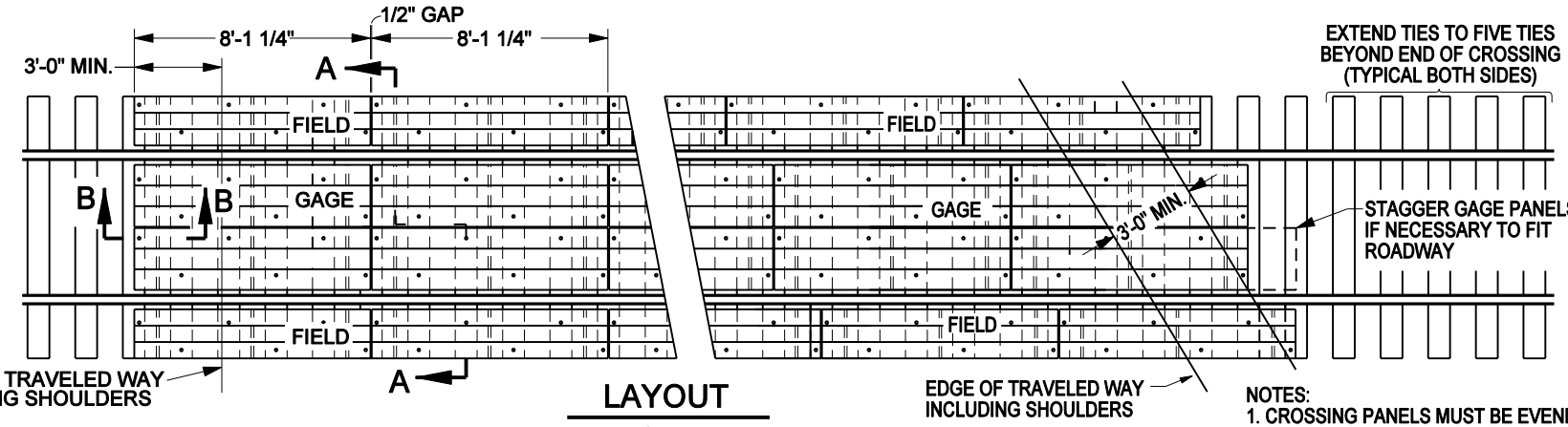
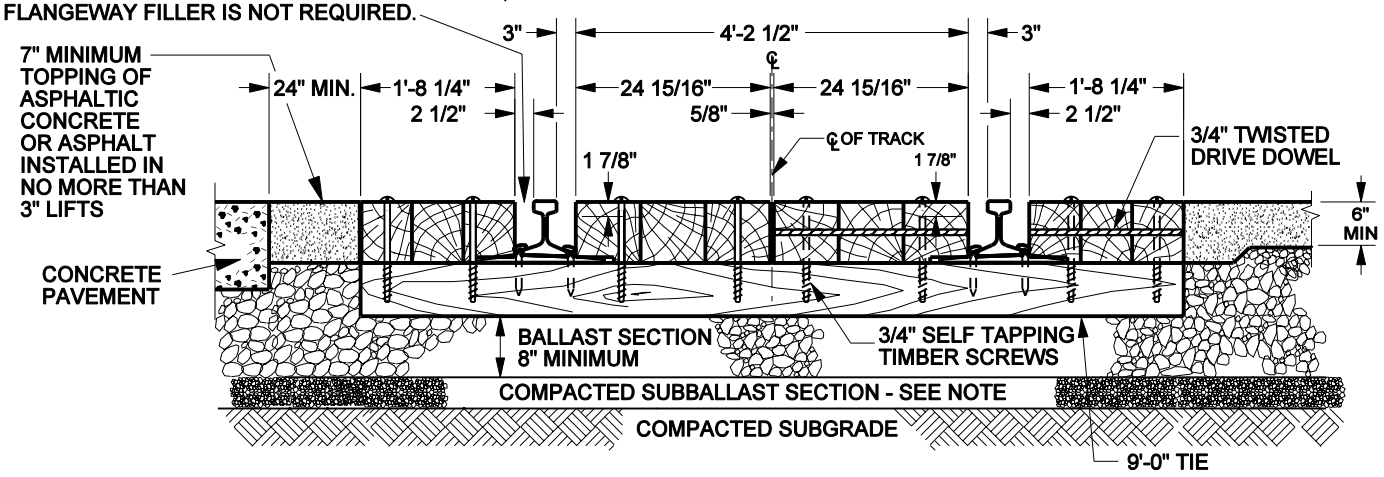


LAYOUT

WITHOUT RAMP

ON PUBLIC CROSSINGS, USE APPROVED RUBBER FLANGE WAY FILLER. ON PRIVATE CROSSINGS, FLANGEWAY FILLER IS NOT REQUIRED.

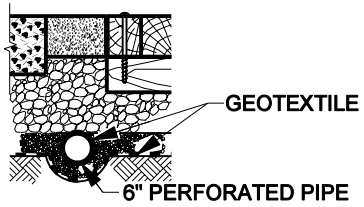


SECTION A-A (THROUGH CROSSING WITH TIMBER TIES)

NOTES:

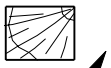
1. CROSSING PANELS MUST BE EVENLY SUPPORTED ON ALL TIES. TRACK STRUCTURE INCLUDING RAIL, OTM, TIES, BALLAST AND ROADBED MUST BE IN EXCELLENT CONDITION. ALL TIES MUST BE 9' LONG, SPACED AT 19 1/2" CENTERS AND EXTEND FIVE TIES BEYOND END OF CROSSING. NEW 7" X 9" X 9'-0" TRACK TIES TO BE INSTALLED IF NECESSARY.
2. CROSSING SITE IS TO BE INSPECTED PRIOR TO START OF INSTALLATION TO DETERMINE THAT PROPER DRAINAGE AND SURFACE SUPPORT IS PROVIDED, TRACK GRADE IS UNIFORM AND EXISTING TIES ARE AT LEAST 9' LONG.
3. IF CONDITIONS WARRANT, SITE IS TO BE OVER-EXCAVATED AND CROSSING DRAINAGE SYSTEM INSTALLED USING COMPACTED, WELL GRADED GRANULAR FILL; SUBBALLAST, GEOTEXTILE AND PERFORATED DRAINAGE PIPE (IF REQUIRED) INSTALLED PER DETAILS OF THIS DRAWING.
4. ADDITIONAL SITE DRAINAGE INCLUDING PROPER DRAINAGE AT EACH QUADRANT OF CROSSING SHALL BE COMPLETED TO ENSURE CROSSING DRAINAGE.
5. RAIL JOINTS TO BE LOCATED TO FALL OUTSIDE THE CROSSING AREA A MINIMUM OF 15'-0" FROM END OF CROSSING TIMBER.

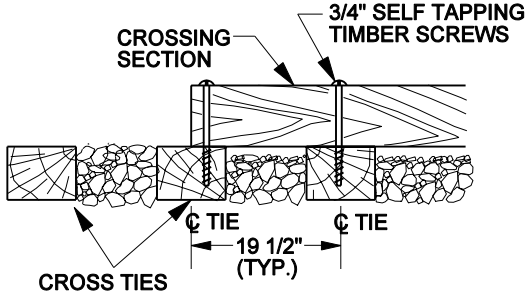
SEE PAGE 2 FOR THE REST OF THE NOTES



NOTE:
PERFORATIONS TO BE PLACED DOWN-WARD NEAR FLOW LINE OF PIPE.

SECTION WITH DRAIN





SECTION B-B

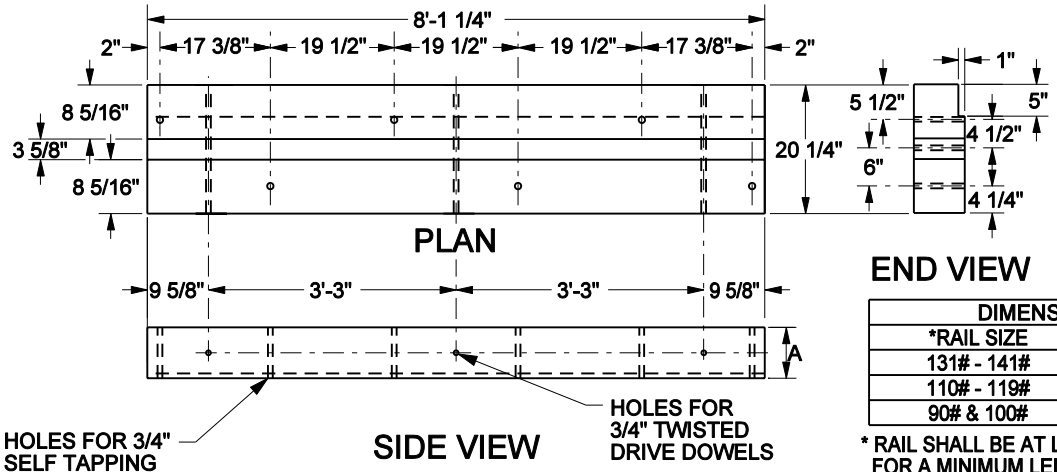
UNION PACIFIC RAILROAD ENGINEERING STANDARDS

INSTALLATION OF ROAD CROSSING W/ PREFAB TIMBER PANELS

ADOPTED: AUG. 17, 1987
REVISED: SEPT. 29, 2005
FILE NO.: 0301H

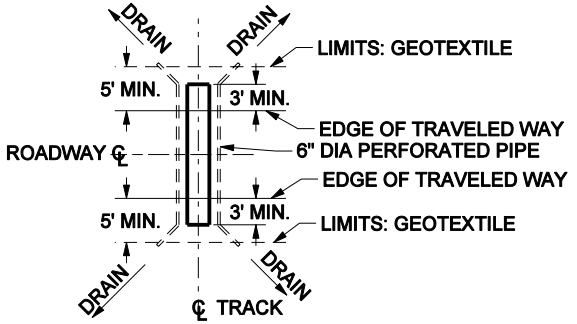
STD DWG 0301H PAGE 1 OF 2

STD DWG 0301H PAGE 1 OF 2



SIDE VIEW

END VIEW



TYPICAL PIPE LAYOUT

DIMENSION CHART		
*RAIL SIZE	A	SCREWS
131# - 141#	8"	3/4" x 13"
110# - 119#	7 3/8"	3/4" x 13"
90# & 100#	6 3/4"	3/4" x 12"

* RAIL SHALL BE AT LEAST 115# FOR A MINIMUM LENGTH OF 20' BEYOND THE EDGE OF TRAVELED WAY

SUBBALLAST NOTE:
SUBBALLAST SECTION TO BE A MINIMUM OF 4" WHEN RENEWING EXISTING CROSSING. FOR NEW CONSTRUCTION, SUBBALLAST SECTION TO BE IN ACCORDANCE WITH CONSTRUCTION DESIGN STANDARDS OR AS REQ'D. BY STATE OR LOCAL AGENCIES.

NOTES (CONTINUED FROM PAGE 1):

FABRICATION AND TREATMENT:
1. CROSSING SECTIONS TO BE FABRICATED AND ASSEMBLED TO AVOID ANY CUTTING OR FITTING AT THE POINT OF INSTALLATION. SECTIONS TO BE PREDRILLED WITH 1/2" HOLES AND TRANSVERSELY DOWELED WITH 3/4" TWISTED DRIVE DOWELS. EACH PLANK TO BE FRAMED, BORED AND TREATED WITH A P2 SOLUTION TO 8 LBS. PER CUBIC FOOT RETENTION PRIOR TO ASSEMBLY INTO CROSSING SECTION. PLACE THE CROSSING SECTION MARK ON THE END OF ALL SECTIONS. EACH MARK TO HAVE A SUFFIX DENOTING RAIL SIZE AS SHOWN UNDER CATEGORIES IN DIMENSION CHART.

MATERIALS AND INSTALLATION:
1. REQUISITIONS FOR PREFABRICATED CROSSING SECTIONS TO BE MADE SPECIFYING THE NUMBER OF EACH TYPE OF SECTION REQUIRED (A OR B) AND THE WEIGHT OF RAIL WITH WHICH IT IS TO BE USED (133, 131, ETC.) AS DENOTED IN THE DIMENSION CHART UNDER CATEGORIES. DRILLING TO START AT THE CENTERLINE OF CROSSING AND WORK TOWARDS THE ENDS.

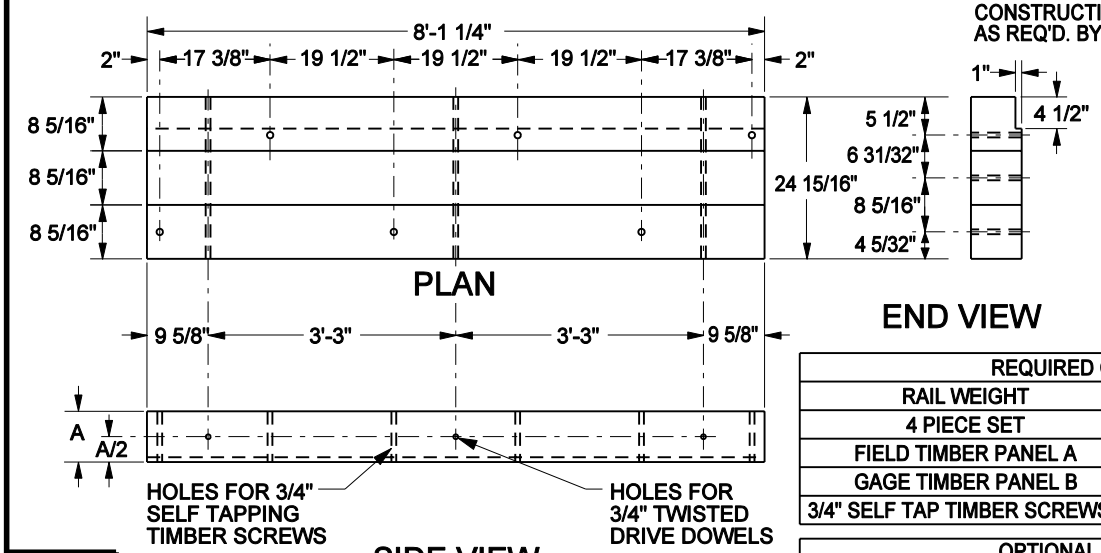
2. GEOTEXTILE AND PIPE TO BE INSTALLED ONLY AT LOCATIONS WHERE REQUIRED BY STATE OR LOCAL AGENCIES OR WHERE DESIGNATED BY CHIEF ENGINEER.

3. REPORT CROSSING GATE MALFUNCTIONS TO 24 HR UPRR CROSSING HOT LINE AT 1-800-848-8715.

4. ALL EXCEPTIONS TO THIS PLAN MUST BE APPROVED BY THE CHIEF ENGINEER.

FIELD TIMBER PANEL A

MATERIAL FOR ONE SECTION
2 - A x 8 1/2" x 8'-1 1/4" TIMBERS
3 - 3/4" x 19 1/2" TWISTED DRIVE DOWELS
6 - 3/4" x 12" SELF TAPPING TIMBER SCREWS
1 - A x 3 1/4" x 8'-1 1/4" TIMBER



SIDE VIEW

END VIEW

REQUIRED COMPONENTS			
RAIL WEIGHT	90#-100#	110#-119#	131#-141#
4 PIECE SET	540-3500	540-3900	540-4300
FIELD TIMBER PANEL A	540-3600	540-4000	540-4400
GAGE TIMBER PANEL B	540-3700	540-4100	540-4500
3/4" SELF TAP TIMBER SCREWS	130-5400	130-5402	

OPTIONAL COMPONENTS	
20' SECTION 6" PERFORATED PIPE	510-3201
6" ADJUSTABLE PIPE ELBOW	510-3557
6" PIPE CONNECTOR BAND	510-3379
100' ROLL GEOTEXTILE	550-0119
FLANGEWAY RUBBER	540-1950

GAGE TIMBER PANEL B

MATERIAL FOR ONE SECTION
3 - A x 8 1/2" x 8'-1 1/4" TIMBERS
3 - 3/4" x 24" TWISTED DRIVE DOWELS
6 - 3/4" x 13" SELF TAPPING TIMBER SCREWS

STD DWG 0301H PAGE 2 OF 2

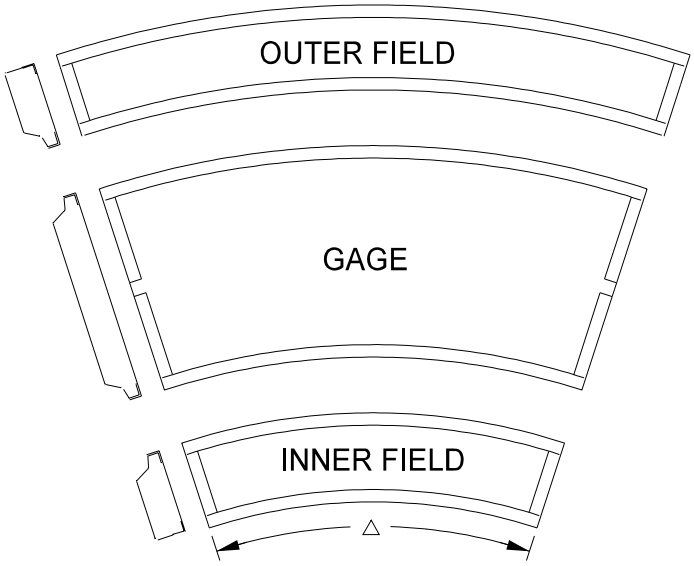
UNION PACIFIC RAILROAD ENGINEERING STANDARDS

INSTALLATION OF ROAD CROSSING W/ PREFAB TIMBER PANELS

ADOPTED: AUG. 17, 1987
REVISED: SEPT. 29, 2005
FILE NO.: 0301H

STD DWG
0301H
PAGE 2 OF 2

200902



(SEE PANEL CURVATURE TABLES)

CURVATURE TABLE
(ON CONCRETE TIES)

DEGREE OF CURVE	RADIUS IN FEET	△	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

CURVATURE TABLE
(ON WOOD TIES)

DEGREE OF CURVE	RADIUS IN FEET	△	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

NOTES:
A CURVED PANEL IS A PANEL THAT IS PIE SHAPED WITH A LONGER OUTER LENGTH THAN THE INNER LENGTH WITH TRUE RADIUSED OUTER AND INNER STEEL.

CURVED PANELS USE STANDARD REINFORCEMENT SIMILAR TO TANGENT PANEL STANDARD REINFORCEMENT.

LAG HOLES ON 10W AND 9W CROSSINGS MUST LINE UP WITH THE CENTERLINE OF TIES.

XING TYPE (RAIL WT.)	BNSF ITEM NO.	UPRR ITEM NO.
10W (115)	055590002	NON-STOCK
10W (133-141)	055590001	NON-STOCK
9W	NON-STOCK	NON-STOCK
10C	NON-STOCK	NON-STOCK
85C	NON-STOCK	NON-STOCK

Burlington Northern Santa Fe Railway

COMMON STANDARDS

UNION PACIFIC

CURVED CONCRETE PANELS

FILE OWNER: UPRR	DATE: APRIL 24, 2001
REV. NO.: 0	DWG NO:200902

200901

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 A615 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 RAILROADS 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 PROCEDURES OF PCI IN 4TH EDITION DIVISION 4.

10) 3/16" WEEP/INSPECTION HOLES SHALL BE PLACED EVERY 2-FT. MIN. 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 PROPERTIES:

- TENSILE STRENGTH (ASTM D412) 850PSI 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.
- VOLUME RESISTIVITY = $1X10^{12}$ (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 TYPE 10C ONLY). TEST RESULTS MUST BE SUBMITTED FOR RAILROAD 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 3/16" (MEASURED ALONG THE DIAGONAL)

2) LENGTH, WIDTH, AND THICKNESS: +/-1/8"

3) THE BOTTOM SURFACE, WHICH WILL BE IN CONTACT WITH THE TIES, SHALL NOT UNDULATE IN ANY DIRECTION MORE THAN 3/32". SEE SPECIAL TESTING NOTE 3 BELOW.

4) REINFORCEMENT PLACEMENT SHALL BE +/-3/4" HORIZONTAL, +/-1/8" VERTICAL.

FINISH:

1) ALL RECESSES AND MINOR CONCRETE SPALLS ARE TO BE FILLED AND FINISHED TO THE PANEL DIMENTIONS USING THE PROPER BONDING AGENT AND REPAIR MATERIAL SURFACE OF THE REPAIRED AREA IS TO MATCH THE COLOR AND TEXTURE OF THE SURROUNDING AREAS.

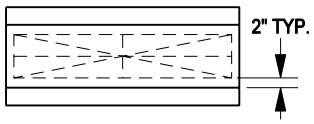
2) THE DRIVING SURFACE IS TO HAVE A LIGHT BROOM FINISH OR AS APPROVED BY RAILROADS. THE ADDITION OF WATER TO THE CONCRETE SURFACE FINISH DURING CASTING IS NOT PERMITTED.

SPECIAL TESTING:

1) TWICE ANNUALY, VENDORS SHALL SUBMIT (VIA AN INDEPENDENT TESTING LABORATORY TO THE RAILROADS) 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%

2) GAGE PANELS SHALL BE DESIGNED WITH SHUNT RESISTANT FEATURES IN ORDER TO PROVIDE A MINIMUM ELECTRICAL RESISTANCE IN ACCORDANCE WITH THE STANDARD ELECTRICAL TEST (DWG 500930).

3) A REPRESENTATIVE SAMPLE OF PANELS SHALL BE CHECKED PERIODICALLY FOR BOTTOM FLATNESS BY USING A STRAIGHT EDGE CALIBRATED TO WITHIN +/-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 I CERTIFIED.

2) THE FABRICATOR SHALL BE RESPONSIBLE FOR LOADING AND PROPERLY SECURING ALL PRECASTCONCRETE MEMBERS FOR SHIPMENT.

3) THE MANUFACTURER SHALL WARRANTY PRODUCT FOR A MINIMUM OF TEN YEARS AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP.

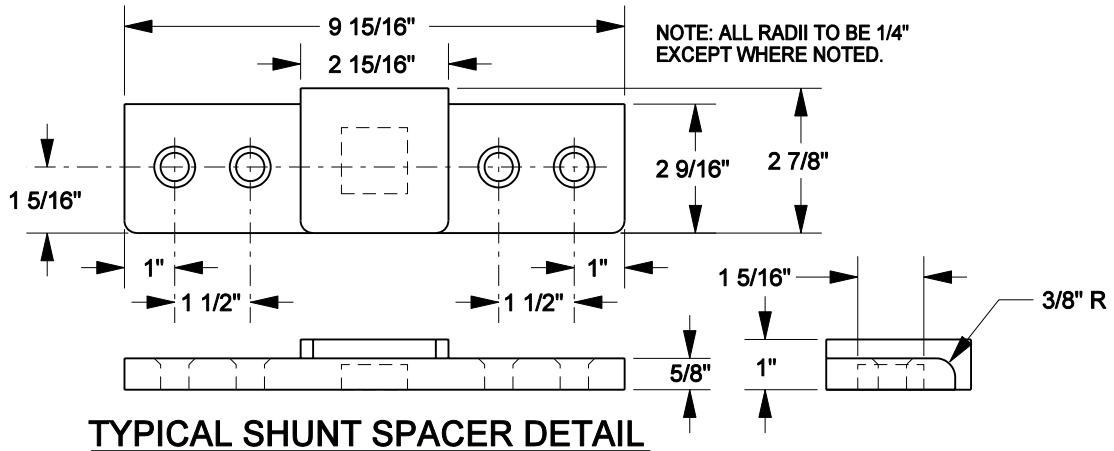
4) MAUNFACTURER TO PERMANENTLY MARK EACH PANEL WITH A CONCRETE IMPRINT FOR SIZE OF RAIL, WEIGHT OF PANEL, MANUFACTURER'S I.D., MONTH/DAY/YEAR OF MANUFACTURE, AND CROSSING TYPE. END OF EACH PANEL TO BE STENCILED PAINTED WITH SIZE OF RAIL, WEIGHT OF PANEL AND CROSSING TYPE.

COMMON STANDARDS

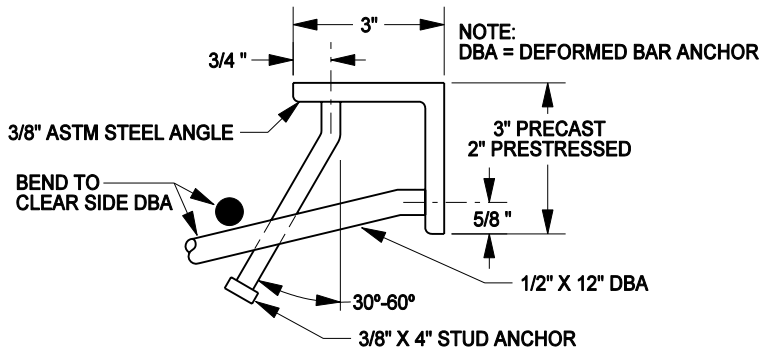
GENERAL SPECIFICATIONS FOR ROAD CROSSINGS WITH CONCRETE PANELS

	FILE OWNER: UPRR	DATE: MARCH 21, 2003
	REV. NO.: 1	DWG NO:200901

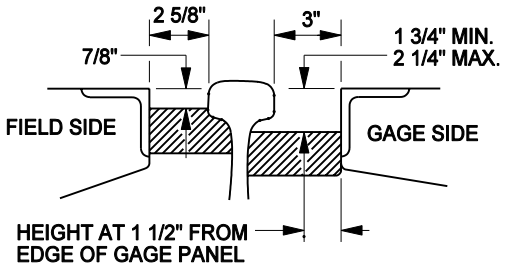
200900



TYPICAL SHUNT SPACER DETAIL
(ALL PANELS)

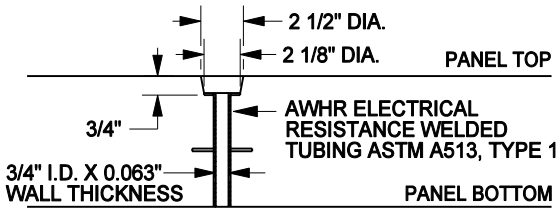


END FRAME DETAIL
(ALL PANELS)

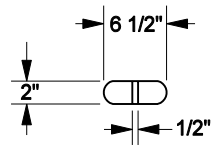


NOTE: VENDOR SHALL SUBMIT PREATTACHED FLANGEWAY FILLER DESIGN AND DETAILS FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.

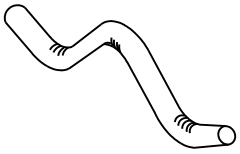
TYPICAL PREATTACHED FLANGEWAY FILLER
(ALL PANELS)



LAG HOLE DETAIL
(9W & 10W)



BLOCKOUT DEPTH = 3"

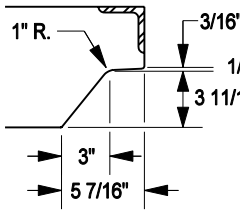


LIFTING INSERTS SHALL BE DESIGNED WITH A MINIMUM SAFETY FACTOR=4. PROFESSIONAL ENGINEER STAMPED AND SEALED DETAILS AND DESIGN CALCULATIONS MUST BE SUBMITTED FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.

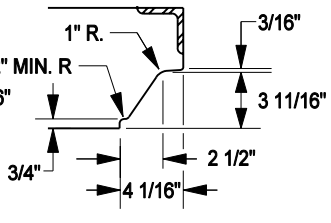
LIFTING INSERTS SHALL BE MECHANICALLY GALVANIZED OR SIMILARILY PROTECTED AGAINST CORROSION.

LIFTING DEVICES SHALL BE USABLE WITH BURKE OR DAYTON 5-TON CLUTCH SYSTEMS.

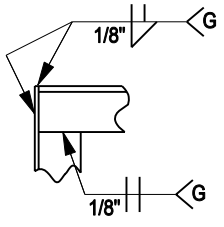
TYPICAL LIFTING DEVICE AND BLOCKOUT
(ALL PANELS)



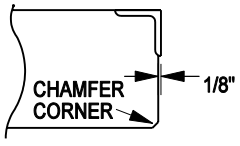
FIELD PANEL
(9W, 10W, & 10C)



GAGE PANEL
(9W, 10W, & 10C)



WELD DETAIL
(ALL PANELS)

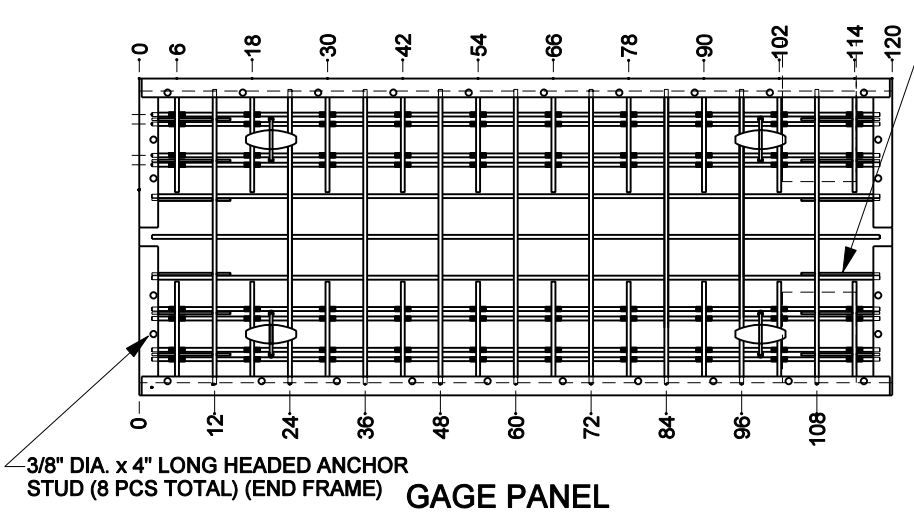


END DETAIL
(ALL PANELS)

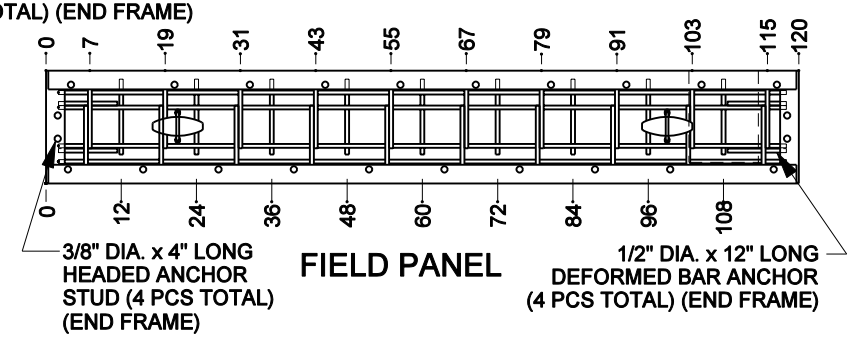
COMMON STANDARDS

TYPICAL DETAILS FOR CONCRETE PANELS

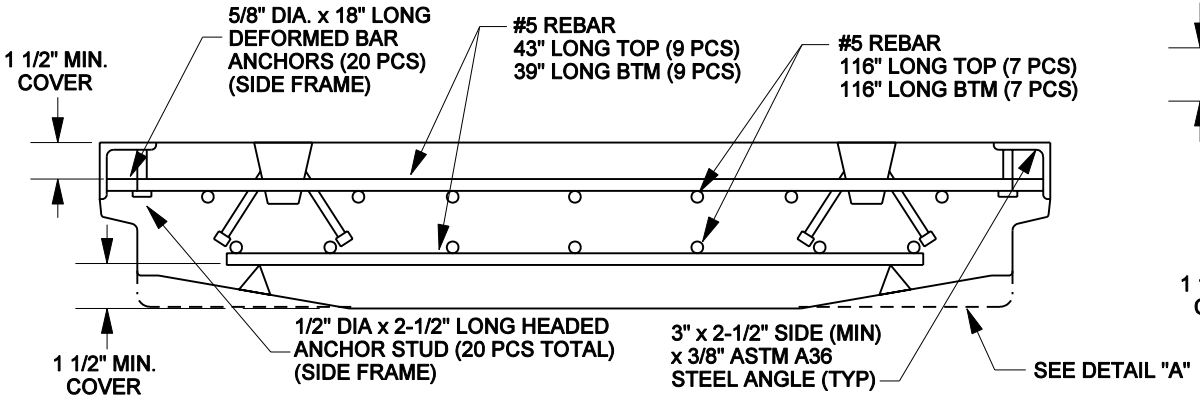
FILE OWNER: UPRR	DATE: APRIL 30, 2003
REV. NO.: 3	DWG NO:200900



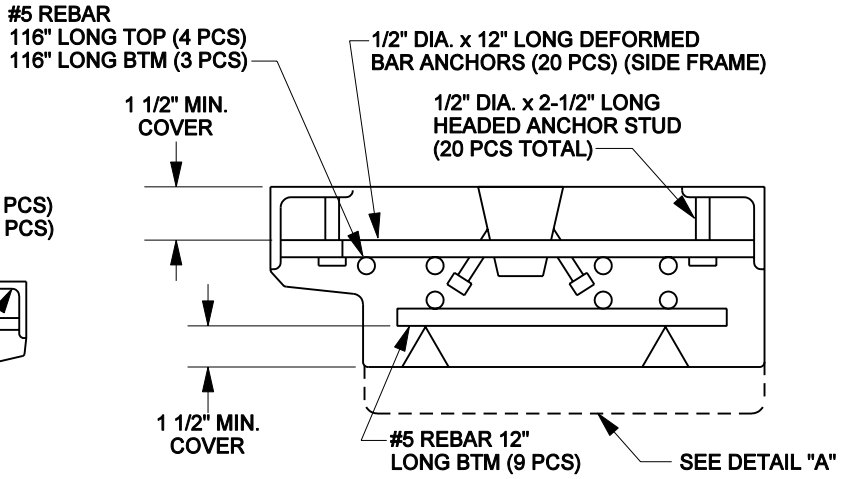
GAGE PANEL



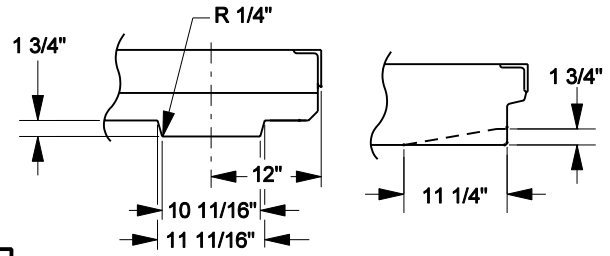
FIELD PANEL



CROSS SECTION - GAGE PANEL



CROSS SECTION - FIELD PANEL



DETAIL A

APPLIES TO ALL THREE PANELS

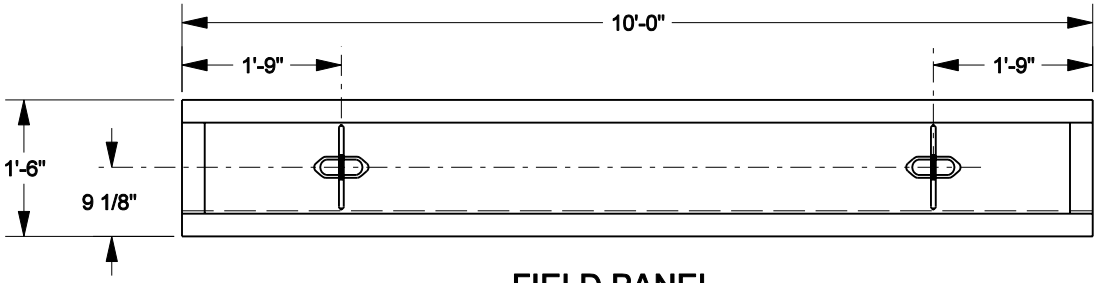
NOTES:
1. CONCRETE COMPRESSIVE STRENGTH SHALL BE AS FOLLOWS:
   @ 28DAYS = 6000 psi MINIMUM
   @ SHIPPMENT = 4000 psi MINIMUM
   @ REMOVAL FROM FORMS = 2500 psi MINIMUM.
2. CROSSING TYPE - 10C

COMMON STANDARDS

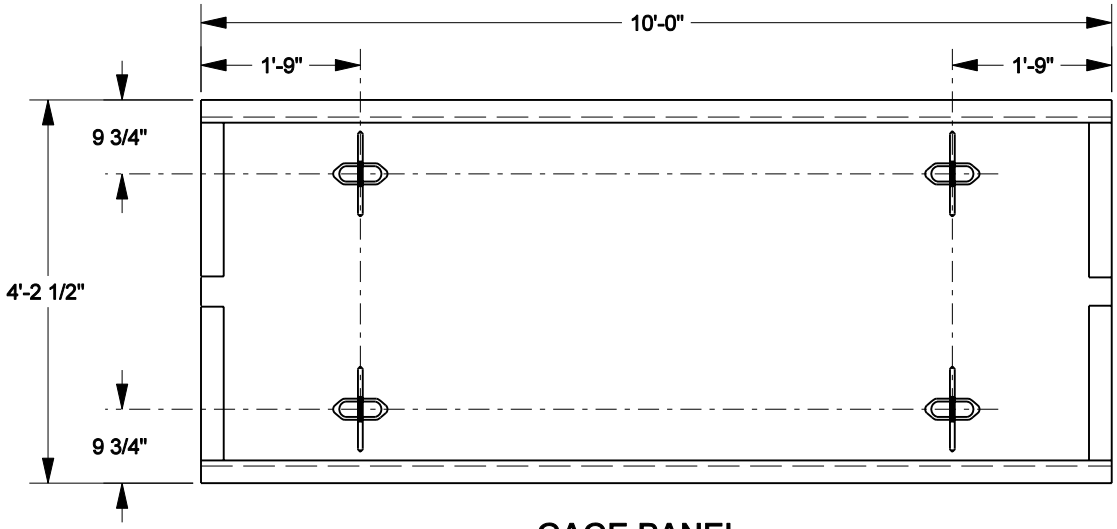
PRECAST CONCRETE PANELS FOR 8'-6" CONCRETE TIES (85C)

	FILE OWNER: UPRR	DATE: MARCH 21, 2003
	REV. NO.: 1	DWG NO: 200401

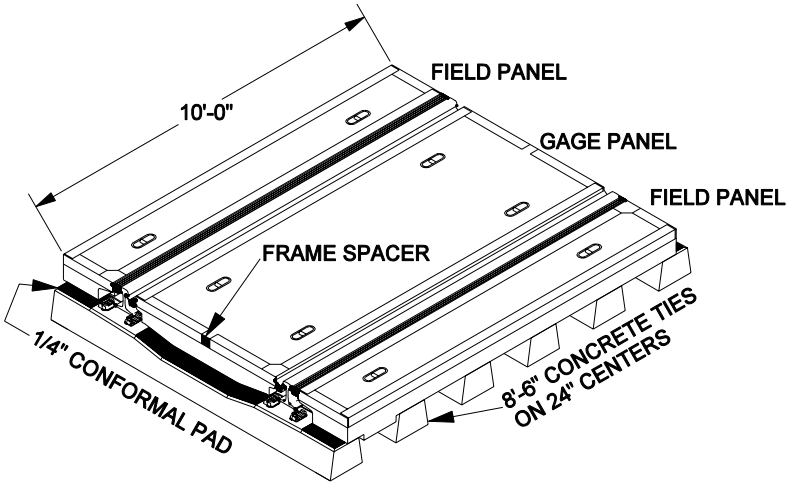
200401



FIELD PANEL



GAGE PANEL

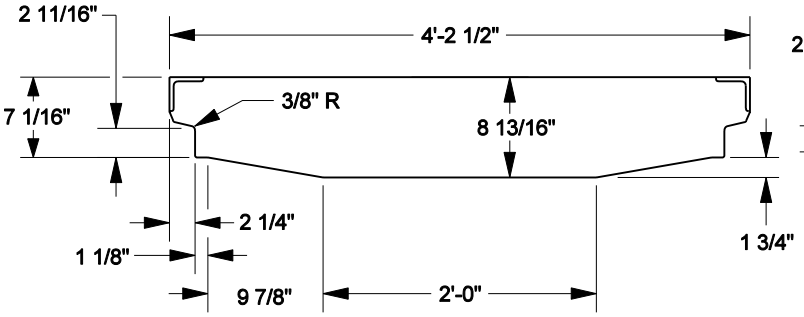


NOTES:
1. THIS CROSSING IS TO BE INSTALLED ON ROADWAYS WITH HIGHWAY TRAFFIC VOLUMES LESS THAN 500 VEHICLES PER DAY AND LIMITED TRUCK TRAFFIC.

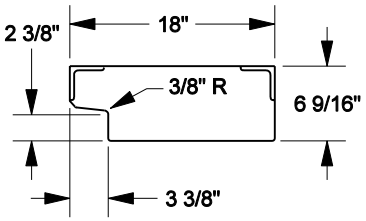
2. AN APPROVED 1/4" THICK CONFORMAL PAD IS REQUIRED BETWEEN CONCRETE TIE AND CONCRETE PANEL.

3. END RESTRAINTS ARE NOT REQUIRED WITH THIS CROSSING.

4. SEE STD DWG 200900 FOR TYPICAL DETAILS CROSSING TYPE - 85C



GAGE PANEL



FIELD PANEL

200400

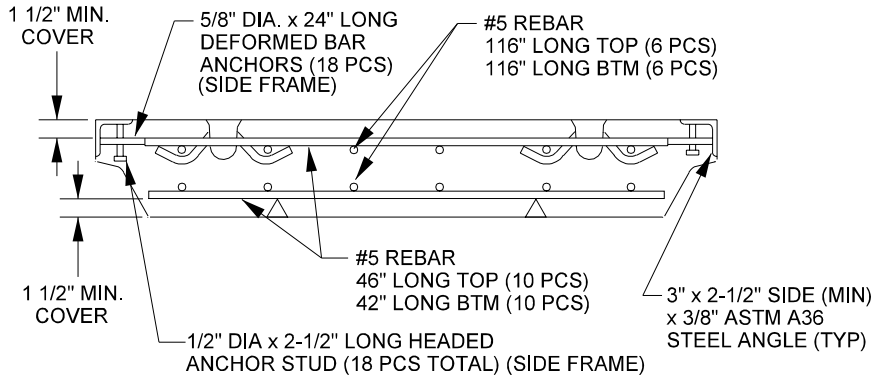
WEIGHT	
GAGE	4600 LBS.
FIELD	1350 LBS.

ITEM NUMBERS	
133-141 LB. UPRR	133-141 LB. BNSF
540-01310	NON-STOCK

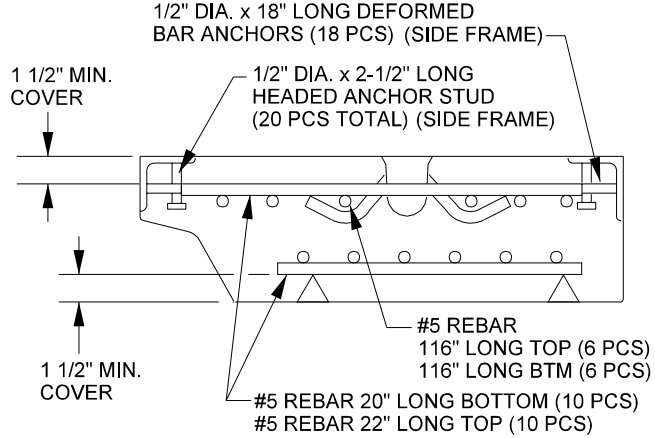
COMMON STANDARDS

LAYOUT FOR CONCRETE PANELS ON 8'-6" LONG CONCRETE TIES (85C)

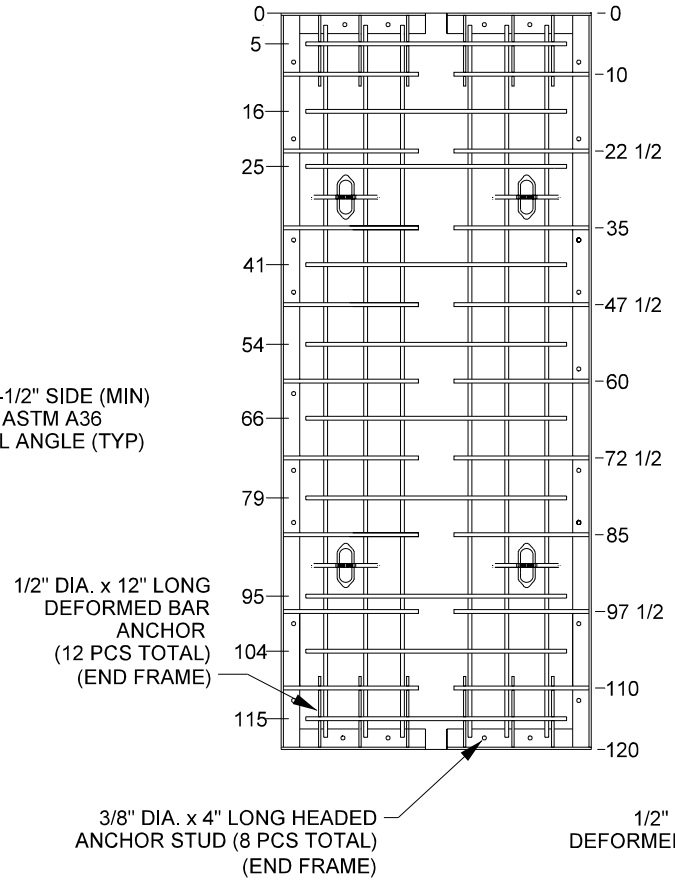
FILE OWNER: UPRR	DATE: MAY 24, 2004
REV. NO.: 2	DWG NO: 200400



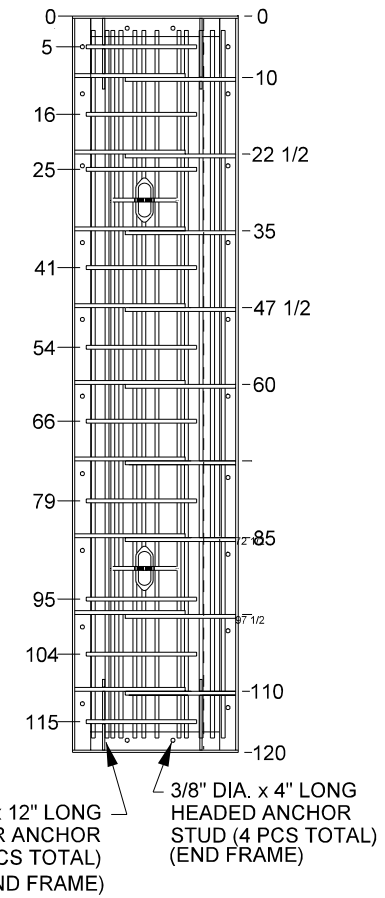
CROSS SECTION - GAGE PANEL



CROSS SECTION - FIELD PANEL



GAGE PANEL



FIELD PANEL

NOTES:
CONCRETE COMPRESSIVE STRENGTH SHALL BE AS FOLLOWS:
@ 28DAYS = 6000 psi MINIMUM
@ SHIPPMENT = 4000 psi MINIMUM
@ REMOVAL FROM FORMS = 2500 psi MINIMUM.

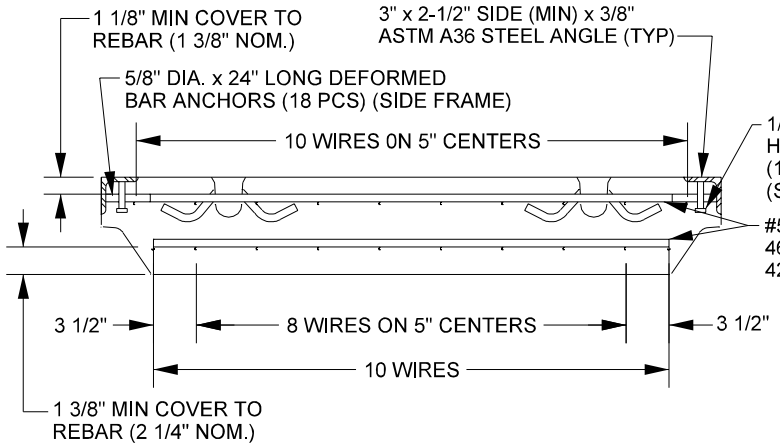
CROSSING TYPE - 10C

COMMON STANDARDS

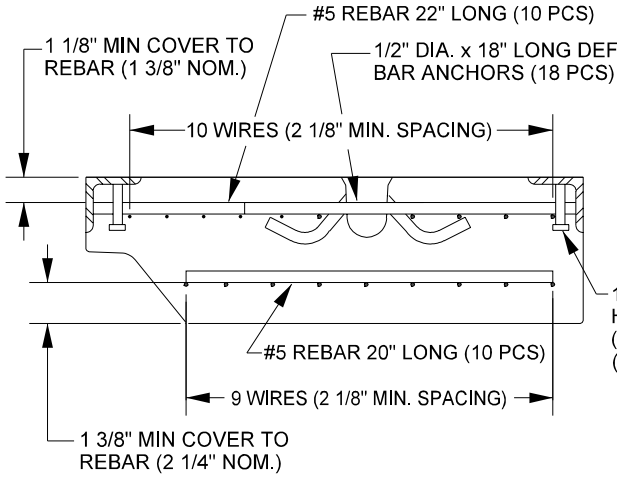
PRECAST CONCRETE PANELS FOR 10' CONCRETE TIES (10C)

FILE OWNER: UPRR	DATE: APRIL 24, 2001
REV. NO.: 0	DWG NO: 200302

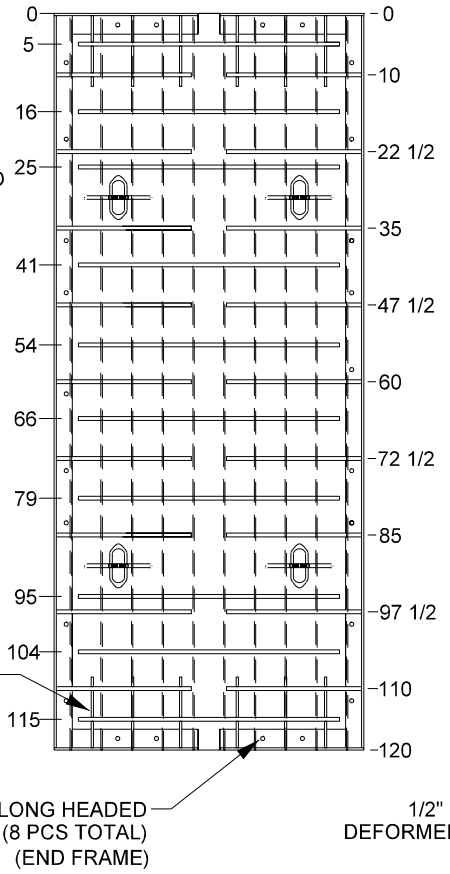
200302



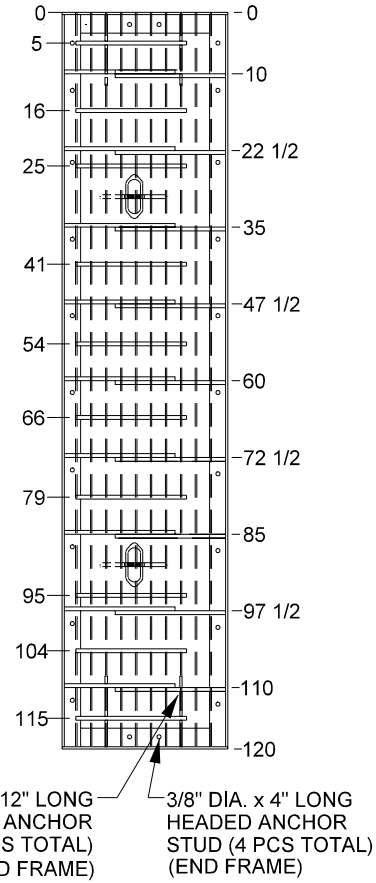
CROSS SECTION - GAGE PANEL



CROSS SECTION - FIELD PANEL



GAGE PANEL



FIELD PANEL

NOTES:
28 DAY CONCRETE COMPRESSIVE STRENGTH = 7000psi
MIN. TRANSFER COMPRESSIVE STRENGTH = 4500psi

PRESTRESSING WIRE SHALL BE 5.25mm DIA. COMFORMING WITH ASTM A-881 "STEEL WIRE DEFORMED, STRESS RELIEVED OR LOW RELAXATION FOR PRESTRESSED CONCRETE TIES" WITH A MINIMUM BREAKING STRENGTH OF 8800 LBf.

WIRE SHALLED BE TENSIONED IN ACCORDANCE WITH PCI REQUIREMENTS TO 6960LBf PER WIRE.

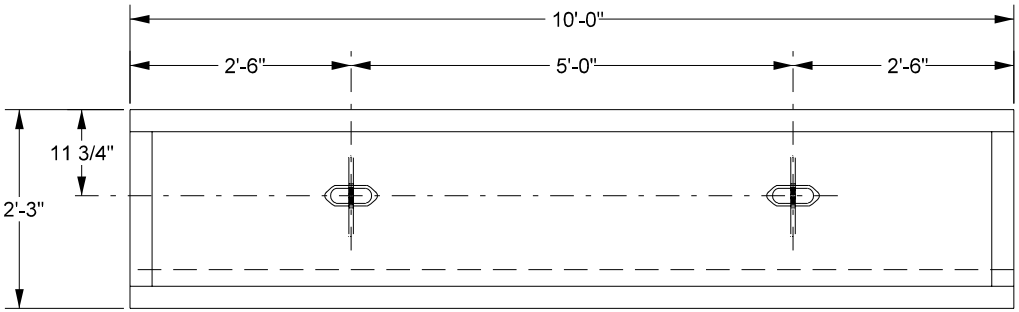
CROSSING TYPE - 10C

COMMON STANDARDS

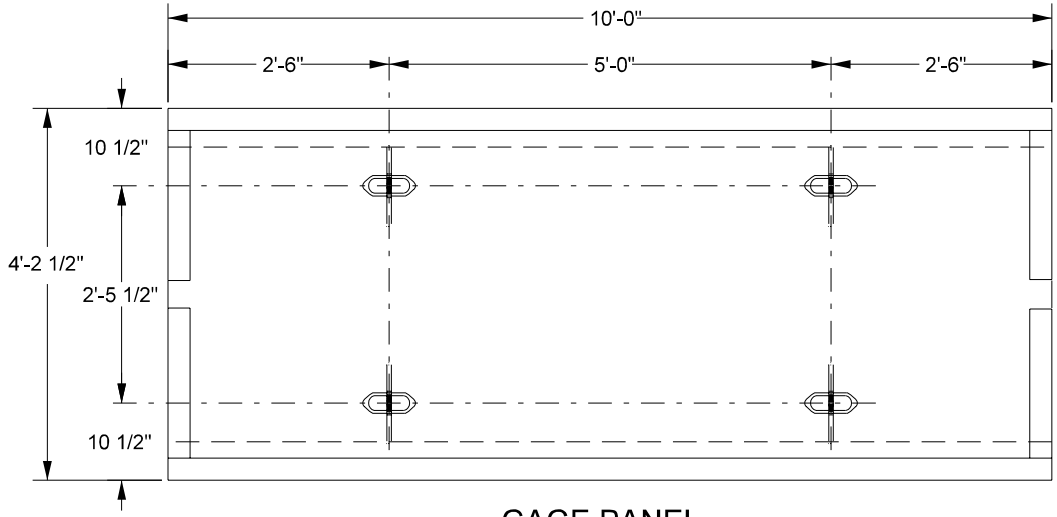
PRESTRESSED CONCRETE PANELS FOR 10' CONCRETE TIES (10C)

FILE OWNER: UPRR	DATE: APRIL 24, 2001
REV. NO.: 0	DWG NO: 200301

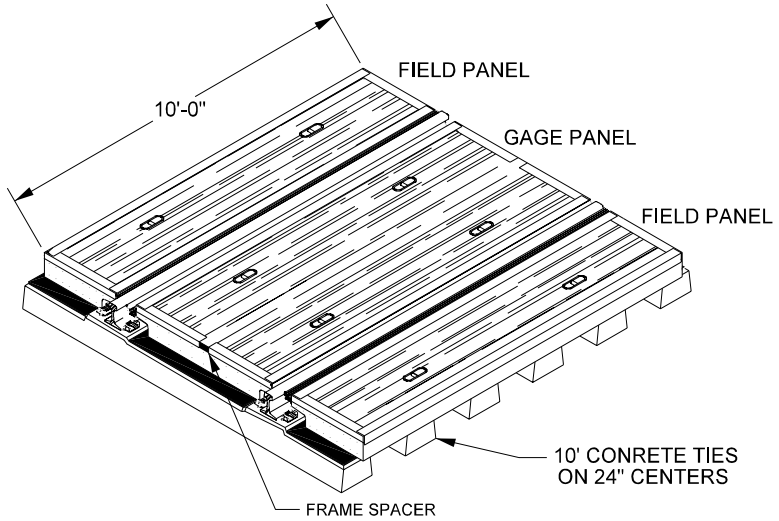
200301



FIELD PANEL



GAGE PANEL



NOTES:
1/4" CONFORMAL RUBBER INTERFACE PAD TO BE PLACED BETWEEN PANEL AND TIES.

CROSSING TYPE - 10C

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

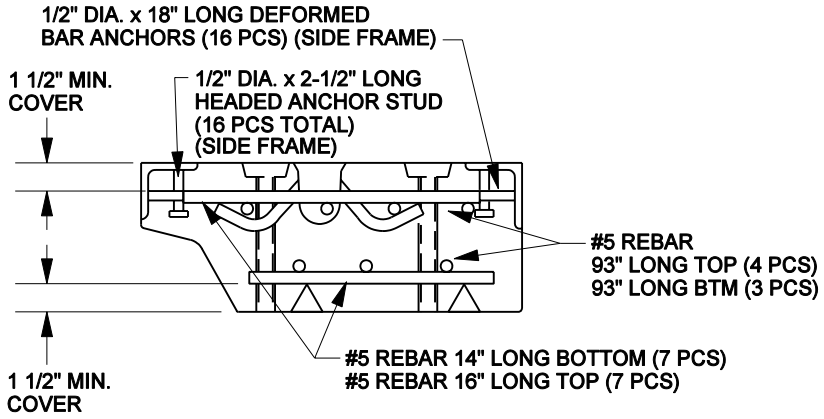
COMMON STANDARDS

LAYOUT FOR CONCRETE PANELS ON 10'-0" LONG CONCRETE TIES (10C)

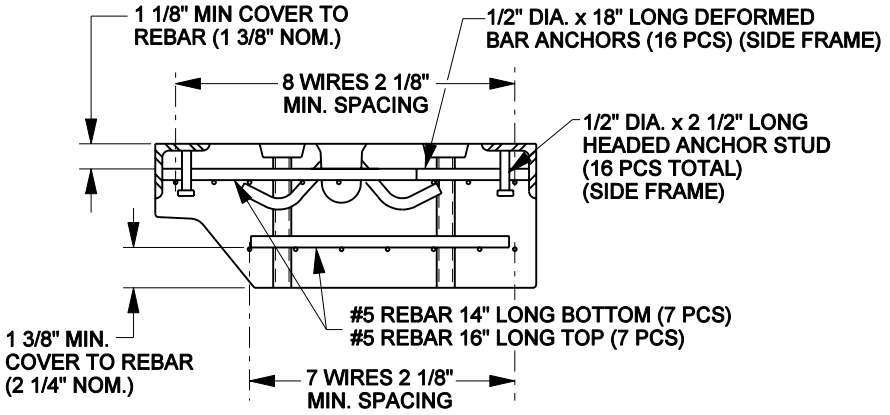
ITEM NUMBERS	
133-141 LB. UPRR	133-141 LB. BNSF
540-1315	NON-STOCK

FILE OWNER: UPRR	DATE: APRIL 24, 2001
REV. NO.: 0	DWG NO: 200300

200300



CROSS SECTION - PRECAST FIELD PANEL



CROSS SECTION - PRESTRESSED FIELD PANEL

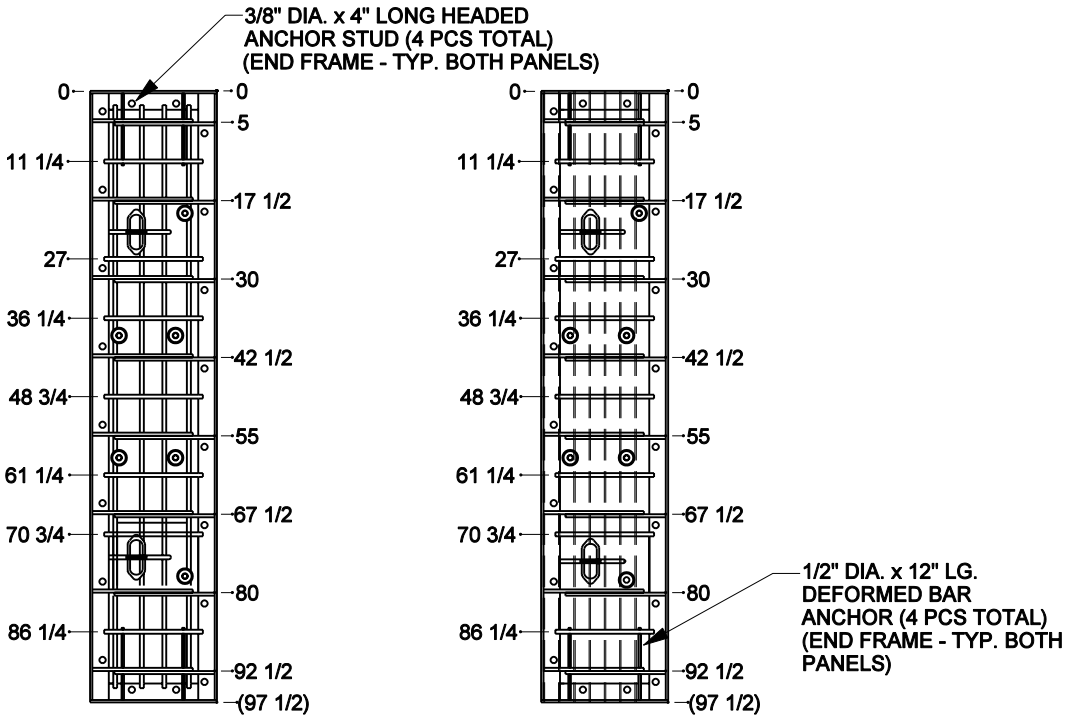
*FOR GAGE PANELS, SEE DWGS 500110 & 500120.

PRECAST NOTES:
1. CONCRETE COMPRESSIVE STRENGTH SHALL BE AS FOLLOWS:
   @ 28DAYS = 6000 psi MINIMUM
   @ SHIPMENT = 4000 psi MINIMUM
   @ REMOVAL FROM FORMS = 2500 psi MINIMUM.

PRESTRESSED NOTES:
1. 28 DAY CONCRETE COMPRESSIVE STRENGTH = 7000psi
   MIN. TRANSFER COMPRESSIVE STRENGTH = 4500psi

2. PRESTRESSING WIRE SHALL BE 5.25mm DIA. COMFORMING WITH ASTM A-881 "STEEL WIRE DEFORMED, STRESS RELIEVED OR LOW RELAXATION FOR PRESTRESSED CONCRETE TIES" WITH A MINIMUM BREAKING STRENGTH OF 8800 LBf.

3. WIRE SHALLED BE TENSIONED IN ACCORDANCE WITH PCI REQUIREMENTS TO 6960LBf PER WIRE.



PRECAST FIELD PANEL

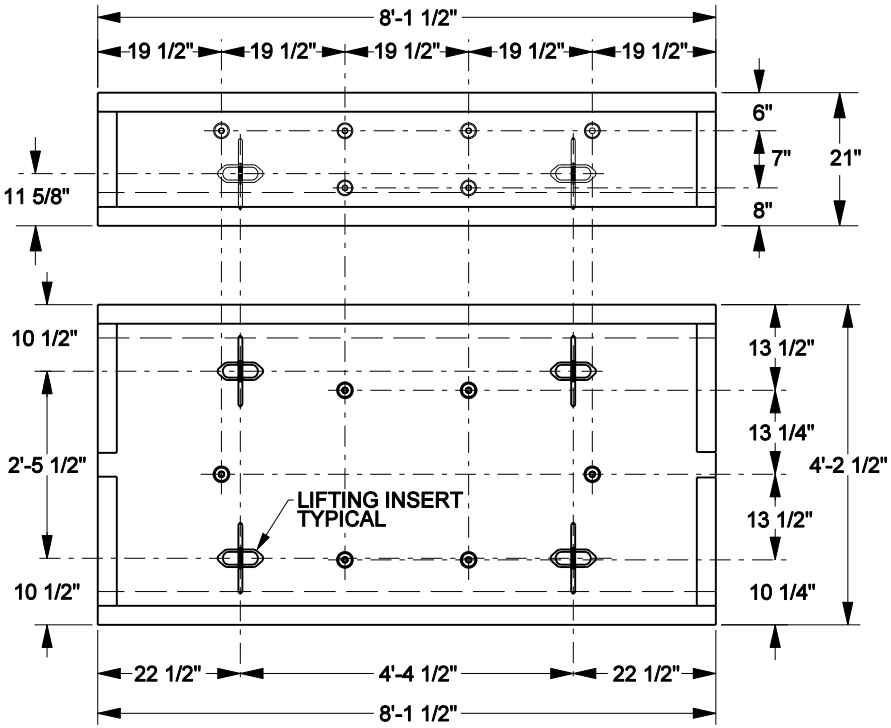
PRESTRESSED FIELD PANEL

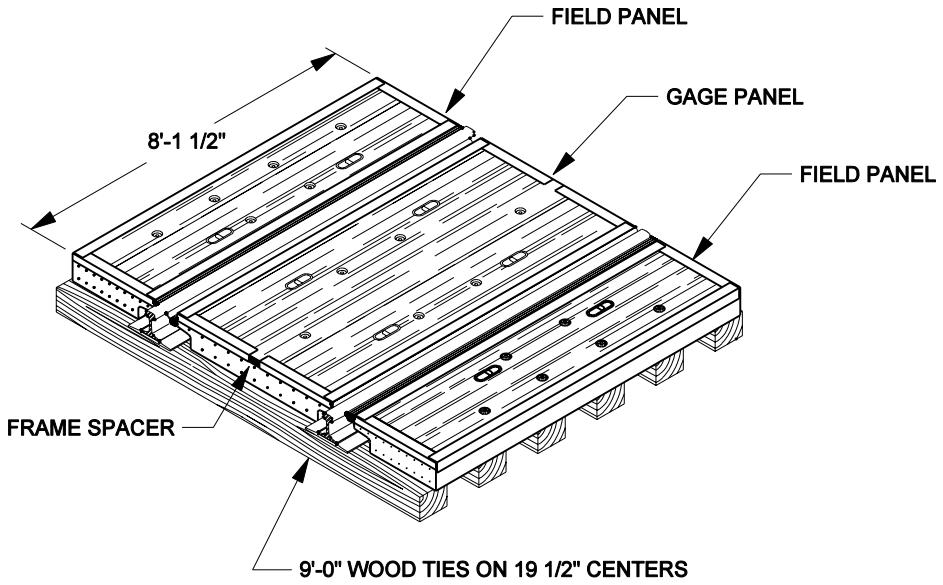
COMMON STANDARDS

PRESTRESSED AND PRECAST CONCRETE PANELS FOR 9'-0" LONG WOOD TIES (9W)

	FILE OWNER: UPRR	DATE: MARCH 26, 2003
	REV. NO.: 1	DWG NO: 200201

200201





NOTES:
1. THIS CROSSING IS TO BE INSTALLED ON ROADWAYS WITH HIGHWAY TRAFFIC VOLUMES LESS THAN 500 VEHICLES AND LIMITED TRUCK TRAFFIC.

2. 1/4" RUBBER INTERFACE PAD TO BE PLACED BETWEEN PANEL AND TIES FOR 141 LB. RAIL SECTION. PAD TO BE NAILED TO TIES.

3. CROSSING TYPE - 9W

RAIL SIZE	PANEL HEIGHT	GAGE PANEL WEIGHT	FIELD PANEL WEIGHT
115	7 1/8"	2850 LBS.	1125 LBS.
133-141	7 7/8"	3125 LBS.	1275 LBS.

COMMON STANDARDS

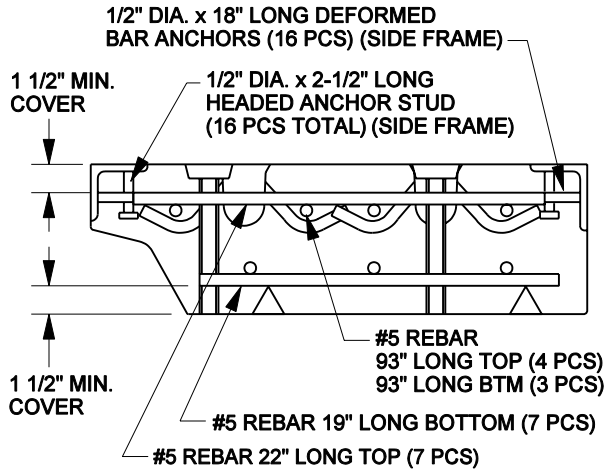
LAYOUT FOR CONCRETE PANELS ON 9'-0" LONG WOOD TIES (9W)

ITEM NUMBERS			
133-141 LB. UPRR	133-141 LB. BNSF	115 LB. UPRR	115 LB. BNSF
540-1300	NON-STOCK	540-0201	NON-STOCK

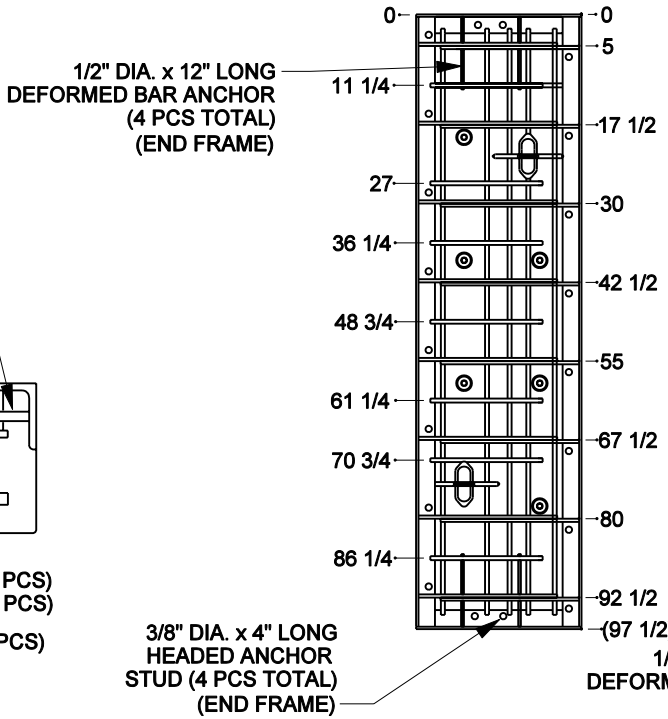
FILE OWNER: UPRR | DATE: MARCH 26, 2003

REV. NO.: 1 | DWG NO: 200200

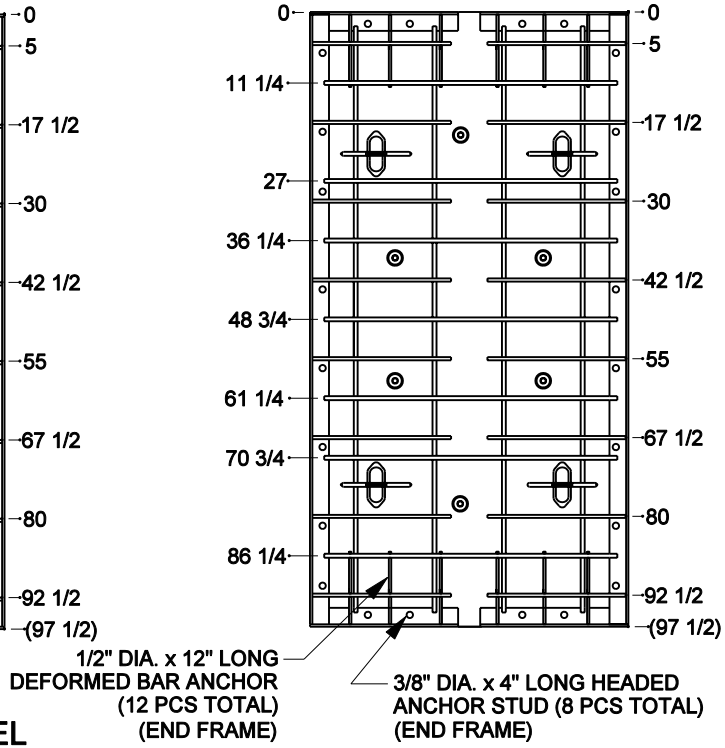
200200



CROSS SECTION - FIELD PANEL



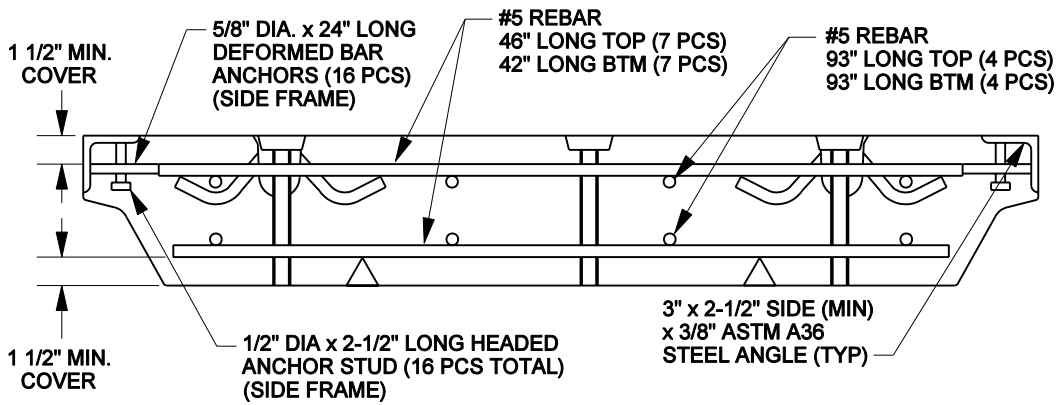
FIELD PANEL



GAGE PANEL

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

CROSSING TYPE - 10W



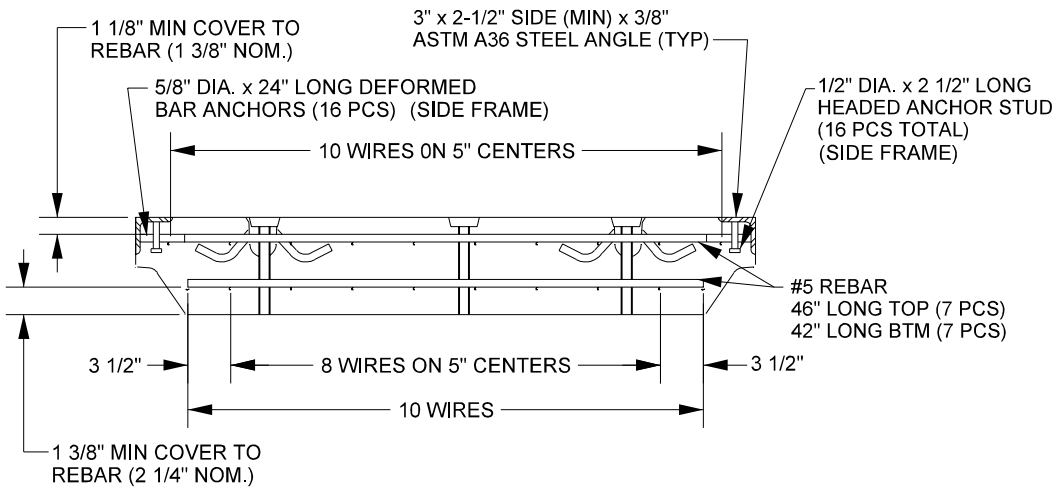
CROSS SECTION - GAGE PANEL

COMMON STANDARDS

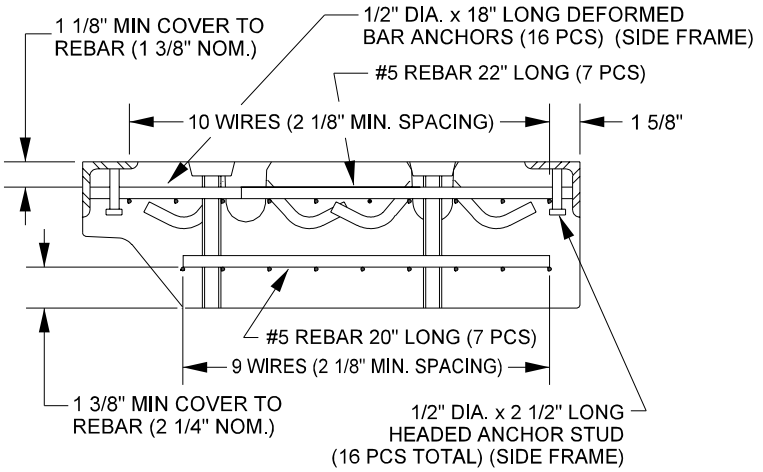
PRECAST CONCRETE PANELS FOR 10'-0" LONG WOOD TIES (10W)

	FILE OWNER: UPRR	DATE: APRIL 24, 2001
	REV. NO.: 0	DWG NO: 200102

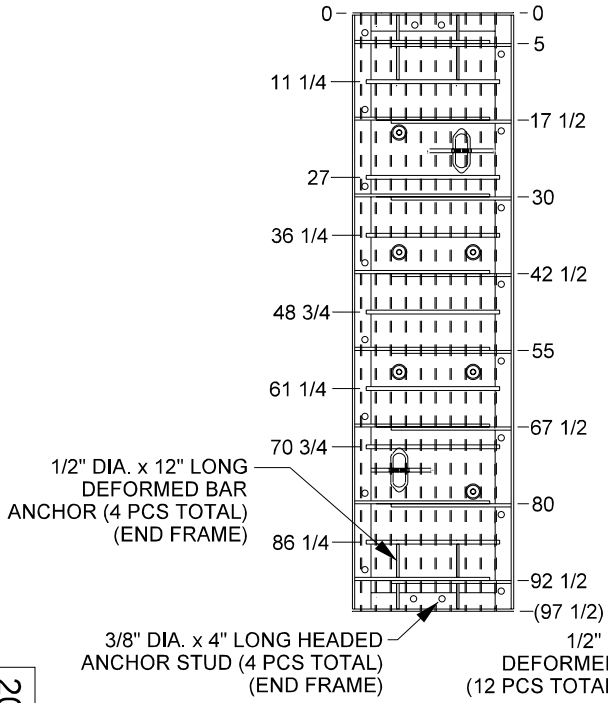
200102



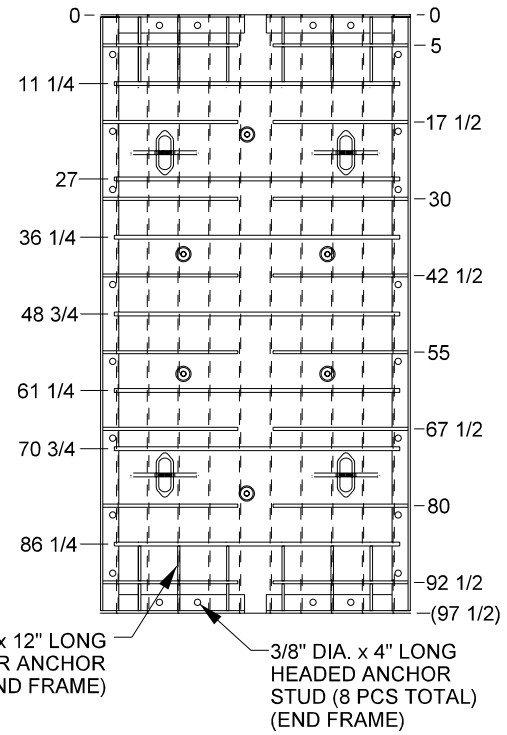
CROSS SECTION - GAGE PANEL



CROSS SECTION - FIELD PANEL



FIELD PANEL



GAGE PANEL

NOTES:
28 DAY CONCRETE COMPRESSIVE STRENGTH = 7000psi
MIN. TRANSFER COMPRESSIVE STRENGTH = 4500psi

PRESTRESSING WIRE SHALL BE 5.25mm DIA. COMFORMING WITH ASTM A-881 "STEEL WIRE DEFORMED, STRESS RELIEVED OR LOW RELAXATION FOR PRESTRESSED CONCRETE TIES" WITH A MINIMUM BREAKING STRENGTH OF 8800 LBf.

WIRE SHALLED BE TENSIONED IN ACCORDANCE WITH PCI REQUIREMENTS TO 6960LBf PER WIRE.

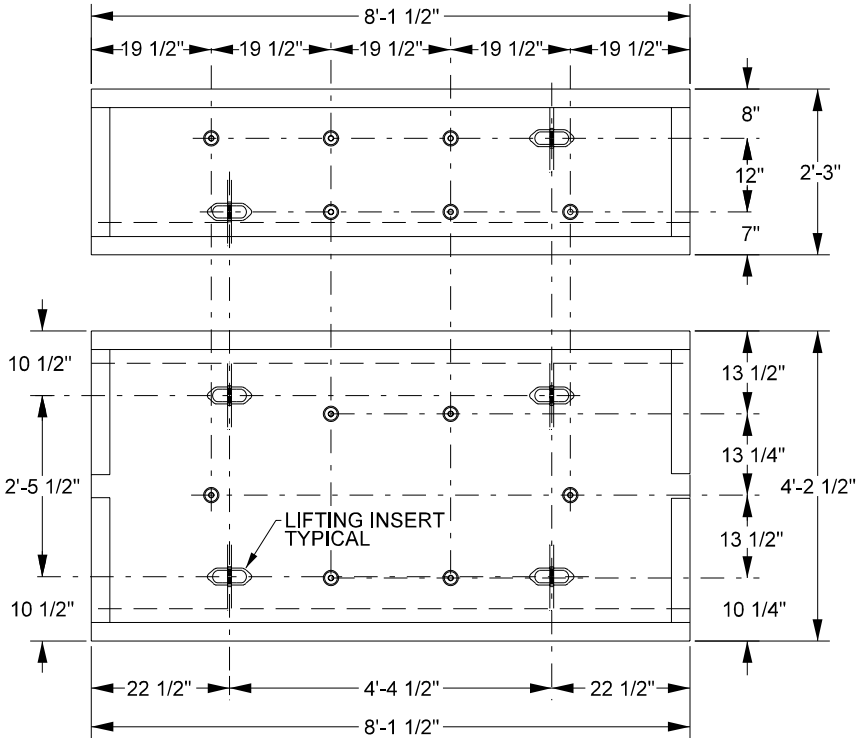
CROSSING TYPE - 10W

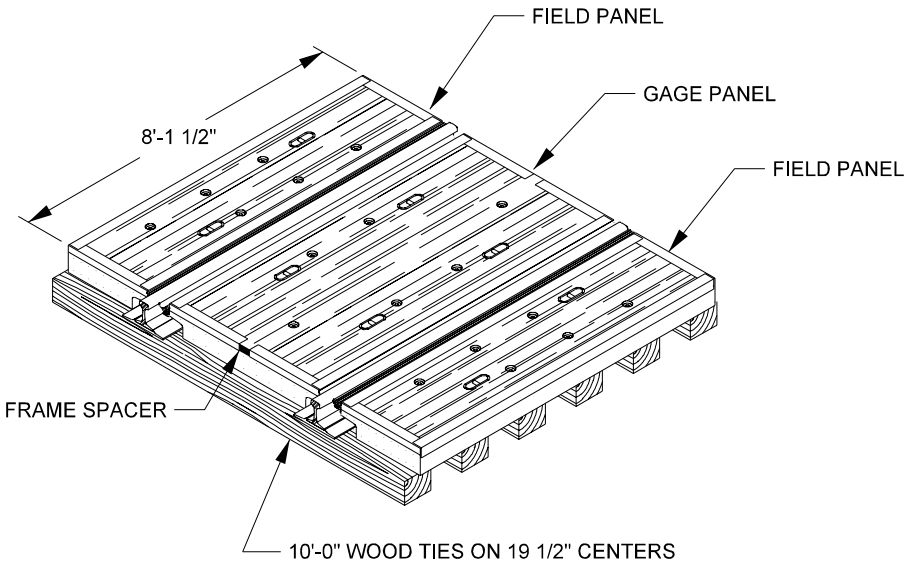
COMMON STANDARDS

PRESTRESSED CONCRETE PANELS FOR 10'-0" LONG WOOD TIES (10W)

	FILE OWNER: UPRR	DATE: APRIL 24, 2001
	REV. NO.: 0	DWG NO: 200101

200101





NOTES:
1/4" RUBBER INTERFACE PAD TO BE PLACED BETWEEN PANEL AND TIES FOR 141 LB. RAIL SECTION. PAD TO BE NAILED TO TIES,

CROSSING TYPE - 10W

RAIL SIZE	PANEL HEIGHT	GAGE PANEL WEIGHT	FIELD PANEL WEIGHT
115	7 1/8"	2850 LBS.	1550 LBS.
133-141	7 7/8"	3125 LBS.	1675 LBS.

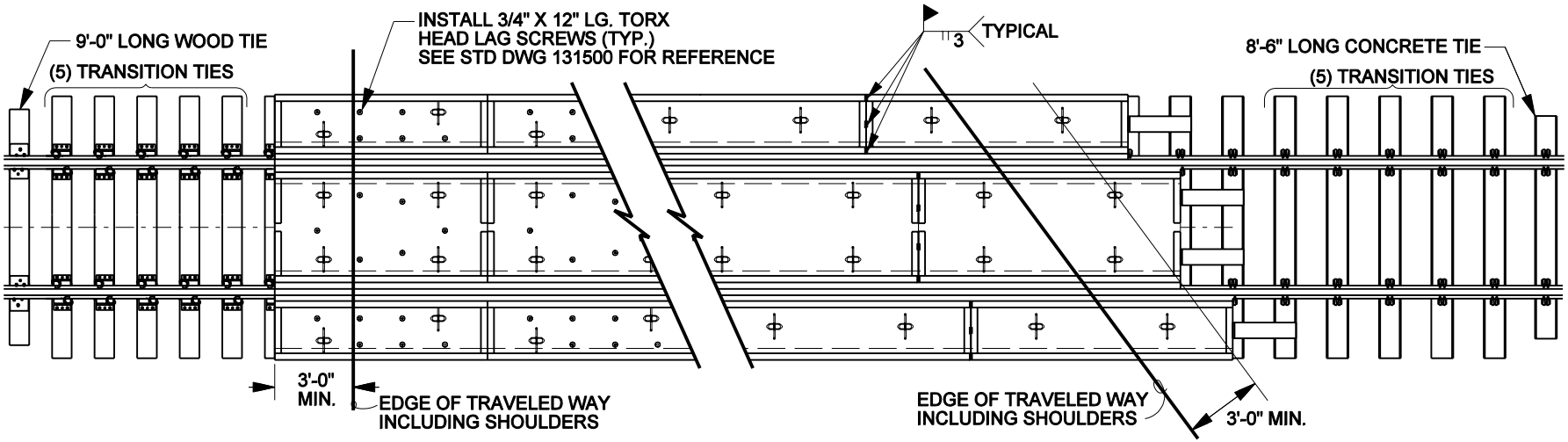
COMMON STANDARDS

LAYOUT FOR CONCRETE PANELS ON 10'-0" LONG WOOD TIES (10W)

ITEM NUMBERS			
133-141 LB. UPRR	133-141 LB. BNSF	115 LB. UPRR	115 LB. BNSF
540-1301	055590975	540-0202	055590973

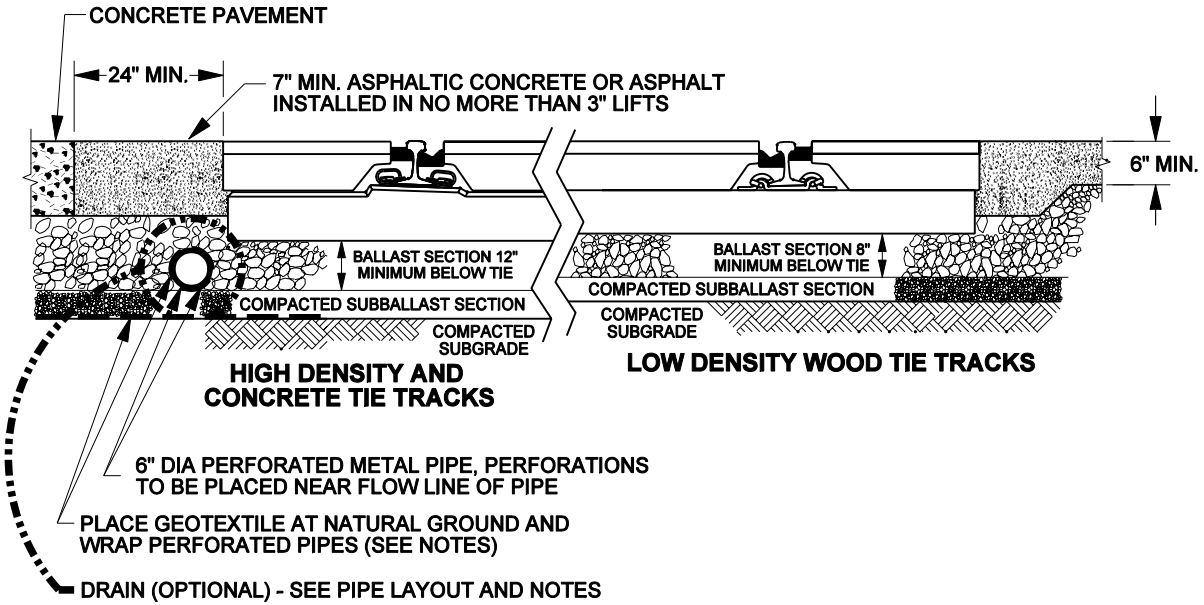
FILE OWNER: UPRR	DATE: APRIL 24, 2001
REV. NO.: 0	DWG NO: 200100

200100



PLAN VIEW OF PANEL WITH TIMBER TIES

PLAN VIEW OF PANEL & JOINT WELD LOCATION W/CONCRETE TIES



HIGH DENSITY AND CONCRETE TIE TRACKS

LOW DENSITY WOOD TIE TRACKS

TYPICAL BALLAST AND ASPHALT DETAIL

NOTES:
SEE PAGE 2 FOR NOTES AND MORE DETAILS.

UNION PACIFIC RAILROAD ENGINEERING STANDARDS

INSTALLATION OF ROAD CROSSINGS W/ PRECAST CONCRETE PANELS

ADOPTED: DEC. 19, 1987
REVISED: FEB. 20, 2007
FILE NO.: 0304G

STD DWG 0304G PAGE 1 OF 2

NOTES:

1. CROSSING PANEL SUPPORT THROUGH THE CROSSING MUST BE UNIFORM. CONCRETE TIE SPACING IS TO BE A MAXIMUM OF 24" CENTER TO CENTER. WOOD TIE SPACING TO BE MAXIMUM OF 19 1/2" CENTER TO CENTER. TIE SPACING MUST BE ADJUSTED TO SUPPORT THE ENDS OF THE PANELS

2. CROSSING SITE IS TO BE INSPECTED PRIOR TO START OF INSTALLATION TO DETERMINE THAT PROPER DRAINAGE AND SURFACE SUPPORT IS PROVIDED, TRACK GRADE IS UNIFORM AND EXISTING TIES ARE AT LEAST 10' LONG.

3. IF CONDITIONS WARRANT, SITE IS TO BE OVER-EXCAVATED AND CROSSING DRAINAGE SYSTEM INSTALLED USING COMPACTED, WELL GRADED GRANULAR FILL; SUBBALLAST, GEOTEXTILE AND PERFORATED DRAINAGE PIPE (IF REQUIRED) INSTALLED PER DETAILS OF THIS DRAWING.

4. ADDITIONAL SITE DRAINAGE INCLUDING PROPER DRAINAGE AT EACH QUADRANT OF CROSSING SHALL BE COMPLETED TO ENSURE CROSSING DRAINAGE.

5. PRECAST PANELS ARE TO BE HANDLED AND SUPPORTED AT SPECIFIED LIFTING INSERT LOCATIONS ONLY. LIFTING EQUIPMENT AND CONNECTION INSERTS ARE TO BE PROPERLY SIZED TO HANDLE THE LENGTH OF PANELS BEING INSTALLED. RING LIFTING DEVICES ARE AVAILABLE FROM COMPANY WAREHOUSE

6. APPROACH ASPHALT ROADWAY PAVING IS TO MEET STATE DOT HIGHWAY SPECIFICATIONS AND INSTALLED ACCORDINGLY. ASPHALT IS TO BE INSTALLED WITH PAVER WITH MAXIMUM 3" LIFTS AND LAID PARALLEL TO CROSSING TO MINIMIZE APPROACH SETTLEMENTS.

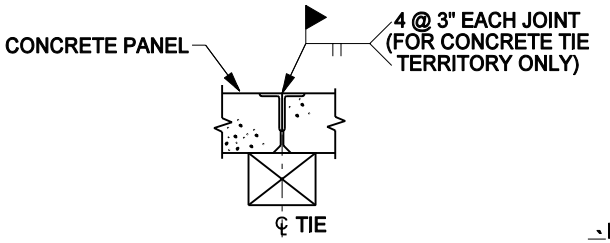
7. GEOTEXTILE AND PIPE TO BE INSTALLED ONLY AT LOCATIONS WHERE REQUIRED BY STATE OR LOCAL AGENCIES OR WHERE DESIGNATED BY CHIEF ENGINEER.

8. GALVANIZED ELASTIC FASTENERS ARE TO BE USED WITHIN THE CROSSING AREA AND ON THE (5) TRANSITION TIES ON EACH SIDE OF THE CROSSING. PANDROL E-CLIPS TO BE USED ON WOOD TIE CROSSINGS AND SAFELOK CLIPS ON CONCRETE TIE CROSSINGS.

9. ALL RAIL JOINTS IN CROSSING AREA TO BE WELDED, DO NOT INSTALL BOLTED JOINT BARS.

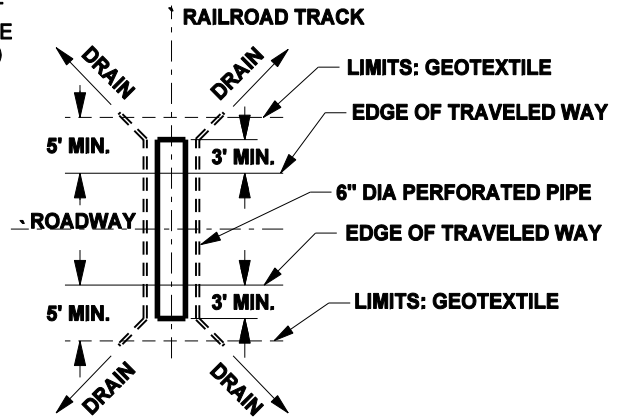
10. REPORT CROSSING GATE MALFUNCTIONS TO 24 HR UPRR CROSSING HOT LINE AT 1-800-848-8715.

11. ALL EXCEPTIONS TO THIS PLAN MUST BE APPROVED BY THE CHIEF ENGINEER.



JOINT BETWEEN PANELS

INTERIOR JOINTS BETWEEN PANELS MUST REST ON CENTER LINE OF A WOOD OR CONCRETE TIE AS SHOWN

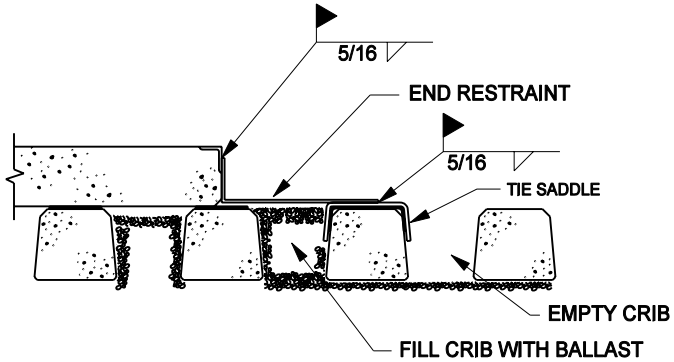


TYPICAL PIPE LAYOUT

REQUIRED COMPONENTS	
RING LIFTING DEVICE	410-1371
3/4" TORX SCREW FOR WOOD TIES (STD DWG 131500)	130-5400
ELASTOMERIC BEARING PAD FOR 141 LB. RAIL ON WOOD TIES	540-0203
CONFORMAL ELASTOMERIC BEARING PAD FOR 10'-0" CONCRETE TIES	503-6315
CONFORMAL ELASTOMERIC BEARING PAD FOR 8'-6" CONCRETE TIES	503-6312
END RESTRAINT FOR CONCRETE TIES (ONLY)	540-1925

OPTIONAL COMPONENTS (SET INCLUDES 6 PIECES)	
20' SECTION 6" PERFORATED PIPE	510-3201
6" ADJUSTABLE ELBOW	510-3557
6" PIPE BANDS	510-3379
100' ROLL GEOTEXTILE	550-0119

NOTE:
GEOTEXTILE & PIPE TO BE INSTALLED ONLY AT LOCATIONS WHERE REQUIRED BY STATE OR LOCAL AGENCIES OR WHERE DESIGNATED BY CHIEF ENGINEER.



END RESTRAINT DETAIL (FOR CONCRETE TIES ONLY)

UNION PACIFIC RAILROAD ENGINEERING STANDARDS

INSTALLATION OF ROAD CROSSINGS W/ PRECAST CONCRETE PANELS

ADOPTED: DEC. 19, 1987
REVISED: OCT. 3, 2005
FILE NO.: 0304G

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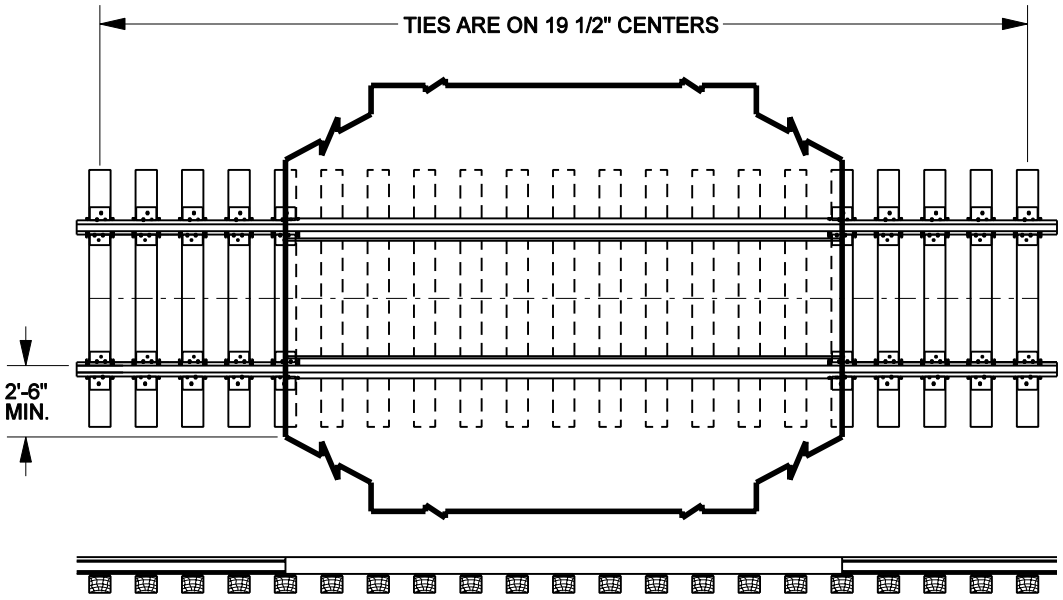
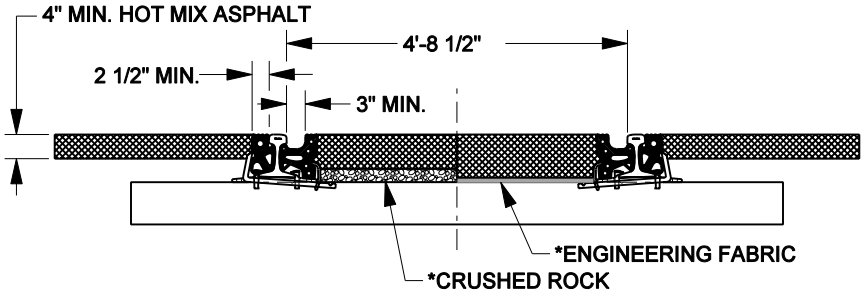
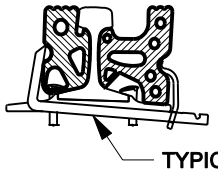


NOTE: SEE STD DWG 0301 FOR DRAINAGE DETAILS



*ENGINEERING FABRIC OR 2" OF CRUSHED ROCK MUST BE USED TO PREVENT HOT MIX ASPHALT FROM BONDING TO TIES

CROSS SECTION DETAIL



SEAL SECTION

ORDERING NOTE:
RUBBER RAIL SEAL CROSSING SECTIONS ARE TO BE ORDERED BY "TRACK FEET" IN 8'-0" INCREMENTS. EACH 8'-0" INCREMENT WILL INCLUDE (2) GAGE & (2) FIELD SIDE RAIL SEAL SECTIONS, (10) CLAMPS & ANY REQUIRED HARDWARE TO CONNECT THE SECTIONS TOGETHER.

NOTES:

1) USE OF THIS STANDARD FOR NEW CONSTRUCTION IS LIMITED TO INDUSTRIAL LEAD TRACKS, AND SPUR TRACKS WHERE THE AVERAGE DAILY TRAFFIC VOLUME DOES NOT EXCEED 500. USE ON MAIN LINES IS RESTRICTED TO TEMPORARY REPAIRS TO EXISTING CROSSINGS SURFACES.

2) CROSSING SITE IS TO BE INSPECTED PRIOR TO START OF INSTALLATION TO DETERMINE THAT PROPER DRAINAGE AND SURFACE SUPPORT IS PROVIDED, TRACK GRADE IS UNIFORM.

3) FOR COMPLETE RENEWAL OF CROSSING & NEW CONSTRUCTION: TRACK STRUCTURE INCLUDING RAIL, OTM, TIES, BALLAST, AND ROADBED MUST BE IN EXCELLENT CONDITION. ALL TIES MUST BE 9 FT. LONG, SPACED AT 19 1/2" CENTERS AND EXTEND 5 TIES BEYOND END OF CROSSING. NEW 7"X9"X9' TRACK TIES TO BE INSTALLED IF NECESSARY. IF CONDITIONS WARRANT, SITE IS TO BE OVER-EXCAVATED AND CROSSING DRAINAGE SYSTEM INSTALLED USING COMPACTED, WELL-GRADED GRANULAR FILL; SUBBALLAST, GEOTEXTILE, AND PERFORATED DRAINAGE PIPE (IF REQUIRED) INSTALLED PER DETAILS OF THIS DRAWING. ADDITIONAL SITE DRAINAGE INCLUDING PROPER DRAINAGE AT EACH QUADRANT OF CROSSING SHALL BE COMPLETED TO ENSURE CROSSING DRAINAGE. SUBBALLAST SECTION TO BE A MINIMUM OF 4" WHEN COMPLETE RENEWAL OF EXISTING CROSSING. FOR NEW CONSTRUCTION, SUBBALLAST SECTION TO BE IN ACCORDANCE WITH CONSTRUCTION DESIGN STANDARDS OR AS REQUIRED BY STATE OR LOCAL AGENCIES. USE OF GEOTEXTILE AND DRAINAGE PIPE TO BE ONLY AT LOCATIONS WHERE REQUIRED BY STATE OR LOCAL AGENCIES OR WHERE SPECIFICALLY DESIGNATED BY CHIEF ENGINEER.

4) IN ALL INSTALLATIONS THE RAIL JOINTS SHOULD FALL OUTSIDE THE CROSSING AREA A MINIMUM OF 15 FEET FROM THE END OF THE CROSSING.

5) USE OF CLAMPS ARE REQUIRED IN EACH TIE CRIB WITHIN THE LIMITS OF THE CROSSING. CLAMPS MUST BE ATTACHED PRIOR TO PLACEMENT OF ASPHALTIC CONCRETE (SEE SECTION DETAILS).

6) HOT MIX ASPHALTIC CONCRETE MUST COMPLY WITH STATE D.O.T. SPECIFICATIONS AND BE PLACED IN 2 INCHES MINIMUM & 4 INCHES MAXIMUM LIFTS. CARE MUST BE TAKEN DURING COMPACTION OF ASPHALT TO PREVENT DAMAGE TO HOLD DOWN CLAMPS OR RUBBER. ASPHALT SHOULD BE ROLLED PARALLEL TO THE RAIL UNTIL THE FINAL LIFT AND COMPACTION. FINAL LIFT OF ASPHALT IS TO BE LEVEL WITH THE TOP OF RAIL FOR 30 INCHES FROM THE FIELD SIDE OF THE RAIL.

7) SLOPE EDGE OF PAVING TO RETURN TO ORIGINAL EDGE OF PAVING ALIGNMENT. LENGTH OF TRANSITION WILL DEPEND ON LOCAL CONDITIONS.

8) AT THE TIE-IN POINT WITH THE EXISTING PAVEMENT, THE OLD PAVEMENT MUST BE CUT DOWN A MINIMUM 2" TO ELIMINATE A FEATHER EDGE ON THE NEW PAVEMENT.

9) USE STATE D.O.T. SPECIFICATION FOR THE ASPHALT SPRAY TACK COAT.

10) ENVIRONMENTAL RULES OF THE GOVERNMENT BODY HAVING AUTHORITY WILL BE FOLLOWED WHEN DISPOSING OF THE PAVEMENT REMOVED FROM THE CROSSING.

11) MATERIAL USED ON GAGE SIDE RAIL SEAL SHALL HAVE AN ELECTRICAL RESISTANCE OF A MINIMUM OF 10 MEGOHMS AT 500 VOLTS DC.

12) REPORT CROSSING GATE MALFUNCTIONS TO 24 HR UPRR CROSSING HOT LINE AT 1-800-848-8715.

13) ALL EXCEPTIONS TO THIS PLAN MUST BE APPROVED BY THE CHIEF ENGINEER.

RAIL SIZE	ITEM NO.
112-115 LB.	540-0206
132-141 LB.	540-1290

UNION PACIFIC RAILROAD ENGINEERING STANDARDS

LIGHT DUTY ROAD CROSSING ASPHALT WITH RUBBER SEAL SECTIONS

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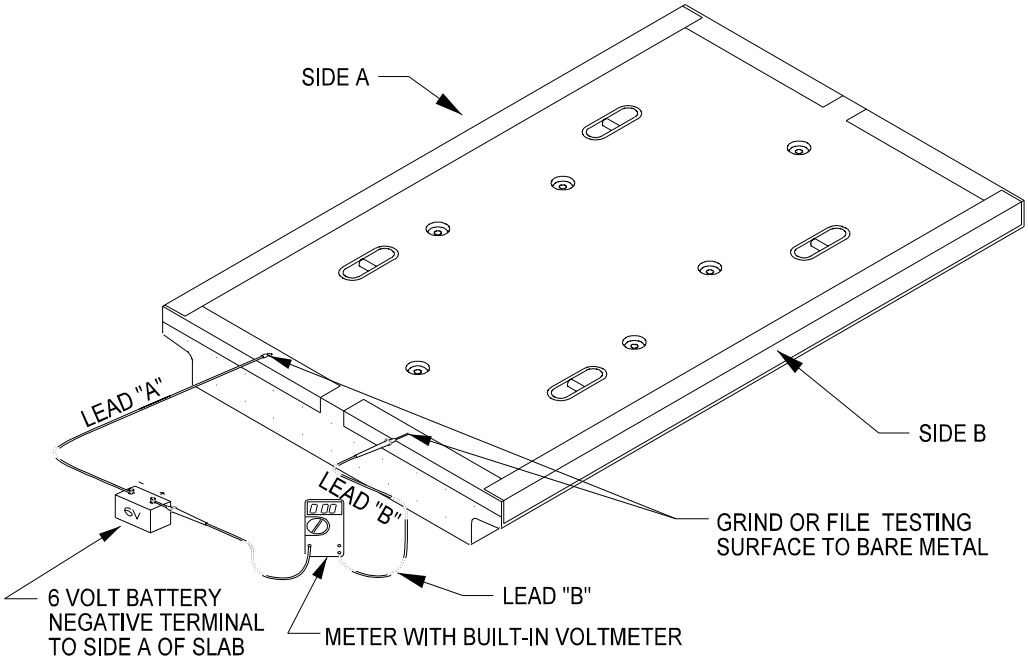
200903



STANDARD ELECTRICAL TEST

ELECTRICAL TEST STEPS:

1. BATTERY SHALL BE 5.0 (FIVE) AMPS OR GREATER.
2. SLABS ARE READY FOR TESTING WHEN 72 HOURS HAVE ELAPSED FROM CASTINGOF CONCRETE.
3. MUST BE LESS THAN 2.0 (TWO) AMPS TO PASS THE TEST. RE-TEST AFTER TWO (2) DAYS IF GREATER THAN 2.0 (TWO) AMPS. REJECT IF AMPERAGE REMAINS ABOVE 2.0 (TWO) AMPS.
4. 0.3-0.4 AMPS IS A NORMAL READING. 2.0 (TWO) AMPS OR LESS PASS THE TEST.

COMMON STANDARDS

SHUNT RESISTANCE TEST FOR CONCRETE PANELS

	FILE OWNER: UPRR	DATE: APRIL 24, 2001
	REV. NO.: 0	DWG NO:200903