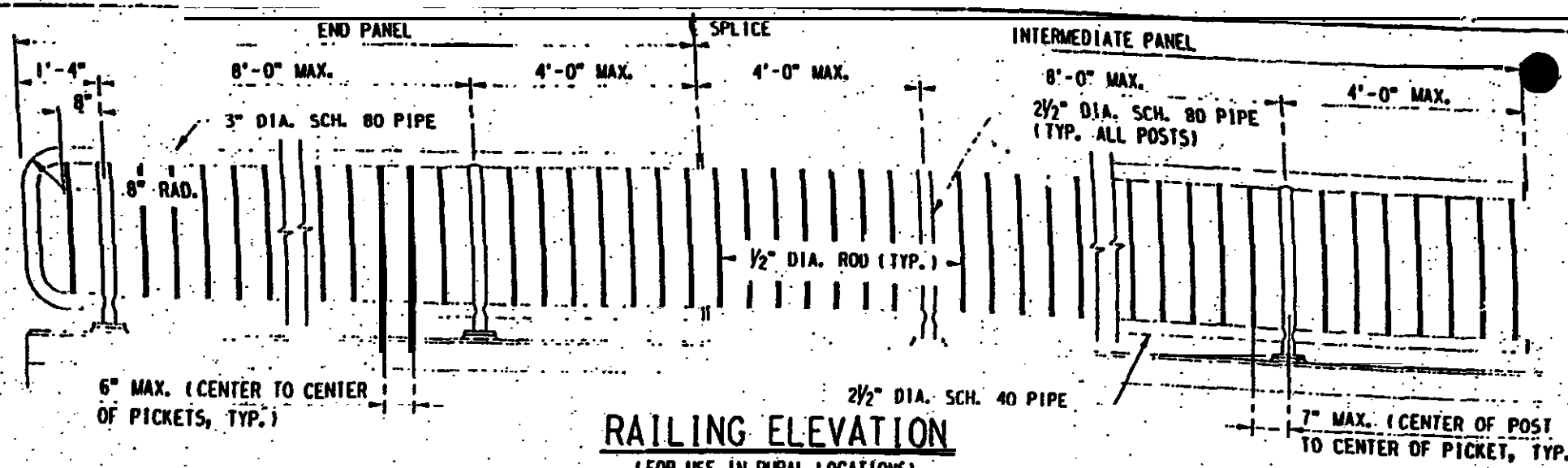
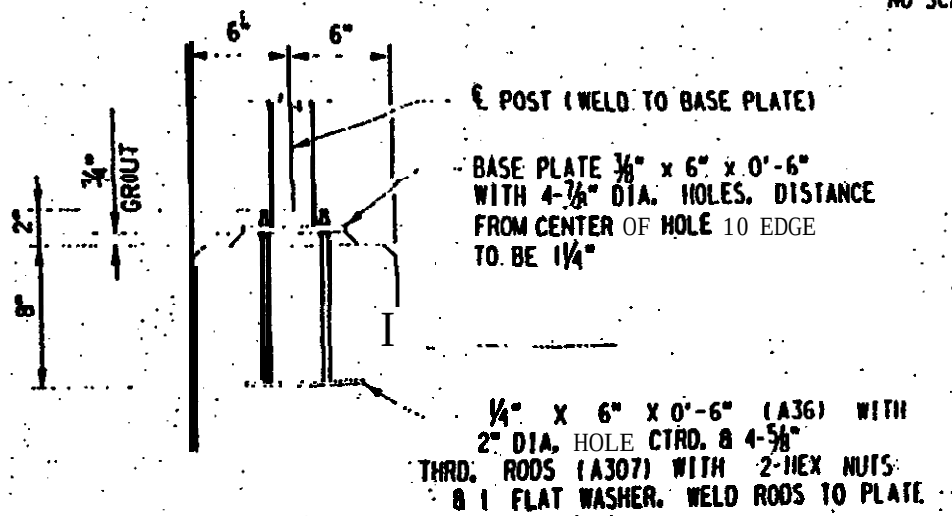
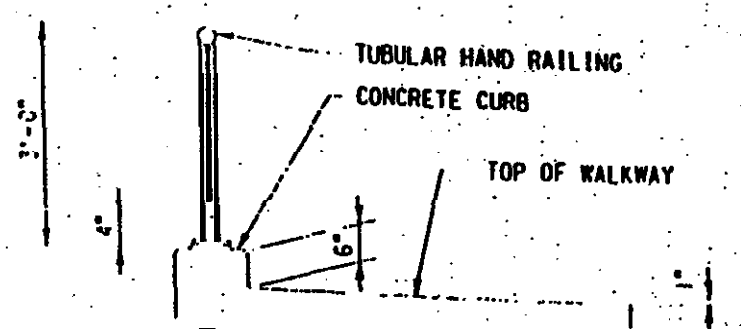



## RAILING ELEVATION

(FOR USE IN RURAL LOCATIONS)
NO SCALE




## TYPICAL SECTION

NO SCALE

1. GALVANIZE RAIL ASSEMBLY AFTER FABRICATION.
2. POSTS SHALL BE VERTICAL.
3. PROVIDE RAILING CONNECTION DETAILS.
4. PROVIDE SPLICE AND EXPANSION JOINT DETAILS.

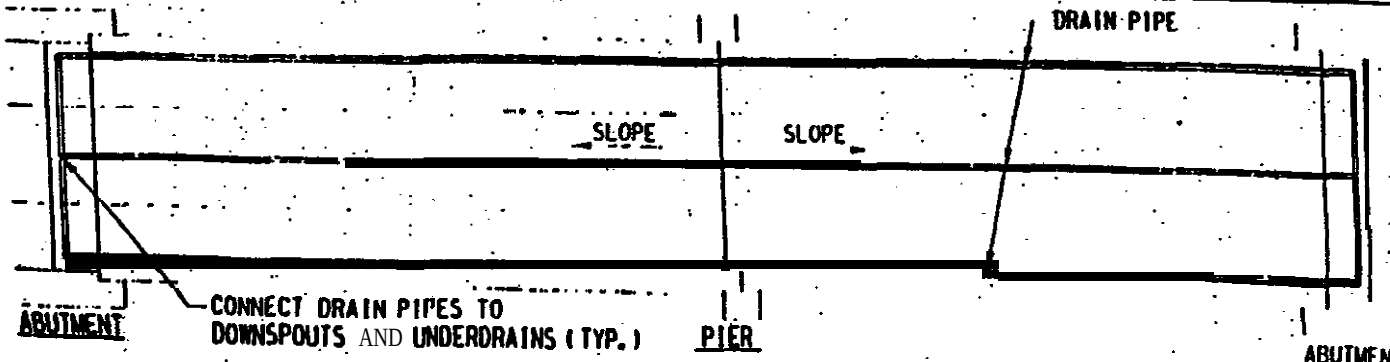
UNION PACIFIC RAILROAD

PICKET HAND RAILING DETAILS

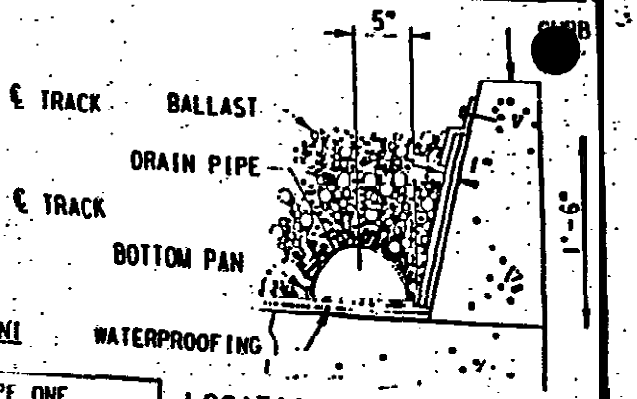
OFFICE OF CHIEF ENGINEER DESIGN

DATE: 3-31-98

DRAWING UP12

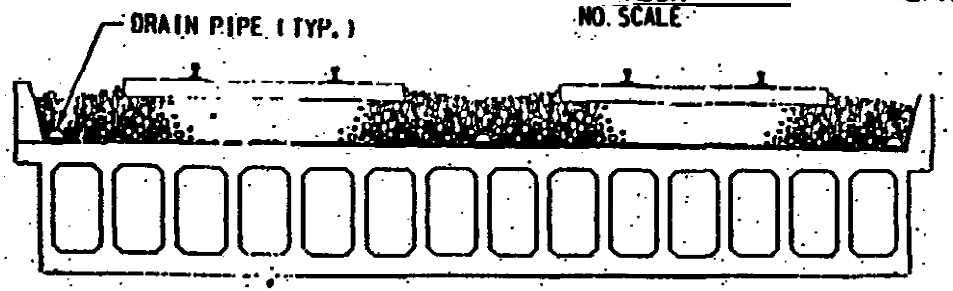



DECK PLAN
NO SCALE

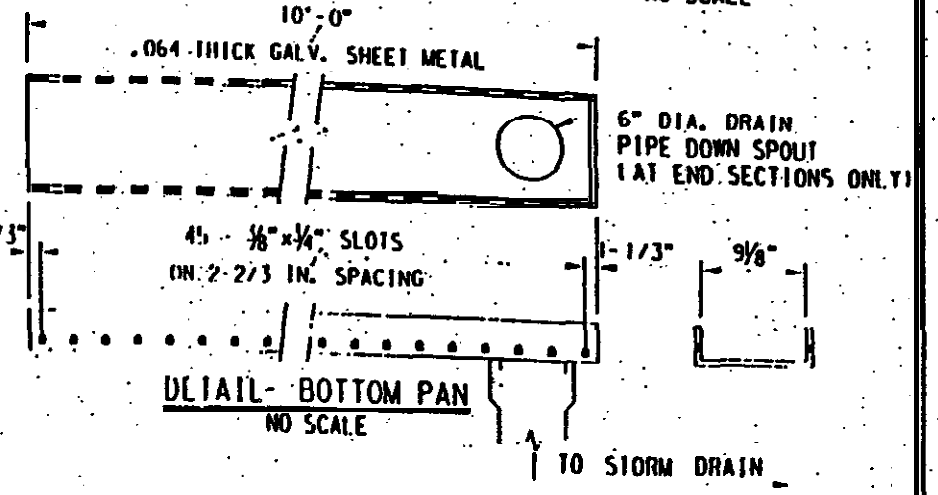



NOTE: LAP DRAIN PIPE ONE CORRUGATION AT EACH END.

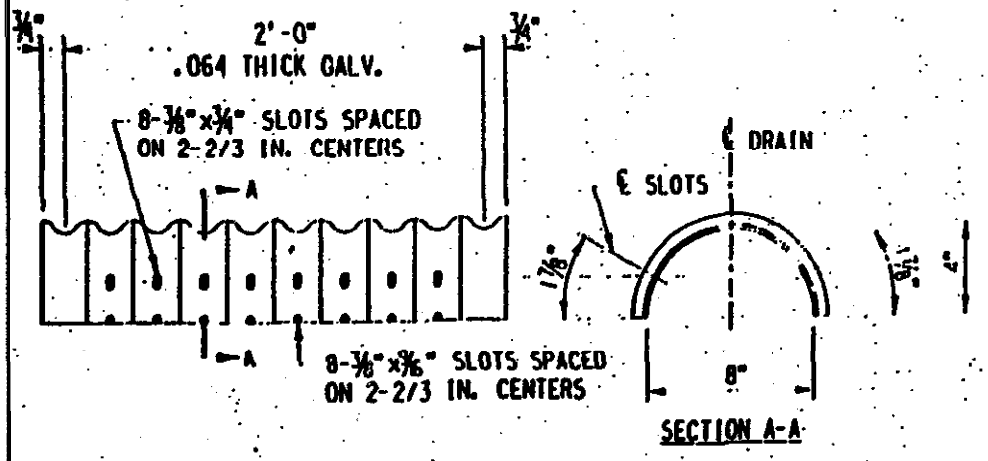
LOCATION OF DRAIN PIPE
NO SCALE




TYPICAL DECK SECTION
NO SCALE




DETAIL- BOTTOM PAN
NO SCALE




SECTION A-A

DETAIL- DRAIN PIPE
NO SCALE

UNION PACIFIC RAILROAD

DECK DRAIN DETAILS
OFFICE OF CHIEF ENGINEER DESIGN

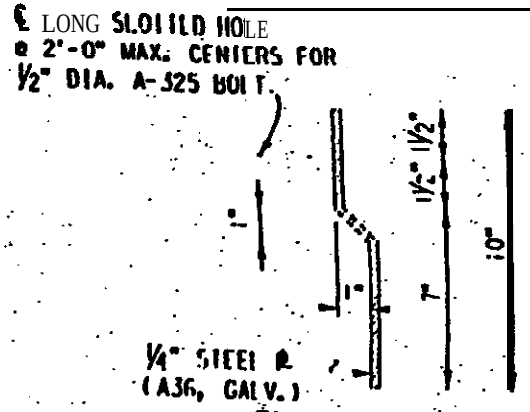
DATE: 3-31-98

DRAWING UP13

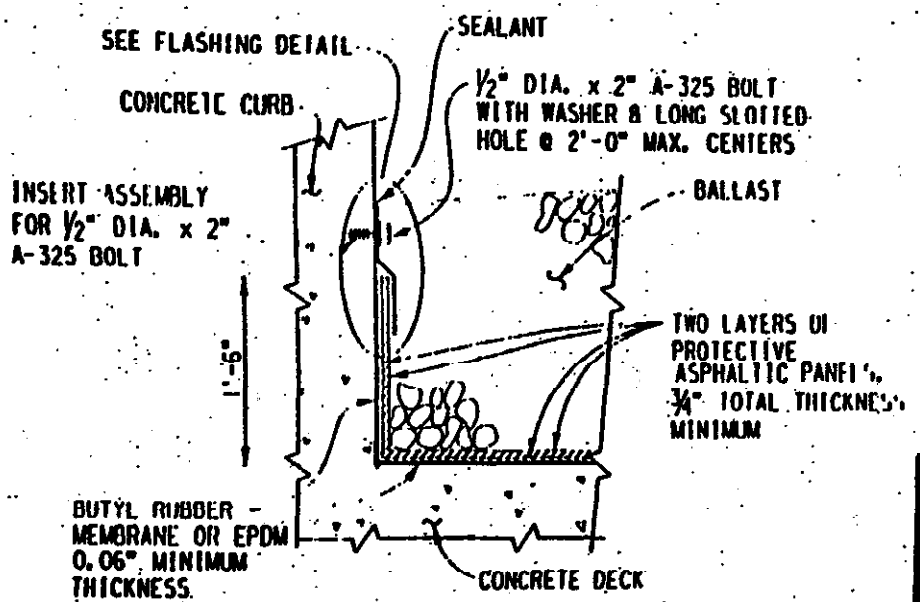
NOTES:

1. ALL STRUCTURAL STEEL PLATES, BOLTS AND WASHERS SHALL BE GALVANIZED.

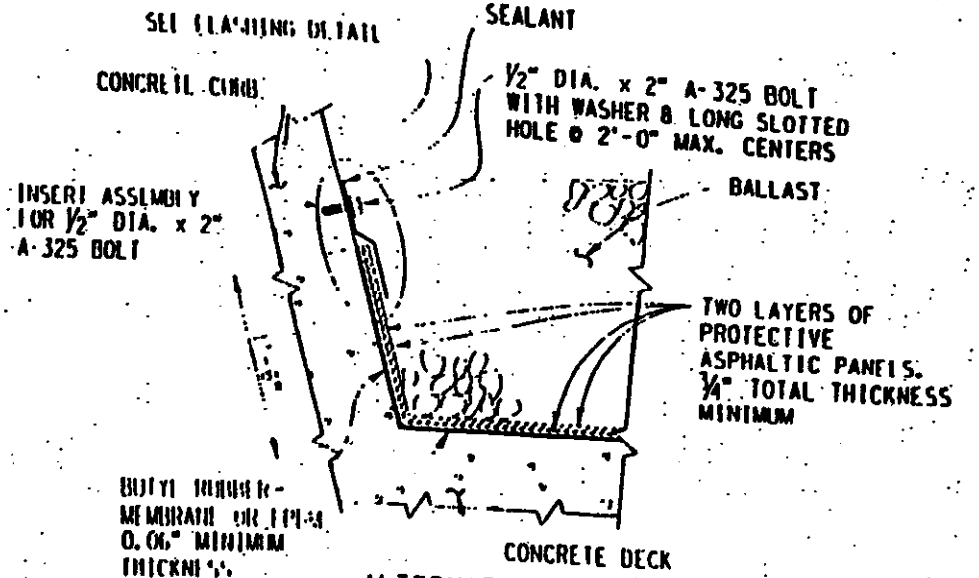
2. DISCONTINUE FLASHING OVER PIERS AND ABUTMENTS.




FLASHING DETAIL




ALTERNATIVE 1




ALTERNATIVE 2

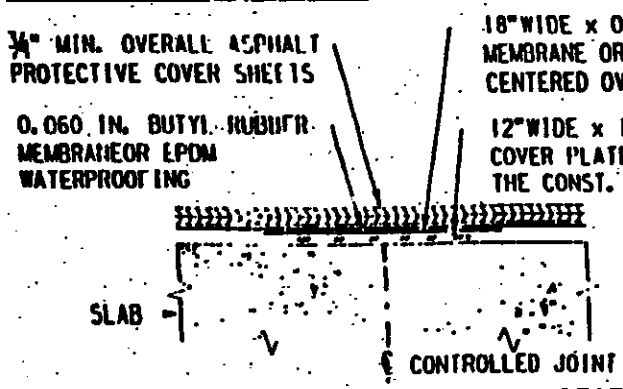
UNION PACIFIC RAILROAD

FLASHING DETAILS FOR WATERPROOFING . . . .

OFFICE OF CHIEF . . ENGINEER DESIGN

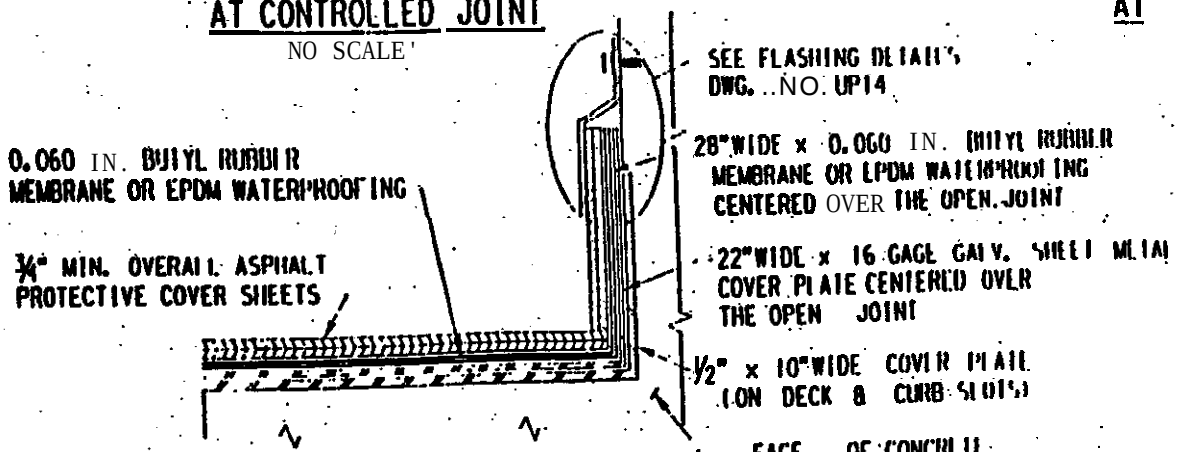
DATE: 3-31 '98

DRAWING UP14



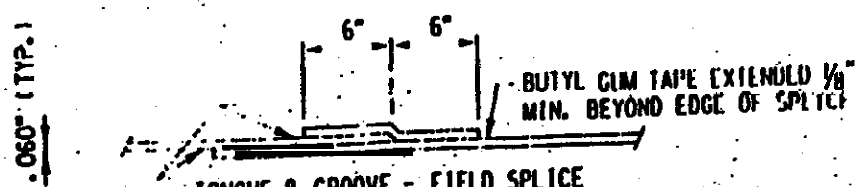

TYPICAL LONGITUDINAL SECTION AT CONTROLLED JOINT

NO SCALE




TYPICAL TRANSVERSE SECTION AT OPEN JOINT

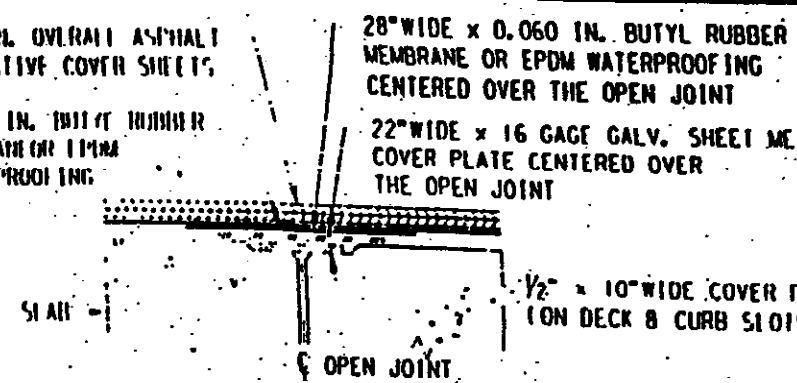
NO SCALE




TONGUE & GROOVE - FIELD SPLICE

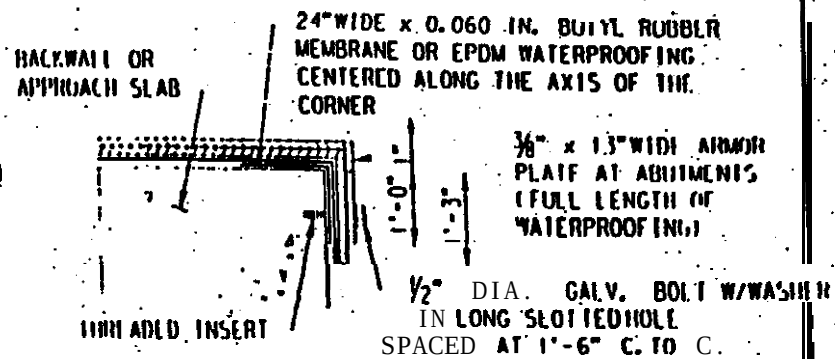
BUTYL RUBBER MEMBRANE OR EPDM WATERPROOFING SPLICE DETAIL

NO SCALE




TYPICAL LONGITUDINAL SECTION AT BENTS & BACKWALL

NO SCALE




TYPICAL LONGITUDINAL SECTION AT END OF BACKWALL / APPROACH SLABS

NO SCALE

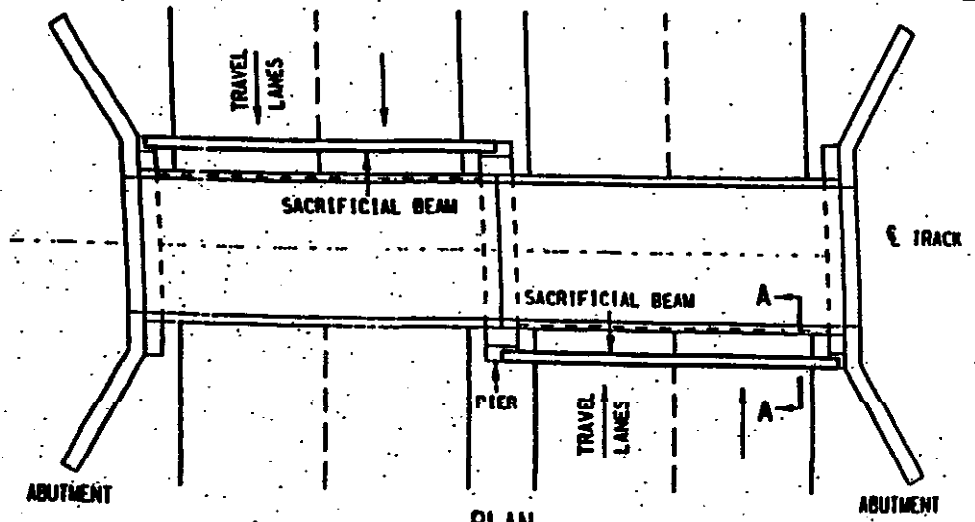
UNION PACIFIC RAILROAD

WATERPROOFING DETAILS

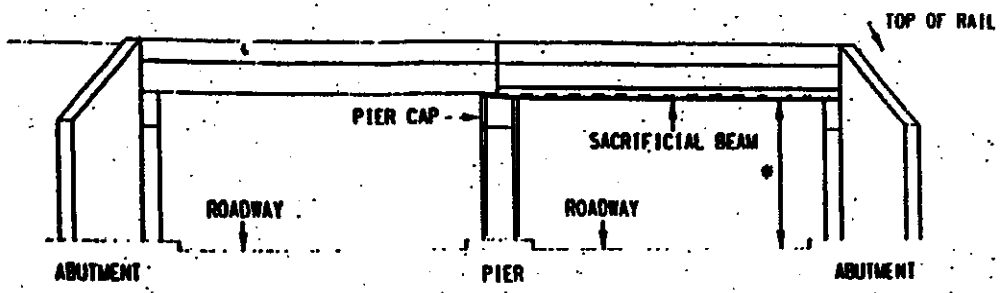
OFFICE OF CHIEF ENGINEER DESIGN

DATE: 3-31 '48

DRAWING UP15



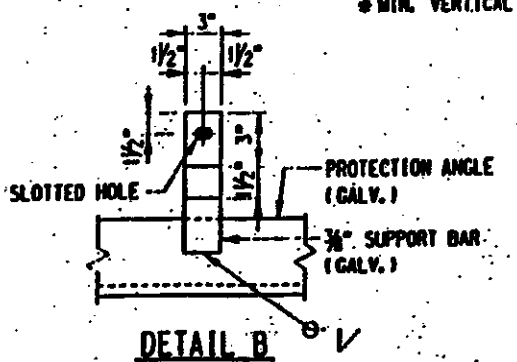

PLAN



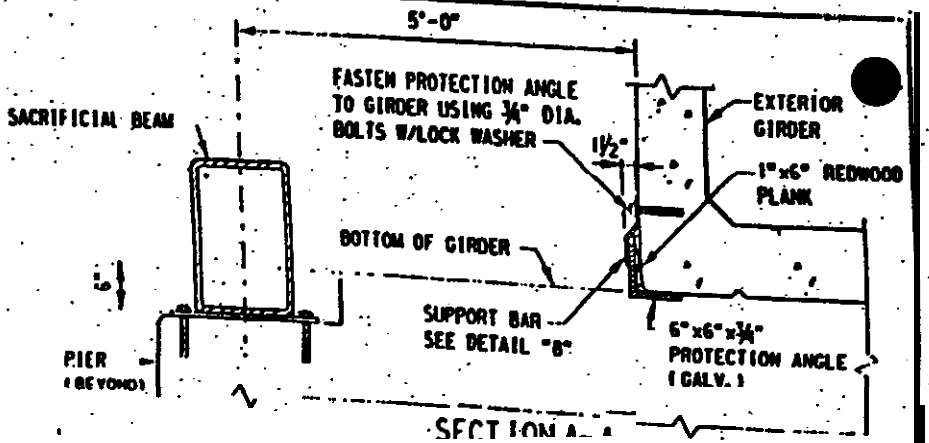

ELEVATION

## LAYOUT OF COLLISION IMPACT DEVICES & SACRIFITIAL BEAM

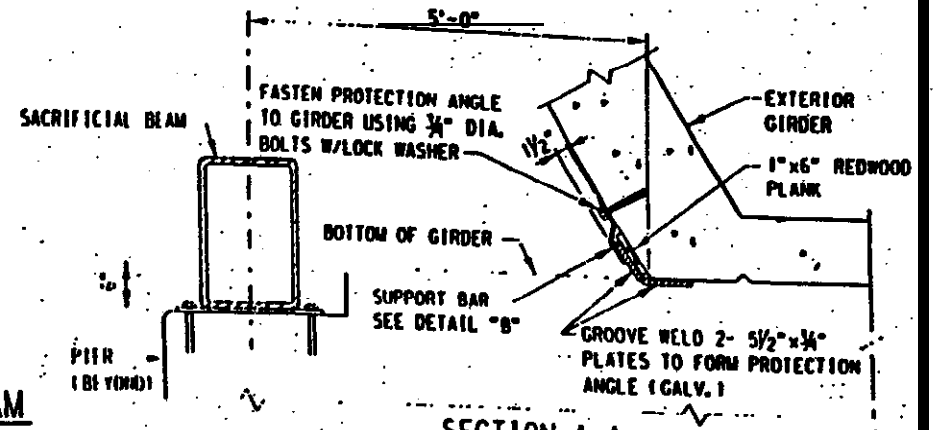
* MIN. VERTICAL CLEARANCE REFER TO TEXT




DETAIL B




SECTION A-A
(AT VERTICAL FACED GIRDER)




SECTION A-A
(AT SLOPED FACED GIRDER)

# UNION PACIFIC RAILROAD

## COLLISION IMPACT DEVICES & SACRIFICIAL BEAM

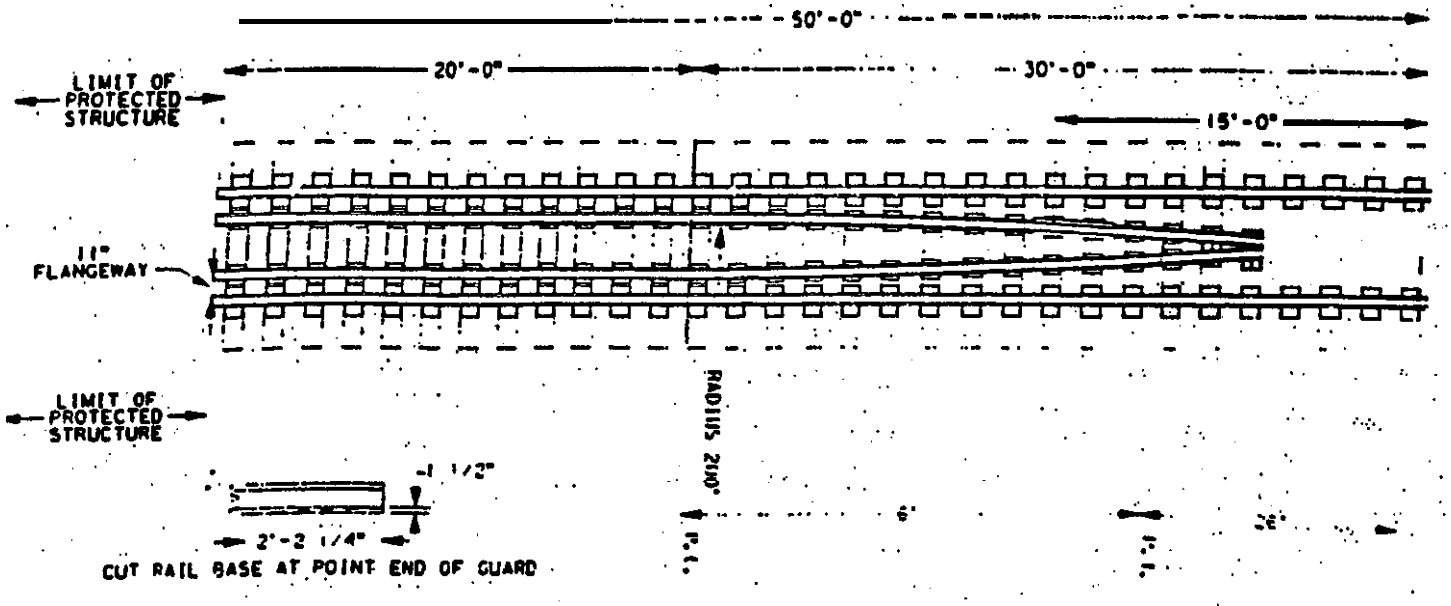
OFFICE OF CHIEF ENGINEER DESIGN

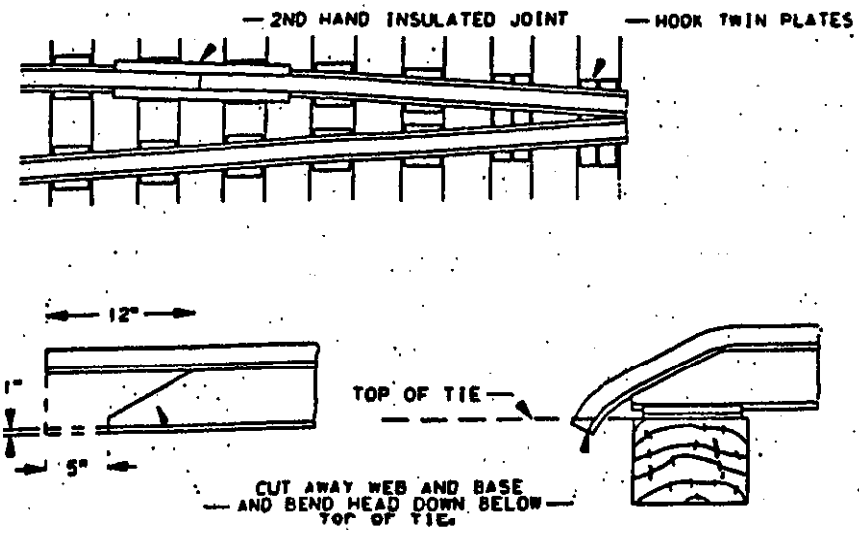
DATE: 3-31-98

DRAWING UP16

STD DWG 4005

# GENERAL ARRANGEMENT




DEPRESSED RAIL HEAD, DETAIL

NOTES:
INSIDE GUARD RAILS SHALL BE MADE FROM SECOND HAND RAIL AND MAY BE OF THE SAME RAIL SECTION AS THE RUNNING RAILS BUT MUST NOT BE MORE THAN 23 LBS. LIGHTER THAN THE RUNNING RAILS.

NO INSIDE GUARD RAIL LIGHTER THAN 70 LBS. SHALL BE USED.

INSIDE GUARD RAILS ARE TO BE FULLY TIE PLATED WITH SECOND-HAND TIE PLATES, WHERE CLEARANCE PREVENTS THE USE OF TIE PLATES, HOOK TWIN PLATES CAN BE USED IN GUARD RIAL CONVERGENCE AREA.

MINIMUM CLEARANCE BETWEEN THE RUNNING RAIL PLATES AND THE GUARD RAIL PLATES MUST NOT BE LESS THAN 1".

INSTALL GUARD RAIL PLATES SO AS TO CANT THE GUARD RAIL OUTWARD TOWARD THE RUNNING RAIL. WHEN SINGLE SHOULDER FLAT GUARD RAIL PLATES ARE USED, INSTALL THE PLATES WITH THE SHOULDERS ON THE INSIDE TOWARD THE CENTER OF THE TRACK.

SECOND-HAND INSULATED JOINTS TO BE INSTALLED IN GUARD RAILS IN ALL SIGNAL TERRITORIES 15 FEET FROM END OF GOOD RAIL ON ONE SIDE.

INSIDE GUARDS TO BE SPIKED TO THEIR FULL LENGTH WITH 2 SPIKES PER TIE. WHERE NECESSARY, PARTICULARLY ON CURVES, DOUBLE SPIKE GUARD RAIL BOTH INSIDE AND OUT.

ALL GUARD RAIL JOINTS TO BE BOLTED AND WHEN AVAILABLE, SECOND HAND JOINTS SHOULD BE USED.

GUARD RAIL TO BE LAID WITH FULL RAIL (NO JOINTS) IN THE CURVED POSITION.

GRADE SEPARATION SUPPORTING MEMBER REFERS TO POSTS, COLUMNS, BENTS, PIERS, ABUTMENTS, ETC. SUPPORTING BRIDGES, VIADUCTS, ETC. OVER OR ADJACENT TO THE TRACK.

REF. PREVIOUS UP STD DWG PAGE 2503-A.

## INSTALLATION

GRADE SEPARATION STRUCTURES:
DOUBLE INSIDE GUARD RAILS ARE TO BE INSTALLED ON ALL F.R.A. CLASS 4 AND 5 TRACK WHERE HORIZONTAL CLEARANCES ON BOTH SIDES ARE LESS THAN 18 FEET FROM THE CENTERLINE OF TRACK TO A SUPPORTING MEMBER. CLASS 2 CARRYING MORE THAN 20 M.G.T. TRAFFIC AND ALL CLASS 3 TRACK SHALL HAVE DOUBLE INSIDE GUARD RAILS INSTALLED WHERE HORIZONTAL CLEARANCE ON BOTH SIDES IS LESS THAN 12'-6" FROM THE CENTERLINE OF TRACK TO A STRUCTURE SUPPORTING MEMBER.

BRIDGES LOCATED ON CLASS 3, 4 AND 5 TRACK ALONG WITH BRIDGES LOCATED ON, CLASS 2 TRACK WITH OVER 20 M.G.T.

DOUBLE INSIDE GUARD RAILS ARE TO BE INSTALLED ON:
ALL THROUGH OR DECK TRUSSES AND THROUGH PLATE GIRDER SPANS.
ALL BRIDGES THAT ARE 40 FEET OR HIGHER AND 150 FEET IN LENGTH, AND ON ALL BRIDGES 30 FEET OR MORE IN LENGTH WHERE CURVATURE EXCEEDS 5 DEGREES: UNLESS EXCEPTION IS APPROVED BY CHIEF ENGINEER.

TUNNELS: [illegible]

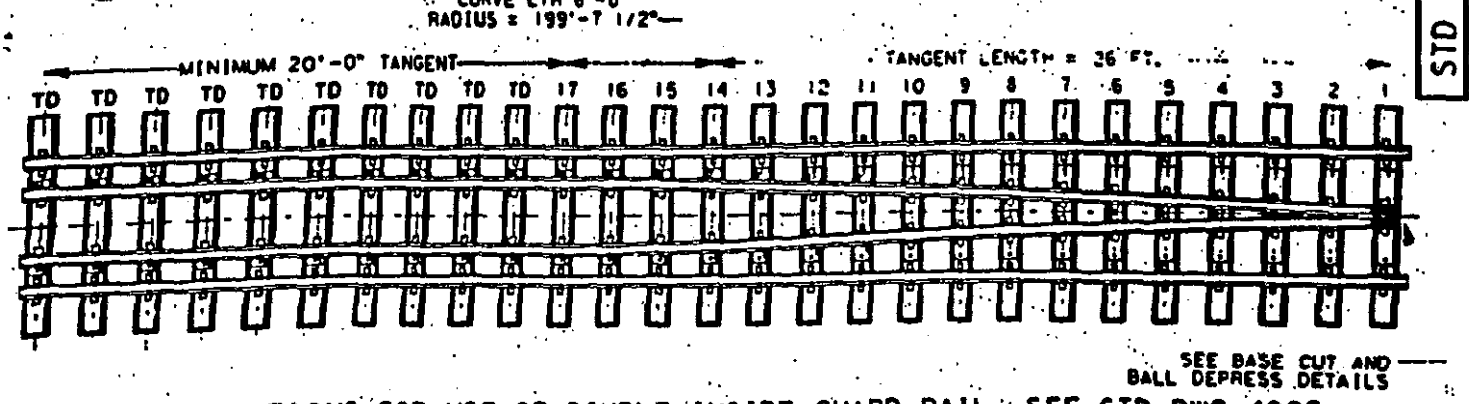
UNION PACIFIC RAILROAD
ENGINEERING STANDARDS

# DOUBLE INSIDE GUARD RAIL

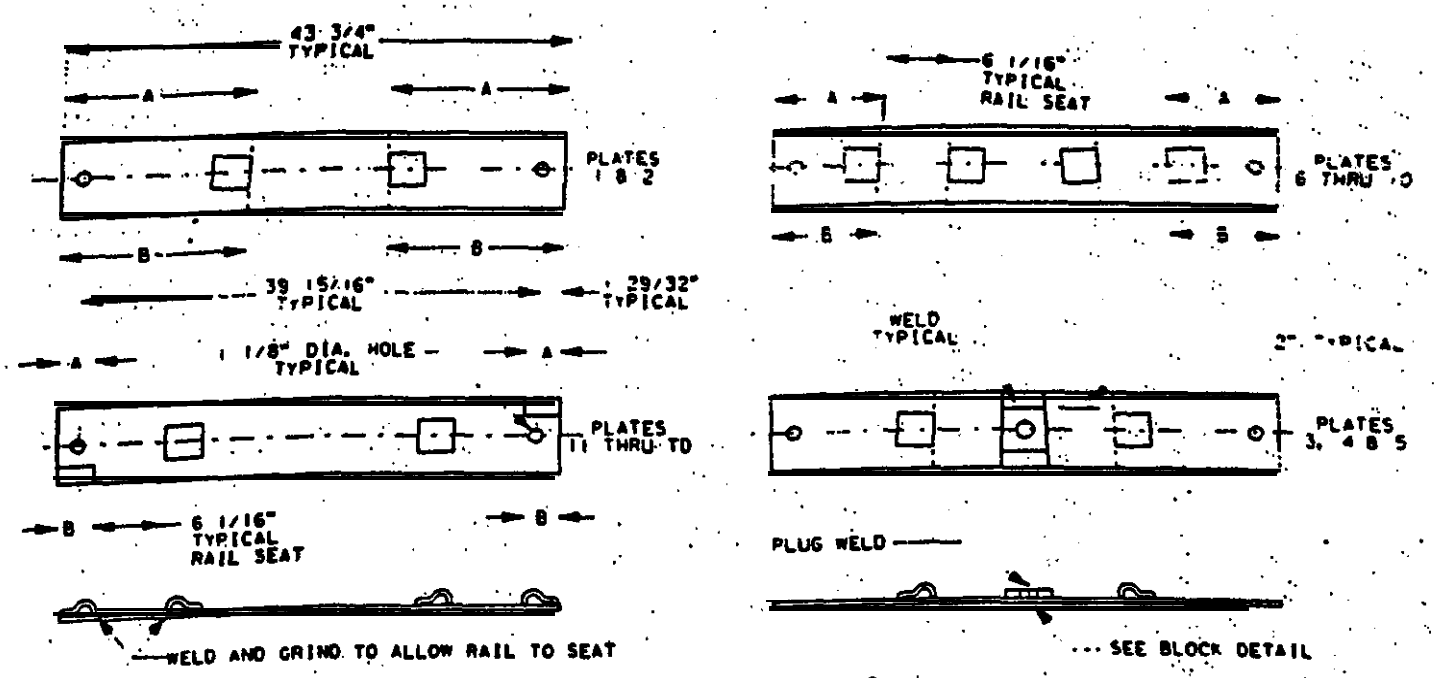
UNION PACIFIC ADOPTED: OCT. 1905

STD DWG

STD DWG 4015

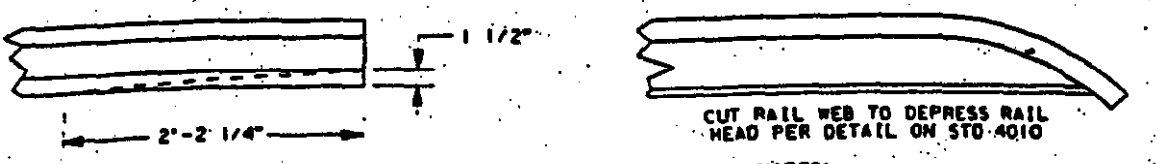



INSTRUCTIONS FOR USE OF DOUBLE INSIDE GUARD RAIL, SEE STD DWG 4005




STEEL PLATE DETAILS

1/2" X 7" X 43 3/4" A36 STEEL PLATE




CUT RAIL BASE AT POINT END OF GUARD RAIL

NOTES:
USE PANDROL #7299 WELD ON SHOULDERS.

FOR PLATES TD THRU NO. 11 TD, NOT PANDROL SHOULDERS TO 1/2" WIDE & ⊙P WELD TOPLATE AS SHOWN.

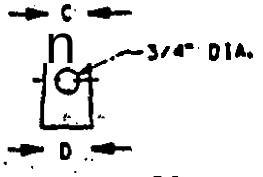
USE COACH SCREW U.P. ITEM NO. 503-8750
WASHER U.P. ITEM NO. 503-8700
PLATES 1-17 U.P. ITEM NO. 940-5625
TD PLATES U.P. ITEM NO. 940-5620

PLATES 1-17 TWO SETS REQUIRED PER INSTALLATION.

FOR CONCRETE TIE, SEE STD DWG 0202

SHOULDER LOCATION DIMENSIONS

| PLATE NO. | A (IN.) | B (IN.) |
|---|---|---|
| 1 | 16.858 | 16.588 |
| 2 | 15.939 | 15.671 |
| 3 | 15.023 | 14.756 |
| 4 | 14.106 | 13.838 |
| 5 | 13.189 | 12.921 |
| 6 | 12.272 | 12.004 |
| 7 | 11.356 | 11.088 |
| 8 | 10.439 | 10.171 |
| 9 | 9.523 | 9.256 |
| 10 | 8.606 | 8.339 |
| 11 | 7.689 | 7.422 |
| 12 | 6.773 | 6.505 |
| 13 | 5.859 | 5.591 |
| 14 | 4.941 | 4.683 |
| 15 | 4.160 | 3.980 |
| 16 | 3.627 | 3.817 |




1/2" X 4" A36 STEEL BLOCK

1/2" X 4" STEEL BLOCK DIMENSIONS

| PLATE | C (IN.) | D (IN.) |
|---|---|---|
| 3 | 1.791 | 2.098 |
| 4 | 3.624 | 3.930 |

UNION PACIFIC RAILROAD ENGINEERING STANDARDS

# DOUBLE INSIDE GUARD RAIL FOR CONCRETE TIES

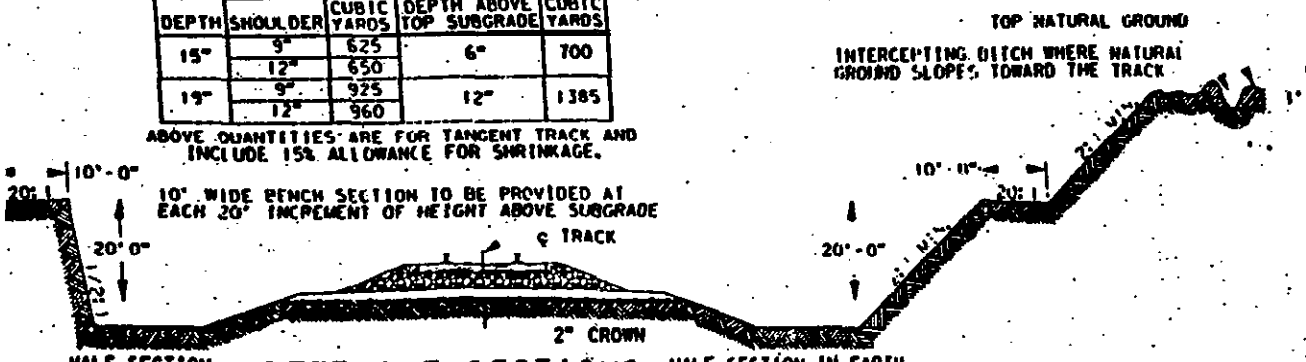
UNION PACIFIC

ADOPTED: DEC. 31, 1996

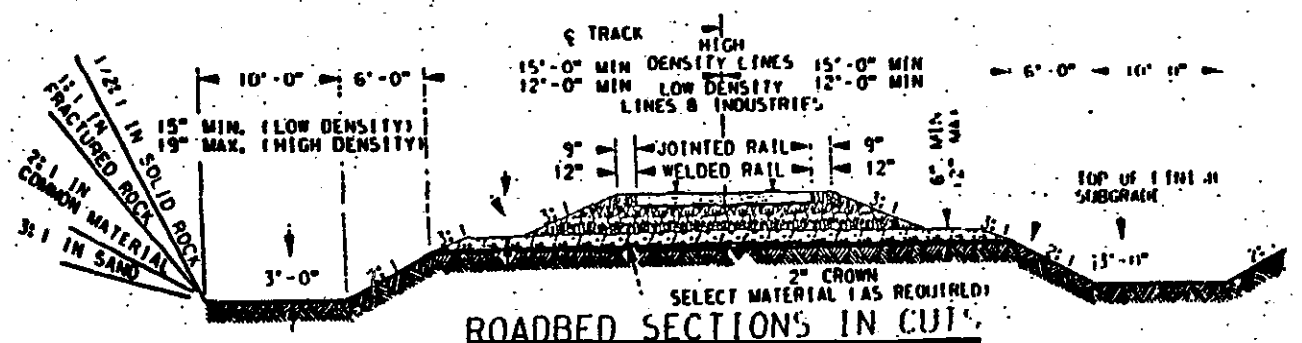
STD DWG

| MATERIAL REQUIRED FOR 1000 FEET OF SINGLE TRACK | | | | |
|---|---|---|---|---|
| BALLAST | | | SELECTED MATERIAL | |
| DEPTH | SHOULDER | CUBIC YARDS | DEPTH ABOVE TOP SUBGRADE | CUBIC YARDS |
| 15" | 9" | 625 | 6" | 700 |
| | 12" | 650 | | |
| 19" | 9" | 925 | 12" | 1385 |
| | 12" | 960 | | |

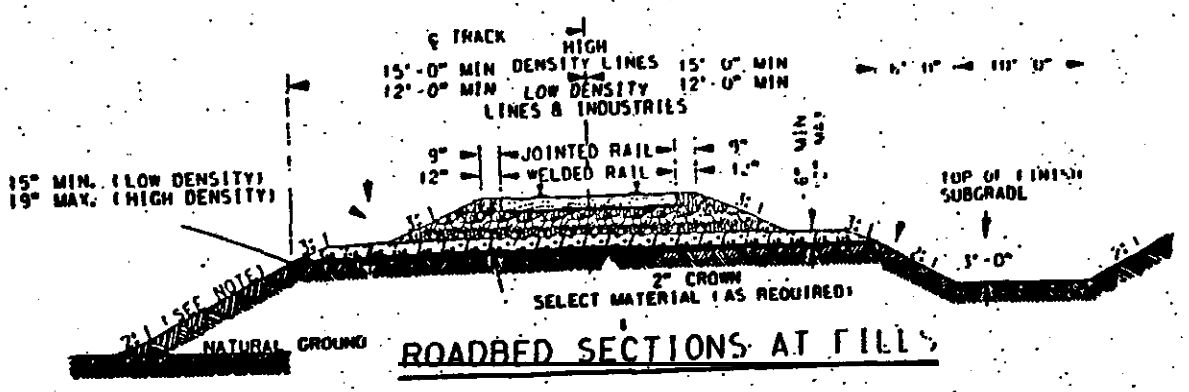
ABOVE QUANTITIES ARE FOR TANGENT TRACK AND INCLUDE 15% ALLOWANCE FOR SHRINKAGE.



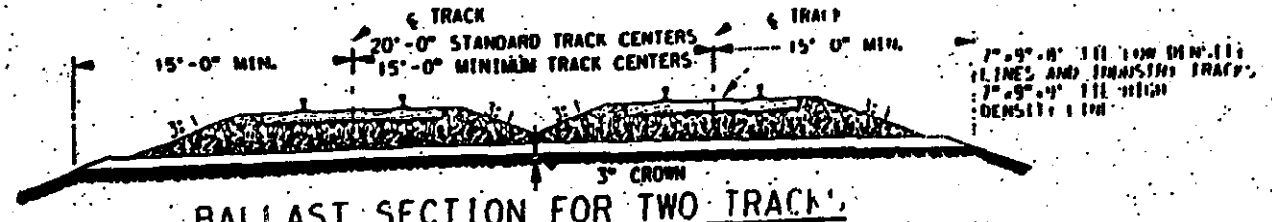

DEEP CUT SECTIONS



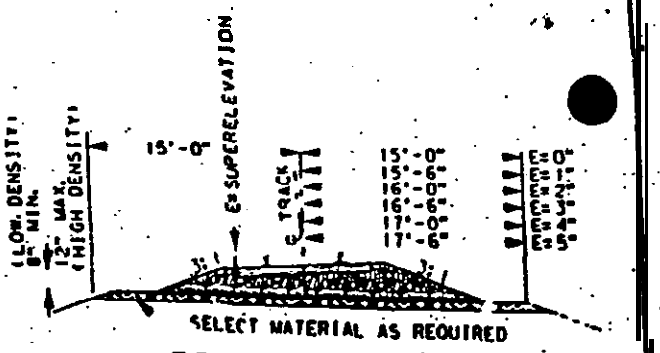

ROADBED SECTIONS IN CUTS




ROADBED SECTIONS AT FILLS




BALLAST SECTION FOR TWO TRACKS




ROADBED SECTION AT CURVED TRACK

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

NOTES:

THE DEPTH OF BALLAST AND DEPTH OF SELECTED MATERIAL SHALL BE DECIDED ON THE BASIS OF VOLUME OF TRAFFIC AND THE QUALITY OF SELECTED MATERIAL AND SUBGRADE DETERMINED BY THE RAILROAD'S ENGINEER SUBJECT TO THE APPROVAL OF THE CHIEF ENGINEER.

SLOPES SHOWN FOR BANKS IN CUTS AND ON FILLS SHALL BE CONSIDERED STANDARD AND GENERALLY USED, BUT MAY BE MODIFIED AS REQUIRED BY LOCAL CONDITIONS AND CHARACTER OF MATERIAL.

BALLAST MUST BE EQUALIZED IN ADVANCE OF DRESSING SO THAT FINAL SECTION WILL CONFORM TO SLOPE REQUIREMENTS AND CHARACTER OF MATERIAL.

WHERE OFF-TRACK ROADWAY IS TO BE PROVIDED, ADD 8'-0" ADDITIONAL WIDTH TO THE ROADBED SECTION AT TOP OF SUBGRADE ELEVATION.

ALL FILL SLOPES SHALL BE FACED WITH COVER OF MATERIAL SUITABLE FOR GROWING GRASS AND HAVING A THICKNESS OF APPROXIMATELY 6 INCHES. THE OUTER SURFACE OF THIS COVER SHALL COINCIDE WITH THE DESIGN SLOPE OF THE EMBANKMENT. MATERIAL FOR THIS COVER MAY BE OBTAINED FROM STRIPPING.

FLOW LINE ON 0.2% MINIMUM GRADE DITCHES AND BENCHES.

FLAT BOTTOM DITCHES ARE REQUIRED FOR HIGH DENSITY LINES, HOWEVER A "V" DITCH IS ACCEPTABLE FOR INDUSTRY TRACKS WHEN RIGHT-OF-WAY IS LIMITED AND WHERE LOCAL CONDITIONS AND CHARACTER OF MATERIAL SO REQUIRE.

REF U.P. STD DWG PAGE 0001.

UNION PACIFIC RAILROAD
ENGINEERING STANDARDS

# ROADBED SECTION FOR WOOD TIE TRACK CONSTRUCTION

ADOPTED: JAN. 21, 1927
REVISED: DEC. 31, 1996
FILE NO.: 0001

STD DWG
0001

STD DWG

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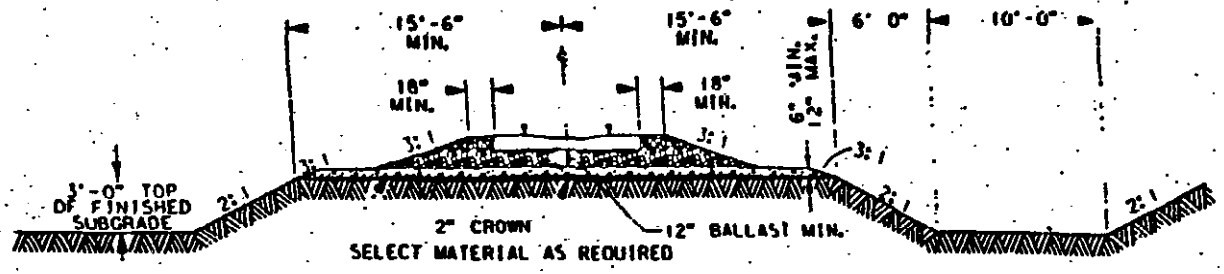
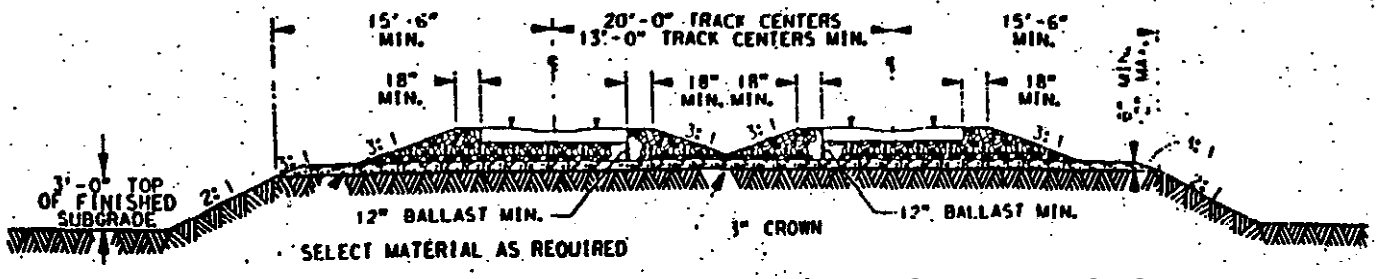
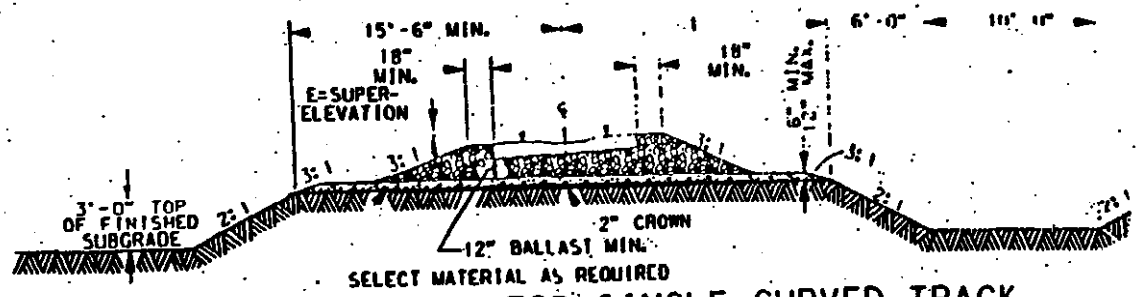



BALLAST SECTIONS FOR SINGLE TANGENT TRACK

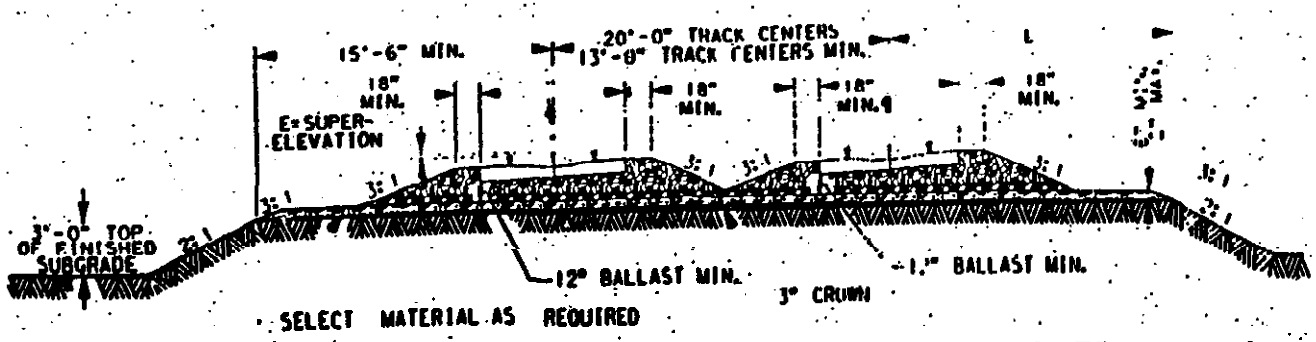



BALLAST SECTION FOR TWO TANGENT TRACKS-

| BALLAST REQUIRED FOR 1000 FEET OF SINGLE TRACK (CUBIC YARDS) | | |
|---|---|---|
| E (IN.) | 18" | L MIN. |
| 0 | 1053 | 15'-6" |
| 1 | 1125 | 16'-0" |
| 2 | 1196 | 16'-6" |
| 3 | 1274 | 17'-0" |
| 4 | 1360 | 17'-6" |
| 5 | 1442 | 18'-0" |




BALLAST SECTIONS FOR SINGLE CURVED TRACK




BALLAST SECTION FOR T W O CURVED TRACKS

NOTES:
ACTUAL SUBBALLAST DEPTH TO BE DETERMINED BY CHIEF ENGINEER OF DESIGN.

SUBGRADE EXTENSION TO 16'-6" WHEN SUPERELEVATION IS 5" OR GREATER.

TOP OF BALLAST TO BE FLAT ACROSS AT 1" UNDER BOTTOM OF RAIL.

FOR ROADBED DETAILS, SEE STD DWG 0001
FOR CONCRETE TIE DETAILS, SEE STD DWG 0201

SOURCES OF ACCEPTABLE BALLAST FOR CONCRETE TIE TRACK ARE:

| | |
|---|---|
| U.P. RESOURCES | SWELTER, UT |
| OR | CADSHILL, MO |
| MERIDIAN | GRANITE, WY |
| HARNEY ROCK | HAINES, OR |

UNION PACIFIC RAILROAD
ENGINEERING STANDARDS

# ROADBED SECTIONS FOR CONCRETE TIE TRACK CONSTRUCTION

UNION PACIFIC

ADOPTED: DEC. 31, 1996
REVISED:
FILE NO.: 0002

STD DWG
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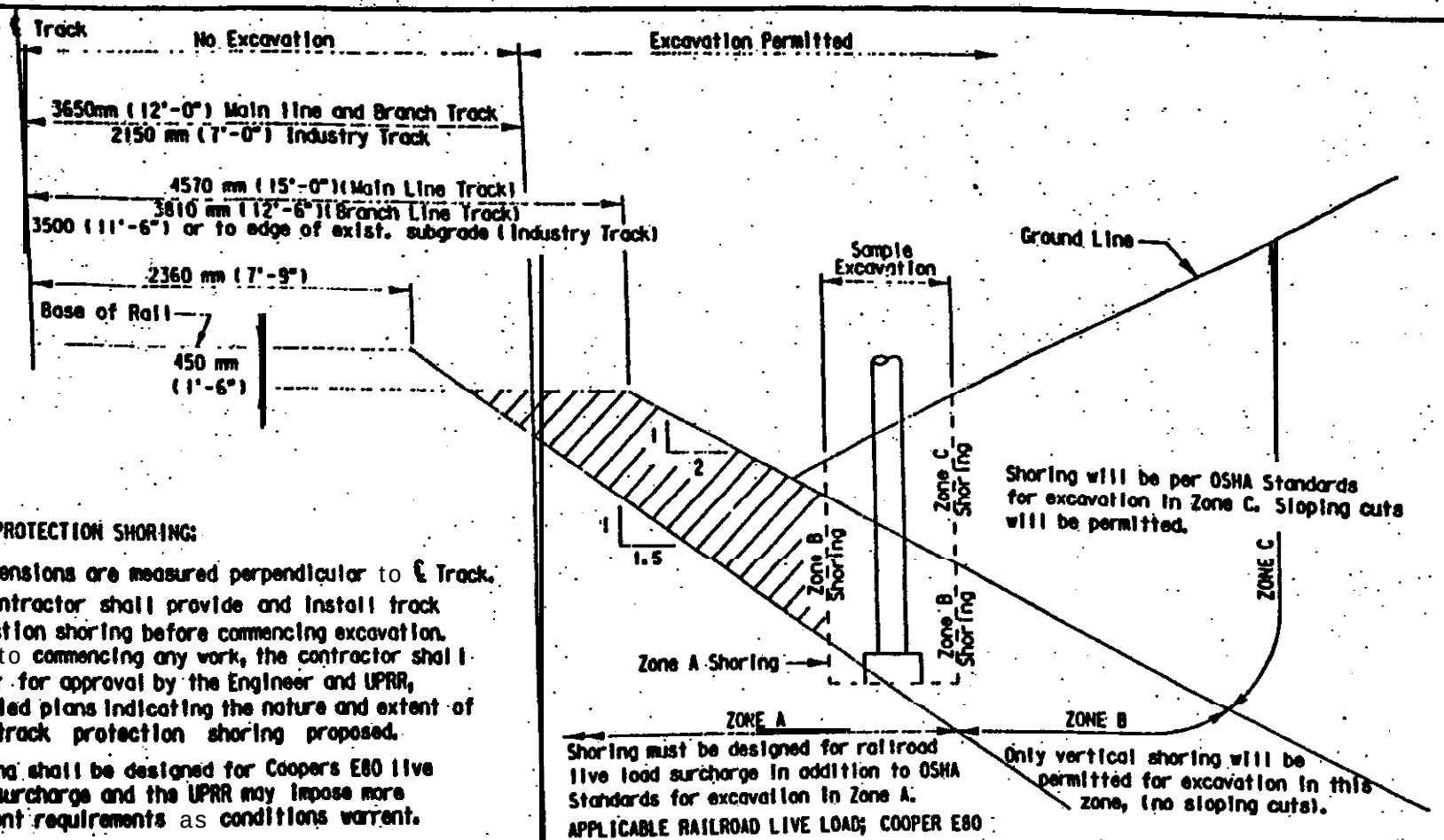


TRACK PROTECTION SHORING:

All dimensions are measured perpendicular to ℄ Track.

The contractor shall provide and install track protection shoring before commencing excavation. Prior to commencing any work, the contractor shall submit for approval by the Engineer and UPRR, detailed plans indicating the nature and extent of the track protection shoring proposed.

Shoring shall be designed for Coopers E80 live load surcharge and the UPRR may impose more stringent requirements as conditions warrent.

For excavations which encroach into railroad live load surcharge zone, shoring plans will be accompanied by 0 copy of the design calculations, and both must be stamped by a registered professional engineer.

Design of shoring shall comply with UPRR guidlines for design and construction of shoring adjacent to active railroad tracks.

TRACK PROTECTION SHORING REQUIREMENTS

UNION PACIFIC RAILROAD

GENERAL SHORING REQUIREMENTS

OFFICE OF CHIEF ENGINEER DESIGN

DATE: 3-31-98 REDRAWN C. E. 106613