

STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS—STATE OF COLORADO

PLAN AND PROFILE OF PROPOSED AS CONSTRUCTED
COLORADO PROJECT NO. MP03-0052-23
STATE HIGHWAY NO. 52
BOULDER COUNTY

TOTAL ROAD MILES NO.	DIVISION	PROJECT NO.	SHEET NO.
III	COLORADO	MP03005223	1

AS CONSTRUCTED	
NO REVISIONS	REVISED 4-2-87 VOD

REVISIONS	

INDEX OF SHEETS

SHEET NO.

1. TITLE PAGE AND TABULATION OF LENGTH AND DESIGN DATA
2. STANDARD PLANS LIST
3. TYPICAL SECTIONS, TABULATION OF GUARD RAIL, SURFACING PLAN, GENERAL NOTES, REFLECTOR TAB DETAILS AND NOTES AND SCHEDULE OF CONSTRUCTION TRAFFIC CONTROL DEVICES, SUMMARY OF APPROXIMATE QUANTITIES
4. PLAN AND PROFILE
5. DETAILS FOR STRUCTURE NO. D-16-U
- 6-9.

SCALES OF ORIGINAL DRAWINGS

ON PLAN, 1 IN. = 50 FT.
ON PROFILE 1 IN. = 50 FT. HORIZONTAL
1 IN. = 5 FT. VERTICAL

STA. 127+78 BEGIN MP03-0052-23

Begin Major Structure No. D-16-U =

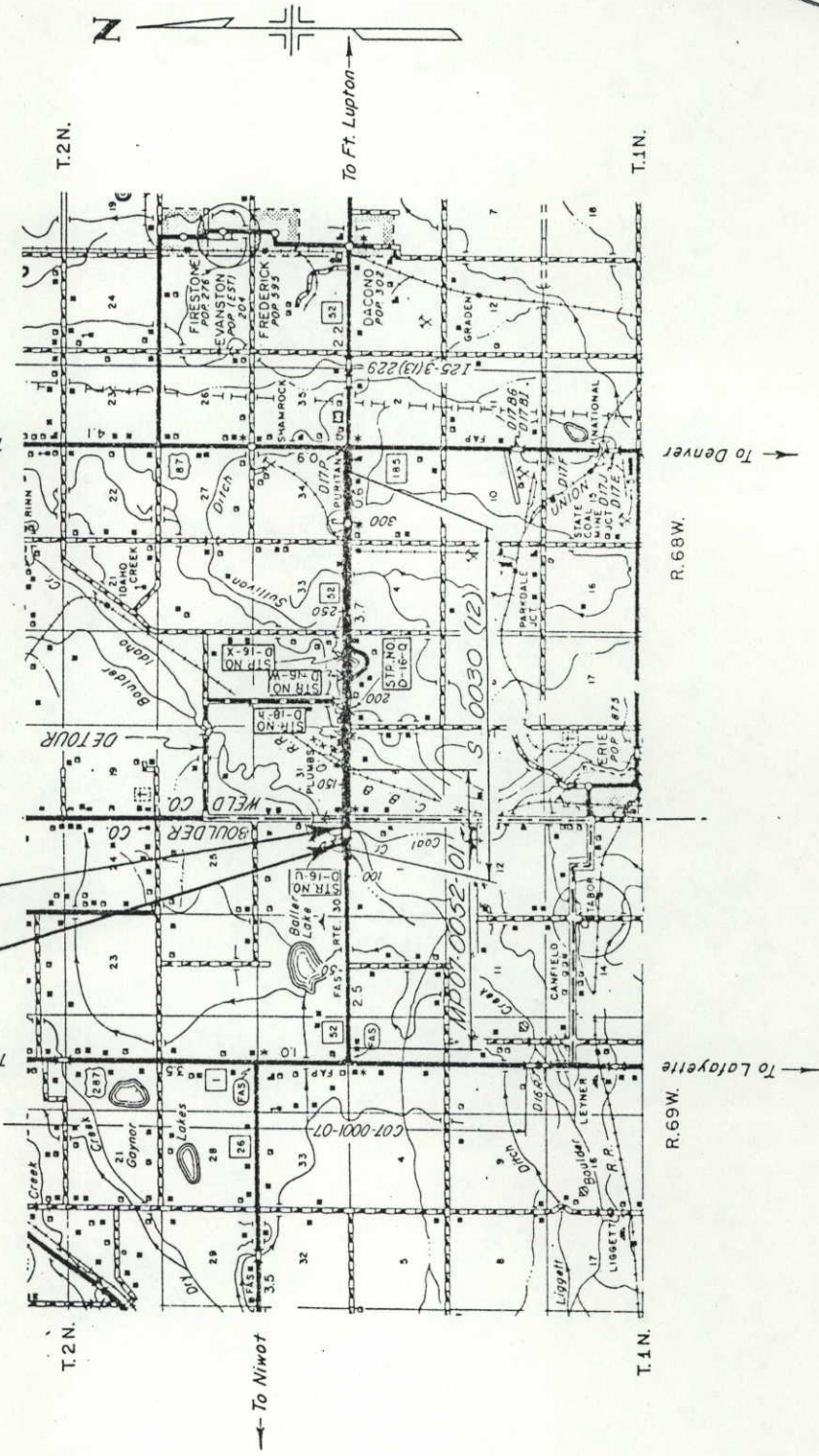
Sta. 127+78 on S 0030(12)-M.P. 7.165 Begin

STA. 129+01.5 END MP03-0052-23

End Major Structure No. D-16-U =

Sta. 129+01.5 on S 0030(12)-M.P. 7.188 End

LENGTH AND DESIGN DATA	
STATION	MAJOR STRUCTURE LINEAR FEET
127+78 BEGIN MP 03-0052-23 = BEGIN MAJOR STRUCTURE NO. D-16-U = 127+78 ON S 0030(12)-M.P. 7.165 BEGIN	123.5
129+01.5 END MP 03-0052-23 = END MAJOR STRUCTURE NO. D-16-U = 129+01.5 ON S 0030(12)-M.P. 7.188 END	123.5
TOTAL	123.5
SUMMARY	LIN. FT. MILES
MAJOR STRUCTURE	123.5 0.023
PROJECT CROSS LENGTH	123.5 0.023
DESIGN DATA	
MAXIMUM DEGREE OF CURVE	N/A
MAXIMUM GRADE	0.15%
MINIMUM S.S.D. HORIZONTAL	>1300'
MINIMUM S.S.D. VERTICAL	>1300'
MAXIMUM DESIGN SPEED	70 M.P.H.
2006 DESIGN TRAFFIC VOLUME	ADT 10,320



AS CONSTRUCTED PLANS
RETURN TO DIST. 4 DESIGN

DIVISION OF HIGHWAYS	
APPROVED:	7-22-86 DATE
7-22-86	
7-22-86	

AS CONSTRUCTED INFORMATION	
CONTRACTOR ELATIRON STRUCTURES	
DESIGN ENGINEER KATOLAND	
(Project or Resident)	
PROJECT STARTED	JANUARY 27 1987
PROJECT COMPLETED	APRIL 21 1987
AS CONSTRUCTED PLANS	
APPROVED L.G. DUNN	
DIST. CENTER ENGINEER	
6-18-87 DATE	



SCALE OF MILES
0 1/2 1

AS CONSTRUCTED

NO. REVISIONS4-2187REVISEDVOID

FEDERAL ROAD REGION NO. VIII

DIVISION COLORADO

PROJECT NO. MP03-0032-23

SHEET NO. 2

TOTAL SHEETS

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☐ M-107-1	TEMPORARY EROSION CONTROL.....	2	☐ S-614-1	TYPICAL GROUND SIGN PLACEMENT.....	79
☐ M-203-1	APPROACH ROADS, FLARING, CUT SLOPE TREATMENT, BRIDGE & CREST WIDENING.....	3	☐ S-614-2	CLASS I GROUND SIGN INSTALLATIONS.....	80
☐ M-203-2	DITCH TYPES.....	4	☐ S-614-3	CLASS II GROUND SIGN INSTALLATIONS.....	81
☐ M-203-10	SUPERELEVATION OF CURVES - CROWNED HIGHWAYS.....	5	☐ S-614-4	CLASS III SIGNS, LAMINATED ALUMINUM PANELS AND POST SPACING TABLE.....(2 SHEETS)	82
☐ M-203-11	SUPERELEVATION OF CURVES - DIVIDED HIGHWAYS - SHOULDER PIVOT.....	6	☐ S-614-5	BREAK-AWAY SIGN SUPPORT DETAILS FOR GROUND SIGNS.....(2 SHEETS)	84
☐ M-203-12	SUPERELEVATION OF CURVES - STREETS.....	7	☐ S-614-6	CONCRETE FOOTINGS AND SIGN ISLANDS FOR CLASS III SIGNS.....(2 SHEETS)	86
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☒ M-206-1	EXCAVATION AND BACKFILL FOR STRUCTURES.....(2 SHEETS)	9	☐ S-614-11	MILEPOST SIGN AND INSTALLATION.....	89
☐ M-206-2	EXCAVATION AND BACKFILL FOR BRIDGES.....	11	☐ S-614-12	STRUCTURE NUMBER INSTALLATION (BRIDGE INFORMATION SHEET).....	90
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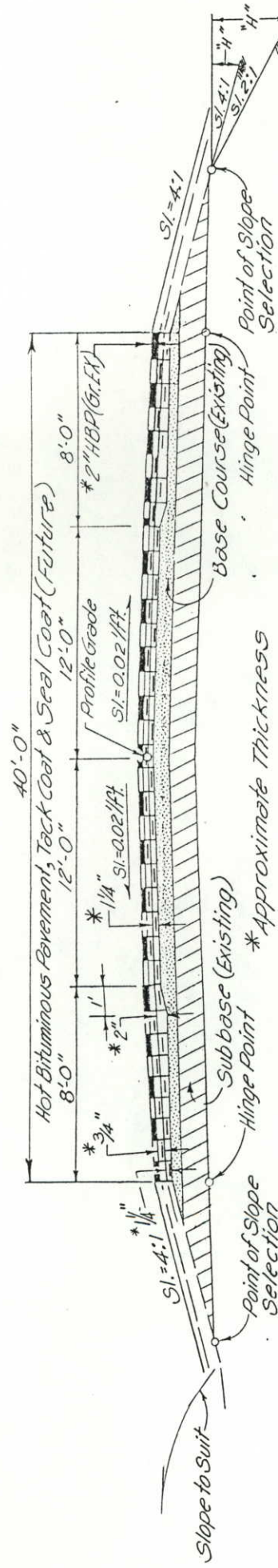
THE STANDARD PLAN SHEETS INDICATED HEREON BY A MARKED BOX ARE TO BE USED TO CONSTRUCT THIS PROJECT.

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

STANDARD PLANS LIST

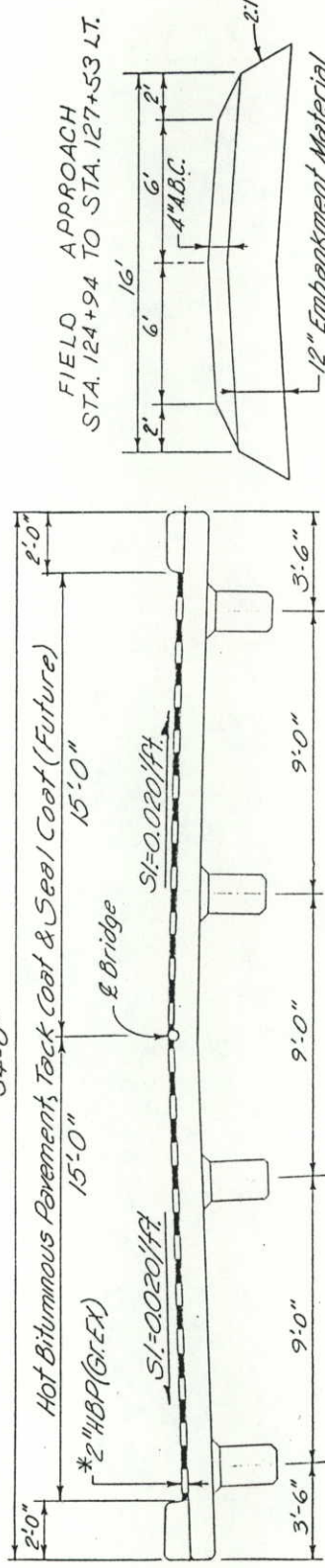
M & S STANDARDS - JANUARY, 1982

TYPICAL SECTION



MATERIAL SHALL BE PLACED IN SEPARATE COURSES AT THE FOLLOWING APPROXIMATE RATES PER 100 LIN. FT. OF ROADWAY.

BITUMINOUS PAVEMENT TOP LAYER BRIDGE ROADWAY



FIELD APPROACH
STA. 124+94 TO STA. 127+53 LT.

TABULATION OF GUARD RAIL

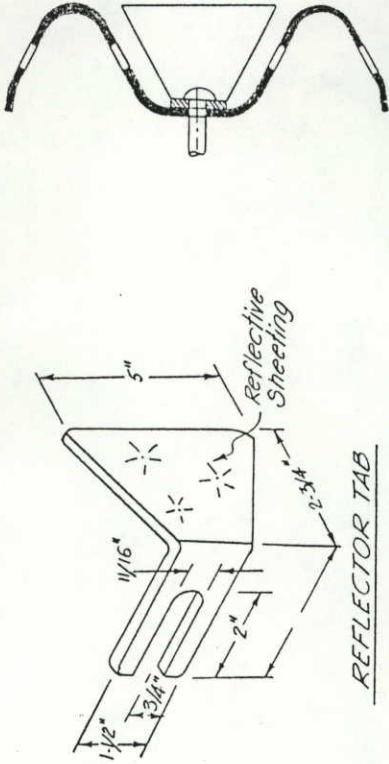
Station to Station	Side	Removal of Guard Rail Type 3		Guard Rail Type 3 (6-3 Post Spacing)		End Anchorage Type 3E
		L in. Ft.	FINAL 25	L in. Ft.	FINAL 225	
Sta. 125+53 to Sta. 127+78	Rt	25	12.5	225	150	1
Sta. 126+28 to Sta. 127+78	Lt	12.5	12.5	150	150	1
Sta. 129+01.5 to Sta. 130+51.5	Rt	12.5	12.5	150	150	1
Sta. 129+01.5 to Sta. 131+26.6	Lt	25	25	225	225	1
Total		75	75	750	750	4

SURFACING PLAN

STATION TO STATION	Source	HOT BITUMINOUS PAVEMENT	
		(Grading EX) (Haul & Asphalt)	
		Tons	
Approach to Project Sta. 127+28 to Sta. 127+78	CONTRACTORS	20	
Bridge Slt. D-16-U		See Bridge Plans	
Approach to Project Sta. 129+0.5 to Sta. 129+51.5		20	
Total Quantities		40	46.85

CONSTRUCTION TRAFFIC CONTROL DEVICES

Sign Code	LEGEND	Dimensions	PANEL SIZE-QUANTITY				
			EACH				OTHER
			A	B			
48W20-1	Road/Const/Dist	48"x48"		2	6		
48W20-4	One Lane/Road/Dist	48"x48"		2	2		
48W20-7a	Flanger Symbol	48"x48"		2			
48W20-50	Be/Prepared/Stop	48"x48"		2	2		
36R2-140	Speed/Limit/40	36"x48"		2	2		
36R2-125	Speed/Limit/25	36"x48"		2	2		
24R2-155	Speed/Limit/55	24"x30"	2		2		
60G20-2	End/Construction	60"x24"		2	2		
Traffic Cone		28"					30
Totals			2	2	14	18	30



MOUNTING POSITION ON
GUARD RAIL TYPE 3

THE REFLECTOR TAB SHALL BE MANUFACTURED FROM 8 GAUGE GALVANIZED STEEL TO THE DIMENSIONS SHOWN ABOVE.

SMOOTH SURFACE TYPE REFLECTIVE SHEETING, AS SPECIFIED IN SECTION 713.10 OF THE STANDARD SPECIFICATIONS, SHALL BE APPLIED TO THE REFLECTOR TAB.

THE REFLECTOR TAB SHALL BE MOUNTED WITH THE REFLECTORIZED SURFACE FACING APPROACHING TRAFFIC.

FOR A TWO-LANE ROADWAY, BOTH SIDES OF THE TAB SHALL BE REFLECTORIZED. FOR A DIVIDED ROADWAY, ONE SIDE OF THE TAB SHALL BE REFLECTORIZED AND THE COLOR OF REFLECTIVE SHEETING SHALL MATCH THE COLOR OF THE EDGE STRIPE ON THE PAVEMENT, EITHER CRYSTAL OR YELLOW.

REFLECTOR TABS SHALL BE MOUNTED ON ALL GUARD RAIL TYPE 3 AT ALTERNATE POSTS OR A MAXIMUM SPACING OF 12'-6" BEGINNING AT THE THIRD POST FROM THE END SECTION.

IF THE TAB SHOULD FALL ON A GUARD RAIL SPLICE, A RECTANGULAR WASHER SHALL BE PLACED BETWEEN THE REFLECTOR TAB AND THE GUARD RAIL.

SEE COLORADO STANDARD PLANS M-606-1 AND M-606-2 FOR THE APPROPRIATE GUARD RAIL STANDARDS.

REFLECTOR TABS WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE COST OF THE GUARD RAIL ITEMS.

FINAL
SUMMARY OF APPROXIMATE QUANTITIES

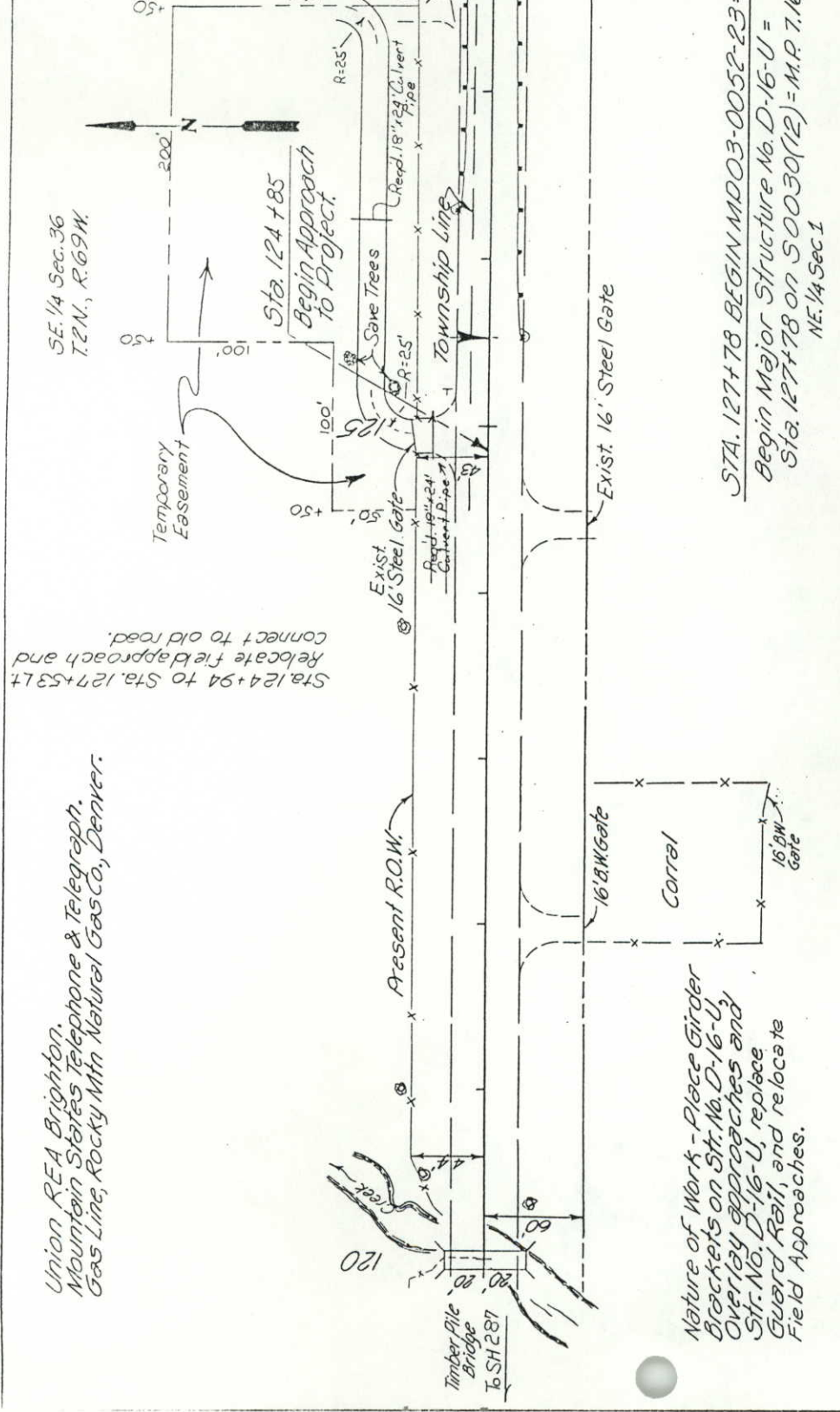
AS CONSTRUCTED		DIVISION		PROJ. NO.	SHEET NO.	TOTAL SHEETS
NO REVISIONS	REVISED	MP03-0052-23	XIII	4		
VOID						

INDEX	CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	ROADWAY		Str. #D-16-U	PROJECT TOTALS		DIFF. +/-	% PLAN
				PLAN	ASCONST		PLAN	AS CONST.		
FORM 305	202	Removal of Bridge Railing	Lin. Ft.							
	202	Removal of Guard Rail Type 3	Lin. Ft.	75	75	244	244	244		100
	203	Embankment Material (Complete in Place)	Cu. Yd.	497	299		497	397	-100	100
	304	Aggregate Base Course (Class 6) (Hay 1)	Ton	90	11.25		90	11.25	-77.25	13
	403	Hot Bituminous Pavement (Gravel) (Asphalt and Asphalt)	Ton	40	46.85		84	46.85	-32.15	56
	411	Emulsified Asphalt (Slow-Setting)	Gal.	48	45		39	45	+6	115
	509	Structural Steel	Lb.			2510	2510	1949	-561	78
	606	Guard Rail Type 3 (6-3 Post Spacing)	Lin. Ft.							
	606	End Anchorage Type 3E	Each	750	750		750	750		100
	606	Bridge Rail Type 3R	Lin. Ft.	4	4		4	4		100
	607	Fence Barbed Wire with Metal Posts (Deleted by Form 105)	Lin. Ft.			243	243	243		100
	612	Delineator (Type III)	Each	26	2		26	0	-26	0
	614	Flagging	Hour	150	172.5		150	172.5	+22.5	115
	614	Traffic Control Supervisor	Day	15	10		15	10	-5	67
	614	Construction Traffic Sign (Panel Sign A)	Each	2	2		2	2		100
	614	Construction Traffic Sign (Panel Sign B)	Each	14	18		14	18	+4	129
	614	Traffic Cone	Each	30	30		30	30		100
	617	18 Inch Culvert Pipe	Lin. Ft.	72	24		72	24	-48	33
	626	Mobilization	L.S.	0.5	0.5	0.5	1	1		100
		<u>FORCE ACCOUNT</u>								
	F/A01	Minor Contract Revisions	F.A.	0.5	0	0.5	1	0	-1	0
FORM 305	F/A02	MBE Incentive Payment	F.A.	1.0	#(1051.35)		1	(#1051.35)		100

Δ 80.55 Tons at Contractors Expense

SE 1/4 Sec. 36
T.2N., R.69W.
Sta. 124+85
Begin Approach to Project.

Sta. 124+94 to Sta. 127+53.17
Relocate field approach and connect to old road.



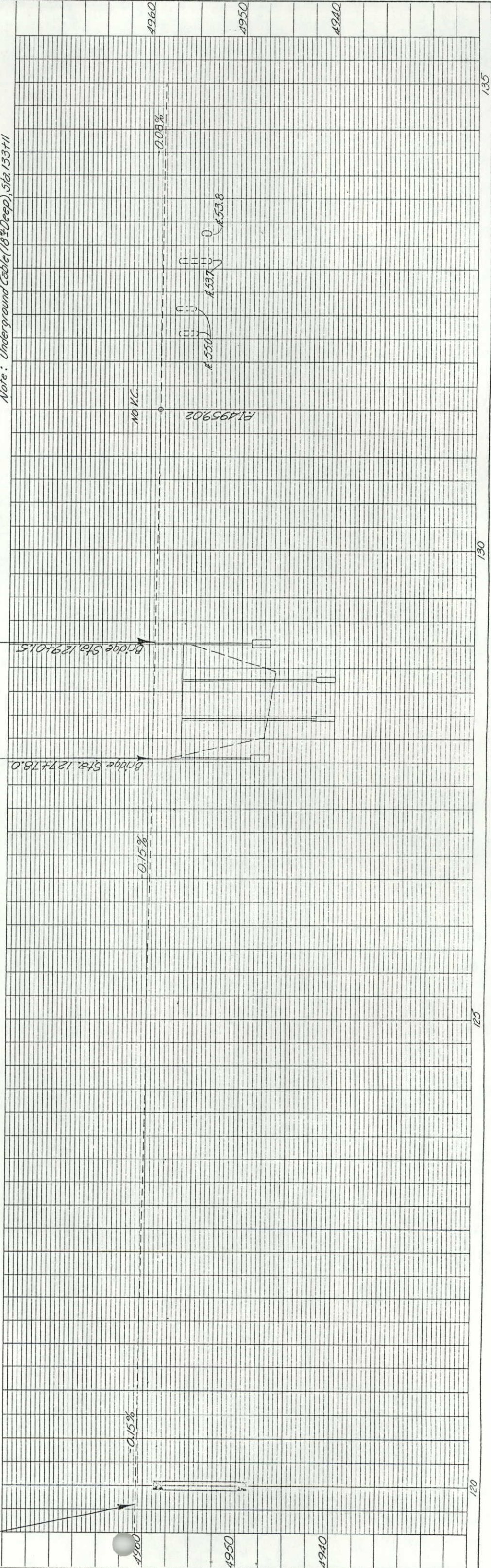
Nature of Work - Place Girder Brackets on Str. No. D-16-U, Overlay approaches and Str. No. D-16-U, replace Guard Rail, and relocate Field Approaches.

Grade 2" Higher

STA. 127+78 BEGIN MDO3-0052-23 =
Begin Major Structure No. D-16-U =
Sta. 127+78 on S0030(12) = M.P. 7.165
NE 1/4 Sec 1

STA. 129+01.5 END MDO3-0052-23
End Major Structure No. D-16-U =
Sta. 129+01.5 on S0030(12) = M.P. 7.188
NE 1/4, Sec. 1
T.1N., R.69W.

Note: Underground Cable (18" Deep), Sta. 133+11



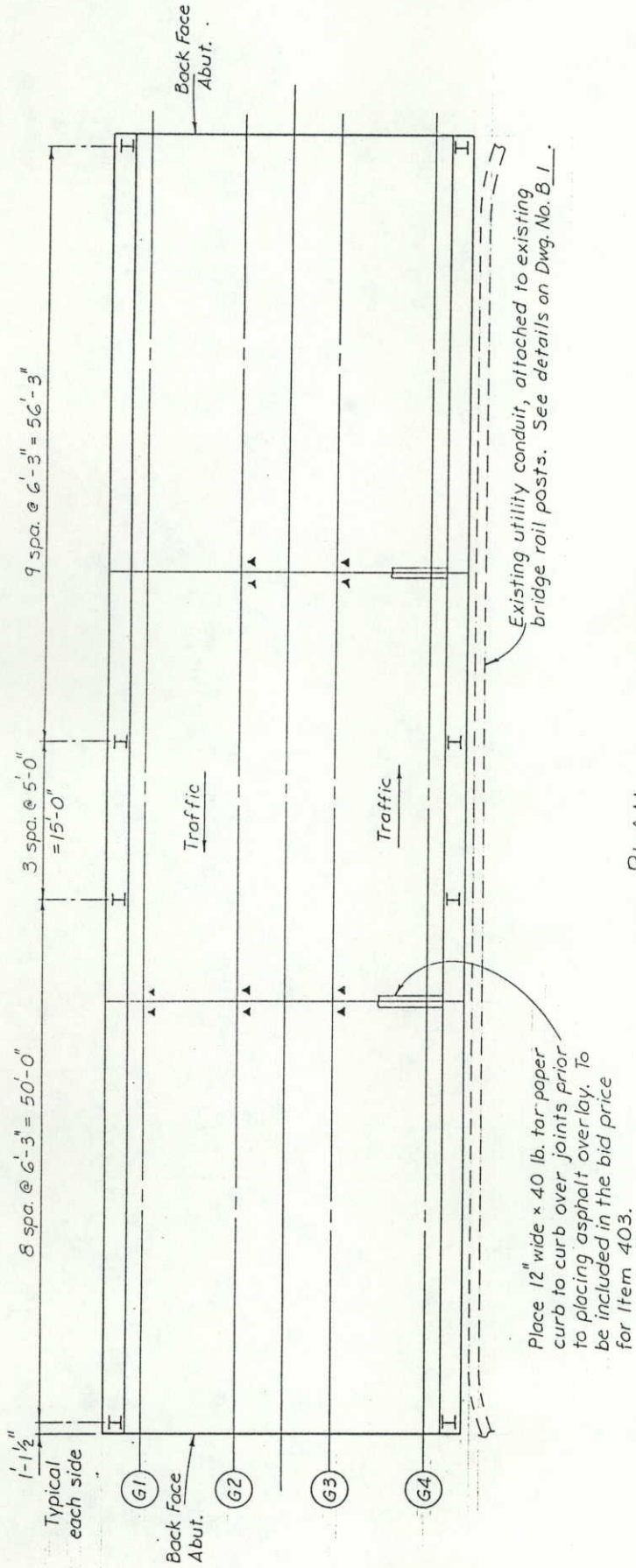
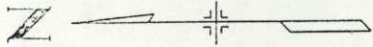
AS CONSTRUCTED	
NO REVISIONS	REVISED 4-21-87 VOID
FEDERAL ROAD REGION NO. VIII	DIVISION COLORADO
PROJECT NO. MDO3-0052-23	SHEET NO. 5
TOTAL SHEETS	

Original Scale: 1" = 50' Plan

T.2N., R.68W.
SW 1/4 Sec. 31

T.1N., R.68W.
NW 1/4, Sec. 6

DESIGNED BY	T.C.F.	01/86
CHECKED BY	D.J.S.	01/86
INITIAL DATE	T.C.F.	01/86
QUANTITIES BY	T.C.F.	01/86
CHECKED BY	D.J.S.	01/86



PLAN
▲ Girder Bracket Locations

AS CONSTRUCTED	
NO REVISIONS	4-21-87
REVISED	
VOID	

FED. ROAD REGION	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLO.	M.P.03-0052-23	7	

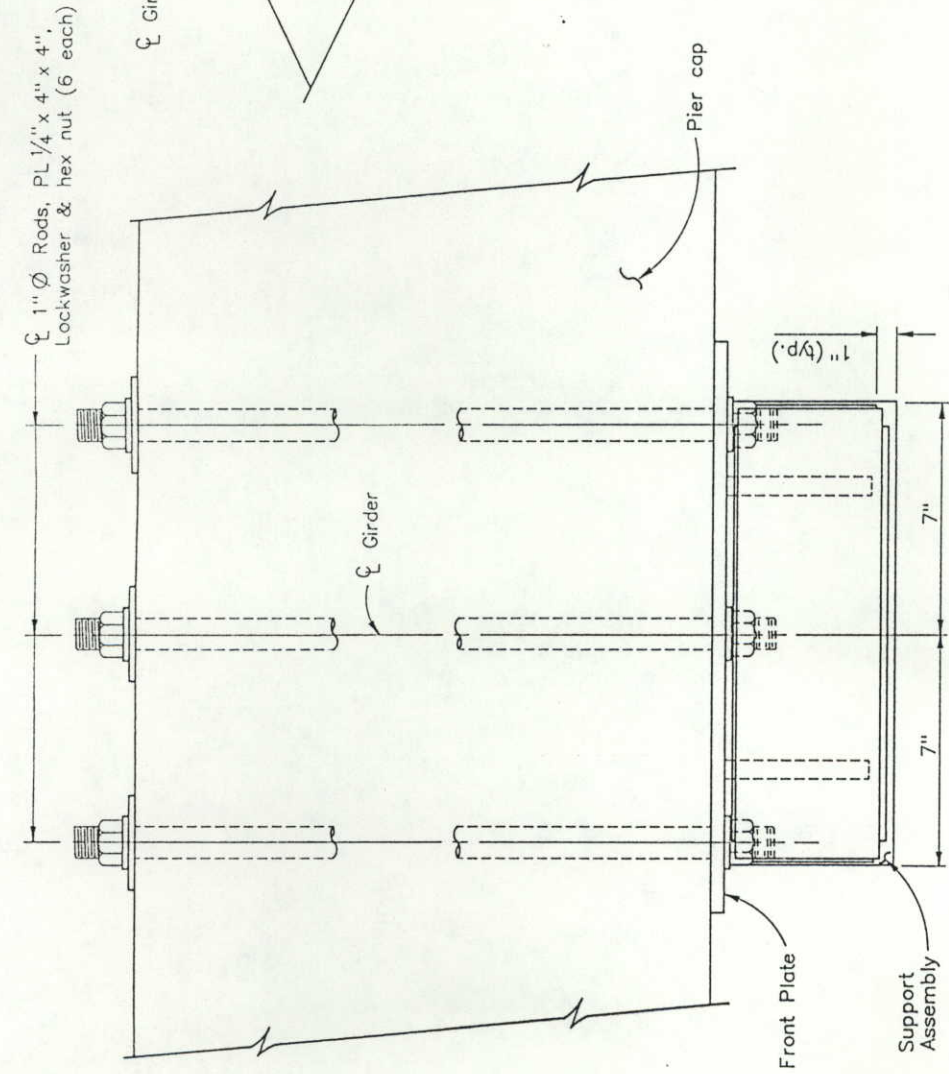
REVISIONS	

DIVISION OF HIGHWAYS

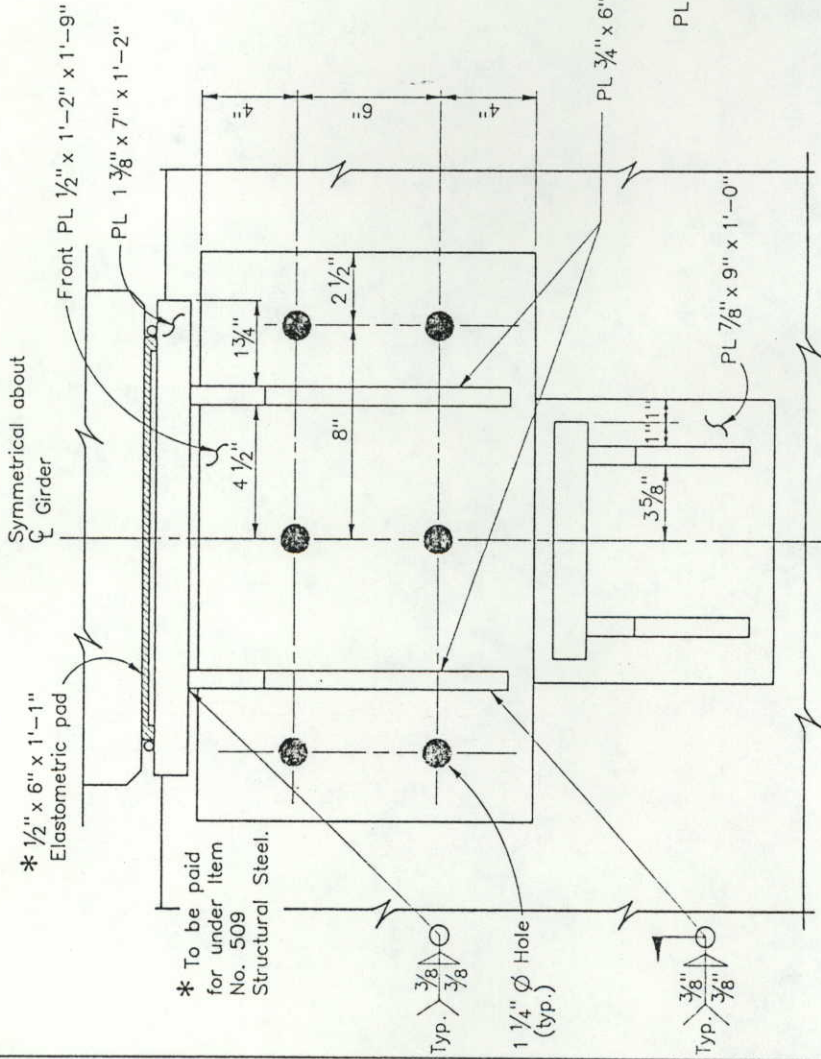
PLAN

DESIGNER	T. Fischer	STRUCTURE NUMBERS	D-1G-U
DETAILER	T. Fischer	DRAWING NUMBER	2 OF 4
		OF	4
		DRAWINGS	

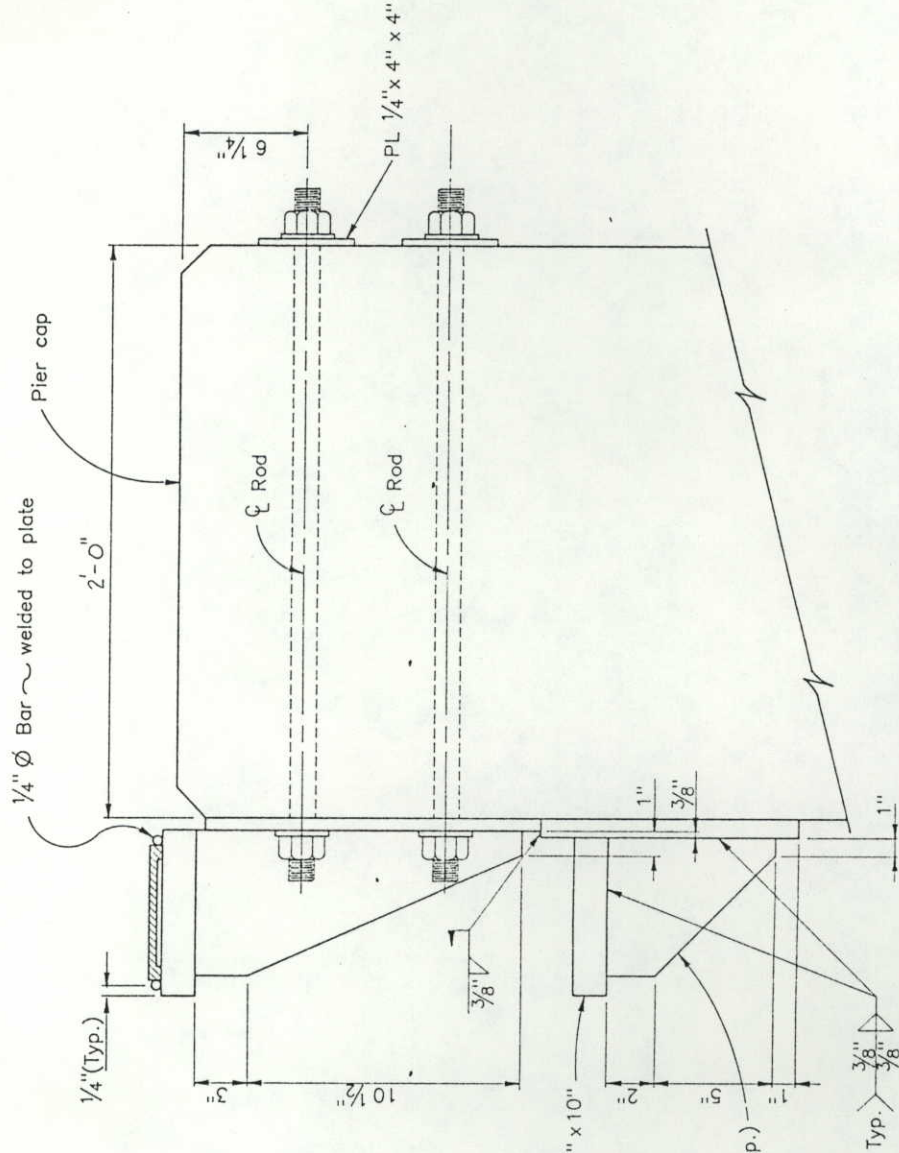
DESIGNED BY	T.C.F.	01-86
CHECKED BY	D.J.S.	01-86
INITIAL	DATE	
CHECKED BY	T.C.F.	01-86
QUANTITIES BY	D.J.S.	01-86
CHECKED BY	T.C.F.	01-86
DATE		



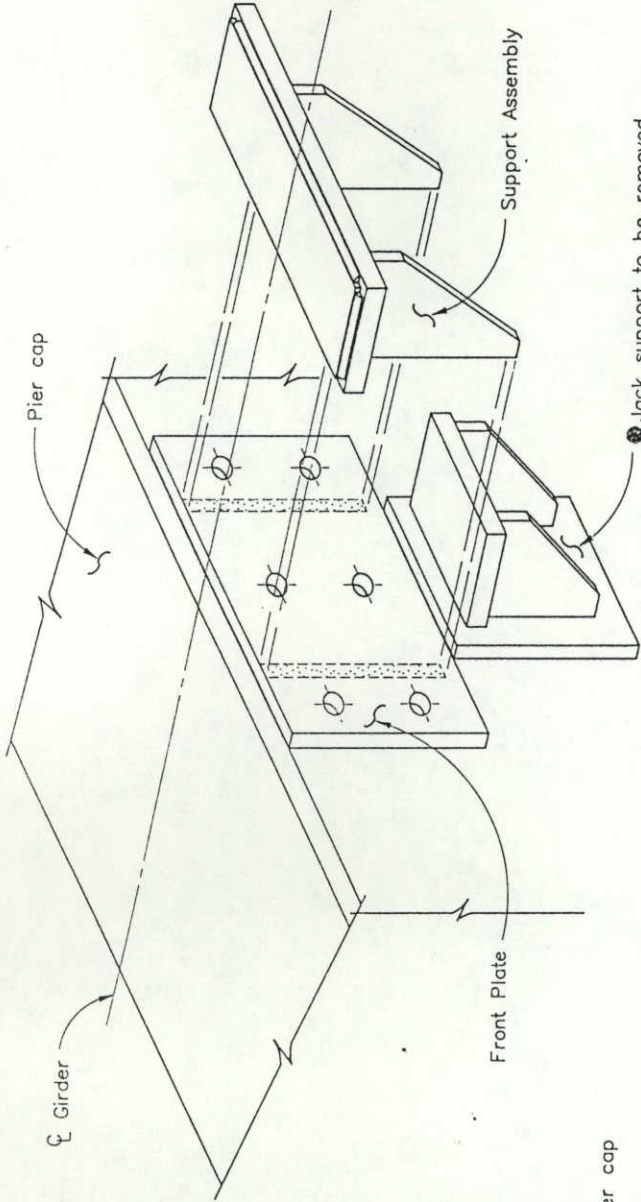
PLAN



ELEVATION



SECTION THRU PIER CAP



ISOMETRIC VIEW

SUGGESTED CONSTRUCTION PROCEDURE

1. LOCATE AND MARK CENTERLINE OF THE GIRDER ON THE PIER CAP.
2. MARK LOCATION OF BOLT HOLES ON PIER CAP, SEE ELEVATION VIEW AND SECTION THROUGH PIER CAP.
3. DRILL HOLES THROUGH PIER CAP AS SHOWN.
4. CUT HOLES IN THE PLYWOOD FORM TO MATCH THE HOLES IN THE PIER CAP.
5. REMOVE LOOSE CONCRETE AND CLEAN THE REINFORCING STEEL.
6. BOLT THE FORM IN PLACE AND RESTORE THE PIER CAP TO ITS ORIGINAL SECTION USING AN APPROVED GROUT, (DURACAL, ETC.)
7. ALLOW CURING TIME AS RECOMMENDED BY THE MANUFACTURER BEFORE REMOVING THE FORM.
8. USING THE FORM FOR A PATTERN, CUT THE BOLT HOLES IN THE FRONT PLATE.
9. ATTACH THE PLATES AND TIGHTEN THE BOLTS (100 LB.-FT. TORQUE).
10. RAISE THE SUPPORT ASSEMBLY UNTIL THE ELASTOMERIC PAD IS COMPRESSED 1/16" (200 psi x PAD AREA = JACKING FORCE).
11. FIELD WELD THE SUPPORT ASSEMBLY TO THE FRONT PLATE.
12. PAINT ALL STEEL AS DIRECTED BY THE ENGINEER.

AS CONSTRUCTED

NO REVISIONS 4-21-87 REVISED VOID

FED. ROAD REGION VIII

DIVISION COLO.

PROJ. NO. MP 03-0052-23

SHEET NO. 8

TOTAL SHEETS

DIVISION OF HIGHWAYS

GIRDER BRACKET DETAIL

Girder reaction (D.L. + L.L.) = 84.8 kips

DESIGNER T. Fischer

DETAILER T. Fischer

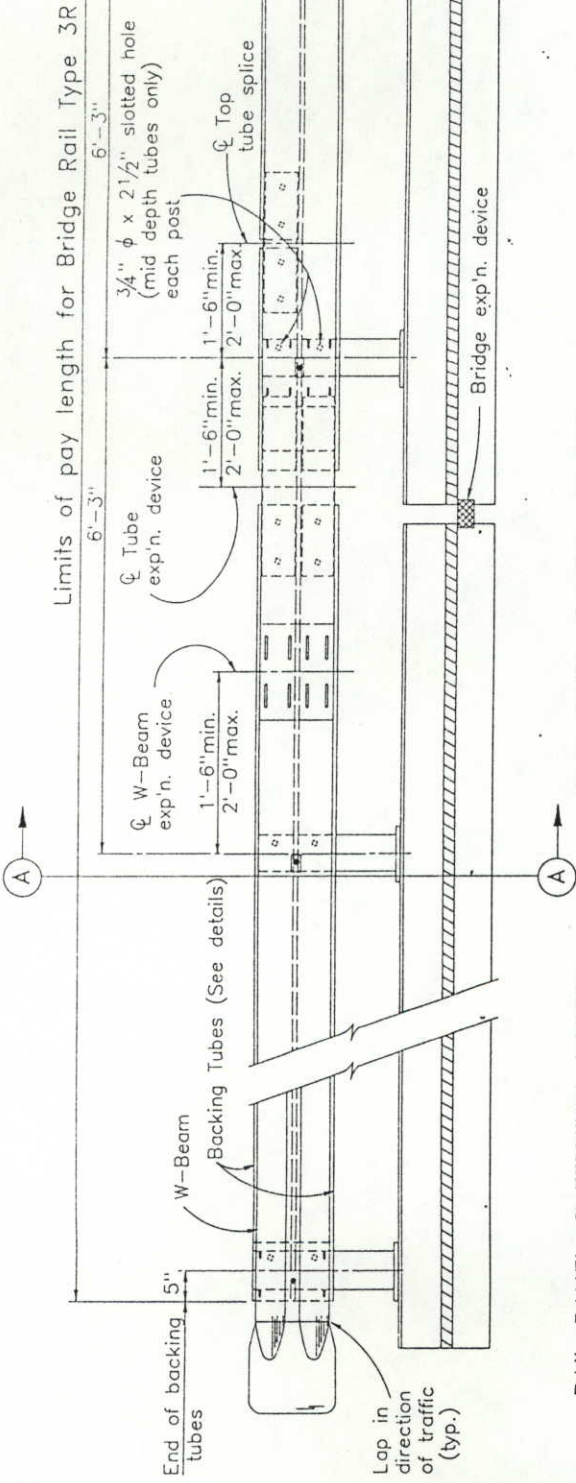
DRAWING NUMBER B 3 OF 4 DRAWINGS

G801

REVISION DATES 1/86

(PRELIMINARY STAGE ONLY)

DESIGNED BY	T.C.F.	01/86
CHECKED BY	D.J.S.	03/86
QUANTITIES BY	T.C.F.	03/86
CHECKED BY	D.J.S.	03/86



RAIL PANEL @ TERMINAL SECTION

(See roadway plans for ends requiring terminal section.)

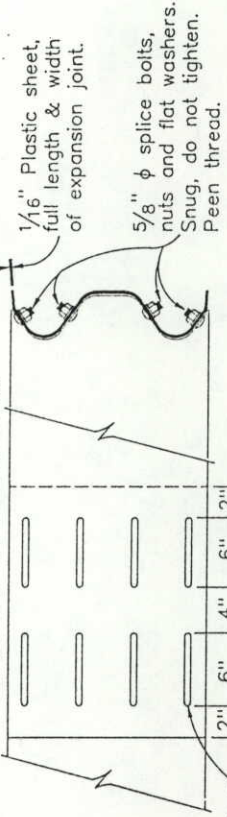


END DETAIL - BACKING TUBES

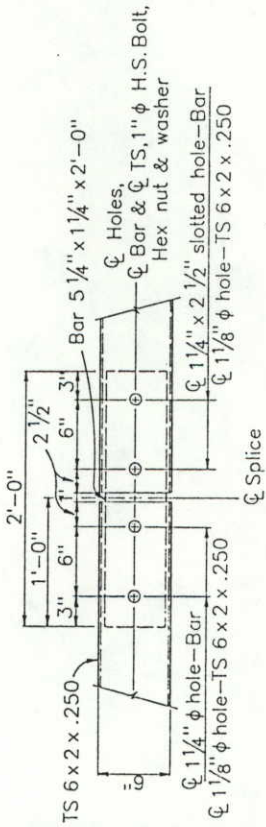
RAIL PANEL @ EXP'N. DEVICE

Flush on roadway side

ELEVATION - BRIDGE RAIL

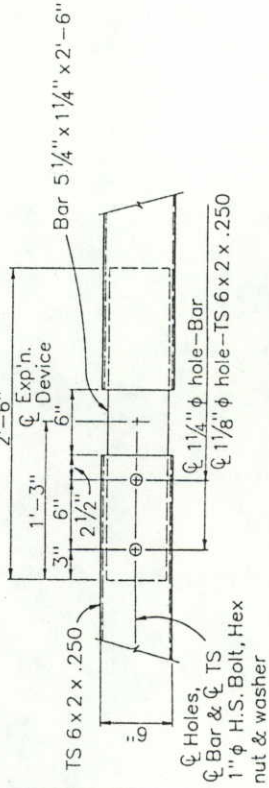


EXP'N. DEVICE (W-BEAM)



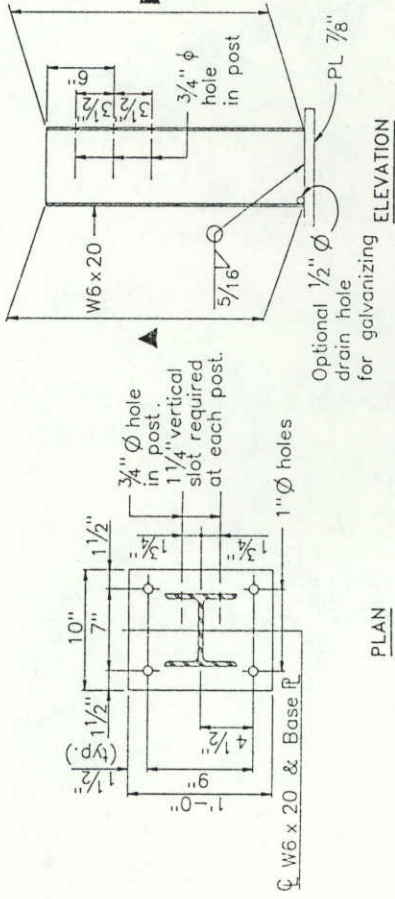
TUBE SPLICE

Top and bottom tube splices shall not be located together but staggered as shown.



BACKING TUBE @ EXP'N DEVICE

Req'd. near all bridge exp'n. joints as shown on the plans.



PLAN

OPTIONAL 1/2" phi drain hole for galvanizing ELEVATION

INFORMATION ONLY

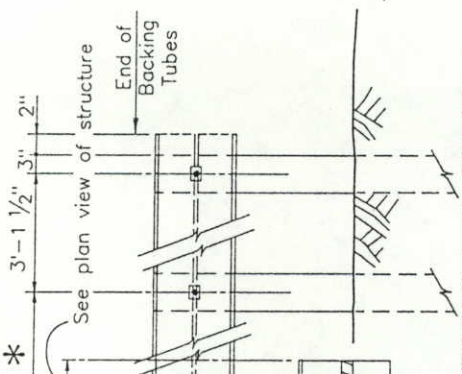
Description	Unit	Per Lin. Ft.
Structural Steel (Galvanized)	Lb.	45.0 Avg.
Bridge Rail Type 3R - W Beam	Lin.Ft.	1.0

Note: At each expansion device add 235 lb. of Structural Steel (Galvanized)

AS CONSTRUCTED

NO REVISIONS 4-21-87 REVISED VOID

Limits of pay length for Guard Rail Type 3. See Std. M-606-1.



NOTE: BACKING TUBES EXTENDED PAST BRIDGE TO BE INCLUDED IN ITEM 606 - BRIDGE RAIL TYPE 3R

POST DETAIL MEASUREMENTS

STR. NO.	▲	■	*
D-16-U	1'-5 3/4"	1'-6"	3'-1 1/2"

NOTES

ALL TUBES SHALL BE FABRICATED FROM ASTM A-500 GRADE B.

ALL POSTS SHALL BE FABRICATED FROM ASTM A-36 STEEL. ALL SPLICES AND EXPANSION DEVICES FOR TUBE SHALL BE FABRICATED FROM ASTM A572, GRADE 50. THE ABOVE MATERIAL, W-BEAM, AND ALL ANCHOR BOLTS AND MISCELLANEOUS BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH THE SPECIFICATIONS.

POSTS, BASE PLATES, ANCHOR BOLTS, MISCELLANEOUS BOLTS, NUTS, WASHERS, TUBES, TUBE EXPANSION DEVICES, TUBE SPLICES, END PLATES, W-BEAM, AND W-BEAM EXPANSION DEVICES SHALL BE INCLUDED IN ITEM 606 - BRIDGE RAIL TYPE 3R.

THE BACKING TUBES SHALL BE SHOP BENT OR FABRICATED TO FIT HORIZONTAL CURVE WHEN RADIUS IS LESS THAN 1500 FEET.

TUBES SHALL BE CONTINUOUS OVER NOT LESS THAN TWO POSTS.

POSTS SHALL BE PERPENDICULAR TO THE GRADE OF THE DECK.

CONTRACTOR SHALL PROVIDE TERMINAL SECTION (FLARED) WHEN NO APPROACH GUARD RAIL IS USED WITH THE COST INCLUDED IN ITEM 606 - BRIDGE RAIL, TYPE 3R. FOR DETAILS SEE STD. M-606-1.

FOR ADDITIONAL DETAILS, SEE STD. M-606-1.

OPTIONAL DRAIN HOLE FOR GALVANIZING MAY BE DRILLED, PUNCHED, OR CLIPPED LEAVING SMOOTH SURFACES AND TRANSITIONS. NO FLAME CUTTING OR AIR CARBON ARC GOUGING IS ALLOWED.

STRUCTURAL STEEL:

AASHTO M-183(ASTM A-36) $f_s = 20,000$ psi

AASHTO M-223(ASTM A-572) $f_s = 37,500$ psi
GRADE 50

COLD FORMED ASTM A-500 $f_s = 27,600$ psi
GRADE B

DIVISION OF HIGHWAYS

BRIDGE RAIL TYPE 3R

DESIGNER	T. Fischer	STRUCTURE	D-16-U
DETAILER	T. Fischer	NUMBERS	
DRAWING NUMBER	B 4	OF	4
DRAWINGS			