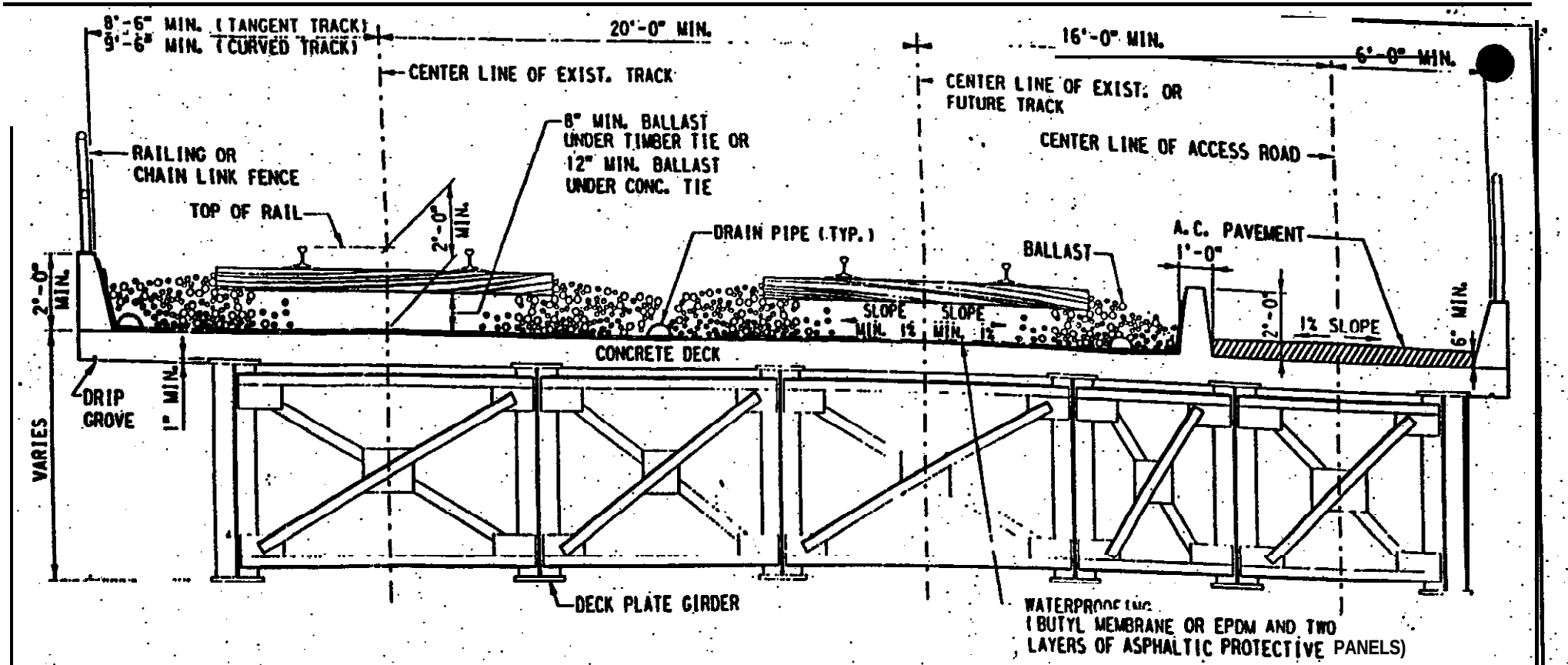



## STEEL DECK PLATE GIRDERS WITH CONCRETE DECK

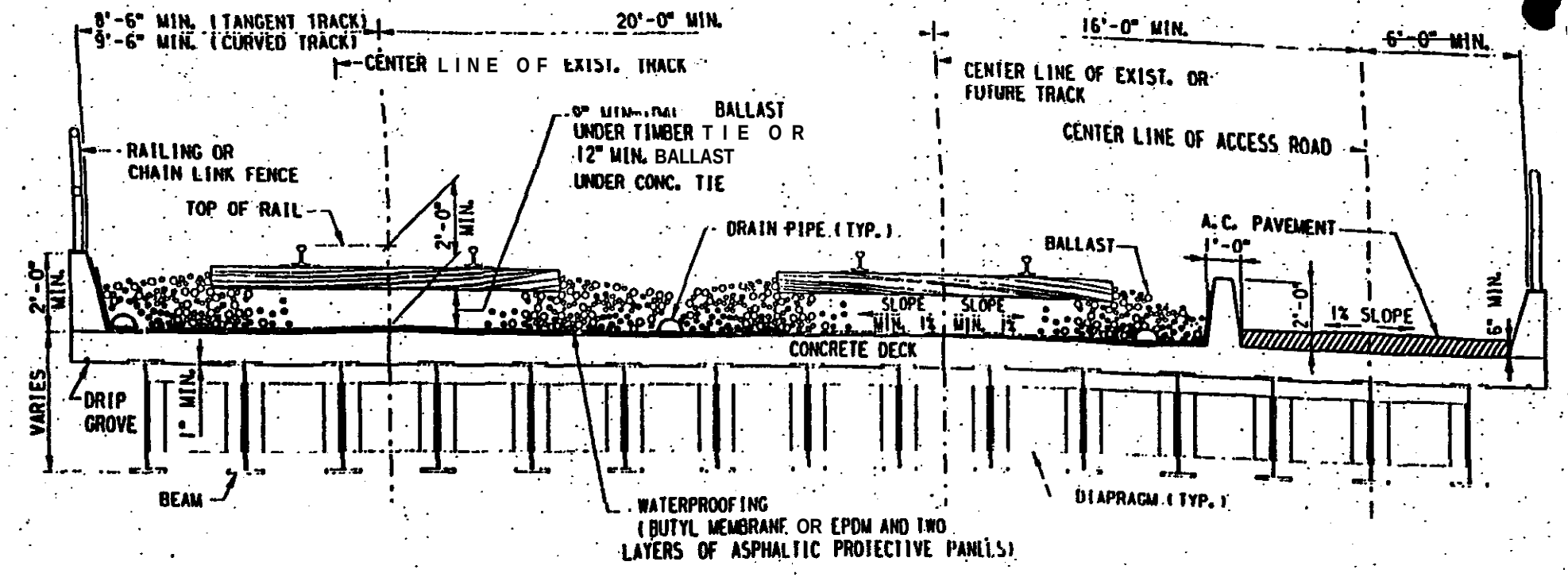
NO SCALE

UNION PACIFIC RAILROAD

STEEL DECK PLATE
GIRDER SPAN WITH CONCRETE DECK
OFFICE OF CHIEF ENGINEER DESIGN

DATE: 3-31-98

DRAWING UP1




STEEL BEAMS WITH CONCRETE DECK

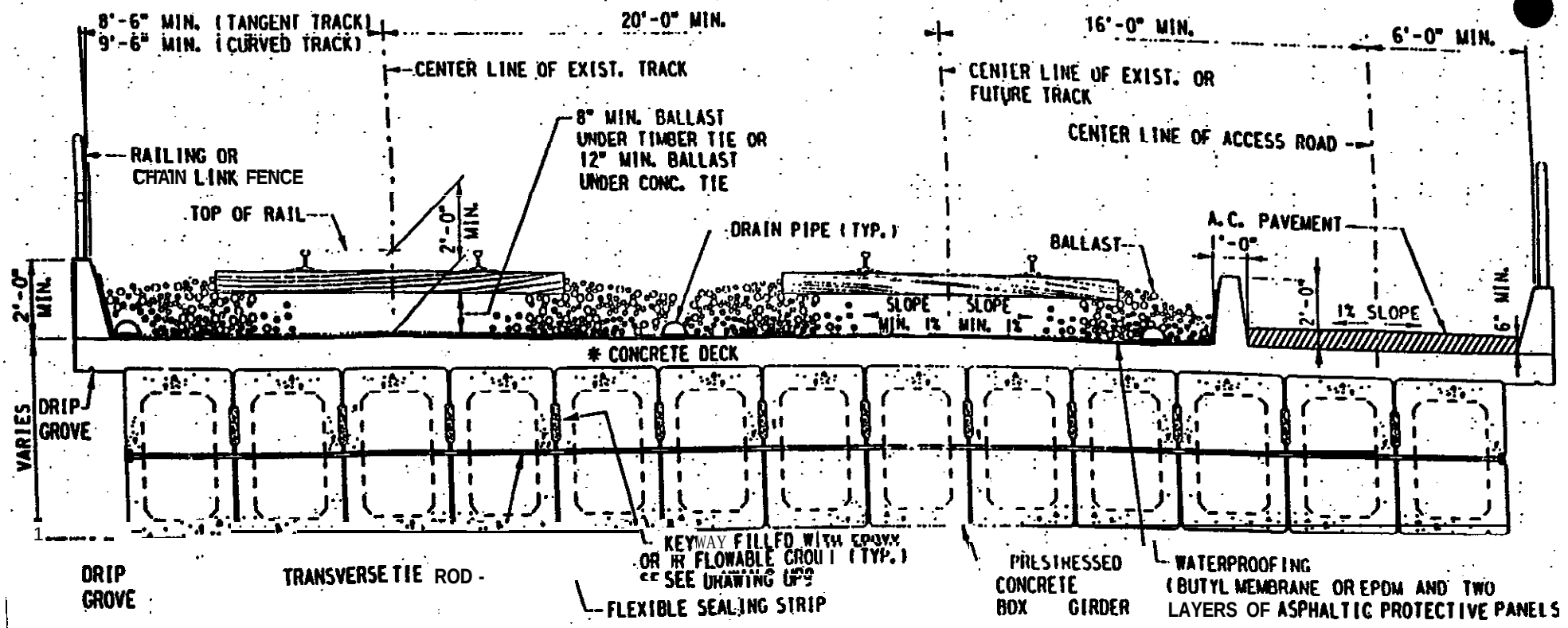
NO SCALE

UNION PACIFIC RAILROAD

STEEL BEAM
SPAN WITH CONCRETE DECK
OFFICE OF CHIEF ENGINEER DESIGN

DATE: 3-31-98

DRAWING UP2




# PRECAST CONCRETE BOX GIRDERS WITH CAST IN PLACE CONCRETE DECK

NO SCALE

*CONCRETE DECK IS OPTIONAL

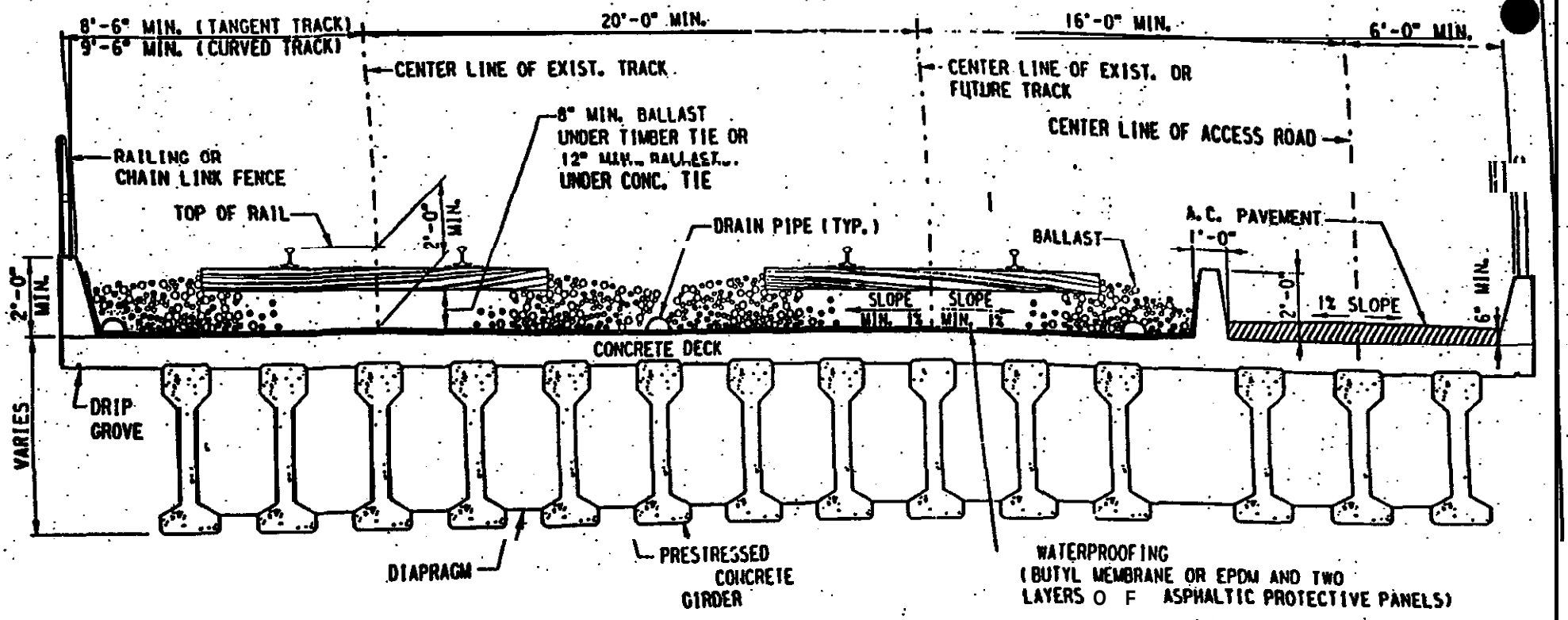
UNION PACIFIC RAILROAD

PRESTRESSED PRECAST CONCRETE BOX GIRDER SPAN WITH OR WITHOUT CONCRETE DECK

OFFICE OF CHIEF ENGINEER DESIGN

DATE: 3-31-98

DRAWING UP




## PRECAST CONCRETE BEAMS WITH CAST IN PLACE CONCRETE DECK

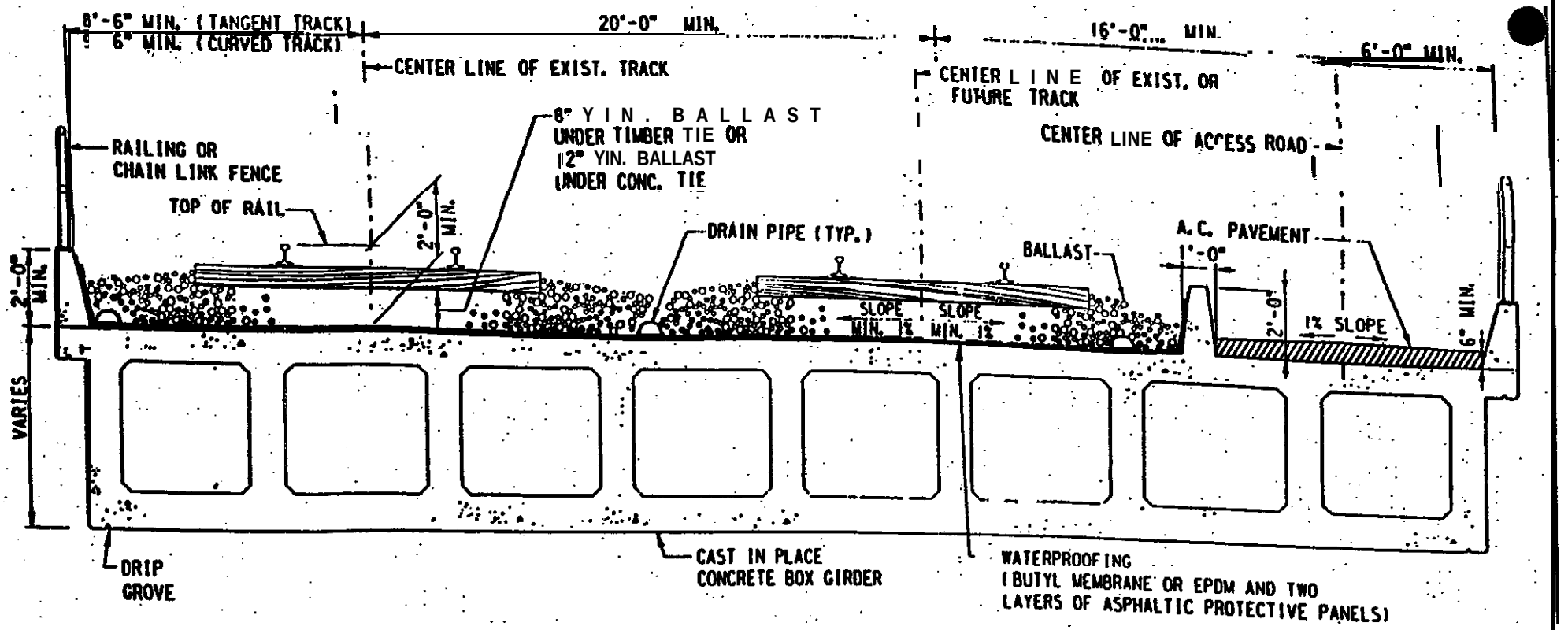
NO SCALE

UNION PACIFIC RAILROAD

PRESTRESSED PRECAST CONCRETE AASHTO TYPE. BEAM SPAN WITH CONCRETE DECK
OFFICE OF CHIEF ENGINEER DESIGN

DATE: 3-31-98

DRAWING UP4




## CONVENTIONAL REINFORCED CONCRETE BOX GIRDERS

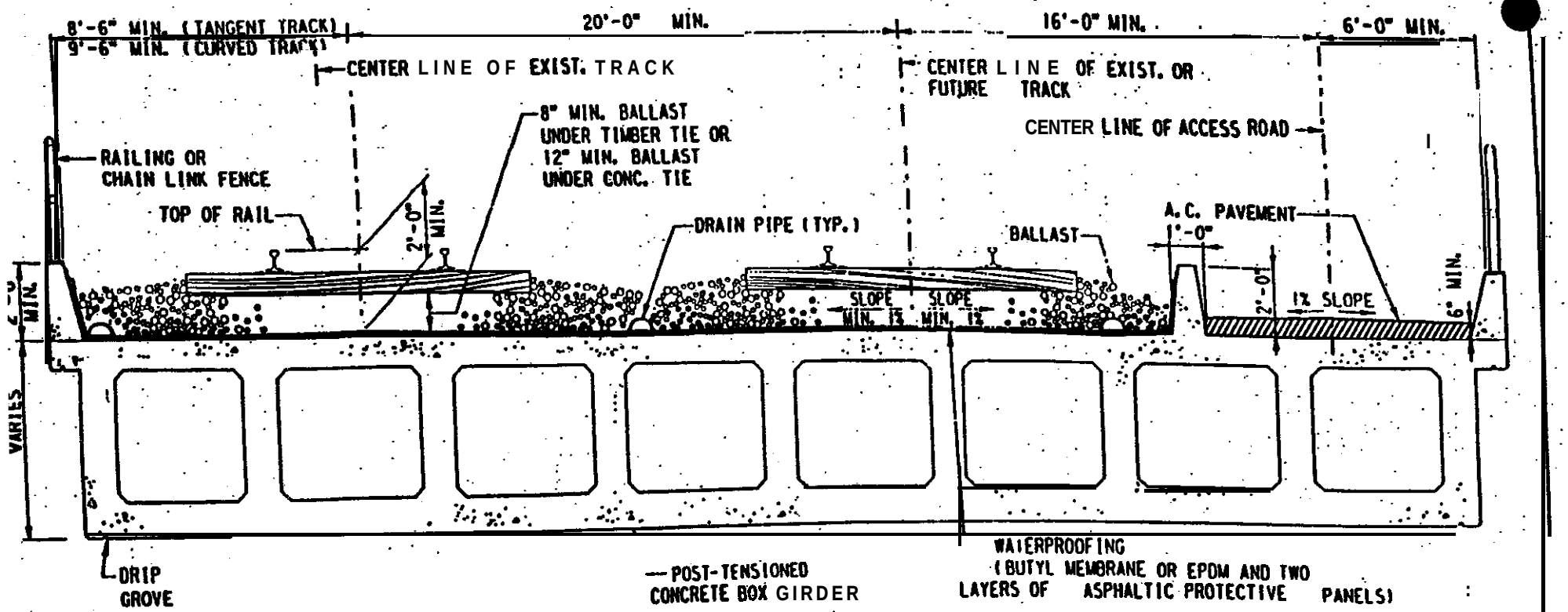
: NO SCALE

UNION PACIFIC RAILROAD

CAST-IN-PLACE CONCRETE BOX
GIRDER SPAN" CONVENTIONAL REINFORCED
OFFICE OF CHIEF ENGINEER DESIGN

DATE: 3-31-98

DRAWING UP5




# POST-TENSIONED CONCRETE BOX GIRDERS

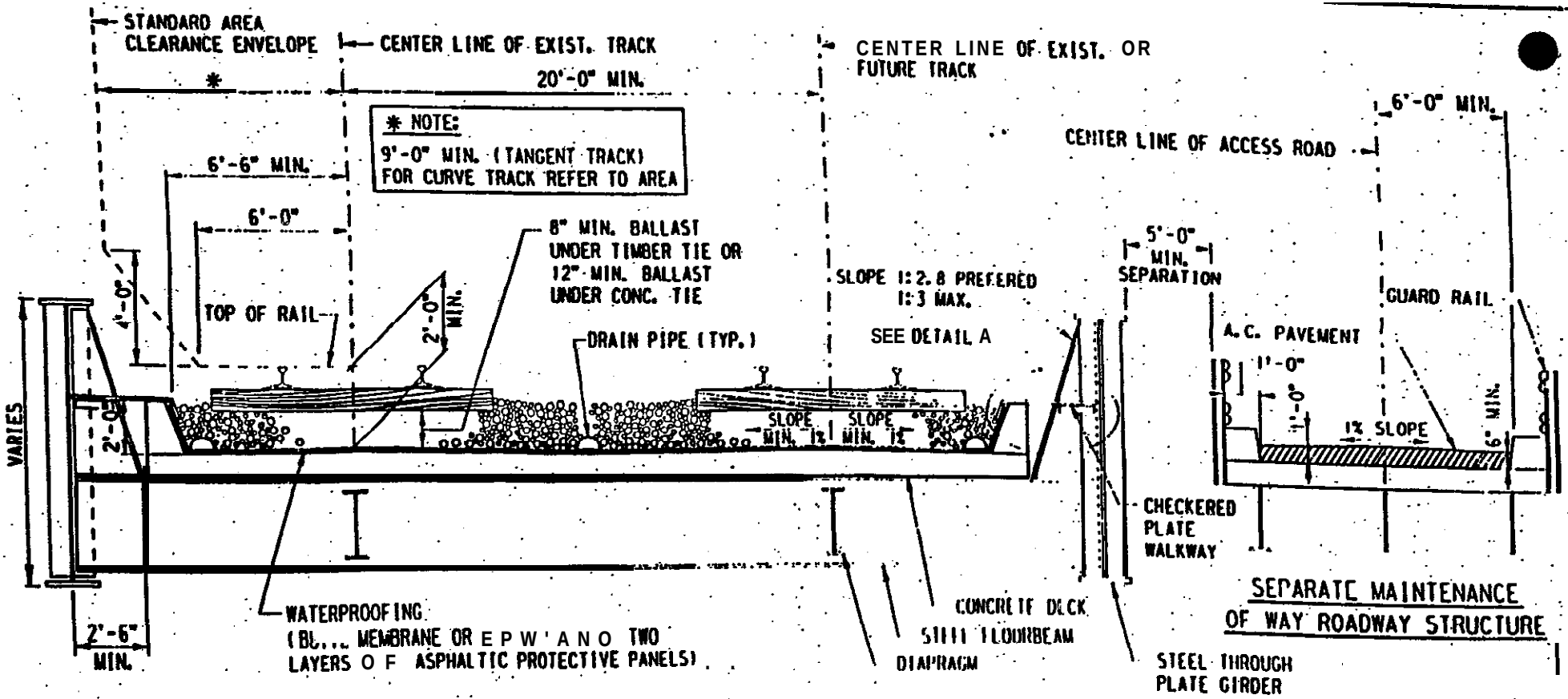
NO SCALE

UNION PACIFIC RAILROAD

CAST-IN-PLACE POST-TENSIONED CONCRETE BOX GIRDER SPAN
OFFICE OF CHIEF ENGINEER DESIGN

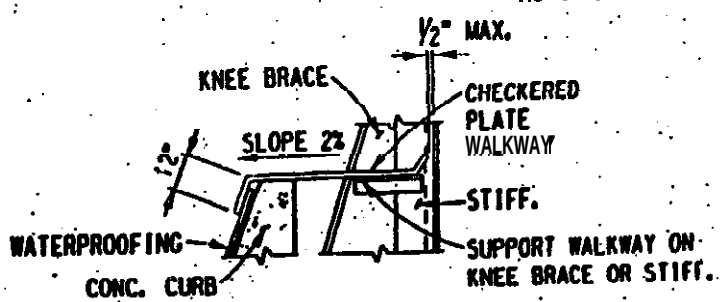
DATE: 3-31-98

DRAWING UP5




## STEEL THROUGH PLATE GIRDERS WITH CONCRETE DECK

NO SCALE



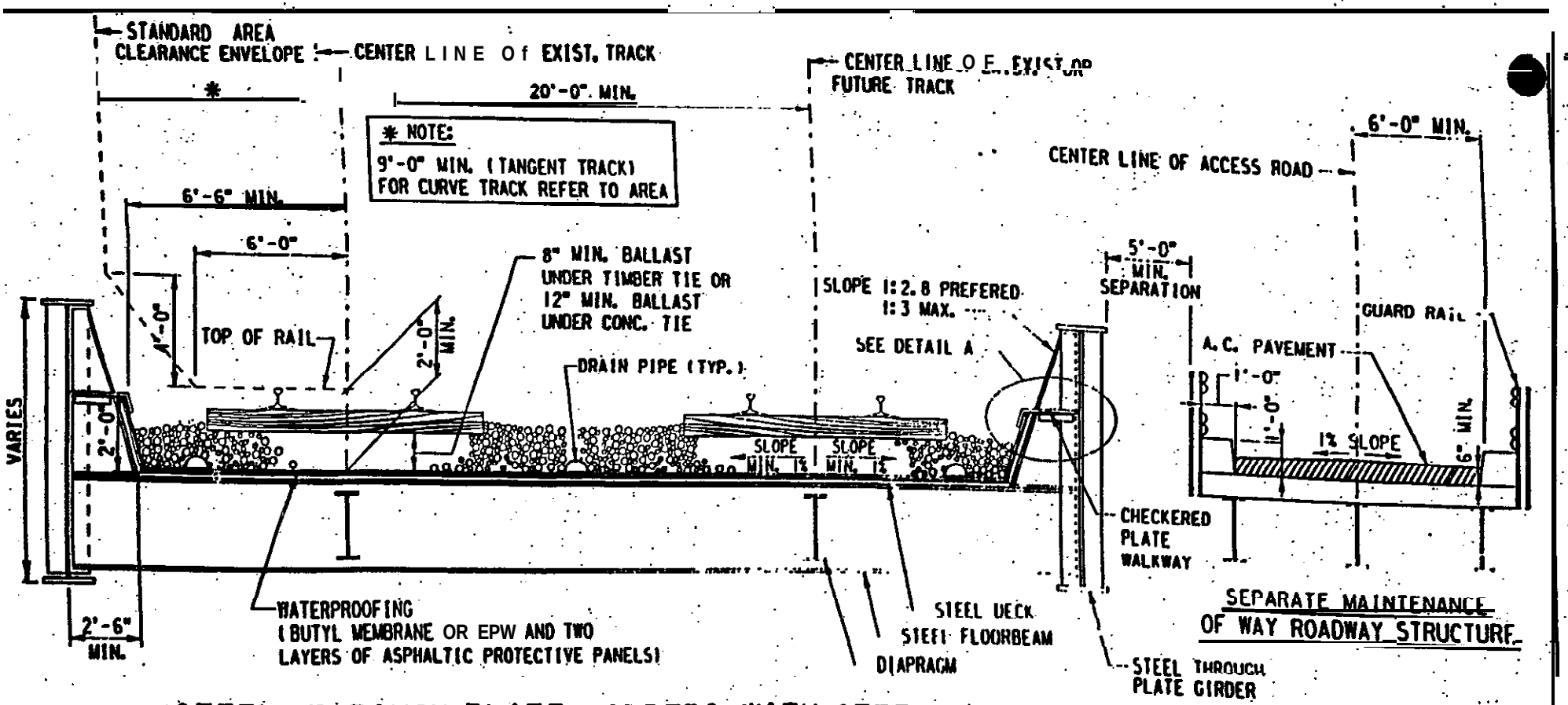

DETAIL A

UNION PACIFIC RAILROAD

STEEL THROUGH
PLATE GIRDER SPAN WITH CONC. DECK
OFFICE OF CHIEF ENGINEER DESIGN

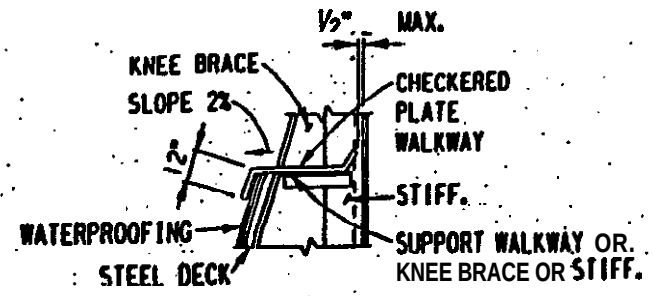
DATE: 3-31-98

DRAWING UP7




## STEEL THROUGH PLATE GIRDERS WITH STEEL DECK

NO SCALE




DETAIL A

UNION PACIFIC RAILROAD

STEEL THROUGH
PLATE GIRDER SPAN WITH STEEL DECK
OFFICE OF CHIEF ENGINEER DESIGN

DATE: 3-31-98

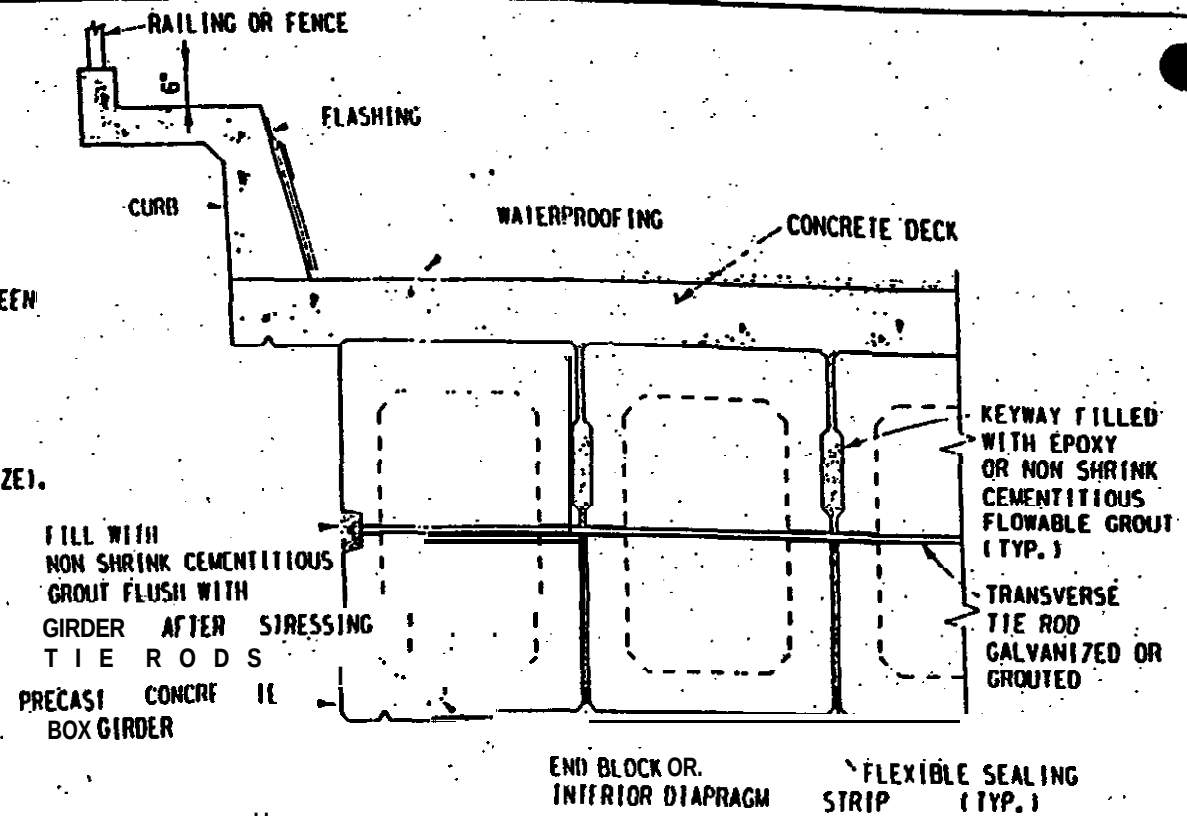
DRAWING UP

## PROCEDURE FOR GROUTING BETWEEN GIRDERS
### ( EPOXY GROUT )

1. BEFORE SETTING GIRDERS, THOROUGHLY WIRE BRUSH THE ENTIRE CONTACT SURFACES OF EACH GIRDER.
2. INSTALL 2 LAYERS OF 3"x4" FLEXIBLE SEALING STRIPS (POLY-URETHANE-ETHER TYPE DENSITY 1.5) AT THE BOTTOM OF THE GAP AND AROUND TIE ROD HOLES AND ENDS OF GIRDERS TO PREVENT GROUT LEAKAGE. THE MAXIMUM GAP BETWEEN GIRDERS SHOULD BE ¾".
3. INSTALL TIE RODS AND TENSION 50%.
4. PLACE 4' SAND ON TOP OF SEALING STRIPS TO PROTECT SEALING STRIPS FROM EPOXY HEAT.
5. FILL THE GAP WITH DRY CLEAN PEA GRAVEL (½" MAXIMUM SIZE). IN COLD WEATHER, HEAT THE PEA GRAVEL.
6. POUR EPOXY GROUT TO FILL ALL VOIDS IN GAP. THIS MAY TAKE 2 TO 3 SUCCESSIVE POURINGS.
7. TENSION TIE RODS 100%.

## PROCEDURE FOR GROUTING BETWEEN GIRDERS
### ( NON SHRINK CEMENTITIOUS FLOWABLE GROUT)

1. BEFORE SETTING GIRDERS, THOROUGHLY WIRE BRUSH THE ENTIRE CONTACT SURFACES OF EACH GIRDER.
2. INSTALL 2 LAYERS OF 3"x4" FLEXIBLE SEALING STRIPS (POLY-URETHANE-ETHER TYPE DENSITY 1.5) AT THE BOTTOM OF THE GAP AND AROUND TIE ROD HOLES AND ENDS OF GIRDERS TO PREVENT GROUT LEAKAGE. THE MAXIMUM GAP BETWEEN GIRDERS SHOULD BE ¾".
3. INSTALL TIE RODS, AND TENSION 50%.
4. PLACE FLOWABLE NON SHRINK CEMENTITIOUS GROUT BETWEEN GIRDERS. (GROUT TO BE MIXED TO A POURABLE CONSISTENCY. THE MATERIAL SHALL BE MIXED TO A COMBINATION BETWEEN FLOWABLE AND FLUID SO AS NOT TO FORM AIR POCKETS BETWEEN GIRDERS WHILE BEING POURED).
5. AFTER GROUT HAS REACHED A COMPRESSIVE STRENGTH OF 3000 P.S.I., TENSION TIE RODS 100%.




## MULTIPLE PRESTRESSED CONCRETE GIRDER BONDING DETAIL

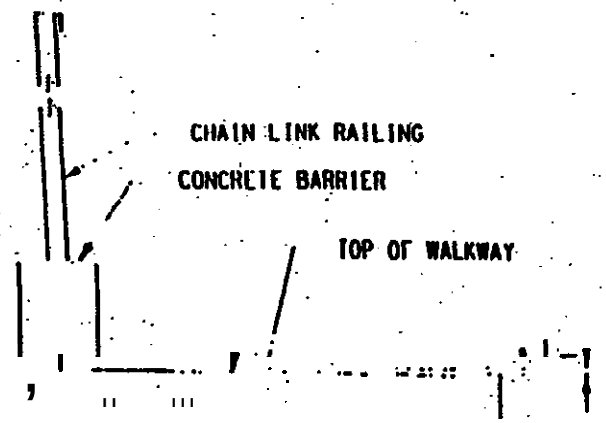
NO SCALE

UNION PACIFIC RAILROAD

BONDING DETAILS FOR MULTIPLE PRESTRESSED PRECAST CONCRETE GIRDERS
OFFICE OF CHIEF ENGINEER DESIGN

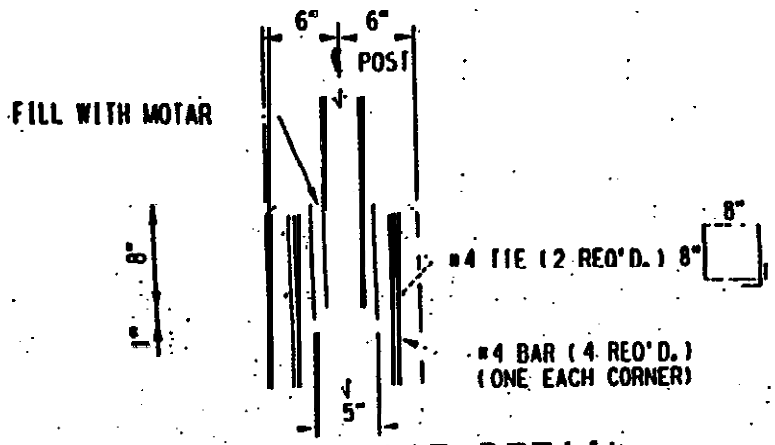
DATE: 3-31-98

DRAWING UP9




## TYPICAL SECTION

NO SCALE

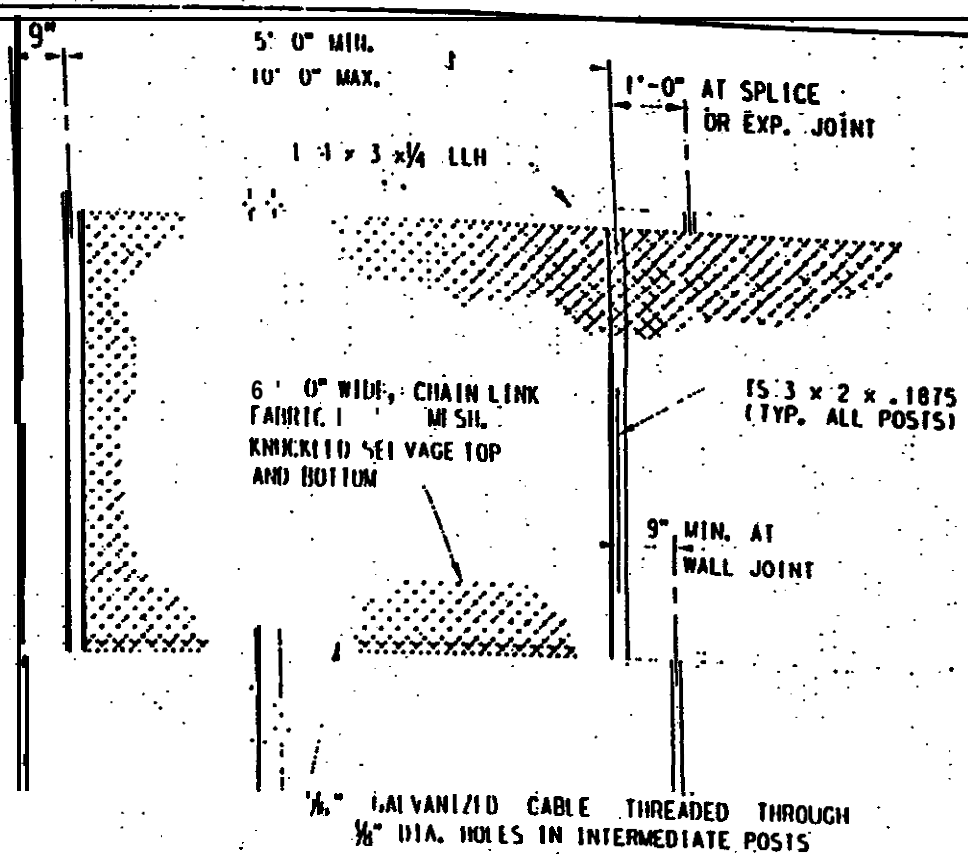



## POST ANCHORAGE DETAIL

NO SCALE

NOTES:

1. RAILING ASSEMBLY EXCEPT CHAIN LINK FABRIC TO BE GALVANIZED AFTER FABRICATION.
2. POSTS SHALL BE VERTICAL.
3. PROVIDE HARDWARE AND DETAILS FOR ATTACHMENTS TO CABLE, POSTS, AND TOP RAILING.
4. PROVIDE SPLICE AND EXPANSION JOINT DETAILS.




## RAILING ELEVATION

NO SCALE

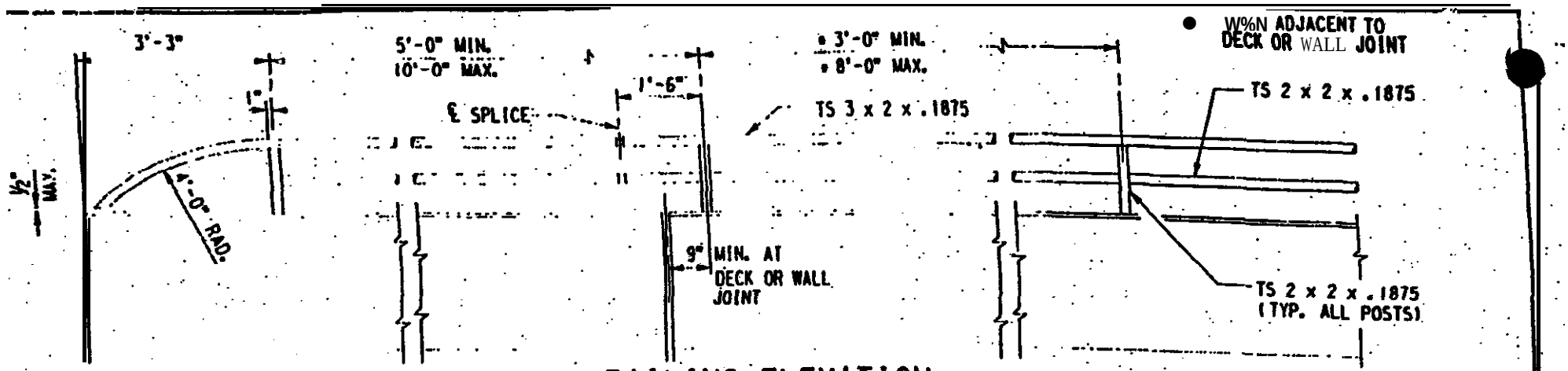
UNION PACIFIC RAILROAD

CHAIN LINK RAILING DETAILS

OFFICE OF CHIEF ENGINEER DESIGN

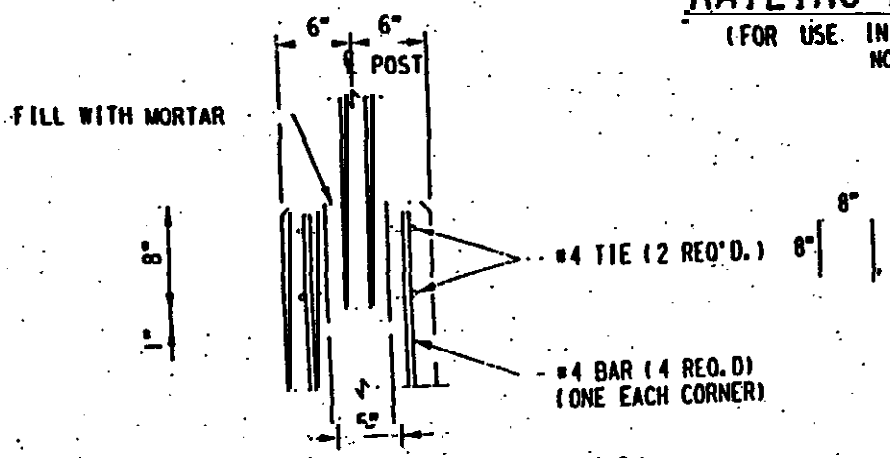
DATE: 3-31 '98

DRAWING UP10



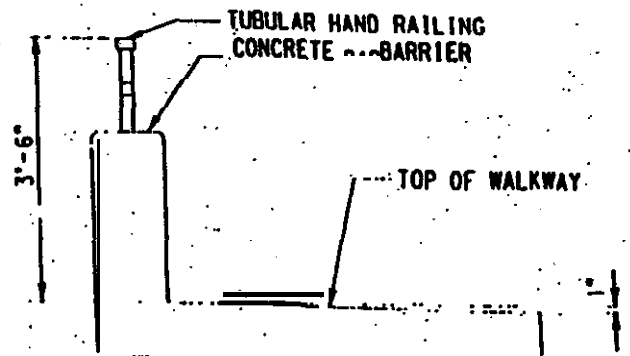

## RAILING ELEVATION

(FOR USE IN RURAL LOCATIONS)
NO SCALE




## POST ANCHORAGE DETAIL

NO SCALE




## TYPICAL SECTION

NO SCALE

**NOTES:**

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

## TUBULAR HAND RAILING DETAILS

OFFICE OF 'CHIEF ENGINEER DESIGN

DATE: 3-31-98

DRAWING UP11