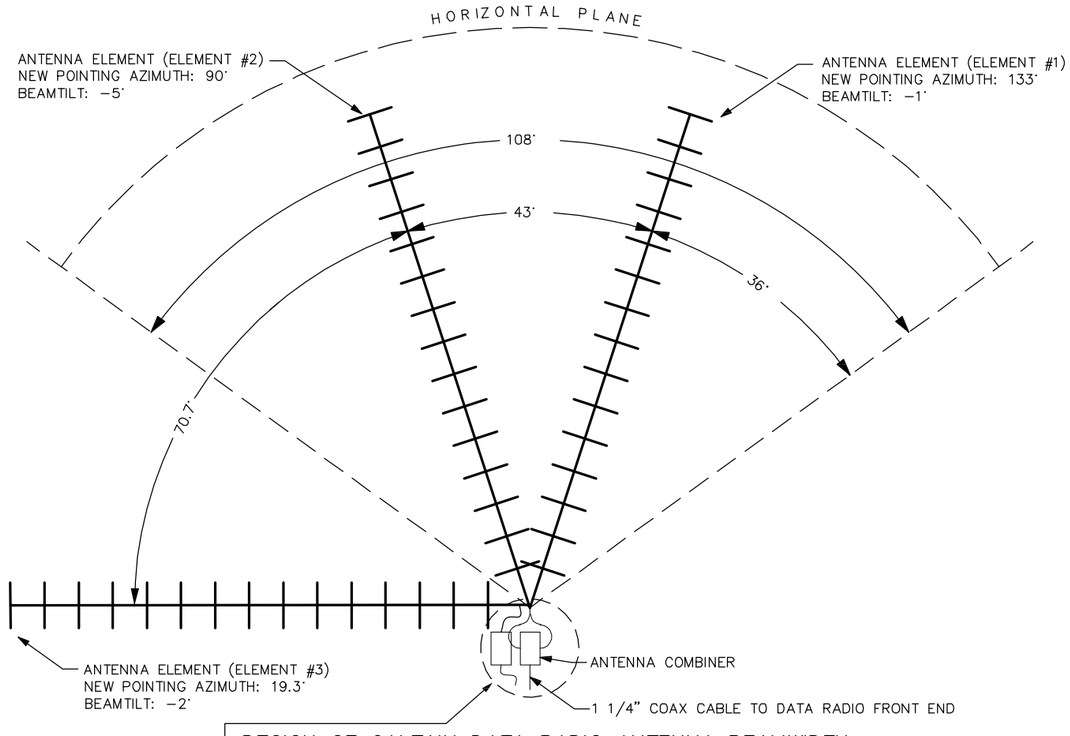
REV: | EDITION: FOURTH

TRAIN CONTROL

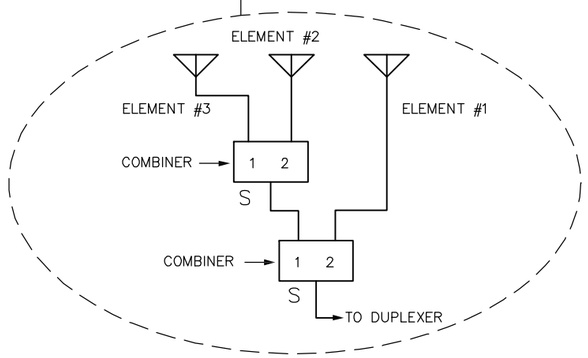
STANDARD DRAWING NO.: SD–6609

Manufacturer Mfg. Part Number	MAXRAD MYA93012
896–960 MHz Yagi/Corner Reflector Antenna	
Antenna Type:	12 – ELEMENT YAGI
DESCRIPTION:	12 ELEMENT YAGI. 11 dB DIRECTIONAL GAIN. SOLID ELEMENTS MOUNTED THROUGH BOOM FOR LONG LIFE. ALSO AVAILABLE WITH A DURABLE BLACK FINISH.
ELECTRICAL SPECIFICATIONS General Frequency (MHz): Bandwidth @ rated VSWR (MHz) Specific Frequency: see below	 806–960 80
Gain (dBd): Gain (dBi):	11 13, 15
Horizontal Beamwidth (degrees): Vertical Beamwidth (degrees):	36 DEG. 34 DEG.
Front to Back Ratio (dB): Maximum Power Input (W): VSWR @ 50 ohms:	20 dB 150 WATTS 1.5:1
Polarization: Lightning Protection:	VERT./HORIZ. DC GROUND
MECHANICAL SPECIFICATIONS Size (HxWxD): Weight (Lbs):	 4' 2
Rated Wind Velocity (MPH): Wind Load, Flat Plate (Ft2): Lateral Thrust (Lbs): Bending Moment (ft Lbs):	125 0.27 16.6 23.3

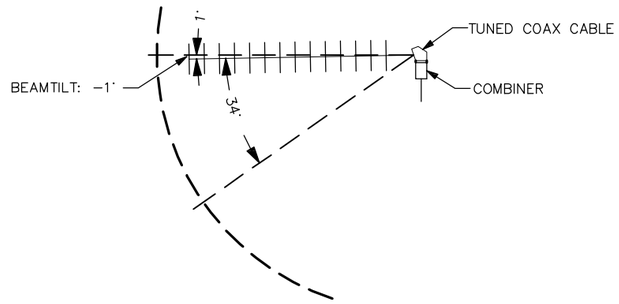
DATA RADIO BASE STATION ANTENNA SINGLE ANTENNA SPECIFICATIONS



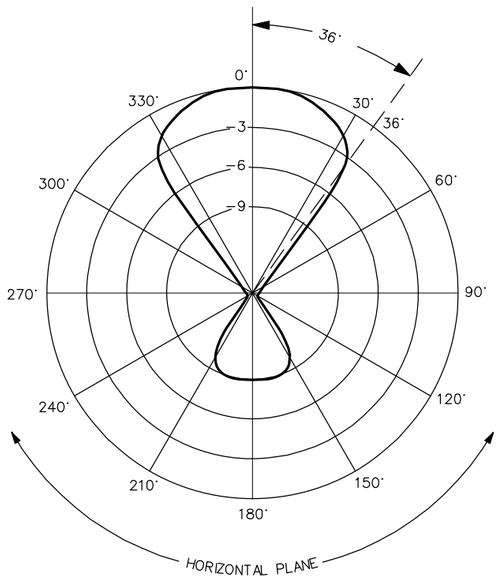
DESIGN OF CALTAIN DATA RADIO ANTENNA BEAMWIDTH



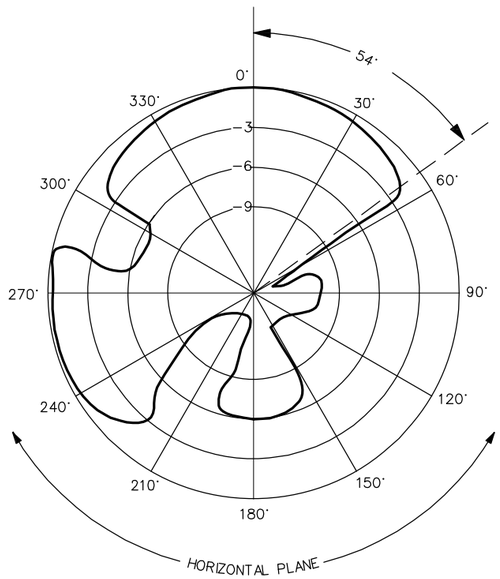
VERTICAL PLANE



NOTE: THE 34° ANGLE REPRESENTS THE VERTICAL BEAM WIDTH



SINGLE ANTENNA; VERTICALLY POLARIZED



3 ANTENNA PHASED ARRAY; VERTICALLY POLARIZED

NOTE:

1. 0 dB REFERENCE ON SINGLE ANTENNA PATTERN CORRESPONDS TO 13dBi GAIN
2. 0 dB REFERENCE ON PHASED ARRAY PATTERN CORRESPONDS TO 15dBi GAIN
3. ANTENNA POINTING AZIMUTHS ARE WITH RESPECT TO TRUE NORTH

REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP	DESCRIPTION

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

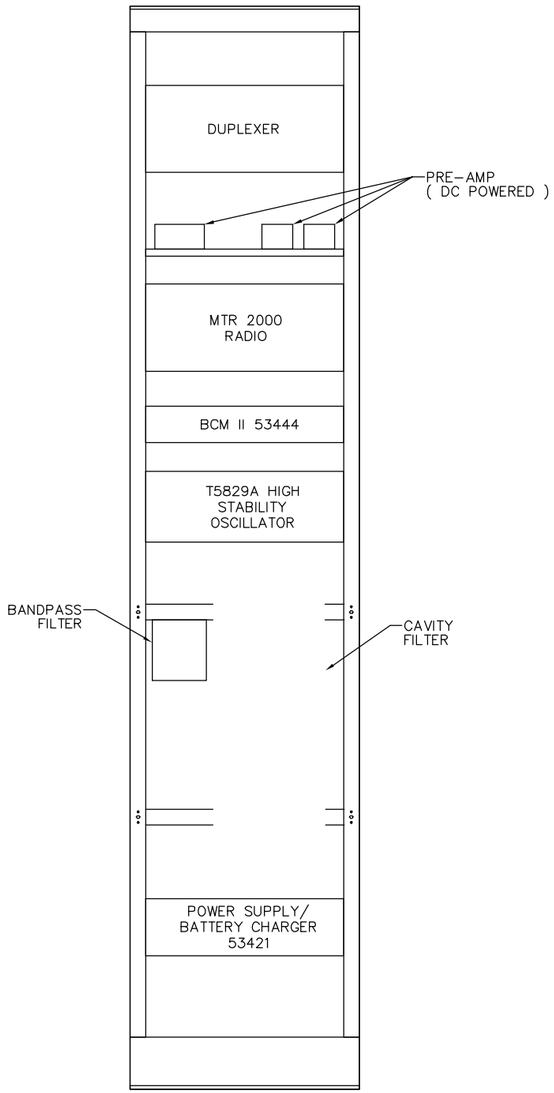
TRAIN CONTROL COMMUNICATION
ATCS (DATA) RADIO SYSTEM
SAN BRUNO MOUNTAIN
BASE STATION
ATCS ANTENNA ARRAY DETAILS

CADD FILE NAME: SD–6610

REV: | EDITION: FOURTH

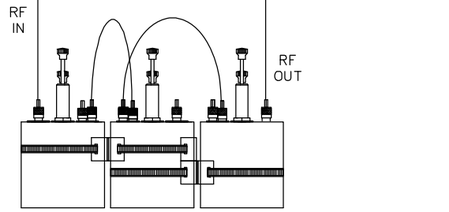
TRAIN CONTROL

STANDARD DRAWING NO.: SD–6610

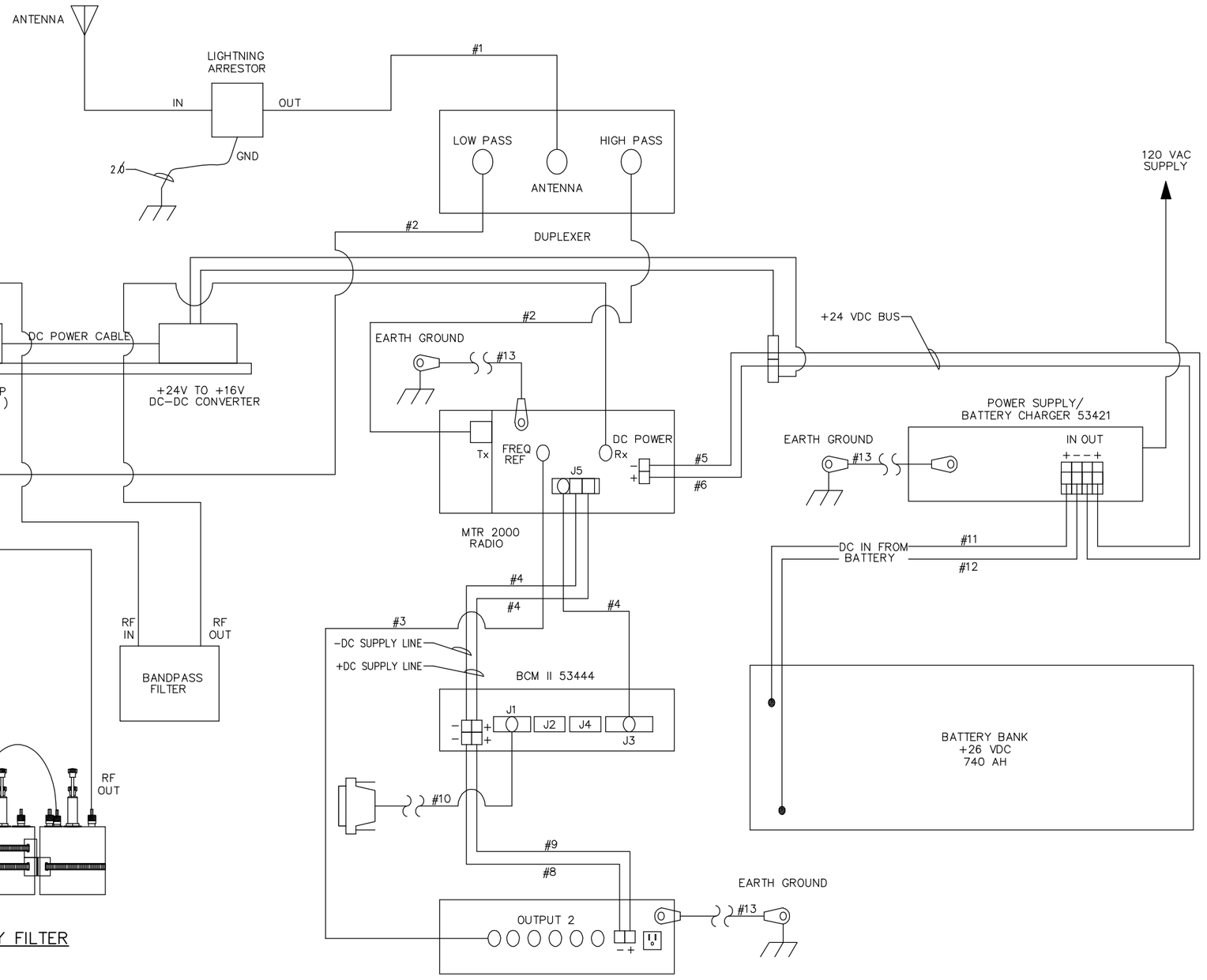


EQUIPMENT RACK
REAR ELEVATION VIEW

NOT TO SCALE



CAVITY FILTER



T5829A HIGH STABILITY OSCILLATOR

REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

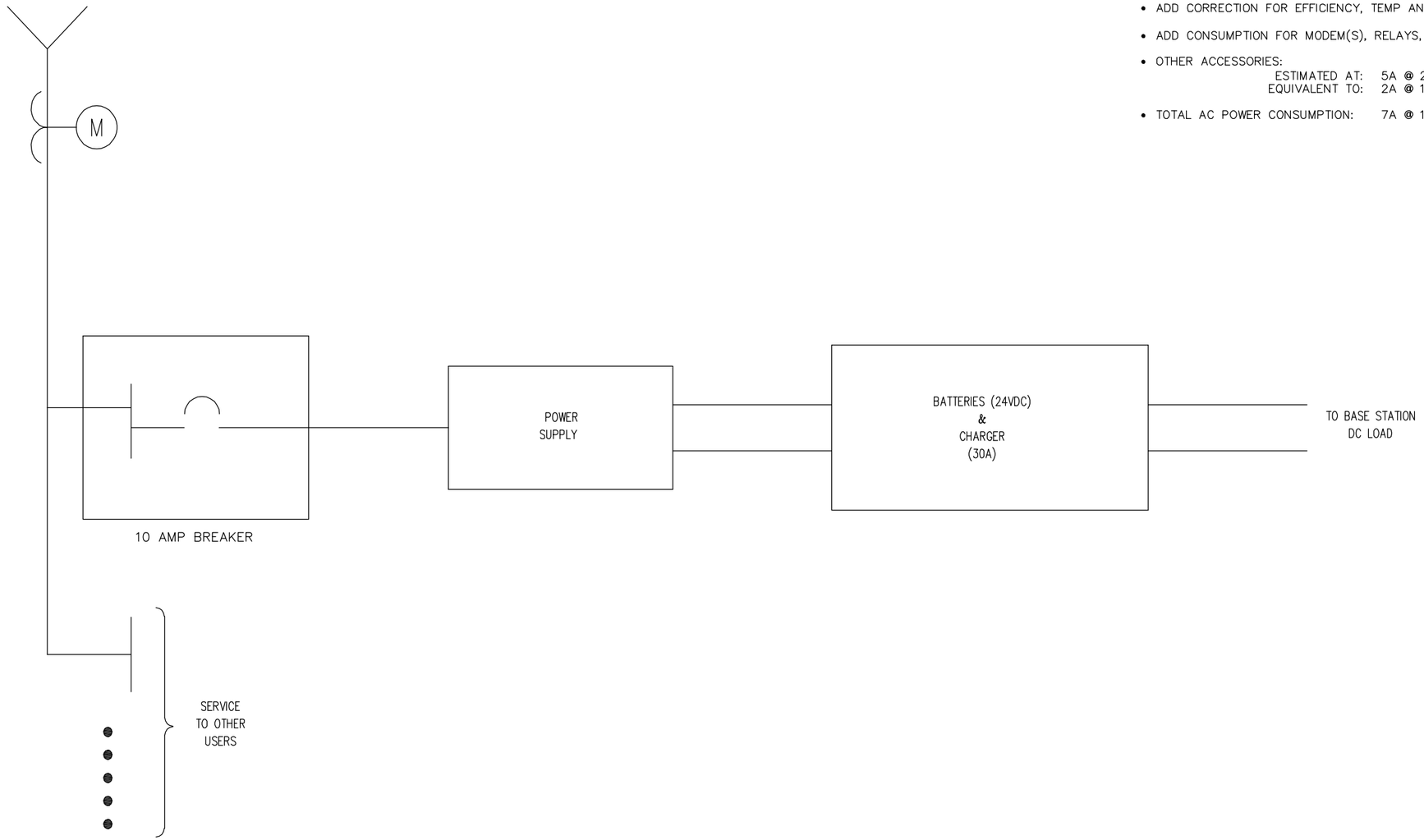
TRAIN CONTROL COMMUNICATION
ATCS (DATA) RADIO SYSTEM
BASE STATION
SIGNAL AND DC LINE DIAGRAM

CADD FILE NAME: SD-6611

REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD-6611



NOTE:

1. ELECTRICAL LOAD ANALYSIS:
   - DATA RADIO POWER CONSUMPTION: 11A 24VDC
     EQUIVALENT TO: 3A @ 110 VAC
   - ADD CORRECTION FOR EFFICIENCY, TEMP AND MARGIN = 5A @ 110VAC
   - ADD CONSUMPTION FOR MODEM(S), RELAYS, PRE-AMPS
   - OTHER ACCESSORIES:
     ESTIMATED AT: 5A @ 24VDC(MAX)
     EQUIVALENT TO: 2A @ 110VAC
   - TOTAL AC POWER CONSUMPTION: 7A @ 110VAC

REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

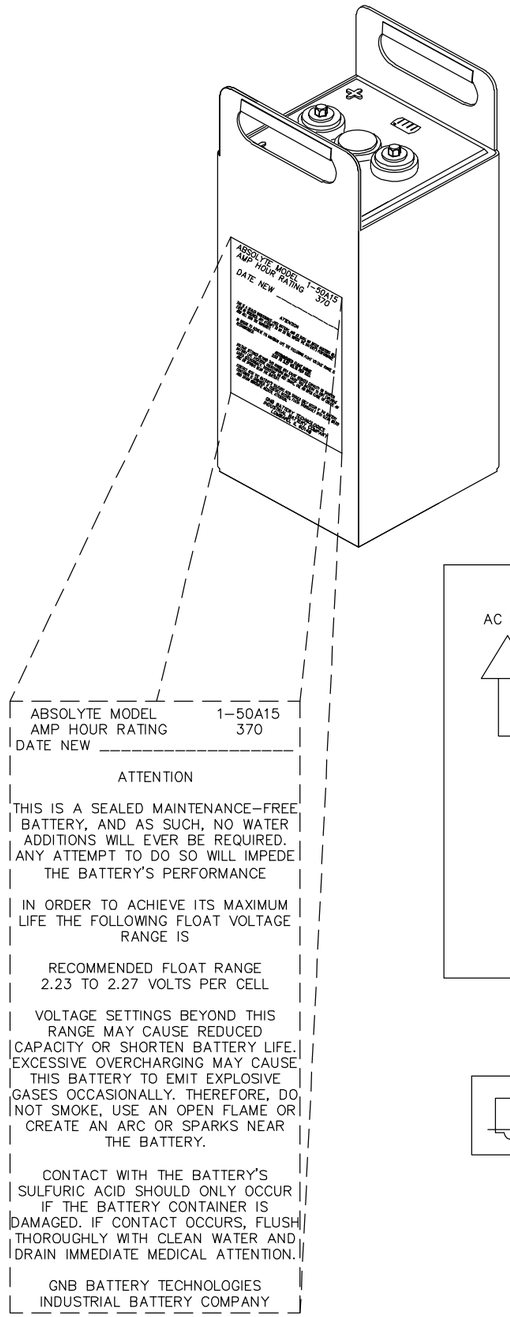
TRAIN CONTROL COMMUNICATION
ATCS (DATA) RADIO SYSTEM
BASE STATION
ELECTRICAL LOAD ANALYSIS

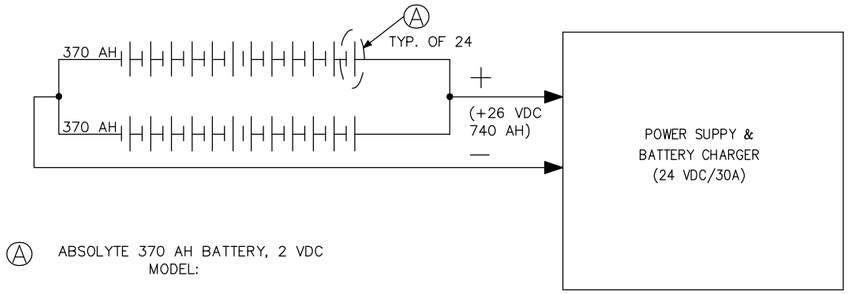
CADD FILE NAME: SD-6612

REV: | EDITION: FOURTH

TRAIN CONTROL

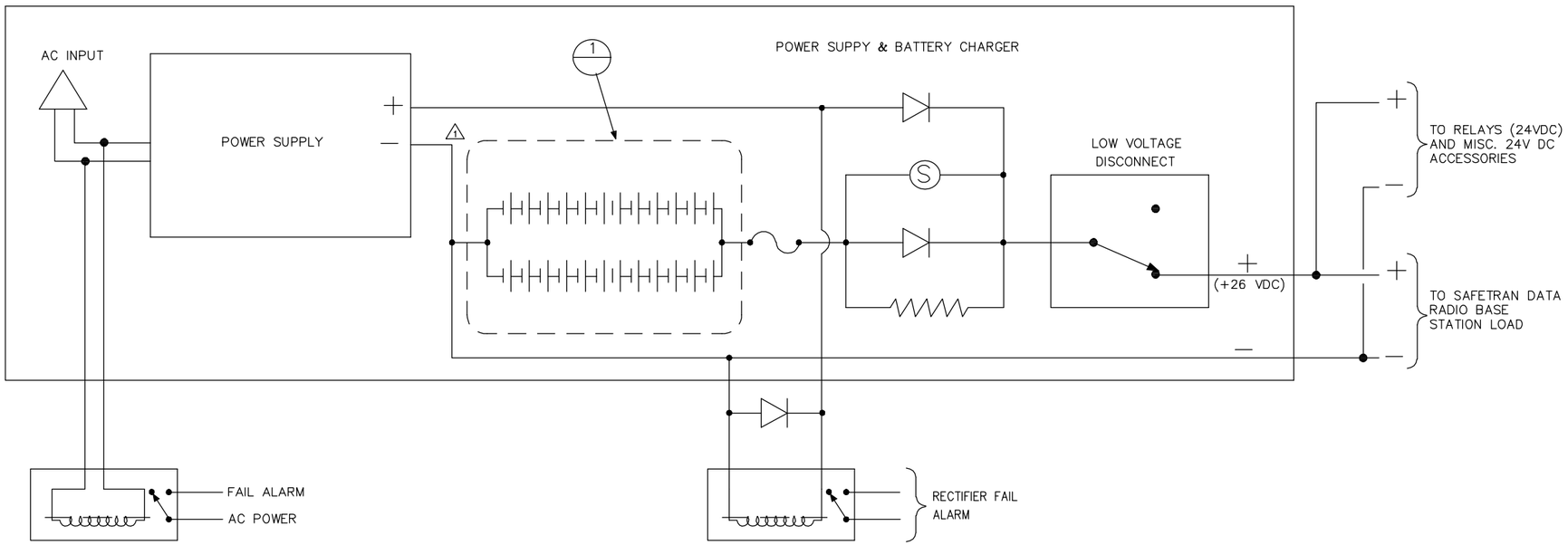
STANDARD DRAWING NO.: SD-6612





Ⓐ ABSOLYTE 370 AH BATTERY, 2 VDC MODEL:

BATTERY DETAIL ①
NOT TO SCALE



NOTE:

1. ALL EQUIPMENT WILL BE POWERED FROM 24VDC BATTERY PLANT WHICH WILL BE CONFIGURED TO FLOAT CHANGE.

DATA RADIO BASE STATION BATTERY CAPACITY CACULATION

WORST CASE SCENARIO: DUTY CYCLE: 50% ASSUME 40/40/20 FOR TX/RX/STANDBY.
BCP DC POWER CONSUMPTION: 11A Tx, 1A Rx, 1A STANDBY
CAPACITY REQUIRED (FOR 48 HOUR CONTINUOUS BACKUP)
= 11 X 19.2 + 1 X 19.2 + 1 X 9.6 = 211.2 + 19.2 + 9.6
CAPACITY REQUIRED = 240 AH
CORRECTED FOR TEMP, AGING & MARGIN = 240 X 1.1 X 1.2 X 1.25 = 396 AH
ADD RELAYS, BASE CONTROL MODULE & DC ACCESSORIES = 200 AH
FOR A TOTAL FOR ONE BASE STATION OF = 596 AH
ADD 20% CONVENIENCE MARGIN = 715 AH
TOTAL BATTERY SUPPLIED = 740 AH

REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP	DESCRIPTION

PENINSULA CORRIDOR JOINT POWERS BOARD

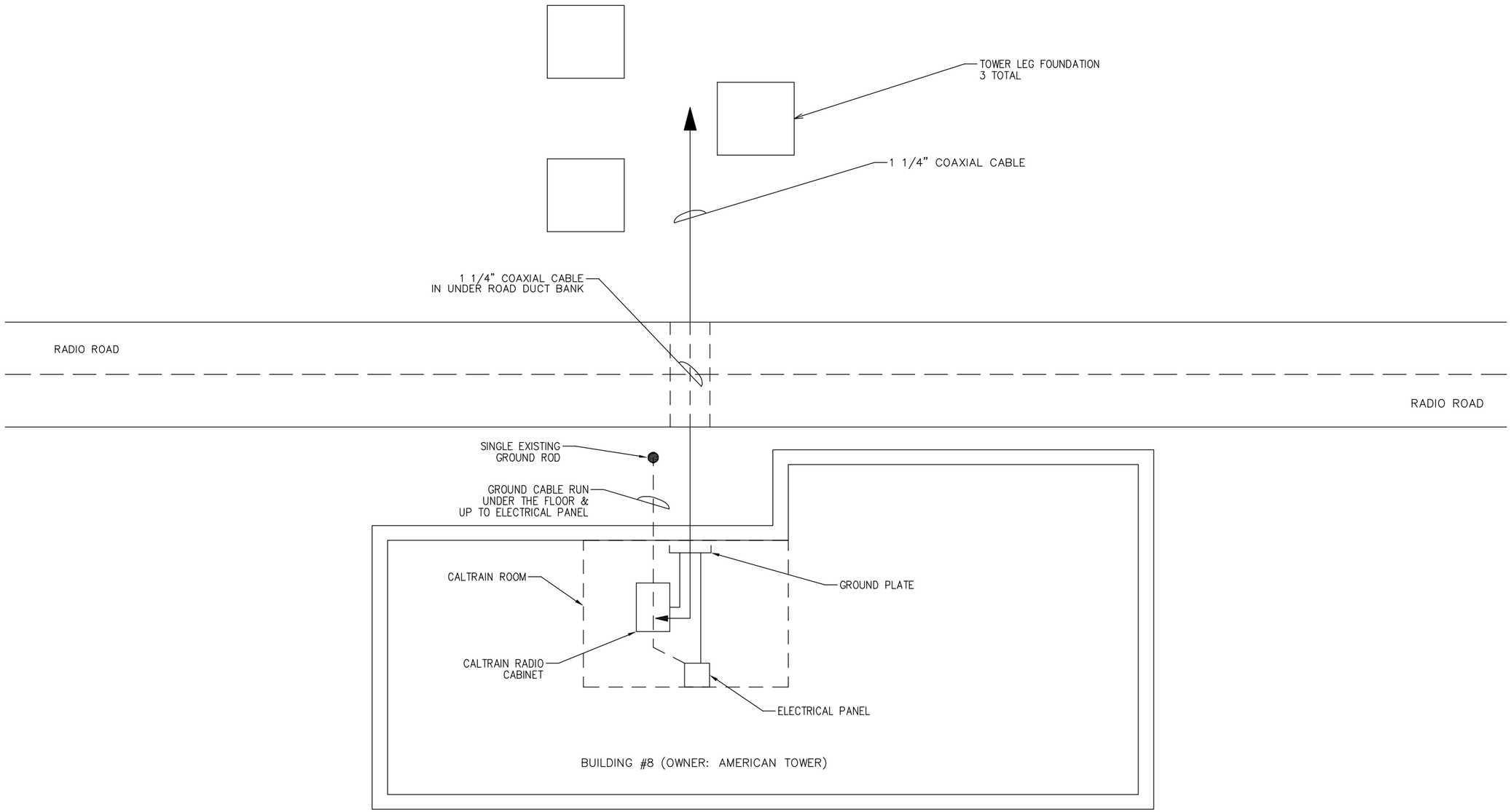
APPROVED BY:
Bin Zhang
DEPUTY DIRECTOR, ENGINEERING

Caltrain®
1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

TRAIN CONTROL COMMUNICATION
ATCS (DATA) RADIO SYSTEM
BASE STATION
BATTERY BACKUP SYSTEM

CADD FILE NAME: SD-6613
REV: EDITION: FOURTH
TRAIN CONTROL
STANDARD DRAWING NO.: SD-6613



REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

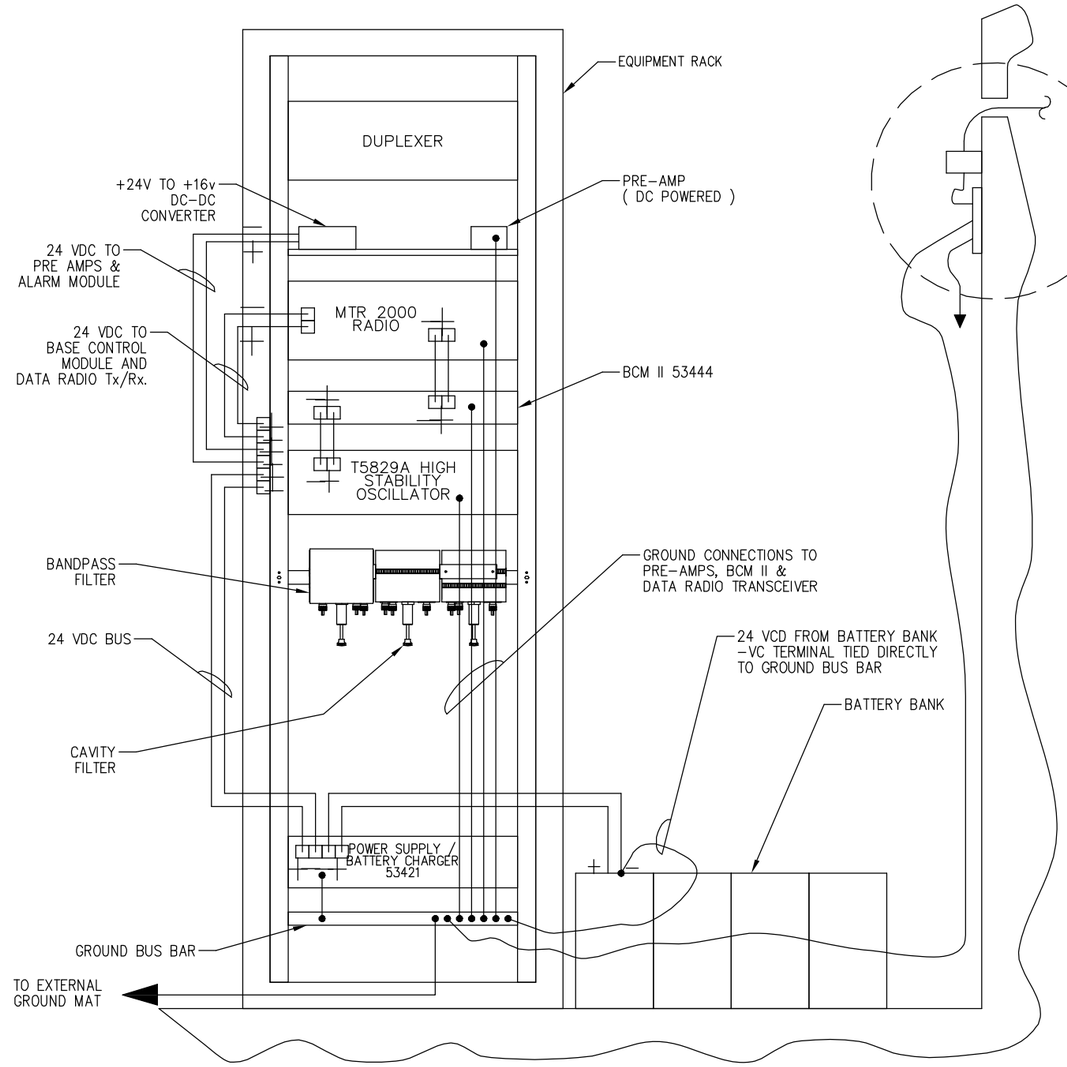
TRAIN CONTROL COMMUNICATION
ATCS (DATA) RADIO SYSTEM
SAN BRUNO MOUNTAIN STATION
AMERICAN TOWER BUILDING NO. 8

CADD FILE NAME: SD-6614

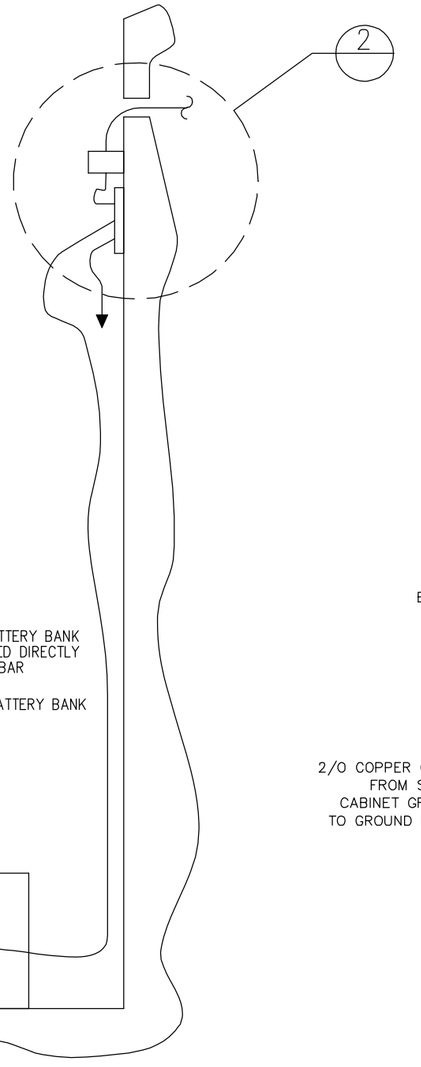
REV: | EDITION: FOURTH

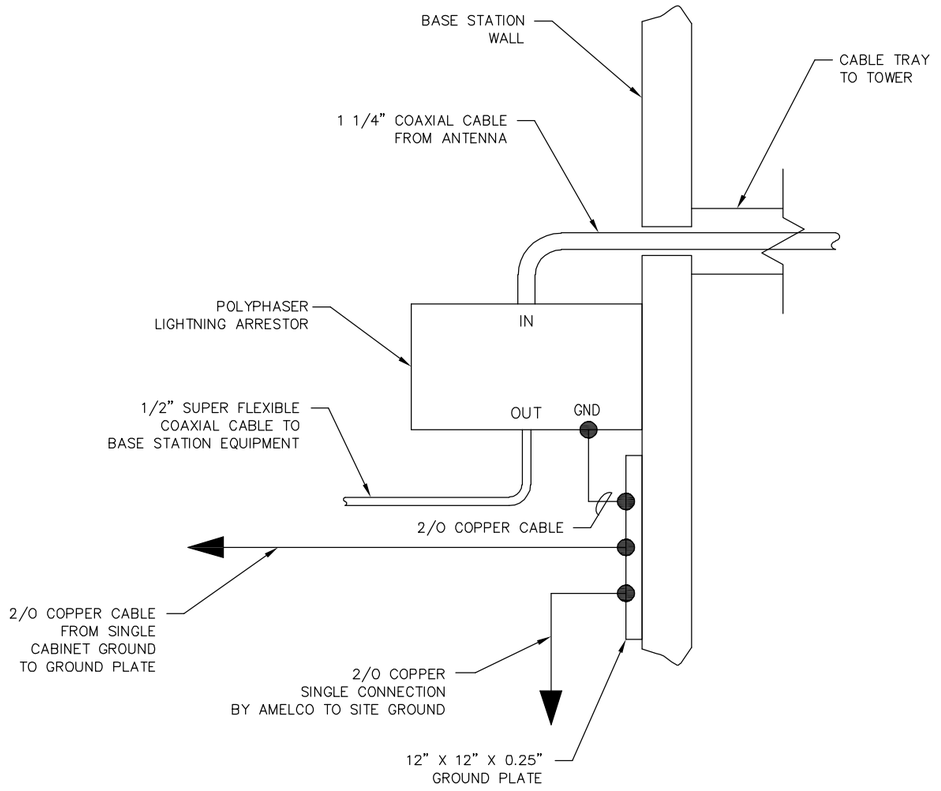
TRAIN CONTROL

STANDARD DRAWING NO.: SD-6614



EQUIPMENT RACK & BATTERIES
REAR ELEVATION VIEW
NOT TO SCALE





DETAIL 2
NOT TO SCALE

REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

PENINSULA CORRIDOR JOINT POWERS BOARD

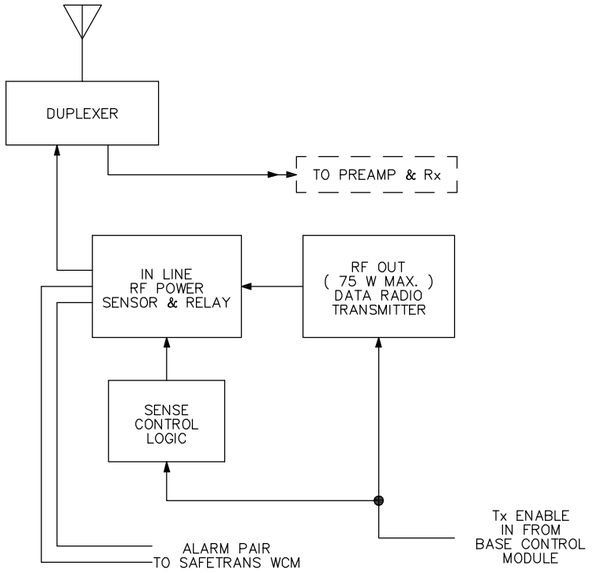
APPROVED BY:
Bin Zhang
DEPUTY DIRECTOR, ENGINEERING

Caltrain
1250 San Carlos Avenue
San Carlos, CA 94070

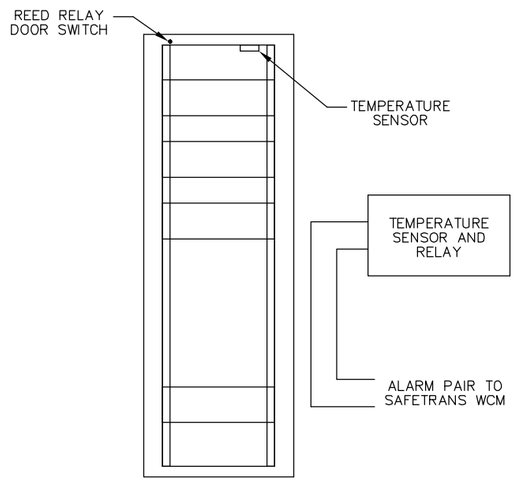
STANDARD DRAWINGS

TRAIN CONTROL COMMUNICATION
ATCS (DATA) RADIO SYSTEM
GROUNDING AND LIGHTNING
PROTECTION SYSTEM

CADD FILE NAME: SD-6615
REV: | EDITION: FOURTH
TRAIN CONTROL
STANDARD DRAWING NO.: SD-6615



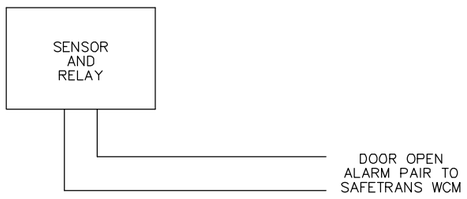
RF LOW/LOSS OF POWER ALARM
BLOCK DIAGRAM (SEE NOTE 1)
NTS



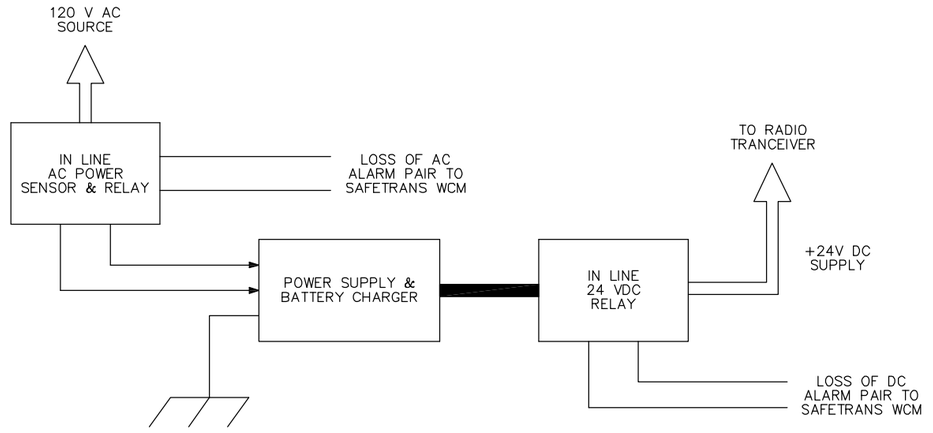
HIGH TEMPERATURE ALARM
BLOCK DIAGRAM (SEE NOTE 2)
NTS

NOTES:

1. ALARM WILL BE GENERATED IF TRANSMIT POWER FALLS TO 32w OR LESS (−3dB OR LOWER)
2. SENSOR SHALL BE PLACED ADJACENT TO THE EQUIPMENT RACK AND SHALL PRODUCE AN ALARM IF THE TEMPERATURE RISES GREATER THAN 5˚ ABOVE THE SET "TOP OF RANGE VALUE"
3. THE VSWR SENSOR SHALL GENERATE AN ALARM IF THE VSWR RISES 10% OR GREATER FROM THE SET "TOP OF RANGE" VALUE



DOOR OPEN ALARM
BLOCK DIAGRAM
NTS



LOSS OF AC & DC POWER
BLOCK DIAGRAM
NTS

REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

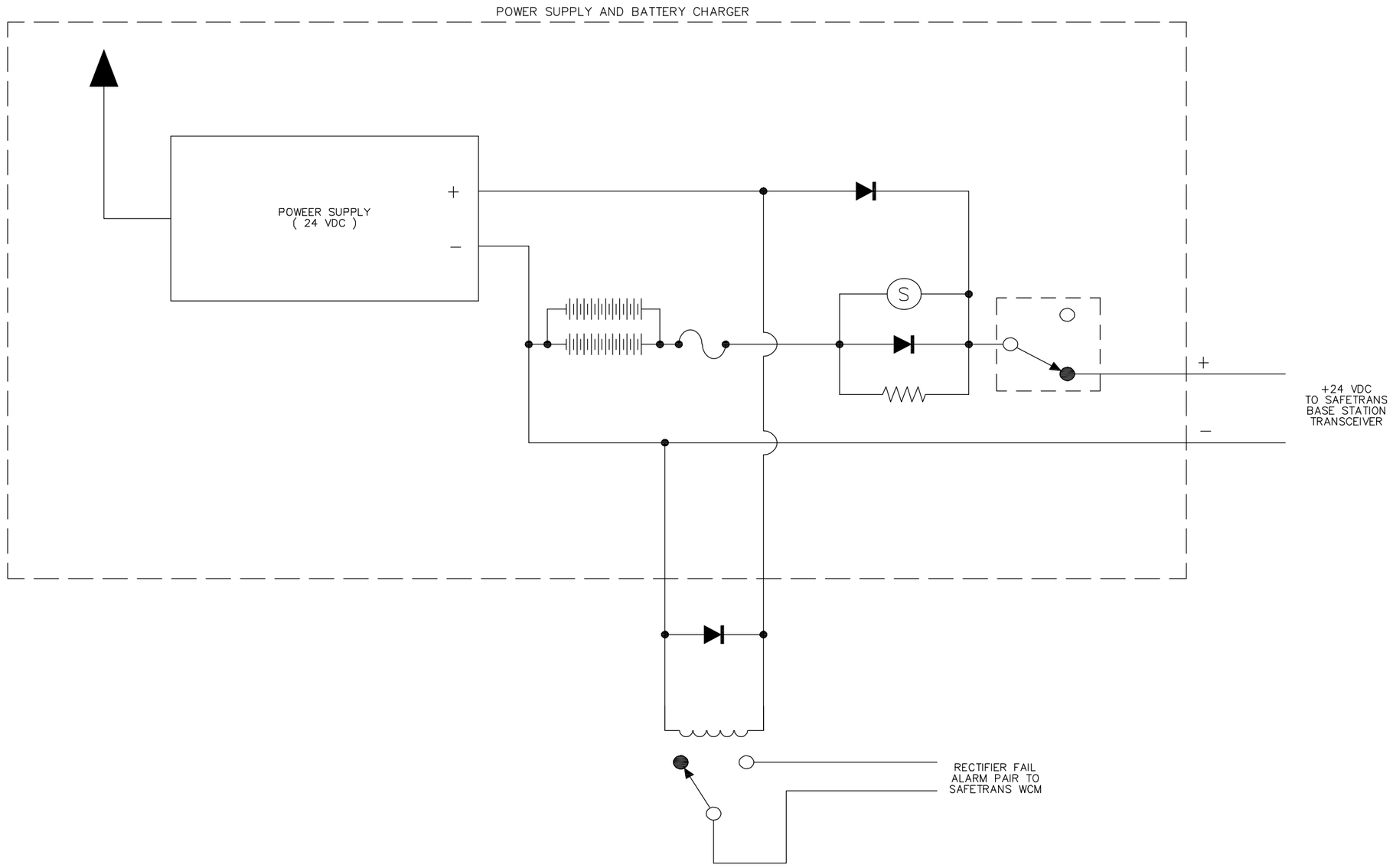
TRAIN CONTROL COMMUNICATION
ATCS (DATA) RADIO SYSTEM
BASE STATION SITE ALARMS
BLOCK DIAGRAM

CADD FILE NAME: SD−6616

REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD−6616



REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

TRAIN CONTROL COMMUNICATION
ATCS (DATA) RADIO SYSTEM
BASE STATION RECTIFIER FAIL ALARM
CIRCUIT DIAGRAM

CADD FILE NAME: SD–6617

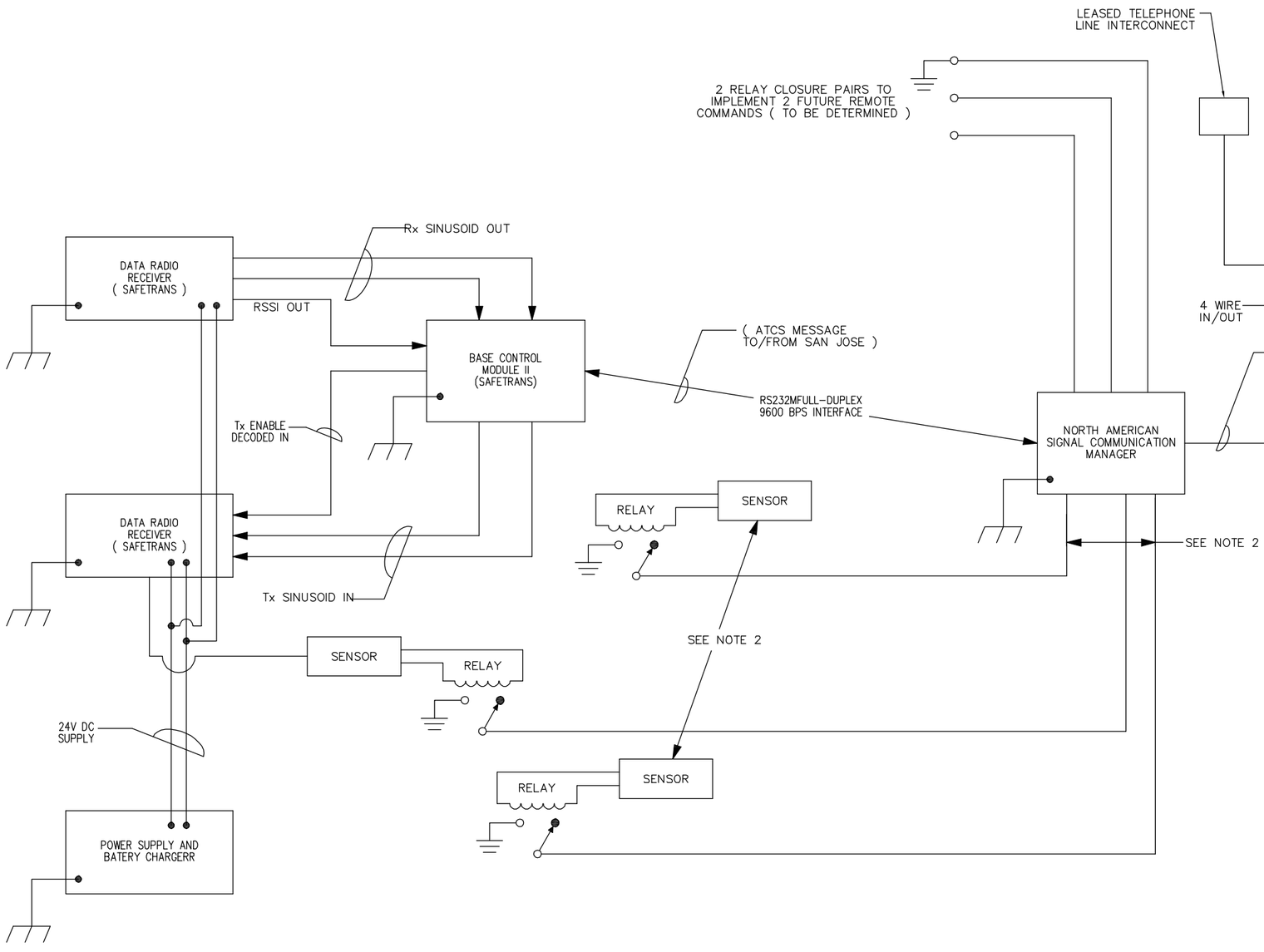
REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD–6617

NOTES:

1. MATCH CORRESPONDING 4 WIRE MODEM AT CCF
2. TYPICAL OF 8. A TOTAL OF FOUR (4) MIN. UP TO EIGHT (MAX.) EQUIPMENT STATUS CONDITIONS SHALL BE MONITORED BY THE SENSOR TO GENERATE ALARMS WHICH SHALL BE ENCODED BY THE WCM AND INCORPORATED INTO THE ATCS MESSAGE FOR TRANSMISSION BACK TO THE RAIL OPERATIONS CONTROL AT CCF



REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP	DESCRIPTION

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

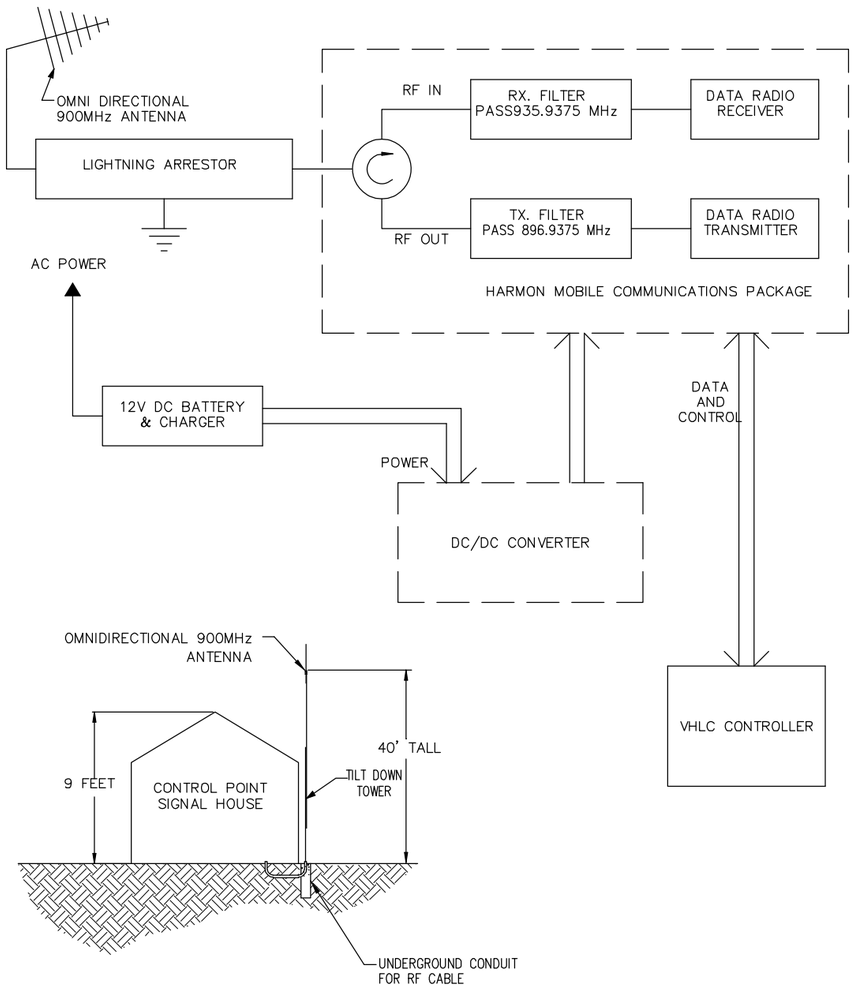
TRAIN CONTROL COMMUNICATION
ATCS (DATA) RADIO SYSTEM
INTERFACE TO LEASED
TELEPHONE CIRCUITS
CIRCUIT DIAGRAM

CADD FILE NAME: SD-6618

REV: | EDITION: FOURTH

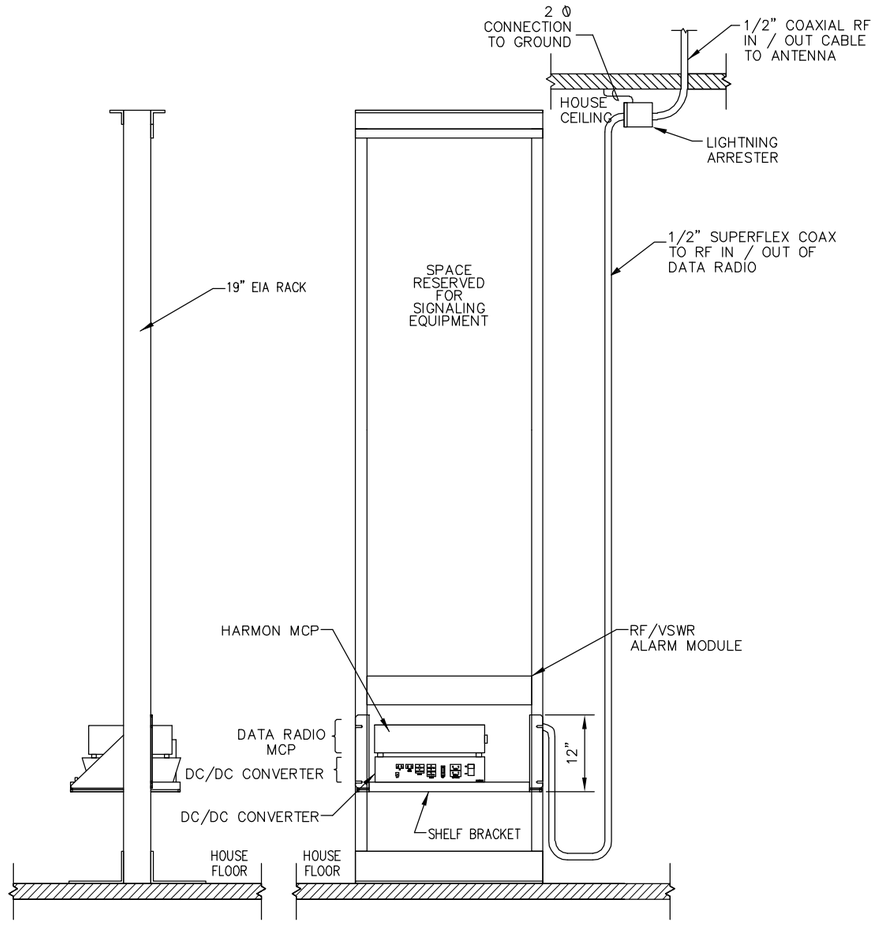
TRAIN CONTROL

STANDARD DRAWING NO.: SD-6618



CONTROL POINT RADIO
HUT & ANTENNA DETAIL

NOT TO SCALE



CONTROL POINT RADIO
RACK ASSEMBLY DETAIL

NOT TO SCALE

REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

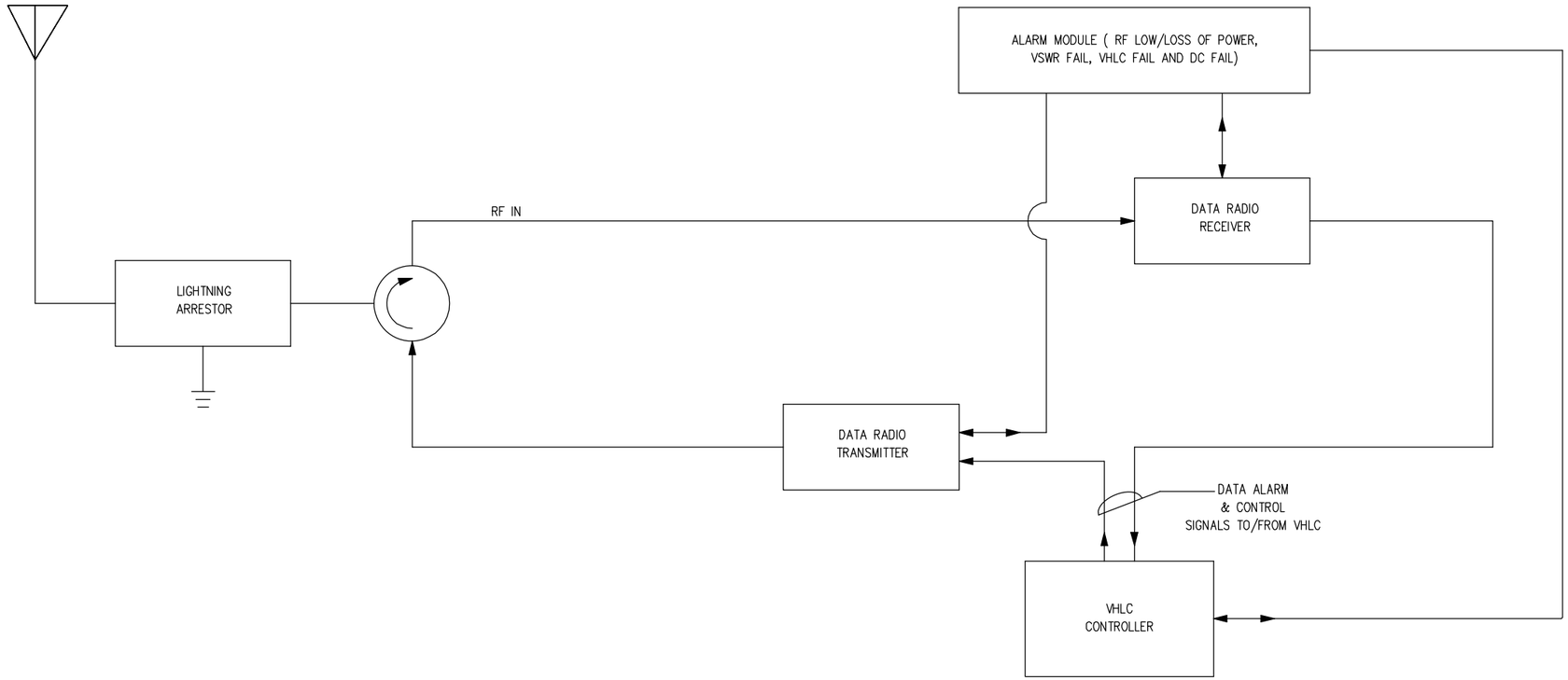
TRAIN CONTROL COMMUNICATION
ATCS (DATA) RADIO SYSTEM
MOBILE DATA RADIO SYSTEM
BLOCK DIAGRAM

CADD FILE NAME: SD-6619

REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD-6619



REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

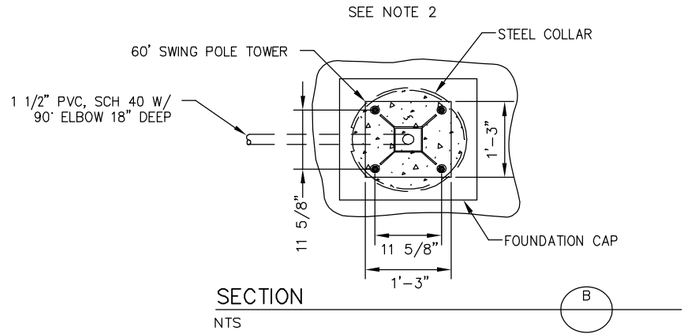
TRAIN CONTROL COMMUNICATION ATCS (DATA) RADIO SYSTEM RADIO INTERFACE AND FRONT END CIRCUIT DIAGRAM

CADD FILE NAME: SD-6620

REV: | EDITION: FOURTH

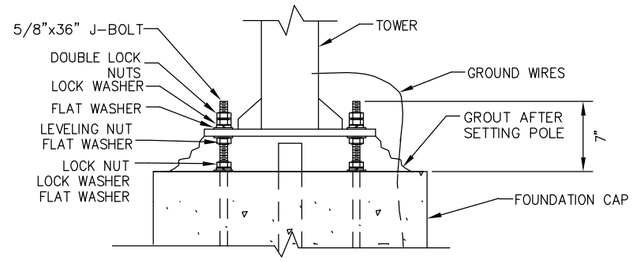
TRAIN CONTROL

STANDARD DRAWING NO.: SD-6620



SECTION B

NTS



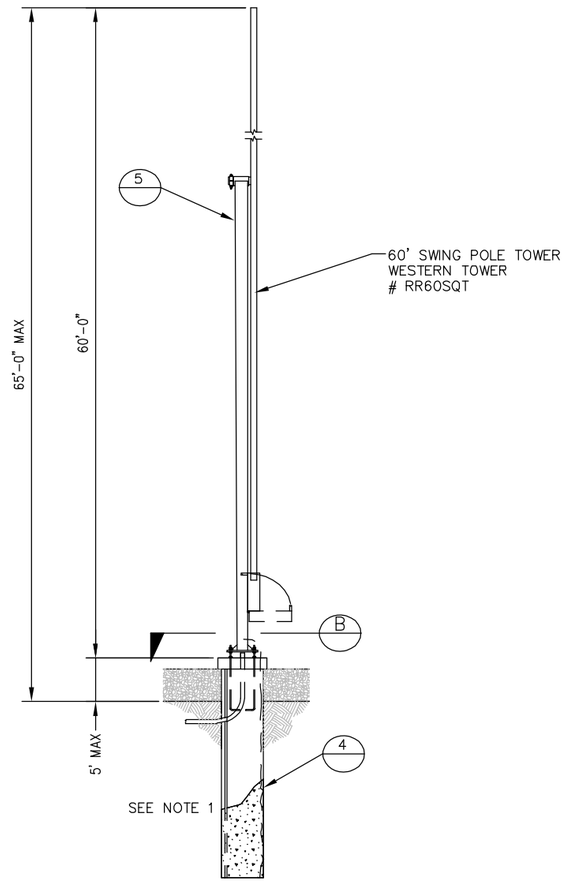
DETAIL 6

NTS

NOTES:

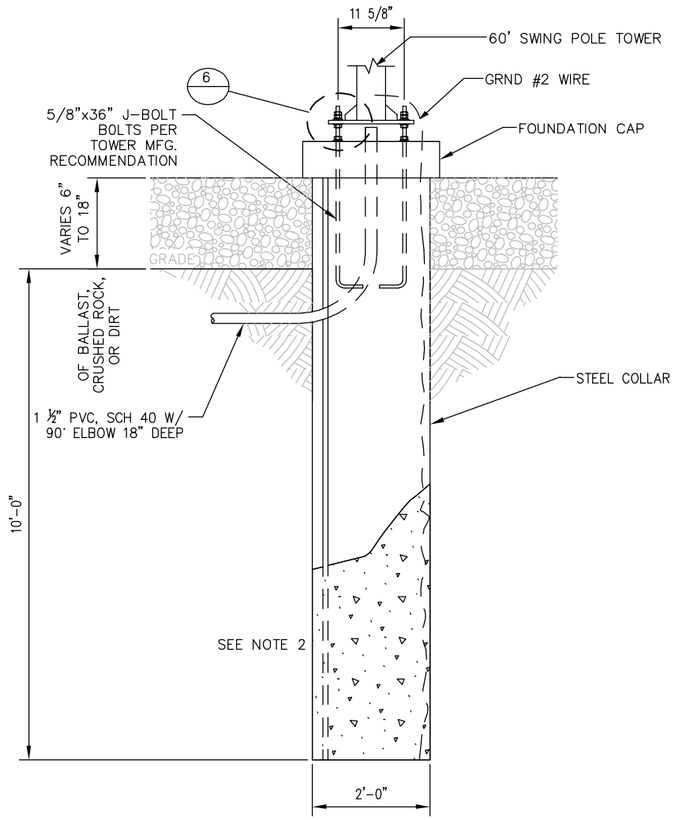
1. FOOTING PER WESTERN TOWERS PLAN.
2. CONCRETE PER CALTRANS STANDARDS
   f'c = 3,250 PSI
   fy = 40,000 PSI
3. WESTERN TOWERS FOUNDATION CAGE
   #4 SPIRAL WITH 6" PITCH
   6 #5 VERTICAL
4. THIS TOWER AND FOUNDATION USED AT CP BRISBANE, CP SIERRA, CP MAYFIELD, CP MARY AND CP HENDY.

FOR MAINTENANCE ONLY



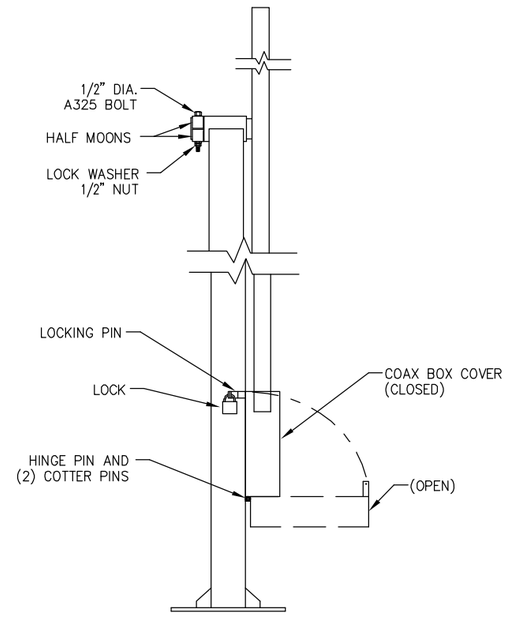
TOWER ELEVATION AND FOUNDATION

NTS



FOUNDATION DETAIL 4

NTS



TOWER DETAIL 5

NTS

REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

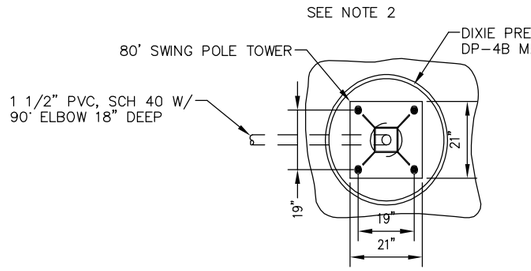
TRAIN CONTROL COMMUNICATION
ATCS (DATA) RADIO SYSTEM
40 AND 60 FOOT TILT-DOWN TOWER
FOUNDATION DETAILS

CADD FILE NAME: SD-6701

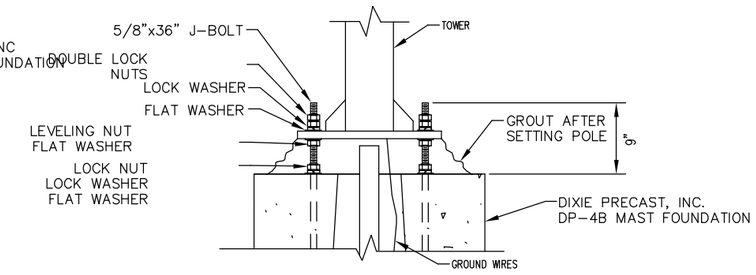
REV: | EDITION: FOURTH

TRAIN CONTROL

STANDARD DRAWING NO.: SD-6701



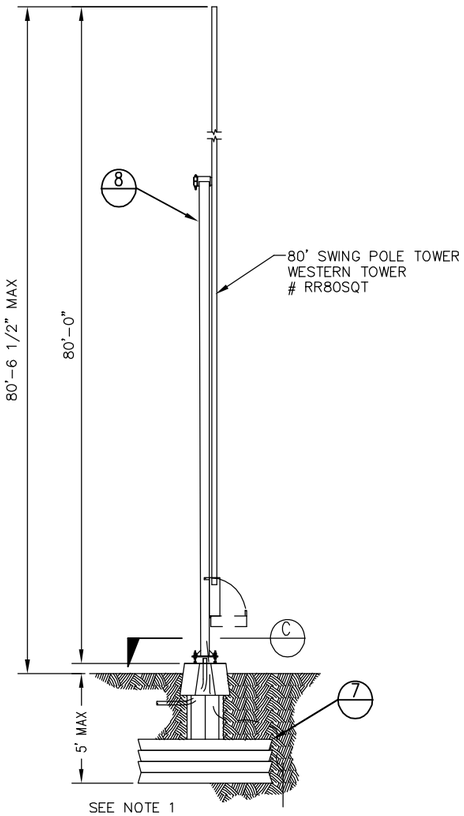
SECTION C
NTS



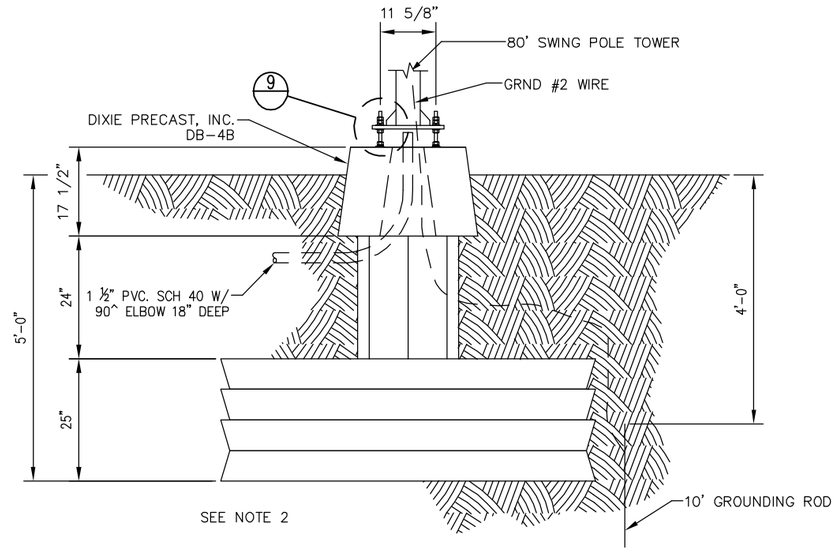
DETAIL 9
NTS

NOTES:

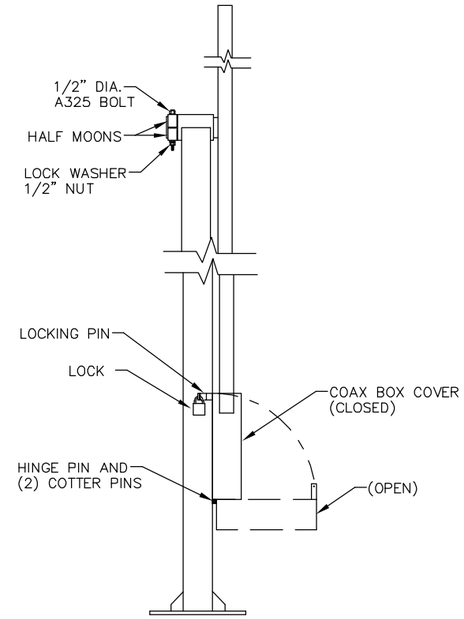
1. FOOTING PER WESTERN TOWERS PLAN. DIXIE PRECAST, INC. DP-4B 4 BOLT SINGLE MAST CANTILEVER FOUNDATION.
2. CONCRETE PER CALTRANS STANDARDS
   f'c = 3,250 PSI
   fy = 40,000 PSI
3. WESTERN TOWERS FOUNDATION CAGE
   #4 SPIRAL WITH 6" PITCH
   6 #5 VERTICAL
4. FOR NEW INSTALLATIONS, TOWER STRUCTURE AND FOUNDATION SHALL BE DESIGNED BY A PROFESSIONAL CIVIL OR STRUCTURAL ENGINEER LICENSED IN CALIFORNIA.
5. THIS TOWER AND FOUNDATION USED AT CP COMMON STREET AND CP TUNNEL.



TOWER ELEVATION AND FOUNDATION
NTS



FOUNDATION DETAIL 7
NTS



TOWER DETAIL 8
NTS

FOR MAINTENANCE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:
Bin Zhang
DEPUTY DIRECTOR, ENGINEERING

Caltrain
1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

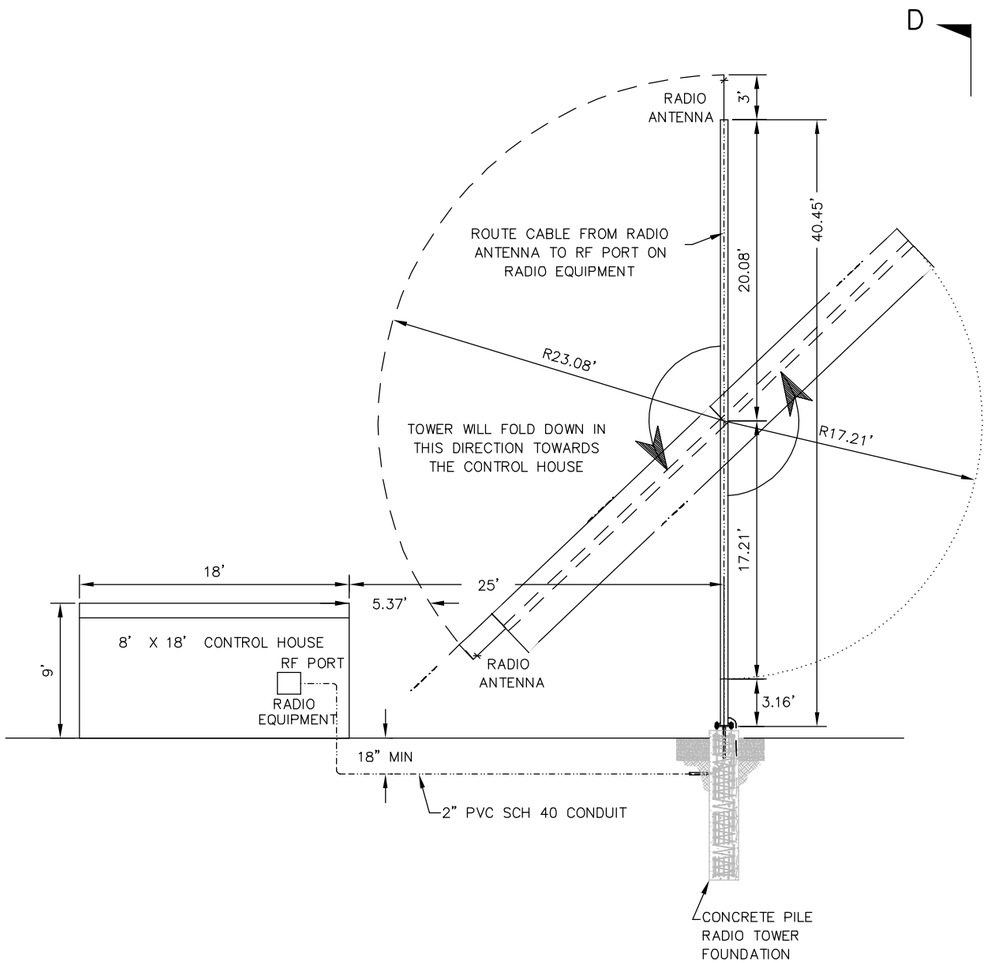
TRAIN CONTROL COMMUNICATION
ATCS (DATA) RADIO SYSTEM
80 FOOT TILT-DOWN TOWER
FOUNDATION DETAILS

CADD FILE NAME: SD-6702
REV:
EDITION: FOURTH
TRAIN CONTROL
STANDARD DRAWING NO.: SD-6702

NOTES:

1. CONFIGURE TOWER SO THAT IT TILTS DOWN PARALLEL TO THE TRACKS.
2. FOR NEW INSTALLATIONS, TOWER TILT MECHANISM SHALL BE DESIGNED BY A PROFESSIONAL ELECTRICAL ENGINEER LICENSED IN CALIFORNIA.
3. THIS DRAWING SHOWS A GENERIC ANTENNA LAYOUT FOR THE FOLLOWING CP LOCATIONS:

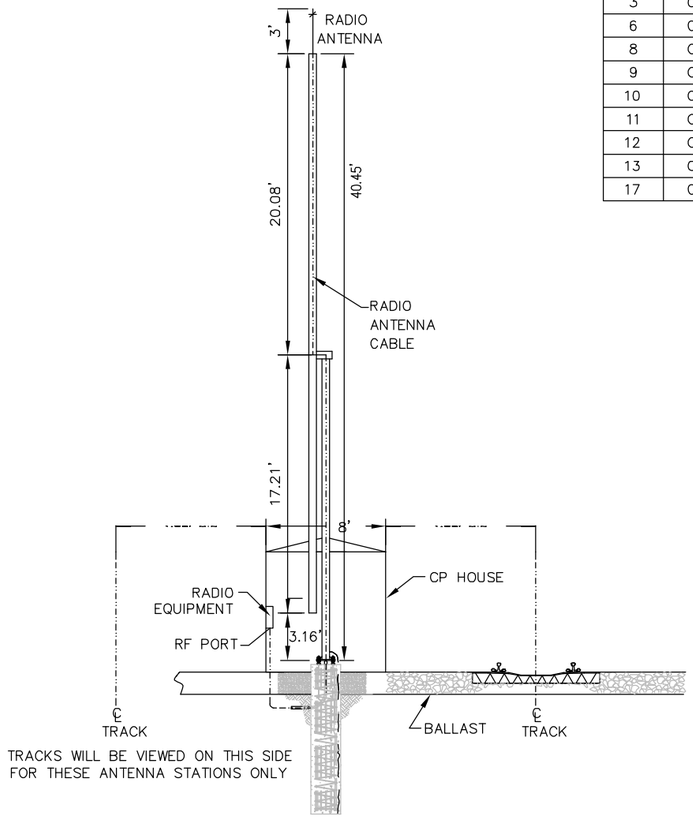
CONTROL POINTS WITH 40 FT TOWERS		
CP NO.	CP NAME	M.P.
3	CP GENEVA	5.5
6	CP CENTER	12.8
8	CP TROUSDALE	14.2
9	CP PALM	18.2
10	CP RALSTON	21.6
11	CP DUMBARTON	26.0
12	CP JUNCTION	27.2
13	CP ALMA	29.2
17	CP BOWERS	41.6



SECTION

NTS

D



SECTION D

NTS

FOR MAINTENANCE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

TRAIN CONTROL COMMUNICATION
ATCS (DATA) RADIO SYSTEM
40 FOOT TILT-DOWN TOWER
TILT MECHANISM

CADD FILE NAME: SD-6703

REV: | EDITION: FOURTH

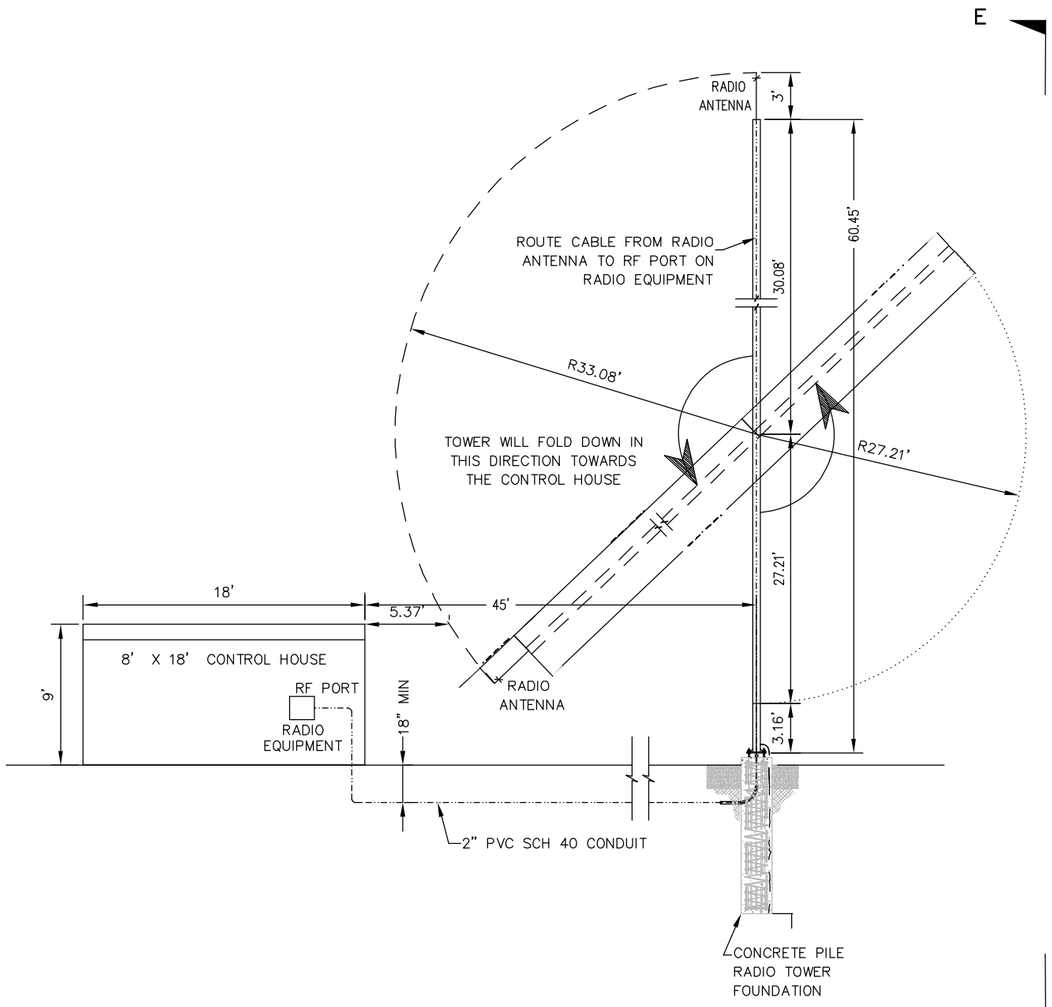
TRAIN CONTROL

STANDARD DRAWING NO.: SD-6703

NOTES:

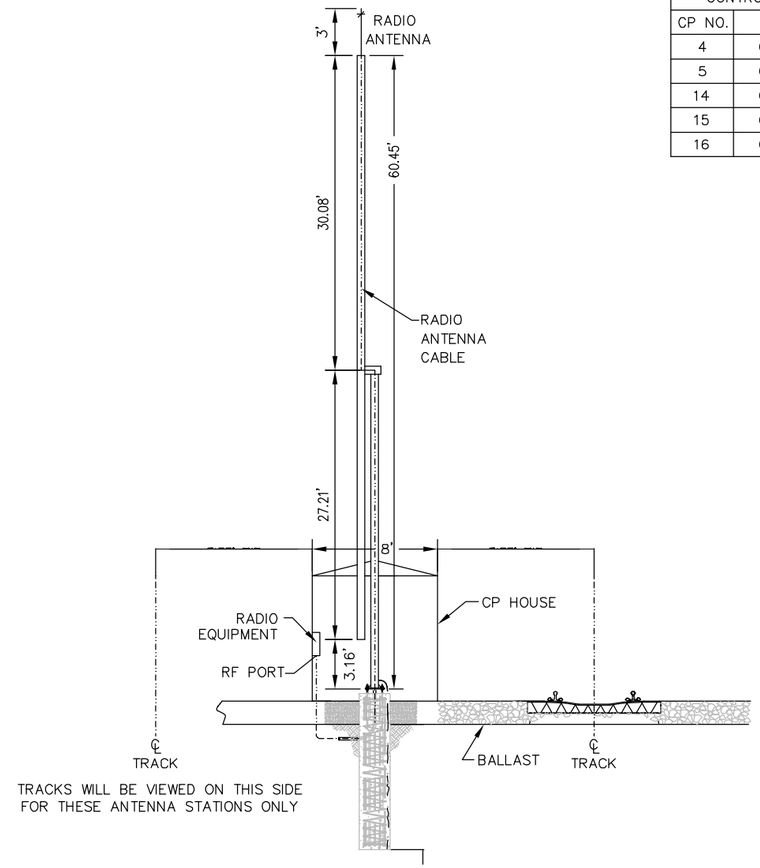
1. CONFIGURE TOWER SO THAT IT TILTS DOWN PARALLEL TO THE TRACKS.
2. FOR NEW INSTALLATIONS, TOWER TILT MECHANISM SHALL BE DESIGNED BY A PROFESSIONAL ELECTRICAL ENGINEER LICENSED IN CALIFORNIA.
3. THIS DRAWING SHOWS A GENERIC ANTENNA LAYOUT FOR THE FOLLOWING CP LOCATIONS:

CONTROL POINTS WITH 60 FT TOWERS		
CP NO.	CP NAME	M.P.
4	CP BRISBANE	7.0
5	CP SIERRA	8.1
14	CP MAYFIELD	33.8
15	CP MARY	38.2
16	CP HENDY	39.4



SECTION

NTS



SECTION E

NTS

FOR MAINTENANCE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DEPUTY DIRECTOR, ENGINEERING

Caltrain

1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

TRAIN CONTROL COMMUNICATION
ATCS (DATA) RADIO SYSTEM
60 FOOT TILT-DOWN TOWER
TILT MECHANISM

CADD FILE NAME: SD-6704

REV: | EDITION: FOURTH

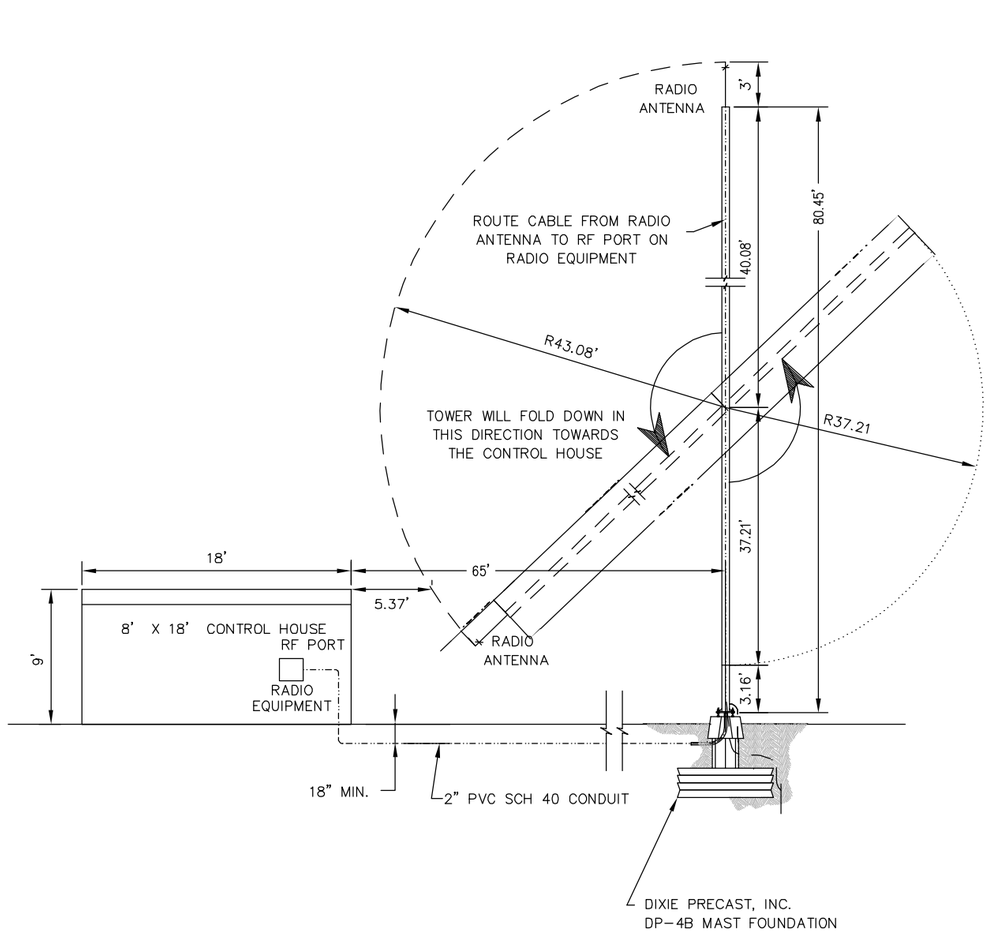
TRAIN CONTROL

STANDARD DRAWING NO.: SD-6704

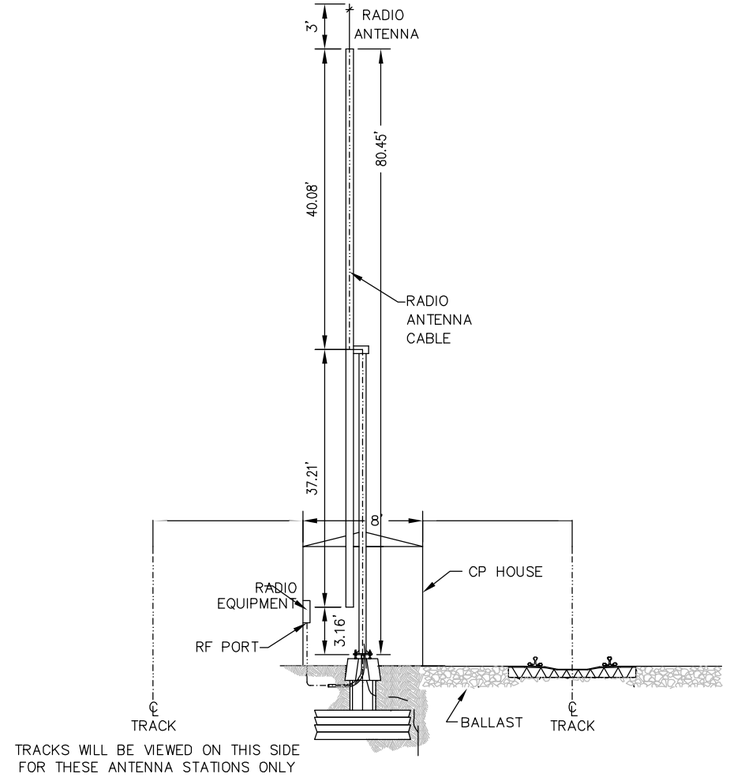
NOTES:

1. CONFIGURE TOWER SO THAT IT TILTS DOWN PARALLEL TO THE TRACKS.
2. FOR NEW INSTALLATIONS, TOWER TILT MECHANISM SHALL BE DESIGNED BY A PROFESSIONAL ELECTRICAL ENGINEER LICENSED IN CALIFORNIA.
3. THIS DRAWING SHOWS A GENERIC ANTENNA LAYOUT FOR THE FOLLOWING CP LOCATIONS:

CONTROL POINTS WITH 80 FT TOWERS		
CP NO.	CP NAME	M.P.
1	CP COMMON ST.	0.8
2	CP TUNNEL	5.0



SECTION
NTS



SECTION F
NTS

FOR MAINTENANCE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

PENINSULA CORRIDOR JOINT POWERS BOARD

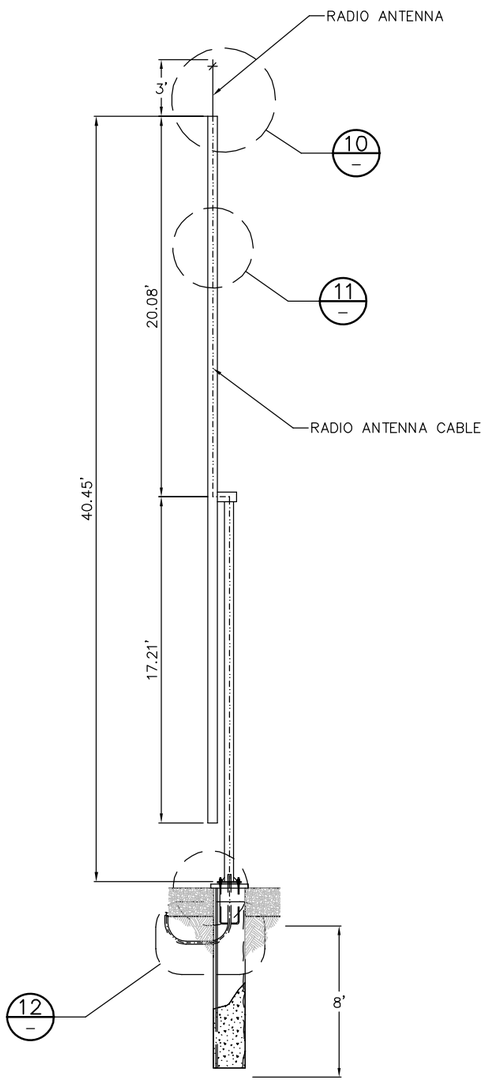
APPROVED BY:
Bin Zhang
DEPUTY DIRECTOR, ENGINEERING

Caltrain
1250 San Carlos Avenue
San Carlos, CA 94070

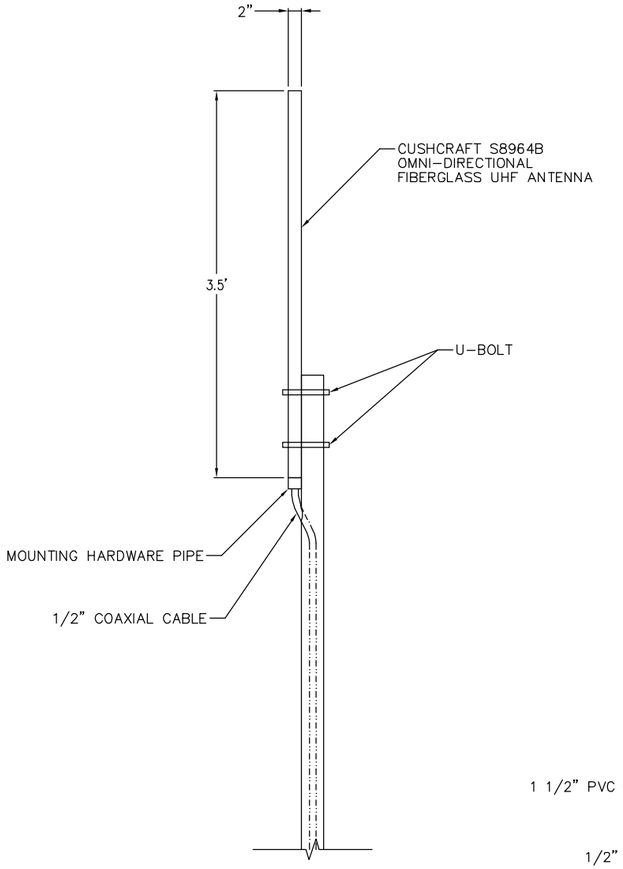
STANDARD DRAWINGS

TRAIN CONTROL COMMUNICATION
ATCS (DATA) RADIO SYSTEM
80 FOOT TILT-DOWN TOWER
TILT MECHANISM

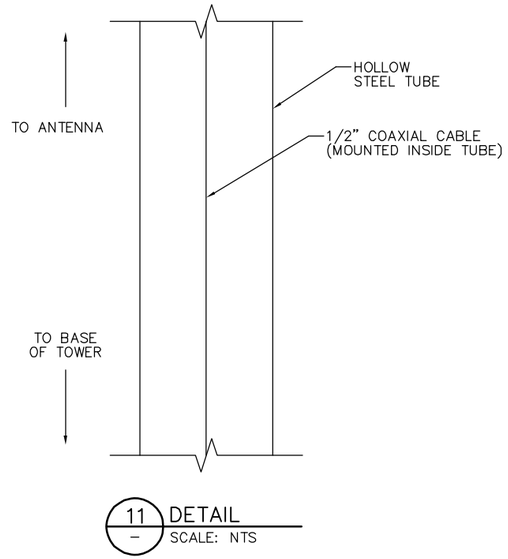
CADD FILE NAME: SD-6705
REV:
EDITION: FOURTH
TRAIN CONTROL
STANDARD DRAWING NO.: SD-6705



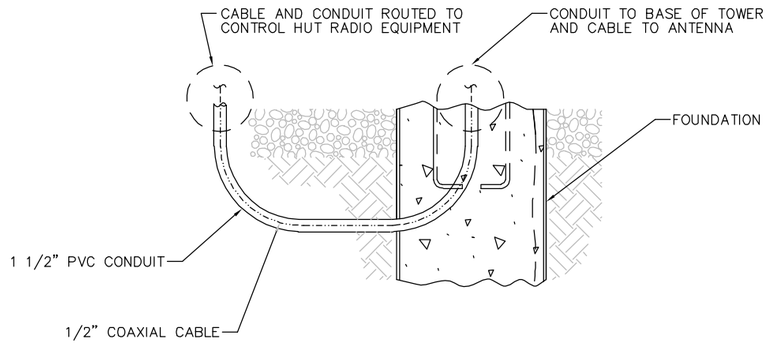
TYPICAL CONTROL POINT
TILE DOWN ANTENNA DETAIL
SCALE: NTS



10 DETAIL
SCALE: NTS



11 DETAIL
SCALE: NTS



12 DETAIL
SCALE: NTS

NOTE:

THE ANTENNA FOR CP BART WILL BE INSTALLED ON THE RAILROAD SIGNAL BRIDGE.

OMNIDIRECTIONAL UHF ANTENNA

MANUFACTURER:	CUSHCRAFT/SIGNALS
TABLE:	S8964B
GENERAL FREQ. (MHz.):	896 – 960 MHz.
BANDWIDTH (MHz.):	64 MHz.
GAIN (dBd):	4 dBd
GAIN (dBi);	6.15 dBi
MAX. POWER INPUT (WATTS):	150 WATTS VERT.
BANDWIDTH:	20 DEG.
DOWNTILT (DEG.):	NONE
VSWR:	1.2:1
POLARIZATION:	VERTICAL
INTERMODULATION:	N/A
NULL FILL:	N/A
SIDELOBE SUPPRESION (dB):	N/A
LIGHTNING PROTECTION:	DC GROUND
SIZE (HXWXD"):	3.5 X 2"
WEIGHT (LBS.):	1.1 LBS.
RATED WIND VELOCITY (MPH):	125 MPH
WIND LOAD (SQ. FT.):	0.22 SQ. FT.
LATERAL THRUST @ RWV (LBS.):	N/A
BENDING MOMENT @ RWV (LBS.):	N/A

FOR MAINTENANCE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION
					01012024 FOURTH EDITION

REV	DATE	BY	CHK	APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:
Bin Zhang
DEPUTY DIRECTOR, ENGINEERING

Caltrain
1250 San Carlos Avenue
San Carlos, CA 94070

STANDARD DRAWINGS

TRAIN CONTROL COMMUNICATION
ATCS (DATA) RADIO SYSTEM
OMNIDIRECTIONAL ANTENNA
TYPICAL DETAILS

CADD FILE NAME: SD-6706
REV:
EDITION: FOURTH
TRAIN CONTROL
STANDARD DRAWING NO.: SD-6706