DIST. NO.	STATE	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
3	COLO	[illegible]	[illegible]	[illegible]

COLORADO
STATE HIGHWAY DEPARTMENT

PLAN AND PROFILE OF PROPOSED
COMB. S N FEDERAL AID PROJECT NO. 163 (2) & 231-A (2)
STATE HIGHWAY NO. ~~6~~ 50
PUEBLO COUNTY

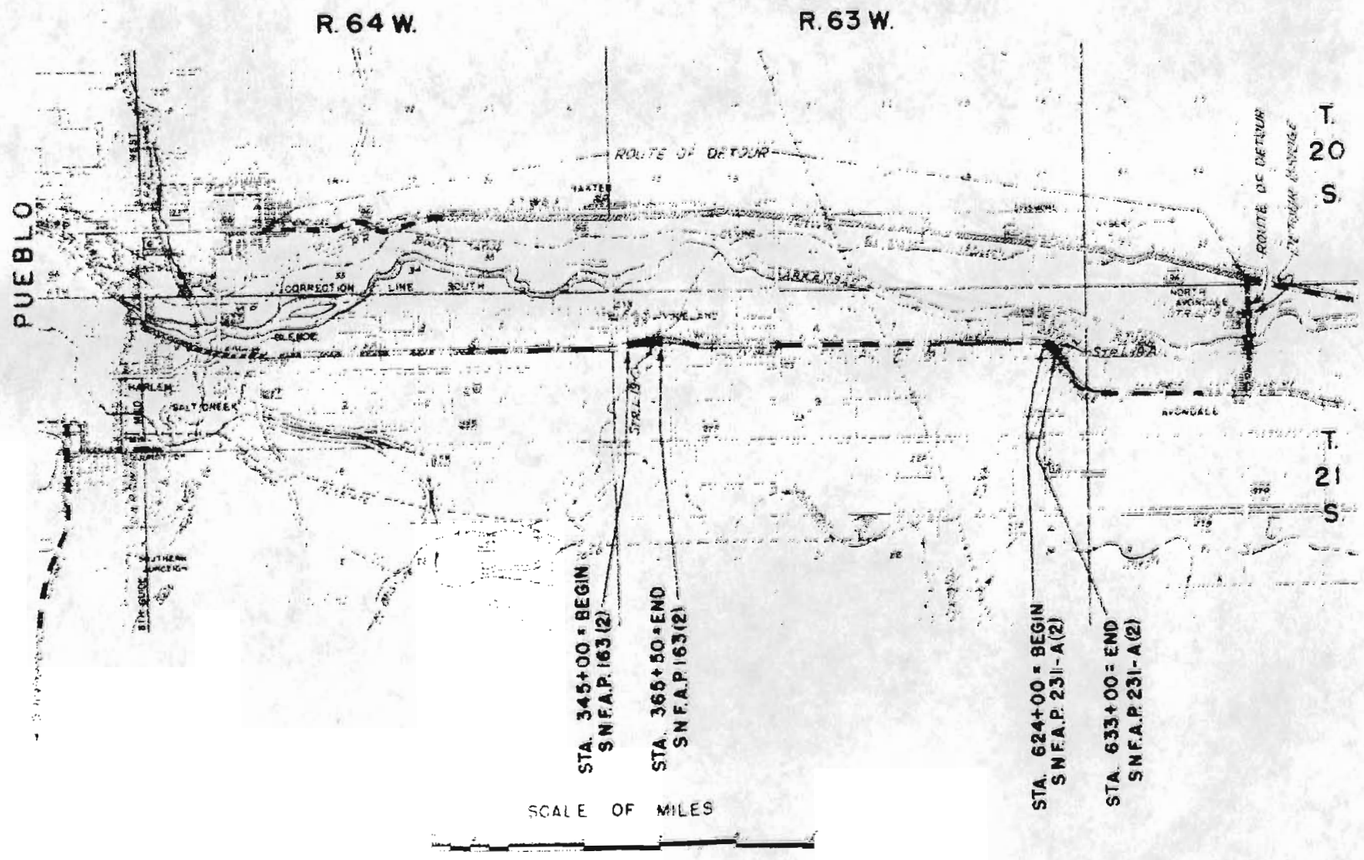
SCALES OF ORIGINAL TRACINGS
ON PLAN 1 IN. = 100 FT.
ON PROFILE 1 IN. = 100 FT. HORIZONTAL
1 IN. = 10 FT. VERTICAL
GRADE LINE ON PROFILE IS SHOWN AS GRADE OF FINISHED ROAD
GROSS LENGTH OF PROJECT [illegible]
NET LENGTH OF PROJECT [illegible]

INDEX OF SHEETS

CONVENTIONAL SIGNS

Center Line
Right of Way Line
Township or Range Line
Section Line
Quarter Section Line
Barbed Wire Fence
Combination Wire Fence
Telephone Line

INACTIVE

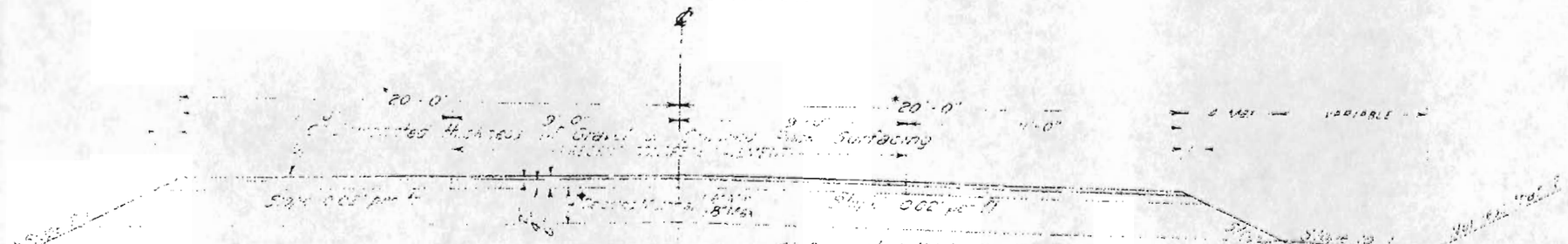


Note:
[illegible] Sta 12 [illegible] Project go over the plan and profile with the [illegible] the Railway and representatives of this Department.
I. D. Bell — Division Engineer — Pueblo
R. B. Tillson — Resident Engineer — Pueblo

2-24-41

TYPICAL CROSS SECTION OF IMPROVEMENT AND SUMMARY OF QUANTITIES

TYPICAL SECTION



VARIATIONS OF TYPICAL SECTION AND LIMITS OF PAVEMENT REMOVAL

Station to Station	Existing Pavement	Grading	Select Material	Surfacing Bituminous
315+00 to 350+00		* None		
350+00 to 352+00		Typical Section (Widening Overall)		2
352+00 to 355+02.8	Bituminous		6	126
355+47.3 to 365+50	" "		6	126
365+50 to 367+50		(Widening)	6	126
[illegible]	[illegible]	[illegible]	18	126
[illegible]				126
[illegible]				[illegible]

* Where [illegible] is to be used to add 3" of [illegible] surfacing, [illegible] and closing of [illegible] required

SUMMARY OF APPROXIMATE QUANTITIES

No.	Item	Unit	SN-AP 163(2) Roadway Excl. Bridge	SN-AP 163(2) Bridge	SN-AP 163(2) Total	SN-AP 223-A(2) Roadway Excl. Bridge	SN-AP 223-A(2) Bridge	SN-AP 223-A(2) Total	Totals
[illegible]	[illegible] Project	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]
[illegible]	[illegible]								
[illegible]	[illegible]								
[illegible]	[illegible] Bridge								
[illegible]	[illegible]								
16	Removing, Assembling & Setting Roadway	Each	3		3				3
17	Removing & Resetting Timber Guard Posts	"	40		40	40		40	80
19	Removing Concrete Pavement	Sq. Yd.	2800		2800	1150		1150	3950
19b	Removing & Resetting Gates	Each	1		1				1
19d	Removing Fence	Lin. Ft.	3100		3100	1800		1800	4900
30	Unclassified Excavation	Cu. Yd.	4500		4500	4500		4500	9000
30	Unclassified Borrow Excavation		200		200	100		100	300
42a	Dry Rock Excavation (Str.)		5		5	5		5	20
42b	Dry Common Excavation (Str.)		0	0.5	0.5	20	0.5	20.5	21
42c	Wet Rock Excavation (Str.)		5	75	80	10		10	90
42d	Wet Common Excavation (Str.)		75	0.5	75.5	180		180	255.5
42e	Mechanical Tamping	Hr.	15	130	145	5		5	150
18c	Station Yard Overhaul	Sta. Yd.	9500		9500	6000		6000	15500
18d	Yard Mile Overhaul	Yd. Mi.	50		50				50
18e	Grave[illegible] Crushed Rock Surfacing	Ton	2000		2000	1100		1100	3100
42a	Untreated Bridge Timber	M ft bm					6.6	6.6	6.6
42b	Treated Bridge Timber	"		1.2	1.2				1.2
46a	Class A Concrete	Cu. Yd.	25	379	404		23	23	427
46c	Class C Concrete (Handrails)			2	2		8	8	10
47	Reinforcing Steel	Lb.	2300	47300	49600		2000	2000	51,600
48	Structural Steel	Lb.		278000	278000		33900	33900	311,900
530	18" Corrugated Metal Culvert Pipe	Lin. Ft.	30		30				30
60a	Treated Timber Piling	" "		1436	1436				1436
66	Riprap Enclosed in Wire Netting	Cu. Yd.		295	295				295
710	6" Perforated Corrugated Metal Pipe Underdrain	Lin. Ft.				670		670	670
76c	Barbed Wire Fence with Metal Posts	"	2600		2600	1800		1800	4400
76f	Combination Wire Fence with Metal Posts	"	500		500				500
76g	Barbed Wire Gates	Each	1		1				1
76h	Driveway Gates	"	1		1				1
81a	Project Markers	"	1		1	1		1	2
81c	Right of Way Markers	"	9		9	4		4	13
89a	Drain Pipe (Concrete Floor) 3" x 5'-0"	"		16	16				16
89b	Drain Pipe (Concrete Floor) 3" x 1'-6"	"					4	4	4

GENERAL NOTES

[illegible]

FED. ROAD DIST. NO.	STATE	S N-FED.AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO	163-(21)	3	

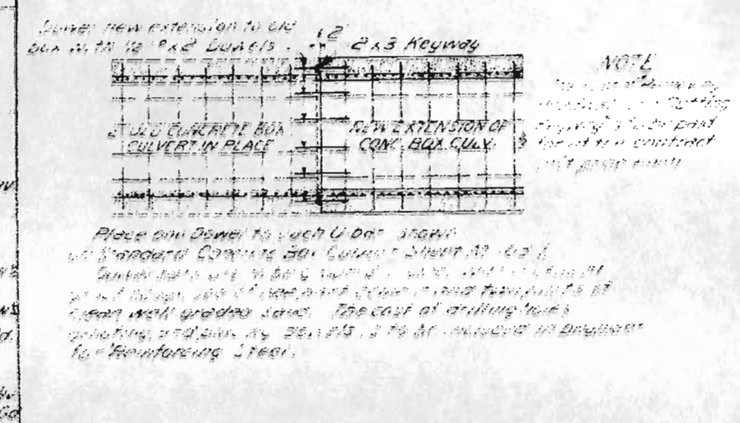
LIST OF STRUCTURES

STATION	DESCRIPTION	REMOVE STRUCTURE NO.	UNCLASSIFIED EXCAVATION CU. YDS. EXCAV.	UNCLASSIFIED EXCAVATION CU. YDS. EMB.	UNCLASS. DITCH EXCAV. CU. YDS.	STRUCTURAL EXCAVATION CU. YDS.	GRAVEL OR CR. ROCK SURFACING TONS	CONCRETE CU. YDS. CLASS "A"	CONCRETE CU. YDS. CLASS "B"	REINF. STEEL LBS.		CORRUGATED METAL CULVERT PIPE LIN. FT. 18"		MISCELLANEOUS
345+00	Project Marker													1- Project Marker
344+00 to 345+60	Ditch Change on Rt.				20									
347+05	Remove Sign on Rt.	1												
348+50	Remove Sign on Lt.	1												
348+70	Remove Sign on Lt.	1												
349+25	Remove Sign on Lt.	1												
349+40 to 350+00	Ditch Change on Rt.				10									
350+20	Remove 12"x18" C.M.P. Side Drain (2 Conc. Hdwls.), Rd. Appr., & C.M.P. Side Drain Lt.	1	20			10	10					30		
350+35	Remove Sign on Lt.	1												
351+45	Remove Sign on Lt.	1												
352+00 to 357+80	Berm Reservoir on Lt.			200										
352+00 to 357+928	Remove Concrete Pavement.													Rem. 1484 Sq. Yds. Conc. Pav.
352+95	Road Approach on Rt.			10			10							
353+05	Remove Sign on Rt.	1												
353+26	Extend Pres. 2'x2' C.B.C. 5 Lt. & 7 Rt., Ditches, Rem. Hdwls. & Cut Keyways.				10	26		8.86		*872				Rem. Hdwls. Cut 2 Keyways
356+15	Extend Pres. 3'x3' C.B.C. 9 Lt. & 7 Rt. Ditches, Rem. Hdwls. & Cut Keyways.				50	50		15.21		*415				Rem. Hdwls. Cut 2 Keyways
357+19 to 357+90	Remove & Reset Guard Posts Lt. & Rt.													Rem. & reset 4 Timb. Gd. Posts.
357+928 to 359+473	Rem. Pres. & Superstructure. Remodel Pres. Abuts. & place New Superstructure.					(See Summary of Quantities)								
359+473 to 359+50	Remove Concrete Pavement													Rem. 1006 Sq. Yds. Conc. Pav.
359+50 to 360+25	Remove & Reset Guard Posts Lt. & Rt.													Rem. & Reset 20 Timb. Gd. Posts.
360+50 to 362+50	Drain Ditch & Dike on Lt.				80									
365+50	Remove Concrete Pavement, Approach to Project		180				300							Remove 1000 Sq. Yds. Conc. Pav.
TOTAL		8	200	210	170	85	320	2449		22.97		30		

* Structural Excavation is estimated to be 95% Common and 5% Rock. Each of which is estimated to be 10% Dry and 90% Wet.

* Includes Dowel Bars.

DETAIL OF JOINT FOR CONCRETE BOX CULVERT EXTENSION



FENCING REQUIREMENTS

STATION	SIDE	REMOVE FENCE Lin. Ft.	BUILD BARBED WIRE Lin. Ft.	BUILD COMBINATION Lin. Ft.		GATES: RA. REB'D FE. RE. No.	GATES: DRIVEWAYS No.	GATES: RE. MOVE & RE. BUILD No.
344+00 to 357+80	Lt.	1,415						
344+00 to 357+70	Lt.		1,400					
344+00 to 352+87	Rt.	900	900					
345+10	Lt.							*1
350+20	Lt.					1		
352+95	Rt.						1	
353+03 to 357+45	Rt.	450		460				
360+35 to 363+18	Rt.	285						
360+75 to 363+18	Rt.		250					
TOTAL		3,050	2,550	460		1	1	1

* Gate to be rebuilt in Cross Fence outside of Right of Way.

ROW MARKERS

STATION	SIDE	NO.
345+00	Lt. & Rt.	2
351+00	Lt.	1
352+00	Lt.	1
356+00	Rt.	1
357+00	Rt.	1
357+50	Lt.	1
362+00	Rt.	1
363+18	Rt.	1
TOTAL		9

SURFACING PLAN

It is estimated that material for Gravel Surfacing for the Project is available in the vicinity of the pits indicated in the following tabulation. Estimated quantities involved in this operation are shown below.

No alteration of the Surfacing Plan as here outlined will be allowed without written permission from the Department.

MATERIAL TO BE PLACED	SOURCE	QUANTITY: TONS AVAILABLE	QUANTITY: TONS USED	OVERHAUL TON MILES
350+00 to 352+00	Surfacing Pit within R.O.W. Sta. 346± to 349±.	Ample	142	
352+00 to 357+928		"	747	
359+47.3 to 365+50		"	760	
Rd. Appr. & Appr. to Proj.		"	320	
	TOTAL		1969	

LIST OF STRUCTURES

STATION	DESCRIPTION	REMOVE STRUCTURE NO.	UNCLASSIFIED EXCAVATION CU. YDS. EXCAV.	EMB.	UNCLASS. DITCH EXCAV. CU. YDS.	STRUCTURAL EXCAVATION CU. YDS. *	GRAVEL OR CR. ROCK SURFACING TONS			PERF. C.M.P. UNDERDRAIN Lin. Ft. 6"	MISCELLANEOUS
624+00	Project Marker & Appr. to Project		200				50				1 - Project Marker
624+00 to 628+20	6" Perf. C.M.P. Underdrain & Outlet Ditch Lt.				5	130				420	
624+00 to 626+50	6" Perf. C.M.P. Underdrain & Outlet Ditch Rt.				5	80				250	
628+24 to 628+95	Remove & Reset Guard Posts Lt. & Rt.										Remove & Reset 20 Timber Guard Posts
628+979 to 629+62	Remove Pres. Br. Superstructure Remodel Pres. Abuts. & place New Superstructure			(See Summary for Quantities)							
628+00 to 628+979	Remove Concrete Pavement.										Rem. 396 Sq. Yds. Conc. Pav.
629+65 to 630+36	Remove & Reset Guard Posts Lt. & Rt.										Remove & Reset 20 Timber Guard Posts
629+62 to 630+50	Remove Concrete Pavement.										Rem. 176 Sq. Yds. Conc. Pav.
633+00	Approach to Project.		50				50				
TOTAL			250		10	210	100			670	

* [illegible]

SURFACING PLAN

It is estimated that material for Gravel Surfacing for the Project is available in the vicinity of the pits indicated in the following tabulation. Estimated quantities involved in this operation are shown below.

No alteration of the Surfacing Plan as here outlined will be allowed without written permission from the Department.

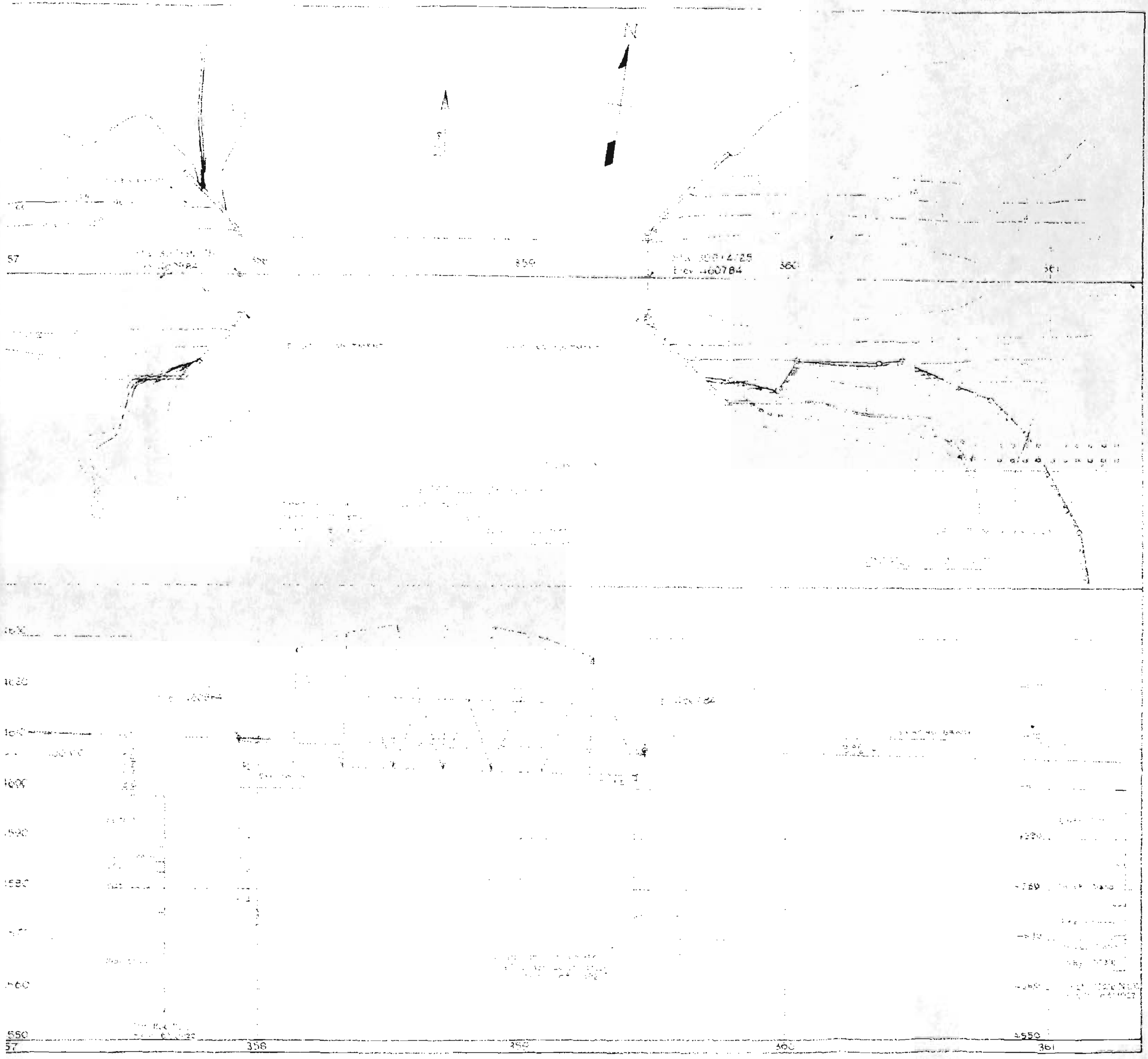
MATERIAL TO BE PLACED	SOURCE	QUANTITY TONS AVAILABLE	QUANTITY TONS USED	OVERHAUL TON MILES
624+00 to 625+00	Surfacing Pit 500 ft.		126	
625+00 to 628+979	Lt. of Sta. 625+00		502	
629+621 to 630+50			111	
630+50 to 633+00			178	
Appr. to Project			100	
	TOTAL		1017	

FENCING REQUIREMENTS

STATION	SIDE	REMOVE FENCE Lin. Ft.	BUILD BARBED WIRE Lin. Ft.	
622+ to 628+85	Rt.	680	680	
625+ to 628+85	Lt.	590	610	
629+70 to 632+70	Lt.	300	315	
629+70 to 631+20	Rt.	180	160	
TOTAL		1,750	1,765	

R.O.W. MARKERS

STATION	SIDE	NO.
630+00	Lt. & Rt.	2
633+00	Lt. & Rt.	2
TOTAL		4



SUMMARY OF QUANTITIES FOR ENTIRE BRIDGE

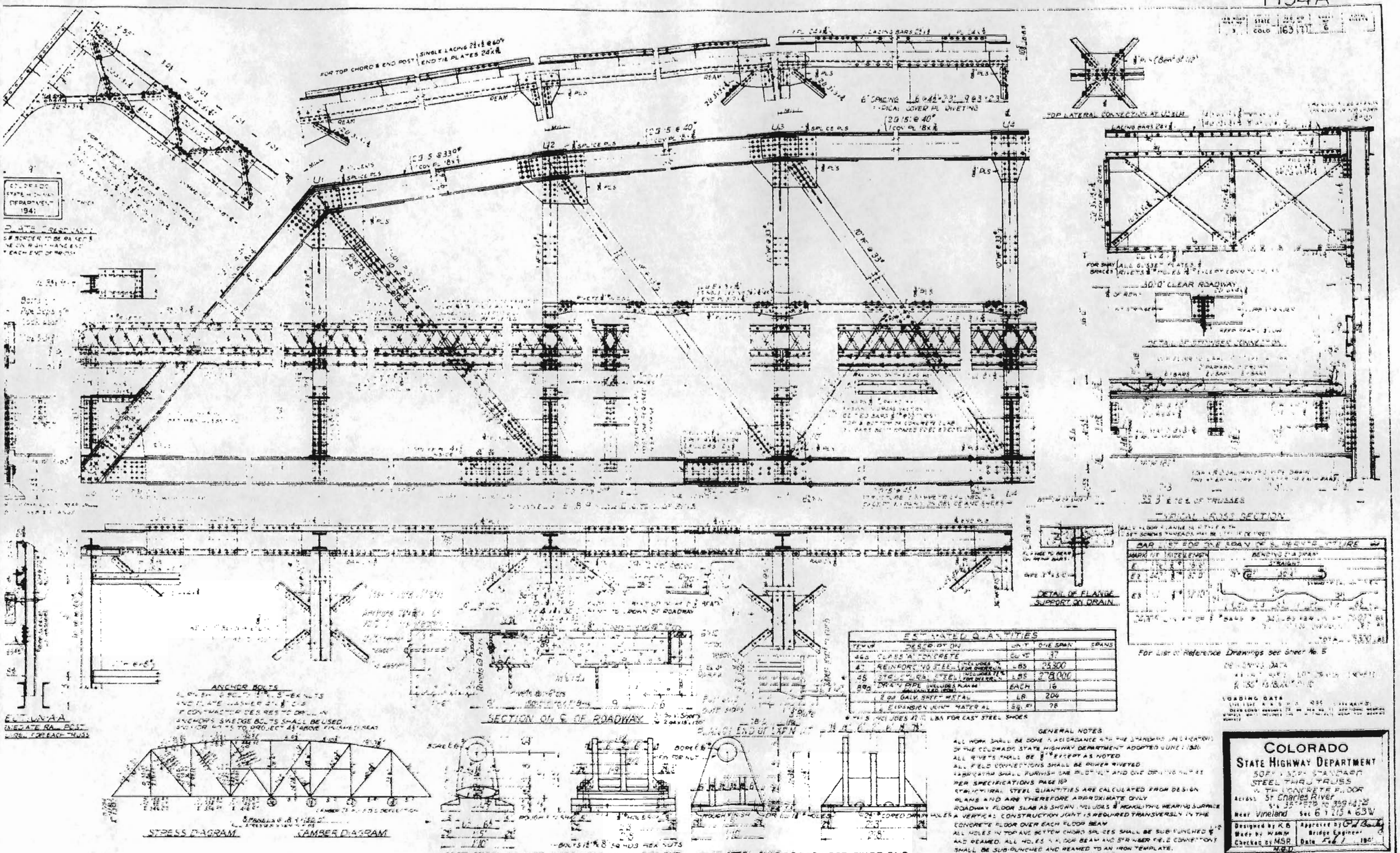
Item	Description	Quantities
[illegible]	Removal of [illegible] Portions of Old Structure	[illegible]
[illegible]	Dry Rock Excavation	[illegible]
[illegible]	Dry Common Excavation	[illegible]
[illegible]	▲ Wet Rock Excavation	[illegible]
[illegible]	▲ Wet Common Excavation	[illegible]
[illegible]	Mechanical Tamping	[illegible]
[illegible]	Treated Bridge Timber	[illegible]
[illegible]	Class A Concrete	[illegible]
[illegible]	Class A [illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	Treated Timber Piling	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

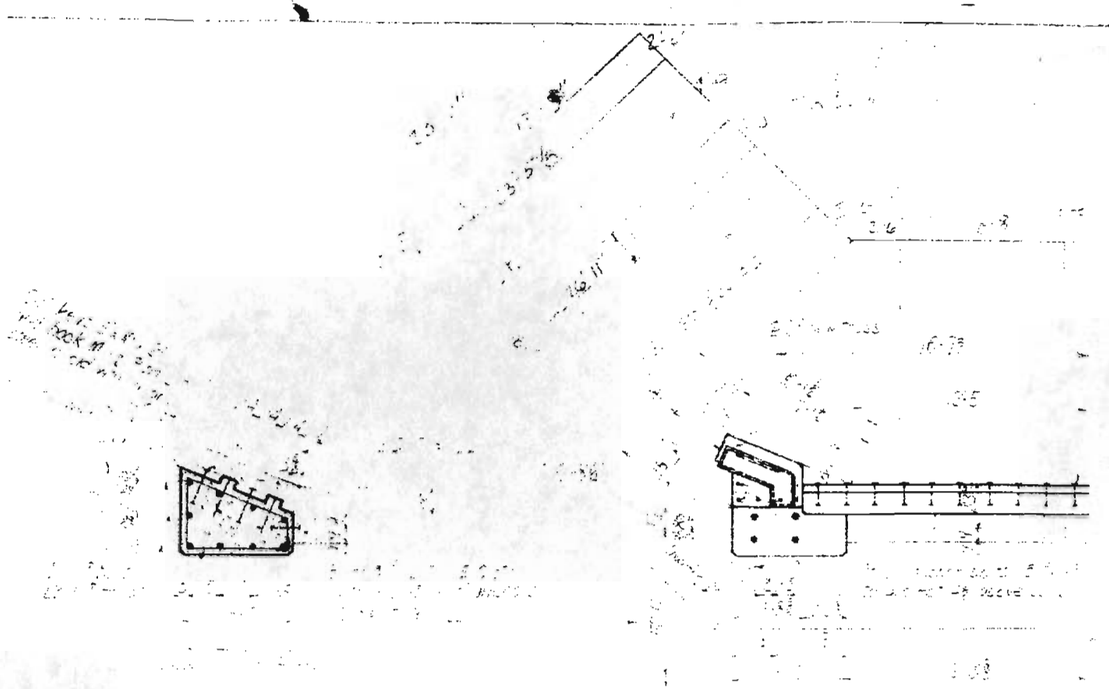
MECHANICALLY TAMPED BACKFILL

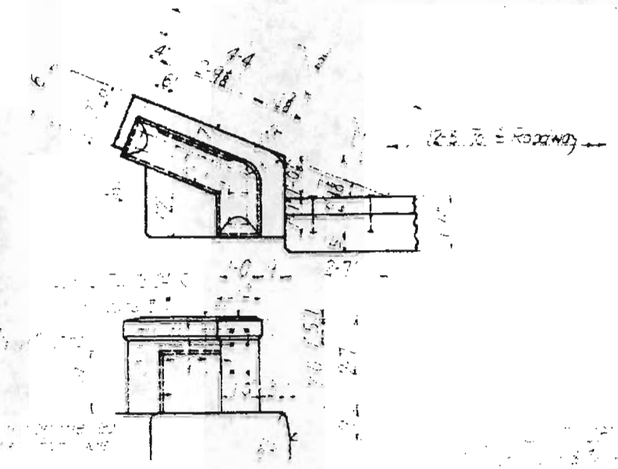
COLORADO
STATE HIGHWAY DEPARTMENT

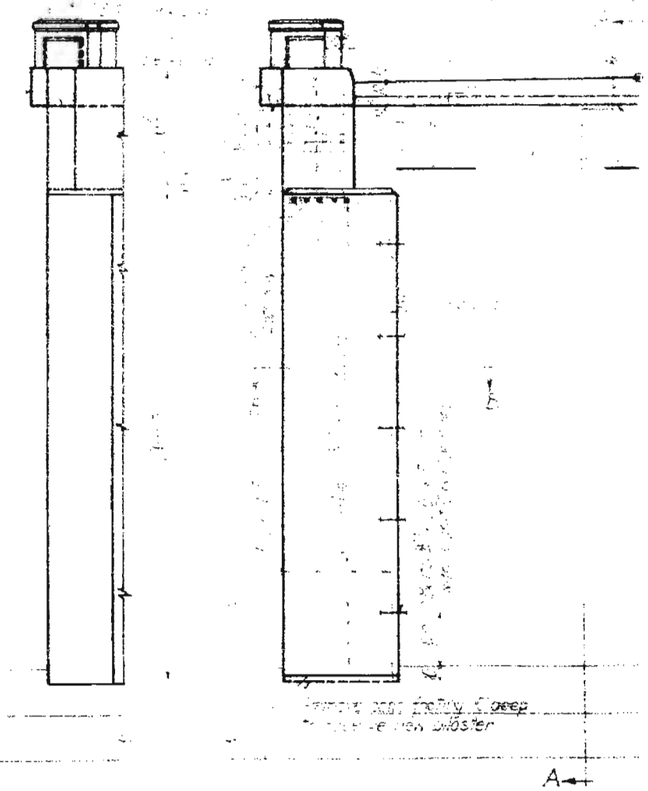
CENTRAL [illegible] AND

[illegible] Feb 12 1941


SECTION ON ℄ OF ROADWAY
TYPICAL TRUSS SECTION
TOP LATERAL CONNECTION AT U3 U4
DETAIL OF FLANGE SUPPORT ON DRAIN
STRESS DIAGRAM
CAMBER DIAGRAM
CAST STEEL ROCKER REQUIRED EXPANSION END
CAST STEEL SHOE - 2 REQUIRED FIXED END
ANCHOR BOLTS
30'-0" CLEAR ROADWAY
ESTIMATED QUANTITIES
GENERAL NOTES
COLORADO
STATE HIGHWAY DEPARTMENT
STEEL THRU TRUSS
WITH CONCRETE FLOOR
St Charles River
Near Vineland
STRUCTURE NO L-19-C







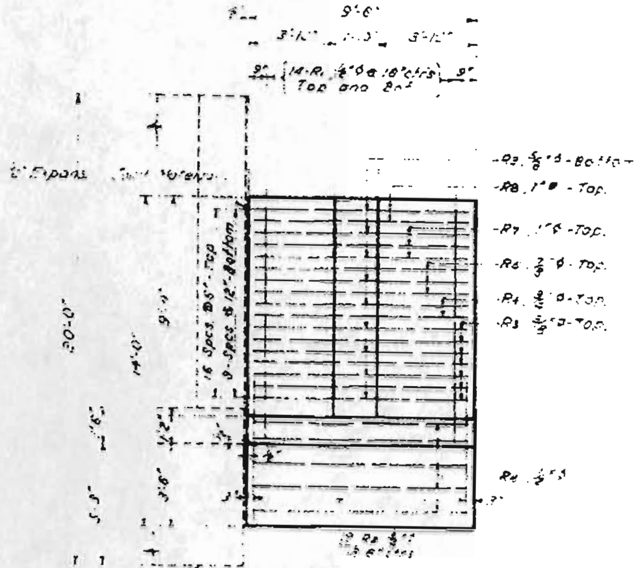
HALF ELEVATION

SECTION A-A

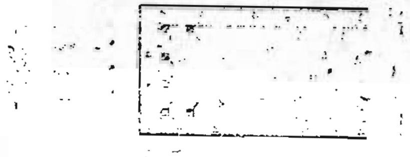
COLORADO
STATE HIGHWAY DEPARTMENT

REVISIONS

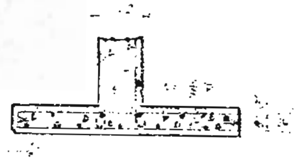
DIST. NO.	STATE	F.A.P.	SHEET NO	TOTAL SHEETS
3	COLO	163(2)	8	

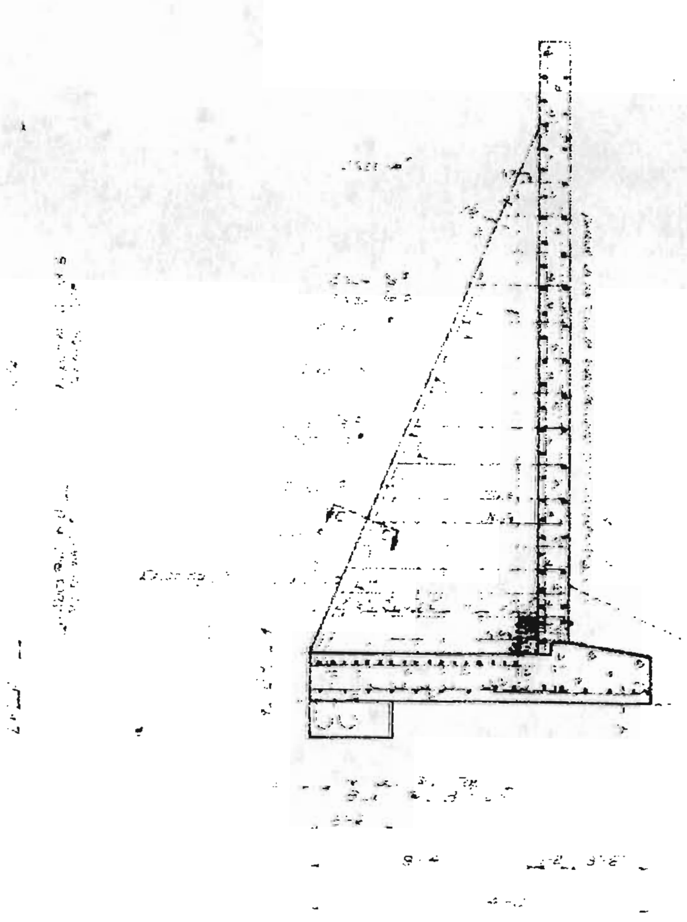


PLAN

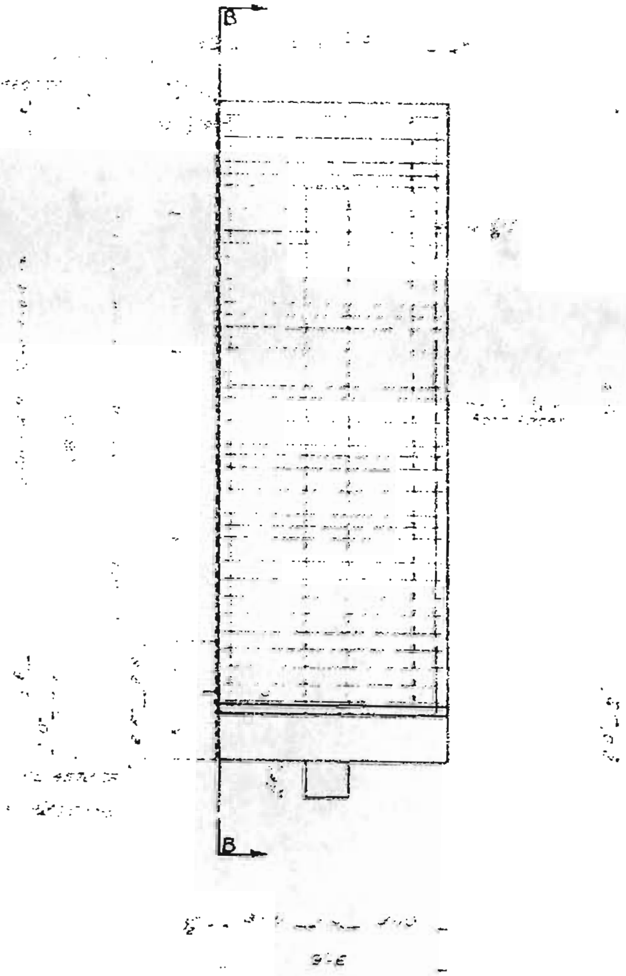


SECTION C-C





SECTION B-B



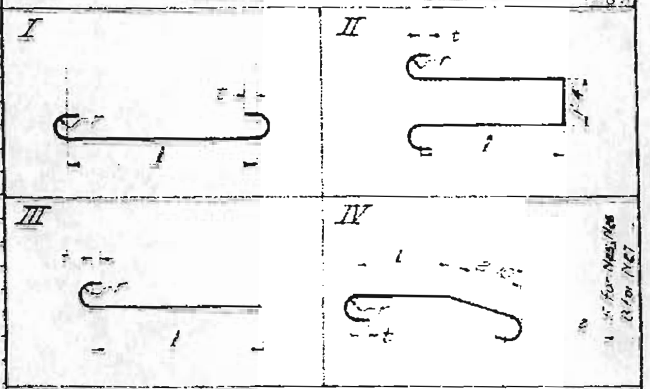
ELEVATION

For List of Reference Drawings see Sheet No. 5

BAR LIST

MARK	SIZE	NO REQD	LENGTH	TYPE	l	r	t
[illegible]	5/8"φ	4	10'-3"	I	8'-7"	2½	2
[illegible]	½"φ	[illegible]	25'-1	Str.			
[illegible]			6'-0		8"		
[illegible]	1"φ	[illegible]	by 1'-3" to	II	by 7½" to	2"	2
[illegible]			7'-3"		7'-3½"		
[illegible]			18'-3"		7'-9"		
[illegible]	¾"φ	[illegible]	by 1'-9 to	II	by 5" to	2	2"
[illegible]			22'-4"		9'-10"		
[illegible]	[illegible]	2	8'-2"	III	6'-10"	4"	3½"
[illegible]	[illegible]	2	10'-7"	II	9'-3"	4"	3½"
[illegible]	7/8"φ	2	2[illegible]-6	II	11'-8	3½	3"
[illegible]	7/8"φ	2	15'-3	III	14'-1	3½	3"
[illegible]	7/8"φ	2	18'-10	III	7'-8	3½	3
[illegible]	5/8"φ	2	22'-[illegible]	II	[illegible]-4	3½	3"
[illegible]	1"φ	2	30'-4	IV	24'-2	5"	4½
[illegible]	1"φ	2	31'-4"	IV	[illegible]	5	4½
[illegible]	[illegible]	2	18'-4"	III	9'-6	4½	4
R	½"φ	[illegible]	[illegible]	Str.			
[illegible]	[illegible]	[illegible]	[illegible]	II	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
[illegible]	[illegible]	2	[illegible]-4	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
R₁	[illegible]	5	9'-[illegible]	[illegible]			
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

BENDING DIAGRAMS



BAR SUMMARY

905	⅝"φ @ [illegible]	943
154	1"φ @ [illegible]	[illegible]
[illegible]	[illegible]	278
[illegible]	[illegible]	[illegible]
338	[illegible]	[illegible]
32	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

[illegible] 26

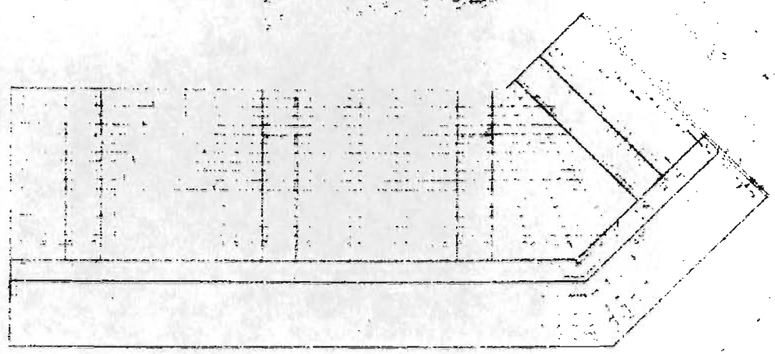
Total [illegible] 40 [illegible]

LOADING DATA
[illegible]

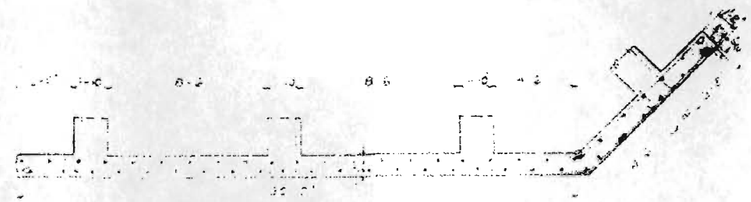
DESIGNING DATA
[illegible] CONCRETE
[illegible] 1800#sq.in. n=12

STRUCTURE NO. L-19-C

COLORADO
STATE HIGHWAY DEPARTMENT
150' x 30' STEEL THRU TRUSS
WING EXTENSION
NORTH SIDE OF WEST ABUT
Across ST CHARLES RIVER
Sta 357+90.15 to 359+47.25
Near Vineland Sec 6 T 21 S R 63 W
Designed by MSD
Made by FAF & HCC
Checked by
Approved by E J Bailey
Bridge Engineer
Date: Feb 1st 1941.



ELEVATION



SECTION

BAR SUMMARY

BAR SIZE	LENGTH	TYPE	
[illegible]	[illegible]	[illegible]	[illegible]

BAR LIST

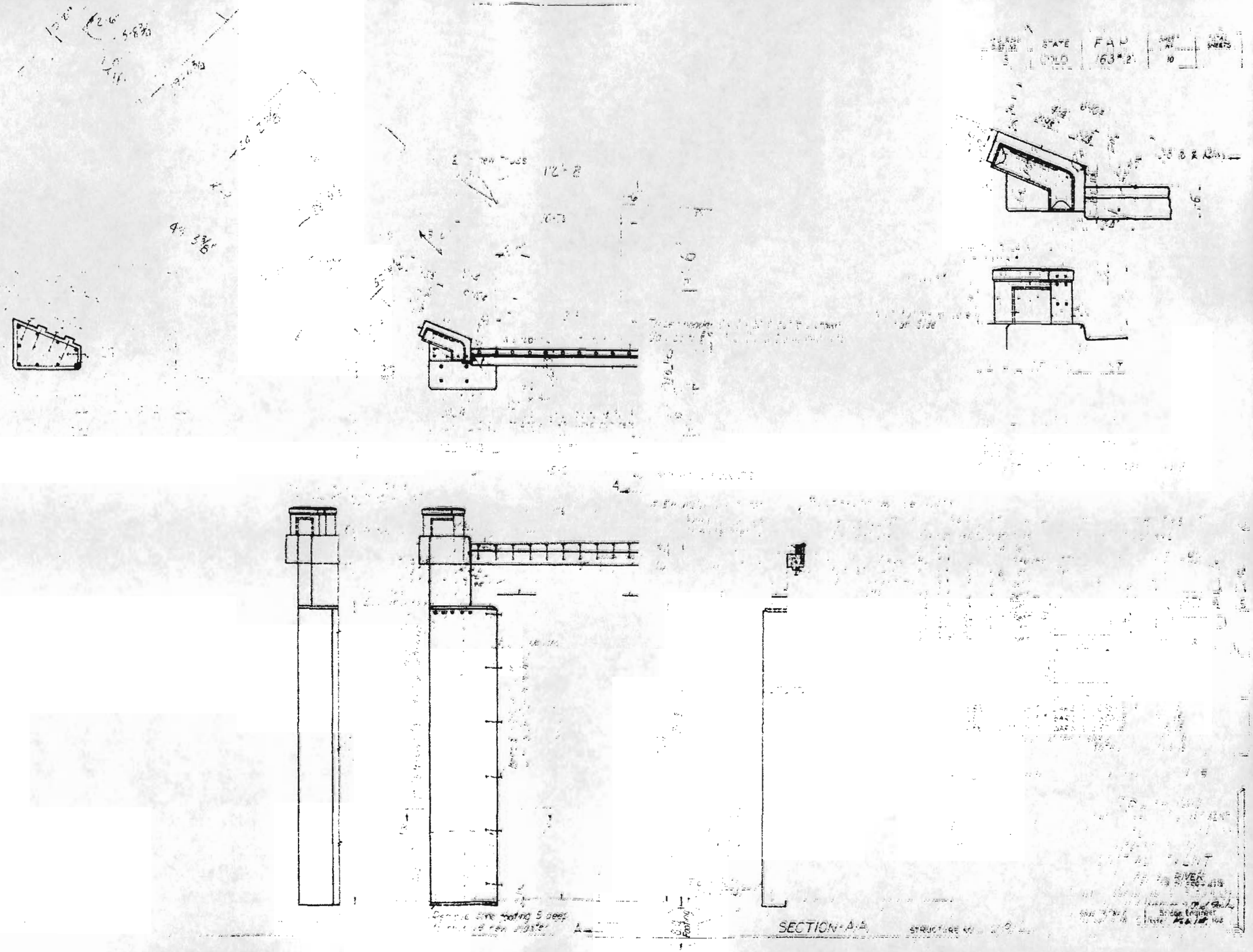
BAR SIZE	LENGTH	TYPE	
[illegible]	[illegible]	[illegible]	[illegible]

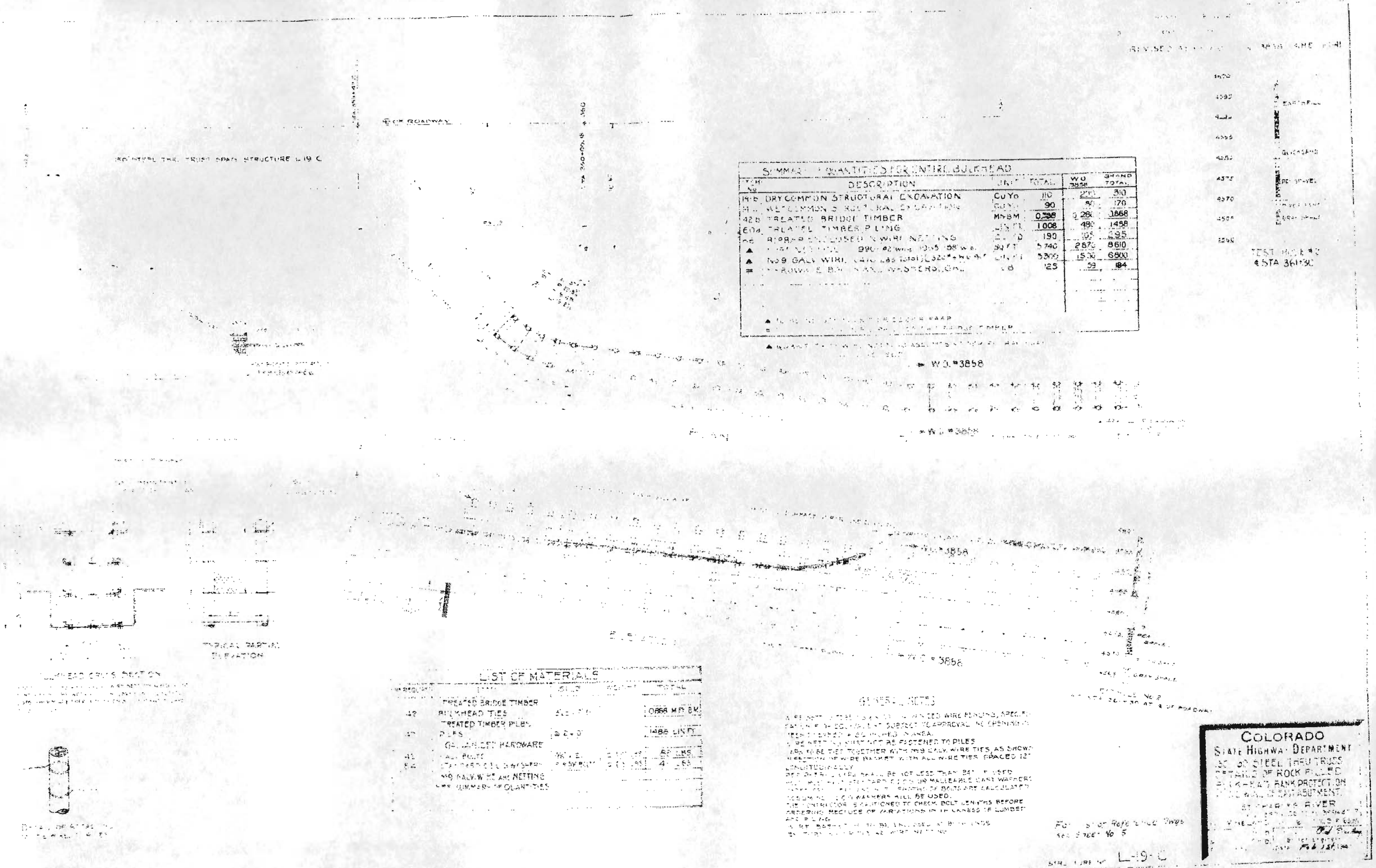
FED. AID PROJ. NO.	STATE	F.A.P.
[illegible]	COLO.	[illegible]

COLORADO
STATE HIGHWAY DEPARTMENT
150'x30' STEEL THRU TRUSS
WING EXTENSION
SOUTH SIDE - NORTH ABUTMENT

FOR LIST OF REFERENCE DRAWINGS SEE SHEET No. 5

STRUCTURE NO. L-19-C


STATE
OHIO
FAP
163
SECTION A-A
Footing



SUMMARY OF QUANTITIES FOR ENTIRE BULKHEAD

ITEM No	DESCRIPTION	UNIT	TOTAL	W.O. 3858	GRAND TOTAL
1106	DRY COMMON STRUCTURAL EXCAVATION	CU YD	110	270	380
1106	WET COMMON STRUCTURAL EXCAVATION	CU YD	90	80	170
428	TREATED BRIDGE TIMBER	MFBM	0.588	0.280	0.868
604	TREATED TIMBER PILING	LIN FT	1.008	480	1.488
606	RIPRAP ENCLOSED IN WIRE NETTING	CU YD	190	105	295
▲	[illegible]	SQ FT	5,740	2,870	8,610
▲	No 9 GALV WIRE [illegible]	LIN FT	5,300	1,500	6,800
■	[illegible]	LB	125	59	184

▲ [illegible] BASKET

■ [illegible] TIMBER

▲ [illegible] ASSUMED [illegible]

W.O. #3858

W.O. #3858

W.O. #3858

TYPICAL PARTIAL ELEVATION

LUMBER CROSS SECTION

[illegible]

[illegible]

LIST OF MATERIALS

QUANTITY	ITEM	SIZE	WEIGHT	TOTAL
	TREATED BRIDGE TIMBER			0.868 MFBM
42	BULKHEAD TIES	[illegible]		
	TREATED TIMBER PILES			1.488 LIN FT
42	PILES	@ 2'-0"		
	GALVANIZED HARDWARE			
42	[illegible] BOLTS	[illegible]	[illegible]	[illegible] LBS
84	[illegible]	[illegible]	[illegible]	[illegible] LBS
	No 9 GALV WIRE AND NETTING			
	[illegible] SUMMARY OF QUANTITIES			

GENERAL NOTES

A BULKHEAD [illegible] WIRE NETTING, SPECIFIED [illegible] SUBJECT TO APPROVAL [illegible] OPENINGS [illegible] IN AREA.

[illegible] AS FASTENED TO PILES.

[illegible] TIES TOGETHER WITH No 9 GALV. WIRE TIES, AS SHOWN [illegible] OF WIRE BASKET WITH ALL WIRE TIES SPACED 12" LONGITUDINALLY.

[illegible] LESS THAN 24" [illegible] USED.

[illegible] MALLEABLE CAST WASHERS [illegible] OF BOLTS ARE CALCULATED [illegible] WASHERS WILL BE USED.

[illegible] TO CHECK BOLT LENGTHS BEFORE ORDERING, BECAUSE OF VARIATIONS IN THE LENGTH OF LUMBER [illegible]

[illegible] WIRE NETTING

[illegible] Sheet No 5

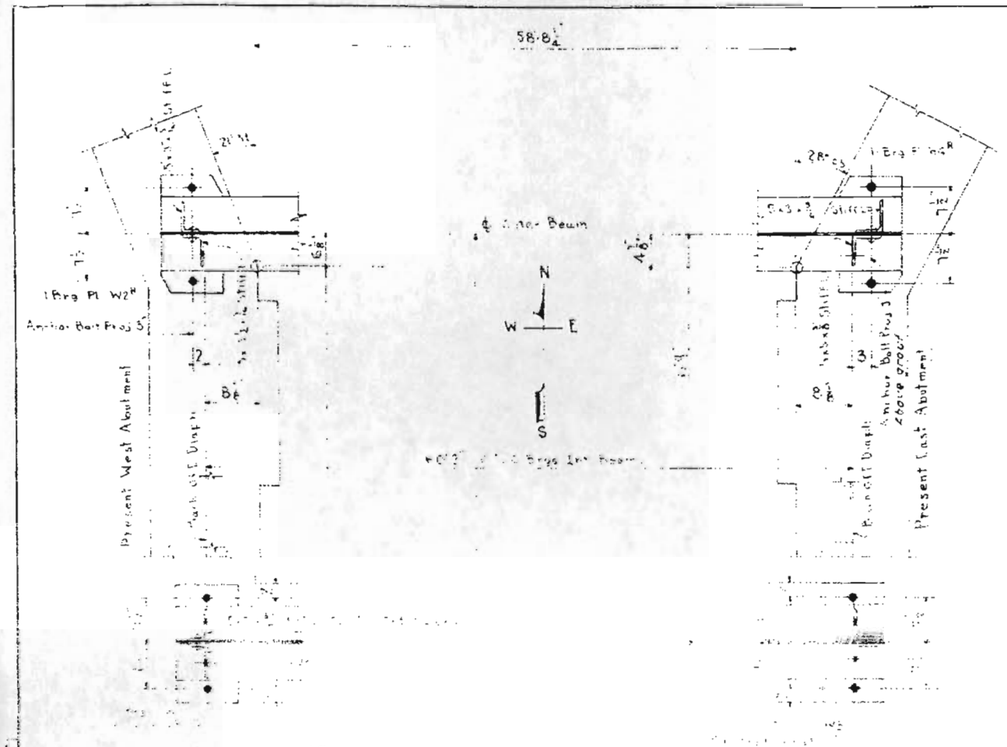
STRUCTURE NO. L-19-C

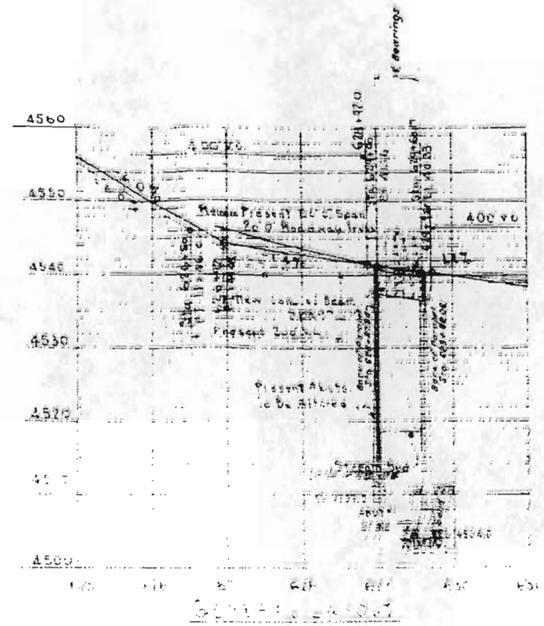
COLORADO
STATE HIGHWAY DEPARTMENT
[illegible] STEEL THRU TRUSS
[illegible] OF ROCK FILLED
[illegible] BANK PROTECTION
[illegible] ABUTMENT
[illegible] RIVER

REVISIONS

12-5-40 Revised Grade & Quantities

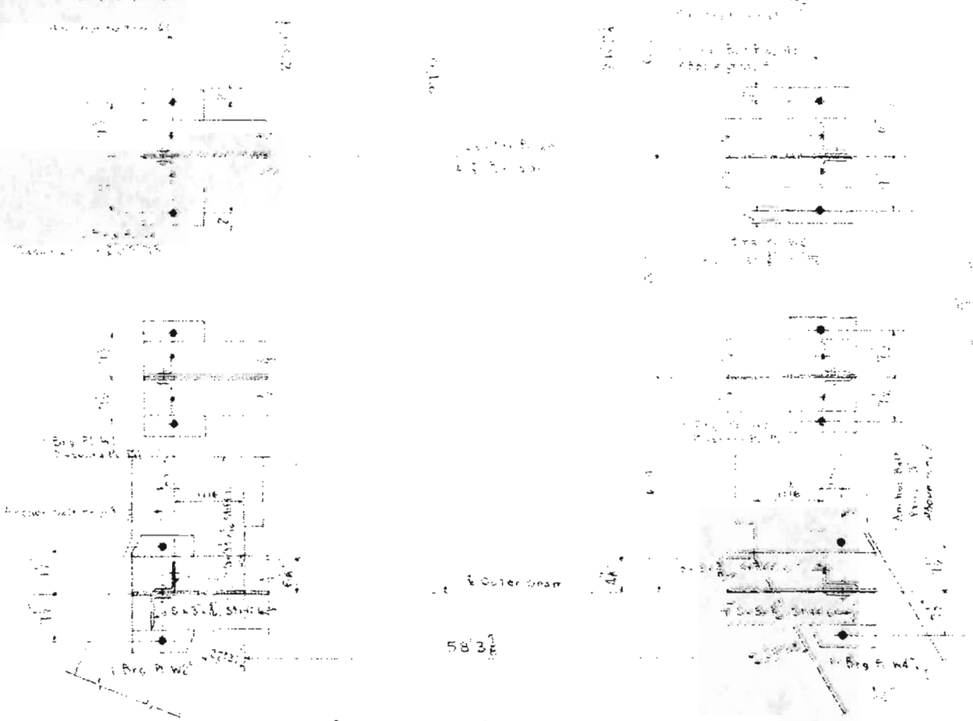
FED. ROAD DIST. NO.	STATE	F A P	SHEET NO.	TOTAL SHEETS
3	COLO.	231 A (2)	12	





Summary Of Quantities - Except Detour Bridge

Item No	Description	Unit	Superstruct	West Abut	East Abut	Total
11a	Removal and Altering Portions of Present Structure	Lump Sum				
14b	Dry Common Excavation (Str)	Cu. yd		25	25	50
14c	Mechanical Tamping	Per. Hr.		6	6	12
[illegible]	Class A Concrete	Cu. yd	70	8	5	83
[illegible]	Class A Concrete (Paving)	Cu. yd	6	5	1	12
47	Reinforcing Steel (Plus [illegible])	Lb.	11810	75	100	11985
48	Structural Steel (Plus [illegible])	Lb.	73750	40	40	73830
89c	Drain Pipe [illegible]	Each	4			4
42c	Untreated Bridge Timber	M.F.B.M.		120	180	300
	1" Exp. Joint Material	Sq. Ft.	6			6
	2" Exp. Joint Material	Sq. Ft.	6			6
	3" Exp. Joint Material	Sq. Ft.	30			30
	[illegible]	Lb.	215			215



Structural Steel Layout

Details Of Expansion Device - One Bridge

Holes to Receive Bolts to Be Drilled In the Field and Bolts Grouted In

20 Anchor Bolts

General Notes

All rivets to be [illegible]. All rivets to be power driven. Field paint [illegible] coats of [illegible]. All hand rails to be built accurately to line and grade.

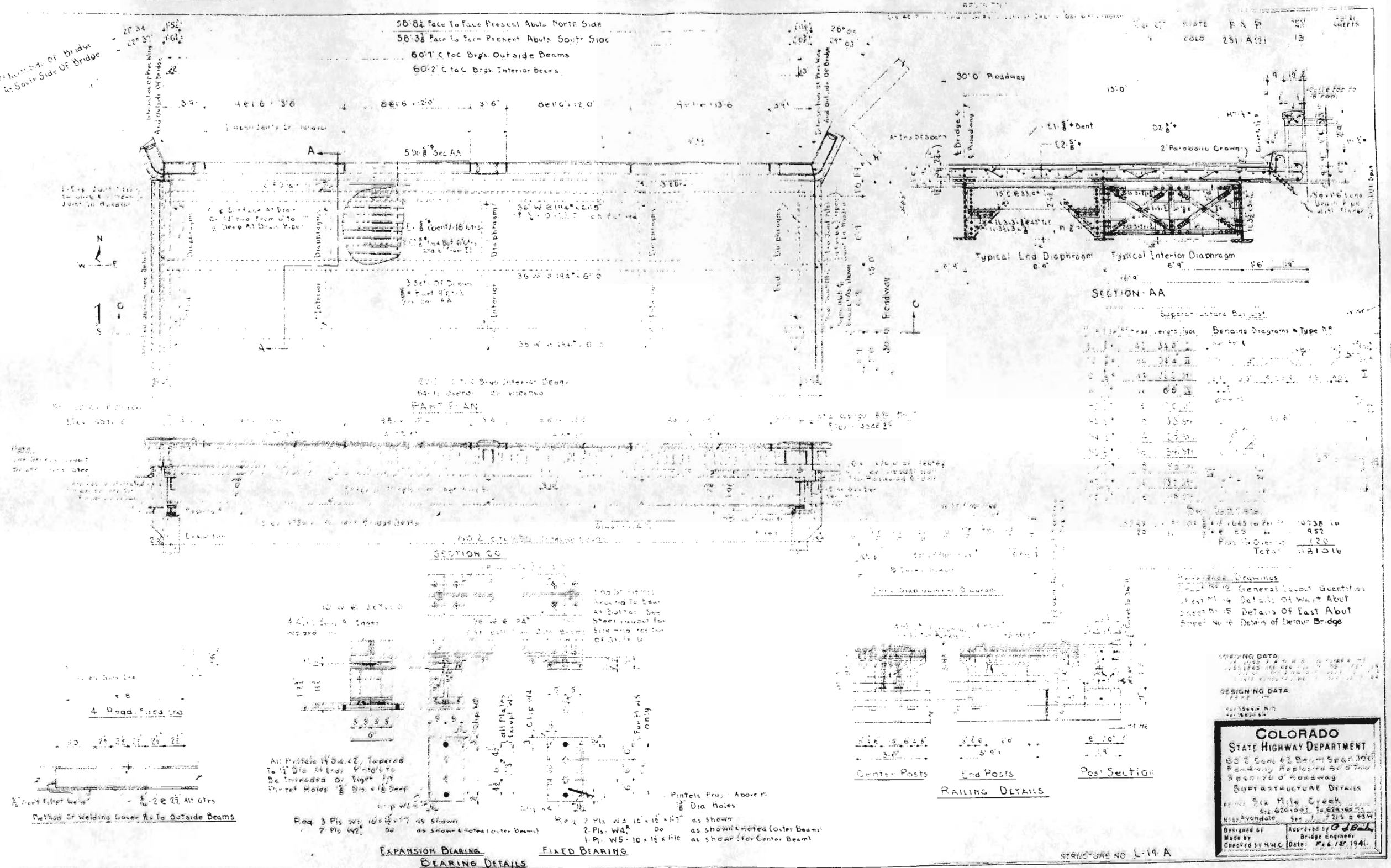
Design Data

COLORADO
State Highway Department

Bridge Plan
Plan Section of Roadway
Structural Steel Layout
Summary of Quantities

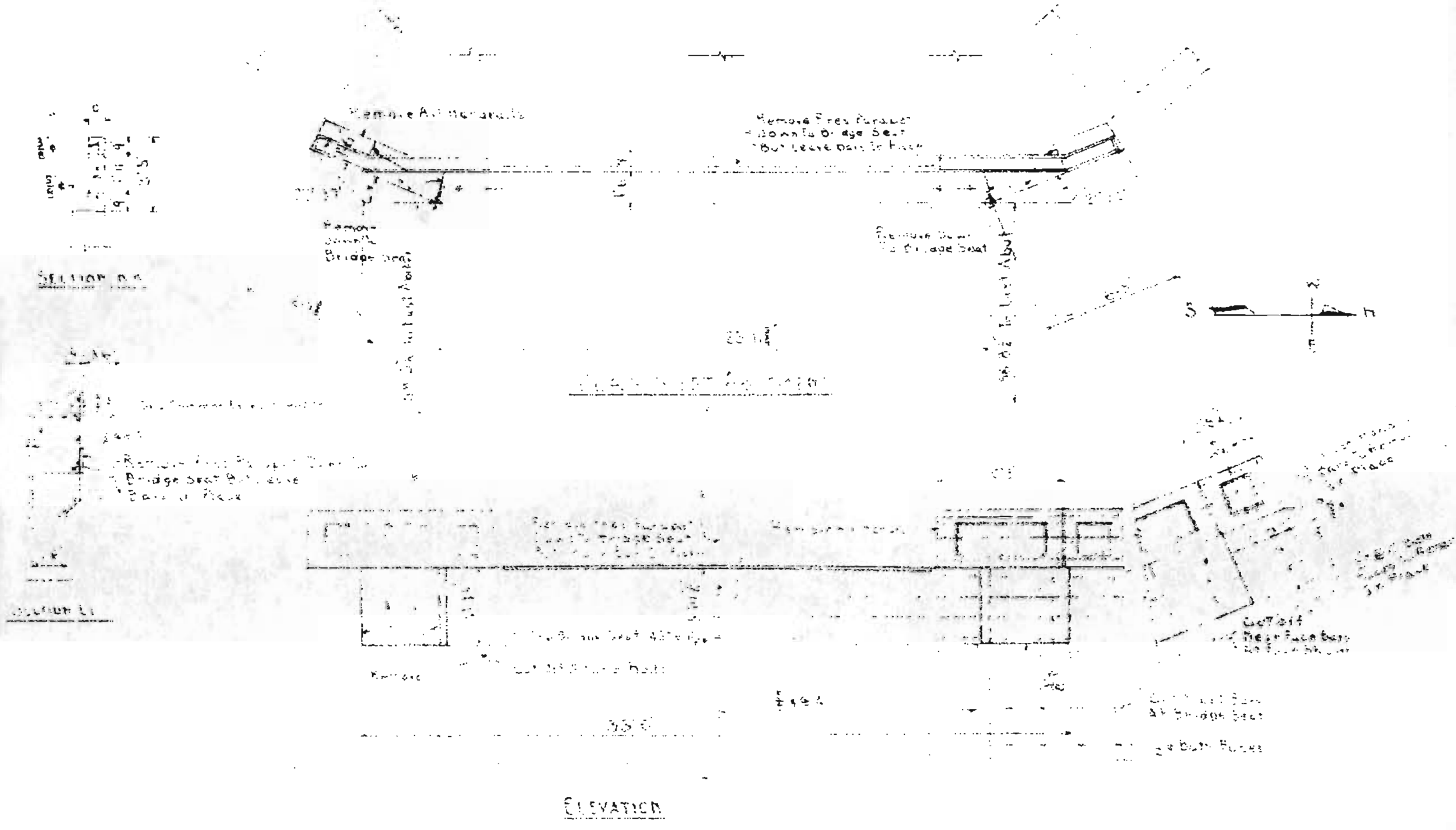
Made by
Checked by

Bridge Engineer
Date Feb 13, 1941

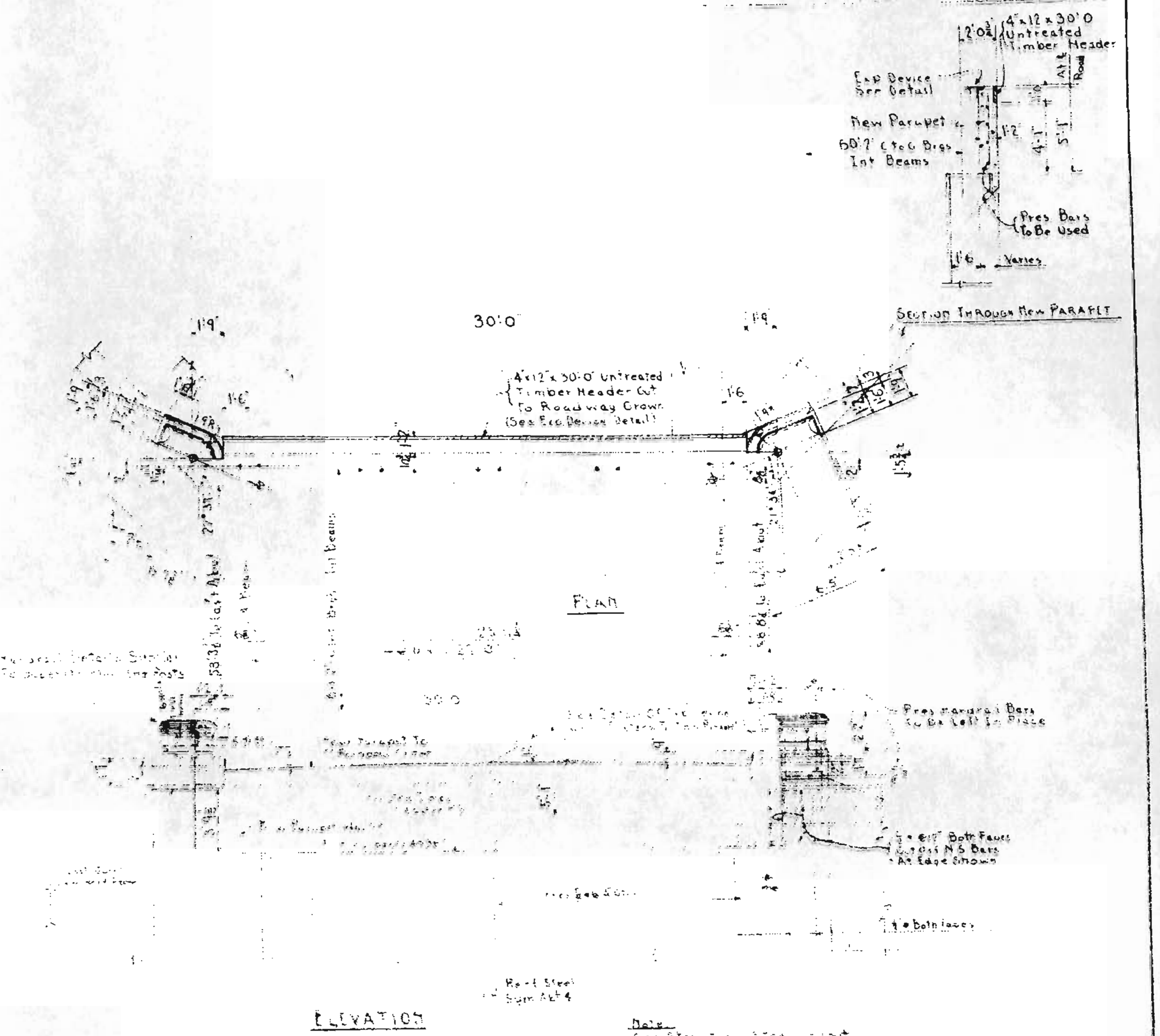

58'-8¾ Face To Face Present Abuts North Side
58'-3⅜ Face To Face Present Abuts South Side
60'-1" C to C Brgs. Outside Beams
60'-2" C to C Brgs. Interior Beams
30'-0" Roadway
15'-0"
2" Parabolic Crown
Typical End Diaphragm
Typical Interior Diaphragm
SECTION-AA
PART PLAN
SECTION CC
Expansion
Fixed
Method Of Welding Cover Pls To Outside Beams
EXPANSION BEARING
FIXED BEARING
BEARING DETAILS
Center Posts
End Posts
Post Section
RAILING DETAILS
Reference Drawings
Sheet No 12 General Layout Quantities
Sheet No 14 Details Of West Abut
Sheet No 15 Details Of East Abut
Sheet No 16 Details Of Detour Bridge
DESIGNING DATA
COLORADO
STATE HIGHWAY DEPARTMENT
Six Mile Creek
Avondale
Designed by
Made by
Checked by N.W.C.
Approved by
Bridge Engineer
Date: Feb. 7th 1941
STRUCTURE NO. L-19-A

REVISIONS

DIST NO	STATE	FAP	SHEET NO	TOTAL SHEETS
3	COLO	231 A(2)	14	



Sketch Of Present Abutment Showing Parts To Be Removed



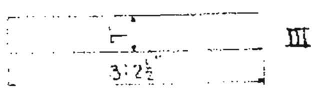
Details Of Altered Abutment

Reference Drawings
Sheet Nº 12 General Layout, Quantities
Sheet Nº 14 Superstructure Details
Sheet Nº 15 Details Of East Abut
Sheet No 16 Details of Detour Bridge

Bar List For West Abutment

Mark	Size	No Read	Length	Type
H2	½"	8	7'0"	III
H9	½"	12	2'6"	Str.

Bending Diagram



Bar Summary

86 Lin Ft ½" Bars At 85 Lb Per Lin Ft = 73 Lb
Plus 1% = 2
Total = 75 Lb

Note
See Structural Steel Layout For Anchor Bolt Setting. Pour New Handrail & Parapet After Steel Is Set.
Note That Rails Are Not Parallel But That Structural Steel Is Set Square. Parapet Is To Be Built Parallel To The ℄ Brgs.
H2 & H9 Bars Are New Reinf Bars. All Other Reinf Is Present Steel To Be Used In Place.

LOADING DATA
[illegible]

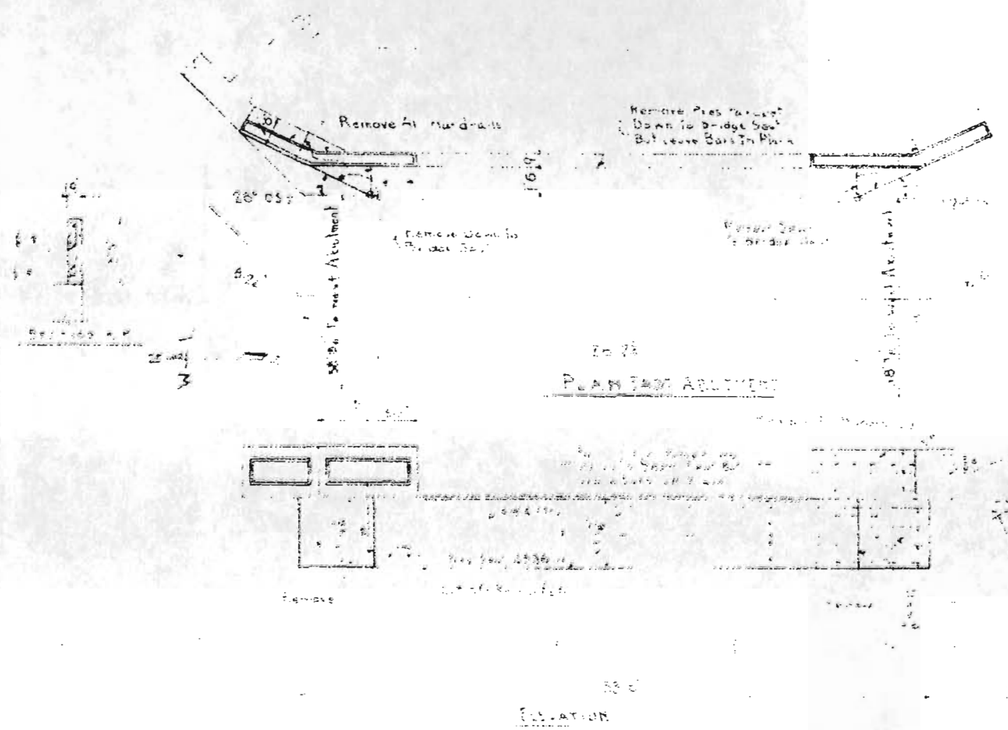
DESIGNING DATA
[illegible]

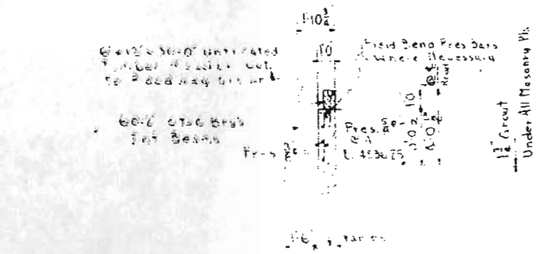
COLORADO
STATE HIGHWAY DEPARTMENT
60'7" Conc & I Beam Span 30'0" Roadway Replacing 60'0" Truss Span 20'5" Roadway
DETAILS OF WEST ABUTMENT
Across Six Mile Creek
Sta 629+00 To 629+60
Near Avondale Sec 1 T 21 S R 63 W

Designed by NWS Made by Checked by	Approved by O. S. Bowley Bridge Engineer Date Feb. 1st, 1941.

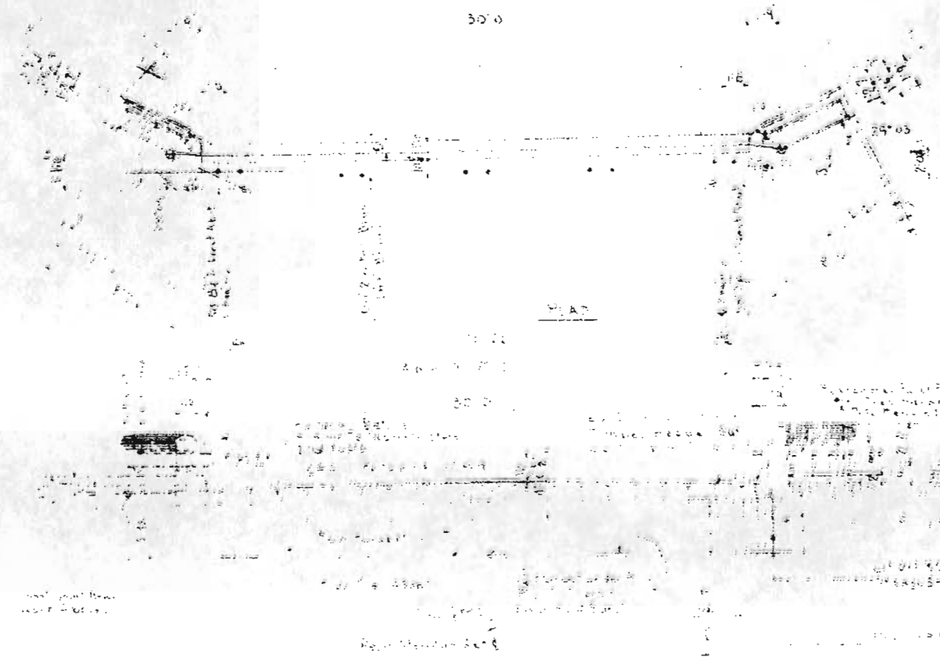
STRUCTURE NO L-19-A

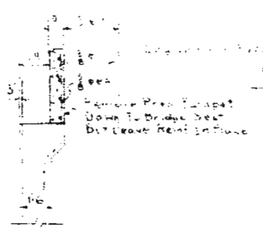
STATE	F. A. P.	SHEET NO.	TOTAL SHEETS
COLO	231-A(7)	15	





Section Through New Parapet





Section Through Parapet

Details Of Parapet Wall Showing Parts To Be Removed

Section Of Plain Abutment

Bar Summary

118 Lin. Ft. Of 3" Bars @ .85 Lb Per Lin. Ft. = 99 Lb
Plus 1% Overrun
Total = 100 Lb

Maintenance Drawings

Sheet No. 12	General Layout Quantities
Sheet No. 13	Superstructure Details
Sheet No. 14	Details Of West Abut
Sheet No. 15	Details of Detour Bridge

Notes

Bridge Data

Roadway Data

COLORADO
STATE HIGHWAY DEPARTMENT

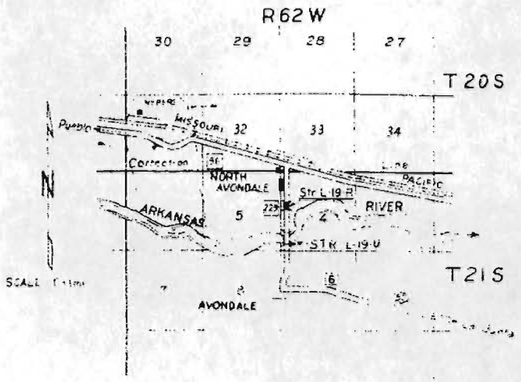
Bridge Over Six Mile Creek
Details Of Altered East Abut.

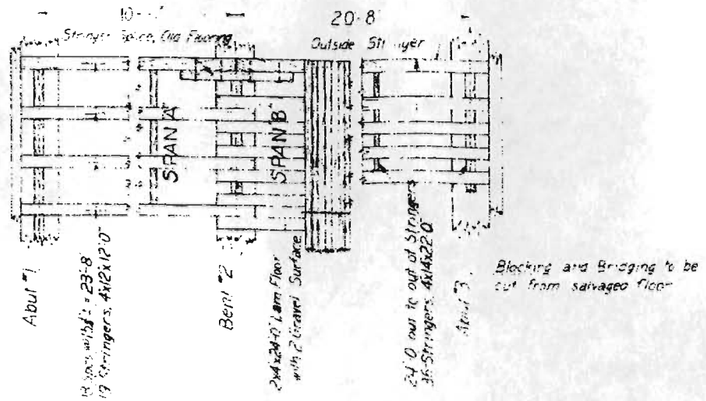
Made by
Checked by
Supervised by
Bridge Engineer
Date Feb. 1st 1941

STRUCTURE NO. L-19-A

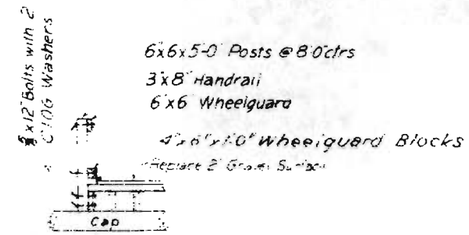
REVISIONS

	STATE	FAP	
3	COLO	BRIA (2)	16

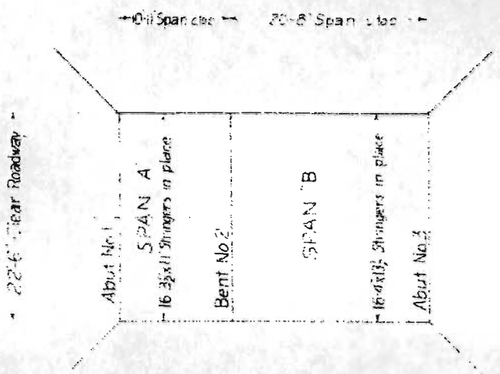




PART SECTION OF NEW FLOOR



TYPICAL DETAIL OF NEW HANDRAIL



GENERAL LAYOUT OF PRESENT STRUCTURE

BILL OF MATERIAL

252	pieces	Flooring	2"x4"x24'-0"	4032	Bd Ft
8	do	Stringers	4"x10"x22'-0"	144	do
12	do	do	4"x14"x22'-0"	2054	do
4	do	Handrail S4S	3"x8"x18'-0"	144	do
4	do	Wheelguard	6"x6"x18'-0"	216	do
1	do	do Blocks	4"x6"x1'-0"	20	do
10	do	Handrail Posts S4S	6"x6"x5'-0"	150	do
			Total	6728	Bd Ft
Hardware:		20d Nails	250	Lbs	
		4" Bolts ⅝"x10"	48	do	
		80 ⅝" C.C.S. Washers	60	do	
			Total	358	Lbs

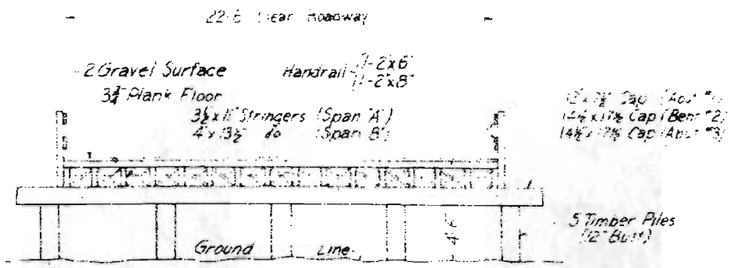
Nailing Directions

[illegible] Planks to Two Planks. [illegible] and the [illegible] planks to stringers with 20d nails at [illegible] centers [illegible] upper floor plank.

Stringers to Cap. [illegible] per stringer per cap.

SUMMARY OF QUANTITIES

For Furnishing & Replacing parts of Structure.	Lump Sum
40% Untreated Timber.	6.728 M Bd Ft



TYPICAL SECTION THRU PRESENT STRUCTURE

LOADING DATA
[illegible] 1935 H-12½

DESIGNING DATA
NEW SUPERSTRUCTURE TIMBER
fs = 1400%

GENERAL NOTES

All work shall be done according to the Standard Specifications of the Colorado State Highway Department Adopted June 1940.

All timber shall be dense Southern Pine or West Coast Douglas Fir.

All Handrail and Posts above the wheelguards shall be Painted White, and all Handrail Posts below the top of wheelguards shall be Painted Black as specified.

STRUCTURE NO. L-19-R

COLORADO
STATE HIGHWAY DEPARTMENT
ALTERATIONS
FOR DETOUR BRIDGE
S.H. NO. 229

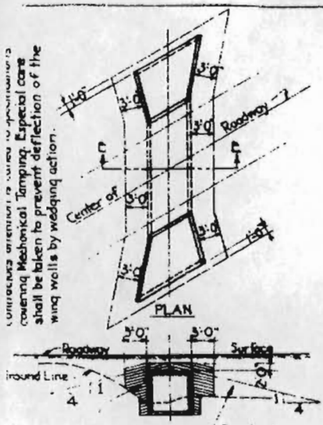
Across DRAW
Site
Near AVONDALE Sec. 4 T 21 S R 62 W

Designed by WWD	Approved by C. A. Bailey
Made by WWD	Bridge Engineer
Checked by	Date: Feb 1st, 1941

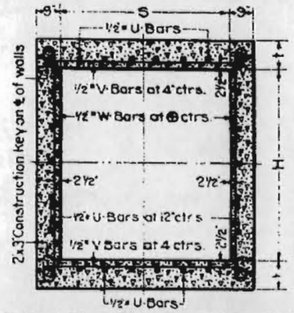
REVISIONS

FED. ROAD DIST. NO	STATE	SHEET NO.	TOTAL SHEETS
3	COLO.		

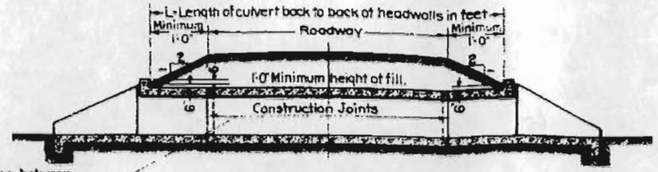
STANDARD M-103-E



SECTION E-E
MECHANICALLY TAMPED BACKFILL

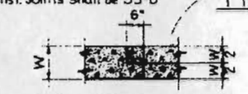


TYPICAL SECTION THRU BOX.

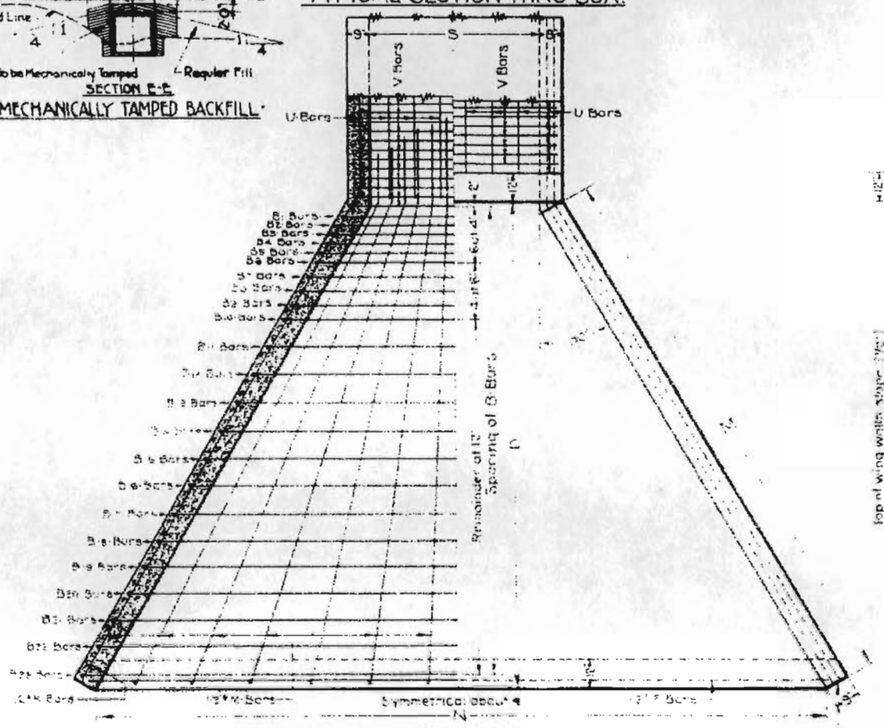


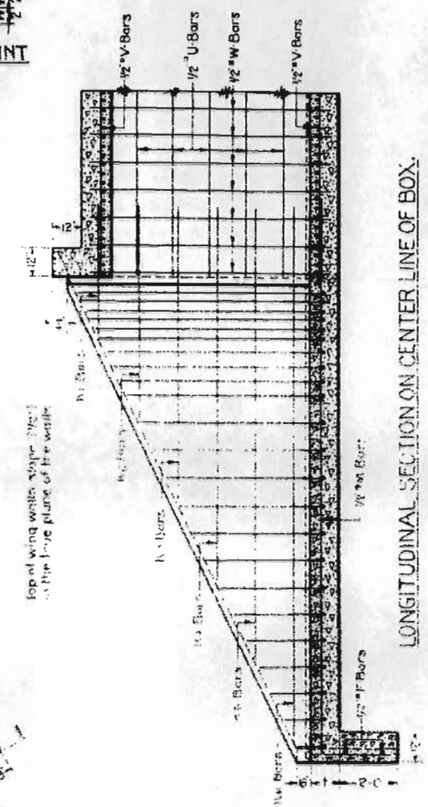
TYPICAL SECTION SHOWING RELATION OF CULVERT TO ROADWAY.

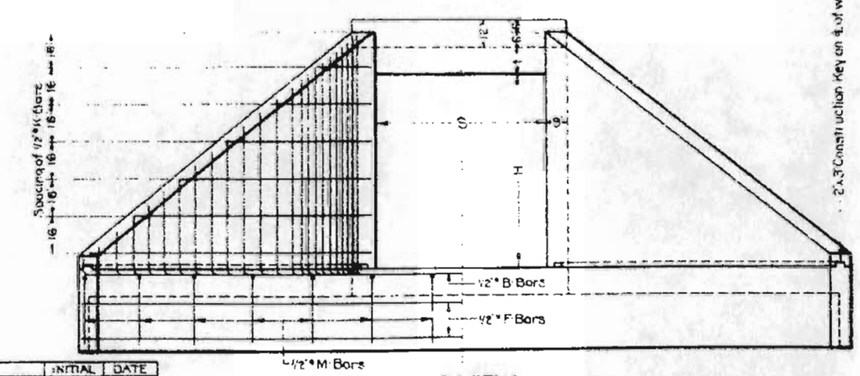
Maximum distance between Const. Joints shall be 35'-0"



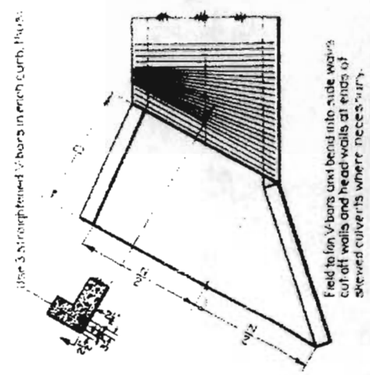
HALF-LAP CONST'N JOINT







END VIEW.



PART PLAN
FOR SKEWED HEADWALLS.

⊕ W BARS	SPACING	NUMBER
H = 1'-0" TO 5'-0" INCL	12"	2L + 6
H = 6'-0"	8 1/2"	2.82L + 6
H = 7'-0"	6"	4L + 6

REINFORCEMENT BAR LIST

USE BARS FOR	MARK	SIZE	NUMBER	DIMENSION P	DIMENSION Q	TOTAL LENGTH
All Sizes	V	1/2"*	8L+14	S + 10"		S + 2'-2"
" "	W	1/2"*	⊕	H + 7"		H + 1'-11"
" "	F	1/2"*	4			N + 0'-3"
" "	U	1/2"*	★			L + 1'-8"
" "	K 1	1/2"*	4		3'-4"	5'-4"
H = 2'-0" or more	K 2	1/2"*	4		6'-8"	8'-8"
H = 3'-0" " "	K 3	1/2"*	4		10'-0"	12'-0"
H = 5'-0" " "	K 4	1/2"*	4		13'-4"	15'-4"
H = 6'-0" " "	K 5	1/2"*	4		16'-8"	18'-8"
H = 7'-0" " "	K 6	1/2"*	4		20'-0"	22'-0"
All Sizes	B 1	1/2"*	2	S + 1'-6"	H + 1'-0"	
" "	B 2	1/2"*	2	S + 1'-11"	H + 0'-11"	
" "	B 3	1/2"*	2	S + 2'-3"	H + 0'-9"	
" "	B 4	1/2"*	2	S + 2'-8"	H + 0'-7"	
" "	B 5	1/2"*	2	S + 3'-0"	H + 0'-5"	
" "	B 6	1/2"*	2	S + 3'-5"	H + 0'-3"	
" "	B 7	1/2"*	2	S + 4'-0"	H + 0'-1"	
" "	B 8	1/2"*	2	S + 4'-7"	H − 0'-5"	
" "	B 9	1/2"*	2	S + 5'-2"	H − 0'-6"	
H = 1'-6" or more	B 10	1/2"*	2	S + 6'-0"	H − 0'-11"	
H = 2'-0" " "	B 11	1/2"*	2	S + 7'-6"	H − 1'-5"	P = 2Q − 2"
H = 3'-0" " "	B 12	1/2"*	2	S + 8'-8"	H − 1'-10"	
H = 3'-0" " "	B 13	1/2"*	2	S + 9'-10"	H − 2'-4"	
H = 4'-0" " "	B 14	1/2"*	2	S + 11'-0"	H − 2'-9"	
H = 4'-0" " "	B 15	1/2"*	2	S + 12'-2"	H − 3'-2"	
H = 5'-0" " "	B 16	1/2"*	2	S + 13'-4"	H − 3'-7"	
H = 5'-0" " "	B 17	1/2"*	2	S + 14'-6"	H − 4'-0"	
H = 6'-0" " "	B 18	1/2"*	2	S + 15'-8"	H − 4'-5"	
H = 6'-0" " "	B 19	1/2"*	2	S + 16'-10"	H − 4'-11"	
H = 6'-0" " "	B 20	1/2"*	2	S + 18'-0"	H − 5'-4"	
H = 7'-0" " "	B 21	1/2"*	2	S + 19'-2"	H − 5'-10"	
H = 7'-0" " "	B 22	1/2"*	2	S + 20'-4"	H − 6'-5"	
All Sizes	M	1/2"*	S+H+4	D + 3'-0"		D + 5'-3"

★ See Table of Dimensions and Quantities

TABLE OF DIMENSIONS AND QUANTITIES

STEEL QUANTITIES GIVEN HEREON INCLUDE ALLOWANCE FOR OVERRUN OF %

TOTAL QUANTITIES FOR ONE BOX, HEADWALLS, THE QUANTITY FOR TWO HEADWALLS PLUS (QUANTITY FOR ONE LINEAL FT OF BOX)

S	H	HEIGHT OF FILL ALLOWED	DIMENSION M	DIMENSIONS IN	DIMENSIONS IN D	THICKNESS OF SLAB	NUMBER OF U BARS PER BOX	QUANTITIES FOR ONE LINEAL FT OF BOX CONCRETE CU YDS	QUANTITIES FOR ONE LINEAL FT OF BOX STEEL LBS	QUANTITIES FOR TWO HEADWALLS CONCRETE CU YDS	QUANTITIES FOR TWO HEADWALLS STEEL LBS	STRUCTURAL EXCAVATION TWO CUT OFF WALLS SQ FT	STRUCTURAL EXCAVATION TWO CUT OFF WALLS CU YDS
1'-6"	1'-6"	27'-0"	3'-2"	6'-0"	4'-10 1/2"	7"	6	0.213	31.6	4.0	295	108	4
2'-0"	2'-0"	25'-0"	3'-6"	8'-9"	6'-0 1/2"	8"	6		35.1	5.6	428	148	5
3'-0"	1'-0"	18'-6"	4'-2"	7'-4"	5'-11 1/2"	8"	6		38.5	4.1	364	105	4
3'-0"	2'-0"	18'-6"	6'-8"	9'-10"	6'-11 1/2"	8"	10		41.3	6.3	493	185	6
3'-0"	3'-0"	18'-6"	9'-2"	12'-4"	8'-3"	8"	10		45.4	9.4	655	235	7
4'-0"	2'-0"	14'-0"	6'-9 1/2"	10'-11 1/2"	6'-7 1/2"	8"	12		48.8	7.3	585	184	6
4'-0"	3'-0"	14'-0"	9'-3"	13'-5"	8'-4"	8"	12		52.5	10.6	734	259	7
4'-0"	4'-0"	14'-0"	11'-9 1/2"	15'-11 1/2"	10'-6 1/2"	8"	16		55.1	14.3	884	348	8
5'-0"	3'-0"	11'-6"	9'-4"	14'-0"	8'-9 1/2"	9"	16		59.1	11.8	815	284	8
5'-0"	4'-0"	11'-6"	12'-0"	17'-0"	10'-7 1/2"	9"	18		62.6	15.8	973	378	9
5'-0"	5'-0"	11'-6"	14'-9"	19'-9"	12'-9 1/2"	9"	20		66.0	20.2	1150	477	10
6'-0"	3'-0"	10'-0"	10'-0"	15'-9"	9'-8 1/2"	10"	16		62.6	9.9	705	227	7
6'-0"	4'-0"	10'-0"	13'-3"	18'-9"	11'-6 1/2"	10"	18		66.2	13.7	894	313	8
6'-0"	5'-0"	10'-0"	16'-7"	21'-9"	13'-10 1/2"	10"	20		69.4	18.1	1044	408	9
6'-0"	6'-0"	10'-0"	19'-7"	24'-9"	16'-3 1/2"	10"	22		72.8	22.7	1291	516	11
6'-0"	7'-0"	10'-0"	22'-7"	27'-9"	18'-7 1/2"	10"	24		81.5	28.6	1585	654	12
6'-0"	8'-0"	10'-0"	25'-7"	30'-9"	21'-4"	12"	26		95.0	34.8	1855	762	13

GENERAL NOTES.

All work shall be done according to the Standard Specifications of the Colorado State Highway Department, Adopted June 1940.

All concrete shall be class "A".

All exposed surfaces shall be rubbed free of form marks.

All walls shall have forms on both sides.

All construction joints shall be thoroughly cleaned before fresh concrete is poured.

Footings in rock shall be poured out to the rock and not formed.

For culverts required and governing dimensions see sheet No 2.

All reinforcing bars shall be deformed.

All reinforcing bars shall be tagged with the sheet number and letter designation.

Secondary bars when spliced shall be given a lap of 30 diameters.

Main bars shall not be spliced.

Soundings and depth of footings shown are according to the best available data. If, however, different conditions are encountered, the engineer will inspect and determine if redesign is necessary.

Pour wing footings monolithically with floor of box.

The use of main construction joints, undesirable should field conditions require, construct on joints may be made on a vertical plane perpendicular to centerline of culvert and shall be half-lap joint as shown in detail.

This design not to be used when height of fill exceeds the allowable tabulated.

Backfill behind wing walls must be composed of firm and uniform material throughout.

All backfilling in approaches, to and over culverts, shall be laid in layers not exceeding 6 inches in depth and each layer shall be compacted in accordance with the illustration for Mechanically Tamped Backfill shown on this drawing.

LOADING DATA
EFFECTIVE JUNE 1935 CLASS A (H-15)

COLORADO
STATE HIGHWAY DEPARTMENT
CONCRETE BOX CULVERTS

1'×1'	4'×2	5'×4	6'×4
2'×2	4'×3	5'×5	6'×5
3'×1	4'×4	6'×2	6'×6
3'×2	5'×3	6'×3	6'×7
3'×3			

Designed by K.B
Made by AGK
Checked by
Approved by [signature] Bridge Engineer
Date: July 18, 1940.

	INITIAL	DATE
ORIGINAL BY		
CHECKED BY		
SANDYKE BY		
CHECKED BY		

STANDARD M-103-E

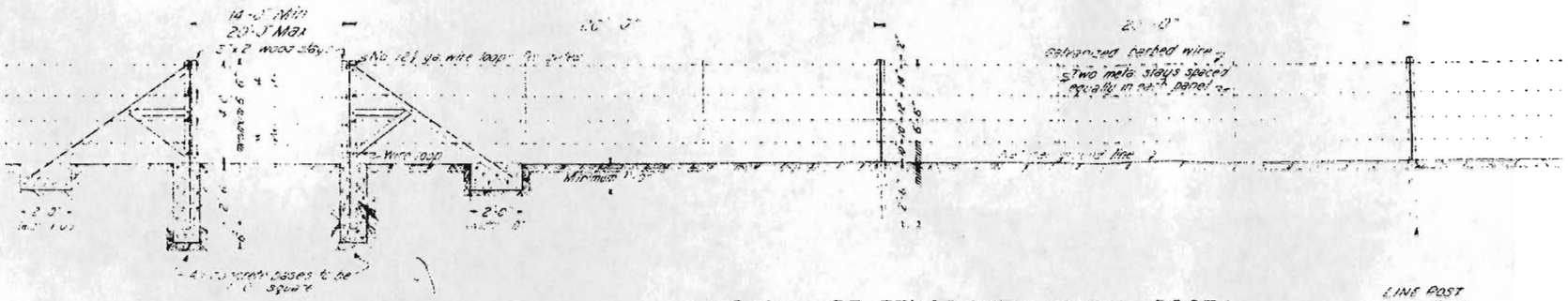
STRUCTURE NO

REVISIONS

FED. ROAD DIST. NO.	STATE	S.N.F.A.P.	SHEET NO.	TOTAL SHEETS
3	COLO.	168 (1) 231 (1)	18	

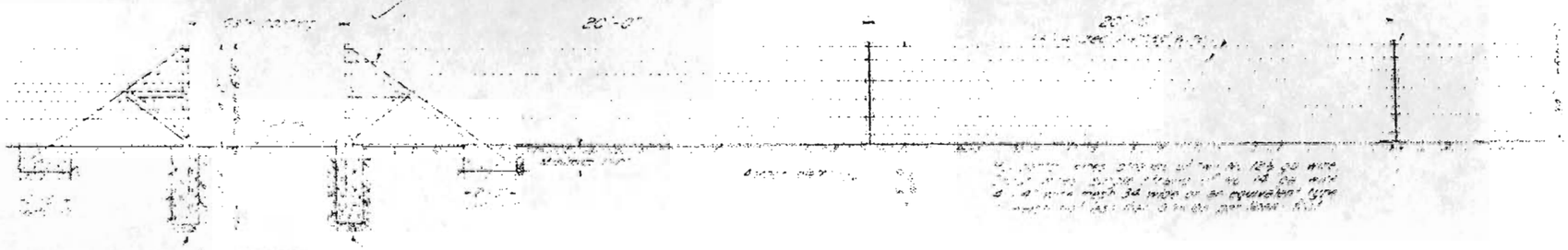
Rev. 4-16-40 F.B.B. Alternate for End and Corner Posts.
Rev. 6-28-40 - A.Z. - 1940 Specs.

STANDARD M-27-B



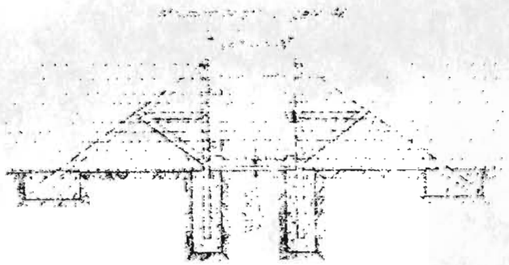
BARBED WIRE FENCE WITH METAL POSTS

Item No. 76 c

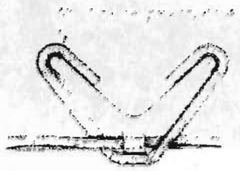


COMBINATION WIRE FENCE WITH METAL POSTS

DRIVEWAY GATE



WALK GATE



TYPICAL SET ON THROUGH FENCE POST

CORNER POST WITH BRACING

FENCE INTERSECTION WITH BRACING

FENCE TREATMENT AT STRUCTURES
(ON ALL STRUCTURES 4'-0" AND OVER)

GENERAL NOTES

All wire shall be done in accordance with the Standard Specifications of the Colorado State Highway Department adopted June 1 1940.

Barbed wire shall be of standard make, not lighter than No. 12½ gauge galvanized with two point barb spaced not more than five inches apart.

Wire mesh must be galvanized and not lighter than shown and noted on this plan.

All line posts to be structural steel to weigh not less than 2.00 pounds per lineal foot.

Suitable anchor plates shall be securely riveted or welded to each line post.

All posts to be painted with an approved waterproof asphalt or mineral paint or hot dip galvanized.

All corner, end, and gate posts including braces are to be structural steel 2" x 2" x ⅛" angles to weigh not less than 3.15 lbs per lineal foot, except post supporting driveway gate Item No. 76h.

All footings or bases shall be of class "A" concrete with reinforced steel and shall be included in the price bid per lineal foot of fence with metal posts.

If knee braces are omitted from end, corner, and gate posts the vertical post must be at least 2½" x 2½" x ¼".

Corner posts are to be of the same detail for bracing as End Posts and shall be provided with bracing on both legs of the corner angle.

* In lieu of the end and corner posts shown hereon, A.S. & W. Co. Expanding Anchor End and Corner Posts (Extra Heavy Duty, 7'-0") or an acceptable equivalent of similar type may be used, concrete omitted.

COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD
WIRE FENCE WITH
METAL POSTS

Designed by R.E.L.	Approved by
Made by F.B.B.	
Checked by R.E.L.	Date Apr. 17 1939

STANDARD M-10-A

FED. ROAD DIST. NO.	STATE	S.N.F.A.P. PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO	163(1) 231A(2)	19	

[redacted]

[illegible] 1936 AASHO changed to 1935 Specifications
[illegible] 1936 A.S.B.A. changed to 1937 Specifications.
[illegible] YEAR NUMBER MARKING ADDED.
[illegible] CHANGED TO 1940 SPECIFICATIONS

SCALE OF LETTERING

A B C D E F G H I J

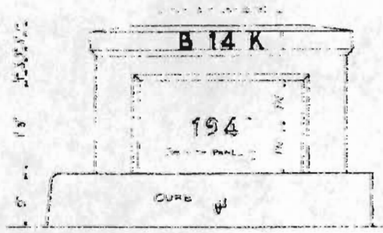
K L M N O P Q R S T

U V W X Y Z

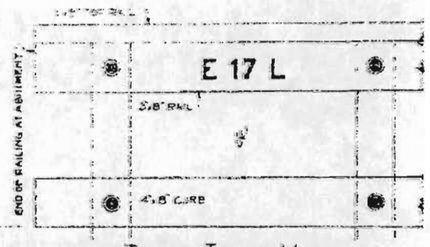
1 2 3 4 5 6 7 8 9 0 .

I 14 K

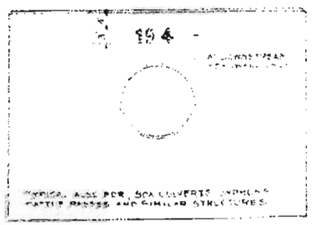
SAMPLE BRIDGE NUMBER



TYPICAL CONCRETE ENDPOST.



TYPICAL TIMBER WING



TYPICAL CULVERT HEADWALL.

NOTES:
THE YEAR NUMBER SHALL BE RECESSED INTO THE PANEL OF THE ENDPOST AT THE RIGHT HAND SIDE OF EACH BRIDGE-END AND INTO THE FACE OF THE DOWNSTREAM HEADWALL OF CULVERTS ETC. A MINIMUM OF 3/8", AS SHOWN. THE NUMBER FOR EACH STRUCTURE SHALL CORRESPOND WITH THE PARTICULAR YEAR IN WHICH THE CONCRETE IS POURED. NUMBERS TO BE OF SIZE, SHAPE AND SPACING AS SHOWN ON THIS SHEET, MADE OF WOOD OR METAL AND ATTACHED TO THE FORMS BEFORE CONCRETE IS POURED.

GENERAL NOTES

[illegible] THE CORRECT NUMBER FOR EACH BRIDGE IS SHOWN IN THE LOWER RIGHT HAND [illegible] OF THE DETAIL SHEET FOR THAT PARTICULAR BRIDGE.
THE SIZE, SHAPE AND SPACING OF THE LETTERS AND FIGURES SHALL BE IDENTICAL WITH THE SAMPLE SHOWN ON THIS SHEET. ADDITIONAL COPIES OF THIS FULL SIZE SHEET CAN BE OBTAINED FROM THE DEPARTMENT WITHOUT CHARGE.
BEFORE STENCILING THE NUMBER ON THE BRIDGE THE SURFACE MUST BE THOROUGHLY CLEANED. A PROPER WHITE BACKGROUND SHALL BE PAINTED ON CONCRETE SURFACES. ON [illegible] NORMALLY THE WHITE PAINT [illegible] THE BRIDGE WILL BE SATISFACTORY ON CONCRETE. EXPOSE THE DRY CONCRETE SURFACE SHALL BE PROPERLY SIZED BEFORE PLACING THE WHITE RECTANGLE, UNLESS AN APPROVED WHITE CONCRETE PAINT IS USED.
TWO COATS OF ACCEPTABLE WHITE PAINT SHALL BE APPLIED TO THE CONCRETE IN A NEAT RECTANGULAR SHAPE AND EXTEND THREE INCHES BEYOND THE LIMITS OF THE STRUCTURE NUMBER.
AFTER THE WHITE BACKGROUND HAS DRIED SUFFICIENTLY, THE CORRECT STRUCTURE NUMBER SHALL BE CAREFULLY STENCILLED ON IT WITH TWO COATS OF STANDARD "C" SECOND FIELD GRADE PAINT AS SPECIFIED UNDER ITEM 41 STEEL BRIDGES. THE BRACES OF THE STENCILLED LETTERS AND FIGURES SHALL BE CAREFULLY FILLED IN BY HAND TO MAKE SOLID FIGURES. SUFFICIENT TIME BETWEEN SUCCESSIVE COATS SHALL BE ALLOWED TO PERMIT THE PRECEDING COAT TO DRY.
THIS WORK WILL NOT BE PAID FOR AS A SEPARATE ITEM. COMPENSATION SHALL BE INCLUDED IN THE ORIGINAL CONTRACT ITEMS.

COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD STRUCTURE NUMBER, LETTERING AND YEAR NUMBER MARKING.

Designed by [illegible]
Made by [illegible]
Check Design [illegible]
Check Detail [illegible]

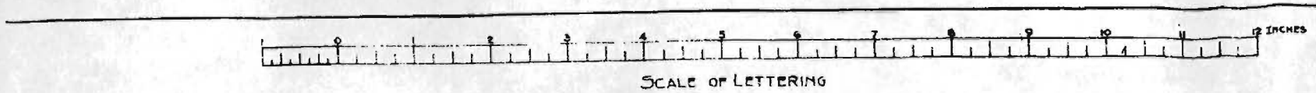
Approved by [illegible]
Bridge Engineer
Date Feb. 6, 1945

STRUCTURE NO.

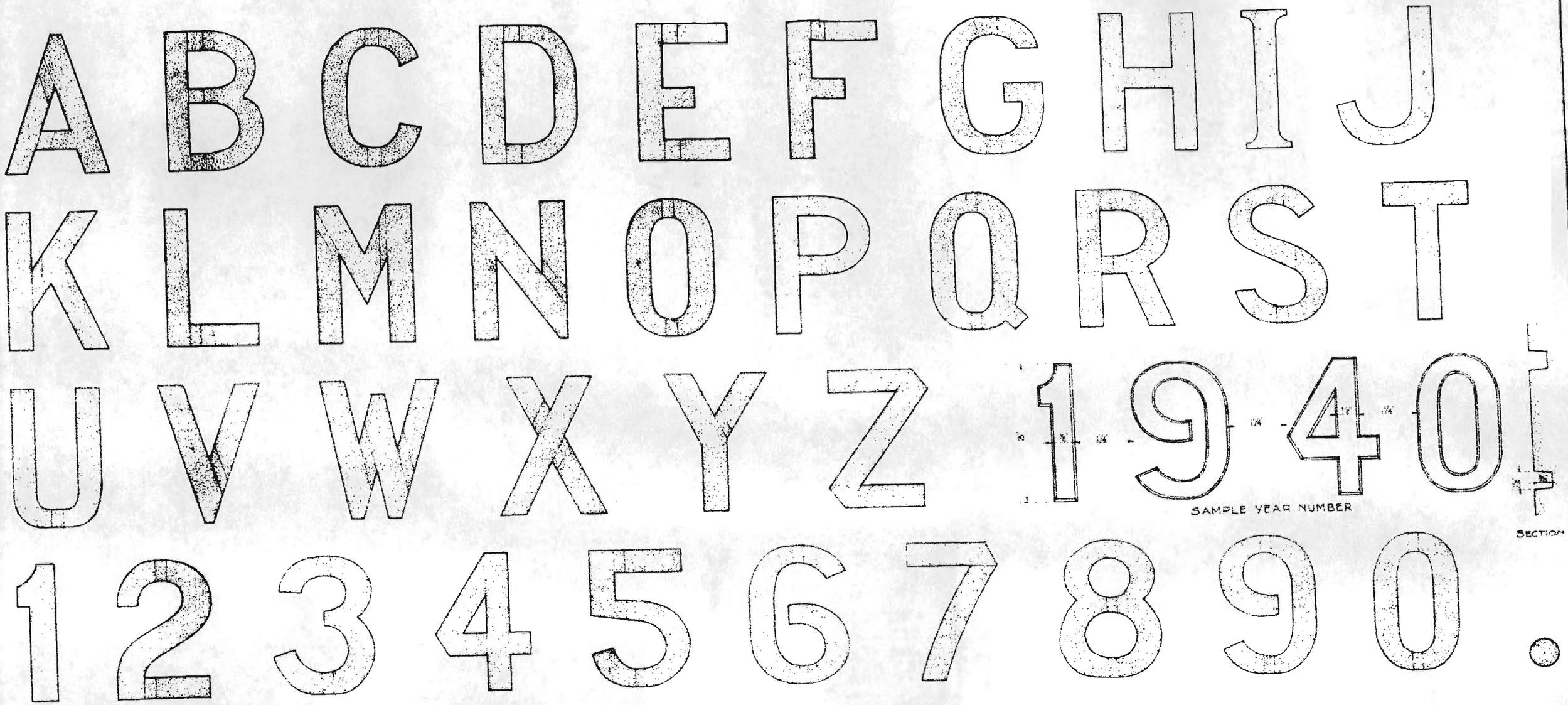
STANDARD M-10-A.

STANDARD M-14-A [redacted]

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	103(2)	20	

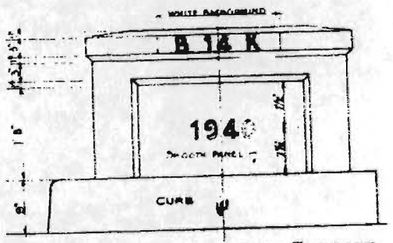


SCALE OF LETTERING

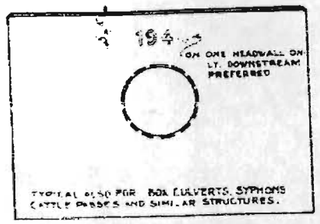


SAMPLE YEAR NUMBER

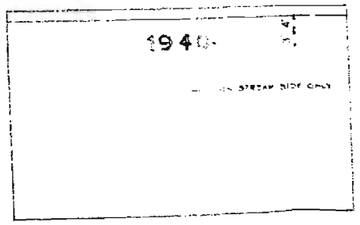
SECTION



·TYPICAL CONCRETE ENDPOST·



·TYPICAL CULVERT HEADWALL·



·TYPICAL RETAINING WALL·

GENERAL NOTES

ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS OF THE COLORADO STATE HIGHWAY DEPARTMENT, ADOPTED JUNE 1, 1940.

THE SIZE, SHAPE AND SPACING OF THE NUMBERS SHALL BE IDENTICAL WITH THE FULL SIZE SHOWN ON THIS SHEET. ADDITIONAL COPIES OF THIS FULL SIZE SHEET CAN BE OBTAINED FROM THE DEPARTMENT WITHOUT CHARGE.

THIS WORK WILL NOT BE PAID FOR AS A SEPARATE ITEM. COMPENSATION SHALL BE INCLUDED IN THE ORIGINAL CONTRACT ITEMS.

THE YEAR NUMBER SHALL BE RECESSED INTO THE PANEL OF THE ENDPOST AT THE RIGHT HAND SIDE OF EACH BRIDGE-END AND INTO THE FACE OF THE DOWNSTREAM HEADWALL OF CULVERTS, SYPHONS, RETAINING WALLS ETC. A MINIMUM OF 3/8" AS SHOWN.

THE YEAR NUMBER FOR EACH STRUCTURE SHALL CORRESPOND WITH THE PARTICULAR YEAR IN WHICH THE CONCRETE IS POURED.

NUMBERS TO BE MADE OF WOOD, METAL OR ANY OTHER SUITABLE MATERIAL AND ATTACHED TO THE FORMS BEFORE CONCRETE IS POURED.

COLORADO
STATE HIGHWAY DEPARTMENT

STANDARD STRUCTURE
YEAR NUMBER MARKING

Designed by A.H.D.	Approved by P. D. Bailey
Made by V.H.D.	Bridge Engineer
Check Design	Date June 1st 1940
Check Detail	

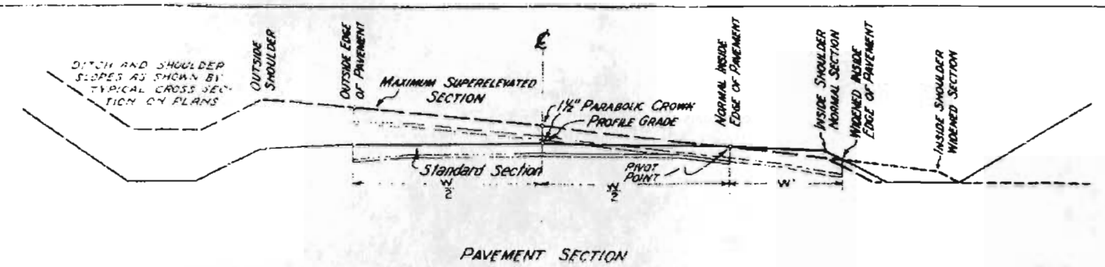
STRUCTURE NO. _____

REVISIONS

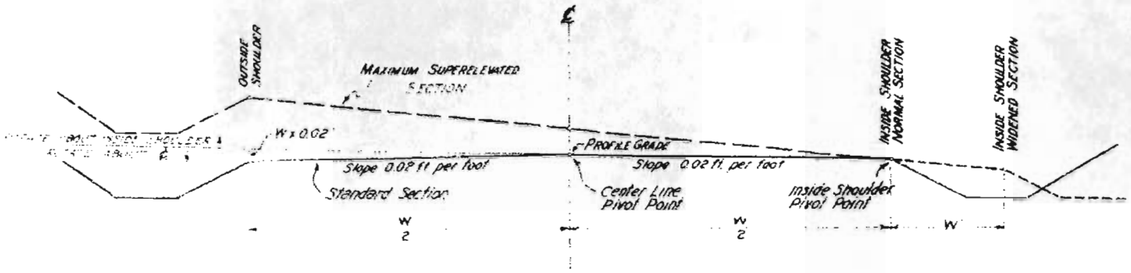
STANDARD M-I-B

DIST. NO.	STATE	
3	COLO.	[redacted]

Rev. 11-2-38 P.B.B. Widening Transition



PAVEMENT SECTION

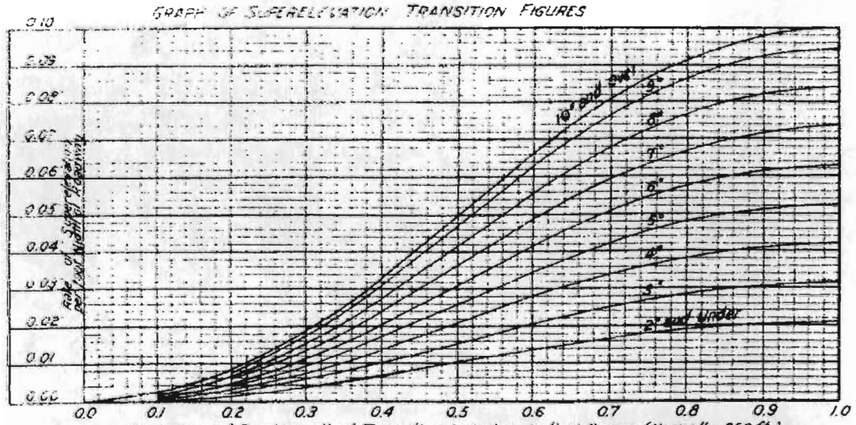


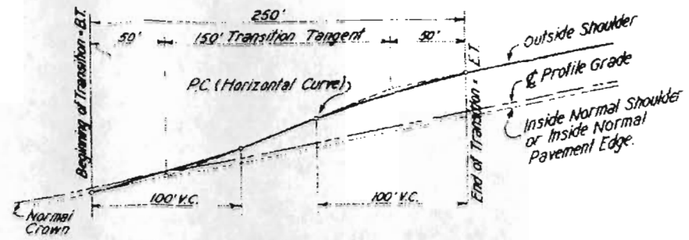
GRADED OR SURFACED SECTION

SUPERELEVATION AND WIDENING TABLES

Distance from B.T. in Feet	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Max 1.0
Degree of Curvature	Rate of Superelevation (in Feet) per Foot Width of Roadway									
2° and Under	0.00044	0.00175	0.00394	0.00700	0.01050	0.01400	0.01706	0.01925	0.02056	0.02100
3°	0.00056	0.00263	0.00591	0.01050	0.01575	0.02100	0.02559	0.02888	0.03084	0.03150
4°	0.00083	0.00350	0.00788	0.01400	0.02100	0.02800	0.03413	0.03850	0.04113	0.04200
5°	0.00109	0.00438	0.00984	0.01750	0.02625	0.03500	0.04266	0.04813	0.05141	0.05250
6°	0.00131	0.00525	0.01181	0.02100	0.03150	0.04200	0.05119	0.05775	0.06169	0.06300
7°	0.00153	0.00613	0.01378	0.02450	0.03675	0.04900	0.05972	0.06738	0.07197	0.07350
8°	0.00175	0.00700	0.01575	0.02800	0.04200	0.05600	0.06825	0.07700	0.08225	0.08400
9°	0.00197	0.00788	0.01772	0.03150	0.04725	0.06300	0.07678	0.08663	0.09253	0.09450
10° and Over	0.00200	0.00833	0.01875	0.03333	0.05000	0.06667	0.08125	0.09166	0.09792	0.10000
	Offsets for Widening - W (in Feet)									
Over 0° Under 2°	0.05	0.12	0.27	0.48	0.75	1.08	1.47	1.92	2.43	3.00
2° " " 5°	0.04	0.15	0.36	0.64	1.00	1.44	1.96	2.56	3.24	4.00
5° " 10°	0.05	0.20	0.45	0.80	1.25	1.80	2.45	3.20	4.05	5.00
10° and Over	0.06	0.24	0.54	0.96	1.50	2.16	2.94	3.84	4.86	6.00

GRAPH OF SUPERELEVATION TRANSITION FIGURES

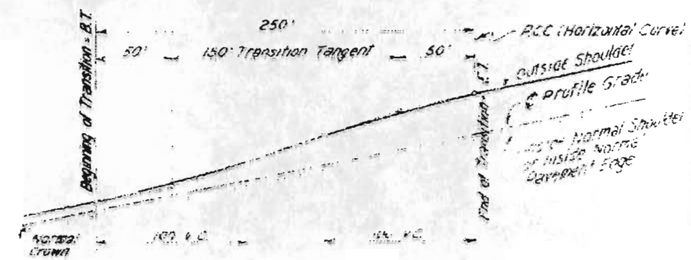




CASE I: SIMPLE CURVE WITH UNLIMITED TANGENT APPROACH

NOTE CASE I

The transition in this case, from crowned section to superelevated section, shall proceed uniformly by raising the outside shoulder, over a distance of 250 ft. as shown, beginning at a point on the tangent 150 ft. from the end of the curve and acquiring full superelevation at a point 100 ft. inside the curve.



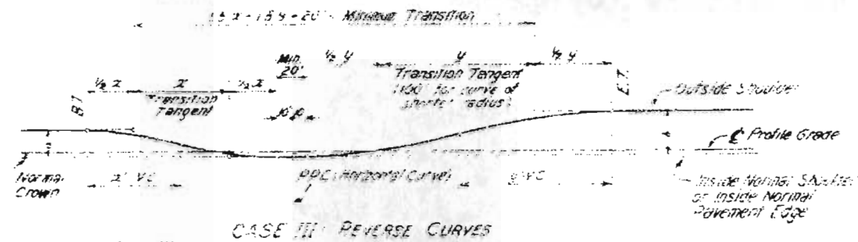
CASE II: COMPOUND CURVE

NOTE CASE II

Superelevation transitions at the outside ends of compound curves shall be constructed in accordance with rules given under CASE I.

Superelevation transition between the arcs of different radii shall be made as in CASE I, except that the entire transition shall lie within the limits of the curve of the longer radius.

In cases where curves in the same direction have a tangent distance of less than 300 ft. between points of curve, the intervening tangent shall be superelevated an amount equal to that of the curve of greater radius and the transition shall be made as in the case of a true compound curve.



CASE III: REVERSE CURVES

NOTE CASE III

Transitions between true reverse curves shall be accomplished as shown on the above diagram.

Transition tangents shall be directly proportional to the amount of superelevation of the respective curves.

EXAMPLE: Let a represent the amount of superelevation on 1st curve;
" b " " " " 2nd " ;
" x " " " " transition tangent on 1st " ;
" y " " " " " " 2nd " ;

then, $a : b = x : y$.

The transition tangent of the curve having the shorter radius shall be set at 100 ft.

A normal crowned section 20 ft. long, 10 ft. on each side of the P.R.C. shall be used.

In cases where curves in opposite directions are in such proximity that a standard transition can not be had, the practice outlined for true reversing curves shall be used.

The total distance between the P.T. of the first curve and the P.C. of the succeeding curve shall be prorated into the transition distance of the respective curves until a maximum of 150 ft. of transition tangent for each curve is achieved.

GENERAL NOTES

Curves on projects using the Sections shown are to be superelevated and widened as indicated in the accompanying drawings and tables.

The normal inside edge of the Pavement slab is to remain at the standard elevation of 0.125 ft. below the profile grade, and the outside edge of the slab is to be superelevated at the rate per foot width of roadway given in the table. The Section is to be rotated about the normal inside edge of the Pavement, with a 1½" parabolic crown for curves of 10° and under and a flat crown for widened Sections.

The normal inside edge of the Graded or Surfaced Section is to remain at the standard elevation of 0.02 ft. per foot width of roadway below the profile grade or as shown on the Typical Section for the Project. Also, the centerline pivot point is to be used until the superelevation equals 0.02 ft. per foot width of roadway, but when this elevation is exceeded the normal inside shoulder pivot point is to be used.

When the degree of curvature exceeds 10° the inside edge of the Pavement slab or the inside shoulder of the Graded or Surfaced Section is to be widened from the normal inside edge or shoulder, respectively, as shown by the table and plan or by cross-sections. Curves of 10° or less are not to be widened.

The slope of the shoulders and widened sections shall conform to the rate per foot width of roadway required except that the inside shoulder of paved sections shall maintain the Typical Section slope until this slope is exceeded by the required superelevation slope.

The outside ditch on superelevated Sections is to be modified, where necessary to provide drainage. Otherwise this ditch shall conform to normal ditch section shown for Project.

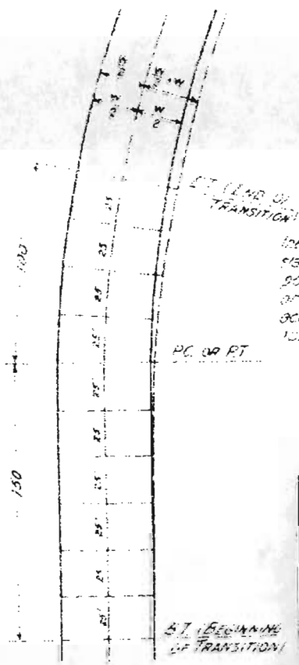
The rate of superelevation per foot width of roadway to be applied at the outside shoulder of the roadway is computed as follows:

The full superelevation per foot width of roadway rate for a given degree of curvature is

0.0005 ft. x Degree of Curvature

The max. mum superelevation of 0.10 ft. per foot width applies to curves of 10° and over and is not to be exceeded.

Where transition cannot be made by the standard meet shall be covered by adjustments indicated with curve data on plans.



GENERAL PLAN OF WIDENING

COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD
METHODS FOR
SUPERELEVATION &
WIDENING OF CURVES

Checked: P.B.B. Approved: H. Marshall
Date: FEB 23RD 1937

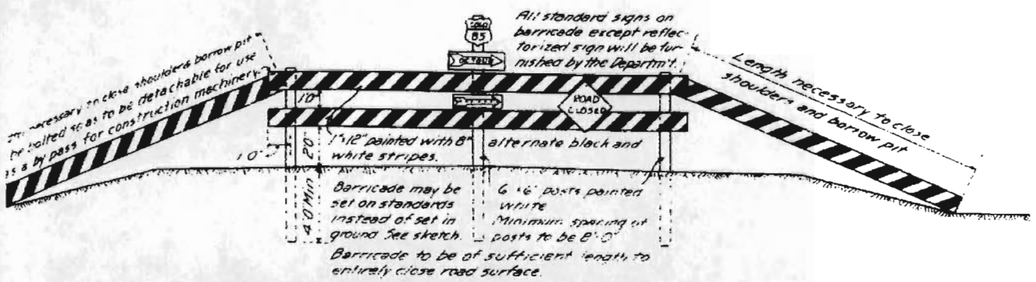
STANDARD M-2-B

FED ROAD DIST. NO.	STATE	PROJ NO.	SHEET NO.	TOTAL SHEETS
3	COLO		22	

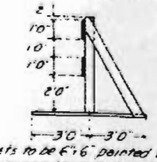
Revised 6-1-37 A.D.R. Changed to 1937 Specifications
Revised 8-18-39 A.T. Changed side drain note.
Revised 12-1-39 A.T. Changed typical plans for side approach roads.
Revised 2-10-40 A.T. Changed taper of grades for side approach roads.
Rev. 6-28-40-A.T.-1940 Specs.

TYPICAL PLANS FOR SIDE APPROACH ROADS

DETAILS OF PERMANENT BARRICADE



END VIEW OF PORTABLE BARRICADE



Posts to be 6"x6" painted white Base and brace to be 2"x6" painted white, and nailed with 12d nails. Base to be weighted if necessary for stability.

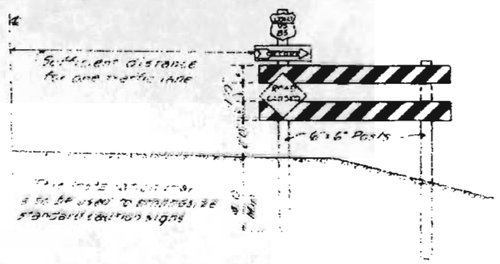
POSITION OF SIGNS RELATIVE TO ROADBED

This position to be governed by the maximum day and night visibility which is influenced by grade, curvature, intervening vegetation, hills, signs, shoulders, fences, etc.

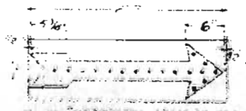
Exact location to be staked by the Engineer, but in no case shall it be more than 8 feet from the travelled zone.

Barricades to be placed as construction conditions require

DETAILS OF PARTIAL BARRICADE



SUGGESTED DETAIL OF REFLECTORIZED ARROW

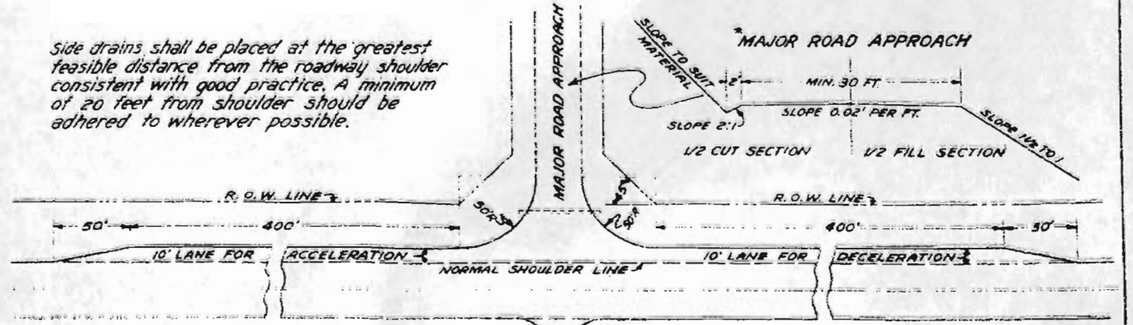


Reflector Buttons and Sign shall be subject to Department approval. Reflector Buttons shall be Signal Service 51 A (1 white crystal) or suitable equivalent.

DETAILS OF ROAD UNDER CONSTRUCTION SIGN

Sign to be made of 1" material with at least three coats on the back. Background to be white, SLOW and words to be red, and other lettering to be black. Sign to be set on 2"x6" posts 4 ft. in the ground.

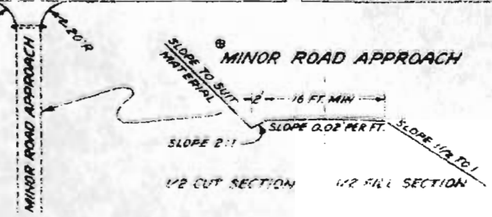
MAJOR ROAD APPROACH



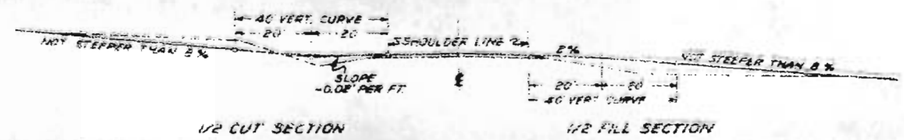
* Major Road Approaches shall be used only where indicated in structure notes on plans.

⊕ Minor Road Approaches shall be used at all places which are not indicated as "Major Road Approaches." The width of crowned section shall not be less than the existing crowned width of the approaching road, but in no case shall it be less than 16 feet.

MINOR ROAD APPROACH

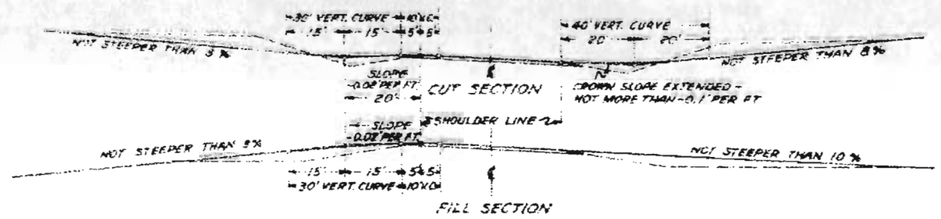


STANDARD CROWNED SECTION



1/2 CUT SECTION 1/2 FILL SECTION

SUPERELEVATED SECTION



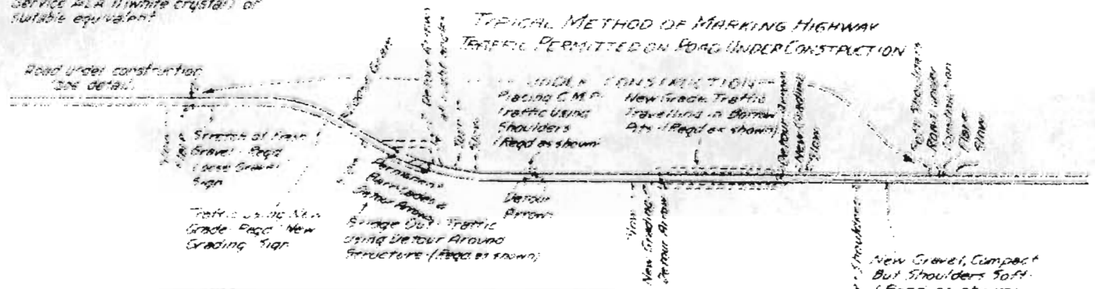
GENERAL NOTES ON APPROACHES

The maximum grades shown are to be the limiting grades for all except extreme cases.

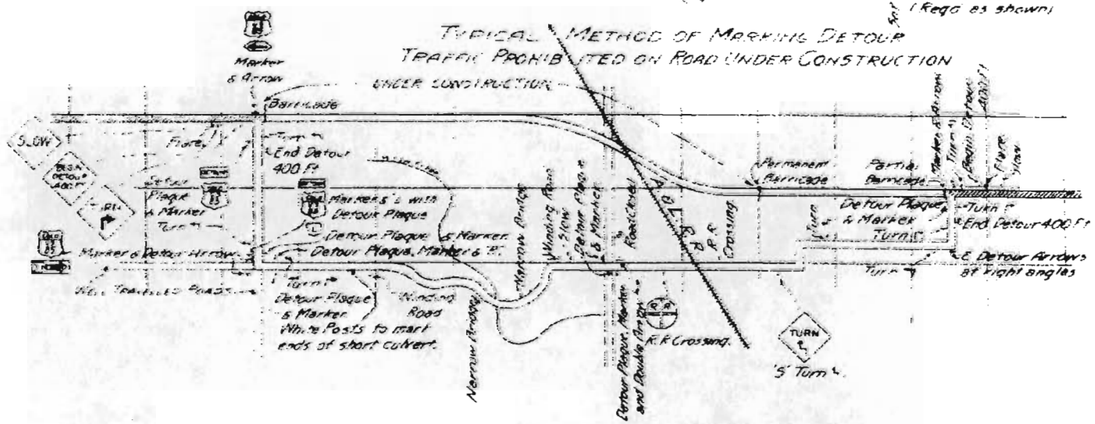
When the length of the approach as determined by the intersection of these grades with the natural ground is such as to damage the property so served, or cause unreasonable conditions, the grades may be modified.

In such cases, methods used, and maximum grades, shall be as indicated on the plans or provided by work order.

TYPICAL METHOD OF MARKING HIGHWAY TRAFFIC PERMITTED ON ROAD UNDER CONSTRUCTION



TYPICAL METHOD OF MARKING DETOUR TRAFFIC PROHIBITED ON ROAD UNDER CONSTRUCTION



GENERAL NOTES FOR ROADWAY CONSTRUCTION TRAFFIC SIGNS

All work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department adopted for June 1935.

Whenever traffic is permitted on a road while under construction, the Contractor shall at all times adequately and appropriately mark any and all hazards on the Project with well painted, well maintained barricades, and standard caution and warning signs. The Contractor shall also mark with standard directional signs any places where the direction of the flow of traffic is not plain.

Whenever traffic is prohibited from a Project under construction, the Detour will be marked by the Department and the barricades at either end of the Project shall be erected and maintained by the Contractor.

All signs and barricades shall be immediately moved, hidden to, removed, or changed to appropriately mark hazards, or conditions altered, corrected, or changed by construction progress.

The Contractor shall furnish:

(1) All barricade material. It shall always be well painted as per sketch, and well maintained.
(2) A reflectorized arrow, of an approved type for each barricade at the ends of the Project, and at other barricades required where traffic is permitted on road under construction.
(3) "SLOW-ROAD UNDER CONSTRUCTION" signs as required.
(4) Any special signs the Department may deem necessary for the protection of traffic over the Project.
(5) At least three (3) flares or torches for each barricade, and other flares to illuminate such signs as are called for on these plans, or as the Department may direct.

Flares or torches shall be placed between 3 and 5 feet ahead of the sign or object to be illuminated, and shall be kept burning from sunset to sunrise.

Costs of all of the foregoing materials and work by the Contractor shall be included in the original contract prices for the Project.

The Highway Department will furnish all standard signs not required to be furnished by the Contractor.

COLORADO STATE HIGHWAY DEPARTMENT
TYPICAL
SIDE APPROACH ROADS
ROADWAY CONSTRUCTION TRAFFIC SIGNS

Designed by J.S.M. Made by S.D.L. Check J.S.M. Check K.A.K.
Approved by J.S. Marshall
Date Aug. 20, 1935

REVISIONS

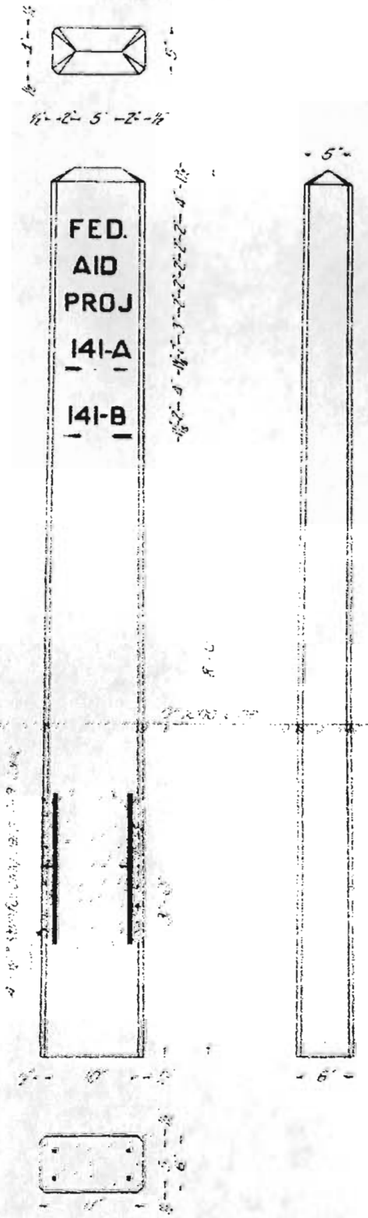
Rev 6-28-47 - A.I.S. 1940 Specs.

STANDARD M-7-B

FED. ROAD DIST. NO.	STATE	SHEET NO.	TOTAL SHEETS
3	COLO.	SNFAP 23	23

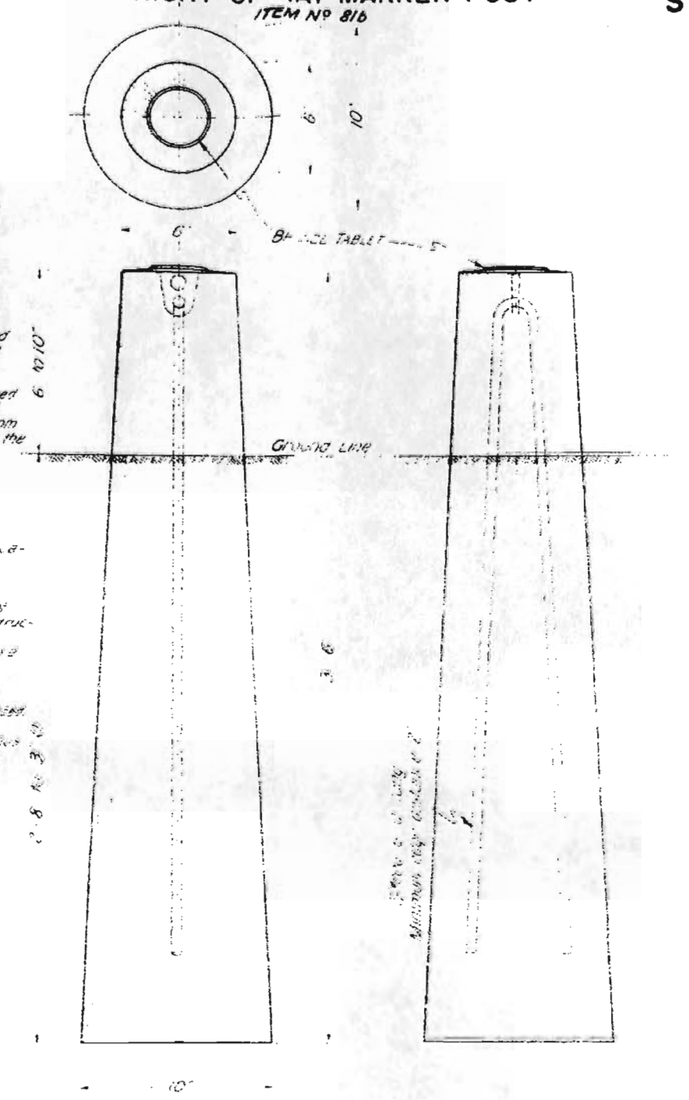
PROJECT MARKER POST

ITEM Nº 81B



RIGHT OF WAY MARKER POST

ITEM Nº 81b

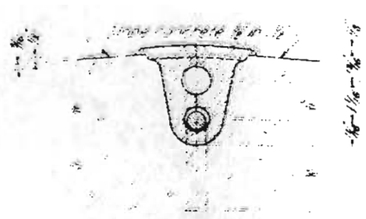


NOTES FOR PROJECT MARKER POSTS

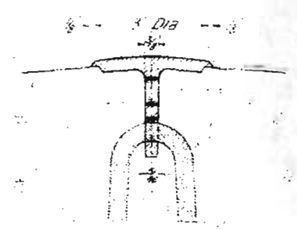
All work shall be done in accordance with the standard specifications of the Colorado State Highway Department, adopted June 1, 1940.
Posts shall be made of Class "A" concrete except use white Portland Cement.
All exposed surfaces shall be rubbed free of form marks.
All letters and numbers shall be 2" plain upright block, painted or stenciled on the concrete with a good quality of black paint. See item Nº 81. "Second Field Coat - Dark".
Numbers and arrows shall show the proper numbers and directions of the projects each way from where the post is placed. Post to be set with sign facing the road at the end of the project, two feet inside the R.O.W. line or at a point amply protected from traffic in such a position that the sign will indicate properly the projects to which it refers.

NOTES FOR R.O.W. MARKER POSTS

All work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department, adopted June 1, 1940.
Posts shall be made of Class "A" concrete.
The [illegible] of the [illegible] shall be rubbed free of form marks, and the top surface of the post must be constructed [illegible].
All exposed surfaces of the bronze tablet are to be [illegible] to a [illegible] surface.
[illegible] to be stamped [illegible] inches or [illegible] inch [illegible] on the bronze tablet [illegible] on the line [illegible] to be stamped in the field by the engineer [illegible] after post is placed.
[illegible] letters and figures to be used.
Project designation [illegible] shall be properly shown. This [illegible] for Federal Aid Projects, [illegible] for State Projects [illegible] for R.O.W. Projects etc.



SECTION B-B



SECTION A-A

DETAIL OF BRONZE TABLET
FOR RIGHT OF WAY MARKER POST

COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD
MARKER POSTS

Designed by R.F.I.
Made by F.F.S.
Checked by R.E.L.
Approved by [signature]
Date Apr. 1941

STA. 345+00 – BEGIN SN F.A.P. 163 (2)

345+00 – Req'd Project Marker

344+00 to 345+60 – Req'd 20 Cu. yds Excav. for Ditch Change on Rt

347+05 – Remove Sign on Rt

348+50 – Rem. Sign on Lt
348+70 – Rem. Sign on Lt

349+25 – Remove Sign on Lt

349+00 to 350+00 – Req'd 10 cu yds Excav. for Ditch Change on Rt

350+20 – Remove 12" x 18' C.M.P. Side Drain (2-Conc. Headwalls) on Lt. Req'd 20 cu yds. Excav and 18" x 30' C.M.P. Side Drain for Road Approach on Lt

350+35 – Remove Sign on Lt

351+45 – Remove Sign on Lt

352+00 to 353+80 – Req'd 200 cu yds Embank Berm Reservoir on Lt

350+00 to 351+00 – Req'd 60 Cu. Yds Excav. for Ditch on Lt. (use 30 Cu. Yds. to make Roadway ditch.)

350+00 – Req'd 10 cu yds. Embank for Road Approach on Rt

353+68 – Remove Sign on Rt

353+26 – Extend present 3'x3' Conc. Box Culv. 9 ft on Lt and 7 ft on Rt. and Req'd 50 cu yds. Excav for Inlet and Outlet Ditches. Remove Headwalls and cut Keyways

352+00 to 357+92.8 – Rem. 1186 sq. yds Concrete Pavement

357+00 to 357+96 – Remove and Reset 20 Timber Guard Posts on Lt and Rt

356+15 – Extend present 3'x3' Conc. Box Culv. 9 ft on Lt and 7 ft on Rt. and Req'd 50 cu yds. Excav. for Inlet and Outlet ditches. Remove Headwalls and cut Keyways.

357+92.8 to 359+47.3 – Remove Present Bridge Superstructure. Remodel Present Abuts. and place New Superstructure as per details on Sheet Nos. [illegible]

359+47.3 to 365+50 – Remove 1206 sq. yds Concrete Pavement

359+50 to 360+2[illegible] – Rem. and Reset 20 Timber Guard Posts on Lt & Rt

365+50 – Req'd 180 cu yds Excav. and remove 400 sq. yds Conc. Pavt for Approach to Project

STA. 365+50 – END SN F.A.P. 163 (2)

P.I. 3.30

P.I. 98.70

99.23

98.85

00.65