Port of
LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

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NO.	DATE			RR-000
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2		RAILROAD STANDARD PLANS	APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER	1 OF 1
3			P.E. NO.: C-54141 DATE: 09-19-2013	
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ABBREVIATIONS:

AAR	ASSOCIATION OF AMERICAN RAILROAD
ABND	ABANDONED
AC	ASPHALT CONCRETE, AIR COMPRESSOR
ACF	AIR COALESCING FILTER
ACI	AMERICAN CONCRETE INSTITUTE
ACD	ASBESTOS CEMENT DUCT
ACTA	ALAMEDA CORRIDOR TRANSPORTATION AUTHORITY
AD	AIR DRYER
ALT	ARCO LEAD TRACK
APPROX	APPROXIMATE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIAL
AVE	AVENUE
AREMA	AMERICAN RAILWAY ENGINEERING AND MAINTENANCE OF WAY ASSOCIATION
AWS	AMERICAN WELDING SOCIETY
AB	ANCHOR BOLT
A/R	AS REQUIRED
BAU	BUILDING ACCESS UNIT
BLDG	BUILDING
BM	BENCH MARK
BNSF	BURLINGTON NORTHERN SANTA FE RAILWAY COMPANY
CA	COMPRESSED AIR
CAF	COMPRESSED AIR FILTER
CB	CATCH BASIN
CC	CENTER TO CENTER
CF	CURB FACE
CL, CLR	CLEAR
CM	CONCRETE MODULE
CMB	CRUSHED MISCELLANEOUS BASE
CMU	CONCRETE MASONRY UNIT
CO	CONDUIT
CONC	CONCRETE
CONST	CONSTUCT OR CONSTRUCTION
CONT	CONTINUOUS
CP	CONCRETE PIPE OR CLEAR POINT
CPUC	CALIFORNIA PUBLIC UTILITIES COMMISSION
CS	POINT OF CURVE TO SPIRAL
CSG	CASING
CSTG	CASTING
CT	CONCRETE TIE
CY	CUBIC YARDS
CWR	CONTINUOUS WELDED RAIL
DIA	DIAMETER
DIM	DIMENSION
DIP	DUCTILE IRON PIPE
DIST	DISTANCE
DMH	DRAINAGE MANHOLE
DWG	DRAWING
DWL	DOWEL
Da	DEGREE OF CURVE (ARCH DEFINITION)
Dc	DEGREE OF CURVE (CHORD DEFINITION)
D-LOAD	DEAD LOAD
E	EAST
EA	EACH
Ea	ACTUAL SUPER ELEVATION
EL, ELEV	ELEVATION
ELEC	ELECTRIC OR ELECTRICAL
EMH	ELECTRICAL MANHOLE
EOCM	EDGE OF CONCRETE MODULE
EOPL	EDGE OF PANEL
EP	EDGE OF PAVEMENT
EQ	EQUAL
EX, EXIST	EXISTING
FG	FINISHED GRADE
FH	FIRE HYDRANT
FL	FLOW LINE
FS	FINISHED SURFACE
FT	FOOT OR FEET
FTG	FOOTING
FW	FIREWATER
G	GAS
GA	GAGE/GAUGE
GALV	GALVANIZED
GATX	GATX CORPORATION
GB	GRADE BREAK
GCOR	GENERAL CODE OF REGULATIONS
GL	GRADING LIMIT
GP	GUARD POST
GR	GRADE
GRD	GROUND
GRS	GALAVANIZED RIGID STEEL
GTE	GENERAL TELEPHONE & ELECTRIC
GV	GATE VALVE
HDPE	HIGH DENSITY POLYETHYLINE PIPE
HH	HAND HOLD
HMAC	HOT MIX ASPHALT CONCRETE
HORIZ	HORIZONTAL
HPG	HIGH PRESSURE GAS
HTTO	HAND THROWN TURNOUT
H2	HYDROGEN
ICTF	INTERMODAL CONTAINER TRANSFER FACILITY
ID	INSIDE DIAMETER
IN	INCH OR INCHES
INC	INCORPORATED
IND	INDUSTRY
INV	INVERT
INJ	INJECTION
IP	IRON PIPE
JT	JOINT
KSI	KIPS PER SQUARE INCH
L	LENGTH OR LENGTH OF CURVE
Lv	LENGTH OF VERTICAL CURVE
LACFCD	LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
LADPW	LOS ANGELES DEPARTMENT OF PUBLIC WORKS
LADWP	LOS ANGELES DEPARTMENT OF WATER & POWER
-PS	POWER SERVICE
-WS	WATER SERVICE
LB	POUND
LBL	LONG BEACH LEAD
LEN	LENGTH
LF	LINEAR FEET
LG	LONG
LH	LEFT HAND
LLV	LONG LEG VERTICAL
LT	LEFT
LA	LOS ANGELES
MAX	MAXIMUM
MCI	MCI COMMUNICATIONS
MECH	MECHANICAL
MH	MANHOLE
MLLW	MEAN LOWER LOW WATER
MIN	MINIMUM
MISC	MISCELLANEOUS
MFR	MANUFACTURER
MP	MILE POST
MTL	MATERIAL
M/L	MAINLINE (RAILROAD TRACK)
N	NORTH
Nv	NUMBER OF STATIONS FOR VERTICAL CURVE
NO	NUMBER
NPS	NOMINAL PIPE SIZE
NTP	NOTICE TO PROCEED
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OPP	OPPOSITE
OTM	OTHER TRACK MATERIAL
P	POWER
PACTEL	PACIFIC TELEPHONE
PB	PULL BOX
PC	POINT OF CURVE
PCC	POINT OF COMPOUND CURVE
PCF	POUNDS PER CUBIC FOOT
PGL	PROFILE GRADE LINE
PHL	PACIFIC HARBOR LINE
PI	POINT OF INTERSECTION / PRESSURE INSTRUMENT
PITO	POINT OF INTERSECTION OF TURNOUT
PMH	POWER MANHOLE
POB	POINT OF BEGINNING
POE	POINT OF ENDING
POC	POINT ON CURVE
POI	POWER OFF INDICATOR
POLB	PORT OF LONG BEACH
POTO	POWER OPERATED TURNOUT
PP	POWER POLE
PS	POINT OF SWITCH
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAGE
PT	POINT OF TANGENCY
PVC	POLYVINYL CHLORIDE
PVC	POINT OF VERTICAL CURVE
PVI	POINT OF VERTICAL INTERSECTION
PVMT	PAVEMENT
PVT	POINT OF VERTICAL TANGENT
QTY	QUANTITY
R	RADIUS OR RATE OF CHANGE
RB	RAIL BRACE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
REF	REFERENCE
REINF	REINFORCEMENT OR REINFORCED
REQD	REQUIRED
REV	REVISION
RH	RIGHT HAND
RR	RAILROAD
RT	RIGHT
R/W	RIGHT OF WAY
S	SLOPE
SCG	SOUTHERN CALIFORNIA GAS COMPANY
SCH	SCHEDULE
SCSP	SLOTTED CORRUGATED STEEL PIPE
SD	STORM DRAIN
SF	SQUARE FEET
SHT	SHEET
SMH	SEWER MANHOLE
SP	SIGN POST
SPEC	SPECIFICATION
SQ	SQUARE
SS	SANITARY SEWER
SSPWC	STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION
ST	STREET
ST	STRUCTURAL TUBING
ST	POINT OF SPIRAL TO TANGENT
STA	STATION
STD	STANDARD
STIFF	STIFFENER
T	TANGENT
TC	TOP OF CURB
TEL	TELEPHONE
TG	TOP OF GRATE
THK	THICK
THRU	THROUGH
TI	TEMPERATURE INDICATOR
TILT	TERMINAL ISLAND LEAD TRACK
TIM	TRAIN IN MOTION
TLA	TRINADAD LAKE ASPHALT
TMH	TELEPHONE MANHOLE
T/R	TOP OF RAIL
TRK	TRACK
TS	POINT OF TANGENT TO SPIRAL
TT	TIMBER TIE
TYP	TYPICAL
T.O.	TURNOUT
UNO	UNLESS NOTED OTHERWISE
UPRR	UNION PACIFIC RAILROAD
UPSP	UNION PACIFIC SAN PEDRO BRANCH TRACK
V	VALVE OR VENT OR SPEED
VAR	VARIES
VB	VALVE BOX
VCP	VITRIFIED CLAY PIPE
VERT	VERTICAL
W	WATER OR WEST
W/	WITH
WM	WATER METER
WOG	WATER/OIL/GAS
WP	WORKING POINT
WWM	WELDED WIRE MESH
W/O	WITHOUT
XING	RAILROAD CROSSING
XS	CROSSING SHELTER
#	NUMBER
△	CENTRAL ANGLE
Ø	DIAMETER
2:1 SLOPE	2 HORIZONTAL TO 1 VERTICAL
&	AND
@	AT
℄	CENTER LINE

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...*RR-102 Standard Abbreviations

GENERAL

BUILDING — BUILDING

CONCRETE CURB AND GUTTER

R/W LINE

ELECTRICAL

VERTICAL BEND

E — EXISTING ELECTRICAL DUCT

ELEC. METER PANEL — ELECTRICAL METER PANEL

ELEC. PAD — ELECTRICAL PAD

LIGHT POLE

POWER POLE

R — RISER

STUB OUT

E — METER

GP — GUY POLE

E — ELECTRICAL MANHOLE

EP — ELECTRICAL PANEL BOX

TP — TRAFFIC PANEL BOX

RR — RR SIGNAL POLE

TL — TRAFFIC LIGHT POLE

PB — PULLBOX

GAS

G — GAS LINE

GAS VERTICAL BEND

GAS VALVE

G — GAS RISER

G — GAS METER

GAS REDUCER

OIL

O — OIL LINE

WI — WATER INJECTION LINE

WG — WET GAS LINE

CH — OIL CHEMICAL LINE

O/W — OIL WATER LINE

DG — DRY GAS LINE

OIL VERTICAL BEND

VB — OIL VALVE BOX

OW — OIL WELL STEM

OIL REDUCER

O — OIL RISER

O|S — OIL TEST/ STUBOUT

OIL VALVE

V — OIL VENT

SEWER

S — SEWER LINE

SEWER VERTICAL BEND

CHIMNEY — SEWER CHIMNEY

CO — SEWER CLEAN OUT

DRAIN

D — STORMDRAIN MANHOLE

PS — STORMDRAIN PUMP STATION

TELEPHONE

TELEPHONE VERTICAL BEND

T — TELEPHONE MANHOLE

COM — TELEPHONE PANEL BOX

TP — TELEPHONE POLE

JB — JUNCTION BOX

FO — FIBER OPTIC DUCT

T — TELEPHONE DUCT

FA — FIRE ALARM

TV — TELEVISION CABLE

STRUCTURE

RETAINING WALL

CHAINLINK FENCE

BLOCK WALL

FENCE, OTHER

GUARD RAIL

TANK ABOVE GROUND

FENCE TURNSTYLE

FENCE GATE

TRANSMISSION TOWER

LARGE TANK OUTLINE

TANK UNDERGROUND

POINT OF MINIMUM CLEARANCE

DENOTES EXISTING STRUCTURE

XX.XX — DENOTES BOTTOM OF FOOTING

WATER

BF — BACKFLOW

WATER VERTICAL BEND

WATER VALVE

W — WATER LINE/ LATERAL

SPR — SPRINKLER LINE

CHECK VALVE

FIRE HYDRANT

W — WATER METER

REDUCER

W — WATER MANHOLE

W — RISER

Y — WATER: SIAMESE

SPRINKLER PIT

SPB — SPRINKLER PULLBOX

DI — DROP INLET

RAIL

EXISTING TRACK

POWER OPERATED TURNOUT (POTO)

HAND THROWN TURNOUT (HTTO)

REF S1|S2 — NUMBER OF DETAIL, SECTION OR ELEVATION NUMBERED CONSECUTIVELY ON EACH SHEET.

S1- DRAWING NUMBER WHERE DETAIL SECTION OR ELEVATION ORIGINATED.

S2- DRAWING NUMBER WHERE DETAIL SECTION OR ELEVATION DRAWN.

REF S1|S2 — SECTION NUMBER

REF S1|S2 DETAIL SCALE 1" = 1-0'

REF S1|S2 SECTION SCALE 1" = 1-0'

REF S1|S2 TITLE SCALE 1" = 1-0'

REVISIONS	
NO.	DATE
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Port of LONG BEACH The Green Port

RAILROAD STANDARD PLANS

STANDARD SYMBOLS EXISTING

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-103

SHEET NO: 1 OF 1

10/4/2013

...*RR-103 Standard Symbols &slash; Existing

GENERAL

BUILDING — BUILDING

CONCRETE CURB AND GUTTER

LIMIT OF WORK

R/W LINE

ELECTRICAL

E — EXISTING ELECTRICAL DUCT

E — VERTICAL BEND

ELEC. METER PANEL — ELECTRICAL METER PANEL

ELEC. PAD — ELECTRICAL PAD

LIGHT POLE

POWER POLE

RISER

STUB OUT

METER

GUY POLE

ELECTRICAL MANHOLE

ELECTRICAL PANEL BOX

TRAFFIC PANEL BOX

RR SIGNAL POLE

TRAFFIC LIGHT POLE

PULLBOX

GAS

G — GAS LINE

G — GAS VERTICAL BEND

GAS VALVE

GAS RISER

GAS METER

GAS REDUCER

OIL

O — OIL LINE

O — OIL VERTICAL BEND

WI — WATER INJECTION LINE

WG — WET GAS LINE

CH — OIL CHEMICAL LINE

O/W — OIL WATER LINE

DG — DRY GAS LINE

VB — OIL VALVE BOX

OW — OIL WELL STEM

OIL REDUCER

OIL RISER

o|s — OIL TEST/ STUBOUT

OIL VALVE

OIL VENT

SEWER

S — SEWER LINE

S — SEWER VERTICAL BEND

SEWER CHIMNEY

CO — SEWER CLEAN OUT

DRAIN

STORMDRAIN MANHOLE

PS — STORMDRAIN PUMP STATION

TELEPHONE

T — TELEPHONE MANHOLE

COM — TELEPHONE PANEL BOX

TP — TELEPHONE POLE

JB — JUNCTION BOX

FO — FIBER OPTIC DUCT

T — TELEPHONE VERTICAL BEND

T — TELEPHONE DUCT

FA — FIRE ALARM

TV — TELEVISION CABLE

STRUCTURE

RETAINING WALL

CHAINLINK FENCE

BLOCK WALL

FENCE, OTHER

GUARD RAIL

TANK ABOVE GROUND

FENCE TURNSTYLE

FENCE GATE

TRANSMISSION TOWER

LARGE TANK OUTLINE

TANK UNDERGROUND

POINT OF MINIMUM CLEARANCE

XX.XX — DENOTES BOTTOM OF FOOTING

WATER

BF — BACKFLOW

WATER VALVE

W — WATER LINE/ LATERAL

W — WATER VERTICAL BEND

SPR — SPRINKLER LINE

CHECK VALVE

FIRE HYDRANT

W — WATER METER

REDUCER

W — WATER MANHOLE

W — RISER

Y — WATER: SIAMESE

SPRINKLER PIT

SPB — SPRINKLER PULLBOX

DI — DROP INLET

RAIL

RAILROAD TRACK

POWER OPERATED TURNOUT (POTO)

HAND THROWN TURNOUT (HTTO)

SIGN AND STRIPING

T — THERMOPLASTIC

1 — INSTALL NEW SIGN

2 — REMOVE EXISTING SIGN

TYPE IV ARROW (THERMOPLASTIC)

OIL RISER

TYPE III ARROW (THERMOPLASTIC)

TYPE VI ARROW (THERMOPLASTIC)

NEW SIGN & POST

FLOW DIRECTION

MONUMENT

P — POST OR IRON PIPE

SIGNAL CONTROL BOX

SPRINKLER HEAD

TREE - PALM

TREE - OTHER

A — COMPRESSOR AIR RISER

CA — COMPRESSOR AIR LINE

TRACK BALLAST #4A

WALKWAY AND YARD BALLAST #5

CMB SUBBALLAST
(CRUSHED MISCELLANEOUS BASE)

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD
STANDARD PLANS

STANDARD SYMBOLS PROPOSED

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

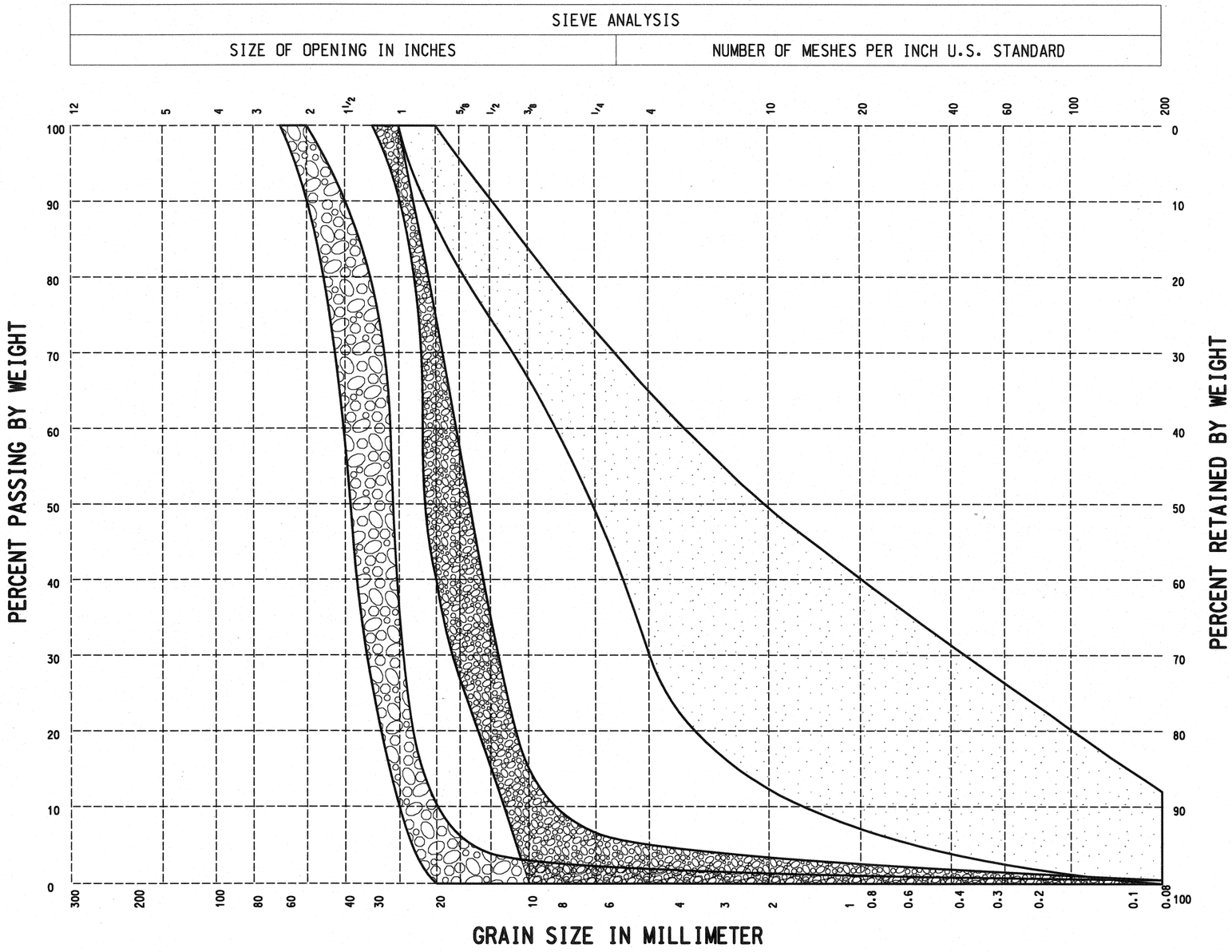
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-104

SHEET NO: 1 OF 1

10/4/2013

...*RR-104 Standard Symbols &slash; Proposed



SQUARE OPENING	#4A	#5	SUBBALLAST
	2"-3/4"	1"-3/8"	¾"-0"
2½"	100	–	–
2"	90–100	–	–
1¾"	–	–	–
1½"	60–90	–	–
1¼"	–	100	–
1"	10–35	90–100	100
¾"	0–10	40–75	87–100
½"	–	15–35	–
⅜"	0–3	0–15	–
NO 4	–	0–5	30–65
NO 8	–	–	–
NO 10	–	–	–
NO 30	–	–	5–35
NO 200	0–0.5	0–0.5	0–12

PERCENT PASSING (BY WEIGHT)
[ALL AGGREGATE SAMPLING AND TESTING PER ASTM LATEST REVISION.]

NOTES:

FOR STANDARD CROSS SECTIONS, SEE RR-111 & RR-112.

#4A BALLAST FOR MAIN TRACK & NON-SWITCHING RUNNING TRACKS PER AREMA

#5 BALLAST FOR WALKWAY AND YARD TRACK PER AREMA

SUBBALLAST: CRUSHED MISCELLANEOUS BASE
LA GREENBOOK 200-2.4, TABLE 200-2.4.2(A) FINE
(2010) CALTRANS 26-1.02B, (CLASS 2 AGGREGATE BASE, 3/4-INCH MAXIMUM)
CMB SUBBALLAST SHALL NOT INCLUDE RECLAIMED OR CRUSHED CONCRETE

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

BALLAST & SUBBALLAST GRADATION TABLE

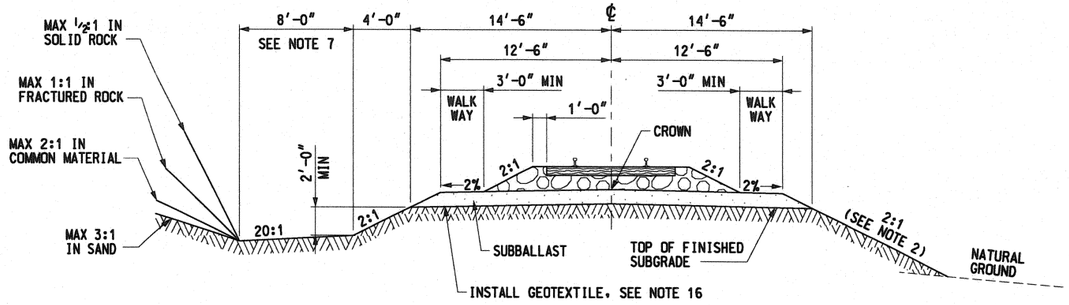
APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-110

SHEET NO: 1 OF 1

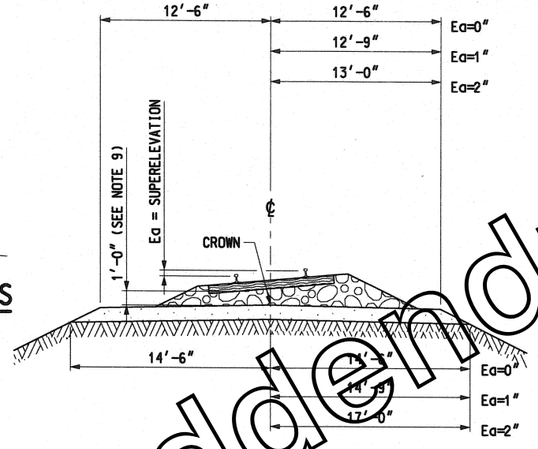
10/4/2013

...*RR-110 Ballast & Subballast Gradation Table



CUT SECTIONS — MAINLINE ROADBED SECTION — FILL SECTIONS

NTS



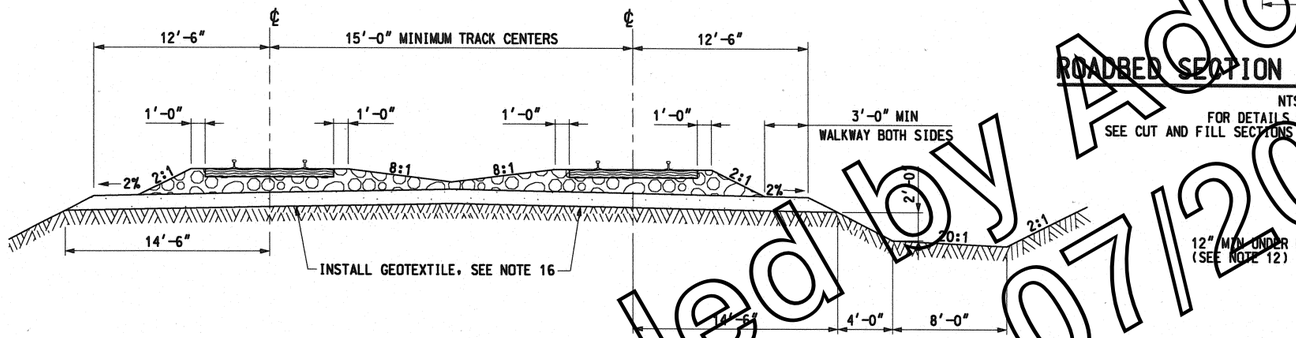
ROADBED SECTION AT CURVED TRACK

NTS

FOR DETAILS NOT SHOWN, SEE CUT AND FILL SECTIONS ELSWHERE ON THIS SHEET

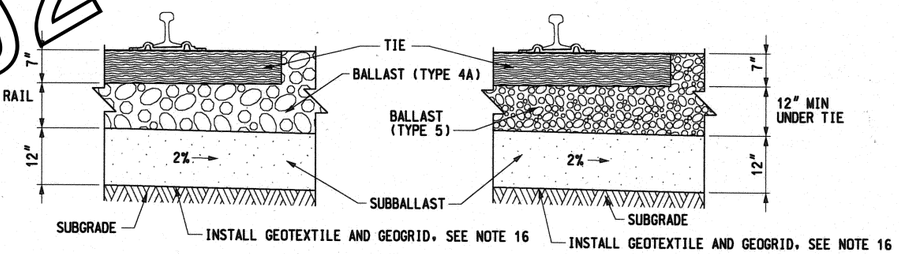
NOTES:

1. THE DEPTH OF BALLAST AND DEPTH OF SELECT MATERIAL SHALL BE DECIDED ON THE BASIS OF VOLUME OF TRAFFIC AND ON THE QUALITY OF SELECTED MATERIAL AND SUBGRADE AS DETERMINED BY POLB.
2. SLOPES SHOWN FOR BANKS IN CUTS AND ON FILLS SHALL BE CONSIDERED STANDARD AND GENERALLY USED, BUT MAY BE MODIFIED BY THE POLB AS REQUIRED BY LOCAL CONDITIONS AND CHARACTER OF MATERIAL.
3. BALLAST MUST BE REGULATED IN ADVANCE OF DRESSING SO THAT FINAL SECTION WILL CONFORM TO SLOPE REQUIREMENTS AND CHARACTER OF MATERIAL.
4. WHERE OFF-TRACK ROADWAY IS TO BE PROVIDED, EXTEND THE ROADBED SECTION BY 8'-0" AND MAINTAIN 2% SLOPE AWAY FROM TRACK.
5. ALL FILL SLOPES SHALL BE FACED WITH COVER OF MATERIAL SUITABLE FOR GROWING GRASS AND HAVING A THICKNESS OF APPROXIMATELY 6". THE OUTER SURFACE OF THIS COVER SHALL COINCIDE WITH THE DESIGN SLOPE OF THE EMBANKMENT. MATERIAL FOR THIS COVER MAY BE OBTAINED FROM STRIPPINGS.
6. DEPTH OF DITCHES WILL VARY IN ORDER TO PROVIDE FLOW LINE OF 0.2% MINIMUM GRADE IN DITCHES AND IN BENCHES.
7. SLOPED BOTTOM DITCHES ARE REQUIRED FOR MAIN LINES. A "V" DITCH IS ACCEPTABLE FOR INDUSTRY AND YARD TRACKS WHEN RIGHT-OF-WAY IS LIMITED AND WHERE LOCAL CONDITIONS AND CHARACTER OF MATERIAL SO REQUIRE. WIDTH OF SLOPED BOTTOM DITCHES MAY EXCEED 8' DEPENDING ON LOCAL CONDITIONS AND HYDRAULIC REQUIREMENTS.
8. ALL MINIMUM DIMENSIONS SHALL BE MET UNLESS OTHERWISE APPROVED BY POLB.
9. THE PROFILE GRADE LINE ON SUPERELEVATED TRACK APPLIES TO THE LOW RAIL. MAINTAIN DEPTH OF BALLAST EQUAL TO TANGENT TRACK UNDER THE LOW RAIL.
10. ALL SECTIONS ON THIS STANDARD APPLY TO NEW TRACK CONSTRUCTION, AND WHERE PRACTICAL, TRACK RECONSTRUCTION.
11. SEE RR-102 THROUGH RR-104 FOR ABBREVIATIONS AND SYMBOLS.
12. WHEN TRANSITIONING FROM TIMBER TO CONCRETE TIES, INCREASE BALLAST DEPTH LINEARLY TO 12" OVER A 50' SEGMENT STARTING AT THE CENTER OF THE LAST TIMBER TIE.
13. SEE SHEET RR-141 FOR SUPERELEVATION TABLES.
14. SEE SHEET RR-118 FOR UNDERDRAIN DETAILS IF REQUIRED IN LIEU OF DITCHES.
15. TRACK SPACING IN MARINE TERMINAL REQUIRES SPECIFIC DESIGN.
16. SEE RR-116 FOR GEOTEXTILE, GEOGRID REQUIREMENTS AND PLACEMENT.



ROADBED SECTION FOR MULTIPLE MAIN TRACKS

NTS

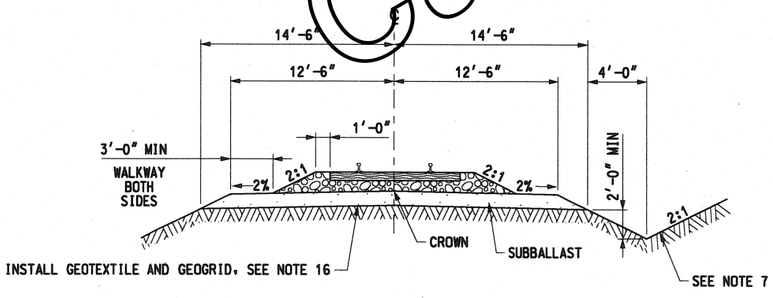


ROADBED SECTION DETAIL FOR MAINLINE & LEAD TRACKS

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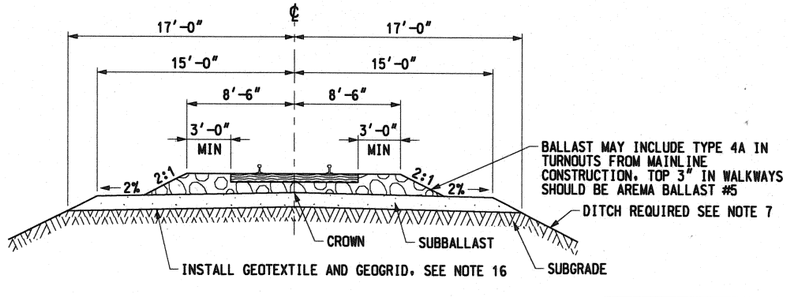
ROADBED SECTION DETAIL FOR YARD BODY TRACKS

NTS



ROADBED SECTION FOR YARD TRACKS

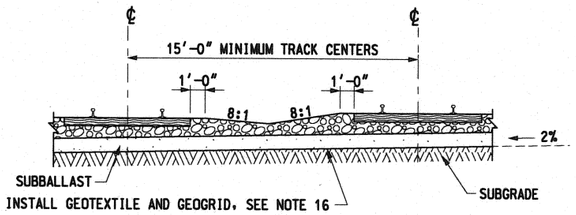
NTS



ROADBED SECTION FOR TURNOUTS AND CAR SPOTS IN YARDS

NTS

SEE RR-130 FOR REQUIRED LIMITS



ROADBED SECTION FOR ADJACENT YARD TRACKS

NTS

REVISIONS	
NO.	DATE
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Port of LONG BEACH — The Green Port

RAILROAD STANDARD PLANS

ROADBED SECTIONS FOR TRACK CONSTRUCTED USING TIMBER TIES

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

P.E. NO.: C-54141 DATE: 09-19-2013

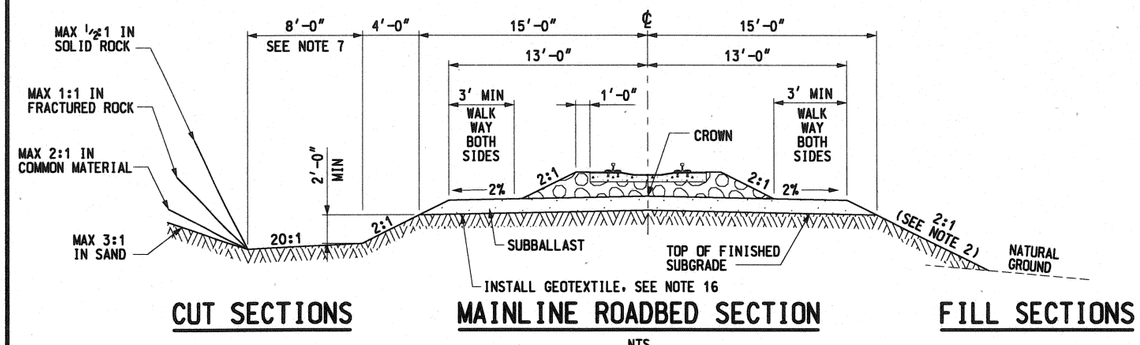
DRAWING NO: RR-111

SHEET NO: 1 OF 1

10/4/2013

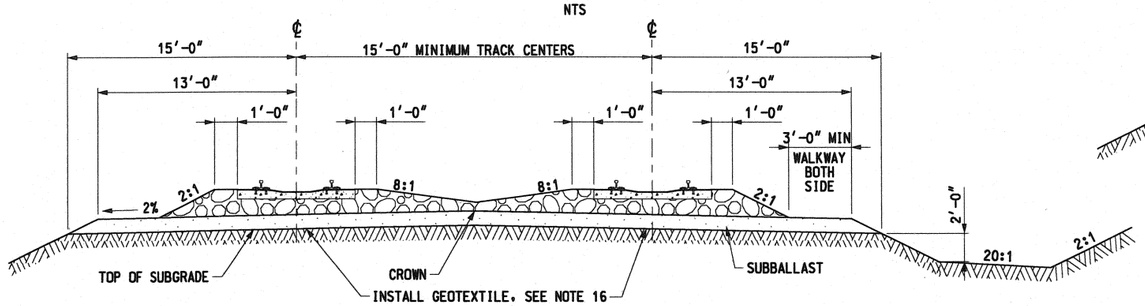
...*RR-111 Road Bed Sections for Track Constructed Using Timber Ties

Canceled by Addendum on 07/2026



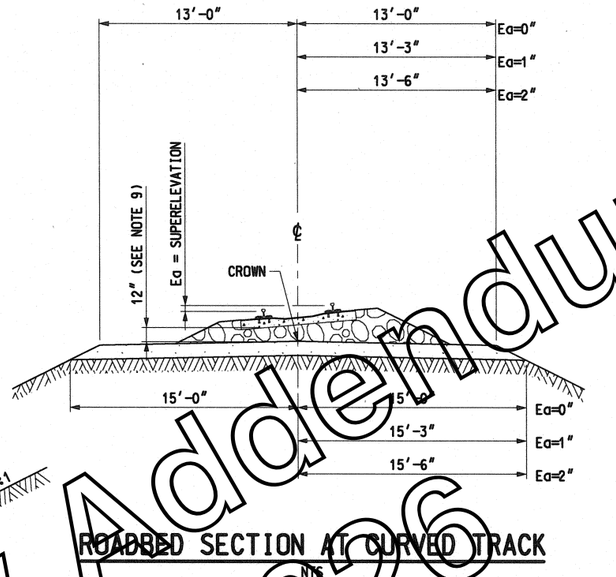
CUT SECTIONS | MAINLINE ROADBED SECTION | FILL SECTIONS

NTS



ROADBED SECTION FOR MULTIPLE MAIN TRACKS

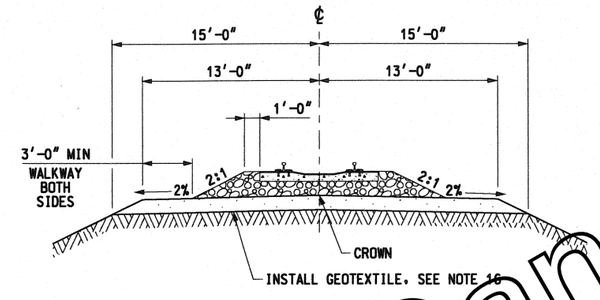
NTS



ROADBED SECTION AT CURVED TRACK

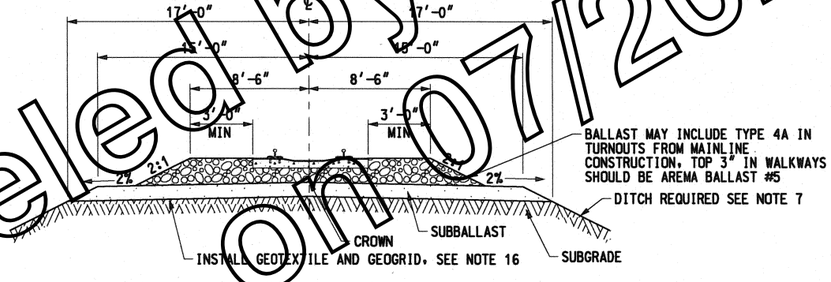
NTS

FOR DETAILS NOT SHOWN, SEE CUT AND FILL SECTIONS ELSEWHERE ON THIS SHEET



ROADBED SECTION FOR YARD TRACKS

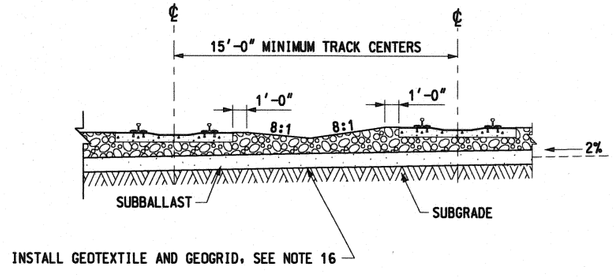
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ROADBED SECTION FOR TURNOUTS AND CAR SPOTS IN YARDS

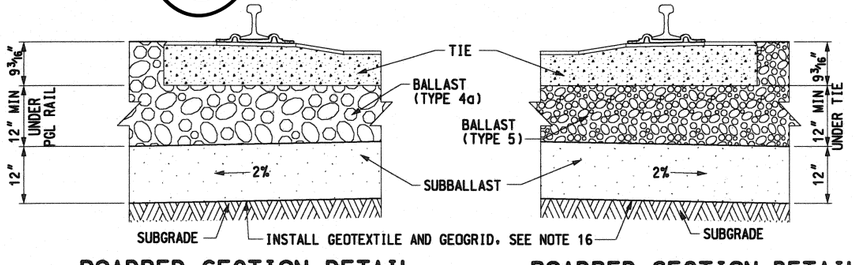
NTS

SEE RR-130 FOR REQUIRED LIMITS



ROADBED SECTION FOR ADJACENT YARD TRACKS

NTS



ROADBED SECTION DETAIL FOR MAINLINE & LEAD TRACKS

NTS

ROADBED SECTION DETAIL FOR YARD BODY TRACKS

NTS

NOTES:

1. THE DEPTH OF BALLAST AND DEPTH OF SELECT MATERIAL SHALL BE DECIDED ON THE BASIS OF VOLUME OF TRAFFIC AND ON THE QUALITY OF SELECTED MATERIAL AND SUBGRADE AS DETERMINED BY POLB.
2. SLOPES SHOWN FOR BANKS IN CUTS AND ON FILLS SHALL BE CONSIDERED STANDARD AND GENERALLY USED, BUT MAY BE MODIFIED BY THE POLB AS REQUIRED BY LOCAL CONDITIONS AND CHARACTER OF MATERIAL.
3. BALLAST MUST BE REGULATED IN ADVANCE OF DRESSING SO THAT FINAL SECTION WILL CONFORM TO SLOPE REQUIREMENTS AND CHARACTER OF MATERIAL.
4. WHERE OFF-TRACK ROADWAY IS TO BE PROVIDED, EXTEND THE ROADBED SECTION BY 8'-0" AND MAINTAIN 2% SLOPE AWAY FROM TRACK.
5. ALL FILL SLOPES SHALL BE FACED WITH COVER OF MATERIAL SUITABLE FOR GROWING GRASS AND HAVING A THICKNESS OF APPROXIMATELY 6". THE OUTER SURFACE OF THIS COVER SHALL COINCIDE WITH THE DESIGN SLOPE OF THE EMBANKMENT. MATERIAL FOR THIS COVER MAY BE OBTAINED FROM STRIPPINGS.
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9. THE PROFILE GRADE LINE ON SUPERELEVATED TRACK APPLIES TO THE LOW RAIL. MAINTAIN DEPTH OF BALLAST EQUAL TO TANGENT TRACK UNDER THE LOW RAIL.
10. ALL SECTIONS ON THIS STANDARD APPLY TO NEW TRACK CONSTRUCTION, AND WHERE PRACTICAL, TRACK RECONSTRUCTION.
11. SEE RR-102 THROUGH RR-104 FOR ABBREVIATIONS AND SYMBOLS.
12. WHEN TRANSITIONING FROM TIMBER TO CONCRETE TIES, INCREASE BALLAST DEPTH LINEARLY TO 12" OVER A 50' SEGMENT STARTING AT THE CENTER OF THE LAST TIMBER TIE.
13. SEE SHEET RR-141 FOR SUPERELEVATION TABLES.
14. SEE SHEET RR-118 FOR UNDERDRAIN DETAILS IF REQUIRED IN LIEU OF DITCHES.
15. TRACK SPACING IN MARINE TERMINAL REQUIRES SPECIFIC DESIGN.
16. SEE RR-116 FOR GEOTEXTILE, GEOGRID REQUIREMENTS AND PLACEMENT.

Canceled by Addendum No. 3 on 07/2020

REVISIONS	
NO.	DATE
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Port of LONG BEACH The Green Port

RAILROAD STANDARD PLANS

ROADBED SECTIONS FOR TRACK CONSTRUCTED USING CONCRETE TIES

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

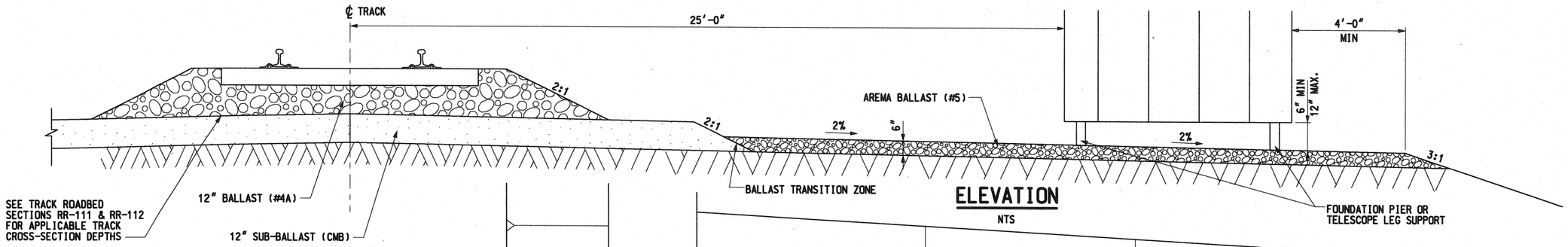
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-112

SHEET NO: 1 OF 1

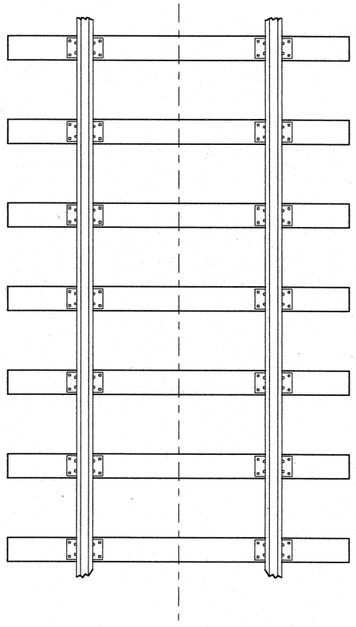
10/4/2013

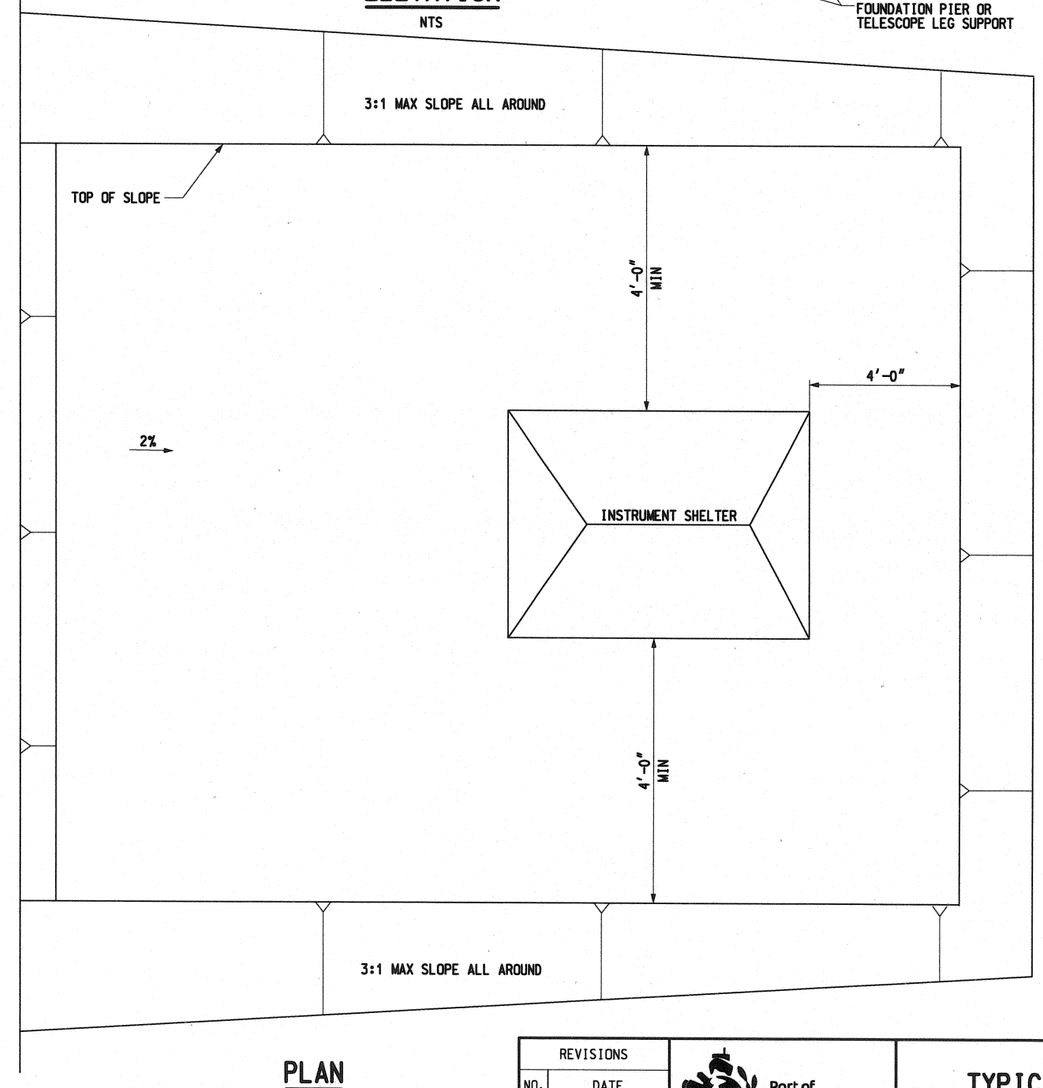
...*RR-112 Road Bed Sections for Track Constructed Using Concrete Ties



ELEVATION

NTS





PLAN

NTS

NOTES:

1. PROVIDE GRADED PAD FOR INSTRUMENT SHELTER. PAD SHALL DRAIN AWAY FROM THE TRACKS AND SHALL CONFORM TO THE OVERALL DRAINAGE PATTERN IN THE AREA.
2. LOCATE SHELTER WITH ACCESS DOOR FACING TRACKS WITH REQUIRED CLEARANCE.
3. SEE PLANS FOR DETAILS OF SPECIFIC INSTALLATIONS.

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

TYPICAL EMBANKMENT FOR INSTRUMENT SHELTER

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

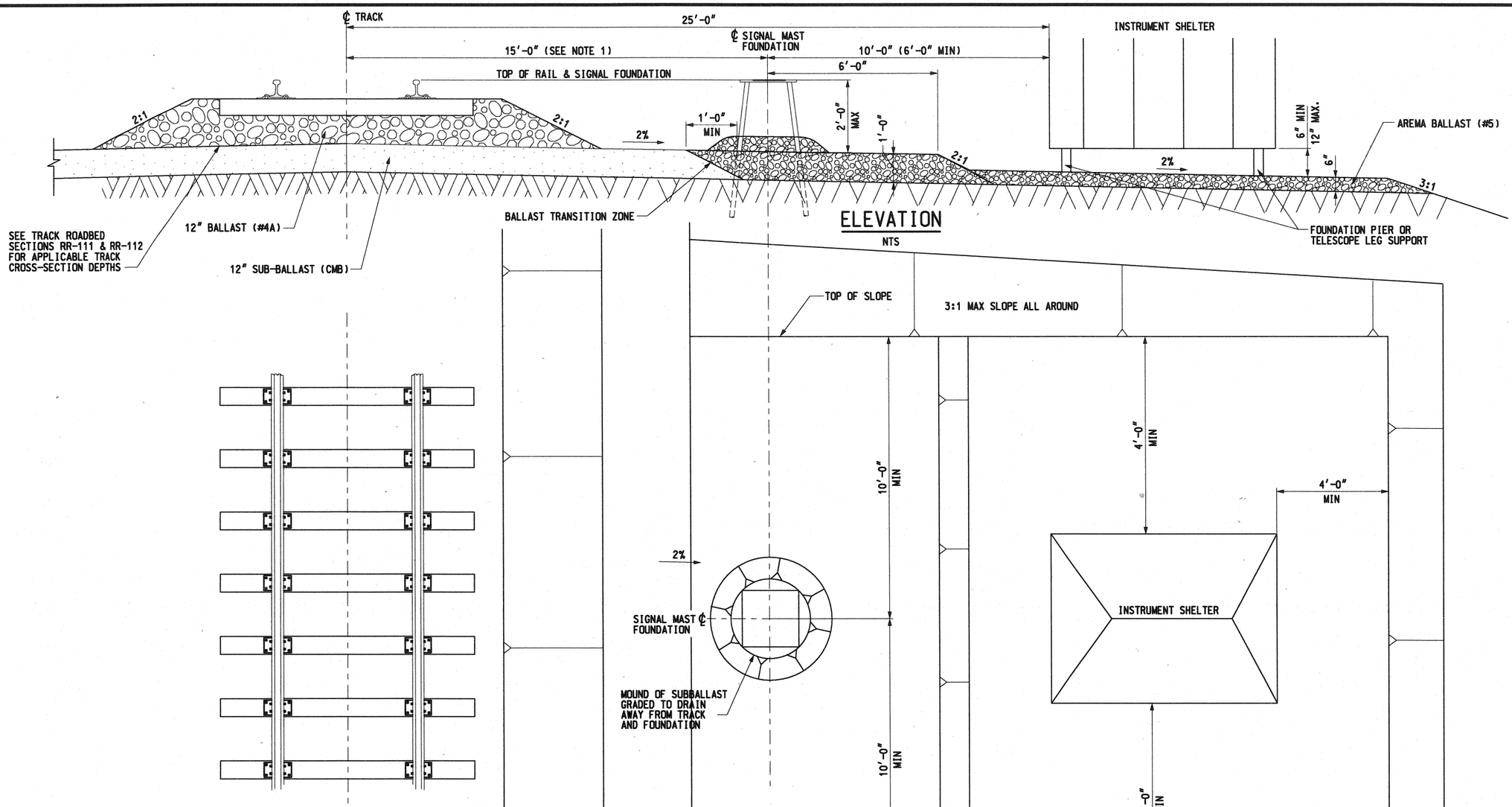
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-113

SHEET NO: 1 OF 1

10/4/2013

...\RR-114 Typical Embankment for Signal Facility with Instrument Enclosure



ELEVATION
NTS

PLAN
NTS

NOTES:

1. MINIMUM OF MAST TO CENTERLINE OF TRACK IS 15 FEET UPON APPROVAL OF POLB.
2. SIZE OF EMBANKMENT FOR SIGNAL LOCATION WILL BE ADJUSTED ACCORDING TO WHETHER THE SITE INCLUDES AN INSTRUMENT SHELTER AND THE SIZE OF THE SHELTER.
3. SIGNAL EMBANKMENT SHALL BE DESIGNED TO ACCOMODATE DRAINAGE OF THE RIGHT OF WAY; IF NECESSARY, A CULVERT PIPE MAY BE PLACED BENEATH THE EMBANKMENT TO CARRY RIGHT OF WAY DITCHES PAST THE SIGNAL LOCATION.
4. IF SUFFICIENT SPACE DOES NOT EXIST FOR SLOPED EMBANKMENT FOR SIGNAL LOCATIONS, A RETAINING STRUCTURE AND SAFETY BARRIERS (HANDRAILS) SHALL BE PROVIDED.
5. SIGNAL CONDUITS ARE NOT SHOWN. DESIGNERS OF SIGNAL FACILITIES AND EMBANKMENTS MUST COORDINATE LOCATIONS OF CONDUITS, DRAINAGE CULVERTS AND RETAINING WALLS.
6. ANY DEVIATIONS FROM THIS STANDARD TO BE APPROVED BY POLB.

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

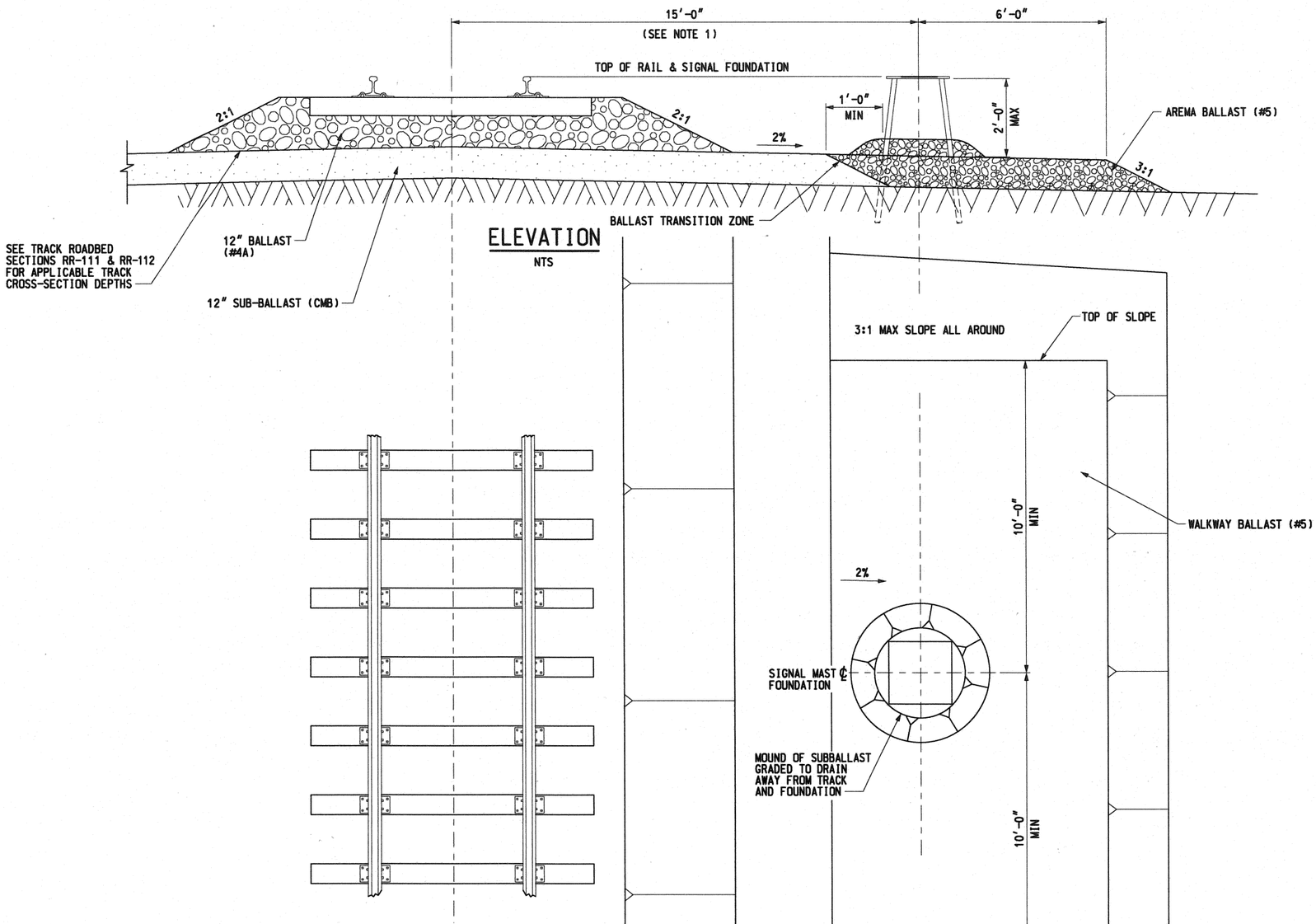
TYPICAL EMBANKMENT FOR SIGNAL FACILITY WITH INSTRUMENT SHELTER

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-114
SHEET NO: 1 OF 1

10/4/2013

...*RR-114 Typical Embankment for Signal Facility with Instrument Enclosure



ELEVATION
NTS

PLAN
NTS

NOTES:

1. MINIMUM OF MAST TO CENTERLINE OF TRACK IS 15 FEET UPON APPROVAL OF POLB.
2. SIGNAL EMBANKMENT SHALL BE DESIGNED TO ACCOMODATE DRAINAGE OF THE RIGHT OF WAY: IF NECESSARY, A CULVERT PIPE MAY BE PLACED BENEATH THE EMBANKMENT TO CARRY RIGHT OF WAY DITCHES PAST THE SIGNAL LOCATION.
3. IF SUFFICIENT SPACE DOES NOT EXIST FOR SLOPED EMBANKMENT FOR SIGNAL LOCATIONS, A RETAINING STRUCTURE AND SAFETY BARRIERS (HANDRAILS) SHALL BE PROVIDED.
4. SIGNAL CONDUITS ARE NOT SHOWN. DESIGNERS OF SIGNAL FACILITIES AND EMBANKMENTS MUST COORDINATE LOCATIONS OF CONDUITS, DRAINAGE CULVERTS AND RETAINING WALLS.
5. ANY DEVIATIONS FROM THIS STANDARD TO BE APPROVED BY POLB.

REVISIONS	
NO.	DATE
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

TYPICAL EMBANKMENT FOR SIGNAL FACILITY (SIGNAL FOUNDATION ONLY)

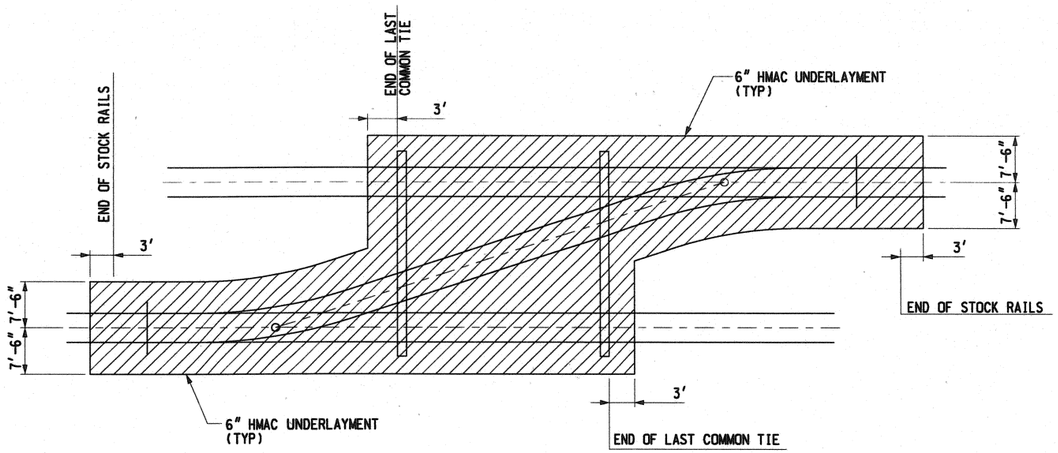
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-115

SHEET NO: 1 OF 1

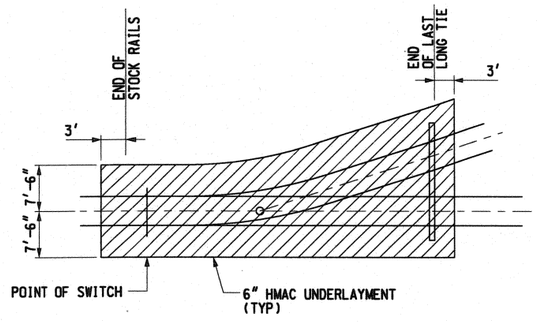
10/4/2013

...#RR-115 Typical Embankment for Signal Facility, Signal Foundation Only



TYPICAL HMAC UNDERLAYMENT AT CROSSOVERS

NTS



TYPICAL HMAC UNDERLAYMENT AT TURNOUTS

NTS

HMAC VOLUME QUANTITIES

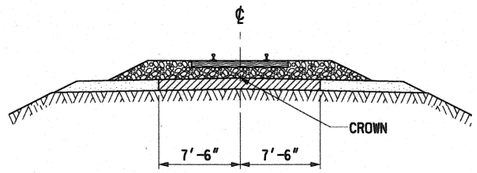
TURNOUT NO	AREA OF HMAC (SF)	VOLUME OF 6" HMAC (CY)	* WEIGHT OF HMAC (TONS)
8	1830	34	67
9	2165	40	78
10	2400	45	88
11	2635	49	96
15	3520	66	129

CROSSOVER NO	TRACK CENTER DISTANCE (FT)	AREA OF HMAC (SF)	VOLUME OF 6" HMAC (CY)	* WEIGHT OF HMAC (TONS)
8	15	4060	75	146
9	15	4065	75	146
10	15	4490	83	163
11	15	4920	91	178
15	15	6325	117	229

*CALCULATIONS FOR THEORETICAL WEIGHT OF HMAC BASED ON UNIT WEIGHT OF 145 LBS PER CUBIC FOOT.

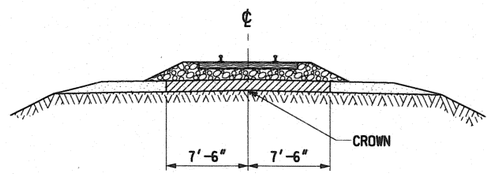
LEGEND

- BALLAST
- HOT MIX ASPHALT CONCRETE
- SUBBALLAST
- SUBGRADE
- GEOGRID
- GEOTEXTILE



TYPICAL HMAC UNDERLAYMENT SECTION IN YARDS

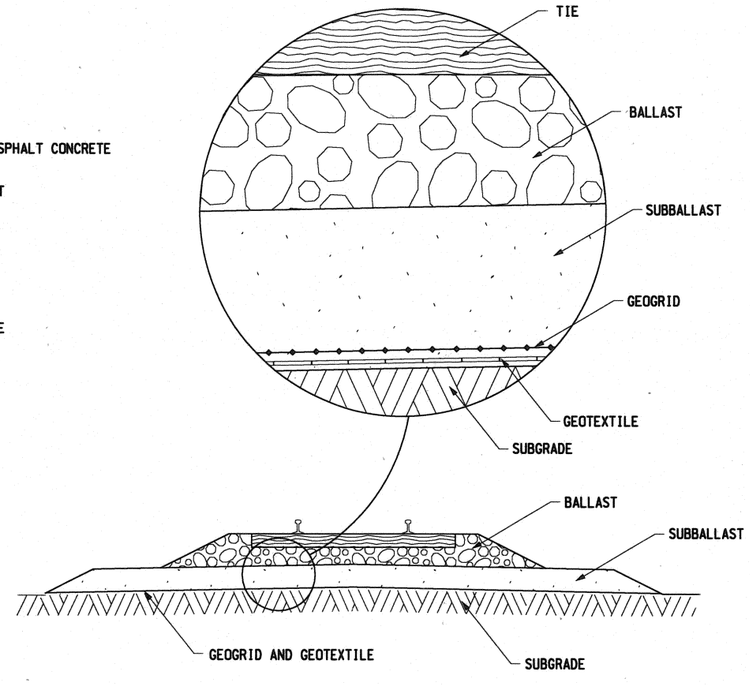
NTS



TYPICAL HMAC UNDERLAYMENT SECTION ON MAINLINES

NTS

NOTE: SEE SHEET RR-111 AND RR-112 FOR TRACK CROSS SECTION DIMENSIONS.



GEOGRID AND/OR GEOTEXTILE PLACEMENT

NTS

GEOGRID AND GEOTEXTILE NOTES:

1. GEOTEXTILE REQUIRED FOR ALL TRACK MUST COMPLY WITH REQUIREMENTS OF AREMA TABLE 1-10-2 (REGULAR WEIGHT) FOR NORMAL TRACK APPLICATION OR AREMA TABLE 1-10-2 (HEAVY WEIGHT) FOR TURNOUT AND CROSSING APPLICATIONS.
2. GEOGRIDS REQUIRED FOR ALL TURNOUTS, CROSSINGS AND YARD BODY TRACKS UNLESS HMAC IS SPECIFIED. GEOGRID MUST COMPLY WITH REQUIREMENTS OF AREMA TABLE 1-10-10 (SUB-BALLAST REINFORCEMENT).
3. HMAC IS REQUIRED IN LIEU OF GEOGRIDS FOR CROSSOVER LOCATIONS IN HEAVY USE LEADS, MAINLINES, OR WHERE DIRECTED BY POLB. GEOTEXTILE IS STILL REQUIRED PER NOTE 1 FOR INSTALLATION OF HMAC.
4. GEOTEXTILE IS TO BE PLACED DIRECTLY ON TOP OF COMPACTED SUBGRADE.
5. GEOGRID OR 6" HMAC IS PLACED ON TOP OF GEOTEXTILE.
6. SUB-BALLAST IS THEN PLACED TO REQUIRED DESIGN ELEVATIONS.

REVISIONS	
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Port of LONG BEACH The Green Port

RAILROAD STANDARD PLANS

GEOGRID, GEOTEXTILE, OR HMAC UNDERLAYMENT FOR SELECT CRITICAL LOCATIONS

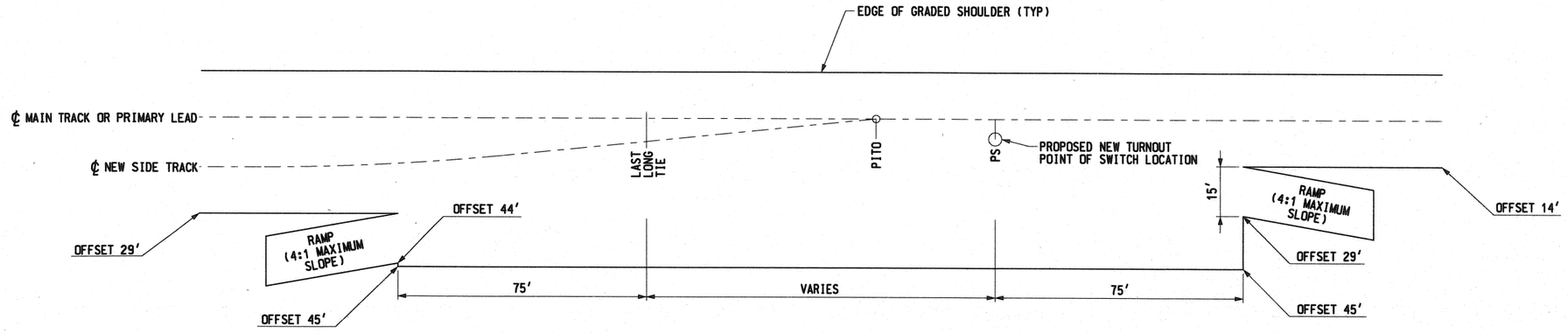
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-116

SHEET NO: 1 OF 1

10/4/2013



NOTE:

OFFSETS ARE MEASURED FROM CENTERLINE OF MAIN TRACK.

NOTES:

1. TURNOUT CONSTRUCTION PADS ARE DESIRABLE BUT NOT MANDATORY AS PROPERTY MAY NOT BE AVAILABLE FOR CONSTRUCTION.
2. THIS DRAWING REPRESENTS THE SPACE REQUIRED TO CONSTRUCT A TURNOUT ADJACENT TO ITS INTENDED INSTALLATION LOCATION, WHILE MAINTAINING TRAFFIC ON PRIMARY TRACK.

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

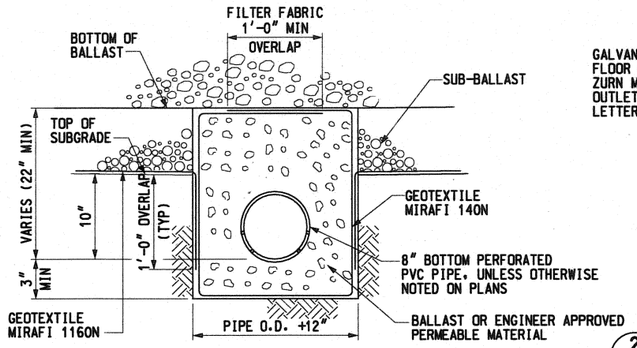
TURNOUT CONSTRUCTION PADS

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-117

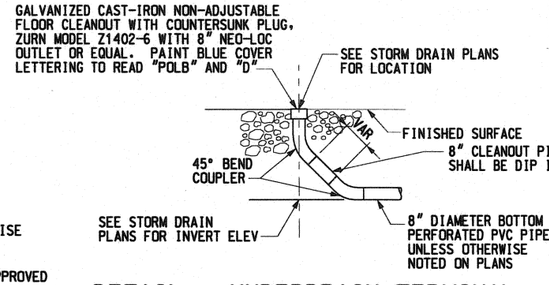
SHEET NO: 1 OF 1

10/4/2013



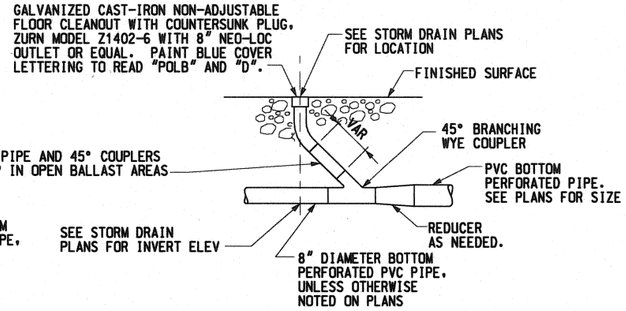
1 DETAIL - UNDERDRAIN BACKFILL

NTS



2 DETAIL - UNDERDRAIN TERMINAL RISER (UNPAVED)

NTS

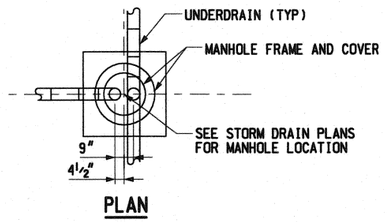


3 DETAIL - UNDERDRAIN INTERMEDIATE RISER (UNPAVED)

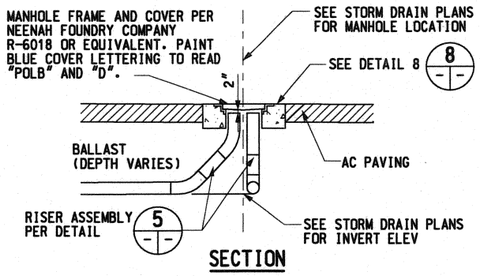
NTS

NOTES:

1. ALL UNDERDRAIN RISERS SHALL BE INSTALLED ON UPSTREAM END OF MAIN PIPE AT CONFLUENCE POINTS.
2. ALL UNDERDRAIN PIPES ARE 8" BOTTOM PERFORATED, UNLESS OTHERWISE NOTED ON PLANS.
3. CONTRACTOR SHALL FIELD FIT BENDS FOR PIPES CHANGING DIRECTION, UNLESS OTHERWISE NOTED ON PLANS. MAXIMUM DEFLECTION ANGLE ON ELBOW SHALL NOT EXCEED 30 DEGREES.
4. ALL CROSSING PIPE JOINTS SHALL BE RUBBER GASKET JOINTS. NO PIPE JOINTS ARE ALLOWED UNDER RAILROAD TRACK OR WITHIN 5 FEET OFFSET ON EITHER SIDE OF TRACK CENTERLINE.
5. ALL PERFORATED PVC PIPES AND PIPE FITTINGS SHALL CONFORM TO ASTM SPECIFICATIONS.
6. MANHOLE FRAME AND COVER SHALL BE TRAFFIC RATED HR-25.



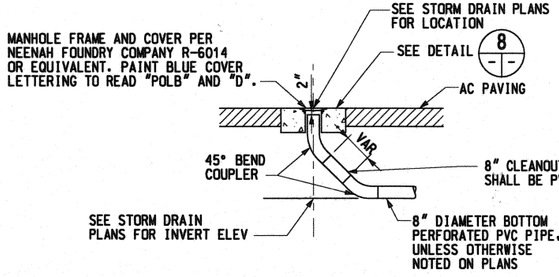
PLAN



SECTION

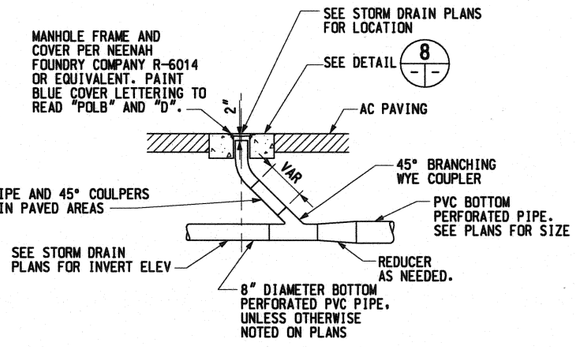
4 DETAIL - UNDERDRAIN DOUBLE RISER (PAVED)

NTS



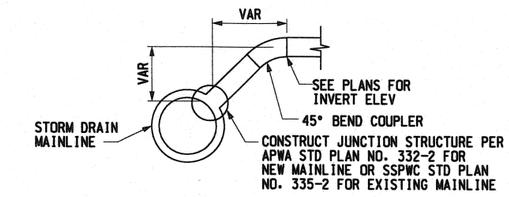
5 DETAIL - UNDERDRAIN TERMINAL RISER (PAVED)

NTS



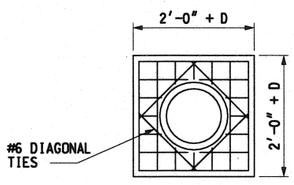
6 DETAIL 6 - UNDERDRAIN INTERMEDIATE RISER (PAVED)

NTS

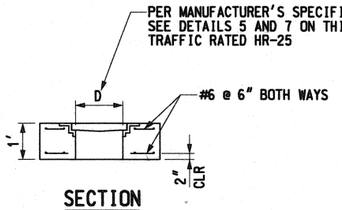


9 DETAIL - SADDLE CONNECTION FOR STORM DRAIN

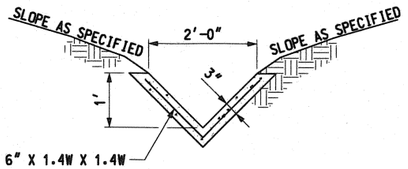
NTS



PLAN

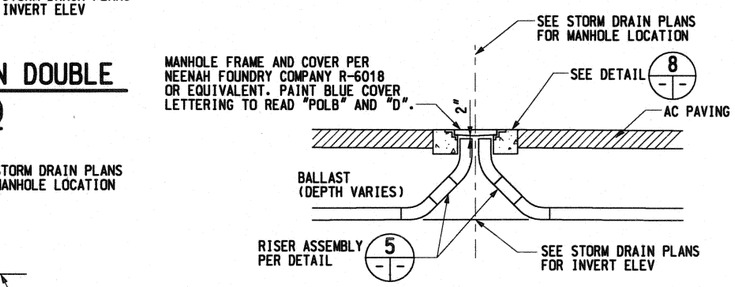


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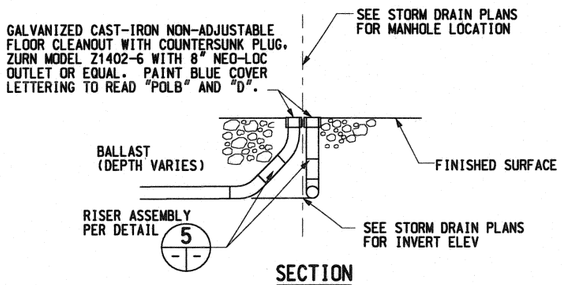
10 DETAIL - CONCRETE SWALE

NTS



7 DETAIL - UNDERDRAIN DOUBLE TERMINAL RISER (PAVED)

NTS



SECTION

8 DETAIL - FRAME AND COVER

NTS

11 DETAIL - UNDERDRAIN DOUBLE RISER (UNPAVED)

NTS

REVISIONS	
NO.	DATE
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Port of LONG BEACH The Green Port

RAILROAD STANDARD PLANS

TRACK UNDERDRAIN AND STORM DRAIN DETAILS

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

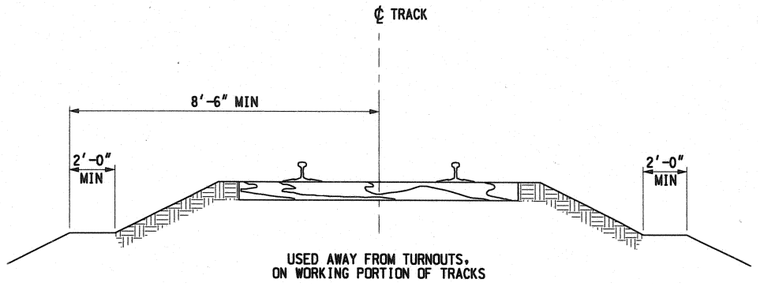
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-118

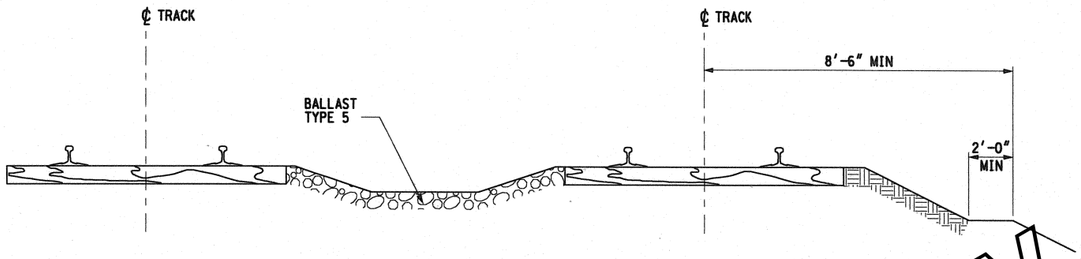
SHEET NO: 1 OF 1

10/4/2013

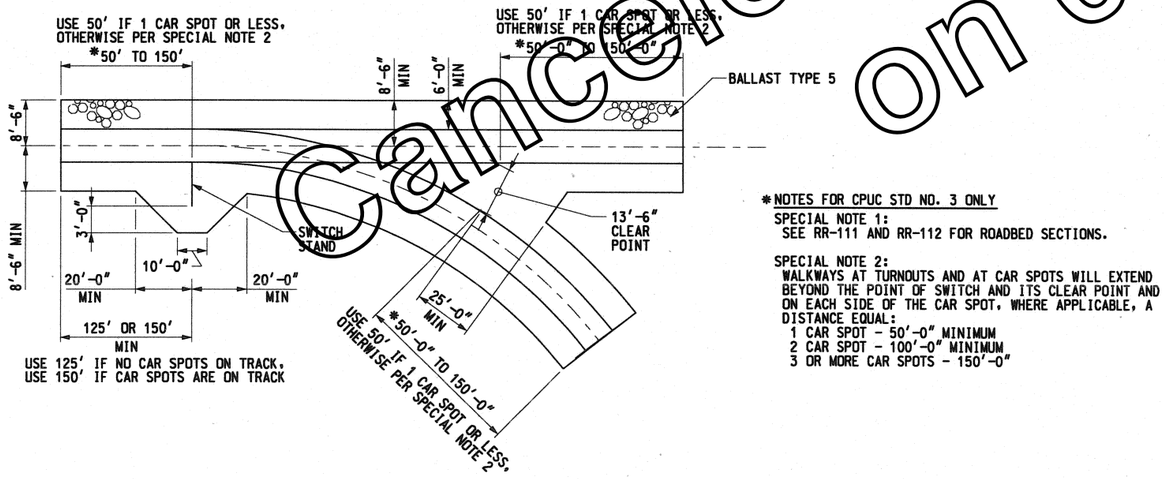
...*RR-118 Track UnderDrain and Storm Drain Details



CPUC STANDARD NO. 1 GENERAL WALKWAY



CPUC STANDARD NO. 2 TYPICAL TRACK CONFIGURATION YARD TRACKS



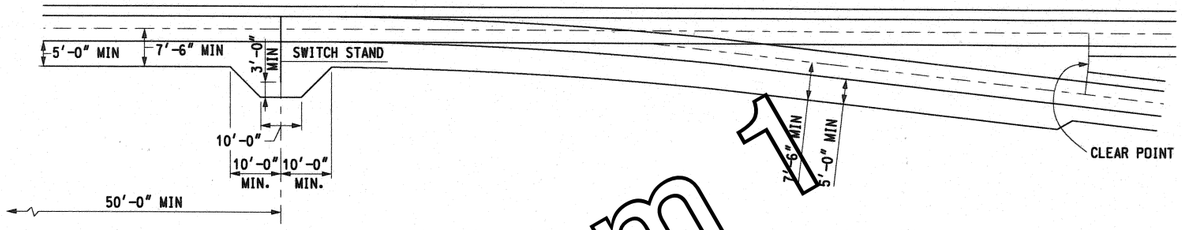
CPUC STANDARD NO. 3 WALKWAYS FOR TYPICAL TURNOUT IN YARDS

WALKWAYS WHERE SWITCHES ARE NON-POWER OPERATED.

*NOTES FOR CPUC STD NO. 3 ONLY

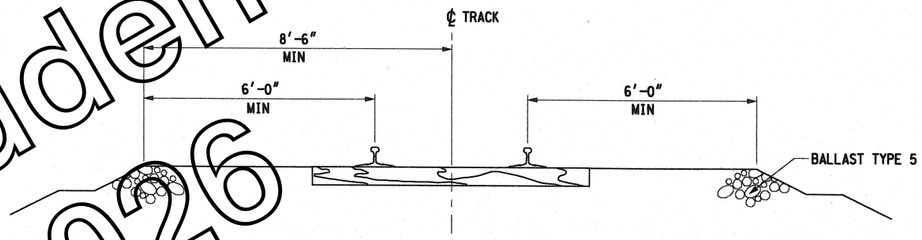
SPECIAL NOTE 1:
SEE RR-111 AND RR-112 FOR ROADBED SECTIONS.

SPECIAL NOTE 2:
WALKWAYS AT TURNOUTS AND AT CAR SPOTS WILL EXTEND BEYOND THE POINT OF SWITCH AND ITS CLEAR POINT AND ON EACH SIDE OF THE CAR SPOT. WHERE APPLICABLE, A DISTANCE EQUAL:
1 CAR SPOT – 50′-0″ MINIMUM
2 CAR SPOT – 100′-0″ MINIMUM
3 OR MORE CAR SPOTS – 150′-0″



CPUC STANDARD NO. 5 WALKWAYS FOR TYPICAL TURNOUT IN YARDS

WALKWAYS WHERE SWITCHES ARE POWER OPERATED.



CPUC STANDARD NO. 6 WALKWAY AT TURNOUTS AND CAR SPOTS

USED AT WALKWAYS IN YARDS, WHERE SWITCHING IS PERFORMED.
SEE CPUC STANDARD NO. 3 THIS SHEET.

NOTES:

1. THIS SHEET DEPICTS REQUIREMENTS AS DETAILED IN CPUC GENERAL ORDER 118A.
2. IN ALL CASES LATERAL CLEARANCE AND TRACK SPACING WILL MATCH CPUC G.O. 26-D.
3. WALKWAYS SHALL BE MAINTAINED AND KEPT FREE FROM VEGETATION.
4. IF PHYSICAL CONDITIONS REQUIRE, THE MINIMUM REQUIRED WALKWAY WIDTH FOR NO 1 TYPE WALKWAYS MAY BE REDUCED TO 2′ MINIMUM UPON APPROVAL OF POLB.
5. FOR DETAILS OF STANDARD ROADBED SECTIONS REFER TO RR-111 & RR-112.
6. BALLAST SHOULDER SHALL BE 12″.
7. WHERE PAVING IS USED WITHIN THE WALKWAY AREAS, IT SHALL CONFORM TO THE DIMENSIONS AND SLOPES SHOWN FOR CRUSHED ROCK WALKWAYS.
8. ROADWAY ROCK SHALL BE CRUSHED ROCK IN CONFORMANCE WITH AREMA STANDARDS 4A OR 5 AS APPROPRIATE.

Canceled by Addendum on 07/2026

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NO.	DATE
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Port of LONG BEACH
The Green Port

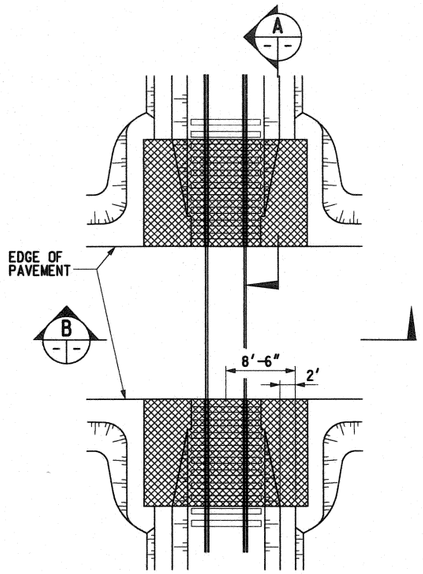
RAILROAD STANDARD PLANS

CPUC MINIMUM WALKWAY STANDARDS

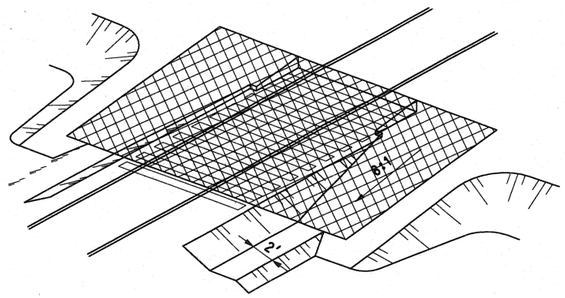
APPROVED BY: SEAN A. GAMETTE – ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-130
SHEET NO: 1 OF 1

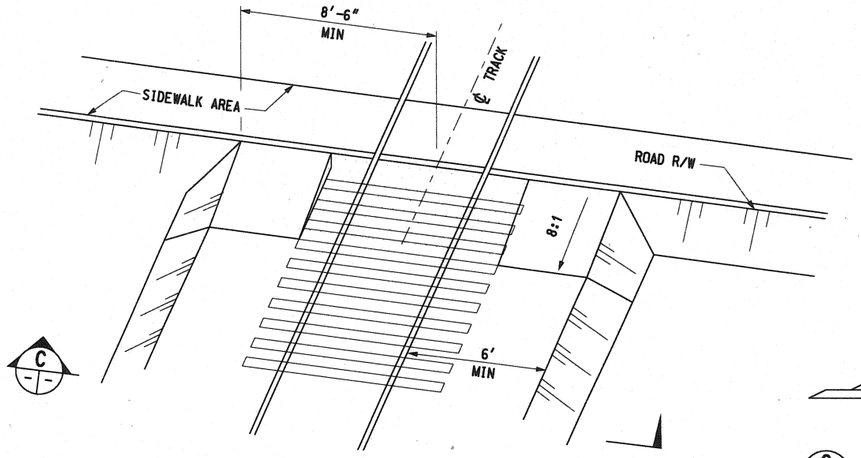
10/4/2013



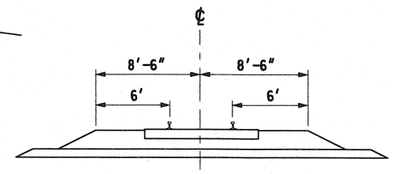
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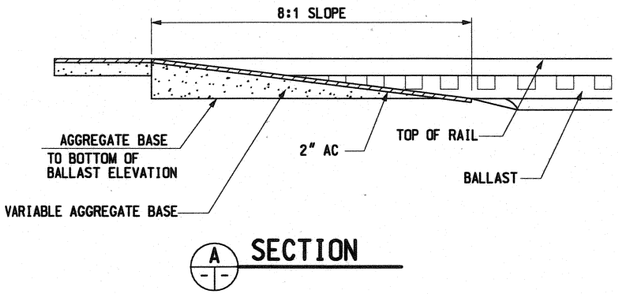
PICTORIAL VIEW



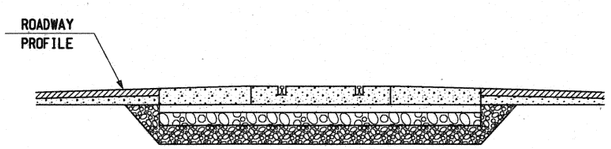
NOTE: PROVIDE 8:1 AC RAMP BETWEEN RAILS (TYP).



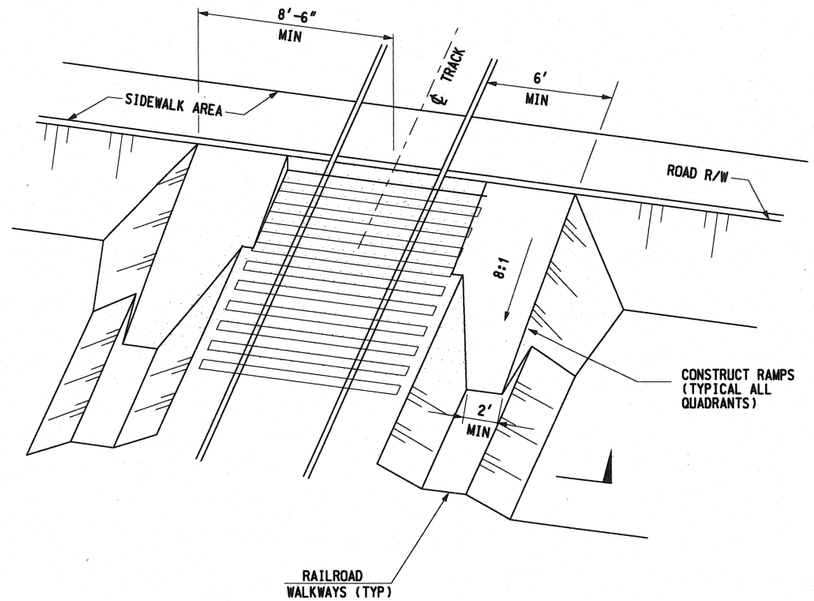
C SECTION (STANDARD 6)

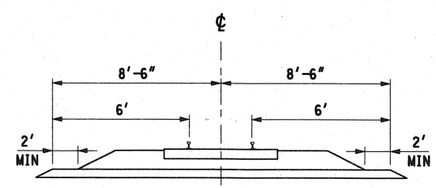


A SECTION



B SECTION
(SEE RR-390, DETAIL 5)





D SECTION (STANDARD 1)

2 DETAIL - CPUC WALKWAY DETAILS (PER GENERAL ORDER NO 118)

NTS

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

ROADWAY INTERSECTION WALKWAY CLEARANCE DETAILS

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-131

SHEET NO: 1 OF 1

10/4/2013

...*RR-131 Roadway Intersection Walkway Clearance Details

VERTICAL CURVES: A PARABOLIC VERTICAL CURVE WILL BE USED TO EASE THE CHANGE IN GRADIENTS IN ORDER TO REDUCE COUPLER AND DIAPHRAGM BINDING AND REDUCE THE DANGER OF BREAKING THE TRAIN IN TWO AS A RESULT.

(A) FOR POLB MAIN TRACK, SPEED UNDER 35 MPH, USE THE RATE OF CHANGE METHOD FOR CALCULATING VERTICAL CURVE LENGTH:

$Nv \geq (g1-g2)/r$ & $Nv \times 100 = Lv$

Nv = NUMBER OF STATIONS FOR VERTICAL CURVE ROUNDED UP TO EVEN STATION
g1 = ENTERING GRADIENT (PERCENT)
g2 = LEAVING GRADIENT (PERCENT)
r = RATE OF CHANGE
(r = 0.2 IN SUMMIT CURVE)
(r = 1.0 IN SAG CURVE)
Lv = LENGTH OF VERTICAL CURVE

NOTE:

THE MINIMUN LENGTH OF THE VERTICAL CURVE FOR BOTH SAGS AND SUMMITS SHALL NOT BE LESS THAN 100' LONG.

EXAMPLE:

0.6% RISING GRADE MEETS 0.32% DOWN GRADE

AT PVI STATION 115+00
g1 = 0.6, g2= - 32, r = 0.2

$Nv \geq (0.6 - (-.32)/0.2$
$Nv \geq 4.6$ USE 5
Lv = 500 FEET

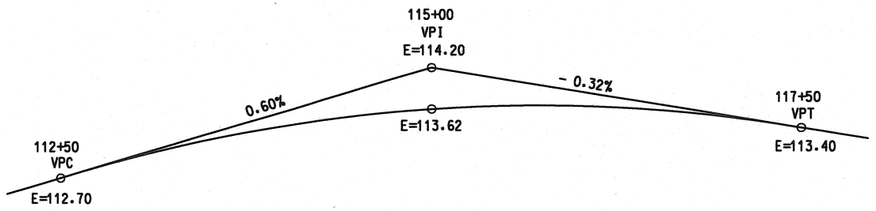


FIGURE A
NTS

(B) FOR YARD AND OTHER AUXILLARY TRACKS USE AREMA VERTICAL CURVE FORMULA:

$Lv = (D \times V^2 \times K)/A$

D = ABSOLUTE VALUE OF DIFFERENCE IN GRADIENTS (DECIMAL)
V = DESIGN VELOCITY OF TRACK ∴ USE 20 MPH FOR YARD TRACK
K = CONVERSION FACTOR TO CHANGE UNITS (0.0215)
A = VERTICAL ACCELARATION FOR FREIGHT OPERATIONS USE 0.10 FEET/SEC
Lv= LENGTH OF VERTICAL CURVE IN FEET (MINIMUM ALLOWABLE 100 FEET)

NOTE:

THE MINIMUN LENGTH OF THE VERTICAL CURVE FOR BOTH SAGS AND SUMMITS SHALL NOT BE LESS THAN 100' LONG.

EXAMPLE:

0.6% RISING GRADE MEETS 0.32% DOWN GRADE

D = 0.92
V = 20 MPH
K = 0.0215
A = 0.10
Lv= 79.12 FEET ∴ USE 100 FEET

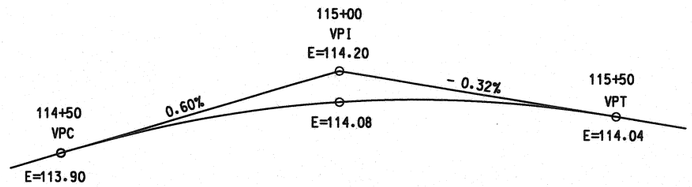


FIGURE B
NTS

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

VERTICAL CURVE GEOMETRY

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-140

SHEET NO: 1 OF 1

10/4/2013

...*RR-140 Vertical Curve Geometry

TABLE F2.0 – 2.0 INCH UNBALANCED SUPER ELEVATION FOR FREIGHT OPERATIONS – STANDARD SPIRAL LENGTHS

ABBREVIATIONS			
E =	EQUILIBRIUM SUPER ELEVATION OF OUTSIDE RAIL (IN)	Vmax =	MAXIMUM ALLOWABLE OPERATING SPEED (MPH)
Eu =	UNBALANCED SUPER ELEVATION OF OUTSIDE RAIL (IN)	Ls =	SPIRAL LENGTH (FT)
Ea =	ACTUAL SUPER ELEVATION OF OUTSIDE RAIL (IN)	D =	DEGREE OF CURVATURE (DECIMAL DEGREES)

FORMULAS

$E = 0.0007DV_{max}^2$ $\quad Ea = E - Eu$

SPIRAL LENGTH: THE LONGEST OF: $\quad Ls = 1.2V_{max}Ea$; $\quad Ls = 62Ea$; $\quad Ls_{MIN} = 40'$

CURVATURE – DEGREES AND MINUTES	MAXIMUM ALLOWABLE FREIGHT OPERATING SPEED – MILES PER HOUR									
	20		25		30		35		40	
	Ea	Ls	Ea	Ls	Ea	Ls	Ea	Ls	Ea	Ls
0°15′	0.00″	40′	0.00″	40′	0.00″	40′	0.00″	40′	0.00″	40′
0°30′	0.00″	40′	0.00″	40′	0.00″	40′	0.00″	40′	0.00″	40′
0°45′	0.00″	40′	0.00″	40′	0.00″	40′	0.00″	40′	0.00″	40′
1°00′	0.00″	40′	0.00″	40′	0.00″	40′	0.00″	40′	0.00″	40′
1°15′	0.00″	40′	0.00″	40′	0.00″	40′	0.00″	40′	0.00″	40′
1°30′	0.00″	40′	0.00″	40′	0.00″	40′	0.00″	40′	0.00″	40′
1°45′	0.00″	40′	0.00″	40′	0.00″	40′	0.00″	40′	0.00″	40′
2°00′	0.00″	40′	0.00″	40′	0.00″	40′	0.00″	40′	0.25″	40′
2°15′	0.00″	40′	0.00″	40′	0.00″	40′	0.00″	40′	0.75″	50′
2°30′	0.00″	40′	0.00″	40′	0.00″	40′	0.25″	40′	1.00″	70′
2°45′	0.00″	40′	0.00″	40′	0.00″	40′	0.50″	40′	1.25″	80′
3°00′	0.00″	40′	0.00″	40′	0.00″	40′	0.75″	50′	1.50″	100′
3°15′	0.00″	40′	0.00″	40′	0.25″	40′	1.00″	70′	1.75″	110′
3°30′	0.00″	40′	0.00″	40′	0.25″	40′	1.25″	80′	2.00″	130′
3°45′	0.00″	40′	0.00″	40′	0.50″	40′	1.25″	80′	2.25″	140′
4°00′	0.00″	40′	0.00″	40′	0.75″	50′	1.50″	100′	2.50″	160′
4°15′	0.00″	40′	0.00″	40′	0.75″	50′	1.75″	110′	3.00″	190′
4°30′	0.00″	40′	0.00″	40′	1.00″	70′	2.00″	130′	3.25″	210′
4°45′	0.00″	40′	0.25″	40′	1.00″	70′	2.25″	140′	3.50″	220′
5°00′	0.00″	40′	0.25″	40′	1.25″	80′	2.50″	160′	3.75″	240′
5°15′	0.00″	40′	0.50″	40′	1.50″	100′	2.75″	180′	4.00″	250′
5°30′	0.00″	40′	0.50″	40′	1.50″	100′	2.75″	180′	4.25″	270′
5°45′	0.00″	40′	0.75″	50′	1.75″	110′	3.00″	190′	4.50″	280′
6°00′	0.00″	40′	0.75″	50′	2.00″	130′	3.25″	210′	4.75″	300′
6°15′	0.00″	40′	0.75″	50′	2.00″	130′	3.50″	220′	5.00″	310′
6°30′	0.00″	40′	1.00″	70′	2.25″	140′	3.75″	240′	5.50″	350′
6°45′	0.00″	40′	1.00″	70′	2.50″	160′	4.00″	250′	5.75″	360′
7°00′	0.00″	40′	1.25″	80′	2.50″	160′	4.25″	270′	6.00″	380′
7°15′	0.25″	40′	1.25″	80′	2.75″	180′	4.25″	270′		
7°30′	0.25″	40′	1.50″	100′	2.75″	180′	4.50″	280′		
7°45′	0.25″	40′	1.50″	100′	3.00″	190′	4.75″	300′		
8°00′	0.25″	40′	1.50″	100′	3.25″	210′	5.00″	310′		
8°15′	0.50″	40′	1.75″	110′	3.25″	210′	5.25″	330′		
8°30′	0.50″	40′	1.75″	110′	3.50″	220′	5.50″	350′		
8°45′	0.50″	40′	2.00″	130′	3.75″	240′	5.75″	360′		
9°00′	0.75″	50′	2.00″	130′	3.75″	240′	5.75″	360′		
9°15′	0.75″	50′	2.25″	140′	4.00″	250′	6.00″	380′		
9°30′	0.75″	50′	2.25″	140′	4.00″	250′				
9°45′	0.75″	50′	2.50″	160′	4.25″	270′				
10°00′	1.00″	70′	2.50″	160′	4.50″	280′				
10°15′	1.00″	70′	2.50″	160′	4.50″	280′				
10°30′	1.00″	70′	2.75″	180′	4.75″	300′				
10°45′	1.25″	80′	2.75″	180′	5.00″	310′				
11°00′	1.25″	80′	3.00″	190′	5.00″	310′				
11°15′	1.25″	80′	3.00″	190′	5.25″	330′				
11°30′	1.25″	80′	3.25″	210′	5.25″	330′				
11°45′	1.50″	100′	3.25″	210′	5.50″	350′				
12°00′	1.50″	100′	3.25″	210′	5.75″	360′				

NOTES:

1. NO SPIRALS OR SUPERELEVATIONS WILL BE PERMITTED TO THE RIGHT OF HEAVY LINE WITHOUT PRIOR APPROVAL FROM THE POLB.
2. WHERE CURVATURE IS MORE THAN 5 MINUTES MORE THAN A LISTED FIGURE, THE NEXT HIGHER ELEVATION AND RESULTING SPIRAL LENGTH WILL BE USED.

TABLE FML – 3.0 INCH UNBALANCED SUPER ELEVATION FOR FREIGHT OPERATIONS – MAINTENANCE LIMIT

ABBREVIATIONS			
E =	EQUILIBRIUM SUPER ELEVATION OF OUTSIDE RAIL (IN)	Vmax =	MAXIMUM ALLOWABLE OPERATING SPEED (MPH)
Eu =	UNBALANCED SUPER ELEVATION OF OUTSIDE RAIL (IN)	Ls =	SPIRAL LENGTH (FT)
Ea =	ACTUAL SUPER ELEVATION OF OUTSIDE RAIL (IN)	D =	DEGREE OF CURVATURE (DECIMAL DEGREES)

FORMULAS

$E = 0.0007DV_{max}^2$ $\quad Ea = E - Eu$

CURVATURE – DEGREES AND MINUTES	MAXIMUM ALLOWABLE FREIGHT OPERATING SPEED – MILES PER HOUR				
	20	25	30	35	40
0°15′	0.00″	0.00″	0.00″	0.00″	0.00″
0°30′	0.00″	0.00″	0.00″	0.00″	0.00″
0°45′	0.00″	0.00″	0.00″	0.00″	0.00″
1°00′	0.00″	0.00″	0.00″	0.00″	0.00″
1°15′	0.00″	0.00″	0.00″	0.00″	0.00″
1°30′	0.00″	0.00″	0.00″	0.00″	0.00″
1°45′	0.00″	0.00″	0.00″	0.00″	0.00″
2°00′	0.00″	0.00″	0.00″	0.00″	0.00″
2°15′	0.00″	0.00″	0.00″	0.00″	0.00″
2°30′	0.00″	0.00″	0.00″	0.00″	0.00″
2°45′	0.00″	0.00″	0.00″	0.00″	0.25″
3°00′	0.00″	0.00″	0.00″	0.00″	0.50″
3°15′	0.00″	0.00″	0.00″	0.00″	0.75″
3°30′	0.00″	0.00″	0.00″	0.25″	1.00″
3°45′	0.00″	0.00″	0.00″	0.25″	1.25″
4°00′	0.00″	0.00″	0.00″	0.50″	1.50″
4°15′	0.00″	0.00″	0.00″	0.75″	2.00″
4°30′	0.00″	0.00″	0.00″	1.00″	2.25″
4°45′	0.00″	0.00″	0.00″	1.25″	2.50″
5°00′	0.00″	0.00″	0.25″	1.50″	2.75″
5°15′	0.00″	0.00″	0.50″	1.75″	3.00″
5°30′	0.00″	0.00″	0.50″	1.75″	3.25″
5°45′	0.00″	0.00″	0.75″	2.00″	3.50″
6°00′	0.00″	0.00″	1.00″	2.25″	3.75″
6°15′	0.00″	0.00″	1.00″	2.50″	4.00″
6°30′	0.00″	0.00″	1.25″	2.75″	4.50″
6°45′	0.00″	0.00″	1.50″	3.00″	4.75″
7°00′	0.00″	0.25″	1.50″	3.25″	5.00″
7°15′	0.00″	0.25″	1.75″	3.25″	5.25″
7°30′	0.00″	0.50″	1.75″	3.50″	5.50″
7°45′	0.00″	0.50″	2.00″	3.75″	5.75″
8°00′	0.00″	0.50″	2.25″	4.00″	6.00″
8°15′	0.00″	0.75″	2.25″	4.25″	
8°30′	0.00″	0.75″	2.50″	4.50″	
8°45′	0.00″	1.00″	2.75″	4.75″	
9°00′	0.00″	1.00″	2.75″	4.75″	
9°15′	0.00″	1.25″	3.00″	5.00″	
9°30′	0.00″	1.25″	3.00″	5.25″	
9°45′	0.00″	1.50″	3.25″	5.50″	
10°00′	0.00″	1.50″	3.50″	5.75″	
10°15′	0.00″	1.50″	3.50″	6.00″	
10°30′	0.00″	1.75″	3.75″		
10°45′	0.25″	1.75″	4.00″		
11°00′	0.25″	2.00″	4.00″		
11°15′	0.25″	2.00″	4.25″		
11°30′	0.25″	2.25″	4.25″		
11°45′	0.50″	2.25″	4.50″		
12°00′	0.50″	2.25″	4.75″		

NOTES:

1. AT ALL TIMES THE TRACK MUST BE IN CONFORMANCE WITH 49CFR213. TABLE F2.0 DEFINE THE LIMITING DESIGN SPEED FOR FREIGHT TRAINS. TABLE FML-3 INCHES UNDERBALANCE IS THE LIMITING CONDITION FOR ALL FREIGHT TRAINS. ANY COMBINATION OF CURVATURE OR ACTUAL ELEVATION THAT IS DISCOVERED OR CREATED THAT RESULTS IN THE OPERATING SPEED TO EXCEED THE SPEED PERMITTED BY THESE TABLES REQUIRES IMMEDIATE REMEDIAL ACTION.
2. SUPERELEVATION AND SPIRAL LENGTHS WILL BE MAINTAINED TO THE VALUES REQUIRED FOR THE OPERATING SPEED.
3. IF THE ACTUAL SUPERELEVATION AND CURVATURE MEASURED IN THE FIELD BY GEOMETRY CARS OR BY MANUAL INSPECTION ARE FOUND TO RESULT IN AN ALLOWABLE SPEED LESS THAN PERMITTED BY TABLE FML, A TEMPORARY SPEED REDUCTION MUST BE IMPOSED TO THE NEXT LOWER SPEED THAT WILL ACCOMMODATE THE ACTUAL MEASURED SUPERELEVATION. THE TEMPORARY SPEED REDUCTION MUST REMAIN UNTIL THE SUPERELEVATION LIMITS ARE RAISED TO THE VALUES SHOWN IN TABLE F2.0 FOR THE DESIGN SPEED.

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Port of LONG BEACH
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RAILROAD STANDARD PLANS

UNBALANCED SUPER ELEVATION TABLES

APPROVED BY: SEAN A. GAMETTE – ACTING CHIEF HARBOR ENGINEER

P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-141

SHEET NO: 1 OF 1

10/4/2013

...*RR-141 Unbalanced Super Elevation Tables

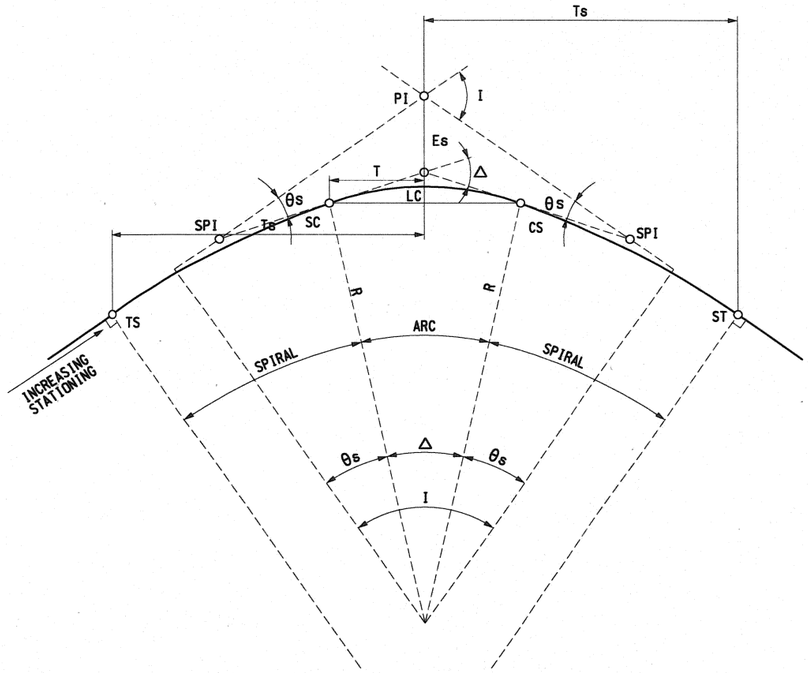


FIGURE A
CIRCULAR CURVE
WITH SPIRAL TRANSITIONS

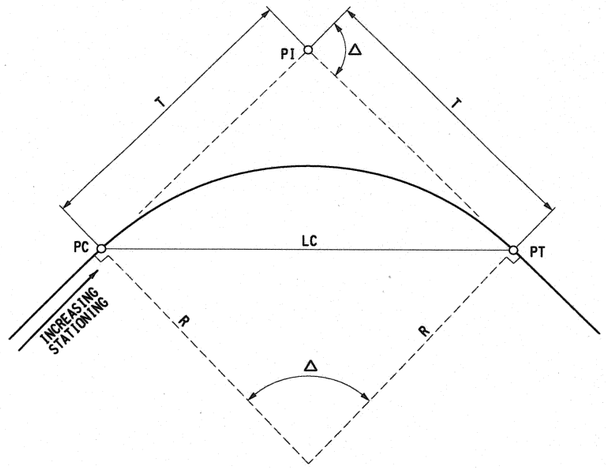


FIGURE B
SIMPLE CIRCULAR CURVE

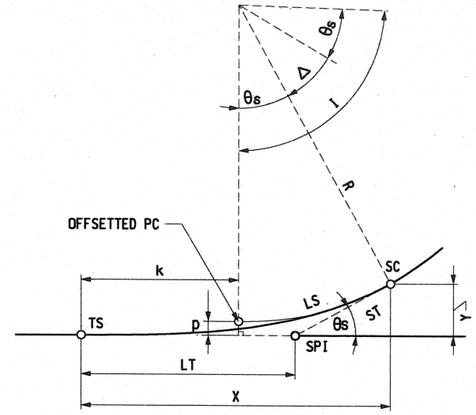


FIGURE C
SPIRAL TRANSITION CURVE

ABBREVIATIONS AND SYMBOLS

CC	COMPOUND CURVE
CS	CURVE TO SPIRAL
Δ	CENTRAL ANGLE OF CIRCULAR CURVE
Dc	DEGREE OF CURVATURE (CHORD DEFINITION)
E	EQUILIBRIUM SUPER ELEVATION (Eq + Eu)
Eq	ACTUAL SUPER ELEVATION
Es	EXTERNAL DISTANCE FROM PI TO CIRCULAR CURVE
Eu	UNBALANCED SUPER ELEVATION (CANT DEFICIENCY)
I	TOTAL INTERSECTION ANGLE (DEFLECTION ANGLE AT THE PI)
K	INCREASE IN DEGREES OF CURVATURE PER 100 FT STATIONS ALONG SPIRAL
k	TANGENT DISTANCE FROM THE TS TO THE OFFSETTED PC
L	CHORDED LENGTH OF CIRCULAR CURVE
LC	LONG CHORD
LS	LENGTH OF SPIRAL
LT	LONG TANGENT (DISTANCE FROM THE TS TO THE SPI)
p	ORDINATE OF THE OFFSETTED PC
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
PI	POINT OF INTERSECTION
PT	POINT OF TANGENCY
R	RADIUS
S	LENGTH OF SPIRAL (LS) IN 100 FT STATIONS
SC	SPIRAL TO CURVE
SPI	POINT OF INTERSECTION BETWEEN TS AND SC
ST	SPIRAL TO TANGENT
ST	SHORT TANGENT (DISTANCE FROM SPI TO SC)
T	TANGENT LENGTH OF CIRCULAR CURVE
TS	TANGENT TO SPIRAL
Ts	TOTAL TANGENT DISTANCE OF A SPIRALED CURVE
θs	SPIRAL ANGLE
X	TANGENT DISTANCE FROM TS TO SC
Y	TANGENT OFFSET TO THE SC

KEY FORMULAE

$R = \frac{50'}{\sin\left(\frac{Dc}{2}\right)}$

$\Delta = I - 2\,\theta s$

$L = \frac{\Delta}{Dc} \times 100$

$T = R \tan\left(\frac{\Delta}{2}\right)$

$LC = 2R \sin\left(\frac{\Delta}{2}\right)$

$LS = \frac{200\,\theta s}{Dc}$

$S = \frac{LS}{100}$

$\theta s = \frac{LS\,Dc}{200}$

$K = \frac{100\,Dc}{LS}$

$LT = X - \frac{Y}{\tan \theta s}$

$ST = \frac{Y}{\sin \theta s}$

$Ts = (R+p)\tan\left(\frac{I}{2}\right) + k$

$Es = (R+p)\,ex\,\sec\left(\frac{I}{2}\right) + p$

$X = 1 - 0.003048\,\theta s^2 S$

$Y = 0.582\,\theta s S - 0.00001264\,\theta s^3 S$

$k = \frac{LS}{2} - 0.000508\,\Delta^2 S$

$p = 0.1454\,\Delta S$

NOTES:

1. CIRCULAR CURVES ARE DEFINED BY THE CHORD DEFINITION (CENTRAL ANGLE SUBTENDED BY A CHORD OF 100 FEET) OF CURVATURE AND SPECIFIED BY DEGREE.
2. SPIRALS ARE DEFINED BY THE CLOTHOID DEFINITION. AUTHORIZATION FROM POLB SHALL BE OBTAINED IF ANY DIFFERENT METHOD OR PARAMETERS ARE UTILIZED FOR SPIRAL TRANSITION CURVES. THE REQUEST SHALL BE FULLY DOCUMENTED WITH DESIGN DATA, CALCULATIONS AND OTHER PERTINENT INFORMATION.
3. THE TRACK GEOMETRY DATA TABLE, SHOWN IN RR-142 2 OF 2, SHALL BE COMPLETED AND SUBMITTED TO POLB FOR REVIEW, COMMENT AND APPROVAL FOR ALL CURVES.
4. ALL ANGLES ARE IN DEGREES, DISTANCES AND LENGTHS ARE IN FEET, EXCEPT SUPERELEVATIONS ARE IN INCHES AND SPEEDS ARE IN MILES PER HOUR (MPH).

REVISIONS	
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Port of LONG BEACH
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RAILROAD STANDARD PLANS

HORIZONTAL CURVE GEOMETRY

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-142

SHEET NO: 1 OF 2

10/4/2013

	TRACK GEOMETRY DATA TABLE																								
	STATIONING DATA							INPUT DATA						CURVE DATA				SPIRAL DATA							
	CURVE OR TURNOUT NO	DESC	BEARING	DISTANCE	STATION	NORTHING	EASTING	Dc	Ea	Eu	V (FRT)	LS	I	R	Δ	L	T	θs	X	Y	k	p	LT	ST	Ts
								DEGREES	INCHES	INCHES	MPH	FEET	DEGREES	FEET	DEGREES	FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET
		POB			X	X	X																		
	M1	TS	X	X	X	X	X					X						X	X	X	X	X	X	X	X
		SC			X	X	X																		
CIRCULAR CURVE WITH SPIRAL TRANSITIONS		PI			X	X	X	X	X	X	X		X	X	X	X	X								
		CS			X	X	X					X						X	X	X	X	X	X	X	X
		ST			X	X	X																		
	C33	PITO	X	X	X	X	X																		
TURNOUT		PI	X	X	X	X	X																		
		PS	X	X	X	X	X																		
	M2	TS			X	X	X					X						X	X	X	X	X	X	X	X
		SC			X	X	X																		
		PI			X	X	X	X	X	X	X		X	X	X	X	X								
		CS			X	X	X					X						X	X	X	X	X	X	X	X
COMPOUND CIRCULAR CURVE WITH SPIRAL TRANSITIONS		SC			X	X	X																		
		PI			X	X	X	X	X	X	X		X	X	X	X	X								
		CS			X	X	X					X						X	X	X	X	X	X	X	X
		ST			X	X	X																		
	M3	PC	X	X	X	X	X																		
		PI			X	X	X	X	X	X	X			X	X	X	X								
SIMPLE CIRCULAR CURVE		PT			X	X	X																		
	M4	PC	X	X	X	X	X																		
		PI			X	X	X	X	X	X	X		X	X	X	X	X								
		PCC			X	X	X																		
COMPOUND CIRCULAR CURVE		PI			X	X	X	X	X	X	X		X	X	X	X	X								
		PT			X	X	X																		
		POE	X	X	X	X	X																		

NOTES:

1. TRACK GEOMETRY DATA TABLES SHALL BE COMPLETED AND INCLUDED WITH DESIGN DRAWINGS SUBMITTED TO POLB FOR REVIEW, COMMENT, AND APPROVAL. EACH PROPOSED OR REALIGNED TRACK SHALL REQUIRE A SEPARATE TABLE.
2. CELLS MARKED WITH AN "X" WILL NORMALLY CONTAIN DATA.
3. IN PRACTICE, COMPOUND CURVES WITH MORE THAN TWO CIRCULAR ARCS ARE RARE. IN THEORY, A COMPOUND CURVE CAN HAVE AN INFINITE NUMBER OF CIRCULAR ARCS.
4. IN THE EVENT A DESIGNER MUST PROPOSE A CURVE THAT DOES NOT MEET DESIGN REQUIREMENTS PER POLB AND RR-141, THE DESIGNER SHALL CLEARLY INDICATE IT ON THE GEOMETRY TABLE. THE DESIGNER SHALL, FOR EACH PROPOSED SUBSTANDARD CURVE, SUBMIT TO POLB A WRITTEN REQUEST AND JUSTIFICATION FOR A DESIGN WAIVER.

REVISIONS	
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RAILROAD STANDARD PLANS

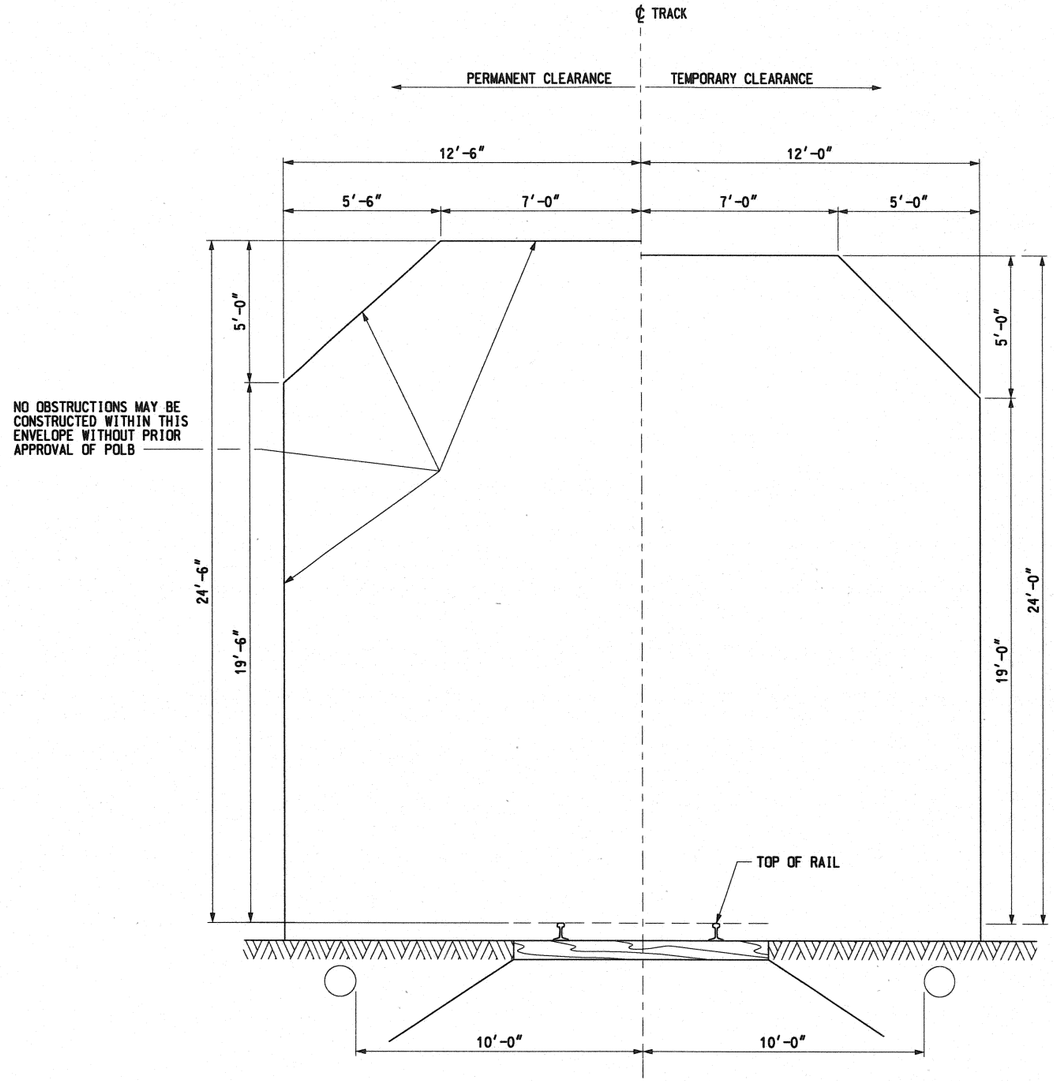
TRACK GEOMETRY DATA TABLE

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-142

SHEET NO: 2 OF 2

10/4/2013



NO PARALLEL UTILITIES INSIDE 10′-0″ OF CENTERLINE OF TRACK OR INSIDE OF 2:1 SLOPE FROM END OF TIE.

CLEARANCE REQUIREMENTS FOR NEW CONSTRUCTION OR DESIGN

SCALE: $\frac{3}{8}$″ = 1′-0″

NOTES:

1. STANDARD PERMANENT AND TEMPORARY CLEARANCES SHOWN ON THIS SHEET SHALL BE USED FOR NEW DESIGN AND CONSTRUCTION WHEREVER PRACTICAL. ANY PERMANENT OR TEMPORARY CONSTRUCTION PROPOSED WITHIN THE DIMENSIONS SHOWN SHALL REQUIRE THE PRIOR APPROVAL OF POLB.
2. SEE RR-172 FOR MINIMUM VERTICAL CLEARANCES FOR OVERHEAD WIRES.
3. RAIL/HIGHWAY GRADE SEPARATIONS MAY REQUIRE PROVISIONS FOR A MAINTENANCE ROAD AND/OR FUTURE ADDITIONAL TRACK(S).
4. WIDER CLEARANCES MAY BE REQUIRED TO PROVIDE VISIBILITY FOR WAYSIDE SIGNALS.
5. IN A CURVE ON SUPERELEVATED TRACK THE HORIZONTAL CLEARANCES SHALL BE MEASURED PERPENDICULAR TO THE PLANE ACROSS THE TOP OF BOTH RAILS AND THE VERTICAL CLEARANCE SHALL BE MEASURED FROM THE HIGH RAIL.
6. POLB STANDARD: THE CLOSEST PORTION OF ANY SIGN OR FENCE SHALL BE LOCATED NO CLOSER THAN 10-FEET FROM TRACK CENTERLINE.

REVISIONS	
NO.	DATE
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Port of LONG BEACH
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RAILROAD STANDARD PLANS

STANDARD CLEARANCE OF STRUCTURES

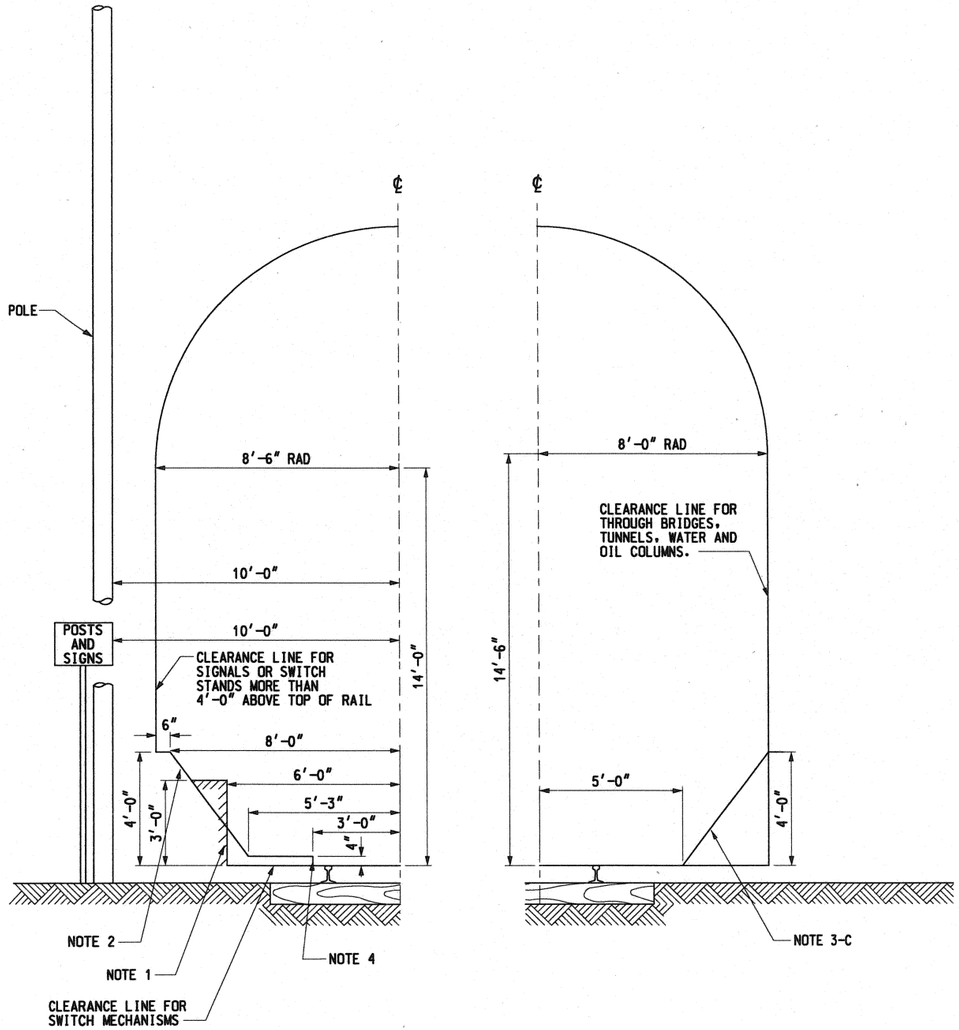
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-160

SHEET NO: 1 OF 1

10/4/2013

...\RR-160 Standard Clearance of Structures



TYPICAL
CLEARANCE OF STRUCTURES FROM RAILROAD TRACKS AS GENERALLY PRESCRIBED BY PUBLIC UTILITIES COMMISSION - STATE OF CALIFORNIA GENERAL ORDER NO. 26-D

(EFFECTIVE FEBRUARY 1, 1948)
FOR NEW WORK AND RECONSTRUCTION OF EXISTING FACILITIES ADJACENT TO STANDARD GAUGE RAILROAD TRACKS TRANSPORTING FREIGHT CARS.

NOTES:

1. CLEARANCE LINE FOR SIGNALS OR SWITCH STANDS 3′-0″ OR LESS ABOVE TOP OF RAIL AND LOCATED BETWEEN TRACKS WHERE NOT PRACTICABLE TO MAINTAIN CLEARANCES OTHERWISE PRESCRIBED.

2. CLEARANCE LINE FOR PORTIONS OF BLOCK SIGNALS 4′-0″ OR LESS ABOVE TOP OF RAIL.

3. DECREASED CLEARANCES FOR:
   A) REFUGE PLATFORMS ON BRIDGES AND TRESTLES NOT PROVIDED WITH WALKWAYS
   B) HANDRAILS
   C) KNEE BRACE

   MINIMUM CLEARANCES FOR HANDRAILS ON BRIDGES WITH WALKWAYS SHALL BE 7′-9″.
   DECREASED CLEARANCES, EXCEPT AS PROVIDED FOR HANDRAILS ARE NOT PERMITTED ON THROUGH BRIDGES WHERE WORK OF TRAINMEN OR YARDMEN REQUIRE THEM TO BE ON DECK OF BRIDGE FOR PURPOSE OF COUPLING OR UNCOUPLING CARS IN PERFORMING SWITCHING SERVICE ON A SWITCHING LEAD.

4. SWITCH BOXES, SWITCH OPERATING MECHANICS AND ASSESSORIES NECESSARY FOR CONTROL AND OPERATION OF SIGNAL AND INTERLOCKERS PROJECTING NOT MORE THAT 0′-4″ ABOVE TOP OF RAIL (CPUC GENERAL ORDER NO. 26D, SECTION 3.8)

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

REQUIRED LEGAL MINIMUM CLEARANCE OF STRUCTURES

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-161
SHEET NO: 1 OF 1

10/4/2013

...*RR-161 Required Legal Minimum Clearance of Structures

SPACING OF TRACKS ON CURVES

DEGREE OF CURVE	DISTANCE BETWEEN TRACK CENTERS– SUPERELEVATION SAME ON EACH TRACK– SEE NOTE 2	
	MAIN OR RUNNING AND ADJACENT TRACKS	INDUSTRY AND YARD TRACKS
TANGENT	15′–0″	15′–0″
1°	15′–2″	15′–0″
2°	15′–4″	15′–0″
3°	15′–6″	15′–0″
4°	15′–8″	15′–0″
5°	15′–10″	15′–0″
6°	16′–0″	15′–0″
7°	16′–2″	15′–2″
8°	16′–4″	15′–4″
9°	16′–6″	15′–6″
10°	16′–8″	15′–8″
11°	16′–10″	15′–10″
12°	17′–0″	16′–0″
13°	17′–2″	16′–2″
14°	17′–4″	16′–4″
15°	17′–6″	16′–6″
OVER 15°	INCREASE BY $\frac{1}{2}$ INCH PER 15 MINUTES OF CURVE	

NOTES:

1. MINIMUM DISTANCE BETWEEN CENTER LINES OF ADJACENT TRACKS ON ALL NEW CONSTRUCTION SHALL BE AS FOLLOWS:

   A. MAIN TRACKS ——— 15′–0″ MINIMUM.
   B. MAIN SIDING, RUNNING AND DRILL TRACKS AND ADJACENT TRACK (EXCEPT YARD TRACK) ——— 15′–0″
   C. LADDER TRACK AND ADJACENT TRACK ——— 20′–0″
   D. INDUSTRY, YARD AND HOUSE TRACKS ——— 15′–0″
   E. YARD TRACK AND ADJACENT MAIN OR RUNNING TRACK —— 25′–0″
   F. ON CURVES, TRACK CENTERS AS SHOWN ABOVE SHALL BE INCREASED AS FOLLOWS (ALSO SEE TABLE ON THIS SHEET):
      a. TRACKS PER NOTES A, B AND E – INCREASE BY $\frac{1}{2}$ INCH PER EACH 15 MINUTES OF CURVE.
      b. TRACKS PER NOTE D (YARD TRACKS) – INCREASE BY $\frac{1}{2}$ INCH PER EACH 15 MINUTES OF CURVE IN EXCESS OF 6 DEGREES.

2. INCREASED DISTANCES BETWEEN TRACK CENTERS SHALL BE APPLIED IN $\frac{1}{2}$ INCH INCREMENTS. DEGREES OF CURVATURE THAT ARE NOT EXACT 15 MINUTE INCREMENTS SHALL BE ROUNDED UP TO THE NEXT GREATER 15 MINUTE INCREMENT. FOR EXAMPLE, IF TWO CURVED TRACKS ARE TO BE PARALLEL AND THE INNER TRACK IS D=8°15′10″, THEY SHALL BE SEPARATED BASED ON THE ASSUMPTION THAT ITS CURVATURE IS D=8°30′.

3. WHERE ADJACENT TRACK IS ON THE OUTSIDE OF A CURVE AND ITS SUPERELEVATION IS MORE THAN ON THE INSIDE TRACK, DISTANCE BETWEEN THE TRACKS SHALL BE INCREASED THREE INCHES FOR EACH INCH DIFFERENCE IN SUPERELEVATION. THE INCREASE SHALL BE ADDED TO THE AMOUNT SHOWN IN TABLE AT LEFT. WHERE SUCH TRACK HAS THE SAME OR LESS AMOUNT OF SUPERELEVATION, USE SPACING AS SHOWN IN THE TABLE.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

TRACK CENTER SPACING

APPROVED BY: _____
SEAN A. GAMETTE – ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-162

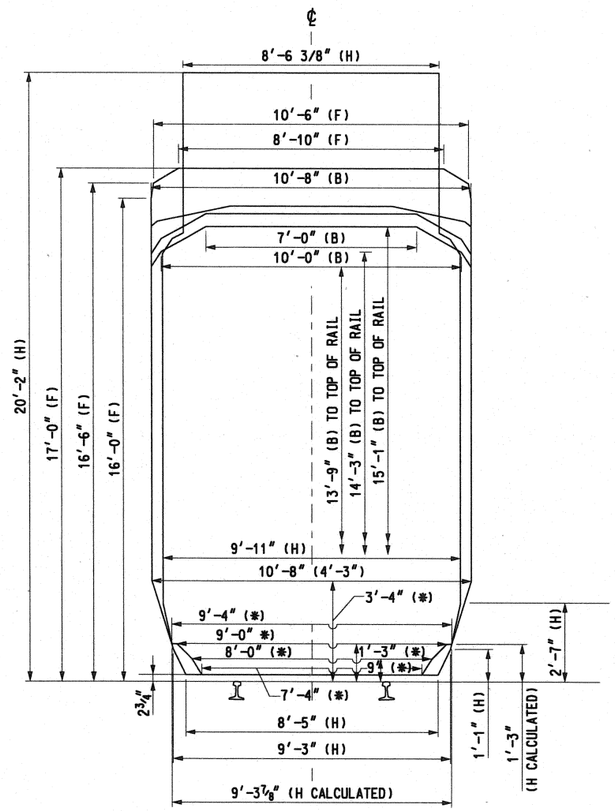
SHEET NO: 1 OF 1

10/4/2013

...*RR-162 Track Center Spacing

COMPILATION OF EQUIPMENT DIAGRAM PLATES B,C,E,F AND H
AS SHOWN IN
"ASSOCIATION OF AMERICAN RAILROADS
MECHANICAL DIVISION
MANUAL OF STANDARDS AND RECOMMENDED PRACTICES"

——— PLATE B (EQUIPMENT DIAGRAM FOR UNRESTRICTED INTERCHANGE SERVICE)
——— PLATE C (EQUIPMENT DIAGRAM FOR LIMITED INTERCHANGE SERVICE)
——— PLATE E (EQUIPMENT DIAGRAM FOR LIMITED INTERCHANGE SERVICE)
——— PLATE F (EQUIPMENT DIAGRAM FOR LIMITED INTERCHANGE SERVICE)
——— PLATE H (EQUIPMENT DIAGRAM FOR DOUBLE-STACK CONTAINER CARS IN CONTROLLED INTERCHANGE AND OTHER LIMITED INTERCHANGE SERVICE CARS HAVING EXTREME LOWER CLEARANCE)



THE 2 3/4″ ABOVE TOP OF RAIL IS ABSOLUTE MINIMUM UNDER ANY AND ALL CONDITIONS OF LADING, OPERATION, AND MAINTENANCE.
* DIMENSION APPLIES TO PLATES B, C, E AND F

DETAIL 1 - AAR EQUIPMENT DIAGRAMS

NTS

NOTES:

1. THE ABOVE DIAGRAM SHOWS THE LIMITS OF PLATE B (EQUIPMENT DIAGRAM FOR UNRESTRICTED INTERCHANGE SERVICE) ALONG WITH A COMPILATION OF THE MAXIMUM LIMITS OF PLATES C,E,F AND H WHICH HAVE LIMITED INTERCHANGE SERVICE. ALL PLATES ARE SHOWN IN THE AAR MECHANICAL DIVISION MANUAL OF STANDARDS AND RECOMMENDED PRACTICES.
2. NO STRUCTURES OR OBSTRUCTIONS SHALL BE PLACED WITHIN THE OUTER PERIMETER WHICH IS THE COMBINED MAXIMUM LIMIT OF ALL DIAGRAMS. NO STRUCTURES OR OBSTRUCTIONS SHALL BE PLACED IN VIOLATION OF CPUC CLEARANCE REQUIREMENTS AS SHOWN ON RR-160 AND RR-161.
3. IN CASES WHERE CPUC AND ARR MINIMUM CLEARANCES ARE IN CONFLICT, CONTRACTOR SHALL MEET THE MOST STRINGENT REQUIREMENT.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

CPUC LEGAL CLEARANCE OF STRUCTURES AND AAR EQUIPMENT DIAGRAMS

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-163
SHEET NO: 1 OF 1

10/4/2013

...*RR-163 CPUC Legal Clearance of Structures and AAR Equipment Diagrams

1. SCOPE

A. PIPELINES INCLUDED UNDER THESE SPECIFICATIONS ARE THOSE INSTALLED TO CARRY STEAM, WATER OR ANY NON-FLAMMABLE SUBSTANCE WHICH, FROM ITS NATURE OR PRESSURE, MIGHT CAUSE DAMAGE IF ESCAPING ON OR IN THE VICINITY OF RAILWAY PROPERTY.

B. THE TERM "ENGINEER" USED HEREIN MEANS THE CHIEF ENGINEER OF THE PORT OF LONG BEACH OR THEIR AUTHORIZED REPRESENTATIVE.

C. FOR ADDITIONAL INFORMATION ON PIPELINE CASING REQUIREMENTS PLEASE SEE AREMA MANUAL FOR RAILWAY ENGINEERING VOLUME 1, CHAPTER 1, SECTION 5.

2. GENERAL REQUIREMENTS

A. PIPELINES UNDER RAILWAY TRACKS AND ACROSS RAILWAY RIGHTS-OF-WAY SHALL BE ENCASED IN A LARGER PIPE OR CONDUIT CALLED THE CASING PIPE AS INDICATED IN FIGURE 1.

B. PIPELINES SHALL BE INSTALLED UNDER TRACKS BY BORING OR JACKING IF PRACTICABLE.

C. PIPELINES SHALL BE LOCATED, WHERE PRACTICABLE, TO CROSS TRACKS AT APPROXIMATELY RIGHT ANGLES THERETO BUT PREFERABLY AT NOT LESS THAN 45 DEGREES AND SHALL NOT BE PLACED WITHIN CULVERTS NOR UNDER RAILWAY BRIDGES WHERE THERE IS A LIKELIHOOD OF RESTRICTING THE AREA REQUIRED FOR THE PURPOSES FOR WHICH THE BRIDGES OR CULVERTS WERE BUILT, OR OF ENDANGERING THE FOUNDATIONS.

D. WHERE LAWS OR ORDERS OF PUBLIC AUTHORITY PRESCRIBE A HIGHER DEGREE OF PROTECTION THAN SPECIFIED HEREIN, THEN THE HIGHER DEGREE OF PROTECTION SO PRESCRIBED SHALL BE DEEMED A PART OF THE THESE SPECIFICATIONS.

E. PIPELINES AND CASING PIPE SHALL BE SUITABLY INSULATED FROM UNDERGROUND CONDUITS CARRYING ELECTRIC WIRES ON RAILWAY RIGHTS-OF-WAY. PIPELINE MUST BE ABLE TO BE ELECTRONICALLY LOCATED.

3. PIPELINE INSPECTION AND MAINTENANCE

A. PIPELINE OWNERS ENGAGED IN THE TRANSPORT OF NON-FLAMMABLE SUBSTANCES ARE SUBJECT TO REGULATIONS OF THE FEDERAL GOVERNMENT. THESE REGULATIONS REQUIRE CERTAIN INSPECTION ROUTINES THAT, IN THE GENERAL CASE, ARE CONDUCTED FROM WITHIN THE CARRIER PIPE OR BY NON-DESTRUCTIVE METHODS NOT REQUIRING IT BE EXPOSED.

B. IT IS THE RESPONSIBILITY OF THE PIPELINE OWNER TO CONDUCT THE NECESSARY INSPECTIONS WITHOUT INTERFERENCE TO THE OPERATIONS OF THE RAILWAY COMPANY. SHOULD IN BECOME NECESSARY TO EXPOSE A PIPE FOR AN INSPECTION, OF FOR ITS REPLACEMENT, THE OWNER SHALL DESIGN A PROCEDURE THAT DOES NOT INTERFERE WITH RAILWAY OPERATIONS, AND SHALL MAKE PRIOR ARRANGEMENTS WITH THE RAILWAY AS MAY BE NECESSARY TO PERMIT SAFE CONDUCT OF THE WORK.

C. PIPELINE MAINTENANCE SHALL BE LIMITED TO THE INSTALLATION OF A NEW CARRIER PIPE IN AN EXISTING CASING, RENEWAL OF CARRIER AND CASING PIPE SEPARATORS OR THE INSTALLATION OF A NEW CROSSING. IN ALL CASES, THE WORK SHALL BE CONDUCTED IN THE SAME MANNER AS IN THE INSTALLATION OF A NEW CROSSING, WHICH IS SUBJECT TO THE REQUIREMENTS OF THESE SPECIFICATIONS. CASINGS ABANDONED OR REPLACED BY NEW LOCATION WORK SHALL BE BACKFILLED BY METHODS AND MATERIALS AS DIRECTED BY THE ENGINEER. THE LOCATION OF ABANDONED FACILITIES SHALL BE RECORDED AND RECORDS MAINTAINED BY THE PIPELINE OWNER.

D. THE OWNERS OF PIPELINES NOT SUBJECT TO REGULATIONS REQUIRING INSPECTION ARE EXPECTED TO INSPECT THEIR FACILITIES AS A MATTER OF DUE DILIGENCE IN THE CONDUCT OF ITS BUSINESS. THE RAILWAY MAY, AS A RIGHT BUT NOT A DUTY, REQUIRE AN INSPECTION OF THE CONSTRUCTION, TO INCLUDE RECEIVING A WRITTEN REPORT OF FINDINGS CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER. MAINTENANCE OF THESE FACILITIES SHALL BE CONDUCTED AS ABOVE DESCRIBED.

4. CARRIER PIPE

A. CARRIER LINE PIPE AND JOINTS SHALL BE OF ACCEPTABLE MATERIAL AND CONSTRUCTION AS APPROVED BY THE ENGINEER. JOINTS FOR CARRIER LINE PIPE OPERATING UNDER PRESSURE SHALL BE LEAKPROOF MECHANICAL OR WELDED TYPE.

B. THE PIPE SHALL BE LAID WITH SUFFICIENT SLACK SO THAT IT IS NOT IN TENSION.

C. PLASTIC CARRIER PIPE MATERIALS INCLUDES THERMOPLASTIC AND THERMOSET PLASTIC PIPES. THERMOPLASITC TYPES INCLUDE POLYVINYL CHLORIDE (PVC), ACRYLONITRILE BUTADIENE STYRENE (ABS), POLYETHELENE (PE), POLYBUTYLENE (PB), CELLULOSE ACETATE BUTYRATE (CAB) AND STYRENE RUBBER (SR). THERMOSET TYPES INCLUDE REINFORCED PLASTIC MORTAR (RPM), REINFORCED THERMOSETTING RESIN (RTR) AND FIBERGLASS REINFORCED PLASTIC (FRP). FOR SPECIFIC INFORMATION ON CARRIER PIPE CHEMICAL RESISTANCE, PRESSURE, DESIGN AND CONSTRUCTION MATERIAL REQUIREMENTS PLEASE SEE AREMA MANUAL FOR RAILWAY ENGINEERING VOLUME 1, CHAPTER 1, SECTION 5.3.3.

D. CODES, SPECIFICATIONS AND REGULATIONS CURRENT AT TIME OF CONSTRUCTING THE PIPELINE SHALL GOVERN THE INSTALLATION OF THE FACILITY WITHIN THE RAILWAY RIGHTS-OF-WAY. THE PROOF TESTING OF THE STRENGTH OF CARRIER PIPE SHALL BE IN ACCORDANCE WITH ANSI REQUIREMENTS.

5. STEEL CASING PIPE

A. CASING PIPE AND JOINTS SHALL BE LEAKPROOF CONSTRUCTION, CAPABLE OF WITHSTANDING RAILWAY LOADING. THE INSIDE DIAMETER OF THE CASING PIPE SHALL BE AT LEAST 2 IN. GREATER THAN THE LARGEST OUTSIDE DIAMETER OF THE CARRIER PIPE, JOINTS OR COUPLINGS, FOR CARRIER PIPE LESS THAN 6 IN. IN DIAMETER; AND AT LEAST 4 IN. GREATER FOR CARRIER PIPE 6 IN. AND OVER IN DIAMETER. IT SHALL, IN ALL CASES, BE GREAT ENOUGH TO ALLOW THE CARRIER PIPE TO BE REMOVED SUBSEQUENTLY WITHOUT DISTURBING THE CASING PIPE OR ROADBED.

B. WHEN CASING IS INSTALLED WITHOUT BENEFIT OF A PROTECTIVE COATING OR SAID CASING IS NOT CATHODICALLY PROTECTED, THE WALL THICKNESS SHOWN ABOVE SHALL BE INCREASED TO THE NEAREST STANDARD SIZE WHICH IS A MINIMUM OF 0.063 IN. GREATER THAN THE THICKNESS REQUIRED EXCEPT FOR DIAMETERS UNDER 12-3/4 IN.

C. STEEL CASING PIPE STRENGTH
STEEL PIPE SHALL HAVE A SPECIFIED MINIMUM YIELD STRENGTH, SMYS, OF AT LEAST 35,000 PSI.

D. RCP OR CMP
REINFORCED CONCRETE PIPE OR CORRUGATED METAL PIPE IS ONLY TO BE USED IN SPECIAL CIRCUMSTANCES WITH WRITTEN APPROVAL FROM THE PORT ENGINEERING DEPARTMENT. FOR USE OF THESE PIPE TYPES, SEE AREMA SECTION 5.3.4.2 FOR SPECIAL INSTRUCTIONS.

6. LENGTH OF CASING PIPE

CASING PIPE UNDER TRACKS AND ACROSS RAILWAY RIGHTS-OF-WAY SHALL EXTEND TO THE GREATER OF THE FOLLOWING DISTANCES, MEASURED AT RIGHT ANGLES TO CENTERLINE OF TRACK. IF ADDITIONAL TRACKS ARE CONSTRUCTED IN THE FUTURE OR IF THE RAILWAY DETERMINES THAT THE ROADBED SHOULD BE WIDENED, THE CASING SHALL BE EXTENDED OR OTHER SPECIAL DESIGN INCORPORATED:

2 FT. BEYOND TOE OF SLOPE

3 FT. BEYOND DITCH

A MINIMUM DISTANCE OF 25 FT. EACH SIDE FROM CENTERLINE OF OUTSIDE TRACK WHEN CASING IS SEALED AT BOTH ENDS.

7. CONSTRUCTION

CASING PIPE SHALL BE SO CONSTRUCTED AS TO PREVENT LEAKAGE OF ANY SUBSTANCE FROM THE CASING THROUGHOUT ITS LENGTH, EXCEPT AT ENDS. CASING SHALL BE SO INSTALLED AS TO PREVENT THE FORMATION OF A WATERWAY UNDER THE RAILWAY, AND WITH AN EVEN BEARING THROUGHOUT ITS LENGTH, AND SHALL SLOPE TO ONE END (EXCEPT FOR LONGITUDINAL OCCUPANCY).

WHERE CASING AND/OR CARRIER PIPE IS CATHODICALLY PROTECTED, THE ENGINEER SHALL BE NOTIFIED AND SUITABLE TEST WADE TO ENSURE THAT OTHER RAILWAY STRUCTURES AND FACILITIES ARE ADEQUATELY PROTECTED FROM THE CATHODIC CURRENT IN ACCORDANCE WITH THE RECOMMENDATIONS OF CURRENT REPORTS OF CORRELATING COMMITTEE ON CATHODIC PROTECTION, PUBLISHED BY THE NATIONAL ASSOCIATION OF CORROSION ENGINEERS.

8. METHOD OF INSTALLATION

BORED OR JACKED INSTALLATIONS SHALL HAVE A BORED HOLE DIAMETER ESSENTIALLY THE SAME AS THE OUTSIDE DIAMETER OF THE PIPE PLUS THE THICKNESS OF THE PROTECTIVE COATING. IF VOIDS SHOULD DEVELOP OR IF THE BORED HOLE DIAMETER IS GREATER THAN THE OUTSIDE DIAMETER OF THE PIPE (INCLUDING COATING) BY MORE THAN APPROXIMATELY 1 IN., REMEDIAL MEASURES AS APPROVED BY THE POLB ENGINEER SHALL BE TAKEN. BORING OPERATIONS SHALL NOT BE STOPPED IF SUCH STOPPAGE WOULD BE DETRIMENTAL TO THE RAILWAY.

9. DEPTH OF INSTALLATION

CASING PIPE

CASING PIPE UNDER RAILWAY TRACKS AND ACROSS RAILWAY RIGHTS-OF-WAY SHALL BE NOT LESS THAT 5-1/2 FT. FROM BASE OF RAIL TO TOP OF CASING AT ITS CLOSEST POINT, EXCEPT THAT UNDER SECONDARY OR INDUSTRY TRACKS THIS DISTANCE MAY BE 4-1/2 FT. ON OTHER PORTIONS OF RIGHTS-OF-WAY WHERE CASING IS NOT DIRECTLY BENEATH ANY TRACK, THE DEPTH FROM GROUND SURFACE OR FROM BOTTOM OF DITCHES TO TOP OF CASING SHALL NOT BE LESS THAN 3 FT.

CARRIER PIPE

CARRIER PIPE INSTALLED UNDER SECONDARY OR INDUSTRY TRACKS WITHOUT BENEFIT OF CASING SHALL BE NOT LESS THAN 4-1/2 FT. FROM BASE OF RAIL TO TOP OF PIPE AT ITS CLOSEST POINT NOR LESS THAN 3 FT. FROM GROUND SURFACE OR FROM BOTTOM OF DITCHES.

10. SHUT-OFF VALVES

ACCESSIBLE EMERGENCY SHUT-OFF VALVES SHALL BE INSTALLED WITHIN EFFECTIVE DISTANCES EACH SIDE OF THE RAILWAY AS MUTUALLY AGREED TO BY THE ENGINEER AND THE PIPELINE COMPANY. THESE VALVES SHOULD BE MARKED WITH SIGNS FOR IDENTIFICATION. WHERE PIPELINES ARE PROVIDED WITH AUTOMATIC CONTROL STATIONS AT LOCATIONS AND WITHIN DISTANCES APPROVED BY THE ENGINEER, NO ADDITIONAL VALVES SHALL BE REQUIRED.

11. APPROVAL OF PLANS

PLANS FOR PROPOSED INSTALLATION SHALL BE SUBMITTED TO AND MEET THE APPROVAL OF THE ENGINEER BEFORE CONSTRUCTION IS BEGUN.

PLANS SHALL BE DRAWN TO SCALE SHOWING THE RELATION OF THE PROPOSED PIPELINE TO RAILWAY TRACKS, ANGLE OF CROSSING, LOCATION OF VALVES, RAILWAY SURVEY STATION, RIGHT-OF-WAY LINES AND GENERAL LAYOUT OF TRACKS AND RAILWAY FACILITIES. PLANS SHOULD ALSO SHOW A CROSS SECTION (OR SECTIONS) FROM FIELD SURVEY, SHOWING PIPE IN RELATION TO ACTUAL PROFILE OF GROUND AND TRACKS. IF OPEN-CUTTING OR TUNNELING IS NECESSARY, DETAILS OF SHEETING AND METHOD OF SUPPORTING TRACKS OR DRIVING TUNNEL SHALL BE SHOWN.

12. EXECUTION OF WORK

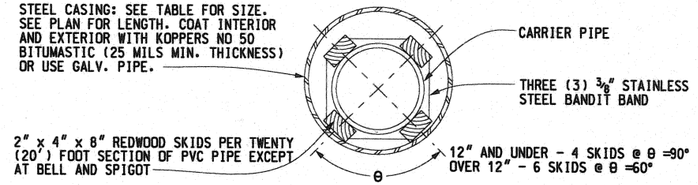
THE EXECUTION OF WORK ON RAILWAY RIGHTS-OF-WAY, INCLUDING THE SUPPORTING OF TRACKS, SHALL BE SUBJECT TO THE INSPECTION AND DIRECTION OF THE ENGINEER.

13. COORDINATION WITH RAILROADS

FOURTEEN (14) DAY MINIMUM NOTICE SHALL BE GIVEN TO POLB ENGINEERING DEPARTMENT PRIOR TO ANY WORK WITHIN TWENTY FEET (20') OF ANY TRACK CENTERLINE. POLB CONTACT IS CHARLIE TSAI AT (562) 283-7286. CONTRACTOR TO SUBMIT SCHEDULE AND RAILWAY WORK PLAN TO POLB AND PAY FOR ANY RAIL FLAGGING. TRAIN OPERATIONS SHALL BE MAINTAINED.

14. RAILROAD TRACK

FOULING OR DAMAGE TO THE RAILROAD TRACK SHALL BE REPLACED IMMEDIATELY AND APPROVED BY THE PORT. THIS INCLUDES: TRACK SUBGRADE COMPACTED TO 95%; BALLAST SHALL BE TYPE 4A PER AREMA; SUBBALLAST SHALL BE CRUSHED MISCELLANEOUS BASE (CMB), FINE GRADATION PER SECTION 200-2 OF SSPWC; AND RE-ALIGNING OF TRACK AND TAMPING PER AREMA.



A SECTION - TYPICAL STEEL CASING

NTS

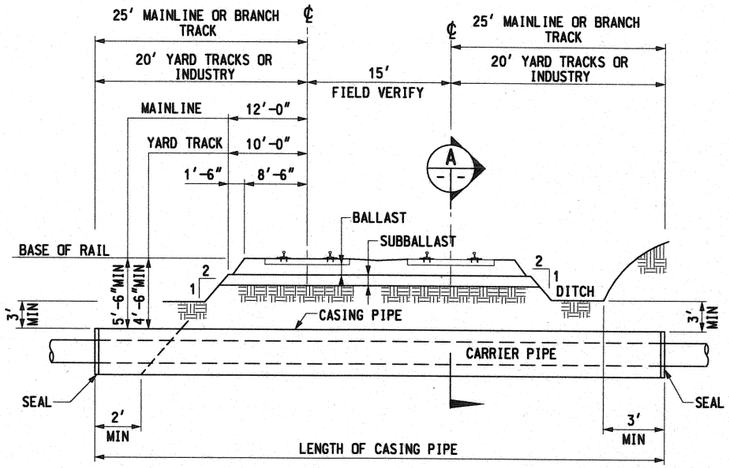


FIGURE 1-TYPICAL STEEL CASING REQUIREMENTS

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TABLE 1
TABLE FOR DETERMINING MINIMUM SIZE OF STEEL CASING

MINIMUM SIZE STEEL CASING FOR CARRIER PIPES SHOWN

NOMINAL SIZE CARRIER	STEEL OR PLASTIC MINIMUM NOMINAL SIZE OF CASING	NOMINAL SIZE CARRIER	TYPE OF CARRIER PIPE AND STYLE OF JOINT: AWWA DUCTILE IRON TYTON	AWWA DUCTILE IRON BELL-SPIGOT	AWWA DUCTILE IRON MECHANICAL	WELDED STEEL	V.C. PIPE EXTRA STRONG
			MINIMUM NOMINAL SIZE OF CASING				
3/4"	2"	4"	10"	10"	12"	8"	10"
1"	2 1/2"	6"	14"	14"	16"	10"	14"
1 1/4"	3"	8"	16"	16"	18"	12"	16"
1 1/2"	3 1/2"	10"	18"	20"	20"	14"	18"
2"	4"	12"	22"	22"	22"	16"	20"
2 1/2"	4 1/2"	14"	24"	24"	26"	18"	22"
3"	6"	16"	26"	26"	28"	20"	24"
3 1/2"	8"	18"	28"	28"	30"	24"	28"
4"	8"	20"	30"	30"	32"	26"	32"
6"	10"	24"	36"	36"	36"	30"	36"
> 6"	4"+CARRIER+JOINT	℄ 30"	4" + CARRIER + JOINT			36"	42"
						42"	48"

TABLE 2
STEEL CASING THICKNESS
(CASING WITH PROTECTIVE COATING)

NOMINAL DIAMETER (INCHES)	MIN. WALL THICKNESS (INCHES)	NOMINAL DIAMETER (INCHES)	MIN. WALL THICKNESS (INCHES)
14" & UNDER	0.188"	44" & 46"	0.594"
16"	0.219"	48"	0.625"
18"	0.250"	50"	0.656"
20" & 22"	0.281"	52"	0.688"
24"	0.312"	54"	0.719"
26"	0.344"	56" & 58"	0.750"
28"	0.375"	60"	0.781"
30"	0.406"	62"	0.813"
32"	0.438"	64"	0.844"
34" & 36"	0.469"	66" & 68"	0.875"
38"	0.500"	70"	0.906"
40"	0.531"	72"	0.938"
42"	0.563"		

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

STANDARD CASING REQUIREMENTS (NON-FLAMMABLE)

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-170

SHEET NO: 1 OF 1

10/4/2013

...*RR-170 Standard Casing Requirements (Non-Flammable)

1. SCOPE

A. THESE SPECIFICATIONS COVER MINIMUM REQUIREMENTS FOR PIPELINES INSTALLED ON OR ADJACENT TO RAILWAY RIGHTS-OF-WAY TO CARRY LIQUID FLAMMABLE PRODUCTS OR HIGHLY VOLATILE SUBSTANCES UNDER PRESSURE.

B. THE TERM "ENGINEER" USED HEREIN MEANS THE CHIEF ENGINEER OF THE PORT OF LONG BEACH OR THEIR AUTHORIZED REPRESENTATIVE.

C. FOR ADDITIONAL INFORMATION ON PIPELINE CASING REQUIREMENTS PLEASE SEE AREMA MANUAL FOR RAILWAY ENGINEERING VOLUME 1, CHAPTER 1, SECTION 5.

2. GENERAL REQUIREMENTS

A. PIPELINES UNDER RAILWAY TRACKS AND ACROSS RAILWAY RIGHTS-OF-WAY SHALL BE ENCASED IN A LARGER PIPE OR CONDUIT CALLED THE CASING PIPE AS INDICATED IN FIGURE 1 ON SHEET RR-171, SHEET 2 OF 2.

B. PIPELINES SHALL BE INSTALLED UNDER EXISTING TRACKS BY BORING OR JACKING IF PRACTICABLE.

C. PIPELINES SHALL BE LOCATED, WHERE PRACTICABLE, TO CROSS TRACKS AT APPROXIMATELY RIGHT ANGLES THERETO BUT PREFERABLY AT NOT LESS THAN 45 DEGREES AND SHALL NOT BE PLACED WITHIN A CULVERT, UNDER A RAILWAY BRIDGE NOR CLOSER THAN 45 FT TO ANY PORTION OF ANY RAILWAY BRIDGE, BUILDING OR IMPORTANT STRUCTURE, EXCEPT IN SPECIAL CASES AND THEN BY SPECIAL DESIGN AS APPROVED BY THE ENGINEER.

D. PIPELINES CARRYING FLAMMABLE SUBSTANCES SHALL, WHERE PRACTICABLE, CROSS ANY RAILWAY WHERE TRACKS ARE CARRIED ON AN EMBANKMENT.

E. EMERGENCY RESPONSE PROCEDURES SHOULD BE DEVELOPED TO HANDLE A SITUATION IN WHICH A PIPELINE LEAK OR RAILROAD DERAILMENT OR INCIDENT MAY JEOPARDIZE THE INTEGRITY OF THE PIPELINE. LOCAL CONDITIONS SHOULD BE CONSIDERED WHEN DEVELOPING THESE PROCEDURES.

F. WHERE LAWS OR ORDERS OF PUBLIC AUTHORITY PRESCRIBE A HIGHER DEGREE OF PROTECTION THAN SPECIFIED HEREIN, THEN THE HIGHER DEGREE OF PROTECTION SO PRESCRIBED SHALL BE DEEMED A PART OF THE THESE SPECIFICATIONS.

G. PIPELINES AND CASING PIPE SHALL BE SUITABLY INSULATED FROM UNDERGROUND CONDUITS CARRYING ELECTRIC WIRES ON RAILWAY RIGHTS-OF-WAY. ALL PIPELINES, EXCEPT THOSE IN STREETS, SHALL BE PROMINENTLY MARKED AT THE RIGHTS-OF-WAY (ON BOTH SIDES OF TRACK FOR UNDERCROSSINGS) BY SIGNS SUBSTANTIALLY WORDED THUS:

"HIGH PRESSURE...MAIN...IN VICINITY. CALL...."

H. ADDITIONAL SIGNING MAY BE REQUIRED BY THE ENGINEER WHERE ABOVE SIGNS ARE NOT READILY VISIBLE FROM THE TRACK.

3. PIPELINE INSPECTION AND MAINTENANCE

A. PIPELINE OWNERS ENGAGED IN THE TRANSPORT OF LIQUID FLAMMABLE OR HIGHLY VOLATILE SUBSTANCES ARE SUBJECT TO REGULATIONS OF THE FEDERAL GOVERNMENT. THESE REGULATIONS REQUIRE CERTAIN INSPECTION ROUTINES THAT, IN THE GENERAL CASE, ARE CONDUCTED FROM WITHIN THE CARRIER PIPE OR BY NON-DESTRUCTIVE METHODS NOT REQUIRING IT BE EXPOSED.

B. IT IS THE RESPONSIBILITY OF THE PIPELINE OWNER TO CONDUCT THE NECESSARY INSPECTIONS WITHOUT INTERFERENCE TO THE OPERATIONS OF THE RAILWAY COMPANY. SHOULD IT BECOME NECESSARY TO EXPOSE A PIPE FOR AN INSPECTION, OF FOR ITS REPLACEMENT, THE OWNER SHALL DESIGN A PROCEDURE THAT DOES NOT INTERFERE WITH RAILWAY OPERATIONS, AND SHALL MAKE PRIOR ARRANGEMENTS WITH THE RAILWAY AS MAY BE NECESSARY TO PERMIT SAFE CONDUCT OF THE WORK.

C. PIPELINE MAINTENANCE SHALL BE LIMITED TO THE INSTALLATION OF A NEW CARRIER PIPE IN AN EXISTING CASING, RENEWAL OF CARRIER AND CASING PIPE SEPARATORS OR THE INSTALLATION OF A NEW CROSSING. IN ALL CASES, THE WORK SHALL BE CONDUCTED IN THE SAME MANNER AS IN THE INSTALLATION OF A NEW CROSSING, WHICH IS SUBJECT TO THE REQUIREMENTS OF THESE SPECIFICATIONS. CASINGS ABANDONED OR REPLACED BY NEW LOCATION WORK SHALL BE BACKFILLED BY METHODS AND MATERIALS AS DIRECTED BY THE ENGINEER. THE LOCATION OF ABANDONED FACILITIES SHALL BE RECORDED AND RECORDS MAINTAINED BY THE PIPELINE OWNER.

D. THE OWNERS OF PIPELINES NOT SUBJECT TO REGULATIONS REQUIRING INSPECTION ARE EXPECTED TO INSPECT THEIR FACILITIES AS A MATTER OF DUE DILIGENCE IN THE CONDUCT OF ITS BUSINESS. THE RAILWAY MAY, AS A RIGHT BUT NOT A DUTY, REQUIRE AN INSPECTION OF THE CONSTRUCTION, TO INCLUDE RECEIVING A WRITTEN REPORT OF FINDINGS CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER. MAINTENANCE OF THESE FACILITIES SHALL BE CONDUCTED AS ABOVE DESCRIBED.

4. STEEL CARRIER PIPE

A. PIPELINES CARRYING OIL, LIQUEFIED PETROLEUM GAS AND OTHER FLAMMABLE LIQUID PRODUCTS SHALL BE OF STEEL AND CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI B 31.4 LIQUID TRANSPORTATION SYSTEMS FOR HYDROCARBONS, LIQUID PETROLEUM GAS, ANHYDROUS AMMONIA, AND ALCOHOLS, AND OTHER APPLICABLE ANSI CODES, EXCEPT THAT THE MAXIMUM ALLOWABLE STRESSES FOR DESIGN OF STEEL PIPE SHALL NOT EXCEED THE FOLLOWING PERCENTAGES OF THE SPECIFIED MINIMUM YIELD STRENGTH (MULTIPLIED BY LONGITUDINAL JOINT FACTOR) OF THE PIPE AS DEFINED IN THE ABOVE CODES.

B. REQUISITES FOR STEEL CARRIER LINE PIPE UNDER RAILWAY TRACKS SHALL APPLY FOR A MINIMUM DISTANCE OF 50 FT (MEASURED AT RIGHT ANGLES) FROM CENTERLINE OF OUTSIDE TRACKS OR 2 FT BEYOND TOE OF SLOPE OR 25 FT BEYOND THE ENDS OF CASING (WHEN CASING IS REQUIRED), WHICHEVER IS GREATER.

C. ALLOWABLE HOOP STRESS DUE TO INTERNAL PRESSURE WITH CASING PIPE

THE FOLLOWING PERCENTAGES APPLY TO HOOP STRESS IN STEEL PIPE WITHIN A CASING UNDER RAILWAY TRACKS AND ACROSS RAILWAY RIGHTS-OF-WAY:

1) FIFTY PERCENT (50%) FOR PIPELINES CARRYING CONDENSATE, NATURAL GASOLINE, NATURAL GAS LIQUIDS, LIQUEFIED PETROLEUM GAS, AND OTHER LIQUID PETROLEUM PRODUCTS.

2) SIXTY PERCENT (60%) FOR GAS PIPELINES.

3) SEVENTY-TWO PERCENT (72%) ON OIL PIPELINES.

D. THE PIPE SHALL BE LAID WITH SUFFICIENT SLACK SO THAT IT IS NOT IN TENSION.

E. FOR CONVEYANCE OF NON-LIQUID FLAMMABLE SUBSTANCES, SEE AREMA SECTION 5.4.1 FOR SPECIAL INSTRUCTIONS REGARDING PLASTIC CARRIER PIPE.

5. CASING PIPE

A. CASING PIPE AND JOINTS SHALL BE OF STEEL AND OF LEAKPROOF CONSTRUCTION, CAPABLE OF WITHSTANDING RAILWAY LOADING. THE INSIDE DIAMETER OF THE CASING PIPE SHALL BE LARGE ENOUGH TO ALLOW THE CARRIER PIPE TO BE REMOVED SUBSEQUENTLY WITHOUT DISTURBING THE CASING PIPE. ALL JOINTS OR COUPLINGS, SUPPORTS, INSULATORS OR CENTERING DEVICES FOR THE CARRIER PIPE WITHIN A CASING UNDER RAILROAD TRACKS SHALL BE TAKEN INTO ACCOUNT.

B. WHEN CASING IS INSTALLED WITHOUT BENEFIT OF A PROTECTIVE COATING OR SAID CASING IS NOT CATHODICALLY PROTECTED, THE WALL THICKNESS SHALL BE INCREASED TO THE NEAREST STANDARD SIZE WHICH IS A MINIMUM OF 0.063 IN. GREATER THAN THE THICKNESS REQUIRED EXCEPT FOR DIAMETERS UNDER 12-3/4 IN.

6. STEEL CASING PIPE STRENGTH

STEEL PIPE SHALL HAVE A SPECIFIED MINIMUM YIELD STRENGTH, SMYS, OF AT LEAST 35,000 PSI.

7. LENGTH OF CASING PIPE

CASING PIPE UNDER RAILWAY TRACKS AND ACROSS RAILWAY RIGHTS-OF-WAY SHALL EXTEND TO THE GREATER OF THE FOLLOWING DISTANCES, MEASURED AT RIGHT ANGLES TO CENTERLINE OF TRACK. IF ADDITIONAL TRACKS ARE CONSTRUCTED IN THE FUTURE OR IF THE RAILWAY DETERMINES THAT THE ROADBED SHOULD BE WIDENED, THE CASING SHALL BE EXTENDED OR OTHER SPECIAL DESIGN INCORPORATED:

A. 2 FT BEYOND TOE OF SLOPE

B. 3 FT BEYOND DITCH

C. A MINIMUM DISTANCE OF 25 FT EACH SIDE FROM CENTERLINE OF OUTSIDE TRACK WHEN CASING IS SEALED AT BOTH ENDS.

D. A MINIMUM DISTANCE OF 45 FT EACH SIDE FROM CENTERLINE OF OUTSIDE TRACK WHEN CASING IS OPEN AT BOTH ENDS.

E. PLASTIC CARRIER PIPE CONVEYING FLAMMABLE SUBSTANCES SHALL BE ENCASED THE ENTIRE LIMITS OF THE RIGHT-OF-WAY. IF SPECIAL CONDITIONS EXIST WHICH PREVENT ENCASEMENT WITHIN THE ENTIRE LIMITS OF THE RIGHT-OF-WAY, THE MINIMUM ENCASED LENGTHS MUST BE APPROVED BY THE ENGINEER.

8. CONSTRUCTION

A. CASING PIPE SHALL BE SO CONSTRUCTED AS TO PREVENT LEAKAGE OF ANY SUBSTANCE FROM THE CASING THROUGHOUT ITS LENGTH, EXCEPT AT ENDS OF CASING WHERE ENDS ARE LEFT OPEN, OR THROUGH VENT PIPES WHEN ENDS OF CASING ARE SEALED. CASING SHALL BE SO INSTALLED AS TO PREVENT THE FORMATION OF A WATERWAY UNDER THE RAILWAY, AND WITH AN EVEN BEARING THROUGHOUT ITS LENGTH, AND SHALL SLOPE TO ONE END.

B. WHERE CASING AND/OR CARRIER PIPE IS CATHODICALLY PROTECTED, THE ENGINEER SHALL BE NOTIFIED AND A SUITABLE TEST MADE TO ENSURE THAT OTHER RAILWAY STRUCTURES AND FACILITIES ARE ADEQUATELY PROTECTED FROM THE CATHODIC CURRENT IN ACCORDANCE WITH THE RECOMMENDATION OF CURRENT REPORTS OF CORRELATING COMMITTEE ON CATHODIC PROTECTION, PUBLISHED BY THE NATIONAL ASSOCIATION OF CORROSION ENGINEERS.

C. PIPELINES 30" OR GREATER REQUIRE A TUNNEL PERMIT FROM CAL-OSHA.

9. METHOD OF INSTALLATION

BORED OR JACKED INSTALLATIONS SHALL HAVE A BORED HOLE DIAMETER ESSENTIALLY THE SAME AS THE OUTSIDE DIAMETER OF THE PIPE PLUS THE THICKNESS OF THE PROTECTIVE COATING. IF VOIDS SHOULD DEVELOP OR IF THE BORED HOLE DIAMETER IS GREATER THAN THE OUTSIDE DIAMETER OF THE PIPE (INCLUDING COATING) BY MORE THAN APPROXIMATELY 1 IN., REMEDIAL MEASURES AS APPROVED BY THE ENGINEER SHALL BE TAKEN. BORING OPERATIONS SHALL NOT BE STOPPED IF SUCH STOPPAGE WOULD BE DETRIMENTAL TO THE RAILWAY.

10. DEPTH OF INSTALLATION

CASING PIPE

CASING PIPE UNDER RAILWAY TRACKS AND ACROSS RAILWAY RIGHTS-OF-WAY SHALL BE NOT LESS THAT 5-1/2 FT FROM BASE OF RAIL TO TOP OF CASING AT ITS CLOSEST POINT, EXCEPT THAT UNDER SECONDARY OR INDUSTRY TRACKS THIS DISTANCE MAY BE 4-1/2 FT ON OTHER PORTIONS OF RIGHTS-OF-WAY WHERE CASING IS NOT DIRECTLY BENEATH ANY TRACK, THE DEPTH FROM GROUND SURFACE OR FROM BOTTOM OF DITCHES TO TOP OF CASING SHALL NOT BE LESS THAN 3 FT.

CARRIER PIPE

STEEL CARRIER PIPE INSTALLED UNDER SECONDARY OR INDUSTRY TRACKS WITHOUT BENEFIT OF CASING SHALL BE NOT LESS THAN 10 FT FROM BASE OF RAIL TO TOP OF PIPE AT ITS CLOSEST POINT NOR LESS THAN 6 FT FROM GROUND SURFACE OR FROM BOTTOM OF DITCHES.

11. INSPECTION AND TESTING

ANSI CODES CURRENT AT TIME OF CONSTRUCTING THE PIPELINE SHALL GOVERN THE INSPECTION AND TESTING OF THE FACILITY WITH THE RAILWAY RIGHTS-OF-WAY EXCEPT AS FOLLOWS: ONE-HUNDRED PERCENT OF ALL STEEL PIPE FIELD WELDS SHALL BE INSPECTED BY RADIOGRAPHIC EXAMINATION, AND SUCH FIELD WELDS SHALL BE INSPECTED FOR 100 PERCENT OF THE CIRCUMFERENCE.

12. SEALS

A. WHERE ENDS OF CASING ARE BELOW GROUND THEY SHALL BE SUITABLY SEALED.

B. WHERE ENDS OF CASING ARE AT OR ABOVE GROUND SURFACE AND ABOVE HIGH-WATER LEVEL THEY MAY BE LEFT OPEN, PROVIDED DRAINAGE IS AFFORDED IN SUCH MANNER THAT LEAKAGE WILL BE CONDUCTED AWAY FROM RAILWAY TRACKS OR STRUCTURE. WHERE PROPER DRAINAGE IS NOT PROVIDED, THE ENDS OF CASING SHALL BE SEALED.

13. VENTS

CASING PIPE, WHEN SEALED, SHALL BE PROPERLY VENTED. VENT PIPES SHALL BE OF SUFFICIENT DIAMETER, BUT IN NO CASE LESS THAN 2 IN. IN DIAMETER, SHALL BE ATTACHED NEAR END OF CASING AND PROJECT THROUGH GROUND SURFACE AT RIGHT-OF-WAY LINES OR NOT LESS THAN 45 FT (MEASURED AT RIGHT ANGLES) FROM CENTERLINE OF NEAREST TRACK. VENT PIPE, OR PIPES, SHALL EXTEND NOT LESS THAN 4 FT ABOVE GROUND SURFACE. TOP OF VENT PIPE SHALL BE FITTED WITH DOWN-TURNED ELBOW PROPERLY SCREENED, OR A RELIEF VALVE. VENTS IN LOCATIONS SUBJECT TO HIGH WATER SHALL BE EXTENDED ABOVE THE MAXIMUM ELEVATION OF HIGH WATER AND SHALL BE SUPPORTED AND PROTECTED IN A MANNER THAT MEETS THE APPROVAL OF THE ENGINEER. VENT PIPES SHALL BE NO CLOSER THAN 4 FT (VERTICALLY) FROM AERIAL ELECTRIC WIRES.

14. SHUT-OFF VALVES

ACCESSIBLE EMERGENCY SHUT-OFF VALVES SHALL BE INSTALLED WITHIN EFFECTIVE DISTANCES EACH SIDE OF THE RAILWAY AS MUTUALLY AGREED TO BY THE ENGINEER AND THE PIPELINE COMPANY. THESE VALVES SHOULD BE MARKED WITH SIGNS FOR IDENTIFICATION. WHERE PIPELINES ARE PROVIDED WITH AUTOMATIC CONTROL STATIONS AT LOCATIONS AND WITHIN DISTANCES APPROVED BY THE ENGINEER, NO ADDITIONAL VALVES SHALL BE REQUIRED.

15. APPROVAL OF PLANS

A. PLANS FOR PROPOSED INSTALLATION SHALL BE SUBMITTED TO AND MEET THE APPROVAL OF THE ENGINEER BEFORE CONSTRUCTION IS BEGUN.

B. PLANS SHALL BE DRAWN TO SCALE SHOWING THE RELATION OF THE PROPOSED PIPELINE TO RAILWAY TRACKS, ANGLE OF CROSSING, LOCATION OF VALVES, RAIL WAY SURVEY STATION, RIGHT-OF-WAY LINES AND GENERAL LAYOUT OF TRACKS AND RAILWAY FACILITIES. PLANS SHOULD ALSO SHOW A CROSS SECTION (OR SECTIONS) FROM FIELD SURVEY, SHOWING PIPE IN RELATION TO ACTUAL PROFILE OF GROUND AND TRACKS. IF OPEN-CUTTING OR TUNNELING IS NECESSARY, DETAILS OF SHEETING AND METHOD OF SUPPORTING TRACKS OR DRIVING TUNNEL SHALL BE SHOWN.

16. EXECUTION OF WORK

THE EXECUTION OF WORK ON RAILWAY RIGHTS-OF-WAY, INCLUDING THE SUPPORTING OF TRACKS, SHALL BE SUBJECT TO THE INSPECTION AND DIRECTION OF THE ENGINEER.

17. COORDINATION WITH RAILROADS

FOURTEEN (14) DAY MINIMUM NOTICE SHALL BE GIVEN TO POLB ENGINEERING DEPARTMENT PRIOR TO ANY WORK WITHIN TWENTY FEET (20') OF ANY TRACK CENTERLINE. POLB CONTACT IS CHARLIE TSAI AT (562) 283-7286. CONTRACTOR TO SUBMIT SCHEDULE AND RAILWAY WORK PLAN TO POLB AND PAY FOR ANY RAIL FLAGGING. TRAIN OPERATIONS SHALL BE MAINTAINED.

18. RAILROAD TRACK

FOULING OR DAMAGE TO THE RAILROAD TRACK SHALL BE REPLACED IMMEDIATELY AND APPROVED BY THE PORT. THIS INCLUDES: TRACK SUBGRADE COMPACTED TO 95%; BALLAST SHALL BE TYPE 4A PER AREMA; SUBBALLAST SHALL BE CRUSHED MISCELLANEOUS BASE (CMB), FINE GRADATION PER SECTION 200-2 OF SSPWC; AND RE-ALIGNING OF TRACK AND TAMPING PER AREMA.

NOTE:

FIGURE 1 AND TABLES 1 & 2 ARE ON SHEET RR-171 2 OF 2.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

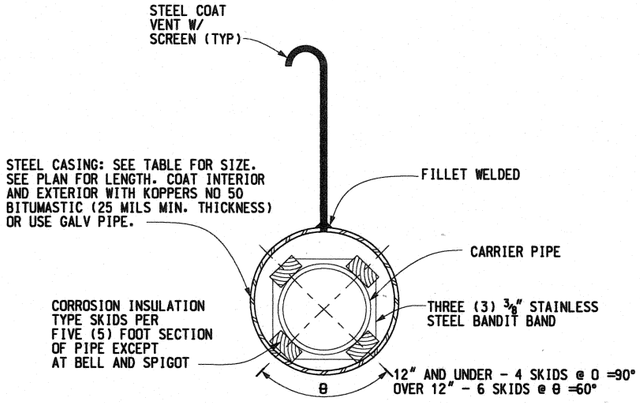
STANDARD CASING REQUIREMENTS (FLAMMABLE)

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-171

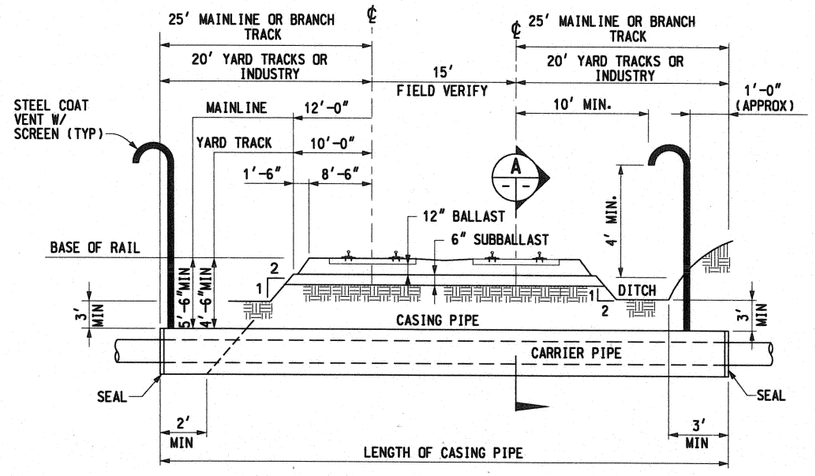
SHEET NO: 1 OF 2

10/4/2013



A SECTION - TYPICAL STEEL CASING

NTS



TYPICAL STEEL CASING REQUIREMENTS-FIGURE 1

NTS

TABLE 1
TABLE FOR DETERMINING MINIMUM SIZE CASING

NOMINAL SIZE CARRIER STEEL	NOMINAL SIZE STEEL CASING PIPE
3/4"	2"
1"	2 1/2"
1 1/4"	3"
1 1/2"	3 1/2"
2"	4"
2 1/2"	4 1/2"
3"	6"
3 1/2"	8"
4"	8"
6"	10"
8"	12"
10"	14"
12"	16"
14"	18"
16"	20"
18"	22"
20"	24"
>20"	CARRIER PIPE + 4"

TABLE 2
THICKNESS OF STEEL CASING PIPE (CASING WITH PROTECTIVE COATING)

NOMINAL DIAMETER (INCHES)	MIN. WALL THICKNESS (INCHES)
14" & UNDER	0.188"
16"	0.219"
18"	0.250"
20" & 22"	0.281"
24"	0.312"
26"	0.344"
28"	0.375"
30"	0.406"
32"	0.438"
34" & 36"	0.469"
38"	0.500"
40"	0.531"
42"	0.563"
44" & 46"	0.594"
48	0.625"
50"	0.656"
52"	0.688"

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

STANDARD CASING REQUIREMENTS (FLAMMABLE)

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

P.E. NO.: C-54141 DATE: 09-19-2013

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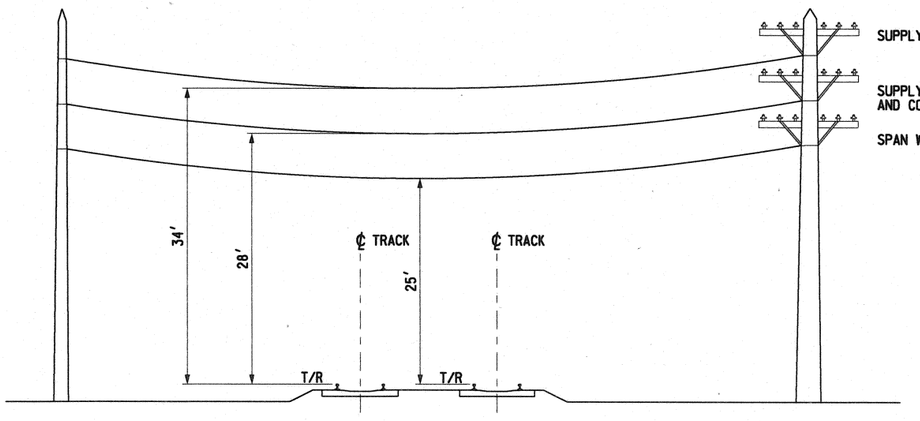
SHEET NO: 2 OF 2

10/4/2013

TABLE 1: CPUC GENERAL ORDER 95 BASIC MINIMUM ALLOWABLE VERTICAL CLEARANCE OF WIRES ABOVE RAILROADS, ROADWAYS, POLES, BUILDINGS, STRUCTURES OR OTHER OBJECTS

CASE NO	NATURE OF CLEARANCE	A SPAN WIRES (OTHER THAN TROLLEY SPAN WIRES) OVERHEAD GUYS AND MESSENGERS	B COMMUNICATION CONDUCTORS (INCLUDING OPEN WIRE, CABLES & SERVICE DROPS)	C TROLLEY CONTACT, FEEDER AND SPAN WIRES, UNDER 5 KV	D SUPPLY CONDUCTORS & SUPPLY CABLES UNDER 22.5 KV, SIGNAL WIRES	E SUPPLY CONDUCTORS & SUPPLY CABLES, 22.5 KV TO UNDER 300 KV	F SUPPLY CONDUCTORS & SUPPLY CABLES, 300 KV AND GREATER
1	CROSSING ABOVE TRACKS OF RAILROADS WHICH TRANSPORT OR PROPOSE TO TRANSPORT FREIGHT CARS (MAXIMUM HEIGHT 20'-9" WHERE NOT OPERATED BY OVERHEAD CONTACT WIRES.	25-FT	28-FT*	22.5-FT	28-FT	34-FT	34-FT
2	CROSSING OR PARALLELING ABOVE TRACKS OF RAILROAD OPERATED BY OVERHEAD TROLLEYS.	26-FT	26-FT	22.5-FT	30-FT*	34-FT*	34-FT*
3	CROSSING OR ALONG ROADWAYS IN URBAN DISTRICTS OR CROSSING ROADWAYS IN RURAL DISTRICTS.	18-FT	18-FT	19-FT	25-FT	30-FT	30-FT
4	ABOVE GROUND ALONG ROADWAYS IN RURAL DISTRICTS OR ACROSS OTHER AREAS CAPABLE OF BEING TRAVERSED BY VEHICLES OR AGRICULTURAL EQUIPMENT.	18-FT*	18-FT*	19-FT	25-FT	30-FT	30-FT
5	ABOVE GROUND IN AREAS ACCESSIBLE TO PEDESTRIANS ONLY.	8-FT	10-FT	19-FT	17-FT	25-FT	25-FT
6	VERTICAL CLEARANCE ABOVE WALKABLE SURFACES ON BUILDINGS, (EXCEPT GENERATING PLANTS OR SUBSTATIONS) BRIDGES OR OTHER STRUCTURES WHICH DO NOT ORDINARILY SUPPORT CONDUCTORS, WHETHER ATTACHED OR UNATTACHED.	8-FT	8-FT	8-FT	12-FT	12-FT	20-FT
6A	VERTICAL CLEARANCE ABOVE NON-WALKABLE SURFACES ON BUILDINGS, (EXCEPT GENERATING PLANTS OR SUBSTATIONS) BRIDGES OR OTHER STRUCTURES, WHICH DO NOT ORDINARILY SUPPORT CONDUCTORS, WHETHER ATTACHED OR UNATTACHED.	2-FT	8-FT	8-FT	8-FT	8-FT	20-FT
7	HORIZONTAL CLEARANCE OF CONDUCTOR AT REST FROM BUILDINGS (EXCEPT GENERATING PLANTS AND SUBSTATIONS), BRIDGES OR OTHER STRUCTURES (UPON WHICH MEN MAY WORK) WHERE SUCH CONDUCTOR IS NOT ATTACHED THERETO.	-	3-FT	3-FT	6-FT	6-FT	15-FT
8	DISTANCE OF CONDUCTOR FROM CENTER LINE OF POLE, WHETHER ATTACHED OR UNATTACHED.	-	15-IN	15-IN	18-IN	18-IN	NOT APPLICABLE
9	DISTANCE OF CONDUCTOR FROM SURFACE OF POLE CROSS ARM OR OTHER OVERHEAD LINE STRUCTURE UPON WHICH IT IS SUPPORTED, PROVIDING IT COMPLIES WITH CASE 8 ABOVE.	-	3-IN	3-IN	3-IN	3-IN	NOT APPLICABLE

* EXCEEDS CPUC GENERAL ORDER 95 BASIC MINIMUM ALLOWABLE VERTICAL CLEARANCE.



SUPPLY LINES 22.5 KV AND GREATER

SUPPLY LINES UNDER 22.5 KV, SIGNAL LINES, AND COMMUNICATIONS CONDUCTORS

SPAN WIRES, OVERHEAD GUYS, AND MESSENGERS

MINIMUM CLEARANCES OF WIRES ABOVE RAILROADS - CASE 1

MINIMUM CLEARANCES OF WIRES ABOVE RAILROADS, ROADWAYS, ETC.

1. CLEARANCES BETWEEN OVERHEAD CONDUCTORS, GUYS, MESSENGERS OR TROLLEY SPAN WIRES AND TOPS OF RAILS, SURFACES OF ROADWAYS OR OTHER GENERALLY ACCESSIBLE AREAS ACROSS, ALONG OR ABOVE WHICH ANY OF THE FORMER PASS; ALSO THE CLEARANCES BETWEEN CONDUCTORS, GUYS, MESSENGERS OR TROLLEY SPAN WIRES AND BUILDINGS, POLES, STRUCTURES, OR OTHER OBJECTS, SHALL NOT BE LESS THAN THOSE SET FORTH IN TABLE 1, AT A TEMPERATURE OF 60°F AND NO WIND.
2. THE CLEARANCES SPECIFIED IN TABLE 1, CASE 1, COLUMNS A, B, D, E AND F, SHALL IN NO CASE BE REDUCED MORE THAN 5% BELOW THE TABULAR VALUES BECAUSE OF TEMPERATURE AND LOADING AS SPECIFIED IN CPUC G.O. 95 RULE 43. THE CLEARANCES SPECIFIED IN TABLE 1, CASES 2 TO 6 INCLUSIVE, SHALL IN NO CASE BE REDUCED MORE THAN 10% BELOW THE TABULAR VALUES BECAUSE OF TEMPERATURE AND LOADING AS SPECIFIED IN CPUC G.O. 95 RULE 43.
3. THE CLEARANCE SPECIFIED IN TABLE 1, CASE 1, COLUMN C (22.5 FEET), SHALL IN NO CASE BE REDUCED BELOW THE TABULAR VALUE BECAUSE OF TEMPERATURE AND LOADING AS SPECIFIED IN RULE 43.
4. WHERE SUPPLY CONDUCTORS ARE SUPPORTED BY SUSPENSION INSULATORS AT CROSSINGS OVER RAILROADS WHICH TRANSPORT FREIGHT CARS, THE INITIAL CLEARANCES SHALL BE SUFFICIENT TO PREVENT REDUCTION TO CLEARANCES LESS THAN 95% OF THE CLEARANCES SPECIFIED IN TABLE 1, CASE 1, THROUGH THE BREAKING OF A CONDUCTOR IN EITHER OF THE ADJOINING SPANS.

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RAILROAD STANDARD PLANS

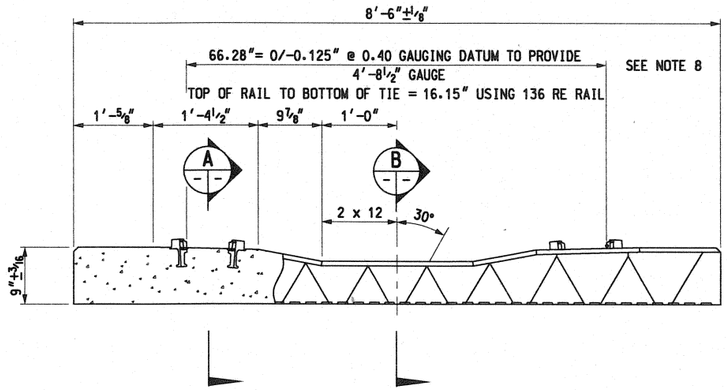
MINIMUM VERTICAL CLEARANCES FOR WIRES

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

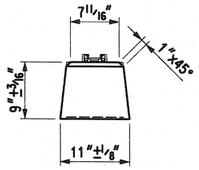
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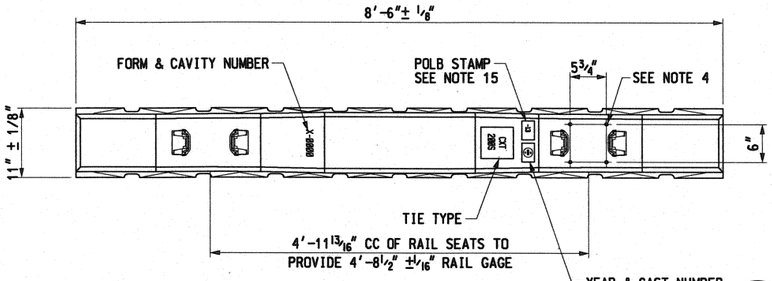
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ELEVATION



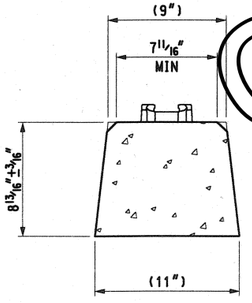
END VIEW



PLAN

1 DETAIL - TYPICAL CONCRETE CROSS TIE

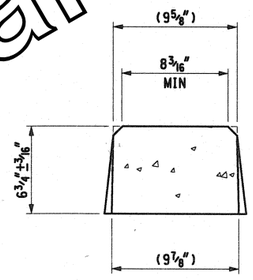
SCALE: 1" = 1'-0"



(MIDWAY BETWEEN SHOULDERS)

A SECTION

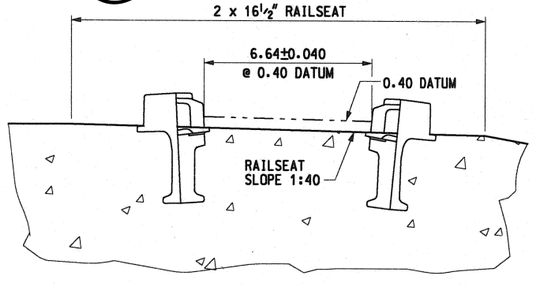
SCALE: 1" = 2'-0"



(CENTER OF TIE)

B SECTION

SCALE: 1" = 2'-0"



2 DETAIL - SHOULDER LOCATION

SCALE: 1/4" = 1'-0"

NOTES:

1. CONCRETE STRENGTH (USING CYLINDER STRENGTHS):
   28 DAY SPECIFIED = 7000 PSI
   TRANSFER MINIMUM = 4500 PSI.
2. AIR ENTRAINED CONCRETE TO BE USED AIR CONTENT TO BE A MINIMUM OF 3.5% IN THE HARDENED CONCRETE.
3. THE RAILSEAT SHALL BE A FLAT SMOOTH SURFACE ±0.5mm (0.02").
4. GAUGING POINTS FOR FLATNESS AND WIND. WIND BETWEEN RAILSEATS NOT TO EXCEED 1/16" BETWEEN THESE POINTS.
5. APPROPRIATE WIRE PATTERN TO MEET AREMA STANDARDS AND STRENGTH REQUIREMENTS ENUMERATED BELOW.
6. ENDS OF PRESTRESSING WIRE TO BE CUT OFF TO WITHIN 1/8" FROM SURROUNDING CONCRETE AT TIE ENDS.
7. THIS TIE DESIGNED TO COMPLY WITH THE PERFORMANCE REQUIREMENTS OF THE AREMA MANUAL FOR RAILWAY ENGIEERING. TIES TO BE MANUFACTURED IN ACCORDANCE WITH CUSTOMER SUPPLIED SPECIFICATIONS AND/OR ACCEPTED PCI PRACTICE FOR PRESTRESSED CONCRETE.
8. THIS TIE IS DESIGNED TO PROVIDE TRACK GAUGE USING RAIL AND THE FASTENING COMPONENTS LISTED HEREON. THE OUT-TO-OUT SHOULDER DIMENSION IS CALCULATED TO PROVIDE THE GAUGE INDICATED ASSUMING NOMINAL DIMENSIONS FOR RAIL PADS, INSULATORS, AND RAIL. TOLERANCE ON SHOULDER POSITION AND RAILSEAT INCLINATION ARE THOSE FOUND BY EXPERIENCE TO BE ACHIEVABLE AND SATISFACTORY IN PRACTICE.
9. USA PATENT # 5,104,039 COVERS THE INCREASED LATERAL RESISTANCE OF A CONCRETE TIE BY A MULTIPLICITY OF INDENTS.
10. RAIL FASTENING INFORMATION:

    CAST-IN COMPONENTS
    DUCTILE IRON SHOULDER: PANDROL 38450 OR AIRBOSS AB2001 OR AB4050
    SHOULDER ANGLE: 4°

    LOOSE COMPONENTS (SAFELOK)
    INSULATORS:
    FIELD SIDE: LL - 4018 (OR EQUAL)
    GAUGE SIDE: LL - 1061 (OR EQUAL)
    CLIP: PANDROL 36800 OR AIRBOSS 2000
    RAIL PADS: ARMSTED RPS LL - 1036 (OR EQUAL)
11. CONFIRM RAIL FASTENING INFORMATION IF REQUESTED TO SUPPLY TIES WITH PANDROL e-CLIP FASTENING SYSTEM.
12. RAILSEAT CANT: 1:40 (0.144 @ 5 3/4" GAUGING POINT)
    MAX = 0.164" @ 5 3/4" GAUGING POINT
    MIN = 0.128" @ 5 3/4" GAUGING POINT
13. APPROXIMATE WEIGHT OF TIE = 710 LBS. (USING AIR ENTRAINED CONCRETE).
14. FLEXURAL BENDING CAPACITY:
    RAILSEAT POSITIVE: 319 IN-KIPS
    RAILSEAT NEGATIVE: 184 IN-KIPS
    RAILSEAT NEGATIVE: 205 IN-KIPS
15. POLB SHALL BE CAST INTO THE TIE AT THE LOCATION INDICATED TO CLEARLY SHOW TIE OWNERSHIP BY THE PORT OF LONG BEACH.
16. TIE SPACING SHALL BE NOMINAL 24".

Canceled by Addendum #1 on 07/2026

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

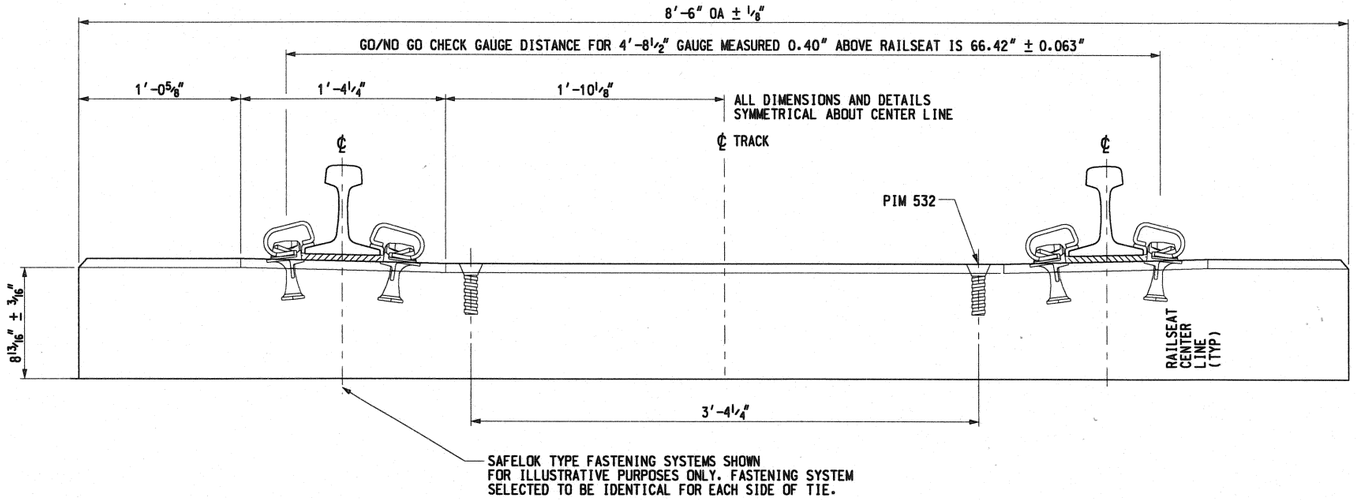
CONCRETE TIES - DETAILS

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-201

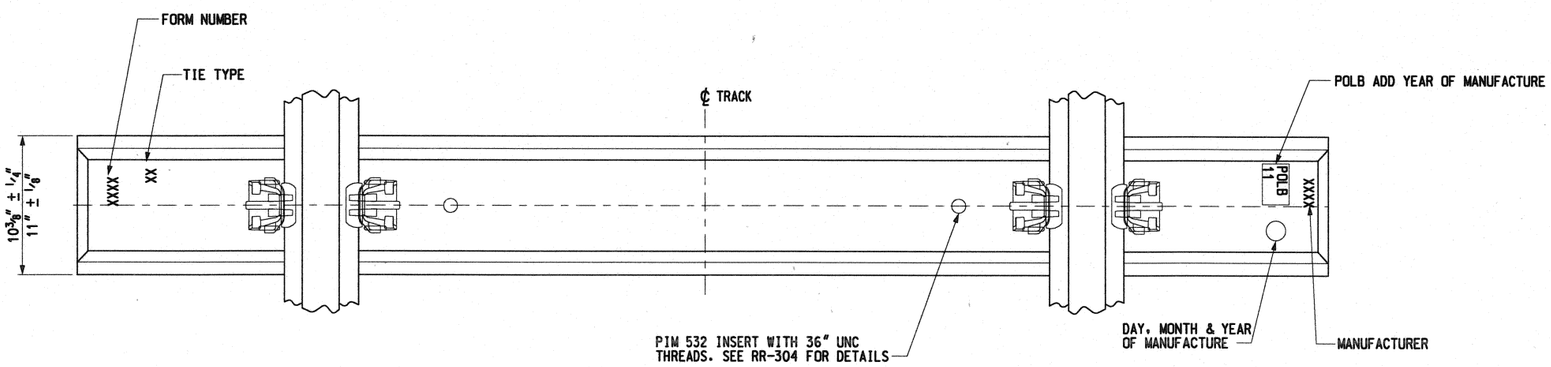
SHEET NO: 1 OF 1

10/4/2013



ELEVATION

NTS
(FRICTION PATTERN NOT SHOWN FOR CLARITY)



PLAN VIEW

NTS

NOTES:

1. TIES TO BE MANUFACTURED IN ACCORDANCE WITH POLB STANDARDS. (SEE RR-201).
2. FASTENING SYSTEM TO BE APPROVED BY POLB. NOTE THAT CENTER OF TIE SUPPORTS GUARD RAIL ATTACHMENT SYSTEM.
3. GUARD RAIL FASTENINGS:

   PIM 532 INSERT 7/8" - 9 UNC THREAD
   VASSLOH FE6 SPRING WASH
   HEAVY HEX 7/8" - 9 UNC BOLT
   CXT M-180 CAST IRON CLIP OR EQUIVALENT.
4. FRICTION PATTERN SHALL BE CAST INTO SIDES OF TIES AND EMBOSSED INTO BOTTOM OF TIES.
5. GUARD RAIL MUST BE SMALLER THAN OR EQUAL IN HEIGHT TO RUNNING RAIL. DO NOT USE SMALLER THAN 115 LB GUARD RAIL SECTION WITH 132 LB - 136 LB RUNNING RAIL. DO NOT USE SMALLER THAN 132 LB GUARD RAIL SECTION WITH 141 LB RUNNING RAIL.
6. SEE RR-302 THRU RR-304 FOR DETAILS ON COACH SCREW, INSERT, AND WASHER.
7. SEE RR-338 FOR DETAILS ON INSIDE GUARD RAIL PLATES FOR CONCRETE TIES.

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Port of LONG BEACH
The Green Port

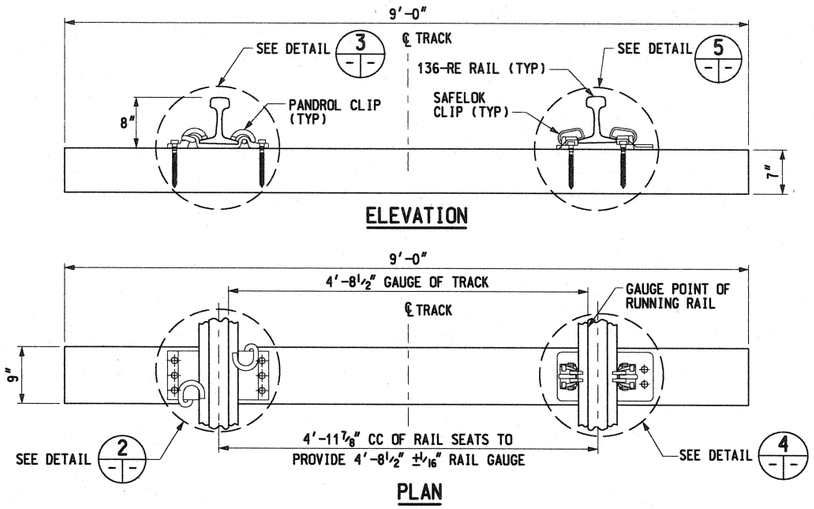
RAILROAD STANDARD PLANS

CONCRETE TIE - GUARD RAIL

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

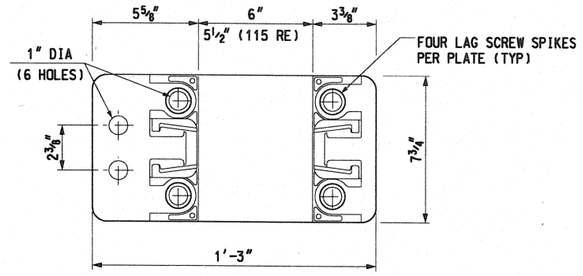
DRAWING NO: RR-202
SHEET NO: 1 OF 1

10/4/2013



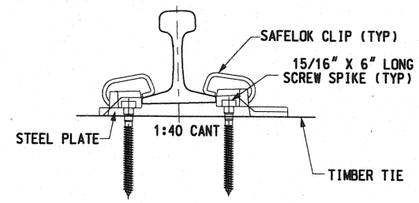
1 DETAIL - 7″ X 9″ X 9′-0″ TIMBER TIE

SCALE: 1″ = 1′-0″



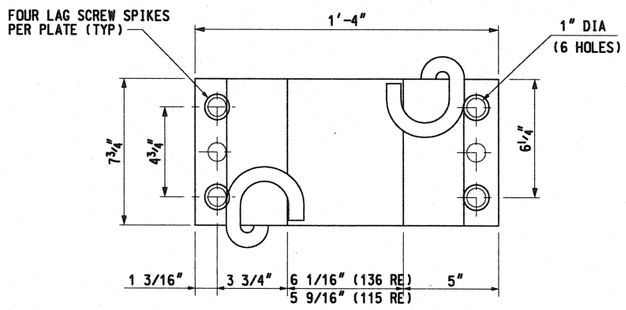
4 DETAIL - SAFELOK 36800 CLIP PLATE

SCALE: 1″ = 3′-0″



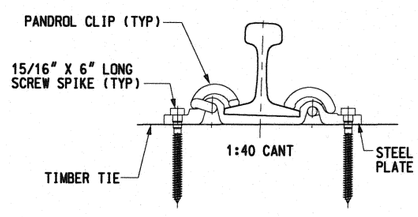
5 DETAIL - SAFELOK U2000 ELASTIC CLIP

SCALE: 1″ = 2′-0″



2 DETAIL - PANDROL "e" CLIP PLATE

SCALE: 1″ = 3′-0″



3 DETAIL - PANDROL "e" CLIPS

SCALE: 1″ = 2′-0″

RAIL FASTENINGS

PANDROL/SAFELOK: RAIL FASTENINGS
TO BE USED AS FOLLOWS:

TANGENT TRACK AND CURVES :
SAFELOK CLIP - U2000 (OR EQUAL)
PANDROL CLIP - e 2055 (OR EQUAL)

GENERAL NOTES:

1. STANDARD TIMBER CROSS TIES SHALL BE 7″ X 9″ X 9′-0″ AND SHALL BE PLACED ON 19½″ CENTERS.
2. RAIL WEIGHT 136 RE (LBS PER YARD)
3. RAILSEAT SHALL BE A FLAT SMOOTH SURFACE ±1/32″.
4. RAILSEAT CANT = 1:40
5. FOUR LAG SCREW SPIKES PER PLATE.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

TIMBER TIES - DETAILS

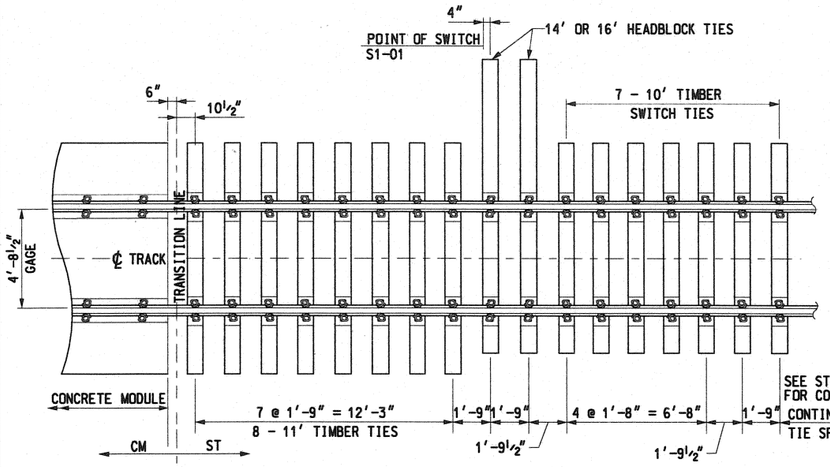
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-203

SHEET NO: 1 OF 1

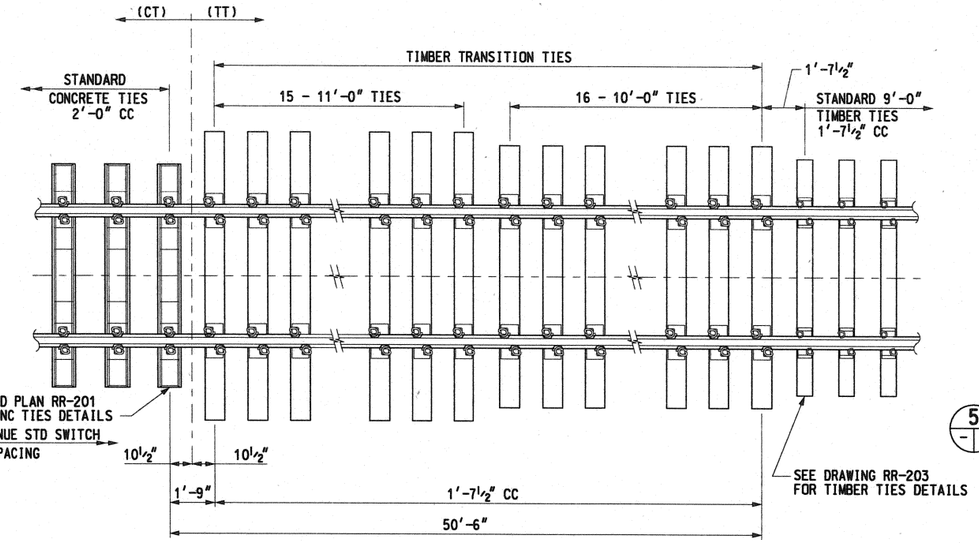
10/4/2013

...*RR-203 Timber Ties - Details



1 DETAIL - TRANSITION BETWEEN CONCRETE MODULE AND TIMBER SWITCH TIES

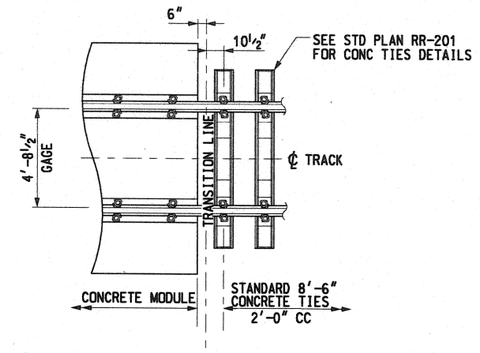
SCALE: NONE



3 DETAIL - TRANSITION BETWEEN TIMBER TIE AND CONCRETE TIES

SCALE: NONE

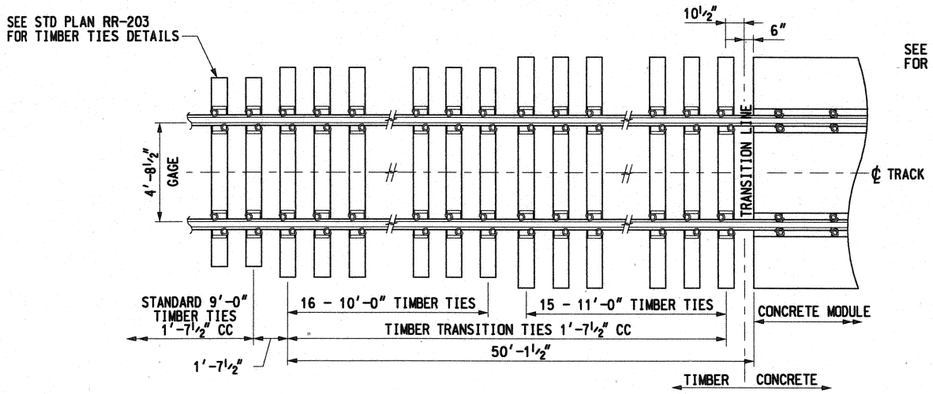
NOTE: THE LEFT SIDE OF THE TRANSITION IS SHOWN.



5 DETAIL - TRANSITION BETWEEN CONCRETE MODULE AND CONCRETE CROSS TIES

SCALE: NONE

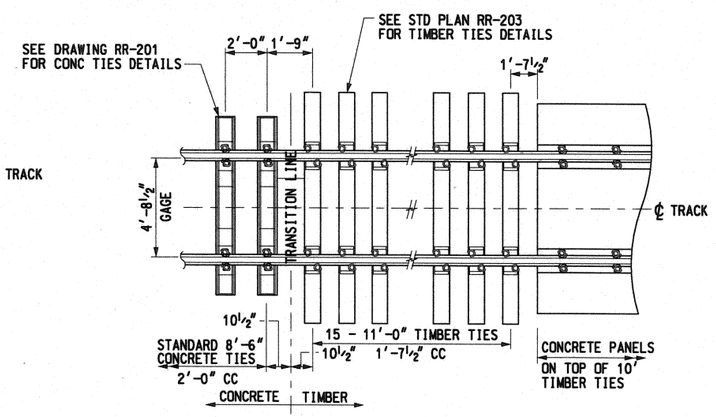
NOTE: THE RIGHT SIDE OF THE TRANSITION IS SHOWN.



2 DETAIL - TRANSITION BETWEEN TIMBER TIES AND CONCRETE MODULES

SCALE: NONE

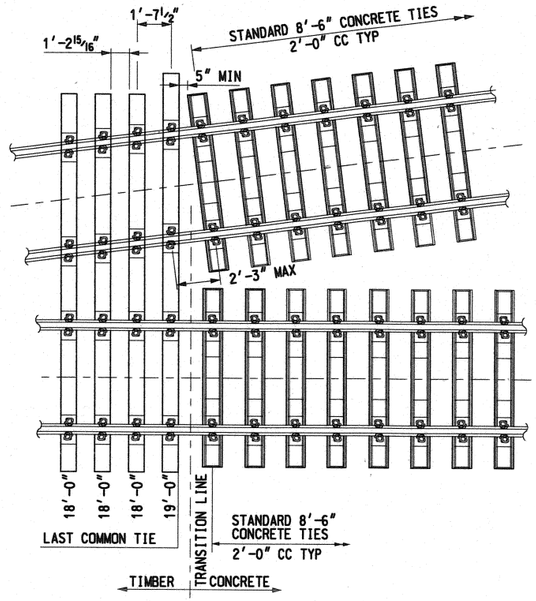
NOTE: THE LEFT SIDE OF THE TRANSITION IS SHOWN.



4 DETAIL - TRANSITION BETWEEN CONCRETE TIES AND CONCRETE PANEL ON TIMBER TIES

SCALE: NONE

NOTE: THE LEFT SIDE OF THE TRANSITION IS SHOWN.



6 DETAIL - TRANSITION BETWEEN SPECIAL TIES AND CONCRETE TIES

SCALE: NONE

NOTE: LEFT HAND TURNOUT TRANSITION SHOWN.

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Port of LONG BEACH
The Green Port

RAILROAD
STANDARD PLANS

TIE TRANSITION - DETAILS

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

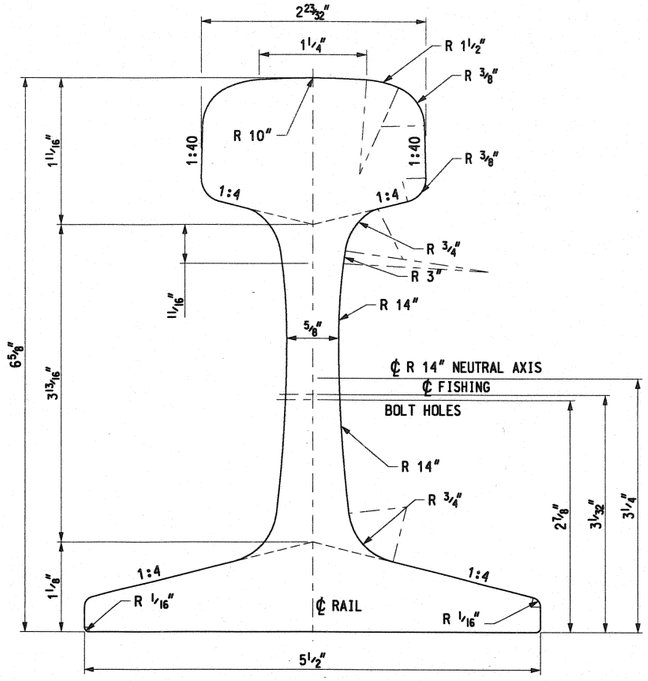
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-204

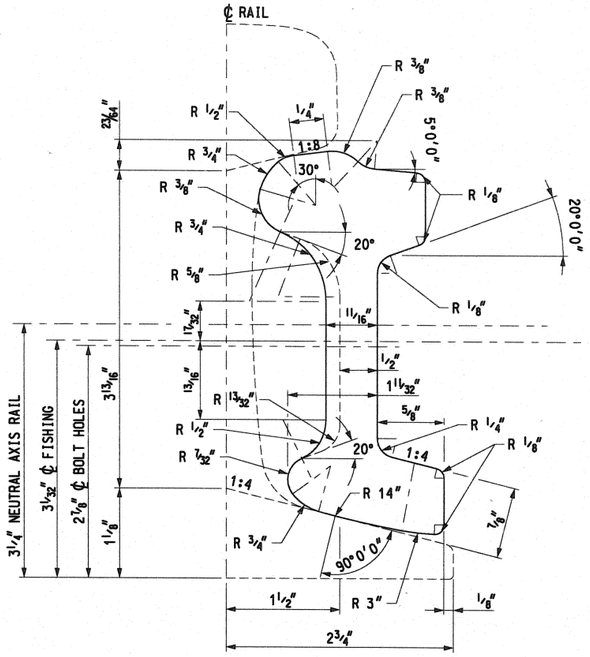
SHEET NO: 1 OF 1

10/4/2013

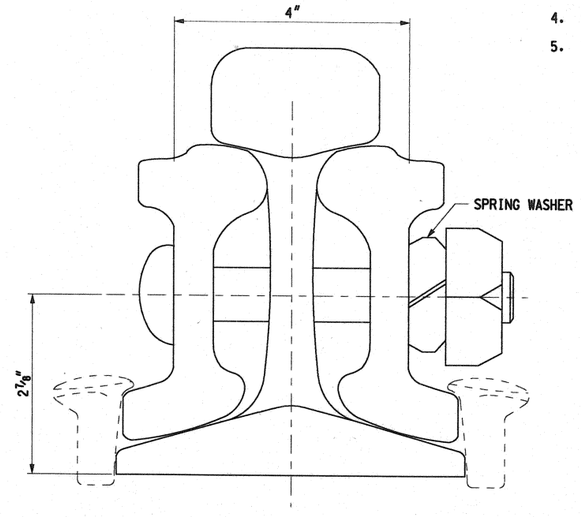
...\RR-204 Tie Transition - Details



115 RE RAIL



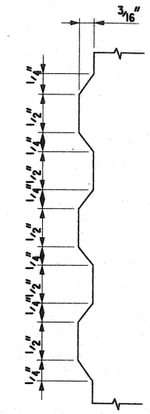
JOINT BAR



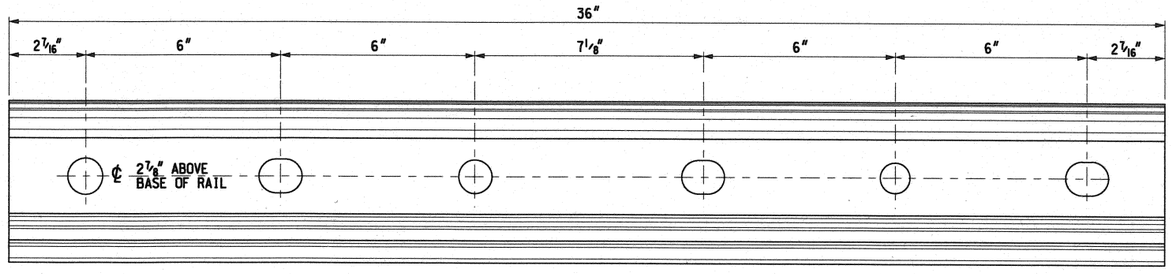
ASSEMBLY

NOTES:

1. RAILS, JOINT BARS AND TRACK BOLTS SHALL CONFORM TO THE POLB CURRENT SPECIFICATION.
2. REQUISITIONS AND ORDERS FOR TRACK BOLTS SHALL DESIGNATE DIAMETER OF BOLT PER POLB RR-302.
3. LENGTH OF TRACK BOLT WILL PERMIT USE OF SPRING WASHER UP TO APPROXIMATELY 0.78" THICK.
4. ALL BOLT HOLES SHALL BE CHAMFERED.
5. THIS PLAN FOR USE IN NEW RAIL INSTALLATION.

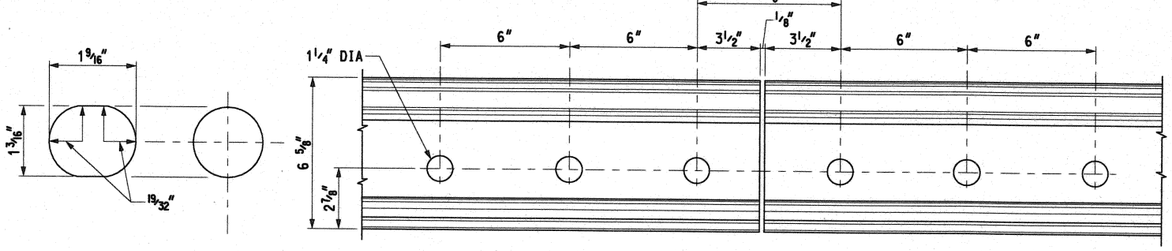


LONGITUDINAL SECTION OF JOINT BAR



JOINT BAR PUNCHING

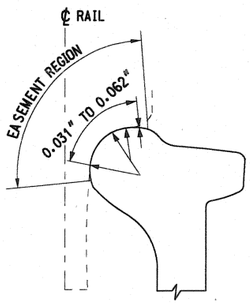
(FRONT VIEW)

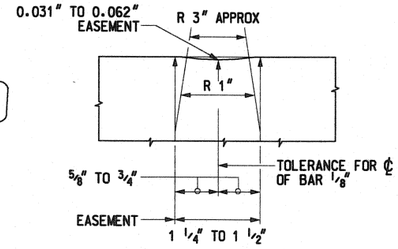


SIZE OF BOLT HOLES

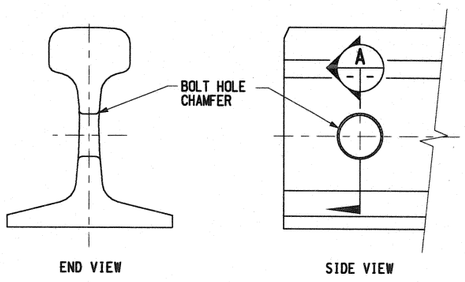
(IN JOINT BAR)

RAIL END DRILLING



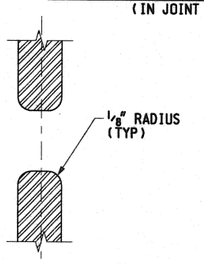


DETAIL OF HEAD EASEMENT



BOLT HOLE CHAMFERING

NTS



A SECTION - BOLT HOLE CHAMFER

NTS

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

RAIL AND JOINT ASSEMBLY FOR 115 LB RE RAIL

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

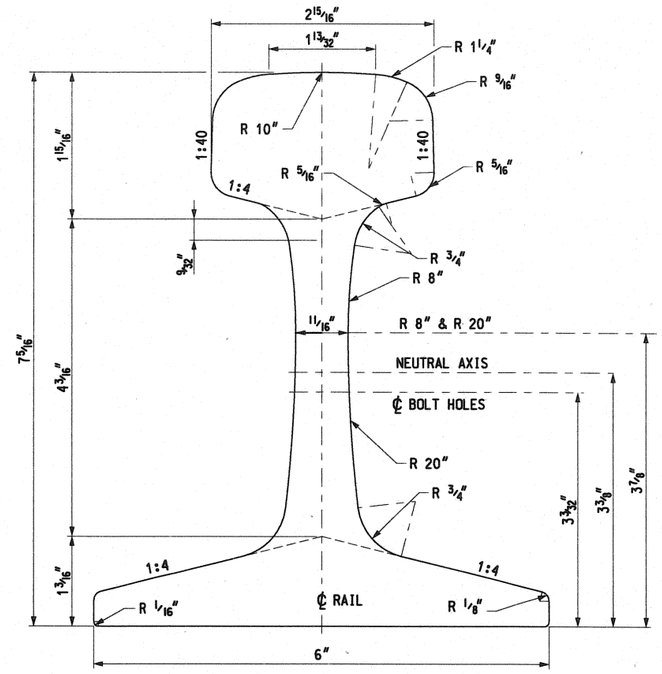
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-210

SHEET NO: 1 OF 1

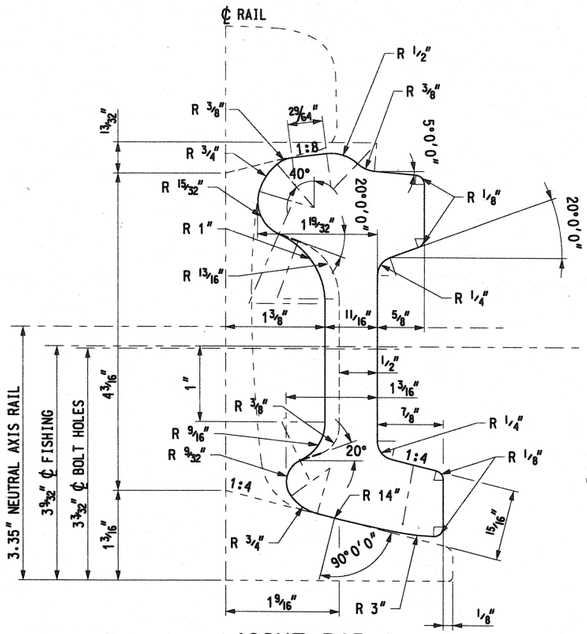
10/4/2013

...*RR-210 Rail and Joint Assembly For 115 lb RE Rail



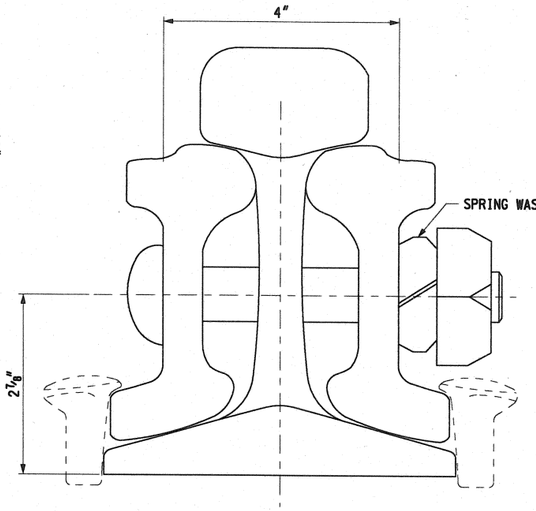
136 RE RAIL

NTS



JOINT BAR

NTS

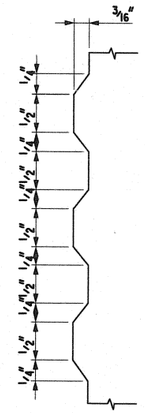


ASSEMBLY

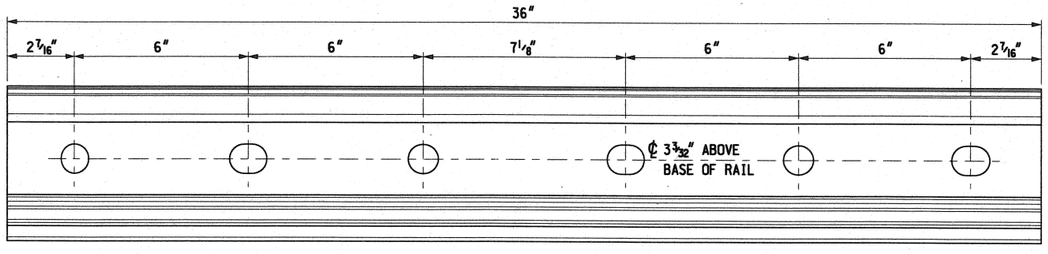
NTS

NOTES:

1. RAILS, JOINT BARS AND TRACK BOLTS SHALL CONFORM TO THE POLB CURRENT SPECIFICATION.
2. REQUISITIONS AND ORDERS FOR TRACK BOLTS SHALL DESIGNATE DIAMETER OF BOLT PER POLB RR-302.
3. LENGTH OF TRACK BOLT WILL PERMIT USE OF SPRING WASHER UP TO APPROXIMATELY 0.76" THICK.
4. ALL BOLT HOLES SHALL BE CHAMFERED.

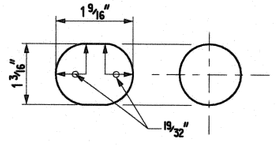


LONGITUDINAL SECTION OF JOINT BAR



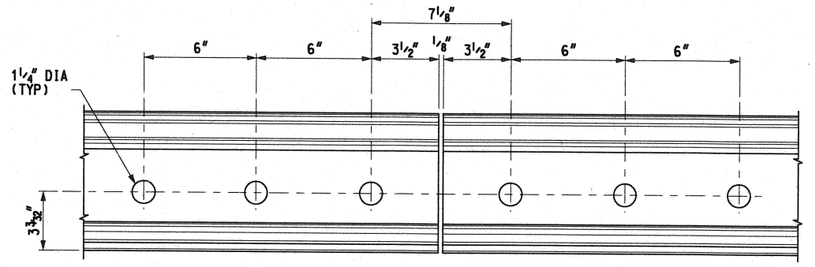
JOINT BAR PUNCHING

NTS
(FRONT VIEW)



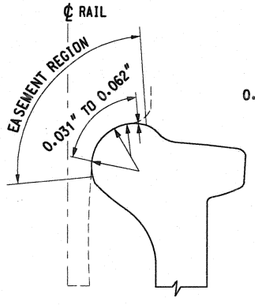
SIZE OF BOLT HOLES

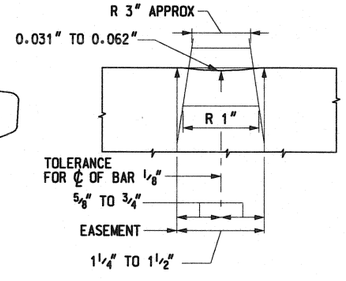
NTS
(IN JOINT BAR)



RAIL END DRILLING

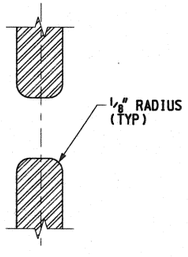
NTS



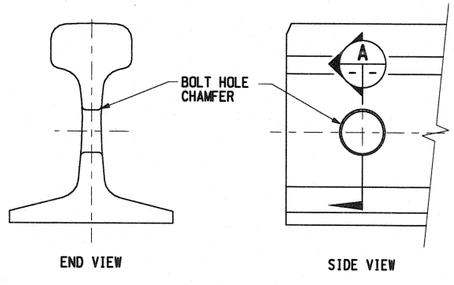


DETAIL OF HEAD EASEMENT

NTS



SECTION - BOLT HOLE CHAMFER



BOLT HOLE CHAMFERING

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

RAIL AND JOINT ASSEMBLY FOR 136 LB RE RAIL

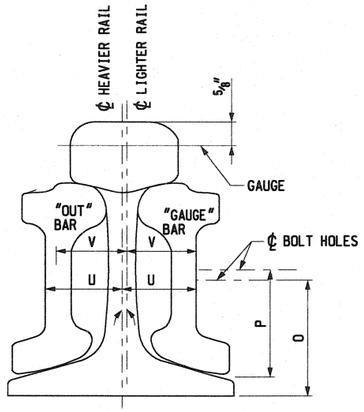
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-211

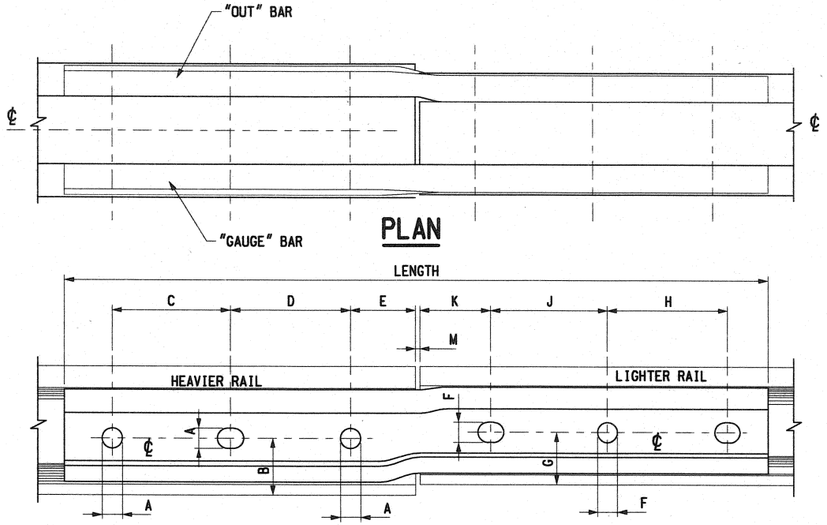
SHEET NO: 1 OF 1

10/4/2013

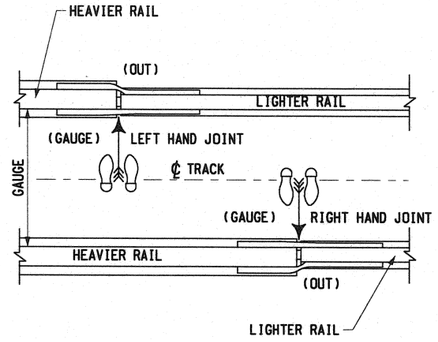
...*RR-211 Rail and Joint Assembly For 136 lb RE Rail



END ELEVATION



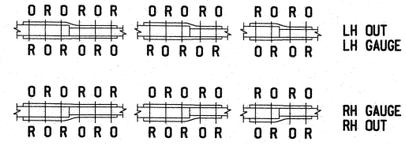
ELEVATION OF "GAUGE" BAR



IDENTIFICATION SKETCH

NOTES:

1. THIS PLAN SHOWS GENERAL INFORMATION FOR COMPROMISE JOINTS.
2. TO DETERMINE RIGHT HAND OR LEFT HAND JOINT: STAND BETWEEN RAILS IN THE TRACK, FACING RAILS TO BE JOINED. WHEN HEAVIER RAIL IS ON THE RIGHT HAND SIDE, IT IS A RIGHT HAND JOINT AND WHEN HEAVIER RAIL IS ON THE LEFT HAND SIDE, IT IS A LEFT HAND JOINT. ONE RIGHT HAND AND ONE LEFT HAND JOINT FORM A SET (FOUR BARS).
3. EACH BAR TO BE MARKED WITH THE FOLLOWING STAMPED IN DATA:
   SECTION OF RAIL, AT EACH END,
   "RH" OR "LH", FOR RIGHT HAND OR LEFT HAND,
   "GAUGE" OR "OUT", FOR GAUGE SIDE OR OUTSIDE,
   PATTERN NUMBER,
   NAME OR TRADE MARK OF MANUFACTURER,
   YEAR MANUFACTURED.
4. ON ACCOUNT OF VARIOUS RAIL DRILLINGS FOR SECTIONS OTHER THAN SHOWN, REQUISITIONS AND ORDERS FOR COMPROMISE JOINTS FOR SUCH OTHER RAIL SHALL SHOW DIMENSIONS FOR B, F, J, K, AND O. FOR HEAVIER RAIL AND D, G, M AND P FOR THE LIGHTER RAIL.
5. BOLTS FOR COMPROMISE JOINTS ARE SAME AS FOR CORRESPONDING STANDARD JOINT BARS.
6. THE TYPE OF HOLES IN COMPROMISE BARS ARE AS SHOWN BELOW. "R" DENOTES ROUND HOLES AND "O" DENOTES OVAL HOLES.



1. THIRD HOLE IN 110 LB RAIL TO BE DRILLED IN THE FIELD.
2. USE STANDARD JOINT BAR PER RR-210, MACHINED & LABELED TO INDICATE RAIL SIZE AND GAUGE AND FIELD SIDES.
3. USE STANDARD JOINT BAR PER RR-211, MACHINED & LABELED TO INDICATE RAIL SIZE AND GAUGE AND FIELD SIDES.

COMPROMISE JOINT DIMENSIONS AND LENGTHS:

		HEAVY		A	B	C	D	E	LIGHT		F	G	H	J	K		M
HEAVIER RAIL : LIGHTER RAIL	LENGTH	RAIL HEIGHT	BOLT DIA	DIAMETER OF HOLE IN BAR	BASE RAIL TO CL OF RAIL DRILLING	CTR 2nd TO CTR 3rd HOLE	CTR 1st TO CTR 2nd HOLE	RAIL END TO CTR 1st HOLE	RAIL HEIGHT	BOLT DIA	DIAMETER OF HOLE IN RAIL	BASE RAIL TO CL OF RAIL DRILLING	CTR 2nd TO CTR 3rd HOLE	CTR 1st TO CTR 2nd HOLE	RAIL END TO CTR 1st HOLE	AMOUNT OF WEAR	GAP BETWEEN RAIL ENDS
141 RE To 136 RE	36"	7 7/16"	1 1/8"	1 5/16"	3 3/32"	6"	6"	3 1/2"	7 5/16"	1 1/8"	1 5/16"	3 3/32"	6"	6"	3 1/2"	—	1/8"
141 RE To 132 RE	36"	7 7/16"	1 1/8"	1 5/16"	3 3/32"	6"	6"	3 1/2"	7 1/8"	1 1/8"	1 5/16"	3 3/32"	6"	6"	3 1/2"	1/4"	1/8"
141 RE To 119 CFI	36"	7 7/16"	1 1/8"	1 5/16"	3 3/32"	6"	6"	3 1/2"	6 13/16"	1 1/8"	1 5/16"	2 7/8"	6"	6"	3 1/2"	1/4"	1/8"
141 RE To 115 RE	36"	7 7/16"	1 1/8"	1 5/16"	3 3/32"	6"	6"	3 1/2"	6 5/8"	1 1/8"	1 5/16"	2 7/8"	6"	6"	3 1/2"	1/4"	1/8"
136 RE To 132 RE	36"	7 5/16"	1 1/8"	1 5/16"	3 3/32"	6"	6"	3 1/2"	7 1/8"	1 1/8"	1 5/16"	3 3/32"	6"	6"	3 1/2"	1/4"	1/8"
136 RE To 119 CFI	36"	7 5/16"	1 1/8"	1 5/16"	3 3/32"	6"	6"	3 1/2"	6 13/16"	1 1/8"	1 5/16"	2 7/8"	6"	6"	3 1/2"	1/4"	1/8"
136 RE To 115 RE	36"	7 5/16"	1 1/8"	1 5/16"	3 3/32"	6"	6"	3 1/2"	6 5/8"	1 1/8"	1 5/16"	2 7/8"	6"	6"	3 1/2"	1/4"	1/8"
132 RE To 119 CFI	36"	7 1/8"	1 1/8"	1 5/16"	3 3/32"	6 1/2"	6 1/2"	2 1/2"	6 13/16"	1 1/8"	1 5/16"	2 7/8"	6"	6"	3 1/2"	—	1/8"
132 RE To 115 RE	36"	7 1/8"	1 1/8"	1 5/16"	3 3/32"	6"	6"	3 1/2"	6 5/8"	1 1/8"	1 5/16"	2 7/8"	6"	6"	3 1/2"	—	1/8"
119 RE To 115 RE	36"	6 13/16"	1 1/8"	1 5/16"	2 7/8"	6"	6"	3 1/2"	6 5/8"	1 1/8"	1 5/16"	2 7/8"	6 1/2"	6 1/2"	2 1/2"	—	1/8"
115 RE To 110 RE	30"	6 5/8"	1 1/8"	1 5/16"	2 7/8"	6"	6"	3 1/2"	6 1/4"	1"	1 3/16"	2 45/64"	—	5"	2 15/32"	—	1/8"
115 RE To 100 RA	30"	6 5/8"	1 1/8"	1 5/16"	2 7/8"	6"	6"	3 1/2"	6"	1"	1 3/16"	2 5/8"	—	5"	2 15/32"	—	1/8"
115 RE To 100 RE	30"	6 5/8"	1 1/8"	1 5/16"	2 7/8"	6"	6"	3 1/2"	6"	1"	1 3/16"	2 11/16"	—	5 1/2"	2 11/16"	—	1/8"
110 RE To 90 RA	24"	6 1/4"	1"	1 3/16"	2 5/8"	—	5 1/2"	2 11/16"	5 5/8"	1"	1 3/16"	2 37/64"	—	5"	2 13/32"	—	5/32"
110 RE To 85	24"	6 1/4"	1"	1 3/16"	2 5/8"	—	5 1/2"	2 11/16"	5 3/8"	1"	1 3/16"	2 29/64"	—	7"	2 7/16"	—	5/32"
90 RA To 85	24"	5 5/8"	1"	1 3/16"	2 13/16"	—	5"	2 13/32"	5 3/8"	1"	1 3/16"	2 29/64"	—	5"	2 15/32"	—	3/16"

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

COMPROMISE JOINTS FOR VARIOUS WEIGHTS OF RAILS

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

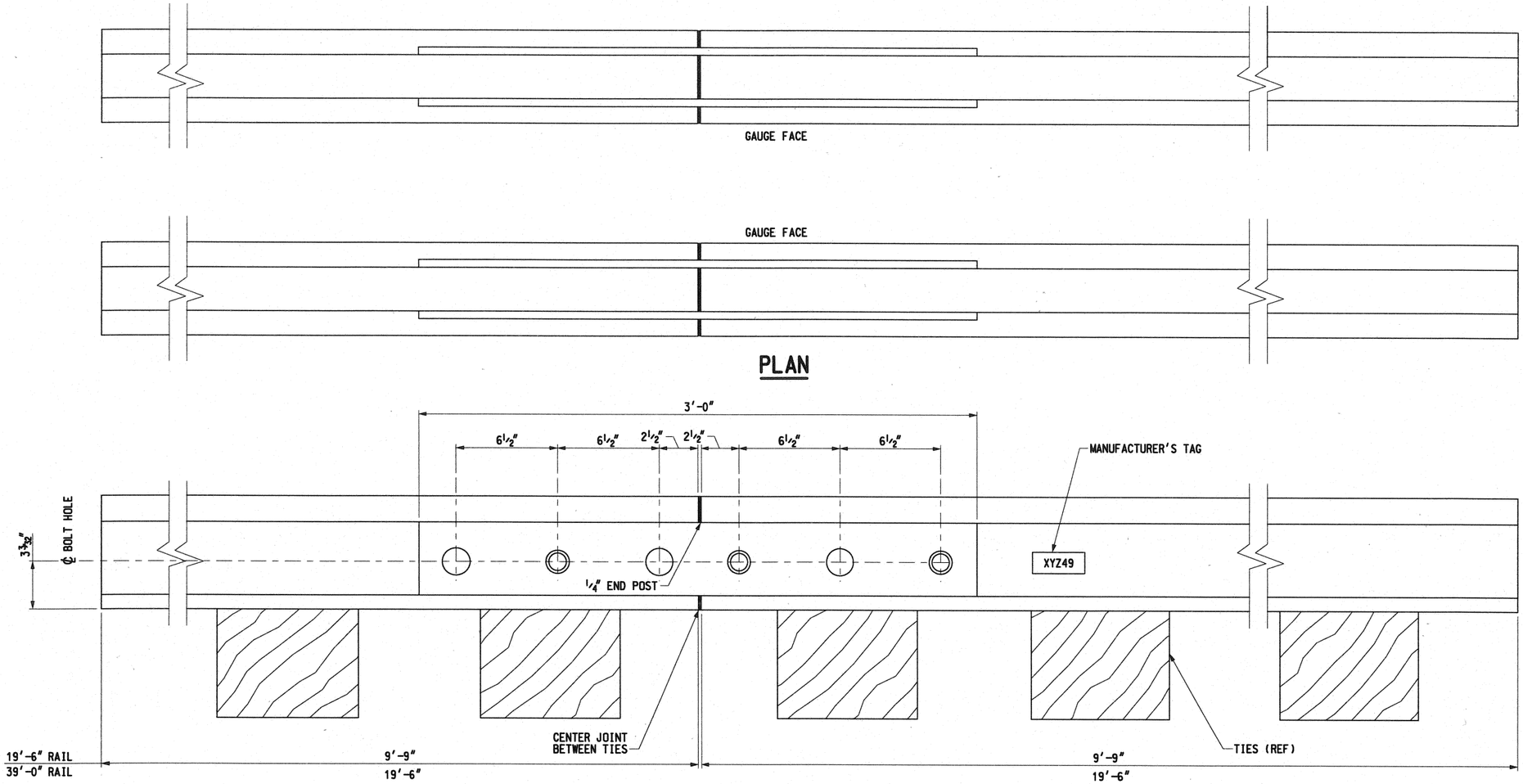
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-212

SHEET NO: 1 OF 1

10/4/2013

...*RR-212 Compromise Joints for Various Weights of Rails



PLAN

PROFILE

NOTES:

1. INSULATED JOINT PLUG SHALL MEET OR EXCEED CURRENT AREMA SPECIFICATION 2.11. ONLY ALLEGHENY BONDED INSULATED JOINT OR APPROVED EQUAL WILL BE ACCEPTED.
2. INSULATED JOINT PLUGS SHALL BE MANUFACTURED FROM NEW HEAD HARDENED RAIL. INSULATED JOINTS SHALL BE INSTALLED AS SHOWN IN PLANS OR AS DIRECTED. GOOD USABLE SECOND HAND HEAD HARDENED RAIL WITH ¼" HEADLOSS MAY BE USED FOR JOINTS MANUFACTURED FOR ¼" HEADWEAR. INSULATED JOINTS FOR USE IN TURNOUTS, RAIL WILL BE BENT FOR CLOSURE OR TURNOUT SIDE.
3. ALL HOLES SHALL BE CHAMFERED.
4. 1" A490 HUCK BOLTS WITH STAGGERED PATTERN SHALL BE FURNISHED.
5. WHEN NECESSARY, 1 ⅛" GRADE 8 BOLTS WITH SECURITY LOCKNUTS, LUBRICATED AND TORQUED TO 850 FT LBS, MAY BE SUBSTITUTED FOR HUCK BOLTS.
6. INSULATED JOINT PLUGS TO BE MANUFACTURED AND CURED IN A CONTROLLED ENVIRONMENT AT THE MANUFACTURER'S PLANT. NO FABRICATION OF INSULATED JOINT PLUGS IN THE FIELD WILL BE ACCEPTED. AFTER HUCKING OR BOLTING, MANUFACTURER SHALL REMOVE EXCESS EPOXY FROM RAIL AND JOINT BAR. MANUFACTURER SHALL ADHERE IDENTIFICATION TAG TO THE WEB OF RAIL DEPICTING MANUFACTURER'S NAME, CONTROL NUMBER, LOCATION, MONTH (01) AND YEAR (2XXX) WHERE JOINTS WERE FABRICATED.

NOTES: (CONT)

7. MANUFACTURER SHALL MARK A BALANCE POINT ON THE HEAD OF RAIL FOR HANDLING.
8. INSULATED JOINT PLUGS SHALL BE CENTERED BETWEEN TIE CRIBS WHEN INSTALLED.
9. SUPPLIERS OF MATERIAL SHOWN ON TRACK STANDARD DRAWINGS SHALL FORMALLY SUBMIT THEIR SHOP DRAWINGS TO POLB FOR APPROVAL. MATERIAL SHIPPED WITHOUT WRITTEN APPROVAL FROM POLB WILL NOT BE ACCEPTED.
10. PREFABRICATED JOINTS OF OTHER LENGTHS AS SPECIFIED MAY BE REQUIRED IN TURNOUTS.
11. ONLY TOELESS JOINT BARS ARE TO BE USED FASTENED WITH SHAVED E-CLIPS FOR INSULATED JOINTS. SEE RR-312.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

PREFABRICATED BONDED INSULATED JOINT

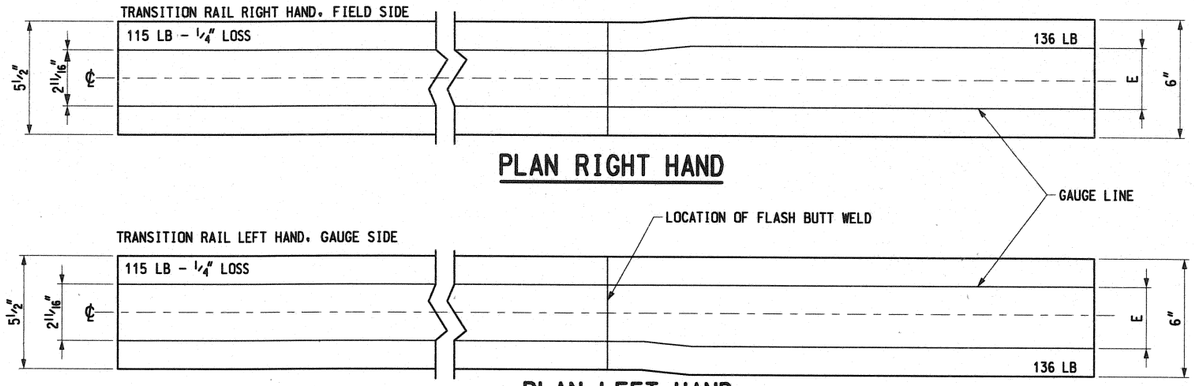
APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

P.E. NO.: C-54141 DATE: 09-19-2013

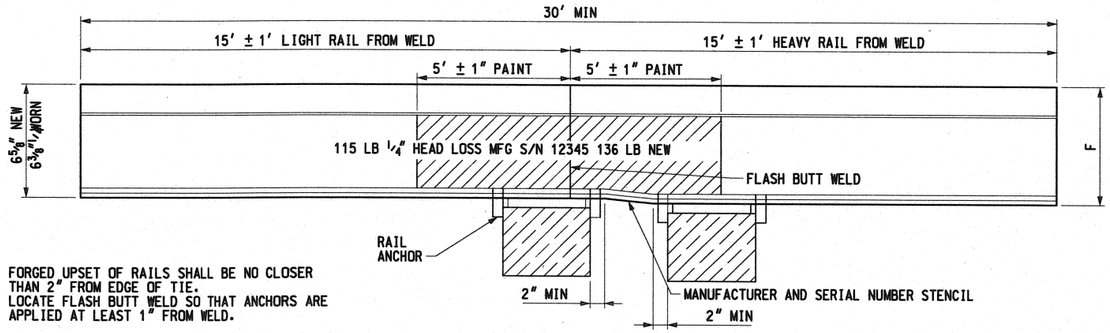
DRAWING NO: RR-213

SHEET NO: 1 OF 1

10/4/2013



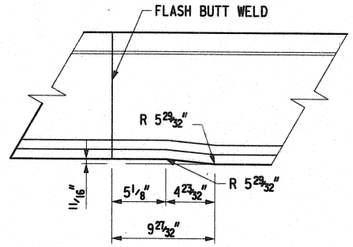
TRANSITION RAIL HAND IDENTIFICATION



FORGED UPSET OF RAILS SHALL BE NO CLOSER THAN 2" FROM EDGE OF TIE.
LOCATE FLASH BUTT WELD SO THAT ANCHORS ARE APPLIED AT LEAST 1" FROM WELD.

ELEVATION

FACING GAUGE SIDE OF RAIL



TRANSITION DETAIL

RAIL	E	F
132 LB 1/4" WORN	2 31/32"	6 7/8"
136 LB NEW	2 29/32"	7 5/16"
136 LB 1/4" WORN	2 29/32"	7 1/16"
141 LB NEW	2 29/32"	7 1/16"

BILL OF MATERIALS

TRANSITION RAIL ASSEMBLIES –
LEFT HAND AND RIGHT HAND

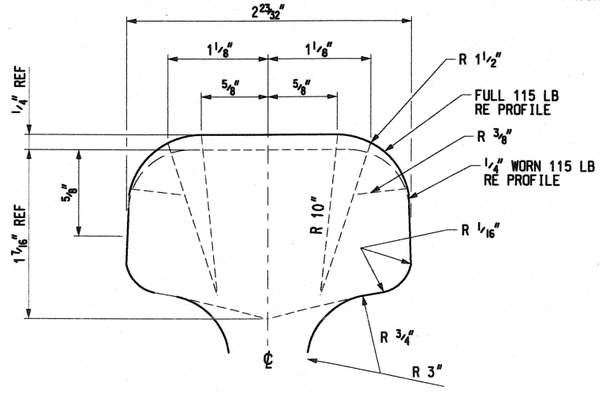
141 LB NEW TO 115 LB NEW
141 LB NEW TO 115 LB 1/4" HEAD LOSS
136 LB NEW TO 115 LB NEW
136 LB NEW TO 115 LB 1/4" HEAD LOSS
136 LB 1/4" HEAD LOSS TO 115 LB 1/4" HEAD LOSS
132 LB 1/4" HEAD LOSS TO 115 LB 1/4" HEAD LOSS

NOTES:

1. TO DETERMINE HAND OF TRANSITION RAIL:
   A. FACE GAUGE SIDE OF TRANSITION RAIL. IF TRANSITION RAIL IS INSTALLED IN TRACK, STAND IN CENTER OF TRACK.
   B. MANUFACTURER'S TAG SHOULD BE VISIBLE IN WEB AREA. GAUGE SIDE.
   C. TAG SHOULD READ "GAUGE SIDE".
   D. WHEN HEAVY OR HIGH RAIL IS ON THE RIGHT, IT IS A RIGHT HAND TRANSITION RAIL. WHEN HEAVY OR HIGH RAIL IS ON THE LEFT, IT IS A LEFT HAND TRANSITION RAIL.
2. TRANSITION RAIL LENGTHS WERE CALCULATED USING 19 1/2" TIE SPACING FOR WOOD AND 24" TIE SPACING FOR CONCRETE.
3. ALWAYS MEASURE TRANSITION RAIL LENGTH BEFORE CUTTING OUT OLD RAIL.
4. BOX ANCHOR TIE EACH SIDE OF TRANSITION.
   BOX ANCHOR TIE EACH SIDE OF THERMITE WELDS, AS SHOWN.
   OTHERWISE, ANCHOR PER RR-301 1 OF 3.

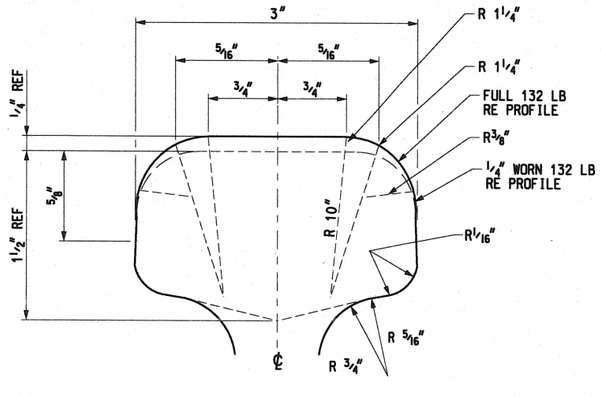
NOTES FOR MANUFACTURERS:

1. TRANSITION RAILS ARE FURNISHED AS PAIRS AND ARE RIGHT OR LEFT HANDED.
2. MANUFACTURER TO PLACE ID TAG READING "GAUGE SIDE" ON WEB OF RAIL GAUGE SIDE AND OTHER APPROPRIATE INFORMATION AS SHOWN.
3. MACHINED SURFACES MUST BE FREE OF SEAMS AND RIDGES.
4. FLASH BUTT WELD TO BE GROUND FLUSH WITH PARENT RAILS ON BASE AND SIDES OF BASE, +0.000" TO -0.010".
5. TEMPLATES MUST BE USED TO CHECK FINISHED GAUGE CORNER AND TOP RADII.
6. HEAD HARDENED RAIL TO BE USED UNLESS OTHERWISE SPECIFIED.
7. MANUFACTURER TO MARK LIFT/BALANCE POINT FOR EACH RAIL LENGTH MANUFACTURED AND ACTUAL WEIGHT OF RAIL, STENCILED ON HEAD OF RAIL.
8. MANUFACTURER TO PAINT WEB OF RAIL, 10 FEET CENTERED ON WELD AND SOLID WHITE BOTH SIDES. USING 2 1/2" BLOCK STENCIL AND BLACK PAINT, MARK RAIL TRANSITIONS, I.E. 136 LB NEW AND 132 LB 1/4" HEAD LOSS AT APPROPRIATE END OF THE WHITE PAINTING. STENCIL IN BLACK THE MFG NAME AND S/N BETWEEN MARKING RAIL TRANSITIONS USING 2" BLOCK STENCIL.



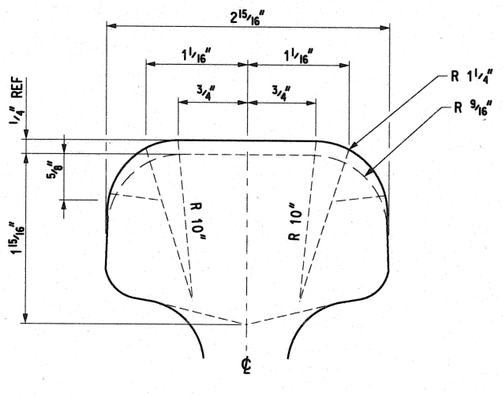
TOP RADII DETAIL

115 LB



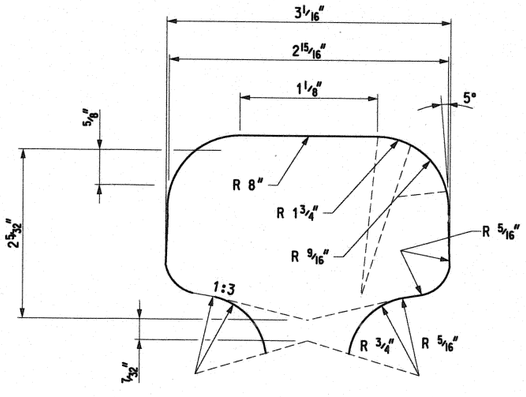
TOP RADII DETAIL

132 LB



TOP RADII DETAIL

136 LB



TOP RADII DETAIL

141 LB

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

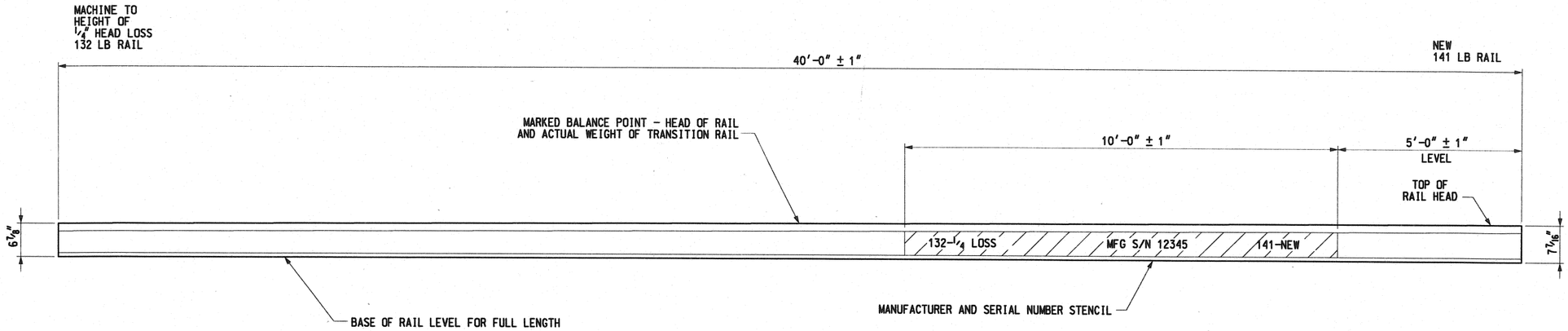
FORGED TRANSITION RAILS

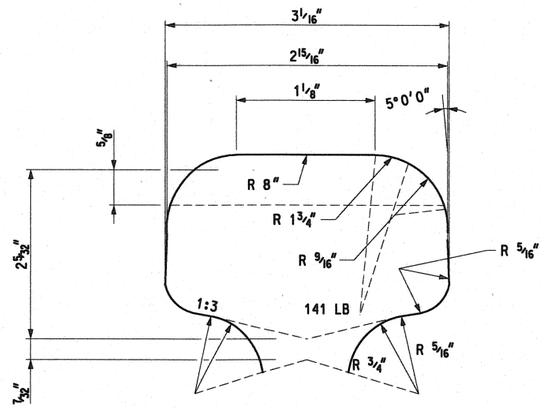
APPROVED BY: _____
SEAN A. GAMETTE – ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-214

SHEET NO: 1 OF 1

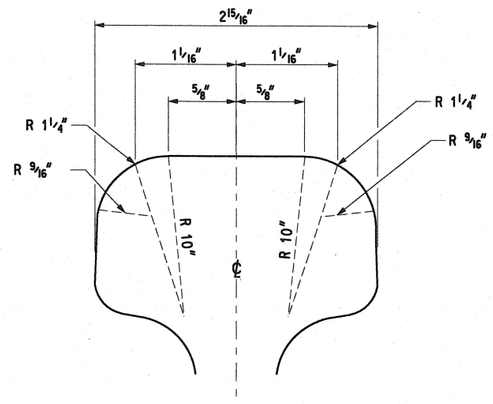
10/4/2013





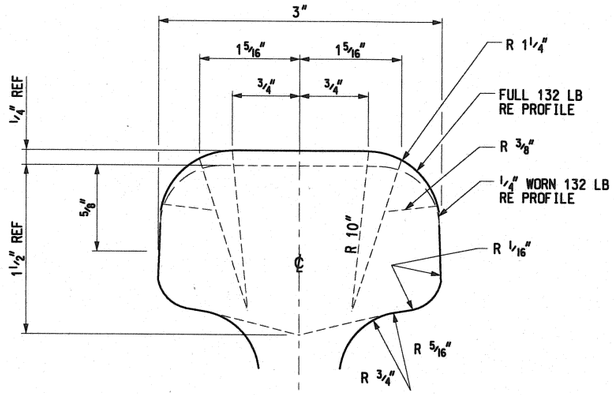
TOP RADII DETAIL

141 LB



TOP RADII DETAIL

136 LB



TOP RADII DETAIL

132 LB

RAIL HEIGHT		
SECTION	NEW	1/4" HEAD LOSS
141 LB	7 7/16"	-
136 LB	7 5/16"	-
132 LB	-	6 7/8"

BILL OF MATERIALS

QUANTITY TRANSITION RAIL
1 EA TRANSITION RAIL, 141 LB NEW TO 132 LB 1/4" HEAD LOSS
1 EA TRANSITION RAIL, 136 LB NEW TO 132 LB 1/4" HEAD LOSS

NOTES:

1. RAIL TO BE PURCHASED AND MANUFACTURED TO CURRENT "POLB SPECIFICATIONS FOR HEAD HARDENED RAIL".
2. TRANSITION RAIL TO BE MANUFACTURED FROM HEAD HARDENED RAIL.
3. MACHINED SURFACES MUST BE FREE OF SEAMS AND RIDGES.
4. TEMPLATES MUST BE USED TO CHECK FINISHED GAUGE CORNER AND TOP RADII.
5. MANUFACTURER TO MARK LIFT/BALANCE POINT FOR EACH RAIL LENGTH AND ACTUAL WEIGHT OF RAIL, STENCILED ON HEAD OF RAIL.
6. MANUFACTURER SHALL PAINT WEB OF RAIL, 10 FEET AS SHOWN ON RAIL, SOLID WHITE, BOTH SIDES. USING 2 1/2" BLOCK STENCIL AND BLACK PAINT, MARK RAIL TRANSITIONS, I.E. 141-NEW AND 132 1/4" LOSS AT EACH END OF THE WHITE PAINTING. STENCIL IN BLACK THE MFG NAME AND S/N BETWEEN MARKING RAIL TRANSITIONS USING 2" BLOCK STENCIL.
7. THE 141 LB TRANSITION RAIL CAN BE USED WITH 136 LB AND 132 LB RAIL SECTIONS NEW TO 1/4" HEAD LOSS.
8. TRANSITION RAIL IS UNIVERSAL AND CAN BE USED AS RIGHT HAND OR LEFT HAND RAIL.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

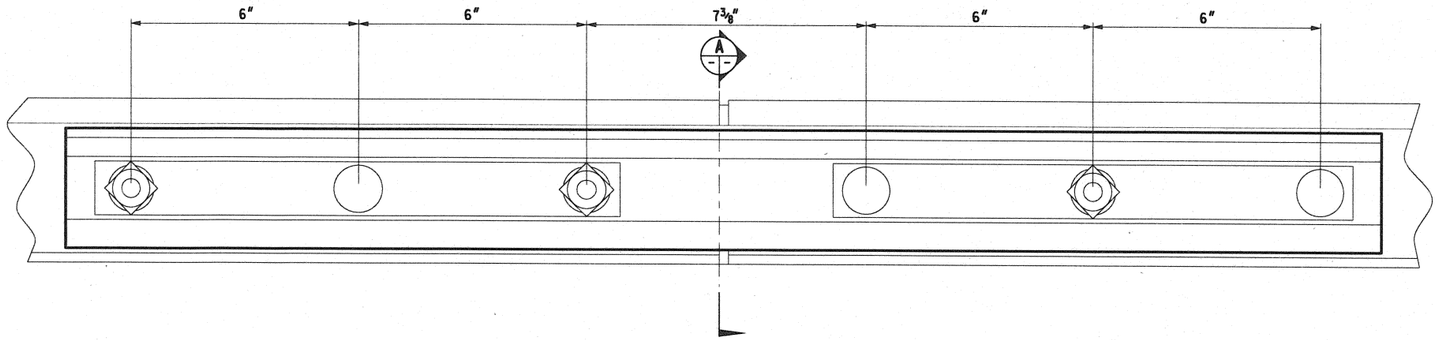
PLANED TRANSITION RAILS

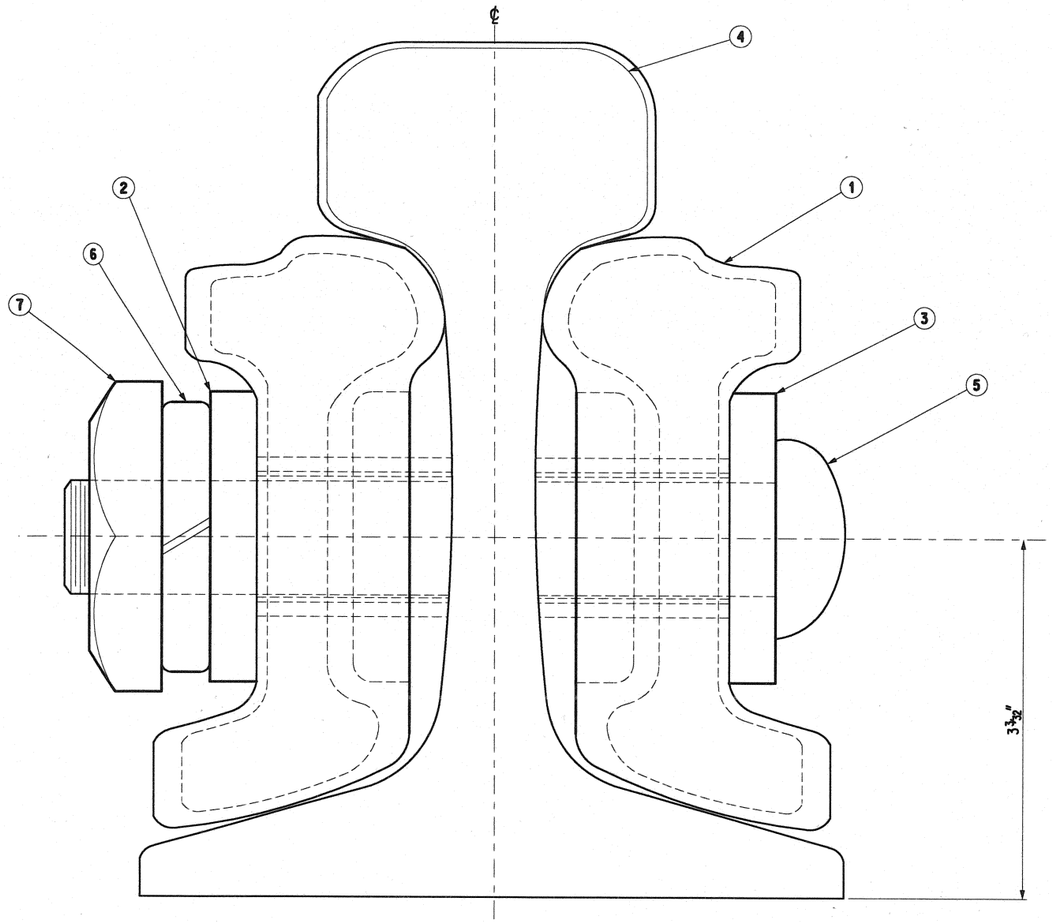
APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-215

SHEET NO: 1 OF 1

10/4/2013





A SECTION
NO SCALE

ITEM	QTY	DESCRIPTION
1	2	POLY INSULATED JOINT BAR 36 1/2" LONG
2	2	STEEL BACKUP PLATE 1/2" THICK X 15 1/4" LONG
3	2	STEEL BACKUP PLATE 1/2" THICK X 15 1/4" LONG
4	1	SCOTCHPLY END POST 3/8" THICK
5	6	OVAL NECK BOLT 1" X 7 1/2" LONG
6	6	1" LOCKWASHER
7	6	1" SQUARE NUT

NOTE:

USE THE PREFABRICATED BONDED INSULATED JOINT UNLESS APPROVED BY THE POLB.

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Port of LONG BEACH
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RAILROAD
STANDARD PLANS

POLY-INSULATED JOINT
141-136-132 LB RE RAIL

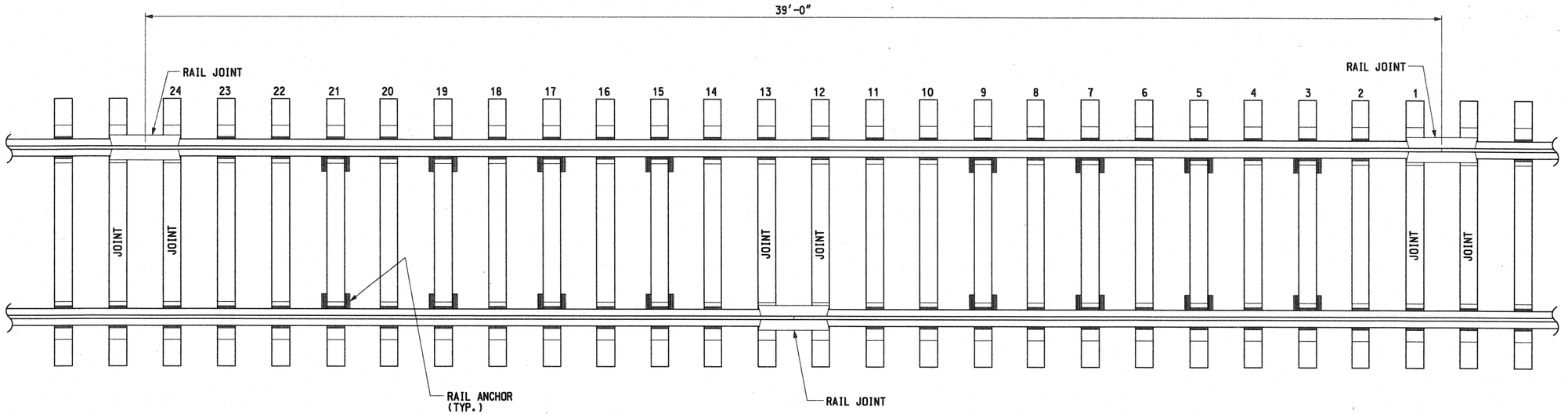
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO:
RR-216

SHEET NO:
1 OF 1

10/4/2013

...*RR-216 Poly-Insulated Joint 141-136-132 Lb RE Rail



16 ANCHORS PER 39 FT. RAIL

NOTES:

1. RAIL ANCHORS SHALL NOT BE PLACED AGAINST JOINT TIES, INCLUDING INSULATED JOINTS.
2. WHILE THE NUMBER OF ANCHORS REQUIRED MAY VARY WITH LOCAL CONDITIONS, STANDARD IS 16 ANCHORS PER RAIL LENGTH OF 39 FT OR 24 TIES.
3. AT LOCATIONS WHERE ADDITIONAL ANCHORS ARE REQUIRED, POLB WILL DETERMINE THE NUMBER OF ANCHORS REQUIRED.
4. RAIL ANCHOR SHALL BE DRIVEN ON BASE OF RAIL UNTIL LOCKING NOTCH ENGAGES EDGE OF OPPOSITE FLANGE. ANCHORS MUST NOT BE DRIVEN ALONG THE RAIL. IF ADJUSTMENTS ARE NECESSARY, REMOVE AND RE-APPLY.
5. FOR CONTINUOUS WELDED RAIL, APPLICATION OF ANCHORS SHALL BE IN ACCORDANCE WITH RR-301 2 OF 3.
6. TURNOUTS THAT ARE NOT FASTENED WITH ELASTIC CLIPS ARE TO BE FULLY BOX ANCHORED EXCEPT AT JOINTS OR LOCATIONS WHERE ANCHOR WILL INTERFERE WITH SWITCH OPERATION.
7. ELASTIC FASTENERS WILL SATISFY RAIL ANCHORAGE NEEDS. USE OF ANCHORS IN COMBINATION WITH ELASTIC FASTENERS SHALL BE DONE ONLY AS DIRECTED BY POLB ENGINEER.
8. FOR JOINTED RAIL IN LENGTHS IN EXCESS OF 39 FT, CONTINUE THE PATTERN OF BOX ANCHORS APPLIED TO EACH RAIL ON EVERY THIRD TIE, SKIPPING AND ADJUSTING FOR JOINT TIES.
9. ANCHOR PATTERN IS EVERY THIRD TIE TO BE BOX ANCHORED SKIPPING TIES WHERE JOINT BAR IS PRESENT. TIES NUMBER 2, 11, 14, AND 23 MAY BE IMPACTED BY JOINT BAR. IF THIS OCCURS, ANCHOR ADJACENT TIE INSTEAD TO MAINTAIN 8 BOX ANCHORED TIES PER 39 FT.
10. EPOXY BONDED INSULATED JOINTS ARE TO BE CONSIDERED AS CONTINUOUS LENGTHS OF RAIL AND NOT AS "JOINTS" FOR THE PURPOSES OF SELECTING ANCHOR PATTERNS.

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Port of LONG BEACH
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RAILROAD STANDARD PLANS

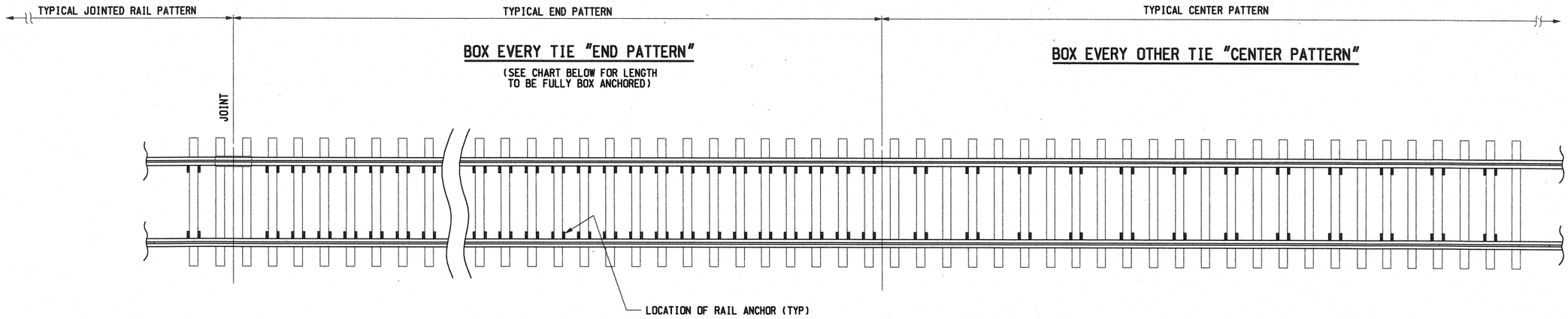
APPLICATION OF ANCHORS TO JOINTED RAIL

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-301

SHEET NO: 1 OF 3

10/4/2013



	END PATTERN ANCHORING REQUIRED AT EACH END OF CWR	
LENGTH OF CWR	MIN DISTANCE OF END PATTERN (FT)	EQUIVALENT NUMBER OF TIES
1000' OR MORE	200	120
800 TO 1000'	160	96
600 TO 800'	120	72
400 TO 600'	80	48
200 TO 400'	40	24

NOTES:

1. END PATTERN IS TO BE APPLIED TO BOTH RAILS WHEN JOINT IS ON ONLY ONE RAIL.
2. FOR JOINTED RAIL, APPLICATION OF ANCHORS SHALL BE IN ACCORDANCE WITH DRAWING RR-301 1 OF 3.
3. BOX ANCHOR EVERY TIE FOR A DISTANCE OF 200 FT AHEAD OF AND BEHIND TURNOUTS ON MAIN TRACK AND TO THE CLEARANCE POINT ON SIDE TRACK OF TURNOUT FOR ALL SWITCHES IN CWR TERRITORY. ALSO BOX ANCHOR EVERY TIE AS ABOVE FOR RAILROAD DIAMOND CROSSINGS.
4. FULLY BOX ANCHOR HOT BOX OR DRAGGING EQUIPMENT DETECTORS FOR 200 FT IN EACH DIRECTION.
5. EPOXY BONDED INSULATED JOINTS DO NOT REQUIRE END PATTERNS.
6. RAIL ANCHORS MUST NOT BE PLACED AGAINST JOINT TIES, INCLUDING INSULATED JOINTS.
7. AT LOCATIONS WHERE ADDITIONAL ANCHORS ARE REQUIRED, POLB WILL DETERMINE THE NUMBER OF ANCHORS REQUIRED.
8. RAIL ANCHOR SHALL BE DRIVEN ON BASE OF RAIL UNTIL LOCKING NOTCH ENGAGES EDGE OF OPPOSITE FLANGE. ANCHORS MUST NOT BE DRIVEN ALONG THE RAIL. IF ADJUSTMENTS ARE NECESSARY, REMOVE AND RE-APPLY.
9. ELASTIC FASTENERS WILL SATISFY RAIL ANCHORAGE NEEDS. USE OF ANCHORS IN COMBINATION WITH ELASTIC FASTENERS SHALL BE DONE ONLY AS DIRECTED BY POLB.
10. IF FIELD WELD INTERFERES WITH TYPICAL END PATTERN, ANCHOR MAY BE OMITTED. DO NOT APPLY ANCHOR TO SAME SIDE OF TIE ON OPPOSITE RAIL, AS ANCHOR PATTERN MUST BE A MIRROR PATTERN TO AVOID SKEWING TIES.
11. APPLIES TO ALL TRACKS-MAINLINE, SIDING, AND YARD WITH CONTINUOUS WELDED RAIL.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

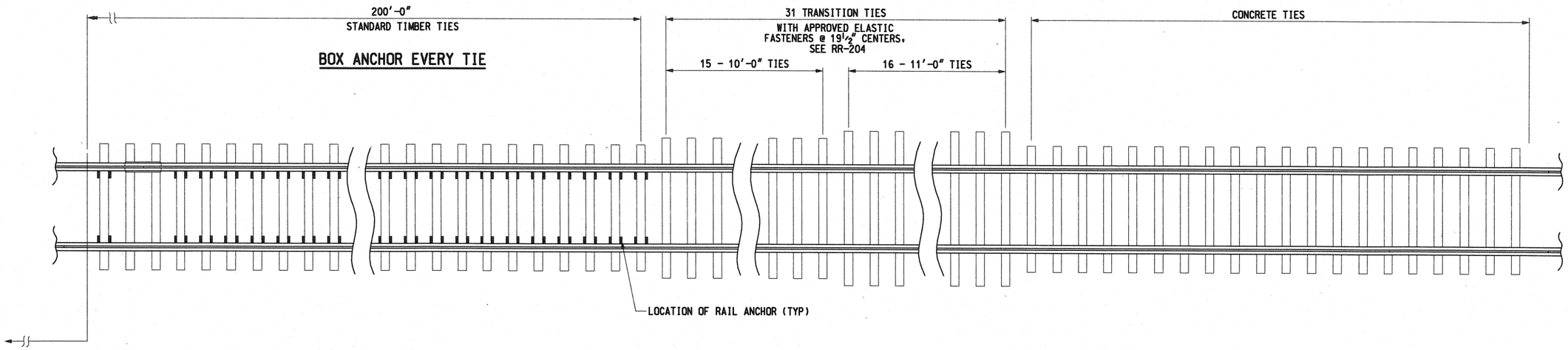
APPLICATION OF ANCHORS TO CONTINUOUS WELDED RAIL TIMBER TIES

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-301

SHEET NO: 2 OF 3

10/4/2013



STANDARD RAIL ANCHOR PATTERN PER RR-301 2 OF 3 IF CWR,
AND RR-301 1 OF 3 IF JOINTED RAIL

NOTES:

1. TRANSITION TIES ZONE, SEE RR-204 FOR DETAILS.
2. BOX ANCHORS ARE REQUIRED FOR 200 FT IN THE TIMBER TIES AFTER TRANSITION TIES. ANCHORS ON BOTH RAILS WILL BE OMITTED IF RAIL JOINTS ARE PRESENT.
3. RAIL ANCHORS MUST NOT BE PLACED AGAINST JOINT TIES, INCLUDING INSULATED JOINTS. GLUE LAMINATED INSULATED JOINTS ARE NOT CONSIDERED AS JOINTS AND WILL BE FULLY ANCHORED.
4. AT LOCATIONS WHERE ADDITIONAL ANCHORS ARE REQUIRED, POLB WILL DETERMINE THE NUMBER OF ANCHORS REQUIRED.
5. RAIL ANCHOR SHALL BE DRIVEN ON BASE OF RAIL UNTIL LOCKING NOTCH ENGAGES EDGE OF OPPOSITE FLANGE. ANCHORS MUST NOT BE DRIVEN ALONG THE RAIL. IF ADJUSTMENTS ARE NECESSARY, REMOVE AND RE-APPLY.
6. ELASTIC FASTENERS IN TIMBER TIE ZONE WILL SATISFY RAIL ANCHORAGE NEEDS. USE OF ANCHORS IN COMBINATION WITH ELASTIC FASTENERS SHALL BE DONE ONLY AS DIRECTED BY POLB.
7. APPLIES TO ALL CONCRETE TIE TRACKS-MAINLINE, SIDING, AND YARD.

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RAILROAD
STANDARD PLANS

APPLICATION OF ANCHORS ON CONTINOUS WELDED RAIL - CONCRETE TO TIMBER TIES

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

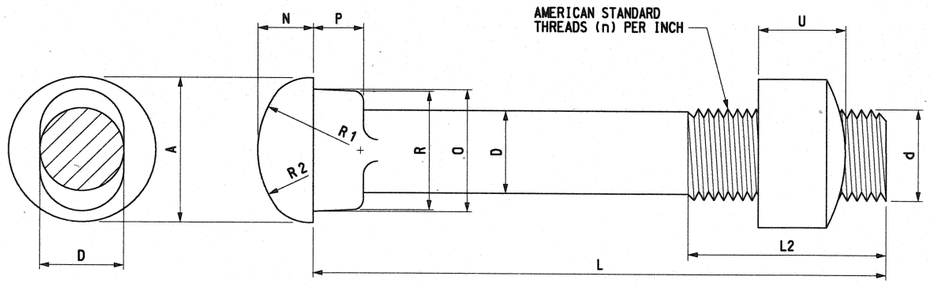
DRAWING NO: RR-301

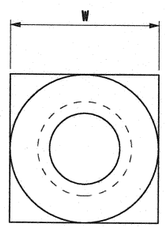
SHEET NO: 3 OF 3

10/4/2013

DIMENSION TABLE (INCHES)

WEIGHT AND SECTION OF RAIL	BOLT													NUT		WEIGHT EACH (BOLT AND NUT)	NUMBER OF BOLTS PER 200 LB KEG	SPRING WASHER		
	THREADS			BODY		HEAD				NECK										
	OUTSIDE DIAMETER	LENGTH	NUMBER PER INCH	SHANK DIAMETER	LENGTH UNDER HEAD	DIAMETER	THICKNESS	LONG RADIUS	SHORT RADIUS	MAXIMUM WIDTH	MINIMUM WIDTH	DEPTH	THICKNESS	WIDTH			INSIDE DIAMETER	OUTSIDE DIAMETER	THICKNESS
	d	L2	n	D	L	A	N	R1	R2	O	R	P	U	W	LBS		ID	OD	T
80 LB ASCE	13/16	1 1/2	10	3/4	4 3/8	1 7/16	9/16			1 1/16	1 1/32	7/16	3/4	1 3/8	1.09	184	7/8	1 3/4	7/16
75 LB CS & CS REV	15/16	1 7/8	9	7/8	4 3/4	1 9/16	11/16			1 7/32	1 3/16	1/2	1 1/8	1 1/2	1.56	128	1 1/16	2 1/16	9/16
80 LB ASCE																			
90 LB AREA	"	"	"	7/8	5 1/8	"	"			"	"	"	"	"	1.62	123	1 1/16	2 1/16	9/16
110 LB RE	1 1/16	2 1/8	8	1	5 3/8	1 11/16	3/4			1 11/32	1 5/16	5/8	1 1/4	1 5/8	2.22	90	1 1/8	2 1/8	9/16
130 LB PS, 130 LB RE	"	"	"	1	6 3/8	"	"			"	"	"	"	"	2.45	82	1 1/8	2 1/8	9/16
112 LB, 115 LB, 131 LB RE	1 1/8	2 1/2	7	1 1/16	6 1/2	1 57/64	45/64	1 55/64	43/64	1 17/32	1 1/2	5/8	1 1/8	1 11/16	2.62	76	1 3/16	2 7/32	9/16
113 LB HF, 132 LB HF																			
119 LB CF&I, 136 LB RE 141 LB RE																			

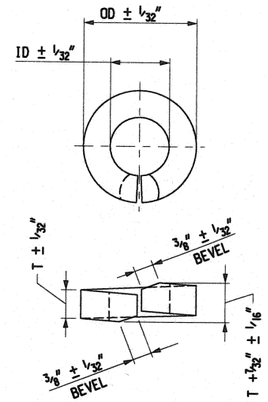




TRACK BOLT AND NUT

NOTES:

1. BOLTS AND NUTS TO BE MADE OF CLASS B STEEL.
2. NOMINAL SIZE OF BOLT IS THE THREAD DIAMETER (d).
3. WASHERS TO CONFORM TO AREMA SPECIFICATIONS.



SPRING WASHER
(NO TENSION)

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Port of LONG BEACH
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RAILROAD STANDARD PLANS

TRACK BOLTS, NUTS AND WASHER

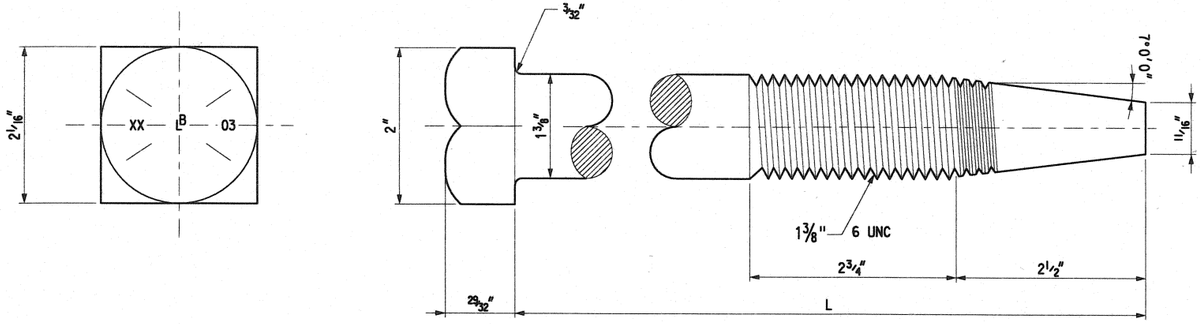
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-302

SHEET NO: 1 OF 1

10/4/2013

...*RR-302 Track Bolts, Nuts and Washer

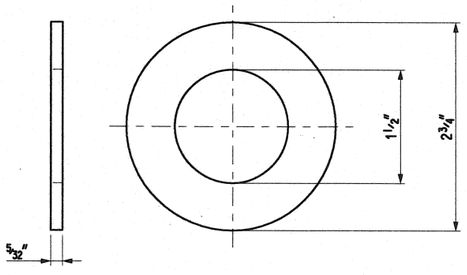


LENGTH = L
19 1/2"
20"
20 1/2"
21"
21 1/2"

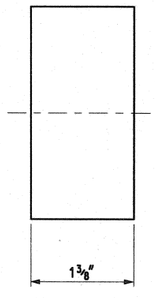
NOTES:

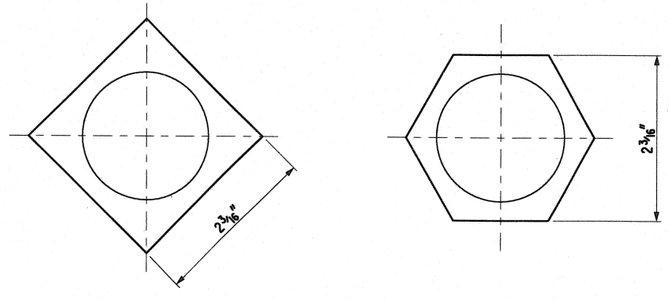
1. WHEN USING/ORDERING TAPERED BOLTS, ADD 2 1/2" TO OLD BOLT LENGTH.
2. BOLT SHALL CONFORM TO THE CURRENT VERSION OF SAE J429 GRADE 8. HEAT TREATED TO 150,000 PSI TENSILE STRENGTH, 130,000 PSI YIELD, OIL QUENCHED FROM 4140 STEEL. HEAD MARKINGS SHALL INCLUDE GRADE 8 GRADE MARKINGS, MANUFACTURER ID, MONTH AND YEAR OF MANUFACTURE. THREADS TO BE ROLLED AND CONFORM TO ANSI/ASME B1.1 UNC-2A THREAD FORM.
3. NUTS SHALL CONFORM TO HARDNESS AND MATERIAL REQUIREMENTS OF SAE J995 GRADE 8 OR ASTM A-563 GRADE 'DH' AND DIMENSIONAL REQUIREMENTS OF ANSI/ASME B18.2.2 HEAVY HEX OR SQUARE NUTS, PLAIN FINISH. HEAVY HEX OR SQUARE LOCK NUT THREADS SHALL CONFORM TO ANSI/ASME B1.1 UNC-2B THREAD FORM, FREE FIT.
4. FLAT WASHERS SHALL CONFORM TO HARDNESS REQUIREMENTS OF THE CURRENT VERSION OF ASTM F-436 AND BE 5/32" THICK.
5. WORKMANSHIP: BOLTS, NUTS, AND WASHERS SHALL BE FREE FROM BURRS, SEAMS, LAPS, AND SCALE.

TAPERED FROG BOLTS



WASHER





SQ NUT OR HEX NUT

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

TAPERED FROG BOLT ASSEMBLY

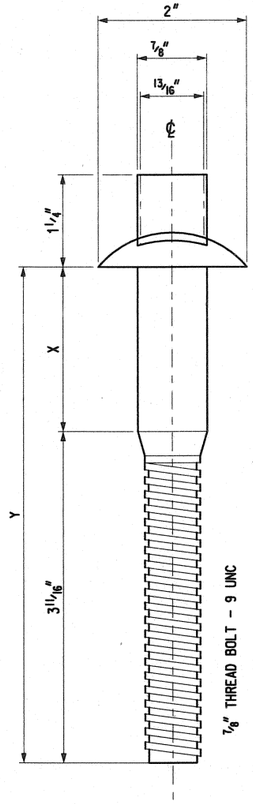
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-303

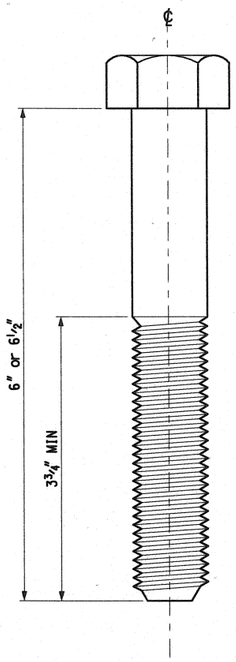
SHEET NO: 1 OF 1

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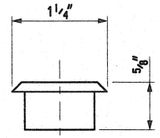
...*RR-303 Tapered Frog Bolt Assembly



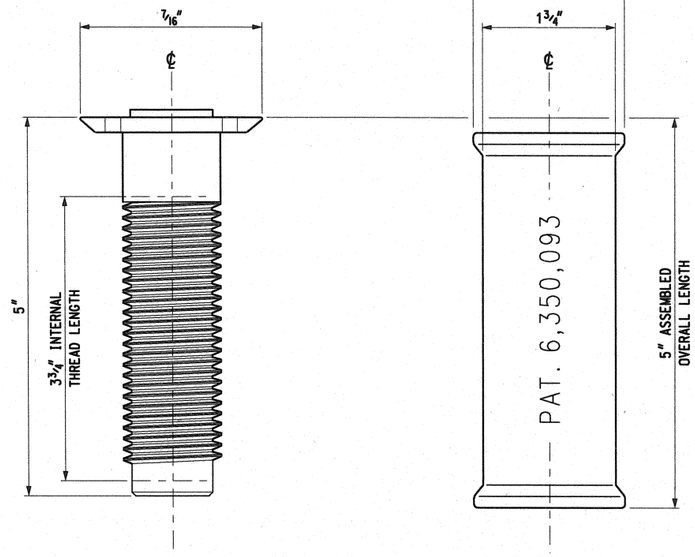
VAPE BOLT
NTS



6" OR 6-1/2" LONG 7/8" UNC BOLT GR A-325 YELLOW ZINC BICHROMATE
NTS



DEBRIS CAP LUG
(CCF 1-14.20)



NYLON 66 THREAD INSERT
NTS
COLOR-WHITE
REMOVABLE/REPLACEABLE

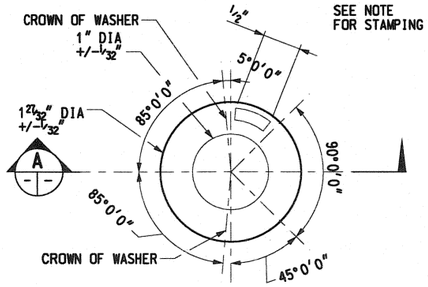
DUCTILE IRON HOUSING
NTS
INTERNALLY THREADED

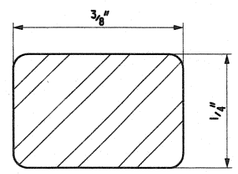
VAPE BOLT DIMENSIONS

X GRIP LENGTH	Y SHANK LENGTH	FOR USE THROUGH
2 3/16"	5 7/8"	3/4" PLATING
2 5/8"	6 3/8"	1" PLATING

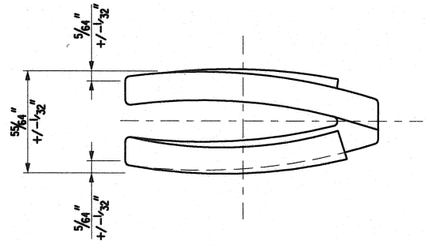
NOTES:

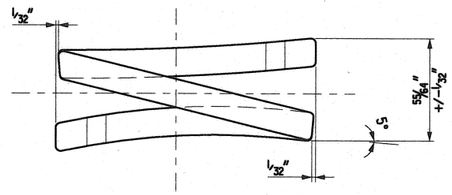
1. 6" OR 6-1/2" LONG 7/8" UNC BOLT GR A-325 YELLOW ZINC BICHROMATE.
2. TO AVOID DAMAGE TO THE TIE, ENSURE THAT PROPER SCREW SIZE IS USED FOR VARIOUS PLATE THICKNESSES. (SEE TABLE)
3. VAPE SCREW TO BE TORQUED TO 150 FT-LBS. THIS TORQUE CORRESPONDS TO A 1mm CLEARANCE BETWEEN COILS ON THE SPRING WASHER.
4. FOR CONCRETE GUARD RAIL TIE SEE RR-202. FOR CONCRETE SWITCH TIE SEE CORRESPONDING TIE PLAN.
5. SPRING WASHERS SHALL CONFORM TO UIC CODE 864-3. DIMENSIONS AS DELIVERED (UNLOADED). STAMPING IS TO BE DONE IN AREA INDICATED ON CURRENT YEAR AND SUPPLIER'S LOGO.





A SECTION
NTS





HELICAL SPRING WASHER
NTS

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

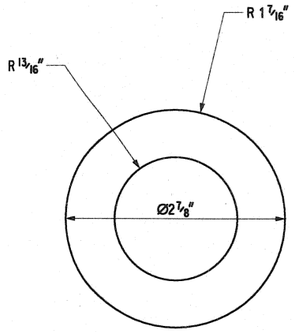
PIM 532 SCREW, INSERT AND HELICAL WASHER FOR CONCRETE TIES

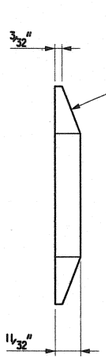
APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-304
SHEET NO: 1 OF 1

10/4/2013

...*RR-304 PIM 532 Screw Insert and Helical Washer for Concrete Ties



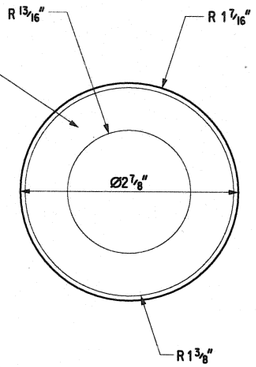


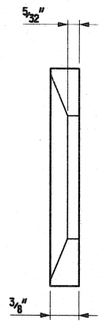
PLAN VIEW SECTION VIEW

TOP WASHER

NTS

INSTALL UNDER BOLT HEAD OR NUT



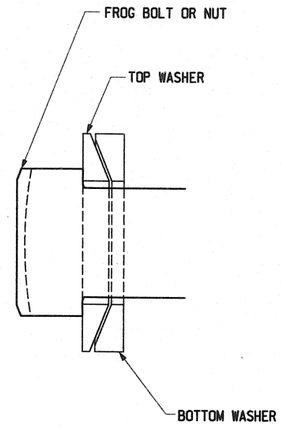


PLAN VIEW SECTION VIEW

BOTTOM WASHER

NTS

INSTALL AGAINST ITEM BEING BOLTED BELOW TOP WASHER



SECTION VIEW

ASSEMBLED WASHER SET

NTS

INSTALLATION NOTES:

1. INSTALL TOP WASHER UNDER BOLT HEAD OR NUT.
2. INSTALL BOTTOM WASHER BELOW TOP WASHER AND AGAINST FROG OR OBJECT BEING CLAMPED.
3. USE OF D-WASHER OR BEVELED WASHERS ARE REQUIRED WHEN INSTALLING SPHERICAL (SELF-ALIGNING) WASHERS ON RAIL AND ON FROGS, WHERE APPLICABLE.
4. BOLT HEAD LOCKS WILL NOT WORK WITH SPHERICAL WASHERS, AND NEED TO BE REPLACED WITH D-WASHERS, BEVELED WASHERS, OR REMOVED BY GRINDING.

MANUFACTURING SPECIFICATION:

1. SURFACE FINISH COEFFICIENT OF FRICTION SHALL BE 0.05-0.10.
2. FINISHED SURFACES MUST PROVIDE LONG-TERM (NOT TEMPORARY) LUBRICATION EFFECTS UNDER EXTREME PRESSURE: 150,000 PSI (10,500 KG/CM SQUARED).
3. FINISHED WASHERS MUST WITHSTAND 1000 HOURS OF ASTM B-117 SALT FOG TEST, WITH LESS THAN 15% RED RUST.
4. FINISHED WASHERS SHALL HAVE THE MINIMUM HARDNESS APPROPRIATE AND SUFFICIENT FOR USE WITH HIGH STRENGTH FASTENERS.
5. MINIMUM COMPENSATING ANGLE SHALL BE 10 DEGREES IN ALL DIRECTIONS.
6. PARTS SHALL BE MARKED WITH MANUFACTURERS IDENTIFYING CHARACTERISTICS.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

SPHERICAL (SELF-CENTERING) WASHER SET

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

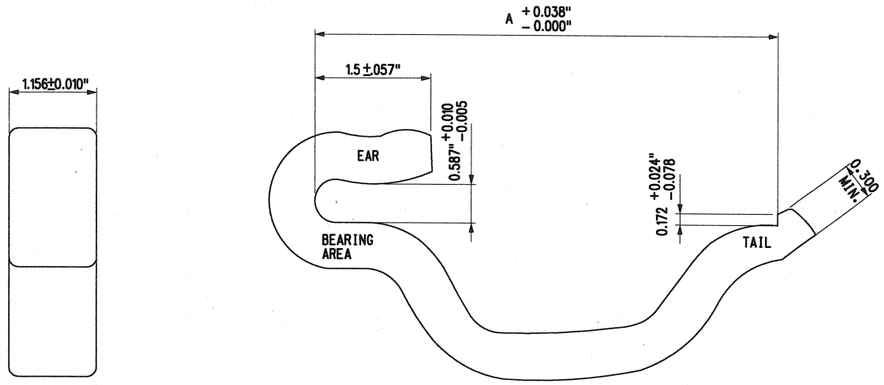
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-305

SHEET NO: 1 OF 1

10/4/2013

...*RR-305 Spherical (Self-Centering) Washer Set



RAIL BASE SIZE	A
5½"	5.625"
6"	6.125"

NOTES:

1. MATERIAL FOR RAIL ANCHOR TO BE HIGH CARBON STEEL.
2. MATERIAL FOR RAIL ANCHOR TO BE HEAT TREATED TO RC 34-47, TARGET RANGE RC 39-44.
3. ALL DIMENSIONS ARE MINIMUM UNLESS OTHERWISE SPECIFIED.
4. TYPICAL CHEMISTRY, CARBON 0.58-0.90, MANGANESE 0.7-1.1, SILICON 0.5 MAXIMUM.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

BAR STOCK ANCHOR FOR 5 1/2" AND 6" BASE RAIL

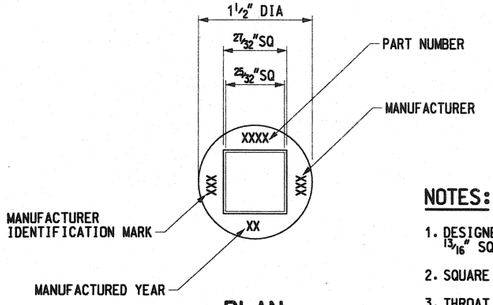
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-306

SHEET NO: 1 OF 1

10/4/2013

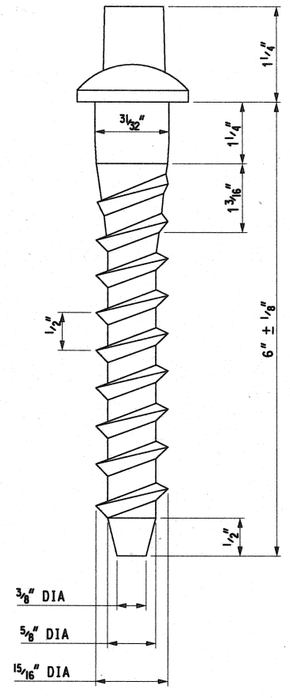
...*RR-306 Bar Stock Anchor for 5 1&slash;2" and 6" Base Rail



PLAN
NTS

NOTES:

1. DESIGNED FOR USE WITH 13/16" SQUARE SOCKET.
2. SQUARE HEAD TIMBER SCREW.
3. THROAT LENGTH 1-1/4".

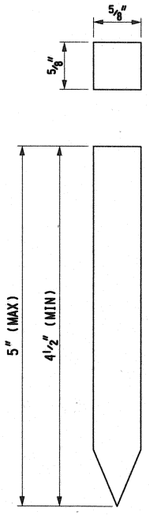


ELEVATION 15/16" SCREW SPIKE
NTS

TIGHT SPIKE
OR APPROVED EQUAL, SPIKE HOLE FINISHING COMPOUND

NOTES:

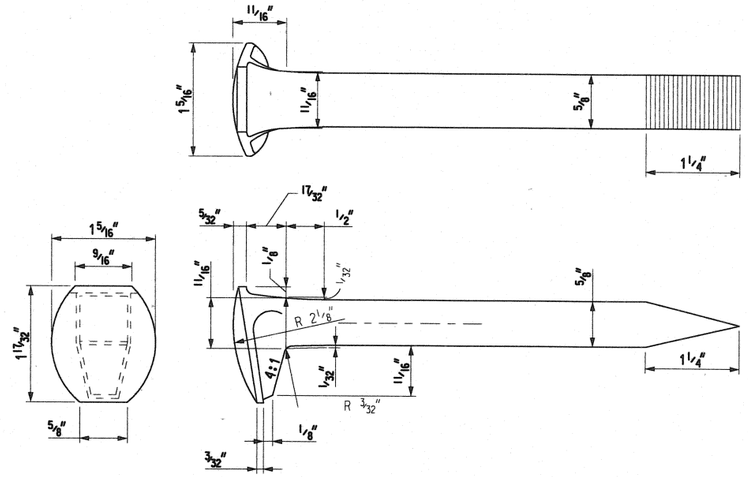
1. CONSISTS OF A 2-PART FILLER MATERIAL-PART A (ISOCYANATE) AND PART B (POLYOL).
2. OPERATORS MUST BE PROPERLY TRAINED AND USE APPROPRIATE EQUIPMENT FOR INSTALLATION OF MATERIAL.
3. MATERIAL IS SUPPLIED IN SEVERAL SIZES INCLUDING SMALL CAULK GUN TUBES FOR MINOR INSTALLATION REQUIREMENTS.
4. MUST ADHERE TO REQUIREMENTS OF MATERIAL SAFETY DATA SHEET WHEN HANDLING MATERIAL.



TIE PLUG
NTS

NOTES:

1. TIE PLUG TO CONFORM TO AREMA STANDARDS.
2. TIE PLUG TO BE FABRICATED FROM HARDWOOD TREATED WITH CREOSOTE, CCA, OR BORATE.
3. MAY BE BUNDLED OR BAGGED.
4. PLUG MUST BE FULLY INSERTED INTO EMPTY SPIKE HOLE AND TAMPED INTO PLACE. REMOVE EXCESS PLUG WITH ADZE.



TRACK SPIKE
NTS

NOTES:

1. TRACK SPIKES MUST CONFORM TO AREMA SPECIFICATIONS WITH REINFORCED THROAT.
2. WEIGHT = 0.85 LBS.
3. PACKAGE IN 50# BOX OR 100# KG.

MATERIAL SPECIFICATIONS:

1. ALL SCREW SPIKES TO BE HOT FORGED.
2. SCREW SPIKES TO BE MADE FROM MEDIUM CARBON STEEL TO MEET ASTM A-66 SPECIFICATIONS.
3. SCREW SPIKES TO BE COATED TO RESIST CORROSION.
4. APPROXIMATE SHIPPING WEIGHT OF EACH SCREW SPIKE: 1.1 LBS.
5. SCREW SPIKES TO BE PACKED 100 TO A BAG.

INSTALLATION INSTRUCTIONS:

1. PRE-DRILL TIMBER TIES WITH 11/16" DIA DRILL BIT TO DEPTH OF 5½".
2. PRE-DRILLED HOLES MUST BE PERPENDICULAR WITH BASE PLATE.
3. USING A ¾" SQUARE DRIVE SOCKET AND AN IMPACT WRENCH, SCREW IN UNTIL SNUG.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

5/8" TRACK SPIKE, 15/16" SCREW SPIKE AND TIE PLUG

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

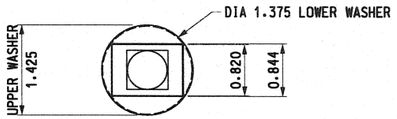
P.E. NO.: C-54141 DATE: 09-19-2013

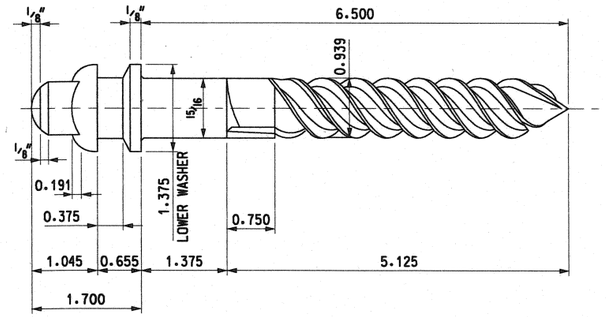
DRAWING NO: RR-307

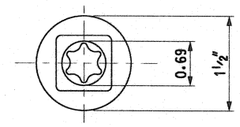
SHEET NO: 1 OF 2

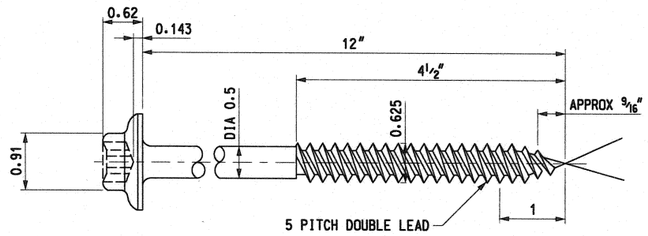
10/4/2013

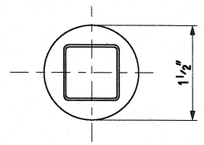
...*RR-307 5&slash;8" Track Spike, 15&slash;16" Screw Spike and Tie Plug 1 of 2

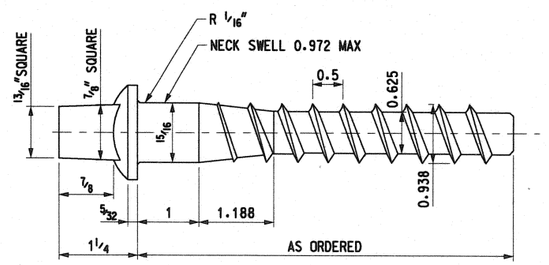












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Port of LONG BEACH
The Green Port

RAILROAD
STANDARD PLANS

SCREW SPIKES AND TIMBER SCREW

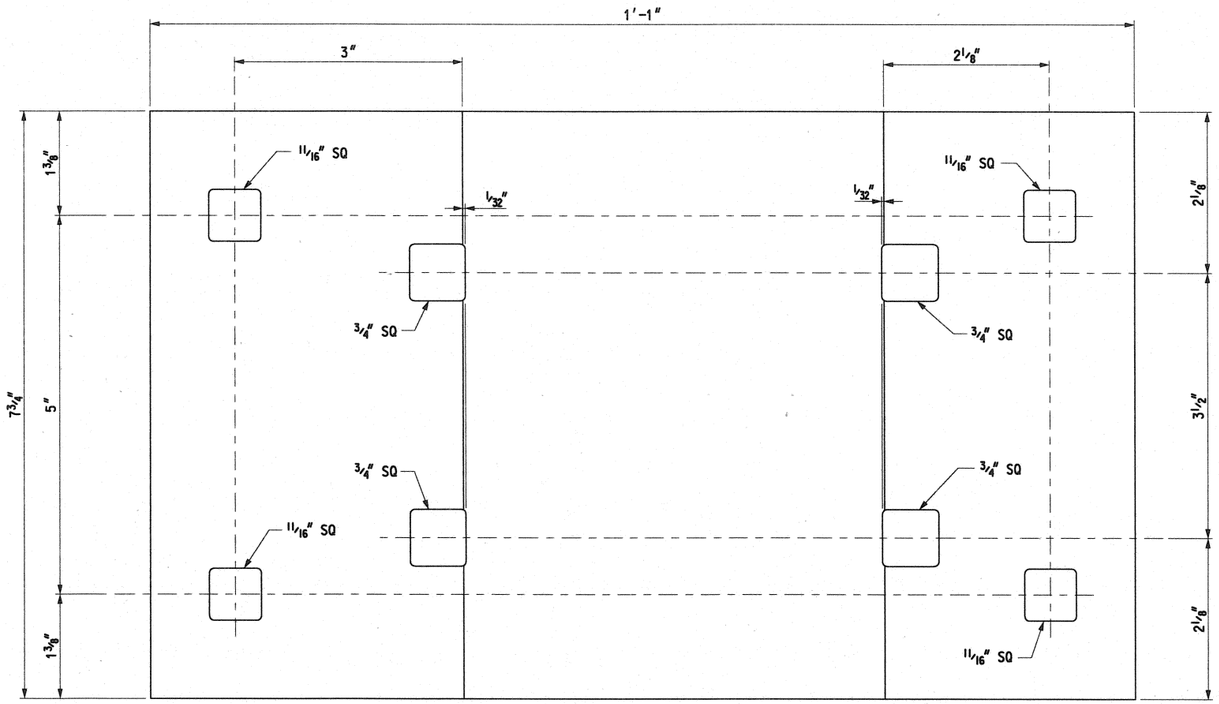
APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

P.E. NO.: C-54141 DATE: 09-19-2013

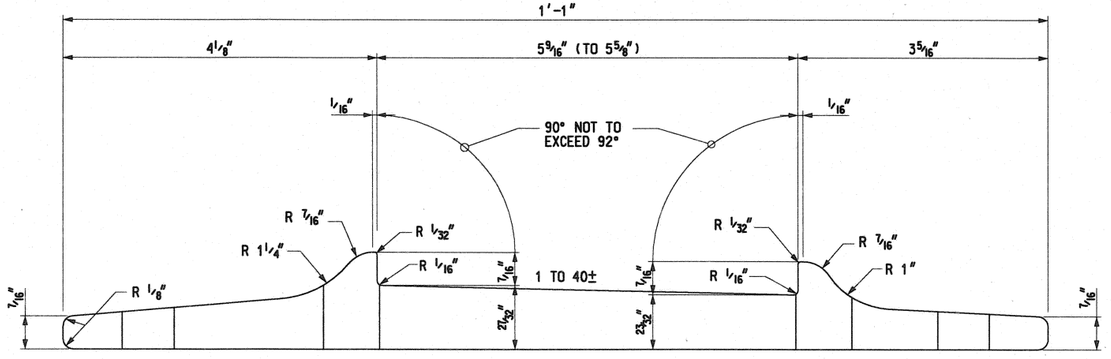
DRAWING NO: RR-307

SHEET NO: 2 OF 2

10/4/2013



PLAN
NTS



ELEVATION
NTS

NOTES:

1. ALL SQUARE SPIKE HOLES SHALL HAVE 1/16" FILLETS IN CORNERS.
2. ESTIMATED WEIGHT: 19.60 LBS EACH.
3. MUST MEET AREMA SPECIFICATIONS.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

STANDARD 13" TIE PLATE FOR 5 1/2" BASE RAIL (115 RE RAIL)

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

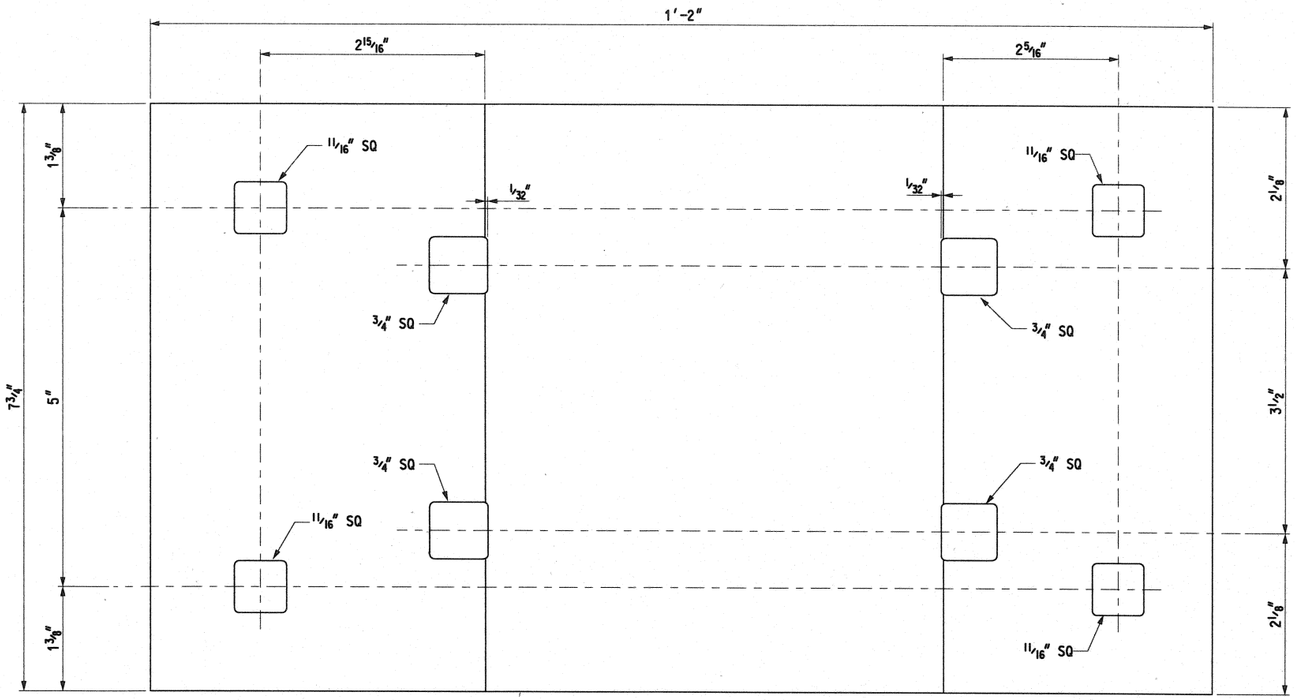
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-308

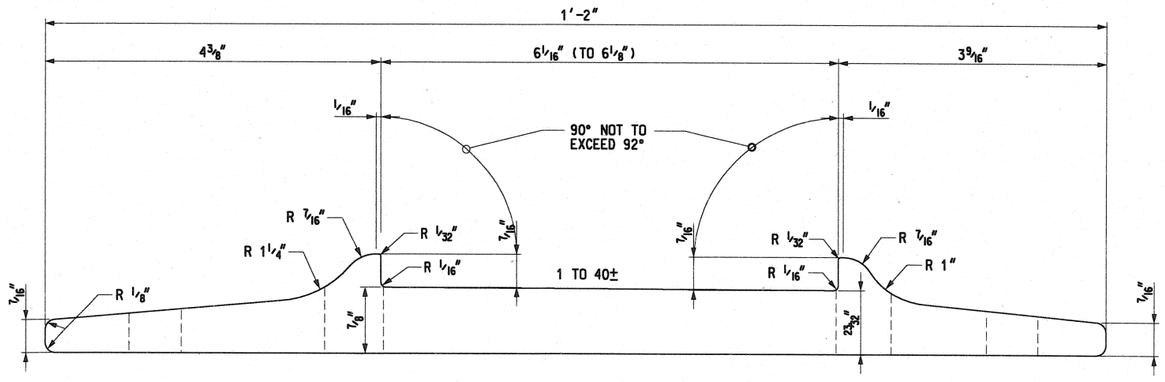
SHEET NO: 1 OF 1

10/4/2013

...*RR-308 Standard 13" Tie Plate for 5 1&slash;2" Base Rail



PLAN
NTS



ELEVATION
NTS

NOTES:

1. ALL SQUARE SPIKE HOLES SHALL HAVE 1/16" FILLETS IN CORNERS.
2. ESTIMATED WEIGHT: 21.47 LBS EACH.
3. MUST MEET AREMA SPECIFICATIONS.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

STANDARD 14" TIE PLATE FOR 6" BASE RAIL (136 RE RAIL)

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-309

SHEET NO: 1 OF 1

10/4/2013

...\RR-309 Standard 14" Tie Plate for 6" Base Rail

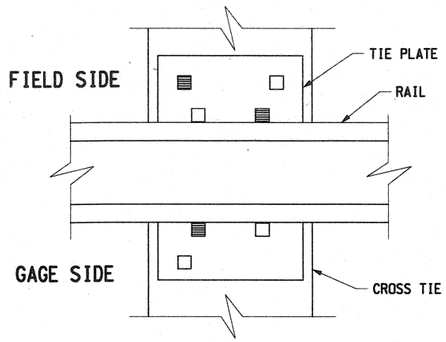


FIG. A

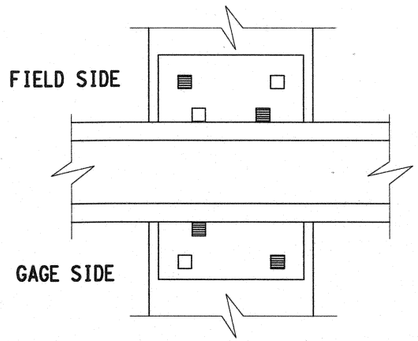


FIG. B

TIE PLATE WITH HOLD-DOWN SPIKE HOLES

NTS

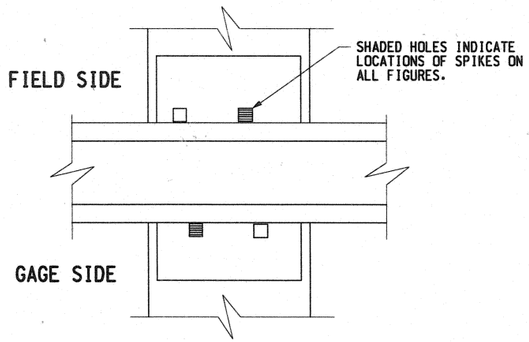


FIG. D

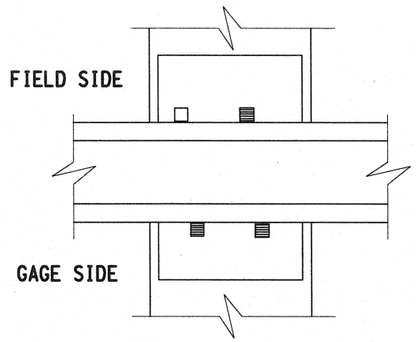
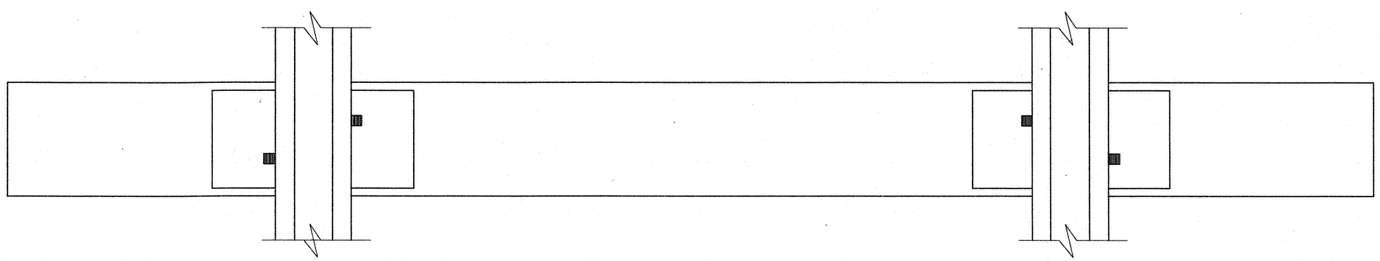


FIG. E

TIE PLATE WITHOUT HOLD-DOWN SPIKE HOLES

NTS



GAGE SPIKES ALIGNED ACROSS BOTH RAILS

NTS

(INSIDE SPIKE TO LOWEST MILEPOST)

NOTES:

1. TIE PLATE SPIKING FOR PLATES WITH HOLD-DOWN SPIKE HOLES.

   FIGURE A - TANGENT AND CURVES TO 2°00' - 3 SPIKES REQUIRED, 2 LINE AND 1 HOLD-DOWN

   FIGURE B - CURVES 2°01' AND OVER 4 SPIKES REQUIRED, 2 LINE AND 2 HOLD-DOWN

2. TIE PLATE SPIKING FOR PLATES WITHOUT HOLD-DOWN SPIKE HOLES.

   FIGURE D - TANGENT AND CURVES TO 2°00' - 2 LINE SPIKES REQUIRED.

   FIGURE E - CURVES 2°01' AND OVER, 3 LINE SPIKES REQUIRED.

3. TIE PLATE SPIKING FOR PANDROL TYPE FASTENING SYSTEMS FIGURE G, 4 SCREW SPIKES REQUIRED.

4. ANY VARIATIONS IN THE SPIKING PATTERNS ILLUSTRATED IN FIGURES A THRU E MUST BE APPROVED BY POLB.

5. YARD AND INDUSTRY TRACK TO BE SPIKED WITH NOT LESS THAN TWO SPIKES TO EACH TIE PLATE.

6. CUT SPIKES MAY BE USED ON "PANDROL" PLATE SQUARE HOLES FOR TEMPORARY ASSEMBLY OF TRACK. THEY WILL NOT BE REMOVED AFTER INSTALLATION OF SCREW SPIKES.

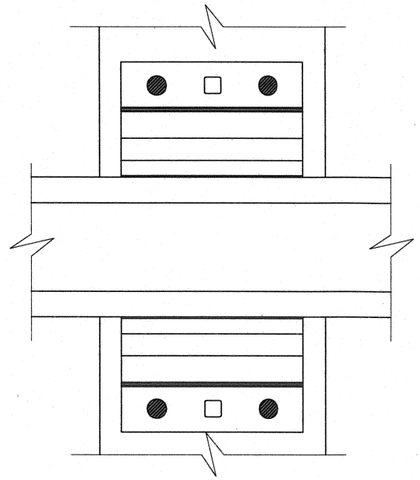


FIGURE G

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

TIE PLATE SPIKING PATTERNS

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

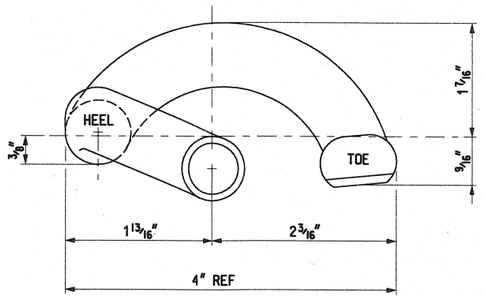
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-310

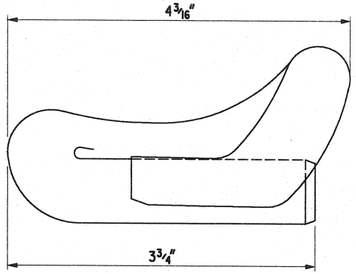
SHEET NO: 1 OF 1

10/4/2013

...*RR-310 Tie Plate Spiking Patterns

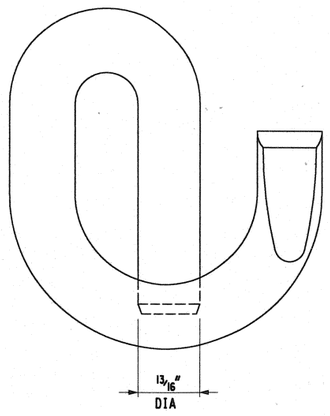


FRONT

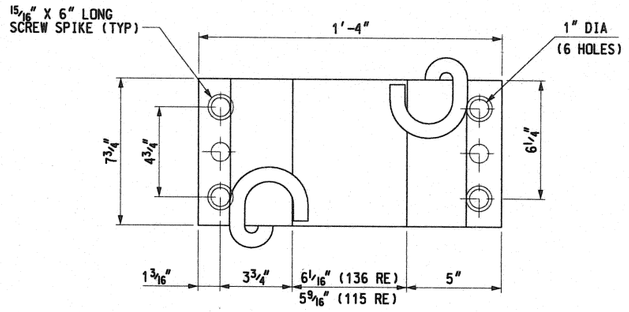


SIDE

(RH CLIP SHOWN, LH OPPOSITE)

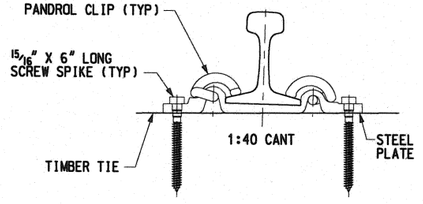


BOTTOM



2 DETAIL - PANDROL "e" CLIP PLATE

SCALE: 1" = 3'-0"



3 DETAIL - PANDROL "e" CLIPS

SCALE: 1" = 2'-0"

NOTES:

1. PANDROL PART NO 2055
2. CLIP IS STANDARD TYPE. GALVANIZED CLIP IS NOT REQUIRED TO COMPLY WITH THIS STANDARD.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

PANDROL "e" CLIP FASTENERS AND ASSEMBLY

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

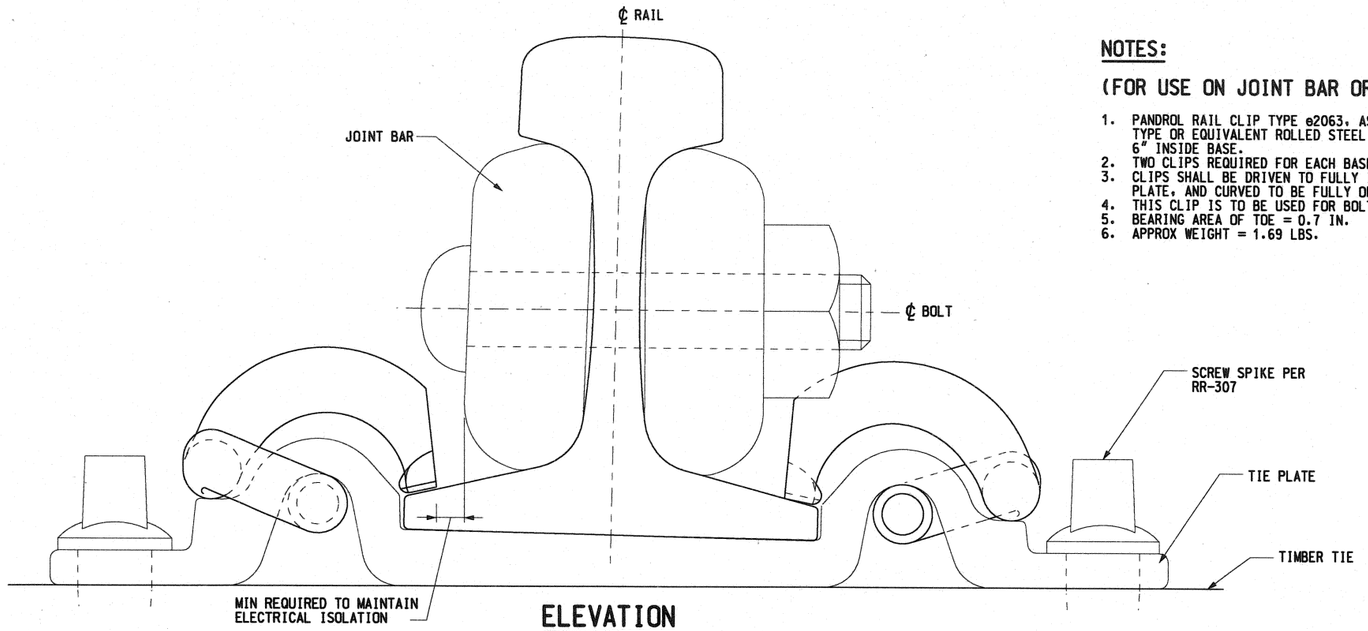
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-311

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...\RR-311 Pandrol "e" Clip Fasteners and Assembly

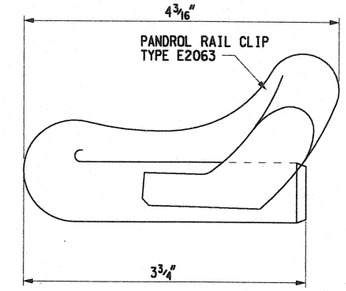


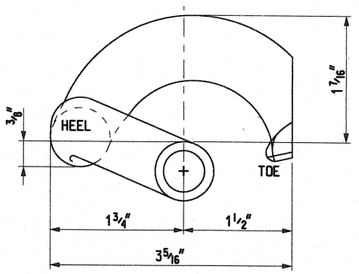
ELEVATION
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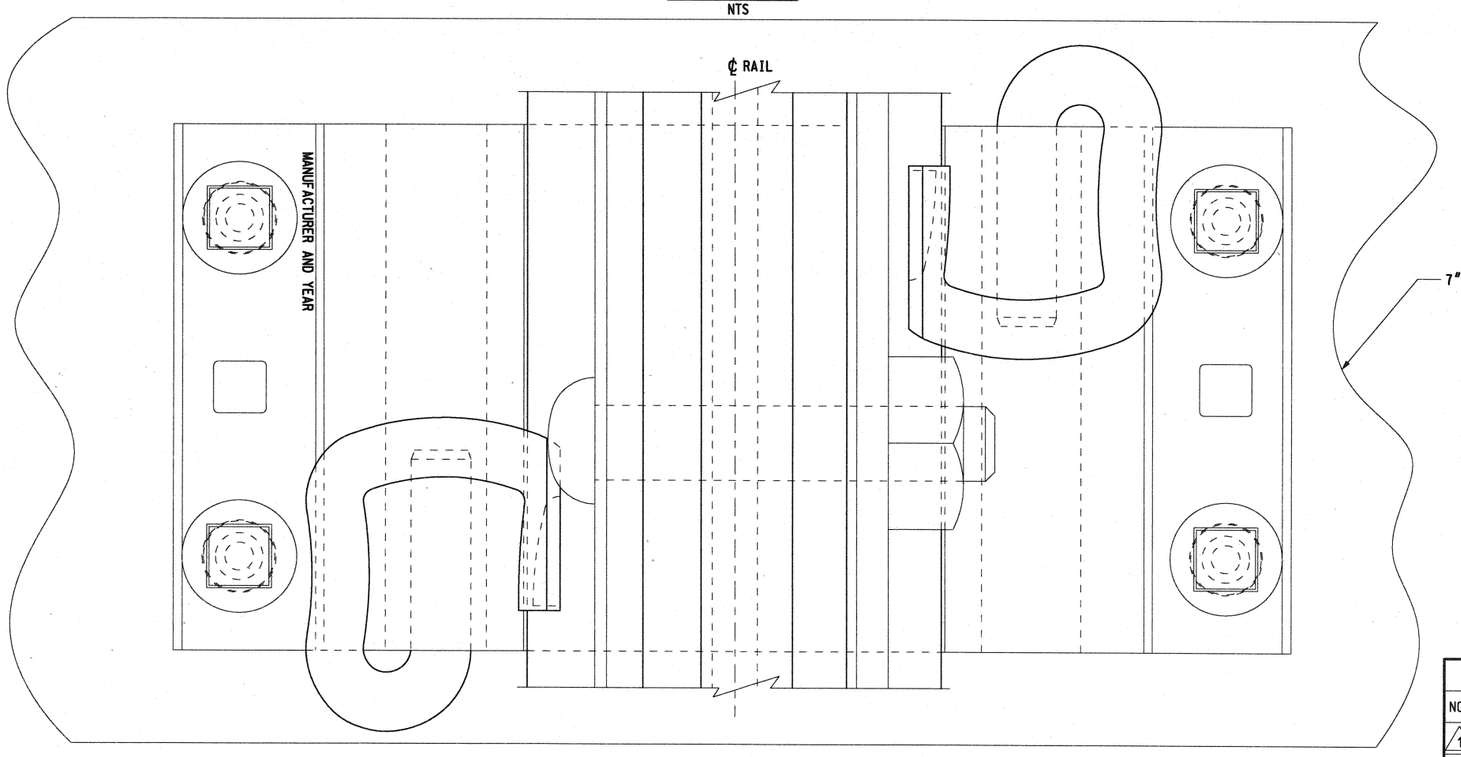
NOTES:

(FOR USE ON JOINT BAR OR INSULATED JOINT)

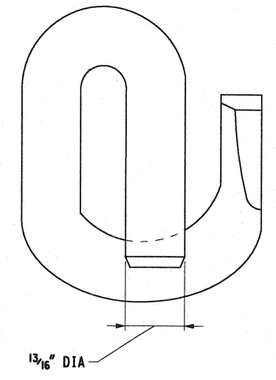
1. PANDROL RAIL CLIP TYPE e2063, AS SHOWN, IS USED WITH PANDROL TYPE OR EQUIVALENT ROLLED STEEL BASE PLATES FOR RAIL WITH 5½" OR 6" INSIDE BASE.
2. TWO CLIPS REQUIRED FOR EACH BASE PLATE.
3. CLIPS SHALL BE DRIVEN TO FULLY INSERT STRAIGHT PART OF ANCHOR INTO PLATE, AND CURVED TO BE FULLY OUTSIDE PLATE.
4. THIS CLIP IS TO BE USED FOR BOLTED OR INSULATED JOINTS.
5. BEARING AREA OF TOE = 0.7 IN.
6. APPROX WEIGHT = 1.69 LBS.







PLAN
NTS



SHAVED CLIP FOR ANGLE BAR
NTS

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

PANDROL JOINT "e" CLIP TYPE e2063

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

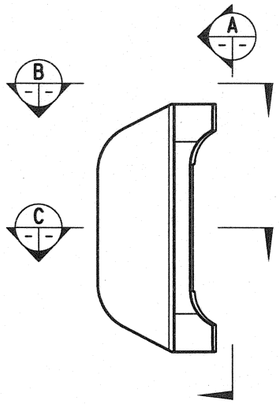
P.E. NO.: C-54141 DATE: 09-19-2013

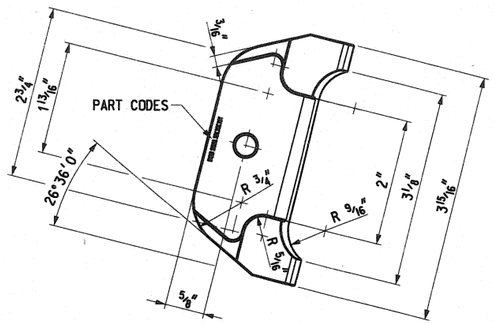
DRAWING NO: RR-312

SHEET NO: 1 OF 1

10/4/2013

...*RR-312 Pandrol Joint E-Clip Type e2063





PART CODES:

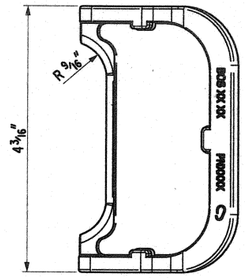
MANUFACTURER CODE
MATERIAL CODE
MOLD CAVITY
PART NUMBER

AIRBOSS RAILWAY PRODUCTS BOS 1234 56 78 90

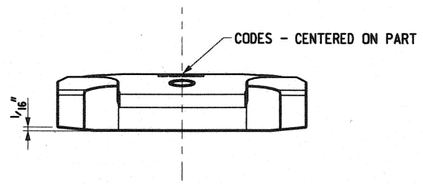
PRODUCT MANUFACTURE DATE CODE TO BE 10MM DIA., CLEARLY SHOWING MONTH AND YEAR OF MANUFACTURE.

NOTES:

1) ALL DIMENSIONAL TOLERANCES ARE +/-1.0 MM/DEGREE, UNLESS SPECIFIED.
2) MOISTURE CONDITIONED, WHEN APPLICABLE, IS CONDUCTED TO UNIT RAIL ID-001.
3) APPROVED RAW MATERIAL: UNIT RAIL GRADE #34, OR AS SPECIFIED ON UNIT RAIL PURCHASE ORDER.
4) ALL INSULATORS ARE SUBJECTED TO TI-001, TOP IMPACT TESTING.
5) USE HEAVY DUTY INSULATOR ON CURVES 2° AND ABOVE.

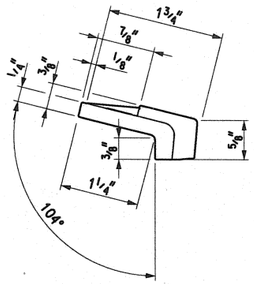


PLAN

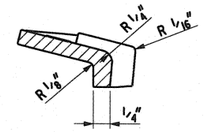


POST THICKNESS DIMENSION 6.8 MM TO BE MEASURED AT ANY LOCATION ON BOTTOM.
FLASH ON PARTING LINE TO BE LESS THAN 0.5MM HIGH.

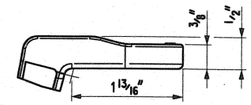
A SECTION
SCALE: NTS



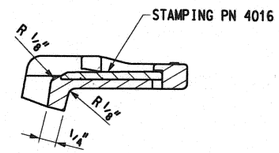
B SECTION
SCALE: NTS



C SECTION
SCALE: NTS



SIDE



SECTION

PLASTIC INSULATOR (RPS-00-1061)

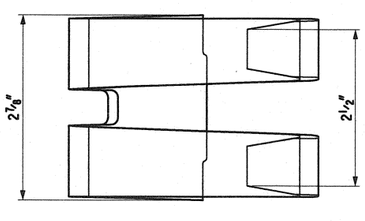
NTS

STD AIRBOSS/SAFELOK HEAVY DUTY INSULATOR

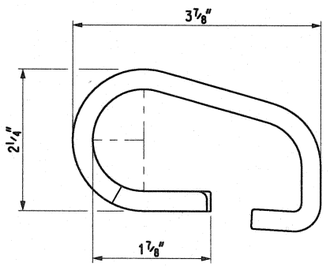
NTS

NOTES:

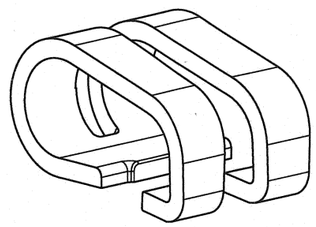
HEAVY DUTY INSULATOR, STANDARD DEPTH & THICKNESS FOR AIRBOSS/SAFELOK TYPE ASSEMBLIES.
ASSEMBLY CONSISTING OF STEEL STAMPING AND PLASTIC SHEATH.
SHEATH MATERIAL: AMSTED APPROVED GRADE #34: PS-008.
STAMPING MATERIAL: AMSTED APPROVED GRADE #61. STAMPING PN 4016
PART PACKAGING: SEE PURCHASE ORDER FOR INSTRUCTIONS.



TOP



SIDE



PN U2000 SPRING CLIP

NTS

PN U2000

SALES DRAWING OF BASIC DIMENSIONS.
TOE LOAD: 4,750 LB-FORCE, PER RAIL SEAT NOMINAL.
TEMPER TO 43-47 HRC.
CLIPS TO BE FREE OF NOTCHES, BURRS, SCRATCHES, ETC.
RED OXIDE PRIMER COATED, UNLESS SPECIFIED OTHERWISE.

AMSTED RPS MATERIAL CODE #50. PRODUCT SPECIFICATION PS-007

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

SAFELOK FASTENERS, TIE PADS AND INSULATORS

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-313
SHEET NO: 1 OF 1

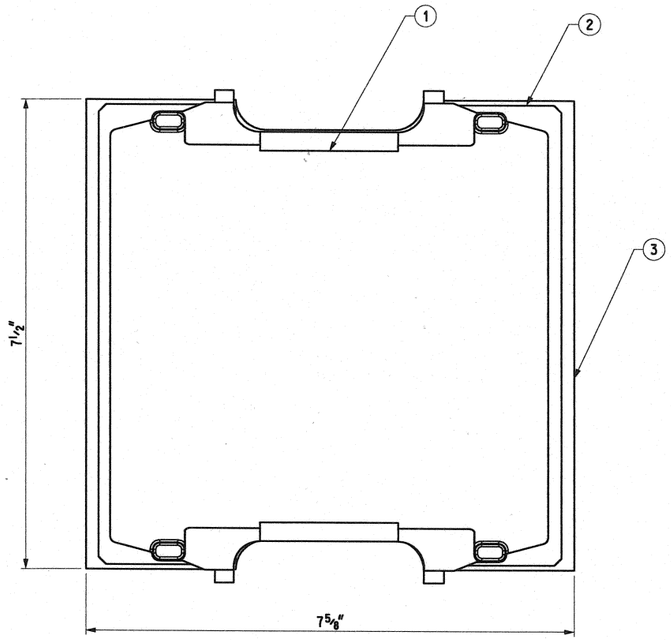
10/4/2013

...\RR-313 Safelock Fasteners, Tie Pads and Insulators

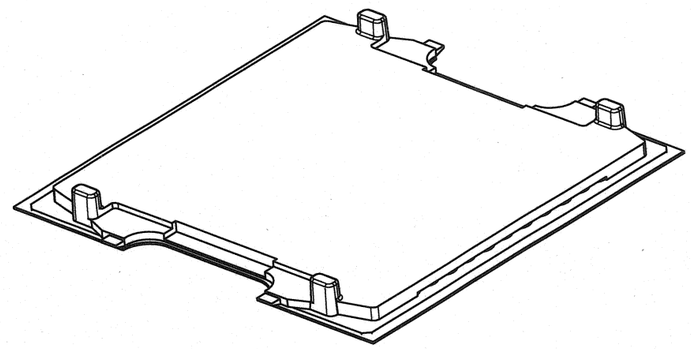
PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	1011	POLY PAD 6.0 MM
2	1	1010	ABRASION PLATE, 1.4MM (U OR M DESIGN)
3	1	1004	GASKET



SIDE
NTS



TOP
NTS



ISOMETRIC
NTS

ASSEMBLY PART NO: U1036:

FOR NEW TIES OR MAINTENANCE OF EXISTING TIES.

- 6.0 MM THICK. POLYURETHANE PAD U1011 (RMS #16)
- 1.4 MM THICK. U1010 OR M1010
- ABRASION GASKET U1004

PARTS ASSEMBLED TOGETHER WITH TAPE INTO ONE UNIT.

REVISIONS	
NO.	DATE
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Port of LONG BEACH
The Green Port

RAILROAD
STANDARD PLANS

SAFELOK CONCRETE TIE PADS 6" BASE RAIL

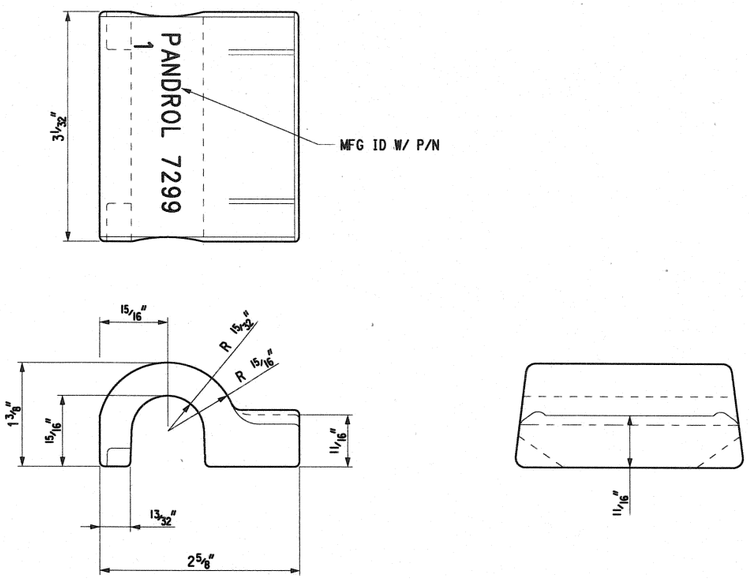
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-314

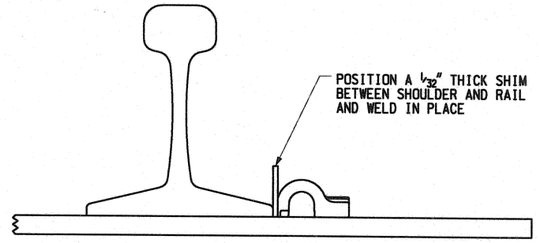
SHEET NO: 1 OF 1

10/4/2013

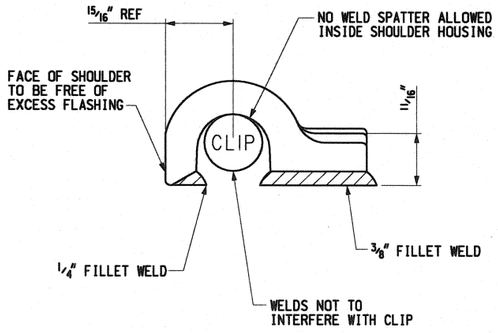
...*RR-314 Safelok Concrete Tie Pads 6" Base Rail

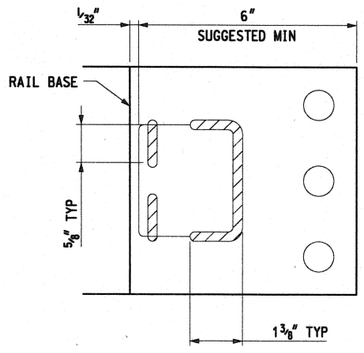


WELD-ON SHOULDER PANDROL P/N 7299-1



POSITIONING SHOULDER





WELDING DETAIL OF 7299-1 SHOULDER

NOTES:

1. ALL WELDS TO BE IN ACCORDANCE WITH AREMA WELDING SPECIFICATIONS, 1/8" 7018 WELDING ROD, 3-PASSES.
2. ALL WELDS TO HAVE FULL PENETRATION TO BOTH PLATE AND SHOULDER.
3. WELD MUST NOT INTERFERE WITH EITHER THE RAIL OR THE CLIP.
4. RAIL SEATS AND INSIDE SHOULDER HOUSING TO BE FREE OF EXCESS WELD, SLAG, AND SPATTER.
5. SHOULDERS TO BE TACKED (OR CLAMPED) DOWN PRIOR TO FINAL WELDING, TO PREVENT THE CLIP FROM RISING DURING THE FINAL WELDS.
6. SHOULDER TO BE GENERALLY CENTERED ON THE PLATE, IF POSSIBLE.

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

WELD-ON SHOULDER FOR PANDROL "e" CLIPS

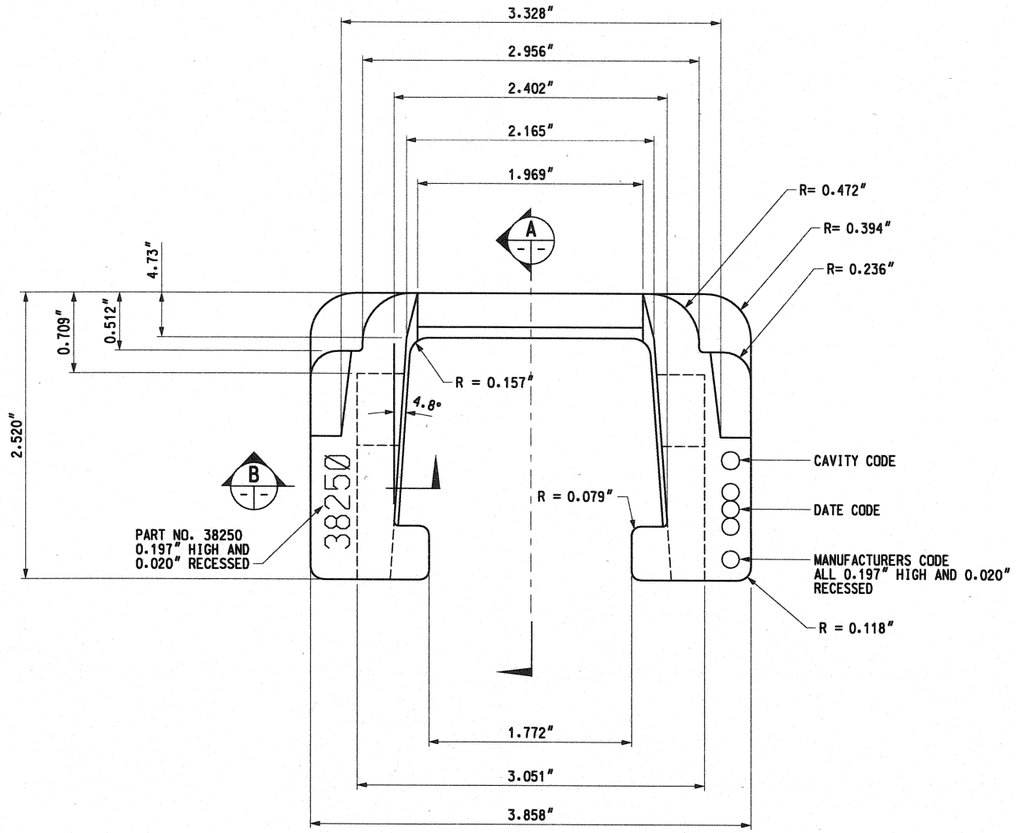
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

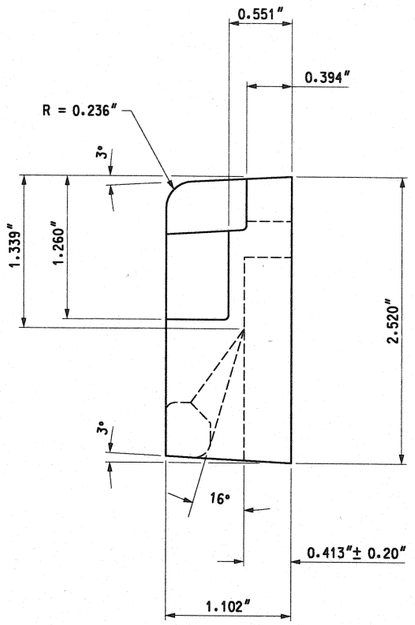
DRAWING NO: RR-315

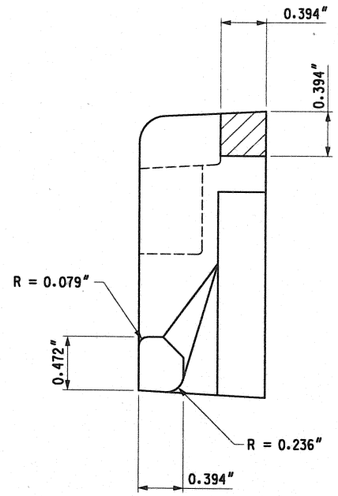
SHEET NO: 1 OF 1

10/4/2013

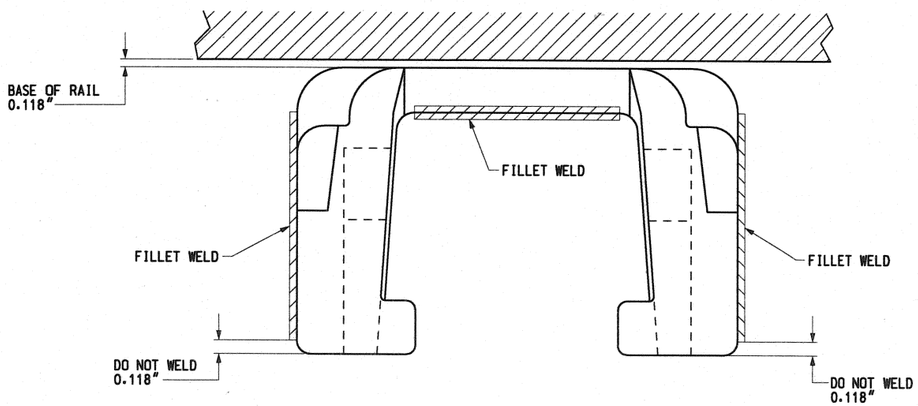
...*RR-315 Weld-on Shoulder for Pandrol "e"Clips



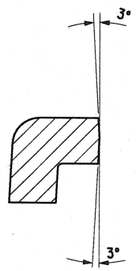




A SECTION
SCALE: 1½" = 1'-0"



WELD DETAIL
SCALE: 1½" = 1'-0"



B SECTION - REMOVED
SCALE: 1½" = 1'-0"

NOTES:

1. RECOMMENDED WELDING ROD: 7018 LOW HYDROGEN, AWS E9018 10., E10018 D2.
2. SHOULDER TO BE WELDED TO STEEL PLATES. REQUIRES WELDING AS SHOWN AND NO POST WELD GRINDING REQUIRED.
3. MATERIAL IS A148 CAST STEEL
4. NO INSULATOR NEEDED FOR THIS SHOULDER.

REVISIONS	
NO.	DATE
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Port of LONG BEACH
The Green Port

RAILROAD
STANDARD PLANS

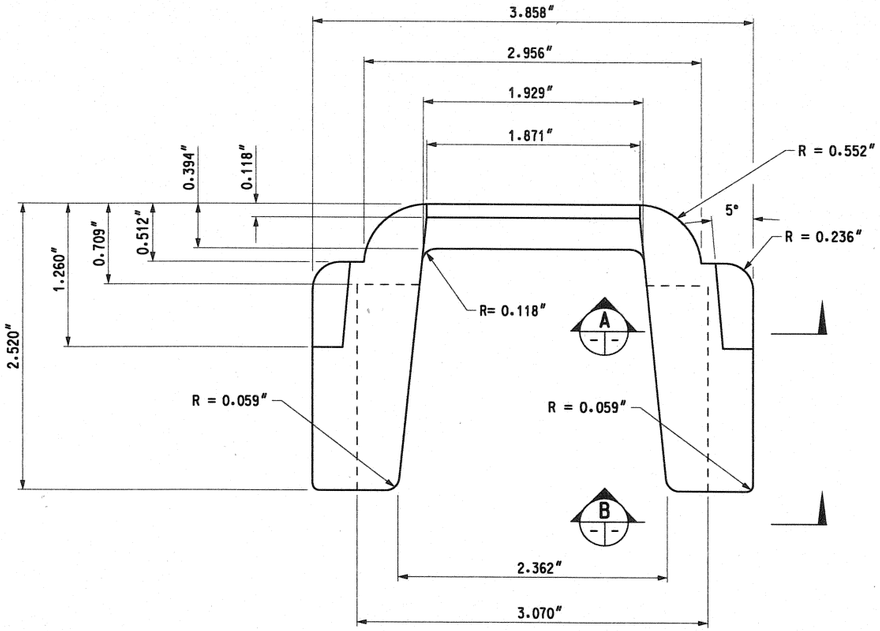
NON-INSULATED WELD ON SHOULDER #38250 FOR SAFELOK CLIP

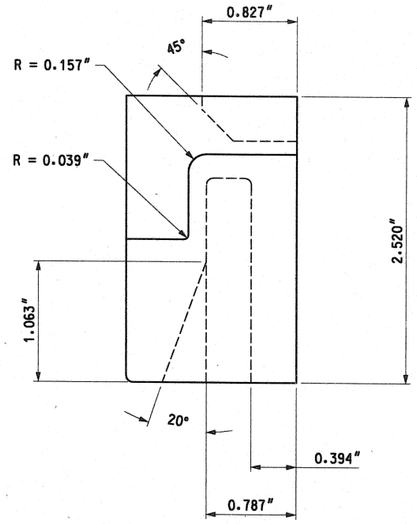
APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-316
SHEET NO: 1 OF 1

10/4/2013

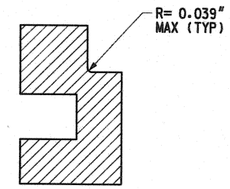
...*RR-316 Non -Insulated Weld On Shoulder #38250 For Safelok Clip





INSULATED SHOULDER #36606

SCALE: 1½" = 1'-0"

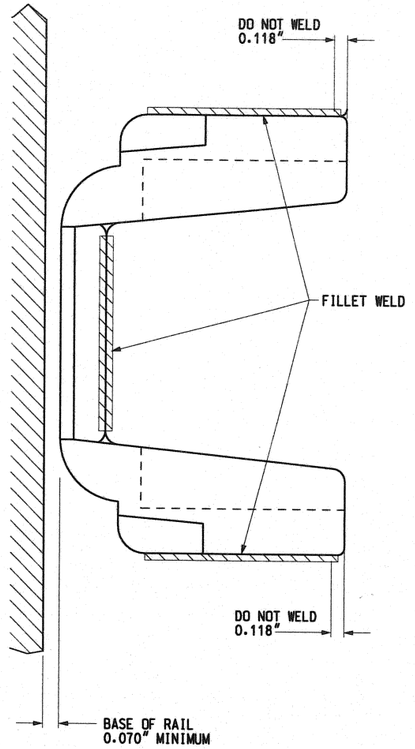


A SECTION

SCALE: 1½" = 1'-0"



PART NO. ON THIS FACE
0.197" x 0.020" DEEP
OR RAISED

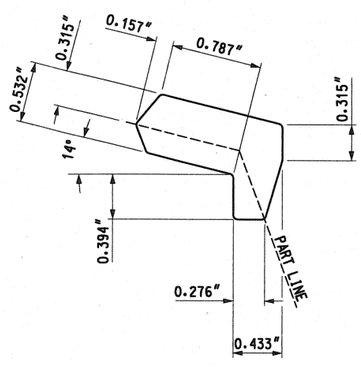


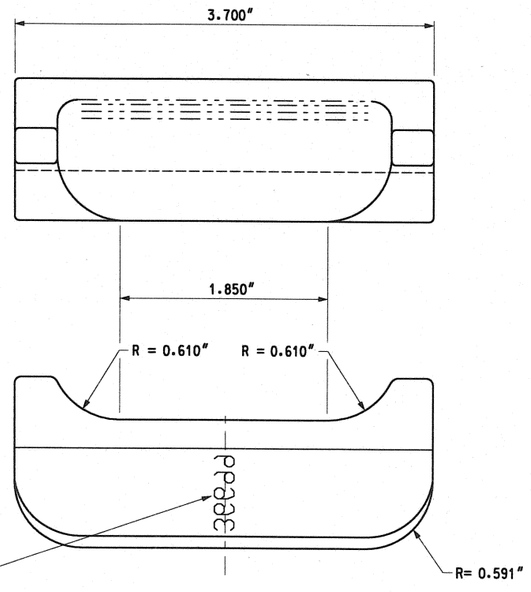
B SECTION

SCALE: 1½" = 1'-0"

WELD DETAIL

SCALE: 1½" = 1'-0"





PART NO. TO BE 0.157" HIGH
x 0.029" DEEP ALONG OPPOSITE
SIDE AS SHOWN 36699

CAST SPACER #36699

SCALE: 1½" = 1'-0"

NOTES:

1. ALL RADII TO BE 0.070" EXCEPT WHERE NOTED.
2. SHOULDER TO BE WELDED TO STEEL PLATES. REQUIRES WELDING AS SHOWN AND NO POST WELD GRINDING REQUIRED.
3. MATERIAL IS A148 CAST STEEL.
4. MOST INSTALLATIONS REQUIRE INSULATORS AND PADS. CAST SPACER REQUIRED INSTEAD OF TIE PAD AND CLIP INSULATOR IN INSULATED WELD-ON SHOULDER APPLICATION IN SOME SPECIAL TRACKWORK.

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

INSULATED WELD ON SHOULDER #36606 AND CAST SPACER #36699

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

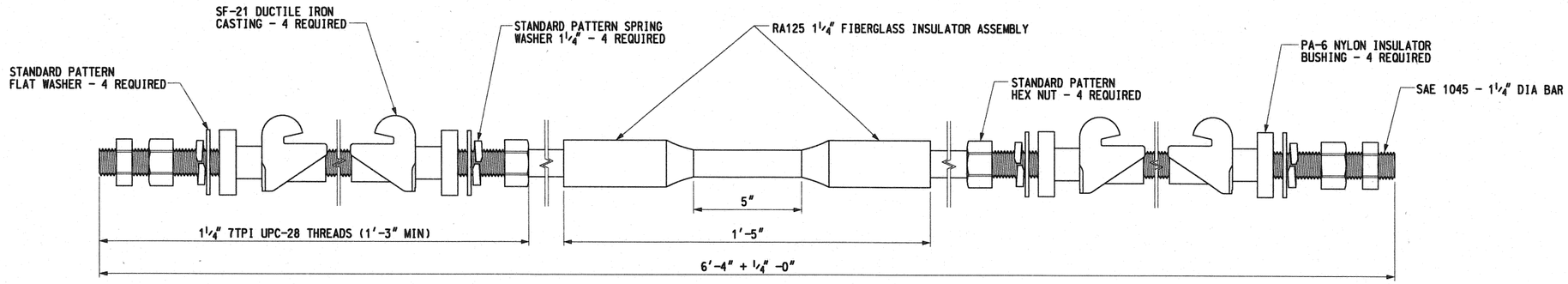
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-317

SHEET NO: 1 OF 1

10/4/2013

...*RR-317 Insulated Weld On Shoulder#36606 and Cast Spacer #36699



SPECIAL NOTE TO MANUFACTURER:
ALL THREADS TO BE COATED WITH BOSTIK "NEVER-SEIZE".

NOTES:

1. ROD SHALL BE SAE1045. THREADS SHALL BE 1¼" 7 UNC-2B.
2. RAIL ENGAGEMENT FITTINGS (SF-21) SHALL BE OF 60, 000 PSI TENSILE, 45, 000 PSI YIELD, AND 12% ELONGATION PROPERTIES WITH STANDARD MILL TOLERANCES.
3. AFTER ASSEMBLING THE RA125, BUFF SMOOTH ALL WRENCH MARKS.
4. PA-6 INSULATORS ARE POLYMIDE TYPE 6 NYLON. ALL RODS SHALL BE SHIPPED ASSEMBLED.
5. INCLUDE JAM NUT ON EACH END OF ASSEMBLY.
6. CHAMFER ENDS OF ROD BEFORE THREADING.

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD
STANDARD PLANS

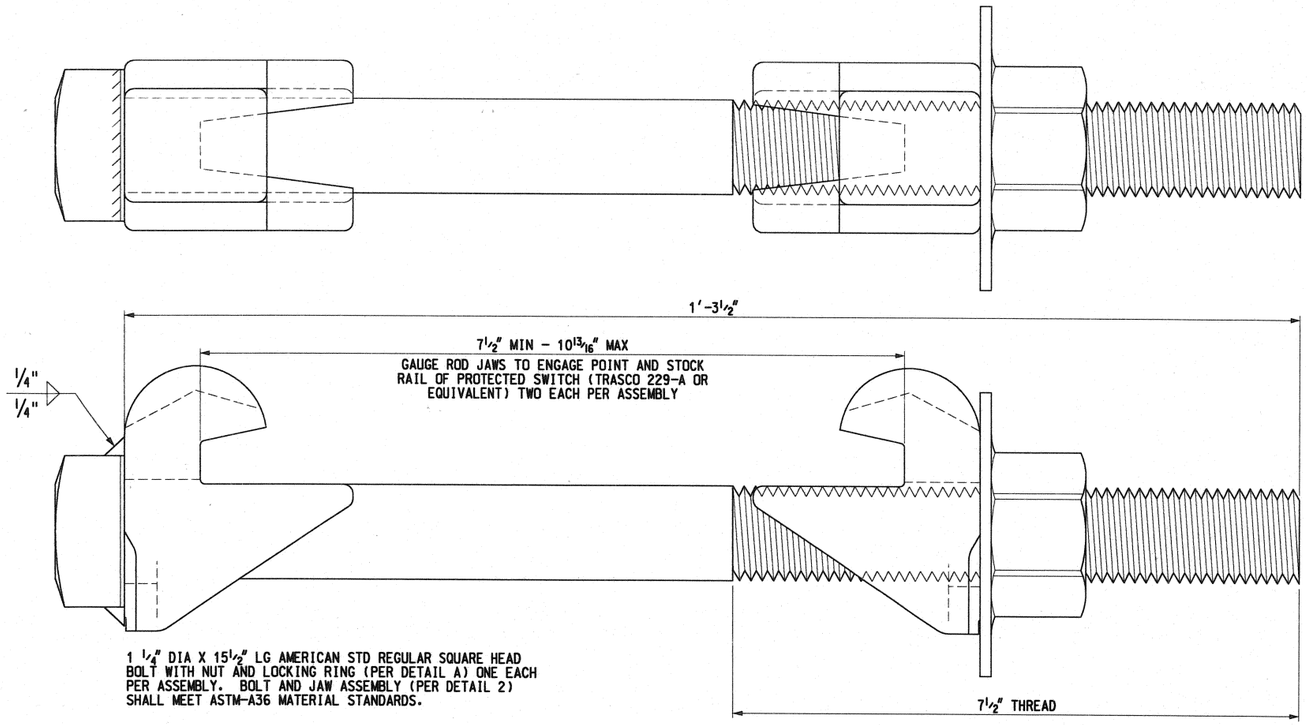
INSULATED GAUGE ROD

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-318

SHEET NO: 1 OF 1

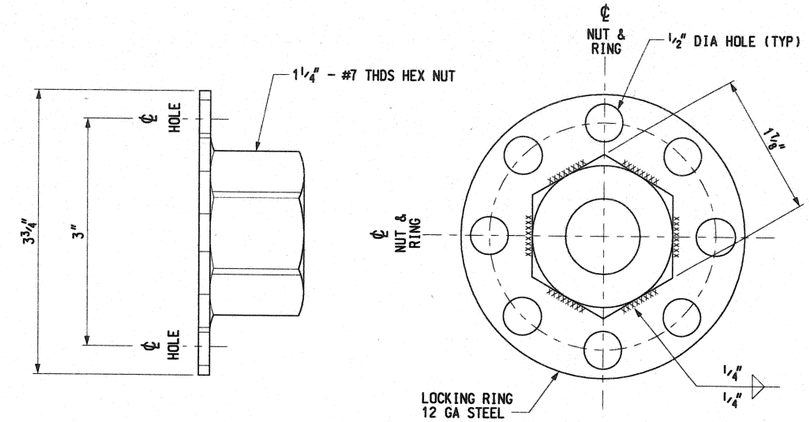
10/4/2013



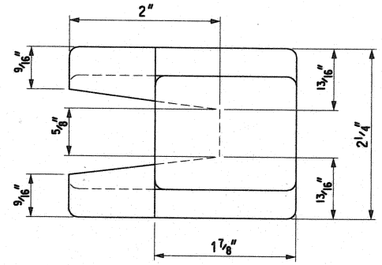
SWITCH POINT CLAMP

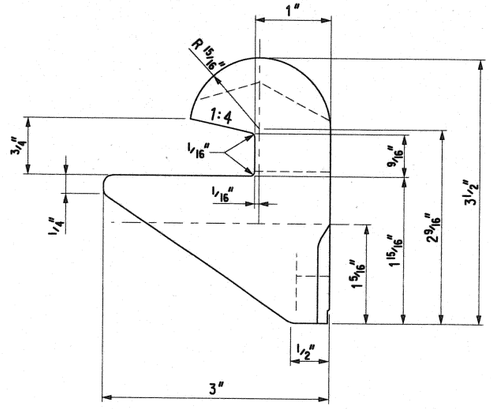
NOTES:

1. TO BE INSTALLED ALONG SWITCH POINT BETWEEN POINT OF SWITCH AND NO 2 ROD.
2. PAINT ASSEMBLY DARK BLUE. EXCEPT THREADS. USE SWITCH PADLOCK.
3. WHEN CLAMP IS APPLIED ON SWITCH WITH HAND THROW SWITCH STAND, STANDARD SWITCH LOCK WILL BE REPLACED WITH MAINTENANCE PADLOCK, AND TAGGED "OUT OF SERVICE".



1 DETAIL - NUT AND LOCKING RING





2 DETAIL - CLAMP CASTING

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

SWITCH POINT CLAMP

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

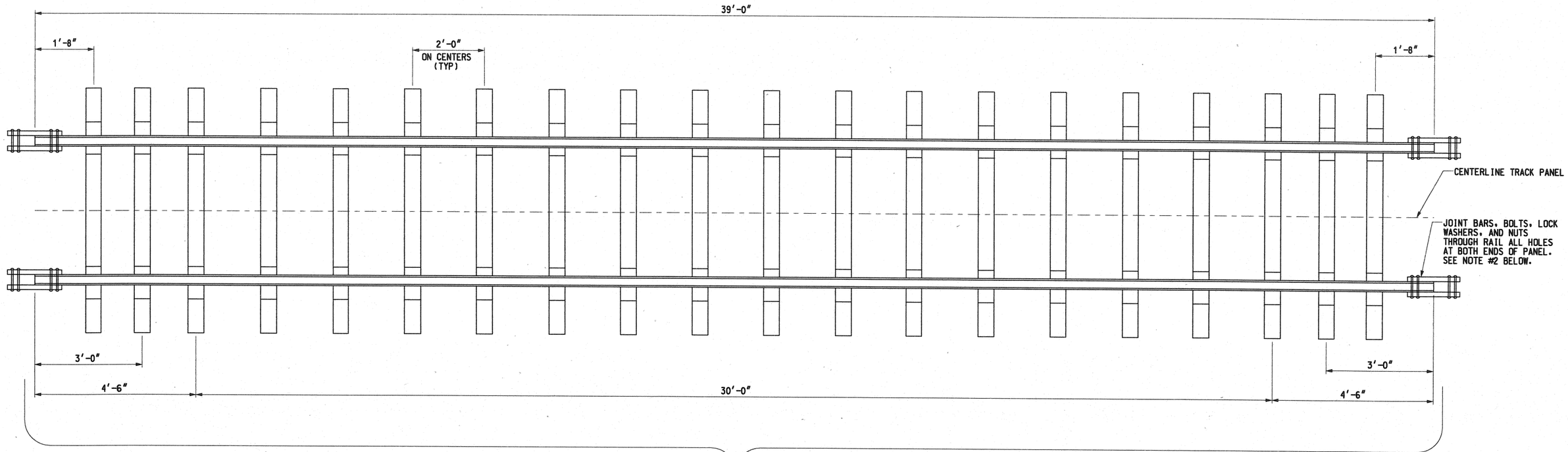
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-319

SHEET NO: 1 OF 1

10/4/2013

...\RR-319 Switch Point Clamp



CONCRETE TIE EMERGENCY TRACK PANEL

PANEL WEIGHT: 8'-6", 630 LB TIE IS 16,200 LBS.
NTS

NOTES:

1. 39' TRACK PANEL WITH 8'-6" CONCRETE TIES, HEAD HARDENED RAIL, NEW 136 LB. RE DRILLING PATTERN, ANGLE BARS & BOLTS EQUAL TO CURRENT STANDARD SPECIFICATION, 24" TIE SPACING FOR CONCRETE TIES.
2. NEW RAIL TO ONLY HAVE TWO OUTSIDE BOLT HOLES DRILLED (2ND AND 3RD HOLES ONLY) ON EACH RAIL END IN ORDER TO FACILITATE FUTURE FIELD WELDING.
3. TIES EQUIPPED SAFELOK FASTENERS INSULATORS APPROVED TIE PAD, OR APPROVED EQUAL.
4. USE REQUIRED JOINT BAR CLIPS ON END TIES.

BILL OF MATERIAL		
NO.	QTY.	DESCRIPTION
1	20	TIE CONCRETE
2	2	136# RE RAIL - 39'
3	8	JOINT BARS 136# - 36"
3	16	TRACK BOLTS 1 1/8 X 6"
4	16	1 1/8" SPRING WASHERS
4	16	1 1/8" SQUARE NUTS
5	20	TIE PADS U-1036
6	40	INSULATORS U-4018
9	40	INSULATORS U-1061
10	40	SAFELOCK CLIPS U-2000

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

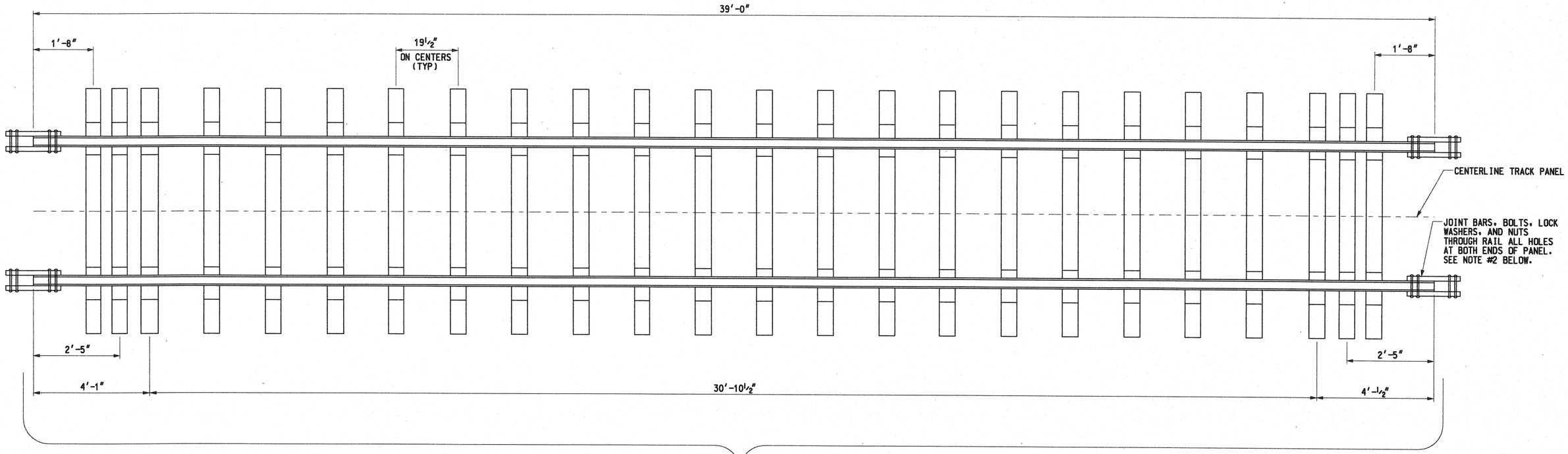
EMERGENCY TRACK PANELS: CONCRETE 1 OF 2

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-320

SHEET NO: 1 OF 2

10/4/2013



24 TIES

TIMBER TIE EMERGENCY TRACK PANEL

PANEL WEIGHT: 8'-6", 400 LB TIE IS 13,700 LBS.
NTS

NOTES:

1. 39' TRACK PANEL WITH 8'-6" TIMBER TIES, HEAD HARDENED RAIL, NEW 136 LB. RE DRILLING PATTERN, ANGLE BARS & BOLTS EQUAL TO CURRENT STANDARD SPECIFICATION, 19½" TIE SPACING FOR TIMBER TIES.
2. NEW RAIL TO ONLY HAVE TWO OUTSIDE BOLT HOLES DRILLED (2ND AND 3RD HOLES ONLY) ON EACH RAIL END IN ORDER TO FACILITATE FUTURE FIELD WELDING.
3. TIES EQUIPPED WITH 14" PLATE, SPIKES AND ANCHORS.
4. ALL TIES ARE ALL TIES ARE FULLY BOX ANCHORED.
5. ALL PLATES SPIKED WITH 4 SPIKES PER PLATE (GAGE, FIELD, 2 PLATE SPIKES).

BILL OF MATERIAL		
NO.	QTY.	DESCRIPTION
1	2	136# RE RAIL - 39'
2	24	TIES TIMBER GR4 7"X9"X9'-0"
3	48	DS 14" TIE PLATES
3	192	SPIKES 6"
4	8	JOINT BARS - 136# - 36"
4	16	TRACK BOLTS 1⅛ X 6"
5	16	1½" WASHERS
6	16	1⅛" RACK NUT 5e
9	96	ANCHORS 6" BASE DRIVE-ON
10		

REVISIONS	
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Port of LONG BEACH
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RAILROAD STANDARD PLANS

EMERGENCY TRACK PANELS: TIMBER 2 OF 2

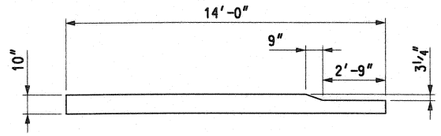
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-320

SHEET NO: 2 OF 2

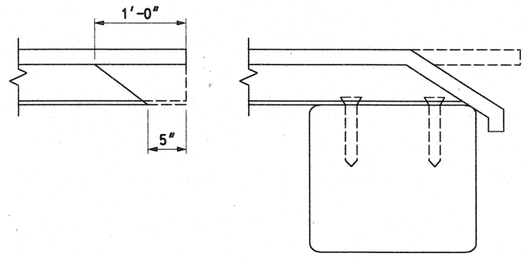
10/4/2013

...\RR-320 Emergency Track Panel: Timber 2 of 2



DAPPING DETAIL - HEADBLOCK TIES

NTS
(8"x10"x14'-0")



DEPRESSED RAIL HEAD DETAIL

NTS

DOUBLE POINT DERAIL DATA

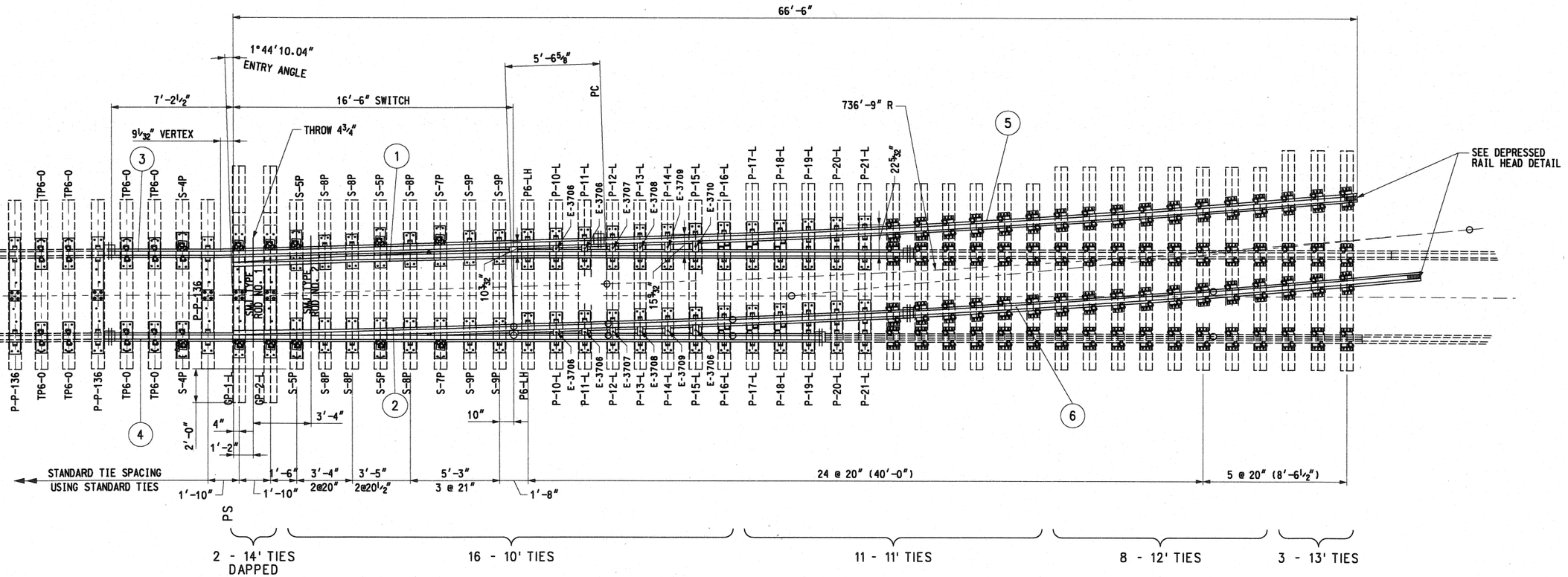
SWITCH GEOMETRY: 16'-6"
VERTEX DISTANCE: 9 1/32"
SWITCH ANGLE: 1°44'11"
SWITCH HEEL SPREAD: 6 1/4"
RADIUS OF CL CURVE: 736'-9"
DEGREE OF CL CURVE: 7°46'58"
CENTRAL ANGLE OF TURNOUT CURVE: 3°59'18"

LEGEND

WELDED JOINTS

NOTES:

1. SEE RR-330 2 OF 2 FOR BILL OF MATERIALS. CIRCLED ITEM NUMBERS APPLY TO BILL OF MATERIAL ITEMS.
2. ALL RAIL SHALL HAVE IDENTIFICATION COLOR CODE PAINTED ON WEB CLEAR OF JOINT AREA.
3. LH AND RH SWITCH POINTS WITH MANGANESE TIP.
4. TIMBER TIES TO CONFORM TO POLB STANDARD SPECIFICATIONS.
5. RH SWITCH POINT DERAIL IS MIRROR IMAGE OF THIS LAYOUT. SEE BILL OF MATERIALS FOR REFERENCE TO SPECIFIC PARTS.



PLAN

NTS

REVISIONS	
NO.	DATE
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

16'-6" DOUBLE POINT DERAIL

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-330

SHEET NO: 1 OF 2

10/4/2013

...*RR-330 16'-6" Double Point Derail

BILL OF MATERIAL				BILL OF MATERIAL			
ITEM	LH QTY	RH QTY	DESCRIPTION	ITEM	LH QTY	RH QTY	DESCRIPTION
1	1	1	SAMSON POINT, 16'-6"/40'-0" LONG, FLOATING HEEL, MANGANESE TIP, LH	33	2	-	SWITCH PLATE (P-15-L)
2	1	1	SAMSON POINT, 16'-6"/40'-0" LONG, FLOATING HEEL, MANGANESE TIP, RH	34	-	2	SWITCH PLATE (P-15-R)
3	1	-	STOCK RAIL, SAMSON UNDERCUT, BENT & CURVED, 28'-10" LONG, LH/LHTO	35	2	-	SWITCH PLATE (P-16-L)
3	-	1	STOCK RAIL, SAMSON UNDERCUT, BENT & CURVED, 28'-10" LONG, RH/RHTO	36	-	2	SWITCH PLATE (P-16-R)
4	1	-	STOCK RAIL, SAMSON UNDERCUT, STRAIGHT, 42'-0" LONG, RH/LHTO	37	2	-	SWITCH PLATE (P-17-L)
4	-	1	STOCK RAIL, SAMSON UNDERCUT, STRAIGHT, 42'-0" LONG, LH/RHTO	38	-	2	SWITCH PLATE (P-17-R)
5	1	1	CURVED RAIL 44'-11 9/16" LONG	39	2	-	SWITCH PLATE (P-18-L)
6	1	1	CURVED RAIL 30'-4 1/8" LONG	40	-	2	SWITCH PLATE (P-18-R)
9	1	1	SWITCH ROD #1 ASSEMBLY, 'SMJ' VERTICAL C/W BASKET ASSEMBLY	41	2	-	SWITCH PLATE (P-19-L)
10	1	1	SWITCH ROD #2 ASSEMBLY, 'SMJ' VERTICAL	42	-	2	SWITCH PLATE (P-19-R)
11	3	3	GAUGE PLATE, INSULATED (P-P-136)	43	2	-	SWITCH PLATE (P-20-L)
12	1	-	GAUGE PLATE, INS (GP-1-L)	44	-	2	SWITCH PLATE (P-20-R)
13	-	1	GAUGE PLATE, INS (GP-1-R)	45	2	-	SWITCH PLATE (P-21-L)
14	1	-	GAUGE PLATE, INS (GP-2-L)	46	-	2	SWITCH PLATE (P-21-R)
15	-	1	GAUGE PLATE, INS (GP-2-R)	47	72	72	TIE PLATE, ROLLED PANDROL, 6" RAIL BASE, CANTED, 1" DIA HOLES
16	2	2	BRACE SLIDE PLATE (S-4P)	48	4	4	HOLD-DOWN CLIP (E3706)
17	4	4	BRACE SLIDE PLATE (S-5P)	49	2	2	HOLD-DOWN CLIP (E3707)
18	2	2	BRACE SLIDE PLATE (S-7P)	50	2	2	HOLD-DOWN CLIP (E3708)
19	2	-	SWITCH HEEL PLATE (P6-LH)	51	2	2	HOLD-DOWN CLIP (E3709)
20	-	2	SWITCH HEEL PLATE (P6-RH)	52	2	2	HOLD-DOWN CLIP (E3710)
21	6	6	SLIDE PLATE (S-8P), 1/4" RISER	53	264	264	PANDROL SPRING CLIP (E2055)
22	4	4	SLIDE PLATE (S-9P), 0" RISER	54	8	8	PANDROL SPRING CLIP, (E2063), FOR JOINT BARS
23	2	-	SWITCH PLATE (P-10-L)	55	536	536	SCREW SPIKE, 15/16" DIA X 6" LONG
24	-	2	SWITCH PLATE (P-10-R)	56	12	12	BOLTLESS BRACE, 136RE 'SURFIT'
25	2	-	SWITCH PLATE (P-11-L)	57	12	12	SERRATED WASHER FOR BOLTLESS BRACE
26	-	2	SWITCH PLATE (P-11-R)	58	16	16	TIE, HARDWOOD, TREATED, 7" X 9" X 10'-0" LONG
27	2	-	SWITCH PLATE (P-12-L)	59	11	11	TIE, HARDWOOD, TREATED, 7" X 9" X 11'-0" LONG
28	-	2	SWITCH PLATE (P-12-R)	60	8	8	TIE, HARDWOOD, TREATED, 7" X 9" X 12'-0" LONG
29	2	-	SWITCH PLATE (P-13-L)	61	3	3	TIE, HARDWOOD, TREATED, 7" X 9" X 13'-0" LONG
30	-	2	SWITCH PLATE (P-13-R)	62	2	2	TIE, HARDWOOD, TREATED, 10" X 8" X 14'-0" LONG, DAPPED
31	2	-	SWITCH PLATE (P-14-L)	63	8	8	TIE PLATE, TP6-0, NO CANT
32	-	2	SWITCH PLATE (P-14-R)				

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

16'-6" DOUBLE POINT DERAIL BILL OF MATERIAL

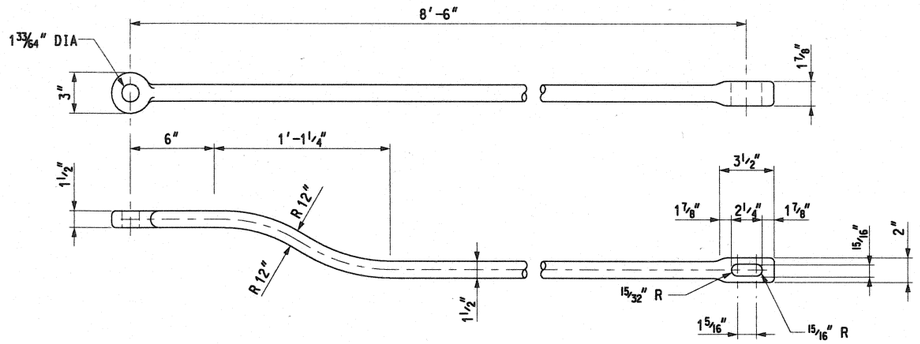
APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-330

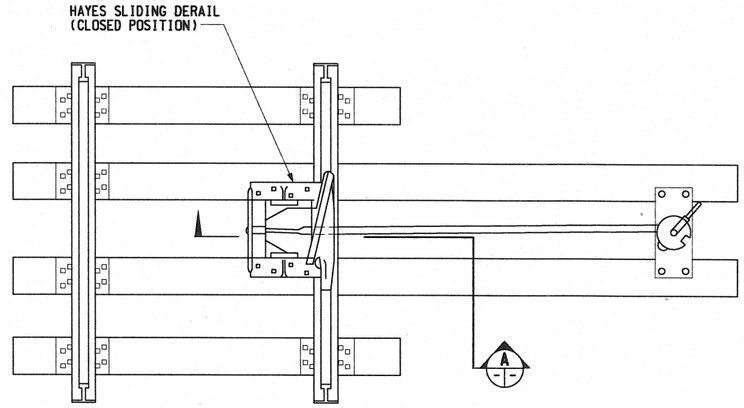
SHEET NO: 2 OF 2

10/4/2013

...*RR-330 16'-6" Double Point Derail - Bill of Materials



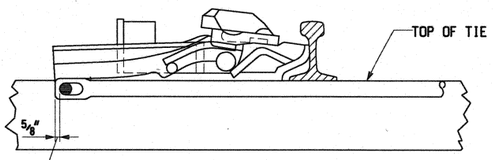
CONNECTING ROD FOR USE WITH HAYES DERAIL AND HIGH OR LOW SWITCH STANDS PER RR-370 THROUGH RR-375



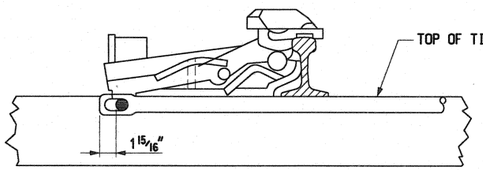
GENERAL PLAN FOR CONNECTING ROD WITH HAYES SLIDING DERAIL

NOTE:

SINCE THE THROW OF SWITCH STAND IS ONLY 5", THE SLOTTED HOLE IN ROD IS PROVIDED TO PERMIT MOVEMENT OF 6 1/4" REQUIRED FOR PROPER FUNCTIONING OF HAYES SLIDING DERAIL.



A SECTION (OPEN)



A SECTION (CLOSED)

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

CONNECTING RODS FOR DERAILS

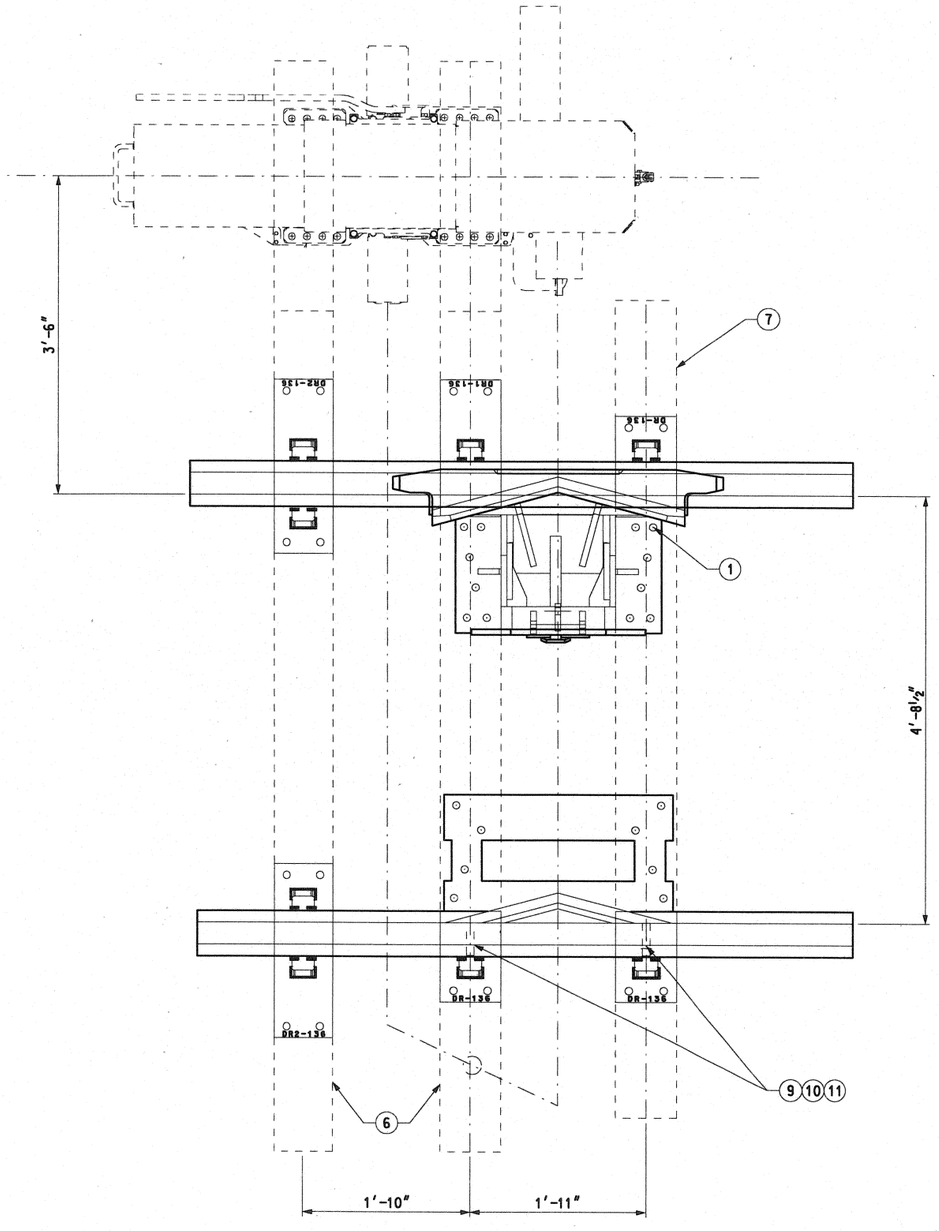
APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-331

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BILL OF MATERIAL		
ITEM	QTY	DESCRIPTION
1	1	HAYS DERAIL HBXS-8-SS C/W CROWDER
2	1	RODDING KIT FOR WCH DERAIL FOR USE WITH US&S M23E SW/MACHINE
3	3	TIE PLATE DR-136
4	1	TIE PLATE DR1-136
5	2	TIE PLATE DR2-136
6	2	TIE HARDWOOD TREATED DAPPED 8" X 10" X 12'-0"
7	1	TIE HARDWOOD TREATED 8" X 10" X 9'-0"
8	46	SCREW SPIKE $^{15}/_{16}$" X 6"
9	2	BOLT HEX 1" X 4" GR5
10	2	NUT HEAVY HEX 1" GR5
11	2	WASHER SPRING HEAVY 1"
12	8	CLIP PANDROL E2055G RH GALVANIZED

INSTALLATION REQUIREMENT NOTES:

1. CROWDER WITH SLIDING DERAIL SHOWN. WHEEL CROWDER STROKE IS $5^{1}/_{4}$" WITH $^{7}/_{8}$" DIAMETER PINS.
2. PAINT: SAFETY YELLOW.
3. FOR PROPER THROW OF SWITCH STAND TO DERAIL/CROWDER. ADJUST SWITCH STAND CRANK EYE FOR $5^{1}/_{4}$" THROW.
4. MAKE SURE THAT YOUR SWITCH STAND (HEAD BLOCK) TIES THAT HOLD THE DERAIL ARE HIGH QUALITY.
5. READ THE MANUFACTURER'S INSTRUCTIONS.
6. PLACE THE DERAIL TIGHTLY AGAINST THE RAIL.
7. SPIKE BOTH RAILS TO THE TIES AT THE PROPER GAUGE.
8. FASTEN THE DERAIL AND CROWDER THROUGH ALL THE SCREW SPIKE HOLES. PRE-DRILL HOLES TO PREVENT THE TIES FROM SPLITTING.
9. HAVE GOOD DRAINAGE AND BALLAST. THE AREA UNDER THE DERAIL MUST BE POCKETED TO PREVENT BINDING IN ADVERSE WEATHER CONDITIONS.

INSTALLATION OF CROWDER NOTES:

1. PLACE THE WHEEL CROWDER TIGHTLY AGAINST THE WEB OF THE RAIL.
2. RAIL CROWDER MOUNTING BOLT HOLE TO BE MATCH MARKED FROM THE RAIL CROWDER AND DRILLED IN THE FIELD.
3. USE THE WEB SET SCREWS TO ADJUST AND MAINTAIN PROPER WHEEL CROWDER POINT CONTACTS WITH THE RAIL.
4. WITH BOTH RAIL AND WHEEL CROWDER SECURED AND IN DERAILING POSITION, ATTACH THE CONNECTING ROD TO THE LEFT LUG ON THE DERAIL. THEN CONNECT THE OPPOSITE END OF THE CONNECTING ROD WITH THE TURNBUCKLE INTO THE REVERSING CRANK MECHANISM ON THE BASE OF THE WHEEL CROWDER.
5. ATTACH THE SWITCH STAND CONNECTING ROD OF THE MANUAL OR ELECTRIC SWITCH STAND TO THE TURNBUCKLE ON THE SWITCH STAND OR ELECTRIC SWITCH STAND. THE OPPOSITE END OF THE CONNECTING ROD CONNECTS TO THE RIGHT HAND LUG ON THE DERAIL. ADJUST THE THROW ON YOUR SWITCH STAND TO A $5^{1}/_{4}$" THROW. A SHORTER THROW WILL GIVE YOU PRESSURE ON THE CONNECTING ROD OR SWITCH STAND EYE. PRESSURE ON THE EYE AND CONNECTING ROD CAN RESULT IN A FAILURE OF THAT COMPONENT. ADJUST AS NECESSARY.
6. PLACE COTTER KEYS TO SECURE THE NUTS.
7. INSTALL A SWITCH LOCK.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

BI-DIRECTIONAL DERAIL WITH WHEEL CROWDER AND POWER SWITCH MACHINE

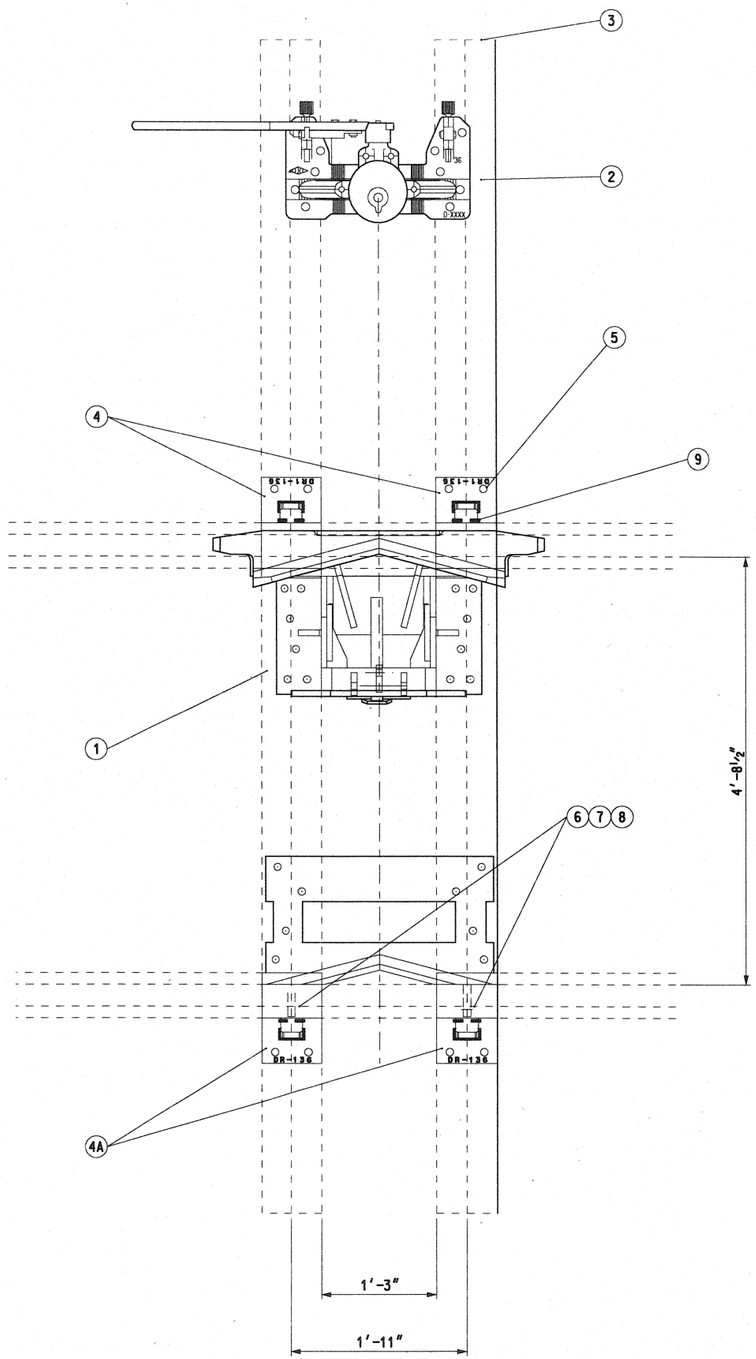
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-332

SHEET NO: 1 OF 1

10/4/2013

...*RR-332 Bi-Directional Derail with Wheel Crower and Power Switch Machine



BILL OF MATERIAL

ITEM	QTY	DESCRIPTION
1	1	HAYS DERAIL HBXS-8-SS C/W CROWDER
2	1	36E SWITCH STAND WITH TARGET & TRI-GLIDE HANDLE
3	2	TIE HARDWOOD TREATED, 8" X 12" X 14'-0"
4	2	TIE PLATE DR1-136
4A	2	TIE PLATE DR-136
5	38	SCREW SPIKE $^{15}/_{16}$" X 6"
6	2	BOLT HEX 1" X 4" GR 5
7	2	NUT HEAVY HEX 1" GR 5
8	2	WASHER SPRING HEAVY 1"
9	4	CLIP PANDROL E2055G RH GALVANIZED

INSTALLATION REQUIREMENT NOTES:

1. CROWDER WITH SLIDING DERAIL SHOWN. WHEEL CROWDER STROKE IS $5^{1}/_{4}$" WITH $^{7}/_{8}$" DIAMETER PINS.
2. PAINT: SAFETY YELLOW.
3. FOR PROPER THROW OF SWITCH STAND TO DERAIL/CROWDER, ADJUST SWITCH STAND CRANK EYE FOR $5^{1}/_{4}$" THROW.
4. MAKE SURE THAT YOUR SWITCH STAND (HEAD BLOCK) TIES THAT HOLD THE DERAIL ARE HIGH QUALITY.
5. READ THE MANUFACTURER'S INSTRUCTIONS.
6. PLACE THE DERAIL TIGHTLY AGAINST THE RAIL.
7. SPIKE BOTH RAILS TO THE TIES AT THE PROPER GAUGE.
8. FASTEN THE DERAIL AND CROWDER THROUGH ALL THE SCREW SPIKE HOLES. PRE-DRILL HOLES TO PREVENT THE TIES FROM SPLITTING.
9. HAVE GOOD DRAINAGE AND BALLAST. THE AREA UNDER THE DERAIL MUST BE POCKETED TO PREVENT BINDING IN ADVERSE WEATHER CONDITIONS.

INSTALLATION OF CROWDER NOTES:

1. PLACE THE WHEEL CROWDER TIGHTLY AGAINST THE WEB OF THE RAIL.
2. RAIL CROWDER MOUNTING BOLT HOLE TO BE MATCH MARKED FROM THE RAIL CROWDER AND DRILLED IN THE FIELD.
3. USE THE WEB SET SCREWS TO ADJUST AND MAINTAIN PROPER WHEEL CROWDER POINT CONTACTS WITH THE RAIL.
4. WITH BOTH RAIL AND WHEEL CROWDER SECURED AND IN DERAILING POSITION, ATTACH THE CONNECTING ROD TO THE LEFT LUG ON THE DERAIL. THEN CONNECT THE OPPOSITE END OF THE CONNECTING ROD WITH THE TURNBUCKLE INTO THE REVERSING CRANK MECHANISM ON THE BASE OF THE WHEEL CROWDER.
5. ATTACH THE SWITCH STAND CONNECTING ROD OF THE MANUAL OR ELECTRIC SWITCH STAND TO THE TURNBUCKLE ON THE SWITCH STAND OR ELECTRIC SWITCH STAND. THE OPPOSITE END OF THE CONNECTING ROD CONNECTS TO THE RIGHT HAND LUG ON THE DERAIL. ADJUST THE THROW ON YOUR SWITCH STAND TO A $5^{1}/_{4}$" THROW. A SHORTER THROW WILL GIVE YOU PRESSURE ON THE CONNECTING ROD OR SWITCH STAND EYE. PRESSURE ON THE EYE AND CONNECTING ROD CAN RESULT IN A FAILURE OF THAT COMPONENT. ADJUST AS NECESSARY.
6. PLACE COTTER KEYS TO SECURE THE NUTS.
7. INSTALL A SWITCH LOCK.

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RAILROAD STANDARD PLANS

BI-DIRECTIONAL DERAIL WITH WHEEL CROWDER AND HAND THROW SWITCH STAND

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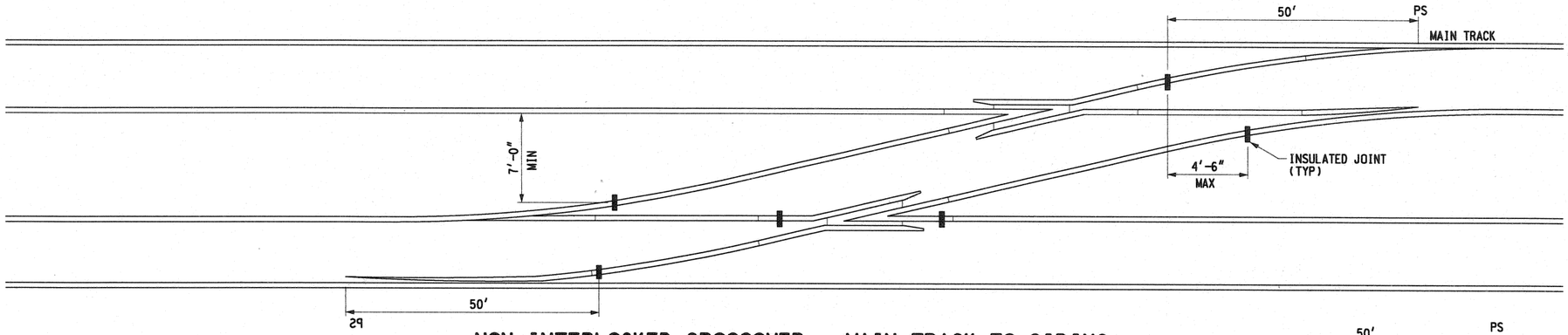
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-333

SHEET NO: 1 OF 1

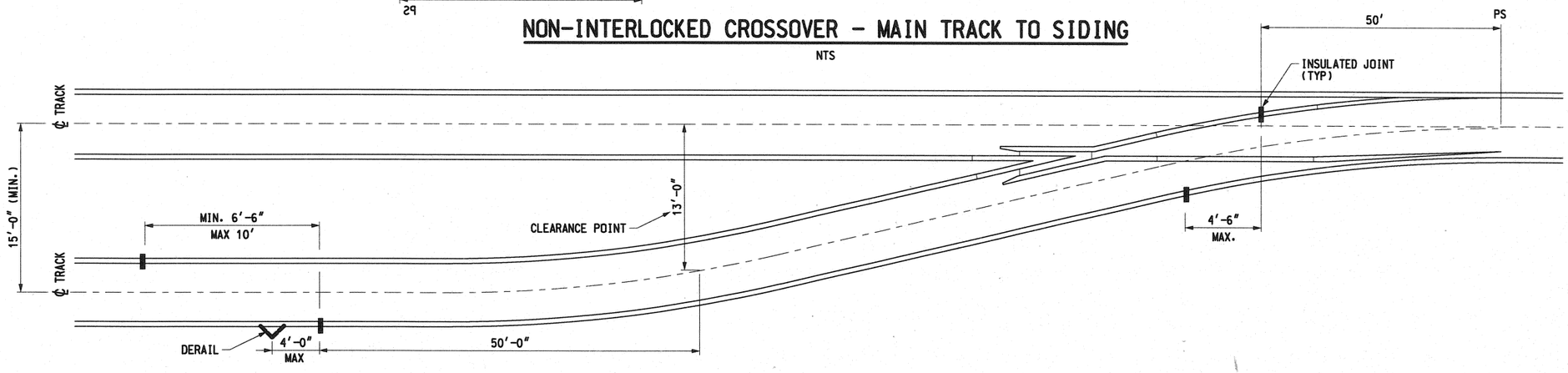
10/4/2013

...*RR-333 Bi-Directional Derail with Wheel Crowder and Hand Throw Switch Stand



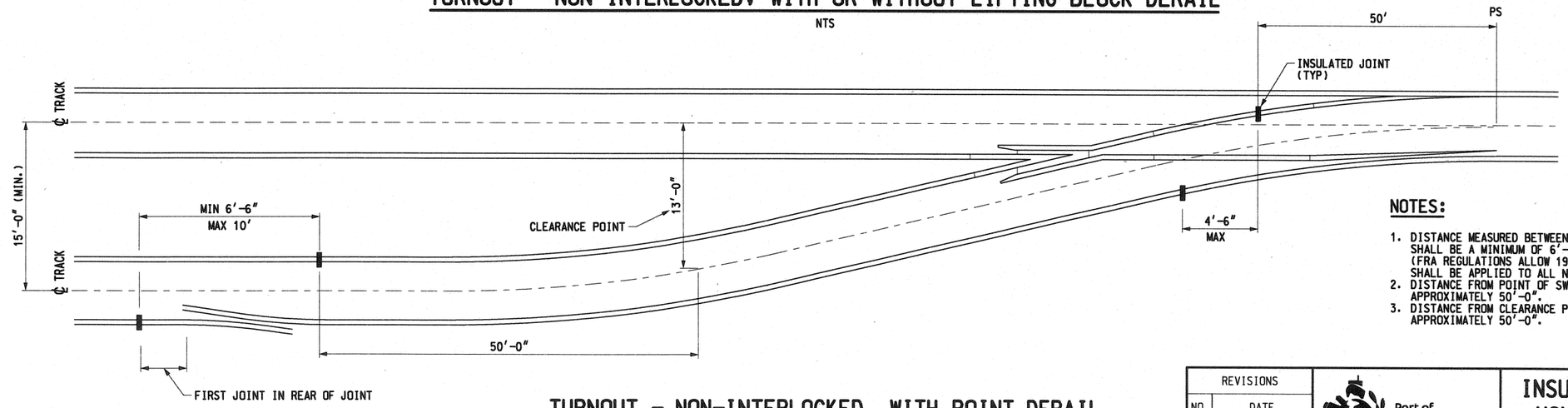
NON-INTERLOCKED CROSSOVER - MAIN TRACK TO SIDING

NTS



TURNOUT - NON-INTERLOCKED, WITH OR WITHOUT LIFTING BLOCK DERAIL

NTS



TURNOUT - NON-INTERLOCKED, WITH POINT DERAIL

NTS

NOTES:

1. DISTANCE MEASURED BETWEEN END POSTS OF INSULATED JOINTS SHALL BE A MINIMUM OF 6'-6" AND A MAXIMUM OF 10'-0". (FRA REGULATIONS ALLOW 19'-6" STAGGER BUT ABOVE STANDARD SHALL BE APPLIED TO ALL NEW CONSTRUCTION).
2. DISTANCE FROM POINT OF SWITCH TO FIRST INSULATED JOINT SHALL BE APPROXIMATELY 50'-0".
3. DISTANCE FROM CLEARANCE POINT TO INSULATED JOINT SHALL BE APPROXIMATELY 50'-0".

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RAILROAD STANDARD PLANS

INSULATED JOINT LOCATION NON-INTERLOCKED SWITCH AND DERAILS

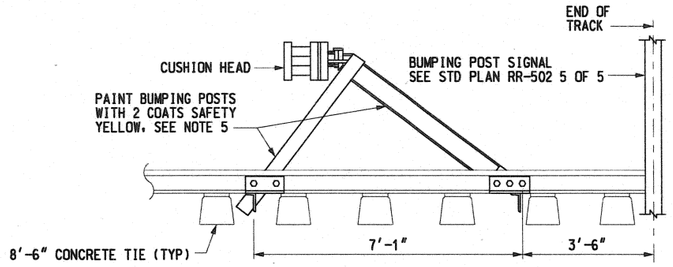
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-334

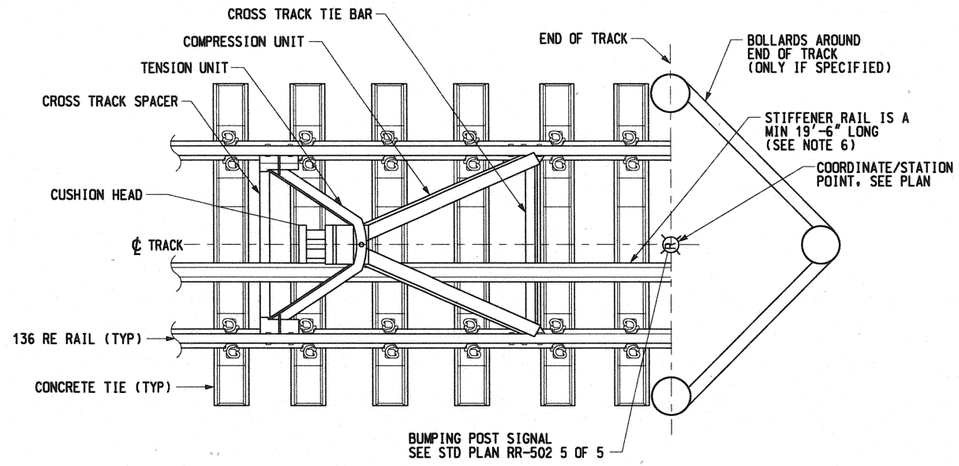
SHEET NO: 1 OF 1

10/4/2013

...\RR-334 Insulated Joint Location Non-interlocked Switch



ELEVATION



PLAN

DETAIL - BUMPING POST

SCALE: 1" = 2'-0"

NOTES:

1. BUMPING POST SHALL BE WESTERN-CULLEN-HAYES, INC. TYPE WA WITH HAYCO SHOCK FREE CUSHION HEAD OR APPROVED EQUAL.
2. INSTALL TIES WITHIN BUMPING POST AREA PER MANUFACTURER'S RECOMMENDED SPACING.
3. INSTALL CROSS TRACK SPACER AND CROSS TRACK TIE BAR BEFORE PAVING. LEAVE OPENINGS IN PAVING FOR COMPRESSION UNIT AND TENSION UNIT BOLT INSTALLATION.
4. USE FILTER BARS IN LIEU OF OUTSIDE ANCHOR STRAPS WITH TYPE WA BUMPING POST.
5. THE FINISH COAT SHALL BE ELLIS PAINT COMPANY SHAFT-LAC QUICK DRY YELLOW ENAMEL 345, OR APPROVALD EQUAL. THE FINISH COAT SHALL BE APPLIED IN TWO (2) COATS. THE SECOND COAT SHALL BE APPLIED WITHIN ONE (1) HOUR OF THE FIRST COAT. THE TOTAL SHALL BE 1.5 TO 2.0 MILS PER COAT. RUNS, SAGS, OR CURTAINS ARE CAUSE FOR REJECTION.
6. IF TIMBER TIES ARE USED IN TRACK CONSTRUCTION, INCLUDE 2 STIFFENER RAILS WITH BUMPING POST FULLY SPIKED TO TIES AS INDICATED IN MANUFACTURERS DETAIL (ONLY ONE SHOWN FOR CLARITY).

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RAILROAD STANDARD PLANS

STEEL BUMPING POST

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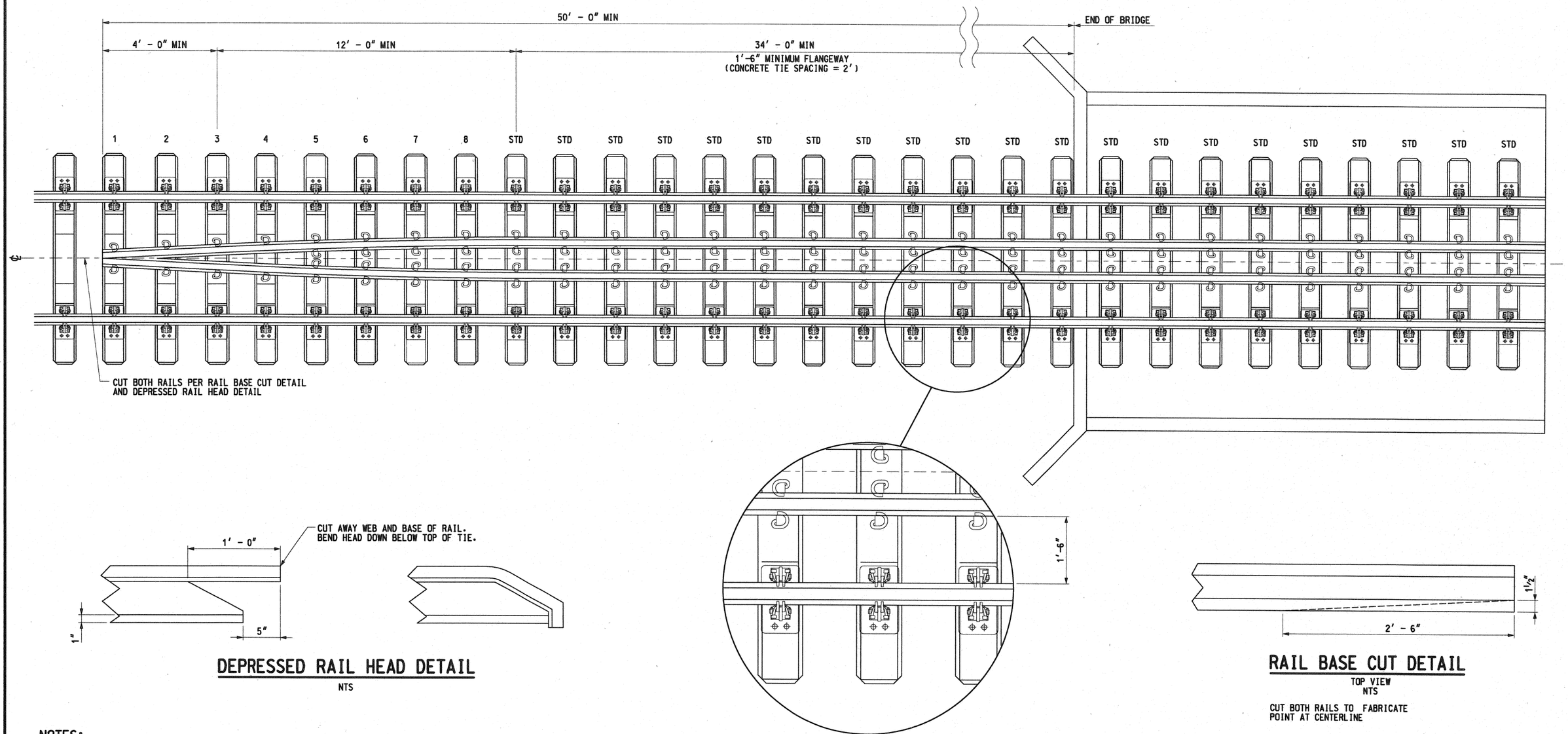
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-335

SHEET NO: 1 OF 1

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...*RR-335 Steel Bumping Post



DEPRESSED RAIL HEAD DETAIL

NTS

RAIL BASE CUT DETAIL

TOP VIEW
NTS

CUT BOTH RAILS TO FABRICATE
POINT AT CENTERLINE

NOTES:

1. INSIDE GUARD RAILS ON BRIDGES SHALL BE REQUIRED FOR ALL SPANS WHERE EXPOSED STRUCTURAL STEEL IS PRESENT ABOVE T/R AND IS SUBJECTED TO STRUCTURAL DAMAGE BY DERAILED EQUIPMENT. INSIDE GUARD RAILS SHALL BE INSTALLED ON BRIDGES WHERE INDIVIDUAL SPANS ARE OVER 100 FEET IN LENGTH OR WHERE THE ENTIRE STRUCTURE IS OVER 800 FEET IN LENGTH AND AT LEAST ONE SPAN CROSSES OVER A WATERWAY THAT NORMALLY CONTAINS WATER AT LEAST 15 FEET DEEP. INSIDE GUARD RAILS SHALL EXTEND 50 FEET BEYOND THE SPAN OR SPANS TO BE PROTECTED.
2. INSIDE GUARD RAILS SHALL BE INSTALLED ON ANY OTHER BRIDGE AS DIRECTED BY POLB.
3. INSIDE GUARD RAILS ARE NOT REQUIRED ON BRIDGES UNTIL BRIDGE OR BRIDGE DECK IS REPLACED OR RUNNING RAIL IS REPLACED ACROSS BRIDGE UNLESS DIRECTED BY POLB.
4. INSIDE GUARD RAILS MAY BE CONSTRUCTED USING SECOND HAND RAIL NOT LESS THAN 23 LBS LIGHTER OR NO LARGER THAN RUNNING RAILS. IF GUARD RAIL HAS 5½" BASE, USE MODIFIED PLATES FOR 5½" BASE RR-308.
5. ON CONCRETE TIES, GUARD RAILS SHALL BE FASTENED TO EACH TIE.
6. GUARD RAIL JOINTS, IF PRESENT, SHALL BE FULLY BOLTED USING SECOND-HAND JOINT BARS.
7. THE QUANTITY OF STD PLATES ON CONCRETE TIES WILL VARY DEPENDING ON THE NUMBER OF TIES. THEY ARE TO BE ORDERED AS NEEDED. PLATES 1 THROUGH 8 COME AS TWO SETS AND ARE TO BE ROTATED 180° ON OPPOSITE ENDS.

REFERENCE DRAWINGS:
FOR GUARD RAIL PLATES SEE RR-338
FOR CONCRETE TIE SEE RR-202
FOR SCREW AND WASHER SEE RR-304

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Port of LONG BEACH
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RAILROAD
STANDARD PLANS

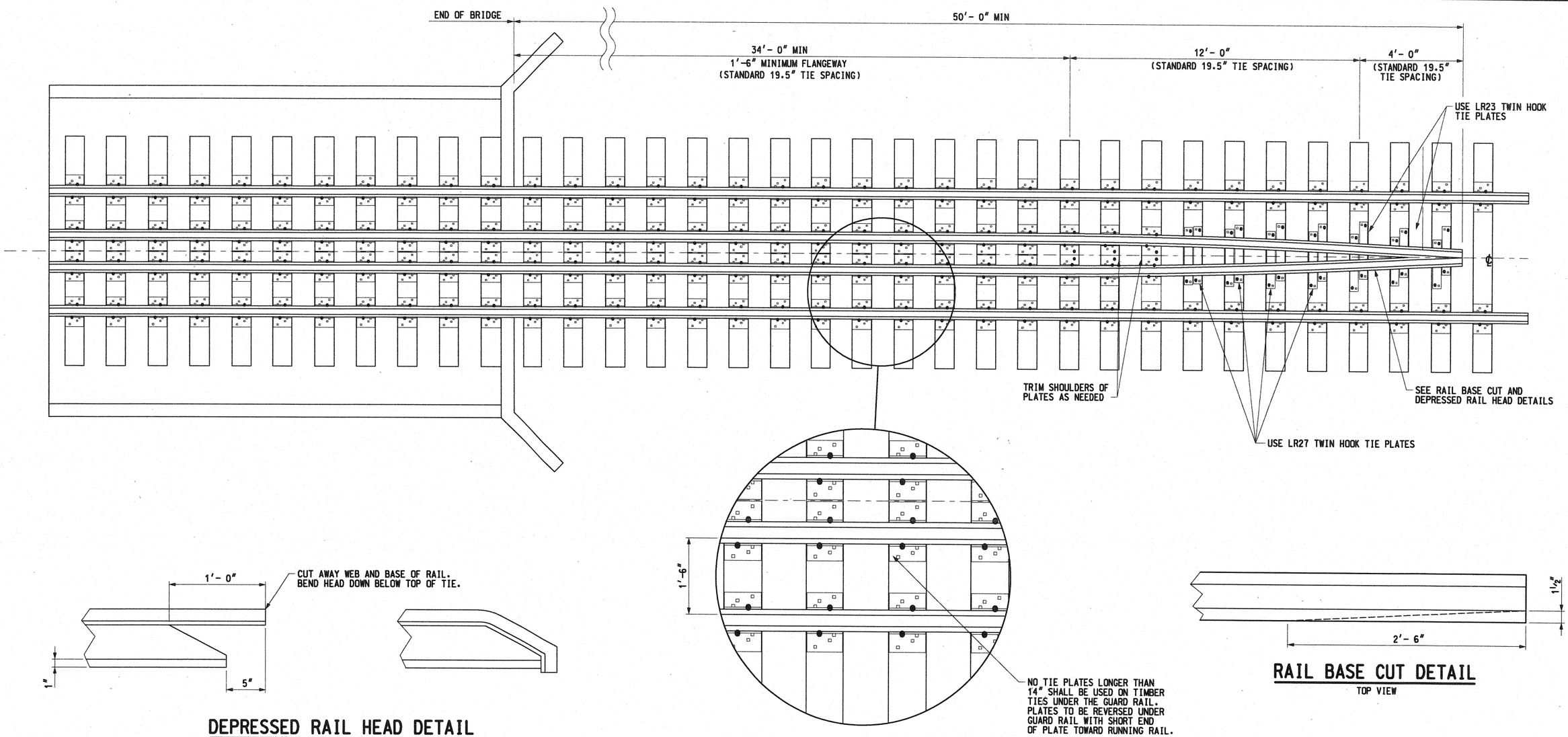
INSIDE GUARD RAIL FOR CONCRETE TIES

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-336
SHEET NO: 1 OF 1

10/4/2013

...*RR-336 Inside Guard Rail for Concrete Ties



DEPRESSED RAIL HEAD DETAIL

NO SCALE

RAIL BASE CUT DETAIL

TOP VIEW

NOTES:

1. INSIDE GUARD RAILS ON BRIDGES SHALL BE REQUIRED FOR ALL SPANS WHERE EXPOSED STRUCTURAL STEEL IS PRESENT ABOVE T/R AND IS SUBJECTED TO STRUCTURAL DAMAGE BY DERAILED EQUIPMENT. INSIDE GUARD RAILS SHALL BE INSTALLED ON BRIDGES WHERE INDIVIDUAL SPANS ARE OVER 100 FEET IN LENGTH OR WHERE THE ENTIRE STRUCTURE IS OVER 800 FEET IN LENGTH AND AT LEAST ONE SPAN CROSSES OVER A WATERWAY THAT NORMALLY CONTAINS WATER AT LEAST 15 FEET DEEP. INSIDE GUARD RAILS SHALL EXTEND 50 FEET BEYOND THE SPAN OR SPANS TO BE PROTECTED.
2. INSIDE GUARD RAILS SHALL BE INSTALLED ON ANY OTHER BRIDGE AS DIRECTED BY THE POLB.
3. INSIDE GUARD RAILS ARE NOT REQUIRED ON BRIDGES UNTIL BRIDGE OR BRIDGE DECK IS REPLACED OR RUNNING RAIL IS REPLACED ACROSS BRIDGE
4. INSIDE GUARD RAILS MAY BE CONSTRUCTED USING SECOND HAND RAIL NOT LESS THAN 23 LBS LIGHTER OR NO LARGER THAN RUNNING RAILS. IF GUARD RAIL HAS 5½" BASE, USE MODIFIED PLATES FOR 5½" BASE RR-308.
5. ON WOOD TIES, GUARD RAILS SHALL BE FULLY PLATED
6. WITH 2 SPIKES PER PLATE.
7. GUARD RAIL JOINTS, IF PRESENTS, SHALL BE FULLY BOLTED USING SECOND-HAND JOINT BARS.
8. ON TANGENT TRACK, SPIKE THE INSIDE GUARD RAIL WITH TWO SPIKES PER PLATE ON EACH RAIL OF THE TANGENT PORTION AND THREE SPIKES ON EACH RAIL OF THE CURVED PORTION.

ON WOOD TIES, BOX ANCHOR TWO TIES NEAR THE CENTER OF BRIDGE TO RESTRICT LONGITUDINAL MOVEMENT OF GUARD RAIL.

REFERENCE DRAWINGS:
FOR GUARD RAIL PLATES SEE RR-338
FOR SCREW SPIKE SEE RR-307

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Port of LONG BEACH
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RAILROAD
STANDARD PLANS

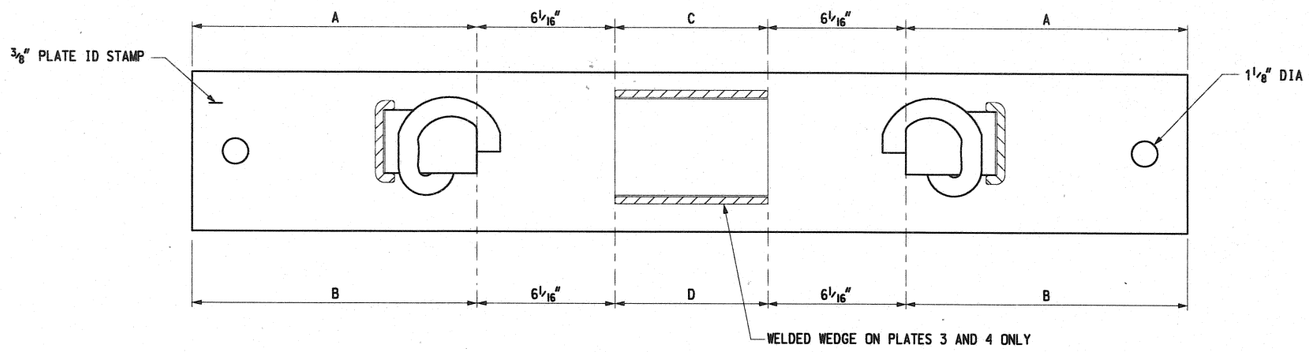
INSIDE GUARD RAIL FOR TIMBER TIES

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

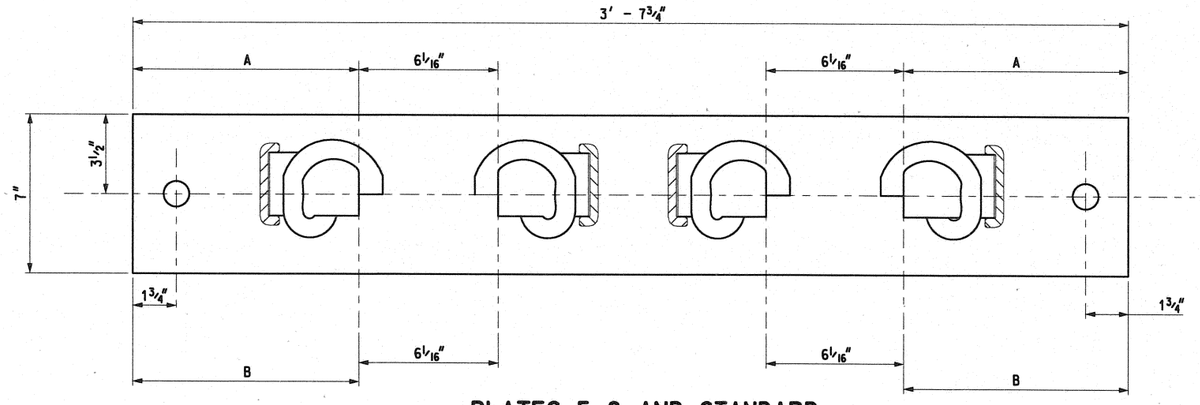
DRAWING NO: RR-337

SHEET NO: 1 OF 1

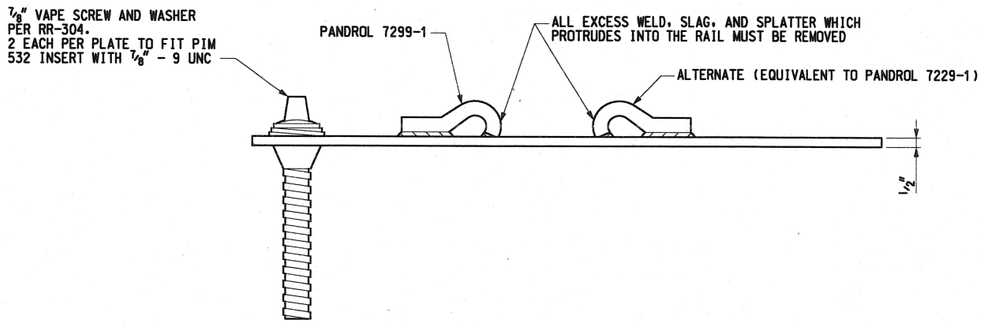
10/4/2013



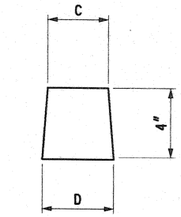
PLATES 1 – 4



PLATES 5–8 AND STANDARD



DOUBLE INSIDE GUARD RAIL PLATE DETAILS



1/2" X 4" A36 STEEL BLOCK (WEDGE) FOR PLATES 3 & 4

PLATE ID	C (IN)	D (IN)
3	2.65	3.14
4	5.34	5.74

ENTRY PLATES

PLATE ID	A (IN)	B (IN)
1	17.12	16.75
2	15.85	15.69
3	14.59	14.15
4	13.21	12.87
5	12.11	11.83
6	11.24	11.03
7	10.60	10.47
8	10.21	10.14

STANDARD PLATE

PLATE ID	A (IN)	B (IN)
STD	10.05	10.05

DOUBLE INSIDE GUARD RAIL ITEM NUMBERS SET INCLUDES ALL ENTRY PLATES (2 OF EACH)	
STD PLATE (EACH)	ENTRY PLATES 1-8 (SET)

NOTES:

1. NO INSIDE CLIPS FOR PLATES 1, 2, 3, & 4. REQUIRES STEEL WEDGE ON PLATES 3 & 4.
2. IF 5 1/2" BASE RAIL WILL BE USED FOR GUARD RAIL, THEN DIMENSIONS A & B ARE TO BE INCREASED BY 0.50 (IN), AND THE RAIL SEAT DIMENSION WILL CHANGE FROM 6 1/16" TO 5 5/16".

REVISIONS	
NO.	DATE
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

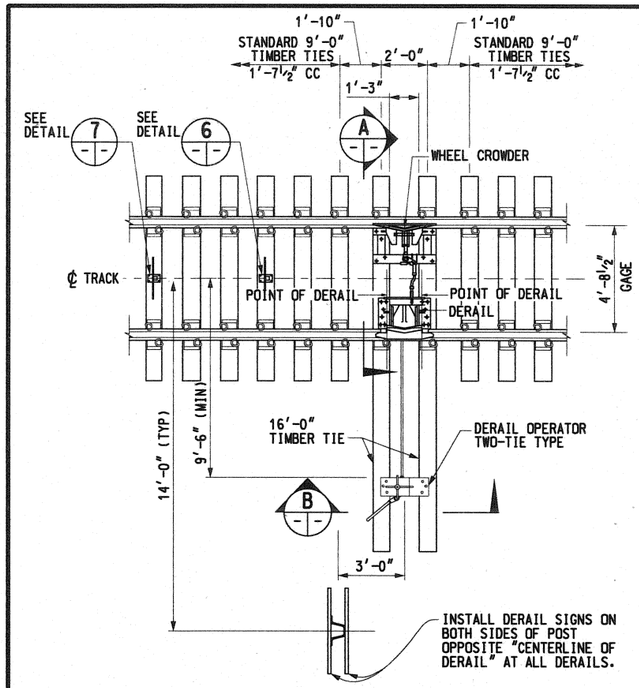
INSIDE GUARD RAIL PLATES

APPROVED BY: _____
SEAN A. GAMETTE – ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-338

SHEET NO: 1 OF 1

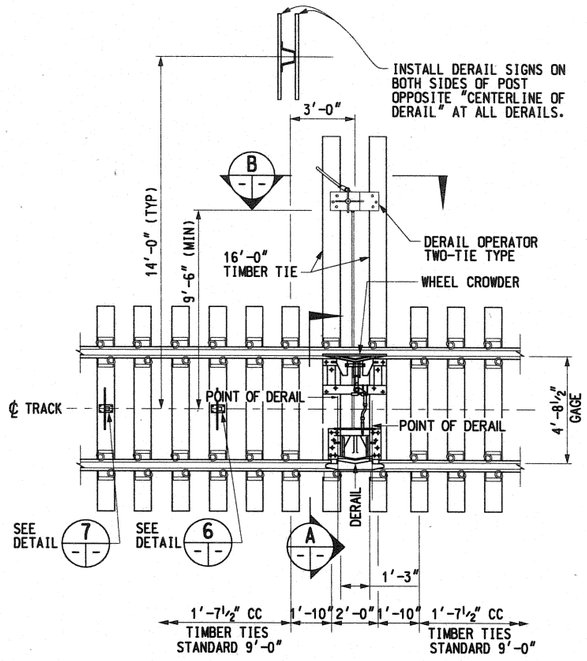
10/4/2013



1 DETAIL - HAND OPERATED DERAIL - NEAR RAIL

NTS

NOTE: SEE PLAN FOR NEAR RAIL VERSES FAR RAIL DETERMINATION.



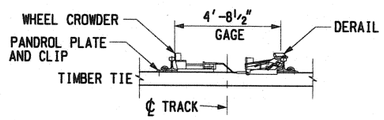
2 DETAIL - HAND OPERATED DERAIL - FAR RAIL

NTS

NOTE: SEE PLAN FOR NEAR RAIL VERSES FAR RAIL DETERMINATION.

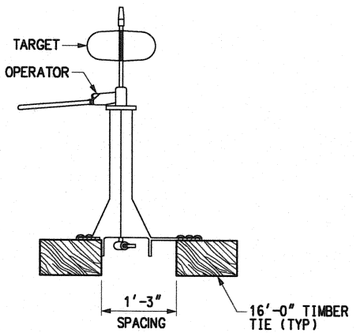
NOTE:

SEE SHEETS RR-402, RR-403 & RR-405 FOR ADDITIONAL DERAIL SIGN DETAILS.



A SECTION

NTS



B SECTION

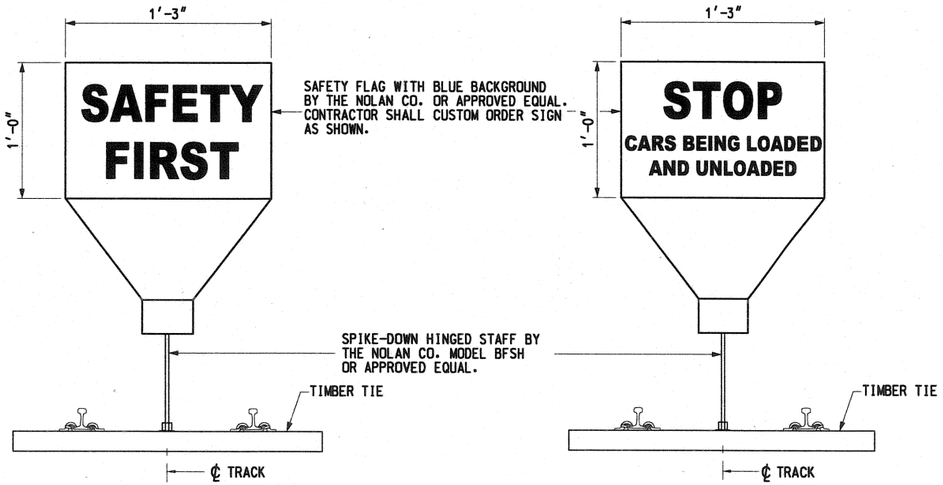
NTS

DERAIL SIGN NOTES:

1. LETTERS "DERAIL" SHALL CONFORM TO SERIES C LETTERS AS SHOWN IN THE "STANDARD HIGHWAY SIGN" BOOK PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION. LETTER SHALL BE HIGH PRESSURE SENSITIVE BLACK 3650-12 SCOTCHCAL PLUS (OR APPROVED EQUAL).
2. PANEL SHALL BE: 0.063" THICK SHEET ALUMINUM: 6061-T6 OR 5052-H38 ALLOY AND TEMPER: PUNCH SIZE SHALL BE $\frac{3}{8}$" X $\frac{3}{4}$".
3. DECAL (BACKGROUND) SHALL BE: PRESSURE SENSITIVE SILVER 3870 SCOTCHLITE - HIGH INTENSITY - REFLECTIVE SHEETING (OR APPROVED EQUAL) WITH $\frac{3}{8}$" BLACK BORDER AND $\frac{3}{8}$" MARGIN.

DERAIL NOTES:

1. HAND OPERATED DERAILS SHALL BE STANDARD TWO TIE OPERATING STANDS WITH TARGET, CONNECTING RODS AND SIGNS.
2. HAND OPERATED DERAILS TO BE WESTERN-CULLEN-HAYES, INC. MODEL HBXS DOUBLE END SLIDING DERAIL, SIZE 8, OR EQUIVALENT.
3. TIE SPACING DIMENSIONS SHOWN ON THIS PLAN ARE ALONG THE CENTERLINE OF TRACK.
4. TWO 16'-0" TIES SHALL BE INSTALLED TO ACCOMMODATE FUTURE POWER DERAIL OPERATOR WHERE SHOWN ON THE PLANS.
5. DERAIL STAND TO BE WESTERN-CULLEN-HAYES, INC. MODEL HRS-100, HIGH RISE DERAIL OPERATING STAND.
6. WHEEL CROWDER TO BE WESTERN-CULLEN-HAYES, INC. MODEL WCX.
7. PROVIDE ELECTRICAL CONDUIT WITH STUBOUT FOR ALL DERAILS TO ACCOMMODATE FUTURE POWER DERAIL OPERATION WHERE CONDUITS ARE SHOWN ON THE PLANS. SEE PLAN FOR STUBOUT LOCATION.
8. SEE SHEETS RR-402 AND RR-405 FOR DERAIL SIGN DETAILS.



6 DETAIL - DERAIL HINGED WARNING SIGN # 1

NTS

7 DETAIL - DERAIL HINGED WARNING SIGN # 2

NTS

NOTES:

1. PLATES TO BE SHEET ALUMINUM, MILL FINISH SIMILAR TO ALCOA 61S-T6(61ST). PLATE TO BE $\frac{1}{8}$" THICK.
2. APPLY 3M SCOTCHLITE HIGH INTENSITY SILVER REFLECTIVE SHEETING, OR APPROVED EQUAL, TO PLATES. APPLY 3" HIGH LETTERS AND NUMBERS TO SHEETING. LETTERS AND NUMBERS SHALL BE BLACK VINYL, CUT WITH CLEAR LAMINATE UV AND WEATHER PROTECTION MANUFACTURED BY INTERNATIONAL DESIGN & MARKETING, INC., HUNTINGTON BEACH, CA. 800-689-7446 OR APPROVED EQUAL.
3. CONTRACTOR SHALL APPLY PLATES TO TIMBER TIES USING 4 - 2½" STAINLESS STEEL SCREWS.

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

DERAIL DETAILS

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

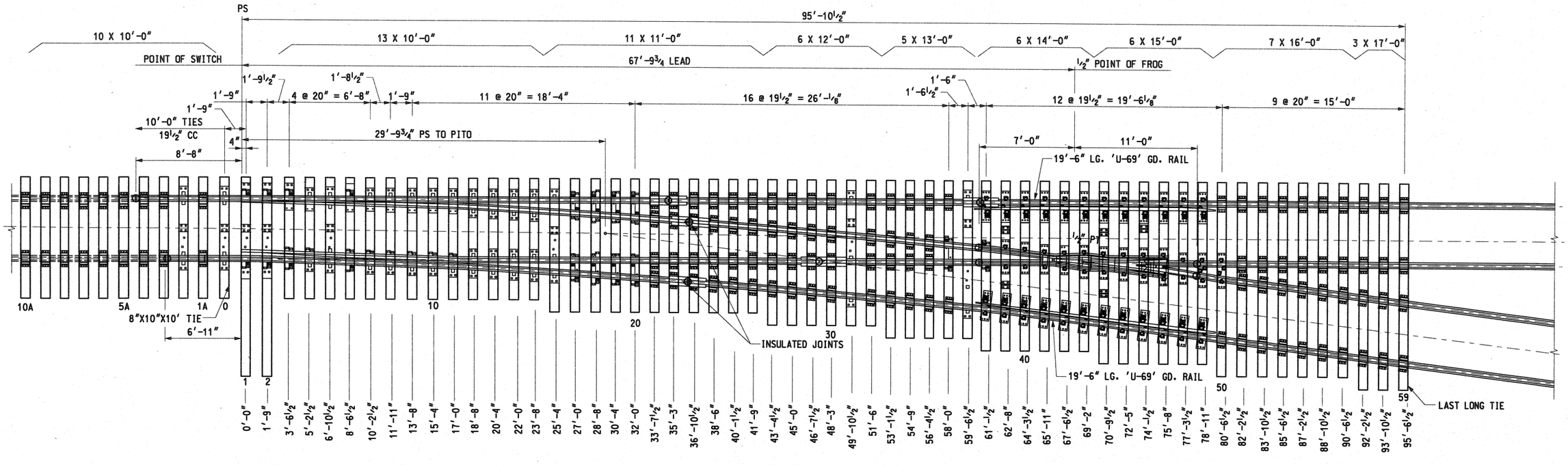
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-339

SHEET NO: 1 OF 1

10/4/2013

...*RR-339 Derail Details



NO. 8 TURNOUT

R.H. TURNOUT SHOWN - L.H. OPPOSITE

QTY	BILL OF MATERIAL FOR NO. 8 136RE RH TURNOUT C/W RBM FROG
140	STANDARD PANDROL TIE PLATES 6" RAIL BASE
584	15/16" DIA SCREW SPIKES
404	e2055 RAIL CLIPS
2	16'-6" STRAIGHT SWITCH POINTS COMPLETE WITH SWITCH PLATES MILLED WITH ADJUSTABLE RAIL BRACES
1	NO. 8 RAIL BOUND MANGANESE STEEL FROG COMPLETE WITH PLATES
1 SET	TIMBER TIES (SEE TABLE)
2	GUARD RAILS COMPLETE WITH PLATES 19'-6" - U69
1	36'-10" STRAIGHT SWITCH STOCK RAIL
1	37'-0" CURVED SWITCH STOCK RAIL
1	27'-7 3/4" STRAIGHT CLOSURE RAIL
1	14'-9", 13'-0 3/16" CURVED CLOSURE RAILS
1	29'-5", 39'-0" STRAIGHT BUFFER RAILS
1	21'-3", 36'-2" CURVED BUFFER RAILS
1	NO. 1 (WITH BASKET IF NECESSARY) & NO. 2 INSULATED VERTICAL SWITCH RODS
4	INSULATED GAGE PLATES
2	FLOATING HEEL BLOCKS
3	INSULATED FROG GAGE PLATES
A/R	ELASTIC SPRING CLIPS WITH INSULATED SHOULDERS
A/R	STANDARD & SPECIAL PLATES
2	SWITCH POINT PROTECTORS
1	SWITCH STAND RACOR 22-E OR AS DIRECTED

SWITCH TIES	
LENGTH	QTY
10'-0"	23
8"x10"x10'-0"	1
11'-0"	11
12'-0"	6
13'-0"	5
14'-0"	6
15'-0"	6
16'-0"	9
17'-0"	3
TOTAL QTY = 70	
TOTAL L.F. = 867	

1-8" X 10" X 10'-0"
ALL TIES 7" X 9" X LENGTHS GIVEN EXCEPT TIE # 0

* HEADBLOCK TIES SHALL BE 16'-0" FOR SWITCH STANDS LOCATED ON THE OUTSIDE OF TRACKS AND 14' FOR INSIDE ABOVE TABLE SHOWS OUTSIDE SWITCH STAND PLACEMENT TIE COUNTS

LEGEND:

⊕ INDICATES 36" 6-HOLE BONDED INSULATED JOINT (1/4" END POST)

O STANDARD JOINT

NOTES:

1. SWITCH POINTS TO BE DOUBLE REINFORCED WITH 2'-8" LONG SOLID MANGANESE STEEL SAMSON TYPE SWITCH POINTS AND UNIVERSALLY UNDERCUT STOCK RAIL. TURNOUTS SHALL HAVE VERTICAL SWITCH RODS.
2. FROG SHALL BE HIGH INTEGRITY, EXPLOSION HARDENED, RAIL BOUND MANGANESE STEEL CASTING WITH MITERED HEEL AND EXTENDED HEEL AND WING RAILS.
3. ALL SWITCH RODS AND GAUGE PLATES ARE TO BE INSULATED TYPES.
4. STOCK RAILS ARE TO BE BENT IN THE MILL OR IN THE SHOP.
5. INSTALL INSULATED JOINTS ON ALL TURNOUTS AS SHOWN ABOVE. INSULATED JOINTS ARE TO BE POLY-INSULATED TYPE ONLY.
6. A MINIMUM 1" GAP MUST BE MAINTAINED BETWEEN THE ENDS OF METAL TIE PLATES LOCATED BEYOND THE CLOSURE AREA OF INSULATED JOINTS IN ORDER TO PROVIDE PROPER TRACK CIRCUIT PROTECTION.
7. SWITCH STAND SHALL BE RACOR TRI-GLIDE. ALL SWITCH STANDS LOCATED ON THE OUTSIDE OF TRACKS SHALL BE INSTALLED A MINIMUM OF 8'-6" FROM CENTERLINE OF TRACK. ALL SWITCH STANDS INSTALLED BETWEEN TRACKS SHALL BE A MINIMUM OF 6'-0" FROM CENTERLINE OF TRACK.
8. ACTUAL TURNOUT DATA, TURNOUT OFFSETS, RAIL LENGTHS, AND SWITCH TIE LENGTHS MAY VARY ON MANUFACTURER'S SHOP DRAWINGS.
9. ARC METHOD IS USED TO CALCULATE TURNOUT CURVE DATA AND OFFSETS.
10. RAIL FASTENERS SHALL BE PANDROL TYPE e-2055 ELASTIC CLIP.
11. ALL SWITCH TIES SHALL BE TIMBER.
12. INSTALL SWITCH POINT PROTECTORS AHEAD OF SWITCH POINTS ON BOTH INSIDE RAIL AS SHOWN.
13. INSTALL TWO INSULATED GAGE PLATES LOCATED AT THREE TIE SPACINGS IN ADVANCE OF SWITCH PER AREMA 223-03.
14. PROVIDE ELECTRICAL CONDUIT W/ STUB OUT FOR ALL TURNOUT SWITCHES TO ACCOMODATE FUTURE POWER SWITCHING. SEE STD PLAN RR-503 FOR STUB OUT LOCATION.

FOR IN-PAVEMENT TYPE SWITCH SEE SHEETS RR-601 TO RR-605.

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

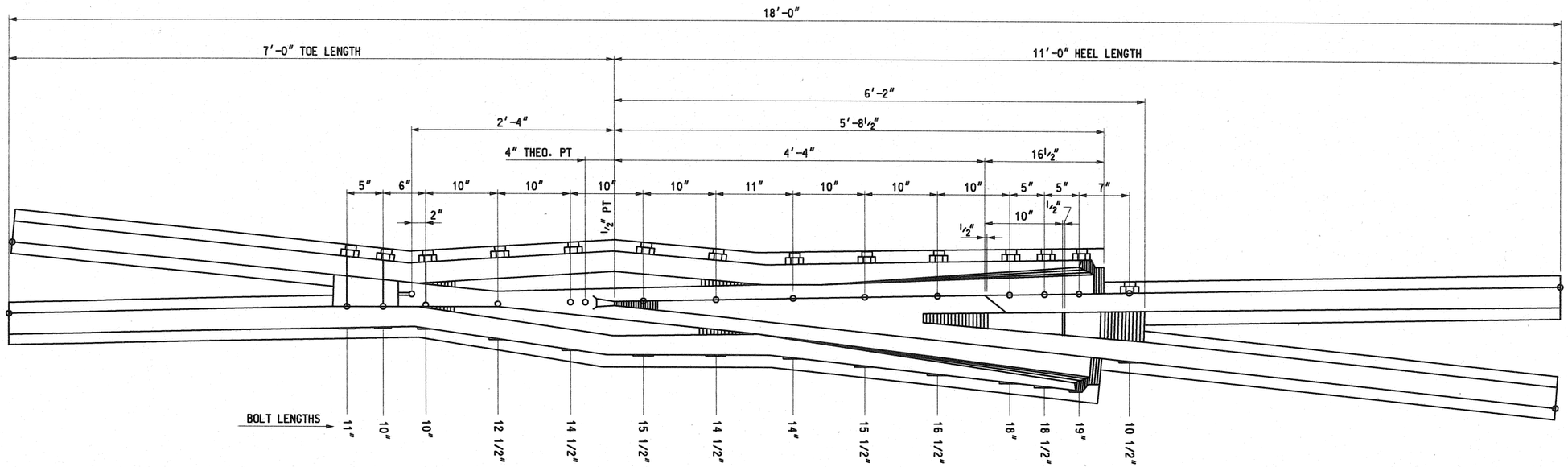
NUMBER 8 TURNOUT 136 LB

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

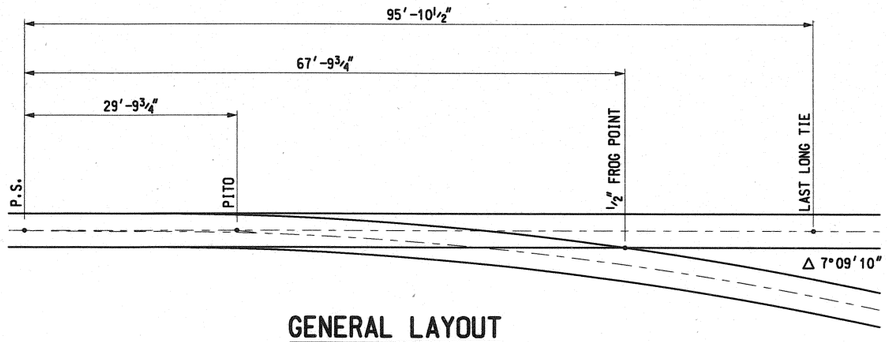
DRAWING NO: RR-350

SHEET NO: 1 OF 2

10/4/2013



NO. 8 RBM FROG



GENERAL LAYOUT

FROG DATA	
ANGLE	7°09′10″
TOE LENGTH	7′-0″
HEEL LENGTH	11′-0″
TOTAL LENGTH	18′-0″

TURNOUT DATA	
SWITCH LENGTH	16′-6″ (STRAIGHT)
ACTUAL LEAD	67′-9 3/4″
PS TO PITO	29′-9 3/4″
RADIUS OF CENTER LINE	487.28′
DEGREE OF CURVE	11°46′44″
CENTRAL ANGLE - CLOSURE CURVE	5°24′54″
RISERS	UNIFORM

LIST OF FROG BOLTS	
QTY	DESCRIPTION
2	BOLT. SO HD. 1⅜″ UNC X 10″ LONG GR. 8
1	BOLT. SO HD. 1⅜″ UNC X 10½″ LONG GR. 8
1	BOLT. SO HD. 1⅜″ UNC X 11″ LONG GR. 8
1	BOLT. SO HD. 1⅜″ UNC X 12½″ LONG GR. 8
1	BOLT. SO HD. 1⅜″ UNC X 14″ LONG GR. 8
2	BOLT. SO HD. 1⅜″ UNC X 14½″ LONG GR. 8
2	BOLT. SO HD. 1⅜″ UNC X 15½″ LONG GR. 8
1	BOLT. SO HD. 1⅜″ UNC X 16½″ LONG GR. 8
1	BOLT. SO HD. 1⅜″ UNC X 18″ LONG GR. 8
1	BOLT. SO HD. 1⅜″ UNC X 18½″ LONG GR. 8
1	BOLT. SO HD. 1⅜″ UNC X 19″ LONG GR. 8
14	HEAD LOCK WASHER (UTW 132)
14	TAIL WASHER (UTW 132)
14	NUT. 1⅜″ DIA HEAVY HEX SECURITY LOCK, GR. 8
14	FLAT WASHER. 1⅜″ TYPE B HARDENED F436

NOTES:

1. ALL MEASUREMENTS GIVEN AT ⅝″ BELOW TOP OF RAIL & TO ½″ POINT OF FROG.
2. FLANGEWAYS: 1⅞″ WIDE x 2″ DEEP EXC 1 13/16″ WIDE THRU HEAVY POINT AREA) HT 1⅜″ DIA (GRADE 8) SAE J429, HEAVY HEX HEAD BOLT WIDTH.
3. DRILLING: 9½″ x 6″ - 1⅛″ DIA - 3 3/32″ AB.
4. ALL BOLT HOLES SHALL BE CHAMFERED 1/16″.
5. EXPLOSION HARDEN MANGANESE CASTING PER AREA SPEC M2-7 MINIMUM BHN352.
6. RAILS TO BE FULLY HEAT TREATED OR DEEP HEAD HARDENED.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

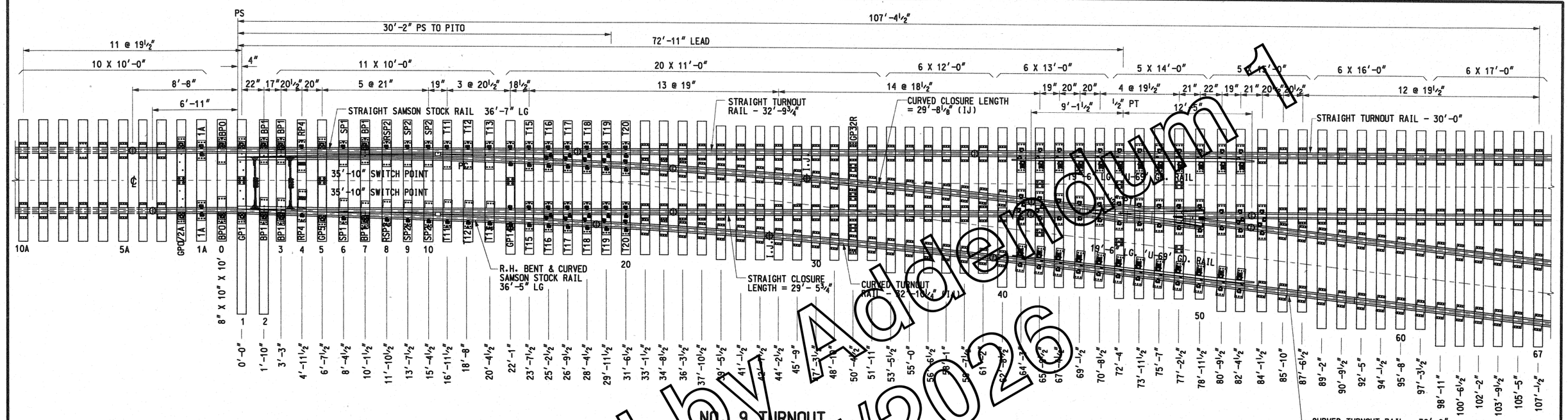
NUMBER 8 TURNOUT 136 LB

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-350

SHEET NO: 2 OF 2

10/4/2013



NO. 9 TURNOUT

R.H. TURNOUT SHOWN - L.H. OPPOSITE

BILL OF MATERIAL FOR NO. 9 136RE RH TURNOUT C/W RBM FROG	
QTY	DESCRIPTION
1	36'-7" 136RE LH STRAIGHT SAMSON STOCK RAIL FOR RH TURNOUT
1	36'-5" 136RE RH BENT SAMSON STOCK RAIL FOR RH TURNOUT
1	32'-9¾" 136RE STRAIGHT RUNNING RAIL
1	30'-0" 136RE STRAIGHT RUNNING RAIL
1	29'-5¾" 136RE STRAIGHT CLOSURE RAIL
1	29'-8⅛" 136RE CURVED CLOSURE RAIL (IJ RAIL)
1	32'-10¼" 136RE CURVED TURNOUT RAIL (IJ RAIL)
1	30'-0" 136RE CURVED TURNOUT RAIL
1	16'-6" 136RE LH SAMSON DET. 5100 SWITCH POINT WITH UNIFORM RISER ON 35'-10" RAIL
1	16'-6" 136RE RH SAMSON DET. 5100 SWITCH POINT WITH UNIFORM RISER ON 35'-10" RAIL
1	PAIR OF 2-HOLE FLOATING HEEL BLOCK ASSEMBLY FOR 16'-6" 136RE UNIFORM RISER SWITCH
1	NO.9 136LB RE RBM FROG C/W PANDROLIZED FROG BASE PLATES
1	PANDROLIZED SWITCH PLATE PACK FOR 16'-6" 136RE UNIFORM RISER SWITCH
1	PANDROLIZED TURNOUT PLATE PACK FOR RH NO. 9 UNIFORM RISER
2	19'-6" U69 GUARD RAILS C/W GUARD RAIL PLATES, AND HARDWARE
1	NO.1 VERTICAL INSULATED SWITCH ROD
1	NO.2 VERTICAL INSULATED SWITCH ROD
4	ADJUSTABLE ROCKER CLIPS
5	ADDITIONAL GAGE PLATES (3 @ THE FROG AND 2 THRU THE TURNOUT)
102	PANDROL ROLLED 1:40 CANT TIE PLATE 6" BASE
4	PANDROL ROLLED 1:40 CANT TIE PLATE 6" BASE (CUT FOR CLEARANCE)
A/R	PANDROL "e" CLIP 2055
A/R	15/16" x 6" SCREW SPIKE
36	SET OF PANDROL "C" CLIP AND "C" PLATE FOR JOINT BAR FASTENING
2	INSULATED JOINT KIT C/W ⅜" END POST & HARDWARE
1	SWITCH STAND RACOR 22-E OR AS DIRECTED

SWITCH TIES	
LENGTH	QTY
10'-0"	21
8"x10"x10'-0"	1
11'-0"	20
12'-0"	6
13'-0"	6
14'-0"	5
15'-0"	5
16'-0"	8
17'-0"	6
TOTAL QTY = 78	
TOTAL L.F. = 965 LF	

1-8" X 10" X 10'-0"
ALL TIES 7" X 9" X LENGTHS GIVEN EXCEPT TIE # 0

* HEADBLOCK TIES SHALL BE 16'-0" FOR SWITCH STANDS LOCATED ON THE OUTSIDE OF TRACKS AND 14' FOR INSIDE ABOVE TABLE SHOWS OUTSIDE SWITCH STAND PLACEMENT TIE COUNTS

LEGEND:

⊕ INDICATES 36" 6-HOLE BONDED INSULATED JOINT (1/4" END POST)

○ STANDARD JOINT

NOTES:

8. SWITCH POINTS TO BE DOUBLE REINFORCED WITH 2'-8" LONG SOLID MANGANESE STEEL SAMSON TYPE SWITCH POINTS AND UNIVERSALLY UNDERCUT STOCK RAIL. TURNOUTS SHALL HAVE VERTICAL SWITCH RODS.
9.
2. FROG SHALL BE GLUED, HIGH INTEGRITY, EXPLOSION HARDENED, RAIL BOUND MANGANESE STEEL CASTING WITH
10. MITERED HEEL AND EXTENDED HEEL AND WING RAILS.

3. ALL SWITCH RODS AND GAUGE PLATES ARE TO BE INSULATED
11. TYPES.

42. STOCK RAILS ARE TO BE BENT IN THE MILL OR IN THE SHOP.

53. INSTALL INSULATED JOINTS ON ALL TURNOUTS AS SHOWN ABOVE. INSULATED JOINTS ARE TO BE POLY-INSULATED TYPE ONLY.

6. A MINIMUM 1" GAP MUST BE MAINTAINED BETWEEN THE ENDS OF METAL TIE PLATES LOCATED BEYOND THE CLOSURE AREA OF INSULATED JOINTS IN ORDER TO PROVIDE PROPER TRACK CIRCUIT PROTECTION.

7. SWITCH STAND SHALL BE RACOR TRI-GLIDE. ALL SWITCH STANDS LOCATED ON THE OUTSIDE OF TRACKS SHALL BE INSTALLED A MINIMUM OF 8'-6" FROM CENTERLINE OF TRACK. ALL SWITCH STANDS INSTALLED BETWEEN TRACKS SHALL BE A MINIMUM OF 6'-0" FROM CENTERLINE OF TRACK.

ACTUAL TURNOUT DATA, TURNOUT OFFSETS, RAIL LENGTHS, AND SWITCH TIE LENGTHS MAY VARY ON MANUFACTURER'S SHOP DRAWINGS.

ARC METHOD IS USED TO CALCULATE TURNOUT CURVE DATA AND OFFSETS.

RAIL FASTENERS SHALL BE PANDROL TYPE e-2055 ELASTIC CLIP.

ALL SWITCH TIES SHALL BE TIMBER.

INSTALL TWO INSULATED GAGE PLATES LOCATED AT THREE TIE SPACINGS IN ADVANCE OF SWITCH PER AREMA 223-03.

PROVIDE ELECTRICAL CONDUIT W/ STUB OUT FOR ALL TURNOUT SWITCHES TO ACCOMODATE FUTURE POWER SWITCHING. SEE STD PLAN RR-503 FOR STUB OUT LOCATION.

FOR IN-PAVEMENT TYPE SWITCH SEE SHEETS RR-611 TO RR-615.

Canceled on 07/2026
Added by Addendum 1

REVISIONS	
NO.	DATE
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Port of LONG BEACH The Green Port

RAILROAD STANDARD PLANS

NUMBER 9 TURNOUT 136 LB

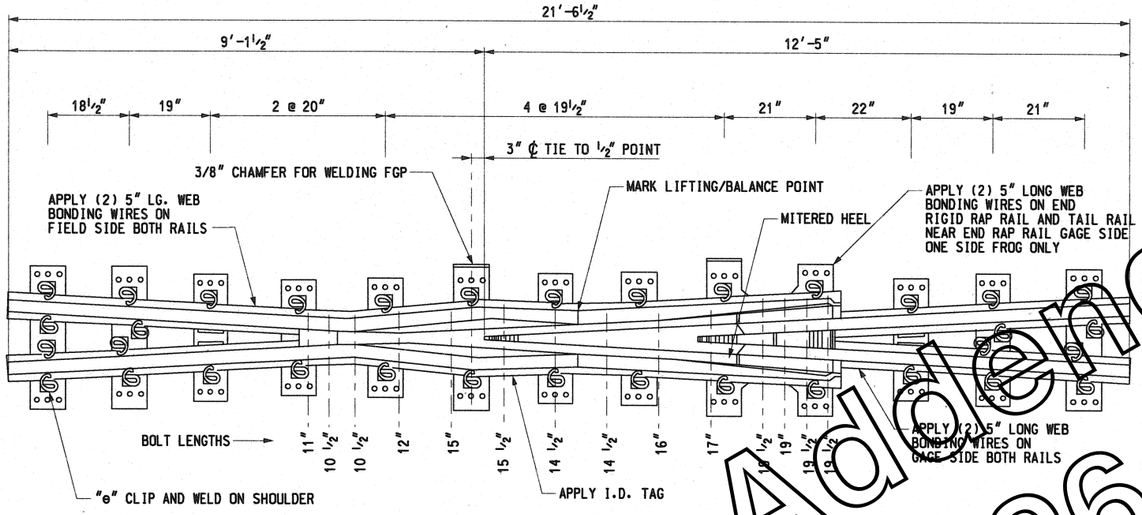
APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

P.E. NO.: C-54141 DATE: 09-19-2013

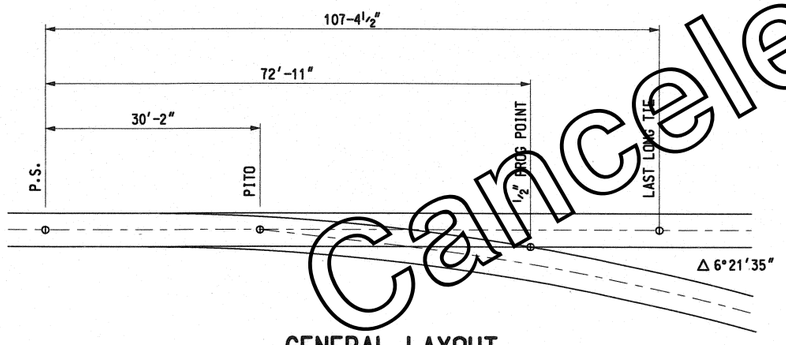
DRAWING NO: RR-351

SHEET NO: 1 OF 2

10/4/2013



NO. 9 RBM FROG



GENERAL LAYOUT

RBM FROG DATA	
ANGLE	6°21′35″
TOE LENGTH	9′-1½″
HEEL LENGTH	12′-5″
TOTAL LENGTH	21′-6½″

TURNOUT DATA	
SWITCH LENGTH	16′-6″ (STRAIGHT)
ACTUAL LEAD	72′-11″
PS TO PITO	30′-2″
RADIUS OF CENTER LINE	614′
T =	24.59′
DEGREE OF CURVE	9°20′31″
CENTRAL ANGLE - CLOSURE CURVE	4°35′13″
RISERS	UNIFORM

LIST OF FROG BOLTS	
QTY	DESCRIPTION
2	BOLT. SQ HD. 1⅜″ UNC X 10½″ LONG GR. 8
1	BOLT. SQ HD. 1⅜″ UNC X 11″ LONG GR. 8
1	BOLT. SQ HD. 1⅜″ UNC X 12″ LONG GR. 8
2	BOLT. SQ HD. 1⅜″ UNC X 14½″ LONG GR. 8
1	BOLT. SQ HD. 1⅜″ UNC X 15″ LONG GR. 8
1	BOLT. SQ HD. 1⅜″ UNC X 15½″ LONG GR. 8
1	BOLT. SQ HD. 1⅜″ UNC X 16″ LONG GR. 8
1	BOLT. SQ HD. 1⅜″ UNC X 17″ LONG GR. 8
1	BOLT. SQ HD. 1⅜″ UNC X 19″ LONG GR. 8
3	BOLT. SQ HD. 1⅜″ UNC X 19½″ LONG GR. 8
14	HEAD LOCK WASHER (UTW 132)
14	TAIL WASHER (UTW 132)
14	NUT. 1⅜″ DIA HEAVY HEX SECURITY LOCK, GR. 8
14	FLAT WASHER. 1⅜″ TYPE B HARDENED F436

NOTES:

1. ALL MEASUREMENTS GIVEN AT 5/8″ BELOW TOP OF RAIL & TO ½″ POINT OF FROG.
2. FLANGEWAYS: 1⅞″ WIDE x 2″ DEEP EXC 1 13/16″ WIDE THRU HEAVY POINT AREA) HT 1⅜″ DIA (GRADE 8) SAE J429, HEAVY HEX HEAD BOLT WIDTH.
3. DRILLING: 9½″ x 6″ - 1⅛″ DIA - 3 3/32″ AB.
4. ALL BOLT HOLES SHALL BE CHAMFERED 1/16″.
5. EXPLOSION HARDEN MANGANESE CASTING PER AREA SPEC M2-7 MINIMUM BHN352.
6. RAILS TO BE FULLY HEAT TREATED OR DEEP HEAD HARDENED.

REVISIONS	
NO.	DATE
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

NUMBER 9 TURNOUT 136 LB

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

P.E. NO.: C-54141 DATE: 09-19-2013

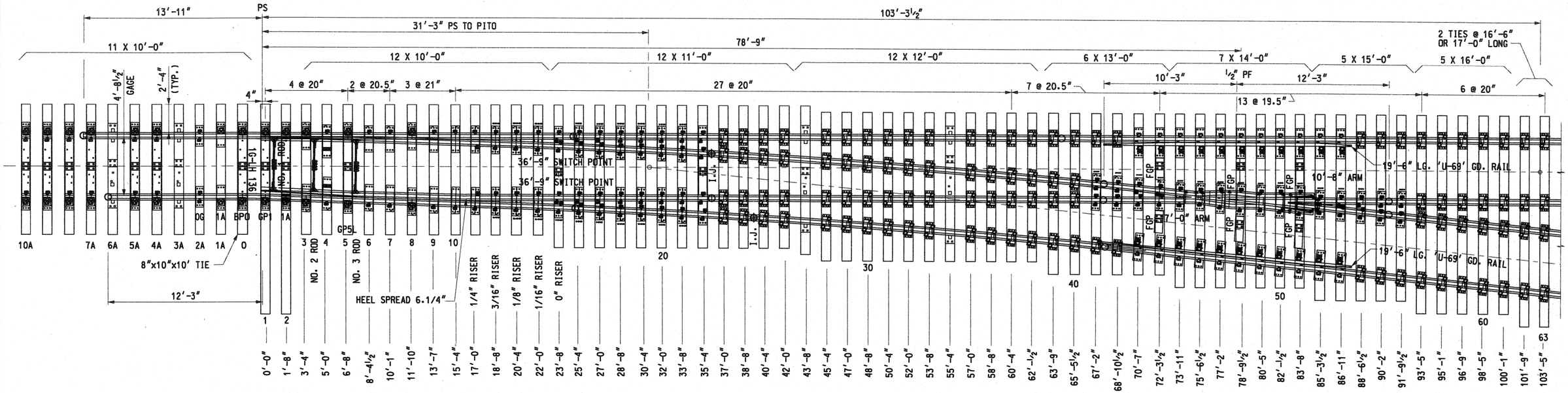
DRAWING NO: RR-351

SHEET NO: 2 OF 2

10/4/2013

...*RR-351 Number9 Turnout 136 lb - 2 of 2

Canceled by Addendum 1
On 07/2026



NO. 10 TURNOUT

R.H. TURNOUT SHOWN - L.H. OPPOSITE

BILL OF MATERIAL FOR NO.10 136RE RH TURNOUT C/W RBM FROG	
QTY	DESCRIPTION
1	39'-6" 136RE LH STRAIGHT SAMSON STOCK RAIL FOR RH TURNOUT
1	38'-0" 136RE RH BENT SAMSON STOCK RAIL FOR RH TURNOUT
1	39'-6" 136RE STRAIGHT RUNNING RAIL
1	39'-0" 136RE STRAIGHT RUNNING RAIL
1	34'-11 3/4" 136RE STRAIGHT CLOSURE RAIL
1	35'-1 1/2" 136RE CURVED CLOSURE RAIL
1	(1) EACH 14'-6" AND 28'-6" CURVED TURNOUT RAILS - 136RE
1	39'-0" 136RE STRAIGHT TURNOUT RAIL
1	18'-2" 136RE FROG END TANGENT RAIL
1	18'-4" 136RE FROG END TURNOUT RAIL
1	16'-6" 136RE LH SAMSON DET. 5100 SWITCH POINT WITH UNIFORM RISER ON 36'-9" RAIL
1	16'-6" 136RE RH SAMSON DET. 5100 SWITCH POINT WITH UNIFORM RISER ON 36'-9" RAIL
1	PAIR OF 2-HOLE FLOATING HEEL BLOCK ASSEMBLY FOR 16'-6" 136RE UNIFORM RISER SWITCH
1	NO.10 136LB RE RBM FROG C/W PANDROLIZED FROG BASE PLATES
1	PANDROLIZED SWITCH PLATE PACK FOR 16'-6" 136RE UNIFORM RISER SWITCH
1	PANDROLIZED TURNOUT PLATE PACK FOR R.H. NO. 10 UNIFORM RISER
2	19'-6" SEC U69 GUARD RAILS C/W PLATES & HARDWARE
1	NO.1 VERTICAL INSULATED SWITCH ROD
1	NO.2 VERTICAL INSULATED SWITCH ROD
1	NO.3 VERTICAL INSULATED SWITCH ROD
6	ADJUSTABLE ROCKER CLIPS
6	ADDITIONAL GAGE PLATES (3 @ THE FROG AND 3 THRU THE TURNOUT)
104	PANDROL ROLLED 1:40 CANT TIE PLATE 6" BASE
558	PANDROL "e" CLIP 2055
735	15/16" X 6" SCREW SPIKE
52	SET OF PANDROL "C" CLIP AND "C" PLATE FOR JOINT BAR FASTENING
2	TOUGH-COAT INSULATED JOINT KIT C/W 3/8" END POST & HARDWARE
1	SWITCH STAND RACOR 22-E OR AS DIRECTED

SWITCH TIES	
LENGTH	QTY
10'-0"	22
8"x10"x10'	1
11'-0"	12
12'-0"	12
13'-0"	6
14'-0"	7
15'-0"	5
16'-0"	7
17'-0"	2
TOTAL QTY = 74	
TOTAL L.F. = 903 LF	

1-8" X 10" X 10'-0"
ALL TIES 7" X 9" X LENGTHS GIVEN EXCEPT TIE # 0

* HEADBLOCK TIES SHALL BE 16'-0" FOR SWITCH STANDS LOCATED ON THE OUTSIDE OF TRACKS AND 14' FOR INSIDE ABOVE TABLE SHOWS OUTSIDE SWITCH STAND PLACEMENT TIE COUNTS

LEGEND:

⊕ INDICATES 36" 6-HOLE BONDED INSULATED JOINT (1/4" END POST)

O STANDARD JOINT

NOTES:

1. SWITCH POINTS TO BE DOUBLE REINFORCED WITH 2'-8" LONG SOLID MANGANESE STEEL SAMSON TYPE SWITCH POINTS AND UNIVERSALLY UNDERCUT STOCK RAIL. TURNOUTS SHALL HAVE VERTICAL SWITCH RODS.
2. FROG SHALL BE GLUED, HIGH INTEGRITY, EXPLOSION HARDENED, RAIL BOUND MANGANESE STEEL CASTING WITH MITERED HEEL AND EXTENDED HEEL AND WING RAILS.
3. ALL SWITCH RODS AND GAUGE PLATES ARE TO BE INSULATED TYPES.
4. STOCK RAILS ARE TO BE BENT IN THE MILL OR IN THE SHOP.
5. INSTALL INSULATED JOINTS ON ALL TURNOUTS AS SHOWN ABOVE. INSULATED JOINTS ARE TO BE POLY-INSULATED TYPE ONLY.
6. A MINIMUM 1" GAP MUST BE MAINTAINED BETWEEN THE ENDS OF METAL TIE PLATES LOCATED BEYOND THE CLOSURE AREA OF INSULATED JOINTS IN ORDER TO PROVIDE PROPER TRACK CIRCUIT PROTECTION.
7. SWITCH STAND SHALL BE RACOR TRI-GLIDE. ALL SWITCH STANDS LOCATED ON THE OUTSIDE OF TRACKS SHALL BE INSTALLED A MINIMUM OF 8'-6" FROM CENTERLINE OF TRACK. ALL SWITCH STANDS INSTALLED BETWEEN TRACKS SHALL BE A MINIMUM OF 6'-0" FROM CENTERLINE OF TRACK.
8. ACTUAL TURNOUT DATA, TURNOUT OFFSETS, RAIL LENGTHS, AND SWITCH TIE LENGTHS MAY VARY ON MANUFACTURER'S SHOP DRAWINGS.
9. ARC METHOD IS USED TO CALCULATE TURNOUT CURVE DATA AND OFFSETS.
10. RAIL FASTENERS SHALL BE PANDROL TYPE E-2055 ELASTIC CLIP.
11. ALL SWITCH TIES SHALL BE TIMBER.
12. PROVIDE ELECTRICAL CONDUIT W/ STUB OUT FOR ALL TURNOUT SWITCHES TO ACCOMODATE FUTURE POWER SWITCHING. SEE STD PLAN RR-503 FOR STUB OUT LOCATION.

FOR IN-PAVEMENT TYPE SWITCH SEE SHEETS RR-621 TO RR-625.

REVISIONS	
NO.	DATE
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

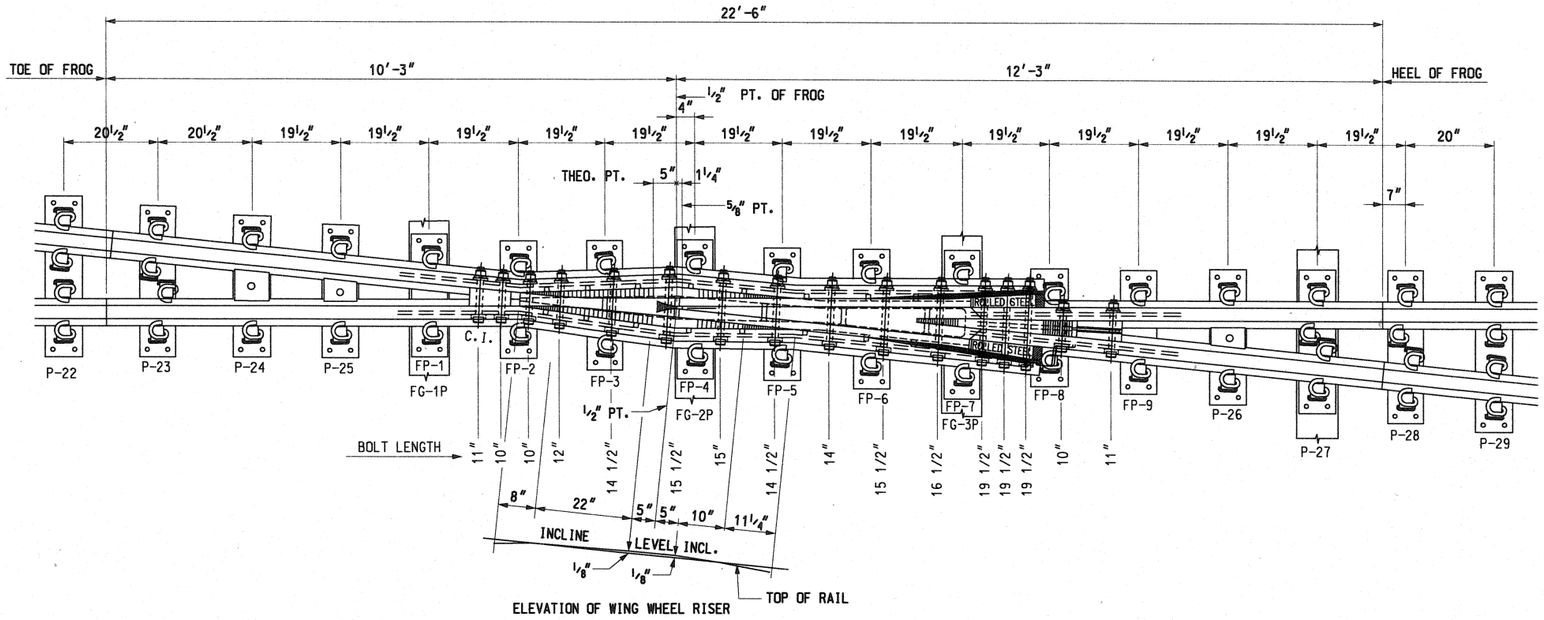
NUMBER 10 TURNOUT 136 LB

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

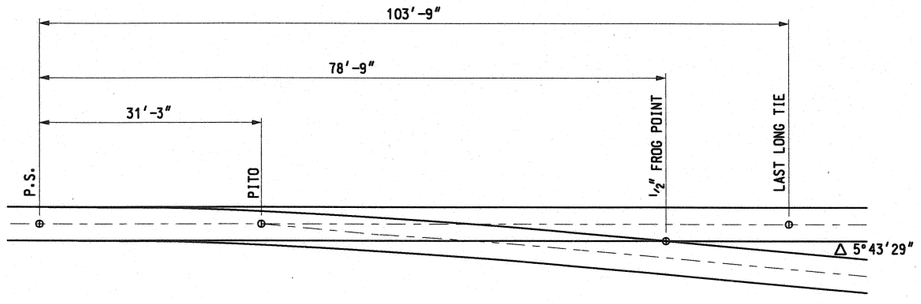
DRAWING NO: RR-352

SHEET NO: 1 OF 2

10/4/2013



NO. 10 RBM FROG



FROG DATA	
ANGLE	5°43′29″
TOE LENGTH	10′-3″
HEEL LENGTH	12′-3″
TOTAL LENGTH	22′-6″

GENERAL LAYOUT

TURNOUT DATA	
SWITCH LENGTH	16′-6″
ACTUAL LEAD	78′-9″
PS TO PITO	31′-3″
RADIUS OF CENTER LINE	742.29′
DEGREE OF CURVE	7°43′29″
CENTRAL ANGLE - CLOSURE CURVE	3°44′13″
HEEL SPREAD	6¼″

LIST OF FROG BOLTS	
QTY	DESCRIPTION
3	BOLT. SQ HD. 1⅜″ UNC X 10″ LONG GR. 8
2	BOLT. SQ HD. 1⅜″ UNC X 11″ LONG GR. 8
1	BOLT. SQ HD. 1⅜″ UNC X 12″ LONG GR. 8
1	BOLT. SQ HD. 1⅜″ UNC X 14″ LONG GR. 8
2	BOLT. SQ HD. 1⅜″ UNC X 14½″ LONG GR. 8
1	BOLT. SQ HD. 1⅜″ UNC X 15″ LONG GR. 8
2	BOLT. SQ HD. 1⅜″ UNC X 15½″ LONG GR. 8
1	BOLT. SQ HD. 1⅜″ UNC X 16½″ LONG GR. 8
1	BOLT. SQ HD. 1⅜″ UNC X 18½″ LONG GR. 8
1	BOLT. SQ HD. 1⅜″ UNC X 19″ LONG GR. 8
1	BOLT. SQ HD. 1⅜″ UNC X 19½″ LONG GR. 8
14	HEAD LOCK WASHER (UTW 132)
14	TAIL WASHER (UTW 132)
14	NUT. 1⅜″ DIA HEAVY HEX SECURITY LOCK, GR. 8
14	FLAT WASHER. 1⅜″ TYPE B HARDENED F436

NOTES:

1. ALL MEASUREMENTS GIVEN AT 5/8″ BELOW TOP OF RAIL & TO ½″ POINT OF FROG.
2. FLANGEWAYS: 1⅞″ WIDE x 2″ DEEP EXC 1 13/16″ WIDE THRU HEAVY POINT AREA) HT 1⅜″ DIA (GRADE 8) SAE J429, HEAVY HEX HEAD BOLT WIDTH.
3. DRILLING: 9½″ x 6″ - 1⅛″ DIA - 3 3/32″ AB.
4. ALL BOLT HOLES SHALL BE CHAMFERED 1/16″.
5. EXPLOSION HARDEN MANGANESE CASTING PER AREA SPEC M2-7 MINIMUM BHN352.
6. RAILS TO BE FULLY HEAT TREATED OR DEEP HEAD HARDENED.

REVISIONS	
NO.	DATE
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

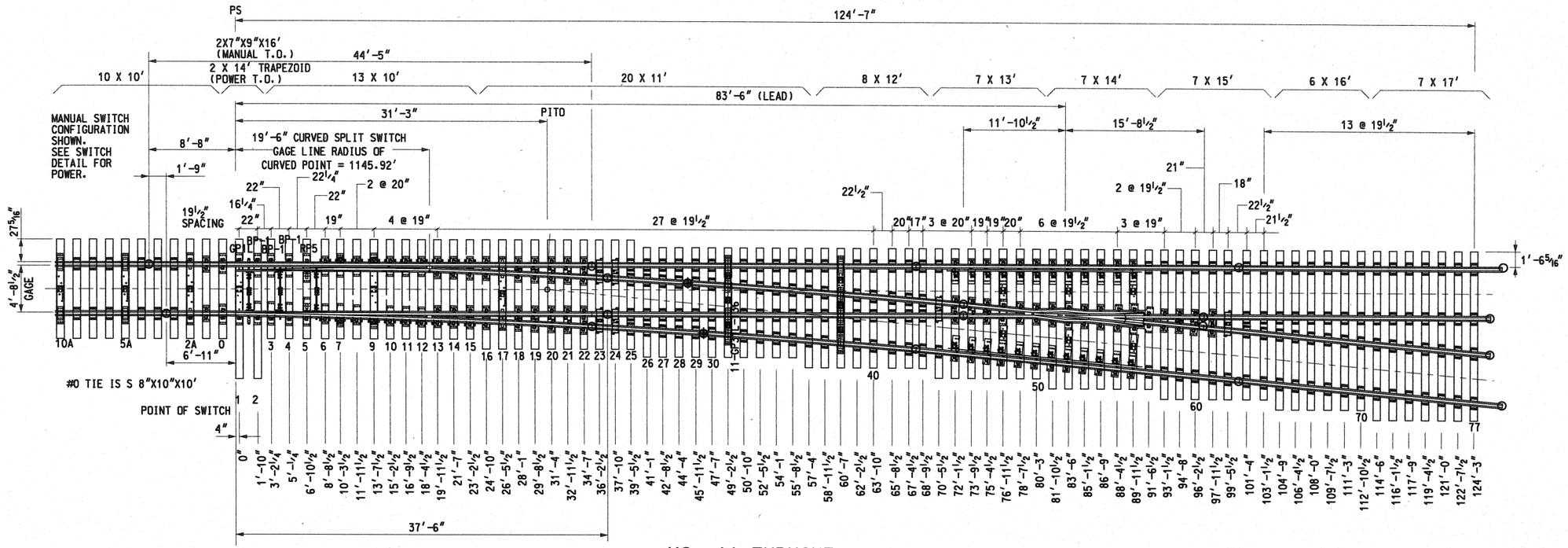
NUMBER 10 TURNOUT 136 LB

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-352

SHEET NO: 2 OF 2

10/4/2013



NO. 11 TURNOUT

R.H. TURNOUT SHOWN - L.H. OPPOSITE

BILL OF MATERIAL FOR NO. 11 136RE RH TURNOUT C/W RBM FROG	
QTY	DESCRIPTION
1	LH STRAIGHT SAMSON STOCK RAIL
1	RH BENT SAMSON STOCK RAIL
1	RH STRAIGHT SAMSON SW. POINT 19-6 EXTENDED TO 39'-0"
1	LH CURVED SAMSON SW. POINT 19-6 EXTENDED TO 39'-0"
1	SET OF INSULATED VERTICAL MJS RODS 1, 2 & 3
1	SET OF INSULATED GUAGE PLATE GP, GPO/2A, GP1, GPM1, GPM2
1	SET OF INSULATED GUAGE PLATE GP17, GP25, GP38
1	SET OF SWITCH AND RISER PLATES
2	ROLLER PLATE RP5
2	ROLLER BEARING ASSEMBLY
1	SET OF TURNOUT PLATES T13 AND T22
2	FLOATING HEEL STOCK WITH HARDWARE
18	LV BOLTERS BRAE
18	LV BRAE LOCKING PLATE
2	19'-6" GUARD RAIL U-69

SWITCH TIES	
LENGTH	QTY
10'-0"	23
8"x10"x10'	1
11'-0"	20
12'-0"	8
13'-0"	7
14'-0"	7
15'-0"	7
16'-0"	8
17'-0"	7
TOTAL QTY = 88	
TOTAL L.F. = 1164 (1168)*	

1-8" X 10" X 10'-0"
ALL TIES 7" X 9" X LENGTHS GIVEN EXCEPT TIE # 0

* HEADBLOCK TIES SHALL BE 16'-0" FOR SWITCH STANDS LOCATED ON THE OUTSIDE OF TRACKS AND 14' FOR INSIDE ABOVE TABLE SHOWS OUTSIDE SWITCH STAND PLACEMENT TIE COUNTS

LEGEND:

⊕ INDICATES 36" 6-HOLE BONDED INSULATED JOINT (1/4" END POST)

○ STANDARD JOINT

NOTES:

1. SWITCH POINTS TO BE DOUBLE REINFORCED WITH 2'-8" LONG SOLID MANGANESE STEEL SAMSON TYPE SWITCH POINTS AND UNIVERSALLY UNDERCUT STOCK RAIL. TURNOUTS SHALL HAVE VERTICAL SWITCH RODS.
2. FROG SHALL BE GLUED, HIGH INTEGRITY, EXPLOSION HARDENED, RAIL BOUND MANGANESE STEEL CASTING WITH MITERED HEEL AND EXTENDED HEEL AND WING RAILS.
3. ALL SWITCH RODS AND GAUGE PLATES ARE TO BE INSULATED TYPES.
4. STOCK RAILS ARE TO BE BENT IN THE MILL OR IN THE SHOP.
5. INSTALL INSULATED JOINTS ON ALL TURNOUTS AS SHOWN ABOVE. INSULATED JOINTS ARE TO BE POLY-INSULATED TYPE ONLY.
6. A MINIMUM 1" GAP MUST BE MAINTAINED BETWEEN THE ENDS OF METAL TIE PLATES LOCATED BEYOND THE CLOSURE AREA OF INSULATED JOINTS IN ORDER TO PROVIDE PROPER TRACK CIRCUIT PROTECTION.
7. SWITCH STAND SHALL BE RACOR TRI-GLIDE. ALL SWITCH STANDS LOCATED ON THE OUTSIDE OF TRACKS SHALL BE INSTALLED A MINIMUM OF 8'-6" FROM CENTERLINE OF TRACK. ALL SWITCH STANDS INSTALLED BETWEEN TRACKS SHALL BE A MINIMUM OF 6'-0" FROM CENTERLINE OF TRACK.
8. POWER SWITCH MACHINE OR HYDRA-SWITCH MACHINE MAY BE USED IN LIEU OF SWITCH STAND.
9. ACTUAL TURNOUT DATA, TURNOUT OFFSETS, RAIL LENGTHS, AND SWITCH TIE LENGTHS MAY VARY ON MANUFACTURER'S SHOP DRAWINGS.
10. ARC METHOD IS USED TO CALCULATE TURNOUT CURVE DATA AND OFFSETS.
11. RAIL FASTENERS SHALL BE PANDROL TYPE e-2055 ELASTIC CLIP.
12. ALL SWITCH TIES SHALL BE TIMBER.
13. PROVIDE ELECTRICAL CONDUIT W/ STUB OUT FOR ALL TURNOUT SWITCHES TO ACCOMODATE FUTURE POWER SWITCHING. SEE STD PLAN RR-503 FOR STUB OUT LOCATION.

FOR IN-PAVEMENT TYPE SWITCH SEE SHEETS RR-631 TO RR-635.

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

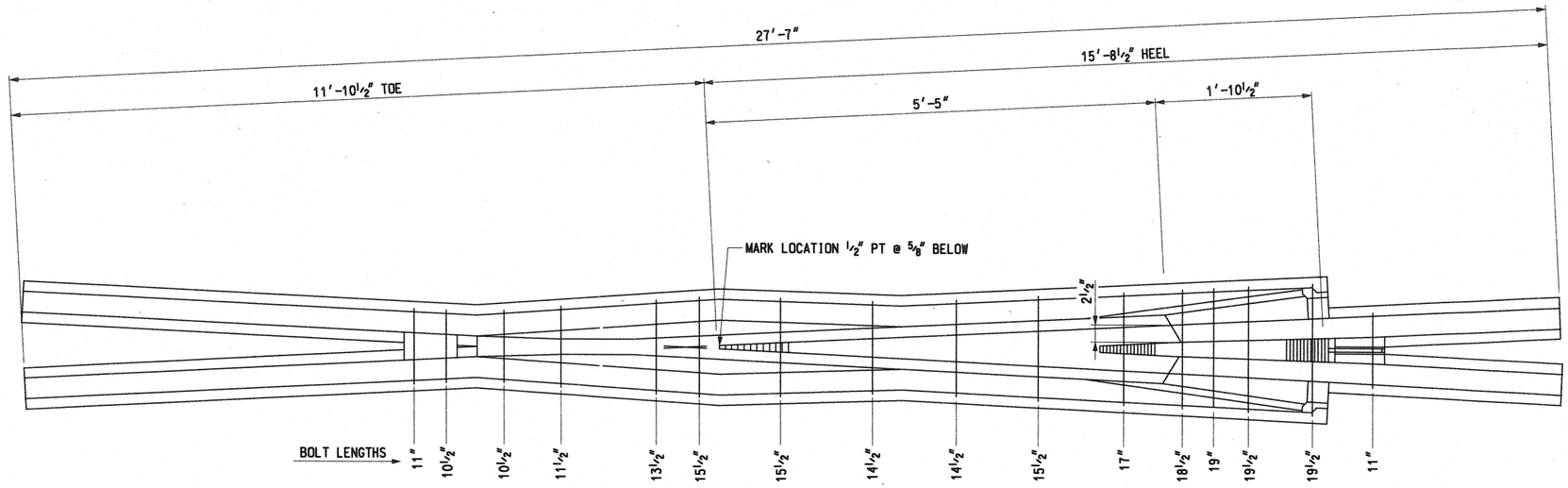
NUMBER 11 TURNOUT 136 LB

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

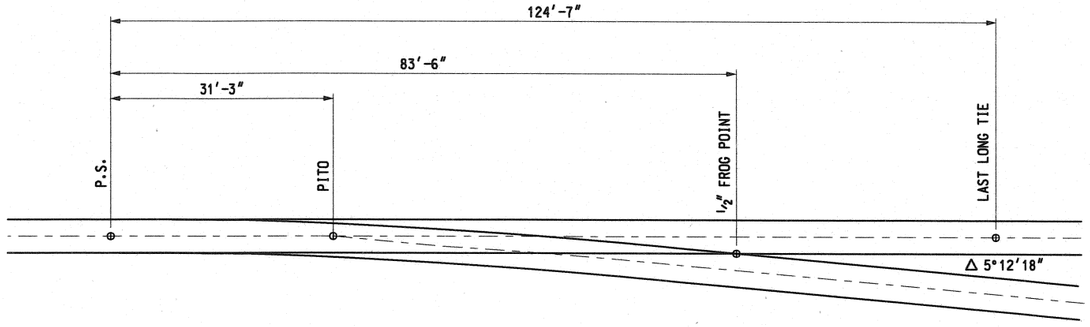
DRAWING NO: RR-353

SHEET NO: 1 OF 2

10/4/2013



NO. 11 RBM FROG



GENERAL LAYOUT

FROG DATA	
ANGLE	5°12′18″
TOE LENGTH	11′-10½″
HEEL LENGTH	15′-8½″
TOTAL LENGTH	27′-7″

TURNOUT DATA	
SWITCH LENGTH	19′-6″ (CURVED)
ACTUAL LEAD	83′-6″
PS TO PITO	31′-3″
RADIUS OF CENTER LINE	1011.69′
DEGREE OF CURVE	5°40′44″
CENTRAL ANGLE – CLOSURE CURVE	3°13′02″
RISERS	GRADUATED
T =	28.35′
HEEL SPREAD	6 1/4″

LIST OF FROG BOLTS	
QTY	DESCRIPTION
2	BOLT. SO HD. 1⅜″ UNC X 10½″ LONG GR. 8
2	BOLT. SO HD. 1⅜″ UNC X 11″ LONG GR. 8
1	BOLT. SO HD. 1⅜″ UNC X 11½″ LONG GR. 8
1	BOLT. SO HD. 1⅜″ UNC X 13½″ LONG GR. 8
2	BOLT. SO HD. 1⅜″ UNC X 14½″ LONG GR. 8
3	BOLT. SO HD. 1⅜″ UNC X 15½″ LONG GR. 8
1	BOLT. SO HD. 1⅜″ UNC X 17″ LONG GR. 8
1	BOLT. SO HD. 1⅜″ UNC X 18½″ LONG GR. 8
1	BOLT. SO HD. 1⅜″ UNC X 19″ LONG GR. 8
2	BOLT. SO HD. 1⅜″ UNC X 19½″ LONG GR. 8
16	HEAD LOCK WASHER (UTW 132)
16	TAIL WASHER (UTW 132)
16	NUT. 1⅜″ DIA HEAVY HEX SECURITY LOCK, GR. 8
16	FLAT WASHER. 1⅜″ TYPE B HARDENED F436

NOTES:

1. ALL MEASUREMENTS GIVEN AT ⅝″ BELOW TOP OF RAIL & TO ½″ POINT OF FROG.
2. FLANGEWAYS: 1⅞″ WIDE x 2″ DEEP EXC 1 13/16″ WIDE THRU HEAVY POINT AREA) HT 1⅜″ DIA (GRADE 8) SAE J429, HEAVY HEX HEAD BOLT WIDTH.
3. DRILLING: 9½″ x 6″ – 1⅛″ DIA – 3 3/32″ AB.
4. ALL BOLT HOLES SHALL BE CHAMFERED 1/16″.
5. EXPLOSION HARDEN MANGANESE CASTING PER AREA SPEC M2-7 MINIMUM BHN352.
6. RAILS TO BE FULLY HEAT TREATED OR DEEP HEAD HARDENED.

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

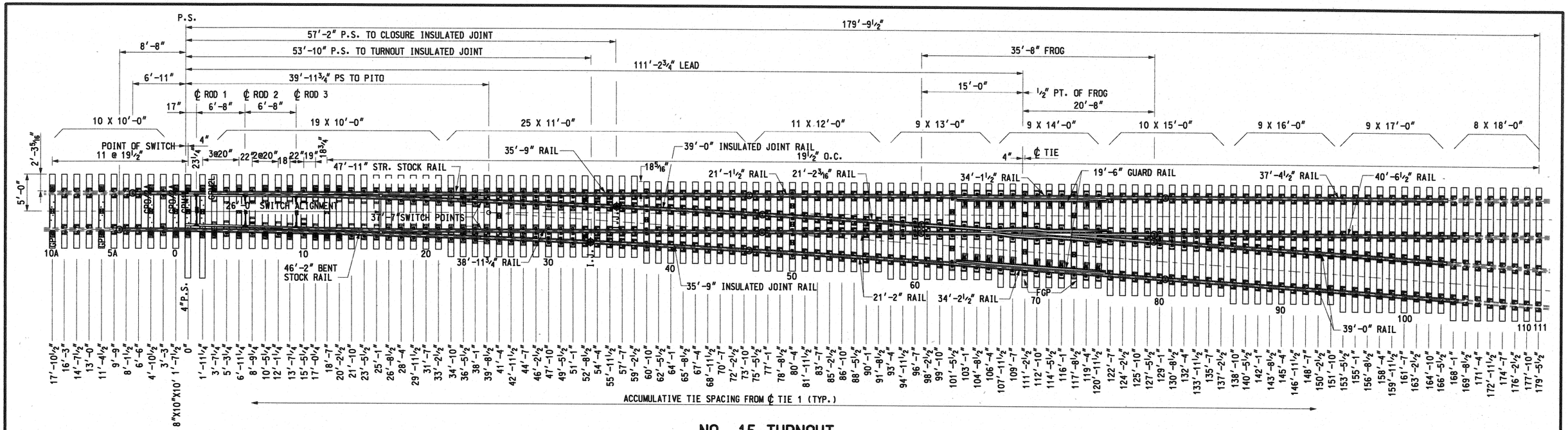
NUMBER 11 TURNOUT 136 LB

APPROVED BY: _____
SEAN A. GAMETTE – ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-353

SHEET NO: 2 OF 2

10/4/2013



NO. 15 TURNOUT

R.H. TURNOUT SHOWN - L.H. OPPOSITE

BILL OF MATERIAL FOR NO. 15 136RE RH TURNOUT W/ RBM FROG		
ITEM	QTY	DESCRIPTION
1	1	47'-11" 136RE STRAIGHT SAMSON STOCK RAIL FOR RH TURNOUT
2	1	46'-2" 136RE BENT SAMSON STOCK RAIL FOR RH TURNOUT
3	1	35'-9" 136RE STRAIGHT RUNNING RAIL
4	1	21'-1 1/2" 136RE STRAIGHT RUNNING RAIL
5	1	34'-1 1/2" 136RE STRAIGHT RUNNING RAIL
6	1	37'-4 1/2" 136RE STRAIGHT RUNNING RAIL
7	1	38'-11 3/4" 136RE STRAIGHT RUNNING RAIL
8	1	21'-2" 136RE STRAIGHT RUNNING RAIL
9	1	40'-6 1/2" 136RE STRAIGHT RUNNING RAIL
10	1	29'-5 3/4" 136RE STRAIGHT CLOSURE RAIL
11	1	39'-0" 136RE CURVED CLOSURE RAIL (I.J. RAIL)
12	1	35'-9" 136RE CURVED TURNOUT RAIL (I.J. RAIL)
13	1	39'-0" 136RE CURVED TURNOUT RAIL
14	1	34'-2 1/2" 136RE CURVED TURNOUT RAIL
15	1	21'-2" 136RE CURVED TURNOUT RAIL
16	1	21'-2 3/16" 136RE CURVED TURNOUT RAIL
17	1	26'-0" 136RE STR SAMSON DET. 5100 SWITCH POINT WITH UNIFORM RISER ON 37'-7" RAIL
18	1	26'-0" 136RE CVD SAMSON DET. 5100 SWITCH POINT WITH UNIFORM RISER ON 37'-7" RAIL
19	2	19'-6" U-69 GUARD RAILS W/ GUARD RAIL PLATES, AND HARDWARE
20	1	PAIR OF 2-HOLE FLOATING HEEL BLOCK ASSEMBLY FOR 26'-0" 136RE UNIFORM RISER SWITCH
21	1	NO.15 136LB RE RBM FROG W/ PANDROLIZED FROG BASE PLATES
22	1	PANDROLIZED SWITCH PLATE PACK FOR 26'-0" 136RE UNIFORM RISER SWITCH
23	1	PANDROLIZED TURNOUT PLATE PACK FOR RH NO. 15 UNIFORM RISER
24	1	NO.1 VERTICAL INSULATED SWITCH ROD
25	1	NO.2 VERTICAL INSULATED SWITCH ROD
26	1	NO.3 VERTICAL INSULATED SWITCH ROD

SWITCH TIES	
LENGTH	QTY
10'-0"	29
8"x10"x10'	1
11'-0"	25
12'-0"	11
13'-0"	9
14'-0"	11
15'-0"	10
16'-0"	9
17'-0"	9
18'-0"	8
TOTAL QTY = 122	
TOTAL L.F. = 1569 *	

1-8" X 10" X 10'-0"
ALL TIES 7" X 9" X LENGTHS GIVEN EXCEPT TIE # 0

* HEADBLOCK TIES SHALL BE 16'-0" FOR SWITCH STANDS LOCATED ON THE OUTSIDE OF TRACKS AND 14' FOR INSIDE ABOVE TABLE SHOWS OUTSIDE SWITCH STAND PLACEMENT TIE COUNTS

LEGEND:

⊕ INDICATES 36" 6-HOLE BONDED INSULATED JOINT (1/4" END POST)

○ STANDARD JOINT

NOTES:

1. SWITCH POINTS TO BE DOUBLE REINFORCED WITH 2'-8" LONG SOLID MANGANESE STEEL SAMSON TYPE SWITCH POINTS AND UNIVERSALLY UNDERCUT STOCK RAIL. TURNOUTS SHALL HAVE VERTICAL SWITCH RODS.
2. FROG SHALL BE GLUED, HIGH INTEGRITY, EXPLOSION HARDENED, RAIL BOUND MANGANESE STEEL CASTING WITH MITERED HEEL AND EXTENDED HEEL AND WING RAILS.
3. ALL SWITCH RODS AND GAUGE PLATES ARE TO BE INSULATED TYPES.
4. STOCK RAILS ARE TO BE BENT IN THE MILL OR IN THE SHOP.
5. INSTALL INSULATED JOINTS ON ALL TURNOUTS AS SHOWN ABOVE. INSULATED JOINTS ARE TO BE POLY-INSULATED TYPE ONLY.
6. A MINIMUM 1" GAP MUST BE MAINTAINED BETWEEN THE ENDS OF METAL TIE PLATES LOCATED BEYOND THE CLOSURE AREA OF INSULATED JOINTS IN ORDER TO PROVIDE PROPER TRACK CIRCUIT PROTECTION.
7. SWITCH STAND SHALL BE RACOR TRI-GLIDE, ALL SWITCH STANDS LOCATED ON THE OUTSIDE OF TRACKS SHALL BE INSTALLED A MINIMUM OF 8'-6" FROM CENTERLINE OF TRACK. ALL SWITCH STANDS INSTALLED BETWEEN TRACKS SHALL BE A MINIMUM OF 6'-0" FROM CENTERLINE OF TRACK.
8. POWER SWITCH MACHINE OR HYDRA-SWITCH MAY BE USED IN LIEU OF SWITCH STAND.
9. ACTUAL TURNOUT DATA, TURNOUT OFFSETS, RAIL LENGTHS, AND SWITCH TIE LENGTHS MAY VARY ON MANUFACTURER'S SHOP DRAWINGS.
10. ARC METHOD IS USED TO CALCULATE TURNOUT CURVE DATA AND OFFSETS.
11. RAIL FASTENERS SHALL BE PANDROL TYPE e-2055 ELASTIC CLIP.
12. ALL SWITCH TIES SHALL BE TIMBER.
13. PROVIDE ELECTRICAL CONDUIT W/ STUB OUT FOR ALL TURNOUT SWITCHES TO ACCOMODATE FUTURE POWER SWITCHING. SEE STD PLAN RR-503 FOR STUB OUT LOCATION.

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

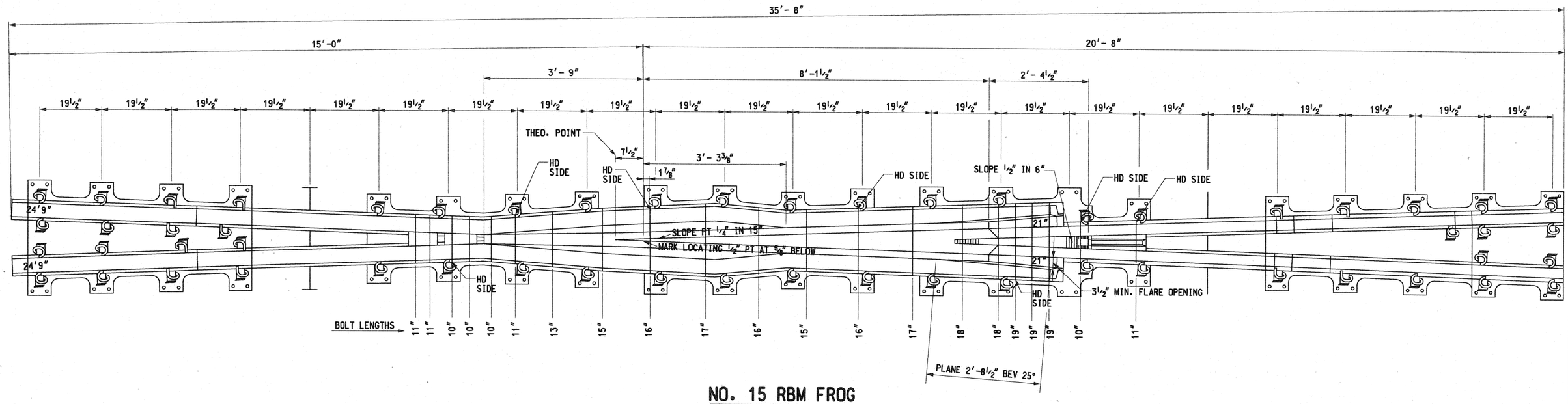
NUMBER 15 TURNOUT 136 LB

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-354

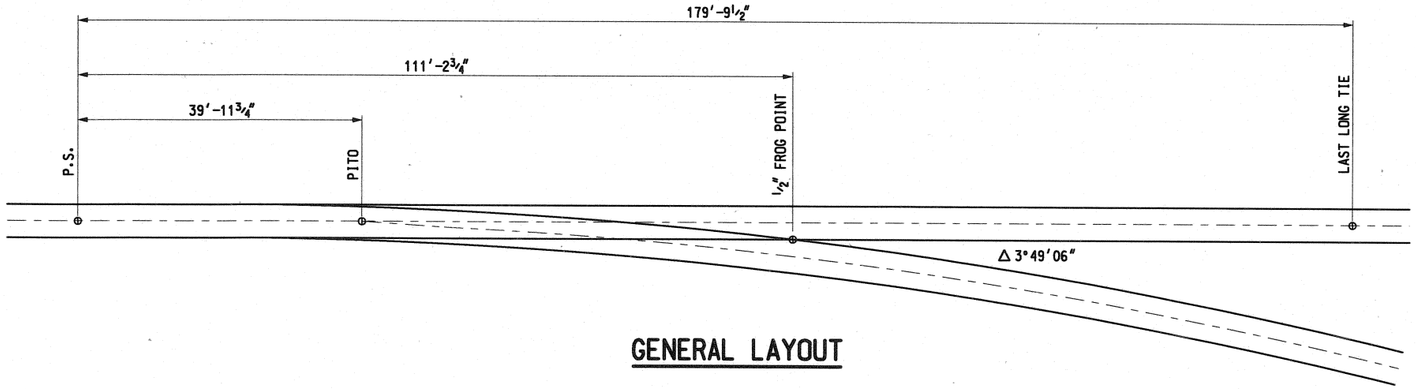
SHEET NO: 1 OF 2

10/4/2013



NO. 15 RBM FROG

FROG DATA	
ANGLE	3°49′06″
TOE LENGTH	15′-0″
HEEL LENGTH	20′-8″
TOTAL LENGTH	35′-8″



GENERAL LAYOUT

TURNOUT DATA	
SWITCH LENGTH	26′-0″
ACTUAL LEAD	111′-2 3/4″
PS TO PITO	39′-11 3/4″
RADIUS OF CENTER LINE	1853.42′
DEGREE OF CURVE	3°05′30″
CENTRAL ANGLE - CLOSURE CURVE	3°04′29″
T =	49.68′
HEEL SPREAD	6¼″

LIST OF FROG BOLTS	
QTY	DESCRIPTION
5	BOLT. SO HD. 1⅜″ UNC X 10″ LONG GR. 8
3	BOLT. SO HD. 1⅜″ UNC X 11″ LONG GR. 8
1	BOLT. SO HD. 1⅜″ UNC X 13″ LONG GR. 8
2	BOLT. SO HD. 1⅜″ UNC X 15″ LONG GR. 8
3	BOLT. SO HD. 1⅜″ UNC X 16″ LONG GR. 8
2	BOLT. SO HD. 1⅜″ UNC X 17″ LONG GR. 8
2	BOLT. SO HD. 1⅜″ UNC X 18″ LONG GR. 8
3	BOLT. SO HD. 1⅜″ UNC X 19″ LONG GR. 8
21	HEAD LOCK WASHER (UTW 132)
21	TAIL WASHER (UTW 132)
21	NUT. 1⅜″ DIA HEAVY HEX SECURITY LOCK. GR. 8
21	FLAT WASHER. 1⅜″ TYPE B HARDENED F436

NOTES:

1. ALL MEASUREMENTS GIVEN AT ⅝″ BELOW TOP OF RAIL & TO ½″ POINT OF FROG.
2. FLANGEWAYS: 1⅞″ WIDE x 2″ DEEP EXC 1 13/16″ WIDE THRU HEAVY POINT AREA) HT 1⅜″ DIA (GRADE 8) SAE J429, HEAVY HEX HEAD BOLT WIDTH.
3. DRILLING: 9½″ x 6″ - 1⅛″ DIA - 3⅜₂″ AB.
4. ALL BOLT HOLES SHALL BE CHAMFERED 1/16″.
5. EXPLOSION HARDEN MANGANESE CASTING PER AREA SPEC M2-7 MINIMUM BHN352.
6. RAILS TO BE FULLY HEAT TREATED OR DEEP HEAD HARDENED.

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

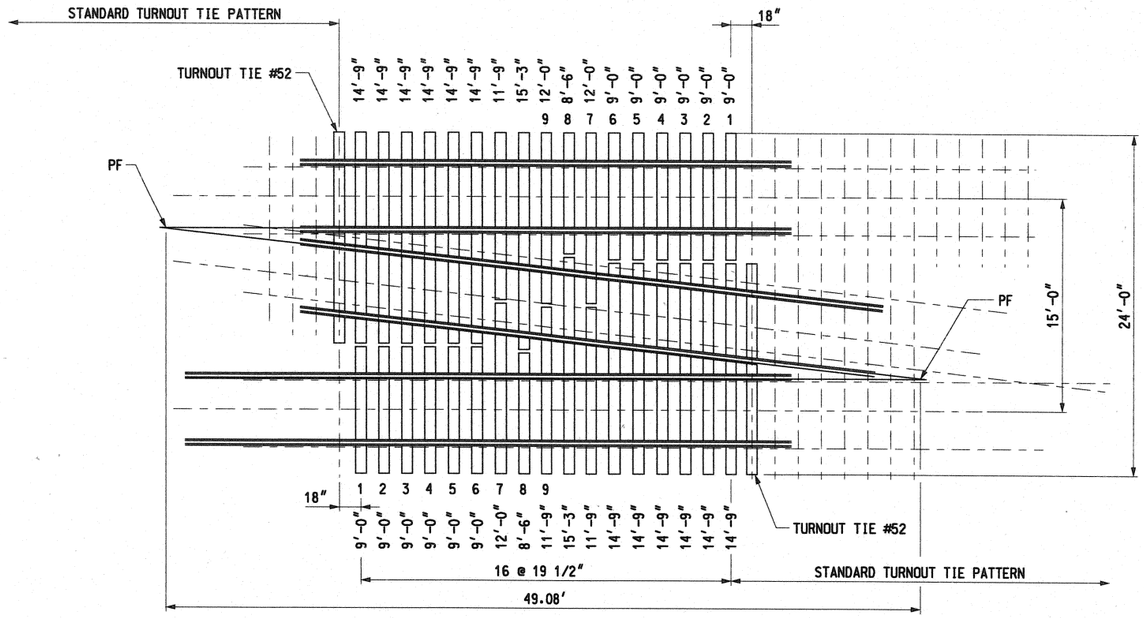
NUMBER 15 TURNOUT 136 LB

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-354

SHEET NO: 2 OF 2

10/4/2013



NO. 9 CROSSOVER - PLAN

NTS

NOTES:

1. DEPICTS TIE PATTERN FOR X-OVER SECTION, ALL X-OVER TIES SPACED AT 1'-7½" ON CENTER. UNLESS NOTED OTHERWISE.
2. RAIL FASTENERS SHALL BE PANDROL TYPE e-2055 ELASTIC CLIP.
3. ALL SWITCH TIES SHALL BE TIMBER.
4. ALL SWITCH TIES CUT TO LENGTH WILL HAVE TIMBER PRESERVATIVE APPLIED TO CUT ENDS.
5. NOTE LAST STANDARD TURNOUT TIE USED IS TIE #52, SEE RR-351, 1 OF 2.
6. 15'-0" STANDARD TURNOUT TIES MAY NEED TO BE TRIMMED IN THE FIELD SO THAT TIES DO NOT BIND WHEN SURFACING EACH TRACK.

X-OVER TIES	
SIZE	QTY
7" x 9" x 8'-6"	2
7" x 9" x 9'-0"	12
7" x 9" x 11'-9"	3
7" x 9" x 12'-0"	3
7" x 9" x 14'-9"	12
7" x 9" x 15'-3"	2

REVISIONS	
NO.	DATE
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

NUMBER 9 TIMBER CROSSOVER AT 15'-0" TRACK CENTERS

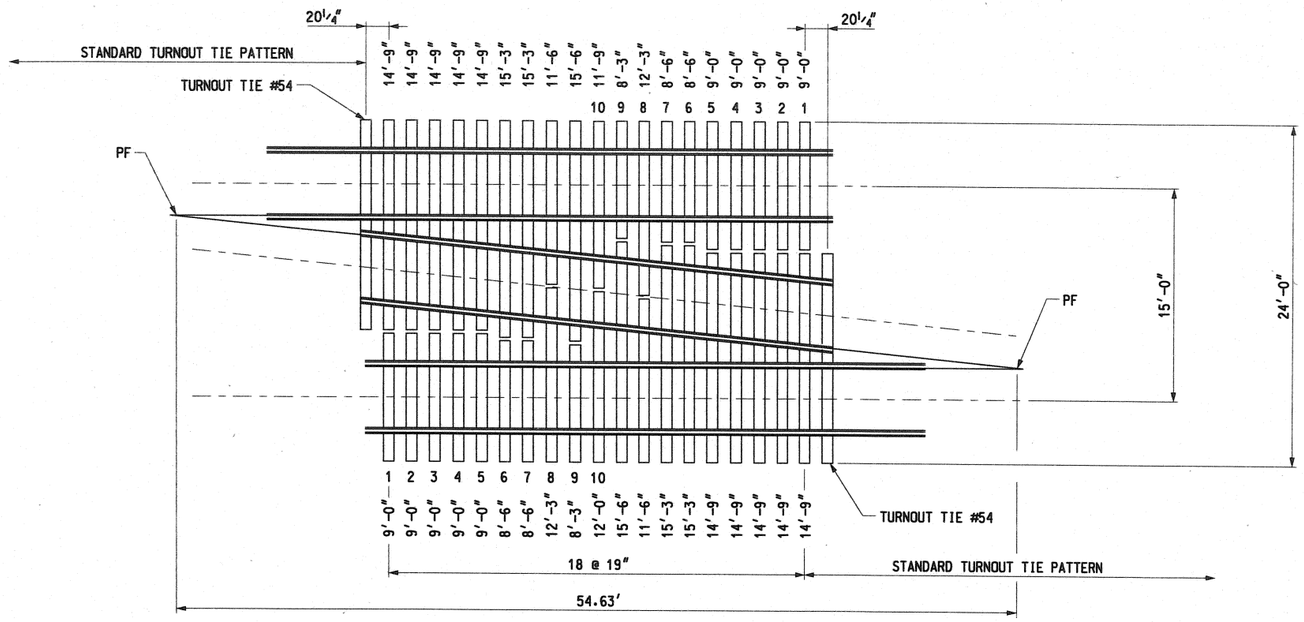
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-355

SHEET NO: 1 OF 1

10/4/2013

...*RR-355 Number 9 Timber Crossover @ 15'-0" Track Centers



NO. 10 CROSSOVER - PLAN

NTS

NOTES:

1. DEPICTS TIE PATTERN FOR X-OVER SECTION, ALL X-OVER TIES SPACED AT 1'-7½" ON CENTER. UNLESS NOTED OTHERWISE.
2. RAIL FASTENERS SHALL BE PANDROL TYPE e-2055 ELASTIC CLIP.
3. ALL SWITCH TIES SHALL BE TIMBER.
4. ALL SWITCH TIES CUT TO LENGTH WILL HAVE TIMBER PRESERVATIVE APPLIED TO CUT ENDS.
5. NOTE LAST STANDARD TURNOUT TIE USED IS TIE #54, SEE RR-352, 1 OF 2.
6. 15'-0" STANDARD TURNOUT TIES MAY NEED TO BE TRIMMED IN THE FIELD SO THAT TIES DO NOT BIND WHEN SURFACING EACH TRACK.

X-OVER TIES	
SIZE	QTY
7" x 9" x 8'-3"	2
7" x 9" x 8'-6"	4
7" x 9" x 9'-0"	10
7" x 9" x 11'-6"	2
7" x 9" x 11'-9"	1
7" x 9" x 12'-0"	1
7" x 9" x 12'-3"	2
7" x 9" x 14'-9"	10
7" x 9" x 15'-3"	4
7" x 9" x 15'-6"	2

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

NUMBER 10 TIMBER CROSSOVER AT 15'-0" TRACK CENTERS

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

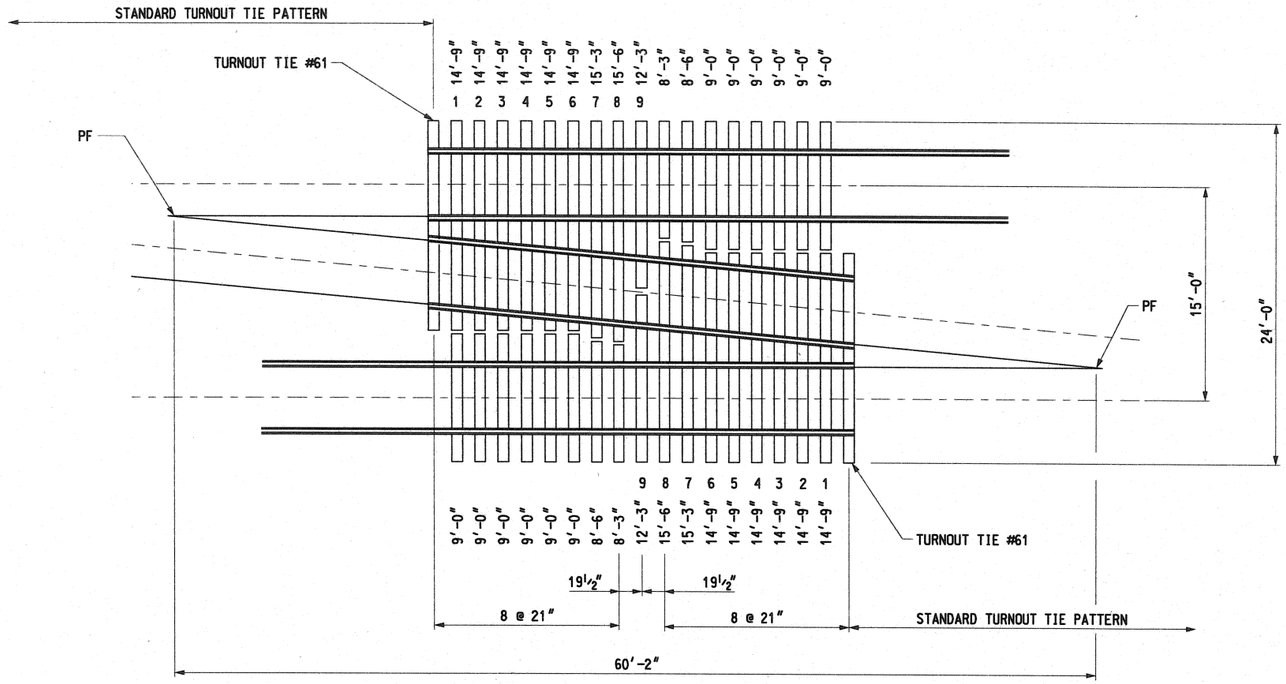
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-356

SHEET NO: 1 OF 1

10/4/2013

...*RR-356 Number 10 Timber Crossover @ 15'-0" Track Centers



NO. 11 CROSSOVER

NTS

NOTES:

1. DEPICTS TIE PATTERN FOR X-OVER SECTION. ALL X-OVER TIES SPACED AT 1'-7½" ON CENTER. UNLESS NOTED OTHERWISE.
2. RAIL FASTENERS SHALL BE PANDROL TYPE e-2055 ELASTIC CLIP.
3. ALL SWITCH TIES SHALL BE TIMBER.
4. ALL SWITCH TIES CUT TO LENGTH WILL HAVE TIMBER PRESERVATIVE APPLIED TO CUT ENDS.
5. NOTE LAST STANDARD TURNOUT TIE USED IS TIE #61. SEE RR-353, 1 OF 2.
6. 15'-0" STANDARD TURNOUT TIES MAY NEED TO BE TRIMMED IN THE FIELD SO THAT TIES DO NOT BIND WHEN SURFACING EACH TRACK.

X-OVER TIES	
SIZE	QTY
7" x 9" x 8'-3"	2
7" x 9" x 8'-6"	2
7" x 9" x 9'-0"	12
7" x 9" x 12'-3"	2
7" x 9" x 14'-9"	12
7" x 9" x 15'-3"	2
7" x 9" x 15'-6"	2

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

NUMBER 11 TIMBER CROSSOVER AT 15'-0" TRACK CENTERS

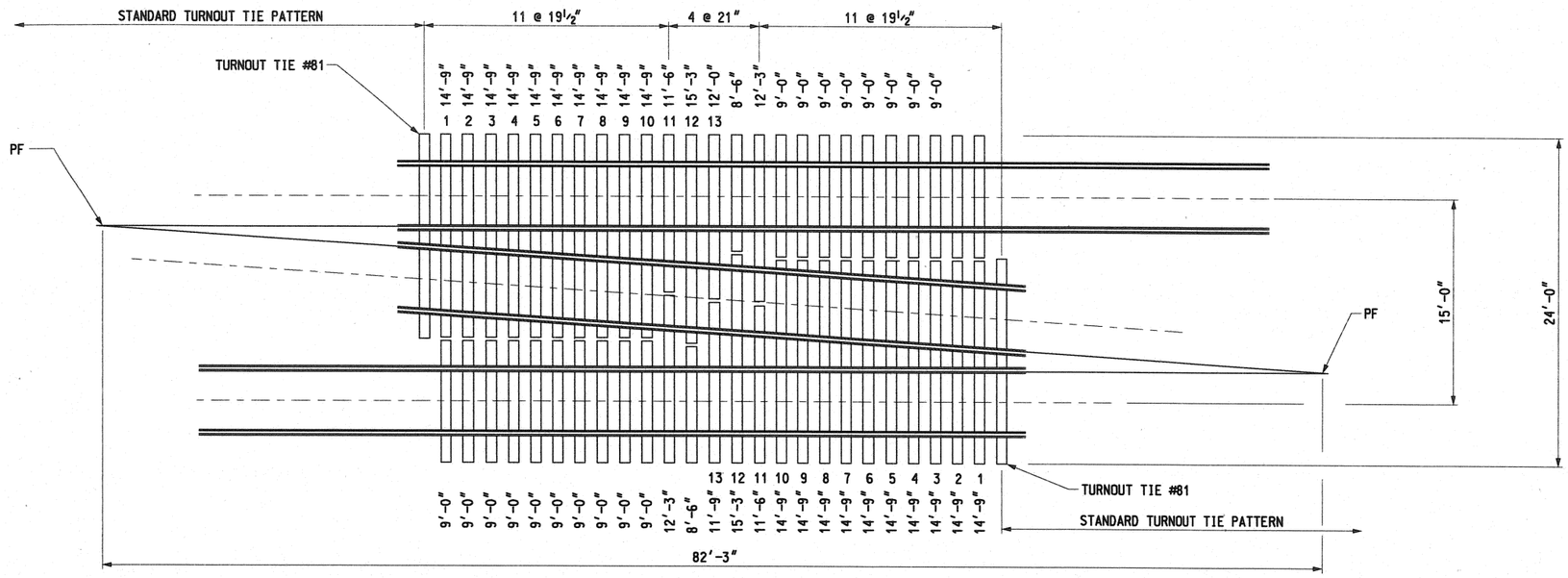
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-357

SHEET NO: 1 OF 1

10/4/2013

...*RR-357 Number 11 Timber Crossover @ 15'-0" Track Centers



NO. 15 CROSSOVER - PLAN

NTS

NOTES:

1. DEPICTS TIE PATTERN FOR X-OVER SECTION, ALL X-OVER TIES SPACED AT 1'-7½" ON CENTER. UNLESS NOTED OTHERWISE.
2. RAIL FASTENERS SHALL BE PANDROL TYPE e-2055 ELASTIC CLIP.
3. ALL SWITCH TIES SHALL BE TIMBER.
4. ALL SWITCH TIES CUT TO LENGTH WILL HAVE TIMBER PRESERVATIVE APPLIED TO CUT ENDS.
5. NOTE LAST STANDARD TURNOUT TIE USED IS TIE #81, SEE RR-354, 1 OF 2.
6. 15'-0" STANDARD TURNOUT TIES MAY NEED TO BE TRIMMED IN THE FIELD SO THAT TIES DO NOT BIND WHEN SURFACING EACH TRACK.

X-OVER TIES	
SIZE	QTY
7" x 9" x 15'-3"	2
7" x 9" x 14'-9"	20
7" x 9" x 12'-3"	2
7" x 9" x 12'-0"	1
7" x 9" x 11'-9"	1
7" x 9" x 11'-6"	2
7" x 9" x 9'-0"	20
7" x 9" x 8'-6"	2

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

NUMBER 15 TIMBER CROSSOVER AT 15'-0" TRACK CENTERS

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-358

SHEET NO: 1 OF 1

10/4/2013

...*RR-358 Number 15 Timber Crossover @ 15'-0" Track Centers

MAXIMUM SPEEDS THROUGH TURNOUTS, SPRING SWITCHES AND SLIP SWITCHES

SUBJECT TO SPEED RESTRICTIONS IMPOSED BY LOCAL CONDITIONS, OTHER THAN THE NUMBER OF THE TURNOUT OR TYPE OF SWITCH, THE FOLLOWING WILL GOVERN THE MAXIMUM SPEEDS PERMITTED THROUGH TURNOUTS AND OVER SPRING SWITCHES:

FREIGHT			
TURNOUT NO	STANDARD		EQUILATERAL (MPH)
-	SWITCH LENGTH (POINTS)	MPH	-
8	16'-6"	10	N/A
9	16'-6"	10	N/A
10	19'-6"	15	N/A
11	19'-6"	15	N/A
15	26'-0"	25	N/A

NOTES:

1. MAXIMUM SPEEDS WERE CALCULATED BASED ON TURNOUT GEOMETRY WITH Eq = 0" AND ASSUMED Eu = 2.0" FOR FREIGHT TRAINS.

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Port of LONG BEACH
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RAILROAD STANDARD PLANS

SPEED THRU TURNOUTS

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

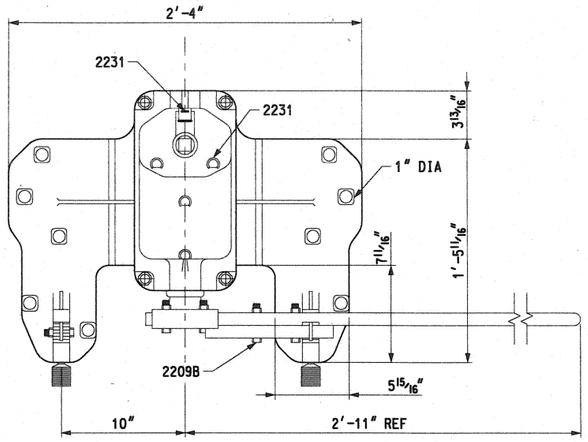
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-359

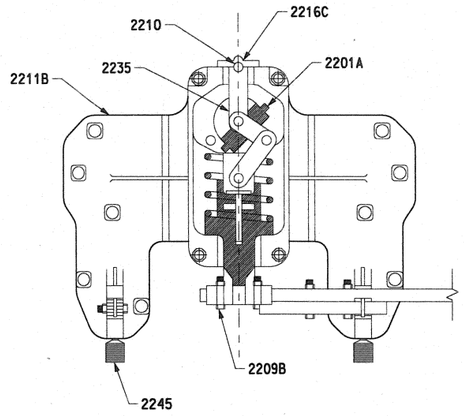
SHEET NO: 1 OF 1

10/4/2013

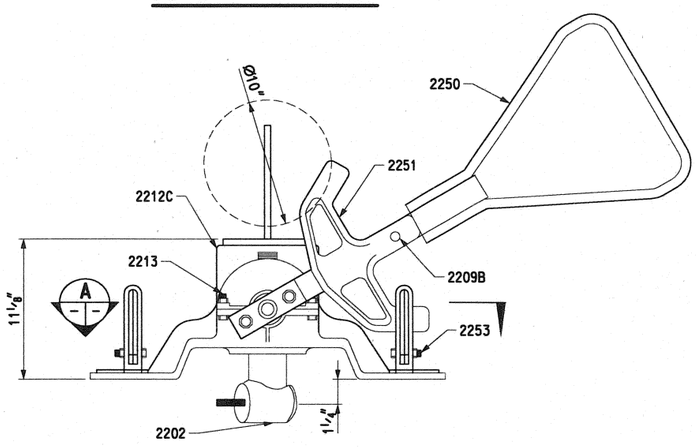
...*RR-359 Speed Thru Turnouts



22-E - TOP VIEW



(A) 22-E - DETAIL VIEW



22-E SWITCH STAND

BILL OF MATERIAL		
CATALOG NO	QTY	DESCRIPTION
2235	1	LINKAGE AND SPRING CAGE ASSEMBLY (SEE ASSEMBLY DRAWING FOR PARTS DRAWINGS)
2216C	1	THRUST BUSHING
2210	1	THRUST BALL 1" DIA
2212C	1	COVER (S-604-C)
2252	1	BASE (D-34645)
2201A	1	SPINDLE (GL-2762)
2202	1	CRANK EYE (GL-1889)
2250	1	TRI-HANDLE LEVER
2213	4	SQUARE HEAD BOLT 5/8" X 3" LONG
	4	HEX NUT 5/8" - 11
	4	LOCK WASHER 5/8"
2209B	4	SQUARE HEAD BOLT 3/4" X 2 3/4" LONG
	4	SECURITY NUT 3/4" - 10
2231	5	1608B GREASE FITTING - DRIVE TYPE
2207	1	TARGET
2208A	1	TARGET MAST
	2	BOLT
	2	NUT
2251	1	YOKE (D-34637)
2253	2	1/2" X 2 1/4" HEX CAP SCREW
	2	HEX SECURITY NUT
2254	2	FOOT LATCH

NOTES:

1. 22-E RECOMMENDED USE: YARD AND OTHER THAN MAIN TRACK
2. IT IS RECOMMENDED THAT SWITCH STANDS BE INSPECTED AND LUBRICATED AT LEAST ONCE A YEAR. ADD OIL IN "OIL CUPS" WITH ANY GOOD GRADE ENGINE OIL. RECOMMEND OIL WITH GRAPHITE CONTENT SHEET 374 SAE 40.
3. IF SWITCH STAND IS DISASSEMBLED, REGREASING OF ALL INTERNAL PARTS IS REQUIRED. APPLY GREASE LIBERALLY IN "THRUST BUSHING" CAVITY, BOTH ENDS "SPRING BASE", "SPINDLE" SLOT, AND ALL BEARING SURFACES (TEXACO NO 904 GREASE).
4. SWITCH STAND TO BE INSTALLED USING SCREW SPIKES
5. FOR SCREW SPIKES, SEE RR-307
   FOR SWITCH TARGET DETAILS, SEE RR-405
   FOR CONNECTOR ROD ASSEMBLY, SEE RR-373
6. HANDLE TO BE PAINTED SAFETY YELLOW.
7. TRI-HANDLE LEVER SWITCH STAND TO BE USED ON ALL NEW CONSTRUCTION, EXCEPT IN CASES WHERE CENTER CLEARANCE IS LESS THAN 15'.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

RACOR 22-E TRI-GLIDE AND TRAILABLE SWITCH STAND

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

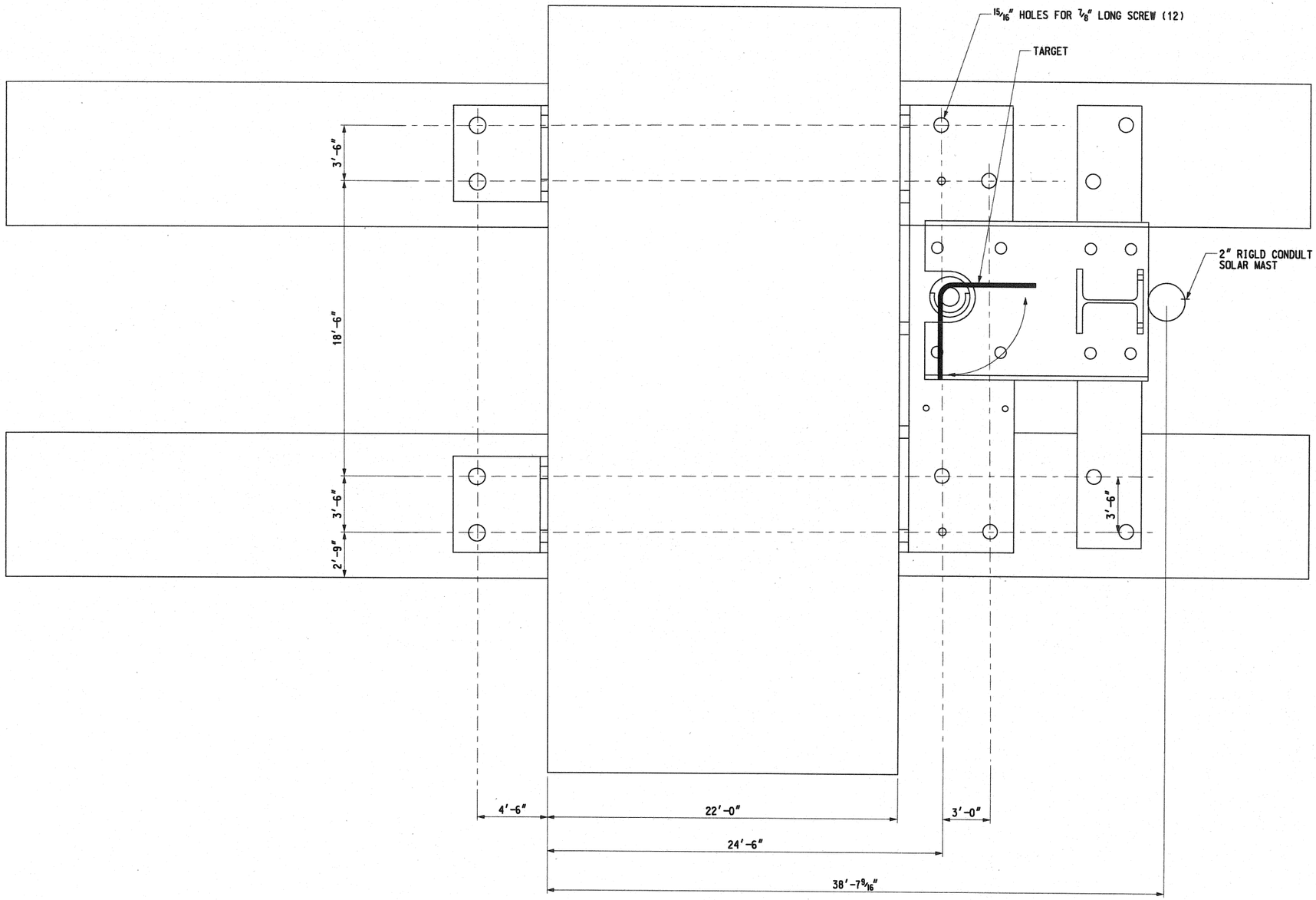
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-370

SHEET NO: 1 OF 1

10/4/2013

...*RR-370 Racor 22E Tri-Glide and Trailable Switch Stand



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Port of LONG BEACH
The Green Port

RAILROAD
STANDARD PLANS

MODEL 3000LP
HYDRA SWITCH - TOP VIEW

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

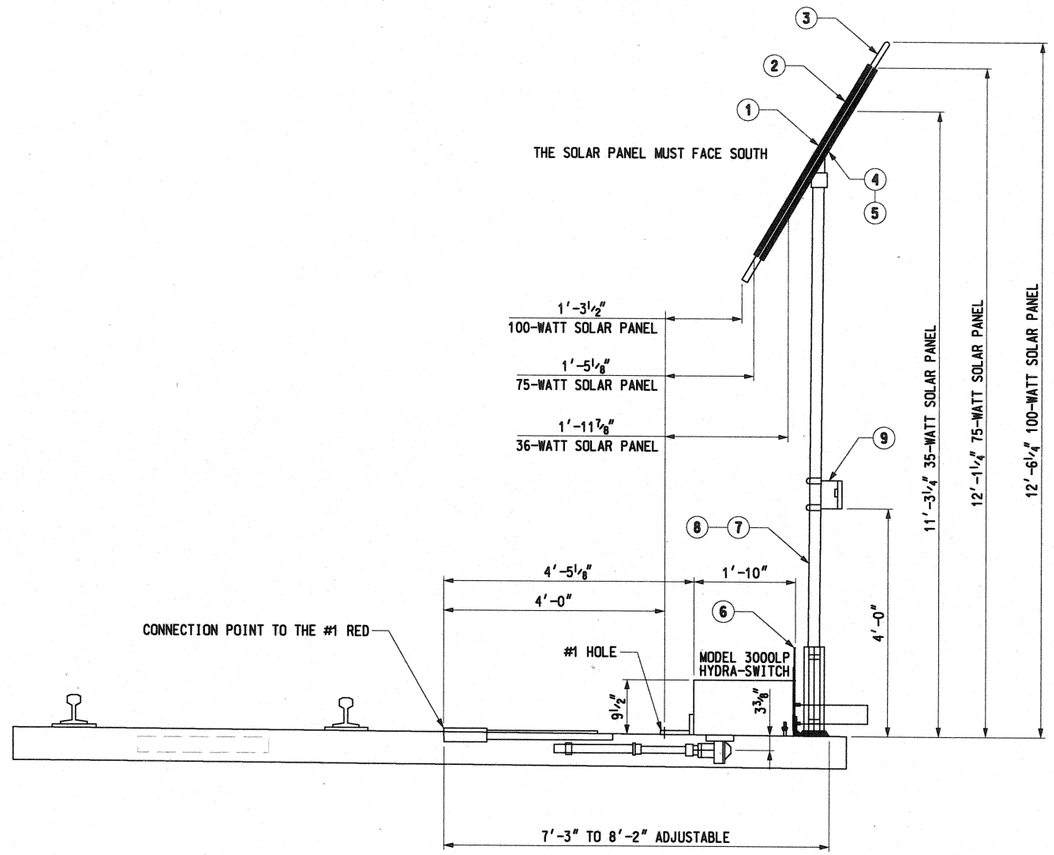
DRAWING NO:
RR-371

SHEET NO:
1 OF 2

10/4/2013

PART NUMBER:

(1)	S35-01	36-WATT SOLAR
(2)	S75-01	75-WATT SOLAR
(3)	S100-01	100-WATT SOLAR
(4)	S-03-60	SOLAR PANEL BRACKET FOR 36-WATT & 75-WATT
(5)	S-13-60	SOLAR PANEL BRACKET FOR 100-WATT
(6)	310045X	BARE BRACKET ASSEMBLY
(7)	S-04	SOLAR MOST FOR 36-WATT 75-WATT SOLAR PANEL
(8)	S-03-600-4	SOLAR MOST FOR 100-WATT SOLAR PANEL
(9)	S-10LPX	BUTTON ASSEMBLY



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Port of LONG BEACH
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RAILROAD STANDARD PLANS

MODEL 3000LP HYDRA SWITCH - SIDE VIEW

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

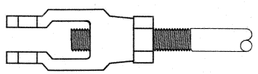
DRAWING NO: RR-371

SHEET NO: 2 OF 2

10/4/2013

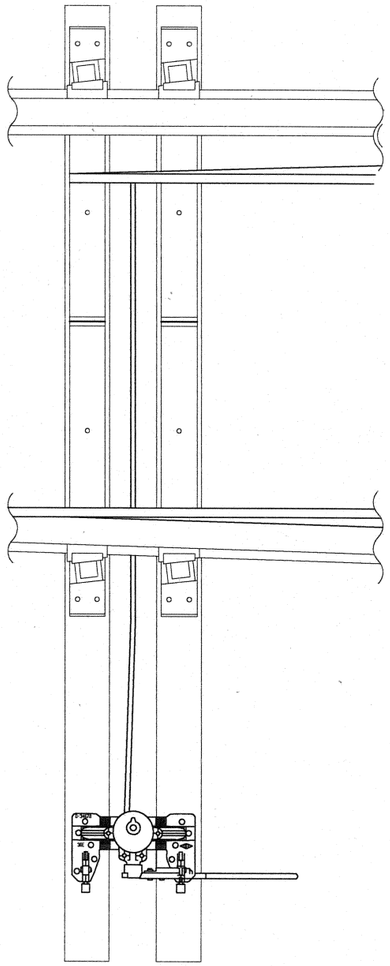
1

CRANKEYE AND CONNECTING ROD CLEVIS SHOULD BE GREASED PRIOR TO INSTALLATION OR ADJUSTMENT. START WITH ABOUT 1" OF THREADS SHOWING ON CONNECTING ROD TURNBUCKLE (TIGHTEN JAM NUT)



2

MEASURE THROW BETWEEN SWITCH POINT & STOCK RAIL AT FIRST ROD

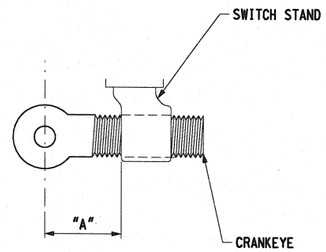


3

SET CRANKEYE SETTING AT DISTANCE "A" FOR MEASURED OPENING AND CORRECT STAND

THROW OF SWITCH	"A" RACOR 22-E
4 1/2"	2 1/16"
4 5/8"	2 3/16"
4 3/4"	2 1/4"
4 1/8"	2 5/16"
5"	2 7/16"
5 1/8"	2 1/2"
5 1/4"	2 5/8"
5 3/8"	2 11/16"
5 1/2"	2 13/16"
5 5/8"	-
5 3/4"	-

"A" WORKS FOR ALL ROD LENGTHS



RACOR 22-E

STANDARD SIDE FOR CRANKEYE

4

MOVE SWITCH POINTS TO HALF-THROWN POSITION (OPENING EQUAL ON BOTH SIDES), AND STAND LEVER IN VERTICAL POSITION. CENTER STAND ON HEADBLOCK TIES AND SPIKE OR LAG TO TIES.

5

HAND THROW SWITCH TO BOTH SIDES SEVERAL TIMES. WHEN POINT CONTACTS STOCK RAIL, LEVER SHOULD NOT BE MORE THAN 1 1/2" TO 2" ABOVE FINAL POSITIONS ON TOP OF LEVER REST FOR BOTH POSITIONS.

IF NOT, ADJUST AS FOLLOWS:

<u>WHEN NEAR POINT FITS PROPERLY AND FAR POINT IS TOO TIGHT:</u>

SHORTEN CRANKEYE SETTING AND SHORTEN CONNECTING ROD CLEVIS.

<u>WHEN NEAR POINT FITS PROPERLY AND FAR POINT IS LOOSE:</u>

LENGTHEN CRANKEYE SETTING AND LENGTHEN CONNECTING ROD CLEVIS.

<u>WHEN FAR POINT FITS PROPERLY AND NEAR POINT IS TOO TIGHT:</u>

SHORTEN CRANKEYE SETTING AND LENGTHEN CONNECTING ROD CLEVIS.

<u>WHEN FAR POINT FITS PROPERLY AND NEAR POINT IS LOOSE:</u>

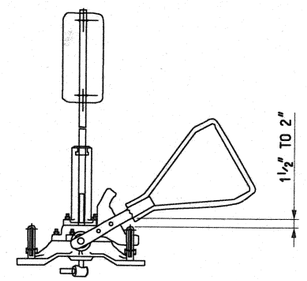
LENGTHEN CRANKEYE SETTING AND SHORTEN CONNECTING ROD CLEVIS.

<u>WHEN BOTH POINTS ARE TIGHT:</u>

SHORTEN CRANKEYE SETTING AND DO NOT CHANGE CONNECTING ROD CLEVIS.

<u>WHEN BOTH POINTS ARE LOOSE:</u>

LENGTHEN CRANKEYE SETTING AND DO NOT CHANGE CONNECTING ROD CLEVIS.



ELEVATION

NOTES:

1. USE 15/16" SCREW SPIKES OR APPROPRIATE PIM SCREWS WHEN INSTALLING NEW SWITCH STANDS ON TIMBER OR CONCRETE TIES.
2. FIELD INSPECTION OF STAND IS RECOMMENDED AT LEAST ANNUALLY OR MORE WHERE STAND IS USED FREQUENTLY.
3. OIL CUPS: USE SAE 40, ADD OIL FREQUENTLY.
4. GREASE SHOULD BE LG312 LITHIUM GRADE 2. REGREASING OF ALL INTERNAL PARTS IS RECOMMENDED BEFORE REASSEMBLY AFTER INSPECTIONS.
5. DIFFERENCES BETWEEN CRANKEYE MEASUREMENTS ON THIS DRAWING AND FINAL ADJUSTMENTS ARE PROBABLY DUE TO TOLERANCES (LOST MOTION) IN CONNECTING ROD/HEAD ROD CONNECTIONS.

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

SWITCH STANDS HAND THROW ADJUSTMENTS AND INSTALLATION INSTRUCTIONS

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

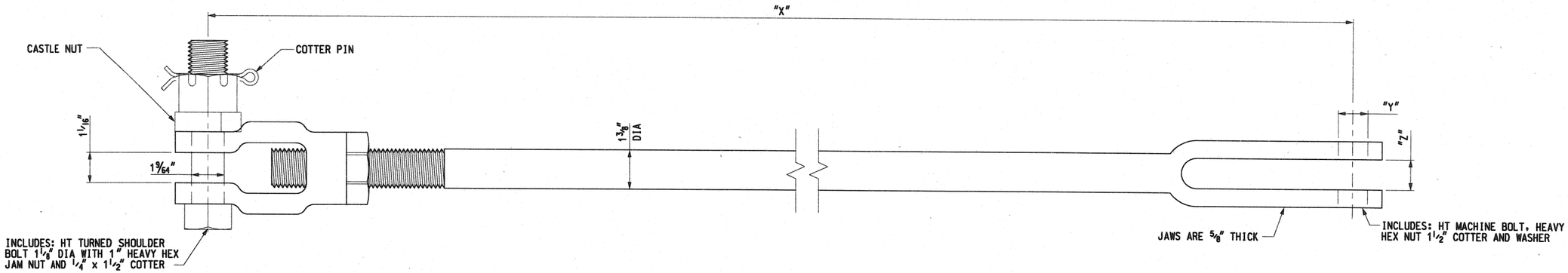
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-372

SHEET NO: 1 OF 1

10/4/2013

...*RR-372 Switch Stand Hand Throw Adjustments and Installation Instructions



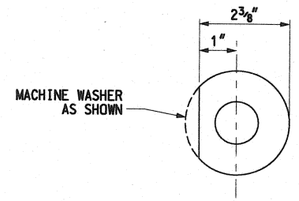
CONNECTING ROD ASSEMBLY FOR ALL SWITCH STANDS WITH ADJUSTABLE CRANK EYE (RACOR 22-E)

NTS

"Y" – 1 9/64" FOR 1" HEAD RODS
– 1 9/64" FOR 1 1/4" HEAD RODS

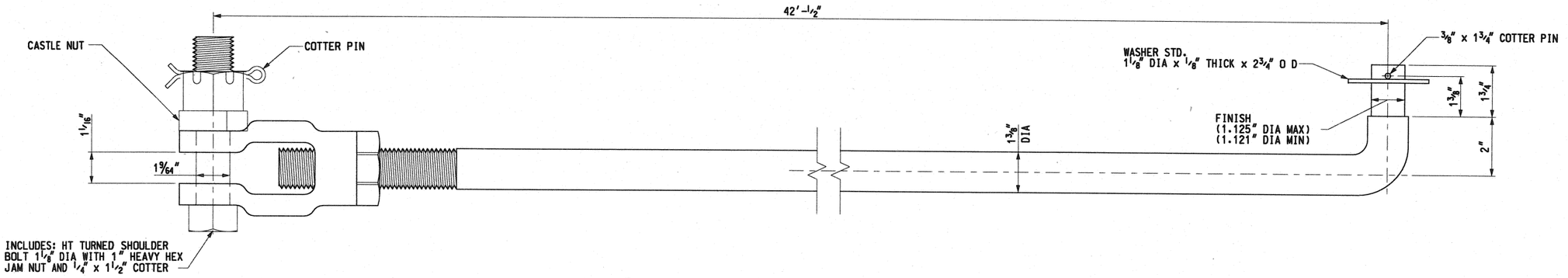
"Z" – 1 1/16" FOR 1" HEAD RODS
– 1 5/16" FOR 1 1/4" HEAD RODS

RAIL SIZE	"X"	HEAD ROD THICKNESS
90-115 LB	3'-4"	1"
132-136 LB	3'-4"	1 1/4"
90-115 LB	5'	1"
132-136 LB	5'	1 1/4"
90-115 LB	7'	1"
132-136 LB	13'-9"	1 1/4"
132-136 LB	7'	1 1/4"



WASHER DETAIL

NTS



CONNECTING ROD ASSEMBLY FOR PAVEMENT TYPE SWITCH STAND

NTS

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

CONNECTING ROD ASSEMBLY

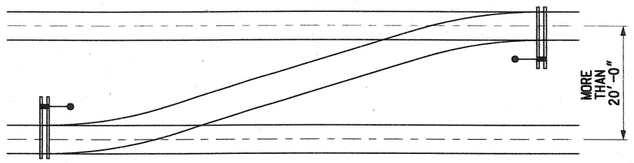
APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-373

SHEET NO: 1 OF 1

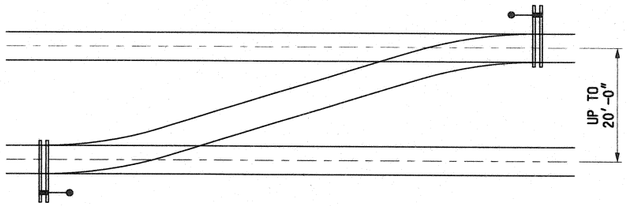
10/4/2013

...*RR-373 Connecting Rod Assembly



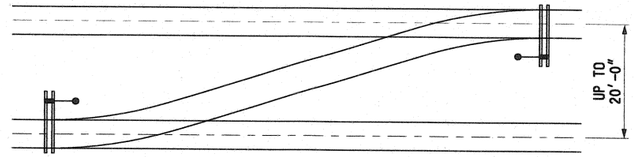
TRACKS MORE THAN 20 FT ON CENTER (INSIDE PLACEMENT)

	SWITCH STANDS	ROD LENGTH	HEADBLOCK TIE LENGTH
MAIN LINE	HYDRASWITCH OR POWER OPERATED	AS REQ'D	16'-0"
YARD	22-E	5'-0"	16'-0"



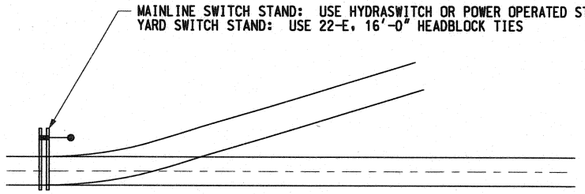
TRACKS 14 FT TO 20 FT ON CENTER (OUTSIDE PLACEMENT)

	SWITCH STANDS	ROD LENGTH	HEADBLOCK TIE LENGTH
MAIN LINE	HYDRASWITCH OR POWER OPERATED	AS REQ'D	16'-0"
YARD	22-E	5'-0"	16'-0"



TRACKS 14 FT TO 20 FT ON CENTER (INSIDE PLACEMENT)

	SWITCH STANDS	ROD LENGTH	HEADBLOCK TIE LENGTH
MAIN LINE	HYDRASWITCH OR POWER OPERATED	AS REQ'D	14'-0"
YARD	22-E WITH BALL SWITCH HANDLE	3'-4"	14'-0"



TYPICAL ALIGNMENT WITH NO CLEARANCE RESTRICTIONS

NOTES:

1. SWITCH STANDS SHALL BE:
   A. WHERE SPACE PERMITS, MOUNTED ON THE CLOSED POINT SIDE OF THE SWITCH WHEN LINED FOR THE MAIN TRACK.
   B. NO LESS THAN 8'-6" (HIGH STANDS) OR 6'-0" (LOW STANDS) FROM THE CENTER OF ANY TRACK TO ANY PART OF THE STAND OR TARGET IN ITS MOST RESTRICTIVE POSITION.
   C. POSITIONED WITH THE HANDLE POINTING TOWARD THE FROG WHEN THE SWITCH IS LINED FOR THE MAIN TRACK.
   D. FIRMLY ATTACHED TO THE HEADBLOCK TIES.
2. WHERE TRACKS ARE 20 FT OR LESS ON CENTER, OUTSIDE PLACEMENT OF SWITCH STANDS IS PREFERRED. INSIDE PLACEMENT SHALL BE USED ONLY WHERE FIELD CONDITIONS MAKE OUTSIDE PLACEMENT IMPRACTICAL.

REVISIONS	
NO.	DATE
1	
2	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

SWITCH STAND PLACEMENT

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

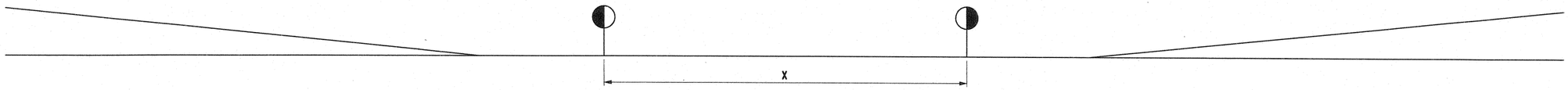
DRAWING NO: RR-374

SHEET NO: 1 OF 1

10/4/2013

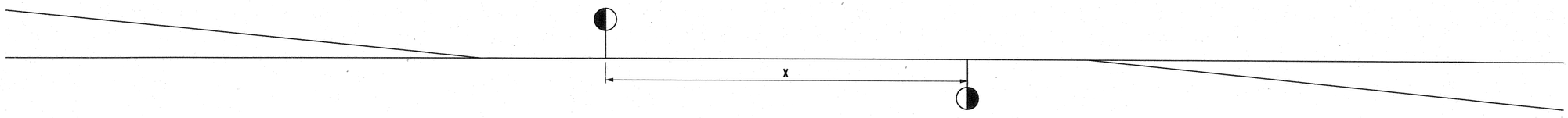
...*RR-374 Switch Stand Placement

FACING TURNOUTS OF OPPOSITE HAND



FROG NO	DESIRABLE X (FT)	MINIMUM X (FT)
8 - 11	100	46
15	122	86

FACING TURNOUTS OF LIKE HAND



FROG NO	DESIRABLE X (FT)	MINIMUM X (FT)
8 - 11	100	52
15	125	90

NOTES:

1. DESIGN SPEED, SIGNAL SPACING AND CIRCUITS WILL GOVERN AT LOCATIONS WHERE INSULATED JOINTS ARE REQUIRED.
2. ANY DISTANCE BETWEEN FACING POINTS OF SWITCH LESS THAN THE MINIMUMS GIVEN SHALL REQUIRE THE APPROVAL OF THE POLB AS AN EXCEPTION.
3. POLB MINIMUM SPACING IS 100 FT. IF LESS DISTANCE IS REQUIRED DUE TO OTHER CONSTRAINTS, A DESIGN EXCEPTION FOR SPACING LESS THAN 100 FT SHALL BE SUBMITTED. UNDER NO CIRCUMSTANCES WILL A DESIGN EXCEPTION BE GRANTED LOWER THAN THESE MINIMUM DISTANCES

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

FACING POINT TURNOUT ARRANGEMENT AND SPACING

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

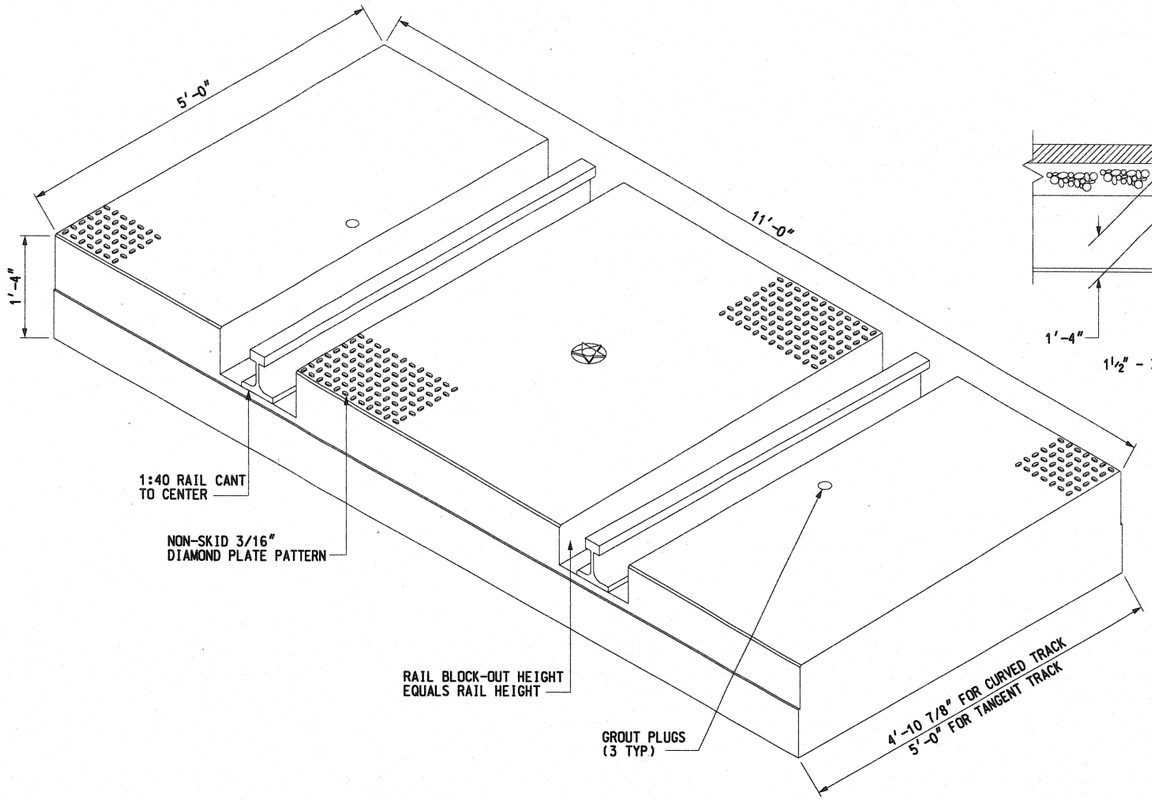
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-375

SHEET NO: 1 OF 1

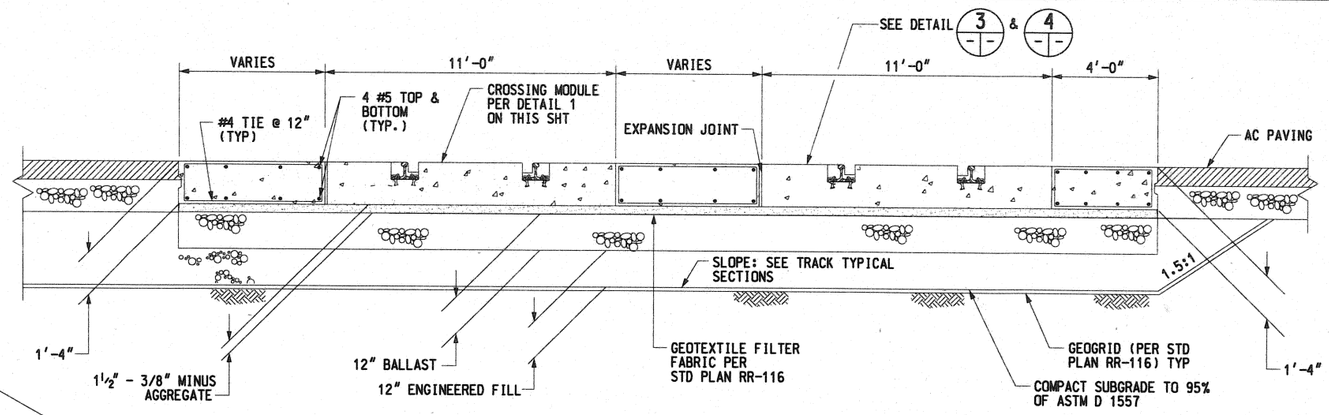
10/4/2013

...*RR-376 Facing Point turnout Arrangement and Spacing



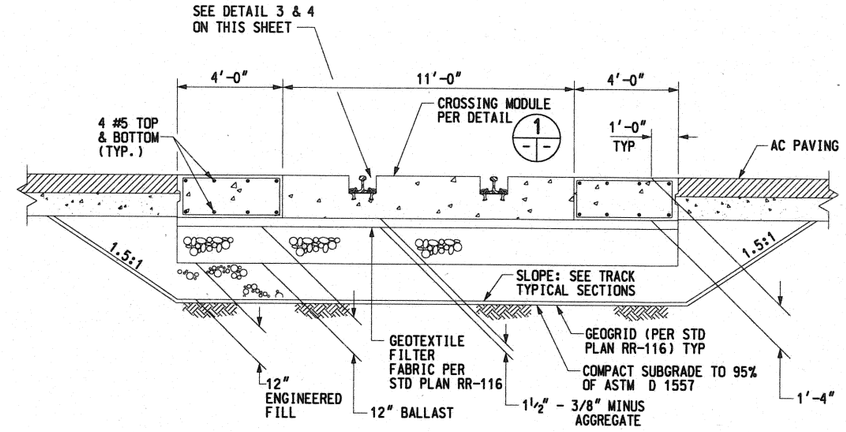
1 DETAIL - STARTRACK II - HEAVY DUTY (10,400 LB)

NTS



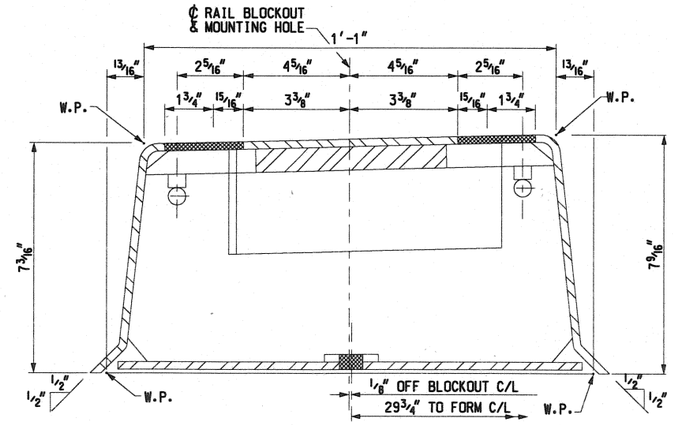
6 DETAIL - MODULE GRADE CROSSING SECTION - DOUBLE TRACK

NTS



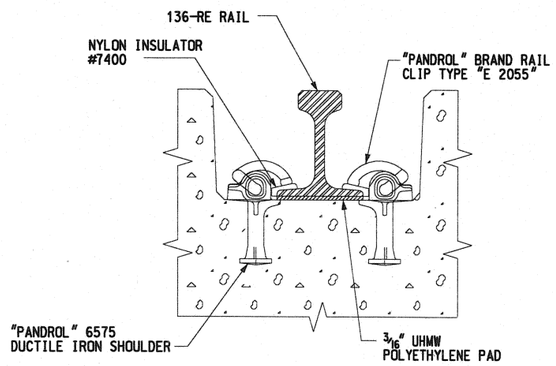
5 DETAIL - MODULE GRADE CROSSING SECTION - SINGLE TRACK

NTS



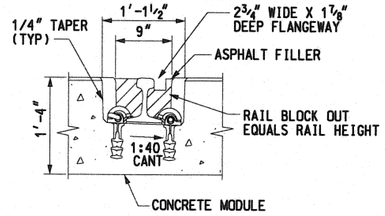
2 DETAIL - RAIL BLOCKOUT

NTS



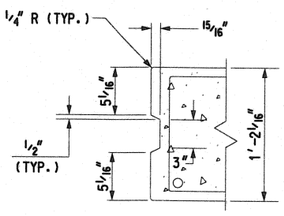
3 DETAIL - RAIL

NTS



4 DETAIL - RAIL INFILL

NTS



7 DETAIL - KEYWAY

SCALE: 1" = 1'-0"

REVISIONS	
NO.	DATE
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

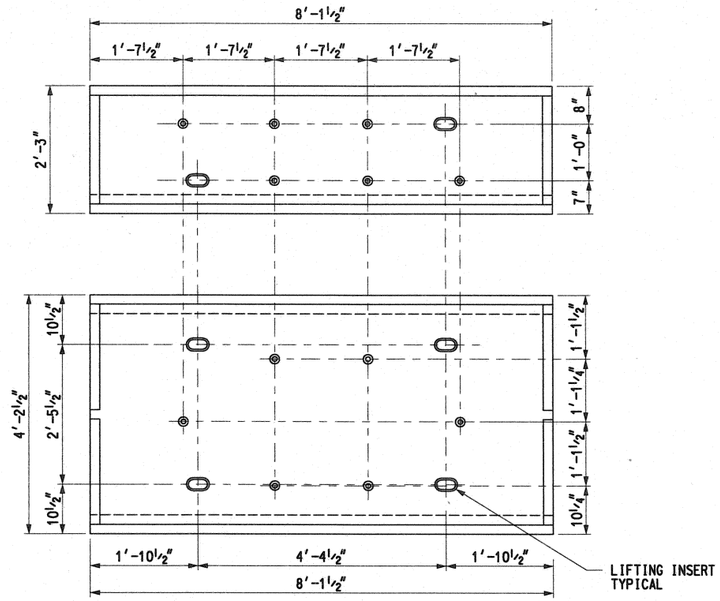
CONCRETE CROSSING MODULE, SECTION AND DETAILS

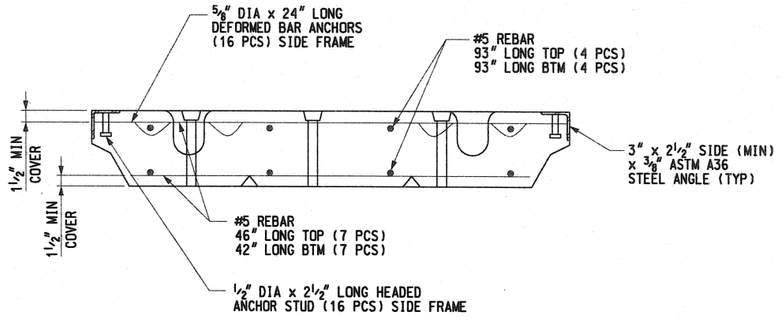
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-390

SHEET NO: 1 OF 1

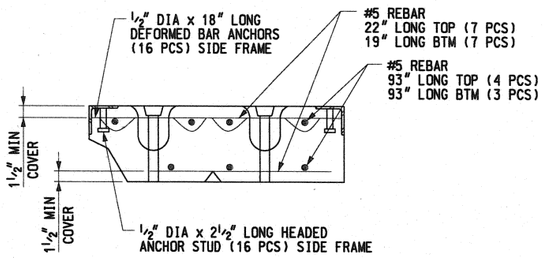
10/4/2013





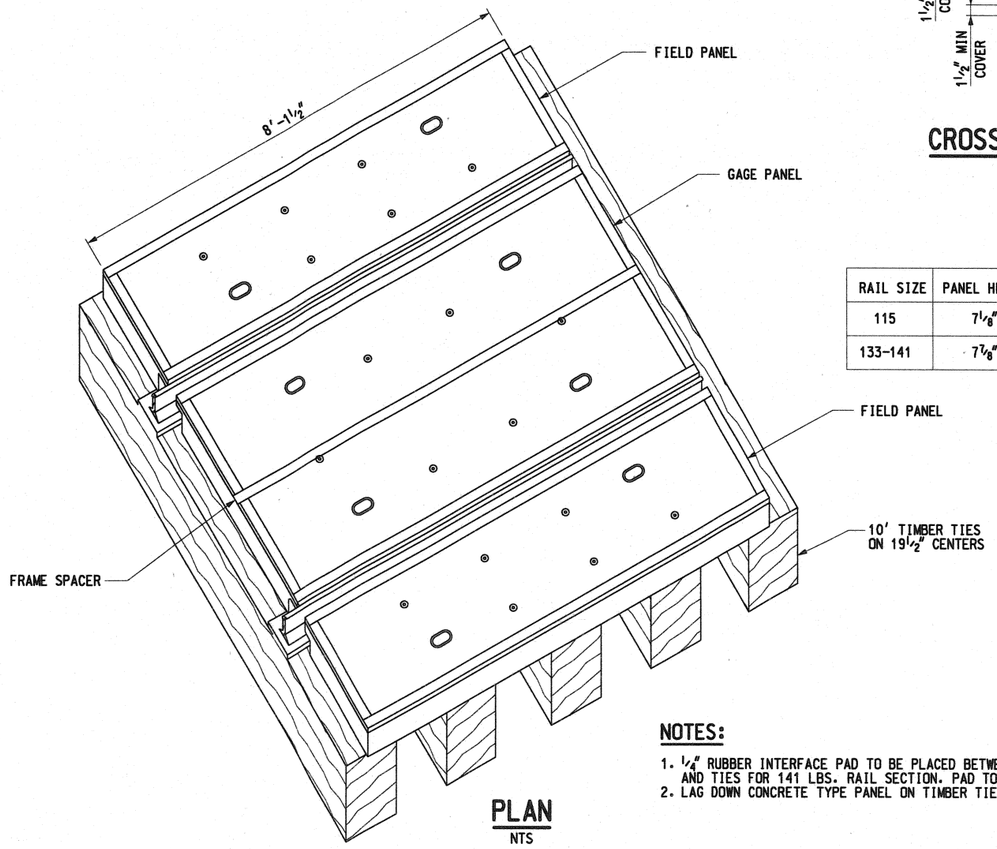
CROSS SECTION - GAGE PANEL

NTS



CROSS SECTION - FIELD PANEL

NTS



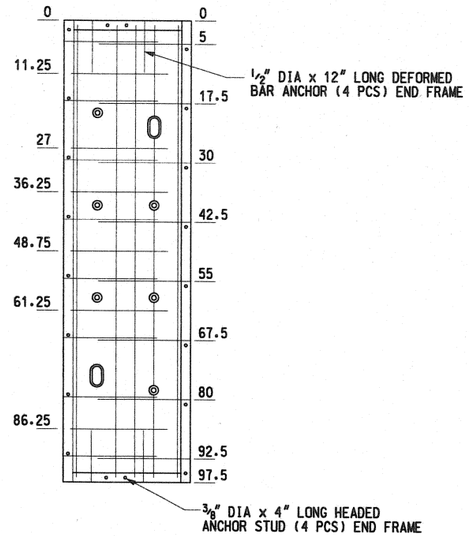
PLAN

NTS

RAIL SIZE	PANEL HEIGHT	GAGE PANEL WEIGHT	FIELD PANEL WEIGHT
115	7⅛"	2850 LBS	1550 LBS
133-141	7⅞"	3125 LBS	1675 LBS

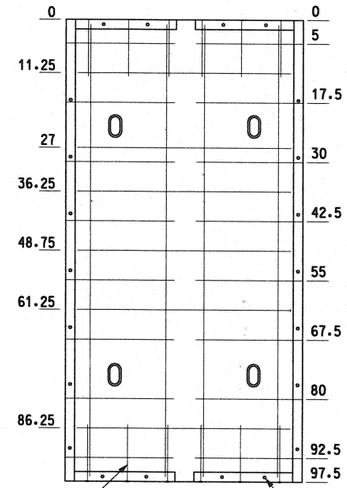
NOTES:

1. ¼" RUBBER INTERFACE PAD TO BE PLACED BETWEEN PANEL AND TIES FOR 141 LBS. RAIL SECTION. PAD TO BE NAILED TO TIES.
2. LAG DOWN CONCRETE TYPE PANEL ON TIMBER TIES (TYP).



FIELD PANEL

NTS



GAGE PANEL

NTS

NOTES:

CONCRETE COMPRESSIVE STRENGTH SHALL BE AS FOLLOWS:
@ 28 DAYS = 6000 PSI MIN.
@ SHIPMENT = 4000 PSI MIN.
@ REMOVAL FROM FORMS = 2500 PSI MIN.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

PRECAST CONCRETE PANELS ON 10' LONG TIMBER TIES (LAG DOWN)

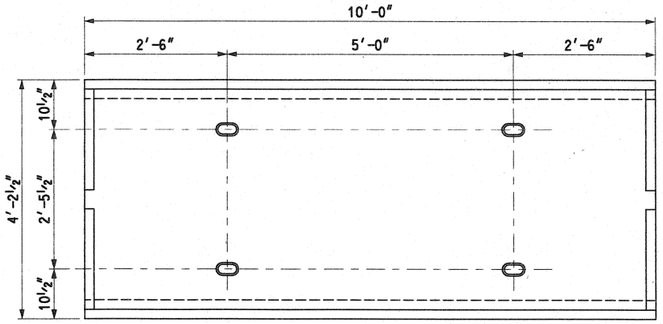
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-391

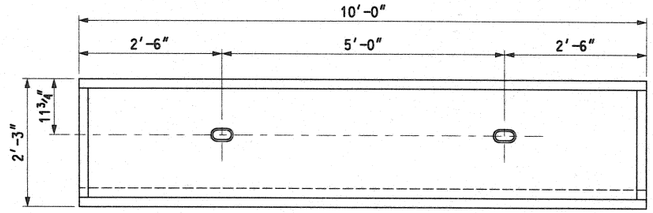
SHEET NO: 1 OF 6

10/4/2013

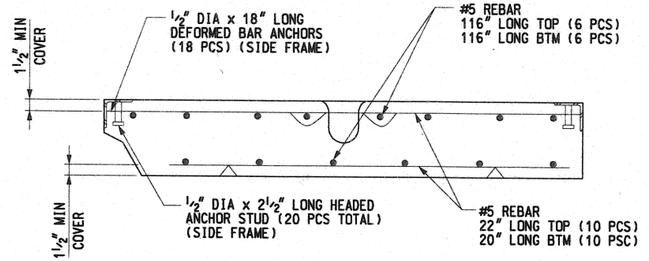
...\RR-391 Precast Concrete Panels on 10' Long Timber Ties (Lag Down) 1 of 6



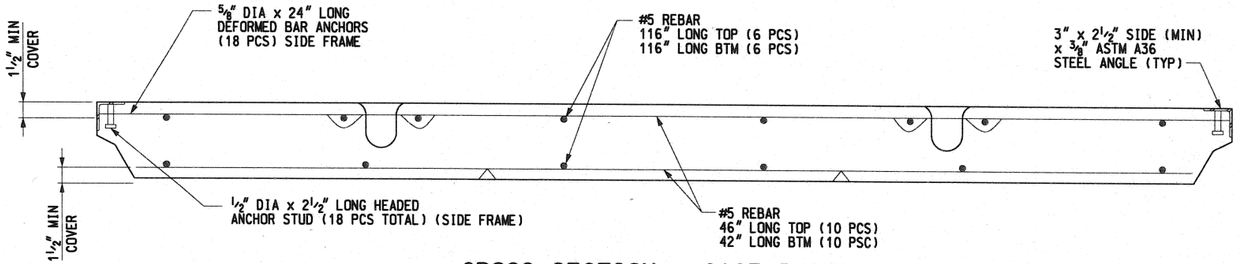
GAGE PANEL
NTS



FIELD PANEL
NTS



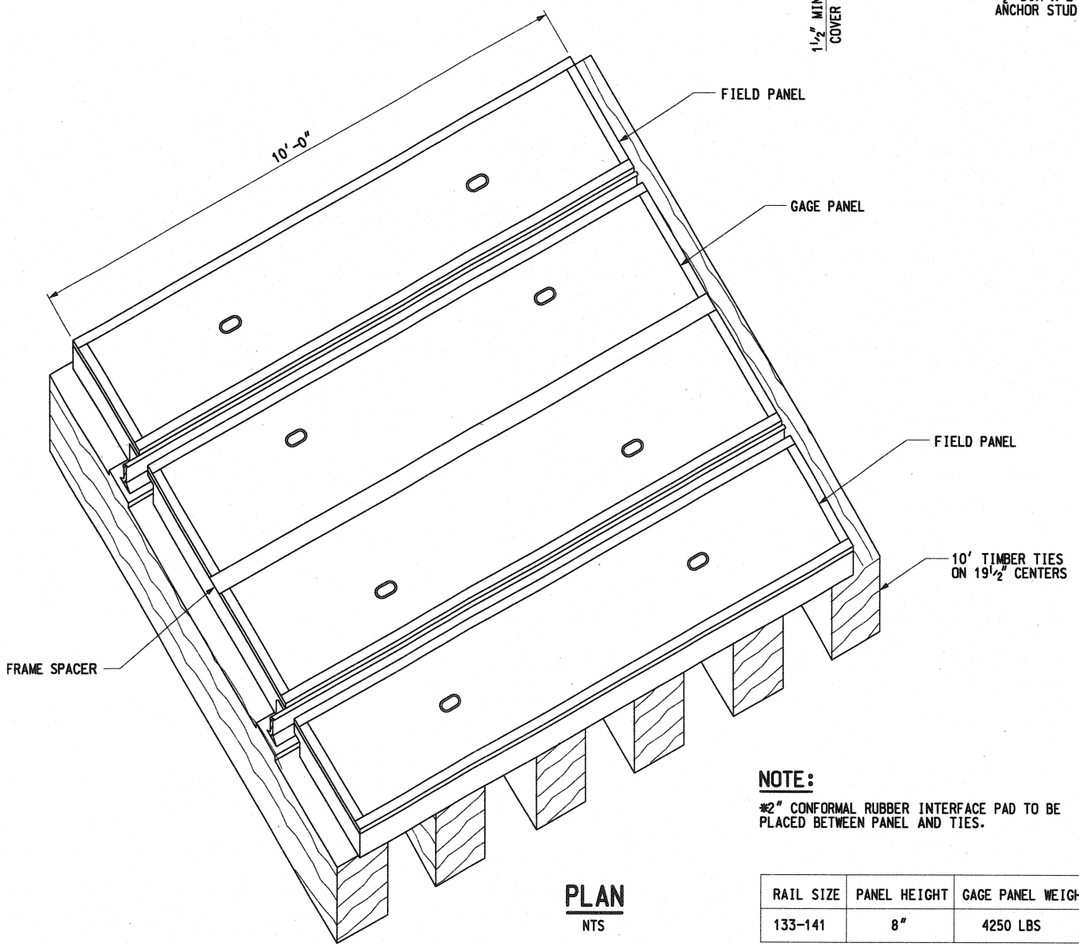
CROSS SECTION – FIELD PANEL
NTS



CROSS SECTION – GAGE PANEL
NTS

NOTES:

1. CONCRETE COMPRESSIVE STRENGTH SHALL BE AS FOLLOWS:
   @ 28 DAYS = 6000 PSI MIN.
   @ SHIPMENT = 4000 PSI MIN.
   @ REMOVAL FROM FORMS = 2500 PSI MIN.
2. GRAVITY TYPE CONCRETE PANEL ON TIMBER TIES.



PLAN
NTS

NOTE:
*2″ CONFORMAL RUBBER INTERFACE PAD TO BE PLACED BETWEEN PANEL AND TIES.

RAIL SIZE	PANEL HEIGHT	GAGE PANEL WEIGHT	FIELD PANEL WEIGHT
133–141	8″	4250 LBS	2150 LBS

FIELD PANEL
NTS

GAGE PANEL
NTS

REVISIONS	
NO.	DATE
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

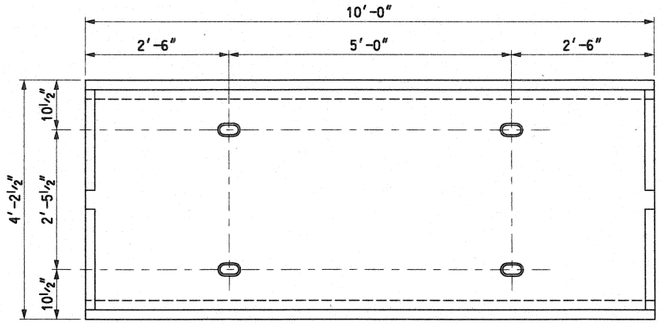
PRECAST CONCRETE PANELS ON 10′ LONG TIMBER TIES (GRAVITY TYPE)

APPROVED BY: _____
SEAN A. GAMETTE – ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

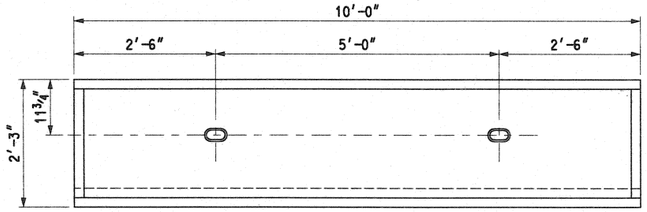
DRAWING NO: RR-391

SHEET NO: 2 OF 6

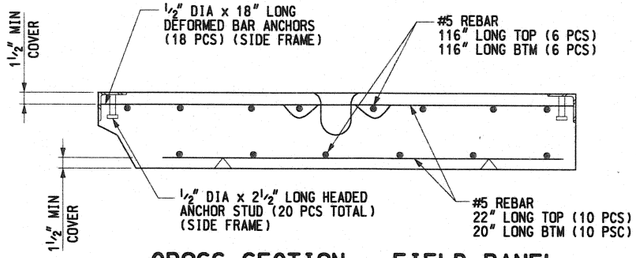
10/4/2013



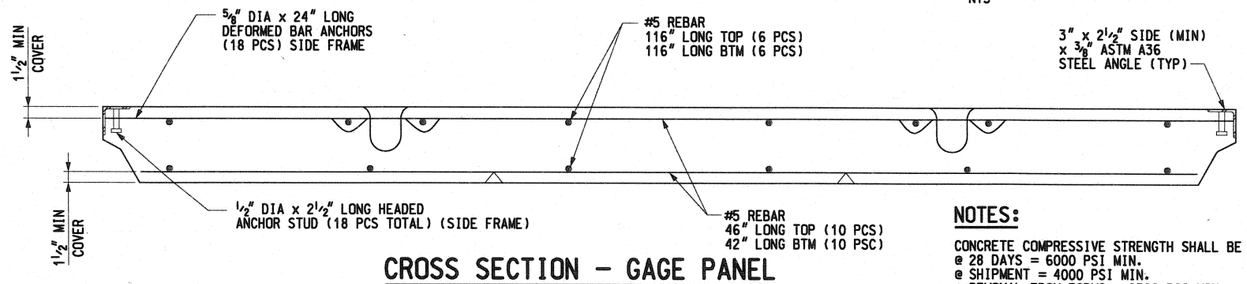
GAGE PANEL
NTS



FIELD PANEL
NTS

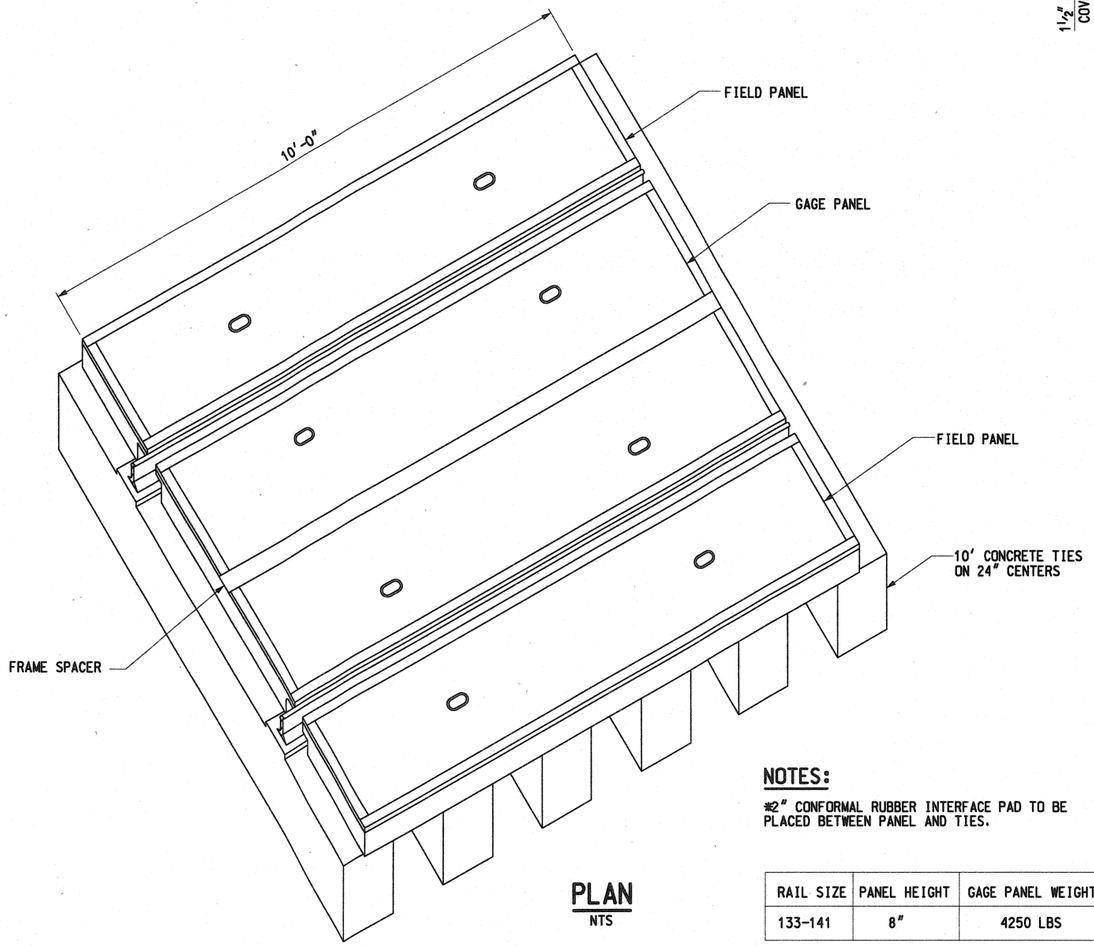


CROSS SECTION – FIELD PANEL
NTS



CROSS SECTION – GAGE PANEL
NTS

NOTES:
CONCRETE COMPRESSIVE STRENGTH SHALL BE AS FOLLOWS:
@ 28 DAYS = 6000 PSI MIN.
@ SHIPMENT = 4000 PSI MIN.
@ REMOVAL FROM FORMS = 2500 PSI MIN.



PLAN
NTS

NOTES:
#2″ CONFORMAL RUBBER INTERFACE PAD TO BE PLACED BETWEEN PANEL AND TIES.

RAIL SIZE	PANEL HEIGHT	GAGE PANEL WEIGHT	FIELD PANEL WEIGHT
133-141	8″	4250 LBS	2150 LBS

FIELD PANEL
NTS

GAGE PANEL
NTS

REVISIONS	
NO.	DATE
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

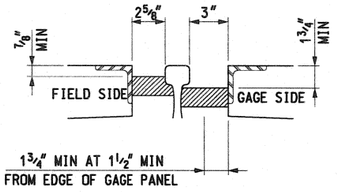
PRECAST CONCRETE PANELS ON 10′ LONG CONCRETE TIES

APPROVED BY: _____
SEAN A. GAMETTE – ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-391
SHEET NO: 3 OF 6

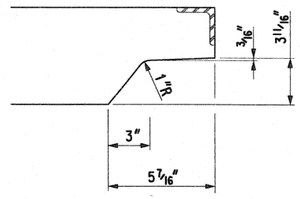
10/4/2013

...*RR-391 Precast Concrete Panels on 10′ Long ConcreteTies 3 of 6

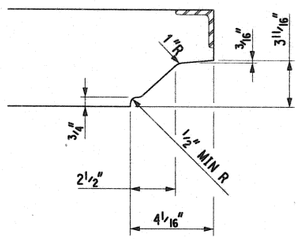


NOTE: VENDOR SHALL SUBMIT PREATTACHED FLANGEWAY FILLER DESIGN AND DETAILS FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.

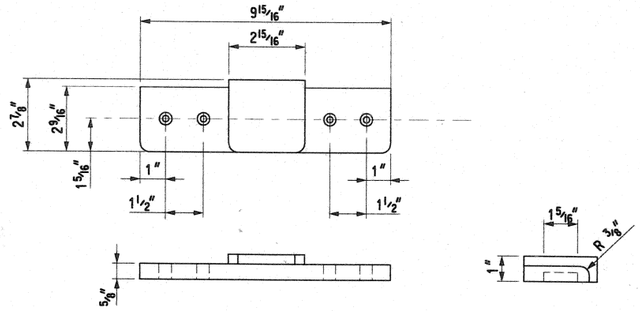
TYPICAL PREATTACHED FLANGEWAY FILLER
NTS



FIELD PANEL
NTS

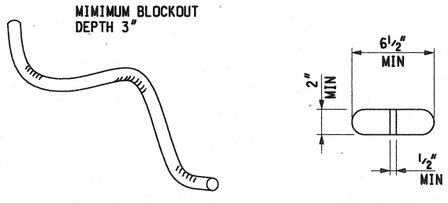


GAGE PANEL
NTS

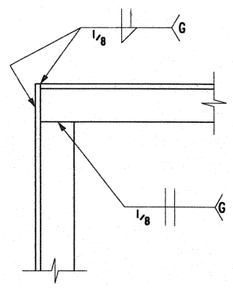


NOTE: ALL RADIUS TO BE 1/4" EXCEPT WHERE NOTED.

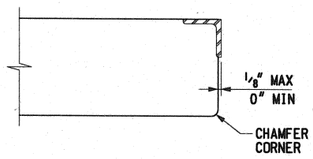
TYPICAL SHUNT SPACER DETAIL
NTS



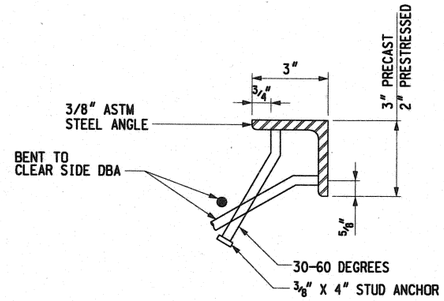
TYPICAL LIFTING DEVICE AND BLOCKOUT
NTS



WELD DETAIL
NTS



END DETAIL
NTS

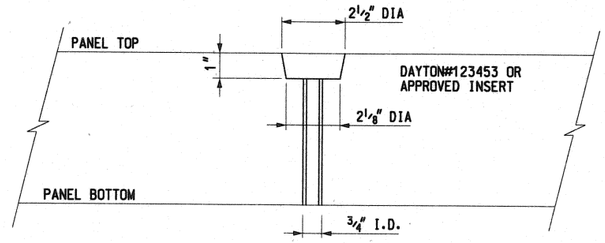


NOTE: DBA = DEFORMED BAR ANCHOR

END FRAME DETAIL
NTS

NOTES:

1. LIFTING INSERTS SHALL BE DESIGNED WITH A MINIMUM SAFETY FACTOR=4. PROFESSIONAL ENGINEER STAMPED AND SEALED DETAILS AND DESIGN CALCULATIONS MUST BE SUBMITTED FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
2. LIFTING INSERTS SHALL BE MECHANICALLY GALVANIZED OR SIMILARILY PROTECTED AGIANST CORRASION.
3. LIFTING DEVICES SHALL BE USABLE WITH BURKE OR DAYTON 5-TON CLUTCH SYSTEMS.
4. PROVIDE LIFTING DEVICES TO OWNER UPON COMPLETION OF CONSTRUCTION.



LAG HOLE DETAIL (TIMER TIES ONLY)
NTS

REVISIONS	
NO.	DATE
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

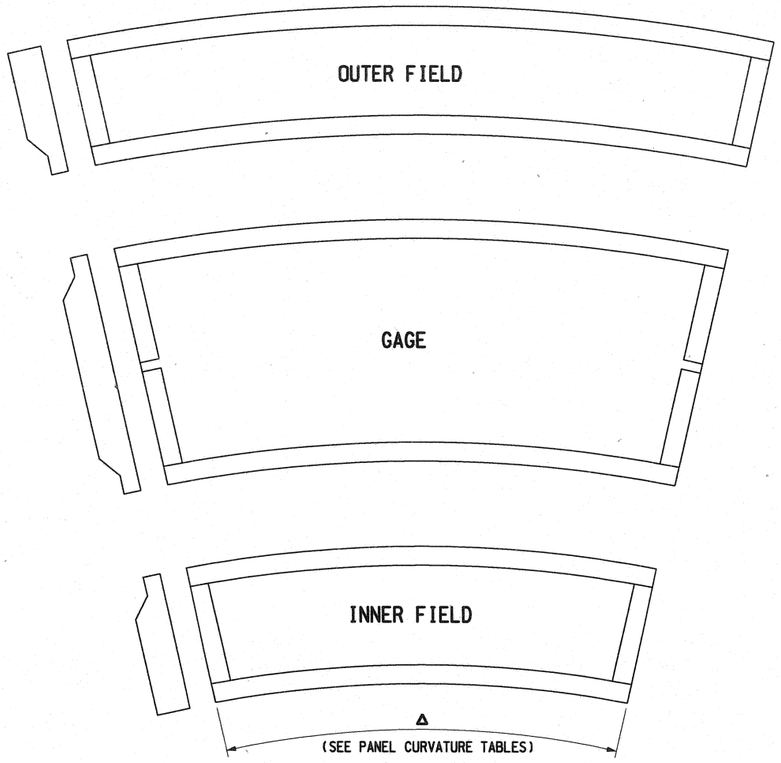
TYPICAL DETAILS FOR CONCRETE PANELS

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-391

SHEET NO: 4 OF 6

10/4/2013

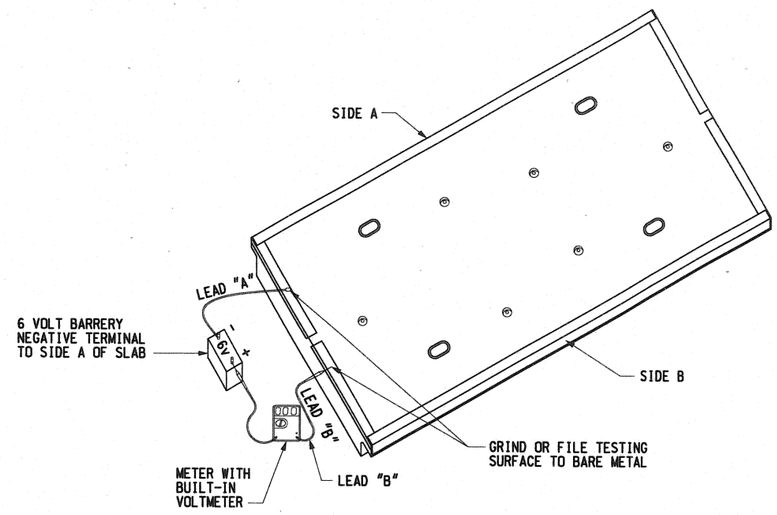


1 DETAIL - CURVED CONCRETE PANELS

NTS

PANEL CURVE DATA TABLE (ON CONCRETE TIES)			
DEGREE OF CURVE	RADIUS IN FEET	Δ	CURVE PANEL
2° OR LESS	2865′	0.20°	NO
3°	1910′	0.30°	YES
4°	1433′	0.40°	YES
5°	1146′	0.50°	YES
6°	955′	0.60°	YES
7°	819′	0.70°	YES
8°	717′	0.80°	YES
9°	637′	0.90°	YES
10°	574′	1.00°	YES
11°	522′	1.10°	YES
12°	478′	1.20°	YES
13°	442′	1.30°	YES
14°	410′	1.40°	YES

PANEL CURVE DATA TABLE (ON TIMBER TIES)			
DEGREE OF CURVE	RADIUS IN FEET	Δ	CURVE PANEL
3° OR LESS	1910′	0.24°	NO
4°	1433′	0.32°	YES
5°	1146′	0.40°	YES
6°	955′	0.48°	YES
7°	819′	0.56°	YES
8°	717′	0.66°	YES
9°	637′	0.74°	YES
10°	574′	0.82°	YES
11°	522′	0.90°	YES
12°	478′	0.98°	YES
13°	442′	1.06°	YES
14°	410′	1.14°	YES



2 DETAIL - STANDARD ELECTRICAL TEST

NTS

ELECTRICAL TEST STEPS:

1. CONTRACTOR SHALL PROVIDE DOCUMENTATION THAT ELECTRICAL TESTS HAVE BEEN DONE AND THE PANELS CONFORM TO THE FOLLOWING CRITERIA.
2. BATTERY SHALL BE 5.0 (FIVE) AMPS OR GREATER.
3. SLABS ARE READY FOR TESTING WHEN 72 HOURS HAVE ELAPSED FROM CASTING OF CONCRETE.
4. MUST BE LESS THAN 2.0 (TWO) AMPS TO PASS THE TEST. RETEST AFTER TWO (2) DAYS IF GREATER THAN 2.0 (TWO) AMPS. REJECT IF AMPERAGE ABOVE 2.0 (TWO) AMPS.
5. 0.3-0.4 AMPS IS A NORMAL READING. 2.0 (TWO) AMPS OR LESS PASS THE TEST.

NOTES:

1. WHERE CURVED PANELS ARE REQUIRED, PROVIDE SHOP DRAWINGS SHOWN DIMENSIONS SPECIFIC TO THE INSTALLATION.
2. CURVED PANELS SHALL MATCH RADIUS OF TRACKS.
3. FOR CURVED PANELS, USE REINFORCEMENT LAYOUT SIMILAR TO TANGENT PANEL STANDARD REINFORCEMENT.
4. LAG HOLES ON 10′ LONG CROSSING PANELS SHALL LINE UP WITH THE CENTER OF TIES.

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

CURVED CONCRETE PANELS AND SHUNT RESISTANCE TEST FOR CONCRETE PANELS

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-391

SHEET NO: 5 OF 6

10/4/2013

MATERIAL SPECIFICATIONS:

1. STRUCTURAL STEEL SHALL CONFORM TO ASTM A-36 SPECIFICATIONS. WELDING TO BE PER AWS CODE
2. ALL EXPOSED STEEL TO RECEIVE ONE COAT PRIMER.
3. END ANGLES FOR GAGE PANEL SHOULD HAVE 3" GAP MINIMUM TO IMPROVE SHUNT RESISTANCE. REINFORCING MATERIAL AND CLADDING TO BE CONSTRUCTED TO MEET SHUNTING REQUIREMENT. A NON-CONDUCTIVE SPACER TO BE ATTACHED TO GAGE FRAME.
4. CLADDING ON ENDS OF PANELS SHOULD EXTEND BEYOND CONCRETE 1/8" (+1/8". -0") TO IMPROVE MATCH WITH ADJACENT PANELS.
5. REINFORCING STEEL SHALL CONFORM TO CURRENT ASTM A 615 SPECIFICATION, GRADE 60. IF ANY WELDING OF REINFORCEMENT STEEL IS REQUIRED, MATERIAL SHALL CONFORM TO ASTM A706 SPECIFICATION, GRADE 60.
6. CONCRETE MATERIAL MIXING, PLACING AND CURING TO BE IN ACCORDANCE WITH PCI "MANUAL FOR QUALITY CONTROL: PRECAST AND PRESTRESSED CONCRETE." MANUAL 115, EDITION 4. CEMENT SHALL HAVE NO MORE THAN 0.6 % TOTAL ALKALI CONTENT. MAXIMUM WATER/CEMENT RATIO = 0.44 (BY WEIGHT). AIR ENTRAINMENT = 6%±1 % IN PLASTIC CONCRETE. SLUMP 3" MAXIMUM.
7. COPIES OF THE CONCRETE DESIGN MIX TO BE SUBMITTED TO ENGINEER FOR APPROVAL PRIOR TO THE START OF THE CASTING OPERATION.
8. TOP SURFACE SHALL BE NON-CRACK DESIGN AND IS TO BE SEALED TO PREVENT ION MIGRATION DUE TO SALTING.
9. CURING SHALL FOLLOW THE RECOMMENDATIONS AND PRECEDURES OF PCI IN 4TH EDITION DIVISION 4.
10. 3/16" WEEP/INSPECTION HOLES SHALL BE PLACED EVERY 2 FEET MINIMUM. ALONG THE TOP OF THE STEEL FRAME ALONG A LINE 3/4" FROM OUTSIDE EDGE.
11. FLANGEWAY FILLER TO BE PERMANENTLY PREATTACHED AND HAVE THE FOLLOWING PROPERITIES:
    * TENSILE STRENGTH (ASTM D412) 850 PSI MIN.
    * ULTIMATE ELONGATION (ASTM D412) 400% MIN.
    * TEAR STRENGTH (ASTM D624) AT 25 DEGREES CELSIUS, 150-PLI MIN.
    * HARDNESS (ASTM D2240) 75±5% SHORE A.
    * COMPRESSION SET (ASTM 395 METHOD B) 100 DEGREES CELSIUS FOR 70 HOURS 45% MAX.
    * ACCELERATED AGING TEST (ASTM D573) 70 HOURS AT 100 DEGREES CELSIUS MUST NOT EXHIBIT A REDUCTION IN PROPERTIES BY GREATER THAN 20%.
    * OZONE RESISTANCE TEST (ASTM D518) MUST HAVE NO CRACKING AFTER EXPOSURE TO 50-PPHM OZONE FOR 96 HOURS AT 40 DEGREES CELSIUS.
    * VOLLUE RESISTIVITY = 1X10 (OHM-CM) OR GREATER (ASTM D257), BUT USING 18% NACL/WATER SOLUTION IN PLACE OF DISTILLED WATER FOR 168 HOURS AT 25 DEGREES CELSIUS AND TESTED AT 500 VDC.
    * ELECTRICAL RESISTANCE: MINIMUM RESISTANCE 10 MEGA OMS MEASURED AT 500 VDC.
    * LOW TEMPERATURE BRITTLENESS (ASTM D2137) AT -40 DEGREES CELSIUS.
    * A SAMPLE SECTION OF THE FLANGEWAY MATERIAL SHALL BE PHYSICALLY TESTED BY APPLYING A LATERAL FORCE OF 10 LB/IN AT 50 DEGREES CELSIUS. THE MAXIMUM LATERAL DISPLACEMENT OF THE TEST IS NOT TO EXCEED 1/4" (CROSSING 10' CONCRETE TIE ONLY). TEST RESULTS MUST BE SUBMITTED FOR ENGINEER APPROVAL.
    * MANUFACTURER TO DESIGN THE PREATTACHED FLANGEWAY FILLER TO ALLOW FOR REMOVAL OF PANELS FOR MAINTENANCE WITHOUT DAMAGING THE FLANGEWAY FILLER OR ANY OTHER COMPONENTS DESIGNED TO HOLD IT TOGETHER.

TOLERANCES:

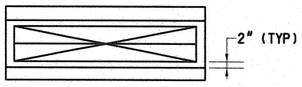
1. OUT OF SQUARE $\frac{3}{16}$" (MEASURED ALONG THE DIAGONAL).
2. LENGTH, WIDTH, AND THICKNESS: $\frac{1}{8}$"±.
3. THE BOTTOM SURFACE, WHICH WILL BE IN CONTACT WITH THE TIES, SHALL NOT UNDULATE IN ANY DIRECTION MORE THAN $\frac{3}{32}$". SEE SPECIAL TESTING NOTE 4 BELOW.
4. REINFORCEMENT PLACEMENT SHALL BE $\frac{3}{4}$"± HORIZONTAL, $\frac{1}{8}$"± VERTICAL.

FINISH:

1. ALL RECESSES AND MINOR CONCRETE SPALLS ARE TO BE FILLED AND FINISHED TO THE PANEL DIMENSIONS USING THE PROPER BONDING AGENT AND REPAIR MATERIAL. SURFACE OF THE REPAIRED AREA IS TO MATCH THE COLOR AND TEXTURE OF THE SURROUNDING AREAS.
2. THE DRIVING SURFACE IS TO HAVE A LIGHT BROOM FINISH OR AS APPROVED BY ENGINEER. THE ADDITION OF WATER TO THE CONCRETE SURFACE FINISH DURING CASTING IS NOT PERMITTED.

SPECIAL TESTING:

1. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION THAT THE FOLLOWING TESTS HAVE BEEN PERFORMED AND THE PANELS CONFORM TO THE FOLLOWING CRITERIA.
2. TWICE ANNUALY, VENDORS SHALL SUBMIT (VIA AN INDEPENDENT TESTING LABORATORY TO THE ENGINEER). THE FOLLOWING TEST ON THE APPROVED MIXED DESIGN
    * ASTM C666 FREEZE/THAW
    * ASTM C227 MORTAR BAR METHOD.
    * ASTM C1260 AT TOTAL ALKALI BURDEN = 0.06 %
3. GAGE PANELS SHALL BE DESIGNED WITH SHUNT RESISTANT FEATURES IN ORDER TO PROVIDE A MINIMUM ELECTRICAL RESISTANCE IN ACCORDANCE WITH THE STANDARD ELECTRICAL TEST (UPRR/BNSF DRAWING 500930).
4. A REPRESENTATIVE SAMPLE OF PANELS SHALL BE CHECKED PERIODICALLY FOR BOTTOM FLATNESS BY USING A STRAIGHT EDGE CALIBRATED TO WITHIN $\frac{1}{32}$"± AND A TAPER GAGE AS FOLLOWS:
    8 POSITIONS OF FLATBAR, CHECK FLATNESS AT EACH POSITION USING TAPER GAGE.



GENERAL:

1. THE MANUFACTURER SHALL BE ISO 9000 OR AAR M-1003 CERTIFIED. ALL TESTING PERSONNEL SHALL BE A MINIMUM OF ACI LEVEL 1 CERTIFIED.
2. THE FABRICATOR SHALL BE RESPONSIBLE FOR LOADING AND PROPERLY SECURING ALL PRECAST CONCRETE MEMBERS FOR SHIPMENT.
3. THE MANUFACTURER SHALL WARRANTY PRODUCT FOR A MINIMUM OF TEN YEARS AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP.
4. MANUFACTURER TO PERMANENTLY MARK EACH PANEL WITH A CONCRETE IMPRINT FOR SIZE OF RAIL, WEIGHT OF PANEL, MANUFACTURER'S I.D., MONTH/YEAR OF MANUFACTURE, AND CROSSING TYPE. END OF EACH PANEL TO BE STENCILED PAINTED WITH SIZE OF RAIL, WEIGHT OF PANEL AND CROSSING TYPE.

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

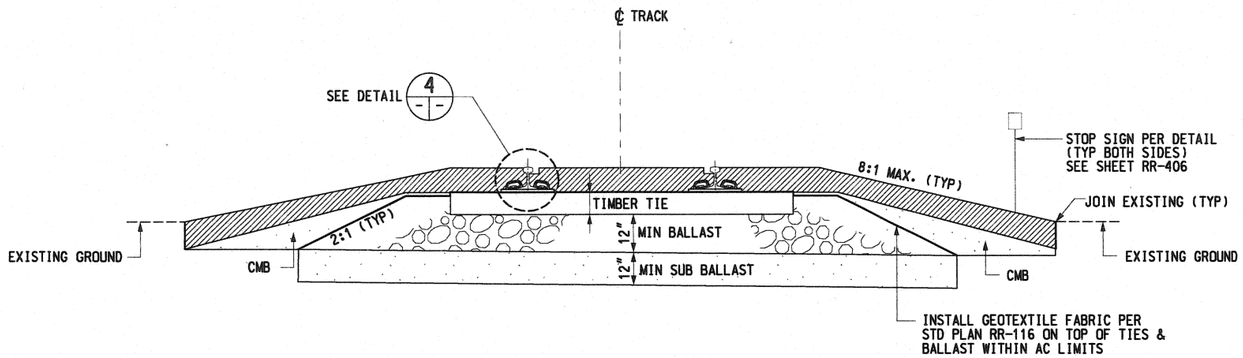
PRECAST CONCRETE PANELS GENERAL SPECIFICATIONS

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-391

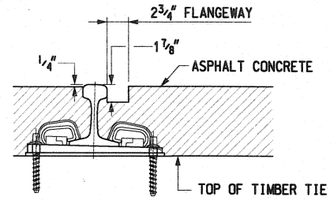
SHEET NO: 6 OF 6

10/4/2013



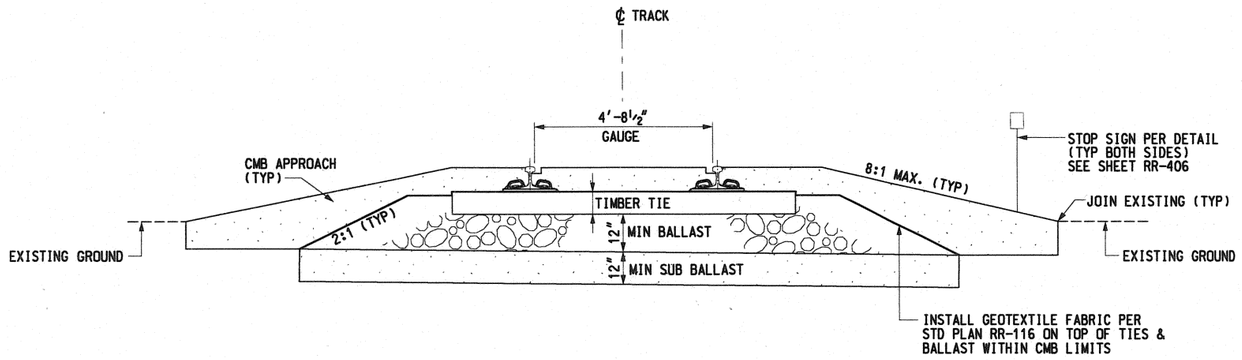
1 DETAIL - TYPICAL AC GRADE CROSSING

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



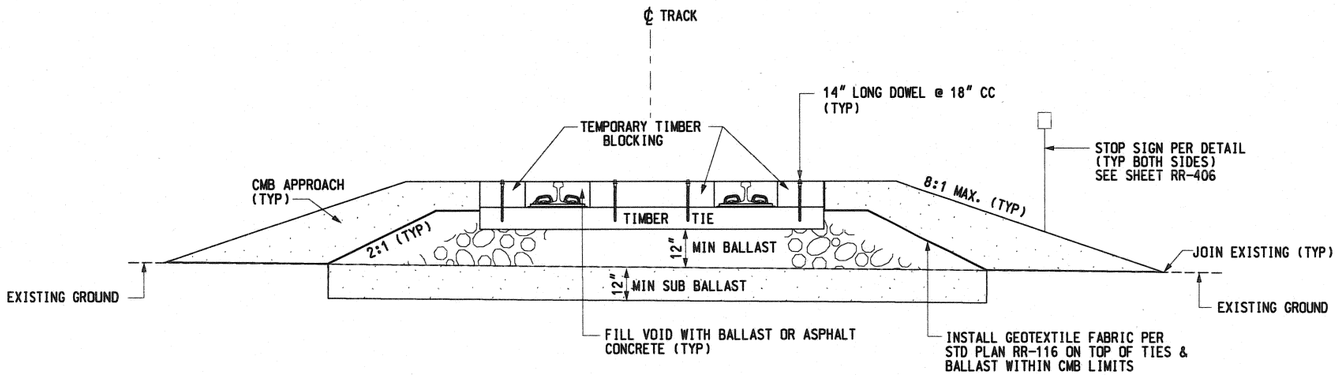
4 DETAIL - AC PAVEMENT FLANGEWAY

NTS



2 DETAIL - TYPICAL CMB GRADE CROSSING

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



3 DETAIL - TYPICAL TIMBER GRADE CROSSING

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

NOTE:

ALL MATERIALS FOR TEMPORARY ROAD CROSSING SHALL BE PROVIDED BY THE CONTRACTOR.

NOTES:

1. REFER TO RR-406 FOR REQUIRED STOP AND PRIVATE CROSSING SIGN.
2. UPON COMPLETION OF WORKS, REMOVE ALL ELEMENTS OF TEMPORARY CROSSING AND RESTORE TRACK SECTION AND BALLAST TO ORIGINAL CONDITION.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

TEMPORARY TRACK CROSSING DURING CONSTRUCTION

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-392

SHEET NO: 1 OF 1

10/4/2013

...*RR-392 Temporary Track Crossing During Construction

1 2 3 4 5 6 7 8 9 0

A B C D E F G H I J

K L M N O P Q R S

T U V W X Y Z &

NOTES:

1. THIS STYLE OF LETTERS TO BE USED ON ALL SIGNS WHEN SPECIFICALLY CALLED FOR ON DRAWING OF THE SIGN.
2. PROPORTIONING OF THE LETTERS MAY BE MODIFIED TO SUIT AVAILABLE SPACE ON THE SIGN.
3. ALL LETTERS AND NUMERALS TO BE BLACK 3M 3650-12 "SCOTCH PLUS" NON REFLECTIVE.

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Port of LONG BEACH
The Green Port

RAILROAD
STANDARD PLANS

LETTERING FOR SIGNS

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

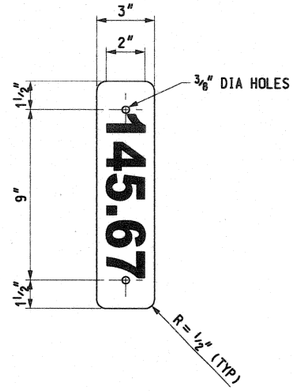
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-400

SHEET NO: 1 OF 1

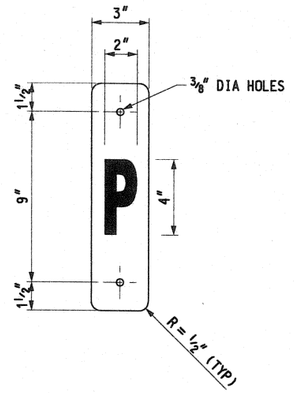
10/4/2013

...*RR-400 Lettering for Signs



BRIDGE, TRESTLE AND CULVERT MARKER

NTS



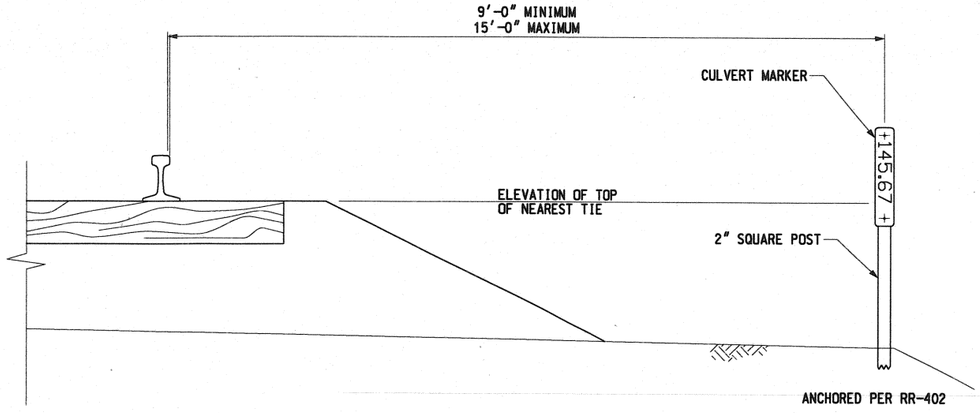
MARKER POST

NTS

BILL OF MATERIAL	
	ITEM
	BRIDGE, TRESTLE AND CULVERT NUMBER MARKER
1	0.25 SQ. FT. ALUMINUM PANEL
1	2" x 2" SQUARE POST (LENGTH VARIES WITH TERRAIN)
2	LONG BOLT WITH NUT AND WASHERS PER RR-403
1	ANCHOR PER RR-402

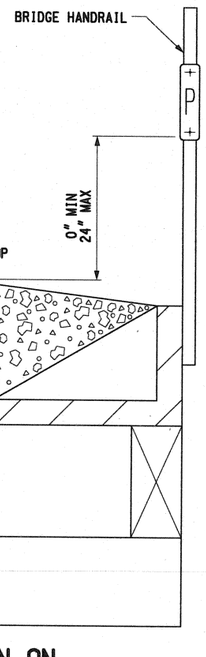
INSTALLATION NOTES

1. BRIDGE AND TRESTLE MARKER SHALL BE SET ON FIELD SIDE OF OUTSIDE TRACK AND USED ONLY AT SUCH LOCATIONS AS APPROVED BY POLB.
2. CULVERT MARKER SHALL BE INSTALLED AT LOCATIONS WHERE HEADWALL, PORTAL OR CULVERT OPENING IS NOT VISIBLE FROM THE TRACK (SUCH AS CULVERTS IN HIGH FILLS). MARKER SHALL BE PLACED ON RIGHT HAND SIDE WHEN FACING IN THE DIRECTION OF INCREASING MILE POSTS.
3. MARKER POST SHALL BE USED TO INDICATE STRUCTURES PROTECTED BY HIGH WATER DETECTOR. MARKERS SHALL BE PLACED AT EACH END OF STRUCTURE. WHERE STRUCTURE HAS HANDRAIL, MARKER MAY BE PLACED ON ENDPOST OF HANDRAIL.



LOCATION PLAN (ELEVATION VIEW)

NTS



MARKER POST SIGN ON BRIDGE HANDRAIL

NTS

MATERIAL SPECIFICATIONS

SIGNS:
⅛" THICK MILL FINISH ALUMINUM PANEL, ALCOA 6016-T6 OR EQUAL. PAINT ALL SIDES WITH LINEAR POLYURETHANE. COLOR FACE OF PANEL WITH ENGINEERING GRADE, PRESSURE SENSITIVE , RETRO-REFLECTIVE WHITE VINYL SHEETING. SILK SCREEN LEGEND WITH BLACK INK. FINISH WITH EXTERIOR GRADE PRESSURE SENSITIVE CLEAR MYLAR, 3M-1150 OR EQUAL.

POST, ANCHOR AND HARDWARE:
PER RR-402.

TEXT STYLE:
"ARIAL BOLD" PER RR-400, SIZE AS INDICATED.

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

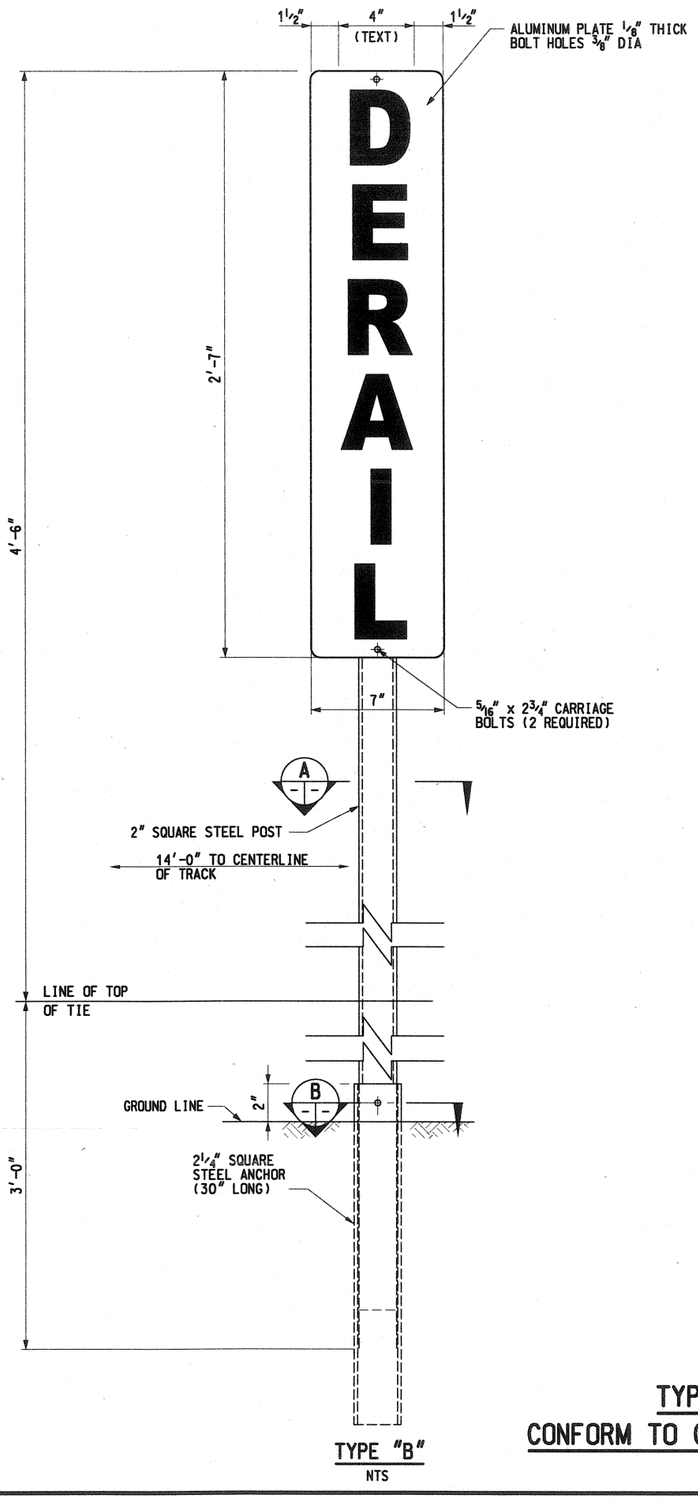
BRIDGE, TRESTLE AND CULVERT NUMBER MARKER

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-401

SHEET NO: 1 OF 1

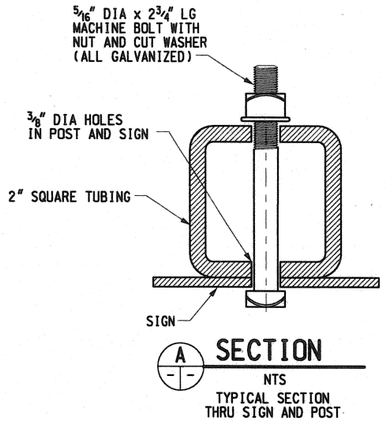
10/4/2013



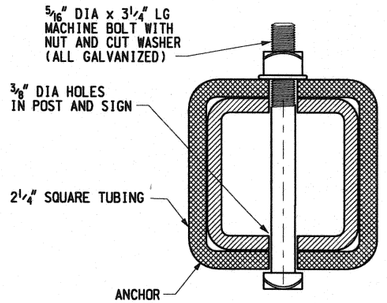
TYPE "B"
NTS

NOTE:

SEE SHEET RR-339 FOR ADDITIONAL DERAIL SIGN AND PLACEMENT DETAILS.



A SECTION
NTS
TYPICAL SECTION
THRU SIGN AND POST



B SECTION
NTS
TYPICAL SECTION
THRU POST AND ANCHOR

MATERIAL SPECIFICATIONS:

SIGNS:
⅛" THICK MILL FINISH ALUMINUM PANEL, ALCOA 6016-T6 OR EQUAL.
PAINT ALL SIDES WITH LINEAR POLYURETHANE. COLOR FACE OF PANEL WITH ENGINEERING GRADE, PRESSURE SENSITIVE, RETRO-REFLECTIVE WHITE VINYL SHEETING. SILK SCREEN LEGEND WITH BLACK INK. FINISH WITH EXTERIOR GRADE PRESSURE SENSITIVE CLEAR MYLAR, 3M-1150 OR EQUAL.
EXPOSED PORTIONS OF PLANK (TYPE A) TO BE PAINTED WITH METALLIC AND LAMPBLACK, MAKING A VERY DARK BROWN. BASE OF PLANK TO HAVE A COAT OF COAL TAR APPLIED HOT TO 6" ABOVE GROUND.

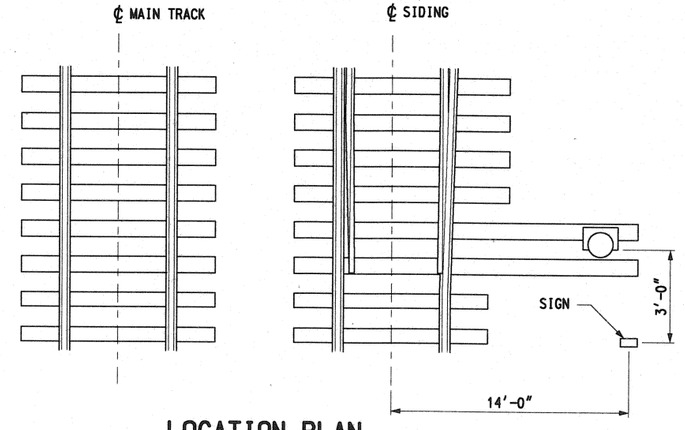
STEEL POSTS:
12 GAGE (.105 THICK) 2.42 LBS. PER LINEAL FOOT SQUARE STEEL TUBE (ASTM A-36) WITH ⅜" DIA MOUNTING HOLES. ALL GALVANIZED IN ACCORDANCE WITH ASTM A-386.

STEEL ANCHORS:
12 GAGE (.105 THICK) 2.42 LBS. PER LINEAL FOOT SQUARE STEEL TUBE (ASTM A-36) WITH ⅜" DIA MOUNTING HOLES. ALL GALVANIZED IN ACCORDANCE WITH ASTM A-386.

TEXT STYLE:
TEXT TO BE "ARIAL BOLD" PER RR-400.
SIZE AS INDICATED.

HARDWARE:
ALL HARDWARE TO BE VANDAL RESISTANT.
BOLTS: ⅝" X 2 ¾" LONG ALUMINUM CARRIAGE BOLTS, 2024-T4 ALLOY. (FOR SIGN)
BOLTS: ⅝" X 3 ¼" LONG ALUMINUM CARRIAGE BOLTS, 2024-T4 ALLOY. (FOR ANCHOR)
NUTS: TAMPER RESISTANT, ALCOA OR EQUAL.
WASHERS: PLAIN, FLAT ALUMINUM WASHERS.

LOCATION
TO BE USED AT ALL DERAILS. SIGN TO BE PLACED DIRECTLY OPPOSITE DERAIL SWITCH ON THE OUTSIDE OF AND 14 FEET FROM THE CENTERLINE OF SIDING, FACING SO AS TO BE READ FROM ENGINE PULLING OUT OF SIDING.



LOCATION PLAN
NTS

TYPE "B" SIGNS CONFORM TO CALIFORNIA STATE LAW

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

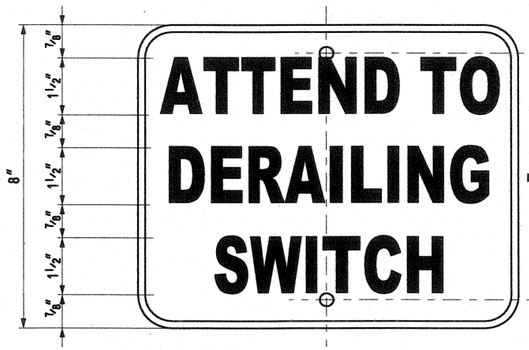
DERAIL SIGN

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

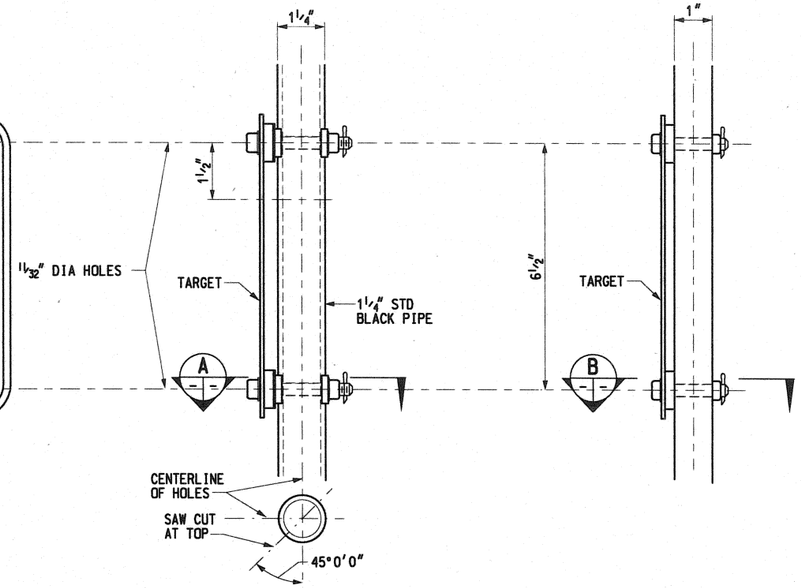
DRAWING NO: RR-402
SHEET NO: 1 OF 1

10/4/2013

...*RR-402 Derail Sign

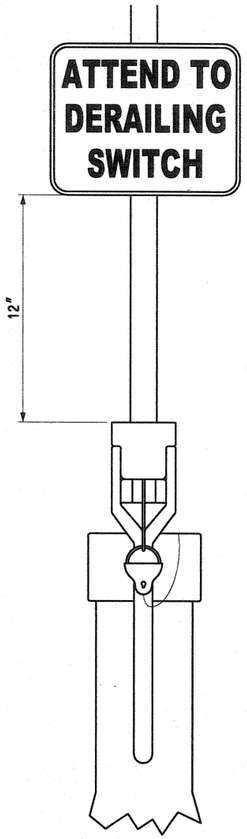


DERAILING SWITCH TARGET
SCALE: NTS



TUBULAR TARGET ROD
(ALTERNATE) SCALE: NTS

SQUARE TARGET ROD
SCALE: NTS



FULL VIEW
SCALE: NTS

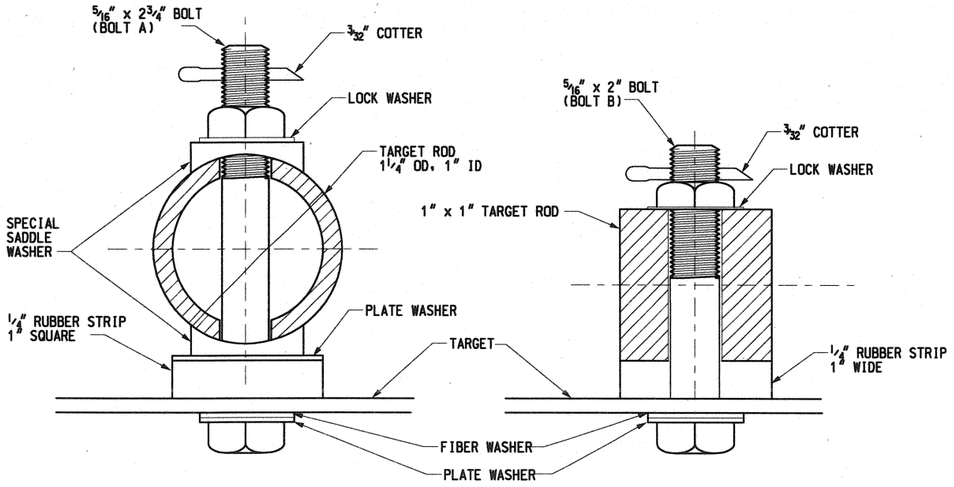
MATERIAL SPECIFICATIONS:

SIGNS:
⅛" THICK MILL FINISH ALUMINUM PANEL, ALCOA 6016-T6 OR EQUAL. PAINT ALL SIDES WITH LINEAR POLYURETHANE. COLOR FACE OF PANEL WITH ENGINEERING GRADE, PRESSURE SENSITIVE , RETRO-REFLECTIVE WHITE VINYL SHEETING. SILK SCREEN LEGEND WITH BLACK INK. FINISH WITH EXTERIOR GRADE PRESSURE SENSITIVE CLEAR MYLAR, 3M-1150 OR EQUAL.

TEXT STYLE:
TEXT TO BE "ARIAL BOLD" PER RR-400.
SIZE AS INDICATED.

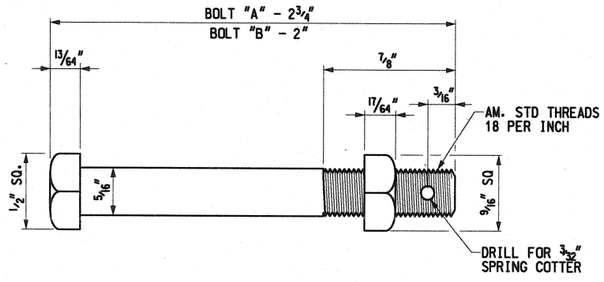
HARDWARE:
ALL HARDWARE TO BE VANDAL RESISTANT.
BOLTS: 5/16" DIA CLASS A STEEL.
NUTS: TAMPER RESISTANT, ALCOA OR EQUAL.
WASHERS: ALUMINUM LOCK WASHERS.

LOCATION:
WHERE DERAIL IS PROVIDED TO PREVENT FOULING OF ANY TRACK, DERAILING SWITCH NOTICE SHALL BE PLACED ON STAND OF THAT PARTICULAR SWITCH THROUGH WHERE THE FOULING MOVEMENT WOULD BE MADE.



A SECTION
SCALE: NTS

B SECTION
SCALE: NTS



5/16" TARGET BOLT
(CLASS A STEEL, SCALE: NTS)

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD
STANDARD PLANS

DERAIL SWITCH NOTICE SIGN

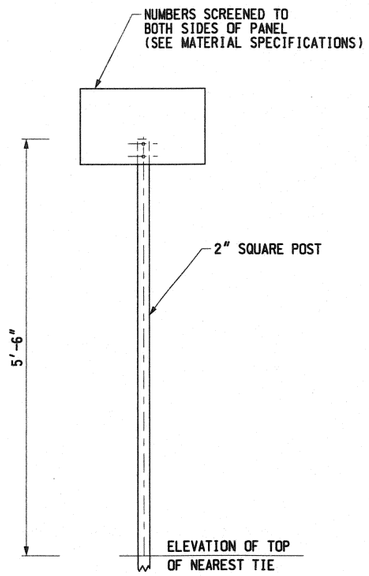
APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-403

SHEET NO: 1 OF 1

10/4/2013

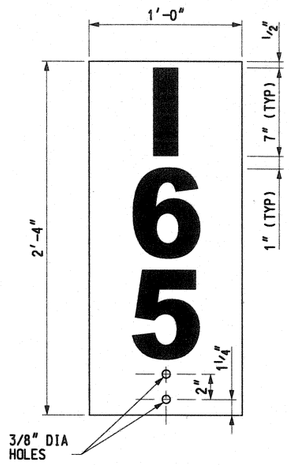
...*RR-403 Derail Switch Notice Sign



ANCHORED PER RR-402

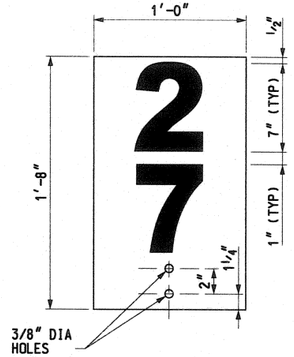
MILE POST

NTS



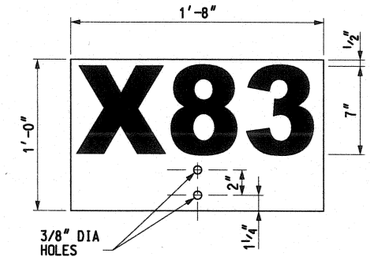
VERTICAL 3 CHARACTER SIGN

NTS



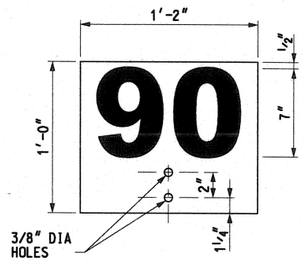
VERTICAL 2 CHARACTER SIGN

NTS



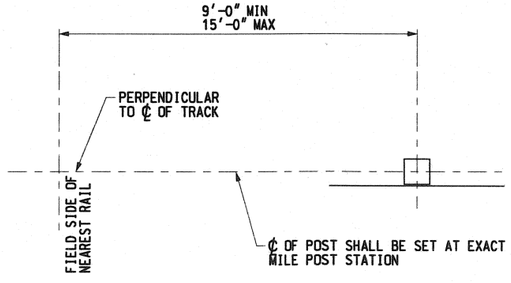
HORIZONTAL 3 CHARACTER SIGN

NTS



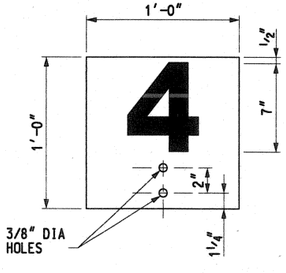
HORIZONTAL 2 CHARACTER SIGN

NTS



LOCATION PLAN

NTS



1 CHARACTER SIGN

NTS

BILL OF MATERIAL	
NUMBER REQUIRED	ITEM
	MILE POST
1	ALUMINUM PANEL (AREA VARIES WITH NO. OF REQ. CHARACTERS)
1	2" x 2" SQUARE POST (LENGTH VARIES WITH TERRAIN)
2	LONG BOLT WITH NUT AND WASHERS PER RR-403
1	ANCHOR PER RR-402

INSTALLATION NOTES

1. TO ALLOW MILE POSTS TO BE READ FROM BOTH DIRECTIONS, ONE DOUBLE-FACED ALUMINUM PANEL WITH WHITE REFLECTIVE SHEETING BACKGROUND AND BLACK PLASTIC NUMERALS SHALL BE MOUNTED AT RIGHT ANGLES TO THE TRACK AT EACH LOCATION.
2. THE POST SHALL BE SET PER THE LOCATION PLAN ON THIS SHEET. EXCEPTIONS SHALL REQUIRE THE APPROVAL OF POLB.
3. IN SINGLE TRACK TERRITORY, MILE POSTS SHALL BE SET ON RIGHT HAND SIDE OF THE TRACK AS ONE FACES IN THE DIRECTION OF INCREASING MILE POSTS. IN MULTIPLE TRACK TERRITORY MILE POSTS SHALL BE SET ON THE FIELD SIDE OF THE TRACK FARTHEST TO THE RIGHT.
4. WHEN THE EXACT MILE POST STATION FALLS WITHIN THE LIMITS OF A BRIDGE, GRADE CROSSING OR OTHER FEATURE WHERE IT WOULD BE IMPRACTICAL TO LOCATE A SIGN, THE MILE POST SHALL INSTEAD BE SET AT THE END OF THE FEATURE NEAREST THE EXACT MILE POST STATION.
5. VERTICAL SIGNS ARE PREFERRED.

MATERIAL SPECIFICATIONS

SIGNS:
1/8" THICK MILL FINISH ALUMINUM PANEL, ALCOA 6016-T6 OR EQUAL. PAINT ALL SIDES WITH LINEAR POLYURETHANE. COLOR FACE OF PANEL WITH ENGINEERING GRADE, PRESSURE SENSITIVE, RETRO-REFLECTIVE WHITE VINYL SHEETING. SILK SCREEN LEGEND WITH BLACK INK. FINISH WITH EXTERIOR GRADE PRESSURE SENSITIVE CLEAR MYLAR, 3M-1150 OR EQUAL.

POST, ANCHOR AND HARDWARE:
PER RR-402.

TEXT STYLE:
"ARIAL BOLD" PER RR-400, SIZE AS INDICATED.

REVISIONS	
NO.	DATE
1	
2	
3	
4	

Port of LONG BEACH
The Green Port

RAILROAD
STANDARD PLANS

MILE POST

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

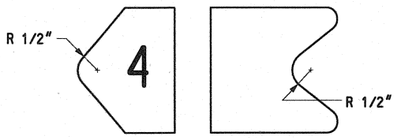
DRAWING NO: RR-404

SHEET NO: 1 OF 1

10/4/2013

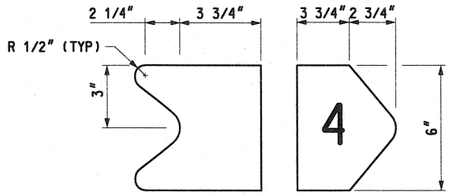
...*RR-404 Mile Post

REFLECTORIZED YELLOW SHEETING
(TARGET INDICATION WHEN
SWITCH IS IN THE REVERSED
POSITION - TURNOUT TRACK
ROUTE TO THE LEFT)



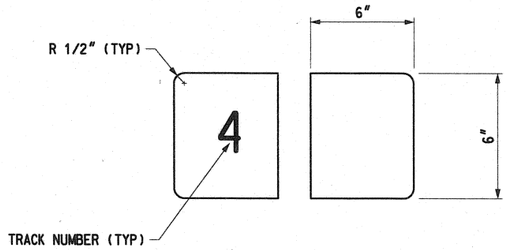
CONFIGURATION 1
(SWITCH)

REFLECTORIZED YELLOW SHEETING
(TARGET INDICATION WHEN
SWITCH IS IN THE REVERSED
POSITION - TURNOUT TRACK
ROUTE TO THE RIGHT)



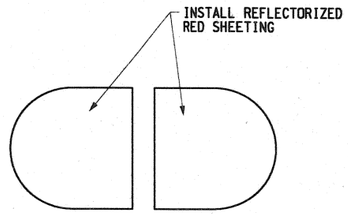
CONFIGURATION 2
(SWITCH)

REFLECTORIZED GREEN SHEETING
(TARGET INDICATION WHEN
SWITCH IS IN THE NORMAL
POSITION - STRAIGHT
TRACK ROUTE)



CONFIGURATION 3
(SWITCH)

REFLECTORIZED RED SHEETING
(TARGET INDICATION WHEN
DERAIL IS IN THE NORMAL
POSITION - DERAIL ACTIVATED)



SEE SHEET RR-405 2 OF 2 FOR EXACT DIMENSIONS

NOTES:

1. ALL INDICATIONS AND TRACK NUMBERS ARE AS OBSERVED ENTERING THE SWITCH.
2. ALL REVERSE POSITION SWITCH TRACK NUMBERS SHALL BE WHITE 3M SCOTCHCAL FILM ON RED 3M SCOTCHLITE HIGH INTENSITY REFLECTORIZED SHEETING OR APPROVED EQUAL. ALL STRAIGHT SWITCH NUMBERS SHALL BE WHITE 3M SCOTCHCAL FILM ON GREEN 3M SCOTCHLITE HIGH INTENSITY SHEETING OR APPROVED EQUAL.
3. CLEAN SWITCH STAND TARGET VANE ACCORDING TO MANUFACTURER PROCEDURES PRIOR TO PLACEMENT OF VANE SHEETING AND TRACK NUMBERS. FIELD TRIM SHEETING TO FIT AFTER PLACEMENT ON TARGET VANES.

1 DETAIL - TYPICAL SWITCH VANE SHEETING
NTS

NOTES:

1. CLEAN DERAIL TARGET VANE ACCORDING TO MANUFACTURER'S PROCEDURES PRIOR TO PLACEMENT OF VANE SHEETING. TRIM SHEETING TO FIT AFTER PLACEMENT ON DERAIL VANES.
2. DERAIL TARGET VANE SHEETING SHALL BE 3M SCOTCHLITE HIGH INTENSITY REFLECTIVE SHEETING OR APPROVED EQUAL.

2 DETAIL - TYPICAL DERAIL VANE SHEETING
NTS

REVISIONS	
NO.	DATE
1	
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Port of LONG BEACH
The Green Port

RAILROAD
STANDARD PLANS

TURNOUT AND DERAIL VANE SHEETING DETAILS

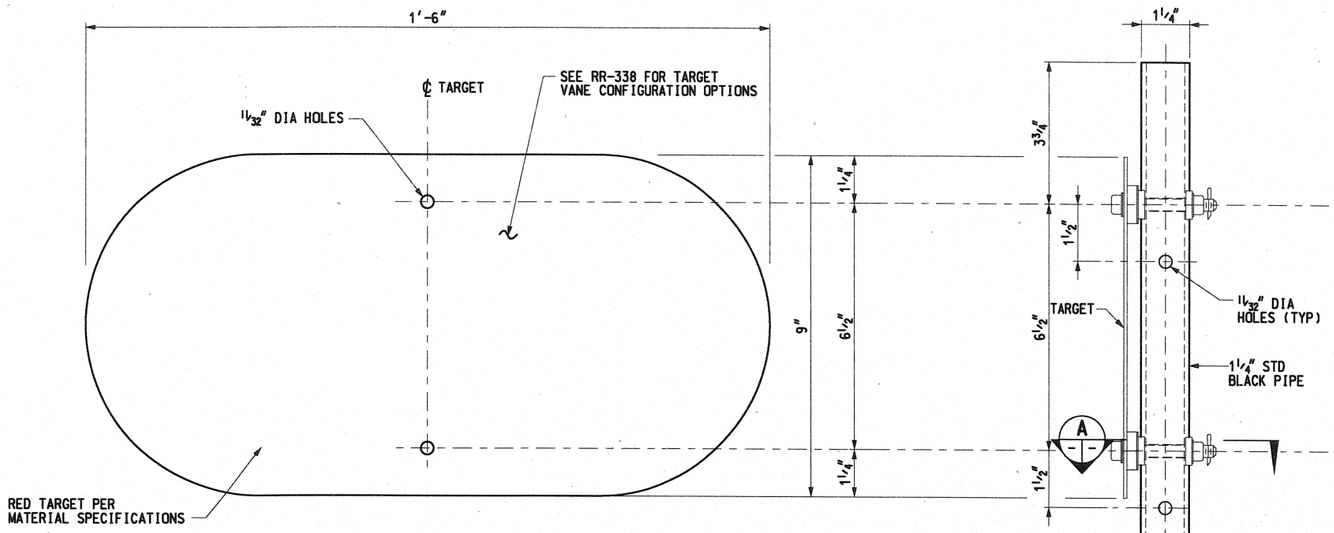
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-405

SHEET NO: 1 OF 2

10/4/2013

DERAILING SWITCH TARGET SHOWN FOR CLARITY. FOR OTHER TARGETS SEE SHEET RR-405 1 OF 2.

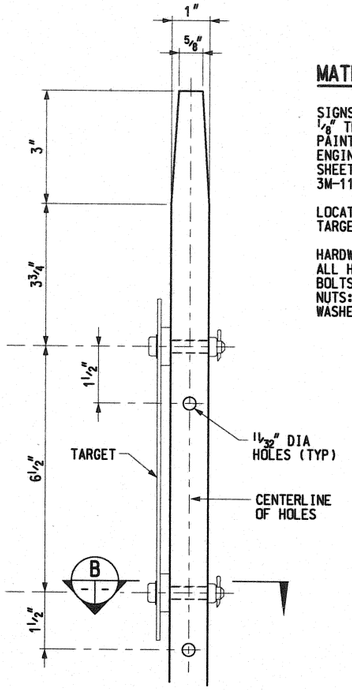


DERAILING SWITCH TARGET

NTS

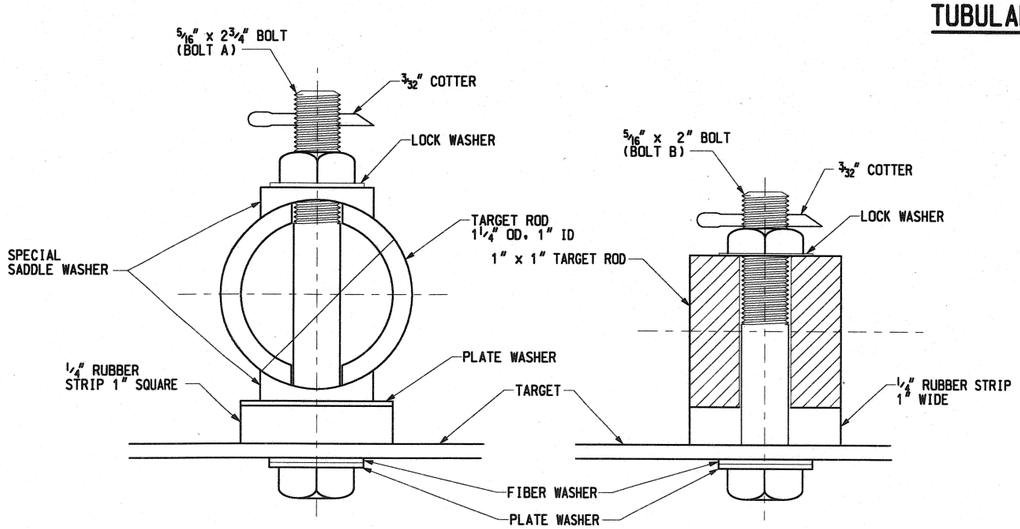
TUBULAR TARGET ROD

NTS



SQUARE TARGET ROD

NTS

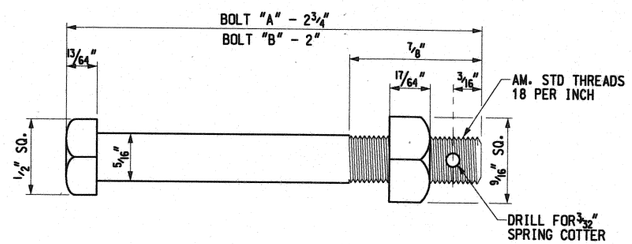


A SECTION

NTS

B SECTION

NTS



5/16" TARGET BOLT

(CLASS A STEEL, SEE SPEC. 1003 - A)

NTS

MATERIAL SPECIFICATIONS:

SIGNS:
1/8" THICK MILL FINISH ALUMINUM PANEL, ALCOA 6016-T6 OR EQUAL. PAINT ALL SIDES WITH LINEAR POLYURETHANE. COLOR FACE OF PANEL WITH ENGINEERING GRADE, PRESSURE SENSITIVE , RETRO-REFLECTIVE RED VINYL SHEETING. FINISH WITH EXTERIOR GRADE PRESSURE SENSITIVE CLEAR MYLAR, 3M-1150 OR EQUAL.

LOCATION:
TARGET TO BE USED ON ALL DERAILING SWITCH STANDS

HARDWARE:
ALL HARDWARE TO BE VANDAL RESISTANT.
BOLTS: 5/16" DIA CARRIAGE BOLTS, 2024-T4 ALLOY.
NUTS: TAMPER RESISTANT, ALCOA OR EQUAL.
WASHERS: ALUMINUM LOCK WASHERS.

REVISIONS	
NO.	DATE
1	
2	
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4	

Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

DERAILING SWITCH TARGET

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

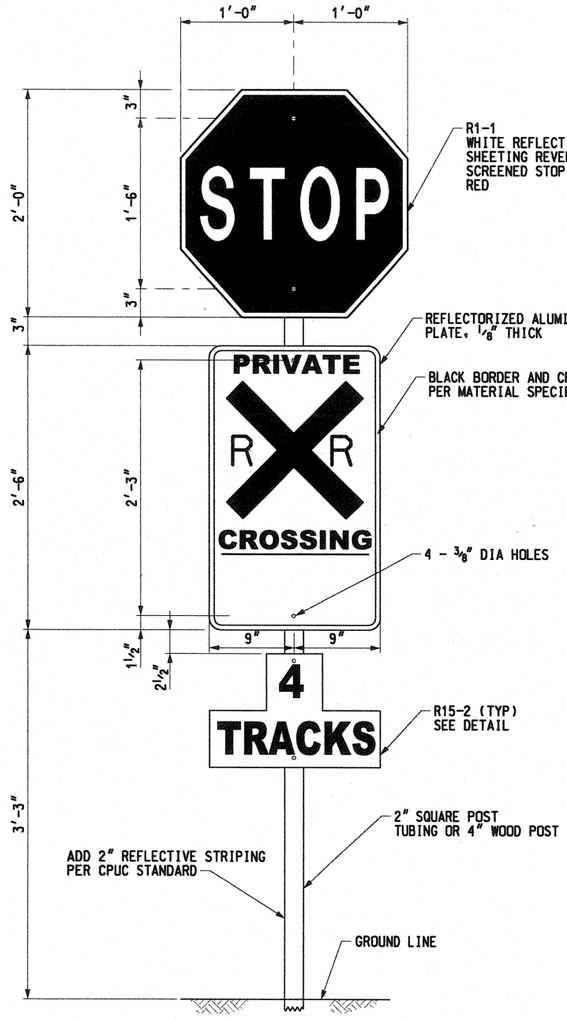
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-405

SHEET NO: 2 OF 2

10/4/2013

...*RR-405 Switch Switch Target



ANCHORED PER RR-402

CPUC STANDARD NO. 1-C

NTS
THIS SIGN COMPLIES WITH THE REQUIREMENTS OF
CALIFORNIA PUBLIC UTILITIES GENERAL ORDER NO. 75-D

BILL OF MATERIAL (PER SIGN LOCATION)	
NUMBER REQUIRED	ITEM
	NO. 1-C PRIVATE CROSSING SIGN - COMPLETE
1	24" STOP SIGN (MUTCD R1-1)
1	3.75 SQ. FT. ALUMINUM PANEL (PRIVATE CROSSING SIGN)
1	2" X 2" SQUARE POST (LENGTH VARIES WITH TERRAIN)
4	LONG BOLT WITH NUT AND WASHERS PER RR-403
1	ANCHOR PER RR-402
	R15-2 NUMBER OF TRACKS SIGN (WHERE REQUIRED)
1	SIGN (MUTCD 15-2)
2	LONG BOLT WITH NUT AND WASHERS PER RR-403

NOTES:

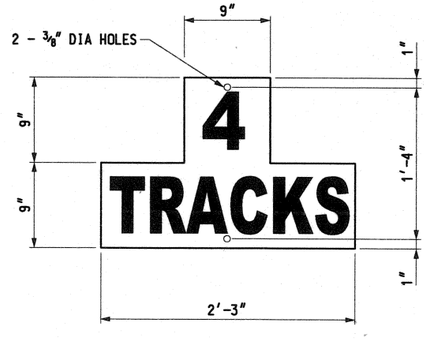
1. CPUC STANDARD NO. 1-C PRIVATE CROSSING SIGN:
   TWO SIGNS SHALL BE USED AT EACH PRIVATE GRADE CROSSING NOT EQUIPPED WITH AUTOMATIC WARNING DEVICES, ONE FACING EACH ROAD APPROACH UNLESS THERE IS NO SPACE TO LOCATE THE SIGN OR SIGNS. EACH CROSSING REQURIES ORDERING TWO (2) SIGNS.
2. THE SIGNS SHALL BE PLACED NO CLOSER THAN 12'-6" FROM THE CENTER LINE OF TRACK TO THE BACK OF POST EXCEPT AS SHOWN FOR INDIVIDUAL STATE REQUIREMENTS.

MATERIAL SPECIFICATIONS:

SIGNS:
1/8" THICK MILL FINISH ALUMINUM PANEL, ALCOA 6016-T6 OR EQUAL. PAINT ALL SIDES WITH LINEAR POLYURETHANE. COLOR FACE OF PANEL WITH ENGINEERING GRADE, PRESSURE SENSITIVE, RETRO-REFLECTIVE WHITE VINYL SHEETING. SILK SCREEN LEGEND WITH BLACK INK. FINISH WITH EXTERIOR GRADE PRESSURE SENSITIVE CLEAR MYLAR, 3M-1150 OR EQUAL.

POST, ANCHOR AND HARDWARE:
PER RR-402.

TEXT STYLE:
"ARIAL BOLD" PER RR-400, SIZE AS INDICATED.



R15-2

NTS

NOTE:

SIGN R15-2 USED ONLY IF THERE IS MORE THAN ONE TRACK. NUMBER SHALL CORRESPOND TO NUMBER OF TRACKS AT CROSSING.

REVISIONS	
NO.	DATE
1	
2	
3	
4	

Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

PRIVATE RAILROAD GRADE CROSSING SIGN

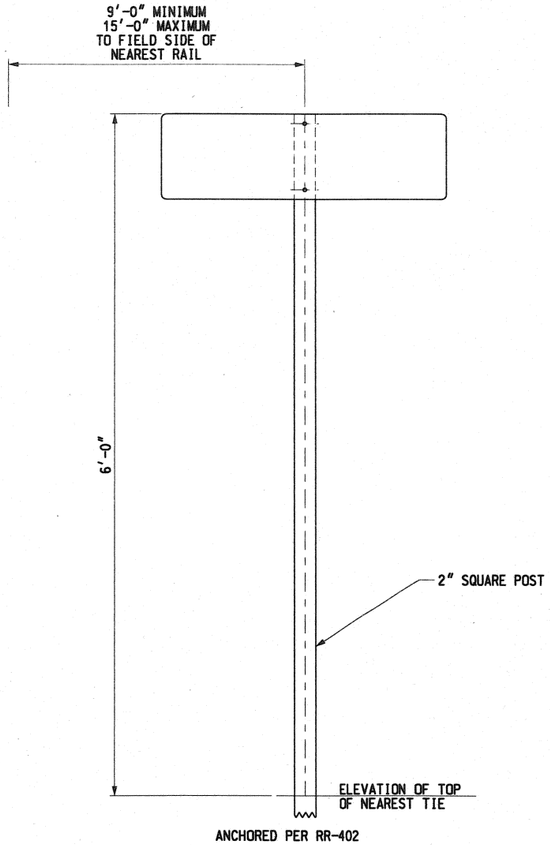
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-406

SHEET NO: 1 OF 1

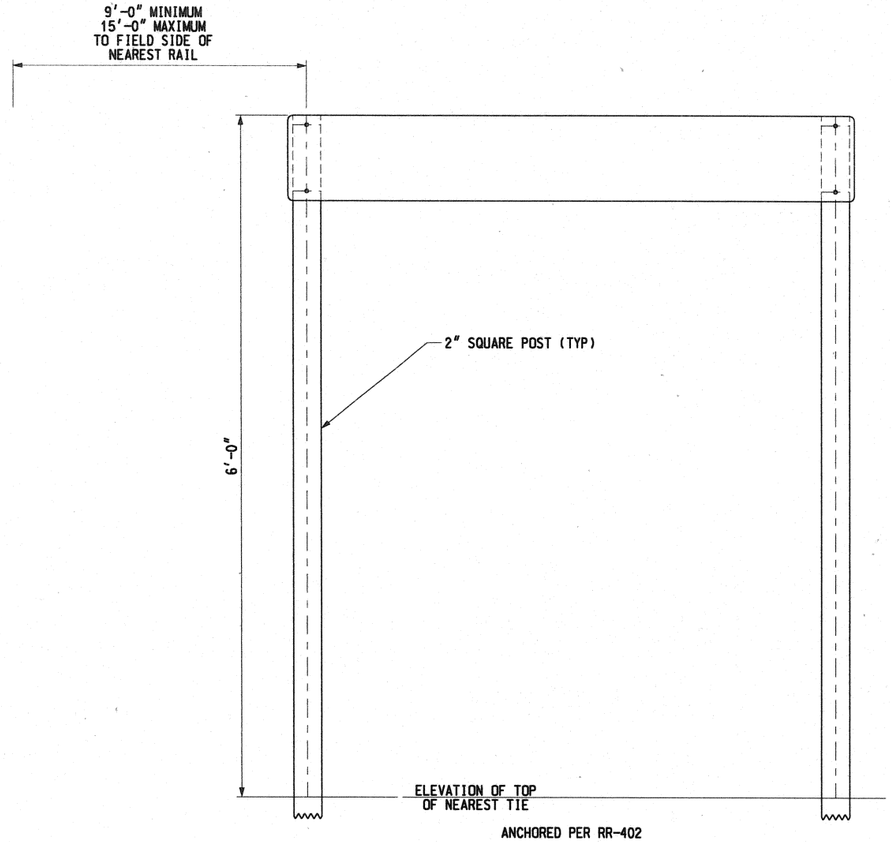
10/4/2013

...*RR-406 Private Railroad Grade Crossing Sign



SINGLE POST MOUNT

NTS



DUAL POST MOUNT

NTS

BILL OF MATERIAL	
NUMBER REQUIRED	ITEM
	SINGLE POST MOUNT STATION SIGN
1 OR 2 1 2 1	ALUMINUM PANEL (AREA VARIES WITH LENGTH OF STATION NAME) 2" x 2" SQUARE POST (LENGTH VARIES WITH TERRAIN) LONG BOLT WITH NUT AND WASHERS PER RR-403 ANCHOR PER RR-402
	DUAL POST MOUNT STATION SIGN
1 OR 2 2 4 2	ALUMINUM PANEL (AREA VARIES WITH LENGTH OF STATION NAME) 2" x 2" SQUARE POST (LENGTH VARIES WITH TERRAIN) LONG BOLT WITH NUT AND WASHERS PER RR-403 ANCHOR PER RR-402

INSTALLATION NOTES

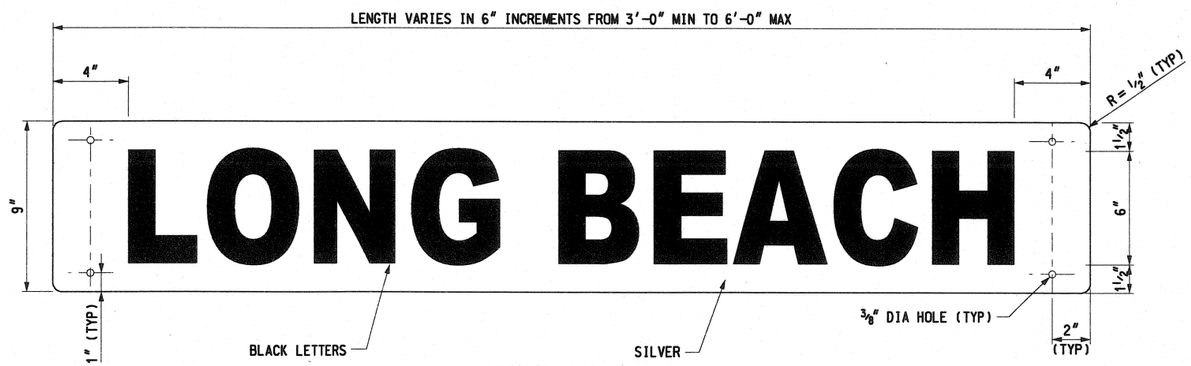
1. SIGNS SHALL BE PLACED AT ALL STATIONS AND BUSINESS TRACKS LISTED ON TIMETABLE SCHEDULE PAGE.
2. IN OTHER THAN CTC TERRITORY, SIGNS SHALL BE MOUNTED ON BOTH SIDES OF POST AND LOCATED AT TIMETABLE STATION LOCATION.
3. TO MINIMIZE THE LENGTH OF THE SIGN, ABBREVIATIONS THAT MAKE MEANING CLEAR MAY BE USED. REQUISITIONS FOR STATION SIGNS SHALL SPECIFY MOUNTING HARDWARE REQUIRED PER TYPICAL MOUNTING DETAILS.
4. STATION SIGN SHALL BE PLACED ON OPPOSITE SIDE OF SWITCH STAND 10'-0" AHEAD OF SWITCH POINTS.

MATERIAL SPECIFICATIONS

SIGNS:
1/8" THICK MILL FINISH ALUMINUM PANEL, ALCOA 6016-T6 OR EQUAL. PAINT ALL SIDES WITH LINEAR POLYURETHANE. COLOR FACE OF PANEL WITH ENGINEERING GRADE, PRESSURE SENSITIVE, RETRO-REFLECTIVE SILVER VINYL SHEETING. SILK SCREEN LEGEND WITH BLACK INK. FINISH WITH EXTERIOR GRADE PRESSURE SENSITIVE CLEAR MYLAR, 3M-1150 OR EQUAL.

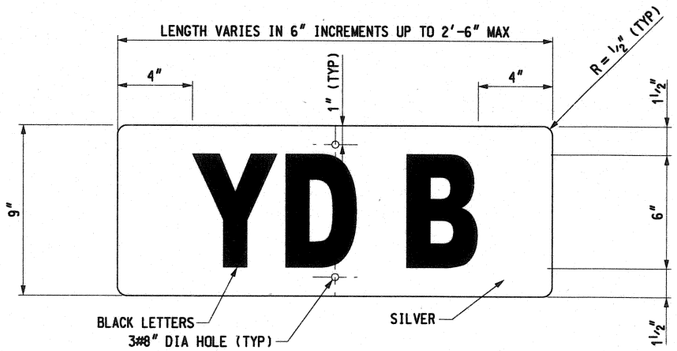
POST, ANCHOR AND HARDWARE:
PER RR-402.

TEXT STYLE:
"ARIAL BOLD" PER RR-400, SIZE AS INDICATED.



WIDE SIGN

NTS



NARROW SIGN

NTS

REVISIONS	
NO.	DATE
1	
2	
3	
4	

Port of LONG BEACH
The Green Port

RAILROAD
STANDARD PLANS

STATION SIGNS

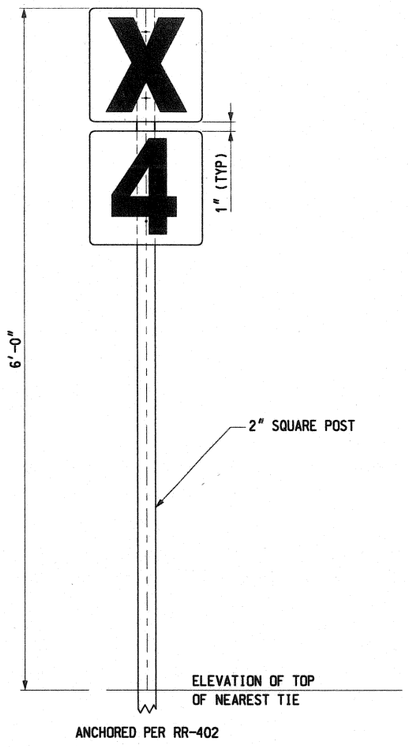
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-407

SHEET NO: 1 OF 1

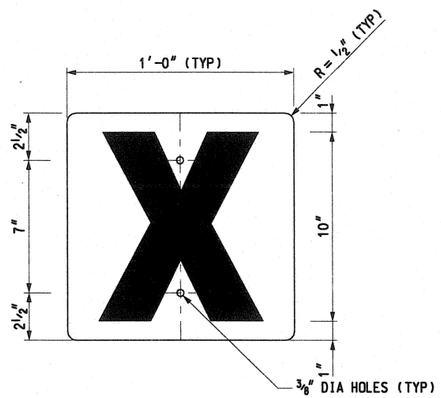
10/4/2013

...*RR-407 Station Signs



WHISTLING POINT SIGN

NTS



REQUIRED PANEL

NTS

BILL OF MATERIAL	
NUMBER REQUIRED	ITEM
	WHISTLING POINT SIGN
1	1 SQ FT ALUMINUM PANEL
1	1 SQ FT ALUMINUM PANEL (OPTIONAL FOR MULTIPLE CROSSINGS)
1	2" x 2" SQUARE POST (LENGTH VARIES WITH TERRAIN)
2	LONG BOLT WITH NUT AND WASHERS PER RR-403
2	LONG BOLT WITH NUT AND WASHERS PER RR-403 (OPTIONAL FOR MULTIPLE CROSSINGS)
1	ANCHOR PER RR-402
	(THIS BILL OF MATERIAL IS FOR ONE SIGN - 2 SIGNS ARE REQUIRED PER CROSSING)

INSTALLATION NOTES

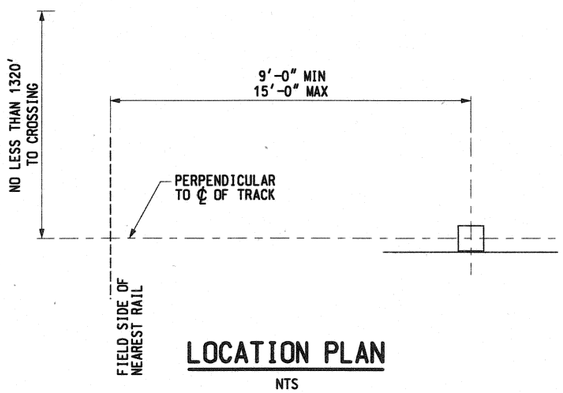
1. SIGNS SHALL BE LOCATED ON THE RIGHT HAND SIDE AND SHALL FACE IN THE DIRECTION OF APPROACH.
2. THE POST SHALL BE SET PER THE LOCATION PLAN ON THIS SHEET. EXCEPTIONS SHALL REQUIRE THE APPROVAL OF POLB.
3. WHERE THERE ARE MULTIPLE PUBLIC CROSSINGS NOT MORE THAN 1320' APART, THE SIGN IN ADVANCE OF THE FIRST CROSSING SHALL INCLUDE A SECOND PANEL DISPLAYING A NUMERAL WHICH REPRESENTS THE NUMBER OF CROSSINGS INVOLVED. WHISTLE SIGNAL UNDER PROVISIONS OF RULE 5.8.2 (11) MUST BE SOUNDED UNTIL THE ENGINE HAS PASSED THROUGH THE LAST CROSSING.

MATERIAL SPECIFICATIONS

SIGNS:
⅛" THICK MILL FINISH ALUMINUM PANEL, ALCOA 6016-T6 OR EQUAL. PAINT ALL SIDES WITH LINEAR POLYURETHANE. COLOR FACE OF PANEL WITH ENGINEERING GRADE, PRESSURE SENSITIVE, RETRO-REFLECTIVE WHITE VINYL SHEETING. SILK SCREEN LEGEND WITH BLACK INK. FINISH WITH EXTERIOR GRADE PRESSURE SENSITIVE CLEAR MYLAR, 3M-1150 OR EQUAL.

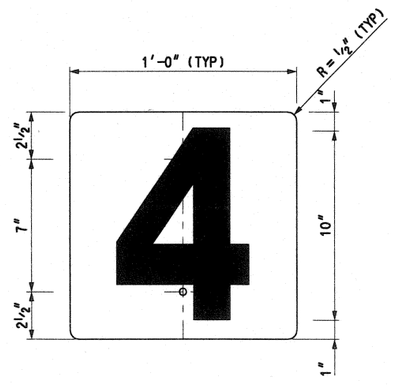
POST, ANCHOR AND HARDWARE:
PER RR-402.

TEXT STYLE:
"ARIAL BOLD" PER RR-400, SIZE AS INDICATED.



LOCATION PLAN

NTS



OPTIONAL PANEL FOR MULTIPLE CROSSINGS

NTS

REVISIONS	
NO.	DATE
1	
2	
3	
4	

Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

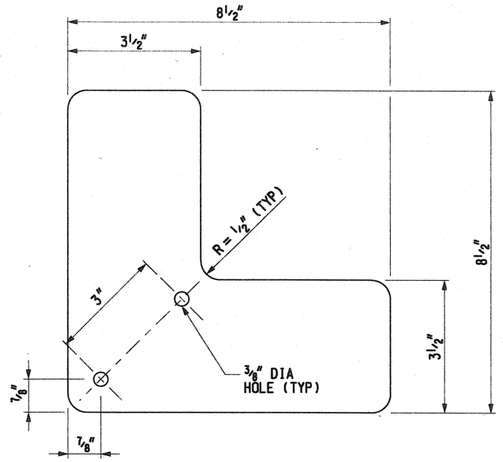
WHISTLING POINT SIGN

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

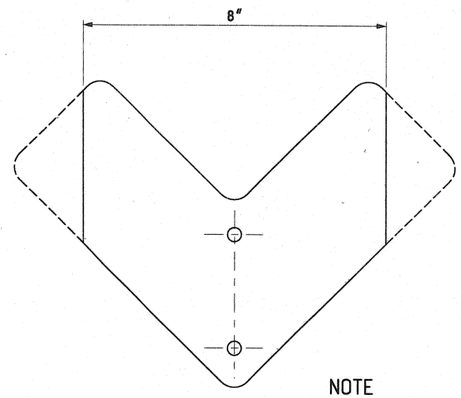
DRAWING NO: RR-408
SHEET NO: 1 OF 1

10/4/2013

...*RR-408 Whistling Point Sign



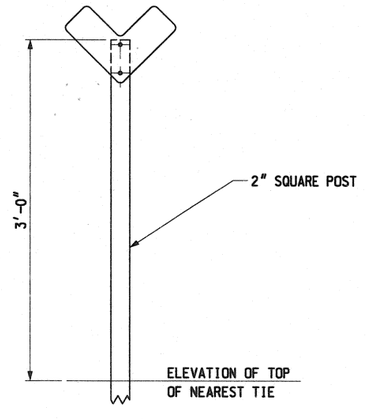
SIGN PLATE DETAIL 1



NOTE

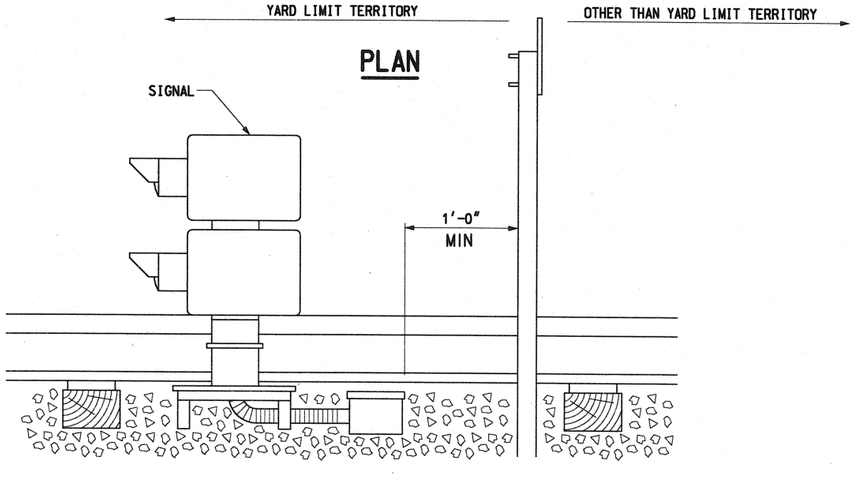
ALL OTHER DIMENSIONS PER DETAIL 1.

OPTIONAL CUT FOR LIMITED CLEARANCE DETAIL 2



ANCHORED PER RR-402

YARD LIMIT SIGN DETAIL 3



ELEVATION INSTALLATION LOCATION DETAIL 4

BILL OF MATERIAL	
NUMBER REQUIRED	ITEM
	YARD LIMIT SIGN FOR TERMINAL TRACKS
1	0.33 SQ. FT. ALUMINUM PANEL OR 0.27 SQ. FT. ALUMINUM PANEL (OPTIONAL CUT)
1	2" x 2" SQUARE POST (LENGTH VARIES WITH TERRAIN)
2	LONG BOLT WITH NUT AND WASHERS PER RR-403
1	ANCHOR PER RR-402

INSTALLATION NOTES

1. SIGN SHALL BE INSTALLED TO INDICATE LIMIT OF TERRITORY OPERATED UNDER RULE 6.13. GCOR.
2. THE POST SHALL BE SET PER THE LOCATION PLAN ON THIS SHEET. EXCEPTIONS SHALL REQUIRE THE APPROVAL OF POLB.

MATERIAL SPECIFICATIONS

SIGNS:
1/8" THICK MILL FINISH ALUMINUM PANEL. ALCOA 6016-T6 OR EQUAL. PAINT ALL SIDES WITH LINEAR POLYURETHANE. COLOR FACE OF PANEL WITH ENGINEERING GRADE, PRESSURE SENSITIVE, RETRO-REFLECTIVE YELLOW VINYL SHEETING NO. 4280-A. FINISH WITH EXTERIOR GRADE PRESSURE SENSITIVE CLEAR MYLAR, 3M-1150 OR EQUAL.

POST, ANCHOR AND HARDWARE:
PER RR-402.

TEXT STYLE:
NONE.

REVISIONS	
NO.	DATE
1	
2	
3	
4	

Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

YARD LIMIT SIGN FOR TERMINAL TRACKS

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

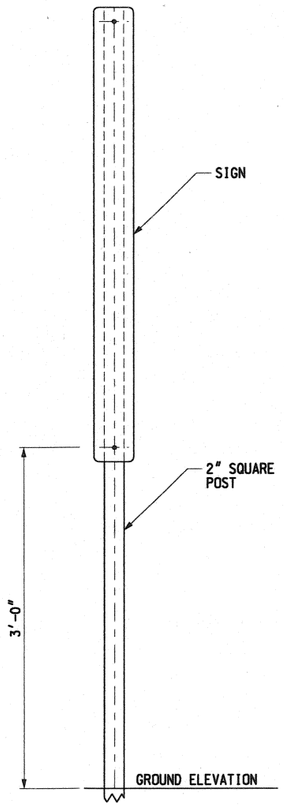
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-409

SHEET NO: 1 OF 1

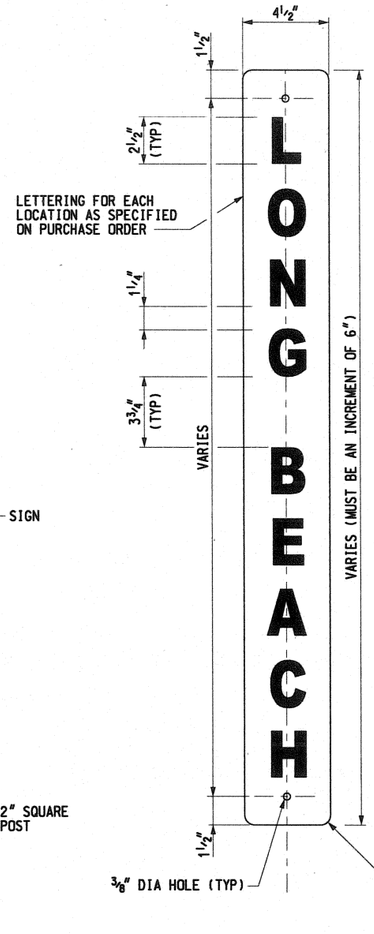
10/4/2013

...\RR-409 Yard Limit Sign for Terminal Tracks

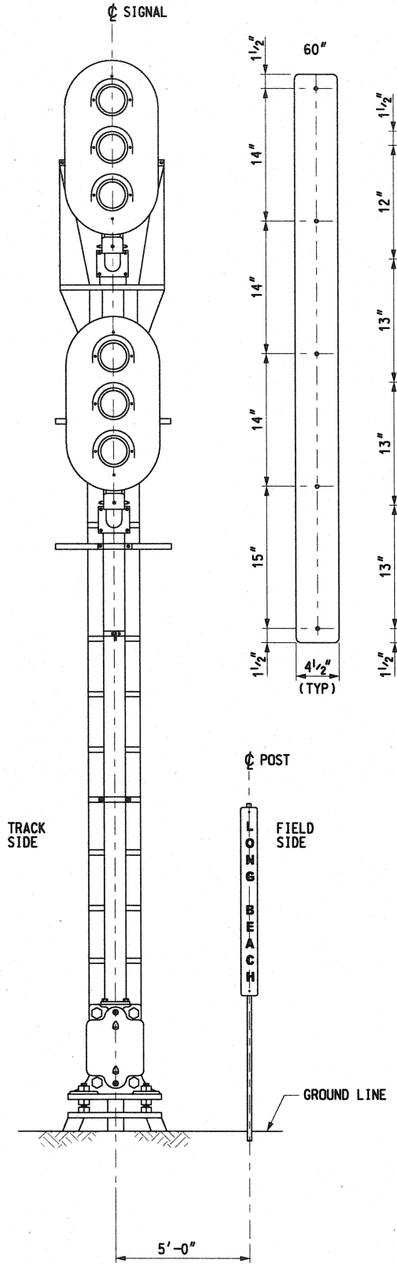


ANCHORED PER RR-402

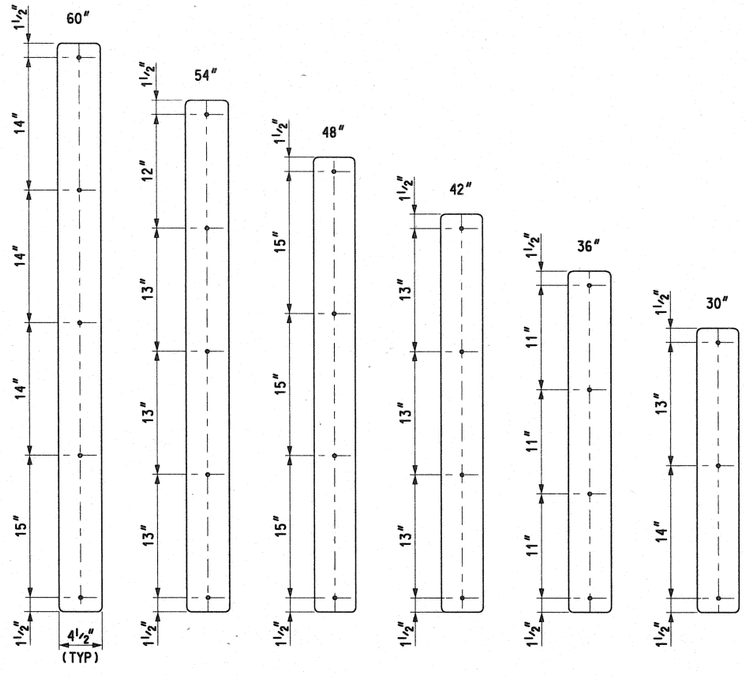
SIGN ELEVATION
DETAIL 1
NTS



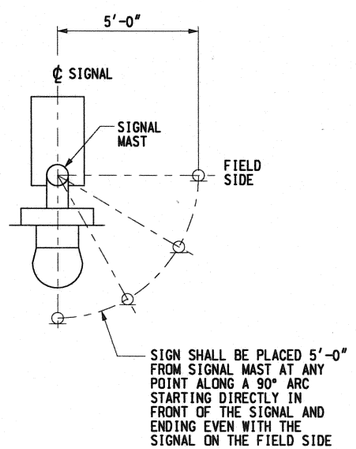
EXAMPLE SIGN
DETAIL 2
NTS



FRONT ELEVATION



EXTRA BOLT HOLE EXAMPLES
DETAIL 4
NTS



PLAN

TYPICAL INSTALLATION
DETAIL 3
NTS

BILL OF MATERIAL	
NUMBER REQUIRED	ITEM
	CP LIMIT SIGN
1	ALUMINUM PANEL (AREA VARIES WITH NO. OF REQ. CHARACTERS)
1	2" x 2" SQUARE POST (LENGTH VARIES WITH TERRAIN)
3-5	LONG BOLT WITH NUT AND WASHERS PER RR-403 (NO. VARIES WITH REQ. HEIGHT OF SIGN).
1	ANCHOR PER RR-402

INSTALLATION NOTES

1. SIGNS SHALL BE SET ADJACENT TO SIGNAL CONTROLLING ENTRANCE TO CONTROL POINTS AT LOCATIONS DESIGNATED BY THE POLB. THIS IS GENERALLY WHERE CONTROL POINTS ARE LESS THAN 1500 FEET APART.
2. SIGNS SHALL BE INSTALLED BY TRACK AND SIGNAL FORCES WORKING TOGETHER ONLY AFTER CONFIRMING THAT THE PROPOSED LOCATION IS CLEAR OF OBSTRUCTIONS OR UNDERGROUND UTILITIES.
3. SIGNS SHALL BE LOCATED AS CLOSE AS PRACTICABLE TO THE SIGNAL WHICH CONTROLS ENTRANCE TO THE CONTROL POINT. THE PREFERRED LOCATION IS SHOWN IN DETAIL 3. PLACEMENT MAY BE ALTERED WHERE REQUIRED BY FIELD CONDITIONS PROVIDED IT CLEARLY ESTABLISHES THE LIMIT OF THE CONTROL POINT. IN ALL CASES, PLACEMENT WILL CONFORM TO THE LATERAL CLEARANCES REQUIRED BY CALIFORNIA PUBLIC UTILITIES COMMISSION GENERAL ORDER 26D. (WHERE "DWARF SIGNALS" ARE USED, SIGN SHALL BE PLACED SO AS NOT TO OBSTRUCT THE SIGNALS).
4. SIGNS MORE THAN 24" TALL SHALL REQUIRE ADDITIONAL BOLTS NO LESS THAN 10" AND NO MORE THAN 15" APART. SEE DETAIL 4.

MATERIAL SPECIFICATIONS

SIGNS:
1/8" THICK MILL FINISH ALUMINUM PANEL, ALCOA 6016-T6 OR EQUAL. PAINT ALL SIDES WITH LINEAR POLYURETHANE. COLOR FACE OF PANEL WITH ENGINEERING GRADE, PRESSURE SENSITIVE, RETRO-REFLECTIVE WHITE VINYL SHEETING. SILK SCREEN LEGEND WITH BLACK INK. FINISH WITH EXTERIOR GRADE PRESSURE SENSITIVE CLEAR MYLAR, 3M-1150 OR EQUAL.

POST, ANCHOR AND HARDWARE:
PER RR-402.

TEXT STYLE:
"ARIAL BOLD" PER RR-400, SIZE AS INDICATED.

REVISIONS	
NO.	DATE
1	
2	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

CONTROL POINT LIMIT SIGN

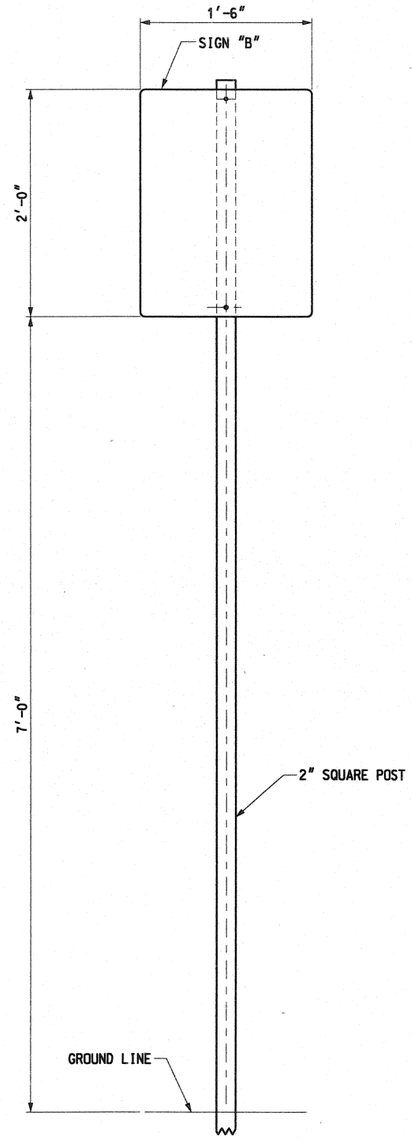
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-410

SHEET NO: 1 OF 1

10/4/2013

...*RR-410 Control Point Limit Sign



ANCHORED PER RR-402

SIGN ELEVATION

NTS



SIGN "B" (DOUBLE SIDED)

NTS

BILL OF MATERIAL	
NUMBER REQUIRED	ITEM
	WARNING SIGN ASSEMBLY
1	3.00 SQ. FT. ALUMINUM PANEL (SIGN "B")
1	2" x 2" SQUARE POST (LENGTH VARIES WITH TERRAIN)
2	LONG BOLT WITH NUT AND WASHERS PER RR-403
1	ANCHOR PER RR-402

INSTALLATION NOTES

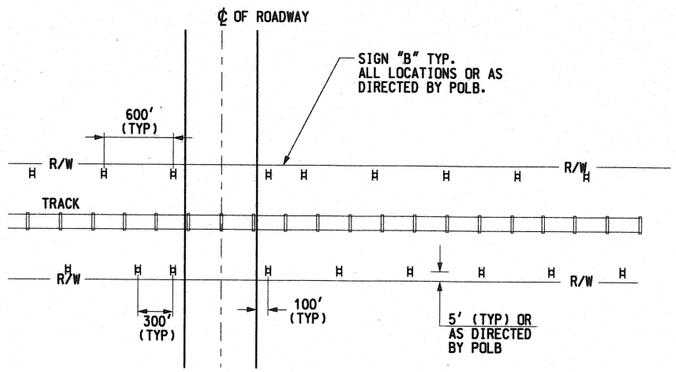
1. ORIENTATION OF SIGNS WILL BE COORDINATED WITH THE POLB.
2. SIGNS SHALL BE STAGGERED ALONG LENGTH OF CORRIDOR PER THE LOCATION PLAN ON THIS SHEET.
3. COMPLETE WARNING SIGN ASSEMBLY SHALL INCLUDE ONE DOUBLE-SIDED TYPE "B" SIGN.
4. SIGNS MAY BE MOUNTED ON CHAINLINK FENCE (IF AVAILABLE).

MATERIAL SPECIFICATIONS:

SIGNS:
1/8" THICK MILL FINISH ALUMINUM PANEL, ALCOA 6016-T6 OR EQUAL. PAINT ALL SIDES WITH LINEAR POLYURETHANE. COLOR FACE OF PANEL WITH ENGINEERING GRADE, PRESSURE SENSITIVE , RETRO-REFLECTIVE WHITE VINYL SHEETING. SILK SCREEN LEGEND WITH BLACK INK. FINISH WITH EXTERIOR GRADE PRESSURE SENSITIVE CLEAR MYLAR, 3M-1150 OR EQUAL.

POST, ANCHOR AND HARDWARE:
PER RR-402.

TEXT STYLE:
"ARIAL BOLD" PER RR-400, SIZE AS INDICATED.



LOCATION PLAN

NTS

REVISIONS	
NO.	DATE
1	
2	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

NO TRESPASSING SIGNS

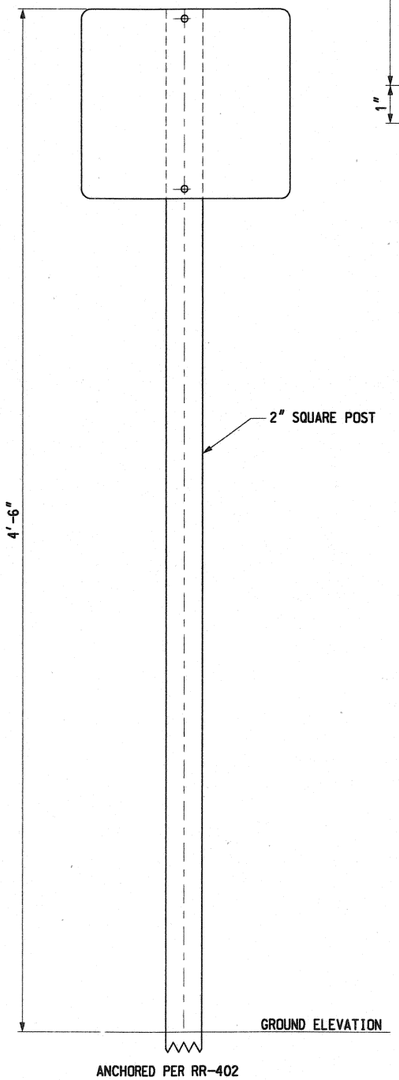
APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-411

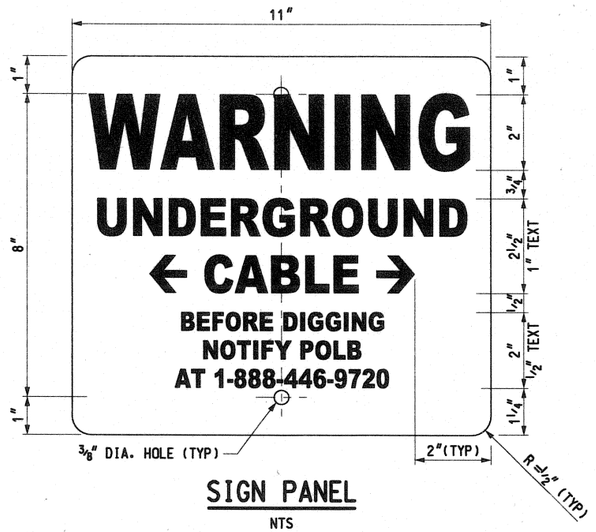
SHEET NO: 1 OF 1

10/4/2013

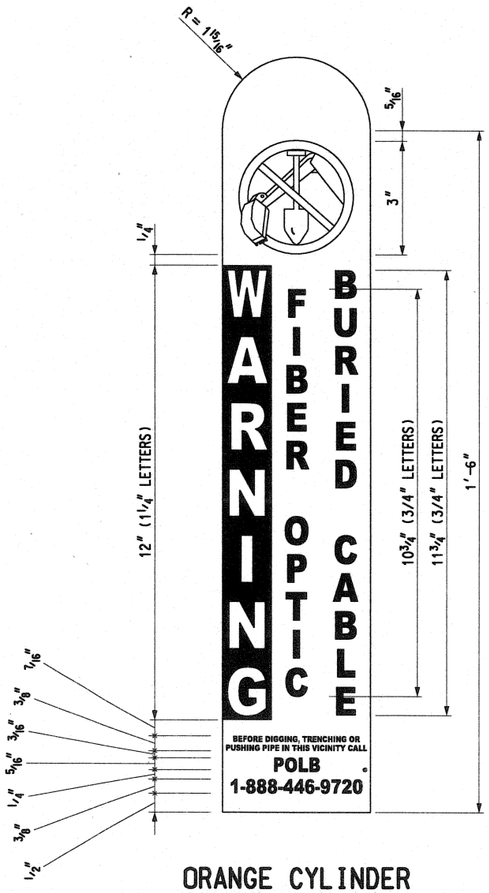
...\RR-411 No Tresspassing Signs



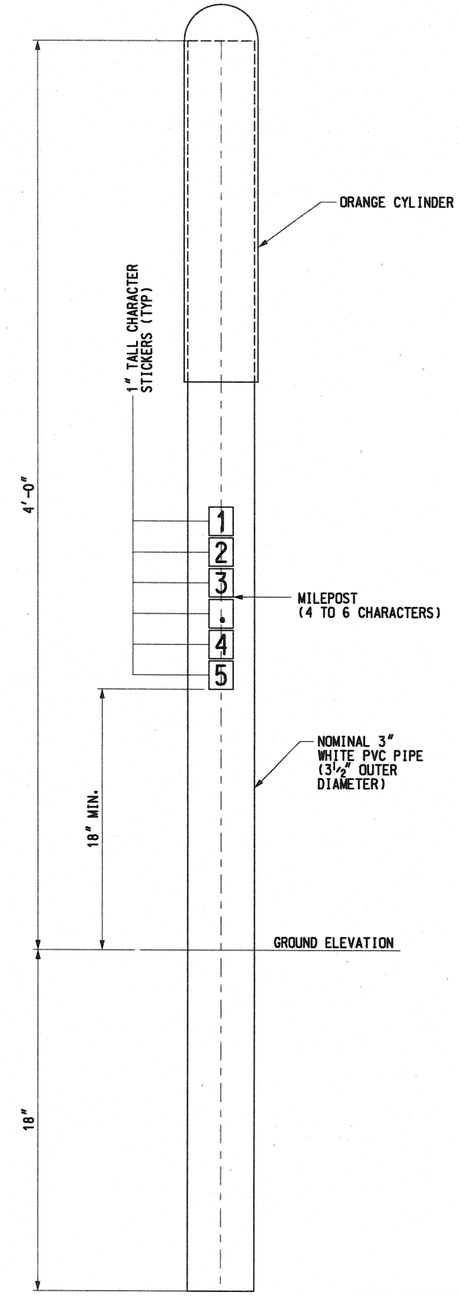
UNDERGROUND CABLE SIGN
NTS



SIGN PANEL
NTS



ORANGE CYLINDER
NTS



FIBER OPTIC CABLE MARKER
NTS

BILL OF MATERIAL	
NUMBER REQUIRED	ITEM
	UNDERGROUND CABLE SIGN
1	0.76 SQ. FT. ALUMINUM PANEL
1	2" x 2" x 78" LONG SQUARE POST (LENGTH VARIES WITH TERRAIN)
2	LONG BOLT WITH NUT AND WASHERS PER RR-403
1	ANCHOR PER RR-402
	FIBER OPTIC CABLE MARKER
1	NOMINAL 3" DIAMETER WHITE PVC PIPE, 66" LONG
1	REFLECTIVE ORANGE CYLINDER WITH BLACK LETTERING AS SHOWN ON THIS SHEET
6-8	1" TALL CHARACTER STICKERS WITH BLACK LETTERS OR NUMERALS ON REFLECTIVE ORANGE BACKGROUND (VARIES WITH MILEPOST)

INSTALLATION NOTES

1. SIGNS OR MARKERS SHALL BE PLACED ADJACENT TO ALL UNDERGROUND SIGNAL, COMMUNICATION AND ELECTRICAL CABLES.
2. SIGN FACE SHALL BE ORIENTED PARALLEL TO CABLE.
3. CL OF SIGN OR MARKER POST SHALL BE SET NO CLOSER THAN 9'-0" FROM THE FIELD SIDE OF THE NEAREST RAIL. EXCEPTIONS SHALL REQUIRE THE APPROVAL OF POLB. INSTALLER SHALL AVOID DAMAGING UNDERGROUND UTILITY.
4. SIGNS OR MARKERS SHALL BE PLACED:
   a. NO MORE THAN 500' APART
   b. AT EVERY SPLICE LOCATION
   c. AT EVERY POINT OF CHANGE OF DIRECTION
   d. ON EACH SIDE OF BORE OR BRIDGE ATTACHMENT
   e. WITHIN SIGHT OF MARKERS BEFORE AND AFTER.
   f. 1' OFFSET FROM THE UNDERGROUND RUNNING LINE WHEREVER POSSIBLE. THE ACTUAL OFFSET SHALL BE PERMANENTLY NOTED ON THE SIGN OR MARKER.
5. MARKERS SHALL BE INDIVIDUALLY NUMBERED AND SHOWN ON THE AS-BUILT DRAWINGS.

MATERIAL SPECIFICATIONS

SIGNS:
1/8" THICK MILL FINISH ALUMINUM PANEL, ALCOA 6016-T6 OR EQUAL. PAINT ALL SIDES WITH LINEAR POLYURETHANE. COLOR FACE OF PANEL WITH ENGINEERING GRADE, PRESSURE SENSITIVE, RETRO-REFLECTIVE ORANGE VINYL SHEETING. SILK SCREEN LEGEND WITH BLACK INK. FINISH WITH EXTERIOR GRADE PRESSURE SENSITIVE CLEAR MYLAR, 3M-1150 OR EQUAL.

POST, ANCHOR AND HARDWARE:
PER RR-402.

TEXT STYLE:
"ARIAL BOLD" PER RR-400, SIZE AS INDICATED.

MARKERS:
3 1/8" OUTER DIAMETER, 3 1/2" INNER DIAMETER PVC CYLINDER WITH ENGINEERING GRADE RETRO-REFLECTIVE ORANGE COATING. SILK SCREEN LEGEND WITH BLACK INK.

REVISIONS	
NO.	DATE
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

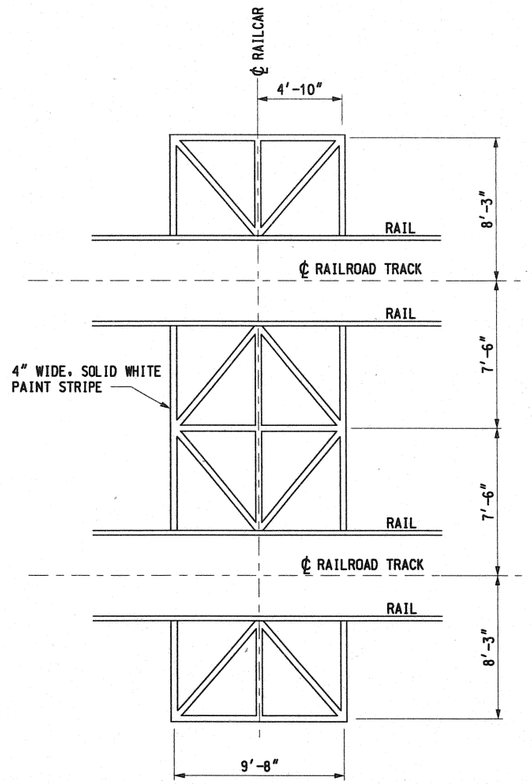
UNDERGROUND CABLE SIGN AND FIBER OPTIC CABLE MARKER

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

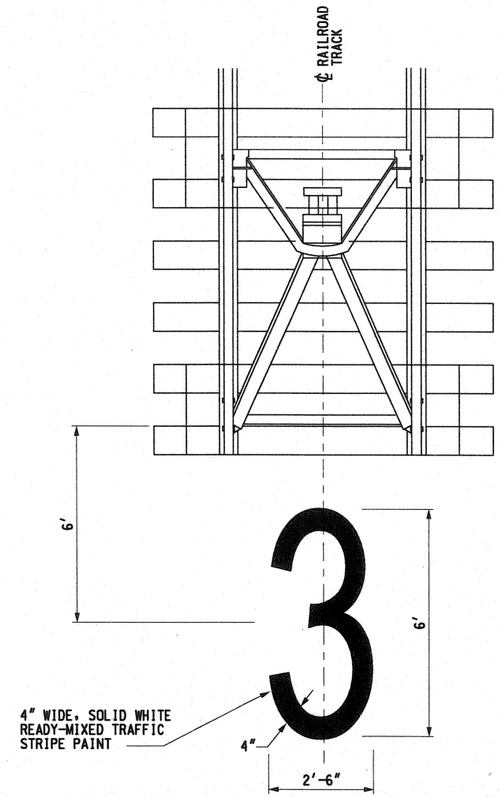
DRAWING NO: RR-412
SHEET NO: 1 OF 1

10/4/2013

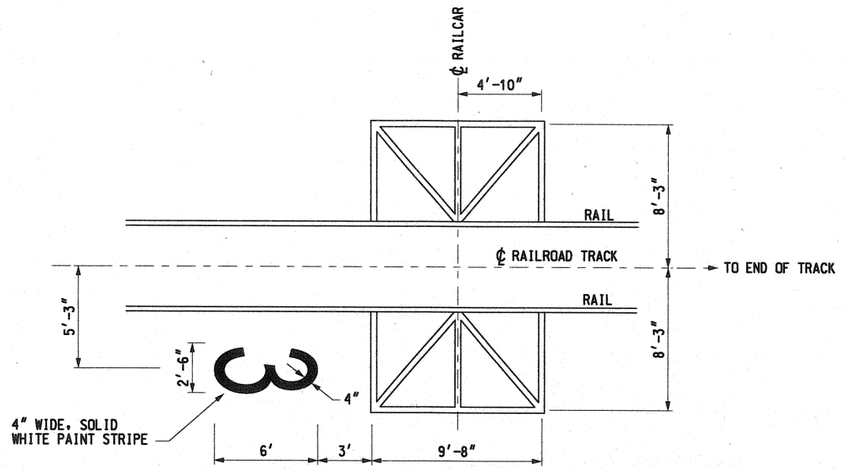
...*RR-412 Underground Cable Sign and Fiber Optic Cable Marker



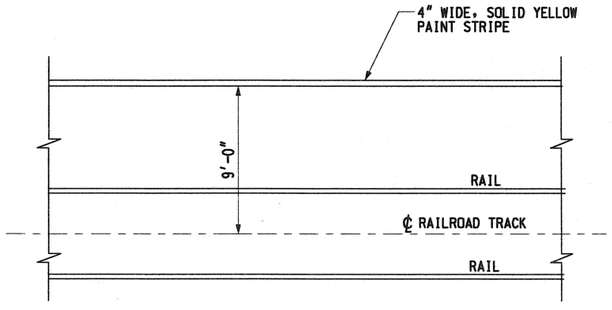
1 DETAIL – RAIL CAR SPOT STRIPING
NTS



2 DETAIL – TRACK NUMBER AT END OF TRACK
NTS



3 DETAIL – TRACK NUMBER AT RAIL CAR SPOT
NTS



4 DETAIL – TRACK SAFETY LINE
NTS

REVISIONS	
NO.	DATE
1	
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Port of LONG BEACH
The Green Port

RAILROAD
STANDARD PLANS

RAIL YARD PAINT STRIPING AND TRACK NUMBERS

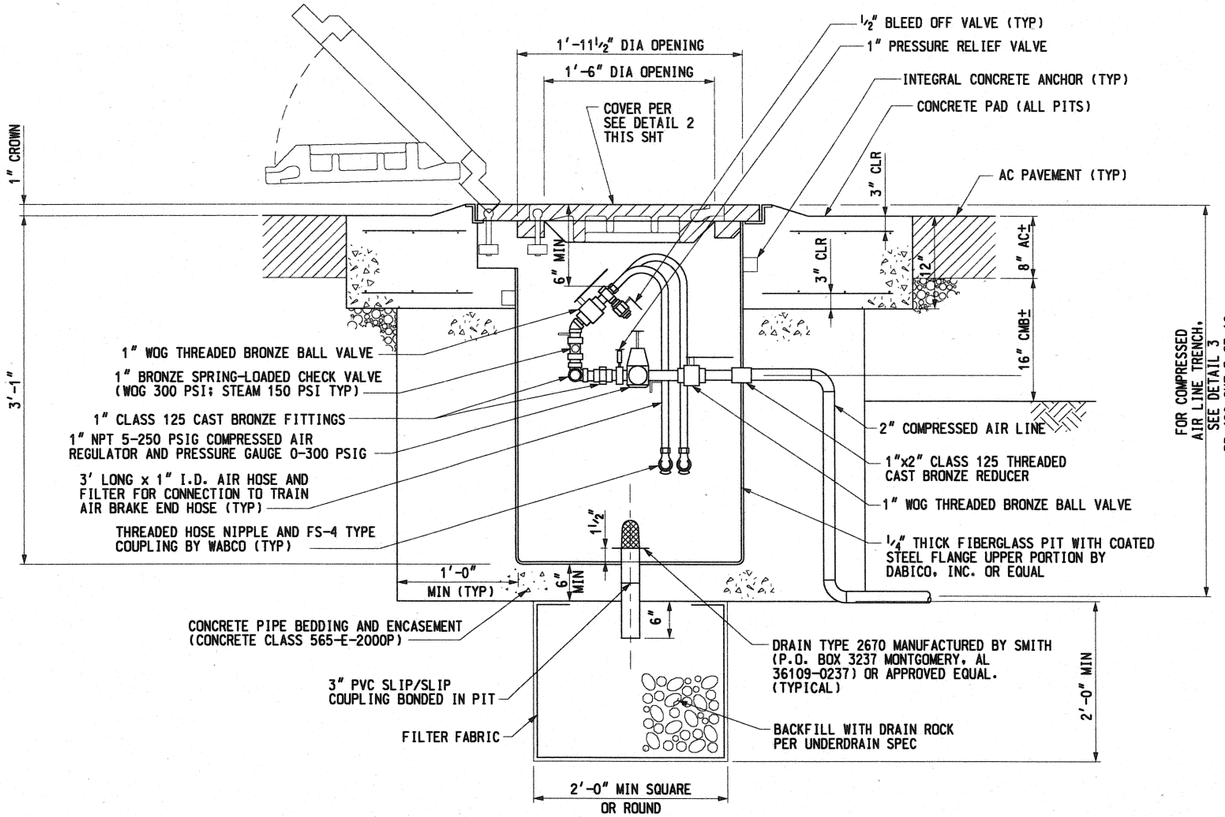
APPROVED BY: _____
SEAN A. GAMETTE – ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-413

SHEET NO: 1 OF 1

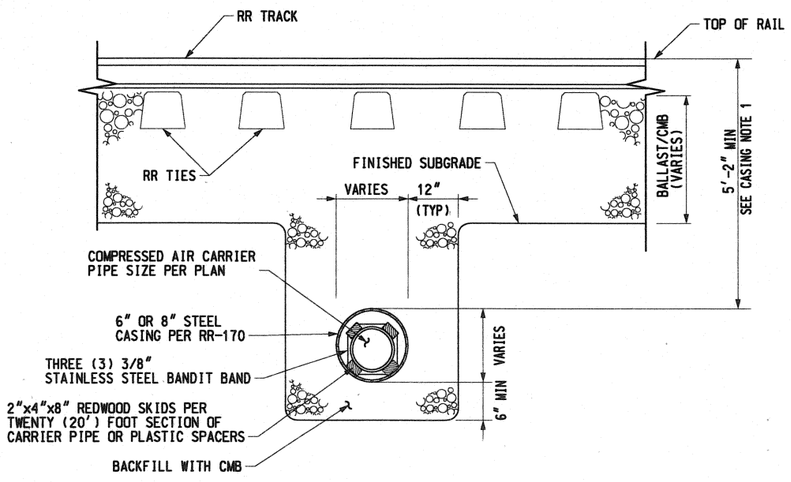
10/4/2013

...*RR-413 Rail Yard Paint Striping and Track Numbers



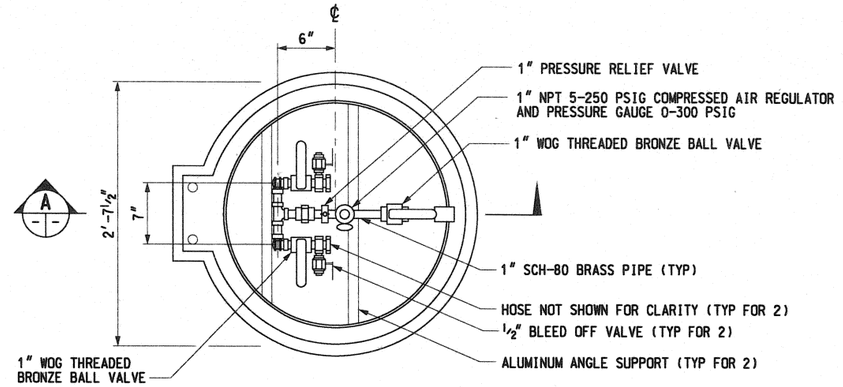
A SECTION - COMPRESSED AIR PIT WITH DUAL PORT

NTS



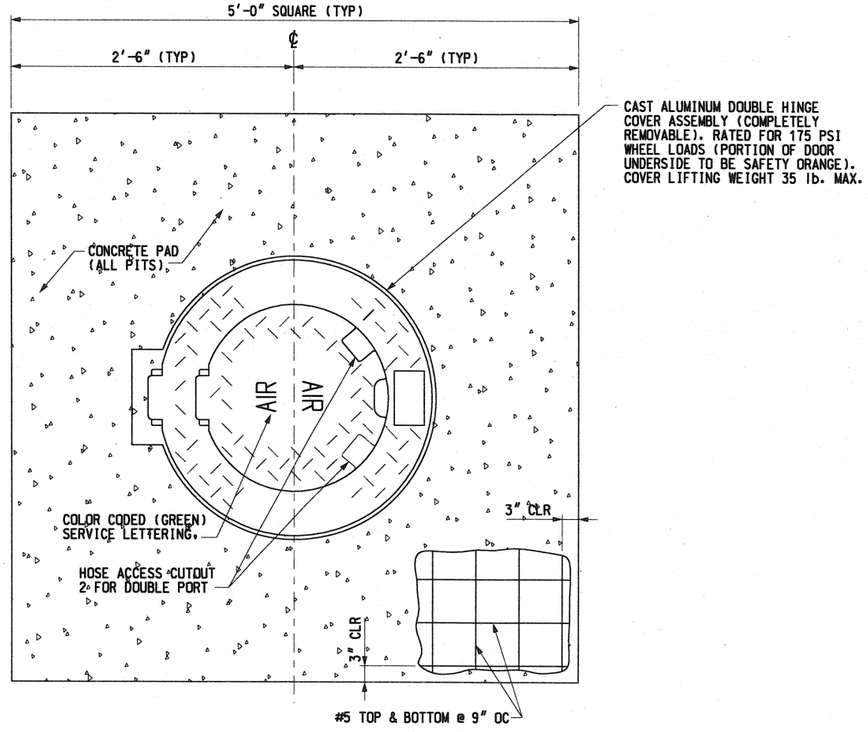
3 DETAIL - UNDER TRACK COMPRESSED AIR LINE CASING

NTS



1 DETAIL - COMPRESSED AIR PIT WITH DUAL PORT

NTS



2 DETAIL - COVER

NTS

GENERAL NOTES:

1. UNLESS OTHERWISE NOTED, DIMENSIONAL TOLERANCE IS ± ½″.
2. CONTRACTOR TO VERIFY COVER SERVICE LETTERING.
3. CONTRACTOR TO VERIFY COMPRESSED AIR PIPE ENTRY ORIENTATION IN RELATION TO COVER HINGES FOR EASE OF OPERATION.
4. CONTRACTOR TO CENTER AIR PIT IN CONCRETE PAD, BOTH DIRECTIONS.

NOTE:

EQUIPMENT SELECTION AND SIZES, EQUIPMENT PAD COUNT AND SIZES, BUILDING SIZE AND PIPELINE SIZES ARE NOT TYPICAL AND MUST BE DETERMINED BASED ON PROJECT REQUIREMENTS.

REVISIONS	
NO.	DATE
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

COMPRESSED AIR SYSTEM (CAS) DETAILS - 1

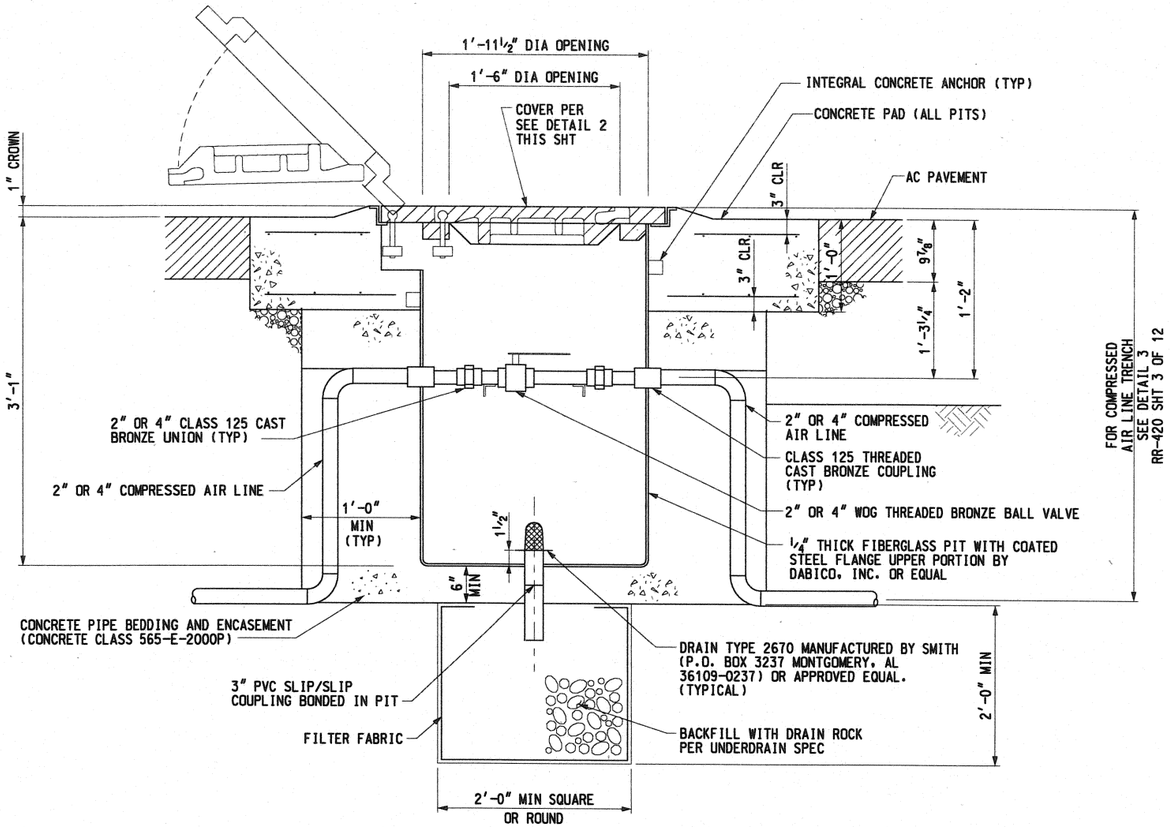
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

P.E. NO.: C-54141 DATE: 09-19-2013

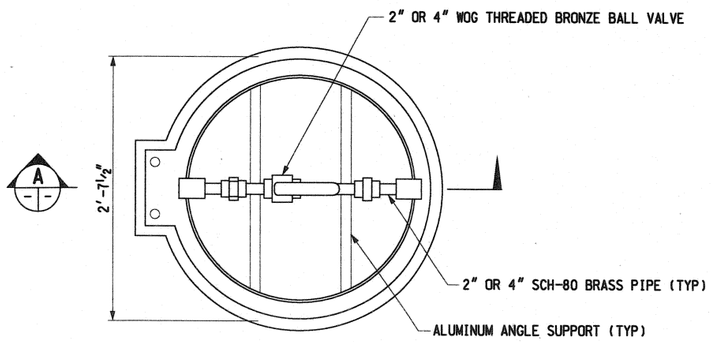
DRAWING NO: RR-420

SHEET NO: 1 OF 12

10/4/2013



A SECTION - ISOLATION VALVE PIT
NTS



1 DETAIL - OPEN ISOLATION VALVE PIT
NTS

NOTES:

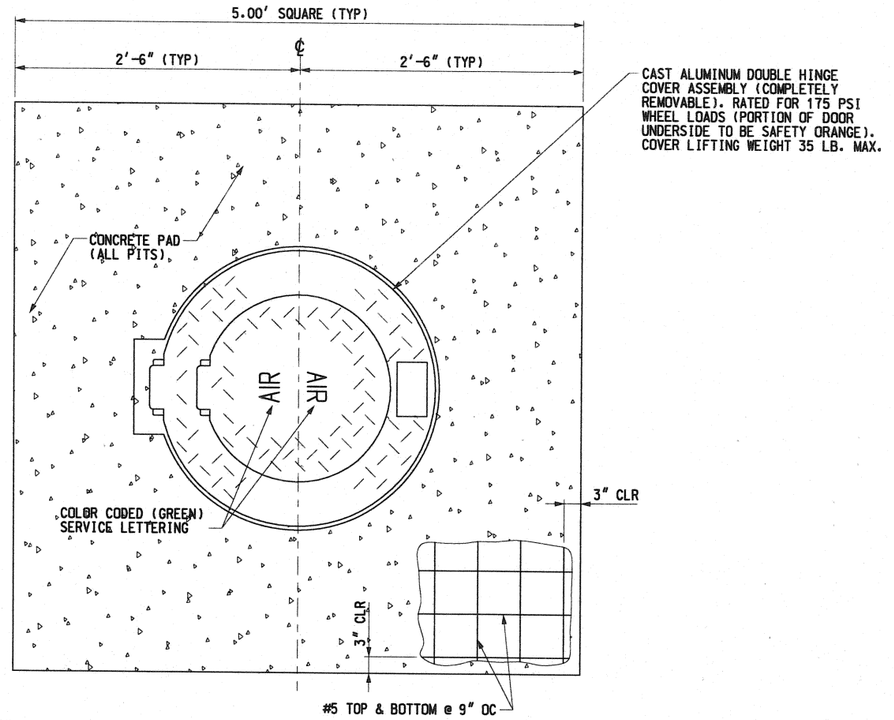
1. FOR COMPRESSED AIR LINE SIZES SEE PLAN.

NOTE:

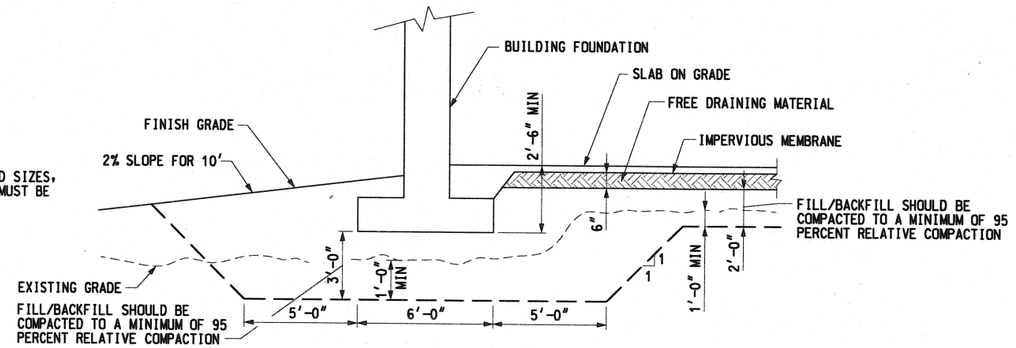
EQUIPMENT SELECTION AND SIZES, EQUIPMENT PAD COUNT AND SIZES, BUILDING SIZE AND PIPELINE SIZES ARE NOT TYPICAL AND MUST BE DETERMINED BASED ON PROJECT REQUIREMENTS.

GENERAL NOTES:

1. UNLESS OTHERWISE NOTED, DIMENSIONAL TOLERANCE IS ± ½".
2. CONTRACTOR TO VERIFY COVER SERVICE LETTERING.
3. CONTRACTOR TO VERIFY COMPRESSED AIR PIPE ENTRY ORIENTATION IN RELATION TO COVER HINGES FOR EASE OF OPERATION.
4. CONTRACTOR TO CENTER AIR PIT IN CONCRETE PAD, BOTH DIRECTIONS.



2 DETAIL - COVER
NTS



3 DETAIL - GRADING/FOUNDATION
NTS

REVISIONS	
NO.	DATE
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Port of LONG BEACH
The Green Port

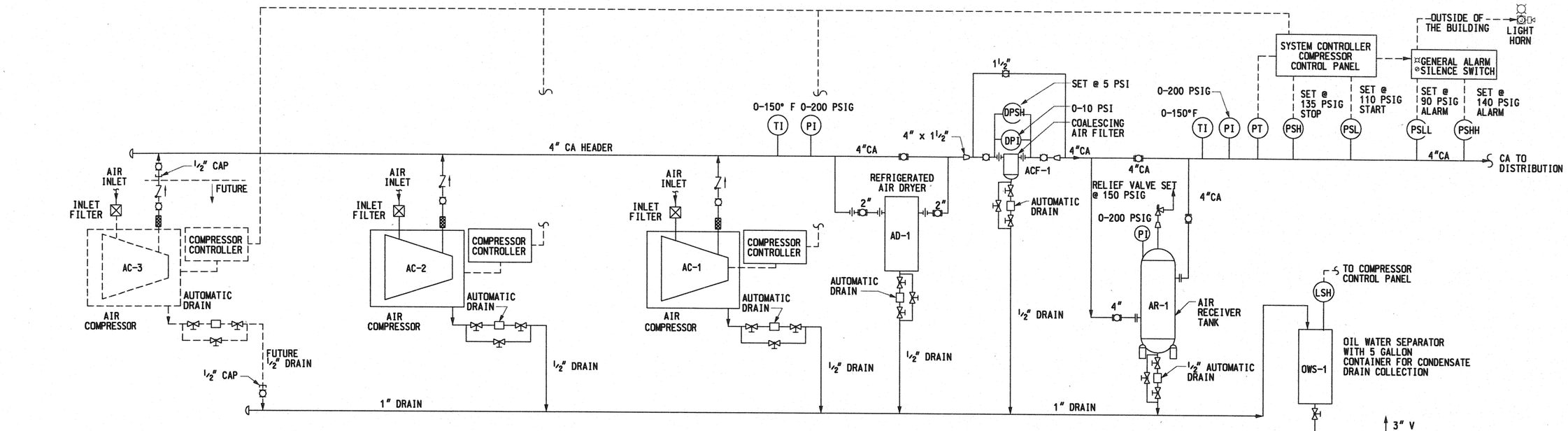
RAILROAD STANDARD PLANS

COMPRESSED AIR SYSTEM (CAS) DETAILS - 2

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

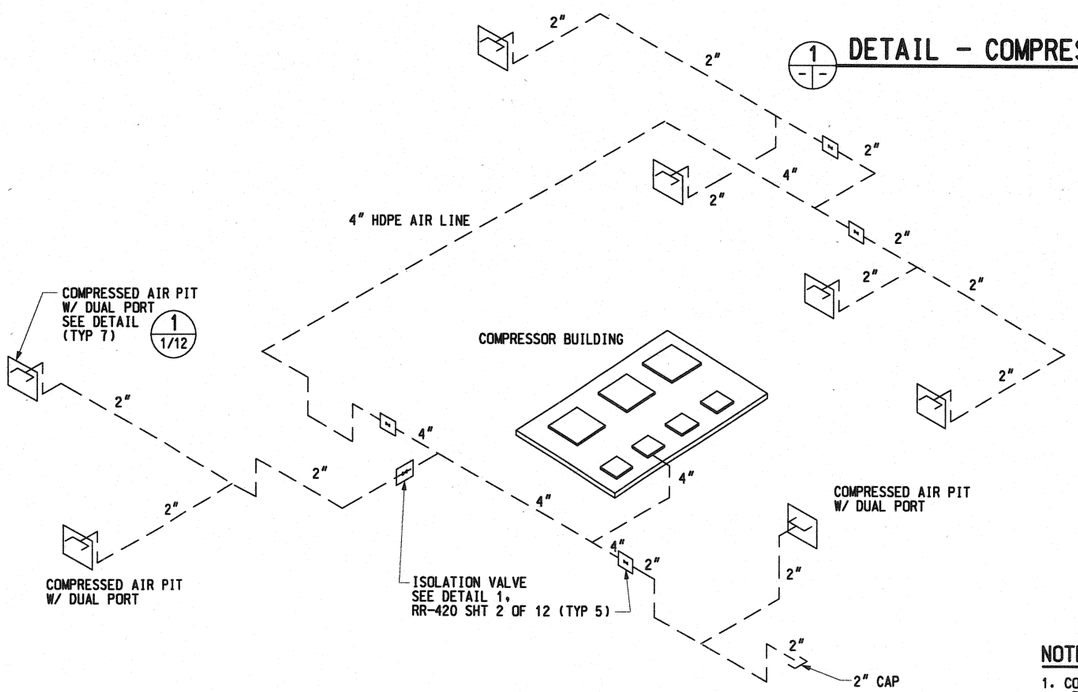
DRAWING NO: RR-420
SHEET NO: 2 OF 12

10/4/2013



1 DETAIL - COMPRESSED AIR SYSTEM FLOW DIAGRAM

NTS

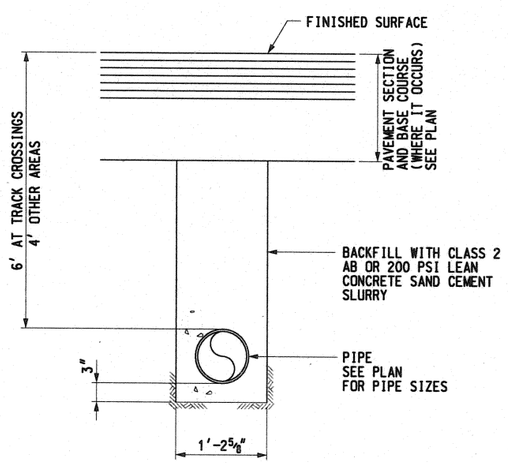


2 DETAIL - SAMPLE COMPRESSED AIR DISTRIBUTION SYSTEM SCHEMATIC

NTS

NOTE:

1. FOR COMPRESSED AIR DISTRIBUTION SYSTEM, SEE PROJECT PLANS.

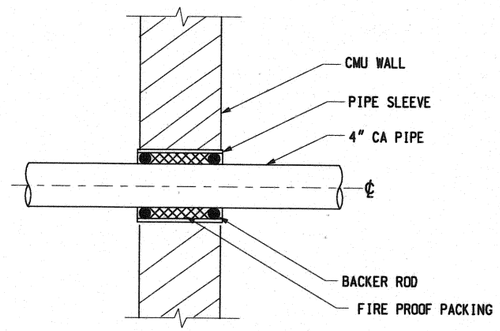


3 DETAIL - AIR LINE TRENCH

NTS

NOTE:

1. CONTRACTOR SHALL PROVIDE REDUCERS, BETWEEN MECHANICAL EQUIPMENT AND COMPRESSED AIR LINES AT NOZZLES AS REQUIRED.



4 DETAIL - PIPE THROUGH WALL

NTS

NOTE:

EQUIPMENT SELECTION AND SIZES, EQUIPMENT PAD COUNT AND SIZES, BUILDING SIZE AND PIPELINE SIZES ARE NOT TYPICAL AND MUST BE DETERMINED BASED ON PROJECT REQUIREMENTS.

REVISIONS	
NO.	DATE
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

COMPRESSED AIR SYSTEM (CAS) DETAILS - 3

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

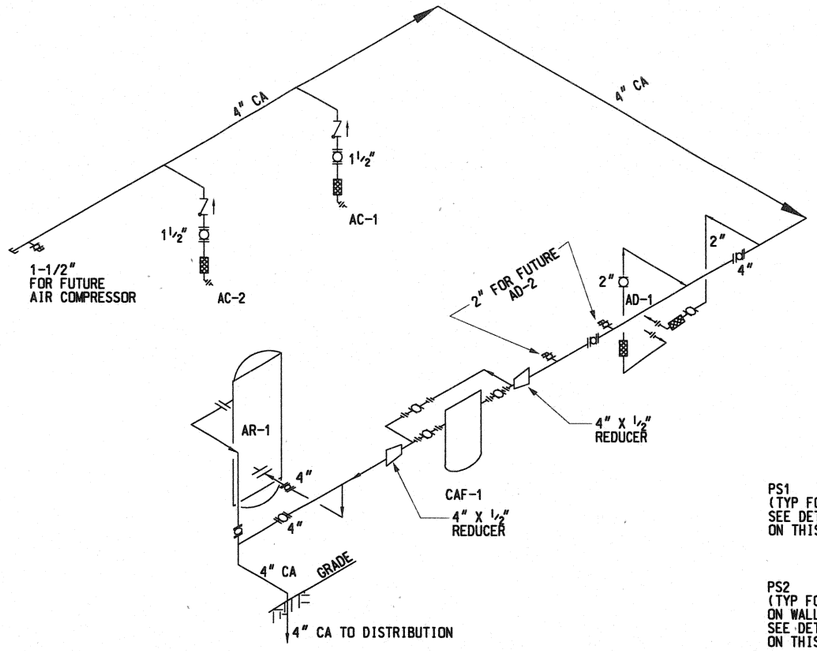
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-420

SHEET NO: 3 OF 12

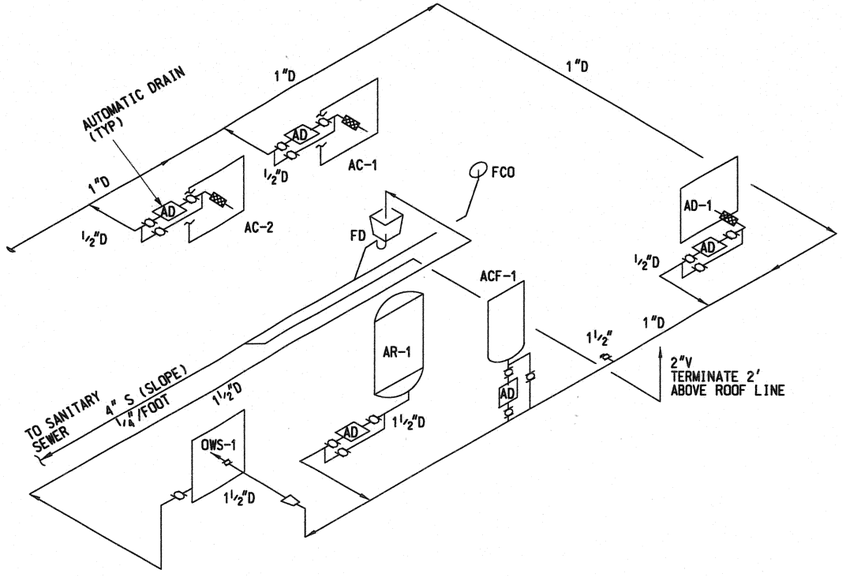
10/4/2013

...*RR-420 Compressed Air System (CAS) Details - 3, 3 of 12



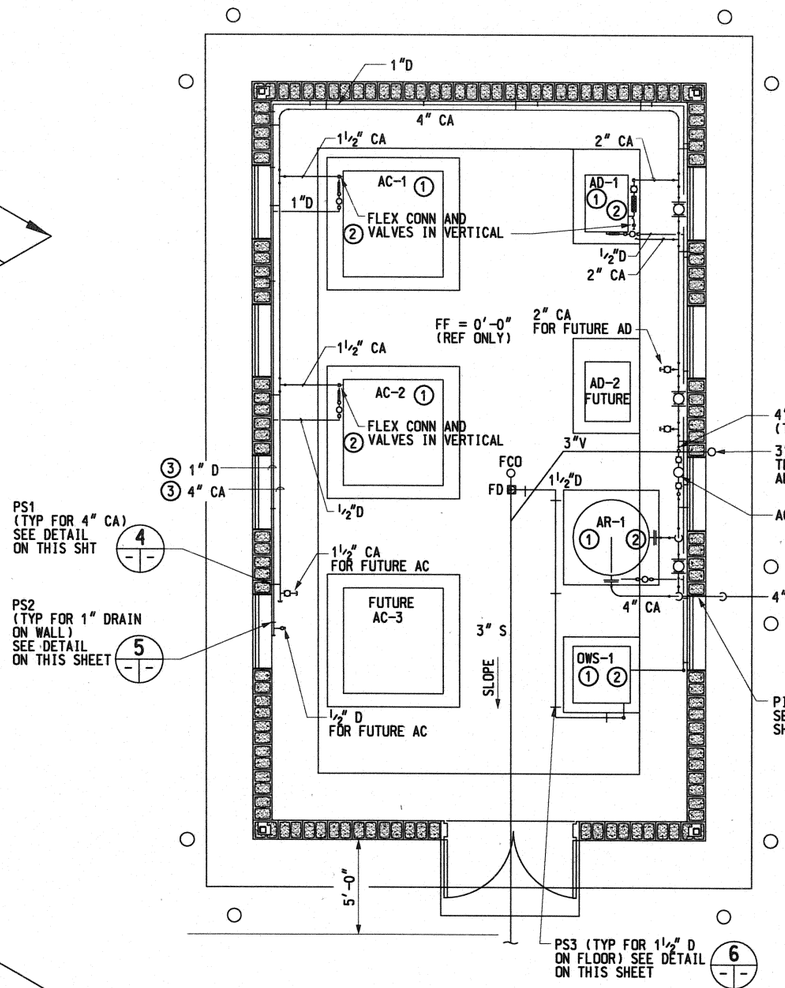
2 DETAIL - COMPRESSED AIR PIPING ISOMETRIC (WITHIN COMPRESSOR BUILDING)

NTS



3 DETAIL - DRAIN PIPING ISOMETRIC (WITHIN COMPRESSOR BUILDING)

NTS



1 DETAIL - EQUIPMENT AND PIPING PLAN

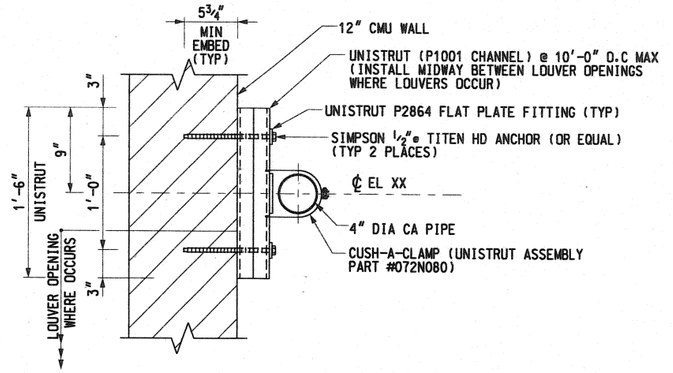
SCALE: 1½" = 1'-0"

NOTES (FLOOR/FOUNDATION):

1. CONTRACTOR SHALL VERIFY EQUIPMENT SKID DIMENSIONS PRIOR TO CONSTRUCTION OF EQUIPMENT PAD.
2. CONTRACTOR SHALL VERIFY THE POINT OF CONNECTIONS ON EQUIPMENT AND CONNECT THE PIPING TO COMPRESSED AIR HEADER AND DRAIN HEADER. STAINLESS STEEL FLEXIBLE CONNECTIONS AND UNIONS SHALL BE USED AT AC-1 & 2, AD-1, ACF-1 AND OWS-1.
3. CONTRACTOR SHALL INSTALL THE 4" COMPRESSED AIR HEADER AND 1" DRAIN LINE HEADER ALONG THE WALL. PIPING SHALL CLEAR THE WALL LOUVER OPENINGS. PROVIDE AND INSTALL PIPE SUPPORTS PER DETAILS REFERENCED.
4. THIS STANDARD DRAWING IS BASED ON PROVIDING TWO AIR COMPRESSORS WITH PROVISIONS FOR FUTURE THIRD AIR COMPRESSOR. ADJUST DETAILS TO SPECIFIC INSTALLATIONS.

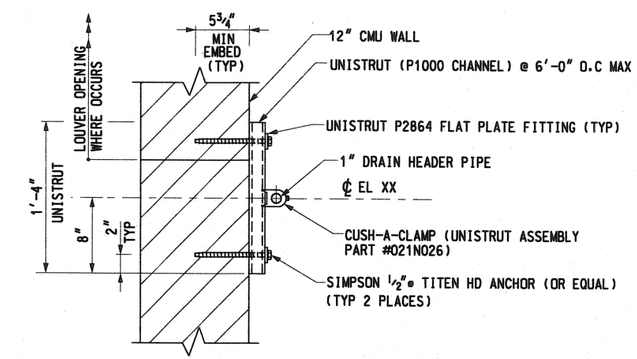
NOTE:

EQUIPMENT SELECTION AND SIZES, EQUIPMENT PAD COUNT AND SIZES, BUILDING SIZE AND PIPELINE SIZES ARE NOT TYPICAL AND MUST BE DETERMINED BASED ON PROJECT REQUIREMENTS.



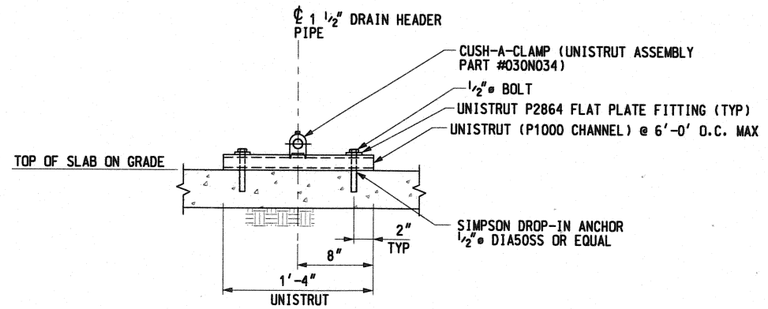
4 DETAIL - PIPE SUPPORT DETAIL PS-1

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



5 DETAIL - PIPE SUPPORT DETAIL PS-2

SCALE: 1½" = 1'-0"



6 DETAIL - PIPE SUPPORT DETAIL PS-3

SCALE: 1½" = 1'-0"

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Port of LONG BEACH The Green Port

RAILROAD STANDARD PLANS

COMPRESSED AIR SYSTEM EQUIPMENT & PIPING PLAN & ISOMETRICS

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-420

SHEET NO: 4 OF 12

10/4/2013

PROJECT DESCRIPTION

ENCLOSURE FOR AIR COMPRESSOR EQUIPMENT.

PROJECT ADDRESS

PROJECT DATA

OCCUPANCY CLASSIFICATION	"U-1" IN 1997 U.B.C.
CONSTRUCTION TYPE:	CONCRETE BLOCK
FLOOR AREA:	
DESIGN AREA:	777 SF
ALLOWABLE AREA:	
BASIC ALLOWABLE AREA	8,000 SF
SEPARATION (4) SIDES, 100% INCREASE	8,000 SF
TOTAL ALLOWABLE AREA:	16,000 SF
HEIGHT/NUMBER OF STORIES:	
DESIGN HEIGHT:	16'-2", 1 STORY
ALLOWABLE HEIGHT	40 FEET,2 STORY

GENERAL NOTES

1. ALL MATERIALS AND CONSTRUCTION SHALL COMPLY WITH THE LATEST ADOPTED EDITION OF THE CITY OF LONG BEACH BUILDING CODE WITH AMENDMENTS, PLUMBING CODE, ELECTRICAL CODE, FIRE CODE, ADA ACT, CALIFORNIA TITLE 24 AND ALL OTHER GOVERNING ORDINANCES.
2. CONTRACTOR SHALL EXAMINE CONSTRUCTION SITE AND BECOME FAMILIAR WITH EXISTING CONDITIONS AFFECTING THE WORK.
3. VERIFY LOCATIONS OF OVERHEAD OR BURIED UTILITIES ON OR NEAR SITE.
4. TAKE HORIZONTAL AND VERTICAL MEASUREMENTS FROM ESTABLISHED SURVEY TIES AND BENCH MARKS. ALL WORK SHALL COMPLY WITH THESE ESTABLISHED LINES AND LEVELS.
5. NOTIFY THE PORT OF DISCREPANCIES BETWEEN ACTUAL MEASUREMENTS AND THOSE INDICATED. DO NOT PROCEED UNTIL DIRECTED BY THE PORT.
6. NO MATERIAL CONTAINING ASBESTOS SHALL BE USED.
7. PROVIDE PRODUCTS AND EQUIPMENT IN ACCORDANCE WITH PLANS, SPECIFICATIONS, GOVERNING CODES, ORDINANCES, AND CURRENT PRACTICES.
8. CONTRACTOR SHALL REMOVE ANY REJECTED OR DAMAGED MATERIAL FROM SITE.
9. REPLACE DEFECTIVE WORK WITH NEW WORK, WITHOUT ADDITIONAL COSTS, WHERE REQUIRED BY THE ENGINEER.
10. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL SHUT-OFF VALVES WITH IDENTIFICATION TAGS OR SIGNS.
11. THE CONTRACTOR SHALL PROVIDE AND INSTALL THE EXIT DOOR HARDWARE. THE EXIT HARDWARE SHALL BE PER UBC CHAPTER 33.
12. THE CONTRACTOR SHALL TAG AND IDENTIFY ALL PIPING IN THE ENCLOSURE.

FOUNDATION

1. CONTRACTOR SHALL REFER TO GEOTECHNICAL REPORT FOR REQUIREMENTS FOR OVER EXCAVATION, COMPACTION AND FILL.

REINFORCING STEEL FOR CONCRETE AND MASONRY

1. REINFORCING BARS, ASTM A615, GRADE 60. ALL REINFORCING STEEL THAT IS TO BE WELDED SHALL CONFORM TO ASTM A706.
2. WELDING ELECTRODES: AWS D1.4, CLASS E80, LOW HYDROGEN.
3. NO BRICK OR POROUS MATERIAL SHALL BE USED TO SUPPORT FOOTING STEEL OFF THE GROUND.
4. FABRICATION, DETAILING AND PLACEMENT OF REINFORCING STEEL SHALL CONFORM TO THE LATEST APPLICABLE ACI STANDARDS AND THE CITY OF LONG BEACH BUILDING CODE WITH AMENDMENTS.

CONCRETE

1. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3250 PSI @ 28 DAYS.
2. CONCRETE SHALL BE NORMAL WEIGHT (145 PCF) 6 SACK 4" MINIMUM SLUMP.
3. PORTLAND CEMENT: ASTM C150, TYPE II.
4. CHAMFER ALL EXPOSED CONCRETE EDGES 3/4 INCH.
5. DESIGN, MATERIALS AND WORKMANSHIP OF ALL CONCRETE WORK SHALL CONFORM TO ACI 318-89.

MASONRY

1. CONCRETE BLOCK MASONRY UNITS: ASTM C90, NORMAL WEIGHT, GRADE 'N' UNITS.
   UNIT AREA STRENGTH f'm=1900 PSI.
   DESIGN STRENGTH f'm=1500 PSI.
2. CONCRETE GROUT SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI @ 28 DAYS.
3. PORTLAND CEMENT - ASTM C150, TYPE II, LOW ALKALI.
4. MORTAR MIX: 1:3 WITH 1/4 PART LIMEPUTTY, TYPE S. COMPRESSIVE STRENGTH OF 1800 PSI @ 28 DAYS.
5. GROUT MIX: 1:3 WITH 2 PARTS PEA GRAVEL.
6. USE BOND BEAM UNITS AT HORIZONTAL REINFORCING.
7. ALL MASONRY OPENINGS INDICATED ARE BASED ON INDICATED LOUVER AND DOOR SIZES. CONTRACTOR TO VERIFY FINAL LOUVER AND DOOR SIZES WITH SUBMITTED SHOP DRAWINGS PRIOR TO CONSTRUCTING MASONRY.
8. ALL MASONRY TO BE LAID IN RUNNING BOND. ALL CELLS TO BE SOLID GROUTED.
9. CONTRACTOR TO SUBMIT PRODUCT DATA FOR PRECAST CONCRETE COPING.
10. SPECIAL INSPECTION REQUIRED.
11. HORIZONTAL STEEL REINFORCEMENT ON MASONRY SHALL BE STAGGERED PER SECTION 1921 OF UBC.

STEEL

1. STRUCTURAL STEEL SHALL CONFORM TO:
   A. STRUCTURAL SHAPES AND PLATES: ASTM A36
   B. TUBES: ASTM A500, GRADE B
   C. ELECTRODES: AWS D1.1, CLASS E70XX
   D. MACHINE BOLTS: ASTM A307
   E. ANCHOR BOLTS: ASTM A36
2. ALL STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS.
3. ALL WELDING SHALL BE DONE BY WELDERS CERTIFIED BY THE AMERICAN WELDING SOCIETY (AWS) AND APPROVED BY THE CITY OF LONG BEACH DEPARTMENT OF BUILDING AND SAFETY. THE ELECTRIC ARC WELDING PROCESS SHALL BE USED.
4. STEEL MANUFACTURER SHALL BE A CITY OF LONG BEACH "APPROVED FABRICATOR."

INSPECTIONS

1. CONTINUOUS SPECIAL INSPECTION IS REQUIRED FOR FIELD WELDING.

PAINTING

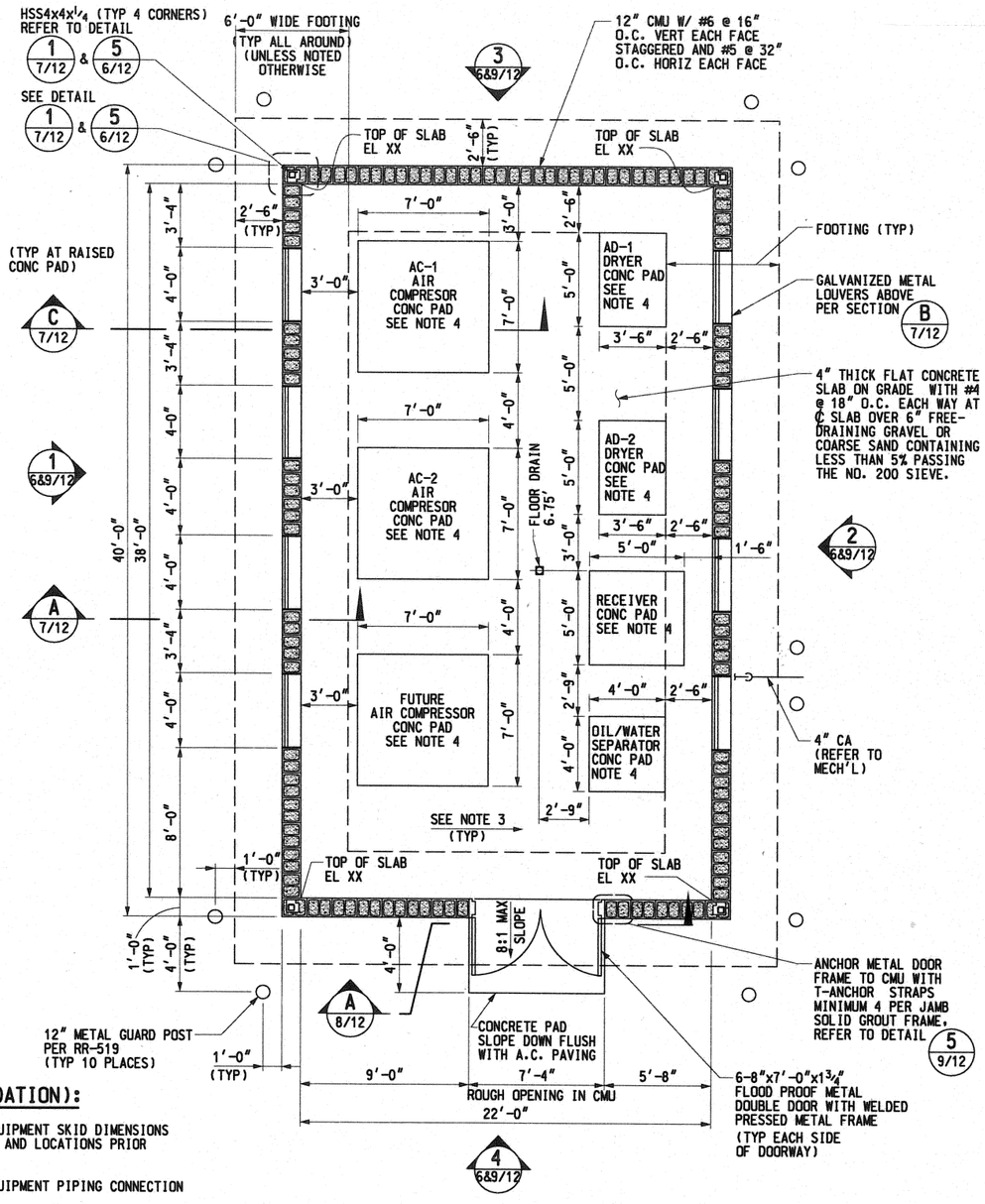
1. THE FOLLOWING ITEMS SHALL BE PAINTED "COLOR" PER THE PAINTING SECTION OF THE SPECIFICATIONS:
   A. EXPOSED STRUCTURAL FRAMING
   B. BOTH SIDES OF STEEL DECKING
   C. HOLLOW METAL DOORS AND FRAMES
   D. ALUMINUM LOUVERS AND PANELS

METAL DECK

1. METAL DECK AT ROOF SHALL CONFORM TO ASTM A446, GRADE A, ZINC COATED IN ACCORDANCE WITH ASTM A525 G-90, WITH A MINIMUM YIELD STRENGTH OF 33,000 PSI.
2. METAL DECK FOR ROOF SHALL BE GALVANIZED VERCO 3", N-24 20 GAUGE MINIMUM, WITH STANDING SEAM SIDELAPS - SB=0.508 CU IN, I=0.837 IN.
   A. ROOF DECK SHALL BE CONNECTED TO THE STRUCTURE WITH HILTI ENP 2-21-L15 POWDER ACTUATED FASTENERS SPACED AS FOLLOWS:
      a. AT PERPENDICULAR SUPPORTS ONE FASTENER EACH FLUTE AT EACH SUPPORT (TOTAL 4 FASTENERS PER 24 INCH PANEL)
      b. AT PARALLEL SUPPORTS, FASTENERS AT 12 INCH O.C.
   B. SIDELAP CONNECTIONS SHALL BE BUTTON PUNCHES @ 12 INCH O.C. STANDING SEAM SIDELAPS MUST BE WELL ENGAGED AND THE PUNCHING OPERATIONS SHARP AND DEEP. THE COATING OF THE OUTER PROTRUDING NOSE OF THE PUNCHED LAP SHOULD BE "STARRED" TO INDICATE NEAR PENETRATION.
3. ANY DAMAGE TO DECK GALVANIZING SHALL BE TREATED WITH ZINC-RICH PAINT MANUFACTURED EXPRESSLY FOR THE REPAIR OF DAMAGED GALVANIZED SURFACES IN ACCORDANCE WITH ASTM A780.
4. PROVIDE 12 GAUGE GALVANIZED METAL CLOSURE CAP AT ALL EXPOSED ENDS OF METAL DECK, AS NOTED.
5. PRIOR TO APPLYING PRIMER TO METAL DECKING, THE DECKING SHALL BE SOLVENT CLEANED TO REMOVE ALL CONTAMINANTS IN ACCORDANCE WITH SSPC-SP1 (STEEL STRUCTURES PAINTING COUNCIL-SURFACE PREPARATION METHOD 1).
6. ICBO APPROVALS: VERCO DECK - REPORT NO. 2078 DECK FASTENING - REPORT NO. 4373

NOTE:

EQUIPMENT SELECTION AND SIZES, EQUIPMENT PAD COUNT AND SIZES, BUILDING SIZE AND PIPELINE SIZES ARE NOT TYPICAL AND MUST BE DETERMINED BASED ON PROJECT REQUIREMENTS.



NOTES (FLOOR/FOUNDATION):

1. CONTRACTOR TO VERIFY EQUIPMENT SKID DIMENSIONS AND EQUIPMENT PAD SIZES AND LOCATIONS PRIOR TO INSTALLATION.
2. CONTRACTOR TO VERIFY EQUIPMENT PIPING CONNECTION LOCATIONS.
3. SLOPE 4" CONCRETE FLOOR SLAB TO FLOOR DRAIN.
4. SEE SECTION C 7/12 ELEVATION. FOR TOP OF CONCRETE PAD

1 - - DETAIL - FLOOR/FOUNDATION PLAN

SCALE: 1/4" = 1'-0"

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Port of LONG BEACH The Green Port

RAILROAD STANDARD PLANS

CAS GENERAL NOTES & ENCLOSURE FLOOR / FOUNDATION PLAN

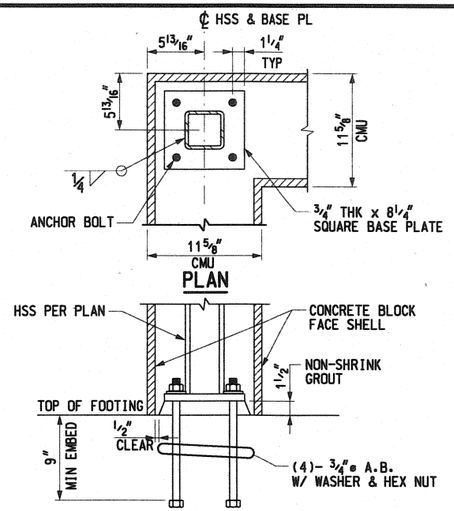
APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-420

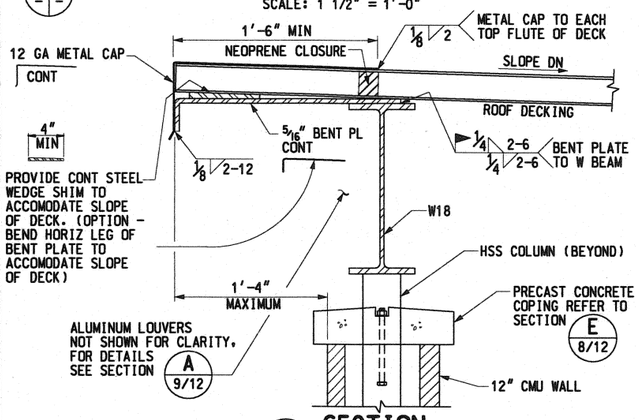
SHEET NO: 5 OF 12

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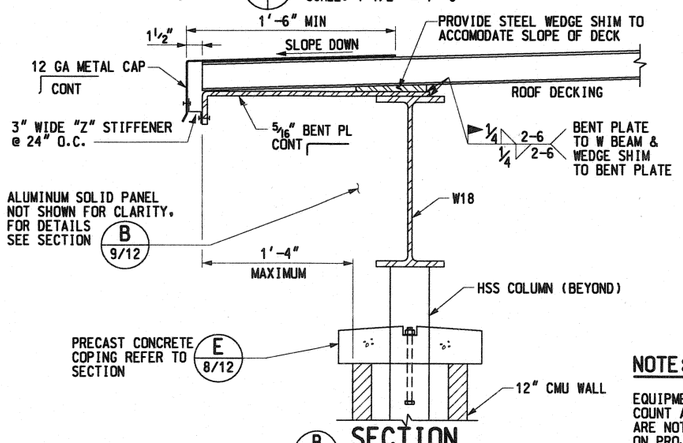
5 DETAIL - BASE PLATE & ANCHOR BOLTS

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



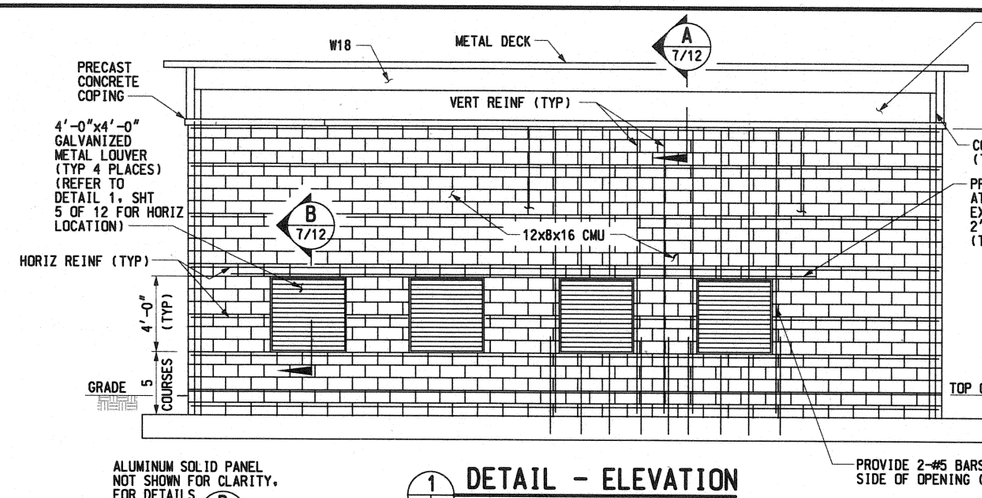
A SECTION

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



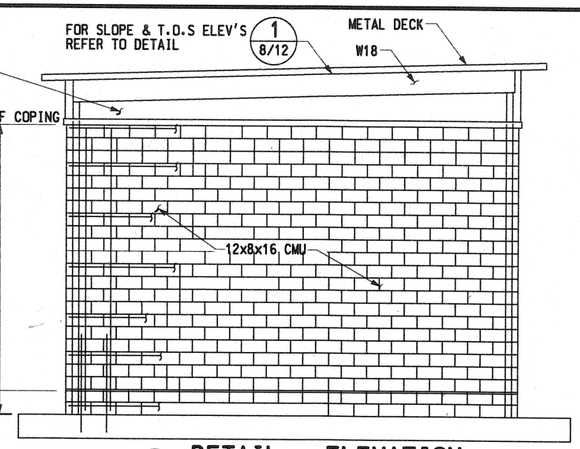
B SECTION

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



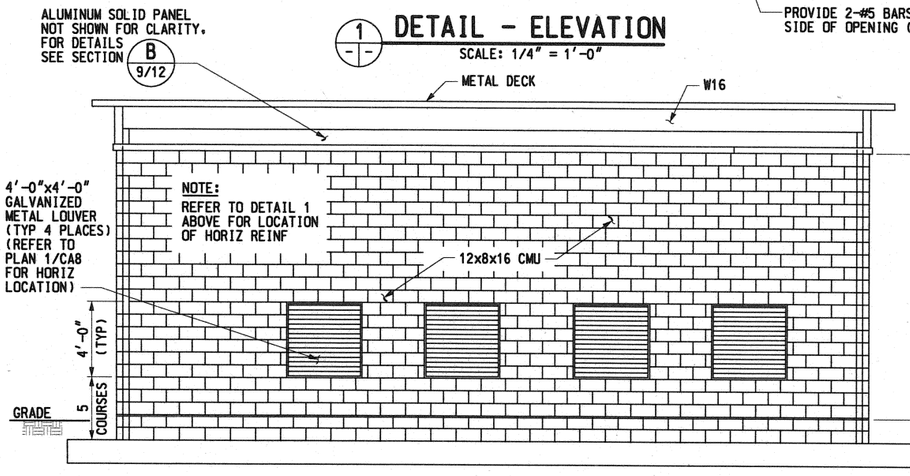
1 DETAIL - ELEVATION

SCALE: 1/4" = 1'-0"



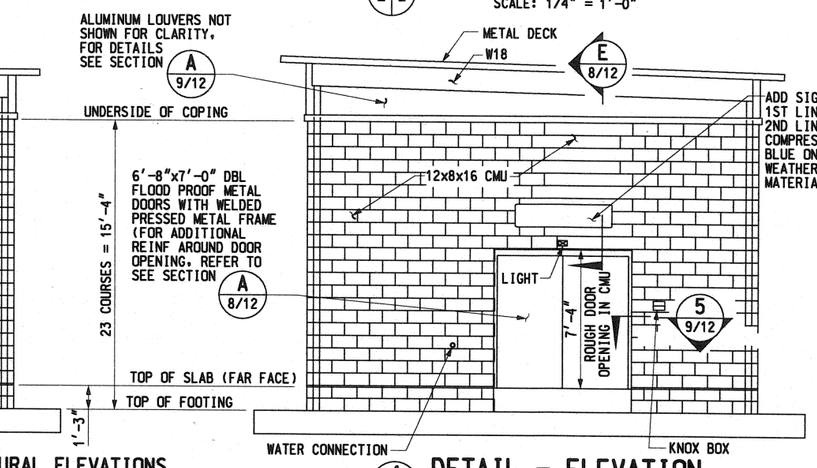
3 DETAIL - ELEVATION

SCALE: 1/4" = 1'-0"



2 DETAIL - ELEVATION

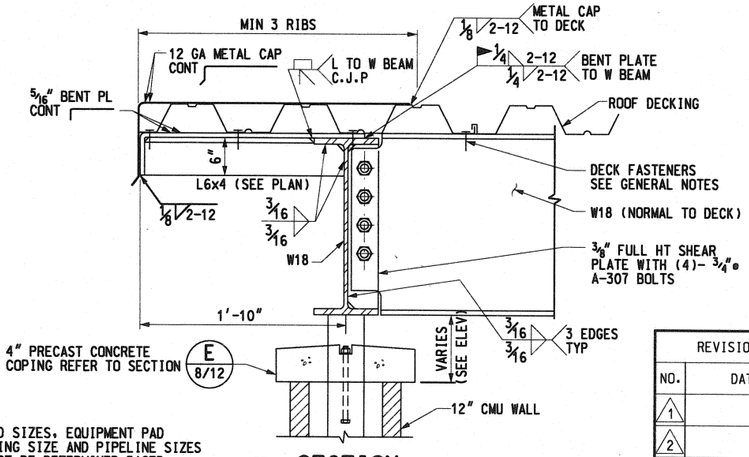
SCALE: 1/4" = 1'-0"



4 DETAIL - ELEVATION

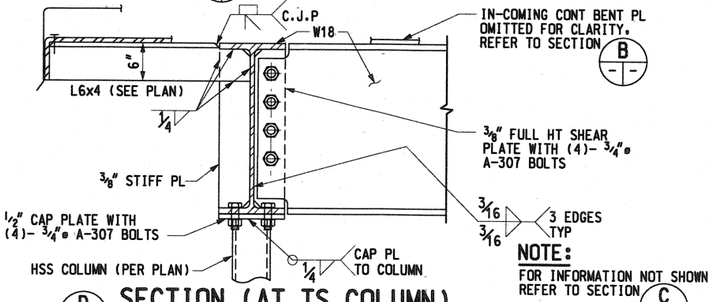
SCALE: 1/4" = 1'-0"

STRUCTURAL ELEVATIONS



C SECTION

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



D SECTION (AT TS COLUMN)

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

NOTE:

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REVISIONS	
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Port of LONG BEACH The Green Port

RAILROAD STANDARD PLANS

COMPRESSED AIR SYSTEM ENCLOSURE DETAILS - 1

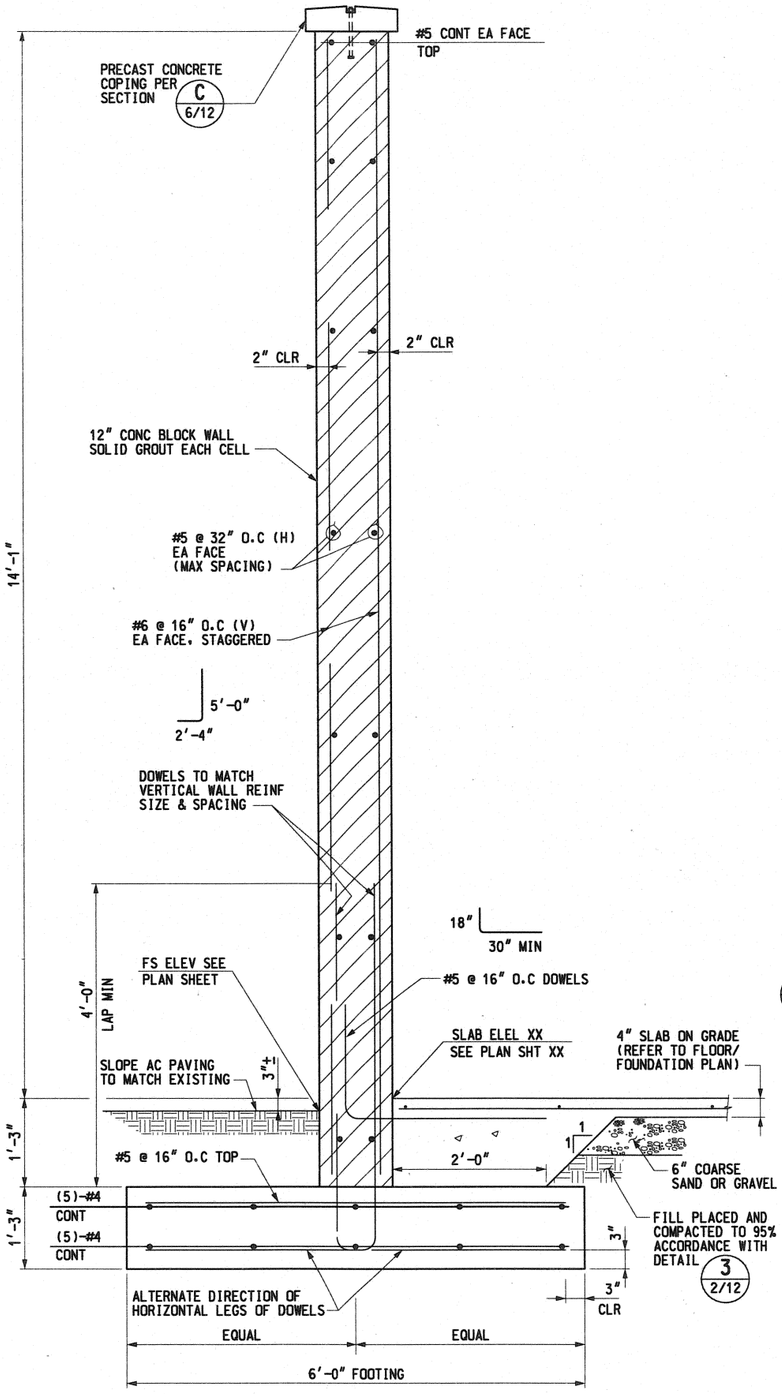
APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

P.E. NO.: C-54141 DATE: 09-19-2013

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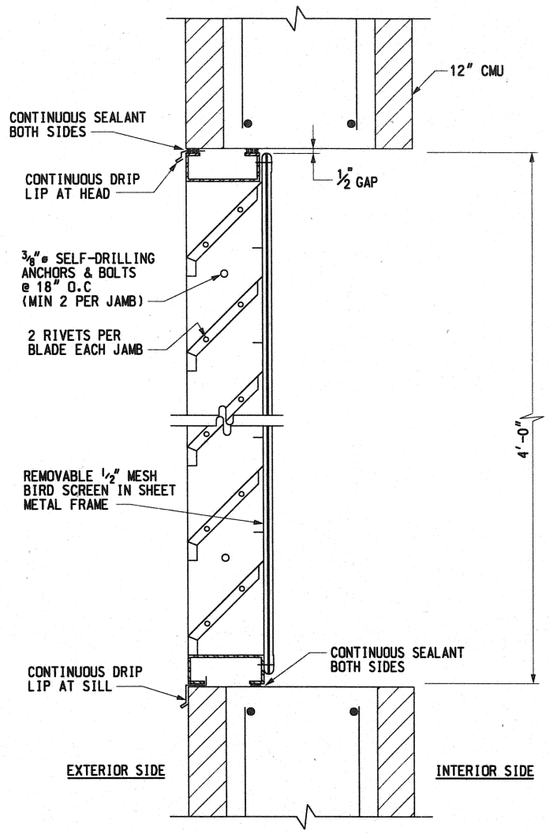
SHEET NO: 6 OF 12

10/4/2013



A SECTION - FREESTANDING CMU WALL

SCALE: 1" = 1'-0"



NOTE:

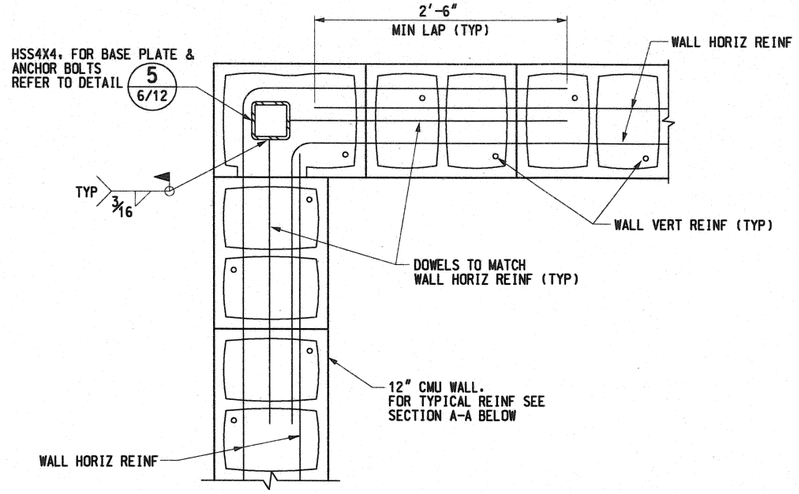
SWEAT INTERSECTION OF BLADE AND JAMB FULL OF SOLDER, TYPICAL.

B SECTION - THRU 4'-0" X 4'-0" LOUVERS

SCALE: 3" = 1'-0"

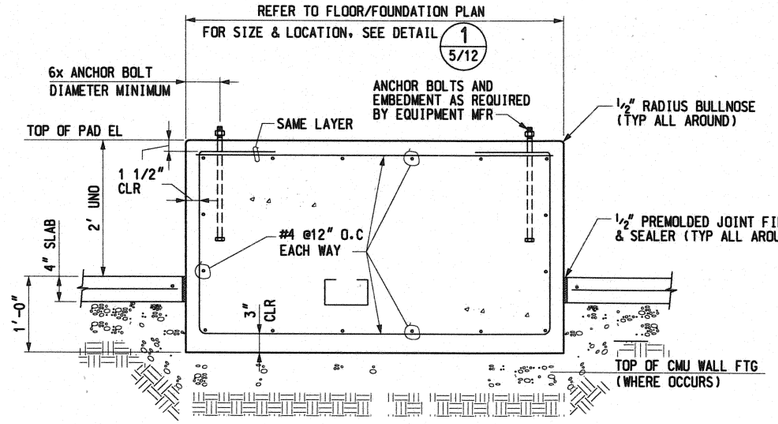
NOTE:

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1 DETAIL - CMU WALL CORNER DETAIL

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



C SECTION - RAISED CONCRETE EQUIPMENT PAD

SCALE: 1" = 1'-0"

REVISIONS	
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Port of LONG BEACH The Green Port

RAILROAD STANDARD PLANS

COMPRESSED AIR SYSTEM ENCLOSURE DETAILS - 2

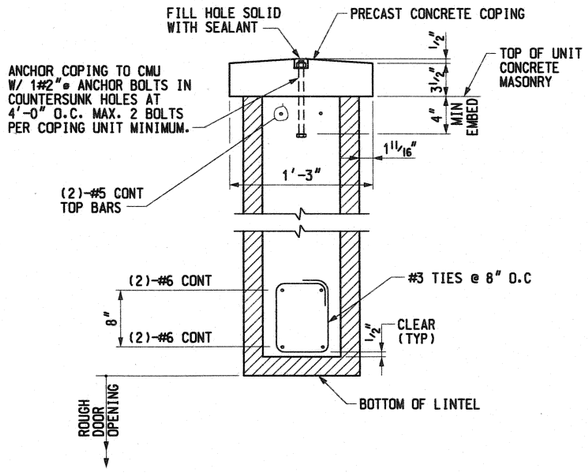
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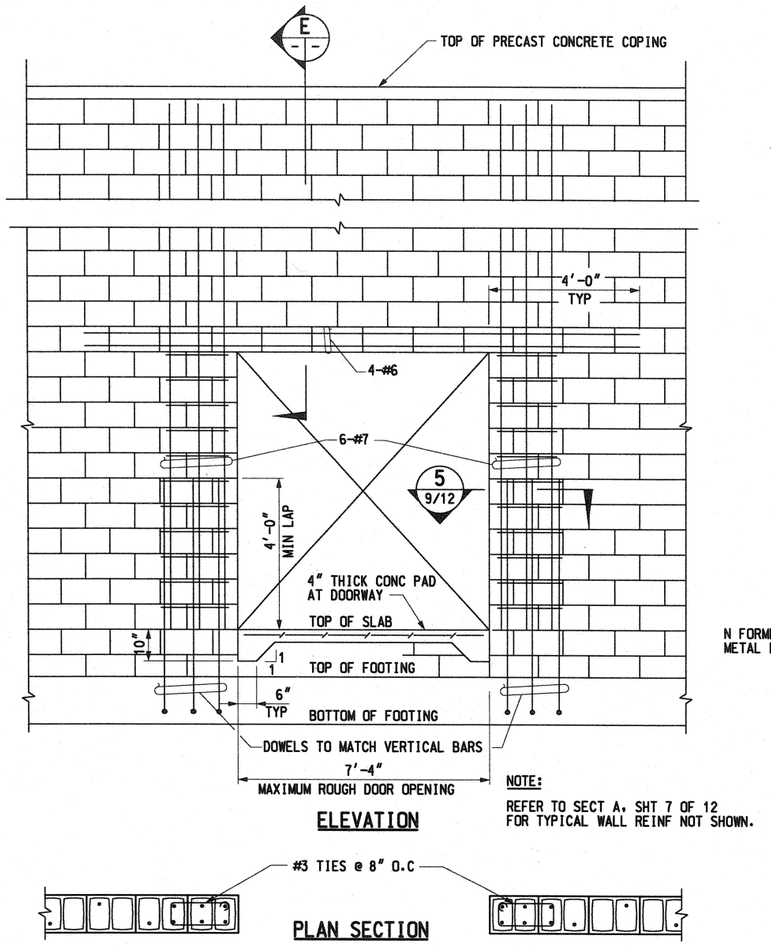
SHEET NO: 7 OF 12

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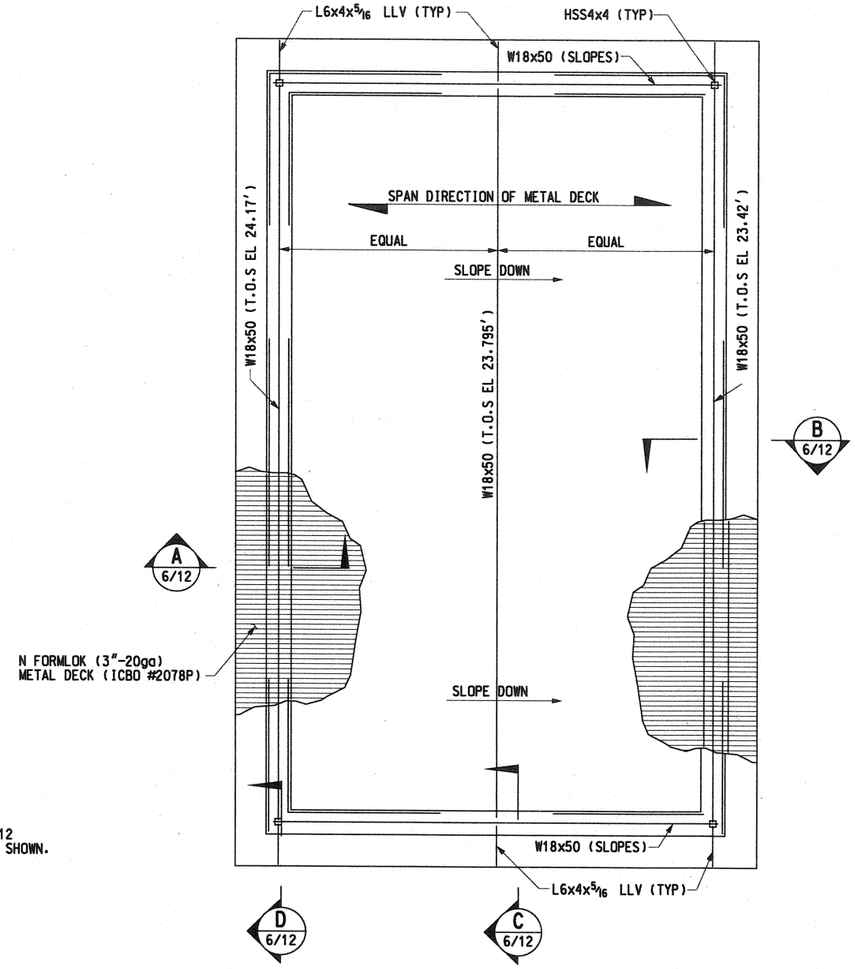
E/- - SECTION - COPING & LINTEL DETAIL

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



A/- - SECTION - REINFORCEMENT AT CMU WALL DOOR OPENING

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



1/- - DETAIL - ROOF/FRAMING PLAN

SCALE: 1/4" = 1'-0"

NOTE:

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REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

COMPRESSED AIR SYSTEM ENCLOSURE DETAILS - 3

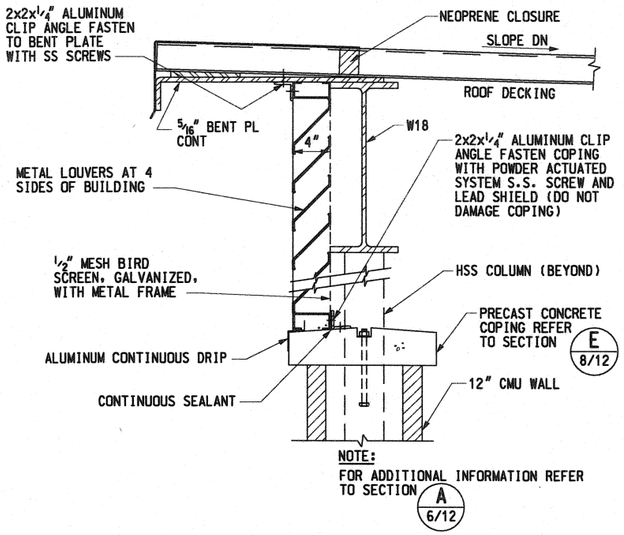
APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

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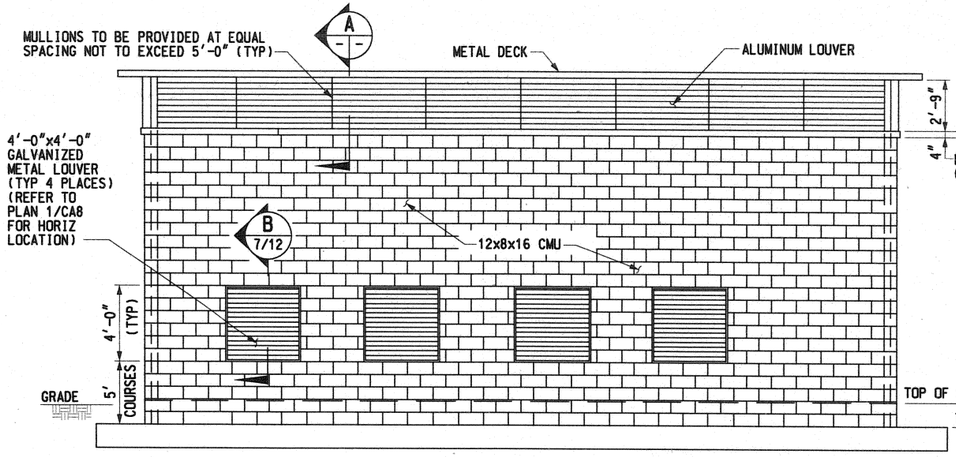
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SHEET NO: 8 OF 12

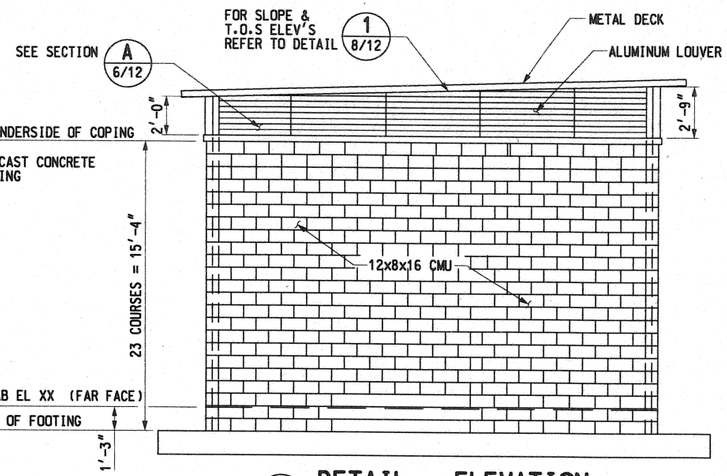
10/4/2013



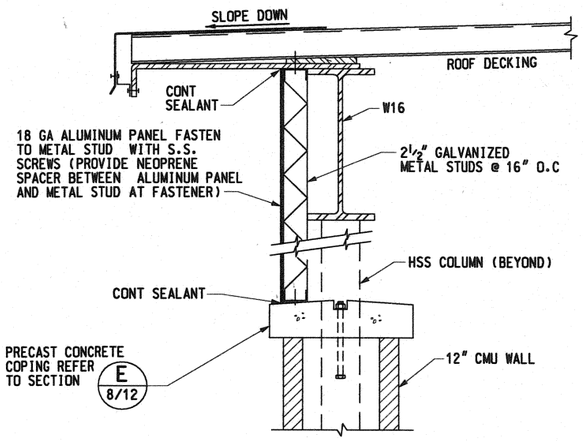
A SECTION - LOUVER
SCALE: 1 1/2" = 1'-0"



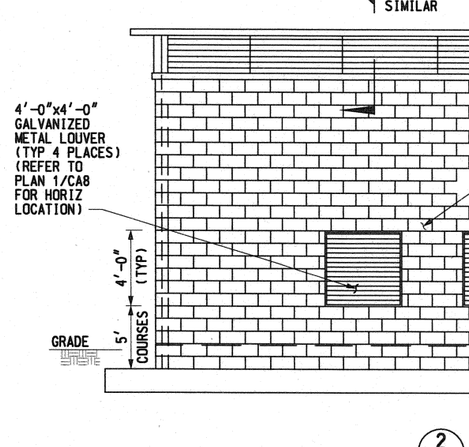
1 DETAIL - ELEVATION
SCALE: 1/4" = 1'-0"



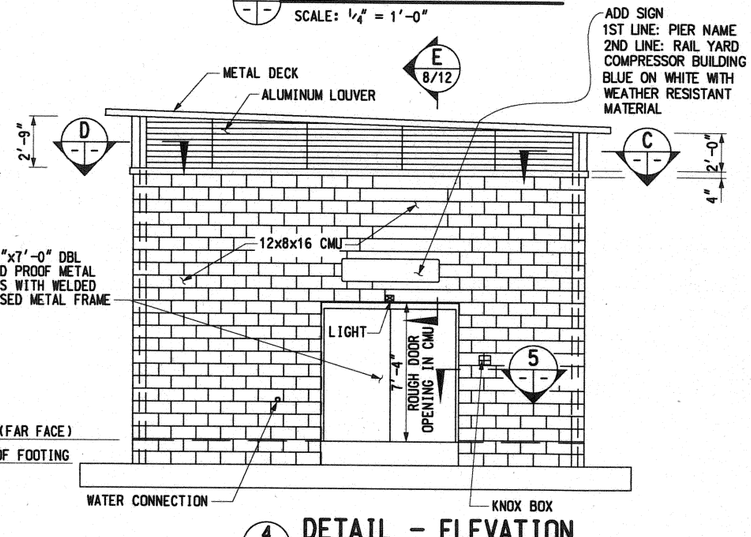
3 DETAIL - ELEVATION
SCALE: 1/4" = 1'-0"



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

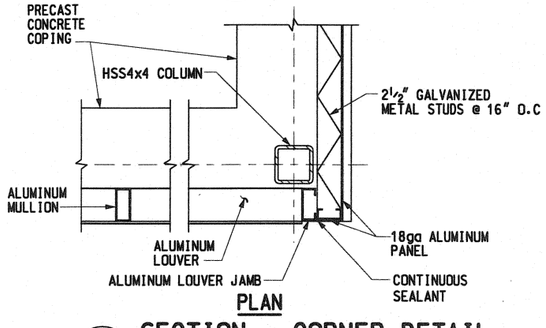


2 DETAIL - ELEVATION
SCALE: 1/4" = 1'-0"

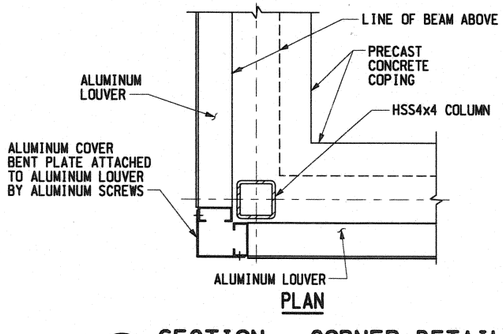


4 DETAIL - ELEVATION
SCALE: 1/4" = 1'-0"

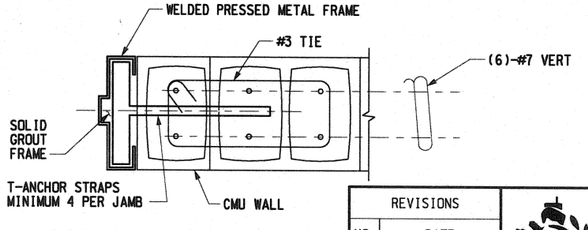
ARCHITECTURAL ELEVATIONS



C SECTION - CORNER DETAIL
SCALE: 1 1/2" = 1'-0"



D SECTION - CORNER DETAIL
SCALE: 1 1/2" = 1'-0"



5 DETAIL - DOOR FRAME
SCALE: 1 1/2" = 1'-0"

NOTE:

EQUIPMENT SELECTION AND SIZES, EQUIPMENT PAD COUNT AND SIZES, BUILDING SIZE AND PIPELINE SIZES ARE NOT TYPICAL AND MUST BE DETERMINED BASED ON PROJECT REQUIREMENTS.

REVISIONS	
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Port of LONG BEACH
The Green Port

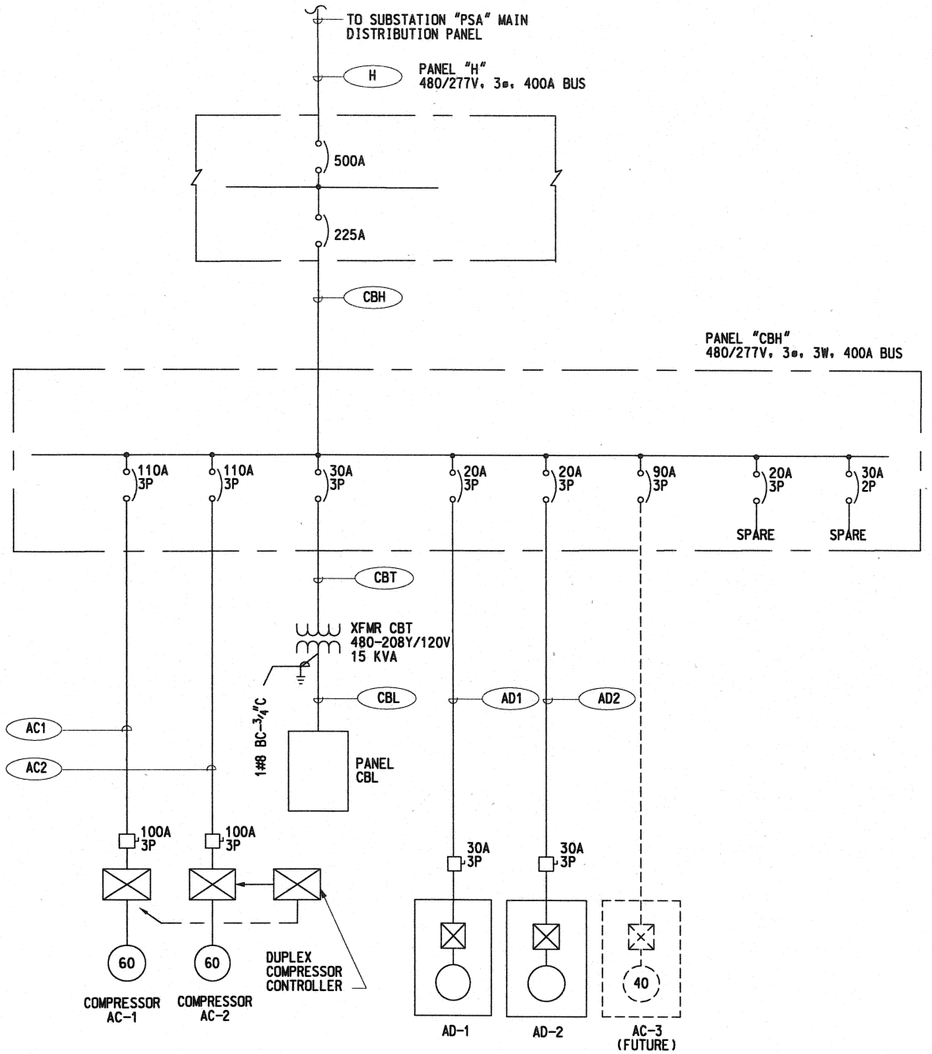
RAILROAD STANDARD PLANS

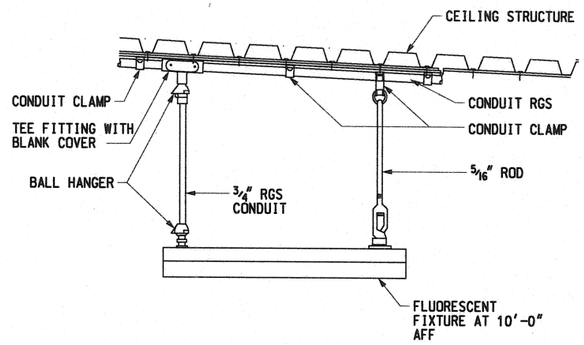
COMPRESSED AIR SYSTEM ENCLOSURE DETAILS - 4

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-420
SHEET NO: 9 OF 12

10/4/2013





1 - - DETAIL - FLOURESCENT LUMINAIRE PENDANT MOUNTED

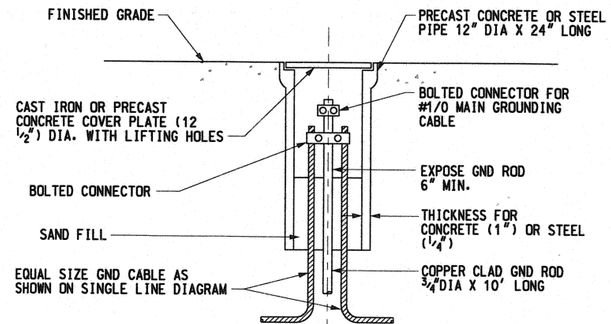
NTS

SYMBOL LIST

225A	CIRCUIT BREAKER, TRIP SHOWN AS SHOWN
	TRANSFORMER
100A 3P	DISCONNECT SWITCH, FUSED RATING AS SHOWN
	GROUND
2	NOTE DESCRIPTION
M	FEEDER/CONDUIT IDENTIFIER

ABBREVIATIONS

A	AMMETER, AMPERE
AFF	ABOVE FINISHED FLOOR
DIA	DIAMETER
GND	GROUND
KVA	KILO-VOLT AMPERE
MIN	MINIMUM
P	POLE
RGS	RIGID STEEL CONDUIT
TYP	TYPICAL
V	VOLT



2 - - DETAIL - GROUNDING WELL

NTS

FEEDER SCHEDULE

CIRCUIT	DESCRIPTIONS	HP	AMPS	VOLTS	PARALLEL CONDUITS	PARALLEL CABLES	FEEDER PHASE WIRES	FEEDER NEUTRAL WIRE	FEEDER GROUND WIRE	FEEDER CONDUIT	L Ft	% VD
CBH	MAIN FEEDER	0.00	195.0	480	No	1	3 # 3/0	1 # 3/0	1 # 6	2-1/2 "C	25	0.15
AC1	AC-1 COMPRESSORS	60.00	77.0	480	No	1	3 # 2/0	0	1 # 2	2 "C	40	0.12
AC2	AC-2 COMPRESSORS	60.00	77.0	480	No	1	3 # 2/0	0	1 # 2	2 "C	40	0.12
CBT	PANEL CBT	0.00	41.6	208	No	1	3 # 6	1 # 6	1 # 10	1 "C	10	0.15
AD1	AIR DRYER 1	0.00	1.9	480	No	1	3 # 12	1 # 12	1 # 12	3/4 "C	20	0.02
AD2	AIR DRYER 2	0.00	1.9	480	No	1	3 # 12	1 # 12	1 # 12	3/4 "C	20	0.02

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Port of LONG BEACH The Green Port

RAILROAD STANDARD PLANS

CAS SYMBOL LIST SINGLE LINE DIAGRAM AND DETAILS

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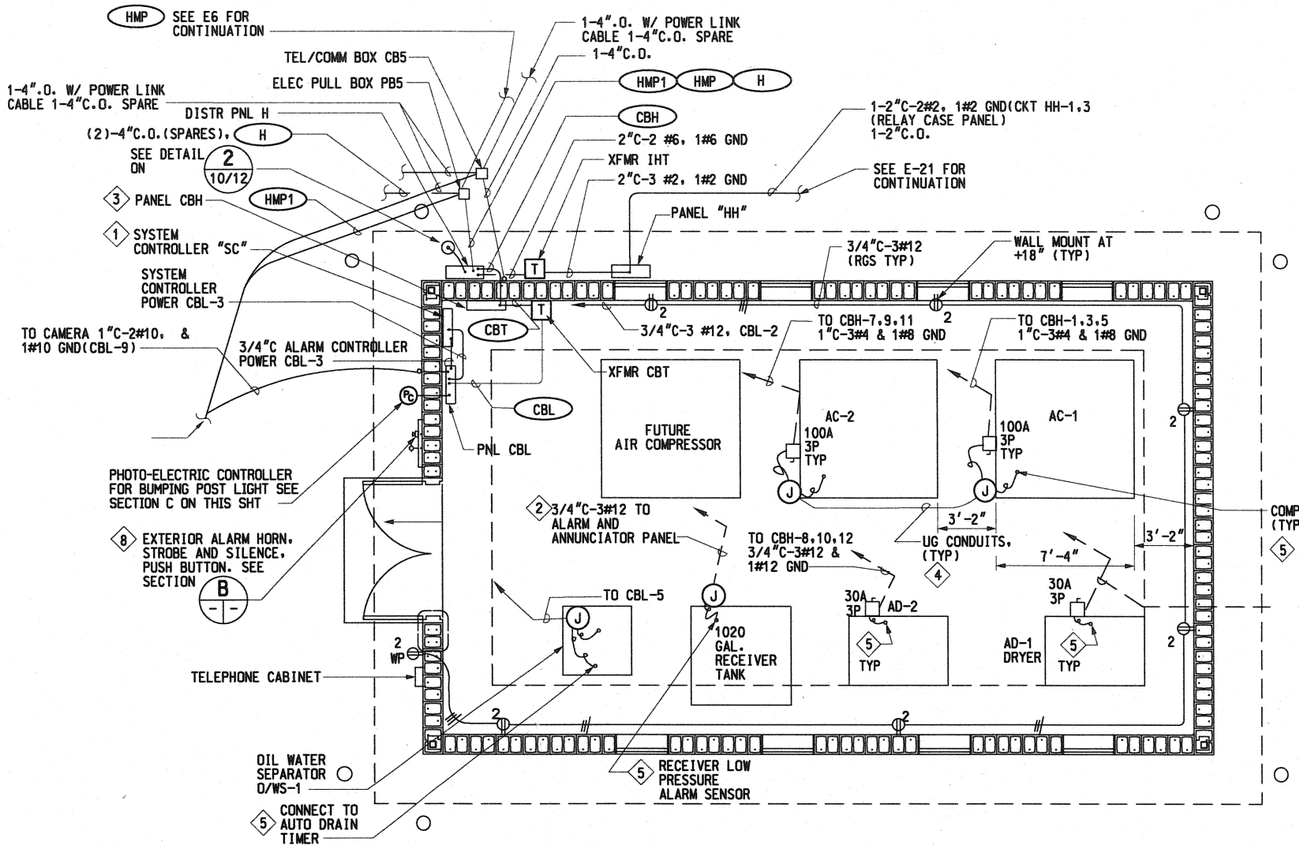
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-420

SHEET NO: 10 OF 12

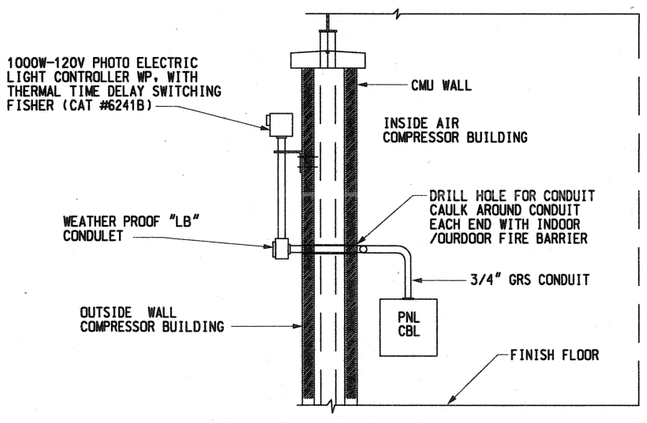
10/4/2013

...*RR-420 Cas Symbol List Single Line Diagram and Details 10 of 12



A SECTION - COMPRESSOR ENCLOSURE ELECTRICAL PLAN

SCALE : 1/4" = 1'-0"

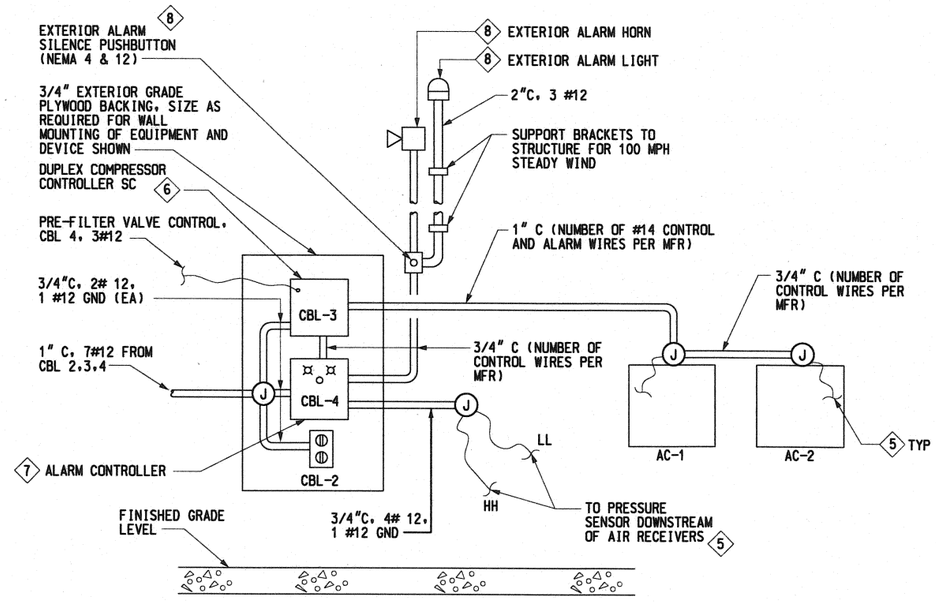


C SECTION - PHOTO - ELECTRIC LIGHT CONTROLLER

NTS

NOTES:

1. ELECTRICAL EQUIPMENT AND LUMINAIRE LOCATIONS SHOWN ARE APPROXIMATE. COORDINATE WITH ARCHITECTURAL, STRUCTURAL AND MECHANICAL INTERFACES FOR EXACT LOCATION.
2. ALL CONDUITS SHALL BE GALVANIZED RIGID STEEL (RGS). ALL CONDUCTORS SHALL BE THWN COPPER, INSULATED, UNLESS NOTED OTHERWISE.
3. INSTALL CIRCUIT SCHEDULE IN THE BACK OF PANEL DOOR UPON COMPLETION OF JOB.
4. UNDERGROUND CONDUIT SHALL BE PVC SCHEDULE 40 WITH GRS ELBOW STUB UPS. PROVIDE TRANSITION COUPLING PVC TO GRS 24" BELOW GRADE.
5. PROVIDE AND INSTALL LIQUID TIGHT FLEXIBLE CONDUIT OF THE SAME TRADE SIZE AS THE RIGID METAL CONDUIT CONNECTED.
6. COMPRESSOR SYSTEM CONTROLLER TERMINATION PER SPECIFICATIONS.
7. ALARM CONTROL AND ANNUNCIATOR PANEL IN NEMA 12 ENCLOSURE. CONTROLLER SHALL BE RONAN DUAL POINT ANNUNCIATOR, SERIES X19, OR APPROVED EQUAL. REFER TO SCHEMATIC DIAGRAM FOR REQUIREMENTS.
8. PROVIDE AND INSTALL OUTDOOR TYPE, WEATHERPROOF, EXTERIOR ALARM HORN, LIGHT, AND SILENCE PUSH-BUTTON. HORN SHALL BE 120 VAC, MINIMUM 100dB AT 10 FEET. EDWARDS CAT. NO. 876-N5 OR APPROVED EQUAL. LIGHT SHALL BE 120 VAC, PIPE MOUNTED, RED, HEAVY DUTY STROBE LIGHT, EDWARDS CAT. NO. 93 SERIES OR APPROVED EQUAL. POLETOP MOUNT LIGHT AT 8 FEET ABOVE ROOFRIDGE ON 2" RGS CONDIUT. SURFACE MOUNT HORN AT 10 FEET, AND PUSH-BUTTON AT 4 FEET ABOVE FINISHED GRADE.
9. COMPRESSOR SHALL BE CERTIFIED WITH PERMIT ISSUED BY OSHA.



B SECTION - SYSTEM CONTROL AND ANNUNCIATOR ELEVATION

NTS

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

COMPRESSOR ENCLOSURE PLAN AND ELEVATION

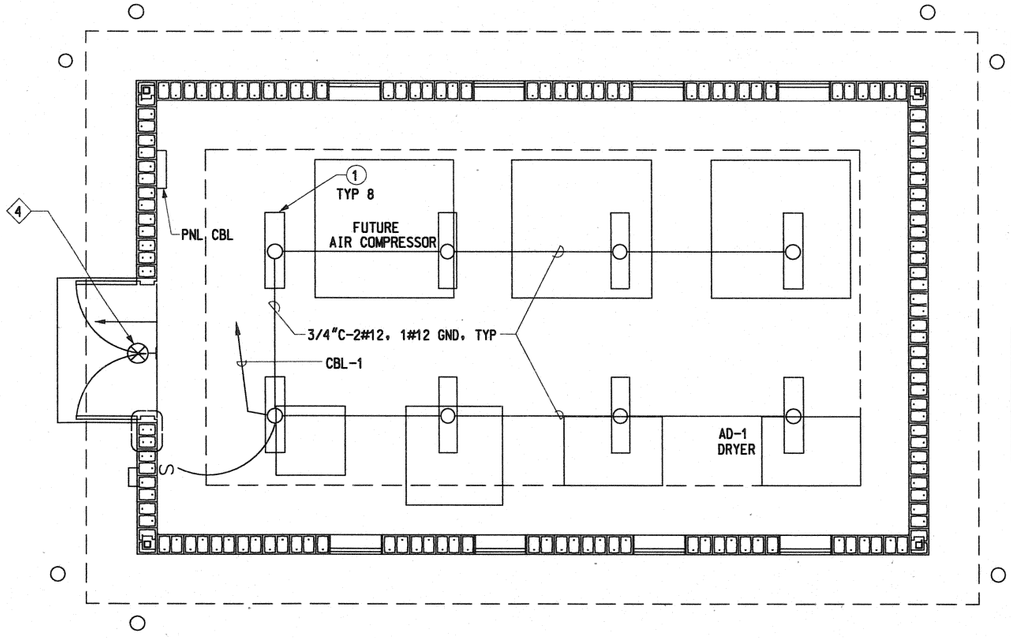
APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-420

SHEET NO: 11 OF 12

10/4/2013



PANEL : CBL			LOCATION: ELECT ROOM MAIN: 50 A			BUS RATING AMPS 100				VOLTS: 208 / 120 PHASE/WIRES: 3 / 4				MOUNTING: SURFACE		
LOAD INFORMATION			VOLTAMPS			CB RATING/POLES						VOLTAMPS			LOAD INFORMATION		
LOAD	NOTE	TYPE	PH-A	PH-B	PH-C	CKT	P	CB	PH	CB	P	Ck†	PH-A	PH-B	PH-C	TYPE	NOTE	LOAD
LIGHTING			680	0	0	1	1	20	A	20	1	2	1,080	0	0			RECEPTACLE LOAD
CONTROL			0	340	0	3	1	20	B	20	1	4	0	900	0			ALARM
WATER SEPARATOR WS-1			0	0	180	5	1	20	C	20	1	6	0	0	180			O/SEPARATOR (FUTURE)
BUMPING POST LIGHT	3		480	0	0	7	1	20	A	20	1	8	0	0	0			
SECURITY CAMERA			0	600	0	9	1	20	B	20	1	10	0	0	0			
			0	0	0	11	1	20	C	20	1	12	0	0	0			
			0	0	0	13	1	20	A	20	1	14	0	0	0			
			0	0	0	15	1	20	B	20	1	16	0	0	0			
			0	0	0	17	1	20	C	20	1	18	0	0	0			
								A	B	C								
TOTAL/PHASE:								2,240	1,840	360								

LOAD BREAKDOWN		DF	VAXDF	VA
CONTINUOUS LOAD	X	1.25	0	0
LARGEST MOTOR	X	1.25	0	0
RECEPTACLE LOAD	X	NEC	0	0
DWELLING TYPE LOADS	X	1.00	0	0
OTHER LOADS	X	1.00	4,440	4,440
SUM			4,440	4,440
CALC'D AMPERES	0	0	12.3	0

NOTES	
1	VIA TIME CLOCK
2	VIA LIGHTING CONTROLLER
3	PROVIDE PHOTO ELECTRIC CONTROLLER
4	
5	
6	
7	

LOAD TYPES	
0.00	
L	LIGHTING LOAD
R	RECEPTACLE LOAD
M	LARGEST MOTOR
D	DWELLING/RESIDENTIAL LOAD

NOTES:

1. PROVIDE AND INSTALL FLUORESCENT LIGHT FIXTURES SUSPENDED FROM CEILING AT 10'-0" ABOVE FINISHED FLOOR. FIXTURES SHALL BE LITHONIA DM 232-120-ES-HC-BCD, OR APPROVED EQUAL. FURNISH WITH 32W T-8 LAMPS.
2. ELECTRICAL EQUIPMENT AND LUMINAIRE LOCATIONS SHOWN ARE APPROXIMATE. COORDINATE WITH ARCHITECTURAL, STRUCTURAL AND MECHANICAL DRAWINGS FOR EXACT LOCATION.
3. PROVIDE DYMO LABEL ON EACH SWITCH, ENCLOSURE AND OUTLET WITH THE BRANCH CIRCUIT IDENTIFICATION.
4. PROVIDE AND INSTALL (INTEGRAL PHOTO CELL) CONTROLLED LIGHT FIXTURE, SURFACE MOUNTED 1 FOOT ABOVE DOOR. FIXTURE SHALL BE LITHONIA TWH-70S-120-PE-RHP, OR APPROVED EQUAL. FURNISH WITH 70W HPS LAMP.

PANEL : CBH			LOCATION: ELECT ROOM MAIN: 150 A			BUS RATING AMPS 225				VOLTS: 480/ 277 PHASE/WIRES: 3/ 4				MOUNTING: SURFACE		
LOAD INFORMATION			VOLTAMPS			CB RATING/POLES						VOLTAMPS			LOAD INFORMATION		
LOAD	NOTE	TYPE	PH-A	PH-B	PH-C	CKT	P	CB	PH	CB	P	Ck†	PH-A	PH-B	PH-C	TYPE	NOTE	LOAD
AC1	1	M	8,320			1	3	90	A	20	3	2	544			M	1	AIR DRYER AD-1
AC1	1	M		8,320		3	-	90	B	20	-	4		544		M	1	AIR DRYER AD-1
AC1	1	M			8,320	5	-	90	C	20	-	6			544	M	1	AIR DRYER AD-1
AC2	1	M	8,320			7	3	90	A	20	3	8	544			M	1	AIR DRYER AD-2
AC2	1	M		8,320		9	-	90	B	20	-	10		544		M	1	AIR DRYER AD-2
AC2	1	M			8,320	11	-	90	C	20	-	12			544	M	1	AIR DRYER AD-2
15KVA TRANSFORMER		L	3,840			13	3	30	A	20	3	14	8,320			M	0	AC-3 (FUTURE)
15KVA TRANSFORMER		L		3,840		15	-	30	B	20	-	16		8,320		M	0	AC-3 (FUTURE)
15KVA TRANSFORMER		L			3,840	17	-	30	C	20	-	18			8,320	M	0	AC-3 (FUTURE)
						19	3	125	A	20	3	20						
						21	-	125	B	20	-	22						
						23	-	125	C	20	-	24						
						25	3	60	A	20	2	26						
						27	-	60	B	20	-	28						
						29	-	60	C	20	1	30						
						31	1	20	A	20	1	32						
						33	1	20	B	20	1	34						
						35	1	20	C	20	1	36						
						37	1	20	A	20	1	38						
						39	1	20	B	20	1	40						
						41	1	20	C	20	1	42						
								A	B	C								
TOTAL/PHASE:								29,888	29,888	29,888								

LOAD BREAKDOWN		DF	VAXDF	VA
CONTINUOUS LOAD	X	1.25	14,400	11520
LARGEST MOTOR	X	1.25	97,680	78144
RECEPTACLE LOAD	X	NEC		
DWELLING TYPE LOADS	X	1.00		
OTHER LOADS	X	1.00		
SUM			112,080	89664
CALC'D AMPERES			134.8	

NOTES	
1	VIA TIME CLOCK
2	VIA LIGHTING CONTROLLER
3	
4	
5	
6	
7	

LOAD TYPES	
0.00	
L	LIGHTING LOAD
R	RECEPTACLE LOAD
M	LARGEST MOTOR
D	DWELLING/RESIDENTIAL LOAD

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

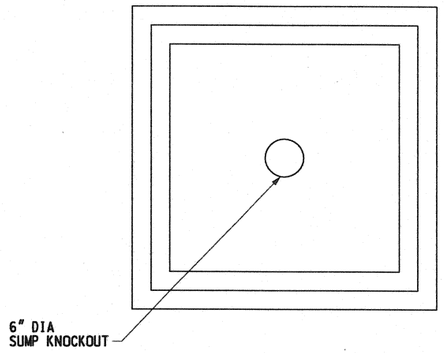
COMPRESSOR ENCLOSURE LIGHTING PLAN AND SCHEDULE

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

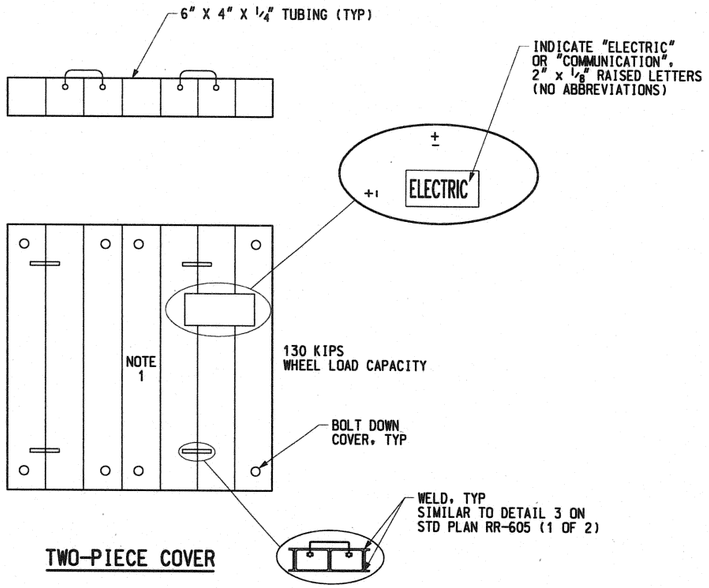
DRAWING NO: RR-420

SHEET NO: 12 OF 12

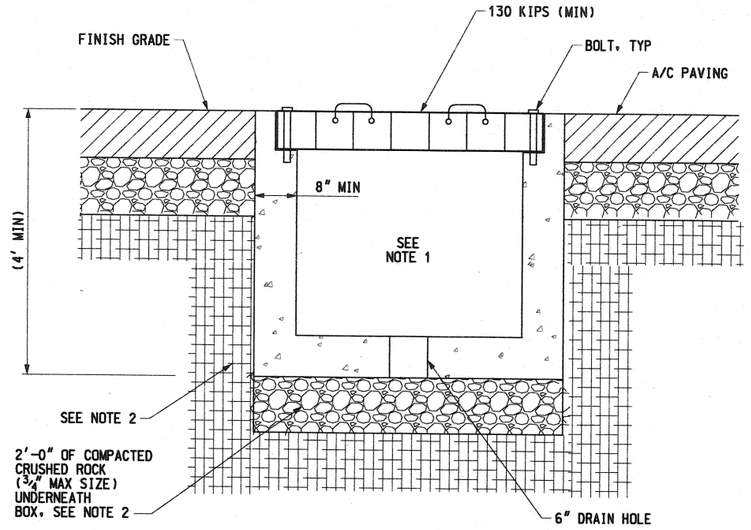
10/4/2013



PLAN



TWO-PIECE COVER



SECTION

1 DETAIL - TYPICAL ELECTRICAL AND TELE/COMM PULL BOXES

NTS

NOTES:

1. DIMENSIONS SHOWN ARE FOR A 36" x 36" PULL BOX AND REPRESENT THE TYPE OF CONSTRUCTION REQUIRED FOR ALL PULL BOX COVERS.
2. 1'-0" OF NATIVE BACKFILL OR ONE SACK SLURRY SHALL BE PLACED AROUND SIDES AND 2'-0" OF COMPACTED CRUSHED ROCK (3/4" MAX SIZE) SHALL BE PLACED UNDER ALL PRECAST CONCRETE BOXES (ELECTRICAL, COMMUNICATION, ETC) AS SHOWN. THIS STANDARD SHALL APPLY TO ALL BOXES 36" x 36" MEASURED HORIZONTALLY, OR LARGER.
3. WELD SQUARE TUBES TOGETHER INTO UNITS OF 2, 3 OR 4 WIDE (4 MAX)
4. PROVIDE TWO HANDLES FOR EACH SECTION OF PULLBOX COVERS.
5. HANDLES SHALL COLLAPSE TO THE TOP SURFACE OF THE PULLBOX COVER.
6. ALL MANHOLES AND BOXES SHALL BE FLUSH WITH PAVEMENT OR NATURAL BALLAST GROUND.
7. EQUIPMENT SELECTION AND SIZES, EQUIPMENT PAD COUNT AND SIZES, BUILDING SIZE AND PIPELINE SIZES ARE NOT TYPICAL AND MUST BE DETERMINED BASED ON PROJECT REQUIREMENTS.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

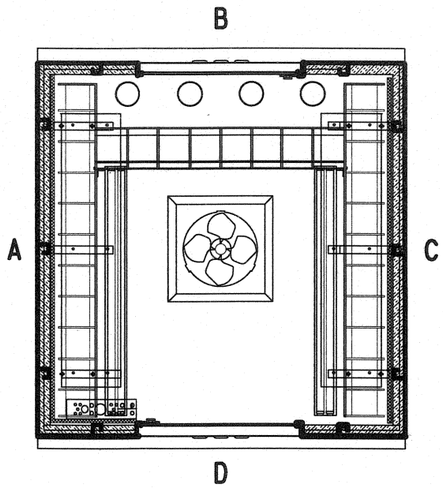
PULLBOX DETAILS

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-501

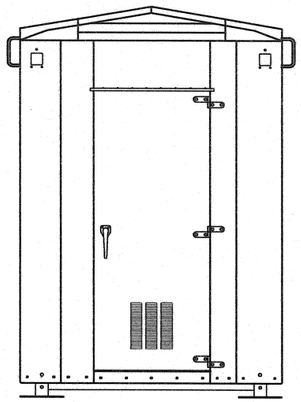
SHEET NO: 1 OF 1

10/4/2013



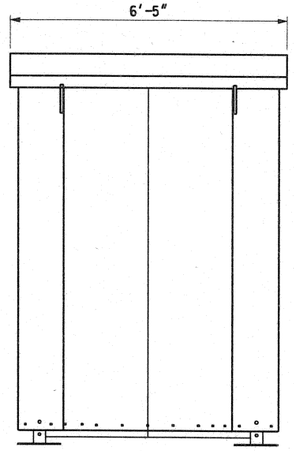
PLAN VIEW

NTS



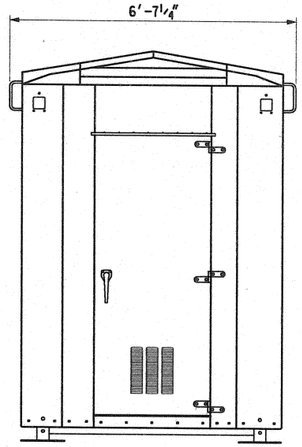
EXTERIOR SIDE "B"

NTS



EXTERIOR SIDE "A" & "C"

NTS

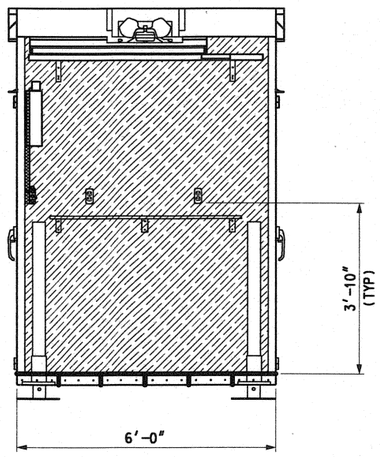


EXTERIOR SIDE "D"

NTS

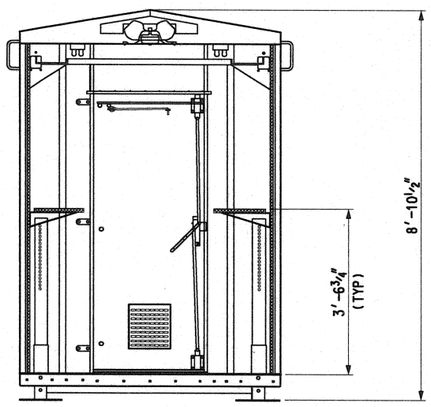
GENERAL SPECIFICATIONS AND FEATURES:

1. FLOOR FABRICATION: 12 GA. GALVANNEALED FORMED CHANNELS.
2. WALL FABRICATION: 12 GA. GALVANNEALED FORMED PANELS.
3. DOOR FABRICATION: 12 GA. GALVANNALED.
4. ROOF FABRICATION: 14 GA. GALVANNEALED.
5. ADJUSTABLE FOUNDATION FABRICATION: 3" SCH. 40 GALVANIZED PIPE W/ 12" x 12" X 1/4" FOOTING PAD.
6. WIRE CHASE FABRICATION: 1 1/2" x 1 1/2" x 3/16" ANGLE IRON FRAME, 1/4"ø H.R.S. RUNGS.
7. INSULATION: 2" FIBERGLASS FACED POLYISOCYANURATE RIGID FORM BOARD ON WALLS, DOORS AND ROOF.
8. PLYWOOD: 3/4" THICK MDO PLYWOOD ON "A" AND "C" WALLS, SHELVES AND TERMINAL BOARD.
9. PAINT SPECIFICATIONS: ONE (1) COAT MIN. 2.3 MIL. GRAY POWDER COAT ON ALL EXTERIOR SURFACE. TWO (2) COATS 2.3 MIL. WHITE LATEX ENAMEL ON ALL INTERIOR SURFACES.
10. 1/8" BLACK RUBBER MATTING ON FLOOR.
11. ALL HARDWARE TO BE ZINC PLATED OR POWDER COATED.



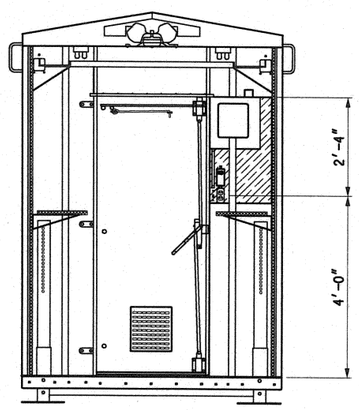
INTERIOR SIDE "A" & "C"

NTS



INTERIOR SIDE "B"

NTS



INTERIOR SIDE "D"

NTS

NOTES:

1. RELAY CASE SHOWN IS APPROXIMATELY 6'x6'x9', WHICH IS THE MINIMUM RELAY CASE SIZE TO BE PROVIDED, UNLESS OTHERWISE APPROVED BY THE POLB.
2. EQUIPMENT CONFIGURATION SHOWN IS TYPICAL FOR A BASIC SYSTEM. THE CONTRACTOR SHALL MODIFY THE TYPICAL CONFIGURATION AS NECESSARY TO ACCOMMODATE CONTRACTOR FURNISHED EQUIPMENT. SUBMIT A DETAILED LAYOUT FOR APPROVAL BY THE POLB.
3. CASE DOORS ARE SHOWN CLOSED. DOOR STOPS SHALL BE PROVIDED TO HOLD THE DOORS AT 90 DEGREES AND AT 170 DEGREES. CASE SHALL BE ORIENTED SO THAT THE FRONT OF THE EQUIPMENT RACK IS ON THE SIDE AWAY FROM THE ADJACENT PULL BOX.
4. PROVIDE 100 WATT LIGHT FIXTURE MOUNTED ON CEILING OF RELAY CASE AT EACH DOOR OPENING.
5. PROVIDE 100A, 120/240VAC SERVICE PANEL IN ACCORDANCE WITH NEC REQUIREMENTS. PROVIDE SURGE SUPPRESSOR SIMILAR TO JOSLYN PART NO. 1259-21-A.
6. PROVIDE THERMOSTATICALLY CONTROLLED AIR CONDITIONING UNIT.
7. PROVIDE PRECAST CONCRETE FOUNDATION PIERS FOR END SUPPORT OF RELAY CASE IN ACCORDANCE WITH THE RECOMMENDATIONS OF AREMA PART 14.4.11. 3/4" STAINLESS STEEL ATTACHMENT BOLTS TO BE FITTED WITH LEVELING NUTS.
8. PROVIDE PVC CONDUIT FROM RELAY CASE TO PULLBOXES AND JUNCTION BOXES.
9. FOR ADDITIONAL CONSTRUCTION, INSTALLATION AND GROUNDING REQUIREMENTS, REFER TO TECHNICAL SPECIFICATIONS.
10. PROVIDE WHITE STROBE LAMP MOUNTED ON TOP OF RELAY CASE TO ALERT WHEN AC POWER OR OTHER DEFECT HAS OCCURED. PROVIDE AC RELAY AND UPS UNIT AS SHOWN. UPS UNIT SHALL BE AMERICAN POWER CONVERSION MODEL BACK-UPS 400 OR AN APPROVED EQUAL.
11. AC CONTROL RELAYS SHALL BE ALLEN-BRADLEY TYPE R FOR INDUSTRIAL APPLICATIONS NON-VITAL CIRCUITS ONLY, OR APPROVED EQUAL.
12. TERMINAL POST PAIRS FOR TERMINATION OF TIM CABLES SHALL BE OF THE INSULATED TEST LINK TYPE. WHERE CIRCUIT VOLTAGE AT THE TERMINAL POST IS GREATER THAN 50 VOLTS, THE TERMINAL POSTS SHALL BE PROVIDED WITH INSULATING NUTS. LIGHTNING ARRESTORS SHALL BE PROVIDED AS SHOWN.
13. MOUNT LCP FACEPLATE KEY CONTROL COVER JUNCTION BOX. JUNCTION BOX SHALL BE SIMILAR TO SAFETRAN TYPE 092607-ABX.
14. ALL ENCLOSURES TO BE CLIMATE CONTROLLED.

TRAIN IN MOTION WARNINGS SYSTEM (TIMS) IS SITE SPECIFIC.
SET OF 5 DRAWINGS NO. RR-502 ARE ONLY A GUIDE.

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

TRAIN WARNING SYSTEM RELAY CASES TYPICAL 6 X 6 HOUSE

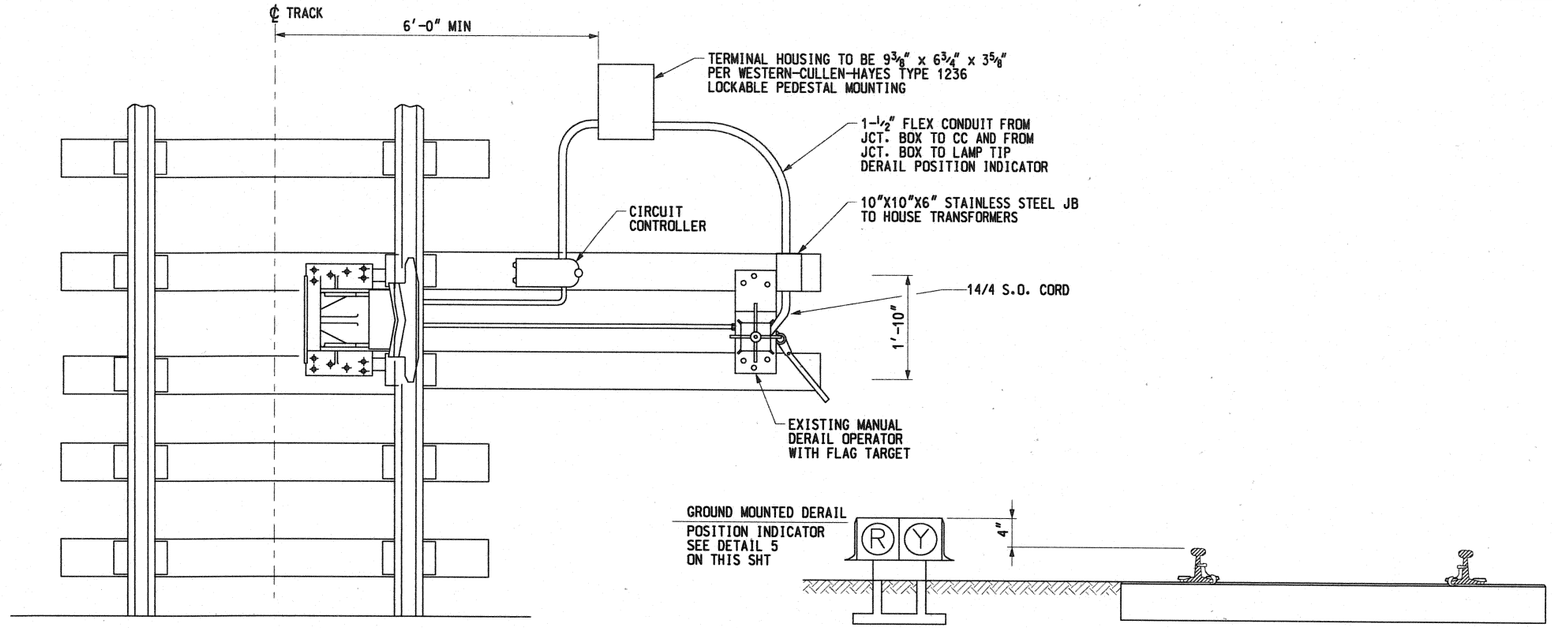
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-502

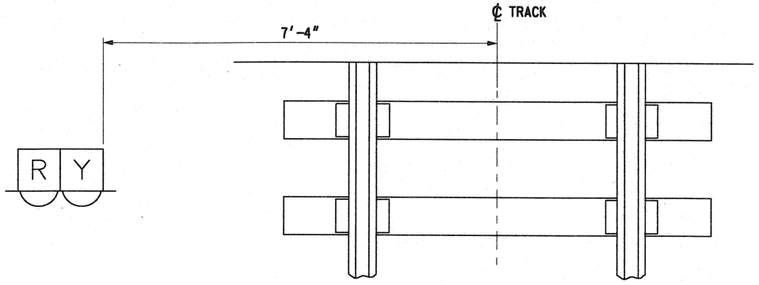
SHEET NO: 1 OF 5

10/4/2013



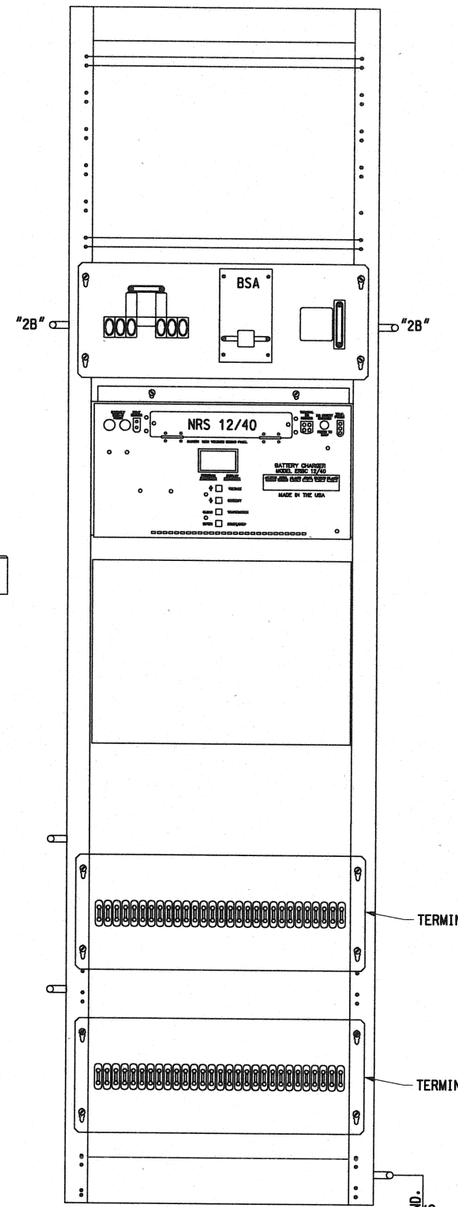
1 DETAIL - TYPICAL DERAIL CIRCUT CONTROLLER LAYOUT

NTS



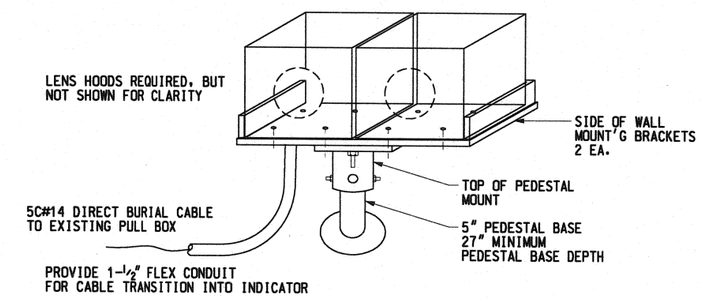
2 DETAIL - TYPICAL DERAIL INDICATOR LAYOUT PLAN

NTS



3 DETAIL - ELEVATION - TYPICAL DERAIL INDICATOR LAYOUT

NTS



4 DETAIL - RELAY CASE (RC) LAYOUT

NTS

5 DETAIL - INDICATOR MOUNTING

NTS

NOTES:

1. THE DERAIL INDICATOR AND CIRCUIT CONTROLLER SHALL BE LOCATED ON THE SAME SIDE OF THE TRACK AS THE HANDTHROW STAND. THE CONTRACTOR SHALL PROVIDE LONGER CIRCUIT CONTROLLER CONNECTING ROD AND HANDTHROW ROD WHERE THE SLIDE BLOCK DERAIL IS TO BE LOCATED ON THE RAIL OPPOSITE FROM THE HANDTHROW STAND.
2. THE CIRCUIT CONTROLLER SHALL BE CONFIGURED WITH SIX INDEPENDENT SETS OF CONTACTS. CIRCUIT CONTROLLER SHALL BE US&S MODEL U-5 WATER PROOF OR APPROVED EQUAL.
3. THE DERAIL INDICATORS SHALL BE VISIBLE FROM EITHER DIRECTION AS VIEWED FROM AN APPROACHING TRAIN AND MUST BE LED LIGHTING.
4. THE DERAIL INDICATOR LAMPS SHALL BE CLUSTER TYPE, YELLOW AND RED LED LAMP UNITS, GELCORE MODELS TR3-YCFB-501 AND TR3-RCFB-501 RESPECTIVELY, OR APPROVED EQUAL. YELLOW INDICATION TO BE ILLUMINATED WHEN THE DERAIL IS IN THE FULL REVERSE OR "OFF" POSITION. RED INDICATOR TO BE ILLUMINATED WHEN THE DERAIL IS NOT IN THE FULL REVERSE OR "OFF" POSITION.
5. THE YELLOW AND RED INDICATOR LAMPS SHALL BE ORIENTED IN THE FIELD RELATIVE TO THE POSITION OF THE SLIDE BLOCK DERAIL. LOCATE THE POSITION INDICATOR ON THE SAME SIDE OF THE TRACK AS THE SLIDE BLOCK DERAIL. THE INDICATOR CLOSEST TO THE TRACK SHALL BE YELLOW. WHEN THE INDICATOR IS LOCATED ON THE SIDE OPPOSITE FROM THE SLIDE BLOCK DERAIL, THE INDICATOR CLOSEST TO THE TRACK SHALL BE RED.
6. FOR DERAIL DETAILS, SEE SHEET RR-330 THROUGH RR-334.
7. INSTALL DERAIL PER RECOMENDATION OF MANUFACTURER.

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Port of LONG BEACH
The Green Port

RAILROAD
STANDARD PLANS

TRAIN WARNING SYSTEM POWER DERAIL LAYOUT

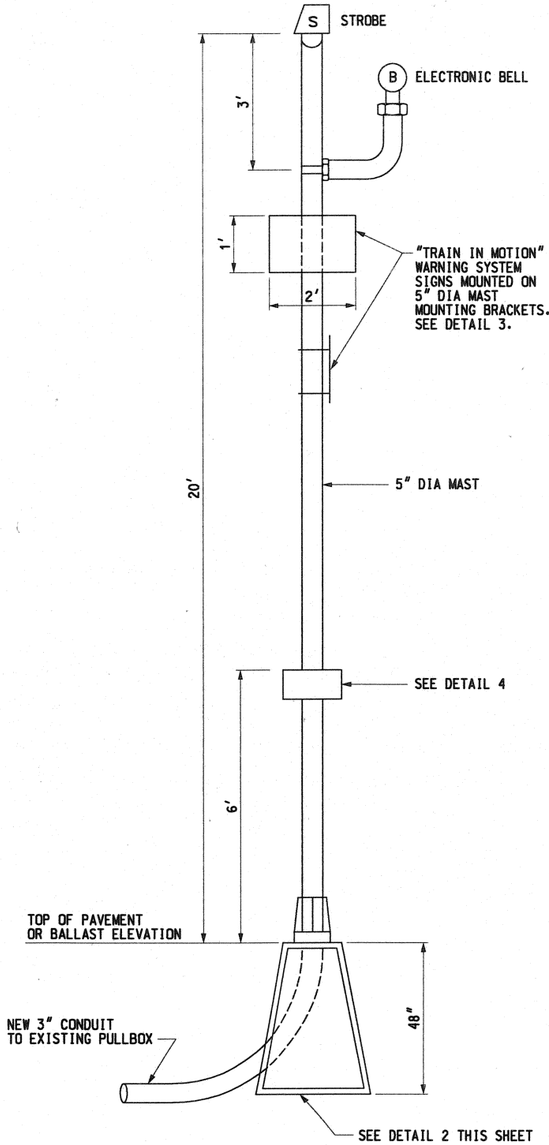
APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-502

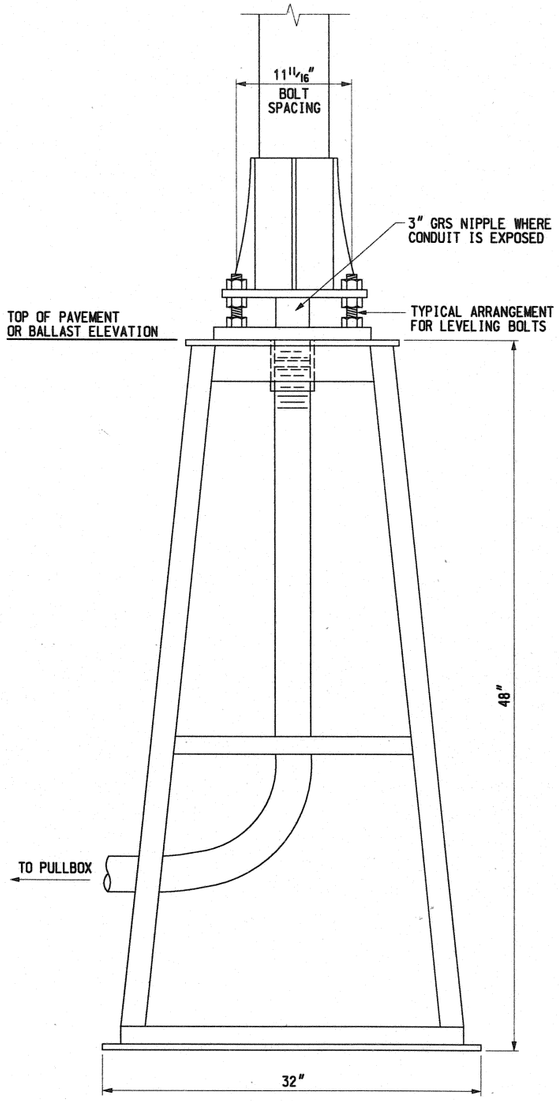
SHEET NO: 2 OF 5

10/4/2013



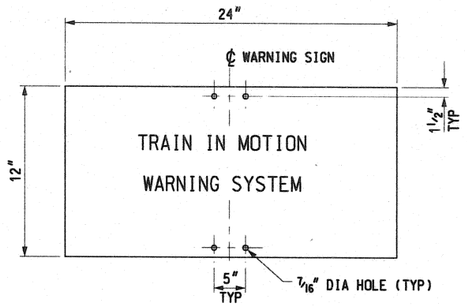
1 DETAIL - TRAIN IN MOTION WAYSIDE INDICATOR

NTS



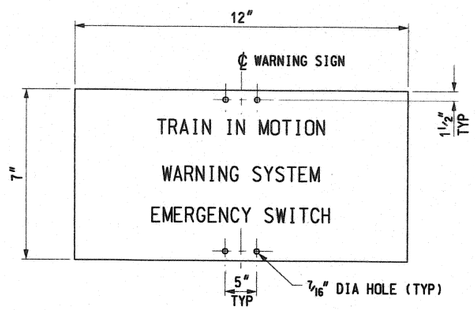
2 DETAIL - TIM INDICATOR FOUNDATION

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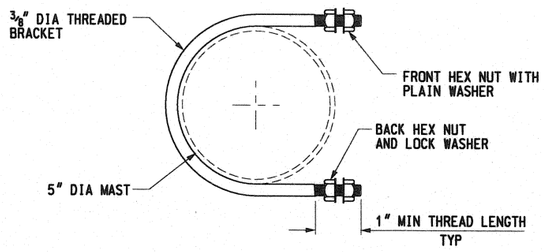
3 DETAIL - TRAIN IN MOTION WARNING SIGN

NTS



4 DETAIL - TRAIN IN MOTION WARNING SIGN EMERGENCY SWITCH

NTS



5 DETAIL BRACKET

NTS

NOTES FOR DETAIL 1:

1. 48 IN GALVANIZED METAL FOUNDATION.
2. ELECTRONIC BELL MOUNTING ELBOW SHALL BE NO LESS THAN 3 FT FROM TOP OF POLE.
3. MAST TO BE 5" IN DIA. 20 FT LONG ALUMINUM WITH 2 IN X 4 IN SLOTS FOR BELL MTG ELBOW.
4. SPLIT BASE SHALL HAVE 11 11/16" x 11 11/16" BOLT SPACING.
5. STROBE LIGHT SHALL BE FEDERAL SIGNAL FIREBALL "FB2PST" OR APPROVED EQUAL FITTED W/ADAPTOR FOR MOUNTING ON 5 IN POLE.
6. FOUNDATIONS SHALL BE HOT DIPPED GALVANIZED AND FURNISHED WITH 4 EACH BOLTS 1" x 8", WITH HEX HEADS.
7. BOLTS SHALL BE THREADED TO ALLOW FOR LEVELING AND FURNISHED WITH 12 NUTS AND 12 FLAT WASHERS.
8. PVC CONDUIT BENDS SHALL BE MANUFACTURED BENDS ONLY. BEND RADIUS TO BE MINIMUM OF 36".

NOTES FOR DETAIL 3:

1. RAIL MOTION WARNING SIGNS SHALL BE SHEET ALUMINUM, WILL FINISH SIMILAR TO ALCOA 615-T6 (61 ST). SIGN TO BE .064 IN THICK.
2. SIGN SHALL HAVE 3M SCOTCHLITE HIGH INTENSITY SILVER REFLECTIVE SHEETING APPLIED, SHALL BE MANUFACTURED BY LYNCH SIGN CO., 417A N. GLENDALE CA 800-475-5739.
3. APPLY 2 INCH HIGH LETTERS TO SHEETING, LETTERS TO BE BLACK VINYL CUT WITH CLEAR LAMINATE, UV AND WEATHER PROTECTION, LETTERS SHALL BE MANUFACTURED BY INTERNATIONAL DESIGN & MARKETING, INC., HUNTINGTON BEACH CA 800-689-7446.
4. TRAIN IN MOTION WARNING SIGNS SHALL BE LOCATED WHERE SHOWN ON THE PLANS, AND SHALL BE MOUNTED ON STROBE & BELL MAST JUST BELOW BELL ELBOW BRACKET AT 90° TO EACH OTHER AS SHOWN.
5. ALL PORTIONS OF THE WARNING SIGNS SHALL BE SET WITH A CLEAR DIMENSION FROM THE NEAREST TRACK CENTERLINE OF 10'0" MINIMUM.

NOTES FOR DETAIL 4:

1. SIGN SHALL BE SHEET ALUMINUM, MILL FINISH SIMILAR TO ALCOA 61S-T6(61ST)
2. SIGN SHALL HAVE 3M SCOTCHLITE HIGH INTENSITY SILVER REFLECTIVE SHEETING APPLIED, AND SHALL BE MANUFACTURED BY LYNCH SIGN CO., 417A N. GLENDALE CA 800-475-5739.
3. APPLY 2 INCH HIGH LETTERS TO SHEETING. LETTERS SHALL BE BLACK VINYL CUT WITH CLEAR LAMINATE, UV AND WEATHER PROTECTION. LETTERS SHALL BE MANUFACTURED BY INTERNATIONAL DESIGN MARKETING, INC., HUNTINGTON BEACH CA 800-689-7446.
4. LOCATE TRAIN IN MOTION WARNING SYSTEM EMERGENCY SWITCH SIGN ON THE PLANS, ADJACENT TO EMERGENCY SWITCH.
5. SIGNS TO BE WEATHER RESISTANT.

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

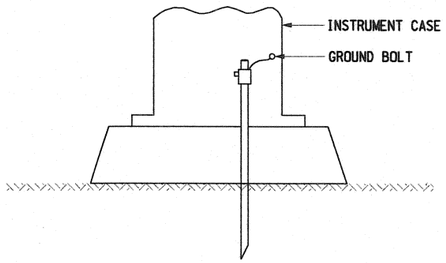
TRAIN WARNING SYSTEM WAYSIDE TIM INDICATOR

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-502

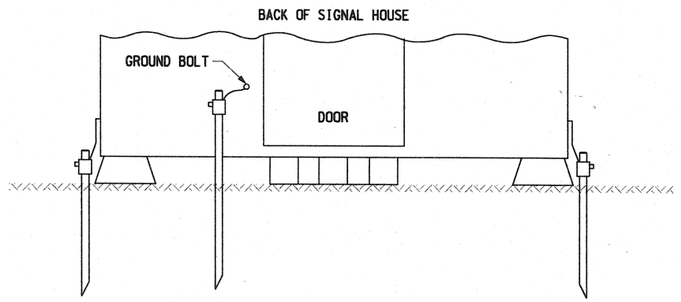
SHEET NO: 3 OF 5

10/4/2013



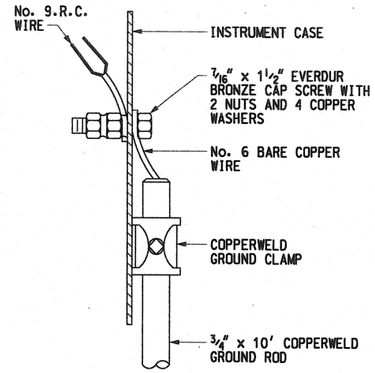
1 DETAIL - INSTRUMENT CASE GROUNDING CONNECTION

NTS



2 DETAIL - SIGNAL HOUSE GROUNDING CONNECTION

NTS

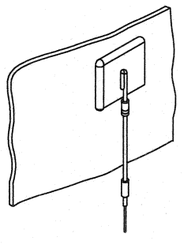


NOTES:

1. BOLTED GROUNDING CONNECTION SHALL ONLY BE USED WHEN MAKING GROUNDING CONNECTIONS TO EXISTING EQUIPMENT.
2. ALL NEW INSTALLATIONS SHALL BE WELDED PER DETAIL 4 THIS SHT.

3 DETAIL - BOLTED GROUNDING CONNECTION

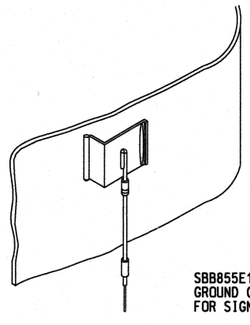
NTS



SBB855C1G36 WELDED GROUND CONNECTION ON ALL NEW HOUSINGS

4 DETAIL - WELDED GROUNDING CONNECTION ON FLAT SURFACE

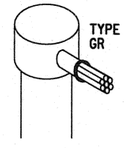
NTS



SBB855E1G72 WELDED GROUND CONNECTION FOR SIGNAL MASTS

5 DETAIL - WELDED GROUNDING CONNECTION ON ROUND SURFACE

NTS



SBGR1181 CADWELD ONE SHOP GROUND ROD CONNECTION

6 DETAIL - GROUND ROD CONNECTION

NTS

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

TRAIN WARNING SYSTEM EQUIPMENT GROUNDING CONNECTION

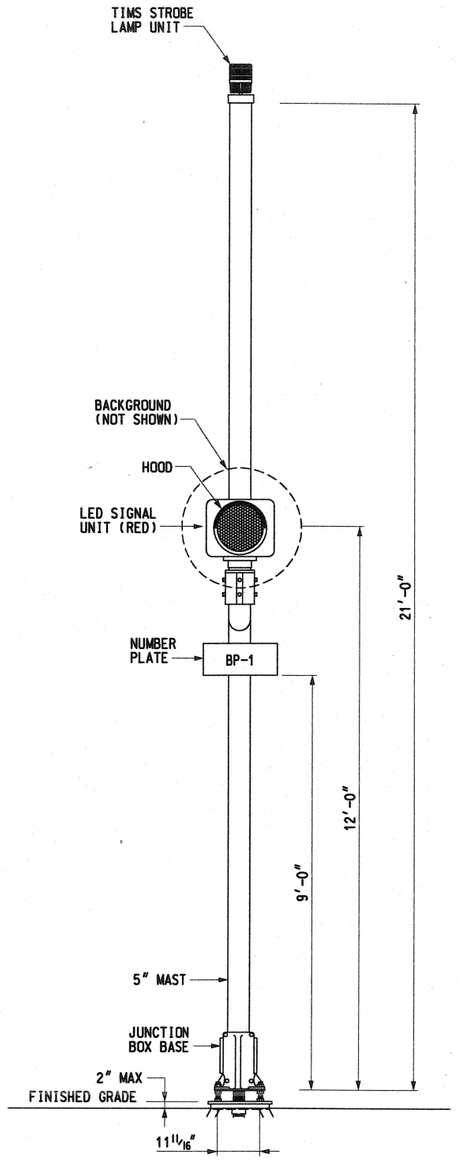
APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-502

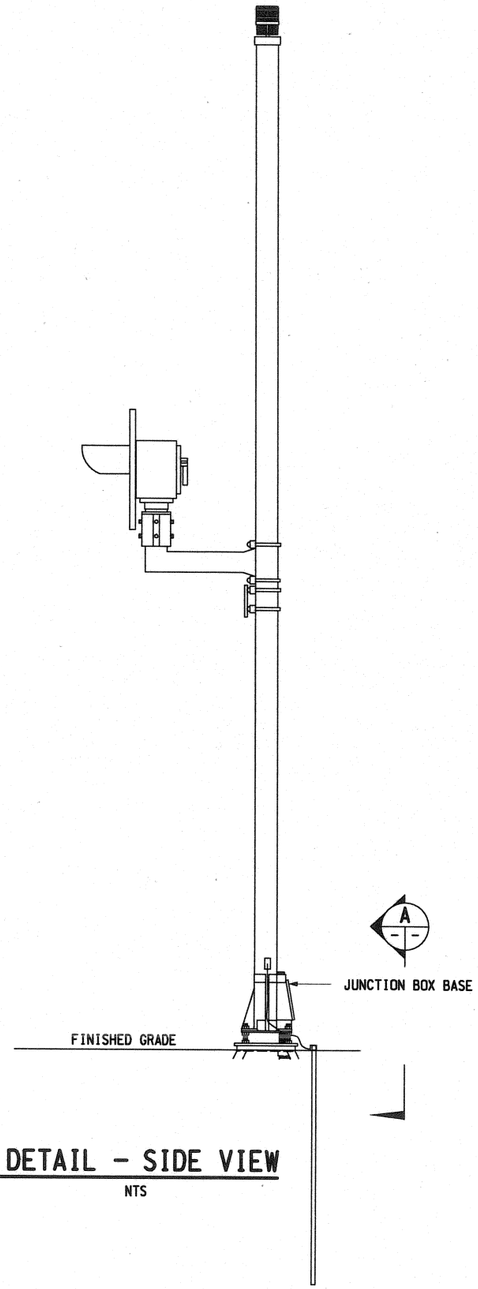
SHEET NO: 4 OF 5

10/4/2013



1 DETAIL - ELEVATION -TYPICAL BUMPING POST SIGNAL

NTS

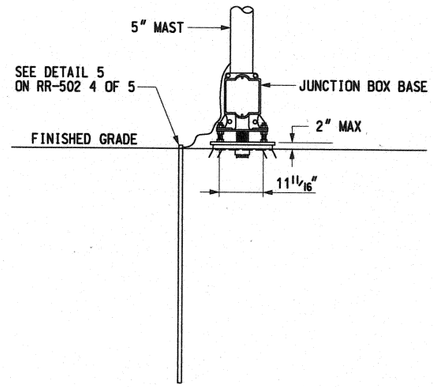


2 DETAIL - SIDE VIEW

NTS

NOTES:

1. TOP OF FOUNDATION TO BE LEVEL WITH SURROUNDING PAVEMENT, TO MAXIMUM 2 INCHES ABOVE TOP OF FINISHED GRADE.
2. SIGNAL HEAD SHALL BE A STANDARD LED TYPE UNIT CONFORMING TO AREMA C&S MANUAL PART 7.1.5. ASPECT SHALL BE RED.
3. NUMBER PLATES SHALL BE PROVIDED AS SHOWN. LABEL SHALL CONSIST OF A TWO ALPHA CHARACTER PREFIX OF "BP" FOLLOWED BY A NUMERIC THAT CORRESPONDS TO THE TRACK DESIGNATION.
4. FOR FOUNDATION DETAILS, REFER TO STD PLAN RR-502 3 OF 5.
5. COORDINATE LOCATION OF BOLLARDS TO ASSURE THAT MAINTENANCE PERSONNEL WILL HAVE UNOBSTRUCTED ACCESS TO THE JUNCTION BOX BASE.



A SECTION

NTS

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

TRAIN WARNING SYSTEM BUMPING POST SIGNAL

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

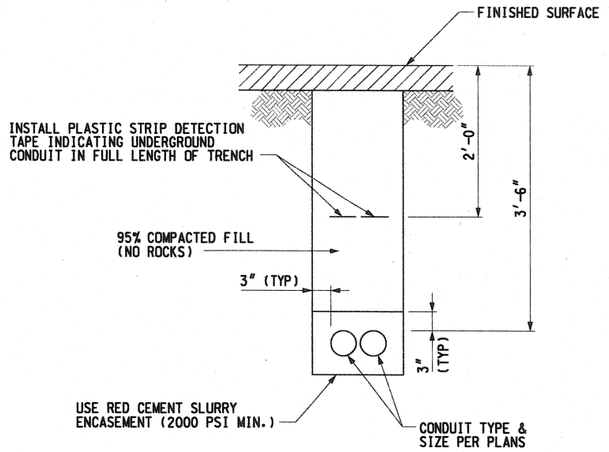
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-502

SHEET NO: 5 OF 5

10/4/2013

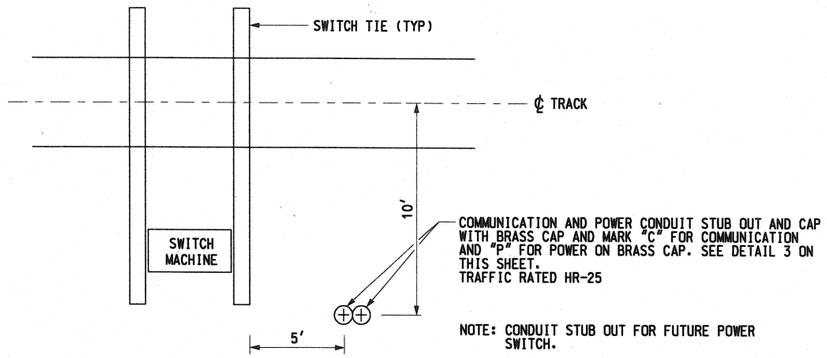
...*RR-502 Train Warning System Bumping Post Signal 5 of 5



NOTES:

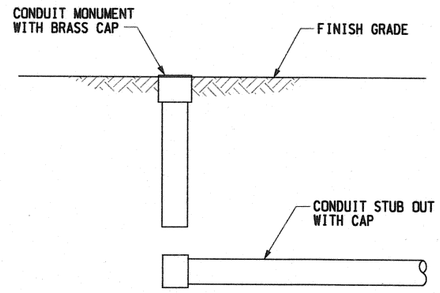
1. SEE SPECIFICATIONS FOR EXCAVATION SAFETY REQUIREMENTS FOR SHORING.
2. MINIMUM DEPTH UNDER RAILROAD TRACKS IS 5'-6".

1 DETAIL - UNDERGROUND CONDUIT SECTION
NTS



NOTE: CONDUIT STUB OUT FOR FUTURE POWER SWITCH.

2 DETAIL - TRACK CONDUIT STUB OUT LOCATION
NTS



ENGRAVE BRASS CAP INDICATING FUNCTIONS, SIZE AND QUANTITY

3 DETAIL - CONDUIT STUB OUT MARKER
NTS

NOTE:

STUB OUT REQUIRED AT ALL SWITCHES WHICH ARE INSTALLED IN SIGNALIZED TRUCK OR POLB MAIN TRACKS, UNLESS POLB ADVISES IN WRITING NOT TO INSTALL STUB OUTS.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

AUTOMATED SWITCH CONDUIT

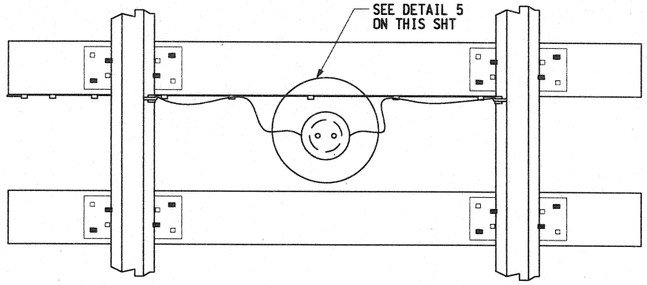
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-503

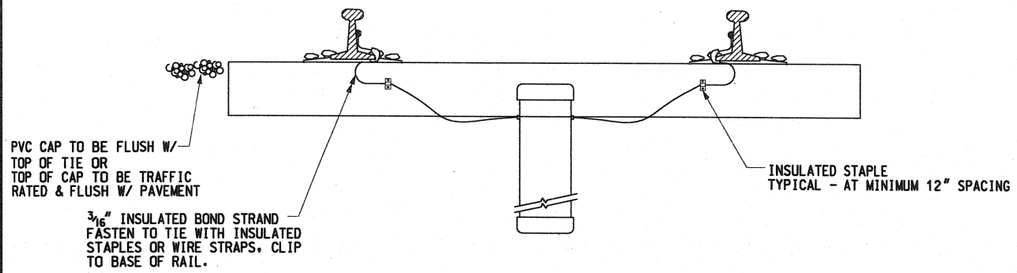
SHEET NO: 1 OF 1

10/4/2013

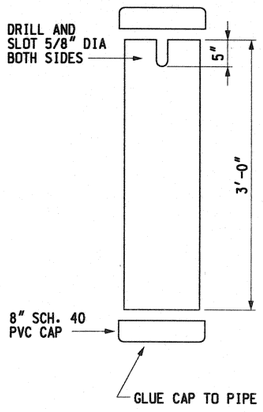
...*RR-503 Automated Switch Conduit



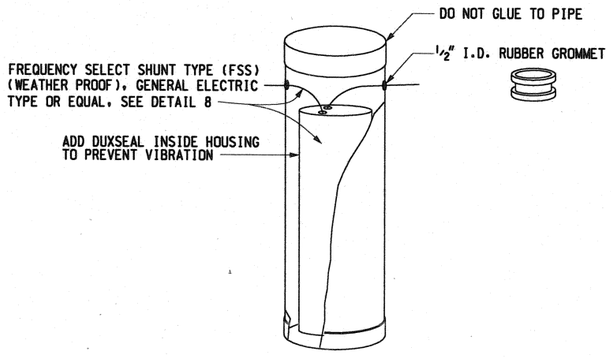
1 DETAIL - TYPICAL TERMINATION SHUNT ON WOOD TIES
NTS



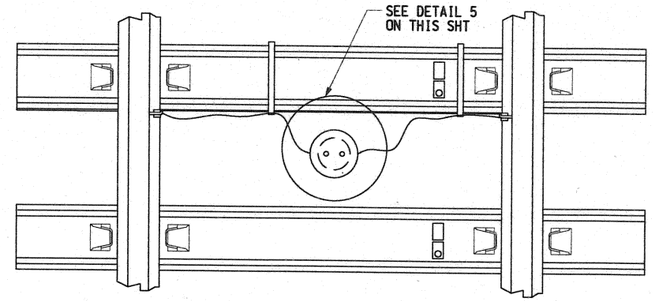
2 DETAIL - TYPICAL TERMINATION SHUNT ON WOOD TIES
NTS



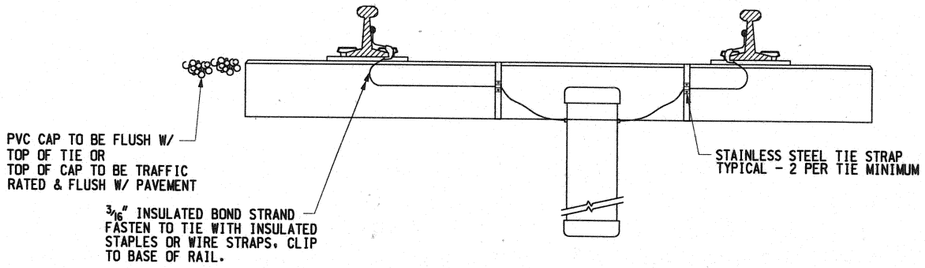
5 DETAIL - TYPICAL TERMINATION SHUNT TUBE
NTS



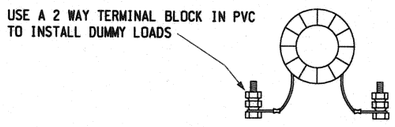
6 DETAIL - TYPICAL TERMINATION SHUNT
NTS



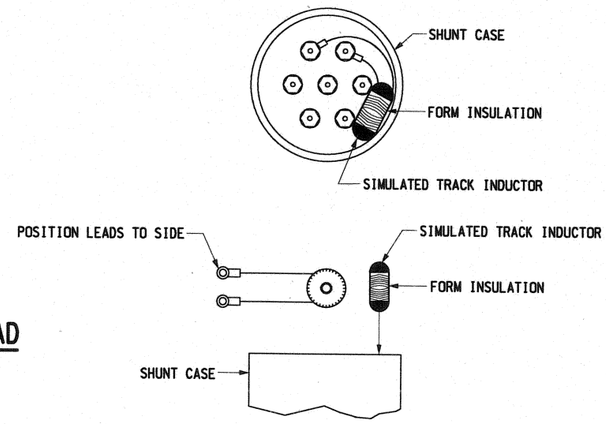
3 DETAIL - TYPICAL TERMINATION SHUNT ON CONCRETE TIES
NTS



4 DETAIL - TYPICAL TERMINATION SHUNT ON CONCRETE TIES
NTS



7 DETAIL - TYPICAL DUMMY LOAD
NTS



8 DETAIL - FREQUENCY SELECT SHUNT (FSS)
(SAFETRANS PART # 62775/62780 SHUNT
NTS

NOTES:

1. FOR RAIL CONNECTION DETAILS SEE PLAN.
2. TOP OF TERMINATION SHUNT TUBE SHALL BE SET FLUSH WITH FINISHED GRADE. PAINT CAP OF TERMINATION SHUNT FLOURESENT ORANGE.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

TERMINATION SHUNT

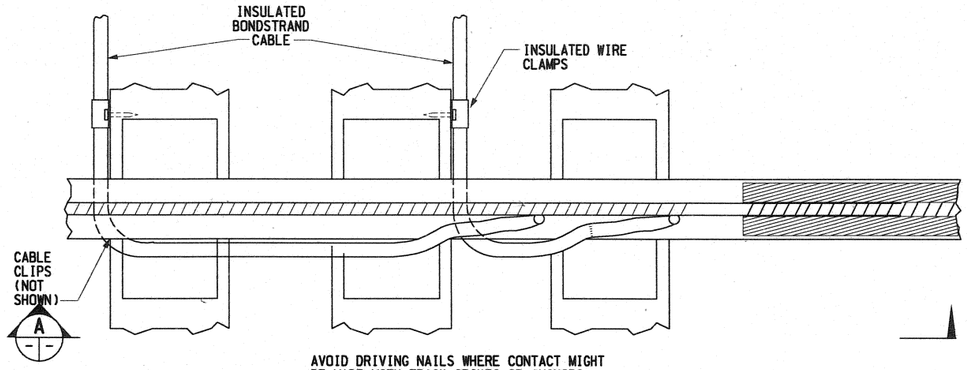
APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-504

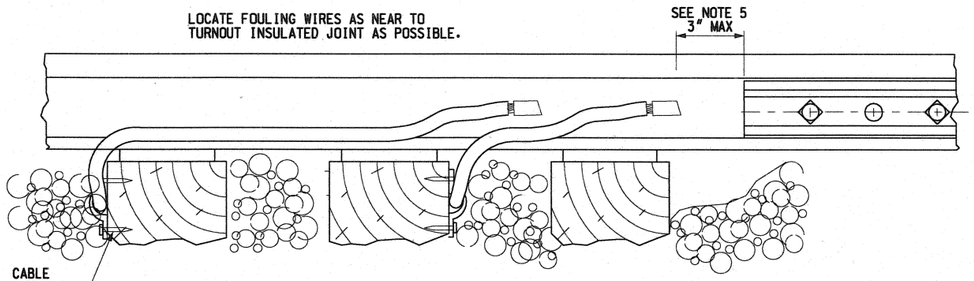
SHEET NO: 1 OF 1

10/4/2013

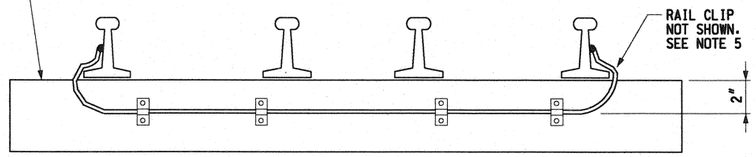
...*RR-504 Termination Shunt



1 DETAIL - TYPICAL FOULING JUMPER RAIL CONNECTION
NTS



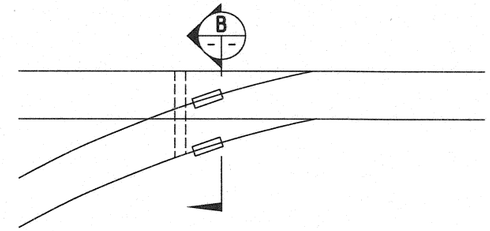
A SECTION - TYPICAL FOULING JUMPER
NTS



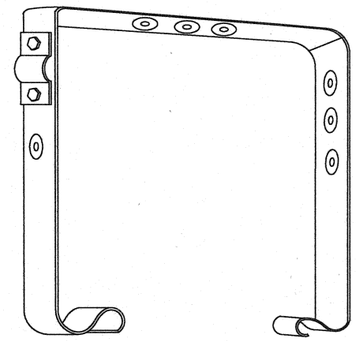
2 DETAIL - TYPICAL FOULING JUMPER ON WOOD TIES
NTS

NOTES:

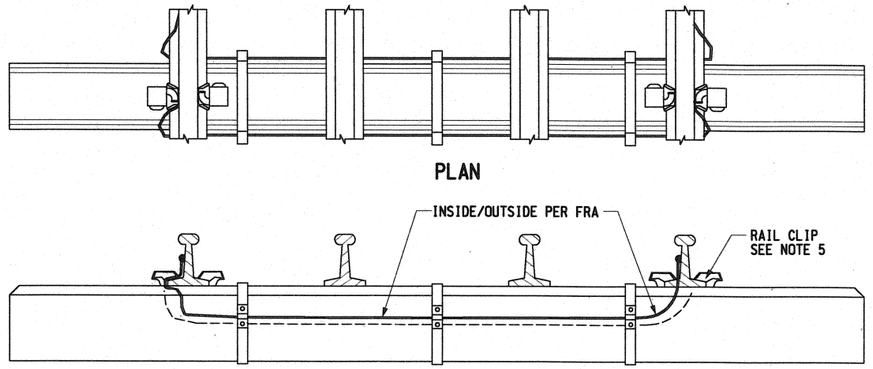
1. USE TWO 3/16" INSULATED CABLES INSTALLED WITH WEB WELD OR EQUIVALENT ATTACHED FROM OPPOSITE SIDES AS SHOWN.
2. FOULING WIRES SHALL BE INSTALLED AS SHOWN ON EACH SIDE OF THE TIE.
3. FOULING WIRES SHALL BE INSTALLED FREE OF SPLICES AND BE EXPOSED FOR VISUAL INSPECTION.
4. AVOID PLACING FOULING JUMPERS WHERE THE JUMPERS ARE SUBJECT TO COMING INTO CONTACT WITH METAL OBJECTS, SUCH AS RAIL ANCHORS.
5. SECURE BONDSTRAND TO BASE OF RAIL WITH HAMMER-ON TYPE RAIL CLIPS SIMILAR TO ERICO PART NO. SBA251 FOR PARALLEL CONNECTIONS AND SBA248B FOR PERPENDICULAR CONNECTIONS. MINIMUM OF ONE RAIL CLIP PER RAIL CONNECTION. WHERE BONDSTRAND RUNS ALONG THE BASE OF RAIL, ADDITIONAL RAIL CLIPS SHALL BE SPACED A MINIMUM OF 18" APART.
6. WHERE BONDSTRAND CONNECTOR CABLE IS USED AS A TRACK CIRCUIT ELEMENT, SUCH AS FOR A FOULING JUMPER, CONNECTION SHALL BE MADE AS SHOWN. OTHERWISE, CONNECTION SHALL BE MADE AS NECESSARY TO MINIMIZE CABLE LENGTHS.



3 DETAIL - TYPICAL FOULING JUMPER LAYOUT
NTS



4 DETAIL - STAINLESS STEEL WIRE STRAP
NTS



B SECTION - TYPICAL FOULING JUMPER ON CONCRETE TIES
NTS

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

FOULING JUMPER PLACEMENT

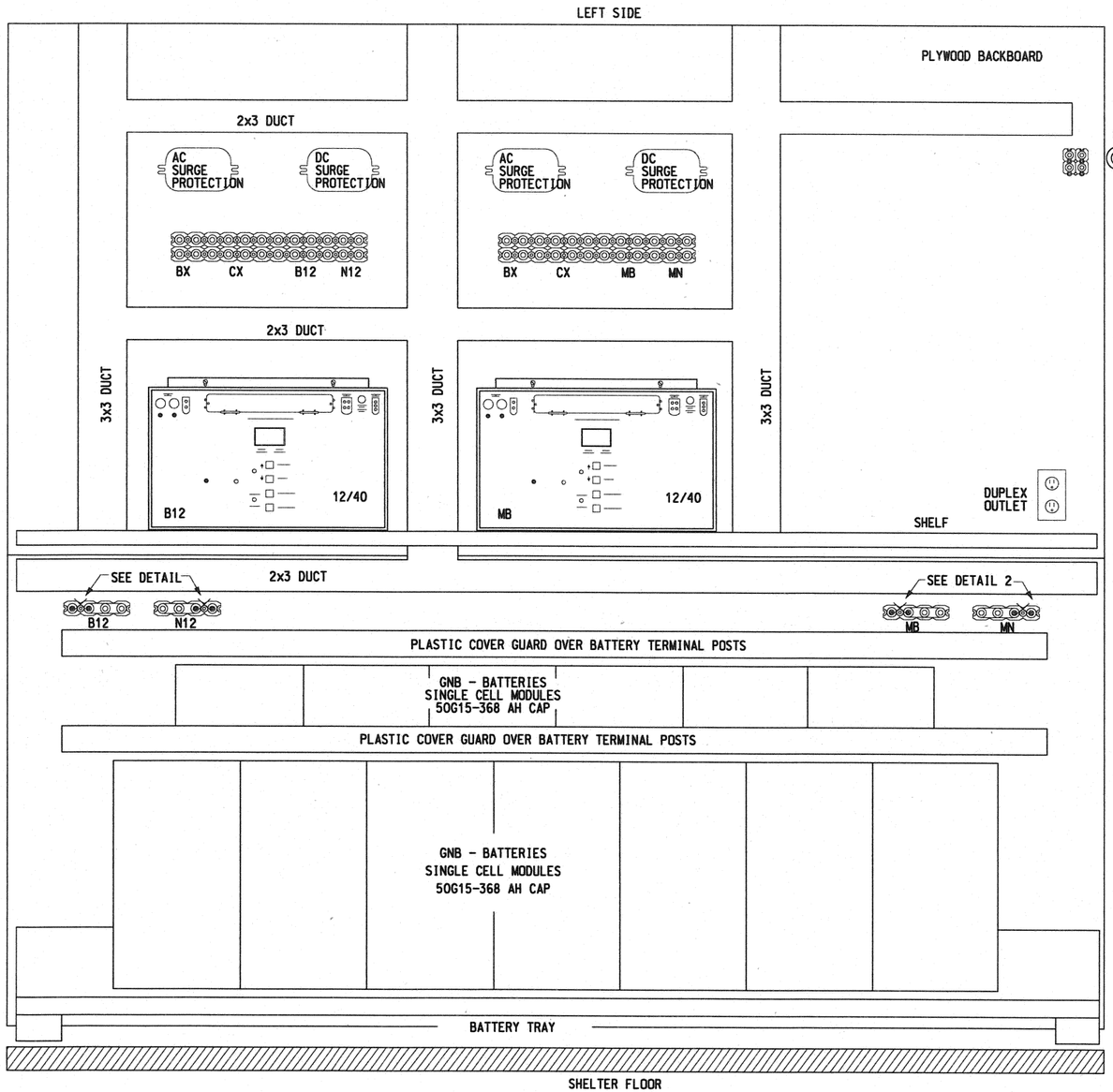
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-505

SHEET NO: 1 OF 1

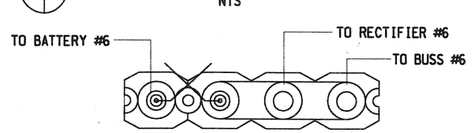
10/4/2013

...*RR-505 Fouling Jumper Placement



A -/- SECTION - BATTERY WALL

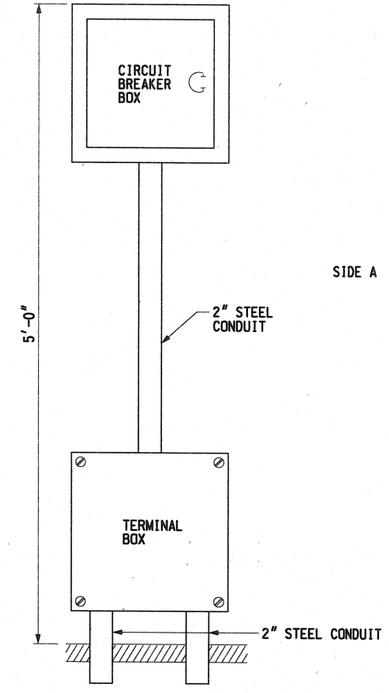
NTS



2 -/- DETAIL - AC POWER CONNECTION

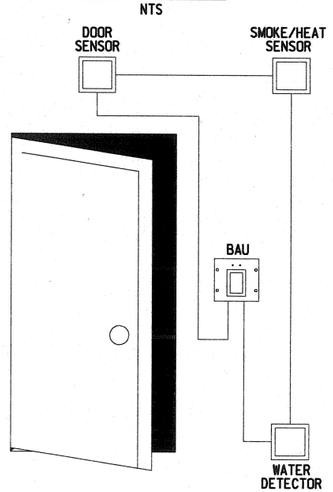
NTS

#9 SOLID WHEN POWER ON
FLASHING WHEN POWER OFF



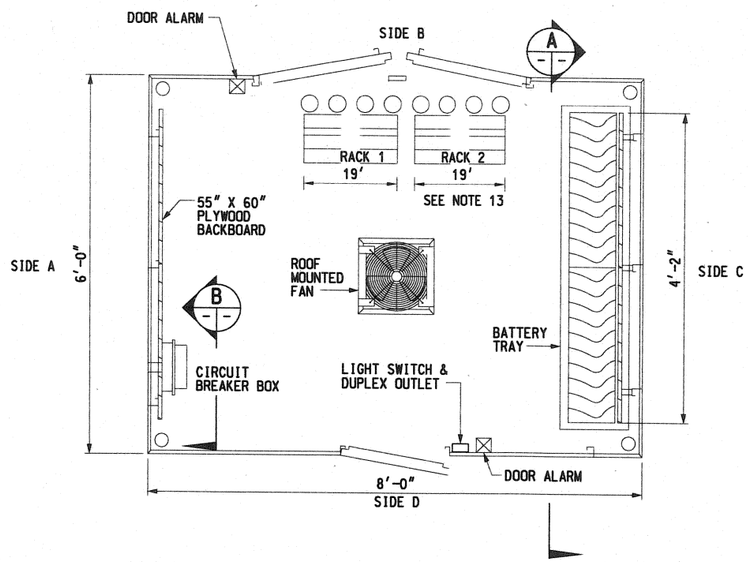
B -/- SECTION - AC POWER CONNECTION

NTS



3 -/- DETAIL - DOOR ALARM

NTS



1 -/- DETAIL - SHELTER PLAN VIEW

NTS

NOTES:

1. SHELTER TO BE INSULATED WITH 2 INCH TERMAX INSULATION.
2. FLOOR AND SHELVES TO BE COVERED WITH 1/8 INCH PYRAMAT RUBBER MAT.
3. OPEN WIRE CHASE TO BE ROUTED ABOVE RACKS, SHELVES AND BACKBOARD.
4. TERMINAL BOARDS AND EQUIPMENT MOUNTING BOARDS ARE TO BE FLAME RETARDENT.
5. MINIMUM OF 4 GROUNDING RODS REQUIRED. ONE IN EACH CORNER. ADDITIONAL GROUNDING RODS MAY BE REQUIRED TO PASS GROUND PATH RESISTANCE TEST. LOCATE IN CLOSE PROXIMITY TO GROUND STUDS. CONNECT GROUNDING RODS TOGETHER WITH TWO (2) #6 SOFT DRAWN COPPER WIRES. WIRES SHALL BE UNDER SHELTER WITH AS MUCH PHYSICAL SEPARATION AS POSSIBLE. DO NOT MAKE ANY SHARP BENDS ON GROUND WIRES.
6. ALL NEW SIGNAL SHELTERS SHALL BE GROUNDED AT EACH CORNER WITH WELDED GROUND CONNECTIONS.
7. THE RAILROAD EMERGENCY 800-NUMBER, NAME OF THE STREET OR ROADWAY CPUC#, AND DOT# TO BE SHOWN ON THE SIDES OF THE SHELTER FACING THE ROADWAY AND FACING THE TRACK. THE LETTERS AND NUMBERS ARE TO BE 4" STENCIL, BLACK IN COLOR. REFER TO MUTCD SECTION 8b.12, FIGURE I-13a, RR-508.
8. DIMENSIONS SHOWN ARE APPROXIMATE FOR 6' X 8' HOUSE. CONTRACTOR SHALL SIZE EACH I/S IN ACCORDANCE WITH EQUIPMENT REQUIRMENTS.
9. WHITE LED 11V, 15W POWER ON INDICATOR (POI) SHALL BE MOUNTED BEHIND LEXAN WINDOW ON SIDE OF SHELTER FACING THE TRACK.
10. DOOR ALARM (DPI, INC MODEL # D-PC-300-10A-2X) OR EQUAL.
11. EVENT RECORDER (MICRO AID PT NO. CWR-72E) OR EQUAL.
12. POWER ON INDICATOR (POI) FACING STREET SIDE.
13. FOR RACK 1 & 2 DETAILS, SEE STD. PLAN RR-507.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

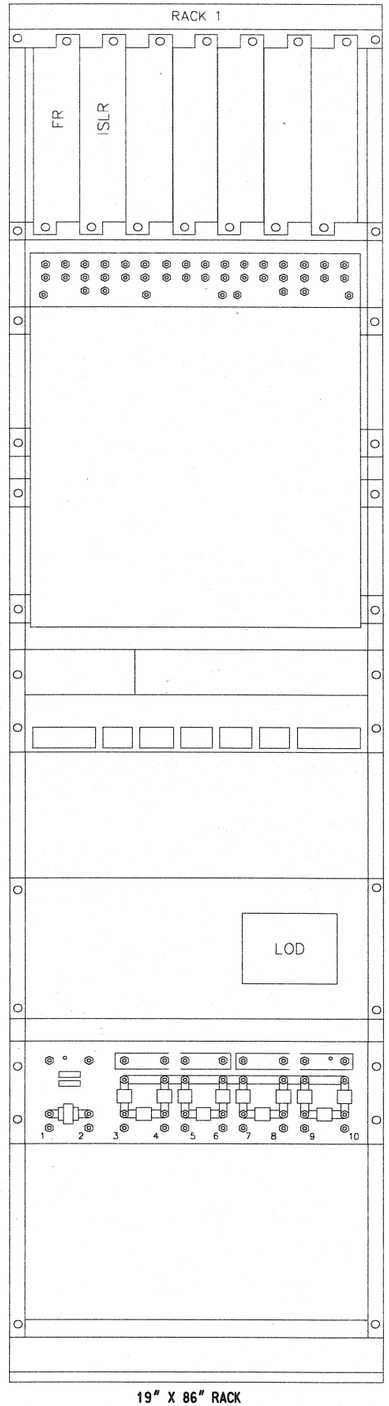
GRADE CROSSING INSTRUMENT SHELTER LAYOUT

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-506

SHEET NO: 1 OF 1

10/4/2013



VITAL RELAYS

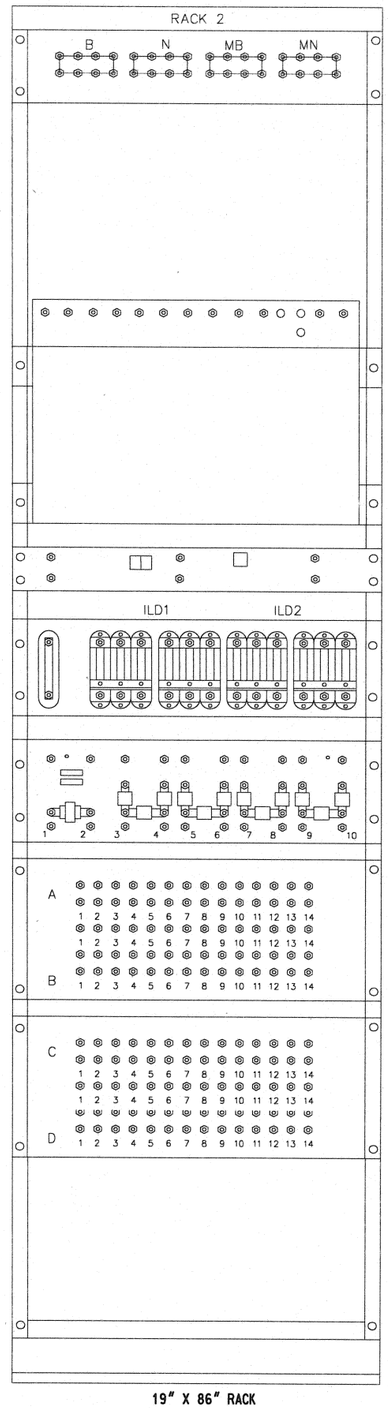
HXP-3R2

CWR-72E
MICRO-AIDE
EVENT RECORDER

GE LOD PANEL

MDSA-2

19" X 86" RACK



BATTERY BUSS PANEL

40A CCU-2

VITAL RELAY DRIVER

RESISTOR PANEL

ARRESTOR PANEL

CABLE PANEL

CABLE PANEL

19" X 86" RACK

NOTES:

1. FOR DETAILS OF TYPICAL INSTRUMENT SHELTER SEE SHT RR-502 1 OF 5.

REVISIONS	
NO.	DATE
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Port of LONG BEACH
The Green Port

RAILROAD
STANDARD PLANS

GRADE CROSSING INSTRUMENT RACK LAYOUT

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-507

SHEET NO: 1 OF 1

10/4/2013

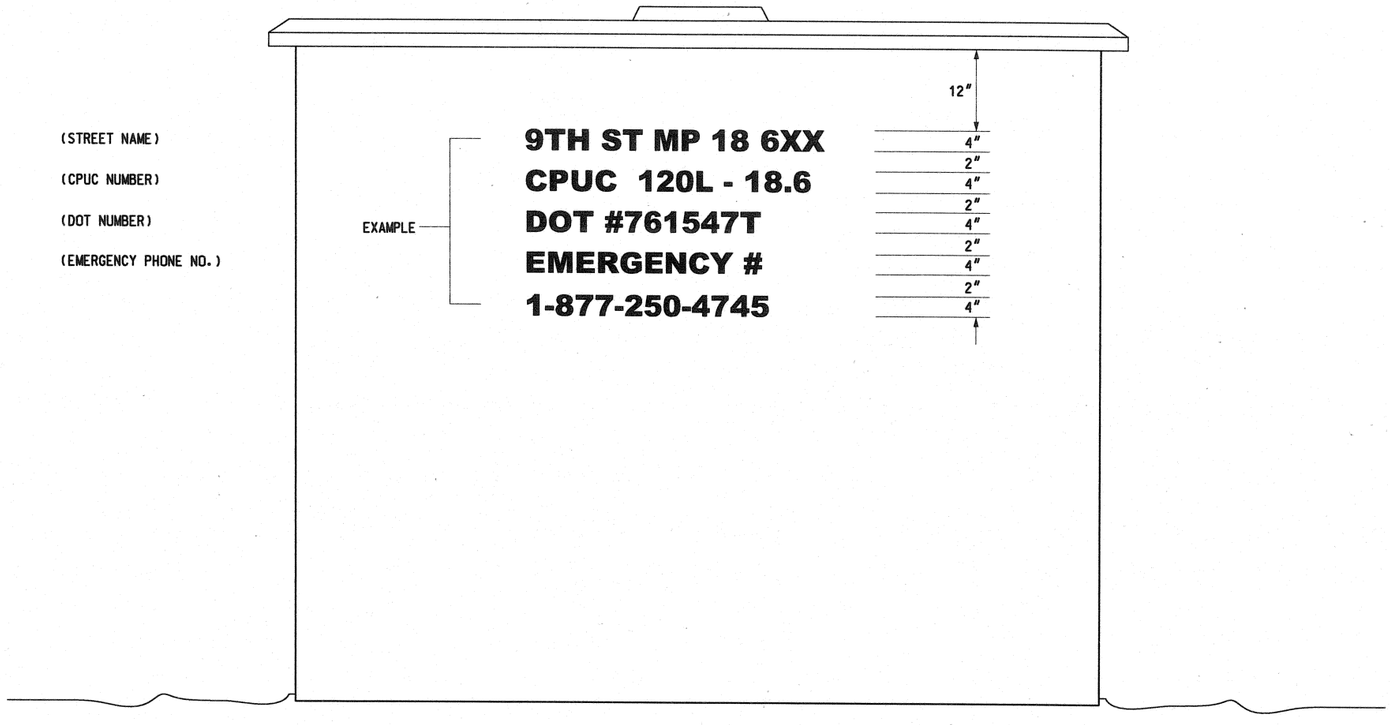
...*RR-507 Grade Crossing Instrument Rack Layout

(STREET NAME)

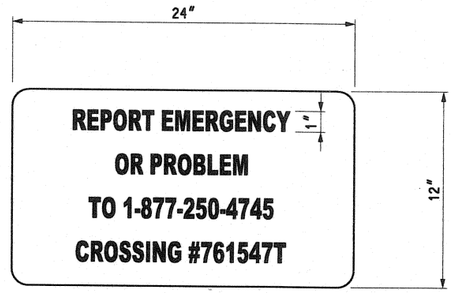
(CPUC NUMBER)

(DOT NUMBER)

(EMERGENCY PHONE NO.)



INSTRUMENT SHELTERS



SIGNS

NOTES:

1. STENCIL LETTERING ON BOTH SIDES OF SHELTER SO AS TO BE VISIBLE FROM ROADWAY AND TRACK.
2. LEGEND TO BE BLACK LETTERS 4" HIGH, CENTERED ON SIDE OF SHELTER.
3. SIGNS WILL ALSO BE REQUIRED AT CROSSING LOCATION PER FRA RULES (2 SIGNS REQUIRED).
4. SIGNS TO BE INSTALLED 12' FROM ℄ OF TRACK AND 9' FROM EDGE OF PUBLIC ROADWAY.

REVISIONS	
NO.	DATE
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

GRADE CROSSING INSTRUMENT SHELTER STENCIL DETAILS

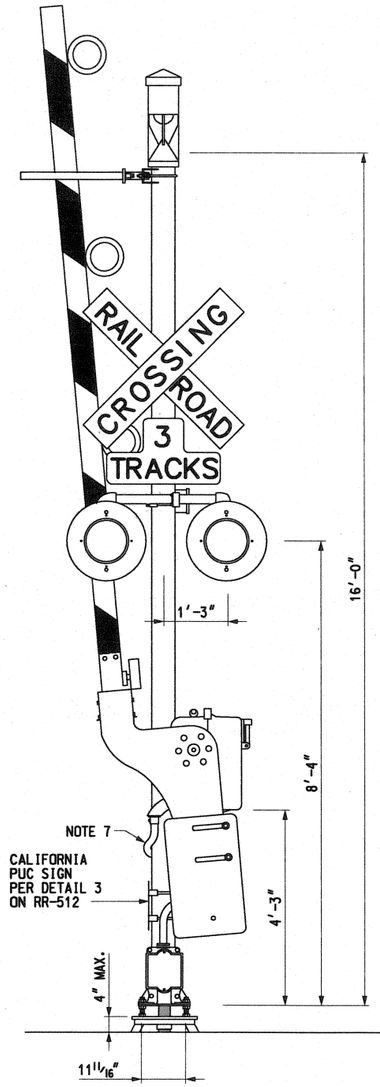
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-508

SHEET NO: 1 OF 1

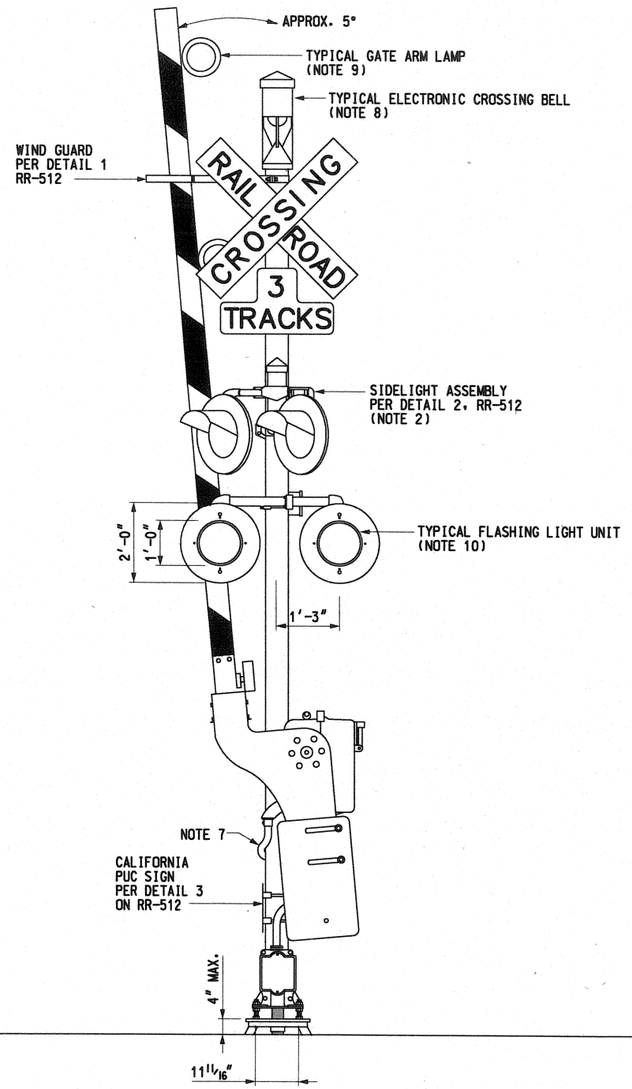
10/4/2013

...*RR-508 Grade Crossing Instrument Shelter Stencil Details



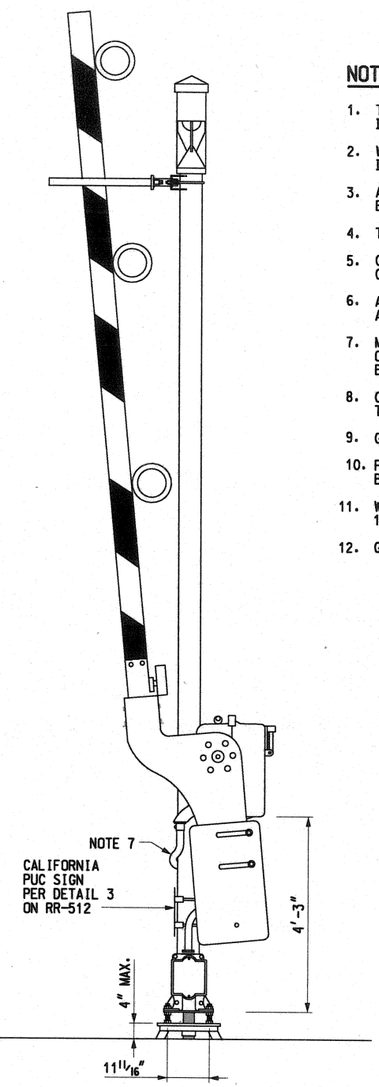
1 DETAIL - TYPICAL CROSSING WARNING GATE WITH FLASHERS

NTS



2 DETAIL - TYPICAL CROSSING WARNING GATE WITH EXTRA FLASHERS

NTS



3 DETAIL - TYPICAL CROSSING WARNING GATE CANTILEVER

NTS

NOTES:

1. TOP OF FOUNDATION TO BE LEVEL WITH CROWN OF ROAD. (MAXIMUM 4 INCHES ABOVE TOP OF GROUND LEVEL).
2. WHEN USED, SIDELIGHT ASSEMBLY TO BE PLACED SO AS NOT TO INTERFERE WITH GATE ARM.
3. ALL PARTS TO BE ALUMINUM IN COLOR EXCEPT VISORS AND BACKGROUNDS WILL BE FLAT BLACK.
4. TRACK SIGN TO BE USED WHEN TWO OR MORE TRACKS CROSS STREET.
5. GATE ARM TO BE ALUMINUM/FIBERGLASS CONFIGURATIONS WITH 4" LED GATE ARM LIGHTS.
6. ALL GATE MECHANISM TO HAVE DOUBLE SIDED COUNTERWEIGHT ARRANGEMENT.
7. METALLIC FLEX CONDUIT TO BE WRAPPED ONCE AROUND THE MAST IN ORDER TO ALLOW MECHANISM TO BE ROTATED SO THAT GATE ARM CAN BE REPLACED WITHOUT BLOCKING THE ROADWAY.
8. CROSSING BELLS SHALL BE OF THE ELECTRONIC TYPE. WC HAYES TYPE.
9. GATE ARM LAMPS SHALL BE LED'S NEG-208-3LEDARRY.
10. FLASHING LIGHT UNITS SHALL BE 12" LED UNITS WITH 24" BACKGROUNDS.
11. WIND BRACKET SHALL BE NEG HIGH WIND BRACKET 36" MOUTH WIG 191036.
12. GATES SHALL BE WC HAYES 3590 SERIES.

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD
STANDARD PLANS

CROSSING WARNING GATE WITH FLASHERS

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-509

SHEET NO: 1 OF 1

10/4/2013

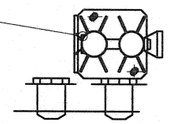
...\RR-509 Crossing Warning Gate With Flasher

GE PROPRIETARY INFORMATION

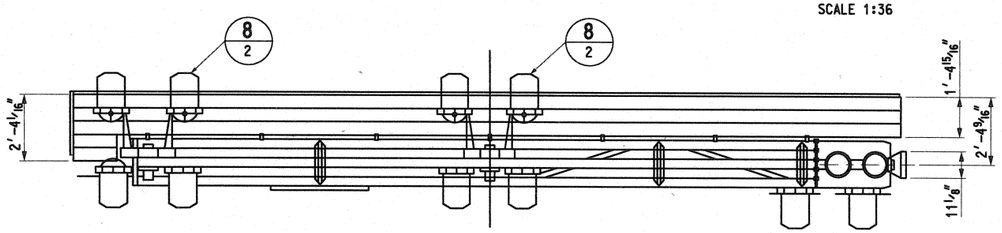
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LIGHTS MOUNTED TO MAIN MAST BY PREPOSITIONED BRKT'S WELDED TO MAST WHEN LOCATION OF SIGNAL IS GIVEN

DETAIL D
SCALE 1:4

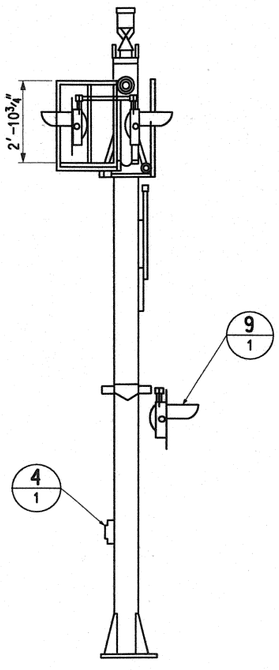


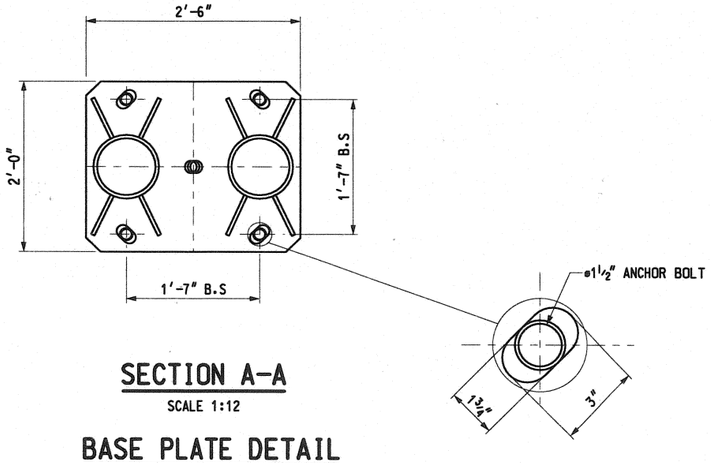
SECTION C-C
SCALE 1:36



ITEM	QTY	DESCRIPTION	PART NO.
1	1	DOUBLE MAST 10" (ALUM) CANTILEVER ARM (17'-26')	54653-01-829
2	1	TRIANGULAR TRUSS CANTILIVER ARM (23'-0")	54637-01-829
3	4	PINNACLE 4" PVC W/ SETSCREW	54-11307
4	1	JCT BOX	54510-03
5	1	PINNACLE 10" MACHINED W/ SETSCREW	54-54002
6	1	PINNACLE 8" MACHINED W/ SETSCREW	54-00513
7	1	ELECTRIC BELL	01035146
8	4	12" F/L 2W LED 24" AL 4" MTG	517G1-G2-103
9	1	12" F/L 1W LED 24" AL BRKT MTG	517G1-G2-607
10	1	RODENT PLATE 8" & 10" DOUBLE MAST	54-00724
11	1	RODENT FILLER	541323-01
12	12	FLANGE BOLT	54-54458
13	1	LADDER GUARD 9" WIDE	54-00121
14	1	LADDER GUARD LOCK BRACKET	54-00131
15	2 EA	COVER PLATE FOR 2" x 4" HOLE	54-00265

(#) ITEM
QUANTITY



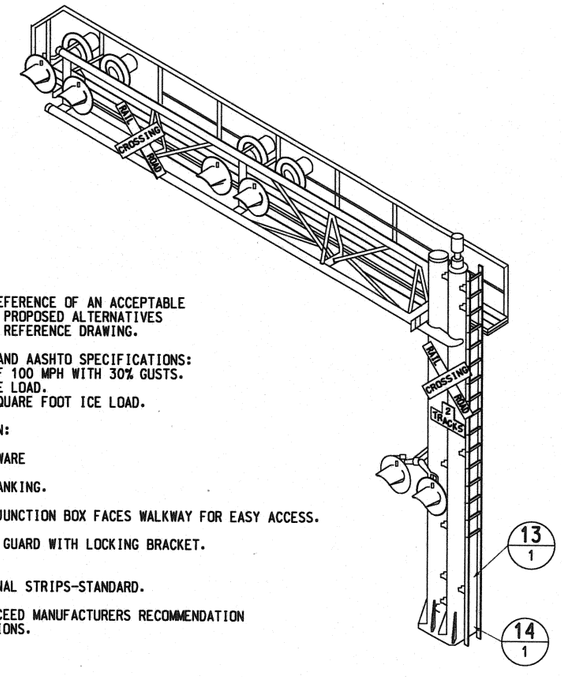


SECTION A-A
SCALE 1:12

BASE PLATE DETAIL

DETAIL OF ANCHOR BOLT
SCALE 1:4

DETAIL E
SCALE 1:4



NOTES:

1. THIS DRAWING DEPICTS A REFERENCE OF AN ACCEPTABLE CANTILEVER ASSEMBLY. ALL PROPOSED ALTERNATIVES MUST MEET OR EXCEED THIS REFERENCE DRAWING.
2. MEETS OR EXCEEDS A.A.R. AND AASHTO SPECIFICATIONS:
   -WITHSTANDS WIND LOADS OF 100 MPH WITH 30% GUSTS.
   -SUPPORTS 500 POUNDS LIVE LOAD.
   -SUPPORTS 3 POUNDS PER SQUARE FOOT ICE LOAD.
3. MATERIALS OF CONSTRUCTION:
   ALL ALUMINUM
   ALL STAINLESS STEEL HARDWARE
4. WALKWAY IS HEAVY DUTY PLANKING.
5. FLASHING LIGHT CROSSARM JUNCTION BOX FACES WALKWAY FOR EASY ACCESS.
6. ASSEMBLY INCLUDES LADDER GUARD WITH LOCKING BRACKET.
7. MAST JUNCTION BOX:
   -7"x10", 12 DOUBLE TERMINAL STRIPS-STANDARD.
8. FOUNDATION TO MEET OR EXCEED MANUFACTURERS RECOMMENDATION FOR EXISTING SOIL CONDITIONS.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

CROSSING WARNING GATE CANTILEVERS 12'-26'

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-510

SHEET NO: 1 OF 1

10/4/2013

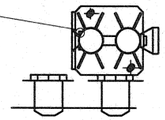
...*RR-510 Crossing Warning Gate Cantilevers 12'-26'

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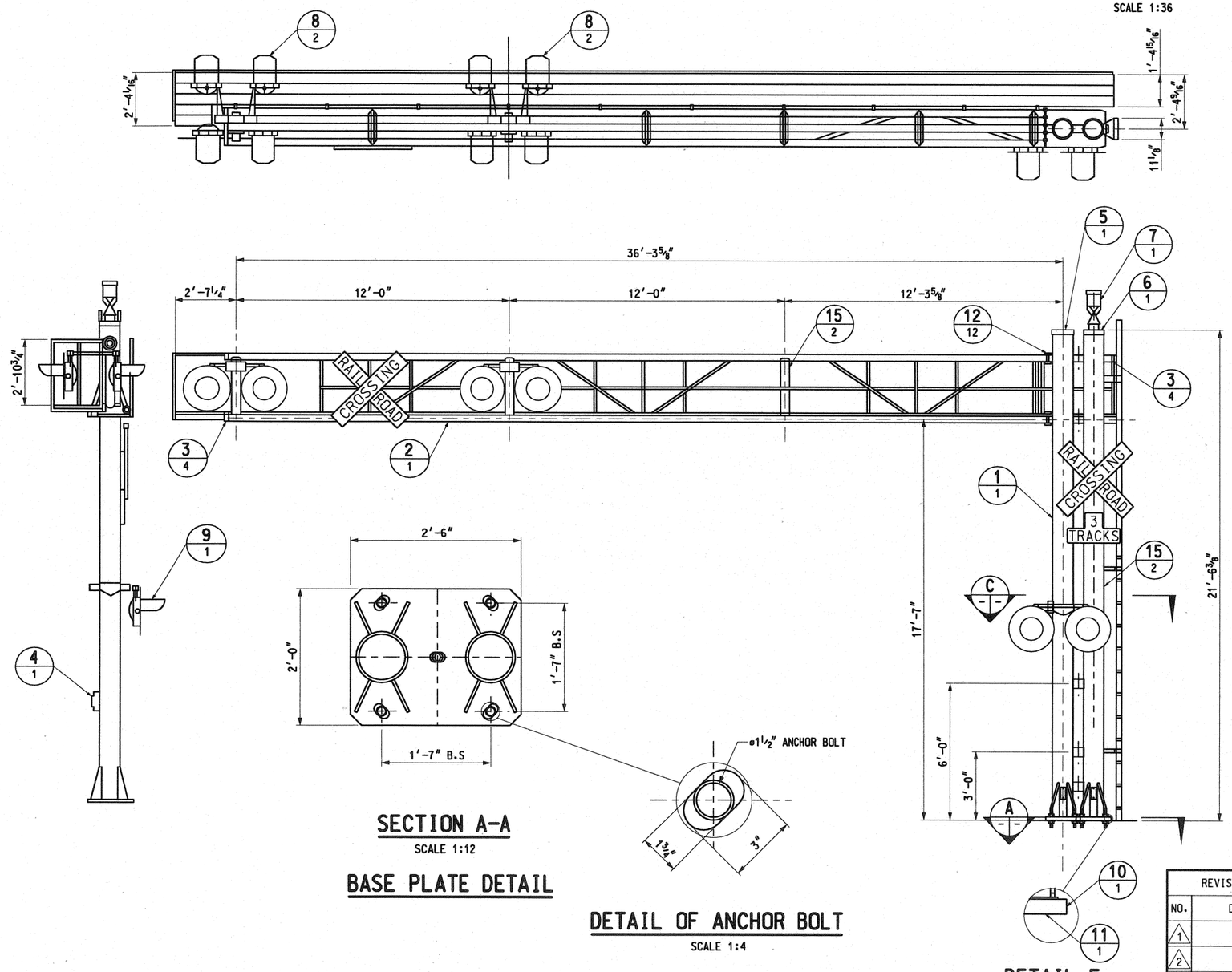
LIGHTS MOUNTED TO MAIN MAST BY PREPOSITIONED BRKT'S WELDED TO MAST WHEN LOCATION OF SIGNAL IS GIVEN

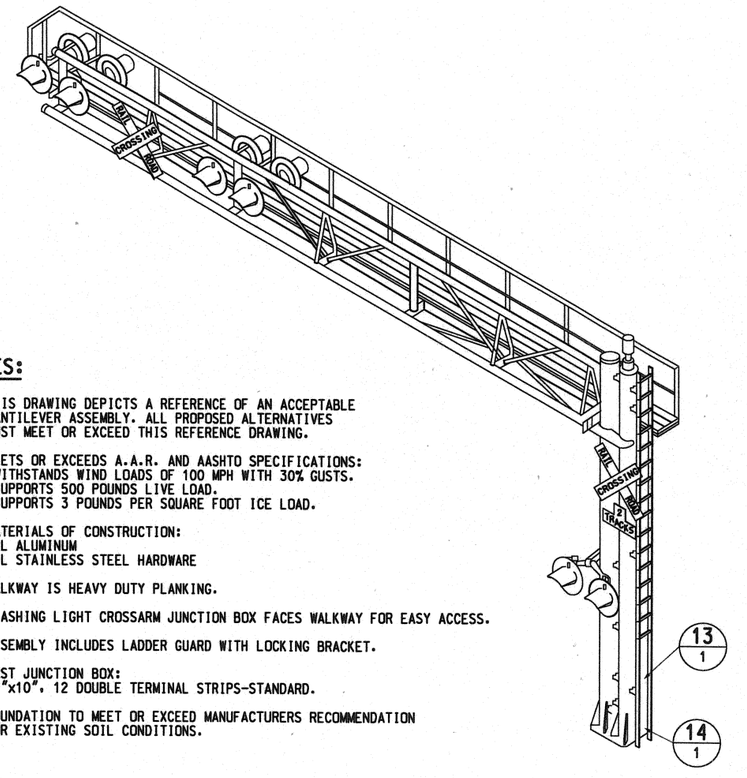
DETAIL D
SCALE 1:4



SECTION C-C
SCALE 1:36

ITEM	QTY	DESCRIPTION	PART NO.
1	1	DOUBLE MAST 10" (ALUM) CANTILEVER ARM (31'-40')	54653-01-829
2	1	TRIANGULAR TRUSS CANTILIVER ARM (37'-0")	54637-01-829
3	4	PINNACLE 4" PVC W/ SETSCREW	54-11307
4	1	JCT BOX	54510-03
5	1	PINNACLE 10" MACHINED W/ SETSCREW	54-54002
6	1	PINNACLE 8" MACHINED W/ SETSCREW	54-00513
7	1	ELECTRIC BELL	01035146
8	4	12" F/L 2W LED 24" AL 4" MTG	517G1-G2-103
9	1	12" F/L 1W LED 24" AL BRKT MTG	517G1-G2-607
10	1	RODENT PLATE 8" & 10" DOUBLE MAST	54-00724
11	1	RODENT FILLER	541323-01
12	12	FLANGE BOLT	54-54458
13	1	LADDER GUARD 9" WIDE	54-00121
14	1	LADDER GUARD LOCK BRACKET	54-00131
15	2 EA	COVER PLATE FOR 2" x 4" HOLE	54-00265





NOTES:

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2. MEETS OR EXCEEDS A.A.R. AND AASHTO SPECIFICATIONS:
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   -SUPPORTS 500 POUNDS LIVE LOAD.
   -SUPPORTS 3 POUNDS PER SQUARE FOOT ICE LOAD.
3. MATERIALS OF CONSTRUCTION:
   ALL ALUMINUM
   ALL STAINLESS STEEL HARDWARE
4. WALKWAY IS HEAVY DUTY PLANKING.
5. FLASHING LIGHT CROSSARM JUNCTION BOX FACES WALKWAY FOR EASY ACCESS.
6. ASSEMBLY INCLUDES LADDER GUARD WITH LOCKING BRACKET.
7. MAST JUNCTION BOX:
   -7"x10", 12 DOUBLE TERMINAL STRIPS-STANDARD.
8. FOUNDATION TO MEET OR EXCEED MANUFACTURERS RECOMMENDATION FOR EXISTING SOIL CONDITIONS.

SECTION A-A
SCALE 1:12

BASE PLATE DETAIL

DETAIL OF ANCHOR BOLT
SCALE 1:4

DETAIL E
SCALE 1:4

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

CROSSING WARNING GATE CANTILEVERS 27'-40'

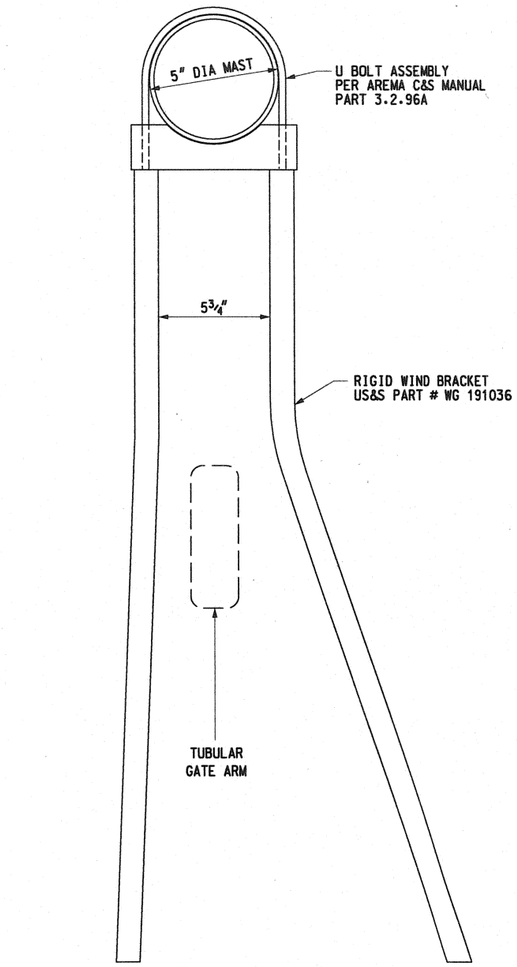
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-511

SHEET NO: 1 OF 1

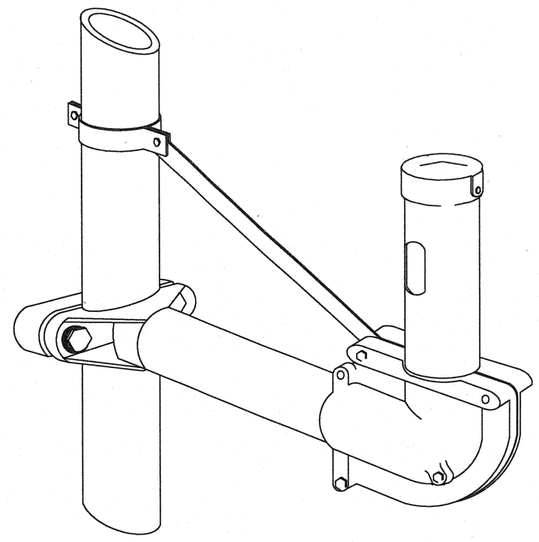
10/4/2013

...*RR-511 Crossing Warning Gate Cantilevers 27'-40'



1 DETAIL - TYPICAL WIND GUARD FOR 5" MAST

NTS

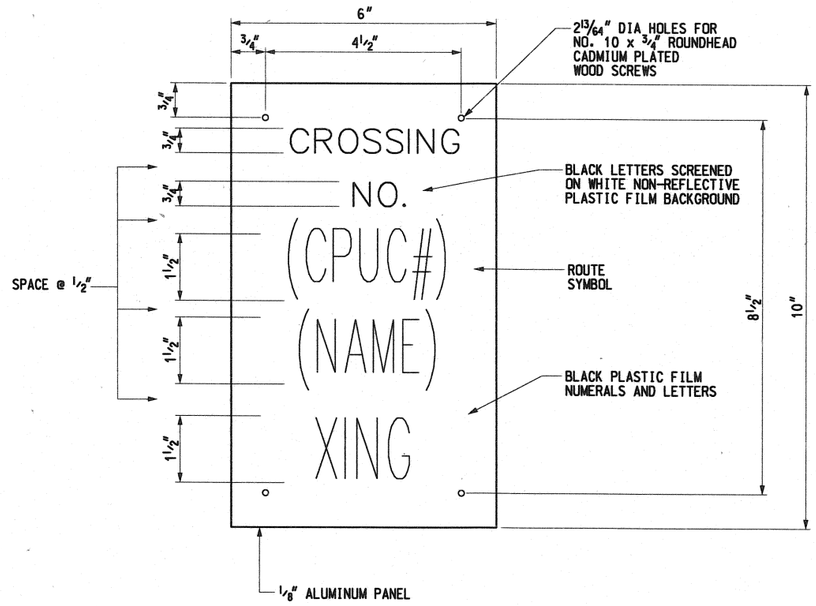


2 DETAIL - TYPICAL SIDELIGHT FLASHER ASSEMBLY FOR 5" MAST

NTS

NOTES:

1. ASSEMBLY TO BE MOUNTED SO AS NOT TO INTERFERE WITH GATE ARM.
2. ROTATE UPPER PIPE AS NECESSARY TO ALIGN SIDELIGHTS TOWARD TRAFFIC.



3 DETAIL - TYPICAL CALIFORNIA HIGHWAY CROSSING SIGN

NTS

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Port of LONG BEACH
The Green Port

RAILROAD
STANDARD PLANS

CROSSING WARNING HARDWARE

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

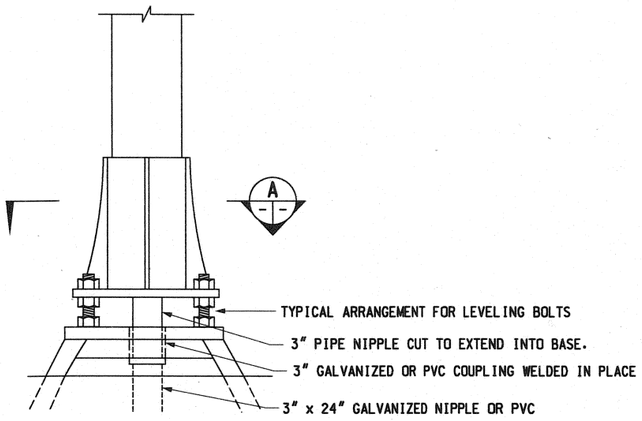
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-512

SHEET NO: 1 OF 1

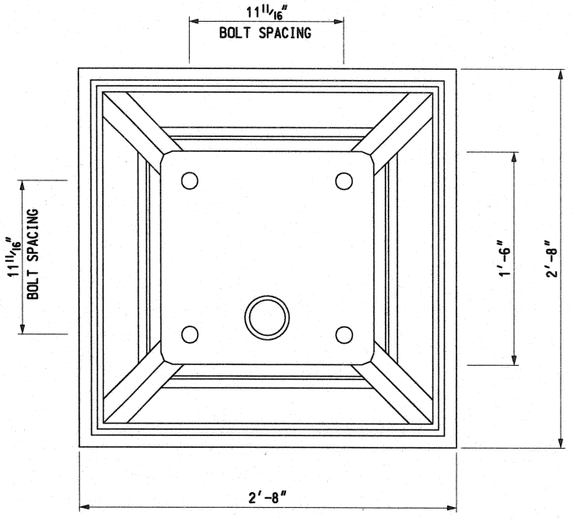
10/4/2013

...*RR-512 Crossing Warning Hardware



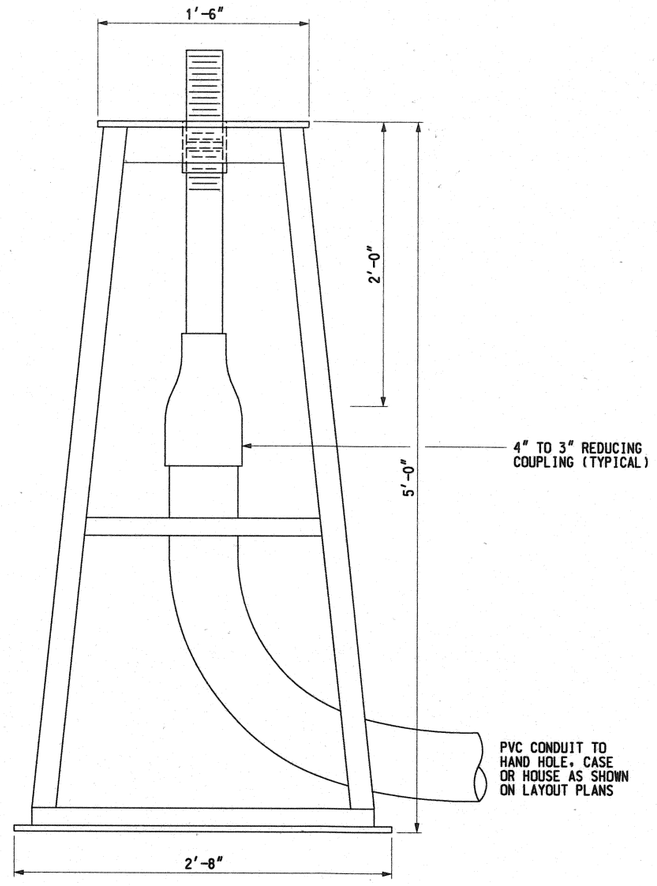
1 DETAIL - TYPICAL WARNING DEVICE MOUNTING

NTS



A SECTION

NTS



2 DETAIL - TYPICAL GALVANIZED STEEL FOUNDATION

NTS

NOTES:

1. FOUNDATIONS TO BE HOT DIPPED GALVANIZED AND FURNISHED WITH 4 BOLTS 1" x 8", WITH HEX HEADS.
2. BOLTS TO BE THREADED TO ALLOW FOR LEVELING AND FURNISHED WITH 12 NUTS AND 12 FLAT WASHERS.
3. PVC CONDUIT BENDS TO BE MANUFACTURED BENDS ONLY. BEND RADIUS TO BE MINIMUM OF 36".

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

CROSSING GATE FOUNDATION

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-513

SHEET NO: 1 OF 1

10/4/2013

...*RR-513 Crossing Gate Foundation

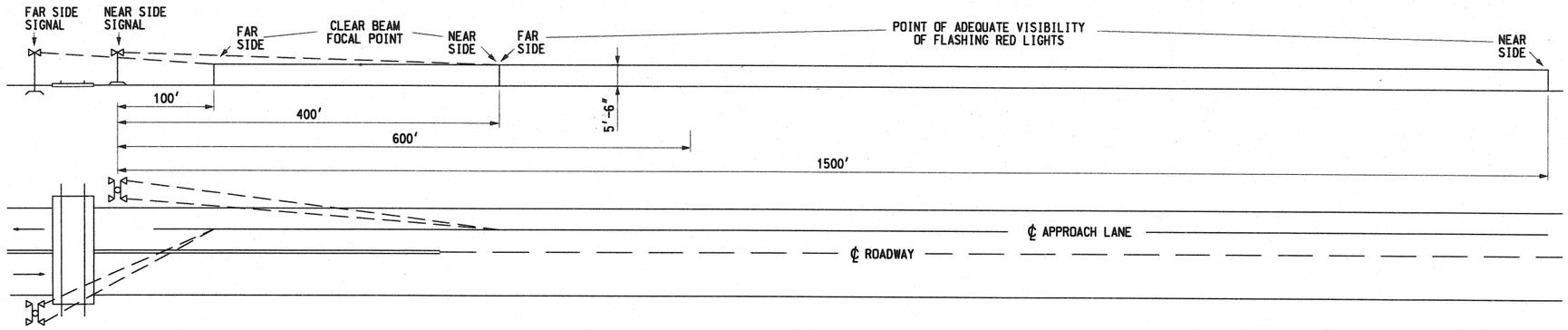


FIGURE 1
SINGLE LANE
GROUND FLASHERS
WITH BACK LIGHTS

1 DETAIL - SINGLE LANE APPROACH GROUND FLASHERS WITH BACK LIGHTS

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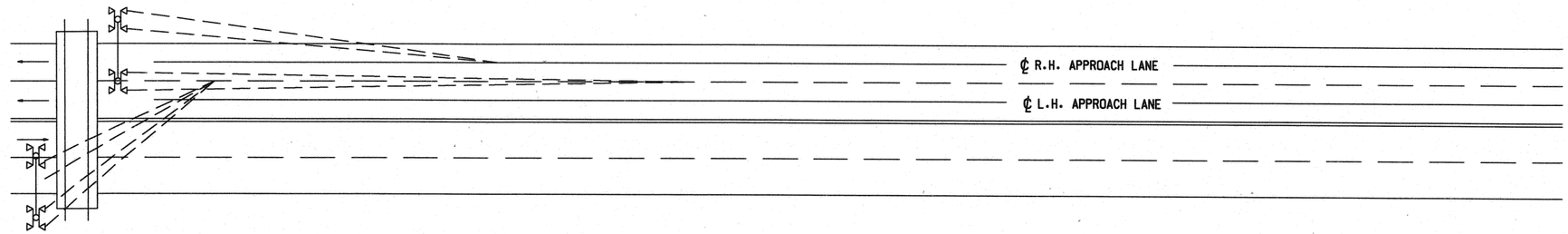


FIGURE 2
TWO LANE APPROACH
CANTILEVER FLASHERS
WITH BACK LIGHTS

2 DETAIL - TWO LANE APPROACH CANTILEVER FLASHERS WITH BACK LIGHTS

NTS

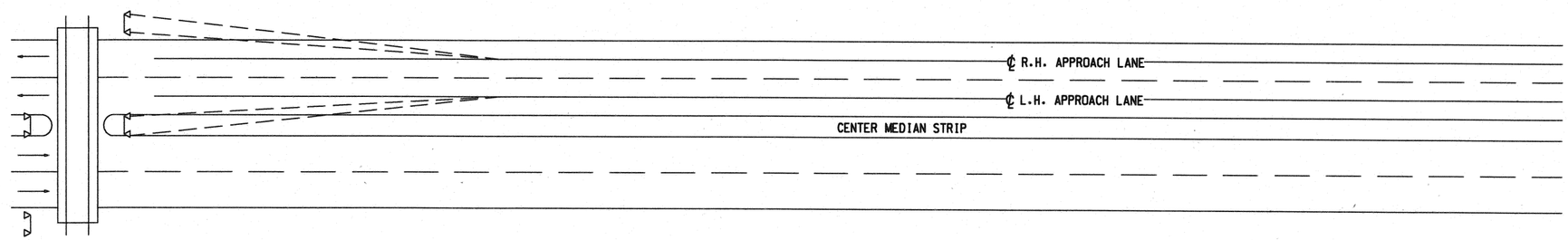


FIGURE 3
TWO LANE APPROACH
GROUND FLASHERS ON
R.H. SIDE AND ONE
MEDIAN - NO BACK
LIGHTS

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

NTS

NOTES:

1. SEE AAR SIGNAL MANUAL PART 3.3.5 FOR OTHER APPLICATIONS.
2. FOR DISTANCES FROM SIGNALS TO FOCAL POINTS, DISTANCE ARE SHOWN ABOVE DETAIL 1.

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Port of LONG BEACH
The Green Port

RAILROAD
STANDARD PLANS

CROSSING WARNING LIGHT ALIGNMENT

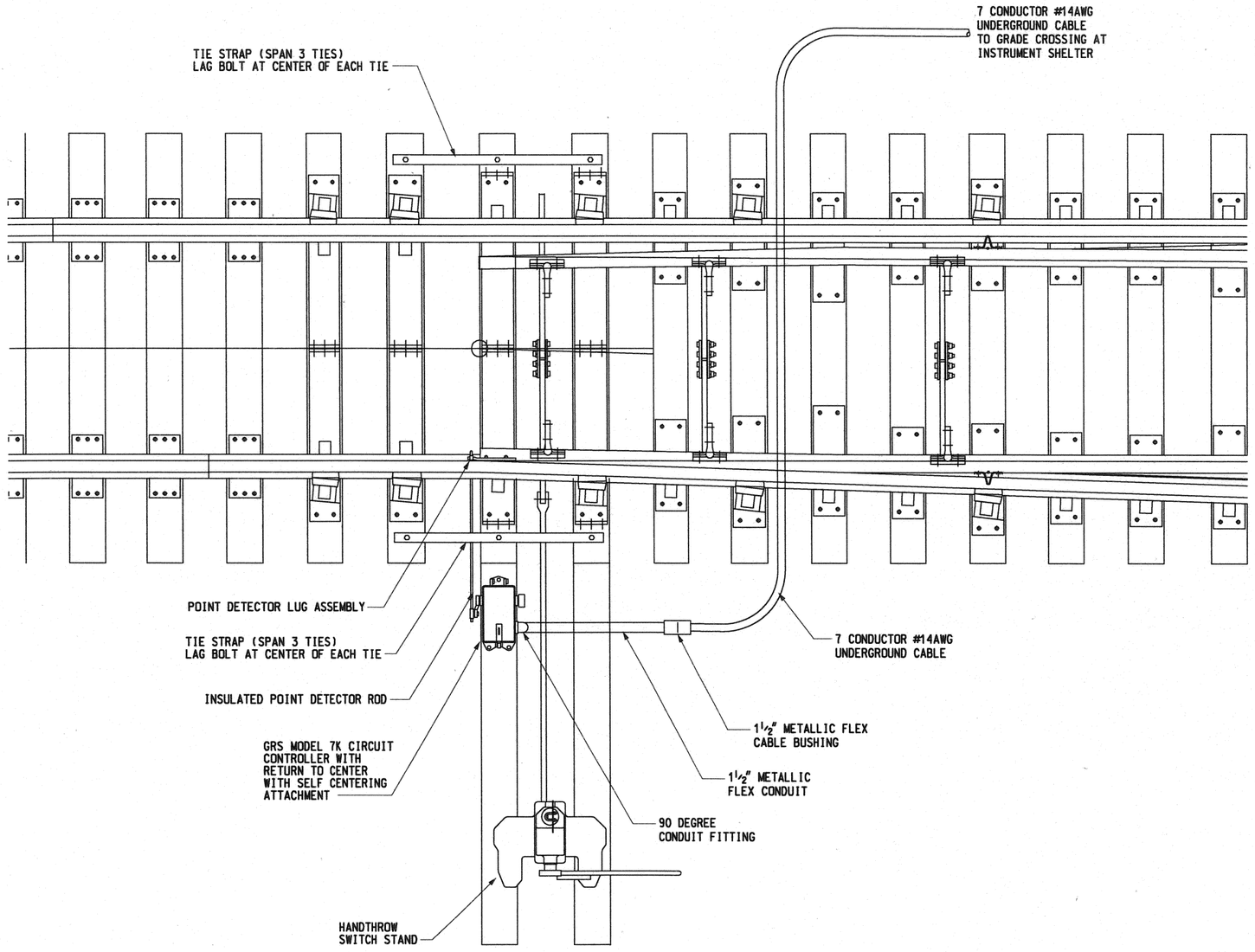
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SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-514

SHEET NO: 1 OF 1

10/4/2013

...*RR-514 Crossing Warning Light Alignment



SWITCH CIRCUIT CONTROLLER

NTS

NOTES:

1. CONTRACTOR SHALL FURNISH AND INSTALL SWITCH CIRCUIT CONTROLLER AND ALL ASSOCIATED RODS, TIE STRAPS, AND MOUNTING HARDWARE.
2. THE CONTRACTOR SHALL FURNISH AND INSTALL A NEW 7 CONDUCTOR #14AWG SIGNAL CABLE BETWEEN THE CONNECTION TO THE NEW CIRCUIT CONTROLLER AND THE NEW INSTRUMENT HOUSE AT THE CROSSING.
3. THE DIRECT BURIED CABLE SHALL BE INSTALLED AT A MINIMUM DEPTH OF 36" BELOW FINISHED GRADE.

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Port of LONG BEACH
The Green Port

RAILROAD
STANDARD PLANS

SWITCH CIRCUIT CONTROLLER AT A TURNOUT SWITCH

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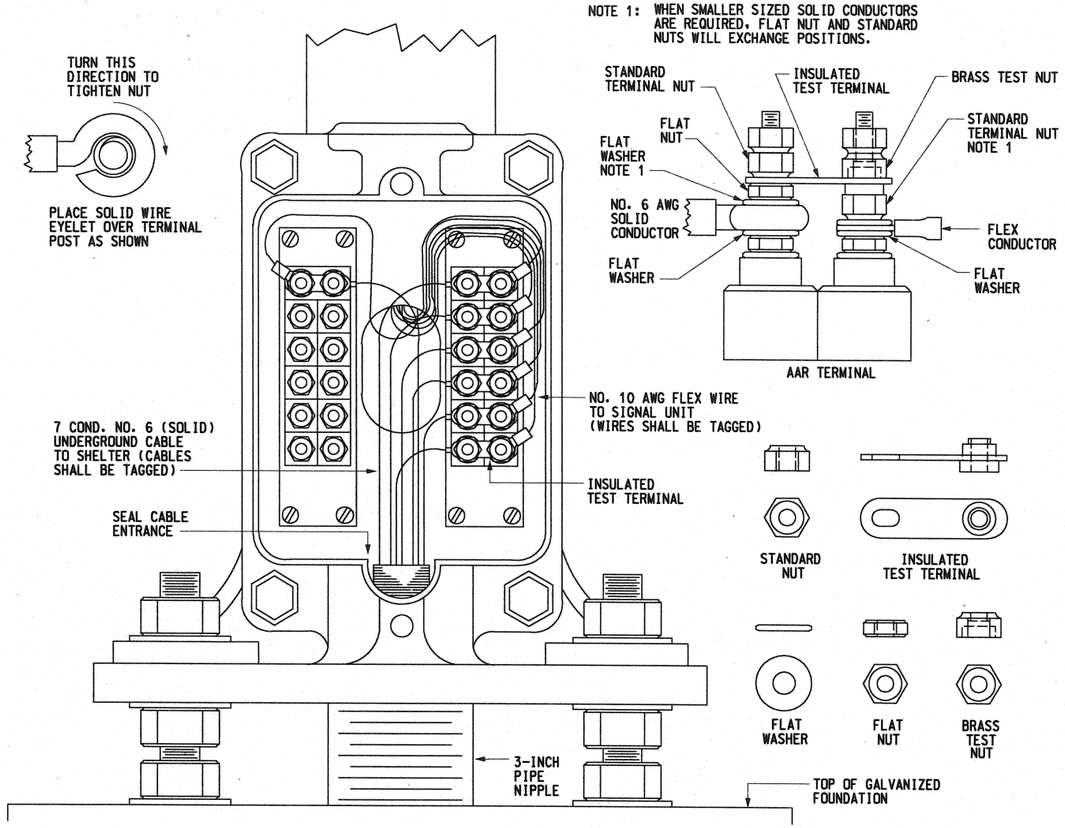
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-515

SHEET NO: 1 OF 1

10/4/2013

...*RR-515 Switch Circuit Controller at a Turnout Switch



NOTE 1: WHEN SMALLER SIZED SOLID CONDUCTORS ARE REQUIRED, FLAT NUT AND STANDARD NUTS WILL EXCHANGE POSITIONS.

CABLE TERMINATION

NTS

NOTES:

1. INSULATION ON SOLID CONDUCTORS SHALL BE REMOVED AND THE EXPOSED BARE WIRE THOROUGHLY CLEANED TO PROVIDE HIGH CONDUCTIVITY, TAKING CARE NOT TO DAMAGE WIRE.
2. 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.
3. 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.
4. INSULATION ON FLEX CONDUCTORS SHALL BE REMOVED AND THE EXPOSED BARE WIRE THOROUGHLY CLEANED TO PROVIDE HIGH CONDUCTIVITY.
5. TERMINALS SHALL BE ATTACHED TO FLEX CONDUCTORS. ONLY SDNR APPROVED TERMINALS SHALL BE UTILIZED. A COMPRESSION TOOL RECOMMENDED BY THE MANUFACTURER OF THE TERMINAL SHALL BE USED TO ATTACH THE TERMINAL.
6. A FLAT WASHER SHALL BE PLACED ON THE BINDING POST. THE TERMINAL SHALL THEN BE PLACED ON THE POST FOLLOWED BY ANOTHER FLAT WASHER. IF APPLICABLE PLACE THE SECOND TERMINAL ON THE POST FOLLOWED BY A FLAT WASHER. A NUT SHALL BE APPLIED AND SERCURELY TIGHTENED WITH A TERMINAL WRENCH.
7. AN INSULATED TEST TERMINAL SHALL BE INSTALLED ONCE THE SOLID CONDUCTORS AND TERMINALS ARE ATTACHED. THE TEST TERMINAL SHALL BE SECURED WITH A SINGLE TERMINAL NUT AND THE CIRCUIT "CLOSED" BY APPLYING THE BRASS NUT. A STANDARD NUT SHALL THEN BE PLACED ON EACH TERMINAL POST TO LOCK DOWN THE INSULATED TEST TERMINAL NUTS.
8. FLEX CONDUCTORS SHALL BE TAGGED USING PHL APPROVED TAGS.
9. WHERE POSSIBLE, SPARE SOLID CABLE CONDUCTORS SHALL BE ATTACHED TO SPARE BINDING POSTS. NOT MORE THAN ONE SOLID CONDUCTOR SHALL BE SECURED TO A POST.
10. NOMENCLATURE TAGS FOR ALL WIRES AND CABLES.

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Port of LONG BEACH
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RAILROAD STANDARD PLANS

TYPICAL CABLE TERMINATION

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-516

SHEET NO: 1 OF 1

10/4/2013

GENERAL NOTES:

1. CONTRACTOR SHALL PROVIDE A COMPLETE WORKING SIGNAL SYSTEM AS SHOWN ON THE CONTRACT DRAWINGS AND AS SPECIFIED. CONTRACTOR SHALL RELOCATE AND/OR REUSE SYSTEMS AND MATERIALS AS SHOWN ON THE CONTRACT DRAWINGS. ALL OTHER SYSTEMS AND MATERIALS SHALL BE NEW.

2. CONTRACTOR SHALL REFER TO ACTA SIGNAL STANDARDS FOR EXPLANATION OF SYMBOLS AND NOMENCLATURE.

3. CONTRACTOR SHALL MAKE ALL NECESSARY MODIFICATIONS TO THE EXISTING SIGNAL SYSTEM; PROTECT OR RELOCATE EXISTING CABLING, SIGNALS, SWITCHES, AND INSTRUMENT HOUSINGS; AND MODIFY ASSOCIATED SIGNAL AND HIGHWAY GRADE CROSSING SYSTEMS TO ENSURE THESE EXISTING SYSTEMS OPERATE AS INTENDED DURING CONSTRUCTION AND INSTALLATION OF THE NEW SIGNAL SYSTEM. CONTRACTOR SHALL TAKE ALL MEASURES NECESSARY TO PROTECT OPERATING SIGNAL AND HIGHWAY GRADE CROSSING SYSTEMS TO ENSURE TRAIN OPERATIONS ARE NOT INTERRUPTED.

4. CONTRACTOR SHALL COORDINATE ALL SIGNAL RELATED WORK WITH PHL. NO MODIFICATIONS, ADJUSTMENTS, REPLACEMENTS, OR REPAIRS SHALL BE MADE WITHOUT PHL'S REPRESENTATIVE PRESENT. THE CONTRACTOR SHALL PERFORM ALL TESTS REQUIRED BY CFR 49, PARTS 234 AND 236 UPON COMPLETION OF ANY MODIFICATIONS, ADJUSTMENTS, REPLACEMENTS, OR REPAIRS. THE CONTRACTOR SHALL RECORD THE REQUIRED TEST AND INSPECTION ON PHL TEST FORMS AND SHALL PROVIDE ORIGINAL FORM TO PHL AND A COPY TO THE ENGINEER.

5. CONTRACTOR SHALL INSTALL NECESSARY TEMPORARY APPARATUS AND CIRCUITRY TO KEEP EACH PHASE OF THE EXISTING SIGNAL SYSTEMS IN OPERATION. NO ADDITIONAL COMPENSATION SHALL BE PAID FOR TEMPORARY WORK. THE CONTRACTOR SHALL REMOVE AND TURN OVER TO PHL ALL SIGNAL APPARATUS USED IN TEMPORARY WORK UNLESS SUCH APPURTENANCES ARE UTILIZED IN THE FINAL SIGNAL SYSTEM.

6. CONTRACTOR SHALL TAKE NO ACTION WHICH WILL VIOLATE ANY RULE OR REGULATION AS SPECIFIED BY CFR 49, THE GENERAL CODE OF OPERATING RULES, TIMETABLE INSTRUCTIONS, GENERAL ORDER, BULLETIN, OR SPECIAL INSTRUCTION; WHICH WILL REDUCE THE INTEGRITY OF THE SIGNAL SYSTEM; OR ENDANGER RAILROAD PERSONNEL, THE PUBLIC, OR EMPLOYEES.

7. EXISTING OR TEMPORARY EQUIPMENT RETIRED FROM SERVICE SHALL BE DELIVERED TO PHL WITHIN 48 HOURS OF BEING REMOVED FROM OPERATION. CONTRACTOR SHALL SECURE AND PROTECT SUCH MATERIAL FROM DAMAGE AND DELIVER TO PHL IN THE SAME CONDITION THE MATERIAL WAS IN PRIOR TO REMOVAL.

8. CONTRACTOR SHALL MAKE ALL NECESSARY ADJUSTMENTS TO HIGHWAY GRADE CROSSING TRAIN DETECTION EQUIPMENT TO ENSURE CROSSING WARNING DEVICES OPERATE AS INTENDED. CONTRACTOR SHALL TEST EACH HIGHWAY GRADE CROSSING SYSTEM, WHICH MAY BE AFFECTED BY THE CONTRACTOR'S WORK, UPON CONNECTING ANY SIGNALIZATION EQUIPMENT TO THE TRACK OR MAKING MODIFICATIONS TO THE TRACK STRUCTURE. CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL, OR OTHER MEANS AS APPROVED BY THE ENGINEER, TO ENSURE HIGHWAY GRADE CROSSING WARNING DEVICES ARE NOT ACTIVATED UNNECESSARILY AS A RESULT OF THE CONTRACTOR'S WORK.

9. THE VARIABLE RESISTOR USED TO ADJUST THE VOLTAGE APPLIED TO THE TRACK SHALL NOT BE SET AT A VALUE LOWER THAN 2 OHMS FOR TRACK CIRCUITS LESS THAN 1000 FT. IN LENGTH AND NOT LOWER THAN 1 OHM FOR TRACK CIRCUITS BETWEEN 1000 FT. AND 4000 FT.

10. THE VARIABLE RESISTOR USED TO ADJUST A TRACK RELAY SHALL BE ADJUSTED TO PROVIDE .7 VDC MEASURED ACROSS THE COILS OF THE RELAY. WHERE MULTIPLE TRACK RELAYS ARE OPERATING IN CONJUNCTION WITH A SINGLE POWER SOURCE, EACH RELAY SHALL MEASURE .7 VDC.

11. SOLID STATE CODED TRACK CIRCUITS SHALL BE ADJUSTED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

12. SIGNAL CIRCUIT AND EQUIPMENT REVISIONS ON CONTRACT DRAWINGS ARE INDICATED AS FOLLOWS:

    —x—x—x— = OUT

    ———————— = IN

13. CONTRACTOR SHALL INSTALL NEW INSULATED BONDED JOINTS AS SHOWN ON CONTRACT DRAWINGS.

14. IF WORK REQUIRES MODIFICATIONS TO DISPATCH SYSTEM AT BADGER BRIDGE. CONTRACTOR SHALL COORDINATE MODIFICATIONS WITH PHL.

GENERAL NOTES (CONT.):

SOLID-STATE INTERLOCKING APPLICATION LOGIC SHALL BE CONFIGURED TO PROVIDE THE FOLLOWING LIGHT OUT CONDITIONS.

INTENDED ASPECT	TOP LAMP DARK	BOTTOM LAMP DARK
(R)	●	NA
(R)	●	NA
(Y)	(R)	NA
(G)	(Y)	NA
(R) / (R)	● / (R)	(R) / ●
(R) / (R)	● / (R)	(R) / ●
(R) / (R)	● / (R)	(R) / ●
(Y) / (R)	(R) / (R)	(Y) / ●
(Y) / (L)	(R) / (R)	(Y) / ●
(Y) / (Y)	● / (Y)	(Y) / ●
(Y) / (R)	● / (R)	(Y) / ●
(G) / (R)	(Y) / (R)	(G) / ●
(R) / (G)	● / (R)	(R) / (Y)
(R) / (Y)	● / (R)	(R) / (R)
(R) / (Y)	● / (R)	(R) / (R)

CODE RATE TRANSMITTED TO APPROACH SIGNAL SHALL DOWNGRADE AS REQUIRED TO REFLECT RESULTING ASPECT. ABILITY TO DOWNGRADE TO "LUNAR" ASPECT IS DEPENDENT UPON "LUNAR" LAMP UNIT BEING PRESENT.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

CONTROL POINT GENERAL SIGNAL NOTES

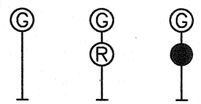
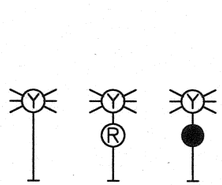
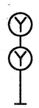
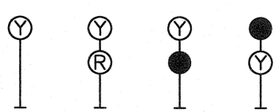
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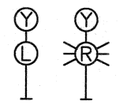
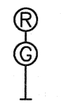
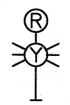
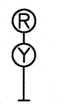
P.E. NO.: C-54141 DATE: 09-19-2013

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10/4/2013

RULE	NAME	SIGNAL ASPECTS	INDICATION
9.1.1	DISTANT SIGNAL CLEAR		PROCEED. IF TRAIN OR ENGINE IS DELAYED BETWEEN DISTANT SIGNAL CLEAR AND BLOCK SIGNAL, INTERLOCKING SIGNAL OR SWITCH POINT INDICATOR, IT MUST PROCEED PREPARED TO STOP SHORT OF NEXT SIGNAL OR SWITCH POINT INDICATOR.
9.1.2	DISTANT SIGNAL APPROACH		PROCEED PREPARED TO STOP BEFORE ANY PART OF TRAIN OR ENGINE PASSES THE NEXT SIGNAL OR SWITCH POINT INDICATOR. THE MAXIMUM SPEED IS 20 MPH WITHIN INTERLOCKING LIMITS OR WITHIN THE LIMITS OF THE CONTROL POINT FOR WHICH DISTANT SIGNAL APPROACH IS DISPLAYED AT THE DISTANT SIGNAL.
9.2.1	CLEAR	 (WITH OR WITHOUT NUMBER PLATE)	PROCEED.
9.2.3	ADVANCE APPROACH	 (WITH OR WITHOUT NUMBER PLATE)	PROCEED PREPARED TO STOP AT SECOND SIGNAL. TRAINS EXCEEDING 40 MPH MUST IMMEDIATELY BEGIN REDUCTION TO 40 MPH AS SOON AS ENGINE PASSES SIGNAL DISPLAYING ADVANCE APPROACH. WHEN NEXT SIGNAL IS SEEN TO DISPLAY AN ASPECT MORE FAVORABLE THAN DIVERGING APPROACH, THE REQUIREMENT TO PROCEED PREPARED TO STOP SHORT OF THE SECOND SIGNAL NO LONGER APPLIES. WHEN NEXT SIGNAL IS SEEN TO DISPLAY CLEAR, THE 40 MPH SPEED REQUREMENT NO LONGER APPLIES.
9.2.4	APPROACH DIVERGING	 (WITH OR WITHOUT NUMBER PLATE)	PROCEED PREPARED TO ADVANCE ON DIVERGING ROUTE AT NEXT SIGNAL AT PRESCRIBED SPEED THROUGH TURNOUT.
9.2.5	APPROACH	 (WITH OR WITHOUT NUMBER PLATE)	PROCEED PREPARED TO STOP BEFORE ANY PART OF TRAIN OR ENGINE PASSES NEXT SIGNAL. TRAINS EXCEEDING 30 MPH MUST IMMEDIATELY REDUCE TO 30 MPH. WHEN NEXT SIGNAL IS SEEN TO DISPLAY A PROCEED INDICATION, REQUIREMENT TO PROCEED PREPARED TO STOP NO LONGER APPLIES. SPEED MAY BE RESUMED AFTER LEADING WHEELS OF TRAIN HAVE PASSED SIGNAL.

RULE	NAME	SIGNAL ASPECTS	INDICATION
9.2.7	APPROACH RESTRICTING	 (WITH OR WITHOUT NUMBER PLATE)	PROCEED PREPARED TO PASS NEXT SIGNAL AT RESTRICTED SPEED, BUT NOT EXCEEDING 15 MPH.
9.2.9	DIVERGING CLEAR	 (WITHOUT NUMBER PLATE)	PROCEED ON DIVERGING ROUTE NOT EXCEEDING PRESCRIBED SPEED THROUGH TURNOUT.
9.2.10	DIVERGING ADVANCE APPROACH	 (WITHOUT NUMBER PLATE)	PROCEED ON DIVERGING ROUTE NOT EXCEEDING PRESCRIBED SPEED THROUGH TURNOUT AND BE PREPARED TO STOP AT SECOND SIGNAL. TRAINS EXCEEDING 40 MPH MUST IMMEDIATELY REDUCE TO 40 MPH. WHEN SIGNAL GOVERNS THE APPROACH TO A CONTROL POINT WITH A 40 MPH TURNOUT SPEED BE PREPARED TO ADVANCE ON NORMAL OR DIVERGING ROUTE.
9.2.10	DIVERGING APPROACH	 (WITHOUT NUMBER PLATE)	PROCEED ON DIVERGING ROUTE AT PRESCRIBED SPEED THROUGH TURNOUT PREPARED TO STOP BEFORE ANY PART OF TRAIN OR ENGINE PASSES NEXT SIGNAL. TRAINS EXCEEDING 30 MPH MUST IMMEDIATELY REDUCE TO THAT SPEED. WHEN THE NEXT SIGNAL IS SEEN TO DISPLAY A PROCEED INDICATION, REQUIREMENT TO STOP NO LONGER APPLIES. SPEED MAY BE RESUMED AFTER THE LEADING WHEELS OF THE TRAIN HAVE PASSED SIGNAL.

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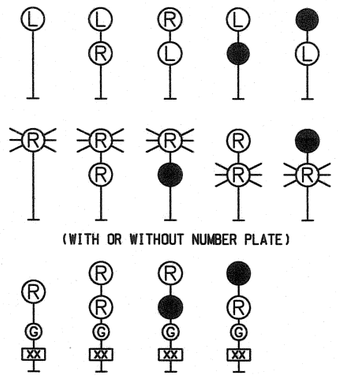
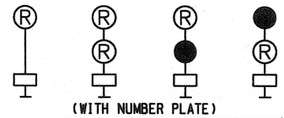
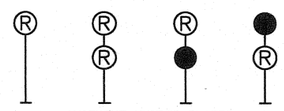
CONTROL POINT GENERAL SIGNAL NOTES

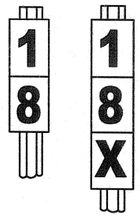
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P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-517

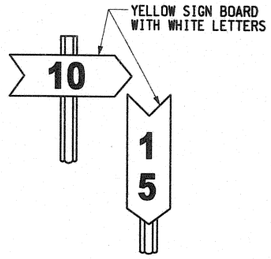
SHEET NO: 2 OF 3

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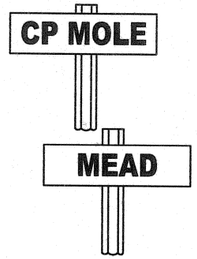
RULE	NAME	SIGNAL ASPECTS	INDICATION
9.2.13	RESTRICTING	 (WITH OR WITHOUT NUMBER PLATE)	PROCEED AT RESTRICTED SPEED, NOT EXCEEDING PRESCRIBED SPEED THROUGH TURNOUT WHEN APPLICABLE.
9.2.13	STOP AND PROCEED	 (WITH NUMBER PLATE)	STOP BEFORE ANY PART OF TRAIN OR ENGINE PASSES THE SIGNAL THEN PROCEED AT RESTRICTED SPEED TO NEXT SIGNAL.
9.2.14	STOP	 (WITHOUT NUMBER PLATE)	STOP BEFORE ANY PART OF TRAIN OR ENGINE PASSES THE SIGNAL.



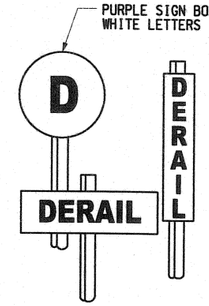
MILEPOSTS



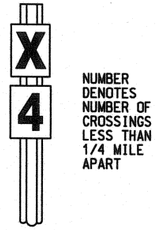
PERMANENT SPEED RESTRICTION



STATION SIGNS



DERAIL SIGN

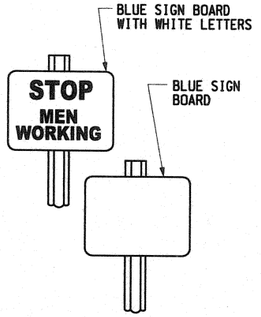


NUMBER DENOTES NUMBER OF CROSSINGS LESS THAN 1/4 MILE APART

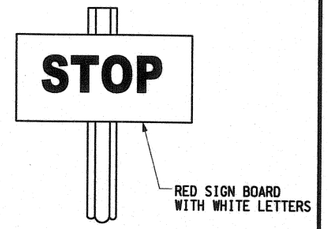
WHISTLE SIGN



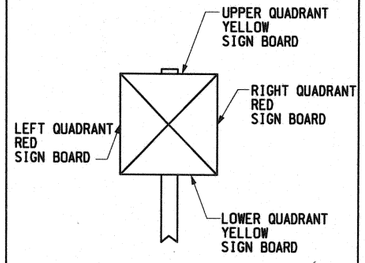
REMOTE CONTROL AREA (RCA)



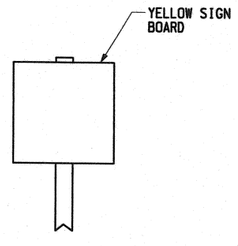
BLUE SIGNAL



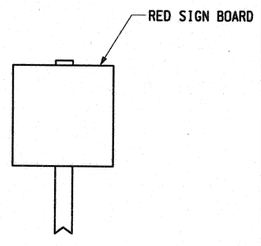
STOP SIGN



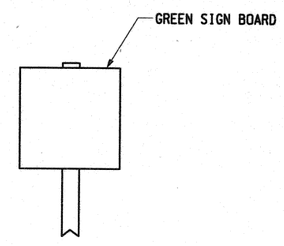
YELLOW-RED FLAG



YELLOW



RED



GREEN

TRACK FLAGS
NTS

NOTE:
ALL SIGNS WHITE BACKGROUND WITH BLACK LETTERING UNLESS OTHERWISE SPECIFIED

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Port of LONG BEACH
The Green Port

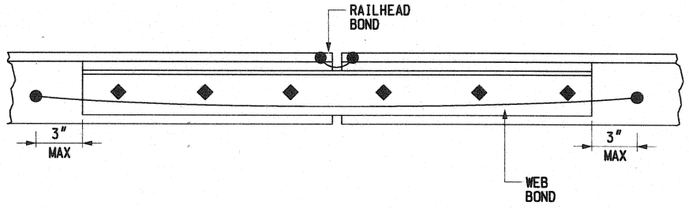
RAILROAD STANDARD PLANS

CONTROL POINT GENERAL SIGNAL NOTES

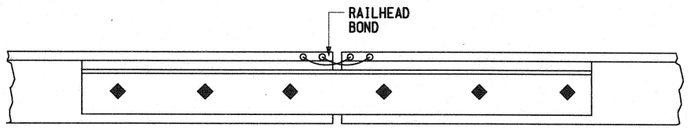
APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-517
SHEET NO: 3 OF 3

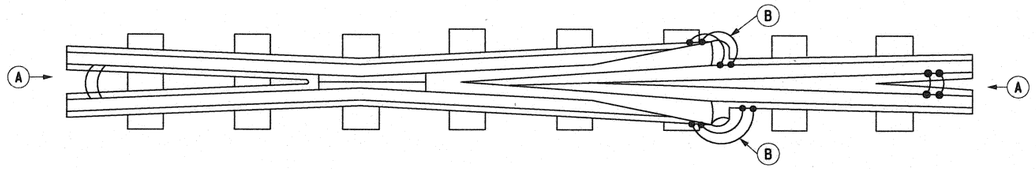
10/4/2013



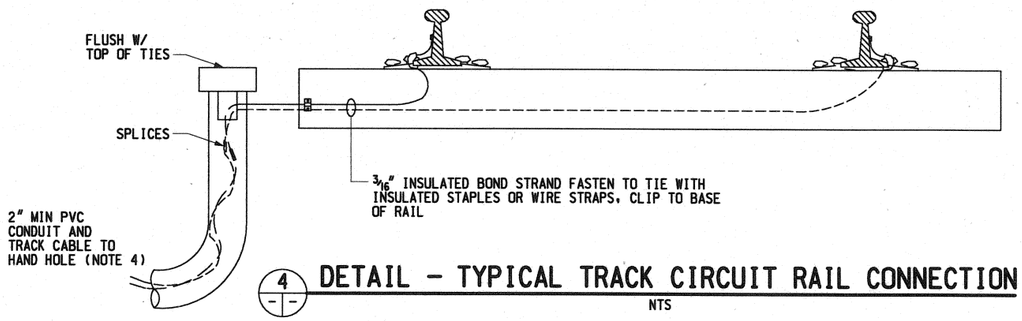
1 DETAIL - TYPICAL JOINT BONDING LAYOUT
NTS



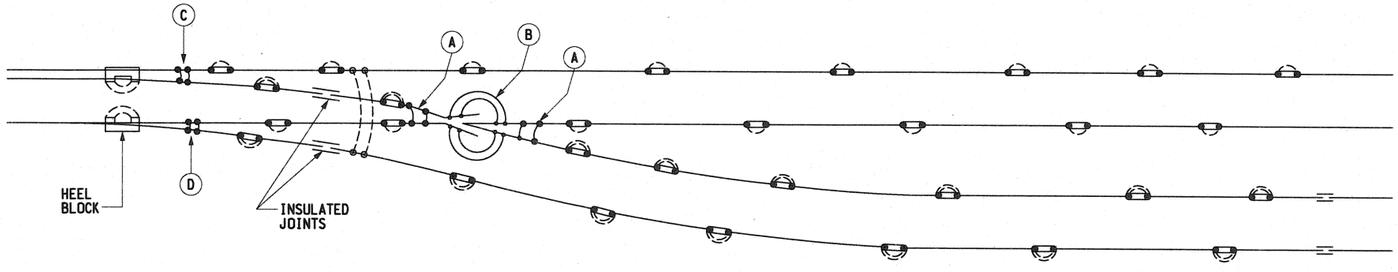
2 DETAIL - TYPICAL FOR ALTERNATE DOUBLE BOND JOINT BONDING LAYOUT
NTS



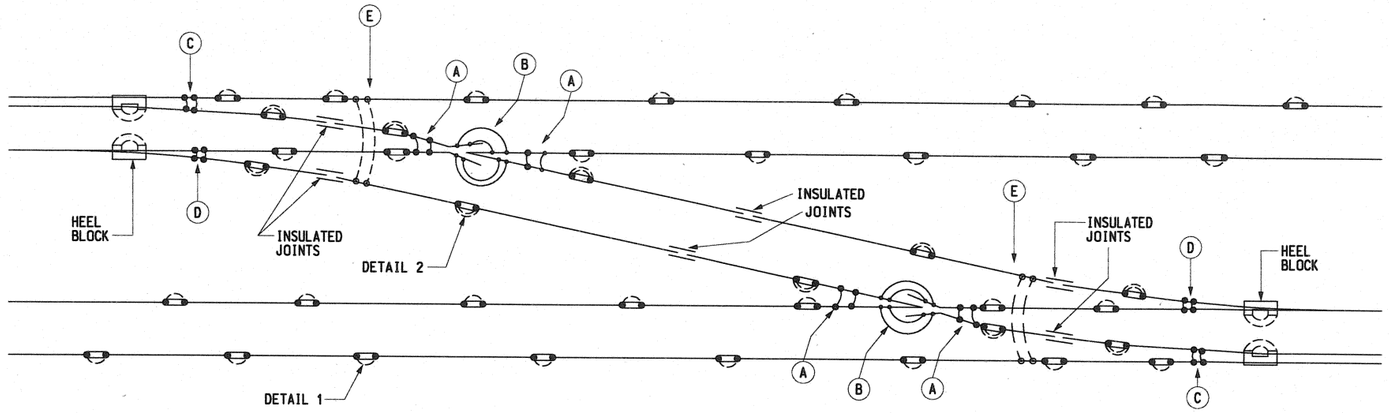
3 DETAIL - TYPICAL TRACK CIRCUIT RAIL CONNECTION
NTS



4 DETAIL - TYPICAL TRACK CIRCUIT RAIL CONNECTION
NTS



5 DETAIL - TYPICAL TURNOUT BONDING
NTS



6 DETAIL - TYPICAL CROSSOVER BONDING
NTS

NOTES:

1. BONDS BETWEEN RAILS AT A, C, AND D MUST BE APPLIED TO RAIL WEB. BONDS BETWEEN RAILS AT B MAY BE APPLIED TO RAILHEAD. BONDS TO BE 12 INCHES LONG AND SHALL BE OF THE WELDED TYPE.
2. TURNOUTS ARE TO BE DOUBLE BONDED USING ONE WEB TYPE BOND AND ONE RAILHEAD BOND.
3. ALL WEB AND RAILHEAD BONDS ARE TO BE OF THE WELDED TYPE.
4. SPLICE #6 SOLID TRACK CABLE TO BOND STRAND. PULL SPLICE BACK INTO CONDUIT AND PLACE CAP OVER END OF CONDUIT. LEAVE MINIMUM 2 FEET OF SLACK TRACK CABLE IN HAND HOLE.
5. REFER TO STD PLAN RR-505 FOR DETAILS OF FOULING JUMPERS.
6. INSULATED JOINTS SHALL BE STAGGERED NOT LESS THAN 2 FEET AND NO GREATER THAN 13 FEET.

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RAILROAD STANDARD PLANS

RAIL CIRCUIT BONDING AND INSULATED JOINT PLACEMENT

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SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

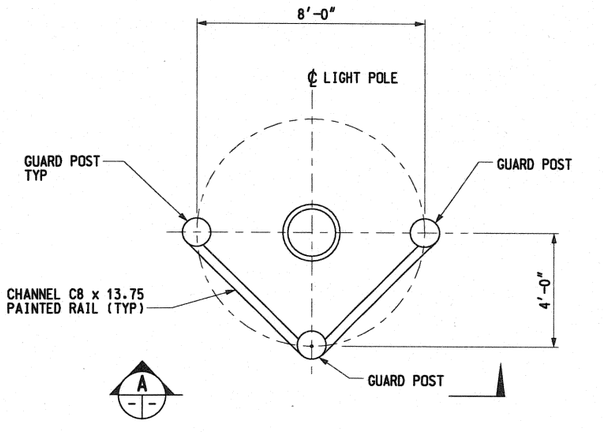
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-518

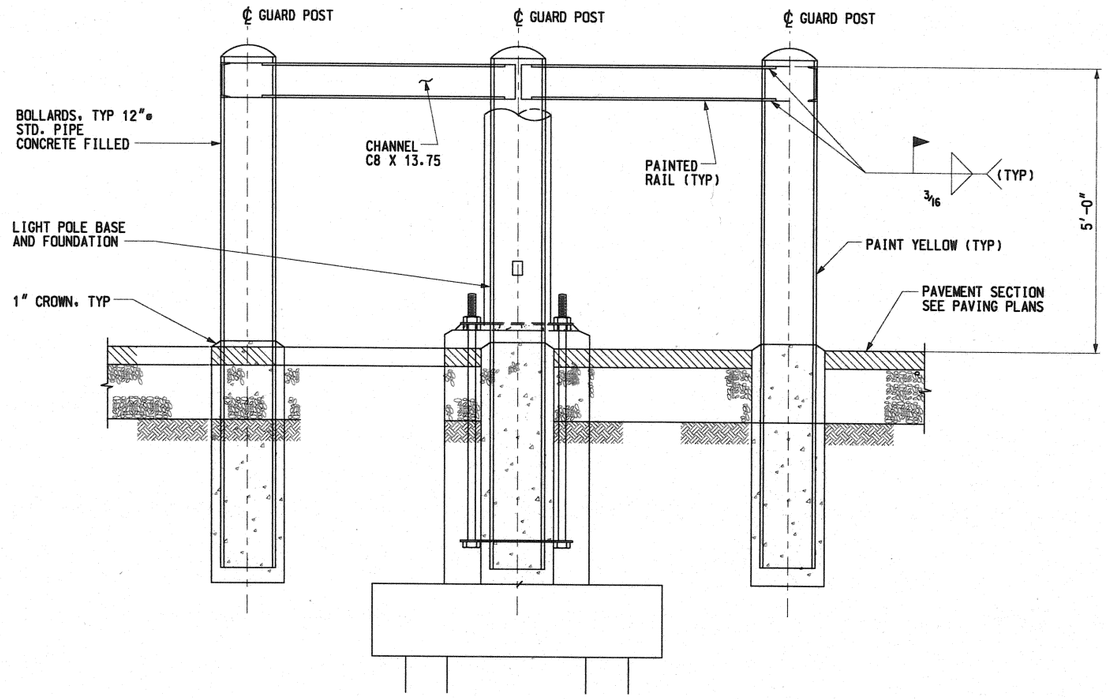
SHEET NO: 1 OF 1

10/4/2013

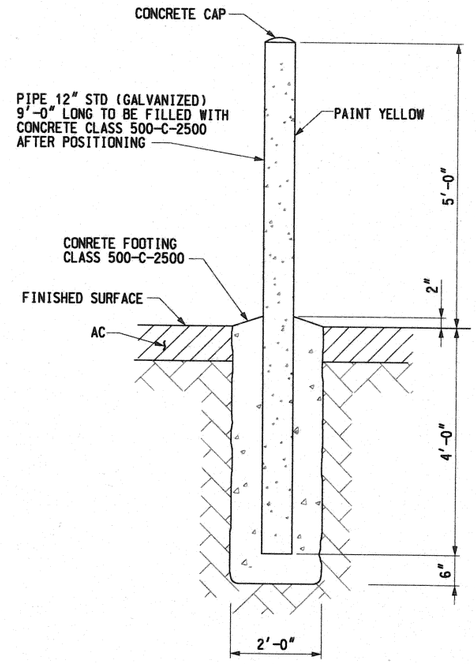
...*RR-518 Rail Circuit Bonding and Insulated Joint Placement



1 DETAIL- LIGHT POST AND GUARD POST
NTS



A SECTION
NTS



2 DETAIL - GUARD POST
NTS

NOTES (GUARD POST):

1. APPLY A MINIMUM OF TWO COATS EACH OF RED OXIDE PRIMER AND CHROME YELLOW ENAMEL PAINT (FEDERAL SPEC. 77-C595, COLOR NO. 13538).
2. CONCRETE SHALL BE CLASS 500-C-2500 IN ACCORDANCE WITH "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" LATEST EDITION, SUBSECTION 201-1.1.2.

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RAILROAD STANDARD PLANS

LIGHT POST AND GUARD POST DETAILS

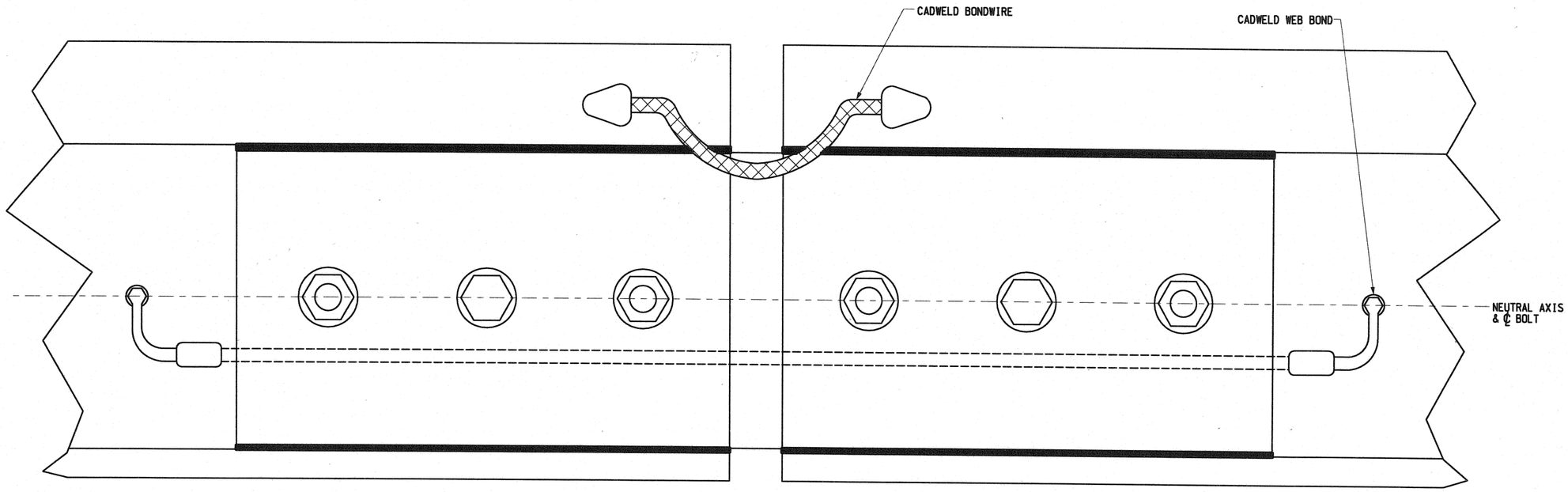
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SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-519

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...\RR-519 Light Post and Bollard Details



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RAILROAD
STANDARD PLANS

BONDING NON-SIGNALED HIGHWAY CROSSINGS

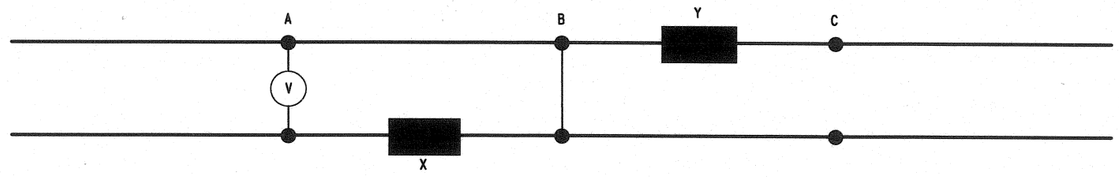
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P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO:
RR-520

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...*RR-520 Bonding Non-Signaled Highway Crossings



1. CONNECT VOLTMETER AT A.
2. PLACE SHUNT AT B.
3. IF VOLTAGE DROPS, INSULATED JOINT X IS DEFECTIVE.
4. REPEAT PROCESS WITH METER AT C TO DETERMINE CONDITION OF INSULATED JOINT Y.

NOTES:

STRIKING JOINT WITH HAMMER WILL GENERALLY DETECT AT INTERMITTENT FAILING JOINT.

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Port of LONG BEACH
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RAILROAD STANDARD PLANS

INSULATED JOINTS (TESTING)

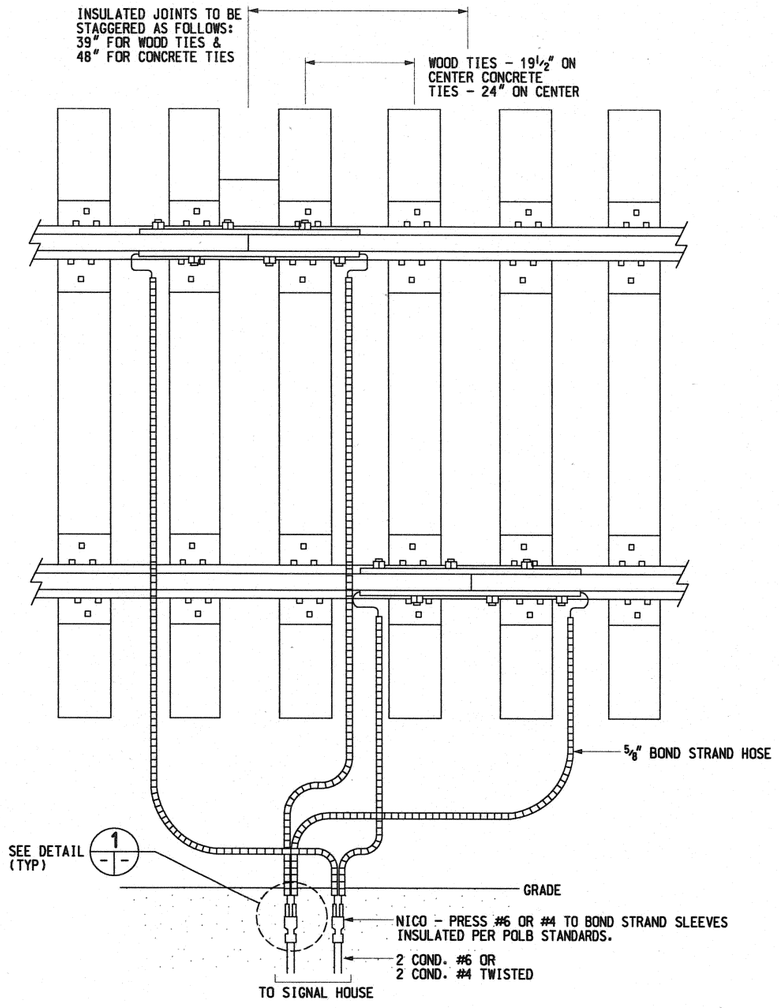
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

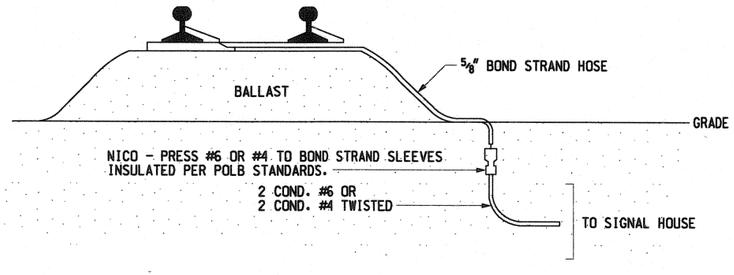
DRAWING NO: RR-521

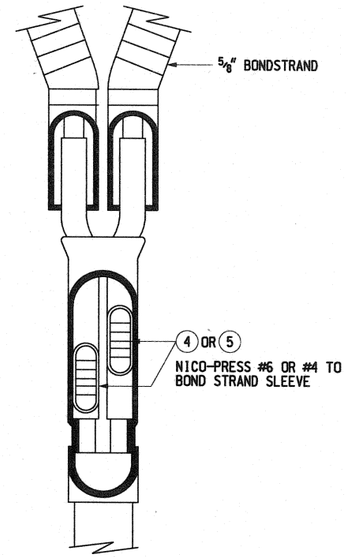
SHEET NO: 1 OF 1

10/4/2013

...\RR-521 Insulated Joints (testing)







1 DETAIL
NTS

NOTES:

1. BURY 5/8" BONDSTRAND HOSE IN BALLAST A MINIMUM 3" TO 5" DEEP TO PREVENT STUMBLING HAZARD.

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RAILROAD STANDARD PLANS

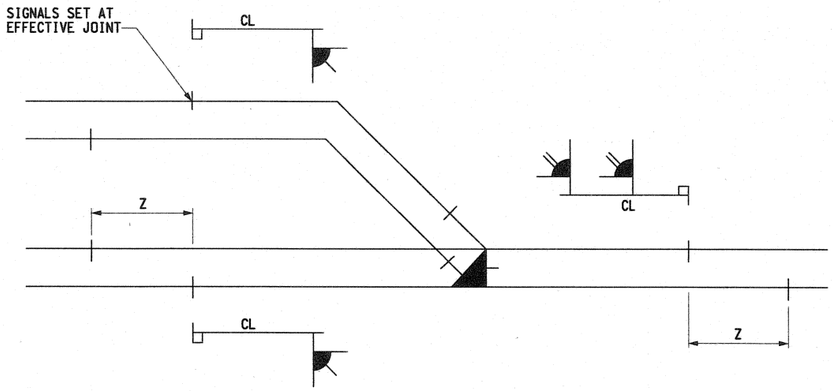
TYPICAL TRACK CIRCUIT CONNECTIONS

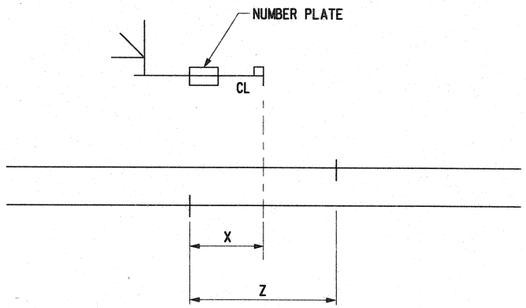
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P.E. NO.: C-54141 DATE: 09-19-2013

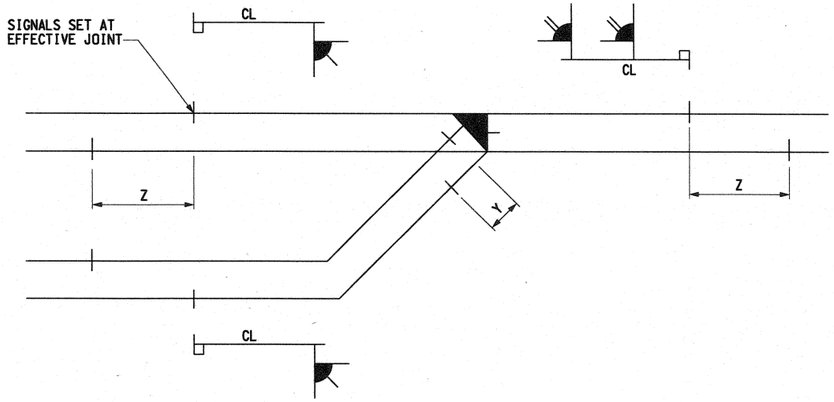
DRAWING NO: RR-522

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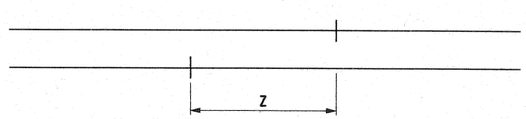
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CUT SECTION
(R/R) - (R/B) - (B/R) - (B/B)



PREFERRED, MINIMUM AND MAXIMUM INSULATED JOINT SPACING AT ABSOLUTE SIGNALS, INTERMEDIATE SIGNALS AND CUT-SECTIONS FOR WOOD AND CONCRETE TIES.

WOOD TIES

X = 1'7½" PREFERRED, (0" MINIMUM,) (9'9" MAXIMUM)

Y = 4'6" MAXIMUM (FOLLOW STANDARD DRAWINGS)

Z = 3'3" PREFERRED AND MINIMUM, (19'6" MAXIMUM)

CONCRETE TIES

X = 2'0" PREFERRED, (0" MINIMUM,) (9'9" MAXIMUM)

Y = 4'6" MAXIMUM (FOLLOW STANDARD DRAWINGS)

Z = 4'0" PREFERRED AND MINIMUM, (19'6" MAXIMUM)

NOTES:

1. ON "NEW" CONSTRUCTION, WHEN POSSIBLE, PREFERRED INSULATED JOINT SPACING TO BE USED.
2. "CL" IS COLORLIGHT SIGNAL (GREEN, YELLOW & RED)

(EFFECTIVE JOINT AT ABSOLUTE SIGNAL TO BE CENTERED ON SIGNAL)

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

INSULATED JOINTS LOCATION OF EFFECTIVE JOINTS

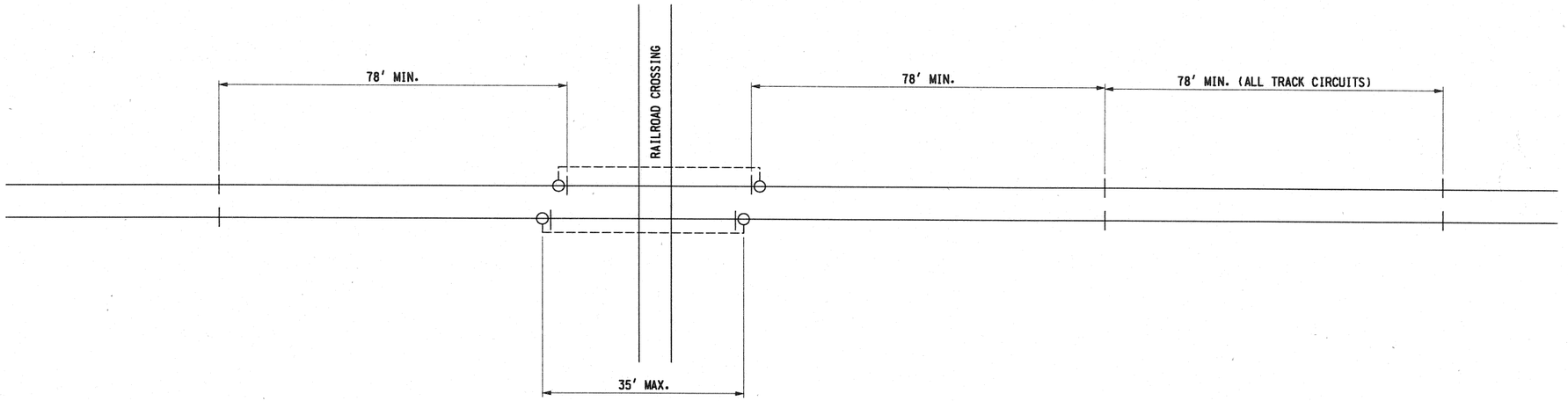
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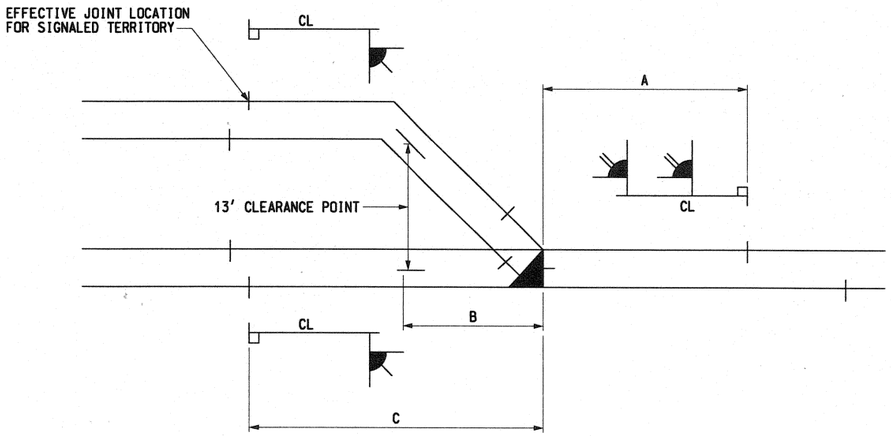
P.E. NO.: C-54141 DATE: 09-19-2013

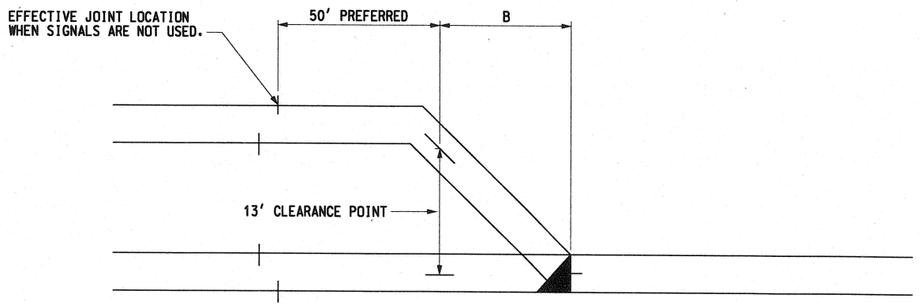
DRAWING NO: RR-523

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TURNOUT SIZE	A	POINT SWITCH – CLEARANCE POINT	POINT SWITCH – SIGNAL & JOINTS
		B	C
		15' TC	15' TC
NO. 15	45'	236'	330'
NO. 11	45'	176'	265'
NO. 10	45'	162'	245'
NO. 9	45'	148'	230'
NO. 8	45'	134'	210'

NOTES:

1. (POINT SWITCH – CLEARANCE POINT):
   IS ROUNDED OFF TO NEAREST FOOT BEYOND 13 FEET OF CLEARANCE POINT.
2. (POINT SWITCH – SIGNAL & JOINTS):
   ARE TO BE PLACED ON TANGENT TRACK WHERE PRACTICAL.
3. DISTANCES SHOWN ARE BEYOND MINIMUM OF 75 FEET FROM 13 FEET CLEARANCE POINT.

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RAILROAD STANDARD PLANS

INSULATED JOINTS LOCATION OF EFFECTIVE JOINTS

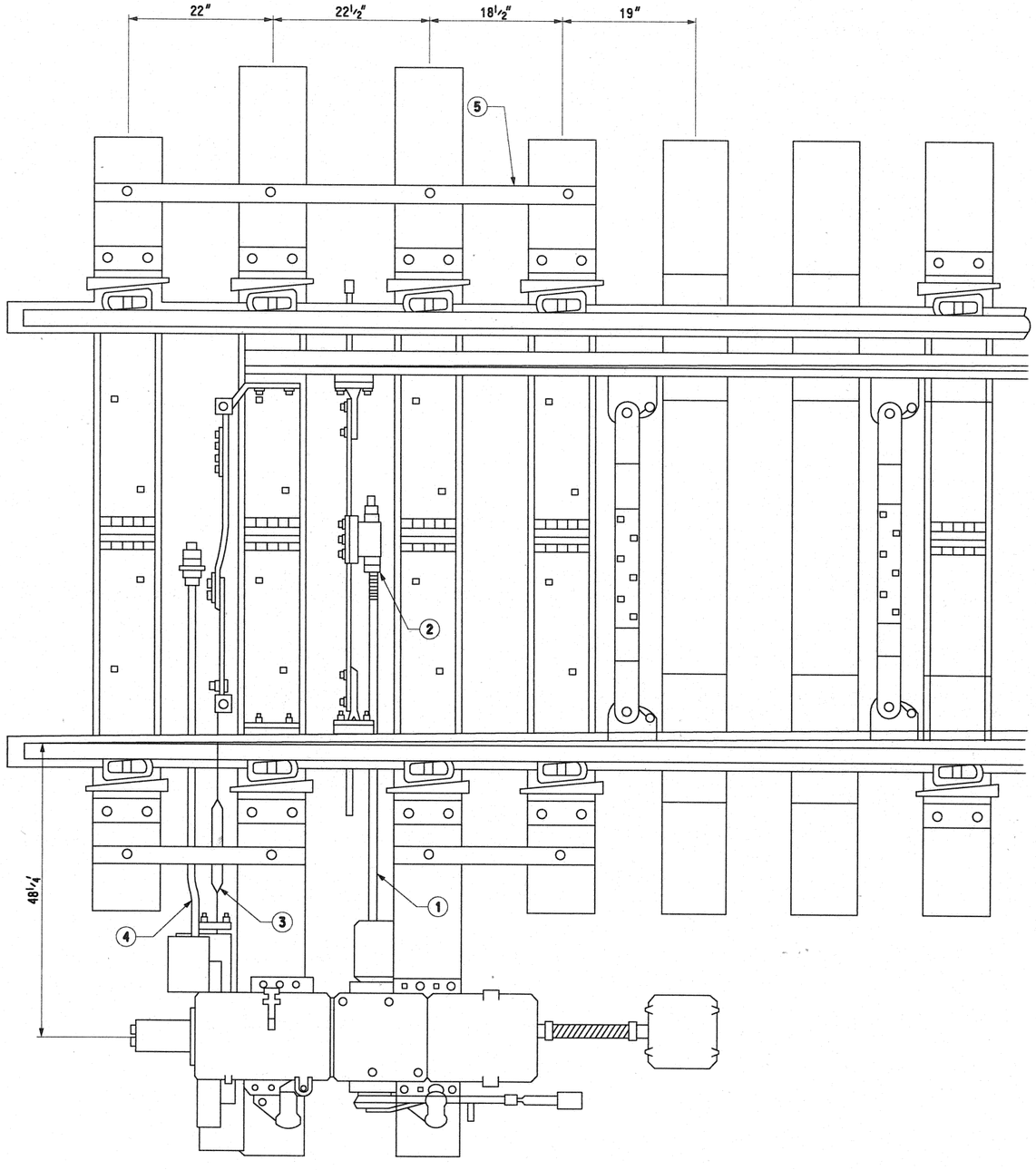
APPROVED BY: _____
SEAN A. GAMETTE – ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-523

SHEET NO: 2 OF 2

10/4/2013

...*RR-523 Insulated Joints Location Effctive Joints 2 of 2



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. ½"×2" STEEL STRAP CUT TO REQUIRED LENGTH AND DRILL FOR ¾" LAG SCREW.

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Port of LONG BEACH
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RAILROAD
STANDARD PLANS

SWITCH MACHINE LAYOUT MOUNTED ON THE RIGHT

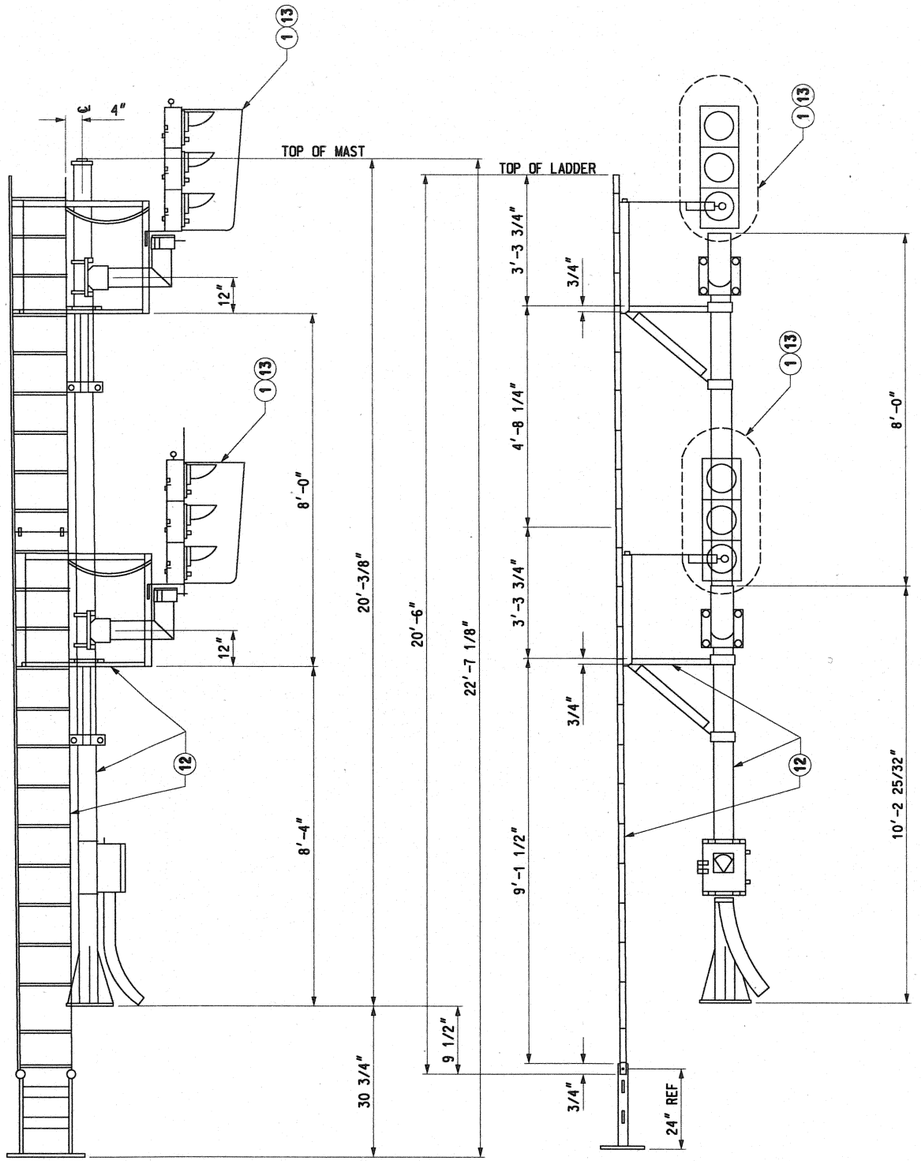
APPROVED BY: _____
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P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-524

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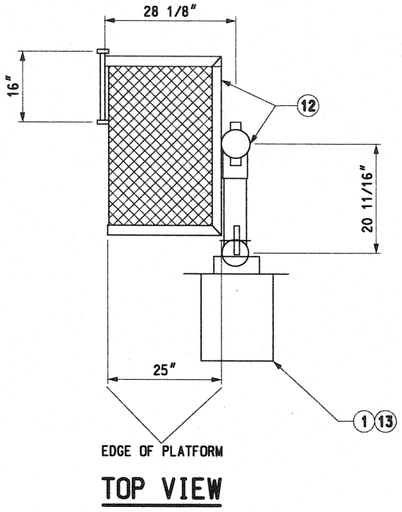
10/4/2013

...*RR-524 Switch Machine Layout Mounted on the Right



REAR VIEW

SIDE VIEW



TOP VIEW

DOUBLE HEAD UNI-DIRECTIONAL COLOR LIGHT SIGNAL

REF#	UM	QUANTITY	DESCRIPTION
1	EA	6	LAMP, INCANDESCENT, 10V-25W
2	EA	1	GROUND ROD, 5/8 INCH X 8 FEET
3	EA	1	GROUND ROD CONN. 4 WAY ONE SHOT
4	LF	25	WIRE, IC#6 AWG. COPPER, SOLID
5	LF	200	WIRE, 5C#6. 2000' ROLL SHIELDED
6	LF	200	WIRE, IC#10 AWG. COPPER, STARANDED
7	EA	3	PADLOCK, SIGNAL, WITHOUT KEY, AMERICAN
8	GA	1	COMPOUND, GLAZING COMMERCIAL
9	EA	0	SIGN, SIGNAL NUMBER & INDICATOR PLATES
10	PR	0	MILEPOST SIGN MOUNTING BUCKLE BRACKET SET
11	ST	1	FOUNDATION COMPONENT SET - 74 1/2 INCHS
12	EA	1	MAST, LADDER AND PLATFORM ASSEMBLY (2 UNIT REAR ENTRY CLOSE CLEARANCE SIGNAL)
13	EA	2	SIGNAL, TYPE "D" SENTINEL 3 UNIT G/Y/R
14	EA	50	TERMINAL, # 12-10 WIRE, RING TONGUE

ALTERNATE COLOR LIGHT SIGNAL HEADS

REF#	UM	QUANTITY	DESCRIPTION
21	EA	1	SIGNAL, TWO POSITON ALUMINUM, C.L. YELLOW/RED, REAR ENTRY
22	EA	1	SIGNAL, TYPE "D" SENTINEL 4 UNIT G/Y/R/L
23	EA	1	SIGNAL, ONE POSITION ALUMINUM, C.L. YELLOW, REAR ENTRY

(UM) UNIT OF MEASURE LEGEND:

EA = EACH (1 UNIT)
LF = 1 LINEAR FOOT
GA = 1 GALLON
PR = 1 PAIR (2 EACH)
ST = 1 SET

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Port of LONG BEACH
The Green Port

RAILROAD
STANDARD PLANS

SIGNAL
DOUBLE HEAD UNIDIRECTIONAL SIDE LADDER

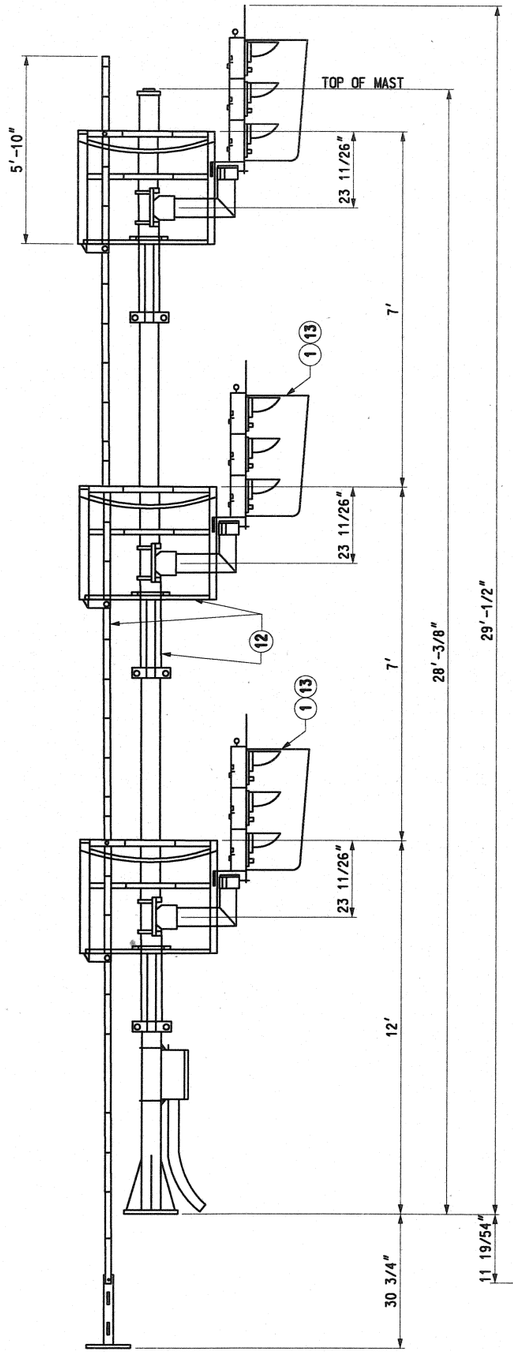
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P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-525

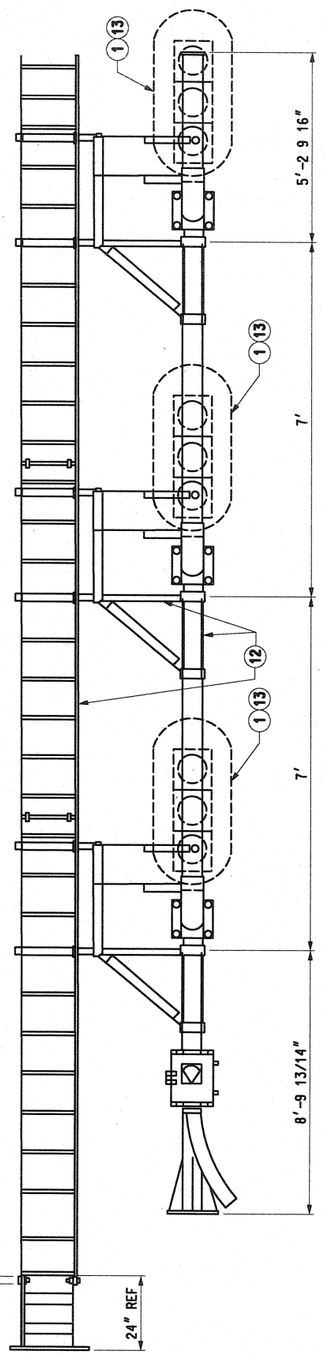
SHEET NO: 1 OF 1

10/4/2013

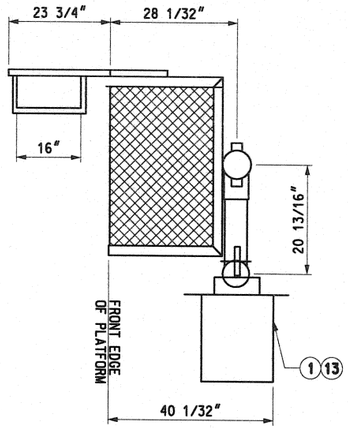
...*RR-525 Signal Double Head Unidirectional Side Ladder



SIDE VIEW



FRONT VIEW



TOP VIEW

TRIPLE HEAD UNI-DIRECTIONAL COLOR LIGHT SIGNAL

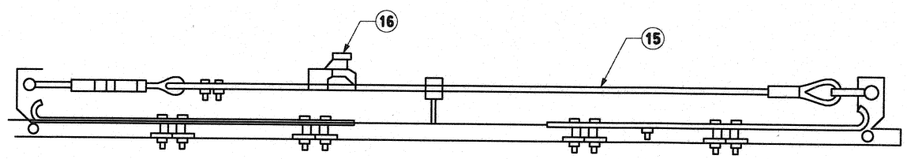
REF#	UM	QUANTITY	DESCRIPTION
1	EA	9	LAMP, INCANDESCENT, 10V-25W
2	EA	1	GROUND ROD, 5/8 INCH X 8 FEET
3	EA	1	GROUND ROD CONN. 4 WAY ONE SHOT
4	LF	25	WIRE, IC#6 AWG. COPPER, SOLID
5	LF	200	WIRE, 5C#6. 2000' ROLL SHIELDED
6	LF	200	WIRE, IC#10 AWG. COPPER, STARANDED
7	EA	3	PADLOCK, SIGNAL, WITHOUT KEY, AMERICAN
8	GA	1	COMPOUND, GLAZING COMMERCIAL
9	EA	0	SIGN, SIGNAL NUMBER & INDICATOR PLATES
10	PR	0	MILEPOST SIGN MOUNTING BUCKLE BRACKET SET
11	ST	1	FOUNDATION COMPONENT SET - 74 1/2 INCHS
12	EA	1	MAST, LADDER AND PLATFORM ASSEMBLY (2 UNIT REAR ENTRY CLOSE CLEARANCE SIGNAL)
13	EA	3	SIGNAL, TYPE "D" SENTINEL 3 UNIT G/Y/R
14	EA	50	TERMINAL, # 12-10 WIRE, RING TONGUE

ALTERNATE COLOR LIGHT SIGNAL HEADS

REF#	UM	QUANTITY	DESCRIPTION
21	EA	1	SIGNAL, TWO POSITON ALUMINUM, C.L. YELLOW/RED, REAR ENTRY
22	EA	1	SIGNAL, TYPE "D" SENTINEL 4 UNIT G/Y/R/L
23	EA	1	SIGNAL, ONE POSITION ALUMINUM, C.L. YELLOW, REAR ENTRY

(UM) UNIT OF MEASURE LEGEND:

EA = EACH (1 UNIT)
LF = 1 LINEAR FOOT
GA = 1 GALLON
PR = 1 PAIR (2 EACH)
ST = 1 SET



DETAIL SURE CLIMB SAFETY CABLE

REVISIONS	
NO.	DATE
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

SIGNAL TRIPLE HEAD UNIDIRECTIONAL SIDE LADDER WITH SURE CLIMB SAFETY CABLE

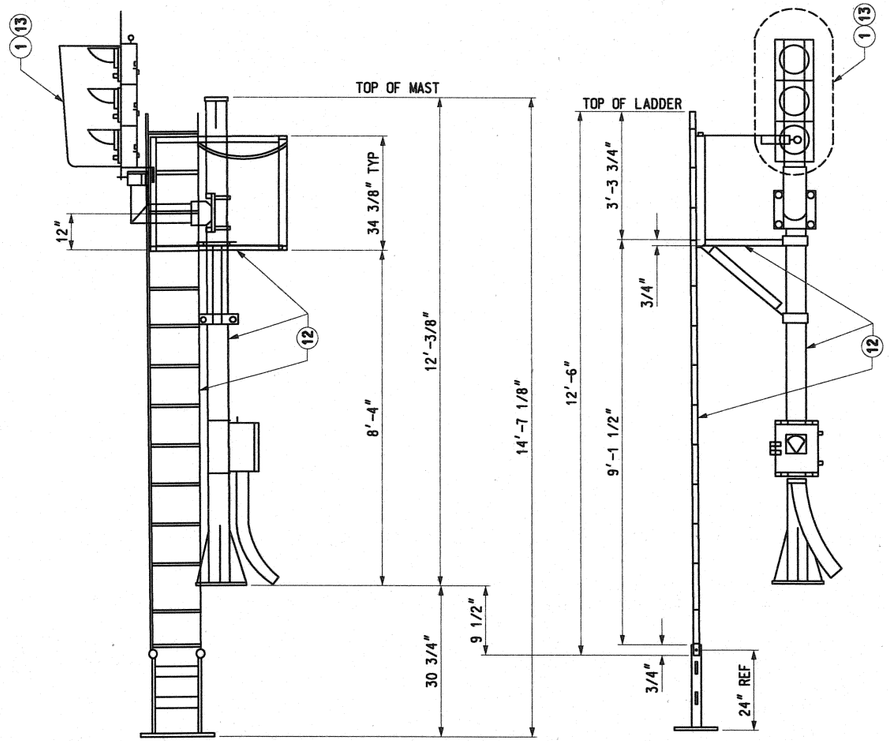
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-526

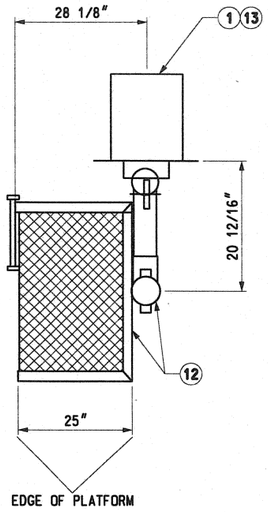
SHEET NO: 1 OF 1

10/4/2013

...*RR-526 Signal Triple Head Uni-Directional Side Ladder With Sure Climb Safety Cable



SIDE VIEW



TOP VIEW

FRONT VIEW

SINGLE HEAD UNI-DIRECTIONAL COLOR LIGHT SIGNAL

REF#	UM	QUANTITY	DESCRIPTION
1	EA	3	LAMP, INCANDESCENT, 10V-25W
2	EA	1	GROUND ROD, 5/8 INCH X 8 FEET
3	EA	1	GROUND ROD CONN. 4 WAY ONE SHOT
4	LF	25	WIRE, IC#6 AWG. COPPER, SOLID
5	LF	200	WIRE, 5C#6. 2000' ROLL SHIELDED
6	LF	200	WIRE, IC#10 AWG. COPPER, STARANDED
7	EA	2	PADLOCK, SIGNAL, WITHOUT KEY, AMERICAN
8	GA	1	COMPOUND, GLAZING COMMERCIAL
9	EA	0	SIGN, SIGNAL NUMBER & INDICATOR PLATES
10	PR	0	MILEPOST SIGN MOUNTING BUCKLE BRACKET SET
11	ST	1	FOUNDATION COMPONENT SET - 74 1/2 INCHS
12	EA	1	MAST, LADDER AND PLATFORM ASSEMBLY (2 UNIT REAR ENTRY CLOSE CLEARANCE SIGNAL)
13	EA	1	SIGNAL, TYPE "D" SENTINEL 3 UNIT G/Y/R
14	EA	50	TERMINAL, # 12-10 WIRE, RING TONGUE

ALTERNATE COLOR LIGHT SIGNAL HEADS

REF#	UM	QUANTITY	DESCRIPTION
21	EA	1	SIGNAL, TWO POSITON ALUMINUM, C.L. YELLOW/RED, REAR ENTRY
22	EA	1	SIGNAL, TYPE "D" SENTINEL 4 UNIT G/Y/R/L
23	EA	1	SIGNAL, ONE POSITION ALUMINUM, C.L. YELLOW, REAR ENTRY

(UM) UNIT OF MEASURE LEGEND:

EA = EACH (1 UNIT)
LF = 1 LINEAR FOOT
GA = 1 GALLON
PR = 1 PAIR (2 EACH)
ST = 1 SET

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Port of LONG BEACH
The Green Port

RAILROAD
STANDARD PLANS

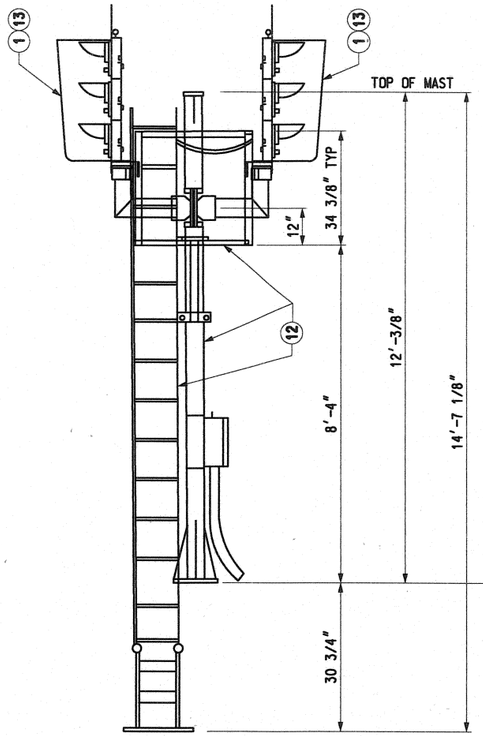
SIGNAL
SINGLE HEAD
SIDE LADDER

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

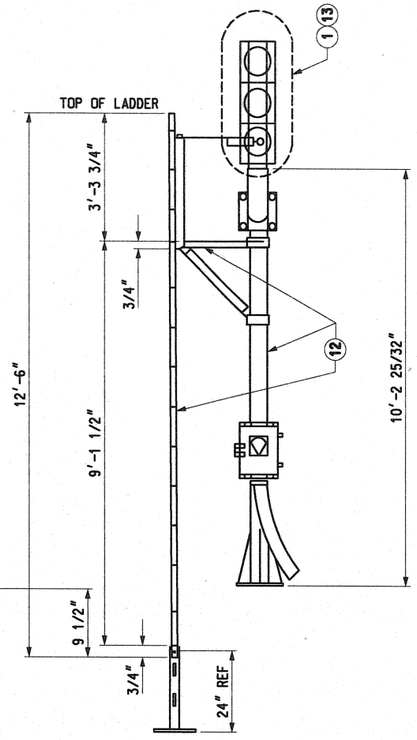
DRAWING NO: RR-527
SHEET NO: 1 OF 1

10/4/2013

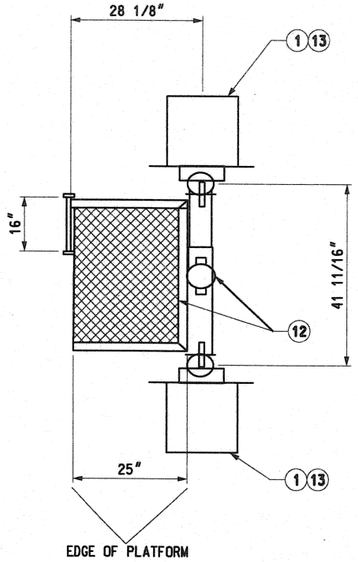
...*RR-527 Signal Single Head Side Ladder



SIDE VIEW



FRONT VIEW



TOP VIEW

SINGLE HEAD BI-DIRECTIONAL COLOR LIGHT SIGNAL

REF#	UM	QUANTITY	DESCRIPTION
1	EA	6	LAMP, INCANDESCENT, 10V-25W
2	EA	1	GROUND ROD, 5/8 INCH X 8 FEET
3	EA	1	GROUND ROD CONN. 4 WAY ONE SHOT
4	LF	25	WIRE, IC#6 AWG. COPPER, SOLID
5	LF	200	WIRE, 5C#6. 2000' ROLL SHIELDED
6	LF	200	WIRE, IC#10 AWG. COPPER, STARANDED
7	EA	3	PADLOCK, SIGNAL, WITHOUT KEY, AMERICAN
8	GA	1	COMPOUND, GLAZING COMMERCIAL
9	EA	0	SIGN, SIGNAL NUMBER & INDICATOR PLATES
10	PR	0	MILEPOST SIGN MOUNTING BUCKLE BRACKET SET
11	ST	1	FOUNDATION COMPONENT SET - 74 1/2 INCHS
12	EA	1	MAST, LADDER AND PLATFORM ASSEMBLY (2 UNIT REAR ENTRY CLOSE CLEARANCE SIGNAL)
13	EA	2	SIGNAL, TYPE "D" SENTINEL 3 UNIT G/Y/R
14	EA	50	TERMINAL, # 12-10 WIRE, RING TONGUE

ALTERNATE COLOR LIGHT SIGNAL HEADS

REF#	UM	QUANTITY	DESCRIPTION
21	EA	1	SIGNAL, TWO POSITON ALUMINUM, C.L. YELLOW/RED, REAR ENTRY
22	EA	1	SIGNAL, TYPE "D" SENTINEL 4 UNIT G/Y/R/L
23	EA	1	SIGNAL, ONE POSITION ALUMINUM, C.L. YELLOW, REAR ENTRY

(UM) UNIT OF MEASURE LEGEND:

EA = EACH (1 UNIT)
LF = 1 LINEAR FOOT
GA = 1 GALLON
PR = 1 PAIR (2 EACH)
ST = 1 SET

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

SIGNAL SINGLE HEADS BACK TO BACK SIDE LADDER

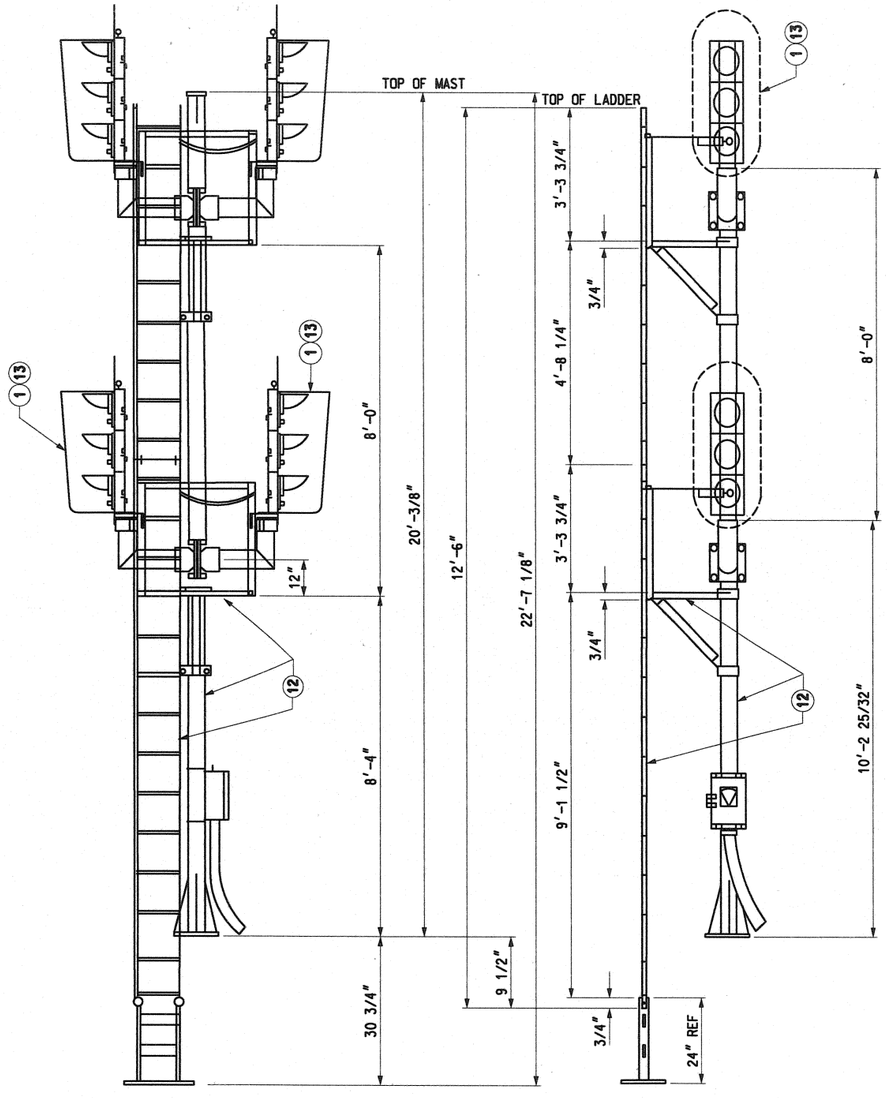
APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-528

SHEET NO: 1 OF 1

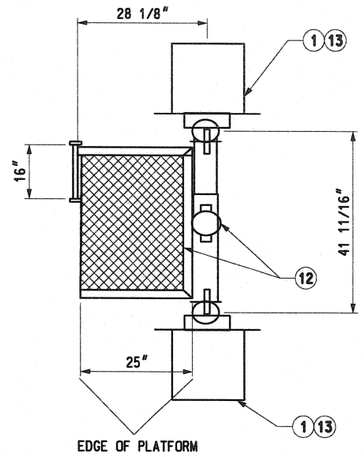
10/4/2013

...*RR-528 Signal Single Head Back to Back Side Ladder



SIDE VIEW

FRONT VIEW



TOP VIEW

DOUBLE HEAD BI-DIRECTIONAL COLOR LIGHT SIGNAL

REF#	UM	QUANTITY	DESCRIPTION
1	EA	12	LAMP, INCANDESCENT, 10V-25W
2	EA	1	GROUND ROD, 5/8 INCH X 8 FEET
3	EA	1	GROUND ROD CONN. 4 WAY ONE SHOT
4	LF	25	WIRE, IC#6 AWG. COPPER, SOLID
5	LF	200	WIRE, 5C#6. 2000' ROLL SHIELDED
6	LF	200	WIRE, IC#10 AWG. COPPER, STARANDED
7	EA	5	PADLOCK, SIGNAL, WITHOUT KEY, AMERICAN
8	GA	1	COMPOUND, GLAZING COMMERCIAL
9	EA	0	SIGN, SIGNAL NUMBER & INDICATOR PLATES
10	PR	0	MILEPOST SIGN MOUNTING BUCKLE BRACKET SET
11	ST	1	FOUNDATION COMPONENT SET - 74 1/2 INCHS
12	EA	1	MAST, LADDER AND PLATFORM ASSEMBLY (2 UNIT REAR ENTRY CLOSE CLEARANCE SIGNAL)
13	EA	4	SIGNAL, TYPE "D" SENTINEL 3 UNIT G/Y/R
14	EA	50	TERMINAL, # 12-10 WIRE, RING TONGUE

ALTERNATE COLOR LIGHT SIGNAL HEADS

REF#	UM	QUANTITY	DESCRIPTION
21	EA	1	SIGNAL, TWO POSITON ALUMINUM, C.L. YELLOW/RED, REAR ENTRY
22	EA	1	SIGNAL, TYPE "D" SENTINEL 4 UNIT G/Y/R/L
23	EA	1	SIGNAL, ONE POSITION ALUMINUM, C.L. YELLOW, REAR ENTRY

(UM) UNIT OF MEASURE LEGEND:

EA = EACH (1 UNIT)
LF = 1 LINEAR FOOT
GA = 1 GALLON
PR = 1 PAIR (2 EACH)
ST = 1 SET

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

SIGNAL BI-DIRECTIONAL BACK TO BACK SIDE LADDER

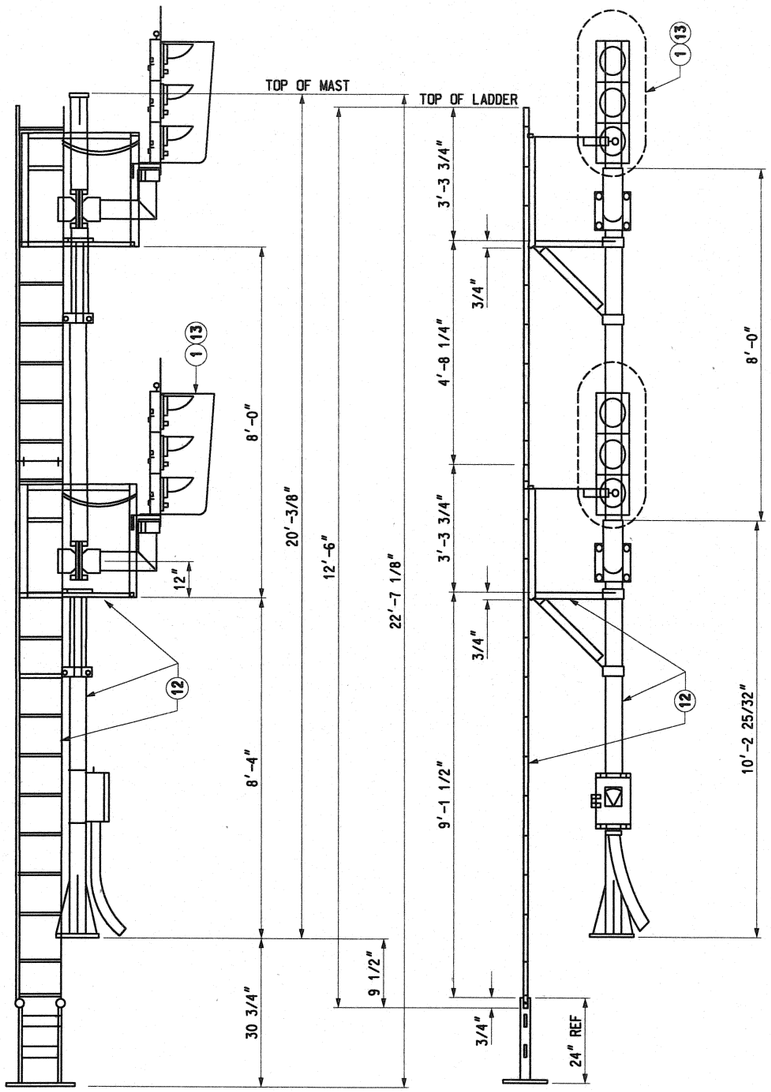
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-529

SHEET NO: 1 OF 1

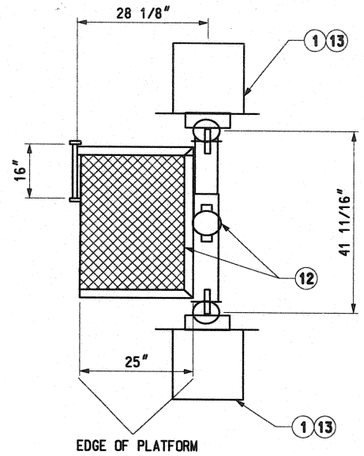
10/4/2013

...*RR-529 Signal Bi-Directional Back to Back Side Ladder



SIDE VIEW

FRONT VIEW



TOP VIEW

DOUBLE HEAD UNI-DIRECTIONAL COLOR LIGHT SIGNAL

REF#	UM	QUANTITY	DESCRIPTION
1	EA	6	LAMP, INCANDESCENT, 10V-25W
2	EA	1	GROUND ROD, 5/8 INCH X 8 FEET
3	EA	1	GROUND ROD CONN. 4 WAY ONE SHOT
4	LF	25	WIRE, IC#6 AWG. COPPER, SOLID
5	LF	200	WIRE, 5C#6. 2000' ROLL SHIELDED
6	LF	200	WIRE, IC#10 AWG. COPPER, STARANDED
7	EA	3	PADLOCK, SIGNAL, WITHOUT KEY, AMERICAN
8	GA	1	COMPOUND, GLAZING COMMERCIAL
9	EA	0	SIGN, SIGNAL NUMBER & INDICATOR PLATES
10	PR	0	MILEPOST SIGN MOUNTING BUCKLE BRACKET SET
11	ST	1	FOUNDATION COMPONENT SET - 74 1/2 INCHS
12	EA	1	MAST, LADDER AND PLATFORM ASSEMBLY (2 UNIT REAR ENTRY CLOSE CLEARANCE SIGNAL)
13	EA	2	SIGNAL, TYPE "D" SENTINEL 3 UNIT G/Y/R
14	EA	50	TERMINAL, # 12-10 WIRE, RING TONGUE

ALTERNATE COLOR LIGHT SIGNAL HEADS

REF#	UM	QUANTITY	DESCRIPTION
21	EA	1	SIGNAL, TWO POSITON ALUMINUM, C.L. YELLOW/RED, REAR ENTRY
22	EA	1	SIGNAL, TYPE "D" SENTINEL 4 UNIT G/Y/R/L
23	EA	1	SIGNAL, ONE POSITION ALUMINUM, C.L. YELLOW, REAR ENTRY

(UM) UNIT OF MEASURE LEGEND:

EA = EACH (1 UNIT)
LF = 1 LINEAR FOOT
GA = 1 GALLON
PR = 1 PAIR (2 EACH)
ST = 1 SET

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD
STANDARD PLANS

SIGNAL
COMBINATION BACK TO BACK
SIDE LADDER

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

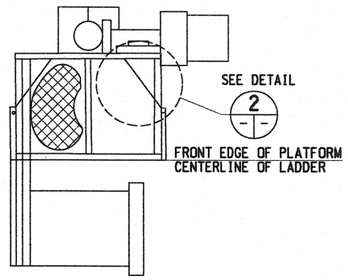
DRAWING NO: RR-530

SHEET NO: 1 OF 1

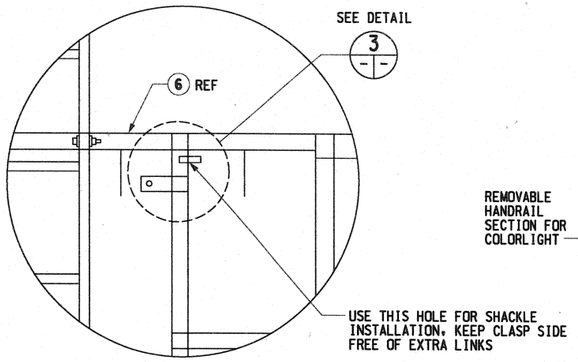
10/4/2013

...\RR-530 Signal Combination Back to Back Side Ladder

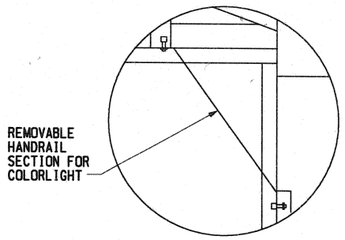
ITEM	QTY.	DESCRIPTION
1	1	MAST STEEL 2 POS. 21' LG.
2	1	STEEL PLATFORM ASSEMBLY
3	1	C/L 5" MTG. KIT
4	1	LADDER
5	1	STEEL LADDER FOUNDATION
6	3	LADDER SUPPORT BRACKET ASSEMBLY
7	1	MAST LADDER PLATFORM ACCENT PLATE



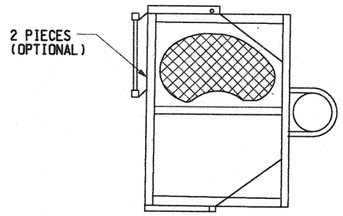
PLAN



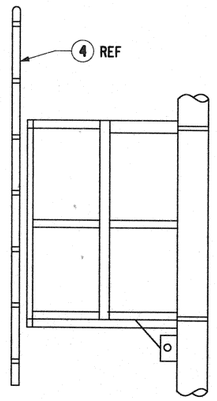
1 DETAIL
NTS



2 DETAIL
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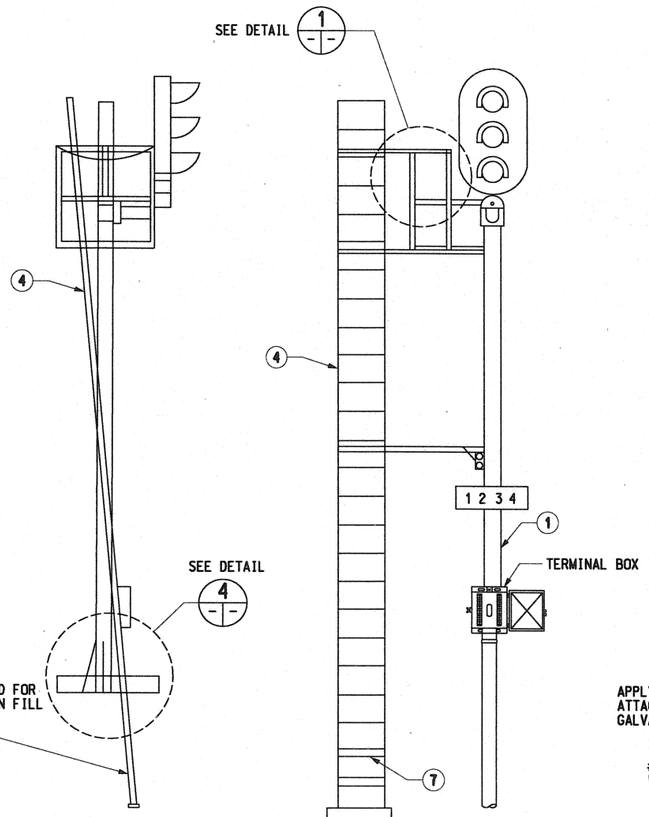


PLAN



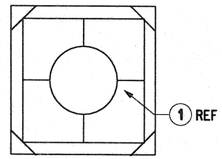
ELEVATION

OPTIONAL VERTICAL LADDER MOUNT

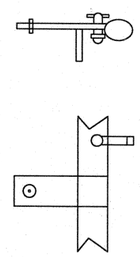


SIDE VIEW

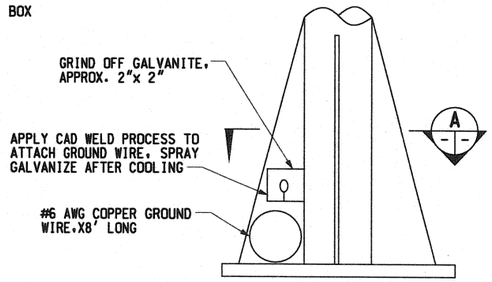
FRONT VIEW



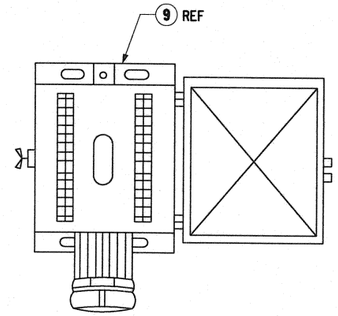
A SECTION
NTS



3 DETAIL
NTS



4 DETAIL
NTS



TERMINAL BOX

NOTES:

1. DRAWING REFLECTS MATERIALS AND DIMENSIONS FOR G.E. TRANSPORTATION SYSTEMS GLOBAL SIGNALING SIGNAL. APPROVED EQUAL MUST CONFORM TO DRAWING.
2. ADD NUMBER BOARD, "P" SIGN, AND/OR "G" SIGN AS REQUIRED.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

TYPICAL COLOR LIGHT SIGNAL - SINGLE UNIT

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

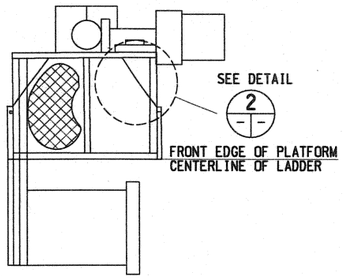
DRAWING NO: RR-531

SHEET NO: 1 OF 1

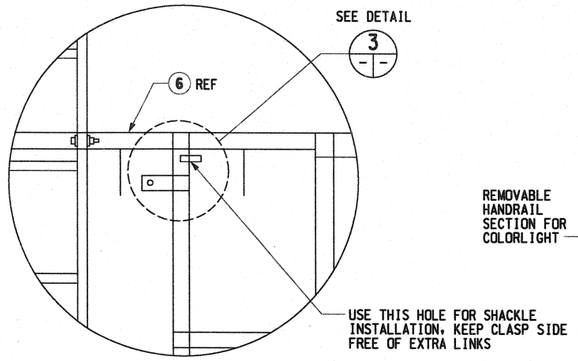
10/4/2013

...*RR-531 Typical Color Light Signal-Single Unit

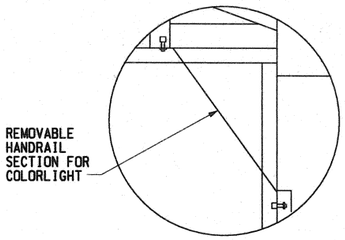
ITEM	QTY.	DESCRIPTION
1	1	MAST STEEL 2 POS. 21' LG.
2	1	STEEL PLATFORM ASSEMBLY
3	1	C/L 5" MTG. KIT
4	1	LADDER
5	1	STEEL LADDER FOUNDATION
6	3	LADDER SUPPORT BRACKET ASSEMBLY
7	1	MAST LADDER PLATFORM ACCENT PLATE



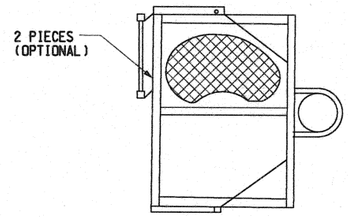
PLAN



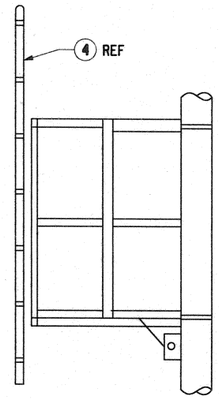
1 DETAIL
NTS



2 DETAIL
NTS

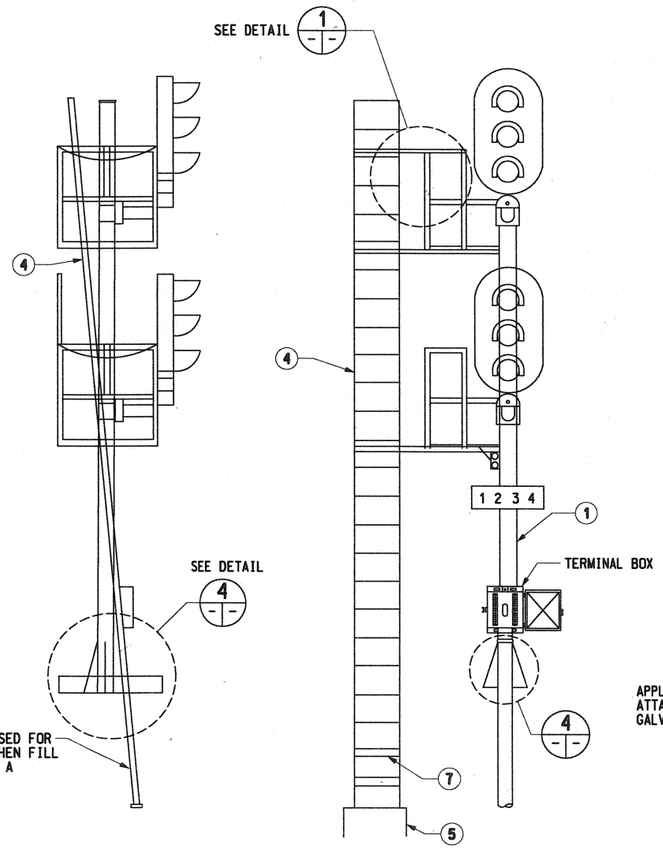


PLAN



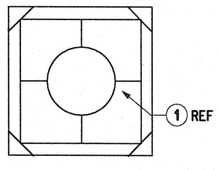
ELEVATION

OPTIONAL VERTICAL LADDER MOUNT

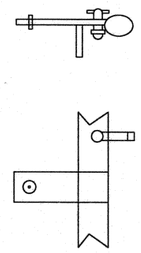


SIDE VIEW

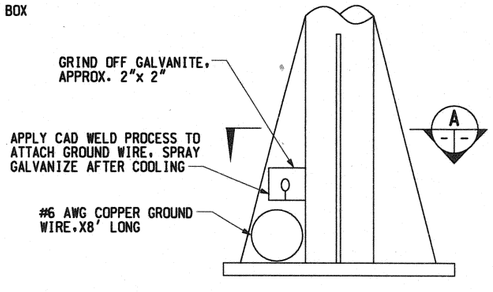
FRONT VIEW



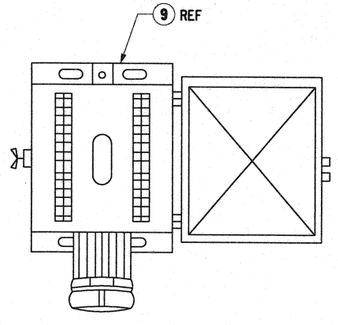
A SECTION
NTS



3 DETAIL
NTS



4 DETAIL
NTS



TERMINAL BOX

NOTES:

1. DRAWING REFLECTS MATERIALS AND DIMENSIONS FOR G.E. TRANSPORTATION SYSTEMS GLOBAL SIGNALING SIGNAL. APPROVED EQUAL MUST CONFORM TO DRAWING.

REVISIONS	
NO.	DATE
1	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

TYPICAL COLOR LIGHT SIGNAL - TWO UNIT

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

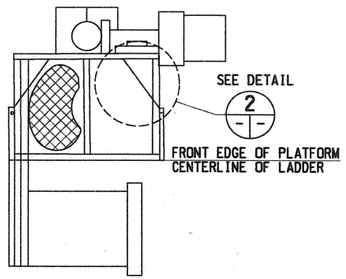
DRAWING NO: RR-532

SHEET NO: 1 OF 1

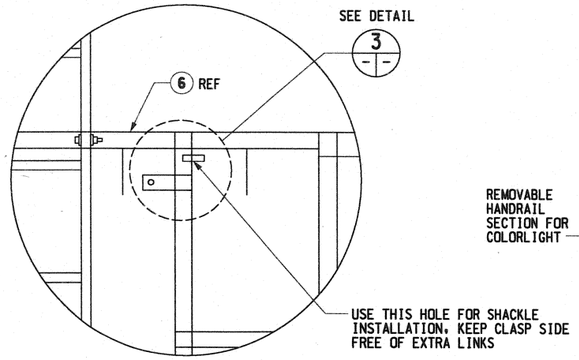
10/4/2013

...*RR-532 Typical Color Light Signal-Two Unit

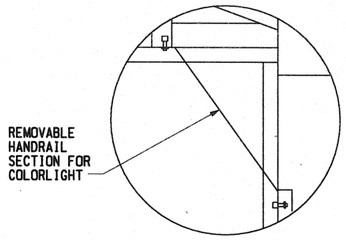
ITEM	QTY.	DESCRIPTION
1	1	MAST STEEL 2 POS. 21' LG.
2	1	STEEL PLATFORM ASSEMBLY
3	1	C/L 5" MTG. KIT
4	1	LADDER
5	1	STEEL LADDER FOUNDATION
6	3	LADDER SUPPORT BRACKET ASSEMBLY
7	1	MAST LADDER PLATFORM ACCENT PLATE



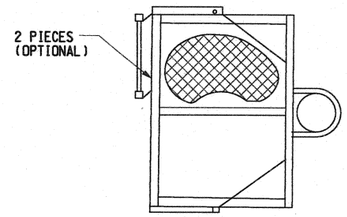
PLAN



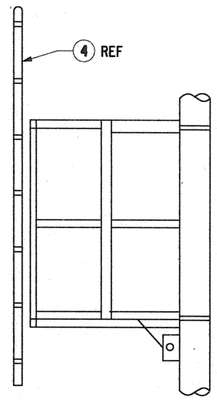
1 DETAIL NTS



2 DETAIL NTS

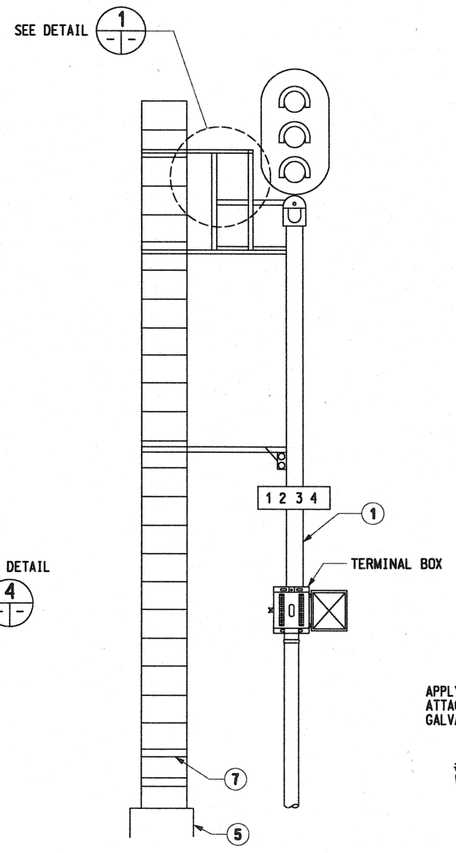


PLAN



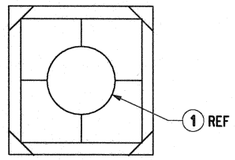
ELEVATION

OPTIONAL VERTICAL LADDER MOUNT

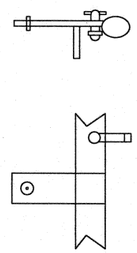


SIDE VIEW

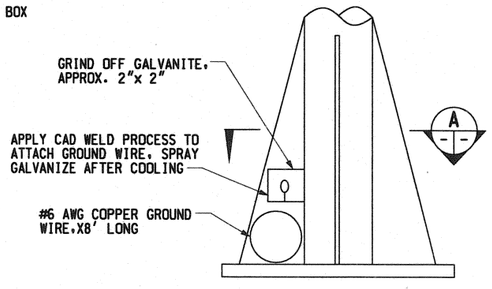
FRONT VIEW



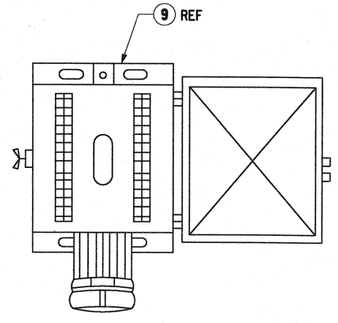
A SECTION NTS



3 DETAIL NTS



4 DETAIL NTS



TERMINAL BOX

NOTES:

1. DRAWING REFLECTS MATERIALS AND DIMENSIONS FOR G.E. TRANSPORTATION SYSTEMS GLOBAL SIGNALING SIGNAL. APPROVED EQUAL MUST CONFORM TO DRAWING.

REVISIONS	
NO.	DATE
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Port of LONG BEACH The Green Port

RAILROAD STANDARD PLANS

TYPICAL COLOR LIGHT SIGNAL - TWO UNIT BI - DIRECTIONAL

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

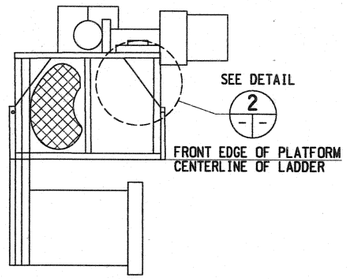
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-533

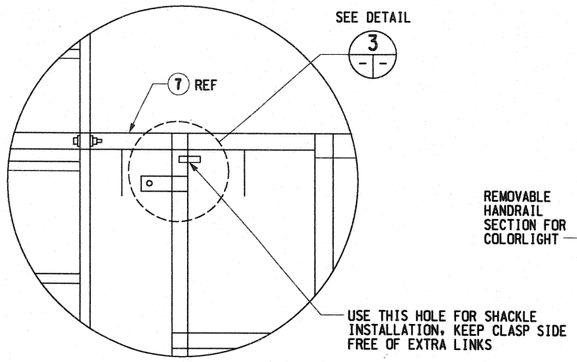
SHEET NO: 1 OF 1

10/4/2013

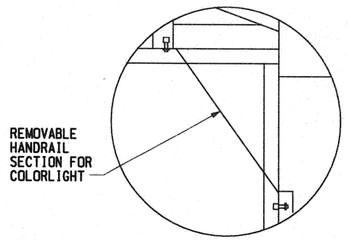
ITEM	QTY.	DESCRIPTION
1	1	MAST STEEL 2 POS. 21' LG.
2	1	STEEL PLATFORM ASSEMBLY
3	1	C/L 5" MTG. KIT
4	1	LADDER
5	1	STEEL LADDER FOUNDATION
6	2	LADDER SUPPORT BRACKET ASSEMBLY
7	3	LADDER SUPPORT BRACKET ASSEMBLY
8	1	MAST LADDER PLATFORM ACCENT PLATE



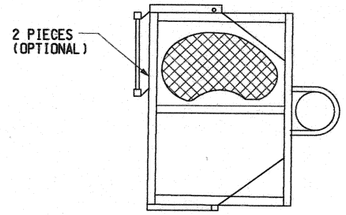
PLAN

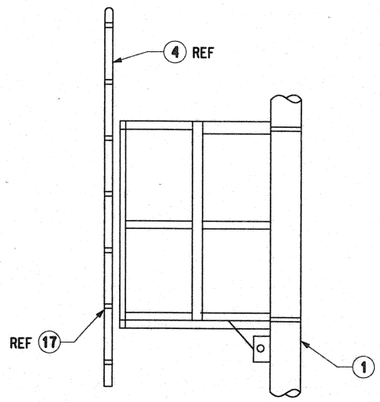


1 DETAIL NTS



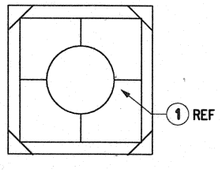
2 DETAIL NTS



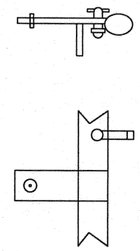


ELEVATION

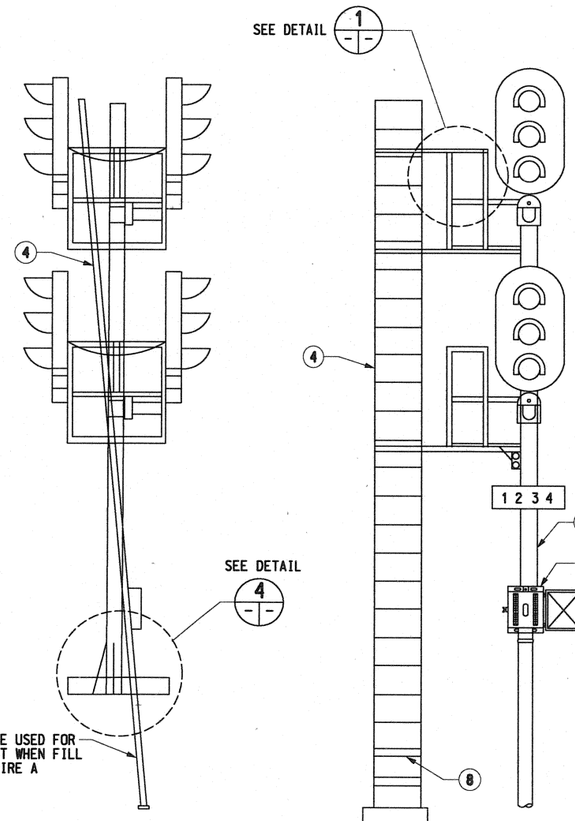
OPTIONAL VERTICAL LADDER MOUNT



A SECTION NTS

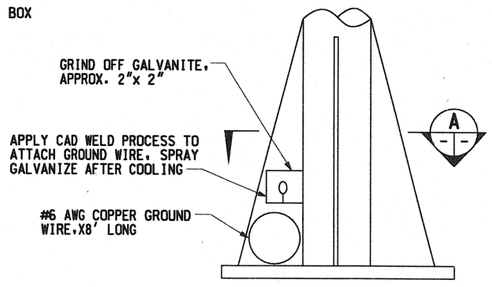


3 DETAIL NTS

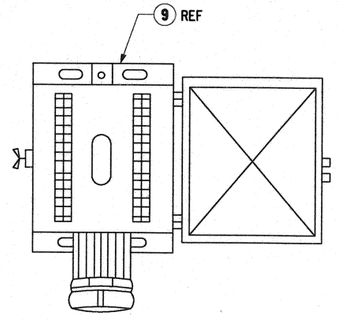


SIDE VIEW

FRONT VIEW



4 DETAIL NTS



TERMINAL BOX

NOTES:

1. DRAWING REFLECTS MATERIALS AND DIMENSIONS FOR G.E. TRANSPORTATION SYSTEMS GLOBAL SIGNALING SIGNAL. APPROVED EQUAL MUST CONFORM TO DRAWING.

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

TYPICAL COLOR LIGHT SIGNAL - FOUR UNIT BI - DIRECTIONAL

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

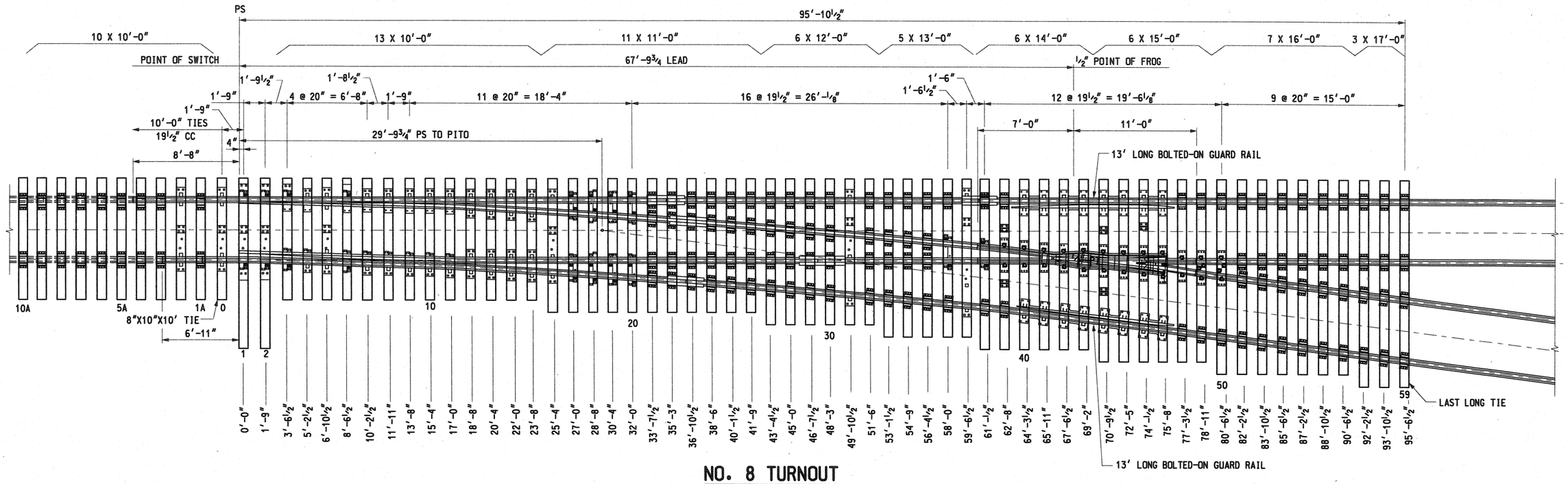
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-534

SHEET NO: 1 OF 1

10/4/2013

...*RR-534 Typical Color Light Signal-Four Unit Bi-Directional



NO. 8 TURNOUT

R.H. TURNOUT SHOWN - L.H. OPPOSITE

QTY	BILL OF MATERIAL FOR NO. 8 136RE RH TURNOUT C/W RBM FROG
140	STANDARD PANDROL TIE PLATES 6" RAIL BASE
584	15/16" DIA SCREW SPIKES
404	e2055 RAIL CLIPS
1	16'-6" STRAIGHT SWITCH POINTS COMPLETE WITH PLATES AND SWITCH STAND
1	NO. 8 RAIL BOUND MANGANESE STEEL FROG COMPLETE WITH PLATES
1 SET	TIMBER TIES (SEE TABLE)
2	13' BOLTED GUARD RAIL AND HARDWARE WITH PLATES
1	36'-10" STRAIGHT SWITCH STOCK RAIL
1	37'-0" CURVED SWITCH STOCK RAIL
1	27'-7 3/4" STRAIGHT CLOSURE RAIL
1 EACH	14'-9", 13'-0 3/16" CURVED CLOSURE RAILS
1 EACH	29'-5", 39'-0" STRAIGHT BUFFER RAILS
1 EACH	21'-3", 36'-2" CURVED BUFFER RAILS
1 EACH	NO. 1 (WITH BASKET IF NECESSARY) & NO. 2 INSULATED VERTICAL SWITCH RODS
4	INSULATED GAGE PLATES
2	FLOATING HEEL BLOCKS
3	INSULATED FROG GAGE PLATES
A/R	ELASTIC SPRING CLIPS WITH INSULATED SHOULDERS
A/R	STANDARD & SPECIAL PLATES
2	SWITCH POINT PROTECTORS
1	1 SET COMPLETE SWITCH PLATES MILLED WITH ADJUSTABLE RAIL BRACES

SWITCH TIES	
LENGTH	QTY
10'-0"	23
8"x10"x10'-0"	1
11'-0"	11
12'-0"	6
13'-0"	5
14'-0"	8
15'-0"	6
16'-0"	7
17'-0"	3
TOTAL QTY = 70	
TOTAL L.F. = 863'	

1 @ 8" X 10" X 10'-0"
ALL TIES 7" X 9" X LENGTHS GIVEN
* HEADBLOCK TIES SHALL BE 14'-0" FOR SWITCH STANDS WITHIN PAVEMENT

NOTES:

1. SWITCH POINTS TO BE DOUBLE REINFORCED WITH 2'-8" LONG SOLID MANGANESE STEEL SAMSON TYPE SWITCH POINTS AND UNIVERSALLY UNDERCUT STOCK RAIL. TURNOUTS SHALL HAVE VERTICAL SWITCH RODS.
2. FROG SHALL BE GLUED, HIGH INTEGRITY, EXPLOSION HARDENED, RAIL BOUND MANGANESE STEEL CASTING WITH MITERED HEEL AND EXTENDED HEEL AND WING RAILS.
3. ALL SWITCH RODS AND GAUGE PLATES ARE TO BE INSULATED TYPES.
4. STOCK RAILS ARE TO BE BENT IN THE MILL OR IN THE SHOP.
5. ACTUAL TURNOUT DATA, TURNOUT OFFSETS, RAIL LENGTHS, AND SWITCH TIE LENGTHS MAY VARY ON MANUFACTURER'S SHOP DRAWINGS.
6. ARC METHOD IS USED TO CALCULATE TURNOUT CURVE DATA AND OFFSETS.
7. RAIL FASTENERS SHALL BE PANDROL TYPE e-2055 ELASTIC CLIP.
8. ALL SWITCH TIES SHALL BE TIMBER.
9. INSTALL TWO INSULATED GAGE PLATES LOCATED AT THREE TIE SPACINGS IN ADVANCE OF SWITCH PER AREMA 223-03.
10. PROVIDE ELECTRICAL CONDUIT W/ STUB OUT FOR ALL TURNOUT SWITCHES TO ACCOMODATE FUTURE POWER SWITCHING. SEE STD PLAN RR-503 FOR STUB OUT LOCATION.
11. PAVEMENT TURNOUTS CANNOT BE INSULATED.

NOTES FOR PAVEMENT TYPE SWITCH:

1. PAVEMENT SWITCH STAND SHALL BE HEAVY DUTY, ENCLOSED DESIGN WITH HINGED COVER AND BOX, ENCLOSED TRAILABLE CONNECTION ROD PER DRAWINGS RR-602, RR-603, RR-604, RR-605 AND RR-373 (ROD).
2. PAVEMENT GUARD AND FROG GUARD RAIL SHALL BE FLUSH WITH PAVEMENT.

REVISIONS	
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Port of LONG BEACH
The Green Port

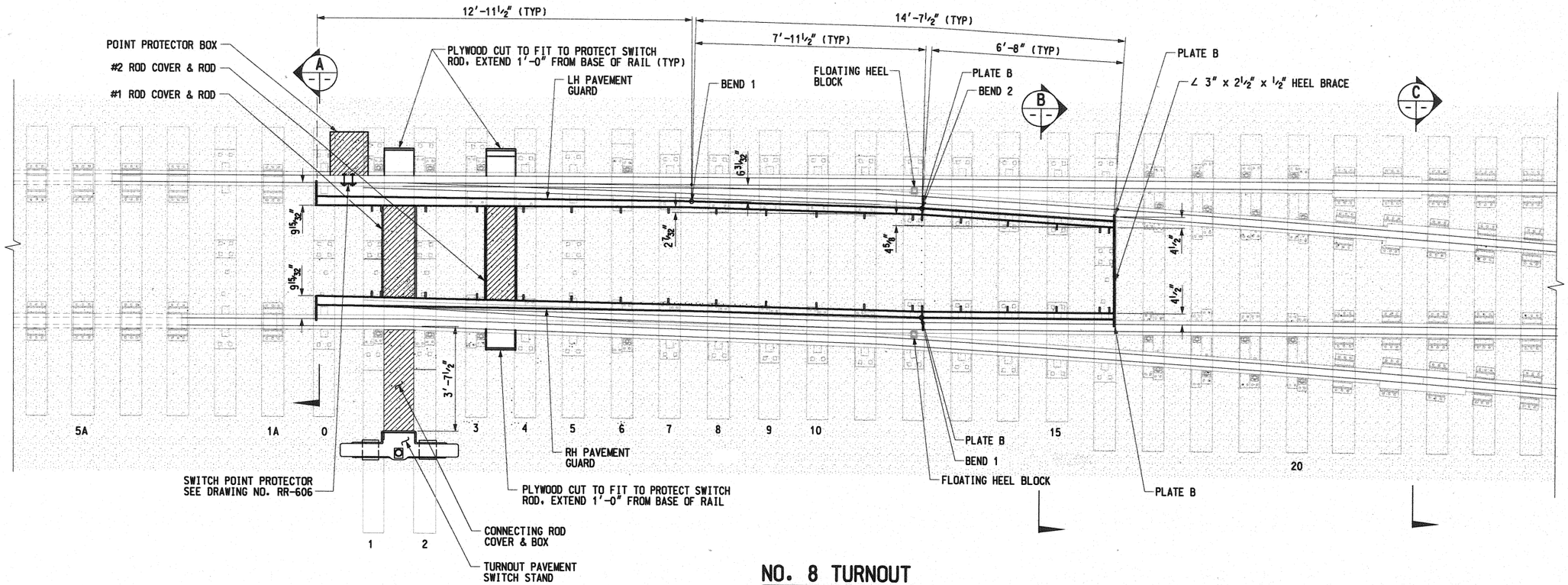
RAILROAD STANDARD PLANS

NUMBER 8 TURNOUT 136 LB FOR USE IN-PAVEMENT

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

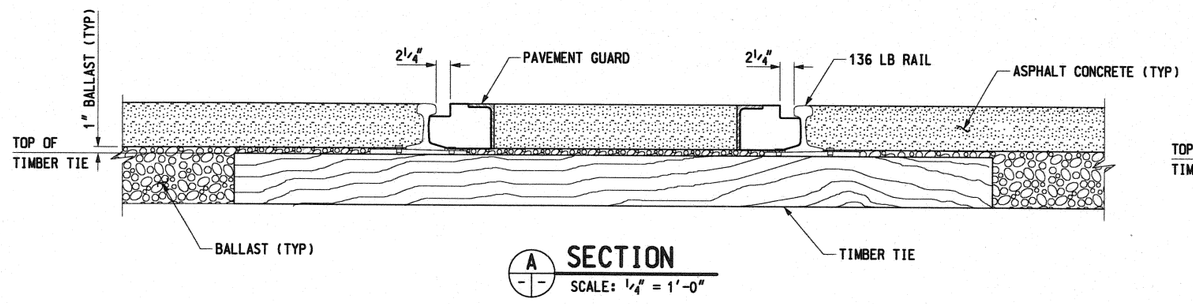
DRAWING NO: RR-601
SHEET NO: 1 OF 1

10/4/2013



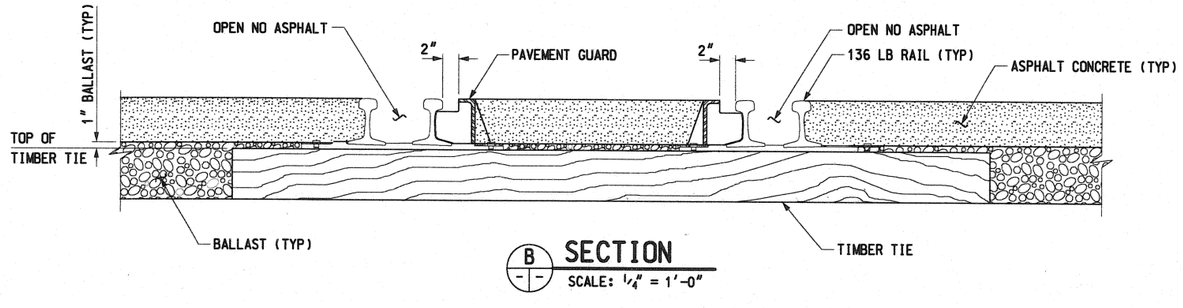
NO. 8 TURNOUT

SCALE: ½″ = 1′-0″



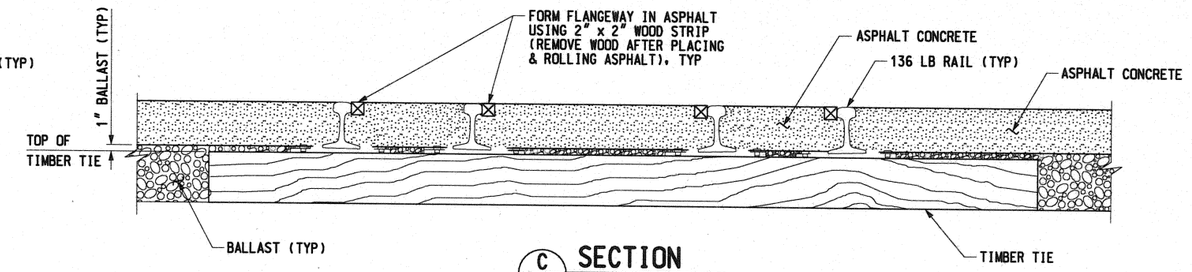
A SECTION

SCALE: ¼″ = 1′-0″



B SECTION

SCALE: ¼″ = 1′-0″



C SECTION

SCALE: ¼″ = 1′-0″

NOTES:

1. TURNOUTS IN PAVEMENT CANNOT BE MADE INSULATED OR MADE TO WORK WITH SIGNALING.
2. SEE DRAWING RR-603 FOR PAVEMENT GUARD DETAILS, DRAWING RR-604 FOR SWITCH STAND DETAILS, DRAWING RR-373 FOR CONNECTING ROD ASSEMBLY, DRAWING RR-605 FOR SWITCH ROD BOX AND CONNECTING ROD BOX DETAILS.
3. UTILIZING A TURNOUT WITH DIFFERENT TIE SPACING REQUIRES CHANGES TO RR-603 AND RR-605.
4. PAVEMENT GUARD MAY REQUIRE SHIMMING OR ADJUSTMENT IN THE FIELD TO ACCOUNT FOR DIFFERING SWITCH PLATE HEIGHT OR THICKNESS. PAVEMENT GUARD WHEN PROPERLY INSTALLED SHOULD BE FLUSH WITH THE TOP OF THE SWITCH POINT AND THE PAVEMENT.
5. BALLAST IN TIE CRIBS UNDER SWITCH RODS TO BE LOW ENOUGH TO ALLOW FREE MOVEMENT OF SWITCH RODS.
6. PAVEMENT STIFFENERS ARE TO BE WELDED TO SWITCH PLATES AND SHALL BE ROUGHLY CENTERED ON SWITCH PLATES.

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

NUMBER 8 TURNOUT 136 LB SWITCH POINT SECTION FOR USE IN-PAVEMENT

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

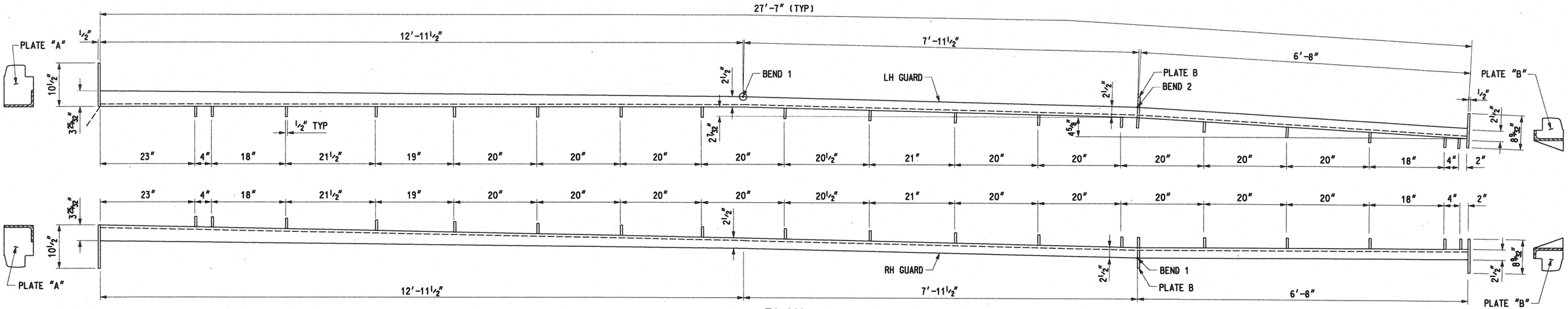
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-602

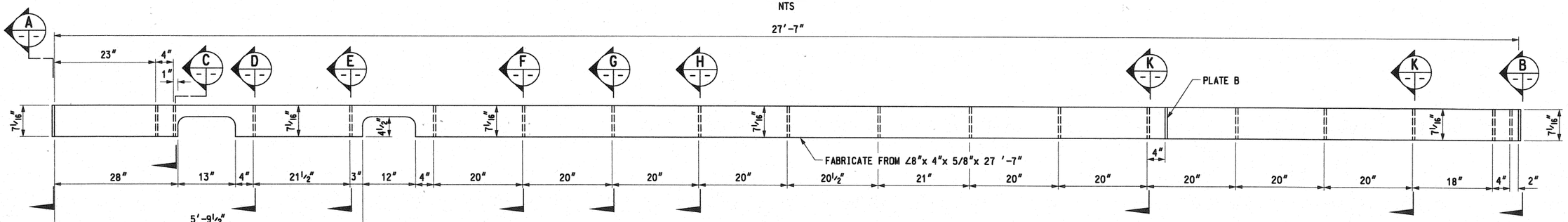
SHEET NO: 1 OF 1

10/4/2013

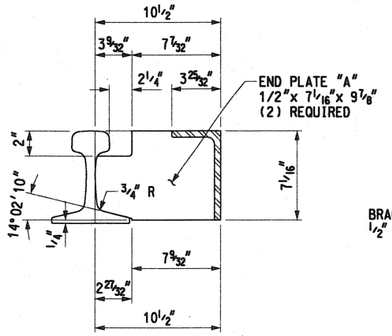
...*RR-602 Number 8 Turnout 136 lb - Switch Point Section for Use in - Pavement



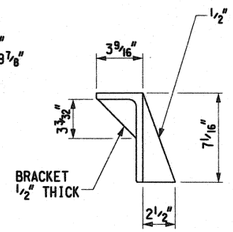
PLAN
NTS



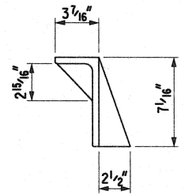
ELEVATION
NTS



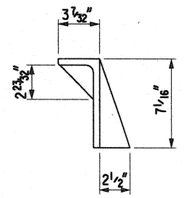
A SECTION
NTS



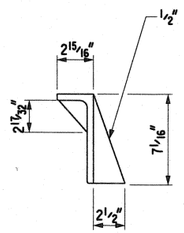
C SECTION
NTS



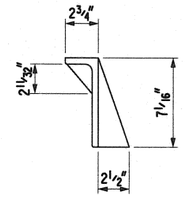
D SECTION
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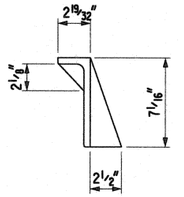
E SECTION
NTS



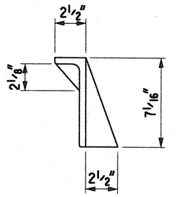
F SECTION
NTS



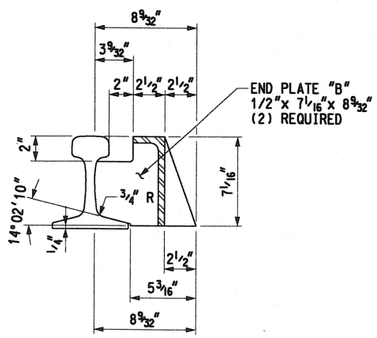
G SECTION
NTS



H SECTION
NTS



K SECTION
NTS



B SECTION
NTS

NOTES:

1. STIFFENERS MAY REQUIRE ADJUSTMENT IN FIELD TO FIT AROUND SWITCH PLATE FASTENERS.
2. STIFFENERS ARE TO BE TACK WELDED TO SWITCH PLATES TO SUPPORT PAVEMENT GUARD PRIOR TO PLACING ASPHALT.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

NUMBER 8 TURNOUT 136 LB PAVEMENT GUARD DETAILS

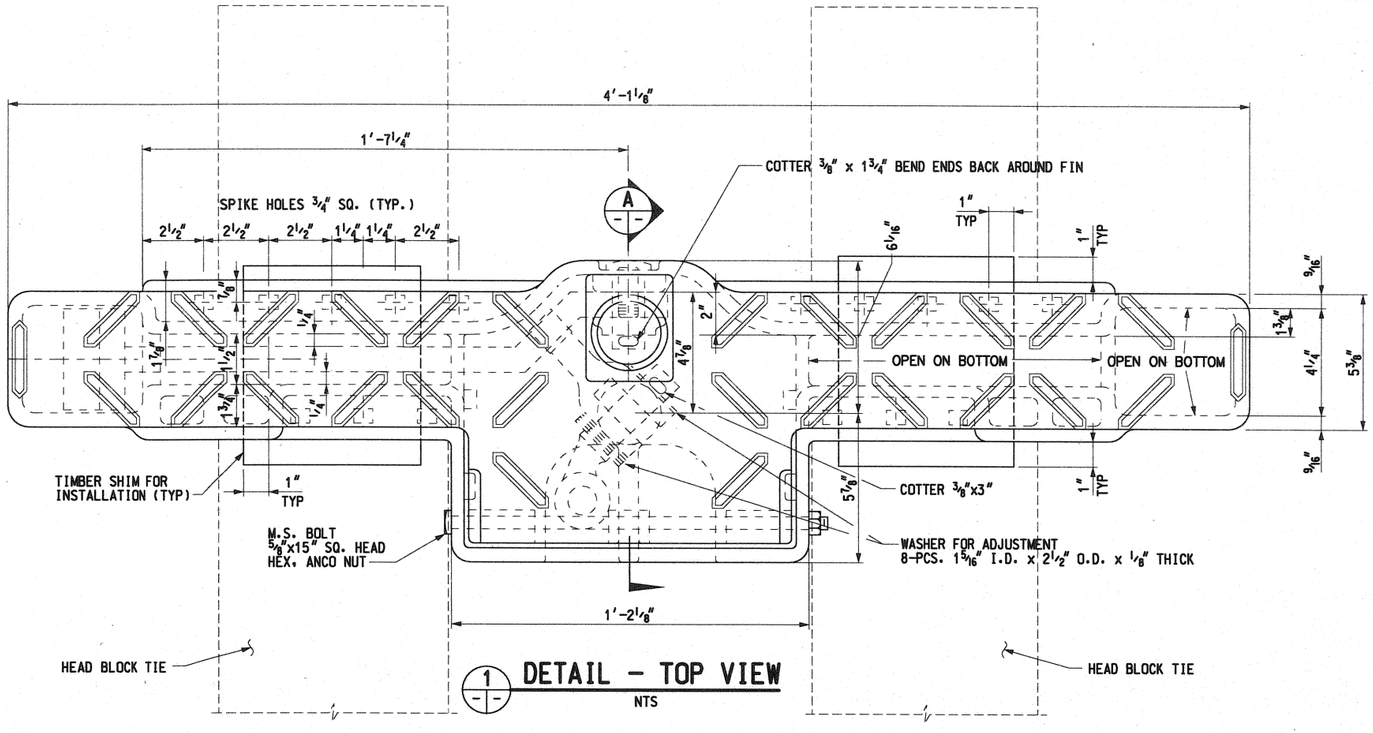
APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-603

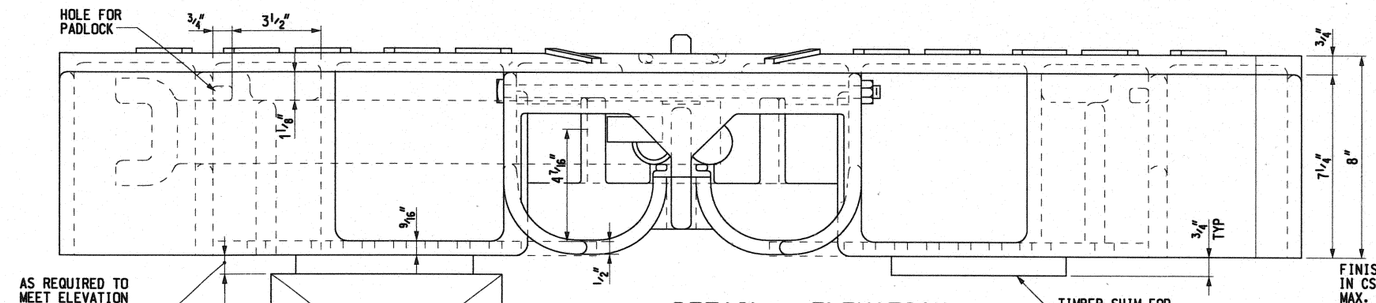
SHEET NO: 1 OF 1

10/4/2013

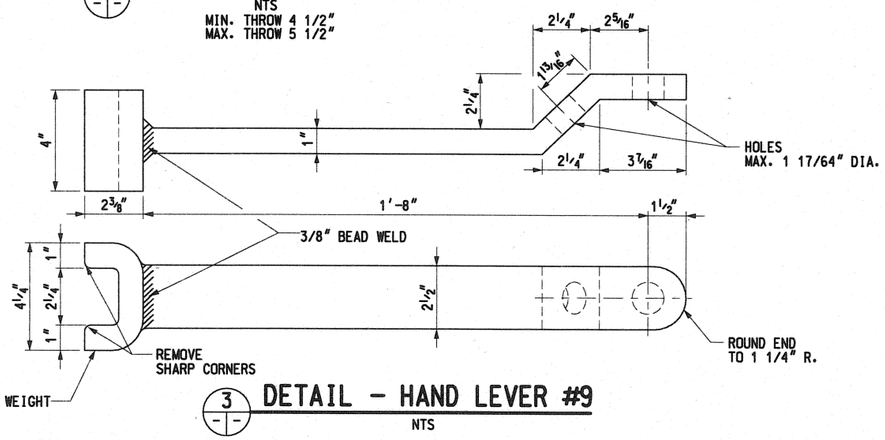
...*RR-603 Number 8 Turnout 136 lb Pavement Guard Details



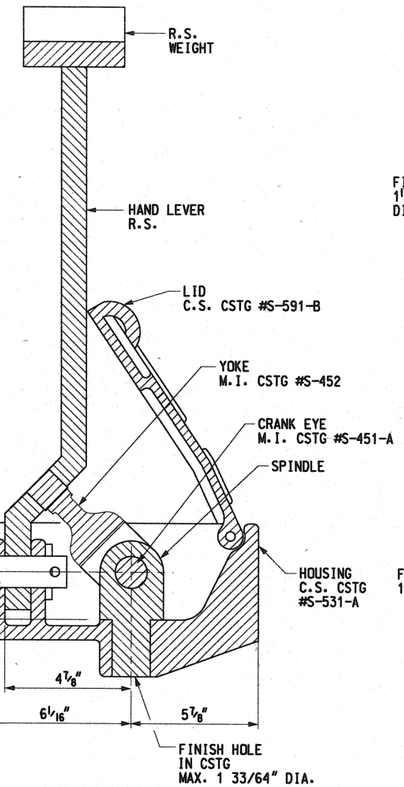
1 DETAIL - TOP VIEW
NTS



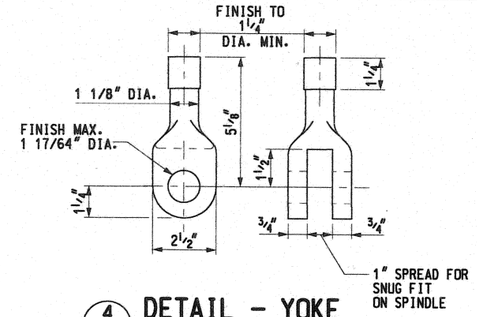
2 DETAIL - ELEVATION
NTS
MIN. THROW 4 1/2"
MAX. THROW 5 1/2"



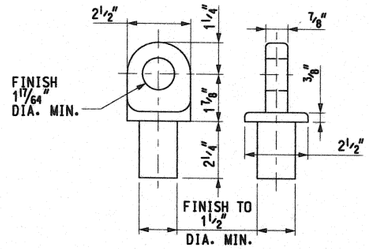
3 DETAIL - HAND LEVER #9
NTS



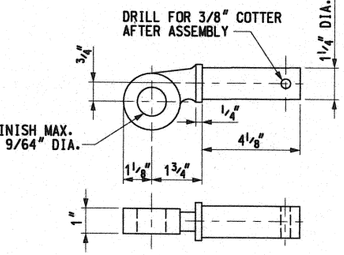
A SECTION
NTS



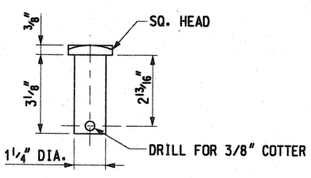
4 DETAIL - YOKE
NTS
M.I. CSTG. #S-450



5 DETAIL - SPINDLE
NTS
M.I. CSTG. #S-450



6 DETAIL - CRANK EYE
NTS
M.I. CSTG. #S-451-A



MAKE FROM BOLT 1 1/4" DIA. X 3 1/8" LONG
SQ. HEAD 3/8" THICK - NO THREADS.

7 DETAIL - PIN
NTS

NOTES:

1. THESE DETAILS ARE SCHEMATIC ONLY.
2. SWITCH STAND ENCLOSURE DETAILS SHOWN FOR NON-INSULATED TURNOUTS ONLY.

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

NUMBER 8 TURNOUT PAVEMENT TYPE SWITCH STAND 136 LB

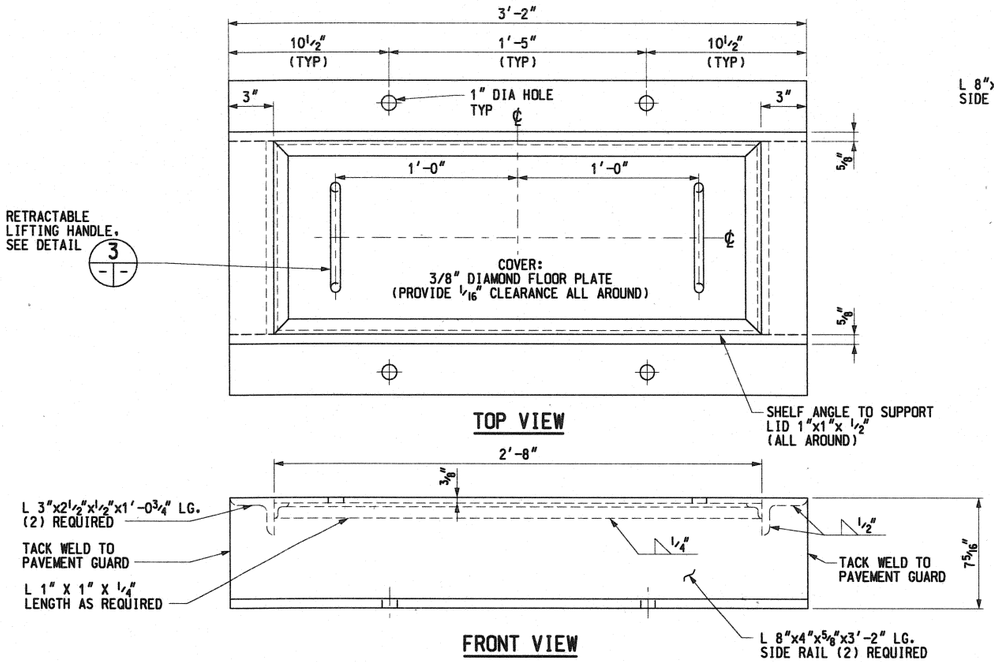
APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-604

SHEET NO: 1 OF 1

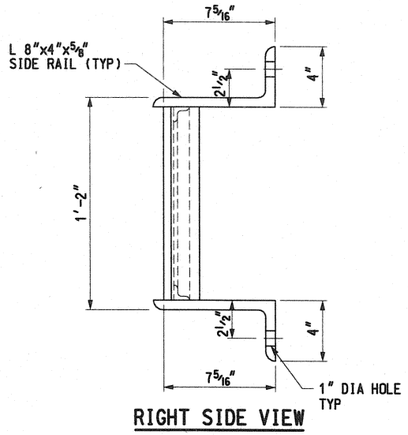
10/4/2013

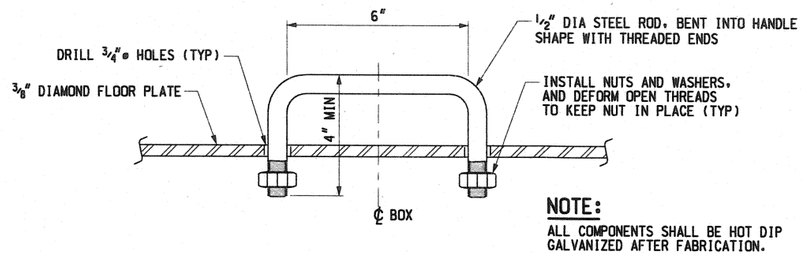
...*RR-604 Number 8 Turnout Pavement Type Switch Stand, 136 lb



1 DETAIL - BOX FOR NO. 1 SWITCH ROD

NTS



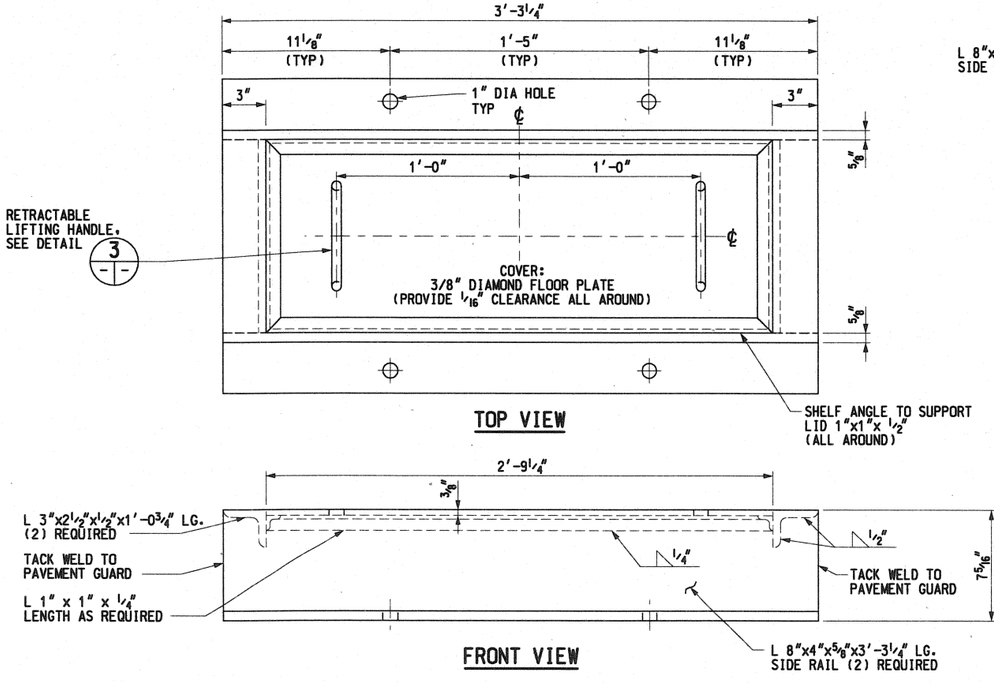


NOTE:

ALL COMPONENTS SHALL BE HOT DIP GALVANIZED AFTER FABRICATION.

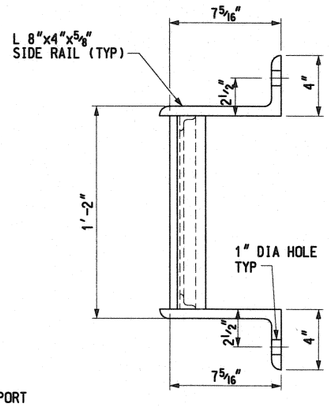
3 DETAIL - RETRACTABLE LIFTING HANDLES

NTS



2 DETAIL - BOX FOR NO. 2 SWITCH ROD

NTS



NOTES:

1. CONTRACTOR SHALL NOTCH BOX SIDE TO FIT GAGE PLATES AND SWITCH PLATES.
2. BOX FOR NO. 1 & NO. 2 SWITCH RODS WILL BE TACK WELDED TO PAVEMENT GUARD AND SET FLUSH TO TOP OF PAVEMENT.
3. CONTRACTOR SHALL ENSURE BOX NO. 3 FOR CONNECTION ROD THAT TOP OF BOX GRADE IS FLUSH WITH PAVEMENT GRADE AND SECURELY FASTENED TO TIMBER TIES WITH SCREW SPIKES.
4. DIMENSIONS & FASTENING SYSTEM SHOWN ON PLAN ARE FOR REFERENCE ONLY. THE CONTRACTOR SHALL SUBMIT PAVEMENT TYPE SWITCH BOX FOR TIMBER SWITCH TIE INSTALLATION FOR APPROVAL BY THE ENGINEER.
5. SEE DRAWING RR-605, SHEET 2 OF 2 FOR CONNECTION ROD BOX AND SWITCH POINT PROTECTION BOX.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

NUMBER 8 TURNOUT PAVEMENT TYPE SWITCH BOX 136 LB

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

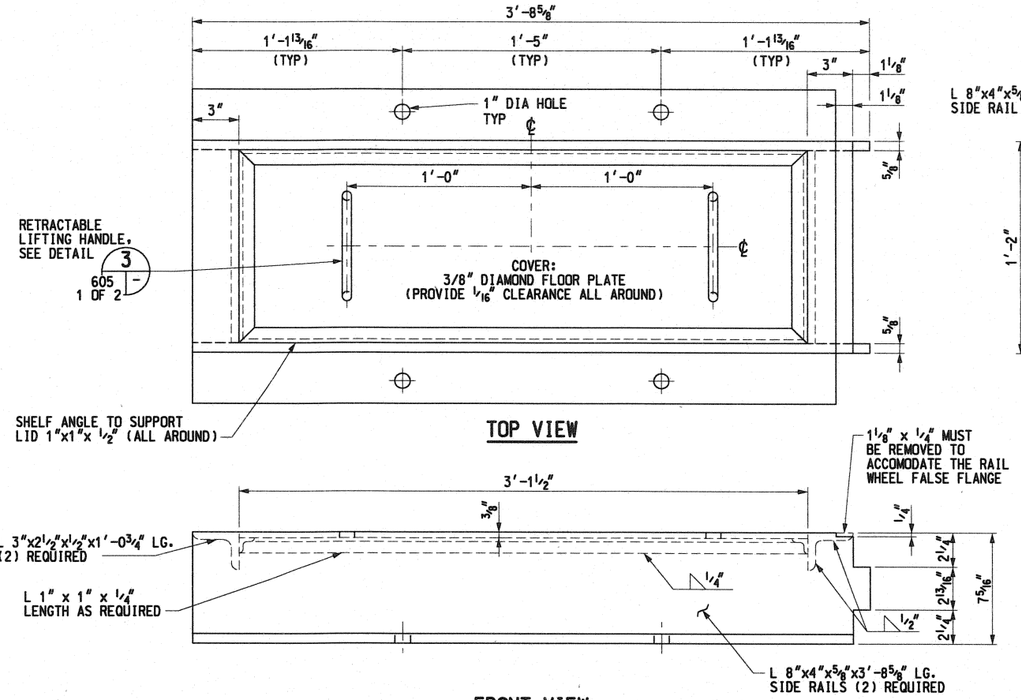
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-605

SHEET NO: 1 OF 2

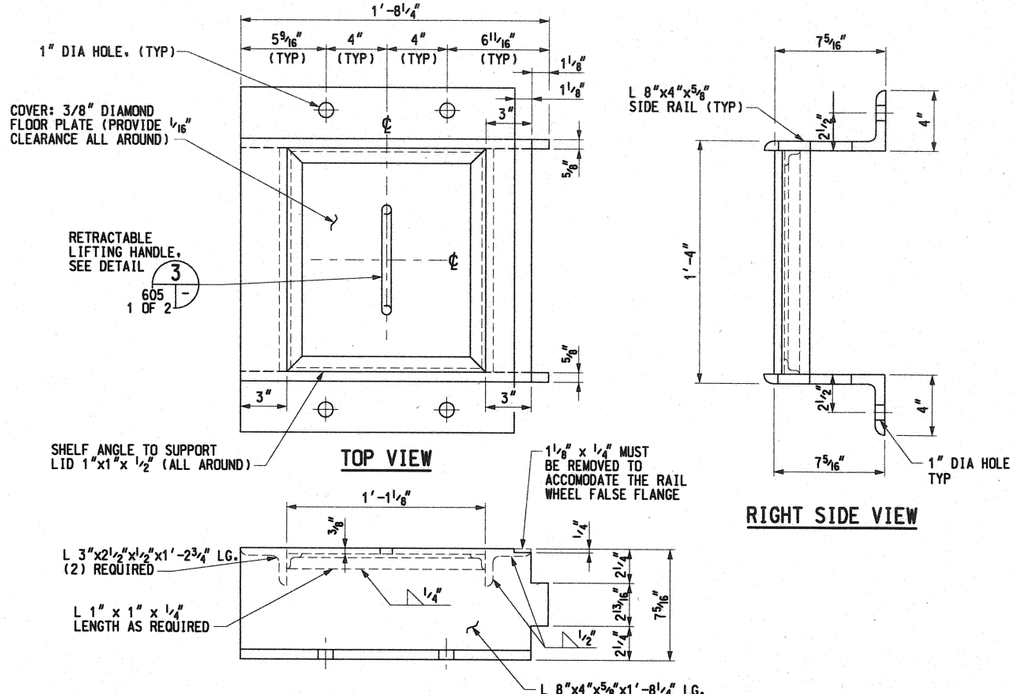
10/4/2013

...*RR-605 Number 8 Turnout Pavement Type Switch Box 136 LB 1 of 2



1 DETAIL - BOX FOR CONNECTION ROD

NTS



2 DETAIL - BOX FOR SWITCH POINT PROTECTOR

NTS

NOTES:

1. CONTRACTOR SHALL NOTCH BOX SIDE TO FIT GAGE PLATES AND SWITCH PLATES.
2. BOX FOR NO. 4 SWITCH POINT PROTECTOR WILL BE TACK WELDED TO PAVEMENT GUARD AND SET FLUSH TO TOP OF PAVEMENT.
3. CONTRACTOR SHALL ENSURE BOX NO. 3 FOR CONNECTION ROD THAT TOP OF BOX GRADE IS FLUSH WITH PAVEMENT GRADE AND SECURELY FASTENED TO TIMBER TIES WITH SCREW SPIKES.
4. DIMENSIONS & FASTENING SYSTEM SHOWN ON PLAN ARE FOR REFERENCE ONLY. THE CONTRACTOR SHALL SUBMIT PAVEMENT TYPE SWITCH BOX FOR TIMBER SWITCH TIE INSTALLATION FOR APPROVAL BY THE ENGINEER.
5. SEE DRAWING RR-605, SHEET 1 OF 2 FOR SWITCH ROD BOXES AND RETRACTABLE LIFTING HANDLE.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

NUMBER 8 TURNOUT PAVEMENT TYPE SWITCH BOX 136 LB

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

P.E. NO.: C-54141 DATE: 09-19-2013

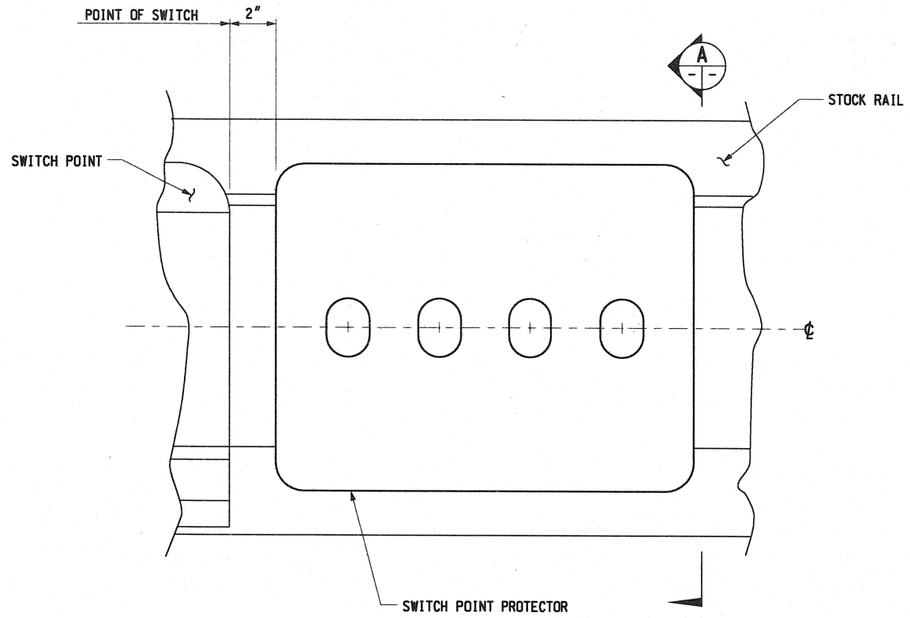
DRAWING NO: RR-605

SHEET NO: 2 OF 2

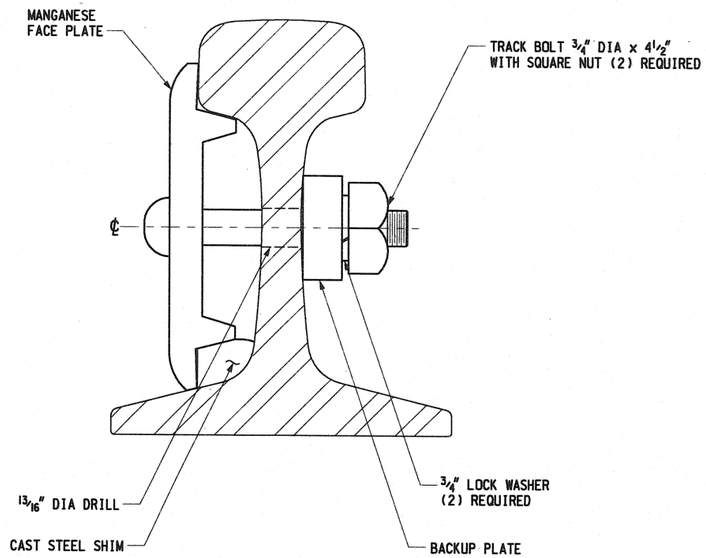
10/4/2013

RAILS COMPANY OR EQUAL

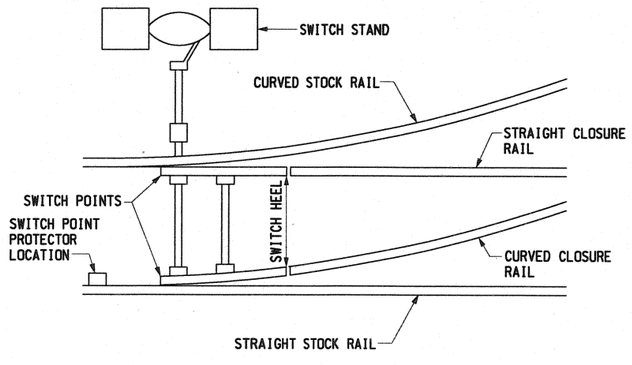
PART NO.	RAILS	MANG. FACE	SHIM	B.U. PLATE
SPP-141	131#, 132#, 136# AREA 141# AB, 127 NYC, 140# AREA	SPP-141-F	SPP-132-S	SPP-132-S



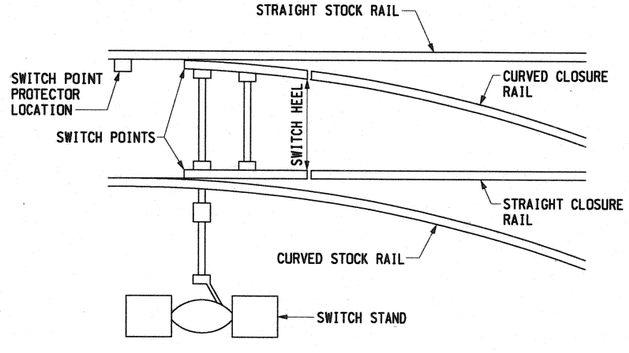
LEFT SIDE VIEW
NTS



A SECTION
NTS



LEFT - HAND SWITCH
NTS



RIGHT - HAND SWITCH
NTS

NOTES FOR SWITCH POINT PROTECTOR:

1. SWITCH POINT PROTECTOR SHOULD ONLY BE USED ON TURNOUTS WHERE SPEED IS LIMITED TO 10 MPH OR LESS ON STRAIGHT OR DIVERGING ROUTES.
2. EDGE OF SWITCH POINT PROTECTOR SHOULD BE 2" FROM END OF SWITCH POINT.
3. LOCATE SWITCH POINT PROTECTOR FACE PLATE AND MARK DRILL LOCATIONS FOR 13/16" DIAMETER HOLES (2) REQUIRED.
4. INSTALL SWITCH POINT PROTECTOR ON DIVERGING ROUTE. SWITCH POINT NOT REQUIRED FOR STRAIGHT SIDE.
5. FACE PLATE MAY BE REVERSED AFTER SUFFICIENT WEAR IS APPARENT.

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Port of LONG BEACH
The Green Port

RAILROAD
STANDARD PLANS

IN-PAVEMENT TURNOUT 136 LB SWITCH POINT PROTECTORS

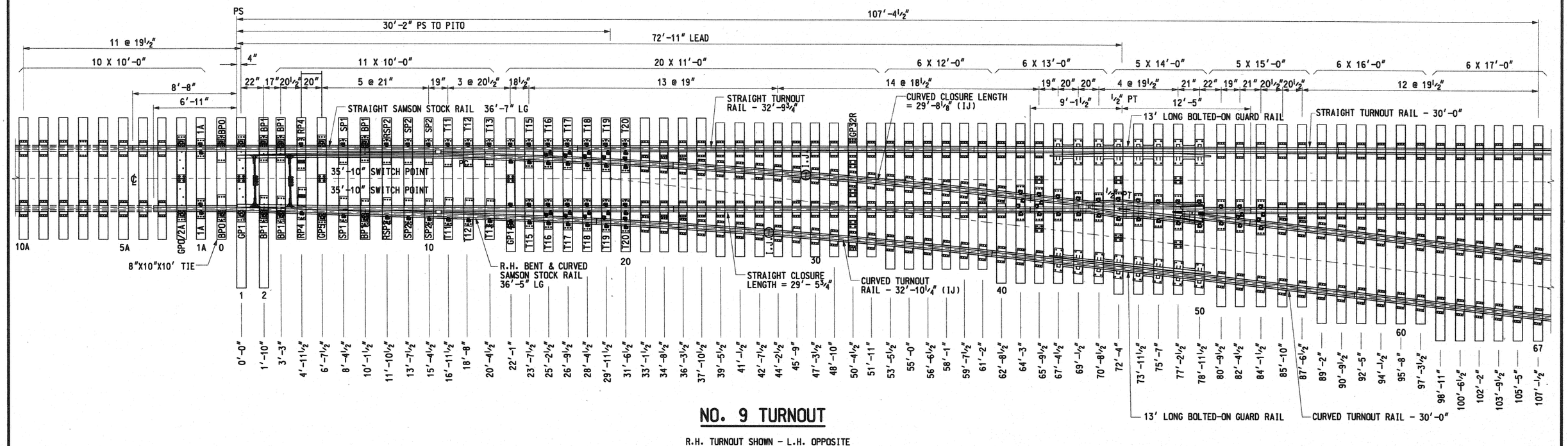
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-606

SHEET NO: 1 OF 1

10/4/2013

...*RR-606 In-Pavement Turnout 136 LB Switch Point Protectors



NO. 9 TURNOUT

R.H. TURNOUT SHOWN - L.H. OPPOSITE

BILL OF MATERIAL FOR NO. 9 136RE RH TURNOUT C/W RBM FROG	
QTY	DESCRIPTION
1	36′-7″ 136RE LH STRAIGHT SAMSON STOCK RAIL FOR RH TURNOUT
1	36′-5″ 136RE RH BENT SAMSON STOCK RAIL FOR RH TURNOUT
1	32′-9¾″ 136RE STRAIGHT RUNNING RAIL
1	30′-0″ 136RE STRAIGHT RUNNING RAIL
1	29′-5¾″ 136RE STRAIGHT CLOSURE RAIL
1	29′-8⅛″ 136RE CURVED CLOSURE RAIL (IJ RAIL)
1	32′-10¼″ 136RE CURVED TURNOUT RAIL (IJ RAIL)
1	30′-0″ 136RE CURVED TURNOUT RAIL
1	16′-6″ 136RE LH SAMSON DET. 5100 SWITCH POINT WITH UNIFORM RISER ON 35′-10″ RAIL
1	16′-6″ 136RE RH SAMSON DET. 5100 SWITCH POINT WITH UNIFORM RISER ON 35′-10″ RAIL
1	PAIR OF 2-HOLE FLOATING HEEL BLOCK ASSEMBLY FOR 16′-6″ 136RE UNIFORM RISER SWITCH
1	NO.9 136LB RE RBM FROG C/W PANDROLIZED FROG BASE PLATES
1	PANDROLIZED SWITCH PLATE PACK FOR 16′-6″ 136RE UNIFORM RISER SWITCH
1	PANDROLIZED TURNOUT PLATE PACK FOR RH NO. 9 UNIFORM RISER
2	13′ BOLTED GUARD RAIL AND HARDWARE WITH PLATES
1	NO.1 VERTICAL INSULATED SWITCH ROD
1	NO.2 VERTICAL INSULATED SWITCH ROD
4	ADJUSTABLE ROCKER CLIPS
5	ADDITIONAL GAGE PLATES (3 @ THE FROG AND 2 THRU THE TURNOUT)
102	PANDROL ROLLED 1:40 CANT TIE PLATE 6″ BASE
4	PANDROL ROLLED 1:40 CANT TIE PLATE 6″ BASE (CUT FOR CLEARANCE)
308	PANDROL "e" CLIP 2055
692	15/16″ x 6″ SCREW SPIKE
36	SET OF PANDROL "C" CLIP AND "C" PLATE FOR JOINT BAR FASTENING
2	TOUGH-COAT INSULATED JOINT KIT C/W ⅜″ END POST & HARDWARE
1	SWITCH STAND (SEE DRAWING RR-604)

SWITCH TIES	
LENGTH	QTY
10′-0″	21
8″x10″x10′-0″	1
11′-0″	20
12′-0″	6
13′-0″	6
14′-0″	7
15′-0″	5
16′-0″	6
17′-0″	6
TOTAL QTY = 78	
TOTAL L.F. = 961 LF	

1 @ 8″ X 10″ X 10′-0″
ALL TIES 7″ X 9″ X LENGTHS GIVEN
* HEADBLOCK TIES SHALL BE 14′-0″ FOR SWITCH STANDS WITHIN PAVEMENT

NOTES FOR PAVEMENT TYPE SWITCH:

1. PAVEMENT SWITCH STAND SHALL BE HEAVY DUTY, ENCLOSED DESIGN WITH HINGED COVER AND BOX, ENCLOSED TRAILABLE CONNECTION ROD PER DRAWING RR-604.
2. GUARD RAIL SHALL BE FLUSH WITH PAVEMENT.

NOTES:

1. SWITCH POINTS TO BE DOUBLE REINFORCED WITH 2′-8″ LONG SOLID MANGANESE STEEL SAMSON TYPE SWITCH POINTS AND UNIVERSALLY UNDERCUT STOCK RAIL. TURNOUTS SHALL HAVE VERTICAL SWITCH RODS.
2. FROG SHALL BE GLUED, HIGH INTEGRITY, EXPLOSION HARDENED, RAIL BOUND MANGANESE STEEL CASTING WITH MITERED HEEL AND EXTENDED HEEL AND WING RAILS.
3. ALL SWITCH RODS AND GAUGE PLATES ARE TO BE INSULATED TYPES.
4. STOCK RAILS ARE TO BE BENT IN THE MILL OR IN THE SHOP.
5. ACTUAL TURNOUT DATA, TURNOUT OFFSETS, RAIL LENGTHS, AND SWITCH TIE LENGTHS MAY VARY ON MANUFACTURER'S SHOP DRAWINGS.
6. ARC METHOD IS USED TO CALCULATE TURNOUT CURVE DATA AND OFFSETS.
7. RAIL FASTENERS SHALL BE PANDROL TYPE e-2055 ELASTIC CLIP.
8. ALL SWITCH TIES SHALL BE TIMBER.
9. INSTALL TWO INSULATED GAGE PLATES LOCATED AT THREE TIE SPACINGS IN ADVANCE OF SWITCH PER AREMA 223-03.
10. PROVIDE ELECTRICAL CONDUIT W/ STUB OUT FOR ALL TURNOUT SWITCHES TO ACCOMODATE FUTURE POWER SWITCHING. SEE STD PLAN RR-503 FOR STUB OUT LOCATION.
11. PAVEMENT TURNOUTS CANNOT BE INSULATED.
12. FOR IN-PAVEMENT POINT PROTECTOR SEE DRAWING RR-606.

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

NUMBER 9 TURNOUT 136 LB FOR USE IN-PAVEMENT

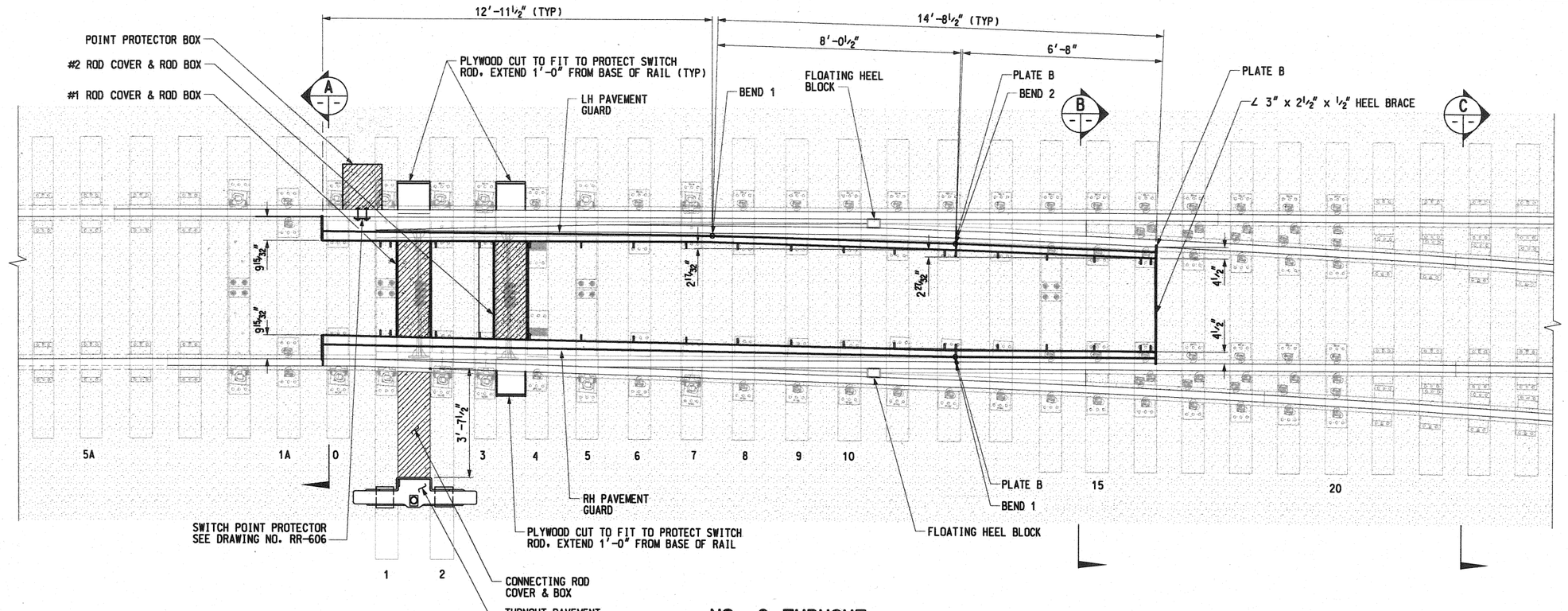
APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-611

SHEET NO: 1 OF 1

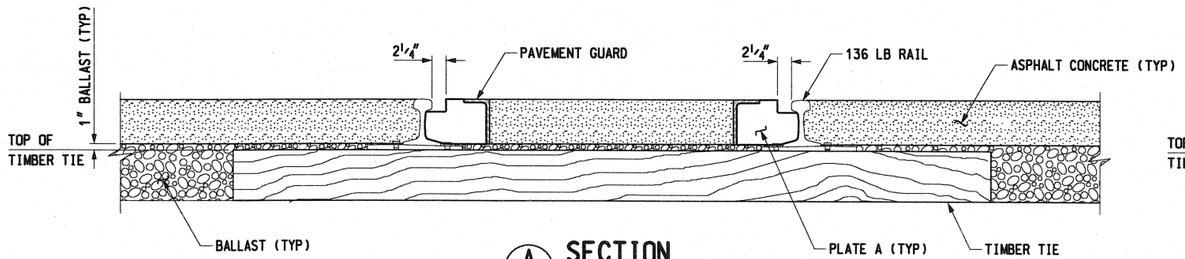
10/4/2013

...*RR-611 Number 9 Turnout 136 lb for use in-pavement



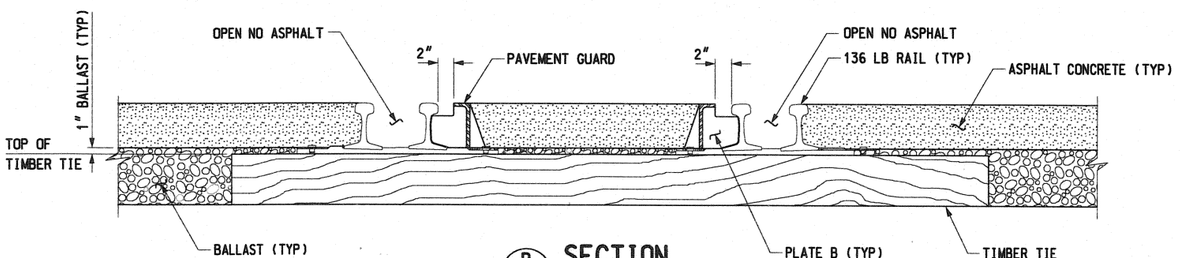
NO. 9 TURNOUT

SCALE: ½" = 1'-0"



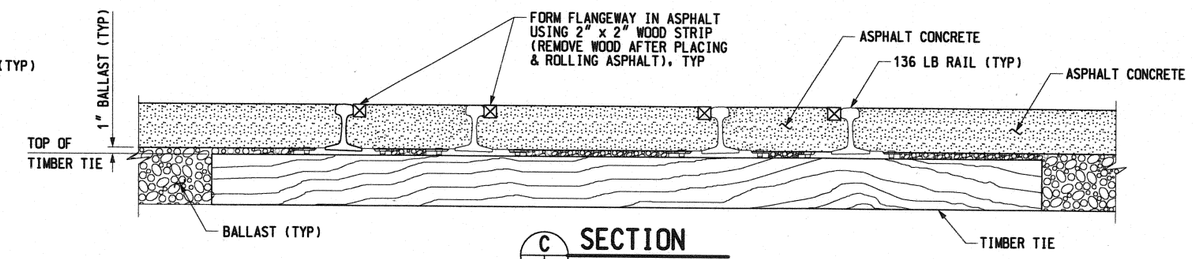
A SECTION

SCALE: ¼" = 1'-0"



B SECTION

SCALE: ¼" = 1'-0"



C SECTION

SCALE: ¼" = 1'-0"

NOTES:

1. TURNOUTS IN PAVEMENT CANNOT BE MADE INSULATED OR MADE TO WORK WITH SIGNALING.
2. SEE DRAWING RR-613 FOR PAVEMENT GUARD DETAILS, DRAWING RR-604 FOR SWITCH STAND DETAILS, DRAWING RR-373 FOR CONNECTING ROD ASSEMBLY, DRAWING RR-615 FOR SWITCH ROD BOX AND CONNECTING ROD BOX DETAILS.
3. UTILIZING A TURNOUT WITH DIFFERENT TIE SPACING REQUIRES CHANGES TO RR-613 AND RR-615.
4. PAVEMENT GUARD MAY REQUIRE SHIMMING OR ADJUSTMENT IN THE FIELD TO ACCOUNT FOR DIFFERING SWITCH PLATE HEIGHT OR THICKNESS. PAVEMENT GUARD WHEN PROPERLY INSTALLED SHOULD BE FLUSH WITH THE TOP OF THE SWITCH POINT AND THE PAVEMENT.
5. BALLAST IN TIE CRIBS UNDER SWITCH RODS TO BE LOW ENOUGH TO ALLOW FREE MOVEMENT OF SWITCH RODS.
6. PAVEMENT STIFFENERS ARE TO BE WELDED TO SWITCH PLATES AND SHALL BE ROUGHLY CENTERED ON SWITCH PLATES.

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

NUMBER 9 TURNOUT 136 LB SWITCH POINT SECTION FOR USE IN-PAVEMENT

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

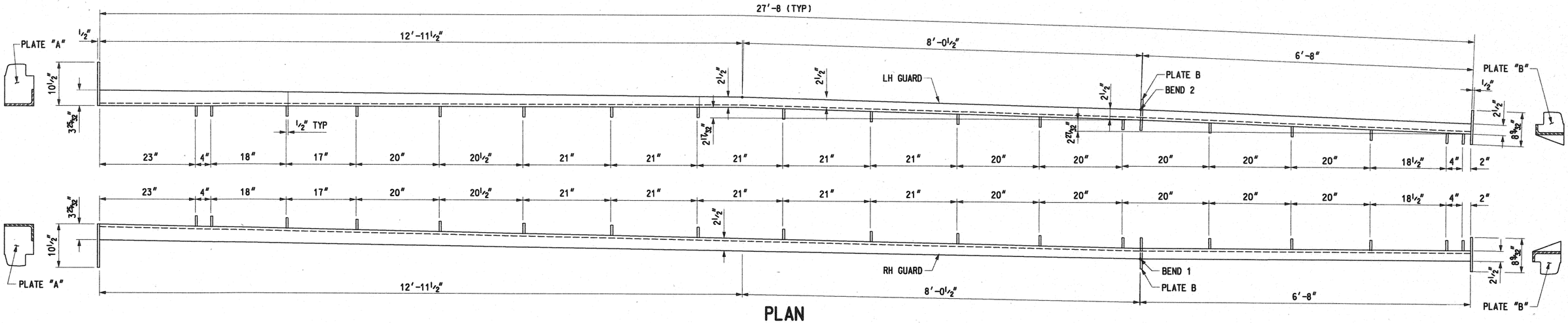
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-612

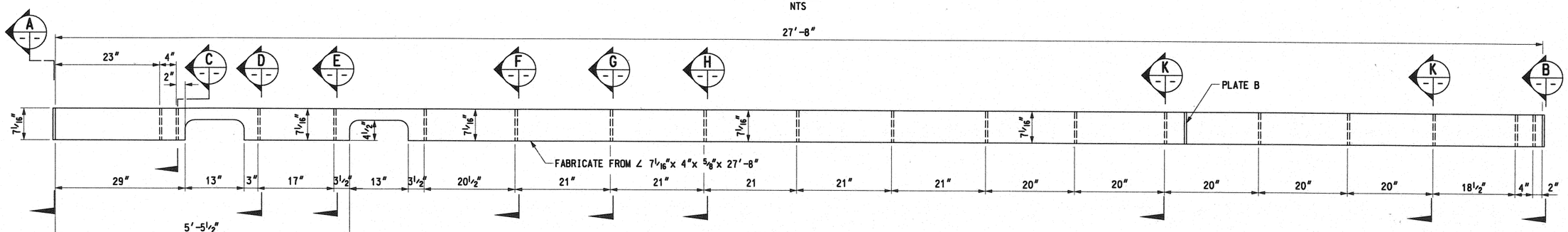
SHEET NO: 1 OF 1

10/4/2013

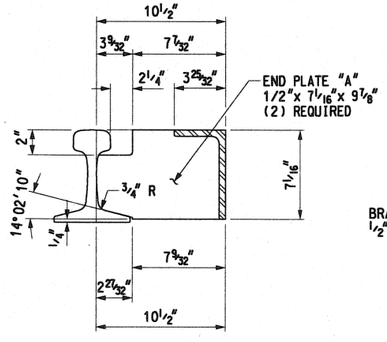
...*RR-612 Number 9 Turnout 136 lb - Switch Point Section for Use in - Pavement



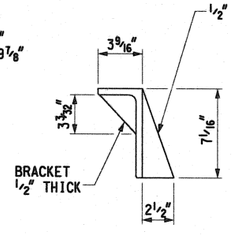
PLAN
NTS



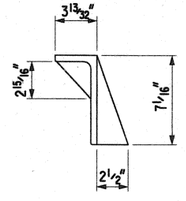
ELEVATION
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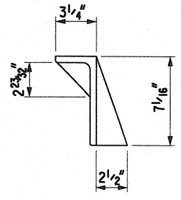
A SECTION
NTS



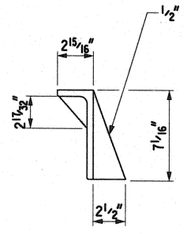
C SECTION
NTS



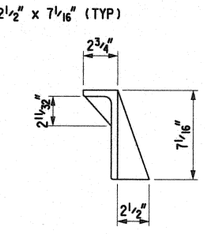
D SECTION
NTS



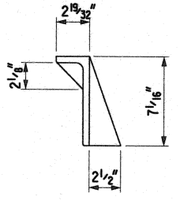
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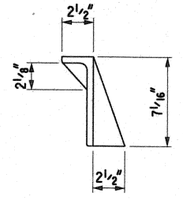
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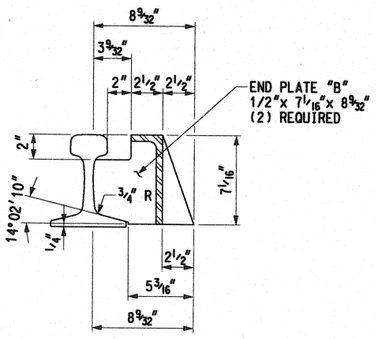
G SECTION
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H SECTION
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K SECTION
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B SECTION
NTS

NOTES:

1. STIFFENERS MAY REQUIRE ADJUSTMENT IN FIELD TO FIT AROUND SWITCH PLATE FASTENERS.
2. STIFFENERS ARE TO BE TACK WELDED TO SWITCH PLATES TO SUPPORT PAVEMENT GUARD PRIOR TO PLACING ASPHALT.

REVISIONS	
NO.	DATE
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

NUMBER 9 TURNOUT 136 LB PAVEMENT GUARD DETAILS

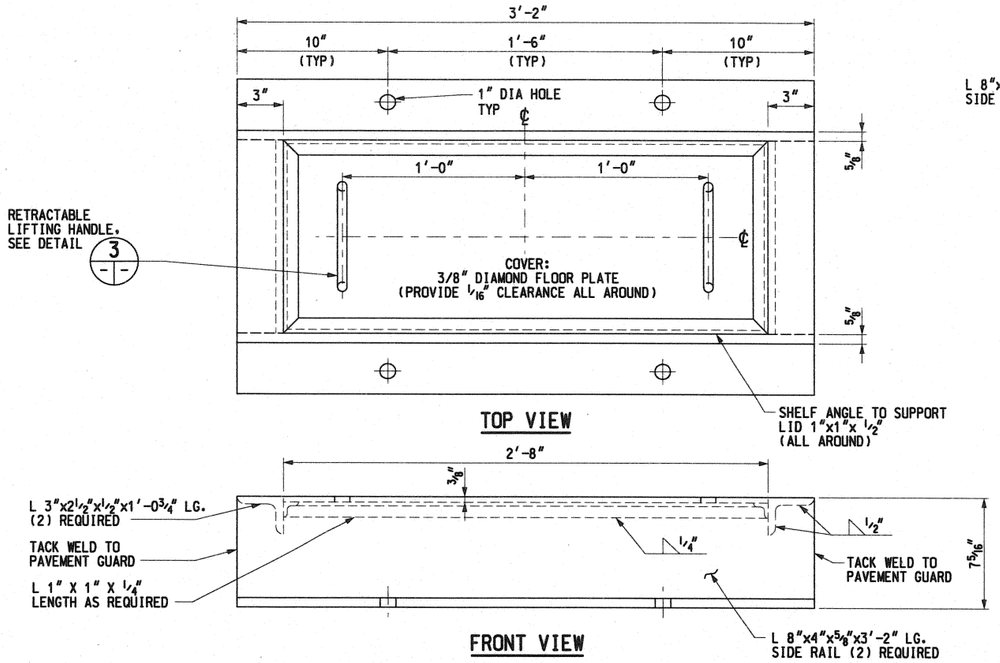
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-613

SHEET NO: 1 OF 1

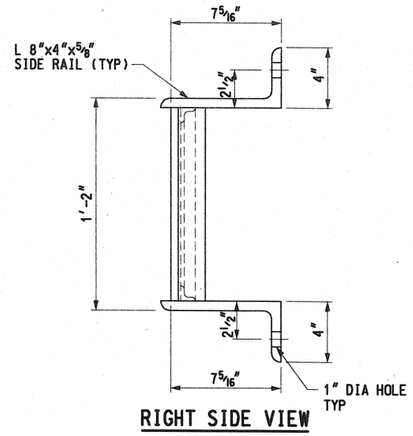
10/4/2013

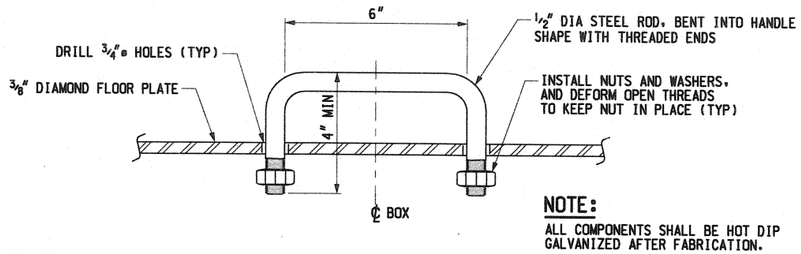
...\RR-613 Number 9 Turnout 136 lb Pavement Guard Details



1 DETAIL - BOX FOR NO. 1 SWITCH ROD

NTS

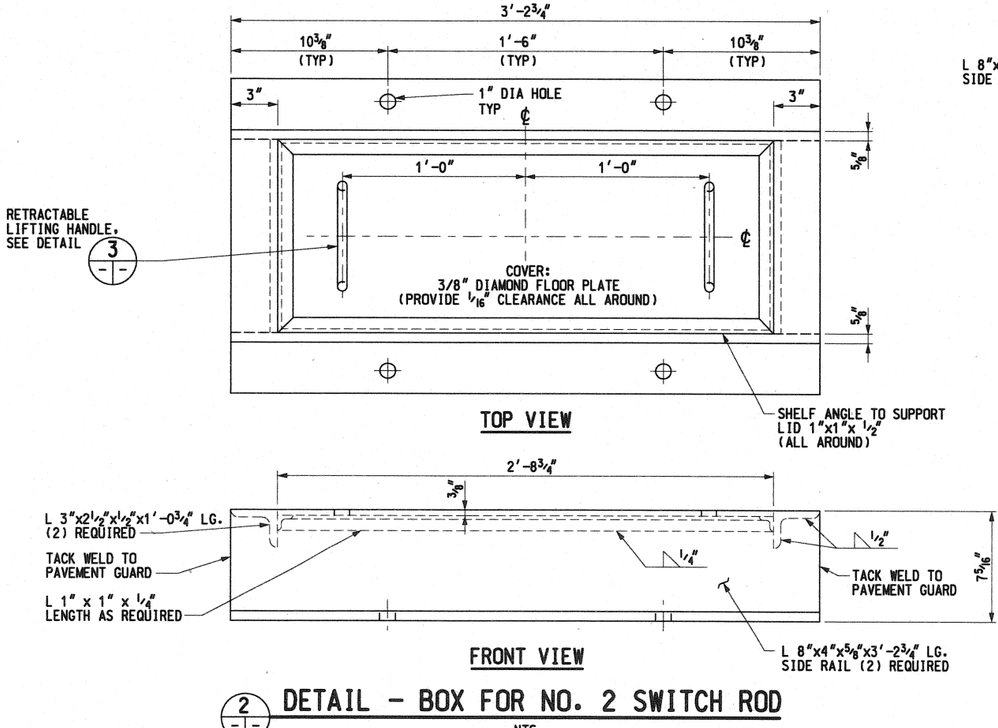




NOTE:
ALL COMPONENTS SHALL BE HOT DIP GALVANIZED AFTER FABRICATION.

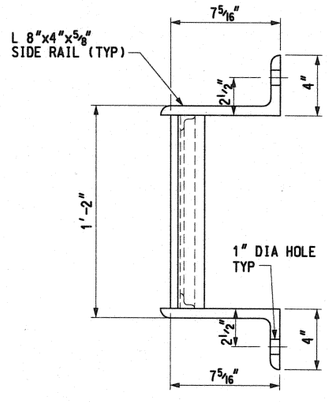
3 DETAIL - RETRACTABLE LIFTING HANDLES

NTS



2 DETAIL - BOX FOR NO. 2 SWITCH ROD

NTS



NOTES:

1. CONTRACTOR SHALL NOTCH BOX SIDE TO FIT GAGE PLATES AND SWITCH PLATES.
2. BOX FOR NO. 1 & NO. 2 SWITCH RODS WILL BE TACK WELDED TO PAVEMENT GUARD AND SET FLUSH TO TOP OF PAVEMENT.
3. CONTRACTOR SHALL ENSURE BOX NO. 3 FOR CONNECTION ROD THAT TOP OF BOX GRADE IS FLUSH WITH PAVEMENT GRADE AND SECURELY FASTENED TO TIMBER TIES WITH SCREW SPIKES.
4. DIMENSIONS & FASTENING SYSTEM SHOWN ON PLAN ARE FOR REFERENCE ONLY. THE CONTRACTOR SHALL SUBMIT PAVEMENT TYPE SWITCH BOX FOR TIMBER SWITCH TIE INSTALLATION FOR APPROVAL BY THE ENGINEER.
5. SEE DRAWING RR-615, SHEET 2 OF 2 FOR CONNECTION ROD BOX AND SWITCH POINT PROTECTION BOX.

REVISIONS	
NO.	DATE
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

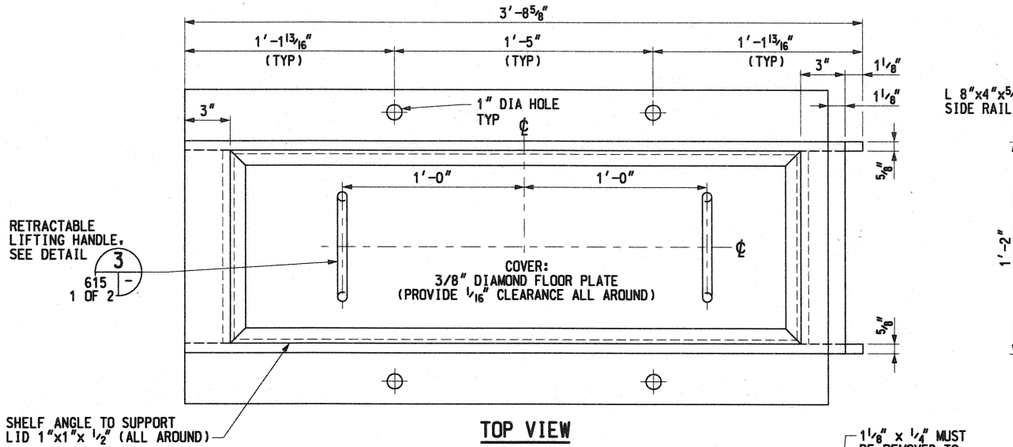
NUMBER 9 TURNOUT PAVEMENT TYPE SWITCH BOX 136 LB

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

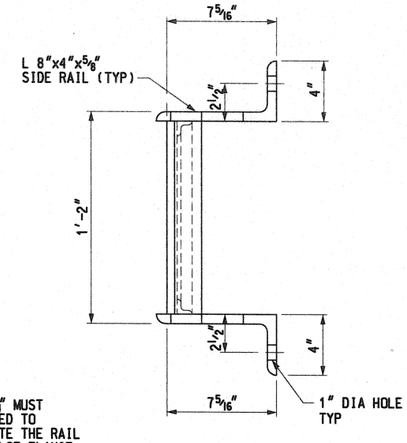
DRAWING NO: RR-615

SHEET NO: 1 OF 2

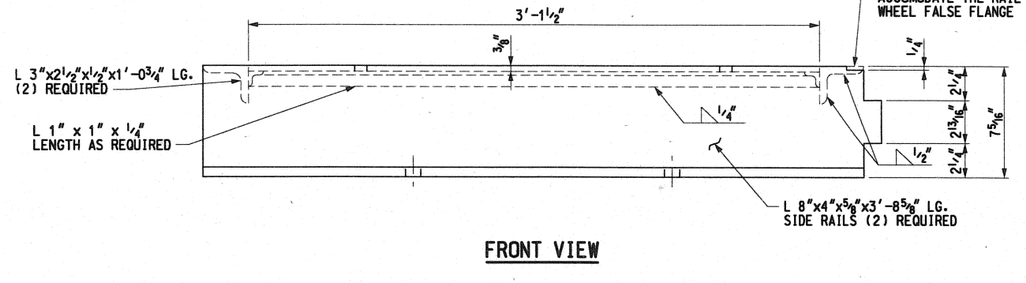
10/4/2013



TOP VIEW



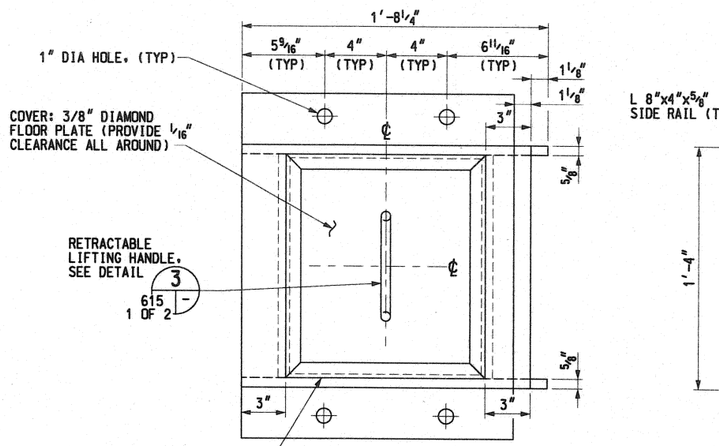
RIGHT SIDE VIEW



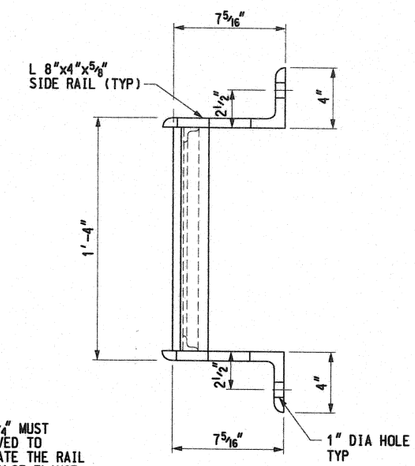
FRONT VIEW

1 DETAIL - BOX FOR CONNECTION ROD

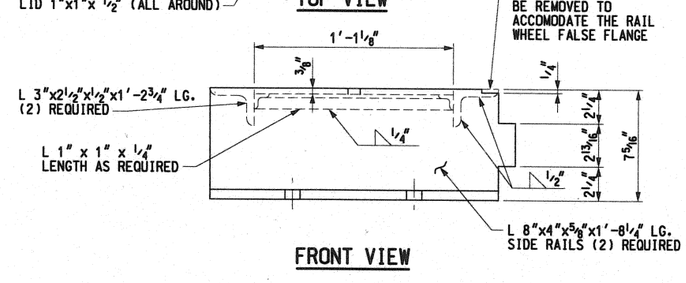
NTS



TOP VIEW



RIGHT SIDE VIEW



FRONT VIEW

2 DETAIL - BOX FOR SWITCH POINT PROTECTOR

NTS

NOTES:

1. CONTRACTOR SHALL NOTCH BOX SIDE TO FIT GAGE PLATES AND SWITCH PLATES.
2. BOX FOR NO. 4 SWITCH POINT PROTECTOR WILL BE TACK WELDED TO PAVEMENT GUARD AND SET FLUSH TO TOP OF PAVEMENT.
3. CONTRACTOR SHALL ENSURE BOX NO. 3 FOR CONNECTION ROD THAT TOP OF BOX GRADE IS FLUSH WITH PAVEMENT GRADE AND SECURELY FASTENED TO TIMBER TIES WITH SCREW SPIKES.
4. DIMENSIONS & FASTENING SYSTEM SHOWN ON PLAN ARE FOR REFERENCE ONLY. THE CONTRACTOR SHALL SUBMIT PAVEMENT TYPE SWITCH BOX FOR TIMBER SWITCH TIE INSTALLATION FOR APPROVAL BY THE ENGINEER.
5. SEE DRAWING RR-615, SHEET 1 OF 2 FOR SWITCH ROD BOXES AND RETRACTABLE LIFTING HANDLE.

REVISIONS	
NO.	DATE
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

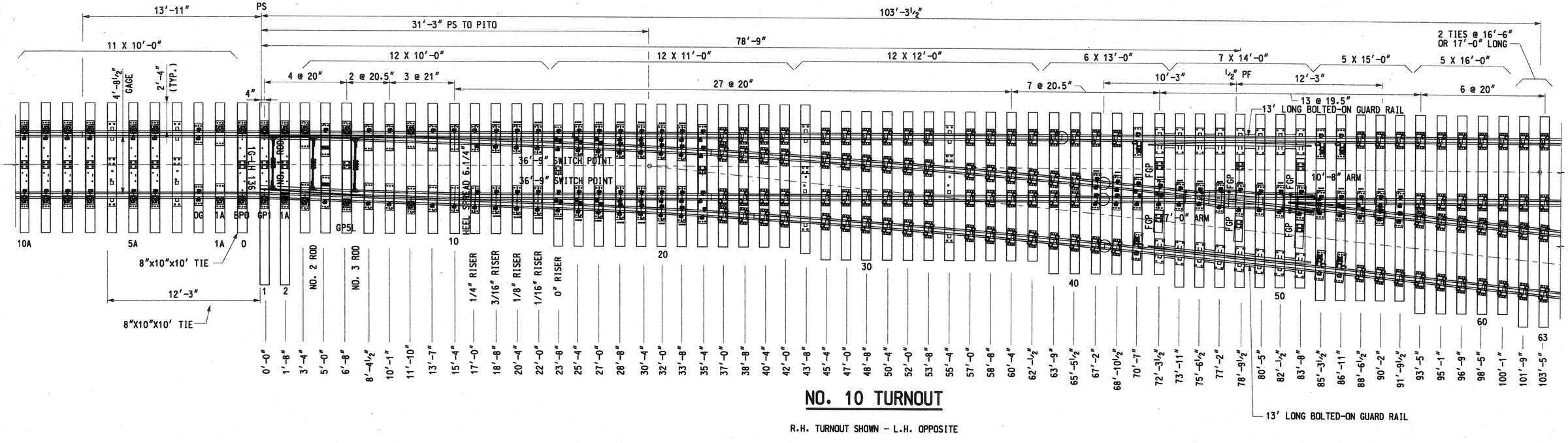
NUMBER 9 TURNOUT PAVEMENT TYPE SWITCH BOX 136 LB

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-615

SHEET NO: 2 OF 2

10/4/2013



NO. 10 TURNOUT

R.H. TURNOUT SHOWN - L.H. OPPOSITE

BILL OF MATERIAL FOR NO.10 136RE RH TURNOUT C/W RBM FROG	
QTY	DESCRIPTION
1	39'-6" 136RE LH STRAIGHT SAMSON STOCK RAIL FOR RH TURNOUT
1	38'-0" 136RE RH BENT SAMSON STOCK RAIL FOR RH TURNOUT
1	39'-6" 136RE STRAIGHT RUNNING RAIL
1	39'-0" 136RE STRAIGHT RUNNING RAIL
1	34'-11 3/4" 136RE STRAIGHT CLOSURE RAIL
1	35'-1 1/2" 136RE CURVED CLOSURE RAIL
1	(1) EACH 14'-6" AND 28'-6" CURVED TURNOUT RAILS - 136RE
1	39'-0" 136RE STRAIGHT TURNOUT RAIL
1	18'-2" 136RE FROG END TANGENT RAIL
1	18'-4" 136RE FROG END TURNOUT RAIL
1	16'-6" 136RE LH SAMSON DET. 5100 SWITCH POINT WITH UNIFORM RISER ON 36'-9" RAIL
1	16'-6" 136RE RH SAMSON DET. 5100 SWITCH POINT WITH UNIFORM RISER ON 36'-9" RAIL
1	PAIR OF 2-HOLE FLOATING HEEL BLOCK ASSEMBLY FOR 16'-6" 136RE UNIFORM RISER SWITCH
1	NO.10 136LB RE RBM FROG C/W PANDROLIZED FROG BASE PLATES
1	PANDROLIZED SWITCH PLATE PACK FOR 16'-6" 136RE UNIFORM RISER SWITCH
1	PANDROLIZED TURNOUT PLATE PACK FOR R.H. NO. 10 UNIFORM RISER
2	13' BOLTED GUARD RAIL AND HARDWARE WITH PLATES
1	NO.1 VERTICAL INSULATED SWITCH ROD
1	NO.2 VERTICAL INSULATED SWITCH ROD
1	NO.3 VERTICAL INSULATED SWITCH ROD
6	ADJUSTABLE ROCKER CLIPS
6	ADDITIONAL GAGE PLATES (3 @ THE FROG AND 3 THRU THE TURNOUT)
104	PANDROL ROLLED 1:40 CANT TIE PLATE 6" BASE
558	PANDROL "e" CLIP 2055
735	15/16" X 6" SCREW SPIKE
52	SET OF PANDROL "C" CLIP AND "C" PLATE FOR JOINT BAR FASTENING
2	TOUGH-COAT INSULATED JOINT KIT C/W 3/8" END POST & HARDWARE
1	SWITCH STAND (SEE DRAWING RR-604)

LEGEND:

(I) STANDARD JOINT

SWITCH TIES	
LENGTH	QTY
10'-0"	22
8"x10"x10'	1
11'-0"	12
12'-0"	12
13'-0"	6
14'-0"	9
15'-0"	5
16'-0"	5
17'-0"	2
TOTAL QTY = 74	
TOTAL L.F. = 899 LF	

1 @ 8" X 10" X 10'-0"
ALL TIES 7" X 9" X LENGTHS GIVEN
* HEADBLOCK TIES SHALL BE 14'-0" FOR SWITCH STANDS WITHIN PAVEMENT

NOTES FOR PAVEMENT TYPE SWITCH:

1. PAVEMENT SWITCH STAND SHALL BE HEAVY DUTY, ENCLOSED DESIGN WITH HINGED COVER AND BOX, ENCLOSED TRAILABLE CONNECTION ROD PER DRAWING RR-604.
2. GUARD RAIL SHALL BE FLUSH WITH PAVEMENT.

NOTES:

1. SWITCH POINTS TO BE DOUBLE REINFORCED WITH 2'-8" LONG SOLID MANGANESE STEEL SAMSON TYPE SWITCH POINTS AND UNIVERSALLY UNDERCUT STOCK RAIL. TURNOUTS SHALL HAVE VERTICAL SWITCH RODS.
2. FROG SHALL BE GLUED, HIGH INTEGRITY, EXPLOSION HARDENED, RAIL BOUND MANGANESE STEEL CASTING WITH MITERED HEEL AND EXTENDED HEEL AND WING RAILS.
3. ALL SWITCH RODS AND GAUGE PLATES ARE TO BE INSULATED TYPES.
4. STOCK RAILS ARE TO BE BENT IN THE MILL OR IN THE SHOP.
5. ACTUAL TURNOUT DATA, TURNOUT OFFSETS, RAIL LENGTHS, AND SWITCH TIE LENGTHS MAY VARY ON MANUFACTURER'S SHOP DRAWINGS.
6. ARC METHOD IS USED TO CALCULATE TURNOUT CURVE DATA AND OFFSETS.
7. RAIL FASTENERS SHALL BE PANDROL TYPE e-2055 ELASTIC CLIP.
8. ALL SWITCH TIES SHALL BE TIMBER.
9. INSTALL TWO INSULATED GAGE PLATES LOCATED AT THREE TIE SPACINGS IN ADVANCE OF SWITCH PER AREMA 223-03.
10. PROVIDE ELECTRICAL CONDUIT W/ STUB OUT FOR ALL TURNOUT SWITCHES TO ACCOMODATE FUTURE POWER SWITCHING. SEE STD PLAN RR-503 FOR STUB OUT LOCATION.
11. PAVEMENT TURNOUTS CANNOT BE INSULATED.
12. FOR IN-PAVEMENT POINT PROTECTOR SEE DRAWING RR-606.

REVISIONS	
NO.	DATE
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

NUMBER 10 TURNOUT 136 LB FOR USE IN-PAVEMENT

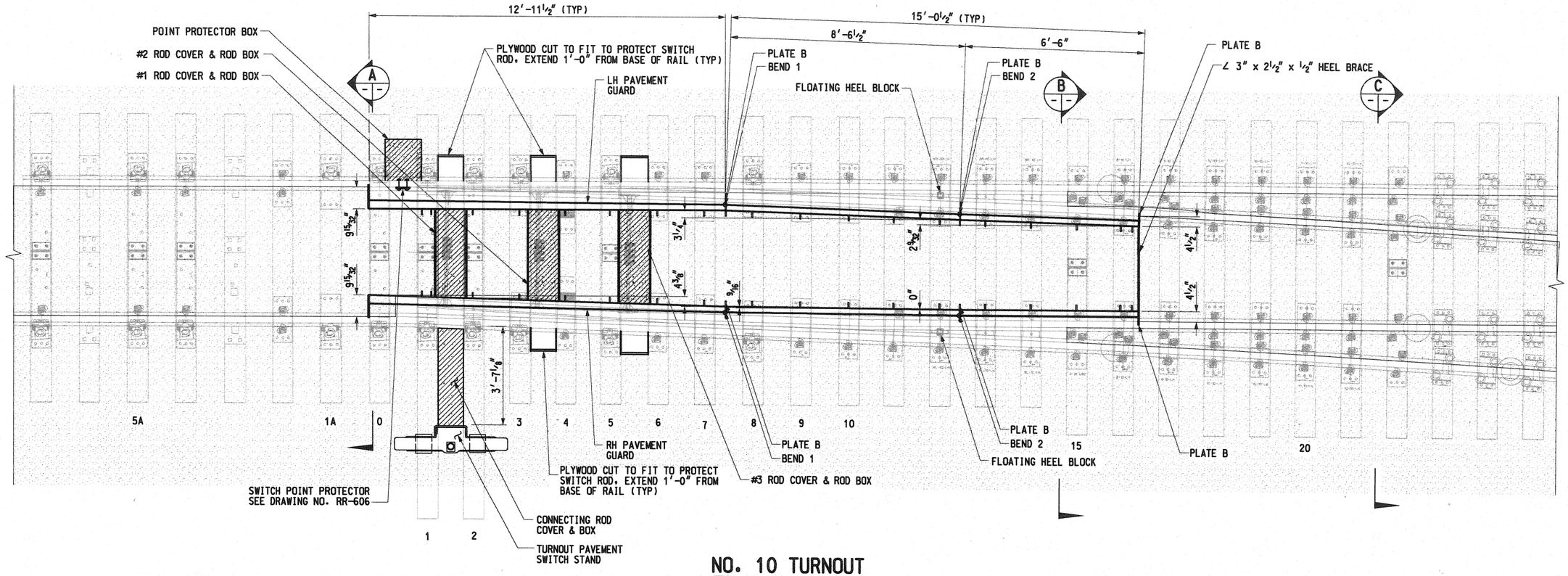
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-621

SHEET NO: 1 OF 1

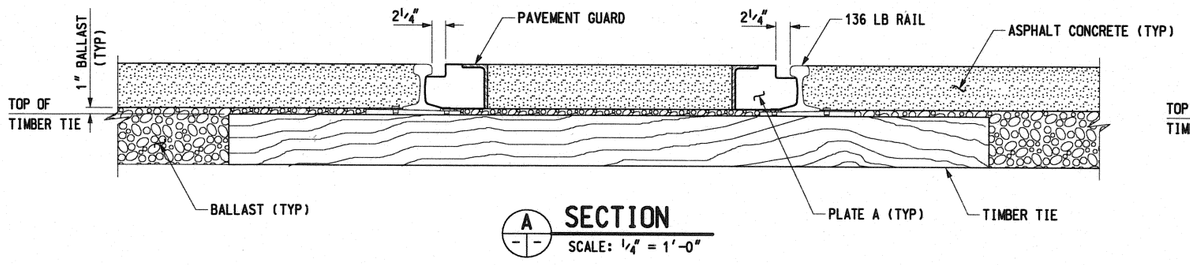
10/4/2013

...*RR-621 Number 10 Turnout 136 lb for use in-pavement



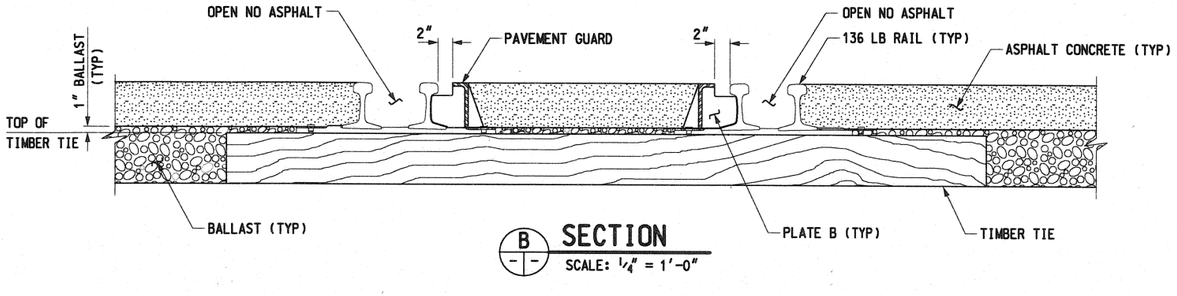
NO. 10 TURNOUT

SCALE: ½″ = 1′-0″



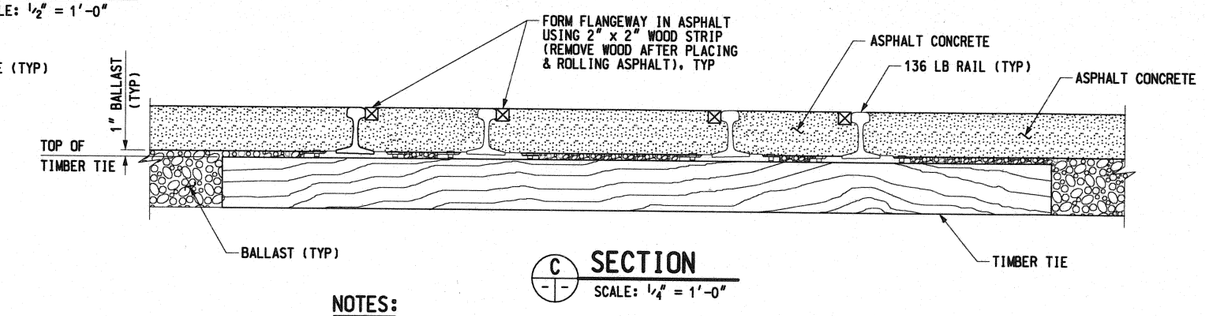
A SECTION

SCALE: ¼″ = 1′-0″



B SECTION

SCALE: ¼″ = 1′-0″



C SECTION

SCALE: ¼″ = 1′-0″

NOTES:

1. TURNOUTS IN PAVEMENT CANNOT BE MADE INSULATED OR MADE TO WORK WITH SIGNALING.
2. SEE DRAWING RR-623 FOR PAVEMENT GUARD DETAILS, DRAWING RR-604 FOR SWITCH STAND DETAILS, DRAWING RR-373 FOR CONNECTING ROD ASSEMBLY, DRAWING RR-625 FOR SWITCH ROD BOX AND CONNECTING ROD BOX DETAILS.
3. UTILIZING A TURNOUT WITH DIFFERENT TIE SPACING REQUIRES CHANGES TO RR-623 AND RR-625.
4. PAVEMENT GUARD MAY REQUIRE SHIMMING OR ADJUSTMENT IN THE FIELD TO ACCOUNT FOR DIFFERING SWITCH PLATE HEIGHT OR THICKNESS. PAVEMENT GUARD WHEN PROPERLY INSTALLED SHOULD BE FLUSH WITH THE TOP OF THE SWITCH POINT AND THE PAVEMENT.
5. BALLAST IN TIE CRIBS UNDER SWITCH RODS TO BE LOW ENOUGH TO ALLOW FREE MOVEMENT OF SWITCH RODS.
6. PAVEMENT STIFFENERS ARE TO BE WELDED TO SWITCH PLATES AND SHALL BE ROUGHLY CENTERED ON SWITCH PLATES.

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

NUMBER 10 TURNOUT 136 LB SWITCH POINT SECTION FOR USE IN-PAVEMENT

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

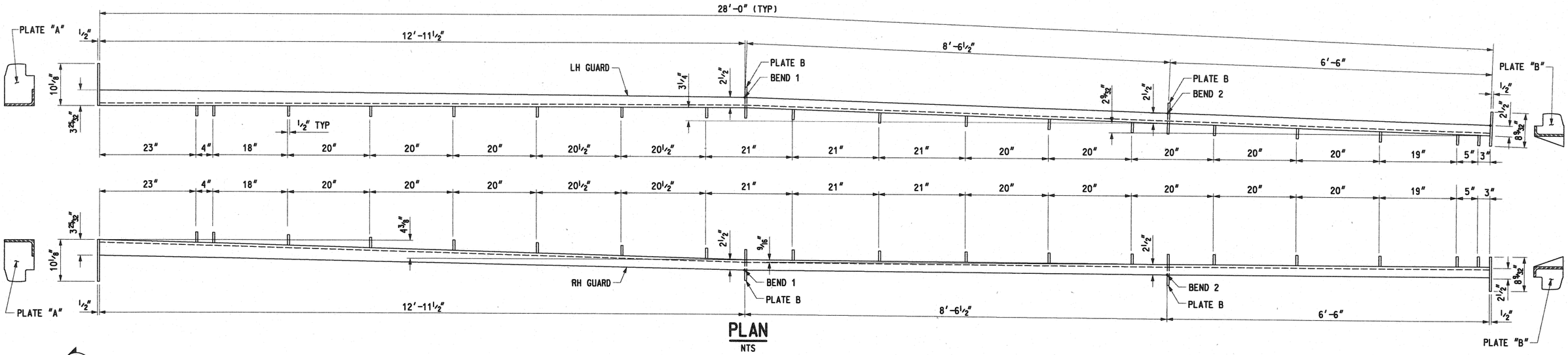
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-622

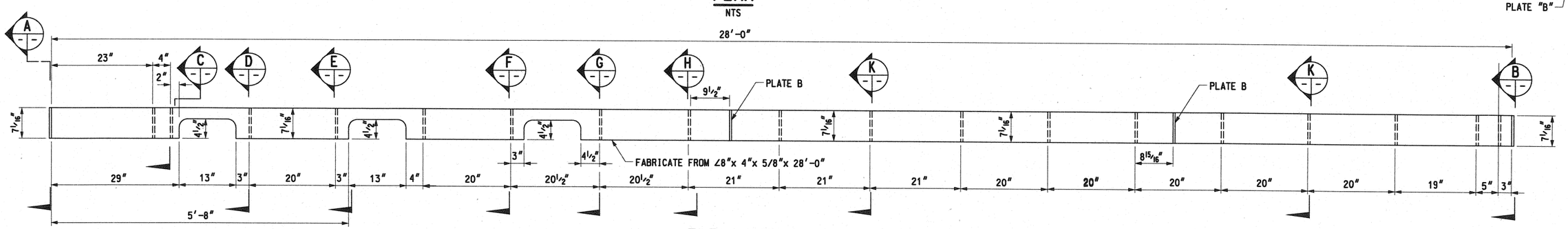
SHEET NO: 1 OF 1

10/4/2013

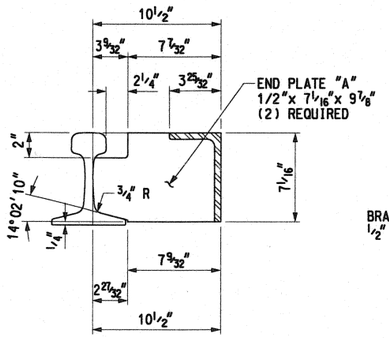
...*RR-622 Number 10 Turnout 136 lb - Switch Point Section for Use in - Pavement



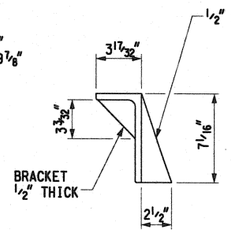
PLAN
NTS



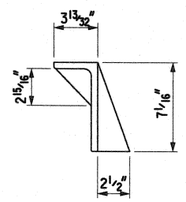
ELEVATION
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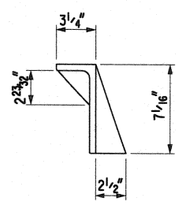
A SECTION
NTS



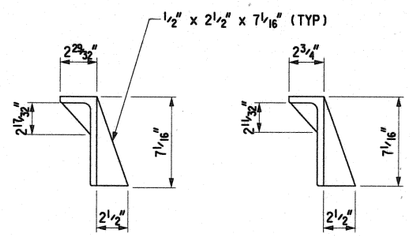
C SECTION
NTS



D SECTION
NTS

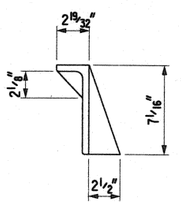


E SECTION
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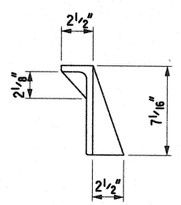


F SECTION
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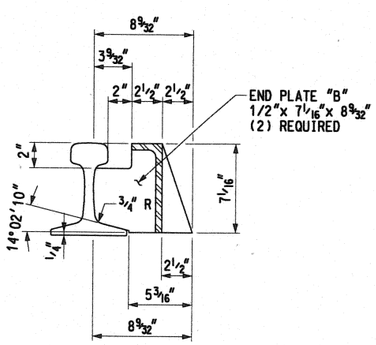
G SECTION
NTS



H SECTION
NTS



K SECTION
NTS



B SECTION
NTS

NOTES:

1. STIFFENERS MAY REQUIRE ADJUSTMENT IN FIELD TO FIT AROUND SWITCH PLATE FASTENERS.
2. STIFFENERS ARE TO BE TACK WELDED TO SWITCH PLATES TO SUPPORT PAVEMENT GUARD PRIOR TO PLACING ASPHALT.

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

NUMBER 10 TURNOUT 136 LB PAVEMENT GUARD DETAILS

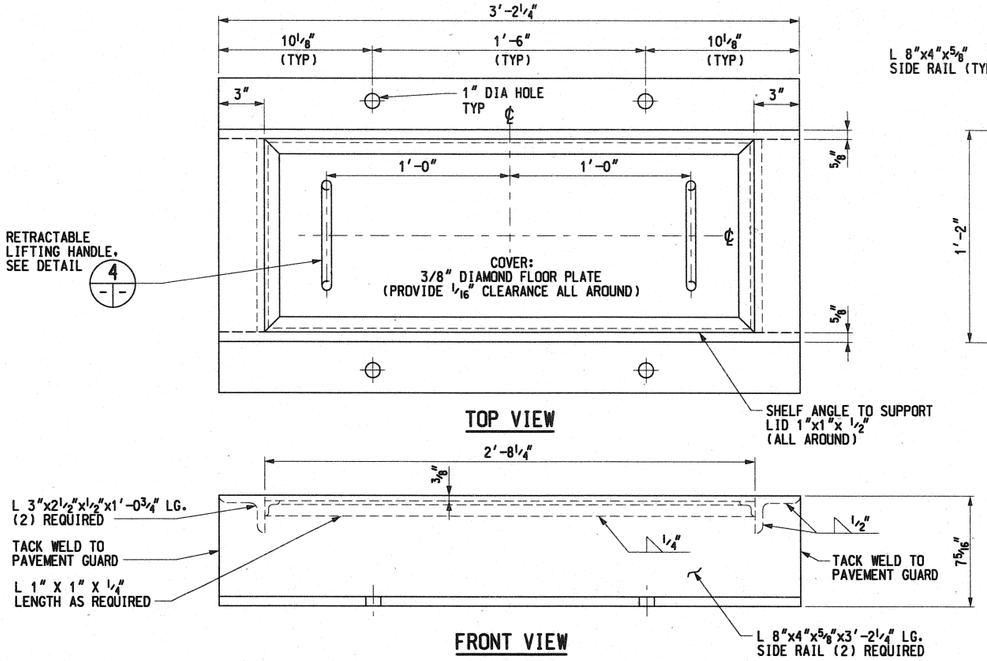
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-623

SHEET NO: 1 OF 1

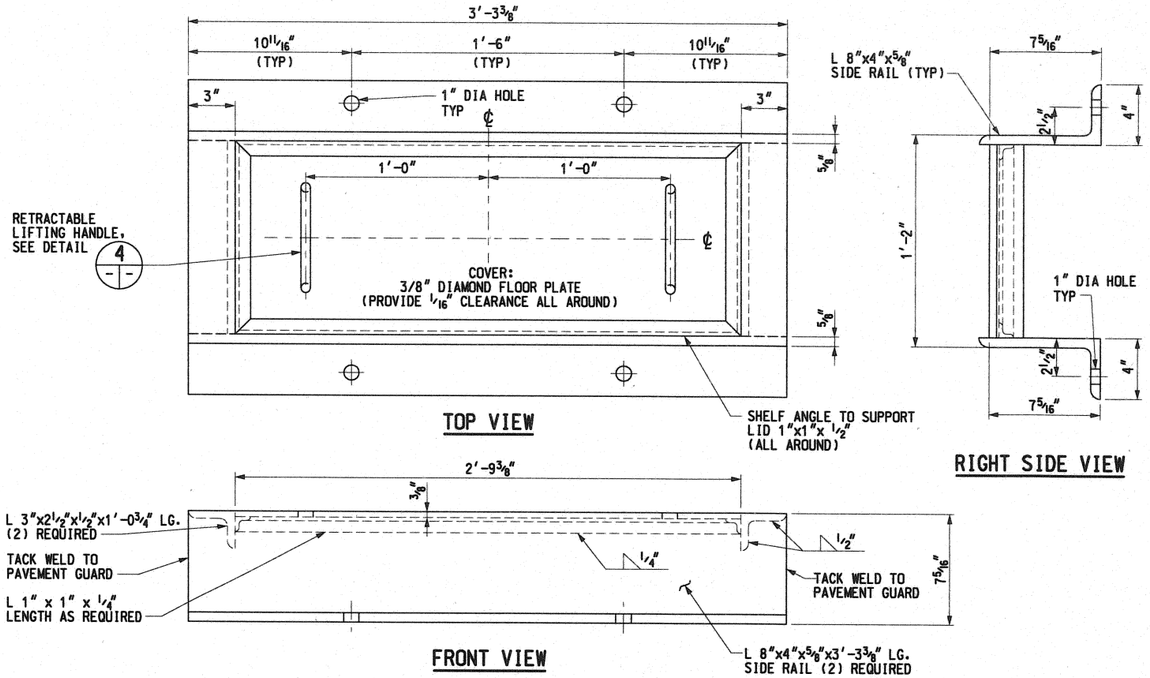
10/4/2013

...*RR-623 Number 10 Turnout 136 lb Pavement Guard Details



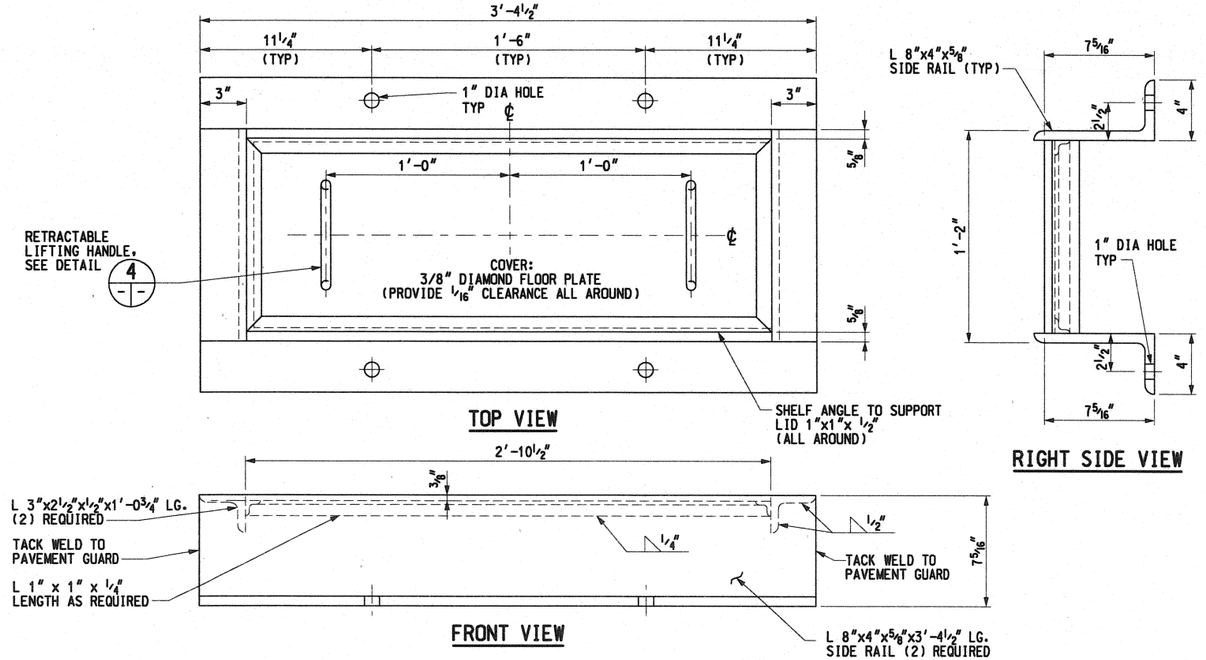
1 DETAIL - BOX FOR NO. 1 SWITCH ROD

NTS



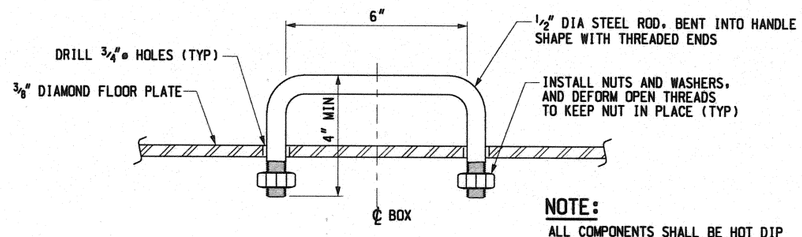
2 DETAIL - BOX FOR NO. 2 SWITCH ROD

NTS



3 DETAIL - BOX FOR NO. 3 SWITCH ROD

NTS



NOTE:
ALL COMPONENTS SHALL BE HOT DIP GALVANIZED AFTER FABRICATION.

4 DETAIL - RETRACTABLE LIFTING HANDLES

NTS

NOTES:

1. CONTRACTOR SHALL NOTCH BOX SIDE TO FIT GAGE PLATES AND SWITCH PLATES.
2. BOX FOR NO. 1, No. 2 & NO. 3 SWITCH RODS WILL BE TACK WELDED TO PAVEMENT GUARD AND SET FLUSH TO TOP OF PAVEMENT.
3. CONTRACTOR SHALL ENSURE BOX NO. 3 FOR CONNECTION ROD THAT TOP OF BOX GRADE IS FLUSH WITH PAVEMENT GRADE AND SECURELY FASTENED TO TIMBER TIES WITH SCREW SPIKES.
4. DIMENSIONS & FASTENING SYSTEM SHOWN ON PLAN ARE FOR REFERENCE ONLY. THE CONTRACTOR SHALL SUBMIT PAVEMENT TYPE SWITCH BOX FOR TIMBER SWITCH TIE INSTALLATION FOR APPROVAL BY THE ENGINEER.
5. SEE DRAWING RR-625, SHEET 2 OF 2 FOR CONNECTION ROD BOX AND SWITCH POINT PROTECTION BOX.

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

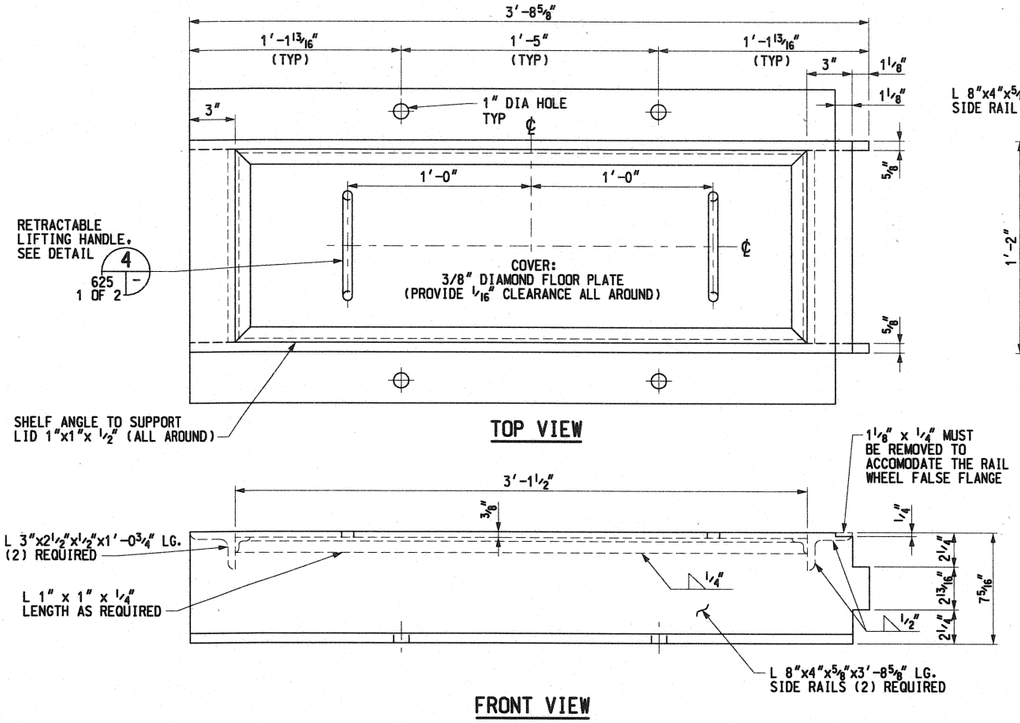
NUMBER 10 TURNOUT PAVEMENT TYPE SWITCH BOX 136 LB

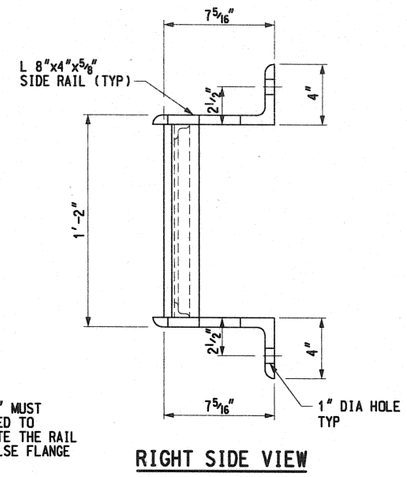
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-625

SHEET NO: 1 OF 2

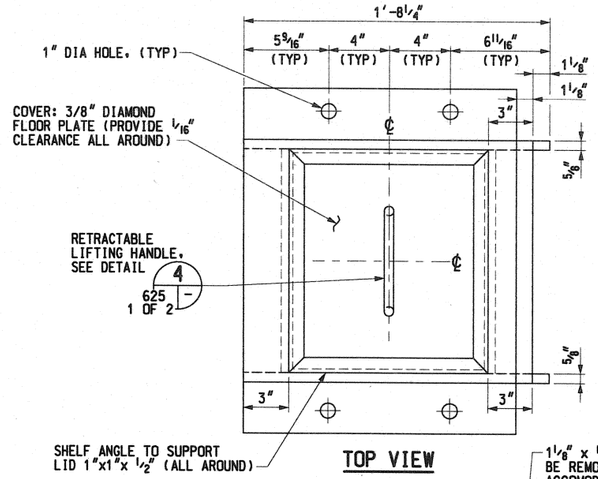
10/4/2013

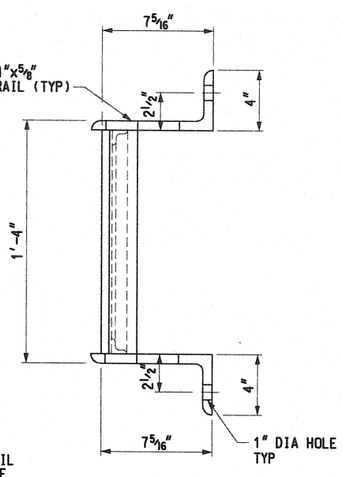




1 DETAIL - BOX FOR CONNECTION ROD

NTS





2 DETAIL - BOX FOR SWITCH POINT PROTECTOR

NTS

NOTES:

1. CONTRACTOR SHALL NOTCH BOX SIDE TO FIT GAGE PLATES AND SWITCH PLATES.
2. BOX FOR NO. 4 SWITCH POINT PROTECTOR WILL BE TACK WELDED TO PAVEMENT GUARD AND SET FLUSH TO TOP OF PAVEMENT.
3. CONTRACTOR SHALL ENSURE BOX NO. 3 FOR CONNECTION ROD THAT TOP OF BOX GRADE IS FLUSH WITH PAVEMENT GRADE AND SECURELY FASTENED TO TIMBER TIES WITH SCREW SPIKES.
4. DIMENSIONS & FASTENING SYSTEM SHOWN ON PLAN ARE FOR REFERENCE ONLY. THE CONTRACTOR SHALL SUBMIT PAVEMENT TYPE SWITCH BOX FOR TIMBER SWITCH TIE INSTALLATION FOR APPROVAL BY THE ENGINEER.
5. SEE DRAWING RR-625, SHEET 1 OF 2 FOR SWITCH ROD BOXES AND RETRACTABLE LIFTING HANDLE.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

NUMBER 10 TURNOUT PAVEMENT TYPE SWITCH BOX 136 LB

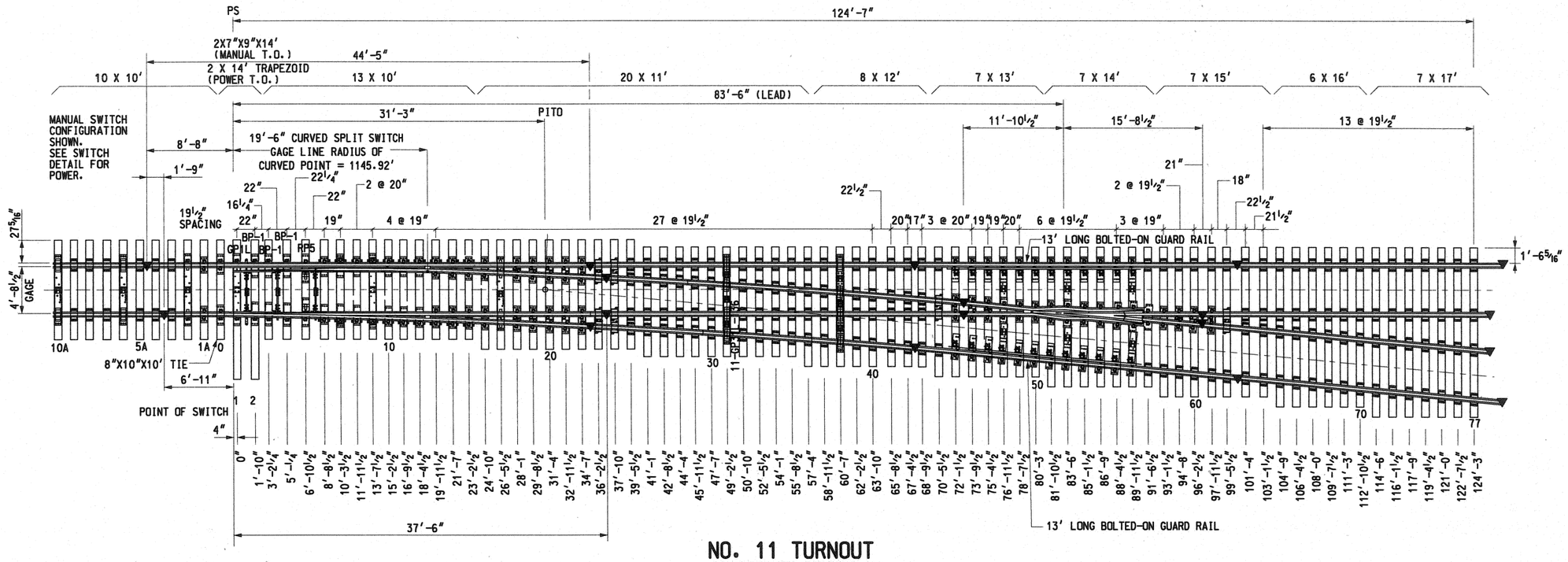
APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-625

SHEET NO: 2 OF 2

10/4/2013



NO. 11 TURNOUT

R.H. TURNOUT SHOWN - L.H. OPPOSITE

BILL OF MATERIAL FOR NO. 11 136RE RH TURNOUT C/W RBM FROG	
QTY	DESCRIPTION
1	LH STRAIGHT SAMSON STOCK RAIL
1	RH BENT SAMSON STOCK RAIL
1	RH STRAIGHT SAMSON SW. POINT 19-6 EXTENDED TO 39'-0"
1	LH CURVED SAMSON SW. POINT 19-6 EXTENDED TO 39'-0"
1	SET OF INSULATED VERTICAL MJS RODS 1, 2 & 3
1	SET OF INSULATED GUAGE PLATE GP, GPO/2A, GP1, GPM1, GPM2
1	SET OF INSULATED GUAGE PLATE GP17, GP25, GP38
1	SET OF SWITCH AND RISER PLATES
2	ROLLER PLATE RP5
2	ROLLER BEARING ASSEMBLY (NOT USED IN-PAVEMENT)
1	SET OF TURNOUT PLATES T13 AND T22
2	FLOATING HEEL BLOCK WITH HARDWARE
18	LV BOLTERS BRAE
18	LV BRAE LOCKING PLATE
2	13' BOLTED GUARD RAIL AND HARDWARE WITH PLATES

JOINT LEGEND

▲ WELDED JOINT
0" GAP

SWITCH TIES	
LENGTH	QTY
10'-0"	23
8"x10"x10'	1
11'-0"	20
12'-0"	8
13'-0"	7
14'-0"	9
15'-0"	7
16'-0"	6
17'-0"	7
TOTAL QTY = 88	
TOTAL L.F. = 1093	

1 @ 8" X 10" X 10'-0"
ALL TIES 7" X 9" X LENGTHS GIVEN
* HEADBLOCK TIES SHALL BE 14'-0" FOR SWITCH STANDS WITHIN PAVEMENT

NOTES FOR PAVEMENT TYPE SWITCH:

1. PAVEMENT SWITCH STAND SHALL BE HEAVY DUTY, ENCLOSED DESIGN WITH HINGED COVER AND BOX, ENCLOSED TRAILABLE CONNECTION ROD PER DRAWING RR-604.
2. GUARD RAIL SHALL BE FLUSH WITH PAVEMENT.

NOTES:

1. SWITCH POINTS TO BE DOUBLE REINFORCED WITH 2'-8" LONG SOLID MANGANESE STEEL SAMSON TYPE SWITCH POINTS AND UNIVERSALLY UNDERCUT STOCK RAIL. TURNOUTS SHALL HAVE VERTICAL SWITCH RODS.
2. FROG SHALL BE GLUED, HIGH INTEGRITY, EXPLOSION HARDENED, RAIL BOUND MANGANESE STEEL CASTING WITH MITERED HEEL AND EXTENDED HEEL AND WING RAILS.
3. ALL SWITCH RODS AND GAUGE PLATES ARE TO BE INSULATED TYPES.
4. STOCK RAILS ARE TO BE BENT IN THE MILL OR IN THE SHOP.
5. ACTUAL TURNOUT DATA, TURNOUT OFFSETS, RAIL LENGTHS, AND SWITCH TIE LENGTHS MAY VARY ON MANUFACTURER'S SHOP DRAWINGS.
6. ARC METHOD IS USED TO CALCULATE TURNOUT CURVE DATA AND OFFSETS.
7. RAIL FASTENERS SHALL BE PANDROL TYPE e-2055 ELASTIC CLIP.
8. ALL SWITCH TIES SHALL BE TIMBER.
9. INSTALL TWO INSULATED GAGE PLATES LOCATED AT THREE TIE SPACINGS IN ADVANCE OF SWITCH PER AREMA 223-03.
10. PROVIDE ELECTRICAL CONDUIT W/ STUB OUT FOR ALL TURNOUT SWITCHES TO ACCOMODATE FUTURE POWER SWITCHING. SEE STD PLAN RR-503 FOR STUB OUT LOCATION.
11. PAVEMENT TURNOUTS CANNOT BE INSULATED.
12. FOR IN-PAVEMENT POINT PROTECTOR SEE DRAWING RR-606
13. SWITCH POINT ROLLERS CANNOT BE INSTALLED AND UTILIZED WITH TURNOUTS THAT WILL BE IN-PAVEMENT. CONSTRUCT TURNOUT USING ROLLER PLATE BUT DO NOT INSTALL ROLLER AS IT WILL INTERFERE WITH THE PLACEMENT OF THE PAVEMENT GUARD.

REVISIONS	
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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

NUMBER 11 TURNOUT 136 LB FOR USE IN-PAVEMENT

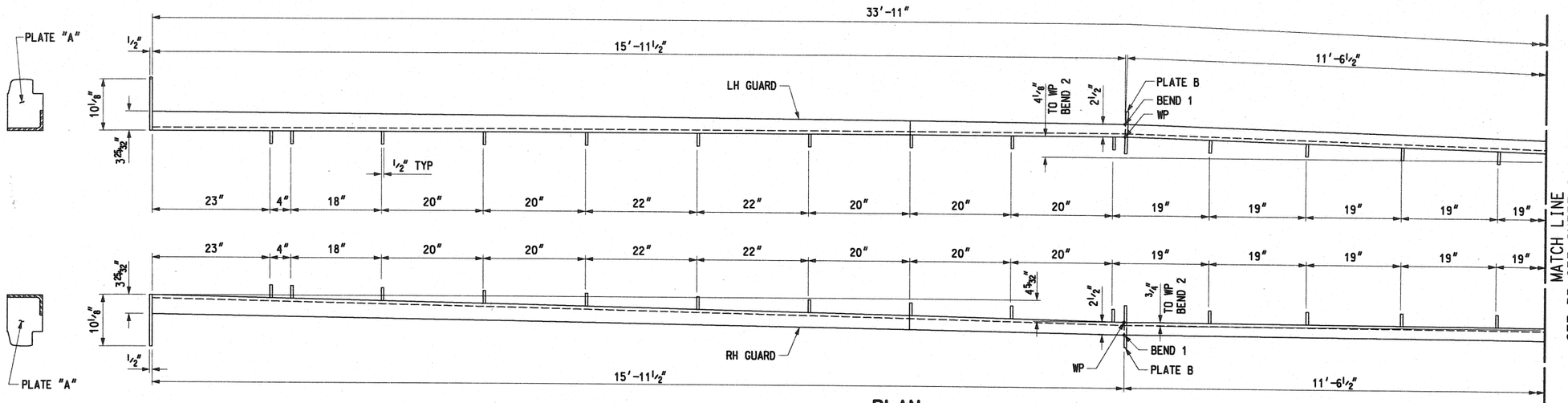
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-631

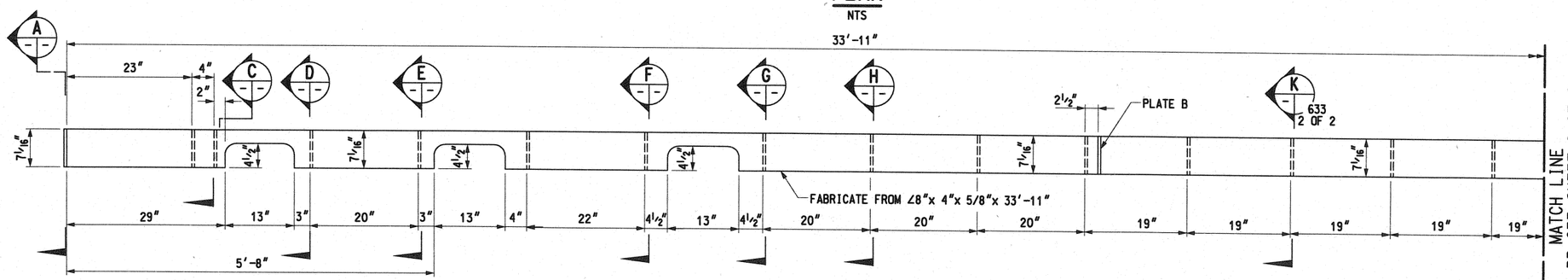
SHEET NO: 1 OF 1

10/4/2013

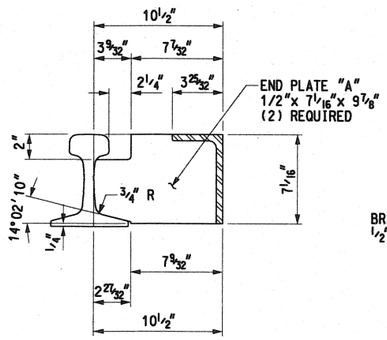
...*RR-631 Number 11 Turnout 136 lb for use in-Pavement



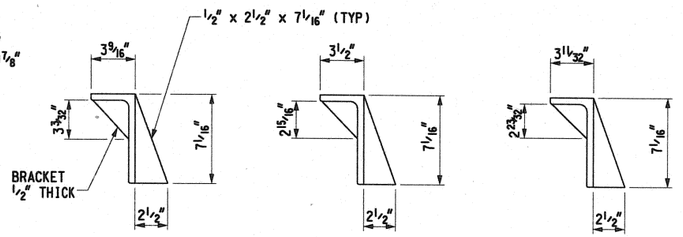
PLAN
NTS



ELEVATION
NTS



A SECTION
NTS



C SECTION
NTS

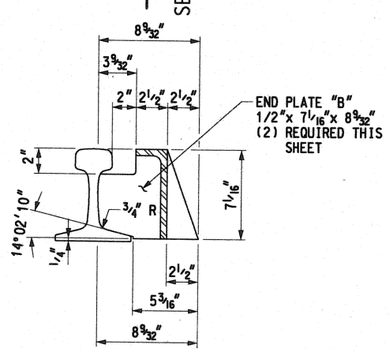
D SECTION
NTS

E SECTION
NTS

F SECTION
NTS

G SECTION
NTS

H SECTION
NTS



B SECTION
NTS

NOTES:

1. STIFFENERS MAY REQUIRE ADJUSTMENT IN FIELD TO FIT AROUND SWITCH PLATE FASTENERS.
2. STIFFENERS ARE TO BE TACK WELDED TO SWITCH PLATES TO SUPPORT PAVEMENT GUARD PRIOR TO PLACING ASPHALT.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

NUMBER 11 TURNOUT 136 LB PAVEMENT GUARD DETAILS

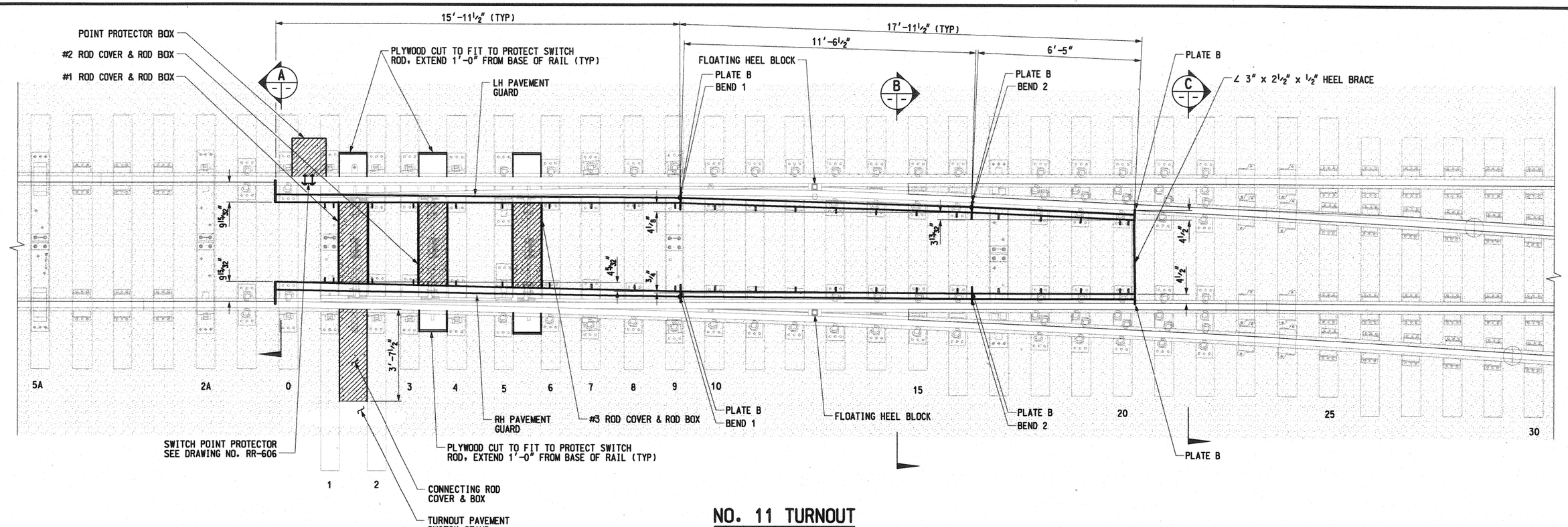
APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-633

SHEET NO: 1 OF 2

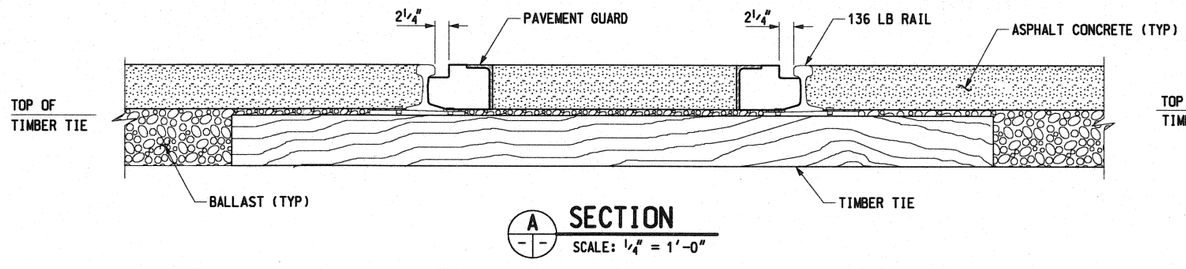
10/4/2013

...\RR-633 Number 11 Turnout 136 LB Pavement Guard Details 1 of 2

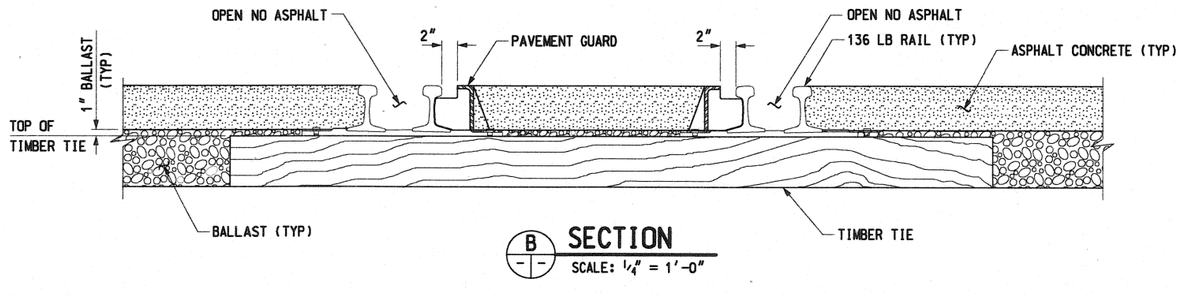


NO. 11 TURNOUT

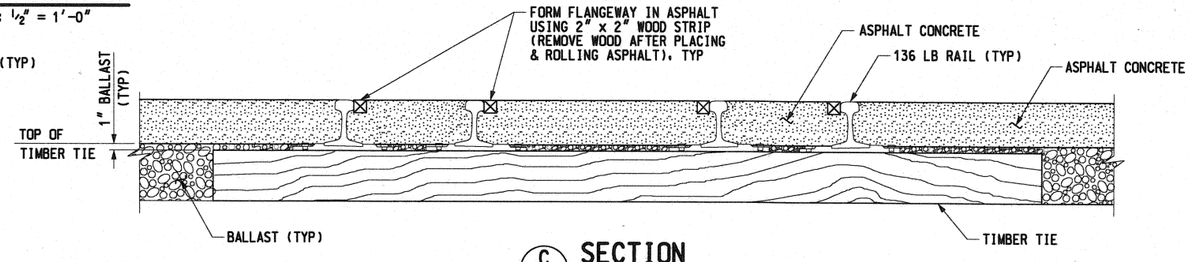
SCALE: ½″ = 1′-0″



A SECTION
SCALE: ¼″ = 1′-0″



B SECTION
SCALE: ¼″ = 1′-0″



C SECTION
SCALE: ¼″ = 1′-0″

NOTES:

1. TURNOUTS IN PAVEMENT CANNOT BE MADE INSULATED OR MADE TO WORK WITH SIGNALING.
2. SEE DRAWING RR-633 FOR PAVEMENT GUARD DETAILS, DRAWING RR-604 FOR SWITCH STAND DETAILS, DRAWING RR-373 FOR CONNECTING ROD ASSEMBLY, DRAWING RR-635 FOR SWITCH ROD BOX AND CONNECTING ROD BOX DETAILS.
3. UTILIZING A TURNOUT WITH DIFFERENT TIE SPACING REQUIRES CHANGES TO RR-633 AND RR-635.
4. PAVEMENT GUARD MAY REQUIRE SHIMMING OR ADJUSTMENT IN THE FIELD TO ACCOUNT FOR DIFFERING SWITCH PLATE HEIGHT OR THICKNESS. PAVEMENT GUARD WHEN PROPERLY INSTALLED SHOULD BE FLUSH WITH THE TOP OF THE SWITCH POINT AND THE PAVEMENT.
5. BALLAST IN TIE CRIBS UNDER SWITCH RODS TO BE LOW ENOUGH TO ALLOW FREE MOVEMENT OF SWITCH RODS.
6. PAVEMENT STIFFENERS ARE TO BE WELDED TO SWITCH PLATES AND SHALL BE ROUGHLY CENTERED ON SWITCH PLATES.
7. SWITCH POINT ROLLERS CANNOT BE INSTALLED AND UTILIZED WITH TURNOUTS THAT WILL BE IN-PAVEMENT. CONSTRUCT TURNOUT USING ROLLER PLATE BUT DO NOT INSTALL ROLLER AS IT WILL INTERFERE WITH THE PLACEMENT OF THE PAVEMENT GUARD.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

NUMBER 11 TURNOUT 136 LB SWITCH POINT SECTION FOR USE IN-PAVEMENT

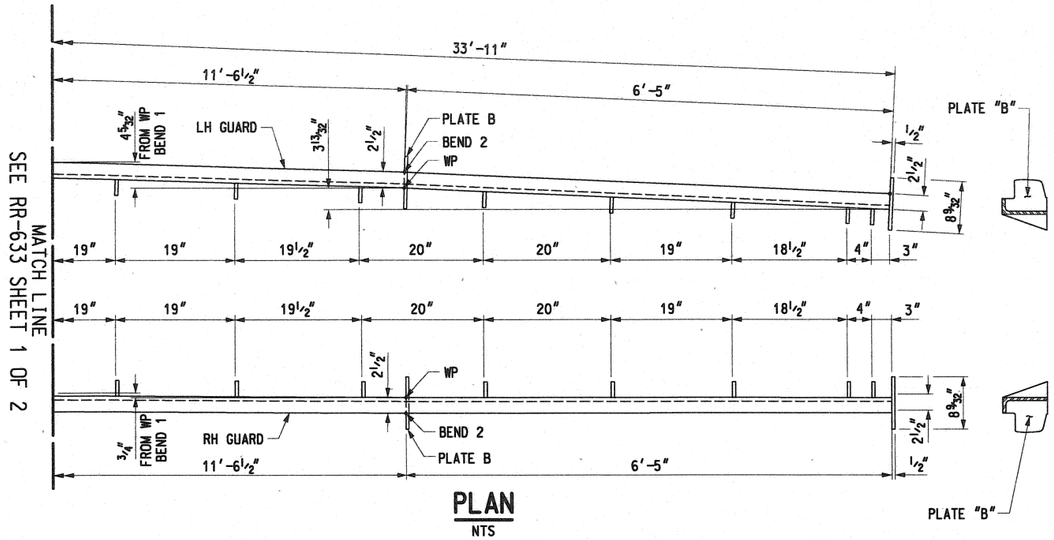
APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-632

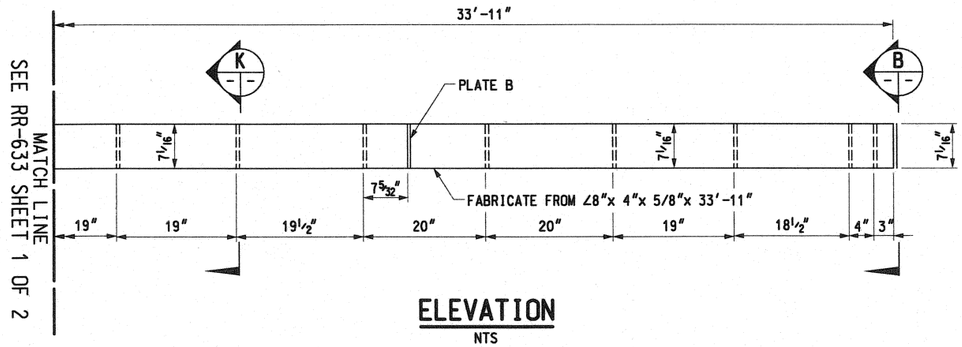
SHEET NO: 1 OF 1

10/4/2013

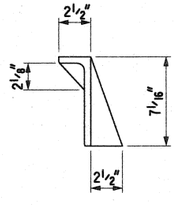
...*RR-632 Number 11 Turnout 136 lb - Switch Point Section for Use in - Pavement



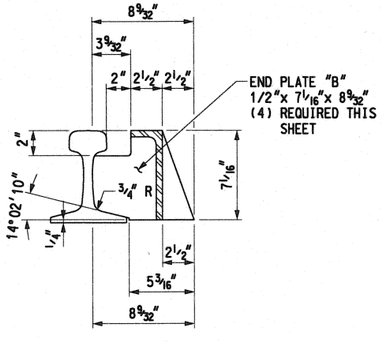
PLAN
NTS



ELEVATION
NTS



K SECTION
NTS



B SECTION
NTS

NOTES:

1. STIFFENERS MAY REQUIRE ADJUSTMENT IN FIELD TO FIT AROUND SWITCH PLATE FASTENERS.
2. STIFFENERS ARE TO BE TACK WELDED TO SWITCH PLATES TO SUPPORT PAVEMENT GUARD PRIOR TO PLACING ASPHALT.

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Port of LONG BEACH
The Green Port

RAILROAD STANDARD PLANS

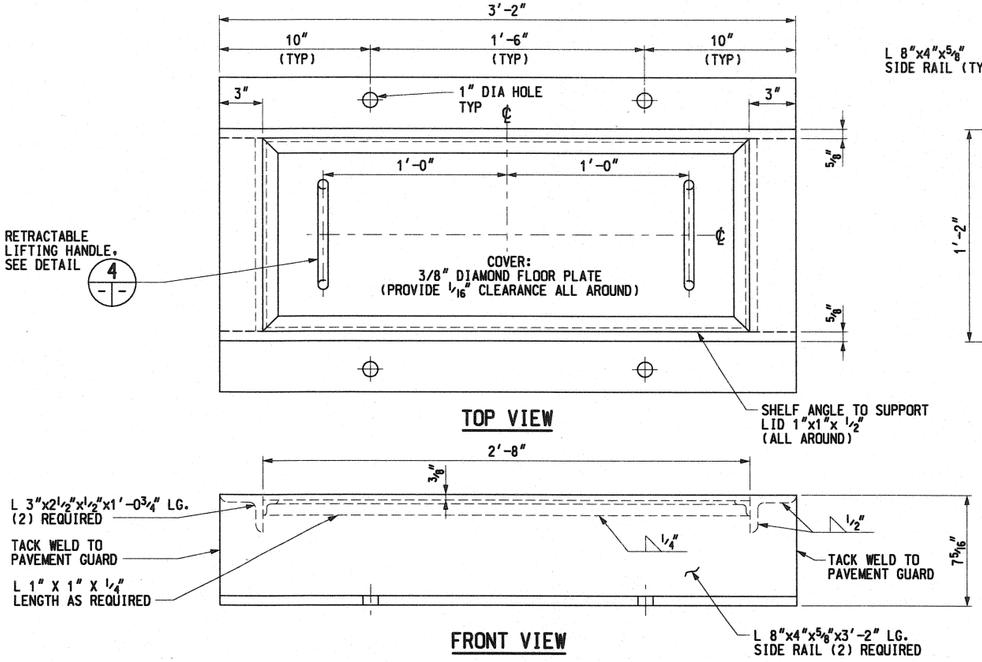
NUMBER 11 TURNOUT 136 LB PAVEMENT GUARD DETAILS

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-633
SHEET NO: 2 OF 2

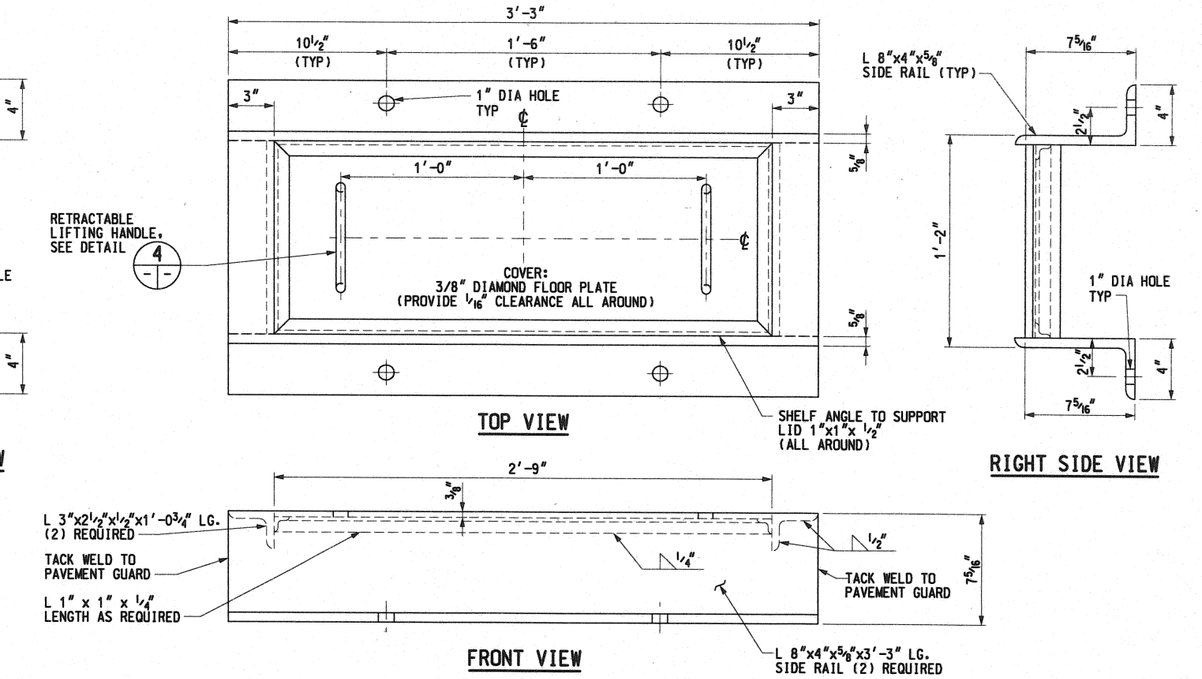
10/4/2013

...*RR-633 Number 11 Turnout 136 LB Pavement Guard Details 2 of 2



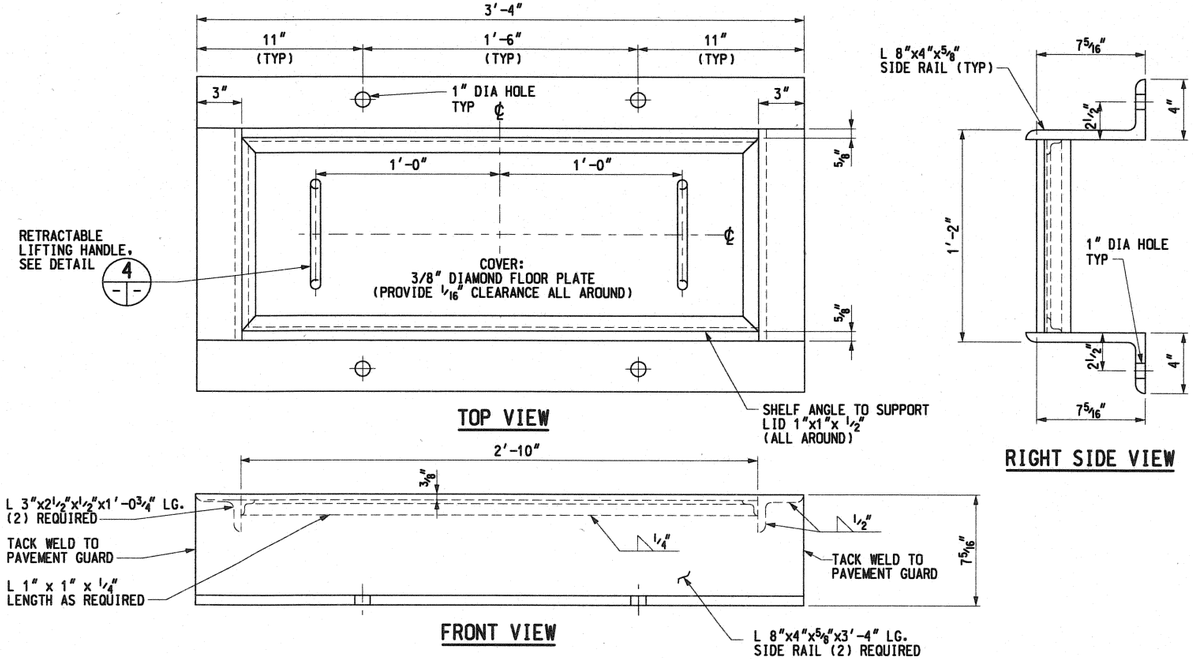
1 DETAIL - BOX FOR NO. 1 SWITCH ROD

NTS



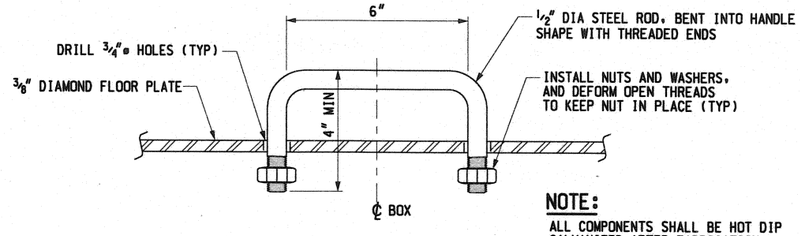
2 DETAIL - BOX FOR NO. 2 SWITCH ROD

NTS



3 DETAIL - BOX FOR NO. 3 SWITCH ROD

NTS



NOTE:
ALL COMPONENTS SHALL BE HOT DIP GALVANIZED AFTER FABRICATION.

4 DETAIL - RETRACTABLE LIFTING HANDLES

NTS

NOTES:

1. CONTRACTOR SHALL NOTCH BOX SIDE TO FIT GAGE PLATES AND SWITCH PLATES.
2. BOX FOR NO. 1, No. 2 & NO. 3 SWITCH RODS WILL BE TACK WELDED TO PAVEMENT GUARD AND SET FLUSH TO TOP OF PAVEMENT.
3. CONTRACTOR SHALL ENSURE BOX NO. 3 FOR CONNECTION ROD THAT TOP OF BOX GRADE IS FLUSH WITH PAVEMENT GRADE AND SECURELY FASTENED TO TIMBER TIES WITH SCREW SPIKES.
4. DIMENSIONS & FASTENING SYSTEM SHOWN ON PLAN ARE FOR REFERENCE ONLY. THE CONTRACTOR SHALL SUBMIT PAVEMENT TYPE SWITCH BOX FOR TIMBER SWITCH TIE INSTALLATION FOR APPROVAL BY THE ENGINEER.
5. SEE DRAWING RR-635, SHEET 2 OF 2 FOR CONNECTION ROD BOX AND SWITCH POINT PROTECTION BOX.

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Port of LONG BEACH
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RAILROAD STANDARD PLANS

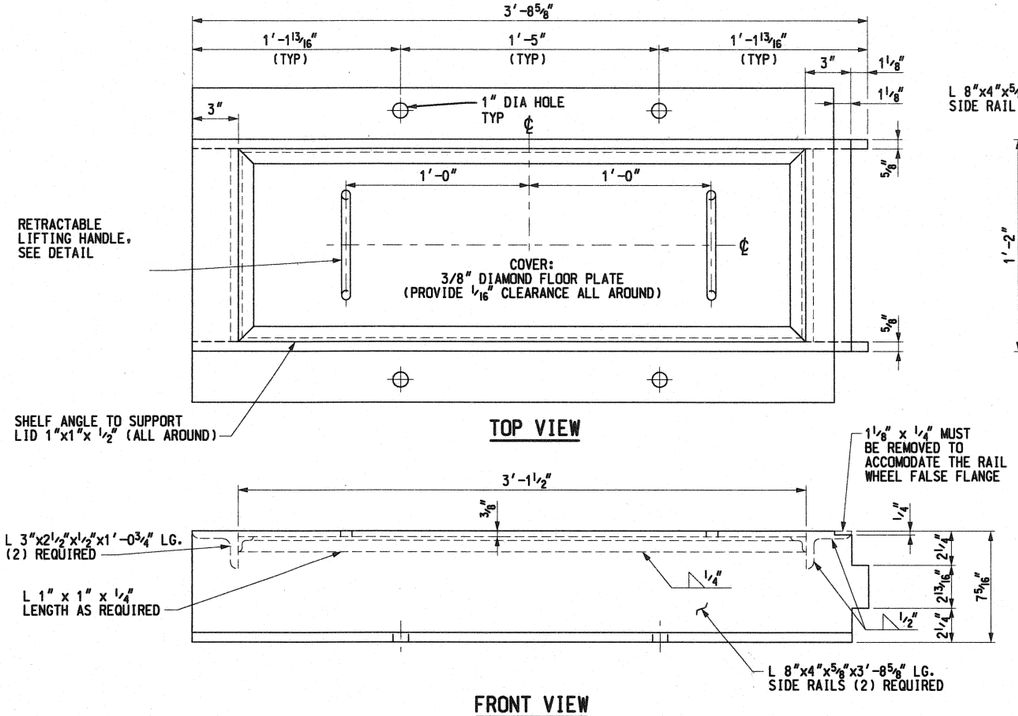
NUMBER 11 TURNOUT PAVEMENT TYPE SWITCH BOX 136 LB

APPROVED BY: _____
SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER
P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-635

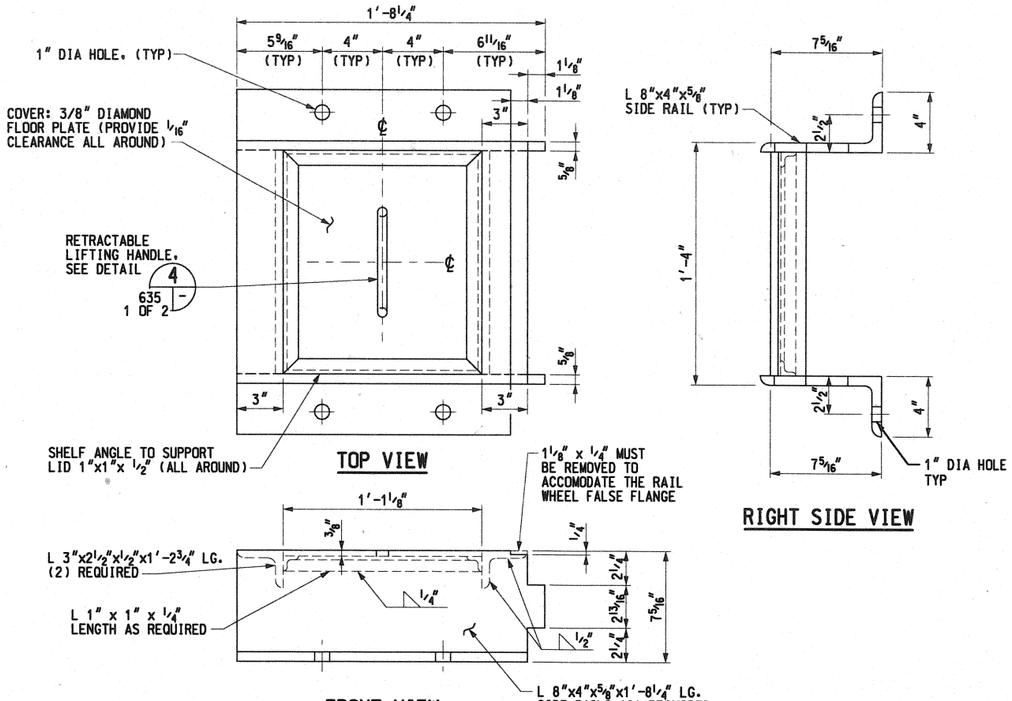
SHEET NO: 1 OF 2

10/4/2013



1 DETAIL - BOX FOR CONNECTION ROD

NTS



2 DETAIL - BOX FOR SWITCH POINT PROTECTOR

NTS

NOTES:

1. CONTRACTOR SHALL NOTCH BOX SIDE TO FIT GAGE PLATES AND SWITCH PLATES.
2. BOX FOR NO. 4 SWITCH POINT PROTECTOR WILL BE TACK WELDED TO PAVEMENT GUARD AND SET FLUSH TO TOP OF PAVEMENT.
3. CONTRACTOR SHALL ENSURE BOX NO. 3 FOR CONNECTION ROD THAT TOP OF BOX GRADE IS FLUSH WITH PAVEMENT GRADE AND SECURELY FASTENED TO TIMBER TIES WITH SCREW SPIKES.
4. DIMENSIONS & FASTENING SYSTEM SHOWN ON PLAN ARE FOR REFERENCE ONLY. THE CONTRACTOR SHALL SUBMIT PAVEMENT TYPE SWITCH BOX FOR TIMBER SWITCH TIE INSTALLATION FOR APPROVAL BY THE ENGINEER.
5. SEE DRAWING RR-635, SHEET 1 OF 2 FOR SWITCH ROD BOXES AND RETRACTABLE LIFTING HANDLE.

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Port of LONG BEACH
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RAILROAD STANDARD PLANS

NUMBER 11 TURNOUT PAVEMENT TYPE SWITCH BOX 136 LB

APPROVED BY: SEAN A. GAMETTE - ACTING CHIEF HARBOR ENGINEER

P.E. NO.: C-54141 DATE: 09-19-2013

DRAWING NO: RR-635

SHEET NO: 2 OF 2

10/4/2013