

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	DA-WI 3(I)	1	

COLORADO STATE HIGHWAY DEPARTMENT

PLAN AND PROFILE OF PROPOSED COLO. DEFENSE ACCESS ROADS PROJECT NO. DA-WI 3(I) STATE HIGHWAY NO. 182 JEFFERSON COUNTY

CONVENTIONAL SIGNS

CENTER LINE OF SURVEY _____
RIGHT OF WAY LINES _____
ONE QUARTER SECTION LINES _____
SECTION LINES _____
TOWNSHIP OR RANGE LINES _____
COUNTY LINES _____
RAILROADS _____
BARBED WIRE FENCE _____
POLE LINES _____

COLO. STATE HIGHWAY DEPT.
SEP 16 1942
RIGHT OF WAY

RECOMMENDED FOR APPROVAL
Chas. V. S.
ASSISTANT ENGINEER DATE 8/30/42

APPROVED
Chas. V. S.
STATE HIGHWAY ENGINEER DATE

RECOMMENDED FOR APPROVAL
DISTRICT ENGINEER
PUBLIC ROADS ADMINISTRATION
FEDERAL WORKS AGENCY

RECOMMENDED FOR APPROVAL
CHIEF WESTERN REGION
PUBLIC ROADS ADMINISTRATION

APPROVED
COMMISSIONER
PUBLIC ROADS ADMINISTRATION
FEDERAL WORKS AGENCY

RECOMMENDED FOR APPROVAL

RECOMMENDED FOR APPROVAL

RECOMMENDED FOR APPROVAL

RECOMMENDED FOR APPROVAL

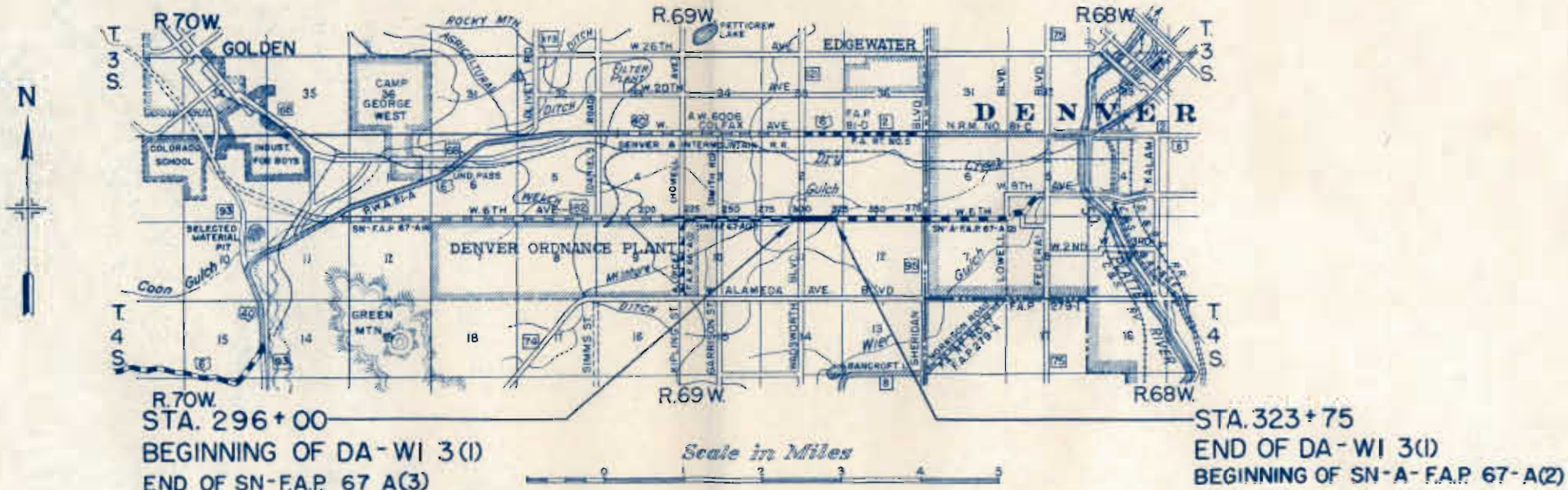
APPROVED

CONST. DIV. NO.	SHEET NO.
3	2

INDEX OF SHEETS

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SCALES OF ORIGINAL TRACINGS
ON PLAN, 1 IN. = 50 FT.
ON PROFILE 1 IN. = 50 FT. HORIZONTAL
1 IN. = 10 FT. VERTICAL
GRADE LINE ON PROFILE IS SHOWN AS GRADE OF FINISHED ROAD
GROSS LENGTH OF PROJECT } 2775.0 FEET + 0.525 MILES
NET LENGTH OF PROJECT }



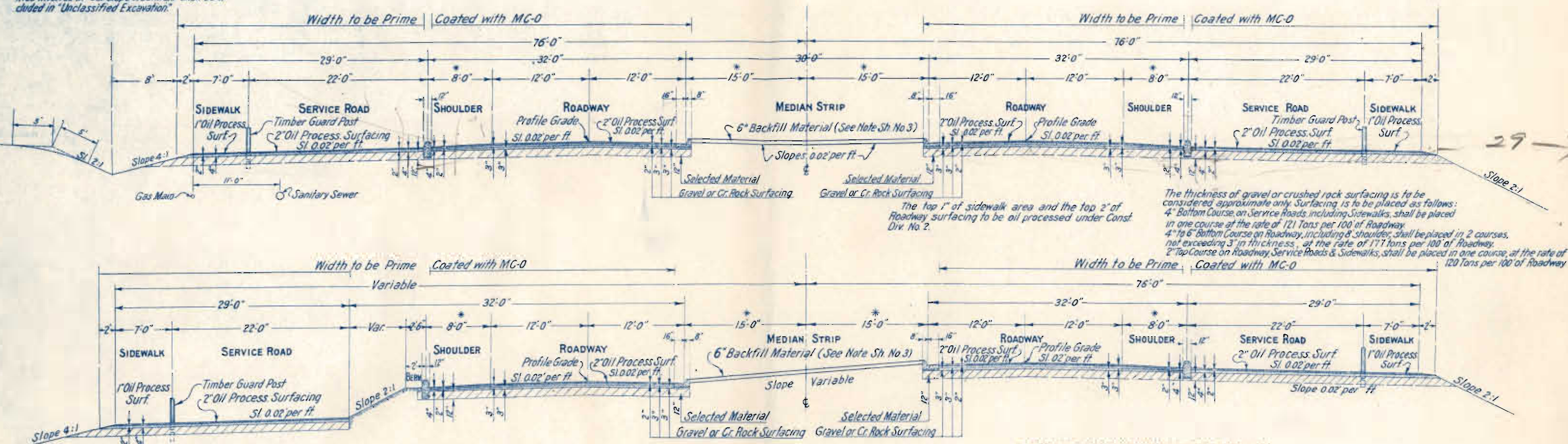
NOTE:
It is recommended that bidders on this Project go over the plan details with one of the following field representatives of this Department.
E.E. Montgomery, Division Engineer located at Denver
F.W. Miller, Resident Engineer located at Denver

CUT SLOPE TREATMENT IN EARTH CUTS

The intersection of cut slopes with the existing ground shall be rounded in earth cuts beginning 5 ft. outside the slope stake and extending 5 ft. down the cut slope. Where the cut slope is less than 5 ft. reduce each of the above widths of slope treatment to fit the actual slope distance. Quantities involved in "Cut Slope Treatment" shall be included in "Unclassified Excavation."

TYPICAL CROSS SECTIONS OF IMPROVEMENT

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	DA-WI-3(1)	2	



The thickness of gravel or crushed rock surfacing is to be considered approximate only. Surfacing is to be placed as follows:
 4" Bottom Course, on Service Roads, including Sidewalks, shall be placed in one course at the rate of 121 Tons per 100' of Roadway.
 4" to 6" Bottom Course on Roadway, including 8' shoulder, shall be placed in 2 courses, not exceeding 3" in thickness, at the rate of 177 Tons per 100' of Roadway.
 2" Top Course on Roadway, Service Roads & Sidewalks, shall be placed in one course, at the rate of 120 Tons per 100' of Roadway.

* Refer to Sheet No. 19 for variable distances at Wadsworth Boulevard intersection.
 At Intersections, the Gravel or Crushed Rock Surfacing on Acceleration or Deceleration Lanes shall be 8" thick.

NOTE:- Construction of Conc. Combin Curb and Gutter is to be done under Const. Division No. 3. Construction Division No. 3 is to be constructed when critical materials are available. The space required for Conc. Combin Curb and Gutter, including returns to Inlets, to be constructed under Const. Division No. 3, is to be filled with Gravel or Crushed Rock Surfacing courses under Const. Division No. 1 and oil processed under Const. Division No. 2.

SURFACING PLAN

STATIONS	LOCATION	TONS		
		TOP	BOTTOM	TOTAL
296+00 to 301+30	Roadway	636	1,579	2215
296+00 to 301+30	Acceleration Lane	86	281	367
296+00 to 301+30	Deceleration Lane	86	281	367
300+80 to 301+80	Break in Med. Strip	9	26	35
301+30 to 309+45	Acceleration Lane	110	360	470
301+30 to 307+95	Deceleration Lane	90	294	384
301+30 to 323+75	Roadway	2694	6690	9384
296+00 to 323+75		113	339	452
TOTAL ROADWAY		3824	9850	13674
301+30	Rt & Lt. Major Road Approch.	270	-	270
	Other Rd. Approches	330	-	330
GRAND TOTAL		4424	9850	14,274

* Material to be used in place of future Conc. Combin Curb & Gutter.

SELECTED MATERIAL PLAN

STATION TO STATION	QUANTITY		SOURCE OF MATERIAL
	TONS	OVERHAUL TON MILES	
296+00 to 323+75 - Roadway	24,062	138,120	Pit No. 1: 25,600 ft. West of Sta. 210+00 (N.E. 1/4 Sec. 10, T. 4 S., R. 70 W.)
296+00 to 309+50 - Accel. & Decel. lanes	2241	12,500	
Totals	26,303	150,620	Ample quantity available

Throughout the entire project the 12" immediately underlying the surfacing material is to be selected material, except under the left, or north service road, which is over the present road. The amount of selected material required over present road will be variable. At all places where present road is 6" or more under the proposed surfacing, the surfacing in the present road shall form a portion of the required 12" of selected material as directed by the Engineer. Selected material shall be classified and paid for under Item No. 13x as "Selected Material" on a tonnage basis. The above tabulation shows the approximate quantities involved in this operation together with the source of selected material.

No alteration of the Selected Material Plan will be allowed without written permission from the Department.

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	DA-W(30)	3	

GENERAL NOTES

This Project is to be constructed in conformity with the Standard Specifications of the Colorado State Highway Department adopted June 1, 1940.

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

All Roadway Excavation required to construct this Project is to be obtained as indicated on the plans. Quantities involved beyond the limits of the ditch, as shown on the Typical Section, either noted on the Profile as "Borrow" or on the List of Structures as "Embankment" 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.

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 side approach roads to the Project, except major road intersections, shall be gravel surfaced with a 4" thickness of "Gravel or Crushed Rock Surfacing" extending from shoulder of Highway to the Right of Way line. Estimated tonnage of Surfacing material required in this operation is shown on the List of Structures.

Except as otherwise noted on the plans, payment for overhaul will be based on measurement along the center line of the Project.

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

• During construction of this Project, local traffic will use the present traveled roadway. At all places on the Project where construction encroaches on present road, local traffic must be provided for at the Contractor's expense. Before proceeding with the construction the Contractor must obtain from the Engineer, written approval of the proposed methods of handling traffic during construction. Thru traffic will be routed around the Project over routes selected by the Department.

The service road section of the highway, at places noted on the Plan and Profile sheets, shall be raised or lowered as shown on the Typical Section, to the line and grade designated by the Engineer. The approximate lines and grades for service roads are shown on cross sections.

The top six (6) inches between curbs of median strip is to be backfilled with top soil selected from excavated material and approved by the Engineer. Balance of Backfill between curbs of median strip to be Embankment material thoroughly compacted and approved by the Engineer. All of the materials involved in this operation shall be classified and paid for as "Unclassified Excavation."

The entire Project shall be cleared in conformity with the Standard Specifications and Special Provisions for this Project, except that such trees or shrubs as the Engineer may designate, shall be left in place and protected from damage during construction operations.

Construction on this Project shall be so prosecuted as not to interfere with the use of water from irrigation ditches encroaching on construction, or with any public utility.

At all major road intersections and where the grades vary on the North and South traffic lanes of the Project, the surface of the highway and of intersecting roads shall be adjusted by the Engineer during construction to provide a smooth riding surface for all traffic movements and to provide for proper drainage.

The ends of all cuts shall be flared and backslopes flattened to discharge side ditch drainage away from the base of adjacent fill slopes. The transition of flattened backslopes and ditch shall be constructed in such manner that a uniform appearance of slope and ditch results, and so as to promote the growth of native groundcover.

• The term "local traffic" shall include all traffic to and from the Denver Ordinance Plant.

Oil Processing operations and incidental work are to be done under Construction Division No. 2 of the Project. Comp. Conc. Curb & Gutter is to be constructed under Const. Div. No. 3.

All Concrete Pipe Culverts shall be provided with two Headwalls, unless otherwise called for on the plans.

SUMMARY OF APPROXIMATE QUANTITIES

NO.	ITEM	UNIT	ROADWAY	PROJECT TOTALS
10a	Clearing & Grubbing entire Project	Lump Sum	*	*
11b	Removal of 23 Structures	Lump Sum	*	*
11c	Removing & Resetting Mail Boxes	Each	14	14
11d	Adjust Manhole Ring & Cover	Each	6	6
12a	Removing Fence	Lin. Ft.	1900	1900
12b	Removing & Rebuilding Fence	Lin. Ft.	900	900
13c	Unclassified Excavation	Cu. Yds.	33,000	33,000
13d	Unclassified Ditch Excavation	Cu. Yds.	300	300
13x	Selected Material	Tons	26,500	26,500
14a	Dry Rock Excavation (Struct.)	Cu. Yds.	100	100
14b	Dry Common Excavation (Struct.)	Cu. Yds.	900	900
14c	Wet Rock Excavation (Struct.)	Cu. Yds.	20	20
14d	Wet Common Excavation (Struct.)	Cu. Yds.	100	100
14e	Mechanical Tamping	Hours	250	250
15a	Rolling Fills	Hours	250	250
15b	Furnishing Roller	Roller Unit	4	4
15c	Wetting Fills	M. Gal.	800	800
18a	Station Yard Overhaul	Sta. Yd.	135,000	135,000
18b	Yard Mile Overhaul	Yd. Mi.	300	300
26a	Gravel or Crushed Rock Surfacing	Ton	14,300	14,300
26c	Overhaul of Selected Material	Ton Mi.	151,000	151,000
37c	Sand Cushion	Cu. Yd.	35	35
42b	Treated Bridge Timber	M. Ft. BM	33.5	33.5
44b	Miscellaneous Treated Timber	M. Ft. BM	9.4	9.4
46a	Class "A" Concrete	Cu. Yd.	31	31
46b	Class "B" Concrete	Cu. Yd.	12	12
47	Reinforcing Steel	Lb.	800	800
47x	Triangular Mesh Reinforcing (049)	Lb.	100	100
52c	24" Concrete Culvert Pipe	Lin. Ft.	545	545
54b	18" Vit. Clay Culvert Pipe	Lin. Ft.	11	11
60a	Treated Timber Piling	Lin. Ft.	1536	1536
60e	Metal Pile Shoes	Each	64	64
70b	6" Vit. Clay Pipe Drain	Lin. Ft.	460	460
76h	Driveway Gates (Wooden)	Each	1	1
81b	Right of Way Markers	Each	16	16
81c	Project Markers (Untr. Timber)	Each	2	2
84ax	Concrete Curb (Double Faced)	Lin. Ft.	5264	5264
85c	Trash Guard (Wooden) for 24" Siphon	Each	4	4
92	Timber Guard Posts	Each	60	60
94c	24" Reinforced Concrete Siphon Pipe	Lin. Ft.	409	409
110b	6" Std. G.I. Valve and Red lead dipped Steel Pipe Connections.	Each	2	2
FORCE ACCOUNT				
Moving Buildings, Fruit and ornamental Trees & Landscape Shrubbery (Work by State Forces)		Lump Sum	*	*
Moving Power Lines (By Public Service Co. Forces)		Lump Sum	*	*
Right of Way		Lump Sum	*	*

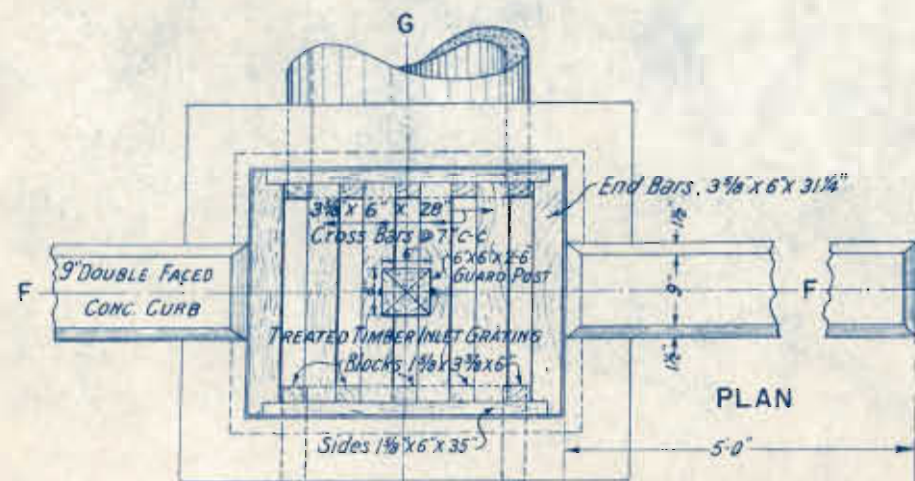
NO.	ITEM	UNIT	ROADWAY	PROJECT TOTALS
CONSTRUCTION DIVISION NO. 2				
15x	Wetting Surfacing	M. Gal.	25	25
30e	Asphaltic Road Material	RG-4 Gal.	11,000	11,000
30g	Asphaltic Road Material	MC-0 Gal.	13,500	13,500
30p	Asphaltic Road Material	SC-3 Gal.	61,500	61,500
31c	Rolling Surfacing	Hours	110	110
31d	Furnishing Roller for Surfacing	Lump Sum	*	*
31x	Road Mix Oil Processing	Sq. Yd.	43,000	43,000
32b	Stone Screenings	Ton	430	430
101	Scarifying, Windrowing & Compacting Surfacing	Sq. Yd.	44,000	44,000
CONSTRUCTION DIVISION NO. 3				
13c	Unclassified Excavation	Cu. Yd.	500	500
37c	Sand Cushion	Cu. Yd.	70	70
84c	Comp. Combination Curb & Gutter	Lin. Ft.	5494	5494

LIST OF STRUCTURES

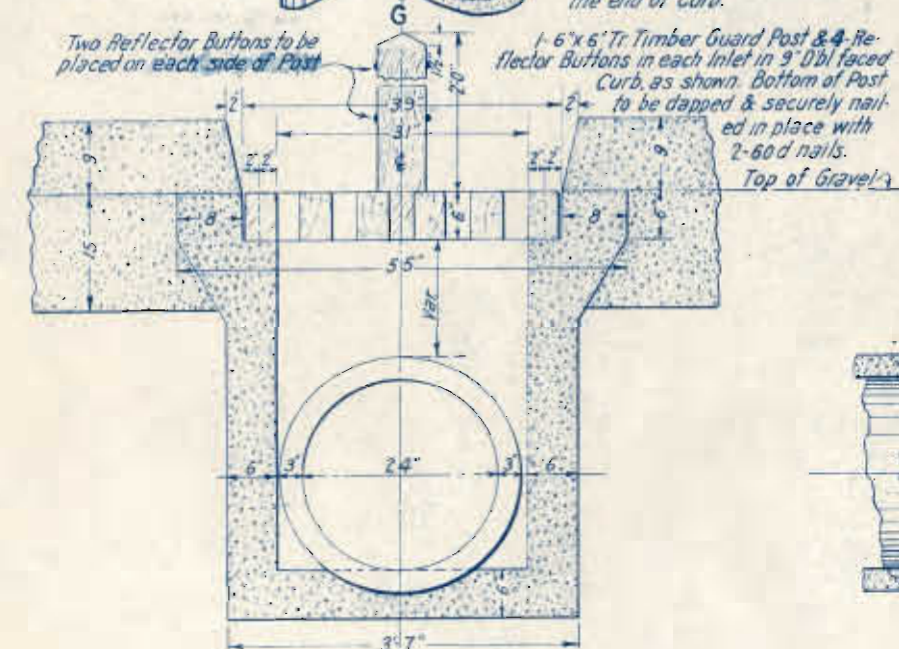
STATION	DESCRIPTION	REMOVE STRUCT.	EXCAVATION CU. YDS.		UNCLASSIFIED DITCH EXCAVATION	STRUCTURAL EXCAVATION CU. YDS. *			MECH. ANCAL TAMPING	GRAVEL SURF.	CONCRETE CU. YDS.		REINF. STEEL	CONCRETE CULVERT PIPE LIN. FT.		REIN. CON SYPHON PIPE 24"	MISCELL. TREATED TIMBER	TRASH GUARDS 24" SYPHON	6" C.I. VALVE & FITTINGS	VIT. CLAY CULV. PIPE 18"	6" VIT. CLAY PIPE DRAIN	MISCELLANEOUS
		NO.	UNCL.	EMB.	CU. YDS.				HOURS	TONS	CL. "A"	CL. "B"	LBS.	24"		LIN. FT.	FT. BM	EACH	EACH	LIN. FT.	LIN. FT.	
296+00 296+10 296+94 298+ 298+60	Project Marker Conc. Pipe Cross Culv.; 3 Conc. Inlets; Outlet Ditch. Remove Rock wall Rt. Remove 2 Sheds & Toilet, Rt. Fill Cellar	1		120	50	125		12			2.91	1.9		130			{ 92 39					Project Marker
301+ 301+20 - 301+60 301+30 301+60 301+91	Remove abandoned scale platform, Rt. Remove 7 Culverts, Rt. & Lt. Rd. Appr. Rt. & Lt. & Conc. Pipe Sd Drain Rt. Remove Conc. Post, Lt. 24"x206" R.C.P. Siphon with 2-way Outlet (Details on Sh's No. 7 & 12 Inlet H=6-0; Outlet H=5-5) Drain Pipe & Valve; Ditch Change, Rt. & Lt. Conc. Pipe Cross Culvert; 1 Conc. Inlet; Outlet ditch.	7	250			20		5	270					44								
301+85 301+ - 302+ 302+ 302+75 303 305+ 305+48	Remove Filling Station, Pumps, Tanks etc. R. & L. Remove House, Rt. Fill Cesspool, Rt. Remove 2 Chicken Houses, Rt. Remove house & Garage Rt. Rd. Appr. & Sd. Dr. Rt.; Rem. Struct., Lt.			50																		
306+ 306+50 306+ 307+02 307+ 307+73 307+87	Rem. House & Shed, Rt. Rd. Appr. & Sd. Dr. Lt. Rem. House, Rt. Rd. Appr. & Sd. Dr. Rt.; Rem. Structs., Lt. Remove House, Rt. Rd. Appr. & Sd. Dr. Lt. Rd. Appr. & Sd. Dr. Rt.; Rem. Struct., Lt.			25		5			15								512					
308+ 309+ 309+15 309+50	Remove House, Rt. Rem. 30 Lin. Ft. Conc. Curb & 35 sq yds Conc. Drive, Rt. & Lt. Rd. Appr. & Sd. Dr. Rt.; Rem. Struct., Lt. Conc. Pipe Cross Culv., 3 Conc. Inlets & outlet ditcher			35		5			15								512					
309+70 310+ 313+10 310+61 311+24 313+92	Rd. Appr. & Sd. Dr. Rt.; Remove House, Rt. Road Approach & Sd. Dr. Lt.; Rem. Struct., Lt. Rd. Appr. & Sd. Dr. Rt.; Rem. Struct., Lt. Rd. Appr. & Sd. Dr. Rt.; Rem. Struct., Lt. 8x8x163 Tr. Timb Box Culvt (Details Sh's 8 & 9); 3 Conc. Inlets; Channel Improvement.			70		10			25								776					
315+ to 318+ 314+32 316+60 314+ 318+27 318+54	Remove Bldgs, Steps & Masonry Ornament, Rt. & Lt. Remove Struct., Lt. Ditch Change, Rt.; Rem. Struct., Rt. Excavating Wet & Unstable Material Rd. Appr. & Sd. Dr. Rt.; Rem. Struct., Lt. 24"x190" R.C.P. Siphon (Inlet H=3-5; Outlet H=4-5); Drain Pipe & Valve. Remove Struct., Lt.			350		5			30								848					
318+72 320+88 321+10	Rd. Appr. & Sd. Dr. Lt. Rd. Appr. & Sd. Dr. Lt. Conc. Pipe Cross Culv. & 3 Conc. Inlets; Outlet Ditch			15		5			15								512					
321+60 322+ 323+49 323+30 323+ 323+75	Rd. Appr. & Sd. Dr. Rt.; Rem. Struct., Lt. Remove House, Rt. & 30 Sq. Yds. Concrete Pavement. Rd. Appr. & Sd. Dr. Rt.; Rem. Struct., Lt. Remove Struct., Lt. Remove House & Garage, Rt. Project Marker			10		5			15								512					
	TOTALS	23	635	935	260	1080		244	600	30.77	11.40	713		545		409	9371	4	2	11	460	

* Force Account - Work by State Forces

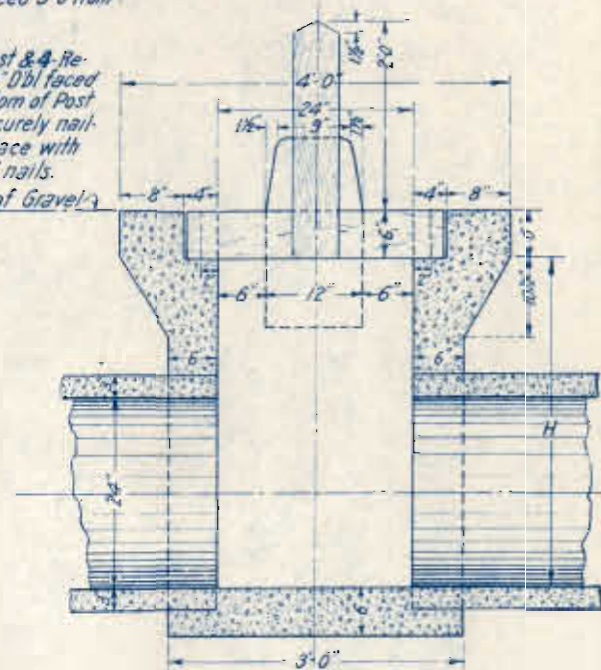
* Structural Excavation is estimated to be 90% Common & 10% Rock, each of which is estimated to be 90% Dry & 10% Wet.



At Intersections, the Inlets in 9" DBI Faced Curb are to be placed 5'-0" from the end of Curb.



SECTION F-F



SECTION G-G

CONCRETE INLET AT DOUBLE FACED CURB

MISCELLANEOUS TREATED TIMBER

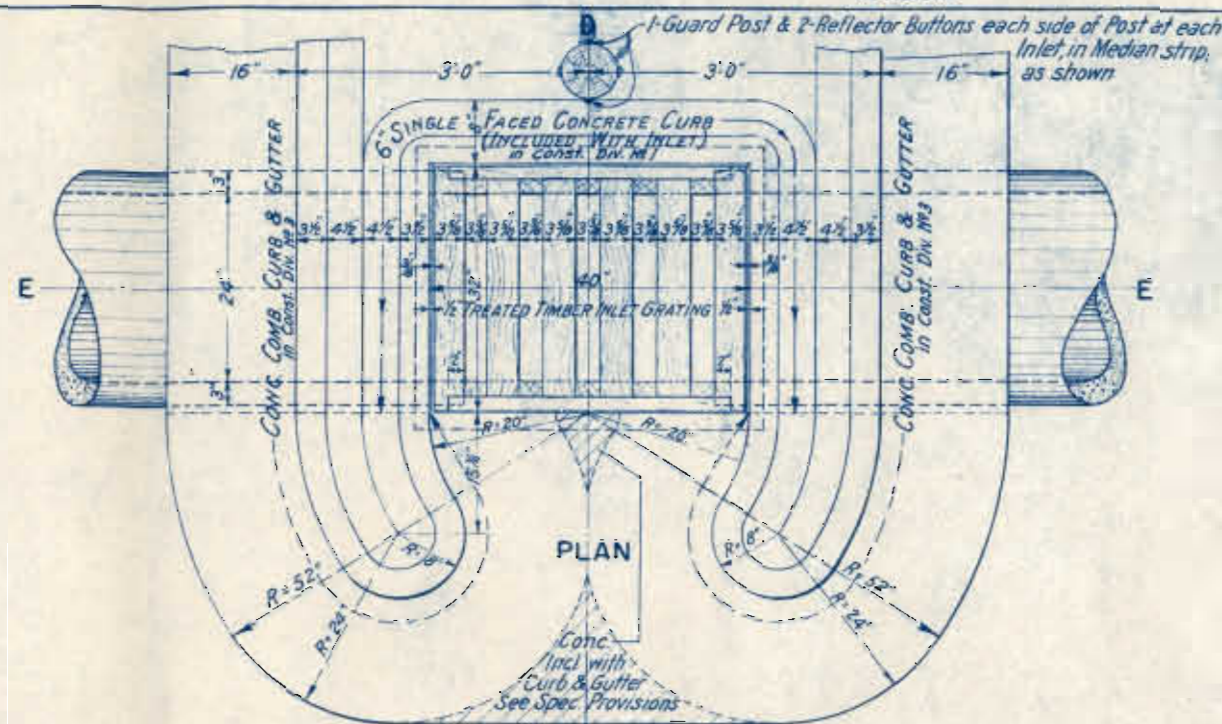
ITEM NO. 44-B

REQUIRED FOR 1 TIMBER INLET GRATING

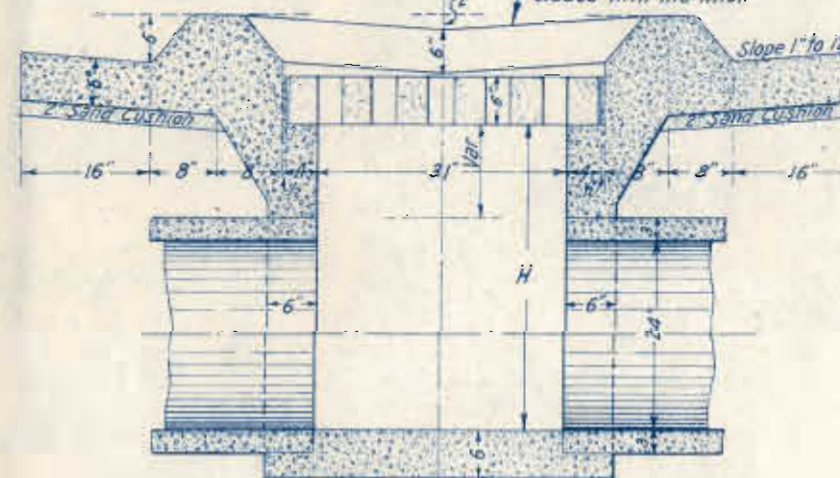
PIECES	SIZE	FT. BM.
4	4"X6"X28"	18.7
2	4"X6"X31 1/4"	10.4
2	2"X6"X35"	5.8
10	2"X4"X6"	3.3
TOTAL - WITHOUT POST		38.2
1	6"X6"X30"	7.5
TOTAL - WITH POST (WHERE REQD)		45.7

NAILING DIRECTIONS

4-16d Nails at each corner of Frame	0.33 Lbs.
2-16d Nails per cross bar per Side Bar	0.33 Lbs.
2-10d Nails per 2"X4"X6" Block	0.34 Lbs.
TOTAL - WITHOUT POST	1.00 Lbs.
2-60d Nails per Guard Post	0.20 Lbs.
TOTAL - WITH POST (Where Req'd)	1.20 Lbs.

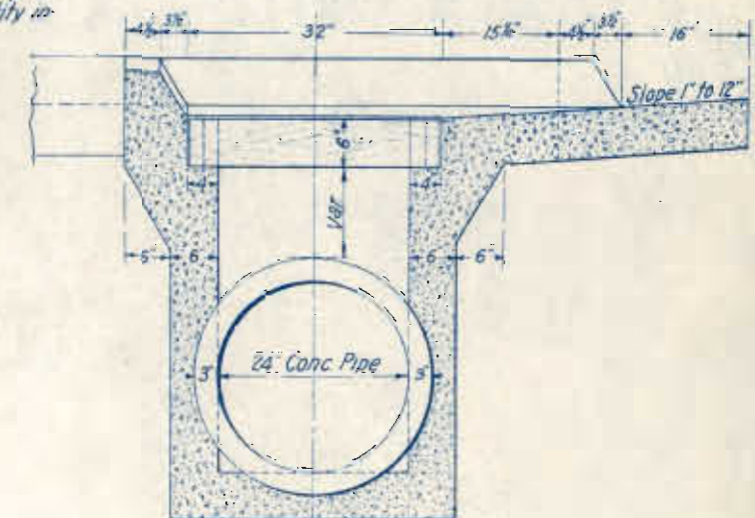


Note: 6" Single Faced Curb on top of sides and back of Inlet to be classified & paid for as Class A Concrete and quantity included with the Inlet.



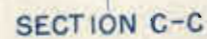
SECTION E-E

CONCRETE INLET AT END OF 6' MEDIAN STRIP



SECTION D-D

COLORADO STATE HIGHWAY DEPARTMENT	
CONCRETE INLETS	
Approved by RSD	Approved by HWM
Checked by	Checked by
Drawn by	Drawn by
Date	Date

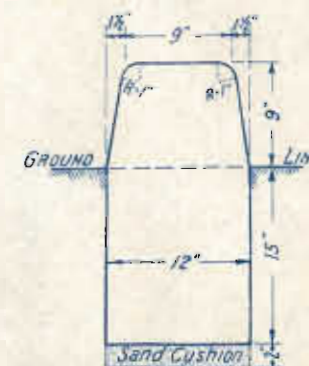


*NOTE:
Curb on top of Inlets to be classified
& paid for as Class "A" Concrete and
quantity included with Inlet.*



Diagram of a ship's bow cross-section showing dimensions for stability analysis. The bow is 12 feet high from the sand cushion to the top of the superstructure. The top of the superstructure is 6 feet wide. The bow is 4 feet wide at the base. The radius of the bow is 4 feet. The distance from the centerline to the bow is 3 feet. The ground is indicated by a dashed line.

6" SINGLE FACED CURB
AT ISLANDS



9" DOUBLE FACED CURB
BETWEEN ROADWAY & SERVICE ROADS

FENCING REQUIREMENTS

LOCATION		REMOVE FENCE	REM & REBUILD FENCE	DRIVEWAY GATES WOODEN		
STA. TO STA.	SIDE	LIN. FT.	LIN. FT.	NO.		
296 +00 - 299 +00	Lt		300			
300 +50 - 301 +00	"	25	75			
301 +60 - 302 +10	"	25	75			
296 +00 - 301 +10	"	510				
299 ±	x	130				
306 +30	x	140				
307 +94	x	140				
312 +00 316 +00	Lt		400			
314 +35 316 +90	R&L	500				
318 +00	R	70				
321 +15 321 +55	x	190				
322 +40	x	150				
321+60	R			1		
TOTALS		1880	850	1		

TIMBER GUARD POSTS

LOCATION			
STA. TO STA.	SIDE	CENTERS	NO.
296 + 06	E		1
297 + 00 - 300 + 62	L&R	100'	10
300 + 76	E		1
301 + 89	E		1
302 + 00 - 323 + 00	L&R	100'	44
309 + 46	E		1
313 + 88	E		1
321 + 06	E		1
TOTAL			60

Timber Guard Posts shall be placed between Service Road & Sidewalk Area, opposite each center line Station and opposite ends of Double faced Curb. Also at each Inlet in Median strip and at end of Median strip at Sta 300+76.

Each Guard Post shall have 4 reflector units,
(two on each side of Post).

CONCRETE CURB

LOCATION		COMB. CURB & GUTTER	DOUBLE FACED CURB
STA. TO STA.	SIDE	LIN. FT.	LIN. FT.
296+00 - 300+66	L&R		926
301+96 - 323+75	L&R		4338
296+00 - 300+81	L&R	954	
301+83 - 323+75	L&R	4360	
296+10	Culvert Inlets	124	
301+85	" "	96	
309+50	" "	524	
313+92	" "	524	
321+10	" "	524	
TOTALS		54932	5264

R.O.W. MARKERS.

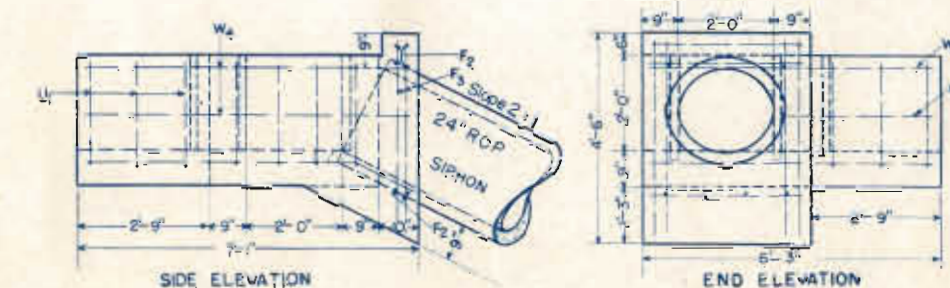
STATION	NO SIDE	
	LEFT	RIGHT
298+01.6	/	
299+75	/	
300+50	/	/
301+00	/	/
301+60	/	/
302+10	/	/
312+00	/	
313+00	/	
314+35		/
315+00	/	
316+00	/	
318+05		/
	10	6
TOTALS	16	

REMOVE & RESET
MAIL BOXES

STATION	NO	
	SIDE	
	LEFT	RIGHT
305+40	1	
306+65	1	
307+15	2	
308+00	1	
309+10	1	
313+30	2	
318+60	1	
321+25	3	
321+70	1	
323+45	1	
TOTALS	14	

ADJUST MANHOLE RING & COVER

STATION	NO SIDE	
	LEFT	RIGHT
296+89	/	
301+40	/	
306+09	/	
310+55	/	
315+07	/	
319+57	/	
TOTALS	6	

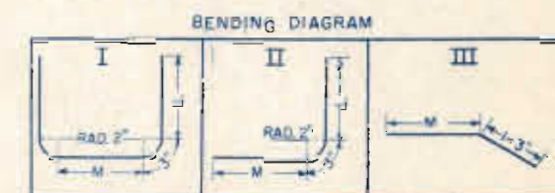
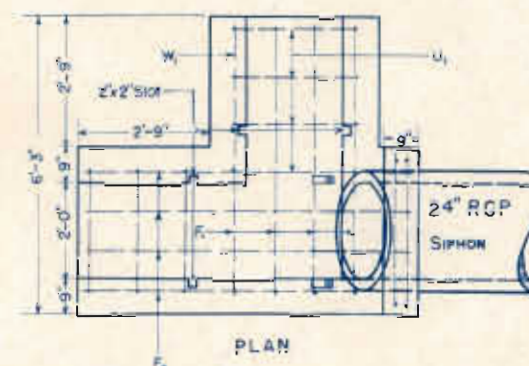


CLASS "A" CONCRETE, 2.3 CU. YDS.

BAR LIST					
MARK	NO REQD	LENGTH	TYPE	L	M
U1	7	6'-2"	I	1'-10"	2'-0"
F1	4	7'-5"	II	1'-10"	3'-4"
F2	6	3'-2"	ST		
F3	4	3'-6"	ST		
F4	4	6'-9"	III		3'-4"
W1	2	6'-3"	II	3'-0"	3'-0"
W2	1	5'-11"	ST		
W3	1	3'-5"	ST		
W4	2	6'-9"	ST		

Bars 72" @ 0.668 Lbs. per Lin Ft.

SUMMARY
Reinf Steel + 1% Overrun = 113 Lbs.

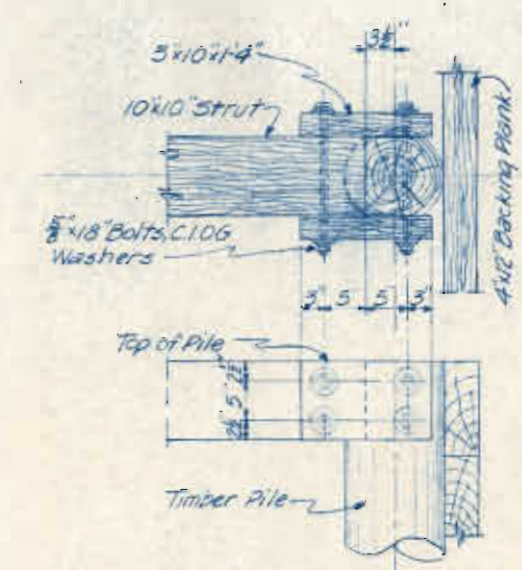
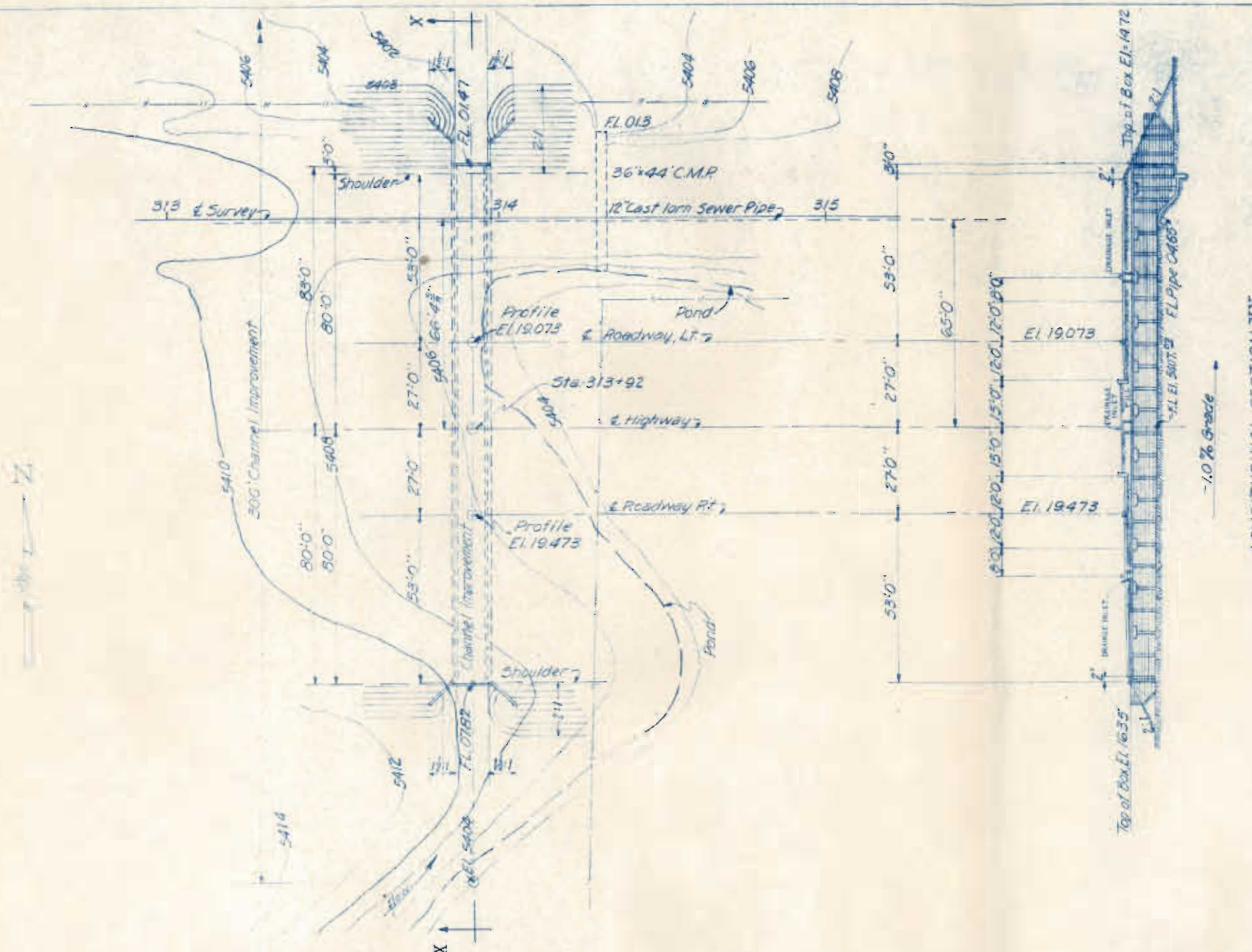


24" R.C.P. SIPHON 2-WAY OUTLET
STA. 301+90

CONCRETE CULVERT PIPE, CONCRETE INLETS & TREATED TIMBER INLET GRATINGS

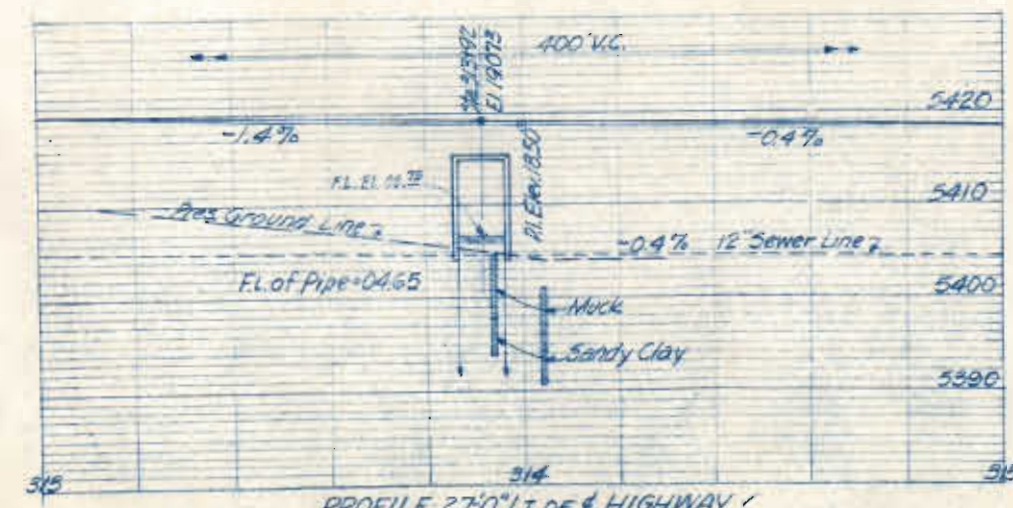
STATION	CONCRETE INLETS						TOTAL CLASS A CONCRETE CU. YD.	TREATED INLET		TIMBER GRATINGS		CONCRETE CULVERT PIPE-24"					TOTAL
	LEFT		MEDIAN		RIGHT			WITH POSTS	M.F.T. BM.	WITHOUT POSTS	M.F.T. BM.	LIN. FT.					
	HEIGHT	CU. YD.	HEIGHT	CU. YD.	HEIGHT	CU. YD.						LEFT	MID	RIGHT			
296+10	36'	1.06	30'	1.02	25'	0.83	2.91	2	.092	1	.039	33'	51'	46'	-	130	
301+85	-	-	30'	1.11	-	-	1.11	-	-	1	.039	85'	-	-	-	85'	
309+50	27'	0.96	23'	0.97	30'	0.93	2.86	2	.092	1	.039	34'	-	43'	33'	112'	
313+92	29	0.89	24'	0.88	20'	0.71	2.48	2	.092	1	.039	-	Wood	Box	-	-	
321+10	68'	1.72	62'	1.68	58'	1.51	4.91	2	.092	1	.039	44'	45'	43'	40'	174	
TOTALS							14.27		.368		.195					581	

FED. ROAD DIST. NO.	STATE	PROJECT	SHEET NO.
5	COLO.	DA-W13(1)	8

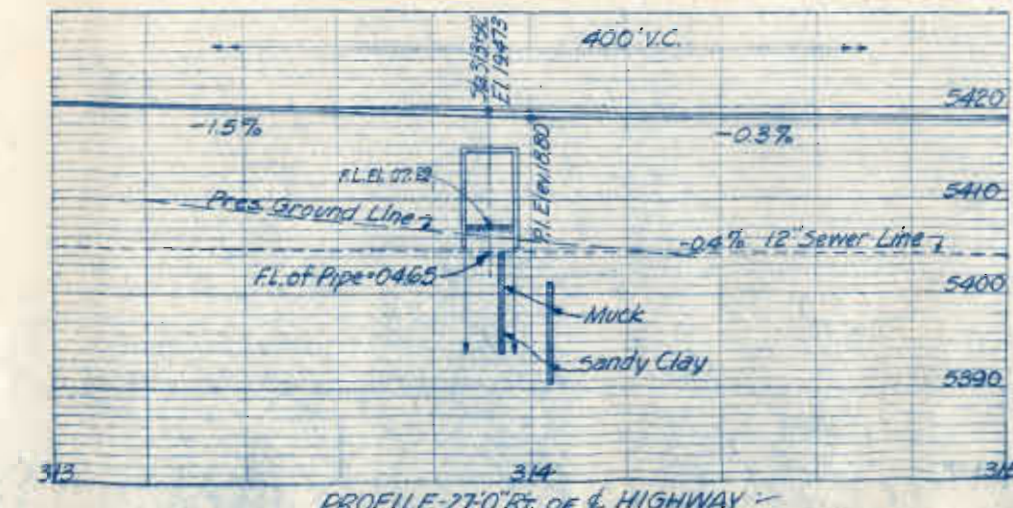


DETAIL OF STRUT AT TOP OF PILE

LONGITUDINAL SECTION XX



PROFILE 27'0\"/>



PROFILE 27'0\"/>

COLORADO
STATE HIGHWAY DEPARTMENT
8x8\"/>

Across Draw
Sta. 313+92.0
Near Denver Ser. 11 T.45 R.69W
Designed by H.W.C. Approved by P. J. Bailey
Made by D.D.W. Bridge Engineer
Checked by H.L.C. Date: July 20, 1941.

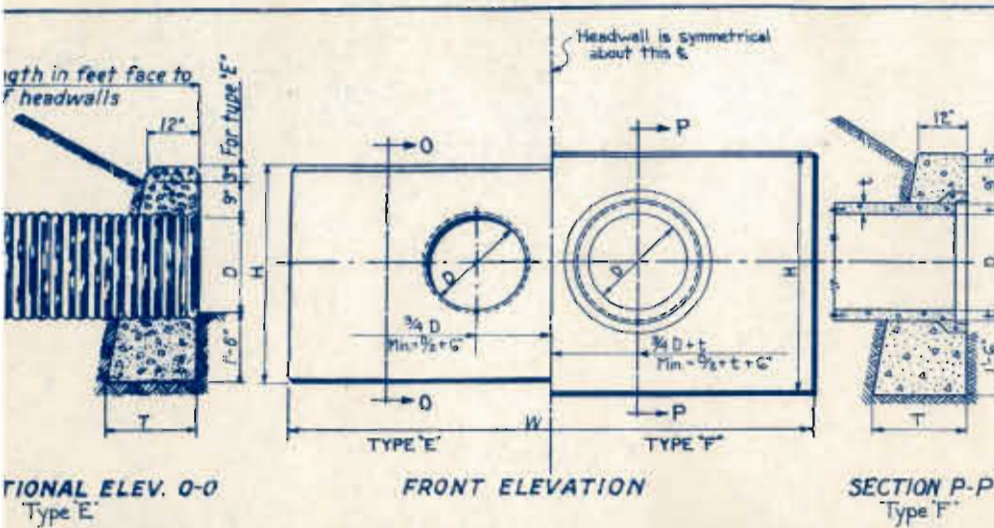


TABLE OF DIMENSIONS & QUANTITIES FOR DOUBLE C.M.P. & REIN. CONC. PIPE CULVERT & HEADWALLS

W	H	T	CL. B CONCRETE FOR 2 HEADWALLS	CORRUGATED METAL PIPE	CEMENT RUBBLE MASONRY
7'-6"	3'-0"	1'-6"	2.4 CU. YDS.	18 GAGE 2xL=LIN. FT.	
7'-6"	4'-0"	1'-6"	3.0 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	5'-0"	1'-6"	3.6 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	6'-0"	1'-6"	4.2 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	7'-0"	1'-6"	4.8 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	8'-0"	1'-6"	5.4 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	9'-0"	1'-6"	6.0 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	10'-0"	1'-6"	6.6 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	11'-0"	1'-6"	7.2 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	12'-0"	1'-6"	7.8 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	13'-0"	1'-6"	8.4 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	14'-0"	1'-6"	9.0 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	15'-0"	1'-6"	9.6 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	16'-0"	1'-6"	10.2 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	17'-0"	1'-6"	10.8 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	18'-0"	1'-6"	11.4 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	19'-0"	1'-6"	12.0 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	20'-0"	1'-6"	12.6 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	21'-0"	1'-6"	13.2 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	22'-0"	1'-6"	13.8 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	23'-0"	1'-6"	14.4 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	24'-0"	1'-6"	15.0 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	25'-0"	1'-6"	15.6 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	26'-0"	1'-6"	16.2 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	27'-0"	1'-6"	16.8 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	28'-0"	1'-6"	17.4 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	29'-0"	1'-6"	18.0 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	30'-0"	1'-6"	18.6 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	31'-0"	1'-6"	19.2 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	32'-0"	1'-6"	19.8 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	33'-0"	1'-6"	20.4 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	34'-0"	1'-6"	21.0 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	35'-0"	1'-6"	21.6 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	36'-0"	1'-6"	22.2 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	37'-0"	1'-6"	22.8 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	38'-0"	1'-6"	23.4 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	39'-0"	1'-6"	24.0 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	40'-0"	1'-6"	24.6 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	41'-0"	1'-6"	25.2 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	42'-0"	1'-6"	25.8 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	43'-0"	1'-6"	26.4 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	44'-0"	1'-6"	27.0 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	45'-0"	1'-6"	27.6 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	46'-0"	1'-6"	28.2 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	47'-0"	1'-6"	28.8 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	48'-0"	1'-6"	29.4 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	49'-0"	1'-6"	30.0 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	50'-0"	1'-6"	30.6 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	51'-0"	1'-6"	31.2 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	52'-0"	1'-6"	31.8 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	53'-0"	1'-6"	32.4 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	54'-0"	1'-6"	33.0 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	55'-0"	1'-6"	33.6 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	56'-0"	1'-6"	34.2 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	57'-0"	1'-6"	34.8 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	58'-0"	1'-6"	35.4 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	59'-0"	1'-6"	36.0 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	60'-0"	1'-6"	36.6 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	61'-0"	1'-6"	37.2 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	62'-0"	1'-6"	37.8 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	63'-0"	1'-6"	38.4 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	64'-0"	1'-6"	39.0 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	65'-0"	1'-6"	39.6 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	66'-0"	1'-6"	40.2 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	67'-0"	1'-6"	40.8 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	68'-0"	1'-6"	41.4 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	69'-0"	1'-6"	42.0 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	70'-0"	1'-6"	42.6 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	71'-0"	1'-6"	43.2 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	72'-0"	1'-6"	43.8 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	73'-0"	1'-6"	44.4 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	74'-0"	1'-6"	45.0 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	75'-0"	1'-6"	45.6 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	76'-0"	1'-6"	46.2 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	77'-0"	1'-6"	46.8 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	78'-0"	1'-6"	47.4 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	79'-0"	1'-6"	48.0 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	80'-0"	1'-6"	48.6 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	81'-0"	1'-6"	49.2 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	82'-0"	1'-6"	49.8 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	83'-0"	1'-6"	50.4 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	84'-0"	1'-6"	51.0 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	85'-0"	1'-6"	51.6 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	86'-0"	1'-6"	52.2 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	87'-0"	1'-6"	52.8 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	88'-0"	1'-6"	53.4 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	89'-0"	1'-6"	54.0 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	90'-0"	1'-6"	54.6 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	91'-0"	1'-6"	55.2 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	92'-0"	1'-6"	55.8 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	93'-0"	1'-6"	56.4 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	94'-0"	1'-6"	57.0 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	95'-0"	1'-6"	57.6 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	96'-0"	1'-6"	58.2 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	97'-0"	1'-6"	58.8 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	98'-0"	1'-6"	59.4 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	99'-0"	1'-6"	60.0 DO	18 GAGE 2xL=LIN. FT.	
7'-6"	100'-0"	1'-6"	60.6 DO	18 GAGE 2xL=LIN. FT.	

D. HEADWALLS FOR DOUBLE CORR. METAL PIPE CULV'S. REINF. CONC.

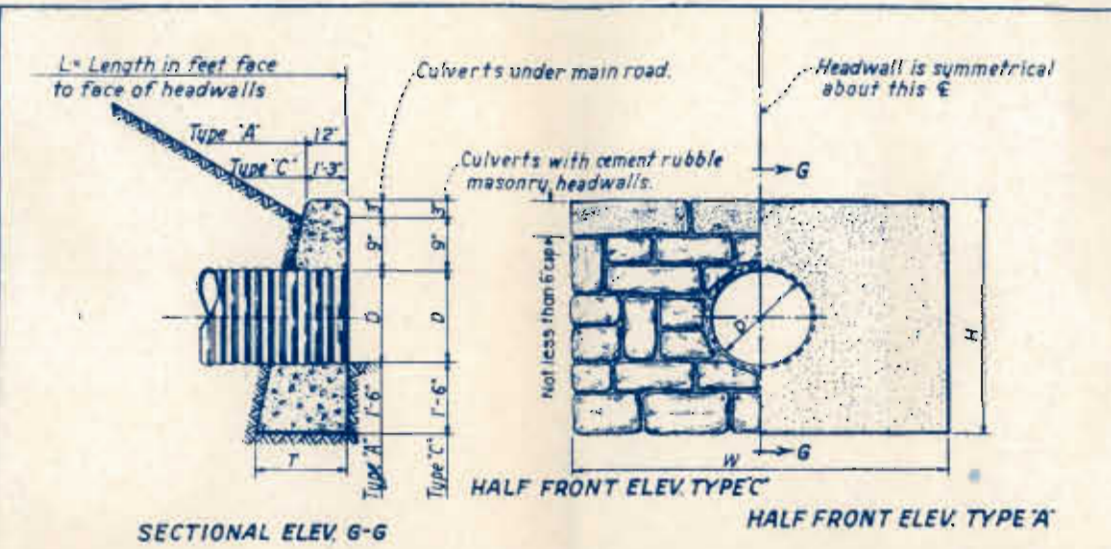
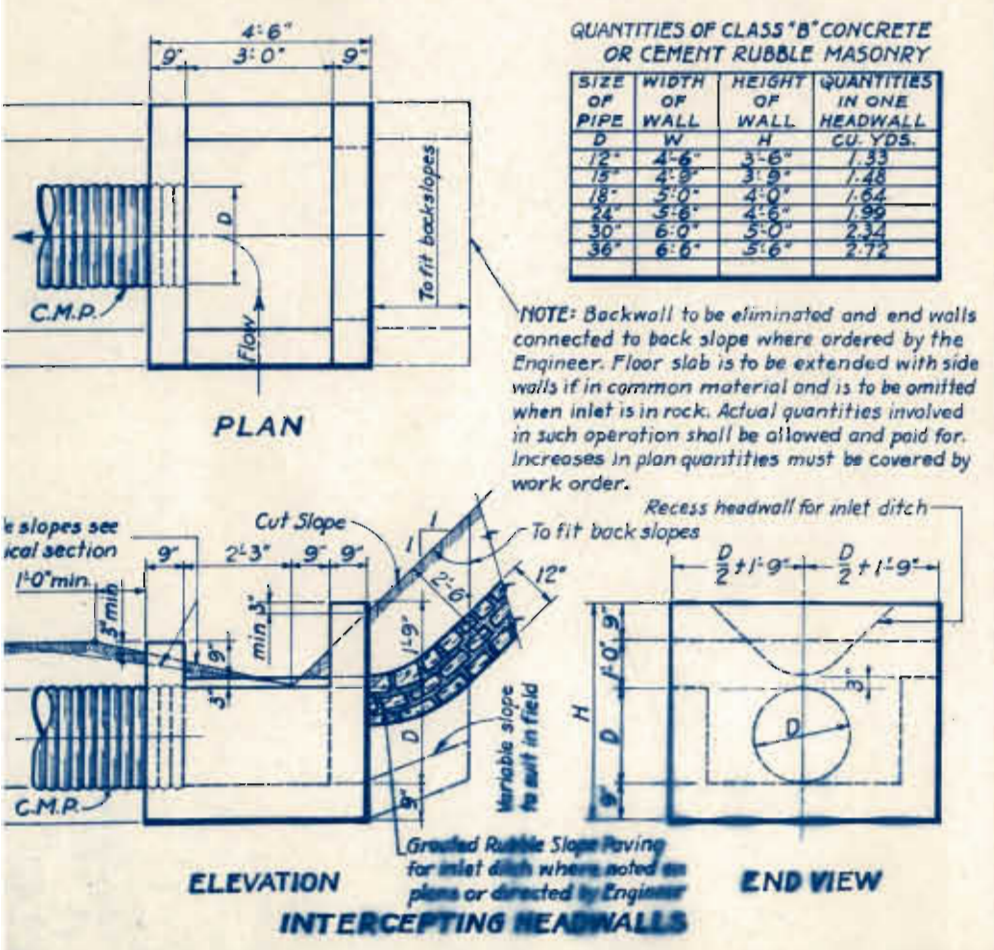
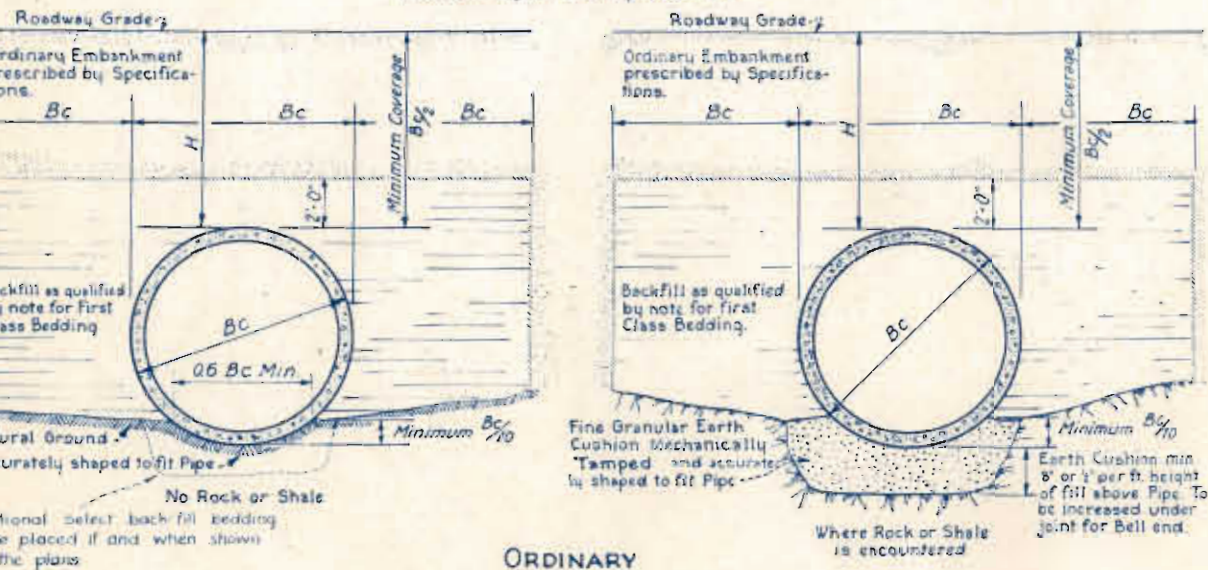


TABLE OF DIMENSIONS & QUANTITIES FOR CORRUGATED METAL PIPE CULVERTS & HEADWALLS

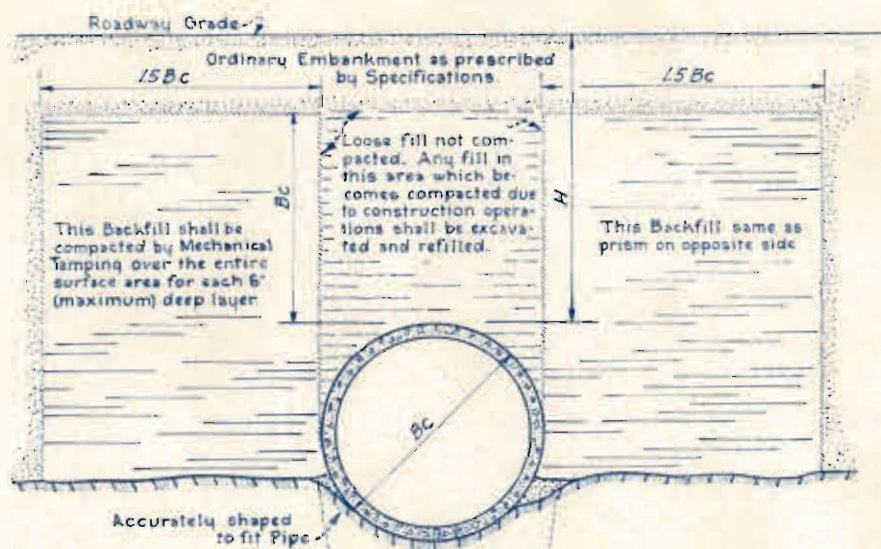
D	W	H	T	CL. B CONCRETE FOR 2 HEADWALLS	CORRUGATED METAL PIPE	CEMENT RUBBLE MASONRY
12"	4'-6"	3'-6"	1'-5"	1.4 CU. YDS.	16 GAGE L=LIN. FT.	
18"	6'-0"	4'-0"	1'-7"	2.2 DO	16 DO L=DO	
24"	7'-6"	5'-0"	1'-9"	3.0 DO	16 DO L=DO	
30"	9'-0"	6'-0"	2'-1"	3.8 DO	16 DO L=DO	
36"	10'-6"	7'-0"	2'-3"	4.6 DO	16 DO L=DO	
42"	12'-0"	8'-0"	2'-5"	5.4 DO	16 DO L=DO	
48"	13'-6"	9'-0"	2'-7"	6.2 DO	16 DO L=DO	
54"	15'-0"	10'-0"	2'-9"	7.0 DO	16 DO L=DO	
60"	16'-6"	11'-0"	3'-1"	7.8 DO	16 DO L=DO	
66"	18'-0"	12'-0"	3'-3"	8.6 DO	16 DO L=DO	
72"	19'-6"	13'-0"	3'-5"	9.4 DO	16 DO L=DO	
78"	21'-0"	14'-0"	3'-7"	10.2 DO	16 DO L=DO	
84"	22'-6"	15'-0"	3'-9"	11.0 DO	16 DO L=DO	
90"	24'-0"	16'-0"	4'-1"	11.8 DO	16 DO L=DO	
96"	25'-6"	17'-0"	4'-3"	12.6 DO	16 DO L=DO	
102"	27'-0"	18'-0"	4'-5"	13.4 DO	16 DO L=DO	
108"	28'-6"	19'-0"	4'-7"	14.2 DO	16 DO L=DO	
114"	30'-0"	20'-0"	4'-9"	15.0 DO	16 DO L=DO	
120"	31'-6"	21'-0"	5'-1"	15.8 DO	16 DO L=DO	
126"	33'-0"	22'-0"	5'-3"	16.6 DO	16 DO L=DO	
132"	34'-6"	23'-0"	5'-5"	17.4 DO	16 DO L=DO	
138"	36'-0"	24'-0"	5'-7"	18.2 DO	16 DO L=DO	
144"	37'-6"	25'-0"	5'-9"	19.0 DO	16 DO L=DO	
150"	39'-0"	26'-0"	6'-1"	19.8 DO	16 DO L=DO	
156"	40'-6"	27'-0"	6'-3"	20.6 DO	16 DO L=DO	
162"	42'-0"	28'-0"	6'-5"	21.4 DO	16 DO L=DO	
168"	43'-6"	29'-0"	6'-7"	22.2 DO	16 DO L=DO	
174"	45'-0"	30'-0"	6'-9"	23.0 DO	16 DO L=DO	
180"	46'-6"	31'-0"	7'-1"	23.8 DO	16 DO L=DO	
186"	48'-0"	32'-0"	7'-3"	24.6 DO	16 DO L=DO	
192"	49'-6"	33'-0"	7'-5"	25.4 DO	16 DO L=DO	
198"	51'-0"	34'-0"	7'-7"	26.2 DO	16 DO L=DO	
204"	52'-6"	35'-0"	7'-9"	27.0 DO	16 DO L=DO	
210"	54'-0"	36'-0"	8'-1"	27.8 DO	16 DO L=DO	
216"	55'-6"	37'-0"	8'-3"	28.6 DO	16 DO L=DO	
222"	57'-0"	38'-0"	8'-5"	29.4 DO	16 DO L=DO	
228"	58'-6"	39'-0"	8'-7"	30.2 DO	16 DO L=DO	
234"	60'-0"	40'-0"	8'-9"	31.0 DO	16 DO L=DO	
240"	61'-6"	41'-0"	9'-1"	31.8 DO	16 DO L=DO	
246"	63'-0"	42'-0"	9'-3"	32.6 DO	16 DO L=DO	
252"	64'-6"	43'-0"	9'-5"	33.4 DO	16 DO L=DO	
258"	66'-0"	44'-0"	9'-7"	34.2 DO	16 DO L=DO	
264"	67'-6"	45'-0"	9'-9"	35.0 DO	16 DO L=DO	
270"	69'-0"	46'-0"	10'-1"	35.8 DO	16 DO L=DO	
276"	70'-6"	47'-0"	10'-3"	36.6 DO	16 DO L=DO	
282"	72'-0"	48'-0"	10'-5"	37.4 DO	16 DO L=DO	
288"	73'-6"	49'-0"	10'-7"	38.2 DO	16 DO L=DO	
294"	75'-0"	50'-0"	10'-9"	39.0 DO	16 DO L=DO	
300"	76'-6"	51'-0"	11'-1"	39.8 DO	16 DO L=DO	
306"	78'-0"	52'-0"	11'-3"	40.6 DO	16 DO L=DO	
312"	79'-6"	53'-0"	11'-5"	41.4 DO	16 DO L=DO	
318"	81'-0"	54'-0"	11'-7"	42.2 DO	16 DO L=DO	
324"	82'-6"	55'-0"	11'-9"	43.0 DO	16 DO L=DO	
330"	84'-0"	56'-0"	12'-1"	43.8 DO	16 DO L=DO	
336"	85'-6"	57'-0"	12'-3"	44.6 DO	16 DO L=DO	
342"	87'-0"	58'-0"	12'-5"	45.4 DO	16 DO L=DO	
348"	88'-6"	59'-0"	12'-7"	46.2 DO	16 DO L=DO	
354"	90'-0"	60'-0"	12'-9"	47.0 DO	16 DO L=DO	
360"	91'-6"	61'-0"	13'-1"	47.8 DO	16 DO L=DO	
366"	93'-0"	62'-0"	13'-3"	48.6 DO	16 DO L=DO	
372"	94'-6"	63'-0"	13'-5"	49.4 DO	16 DO L=DO	
378"	96'-0"	64'-0"	13'-7"	50.2 DO	16 DO L=DO	
384"	97'-6"	65'-0"	13'-9"	51.0 DO	16 DO L=DO	
390"	99'-0"	66'-0"	14'-1"	51.8 DO	16 DO L=DO	
396"	100'-6"	67'-0"	14'-3"	52		

NOTE: Backfill layers for all Types of Bedding must be placed simultaneously on each side of the pipe to maintain equal lateral pressures.



ORDINARY

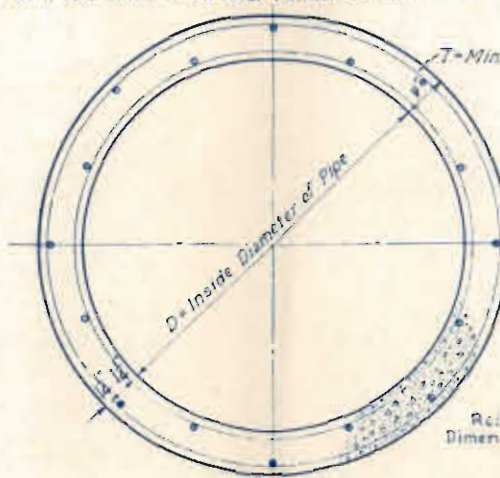
FIRST CLASS



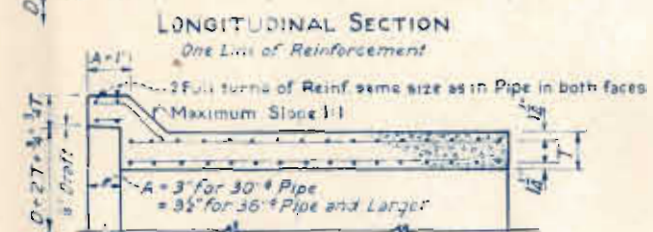
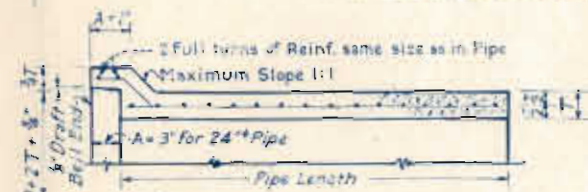
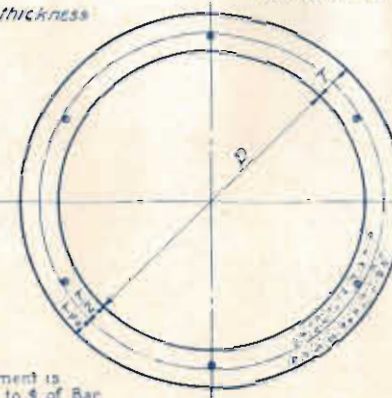
SPECIAL

PIPE CROSS SECTIONS

With Two Lines of Circular Reinforcement



With One Line of Circular Reinforcement



LONGITUDINAL SECTION
TONGUE AND GROOVE TYPE OF JOINT

GENERAL NOTES

All work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department adopted June 1, 1940.
Circular Reinforcement shall be Cold Drawn Steel Wire. If Billet Steel of Hard or Intermediate Grade is used the steel area shall be increased by 25 per cent. Longitudinal Reinforcement shall be Billet Steel of Intermediate Grade.
The type of Pipe Joint used and the field construction there-of to make the joint reasonably water-tight shall be submitted to the Department for approval.
Unless otherwise noted the Type of Bedding shall be Ordinary Bedding. When the maximum fill height as noted hereon for this type of bedding is exceeded then that type of bedding which is indicated by the allowable fill height shall be used.
All Culverts shall have concrete headwalls if and as shown on the plans in accordance with the Department's Stand. Dwg. M-102-F.
Supporting soils shall be composed of firm and uniform material throughout the entire length of Culvert. The soil shall be accurately shaped to fit the Pipe in accordance with the bedding conditions shown hereon.

Special attention is directed to the Lining Requirements noted where rock or rock projections are encountered in the Pipe bed.
This Pipe shall be laid with the Bell or Groove end placed upstream.
All excavation and backfill required for bedding and shaping, except for the hours of Mechanical Tamping shall be included in Contract Unit Price for Reinforced Conc. Pipe.
All excavation and backfill required for Bedding and Shaping including additional Select Backfill Bedding as called for on the plans shall be included in Contract Unit Price for Reinforced Concrete Pipe.
Mechanical Tamping shall be paid for as a Separate item as called for in the Specifications.
Unreinforced Concrete Pipe
Unreinforced Concrete Pipe will be accepted in the following sizes 12", 15", 18", 24", 30", 36", 42", 48", 54", 60", 66", 72", 78", 84".
Unreinforced Concrete Pipe shall meet the same specifications and may be of the same minimum thickness as shown for Reinforced Concrete Pipe. It will be noted however that Unreinforced Concrete Pipe is required to meet the same Three-edged Bearing Tests as specified for Reinforced Concrete Pipe. Thickness of pipe may be increased as required in order to satisfy the Three-edged Bearing Tests.
The same General Notes, Specifications, Bedding Details, etc. shall apply to Unreinforced Concrete Pipe as is noted for Reinforced Concrete Pipe, excepting only those details and requirements which refer specifically to reinforcement.

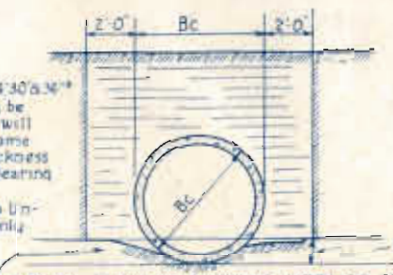
STANDARD M-112-D

Rev. 2-2-42: Add notes H.C.C.
Rev. 3-6-43: Sketch for calc. str. exp. in cut. G.R.B.
Rev. 4-20-42: W.G.S. Unreinforced Concrete Pipe notes.

Revisions: To conform to A.S.T.M. spec. C-76-41 by A.L.C. 12-30-41.
Spec. to include 12", 15", 18", 24", 30", 36", 42", 48", 54", 60", 66", 72", 78", 84" Dia. Pipe. H.C.C. 1-20-42.

STANDARD STRENGTH REINF. CONCRETE CULVERT PIPE				
Based on Concrete with an Ultimate Compressive Strength of 3500 #/in ² and the Three-Edged Bearing Tests in Table I, A.S.T.M. Specification C-76-41.				
Max. Fill Heights above Top of Pipe for Standard Pipe	D Inches	T Inches	Circular Reinforcement Sq. Ins. per Lin. Ft. of Pipe	Longitudinal Re-inforcement Min. Total Area Req'd.
(Fill height not limited for 12", 15" & 18" dia. pipes)	12	2	1 Line	0.07
	15	2 1/4	1 Line	0.09
	18	2 1/2	1 Line	0.12
Type of Bedding Ordinary H = 11 feet First Class H = 13 feet	24	3	1 Line	0.17
	30	3 1/2	1 Line each	0.22
	36	4	2 Lines	0.18
	42	4 1/2	2	0.21
	48	5	2	0.25
	54	5 1/2	2	0.30
	60	6	2	0.33
	66	6 1/2	2	0.37
	72	7	2	0.40
	78	7 1/2	2	0.43
	84	8	2	0.46

EXTRA STRENGTH REINF. CONCRETE CULVERT PIPE				
Based on Concrete with an Ultimate Compressive Strength of 4500 #/in ² and the Three-Edged Bearing Tests in Table II, A.S.T.M. Specification C-76-41				
Max. Fill Heights above Top of Pipe for Extra Strength Pipe	D Inches	T Inches	Circular Reinforcement Sq. Ins. per Lin. Ft. of Pipe	Longitudinal Re-inforcement Min. Total Area Req'd.
Type of Bedding Ordinary H = 16 feet First Class H = 19 feet Ordinary Special H = 24 feet First Class Special H = 30 feet	24	3	1 Line	0.26
	30	3 1/2	1 Line each	0.31
	36	4	2 Lines	0.28
	42	4 1/2	2	0.33
	48	5	2	0.38
	54	5 1/2	2	0.44
	60	6	2	0.50
	66	6 1/2	2	0.56
	72	7	2	0.60
	78	7 1/2	2	0.65
	84	8	2	0.72



COLORADO STATE HIGHWAY DEPARTMENT
UNREINFORCED CONCRETE PIPE
Sizes: 12", 15", 18", 24", 30", 36"
REINFORCED CONCRETE PIPE
STANDARD & EXTRA STRENGTH
Sizes: 12", 15", 18", 24", 30", 36", 42", 48", 54", 60", 66", 72", 78", 84"
Designed by W.G.S. Approved by P. Bailey
Checked by A.L.C. Date: June 11, 1940.

STANDARD M-122-AY
FOR 24" SIPHON

FED. ROAD DIST. NO.	STATE	DA-WZ	SHEET NO.	TOTAL SHEETS
3	COLO.	3(1)	12	

REV. 4-23-42 REQUIRING REINFORCED PIPE - E.U.T.

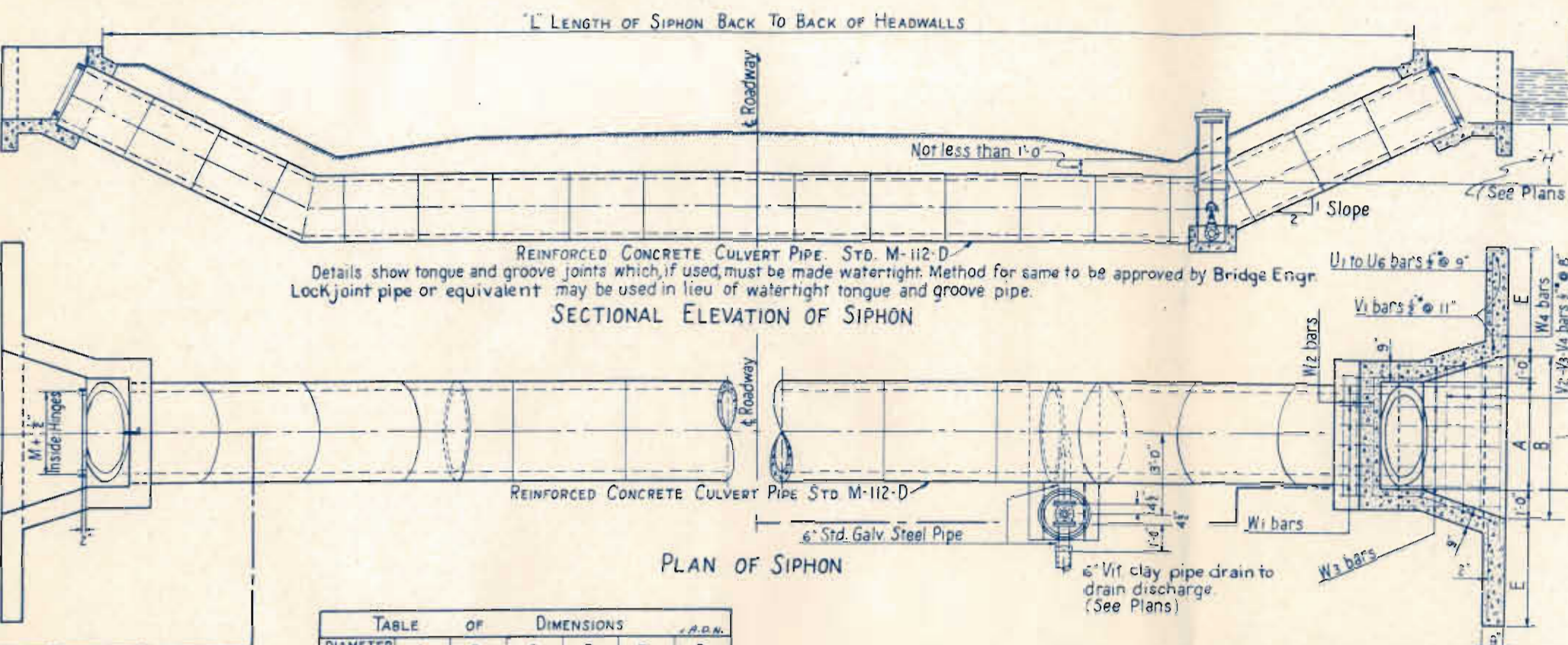


TABLE OF DIMENSIONS

DIAMETER OF PIPE	A	B	C	E	F	P
18"	2'-6"	4'-6"	0'-9"	2'-6"	2'-6"	0'-9"
24"	3'-0"	5'-0"	1'-0"	3'-0"	3'-0"	1'-0"
30"	3'-6"	5'-6"	1'-3"	3'-6"	3'-6"	1'-3"
36"	4'-0"	6'-0"	1'-6"	4'-0"	4'-0"	1'-6"

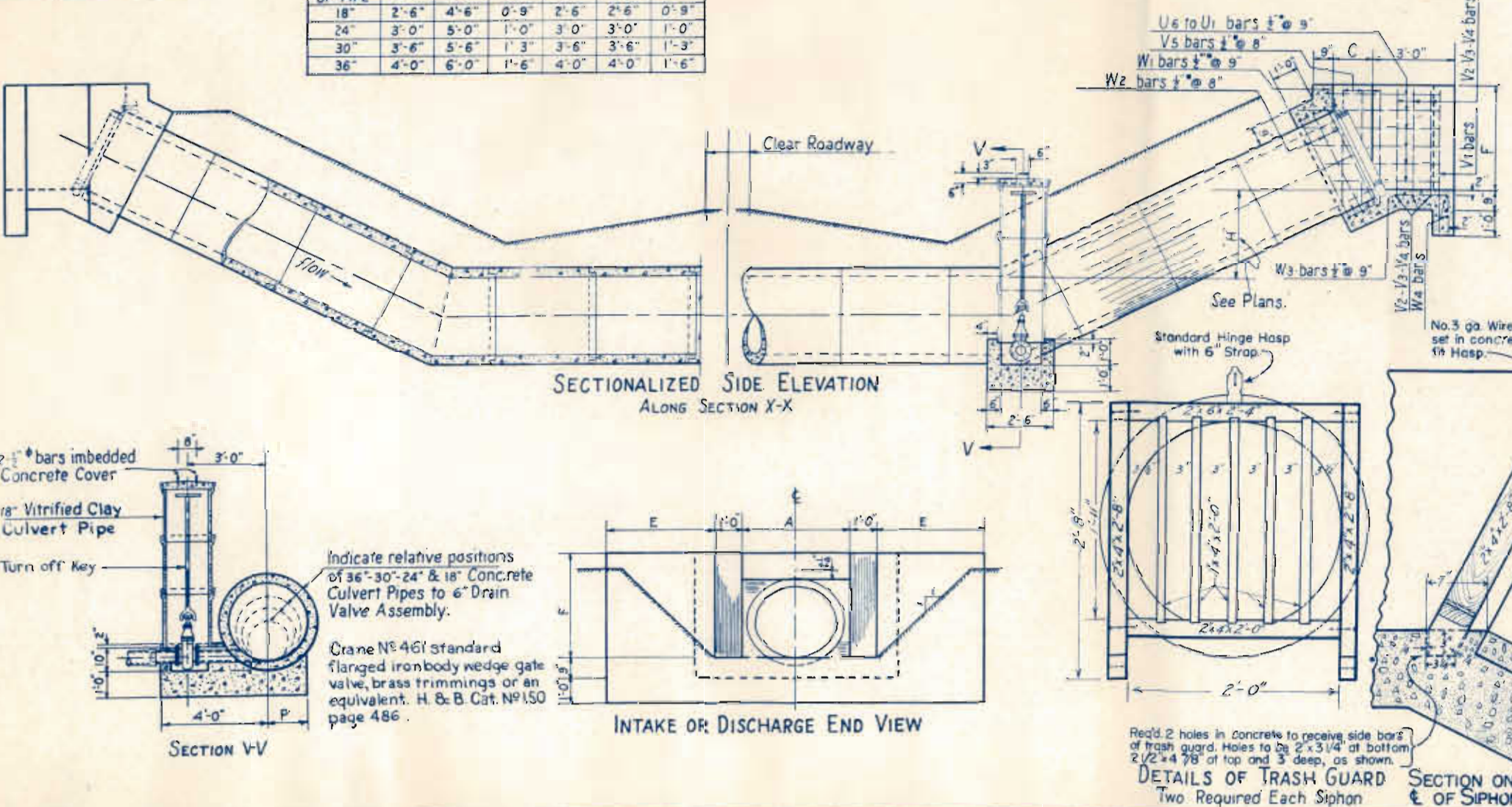
BAR LIST FOR ONE SIPHON

MARK	SIZE	LENGTH OF BARS				NUMBER REQUIRED				BEND TYPE
		18"	24"	30"	36"	18"	24"	30"	36"	
U1	1/2"	6'-3"	6'-9"	7'-3"	7'-9"	4	4	4	4	IV
U2	1/2"	6'-7"	7'-1"	7'-7"	8'-1"	4	4	4	4	IV
U3	1/2"	7'-0"	7'-6"	8'-0"	8'-6"	4	4	4	4	IV
U4	1/2"	7'-4"	7'-10"	8'-4"	8'-10"	4	4	4	4	IV
U5	1/2"		8'-9"	9'-3"	9'-7"		4	4	4	IV
U6	1/2"									IV
V1	1/2"	3'-9"	4'-5"	4'-9"	5'-3"	12	16	16	20	III
V2	1/2"	7'-0"	8'-0"	9'-0"	10'-0"	2	2	2	2	III
V3	1/2"	6'-4"	7'-4"	8'-4"	9'-4"	2	2	2	2	III
V4	1/2"	5'-8"	6'-8"	7'-8"	8'-8"	2	2	2	2	III
V5	1/2"	3'-0"	3'-6"	4'-0"	4'-6"	12	12	12	12	III
W1	1/2"	1'-10"	1'-10"	1'-10"	1'-10"	8	8	8	12	I
W2	1/2"	10'-4"	12'-8"	15'-0"	17'-4"	6	6	6	6	II
W3	1/2"	5'-5"	5'-5"	5'-5"	5'-5"	12	14	16	16	II
W4	1/2"	6'-6"	7'-0"	7'-6"	8'-0"	4	4	4	4	II

SUMMARY OF REINFORCEMENT FOR TWO HEADWALLS

SIPHON	18"	24"	30"	36"	0.85 Lbs Per Lin. Ft.
Lin. Ft.	395	465	585	668	337
Plus 1% Overrun					3
TOTAL WEIGHT	340	400	480	575	

* Field Bend where necessary



SUMMARY OF QUANTITIES FOR ONE SIPHON

ITEM NO.	DESCRIPTION	UNIT	18"	24"	30"	36"	VALVE BASE & COVER
46a	CLASS A CONCRETE	Cu. Yd.	4.0	5.0	6.0	7.0	0.9
47	REINFORCING STEEL	Lb.	340	400	480	575	
94	REINFORCED CONC. SIPHON PIPE	Lin. Ft.	See Plans	See Plans	See Plans	See Plans	
54b	18" VITRIFIED CLAY CULVERT PIPE	Lin. Ft.	See Plans	See Plans	See Plans	See Plans	
85	TRASH GUARDS (WOODEN)	EACH	2	2	2	2	
110b	6" STD. C.I. VALVE & RED LEAD	EACH	See Plans	See Plans	See Plans	See Plans	
70b	6" VIT. CLAY PIPE DRAIN	Lin. Ft.	See Plans	See Plans	See Plans	See Plans	

* Does not include reinforcing steel for concrete pipes.

LIST OF MATERIALS FOR TRASH GUARD

ITEM	DESCRIPTION	UNIT	18"	24"	30"	36"
16d	Nails	No.	20	31	36	41
20d	Nails	No.	10	15	18	21
	Hasp and Staple					
	Total					

NAILING DIRECTIONS FOR TRASH GUARD: 2-16d NAILS AT EACH END OF EACH 1"x4" NAIL. 3-20d NAILS AT EACH UPPER CORNER OF FRAME. 2-20d NAILS AT EACH LOWER CORNER OF FRAME. ALL NAILS SHALL BE CEMENT COATED LIGHT BARBED CAP (FLAT HEAD) OR EQUIVALENT.

ALL TIMBER FOR TRASH GUARD SHALL BE MISCELLANEOUS TREATED TIMBER, ITEM NO. 44D OF THE SPECIFICATIONS.

GENERAL NOTES

ALL WORK SHALL BE DONE ACCORDING TO THE STANDARD SPECIFICATIONS OF THE COLORADO STATE HIGHWAY DEPARTMENT, ADOPTED JUNE 1, 1940.

ALL CONCRETE SHALL BE CLASS "A", EXCEPT REINFORCED CONCRETE PIPE FORMS FOR CONCRETE SURFACES EXPOSED IN THE FINISHED WORK SHALL BE CONSTRUCTED OF SHIP LAP OR TONGUE AND GROOVE LUMBER NOT UNLESS FACED WITH PANEL BOARD.

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

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

REINFORCED CONCRETE CULVERT PIPE SHALL BE CONSTRUCTED, INSTALLED AND BEDDED ACCORDING TO STANDARD M-112-D, EXCEPT UNREINFORCED PIPE NOT PERMITTED.

BELL AND SPIGOT PIPE SHALL NOT BE USED FOR SIPHONS.

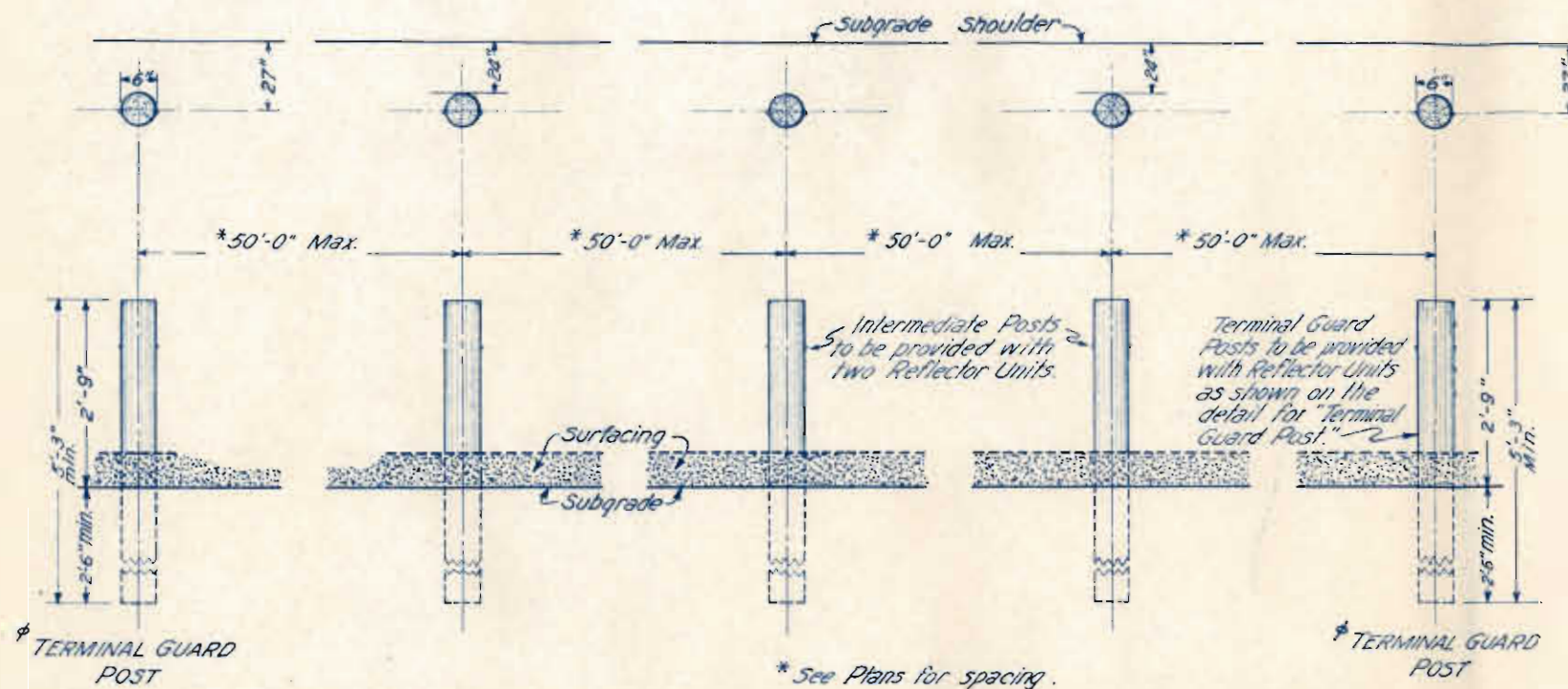
ALL REINFORCED CONCRETE PIPE SHALL BE STANDARD STRENGTH.

COLORADO
STATE HIGHWAY DEPARTMENT

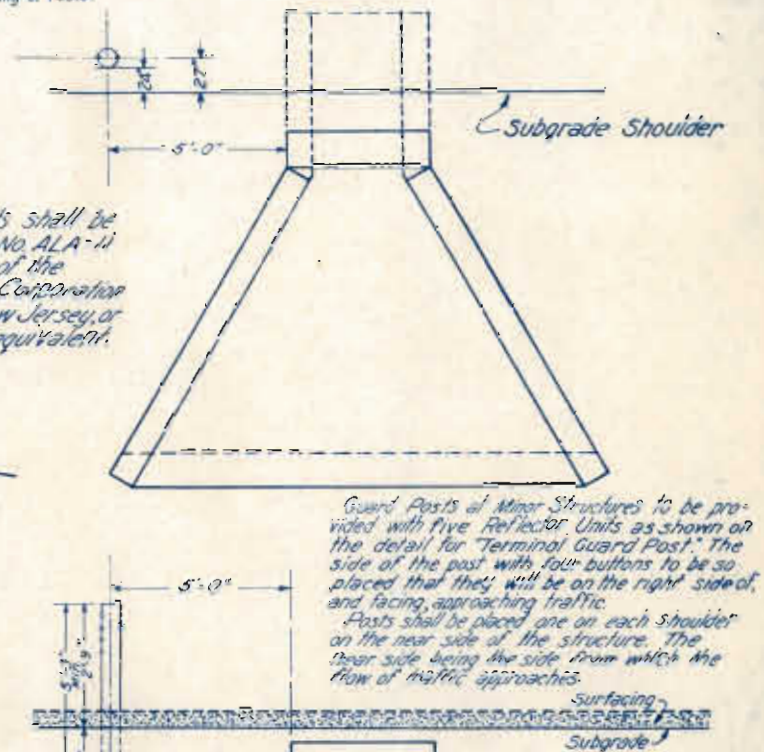
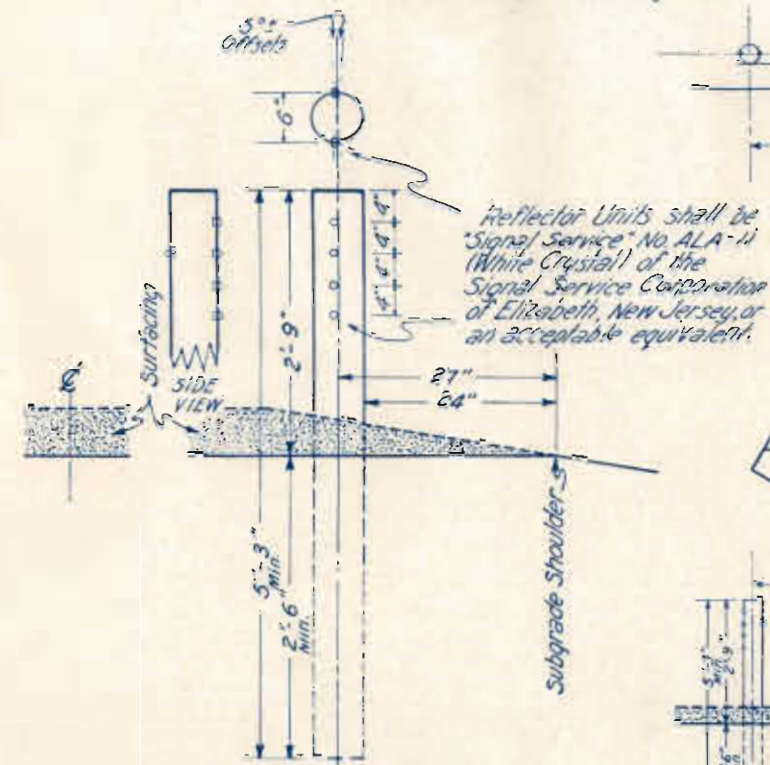
REINFORCED CONCRETE
PIPE SIPHON
SIZES 18", 24", 30", & 36"

Designed by E.F.W. Approved by P.D. Bailey
Made by E.F.W. Bridge Engineer
Checked by A.D.N. Date: March 10, 1942

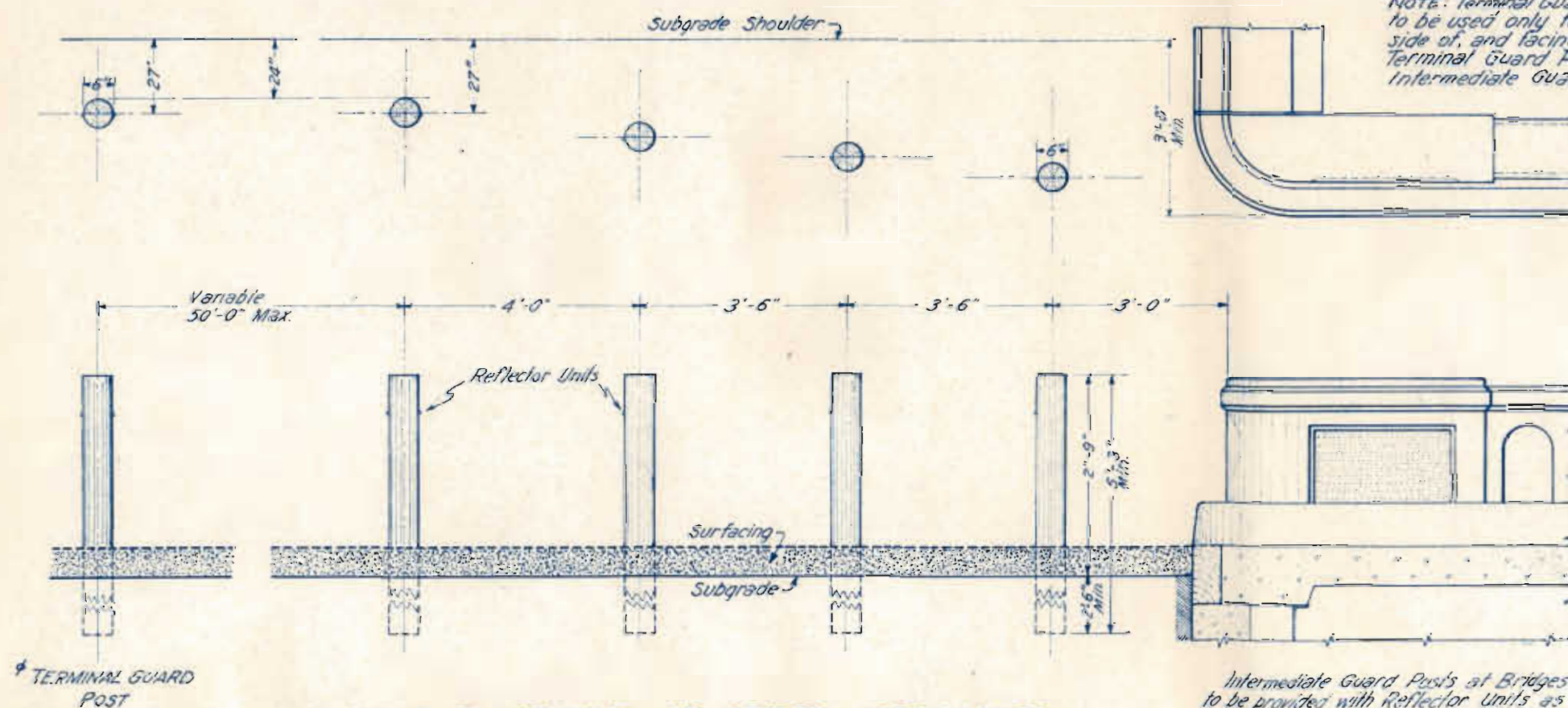
FED. ROAD DIST. NO.	STATE	DA-WI	SHEET NO.	TOTAL SHEETS
3	COLO.	30	13	



SHOWING PLACEMENT ON NORMAL ROADWAY FILLS



SHOWING PLACEMENT AT MINOR STRUCTURES



SHOWING PLACEMENT AT BRIDGE APPROACHES

TERMINAL GUARD POST

NOTE: Terminal Guard Posts as detailed above to be used only for the rear Post on the right side of, and facing approaching traffic. All other Terminal Guard Posts to be identical with Intermediate Guard Posts.

GENERAL NOTES

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

All wood posts shall be made from seasoned, straight, sound Lodgepole Pine, Southern Yellow Pine, or West Coast Douglas Fir.

No section of wood posts shall be less than 6" in diameter.
All wood posts shall be entirely peeled and shaved, thoroly
seasoned and dry, with square tops.

All wood posts shall be set and tamped in plumb and firm, to the lines and grades as directed by the Engineer.

Reflector Units in all posts shall be placed in such position that the units will function at a distance of 500 feet.

On tangents the Reflector Units shall be placed at an angle of approximately five degrees to a line parallel to the centerline of the highway.

in all instances a test shall be made to assure the position of the reflector units to be the most effective possible.

The diameter of holes drilled in the posts shall be drilled approximately one sixteenth ($1/16$) inch less than the diameter

of the signal button base. In all instances the hole shall be enough undersize that the button when driven into the post

shall have complete bond with the post and be securely locked in correct position.

Posits shall be given a standard pressure Creosote treatment and then be thoroughly steam-cleaned in accordance

with requirements of specifications.

**COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD
TIMBER GUARD
POSTS**

Designed by R.E.L.	Approved by J.B. Marshall
Made by R.B.B.	Chief Draftsman
Checked by	Date: Feb. 15, 1939



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

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

The completed gate shall be painted White conforming to the requirements of first and second field coats, light as specified under item No. 41 - Steel Bridges.

All lumber for driveway and walk gates shall be "Miscellaneous Untreated Timber", S.D.S., Item No. 44a.

Staples shall be at least 1½" long, made of No. 9 ga. wire base & staples required per post for barbed wire fence and 14 staples per post for combination wire fence.

Cross braces to be securely nailed with four 40d. nails at each post. End post with bracing to be used at all gates and fence ends.

Corner post with bracing to be used at all corners and angles in fences. Fence intersection with bracing to be used at all intersecting fences.

At all structures of 4'x4' or over the fence shall be ended at eye-bolts in the wings of the structure. Where the type of construction prohibits the use of eye-bolts, an end post with bracing shall be used.

Eye-bolts are to be made from ½" round iron bars with a minimum of 6" of body length embedded in the concrete and a minimum of 1" inside eye diameter.

All wooden posts shall be made from seasoned, straight, sound Lodgepole Pine or Southern Yellow Pine, to be peeled and tops to be sawed off square before pressure treatment.

All posts shall be pressure treated with creosote in conformity with requirements given in the Specifications.

Wire mesh must be not lighter than shown and noted on Plans.

End post with bracing shall conform to details shown above. (Three posts req'd.)
Corner post with bracing shall consist of two end posts with bracing except that the post at the intersection of the two fence lines shall be common to both lines. (Five posts required.)
Fence intersection with bracing shall consist of three end posts with bracing except that the post at the intersection of the three fence lines shall be common to all three lines. (Seven posts req'd.)

Designed by <i>REL</i>	Approved by
Made by <i>PBB</i>	<i>John Szpachoff</i>
Checked by <i>REL</i>	Date: <i>Apr. 27, 1959</i>



SCALE OF LETTERING

STANDARD M-14-A

FED. ROAD DIST. NO.	STATE	DA-W-I PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	GOLO.	3 (1)	15	

Rev. 4-1-42 Deleted Structure No. Lettering - E.J.T.



GENERAL NOTES

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

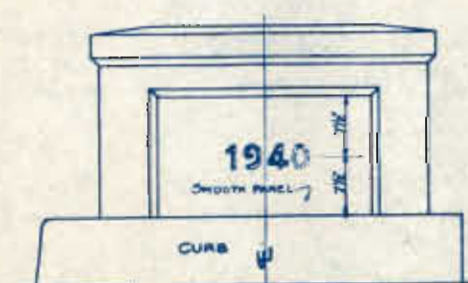
THE SIZE, SHAPE AND SPACING OF THE NUMBERS SHALL BE IDENTICAL WITH THE FULL SIZE SHOWN ON THIS SHEET. ADDITIONAL COPIES OF THIS FULL SIZE SHEET CAN BE OBTAINED FROM THE DEPARTMENT WITHOUT CHARGE.

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

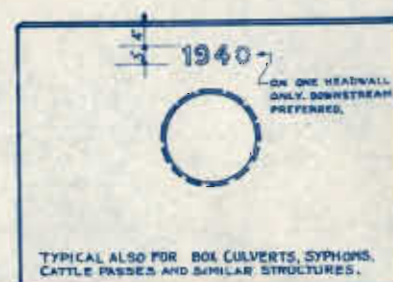
THE YEAR NUMBER SHALL BE RECESSED INTO THE PANEL OF THE ENDPOST AT THE RIGHT HAND SIDE OF EACH BRIDGE-END AND INTO THE FACE OF THE DOWNSTREAM HEADWALL OF CULVERTS, SYPHONS, RETAINING WALLS ETC. A MINIMUM OF 3/8" AS SHOWN.

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

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



TYPICAL CONCRETE ENDPOST



TYPICAL CULVERT HEADWALL



TYPICAL RETAINING WALL

COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD STRUCTURE
YEAR NUMBER MARKING.

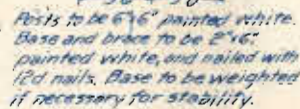
Designed by O.H.D.
Made by O.H.D.
Check Design
Check Detail

Approved by *Ed Bailey*
Bridge Engineer
Date: June 1st, 1940.

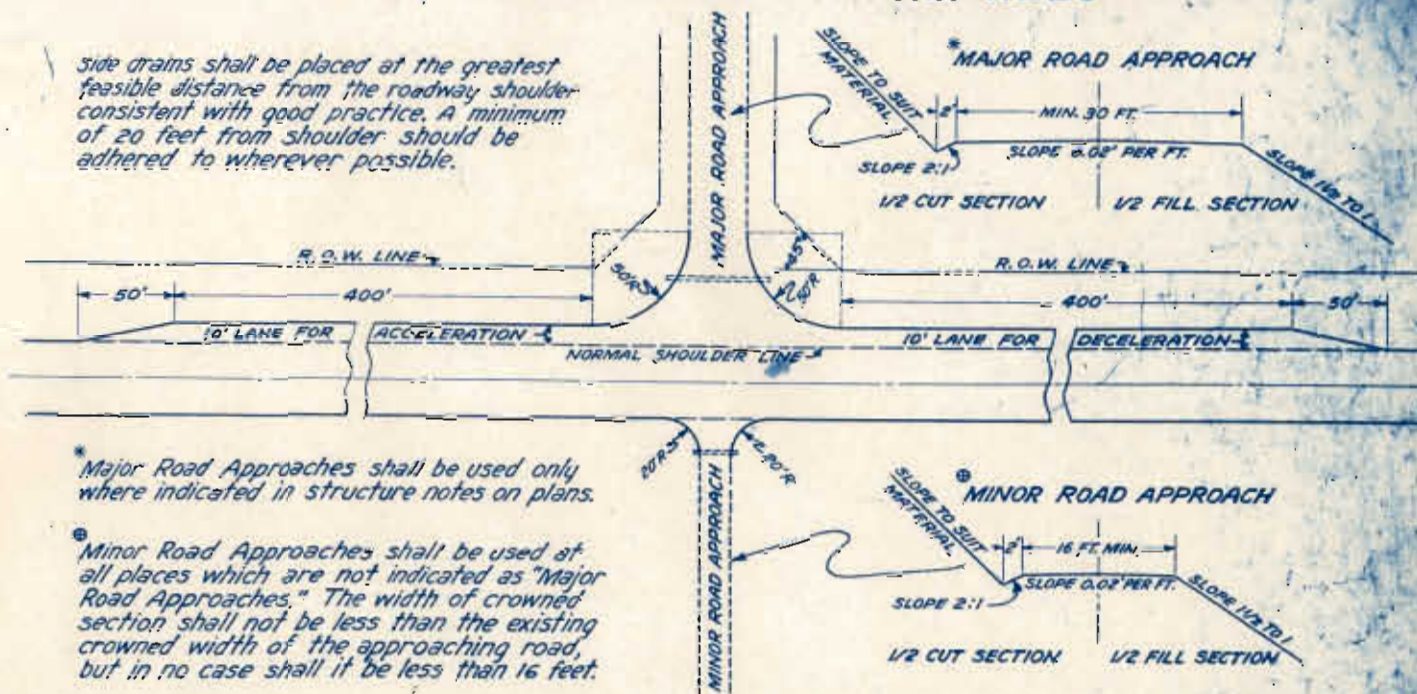
STRUCTURE NO.

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	30	16	

Revised 6-1-57 A.R. Changed to 1937 Specifications.
Revised 8-15-39 A.Z. Changed side drain ditches.
Revised 10-1-39 A.Z. Changed typical plans for side approach roads.
Revised 2-15-40 A.Z. Changed takeoff grades for side approach roads.
APPROACH ROADS Rev. 6-28-80-A.Z.-1940 Specs.

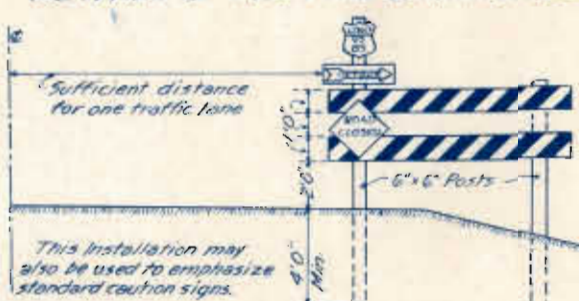


side drains shall be placed at the greatest feasible distance from the roadway shoulder consistent with good practice. A minimum of 20 feet from shoulder should be adhered to wherever possible.



* This Distance to be governed by the maximum day and night visibility which is influenced by grade, curvature, interference of local signs, shrubbery, fences, etc.

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



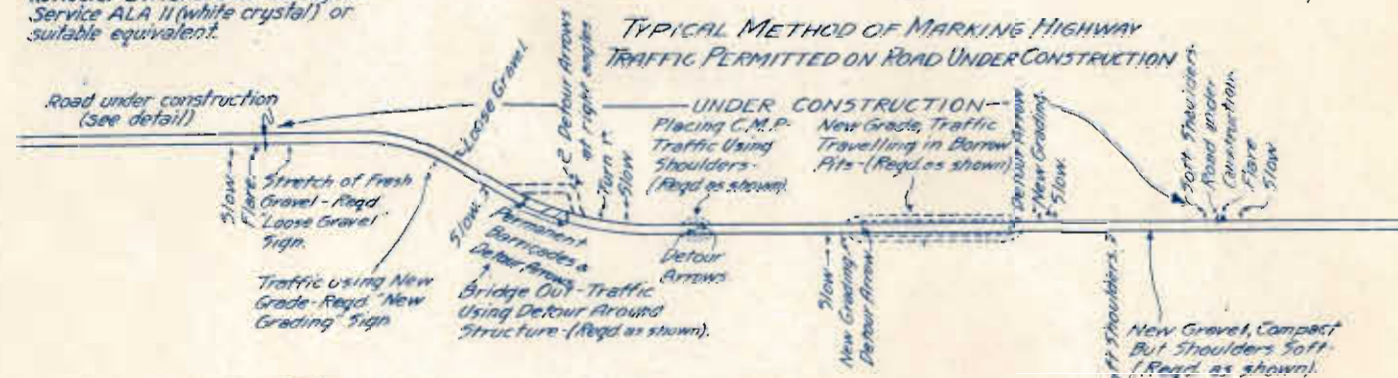
SLOW
ROAD UNDER
CONSTRUCTION

 CONTRACTOR'S NAME

Sign to be made on 1" material with at least three cleats on the back. Background to be white, SLOW and underline to be red, and other lettering to be black. Sign to be set on 2"-6"x6" posts 4 ft. in the ground.

Technical drawing of a mechanical part with dimensions: 2 7/8, 5 1/4, 6, 10, 3/2, 3/2.

Contractor shall be required to have at least two such arrows for use on barricades at the ends of each project. Reflector Buttons and Sign shall be subject to Department approval. Reflector Buttons shall be Signal Service ALA II (white crystal) or suitable equivalent.



TYPICAL METHOD OF MARKING DETOUR TRAFFIC PROHIBITED ON ROAD UNDER CONSTRUCTION

The diagram illustrates a road closure and the setup of a detour system. Key features include:

- Main Road:** Labeled "UNDER CONSTRUCTION". A "Barricade" is placed at the start of the closed section.
- Detour Route:** A "Winding Road" branches off to the right, marked "Slow" and "Narrow Road". It crosses a "Narrow Bridge" and a "River".
- Railroad Crossing:** A "R.R. Crossing" is marked with a "Permanent Barricade" and a "Partial Barricade".
- Detour Markers:**
 - "Marker & Arrow" at the start of the detour.
 - "Marker & L with Detour Plaque" and "Marker & R" along the detour route.
 - "Detour Plaque & Marker" at various points.
 - "Marker & Detour Arrow" at the end of the detour.
- Turns:** "Turn 1", "Turn 2", "Turn 3", and "Turn 4" are marked along the detour route.
- Distances:** "End Detour 400 Ft" and "Begin Detour 400 Ft" are indicated.
- Other Features:**
 - "Well Travelled Road" on the left.
 - "Narrow Bridge" crossing the river.
 - "R.R. Crossing" with a "Permanent Barricade" and "Partial Barricade".
 - "Detour Plaque & Marker" at the end of the detour.
 - "Marker & Detour Arrow" at the end of the detour.

When the length of the approach as determined by the intersection of these grades with the natural ground is such as to damage the property or serve, or cause unreasonable conditions, the grades may be modified. In such cases, methods used, and maximum grades, shall be as indicated on the plans, or provided by work order.

All Work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department adopted June 1, 1940. Whenever traffic is permitted on a road while under construction, the Contractor shall at all times adequately and appropriately mark any and all hazards on the Project with well painted, well maintained barricades and standard caution and warning signs. The Contractor shall also mark with standard directional signs any places where the direction of the flow of traffic is not plain.

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

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

The Contractor shall furnish:

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

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

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

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

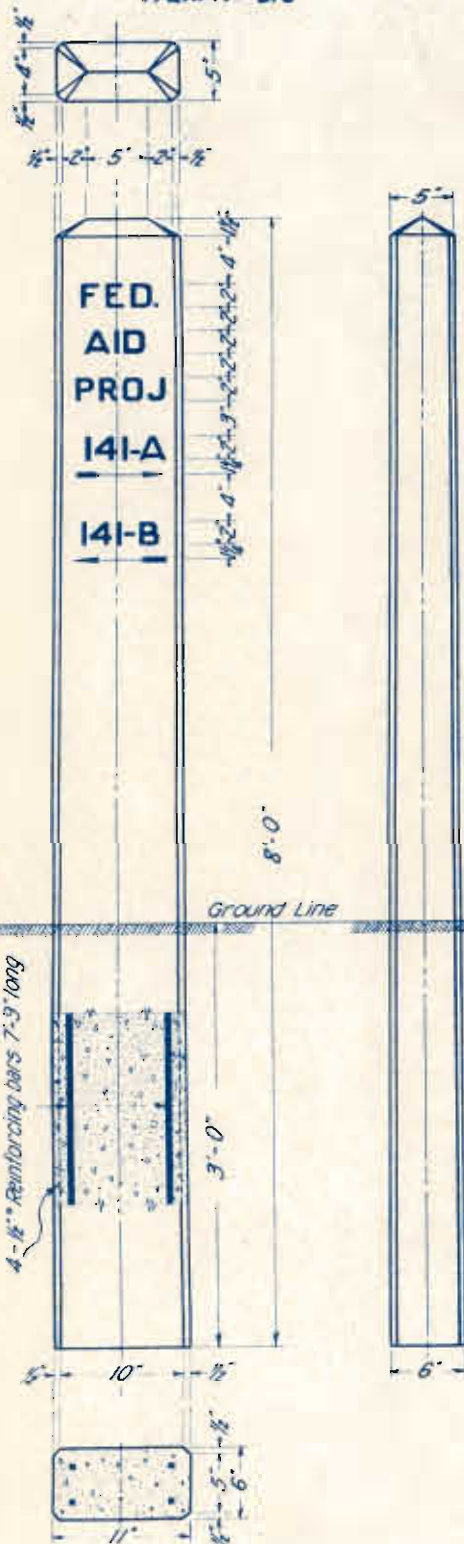
COLORADO
STATE HIGHWAY DEPARTMENT
TYPICAL
SIDE APPROACH ROADS
ROADWAY CONSTRUCTION
TRAFFIC SIGNS

Designed by J.S.M.	Approved by J.S.M.
Made by S.M.	<i>Getmashell</i>
Check J.S.M.	Date: Aug. 20, 1935
Check K.A.K.	

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

Designed by <i>J.S.M.</i>	Approved by <i>J. Marshall</i>
Made by <i>S.M.</i>	Date: <i>Aug 20, 1935</i>
Check <i>J.S.M.</i>	
Check <i>K.A.K.</i>	

PROJECT MARKER POST ITEM N° 818



NOTES FOR PROJECT MARKER POSTS

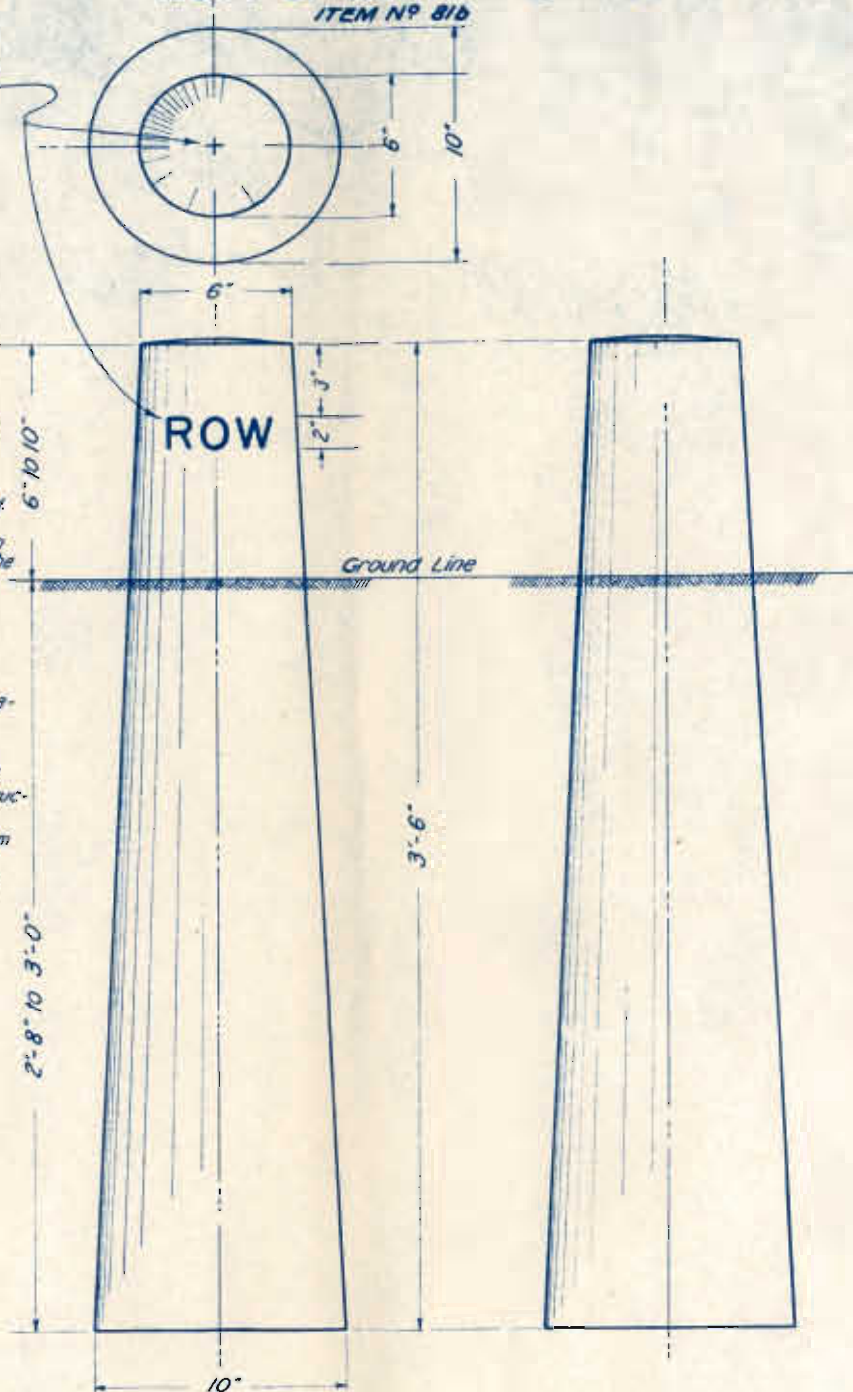
All work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department, adopted June 1, 1940.
Posts shall be made of Class "A" Concrete, except use White Portland Cement.
All exposed surfaces shall be rubbed free of form marks.
All letters and numbers shall be 2" plain upright black, painted or stenciled on the concrete with a good quality of black paint. See Item N° 41, "Second Field Coat - Dark."
Numbers and arrows shall show the proper numbers and directions of the projects each way from where the post is placed.
Post to be set with sign facing the road at the end of the project, two feet inside the R.O.W. line or at a point amply protected from traffic in such a position that the sign will indicate properly the projects to which it refers.

NOTES FOR R.O.W. MARKER POSTS

All work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department, adopted June 1, 1940.
Posts shall be made of Class "A" Concrete.
The upper 12 inches of marker posts shall be rubbed free of form marks, and the top surface of the post must be constructed to drain thoroughly.
Letters on side and cross mark on top to be recessed a minimum of 1/4" into the concrete.
R.O.W. markers to be placed along right of way line with letters facing centerline of highway.

RIGHT OF WAY MARKER POST ITEM N° 818

2" Letters and cross mark to be recessed into top of post a minimum of 1/4"

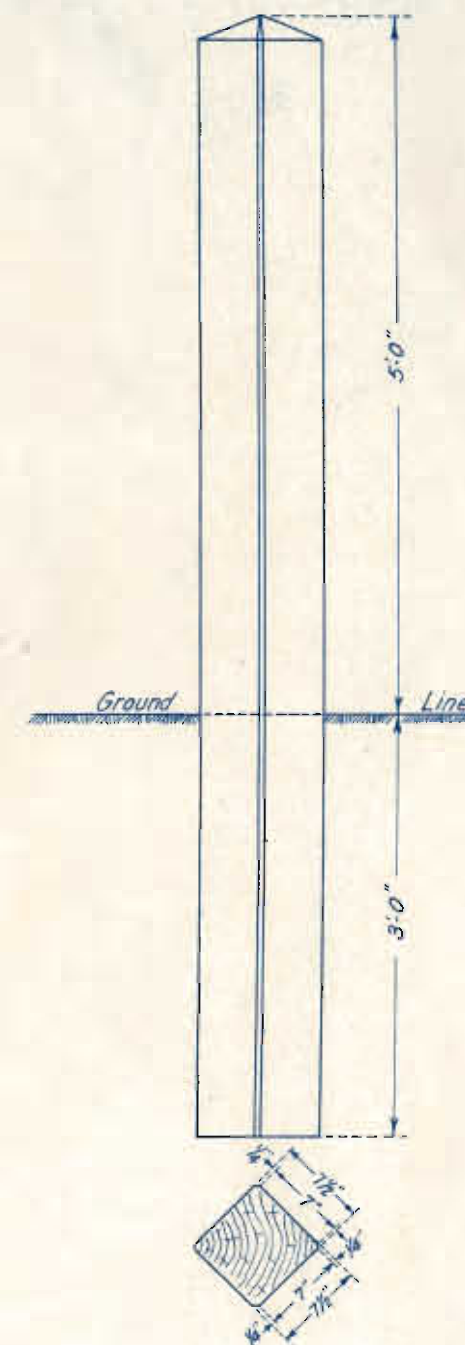


REVISIONS Rev. 6-28-40-A.L.-1940 Specs. Rev. 4-1-42-C.W.-Eliminated bronze tablet & used bar in ROW Marker STANDARD M-7-BY

FED. ROAD DIST. NO.	STATE	DA-WZ	SHEET NO.	TOTAL SHEETS
3	COLO.	3(1)	17	

Rev. 7-9-42 S.B.L. For Untreated Timber Project Marker Post

TIMBER PROJECT MARKER POST MISCELLANEOUS UNTREATED TIMBER ITEM NO. 818



NOTES FOR UNTREATED TIMBER PROJECT MARKER POSTS

All work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department, adopted June 1, 1940, and the Special Provisions for this Project.

Posts shall be 8" x 8" x 8'-0" Untreated Timber, surfaced four sides to 7 1/2" x 7 1/2" and chamfered 1/4".

All letters and numbers shall be 2" plain upright black, painted or stenciled with black paint of a quality approved by the Engineer.

Numbers and arrows shall show the proper numbers and directions of the Projects each way from where the marker is placed.

Post is to be set with one corner facing the road at the end of the Project, two feet inside the R.O.W. line or at a point amply protected from traffic, in such a position that the sign will properly indicate the Projects to which it refers.

Posts shall be painted with two coats of white paint before placing, and one coat after placing.

COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD
MARKER POSTS

Designed by REL
Made by FFS
Checked by REL
Approved by
Date: Apr. 1953

SINGLE 18"x12" TIMBER BOX CULVERT

BILL OF MATERIAL

Miscellaneous Treated Timber

STATION	SIDE	BOX		STRINGERS 3"x12"					SPICE PLATES		CAPS AND SILLS				COLLARS 3"x8"				TOTAL	NAILS		
				NO.					3x2x2-0	● 3"x6"		● 3"x12"		SIDE		TOP & BOT.		LBS.				
		LENGTH	TYPE	8'	10'	12'	14'	16'	NO.	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	BD FT.	50d	60d	TOTAL	
305+40	R	26	S			2			2	4	2'-0"	50	2'-0"	4	1'-6"	4	2'-6"	512	5	28	33	
306+50	L	26	S			2			2	4	2'-0"	50	2'-0"	4	1'-6"	4	2'-6"	512	5	28	33	
307+02	R	26	S			2			2	4	2'-0"	50	2'-0"	4	1'-6"	4	2'-6"	512	5	28	33	
307+73	L	26	S			2			2	4	2'-0"	50	2'-0"	4	1'-6"	4	2'-6"	512	5	28	33	
307+87	R	26	S			2			2	4	2'-0"	50	2'-0"	4	1'-6"	4	2'-6"	512	5	28	33	
309+15	R	26	S			2			2	4	2'-0"	50	2'-0"	4	1'-6"	4	2'-6"	512	5	28	33	
309+70	R	40	S				4		2	4	2'-0"	78	2'-0"	4	1'-6"	4	2'-6"	776	7	44	51	
310+01	R	26	S			2			2	4	2'-0"	50	2'-0"	4	1'-6"	4	2'-6"	512	5	28	33	
311+24	R	26	S			2			2	4	2'-0"	50	2'-0"	4	1'-6"	4	2'-6"	512	5	28	33	
310+27	R	40	S				4		2	4	2'-0"	78	2'-0"	4	1'-6"	4	2'-6"	776	7	44	51	
310+72	L	26	S			2			2	4	2'-0"	50	2'-0"	4	1'-6"	4	2'-6"	512	5	28	33	
320+88	L	40	S				4		2	4	2'-0"	78	2'-0"	4	1'-6"	4	2'-6"	776	7	44	51	
321+00	R	26	S			2			2	4	2'-0"	50	2'-0"	4	1'-6"	4	2'-6"	512	5	28	33	
323+49	R	26	S			2			2	4	2'-0"	50	2'-0"	4	1'-6"	4	2'-6"	512	5	28	33	
313+10	L	34	S				2		4	4	2'-0"	86	2'-0"	4	1'-6"	4	2'-6"	848	7	48	55	
TOTALS		430																8808	83	488	571	

• 3"x10" or 3"x8" caps and sills may be used in lieu of 3"x12".
When 3"x10" or 3"x8" pieces are used the 3"x6" spacer pieces are to be used only where necessary to allow caps and sills to overlap stringer joints a minimum of 3'.

GENERAL NOTES.

All work shall be done according to the standard specifications of the Colorado State Highway Department, adopted June 1, 1940.
All timber shall be close-grained Douglas Fir of the Coast Region or Dense Longleaf or Shortleaf Southern Pine, structural grade.
All timber shall be treated.
All timber shall be fabricated before treatment.
All timber shall be rough full sawn.
All cut surfaces shall be thoroughly saturated with hot creosote oil.

COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD
TIMBER BOX CULVERTS
FOR
SIDE ROAD APPROACHES
SINGLE 18"x12"
DOUBLE 19½"x12"

Designed by J.W.C. Approved by C. J. Bailey
Made by C.R.S. Bridge Engineer
Checked by A.E. Date: Feb. 26, 1942

NAILING DIRECTIONS

Stringers to Sills - Same as caps to stringers.
12" Caps to Stringers - 3-60d nails per cap per str.
10" Caps to Stringers - 3-60d nails per cap per str.
8" Caps to Stringers - 2-60d nails per cap per str.
6" Caps to Stringers - 2-60d nails per cap per str.
Collar (side pieces) - 4-50d nails per piece.
Collar (top & bott.) - 8-50d nails per piece.
Splice Plates - 10-50d nails per plate.

END VIEW

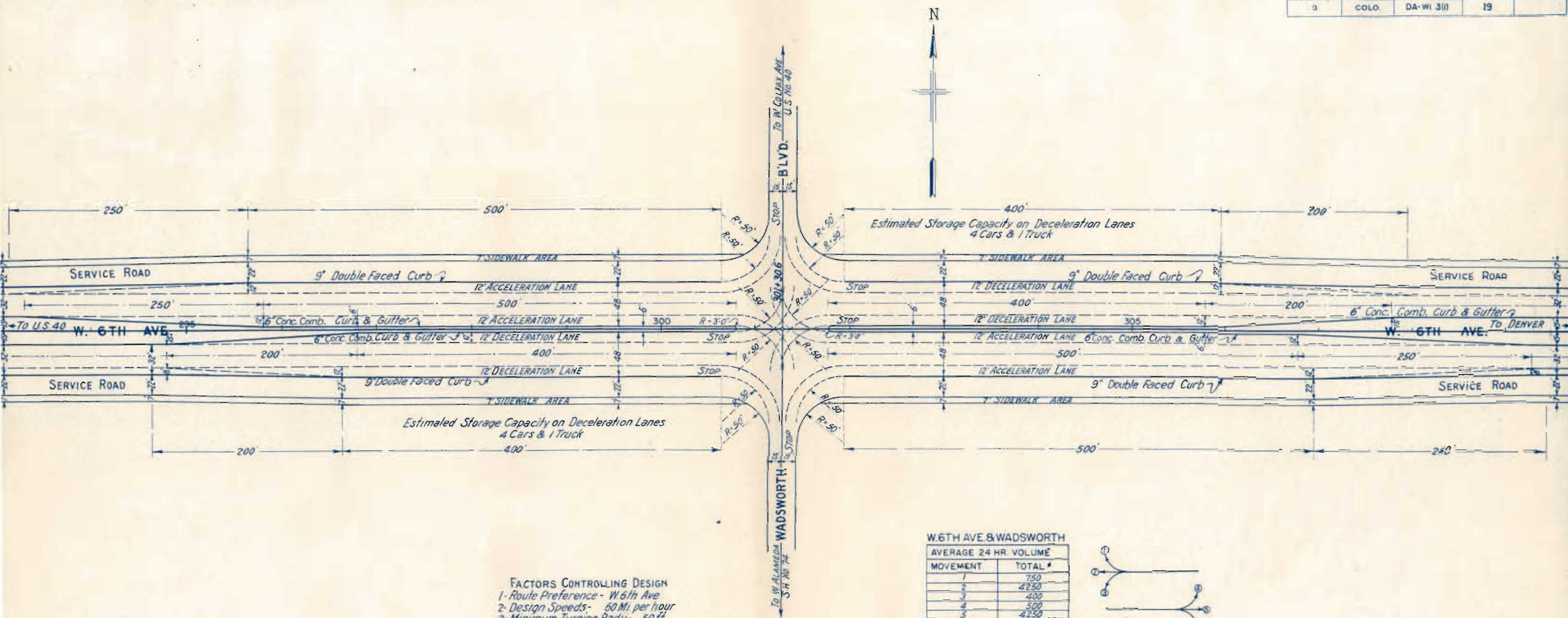
DOUBLE 19½"x12" TIMBER BOX CULVERT

NAILING DIRECTIONS

Stringers to Sills - Same as caps to stringers.
12" Caps to Stringers - 3-60d nails per cap per str.
10" Caps to Stringers - 3-60d nails per cap per str.
8" Caps to Stringers - 2-60d nails per cap per str.
6" Caps to Stringers - 2-60d nails per cap per str.
Collar (side pieces) - 4-50d nails per piece.
Collar (top & bott.) - 12-50d nails per piece.
Splice Plates - 10-50d nails per plate.

END VIEW

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	DA-WI 3(i)	19	

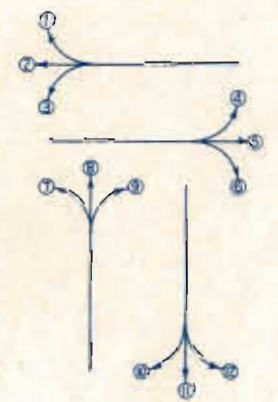


FACTORS CONTROLLING DESIGN
 1- Route Preference - W. 6th Ave.
 2- Design Speeds - 60 Mi. per hour
 3- Minimum Turning Radii - 50 ft.
 4- Restrictions - Stop for all turns
 5- Traffic Movements Prohibited - No U turns.

W. 6TH AVE & WADSWORTH

MOVEMENT	AVERAGE 24 HR. VOLUME
1	750
2	4250
3	400
4	500
5	4250
6	250
7	250
8	250
9	400
10	300
11	250
12	750

* Anticipated Traffic Volume.



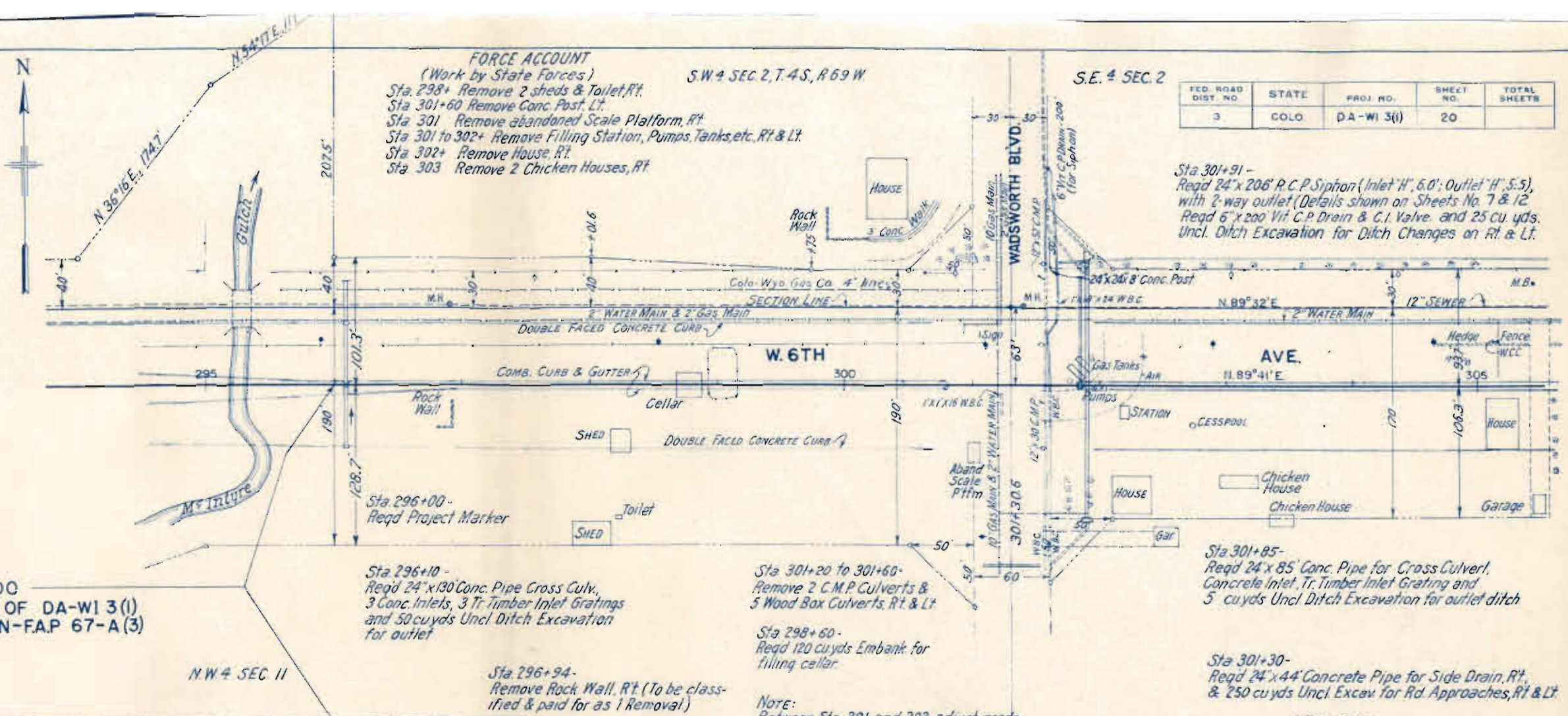
COLORADO
 STATE HIGHWAY DEPARTMENT
 GRADE INTERSECTION
W. 6TH AVE & WADSWORTH
 JEFFERSON COUNTY

Designed by _____
 Made by H.W.M.
 Checked by _____

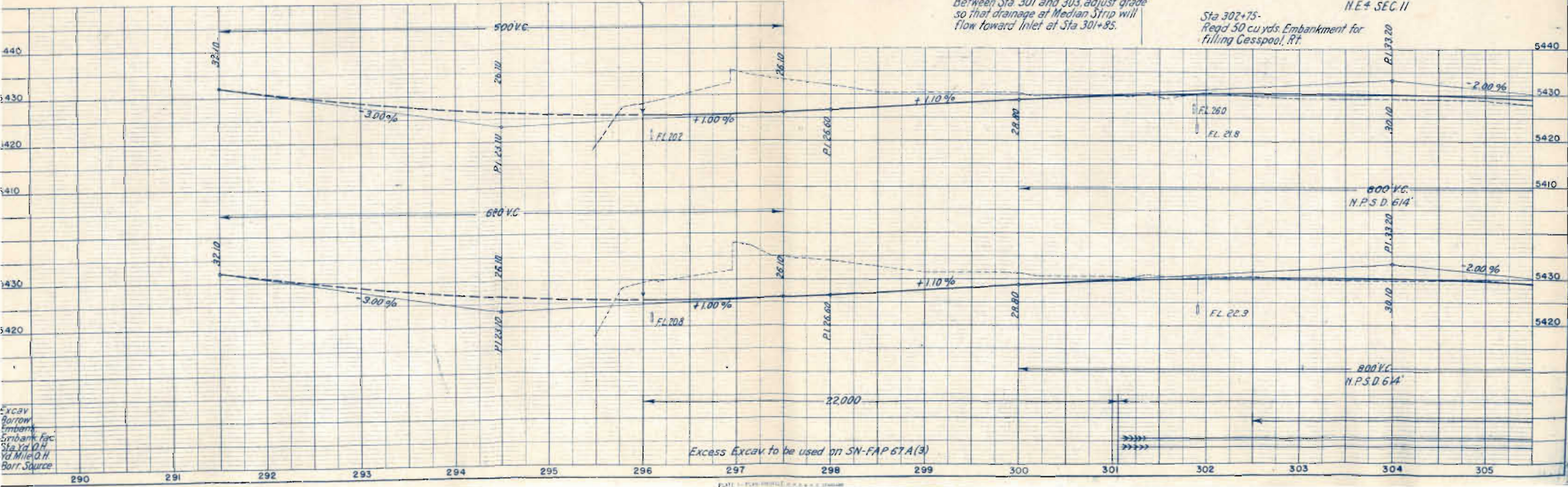
Approved by *H. Marshall*
 Date: *July 23, 1942*

NOTES:
 Alignment and Grade shown on these plans are subject to adjustment after approval by the Denver Office.
 All work required for moving, repairing, reconditioning or revising any and all Public Utilities, due to encroachment on construction of this Project, shall be done by the owners of such Public Utilities.
 Right of Way Markers are tabulated on Sheet No. 7
 Timber Guard Posts are tabulated on Sheet No. 7
 Fencing Requirements are tabulated on Sheet No. 7
 Curbing & Inlet Requirements are tabulated on Sheet No. 7 and details are shown on Sheets No. 5 & 6.

Refer to Sheet No. 19 for details of Wadsworth Blvd. Intersection.
 Clearing and Grubbing throughout the Project is light
 See Special Provisions for Project



FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	DA-WI 3(i)	20	



FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	DA-WI 3(1)	21	

Sta 305+00~
Remove House & Garage Rt.
(F.A. Work by State Forces)
Sta 305+48~ Regd. 20 Cu. Yds. Uncl. Excav.
For Road Appr. Rt. and 26' Sgl. Timb. Side Drain, Rt.
Remove 8"x20" C.M.P. Side Drain Lt.

Sta 306+00~ Remove House & Shed, Rt.
(F.A. Work by State Forces)
Sta 306+50~ Regd. 25 Cu. Yds. Emb. For Road
Appr. Lt. and 26' Sgl. Timb. Side Drain, Lt.

Sta 307+73~ Regd. 25 Cu. Yds. Emb. For Road
Appr. on Lt. and 26' Sgl. Timb. Side Drain, Lt.

Sta 307+87~ Regd. 35 Cu. Yds. Emb. For Road
Appr. on Rt. and 26' Sgl. Timb. Side Drain, Rt.
Remove 6"x12" Wood Box Culvert Lt.

Sta 309+50~ Regd. 24"x112" Conc. Pipe
for Cross Culvert, 3 Conc. Inlets, 3 Tr. Timb.
Inlet Gratings & 25 cu yds Uncl. Ditch Excavation
for outlet ditches.

Sta 309+70~ Regd. 70 Cu. Yds. Emb.
For Road Appr. on Rt. and 40' Sgl.
Timber Side Drain, Rt.

Sta 313+10~ Regd. 350 Cu. Yds.
Emb. for Road Approach Lt. &
44' Sgl. Timber Side Drain, Lt.
Remove 1'x1'x33' Wood Box Culv. Lt.

Sta 310+~ Remove House, Rt.
(F.A. Work by State Forces)

S.E. 1/4 SEC. 2 T4S R69W

Sta 310+61~ Regd. 40 Cu. Yds. Emb. For Road
Appr. on Rt. and 26' Sgl. Timb. Side Drain,
on Rt. and Rem. 1'x1'x16' W.B. Culv. Lt.

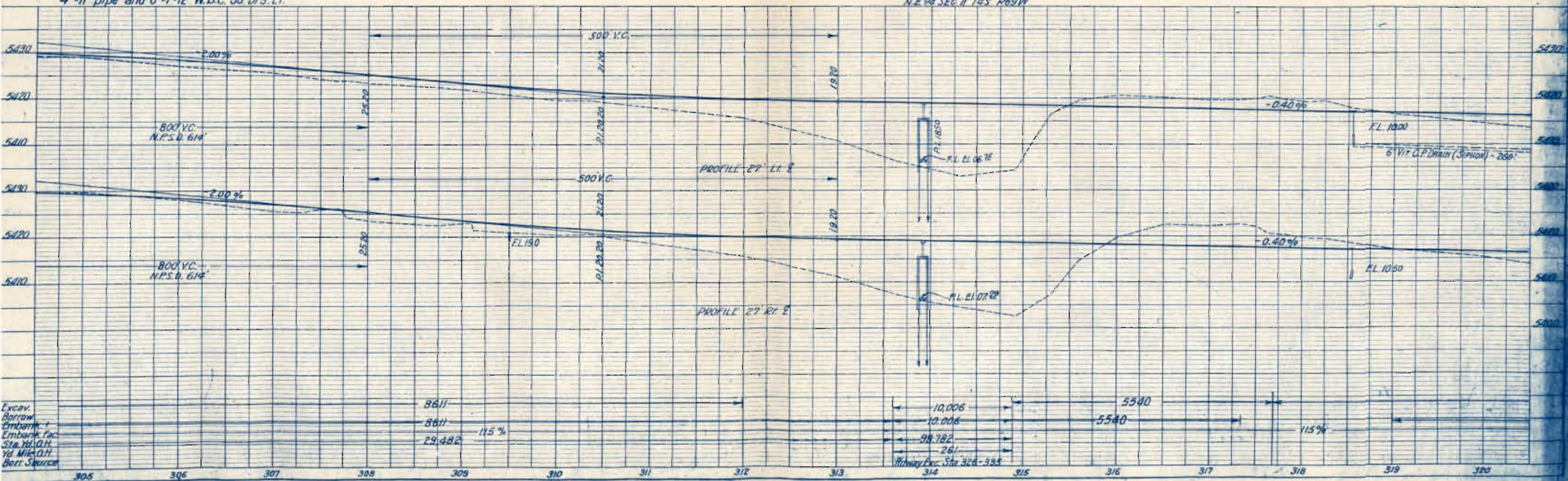
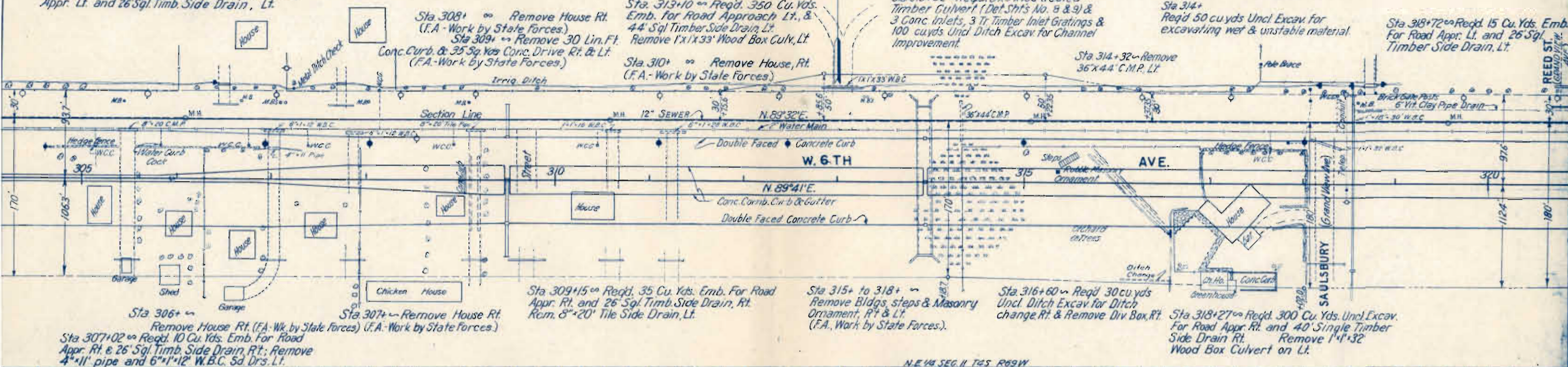
Sta 311+24~ Regd. 50 Cu. Yds. Emb. For Road
Appr. on Rt. and 26' Sgl. Timb. Side Drain, Rt.
Rt. and Remove 6"x1'x28' W.B. Culv. Lt.

Sta 313+92~ Regd. 8'x8'x163' Treated
Timber Culvert (Det. Sh's No. 8 & 9) &
3 Conc. Inlets, 3 Tr. Timber Inlet Gratings &
100 cu yds Uncl. Ditch Excav. for Channel
Improvement.

Sta 318+54~ Regd. 24"x190" R.C.P. Siphon
(Inlet H=3.5'; Outlet H=4.5'); 6'x260' Vit.
C.P. Drain & 6" C.I. Gate Valve
Remove 12'x18'x30' Wood Box Culvert, Lt.

Sta 314+~
Regd. 50 cu yds Uncl. Excav. for
excavating wet & unstable material.

Sta 318+72~ Regd. 15 Cu. Yds. Emb.
For Road Appr. Lt. and 26' Sgl.
Timber Side Drain, Lt.



Sta 320+86 ~ Req'd. 100 Cu Yds. Emb. For Road Appr. Lt. and 40' Singl. Timb Side Drain. Lt.

Sta 321+10 ~ Req'd. 24"x174" Conc. Pipe for Gross Culvert, 3 Concrete Inlets, 3 Tr. Timb Inlet Gratings & 25 cu yds. Uncl. Ditch Excavation for outlet ditch.

Sta 321+60 ~ Req'd. 10 Cu Yds. Emb. For Road Appr. Rt. & 26' Sgl. Timb Side Dr. Rt. Rem. 9"x25" pipe Side Dr. Lt.

Sta 322+ ~ Remove House and 30 Sq Yds. Concr. Paving on Rt. (FA - Work by State Forces)

SE 1/4 SEC. 2 T4S R69W

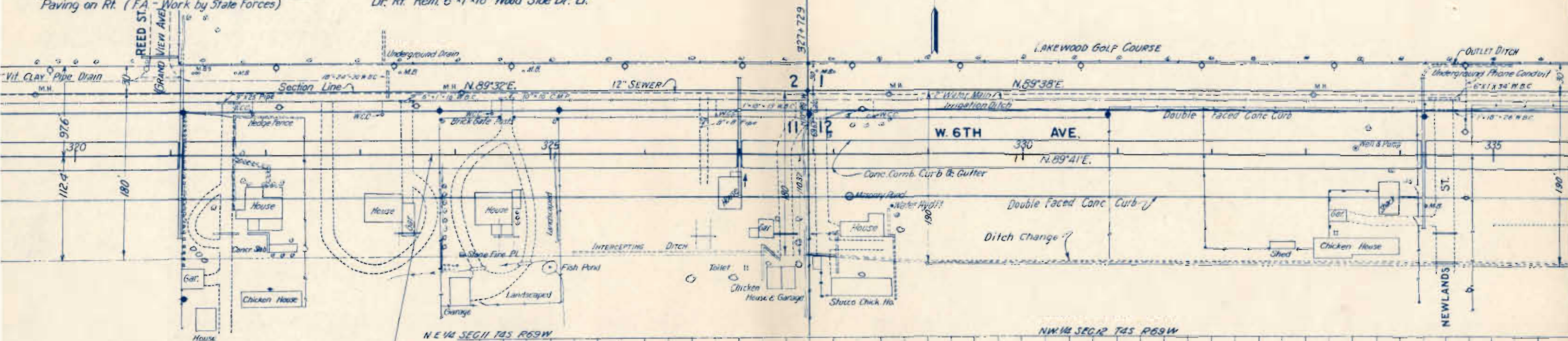
Sta 323+30 ~ Remove 18"x24"x30' Wood Box Culvert. Lt.

Sta 323+ ~ Remove House & Gar. Rt. (FA - Work by State Forces)
Sta 323+49 ~ Req'd. 15 Cu Yds. Unclass. Excav. For Road Appr. Rt. and 26' Singl. Timb Side Dr. Rt. Rem. 6"x1'x16' Wood Side Dr. Lt.

323+75 ~ Req'd Project Marker

SW 1/4 SEC. 1 T4S R69W

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	DA-WI 3(1)	22	



STA. 323+75
END OF DA-WI 3(1)
BEGINNING OF SN-A-F.A.P 67-A(2)

