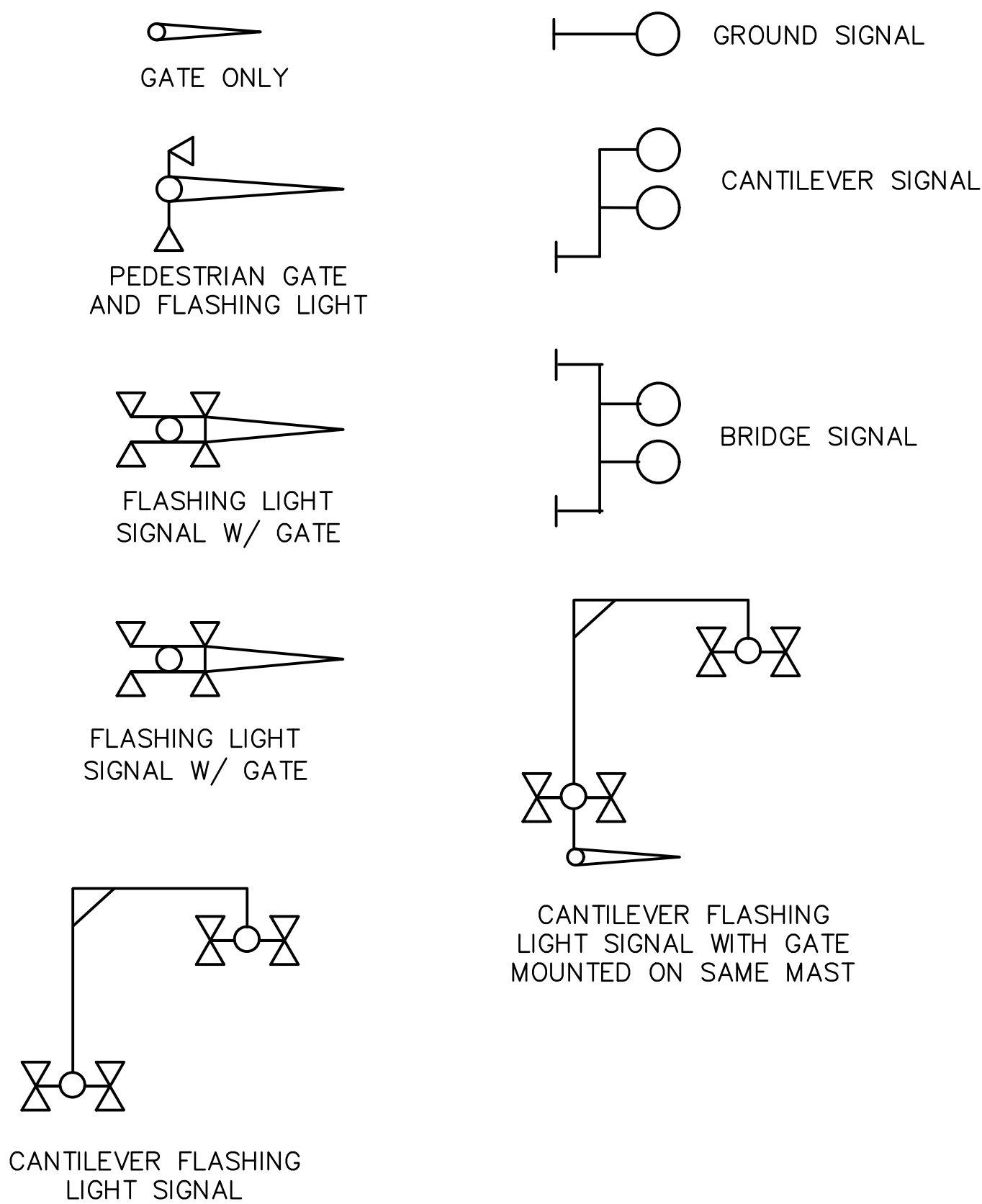
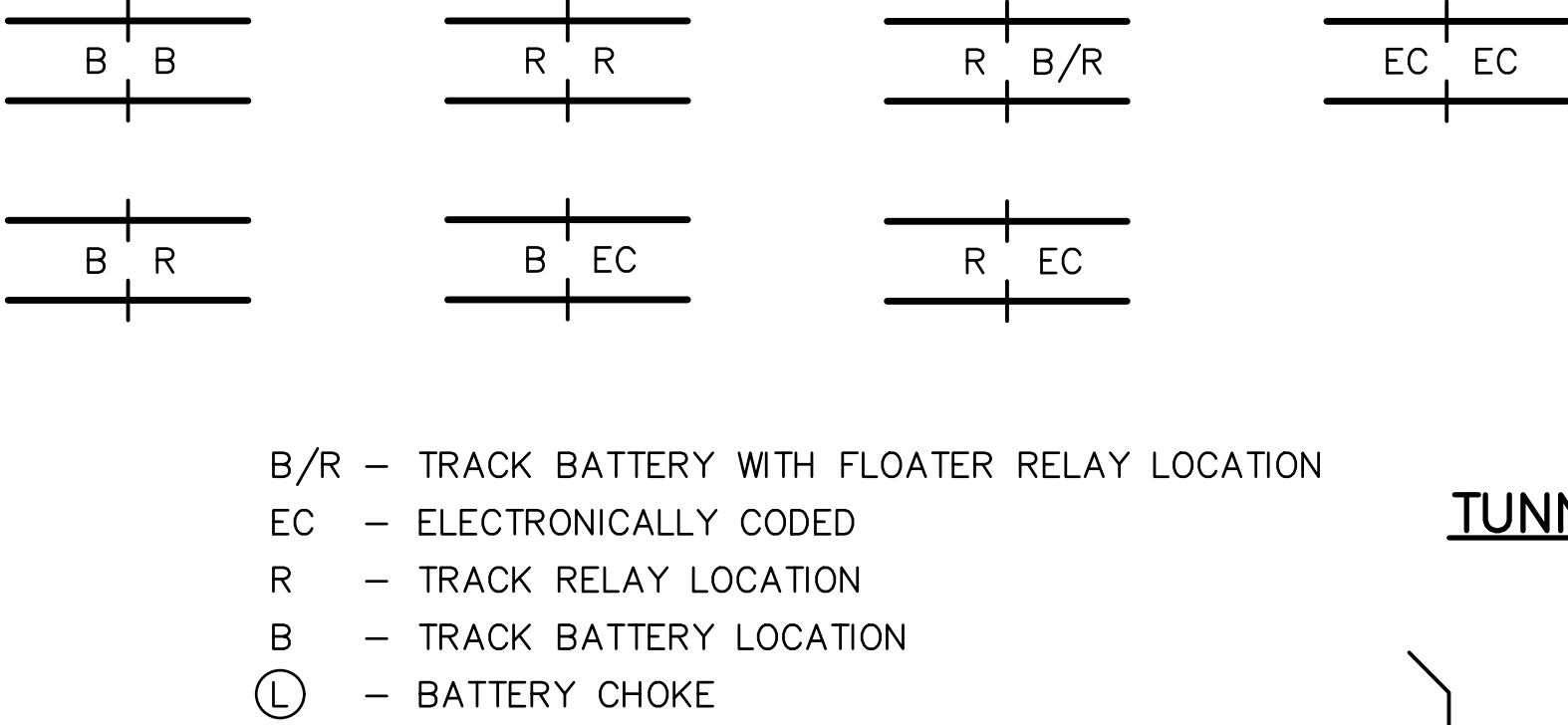


GATES AND SIGNALS

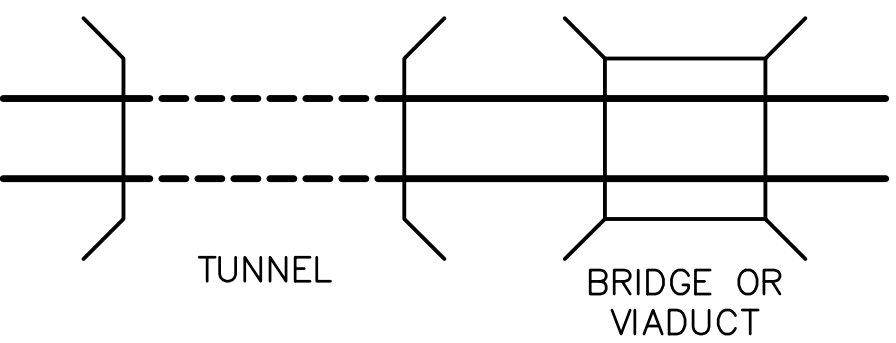


TRACK CIRCUITS

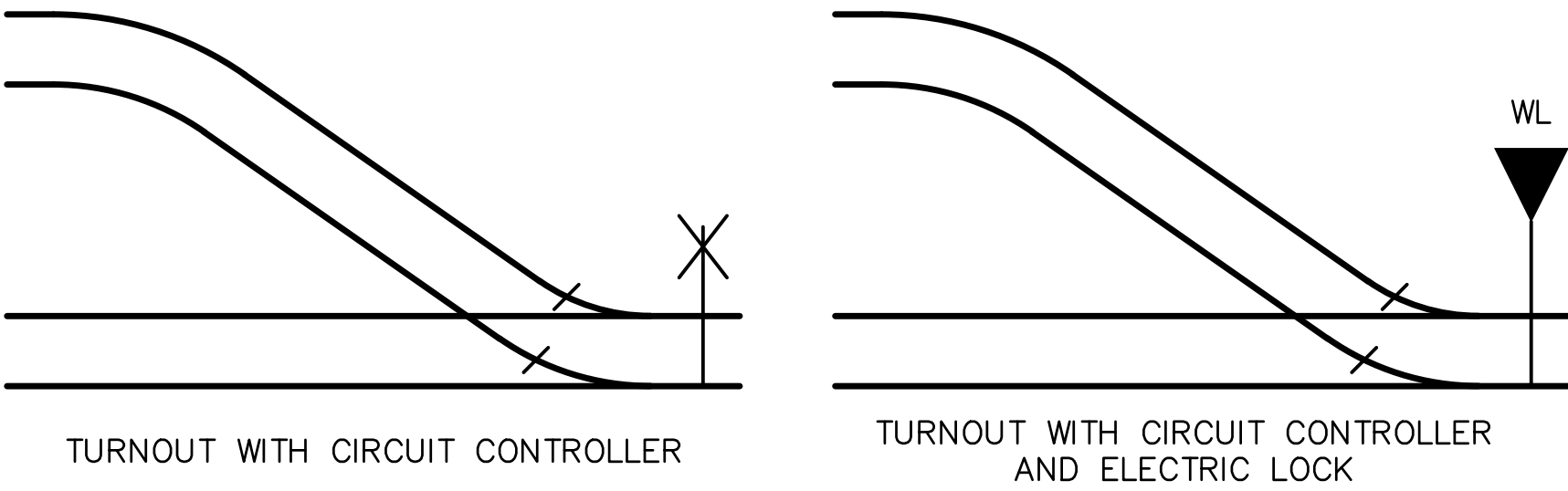


B/R - TRACK BATTERY WITH FLOATER RELAY LOCATION
EC - ELECTRONICALLY CODED
R - TRACK RELAY LOCATION
B - TRACK BATTERY LOCATION
Ⓛ - BATTERY CHOKE

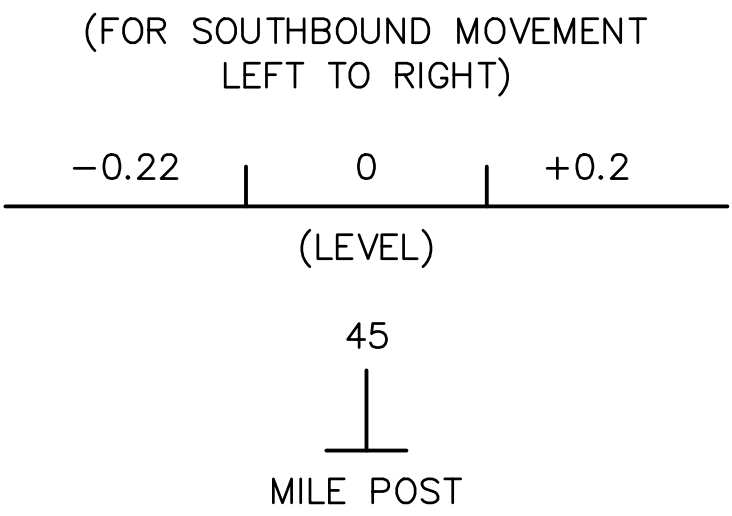
TUNNELS AND BRIDGES



HAND-OPERATED TURNOUTS



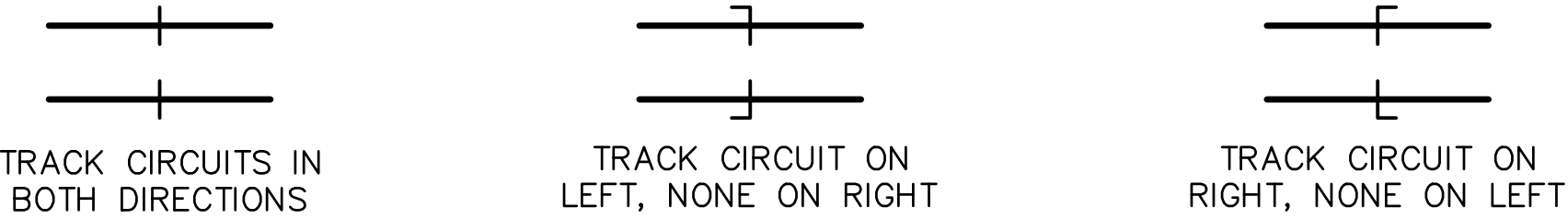
PROFILE (GRADE)



RAIL BONDING



INSULATED RAIL JOINTS



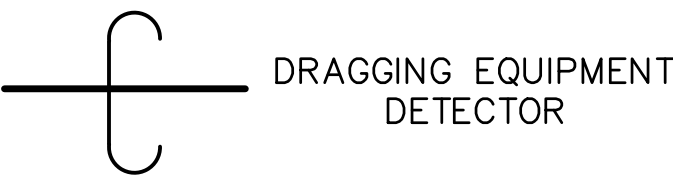
CALTRAIN SIGNAL SYSTEM NOMENCLATURE

- NWS - NORMAL SWITCH REQUEST
RWS - REVERSE SWITCH REQUEST
SGHS - SOUTHWARD SIGNAL REQUEST
NGHS - NORTHWARD SIGNAL REQUEST
FLT - SIGNAL FLEETING
NWK - NORMAL SWITCH INDICATION
RWK - REVERSE SWITCH INDICATION
SGK - SOUTHWARD SIGNAL CLEAR INDICATION
NGK - NORTHWARD SIGNAL CLEAR INDICATION
TEK - SIGNAL IN TIME INDICATION
TK - OS TRACK INDICATION
AK - APPROACH TRACK INDICATION
NWP - NORMAL SWITCH POINT POSITION
RWP - REVERSE SWITCH POINT POSITION
NWR - NORMAL SWITCH CONTROL RELAY
- RWR - REVERSE SWITCH CONTROL RELAY
NJSP - DUAL SELECTOR LEVER
WBC - SWITCH CONTROL RELAY BACK CHECK
GE - GREEN SIGNAL LAMP
YE - YELLOW SIGNAL LAMP
RE - RED SIGNAL LAMP
UAX - UPSTREAM ADJACENT CROSSING
DAX - DOWNSTREAM ADJACENT CROSSING
XR - CROSSING CONTROL RELAY
GCR - GATE CONTROL RELAY
GPR - GATE REPEATER RELAY (GATE IN UP POSITION)
GD - GATE DOWN
FR - FLASHER RELAY
EMS - EMERGENCY ALARM CONTROL CIRCUITS
LOS - LOSS OF SHUNT

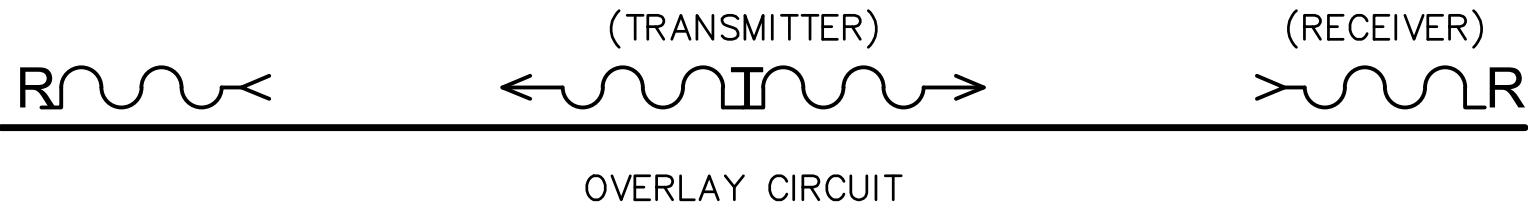
CALTRAIN SIGNAL SYSTEM NOMENCLATURE
TRAFFIC CONTROL/SUPERVISORY CIRCUITS

- IVPMT - PREEMPTION RELAY POSITIVE
NIVPMT - PREEMPTION RELAY NEGATIVE
2VPMT - GATE DOWN RELAY POSITIVE
N2VPMT - PREEMPTION RELAY NEGATIVE
BVSUP - SUPERVISORY RELAY POSITIVE
- NBVSUP - SUPERVISORY RELAY NEGATIVE
BX - SOURCE ENERGY POSITIVE
CX - SOURCE ENERGY NEGATIVE
HEALTH - TRAFFIC SIGNAL HEALTH POSITIVE
NHEALTH - TRAFFIC SIGNAL HEALTH NEGATIVE

DETECTORS



TRACK INSTRUMENT



- HXP HXP CONSTANT WARNING DEVICE (BI-DIRECTIONAL)

HXP HXP CONSTANT WARNING DEVICE (UNI-DIRECTIONAL)

GCP GCP CONSTANT WARNING DEVICE (BI-DIRECTIONAL)

GCP GCP CONSTANT WARNING DEVICE (UNI-DIRECTIONAL)

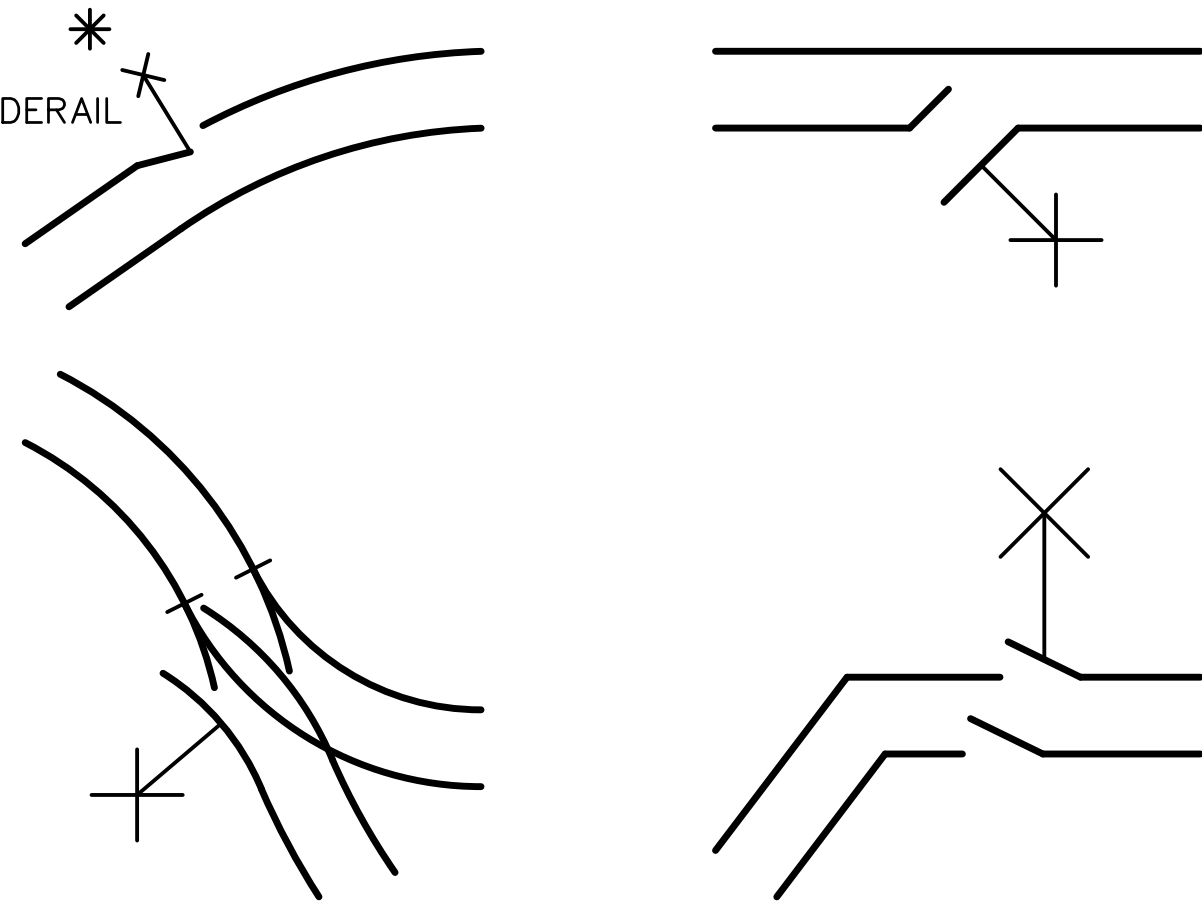
XP4 XP4 CONSTANT WARNING DEVICE (BI-DIRECTIONAL)

XP4 XP4 CONSTANT WARNING DEVICE (UNI-DIRECTIONAL)
- DWBS DOUBLE WIDE BAND SHUNT

XXX HZ NARROW BAND SHUNT

XXX HZ TUNED JOINT COUPLER

DERAILS



PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DIRECTOR, ENGINEERING



ENGINEERING STANDARD DRAWINGS

SIGNAL AND GRADE CROSSING SYSTEMS
GENERAL SIGNAL

CIRCUIT PLAN SYMBOLS

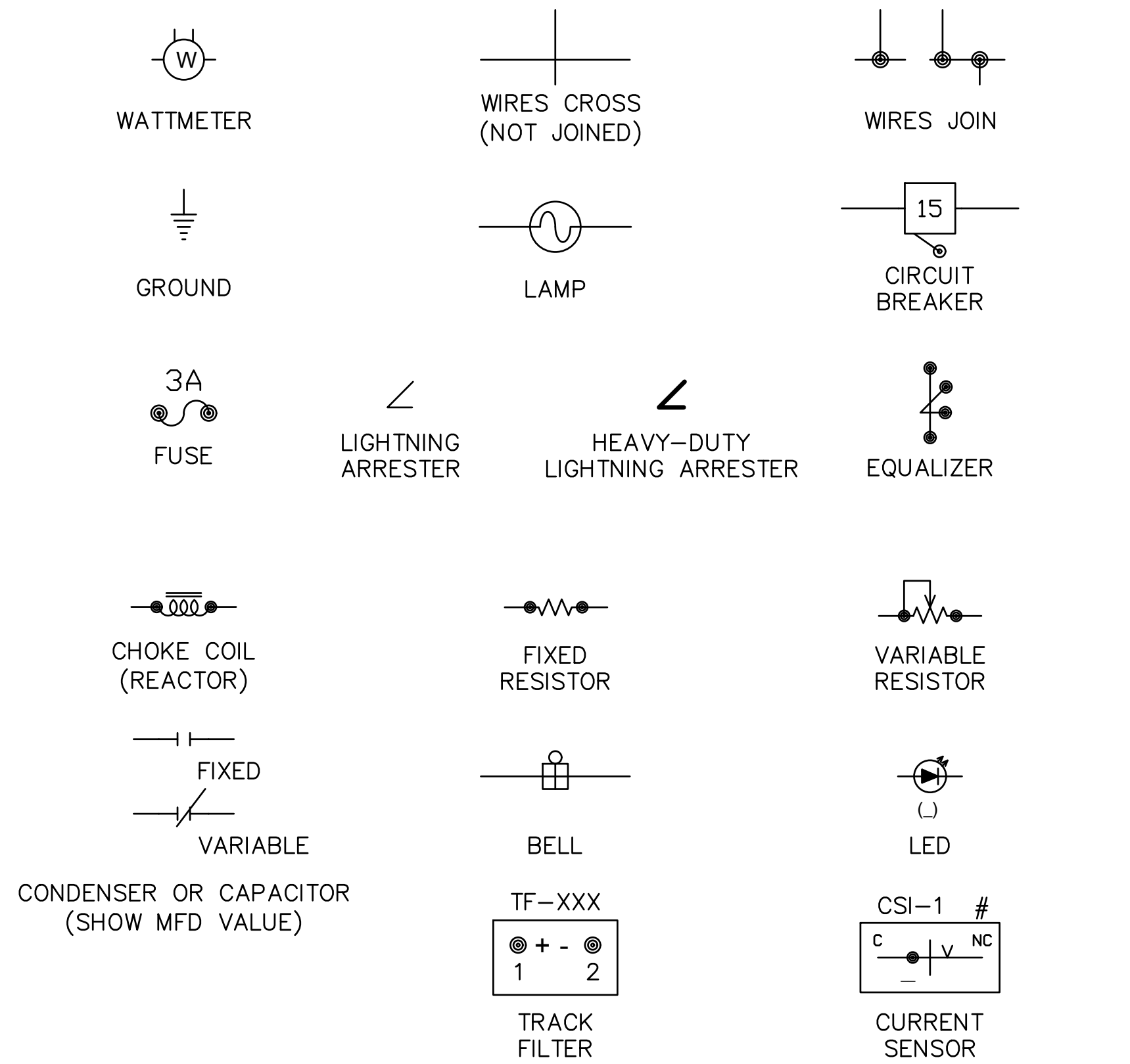
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SD-5101

REV: EDITION:
FIFTH

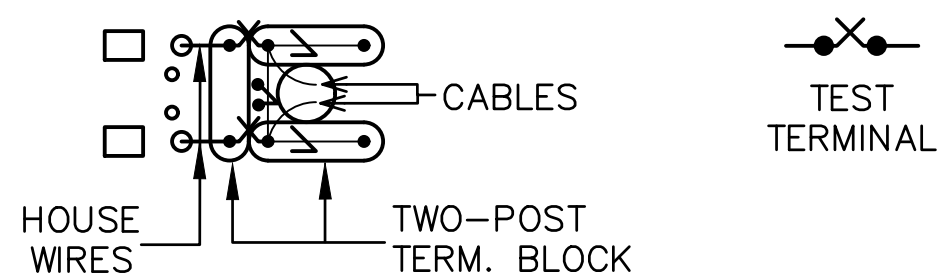
SCALE:
NTS

STANDARD DRAWING NO.:
SD-5101

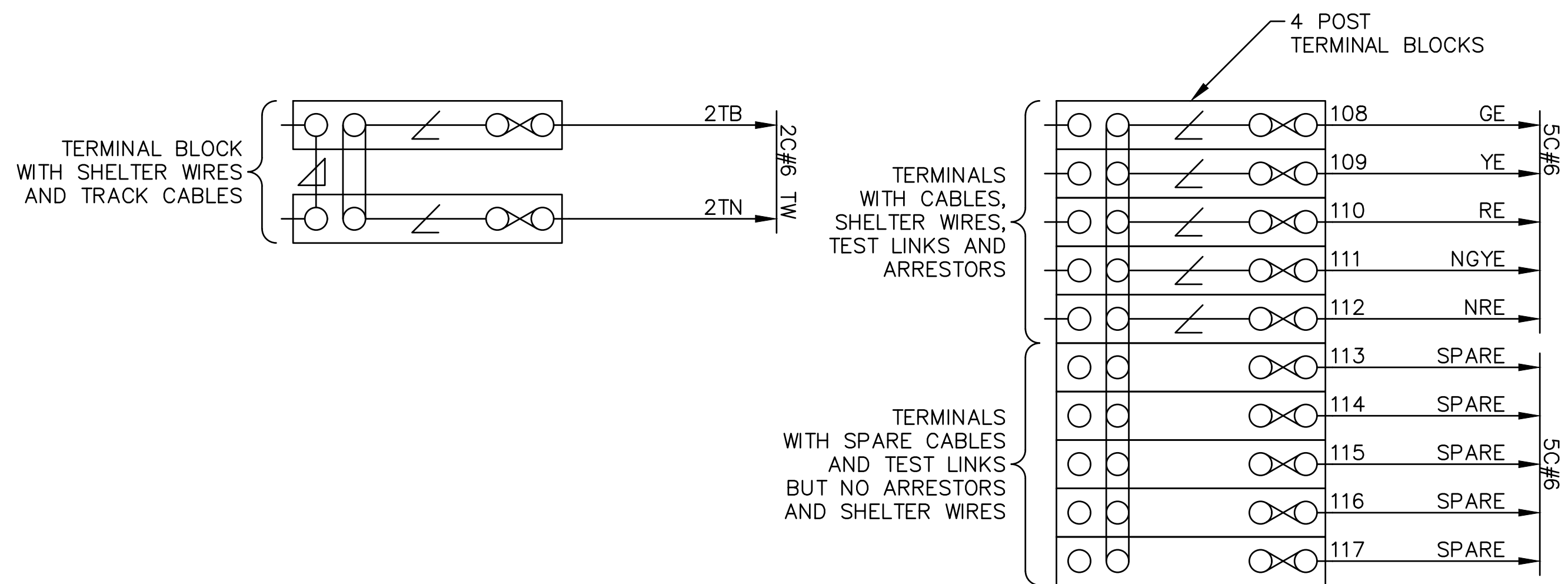
REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP	DESCRIPTION
010126					FIFTH EDITION						



VARIOUS SYMBOLS

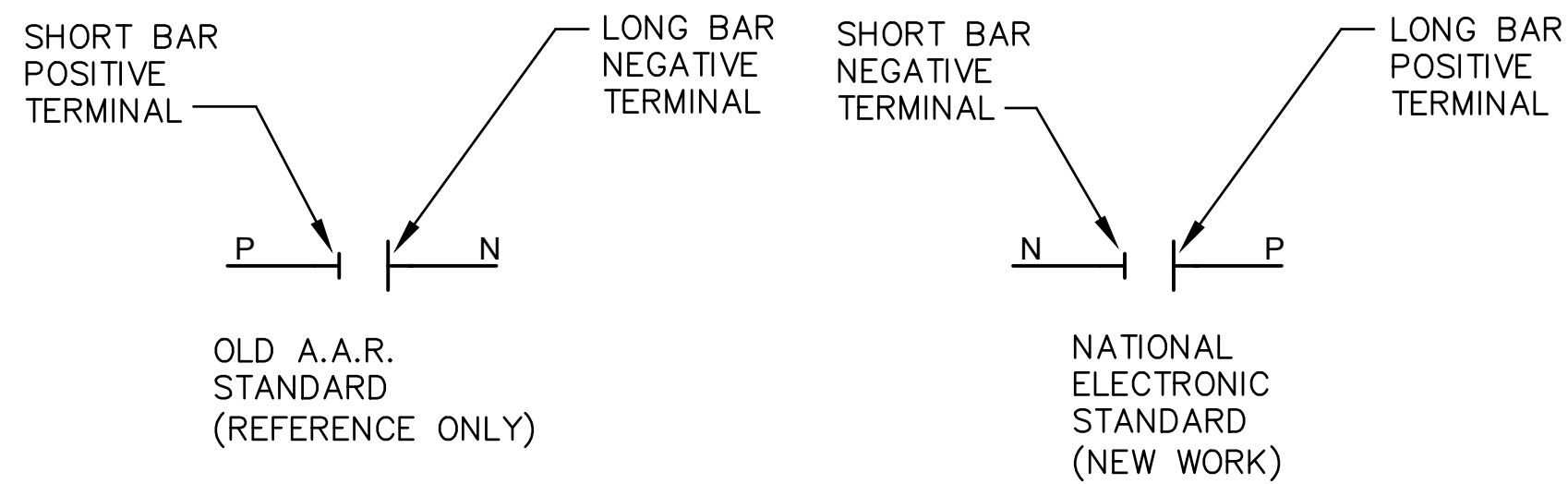


2 POST TERMINAL BLOCKS



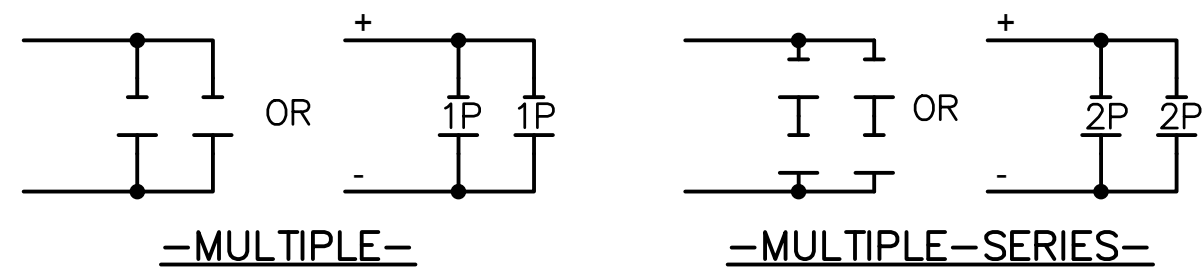
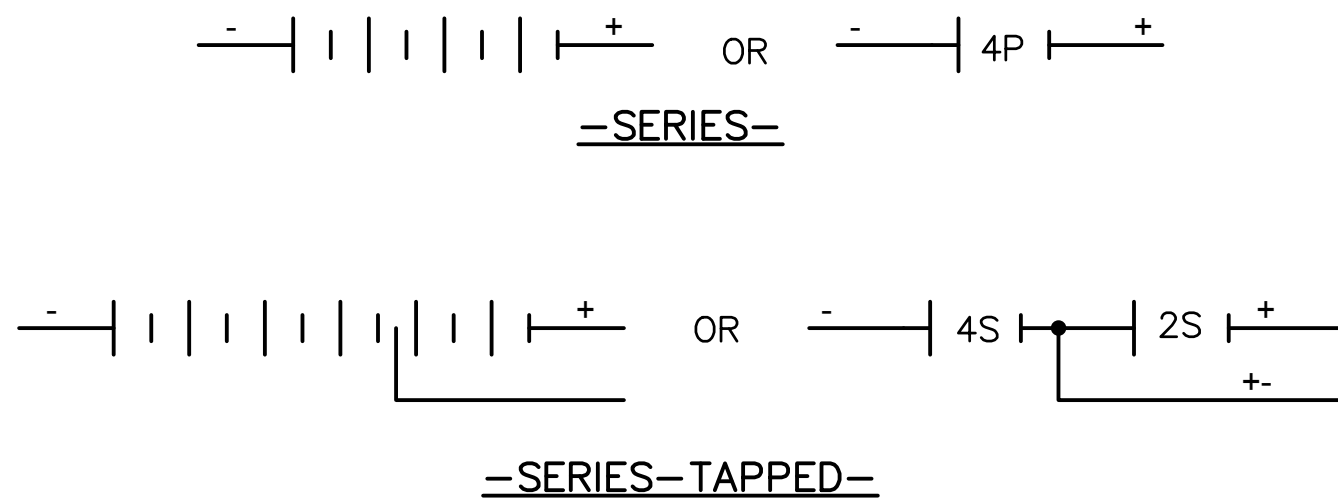
4 POST TERMINAL BLOCKS

DETAILS FOR TERMINAL BOARDS



BATTERIES

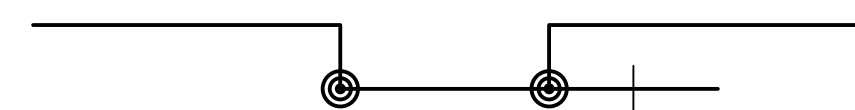
NOTE:
THE NATIONAL ELECTRONIC STANDARD IS SHOWN HERE TO ACQUAINT OUR PERSONNEL WITH THE SYMBOL USED BY OTHER INDUSTRIES AND IS NOT FOR USE ON SIGNAL CIRCUIT PLANS.



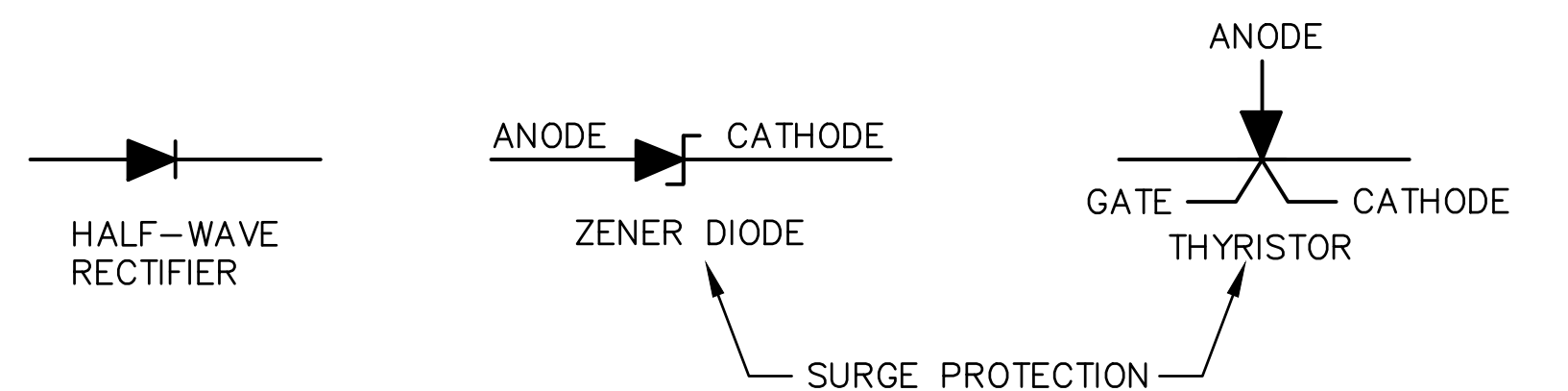
SPECIFY NUMBER OF CELLS USED AND, USING SYMBOLS BELOW, SHOW THE TYPE.

D-DRY CELLS
N-NICKEL-IRON OR NICKEL-CADMIUM STORAGE CELLS
P-PRIMARY CELLS
S-LEAD STORAGE CELLS

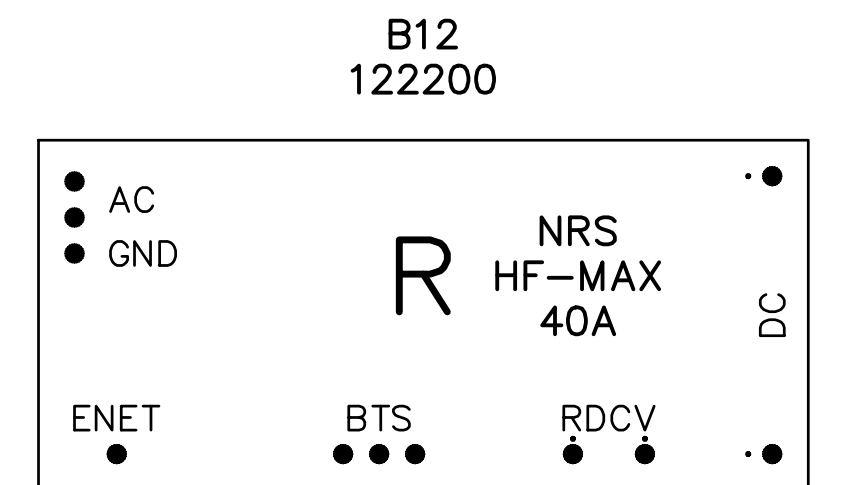
CIRCUIT ARRANGEMENTS



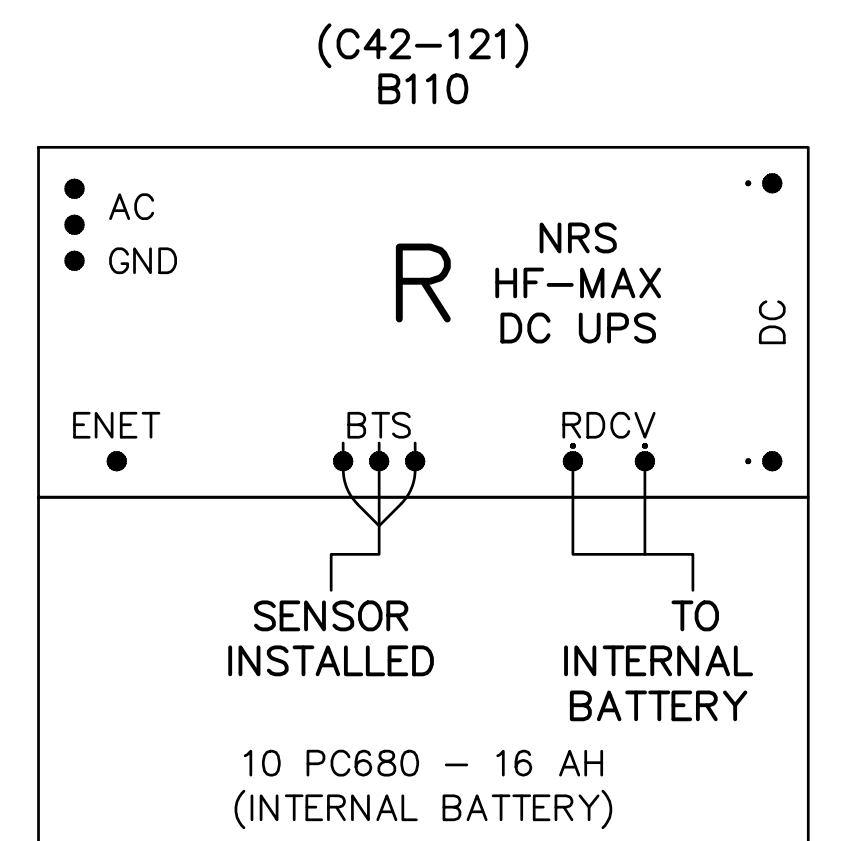
KNIFE SWITCH



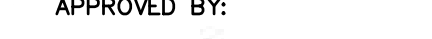

DEVICES USED WITH RECTIFIERS



HF-MAX CHARGER



HF-MAX CHARGER
110 V DC

												PENINSULA CORRIDOR JOINT POWERS BOARD						ENGINEERING STANDARD DRAWINGS						CADD FILE NAME: SD-5102							
												<div>APPROVED BY:</div> <div></div> <div>DIRECTOR, ENGINEERING</div>												SIGNAL AND GRADE CROSSING SYSTEMS GENERAL SIGNAL COMPONENT SYMBOLS AND CIRCUIT PLAN SYMBOLS						REV:	EDITION: FIFTH
																														SCALE: NTS	
010126						FIFTH EDITION																									
REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP	DESCRIPTION																				

ACCEPTABLE PLUG-IN RELAYS FOR USE ON CALTRAIN PROJECTS

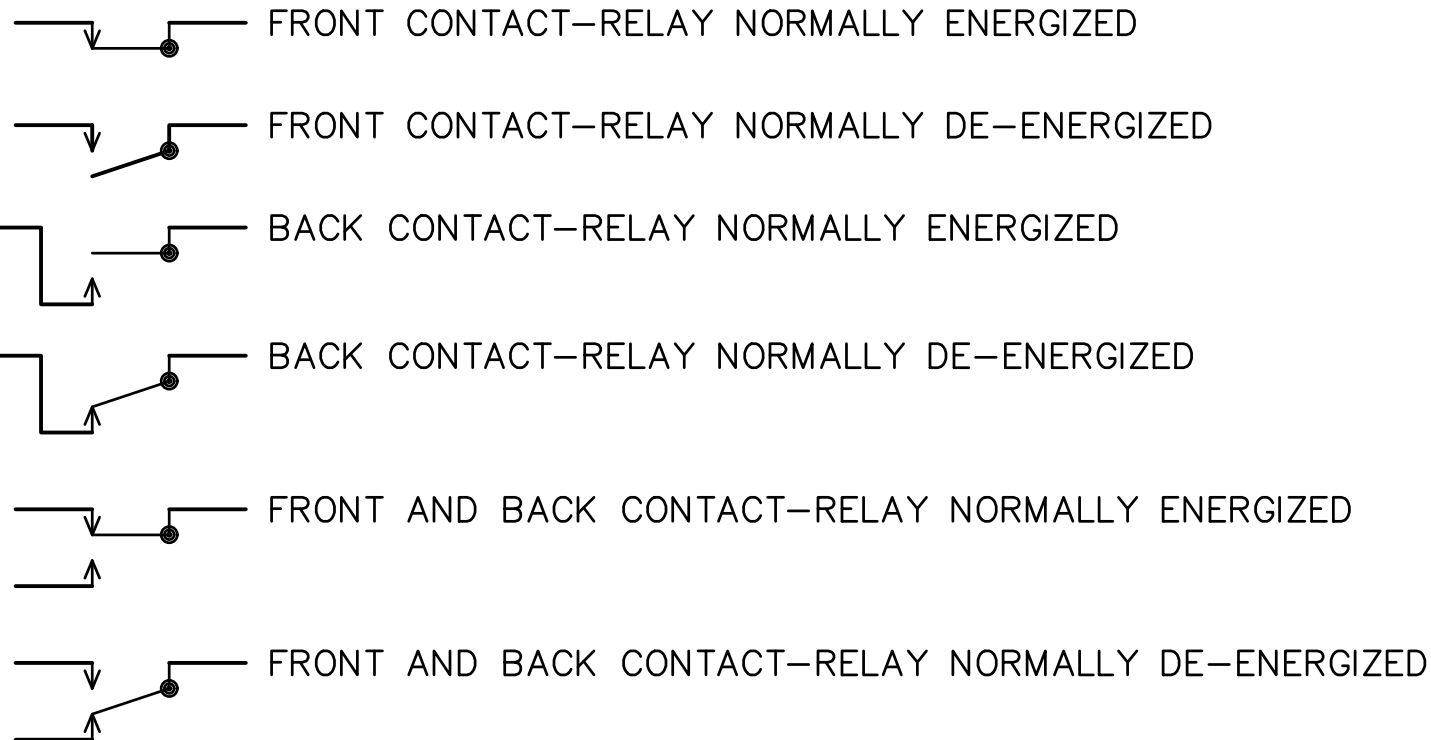
RELAY DESCRIPTION	BASE TYPE	BASE DWG #	CONTACT CONFIGURATION	ASO	OLD SPTC TAB	SIEMENS	OLD SPTC TAB
RELAY, 2 OHM BIASED NEUTRAL TRACK	B1	1	4FB-2F-1B	A62-120	RTM	400510	RTN
RELAY, 0.5 OHM BIASED NEUTRAL TRACK	B1	2	4FB-2F-1B	A62-120	RTM	400510	RTN
RELAY 500 OHM BIASED NEUTRAL REGULAR RELEASE	B1	3	6FB	A62-125	RBM	400500	RBN
RELAY, 60 OHM NEUTRAL FLASHER	B1	4	4FB	A62-195	REF	400700-X	RFH
RELAY, 100/100 OHM NEUTRAL POWER TRANSFER	B1	5	6FB HD	A62-579	RXR	400801-X	RXT
RELAY, 450/.069 OHM NEUTRAL LIGHT OUT	B1	7	4FB	A62-217	RXS	400302	RXU
RELAY, 500 OHM BIASED NEUTRAL SWITCH CONTROL	B1	9	2F-2B EHD	A62-429	RWN	400520	RWT
RELAY, MICROCHRON TIMING 1 SEC TO 19 MIN 59 SEC	B2	10	2FB-3F-2B	A62-627	RUK	NONE	
RELAY, .064/135 OHM NEUTRAL SWITCH OVERLOAD	B1	11	2CBO	A62-430	RWO	400601	RWU
RELAY, 24 OHM NEUTRAL SLOW RELEASE	B1	13	2FB	A62-365	RLY	400221	
RELAY, 500 OHM NEUTRAL REGULAR RELEASE	B1	14	6FB	A62-262	RLT	400000	RLT1
RELAY, 500 OHM NEUTRAL REGULAR RELEASE	B1	15	6FB HD	A62-580	RLV	400023	RLV1

NOTE: SEE SD-5104 FOR CONTACT ARRANGEMENT

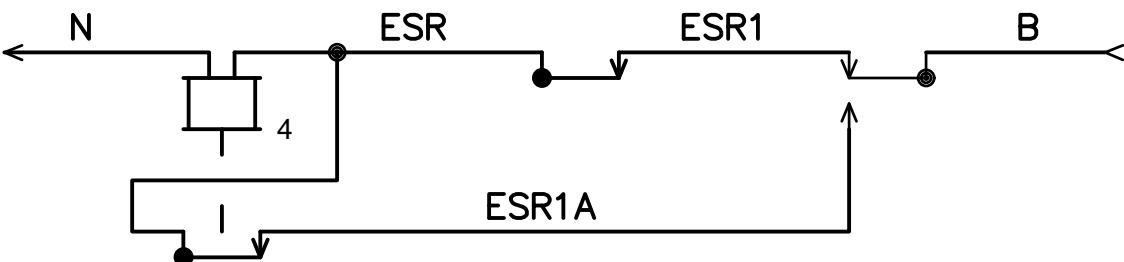
VITAL PLUG-IN RELAYS



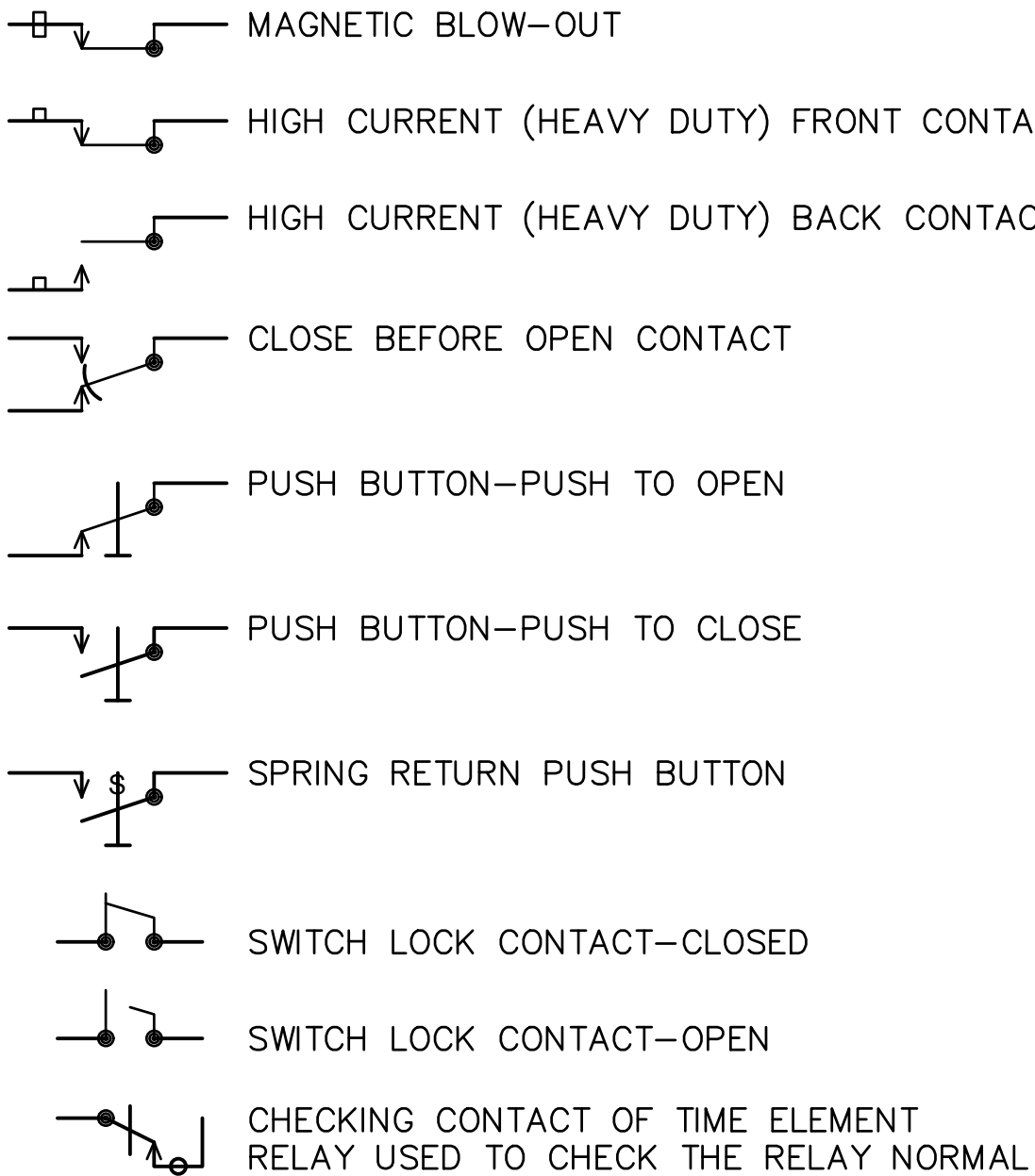
RELAY CONTACTS – TWO POSITION RELAYS



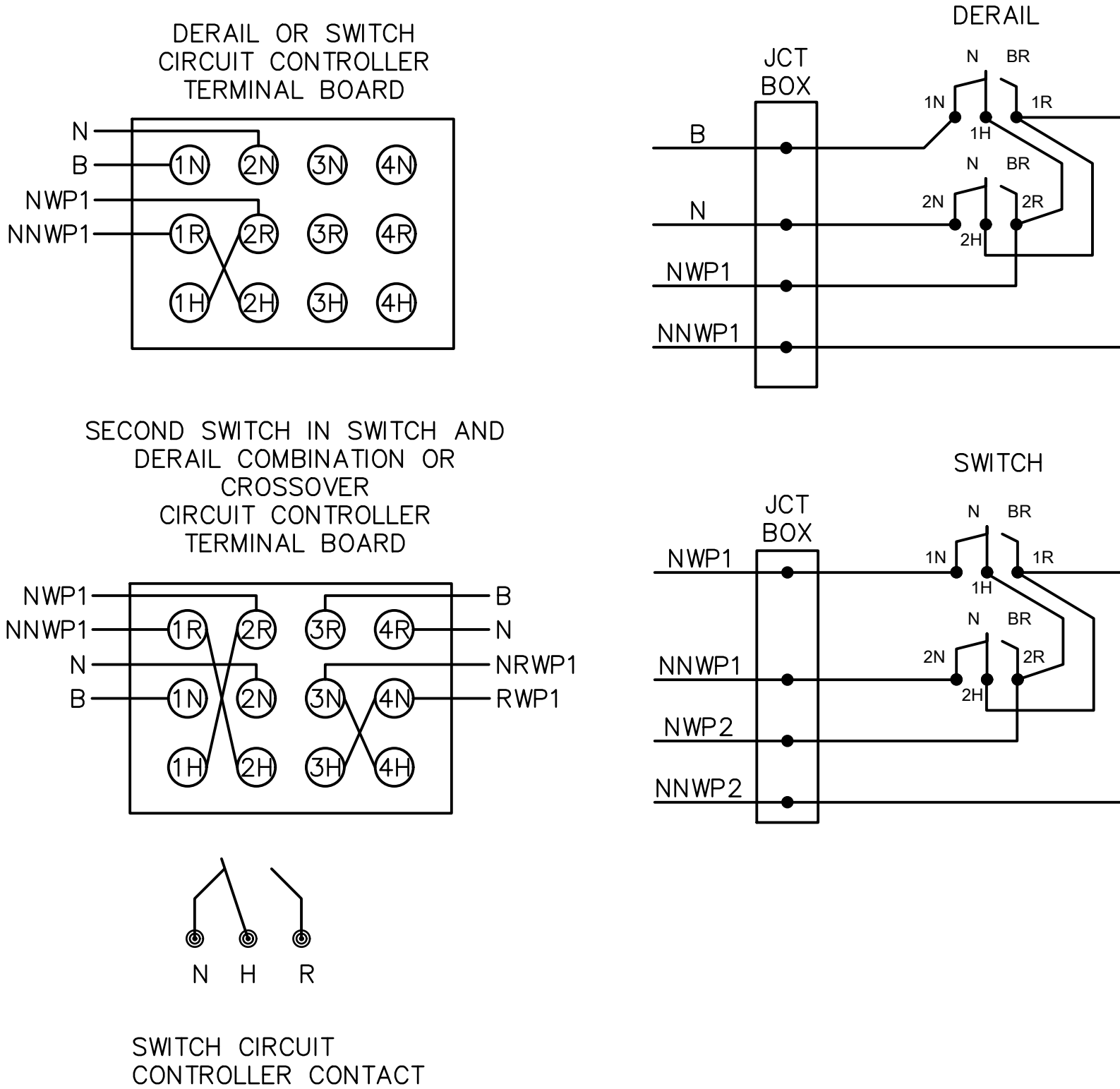
TYPICAL CIRCUIT



RELAY CONTACTS WITH SPECIAL CHARACTERISTICS



SWITCH CIRCUIT CONTROLLER WIRING





																						PENINSULA CORRIDOR JOINT POWERS BOARD											ENGINEERING STANDARD DRAWINGS											CADD FILE NAME: SD—5103																					
																						<div>APPROVED BY:  DIRECTOR, ENGINEERING</div>																						SIGNAL AND GRADE CROSSING SYSTEMS GENERAL SIGNAL											REV: EDITION: FIFTH										
																																												RELAYS AND RELAY CONTACTS SHELF AND VITAL RELAYS											SCALE: NTS										
010126											FIFTH EDITION																																	STANDARD DRAWING NO.: SD—5103																					
REV	DATE	BY	CHK	APP	DESCRIPTION						REV	DATE	BY	CHK	APP	DESCRIPTION																																																	

Figure 1 shows three schematic diagrams of the color channels: RED, YELLOW, and GREEN. Each diagram consists of a circuit diagram and a corresponding color tree diagram.

- RED Channel:** The circuit diagram shows a network of nodes 1 through 6. The color tree diagram shows a central node 250 connected to three nodes labeled R, Y, and G.
- YELLOW Channel:** The circuit diagram shows a network of nodes 1 through 6. The color tree diagram shows a central node 250 connected to three nodes labeled Y, R, and G.
- GREEN Channel:** The circuit diagram shows a network of nodes 1 through 6. The color tree diagram shows a central node 250 connected to three nodes labeled R, G, and Y.

HEAVY LINE INDICATES
NORMAL POSITION OF
SIGNAL

CL

SL

SL - SEARCHLIGHT
CL - COLORLIGHT
— CONTROLLED

Diagram illustrating the construction of a simple linear model. It shows two vertical lines, labeled CL and SL, representing the true and estimated regression lines. A horizontal line represents the true regression line. A legend indicates that the vertical line is GREEN, the diagonal line is YELLOW, and the horizontal line is RED.

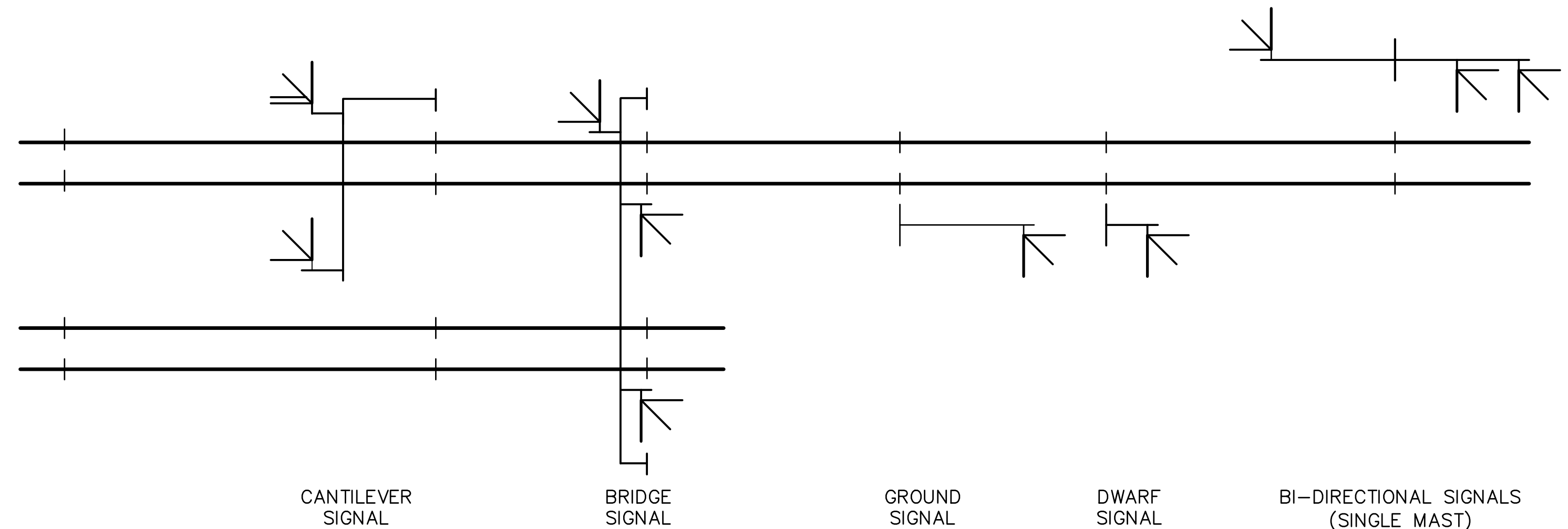
AUTOMATIC SIGNAL

A simple line drawing of a house with a triangular roof. Inside the house, the dimensions "6' x 8'" are written diagonally.



18

6-9

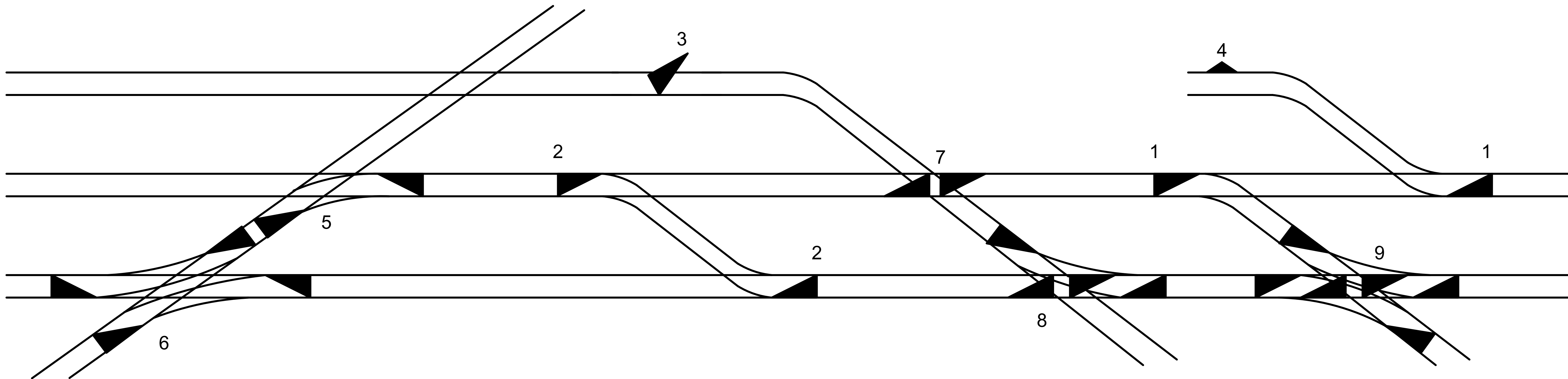
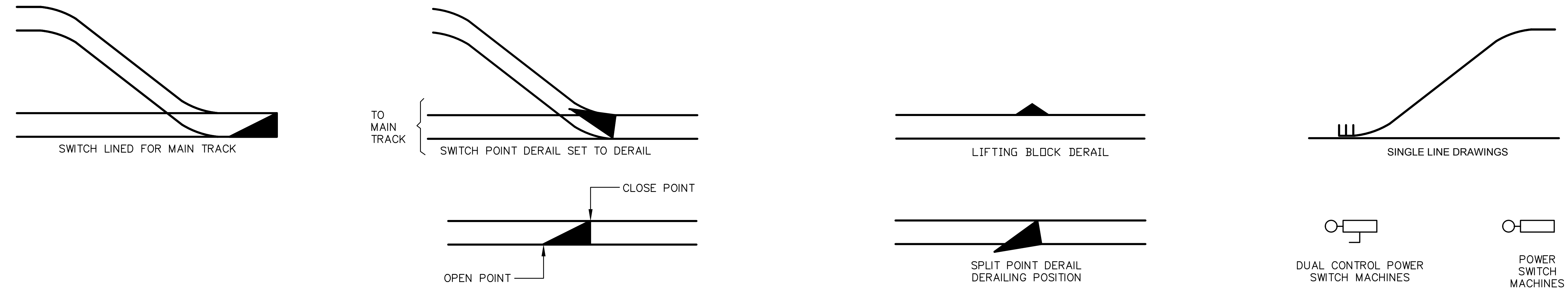
NUMERALS IN HOUSINGS
INDICATE SIZE OR CAPACITY
OF UNIT.



TYPES OF SIGNALS:
CL = COLORLIGHT
SL = SEARCHLIGHT
UL = UNILENS
LED = LIGHT EMITTING DIODE
TL = TRICOLOR LED

												PENINSULA CORRIDOR JOINT POWERS BOARD						ENGINEERING STANDARD DRAWINGS						CADD FILE NAME: SD-5105			
												<div>APPROVED BY:  DIRECTOR, ENGINEERING</div>						<div></div>						REV:		EDITION: FIFTH	
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010126						FIFTH EDITION												SIGNAL AND GRADE CROSSING SYSTEMS GENERAL SIGNAL						STANDARD DRAWING NO.: SD-5105			
REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP	DESCRIPTION							SIGNALS AND HOUSING GRAPHIC SYMBOLS									

INTERLOCKED SWITCHES AND DERAILS

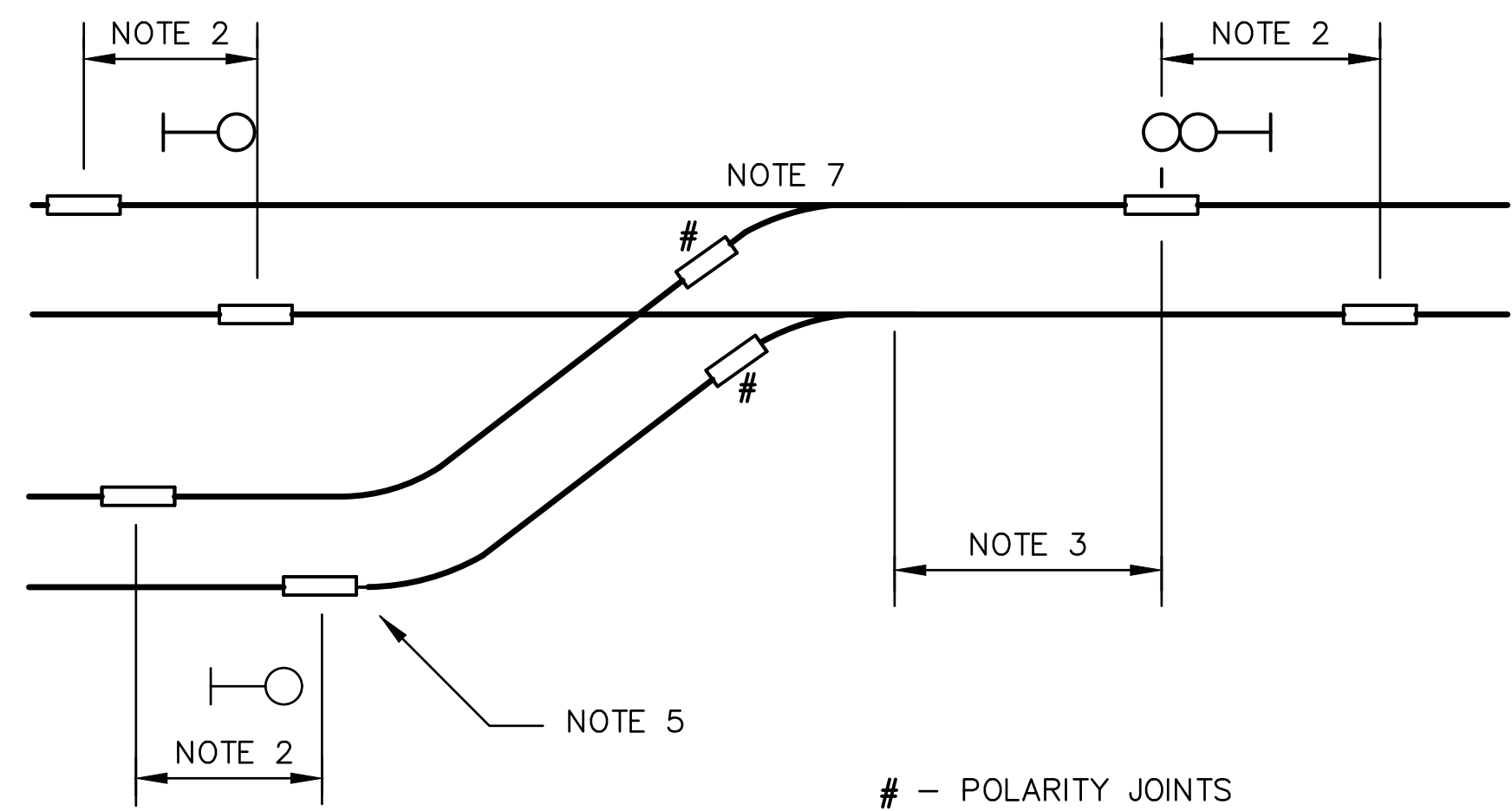
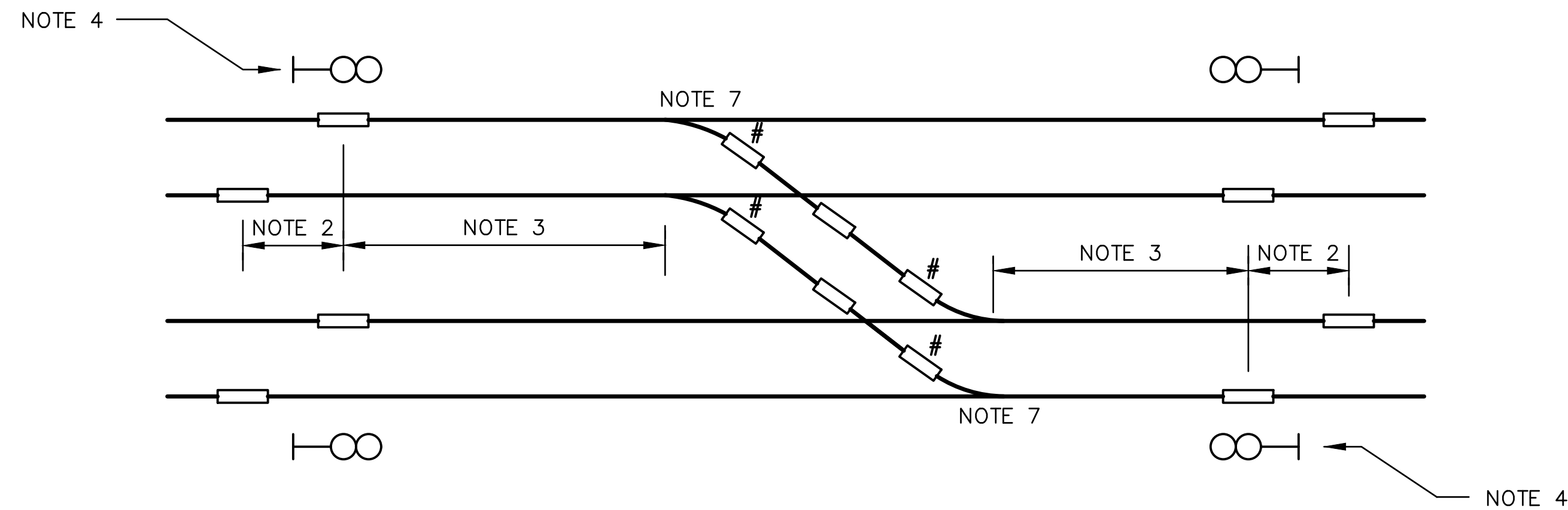


LINE PLAN

NOTES:

- | | |
|---------------------------------------|--|
| 1. SINGLE TURNOUT | 6. DOUBLE SLIP SWITCH WITH RIGID FROG |
| 2. SINGLE CROSSOVER | 7. MOVEABLE POINT CROSSING FROG (M.P.F.) |
| 3. DERAIL POINT TYPE (OLD) | 8. SINGLE SLIP SWITCH WITH M.P.F. |
| 4. DERAIL LIFT TYPE | 9. DOUBLE SLIP SWITCH WITH M.P.F. |
| 5. SINGLE SLIP SWITCH WITH RIGID FROG | |

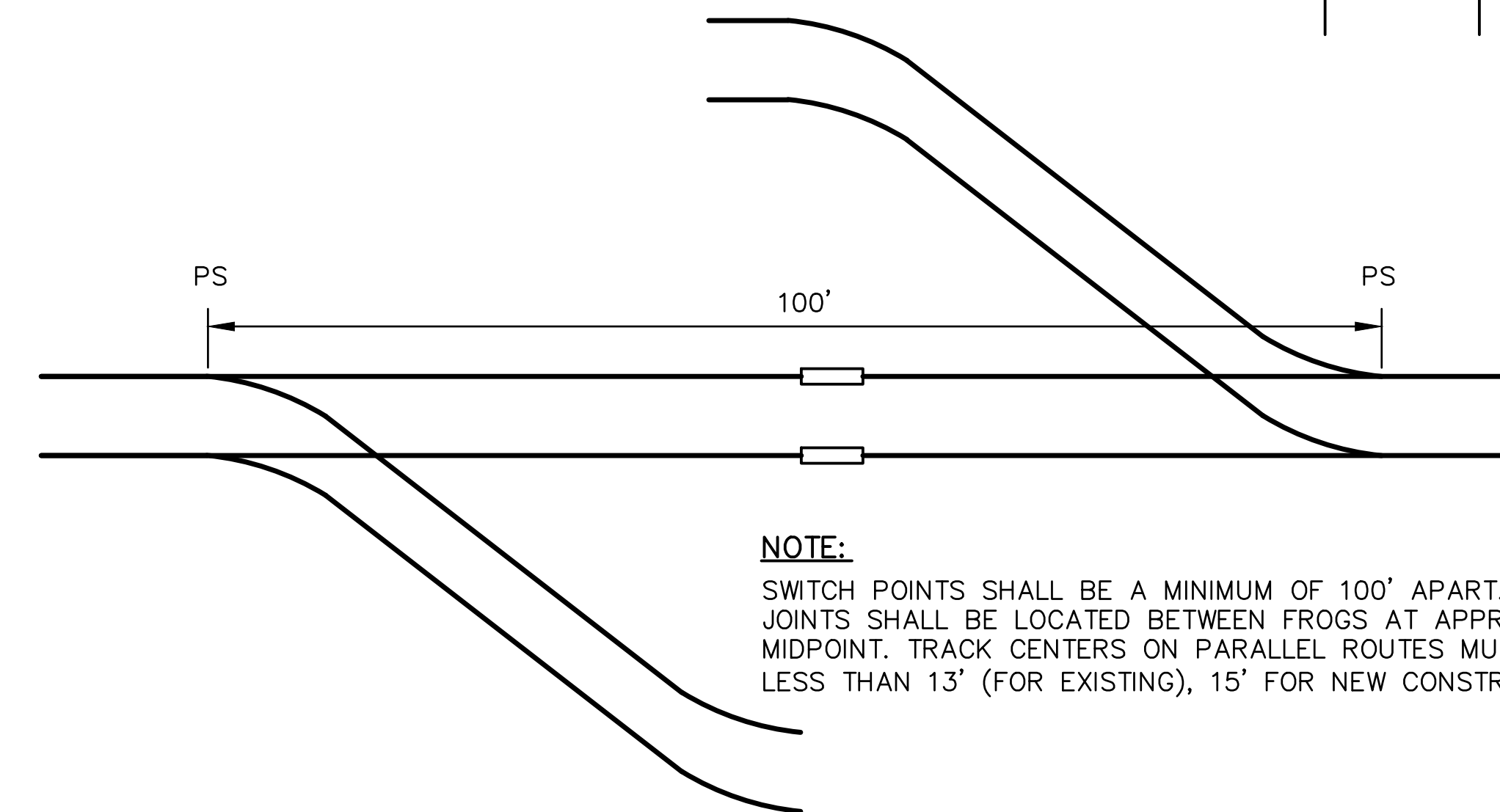
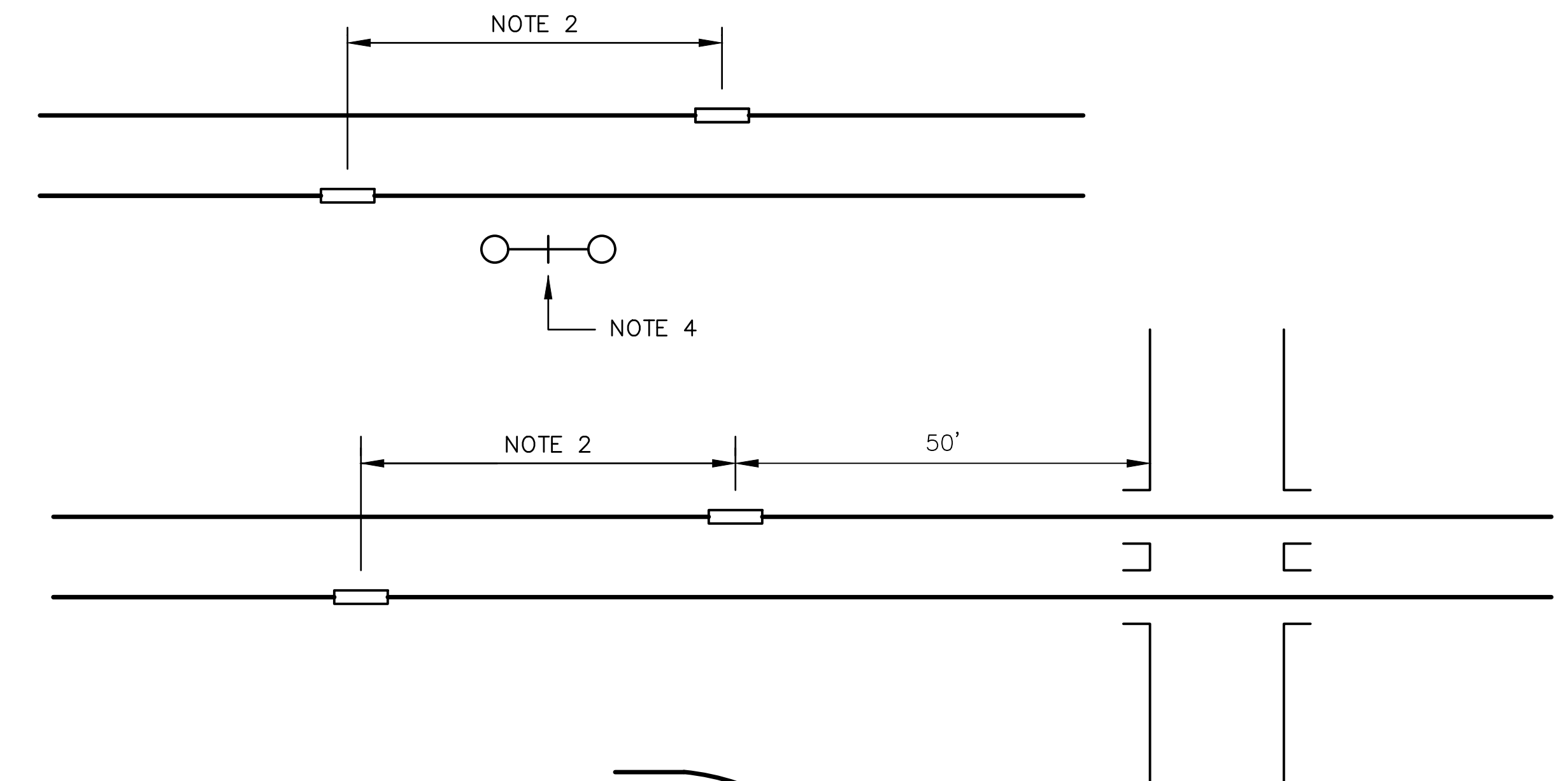
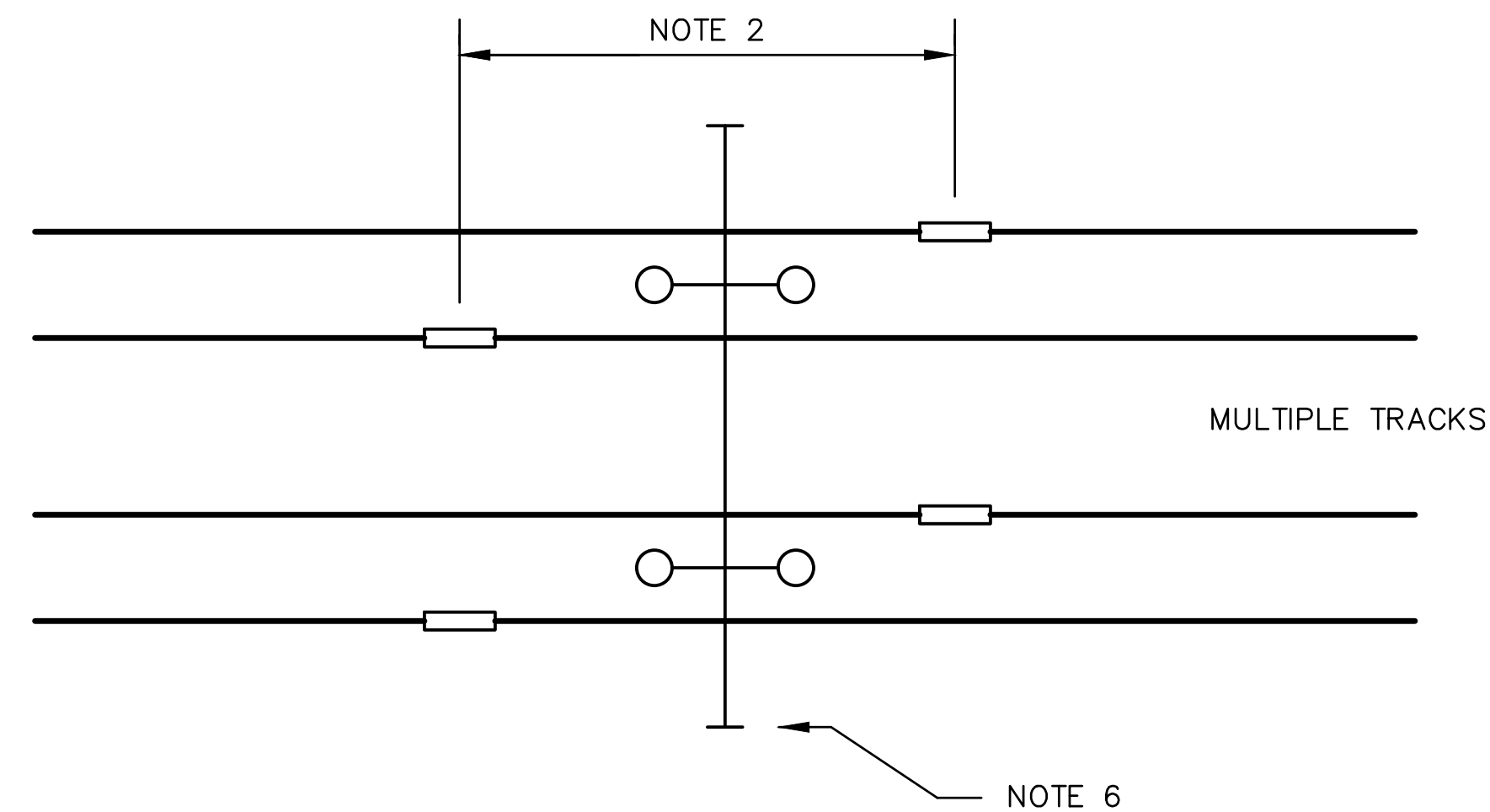
										PENINSULA CORRIDOR JOINT POWERS BOARD		ENGINEERING STANDARD DRAWINGS		CADD FILE NAME: SD-5106	
										APPROVED BY: <i>Bin Zhang</i>		SIGNAL AND GRADE CROSSING SYSTEMS GENERAL SIGNAL		REV:	EDITION: FIFTH
										Caltrain®		SWITCH AND DERAIL SYMBOLS		SCALE:	NTS
														STANDARD DRAWING NO.: SD-5106	
010126					FIFTH EDITION										
REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP					



- POLARITY JOINTS

NOTES:

1. POLARITY JOINTS SHALL HAVE A MAXIMUM STAGGER OF 4'-6".
2. DISTANCE MEASURED BETWEEN END POSTS OF INSULATED JOINTS, EXCEPT POLARITY JOINTS, SHALL BE 4'-8" MIN AND 10' MAX.
3. DISTANCE FROM POINT OF SWITCH TO FIRST INSULATED JOINT SHALL BE APPROXIMATELY 50'. IN NO CASE SHALL THIS DISTANCE BE LESS THAN 20'. INSTALLATIONS LESS THAN 50' MUST BE APPROVED BY CALTRAIN DEPUTY DIRECTOR OF ENGINEERING.
4. SIGNAL SHALL BE CENTERED BETWEEN INSULATED JOINTS.
5. INSULATED JOINT SHALL BE PLACED APPROXIMATELY 50' BEYOND CLEARANCE POINT (13' CENTERS), EXCEPT WHERE THE CLEAR POINT IS ON TANGENT TRACK PARALLEL TO THE MAIN TRACK, IN WHICH CASE INSULATED JOINTS MAY BE PLACED AT CLEARANCE POINT PLUS 15'.
6. SIGNALS ON CANTILEVERS AND BRIDGES SHALL BE LOCATED DIRECTLY ABOVE CENTERLINE OF TRACK. CANTILEVER AND BRIDGE MOUNTED SIGNALS SHALL BE CENTERED BETWEEN INSULATING JOINTS.
7. TIE PLATES UNDER POLARITY JOINTS SHALL HAVE A MINIMUM 1" CLEARANCE FROM TIE PLATE OF OPPOSITE POLARITY.
8. ALL NEW INSULATED JOINTS SHALL COMPLY WITH PTC REQUIREMENTS.



NOTE:

SWITCH POINTS SHALL BE A MINIMUM OF 100' APART. INSULATED JOINTS SHALL BE LOCATED BETWEEN FROGS AT APPROXIMATE MIDPOINT. TRACK CENTERS ON PARALLEL ROUTES MUST BE NO LESS THAN 13' (FOR EXISTING), 15' FOR NEW CONSTRUCTION

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DIRECTOR, ENGINEERING

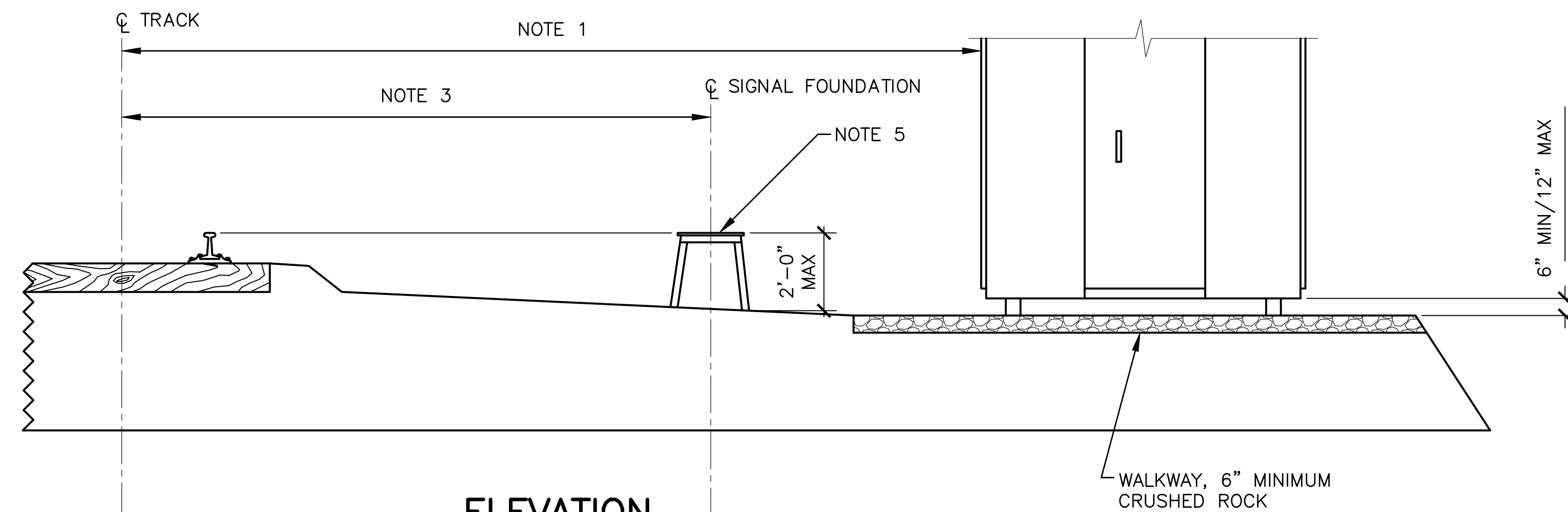


ENGINEERING STANDARD DRAWINGS

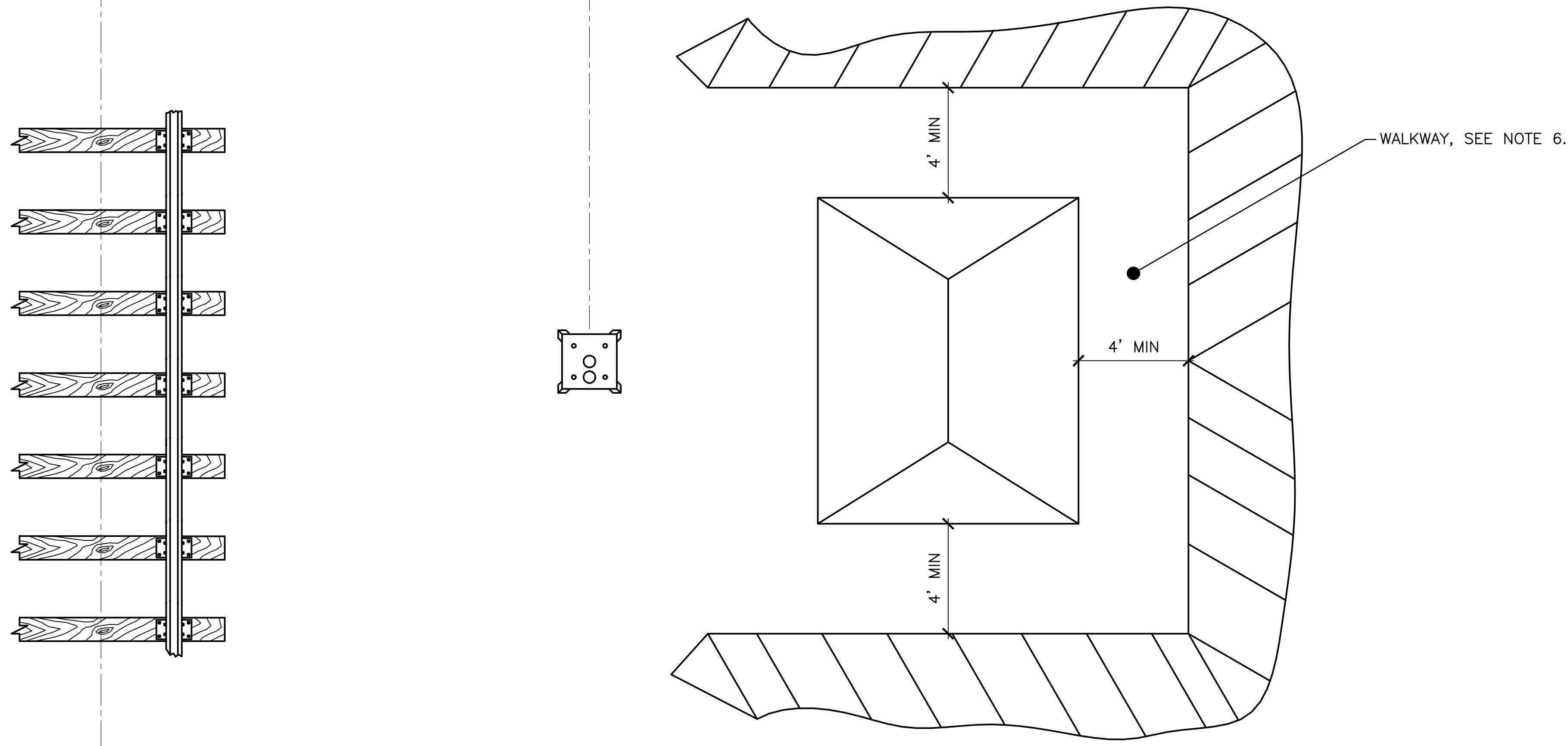
SIGNAL AND GRADE CROSSING SYSTEMS
GENERAL SIGNAL
STANDARD PLACEMENT
INSULATED JOINTS
AT SIGNAL LOCATIONS

CADD FILE NAME:
SD-5107
REV: EDITION:
FIFTH
SCALE:
NTS
STANDARD DRAWING NO.:
SD-5107

REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP	DESCRIPTION
010126					FIFTH EDITION						



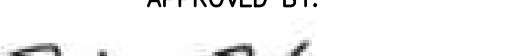

ELEVATION



PLAN VIEW

NOTES:

1. LOCATION FOR WAYSIDE SIGNAL HOUSES SHALL BE AS CLOSE AS POSSIBLE TO CALTRAIN'S RIGHT-OF-WAY LINE WHILE ALLOWING FOR THE 4' MINIMUM CLEARANCE REQUIRED AROUND THE HOUSE. WAYSIDE SIGNAL HOUSES SHALL BE NO LESS THAN 25' FROM THE CENTERLINE OF THE NEAREST TRACK. ANY DEVIATION FROM STANDARD DISTANCE SHALL REQUIRE AN APPROVED VARIANCE REQUEST.
2. LOCATION FOR CROSSING SIGNAL HOUSES SHALL BE 25' FROM THE CENTERLINE OF THE NEAREST TRACK AND 30' FROM FACE OF CURB OR AS DIRECTED BY THE ENGINEER.
3. DISTANCE SHALL BE 15'. SIGNALS SHALL NOT BE PLACED LESS THAN 15' FROM CENTERLINE OF NEAREST TRACK WITHOUT APPROVAL OF THE ENGINEER.
4. INSTALLERS SHALL ENSURE EQUIPMENT IS PLACED ENTIRELY ON CALTRAIN'S PROPERTY AND THAT SIGNAL IS EASILY VIEWED FROM A DISTANCE OF 2000'.
5. TOP OF SIGNAL FOUNDATION SHALL NOT BE HIGHER THAN TOP OF RAIL NOR LOWER THAN BASE OF RAIL.
6. WALKWAY SHALL CONSIST OF A 6" THICK MINIMUM LAYER OF CRUSHED ROCK, 1/4" TO 3/4" IN SIZE. WALKWAY SURFACE SHALL BE LEVEL. IN NO CASE SHALL THE WALKWAY SURFACE HAVE A SLOPE GREATER THAN 2%.
7. WHERE A SLOPE EQUAL TO THE MAIN LINE EMBANKMENT CANNOT BE MAINTAINED, A RETAINING WALL SHALL BE NECESSARY AND DESIGNED TO MAINTAIN THE REQUIRED WALKWAY AROUND SIGNAL HOUSE.

												PENINSULA CORRIDOR JOINT POWERS BOARD						ENGINEERING STANDARD DRAWINGS						CADD FILE NAME: SD-5108			
												<div>APPROVED BY:  DIRECTOR, ENGINEERING</div>												REV: SD-5108		EDITION: FIFTH	
																								SCALE: NTS		STANDARD DRAWING NO.: SD-5108	
																		SIGNAL AND GRADE CROSSING SYSTEMS GENERAL SIGNAL									
																		TYPICAL SIGNAL/CROSSING LOCATION									
REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP	DESCRIPTION																
	010126				FIFTH EDITION																						

TURN THIS DIRECTION
TO TIGHTEN NUT

PLACE SOLID WIRE EYELET OVER
TERMINAL POST AS SHOWN

SHOWN LESS BUT A MINIMUM
OF 32 TERMINALS SHALL BE
PROVIDED FOR A CROSSING
SIGNAL JUNCTION BOX

UNDERGROUND CABLE
TO SHELTER

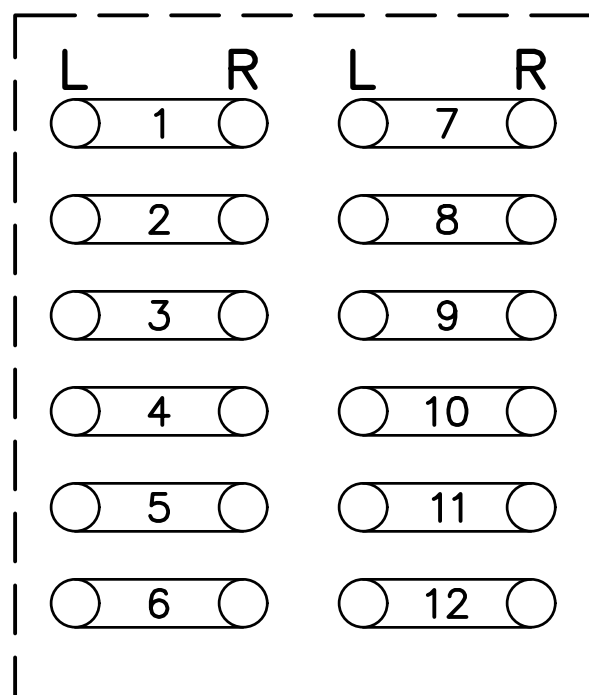
SEAL CABLE ENTRANCE

3/4" - 1" SPACE
BETWEEN NUTS

3-INCH
METAL PIPE
NIPPLE

TOP OF GALVANIZED
FOUNDATION

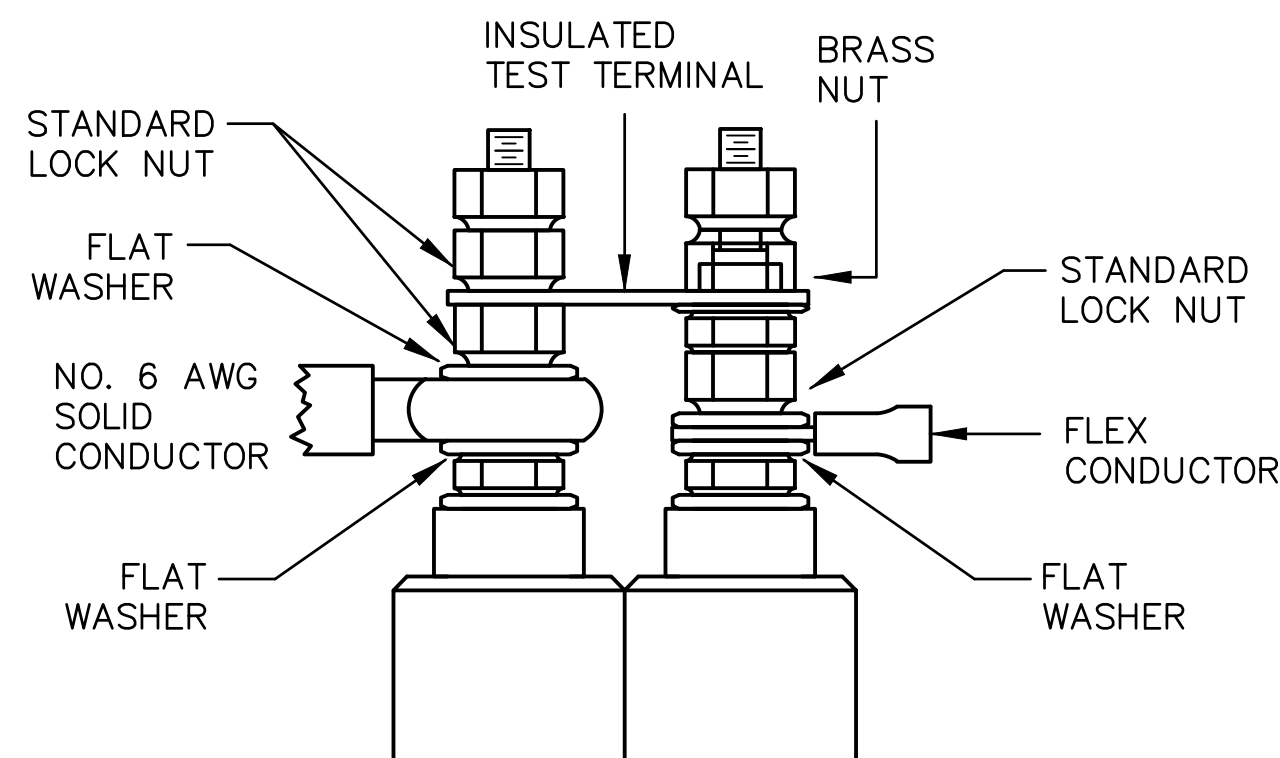
JUNCTION BOX BASE ON POLE



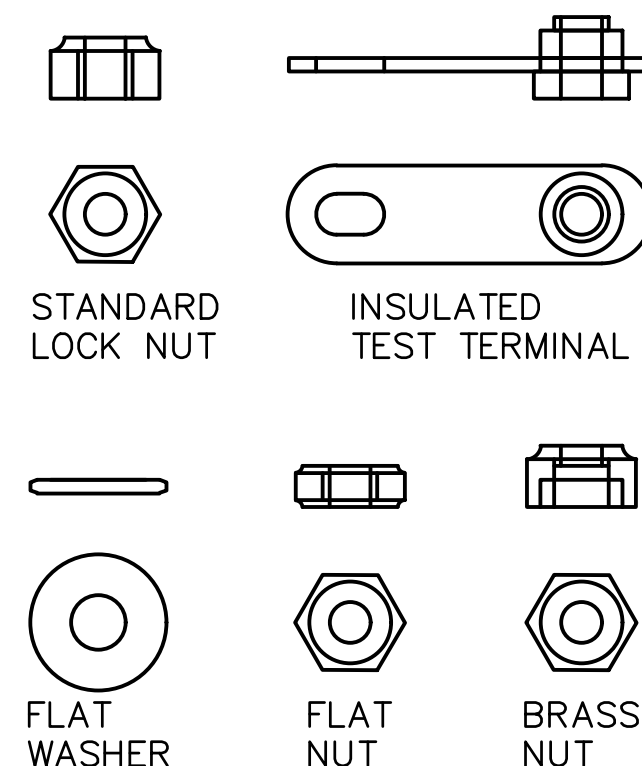
TERMINAL NUMBERING DIAGRAM

NOTE:

WHEN SMALLER SIZED SOLID CONDUCTORS
ARE REQUIRED, FLAT NUT AND STANDARD
NUTS WILL EXCHANGE POSITIONS.



AAR TERMINAL WITH 1 5/8" STUDS



NOTES:

1. ALL CABLES SHALL BE POTHEADED. METAL SHIELDING SHALL BE ATTACHED TO GROUNDING BOLT IN SIGNAL HOUSE.
2. INSULATION ON SOLID CONDUCTORS SHALL BE REMOVED AND THE EXPOSED BARE WIRE THOROUGHLY CLEANED TO PROVIDE HIGH CONDUCTIVITY, TAKING CARE NOT TO NICK OR DAMAGE WIRE.
3. THE BARE WIRE SHALL BE FORMED TO PRODUCE AN EYELET, WHICH SHALL BE PLACED OVER THE BINDING POST. THE EYELET SHALL BE SIZED TO PROVIDE A TIGHT FITTING LOOP AROUND THE POST BUT LOOSE ENOUGH TO EASILY SLIDE ON AND OFF.
4. A FLAT WASHER SHALL BE PLACED ON THE BINDING POST. THE EYELET SHALL THEN BE PLACED ON THE POST FOLLOWED BY ANOTHER FLAT WASHER. A NUT SHALL BE APPLIED AND SECURELY TIGHTENED WITH A TERMINAL WRENCH.
5. INSULATION ON FLEX CONDUCTORS SHALL BE REMOVED USING A SPRING LOADED STRIPPING TOOL RECOMMENDED BY THE MANUFACTURER OF THE WIRE AND THE EXPOSED BARE WIRE THOROUGHLY CLEANED TO PROVIDE HIGH CONDUCTIVITY.
6. EYELET SHALL BE ATTACHED TO FLEX CONDUCTORS. ONLY CALTRAIN APPROVED EYELET SHALL BE UTILIZED. A COMPRESSION TOOL RECOMMENDED BY THE MANUFACTURER OF THE EYELET SHALL BE USED TO ATTACH THE EYELET.
7. A FLAT WASHER SHALL BE PLACED ON THE BINDING POST. THE EYELET SHALL THEN BE PLACED ON THE POST FOLLOWED BY ANOTHER FLAT WASHER. IF APPLICABLE, THE SECOND EYELET SHALL BE PLACED ON THE POST FOLLOWED BY A FLAT WASHER. A NUT SHALL BE APPLIED AND SECURELY TIGHTENED WITH A TERMINAL WRENCH.
8. AN INSULATED TEST LINK SHALL BE INSTALLED ONCE THE SOLID CONDUCTORS AND EYELETS ARE ATTACHED. THE TEST LINK SHALL BE SECURED USING ONE FLAT AND ONE CROWN NUT AND THE CIRCUIT "CLOSED" BY APPLYING THE BRASS NUT.
9. FLEX CONDUCTORS SHALL BE TAGGED USING PCJPB APPROVED TAGS.
10. WHERE POSSIBLE, SPARE SOLID CABLE CONDUCTORS SHALL BE ATTACHED TO SPARE BINDING POSTS. NO MORE THAN ONE SOLID CONDUCTOR SHALL BE SECURED TO A POST.
11. DRAWING DEPICTS TERMINATION OF CABLE CONDUCTORS AND EQUIPMENT WIRING. THIS METHOD SHALL BE USED IN JUNCTION BOXES USED FOR SWITCHES, SIGNALS, CROSSING GATES, CANTILEVERS, ETC. INSULATED TEST TERMINALS SHALL BE INSTALLED ON EACH END OF ANY CABLE TERMINATED SO THAT CABLE CONDUCTORS MAY BE ISOLATED WITHOUT REMOVING CONDUCTOR FROM TERMINAL.

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DIRECTOR, ENGINEERING



ENGINEERING STANDARD DRAWINGS

SIGNAL AND GRADE CROSSING SYSTEMS
GENERAL SIGNAL

TERMINATION
TYPICAL CABLE TERMINATION

CADD FILE NAME:
SD-5109

REV: EDITION:
FIFTH

SCALE: NTS

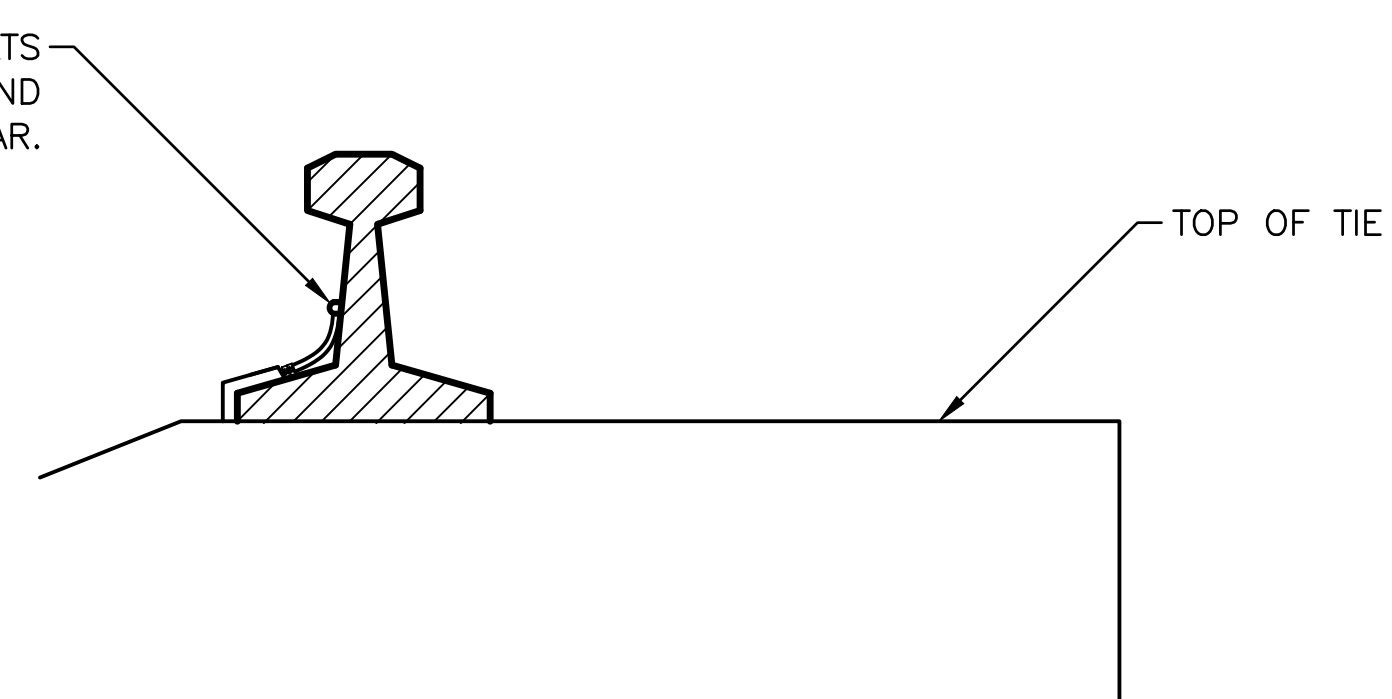
STANDARD DRAWING NO.:
SD-5109

010126 FIFTH EDITION

REV DATE BY CHK APP

DESCRIPTION

REV DATE BY CHK APP



A technical drawing of a roof detail, showing a cross-section of a roof with a chimney and a curved pipe. The drawing is enclosed in a circle. The roof is shown with a horizontal line representing the ground level. A chimney is shown on the left, with a cross-section of the chimney body and a cross-section of the chimney flue. A curved pipe is shown on the right, with a cross-section of the pipe body and a cross-section of the pipe flue. The drawing is a black and white line drawing.



PLAN

Diagram illustrating the installation of track wiring (Track Wire and Bond Strand) along a rail tie.

- EACH TRACK WIRE CONNECTED TO WEB OF RAIL WITH WELD TYPE TRACK CONNECTOR
- RAIL CLIPS
- PLACE RUBBER HOSE WITH BOND STRAND ALONG TIE 1" BELOW TOP OF BALLAST.
- NO. 6 FLEX TRACK WIRE (BOND STRAND) IN RUBBER HOSE.
- BOND STRAND/TRACK WIRE CONNECTION. SEE DETAIL.
- 2C #6 TRACK WIRE, SOLID
- 25' MAX.

NOTES:

1. SEE PCJPB SIGNAL STANDARD "TYPICAL PULL BOX INSTALLATION" DRAWING NO. SD-5123.
2. BOND STRAND/TRACK WIRE CONNECTION MAY BE MADE IN PULL BOX.

[illegible]

APPROVED BY:

Bin Zhang

DIRECTOR, ENGINEERING



SIGNAL AND GRADE CROSSING SYSTEMS GENERAL SIGNAL

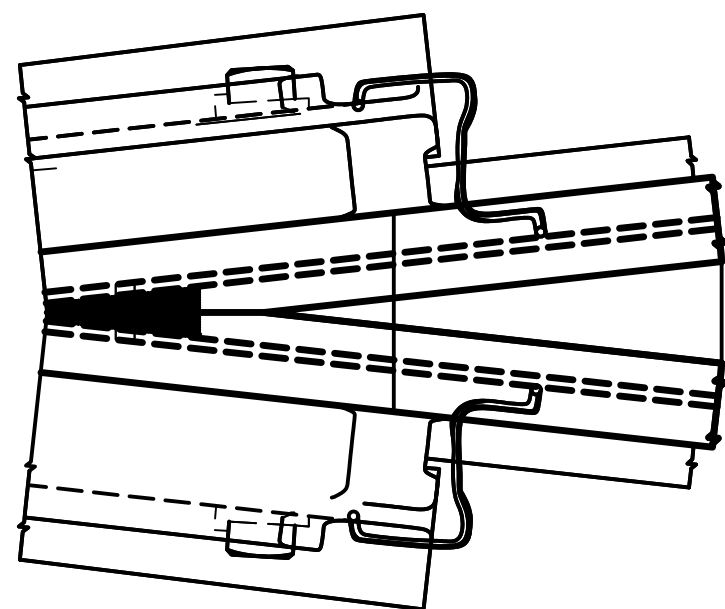
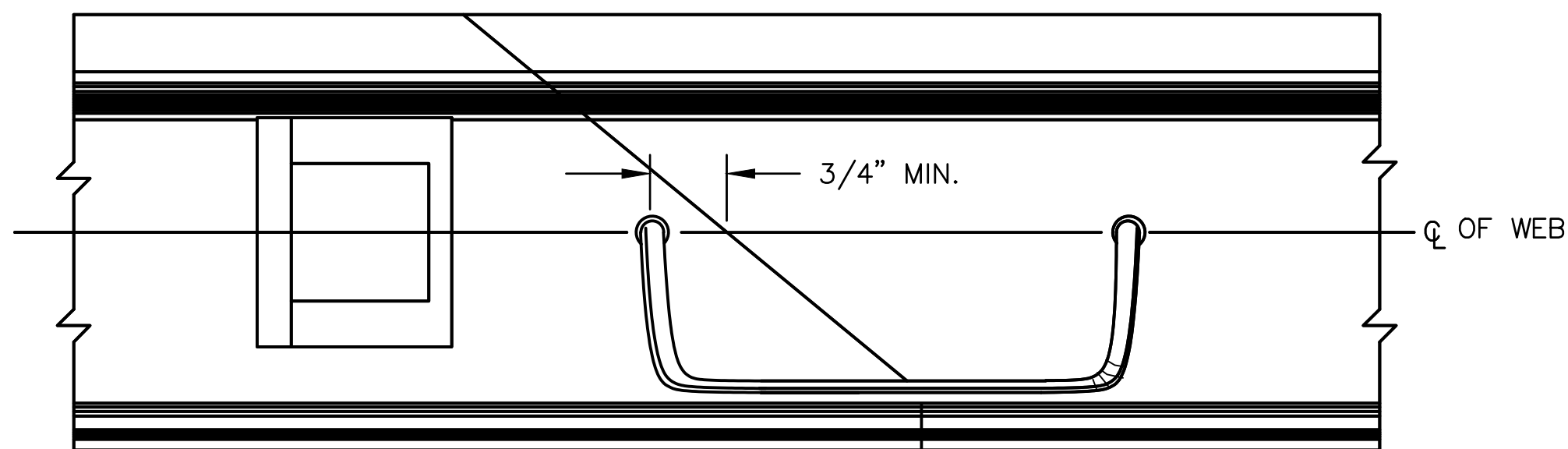
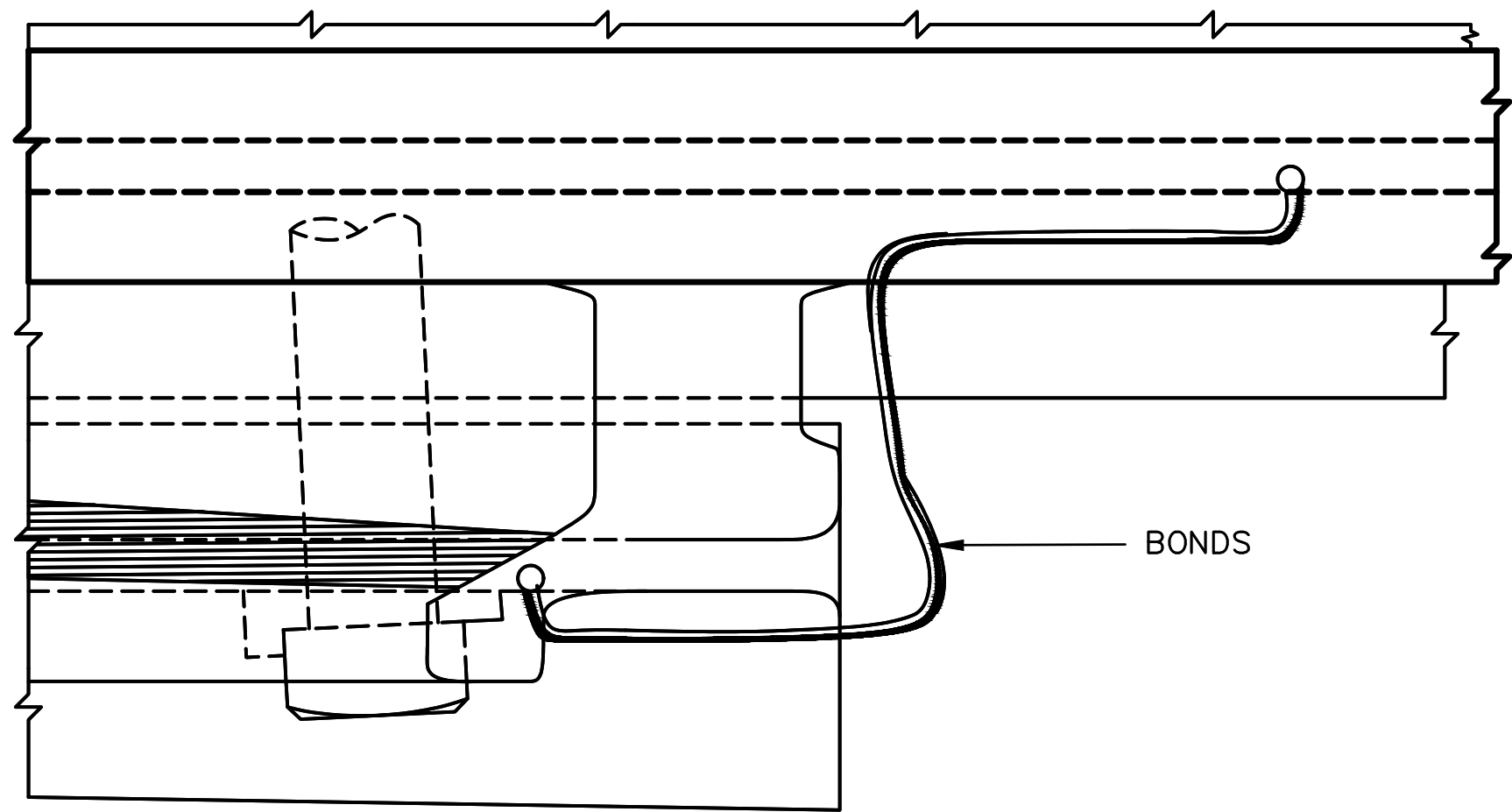
TYPICAL TRACK WIRES TRACK WIRES LAYOUT

CADD FILE NAME:
SD-5110

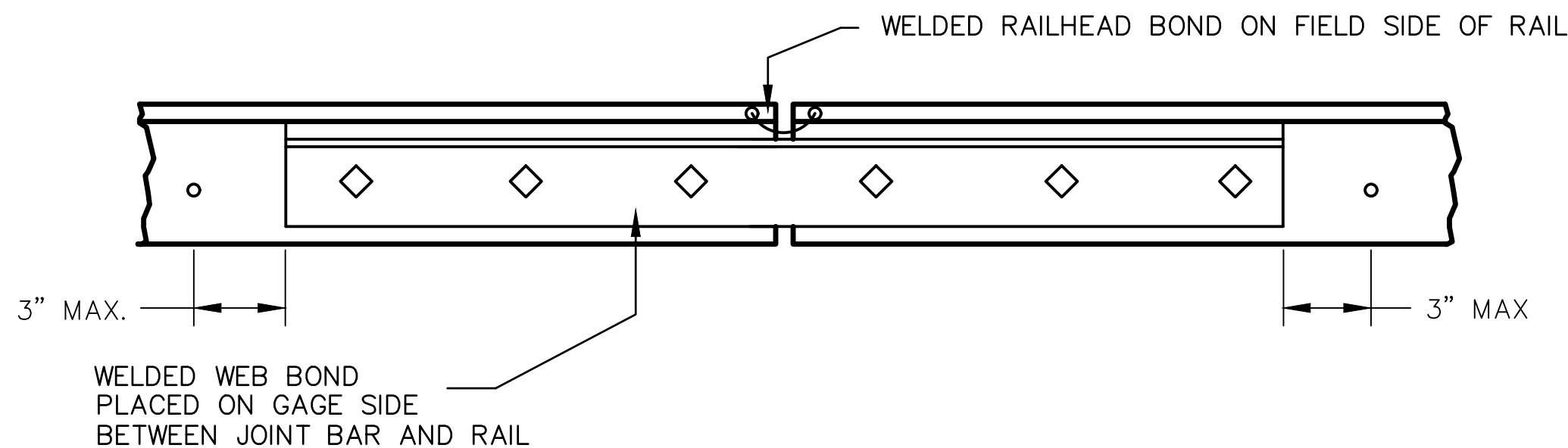
REV:	EDITION:
	FIFTH

SCALE: NTS

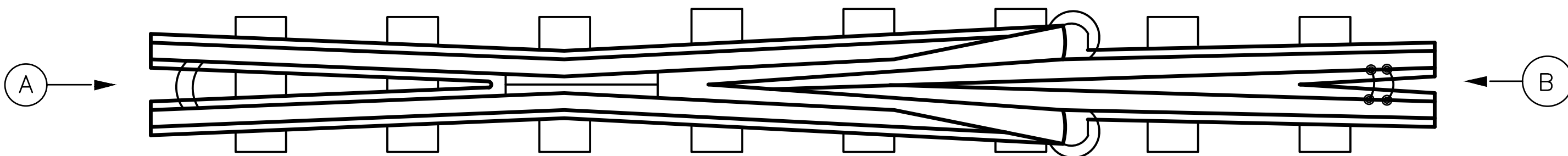
STANDARD DRAWING NO.:
SD-5110



TURNOUT FROG BONDING

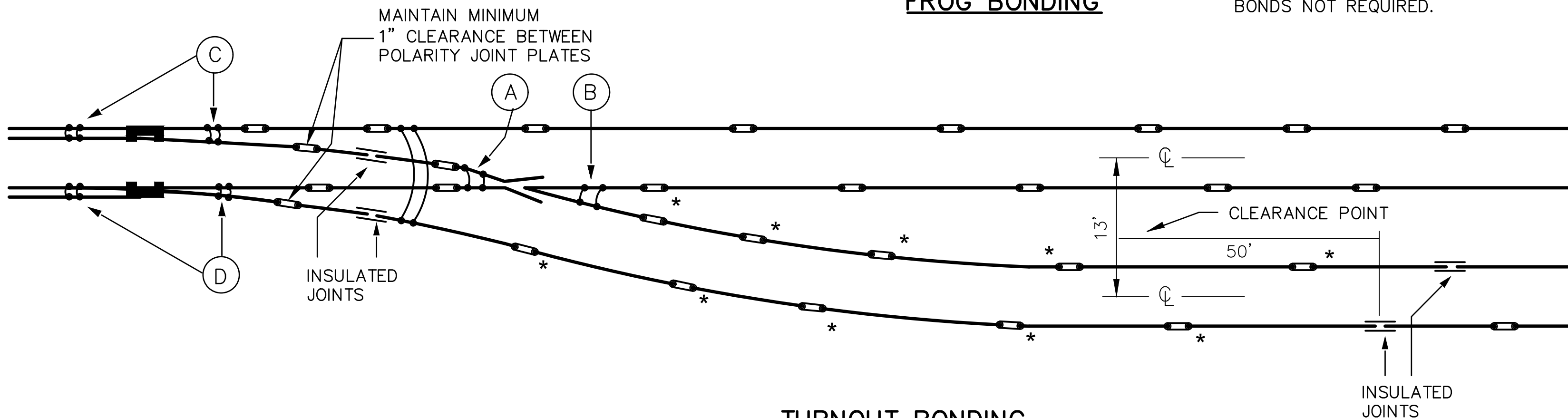


JOINT BONDING



FROG BONDING

NOTE: IN PLACE OF WHERE 2 WING RAILS ARE WELDED — ONE PIECE BONDS NOT REQUIRED.



TURNOUT BONDING

NOTES:

1. BONDS BETWEEN RAILS AT A, B, C AND D SHALL BE APPLIED TO RAIL WEB
2. TURNOUTS SHALL BE DOUBLE BONDED USING ONE WEB TYPE BOND AND ONE RAILHEAD BOND, WITH EXCEPTION TO JOINTS MARKED WITH AN (*), THOSE JOINTS ONLY REQUIRE RAILHEAD BOND WHEN TURNOUT TERMINATES IN A TRACK RELAY
3. ALL WEB BONDS SHALL BE 3/16" IN DIAMETER, 12" LONG WITH STEEL TERMINALS WELDED TO THE WEB OF THE WELDED TYPE
4. ALL RAILHEAD BONDS SHALL BE 3/16" IN DIAMETER WITH STEEL TERMINALS WELDED TO CONDUCTORS OF THE WELDED TYPE. THEY SHALL HAVE A NOMINAL LENGTH OF 6 1/2"
5. LOCATION OF THE INSULATED JOINTS MAY BE MODIFIED ONLY WITH THE ENGINEER'S APPROVAL
6. PLACEMENT OF BOND WIRES SHALL MAXIMIZE BROKEN RAIL DETECTION
7. WIRES TO FOLLOW CONTOUR OF RAIL AND TIE WITH NO EXCESS SLACK
8. ALL BONDS AND TRACK CONNECTIONS UTILIZING 3/16" BOND STRAND SHALL BE WITH STEEL TERMINALS WELDED TO THE RAIL
9. WHERE THE 2 WING RAILS ARE WELDED AS ONE PIECE BONDS ARE NOT REQUIRED
10. ON RIGID FROG, BONDS SHALL BE INSTALLED ON THE SIDE OF THE FROG ON WHICH THE HEADS OF BOLTS ARE LOCATED. ON SPRING RAIL FROG, BONDS ARE NOT REQUIRED ON MOVEABLE SIDE
11. DISTANCE BETWEEN TERMINALS IS SHOWN AS 1". THIS DIMENSION MAY DECREASE, WHEN NECESSARY, DUE TO LIMITED DISTANCE FROM BOLT TO THE END OF THE RAIL
12. WHEN A PLATE CLIP (ON SPRING RAIL FROGS) INTERFERES WITH APPLICATION OF BONDS AS SHOWN HEREON, THE PLATE CLIP SHALL BE ARRANGED TO PERMIT PROPER INSTALLATION OF THE BONDS

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DIRECTOR, ENGINEERING



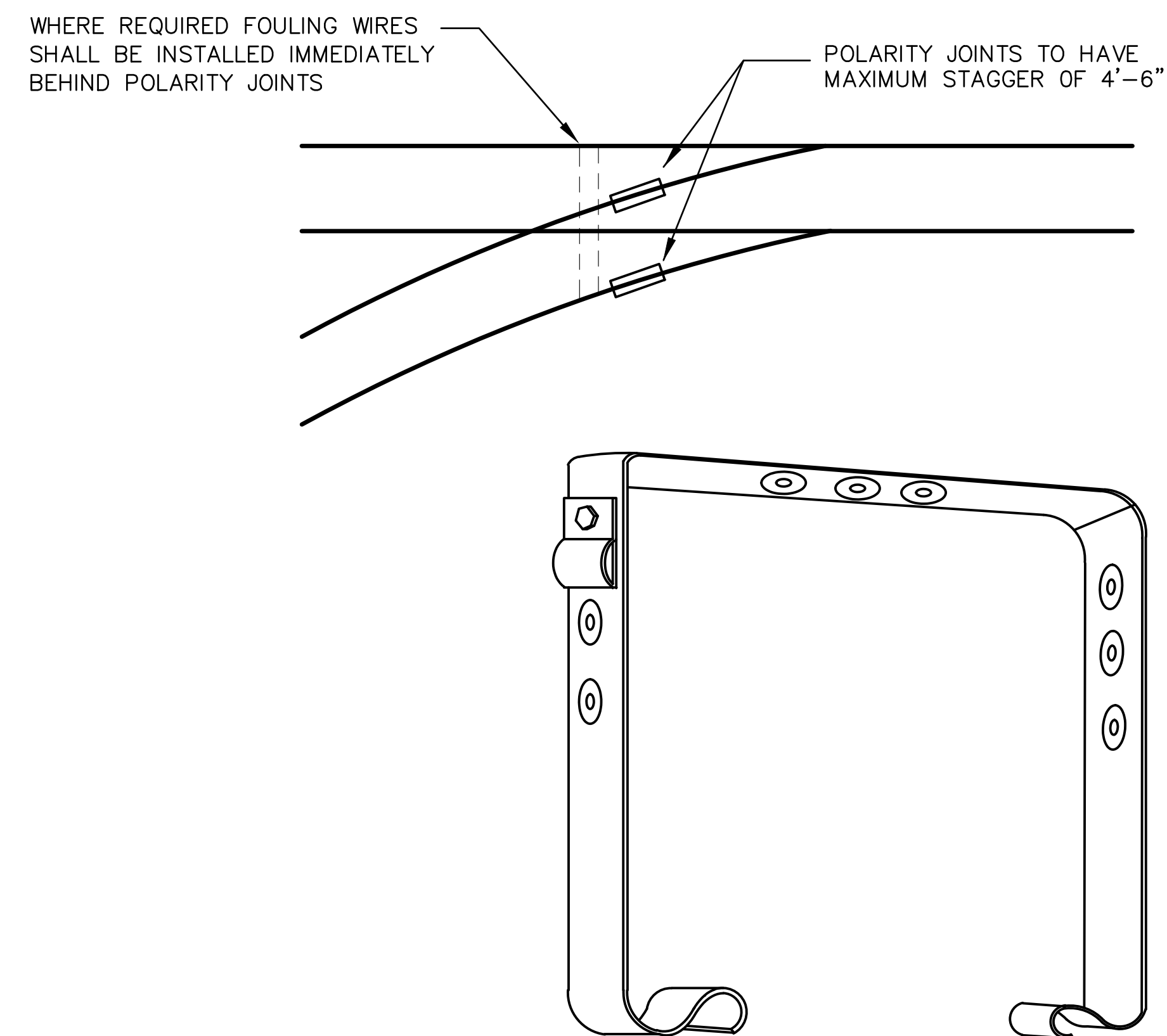
ENGINEERING STANDARD DRAWINGS

SIGNAL AND GRADE CROSSING SYSTEMS
GENERAL SIGNAL

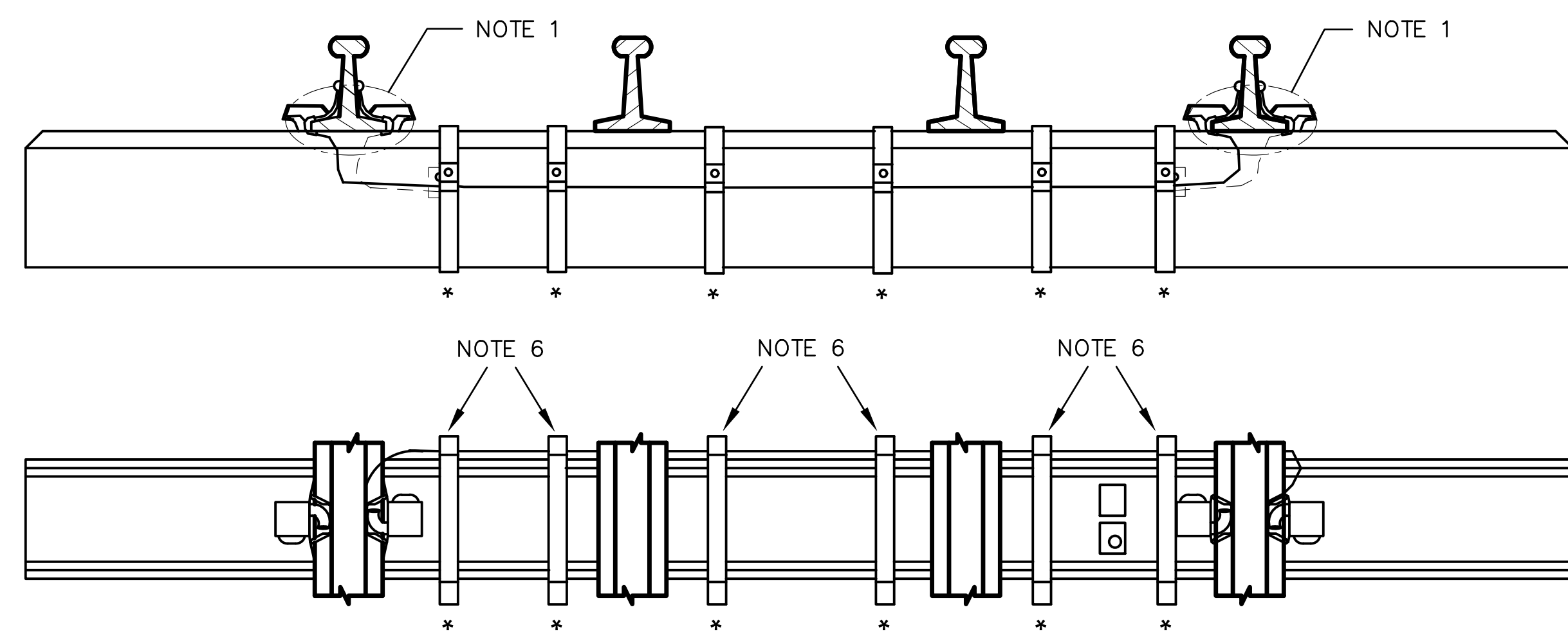
RAIL BONDING DETAILS

CADD FILE NAME:
SD-5112
REV:
EDITION:
FIFTH
SCALE:
NTS
STANDARD DRAWING NO.:
SD-5112

REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP	DESCRIPTION
010126					FIFTH EDITION						



CLAMP SHALL BE SIZED FOR SNUG FIT TO TIE.
SEE SHEET SD-5110 FOR SIZING DETAILS



NOTES:

1. USE TWO STRANDED INSULATED TRACK WIRES INSTALLED WITH WEB WELD ATTACHED FROM OPPOSITE SIDES
2. FOULING WIRES SHALL BE INSTALLED ON SIDE OF ADJACENT TIES
3. FOULING WIRES SHALL BE MAINTAINED FREE OF SPLICES AND BE EXPOSED FOR VISUAL INSPECTION
4. AVOID PLACING FOULING WIRES WHERE THEY MAY COME IN CONTACT WITH RAIL ANCHORS
5. BOND STRAND FOR FOULING WIRES SHALL BE 3/16" SINGLE STRAND WITH 1/16" BLACK PVC INSULATION
- * 6. STRAPS TO BE USED ON CONCRETE TIES. USE INSULATED WIRE CLAMPS, AS SHOWN IN SD-5110, ON WOOD TIES - STRAPS SHALL BE EVENLY SPACED

	010126				FIFTH EDITION										
REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP					

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DIRECTOR, ENGINEERING

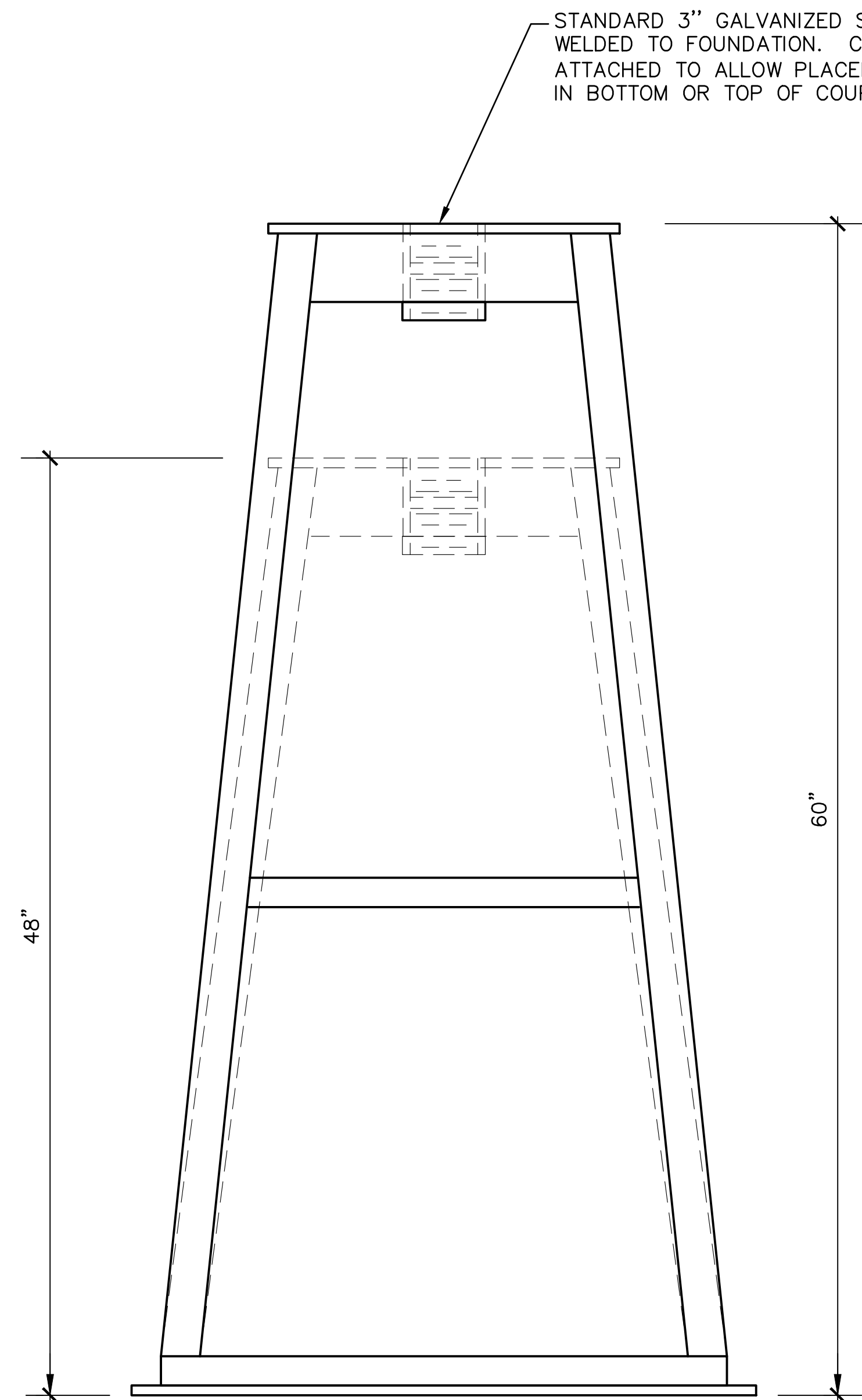


ENGINEERING STANDARD DRAWINGS

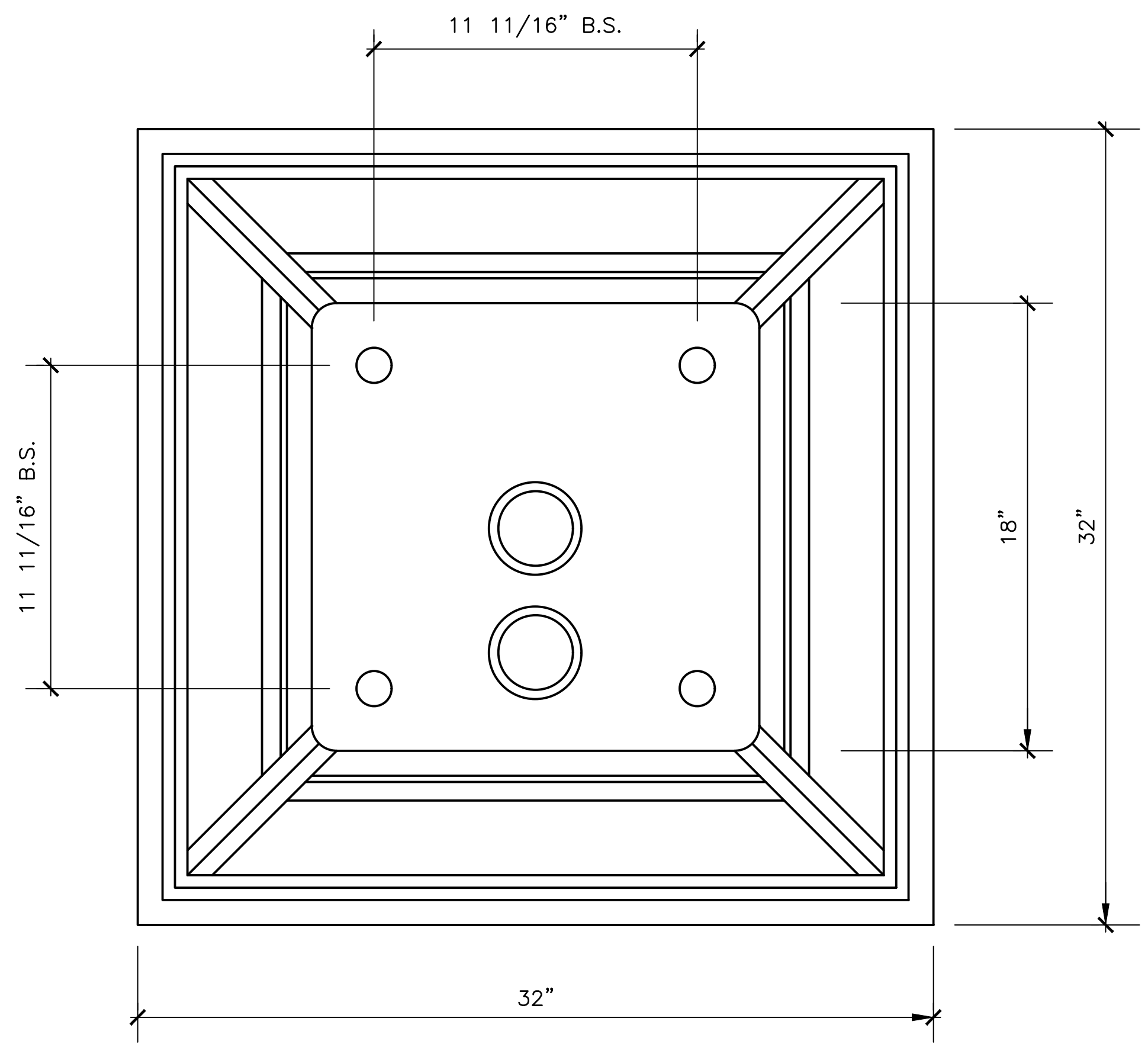
SIGNAL AND GRADE CROSSING SYSTEMS	R
GENERAL SIGNAL	S

STANDARD PLACEMENT OF FOULING WIRES

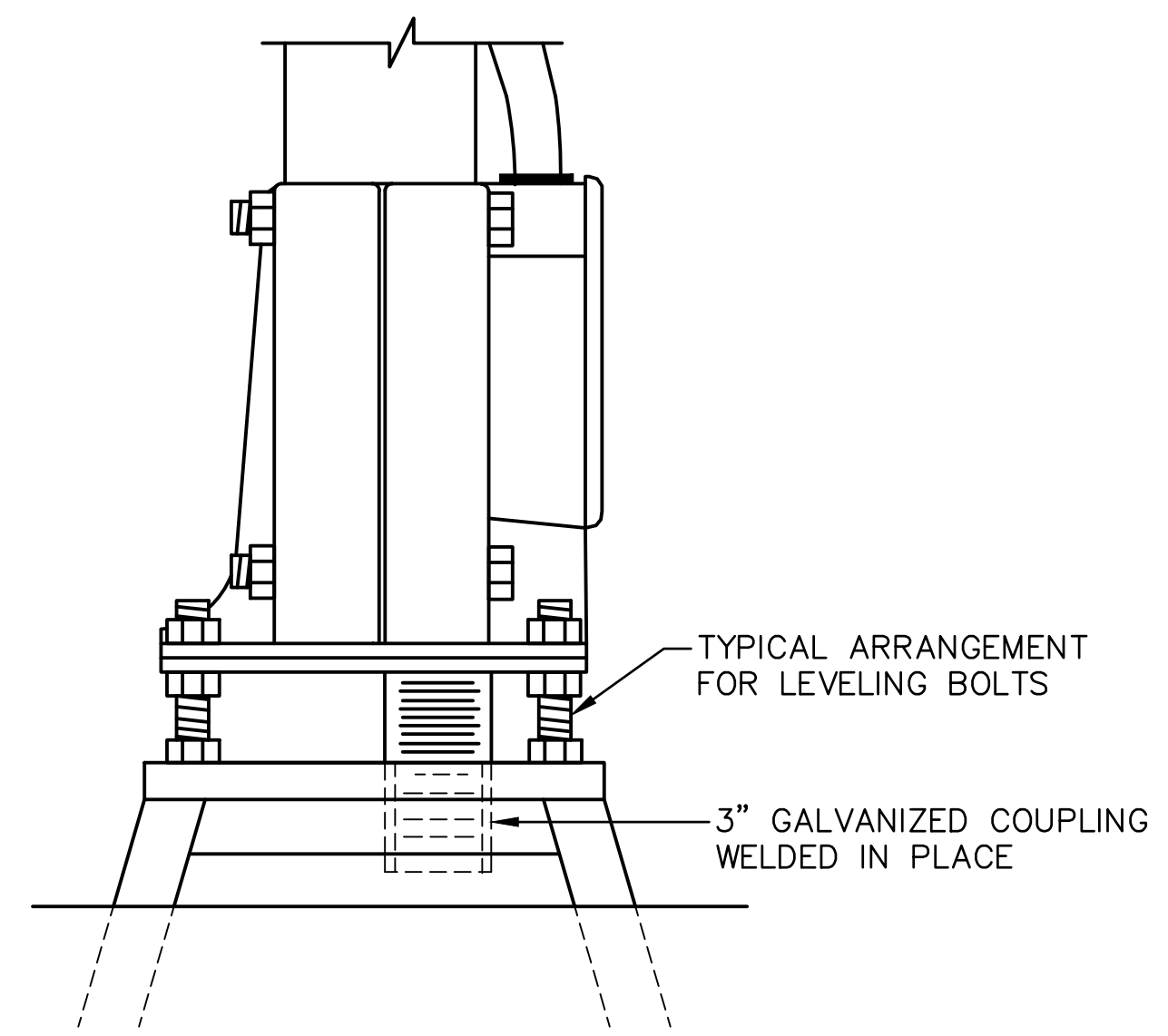
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SCALE: NTS	
STANDARD DRAWING NO.: SD-5113	



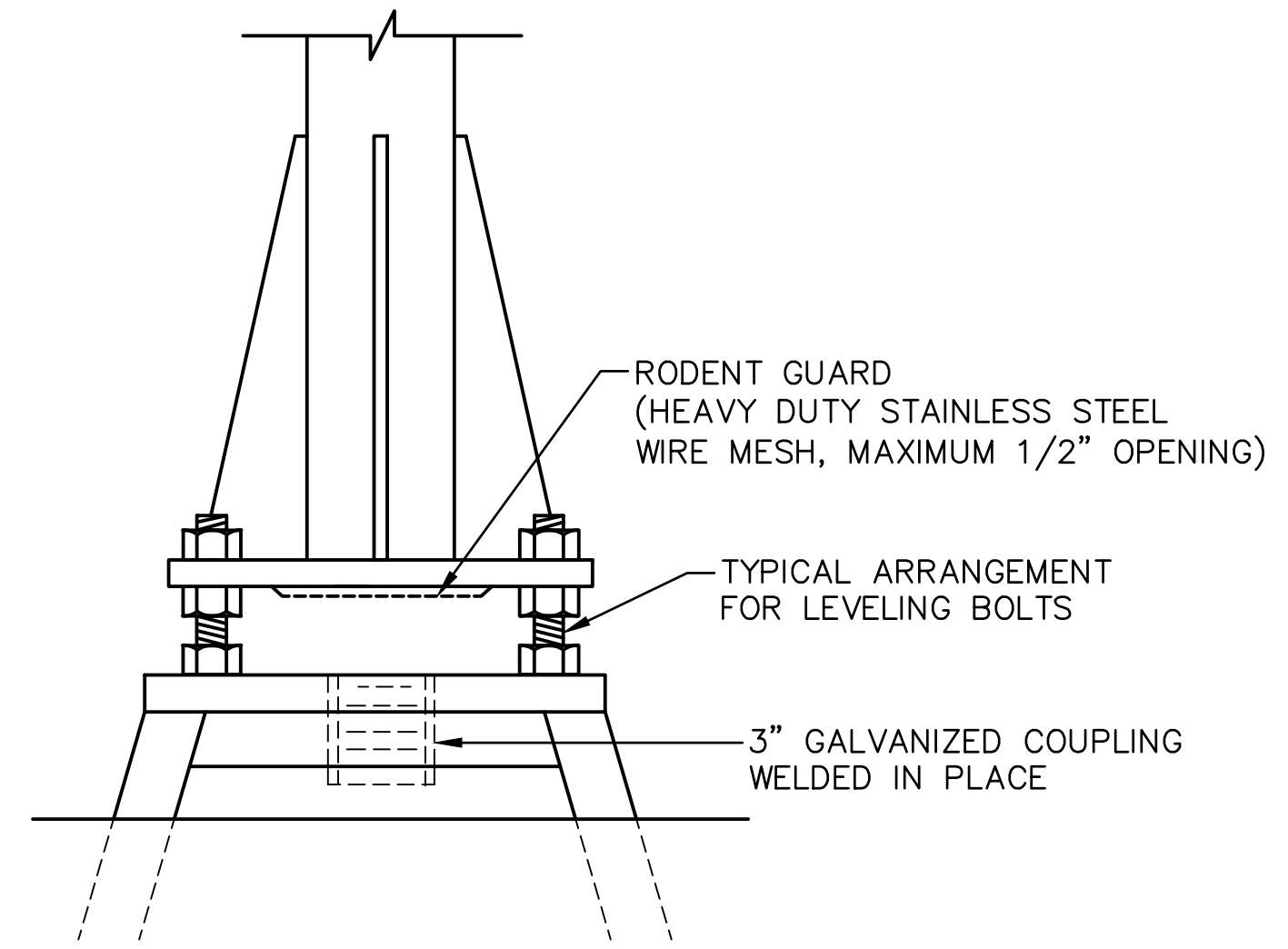
GROUND SIGNAL FOUNDATION



TOP VIEW



GATE FOUNDATION

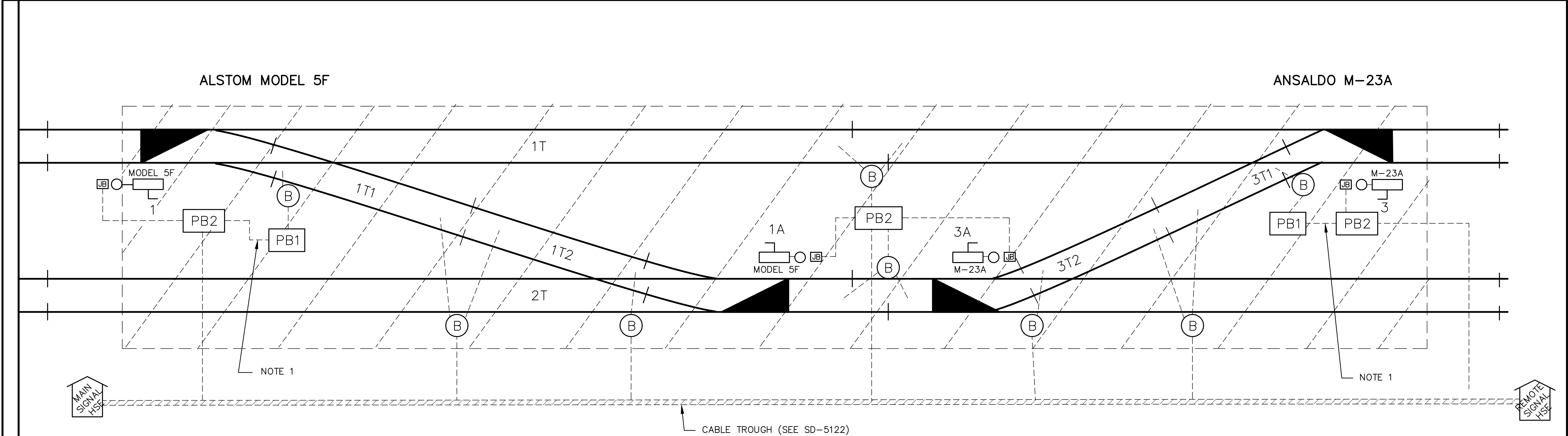


FLASHER MAST FOUNDATION

NOTES:

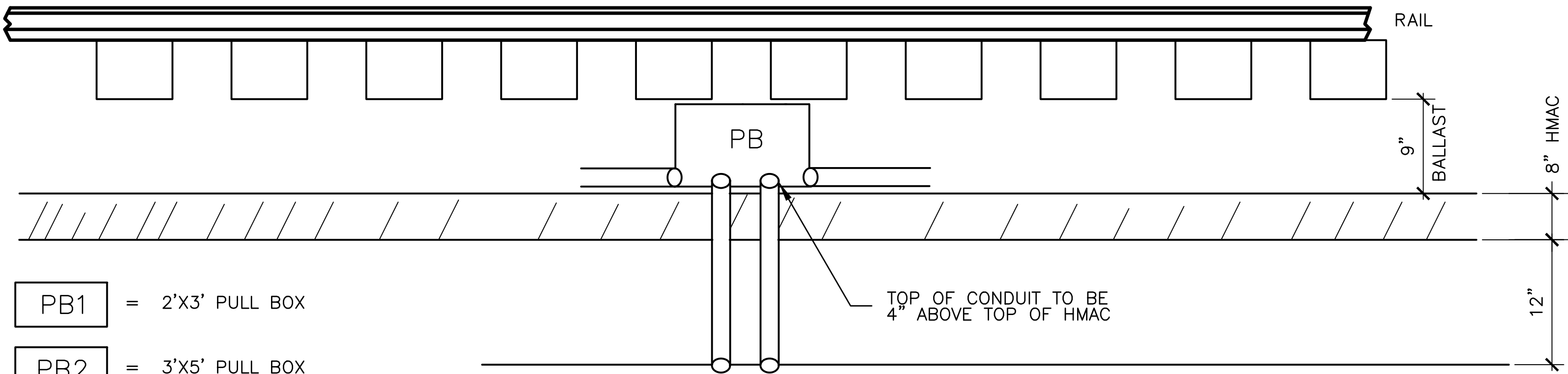
1. FOUNDATIONS SHALL BE HOT DIPPED GALVANIZED
2. FURNISHED WITH 4 EA 1" X 8" BOLTS WITH HEX HEADS, 12 NUTS AND 16 FLAT WASHERS
3. BOLTS SHALL BE THREADED TO ALLOW FOR LEVELING
4. BOLTS, WASHERS AND NUTS SHALL BE CADMIUM STEEL AND SHALL BE PACKAGED SEPARATELY IN A WATER TIGHT CONTAINER SECURELY ATTACHED TO THE FOUNDATION

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NOTES:

1. INSTALL ON TOP OF HMAC IN SCHEDULE 80 PVC CONDUIT OR GRS CONDUIT.
2. WHERE HMAC UNDERLAY IS INSTALLED, ALL SIGNAL CABLES AND TRACK WIRES SHALL BE INSTALLED IN 4" SCHEDULE 80 PVC MIDWAY BETWEEN TRACK CENTERS ABOVE HMAC PAD. SIGNAL AND TRACK CONSTRUCTION CREWS MUST COORDINATE INSTALLATION OF CONDUITS UNDER TRACKS PRIOR TO INSTALLATION OF HMAC. FINAL GRADE SHALL BE IDENTIFIED, INCLUDING ANY DRAINAGE DITCHES WHICH SIGNAL CABLES TRAVERSE. SIGNAL CABLES SHALL BE 36" BELOW BOTTOM OF THE DRAINAGE DITCH UNLESS DITCH IS LINED OR VARIANCE APPROVED BY THE ENGINEER
3. WHEN FIELD CONDITIONS PERMIT, POLARITY TRACK WIRES MAY BE INSTALLED AS SHOWN INSTEAD OF ON TOP OF HMAC.
4. REFER TO SD-5123 FOR CONDUIT ENTRANCE-EXIT REQUIREMENTS FOR PULL-BOXES.
5. ALSTOM (FORMERLY GRS). ANSALDO (FORMERLY US&S).



- PB1 = 2'x3' PULL BOX
PB2 = 3'x5' PULL BOX
JB = JUNCTION BOX
B = TRACK WIRE BOOTLEG (SEE SD-5111)

TYPICAL CROSS SECTION

										PENINSULA CORRIDOR JOINT POWERS BOARD		ENGINEERING STANDARD DRAWINGS		CADD FILE NAME: SD-5115	
										APPROVED BY: <i>Bin Zhang</i>		SIGNAL AND GRADE CROSSING SYSTEMS GENERAL SIGNAL		REV:	EDITION: FIFTH
										Caltrain		CROSSOVER WITH HMAC UNDERLAY TYPICAL CROSSOVER LAYOUT		SCALE:	NTS
														STANDARD DRAWING NO.: SD-5115	
010126					FIFTH EDITION										
REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP					





CONTROL POINT SIGNAL HOUSE

STENCIL LEGEND TO BE VISIBLE
TO TRAINS TRAVELING IN EITHER DIRECTION.

NOTES:

1. GRADE CROSSING SIGNAGE SHALL BE MOUNTED ON GRADE CROSSING WARNING DEVICES AND SHALL NOT BE ON CROSSING HOUSES, PER FRA REQUIREMENTS FOR ENS SIGNAGE REGULATION, 49 CFR PART 234.311 – ENS SIGN PLACEMENT AND MAINTENANCE. SEE SD-5117 FOR ETAILS
2. FOR CONTROL POINT SIGNAL HOUSE / CASE: LEGEND SHALL BE BLACK LETTERS 5” HIGH, EGYPTIAN FONT, BOLD UPPERCASE, CENTERED ON SIDE OF SIGNAL HOUSE AND AT THE FRONT OF CASE

												PENINSULA CORRIDOR JOINT POWERS BOARD						ENGINEERING STANDARD DRAWINGS						CADD FILE NAME: SD—5116																					
												<div>APPROVED BY:  DIRECTOR, ENGINEERING</div>												SIGNAL AND GRADE CROSSING SYSTEMS GENERAL SIGNAL						REV:	EDITION: FIFTH														
																														SCALE: NTS															
010126						FIFTH EDITION																		TYPICAL MARKING LEGEND HOUSE						STANDARD DRAWING NO.: SD—5116															
REV	DATE	BY	CHK	APP	DESCRIPTION											REV	DATE	BY	CHK	APP																									



SCALE: NTS



DETAIL

SCALE: NTS

NOTES:

6. LETTERS AND NUMBERS: RETRO-REFLECTIVE WHITE. 1" HIGH ARIAL.
7. CROSSING NUMBER ON SIGN: RETRO-REFLECTIVE BLUE (FEDERAL STANDARD FS 15080) LETTERS AND NUMBERS OVERPRINTED ON RETRO-REFLECTIVE WHITE FIELD. 1" HIGH ARIAL. IF NECESSARY, CONDENSE BOTTOMMOST TEXT STRING SO THAT IT FITS IN THE BLUE FIELD.
8. BORDERS: RETRO-REFLECTIVE WHITE, 3/8" WIDE.
9. MOUNTING HARDWARE SHALL BE OF TAMPER PROOF STAINLESS STEEL SS316.
10. EMERGENCY NOTIFICATION SIGN PLACEMENT SHALL COMPLY WITH THE REQUIREMENTS OF TITLE 49, PART 234, SUBPART E, SECTION 234.311, ENS SIGNS PLACEMENT AND MAINTENANCE.

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DIRECTOR, ENGINEERING



ENGINEERING STANDARD DRAWINGS

SIGNAL AND GRADE CROSSING SYSTEMS	R
GENERAL SIGNAL	S

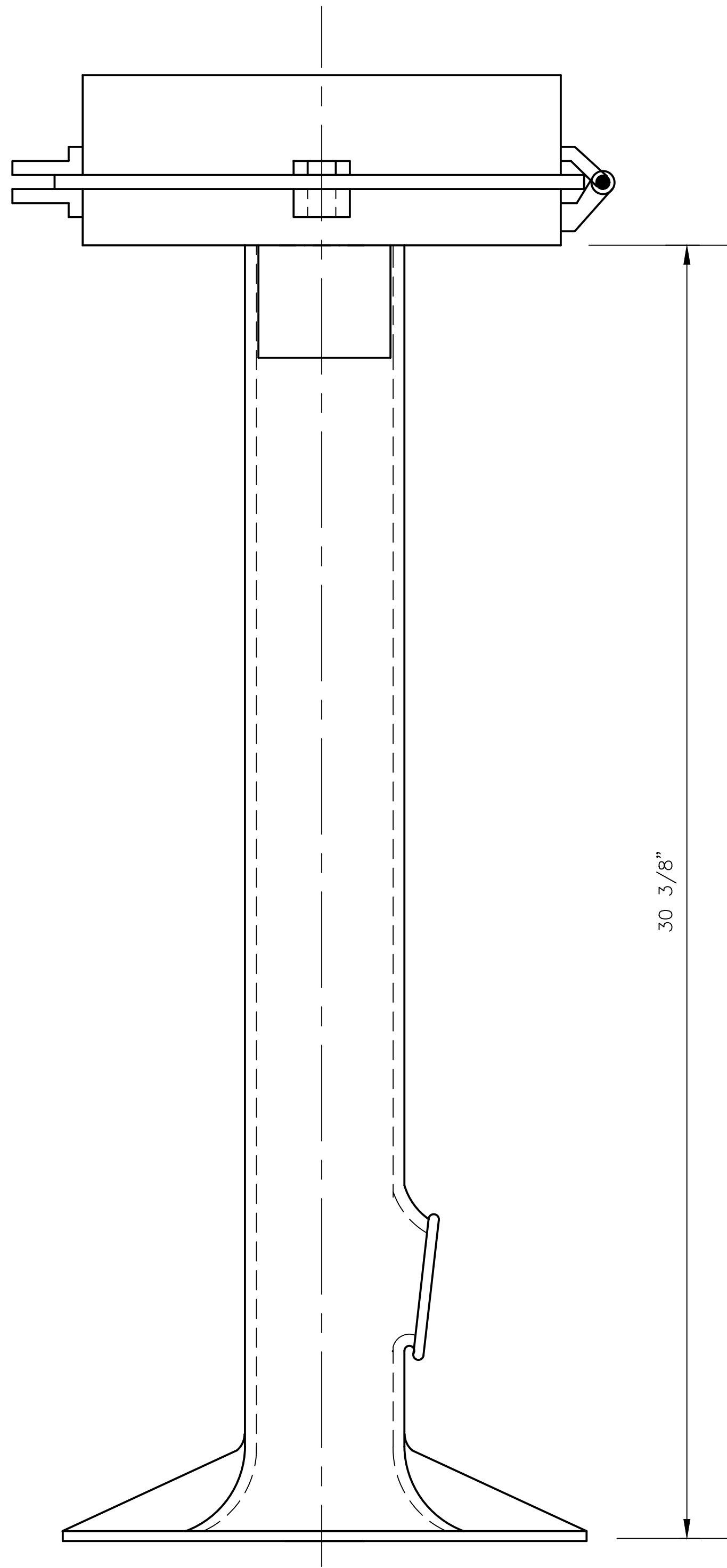
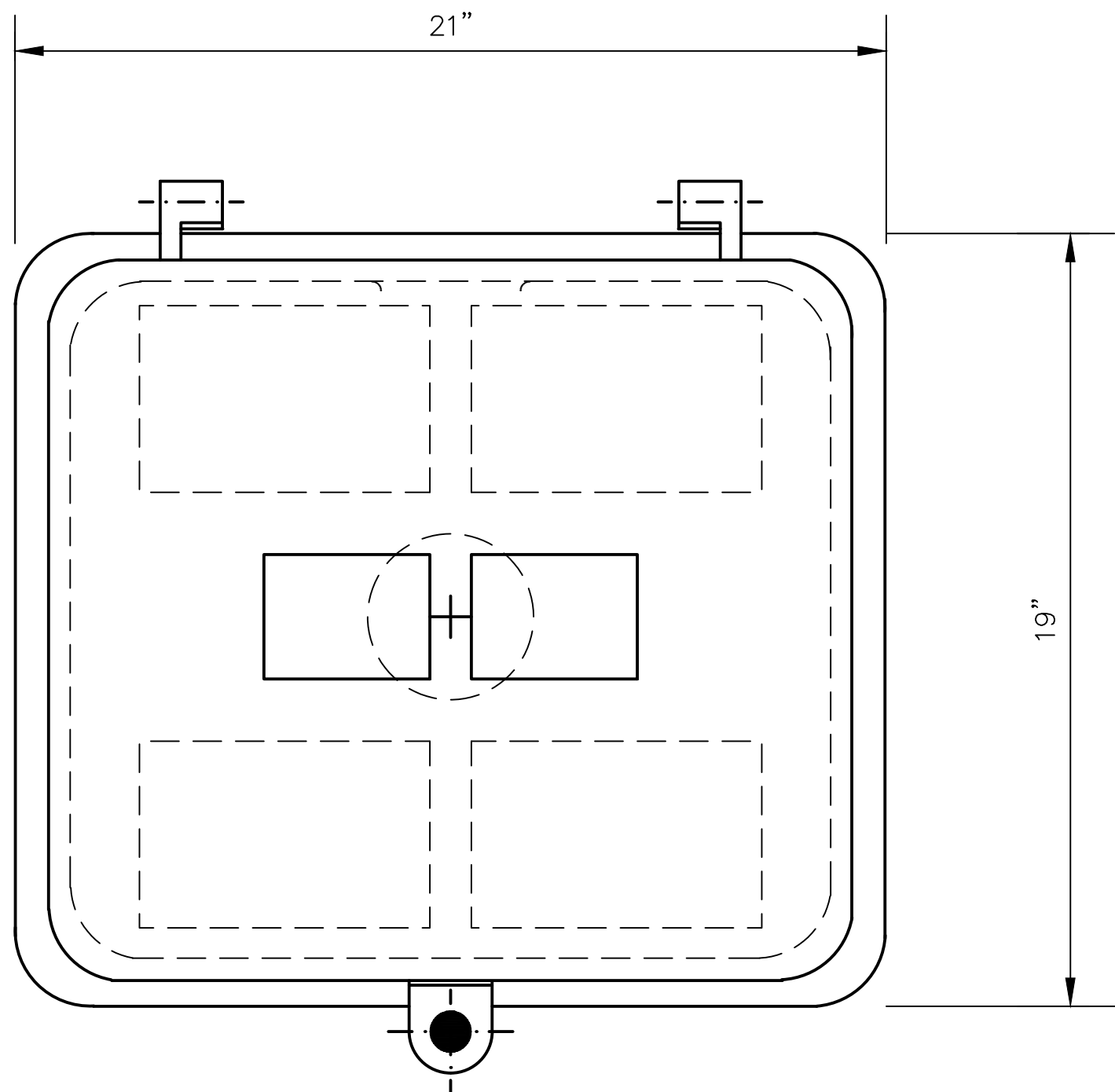
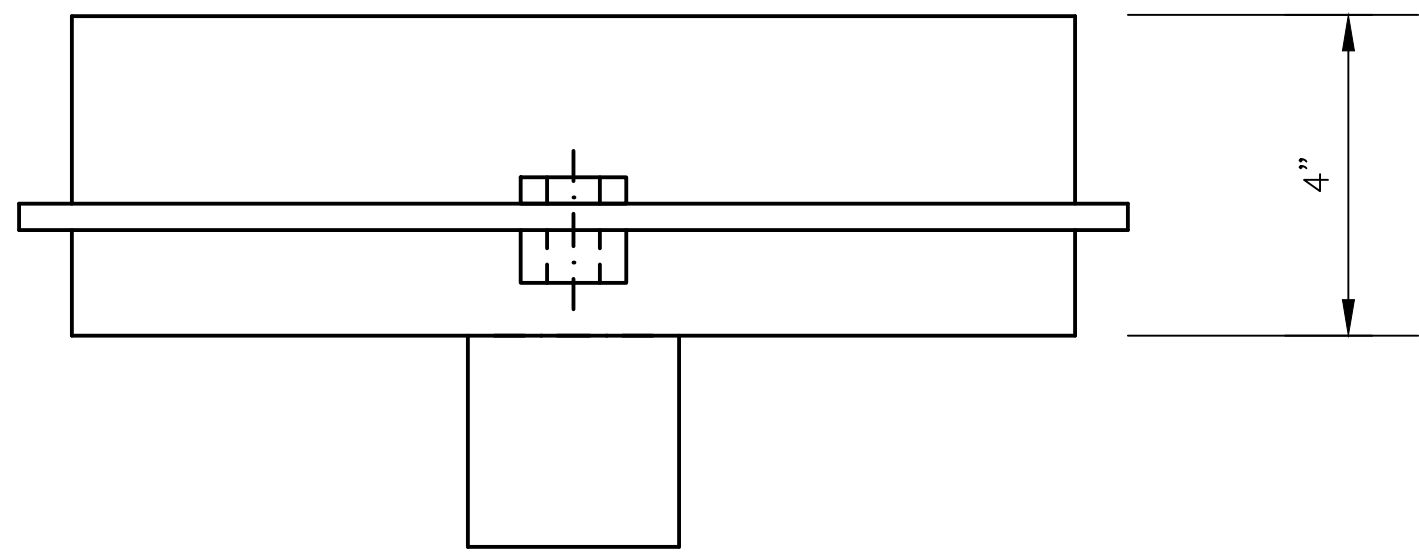
TYPICAL GRADE CROSSING GATE WITH
EMERGENCY NOTIFICATION SIGN

ADD FILE NAME:
SD-5117

EV:	EDITION: FIFTH
-----	-------------------



SCALE: NTS

STANDARD DRAWING NO.:
SD-5117

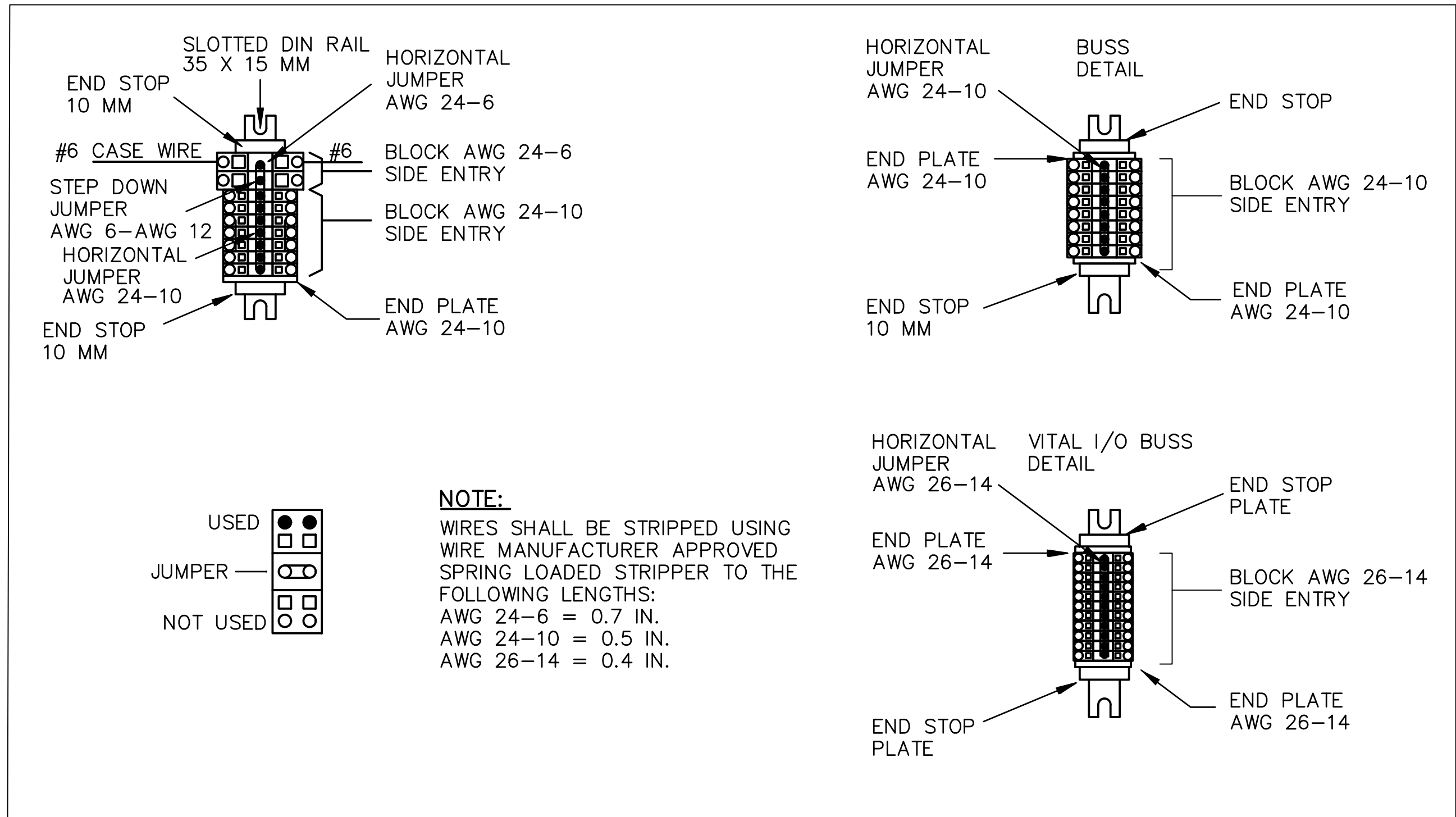


NOTE:
TUNED JOINT COUPLER (TJC) SHALL BE INSTALLED 8'-6" FROM TRACK CENTER. TOP OF BOX SHALL OPEN AWAY FROM TRACK AND SHALL BE LEVEL WITH TOP OF TIE. ADD BALLAST AND GRADE AS NEEDED TO EXTEND TRACK SHOULDER 3' BEYOND BOX.

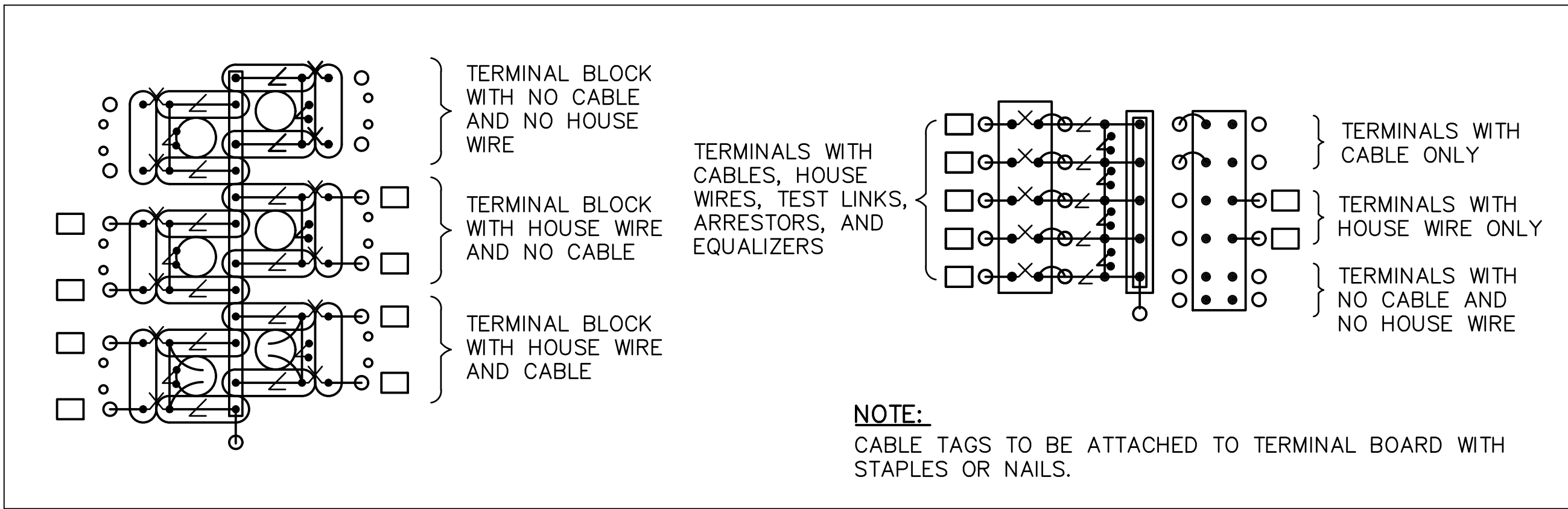
STANDARD TYPE PEDESTAL

										PENINSULA CORRIDOR JOINT POWERS BOARD					ENGINEERING STANDARD DRAWINGS					CADD FILE NAME: SD-5118						
										<div>APPROVED BY:</div> <div></div> <div>DIRECTOR, ENGINEERING</div>										SIGNAL AND GRADE CROSSING SYSTEMS GENERAL SIGNAL JUNCTION BOX TUNED JOINT COUPLER					REV:	EDITION: FIFTH
																									SCALE: NTS	
010126																				STANDARD DRAWING NO.: SD-5118						
REV	DATE	BY	CHK	APP	DESCRIPTION					REV	DATE	BY	CHK	APP												

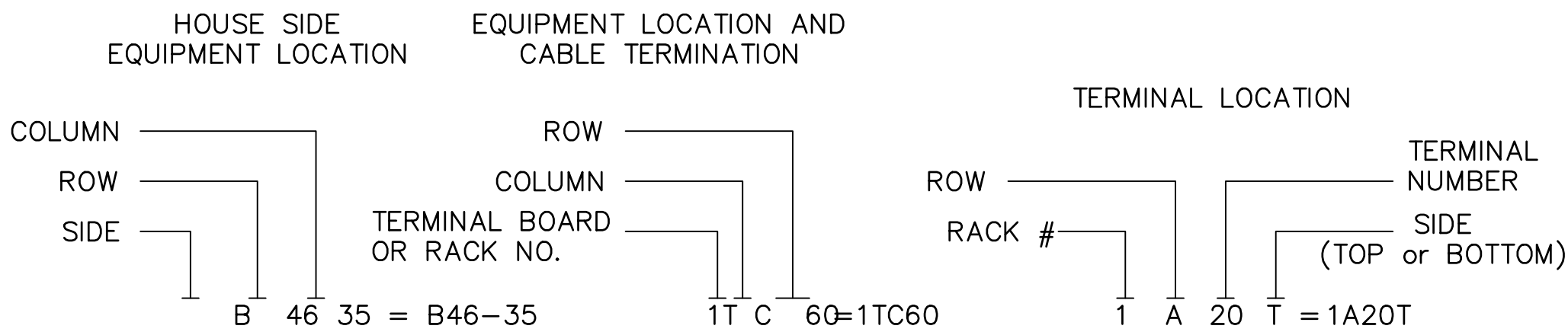
SCREWLESS CAGE CLAMP TERMINAL DETAIL



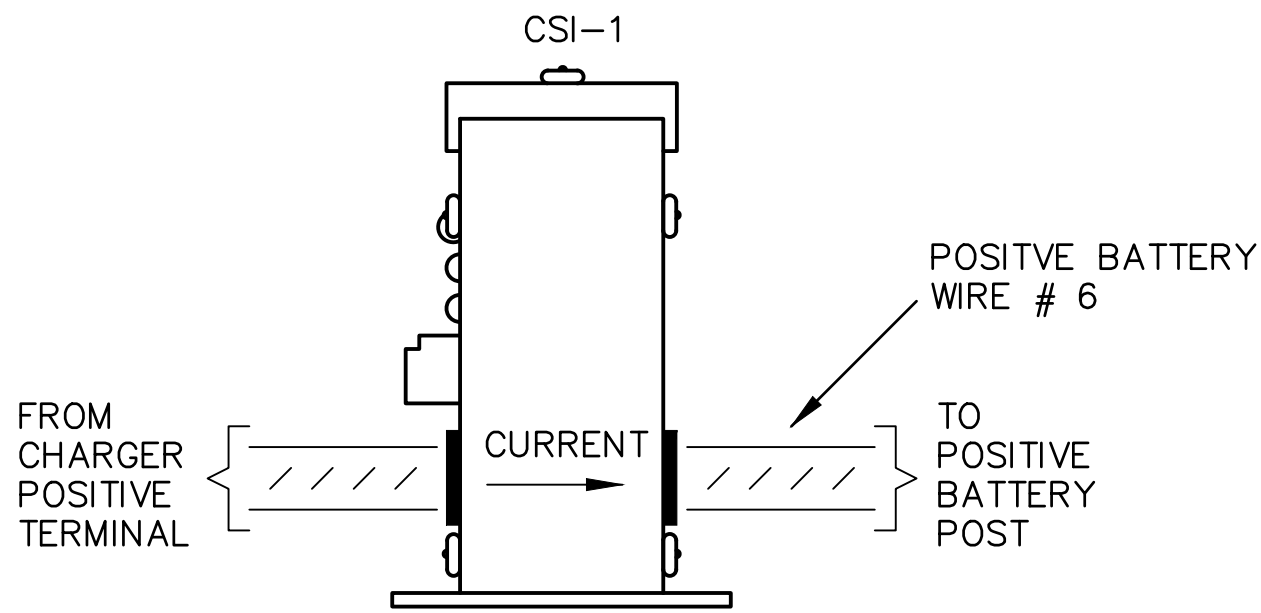
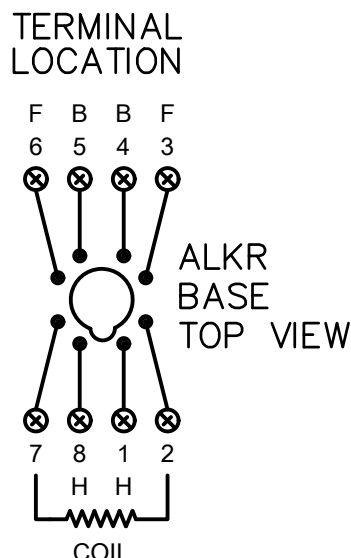
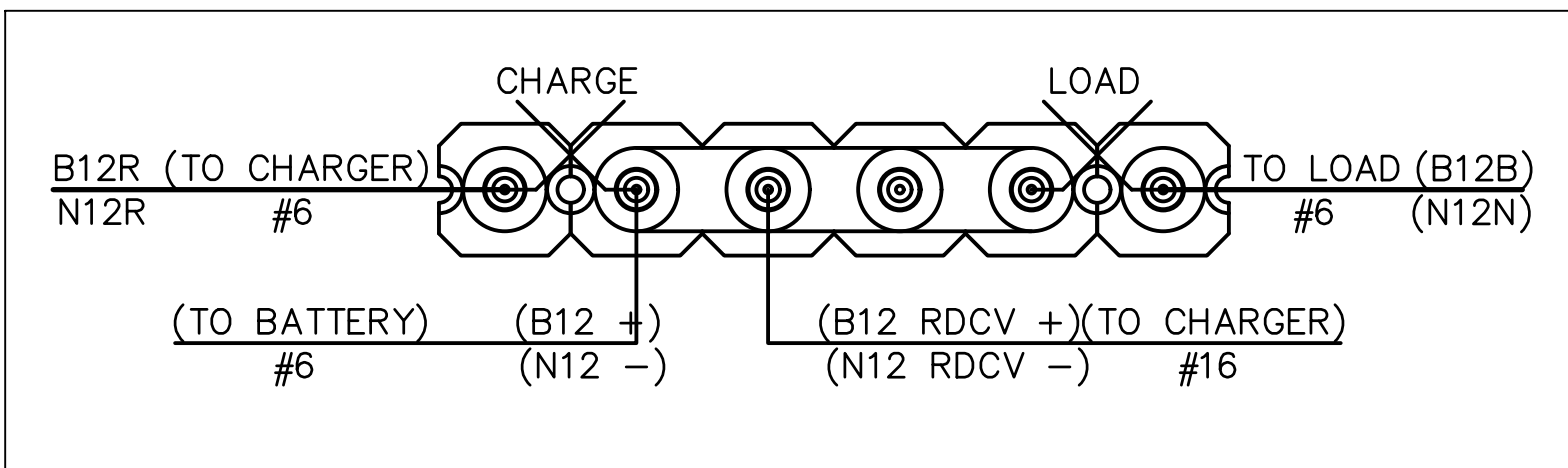
TERMINAL BOARD DETAIL



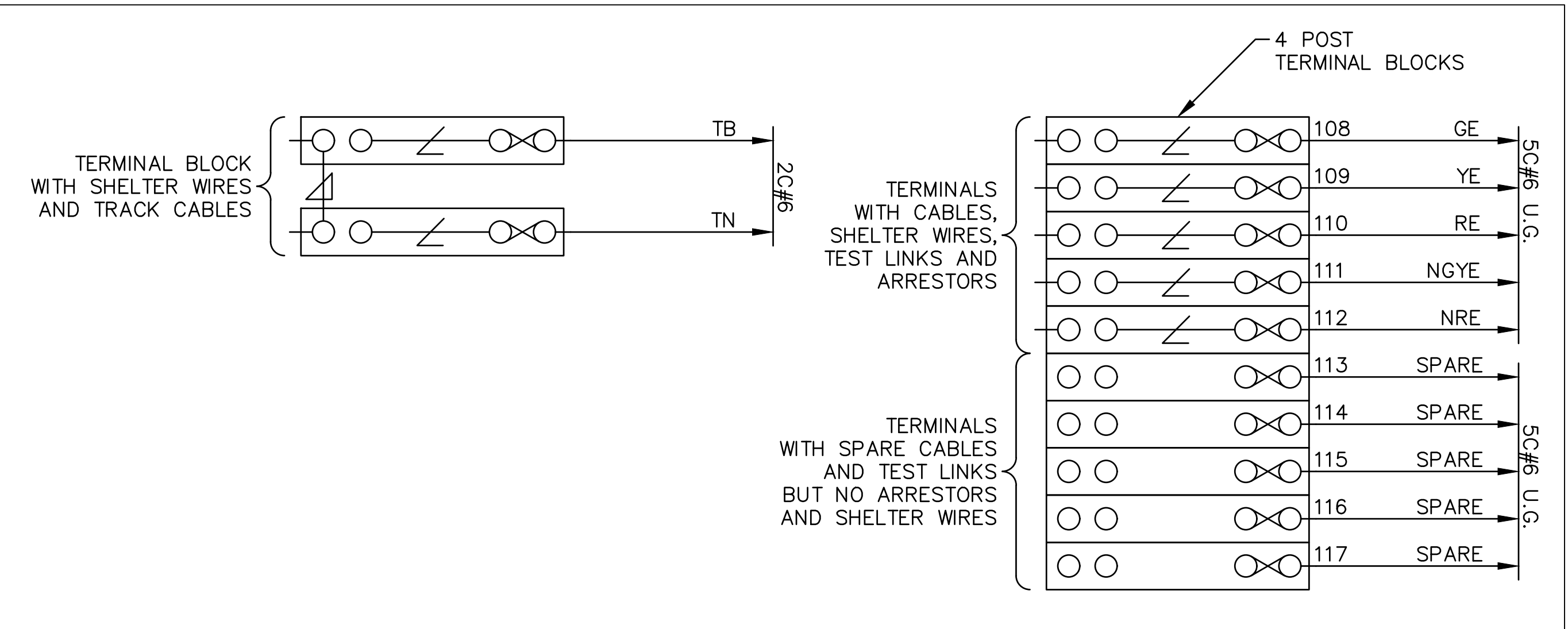
LOCATION LEGENDS



NRS HF-MAX DETAIL A



TERMINAL BOARD DETAIL



NOTES:

- ∠ = CLEARVIEW ARRESTOR
- ⋈ = HEAVY DUTY EQUALIZER
- ⊗ = INSULATED TEST TERMINAL
- = TERMINAL BLOCK
- = TERMINAL BLOCK
- = DRILL 1/2-INCH HOLE AND FINISH EDGES FOR CASE WIRE AND CABLE CONDUCTORS
- = DRILL 1-1/4 INCH HOLE AND FINISH EDGES FOR TRACK WIRE
- ⊗ = ADJUSTABLE RESISTANCE
- ⊗ = TWISTED WIRE
- ⊗ = TEST POINTS FOR XGNDS.
- ⊗ = COIL PER I-324
- ⊗ = DV4 OR EQUAL

NOTE:

UNLESS NOTED OTHERWISE ON SIGNAL DRAWINGS, WIRES SHALL BE #14 AWG FLEX. ALL GROUND WIRES SHALL BE #6 AWG SOFT DRAWN COPPER. WIRES TO BATTERIES SHALL BE #6 AWG FLEX CASE WIRE.

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DIRECTOR, ENGINEERING



ENGINEERING STANDARD DRAWINGS

SIGNAL AND GRADE CROSSING SYSTEMS
GENERAL SIGNAL

WAGO SCREWLESS CAGE CLAMP
BOARD WIRING DETAILS

CADD FILE NAME:

SD-5119

REV:

EDITION:

FIFTH

SCALE:

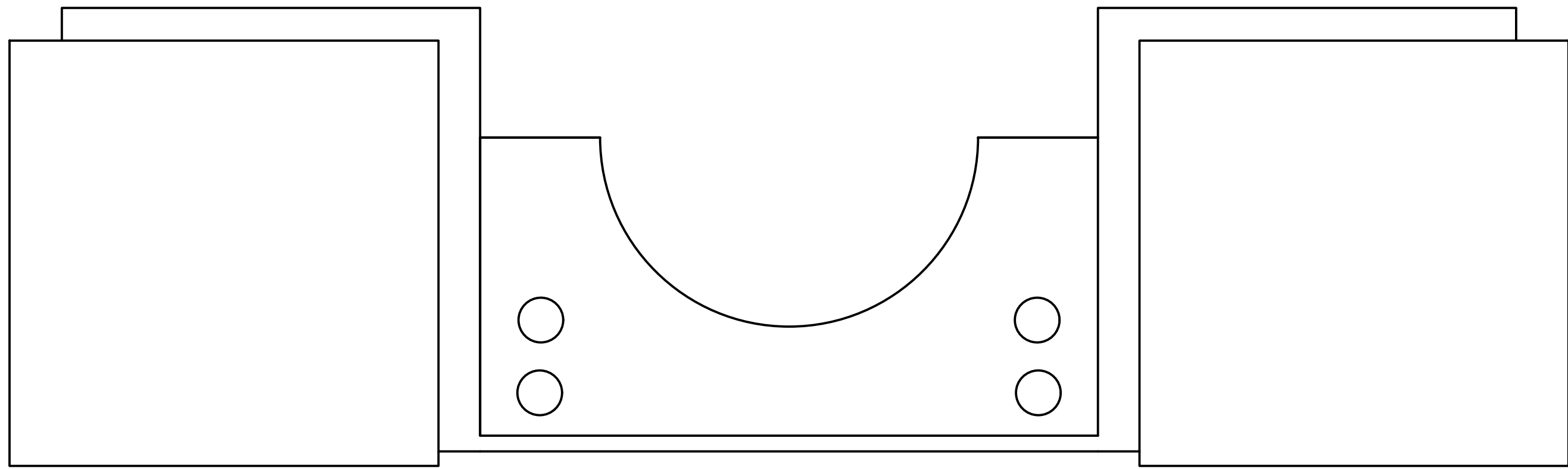
NTS

STANDARD DRAWING NO.:

SD-5119

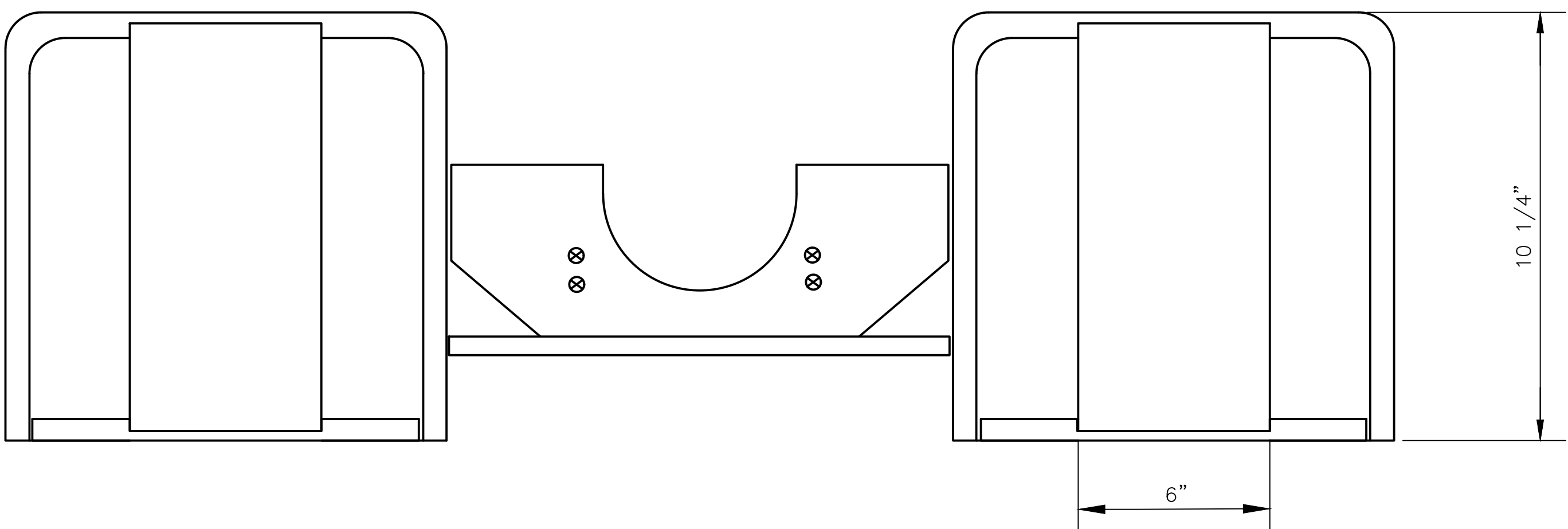
REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP	DESCRIPTION
010126					FIFTH EDITION						

WOOD



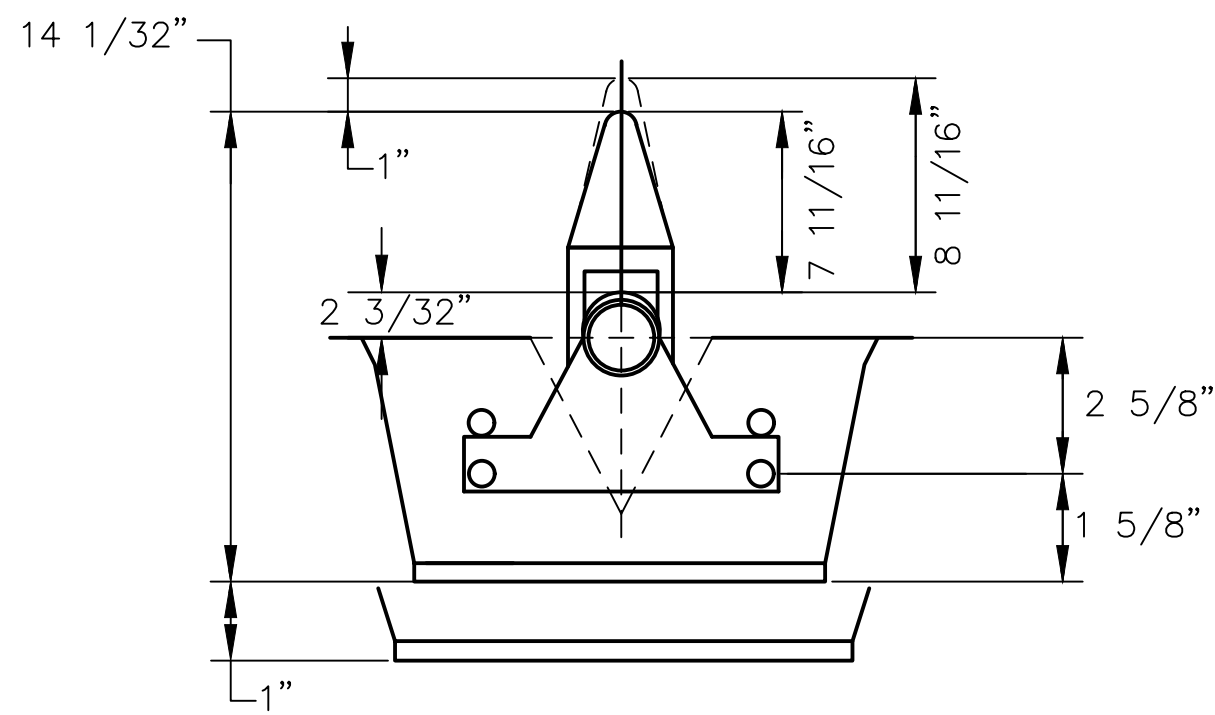
SIDE VIEW

CONCRETE

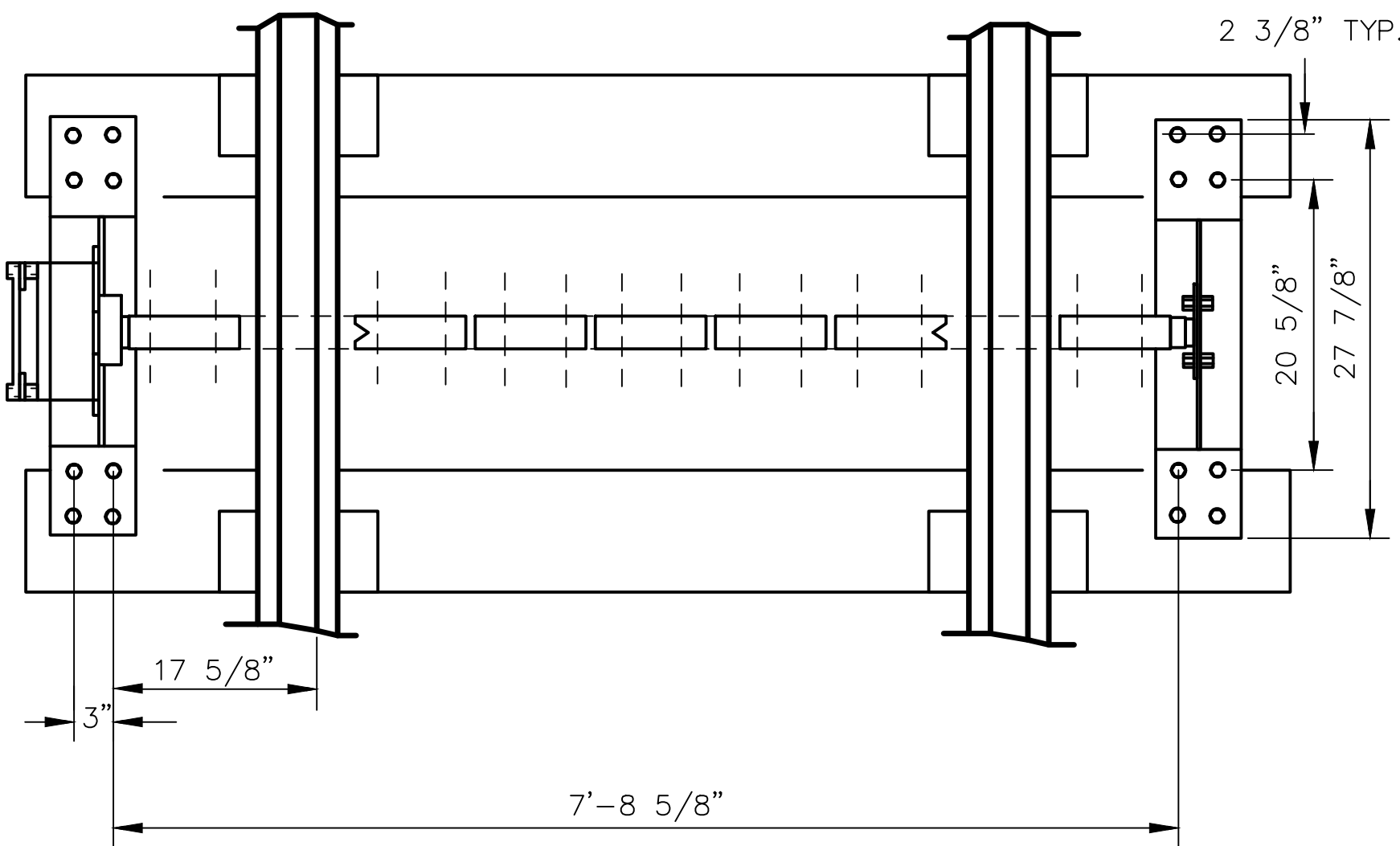


SIDE VIEW

WOOD

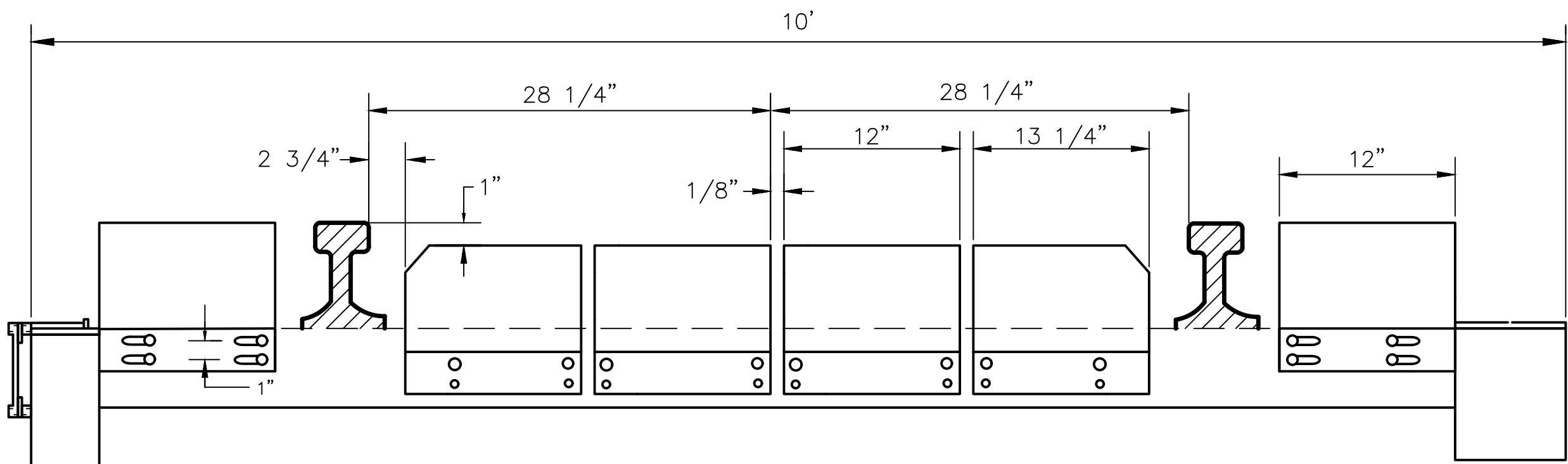


SIDE VIEW

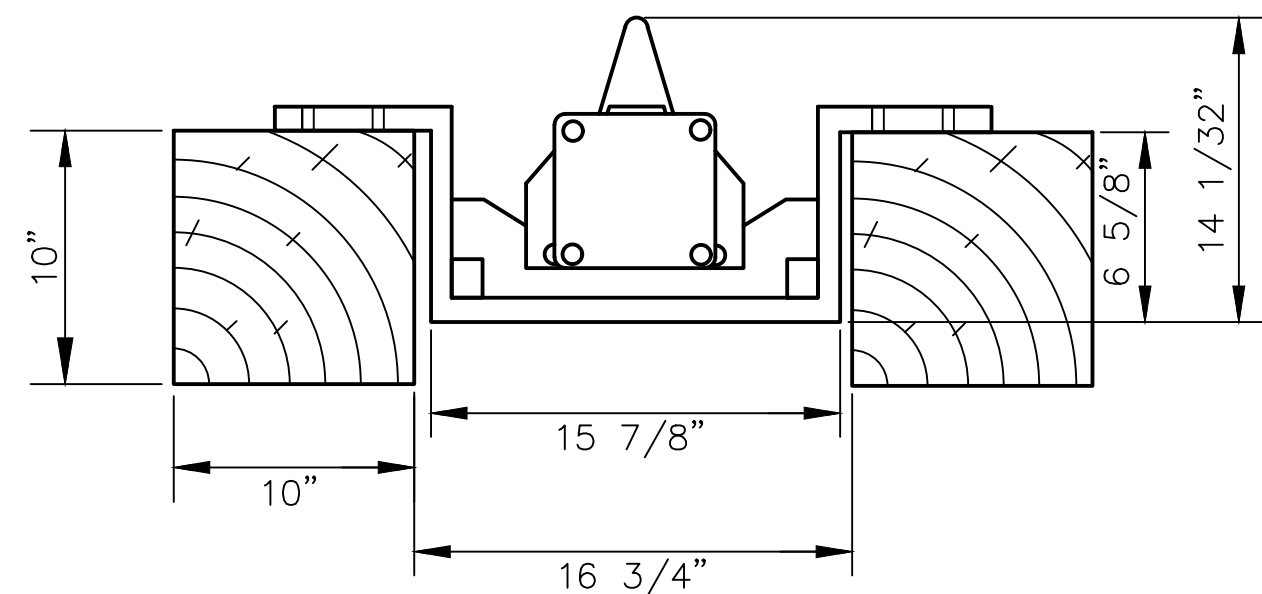


TOP VIEW

CONCRETE



FRONT VIEW



SIDE VIEW

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DIRECTOR, ENGINEERING



ENGINEERING STANDARD DRAWINGS

SIGNAL AND GRADE CROSSING SYSTEMS
GENERAL SIGNAL
DRAGGING EQUIPMENT DETECTION
TIE BRACKET
AND MOUNT ARRANGEMENT

CADD FILE NAME:
SD-5120

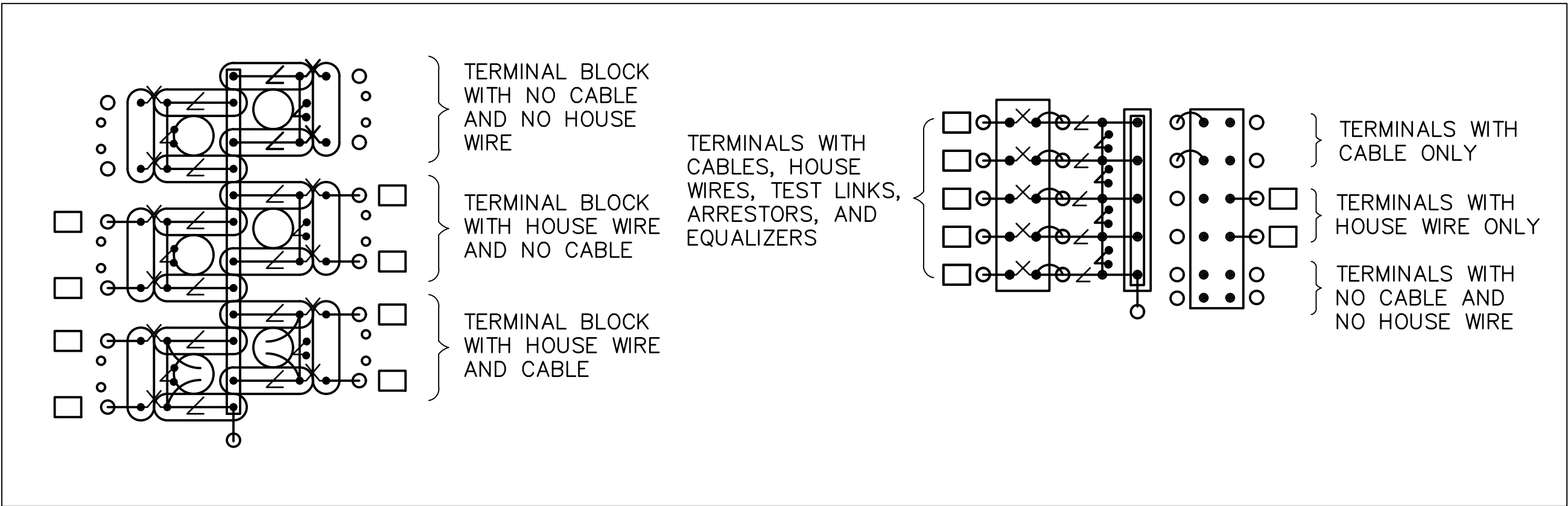
REV: EDITION:
FIFTH

SCALE: NTS

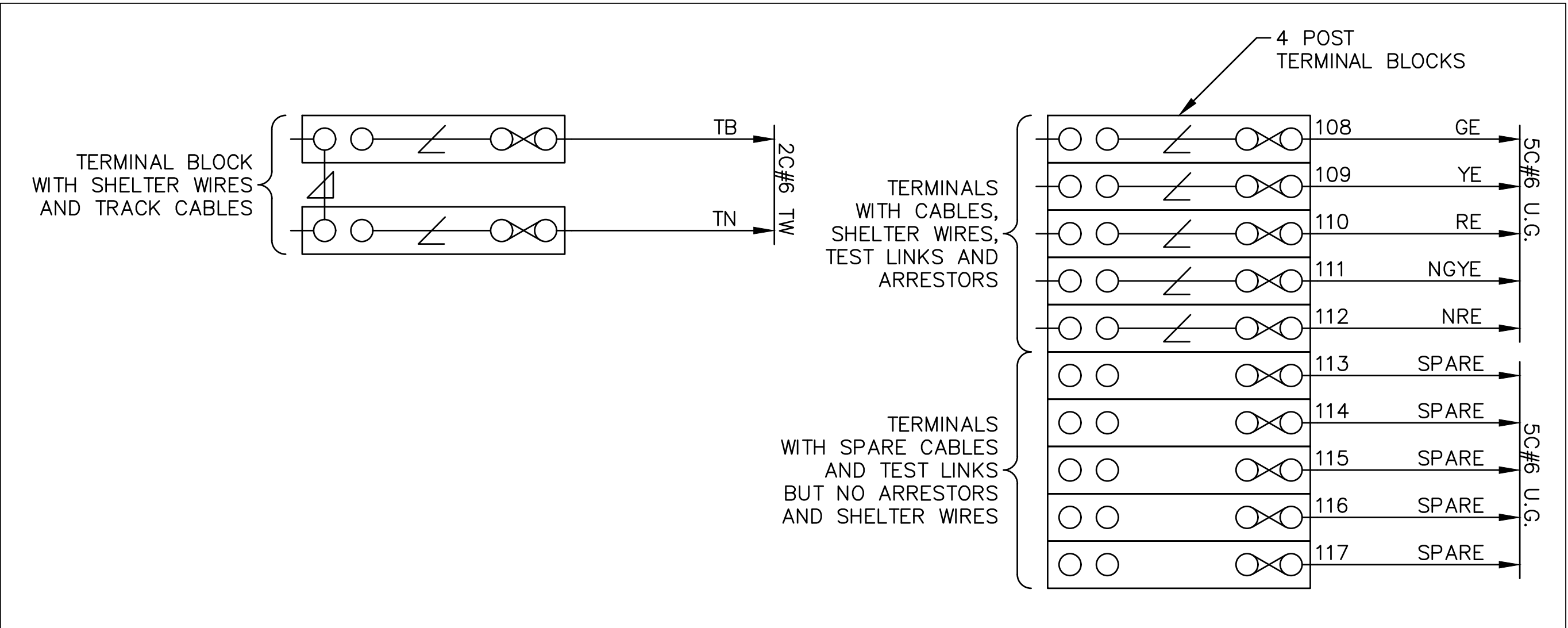
STANDARD DRAWING NO.:
SD-5120

REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP	DESCRIPTION
010126					FIFTH EDITION						

TERMINAL BOARD DETAIL

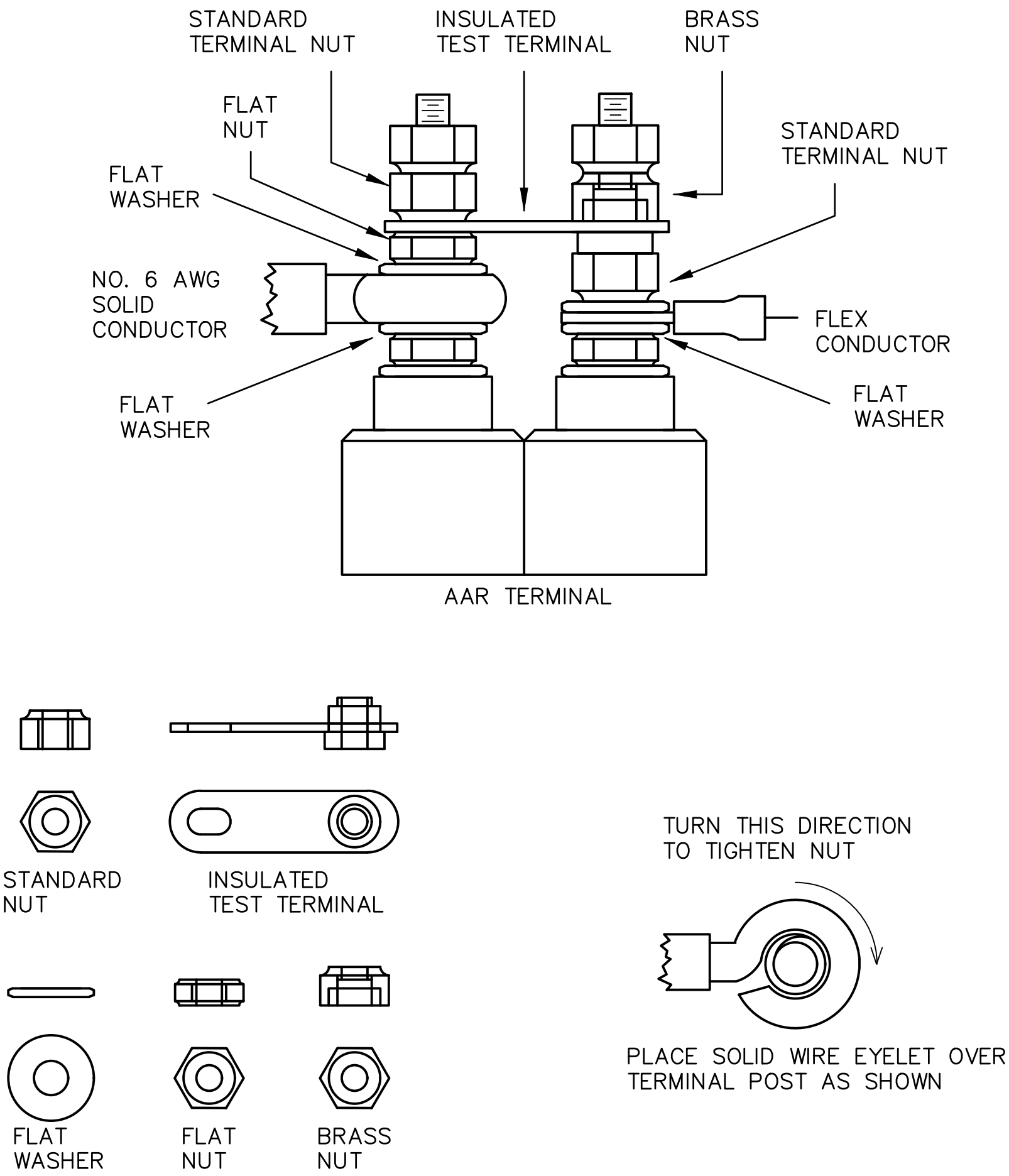
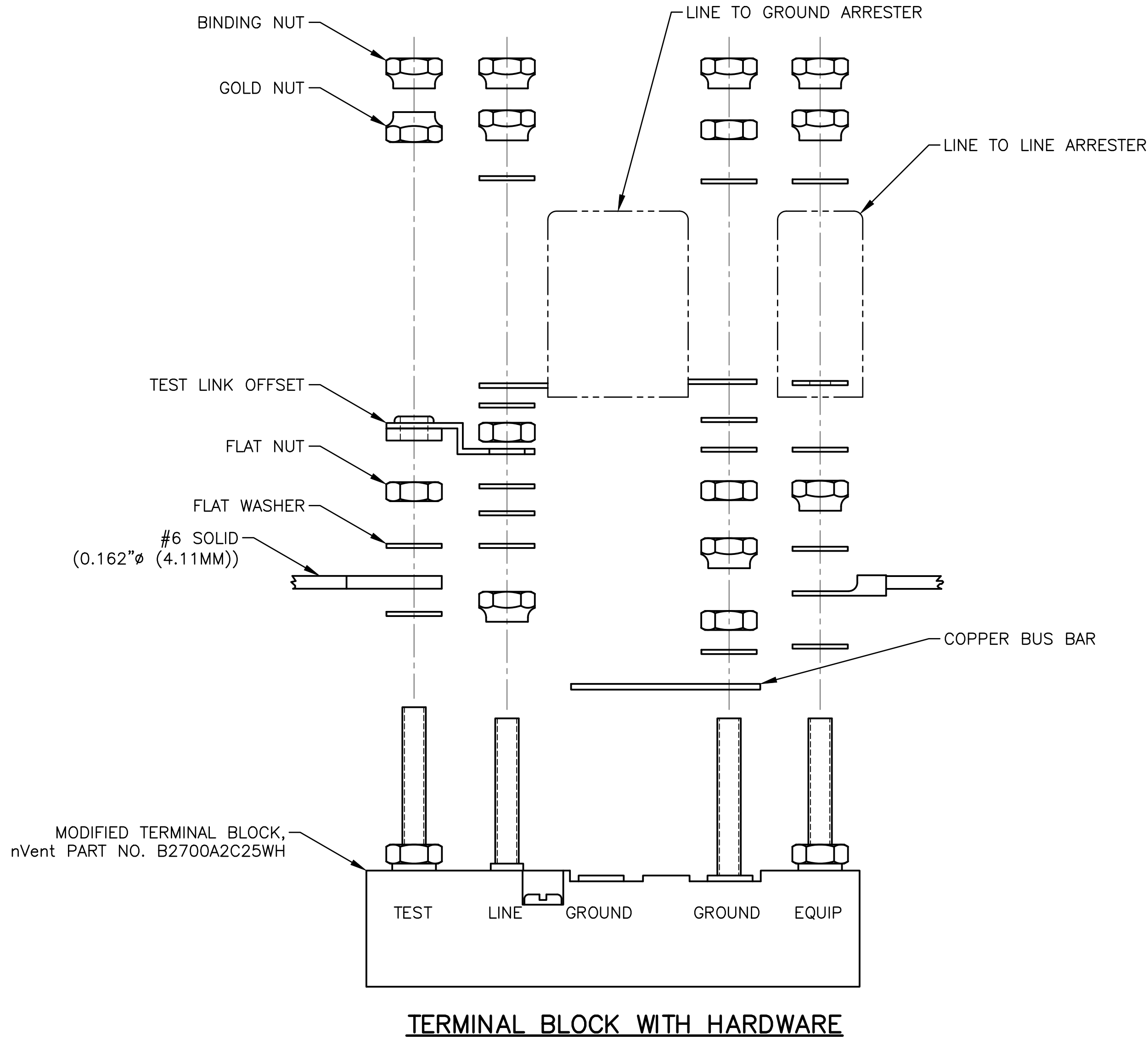


TERMINAL BOARD DETAIL



NOTE:
WHEN SMALLER SIZED SOLID CONDUCTORS ARE REQUIRED, FLAT NUT AND STANDARD NUTS WILL EXCHANGE POSITIONS.

- NOTES:**
- CASE OPTION SIZE SHALL BE DETERMINED BY THE ENGINEER. CASE SHALL BE EQUIPPED WITH A PLYWOOD BACKBOARD SETUP WITH A MINIMUM OF 48 – 2 POST TERMINALS ARRANGED AS OUTLINED IN THE TERMINAL BOARD DETAIL ABOVE AND DISPLAYED IN THE CASE.
 - INSULATION ON SOLID CONDUCTORS SHALL BE REMOVED AND THE EXPOSED BARE WIRE THOROUGHLY CLEANED TO PROVIDE HIGH CONDUCTIVITY, TAKING CARE NOT TO NICK OR DAMAGE WIRE.
 - THE BARE WIRE SHALL BE FORMED TO PRODUCE AN EYELET WHICH SHALL BE PLACED OVER THE BINDING POST. THE EYELET SHALL BE SIZED TO PROVIDE A TIGHT FITTING LOOP AROUND THE POST BUT LOOSE ENOUGH TO EASILY SLIDE ON AND OFF.
 - A FLAT WASHER SHALL BE PLACED ON THE BINDING POST. THE EYELET SHALL THEN BE PLACED ON THE POST FOLLOWED BY ANOTHER FLAT WASHER. A NUT SHALL BE APPLIED AND SECURELY TIGHTENED WITH A TERMINAL WRENCH.
 - INSULATION ON FLEX CONDUCTORS SHALL BE REMOVED USING A SPRING LOADED STRIPPING TOOL RECOMMENDED BY THE MANUFACTURER OF THE WIRE AND THE EXPOSED BARE WIRE THOROUGHLY CLEANED TO PROVIDE HIGH CONDUCTIVITY.
 - EYELET SHALL BE ATTACHED TO FLEX CONDUCTORS. ONLY CALTRAIN APPROVED EYELET SHALL BE UTILIZED. A COMPRESSION TOOL RECOMMENDED BY THE MANUFACTURER OF THE EYELET SHALL BE USED TO ATTACH THE EYELET.
 - A FLAT WASHER SHALL BE PLACED ON THE BINDING POST. THE EYELET SHALL THEN BE PLACED ON THE POST FOLLOWED BY ANOTHER FLAT WASHER. IF APPLICABLE, THE SECOND EYELET SHALL BE PLACED ON THE POST FOLLOWED BY A FLAT WASHER. A NUT SHALL BE APPLIED AND SECURELY TIGHTENED WITH A TERMINAL WRENCH.
 - AN INSULATED TEST LINK SHALL BE INSTALLED ONCE THE SOLID CONDUCTORS AND EYELETS ARE ATTACHED. THE TEST LINK SHALL BE SECURED USING ONE FLAT AND ONE CROWN NUT AND THE CIRCUIT "CLOSED" BY APPLYING THE BRASS NUT.
 - FLEX CONDUCTORS SHALL BE TAGGED USING CALTRAIN APPROVED TAGS.
 - WHERE POSSIBLE, SPARE SOLID CABLE CONDUCTORS SHALL BE ATTACHED TO SPARE BINDING POSTS. NO MORE THAN ONE SOLID CONDUCTOR SHALL BE SECURED TO A POST.



PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DIRECTOR, ENGINEERING



ENGINEERING STANDARD DRAWINGS

SIGNAL AND GRADE CROSSING SYSTEMS
GENERAL SIGNAL

CABLE JUNCTION CASE

CADD FILE NAME:
SD-5121

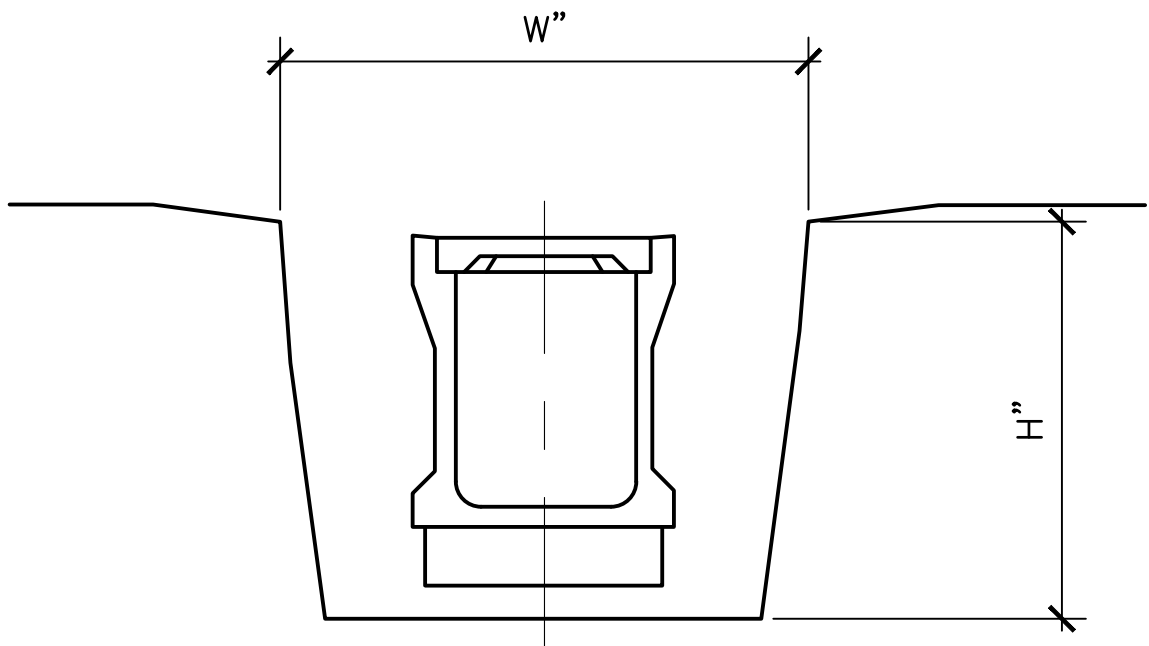
REV: EDITION:
FIFTH

SCALE:
NTS

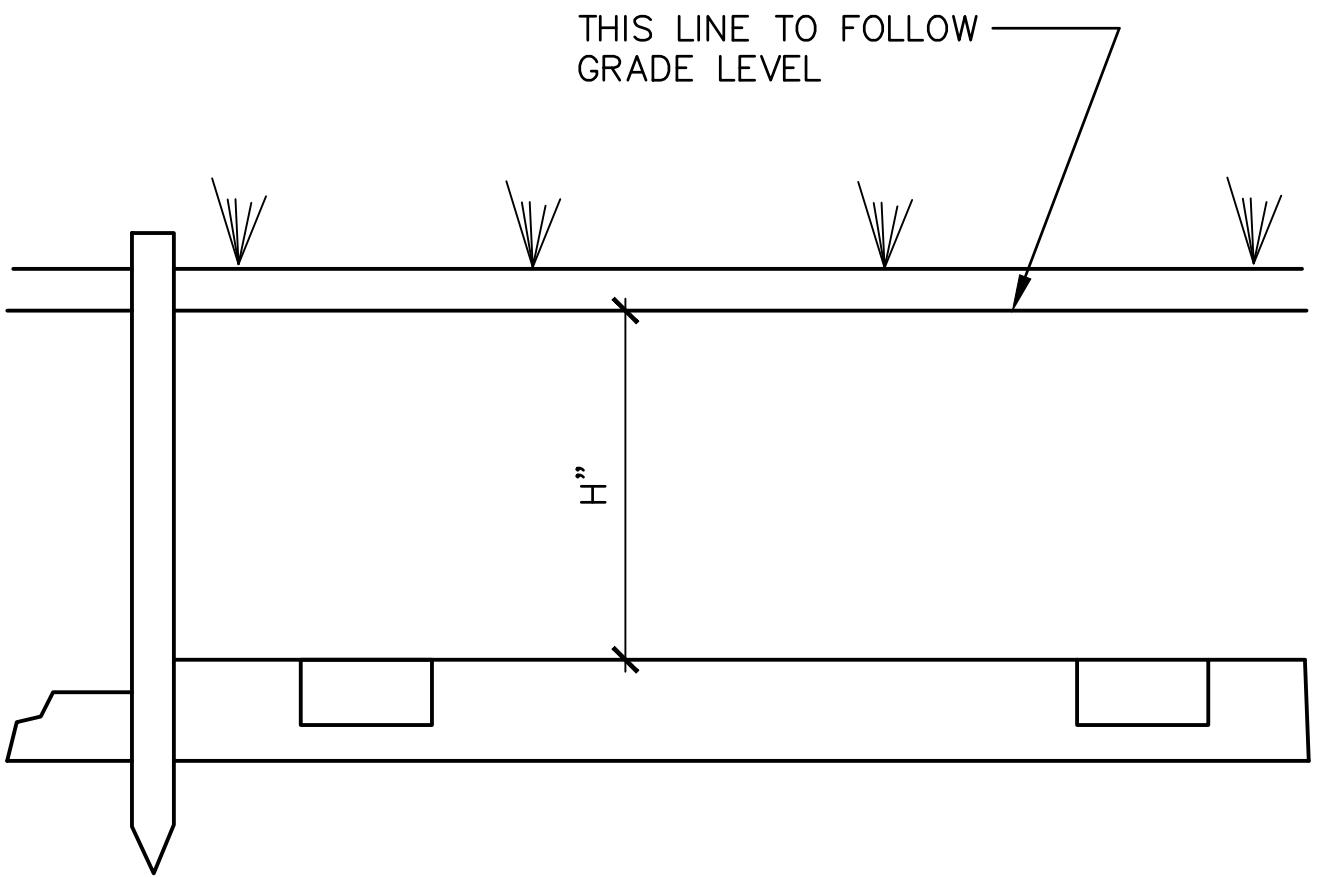
STANDARD DRAWING NO.:
SD-5121

REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP	DESCRIPTION
010126					FIFTH EDITION						

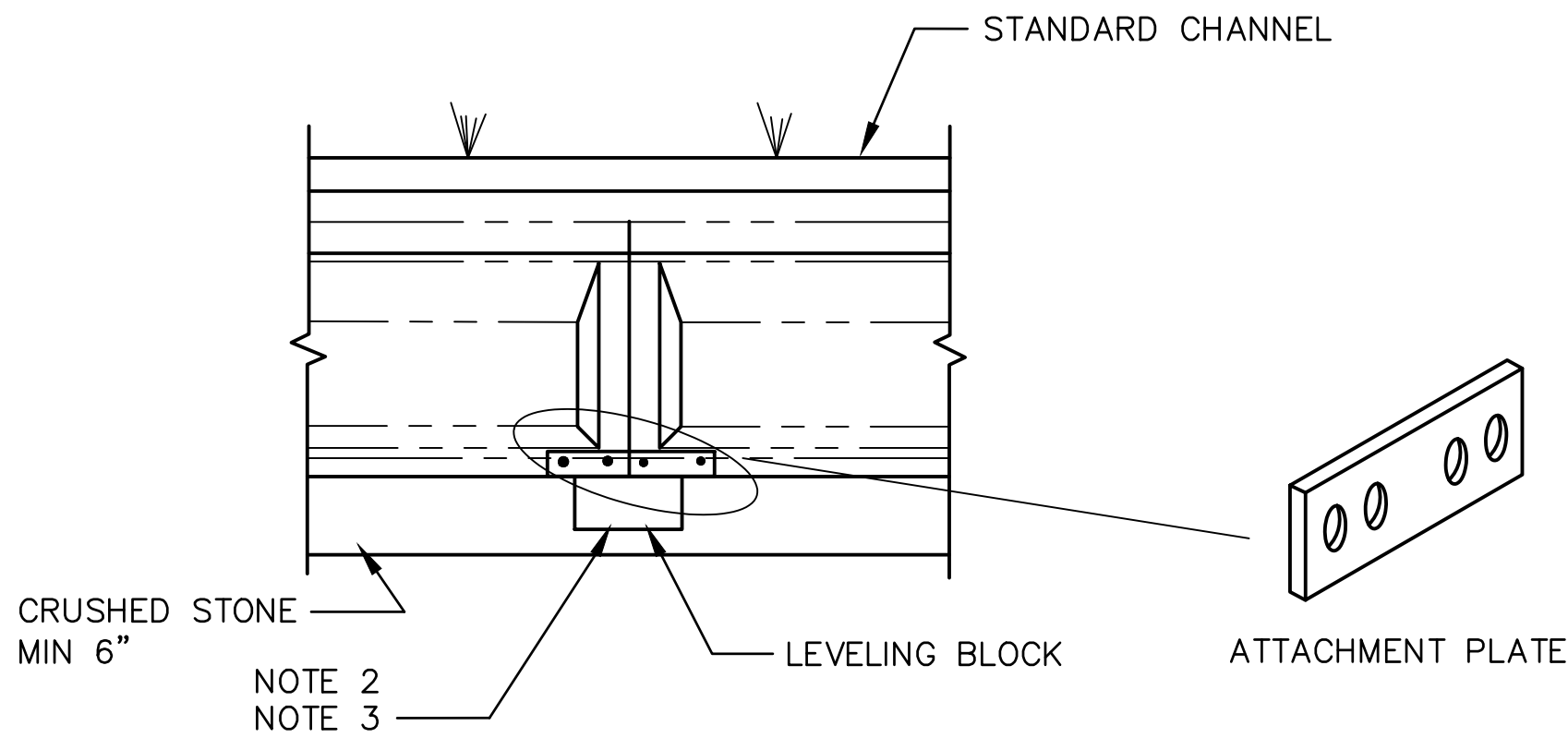
EXCAVATION SIZE CHART		
MODEL	WIDTH	HEIGHT
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128	45"	18"
1216	45"	27"
2012	50"	24"
2016	50"	27"
3012	60"	24"



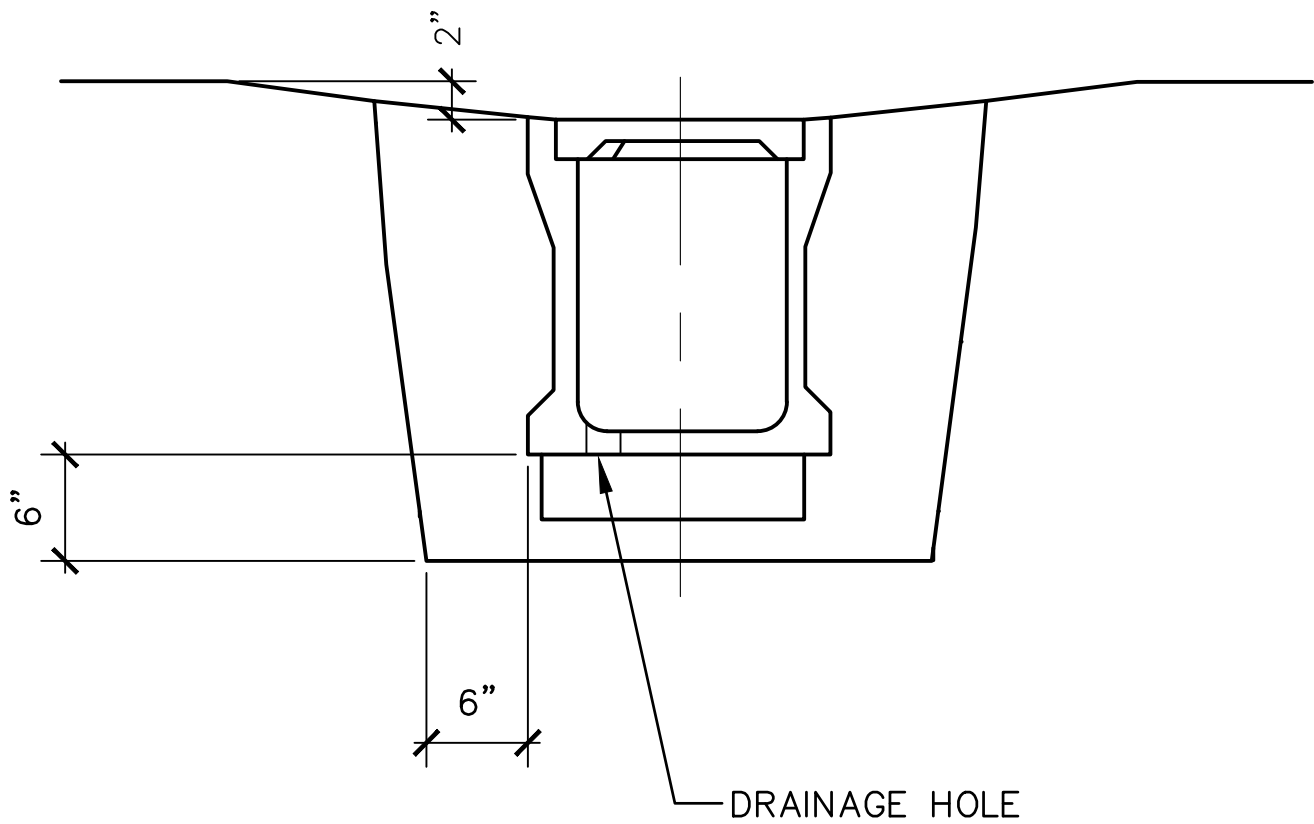
CROSS SECTION



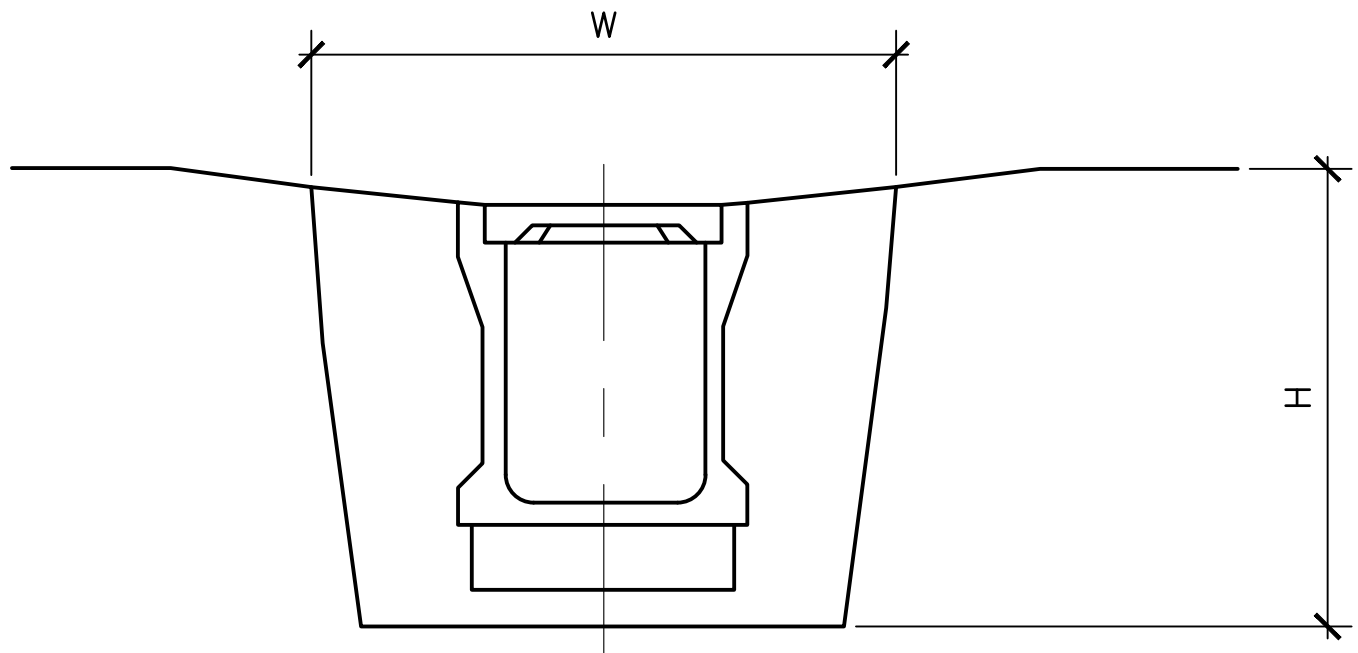
SECTION



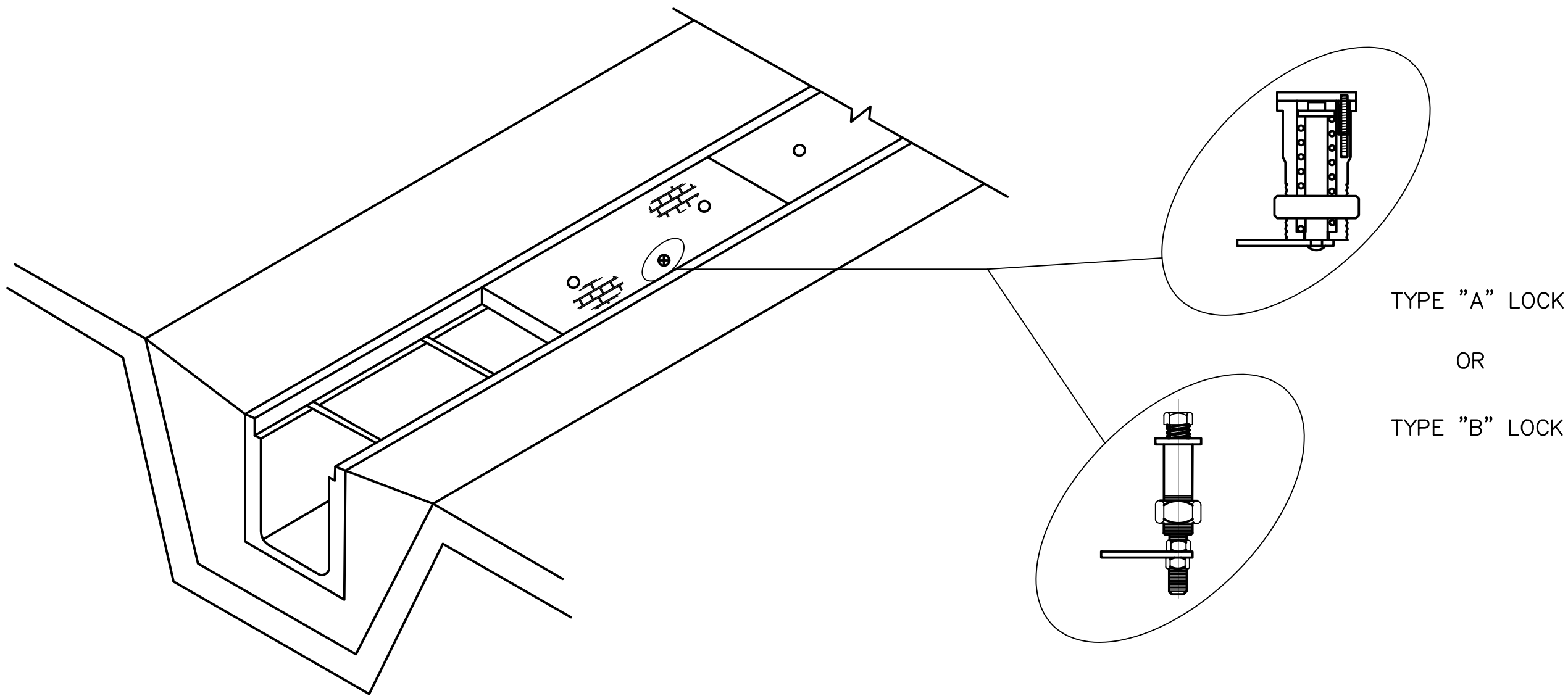
ELEVATION



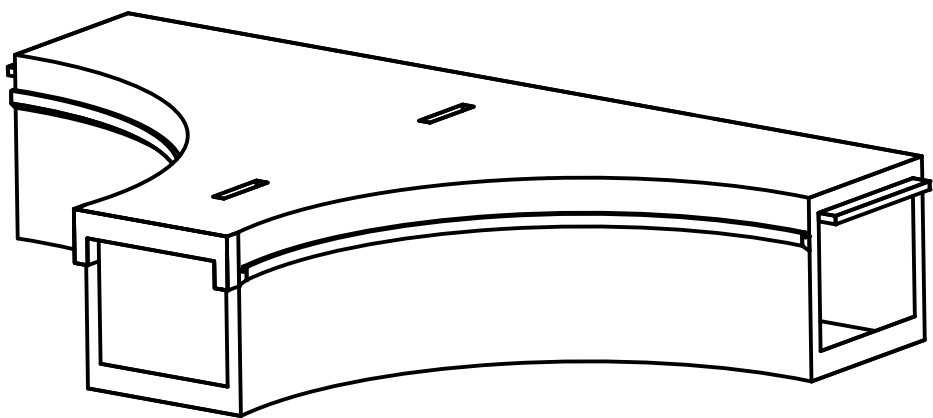
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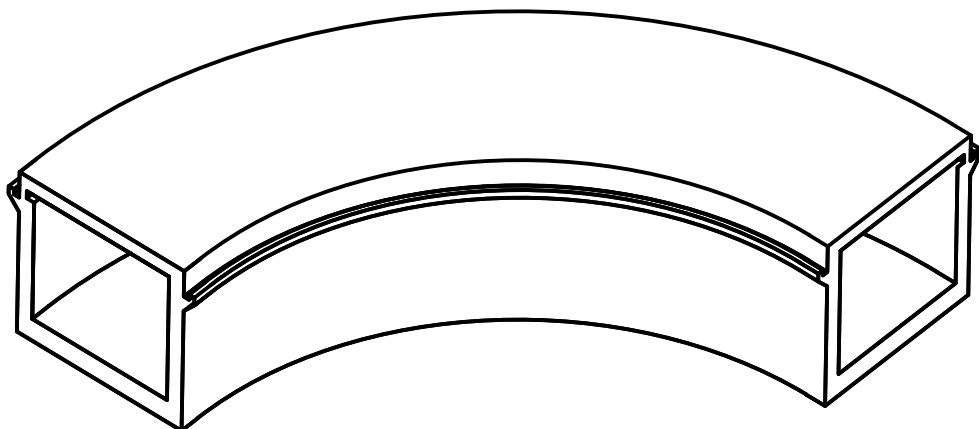
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TYPICAL CABLE TROUGH



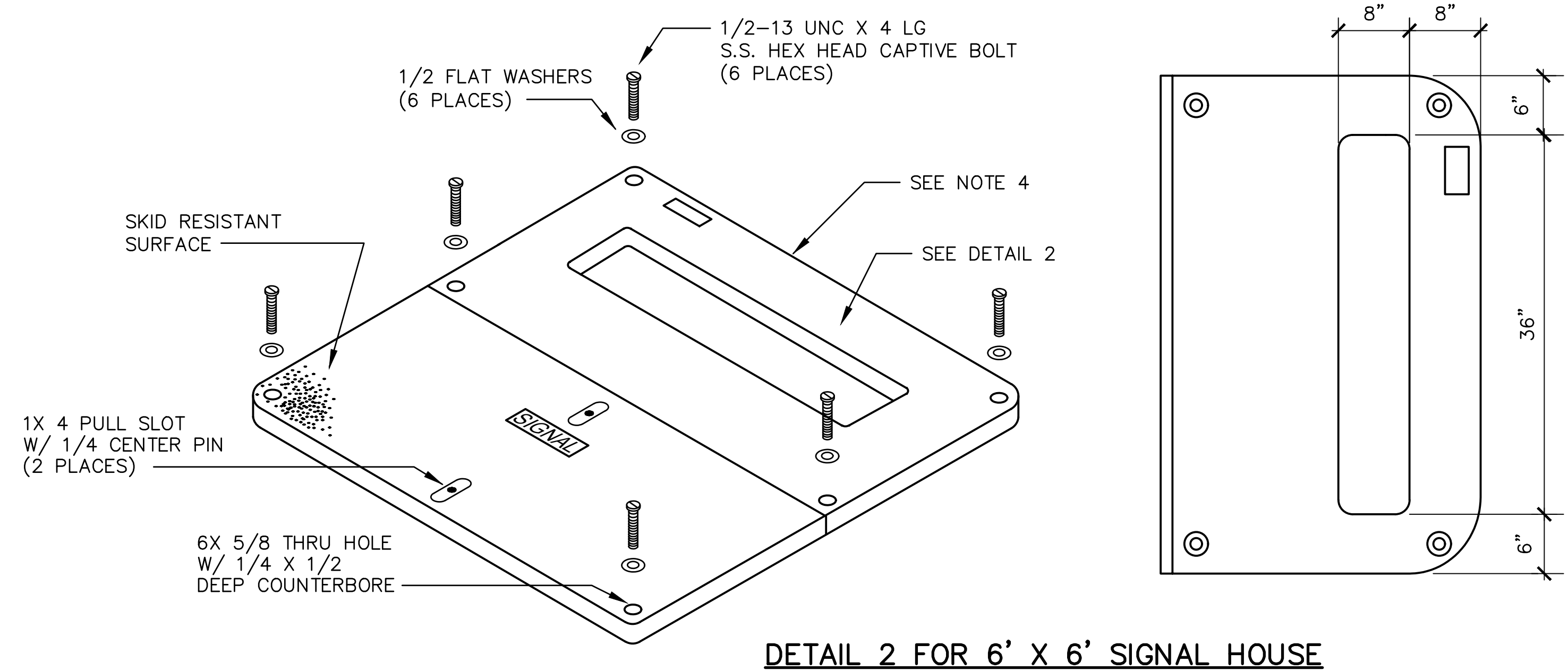
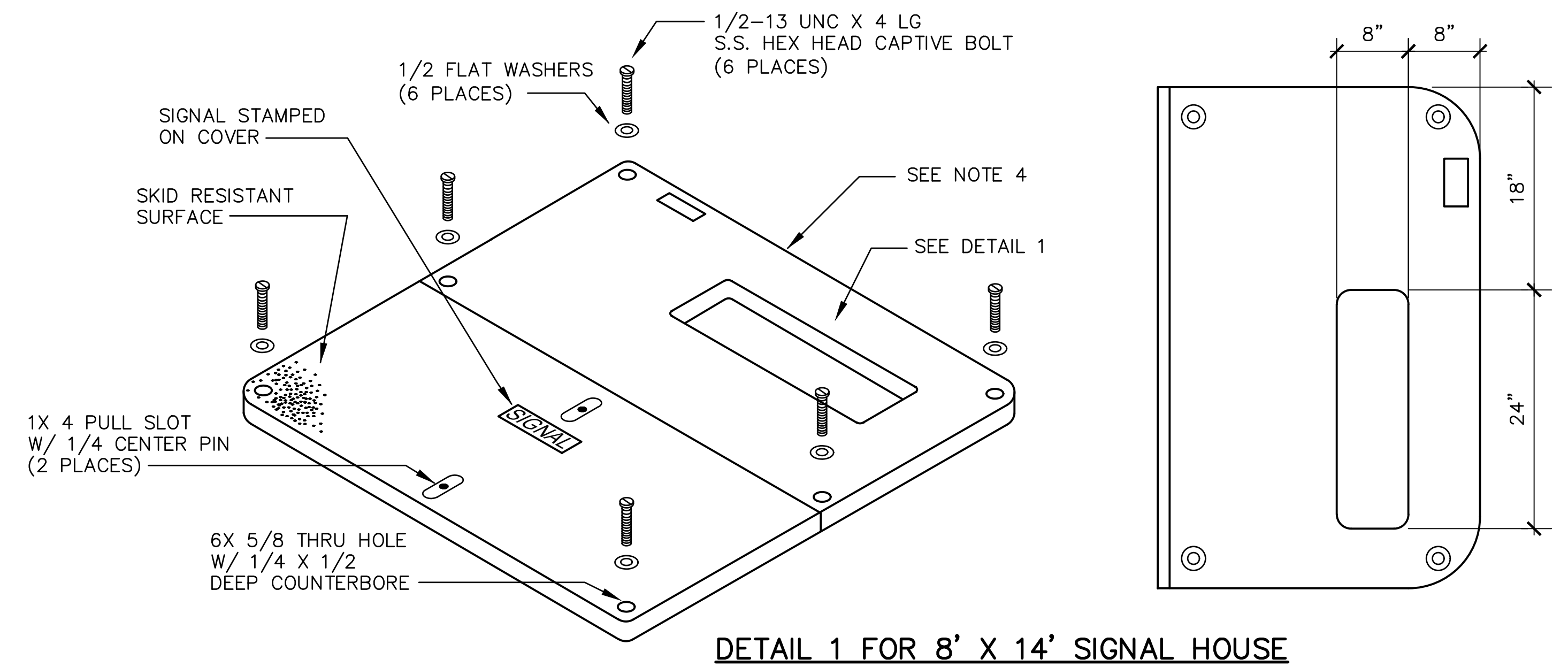
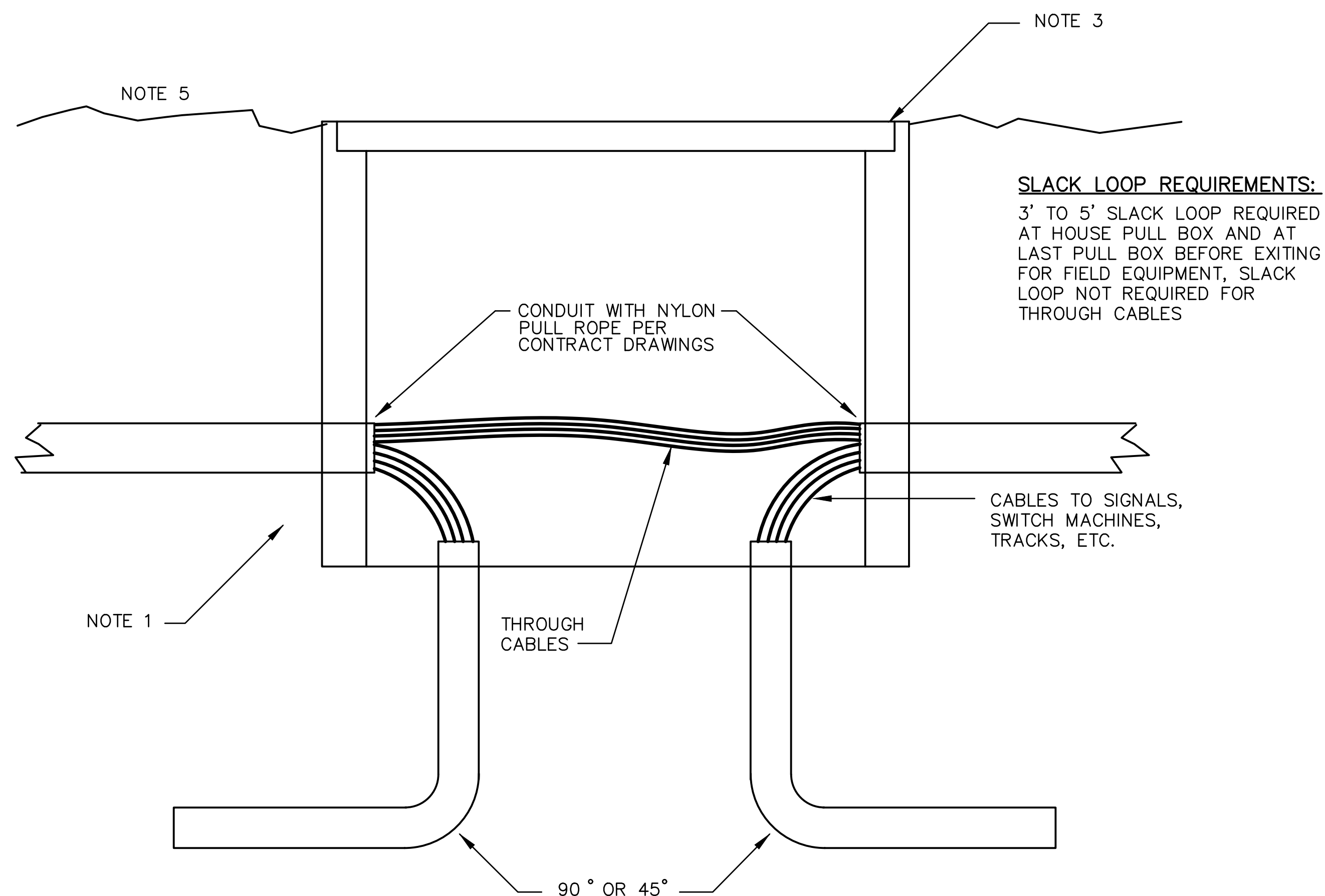
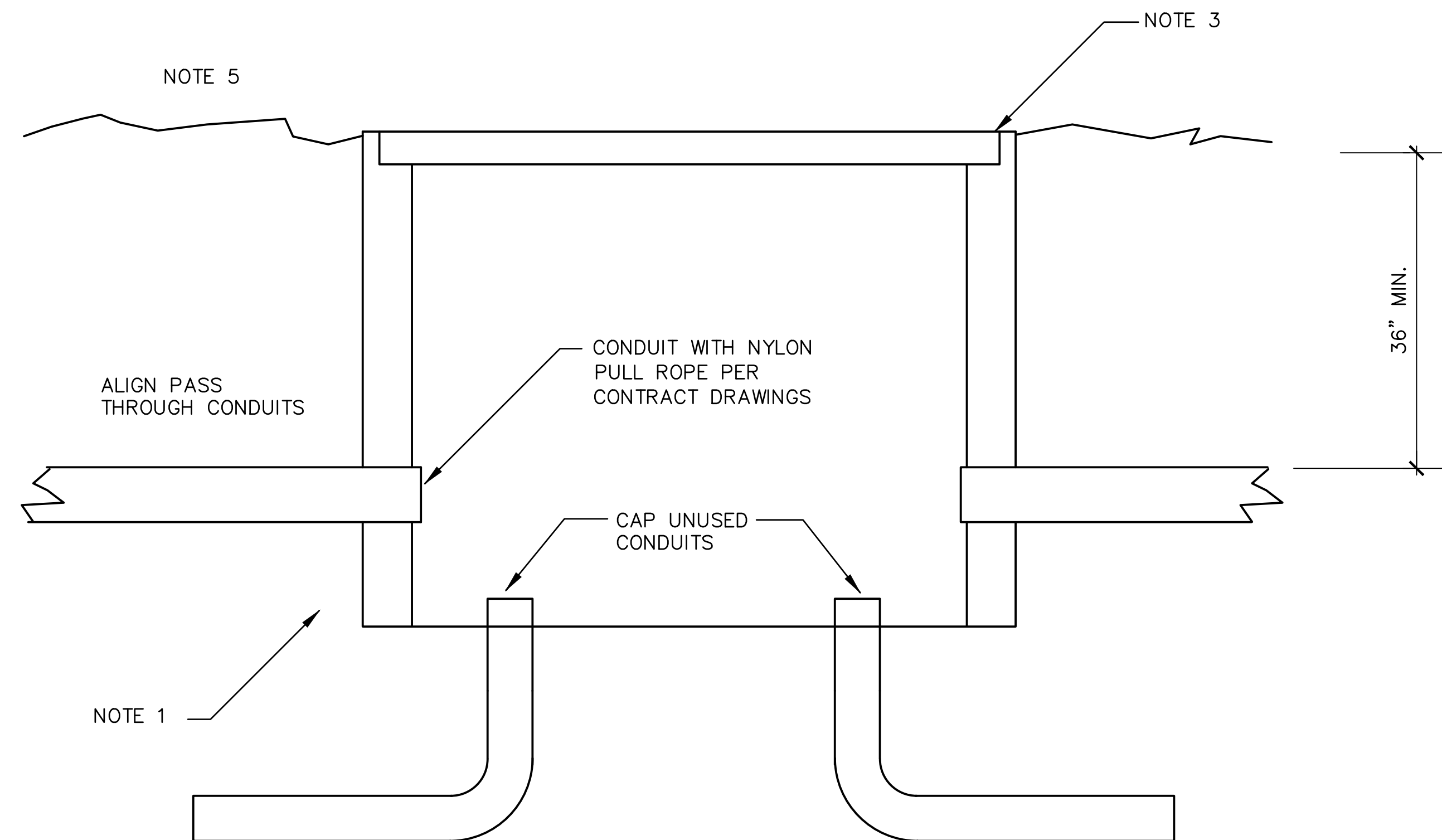
T-INTERSECTION CABLE TROUGH



90° SWEEP CABLE TROUGH

- NOTES:**
1. PREPARE A LINE GRADE TO SET THE LEVELING BLOCKS USING A TRANSIT OR CORD LINE WITH LINE LEVEL
 2. INSTALL AND COMPACT A LAYER OF SMALL AGGREGATE ROCK, MINIMUM 6" DEEP
 3. LOCATE LEVELING BLOCKS TO ALLOW FOR EVEN DISTRIBUTION OF WEIGHT WITH BLOCK SPACING NOT TO EXCEED 48". BLOCK REQUIRED WHEREVER JOINTS LAY. FILL AND COMPACT THE TOP OF LEVELING BLOCKS WITH STONE. USING GRANULAR STONE BACK FILL AGAINST THE SIDES OF THE CHANNELS IN 8" COMPACTED LIFTS TO WITHIN 2" OF FINISHED GRADE
 4. CHANNEL TOP SET AT 2" BELOW FINAL GRADE LEVEL AND BUTT-JOINED TO EACH OTHER ON THE LEVELING BLOCKS; EACH CHANNEL SHOULD BE SUPPORTED FOR 4" ON THE LEVELING BLOCKS AT JOINTS
 5. THE DETAILS OF CABLE TROUGH INTERSECTION ARE FOR ILLUSTRATION ONLY. ACTUAL INTERSECTIONS MAY BE DIFFERENT THAN SHOWN

										PENINSULA CORRIDOR JOINT POWERS BOARD		ENGINEERING STANDARD DRAWINGS		CADD FILE NAME: SD-5122	
										APPROVED BY: <i>Bin Zhang</i>		SIGNAL AND GRADE CROSSING SYSTEMS GENERAL SIGNAL		REV:	EDITION: FIFTH
										Caltrain		TYPICAL SIGNAL/CROSSING LOCATION CABLE TROUGH		SCALE:	NTS
														STANDARD DRAWING NO.: SD-5122	
010126				FIFTH EDITION	REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP

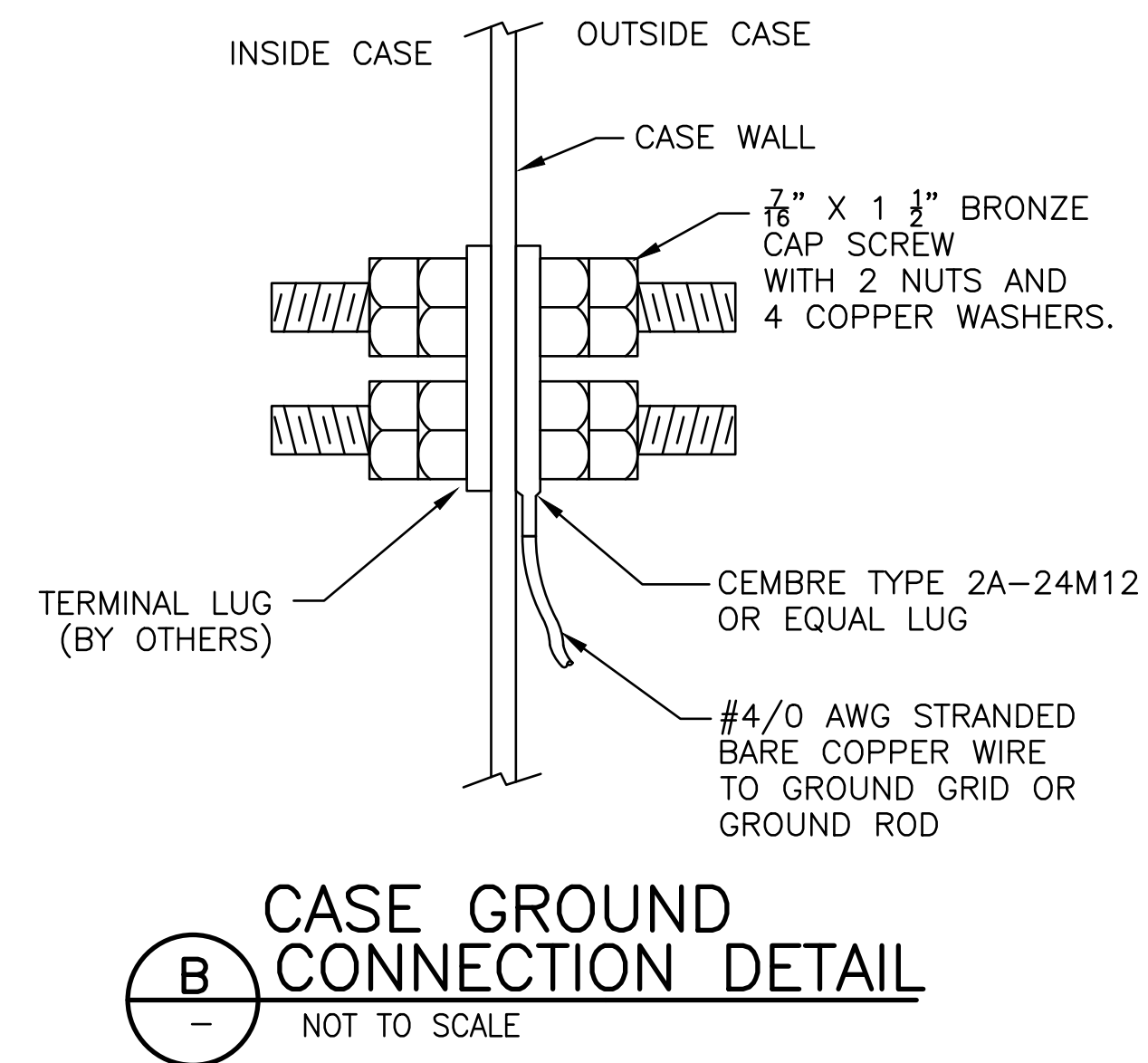


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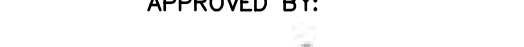

1. PLACE A LAYER OF DRAINAGE ROCKS AT A MINIMUM OF 6" BELOW AND EXTENDING 12" FROM EACH SIDE OF THE PULL BOX. ROCKS SHALL BE COMPACTED PRIOR TO PLACEMENT OF PULL BOX
2. NATIVE MATERIAL SHALL BE USED FOR BACKFILLING CONDUIT. ROCK AND DEBRIS LARGER THAN 3 INCHES IN DIAMETER SHALL BE REMOVED. BACK FILL COMPACTION SHALL BE 95-PERCENT IN 8" LIFTS
3. PULL BOX SHALL BE DESIGNED FOR H-20-44 BRIDGE LOADING AND EQUIPPED WITH COVER DESIGNED FOR VEHICULAR TRAFFIC. MINIMUM NOMINAL SIZE OF PULL BOX SHALL BE 2' X 3' LARGER PULLS BOXES SHALL BE FURNISHED WHERE MINIMUM BEND RADIUS OF CABLE IS A FACTOR. TOP OF PULL BOX SHALL BE LEVEL WITH FINAL GRADE
4. FOR CONTROL POINT, OR CROSSING SIGNAL HOUSE THIS COVER ASSEMBLY SHALL BE USED WITH A 4' X 4' PULL BOX WITH "NOTE 3" DESIGN SPECS. COVER IS DESIGNED WITH AN OPENING FOR THE SIGNAL HOUSE CABLE CHUTE. THE SIDE OF THE COVER WITH THE CABLE CHUTE OPENING IS RATED FOR PEDESTRIAN TRAFFIC ONLY
5. ALL PULL BOXES SHALL BE PROTECTED FROM DAMAGE UNTIL FINAL PLACEMENT IN SERVICE
6. SEAL CONDUIT / CABLE WELLS WITH PLASTER OF PARIS OR OTHER SUITABLE MATERIAL

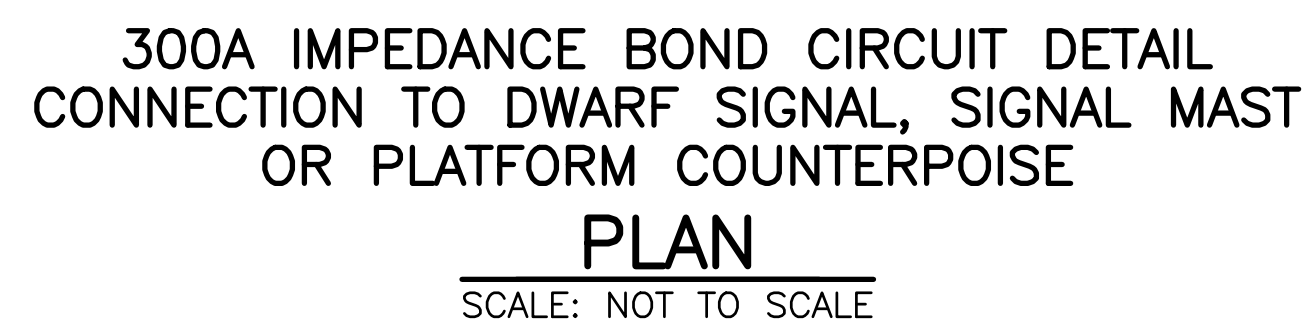
[illegible]

1. CONNECT ALL GROUND WIRES TO FACTORY INSTALLED GROUND STUD ON CASE.
2. CONTRACTOR TO MEASURE GROUND RESISTANCE AFTER INSTALLATION. IF GROUND RESISTANCE IS GREATER THAN 15 Ω , ADDITIONAL GROUND RODS AND A GROUND LOOP TO BE INSTALLED TO MEET 15 Ω . IF NECESSARY USE CHEMICAL TREATMENT OF SOIL TO LOWER THE RESISTIVITY OF GROUND AS REQUIRED.
3. FOR GROUNDING TO SIGNAL EQUIPMENT CASE WITHIN FENCING PERIMETER, SEE SD-5512. REFER TO SIGNALS AND COMMUNICATIONS DUCT BANK DRAWINGS.





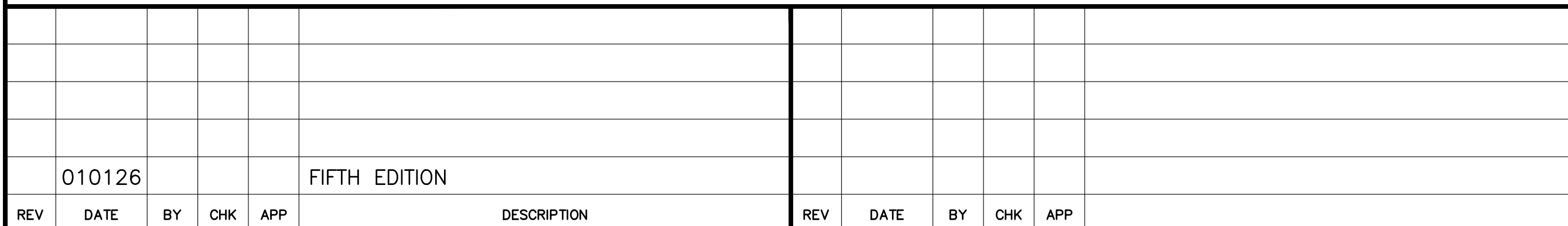
TYPICAL EQUIPMENT CASE
VIEWS
SCALE: NOT TO SCALE

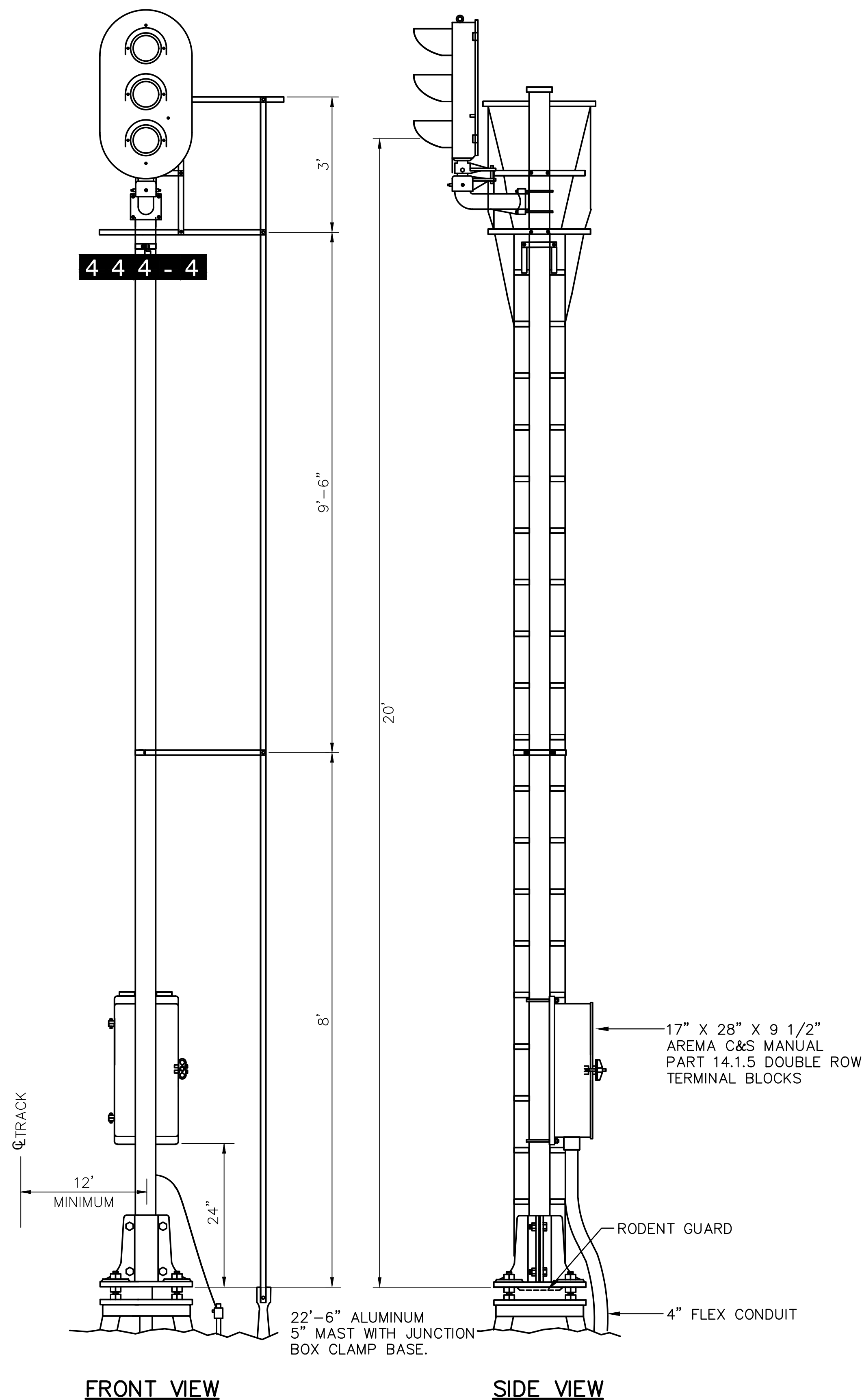
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												<div>APPROVED BY:  DIRECTOR, ENGINEERING</div>												SIGNAL AND GRADE CROSSING SYSTEMS GENERAL SIGNAL						REV:	EDITION: FIFTH
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010126						FIFTH EDITION																		TYPICAL SIGNAL EQUIPMENT CASE GROUNDING						STANDARD DRAWING NO.: SD—5124	
REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP	DESCRIPTION																				



1. FOR CONDUCTOR TYPE, SEE NOTE 7 ON ELECTRIFICATION STANDARD DRAWING E5002.
2. FOR WOOD TIES, USE 3/4"x6" LAG SCREW TO SECURE COPPER BUS. FOR CONCRETE TIES, MAKE THE ATTACHMENTS USING 3/4" MIN. WIDE STAINLESS STEEL STRAPS WRAPPED AROUND THE TIE OR OTHER METHOD AS APPROVED BY ENGINEER.
3. PROVIDE WATERTIGHT BUSHING AT CONDUCTOR EXIT, RATED FOR CONDUCTOR TYPE.
4. PROVIDE COVER/SHIELD FOR BUSBAR. SUBMIT BUSBAR/SHIELD COVER TO CALTRAIN FOR APPROVAL PRIOR TO PROCUREMENT.
5. REFER TO ELECTRIFICATION STANDARD DRAWINGS E5303 AND E5304 FOR ADDITIONAL DETAILS ON CONNECTION TO PLATFORM COUNTERPOISE.

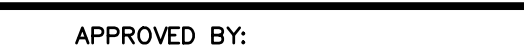

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																				<div>APPROVED BY:  DIRECTOR, ENGINEERING</div>																				SIGNAL AND GRADE CROSSING SYSTEMS GENERAL SIGNAL IMPEDANCE BOND DETAILS										REV:					EDITION: FIFTH				
																																																		SCALE: NTS									
010126										FIFTH EDITION																				STANDARD DRAWING NO.: SD—5125																													
REV	DATE	BY	CHK	APP	DESCRIPTION					REV	DATE	BY	CHK	APP																																													

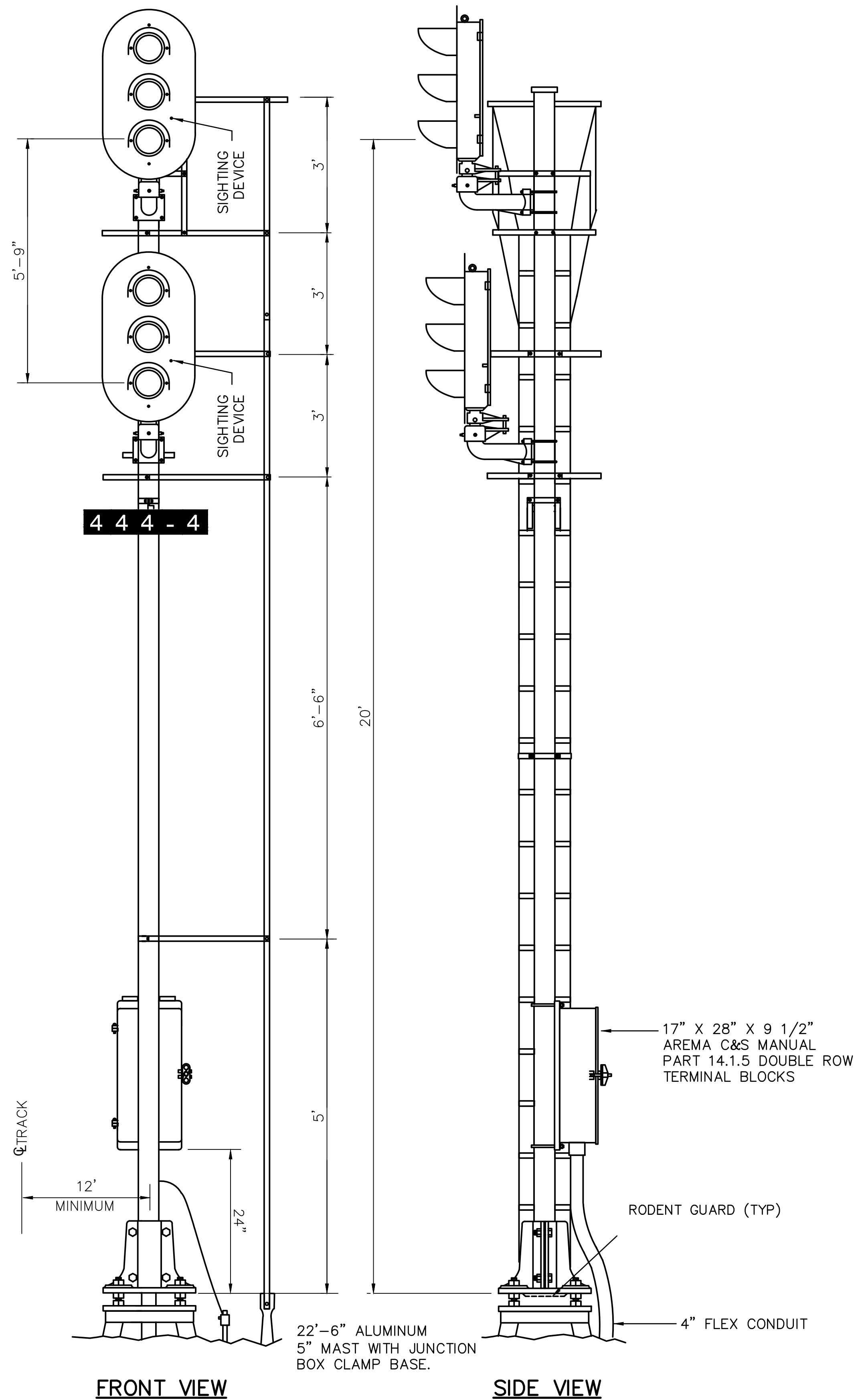




NOTES:

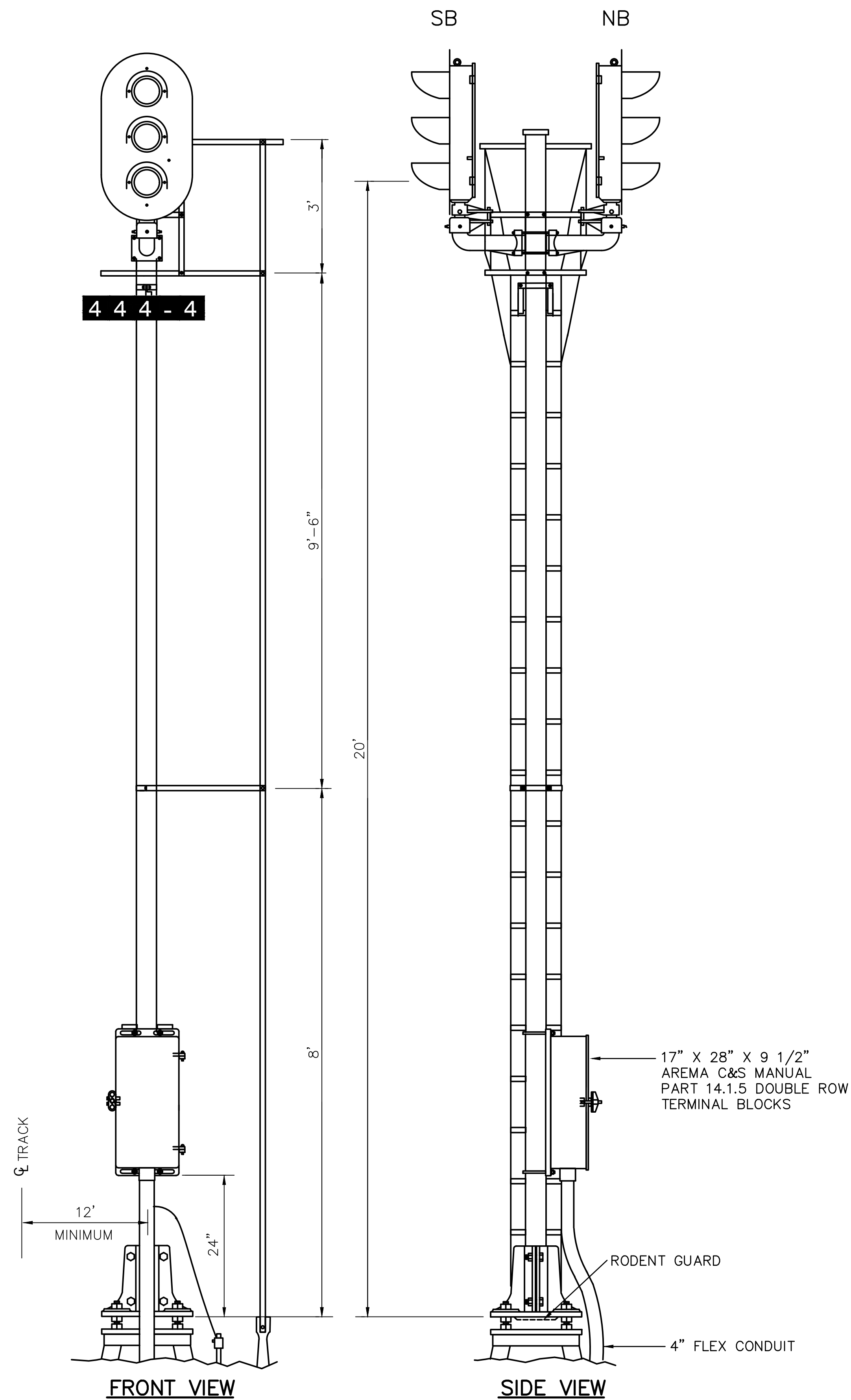
1. WHERE CLEARANCES ARE NOT A FACTOR, SIGNALS SHALL BE SET 12' MINIMUM TO 15' MAXIMUM FROM CENTER LINE OF TRACKS.
2. FOR SIGNAL UNIT REFERENCE SEE SD-5205. NUMBER PLATE TO BE OMITTED ON CONTROLLED SIGNALS.
3. FOR FOUNDATION SEE SD-5114.
4. ALL IN-LINE SIGNAL LIGHT UNITS SHALL BE LED, INCANDESCENT LIGHTS ARE NOT ACCEPTABLE.
5. SIGNAL SHALL BE EQUIPPED WITH LADDER GUARD AND LOCKING BRACKET. LADDER AND PLATFORM SHALL MEET CURRENT OSHA REQUIREMENTS AND SHALL BE MOUNTED ON FIELD SIDE OF MAST.
6. PROVIDE A MINIMUM DISTANCE OF 4' FOR WALKWAY AROUND SIGNAL AND LADDER.
7. A LAYER OF CRUSHED ROCK, 3/4" X 1/4" SHALL BE PLACED AROUND STRUCTURE A MINIMUM DISTANCE OF 4'.
8. SIGNAL ASPECT SIGNALS SHALL HAVE THE BACK SIDE PAINTED SILVER.
9. REFER TO DRAWING SD-5217 FOR GROUNDING REQUIREMENTS AND DETAILS.

												PENINSULA CORRIDOR JOINT POWERS BOARD						ENGINEERING STANDARD DRAWINGS						CADD FILE NAME: SD—5201			
												<div>APPROVED BY:  DIRECTOR, ENGINEERING</div>												REV: SD-5201		EDITION: FIFTH	
																								SCALE: NTS			
																		SIGNAL AND GRADE CROSSING SYSTEMS SIGNAL APPARATUS						STANDARD DRAWING NO.: SD—5201			
																		GROUND SIGNAL SINGLE UNIT COLORLIGHT									
REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP	DESCRIPTION																
	010126				FIFTH EDITION																						




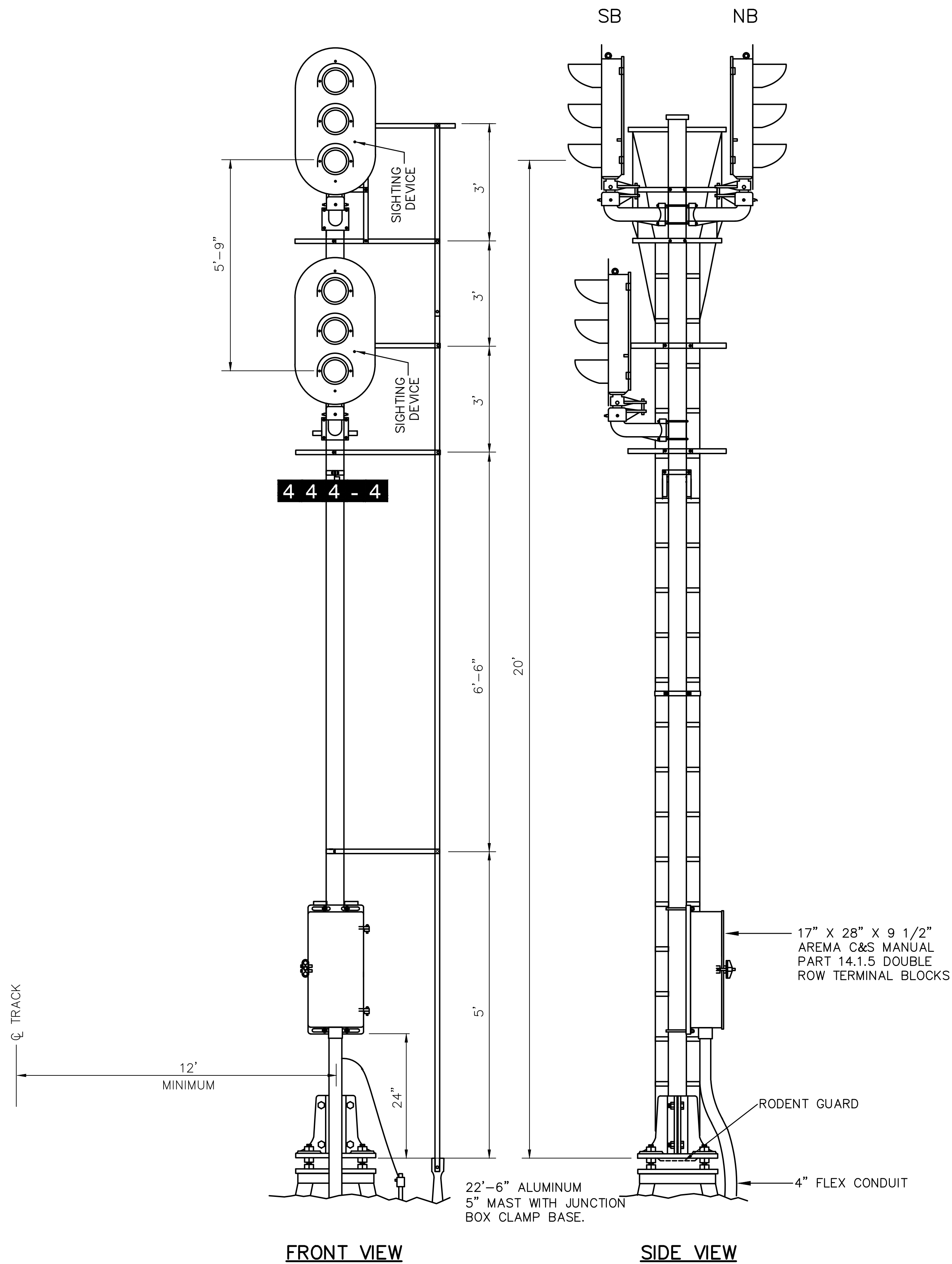
- NOTES:**
1. WHERE CLEARANCES ARE NOT A FACTOR, SIGNALS SHALL BE SET 12' MINIMUM TO 15' MAXIMUM FROM CENTER LINE OF TRACKS.
 2. FOR SIGNAL UNIT REFERENCE SEE SD-5205. NUMBER PLATE TO BE OMITTED ON CONTROLLED SIGNALS.
 3. FOR FOUNDATION SEE SD-5114.
 4. ALL IN-LINE SIGNAL LIGHT UNITS SHALL BE LED, INCANDESCENT LIGHTS ARE NOT ACCEPTABLE.
 5. SIGNAL SHALL BE EQUIPPED WITH LADDER GUARD AND LOCKING BRACKET. LADDER AND PLATFORM SHALL MEET CURRENT OSHA REQUIREMENTS AND SHALL BE MOUNTED ON FIELD SIDE OF MAST.
 6. PROVIDE A MINIMUM DISTANCE OF 4' FOR WALKWAY AROUND SIGNAL AND LADDER.
 7. A LAYER OF CRUSHED ROCK, 3/4" X 1/4" SHALL BE PLACED AROUND STRUCTURE A MINIMUM DISTANCE OF 4'.
 8. REFER TO DRAWING SD-5217 FOR GROUNDING REQUIREMENTS AND DETAILS.

												PENINSULA CORRIDOR JOINT POWERS BOARD		ENGINEERING STANDARD DRAWINGS		CADD FILE NAME: SD-5202	
												APPROVED BY: <i>Bin Zhang</i>		SIGNAL AND GRADE CROSSING SYSTEMS SIGNAL APPARATUS		REV:	EDITION: FIFTH
												Caltrain®		GROUND SIGNAL (22 FEET) DOUBLE UNIT COLORLIGHT		SCALE:	NTS
																STANDARD DRAWING NO.:	SD-5202
010126						FIFTH EDITION						REV	DATE	BY	CHK	APP	DESCRIPTION



- NOTES:**
- WHERE CLEARANCES ARE NOT A FACTOR, SIGNALS SHALL BE SET 12' MINIMUM TO 15' MAXIMUM FROM CENTER LINE OF TRACKS.
 - FOR SIGNAL UNIT REFERENCE SEE SD-5205. NUMBER PLATE TO BE OMITTED ON CONTROLLED SIGNALS.
 - FOR FOUNDATION SEE SD-5114.
 - ALL IN-LINE SIGNAL LIGHT UNITS SHALL BE LED, INCANDESCENT LIGHTS ARE NOT ACCEPTABLE.
 - SIGNAL SHALL BE EQUIPPED WITH LADDER GUARD AND LOCKING BRACKET. LADDER AND PLATFORM SHALL MEET CURRENT OSHA REQUIREMENTS AND SHALL BE MOUNTED ON FIELD SIDE OF MAST.
 - PROVIDE A MINIMUM DISTANCE OF 4' FOR WALKWAY AROUND SIGNAL AND LADDER.
 - A LAYER OF CRUSHED ROCK, 3/4" X 1/4" SHALL BE PLACED AROUND STRUCTURE A MINIMUM DISTANCE OF 4'.
 - REFER TO DRAWING SD-5217 FOR GROUNDING REQUIREMENTS AND DETAILS.

										PENINSULA CORRIDOR JOINT POWERS BOARD		ENGINEERING STANDARD DRAWINGS		CADD FILE NAME: SD-5203	
										APPROVED BY: <i>Bin Zhang</i>		SIGNAL AND GRADE CROSSING SYSTEMS SIGNAL APPARATUS		REV:	EDITION: FIFTH
												GROUND SIGNAL (22 FEET) BI-DIRECTIONAL COLORLIGHT		SCALE: NTS	
010126														STANDARD DRAWING NO.: SD-5203	
REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP					
FIFTH EDITION															

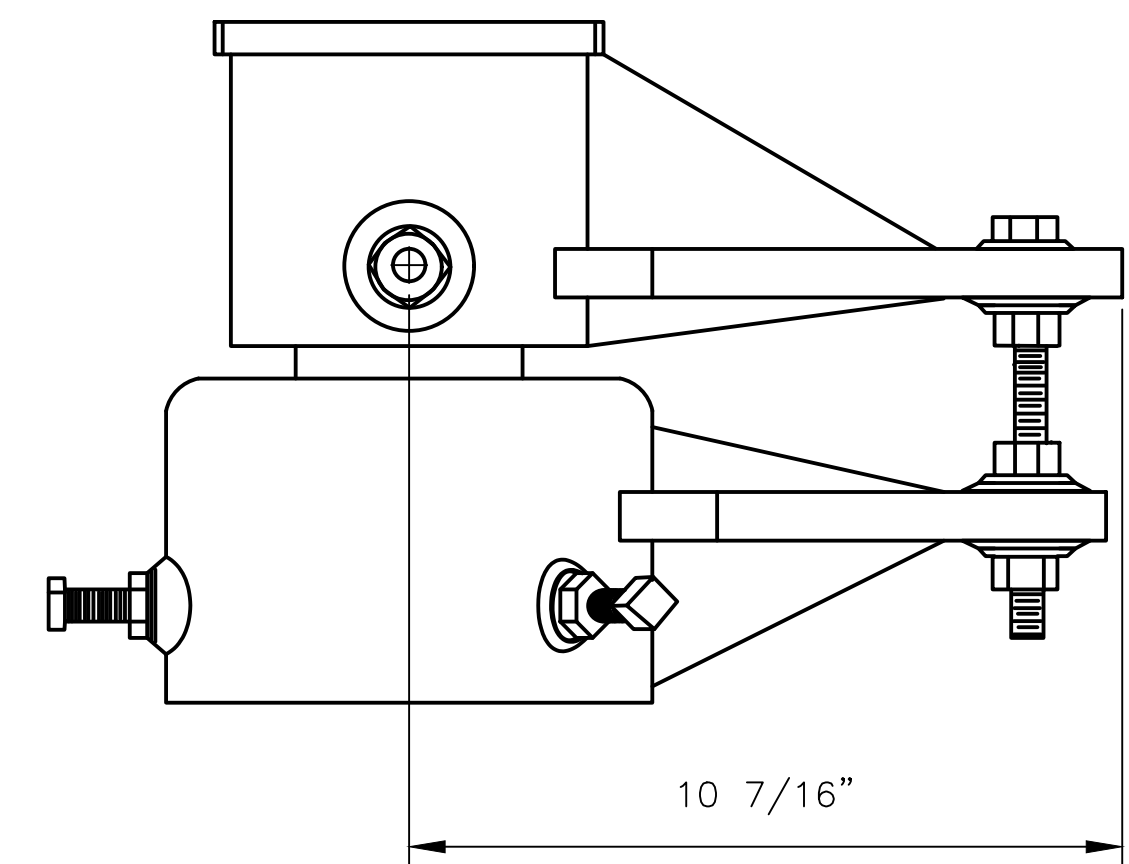
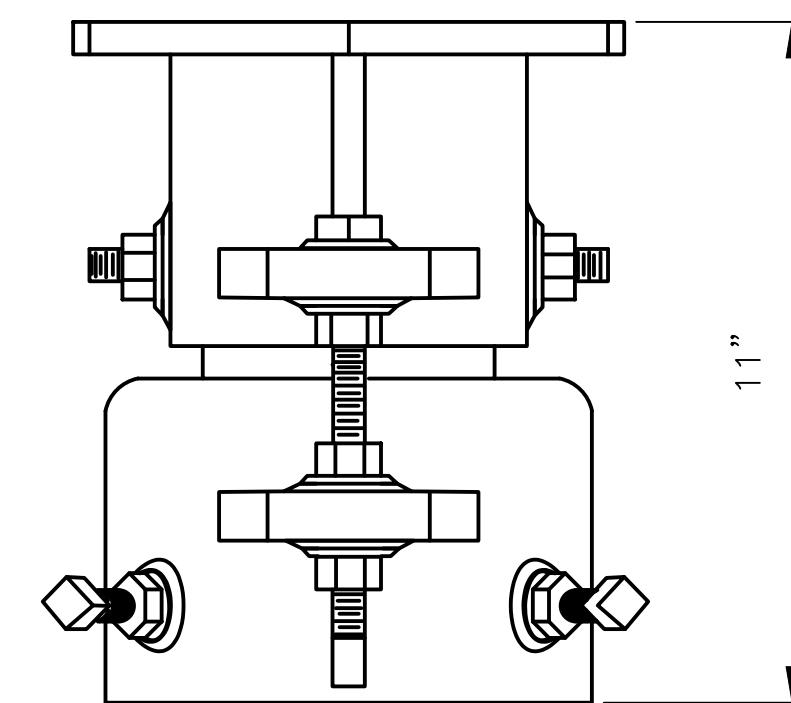
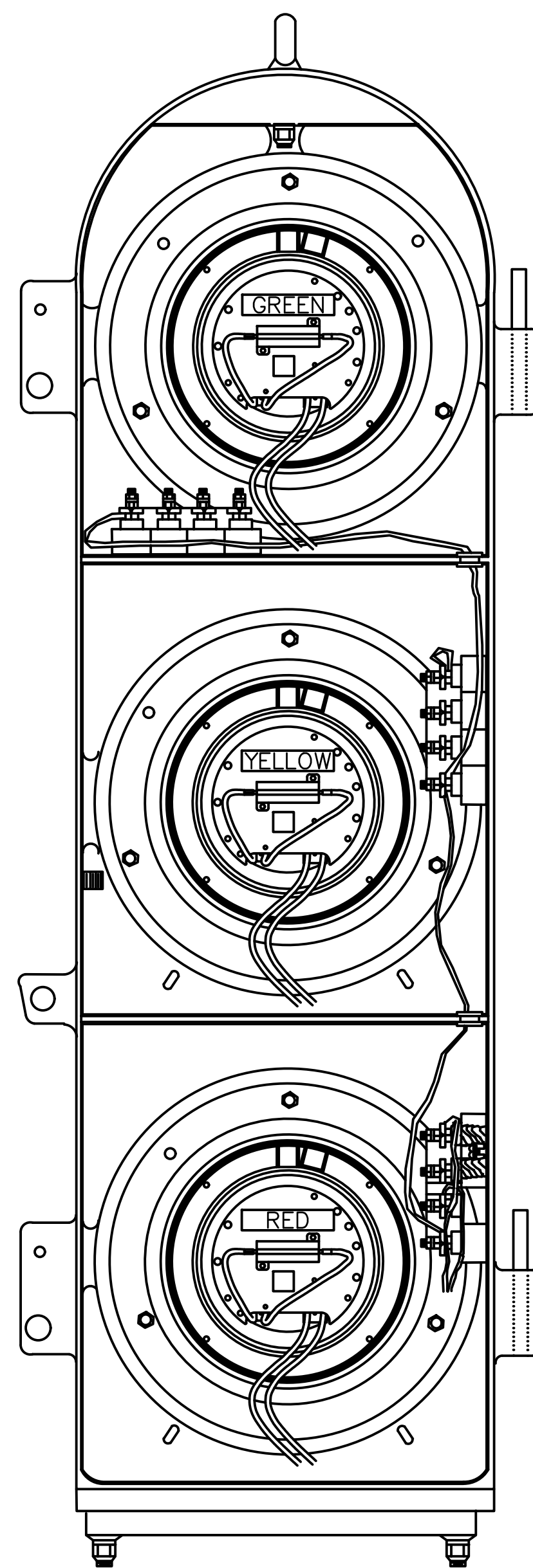
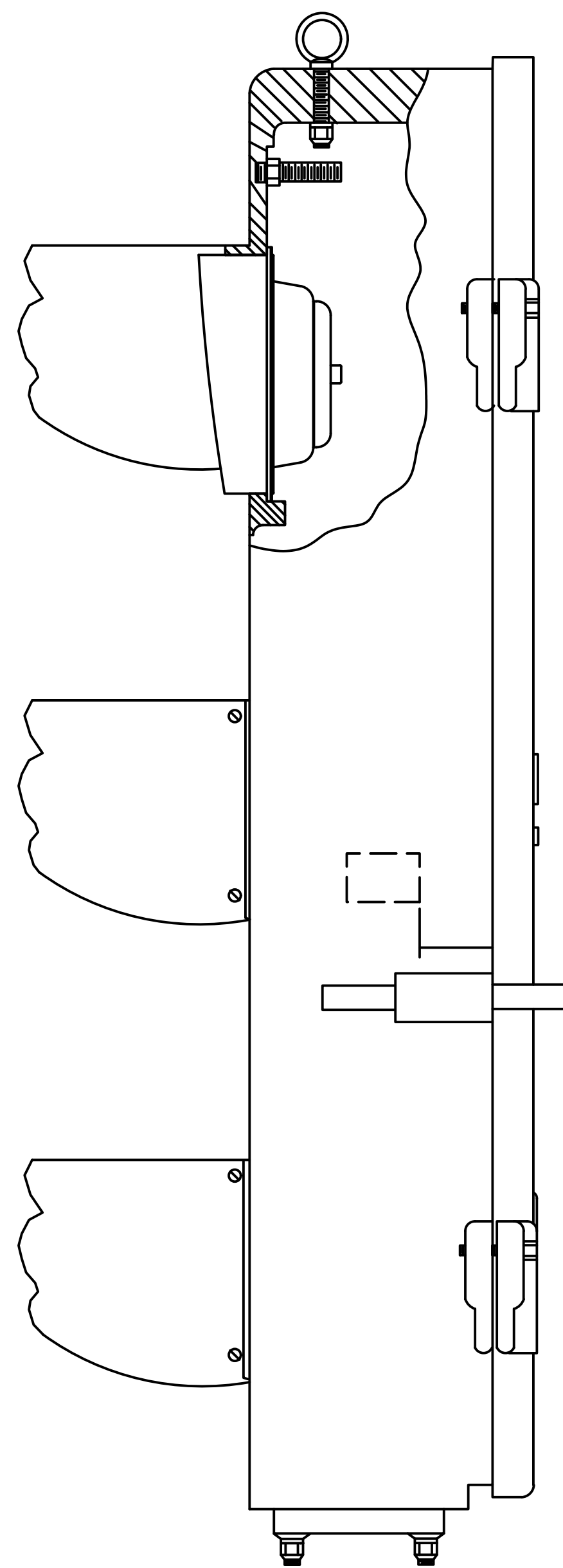


FRONT VIEW

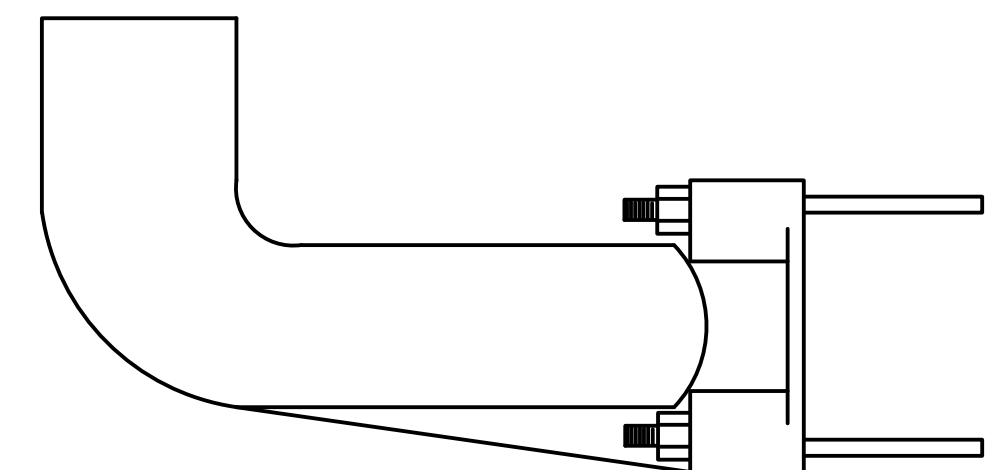
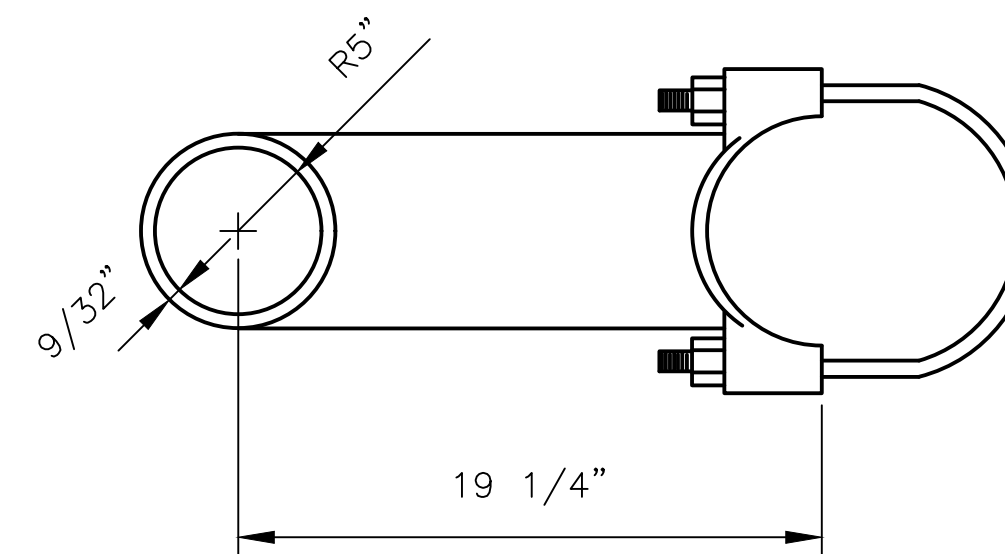
SIDE VIEW

- NOTES:**
- WHERE CLEARANCES ARE NOT A FACTOR, SIGNALS SHALL BE SET 12' MINIMUM TO 15' MAXIMUM FROM CENTER LINE OF TRACKS.
 - FOR SIGNAL UNIT REFERENCE SEE SD-5205. NUMBER PLATE TO BE OMITTED ON CONTROLLED SIGNALS.
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 - ALL IN-LINE SIGNAL LIGHT UNITS SHALL BE LED, INCANDESCENT LIGHTS ARE NOT ACCEPTABLE.
 - SIGNAL SHALL BE EQUIPPED WITH LADDER GUARD AND LOCKING BRACKET. LADDER AND PLATFORM SHALL MEET CURRENT OSHA REQUIREMENTS AND SHALL BE MOUNTED ON FIELD SIDE OF MAST.
 - PROVIDE A MINIMUM DISTANCE OF 4' FOR WALKWAY AROUND SIGNAL AND LADDER.
 - A LAYER OF CRUSHED ROCK, 3/4" X 1/4" SHALL BE PLACED AROUND STRUCTURE A MINIMUM DISTANCE OF 4'.
 - REFER TO DRAWING SD-5217 FOR GROUNDING REQUIREMENTS AND DETAILS.

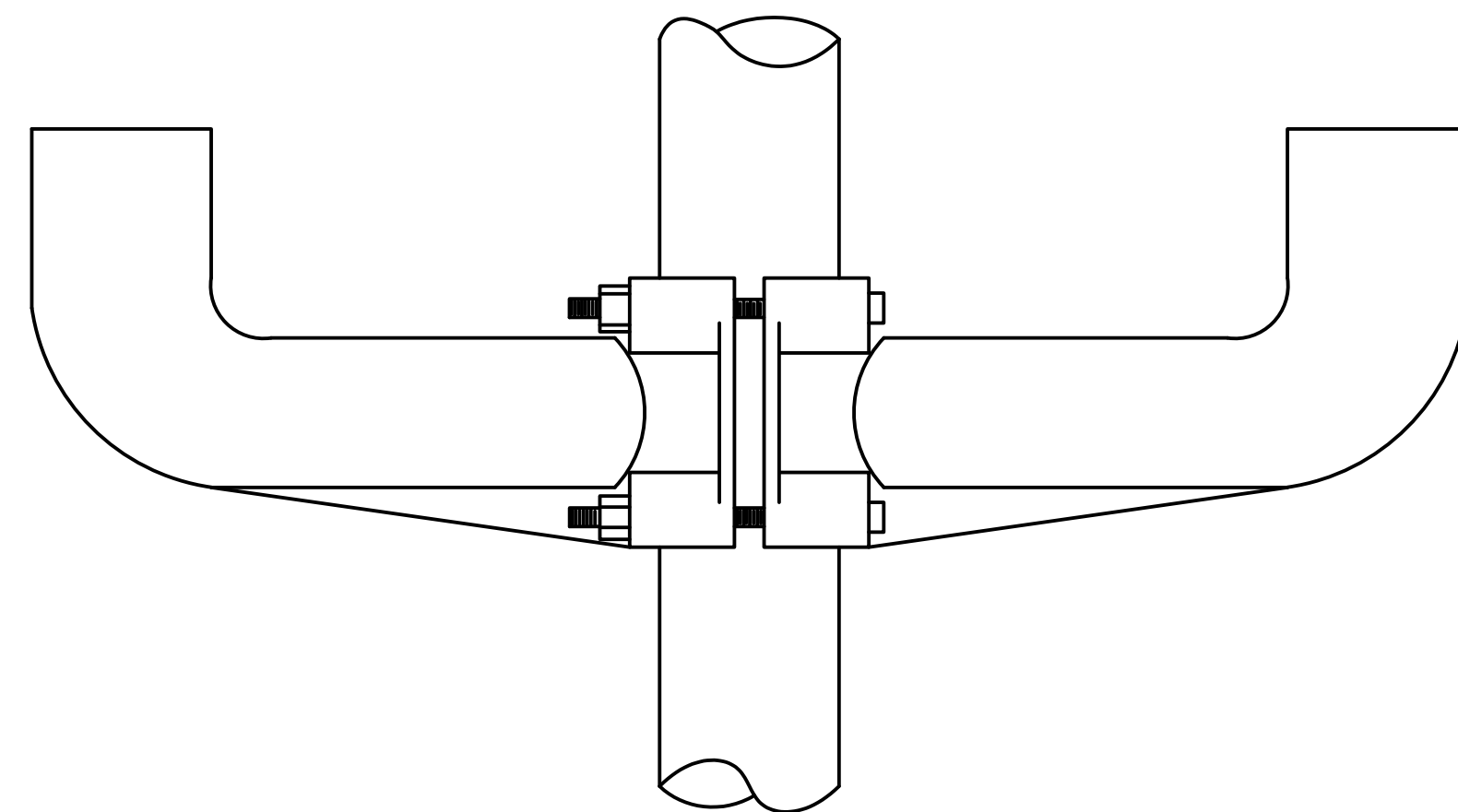
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BRACKET ADJUSTABLE



TUBE TYPE-SINGLE BRACKET

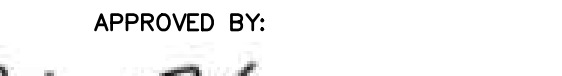



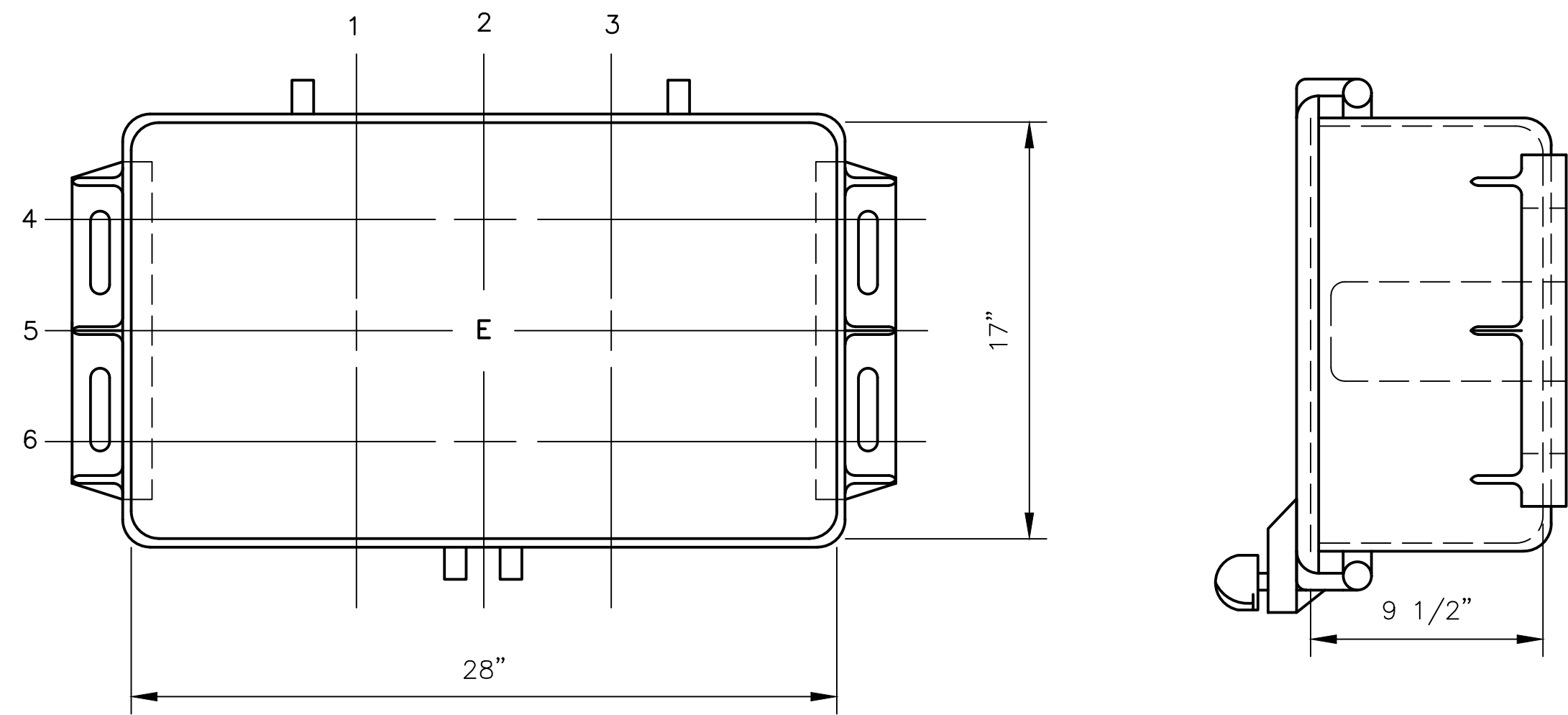
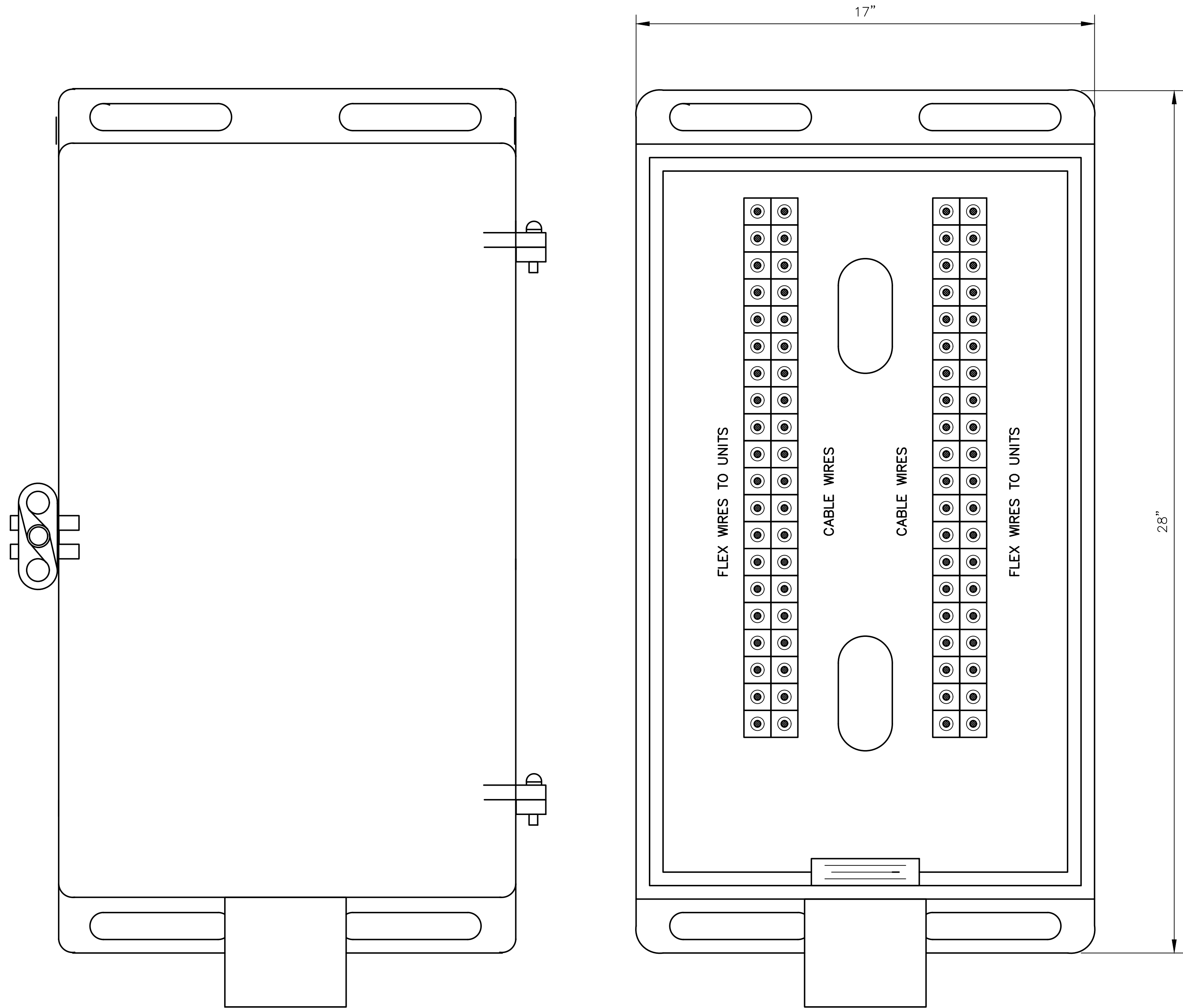
TUBE TYPE-DOUBLE BRACKET

SIGNAL UNIT

NOTE:

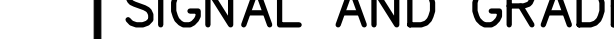

ALL IN-LINE SIGNAL LIGHT UNITS SHALL BE LED. INCANDESCENT LIGHTS ARE NOT ACCEPTABLE.

																				PENINSULA CORRIDOR JOINT POWERS BOARD										ENGINEERING STANDARD DRAWINGS										CADD FILE NAME: SD-5205																													
																				<div>APPROVED BY:</div> <div></div> <div>DIRECTOR, ENGINEERING</div>																				SIGNAL AND GRADE CROSSING SYSTEMS										REV:										EDITION:									
																																								SIGNAL APPARATUS										FIFTH																			
																																																		SCALE:										NOT TO SCALE									
																																								SIGNAL UNIT DETAILS										STANDARD DRAWING NO.:										SD-5205									
																																								TYPICAL COLORLIGHT																													
REV	DATE	BY	CHK	APP	DESCRIPTION					REV	DATE	BY	CHK	APP	DESCRIPTION																																																						
	010126				FIFTH EDITION																																																																

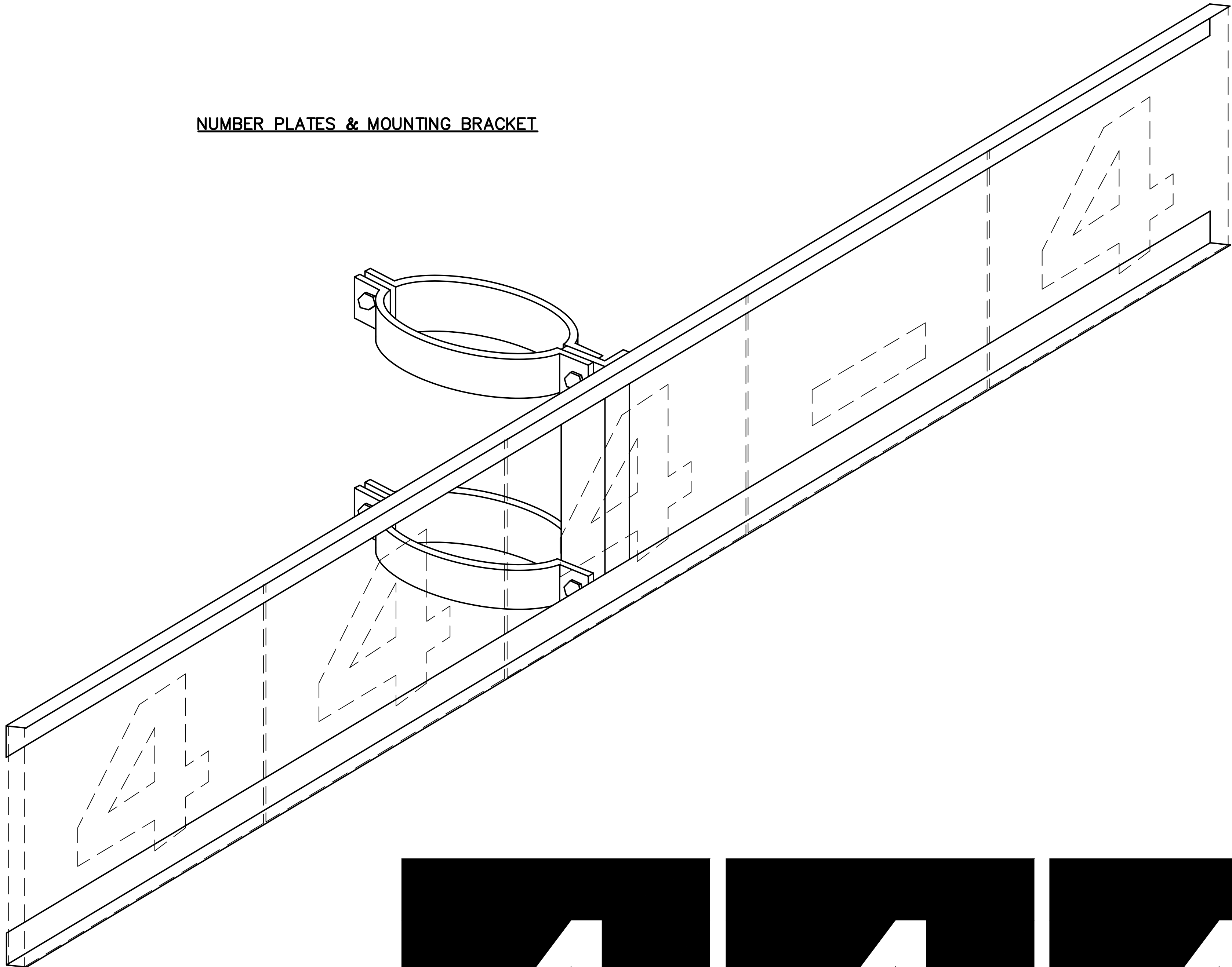


NOTES:

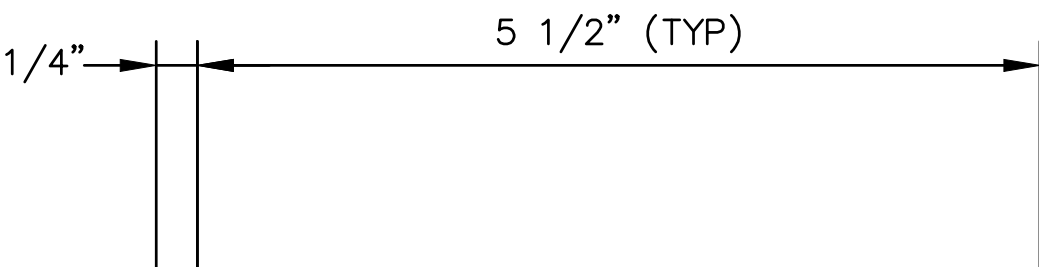
1. TERMINAL BOX SHALL BE ALUMINUM MEASURING 17"W X 28"L 9 1/2"D.
2. INSULATED TEST TERMINALS, AS SHOWN IN SD-5109 SHALL BE INSTALLED BETWEEN FLEX CONDUCTOR AND CABLE CONDUCTOR.
3. ALL CONDUCTORS SHALL BE IDENTIFIED WITH SLEEVE TYPE TAGS. TAGS SHALL DISPLAY NOMENCLATURE AS SHOWN ON CIRCUIT DRAWING.
4. EACH SPARE CABLE CONDUCTOR SHALL BE TERMINATED ON AN AREMA C&S MANUAL PART 14.1.5 TERMINAL AND LOCKED DOWN TIGHTLY WITH TWO TERMINAL NUTS.
5. TERMINALS NOT USED SHALL BE EQUIPPED WITH TWO WASHERS AND TWO CROWN NUTS.
6. CABLE ENTRANCE SHALL BE SEALED TO PREVENT ACCESS BY RODENTS AND OTHER PESTS.
7. PROTECT WIRE FROM SHARP EDGES WITH RUBBER GROMMET/MATTING.
8. AN ADDITIONAL JUNCTION BOX MAY BE REQUIRED IF AMOUNT OF CONDUCTORS EXCEED THE AMOUNT OF TERMINALS.

										PENINSULA CORRIDOR JOINT POWERS BOARD					ENGINEERING STANDARD DRAWINGS					CADD FILE NAME: SD-5206									
										<div>APPROVED BY:</div> <div></div> <div>DIRECTOR, ENGINEERING</div>										SIGNAL AND GRADE CROSSING SYSTEMS SIGNAL APPARATUS					REV:		EDITION: FIFTH		
																									SCALE: NTS				
010126																				STANDARD DRAWING NO.: SD-5206									
REV	DATE	BY	CHK	APP	DESCRIPTION					REV	DATE	BY	CHK	APP															

NUMBER PLATES & MOUNTING BRACKET

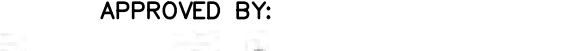



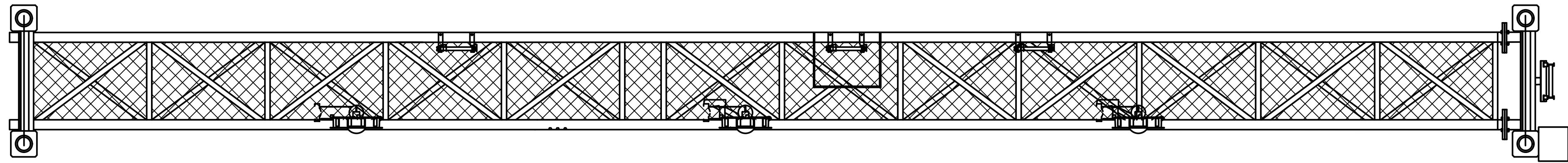
- NOTES:
- 1. UNITYPE FRAMES SHALL BE MADE OF ALUMINUM OR STEEL AND BE COMPLETE WITH ALL HARDWARE REQUIRED FOR MOUNTING TO ALMOST ANY SIZE MAST.
 - 2. ALL NUMBER AND LETTER PLATES SHALL HAVE WHITE IMAGES ON BLACK BACKGROUNDS.
 - 3. MOUNTING BRACKETS SHALL BE FOR 5" PIPE MAST MOUNTING UNLESS OTHERWISE SPECIFIED.
 - 4. BEND TABS ON CORNERS OF PLATES WHEN COTTER KEYS ARE NOT PROVIDED TO PREVENT PLATES FROM SLIDING OUT.



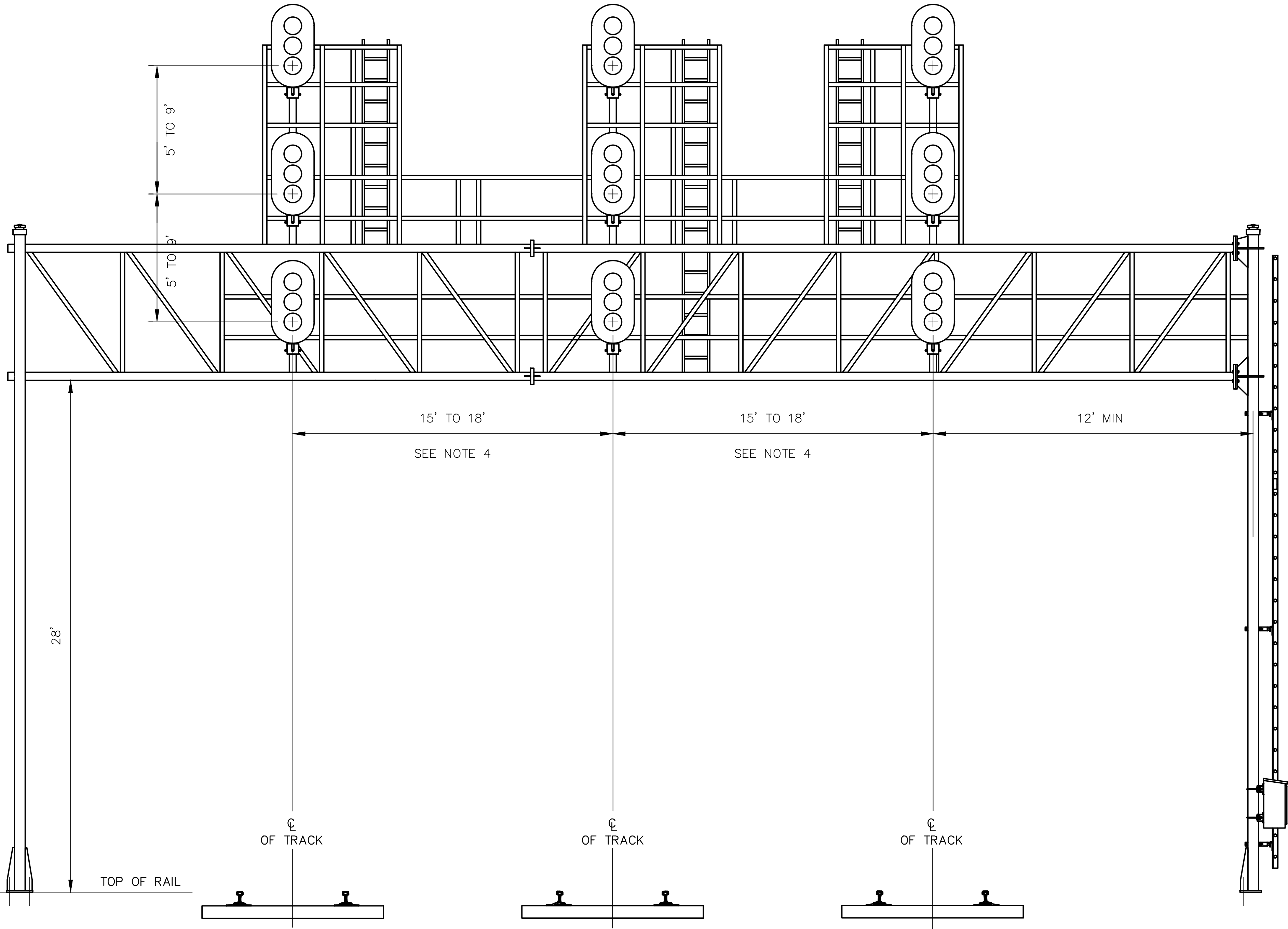
										PENINSULA CORRIDOR JOINT POWERS BOARD		ENGINEERING STANDARD DRAWINGS		CADD FILE NAME: SD-5207	
										APPROVED BY: <i>Bin Zhang</i>		SIGNAL AND GRADE CROSSING SYSTEMS SIGNAL APPARATUS		REV:	EDITION: FIFTH
												SIGNAL NUMBER PLATE DETAILS		SCALE: NTS	
010126					FIFTH EDITION									STANDARD DRAWING NO.: SD-5207	
REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP					

NOT USED

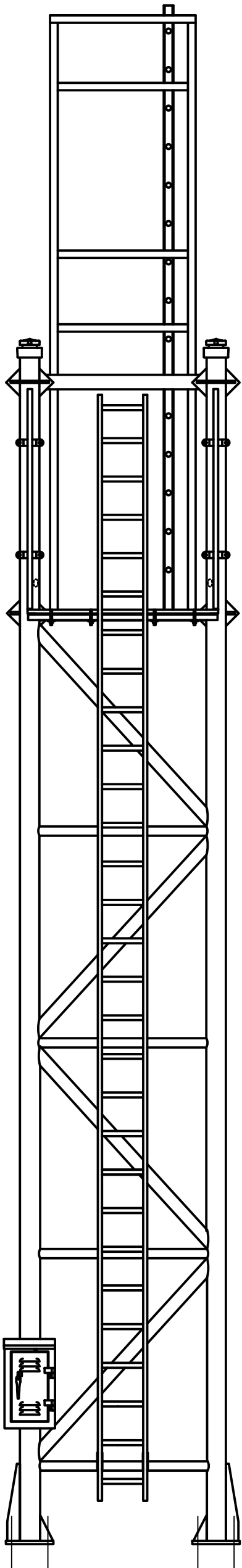
												PENINSULA CORRIDOR JOINT POWERS BOARD						ENGINEERING STANDARD DRAWINGS						CADD FILE NAME: SD-5208	
												<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> APPROVED BY:  DIRECTOR, ENGINEERING </div> <div style="text-align: center;">  </div> </div>						SIGNAL AND GRADE CROSSING SYSTEMS SIGNAL APPARATUS						REV:	EDITION: FIFTH
																		SCALE: NTS						STANDARD DRAWING NO.: SD-5208	
010126						FIFTH EDITION																			
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TOP VIEW



FRONT VIEW

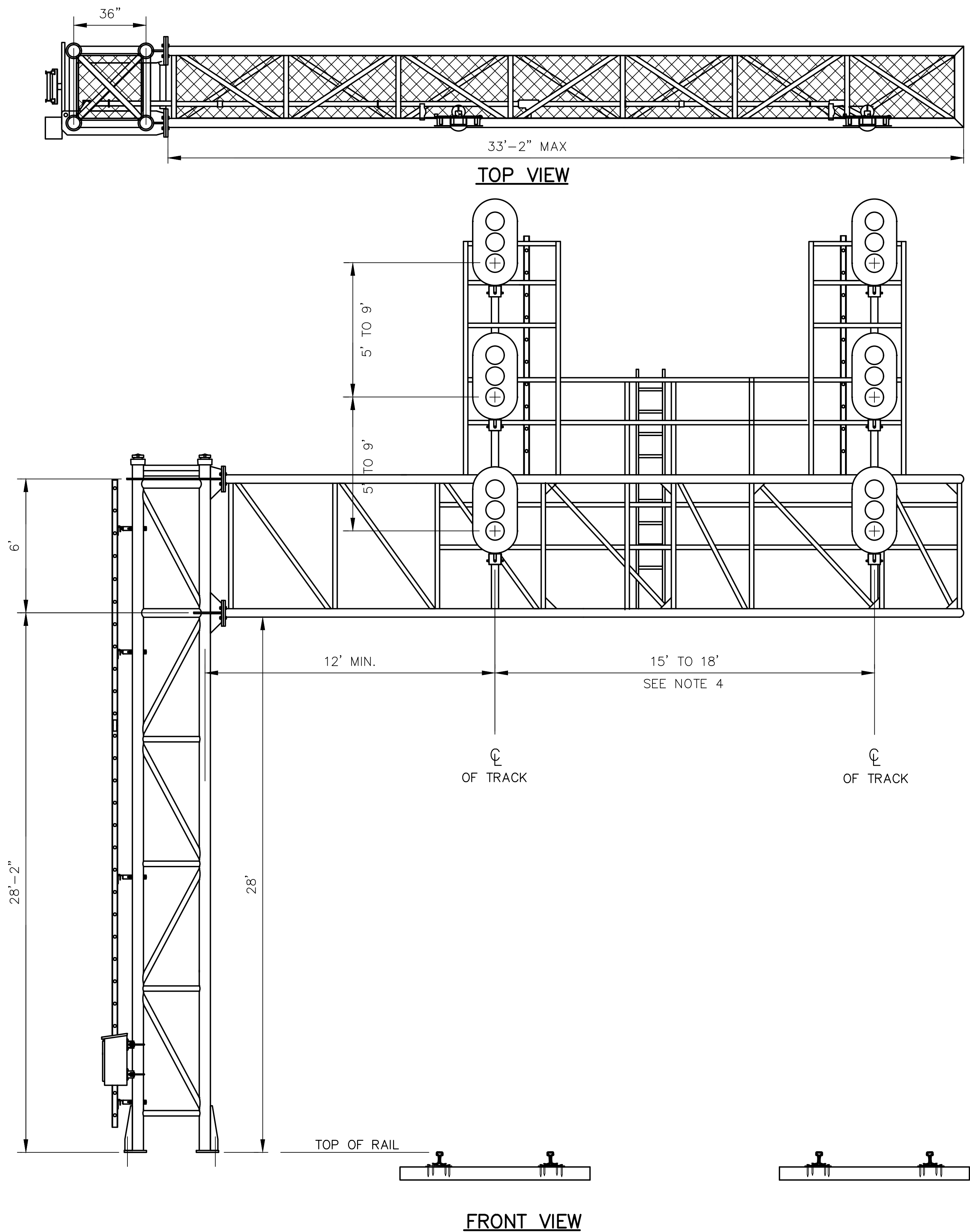


SIDE VIEW

- NOTES:**
1. BASE OF BRIDGE MAST SHALL BE LEVEL WITH TOP OF HIGHEST RAIL.
 2. 41" X 73 3/4" X 24" FREE STANDING POWDER COATED STEEL JUNCTION CASE REQUIRED WHERE MAST MOUNTED JUNCTION CASE DOES NOT HAVE SUFFICIENT CAPACITY.
 3. FIXED LADDER SHALL INCLUDE A FALL ARREST SYSTEM MEETING ALL OSHA REQUIREMENTS.
 4. SPACING OF BRIDGE MOUNTED SIGNALS VARIES PER LOCATION AND WILL BE DETERMINED DURING DESIGN.
 5. REFER TO DRAWING SD-5217 FOR GROUNDING REQUIREMENTS AND DETAILS.

FOOTING REQUIREMENTS:
A LAYER OF CRUSHED ROCK, 3/4" X 1/4", SHALL BE PLACED AROUND STRUCTURE A MINIMUM DISTANCE OF 4' OUT FROM FOOTING. PROVIDE RETAINING WALL IF REQUIRED.

										PENINSULA CORRIDOR JOINT POWERS BOARD		ENGINEERING STANDARD DRAWINGS		CADD FILE NAME: SD-5209	
										APPROVED BY: <i>Bin Zhang</i>		SIGNAL AND GRADE CROSSING SYSTEMS SIGNAL APPARATUS		REV:	EDITION: FIFTH
												SCALE: NTS		STANDARD DRAWING NO.: SD-5209	
										DIRECTOR, ENGINEERING		SIGNAL BRIDGE TYPICAL SIGNAL BRIDGE			
010126				FIFTH EDITION	REV	DATE	BY	CHK	APP						
REV	DATE	BY	CHK	APP	DESCRIPTION		REV	DATE	BY	CHK	APP				



- NOTES:**
1. BASE OF BRIDGE MAST SHALL BE LEVEL WITH TOP OF HIGHEST RAIL.
 2. 41" X 73 3/4" X 24" FREE STANDING POWDER COATED STEEL JUNCTION CASE REQUIRED WHERE MAST MOUNTED JUNCTION CASE DOES NOT HAVE SUFFICIENT CAPACITY.
 3. FIXED LADDER SHALL INCLUDE A FALL ARREST SYSTEM MEETING ALL OSHA REQUIREMENTS.
 4. SPACING OF BRIDGE MOUNTED SIGNALS VARIES PER LOCATION AND WILL BE DETERMINED DURING DESIGN.
 5. REFER TO DRAWING SD-5217 FOR GROUNDING REQUIREMENTS AND DETAILS.

FOOTING REQUIREMENTS:
A LAYER OF CRUSHED ROCK, 3/4" X 1/4", SHALL BE PLACED AROUND STRUCTURE A MINIMUM DISTANCE OF 4' OUT FROM FOOTING. PROVIDE RETAINING WALL IF REQUIRED.

NOTE:
4" FLEX CONDUIT(S) MAY BE RUN OUTSIDE OF FOUNDATION TO ENTER BOTTOM OF JUNCTION BOX. REFER TO SD-5206.

										PENINSULA CORRIDOR JOINT POWERS BOARD		ENGINEERING STANDARD DRAWINGS		CADD FILE NAME: SD-5210	
										APPROVED BY: <i>Bin Zhang</i> DIRECTOR, ENGINEERING		SIGNAL AND GRADE CROSSING SYSTEMS SIGNAL APPARATUS		REV:	EDITION: FIFTH
										Caltrain®		SIGNAL CANTILEVER TYPICAL SIGNAL CANTILEVER		SCALE: NTS	
														STANDARD DRAWING NO.: SD-5210	
010126					FIFTH EDITION										
REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP					



1. CONCRETE SHALL BE IN ACCORDANCE WITH AREMA SPECIFICATIONS FOR CONCRETE STRUCTURES AND FOUNDATIONS.
2. TOP AND BOTTOM SURFACES OF ALL PARTS SHALL BE FLAT AND PARALLEL.
3. STEEL PLATE AND NUT ASSEMBLIES SHALL BE PLACED SUCH THAT WHEN ASSEMBLED. THE BOLTS SHALL BE PERPENDICULAR TO THE BASE PLATE UPPER SURFACE WITHIN ONE DEGREE OF PERPENDICULAR
4. NUT ASSEMBLY SHALL BE ARRANGED SO THAT ONE NUT AND FLAT WASHER WILL BE USED TO SECURE ANCHOR BOLTS TO FOUNDATION. ANOTHER NUT AND FLAT WASHER SHALL BE USED TO LEVEL THE BRIDGE AND OR CANTILEVER MAST AND A THIRD NUT/WASHER COMBINATION TO SECURE MAST IN PLACE.
5. TAMP EXCAVATED HOLE, PROVIDE CURSHED ROCK PRIOR TO SETTING FOUNDATION.

[illegible]**PENINSULA CORRIDOR JOINT POWERS BOARD**

APPROVED BY:

Bin Zhang

DIRECTOR, ENGINEERING

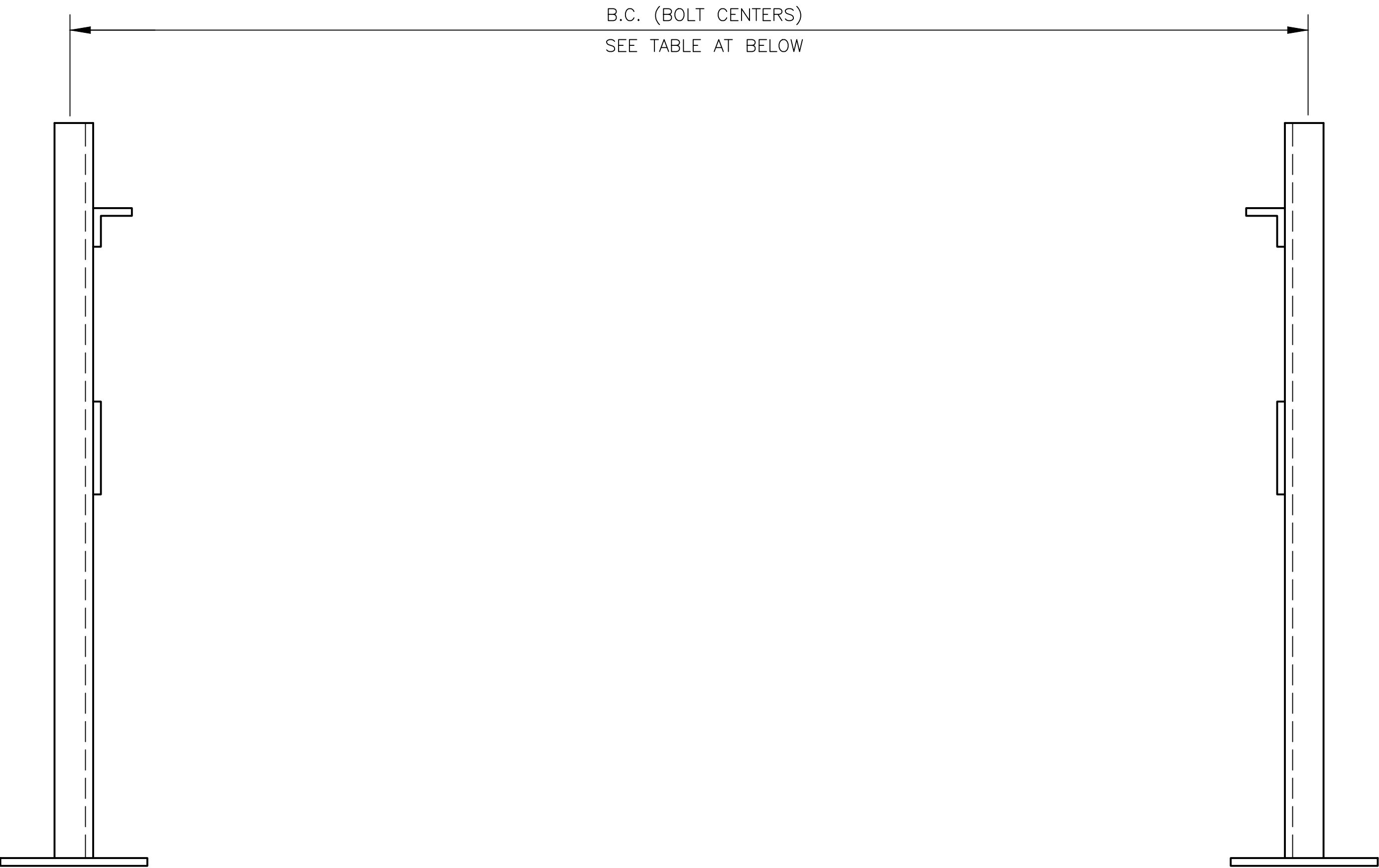
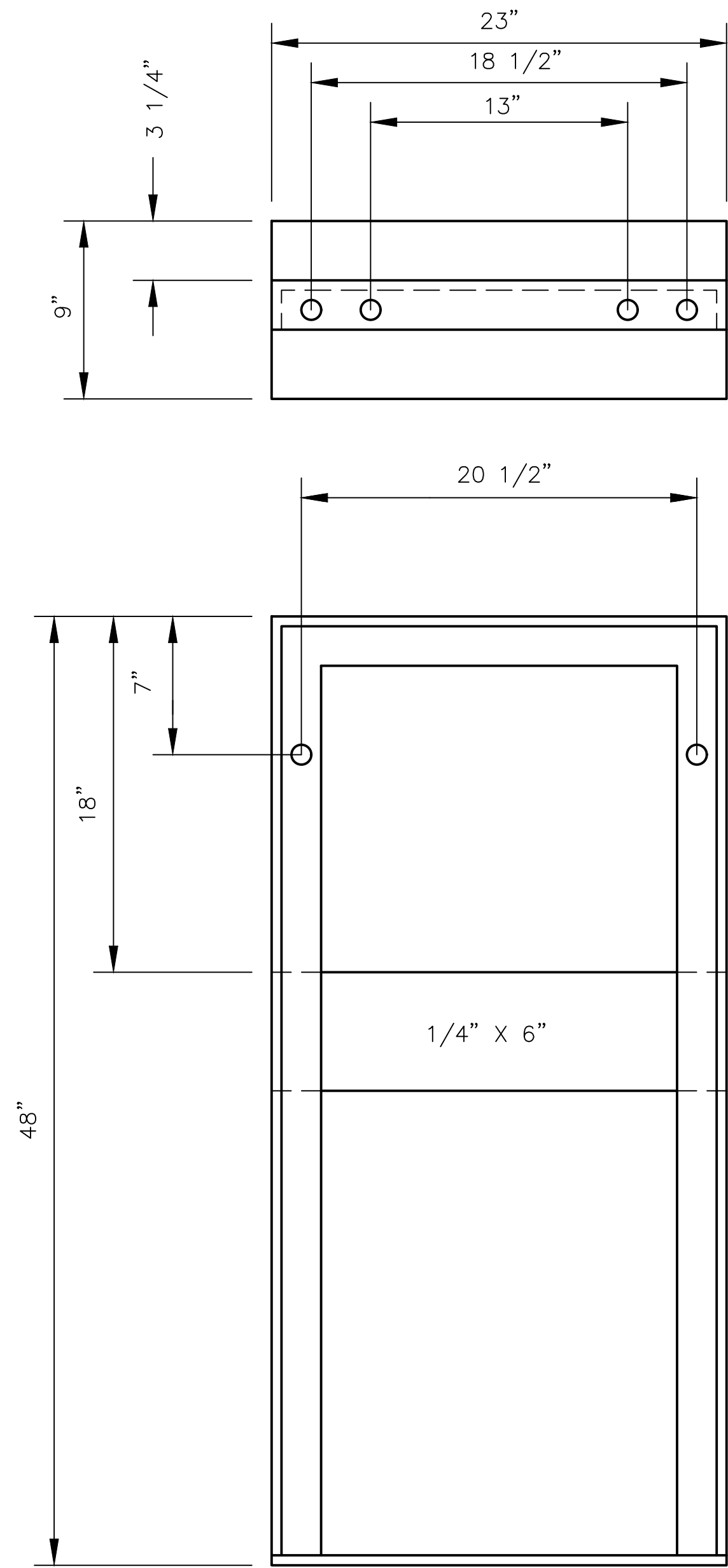


ENGINEERING STANDARD DRAWINGS

SIGNAL AND GRADE CROSSING SYSTEMS SIGNAL APPARATUS	REVISIONS NO. 1 DATE 10/1/80 BY J. L. H.
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TYPICAL BRIDGE AND CANTILEVER FOUNDATION

CADD FILE NAME:	
SD-5211	
REV:	EDITION:
	FIFTH
SCALE:	
NTS	
STANDARD DRAWING NO.:	
SD-5211	

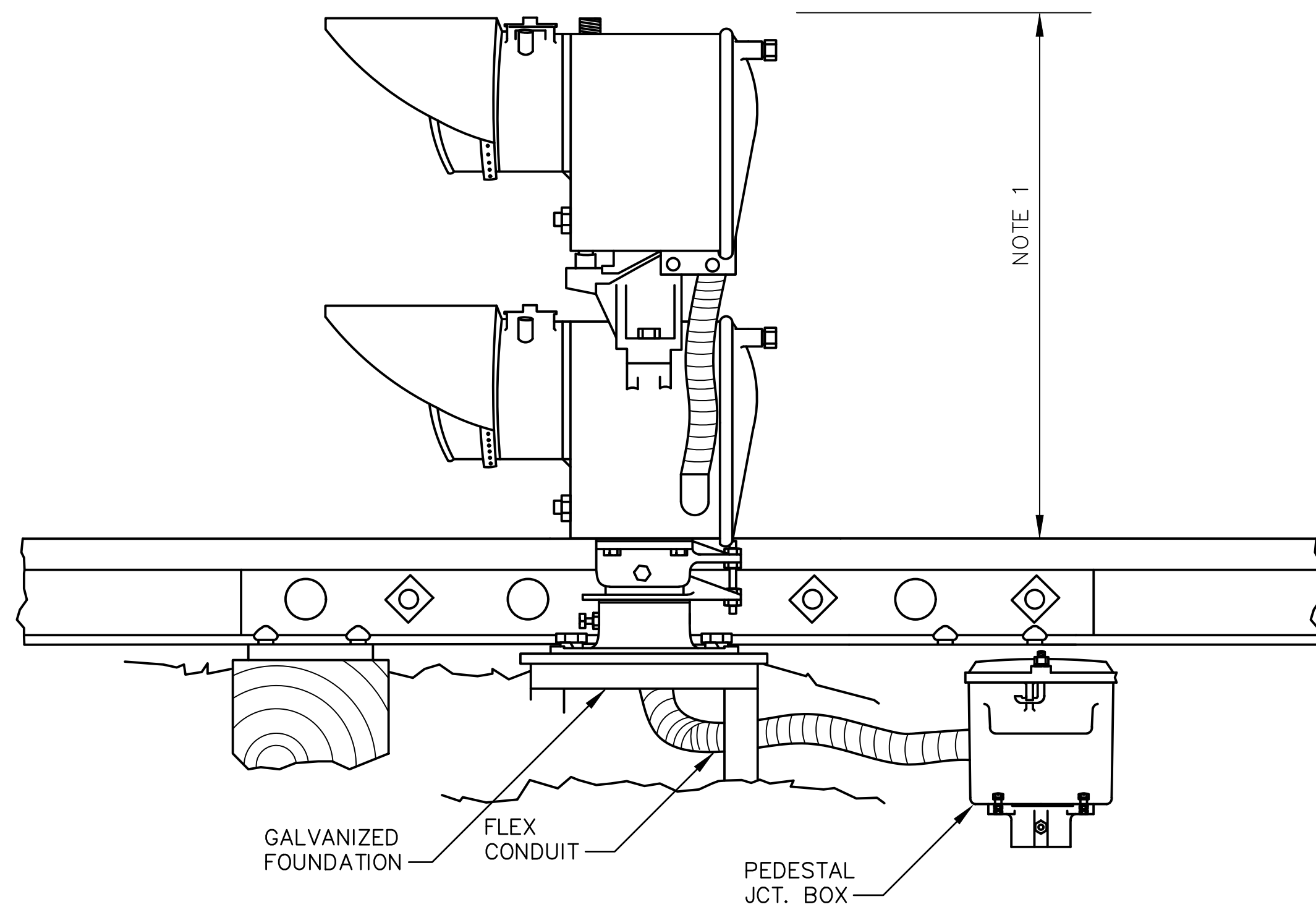


NOTES:

1. FOUNDATION SHALL BE HOT DIPPED GALVANIZED AND IN ACCORDANCE WITH ASTM SPEC A123
2. ALL ANGLE IRON SHALL BE ASTM 1020 STRUCTURAL STEEL 2 1/2" X 2 1/2" X 1/4" THICK AND ALL PLATE STEEL TO BE ASTM 1020 AND AT LEAST 1/4" THICK
3. EACH ASSEMBLY SHALL CONSIST OF 4 (FOUR) GALVANIZED 3/4" X 10" X 1 1/2" LONG HEX HEAD BOLTS, 4 HEX NUTS AND 8 PLAIN WASHERS FOR ATTACHING PIERS TO STRUTS AND CASE
4. TAMP FOUNDATION HOLE, AND PROVIDE CRUSHED ROCK PRIOR TO SETTING FOUNDATION.
5. REFER TO DRAWING SD-5217 FOR GROUNDING REQUIREMENTS AND DETAILS.

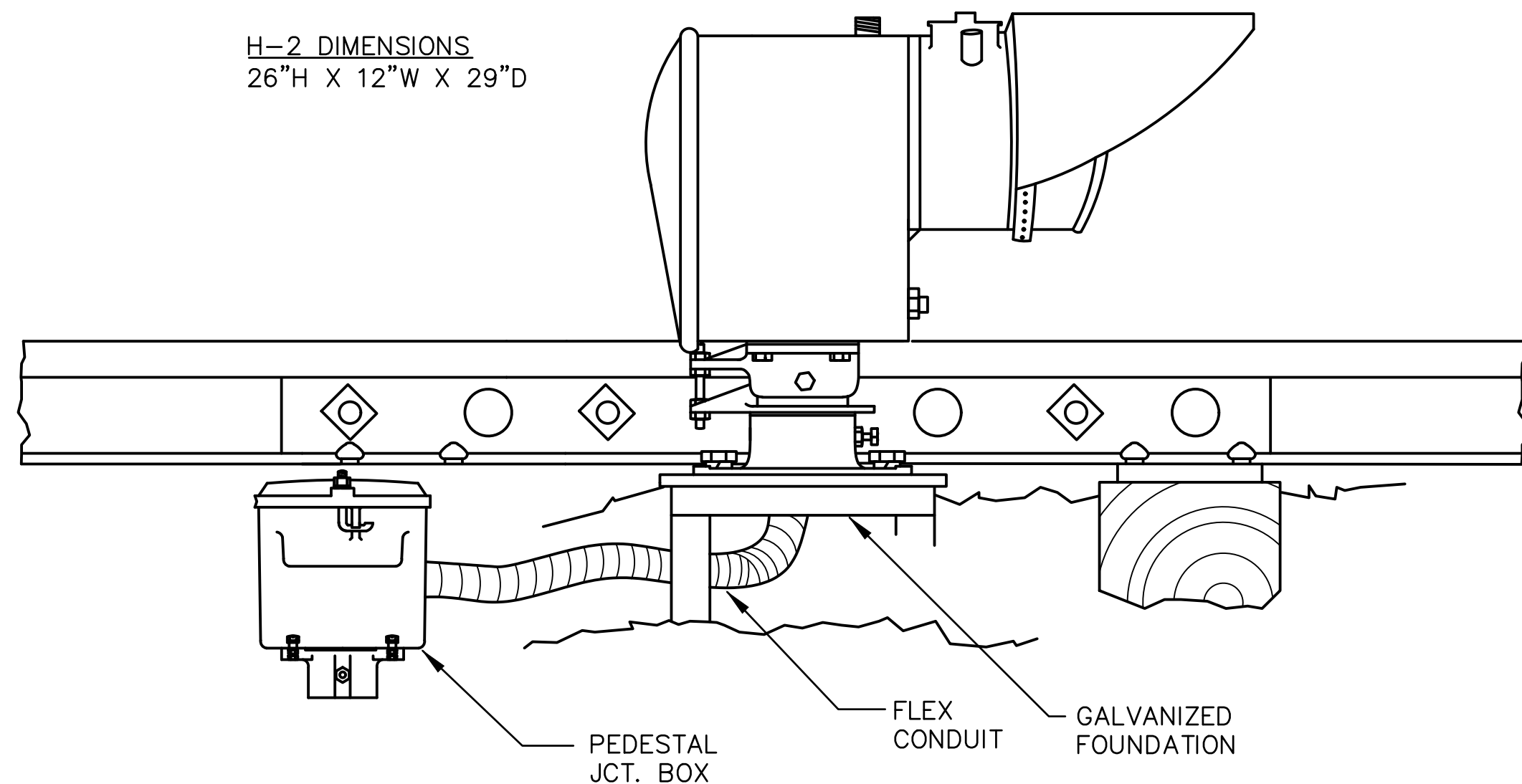
INSTALLATION SET-UP	
(B. C.) BOLT CENTERS	USE WITH CASE
18 1/2" X 34"	2' X 7"
18 1/2" X 43 3/4"	3' X 5"
18 1/2" X 61 1/4"	4' X 11"
18 1/2" X 83 1/4"	6' X 9"
18 1/2" X 118 1/4"	9' X 8"

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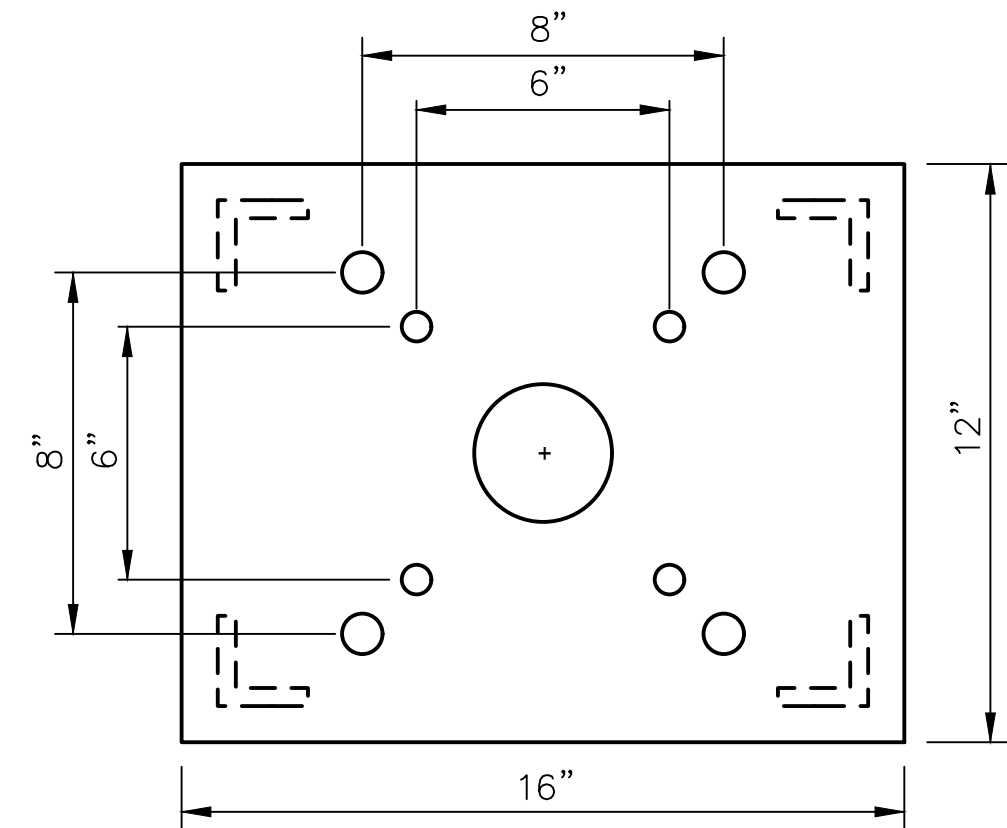
**TYPICAL DOUBLE UNIT
DWARF SIGNAL**

H-2 DIMENSIONS
26"H X 12"W X 29"D

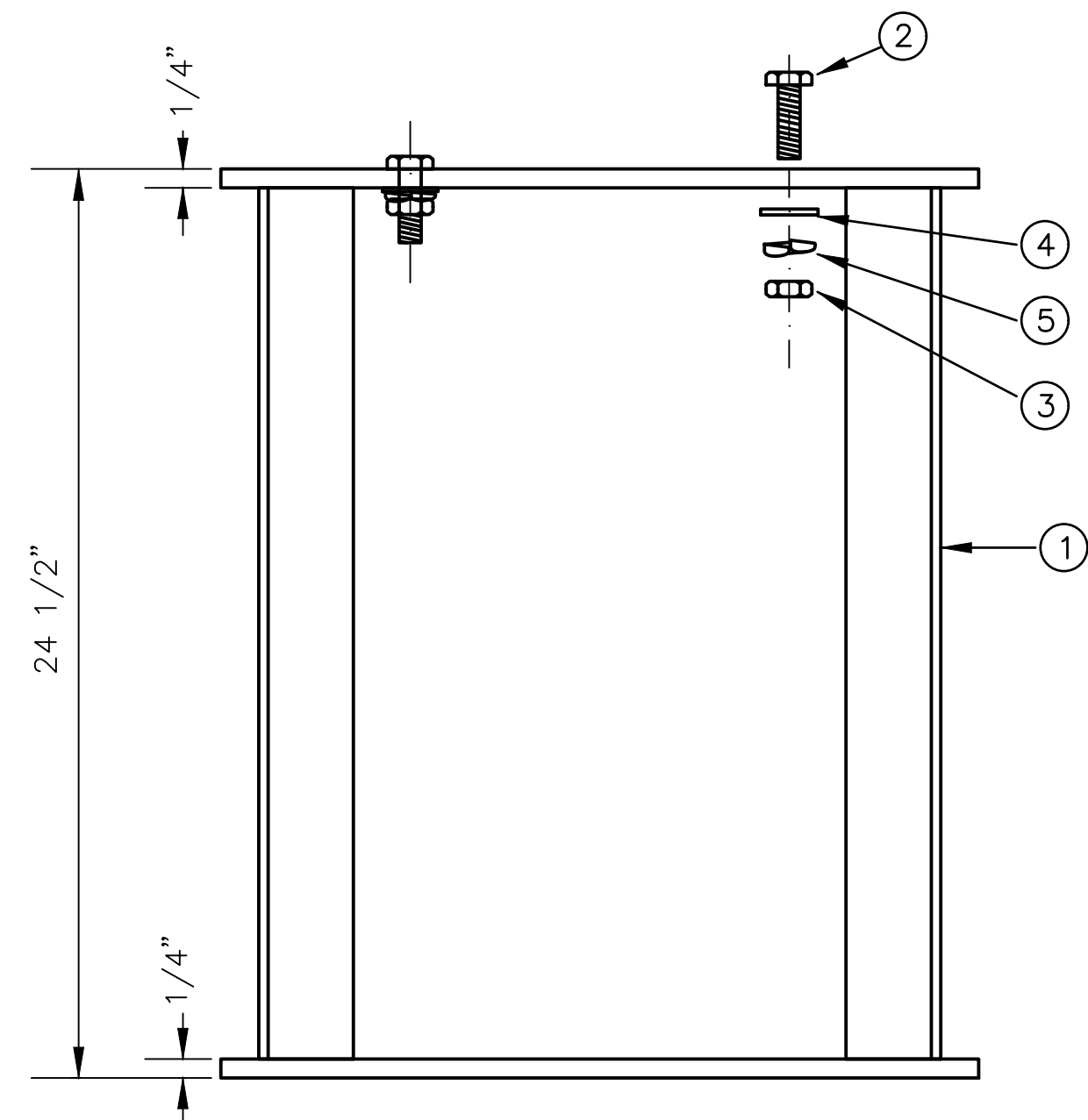


**TYPICAL SINGLE UNIT
DWARF SIGNAL**

ITEM	PART #	QTY	DESCRIPTION
1	8B20133	1	DWARF FOUNDATION WELDMENT
2	KA95491	4	3/4-10 x 2 1/2 HEX HEAD BOLT Z/Y
3	KD96182	4	3/4-10 HEX NUT Z/Y
4	KE97431	4	3/4" FLAT WASHER Z/Y
5	KF97146	4	3/4" SPLIT LOCK WASHER Z/Y

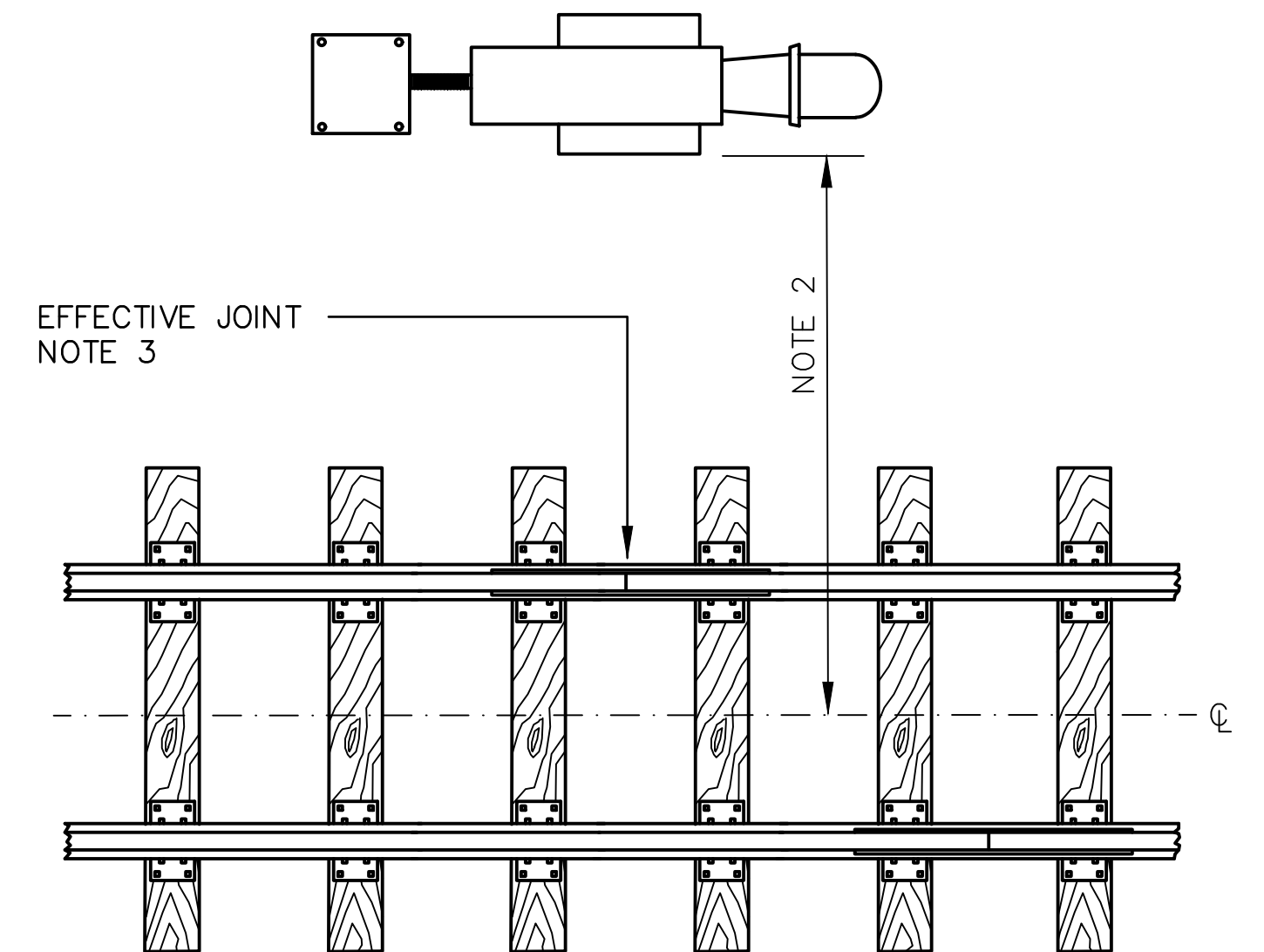


TOP VIEW

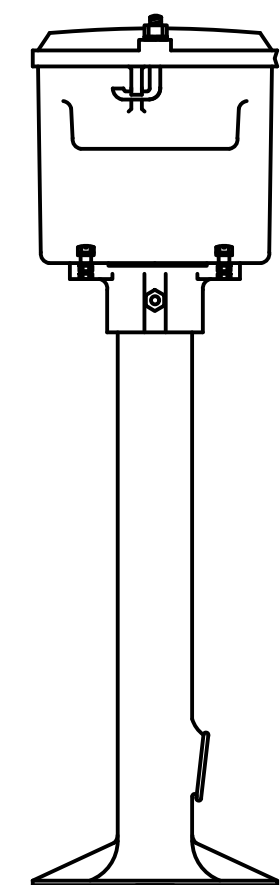


FRONT VIEW

SIGNAL FOUNDATION



**TYPICAL DWARF SIGNAL
PLACEMENT**



JUNCTION BOX PEDESTAL

NOTES:

1. THE VERTICAL HEIGHT OF A DWARF SIGNAL SHALL NOT BE GREATER THAN 34" ABOVE TOP OF ANY ADJACENT RAIL.
2. NO PORTION OF THE DWARF SIGNAL SHALL BE WITHIN 6' OF THE CENTERLINE OF ANY TRACK.
3. SIGNAL FOUNDATION SHALL BE CENTERED ON END POST OF EFFECTIVE INSULATED JOINT.
4. TOP OF JUNCTION BOX LID/COVER SHALL BE LEVEL WITH TOP OF TIE.
5. DESIGNER SHALL SPECIFY MINIMUM AND MAXIMUM ALLOWABLE DISTANCES FROM SIGNAL TO JUNCTION BOX.
6. REFER TO DRAWING SD-5217 FOR GROUNDING REQUIREMENTS AND DETAILS.

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DIRECTOR, ENGINEERING



ENGINEERING STANDARD DRAWINGS

**SIGNAL AND GRADE CROSSING SYSTEMS
SIGNAL APPARATUS**

**H-2 DWARF SIGNAL
PLACEMENT AND FOUNDATION**

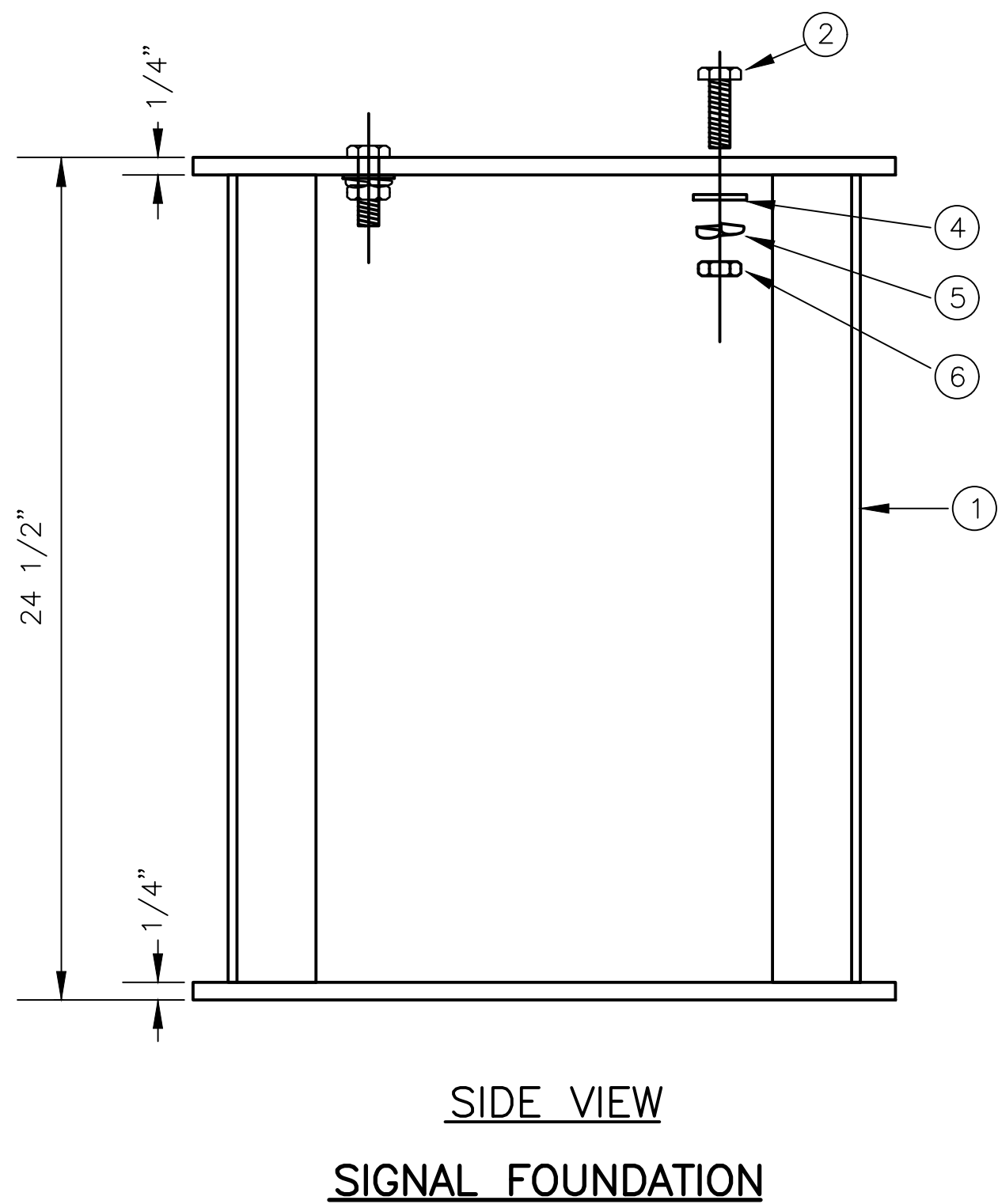
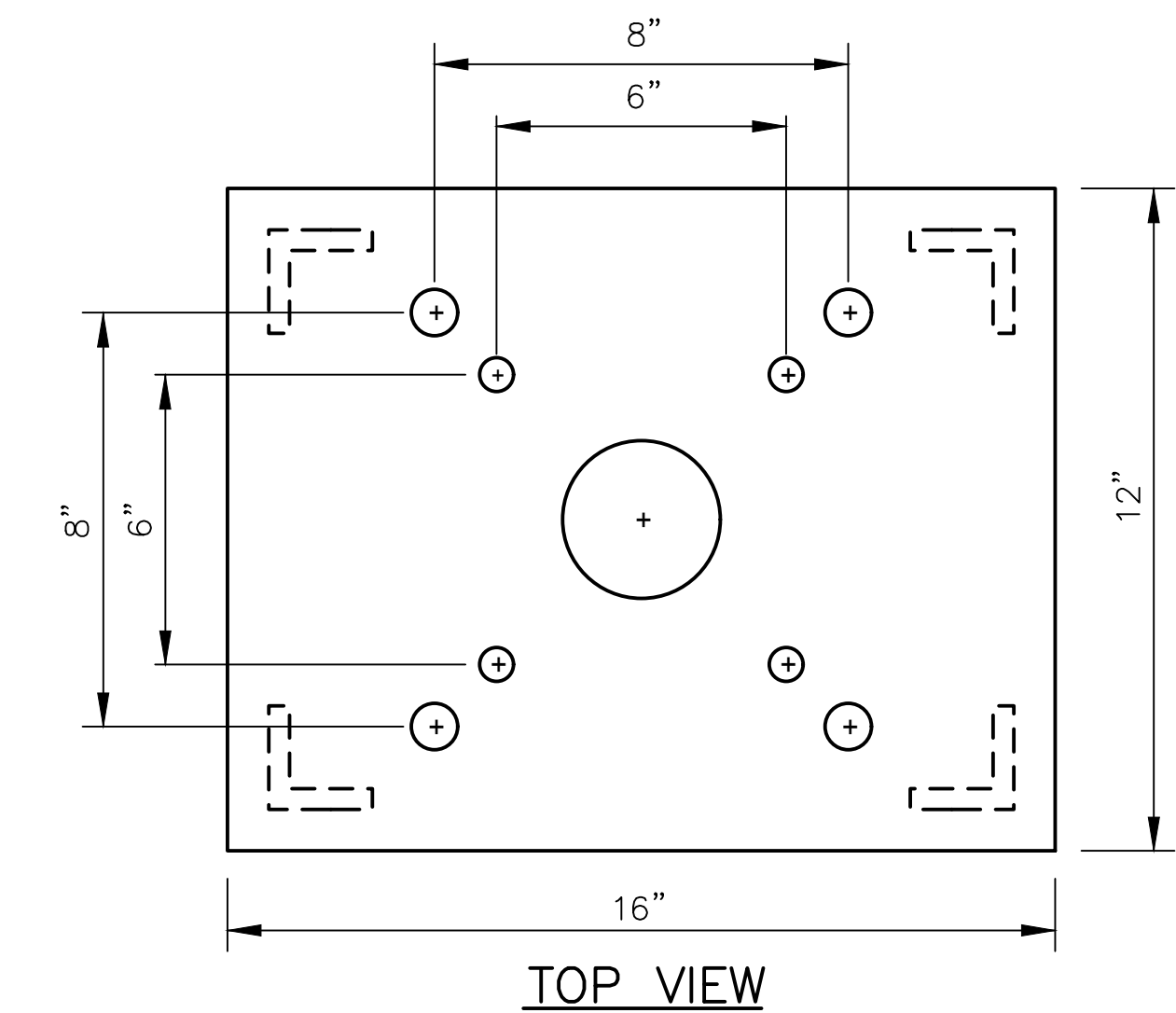
CADD FILE NAME:
SD-5213

REV: EDITION:
FIFTH

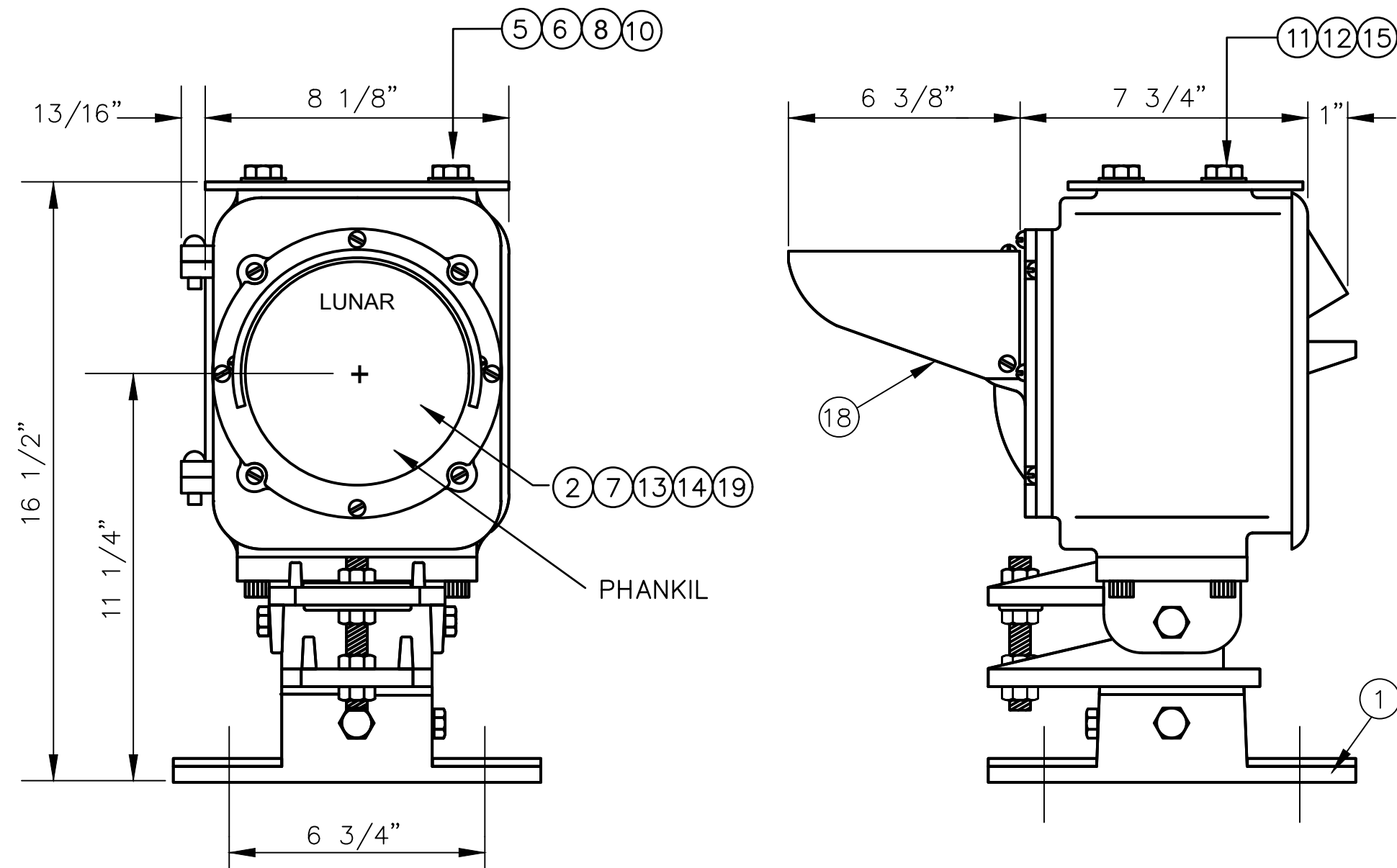
SCALE:
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STANDARD DRAWING NO.:
SD-5213

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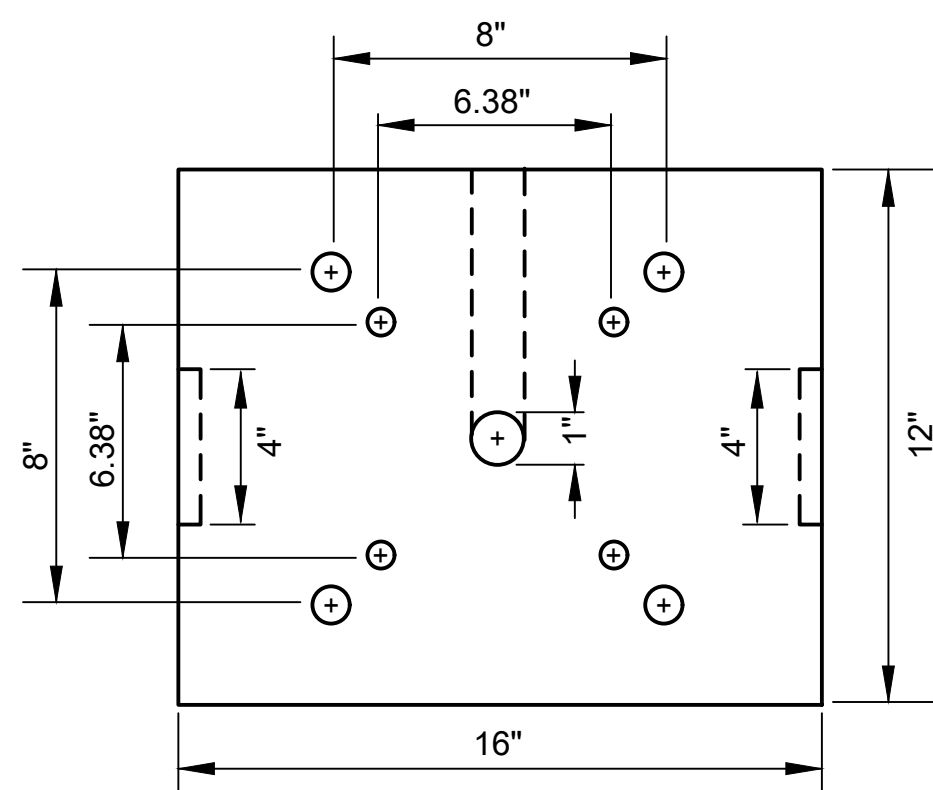
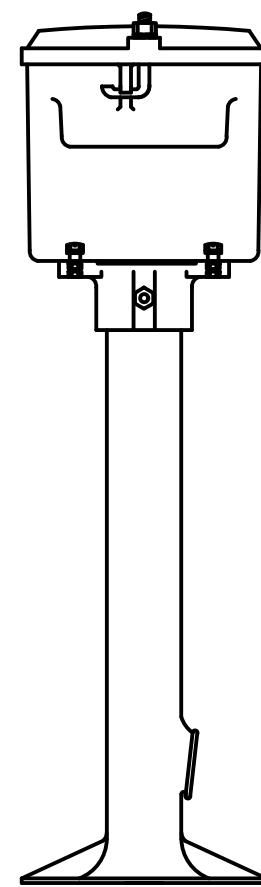


ITEM	PART #	QTY	DESCRIPTION
1	8B20133	1	DWARF FOUNDATION WELDMENT
2	KA95491	4	3/4-10 x 2 1/2 HEX HEAD BOLT Z/Y
3	KD96182	4	3/4-10 HEX NUT Z/Y
4	KE97431	4	3/4" FLAT WASHER Z/Y
5	KF97146	4	3/4" SPLIT LOCK WASHER Z/Y

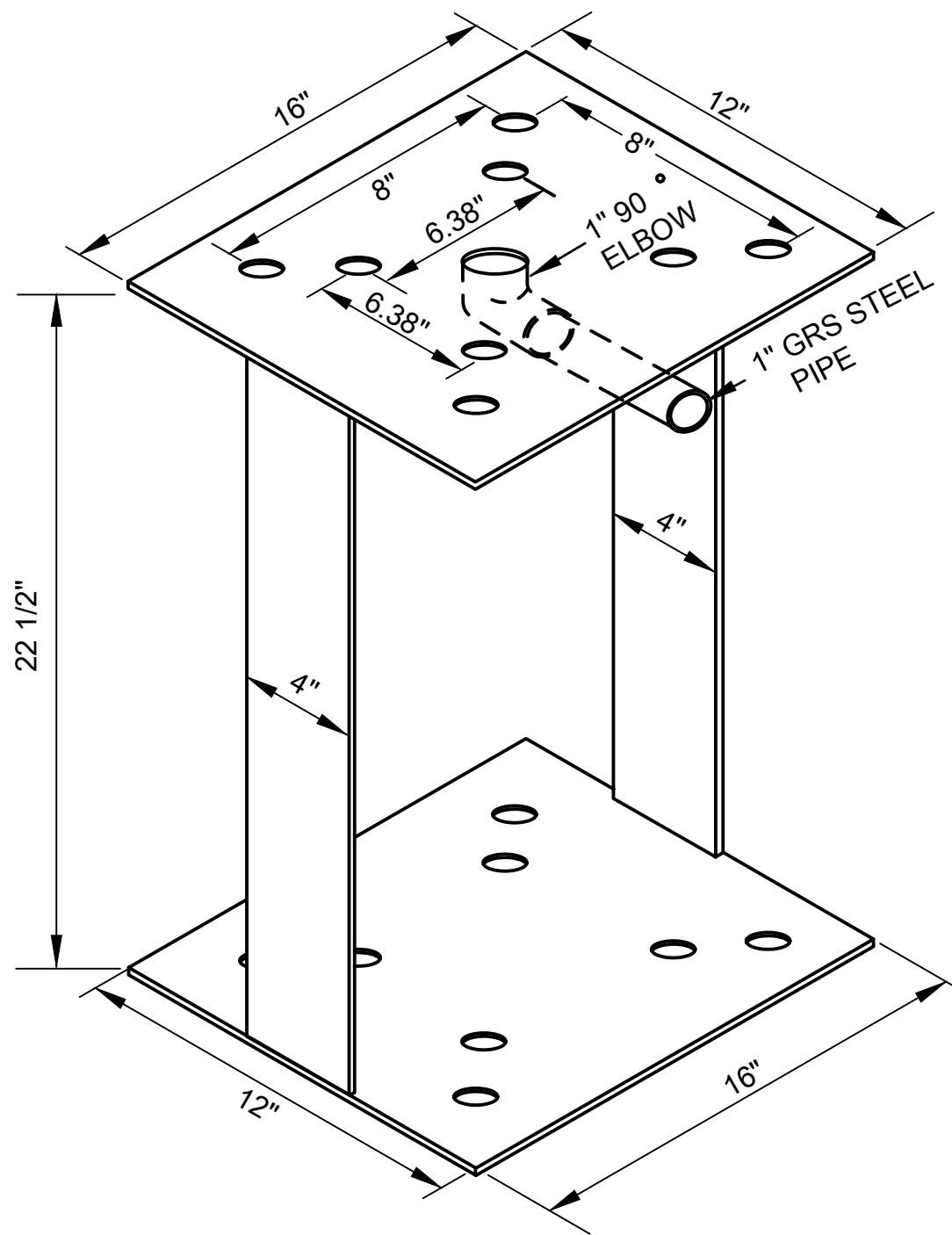


SIEMENS CLS-10D DWARF SIGNAL
OR EQUIVALENT

JUNCTION BOX PEDESTAL

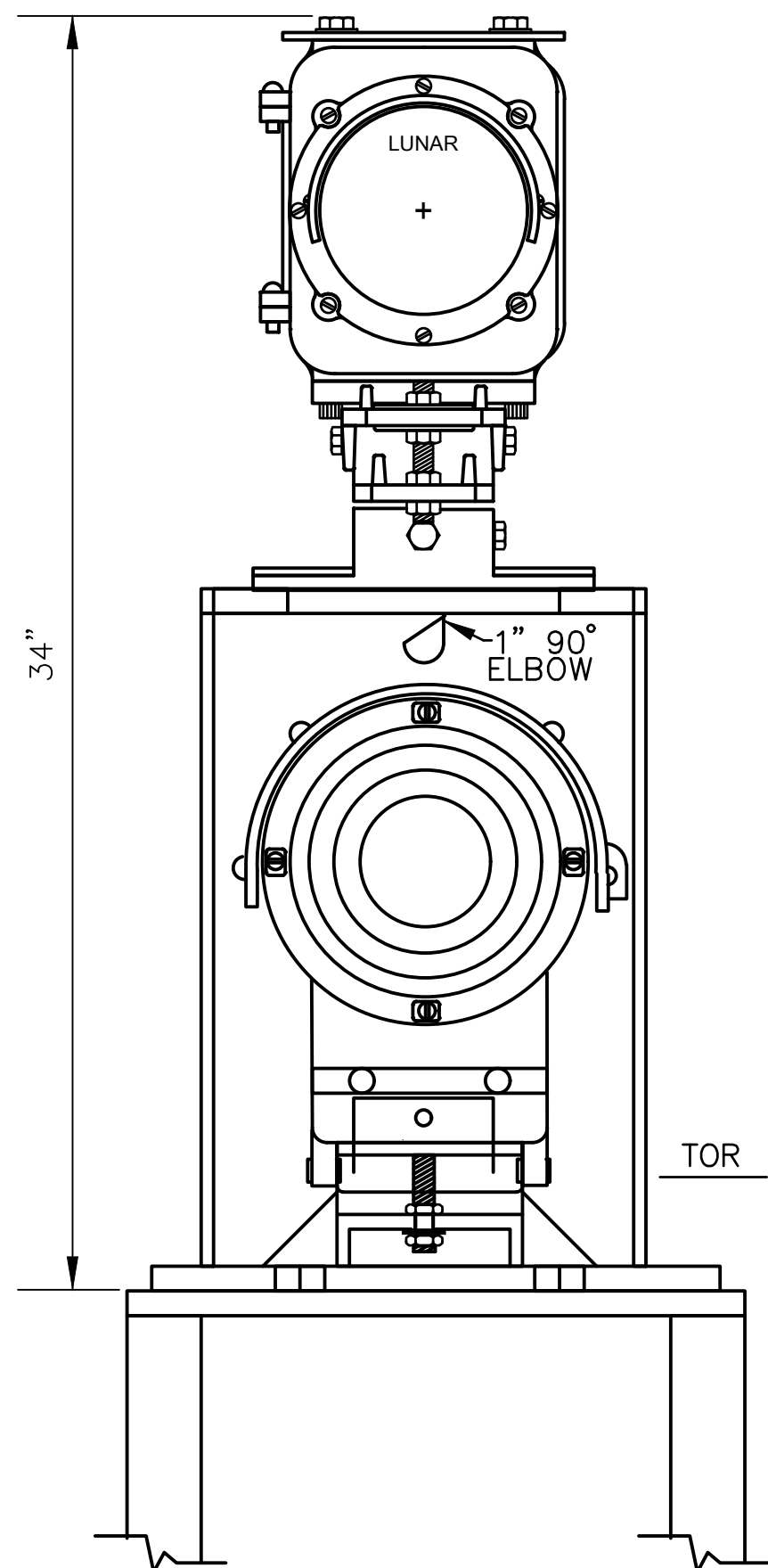


TOP & BOTTOM VIEW

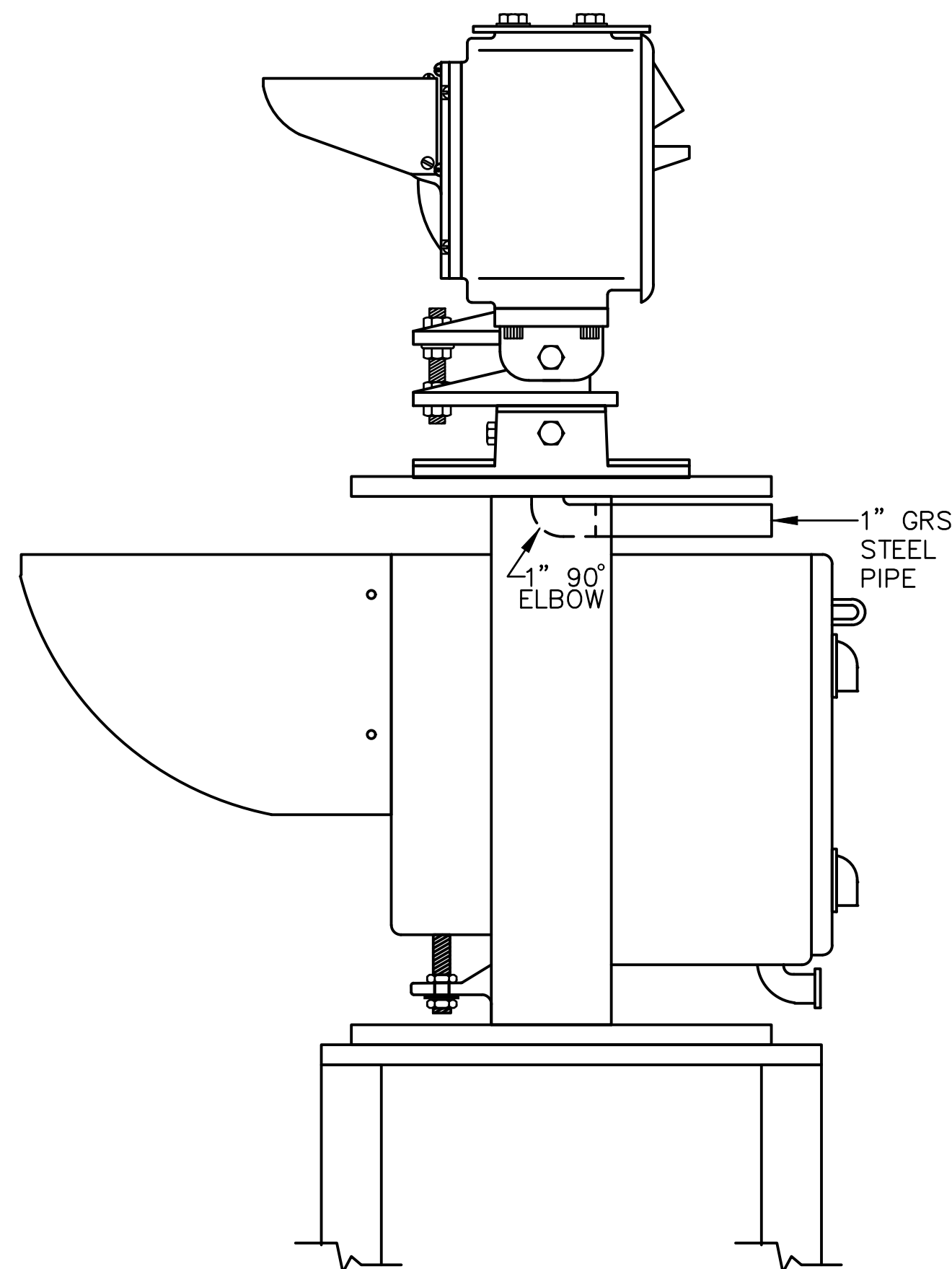


ISOMETRIC VIEW

CLS-10D SIGNAL BRACKET
OR EQUIVALENT



FRONT VIEW



SIDE VIEW

SIEMENS CLS-10D DWARF SIGNAL

ITEM NO:	COMPONENT	DESCRIPTION	USAGE
1	042275-1X	BASE ASSY, DWARF	1
2	042609-X	HEAD CLS-10D 12VDC	1
5	042255-2	CAP, HOUSING	1
6	042268-3	GASKET	2
7	042365-3	BULB, 10V-25W	1
8	042268-2	WASHER 1/2-13	4
10	2108-SC	N HX 1/2-13	4
11	1812-MS	W LKS M 1/2	8
12	1730-SC	W FA 1/2 X 1-1/16	4
13	044075-	LENS 6-3/8 CLEAR	1
14	042257-4L	LENS 6-3/8 LUNAR	1
15	4169-SSC	CS SH 1/2-13 X 1.75	4
18	042005-X1	VISOR, STEEL 6-3/8	1
19		PHANKIL	

- NOTES:
1. THE VERTICAL HEIGHT OF SIGNAL MARKER LIGHT SHALL NOT BE GREATER THAN 34 INCHES ABOVE TOP OF RAIL.
 2. THE VERTICAL HEIGHT OF A DWARF SIGNAL SHALL NOT BE GREATER THAN 34" ABOVE TOP OF ANY ADJACENT RAIL.
 3. REFER TO DRAWING SD-5217 FOR GROUNDING REQUIREMENTS AND DETAILS.

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DIRECTOR, ENGINEERING



ENGINEERING STANDARD DRAWINGS

SIGNAL AND GRADE CROSSING SYSTEMS
SIGNAL APPARATUS

TYPICAL DWARF SIGNAL
SIGNAL MARKER LIGHT

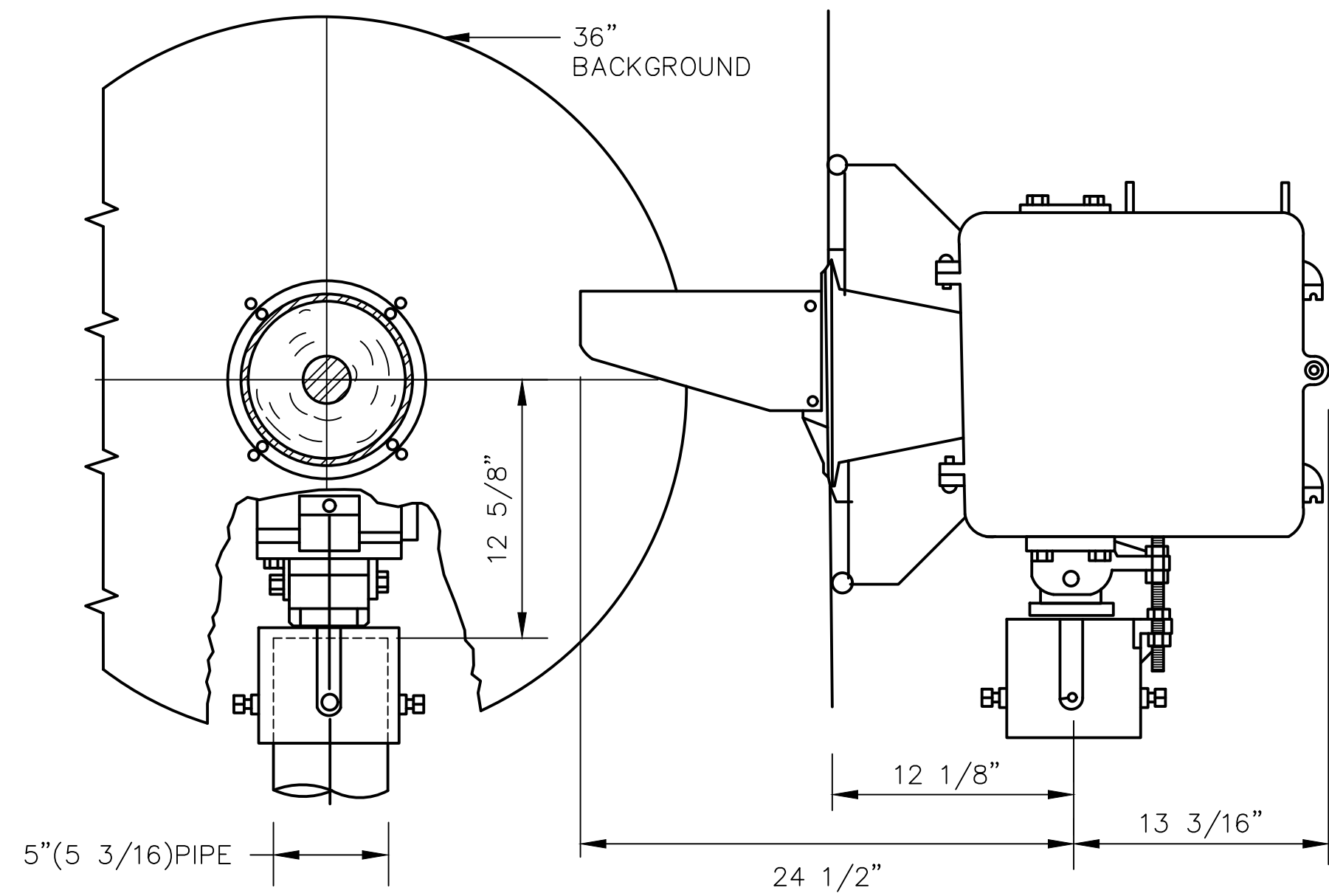
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SD-5214

REV: EDITION:
FIFTH

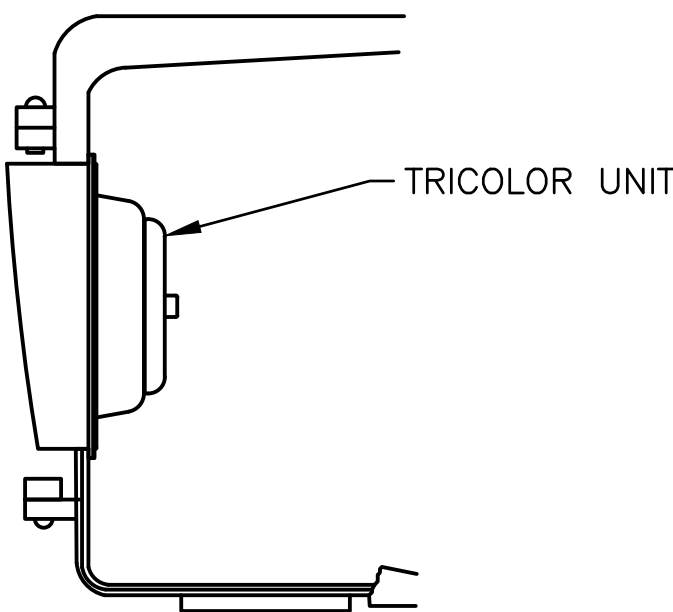
SCALE:
NTS

STANDARD DRAWING NO.:
SD-5214

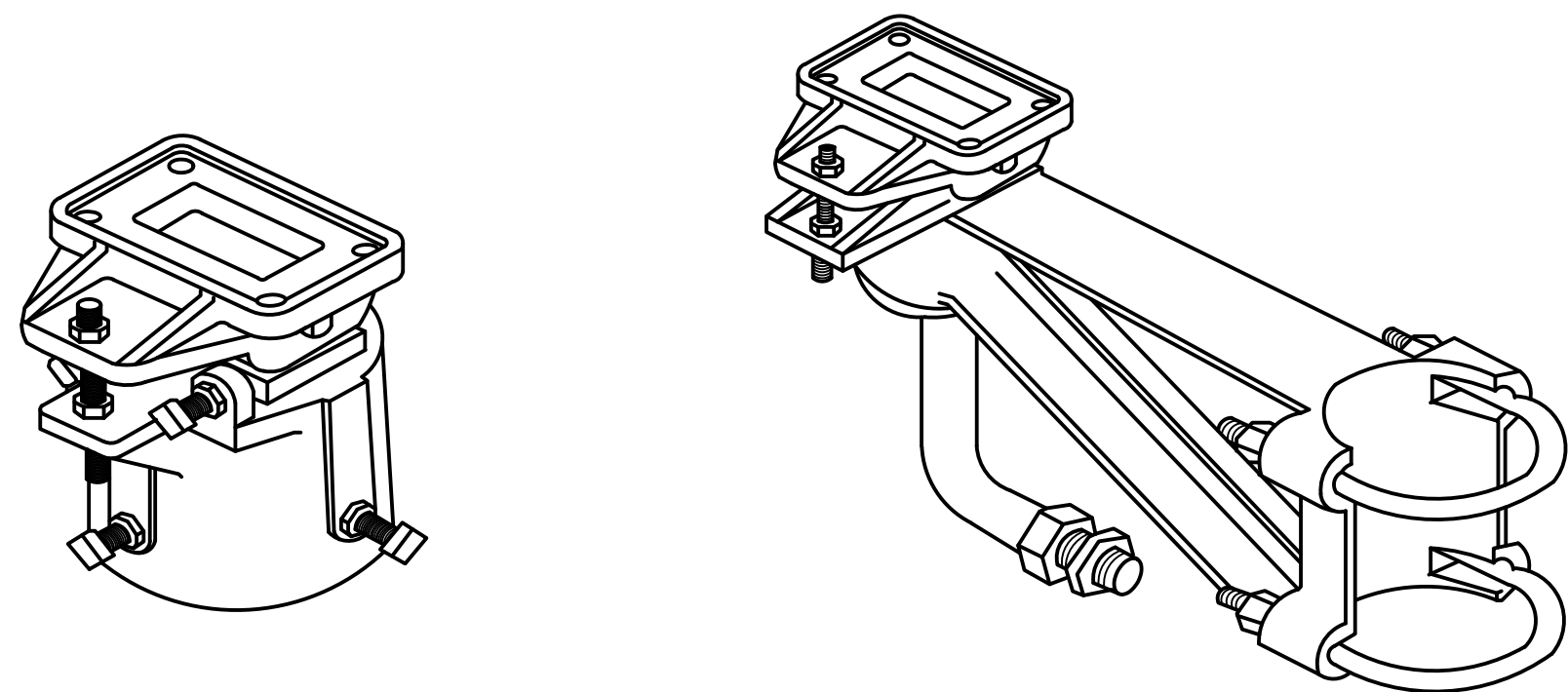
REV	DATE	BY	CHK	APP	DESCRIPTION
010126					FIFTH EDITION



TOP OF MAST MOUNTED

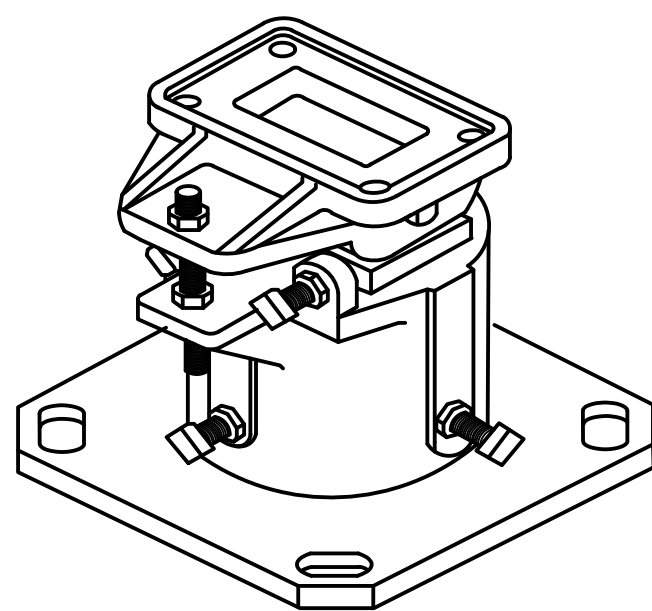


LENSES

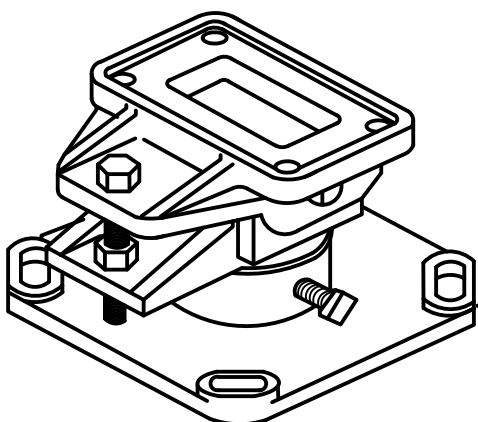


TOP OF MAST MOUNTING

SIDE OR FRONT OF MAST MOUNTING

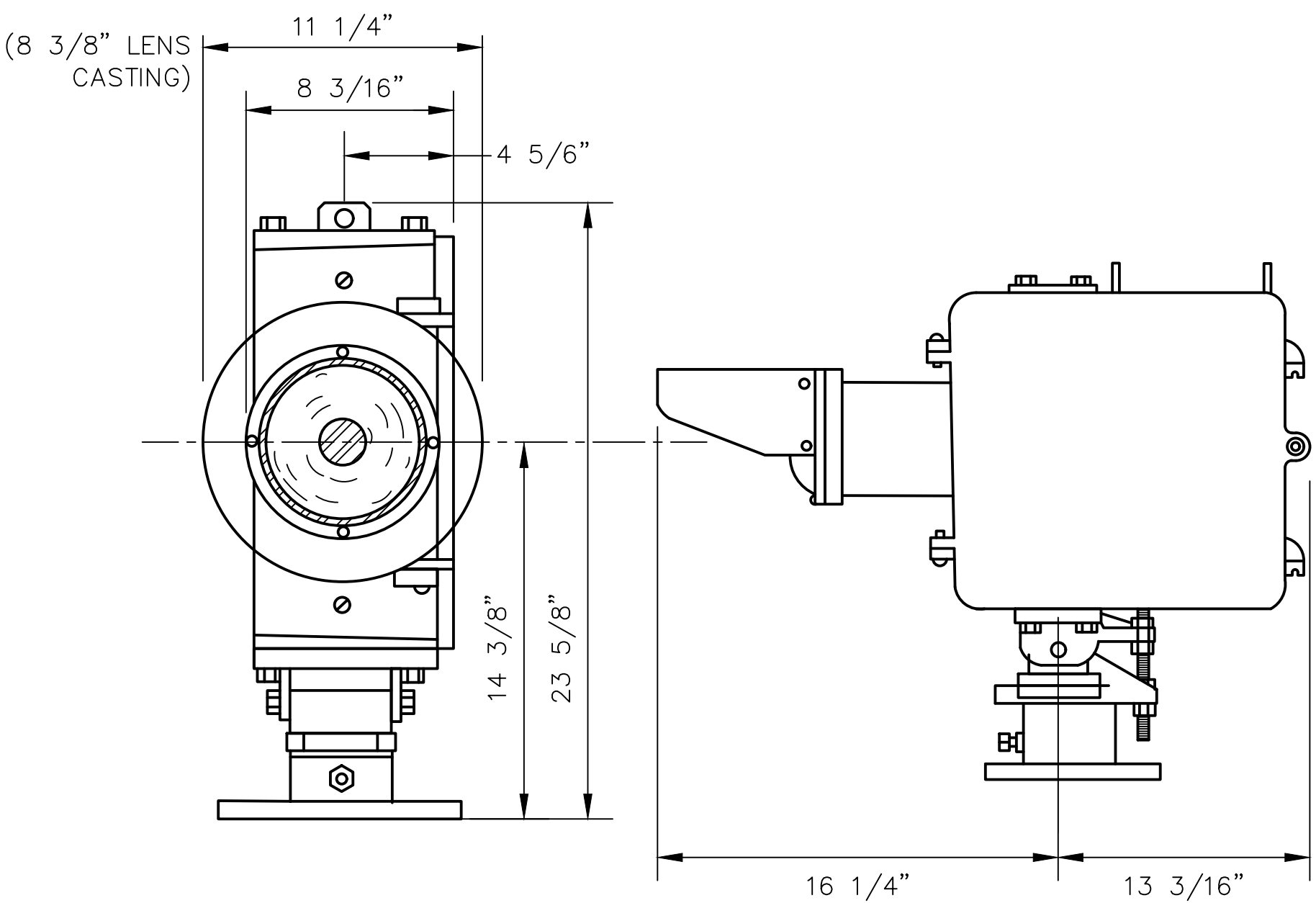


MOUNTING BASE
8" X 8" BOLT SPACING



MOUNTING BASE
6-3/4" X 6-3/4" BOLT SPACING

MOUNTING BRACKETS



DWARF BASE MOUNTED
OUTER DIMENSIONS

- NOTES:
1. LOOSEN LIGHT GUIDE HOLDING SCREW A AND THE FOUR PANEL SCREWS B.
 2. SET DISTANCE "X" FROM THE END OF THE LIGHT GUIDE TO FACE OF LENS CASTING PER TABLE BY SLIDING THE PANEL FORWARD OR BACK AS REQUIRED.
 3. CHECK LIGHT INDICATION AND ADJUST FOCAL LENGTH SETTING FOR OPTIMUM COLLIMATED BEAM INDICATION.
 4. TIGHTEN SCREWS A AND B.
 5. UNI-LENS SHOWN. TRICOLOR LED LAMP UNITS, HOWEVER, SHALL BE INSTALLED, IF THEY FIT INTO THE SIGNALS.

										PENINSULA CORRIDOR JOINT POWERS BOARD		ENGINEERING STANDARD DRAWINGS		CADD FILE NAME: SD-5215	
										APPROVED BY: <i>Bin Zhang</i>		SIGNAL AND GRADE CROSSING SYSTEMS SIGNAL APPARATUS		REV:	EDITION: FIFTH
										DIRECTOR, ENGINEERING		Caltrain		SCALE:	NTS
												TYPICAL DWARF SIGNAL LENSES		STANDARD DRAWING NO.: SD-5215	
010126				FIFTH EDITION	REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP

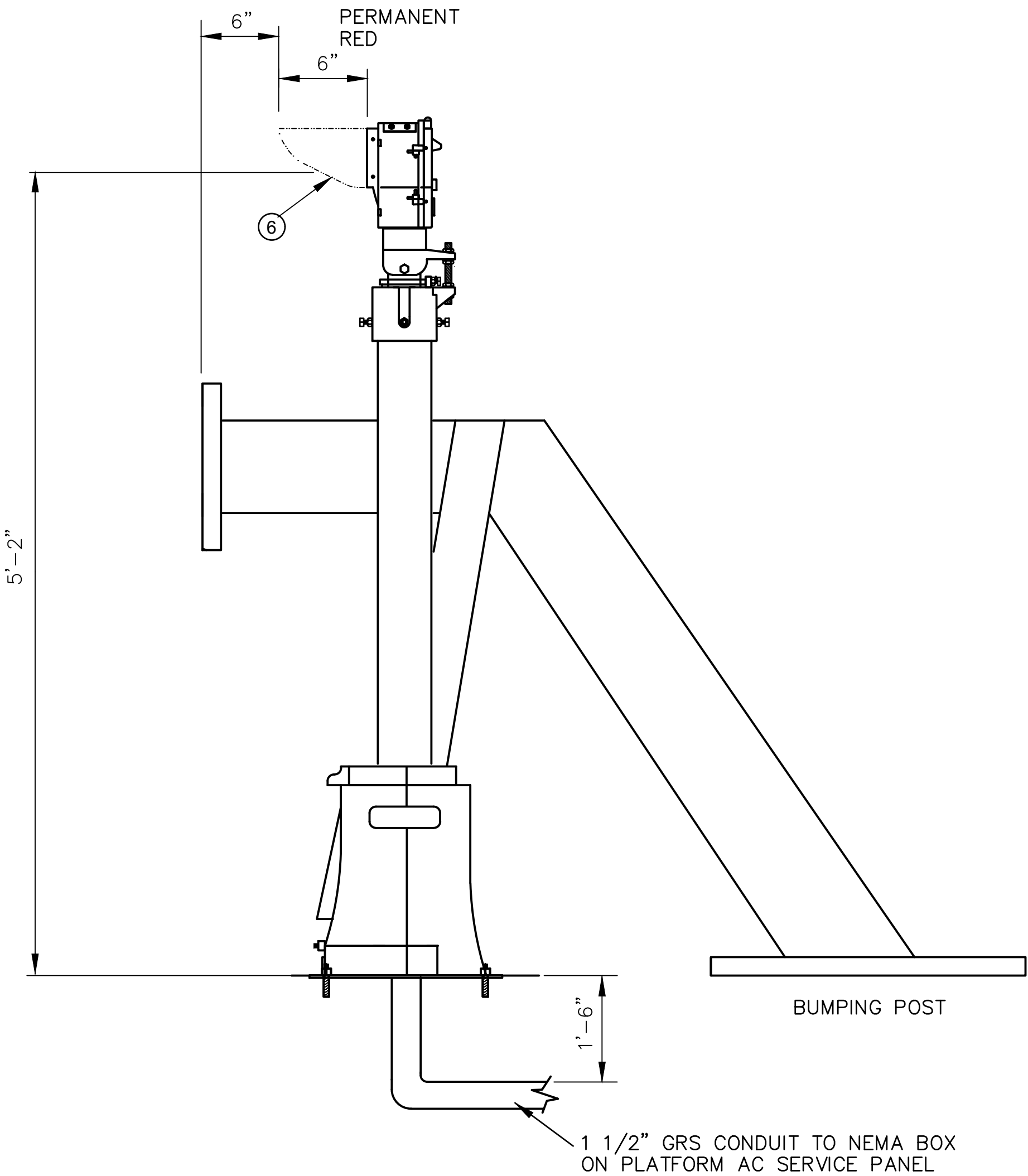
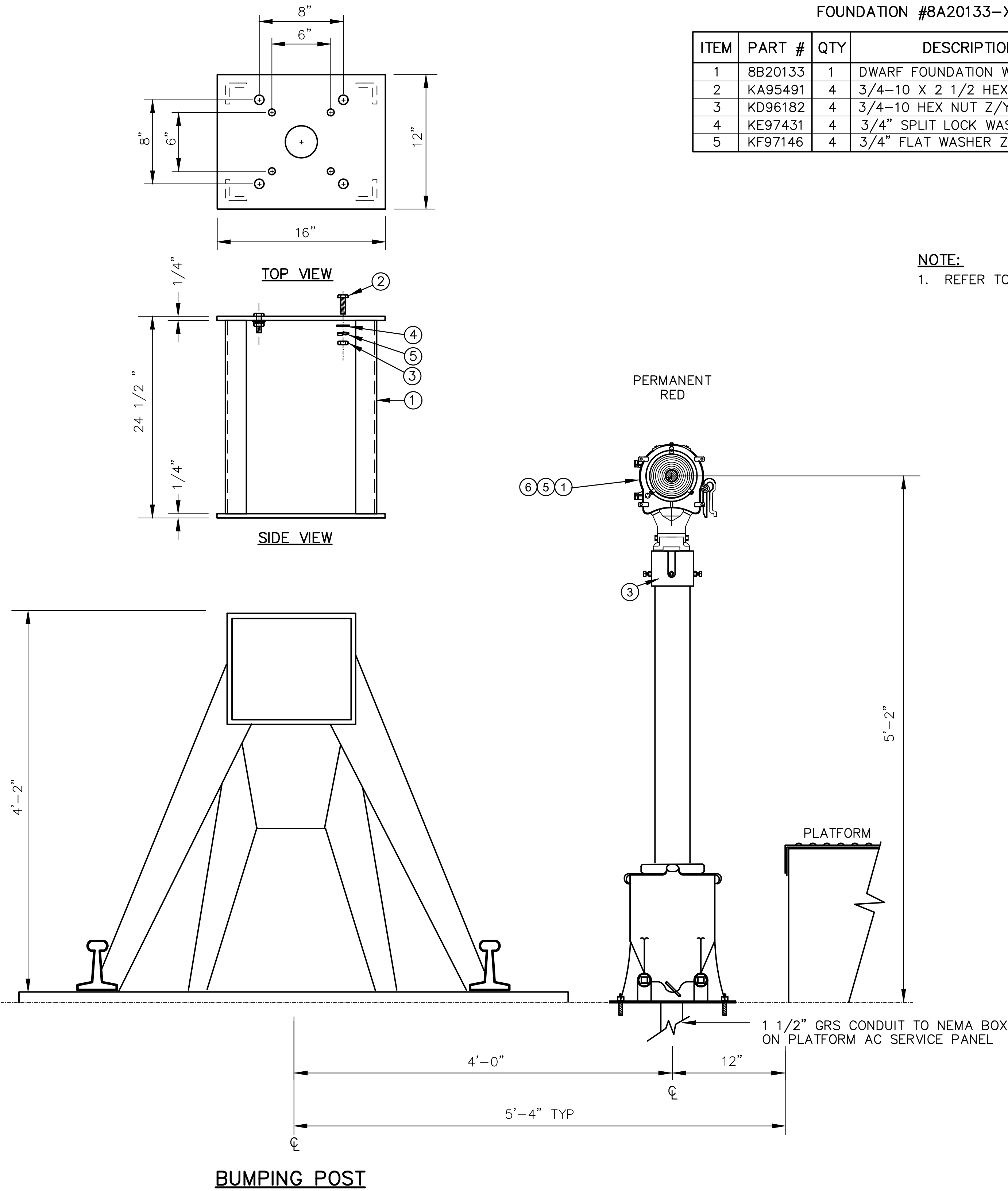
L&W INDUSTRIES DWARF SIGNAL OR EQUIVALENT
FOUNDATION #8A20133-X

ITEM	PART #	QTY	DESCRIPTION
1	8B20133	1	DWARF FOUNDATION WELDMENT
2	KA95491	4	3/4-10 X 2 1/2 HEX HEAD BOLT Z/Y
3	KD96182	4	3/4-10 HEX NUT Z/Y
4	KE97431	4	3/4" SPLIT LOCK WASHER Z/Y
5	KF97146	4	3/4" FLAT WASHER Z/Y

SIEMENS CLS20R COLOR
LIGHT OR EQUIVALENT SIGNAL HEAD

ITEM	QTY.	U.O.M	PART #	DESCRIPTION	* NOT SHOWN
1	1	EA.	EM-3411-CR	COLOR LIGHT SINGLE HEAD RED	
2	1	EA.	EM-3411-CL	COLOR LIGHT SINGLE HEAD LUNAR	*
3	1	EA.	044011-4X	TOP OF 5" MAST MOUNTING BRACKET	
4	1	EA.	044027-2X	DWARF BASE 8"x8" BOLT SPACING	*
5	1	EA.	042365-3	LAMP 10 VOLT 25 WATT	
6	1	EA.	042005-X1	VISOR STEEL WITH MOUNTING HARDWARE	
7	1	EA.	035800-900X	SIGNAL FOUNDATION STEEL	*

NOTE:
1. REFER TO DRAWING SD-5217 FOR GROUNDING REQUIREMENTS AND DETAILS.

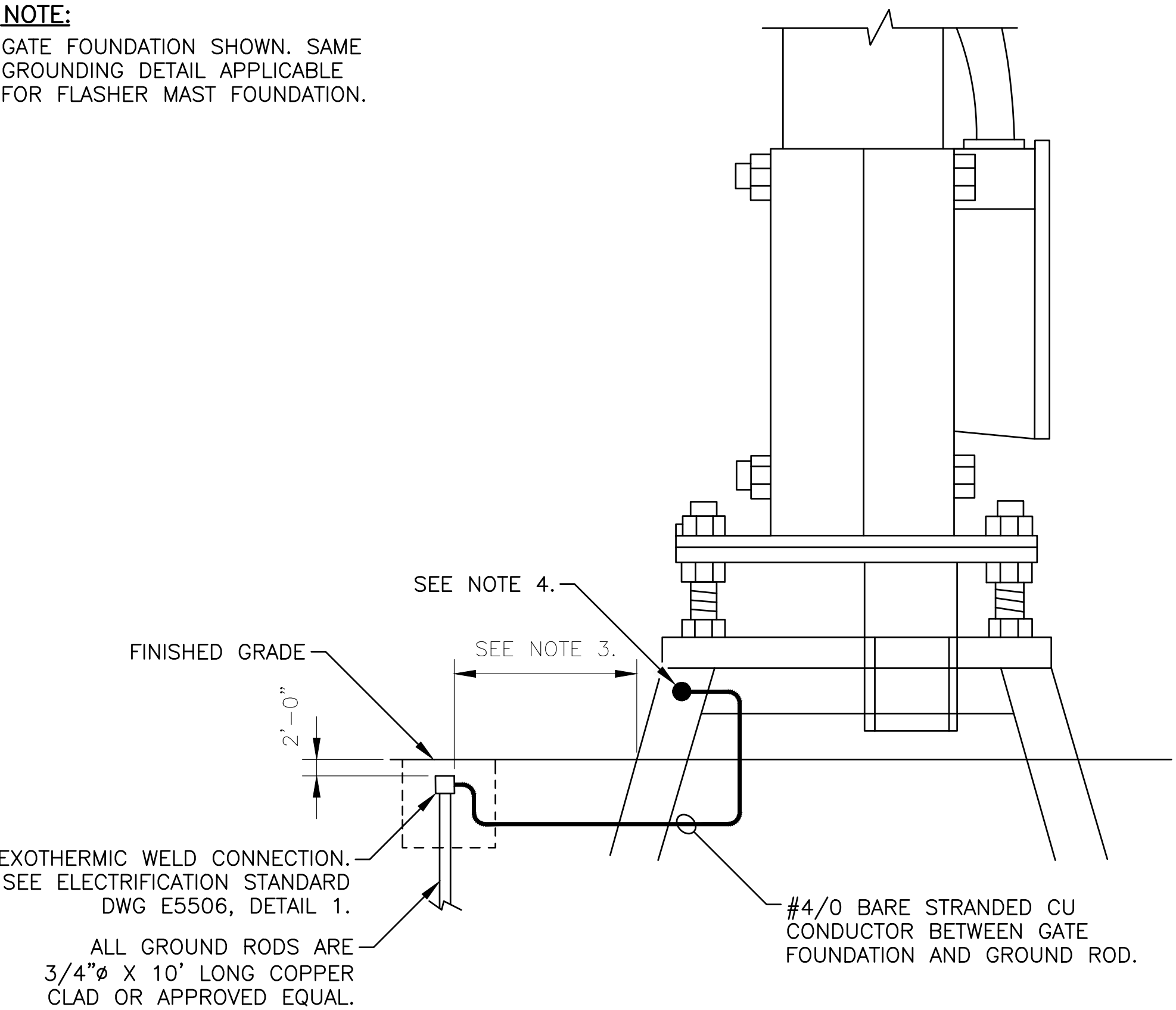


SIEMENS CLS20R SIGNAL OR EQUIVALENT
ONE ASPECT (RED) WITH TOP OF MAST MOUNTING BRACKET

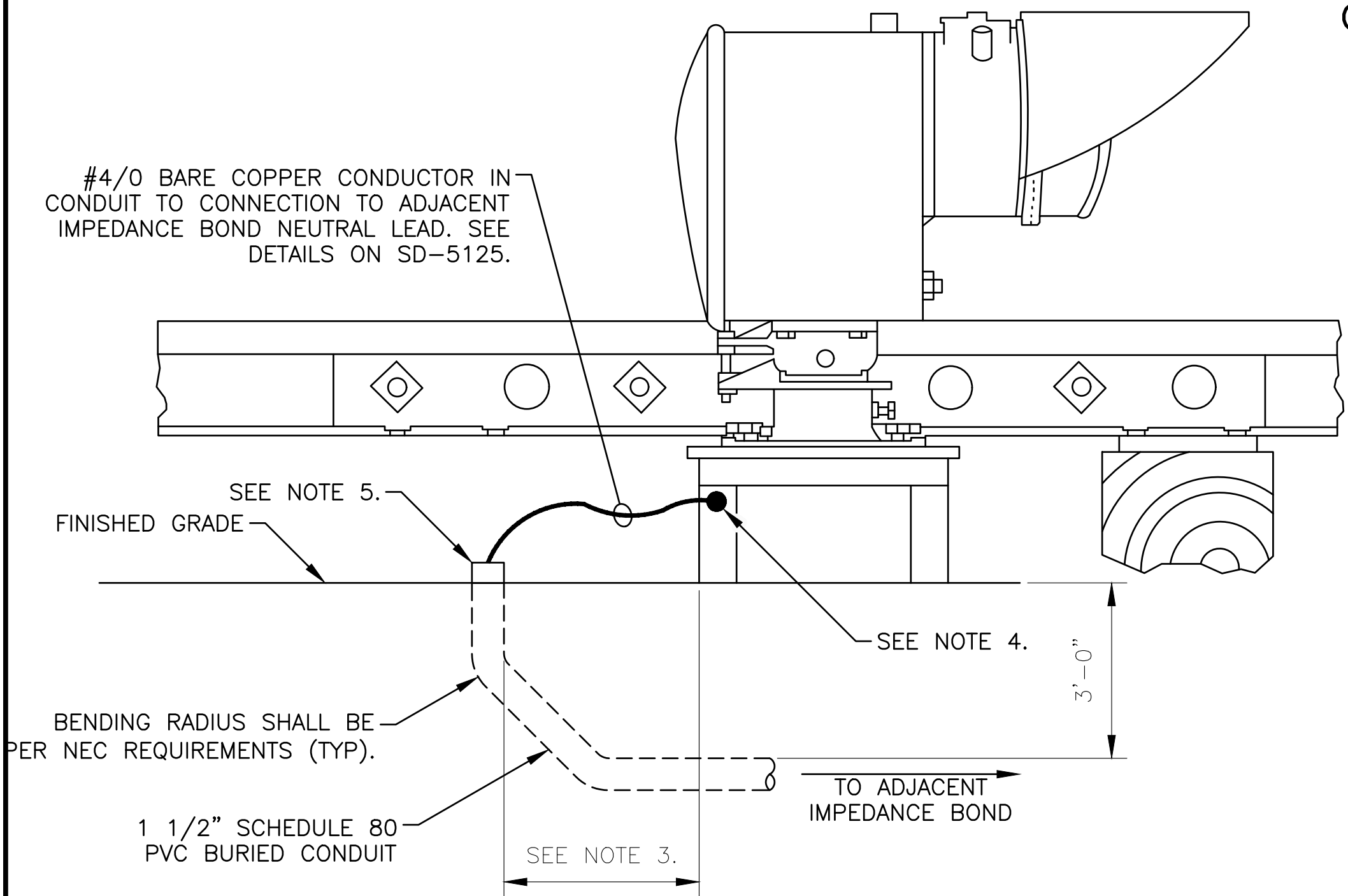
										PENINSULA CORRIDOR JOINT POWERS BOARD		ENGINEERING STANDARD DRAWINGS		CADD FILE NAME: SD-5216	
										APPROVED BY: <i>Bin Zhang</i>		SIGNAL AND GRADE CROSSING SYSTEMS SIGNAL APPARATUS		REV:	EDITION: FIFTH
										DIRECTOR, ENGINEERING		TYPICAL SIGNAL LAYOUT, PERMANENT RED END OF PLATFORM LIGHTS		SCALE:	NTS
														STANDARD DRAWING NO.: SD-5216	
010126				FIFTH EDITION	REV	DATE	BY	CHK	APP						
REV	DATE	BY	CHK	APP											

NOTE:

GATE FOUNDATION SHOWN. SAME
GROUNDING DETAIL APPLICABLE
FOR FLASHER MAST FOUNDATION.



GATE OR FLASHER MAST FOUNDATION
DETAIL
SCALE: NOT TO SCALE



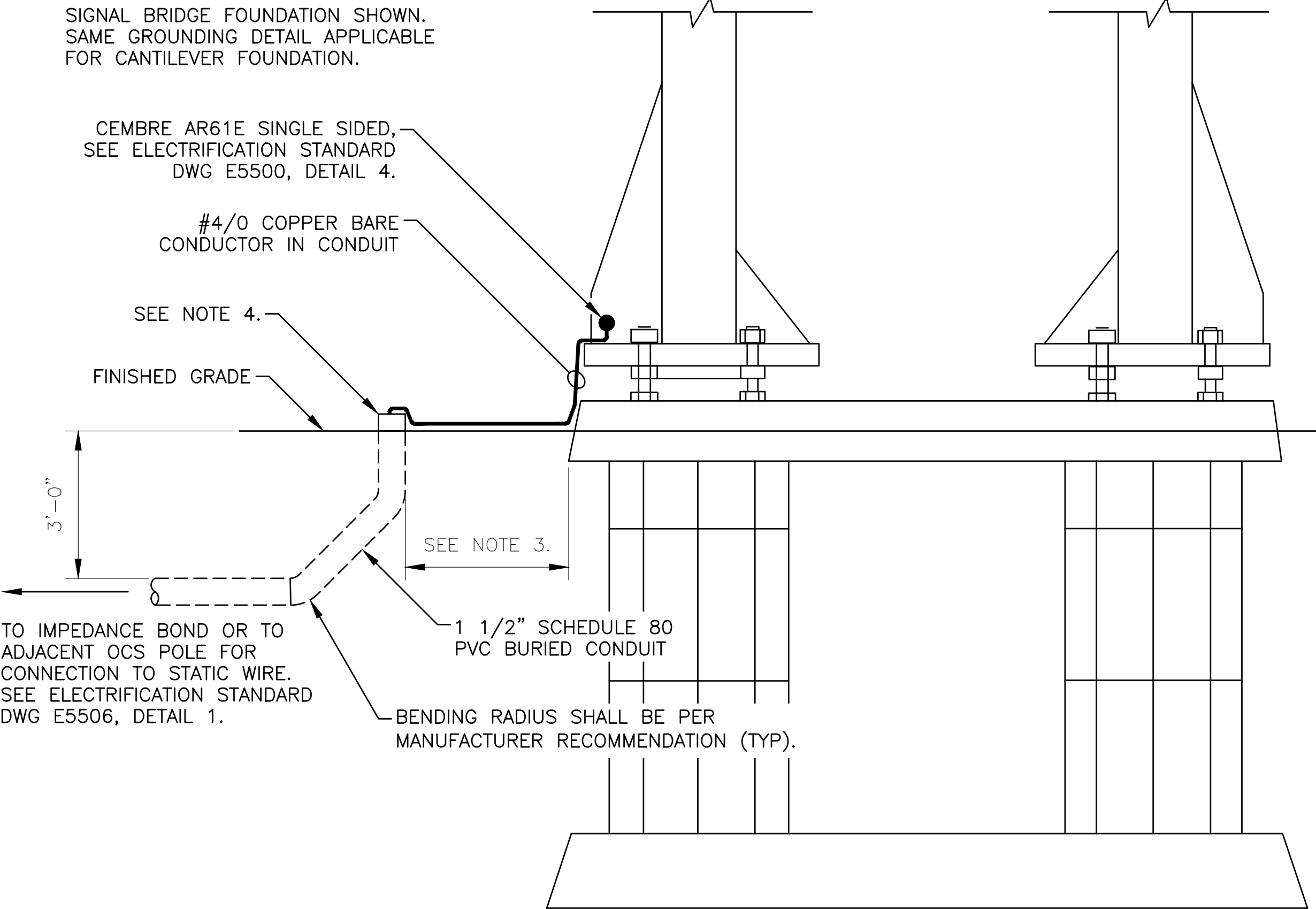
TYPICAL SINGLE UNIT DWARF SIGNAL
DETAIL
SCALE: NOT TO SCALE

NOTES:

1. DRESS ALL GROUNDING CONDUCTORS AGAINST THE STRUCTURES WITH WIRE TIES SUITABLE FOR OUTDOOR USE.
2. ACTUAL GROUND RODS MAY BE LONGER AND HAVE MULTIPLE CONNECTED RODS TO ACHIEVE THE REQUIRED GROUND MAT-TO-EARTH RESISTANCE LEVELS.
3. CONDUIT TO BE LOCATED 12" MIN. FROM STRUCTURE. GROUND ROD OR CONDUIT SHALL NOT INTERFERE WITH UNDERGROUND STRUCTURES.
4. CONNECTION TO STEEL STRUCTURE TO BE MADE CEMBRE AR61E SINGLE SIDED, SEE ELECTRIFICATION STANDARD DWG E5500, DETAIL 4. IF THE STRUCTURE IS ALUMINUM, USE THE TINNED LUG FOR CONNECTION.
5. PROVIDE WATERTIGHT BUSHING AT CABLE EXIT, SIZED FOR APPROPRIATE CABLE TYPE.
6. STRUCTURES WITHIN THE OCLZ REQUIRE CONNECTIONS TO THE IMPEDANCE BOND OR STATIC WIRE OR LOCAL COUNTERPOISE BY MEANS OF A #4/0 AWG BARE STRANDED COPPER BOND CONDUCTOR. THE CONDUCTOR TO BE IN PVC CONDUIT BURIED BELOW FINISHED GRADE AT 3 FEET MIN.

NOTE:

SIGNAL BRIDGE FOUNDATION SHOWN.
SAME GROUNDING DETAIL APPLICABLE
FOR CANTILEVER FOUNDATION.



SIGNAL BRIDGE OR CANTILEVER FOUNDATION
DETAIL
SCALE: NOT TO SCALE

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DIRECTOR, ENGINEERING



ENGINEERING STANDARD DRAWINGS

SIGNAL AND GRADE CROSSING SYSTEMS
SIGNAL APPARATUS

TYPICAL SIGNAL
APPARATUS GROUNDING

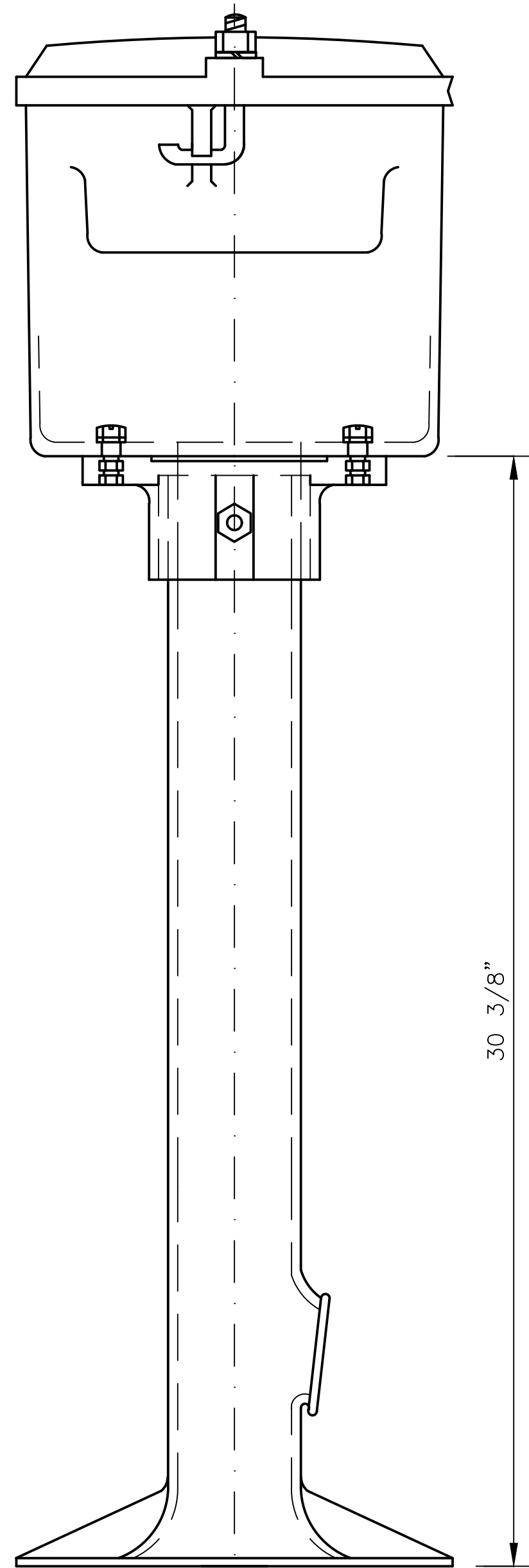
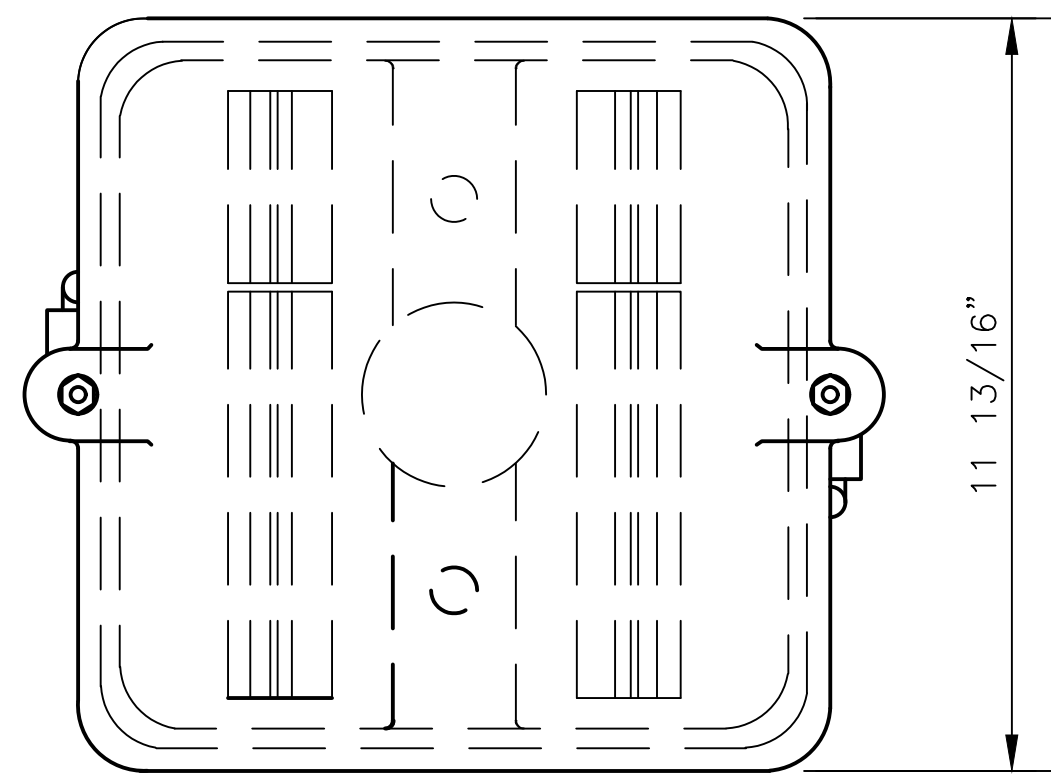
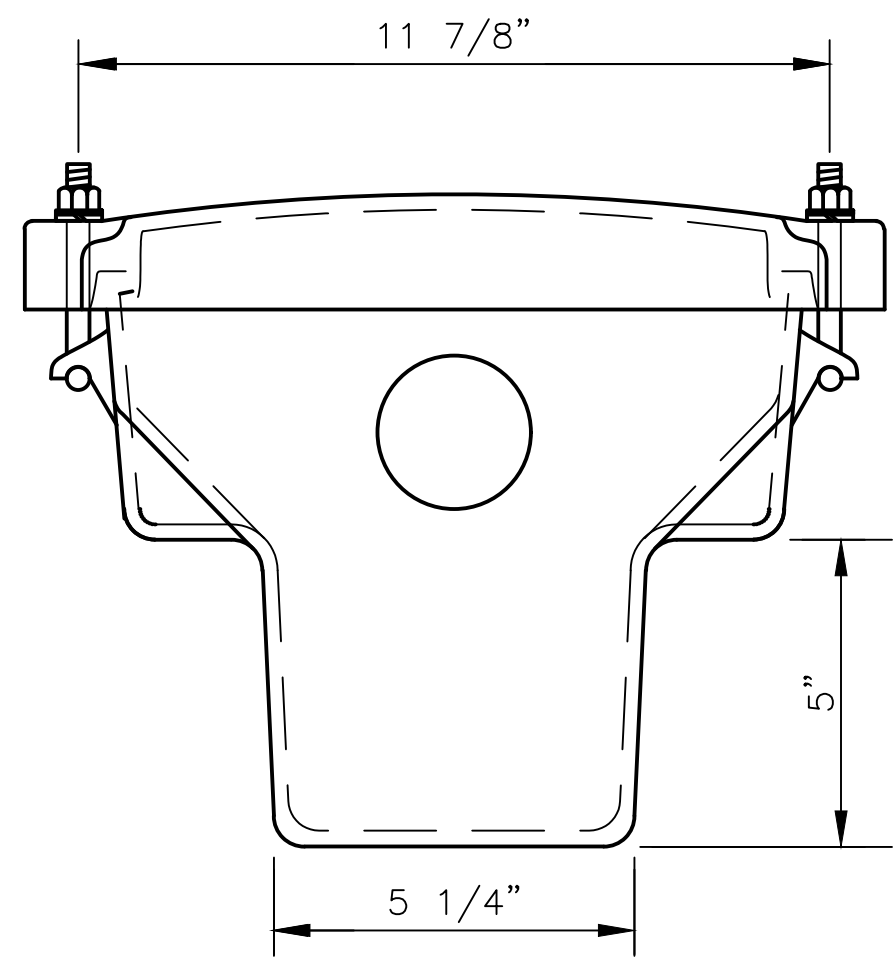
CADD FILE NAME:
SD-5217

REV: EDITION:
FIFTH

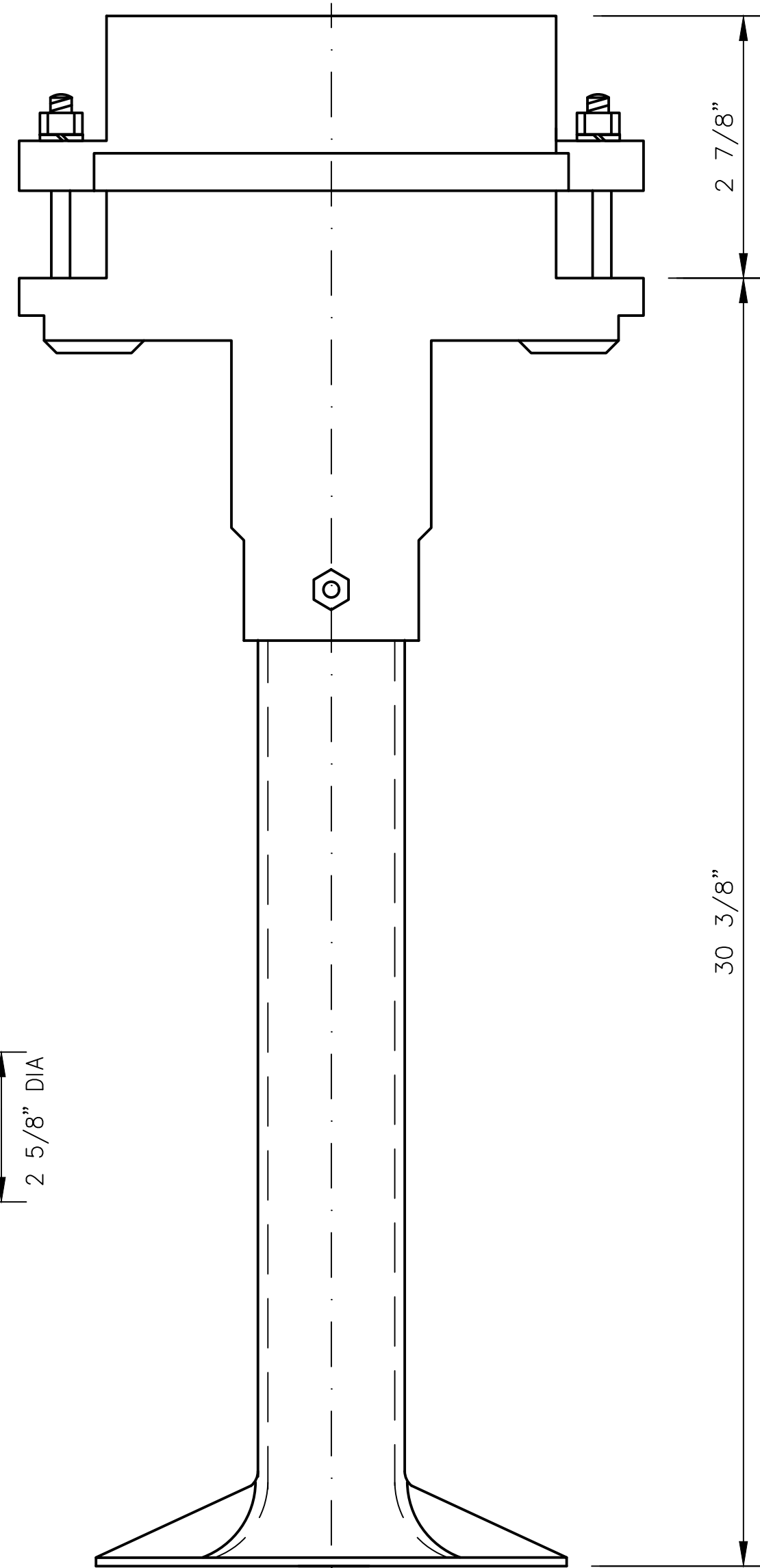
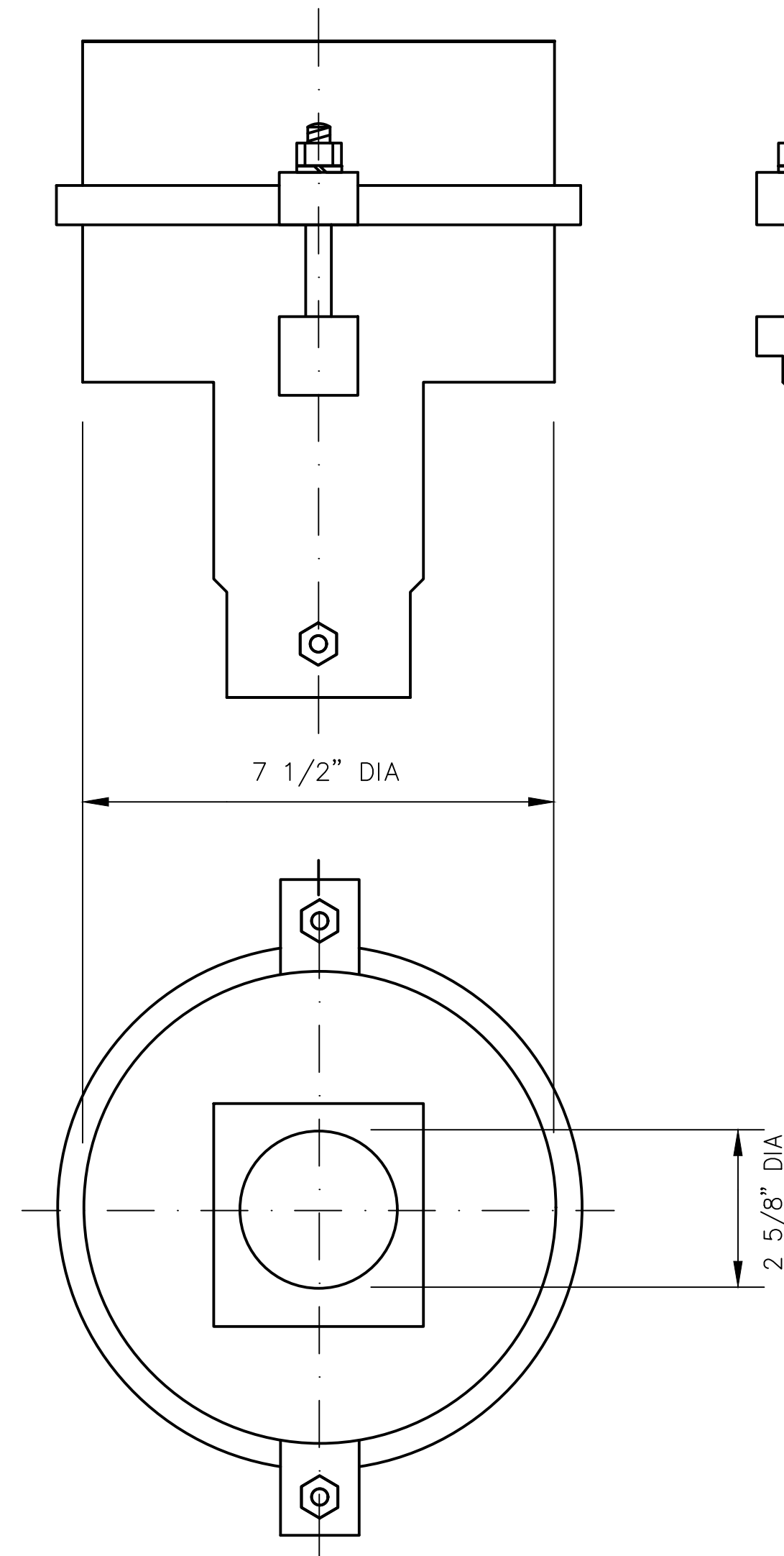
SCALE:
NTS

STANDARD DRAWING NO.:
SD-5217

REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP	DESCRIPTION
010126					FIFTH EDITION						





STANDARD TYPE

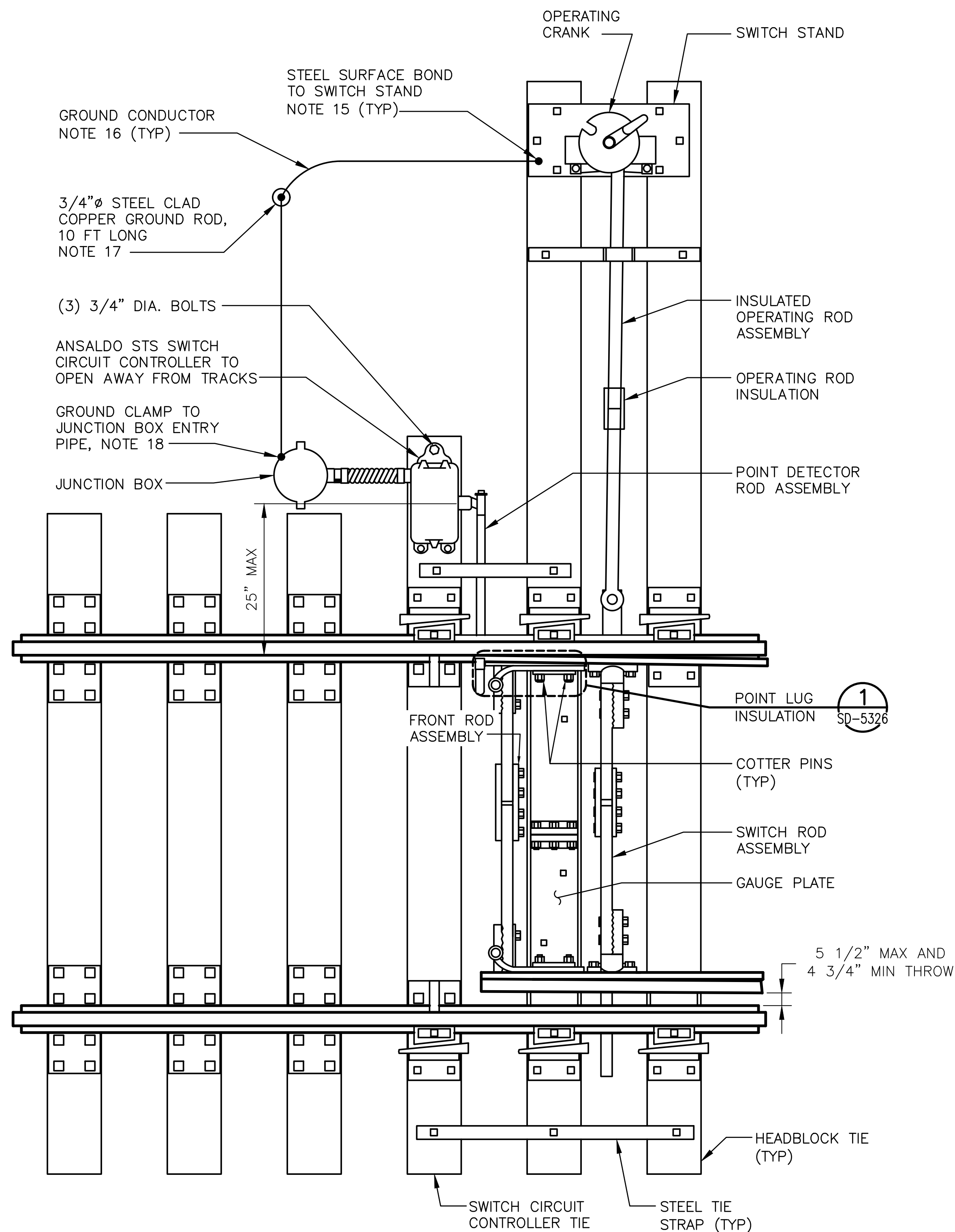


ALTERNATE TYPE

NOTES:

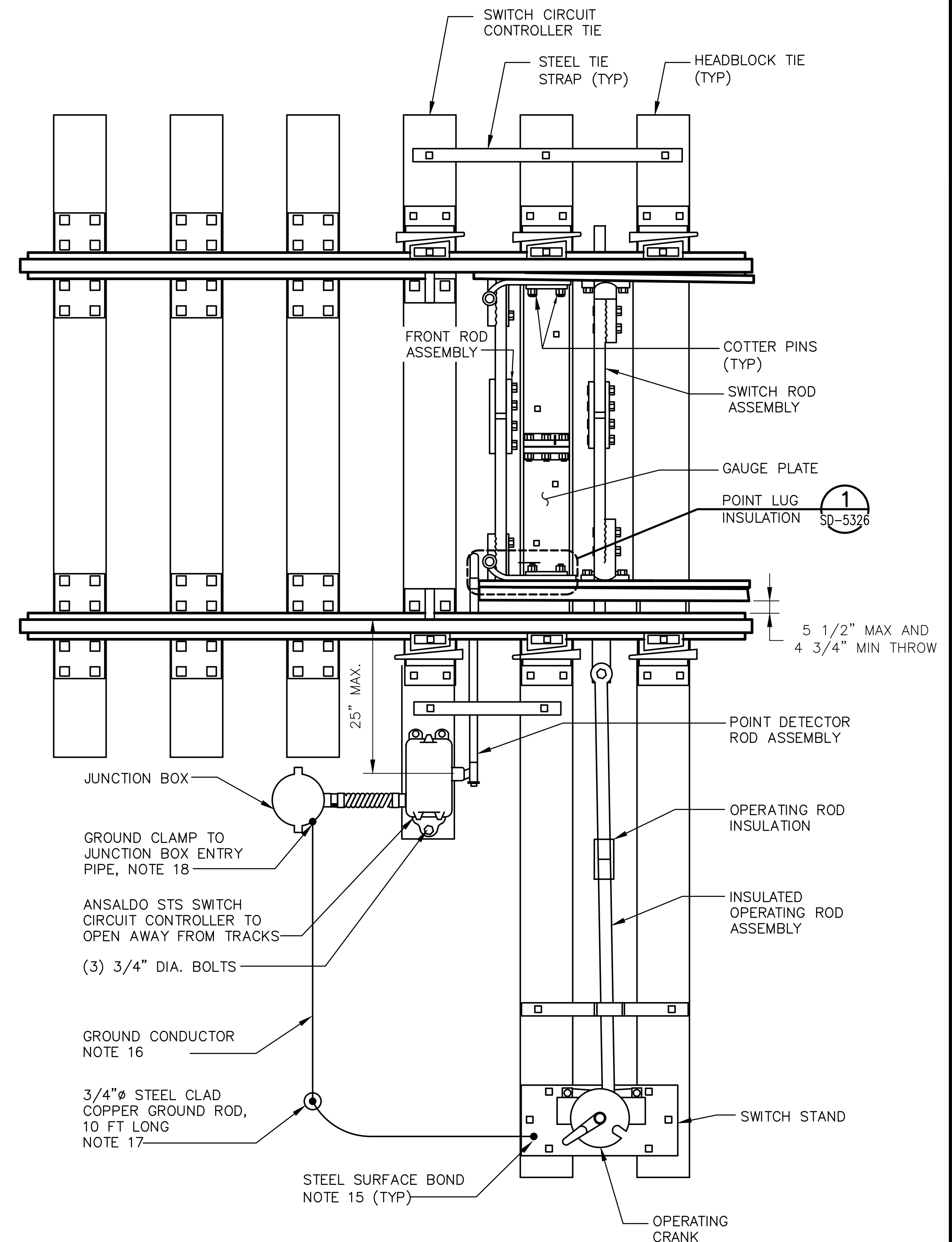
1. STANDARD JUNCTION BOX SHALL CONTAIN A MINIMUM OF 36 AAR TERMINALS
2. ALTERNATE JUNCTION BOX SHALL CONTAIN A MINIMUM OF 12 AREMA C&S MANUAL PART 14.1.5 TERMINAL — TO BE USED ON NEW INSTALLATIONS ONLY WITH APPROVAL OF THE ENGINEER
3. ONLY ONE SOLID WIRE PER TERMINAL INCLUDING SPARES
4. HMAC INSTALLATION — PEDESTAL MODIFICATION. TOP OF BOX LID LEVEL WITH TOP OF TIE
5. GALVANIZED RIGID STEEL (GRS) MAY BE USED IN LIEU OF PEDESTAL AS PART OF A CONDUIT AND PULL BOX INSTALLATION

										PENINSULA CORRIDOR JOINT POWERS BOARD					ENGINEERING STANDARD DRAWINGS					CADD FILE NAME: SD-5301									
										APPROVED BY:  DIRECTOR, ENGINEERING										SIGNAL AND GRADE CROSSING SYSTEMS SWITCH APPARATUS					REV:	EDITION: FIFTH			
																				SCALE: NTS									
010126																				TYPICAL PEDESTAL JUNCTION BOX					STANDARD DRAWING NO.: SD-5301				
REV	DATE	BY	CHK	APP	DESCRIPTION					REV	DATE	BY	CHK	APP															



- NOTES:

1. TOP OF JUNCTION BOX LID SHALL BE LEVEL WITH TOP OF TIE.
2. SWITCH CIRCUIT CONTROLLER SHALL BE EQUIPPED WITH RETURN INTERNAL OR EXTERNAL SPRING.
3. U-5 BOX SHALL BE MOUNTED ON A 10' TIE AND TO OPEN AWAY FROM TRACK.
4. THE CENTER LINE OF THE CRANK SHAFT SHALL BE A MAXIMUM 25" FROM THE GAGE OF THE RAIL.
5. FLEX CONDUIT BETWEEN JUNCTION BOX AND SWITCH CIRCUIT CONTROLLER SHALL BE 18" TO 24" AND CONTAIN A STEEL CORE.
6. FLEX CONDUIT SHALL BE ROUTED SO IT DOES NOT INTERFERE WITH ROD MOVEMENT.
7. SEE TRACK STANDARDS FOR PROPER TIE LENGTH AND SPACING.
8. LAYOUT BASED ON USE OF HIGH SWITCH STAND. MAKE ADJUSTMENTS BASED ON SWITCH STAND USED.
9. WITH THE OPERATING CRANK POINTING VERTICALLY DOWNWARD AND THE SWITCH POINTS IN MID-POSITION, MARK THE LOCATION OF THE CONTROLLER BOX MOUNTING HOLES AND DRILL.
10. PLACE 3/4" DIA. BOLTS THROUGH TIE. HEAD OF BOLT SHALL BE SECURED WITH BRIDGE WASHER AT BOTTOM OF TIE.
11. INSTALL OPERATING ROD ON POINT LUG AND OPERATING CRANK WITH THE SWITCH POINTS IN MID-POSITION.
12. CENTER SCREW JAW ON THREADED PORTION OF POINT DETECTOR ROD.
13. ALLOW AMPLE CLEARANCE BETWEEN THE SIDE OF THE HEAD BLOCK TIE AND THE 3/4" OR 13/32" BALL STUD TO INSURE FREE MOVEMENT.
14. INSTALL POINT LUG INSULATION KIT. SEE DRAWING SD-5326 FOR POINT LUG INSTALLATION DETAILS.
15. SEE DRAWING E5203 DETAIL 2 FOR STEEL SURFACE BOND DETAILS.
16. CONDUCTORS USED FOR GROUNDING AND BONDING SHALL BE #4/0 AWG COPPER, ANNEALED AND SOFT DRAWN. INSTALL 1-FT BELOW GRADE.
17. GROUND RODS SHALL BE INSTALLED AT 1-FT BELOW GRADE AND A MINIMUM OF 1-FT FROM ANY EXPOSED OR UNDERGROUND STRUCTURES. BOND GROUND CONDUCTOR TO GROUND ROD PER EXOTHERMIC WELD OR IRREVERSIBLE COMPRESSION CLAMP.
18. SEE DRAWING E5205 DETAIL 8 FOR GROUND CLAMP TO JUNCTION BOX ENTRY PIPE. VERIFY JUNCTION BOX IS ELECTRICALLY ISOLATED FROM THE RAIL PRIOR TO INSTALLATION OF LOCAL GROUND ROD BOND.

[illegible]**PENINSULA CORRIDOR JOINT POWERS BOARD**

APPROVED BY:

Bin Zhang

DIRECTOR, ENGINEERING

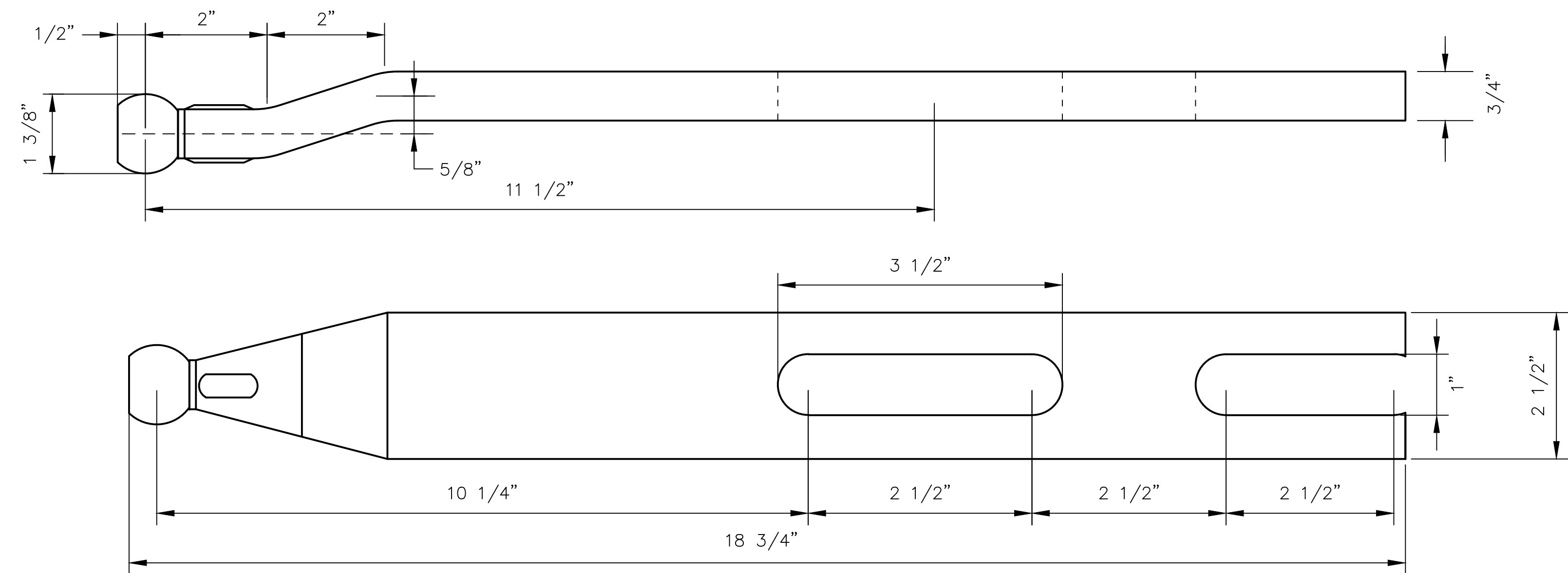


ENGINEERING STANDARD DRAWINGS

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CIRCUIT CONTROLLER PLACEMENT AT HAND THROW SWITCHES

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POINT DETECTOR LUG

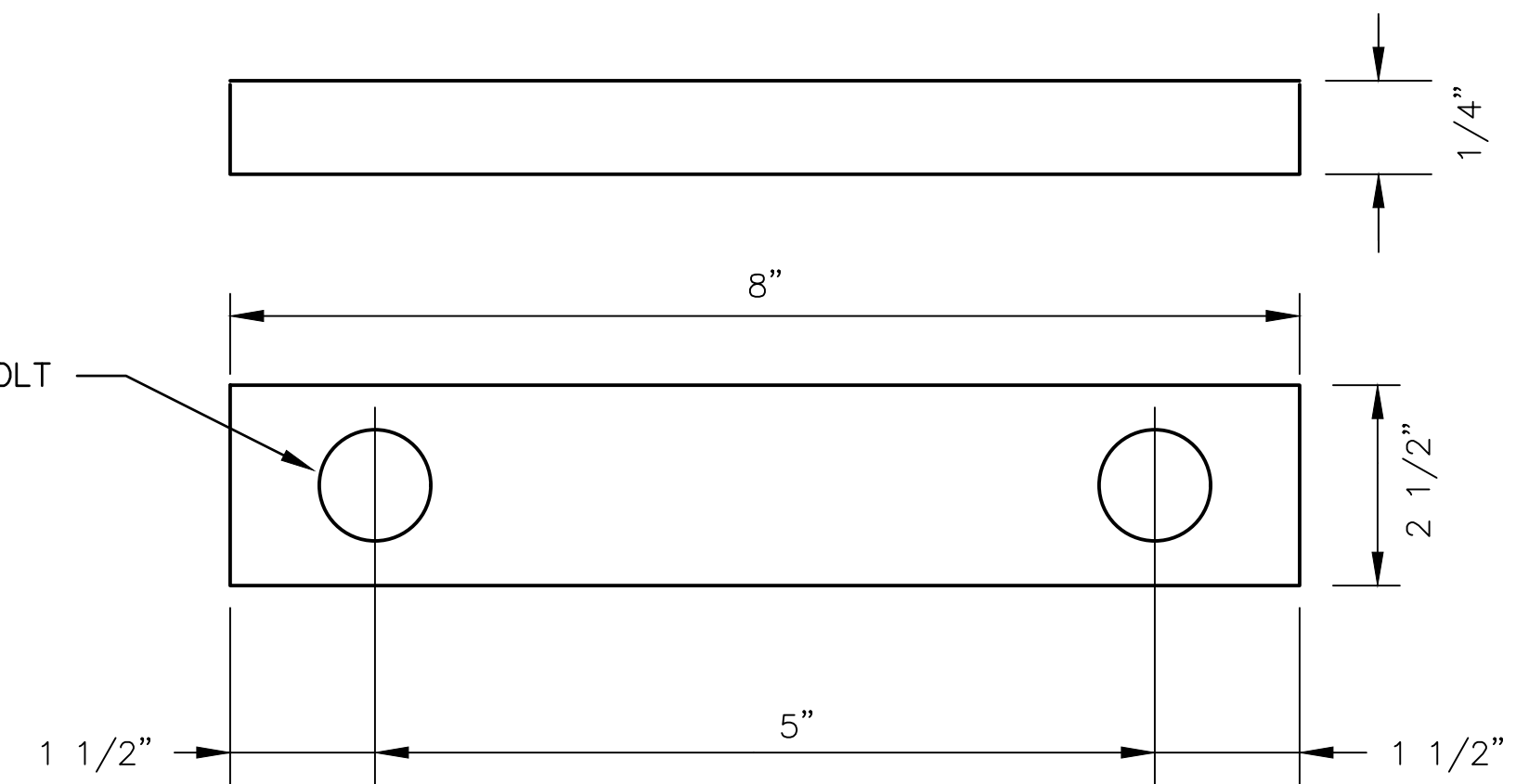
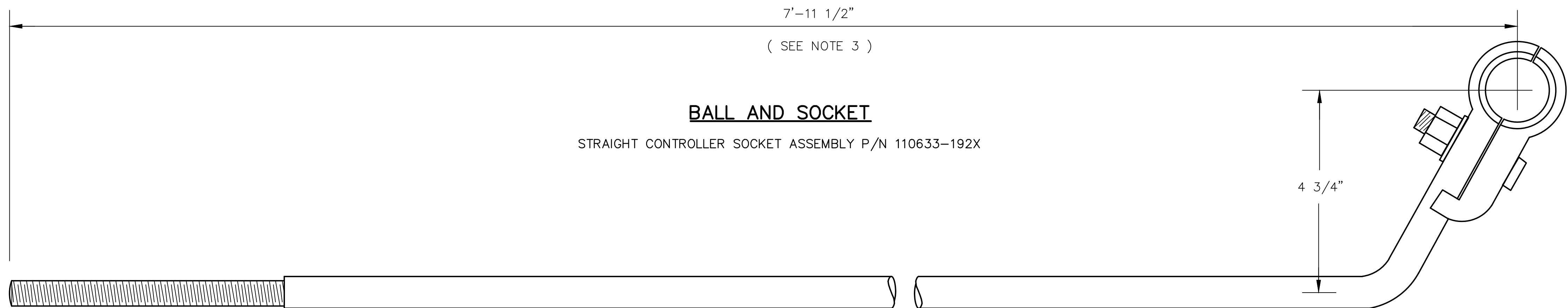


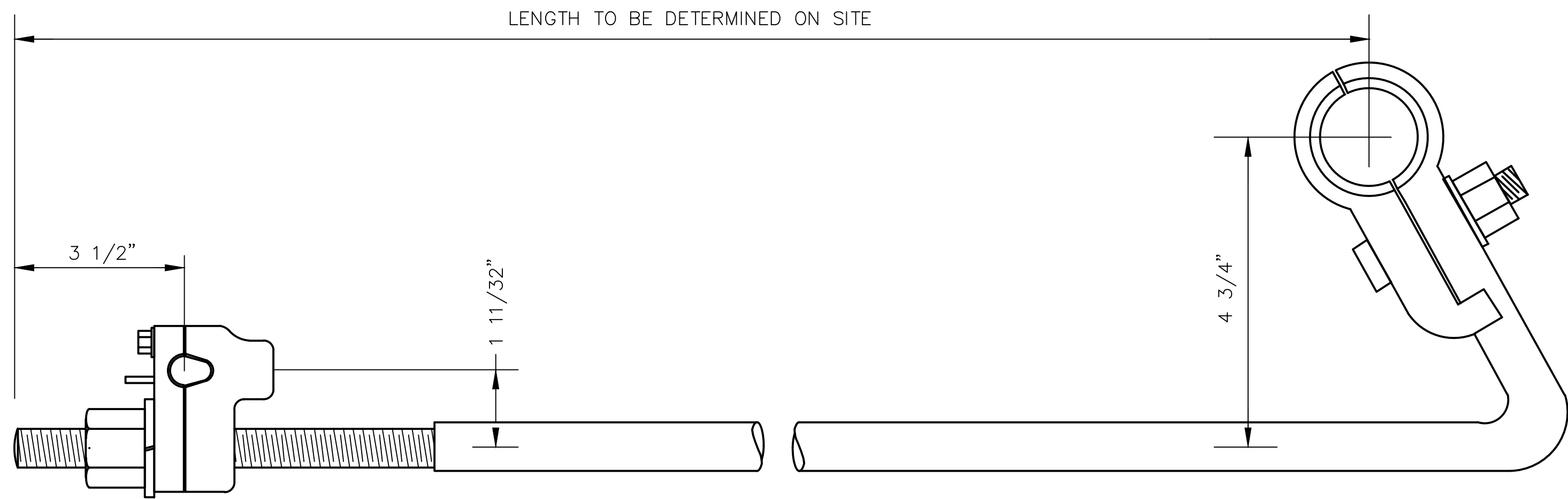
PLATE WASHER



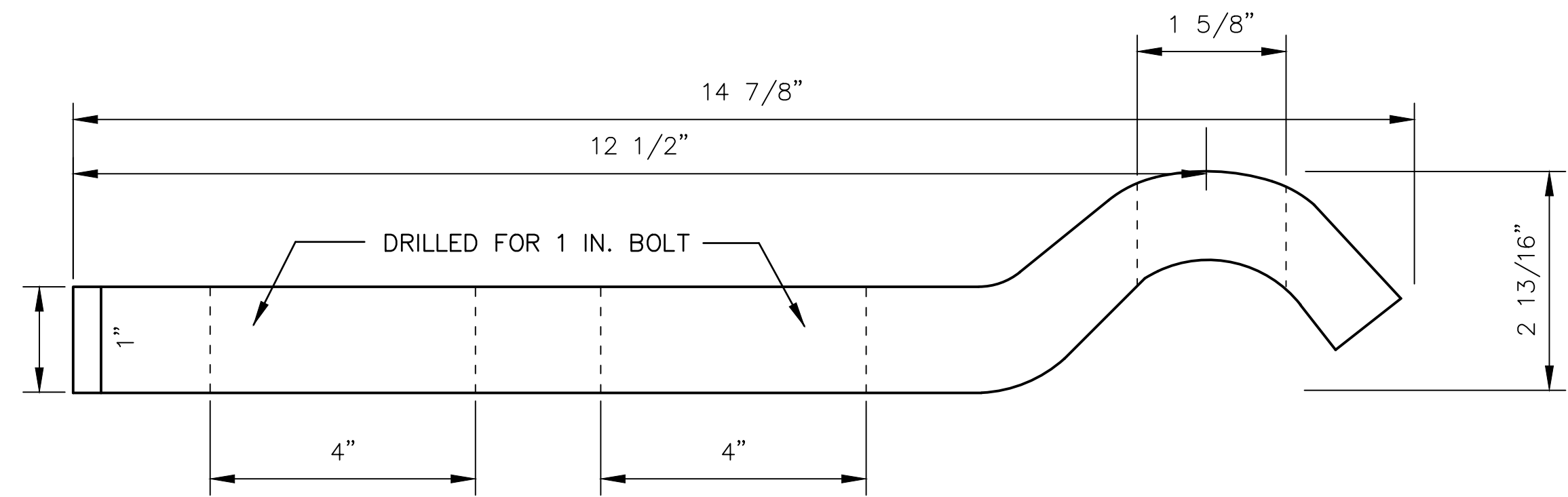
BALL AND SOCKET

STRAIGHT CONTROLLER SOCKET ASSEMBLY P/N 110633-192X

- NOTES:**
1. ALL NUTS SHALL BE TIGHT AND SECURED WITH COTTER KEYS
 2. DRILLED FOR 3/4" ON SOME INSTALLS
 3. NOT USED ON NEW INSTALLATIONS

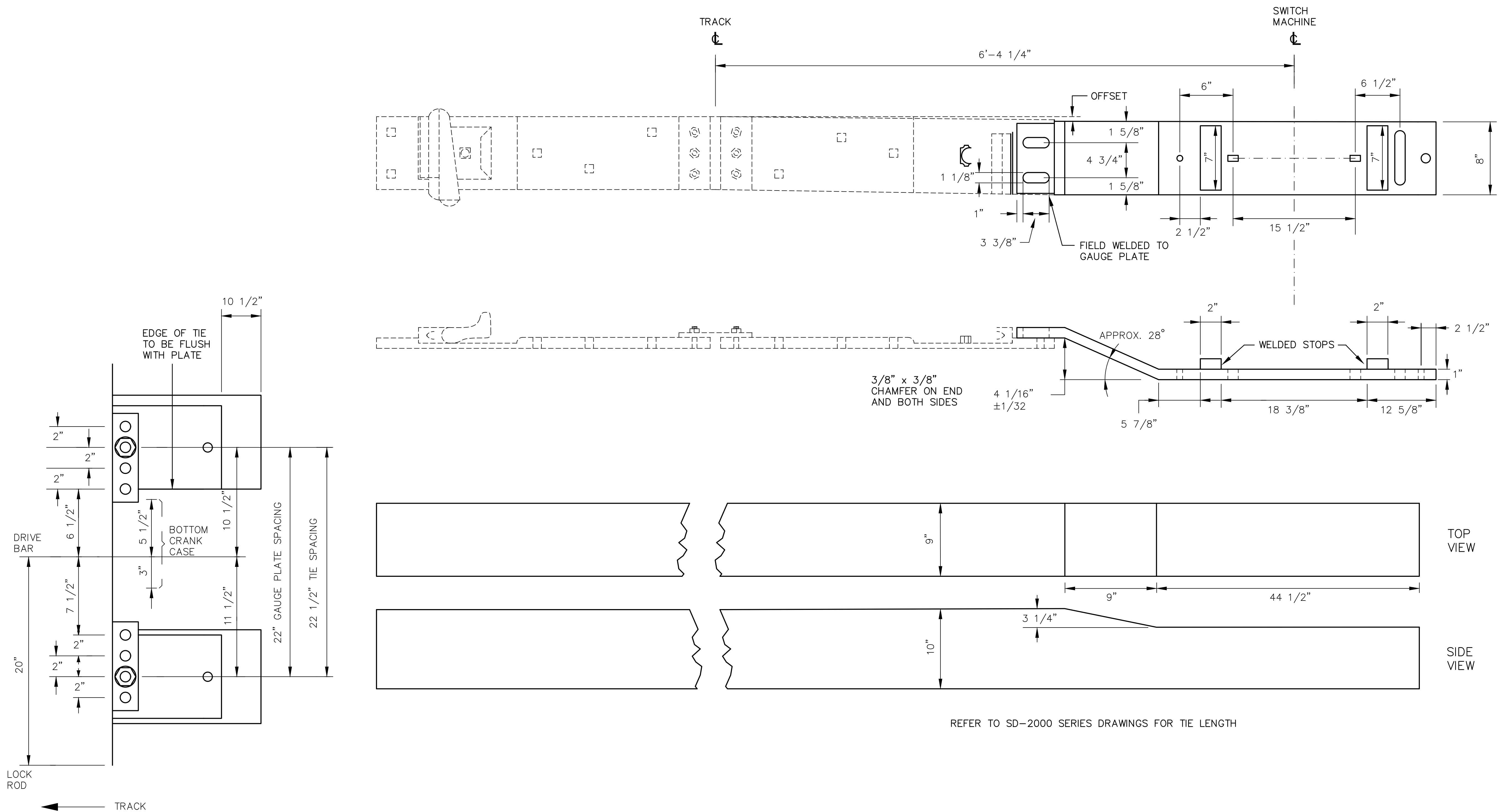


OPERATING RODS



POINT LUG SWIVEL

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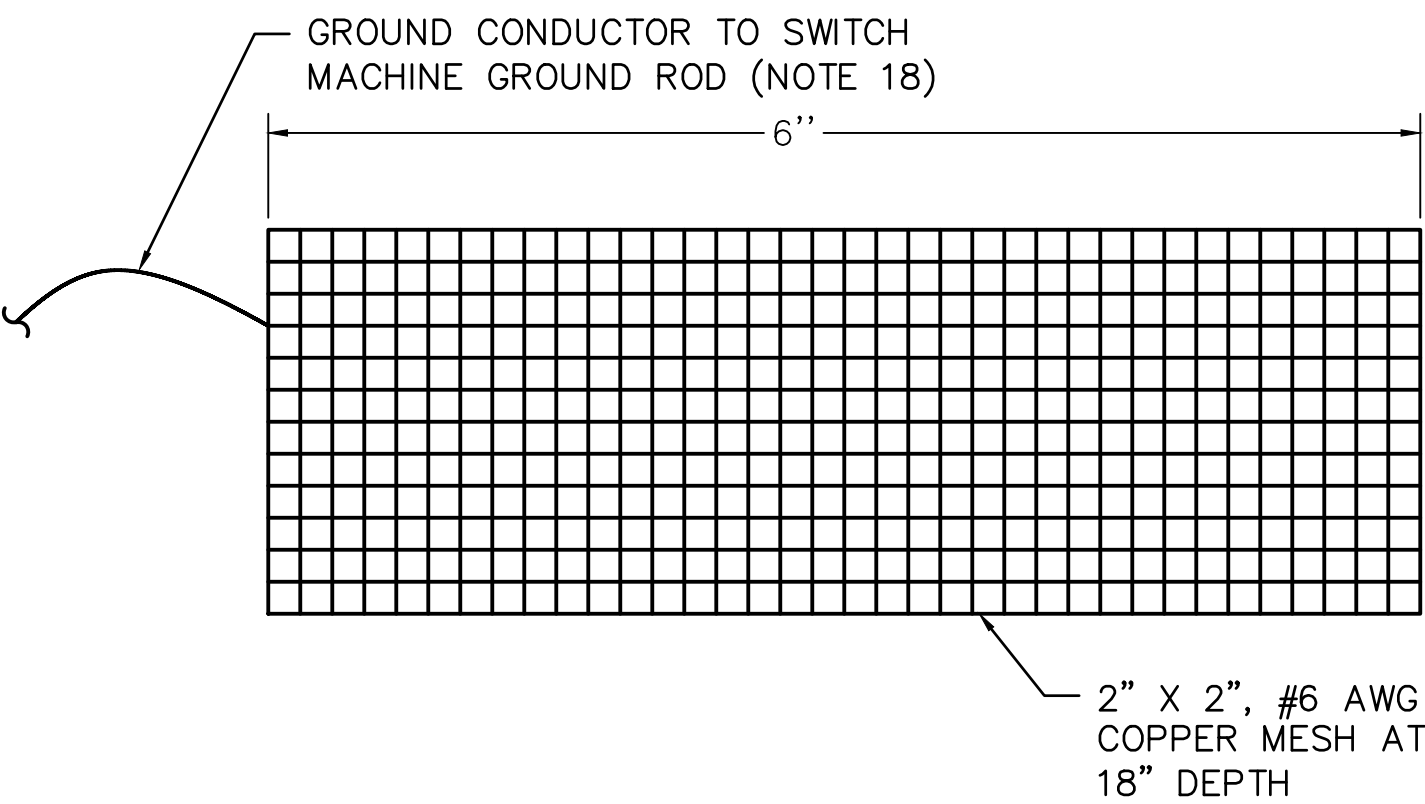
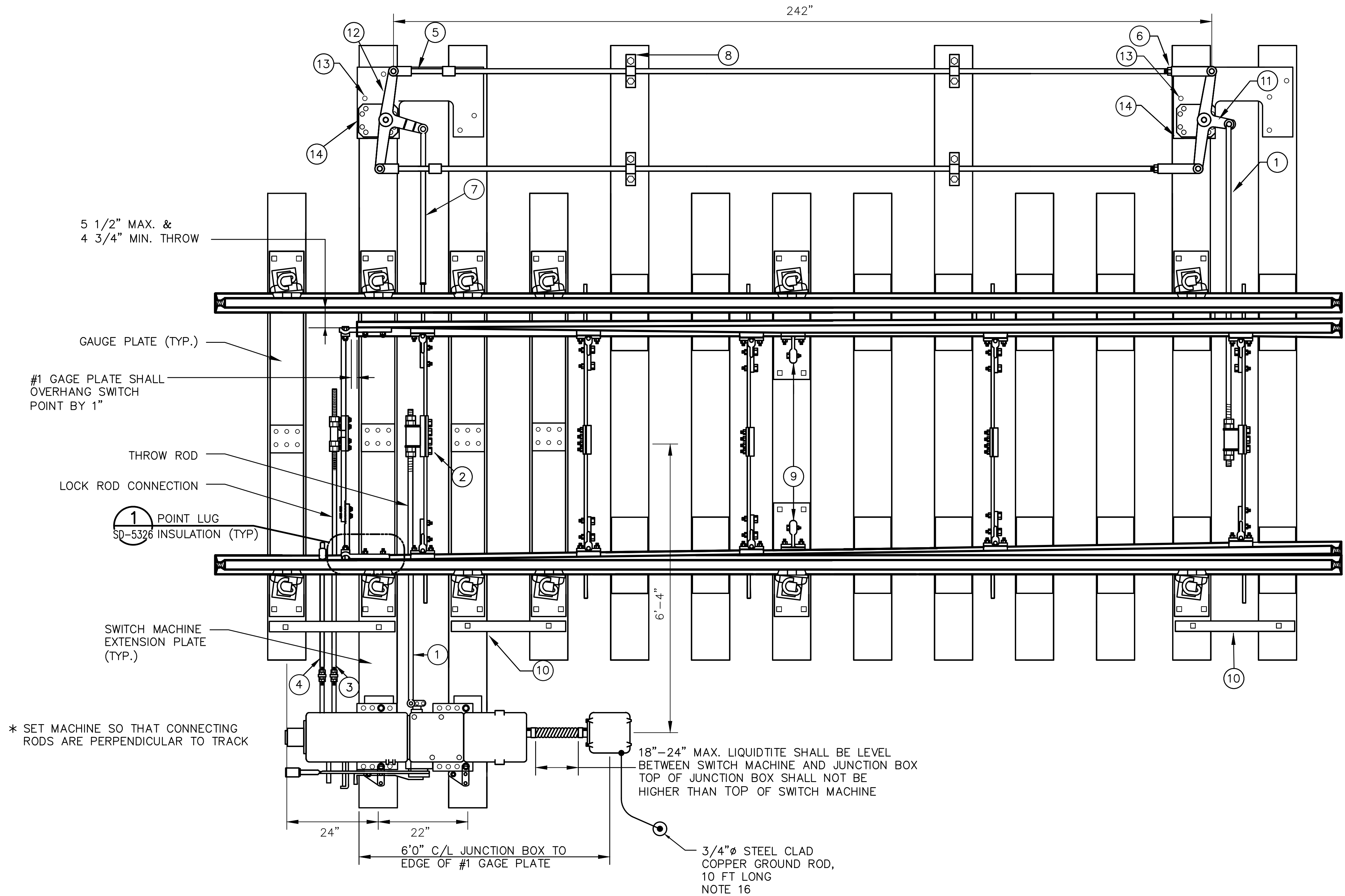


REFER TO SD-2000 SERIES DRAWINGS FOR TIE LENGTH

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NOTES:

1. THROW ROD CUT OFF TO 74" LENGTH. REMOVE ALEMITE FITTING FROM TURNED BOLT TO CLEAR COVER ON SWITCH MACHINE
2. SWITCH ADJUSTER, VERTICAL
3. LOCK ROD CONNECTION
4. POINT DETECTOR ROD
5. SOLID JAW
6. SCREW JAW
7. ADJUSTABLE LINK
8. PIPE GUIDE
9. SWITCH POINT ROLLER, GW-9 (TWO PER SET, 3 SETS PER SWITCH)
10. 2" X 1/2" STEEL STRAPS
11. "T" CRANK STAND ASSEMBLY (SHORT)
12. "T" CRANK STAND ASSEMBLY (LONG)
13. SCREW, 3/4" X 6" LAGS
14. CRANK STAND BASE
15. FOR TIE LENGTH AND TIE SPACING REFER TO SD-2000 SERIES DRAWINGS
16. GROUND RODS SHALL BE INSTALLED AT 1-FT BELOW GRADE AND A MINIMUM OF 1-FT FROM ANY EXPOSED OR UNDERGROUND STRUCTURES. BOND GROUND CONDUCTOR TO GROUND ROD PER EXOTHERMIC WELD OR IRREVERSIBLE COMPRESSION CLAMP.
17. FIELD VERIFY IF A POINT LUG INSULATION KIT IS CURRENTLY INSTALLED. INSTALL POINT LUG INSULATION KIT WHERE NO KIT IS CURRENTLY INSTALLED. SEE DRAWING NO. T5103 FOR INSTALLATION DETAILS.
18. CONDUCTORS USED FOR GROUNDING AND BONDING SHALL BE #4/0 AWG COPPER, ANNEALED AND SOFT DRAWN. INSTALL 1-FT BELOW GRADE.
19. SEE DRAWING E5205 DETAIL 8 FOR GROUND CLAMP TO JUNCTION BOX ENTRY PIPE. VERIFY JUNCTION BOX IS ELECTRICALLY ISOLATED FROM THE RAIL PRIOR TO INSTALLATION OF LOCAL GROUND ROD BOND.



GROUND MAT DETAIL
N.T.S.

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DIRECTOR, ENGINEERING



ENGINEERING STANDARD DRAWINGS

SIGNAL AND GRADE CROSSING SYSTEMS
SWITCH APPARATUS

M-23A SWITCH MACHINE LAYOUT
NO. 20 TURNOUT, RIGHT MOUNTED

CADD FILE NAME:
SD-5306

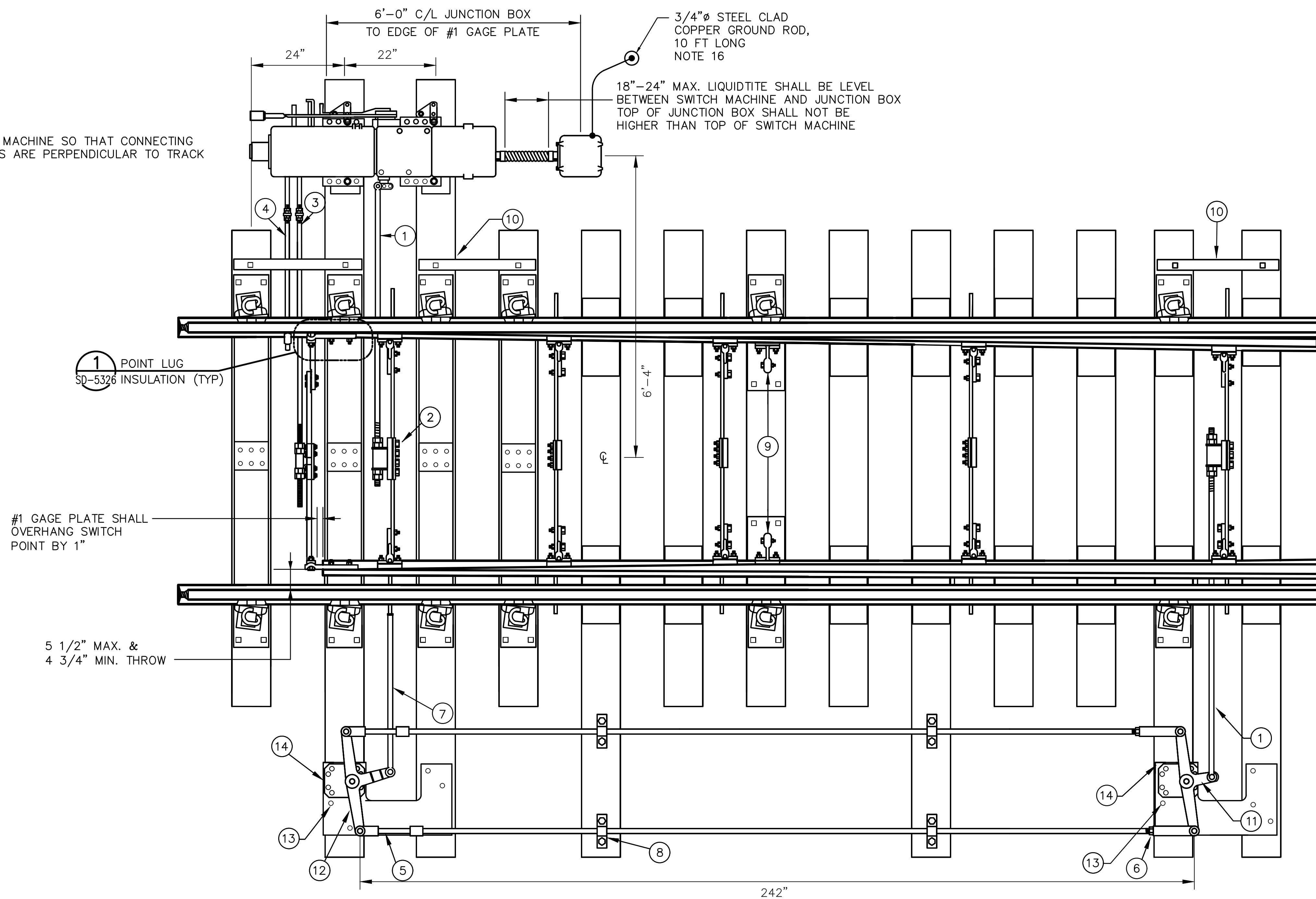
REV: EDITION:
FIFTH

SCALE:
NTS

STANDARD DRAWING NO.:
SD-5306

REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP	DESCRIPTION
010126					FIFTH EDITION						

* SET MACHINE SO THAT CONNECTING
RODS ARE PERPENDICULAR TO TRACK



NOTES:

1. THROW ROD CUT OFF TO 74" LENGTH. REMOVE ALEMITE FITTING FROM TURNED BOLT TO CLEAR COVER ON SWITCH MACHINE
2. SWITCH ADJUSTER, VERTICAL
3. LOCK ROD CONNECTION
4. POINT DETECTOR ROD
5. SOLID JAW
6. SCREW JAW
7. ADJUSTABLE LINK
8. PIPE GUIDE
9. SWITCH POINT ROLLER, GW-9 (TWO PER SET, 3 SETS PER SWITCH)
10. 2" X 1/2" STEEL STRAPS
11. "T" CRANK STAND ASSEMBLY (SHORT)
12. "T" CRANK STAND ASSEMBLY (LONG)
13. SCREW, 3/4" X 6" LAGS
14. CRANK STAND BASE
15. FOR TIE LENGTH AND TIE SPACING REFER TO SD-2000 SERIES DRAWINGS
16. GROUND RODS SHALL BE INSTALLED AT 1-FT BELOW GRADE AND A MINIMUM OF 1-FT FROM ANY EXPOSED OR UNDERGROUND STRUCTURES. BOND GROUND CONDUCTOR TO GROUND ROD PER EXOTHERMIC WELD OR IRREVERSIBLE COMPRESSION CLAMP.
17. FIELD VERIFY IF A POINT LUG INSULATION KIT IS CURRENTLY INSTALLED. INSTALL POINT LUG INSULATION KIT WHERE NO KIT IS CURRENTLY INSTALLED. SEE DRAWING NO. T5103 FOR INSTALLATION DETAILS.
18. CONDUCTORS USED FOR GROUNDING AND BONDING SHALL BE #4/0 AWG COPPER, ANNEALED AND SOFT DRAWN. INSTALL 1-FT BELOW GRADE.
19. SEE DRAWING E5205 DETAIL 8 FOR GROUND CLAMP TO JUNCTION BOX ENTRY PIPE. VERIFY JUNCTION BOX IS ELECTRICALLY ISOLATED FROM THE RAIL PRIOR TO INSTALLATION OF LOCAL GROUND ROD BOND.

GROUND CONDUCTOR TO SWITCH
MACHINE GROUND ROD (NOTE 18)

GROUND MAT DETAIL

N.T.S.

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DIRECTOR, ENGINEERING



ENGINEERING STANDARD DRAWINGS

SIGNAL AND GRADE CROSSING SYSTEMS SWITCH APPARATUS

M-23A SWITCH MACHINE LAYOUT
NO. 20 TURNOUT, LEFT MOUNTED

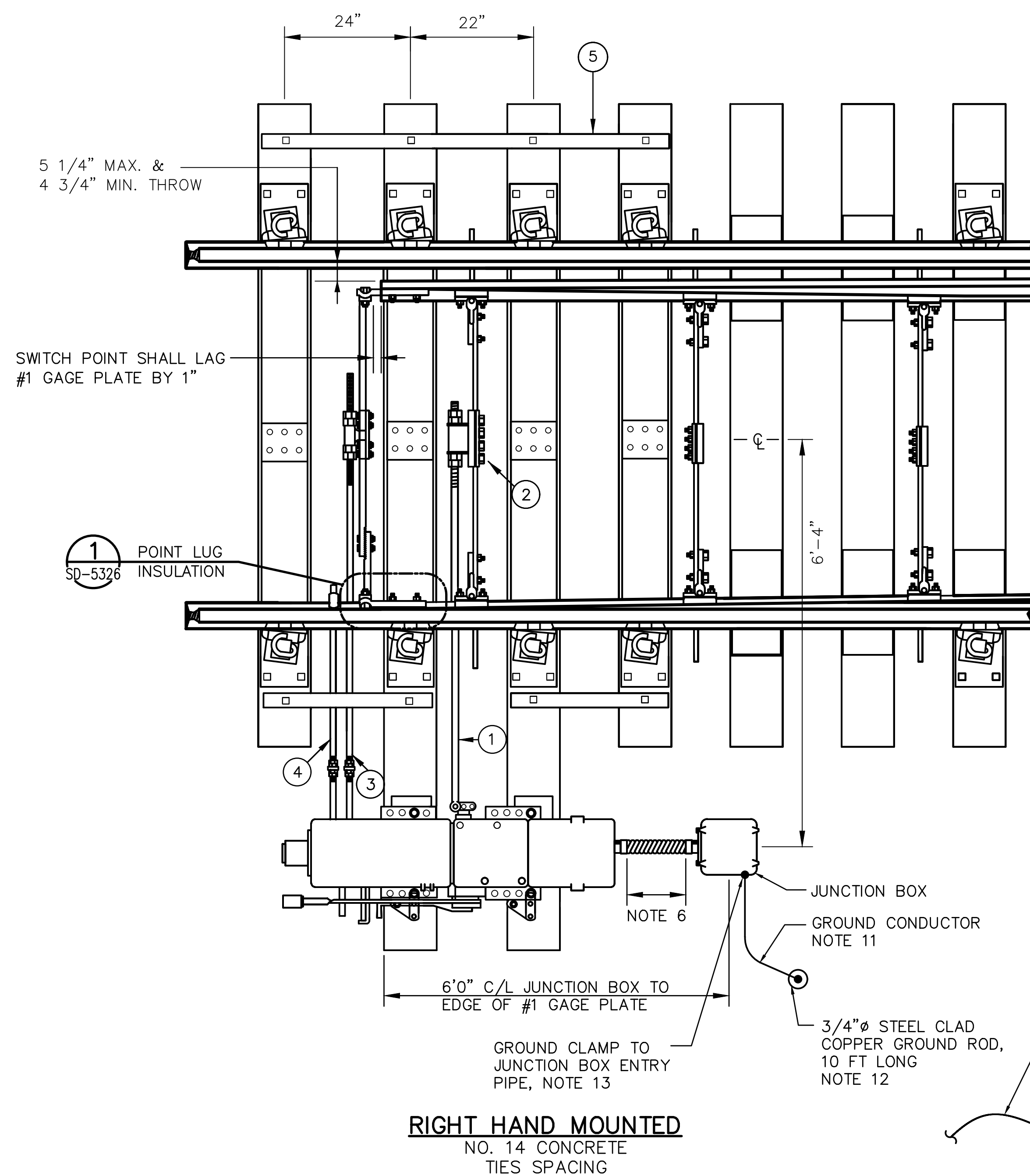
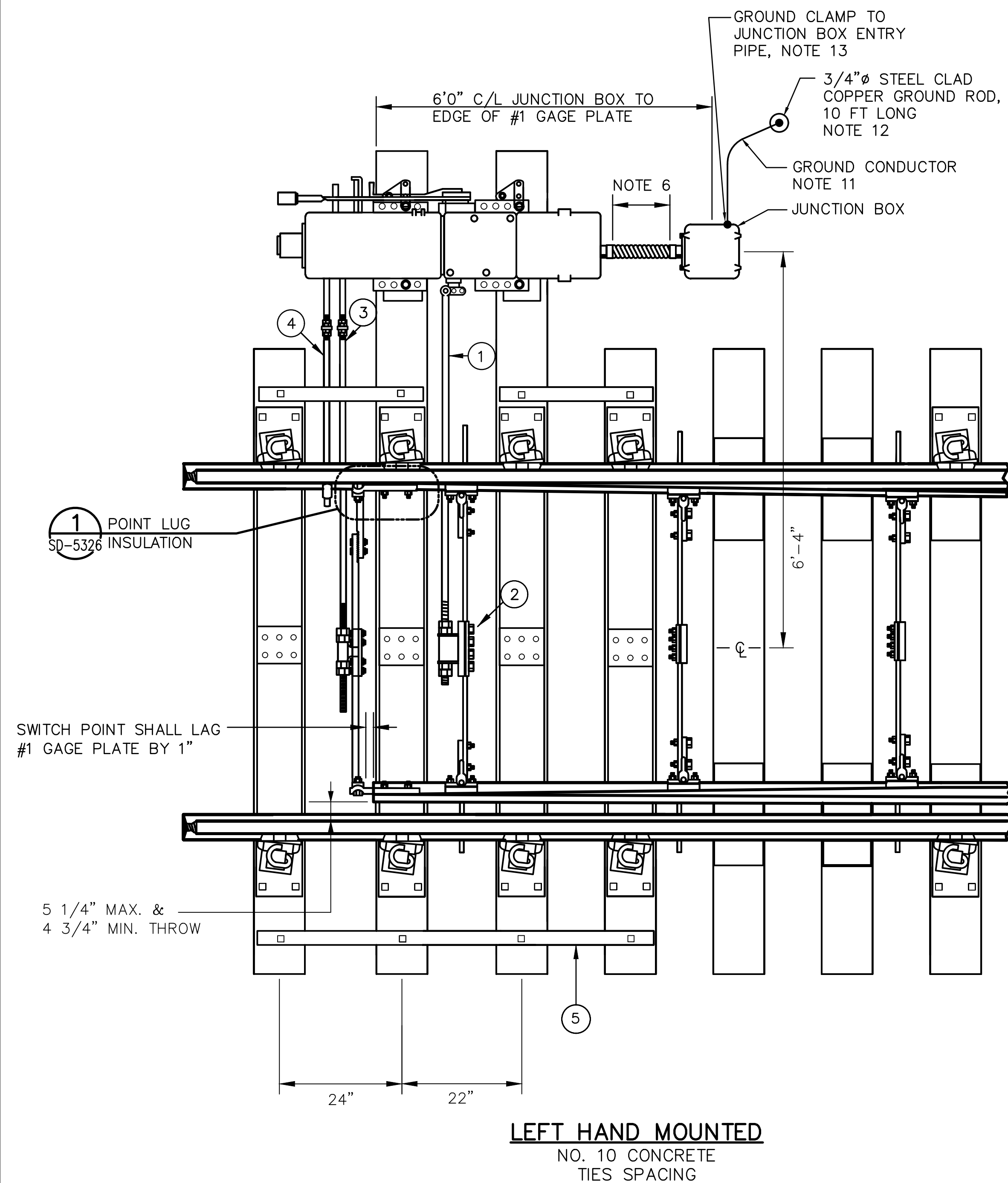
CADD FILE NAME:
SD-5307

REV: EDITION:
FIFTH

SCALE:
NTS

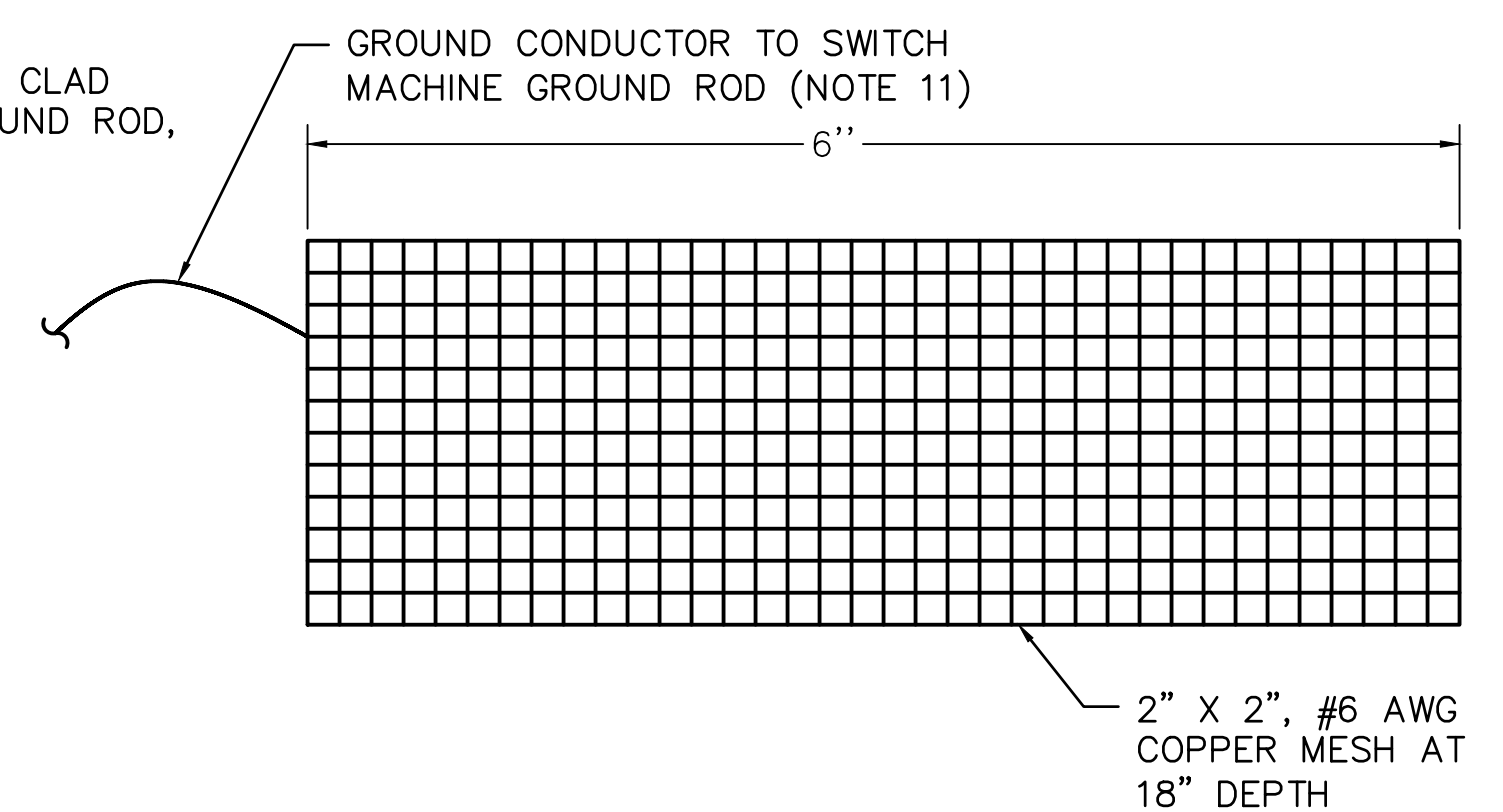
STANDARD DRAWING NO.:
SD-5307

REV	DATE	BY	CHK	APP	DESCRIPTION
010126					FIFTH EDITION



- NOTES:

1. THROW ROD CUT OFF TO 74" LENGTH. REMOVE ALEMITE FITTING TURNED BOLT TO CLEAR COVER ON SWITCH MACHINE
2. SWITCH ADJUSTER, VERTICAL
3. LOCK ROD CONNECTION
4. POINT DETECTOR ROD
5. 1/2" X 2" STEEL STRAP CUT TO REQUIRED LENGTH AND DRILLED FOR 3/4" LAG SCREW
6. 18"-24" MAX. LIQUIDTITE SHALL BE LEVEL BETWEEN SWITCH MACHINE AND JUNCTION BOX. TOP OF JUNCTION BOX SHALL NOT BE HIGHER THAN TOP OF SWITCH MACHINE
7. FLEX CONDUIT TO BE STEEL CORE
8. SET MACHINE SO THAT CONNECTING RODS ARE PERPENDICULAR TO TRACK
9. REFER TO SD-2000 SERIES DRAWINGS FOR TIE SPACING AND LENGTH.
10. INSTALL POINT LUG INSULATION KIT. SEE DRAWING SD-5326 FOR INSTALLATION DETAILS.
11. CONDUCTORS USED FOR GROUNDING AND BONDING SHALL BE #4/0 AWG COPPER, ANNEALED AND SOFT DRAWN. INSTALL 1-FT BELOW GRADE.
12. GROUND RODS SHALL BE INSTALLED AT 1-FT BELOW GRADE AND A MINIMUM OF 1-FT FROM ANY EXPOSED OR UNDERGROUND STRUCTURES. BOND GROUND CONDUCTOR TO GROUND ROD PER EXOTHERMIC WELD OR IRREVERSIBLE COMPRESSION CLAMP.
13. SEE DRAWING E5205 DETAIL 8 FOR GROUND CLAMP TO JUNCTION BOX ENTRY PIPE. VERIFY JUNCTION BOX IS ELECTRICALLY ISOLATED FROM THE RAIL PRIOR TO INSTALLATION OF LOCAL GROUND ROD BOND.

[illegible]

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DIRECTOR, ENGINEERING

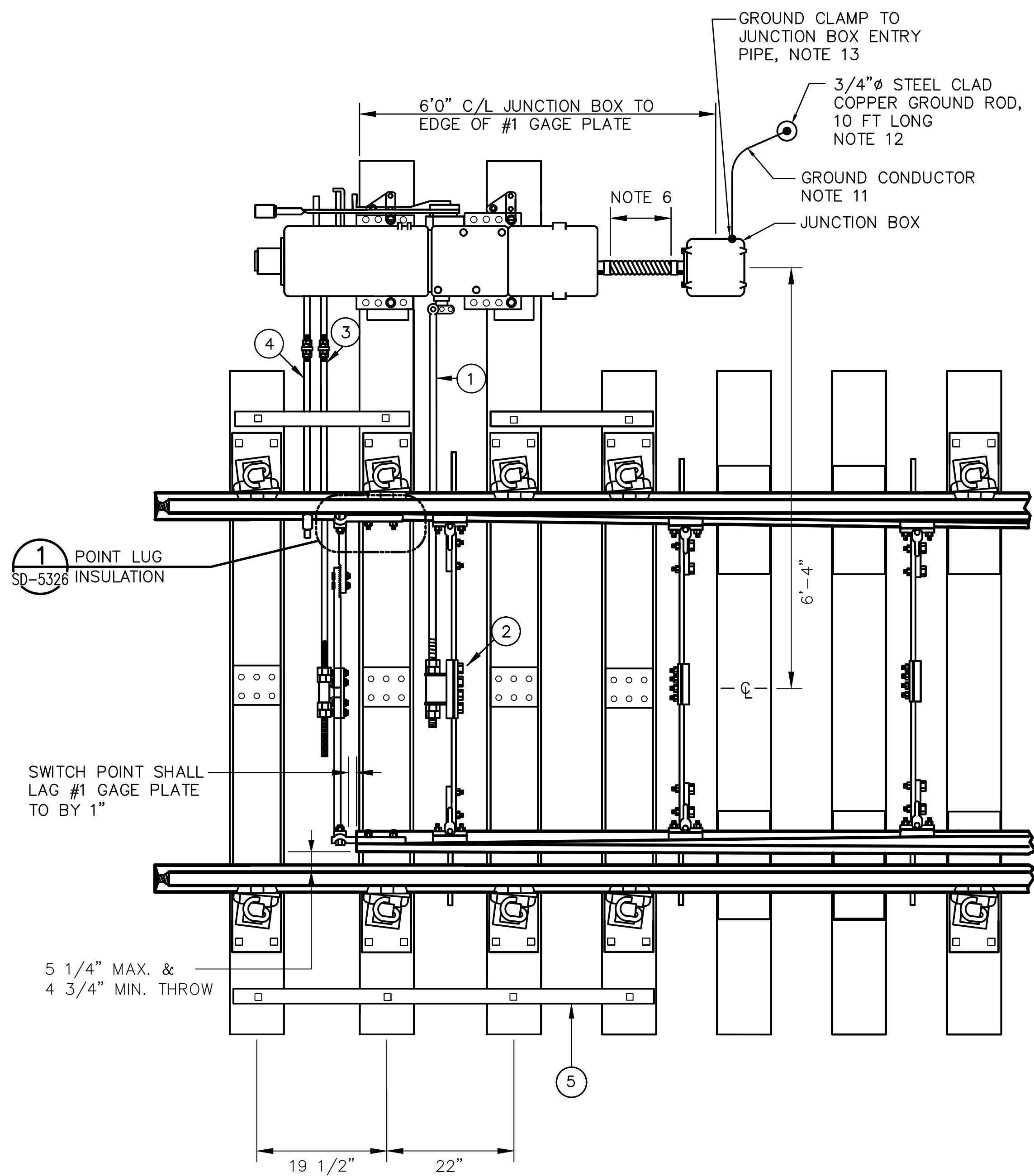


ENGINEERING STANDARD DRAWINGS

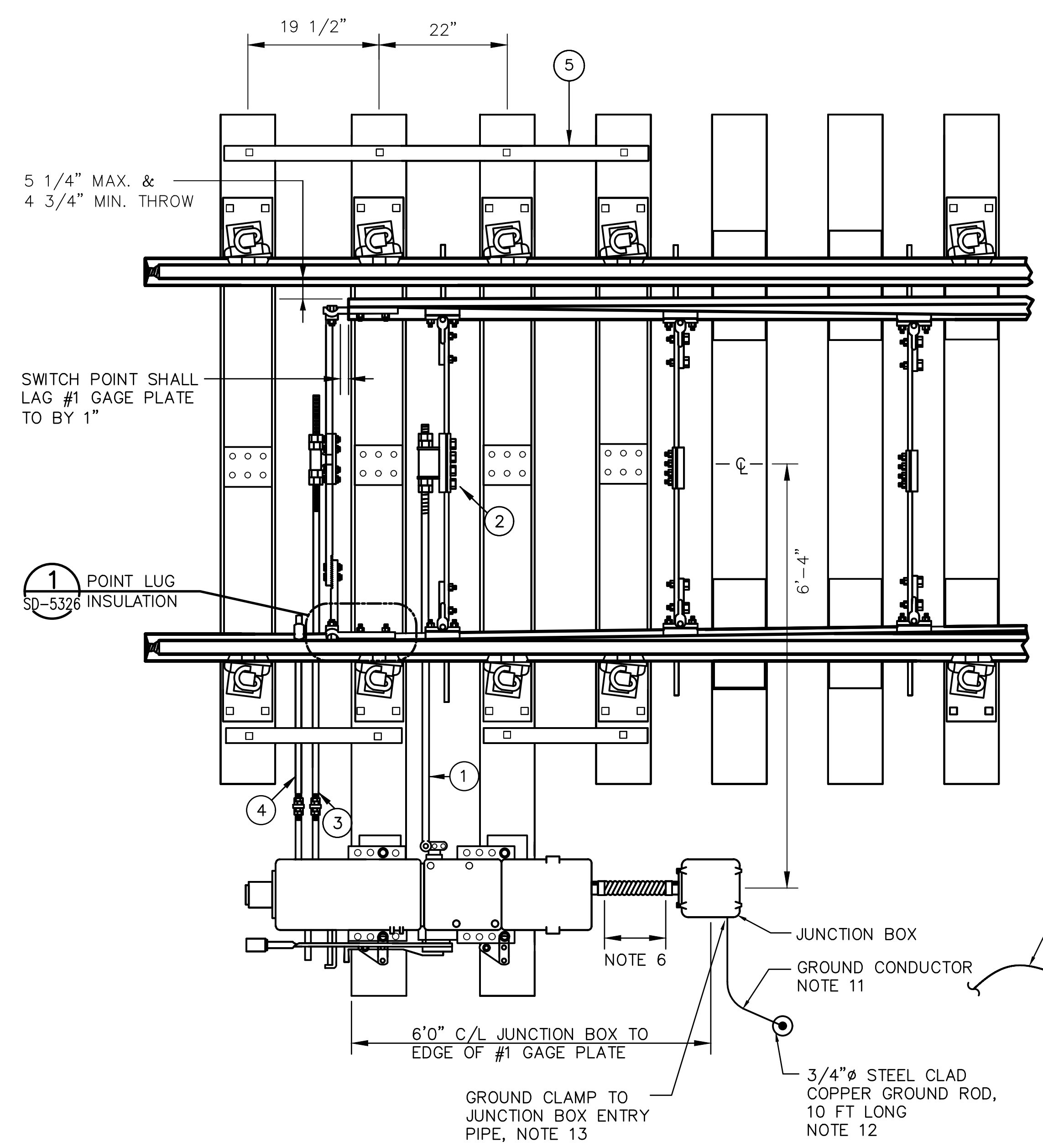
SIGNAL AND GRADE CROSSING SYSTEMS SWITCH APPARATUS

M-23A SWITCH MACHINE LAYOUT
NO. 10 OR NO. 14 CONCRETE TIES

CADD FILE NAME: SD-5308	
REV:	EDITION: FIFTH
SCALE: NTS	
STANDARD DRAWING NO.: SD-5308	



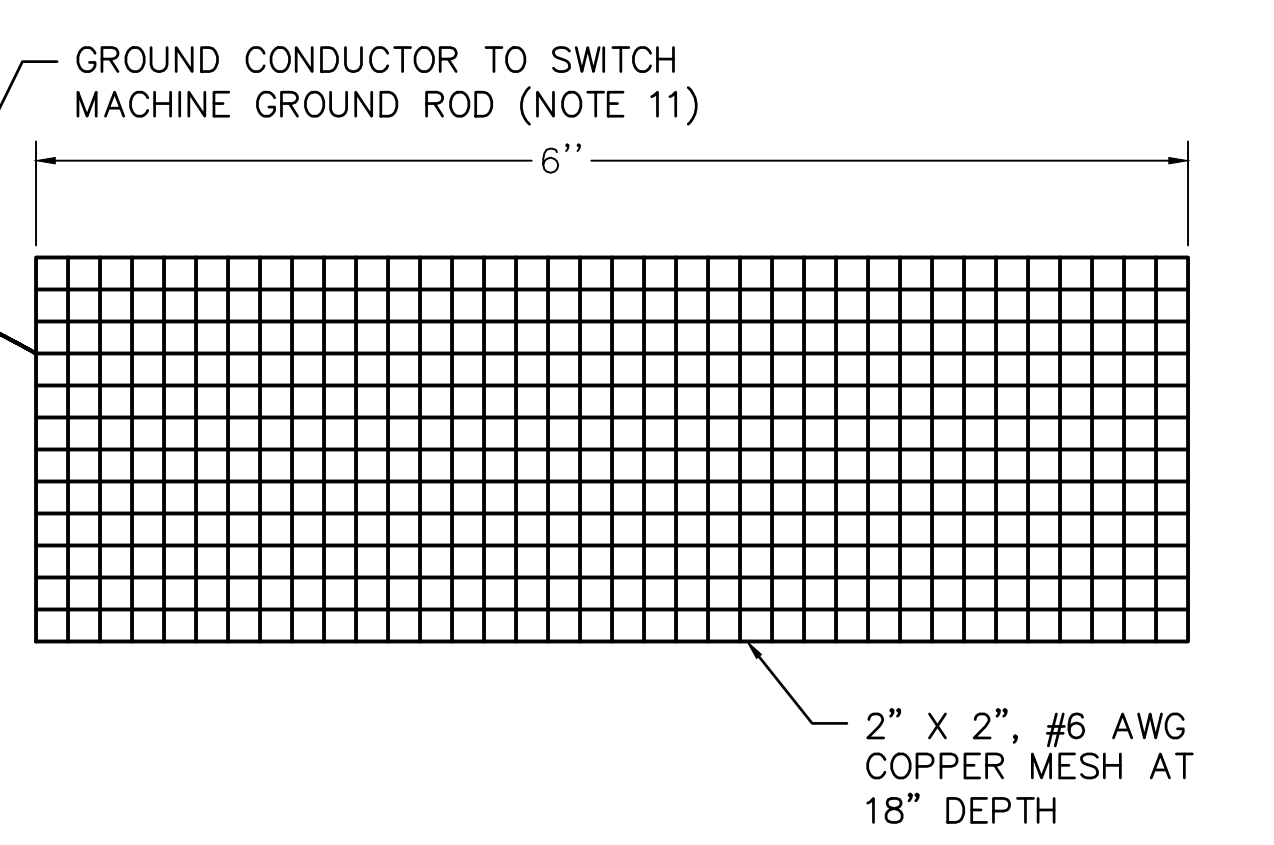
LEFT HAND MOUNTED
NO. 10 WOOD TIES
SPACING



RIGHT HAND MOUNTED
NO. 14 WOOD TIES
SPACING

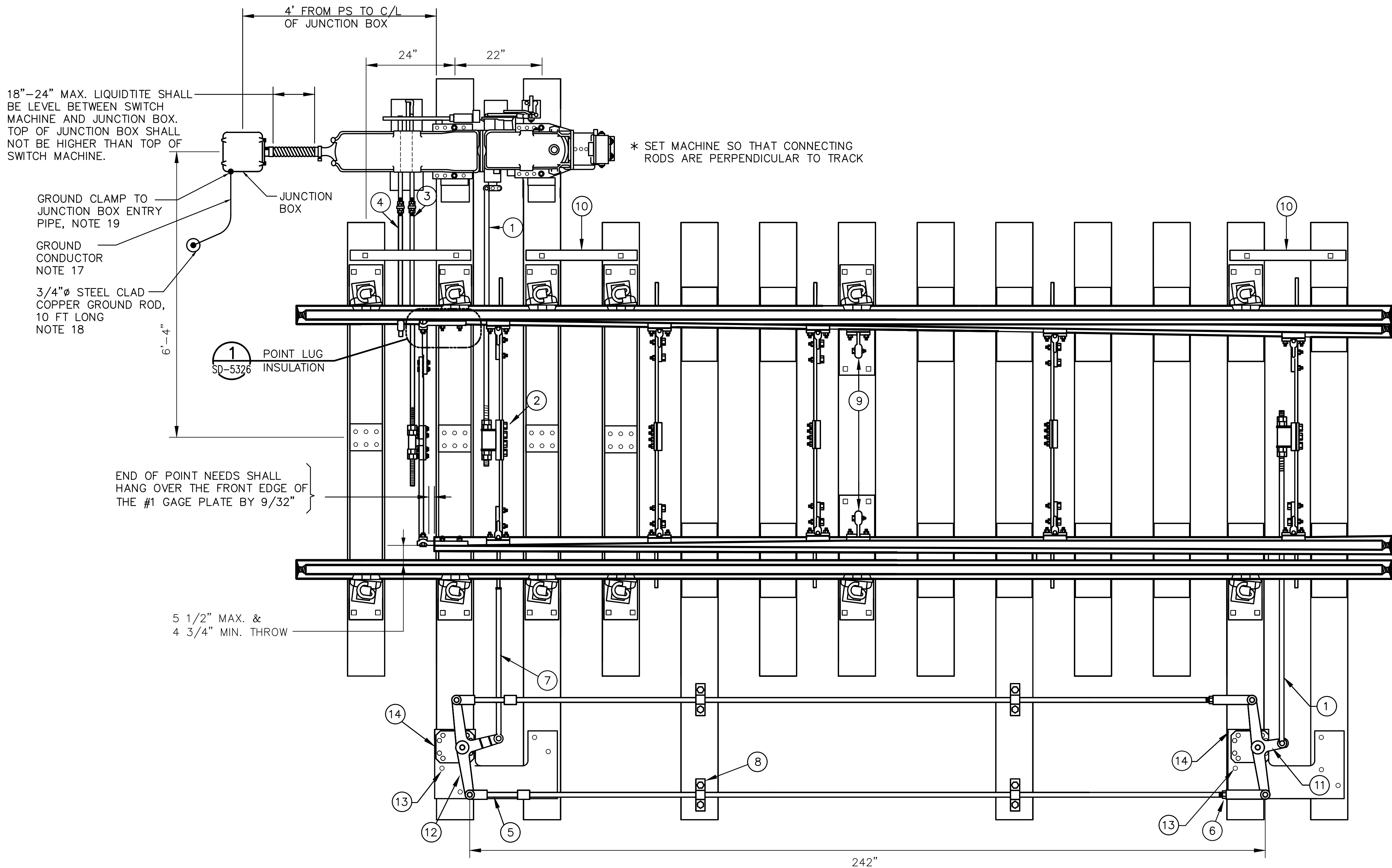
NOTES:

1. THROW ROD CUT OFF TO 74" LENGTH. REMOVE ALEMITE FITTING TURNED BOLT TO CLEAR COVER ON SWITCH MACHINE
2. SWITCH ADJUSTER, VERTICAL
3. LOCK ROD CONNECTION
4. POINT DETECTOR ROD
5. 1/2" X 2" STEEL STRAP CUT TO REQUIRED LENGTH AND DRILLED FOR 3/4" LAG SCREW
6. 18"-24" MAX. LIQUIDTITE SHALL BE LEVEL BETWEEN SWITCH MACHINE AND JUNCTION BOX. TOP OF JUNCTION BOX SHALL NOT BE HIGHER THAN TOP OF SWITCH MACHINE
7. FLEX CONDUIT TO BE STEEL CORE
8. SET MACHINE SO THAT CONNECTING RODS ARE PERPENDICULAR TO TRACK
9. REFER TO SD-2000 SERIES DRAWINGS FOR TIE SPACING AND LENGTH.
10. INSTALL POINT LUG INSULATION KIT. SEE DRAWING SD-5326 FOR INSTALLATION DETAILS.
11. CONDUCTORS USED FOR GROUNDING AND BONDING SHALL BE #4/0 AWG COPPER, ANNEALED AND SOFT DRAWN. INSTALL 1-FT BELOW GRADE.
12. GROUND RODS SHALL BE INSTALLED AT 1-FT BELOW GRADE AND A MINIMUM OF 1-FT FROM ANY EXPOSED OR UNDERGROUND STRUCTURES. BOND GROUND CONDUCTOR TO GROUND ROD PER EXOTHERMIC WELD OR IRREVERSIBLE COMPRESSION CLAMP.
13. SEE DRAWING E5205 DETAIL 8 FOR GROUND CLAMP TO JUNCTION BOX ENTRY PIPE. VERIFY JUNCTION BOX IS ELECTRICALLY ISOLATED FROM THE RAIL PRIOR TO INSTALLATION OF LOCAL GROUND ROD BOND.



GROUND MAT DETAIL
N.T.S.

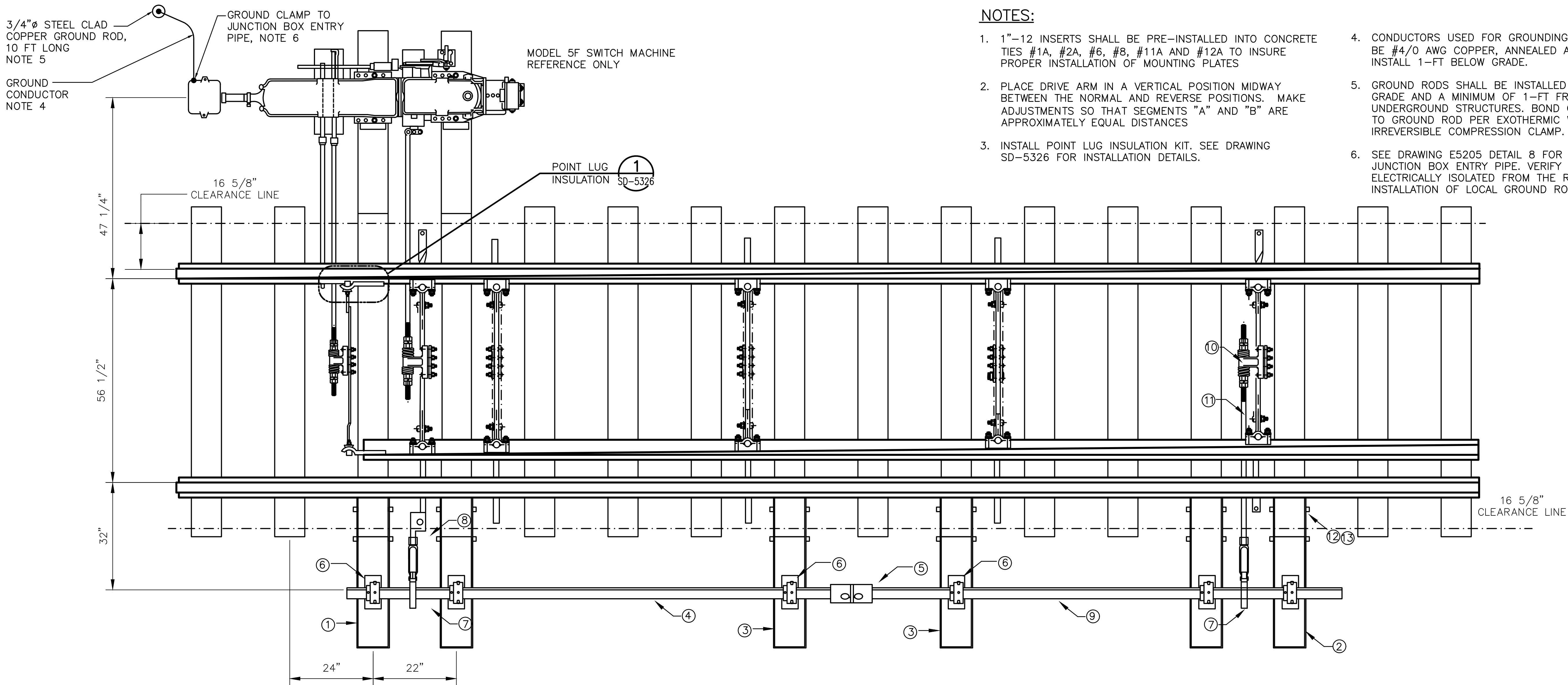
										PENINSULA CORRIDOR JOINT POWERS BOARD		ENGINEERING STANDARD DRAWINGS		CADD FILE NAME: SD-5309	
										APPROVED BY: <i>Bin Zhang</i>		SIGNAL AND GRADE CROSSING SYSTEMS SWITCH APPARATUS		REV:	EDITION: FIFTH
010126										FIFTH EDITION		M-23A SWITCH MACHINE LAYOUT NO. 10 OR NO. 14 WOOD TIES		SCALE: NTS	
REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP				STANDARD DRAWING NO.: SD-5309	



NOTES:

1. THROW ROD CUT OFF TO 74" LENGTH. REMOVE ALEMITE FITTING TURNED BOLT TO CLEAR COVER ON SWITCH MACHINE
2. SWITCH ADJUSTER, VERTICAL
3. LOCK ROD CONNECTION
4. POINT DETECTOR ROD
5. SOLID JAW
6. SCREW JAW
7. ADJUSTABLE LINK
8. PIPE GUIDE
9. SWITCH POINT ROLLER, GW-9 (TWO PER SET, 3 SETS PER SWITCH)
10. 2 IN X 1/2 IN STEEL STRAPS
11. "T" CRANK STAND ASSEMBLY (SHORT)
12. "T" CRANK STAND ASSEMBLY (LONG)
13. SCREW, 3/4 IN X 6 IN LAGS
14. CRANK STAND BASE
15. FOR TIE LENGTH AND TIE SPACING REFER TO SD-2000 SERIES DRAWINGS.
16. INSTALL POINT LUG INSULATION KIT. SEE DRAWING SD-5326 FOR INSTALLATION DETAILS.
17. CONDUCTORS USED FOR GROUNDING AND BONDING SHALL BE #4/0 AWG COPPER, ANNEALED AND SOFT DRAWN. INSTALL 1-FT BELOW GRADE.
18. GROUND RODS SHALL BE INSTALLED AT 1-FT BELOW GRADE AND A MINIMUM OF 1-FT FROM ANY EXPOSED OR UNDERGROUND STRUCTURES. BOND GROUND CONDUCTOR TO GROUND ROD PER EXOTHERMIC WELD OR IRREVERSIBLE COMPRESSION CLAMP.
19. SEE DRAWING E5205 DETAIL 8 FOR GROUND CLAMP TO JUNCTION BOX ENTRY PIPE. VERIFY JUNCTION BOX IS ELECTRICALLY ISOLATED FROM THE RAIL PRIOR TO INSTALLATION OF LOCAL GROUND ROD BOND.

										PENINSULA CORRIDOR JOINT POWERS BOARD		ENGINEERING STANDARD DRAWINGS		CADD FILE NAME: SD-5311	
										APPROVED BY: <i>Bin Zhang</i>		SIGNAL AND GRADE CROSSING SYSTEMS SWITCH APPARATUS		REV:	EDITION: FIFTH
										DIRECTOR, ENGINEERING		Caltrain®		SCALE:	NTS
												5F SWITCH MACHINE LAYOUT NO. 20 TURNOUT, LEFT MOUNTED		STANDARD DRAWING NO.: SD-5311	
010126					FIFTH EDITION										
REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP	DESCRIPTION				



NOTES:

1. 1"-12 INSERTS SHALL BE PRE-INSTALLED INTO CONCRETE TIES #1A, #2A, #6, #8, #11A AND #12A TO INSURE PROPER INSTALLATION OF MOUNTING PLATES
2. PLACE DRIVE ARM IN A VERTICAL POSITION MIDWAY BETWEEN THE NORMAL AND REVERSE POSITIONS. MAKE ADJUSTMENTS SO THAT SEGMENTS "A" AND "B" ARE APPROXIMATELY EQUAL DISTANCES
3. INSTALL POINT LUG INSULATION KIT. SEE DRAWING SD-5326 FOR INSTALLATION DETAILS.
4. CONDUCTORS USED FOR GROUNDING AND BONDING SHALL BE #4/0 AWG COPPER, ANNEALED AND SOFT DRAWN. INSTALL 1-FT BELOW GRADE.
5. GROUND RODS SHALL BE INSTALLED AT 1-FT BELOW GRADE AND A MINIMUM OF 1-FT FROM ANY EXPOSED OR UNDERGROUND STRUCTURES. BOND GROUND CONDUCTOR TO GROUND ROD PER EXOTHERMIC WELD OR IRREVERSIBLE COMPRESSION CLAMP.
6. SEE DRAWING E5205 DETAIL 8 FOR GROUND CLAMP TO JUNCTION BOX ENTRY PIPE. VERIFY JUNCTION BOX IS ELECTRICALLY ISOLATED FROM THE RAIL PRIOR TO INSTALLATION OF LOCAL GROUND ROD BOND.

ITEM #	DESCRIPTION	QUANTITY
1	MOUNTING PLATE, POINT END PILLOW BLOCK	1
2	MOUNTING PLATE, HEEL END PILLOW BLOCK	1
3	MOUNTING PLATE, MID POINT PILLOW BLOCK	2
4	DRIVE BAR, 2" X 2" X 144" LONG	2
5	DRIVE BAR COUPLING ASSEMBLY	1
6	PILLOW BLOCK ASSEMBLY	4
7	DRIVE ARM ASSEMBLY	2
8	FRONT ROD ASSEMBLY	1
9	DRIVE BAR, 2" X 2" X 144" LONG	1
10	BASKET ASSEMBLY	1
11	REAR DRIVE ROD ASSEMBLY	1
12	LOCK WASHER, 1" EXTRA DUTY, ZINC/YELLOW	32
13	BOLT, 1"-8 X 3" HEAVY HEX, ZINC/YELLOW	32
14	VERTICAL CONNECTION ADAPTER	1
15	BOLT ASSEMBLY	1

PENINSULA CORRIDOR JOINT POWERS BOARD

ENGINEERING STANDARD DRAWINGS

APPROVED BY:
Bin Zhang
DIRECTOR, ENGINEERING

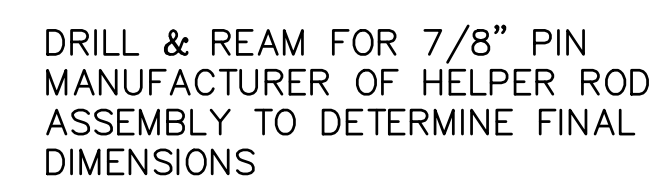
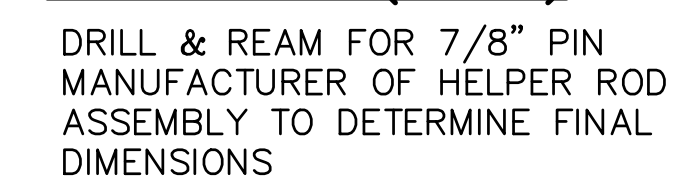
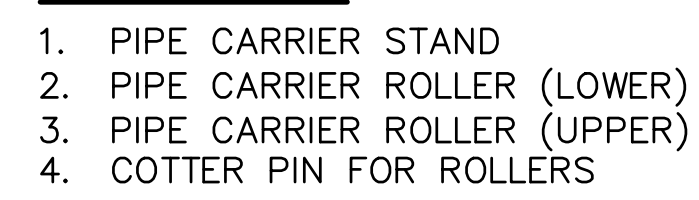




SIGNAL AND GRADE CROSSING SYSTEMS
SWITCH APPARATUS

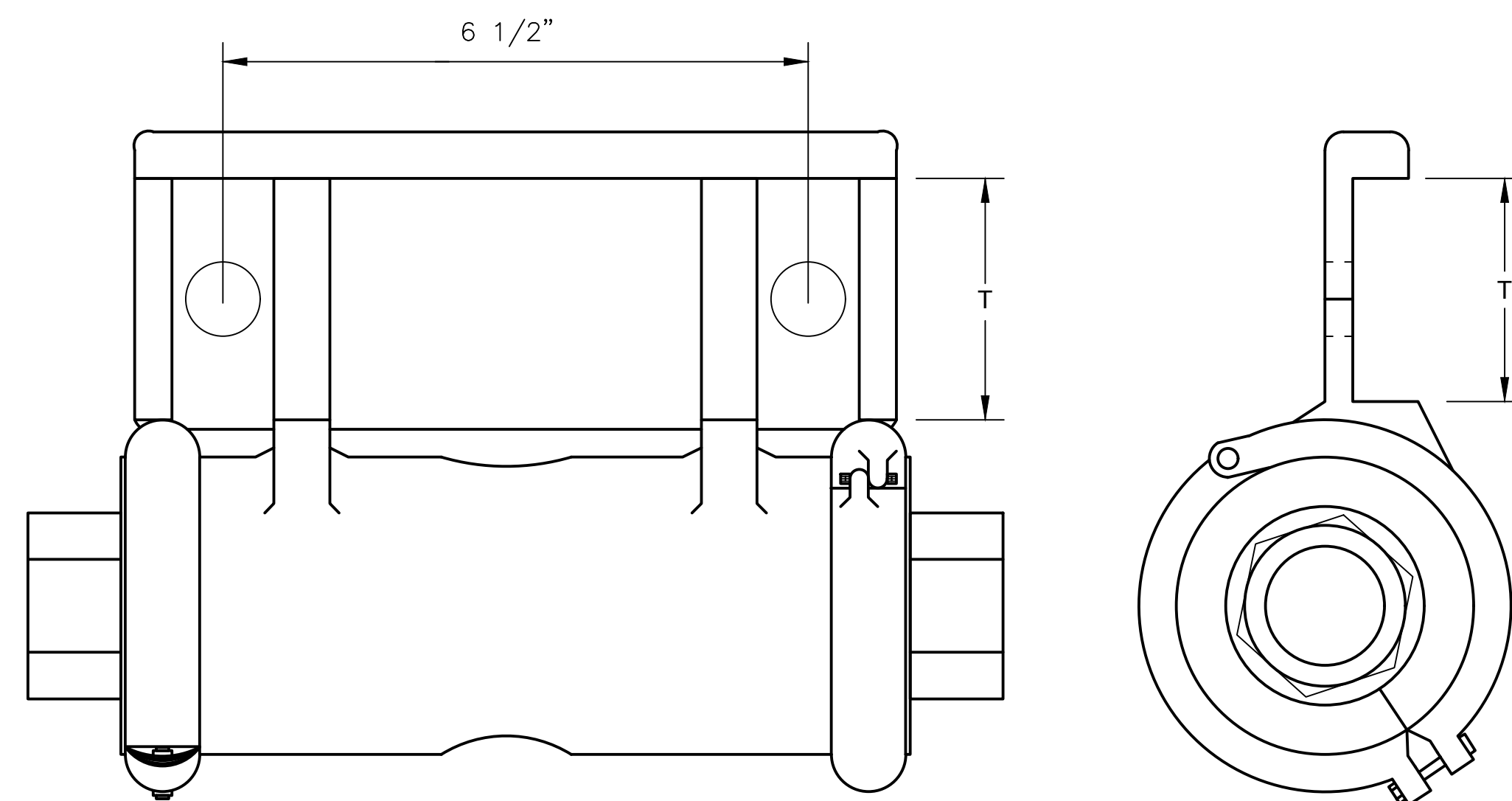
ROTATING HELPER ROD ASSEMBLY
LAYOUT, NO. 20 CONCRETE TIES

CADD FILE NAME:
SD-5314
REV: EDITION:
FIFTH
SCALE:
NTS
STANDARD DRAWING NO.:
SD-5314

REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP	DESCRIPTION
010126					FIFTH EDITION						



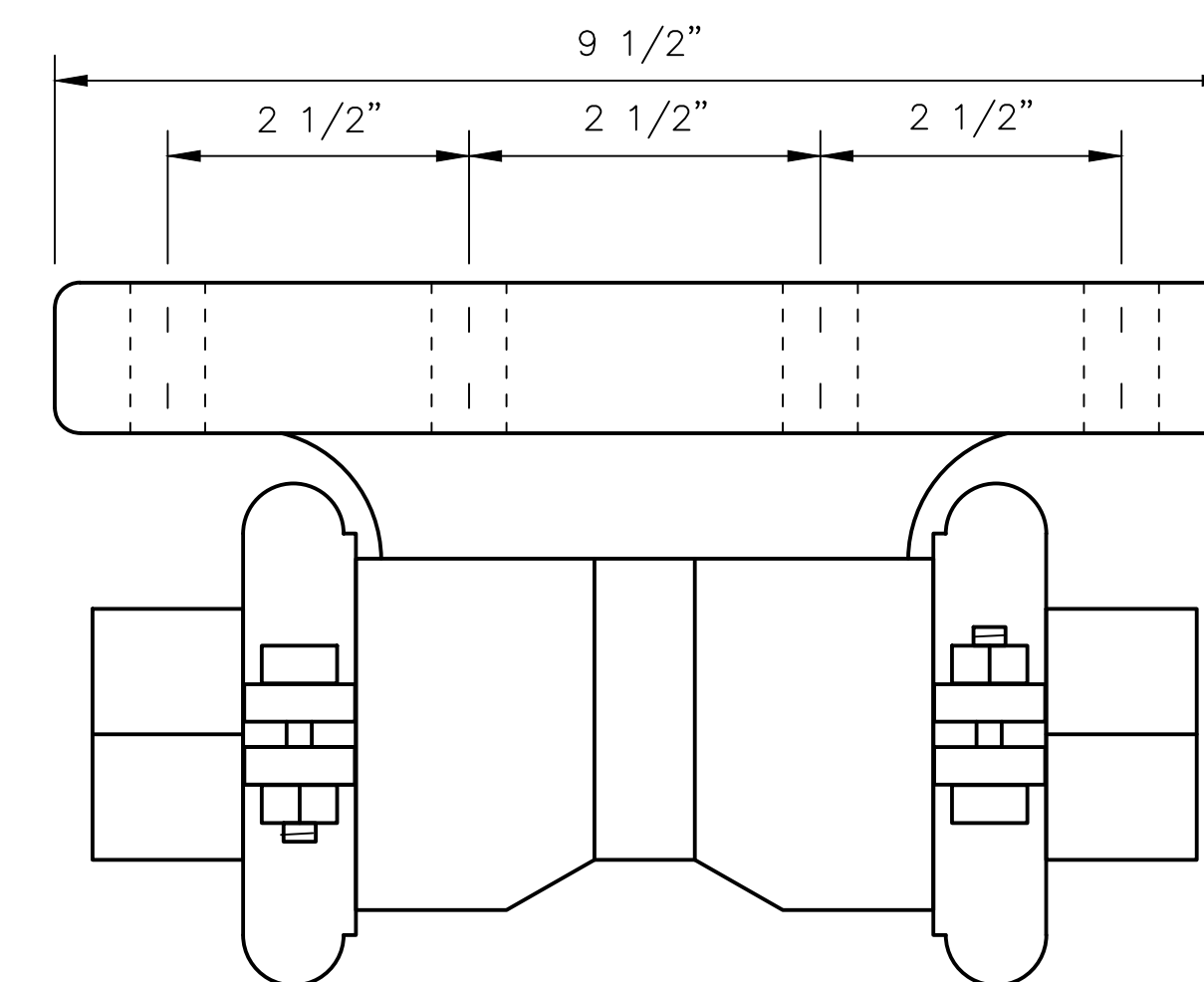
												PENINSULA CORRIDOR JOINT POWERS BOARD						ENGINEERING STANDARD DRAWINGS						CADD FILE NAME: SD-5316								
												<div>APPROVED BY:  DIRECTOR, ENGINEERING</div>						<div></div>						SIGNAL AND GRADE CROSSING SYSTEMS SWITCH APPARATUS						REV:	EDITION: FIFTH	
																								TYPICAL "T" CRANK AND PIPE GUIDE AUXILIARY CONNECTION						SCALE: NTS		
010126 FIFTH EDITION																		STANDARD DRAWING NO.: SD-5316														
REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP	DESCRIPTION																					



SWITCH ADJUSTER FOR HORIZONTAL SWITCH RODS

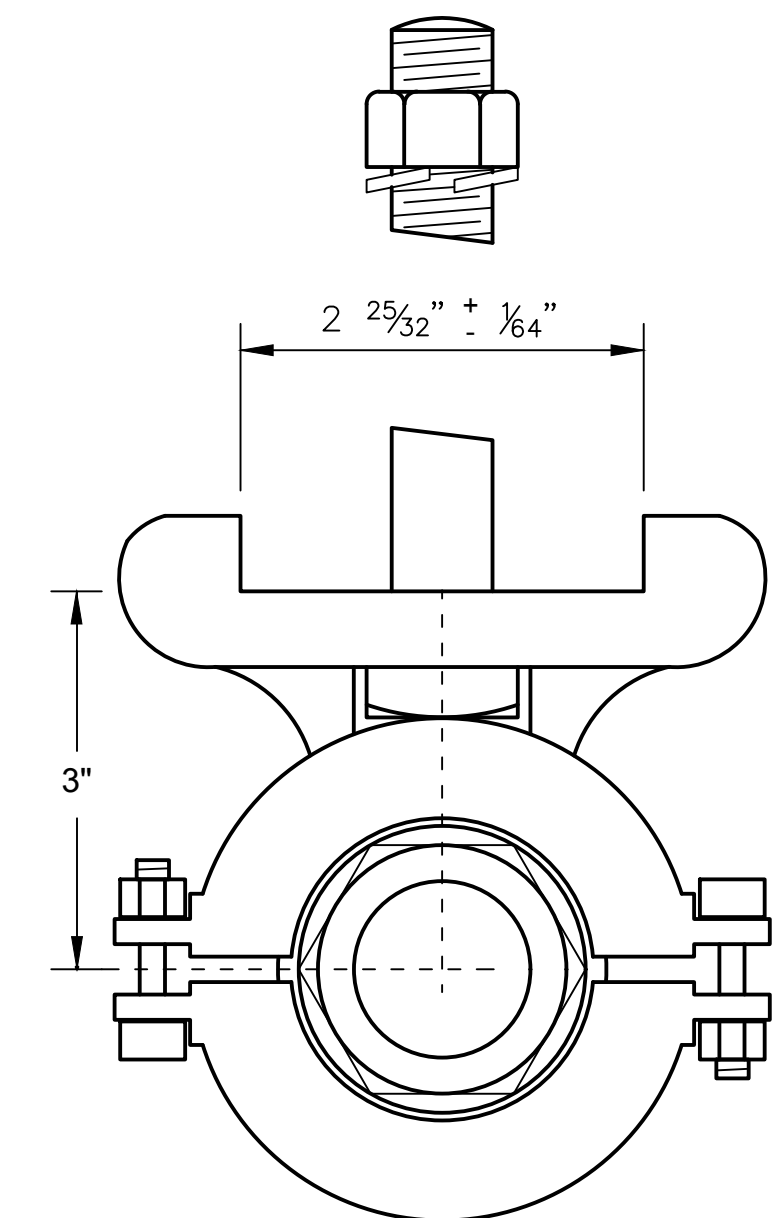
BOSSERT ADJUSTERS SHALL BE FURNISHED COMPLETE
WITH ADJUSTING NUTS AND MOUNTING BOLTS

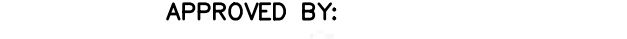

BOSSERT STYLE	WIDTH "T" (IN.)	SIZE (IN.)	QTY.	FOR USE WITH
2B	2 5/8"	3/4 X 3	2	75-119# RAIL
2B-3	3 3/16"	3/4 X 3 1/2	2	131-136# RAIL

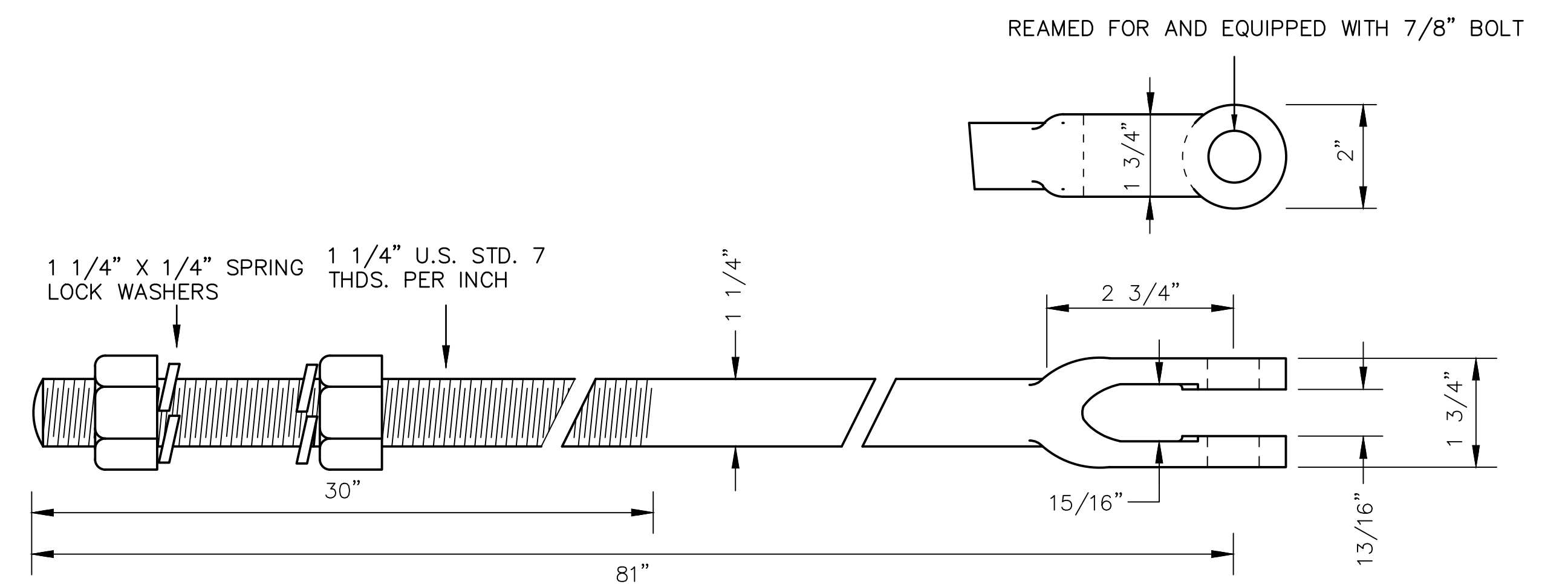
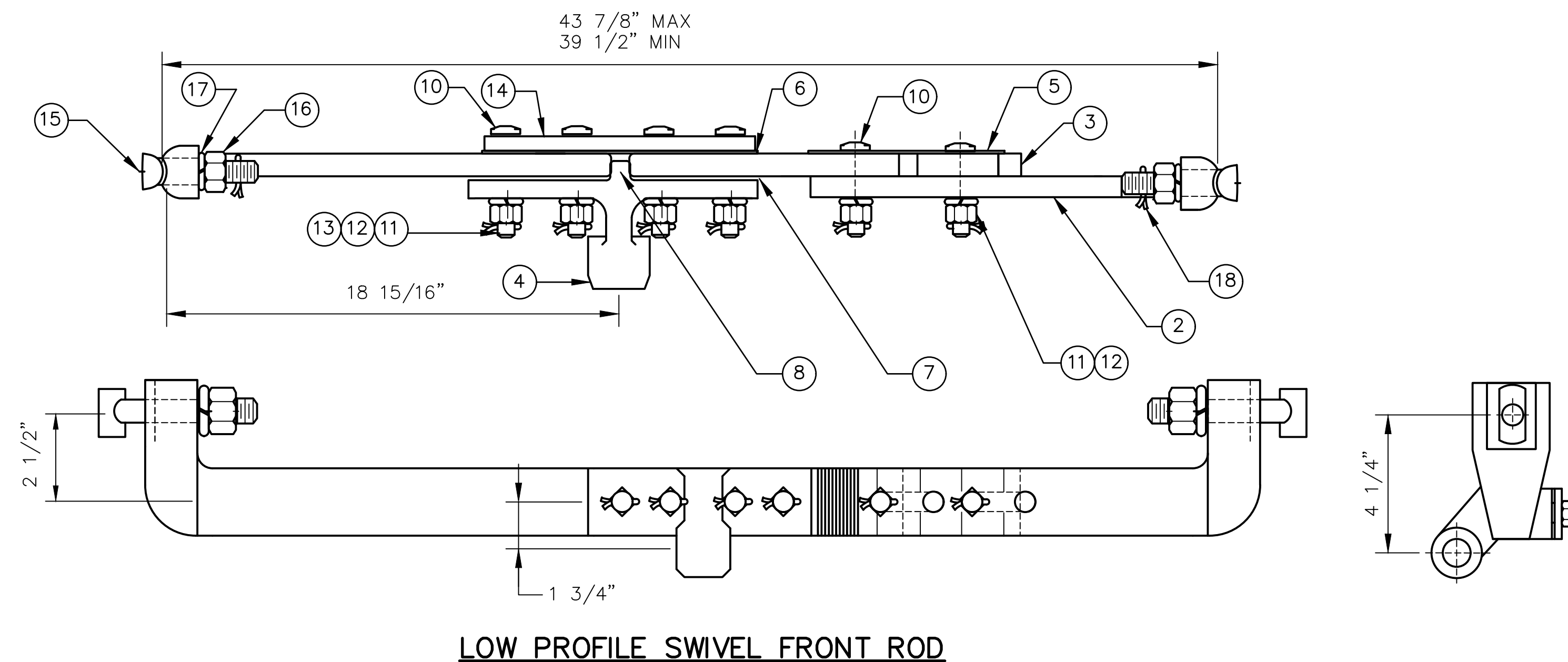
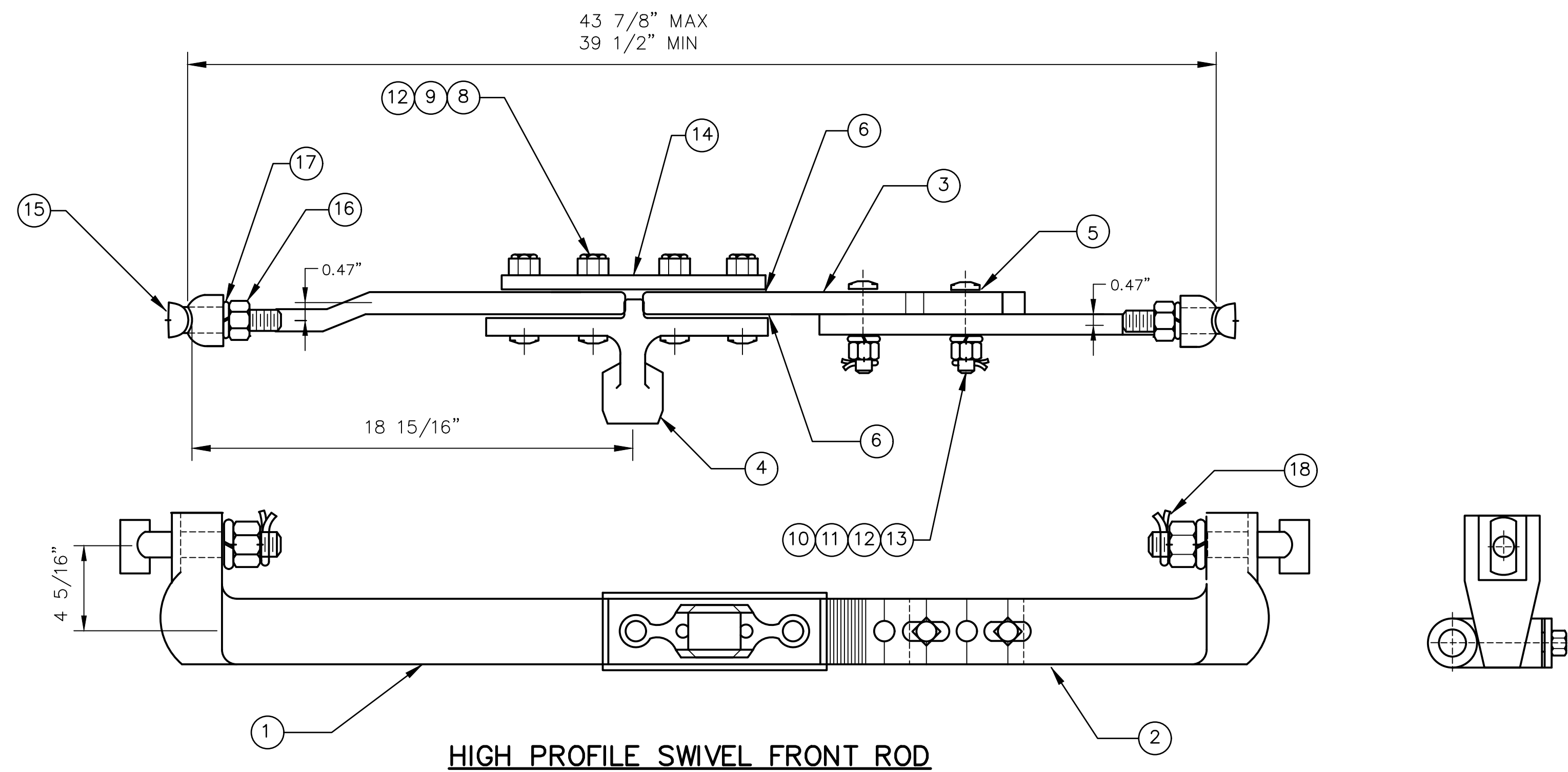


SWITCH ADJUSTER FOR VERTICAL SWITCH RODS

ADJUSTER SHALL BE FURNISHED COMPLETE WITH
ADJUSTING NUTS AND FOUR 3/4" X 4" MOUNTING
BOLTS. (FURNISHED WITH RACOR TYPE MJ ROD)



												PENINSULA CORRIDOR JOINT POWERS BOARD						ENGINEERING STANDARD DRAWINGS						CADD FILE NAME: SD-5317							
												<div>APPROVED BY:  DIRECTOR, ENGINEERING</div>												SIGNAL AND GRADE CROSSING SYSTEMS SWITCH APPARATUS						REV:	EDITION: FIFTH
																								SCALE: NTS						STANDARD DRAWING NO.: SD-5317	
010126 FIFTH EDITION																															
REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP	DESCRIPTION																				





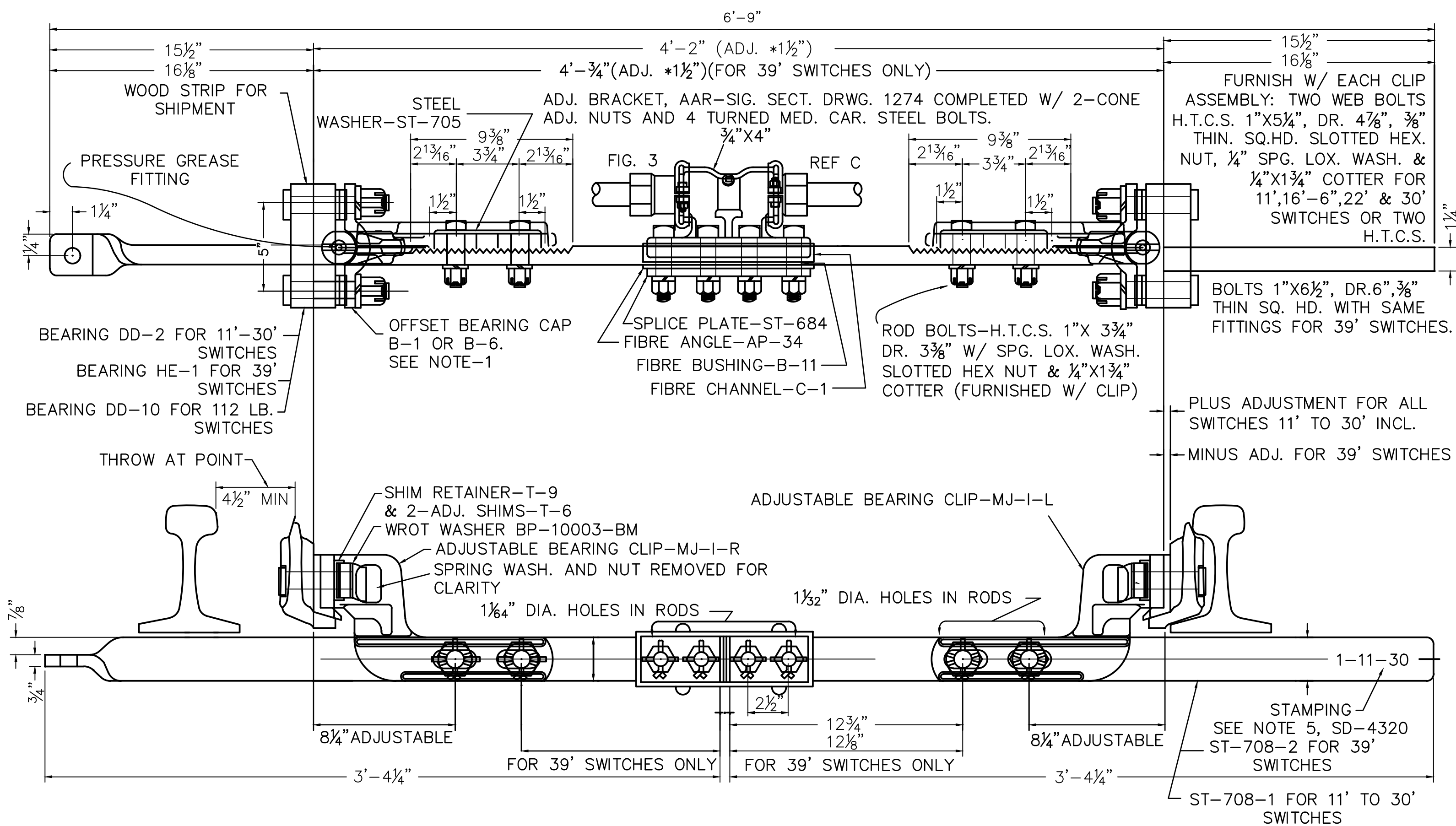
ITEM #	DESCRIPTION / MATERIAL/ APPROX. SIZE
1	SWIVEL FRONT ROD
2	ADJUSTABLE SWIVEL FRONT BAR
3	ADJUSTMENT BAR
4	FRONT LUG
5	PLATE WASHER
6	INSULATION, PLATE
7	INSULATION, L-SHAPE
8	INSULATION BUSHING, ϕ 1" OD X ϕ .766 ID X 1 7/32 LG
9	BOLT. 3/4-10 X 2 3/4" HEX HEAD
10	BOLT. 3/4-10 X 3 3/4" LONG SQ HD DR FOR 3/16 COTTER @ 3 7/16"
11	NUT, 3/4-10 HEAVY SQ. HD.
12	LOCK WASHER, 3/4" HEAVY
13	COTTER PIN, 3/16 X 1 3/4" LONG
14	SPLICE PLATE
15	T BOLT - FRONT ROD, SWIVEL STYLE
16	NUT 1 1/4-7 HEAVY HEX HD.
17	LOCK WASHER, 1 1/4 HEAVY
18	COTTER PIN 1/4" X 2 1/2" LG.
19	COTTER PIN 1 1/4 X 3"

NOTE:

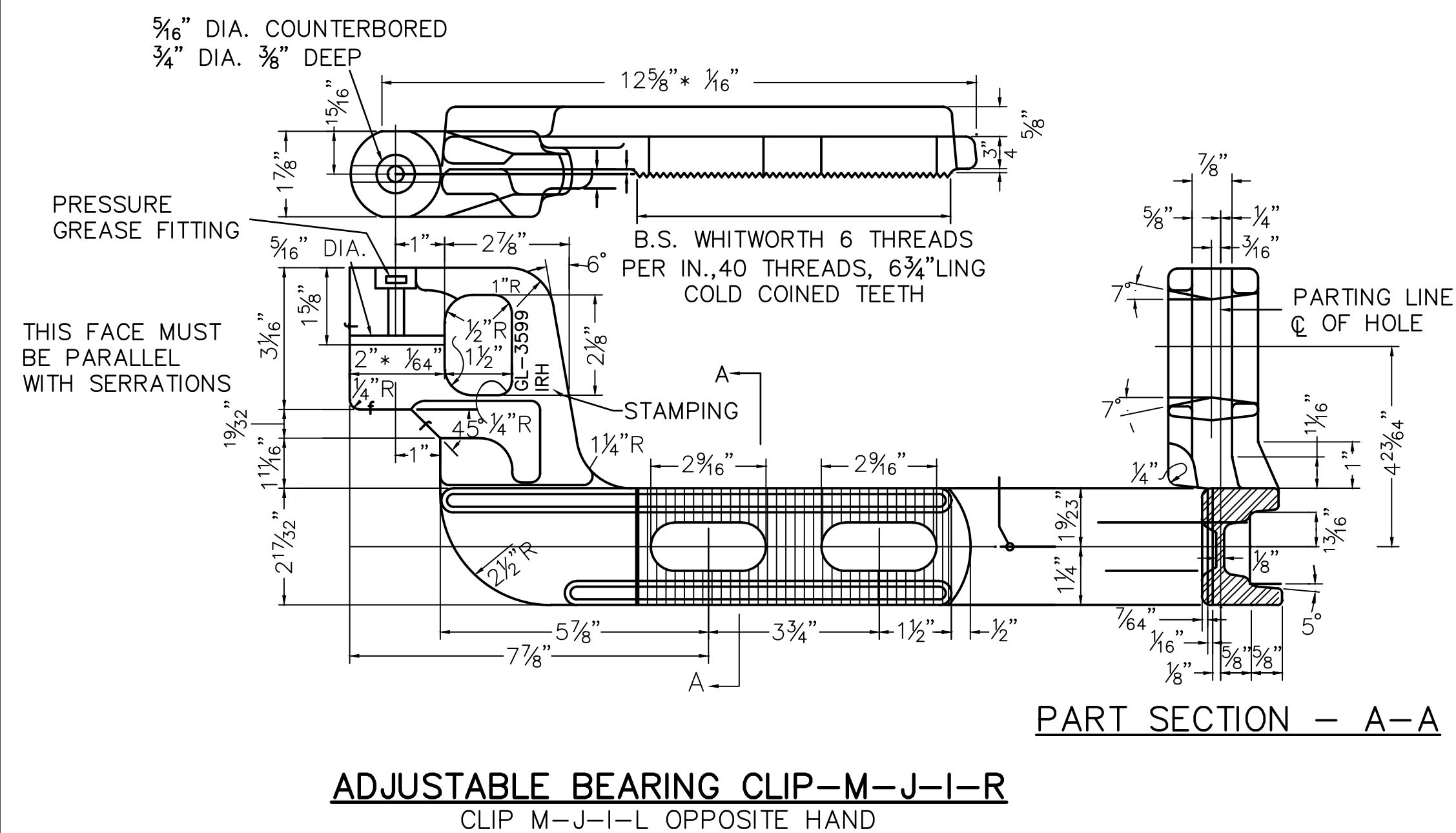
THROW RODS SHALL BE MADE FROM 1 1/4" ROUND BAR STOCK, FURNISHED WITH ONE 7/8" TURNED BOLT, 2 HEXAGONAL NUTS AND 2 SPRING WASHERS, AS SHOWN. NO WELDING OF ROD IS PERMITTED.

	010126				FIFTH EDITION									
REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP				

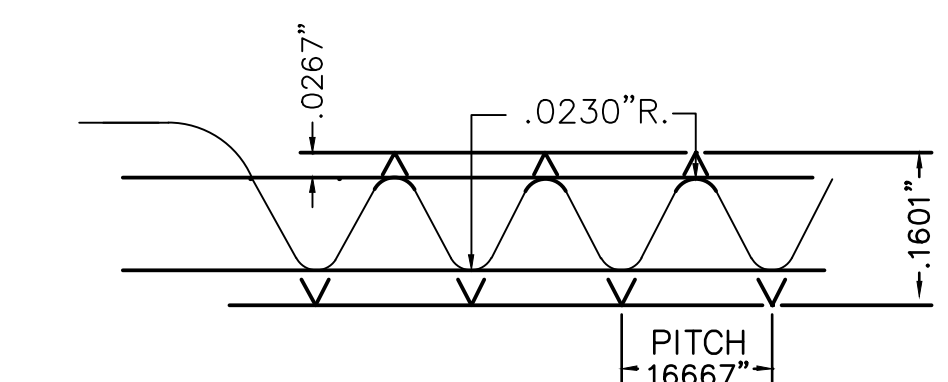
PENINSULA CORRIDOR JOINT POWERS BOARD		ENGINEERING STANDARD DRAWINGS		CADD FILE NAME: SD-5319	
APPROVED BY:  DIRECTOR, ENGINEERING				REV: EDITION: FIFTH	
		SIGNAL AND GRADE CROSSING SYSTEMS SWITCH APPARATUS		SCALE: NTS	
		THROW ROD AND SWIVEL ROD FOR SWITCH MACHINE		STANDARD DRAWING NO.: SD-5319	



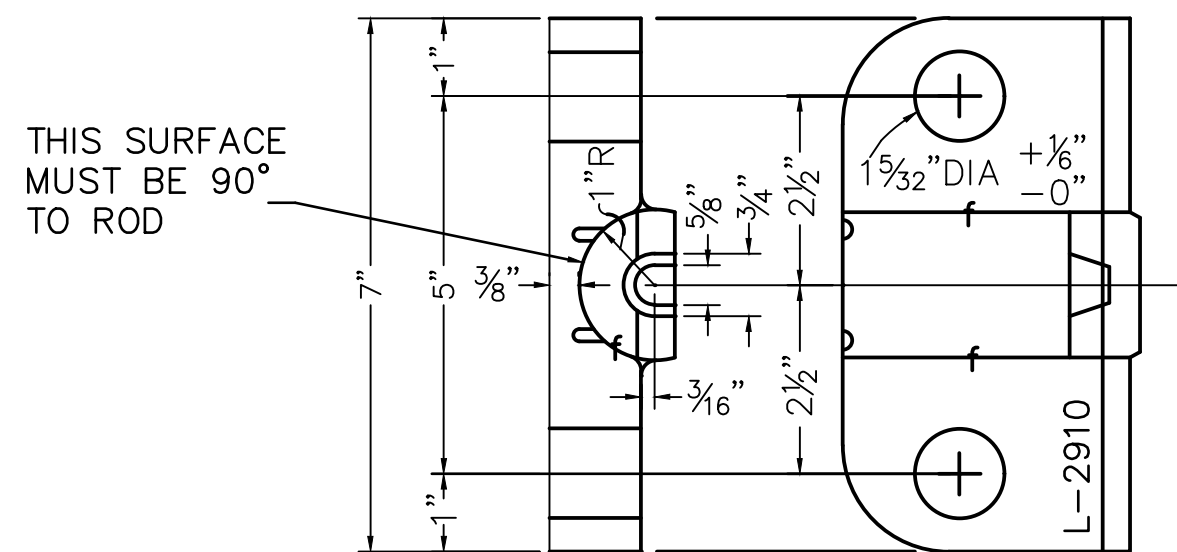
NO.1 SWITCH ROD ASSEMBLY
(SHOW ON MACHINE ON RIGHT)
SEE NOTE-2



ADJUSTABLE BEARING CLIP-M-J-I-R
CLIP M-J-I-L OPPOSITE HAND



ENLARGED PROFILE OF SERRATIONS



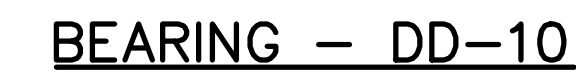
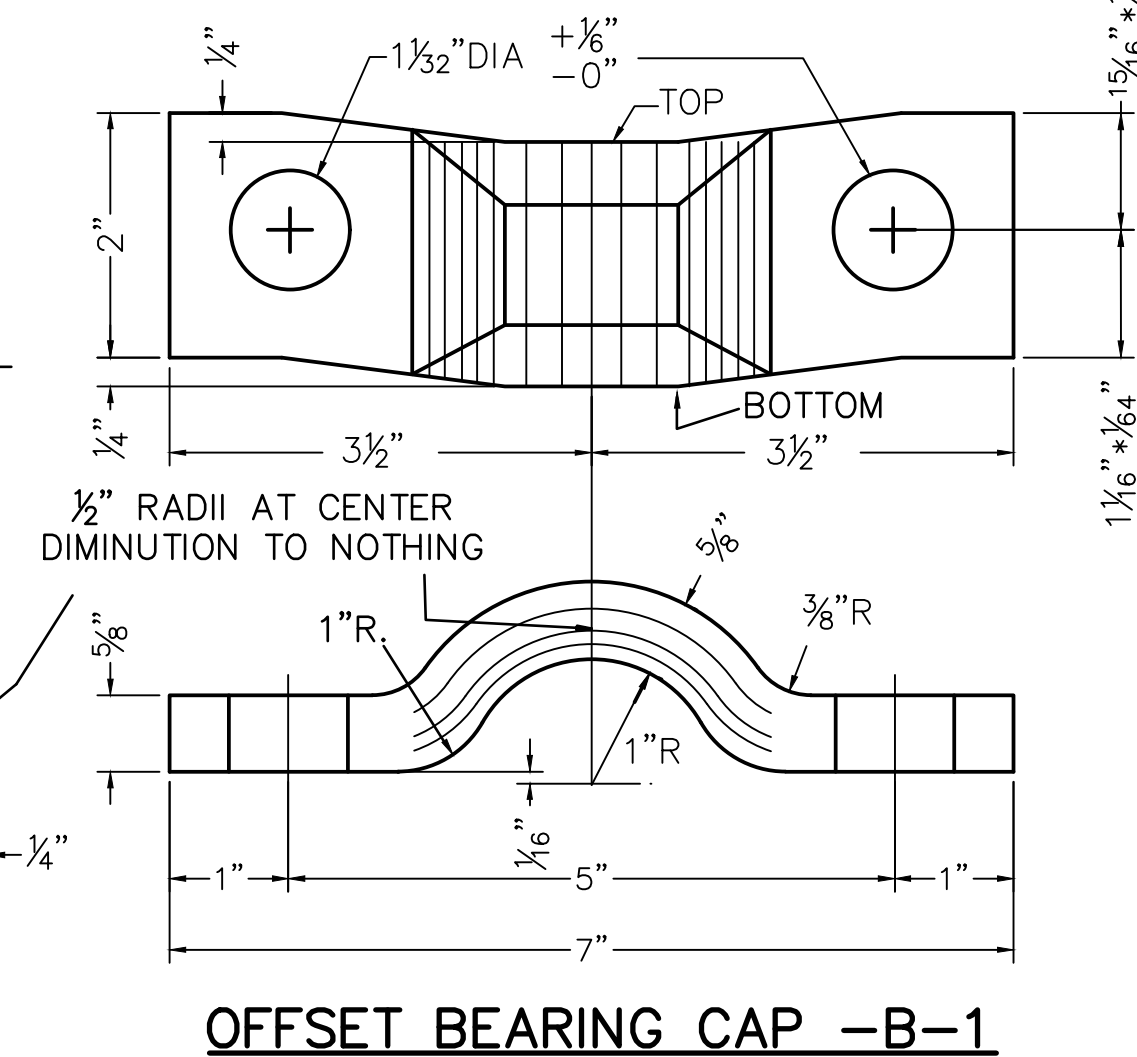
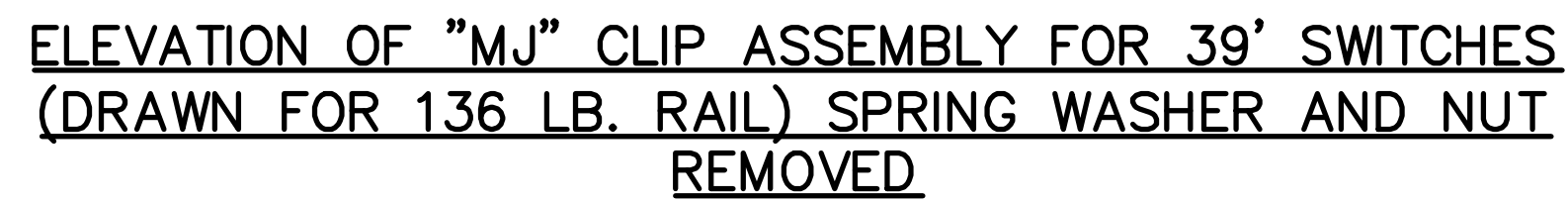
BEARING - DD-2

WEIGHT OF RAIL & LENGTH OF SWITCH	BILL OF MATERIAL FOR 1 TYPE "MJ" SWITCH ROD ASSEMBLY					4603-1
	# REQ'D.	PART #	MATERIAL SPECIF.	DESCRIPTION	DETAIL REMARKS	
ALL	1	M-J-I-L	S.A.E.1020-FOR.STL.	L.H. BEARING CLIP	GL-3598, LH, MACHINED PER DETAIL	
ALL	1	M-J-I-R	S.A.E.1020-FOR.STL.	R.H. BEARING CLIP	GL-3599, RH, MACHINED PER DETAIL	
ALL	4		H.T.C.S.	WEB BOLT	SEE NOTE	
115 TO 136 11' TO 30'	2	DD-2	MALLEABLE IRON	BEARING	PATT. NO. L-2910, MACHINED PER DETAIL	
11' TO 30'	2	DD-10	MALLEABLE IRON	BEARING	PATT. NO. L-2910, MACHINED PER DETAIL	
132 & 136 39'	2	HE-1	MALLEABLE IRON	BEARING	PATT. NO. L-2915, MACHINED PER DETAIL	
115 TO 136 11' TO 30'	2	B-1	S.A.E.1045-FOR.STL.	OFFSET BEARING CAP	HEAT TREATED-BRINDELL-.225 TO .250	
132 & 136 39'	2	B-6	S.A.E.1045-FOR.STL.	OFFSET BEARING CAP	HEAT TREATED-BRINDELL-.225 TO .250	
11' TO 30'	2	B-6	S.A.E.1045-FOR.STL.	OFFSET BEARING CAP	HEAT TREATED-BRINDELL-.225 TO .250	
ALL	4	T-9	S.A.E.1020	SHIM RETAINER	1/8" X 2 3/4" X 2 1/4"	
ALL	12	T-6	STAINLESS STEEL	ADJUSTMENT SHIM	1/16" X 2" X 1 3/4"	
ALL	4	BP-10003-BM	WROT IRON	WROT WASHER	1 1/16" I.D. X 2" O.D. X 1/8" THICK	
ALL	4		H.T.C.S.	ROD BOLT	1" X 3 3/4" DR. 3 3/8" REG. SQ. HD. SLOTTED HEX NUT	
ALL	4		STEEL	SPG. LOX WASHER	FOR 1" ROD BOLTS	
ALL	4		STEEL	COTTER	1/4" X 1 3/4" FOR ROD BOLTS	
ALL	2		STEEL	GREASE FITTING	PRESSURE - FOR BEARING CLIP	
ALL	2	ST-705	S.A.E.1020	STEEL WASHER	1/4" X 1 3/8" X 6 1/4" - FOR ROD BOLTS	
115 TO 136 11' TO 30'	2		WOOD	FILLER STRIP	2" X 7" X 1 1/2" THICK - FOR SHIPPING	
132 & 136 39'	2		WOOD	FILLER STRIP	2" X 7" X 2 1/2" THICK - FOR SHIPPING	
MATERIAL FOR VERTICAL ROD						
112 TO 136 11' TO 30'	1			VERTICAL ROD	USE ONE-ST-708-1	TWIST MACHINE AND DRILL END HOLE.
				VERTICAL ROD	USE ONE-ST-708-1	
132 & 136 39'	1			VERTICAL ROD	USE ONE-ST-708-2	TWIST MACHINE AND DRILL END HOLE.
				VERTICAL ROD	USE ONE-ST-708-2	
ALL	4		MED.CARBON STEEL	CONN.& INSUL. BOLT	3/4" X 4"-TURNED, A.S.A. REG. HEX. NUT	
ALL	4		STEEL	SPRING WASHER	1/4" THICK	
ALL	4		STEEL	COTTER	3/16" X 1 1/2"	
ALL	1	ST-684	H.R. MILD STEEL	SPLICE PLATE	1/2" X 2 1/2" X 9 1/2" FOR INSULATION	
ALL	2	AP-34	AAR-SIG.SEC.13-52	ANGLE	1/8" X 2 1/2" X 4 13/16" HARD FIBRE-PARAFIN COATED	
ALL	4	B-11	AAR-SIG.SEC.13-52	BUSHING	1" O.D. HARD FIBRE-PARAFIN COATED	
ALL	1	C-1	AAR-SIG.SEC.13-52	CHANNEL	1/8" X 1" X 10" HARD FIBRE-PARAFIN COATED	
ALL	1		MALLEABLE IRON	ADJUSTMENT BRACKET		
ALL	2		MALLEABLE IRON	CONE ADJ. NUT	FOR 1 1/4" THROW ROD	

- NOTES:**
- PARTS MAY BE PROCURED SEPARATELY. WHEN A BEARING CLIP ASSEMBLY ONLY IS REQUIRED, SPECIFY WHETHER IT IS FOR CLIP MJ-I-R OR MJ-I-L INCLUDING RAIL SECTION AND LENGTH OF SWITCH. ALL PARTS SHOWN IN BILL OF MATERIAL SHALL BE FURNISHED WITH CLIP ASSEMBLIES
 - WHEN AN INDIVIDUAL PART IS REQUIRED, ORDER BY PART NUMBER. CLIP ASSEMBLIES TO BE USED ON 112-LB. SWITCHES SHALL HAVE BEARING CAP B-6 APPLIED WITH THE BOTTOM SIDE UP AS SHOWN IN ELEVATION ON SHEET-2 OF THIS DRAWING IN ORDER TO SEAT CLIP ON BEARING AT PROPER HEIGHT
 - WHEN COMPLETE RODS ARE ORDERED THEY SHALL BE ASSEMBLED AND INCLUDE ALL PARTS SHOWN IN BILL OF MATERIAL. ORDERS SHALL SPECIFY RAIL SECTION AND LENGTH OF SWITCH. ON INTERLOCKED SWITCHES WITH AUXILIARY THROW ROD, MACHINE SIDE (RIGHT OR LEFT) SHALL ALSO BE SPECIFIED. HOWEVER, THE TWISTED END OF ROD MAY BE POSITIONED FOR OPPOSITE SIDE OF SWITCH BY REMOVING THE ROD BOLTS AND TURNING ROD PORTION OF ASSEMBLY END FOR END 180°
- (NOTES CONTINUED ON SHEET 2 OF 2)

FOR 112, 115, 119, 131, 132, AND 136 LB RAIL

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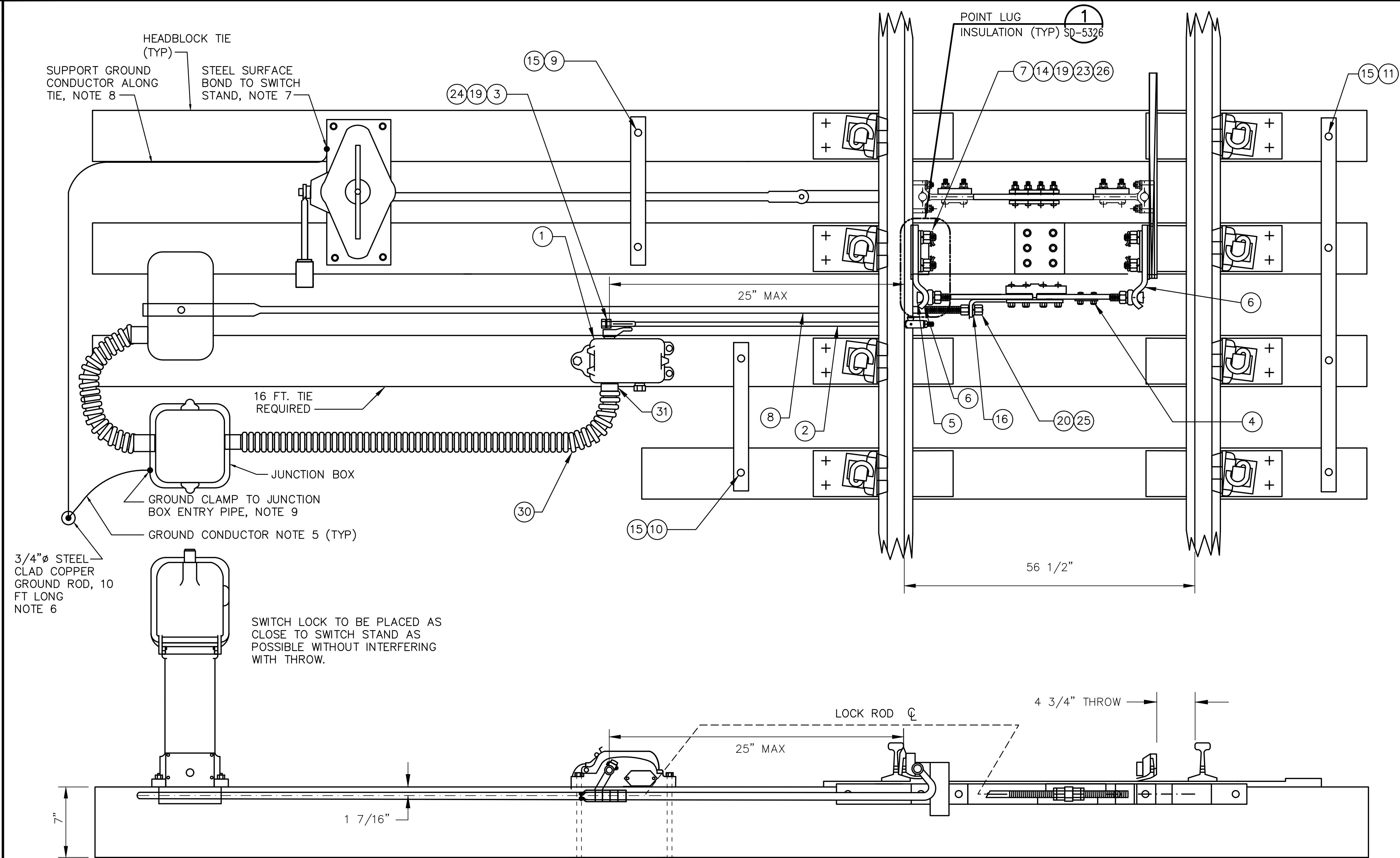


4. TWO WEB BOLTS SHALL BE FURNISHED WITH EACH CLIP ASSEMBLY AS CALLED FOR BY NOTE IN TOP VIEW OF ROD ASSEMBLY. WHEN ROD IS USED ON 11'-0" AND 16'-6" SWITCHES, THE 3/4" THICK SPRING WASHER SHALL BE REPLACED WITH A 3/8" THICK SPRING WASHER TO BRING COTTER WITHIN THE LIMITS OF SLOT IN WEB BOLT NUTS
5. MATERIALS AND WORKMANSHIP SHALL MEET CURRENT AREMA SPECIFICATIONS FOR SPECIAL TRACKWORK
6. VERTICAL SWITCH ROD SHALL BE PLAINLY STAMPED TO INDICATE SWITCH THAT ROD ASSEMBLY CAN BE USED UPON. IDENTIFICATION MARKING SHALL BE AS FOLLOWS:
 - 1-39 FOR USE ON 39'-0" SWITCHES, 132-LB. AND 136-LB. PE RAIL SECTIONS
 - 1-11-30 FOR USE ON 11'-0 TO 30'-0" SWITCHES, 115-LB. RE, 119-LB. C.F.& I., 131-LB, 132-LB. AND 136-LB. RE RAIL SECTIONS
 - 1-112 FOR USE ON 11'-0" TO 30'-0" SWITCHES, 112-LB. RE RAIL SECTION

FOR 112, 115, 119, 131, 132, AND 136 LB RAIL

[illegible]

CADD FILE NAME:	
SD-5322	
REV:	EDITION:
	FIF
SCALE:	
NTS	
STANDARD DRAWING NO.:	
SD-5322	



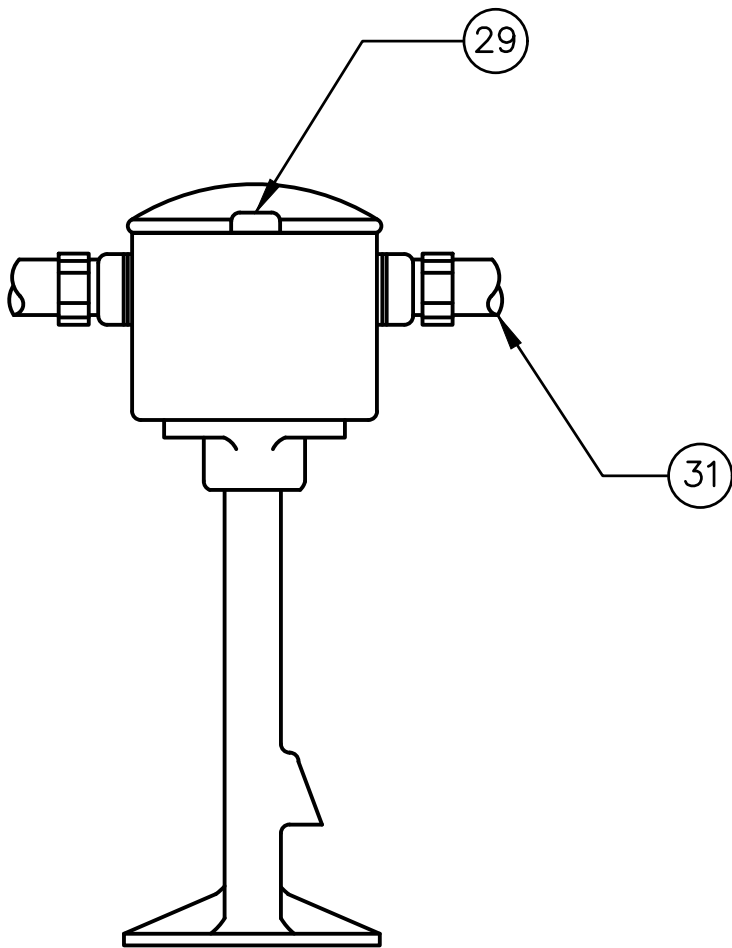
ITEM #	DESCRIPTION / MATERIAL/ APPROX. SIZE	NO. REQ'D
1	U-5 SWITCH CIRCUIT CONTROLLER, 4 POINT CAM, 2 POSITION W/ SPRING, 3/4" OFFSET CRANK & INSULATED BALL STUD	1
2	CIRCUIT CONTROLLER CONNECTING ROD, NEAR SIDE	1
3	CONTROLLER SOCKET, STRAIGHT, ASSEMBLY	1
4	SWIVEL FRONT ROD, HIGH PROFILE	1
5	POINT LUG, BALL END	1
6	SWIVEL POINT LUG	2
7	PLATE WASHER	2
8	LOCKROD CONNECTING ROD, ELECTRIC LOCK	1
9	TIE STRAP, DOUBLE OFFSET, 2-TIE	1
10	TIE STRAP, FLAT, 2-TIE	1
11	TIE STRAP, FLAT, 4-TIE	1
12		
13	STUD, 3/4-10 X 12"	3
14	BOLT, 1-8 X 5" THIN SQ. HD. DR. @ 3 29/32" & 4 21/32"	4
15	LAG SCREW, 3/4" X 5"	8
16	WASHER, SPERICAL	2
17	FLAT WASHER, 3/4" USS	3
18	LOCK WASHER 3/4" HEAVY SPLIT	3
19	LOCK WASHER, 1" HEAVY SPLIT	5
20	NUT, 1 1/4-7 HEAVY HEX CUPPED	3
21	NUT, 3/4" HEAVY HEX HEAD	4
22	NUT, 3/4" HEAVY SQUARE HEAD	4
23	NUT, 1" HEAVY HEX HEAD SLOTTED	5
24	NUT, 1-8 HEAVY HEX	1
25	NUT, 1 1/4-7 HEAVY HEX JAM	2
26	COTTER PIN, 1/4" X 1 3/4"	4
27	GRIP WASHER	3
28		
29	JUNCTION BOX COMPLETE, DOUBLE OUTLET	1
30	CONDUIT, 1 1/2" LUQUIDTITE FLEX	
31	SEALTITE COUPLING, 1 1/2"	2

PROCEDURE:

- CENTER SCREW JAWS ON THREADED PORTION OF POINT DETECTOR ROD
- POSITION SWCC ON HEADBLOCK TIE INSURING AMPLE CLEARANCE FOR OPERATING ROD ON THE POINT LUG AND OPERATING CRANK POINTED VERTICALLY DOWNWARD
- WITH THE SWITCH POINT IN MID-POSITION INSTALL THE OPERATING ROD ON THE POINT LUG AND OPERATING CRANK
- WITH CRANK VERTICALLY DOWNWARD AND SWITCH POINTS CENTERED, MARK HOLES AND DRILL

NOTES:

- TOP OF JUNCTION BOX LID LEVEL W/ TOP OF TIE
- FOR TIE LENGTH AND SPACING REFER TO TRACK STANDARDS
- CIRCUIT CONTROLLER SHALL BE POSITIONED SO THAT LID OPENS AWAY FROM THE TRACK
- INSTALL POINT LUG INSULATION KIT. SEE DRAWING SD-5326.
- CONDUCTORS USED FOR GROUNDING AND BONDING SHALL BE #4/0 AWG COPPER, ANNEALED AND SOFT DRAWN. INSTALL 1-FT BELOW GRADE.
- GROUND RODS SHALL BE INSTALLED AT 1-FT BELOW GRADE AND A MINIMUM OF 1-FT FROM ANY EXPOSED OR UNDERGROUND STRUCTURES. BOND GROUND CONDUCTOR TO GROUND ROD PER EXOTHERMIC WELD OR IRREVERSIBLE COMPRESSION CLAMP.
- SEE DRAWING E5203 DETAIL 2 FOR STEEL SURFACE BOND DETAILS.
- SECURE BARE #4/0 CONDUCTOR EVERY 3-FT TO SIDE OF TIE WHILE RUN BETWEEN TIES. USE ERICO GCHSC1214 TYPE CLIP, OR APPROVED EQUIVALENT, WITH ADHESIVE FOR CONCRETE TIES AND NAILS FOR WOOD TIES.
- SEE DRAWING E5205 DETAIL 8 FOR GROUND CLAMP TO JUNCTION BOX ENTRY PIPE. REFER TO BBII-RFI-001022 AND DVR 29 FOR DETAILS. VERIFY JUNCTION BOX IS ELECTRICALLY ISOLATED FROM THE RAIL PRIOR TO INSTALLATION OF LOCAL GROUND ROD BOND.



JUNCTION BOX DETAIL

FOR PEDESTAL JUNCTION BOX DETAIL SEE SD-5301. LOCATE JUNCTION BOX OUTSIDE BALLAST LINE AND BURY CONDUIT TO PREVENT TRIPPING HAZARD. TOP OF JUNCTION BOX LEVEL WITH TOP OF TIE.

										PENINSULA CORRIDOR JOINT POWERS BOARD		ENGINEERING STANDARD DRAWINGS		CADD FILE NAME: SD-5323	
										APPROVED BY: <i>Bin Zhang</i>		SIGNAL AND GRADE CROSSING SYSTEMS SWITCH APPARATUS		REV:	EDITION: FIFTH
												9B ELECTRIC LOCK HIGH SWITCH LAYOUT		SCALE:	NTS
														STANDARD DRAWING NO.: SD-5323	
010126					FIFTH EDITION										
REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP					

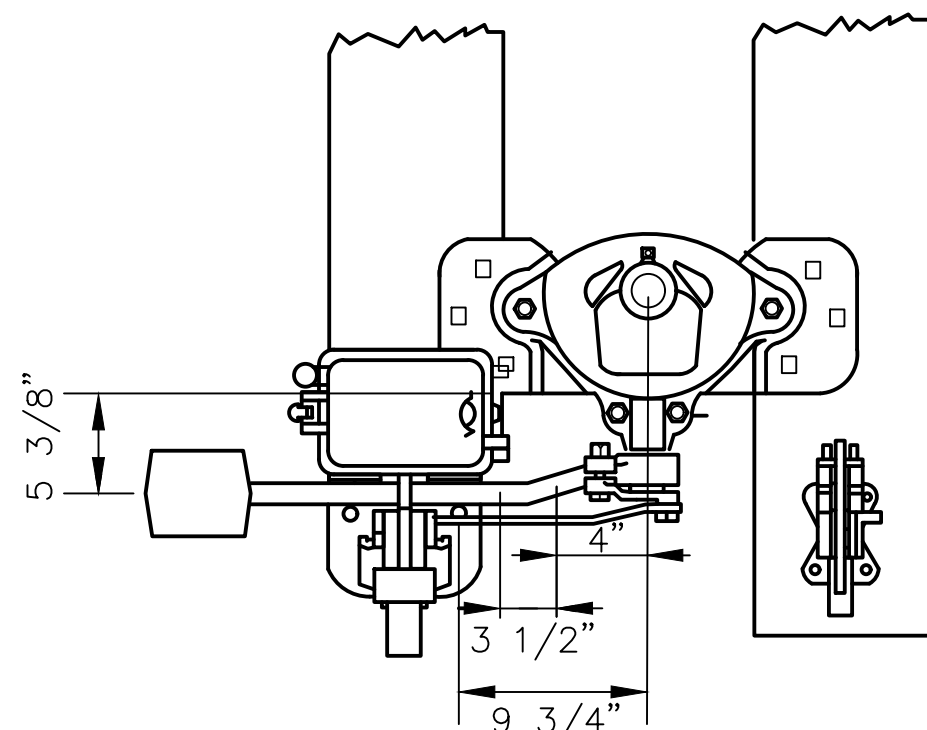


FIGURE A
LAYOUT OF LOCK ON SWITCH STAND

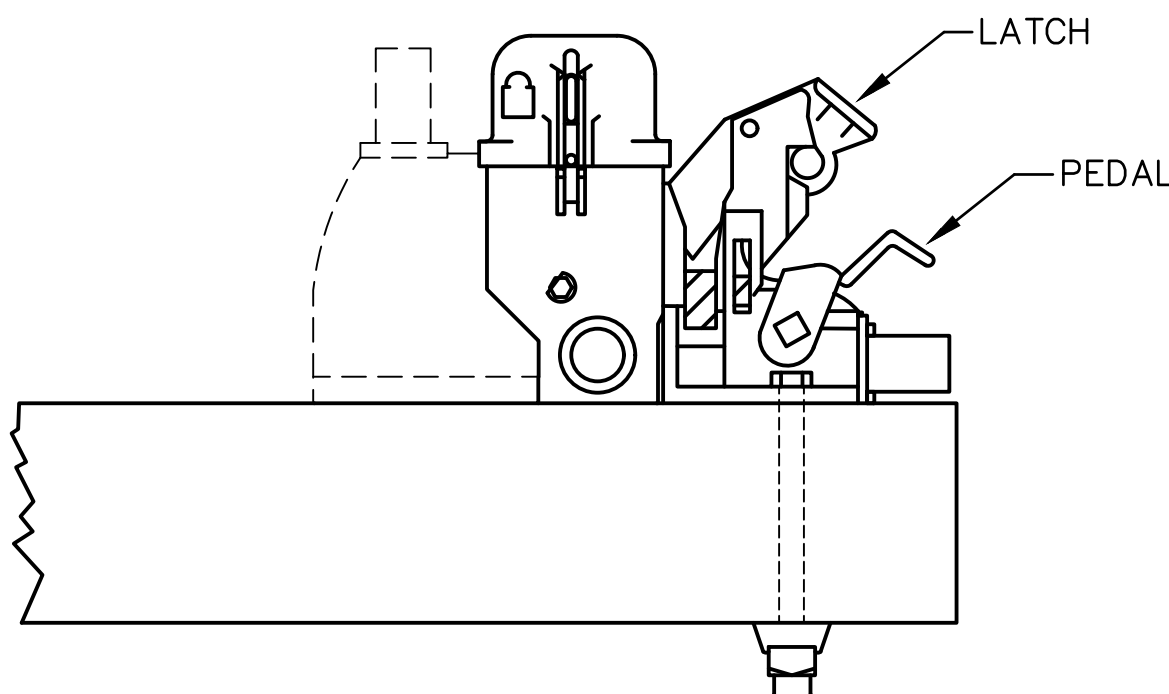


FIGURE B
INSTALLATION OF LOCK ON SWITCH STAND

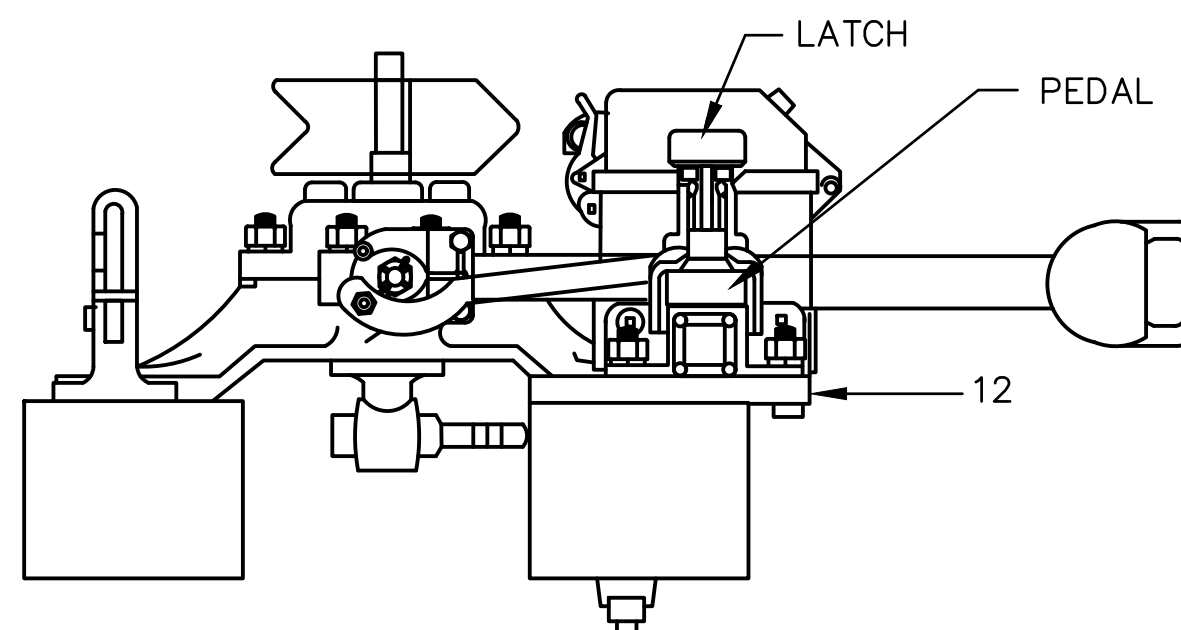


FIGURE A
INSTALLATION OF LOCK ON SWITCH STAND

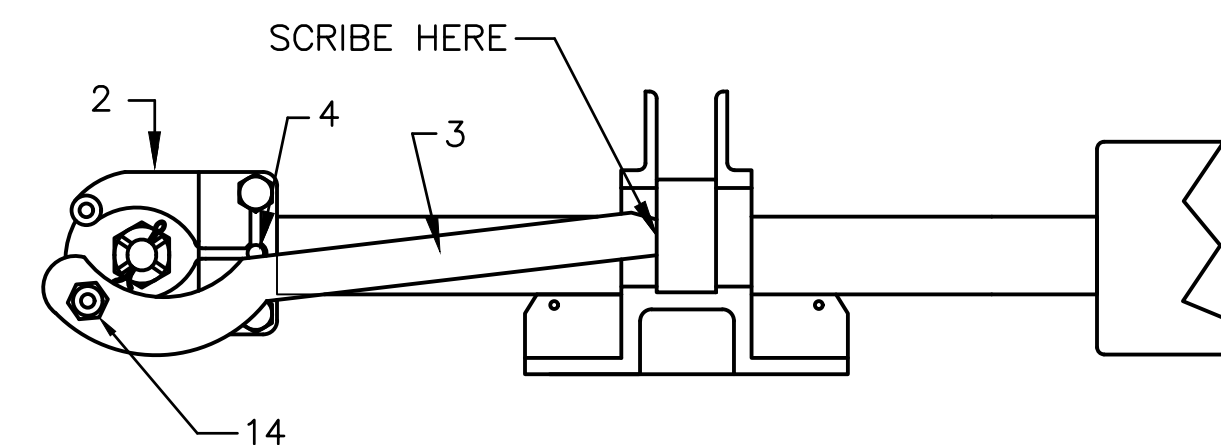


FIGURE B
LATCH ROD ARRANGEMENT

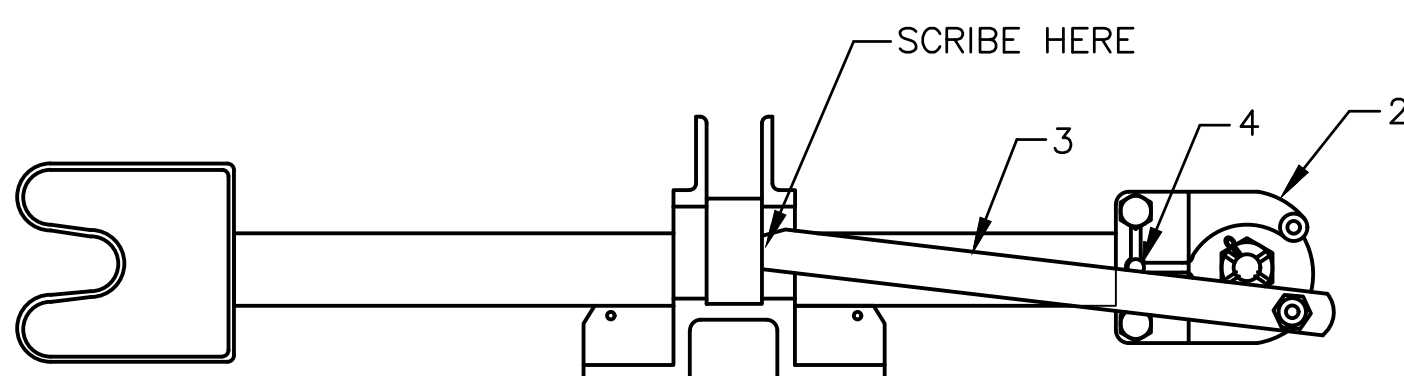


FIGURE C
LATCH ROD ARRANGEMENT

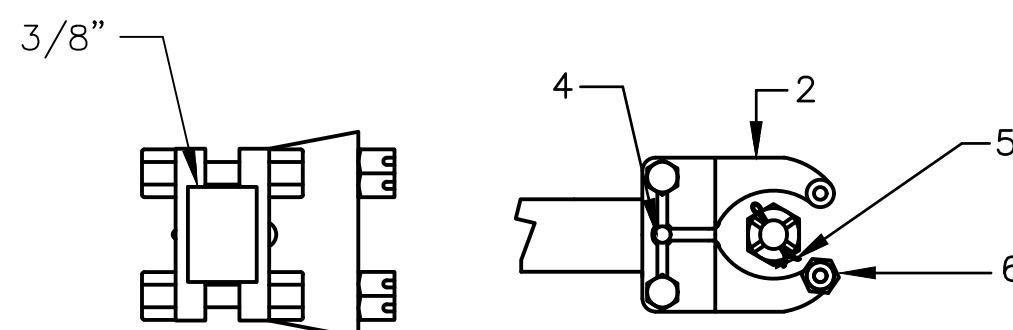


FIGURE D
PIN THROUGH CLAMP & LEVER

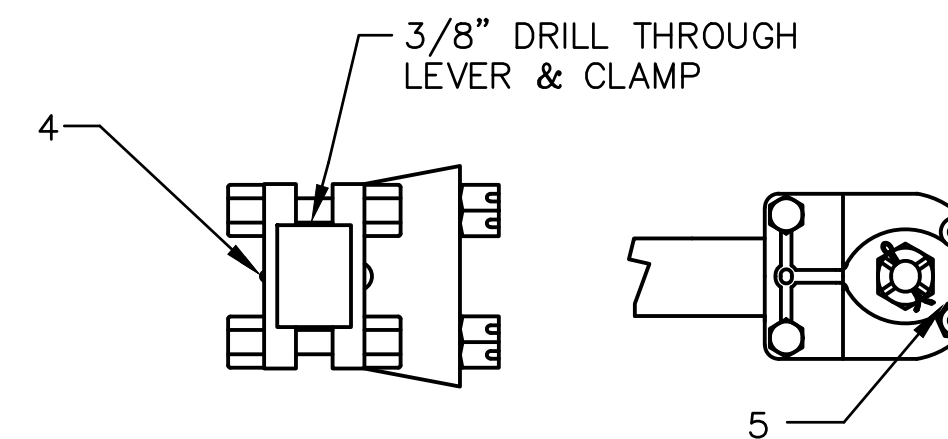
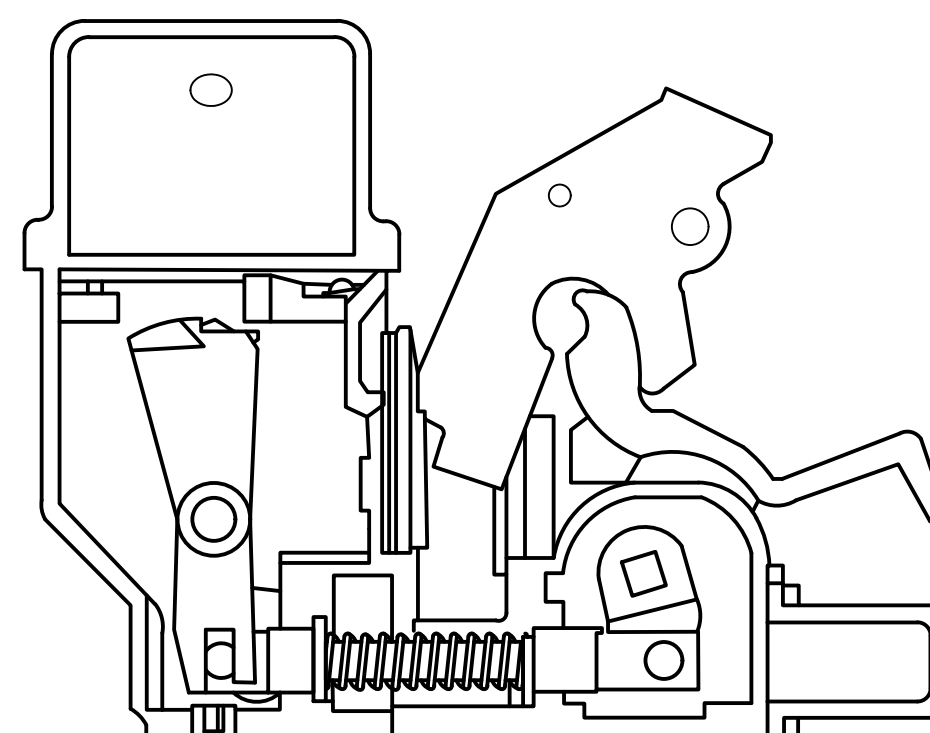


FIGURE C
PIN THROUGH CLAMP & LEVER

50/51 SWITCH STAND

NOTES FOR 50/51 SWITCH STAND:

1. BOLT CLAMP 2 TO SWITCH LEVER, FIGURES A AND D
2. USING A 3/8" DRILL, DRILL THROUGH CLAMP AND LEVER AND INSTALL RIVET 4, FIGURE D
3. NO TIE DAPPING, FIGURE B
4. INSTALL CABLE ENTRANCE ADAPTERS AND VENTILATORS BEFORE BOLTING LOCK IN PLACE. SECURE LOCK ON TIE WITH RODS, GRIP WASHER, NUTS, AND LOCK WASHERS
5. TO ASSEMBLE LATCH ROD FIGURE C-3, PLACE SWITCH LEVER IN LOCKED-UP POSITION, FIGURE A. PRESS PEDAL DOWN AND INSERT LATCH ROD THROUGH RECTANGULAR HOLE IN LOCK STAND. INSERT STUD 6 FIGURE D, THROUGH PIVOT HOLE IN LATCH ROD AND TEMPORARILY SECURE IT TO CLAMP. DEPRESS LATCH AS FAR AS IT WILL GO AND HOLD IT IN POSITION. SCRIBE ACROSS FACE OF LATCH ROD NEXT TO PEDAL CASTING FIGURE C. REMOVE STUD AND LATCH ROD. CUT OFF LATCH ROD 1/32" SHORT OF SCRIBE MARK
6. FOR ADJUSTABLE LATCH ROD FOLLOW PREVIOUS PROCEDURE, EXCEPT ADJUST LATCH ROD IN 1/8" INCREMENTS INSTEAD OF CUTTING
7. IN FINAL ASSEMBLY. TIGHTEN STUD 6 FIGURE D, WITH A WRENCH TO SECURE LATCH ROD TO CLAMP. DRILL THROUGH CLAMP AND STUD WITH A 1/8" DRILL. INSERT PIN 5, FIGURE D

MERIDIAN (RACOR) SWITCH STAND

NOTES FOR MERIDIAN (RACOR) SWITCH STAND:

1. BOLT CLAMP 2 FIGURE B, TO SWITCH LEVER FIGURE C
2. USING A 3/8" DRILL, DRILL THROUGH CLAMP AND LEVER AND INSTALL RIVET 4 FIGURE C
3. INSTALL CABLE ENTRANCE ADAPTERS AND VENTILATORS BEFORE BOLTING LOCK IN PLACE. SECURE LOCK ON TIE AND SUPPORTING PLATE 12 WITH THREADED ROD, BOLT, NUTS, AND WASHERS FIGURE A
4. TO ASSEMBLE LATCH ROD FIGURE B-3, PLACE SWITCH LEVER IN LOCKED-UP POSITION, FIGURE B. PRESS PEDAL DOWN AND INSERT LATCH ROD THROUGH RECTANGULAR HOLE IN LOCK STAND. INSERT STUD BOLT 14 THROUGH PIVOT HOLE IN LATCH ROD AND TEMPORARILY SECURE IT TO CLAMP. DEPRESS LATCH AS FAR AS IT WILL GO AND HOLD IT IN THIS POSITION. SCRIBE ACROSS FACE OF LATCH ROD NEXT TO PEDAL CASTING. REMOVE STUD AND LATCH ROD. CUT OFF LATCH ROD 1/32" SHORT OF SCRIBE MARK
5. IN FINAL ASSEMBLY, TIGHTEN STUD FIGURE B-14 WITH A WRENCH TO SECURE LATCH ROD TO CLAMP. DRILL THROUGH CLAMP AND STUD WITH A 1/8" DRILL. INSERT PIN 5, FIGURE C

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DIRECTOR, ENGINEERING



ENGINEERING STANDARD DRAWINGS

SIGNAL AND GRADE CROSSING SYSTEMS
SWITCH APPARATUS

MODEL 10A
ELECTRIC SWITCH LOCK LAYOUT

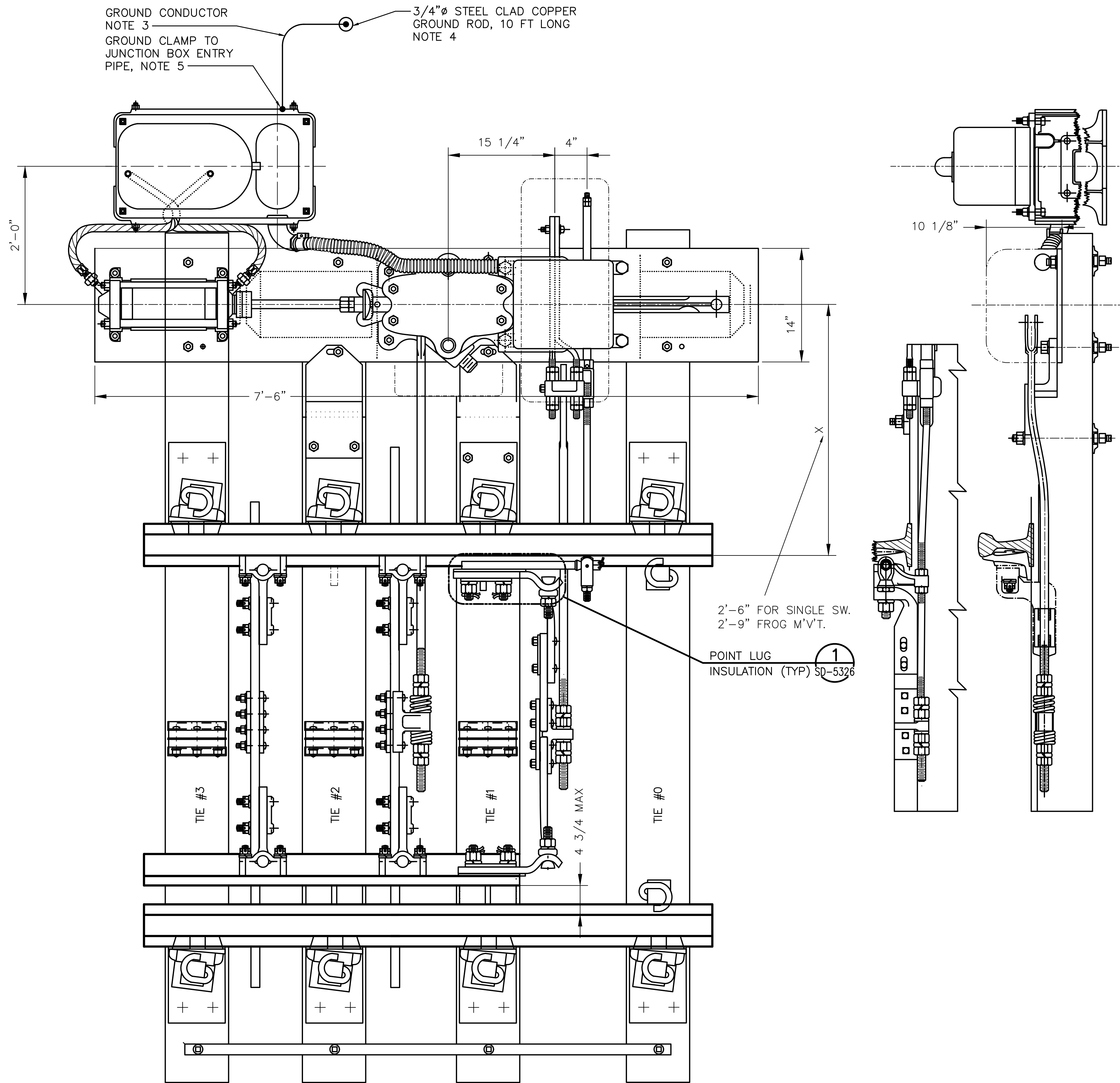
CADD FILE NAME:
SD-5324

REV: EDITION:
FIFTH

SCALE:
NTS

STANDARD DRAWING NO.:
SD-5324

REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP	DESCRIPTION
010126					FIFTH EDITION						



CONSTRUCTION NOTES:

NOTE 1:

WHEN DISMANTLING OR MAKING ADJUSTMENTS, AIR SHALL BE SHUT OFF AT THE GLOBE VALVE LOCATED AT ONE END OF THE "CP" SWITCH VALVE.

NOTE 2: SLIDE BAR

THE SLIDE BAR STROKE (12") MAY BE ADJUSTED BY MEANS OF THE ADJUSTING NUT ON THE END OF THE PISTON ROD TO OBTAIN EQUAL TRAVEL OF THE SLIDE BAR ROLLER ON EITHER SIDE OF THE ESCAPEMENT CRANK BEARING. THE CORRECT POSITION IS OBTAINED WHEN THE LUBRICATING FITTING ON THE SLIDE BAR ROLLER LINES UP WITH THE CENTER OF ONE OF TWO GREASE GUN HOLES IN THE TOP PLATE, WHEN THE BAR IS IN RESPECTIVE EXTREME POSITIONS.

NOTE 3: ESCAPEMENT CRANK

THE MAXIMUM OPERATING ROD THRUST FOR A SWITCH THROW IS OBTAINED WHEN THE OPERATING ARM IS ADJUSTED TO THE SHORTEST POSSIBLE LENGTH TO GIVE THE NECESSARY SWITCH STROKE. ONE-HALF INCH (1/2") LOST MOTION IN THE SWITCH BASKET IS GENERALLY CONSIDERED SUFFICIENT.

NOTE 4: FRICTION LOCK

ADJUSTMENT OF THE FRICTION LOCK SPRING IS OBTAINED WHEN THE SLOTTED END OF THE ADJUSTING SCREW COMES FLUSH WITH THE BODY OF THE FRICTION LOCK ARM INTO WHICH IT IS THREADED.

NOTE 5: ADJUSTMENT

LOOSEN THE CLAMPING OR LOCKING BOLT, ADJUST THE POSITION OF NUTS ON THE SWITCH END UNTIL THE LOCKING DOGS ON THE SLIDE BAR ENTER THEIR RESPECTIVE NOTCHES IN THE LOCK ROD WITHOUT ANY INTERFERENCE AND WITH APPROXIMATELY THE SAME CLEARANCE ON EACH SIDE OF THE LOCKING DOG. TIGHTEN THE CLAMP BOLT AND LOCK NUTS. LOCK RODS ARE IN ADJUSTMENT WHEN THE INDICATING POINTS COINCIDE WITH THE OUTER EDGES OF LONG NOTCHES.

NOTE 6: POINT DETECTOR BAR ADJUSTMENT

TURN THE BAR BY MEANS OF THE TURNBUCKLE, IN OR OUT, ON THE THREADED PORTION OF THE CONNECTING ROD UNTIL THE BEVELED PORTION NEARER THE SWITCH POINT CLEARS THE POINT DETECTOR ROLLER BY 1/16". THIS DIMENSION SHALL BE CHECKED BY USING A 1/16" THICK GAUGE TO ENSURE A SNUG FIT. LOCK THIS ADJUSTMENT WITH THE LOCK NUT ON THE CONNECTING ROD. OPERATE THE MACHINE TO THE OTHER EXTREME POSITION AND OBTAIN THE SAME RELATIONSHIP BETWEEN THE BEVELED PORTION OF THE ADJUSTABLE SLEEVE ON THE DETECTOR BAR AND THE OTHER POINT DETECTOR ROLLER BY TURNING THE SLEEVE IN OR OUT AS NECESSARY. LOCK THE ADJUSTMENT. WITH THESE ADJUSTMENTS. A 1/4" MOTION FROM POINT DETECTOR BAR SHALL BREAK THE INDICATION CIRCUIT AND 5/16" MOTION SHOULD LATCH THE CONTROLLER.

NOTE:

- REFER TO SD-2000 SERIES DRAWINGS FOR TIE SPACING.
- INSTALL POINT LUG INSULATION KIT. SEE DRAWING SD-5326 FOR INSTALLATION DETAILS.
- CONDUCTORS USED FOR GROUNDING AND BONDING SHALL BE #4/0 AWG COPPER, ANNEALED AND SOFT DRAWN. INSTALL 1-FT BELOW GRADE.
- GROUND RODS SHALL BE INSTALLED AT 1-FT BELOW GRADE AND A MINIMUM OF 1-FT FROM ANY EXPOSED OR UNDERGROUND STRUCTURES. BOND GROUND CONDUCTOR TO GROUND ROD PER EXOTHERMIC WELD OR IRREVERSIBLE COMPRESSION CLAMP.
- SEE DRAWING E5205 DETAIL 8 FOR GROUND CLAMP TO JUNCTION BOX ENTRY PIPE. VERIFY JUNCTION BOX IS ELECTRICALLY ISOLATED FROM THE RAIL PRIOR TO INSTALLATION OF LOCAL GROUND ROD BOND.

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DIRECTOR, ENGINEERING



ENGINEERING STANDARD DRAWINGS

SIGNAL AND GRADE CROSSING SYSTEMS SWITCH APPARATUS

A-5 E. P. SWITCH MACHINE
TYPICAL SWITCH MACHINE LAYOUT

CADD FILE NAME:
SD-5325
REV: EDITION:
FIFTH
SCALE:
NTS
STANDARD DRAWING NO.:
SD-5325

REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP	DESCRIPTION
010126					FIFTH EDITION						



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- NOTES:**
1. THIS DRAWING SHALL BE USED ONLY AS A GUIDE. EACH CROSSING SHALL BE EVALUATED AND LED LAMPS ADJUSTED TO PROVIDE OPTIMUM COVERAGE
 2. DEFLECTION FOR BACK LIGHTS AND SIDE LIGHTS: 70°
 3. DEFLECTION FOR LIGHTS FACING TRAFFIC: 30°/15°
 4. DEFLECTION FOR LIGHTS OVER TRAFFIC, BOTH DIRECTIONS: 20°/32°
 5. FIRST NUMBER IS HORIZONTAL DEFLECTION
 6. SECOND NUMBER IS DOWNWARD DEFLECTION
 7. ANGLES OF DEFLECTION DO NOT APPLY TO LED SIGNALS
 8. FOCUS LED LIGHTS TO FOCAL POINT ON DRAWING
 9. MAINTAIN 30 INCH SEPARATION BETWEEN FLASHERS

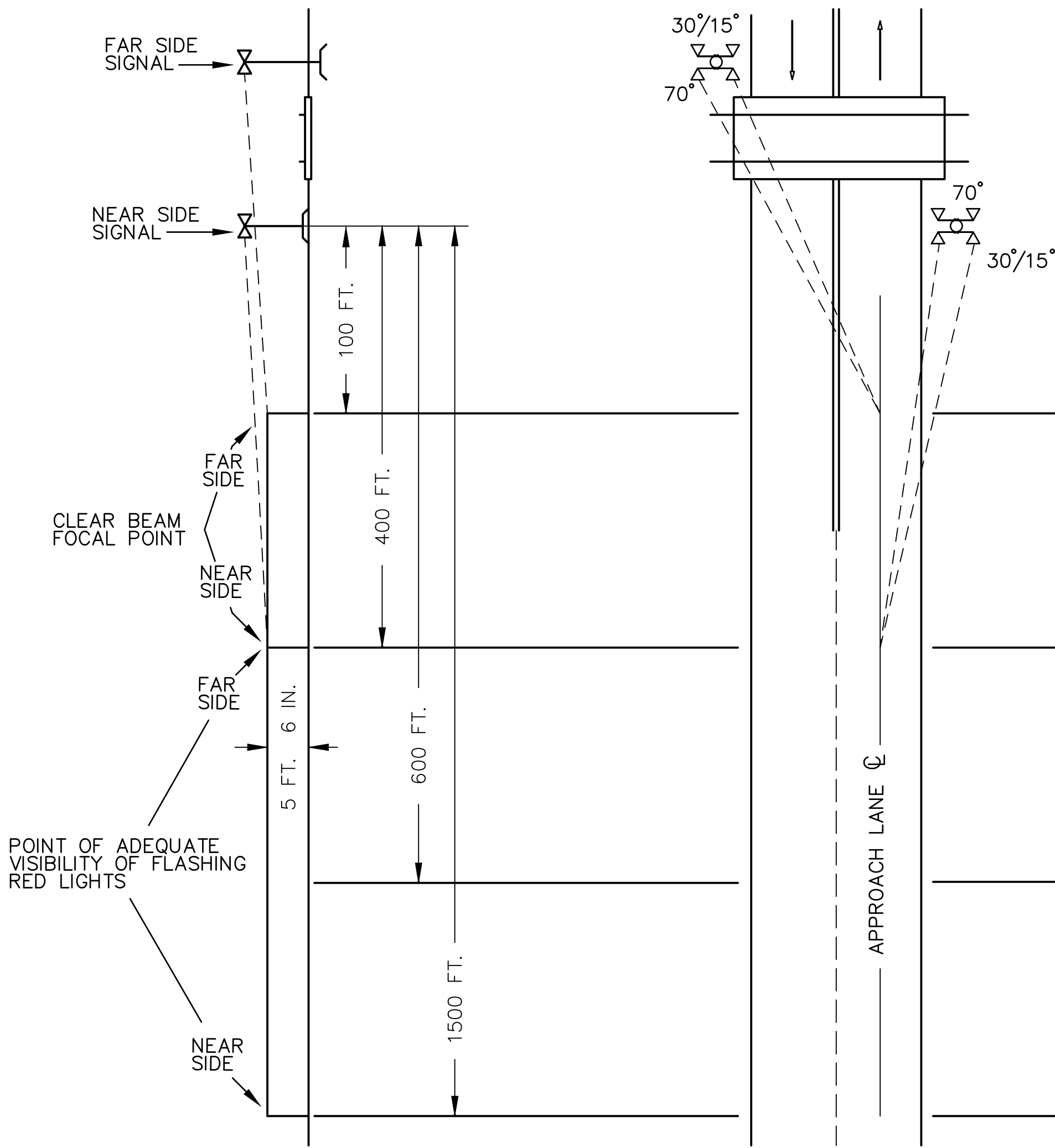


FIGURE 1
SINGLE LANE GROUND FLASHERS
WITH BACK LIGHTS

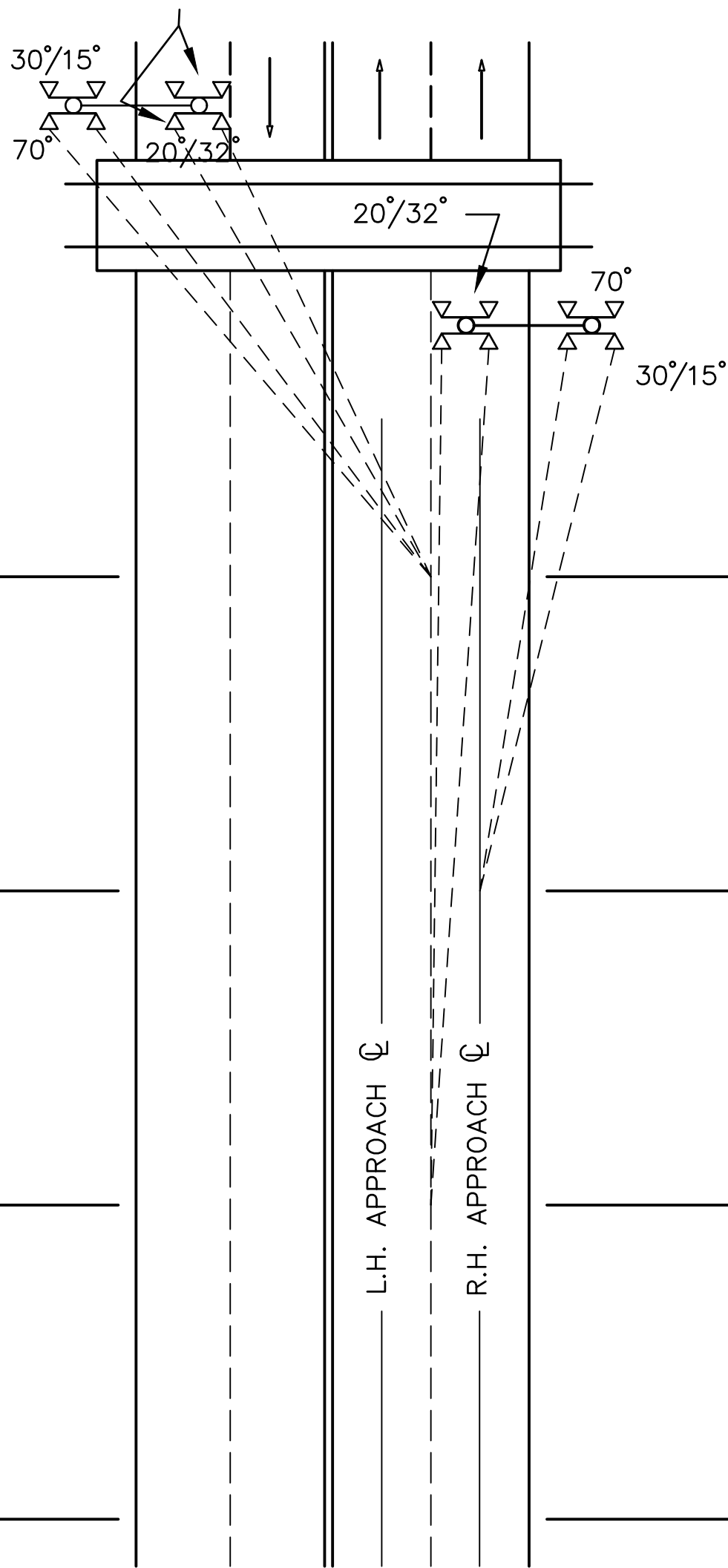


FIGURE 2
TWO LANE APPROACH CANTILEVER
FLASHERS WITH BACK LIGHTS

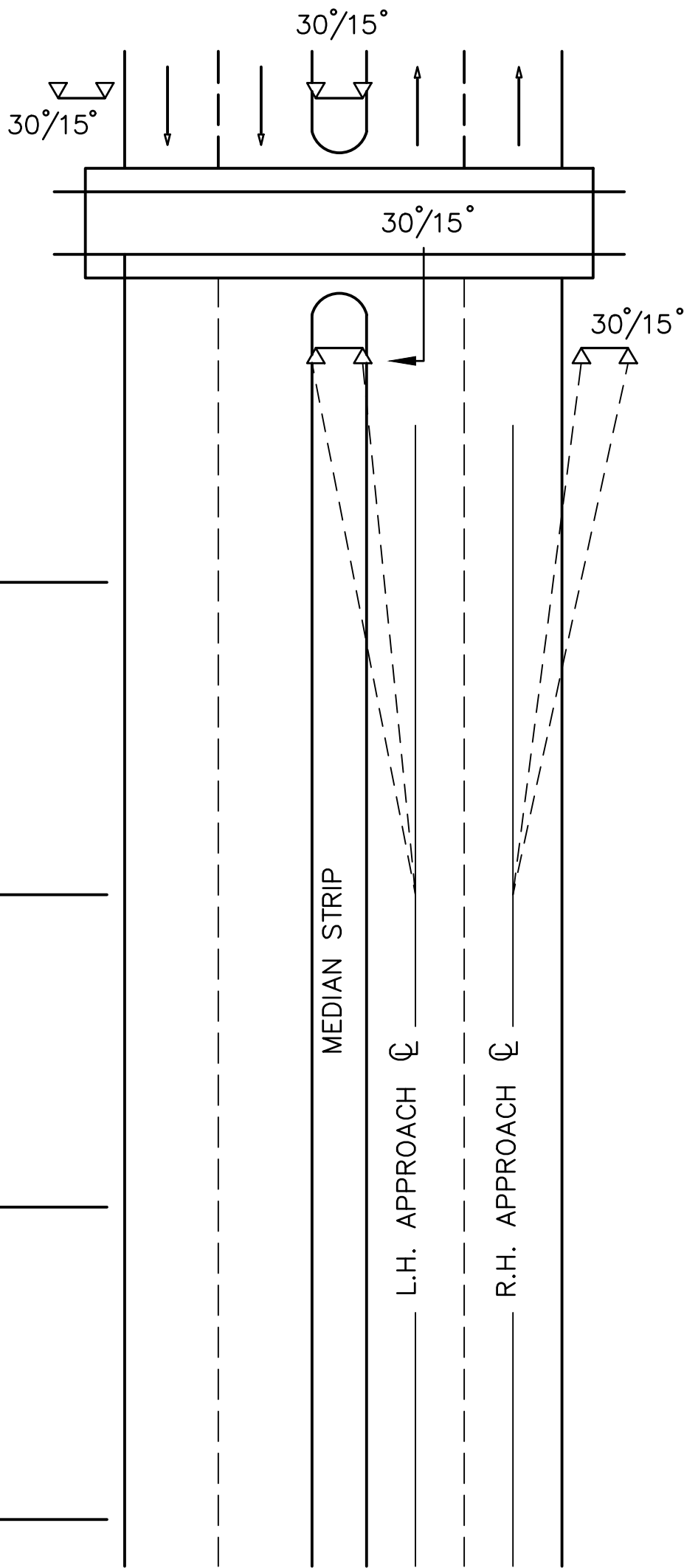
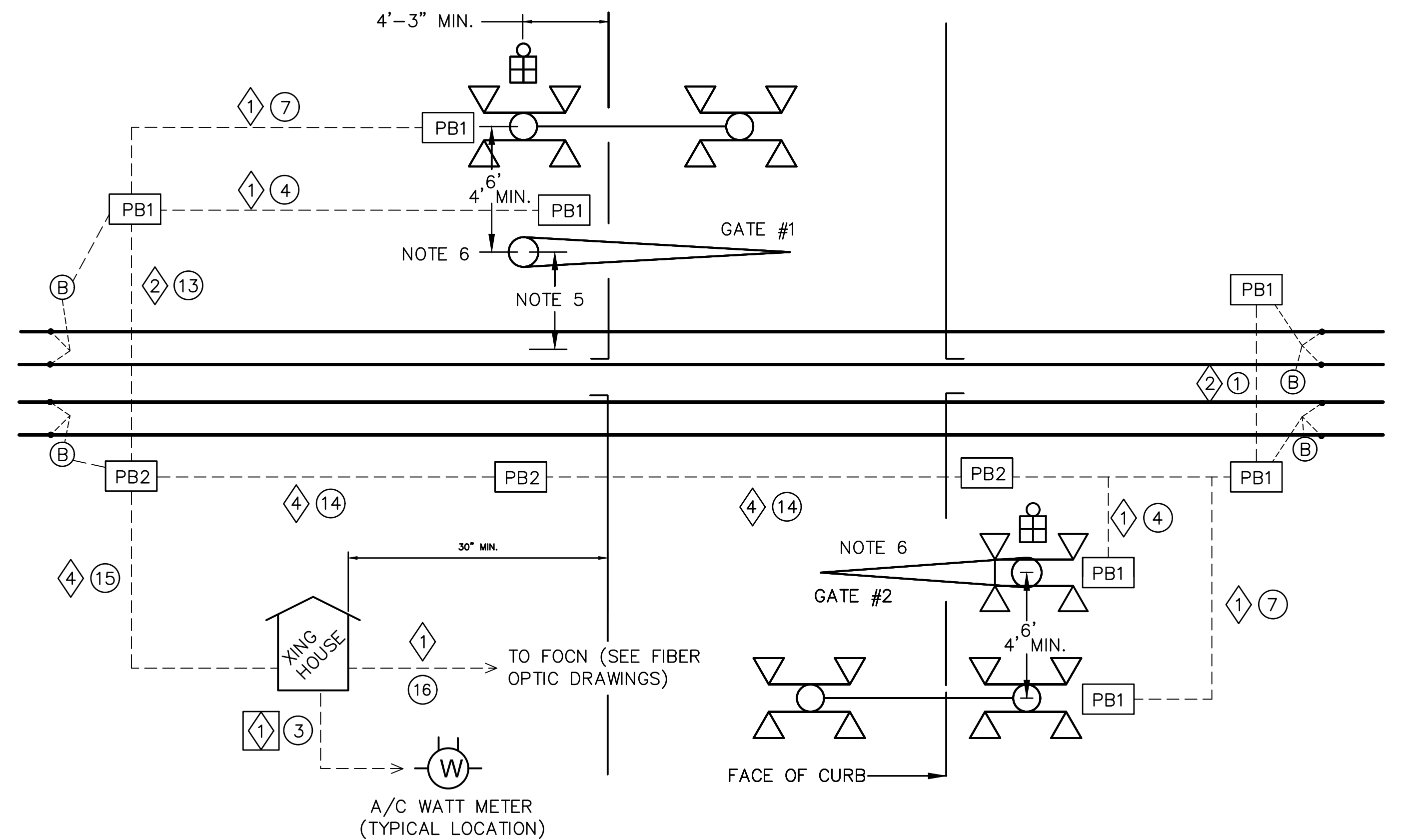
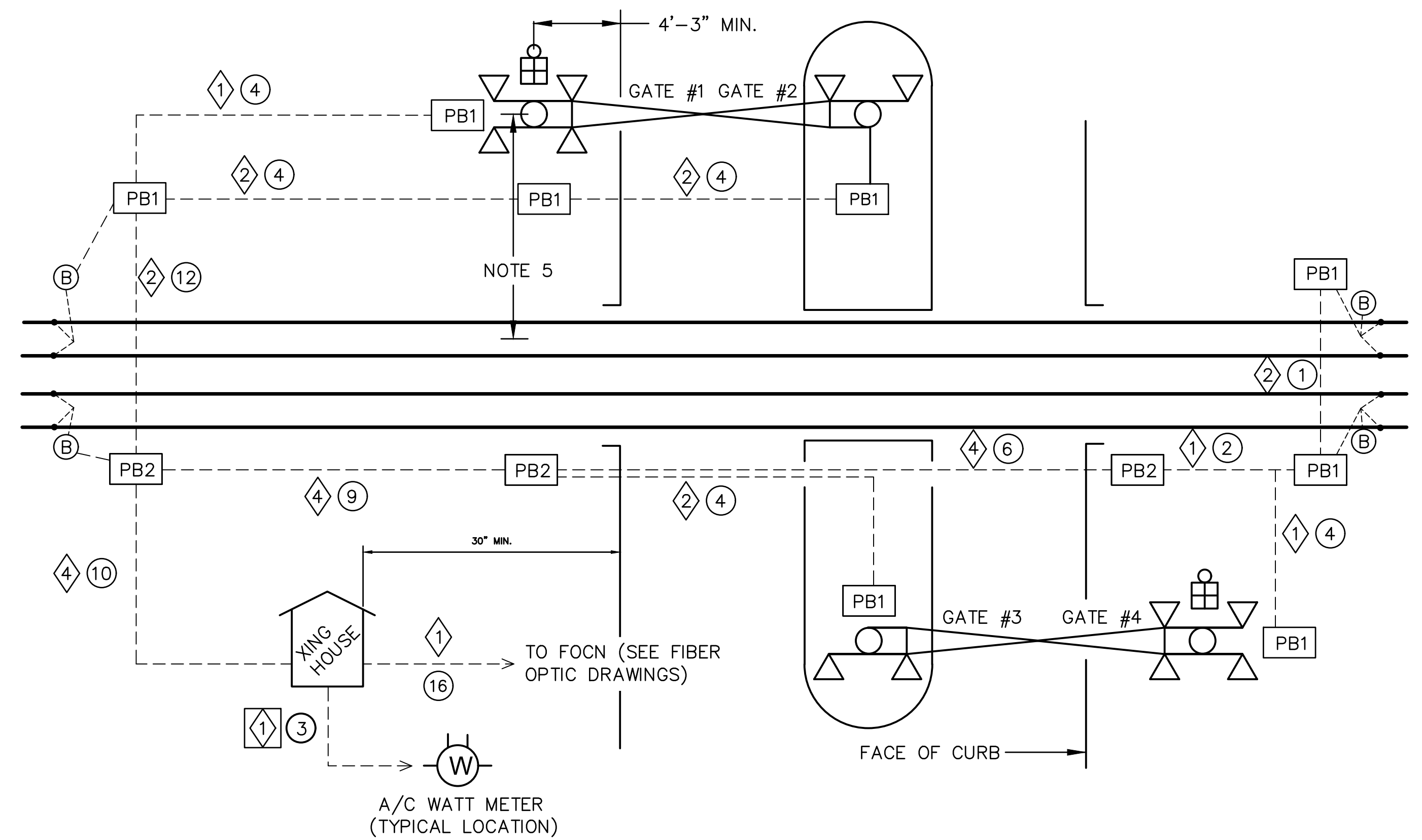
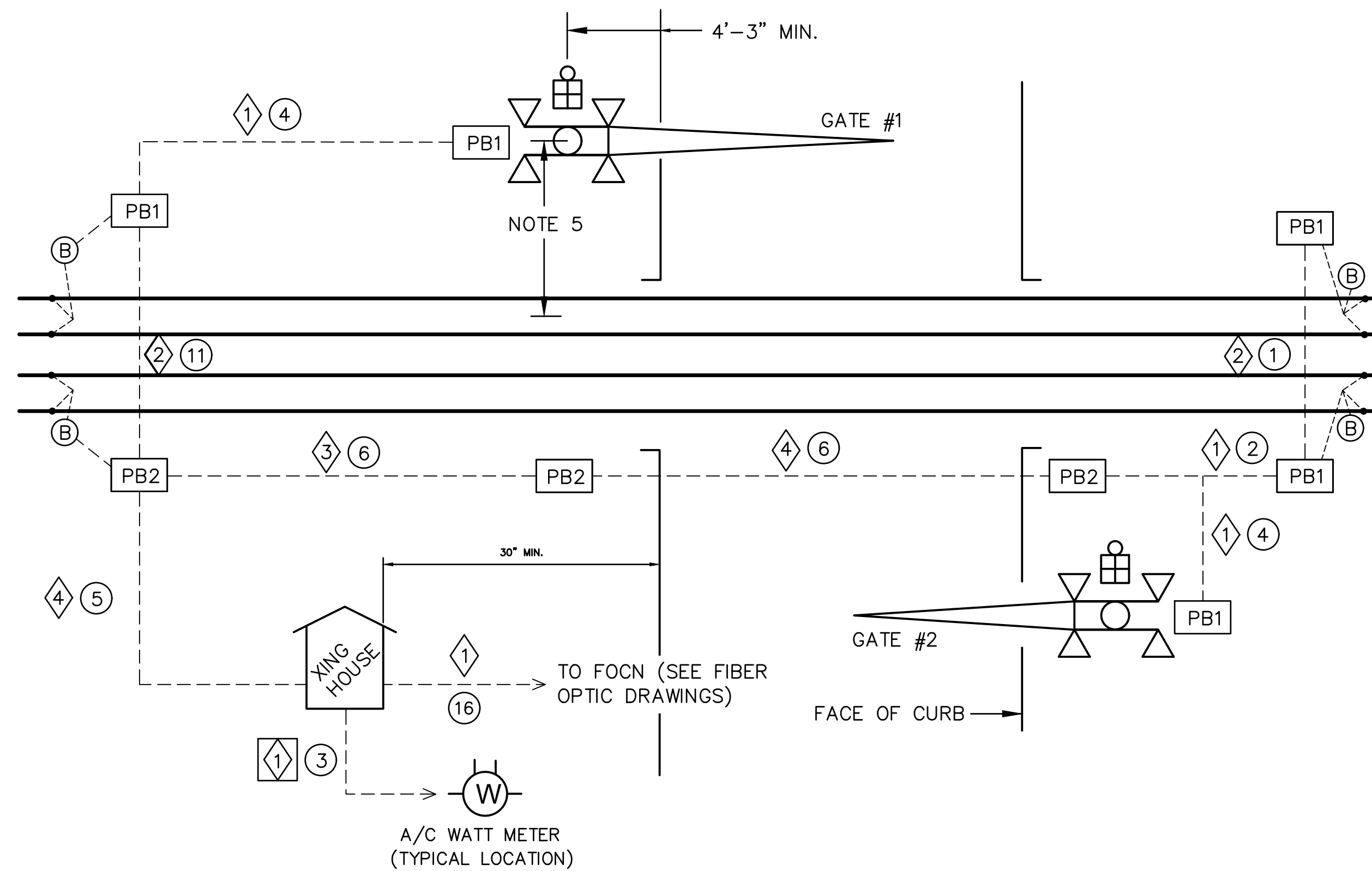







FIGURE 3
TWO LANE APPROACH GROUND FLASHERS ON
R.H. SIDE AND ONE MEDIAN - NO BACK LIGHTS

										PENINSULA CORRIDOR JOINT POWERS BOARD		ENGINEERING STANDARD DRAWINGS		CADD FILE NAME: SD-5401	
										APPROVED BY: <i>Bin Zhang</i>		SIGNAL AND GRADE CROSSING SYSTEMS HIGHWAY GRADE CROSSING APPARATUS		REV:	EDITION: FIFTH
										Caltrain		TYPICAL HIGHWAY CROSSING SIGNALS LIGHT UNIT ALIGNMENT		SCALE: NOT TO SCALE	
														STANDARD DRAWING NO.: SD-5401	
010126					FIFTH EDITION										
REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP					



-  = NUMBER INSCRIBED DENOTES QUANTITY OF 4 INCH SCH. 80 PVC
 = NUMBER INSCRIBED DENOTES QUANTITY OF 2 INCH SCH. 80 PVC
 = 2'X3' PULL BOX
 = 3'X5' PULL BOX
 = TRACK WIRE BOOTLEGS (SEE SD-4112)

- | | | |
|---------------------------------------|---------------------------------------|---------------------------------------|
| ① = 1-TW 2C #6 | ⑧ = 3-5C #6
1-7C #14 | ⑬ = 1-TW 2C #6
3-5C #6
1-7C #14 |
| ② = 2-TW 2C #6 | ⑨ = 2-TW 2C #6
4-5C #6
2-7C #14 | ⑭ = 2-TW 2C #6
3-5C #6
1-7C #14 |
| ③ = 1-3C #2 W/ GND | ⑩ = 4-TW 2C #6
8-5C #6
4-7C #14 | ⑮ = 4-TW 2C #6
6-5C #6
2-7C #14 |
| ④ = 2-5C #6
1-7C #14 | ⑪ = 1-TW 2C #6
2-5C #6
1-7C #14 | ⑯ = SMFO CABLE
(12 STRAND) |
| ⑤ = 4-TW 2C #6
4-5C #6
2-7C #14 | ⑫ = 1-TW 2C #6
4-5C #6
2-7C #14 | |
| ⑥ = 2-TW 2C #6
2-5C #6
1-7C #14 | | |
| ⑦ = 1-5C #6 | | |

NOTES:

1. CROSSING HOUSE AND METER SERVICE LOCATION IS TYPICAL, MAY BE LOCATED IN ANY QUADRANT
2. CROSSING HOUSE LOCATED 25' FROM CENTER LINE OF TRACK. VARIATION ONLY ON APPROVAL OF THE ENGINEER
3. TRACK LEADS LOCATED MINIMUM 50' FROM CURB FACE
4. 125' MINIMUM ISLAND CIRCUIT LENGTH
5. 15' MAXIMUM AND 12' MINIMUM SHALL BE MAINTAINED. NO PART OF FLASHER LIGHT ASSEMBLY TO INTRUDE INTO PUC CLEARANCE ENVELOPE 8'-6" INCHES FROM CENTER LINE ON TANGENT TRACK
6. BACKLIGHTS AND BELL LOCATIONS ON CANTILEVER AND GATES TO BE DETERMINED ON DESIGN OR BY THE ENGINEER
7. COVER OUT OF SERVICE FLASHERS WITH BURLAP AND REMOVE ENERGY

[illegible]**PENINSULA CORRIDOR JOINT POWERS BOARD**

APPROVED BY:

Bin Zhang

DIRECTOR, ENGINEERING

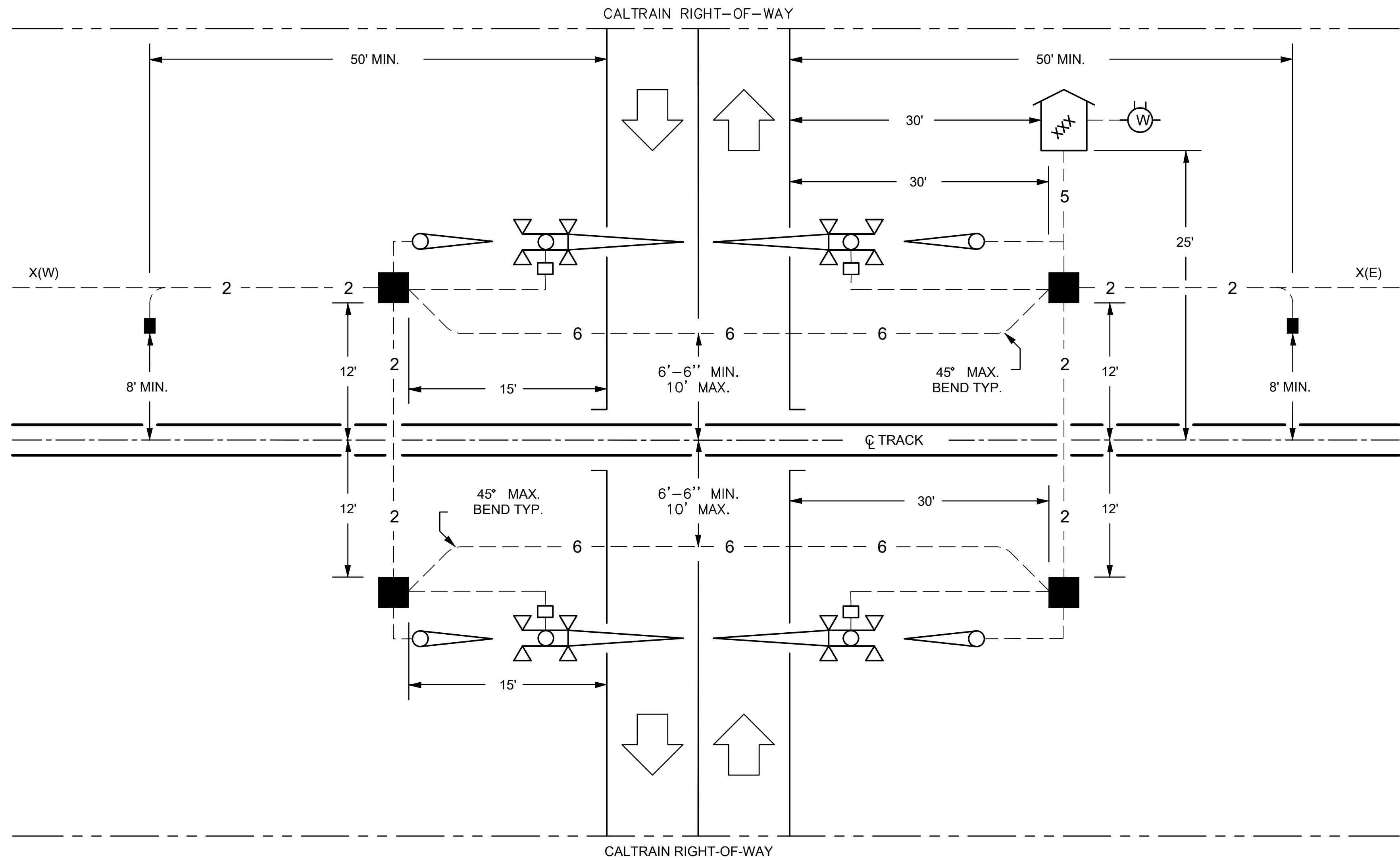


ENGINEERING STANDARD DRAWINGS

SIGNAL GRADE CROSSING SYSTEMS	R
HIGHWAY GRADE CROSSING APPARATUS	S

TYPICAL CROSSING LOCATIONS

CADD FILE NAME:	
SD-5402	
REV:	EDITION:
	FIFTH
SCALE:	
NOT TO SCALE	
STANDARD DRAWING NO.:	
SD-5402	



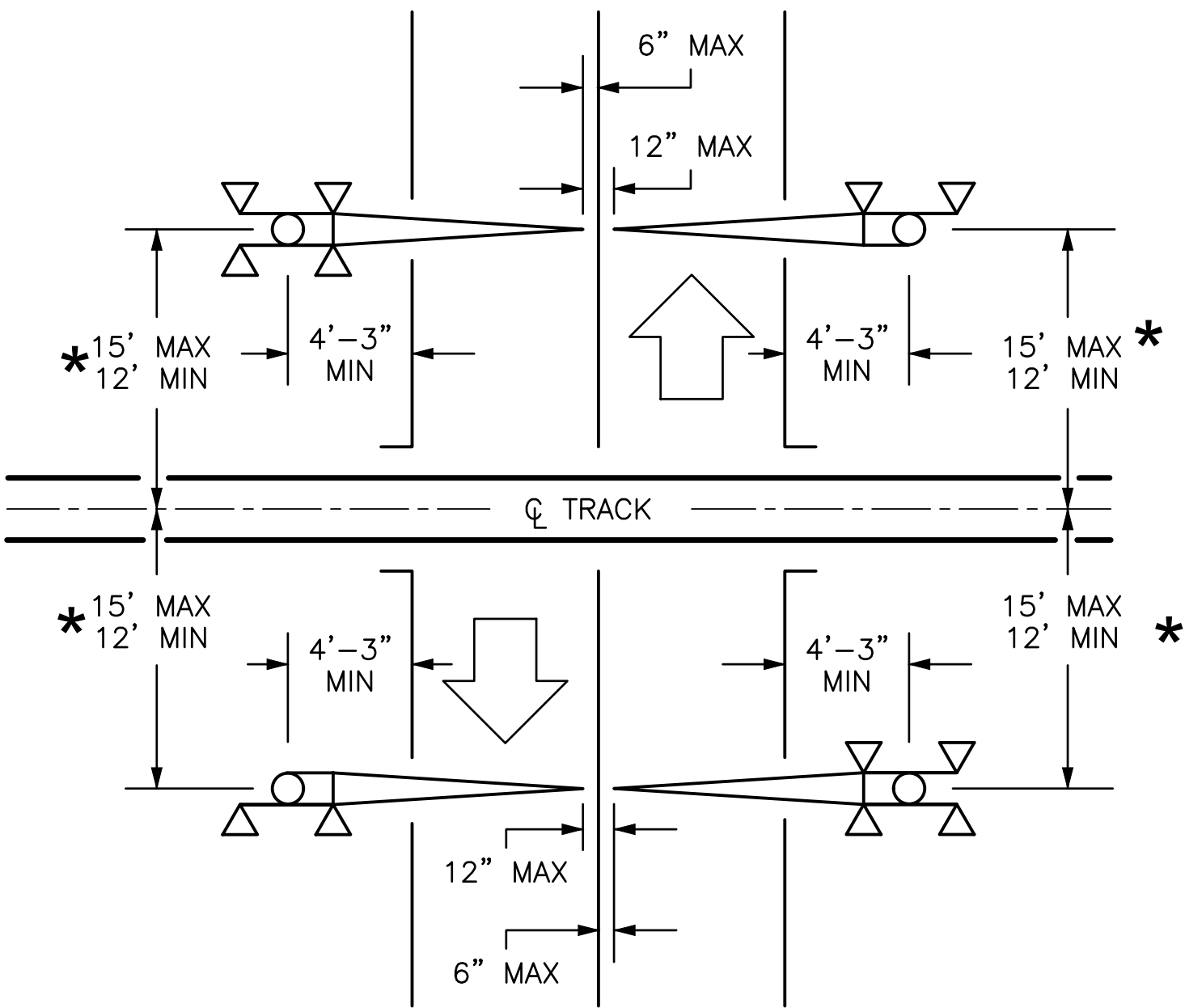
LEGEND	
	10" x 17" x 12" CONCRETE PULL BOX
	24" x 18" x 13" FIBERGLASS PULL BOX
	4' x 4' x 4' CONCRETE PULL BOX
	MULTIPLE CONDUITS (N=NUMBER OF CONDUITS)
	SINGLE CONDUIT
	METER SERVICE
	8X6 CROSSING HOUSE

- NOTES:
- CROSSING SIGNAL HOUSE LOCATION IS TYPICAL, MAY BE LOCATED IN ANY NEUTRAL QUADRANT
 - ALL CONDUITS SHALL BE 4" SCHEDULE 80 PVC UNLESS OTHERWISE SPECIFIED
 - A MINIMUM OF 4 CONDUITS SHALL BE MAINTAINED UNDERNEATH THE ROADWAY ON BOTH SIDES OF TRACK AFTER INITIAL INSTALLATION
 - SPARE CONDUITS SHALL BE INSTALLED COMPLETELY FROM ONE 4' X 4' X 4' PULL BOX TO THE OTHER 4' X 4' X 4' PULL BOX
 - THE AMOUNT OF EXPRESS CONDUITS (6 SHOWN) SHALL BE DETERMINED BY CALTRAIN DURING DESIGN
 - ALL CONDUIT SHALL BE BURIED A MINIMUM OF 36" BELOW TOP OF FINAL GRADE
 - INSTALL CABLE AND TRACK WIRE AS SPECIFIED BY SIGNAL DESIGN DRAWINGS
 - 24" X 18" X 13" PULL BOXES SHALL BE PLACED DIRECTLY BESIDE THE SIGNAL MAST AT A MINIMUM DISTANCE OF 3'-0"
 - DEVIATION FROM THIS STANDARD SHALL BE APPROVED BY CALTRAIN

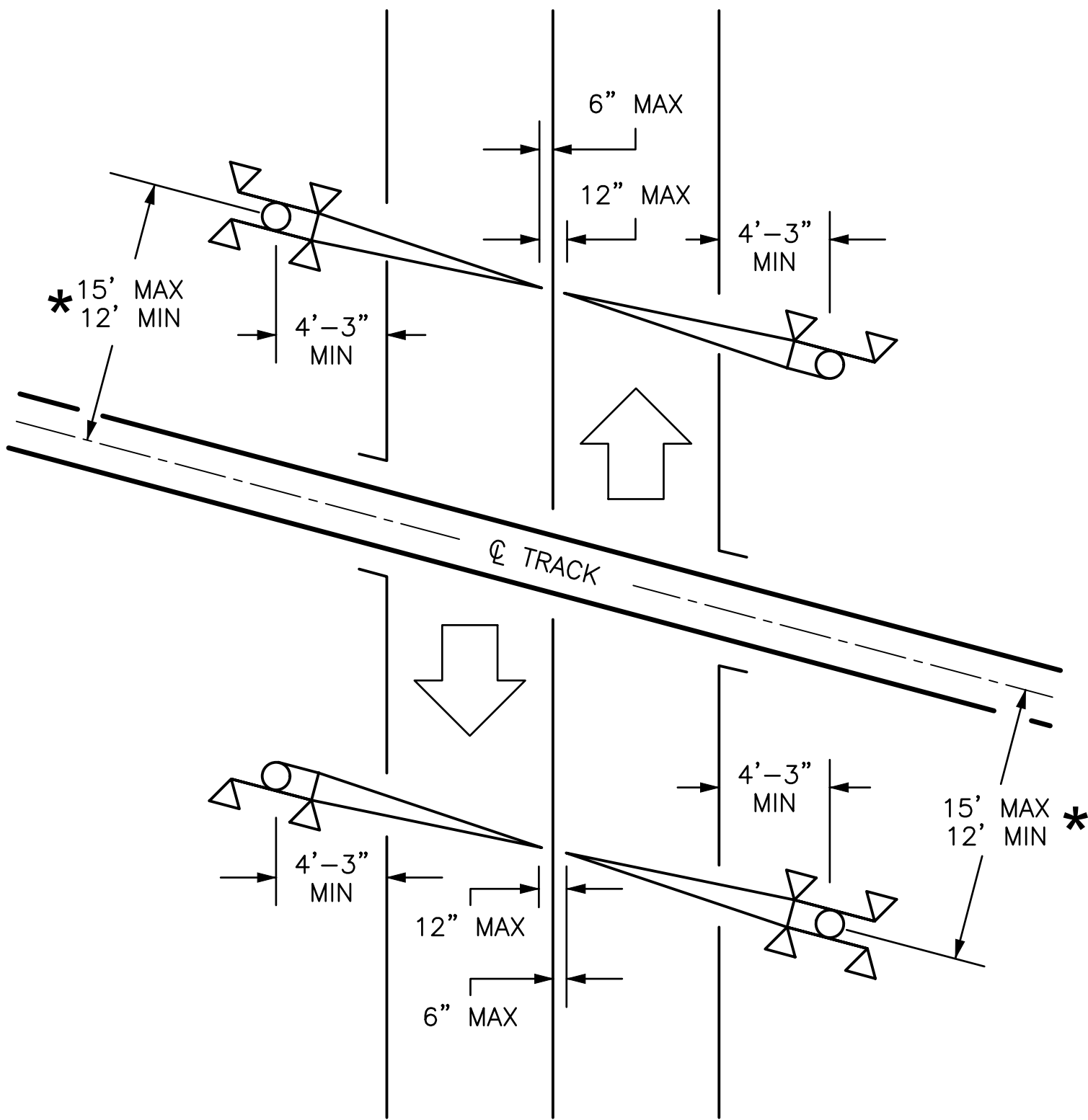
FLASHING LIGHT SIGNALS WITH ENTRANCE AND EXIT GATES
SIGNAL CROSSING HOUSE, PULL BOX AND CONDUIT CONFIGURATION

												PENINSULA CORRIDOR JOINT POWERS BOARD						ENGINEERING STANDARD DRAWINGS						CADD FILE NAME: SD—5403											
												APPROVED BY: <div>Bin Zhang</div> <div>DIRECTOR, ENGINEERING</div>						<div>Caltrain</div>						SIGNAL AND GRADE CROSSING SYSTEMS HIGHWAY GRADE CROSSING APPARATUS						REV:		EDITION: FIFTH			
																								SCALE: NOT TO SCALE						STANDARD DRAWING NO.: SD—5403					
010126												FIFTH EDITION																							
REV	DATE	BY	CHK	APP	DESCRIPTION											REV	DATE	BY	CHK	APP	DESCRIPTION														

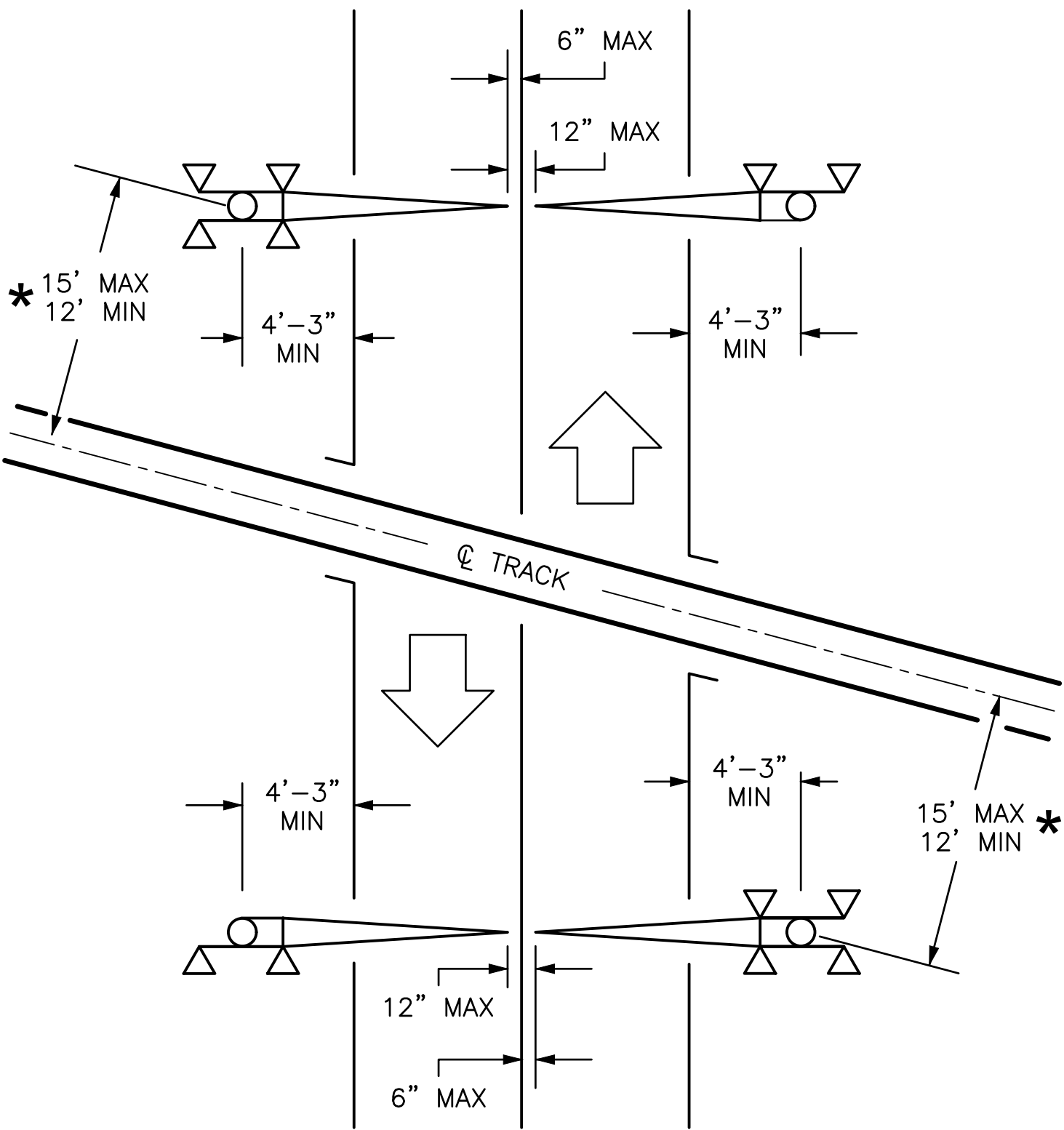
RIGHT ANGLE CROSSING



ANGLED CROSSING
GATES PARALLEL TO TRACK



ANGLED CROSSING
GATES PERPENDICULAR TO ROADWAY




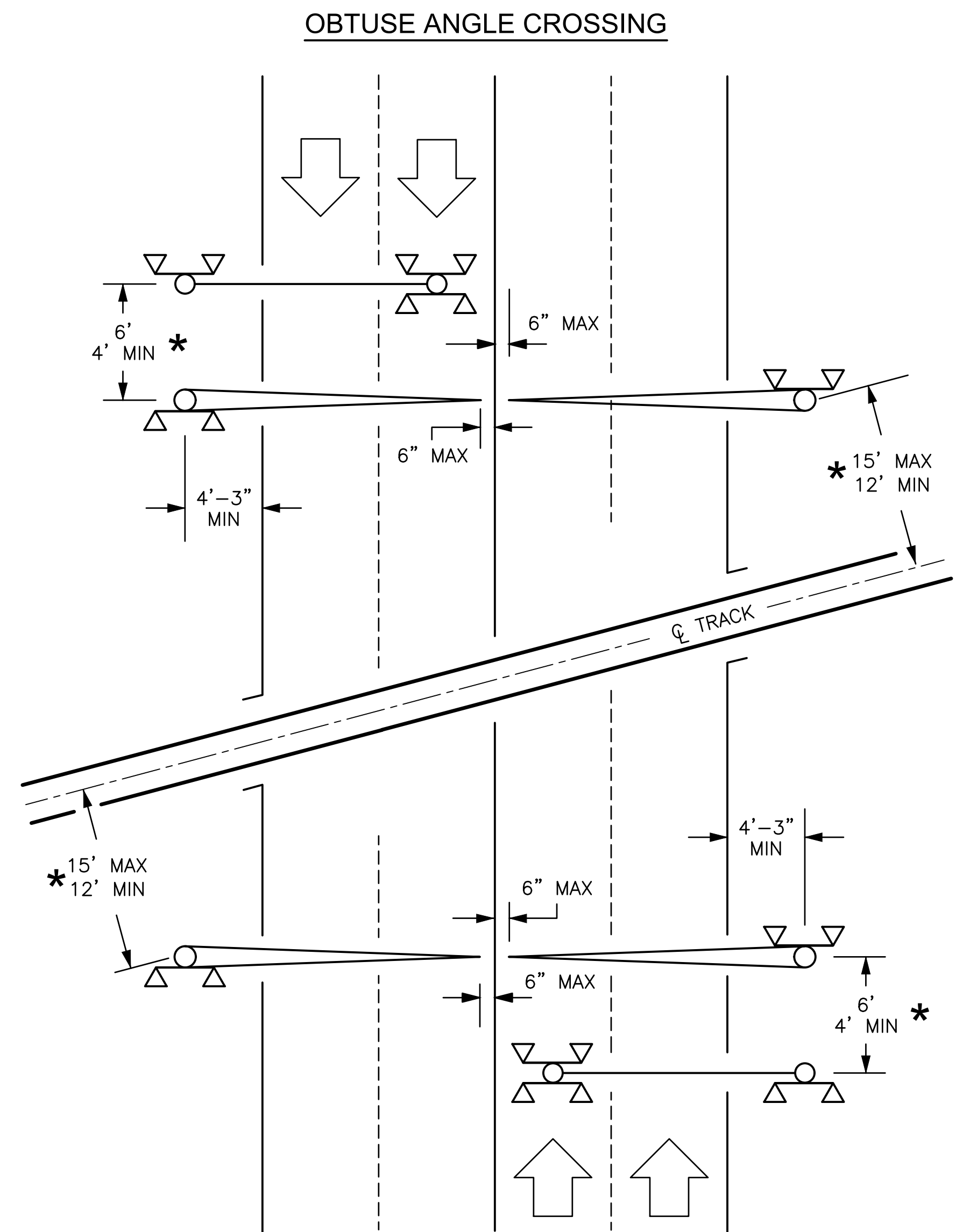
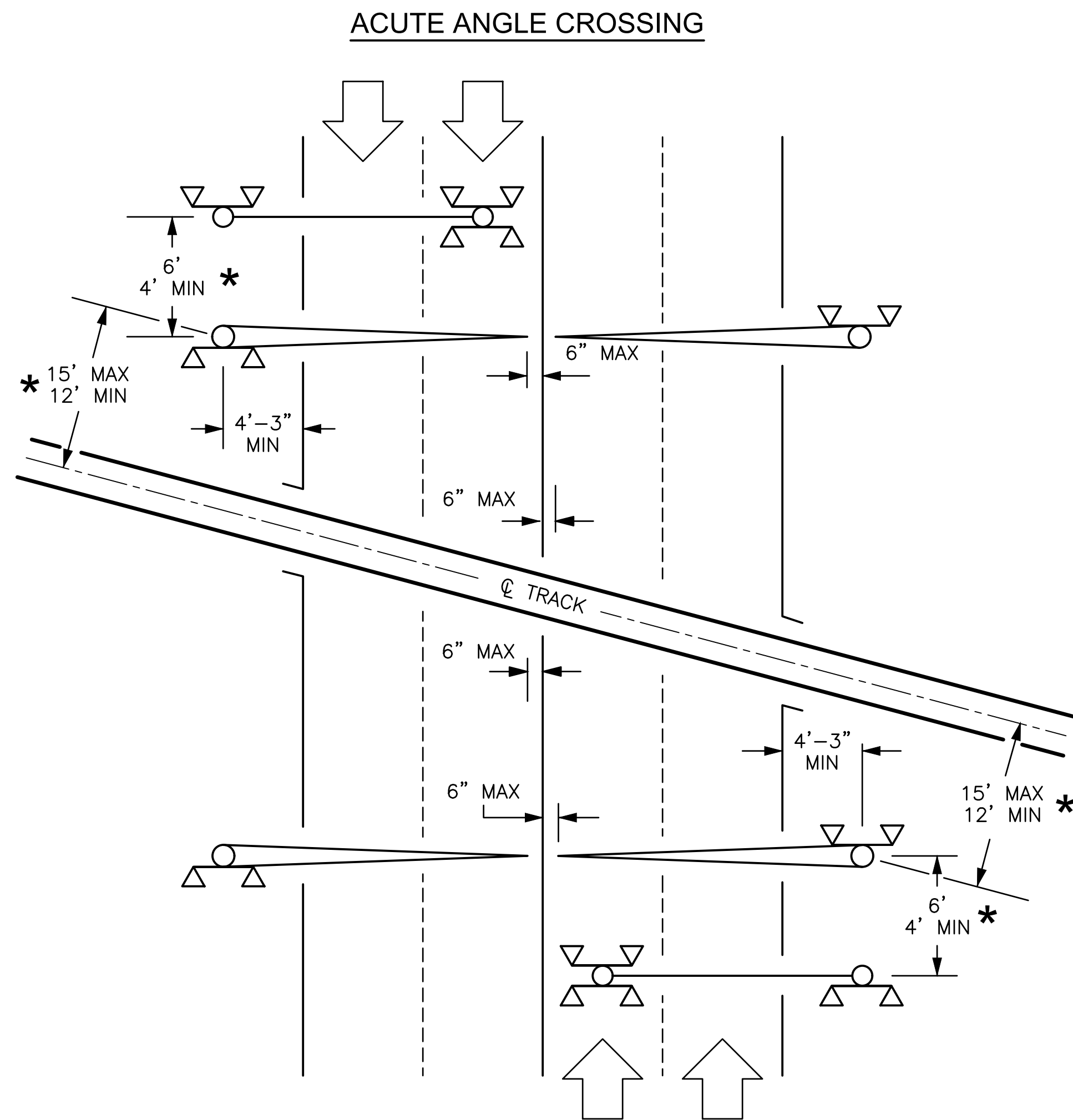
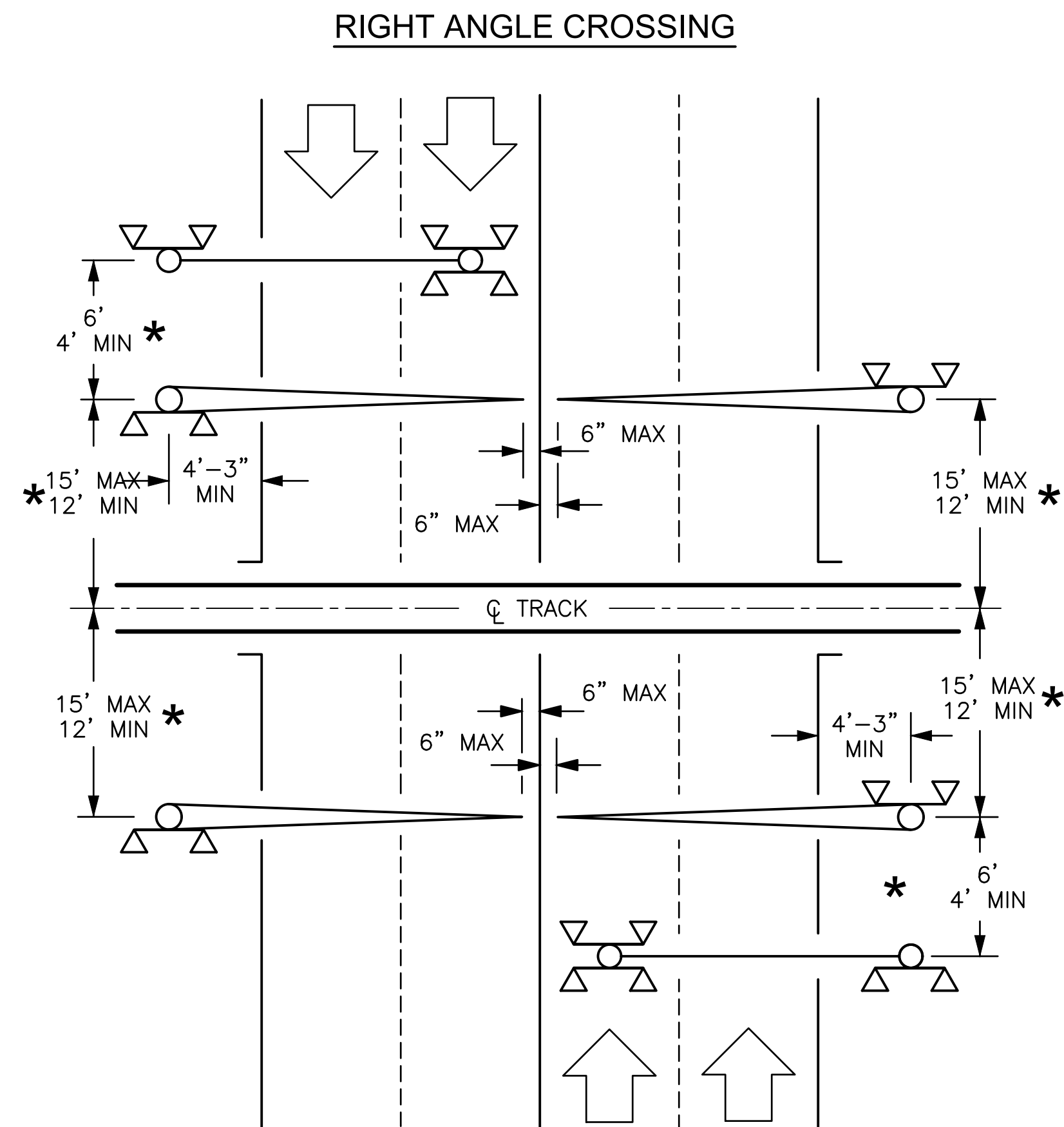
FLASHING LIGHT SIGNALS WITH ENTRANCE AND EXIT GATES

ONE OR MORE TRACKS, TWO-WAY VEHICULAR TRAFFIC, ONE LANE EACH WAY
* USE OF MINIMUM DIMENSIONS SHALL BE AUTHORIZED BY CALTRAIN

NOTES:

1. TYPICAL LOCATION PLAN MAY VARY AS FIELD CONDITIONS REQUIRE.
2. ROADWAY GATE ARM LENGTH SHALL NOT EXCEED 32' MEASURED FROM THE CENTER OF KINGPIN TO THE TIP OF GATE ARM.
3. SEE STANDARD DRAWINGS SD-7000 SERIES FOR ADDITIONAL INFORMATION.
4. REFERENCE AREMA C&S MANUAL PART 3.1.36 FOR DIFFERENT CONFIGURATION.

										PENINSULA CORRIDOR JOINT POWERS BOARD					ENGINEERING STANDARD DRAWINGS					CADD FILE NAME: SD-5404									
										APPROVED BY: <i>Bin Zhang</i> DIRECTOR, ENGINEERING										SIGNAL AND GRADE CROSSING SYSTEMS HIGHWAY GRADE CROSSING APPARATUS					REV:		EDITION: FIFTH		
																				SCALE: NOT TO SCALE									
010126																				FLASHING LIGHT SIGNALS WITH ENTRANCE AND EXIT GATES					STANDARD DRAWING NO.: SD-5404				
REV	DATE	BY	CHK	APP	DESCRIPTION					REV	DATE	BY	CHK	APP															
					FIFTH EDITION																								

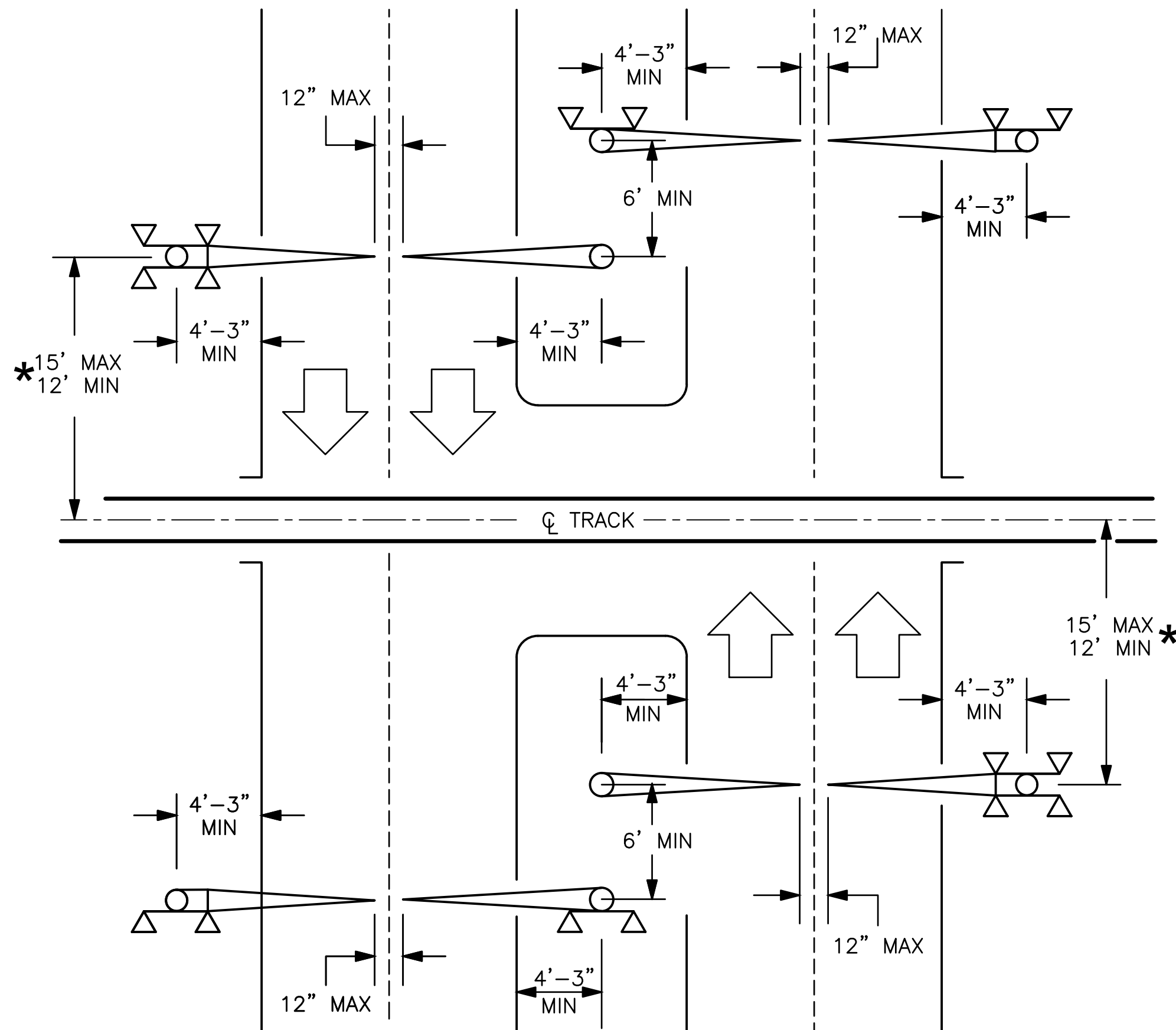


CANTILEVER FLASHERS WITH ENTRANCE AND EXIT GATES:
* ONE OR MORE TRACKS, TWO-WAY VEHICULAR TRAFFIC, TWO LANES EACH WAY
* USE OF MINIMUM DIMENSIONS SHALL BE AUTHORIZED BY CALTRAIN

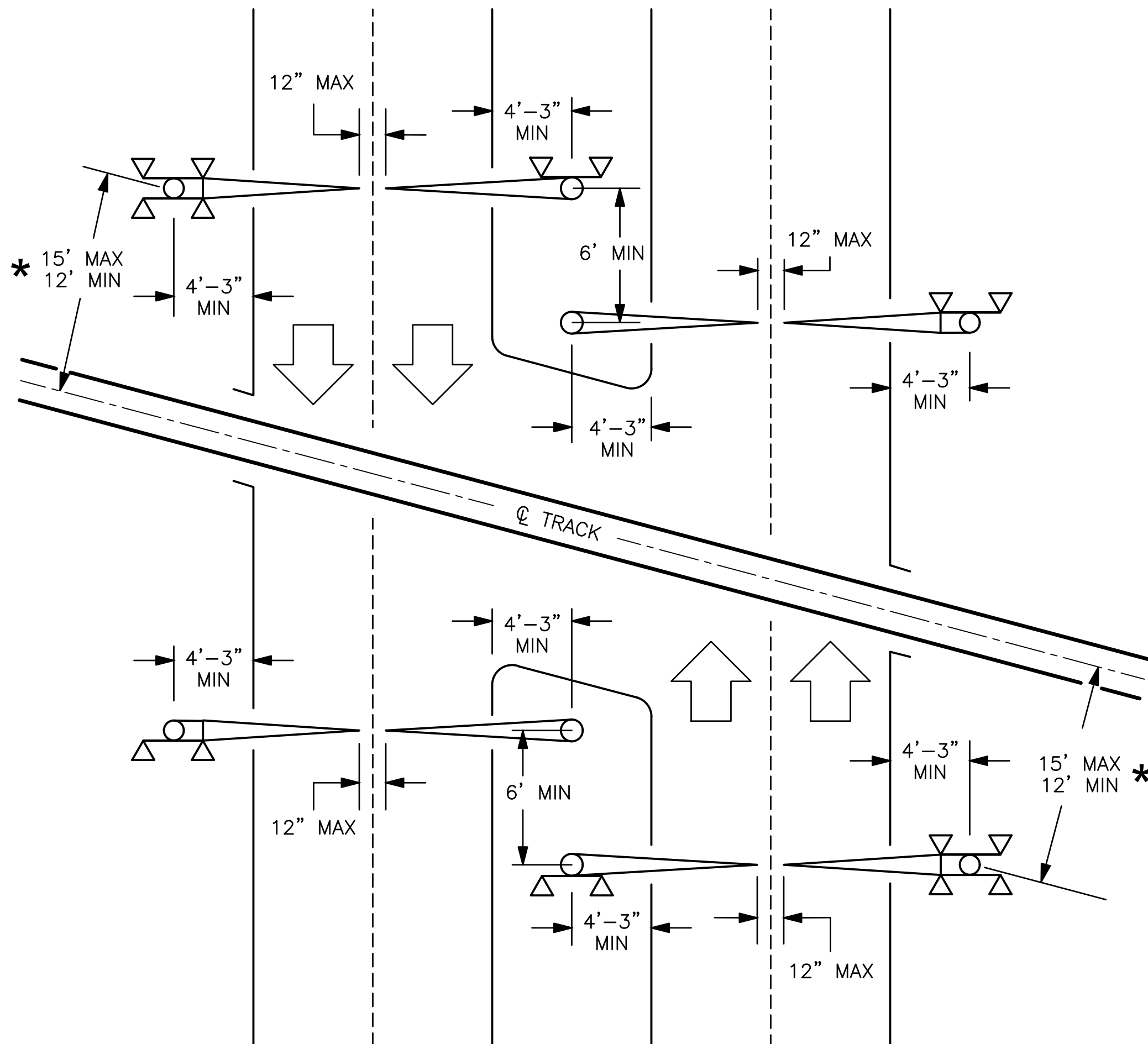
- NOTES:**
1. TYPICAL LOCATION PLAN MAY VARY AS CONDITIONS REQUIRE.
 2. ROADWAY GATE ARM LENGTH SHALL NOT EXCEED 32' MEASURED FROM THE CENTER OF KINGPIN TO THE TIP OF GATE ARM.
 3. SEE STANDARD DRAWINGS SD-7000 SERIES FOR ADDITIONAL INFORMATION.

												PENINSULA CORRIDOR JOINT POWERS BOARD						ENGINEERING STANDARD DRAWINGS						CADD FILE NAME: SD-5405							
												APPROVED BY: <div>Bin Zhang</div> <div>DIRECTOR, ENGINEERING</div>						<div>Caltrain</div>						SIGNAL AND GRADE CROSSING SYSTEMS HIGHWAY GRADE CROSSING APPARATUS						REV:	EDITION: FIFTH
																								SCALE: NOT TO SCALE							
																								CANTILEVER FLASHERS WITH ENTRANCE AND EXIT GATES						STANDARD DRAWING NO.: SD-5405	
REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP	DESCRIPTION		
	010126				FIFTH EDITION																										

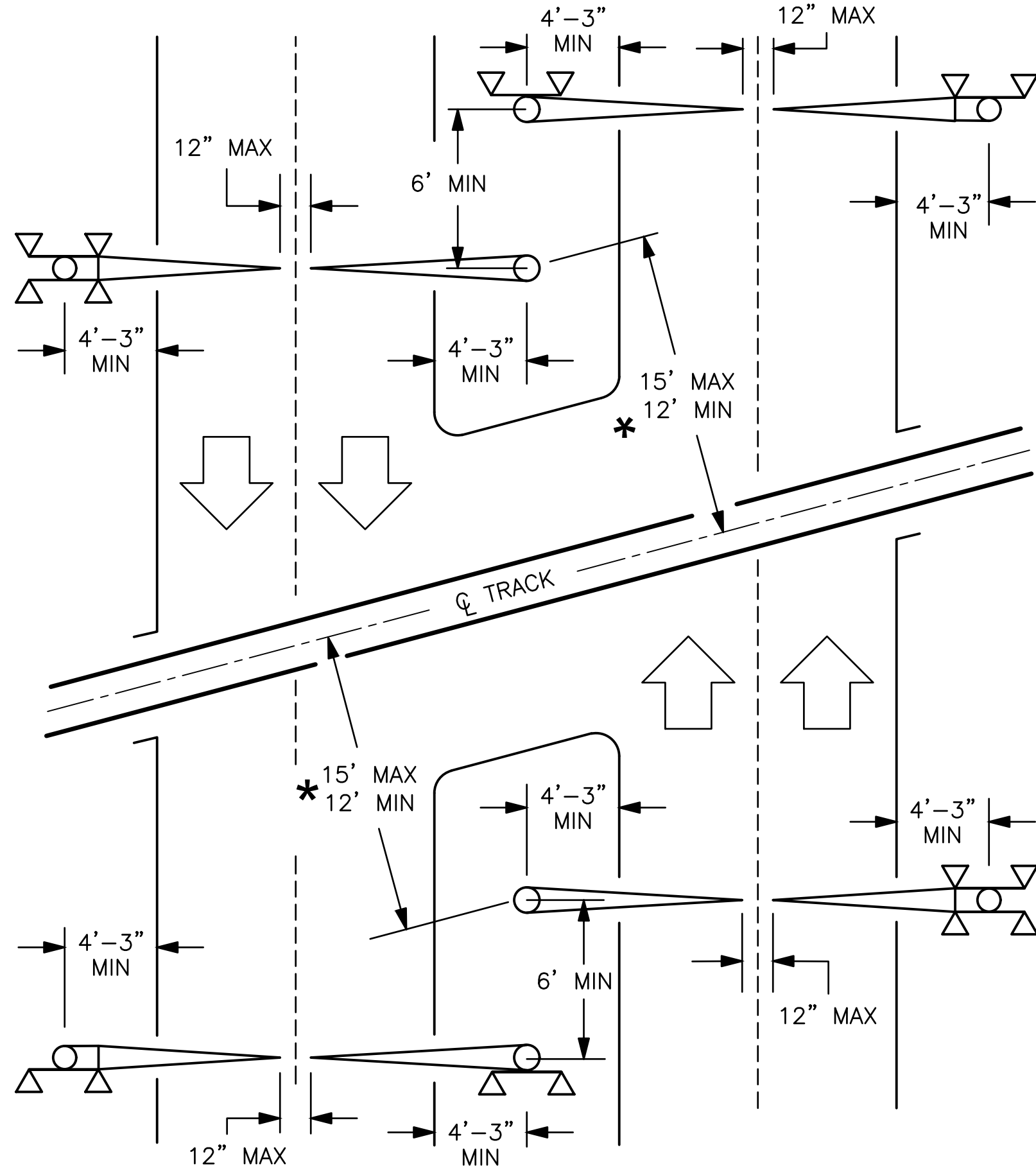
RIGHT ANGLE CROSSING



ACUTE ANGLE CROSSING



OBTUSE ANGLE CROSSING



FLASHING LIGHT SIGNALS WITH ENTRANCE AND EXIT GATES AND MEDIAN
ONE OR MORE TRACKS, TWO-WAY VEHICULAR TRAFFIC, TWO LANES EACH WAY WITH MEDIAN
USE OF MINIMUM DIMENSIONS SHALL BE AUTHORIZED BY CALTRAIN

- NOTES:
1. TYPICAL LOCATION PLAN MAY VARY AS CONDITIONS REQUIRE.
 2. ADDITIONAL MEDIAN WIDTH MAY BE REQUIRED TO PROVIDE CLEARANCE FOR 24" BACKGROUNDS, WIND GUARD OR GATE COUNTERWEIGHTS.
 3. BACK LIGHTS MAY BE ADDED AS CONDITIONS REQUIRE.
 4. ROADWAY GATE ARM LENGTH SHALL NOT EXCEED 32' MEASURED FROM THE CENTER OF KINGPIN TO THE TIP OF GATE ARM.
 5. WHERE BOTH ENTRANCE GATES AND EXIT GATES ARE ALIGNED ON A MEDIAN, FRONT LIGHTS SHALL BE INSTALLED ON THE ASSEMBLY CLOSEST TO TRAFFIC APPROACHING IN THE LAWFUL DIRECTION.
 6. MAINTAIN 30" SEPARATION FOR FLASHERS.
 7. SEE STANDARD DRAWINGS SD-7000 SERIES FOR ADDITIONAL INFORMATION.
 8. REFERENCE AREMA C&S MANUAL PART 3.1.36 FOR DIFFERENT CONFIGURATIONS.

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DIRECTOR, ENGINEERING



ENGINEERING STANDARD DRAWINGS

SIGNAL AND GRADE CROSSING SYSTEMS
HIGHWAY GRADE CROSSING APPARATUS
FLASHING LIGHT SIGNALS WITH
ENTRANCE AND EXIT GATES
AND MEDIAN

CADD FILE NAME:
SD-5406

REV: EDITION:
FIFTH

SCALE:
NTS

STANDARD DRAWING NO.:
SD-5406

REV	DATE	BY	CHK	APP	DESCRIPTION
010126					FIFTH EDITION

Technical drawing of a bridge deck cross-section, showing dimensions and structural details. The drawing includes a central track labeled "TRACK" and various structural elements like girders, supports, and deck slabs. Dimensions are specified in feet and inches, with some values marked as maximum (MAX) or minimum (MIN). Key dimensions include:

- Overall width: 15' MAX, 12' MIN
- Track width: 12" MAX
- Deck slab thickness: 4'-3" MIN
- Support spacing: 6' MIN
- Clearance: 4'-3" MIN
- Track centerline: @ TRACK

The drawing also shows vertical dimensions and structural details for the bridge deck and supports. Arrows indicate the direction of traffic flow.

1. TYPICAL LOCATION PLAN MAY VARY AS CONDITIONS REQUIRE
2. ADDITIONAL MEDIAN WIDTH MAY BE REQUIRED TO PROVIDE CLEARANCE FOR 24" BACKGROUNDS, WINDGUARD OR GATE COUNTERWEIGHTS
3. ROADWAY GATE ARM LENGTH SHALL NOT EXCEED 32' MEASURED FROM THE CENTER OF KINGPIN TO THE TIP OF GATE ARM
4. SEE STANDARD DRAWINGS SD-7000 SERIES FOR ADDITIONAL INFORMATION
5. WHERE BOTH ENTRANCE GATES AND EXIT GATES ARE ALIGNED ON A MEDIAN, FRONT LIGHTS SHALL BE INSTALLED ON THE ASSEMBLY CLOSEST TO TRAFFIC APPROACHING IN THE LAWFUL DIRECTION

CANTILEVER FLASHERS WITH ENTRANCE AND EXIT GATES AND MEDIAN
 ONE OR MORE TRACKS, TWO-WAY VEHICULAR TRAFFIC, THREE OR MORE LANES EACH WAY WITH MEDIAN
 *
 USE OF MINIMUM DIMENSIONS SHALL BE AUTHORIZED BY CALTRAIN

	010126					FIFTH EDITION													
REV	DATE	BY	CHK	APP	DESCRIPTION					REV	DATE	BY	CHK	APP					

APPROVED BY:

Bin Zhang

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SIGNAL AND GRADE CROSSING SYSTEMS	R
HIGHWAY GRADE CROSSING APPARATUS	S
CANTILEVER FLASHERS WITH	S
ENTRANCE AND EXIT GATES	
AND MEDIAN	

CADD FILE NAME:	
SD-5407	
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NOT USED.

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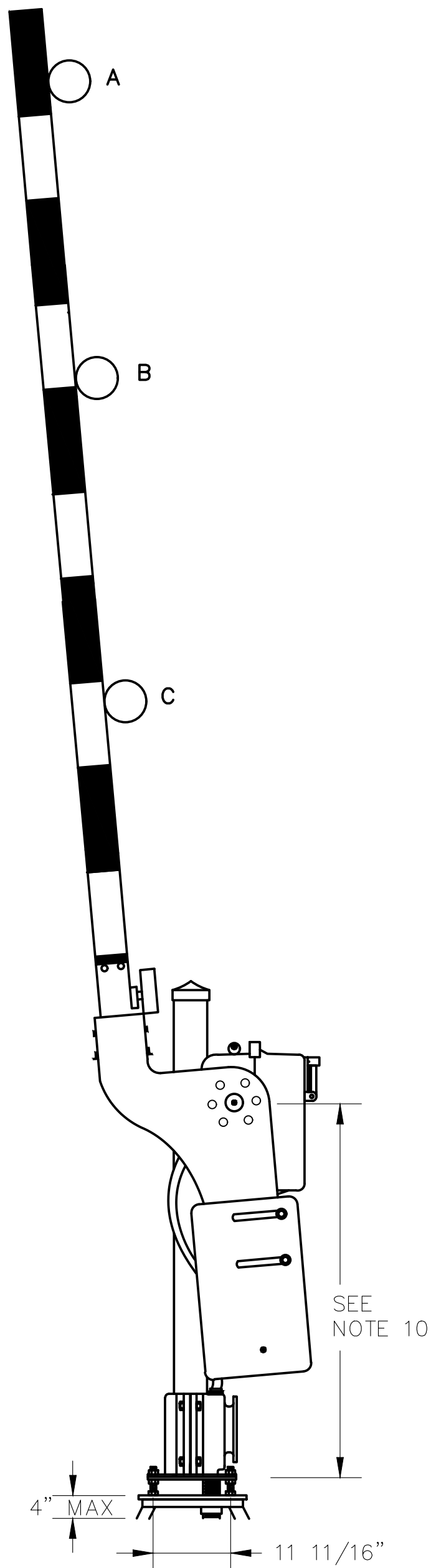
NOTES FOR GATE ARMS:

- GATE ARM LENGTH IS MEASURED FROM GATE MECHANISM CAM SHAFT TO END OF GATE ARM.
- END OF GATE ARM SHALL BE LOCATED WITHIN 12" OF THE CENTERLINE OF ROADWAY OR FACE OF MEDIAN CURB. WHERE PRACTICAL, END OF GATE ARM SHALL EXTEND TO CENTERLINE OF ROADWAY OR FACE OF MEDIAN CURB.
- THE FOLLOWING GUIDELINES SHALL BE USED FOR GATE ARM LAMP PLACEMENT. HIGHWAY CROSSING SHALL BE EVALUATED AND LAMPS PLACED FOR OPTIMUM VIEWING BY MOTORIST.

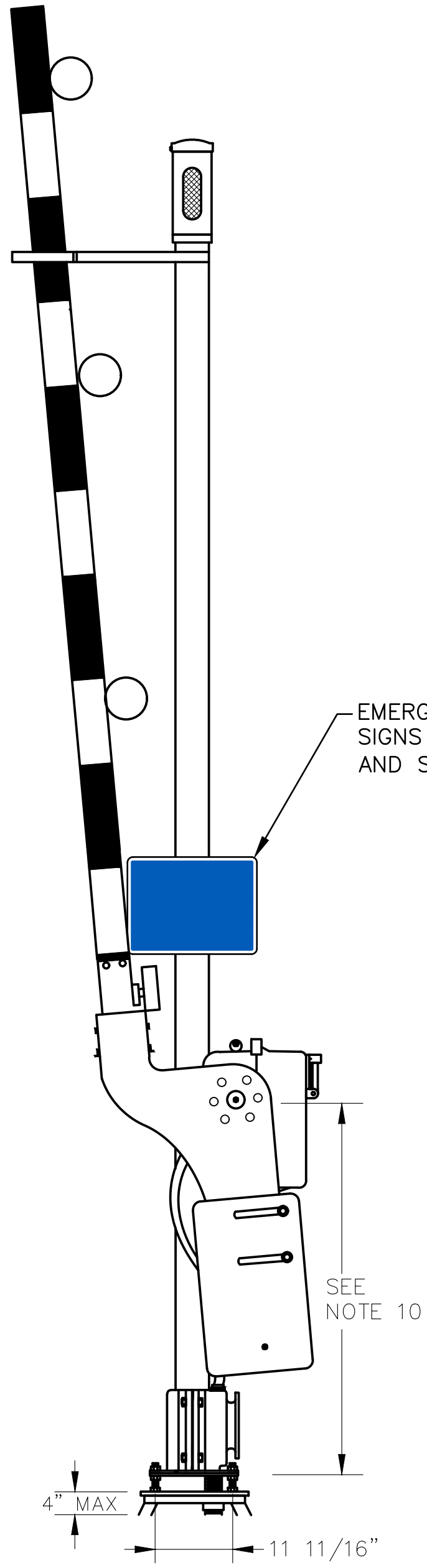
LAMP A:
12" FROM END OF GATE ARM.

LAMP B:
GATE LAMP SHALL BE CENTERED BETWEEN LAMP A AND LAMP C.

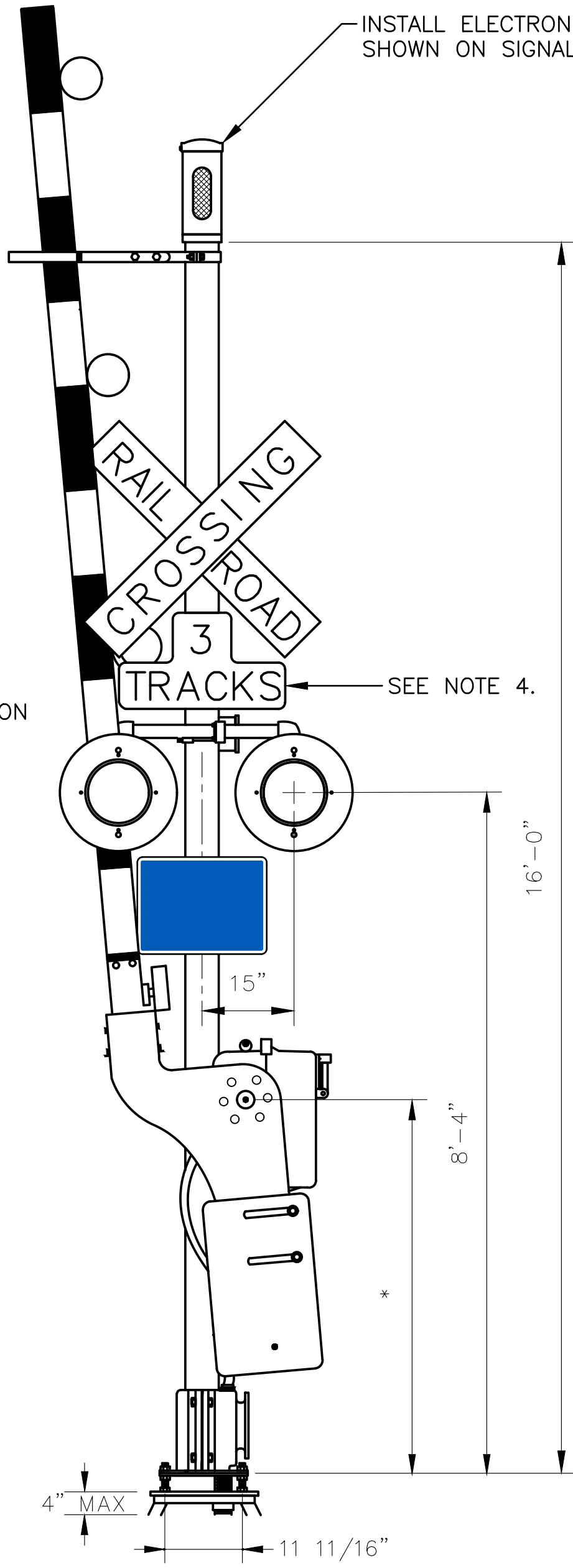
LAMP C:
GATE LAMP SHALL BE 8' FROM CENTER OF MAST.



STUB GATE
(NOT FOR NEW WORK)



GATE USED W/CFLS
(PUC NO. 9A)
SEE NOTE 13



FLS W/GATE
(PUC NO. 9)

NOTES:

- TOP OF FOUNDATION SHALL BE LEVEL WITH CROWN OF ROAD AT MAXIMUM 4" ABOVE TOP OF GROUND LEVEL.
- WHEN USED, SIDELIGHT ASSEMBLY SHALL BE PLACED SO AS NOT TO INTERFERE WITH GATE ARM OR REDUCE TRACK CLEARANCE. 30" SEPARATION OF LIGHT UNITS SHALL BE MAINTAINED.
- ALL PARTS SHALL BE ALUMINUM IN COLOR EXCEPT VISORS AND BACKGROUNDS, WHICH SHALL BE FLAT BLACK.
- TRACK SIGN SHALL BE USED WHEN TWO OR MORE TRACKS CROSS STREET.
- GATE LAMPS SHALL BE 4" DIAMETER
- FLASHING LIGHT SIGNAL UNIT BACKGROUNDS-24" AND VISORS SHALL BE STEEL
- LENS HORIZONTAL DOWNWARD DEFLECTION PER AAR/AREMA.
- BELL SHALL BE ELECTRONIC.
- GATE MECHANISM SHALL BE ADJUSTED SO THAT, WHEN GATE IS IN FULL HORIZONTAL POSITION, THE GATE ARM RESTS BETWEEN 3'-6" TO 4'-6" ABOVE CROWN OF ROADWAY.
- PEDESTRIAN GATE ARM SHALL HAVE TIP LIGHT UP TO 10'. GATE ARMS LONGER THAN 10' TO HAVE THREE LIGHTS.
- PEDESTRIAN GATE ARM SHALL NOT BLOCK ENTIRE WALKWAY. AN EXIT PATH MUST BE PROVIDED FOR PEDESTRIANS WHO ARE IN TRANSIT WHEN GATES ACTIVATE.
- BACK LIGHT AND BELL LOCATIONS ON CANTILEVER AND GATES SHALL BE DETERMINED DURING DESIGN.
- ENS SIGNS TO BE INSTALLED AS NEEDED TO FULLY COMPLY WITH FRA REGULATION 234.311.
- GATE MECHANISM TO BE WESTERN CULLEN HAYES MODEL 3597 2-WIRE GATE CONTROL OR EQUIVALENT.
- PER CPUC GENERAL ORDER #75D, SIGNALS AT ALL NEW LOCATIONS SHALL HAVE LED FLASHER ASSEMBLIES.
- REFER TO DRAWING SD-5217 FOR GROUNDING REQUIREMENTS AND DETAILS.

										PENINSULA CORRIDOR JOINT POWERS BOARD		ENGINEERING STANDARD DRAWINGS		CADD FILE NAME: SD-5409	
										APPROVED BY: <i>Bin Zhang</i>		SIGNAL AND GRADE CROSSING SYSTEMS HIGHWAY GRADE CROSSING APPARATUS		REV:	EDITION: FIFTH
										Caltrain		CROSSING GATE WITH AND WITHOUT FLASHING LIGHT SIGNALS		SCALE:	NTS
														STANDARD DRAWING NO.: SD-5409	
010126					FIFTH EDITION										
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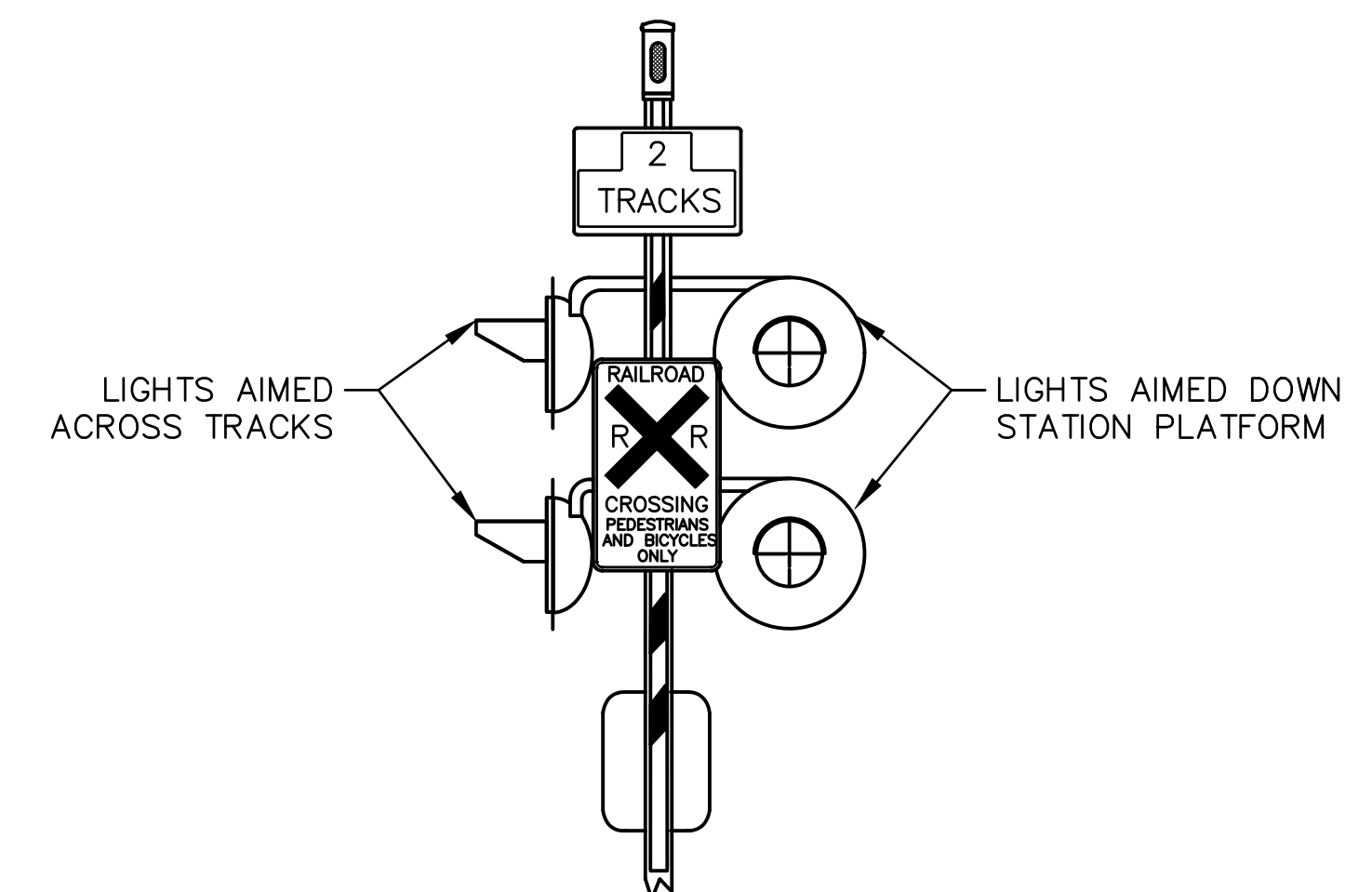
PLAN VIEW

SIDE VIEW

TYPICAL LOCATION

SIDE VIEW



GATE ASSEMBLY PER SD-5409 WITH
ADDITION OF PEDESTRIAN APPURTENANCES



NOTES:

1. PER CPUC GENERAL ORDER #75D, SIGNALS AT ALL NEW LOCATIONS SHALL HAVE LED FLASHER ASSEMBLIES.
2. LIGHT ASSEMBLIES SHALL BE PLACED SO AS NOT TO INTERFERE WITH GATE ARM MOVEMENT.
3. INSTALL BACKLIGHTS WHERE NECESSARY.
4. LOCATE TIP LIGHT 12" FROM TIP OF GATE.
5. SEE SD-7000 SERIES DRAWINGS FOR SIGNAGE AND MOUNTING DETAILS.
6. SMOOTHEN GATE TIP TO REMOVE BURRS AND SHARP EDGES.
7. ENS SIGNS TO BE INSTALLED AS NEEDED TO FULLY COMPLY WITH FRA REGULATION 234.311.
8. GATE MECHANISM TO BE WESTERN CULLEN HAYES MODEL 3597 2-WIRE GATE CONTROL OR EQUIVALENT.
9. REFER TO DRAWING SD-5217 FOR GROUNDING REQUIREMENTS AND DETAILS.

	010126					FIFTH EDITION													
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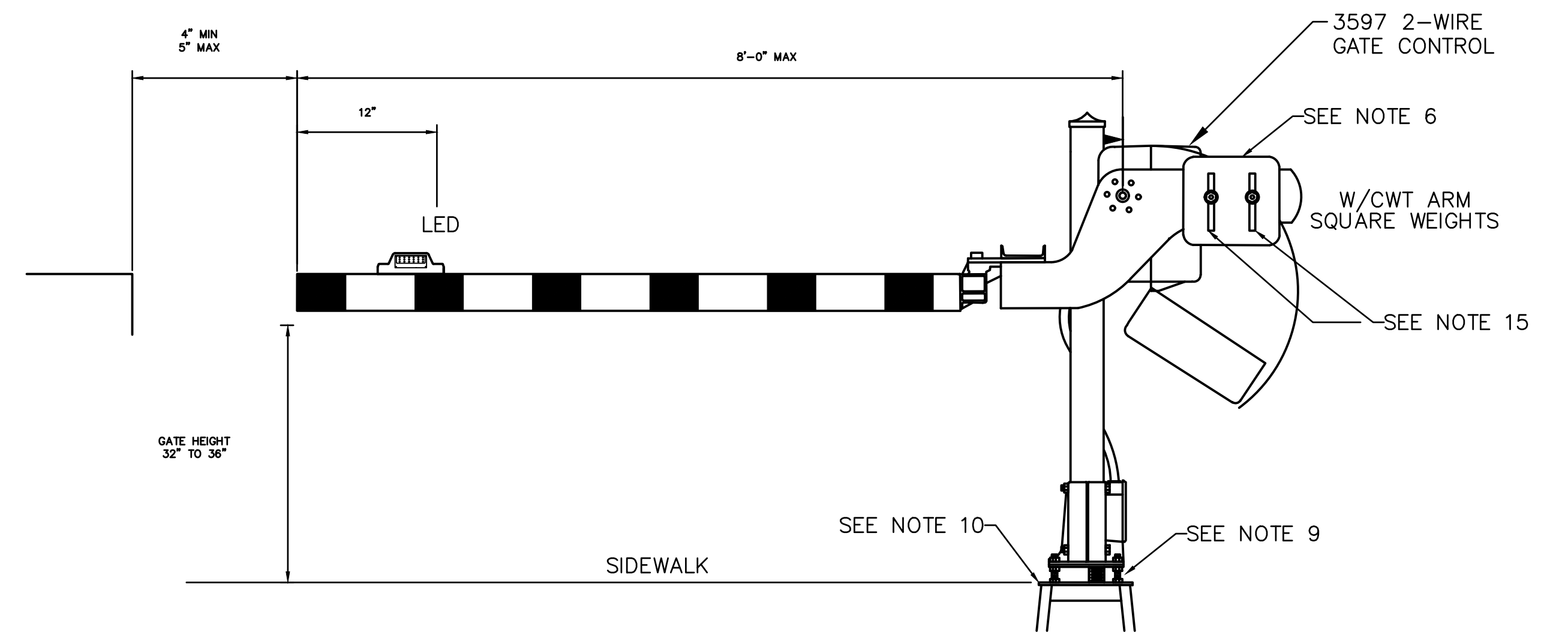
PENINSULA CORRIDOR JOINT POWERS BOARD		ENGINEERING STANDARD DRAWINGS		CADD FILE NAME: SD-5410	
APPROVED BY:  DIRECTOR, ENGINEERING				REV: EDITION: FIFTH	
		SIGNAL AND GRADE CROSSING SYSTEMS HIGHWAY GRADE CROSSING APPARATUS		SCALE: NTS	
		PEDESTRIAN WARNING DEVICE STATION PED CROSSING GATE		STANDARD DRAWING NO.: SD-5410	



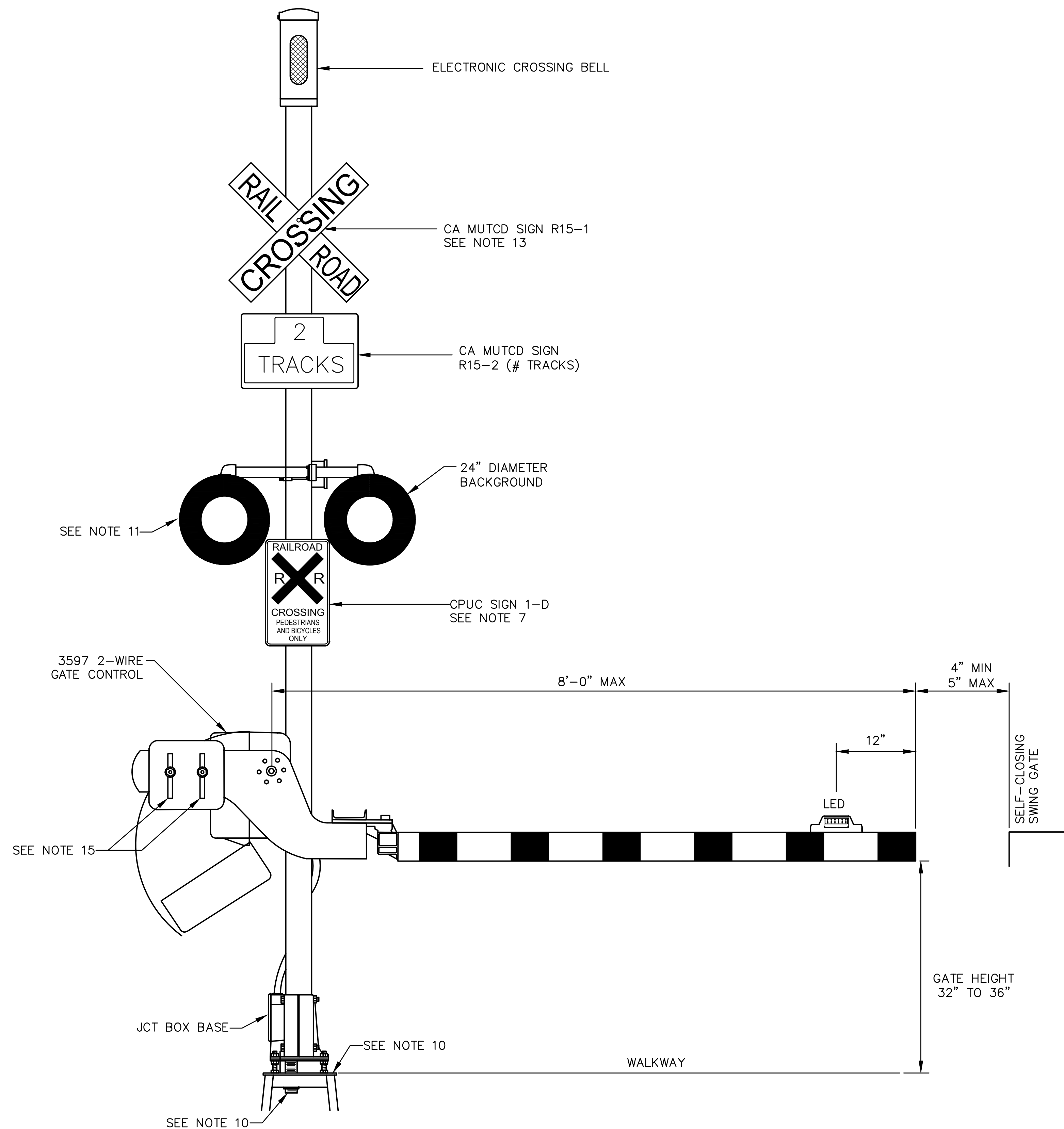
GATE ASSEMBLY PER SD-5409 WITH
ADDITION OF PEDESTRIAN APPURTENANCES.

1. PER CPUC GENERAL ORDER 75D, SIGNALS AT ALL NEW LOCATIONS SHALL HAVE LED FLASHER ASSEMBLIES.
2. FLASHING LIGHT SIGNAL UNITS SHALL BE 12" LED TYPE DESIGNED TO OPERATE WITH A SOLID STATE CROSSING CONTROLLER AND SHALL CONFORM TO AREMA C&S MANUAL RECOMMENDATIONS.
3. 1-WAY OR 2-WAY LED FLASHER ASSEMBLIES SHALL INCLUDE JUNCTION BOX CROSS ARM ASSEMBLY AND LAMP MOUNTING BRACKETS PER AREMA C&S MANUAL PART 3.2.51, 12" LED LAMP UNITS, 24" STEEL BACKGROUNDS, STEEL HOODS AND ALL ASSOCIATED HARDWARE.
4. LIGHT ASSEMBLIES SHALL BE PLACED SO AS NOT TO INTERFERE WITH GATE ARM MOVEMENT.
5. INSTALL FLASHERS PER SITE SPECIFIC SIGNAL DRAWINGS.
6. WHEN COUNTER WEIGHTS ARE ADDED, ENSURE THAT SMALL PLATES ARE USED TO AVOID EXCESSIVE OVERHANG IN AREA PEDESTRIANS MAY OCCUPY.
7. SEE SD-7000 SERIES DRAWINGS FOR CIVIL DETAILS.
8. SMOOTHEN GATE TIP TO REMOVE BURRS AND SHARP EDGES.
9. CABLE ENTRY SHALL BE PROTECTED FROM RODENTS AND VANDALISM.
10. TOP OF FOUNDATION SHALL BE LEVEL WITH SIDEWALK.
11. FOR FLASHER HEIGHT SEE SD-5409 (PUC NO. 9).
12. ORIENTATION OF GATE ARM AND MECHANISM WILL VARY DEPENDING ON SITE SPECIFIC REQUIREMENTS. ORIENTATION AS SHOWN HERE FOR ILLUSTRATION PURPOSES ONLY.
13. INSTALL SIGNS EQUIDISTANT FROM FLASHERS AND ELECTRONIC BELL.
14. ON PEDESTRIAN GATES HALF ARM CAN BE USED ON OPPOSITE SIDE OF ARM WITH COUNTER WEIGHT.
15. ON PEDESTRIAN GATES EXCESS BOLT LENGTH SHALL BE REMOVED FROM SUPPORT BOLTS AFTER INSTALLATION OF COUNTER WEIGHTS.
16. ENS SIGNS TO BE INSTALLED AS NEEDED TO FULLY COMPLY WITH FRA REGULATION 234.311.
17. GATE MECHANISM TO BE WESTERN CULLEN HAYES MODEL 3597 2-WIRE GATE CONTROL OR EQUIVALENT.
18. REFER TO DRAWING SD-5217 FOR GROUNDING REQUIREMENTS AND DETAILS.

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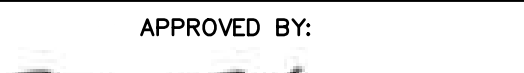

STANDARD DRAWING NO.:
SD-5412



**PED GATE WITH ELECTRONIC
BELL, LED 12" FLASHERS
AND CPUC STD. 1-D**

NOTES:

1. PER CPUC GENERAL ORDER 75D, SIGNALS AT ALL NEW LOCATIONS SHALL HAVE LED FLASHER ASSEMBLIES.
2. FLASHING LIGHT SIGNAL UNITS SHALL BE 12" LED TYPE DESIGNED TO OPERATE WITH A SOLID STATE CROSSING CONTROLLER AND SHALL CONFORM TO AREMA C&S MANUAL RECOMMENDATIONS.
3. 1-WAY OR 2-WAY LED FLASHER ASSEMBLIES SHALL INCLUDE JUNCTION BOX CROSS ARM ASSEMBLY AND LAMP MOUNTING BRACKETS PER AREMA C&S MANUAL PART 3.2.51, 12" LED LAMP UNITS, 24" STEEL BACKGROUNDS, STEEL HOODS AND ALL ASSOCIATED HARDWARE.
4. LIGHT ASSEMBLIES SHALL BE PLACED SO AS NOT TO INTERFERE WITH GATE ARM MOVEMENT.
5. INSTALL FLASHERS PER SITE SPECIFIC SIGNAL DRAWINGS.
6. WHEN COUNTER WEIGHTS ARE ADDED, ENSURE THAT SMALL PLATES ARE USED TO AVOID EXCESSIVE OVERHANG IN AREA PEDESTRIANS MAY OCCUPY.
7. SEE SD-7000 SERIES DRAWINGS FOR CIVIL DETAILS.
8. SMOOTHEN GATE TIP TO REMOVE BURRS AND SHARP EDGES.
9. CABLE ENTRY SHALL BE PROTECTED FROM RODENTS AND VANDALISM.
10. TOP OF FOUNDATION SHALL BE LEVEL WITH SIDEWALK.
11. FOR FLASHER HEIGHT SEE SD-5409 (PUC NO. 9).
12. ORIENTATION OF GATE ARM AND MECHANISM WILL VARY DEPENDING ON SITE SPECIFIC REQUIREMENTS. ORIENTATION AS SHOWN HERE FOR ILLUSTRATION PURPOSES ONLY.
13. INSTALL SIGNS EQUIDISTANT FROM FLASHERS AND ELECTRONIC BELL.
14. ON PEDESTRIAN GATES HALF ARM CAN BE USED ON OPPOSITE SIDE OF ARM WITH COUNTER WEIGHT.
15. ON PEDESTRIAN GATES EXCESS BOLT LENGTH SHALL BE REMOVED FROM SUPPORT BOLTS AFTER INSTALLATION OF COUNTER WEIGHTS.
16. ENS SIGNS TO BE INSTALLED AS NEEDED TO FULLY COMPLY WITH FRA REGULATION 234.311.
17. GATE MECHANISM TO BE WESTERN CULLEN HAYES MODEL 3597 2-WIRE GATE CONTROL OR EQUIVALENT.
18. REFER TO DRAWING SD-5217 FOR GROUNDING REQUIREMENTS AND DETAILS.

												PENINSULA CORRIDOR JOINT POWERS BOARD						ENGINEERING STANDARD DRAWINGS						CADD FILE NAME: SD—5413			
												<div>APPROVED BY:  DIRECTOR, ENGINEERING</div>												REV: SD—5413		EDITION: FIFTH	
																								SCALE: NTS		STANDARD DRAWING NO.: SD—5413	
010126						FIFTH EDITION												SIGNAL AND GRADE CROSSING SYSTEMS HIGHWAY GRADE CROSSING APPARATUS PEDESTRIAN WARNING DEVICE FOR PEDESTRIAN AND BICYCLE ONLY CROSSINGS									
REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP	DESCRIPTION																

The diagram illustrates three different configurations for railroad crossing advance warning gates. Each configuration is shown in relation to a track, a curb line, and a sidewalk.

- GATE WITH STUB MAST:** This configuration features a short, vertical mast with a circular sign. It is positioned on the sidewalk, adjacent to the curb line.
- SWING GATE (TYP):** This configuration shows a gate that swings horizontally across the track. It is positioned on the sidewalk, adjacent to the curb line.
- GATE WITH TALL MAST, FLASHERS, BELL AND PED SIGN (OFF-QUADRANT) MULTIPLE TRACK SIGN:** This configuration features a tall mast with multiple signs, including flashers, a bell, and a pedestrian sign. It is positioned on the sidewalk, adjacent to the curb line.



The diagram also includes labels for the **SIDEWALK**, **CURB LINE**, and **TRACK**.

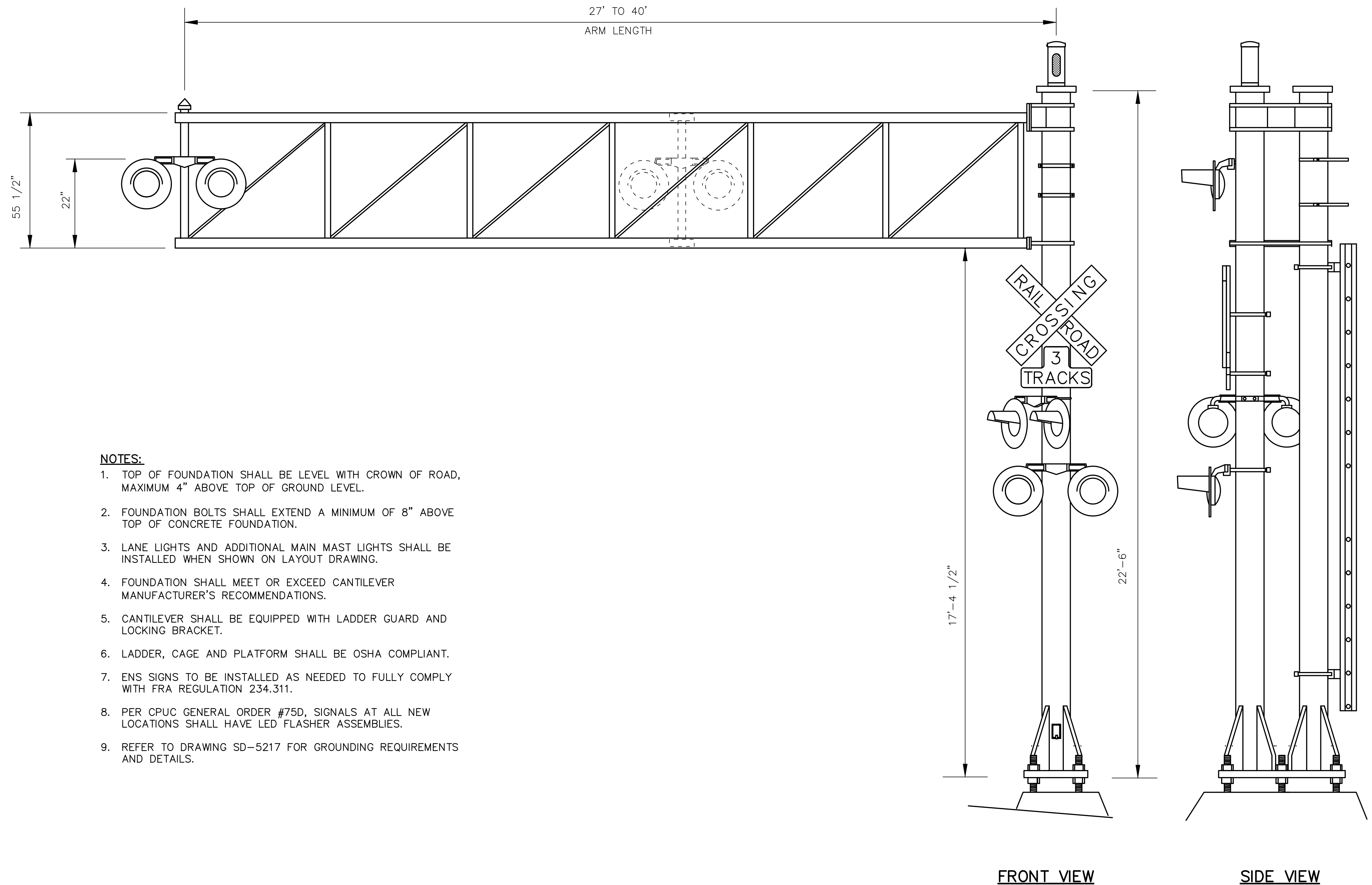
The diagram illustrates a crossing with two different mast configurations. The top section shows a 'GATE WITH STUB MAST' where the mast is short, and the gate is positioned close to the track. The bottom section shows a 'GATE WITH TALL MAST' where the mast is tall, and the gate is positioned further from the track. Both sections include labels for 'SIDEWALK', 'CURB LINE', and 'TRACK'.



Diagram illustrating a single-track railroad crossing with two gates. The crossing is labeled "Q TRACK". The diagram shows the layout of the tracks, sidewalks, and curbs. The gates are labeled:

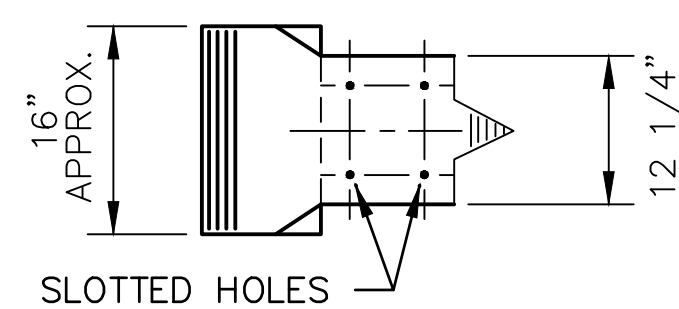
- GATE WITH TALL MAST, FLASHERS, BELL AND PED SIGN (OFF-QUADRANT) MULTIPLE TRACK SIGN
- GATE WITH STUB MAST


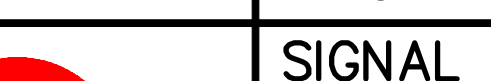
TO MINIMIZE CROSSING DISTANCE, THE PEDESTRIAN GATE SHALL BE PARALLEL TO TRACKS. ALIGN WITH EITHER SIDE OF THE VEHICULAR GATE COUNTER WEIGHT THAT PROVIDES 12' MIN AND 15' MAX (TRACK CENTER TO PED SIGNAL MAST)

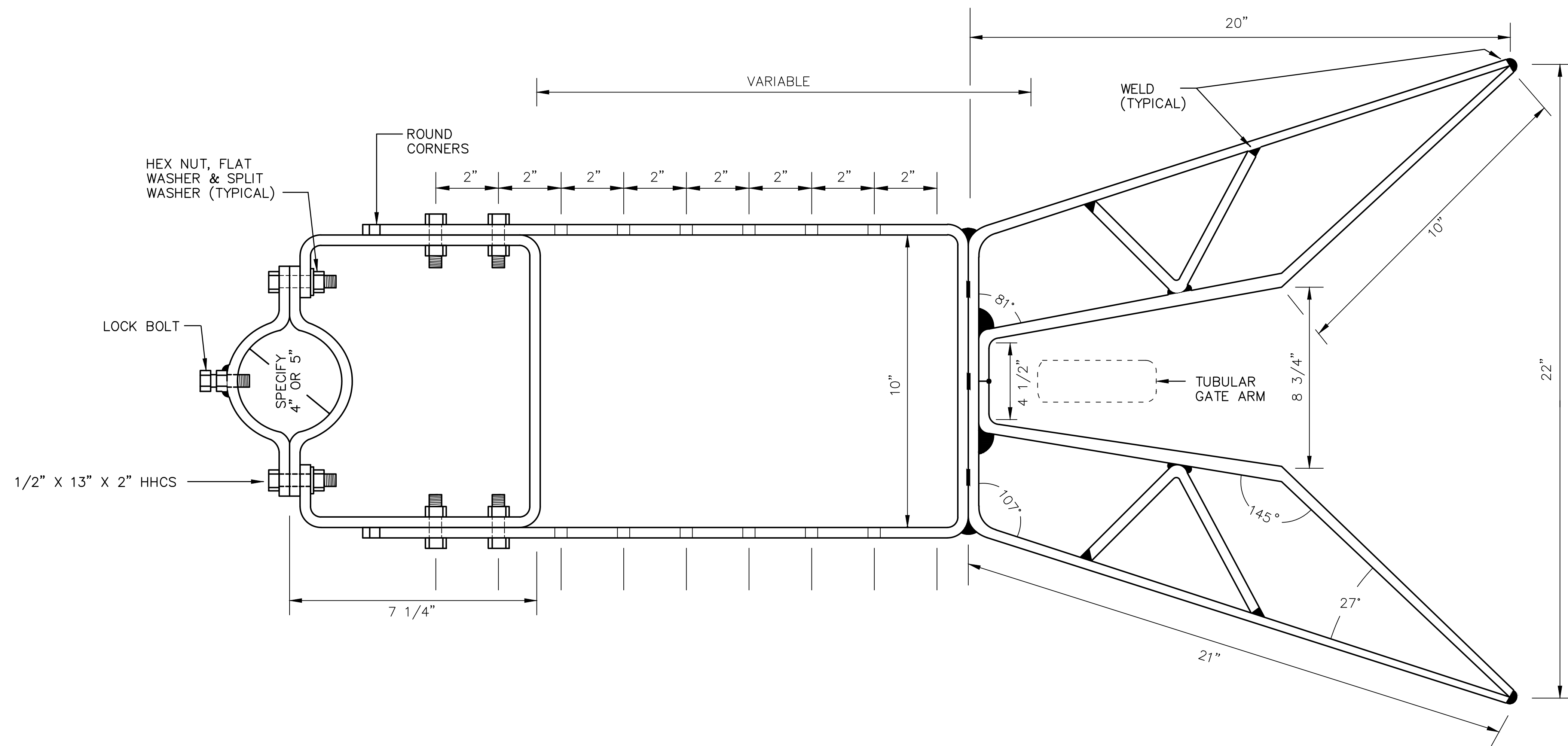
												PENINSULA CORRIDOR JOINT POWERS BOARD						ENGINEERING STANDARD DRAWINGS						CADD FILE NAME: SD-5414	
												<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> APPROVED BY:  DIRECTOR, ENGINEERING </div> <div style="text-align: center;">  </div> </div>						SIGNAL AND GRADE CROSSING SYSTEMS HIGHWAY GRADE CROSSING APPARATUS						REV:	EDITION: FIFTH
																		SCALE: NTS						STANDARD DRAWING NO.: SD-5414	
010126 FIFTH EDITION																									
REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP	DESCRIPTION														



															PENINSULA CORRIDOR JOINT POWERS BOARD					ENGINEERING STANDARD DRAWINGS					CADD FILE NAME: SD-5416									
															<div>APPROVED BY:</div> <div></div> <div>DIRECTOR, ENGINEERING</div>										SIGNAL AND GRADE CROSSING SYSTEMS					REV: EDITION: FIFTH				
																									HIGHWAY GRADE CROSSING APPARATUS					SCALE: NTS				
010126					FIFTH EDITION															MODEL "WNR" WALKOUT					STANDARD DRAWING NO.: SD-5416									
REV	DATE	BY	CHK	APP	DESCRIPTION					REV	DATE	BY	CHK	APP																				





																				PENINSULA CORRIDOR JOINT POWERS BOARD										ENGINEERING STANDARD DRAWINGS										CADD FILE NAME: SD-5417																			
																				<div>APPROVED BY:  DIRECTOR, ENGINEERING</div>																				SIGNAL AND GRADE CROSSING SYSTEMS										REV:EDITION: FIFTH									
																																								HIGHWAY GRADE CROSSING APPARATUS										SCALE: NTS									
010126										FIFTH EDITION																														STANDARD DRAWING NO.: SD-5417																			
REV	DATE	BY	CHK	APP	DESCRIPTION					REV	DATE	BY	CHK	APP	DESCRIPTION																																												

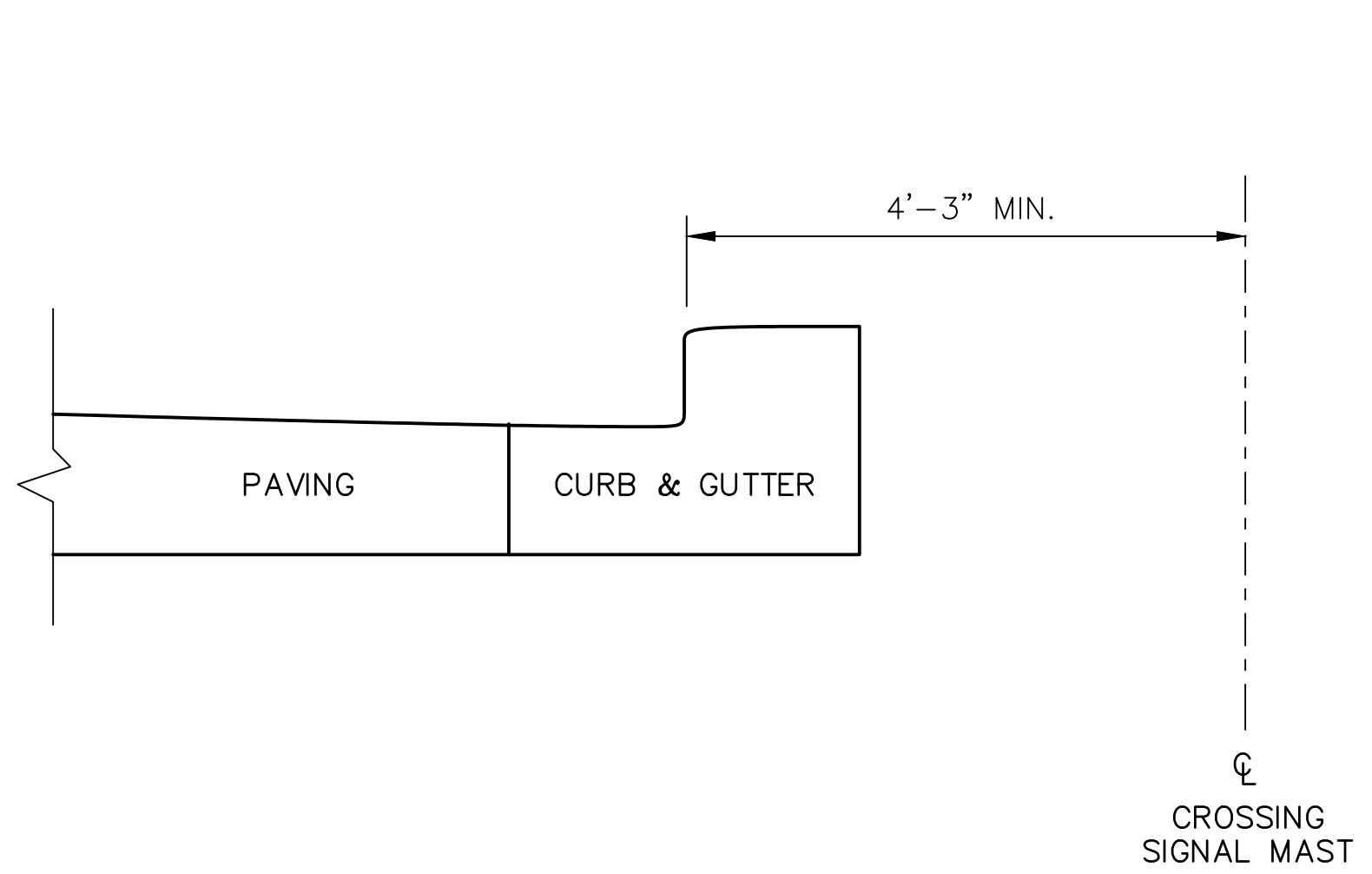


NOTES:

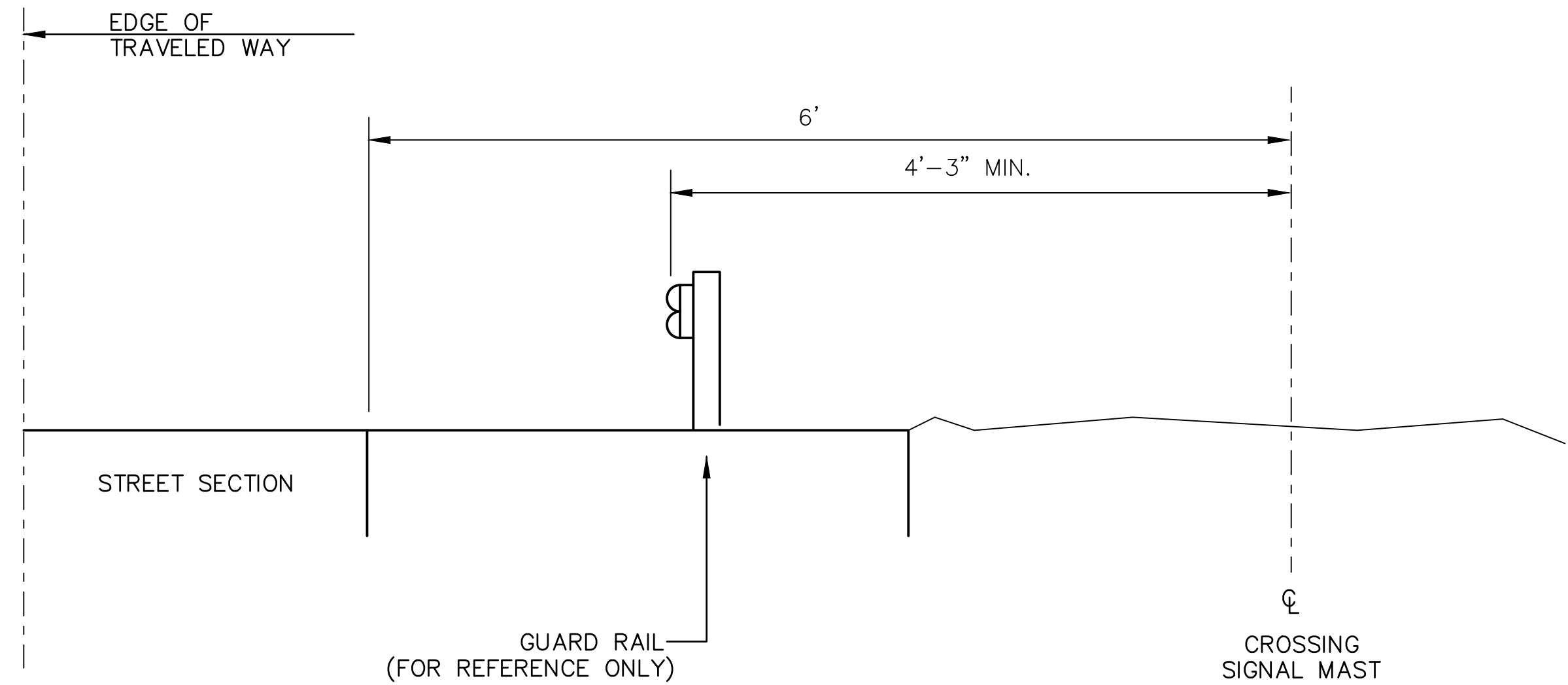
1. ALL HARDWARE SHALL BE 1/2" X 13" X 1 1/2" EXCEPT AS NOTED.
2. SUPPORT SHALL BE CONSTRUCTED OF 1/4" X 2" FLAT BAR ALUMINUM 6061T6 OR 6063T5 OR MATERIAL OF EQUIVALENT TENSILE STRENGTH AND CORROSION RESISTANCE.
3. MAINTAIN MUTCD MINIMUM CLEARANCE

												PENINSULA CORRIDOR JOINT POWERS BOARD						ENGINEERING STANDARD DRAWINGS						CADD FILE NAME: SD-5418							
												<div>APPROVED BY:  DIRECTOR, ENGINEERING</div>												SIGNAL AND GRADE CROSSING SYSTEMS						REV: SD-5418	
																								HIGHWAY GRADE CROSSING APPARATUS						EDITION: FIFTH	
																								SCALE: NTS							
																								STANDARD DRAWING NO.: SD-5418							
REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP	DESCRIPTION																				
	010126				FIFTH EDITION																										

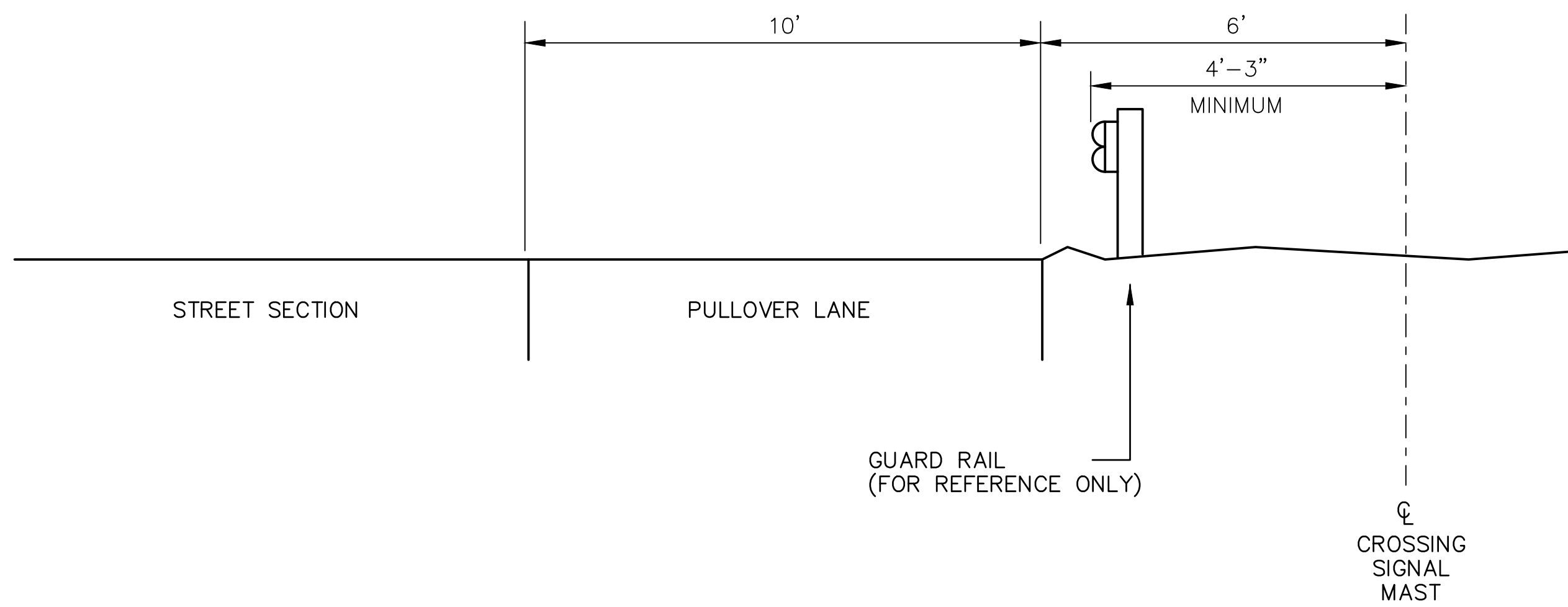
NOTE:
GUARD RAILS ARE ONLY USED WHEN
APPROVED BY CALTRAIN



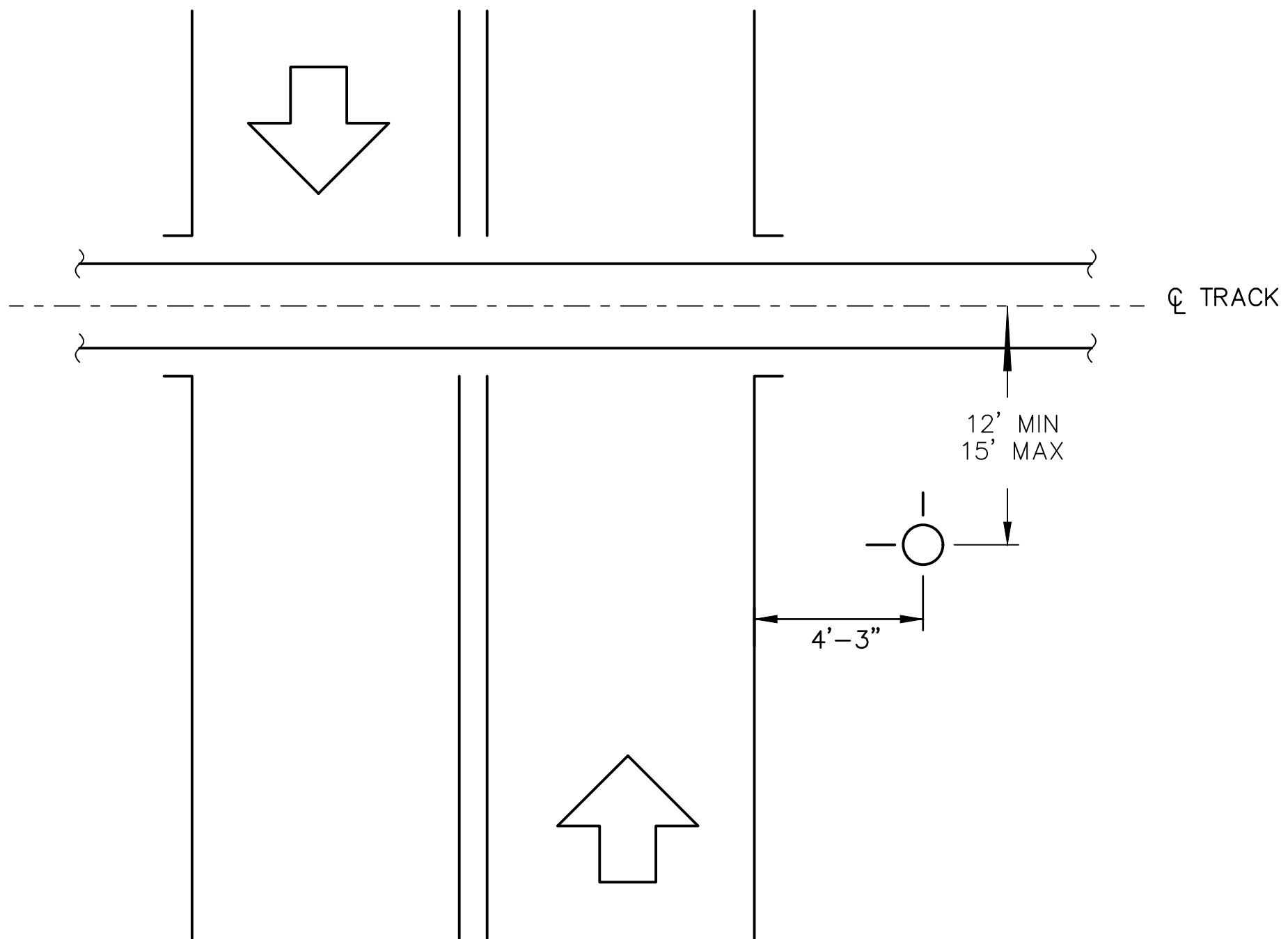
LOCATION OF AUTOMATIC WARNING DEVICE FROM CURB





LOCATION OF AUTOMATIC WARNING DEVICE
FROM ROADWAY WITH NO CURB



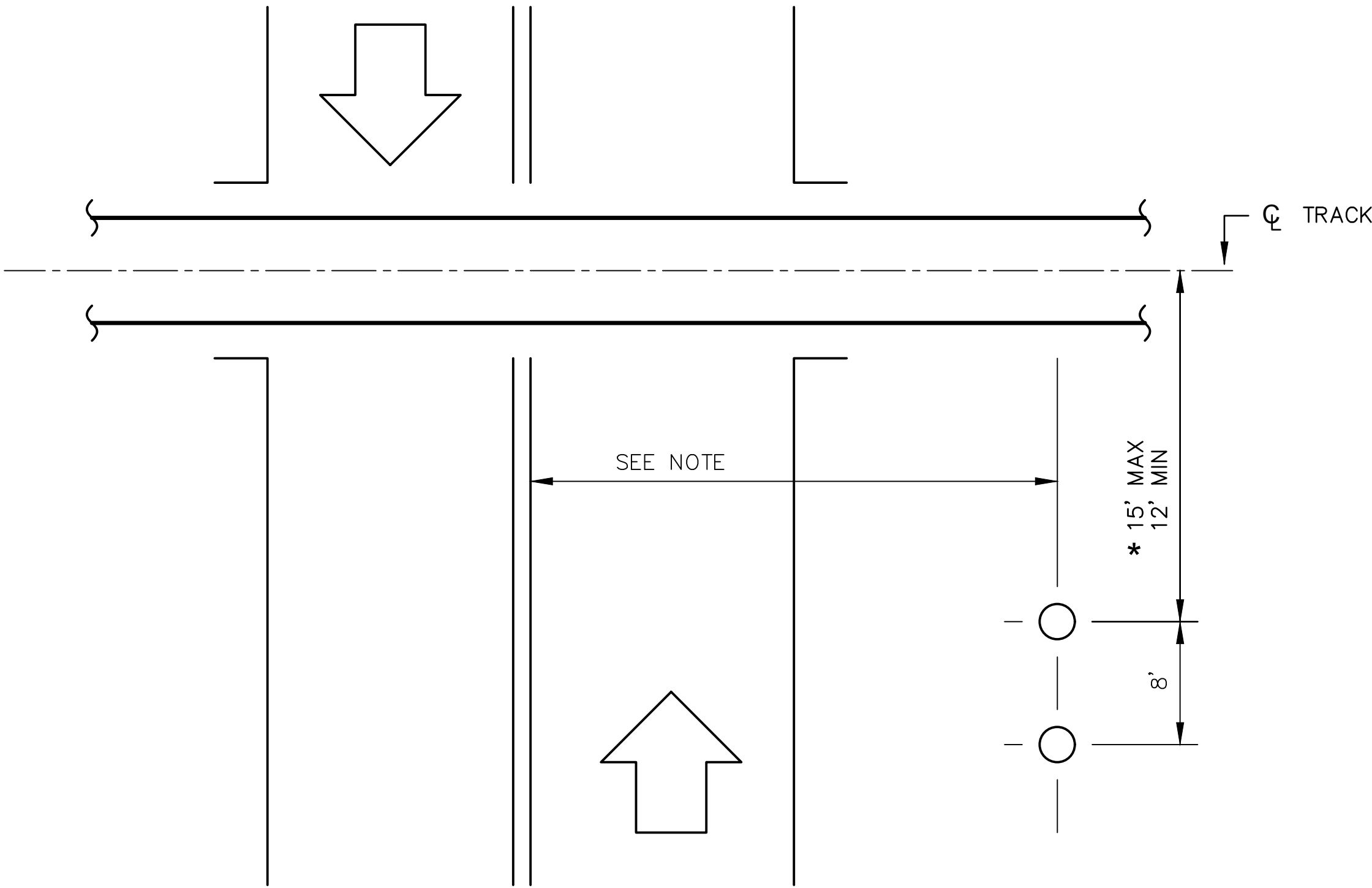
LOCATION OF AUTOMATIC WARNING DEVICE
FROM PULLOVER OR DECELERATION LANE



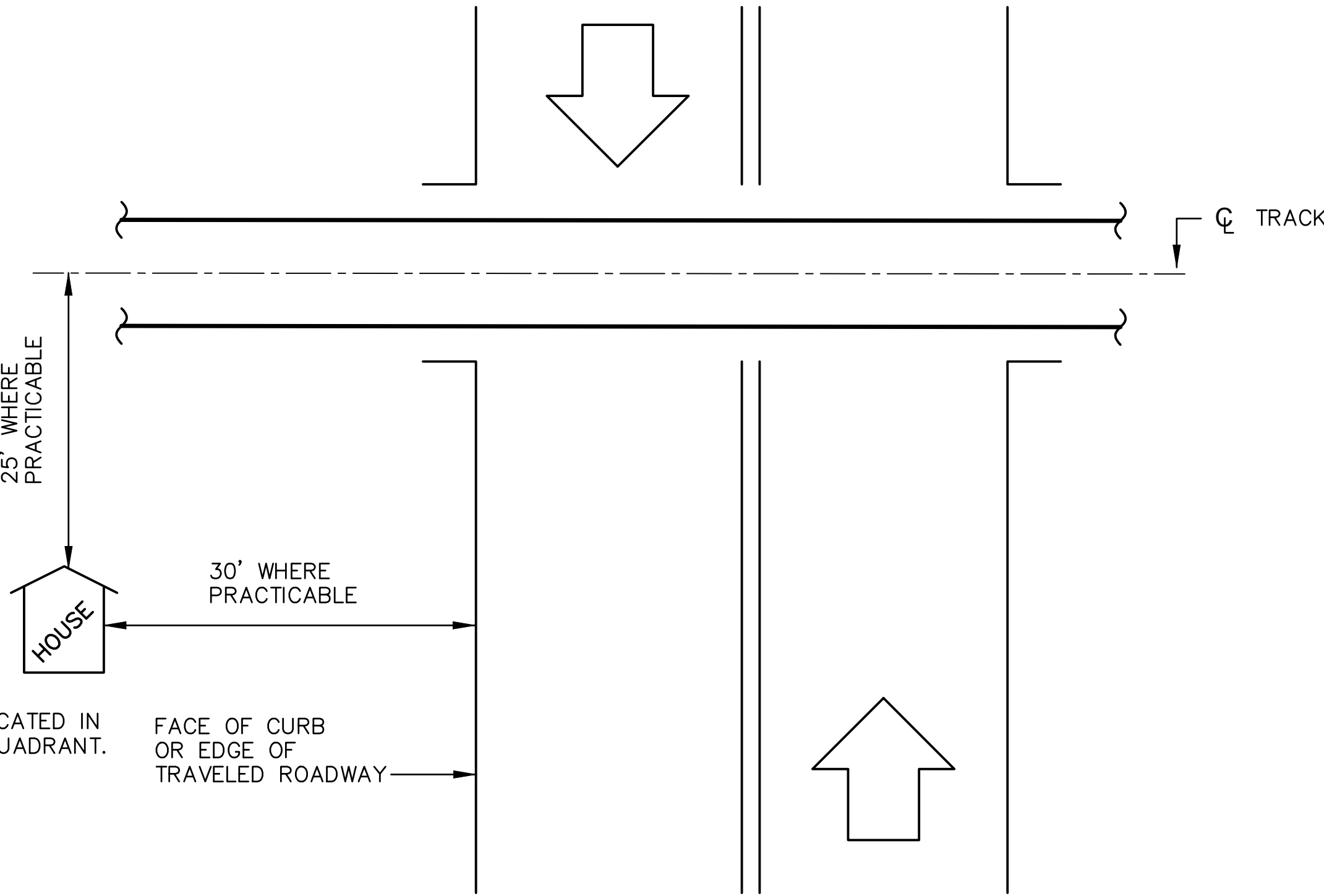
LOCATION OF AUTOMATIC WARNING
DEVICE FROM CL OF TRACK

										PENINSULA CORRIDOR JOINT POWERS BOARD					ENGINEERING STANDARD DRAWINGS					CADD FILE NAME: SD-5419				
										APPROVED BY:  DIRECTOR, ENGINEERING										REV: SD-5419 EDITION: FIFTH				
															SIGNAL AND GRADE CROSSING SYSTEMS HIGHWAY GRADE CROSSING APPARATUS					SCALE: NTS				
010126 FIFTH EDITION															HIGHWAY GRADE CROSSING WARNING DEVICES					STANDARD DRAWING NO.: SD-5419				
REV	DATE	BY	CHK	APP	DESCRIPTION					REV	DATE	BY	CHK	APP										

LOCATION OF AUTOMATIC WARNING DEVICE
WHERE CANTILEVERS AND GATES ARE REQUIRED

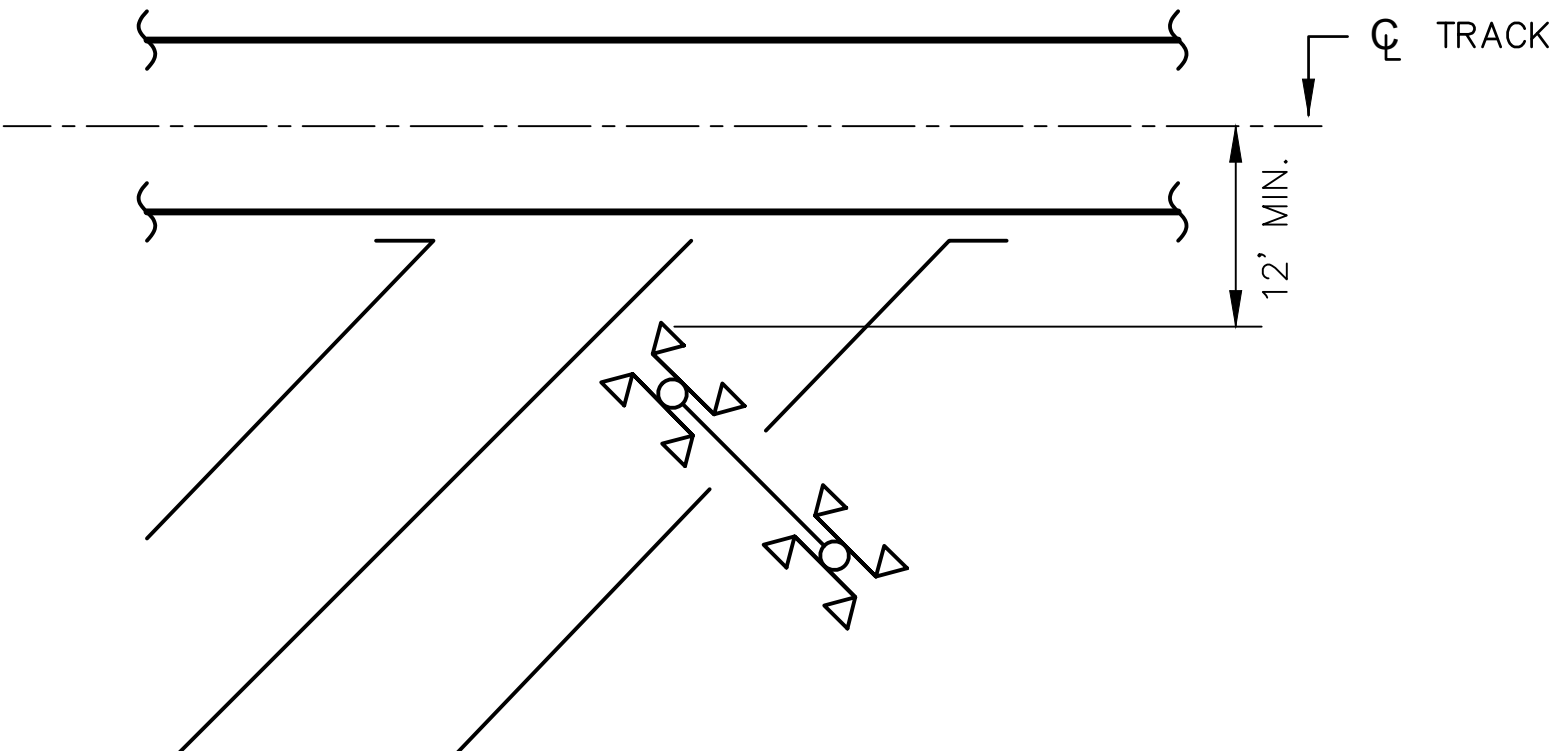
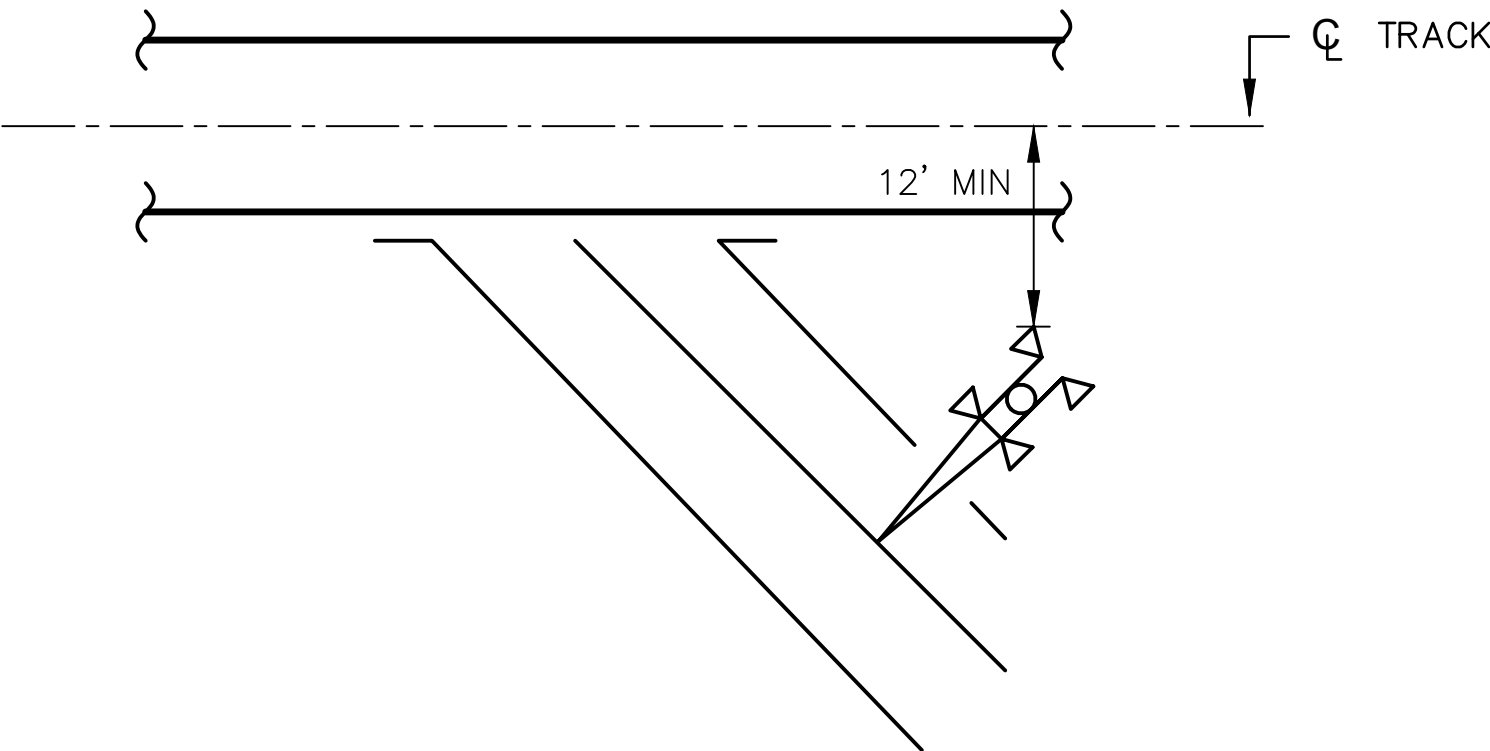
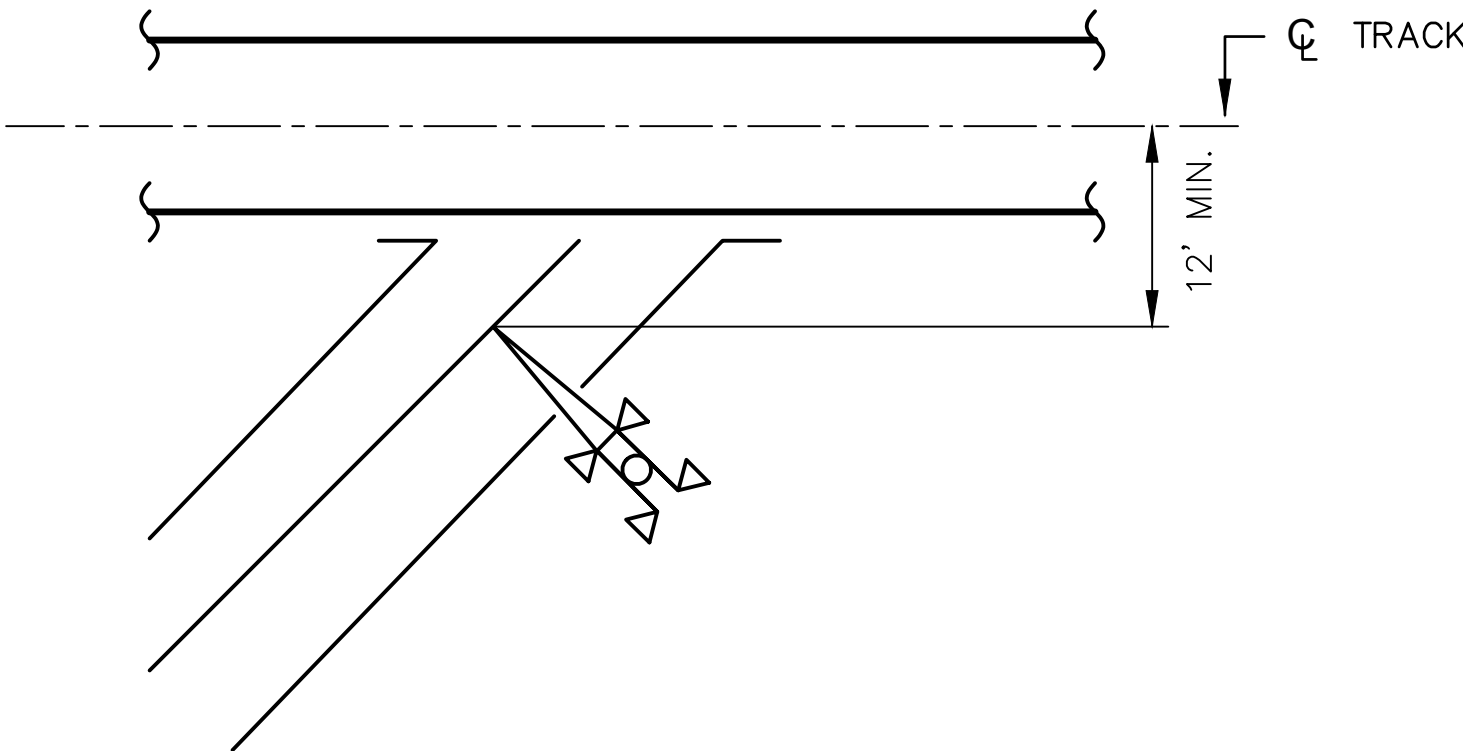


LOCATION OF HOUSE FROM
STREET AND TRACK



NOTE:
HOUSE CAN BE LOCATED IN
EITHER NEUTRAL QUADRANT.

FACE OF CURB
OR EDGE OF
TRAVELED ROADWAY



MINIMUM CLEARANCE OF AUTOMATIC
WARNING DEVICES ANGLED CROSSINGS

NOTE:
EITHER CANTILEVER OR GATE MAY BE CLOSEST TO TRACK AS
LOCAL CONDITIONS REQUIRE AND IF AUTHORIZED BY CALTRAIN.

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DIRECTOR, ENGINEERING



ENGINEERING STANDARD DRAWINGS

SIGNAL AND GRADE CROSSING SYSTEMS
HIGHWAY GRADE CROSSING APPARATUS

LOCATION OF AUTOMATIC
WARNING DEVICES

CADD FILE NAME:
SD-5420

REV: EDITION:
FIFTH



SCALE:
NTS

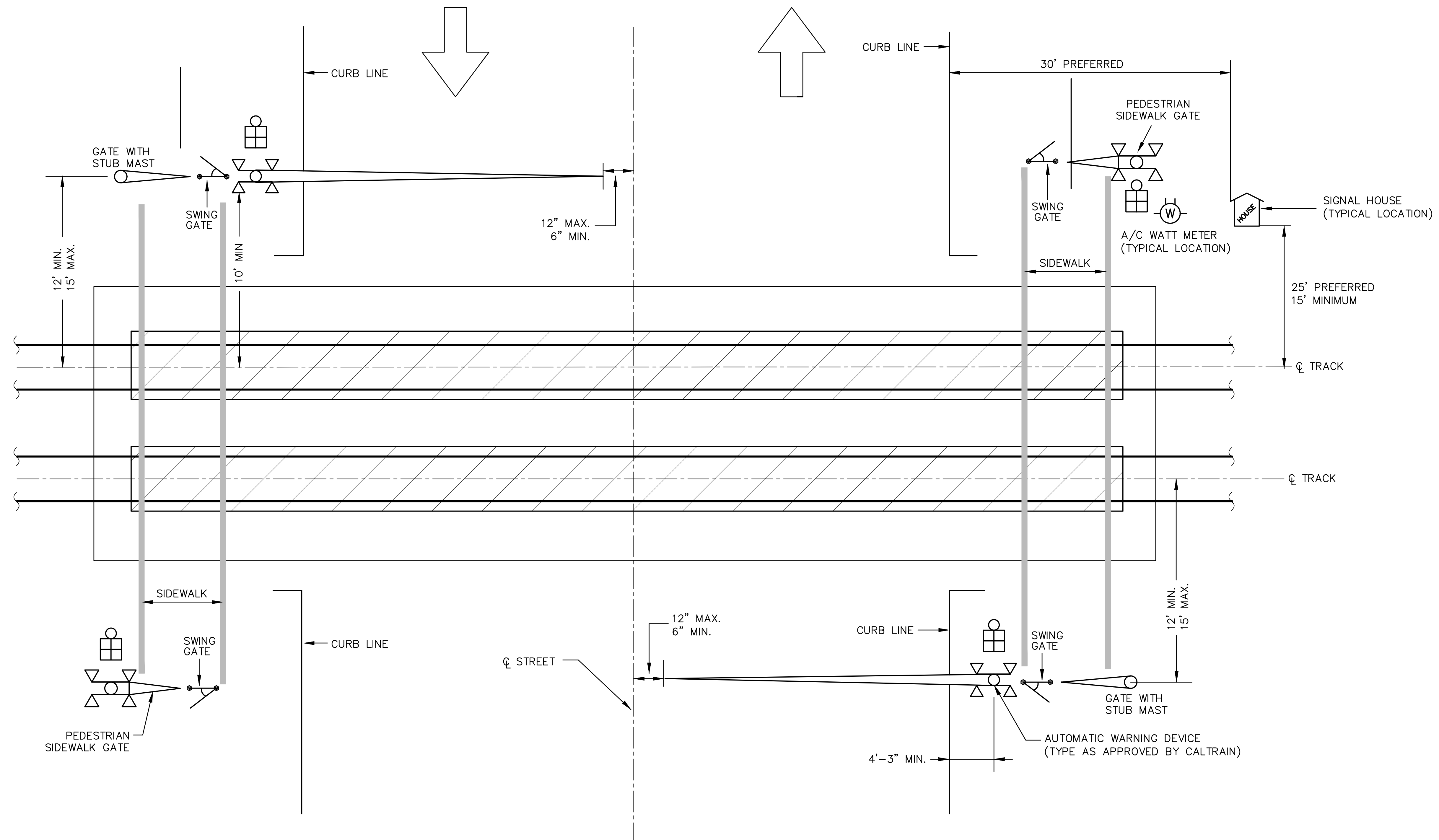
STANDARD DRAWING NO.:
SD-5420

REV	DATE	BY	CHK	APP	DESCRIPTION
010126					FIFTH EDITION

REV	DATE	BY	CHK	APP	DESCRIPTION

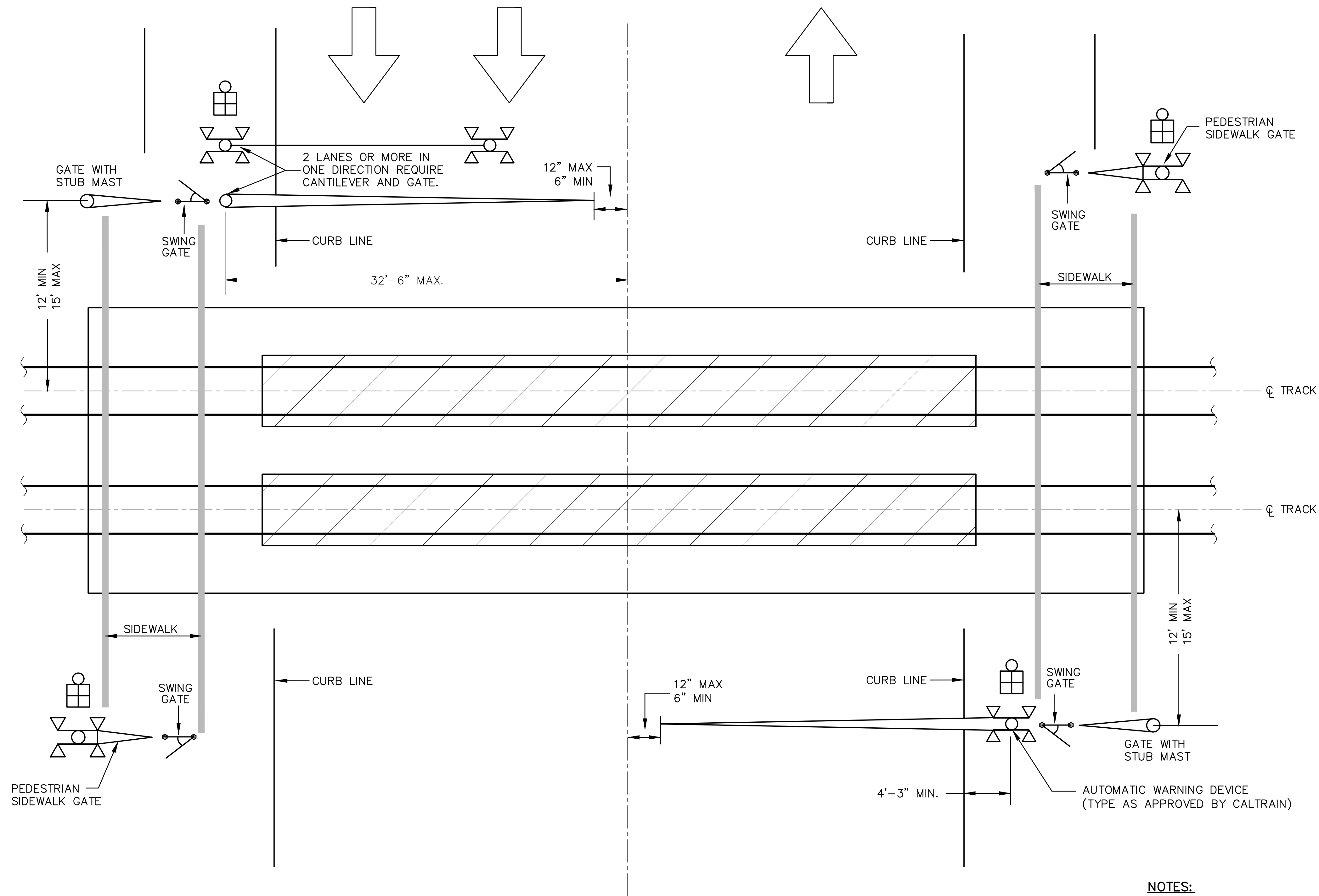
NOT USED.

												PENINSULA CORRIDOR JOINT POWERS BOARD						ENGINEERING STANDARD DRAWINGS						CADD FILE NAME: SD—5420							
												<div>APPROVED BY:  DIRECTOR, ENGINEERING</div>												SIGNAL AND GRADE CROSSING SYSTEMS HIGHWAY GRADE CROSSING APPARATUS						REV:	EDITION: FIFTH
																														SCALE: NTS	
010126						FIFTH EDITION																									
REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP	DESCRIPTION																				



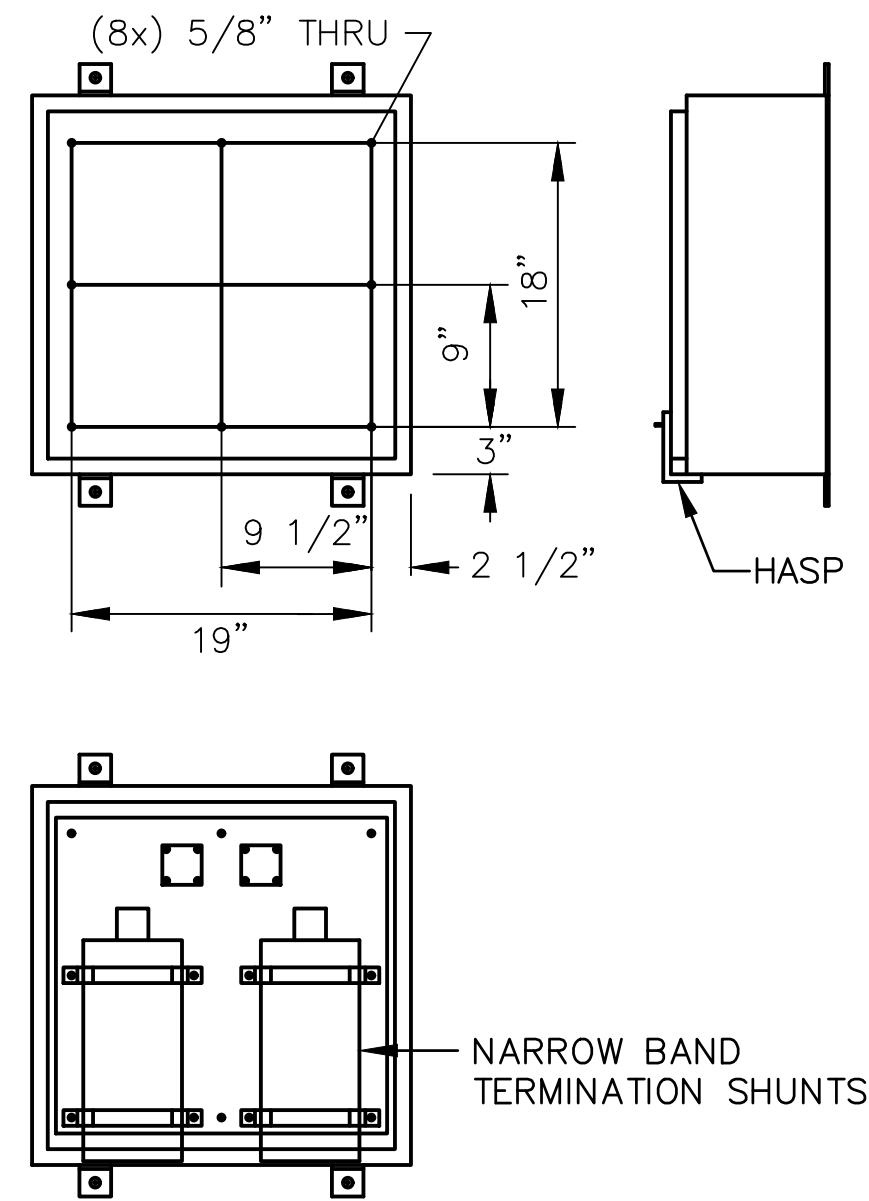
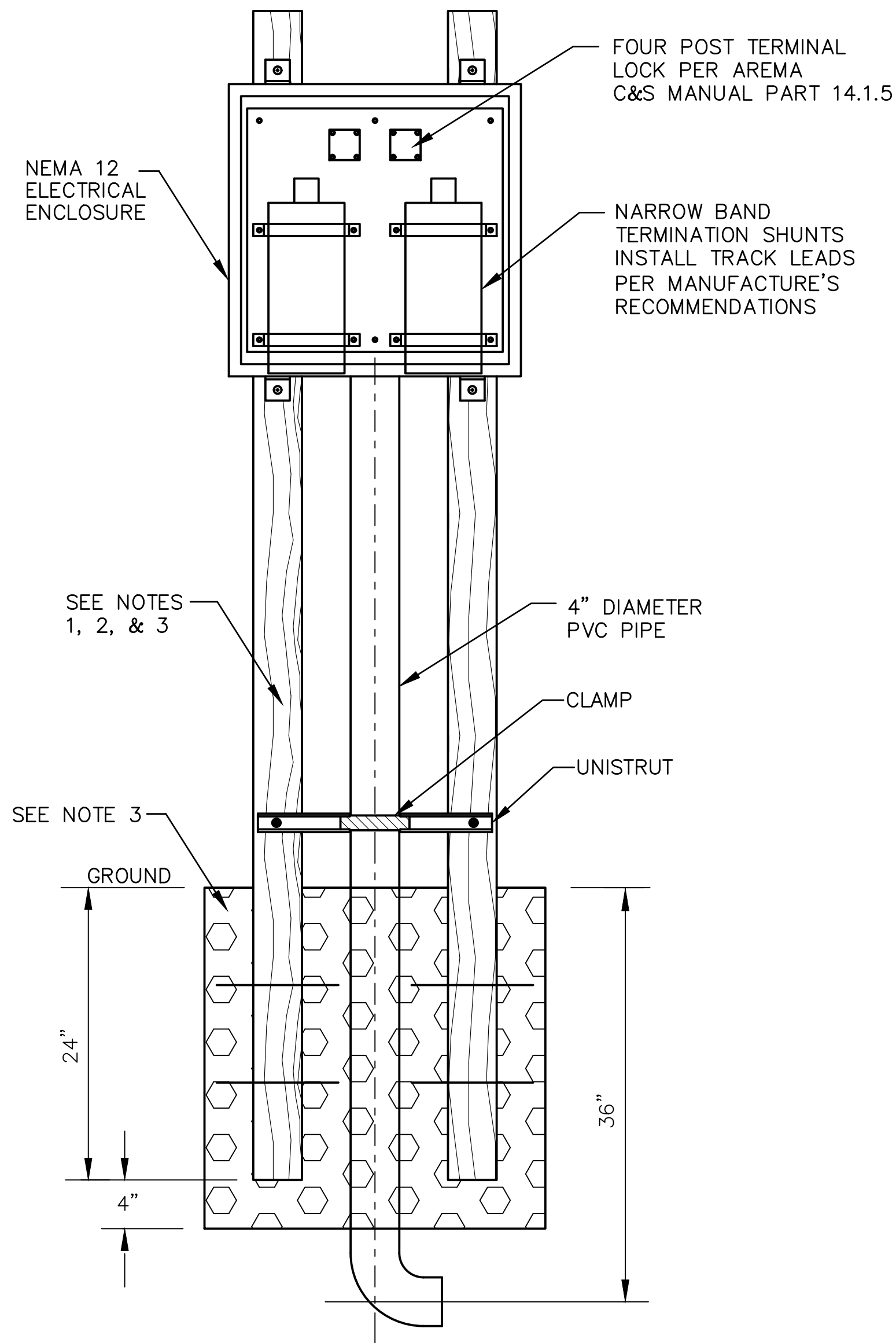
- NOTES:**
1. MAXIMUM VEHICULAR GATE LENGTH IS 32'. IF MORE THAN TWO LANES IN ONE DIRECTION USE CANTILEVER.
 2. INSTALL ONE BELL PER QUADRANT.

										PENINSULA CORRIDOR JOINT POWERS BOARD		ENGINEERING STANDARD DRAWINGS		CADD FILE NAME: SD-5422	
										APPROVED BY: <i>Bin Zhang</i>		SIGNAL AND GRADE CROSSING SYSTEMS HIGHWAY GRADE CROSSING APPARATUS HIGHWAY GRADE CROSSING TYPICAL 2-LANE WITH PEDESTRIAN GATE		REV:	EDITION: FIFTH
										Caltrain		SCALE: NTS		STANDARD DRAWING NO.: SD-5422	
010126					FIFTH EDITION										
REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP					

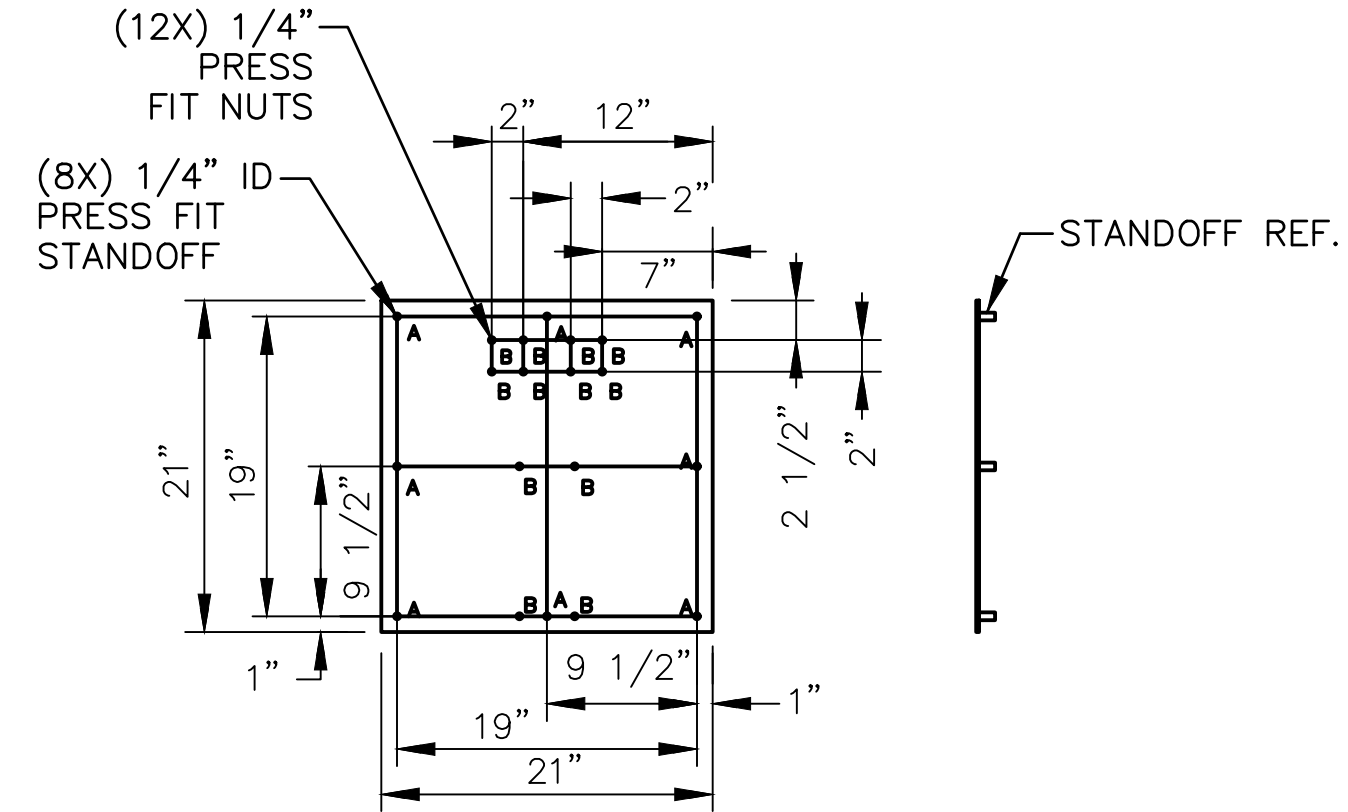


- NOTES:**
1. CENTER MEDIAN IS PREFERRED. WHERE DISTANCE OF GATE MAST TO CENTERLINE OF STREET IS GREATER THAN 32'-6", A 9' MEDIAN WITH FLASHER AND GATE SHALL BE INSTALLED. IF OVER TWO LANES PER DIRECTION, CANTILEVER AND GATES ARE REQUIRED. MAXIMUM GATE LENGTH, 32'.
 2. INSTALL ONE BELL PER QUADRANT.

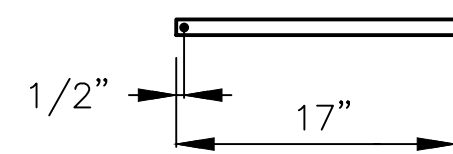
										PENINSULA CORRIDOR JOINT POWERS BOARD		ENGINEERING STANDARD DRAWINGS		CADD FILE NAME: SD-5426	
										APPROVED BY: <i>Bin Zhang</i>		SIGNAL AND GRADE CROSSING SYSTEMS HIGHWAY GRADE CROSSING APPARATUS HIGHWAY GRADE CROSSING NO MEDIAN TYPICAL 3-LANE WITH PEDESTRIAN GATE		REV:	EDITION: FIFTH
										Caltrain®				SCALE:	NTS
														STANDARD DRAWING NO.: SD-5426	
010126					FIFTH EDITION										
REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP					



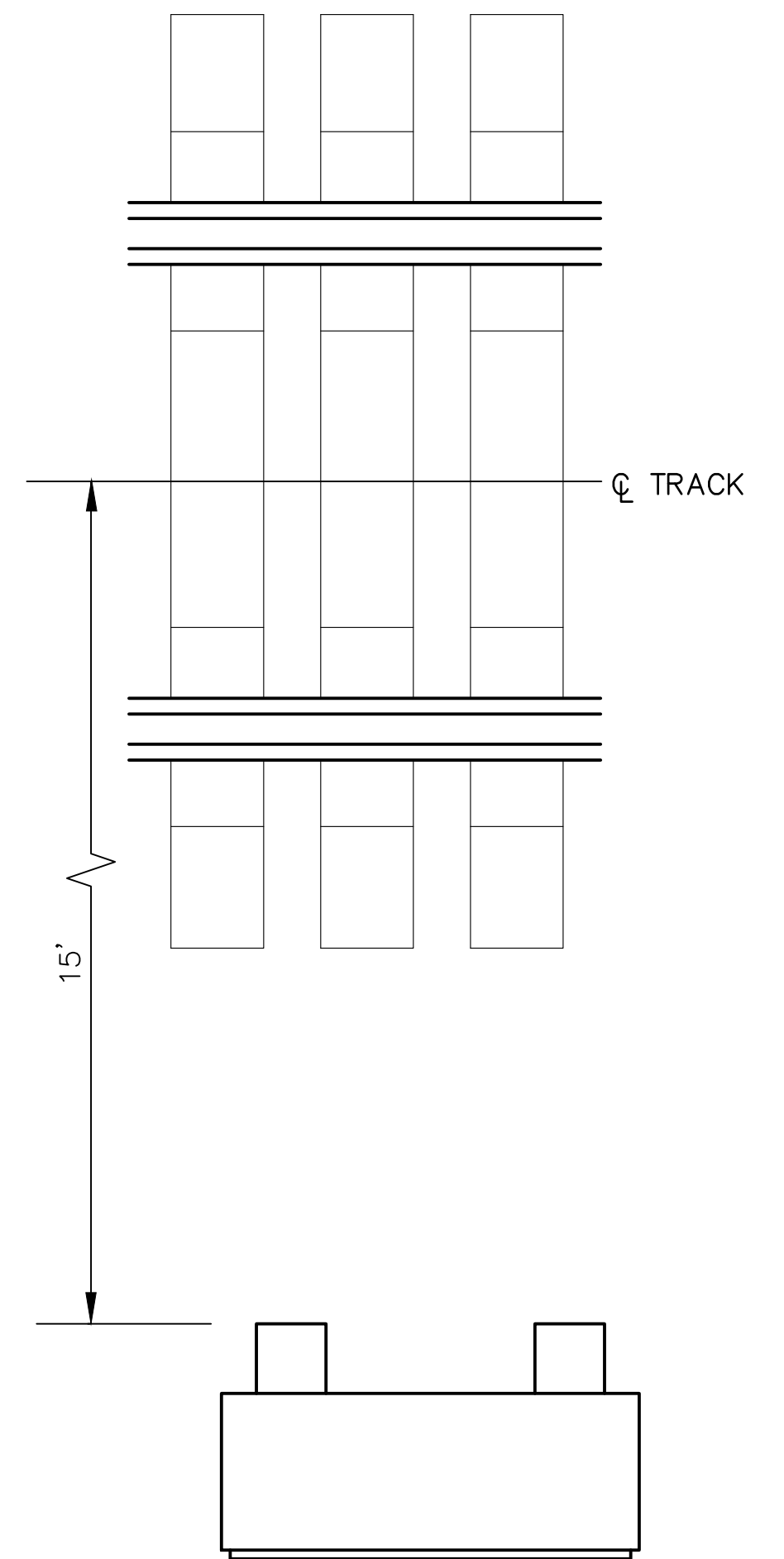
**24" X 24" X 9"
ELECTRICAL ENCLOSURE
NEMA #12 HINGED COVER**



**21" X 21" INSERT PLATE
FOR NEMA 12 ELEC ENCL**



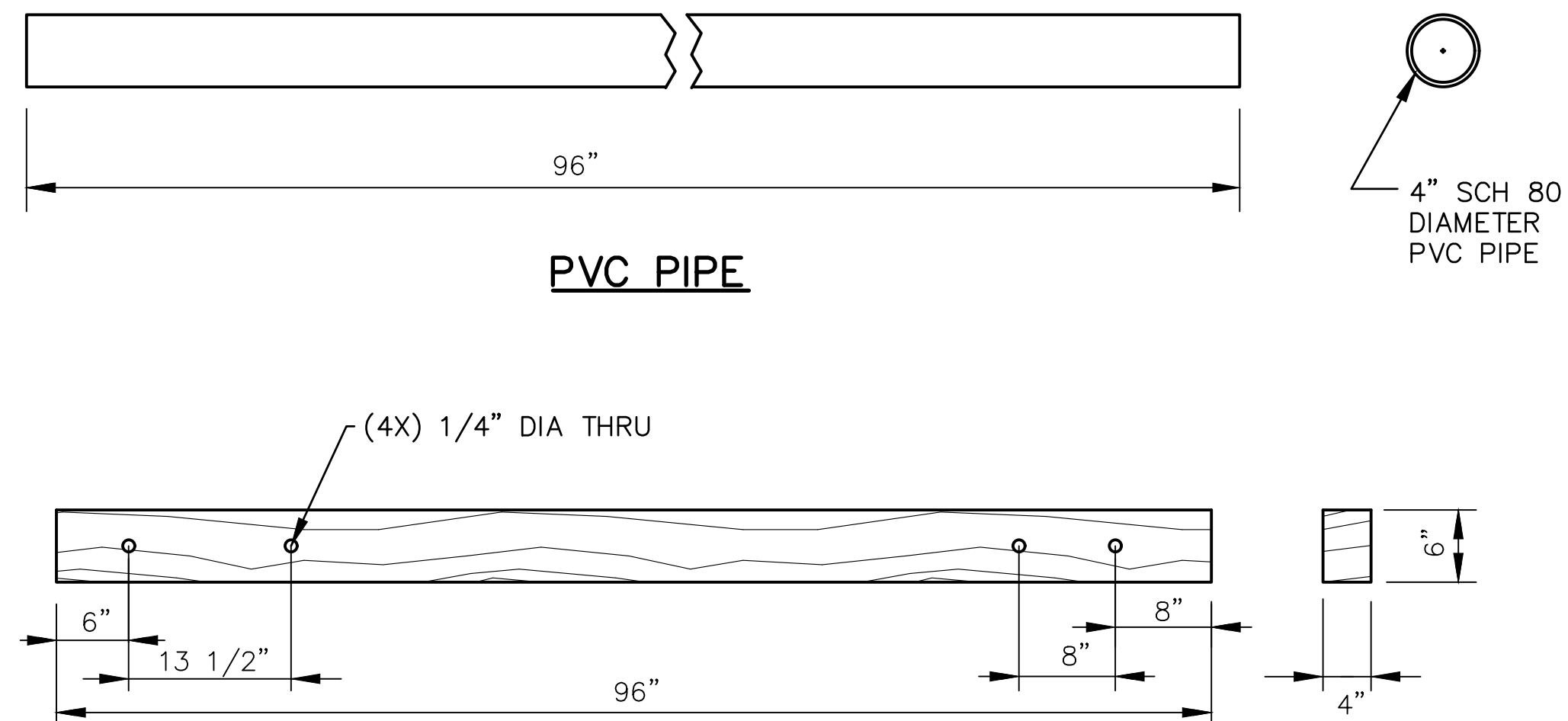
**MOUNTING STRAP
OR CABLE TIES**



LOCATION

NOTES:

1. MATERIAL: POST - 4" X 4" X 8' PRESSURE TREATED WOOD
RIB BARS STEEL - 1/2" DIA X 12" LONG
CONDUIT - 4" DIA PVC SCHEDULE 80
ELECTRICAL BOX - NEMA JIC-12 ENCLOSURE, 24" X 24" X 9", GRAINGER #6C724
INTERIOR PANEL - 21" X 21", GRAINGER #2W829
STANDOFF - (8PCS)
2. THE LOCATION OF THE SHUNT BOX WITH RESPECT TO THE CENTER LINE OF THE TRACK SHALL BE AT LEAST 12', 15' DESIRED
3. THE POST SHALL BE BURIED 24" BELOW THE GROUND IF FOUNDATION IS CONCRETE. THE POST SHALL BE BURIED 36" BELOW THE GROUND IF THE FOUNDATION IS COMPACTED SOIL
4. THE POST SHALL HAVE TWO RIB BARS INSERTED THROUGH PER DIMENSION SPECIFIED FOR RIGID SUPPORT, DRILL HOLES AT THE POST FOR THE BOX AND RIB BARS
5. A PVC SCH 80 4" DIA CONDUIT SHALL BE SUPPLIED TO SUPPORT THE CABLE FROM THE ELECTRICAL BOX TO THE GROUND WITH AN ELBOW. CABLE MUST BE BURIED A MINIMUM OF 36" BELOW THE GROUND.
6. THE ELECTRICAL BOX SHALL BE MODIFIED BY DRILLING MOUNTING HOLES AT THE BACK OF THE PANEL.
7. THE INSERT PANEL SHALL BE MODIFIED BY DRILLING HOLES AND ADDING PRESS FIT NUTS.
8. MOUNT THE INSERT PANEL INTO THE BOX BY ADDING EIGHT STANDOFFS AND FASTEN WITH NUTS AND BOLTS
9. MOUNT THE BOX AGAINST THE POST WITH NUTS, BOLTS, FLAT AND LOCK WASHERS
10. ATTACH THE MOUNTING STRAP OF CABLE TIES TO HOLD THE SHUNT UNIT
11. WIDE BAND SHUNTS SHALL BE DIRECT BURIED A MINIMUM 2' FROM BOTTOM OF TIE WITH TRACK LEADS FACING DOWN - TRACK LEADS SHALL RUN IN BOOTLEG AS SHOWN IN SD-5110



**(2X) 4" X 6" X 8'
PRESSURE TREATED POST**

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DIRECTOR, ENGINEERING



ENGINEERING STANDARD DRAWINGS

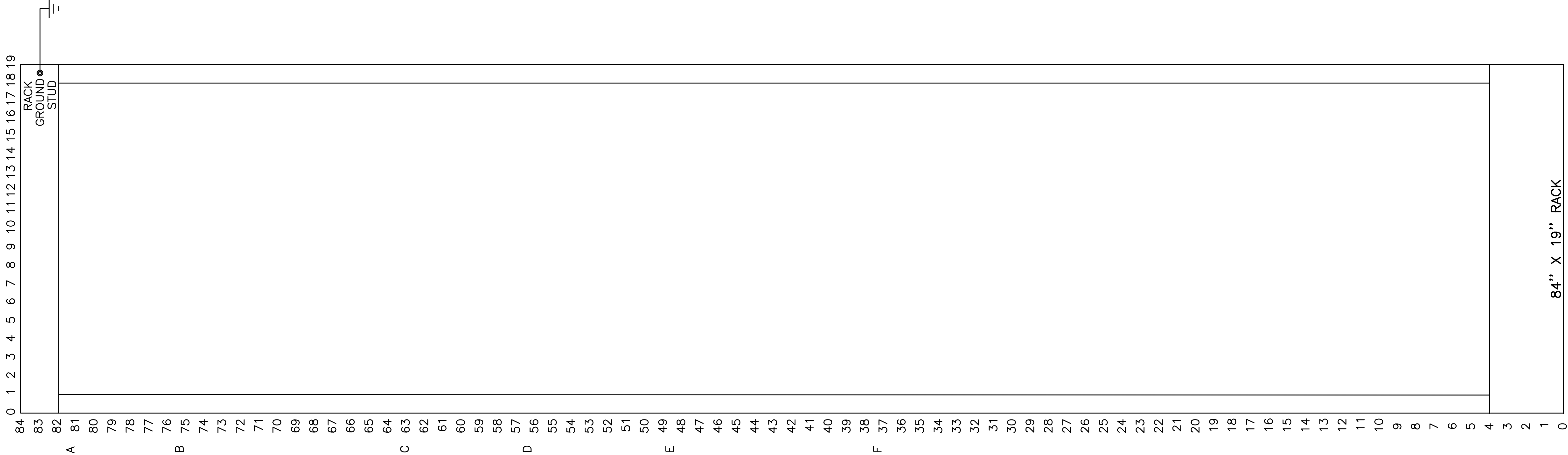
**SIGNAL AND GRADE CROSSING SYSTEMS
HIGHWAY GRADE CROSSING APPARATUS**

**TRACKSIDE TERMINATION
SHUNT ENCLOSURE**

CADD FILE NAME:
SD-5427
REV: EDITION:
FIFTH
SCALE: NTS
STANDARD DRAWING NO.:
SD-5427

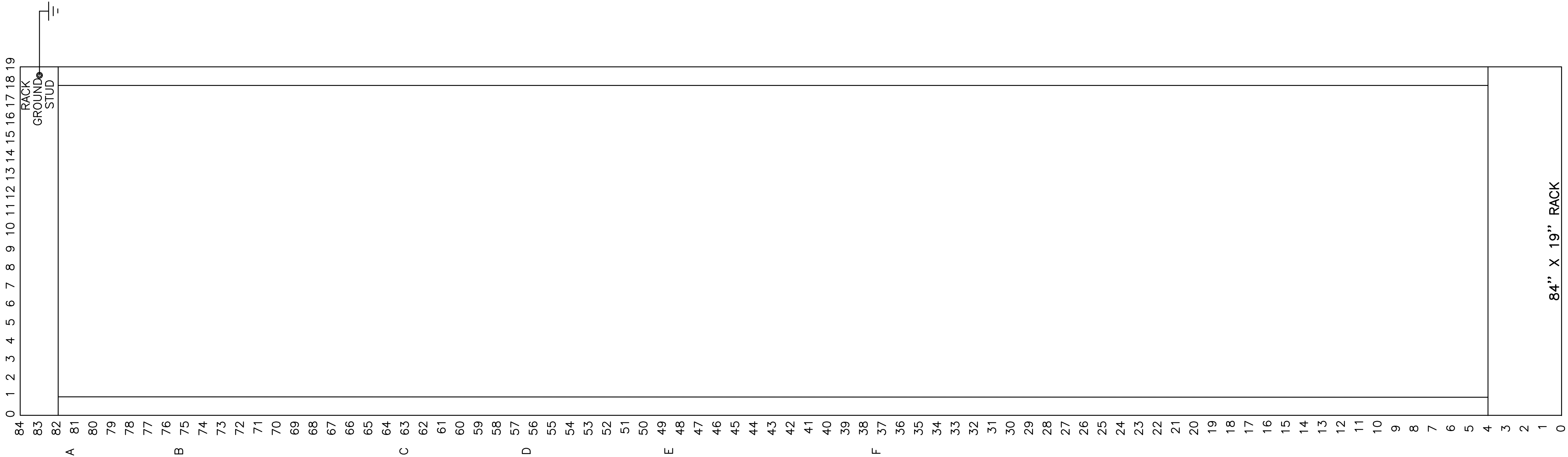
REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP	DESCRIPTION
010126					FIFTH EDITION						

RACK (1) FRONT VIEW





																				PENINSULA CORRIDOR JOINT POWERS BOARD										ENGINEERING STANDARD DRAWINGS										CADD FILE NAME: SD-5503									
																				<div>APPROVED BY:  DIRECTOR, ENGINEERING</div>																				REV: EDITION: FIFTH									
																																								SCALE: NTS									
010126										FIFTH EDITION																				SIGNAL AND GRADE CROSSING SYSTEMS 8' X 14' SIGNAL HOUSE										STANDARD DRAWING NO.: SD-5503									
REV	DATE	BY	CHK	APP	DESCRIPTION					REV	DATE	BY	CHK	APP						RACK 1 DETAILS																													

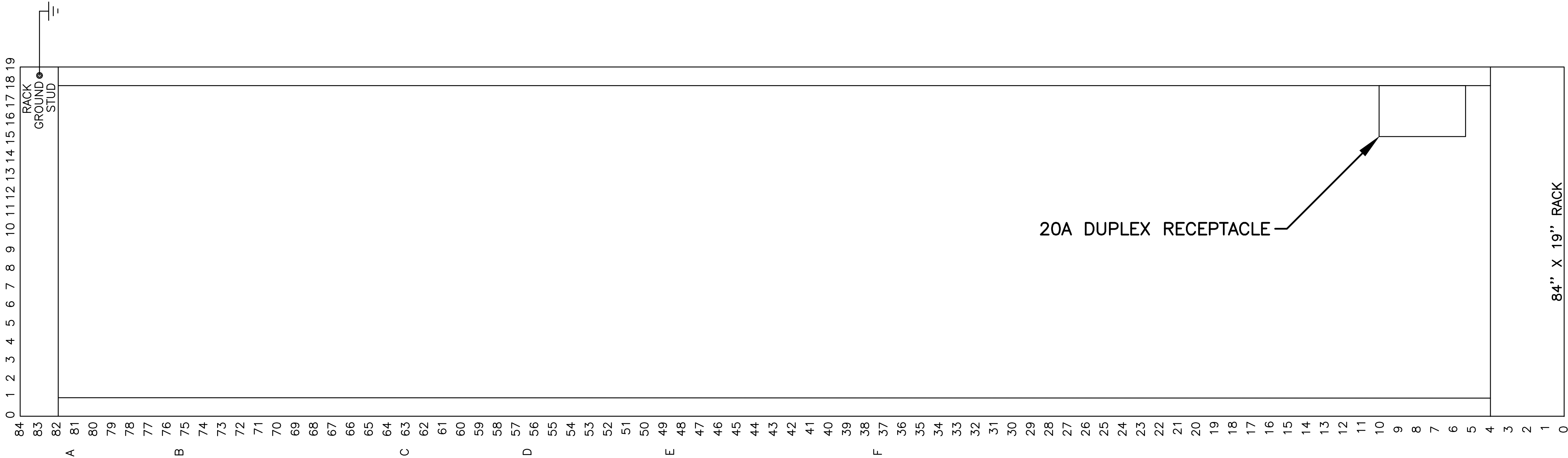
RACK (2) FRONT VIEW



84" X 19" RACK

											PENINSULA CORRIDOR JOINT POWERS BOARD											ENGINEERING STANDARD DRAWINGS											CADD FILE NAME: SD-5504												
											<div>APPROVED BY:  DIRECTOR, ENGINEERING</div>																						SIGNAL AND GRADE CROSSING SYSTEMS 8' X 14' SIGNAL HOUSE											REV:	EDITION: FIFTH
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																																	STANDARD DRAWING NO.: SD-5504												
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RACK (3) FRONT VIEW



																				PENINSULA CORRIDOR JOINT POWERS BOARD										ENGINEERING STANDARD DRAWINGS										CADD FILE NAME: SD-5505																			
																				<div>APPROVED BY:</div> <div><i>Bin Zhang</i></div> <div>DIRECTOR, ENGINEERING</div>										<div></div>										SIGNAL AND GRADE CROSSING SYSTEMS 8' X 14' SIGNAL HOUSE										REV: <div>EDITION: FIFTH</div>									
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010126										FIFTH EDITION																				RACK 3 DETAILS										STANDARD DRAWING NO.: SD-5505																			
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REV

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010126

FIFTH EDITION

DESCRIPTION

REV

DATE

BY

CHK

APP

PENINSULA CORRIDOR JOINT POWERS BOARD

APPROVED BY:

Bin Zhang

DIRECTOR, ENGINEERING

Caltrain

ENGINEERING STANDARD DRAWINGS

SIGNAL AND GRADE CROSSING SYSTEMS

8' X 14' SIGNAL HOUSE

TERMINAL BOARD 1

CADD FILE NAME:

SD-5506

REV:

EDITION:

SCALE:

STANDARD DRAWING NO.:

FIFTH

NTS

SD-5506

TERMINAL BOARD #1

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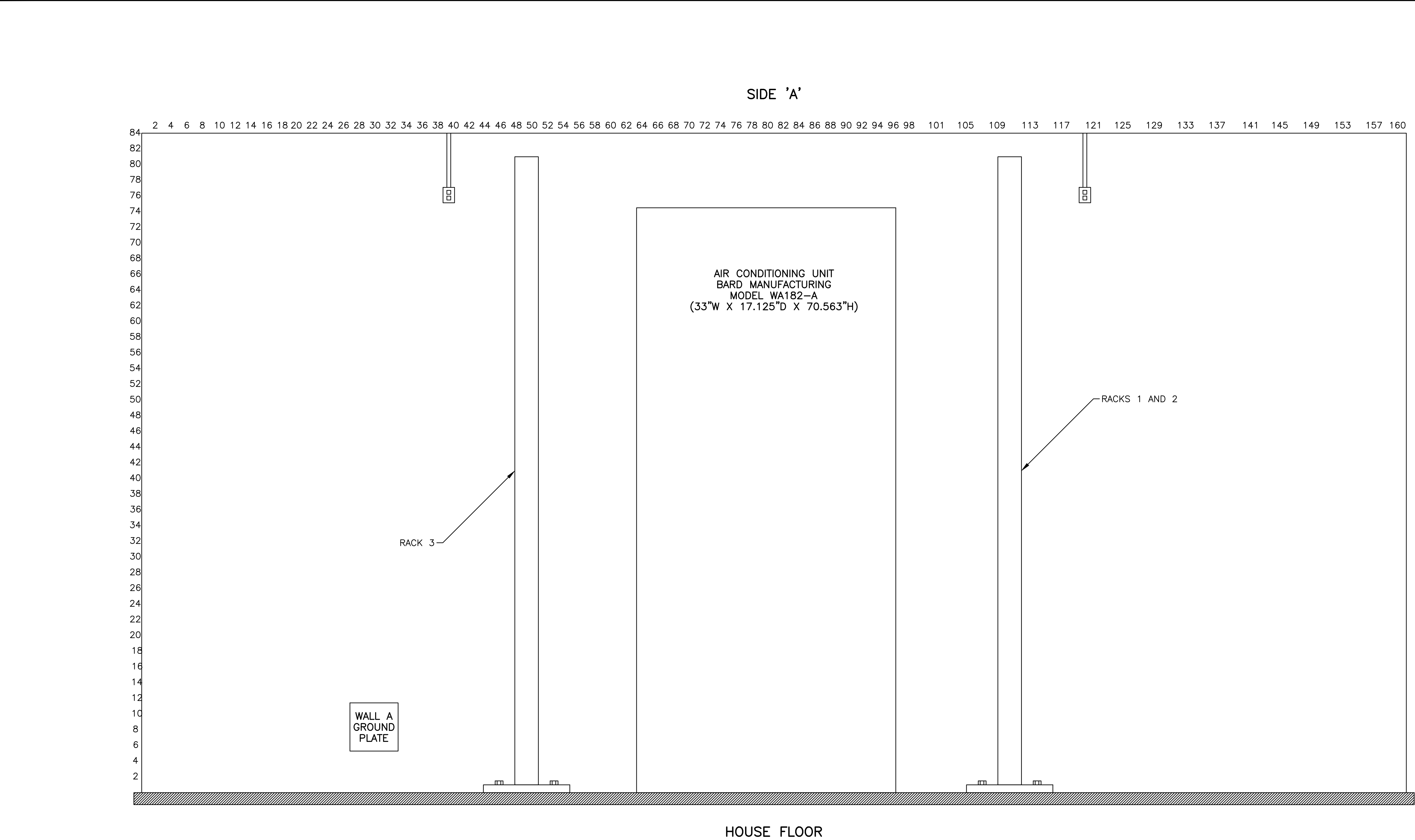
PRIME
GROUND PLATE
(ON FRONT)

36" X 84" TERMINATION BOARD

TERMINAL BOARD #2



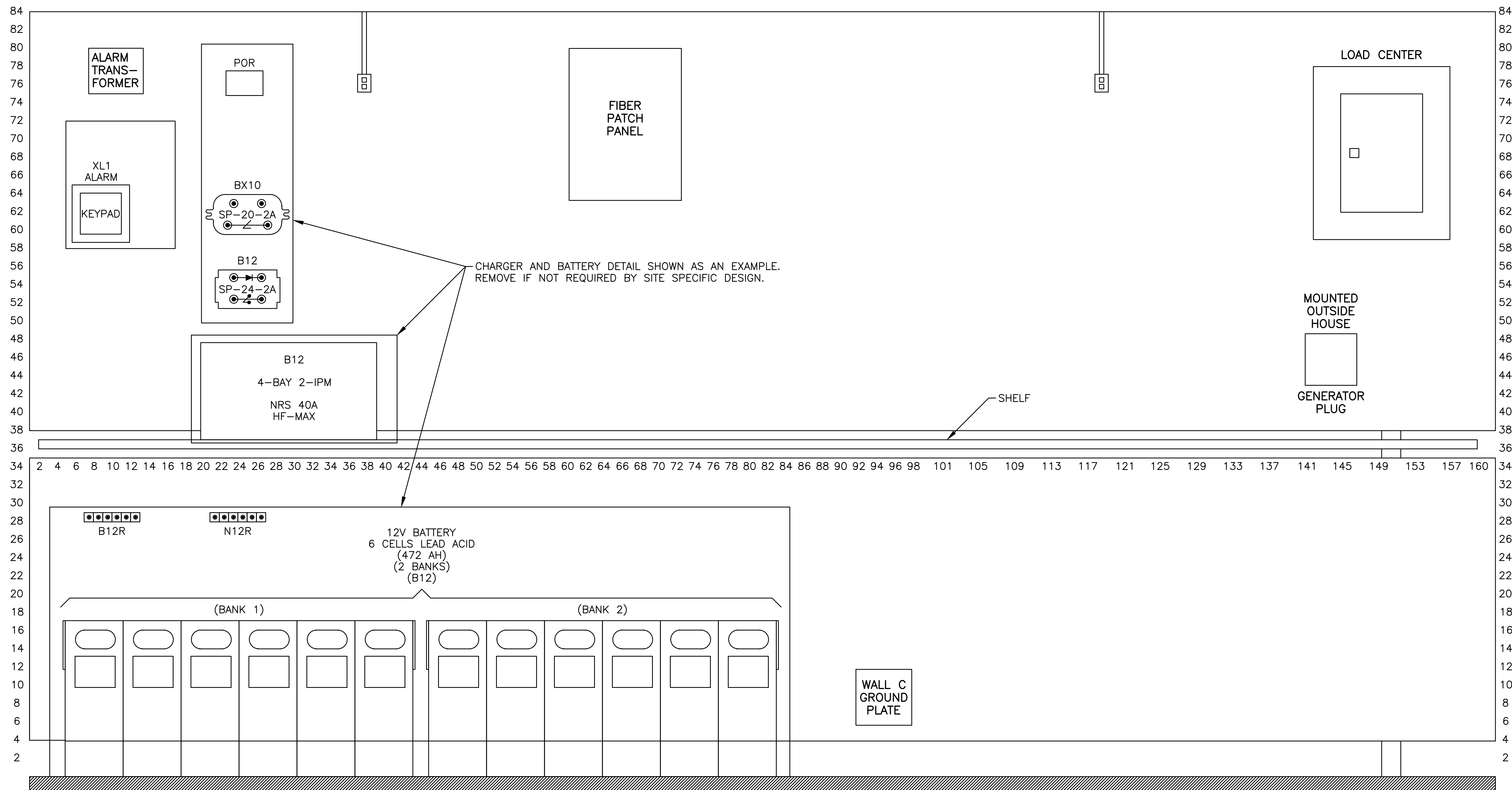
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										<div>APPROVED BY:  DIRECTOR, ENGINEERING</div>																				SIGNAL AND GRADE CROSSING SYSTEMS 8' X 14' SIGNAL HOUSE										REV:	EDITION: FIFTH
																														SCALE: NTS											
																														TERMINAL BOARD 2										STANDARD DRAWING NO.: SD-5507	
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	010126				FIFTH EDITION																																				





HOUSE FLOOR

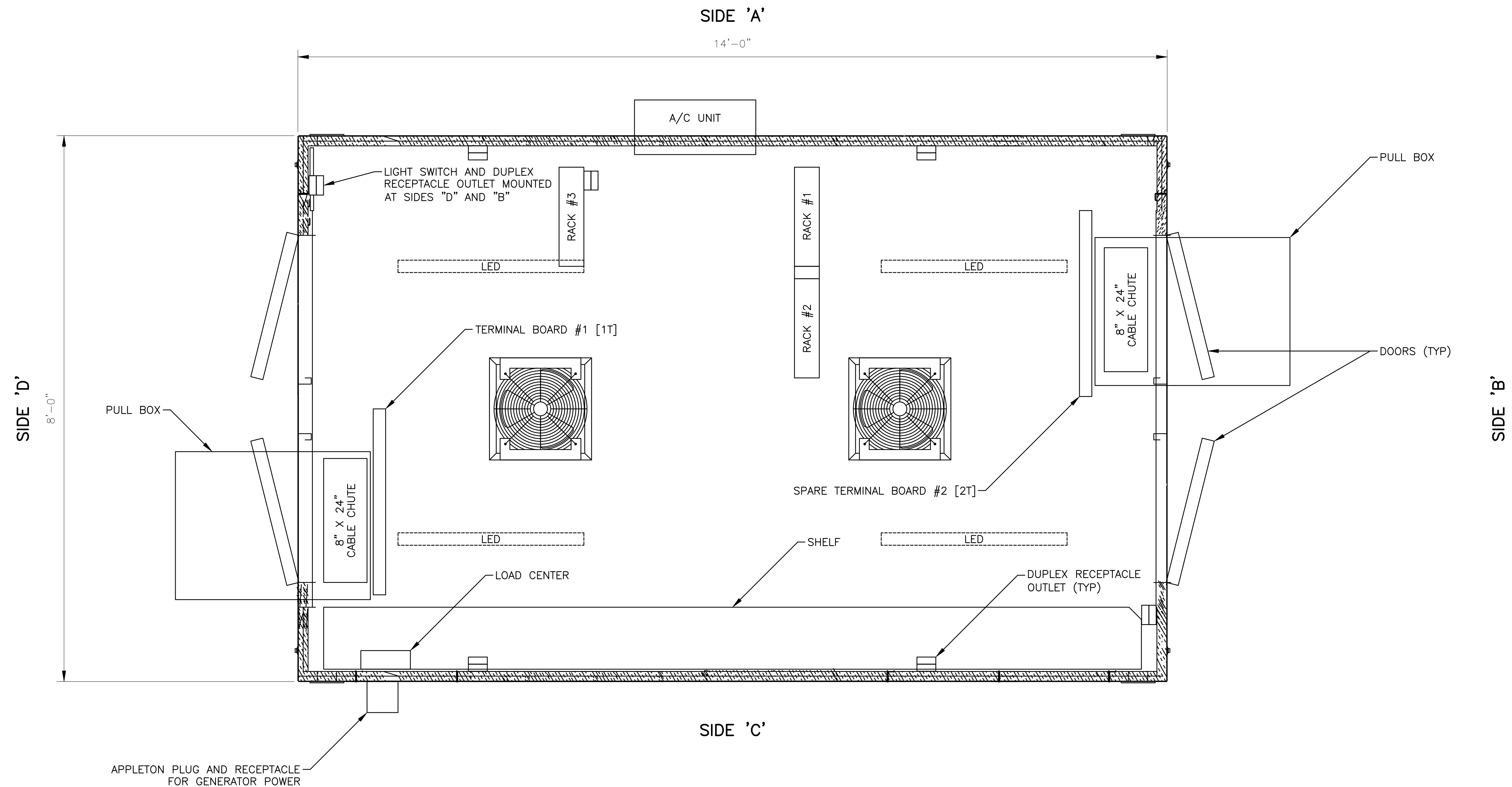
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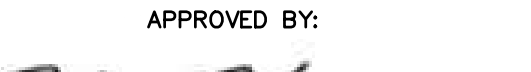



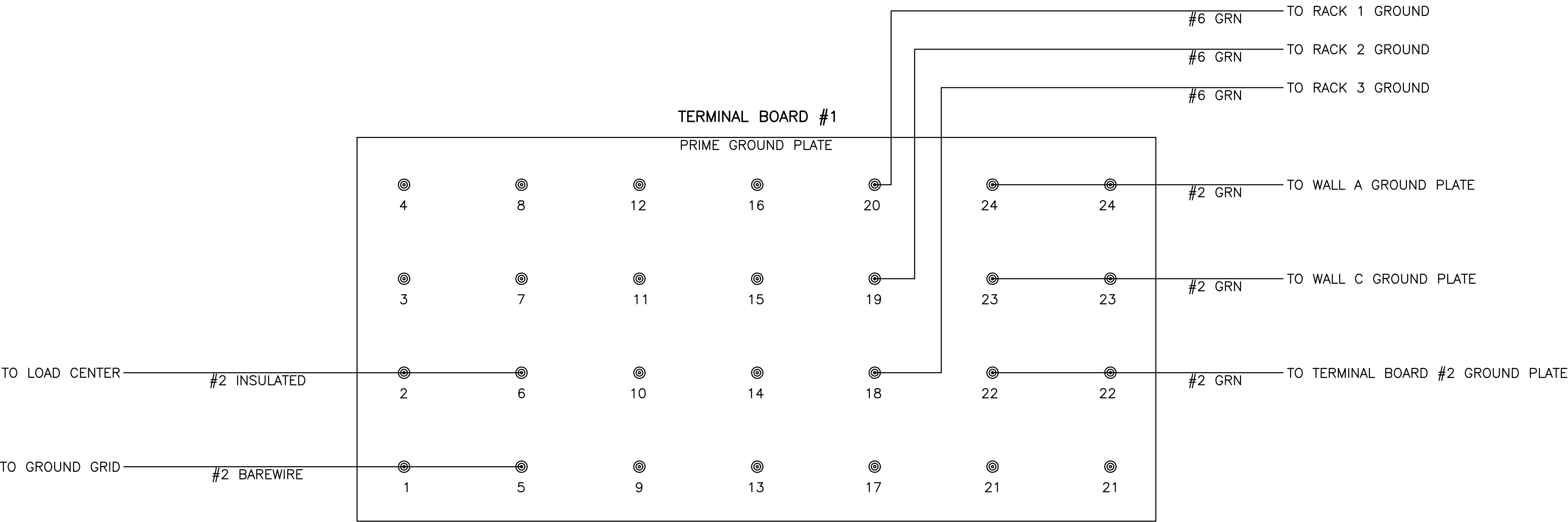
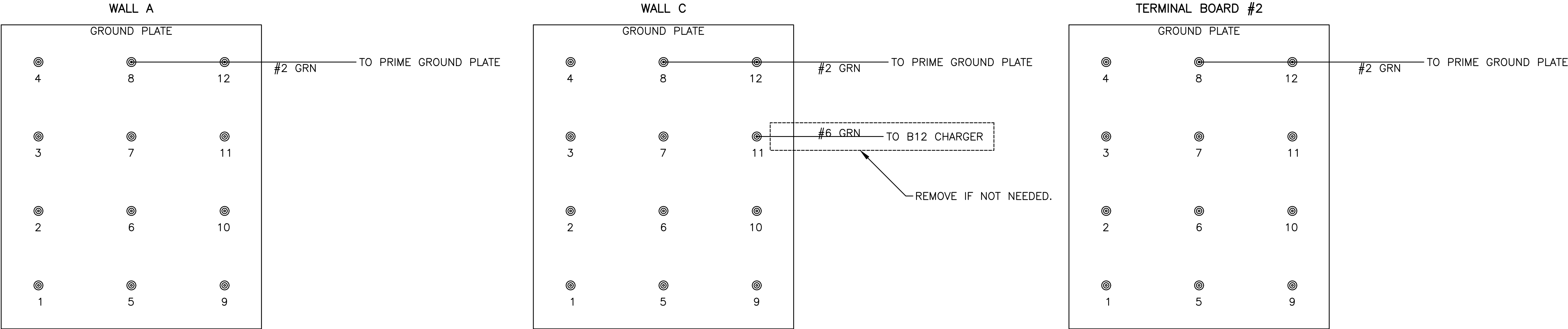
HOUSE FLOOR

																				PENINSULA CORRIDOR JOINT POWERS BOARD										ENGINEERING STANDARD DRAWINGS										CADD FILE NAME: SD-5509																			
																				<div>APPROVED BY:</div> <div></div> <div>DIRECTOR, ENGINEERING</div>										<div></div>										SIGNAL AND GRADE CROSSING SYSTEMS 8' X 14' SIGNAL HOUSE										REV: EDITION: FIFTH									
																																								SCALE: NTS										STANDARD DRAWING NO.: SD-5509									



POWDER COATED STEEL HOUSE
PER PCJPB STANDARDS
PLAN
SCALE: NTS

												PENINSULA CORRIDOR JOINT POWERS BOARD						ENGINEERING STANDARD DRAWINGS						CADD FILE NAME: SD-5510									
												<div>APPROVED BY:  DIRECTOR, ENGINEERING</div>												SIGNAL AND GRADE CROSSING SYSTEMS 8' X 14' SIGNAL HOUSE						REV:		EDITION: FIFTH	
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