FED. ROAD DIVISION NO.	DISTRICT	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F-FG 004-1(6)	1	

Rev. 3-29-50 J.P.K. to Index of Sheets
Rev. 3-6-50 & J.P.K. to Index of Sheets
Rev. 3-20-50 to J.P.K. & Sheet No. 82

COLORADO
STATE HIGHWAY DEPARTMENT

PLAN AND PROFILE OF PROPOSED
FEDERAL AID PROJECT NO. F-FG 004-1(6)
STATE HIGHWAY NO. 14
LARIMER COUNTY

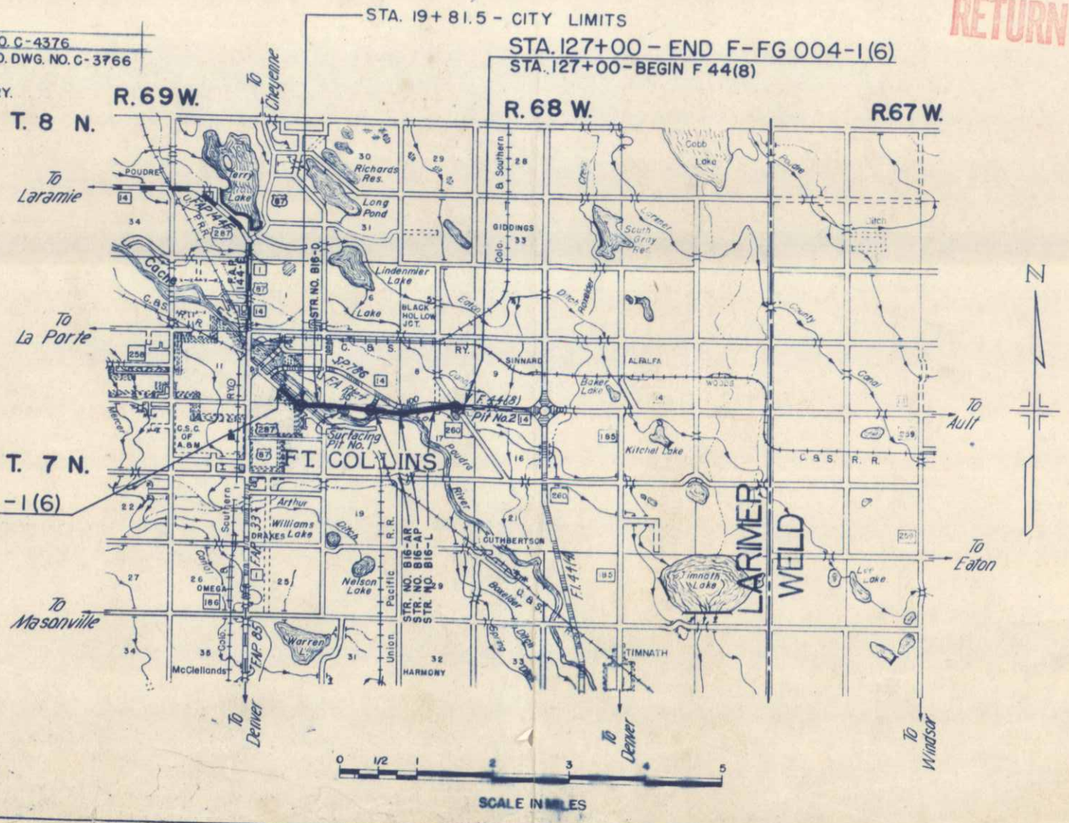
INDEX OF SHEETS

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 } 11,510.0 FT. = 2.179 MI.
NET LENGTH OF PROJECT }

Tang. D
PC
Length
.03 C.P.

AS CONSTRUCTED PLANS
RETURN TO DIST. 4 DESIGN

NOTE -
It is recommended that bidders on this project go over the plan details with one of the following field representatives of this department:
State District Engineer - Denver
District - Construction Engineer - Greeley



CONVENTIONAL SIGNS

CENTER LINE
RIGHT-OF-WAY LINE
TOWNSHIP OR RANGE LINE — T. 8 N., R. 69 W. / T. 7 N., R. 68 W.
SECTION LINE
QUARTER SECTION LINE
PROPERTY OR TRACT LINE
CITY LIMITS
RAILROAD
BARBED WIRE FENCE
WOVEN WIRE-COMBINATION FENCE
BOARD FENCE
TELEPH. & TELEG. LINE
POWER LINE
WATER MAIN
PRESENT ROAD (PLAN SHEETS)
SEWER LINE & DRAIN LINE
POINTS OF ACCESS

RECOMMENDED FOR APPROVAL
Jas. A. Bell
ASSISTANT ENGINEER — DATE 9-8-49

APPROVED
Mark T. Watson
STATE HIGHWAY ENGINEER — DATE 9-12-49

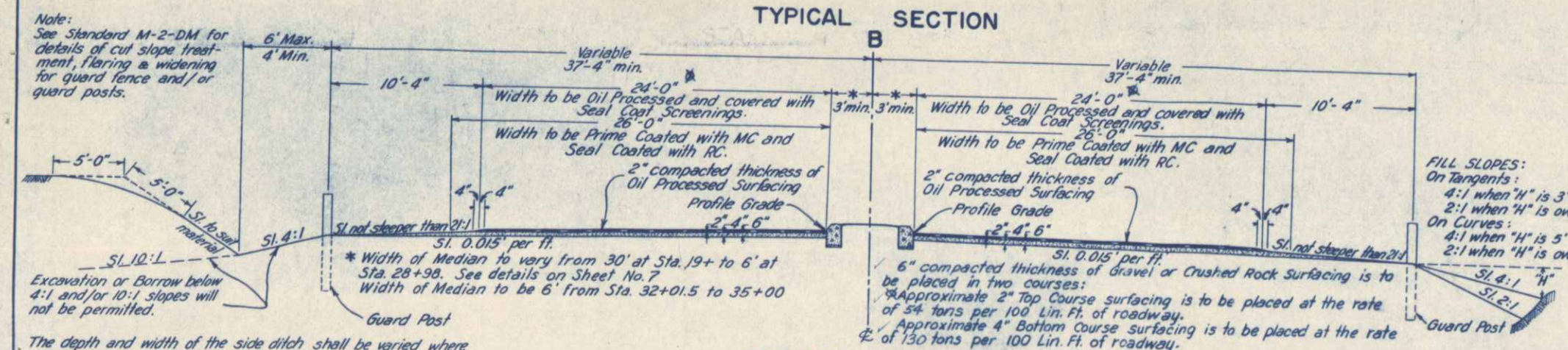
RECOMMENDED FOR APPROVAL
DISTRICT ENGINEER
BUREAU OF PUBLIC ROADS
DEPARTMENT OF COMMERCE

APPROVED
DIVISION ENGINEER
BUREAU OF PUBLIC ROADS
DEPARTMENT OF COMMERCE

TYPICAL CROSS SECTION OF IMPROVEMENT

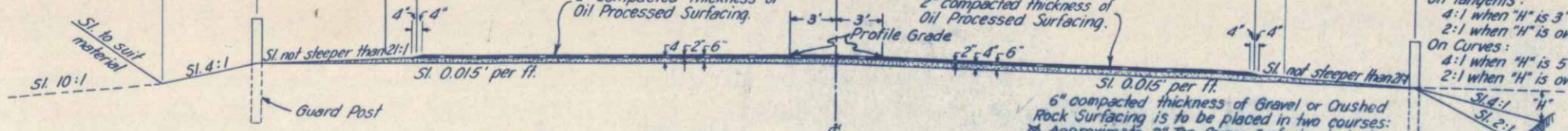
FED. ROAD DIVISION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F-FG 004-1(6)	2	

TYPICAL SECTION B

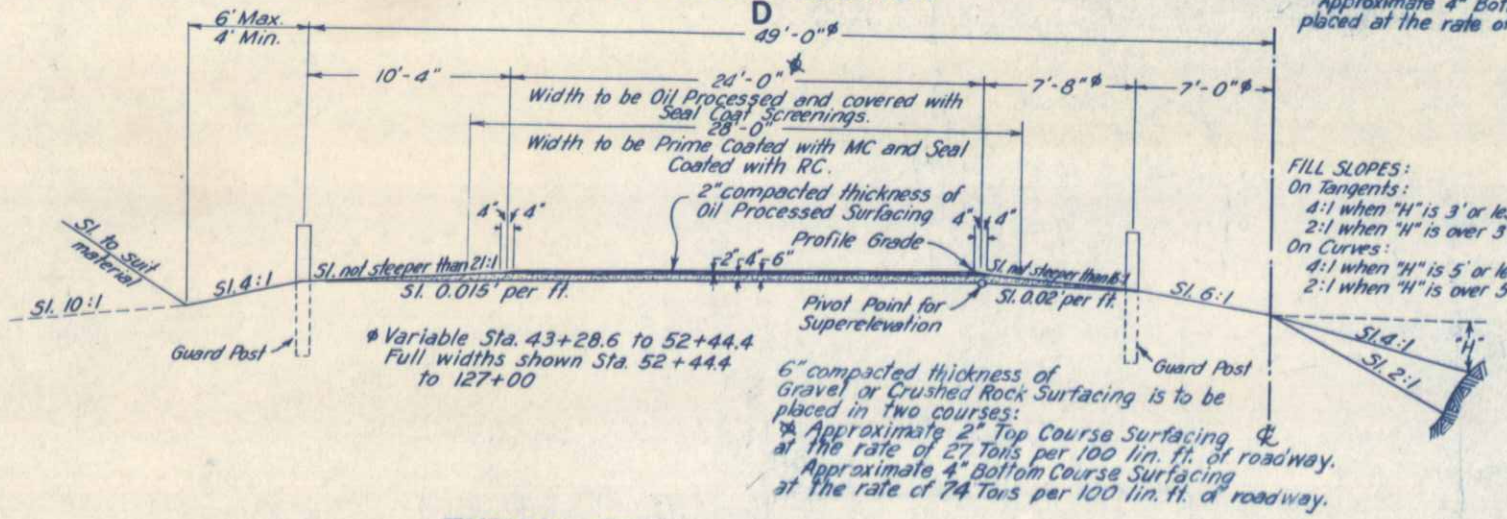


The depth and width of the side ditch shall be varied where necessary in order to provide proper drainage and/or entrance to drainage structures.

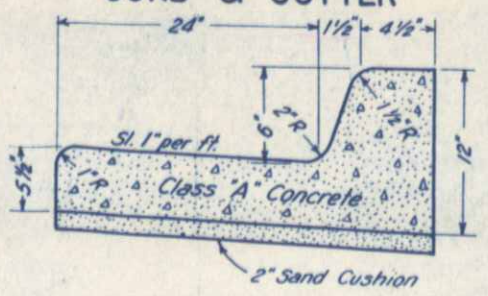
TYPICAL SECTION C



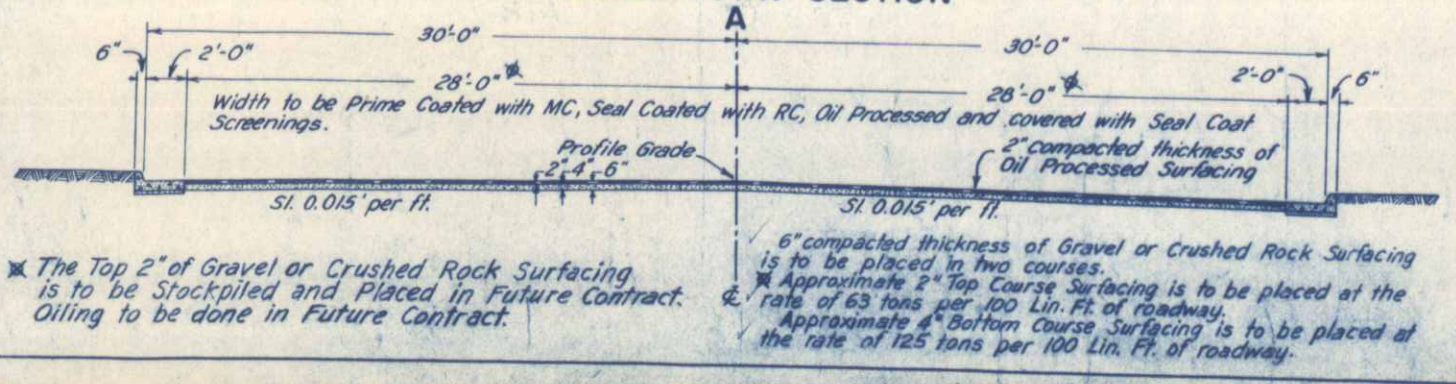
TYPICAL SECTION D



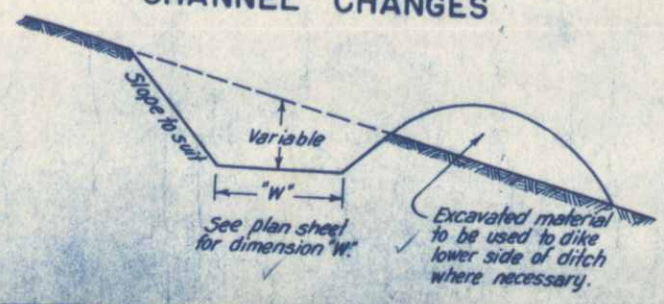
DETAIL OF CONCRETE CURB & GUTTER



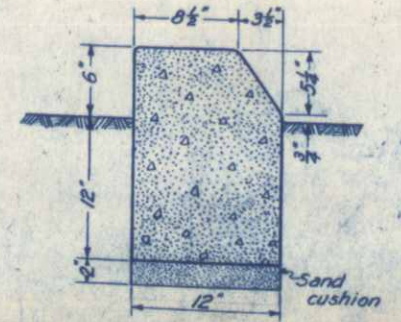
TYPICAL TOWN SECTION A



TYPICAL SECTION OF DITCHES & CHANNEL CHANGES



DETAIL OF CONCRETE CURB



GENERAL NOTES

This Project is to be constructed in conformity with the Standard Specifications of the Colorado State Highway Department adopted January 1, 1948.

All quantities on preliminary plans are to be considered approximate only.

All roadway excavation required to construct this Project is to be obtained and used as indicated on the plans. Quantities involved beyond the limits of the ditches shown on the Typical Cross Section, either noted as "Borrow" on the Plans or as "Embankments" in the List of Structures, are to be classified and paid for as "Unclassified Excavation." These quantities are to be staked as part of the original excavation at locations indicated on the Plans. Any slope stakes beyond the limits of the Typical Section as shown, are subject to change by the Engineer to fit conditions actually met in construction.

All poles encroaching on construction are to be moved by the owners.

All corrugated Metal Pipe Cross Culverts shall be laid with Metal Aprons on each end unless otherwise noted on the plans.

All concrete used on this project shall be "Air Entrained Concrete."

Culverts projecting from embankments shall be covered with approximately 6 inches of embankment material in such a manner that a minimum of pipe shall be exposed in the completed work. This shall be accomplished by warping embankment slopes around and adjacent to the Culvert.

Except as otherwise noted on the plans, payment for overhaul will be based on measurement along the centerline of the project.

Right of Way fences, including line posts, shall be constructed approximately six (6) inches inside the boundary of the Highway Right of Way as shown on the plans.

All curves are to be superelevated and widened as provided by Standard M-4-E (Special Revision) Sheet No. 22 of the plans, except as otherwise noted on Plans.

The Detour for this project lies along the present traveled road. At all places on the project where the new work lies along the present traveled road, the Contractor shall, at his own expense, prosecute construction in such manner that traffic may readily pass over the road. Also, the Contractor shall maintain in safe condition and at his own expense, all temporary approaches to and crossings of intersecting roads.

The Force-Account item, "Clearing of Building Sites, including Removal of Foundation and Appurtenances," shall include removal of all foundations, wells, outhouses and other appurtenances not removed by the owner, and any necessary backfilling of cellars, cess pools, wells, etc., to provide neat road-side conditions. It is estimated that this item applies at the following stations: 15+ to 19+

It is estimated that Old road is to be Obliterated at the following locations: Sta 124+ to Sta. 125+50

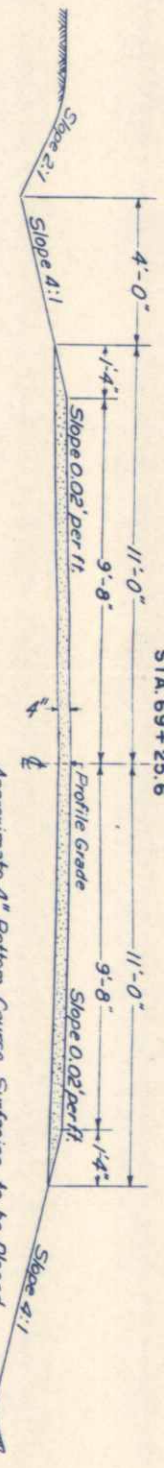
TABULATION OF TYPICAL SECTIONS

STATIONS	TYPICAL SECTION	DESCRIPTION
12+00 to 19+81.5	A	Inside Ft. Collins
19+81.5 to 35+00	B	Outside Ft. Collins 4-Lane Divided
35+00 to 43+28.6	Transition C to D	4-Lane to 2-Lane
43+28.6 to 127+00	D	2-Lane

SUMMARY OF APPROXIMATE QUANTITIES

ITEM NO.	ITEM	UNIT	ROADWAY INSIDE CITY 60'W	ROADWAY OUTSIDE CITY 48' W	ROADWAY OUTSIDE CITY 24' W	BRIDGES OUTSIDE CITY STA. 30+	BRIDGES OUTSIDE CITY STA. 73+	BRIDGES OUTSIDE CITY STA. 86+	BRIDGES OUTSIDE CITY STA. 116+		PROJECT TOTALS
10a	Clearing and Grubbing Entire Project	L.S.	Prorated	Prorated	Prorated						•
11a	Removal of Concrete Pavement	Sq.Yd.			240						240
11b	Adjust Manhole Ring & Cover	Each	1	1							2
11c	Removal of 2 Structures	L.S.			•						•
11d	Removing Concrete Sidewalk	Sq.Ft.	120								120
11e	Removal of Stone House, Sheds & Appurtenances Sta. 67+	L.S.			•						•
11f	Removing & Resetting Mail Boxes	L.S.			•						•
11g	Removal of Concrete Slab, Sta. 69+	Sq.Yd.			38						38
11h	Removal of Portions of Present Structure	L.S.			•						•
12a	Removing Fence	Lin.Ft.	100	1200	3500						4800
12b	Removing & Rebuilding Fence	Lin.Ft.	300		2600						2900
12c	Line Posts (Treated Wood)	Each	10		20						30
13c	Unclassified Excavation	Cu.Yd.	1900	63700	113400	10,000					189,000
13d	Unclassified Ditch Excavation	Cu.Yd.		100	1100						1,200
14a	Dry Rock Excavation (Str.)	Cu.Yd.	20	10	30		5	5	5		75
14b	Dry Common Excavation (Str.)	Cu.Yd.	130	30	200	440	15	80	30		925
14c	Wet Rock Excavation (Str.)	Cu.Yd.	10	10	10	210	5	5	5		255
14d	Wet Common Excavation (Str.)	Cu.Yd.	50	10	70	930	30	5	10		1105
16a	Structure Backfill (Class I)	Cu.Yd.	120	160	450	1200	140	150	180		2400
16d	Mechanical Tamping	Hour	30	40	120	120	15	15	20		360
17ax	Rolling with Tamping Roller (2 Unit)	Hour	10	130	250						390
17ay	Rolling with Tamping Roller (4 Unit)	Hour	10	70	130						210
17b	Rolling with Flat Wheeled Roller	Hour	10	20	70						100
17dx	Furnishing Tamping Roller (2 Unit)	Each	0.1	0.3	0.6						1.0
17dy	Furnishing Tamping Roller (4 Unit)	Each	0.1	0.3	0.6						1.0
17e	Furnishing Flat Wheeled Roller	Each	0.1	0.3	0.6						1.0
17g	Wetting	M Gal.	120	1550	3150						4820
18a	Station Yard Overhaul	Sta. Yd.	6500	74900	962600						1,044,000
18b	Yard Mile Overhaul	Yd. Mi.			30900						30900
18c	Ton Mile Overhaul	Ton. Mi.			1500						1500
26c	Gravel or Crushed Rock Surfacing (Grading C)	Ton	1800	1700	8900						12,400
37c	Sand Cushion	Cu.Yd.	50	20							70
42a	Untreated Bridge Timber	Mfd.bm.				0.5	1.3	0.9	1.4		4.1
42b	Treated Bridge Timber	Mfd.bm.					32.5	19.4	32.9		84.8
43	Asphalt Plank Wearing Surface	Sq.Ft.					1805	783	1805		4393
44a	Miscellaneous Untreated Timber	Mfd.bm.			0.1						0.1
46a	Class "A" Concrete	Cu.Yd.	2		26	1070					1098
47	Reinforcing Steel	Lb.	300		3100	111,700					115,100
48	Structural Steel	Lb.				632,700					632,700
53b	18" Corrugated Metal Culvert Pipe	Lin.Ft.		24	342						366
53c	24" Corrugated Metal Culvert Pipe	Lin.Ft.	344	464	386						1194
53e	36" Corrugated Metal Culvert Pipe	Lin.Ft.			92						92
58c	24" Asbestos Bonded Corr. Metal Culv. Pipe (Bit. Coated)	Lin.Ft.			132						132
58e	36" Asbestos Bonded Corr. Metal Culv. Pipe (Bit. Coated)	Lin.Ft.			362						362
60a	Treated Timber Piling	Lin.Ft.					1104	600	1104		2808
60e	Metal Pile Shoes	Each					48	30	52		130
63	Grouted Rubble Slope & Ditch Pav. (9" Thick)	Sq.Yd.	54		10						64
67b	Heavy Riprap	Cu.Yd.				450					450
76a	Barbed Wire Fence with Treated Wooden Posts	Lin.Ft.		2600	12800						15400
76g	Barbed Wire Gates	Each		1	5						6
76h	Driveway Gates	Each	1								1
80c	Sheet Copper, 32 oz.	Lb.				6					6
76i	Walk Gates	Each	1								1
81b	Right of Way Markers	Each		2	6						8
84a	Concrete Curb	Lin.Ft.	820	2380							3200
84c	Concrete Combination Curb & Gutter	Lin.Ft.	2310								2310
89a	Drain Pipe (Concrete Floor) (4"x 2'-0")	Each				40					40
89b	Drain Pipe (Timber Floor) (3"x 2'-4")	Each					6	2	3		11
92	Timber Guard Posts	Each		44	72						116
95b	Metal Aprons for 18" Corr. Metal Pipe Culverts	Each			1						1
95c	Metal Aprons for 24" Corr. Metal Pipe Culverts	Each		6	12						18
95e	Metal Aprons for 36" Corr. Metal Pipe Culverts	Each			1						1
95ex	Metal Aprons for 36" Corr. Metal Pipe Culverts (Bit. Coated)	Each			2						2
132ga	No. 12 Inlet Grating and Frame	Each	2								2
132rx	Grate Cover	Each			1						1
	STATE FORCES										
81a	Project Marker (State Forces)	Each	1								1
	Advance Warning Sign (State Forces)	Each	2	1							3
	FORCE ACCOUNT										
	Railroad Crossing, Signal & 24" C.M.P. (U.P.R.R. Forces)	L.S.	•								•
	Railroad Crossing & Signal (C.& S.R.R. Forces)	L.S.		•							•
20a	Obliterating Old Road	L.S.			•						•
	Move Power Line (Work by Pub. Ser. Co. of Colo.)	L.S.			•						•
	Move Telephone Lines (Work by Mtn. States Tel. & Tel. Co. Forces)	L.S.	•	•	•						•
	Move Power Lines (Work by City Forces)	L.S.	•	•							•
	Move Teleg. Line (Work by Western Un. Co. Forces)	L.S.	•								•
	Move Power Lines (Work by Poudre Valley REA Forces)	L.S.			•						•
	Rem. & Reset Fire Hydrant, 1 ea. (Work by City Forces)	L.S.	•								•
	Clear Building Sites, including Removal of Foundations	L.S.	•								•
	RIGHT OF WAY										
	Right of Way, including moving of buildings and Appurtenances.	L.S.	•	•	•						•
	NON-PARTICIPATING ITEMS										
26e	Stockpile Surfacing (Grading C)	Ton									4800
102	Scarify & Salvage Oil Processed Surfacing	Sq.Yd.									8500
	ALTERNATE BIDS TO BE RECEIVED FOR CONCRETE PIPE CULVERTS: The following items are to be bid upon in lieu of items: 58c, 58e & 95ex										
52c	24" Reinforced Concrete Culvert Pipe	Lin.Ft.			132						132
52e	36" Reinforced Concrete Culvert Pipe	Lin.Ft.			374						374

GRAVEL SURFACED SECTION FOR ROAD APPROACH STA. 69+ 25.6



Approximate 4" Bottom Course Surfacing to be Placed at the rate of 46 Tons per 100 lin. ft. of Roadway.

Rev. 3-21-49 - Item 31c deleted - E.A.R.
Rev. 11-3-49 - E.A.R. - Bridge Quantities
Rev. 12-5-49 - E.A.R.
Rev. 12-7-49 - E.A.R. - Gates
Rev. 12-16-49 E.A.R. - Alt. Bid Items

FED. ROAD DIVISION NO.	DISTRICT	PROJECT NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F-FG 004-1 (6)	3	

Rev. 12-5-49-E.A.R.

FED. ROAD DIVISION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F-FG004-1(6)	4	

Rev. 11-3-49-E.A.R.-

LIST OF STRUCTURES

STATION	DESCRIPTION	REMOVE STRUCTURE	EXCAVATION: UNCLASSIFIED CU. YDS.	EXCAVATION: UNCLASSIFIED CU. YDS.	EXCAVATION: UNCL. DITCH	STRUCTURAL EXCAVATION: CUBIC YARDS	STRUCTURE BACKFILL CLASS -	MECHANICAL TAMPING	GRAVEL OR CRUSHED ROCK SURF.	CONCRETE: CU. YDS.		REINFORC. STEEL	CORRUGATED METAL CULVERT PIPE: LINEAR FEET						METAL APRONS: EACH			MISCELLANEOUS
		NO.	EXCAV.	EMB.	CU. YDS	Ø	CU. YDS.	HOURS	TON	CL. "A"	CL. "B"	LBS.	18"	24"	30"	36"	84"		24"	30"	36"	
12+00	Project Marker & Approach to Project		100						15													1-Project Marker (To be furnished & installed by State Forces)
12+ to 19+	Move Telegraph Line, Lt.						(FORCE ACCOUNT)		-													
12+ to 22+	Move Power Line, Rt. & Lt.						(FORCE ACCOUNT)		-													
16+ to 27+	Move Telephone Line, Rt. & Lt.						(FORCE ACCOUNT)		-													
13+	Road Approach, Rt.			20					41													
16+50	Advance Warning Sign, Rt.																					1-Advance Warning Sign (To be furnished & installed by State Forces)
15+	Move House & Appurtenances, Rt.						(R.O.W. ITEM)		-													
16+	Move House & Appurtenances, Rt.						(R.O.W. ITEM)		-													
17+70	Remove & Reset Fire Hydrant, Rt.						(FORCE ACCOUNT)		-													
17+70	Advance Warning Sign, Rt. (Mulberry St.)																					1-Advance Warning Sign (To be furnished & installed by State Forces)
17+85	Cross Culvert, No. 12. Conc. Inlet Rt. (H=4'-0"), No. 12 Conc. Inlet Lt. (H=4'-6"), Gr. Rubble Slope & Ditch Paving (9" Thick)					189	114	29		1.4		219		80 264								2-Gratings & Frames, 54 sq. yds. Grouted Rubble Slope & Ditch Paving, (9" Thick)
18+	Road Approach, Rt. (Mulberry St.)			737					400													
18+	Adjust Manhole Ring & Cover to Grade, Rt.																					Adjust Manhole Ring & Cover to Grade
18+	Road Approach, Rt. (Riverside Ave.)			100					267													
19+	Move House & Appurtenances, Rt.						(R.O.W. ITEM)															
19+	Remove Conc. Sidewalk, Rt.																					Remove 120 sq. ft. Conc. Sidewalk
19+	Railroad Crossing						(FORCE ACCOUNT)															
	Totals Inside City (60' Roadway)		100	857		189	114	29	723	1.4		219		344								
20+	Railroad Crossing						(FORCE ACCOUNT)															
20+34	Adjust Manhole Ring & Cover to Grade, Rt.																					Adjust Manhole Ring & Cover to Grade
22+58	Cross Culvert, Outlet Ditch				10	24	76	19						228					2			
28+10	Cross Culvert, Inlet & Outlet Ditches				5	5	48	12						146					2			
28+98.1 to 32+01.9	Bridge & Channel Change (W=300) (Details on Sheets Nos. 10, 11, 12, 13, 14.)						(QUANTITIES IN SUMMARY)															
23+00	Advance Warning Sign, Lt.																					1-Advance Warning Sign (To be furnished & installed by State Forces)
34+	Ditch Change, Lt.				5																	
34+88	Cross Culvert, Inlet & Outlet Ditches				5	5	30	8						90					2			
21+	Road Approach & Side Drain, Lt.			50		3	6	1	80				24									
	Totals Outside City (48' Roadway)			50	25	37	160	40	80				24	464					6			
37+00	Road Approaches & Side Drains, Rt. & Lt.			250		10	20	5	66				38 38									
38+66	Cross Culvert, Inlet & Outlet Ditches.				10	8	32	8						84					2			
39+48	Cross Culvert, Inlet & Outlet Ditches				5	5	23	6						70					2			
46+00	Cross Culvert, Outlet Ditch				5	2	19	5						58					2			
47+75	Asbestos Bonded Cross Culvert, (Bituminous Coated) Inlet & Outlet Ditches				10	31	44	11							270±							
55+ to 62+	Ditch Change, Rt.				130																	
62+09	Cross Culvert, Inlet & Outlet Ditches,				10	4	18	5						54					2			
62+09	Side Drain, Lt.					11	8	2					30									
62+ to 69+	Drain Ditch, Lt.				194																	
64+ to 65+	Ditch Change, Lt.				10																	
67+ to 69+	Remove Stone House, Sheds & Appurtenances, Rt. & Lt.																					Remove Stone House, Sheds & Appurtenances
69+25	See "APPROACH STA. 69+25.6" Sheet 29			0		5	12	3	835				48									
69+ to 74+	Road Approaches, Rt. & Lt., Side Drain, Lt. Drain Ditch, Lt.				60																	
73+88 to 74+47.2	Bridge (Details on Sheet No. 15)						(QUANTITIES IN SUMMARY)															
86+07 to 86+35.5	Bridge (Details on Sheet No. 17)						(QUANTITIES IN SUMMARY)															1-18" Metal Apron
74+55	C.M.P. Culv. Lt., Gr. Rub. Sl. & Ditch Pav. (9" thick)			25									50									10 sq. yds. Gr. Rub. Sl. & Ditch Pav. for outlet apron.
86+57	Cross Culvert, Inlet end connected to Siphon Headwall (Details Sheet No. 5)					4	44	11		1.4		9				92				1		Removal of Portions of Present Structure
87+ to 95+	Ditch Change, Rt.				316																	1-Grate Cover
90+00	Cross Culvert, Inlet & Outlet Ditches				5	4	20	5						60					2			

CONTINUED ON SHEET NO. 5

Rev. 12-5-49-E.A.R.

FED. ROAD DIVISION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F-FG 004-1(6)	5	

Rev. 11-3-49-E.A.R.-Bridge Note Sta. 116+

LIST OF STRUCTURES

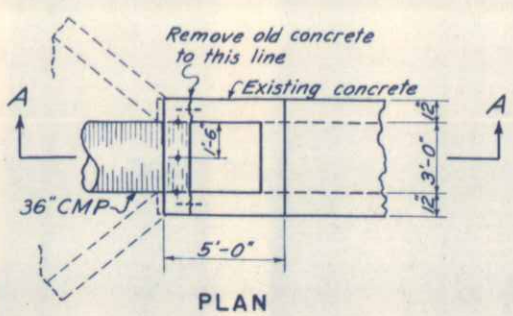
CONTINUED FROM SHEET NO. 4

STATION	DESCRIPTION	REMOVE STRUCTURE NO.	EXCAVATION UNCLASSIFIED CU. YDS. EXC.	EMB.	UNCL. DITCH CU. YDS.	STRUCTURAL EXCAVATION CUBIC YARDS φ	STRUCTURE BACKFILL CLASS-1 CU. YDS.	MECHANICAL TAMPING HOURS	GRAVEL OR CRUSHED ROCK SURF. TON	CONCRETE CU. YDS. CL."A"	CL."B"	REINFORC. STEEL LBS	CORRUGATED METAL CULVERT PIPE LINEAR FEET 18"	24"	30"	36"	METAL APRONS EACH 24"	30"	36"	MISCELLANEOUS
95+84 95+ to 97+ 97+70	Cross Culvert, Inlet & Outlet Ditches, Conc. Div. Box, Rt. (Details on Sheet No. 9) Ditch Change, Rt. Conc. Division Box & Outlet Ditch, Rt.				37 64	23	23	6		1.3		122		60			2			0.01 M ft. b.m. Misc. Untreated Timber
97+ to 109+ 112+80 114+70	(Details on Sheet No. 9) Ditch Change, Rt. Road Approach, Rt. Asbestos Bonded Cross Culvert (Bituminous Coated) Inlet & Outlet Ditches			270	5 133 20	5 51	2 44	1 11	40	1.3		122				92*			2*	0.01 M ft. bm Misc. Untreated Timber
115+ 115+65	Remove 15"x140' V.C.P Asbestos Bonded Cross Culvert (Bituminous Coated) No aprons. Connecting to existing 15" V.C.P. at each end.	1				21	44	11		0.5				132*						
114+00 to 115+50	Removal of Muck		1010																	
116+12 to 116+73.1	Bridge (Details on Sheet No. 18)						(QUANTITIES IN SUMMARY)													
116+ to 125+	Move Telephone Line Rt. and Lt.						(FORCE ACCOUNT)													
117+ 116+ to 117+ 118+50 117+ to 124+ 121+	Fill Manhole, Lt. Remove Concrete Pavement, Lt. Road Approaches Rt. & Lt., Side Drain, Lt. Scarify and Salvage Oil Processed Surfacing Move Power Pole, Lt.			5 100		11	21	5	730				80							Remove 233 sq. yds. of Conc. Pavement. 8500 Sq. Yds. Scarify and Salvage Oil Processed Surf.
122+40 1+	Encase Water Main in Concrete APPROACH STA. 69+25.6 Remove 8"x16' C.M.P.	1				90	60	15		21.5		2839								
4+ to 8+ 4+ to 8+ 6+36	Move Telephone Line, Rt. & Lt. Ditch Change, Rt. Cross Culvert, No Aprons. Inlet & Outlet Ditches				31 5	4	(FORCE ACCOUNT) 16	4					58							
9+ to 10+ 10+	Move Power Line, Rt. & Lt. Remove 15'x23' Conc. Slab Rt. & Lt.						(FORCE ACCOUNT)													Remove 38 sq. yds. Concrete Slab
	Totals Outside City (24' Roadway)	2	1010	650	1050	289	450	114	1671	260		3092	342	386 132*		92 362*	12		1 2*	

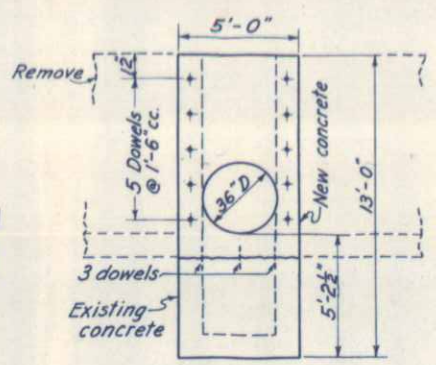
* Asbestos bonded (Bituminous coated)
φ Structural Excavation is estimated to be 90% Common and 10% Rock, each of which is estimated to be 75% Dry and 25% Wet.
θ Quantities on Plan-Profile Sheet No. 29.
▲ Impervious Backfill Material

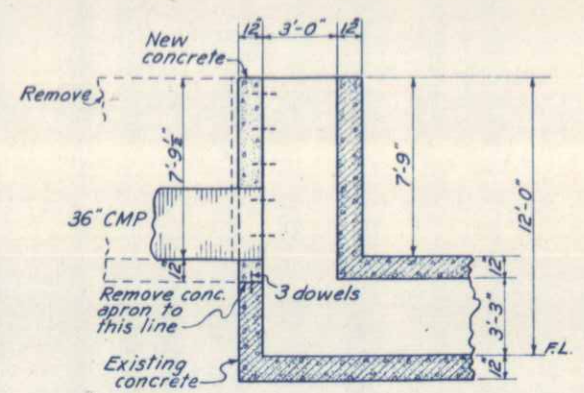
HEADWALL AND GRATE (ATTACHING TO SIPHON HEADWALL) LEFT STA. 86+57

NOTE: Dowels are to be ½" φ deformed reinforcing bars, each 12 inches long and each set 6" in old concrete and 6" in new. 13 Required.



CONCRETE HEADWALL





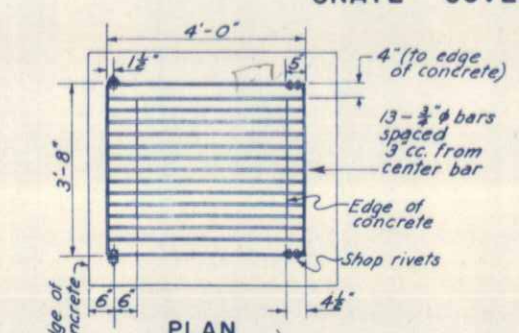
GENERAL NOTES

Old wingwalls and apron shall be removed to lines shown.
All concrete walls shall have forms on both sides.
All concrete surfaces exposed to view shall receive Class 1 surface finish.
Grate Cover is to be painted as per specifications for structural steel.

SUMMARY OF QUANTITIES

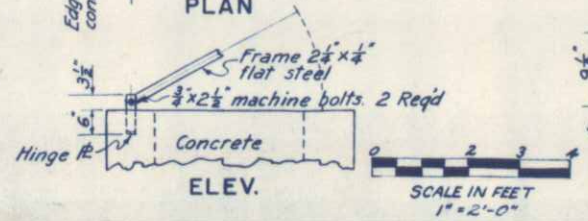
46a	Class "A" Concrete	1.4	cu. yds.
47	Reinforcing Steel	9	lbs.
132rx	Grate Cover	1	
11h	Removal of Portions of Present Structure		

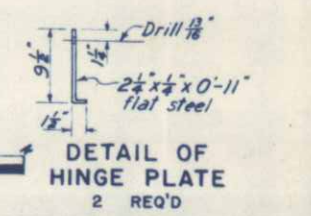
GRATE COVER



WEIGHT of Grate Cover: 110 lbs.

NOTE: Punch frame for ¾" φ bars and weld bars securely in place with a full weld. Fasten grate with hinge bolts and batter threads after installation, to hold nuts. Place ¾" Wrought Washer between grate & hinge plate.





DETAIL OF HINGE PLATE
2 REQ'D

Rev. 4-10-50 w E.E.O w Corrected Errors in Tab. of Length

FED. ROAD DIVISION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F-FG-004-1 (6)	6	

SURFACING PLAN

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

Alteration of the Surfacing Plan as here outlined will be allowed only on written permission from the Department.

MATERIAL TO BE PLACED	SOURCE	QUANTITY AVAILABLE	QUANTITY TONS USED * TOP COURSE GRADING C	QUANTITY TONS USED BOTTOM COURSE GRADING C	OVERHAUL TON MILE
Estimated for loss in stockpile			88		
12+00 to 19+81.5	Pit #1 1530' Rt. Sta 47+00 in N½ Sec. 18, T7N, R68W.	Ample	492	977	
Road Approaches			350	723	
Estimated for Widening			38	70	
Totals Inside City 60'W			968	1770	
Estimated for loss in stockpile			68		
19+81.5 to 28+98.1			495	1192	
32+01.9 to 35+00			161	388	
Estimated for Widening			20	40	
Road Approaches				80	
Totals Outside City 48'			744	1700	
Estimated for loss in stockpile			268		
35+00 to 43+25			363	899	
43+25 to 73+88			827	2266	
74+48.2 to 84+50			271	742	
84+50 to 86+07			42	116	2
86+35.5 to 116+08			804	2203	657
116+68.2 to 124+93.8 Bk.			222	607	418
124+83.8 Ah. to 127+00			58	160	126
Road Approaches				1671	235
Estimated for Widening			95	190	27
Totals Outside City 24'W			2950	8854	1465

Future Construction

* To be Stockpiled on Highway Right of Way, Rt. of Sta. 65+ to Sta. 70+. (Free Haul)

CONCRETE TABULATION

STATION	SIDE	CONC. CURB & GUTTER INSIDE CITY LIN. FT.	CONC. CURB INSIDE CITY 60' W. LIN. FT.	CONC. CURB OUTSIDE CITY 48' W LIN. FT.	SAND CUSHION INSIDE CITY 60' W. CU. YD.	SAND CUSHION OUTSIDE CITY 48' W. CU. YD.
11+60 to 13+38	Rt.	250			3	
12+00 to 18+00	Lt.	600			10	
13+80 to 18+10	Rt.	837#			15	
19+28 to 19+81.5	Lt. & Rt.		100		1	
Mulberry St. Appr.						
14+90 to 20+00	Rt.	545			8	
14+95 to 18+50	Lt. & Rt.		718		4	
19+85 to 20+40	Rt.	75			1	
Begin 48'W						
19+81.5 to 28+98	Lt. & Rt.			1784		11
32+02 to 35+00	Lt. & Rt.			596		4
Totals		2307	818	2380	42	15

Includes distance around block "A".

TABULATION OF LENGTH AND DESIGN DATA

STATION	ROADWAY INSIDE CITY 60'W LIN. FT.	ROADWAY OUTSIDE CITY 48' W LIN. FT.	ROADWAY OUTSIDE CITY 24'W LIN. FT.	BRIDGES OUTSIDE CITY 48' W LIN. FT.	BRIDGES OUTSIDE CITY 24' W LIN. FT.	BRIDGES LOADING
12+00-Begin F-FG004-1(6)						
	781.5					
19+81.5-City Limits, End 60'Rdwy. Begin. 48' Rdwy						
		916.6				
28+98.1 Begin. Bridge				303.8		H-20-44
32+01.9 End Bridge						
		298.1				
35+00 End 48' Rdwy. Begin. 24' Rdwy.						
			3888.0			
73+88 Begin. Bridge					60.2	H-20-44
74+48.2 End Bridge						
			1159.8			
86+07 Begin. Bridge						
86+35.5 End Bridge					28.5	H-20-44
			2972.5			
116+08 Begin. Bridge					60.2	H-20-44
116+68.2 End Bridge						
			825.6			
124+93.8 Bk. Equation 124+83.8 Ah.						
			216.2			
127+00 End F-FG004-1(6) Begin. F44(8)						
Totals	781.5	1214.7	9061.1	303.8	148.9	

SUMMARY	LIN. FT.	MILES
Roadway 60' Inside City	781.5	0.148
Roadway 48' Outside City	1214.7	0.230
Bridges 48' Outside City	303.8	0.057
Total	1518.5	0.287
Roadway 24' Outside City	9061.1	1.716
Bridges 24' Outside City	148.9	0.028
Total	9210.0	1.744
Total F-FG004-1(6)	11,510.0	2.179

DESIGN DATA	
Maximum Degree of Curve	00°30'
Maximum Grade	4.02%
Minimum N.P.S.D. Horizontal	>1300'
Minimum N.P.S.D. Vertical	380'
Maximum Design Speed	60 M.P.H.

R.O.W. MARKERS

STATION	NUMBER LEFT	NUMBER RIGHT
33+70	1	1
Total Outside City 48'W		2
60+10	1	1
85+88	1	1
112+28	1	1
Total Outside City 24'W		6

Rev. 12-7-49-E.A.R. - Fencing

FENCING REQUIREMENTS

STATION	SIDE	REMOVE FENCE LIN. FT.	REMOVE & REBUILD FENCE LIN. FT.	BUILD BARB WIRE FENCE LIN. FT.	LINE POSTS EACH	GATES B.W.	GATES D'WAY	GATES WALK
14+ to 15+	Rt.	10	90		3		1	1
18+ to 19+	Rt.	60	200		7			
Total Inside City 60'W		70	290		10			
21+						1		
19+06 to 28+98	Lt.			1065				
22+20 to 28+98	Rt.			760				
19+06 to 23+08	X	550						
21+72 to 22+04	Rt.	40						
27+62	X	260						
27+85	X	305						
32+01 to 35+00	Lt. & Rt.			758				
Total Outside City 48'W		1155		2583		1		
50+00	Lt					1		
35+00 to 68+70	Lt.			3384				
35+00 to 53+48	Rt.			1844				
37+00	Lt. & Rt.					2		
46+20	X	250						
48+50	X	300						
53+46 to 63+88	Rt.		1042		8			
63+88 to 68+46	Rt.			495				
66+59	X	100						
66+59 to 69+20	Lt. & Rt.	682						
69+20	X	130						
69+30 to 72+00	Rt.			300				
70+50 to 75+00	Lt.			450				
72+00 to 75+84	X	780						
73+06 to 112+18	Rt.			3912				
75+84 to 82+90	Lt.			706				
85+88	X	190						
112+00	Rt.						1	
112+18 to 117+00	Rt.	150		482				
112+50 to 113+54	Lt.	110						
114+90 to 117+90	X	412						
117+54 to 119+00	X	260						
117+80 to 127+00	Lt.		940		8			
117+80 to 118+90	Rt.			110				
Lt. Approach Sta. 69+	Lt.						1	
3+18 to 8+50	Lt.	41	555		4			
8+50 to 11+37	Lt.			300				
3+65 to 11+50	Rt.			797				
11+07 to 11+50	Rt.	43						
Total Outside City 24'W		3428	2537	12780	20	6	1	1

TIMBER GUARD POSTS

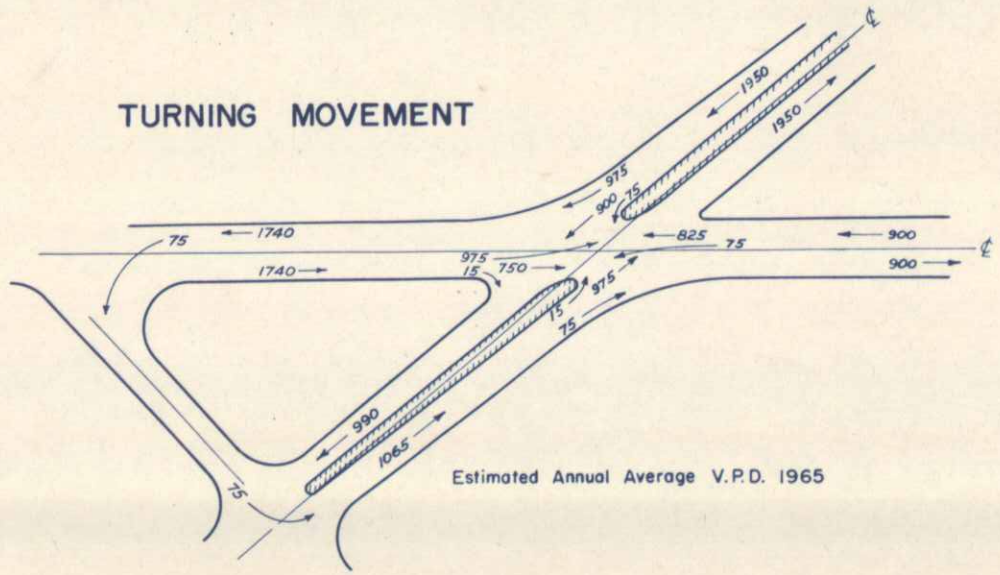
STATION	SPACING	NUMBER LEFT	NUMBER RIGHT
21+50 to 27+00	50'	12	
22+50 to 27+00	50'		10
28+34 to 32+66	Bridge	10	10
34+88	Culv.	1	1
Total Outside City 48' W			44
38+66	Culv.	1	1
39+48	Culv.	1	1
46+00	Culv.		1
47+75	Culv		1
62+09	Culv.	1	1
73+24 to 75+11	Bridge	10	10
85+33 to 86+99	Bridge	10	10
90+00	Culv.	1	1
95+84	Culv.	1	1
115+81 to 117+70	Bridge	10	10
Total Outside City 24' W			72

FED. ROAD DIVISION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F-FG 004-1(6)	7	

Rev 12-19-49 E.A.R.

INTERSECTION STA. 18+84.4 FORT COLLINS – EAST

TURNING MOVEMENT



LEGEND

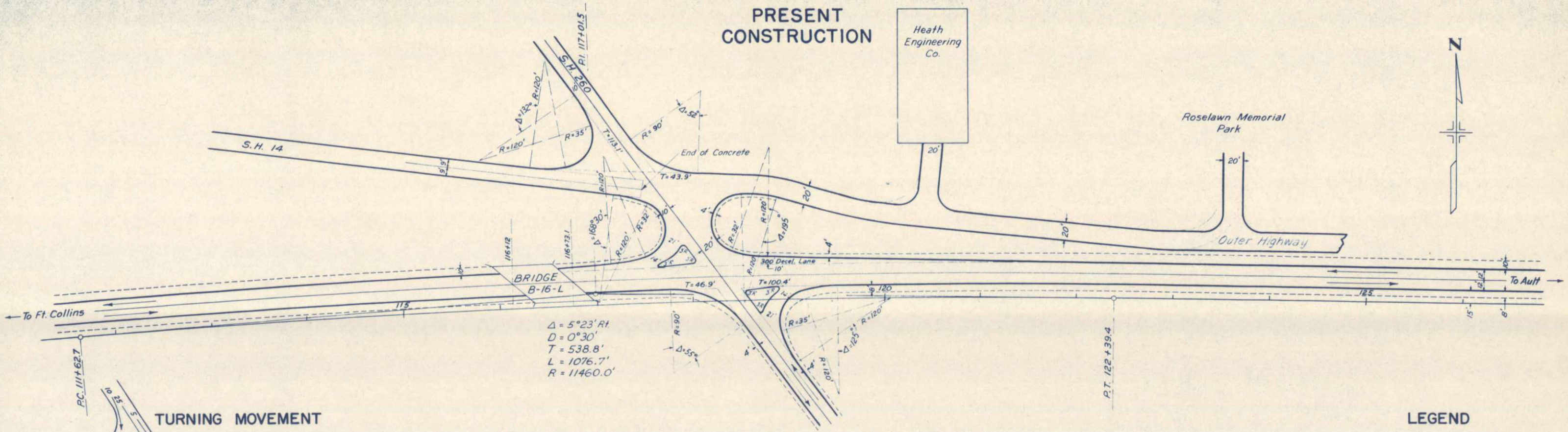
- Traffic Stripe
- Edge of Pavement
- Shoulder Edge
- Railroad
- Raised Median
- City Limits

FED. ROAD DIVISION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F-FG 004-1(6)	8	

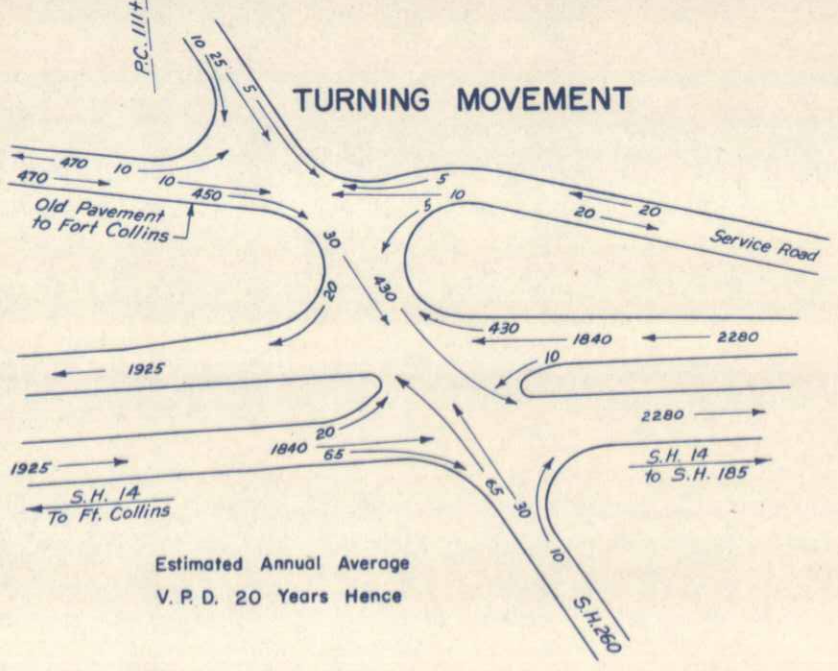
Rev. 11-3-49-E.A.R.

INTERSECTION STA. 118+ FORT COLLINS – EAST

PRESENT CONSTRUCTION



TURNING MOVEMENT



Estimated Annual Average
V. P. D. 20 Years Hence

FUTURE CONSTRUCTION

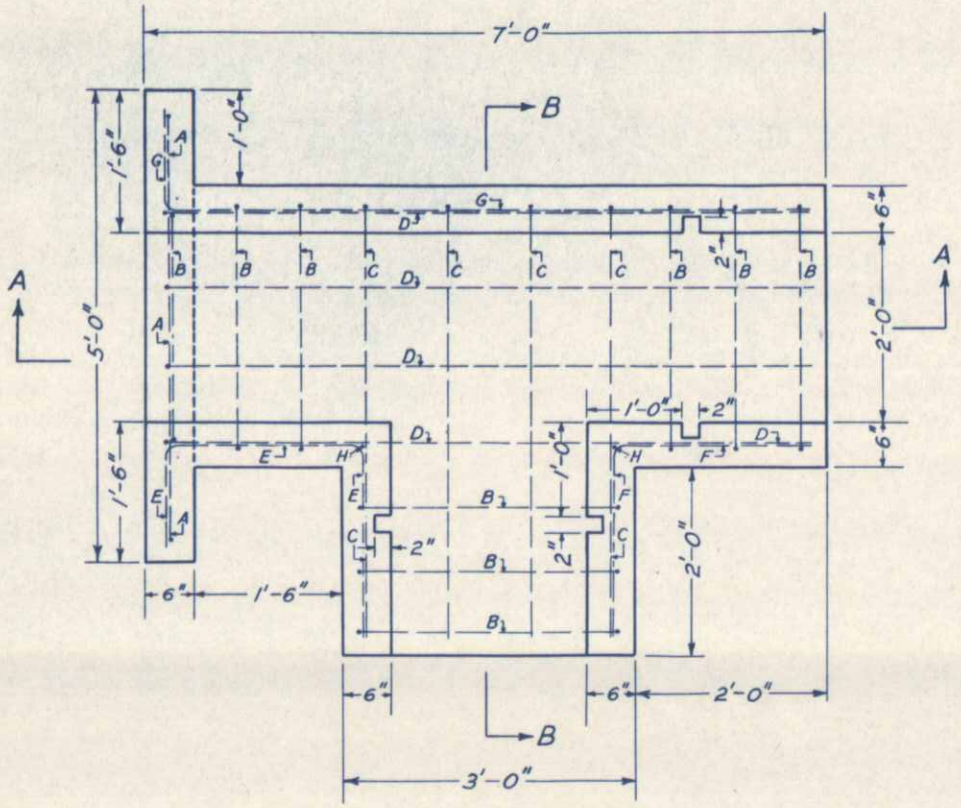
LEGEND

Traffic Stripe
Edge of Pavement
Shoulder Edge
Raised Median

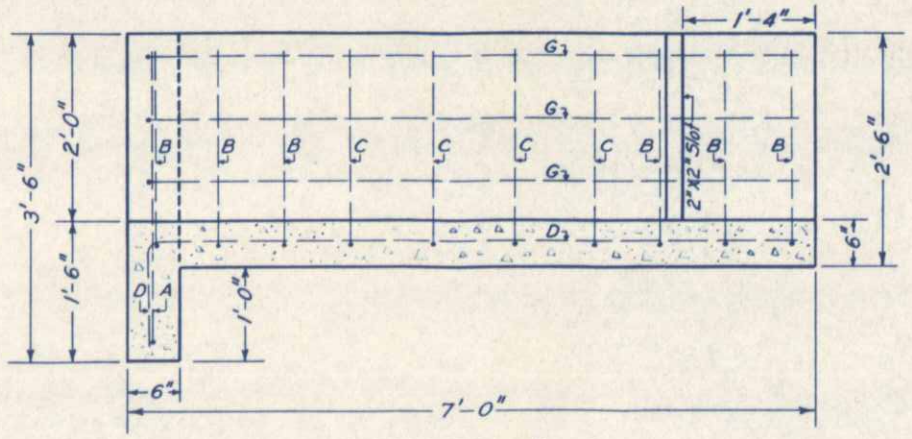
0 50 100 150 200
SCALE IN FEET
Scale of Original Tracing 1"=50'

FED. ROAD DIVISION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F-FG 004-1 (6)	9	

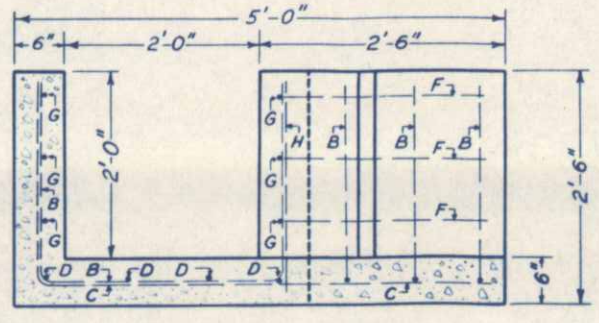
DETAILS OF CONCRETE DIVISION BOX STA. 97+70



PLAN

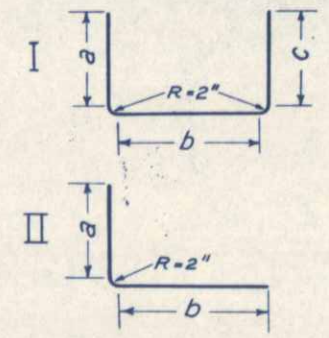


SECTION A–A



SECTION B–B

BENDING DIAGRAM



REINFORCING BAR LIST

Mark	Type	Dimensions a	b	c	Length One Bar	Number Req'd.	Total Length of Bars	Spacing
A	I	2'-11"	4'-2"	2'-11"	10'-6"	1	10'-6"	
B	I	1'-11"	2'-2"	1'-11"	6'-6"	9	58'-6"	8"
C	II	1'-11"	4'-5"		6'-7"	4	26'-4"	10"
D	II	11"	6'-5"		7'-7"	4	30'-4"	10"
E	I	11"	1'-8"	1'-11"	5'-0"	3	15'-0"	8"
F	II	1'-11"	1'-11"		4'-1"	3	12'-3"	8"
G	II	11"	6'-5"		7'-7"	3	22'-9"	8"
H	Straight				2'-2"	2	4'-4"	—
TOTAL							180'-0"	

All bars ½" ϕ @ 0.668 lbs. per lin. ft.
Weight of 180 lin. ft. of bars ----120 lbs.
Overrun, 1% ---------- 2 lbs.
Total ---------- 122 lbs.

Untreated Timber: 4 pcs. 2"X6"X2'-4" = 10 bd. ft.

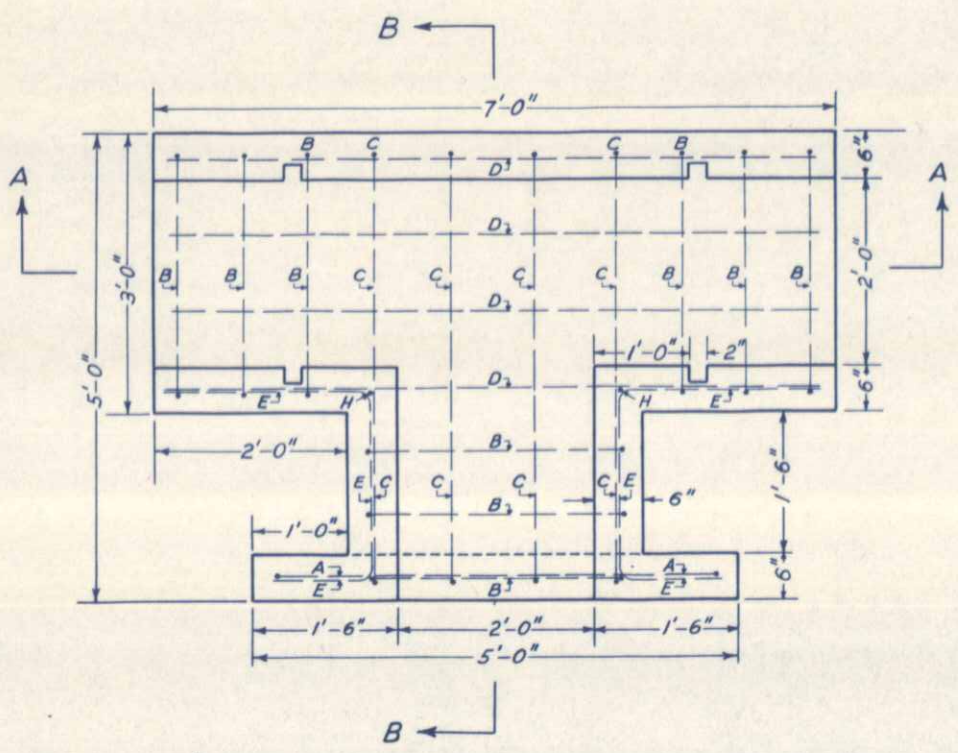
REQ'D. FOR ONE DIVISION BOX
Class "A" Concrete -- 1.3 cu.yd.
Reinf. Steel ---- 122 lbs.
Misc. Untr. Timber -- 0.01 M. ft. b.m.

Scale of Original Tracing 1"= 1'-0"

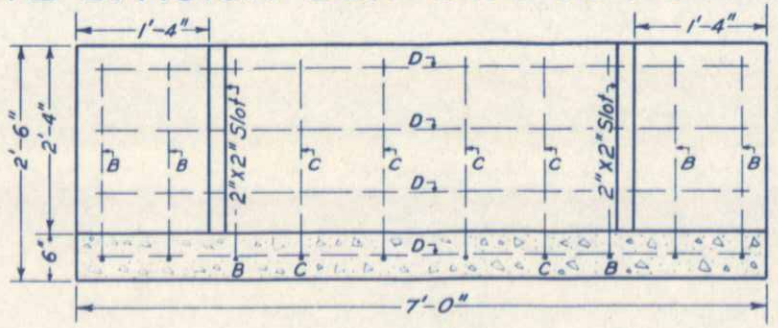
GENERAL NOTES

All work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department, adopted January 1, 1948.
All concrete shall be class "A" concrete.
All walls shall have forms on both sides.
All reinforcing bars shall be deformed, of intermediate grade, and shall be tagged with mark designation and station number.
All exposed corners shall be beveled to a 1" face.
Timber pieces shall be cut and fitted to the slots in the concrete.

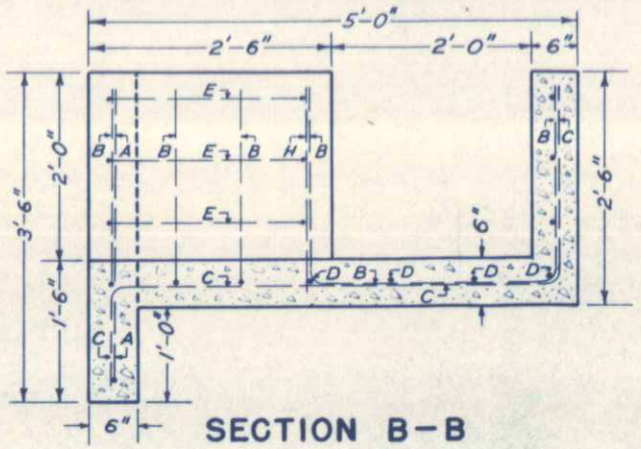
DETAILS OF CONCRETE DIVISION BOX STA. 95+84



PLAN

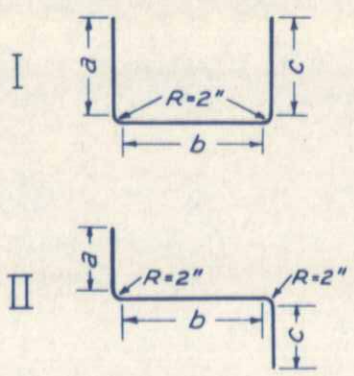


SECTION A–A



SECTION B–B

BENDING DIAGRAM



REINFORCING BAR LIST

Mark	Type	Dimensions a	b	c	Length One Bar	Number Req'd	Total Length of Bars	Spacing
A	I	2'-11"	4'-2"	2'-11"	10'-6"	1	10'-6"	
B	I	1'-11"	2'-2"	1'-11"	6'-6"	9	58'-6"	8"
C	II	1'-11"	4'-2"	11"	7'-6"	4	30'-0"	10"
D	Straight				6'-8"	7	46'-8"	(8" in wall 10" in floor)
E	I	11"	1'-8"	1'-11"	5'-0"	6	30'-0"	8"
H	Straight				2'-2"	2	4'-4"	
TOTAL							180'-0"	

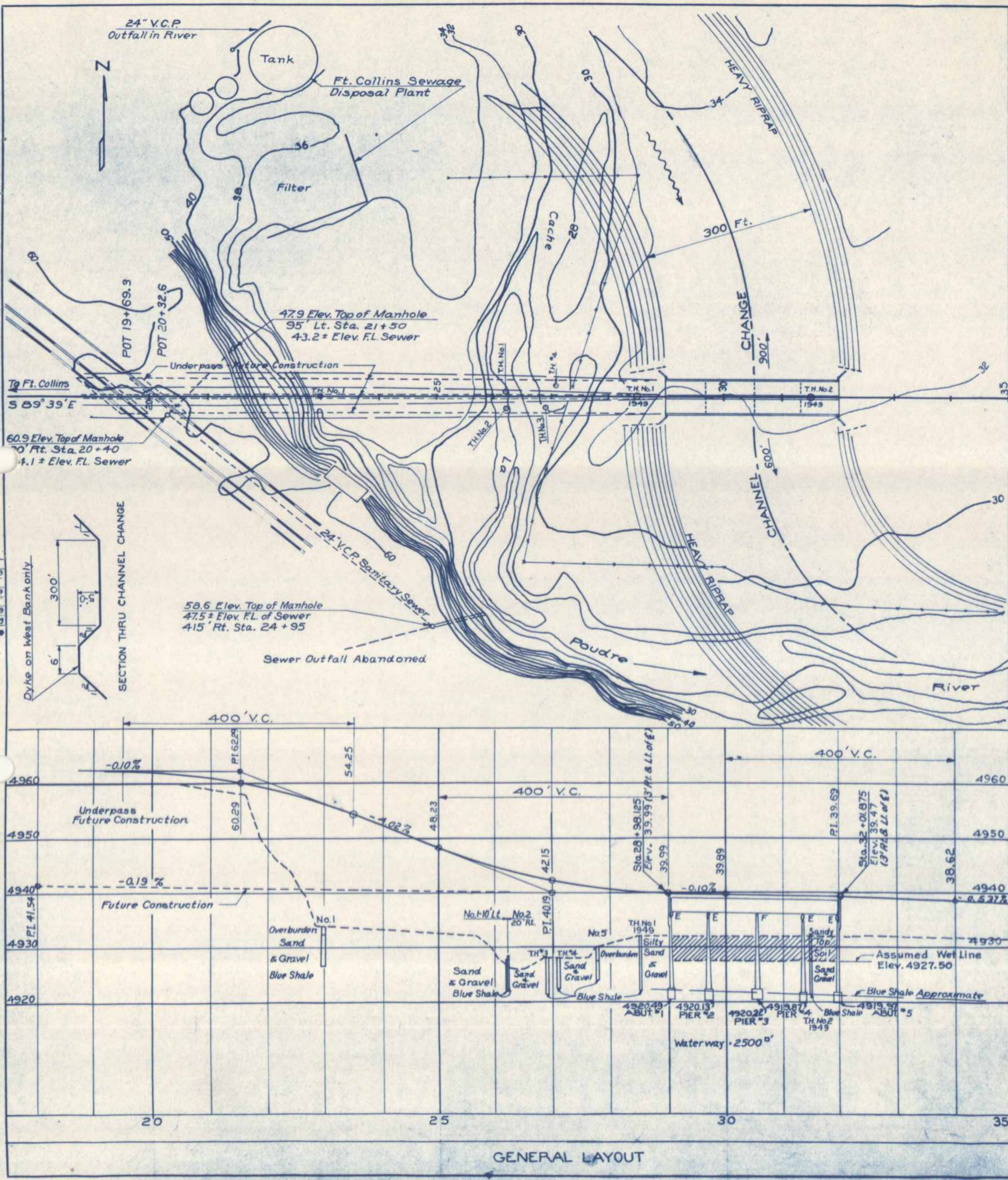
All bars ½" ϕ @ 0.668 lbs. per lin. ft.
Weight of 180 lin. ft. of bars ----120 lbs.
Overrun, 1% ---------- 2 lbs.
Total ---------- 122 lbs.

Untreated Timber: 4 pcs. 2"X6"X2'-4" = 10 bd. ft.

REQD. FOR ONE DIVISION BOX
Class "A" Concrete -- 1.3 cu.yd.
Reinf. Steel ---- 122 lbs.
Misc. Untr. Timber -- 0.01 M. ft. b.m.

Scale of Original Tracing 1"= 1'-0"

FED. ROAD DIV. NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F-FG 004-1(6)	10	



GENERAL LAYOUT

SUMMARY OF QUANTITIES

ITEM	DESCRIPTION	UNIT	SUPERSTRUCTURE	ABUT. #1	PIER #2	PIER #3	PIER #4	ABUT. #5	TOTAL
13c	UNCLASSIFIED EXC. (CHANNEL CHANGE)	CU.YD.							90,000
14a	DRY ROCK EXC. (STR.)	CU.YD.							
14b	DRY COMMON EXC. (STR.)	CU.YD.		220				220	440
14c	WET ROCK EXC. (STR.)	CU.YD.		60	40	30	30	50	210
14d	WET COMMON EXC. (STR.)	CU.YD.		280	100	130	110	310	930
16a	STRUCTURE BACKFILL	CU.YD.		450	100	100	100	450	1200
16d	MECHANICAL TAMPING	HR.		45	10	10	10	45	120
42a	UNTREATED BRIDGE TIMBER	MFLBM		.216				.216	.432
46a	CLASS "A" CONCRETE	CU.YD.	465	162	90	101	90	162	1070
47	REINFORCING STEEL	LB.	74,480	12,230	4000	4690	4000	12,230	111,630
48 +	STRUCTURAL STEEL	LB.	630 530	580	330	330	330	580	+632680
67b	HEAVY RIPRAP	CU.YD.							450
80c	SHEET COPPER, 32 OZ.	LB.	6						6
89a	DRAIN PIPE (CONCRETE FLOOR) 4"ø × 2'0"	EA.	40						40
*	1/2" EXP'N. JOINT MATERIAL	SQ.FT.	120						120
*	3/8" EXP'N. JOINT MATERIAL	SQ.FT.		50				50	100

* = Include in Bid Price for Class A Concrete
+ Includes 24250 Lbs Handrail Steel: 23090 Lbs. for Superstr.; 580 Lbs. for Abut. #1; 580 Lbs. for Abut. #5

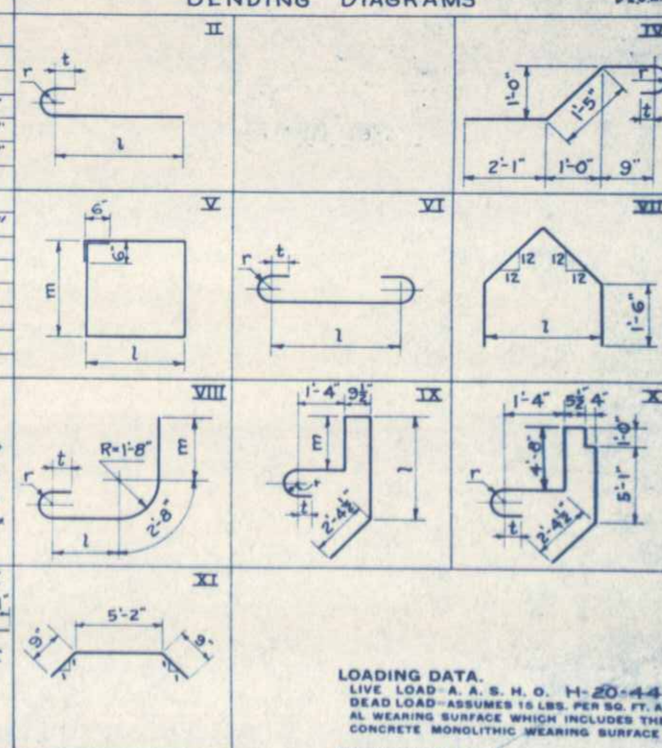
BAR LIST FOR SUPERSTRUCTURE

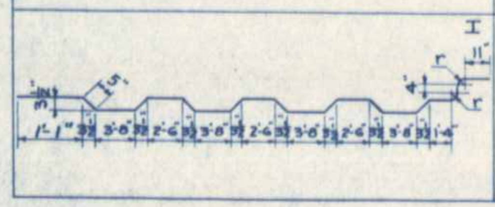
Mark	Size	Req'd	Length	Type	l	m	r	t
E1	5/8"ø	304	29'-10"	I			2 1/2"	
E2	5/8"ø	600	28'-3"	II	27'-5"		2 1/2"	2"
E3	5/8"ø	600	29'-0"	II	28'-2"		2 1/2"	2"
E4	1/2"ø	604	4'-11"	IV			2"	2"
E5	1/2"ø	136	4'-1"	V	1'-1 1/2"	0'-8"		
E6	1/2"ø	136	2'-0"	Str.				
E7	1/2"ø	802	6'-5"	VI	5'-1"		2"	2"
D1	1/2"ø	432	35'-0"	Str.				
D2	1/2"ø	648	28'-6"	Str.				

SUMMARY

42599 1/2"ø bar @ 0.668# = 28456#
43419 5/8"ø bar @ 1.043# = 45286#
Plus 1% for overrun = 738#
TOTAL = 74480#

BENDING DIAGRAMS





32+01.9
28+98.1
3+03.8

39.5
27.5

REFERENCE DRAWINGS

Sheet Nos.
Details of Superstructure.
Sheet No. 11 & 12
Details Abut. No.1 & No.5
Sheet No. 13 -
Details of Piers 14 -

GENERAL NOTES

ALL WORK SHALL BE DONE ACCORDING TO THE STANDARD SPECIFICATIONS OF THE COLORADO STATE HIGHWAY DEPARTMENT. ADOPTED JAN. 1, 1948

ALL CONCRETE SHALL BE CLASS "A," AND AIR-ENTRAINED AS SPECIFIED.

FORMS FOR CONCRETE SURFACES EXPOSED IN THE FINISHED WORK SHALL BE CONSTRUCTED OF SHIPLAP OR TONGUE AND GROOVE LUMBER S3S UNLESS FACED WITH PANEL BOARD.

CONCRETE GIRDERS, FLOOR SLABS AND CURB SHALL BE POURED MONOLITHICALLY.

FOOTINGS IN ROCK SHALL BE POURED OUT TO THE ROCK AND NOT FORMED.

ALL REINFORCING BARS SHALL BE DEFORMED AND TAGGED WITH THE STATION NUMBER AND LETTER DESIGNATION. MAIN BARS SHALL NOT BE SPLICED.

SOUNDINGS AND DEPTH OF FOOTINGS SHOWN ARE ACCORDING TO THE BEST AVAILABLE DATA. IF ESSENTIALLY DIFFERENT CONDITIONS ARE ENCOUNTERED THE BRIDGE ENGINEER WILL INSPECT AND DETERMINE IF REDESIGN IS NECESSARY.

ALL RIVETS TO BE 3/4" DIA. ALL RIVETS TO BE POWER DRIVEN.

ALL STRUCTURAL STEEL SHALL RECEIVE ONE SHOP COAT OF ZINC CHROMATE AND TWO FIELD COATS OF ALUMINUM PAINT.

ALL REINFORCING STEEL SHALL BE OF INTERMEDIATE GRADE.

ALL CONCRETE SURFACES EXPOSED TO VIEW SHALL RECEIVE CLASS I SURFACE FINISH; EXCEPT UNDERSIDE OF FLOOR SLABS AND ABUTMENT FACES BELOW STRINGERS & BETWEEN VERTICAL JOINTS IN WINGWALLS.

LOADING DATA.
LIVE LOAD - A.A.S.H.O. H-20-44
DEAD LOAD - ASSUMES 15 LBS. PER SQ. FT. ADDITIONAL WEARING SURFACE WHICH INCLUDES THE 1/2 INCH CONCRETE MONOLITHIC WEARING SURFACE SHOWN.

DESIGNING DATA.
f_c CONCRETE = 1000 LBS PER SQ.IN.
f_s STRUCTURAL STEEL = 18000 LBS PER SQ.IN.
f_s REINFORCING STEEL = 20000 LBS PER SQ.IN.
$n = 10$

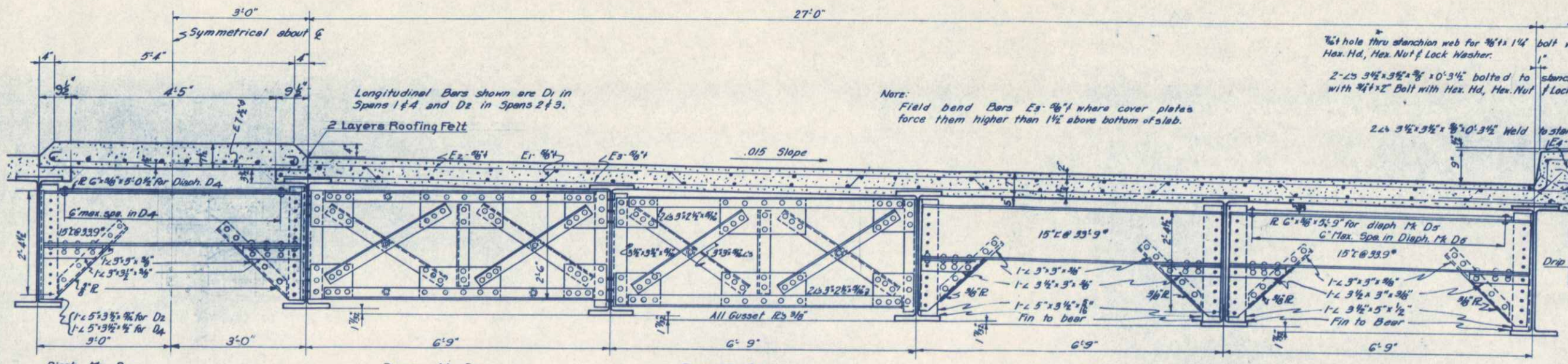
STRUCTURE NO. B-16-D

COLORADO
STATE HIGHWAY DEPARTMENT
4-SPANS 68'-82'-82'-68'
CONTINUOUS COMPOSITE
CONCRETE & I-BEAM BRIDGE
2-27' ROADWAY LANES
GENERAL LAYOUT, NOTES, SUMMARY OF QUANTITIES;
Across CACHE LA POUDRE RIVER
Sta. 28+98.125 to 32+01.875
Near FORT COLLINS Sec. 12 T. 7N R. 69W.

Designed by EFS	Approved by [signature]
Made by EFS	Bridge Engineer
Checked by	Date: Aug. 22, 1949

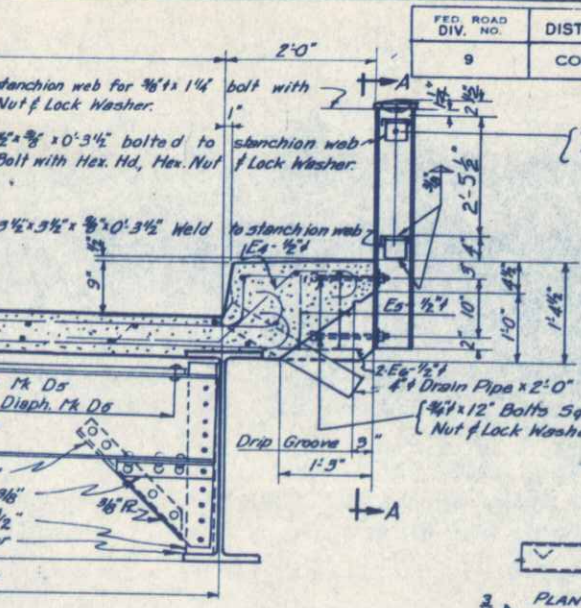
REVISIONS

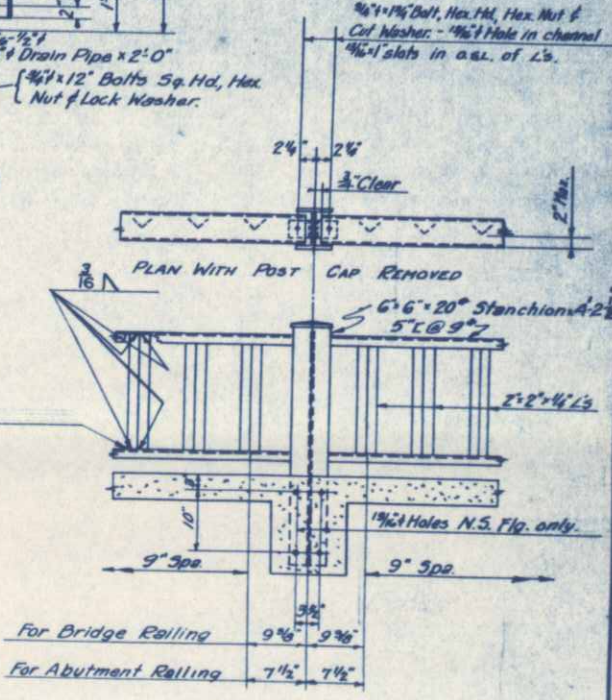
FED. ROAD DIV. NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F-FG 004-1(6)	11	

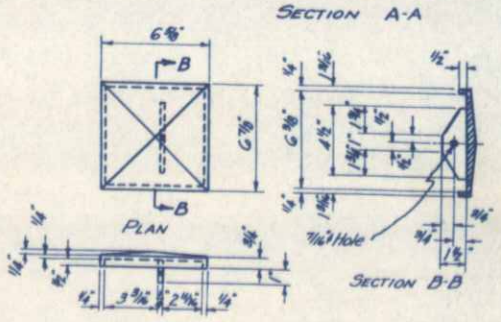


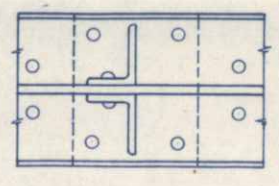
SECTION THRU ROADWAY
Showing arrangement of Reinforcing Steel and Details of Diaphragms

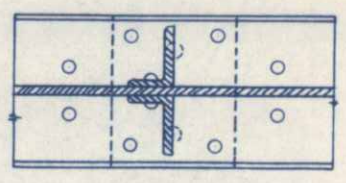
Note:
Field bend Bars Es-⅝"ϕ where cover plates force them higher than 1½" above bottom of slab.

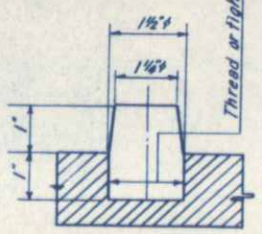




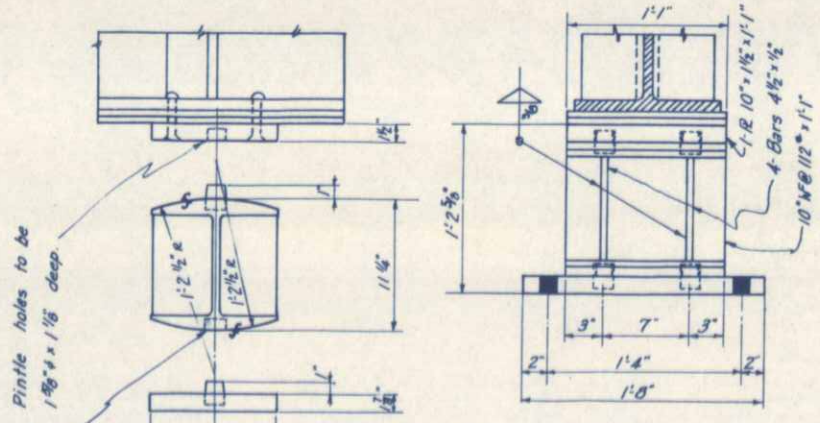






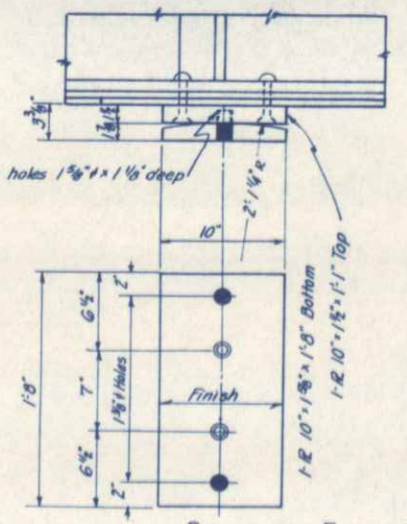


PINTLE DETAIL

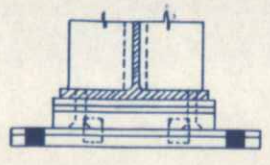


DETAIL OF EXPANSION BEARINGS
40 Required

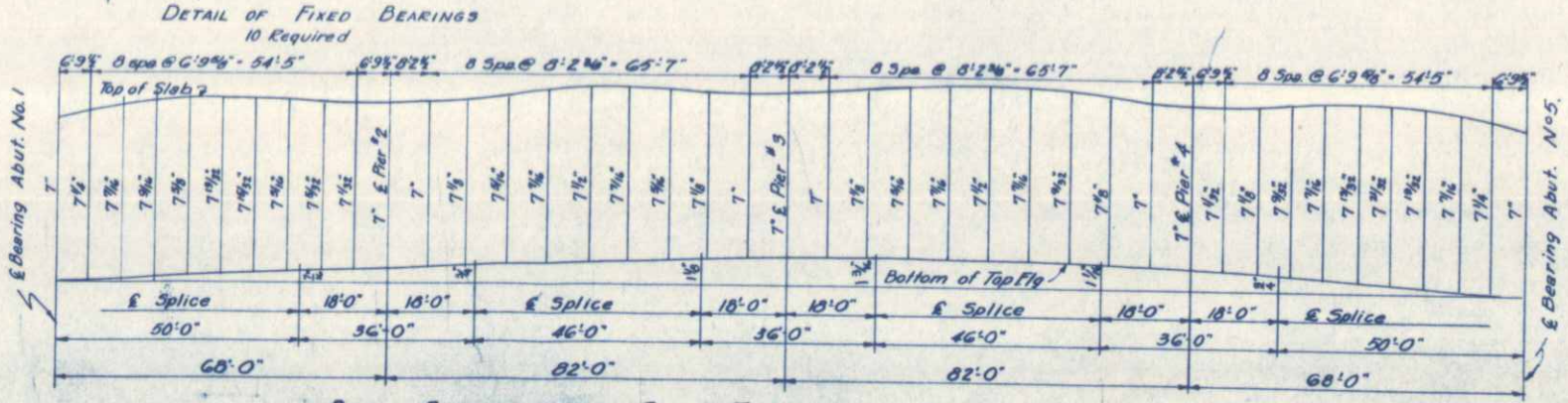
Note: Paint finished bearing surfaces one coat white lead & tallow - See sec. 411-3, 17 of Specs.



DETAIL OF FIXED BEARINGS
10 Required



Reqd 2-1"ϕ x 1'8" Bolts per Bearing



BEAM BLOCKING AND SLAB THICKENING DIAGRAM

STR. NO-B-16-D

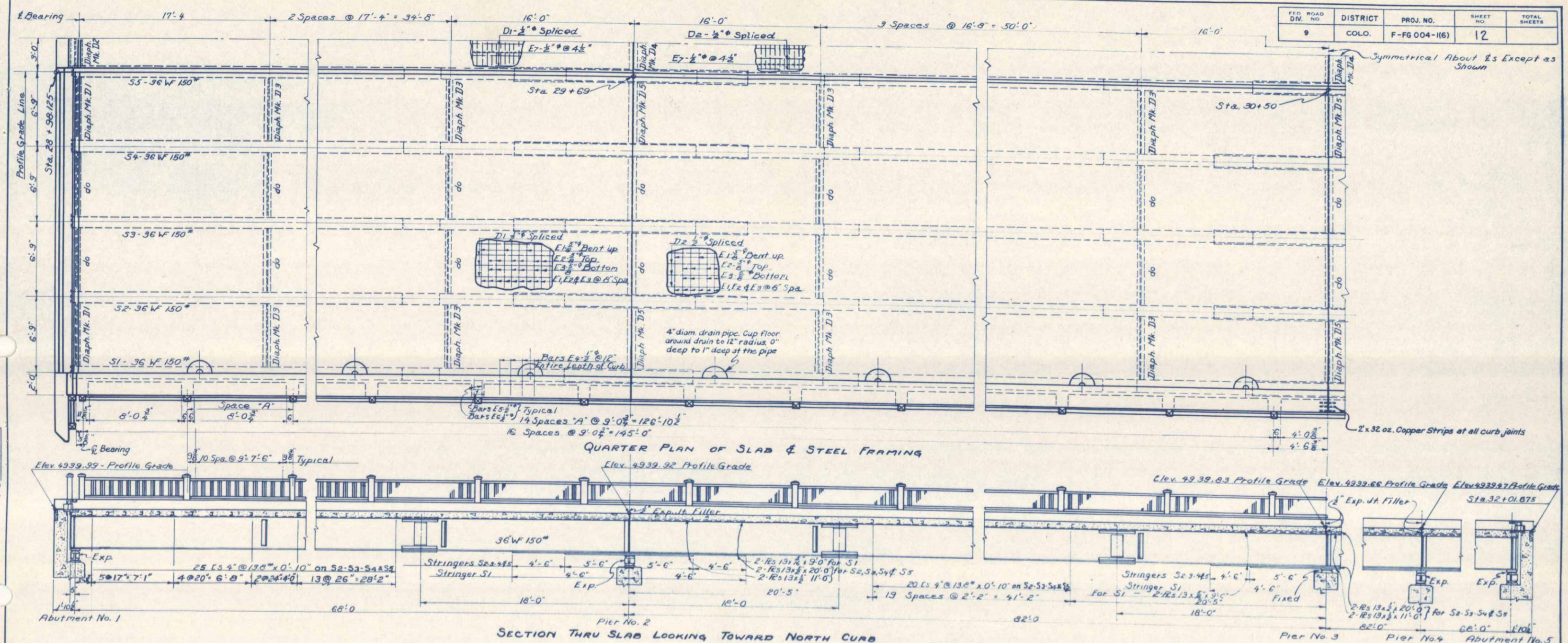
COLORADO
STATE HIGHWAY DEPARTMENT
4 SPANS 68'-82'-82'-68' CONTINUOUS
COMPOSITE CONCRETE & I-BEAM BRIDGE
2-27' ROADWAY LANES
DETAILS OF SUPERSTRUCTURE
Across CACHE LA POUDRE RIVER
Sta. 28+98.125 to 32+01.875
Near FORT COLLINS Sec. 12 T. 7N R. 69W

Designed by EFS	Approved by [illegible]
Made by EFS	Bridge Engineer
Checked by	Date: Aug. 22, 1949.

STRUCTURE NO.

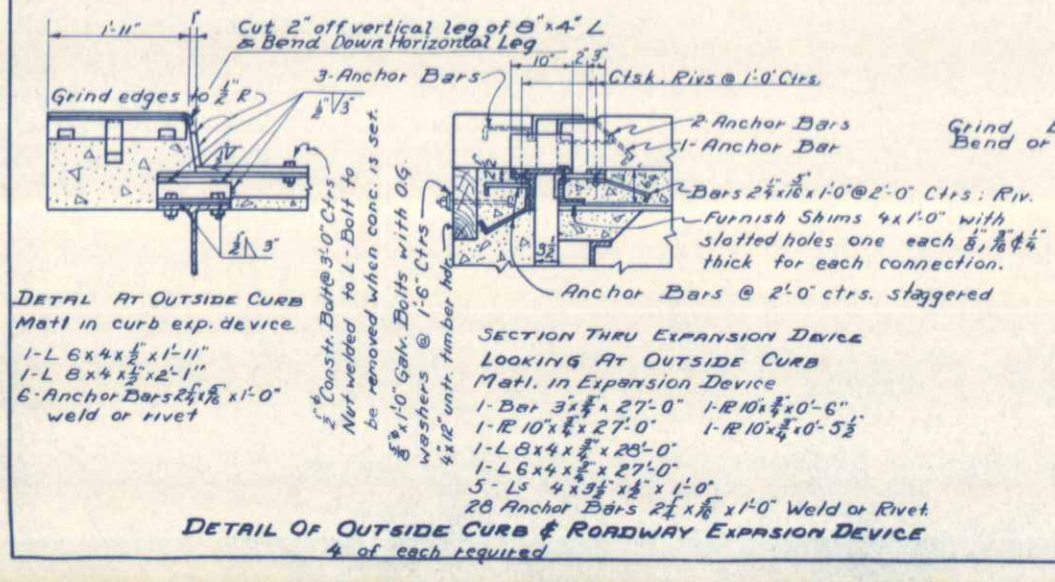
REVISIONS

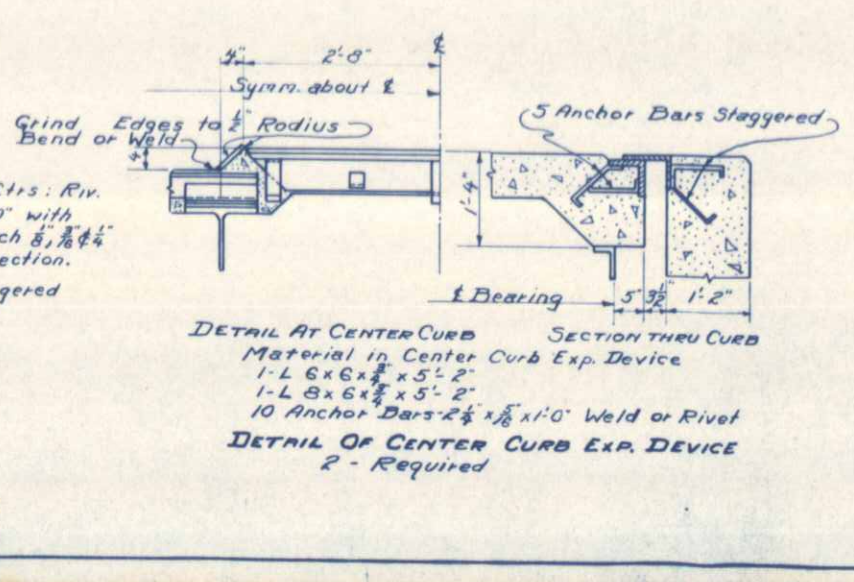
FED. ROAD DIV. NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F-FG 004-1(6)	12	

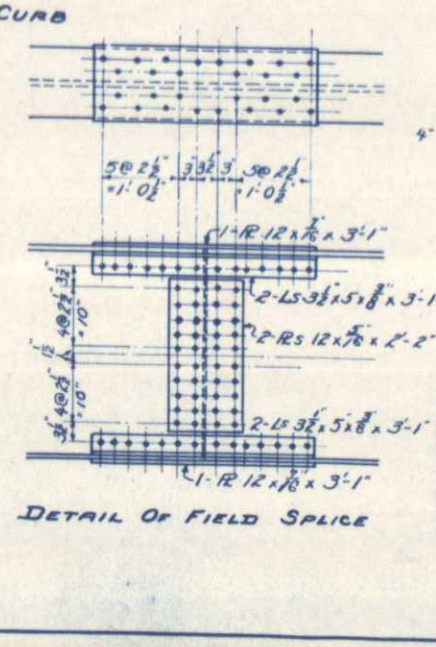


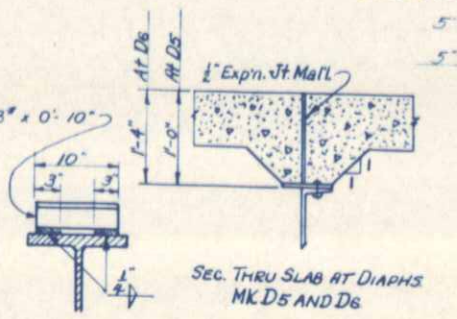
QUARTER PLAN OF SLAB & STEEL FRAMING

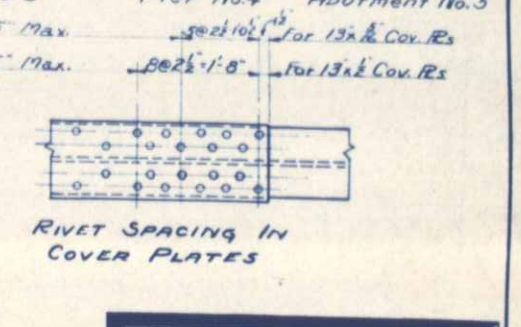
SECTION THRU SLAB LOOKING TOWARD NORTH CURB











CUBIC YARDS CONCRETE			
	EACH ROADWAY	CENTER STRIP	TOTAL
SPANS #1 & #4	48.9	9.2	107.00
SPANS #2 & #3	57.2	11.1	125.50
TOTAL SUPERSTRUCTURE			465.00

NOTE: Pour Roadway Slab on Center Spans First Supporting Each with Falsework at Center to allow Only ½" Deflection Until End Spans are Poured — SEE SPECIAL PROVISIONS.

Structure No. B-16-D

COLORADO
STATE HIGHWAY DEPARTMENT

4 SPANS-68'-82'-82'-68' CONTINUOUS COMPOSITE CONC. & I BEAM BRIDGE
2-27' ROADWAY LANES
DETAILS OF SUPERSTRUCTURE
Across CACHE LA POUDRE RIVER
Sta. 28+38.125 to Sta. 32+01.875
Near Fort Collins Sec. 12 T. 7 N. R. 69 W.

Designed by E.F.S.
Made by E.F.S.
Checked by

Approved by [signature]
Bridge Engineer
Date: Aug. 22, 1949.

FED. ROAD DIV. NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F-FG 004-1(6)	13	

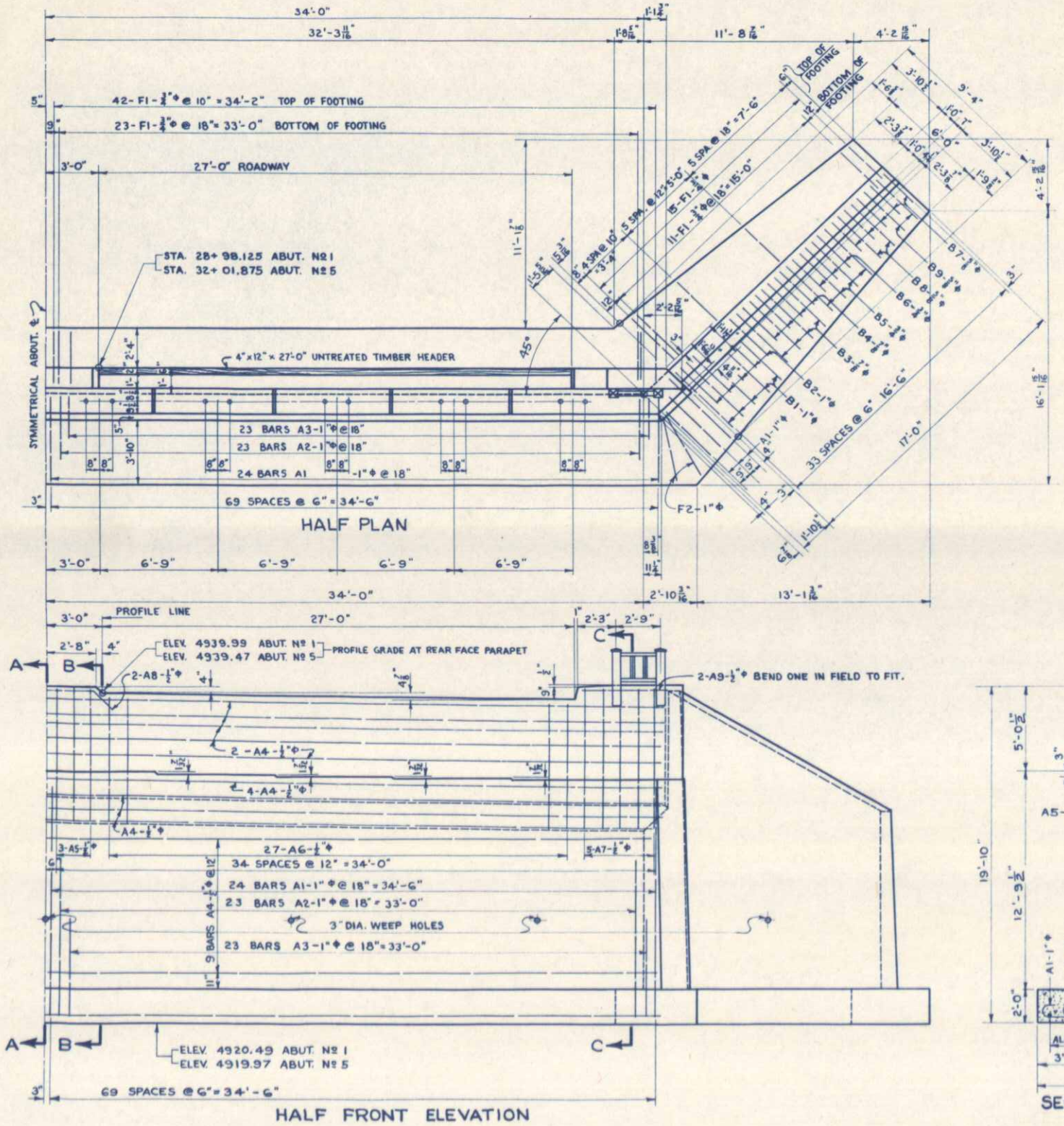
BAR LIST FOR ABUT. No.1 OR 5

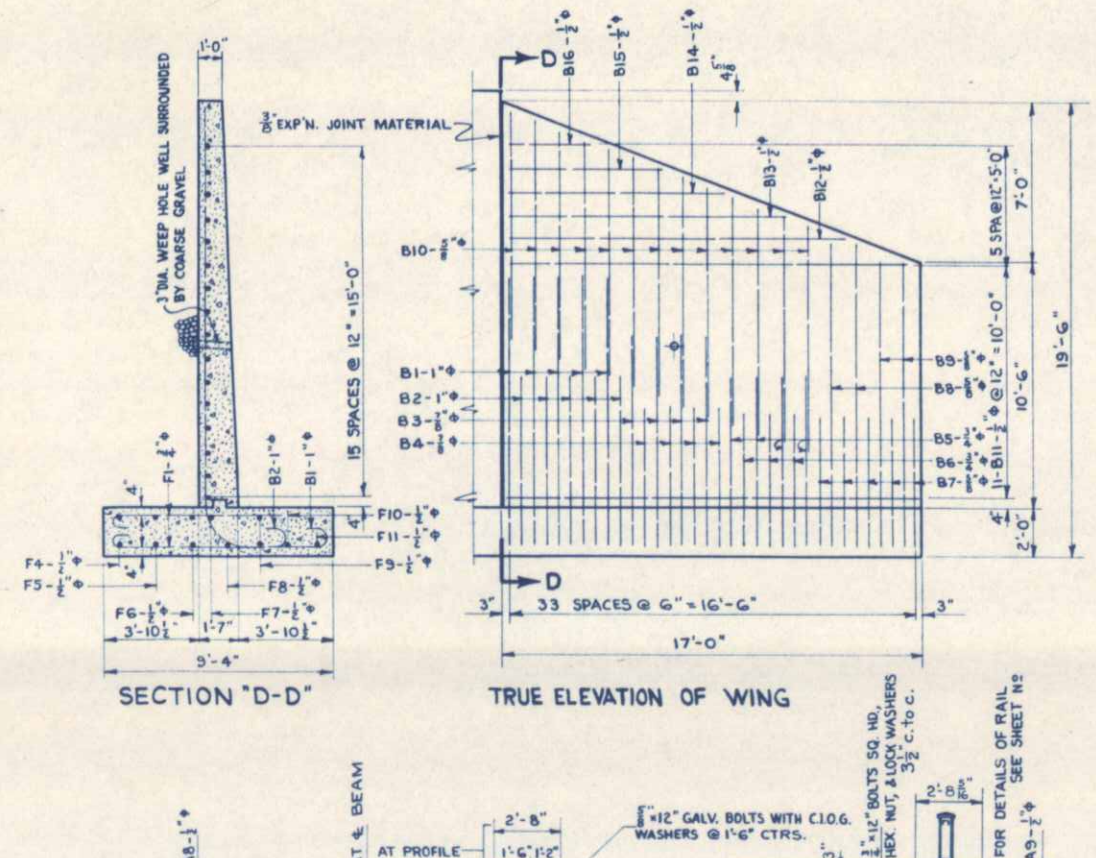
E.F.S. R.J.R.

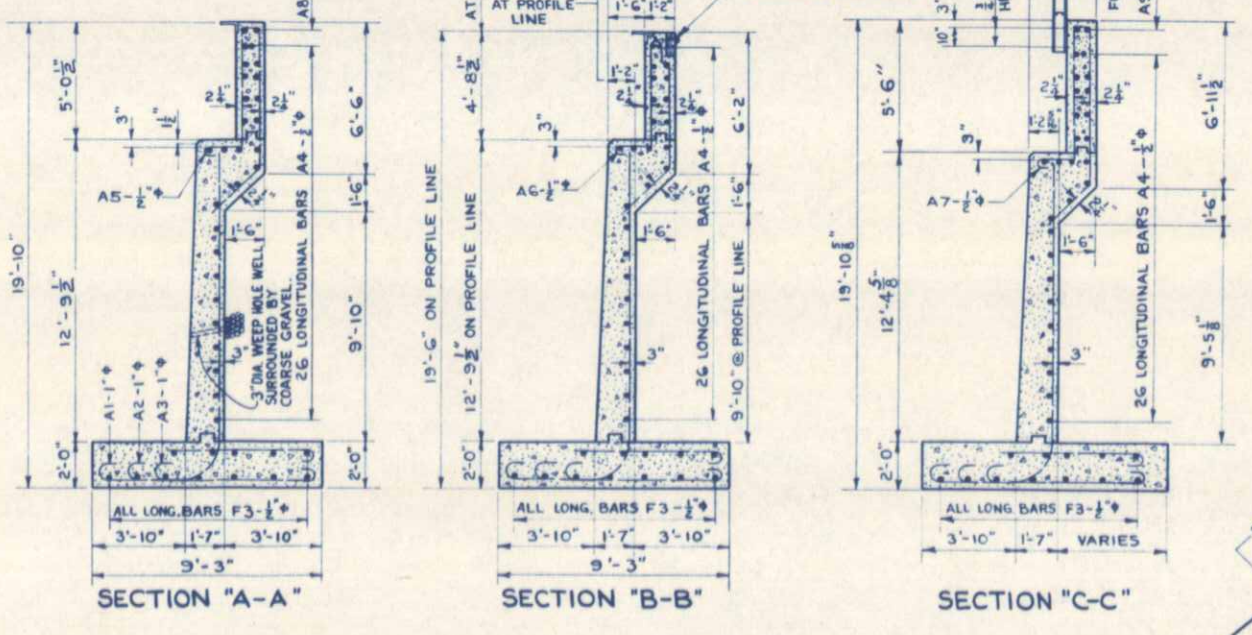
Mark	Size	Req'd.	Length	Type	l	m	r	t
F1	¾" ⌀	182	5'-10"	II	4'-10"		3"	2½"
F2	1" ⌀	4	6'-0"	Str.				
F3	½" ⌀	24	33'-0"	Str.				
F4	½" ⌀	4	19'-0"	Str.				
F5	½" ⌀	4	20'-3"	Str.				
F6	½" ⌀	4	21'-6"	Str.				
F7	½" ⌀	2	22'-0"	Str.				
F8	½" ⌀	2	22'-9"	Str.				
F9	½" ⌀	4	23'-10"	Str.				
F10	½" ⌀	2	24'-10"	Str.				
F11	½" ⌀	2	26'-0"	Str.				
A1	1" ⌀	54	19'-1"	VIII	2'-11"	12'-2"	4"	3½"
A2	1" ⌀	46	13'-3"	VIII	1'-9"	7'-6"	4"	3½"
A3	1" ⌀	46	8'-9"	VIII	0'-7"	4'-2"	4"	3½"
A4	½" ⌀	52	36'-2"	Str.				
A5	½" ⌀	6	16'-7"	IX	6'-5"	5'-0"	2"	2"
A6	½" ⌀	54	15'-11"	X			2"	2"
A7	½" ⌀	10	18'-2"	IX	7'-2½"	5'-9½"	2"	2"
A8	½" ⌀	2	6'-8"	XI				
A9	½" ⌀	4	5'-10"	Str.				
B1	1" ⌀	10	16'-2"	VIII	2'-6"	9'-8"	4"	3½"
B2	1" ⌀	10	10'-5"	VIII	0'-11"	5'-6"	4"	3½"
B3	⅞" ⌀	8	13'-4"	VIII	2'-2"	7'-4"	3½"	3"
B4	⅞" ⌀	8	8'-9"	VIII	0'-9"	4'-2"	3½"	3"
B5	¾" ⌀	8	10'-11"	VIII	1'-9"	5'-6"	3"	2½"
B6	¾" ⌀	6	8'-3"	VIII	0'-7"	4'-0"	3"	2½"
B7	⅝" ⌀	10	7'-8"	VIII	0'-4"	3'-10"	2½"	2"
B8	⅝" ⌀	4	16'-7"	VIII	1'-7"	11'-6"	2½"	2"
B9	⅝" ⌀	4	15'-7"	VIII	1'-5"	10'-8"	2½"	2"
B10	⅝" ⌀	26	9'-10"	Str.				
B11	½" ⌀	22	16'-8"	Str.				
B12	½" ⌀	2	14'-5"	Str.				
B13	½" ⌀	2	12'-0"	Str.				
B14	½" ⌀	2	9'-6"	Str.				
B15	½" ⌀	2	7'-1"	Str.				
B16	½" ⌀	2	4'-8"	Str.				

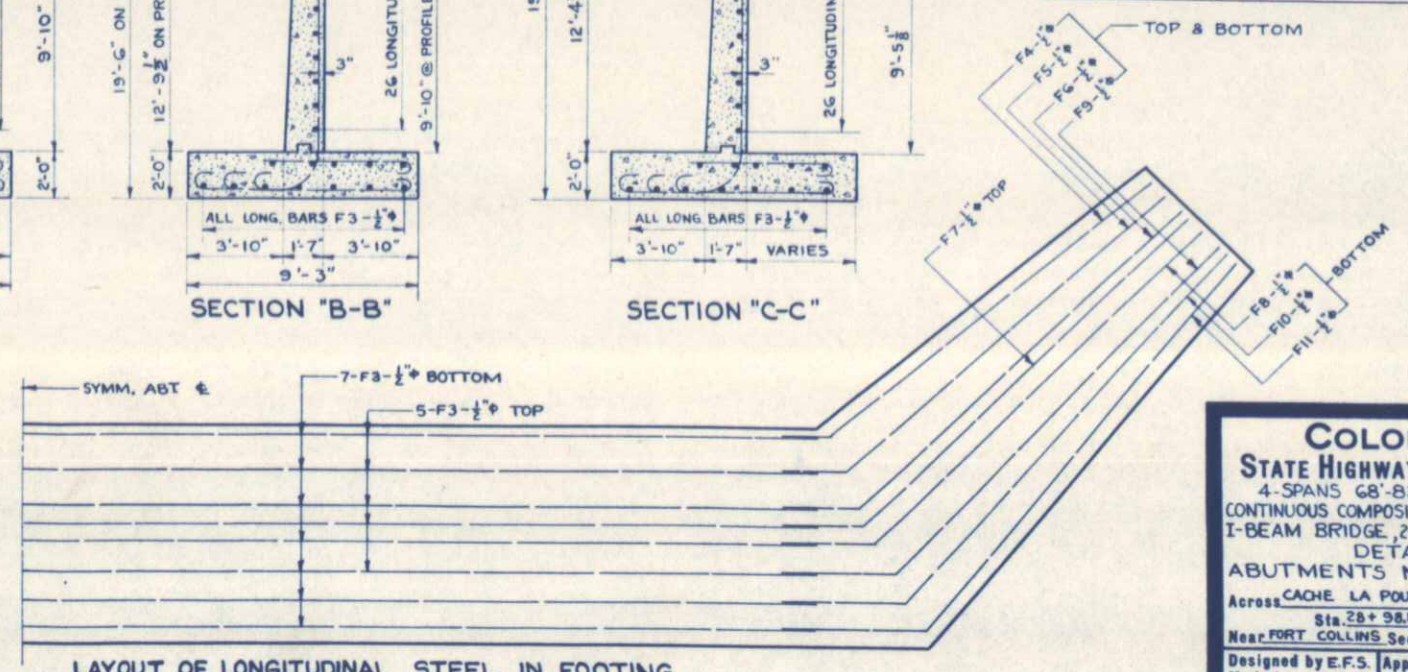
SUMMARY

4843'	½" ⌀ bar @ 0.668#	=	3235#
461'	⅝" ⌀ bar @ 1.043#	=	481#
1199'	¾" ⌀ bar @ 1.502#	=	1801#
177'	⅞" ⌀ bar @ 2.044#	=	362#
2332'	1" ⌀ bar @ 2.670#	=	6226#
	Plus 1% for overrun	=	125#
	TOTAL ABUT. NO. 1	=	12230#
	TOTAL ABUT. NO. 5	=	12230#









LAYOUT OF LONGITUDINAL STEEL IN FOOTING

NOTE : FIELD BEND BARS F4 TO F11-½"⌀ TO FIT

DETAILS OF ABUTMENTS Nº 1 & Nº 5

MAX. FOOTING PRESSURE 3600 LBS. PER SQ. FT.

CUBIC YARDS OF CONCRETE	ABUT. Nº 1	ABUT. Nº 5
FOOTING	69.3	69.3
WALL	55.7	55.7
PARAPET	15.0	15.0
EACH WING = 11	22.0	22.0

COLORADO
STATE HIGHWAY DEPARTMENT
4-SPANS 68'-82'-82'-68'
CONTINUOUS COMPOSITE CONCRETE AND I-BEAM BRIDGE, 2-27' R'DWY. LANES
DETAILS
ABUTMENTS Nº 1 AND Nº 5
Across CACHE LA POUDRE RIVER
Sta. 28+98.125 TO 32+01.875
Near FORT COLLINS Sec. 12 T. 7N R. 69W

Designed by E.F.S.
Made by E.F.S.
Checked by

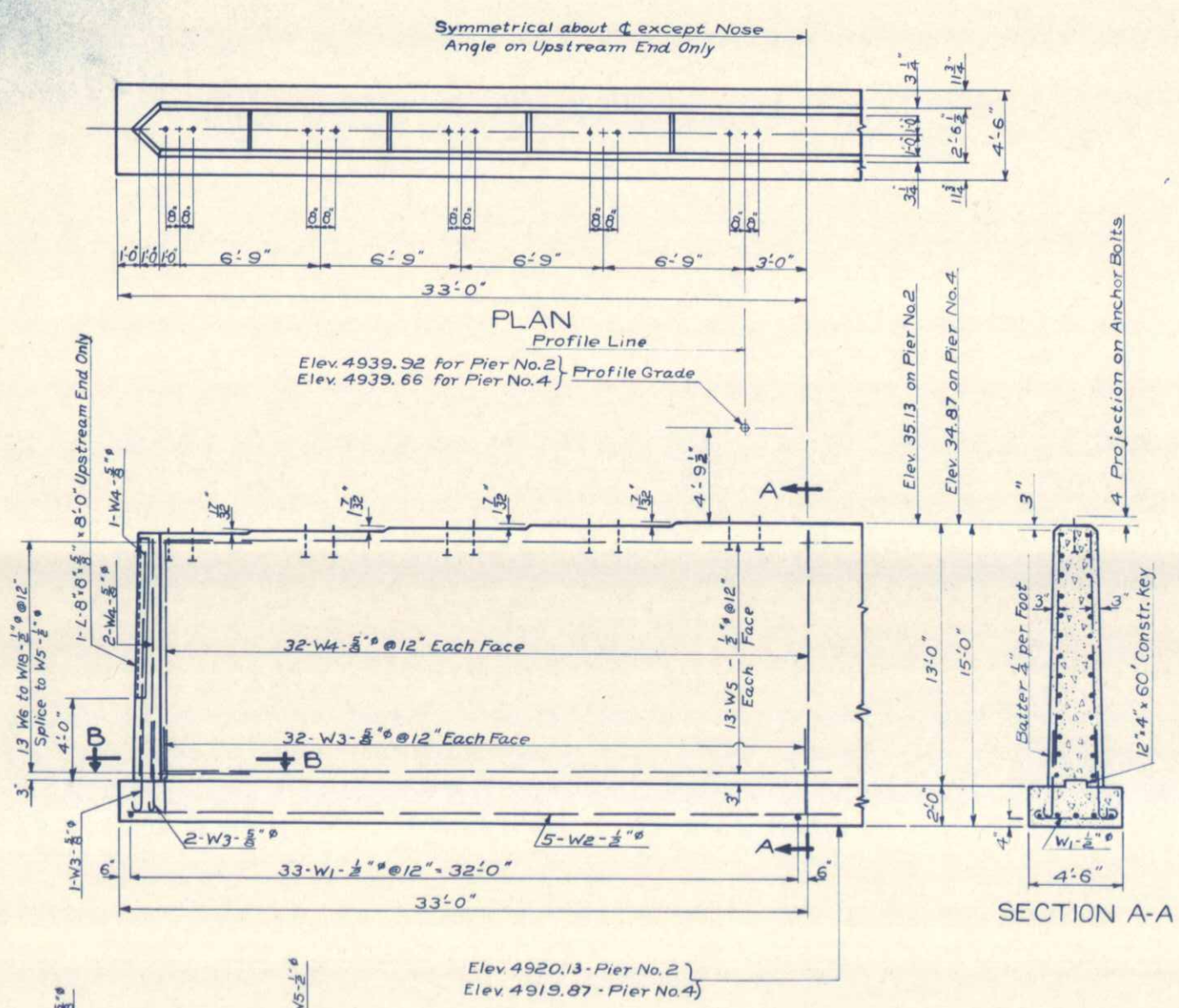
Approved by Chas F. Bailey
Bridge Engineer
Date: Sept. 22, 1949.

STRUCTURE Nº B-16-D

REVISIONS

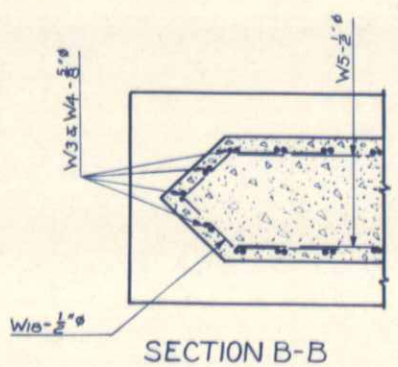
Revised 3-6-50 L.W.F. Nose angle thickness

FED. ROAD DIV. NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F-FG 004-1(6)	14	

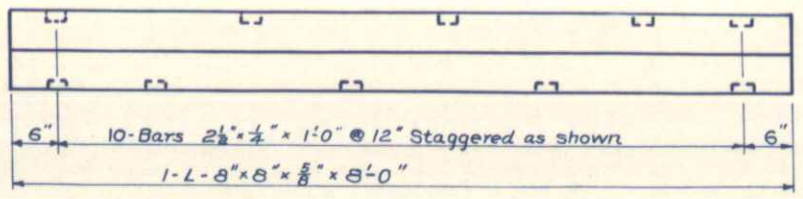


DETAIL OF PIERS No. 2 & No. 4

Max. Footing Pressure = 5730 lbs. per Sq. Ft.

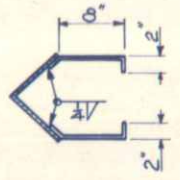


SECTION B-B



DETAILS OF NOSE ANGLE

3 REQUIRED

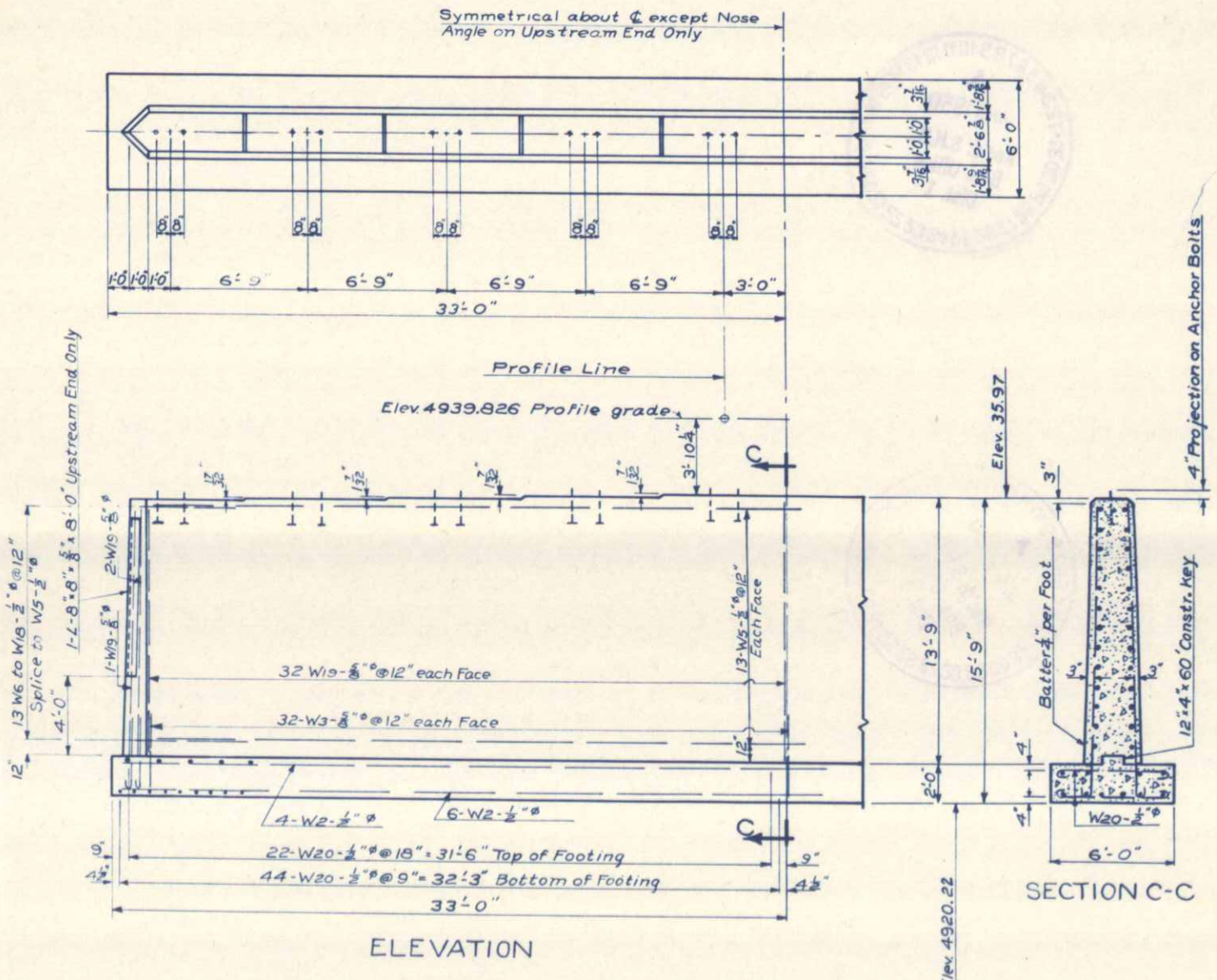


BAR LIST FOR PIER No. 3 — E.F.S. F.L.

Mark	Size	Reqd.	Length	Type	l	m	r	t
W2	½"ø	20	33'-6"	Str.				
W3	⅝ø	132	4'-4"	II	3'-6"		2½"	2"
W5	½"ø	52	31'-9"	Str.				
W6			5'-1"		1'-5¾"			
to	½"ø	2 ea.	by ⅜" to	VII	by ½"			
W18			5'-10"		2'-0¼"			
W19	⅝ø	132	13'-3"	Str.				
W20	½"ø	132	6'-6"	VI	5'-2"		2	2

SUMMARY

3321' ½"ø bar @ 0.668# = 2218#
2321' ⅝ø bar @ 1.043# = 2421#
1% for overrun = 51#
TOTAL = 4690#



DETAIL OF PIER No. 3

Max. Footing Pressure = 6200 Lbs. per Sq. Ft.

BAR LIST FOR PIER No. 2 OR No. 4 — E.F.S. F.L.

Mark	Size	Reqd.	Length	Type	l	m	r	t
W1	½"ø	66	5'-0"	VI	3'-8"		2"	2"
W2	½"ø	10	33'-6"	Str.				
W3	⅝ø	132	4'-4"	II	3'-6"		2½"	2"
W4	⅝ø	132	12'-6"	Str.				
W5	½"ø	52	31'-9"	Str.				
W6			5'-1"		1'-5¾"			
to	½"ø	2 ea.	by ⅜"	VII	by ½"			
W18			5'-10"		2'-0¼"			

SUMMARY

2458' ½"ø bar @ 0.668# = 1642#
2222' ⅝ø bar @ 1.043# = 2318#
1% for overrun = 40#
TOTAL PIER NO. 2 = 4000#
TOTAL PIER NO. 4 = 4000#

CUBIC YARDS CONCRETE — E.F.S. F.L.

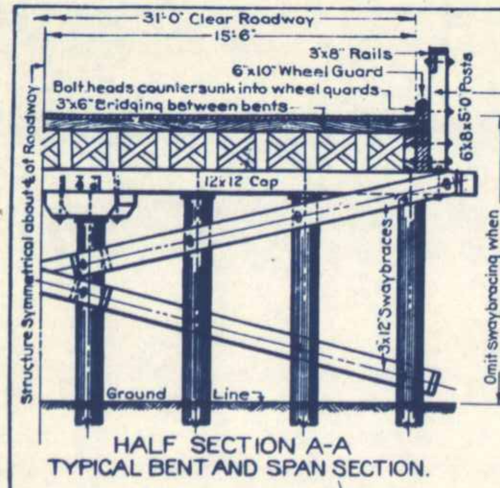
	PIER No.2	PIER No.3	PIER No.4
FOOTING	22.00	29.00	22.00
WALL	68.00	72.00	68.00
TOTAL	90.00	101.00	90.00

COLORADO
STATE HIGHWAY DEPARTMENT
4-SPANS 68'-82'-82'-68'
CONTINUOUS COMPOSITE CONCRETE & I-BEAM BRIDGE
2-27' ROADWAY LANES
DETAILS OF PIERS
Across CACHE LA POUDRE RIVER
Sta. 28+36.125 to 32+01.875
Near FORT COLLINS Sec. 12 T. 7 N. R. 69 W.

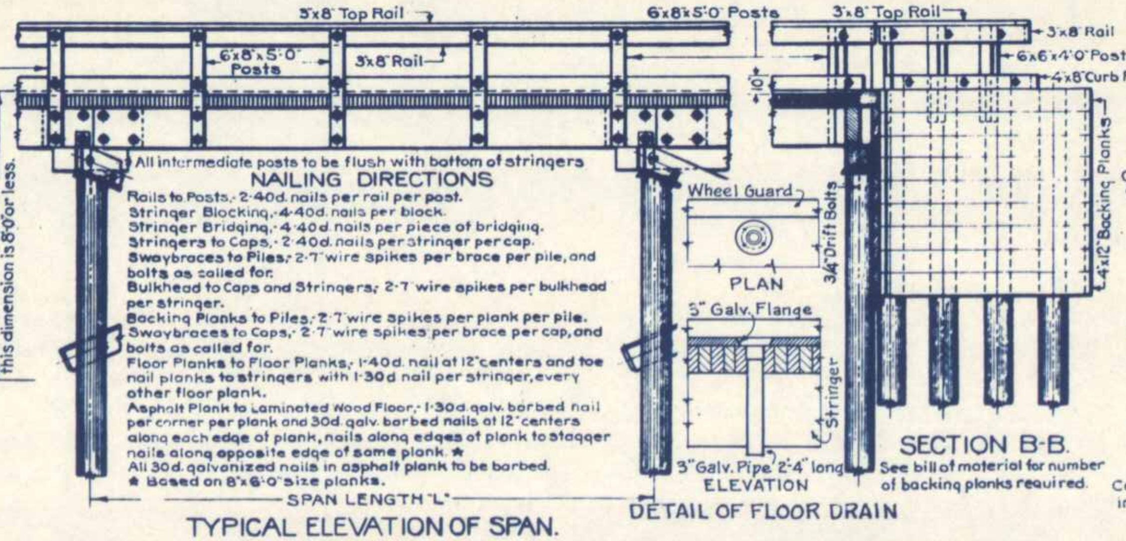
Designed by EFS
Made by EFS
Checked by

Approved by R. L. Reilly
Bridge Engineer
Date: Aug. 23, 1949.

STRUCTURE No. B-16-D



HALF SECTION A-A
TYPICAL BENT AND SPAN SECTION.

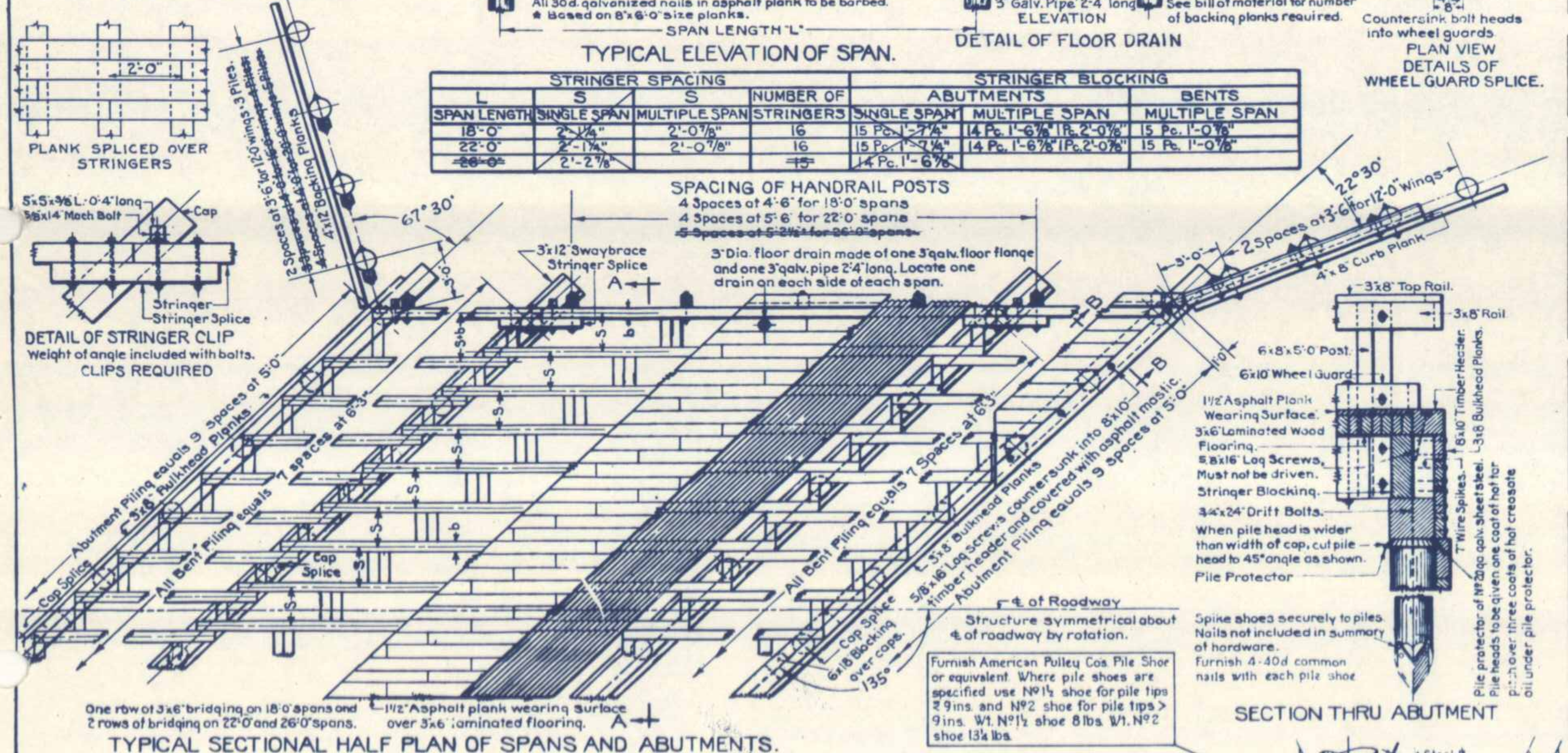


TYPICAL ELEVATION OF SPAN.
DETAIL OF FLOOR DRAIN

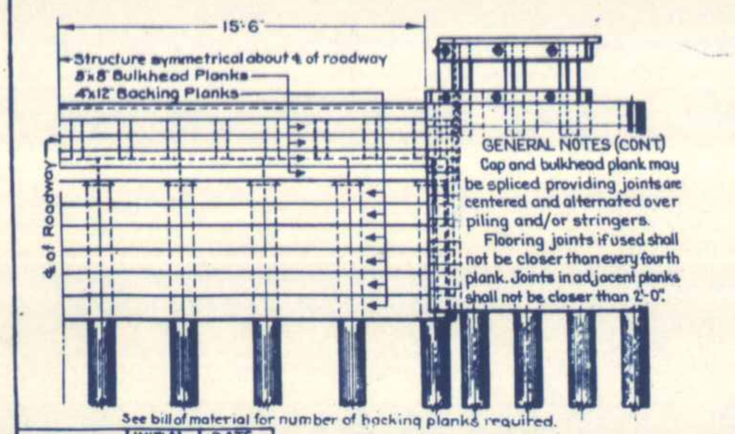
STRINGER SPACING				STRINGER BLOCKING		
L	S	S	NUMBER OF	ABUTMENTS		BENTS
SPAN LENGTH	SINGLE SPAN	MULTIPLE SPAN	STRINGERS	SINGLE SPAN	MULTIPLE SPAN	MULTIPLE SPAN
18'-0"	2'-2⅛"	2'-0⅞"	16	15 Pc. 1'-7⅞"	14 Pc. 1'-6⅞" 1 Pc. 2'-0⅞"	15 Pc. 1'-0⅞"
22'-0"	2'-1⅞"	2'-0⅞"	16	15 Pc. 1'-7⅞"	14 Pc. 1'-6⅞" 1 Pc. 2'-0⅞"	15 Pc. 1'-0⅞"
~~26'-0"~~		2'-2⅞"	15	14 Pc. 1'-6⅞"		

SPACING OF HANDRAIL POSTS
4 Spaces at 4'-6" for 18'-0" spans
4 Spaces at 5'-6" for 22'-0" spans
~~5 Spaces at 5'-2⅖" for 26'-0" spans~~

3" Dia. floor drain made of one 3" galv. floor flange and one 3" galv. pipe 2'-4" long. Locate one drain on each side of each span.



TYPICAL SECTIONAL HALF PLAN OF SPANS AND ABUTMENTS.



HALF END ELEVATION.

	INITIAL	DATE
ORIGINAL BY	L.W.F.	10-18-49
CHECKED BY	J.E.R.	10-20-49
VANDYKE BY	L.W.F.	10-21-49
CHECKED BY		

GENERAL NOTES.

All work shall be done according to the standard specifications of the Colorado State Highway Department. Adopted January 1, 1948.

All timber and piling to be treated or untreated as shown in bills of material.

All timber and piling shall be dense southern yellow pine or west coast douglas fir.

All caps shall be edged to an even depth before treatment. The ends of all stringers shall be dapped on one edge before treatment, to obtain an even depth over caps.

All cut surfaces or bored holes in treated timber or piles shall be thoroly saturated with hot creosote oil.

All piling supporting caps shall be covered with galvanized pile protectors as specified, all other piling tops shall be saturated with hot creosote oil and covered with a thick layer of heavy asphalt or tar.

Joints in top handrail must be staggered with joints in side rail.

All handrailing and posts above the wheel guards shall be painted white and all handrail posts below the top of wheel guards shall be painted black as specified.

All bolts more than 12 inches long must be threaded not less than 4 inches.

Bolts in the finished structure shall not project more than one half inch beyond the nut.

All bolts must have std. C.I.O.G. or malleable cast washers under each head and nut.

Bolt lengths are calculated assuming C.I.O.G. washers will be used.

The contractor is cautioned to check bolt lengths before ordering because of variations in thickness of lumber and piling.

The entire exposed surface of all untreated timber shall be painted one coat as specified immediately after the material is delivered to the project.

Before placing handrailing the contact surfaces shall receive the second coat of paint.

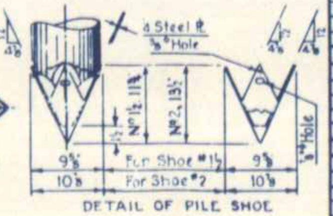
When contractor is permitted to drill holes to facilitate pile driving, these holes must be drilled so piling will stand in vertical position after final driving.

Bid price for asphalt plank shall include galvanized barbed nails and necessary asphalt mop.

All hardware to be galvanized. Weights of hardware as shown are for ungalvanized material.

All necessary blocking for swaybracing shall be treated timber.

All caps must be surfaced on vertical grain face.



GENERAL NOTES (CONT)
Contractors' attention is called to Specifications covering Tamping. Special care must be used to prevent deflection of abutments and wings by wedging action. Backfill in 6" earth layers shall be tamped beginning at the wall and proceeding outward and downward therefrom at a 4:1 min. slope. Below channel elevation tamp uniformly on both sides. Above original ground line tamp out to 6 ft. from the wall. Rolling equipment shall not be used within 6 ft. of any wall.

STANDARD P-20-31-BH-45

Revised 10-21-49 L.W.F. New Sheet Changed Rdwy. from 42'-0" to 31'-0"

REV. 8-8-47 J.W.S.
REV. 1-1-48 A.H.

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	F-FG 004-1(6)	15	

Rev. Title Block 4-10-50 E.E.D. New Sheet

BOLTS AND WASHERS FOR ONE SPAN OF SUPERSTRUCTURE

LOCATION	SIZE	18'-0" SPAN NO.	LENGTH	LBS.	22'-0" SPAN NO.	LENGTH	LBS.	~~26'-0" SPAN~~ NO.	LENGTH	LBS.
POSTS TO RAILS	5/8"	6	10"	7.0	6	10"	7.0	8	10"	9.0
POSTS TO WHEEL GUARDS	3/4"	6	14"	12.7	6	14"	12.7	8	14"	17.0
POSTS TO STRINGERS	3/4"	12	16"	28.3	12	16"	28.3	16	16"	42.0
WHEEL GUARD TO STRINGERS	3/4"	6	36"	29.0	6	38"	30.0	8	38"	40.0
WASHERS - STD. C.I.O.G. 5/8 & 3/4"		12/48		69.0	12/48		69.0	16/64		92.0
TOTAL WEIGHT				146.0			147.0			200.0

BOLTS AND WASHERS FOR ONE ABUTMENT

LOCATION	ITEM	SIZE	NO.	LENGTH	WT. EACH	TOTAL WT.
POSTS TO RAILS	BOLTS	5/8"	2	10"	1.08 LBS.	2.2 LBS.
ANGLE CLIPS TO STRINGERS & CAPS	BOLTS	5/8"	2/2	10"/14"	7.00 LBS.	14.0 LBS.
POSTS TO STRINGERS	BOLTS	3/4"	4	18"	2.60 LBS.	10.4 LBS.
POSTS TO WHEEL GUARDS & CAP SPLICE	BOLTS	3/4"	2/4	14"	2.12 LBS.	12.8 LBS.
WHEEL GUARDS TO STRINGERS	BOLTS	3/4"	2	38"	5.00 LBS.	10.0 LBS.
TIMBER HEADER TO STRINGERS	LAG SCREWS	5/8"	16	16"	1.36 LBS.	21.7 LBS.
CAPS TO CORBEL	BOLTS	3/4"	2	26"	3.56 LBS.	7.5 LBS.
WASHERS - STD. C.I.O.G	WASHERS	5/8-3/4"	22/28		0.75/1.25 LBS.	52.0 LBS.
CAPS TO PILES	DRIFT BOLTS	3/4"	10	24"	3.00 LBS.	30.0 LBS.
TOTAL WEIGHT						161.0 LBS.

BOLTS AND WASHERS FOR ONE WING

LOCATION	ITEM	SIZE	NO.	LENGTH	WT. EACH	TOTAL WT.
POSTS TO RAILS	BOLTS	5/8"	3	11"	1.16 LBS.	3.4 LBS.
POSTS TO PILES	BOLTS	3/4"	6	20"	2.84 LBS.	17.0 LBS.
PILES TO CURB PLANK	BOLTS	5/8"	3	18"	1.74 LBS.	5.2 LBS.
					LBS.	LBS.
WASHERS - STD. C.I.O.G.	WASHERS	5/8-3/4"	12/12		0.75/1.25 LBS.	24.4 LBS.
TOTAL WEIGHT						50.0 LBS.

BOLTS AND WASHERS FOR ONE BENT

LOCATION	ITEM	SIZE	NO.	LENGTH	WT. EACH	TOTAL WT.
POSTS TO RAILS	BOLTS	5/8"	2	10"	1.08 LBS.	2.2 LBS.
POSTS TO WHEEL GUARDS	BOLTS	3/4"	2	14"	2.12 LBS.	4.3 LBS.
ANGLE CLIPS TO CAP	BOLTS	5/8"	2	14"	5.50 LBS.	11.0 LBS.
WHEEL GUARDS TO STRINGERS	BOLTS	3/4"	2	38"	5.00 LBS.	10.0 LBS.
POSTS TO STRINGERS TO SPLICES	BOLTS	3/4"	4	24"	3.32 LBS.	13.3 LBS.
SPLICES TO STRINGERS	BOLTS	5/8"	12	16"	1.57 LBS.	18.9 LBS.
CAP SPLICE	BOLTS	3/4"	4	14"	2.12 LBS.	8.5 LBS.
CAPS TO CORBEL	BOLTS	3/4"	2	26"	3.56 LBS.	7.2 LBS.
SWAYBRACES TO PILES & CAP	BOLTS	5/8"	14	17"	1.66 LBS.	23.5 LBS.
SWAY TO PILE TO SWAY	BOLTS	5/8"	2	20"	1.90 LBS.	3.8 LBS.
~~WASHERS STD. C.I.O.G. NO SWAYS~~	~~WASHERS 5/8-3/4"~~		~~28/28~~		~~0.75/1.25 LBS.~~	~~56.6 LBS.~~
WASHERS - STD. C.I.O.G. WITH SWAYS	WASHERS	5/8-3/4"	60/28		0.75/1.25 LBS.	80.3 LBS.
CAPS TO PILES	DRIFT BOLTS	3/4"	8	24"	3.00 LBS.	24.0 LBS.
~~TOTAL WEIGHT - WITHOUT SWAYBRACES~~						~~156.0 LBS.~~
TOTAL WEIGHT - WITH SWAYBRACES						207.0 LBS.

NAILS

LOCATION	ITEM	18'-0" SPAN	22'-0" SPAN	~~26'-0" SPAN~~
ONE SPAN OF SUPERSTRUCTURE	30D. COMMON	25 LBS.	30 LBS.	35 LBS.
	30D. GALV. BARBED	130 LBS.	155 LBS.	185 LBS.
	40D. COMMON	165 LBS.	202 LBS.	236 LBS.
ONE ABUTMENT	40D. COMMON	6 LBS.	6 LBS.	6 LBS.
	7" WIRE SPIKES	35 LBS.	LBS.	LBS.
ONE WING	40D. COMMON	1 LBS.	1 LBS.	1 LBS.
	7" WIRE SPIKES	7 LBS.	LBS.	LBS.
ONE BENT	40D. COMMON	8 LBS.	8 LBS.	8 LBS.
	7" WIRE SPIKES	7 LBS.	LBS.	LBS.

SUMMARY FOR HARDWARE

BOLTS AND WASHERS	2/1 SPANS	AT	146/147 LBS. PER SPAN	439 LBS.
	2 ABUTMENTS	AT	161 LBS. PER ABUTMENT	322 LBS.
	4 WINGS	AT	50 LBS. PER WING	200 LBS.
	~~BENTS WITHOUT SWAYS~~	~~AT~~	~~LBS. PER BENT~~	~~LBS.~~
	2 BENTS WITH SWAYS	AT	207 LBS. PER BENT	414 LBS.
	TOTAL WEIGHT			1375 LBS.

NAILS LOCATION	UNIT	30D. COMMON EACH	30D. COMMON TOTAL	30D. GALV. EACH	30D. GALV. TOTAL	40D. COMMON EACH	40D. COMMON TOTAL	7" WIRE SPIKES EACH	7" WIRE SPIKES TOTAL
2/1 SPANS	LBS.	25/30	80	130/155	415	165/202	532	—	—
2 ABUTMENTS	LBS.	—	—	—	—	6	12	35	70
4 WINGS	LBS.	—	—	—	—	1	4	7	28
2 BENTS	LBS.	—	—	—	—	8	16	7	14
TOTAL WEIGHT	LBS.		80		415		564		112

SUMMARY OF QUANTITIES

STRUCTURAL EXCAVATION					
ITEM 14a.	DRY ROCK				5 CU. YDS.
ITEM 14b.	DRY COMMON				15 CU. YDS.
ITEM 14c.	WET ROCK				5 CU. YDS.
ITEM 14d.	WET COMMON				30 CU. YDS.
ITEM 42a UNTREATED BRIDGE TIMBER					
2/1 SPANS	AT	264/296	BD. FT. EACH	=	824 BD. FT.
2 ABUTMENTS	AT	40	BD. FT. EACH	=	80 BD. FT.
4 WINGS	AT	76	BD. FT. EACH	=	304 BD. FT.
2 BENTS	AT	40	BD. FT. EACH	=	80 BD. FT.
			TOTAL	=	1288 BD. FT.
ITEM 42b TREATED BRIDGE TIMBER					
2 SPANS	AT	7298	BD. FT. EACH	=	14596 BD. FT.
1 SPANS	AT	9218	BD. FT. EACH	=	9218 BD. FT.
2 ABUTMENTS	AT	2390	BD. FT. EACH	=	4780 BD. FT.
4 WINGS	AT	363	BD. FT. EACH	=	1452 BD. FT.
2 BENTS	AT	1210	BD. FT. EACH	=	2420 BD. FT.
			TOTAL	=	32466 BD. FT.
ITEM 43 ASPHALT PLANK WEARING SURFACE					
2/1 SPANS	AT	560/685	SQ. FT. EACH	=	1805 SQ. FT.
ITEM 60a PILING-TREATED					
2 ABUTMENTS	AT	220	LIN. FT. EACH	=	440 LIN. FT.
4 WINGS	AT	78	LIN. FT. EACH	=	312 LIN. FT.
2 BENTS	AT	176	LIN. FT. EACH	=	352 LIN. FT.
			TOTAL	=	1104 LIN. FT.
ITEM 60e METAL PILE SHOES					
(SEE DETAIL)	No 1½ SHOES	No 2 SHOES	TOTAL	=	48 SHOES
ITEM 69b DRAIN PIPE					
2 PIECES 3" DIA. GALV. PIPE 2'-4" LONG WITH ONE 3" GALV. FLANGE ON EACH PIPE					
3 SPANS	AT	2 COMPLETE PER SPAN		=	6 PIECES
ITEM 16a	STRUCTURE BACKFILL (Class 1)				140 CU. YDS.
ITEM 16d	MECHANICAL TAMPING				14 HRS.

ONE SPAN OF SUPERSTRUCTURE

DESCRIPTION	SIZE	18'-0" SPAN NO.	LENGTH	TOTAL	22'-0" SPAN NO.	LENGTH	TOTAL	~~26'-0" SPAN~~ NO.	LENGTH	TOTAL
UNTREATED TIMBER										
HANDRAILS S4S	3x8	4	18'-0"	144 BD.FT.	4	22'-0"	176 BD.FT.	4	26'-0"	208 BD.FT.
HANDRAIL POSTS S4S	6x8	6	5'-0"	120 BD.FT.	6	5'-0"	120 BD.FT.	8	5'-0"	160 BD.FT.
TOTAL UNTREATED TIMBER				264 BD.FT.			296 BD.FT.			368 BD.FT.
TREATED TIMBER										
FLOORING S4S	3x6	60	18'-0"	1620 BD.FT.	72	18'-0"	1944 BD.FT.	85	18'-0"	2295 BD.FT.
FLOORING S4S	3x6	60	28'-0"	2520 BD.FT.	72	28'-0"	3024 BD.FT.	85	28'-0"	3570 BD.FT.
WHEEL GUARDS ▼	6x10	2	20'-0"	200 BD.FT.	2	24'-0"	240 BD.FT.	2	28'-0"	280 BD.FT.
STRINGERS OUTSIDE INTERMEDIATE SPANS	6x20				2	22'-0"	440 BD.FT.	2	26'-0"	BD.FT.
STRINGERS OUTSIDE END SPANS	6x20	2	18'-5½"	333 BD.FT.				2	26'-4"	BD.FT.
STRINGERS INSIDE INTERMEDIATE AND END SPANS	6x18	14	20'-0"	2520 BD.FT.	14	24'-0"	3360 BD.FT.		28'-0"	BD.FT.
~~STRINGERS SINGLE SPAN~~	6x18									
BRIDGING	3x6	7	10'-0"	105 BD.FT.	14	10'-0"	210 BD.FT.	13	10'-0"	195 BD.FT.
~~TOTAL TR. TIMBER - SINGLE SPAN~~				~~7172 BD.FT.~~			~~9088 BD.FT.~~			11,699 BD.FT.
TOTAL TR. TIMBER - END SPANS				7298 BD.FT.			~~8228 BD.FT.~~			BD.FT.
TOTAL TR. TIMBER - INTER. SPANS				~~7288 BD.FT.~~			9218 BD.FT.			BD.FT.
ASPHALT PLANK WEARING SURF.				560 SQ.FT.			685 SQ.FT.			810 SQ.FT.

ONE ABUTMENT

UNTREATED TIMBER			
HANDRAIL POSTS S4S.	2 PCS.	6"x8"x5'-0"	40 BD.FT.
TOTAL UNTREATED TIMBER			40 BD.FT.
TREATED TIMBER			
TIMBER HEADER	2 Pcs.	8"x10"x24'-0" FINISH TO 7'-8"	320 BD.FT.
CAP	1 Pc. Ea.	12"x12"x24'-0", 28'-0" & 4'-0"	672 BD.FT.
BULKHEAD PLANKS	4 Pcs. Ea.	3"x8"x22'-0" & 28'-0"	400 BD.FT.
BACKING PLANKS	4 Pcs. Ea.	4"x12"x22'-0" & 28'-0"	800 BD.FT.
STRINGER BLOCKING 18'-0" & 22'-0" SPANS (Cut before treatment)	1 Pc.	6"x18"x22'-0"	198 BD.FT.
~~26'-0" SPAN~~	~~1 Pc.~~	~~6"x18"x26'-0"~~	~~188 BD.FT.~~
TOTAL TREATED TIMBER			2390 BD.FT.
PILING - TREATED	10 PIECES AT	22 LIN. FT. EACH =	220 LIN. FT.

ONE WING

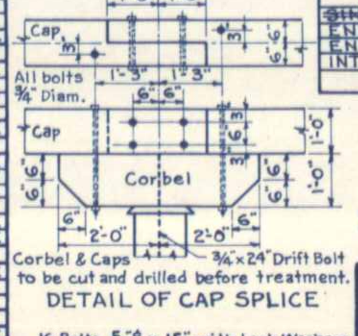
DESCRIPTION	SIZE	12'-0" LENGTH NO.	LENGTH	BD.FT.	~~16'-0" LENGTH~~ NO.	LENGTH	BD.FT.	20'-0" LENGTH NO.	LENGTH	BD.FT.
UNTREATED TIMBER										
HANDRAILS S4S.	3"x8"	1	10'-0"	20	1	12'-0"	24	1	12'-0"	24
	3"x8"	1	10'-0"	20	1	12'-0"	24	1	12'-0"	24
HANDRAIL POSTS S4S.	6x6	3	4'-0"	36	3	4'-0"	36	3	4'-0"	36
TOTAL UNTREATED TIMBER - BD.FT.				76			84			84
TREATED TIMBER										
CURB PLANKS	4"x8"	1	10'-0"	27	1	12'-0"	32	1	12'-0"	32
BACKING PLANKS	4"x12"	7	12'-0"	336		16'-0"			20'-0"	
TOTAL TREATED TIMBER - BD.FT.				363						
PILING - TREATED	3 PIECES AT 26 LIN. FT. EACH =									78 LIN. FT.

ONE BENT

UNTREATED TIMBER			
HANDRAIL POSTS S4S.	2 PCS.	6"x8"x5'-0"	40 BD.FT.
TOTAL UNTREATED TIMBER			40 BD.FT.
TREATED TIMBER			
STRINGER SPLICES	2 PCS.	6"x18"x4'-0"	72 BD.FT.
CAP	1 Pc. Ea.	12"x12"x22'-0", 28'-0" & 4'-0"	648 BD.FT.
SWAYBRACES	2 Pcs. Ea.	3"x12"x22'-0" & 30'-0"	312 BD.FT.
STRINGER BLOCKING 18'-0" & 22'-0" SPANS (Cut before treatment)	1 PC.	6"x18"x18'-0"	162 BD.FT.
	~~Pc.~~		~~BD.FT.~~
SHIMS	16 PCS.	2"x6"x1'-0"	16 BD.FT.
TOTAL TREATED TIMBER			1210 BD.FT.
PILING - TREATED	8 PIECES AT	22 LIN. FT. EACH =	176 LIN. FT.

SPANS	18'-0"	22'-0"	~~26'-0"~~
~~SINGLE~~	~~18'-8"~~	~~22'-8"~~	~~26'-8"~~
END	17'-1"	~~21'-1"~~	
END	20'-0"	~~24'-0"~~	
INTERMEDIATE	~~18'-8"~~	22'-8"	

▼ LENGTHS OF WHEEL GUARD



Corbel & Caps to be cut and drilled before treatment.
DETAIL OF CAP SPLICE

PILE SPLICE

STRUCTURES REQUIRED
2 SPANS AT 18'-0"
1 SPAN AT 22'-0"

LOADING DATA
LIVE LOAD: A.A.S.H.O. 1941 H-20
DEAD LOAD: Assumes 25 lbs per sq. ft. additional wearing surface. This includes 1½" asphalt plank wearing surface.

STRUCTURE NO. B-16-AR

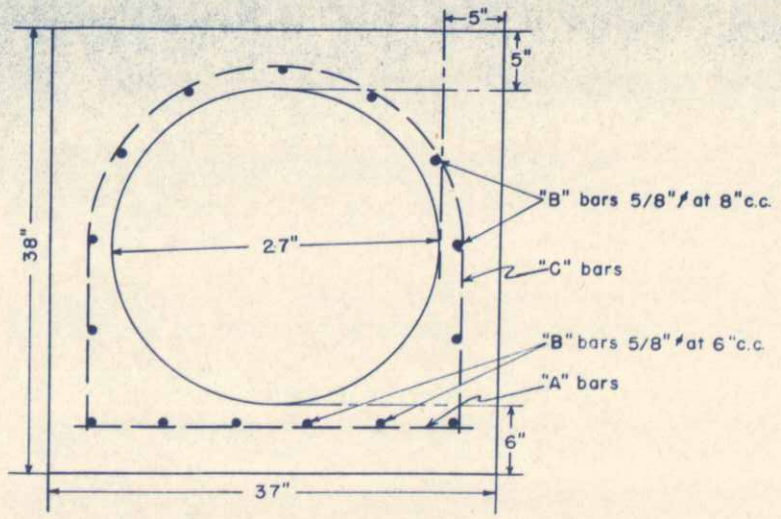
COLORADO
STATE HIGHWAY DEPARTMENT
TREATED TIMBER PILE TRESTLE
WITH 6" LAMINATED FLOOR AND 1½"
ASPHALT PLANK WEARING SURFACE
31 FT. CLEAR ROADWAY
Across Cache La Poudre No. 2 Res. Ditch
Sta. 73+88.00 to 74+48.12
Near Ft. Collins Sec. 18 T. 7 N R. 68 W

Designed by L.M.R.	Approved by [signature]
Made by L.M.R.	Bridge Engineer
Check Design G.H.M.	
Check Detail G.H.M.	Date Aug. 10, 1947

DETAILS FOR ENCASING WATER MAIN, STA. 122 + 40

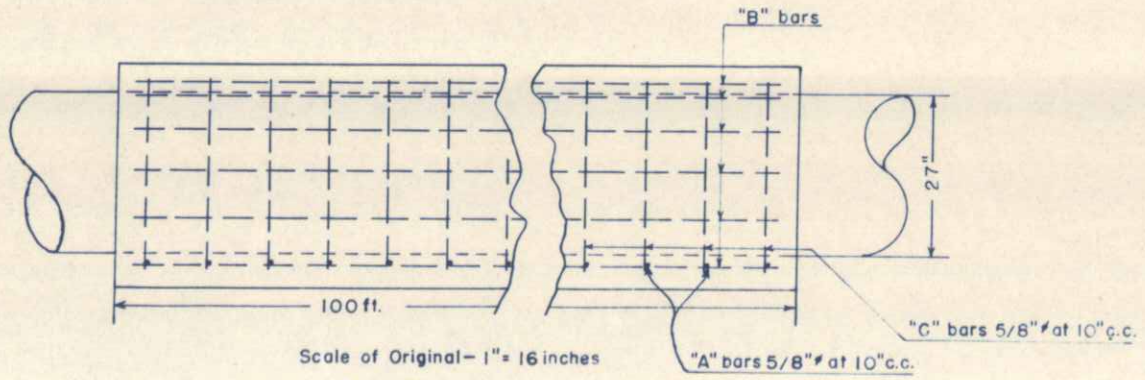
FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	F-FG004-1(16)	16	

New Sheet ⇨ 11-3-49 ⇨ E.O.



Scale of Original – 1" = 8 inches

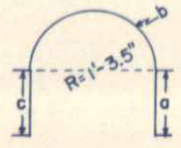
END ELEVATION



Scale of Original – 1" = 16 inches

SIDE ELEVATION

BAR LIST

MARK	TYPE BEND	LENGTH	NUMBER OF BARS	TOTAL LENGTH
A	STRAIGHT	2'-9"	120	330.0'
B	STRAIGHT	99'-6"	15	1492.5'
C		a = 1'-4.5" b = 4'-1.0" c = 1'-4.5" Tot. 6'-10.0"	120	819.6'

SUMMARY

Reinforcing Steel – 2642.1' X 1.043 = 2755.7 Lbs.
Plus 3% Overrun 82.7
Total 2838.4 Lbs.

Class "A" Concrete 21.5 Cu. Yds.

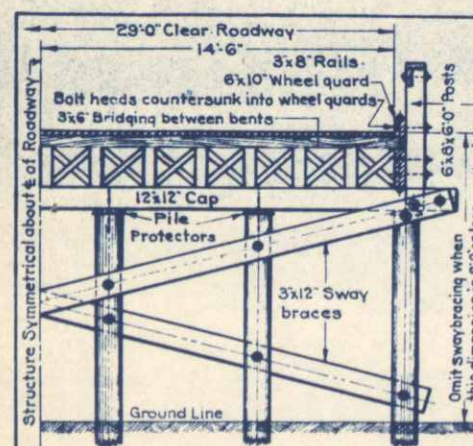
STANDARD P-20-29-BH

Revised 10-21-49 L.W.F. New Sheet - Changed Rdwy. from 42'-0" to 29'-0"

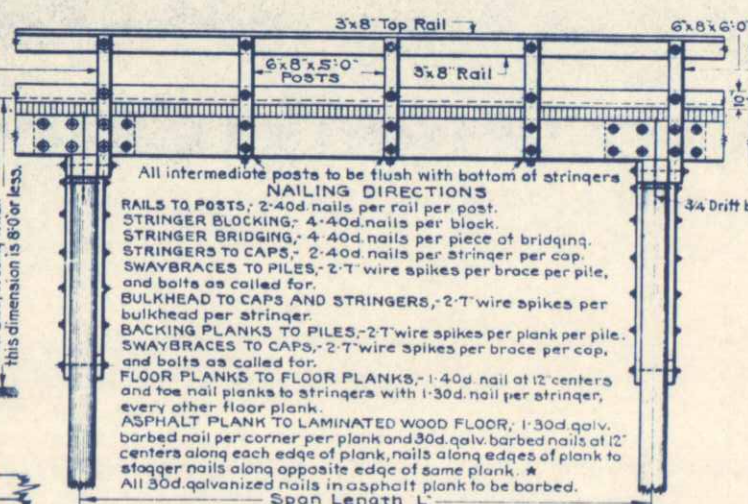
REV. 8-8-47 J.W.S.
Rev. January 1, 1948 J.O.R.

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	F-FG 004-1(6)	17	

New Sheet



HALF SECTION A-A.
TYPICAL BENT AND SPAN SECTION



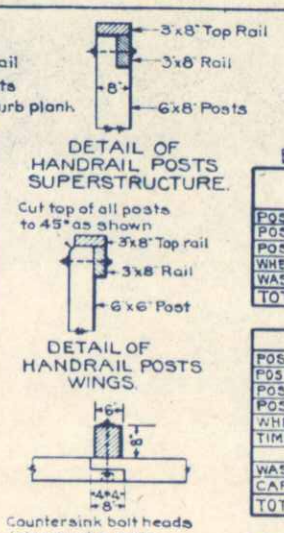
All intermediate posts to be flush with bottom of stringers

NAILING DIRECTIONS

RAILS TO POSTS,- 2-40d. nails per rail per post.
STRINGER BLOCKING,- 4-40d. nails per block.
STRINGER BRIDGING,- 4-40d. nails per piece at bridging.
STRINGERS TO CAPS,- 2-40d. nails per stringer per cap.
SWAYBRACES TO PILES,- 2-T wire spikes per brace per pile, and bolts as called for.
BULKHEAD TO CAPS AND STRINGERS,- 2-T wire spikes per bulkhead per stringer.
BACKING PLANKS TO PILES,- 2-T wire spikes per plank per pile.
SWAYBRACES TO CAPS,- 2-T wire spikes per brace per cap, and bolts as called for.
FLOOR PLANKS TO FLOOR PLANKS,- 1-40d. nail at 12" centers and toe nail planks to stringers with 1-30d. nail per stringer, every other floor plank.
ASPHALT PLANK TO LAMINATED WOOD FLOOR,- 1-30d. galv. barbed nail per corner per plank and 30d. galv. barbed nails at 12" centers along each edge of plank, nails along edges of plank to stagger nails along opposite edge of same plank. ★
All 30d. galvanized nails in asphalt plank to be barbed.

★ Based on 8'x 6'-0" size planks.

TYPICAL ELEVATION OF SPAN.



SECTION B-B.
See bill of material for number of backing planks required

DETAIL OF HANDRAIL POSTS SUPERSTRUCTURE.

DETAIL OF HANDRAIL POSTS WINGS.

Countersink bolt heads into wheel guards.

PLAN VIEW
DETAILS OF WHEEL GUARD SPLICE

BOLTS AND WASHERS FOR ONE SPAN OF SUPERSTRUCTURE

LOCATION	SIZE	19'-0" SPAN NO.	LENGTH	LBS.	23'-0" SPAN NO.	LENGTH	LBS.	27'-0" SPAN NO.	LENGTH	LBS.
POSTS TO RAILS	5/8	8	10	7.0	8	10	7.0	8	10	9.0
POSTS TO WHEEL GUARDS	3/4	6	1'-6"	12.7	6	1'-6"	12.7	8	14	17.0
POSTS TO STRINGERS	3/4	12	10	26.3	12	1'-6"	28.3	16	1'-6"	42.0
WHEEL GUARD TO STRINGERS	3/4	6	36"	25.0	6	38	30.0	8	38	40.0
WASHERS - STD. C.I. O.G.	5/8 & 3/4	12	4.8	6.5.0	12	4.8	82.0	16/24		92.0
TOTAL WEIGHT				146.0			147.8			200

BOLTS AND WASHERS FOR ONE ABUTMENT

LOCATION	ITEM	SIZE	NO.	LENGTH	WT. EACH	TOTAL WT.
POSTS TO RAILS	BOLTS	5/8	2	10	1.08 LBS.	2.2 LBS.
POST TO BULKHEAD TO CAP	BOLTS	5/8	2	2.3	2.15 LBS.	4.3 LBS.
POSTS TO STRINGERS	BOLTS	3/4	4	1'-8"	2.60 LBS.	10.4 LBS.
POSTS TO WHEEL GUARDS	BOLTS	3/4	2	1'-4"	2.12 LBS.	4.3 LBS.
WHEEL GUARDS TO STRINGERS	BOLTS	3/4	2	3'-8"	5.00 LBS.	10.0 LBS.
TIMBER HEADER TO STRINGERS	LAG SCREWS	5/8	16	1'-6"	1.38 LBS.	21.8 LBS.
						~~L.BS.~~
WASHERS - STD. C.I. O.G.	WASHERS	5/8 & 3/4	22/16		0.75/1.25 LBS.	36.1 LBS.
CAPS TO PILES	DRIFT BOLTS	3/4"	7	2'-4"	3.00 LBS.	21.0 LBS.
TOTAL WEIGHT						111.0 LBS.

BOLTS AND WASHERS FOR ONE WING

POSTS TO RAILS	BOLTS	5/8	3	1'-1"	1.16 LBS.	3.4 LBS.
POSTS TO PILES	BOLTS	3/4	6	2'-0"	2.84 LBS.	17.0 LBS.
PILES TO CURB PLANK	BOLTS	5/8	3	1'-8"	1.74 LBS.	5.2 LBS.
						~~L.BS.~~
WASHERS - STD. C.I. O.G.	WASHERS	5/8 & 3/4	12/12		0.75/1.25 LBS.	24.4 LBS.
TOTAL WEIGHT						50.0 LBS.

BOLTS AND WASHERS FOR ONE BENT

POSTS TO RAILS	BOLTS	5/8"	2	10"	1.08 LBS.	2.2 LBS.
POSTS TO WHEEL GUARDS	BOLTS	3/4"	2	1'-4"	2.12 LBS.	4.3 LBS.
POSTS TO CAPS WITHOUT SWAYS	BOLTS	5/8"	2	2'-0"	1.90 LBS.	3.8 LBS.
WHEEL GUARDS TO STRINGERS	BOLTS	3/4"	2	3'-8"	5.00 LBS.	10.0 LBS.
POSTS TO STRINGERS TO SPLICES	BOLTS	3/4"	4	2'-4"	2.60 LBS.	10.4 LBS.
SPLICES TO STRINGERS	BOLTS	5/8"	12	1'-6"	1.57 LBS.	18.9 LBS.
POSTS TO CAPS TO SWAYS	BOLTS	5/8"	2	2'-3"	2.15 LBS.	4.3 LBS.
SWAYS TO CAPS	BOLTS	5/8"	2	1'-7"	1.66 LBS.	3.3 LBS.
SWAYS TO PILES	BOLTS	5/8"	12	1'-7"	1.66 LBS.	19.9 LBS.
						~~L.BS.~~
WASHERS STD. C.I. O.G. NO SWAYS	WASHERS	5/8 & 3/4"	32/16		0.75/1.25 LBS.	44.5 LBS.
WASHERS STD. C.I. O.G. WITH SWAYS	WASHERS	5/8 & 3/4"	60/16		0.75/1.25 LBS.	64.6 LBS.
CAPS TO PILES	DRIFT BOLTS	3/4"	6	2'-4"	3.00 LBS.	18.0 LBS.
TOTAL WEIGHT WITHOUT SWAYS						115.0 LBS.
TOTAL WEIGHT WITH SWAYS						159.0 LBS.

NAILS

LOCATION	ITEM	19'-0" SPAN	23'-0" SPAN	27'-0" SPAN
ONE SPAN OF SUPERSTRUCTURE	30D COMMON	25 LBS.	30 LBS.	35 LBS.
	30D GALV. BARBED	25 LBS.	30 LBS.	35 LBS.
ONE ABUTMENT	40D COMMON	50 LBS.	60 LBS.	75 LBS.
	40D COMMON	136 LBS.	196 LBS.	226 LBS.
	T WIRE SPIKES	LBS.	LBS.	6 LBS.
ONE WING 1-5'10"/2-2'6"/1-5'0"	40D COMMON	1 LBS.	1 LBS.	1 LBS.
	T WIRE SPIKES	LBS.	LBS.	41 LBS.
ONE BENT	40D COMMON	1 LBS.	1 LBS.	1 LBS.
	T WIRE SPIKES	LBS.	LBS.	11/15/19 LBS.
	40D COMMON	8 LBS.	8 LBS.	~~LBS.~~
	T WIRE SPIKES	LBS.	LBS.	~~LBS.~~

SUMMARY FOR HARDWARE

BOLTS AND WASHERS	1 SPAN	AT	200 LBS. PER SPAN		200 LBS.
	2 ABUTMENTS	AT	111 LBS. PER ABUTMENT		222 LBS.
	2 WINGS	AT	50 LBS. PER WING		200 LBS.
	~~BENTS WITHOUT SWAYS~~	~~AT~~	~~115 LBS. PER BENT~~		~~LBS.~~
	~~BENTS WITH SWAYS~~	~~AT~~	~~159 LBS. PER BENT~~		~~LBS.~~
	TOTAL WEIGHT				622 LBS.

NAILS	LOCATION	UNIT	30D COMMON EACH	30D COMMON TOTAL	30D GALV. EACH	30D GALV. TOTAL	40D COMMON EACH	40D COMMON TOTAL	T WIRE SPIKES EACH	T WIRE SPIKES TOTAL
	1 SPAN	LBS.	35	35	175	175	226	226		
	2 ABUTMENTS	LBS.							41	82
	1/2/1 WINGS	LBS.					1/1/1	1	11/15/19	60
	~~BENTS~~	~~LBS.~~						~~L.BS.~~		
	TOTAL WEIGHT	LBS.		35		175		242		142

SUMMARY OF QUANTITIES

STRUCTURAL EXCAVATION

ITEM 14a. DRY ROCK		5 CU. YDS.
ITEM 14b. DRY COMMON		80 CU. YDS.
ITEM 14c. WET ROCK		5 CU. YDS.
ITEM 14d. WET COMMON		5 CU. YDS.

ITEM 42a UNTREATED BRIDGE TIMBER

1 SPAN	AT	384 BD. FT. EACH	=	384 BD. FT.
2 ABUTMENTS	AT	48 BD. FT. EACH	=	96 BD. FT.
1/2/1 WINGS	AT	76/144/84 BD. FT. EACH	=	328 BD. FT.
~~BENTS~~	~~AT~~	~~48 BD. FT. EACH~~	=	~~BD. FT.~~
		TOTAL	=	808 BD. FT.

ITEM 42b TREATED BRIDGE TIMBER

1 SPAN	AT	11652 BD. FT. EACH	=	11652 BD. FT.
~~2 SPANS~~	~~AT~~	~~BD. FT. EACH~~	=	~~BD. FT.~~
2 ABUTMENTS	AT	2412 BD. FT. EACH	=	4824 BD. FT.
1/2/1 WINGS	AT	461/736/312 BD. FT. EACH	=	2851 BD. FT.
~~BENTS~~	~~AT~~	~~BD. FT. EACH~~	=	~~BD. FT.~~
		TOTAL	=	19327 BD. FT.

ITEM 43 ASPHALT PLANK WEARING SURFACE

1 SPAN	AT	783 SQ. FT. EACH	=	783 SQ. FT.

ITEM 60a PILING - TREATED

2 ABUTMENTS	AT	140 LIN. FT. EACH	=	280 LIN. FT.
1/2/1 WINGS	AT	60/30/100 LIN. FT. EACH	=	220 LIN. FT.
~~BENTS~~	~~AT~~	~~LIN. FT. EACH~~	=	~~LIN. FT.~~
		TOTAL	=	600 LIN. FT.

ITEM 60e METAL PILE SHOES

(SEE DETAIL)	№1½ SHOES	№2 SHOES, TOTAL =	30 SHOES

ITEM 89b DRAIN PIPE

2 PIECES 3" DIA. GALV. PIPE 2'-4" LONG WITH ONE 3" GALV. FLANGE ON EACH PIPE.				
1 SPAN	AT	2 COMPLETE PER SPAN	=	2 PIECES

ITEM 16d MECHANICAL TAMPING

ABUT. №1 7.5 HRS. / ABUT. №2 7.5 HRS. (SUB-ABUTS. & WINGS) TOTAL =			15 HRS.
ITEM 16a STRUCTURE BACKFILL (Class 1)			150 CU. YDS.

ONE SPAN OF SUPERSTRUCTURE

UNTREATED TIMBER

DESCRIPTION	SIZE	19'-0" SPAN NO.	LENGTH	TOTAL	23'-0" SPAN NO.	LENGTH	TOTAL	27'-0" SPAN NO.	LENGTH	TOTAL
HANDRAILS 54S.	3"x8"	4	20'-0"	160 BD.FT.	4	24'-0"	192 BD.FT.	4	28'-0"	224 BD.FT.
HANDRAIL POSTS 54S.	6"x8"	6	5'-0"	120 BD.FT.	6	5'-0"	120 BD.FT.	8	5'-0"	160 BD.FT.
TOTAL UNTREATED TIMBER				280 BD.FT.			312 BD.FT.			384 BD.FT.

TREATED TIMBER

FLOORING 54S.	3"x 6"	97	19'-0"	3515 BD.FT.	106	30'-0"	4770 BD.FT.	124	30'-0"	5580 BD.FT.
BRIDGING	3"x 6"	4	6'-0"	96 BD.FT.	7	20'-0"	210 BD.FT.	8	16'-0"	192 BD.FT.
WHEEL GUARDS ▼	6"x10"	2	10'-0"	200 BD.FT.	2	24'-0"	240 BD.FT.	2	28'-0"	280 BD.FT.
STRINGERS OUTSIDE	6"x18"	2	19'-0"	342 BD.FT.						~~BD.FT.~~
INTERMEDIATE SPANS	8"x20"				2	23'-0"	460 BD.FT.			~~BD.FT.~~
STRINGERS OUTSIDE	6"x18"	2	19'-6"	351 BD.FT.						~~BD.FT.~~
END SPANS	6"x20"				2	23'-6"	470 BD.FT.			~~BD.FT.~~
	8"x20"									~~BD.FT.~~
STRINGERS INSIDE-INTERMEDIATE AND END SPANS	6"x18"	15	20'-0"	2340 BD.FT.						~~BD.FT.~~
	6"x20"				14	24'-0"	3360 BD.FT.			~~BD.FT.~~
	8"x20"									~~BD.FT.~~
STRINGERS SINGLE SPAN	6"x18"	15	20'-0"	2700 BD.FT.						~~BD.FT.~~
	6"x20"				15	24'-0"	3840 BD.FT.			~~BD.FT.~~
	8"x20"							15	28'-0"	5600 BD.FT.
TOTAL TR. TIMBER - SINGLE SPAN		6911 BD.FT.			9060 BD.FT.			11,652 BD.FT.		
TOTAL TR. TIMBER - END SPANS		6902 BD.FT.			9050 BD.FT.					BD.FT.
TOTAL TR. TIMBER - INTER. SPANS		6893 BD.FT.			9040 BD.FT.					BD.FT.
ASPHALT PLANK WEARING SURF.		551 SQ.FT.			661 SQ.FT.			783 SQ.FT.		

ONE ABUTMENT

UNTREATED TIMBER

HANDRAIL POSTS 54S.	2 PCS.	6"x 8"x 6'-0"	48 BD.FT.
TOTAL UNTREATED TIMBER			48 BD.FT.

TREATED TIMBER

TIMBER HEADER	1 PC.	8"x10"x30'-0" FINISH TO 7'-9"	200 BD.FT.
CAP	1 PC.	12"x 12"x 34'-0"	408 BD.FT.
BULKHEAD PLANKS	4 PCS.	3"x 8"x 32'-0"	256 BD.FT.
BACKING PLANKS	9 PCS.	4"x 12"x 32'-0"	1152 BD.FT.
STRINGER BLOCKING Cut before treatment 19 & 23 SPANS	1 PC.	6"x 18"x 24'-0"	216 BD.FT.
27 SPAN	1 PC.	6"x 18"x 20'-0"	180 BD.FT.
TOTAL TREATED TIMBER			2412 BD.FT.
PILING - TREATED	"T" PIECES AT 20 LIN. FT. EACH =		140 LIN. FT.

ONE WING

UNTREATED TIMBER

DESCRIPTION	SIZE	10'-0" LENGTH NO.	LENGTH	BD. FT	16'-0" LENGTH NO.	LENGTH	BD. FT	20'-0" LENGTH NO	LENGTH	BD. FT
HANDRAILS 54S.	3"x8"	1	10'-0"	20	1	12'-0"	24	1	12'-0"	24
	3"x8"	1	10'-0"	20	1	12'-0"	24	1	12'-0"	24
HANDRAIL POSTS 54S.	6"x6"	3	4'-0"	36	3	4'-0"	36	3	4'-0"	36
TOTAL UNTREATED TIMBER - BD. FT.				76			84			84

TREATED TIMBER

CURB PLANKS	4"x8"	1	10'-0"	27	1	12'-0"	32	1	12'-0"	32
BACKING PLANKS	4"x12"	11	10'-0"	440	11	16'-0"	704	1	20'-0"	880
TOTAL TREATED TIMBER - BD. FT.				467			736			912
PILING - TREATED 3/4/4/5 PIECES AT 20 LIN. FT. EACH = 60/80/84/100 LIN. FT.										

ONE BENT

UNTREATED TIMBER

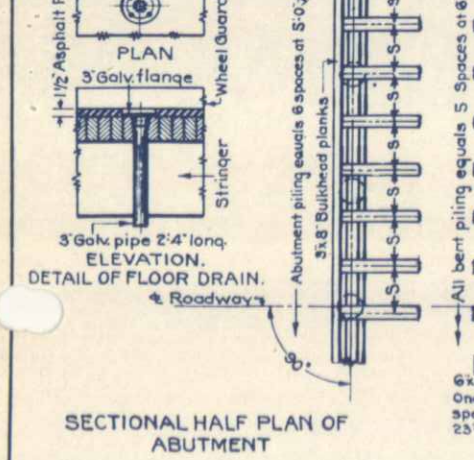
HANDRAIL POSTS 54S.	2 PCS.	6"x 8"x 6'-0"	48 BD.FT.
TOTAL UNTREATED TIMBER			48 BD.FT.

TREATED TIMBER

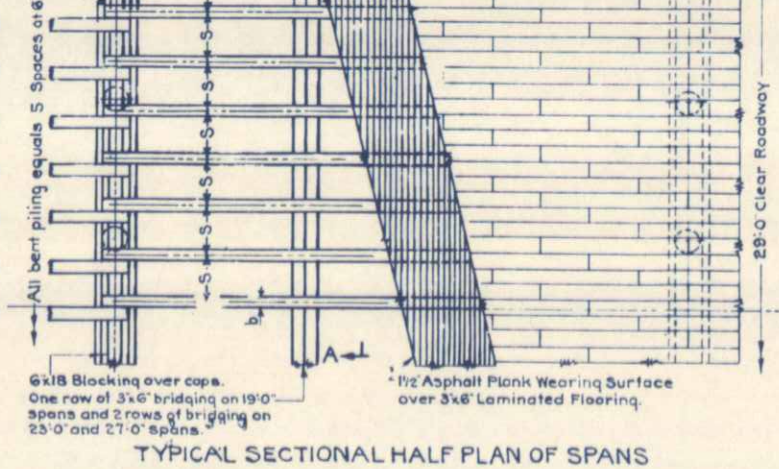
STRINGER SPLICES	2 PCS.	6"x 18"x 4'-0"	72 BD.FT.
CAP	1 PC.	12"x 12"x 34'-0"	408 BD.FT.
SWAYBRACES	2 PCS.	3"x 12"x	BD.FT.
STRINGER BLOCKING Cut before treatment	1 PC.	6"x 18"x 16'-0"	144 BD.FT.
SHIMS	14 PCS.	2"x 6"x 1'-0"	BD.FT.
TOTAL TREATED TIMBER			BD.FT.
PILING - TREATED	6 PIECES AT	LIN. FT. EACH =	LIN. FT.

▼ Lengths of Wheel Guards

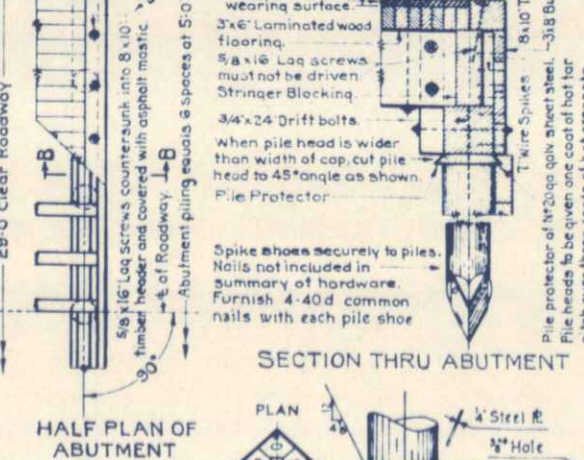
SPANS	19'-0"	23'-0"	27'-0"
SINGLE	19'-0"	23'-0"	27'-0"
END	18'-8"	22'-8"	
END	20'-0"	24'-0"	
INTERMEDIATE	19'-8"	23'-8"	



SECTIONAL HALF PLAN OF ABUTMENT

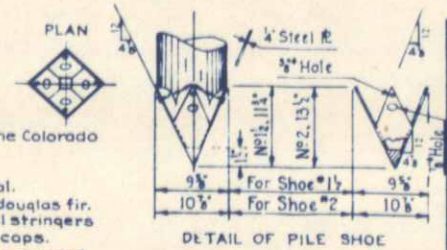


TYPICAL SECTIONAL HALF PLAN OF SPANS



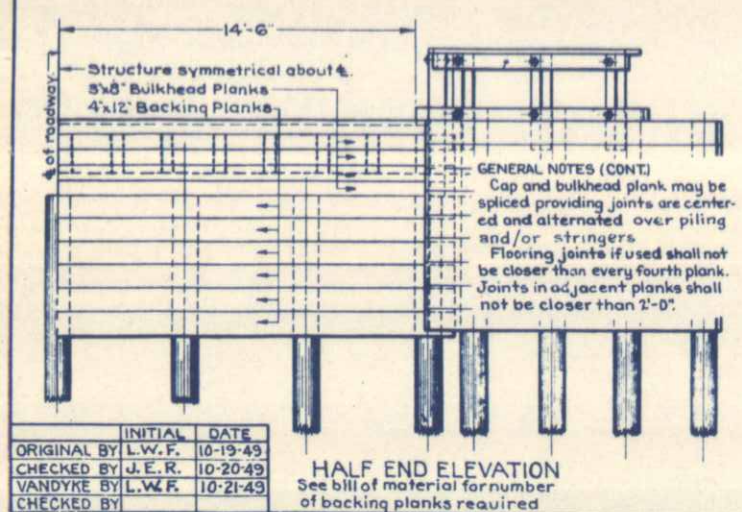
HALF PLAN OF ABUTMENT

SECTION THRU ABUTMENT



DETAIL OF PILE SHOE

Furnish American Pulley Co's. Pile Shoe or equivalent. Where pile shoes are specified use №1½ shoe for pile tips 3'-9" and №2 shoe for pile tips >9'. Wt. №1½, 81 lbs. Wt №2, 134 lbs.



	INITIAL	DATE
ORIGINAL BY	L.W.F.	10-19-49
CHECKED BY	J.E.R.	10-20-49
VANDYKE BY	L.W.F.	10-21-49
CHECKED BY		

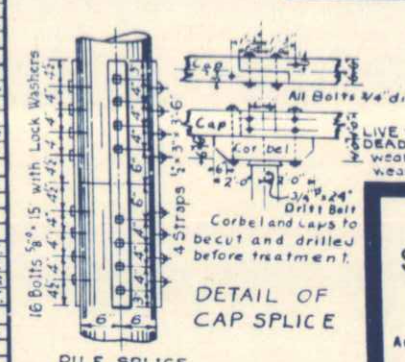
HALF END ELEVATION
See bill of material for number of backing planks required

GENERAL NOTES (CONT.)
Cap and bulkhead plank may be spliced providing joints are centered and alternated over piling and/or stringers.
Flooring joints if used shall not be closer than every fourth plank. Joints in adjacent planks shall not be closer than 2'-0".

GENERAL NOTES

All work shall be done according to the standard Specifications of the Colorado State Highway Department. Adopted January 1, 1948.
All caps must be surfaced on vertical grain face
All timber and piling to be treated or untreated as shown in bills of material.
All timber and piling shall be dense southern yellow pine or west coast douglas fir.
All caps shall be edged to on even depth. The ends of all stringers shall be dapped on one edge, to obtain on even depth over caps.
All cut surfaces or bored holes in treated timber or piles shall be theroly saturated with hot creosote oil.
All piling supporting caps shall be covered with galvanized pile protectors as specified, all other piling tops shall be saturated with hot creosote oil and covered with a thick layer of heavy asphalt or tar.
Joints in top handrail must be staggered with joints in side rail.
All handrailing and posts above the wheel guards shall be painted white and all handrail posts below the top of wheel guards shall be painted black as specified.
All bolts more than 12 inches long must be threaded not less than 4 inches.
Bolts in the finished structure shall not project more than one half inch beyond the nut.
All bolts must have Std. C.I.O.G. or Malleable Cast Washers under each head and nut.
Bolt lengths are calculated assuming C.I.O.G. washers will be used.
The contractor is cautioned to check bolt lengths before ordering because of variations in thickness of lumber and piling.
The entire exposed surface of all untreated timber shall be painted one coat as specified immediately after the material is delivered to the project.
Before placing handrailing the contact surfaces shall receive the second coat of paint.
When contractor is permitted to drill holes to facilitate pile driving, these holes must be drilled so piling will stand in vertical position after final driving.
Bid price for asphalt plank shall include galvanized barbed nails and necessary asphalt mop.
All hardware to be galvanized. Weights of hardware as shown are for unqalvanized material.
All necessary blocking for swaybracing shall be treated timber.

GENR'L. NOTES (CONT.)
Contractors attention is called to Specifications covering Tamping. Special care must be used to prevent deflection of abutments and wings by wedging action. Backfill in 6" earth layers shall be tamped beginning at the wall and proceeding outward and downward therefrom at a 4:1 min. slope. Below elevation tamp uniformly on both sides. Above original ground line tamp out to 6 ft. from the wall. Rolling equipment shall not be used within 6' of any wall.



LOADING DATA
LIVE LOAD - A.A.S.H.O. 1944 H-20
DEAD LOAD - Assumes 25 lbs. per sq. ft. additional wearing surface. This includes 1½" asphalt plank wearing surface.

STRUCTURES REQUIRED
1 SPAN AT 27'-0
~~2 SPANS AT~~

COLORADO
STATE HIGHWAY DEPARTMENT

TREATED TIMBER PILE TRESTLE WITH 6" LAMINATED FLOOR AND 1½" ASPHALT PLANK WEARING SURFACE
28 FT. CLEAR ROADWAY
Across Dry Creek
Sta. 86+07 to 86+35.5
Near Ft. Collins Sec. 17 T. 7 N. R. 68 W

Designed by I.M.R.
Made by I.M.R.
Check Design G.R.B.
Check Detail G.R.B.

Approved by Pat Bailey
Bridge Engineer
Date: Aug. 10, 1949

STRUCTURE NO. B-16-AP

STANDARD P-20-29-BH

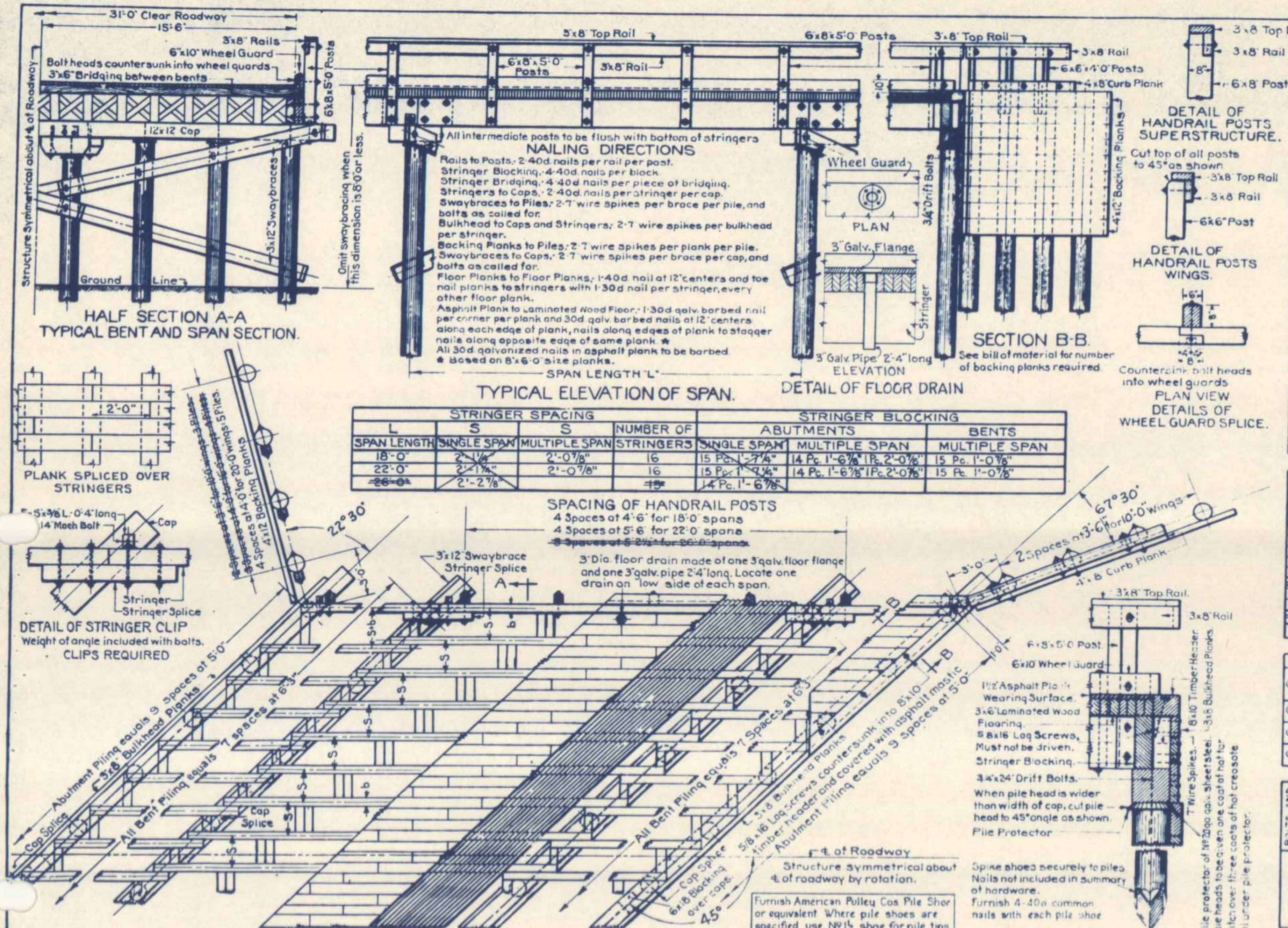
STANDARD P-20-31-BH-45

Revised 10-24-49 L.W.F. New Sheet. Changed Rdwy. from 42'-0" to 31'-0"

REV. 8-8-47 J.W.S.
REV. 1-1-48 A.H.

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	F-FG 004-1(6)	18	

New Sheet



STRINGER SPACING				STRINGER BLOCKING		
L	S	S	NUMBER OF	ABUTMENTS		BENTS
SPAN LENGTH	~~SINGLE SPAN~~	MULTIPLE SPAN	STRINGERS	~~SINGLE SPAN~~	MULTIPLE SPAN	MULTIPLE SPAN
18'-0"	~~2'-1¼"~~	2'-0⅞"	16	~~15 Pc. 1'-7¼"~~	14 Pc. 1'-6⅞" 1 Pc. 2'-0⅞"	15 Pc. 1'-0⅞"
22'-0"	~~2'-1¼"~~	2'-0⅞"	16	~~15 Pc. 1'-7¼"~~	14 Pc. 1'-6⅞" 1 Pc. 2'-0⅞"	15 Pc. 1'-0⅞"
~~26'-0"~~	~~2'-2⅞"~~		~~15~~	~~14 Pc. 1'-6⅞"~~		

SPACING OF HANDRAIL POSTS
4 Spaces at 4'-6" for 18'-0" spans
4 Spaces at 5'-6" for 22'-0" spans
~~5 Spaces at 5'-2½" for 26'-0" spans~~

GENERAL NOTES.

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All bolts more than 12 inches long must be threaded not less than 4 inches.

Bolts in the finished structure shall not project more than one half inch beyond the nut.

All bolts must have std. C.I.O.G. or malleable cast washers under each head and nut.

Bolt lengths are calculated assuming C.I.O.G. washers will be used.

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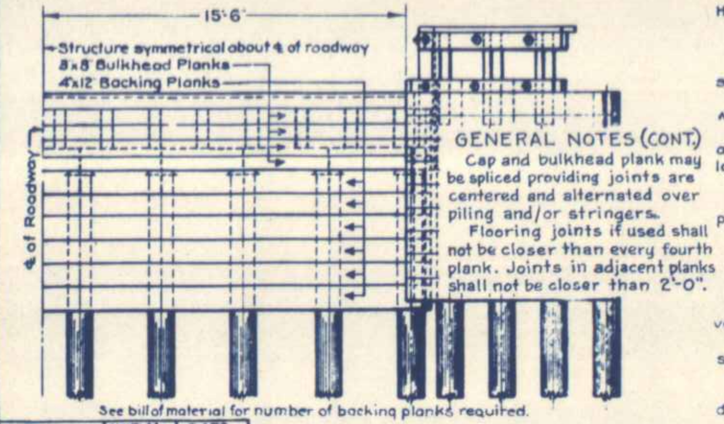

GENERAL NOTES (CONT.)
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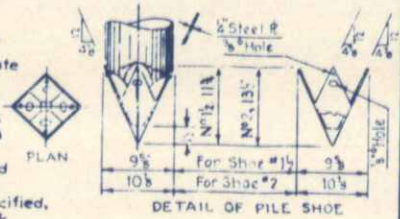
	INITIAL	DATE
ORIGINAL BY	L.W.F.	10-19-49
CHECKED BY	J.E.R.	10-21-49
VANDYKE BY	L.W.F.	10-24-49
CHECKED BY		

HALF END ELEVATION.



DETAIL OF PILE SHOE

GENERAL NOTES (CONT.)

Contractors' attention is called to Specifications Covering Tamping. Special care must be used to prevent deflection of abutments and wings by wedging action. Backfill in 6" earth layers shall be tamped beginning at the wall and proceeding outward and downward therefrom at a 4:1 min. slope. Below channel elevation tamp uniformly on both sides. Above original ground line tamp out to 6 ft. from the wall. Rolling equipment shall not be used within 6' of any wall.

BOLTS AND WASHERS FOR ONE SPAN OF SUPERSTRUCTURE

LOCATION	SIZE	18'-0" SPAN NO.	LENGTH	LBS.	22'-0" SPAN NO.	LENGTH	LBS.	~~26'-0" SPAN~~ NO.	LENGTH	LBS.
POSTS TO RAILS	5/8	6	10"	7.0	6	10"	7.0	8	10"	9.0
POSTS TO WHEEL GUARDS	3/4	6	14"	12.7	6	14"	12.7	8	14"	17.0
POSTS TO STRINGERS	3/4	12	16"	28.3	12	16"	28.3	16	16"	42.0
WHEEL GUARD TO STRINGERS	3/4	6	36"	29.0	6	38"	30.0	8	38"	40.0
WASHERS - STD. C.I.O.G. 5/8 & 3/4		12/48		69.0	12/48		69.0	16/64		92.0
TOTAL WEIGHT				146.0			147.0			200.0

BOLTS AND WASHERS FOR ONE ABUTMENT

LOCATION	ITEM	SIZE	NO.	LENGTH	WT. EACH	TOTAL WT.
POSTS TO RAILS	BOLTS	5/8	2	10"	1.08 LBS.	2.2 LBS.
ANGLE CLIPS TO STRINGERS & CAPS	BOLTS	5/8	2/2	10/14	7.00 LBS.	14.0 LBS.
POSTS TO STRINGERS	BOLTS	3/4	4	18	2.60 LBS.	10.4 LBS.
POSTS TO WHEEL GUARDS & CAP SPLICE	BOLTS	3/4	2/4	14"	2.12 LBS.	12.8 LBS.
WHEEL GUARDS TO STRINGERS	BOLTS	3/4	2	38"	5.00 LBS.	10.0 LBS.
TIMBER HEADER TO STRINGERS	LAG SCREWS	5/8	16	16"	1.36 LBS.	21.7 LBS.
CAPS TO CORBEL	BOLTS	3/4	2	26"	3.56 LBS.	7.5 LBS.
WASHERS - STD. C.I.O.G.	WASHERS 5/8-3/4		22/28		0.75/1.25 LBS.	52.0 LBS.
CAPS TO PILES	DRIFT BOLTS	3/4	10	24"	3.00 LBS.	30.0 LBS.
TOTAL WEIGHT						161.0 LBS.

BOLTS AND WASHERS FOR ONE WING

LOCATION	ITEM	SIZE	NO.	LENGTH	WT. EACH	TOTAL WT.
POSTS TO RAILS	BOLTS	5/8	3	11"	1.16 LBS.	3.4 LBS.
POSTS TO PILES	BOLTS	3/4	6	20"	2.84 LBS.	17.0 LBS.
PILES TO CURB PLANK	BOLTS	5/8	3	18"	1.74 LBS.	5.2 LBS.
					LBS.	LBS.
WASHERS - STD. C.I.O.G.	WASHERS 5/8-3/4		12/12		0.75/1.25 LBS.	24.4 LBS.
TOTAL WEIGHT						50.0 LBS.

BOLTS AND WASHERS FOR ONE BENT

LOCATION	ITEM	SIZE	NO.	LENGTH	WT. EACH	TOTAL WT.
POSTS TO RAILS	BOLTS	5/8	2	10"	1.08 LBS.	2.2 LBS.
POSTS TO WHEEL GUARDS	BOLTS	3/4	2	14"	2.12 LBS.	4.3 LBS.
ANGLE CLIPS TO CAP	BOLTS	5/8	2	14"	5.50 LBS.	11.0 LBS.
WHEEL GUARDS TO STRINGERS	BOLTS	3/4	2	38"	5.00 LBS.	10.0 LBS.
POSTS TO STRINGERS TO SPLICES	BOLTS	3/4	4	24"	3.32 LBS.	13.3 LBS.
SPLICES TO STRINGERS	BOLTS	5/8	12	16"	1.57 LBS.	18.9 LBS.
CAP SPLICE	BOLTS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CAPS TO CORBEL	BOLTS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SWAYBRACES TO PILES & CAP	BOLTS	[illegible]	[illegible]	26"	[illegible]	[illegible]
SWAY TO PILE TO SWAY	BOLTS	5/8	14	17"	1.66 LBS.	23.5 LBS.
	BOLTS	5/8	2	20"	1.90 LBS.	3.8 LBS.
~~WASHERS STD C.I.O.G. NO SWAYS~~	~~WASHERS 5/8-3/4~~		~~28/28~~		~~0.75/1.25 LBS.~~	~~56.0 LBS.~~
WASHERS - STD C.I.O.G. WITH SWAYS	WASHERS 5/8-3/4		60/28		0.75/1.25 LBS.	80.3 LBS.
CAPS TO PILES	DRIFT BOLTS	3/4	8	24"	3.00 LBS.	24.0 LBS.
~~TOTAL WEIGHT - WITHOUT SWAYBRACES~~						~~156.0 LBS.~~
TOTAL WEIGHT - WITH SWAYBRACES						207.0 LBS.

NAILS

LOCATION	ITEM	18'-0" SPAN	22'-0" SPAN	~~26'-0" SPAN~~
ONE SPAN OF SUPERSTRUCTURE	30D COMMON	25 LBS.	30 LBS.	35 LBS.
	30D GALV. BARBED	130 LBS.	155 LBS.	185 LBS.
	40D COMMON	165 LBS.	202 LBS.	236 LBS.
ONE ABUTMENT	40D COMMON	6 LBS.	6 LBS.	6 LBS.
	7" WIRE SPIKES	35 LBS.	LBS.	LBS.
ONE WING 10'-0" / ONE WING 20'-0"	40D COMMON	1 LBS.	1 LBS.	1 LBS.
	7" WIRE SPIKES	7/12 LBS.	LBS.	LBS.
ONE BENT	40D COMMON	8 LBS.	8 LBS.	8 LBS.
	7" WIRE SPIKES	7 LBS.	LBS.	LBS.

SUMMARY FOR HARDWARE

BOLTS AND WASHERS	2/1 SPANS	AT 146/147	LBS. PER SPAN	439 LBS.
	2 ABUTMENTS	AT 161	LBS. PER ABUTMENT	322 LBS.
	4 WINGS	AT 50	LBS. PER WING	200 LBS.
	~~BENTS WITHOUT SWAYS~~	~~AT~~	~~LBS. PER BENT~~	~~LBS.~~
	2 BENTS WITH SWAYS	AT 207	LBS. PER BENT	414 LBS.
	TOTAL WEIGHT			1375 LBS.

NAILS — LOCATION	UNIT	30D COMMON EACH	30D COMMON TOTAL	30D GALV. EACH	30D GALV. TOTAL	40D COMMON EACH	40D COMMON TOTAL	7" WIRE SPIKES EACH	7" WIRE SPIKES TOTAL
2/1 SPANS	LBS.	25/30	80	130/155	415	165/202	532	—	—
2 ABUTMENTS	LBS.	—	—	—	—	6	12	35	70
2/2 WINGS	LBS.	—	—	—	—	1	4	7/12	38
2 BENTS	LBS.	—	—	—	—	8	16	7	14
TOTAL WEIGHT	LBS.		80		415		564		122

SUMMARY OF QUANTITIES

STRUCTURAL EXCAVATION				
ITEM 14a	DRY ROCK			5 CU. YDS.
ITEM 14b	DRY COMMON			30 CU. YDS.
ITEM 14c	WET ROCK			5 CU. YDS.
ITEM 14d	WET COMMON			10 CU. YDS.
ITEM 42a UNTREATED BRIDGE TIMBER				
2/1	SPANS	AT 264/296	BD. FT. EACH =	824 BD. FT.
2	ABUTMENTS	AT 40	BD. FT. EACH =	80 BD. FT.
2/2	WINGS	AT 76/84	BD. FT. EACH =	320 BD. FT.
2	BENTS	AT 40	BD. FT. EACH =	80 BD. FT.
			TOTAL =	1304 BD. FT.
ITEM 42b TREATED BRIDGE TIMBER				
2	SPANS	AT 7298	BD. FT. EACH =	14598 BD. FT.
1	SPANS	AT 9218	BD. FT. EACH =	9218 BD. FT.
2	ABUTMENTS	AT 2390	BD. FT. EACH =	4780 BD. FT.
2/2	WINGS	AT 307/592	BD. FT. EACH =	1798 BD. FT.
2	BENTS	AT 1210	BD. FT. EACH =	2420 BD. FT.
			TOTAL =	32814 BD. FT.
ITEM 43 ASPHALT PLANK WEARING SURFACE				
2/1	SPANS	AT 560/685	SQ. FT. EACH =	1805 SQ. FT.
ITEM 60a PILING - TREATED				
2	ABUTMENTS	AT 200	LIN. FT. EACH =	400 LIN. FT.
2/2	WINGS	AT 120/72	LIN. FT. EACH =	384 LIN. FT.
2	BENTS	AT 160	LIN. FT. EACH =	320 LIN. FT.
			TOTAL =	1104 LIN. FT.
ITEM 60e METAL PILE SHOES				
(SEE DETAIL)	No. 1½ SHOES.	No. 2 SHOES.	TOTAL =	52 SHOES
ITEM 89b DRAIN PIPE				
2 PIECES 3" DIA. GALV. PIPE 2'-4" LONG WITH ONE 3" GALV. FLANGE ON EACH PIPE				
3	SPANS	AT 1	COMPLETE PER SPAN =	3 PIECES
ITEM 16a	STRUCTURE BACKFILL (Class 1)			180 CU. YDS.
ITEM 16d	MECHANICAL TAMPING			18 HRS.

ONE SPAN OF SUPERSTRUCTURE

DESCRIPTION	SIZE	18'-0" SPAN NO.	LENGTH	TOTAL	22'-0" SPAN NO.	LENGTH	TOTAL	~~26'-0" SPAN~~ NO.	LENGTH	TOTAL
UNTREATED TIMBER										
HANDRAILS S4S	3x8	4	18'-0"	144 BD. FT.	4	22'-0"	176 BD. FT.	4	26'-0"	208 BD. FT.
HANDRAIL POSTS S4S	6x8	6	5'-0"	120 BD. FT.	6	5'-0"	120 BD. FT.	8	5'-0"	160 BD. FT.
TOTAL UNTREATED TIMBER				264 BD. FT.			296 BD. FT.			368 BD. FT.
TREATED TIMBER										
FLOORING S4S	3x6	[illegible]	18'-0"	1620 BD. FT.	[illegible]	18'-0"	1544 BD. FT.	[illegible]	18'-0"	[illegible]
FLOORING S4S	3x6	[illegible]	28'-0"	2520 BD. FT.	[illegible]	28'-0"	3024 BD. FT.	[illegible]	28'-0"	3570 BD. FT.
WHEEL GUARDS ▼	6x10	[illegible]	[illegible]	200 BD. FT.	[illegible]	[illegible]	240 BD. FT.	[illegible]	[illegible]	280 BD. FT.
STRINGERS OUTSIDE INTERMEDIATE SPANS	6x20				2	22'-0"	440 BD. FT.			
STRINGERS OUTSIDE END SPANS	6x18	2	18'-5½"	333 BD. FT.						
STRINGERS INSIDE INTERMEDIATE AND END SPANS	6x18	14	20'-0"	2520 BD. FT.	14	24'-0"	3360 BD. FT.			
~~STRINGERS SINGLE SPAN~~										
BRIDGING	3x6	7	10'-0"	105 BD. FT.	14	10'-0"	210 BD. FT.			
~~TOTAL TR. TIMBER - SINGLE SPAN~~				7178 BD. FT.			~~9088 BD. FT.~~			11,699 BD. FT.
TOTAL TR. TIMBER - END SPANS				7298 BD. FT.			~~9228 BD. FT.~~			
TOTAL TR. TIMBER - INTER SPANS				~~7288 BD. FT.~~			9218 BD. FT.			
ASPHALT PLANK WEARING SURF.				560 SQ. FT.			685 SQ. FT.			810 SQ. FT.

ONE ABUTMENT

UNTREATED TIMBER			
HANDRAIL POSTS S4S	2 PCS.	6"x8"x5'-0"	40 BD. FT.
TOTAL UNTREATED TIMBER			40 BD. FT.
TREATED TIMBER			
TIMBER HEADER	2 Pcs.	8x10x24'-0" FINISH TO 7"x8"	320 BD. FT.
CAP	1 Pc. Ea.	12x12x24'-0" & 28'-0" & 4'-0"	672 BD. FT.
BULKHEAD PLANKS	4 Pcs. Ea.	3x8x22'-0" & 28'-0"	400 BD. FT.
BACKING PLANKS	4 Pcs. Ea.	4"x12"x22'-0" & 28'-0"	800 BD. FT.
STRINGER BLOCKING (Cut before treatment) 18'-0" & 22'-0" SPANS	1 Pc.	6"x18"x22'-0"	198 BD. FT.
~~26'-0" SPAN~~	~~1 Pc.~~	~~6"x18"x22'-0"~~	~~198 BD. FT.~~
TOTAL TREATED TIMBER			2390 BD. FT.
PILING - TREATED	10 PIECES AT 20 LIN. FT. EACH =		200 LIN. FT.

ONE WING

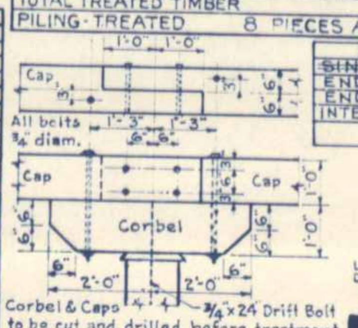
DESCRIPTION	SIZE	10'-0" LENGTH NO.	LENGTH	BD. FT.	~~16'-0" LENGTH~~ NO.	LENGTH	BD. FT.	20'-0" LENGTH NO.	LENGTH	BD. FT.
UNTREATED TIMBER										
HANDRAILS S4S	3x8	1	10'-0"	20	1	12'-0"	24	1	12'-0"	24
	3x8	1	10'-0"	20	1	12'-0"	24	1	12'-0"	24
HANDRAIL POSTS S4S	6x6	3	4'-0"	36	3	4'-0"	36	3	4'-0"	36
TOTAL UNTREATED TIMBER - BD. FT.				76			84			84
TREATED TIMBER										
CURB PLANKS	4x8	1	10'-0"	27	1	12'-0"	32	1	12'-0"	32
BACKING PLANKS	4x12	7	10'-0"	280		16'-0"		7	20'-0"	560
TOTAL TREATED TIMBER - BD. FT.				307						592
PILING - TREATED	5/3 PIECES AT 24/24 LIN. FT. EACH = 120/72 LIN. FT.									

ONE BENT

UNTREATED TIMBER			
HANDRAIL POSTS S4S	2 PCS.	6"x8"x5'-0"	40 BD. FT.
TOTAL UNTREATED TIMBER			40 BD. FT.
TREATED TIMBER			
STRINGER SPLICES	2 PCS.	6"x18"x4'-0"	72 BD. FT.
CAP	1 Pc. Ea.	12"x12"x22'-0", 28'-0" & 4'-0"	648 BD. FT.
SWAYBRACES	2 Pcs. Ea.	3x12"x22'-0" & 30'-0"	312 BD. FT.
STRINGER BLOCKING (Cut before treatment) 18'-0" & 22'-0" SPANS	1 PC.	6x18x18'-0"	162 BD. FT.
	~~PC.~~		~~BD. FT.~~
SHIMS	16 PCS.	2"x6"x1'-0"	16 BD. FT.
TOTAL TREATED TIMBER			1210 BD. FT.
PILING - TREATED	8 PIECES AT 20 LIN. FT. EACH =		160 LIN. FT.

SPANS	18'-0"	22'-0"	~~26'-0"~~
~~SINGLE~~	~~18'-0"~~	~~22'-0"~~	~~26'-0"~~
END	17'-1"	~~21'-1"~~	
END	20'-0"	~~24'-0"~~	
INTERMEDIATE	~~18'-8"~~	22'-8"	

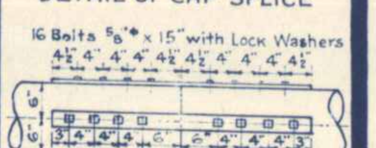
▼ LENGTHS OF WHEEL GUARD



Corbel & Caps to be cut and drilled before treatment.
¾"x24" Drift Bolt

DETAIL OF CAP SPLICE

16 Bolts ⅝"Φ x 15" with Lock Washers



4 Straps ½"x3"x3'-6" Bolts & Straps Galv.
Bolt length given for 12" diam. Pile

PILE SPLICE

STRUCTURES REQUIRED
2 SPANS AT 18'-0"
1 SPAN AT 22'-0"

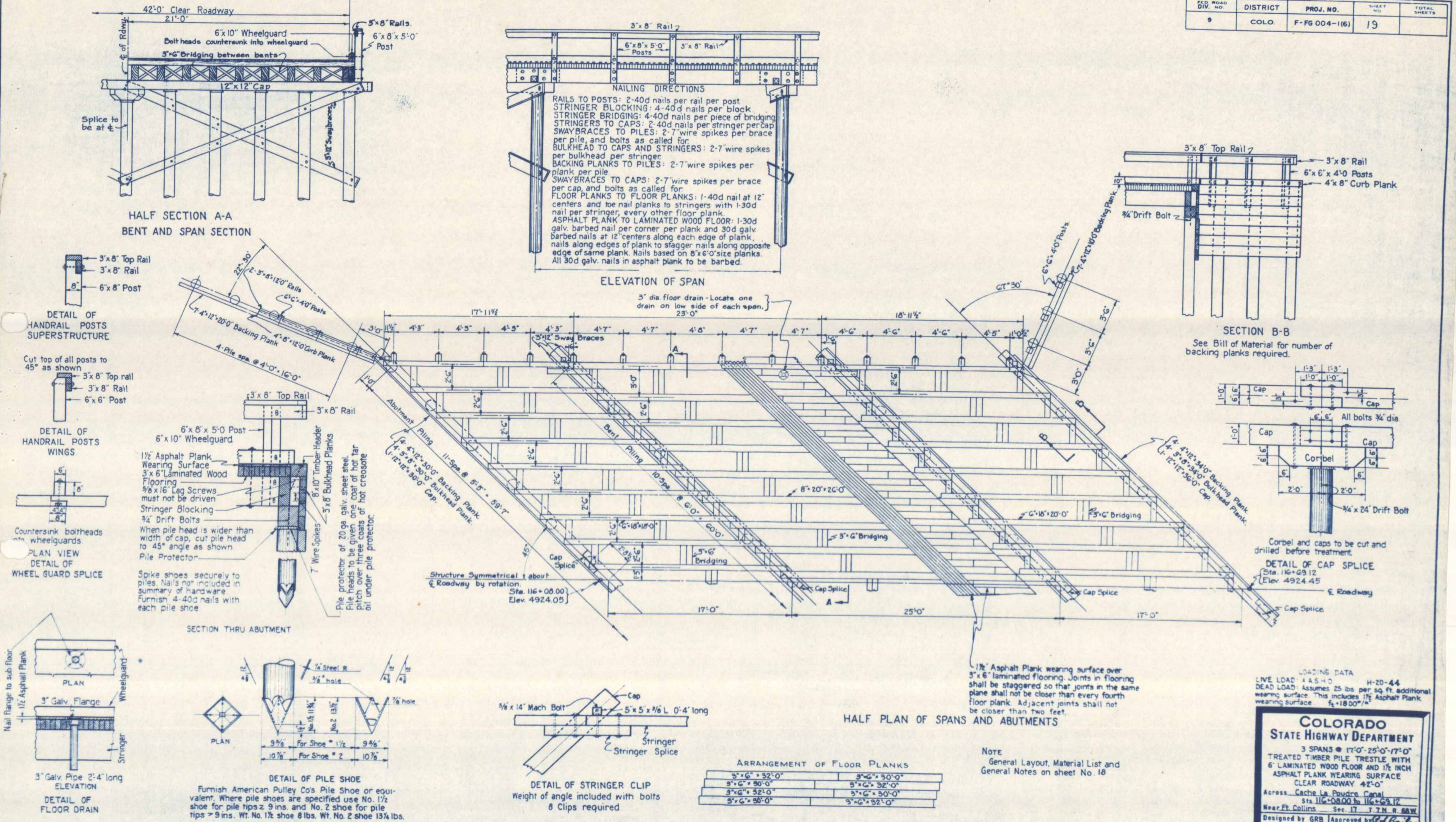
LOADING DATA
LIVE LOAD: A.A.S.H.O. 1941 H-20
DEAD LOAD: Assumes 25 lbs per sq. ft. additional wearing surface. This includes 1½" asphalt plank wearing surface.

COLORADO
STATE HIGHWAY DEPARTMENT
TREATED TIMBER PILE TRESTLE
WITH 6" LAMINATED FLOOR AND 1½" ASPHALT PLANK WEARING SURFACE
31 FT. CLEAR ROADWAY
Across Cache La Poudre Canal
Sta 116 + 08.00 to 116 + 68.12
Near Ft. Collins Sec. 17 T. 7N R. 68W

Designed by I.M.R.	Approved by [signature]
Made by I.M.R.	Bridge Engineer
Check Design G.H.M.	
Check Detail G.H.M.	Date Aug. 10, 1947

STRUCTURE NO. B-16-L

FED. ROAD DIV. NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F-FG 004-1(6)	19	



HALF SECTION A-A
BENT AND SPAN SECTION
42'-0" Clear Roadway
21'-0"
℄ of Rdwy.
6"x10" Wheelguard
Bolt heads countersunk into wheelguard
3"x6" Bridging between bents
12"x12" Cap
5"x8" Rails.
6"x8"x5'-0" Post
Splice to be at ℄
5"x12" Swaybraces
ELEVATION OF SPAN
3"x8" Rail
6"x8"x5'-0" Posts
3"x8" Rail
NAILING DIRECTIONS
RAILS TO POSTS: 2-40d nails per rail per post.
STRINGER BLOCKING: 4-40d nails per block.
STRINGER BRIDGING: 4-40d nails per piece of bridging.
STRINGERS TO CAPS: 2-40d nails per stringer per cap.
SWAYBRACES TO PILES: 2-7" wire spikes per brace per pile, and bolts as called for.
BULKHEAD TO CAPS AND STRINGERS: 2-7" wire spikes per bulkhead per stringer.
BACKING PLANKS TO PILES: 2-7" wire spikes per plank per pile.
SWAYBRACES TO CAPS: 2-7" wire spikes per brace per cap, and bolts as called for.
FLOOR PLANKS TO FLOOR PLANKS: 1-40d nail at 12" centers and toe nail planks to stringers with 1-30d nail per stringer, every other floor plank.
ASPHALT PLANK TO LAMINATED WOOD FLOOR: 1-30d galv. barbed nail per corner per plank and 30d galv. barbed nails at 12" centers along each edge of plank, nails along edges of plank to stagger nails along opposite edge of same plank. Nails based on 8"x6'0" size planks.
All 30d galv. nails in asphalt plank to be barbed.
SECTION B-B
3"x8" Top Rail
3"x8" Rail
6"x6"x4'-0 Posts
4"x8" Curb Plank
10"
3/4" Drift Bolt
See Bill of Material for number of backing planks required.
DETAIL OF HANDRAIL POSTS SUPERSTRUCTURE
3"x8" Top Rail
3"x8" Rail
6"x8" Post
Cut top of all posts to 45° as shown
3"x8" Top rail
3"x8" Rail
6"x6" Post
DETAIL OF HANDRAIL POSTS WINGS
Countersink boltheads into wheelguards.
PLAN VIEW
DETAIL OF WHEEL GUARD SPLICE
SECTION THRU ABUTMENT
3"x8" Top Rail
3"x8" Rail
6"x8"x5'-0 Post
6"x10" Wheelguard
1½" Asphalt Plank Wearing Surface
3"x6" Laminated Wood Flooring
5/8"x16" Lag Screws must not be driven
Stringer Blocking
3/4" Drift Bolts
When pile head is wider than width of cap, cut pile head to 45° angle as shown.
Pile Protector
8"x10" Timber Header
3"x8" Bulkhead Planks
7" Wire Spikes
Pile protector of 20 ga. galv. sheet steel. Pile heads to be given one coat of hot tar pitch over three coats of hot creosote oil under pile protector.
Spike shoes securely to piles. Nails not included in summary of hardware. Furnish 4-40d nails with each pile shoe.
HALF PLAN OF SPANS AND ABUTMENTS
22°-30'
2-3"x8"x12'0" Rails
6"x6"x4'0" Posts
7-4"x12"x20'0" Backing Plank
4"x8"x12'0" Curb Plank
4-Pile spa. @ 4'-0" = 16'-0"
Abutment Piling
4-4"x12"x30'-0" Backing Plank
4-3"x8"x30'-0" Bulkhead Plank.
1-12"x12"x30'-0" Cap.
11-Spa. @ 5'-5" = 59'-7"
Bent Piling
10-Spa. @ 6'-0" = 60'-0"
3"x12" Sway Braces
3" dia. floor drain - Locate one drain on low side of each span.
23'-0"
17'-11½"
18'-11½"
8"x20"x26'-0"
6"x18"x20'-0"
6"x18"x18'-0"
3"x6" Bridging
5"x6" Bridging
Cap Splice
Structure Symmetrical about ℄ Roadway by rotation.
Sta. 116+08.00
Elev. 4924.05
17'-0"
25'-0"
17'-0"
67°30'
6"x6"x4'-0" Posts
7-4"x12"x10'0" Backing Plank
4-4"x12"x34'-0" Backing Plank
4-3"x8"x34'-0" Bulkhead Plank.
1-12"x12"x36'-0" Cap
℄ Roadway
1½" Asphalt Plank wearing surface over 3"x6" laminated flooring. Joints in flooring shall be staggered so that joints in the same plane shall not be closer than every fourth floor plank. Adjacent joints shall not be closer than two feet.
DETAIL OF CAP SPLICE
Cap
Corbel
All bolts 3/4" dia
2'-0"
3/4"x24" Drift Bolt
Corbel and caps to be cut and drilled before treatment.
Sta. 116+69.12
Elev. 4924.45
PLAN
ELEVATION
Nail flange to sub floor
1½" Asphalt Plank
3" Galv. Flange
Wheelguard
Stringer
3" Galv. Pipe 2'-4" long
DETAIL OF FLOOR DRAIN
DETAIL OF PILE SHOE
1/4" Steel ℞
5/8" hole
For Shoe #1½
For Shoe #2
No. 1½ 11¾"
No. 2 13½"
Furnish American Pulley Co's Pile Shoe or equivalent. Where pile shoes are specified use No. 1½ shoe for pile tips ≥ 9 ins. and No. 2 shoe for pile tips > 9 ins. Wt. No. 1½ shoe 8 lbs. Wt. No. 2 shoe 13¾ lbs.
DETAIL OF STRINGER CLIP
5/8"x14" Mach. Bolt
Cap
5"x5"x5/16 L 0'-4" long
Stringer
Stringer Splice
Weight of angle included with bolts
8 Clips required
ARRANGEMENT OF FLOOR PLANKS
3"x6"x32'-0" | 3"x6"x30'-0"
3"x6"x30'-0" | 3"x6"x32'-0"
3"x6"x32'-0" | 3"x6"x30'-0"
3"x6"x30'-0" | 3"x6"x32'-0"

NOTE
General Layout, Material List and General Notes on sheet No. 18

LOADING DATA
LIVE LOAD: A.A.S.H.O. H-20-44
DEAD LOAD: Assumes 25 lbs. per sq. ft. additional wearing surface. This includes 1½" Asphalt Plank wearing surface. $f_t = 1800\#/\square''$

COLORADO
STATE HIGHWAY DEPARTMENT
3 SPANS @ 17'-0"-25'-0"-17'-0"
TREATED TIMBER PILE TRESTLE WITH 6" LAMINATED WOOD FLOOR AND 1½ INCH ASPHALT PLANK WEARING SURFACE
CLEAR ROADWAY 42'-0"
Across Cache La Poudre Canal
Sta. 116+08.00 to 116+69.12
Near Ft. Collins Sec. 17 T. 7 N. R. 68 W.

Designed by	GRB	Approved by	[signature]
Made by	GRB		Bridge Engineer
Checked by	IMR	Date:	Aug. 22, 1949.

STRUCTURE NO. B-16-L

DETAILS SIDE ROAD LEFT STA. 69+25.6

FED. ROAD DIVISION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F-FG004-1(6)	29	

Scale 1" = 50'

8" Tile Drain
P.I. 0+79.9
125'
Water Trough
Shed
House
Cistern
P.O.T. 68+90 = 0+00 of Survey Line
P.O.T. 69+25.6 = 2+08.9
P.O.T. 69+33.3 = 2+37.0
Feed Trough
Cache La Poudre
N3°54'E
8'x16' C.M.P.
2+21.8 So. End Bridge of Survey Line
R=50'
N19°47'E
N17°07'E
P.O.T. 69+56.8 = 0+00 of Survey Line
2+63.4 of Survey Line
Ditch Change
N. 89°23'E.
Ditch
60°
P.I. 8+57.4 = 6+40.7 (Survey)
320'
140'
90°
Chicken House
18'x28' C.M.P. Garage
To Ft. Collins
Mountain States Tel. & Tel.
W.C.
House
Well
Public Service Co. of Colorado
N41°53'E
15'x23' Concrete Slab
Mail Box
P.I. 11+80.2 = 9+62.4 of Survey Line
Δ 81°24' Rt.
Wall
W.C.
Chicken House & Small Buildings
House
Exist. Concrete Pavement
P.T. 9+66.5
P.C. 0+00
Res. Ditch No. 2
P.I. 1+58.8
1 - Reg'd. to Remove 8"x16" C.M.P., Lt.
Mulberry St. Line
S 86°06'E
Future Construction
Ditch
125'
50'
40'
5'
70
74°07'
78°47'
H.S.D. > 1300'
Δ 15°53' R
D 10°00'
T 79.9'
L 158.8'
R 573.0'
N.E. ¼, Sec. 18
T. 7 N., R. 68 W.
FORCE ACCOUNT
4 - Reg'd. to 8 - Reg'd. Move Telephone Line, Rt. & Lt. (Work by Mtn. States Tel. & Tel. Forces)
4 - Reg'd. to 8 - Reg'd. Ditch Change, Rt. (W=1')
6'x36" - Reg'd., 18"x58' Cross Culvert
Mtr. Aprons, Inlet & Outlet Ditches (W=1')
1553.7' to NE Cor. Sec. 18
Section Line
FORCE ACCOUNT
9 - to 10 - Reg'd. More Power Line, Rt. & Lt. (Public Service Co. of Colo.)
P.C. 7+45.5
H.S.D. > 1300'
Δ 22°06' R
D 10°00'
T 111.9'
L 221.0'
R 573.0'
12 - Reg'd. Remove 15'x23' Concrete Slab, Rt. & Lt.
S.E. ¼, Sec. 7
T. 7 N., R. 68 W.
CLEARING & GRUBBING
0+00 To 11+80.2 = CULTIVATED LAND
To Aull S 56°43'E 1361.4' To S.E. Cor. Sec. 7

STA. 0+00
4930
4920
4910
19.10
24.23
25.97
26.05
P.I. 26.80
Sta. 2+43.9, El. 4926.7
Sta. 2+47.9, El. 4925.4
+5.13 %
-0.14 %
F.L. 19.3
F.L. 20.4
El. 24.1
100' V.C.
N.P.S.D. = 160'

FACTOR		1.15					1.15				
EXCAV.											
EMBANK.		12.62									
EMB. x FACTOR		12.51					4297		3736		
BORROW											
STA. YDS. O.H.							63,030		5780		
YD. MI. O.H.									2724		
BORROW SOURCE							PIT NO.1 1530' RT. STA. 47+00 GI=0				

0 5 10

PLATE I-PLAN-PROFILE B. P. R. STANDARD
INGRAM RITTENHOUSE CO., Chicago-New York

Printed in U.S.A. On IMPERIAL Tracing Cloth

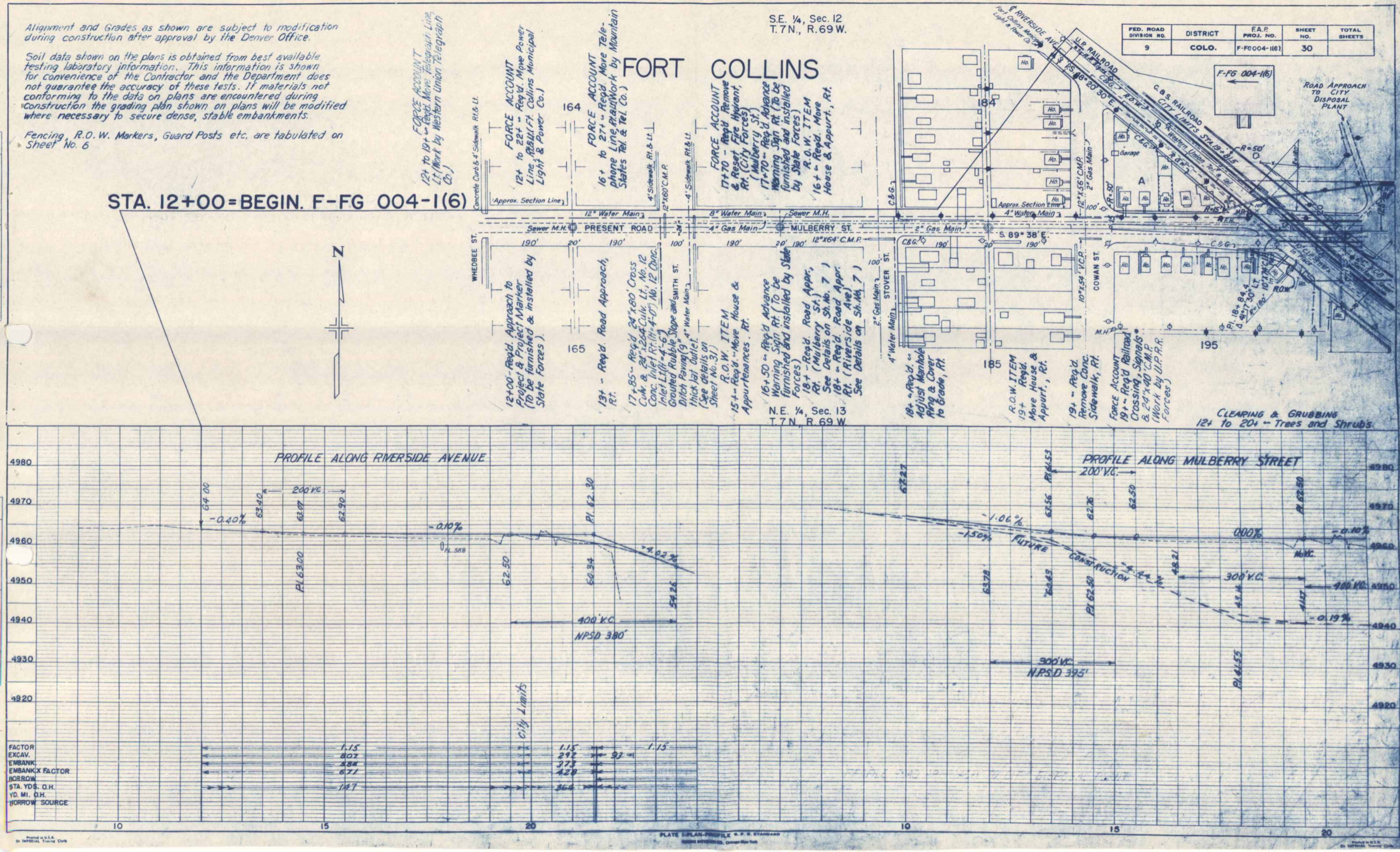
Printed in U.S.A.

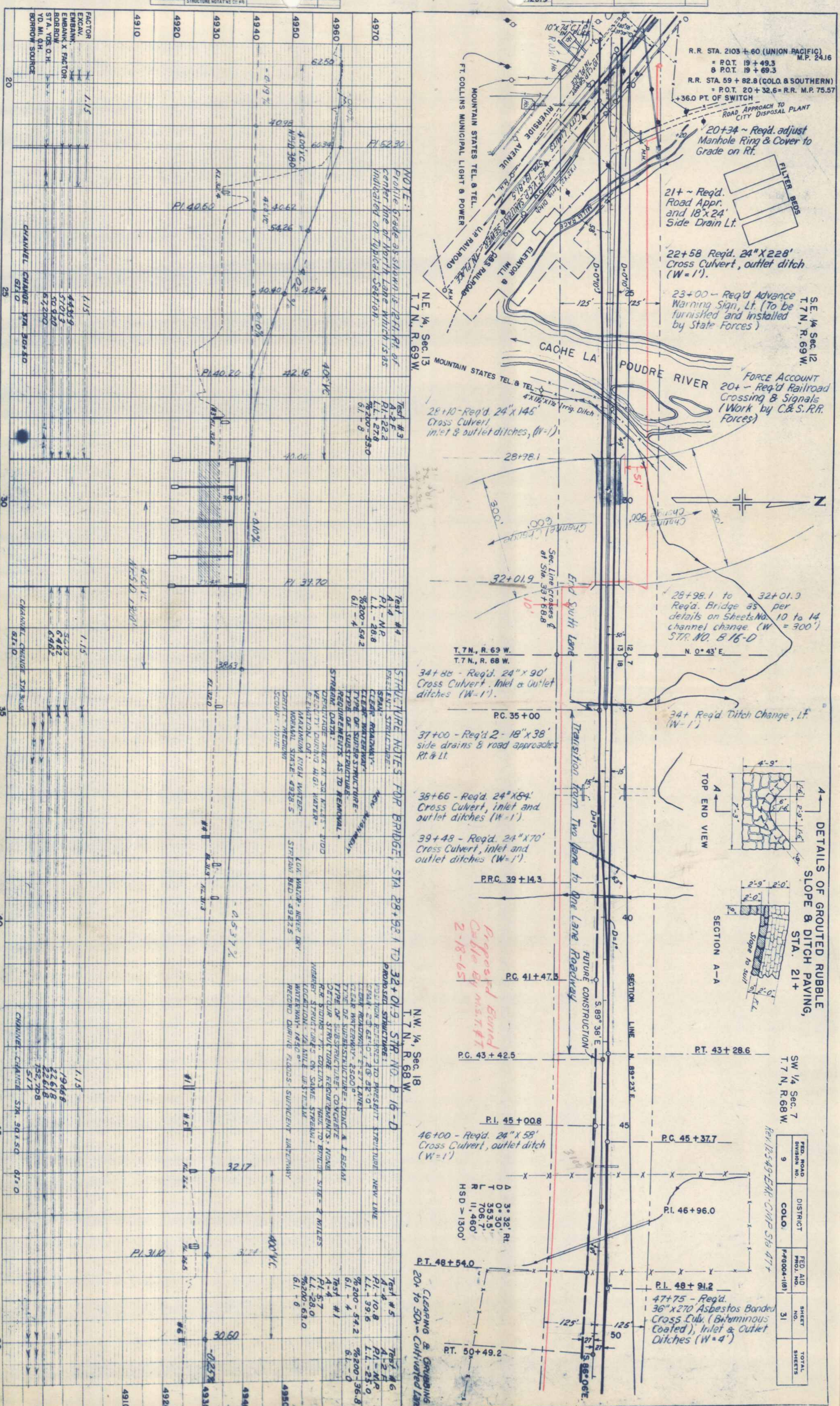
Alignment and Grades as shown are subject to modification during construction after approval by the Denver Office.

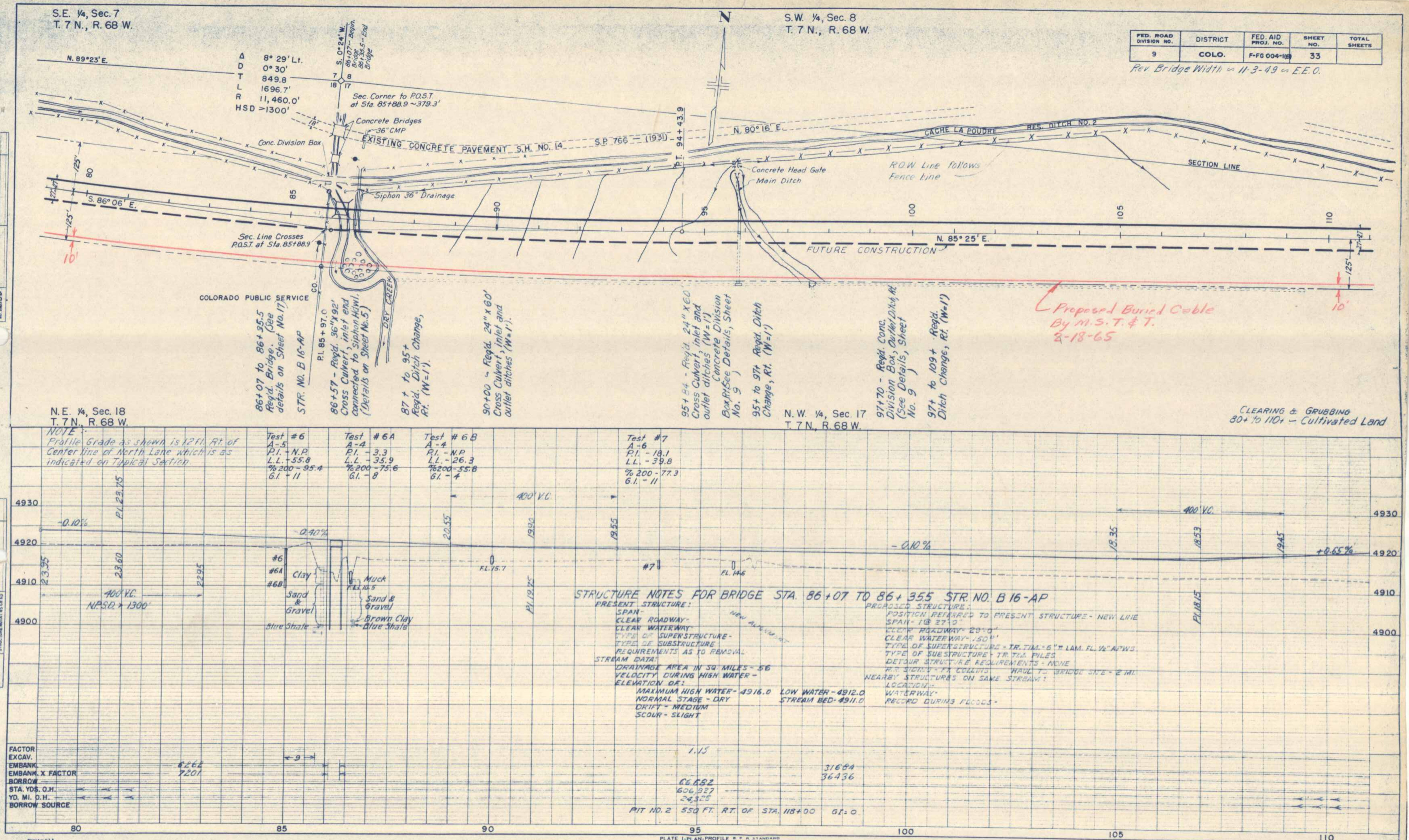
Soil data shown on the plans is obtained from best available testing laboratory information. This information is shown for convenience of the Contractor and the Department does not guarantee the accuracy of these tests. If materials not conforming to the data on plans are encountered during construction the grading plan shown on plans will be modified where necessary to secure dense, stable embankments.

Fencing, R.O.W. Markers, Guard Posts etc. are tabulated on Sheet No. 6

FED. ROAD DIVISION NO.	DISTRICT	F.A.P. PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F-FG004-1(6)	30	



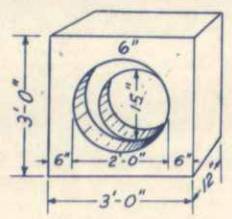

NOTE BOOK NO. 12880
PLOTTED
GRADES CHECKED
B.M.'s NOTED
STRUCTURE NOTAT'NS CH'KD
NOTE BOOK NO. 12879
PLOTTED
ALIGNMENT CHECKED
RT. OF WAY CHECKED
R.R. STA. 2103 + 60 (UNION PACIFIC) M.P. 24.16
= P.O.T. 19 + 49.3
& P.O.T. 19 + 69.3
R.R. STA. 59 + 82.8 (COLO. & SOUTHERN)
= P.O.T. 20 + 32.6 = R.R. M.P. 75.57
+36.0 PT. OF SWITCH
ROAD APPROACH TO CITY DISPOSAL PLANT
20+34 ~ Req'd. adjust Manhole Ring & Cover to Grade on Rt.
FILTER BEDS
21+ ~ Req'd. Road Appr. and 18"x24' Side Drain Lt.
22+58 Req'd. 24"X228' Cross Culvert, outlet ditch (W=1').
23+00 ~ Req'd Advance Warning Sign, Lt. (To be furnished and installed by State Forces)
S.E. 1/4 Sec. 12 T.7 N, R. 69 W.
FORCE ACCOUNT 20+ ~ Req'd Railroad Crossing & Signals (Work by C.&S. R.R. Forces)
10"x74' C.I.P. IN PLACE
10" C.I.P. Sewer IN PLACE
RIVERSIDE AVENUE
City Limits
24" V.C.P. SANITARY SEWER IN PLACE
STA. 19+81.5
U.P. RAILROAD
C&S RAILROAD
ELEVATOR & MILL
MILL RACE
Irrig. Ditch
MOUNTAIN STATES TEL. & TEL.
FT. COLLINS MUNICIPAL LIGHT & POWER
N.E. 1/4, Sec. 13 T.7 N., R. 69 W.
CACHE LA POUDRE RIVER
MOUNTAIN STATES TEL. & TEL.
4'X1½'X1½' Irrig. Ditch
28+10 - Req'd. 24"x146' Cross Culvert inlet & outlet ditches, (W=1')
28+98.1
300'
Channel Change 600'
Channel Change 900'
Sec. Line crosses ℄ at Sta. 33+68.8
32+01.9
End South Lane
28+98.1 to 32+01.9 Req'd. Bridge as per details on Sheets No. 10 to 14 channel change (W = 300') STR. NO. B 16-D
T. 7 N., R. 69 W.
T. 7 N., R. 68 W.
N. 0° 43' E.
34+88 - Req'd. 24"x90' Cross Culvert. Inlet & Outlet ditches (W=1').
P.C. 35+00
34+ Req'd Ditch Change, Lt. (W=1')
37+00 - Req'd 2 - 18"x38' side drains & road approaches Rt. & Lt.
38+66 - Req'd. 24"x84' Cross Culvert, inlet and outlet ditches (W=1').
39+48 - Req'd. 24"x70' Cross Culvert, inlet and outlet ditches (W=1').
P.R.C. 39 + 14.3
Transition from Two Lane to One Lane Roadway
FUTURE CONSTRUCTION
S. 89° 38' E.
SECTION LINE N. 89° 23' E.
Proposed Buried Cable By M.S.T.&T. 2-18-65
P.C. 41 + 47.3
P.C. 43 + 42.5
P.T. 43 + 28.6
DETAILS OF GROUTED RUBBLE SLOPE & DITCH PAVING, STA. 21+
TOP END VIEW
SECTION A-A
Slope to suit
SW 1/4 Sec. 7 T.7 N, R. 68 W.
P.I. 45 + 00.8
P.C. 45 + 37.7
46+00 - Req'd. 24"X58' Cross Culvert, outlet ditch (W=1')
Δ 3° 32' Rt.
D 0° 30'
T 353.5'
L 706.7'
R 11,460'
HSD > 1300'
P.I. 46 + 96.0
P.T. 48 + 54.0
P.I. 48 + 91.2
47+75 - Req'd. 36"x270' Asbestos Bonded Cross Culv. (Bituminous Coated), Inlet & Outlet Ditches (W=4')
P.T. 50 + 49.2
S. 86° 06' E.
Rev. 12-5-49 - EAR - CMP Sta 47+
FED. ROAD DIVISION NO. 9
DISTRICT COLO.
FED. AID PROJ. NO. F-FG004-1(6)
SHEET NO. 31
TOTAL SHEETS
NOTE: Profile Grade as shown is 12 Ft. Rt. of center line of North Lane which is as indicated on Typical Section.
P.I. 62.30
P.I. 40.60
P.I. 40.20
P.I. 39.70
P.I. 31.10
400' V.C.
-0.19%
-0.10%
-0.537%
-0.25%
Test #3 A-2-F P.I. - 22.2 L.L. - 27.8 %200 - 53.0 G.I. - 8
Test #4 A-4 P.I. - N.P. L.L. - 28.8 %200 - 54.2 G.I. - 4
Test #5 A-4 P.I. - 10.8 L.L. - 39.6 %200 - 54.2 G.I. - 4
Test #6 A-2-F P.I. - N.P. L.L. - 25.0 %200 - 36.8 G.I. - 0
Test #1 A-4 P.I. 5.7 L.L. - 28.0 %200 - 63.0 G.I. - 6
STRUCTURE NOTES FOR BRIDGE, STA 28+98.1 TO 32+01.9 STR. NO. B 16-D
PRESENT STRUCTURE:
PROPOSED STRUCTURE:
STREAM DATA:
REQUIREMENTS AS TO REMOVAL
N.W. 1/4, Sec. 18 T.7 N., R. 68 W.
CLEARING & GRUBBING 20+ to 50+ - Cultivated Land
FACTOR
EXCAV.
EMBANK.
EMBANK. X FACTOR
BORROW
STA. YDS. O.H.
YD. MI. O.H.
BORROW SOURCE
CHANNEL CHANGE STA. 30+50
4910
4920
4930
4940
4950
4960
4970
PLATE 1, PLAN-PROFILE B. P. R. STANDARD


FED. ROAD DIVISION NO. 9 | DISTRICT COLO. | FED. AID PROJ. NO. F-FG 004-1(6) | SHEET NO. 33 | TOTAL SHEETS
Rev. Bridge Width ~ 11-3-49 ~ E.E.O.
PLAN
NOTE BOOK NO. 12130
SURVEYED
PLOTTED
ALIGNMENT CHECKED
RT. OF WAY CHECKED
BY
DATE
S.E. ¼, Sec. 7
T. 7 N., R. 68 W.
S.W. ¼, Sec. 8
T. 7 N., R. 68 W.
N.E. ¼, Sec. 18
T. 7 N., R. 68 W.
N.W. ¼, Sec. 17
T. 7 N., R. 68 W.
N
N. 89°23' E.
Δ 8° 29' Lt.
D 0° 30'
T 849.8
L 1696.7'
R 11,460.0'
HSD >1300'
S. 0°24' W.
86+07 ~ Begin. Bridge
86+35.5 ~ End Bridge
Sec. Corner to P.O.S.T. at Sta. 85+88.9 ~ 379.3'
Concrete Bridges
36" CMP
Conc. Division Box
EXISTING CONCRETE PAVEMENT S.H. NO. 14 S.P. 766 – (1931)
P.T. 94+43.9
N. 80° 16' E.
CACHE LA POUDRE RES. DITCH NO. 2
SECTION LINE
ROW Line follows Fence Line
Concrete Head Gate
Main Ditch
Siphon 36" Drainage
S. 86° 06' E.
N. 85° 25' E.
FUTURE CONSTRUCTION
Sec. Line Crosses P.O.S.T. at Sta. 85+88.9
COLORADO PUBLIC SERVICE
CO.
P.I. 85+97.0
DRY CREEK
125'
27' 27'
10'
Proposed Buried Cable By M.S.T.&T. 2-18-65
86+07 to 86+35.5 Req'd. Bridge. (See details on Sheet No. 17)
STR. NO. B 16-AP
86+57 - Req'd. 36"X92' Cross Culvert, inlet end connected to siphon Hdwl. (Details on Sheet No. 5)
87+ to 95+ Req'd. Ditch Change, Rt. (W=1').
90+00 ~ Req'd. 24" x 60' Cross Culvert, inlet and outlet ditches (W=1').
95+84 - Req'd. 24" X 60' Cross Culvert, inlet and outlet ditches (W=1') Concrete Division Box, Rt. (See Details, Sheet No. 9)
95+ to 97+ Req'd. Ditch Change, Rt. (W=1')
97+70 - Req'd. Conc. Division Box, Outlet Ditch, Rt. (See Details, Sheet No. 9)
97+ to 109+ Req'd. Ditch Change, Rt. (W=1')
CLEARING & GRUBBING 80+ to 110+ – Cultivated Land
PROFILE
NOTE BOOK NO. 12881
SURVEYED
PLOTTED
GRADES CHECKED
B.M.'s NOTED
STRUCTURE NOTAT'NS CH'KD
NOTE:
Profile Grade as shown is 12 Ft. Rt. of Center line of North Lane which is as indicated on Typical Section.
Test #6 A-5 P.I. - N.P. L.L. - 55.8 %200 - 95.4 G.I. - 11
Test #6A A-4 P.I. - 3.3 L.L. - 35.9 %200 - 75.6 G.I. - 8
Test #6B A-4 P.I. - N.P. L.L. - 26.3 %200 - 55.8 G.I. - 4
Test #7 A-6 P.I. - 18.1 L.L. - 39.8 %200 - 77.3 G.I. - 11
P.I. 23.75
23.95
23.60
22.95
400' V.C.
NPSD > 1300'
-0.10%
-0.40%
20.55
19.90
19.55
P.I. 19.75
F.L. 15.7
F.L. 14.6
-0.10%
18.35
18.53
19.45
P.I. 18.15
+0.65%
#6 #6A #6B
Clay
Sand & Gravel
Blue Shale
Muck
F.L. 10.5
Brown Clay
#7
STRUCTURE NOTES FOR BRIDGE STA. 86+07 TO 86+35.5 STR. NO. B 16-AP
PRESENT STRUCTURE:
SPAN-
CLEAR ROADWAY-
CLEAR WATERWAY-
TYPE OF SUPERSTRUCTURE-
TYPE OF SUBSTRUCTURE
REQUIREMENTS AS TO REMOVAL
STREAM DATA:
DRAINAGE AREA IN SQ. MILES - 56
VELOCITY DURING HIGH WATER -
ELEVATION OF:
MAXIMUM HIGH WATER - 4916.0 LOW WATER - 4912.0
NORMAL STAGE - DRY STREAM BED - 4911.0
DRIFT - MEDIUM
SCOUR - SLIGHT
PROPOSED STRUCTURE:
POSITION REFERRED TO PRESENT STRUCTURE - NEW LINE
SPAN - 1@ 27'0"
CLEAR ROADWAY - 29'0"
CLEAR WATERWAY - 150'
TYPE OF SUPERSTRUCTURE - TR. TIM. - 6" T. LAM. FL. ½" A.P.W.S.
TYPE OF SUBSTRUCTURE - TR. TIM. PILES
DETOUR STRUCTURE REQUIREMENTS - NONE
R.R. SIDING - FT. COLLINS HAUL TO BRIDGE SITE - 2 MI.
NEARBY STRUCTURES ON SAME STREAM:
LOCATION-
WATERWAY-
RECORD DURING FLOODS-
FACTOR
EXCAV.
EMBANK.
EMBANK. X FACTOR
BORROW
STA. YDS. O.H.
YD. MI. O.H.
BORROW SOURCE
8262
7201
1.15
31684
36436
66,882
606,927
24,325
PIT NO. 2 550 FT. RT. OF STA. 118+00 GI=0
4930
4920
4910
4900
80
85
90
95
100
105
110
PLATE 1-PLAN-PROFILE
EUGENE DIETZGEN CO., Chicago-New York
Printed in U.S.A. On IMPERIAL Tracing Cloth

FED. ROAD DIVISION NO.	DISTRICT	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F-FG004-1(8)	34	

Added Note ⇨ 11-3-49 ⇨ E.E.O. Also Bridge Width
Corrected Bridge Stas. ⇨ 4-10-50 ⇨ E.E.O.

DETAILS OF CONCRETE COLLAR FOR CONNECTING 15" V.C.P. TO 24" C.M.P. STA. 115+



Class "A" Concrete Reqd for One Collar 0.25 cu.yd.

Force Account
116+ to 125+ ⇨ Reqd. Move Telephone Line, Rt. & Lt. (Work by Mountain States Tel. & Tel. Co.)

115+ ⇨ Reqd. Remove 15"x140" V.C.P.

Abandoned 20" Steel Water Pipe Partly Removed
24"X136' C.M.P.

STR. NO. B-16-L

116+08 ⇨ Begin. Bridge

116+68.2 ⇨ End Bridge

R.I. 117+01.5 Projected

S.E. ¼, Sec. 8
T. 7 N., R. 68 W.

116+08 to 116+68.12
Reqd. Bridge (See details on Sheet No. 18 STR. NO. B-16-L

117+ Reqd. Fill
Manhole, Lt.

116+ to 117+ ⇨ Reqd. Remove Conc. Pavement Lt. on S.H. 14

Heath Engr. Co.

118+50 ⇨ Reqd. Road Approaches Rt. & Lt. and 18"x 80' Side Drain, Lt. (See Sheet No. 8)

117+ to 124+ Scarify and Salvage Oil Processed Surfacing

N

Force Account
121+ Reqd. Move Power Pole Lt. (Work by Poudre Valley R.E.A. Forces).

122+40 ⇨ Encase 27" Water Main in Concrete (Details on Sht. No. 16)

EXISTING 18' CONCRETE PAVEMENT S. H. NO. 14

CACHE LA POUDRE RES. DITCH NO. 2

S 82° 55' E.

R.O.W.

R.O.W. Line follows Fence Line

Book No. 12879 Survey

S.H. NO 260

P.I. 115+62.3

Manhole

TO AULT

OIL MAT

SECTION LINE

TO AULT

S. H. NO. 14

S. 89° 12' E.

Survey Line

FUTURE CONSTRUCTION

Greeley City Water Supply Main

N. 85° 25' E.

S. 35° 50' E.

FARM ROAD

5270'

N. 89° 28 E.

184.1'

PROJECT MARKER

16.5'

Proposed Buried Cable by M.S.T.&T. Co. 2-18-65

112+80 ⇨ Reqd. Road Approach Rt.

P.C. 111+62.7

114+00 to 115+50 ⇨ Reqd. removal of Muck.

114+70 ⇨ Reqd. 36"x 92" Asbestos Bonded Cross Culv. (Bituminous Coated) Inlet and Outlet Ditches (W=2')

115+65 ⇨ Reqd. 24" X132' Asbestos Bonded Cross Culvert (Bituminous Coated) with no Aprons, connected to existing 15" V.C.P. at each end. (See details on this Sheet)

15" V.C.P. in bad condition

Δ	5° 23' Rt.
D	0° 30'
T	538.8'
L	1076.7'
R	11,460.0'
HSD	>1300'

POUDRE VALLEY R.E.A.
MOUNTAIN STATES TEL. & TEL.

P.T. 122+39.4

State owned materials pit.

124+93.8 Bk. =
124+83.8 Ah.

EQUATION

N.E. ¼, Sec. 17
T. 7 N., R. 68 W.

8 9
17 16

STA. 127+00 - END F-FG004-1(6) =
STA. 127+00 - BEGIN F 44 (8)

CLEARING & GRUBBING
110+ to 127+ ⇨ Cultivated Land

NOTE:
Profile Grade as shown is 12 ft. Rt. of Centerline of North Lane which is as indicated on Typical Section.

Test #9
A-2-F
P.I. - N.P.
L.L. - 23.8
%200 - 47.8
G.I. - 3

+0.65%

+0.147 %

+0.50%

P.I. 26+60

T.H. #2

#9

25.30

26.85

26.89

F.L. 18.5

F.L. 09.1

F.L. 08.7

SAND & GRAVEL

BLUE SHALE

400' V.C.

N.P.S.D. >1300'

200' V.C.

27.35

27.59

28.00

P.I. 27+40

FACTOR	1.15		1.15	1.15	
EXCAV.			2565		
EMBANK.			2950		
EMBANK. X FACTOR			3392	338	20
BORROW	1654		14603	386	
STA. YDS. O.H.	1901				
YD. MI. O.H.					
BORROW SOURCE					

Pit No. 2 550 Ft. Rt. of Sta. 118+00
81:1

STRUCTURE NOTES FOR BRIDGE, STA. 116+08 TO 116+68.12, STR. NO. B-16-L, SKEW 45°

PRESENT STRUCTURE:
SPAN-
CLEAR ROADWAY-
CLEAR WATERWAY-
TYPE OF SUPERSTRUCTURE-
TYPE OF SUBSTRUCTURE-
REQUIREMENTS AS TO REMOVAL-
STREAM DATA:
DRAINAGE AREA IN SQ. MILES- CANAL
VELOCITY DURING HIGH WATER-
ELEVATION OF:
MAXIMUM HIGH WATER- 4916.5 LOW WATER-
NORMAL STAGE- STREAM BED- 4911.2
DRIFT
SCOUR

NEW ALIGNMENT

PROPOSED STRUCTURE:
POSITION REFERRED TO PRESENT STRUCTURE - NEW LINE
SPAN- 1 @ 22'-0" 2 @ 15'-0"
CLEAR ROADWAY- 51'-0"
CLEAR WATERWAY- 280 sq. ft.
TYPE OF SUPERSTRUCTURE - TR. TIM. - 6" T.E. LAM. FL. 1½" A.P.M.S.
TYPE OF SUBSTRUCTURE - TR. TIMBER PILES
DETOUR STRUCTURE REQUIREMENTS - NONE
R.R. SIDING - FT. COLLINS HAUL TO BRIDGE SITE - 2.5 MI.
NEARBY STRUCTURES ON SAME STREAM:
LOCATION-
WATERWAY-
RECORD DURING FLOODS-

PLAN: SURVEYED, PLOTTED, PLANIMETER CHECKED, R.O.W. NOTED, STRUCTURE NOTATIONS CKED, DATE, BY, TEL. ROAD, TEL. LINE CHECKED, ALIGNMENT CHECKED, TAPE BOOK, NO. 2879

PROFILE: SURVEYED, PLOTTED, PLANIMETER CHECKED, R.O.W. NOTED, STRUCTURE NOTATIONS CKED, DATE, BY, TAPE BOOK, NO. 2288

110 115 120 125 125

PLATE I-PLAN-PROFILE U. S. P. R. STANDARD

Eugene Dietzgen Co., Chicago-New York