

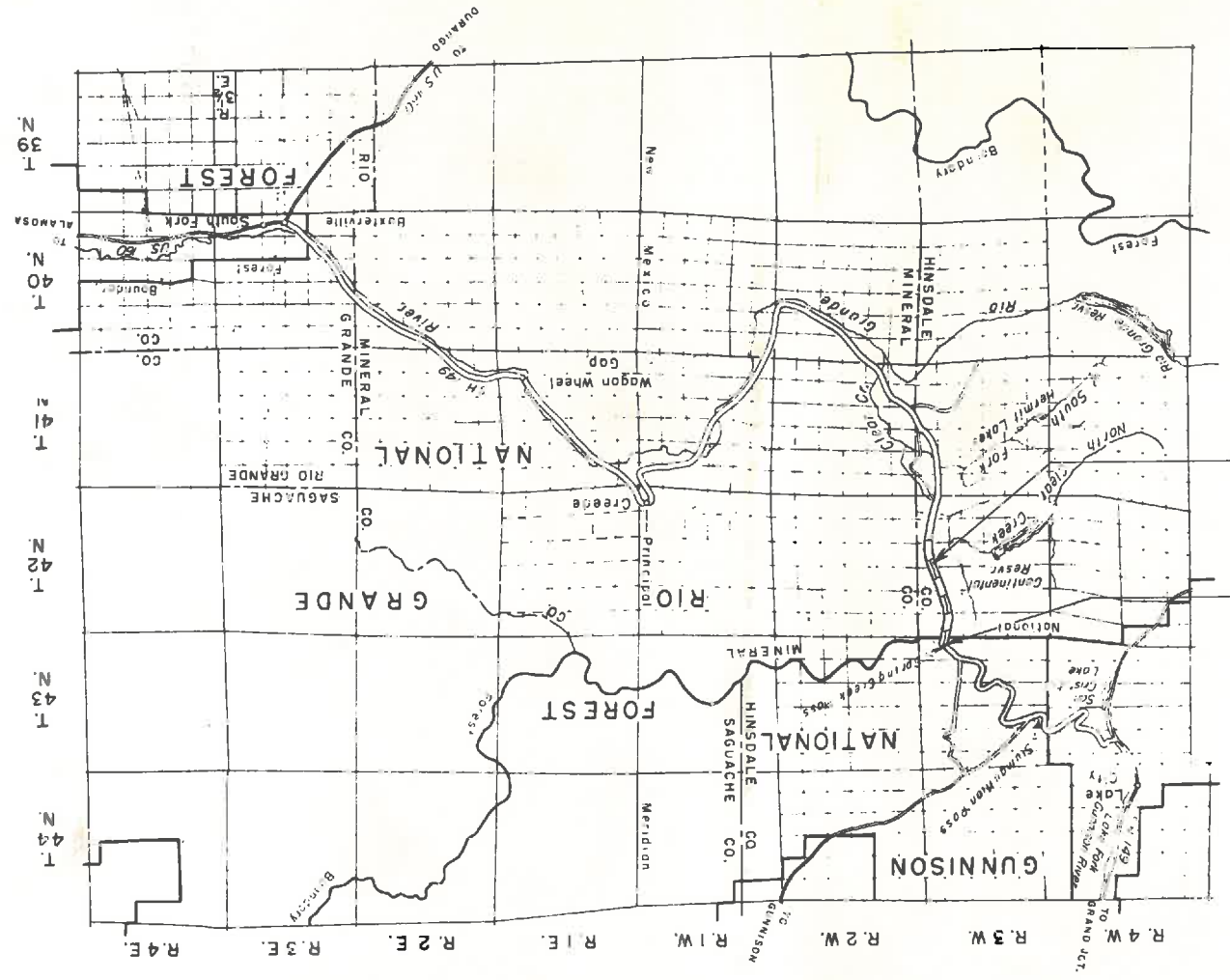
REG.	STATE	PROJECT	SHEET NO.	TOTAL SHEETS
8	Colo.	7-2(1)	1	30

SHEET NO.	DESCRIPTION	STATION TO STATION
1	Title Sheet	
2	Typical Sections	
3-5	Summary (3 Sheets)	
6-14	Plan & Profile (9 Sheets)	1987+00 2223+14.83
15	Std. 107-2, Traffic Signing	
16	Std. 203-1, Approach Roads	
17	Std. 603-1, Fill-Goal Tables for Metal Curb	
18	Std. 603-2, Metal End Sec. for Metal Curb	
19	Std. 603-3, R.C.P. Bedding Details & Fill-Chase Tables	
20	Std. 603-4, End Sec. for R.C.P. Curb	
21	Std. 604-1, Drop Inlets & Pipe Elbow Inlets	
22	Std. 605-1, Underdrain	
23	Std. 607-2, Wire Fence w/Sheet Posts	
24	Std. 607-1, Lay Down Wire Fence	
25-26	Std. 607-6, Prefabricated Type Cattle Guard	
27	Std. 617-1, 5'x7' B Structure-Plate Cattle Pass	
28	Std. 618-1, Loose Riprap Erection Control at Pipe Curb	
29	Std. 623-2, U.M. Maintenance Posts & Delimiters	
30	Std. 633-1, Sign Details	

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
PLANS FOR PROPOSED
CLASS 2
SOUTH FORK - LAKE CITY
HINSDALE COUNTY
LENGTH 4.473 MILES
GUNNISON AND RIO GRANDE NATIONAL FORESTS



- CONVENTIONAL SYMBOLS
- PROPOSED R/W LINE
 - STAKED CENTERLINE
 - EXISTING FENCE
 - R/W LINE FENCED
 - SLOPE LIMIT - TOP OF CUT
 - SLOPE LIMIT - TOP OF FILL
 - FOREST BOUNDARY
 - ROCK AREA
 - MARSH OR SWAMP
 - TREES
 - TRACK OR TRAIL
 - PRESENT ROAD
 - EXISTING BOX CULVERT
 - NEW PIPE CULVERT
 - CHANNEL CHANGES
 - EXISTING PIPE-CULVERT
 - IRRIGATION DITCH OR FURROW DITCH
 - MATERIALS TEST HOLE & NUMBER
 - RIVER WITH BRIDGE
 - INTERMITTENT STREAM
 - VERTICAL CONTROL POINT
 - TRIANGULATION STATION
 - GATE
 - CATTLE GUARD



End Proj. 7-2(1)
 Sta. 2223 + 14.83
 Begin Proj. 7-2(1)
 Sta. 1987 + 00

LEGEND

EXISTING ROAD	UNIMPROVED	GRADED	REINFORCED	COURSE	TREATMENT	NO. OF PLANT	CONCRETE
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Permanent
FILE COPY
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U.S. DEPARTMENT OF TRANSPORTATION
 FEDERAL HIGHWAY ADMINISTRATION
 REGION NO. 8 DENVER, COLORADO
 APPROVED: _____
 REGIONAL ADMINISTRATOR
 DATE: _____

Plans prepared by: E.H.W.A.
 Date: May 1973
 TYPE OF CONSTRUCTION
 Grading, Drainage, & Subbase
 DESIGN DESIGNATION
 A.D.T. (1973) - 350
 A.D.T. (1993) - 470
 D.H.V. - 235
 D. - 65%
 T. - 10%
 V. - 50 M.P.H.

TYPICAL CROSS SECTION

NATIONAL FOREST HIGHWAYS

U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
REGION-8 DENVER, COLORADO

ROUTE: *South Fork - Lake City*
PROJECT: *7-2(1) Grading, Drainage, Subbase*
NATIONAL FOREST: *Gunnison & Rio Grande*
COUNTY: *Hinsdale*
STATE: *Colorado*

ROADBED WIDTHS: GRADED: *46'* SH. to SH.
BASE: *36'* SH. to SH.
SURFACE: *34'* SH. to SH.

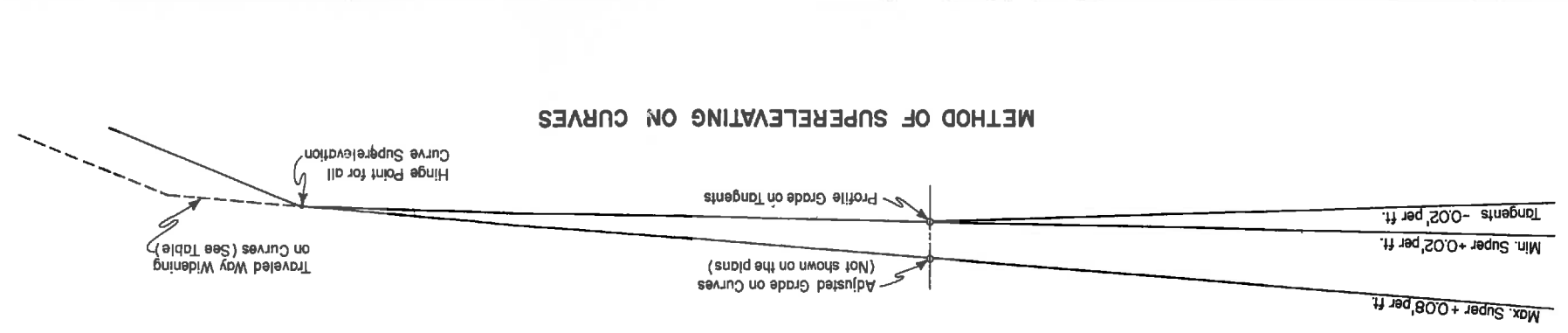
TRAVELED WAY WIDENING

Widening, in feet, for 2-Lane Pavements
(One Way or Two Way)

Degree of Curve	Traveled Way Width	
	22 feet	24 feet
Curve	30 40 50 60 70	30 40 50 60 70
Design Speed (mph)	30 40 50 60 70	30 40 50 60 70
2.0	2.0	2.0
3	2.0	2.0
4	2.0 2.0	2.0 2.0
5	2.0 2.0	2.0 2.0
6	2.0 2.0 2.5	2.0 2.0 2.5
7	2.0 2.5	2.0 2.5
8	2.0 2.5	2.0 2.5
9	2.0 2.5 3.0	2.0 2.5 3.0
10-11	2.0 2.5	2.0 2.5
12-14.5	2.5 3.0	2.5 3.0
15-18	3.0	3.0
19-21	3.5	3.5
22-25	4.0	4.0
26-26.5	4.5	4.5

Revisions

(Subgrade, Base & Surfacing on Curves)
Widening is applied equally on right and left. Where short tangents exist in reversing alignment, continue widening throughout.

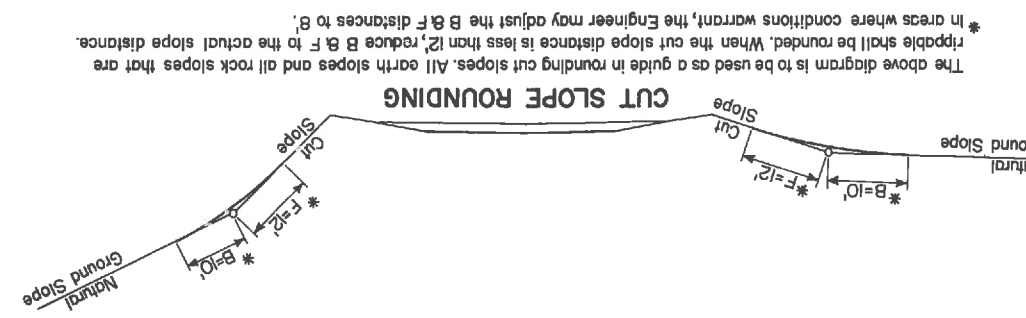


GENERAL NOTES

- The courses above profile grade are a part of the pavement structure and will remain constant; however, to insure adequate structural stability in the subgrade zone, the Engineer may vary the thickness shown in the above table. In such event, the roadway excavations and embankments shall be constructed to the grade that will allow for the required thickness. The thickness of materials shown in the above table are based on laboratory analysis of samples taken at random along the proposed construction.
- The alignment, grade, width of side ditches, and the side slope ratios of roadway excavations and embankments may be adjusted by the Engineer to assure adequate drainage and stability, and to provide an economical balance of quantities.

SELECT BORROW FOR TOPPING

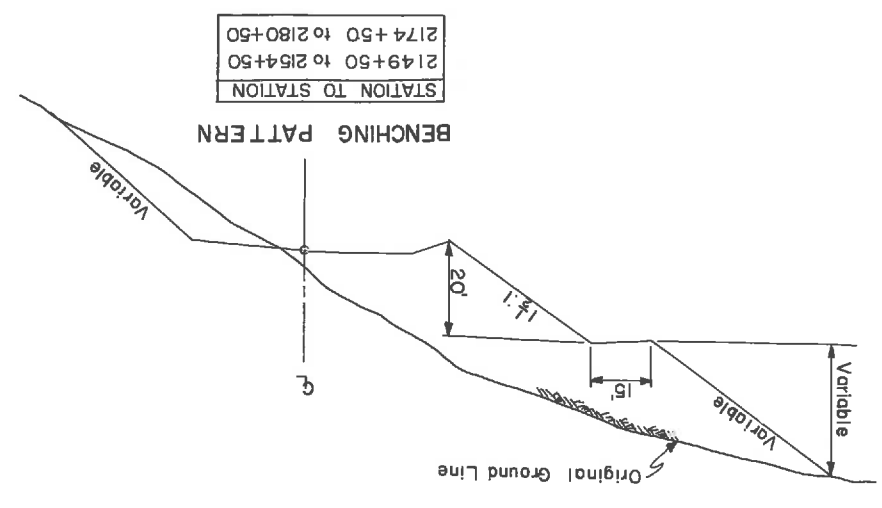
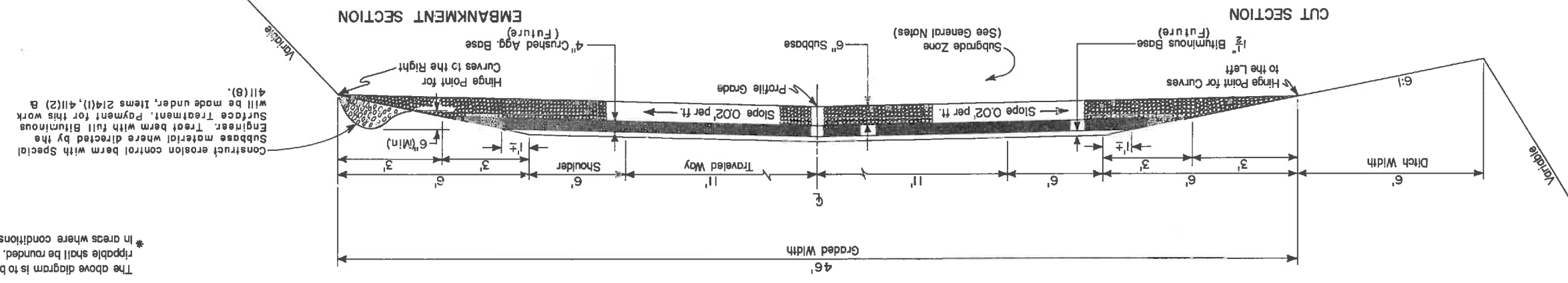
STATION TO STATION	Item	Depth
2007+00 to 2025+00	203 (7)	20"
2025+00 to 2048+00	203 (7)	9"
2089+50 to 2102+00	203 (7)	4"

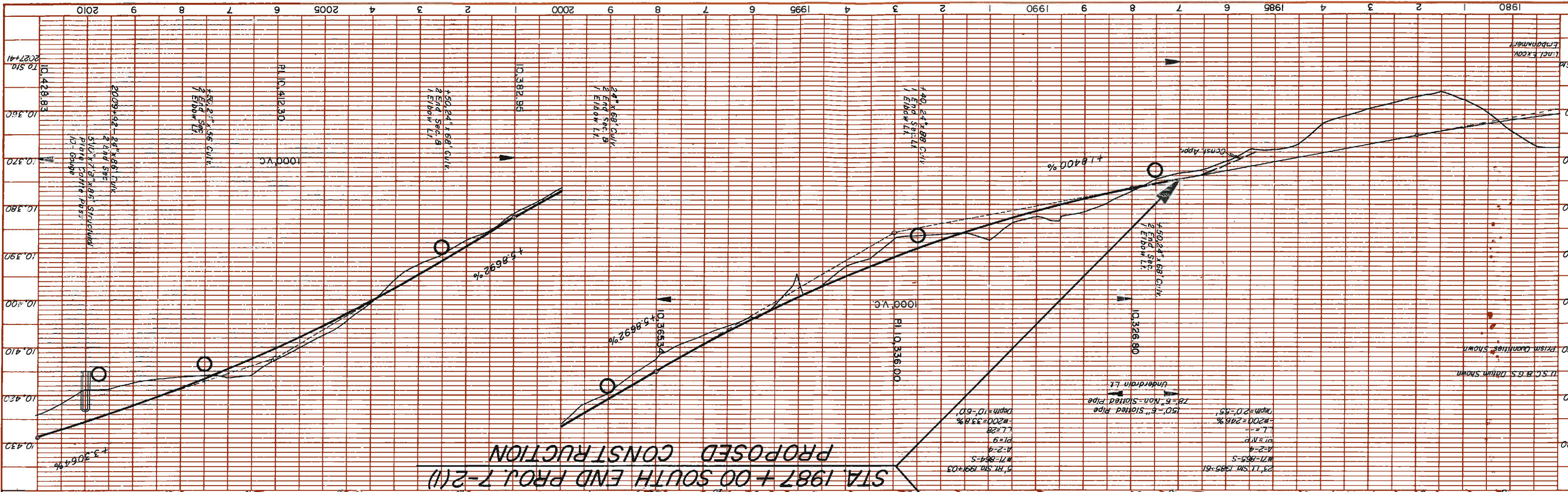


The above tables are to be used as a guide in the construction of the project. The Engineer may vary the slope ratios to fit existing conditions.

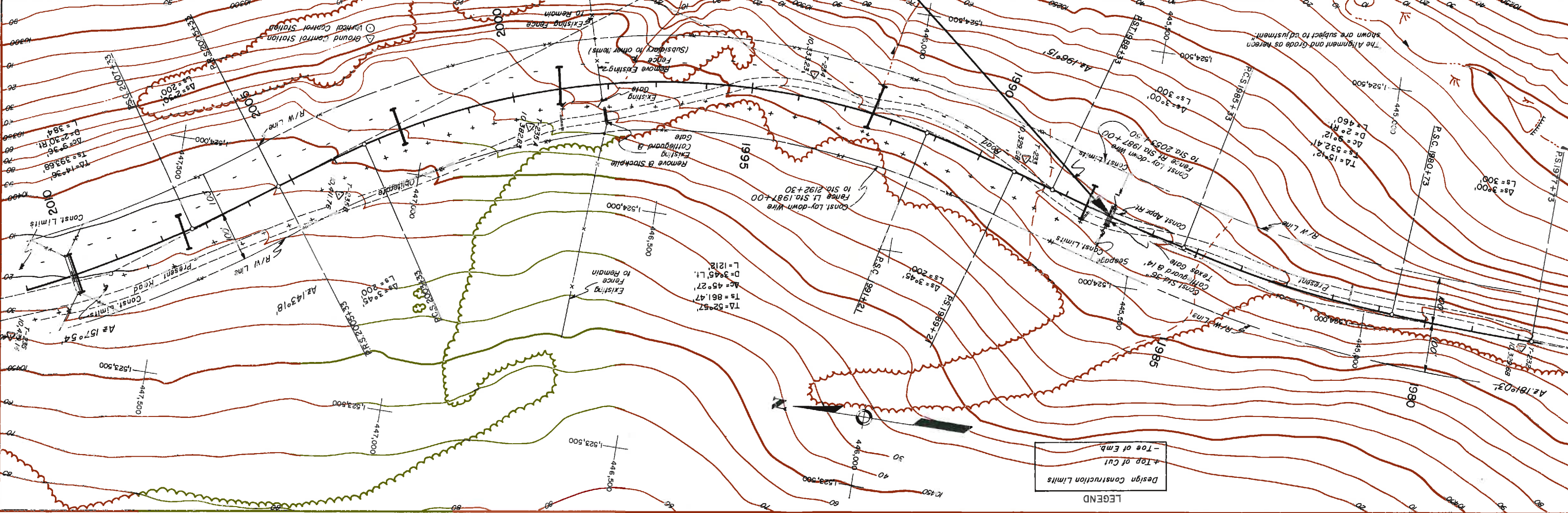
HEIGHT	EMBANKMENT SLOPE
0' to 3'	6:1
3' to 6'	4:1
6' to 10'	3:1
10' to 30'	2:1
over 30'	1 1/2:1

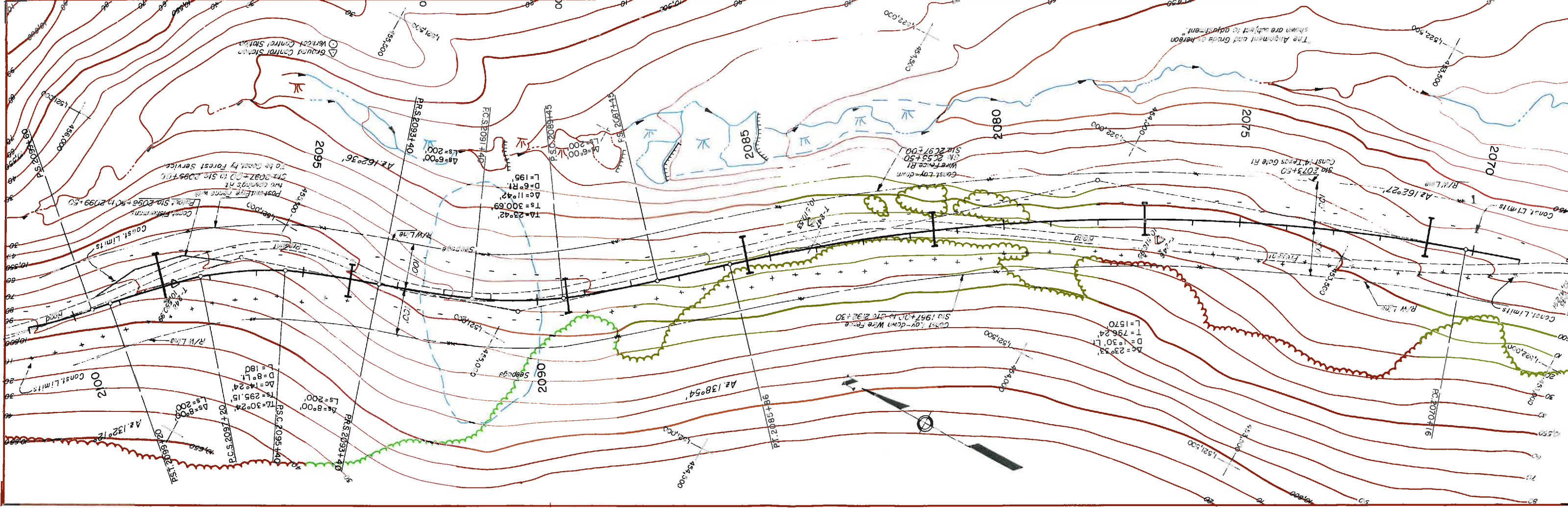
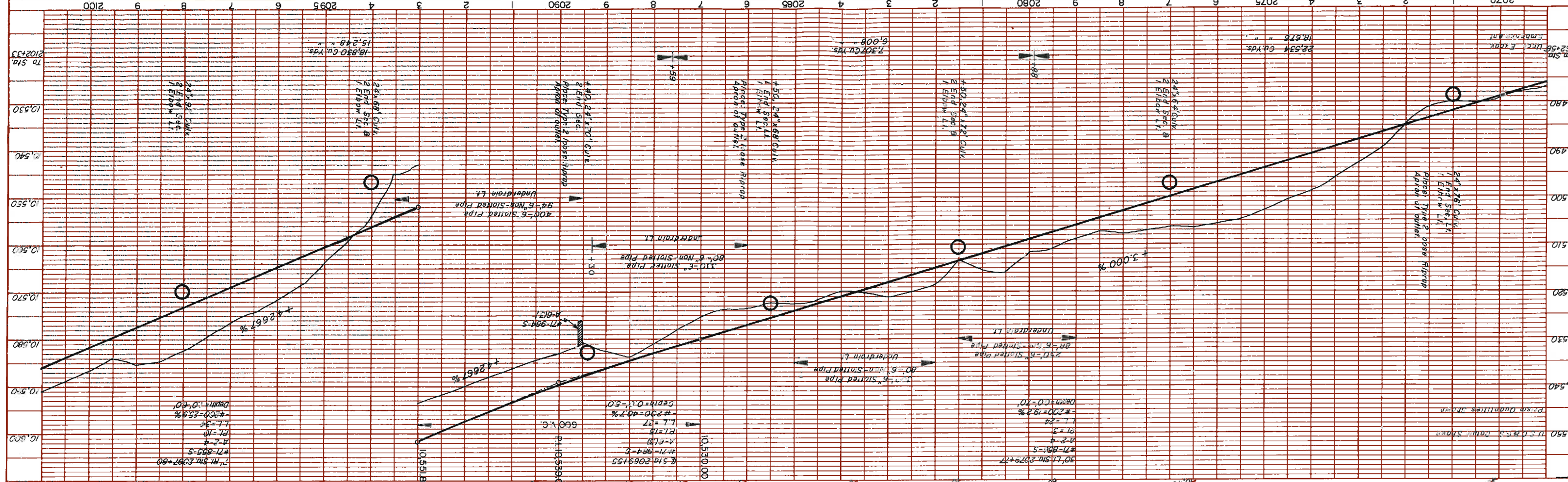
HEIGHT	CUT SLOPE
0' to 3'	6:1
3' to 6'	4:1
6' to 10'	3:1
10' to 30'	2:1
over 30'	1 1/2:1

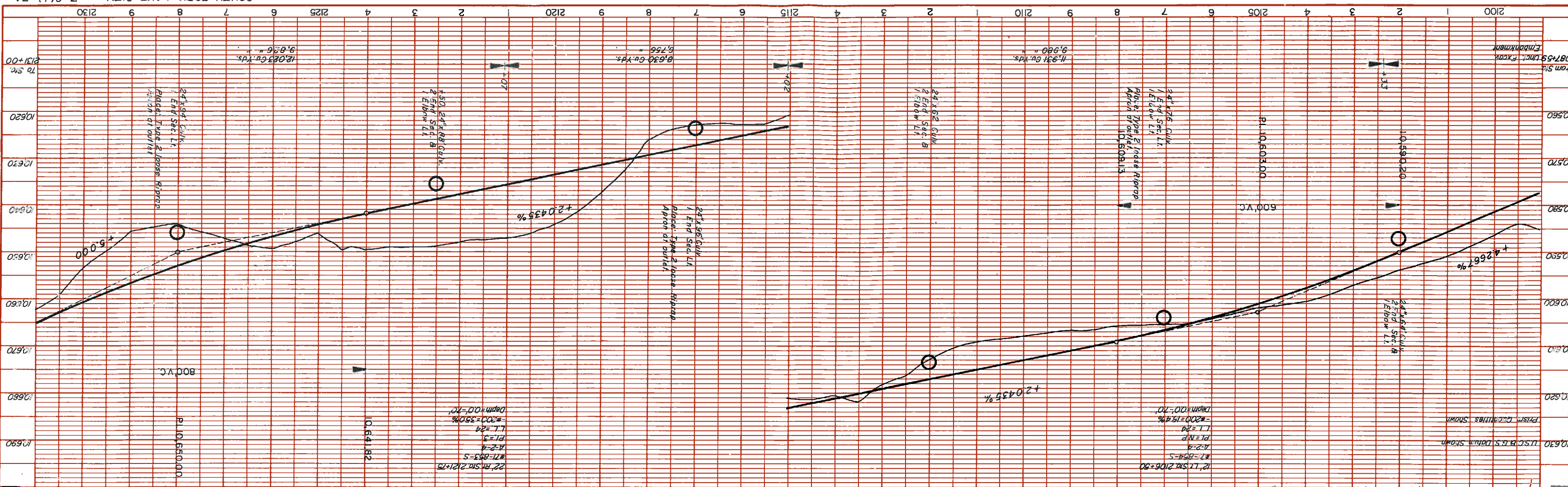
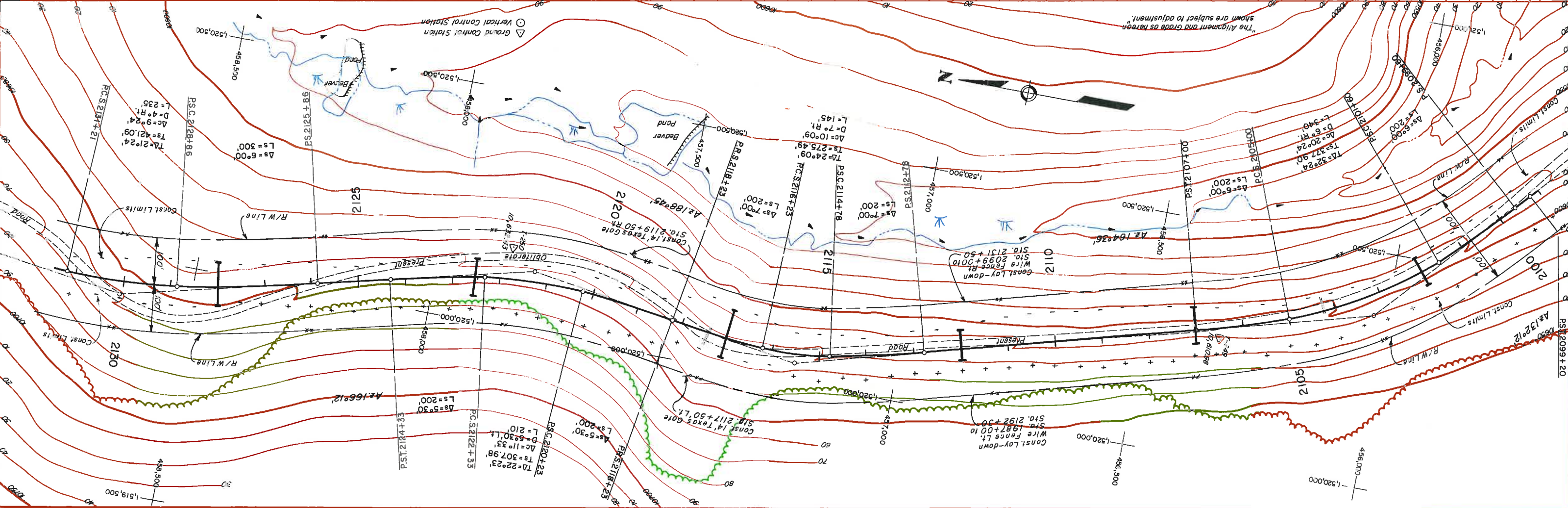


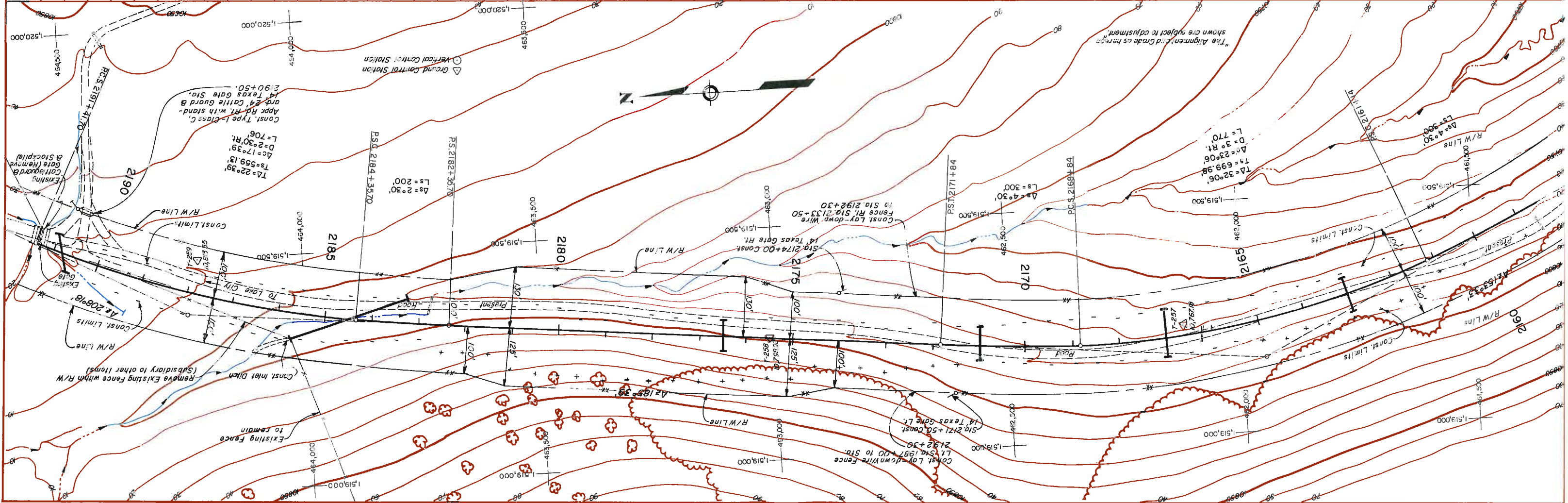
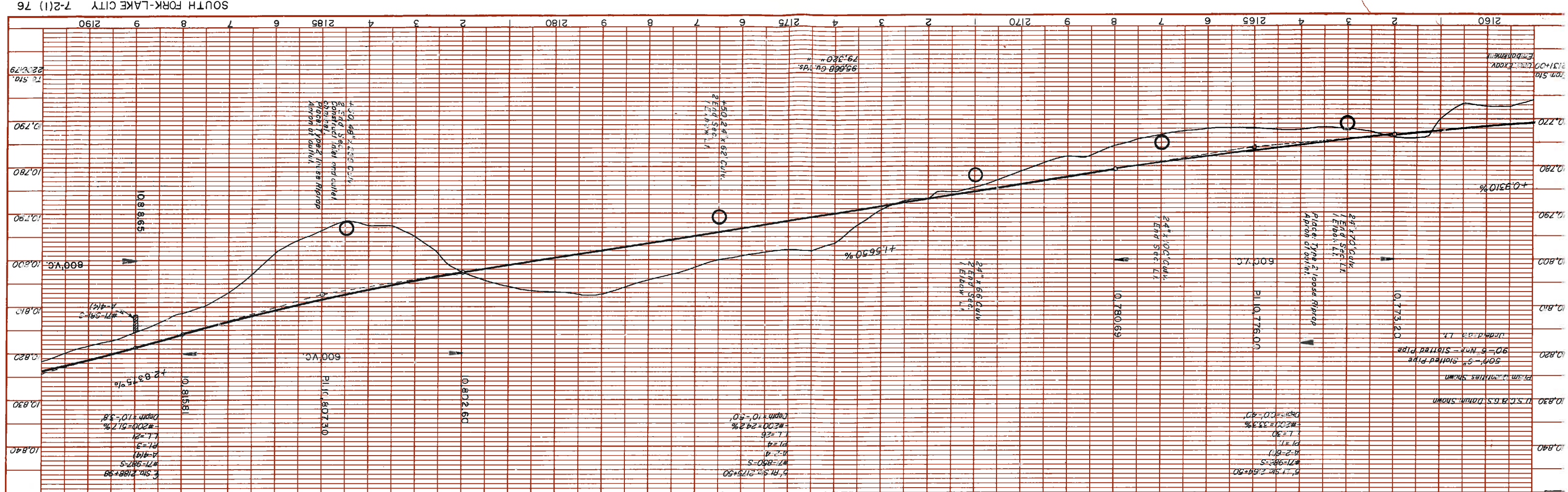


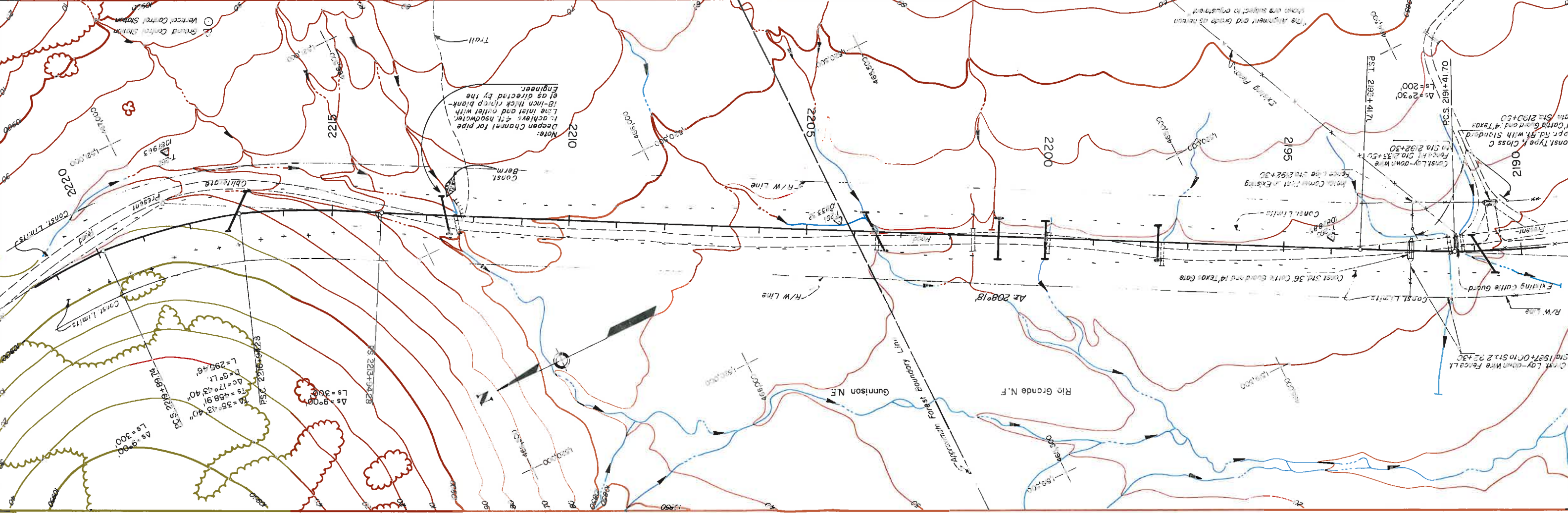
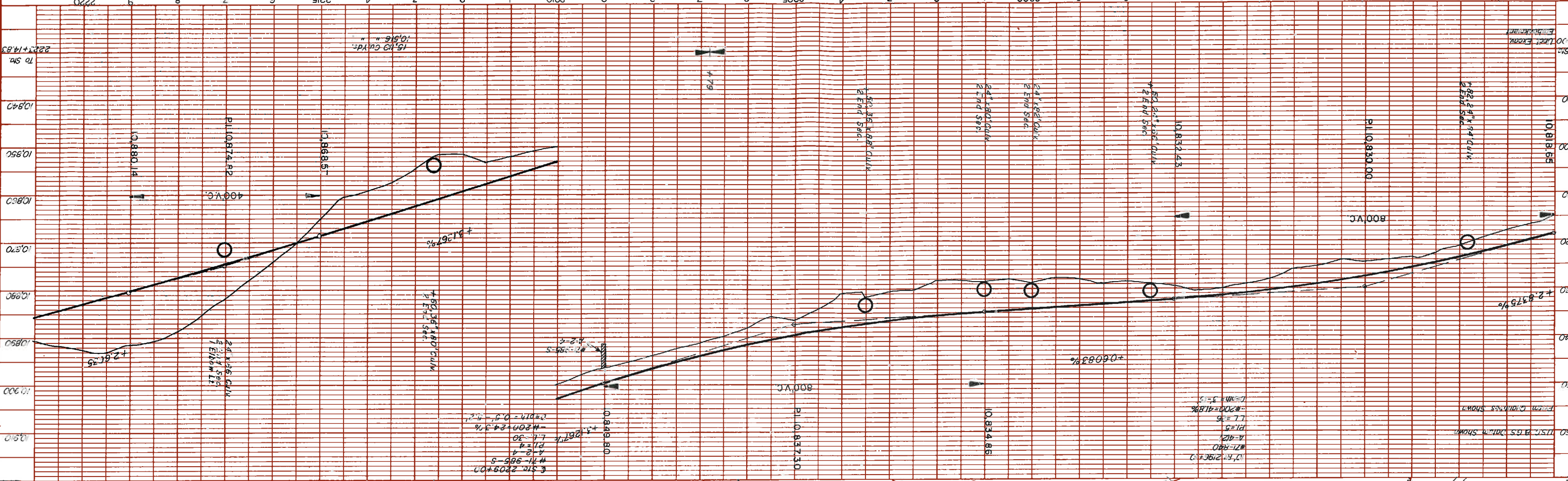
STA 1987+00 SOUTH END PROJ. 7-2(1) PROPOSED CONSTRUCTION

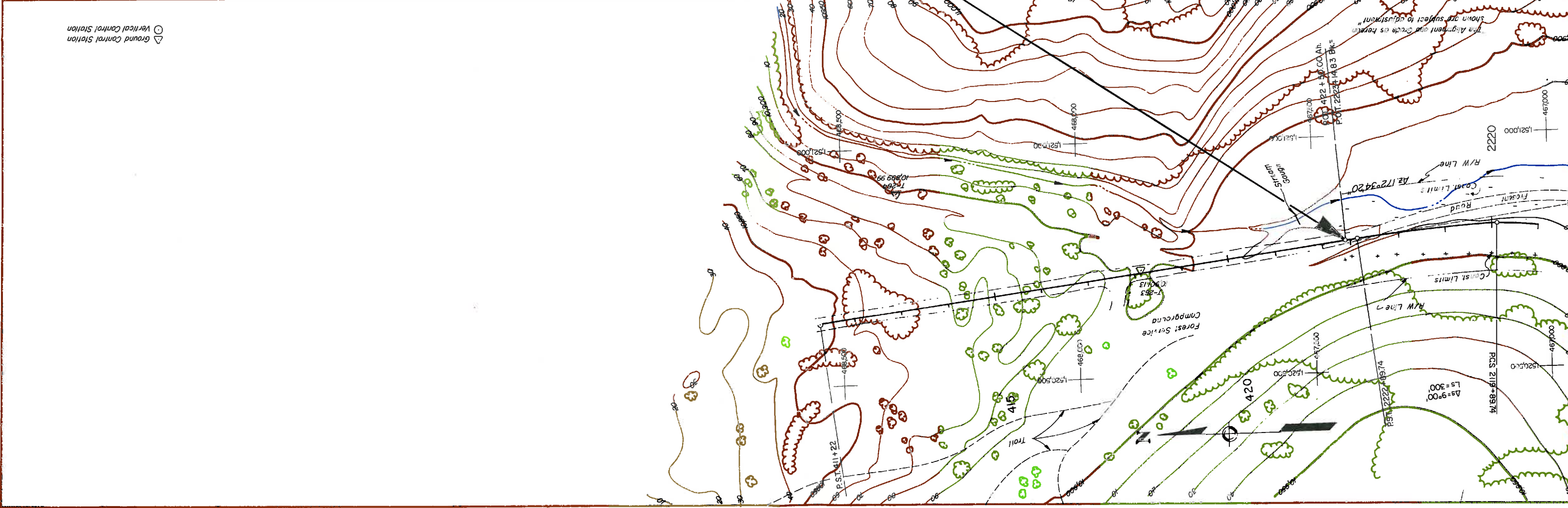
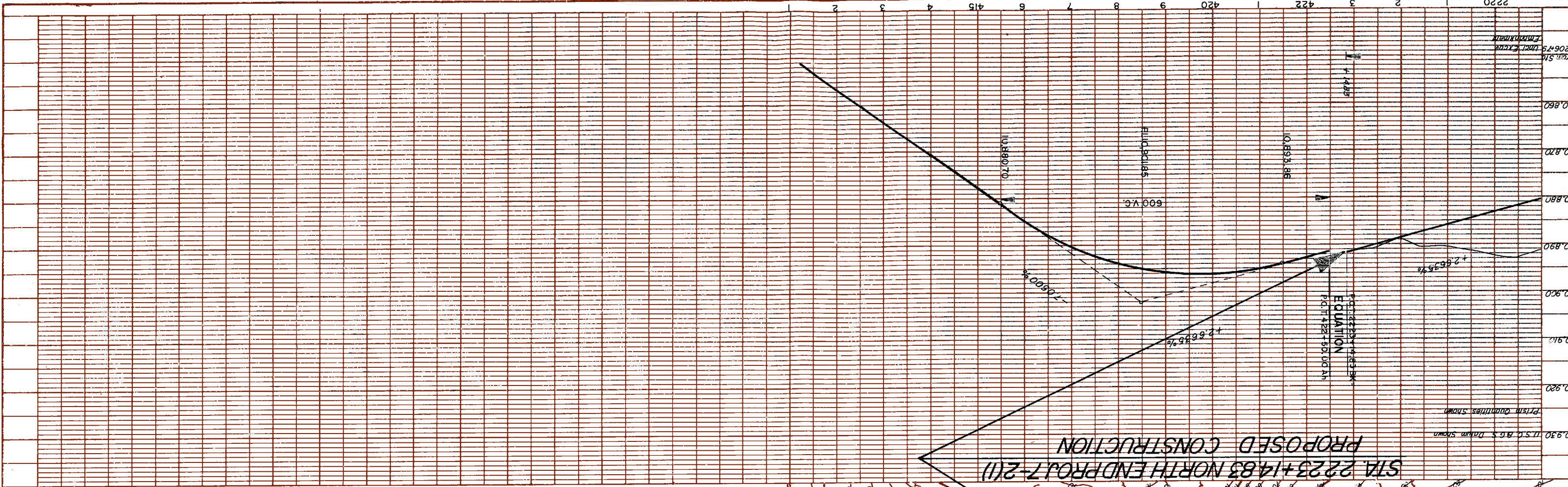








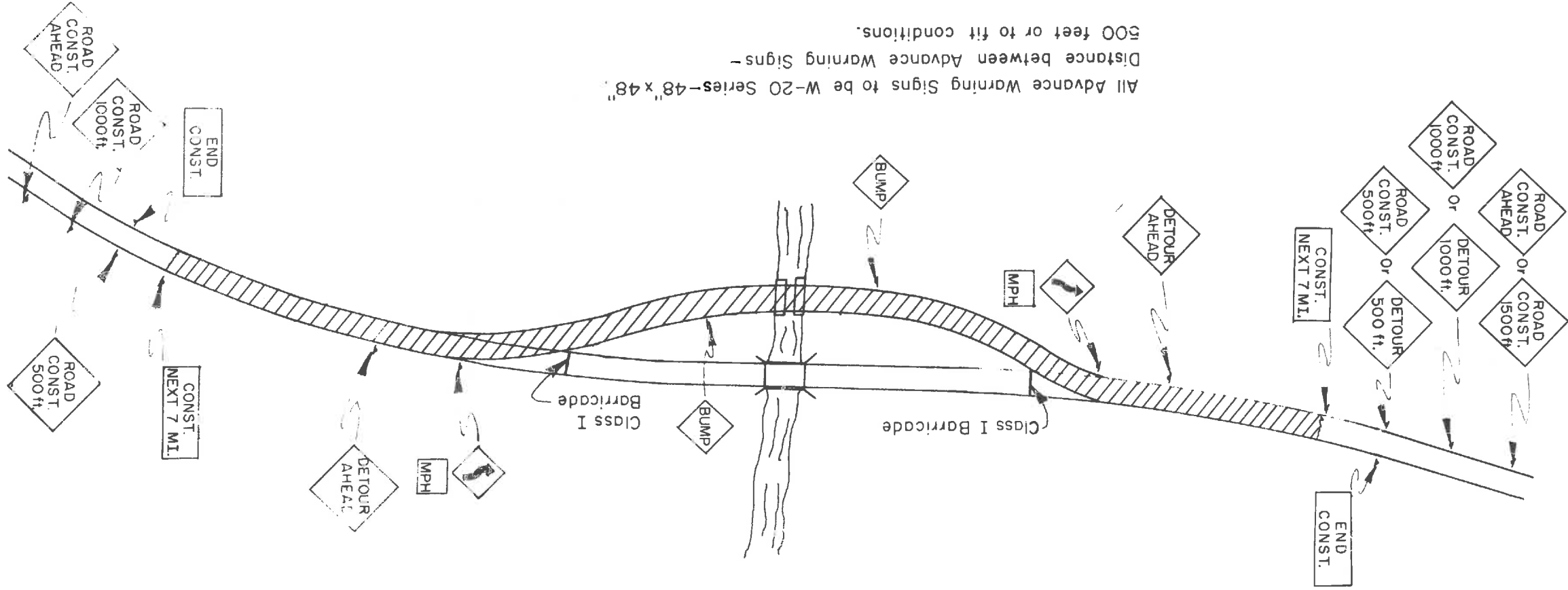




○ Vertical Control Station
 △ Ground Control Station

GENERAL NOTES

1. All signs and barricades shall be in accordance with the Manual on Uniform Traffic Control Devices.
2. All construction signing is subject to inspection & approval of the engineer.
3. Construction signing details shall be reviewed and agreed upon at the Pre-construction Conference.
4. Advance warning signs shall be erected before any construction work is started.
5. Any combination of 3 advance warning signs may be used to cover actual conditions.
6. Major traffic carrying approaches within the project limits will have advance warning signs installed similar to the end approaches shown herein.
7. Signs used to convey a message for night driving must be reflectorized or lighted.
8. Signs are to be covered or otherwise put out of service when not needed.
9. Begin & end construction signs are to be used on all projects.
10. All signs shall be kept clean and in good condition.
11. Additional signs beyond the minimum list may be required to cover the actual construction conditions.
12. In event of conflict, size, character, & placement shall be in accordance with Manual on Uniform Traffic Control Devices.
13. Delineators shall be erected temporarily at locations designated by the Engineer.



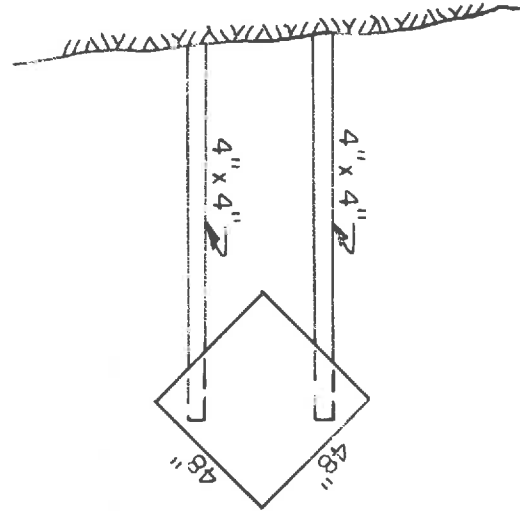
All Advance Warning Signs to be W-20 Series-48"x48" Distance between Advance Warning Signs - 500 feet or to fit conditions.

TYPICAL DETOUR

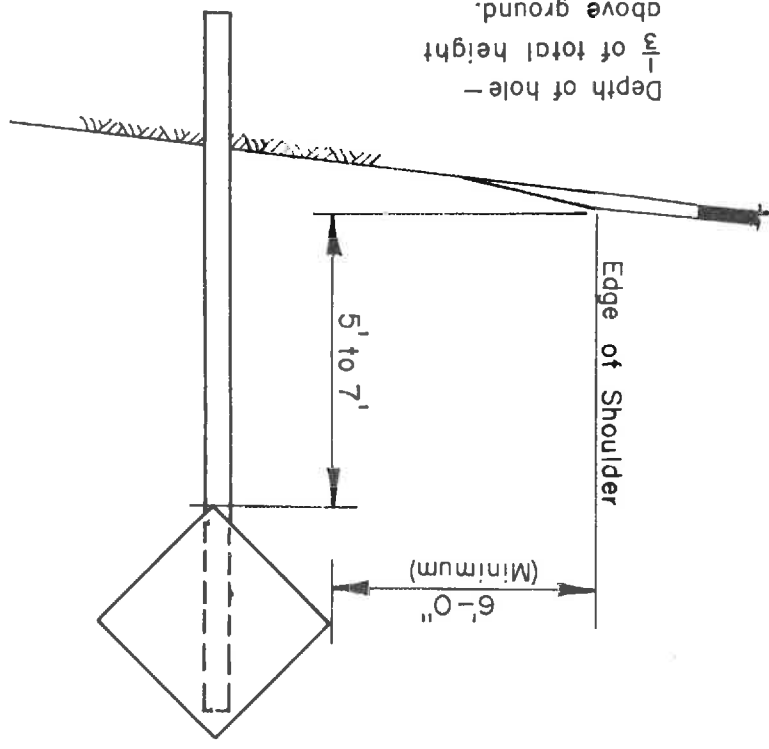
CONSTRUCTION SIGN LIST (MINIMUM)			
CODE	SIZE	NO.	DESCRIPTION
W-20	48" x 48"	6	Advance Warning Signs
G-2C-1	60" x 36"	2	Road Construction
G-2C-2	60" x 24"	2	End Construction
Various	Various	20	Internal Construction Signs

* Forest Highway Projects
 * Number of signs shown is approximate

Signs 36"x36" and under may be mounted on a single 4"x4" post. Over 36"x36" use double 4"x4" post.



PLACEMENT



POST DETAILS

TRAFFIC SIGNING FOR HIGHWAY CONSTRUCTION

U.S. DEPARTMENT OF TRANSPORTATION
 FEDERAL HIGHWAY ADMINISTRATION
 DENVER, COLORADO
 REGION - 8

(Advance Warning & Typical Detour)

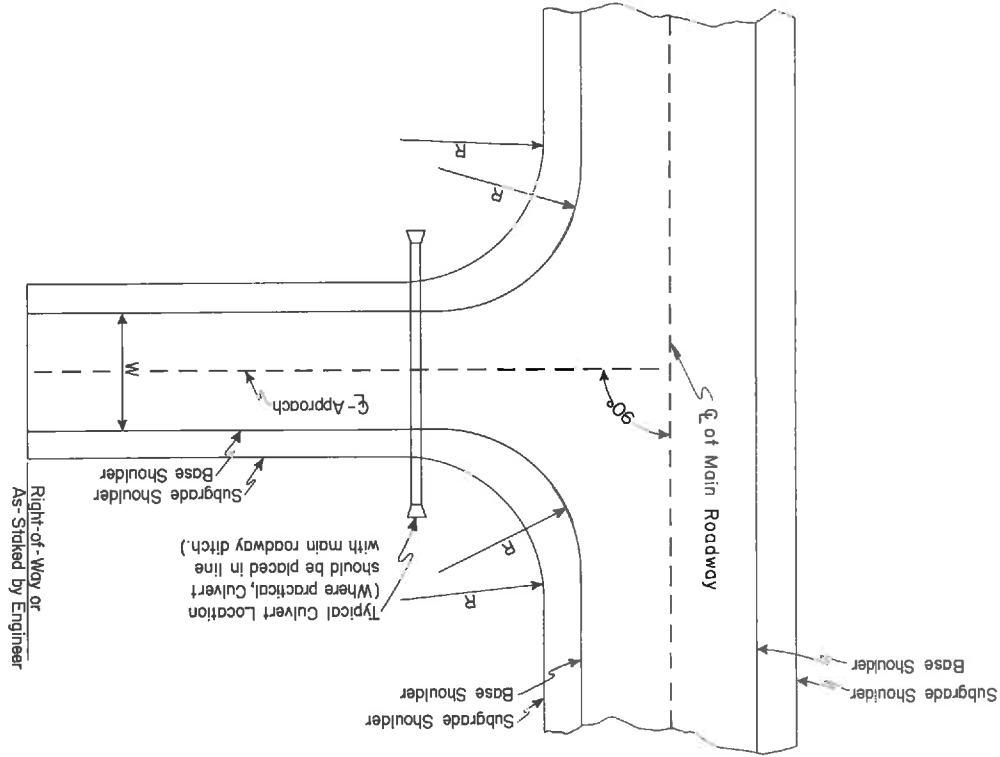
GENERAL NOTES

Construction: Approaches to be constructed to fit local conditions, but in such a manner as to minimize traffic hazards and afford safe and commodious entry and exit of traffic to and from the main roadway. Cut and fill slope ratios and degree of finish for approaches shall be compatible with adjacent roadway construction. Where it becomes necessary to construct approach roads beyond Right-of-Way lines, written permission shall be secured from the property owner under a Right-of-Way agreement or a construction easement. Bituminous base and/or Surfacing courses shall extend to the right-of-way or easement line unless otherwise shown on the plans. Special subbase and crushed aggregate base shall be placed on the remainder of the approach and will not be paved unless covered in the right-of-way agreement or otherwise indicated on the plans. The desirable angle of approach road with the main roadway is 90°. In special conditions this angle may be varied ± 15°.

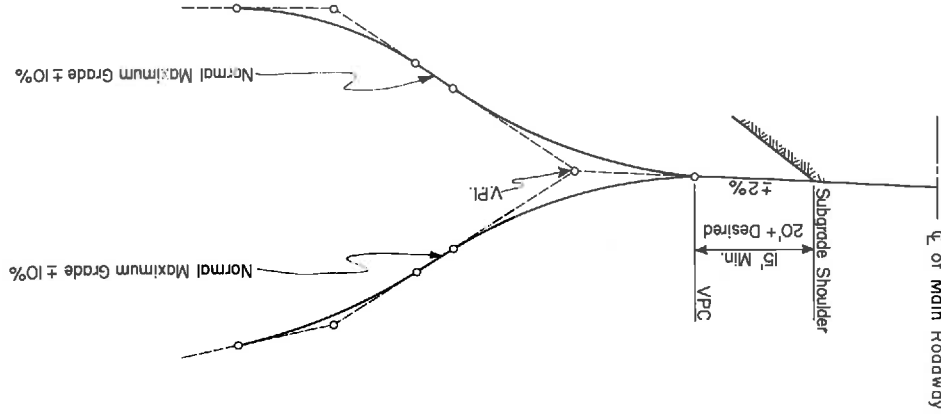
① Radii may be varied by the Engineer to fit unusual field conditions

TYPE	CLASS	W	R	USE
1	A	12	30	Minimum approach to provide access to an area having very limited use, ADT 1 or less
1	B	16	40	Field approach to a limited area, ADT 1 or less
2	A	16	50	Desirable field approach, ADT 1 or less
2	B	20	50	Desirable farm, residence, or other minimum use approach, ADT 1 to 5
2	C	22	50	Desirable public road or other 2-way highway, ADT 5 or greater
2	D	24	75	Public road or other 2-way highway intersection, ADT 5 or greater

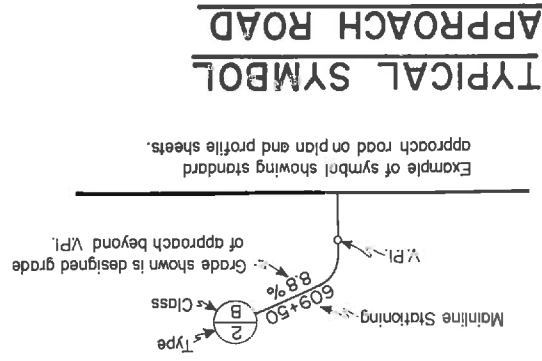
WIDTHS FOR APPROACHES



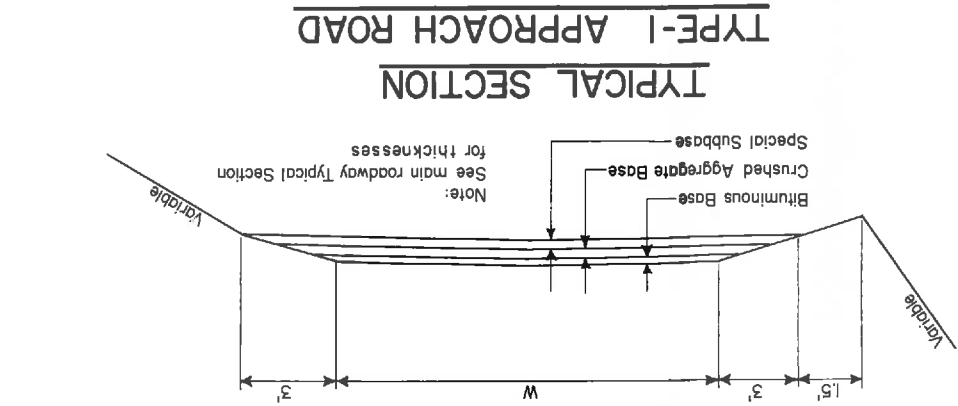
**TYPICAL PLAN
RIGHT ANGLE APPROACH ROAD**



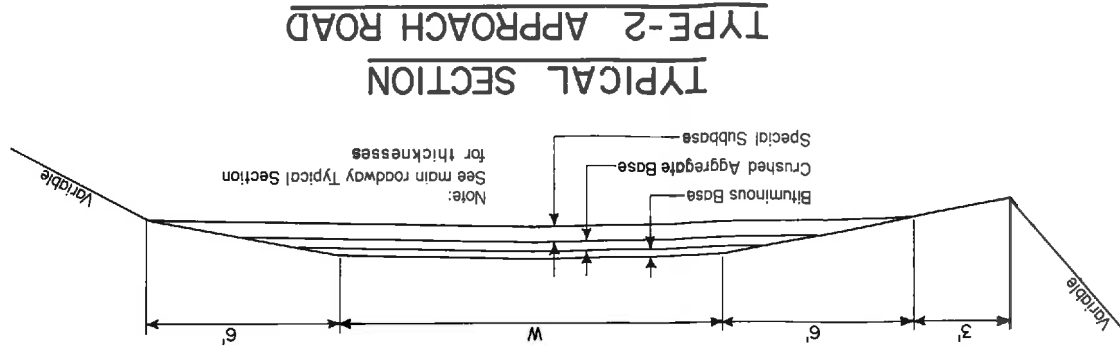
**TYPICAL PROFILE
APPROACH ROAD**



**TYPICAL SYMBOL
APPROACH ROAD**



**TYPICAL SECTION
TYPE-1 APPROACH ROAD**



**TYPICAL SECTION
TYPE-2 APPROACH ROAD**

Revisions

APPROACH ROADS

U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
REGION-8 DENVER, COLORADO

FILL HEIGHT & GAGE TABLES

ROUND PIPE CULVERTS		2 1/2" x 1 1/2" CORRUGATIONS												
PIPE DIAMETER	PIPE MINIMUM COVER	MAXIMUM COVER (FEET)												
		GAGES			GAGES			GAGES			GAGES			
		8	10	12	14	16	18	20	22	24	26	28	30	32
18	12	47	55	70	70	70	70	70	70	70	70	70	70	70
24	12	30	33	40	40	40	40	40	40	40	40	40	40	40
30	12	24	25	36	36	36	36	36	36	36	36	36	36	36
36	12	21	28	30	30	30	30	30	30	30	30	30	30	30
42	12	19	31	20	38	21	43	23	46	24	48	18	25	19
48	12	18	27	19	37	20	40	21	42	22	44	18	24	18
54	12	18	33	19	38	20	39	21	41	17	18	18	18	18
60	12	18	34	19	38	20	40	19	38	20	40	18	38	18
66	12	18	35	18	35	18	35	18	35	18	35	18	35	18
72	12	18	35	18	35	18	35	18	35	18	35	18	35	18
78	12	18	35	18	35	18	35	18	35	18	35	18	35	18
84	12	18	35	18	35	18	35	18	35	18	35	18	35	18

PIPE ARCH CULVERTS		2 1/2" x 1 1/2" CORRUGATIONS												3" x 1" CORRUGATIONS											
CULVERT (Inches)	SPAN X RISE	STEEL PIPE ARCH CULVERT		ALUMINUM PIPE ARCH CULVERT		STEEL PIPE ARCH CULVERT		ALUMINUM PIPE ARCH CULVERT		STEEL PIPE ARCH CULVERT		ALUMINUM PIPE ARCH CULVERT		STEEL PIPE ARCH CULVERT		ALUMINUM PIPE ARCH CULVERT									
		MINIMUM COVER (FEET)	MAXIMUM COVER (FEET)	MINIMUM COVER (FEET)	MAXIMUM COVER (FEET)	MINIMUM COVER (FEET)	MAXIMUM COVER (FEET)	MINIMUM COVER (FEET)	MAXIMUM COVER (FEET)	MINIMUM COVER (FEET)	MAXIMUM COVER (FEET)	MINIMUM COVER (FEET)	MAXIMUM COVER (FEET)	MINIMUM COVER (FEET)	MAXIMUM COVER (FEET)	MINIMUM COVER (FEET)	MAXIMUM COVER (FEET)								
18	11	18	16	18	16	18	16	18	16	18	16	18	16	18	16	18	16								
22	13	18	16	18	16	18	16	18	16	18	16	18	16	18	16	18	16								
25	16	18	16	18	16	18	16	18	16	18	16	18	16	18	16	18	16								
29	18	18	16	18	16	18	16	18	16	18	16	18	16	18	16	18	16								
36	22	18	16	18	16	18	16	18	16	18	16	18	16	18	16	18	16								
43	27	18	16	18	16	18	16	18	16	18	16	18	16	18	16	18	16								
50	31	18	16	18	16	18	16	18	16	18	16	18	16	18	16	18	16								
58	36	18	16	18	16	18	16	18	16	18	16	18	16	18	16	18	16								
65	40	18	16	18	16	18	16	18	16	18	16	18	16	18	16	18	16								
72	44	18	16	18	16	18	16	18	16	18	16	18	16	18	16	18	16								
79	49	18	16	18	16	18	16	18	16	18	16	18	16	18	16	18	16								
85	54	18	16	18	16	18	16	18	16	18	16	18	16	18	16	18	16								

①-Span for spot welded aluminum pipe-arches shall not exceed 36"

EQUIVALENT THICKNESS	NUMBER	STEEL ALUMINUM THICKNESS (INCHES)
8	16	0.064
10	14	0.079
12	12	0.109
14	10	0.138
16	8	0.168

ROUND PIPE CULVERTS		6" x 1" CORRUGATIONS												
PIPE DIAMETER	PIPE MINIMUM COVER	MAXIMUM COVER (FEET)												
		GAGES			GAGES			GAGES			GAGES			
		8	10	12	14	16	18	20	22	24	26	28	30	32
3.0	1.5	27	29	30	37	35	56	41	58	46	60	15	23	24
3.6	1.5	23	24	24	31	28	47	30	48	34	50	15	21	21
4.2	1.5	20	24	22	27	24	41	26	42	28	43	15	20	24
4.8	1.5	19	22	19	25	20	32	21	39	22	44	15	19	22
5.4	1.5	18	20	19	22	20	29	20	35	21	42	15	18	20
6.0	1.5	18	20	19	22	20	29	20	35	21	42	15	18	20
6.6	1.5	18	20	19	22	20	29	20	35	21	42	15	18	20
7.2	1.5	14	17	17	19	17	24	19	29	19	35	14	17	17
7.8	1.5	14	17	17	19	17	24	19	29	19	35	14	17	17
8.4	1.5	14	17	17	19	17	24	19	29	19	35	14	17	17
9.0	1.5	14	17	17	19	17	24	19	29	19	35	14	17	17
9.6	1.5	14	17	17	19	17	24	19	29	19	35	14	17	17

ROUND PIPE CULVERTS		3" x 1" CORRUGATIONS												
PIPE DIAMETER	PIPE MINIMUM COVER	MAXIMUM COVER (FEET)												
		GAGES			GAGES			GAGES			GAGES			
		8	10	12	14	16	18	20	22	24	26	28	30	32
3.6	1.2	34	43	38	58	43	92	56	106	63	118	3.6	4.2	4.2
4.2	1.2	28	38	30	50	37	74	42	84	48	91	4.2	4.8	4.8
4.8	1.2	24	32	27	44	30	60	34	68	38	76	4.8	5.4	5.4
5.4	1.2	22	29	24	39	26	52	29	58	32	64	5.4	6.0	6.0
6.0	1.2	21	25	22	35	24	48	26	52	28	56	6.0	6.6	6.6
6.6	1.2	20	23	20	32	22	44	23	45	25	50	6.6	7.2	7.2
7.2	1.2	19	22	20	29	21	42	22	44	23	46	7.2	7.8	7.8
7.8	1.2	18	20	19	27	20	40	21	42	22	44	7.8	8.4	8.4
8.4	1.2	19	25	19	38	20	40	21	42	21	42	8.4	9.0	9.0
9.0	1.2	18	23	19	37	19	38	20	40	21	42	9.0	9.6	9.6
9.6	1.2	18	23	19	37	19	38	20	40	21	42	9.6	10.2	10.2
10.2	1.2	18	23	19	37	19	38	20	40	21	42	10.2	10.8	10.8
10.8	1.2	18	23	19	37	19	38	20	40	21	42	10.8	11.4	11.4
11.4	1.2	18	23	19	37	19	38	20	40	21	42	11.4	12.0	12.0
12.0	1.2	18	23	19	37	19	38	20	40	21	42	12.0	12.6	12.6

GENERAL NOTES

COVER The minimum cover shall be measured from top of pipe to top of graded roadbed. When a culvert is subjected to heavy loads from construction equipment, it may be necessary to maintain temporary additional cover. The amount of additional cover, placement, and subsequent removal to plan grade is the responsibility of the Contractor and will not be paid for by the Government.

Maximum cover, upon which the gage of pipe is determined, shall be measured from top of pipe to top of finished roadway surfacing.

VERTICAL ELONGATIONS:

Columns "C" are Circular Pipes.
Columns "E" have a 5% Elongation of the Vertical Axis.

FILL-GAGE TABLES
FOR METAL PIPE CULVERT

STANDARD 603-1

U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
REGION - 8 DENVER, COLORADO

Revision 7/1969, 8/1969, 3/1971

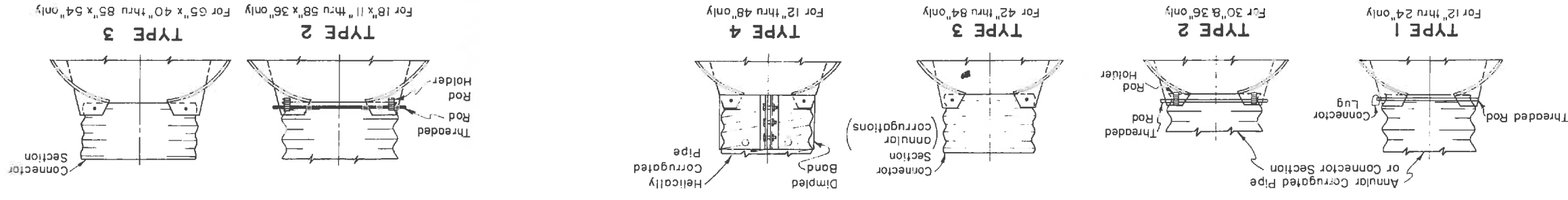
METAL END SECTIONS FOR METAL PIPE CULVERTS

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
REGION - 8 DENVER, COLORADO

Revisions
10/68 31/69
11/69 32/70
1/69 32/71
2/69

END SECTION CONNECTIONS FOR PIPE CULVERTS & PIPE - ARCH CULVERTS

Note:
Type 1 and 2 connections may be attached as Type 3 in lieu of the threaded bolts.
Type 3 connection includes one foot of pipe length for 42" thru 84" diameter. The connector section will be the same gage as the metal end section, and will be attached by galvanized rivets or bolts spaced at six inches (Max.) except that six rivets or bolts will be sufficient for a twelve inch pipe. A shop tack weld one inch long at the same spacing, may be used in lieu of rivets or bolts.
For a Type 4 connection, the dimpled coupling band will be attached to the metal end section by galvanized rivets or bolts spaced at the same interval as the dimples. A shop tack weld one inch long at the same spacing may be used in lieu of rivets or bolts.



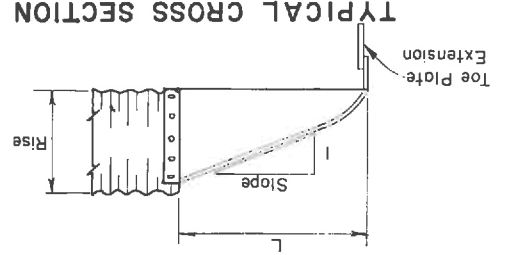
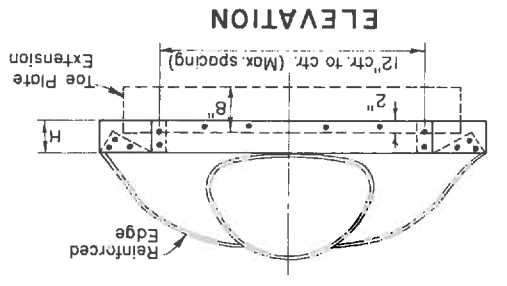
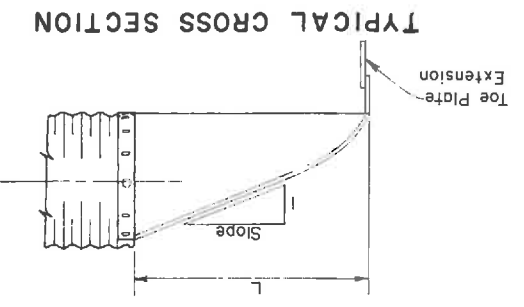
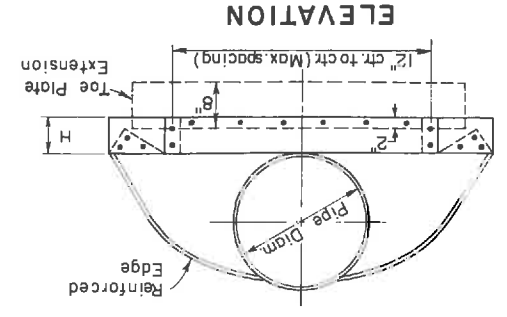
METAL END SECTION FOR PIPE CULVERTS

1. All 3 piece bodies to have 12 gage sides and 10 gage center panels. Width of center panels to be greater than 20% of the pipe periphery. Multiple panel bodies to have lap seams which are to be tightly joined.
2. For 60" thru 84" sizes, reinforced edges to be supplemented with galvanized stiffener angles. The angles will be 2" x 2" x 1/4" for 60" thru 72" diameter and 2 1/2" x 2 1/2" x 1/4" for 78" and 84" diameter. The angles by 3/8" phi galvanized rivets or bolts.
3. Toe plate extensions shall be installed on end sections when directed by the Engineer. Toe plate extensions shall be the same gage as end section.

GENERAL NOTES

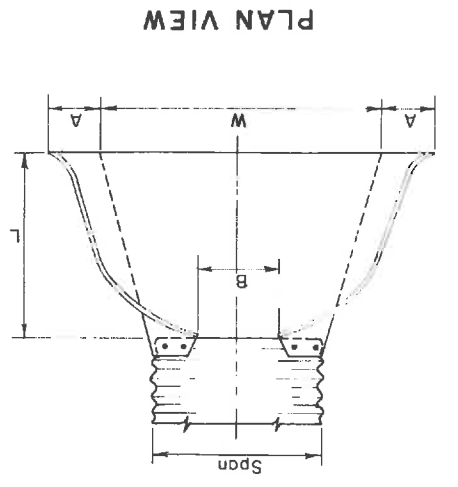
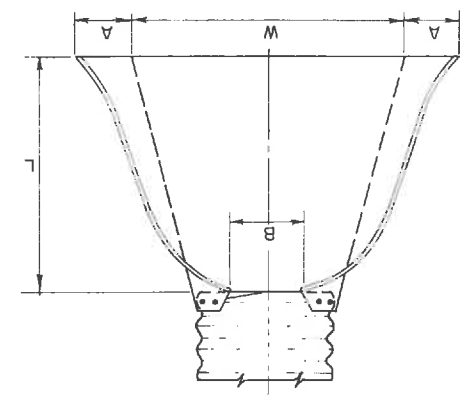
1. All 3 piece bodies to have 12 gage sides and 10 gage center panels. Width of center panels to be greater than 20% of the pipe periphery. Multiple panel bodies to have lap seams which are to be tightly joined by 3/8" phi galvanized rivets or bolts.
2. For the 79" x 49" and 85" x 54" sizes, reinforced edge to be supplemented by 2" x 2" x 1/4" galvanized angles. The angles to be attached by 3/8" phi galvanized nuts and bolts.
3. Angle reinforcement will be placed under the center panel seams on the 79" x 49" and 85" x 54" sizes.
4. Toe plate extensions shall be installed on end sections when directed by the Engineer. Toe plate extensions shall be the same gage as end section.

METAL END SECTION FOR PIPE-ARCH CULVERTS



GENERAL NOTES

PLAN VIEW



* See General Notes for gages

Pipe End Sect. Dimensions	Alum. Steel		Alum. Steel		Approx Body Slope
	A	B	H	L	
12"	6"	6"	21"	24"	2 1/2" 1 Pc.
15"	6"	7"	26"	30"	2 1/2" 1 Pc.
18"	6"	8"	31"	36"	2 1/2" 1 Pc.
21"	6"	9"	36"	42"	2 1/2" 1 Pc.
24"	6"	10"	41"	48"	2 1/2" 1 Pc.
30"	8"	12"	51"	60"	2 1/2" 1 Pc.
36"	9"	14"	60"	72"	2 1/2" 2 Pc.
42"	11"	16"	69"	84"	2 1/2" 2 Pc.
48"	12"	18"	78"	90"	2 1/2" 2 Pc.
54"	12"	18"	84"	102"	2 1/2" 2 Pc.
60"	14"	18"	97"	120"	1 1/2" 3 Pc.
66"	14"	18"	107"	132"	1 1/2" 3 Pc.
72"	14"	18"	117"	144"	1 1/2" 3 Pc.
78"	14"	18"	127"	156"	1 1/2" 3 Pc.
84"	14"	18"	137"	168"	1 1/2" 3 Pc.

Pipe- Arch End Sect. Dimensions	Alum. Steel		Alum. Steel		Span Rise	Approx Body Slope	
	A	B	H	L			
18"	4"	7"	9"	6"	30"	2 1/2" 1 Pc.	
22"	5 1/2"	7"	10"	6"	23"	36"	2 1/2" 1 Pc.
25"	6 1/2"	8"	12"	6"	28"	42"	2 1/2" 1 Pc.
29"	7"	9"	14"	6"	32"	48"	2 1/2" 1 Pc.
36"	8 1/2"	10"	16"	6"	39"	60"	2 1/2" 1 Pc.
43"	10 1/2"	12"	18"	8"	46"	75"	2 1/2" 1 Pc.
50"	12 1/2"	13"	21"	9"	53"	85"	2 1/2" 2 Pc.
58"	14 1/2"	14"	26"	9"	63"	90"	2 1/2" 2 Pc.
65"	15 1/2"	15"	30"	12"	70"	102"	2 1/2" 2 Pc.
72"	17 1/2"	18"	33"	12"	77"	114"	2 1/2" 3 Pc.
79"	18"	18"	36"	12"	77"	126"	2 1/2" 3 Pc.
85"	18"	18"	39"	12"	77"	138"	2 1/2" 3 Pc.

REINFORCED CONCRETE PIPE CULVERTS
COMBINATIONS OF FILL HEIGHT-PROJECTION RATIO-BEDDING-CLASS

CLASS OF PIPE BEDDING	CLASS II					CLASS III					CLASS IV					CLASS V											
	Class B	Class C	Class B	Class C	Class C	Class B	Class C	Class B	Class C	Class C	Class B	Class C	Class B	Class C	Class C	Class B	Class C	Class B	Class C	Class C							
HEIGHT OF COVER (FEET)	12	15	10	13	16	12	15	10	13	16	12	15	10	13	16	12	15	10	13	16	12	15	10	13	16		
PROJECTION RATIO	0.7	0.0	0.7	0.0	0.7	0.7	0.0	0.7	0.0	0.7	0.7	0.0	0.7	0.0	0.7	0.7	0.0	0.7	0.0	0.7	0.7	0.0	0.7	0.0	0.7		
NOMINAL DIA.	18"	24"	30"	36"	42"	48"	54"	60"	66"	72"	78"	84"	13	15	11	13	17	21	25	31	31	21	27	32	39	25	34

Minimum cover for unpaved or flexible paved roadways shall be 75 feet.

GENERAL NOTES

Specifications: Federal Highway Administration FR-69

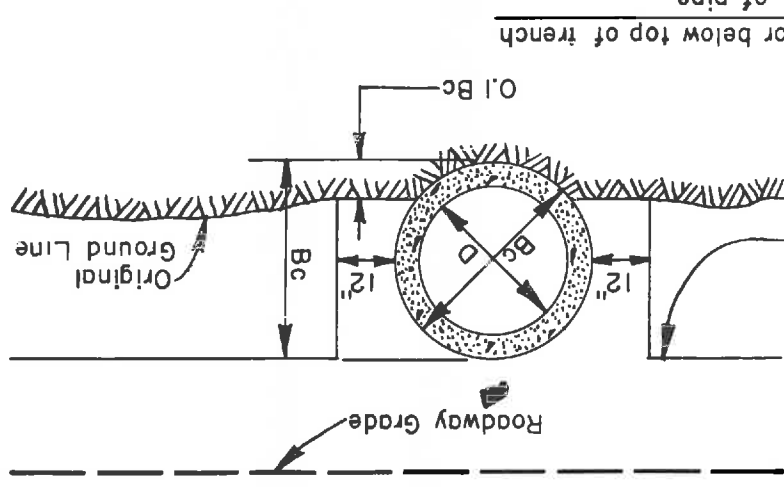
The height of cover for each culvert shall determine the bedding and class of concrete pipe to be used (See Table herewith). Location, length and inside diameter of pipe required shall be shown on plans.

Class "B" bedding is to be used in solid rock.

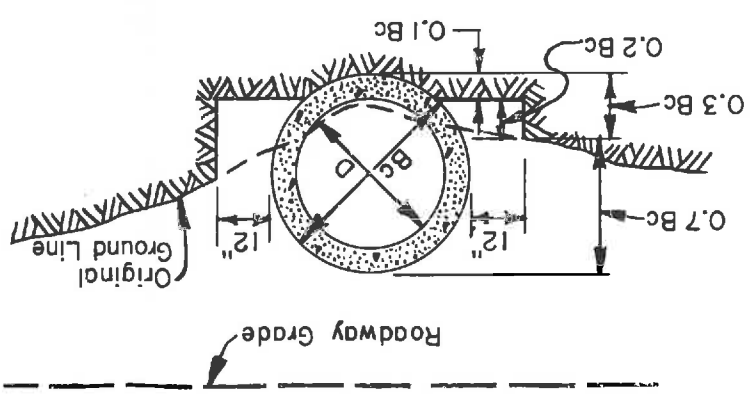
When a projection ratio of 0.0 is used, backfilling shall be made with the materials that were excavated to

produce the projection ratio. If material does not stand with a vertical face when attempting to produce a 0.0 projection ratio, the installation shall be classed as a 0.7 projection ratio.

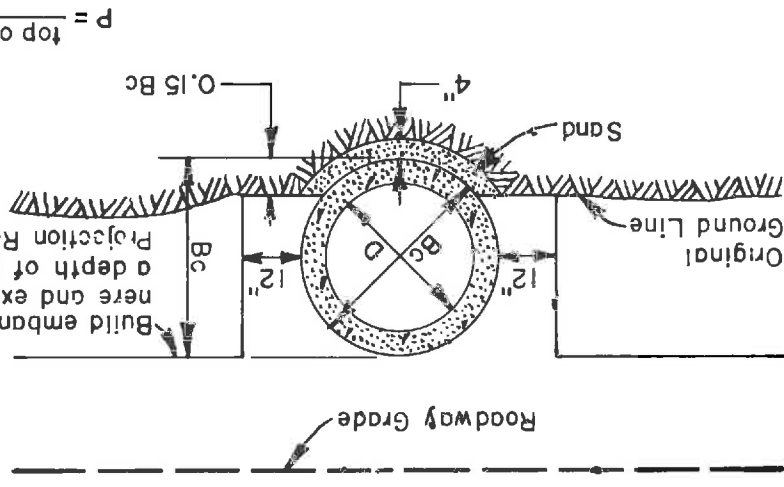
"C" BEDDING
0.0 PROJECTION RATIO



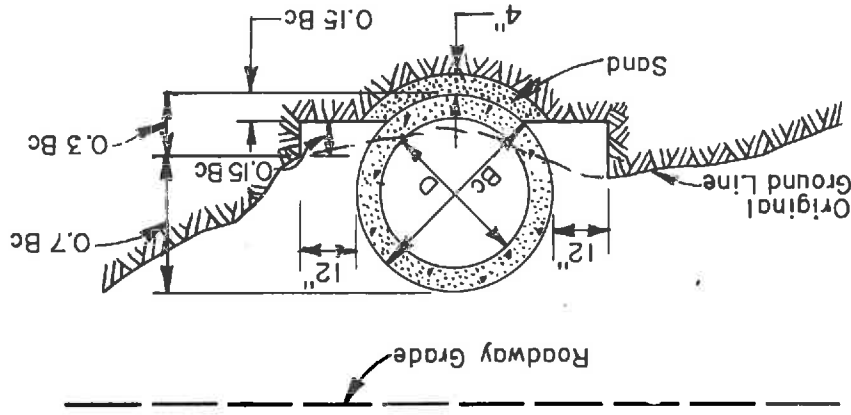
"C" BEDDING
0.7 PROJECTION RATIO



"B" BEDDING
0.0 PROJECTION RATIO

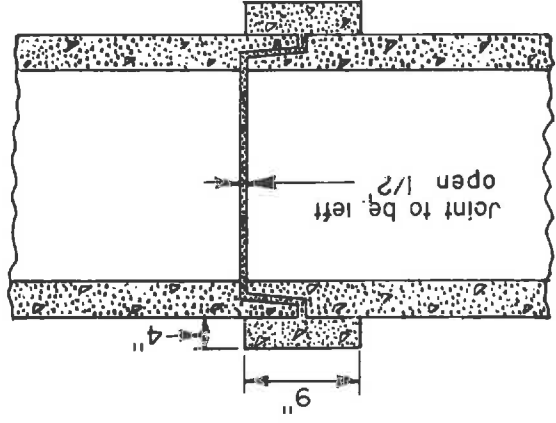


"B" BEDDING
0.7 PROJECTION RATIO



$$P = \frac{\text{O.D. of pipe}}{\text{top of pipe above or below top of trench}}$$

CONCRETE OR MORTAR PIPE JOINT



Where the flow line grade of the pipe is 10% or greater all pipe shall be the Bell and Spigot type or shall be Tongue and Groove pipe with concrete collars as detailed or a type approved in writing by the Engineer.

Revisions 1/1964, 2/1970, 3/1971

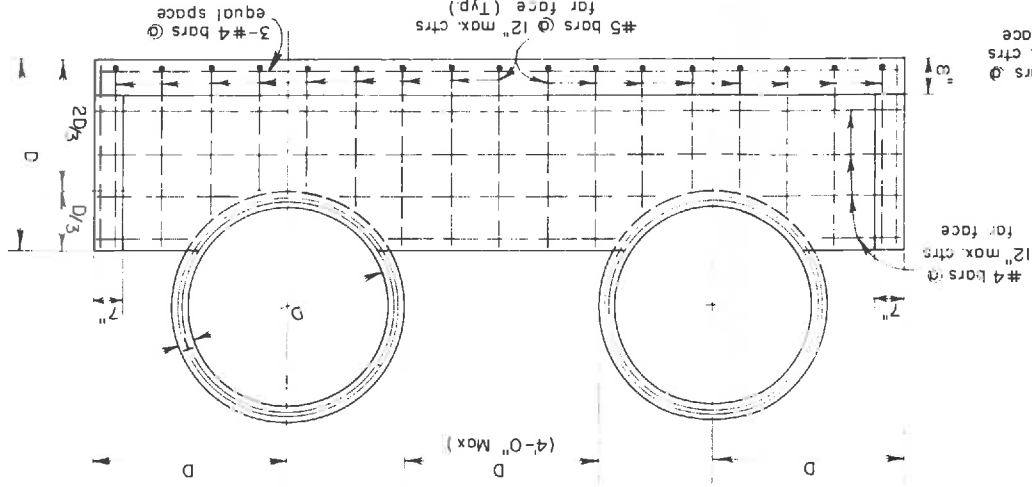
ESTIMATED QUANTITIES FOR ONE CUTOFF WALL

Single Pipe	Reinforcing Steel (Lbs.)	Concrete (Cu Yds)	Reinforcing Steel (Lbs.)	Concrete (Cu Yds)
36"	0.61	55	0.61	55
42"	0.79	70	0.79	70
48"	0.99	85	0.99	85
54"	1.28	110	1.19	105
60"	1.60	130	1.42	125
66"	1.96	170	1.66	140
72"	2.36	185	1.92	155
78"	2.79	220	2.19	170
84"	3.25	250	2.48	185

GENERAL NOTES FOR CUTOFF WALLS

Specifications: Federal Highway Administration, FR-69.
 Concrete: All concrete shall be class "A" using Type II (low alkali) portland cement with an air-entraining admixture, conforming to the requirements of Section 601, Structural Concrete. Concrete shall be poured monolithically, all exposed edges shall be chamfered $\frac{3}{8}$ inch and all exposed surfaces shall have a "Rubbed Finish." Measurement and payment for all concrete shall be in accordance with Section 601.
 Reinforcing Steel: Bars shall conform to ASTM. Specifications A 615, Grade 40. Reinforcing bars shall be included in the price paid for class "A" concrete unless a specific quantity of reinforcing steel is shown on the summary sheet.

MULTIPLE PIPE INSTALLATION

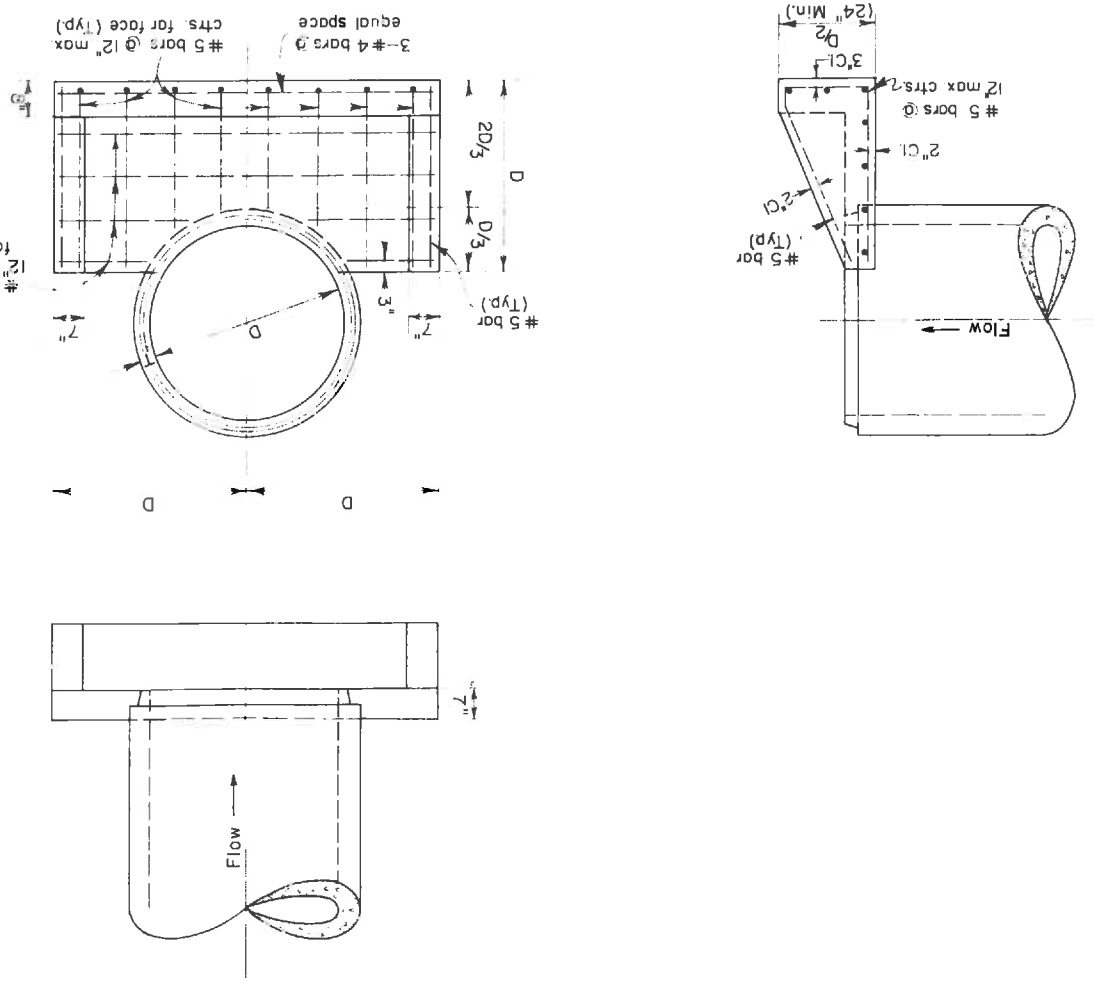


CUTOFF WALL DETAILS FOR REINFORCED CONCRETE PIPE CULVERTS

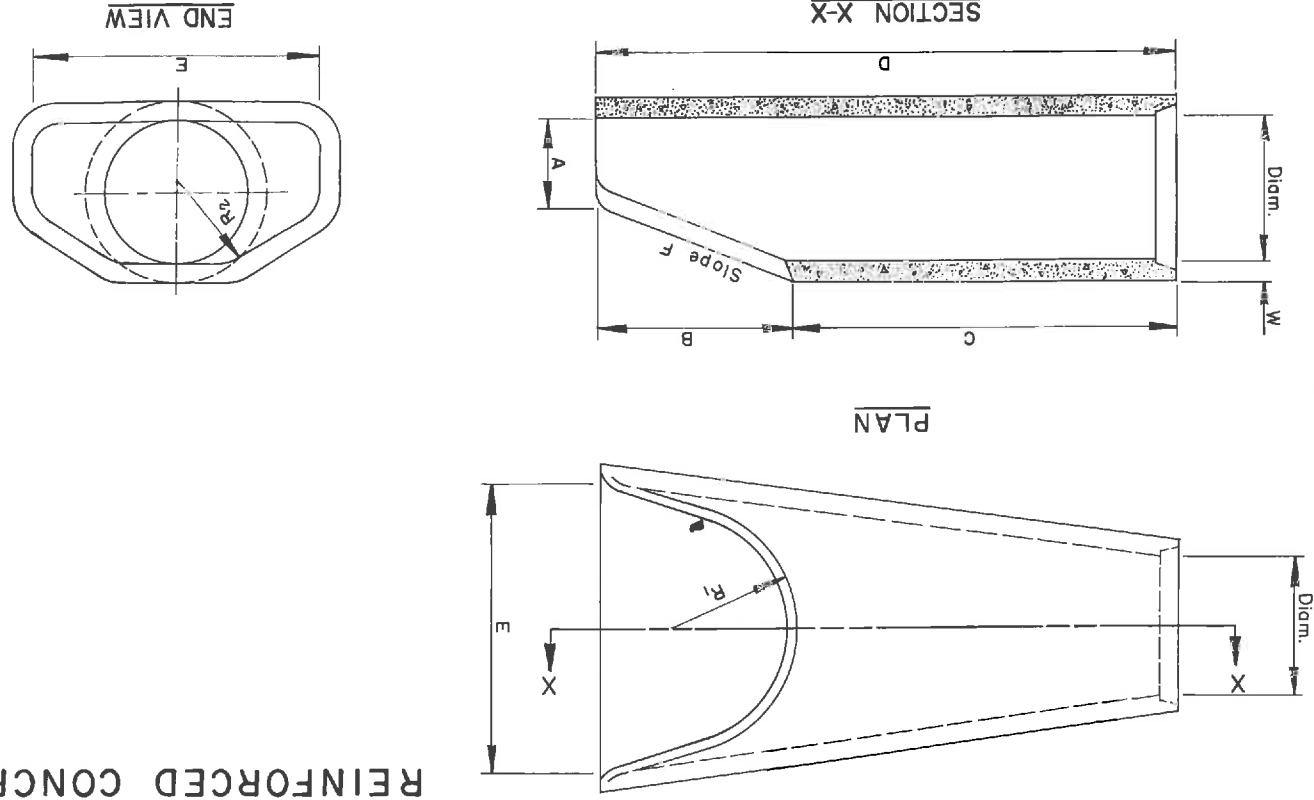
REINFORCED CONCRETE END SECTIONS
 Dimensions in Inches

Diam.	A	B	C	D	E	F	R ₁	R ₂	W
12"	5 1/2"	1'-11"	4'-1"	6'-0"	2'-0"	3:1	10 3/8"	5"	2"
15"	7"	2'-2"	3'-11"	6'-1"	2'-5"	3:1	12 1/2"	11"	2 1/2"
18"	11 1/2"	2'-2"	4'-0"	6'-2"	3'-0"	3:1	15 1/2"	12"	2 3/4"
21"	9"	2'-11"	3'-2"	6'-1"	3'-6"	3:1	16 3/8"	13"	2 3/8"
24"	1'-0"	3'-7"	4'-6"	8'-1"	4'-0"	3:1	16 13/16"	14"	3"
30"	1'-5"	4'-5"	5'-7"	8'-0"	5'-0"	3:1	18 5/8"	15"	3 1/2"
36"	1'-6"	5'-0"	6'-1"	8'-1"	5'-11"	3:1	24 5/8"	20"	4"
42"	2'-0"	5'-1"	6'-0"	8'-1"	6'-6"	3:1	27 1/2"	22"	4 1/2"
48"	2'-4"	5'-10"	7'-4"	8'-2"	7'-0"	3:1	28 1/2"	22"	5"
54"	2'-3"	5'-5"	7'-11"	8'-4"	7'-6"	2 3/4:1	33 3/8"	24"	5 1/2"
60"	3'-0"	6'-10"	8'-10"	8'-4"	8'-2"	2:1	36 1/16"	24"	6"
66"	2'-0"	6'-6"	8'-6"	8'-3"	8'-6"	2:1	36 3/8"	24"	6 1/2"
72"	2'-10 1/2"	6'-3"	8'-3"	8'-0"	9'-0"	2:1	38 15/16"	24"	7"

SINGLE PIPE INSTALLATION



REINFORCED CONCRETE END SECTION FOR PIPE CULVERTS



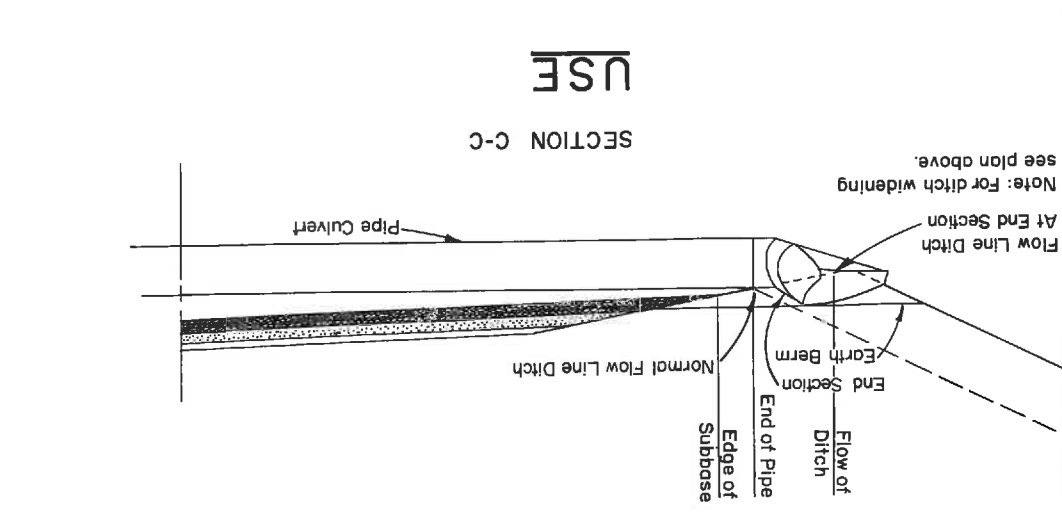
GENERAL NOTES FOR REINFORCED CONCRETE PIPE CULVERT END SECTIONS

Typical end section installation in cut sections shall be as shown on Standard Sheet 604-1.
 End section design shall conform to standard reinforced concrete pipe.

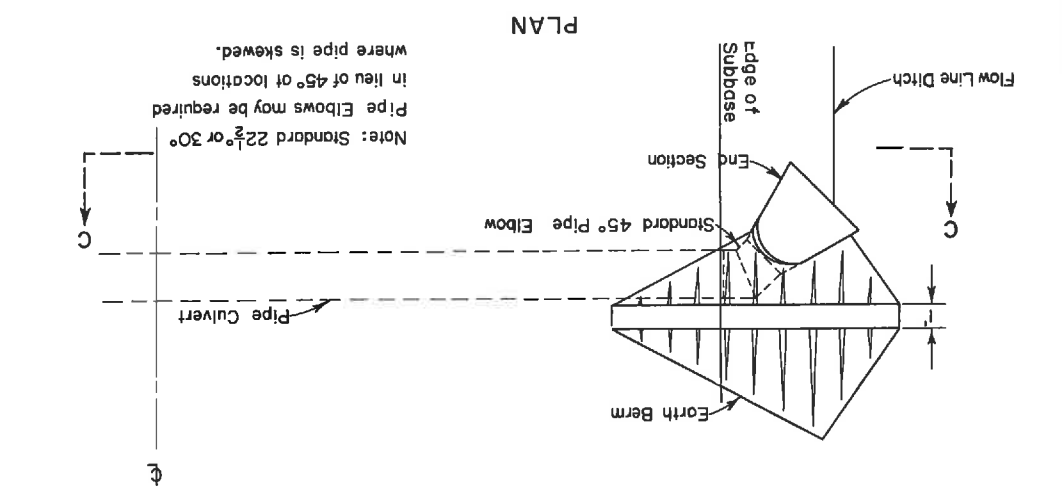
REINFORCED CONCRETE END SECTIONS AND CUTOFF WALLS FOR CONCRETE PIPE CULVERTS

U.S. DEPARTMENT OF TRANSPORTATION
 FEDERAL HIGHWAY ADMINISTRATION
 REGION - 8 DENVER, COLORADO

TYPICAL END SECTION INSTALLATION IN CUT SECTION

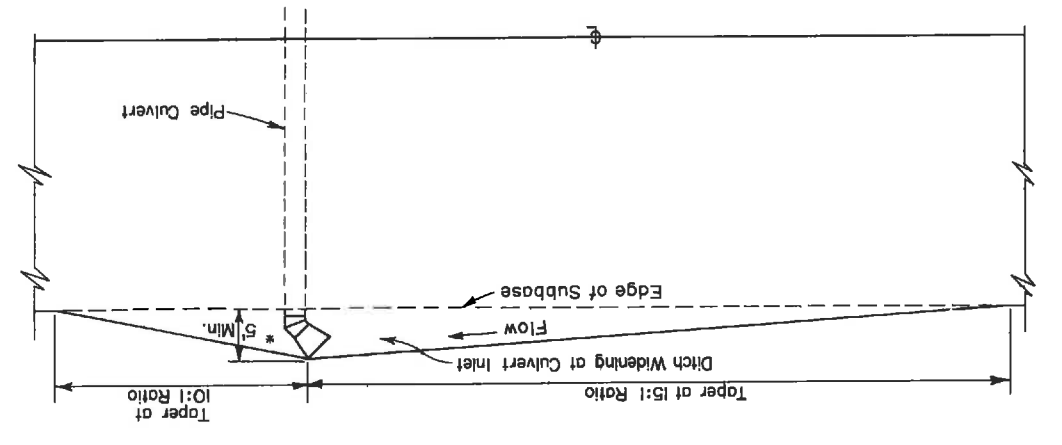


SECTION C-C
USE



DITCH WIDENING PLAN

*When normal ditch width is 5' or greater no taper for catch basin shall be required.

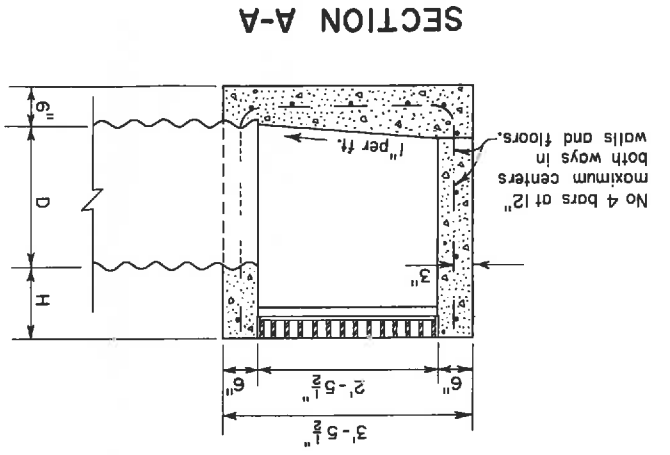
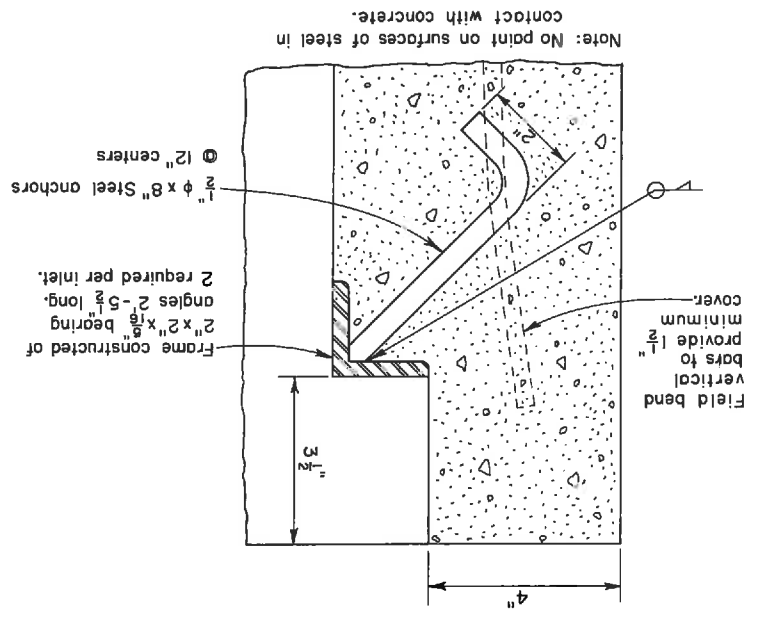


Taper at 15:1 Ratio

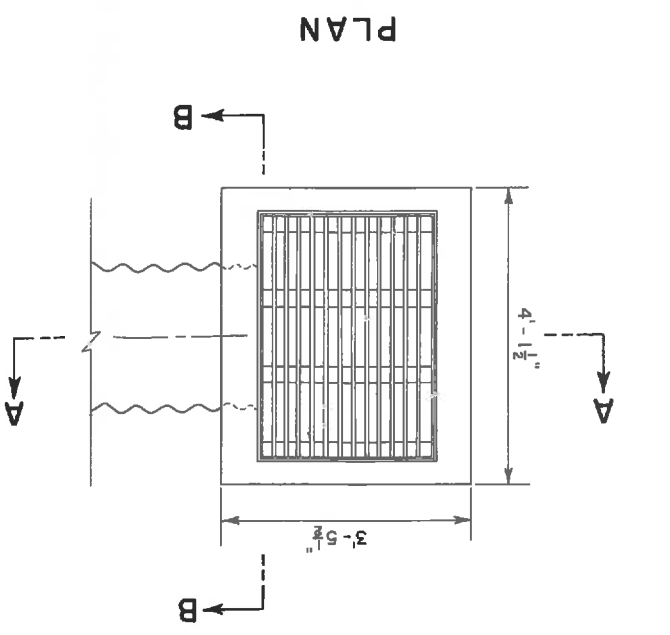
H	CONCRETE												STEEL REINFORCEMENT STEEL
	6"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	
Units	Cu. Yds.	Cu. Yds.	Cu. Yds.	Cu. Yds.	Cu. Yds.	Cu. Yds.	Cu. Yds.	Cu. Yds.	Cu. Yds.	Cu. Yds.	Cu. Yds.	Cu. Yds.	Lbs.
D	0.98	1.10	1.22	1.34	1.47	1.59	1.72	1.84	1.97	2.10	2.23	2.36	Lbs.
	0.81	0.93	1.05	1.17	1.30	1.42	1.54	1.67	1.79	1.92	2.04	2.17	Lbs.
	0.90	1.02	1.14	1.26	1.38	1.51	1.63	1.75	1.87	2.00	2.12	2.24	Lbs.
	0.98	1.10	1.22	1.34	1.47	1.59	1.72	1.84	1.97	2.10	2.23	2.36	Lbs.
	0.81	0.93	1.05	1.17	1.30	1.42	1.54	1.67	1.79	1.92	2.04	2.17	Lbs.
	0.90	1.02	1.14	1.26	1.38	1.51	1.63	1.75	1.87	2.00	2.12	2.24	Lbs.
	0.98	1.10	1.22	1.34	1.47	1.59	1.72	1.84	1.97	2.10	2.23	2.36	Lbs.

MATERIAL QUANTITIES FOR ONE DROP INLET

DETAIL OF BEARING ANGLE FRAME

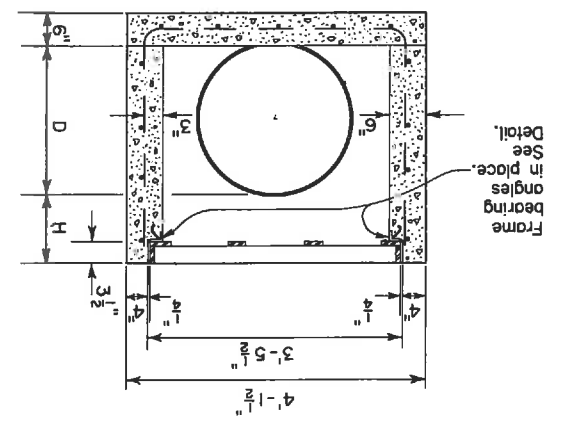


SECTION A-A



PLAN

SECTION B-B (ROTATED 90° Rt.)

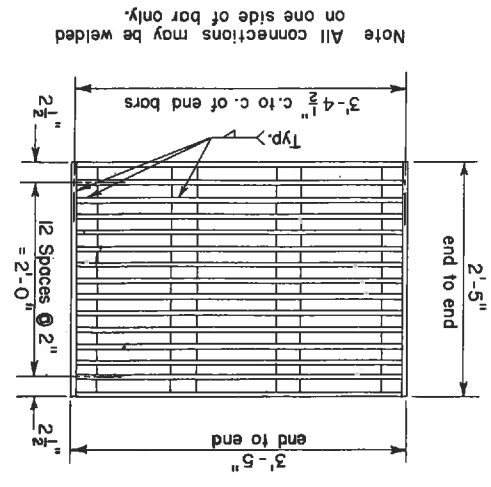


GENERAL NOTES FOR DROP INLETS

Specifications: Federal Highway Administration FR-69 cement with an air-entraining admixture, conforming to the requirements of Section 601, Structural Concrete. All exposed edges and corners shall be chamfered 3/8 inch.
Reinforcing Steel: Bars Shall Conform to A.S.T.M. Specification A 615, Grade 40.
Steel Grating: All steel shall conform to A.S.H.Q. Specifications M 183, and shall be painted in accordance with the provisions of Section 611, Foundations: Foundations shall be inspected and approved by the Engineer prior to pouring the floor.
Construction: The inlets shall be constructed with horizontal tops unless otherwise directed by the Engineer or locations where a sloping top and grating will fit adjacent ground slopes.
Measurement and Payment: Measurement and payment shall be in accordance with Section 604.

MATERIAL FOR STEEL GRATING & FRAME	
6 Bars	3" x 1/2" x 2'-5"
15 Bars	3" x 3/4" x 3'-4"
2 Angles	2" x 2" x 1/8" x 2'-5 1/2"
Approx. Weight = 342 lbs.	

STEEL GRATING



GENERAL NOTES

Specifications: Federal Highway Administration FP-69

Material: Underdrain pipe may be either corrugated metal or plastic and shall be as called for on the plans. The gradation of the granular backfill material shall be as specified in the Special Provisions.

Construction: When the trench is under the roadbed, paved ditch, or other structure, the granular filter material shall completely fill the trench. The granular filter material shall be tamped into place and shall be dampened prior to placing if necessary to prevent segregation.

Perforated pipe shall be placed with the perforations down. The outfall end of the pipe shall be covered with galvanized, No. 17 gage hardware cloth screen having approximately $\frac{1}{2}$ x $\frac{1}{2}$ mesh openings. The screen shall be held securely in place with standard coupling bands. The upgrade end of the underdrain pipe shall be closed with a suitable plug or cap to prevent entry of soil materials. No separate payment shall be made for the screen or the cap.

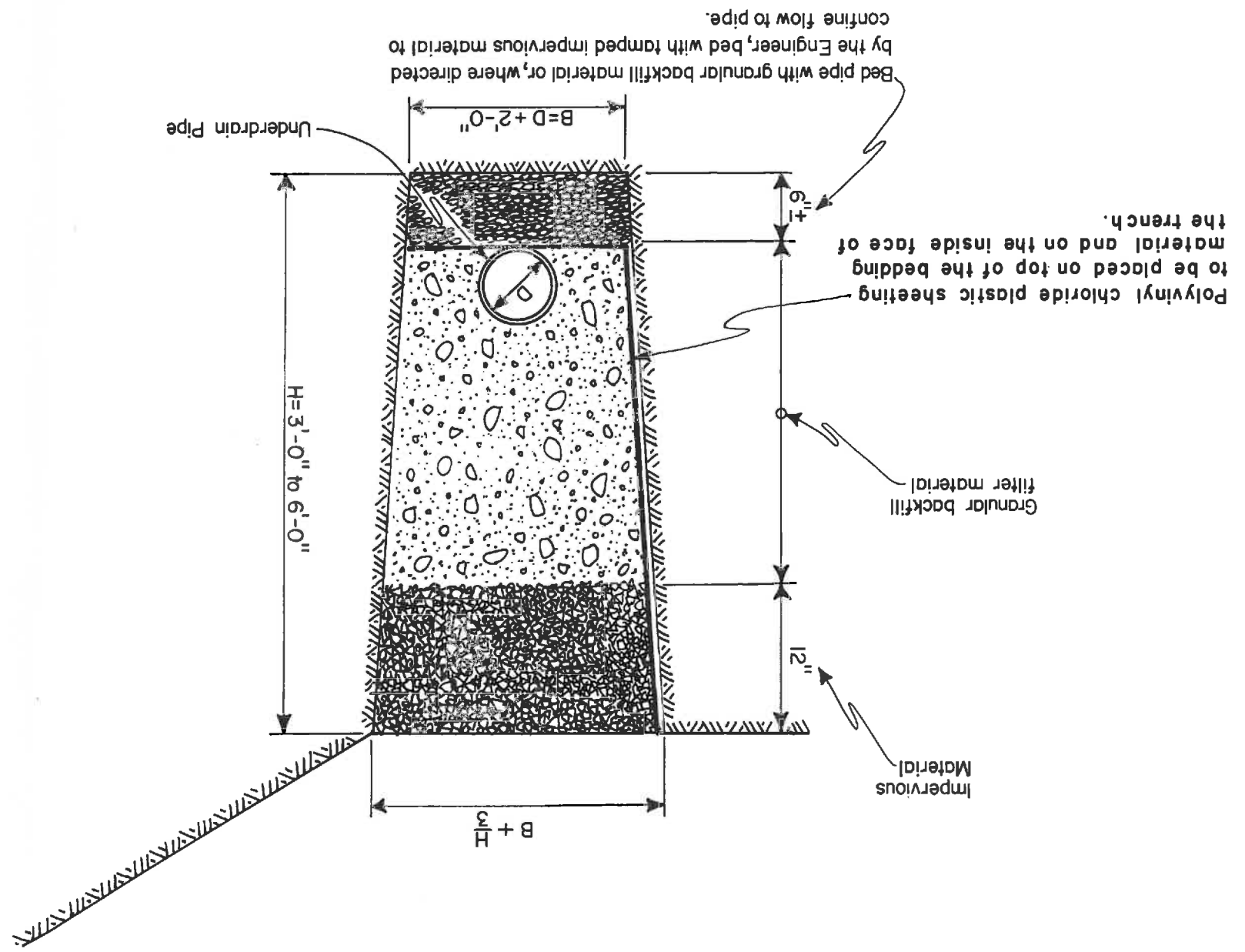
If fittings for the underdrain pipe are required, such as elbows or tees, the centerline length of these fittings shall be included in the linear measurement for underdrain pipe and payment shall be at the unit price for underdrain per lineal foot.

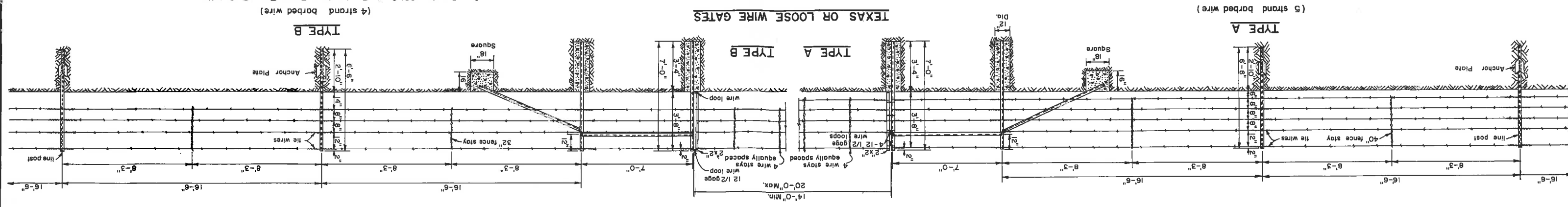
UNDERDRAIN

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
REGION-8 DENVER, COLORADO

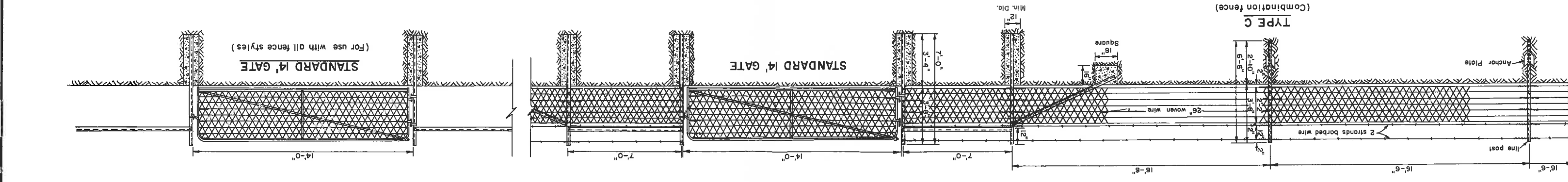
STANDARD 605-1

PIPE UNDERDRAIN





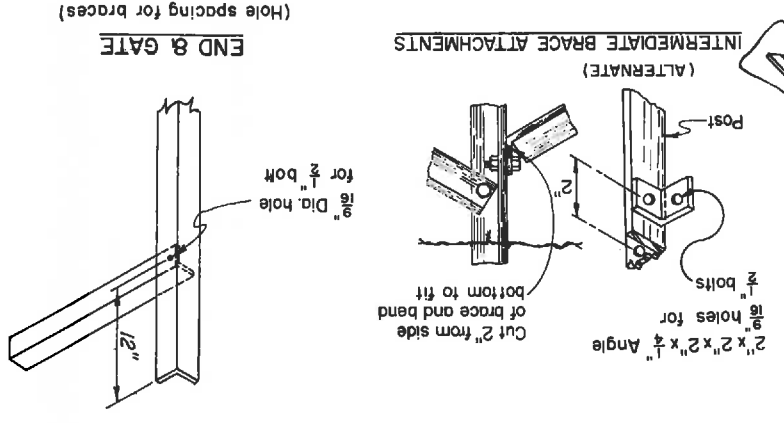
TEXAS OR LOOSE WIRE GATES
 TYPE A TYPE B
 (4 strand barbed wire)
 See Drawing COLO.-1 For Laydown Fence, Type B Details



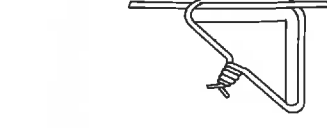
STANDARD 14' GATE
 (For use with all fence styles)

GENERAL NOTES

Specifications: Federal Highway Administration FR-69
 Posts and Braces: All corner, end, gate and intermediate brace posts shall be 2 1/2" x 2 1/2" x 1/4" steel angle sections, 7'-0" long, weighing not less than 3.9 lbs per lin. ft. Braces shall be 2" x 2" x 1/4" steel angles, 7'-0" long, weighing not less than 3.0 lbs per lin. ft. Line posts shall be steel "tees", 6'-6" long, weighing not less than 13 lbs per lin. ft., and shall have an anchor plate sufficient to resist movement. All posts and braces shall be drilled or punched as shown hereon, and shall have a weather resistant green baked enamel finish which shall also be resistant to the shock of driving operations. White paint on the top portion of the posts is optional. Line posts with studded faces will be acceptable in lieu of drilled or punched posts.
 Brace Panels: All corner, end or gate posts shall be braced as detailed hereon. Corner posts and bracing shall be placed at all changes in alignment in excess of 20 degrees. Intermediate bracing shall be placed at all changes in grade in excess of 20 degrees. Where the distance between corners or ends is in excess of 1/2 mile, intermediate bracing shall be inserted at uniform intervals of not more than 1/8 mile.
 Barbed Wire: Barbed wire shall conform to current ASTM Specification A-121, Class 1, and shall be 2 strands of 12 1/2-gage galvanized wire, twisted, having 2 point, double wrap, 1/4-gage round bars, maximum of 4 apart. Minimum net weight shall be 78 lbs. per 80-rod reel. Woven wire shall conform to A.S.T.M. Specifications A 116, and shall be 26" V-mesh, consisting of 7 horizontal cables approximately 4" apart, woven with cross wires 4" apart, to form a one piece fabric. Horizontal cables shall be 2 strands of 12 1/2-gage galvanized wire, twisted, and the cross wires shall be single strand 14-gage galvanized wire. Minimum weight shall be 95 pounds per 10-rod reel.
 Gates: Standard 14' gate shall be 42" high, consisting of a 1 1/2" O.D. galvanized steel tubular frame, with woven wire filler as specified above, except that the cross wires may be either a 2" or 4" spacing. Gates shall have a diagonal adjustable sag-rod (or wire), and adjustable hinges. Latch shall be the self-engaging (pig-ear) type. All fittings shall be galvanized. Minimum weight of gate shall be 70 pounds, exclusive of fittings.
 Miscellaneous: Fence stays shall be double strand, twisted, 9 1/2-gage galvanized wire. Fence ties shall be a minimum of 12 1/2-gage galvanized wire. Every strand of barbed wire and every other strand of woven wire shall be tied to each post in accordance with standard practice. Bolts for attaching braces shall be 1/2" x 1" galvanized machine bolts.
 Concrete: Concrete shall be class A, and shall be allowed to set not less than seven days before wire may be stretched.

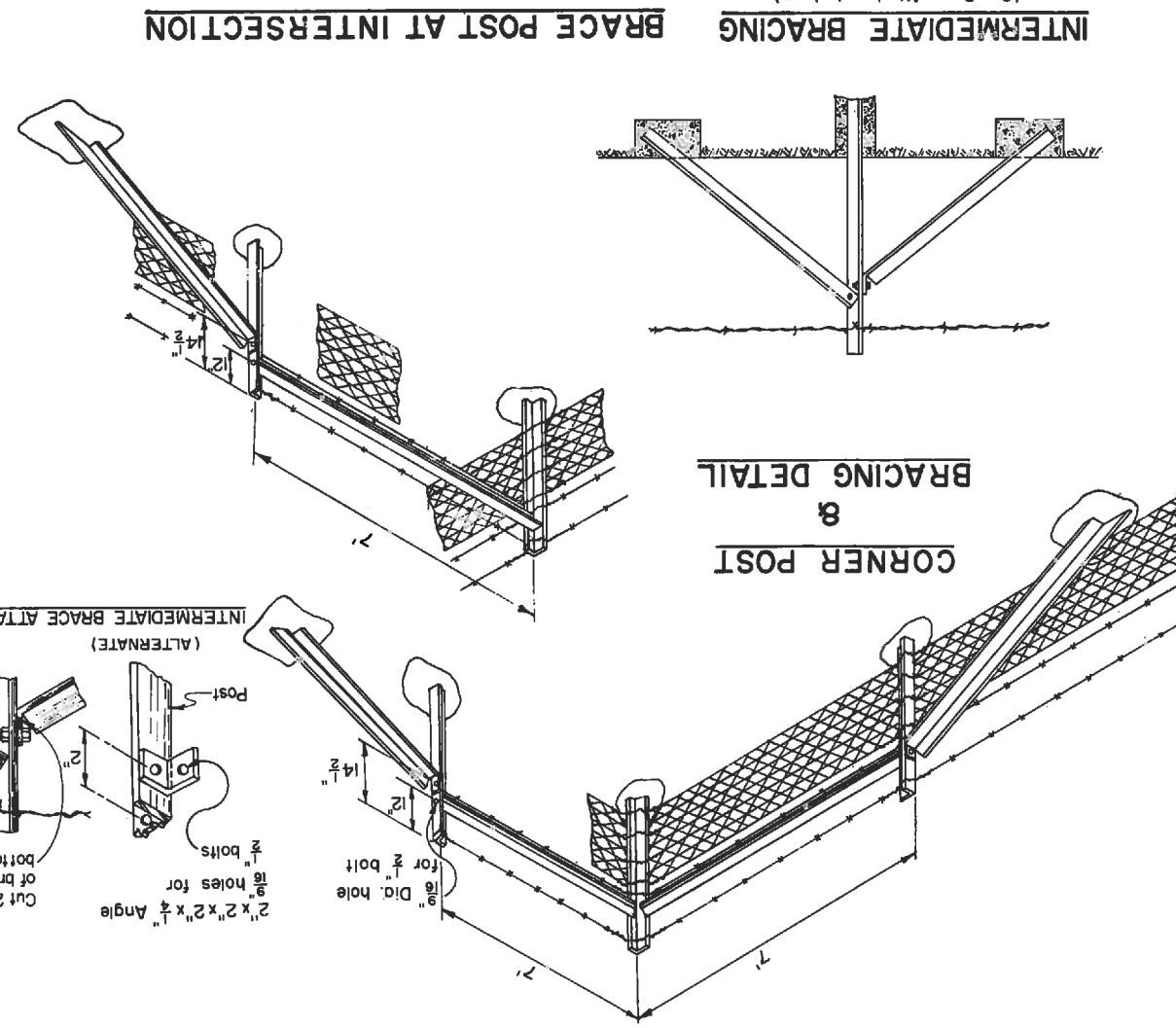


END 8' GATE
 INTERMEDIATE BRACE ATTACHMENTS
 (ALTERNATE)



CORNER POST WIRE TIE
 END BRACE OR
 TYPE 3 POSTS
 (Steel)

For details see general notes.



CORNER POST
 BRACING DETAIL

BRACE POST AT INTERSECTION
 INTERMEDIATE BRACING
 (See Brace Attachment above)

WIRE FENCES
 WITH STEEL POSTS
 (TYPE 3)
 STANDARD 607-2

U. S. DEPARTMENT OF TRANSPORTATION
 FEDERAL HIGHWAY ADMINISTRATION
 REGION - 8 DENVER, COLORADO

Revisions 6/19/64, 11/19/64, 1/19/65, 9/19/66, 11/19/66
 7/19/67, 12/19/67, 2/19/68, 3/19/71, 12/19/71
 1/19/72, 4/19/72

LAY DOWN WIRE FENCE

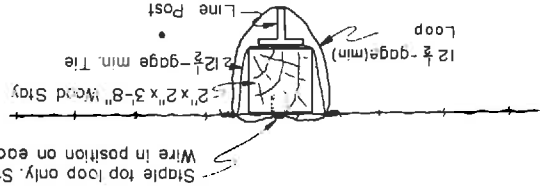
U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
REGION-8 DENVER, COLORADO

COL. O. -- 1

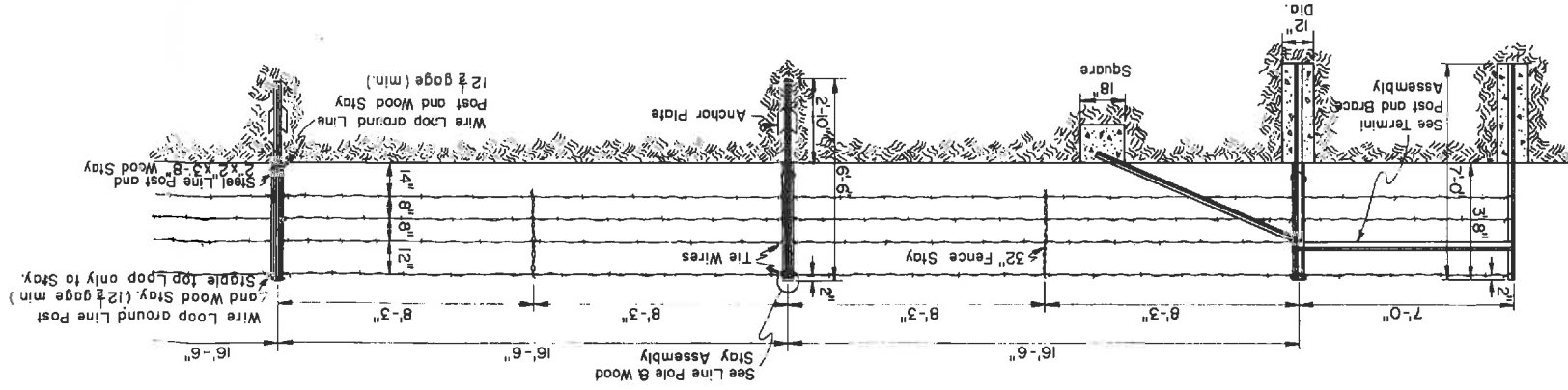
Project 7--(1) South Fork-Lake City

Revisions

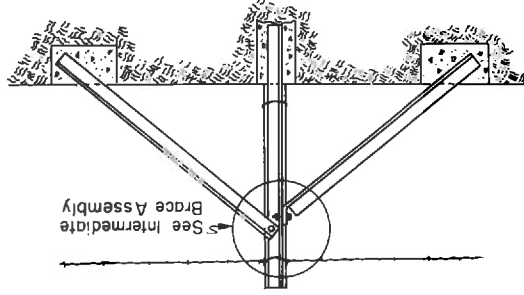
LINE POLE & WOOD STAY ASSEMBLY



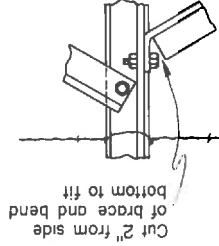
LAY DOWN FENCE



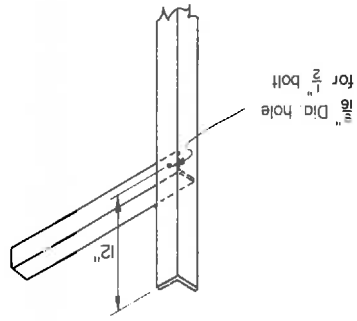
INTERMEDIATE BRACING



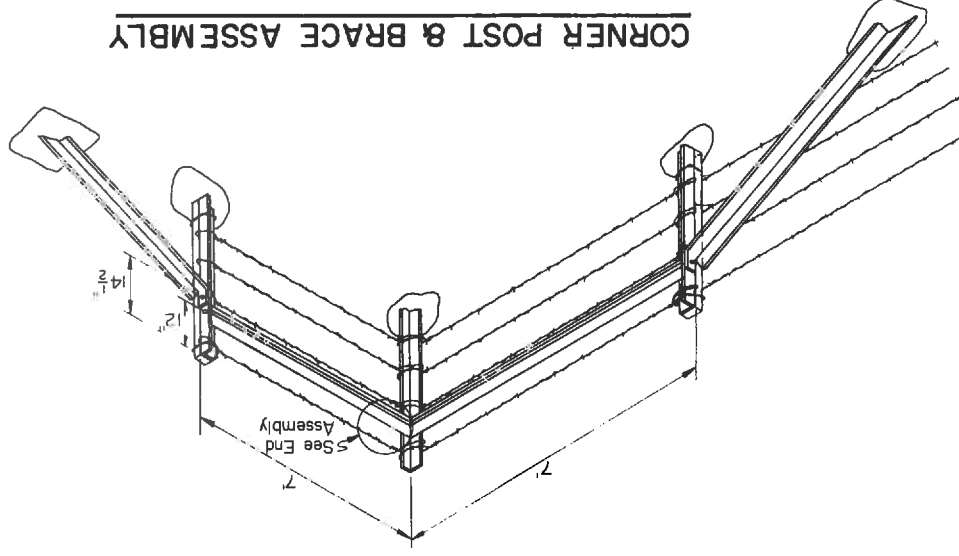
INTERMEDIATE BRACE ASSEMBLY



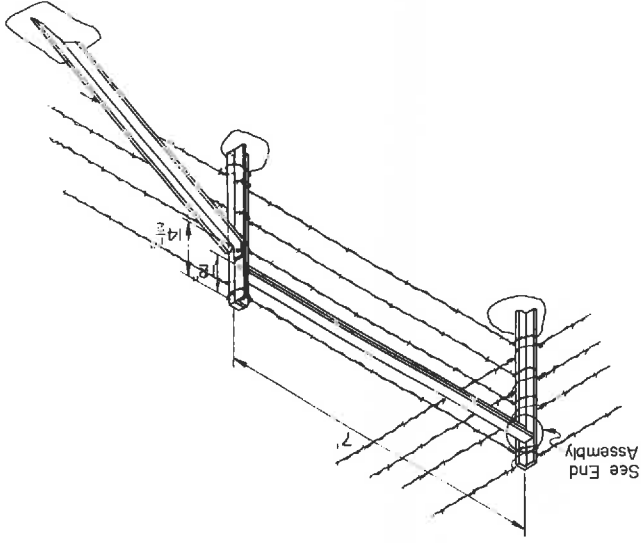
END ASSEMBLY



CORNER POST & BRACE ASSEMBLY



TERMINI POST & BRACE ASSEMBLY



GENERAL NOTES

Specifications: Federal Highway Administration-FP-69.

Posts and Braces: All corner, end, gate and intermediate brace posts shall be 2-1/2"x 2-1/2"x 1/4" steel angle sections, 7'-0" long, weighing not less than 3.9 lbs. per 1in. ft. Braces shall be 2"x 2"x 1/4" steel angles, 7'-0" long, weighing not less than 3.0 lbs. per 1in. ft. The posts shall be steel "Tees", 6"-6" long, weighing not less than 1.3 lbs. per 1in. ft., and shall have an anchor plate sufficient to resist movement. All posts and braces shall be drilled or punched as shown hereon, and shall have a weather resistant green baked enamel finish which shall also be resistant to the shock of driving operations. White paint on the top portion of the post is optional. The posts with studded face will be acceptable in lieu of drilled or punched posts.

Wood Stays: Treated fence stays shall be made from well seasoned, straight, sound, West Coast Douglas Fir, Ponderosa Pine, or Lodgepole Pine. Treatment of posts and fence stays shall be in accordance with FP-69, Section 716, Material for Timber Structures. Treatment shall be either Pentachlorophenol or Creosote. If Pentachlorophenol is used, the minimum net retention shall be 0.30 lbs. per cubic ft., of wood. If Creosote is used, the minimum net retention shall be 5 lbs. of preservative per cubic ft., of wood.

Brace Panels: All corner, end or gate posts shall be braced as detailed hereon. Corner posts and bracing shall be placed at all changes in alignment in excess of 20 degrees. Intermediate bracing shall be placed at all changes in grade in excess of 20 degrees. Where the distance between corners or ends is in excess of 1/8 of mile, intermediate bracing shall be inserted at uniform intervals of not less than 1/8 mile.

Barbed Wire: Barbed wire shall conform to current A.S.T.M. Specification A-121, Class 1, and shall be 2 strands of 12-1/2-gage galvanized wire, twisted, having 2 point, double wrap, 14-gage round bars, maximum of 4" apart. Minimum net weight shall be 78 lbs. per 80-rod reel.

Miscellaneous: Fence stays shall be double strand, twisted, 9-1/2-gage galvanized wire. Fence ties shall be a minimum of 12-1/2-gage galvanized wire. Every strand of barbed wire shall be tied to each lay-down post. Bolts for attaching braces shall be 1/2" x 1" galvanized machine bolts. Loops connecting lay-down posts to line posts shall be 12-1/2-gage (min.) galvanized. Staples shall be 9-gage, galvanized 1-1/2" long.

Concrete: Concrete shall be class B, and shall be allowed to set not less than seven days before wire may be stretched.

ESTIMATED QUANTITIES FOR STANDARD PREFAB CATTLE GUARDS

CATTLE GUARD WIDTH	12'	14'	16'	18'	20'	22'	24'	26'	28'	30'	32'	34'	36'	38'	40'	42'
DESCRIPTION	QUAN.	LENGTH	QUAN.	LENGTH	QUAN.	LENGTH	QUAN.	LENGTH	QUAN.	LENGTH	QUAN.	LENGTH	QUAN.	LENGTH	QUAN.	LENGTH
* 4 REINFORCING BARS A-1 BAR	8	9'-2"	8	9'-2"	8	9'-2"	8	9'-2"	8	9'-2"	8	9'-2"	8	9'-2"	8	9'-2"
* 4 REINFORCING BARS A-2 TIE BAR	20	7'-2"	20	7'-2"	20	7'-2"	20	7'-2"	20	7'-2"	20	7'-2"	20	7'-2"	20	7'-2"
* 4 REINFORCING BARS A-3 TIE BAR	26	9'-0"	30	9'-0"	34	9'-0"	38	9'-0"	42	9'-0"	46	9'-0"	50	9'-0"	54	9'-0"
* 4 REINFORCING BARS A-4 BAR	14	13'-0"	14	15'-0"	14	17'-0"	14	19'-0"	14	21'-0"	14	23'-0"	14	25'-0"	14	27'-0"
* 4 REINFORCING BARS A-5 BAR	4	12'-0"	4	14'-0"	4	16'-0"	4	18'-0"	4	20'-0"	4	22'-0"	4	24'-0"	4	26'-0"
SEE ESTIMATED LIST OF MATERIALS FOR GRID UNIT A											4					
FOR GRID UNIT B											1					
FOR GRID UNIT C											2					
FOR GRID UNIT D																3
CUBIC YARDS CONCRETE LATERAL SUPPORTS	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85
CUBIC YARDS CONCRETE END SUPPORTS	4.16	4.84	5.52	6.19	6.87	7.54	8.22	8.89	9.57	10.24	10.92	11.60	12.27	12.95	13.62	14.30
TOTAL CONCRETE (CUBIC YARDS)	6.01	6.69	7.37	8.04	8.72	9.39	10.07	10.74	11.42	12.09	12.77	13.45	14.12	14.80	15.47	16.15
STRUCTURAL STEEL * AND CROSS BARS POUNDS	2050	2295	2770	3105	3440	3770	4100	4445	4790	5160	5540	5820	6150	6495	6880	7185
REINFORCING STEEL POUNDS * 4 BARS	455															1175
WEIGHTS DO NOT INCLUDE HARDWARE																

ESTIMATED QUANTITIES FOR ONE CATTLE GUARD WING

PART DESCRIPTION	WOODEN WING	STEEL ANGLE	IRON WING	ALUMINUM TUBING WING
MIDDLE SUPPORT	1-2"x6"x6'-0"	TREATED S4S	1-2"x2"x2"x6'-1"	GALV STEEL ANGLE
HORZ BRACE NO.1	1-2"x6"x7'-0"	1-2"OD x 2"x7'-0"	1-2" x 6" x 7'-0"	ALUMINUM TUBING
OUTSIDE DIAG SUPPORTS	2-2"x6"x7'-0"	TREATED S4S	2-2"x2"x2"x7'-3"	4"OD x 8" GALV STEEL ANGLE
				(See Drawing for Fabrication Details)
MIDDLE SUPPORT	1-2"x6"x6'-0"	TREATED S4S	1-2"x2"x2"x6'-1"	GALV STEEL ANGLE
HORZ BRACE NO.1	1-2"x6"x7'-0"	1-2"OD x 2"x7'-0"	1-2" x 6" x 7'-0"	ALUMINUM TUBING
NO. 2	1-2"x6"x5'-0"	TREATED S4S	1-2" x 6" x 5'-0"	GALV STEEL BAR
NO. 3	1-2"x6"x2'-0"	TREATED S4S	1-2" x 6" x 2'-0"	GALV STEEL BAR
NO. 4	1-2" x 4'-0"	GALV STEEL BAR	1-2" x 4'-0"	GALV STEEL BAR
NO. 5	NONE	1-2" x 2'-6"	1-2" x 2'-6"	GALV STEEL BAR
NO. 6	NONE	1-2" x 1'-6"	1-2" x 1'-6"	GALV STEEL BAR
POST	1-6"x6"x8'-0"	TREATED S4S	1-6"x6"x8'-0"	TREATED S4S OR TREATED S4S OR
TOP ANCHOR ASSEMBLY				Toenail Diagonal Supports To The Post With 16-d Bolt W/ Nut and Washer
BOTTOM ANCHOR ASSEMBLY				2"x8"x9'-6" Treated S4S Sill Washers Embedded In Conc. Attach Steel 7' Iron to Bolt With Flat Washer

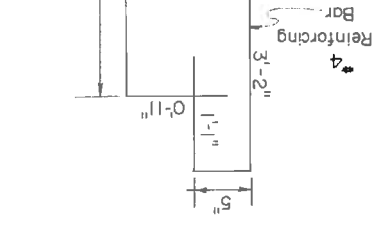
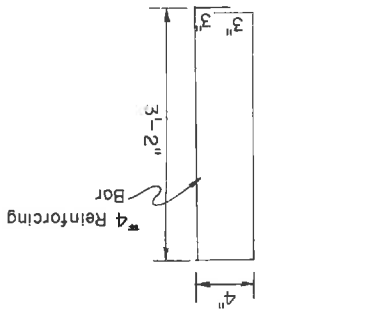
GRID UNIT "A" (8'-0")
LIST OF MATERIALS
2 Ea. 8 C 11.5 x 7'-9" Long
3 Ea. 8 W 17 x 7'-9" Long
Aluminum Tubing

GRID UNIT "B" (10'-0")
LIST OF MATERIALS
2 Ea. 8 C 11.5 x 7'-9" Long
4 Ea. 8 W 17 x 7'-9" Long
13 Ea. Cross Bars x 10'-0" Long

GRID UNIT "C" (12'-0")
LIST OF MATERIALS
2 Ea. 8 C 11.5 x 7'-9" Long
5 Ea. 8 W 17 x 7'-9" Long
13 Ea. Cross Bars x 12'-0" Long

GRID UNIT "D" (14'-0")
LIST OF MATERIALS
2 Ea. 8 C 11.5 x 7'-9" Long
6 Ea. 8 W 17 x 7'-9" Long
13 Ea. Cross Bars x 14'-0" Long

6 Ea. 7 2 1/2" x 2 1/2" x 1'-10" Long
8 Ea. 7 2 1/2" x 2 1/2" x 2'-2" Long
13 Ea. Cross Bars x 14'-0" Long



The Bid Item 607(4) Cattle Guard shall be one structure complete, including structural excavation, sub-structure, super-structure and wing guards.
The Quantities shown on this sheet are for estimating purposes only.

GENERAL NOTES

U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
REGION-8 DENVER, COLORADO

PREFABRICATED TYPE CATTLE GUARD

STANDARD 607-6

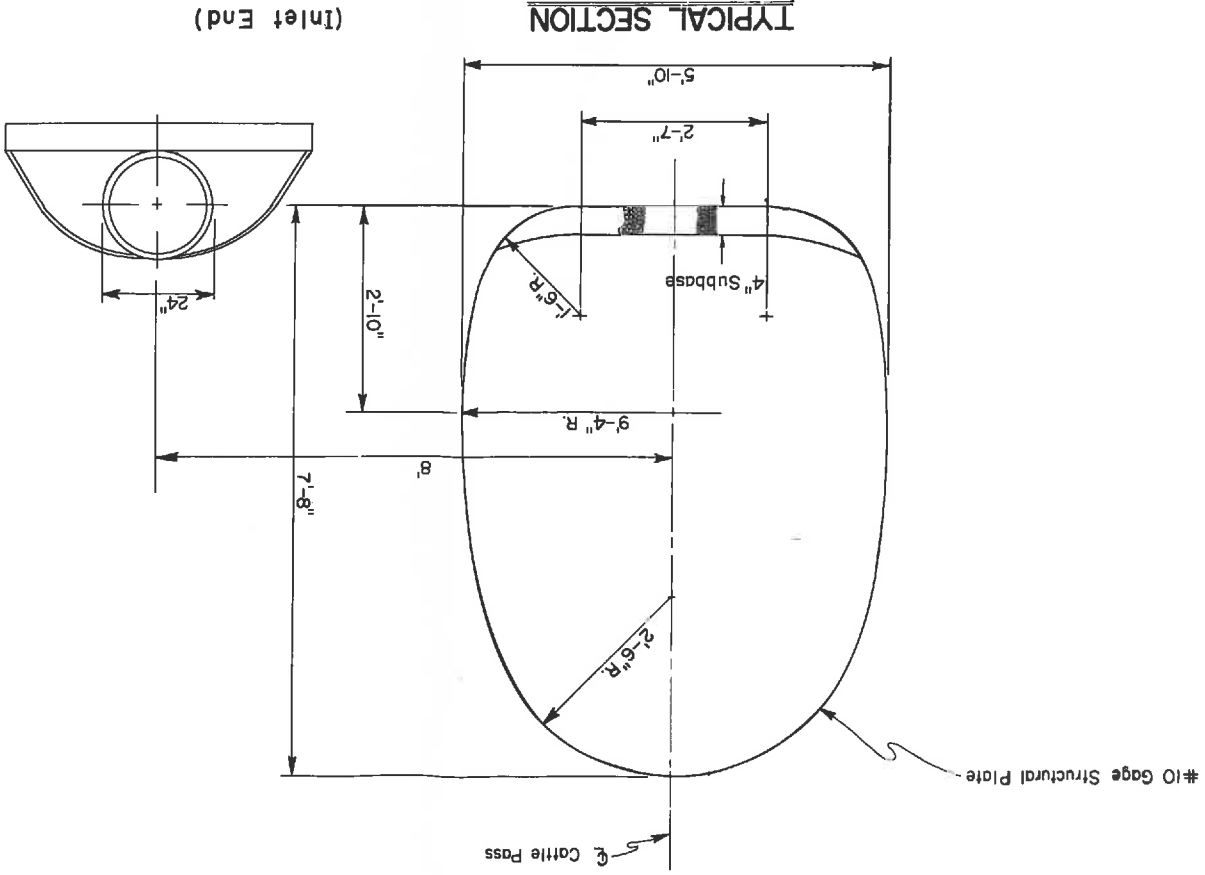
Sheet 2 of 2

GENERAL NOTES

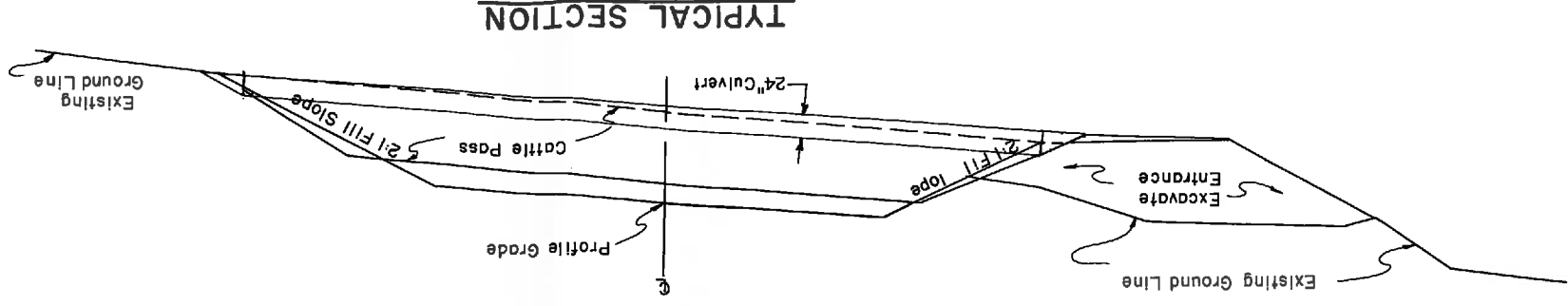
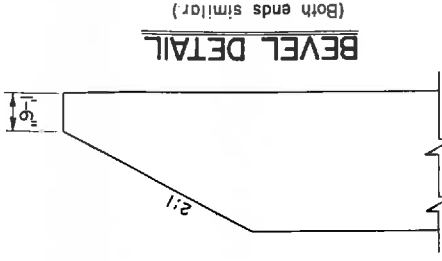
SPECIFICATIONS: Federal Highway Administration, FP-69.

STRUCTURAL-PLATE: Material shall not be ordered until length, location, and grade have been checked in the field by the Engineer. Bevel cuts at ends shall be made at right angles to the longitudinal axis of the structure. Maximum height of cover shall be 10 feet, and minimum height of cover shall be 1 foot. All structural-plate shall be #10 gage galvanized steel manufactured, fabricated, and installed according to Section 617 of F.P. 69.

SUBBASE: Subbase material shall be paid for under item 214, Special Subbase. Placement of subbase material shall be subsidiary to item 617(5), Structural Plate Cattle Pass.



(Taken perpendicular to longitudinal axis.) Dimensions shown are nominal and may vary slightly between manufacturers.



ESTIMATED QUANTITIES		LOCATION	
2010+00	Lin. Ft.	Cu. Yd.	Ton.
86	Structural-Plate Cattle Pass, #10 gage	88	Subbase
	Excavation for Structures (1)	17	

U. S. DEPARTMENT OF TRANSPORTATION
 FEDERAL HIGHWAY ADMINISTRATION
 BUREAU OF PUBLIC ROADS
 REGION - 8 DENVER, COLORADO

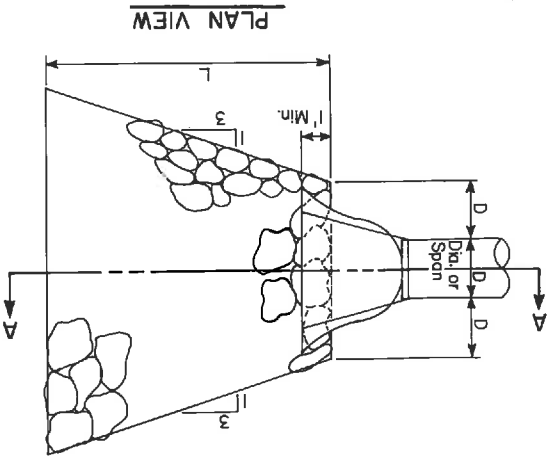
5'-10"x7'-8" STRUCTURAL-
 PLATE CATTLE PASS

Project:

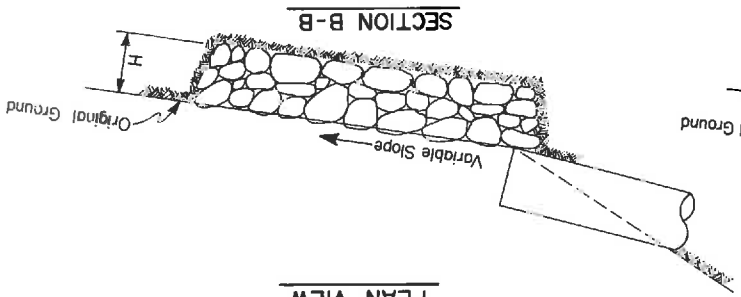
Revisions

STANDARD 617-1

APRON TYPE CLASS	APRON RIPPAP	LENGTH OF APRON (Feet)	DEPTH OF APRON (Feet)
1	A	4 x D	18"
2	B	5 x D	24"
3	C	6 x D	36"
4	C	7 x D	36"
5	C	8 x D	36"

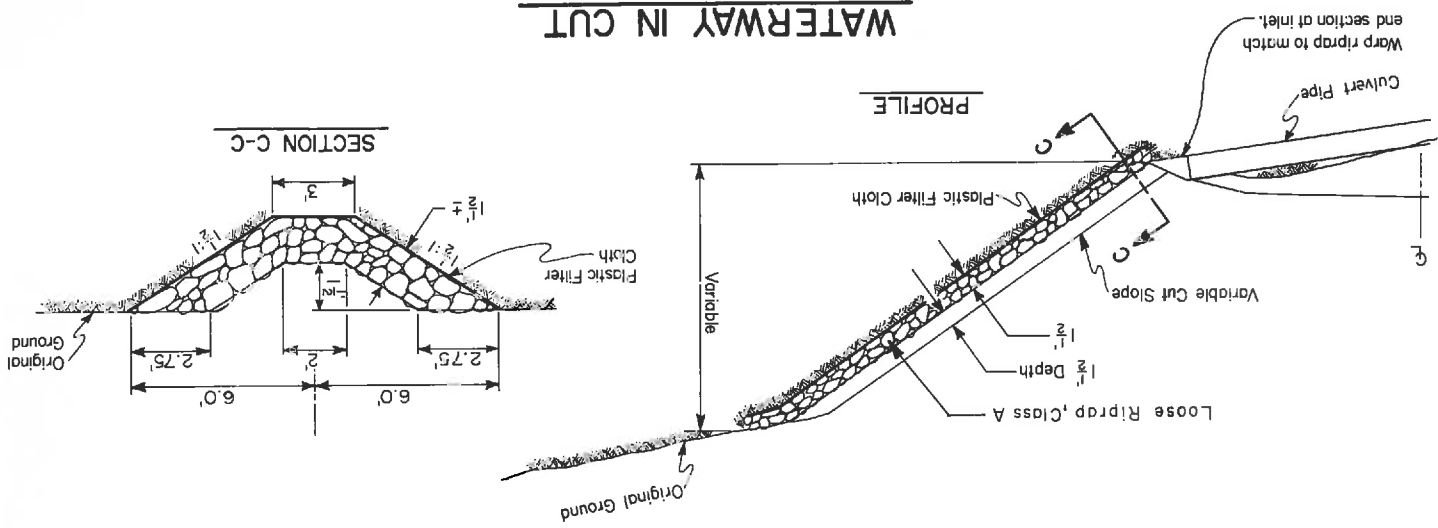


CULVERT WITH STANDARD END SECTION

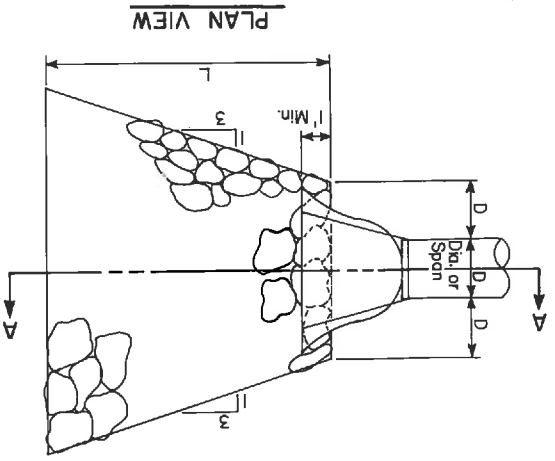


CULVERT WITHOUT STANDARD END SECTION

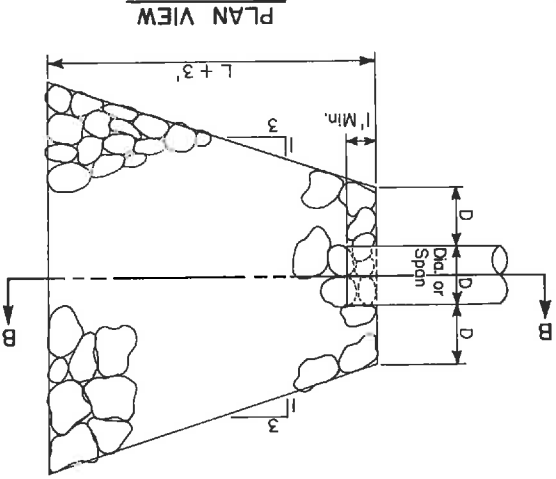
PROTECTIVE APRON



WATERWAY IN CUT



PLAN VIEW



PLAN VIEW

LOOSE RIPPAP GRADATION	
CLASS-A	ROCK DIAMETER PERCENT PASSING
12"	100
6"	50-80
3"	0-10
CLASS-B	
24"	100
12"	50-80
6"	0-10
CLASS-C	
36"	100
24"	50-80
10"	0-10

GENERAL NOTES

LOOSE RIPPAP EROSION CONTROL AT PIPE CULVERTS

U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
REGION-8 DENVER, COLORADO

STANDARD MAINTENANCE POSTS AND DELINEATORS

U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
REGION-8 DENVER, COLORADO

Revisions

Post: Posts for delineators shall be galvanized steel. The posts shall be of a flanged shape conforming in size and to the limitations shown, and shall weigh at least 2 pounds per linear foot. All required holes and cuts shall be made before galvanizing. The post shall be galvanized in accordance with ASHD Designation M-III, and shall meet the specifications and requirements as specified by the Utah Department of Highways.

Reflector Units: Reflector units shall be approximately 3 1/2" in diameter. The reflective area of the reflector unit shall not be less than 6.5 square inches.

The reflector lens shall be methyl methacrylate, meeting requirements of Federal Specifications L-P-380A.

The reflector and reflector housing shall meet the specifications and requirements as specified by the Utah Department of Highways.

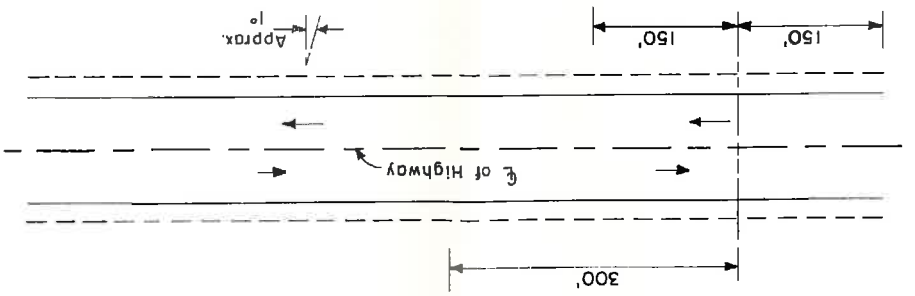
Installation: Posts shall be driven to the depth shown, and shall be vertical and in accurate alignment. They shall be driven by the use of a regular post driver or protected by a driving cap if any means other than a post driver is used.

The reflector unit shall be securely fastened to the steel mounting post with a 5/8" x 2 1/2" stainless steel bolt, with one-way slot and cadmium plated vandol resistant nut. Threads shall be distorted after installation.

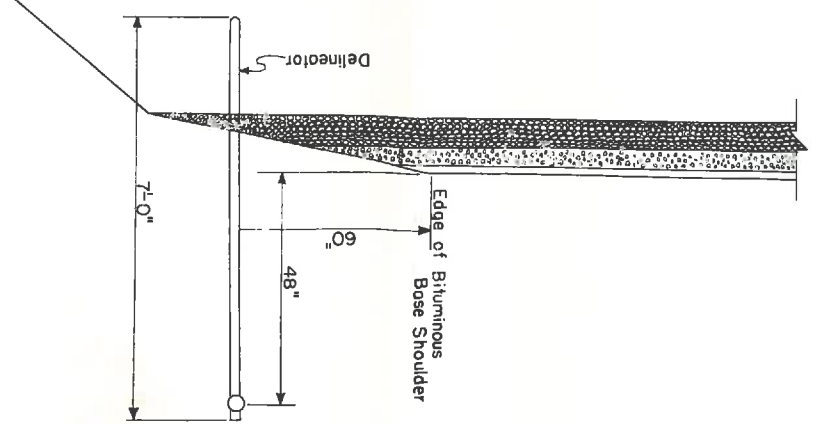
DEGREE OF CURVE	SPACING ON EACH END OF CURVE		
	FIRST SPACE	SECOND SPACE	THIRD SPACE
1	152	200	200
2	106	200	200
3	86	155	200
4	74	133	200
5	66	119	198
7	55	99	165
9	48	86	144
12	41	74	123
15	36	65	108
18	33	59	99
21	30	54	90
25	28	50	84
30	24	43	72
144			

DELINATOR INTERVAL ON HORIZONTAL CURVES

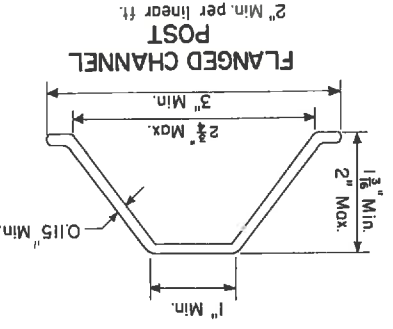
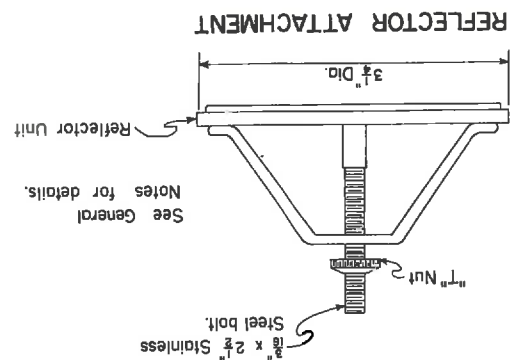
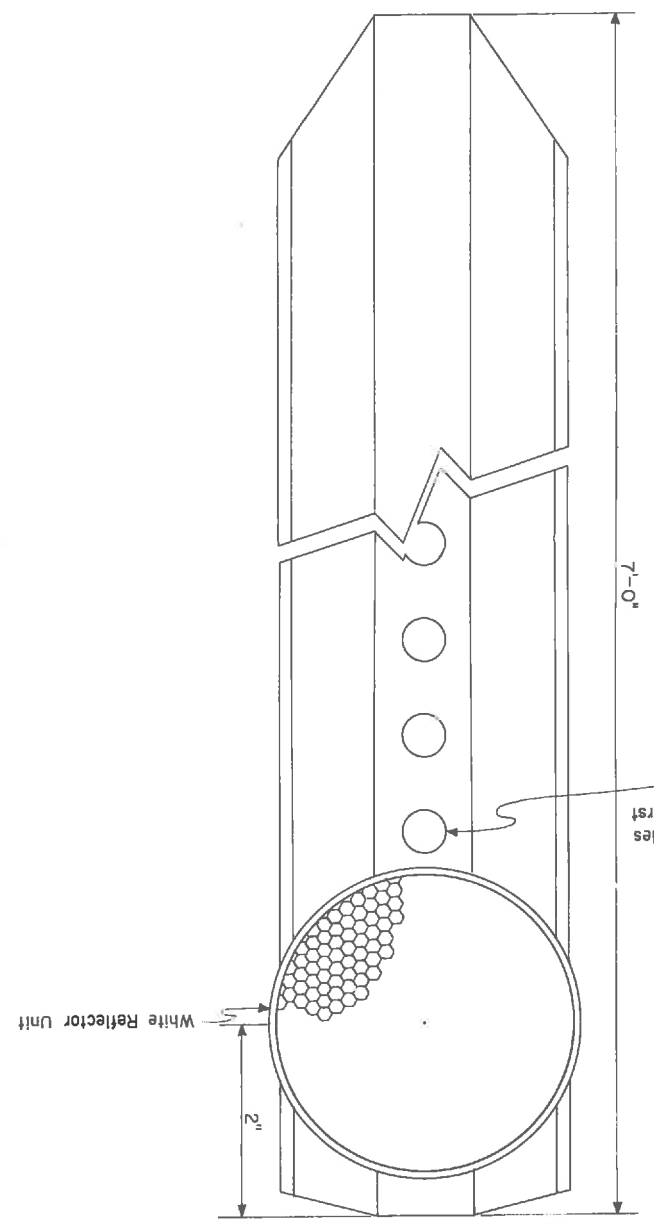
DELINATOR INTERVAL ON TANGENTS



LOCATION OF DELINATOR



DELINATOR TYPE I



GENERAL NOTES FOR DELINEATORS

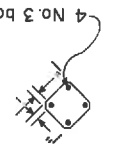
Specifications: Federal Highway Administration, F.P-69.

Materials:

USE

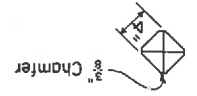
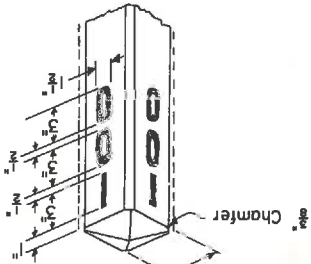
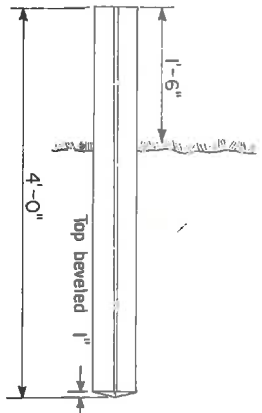
CONCRETE MAINTENANCE MARKER POST

4 No. 3 bars 3'-9" long tied with No. 12 soft annealed iron wire.



Concrete to be Class "Y" FHWA Specifications except that an approved brand of white cement is to be used.

Die cast metal numbers 3" high on adjacent sides reading from top down and spaced as shown. Metal numbers to be non-rusting and black in color, 1/2" in thickness, 1/2" in width, and held by anchors in concrete.

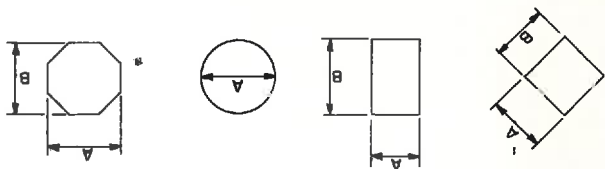


SIGN DETAILS

U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
REGION-8 DENVER, COLORADO

Revisions

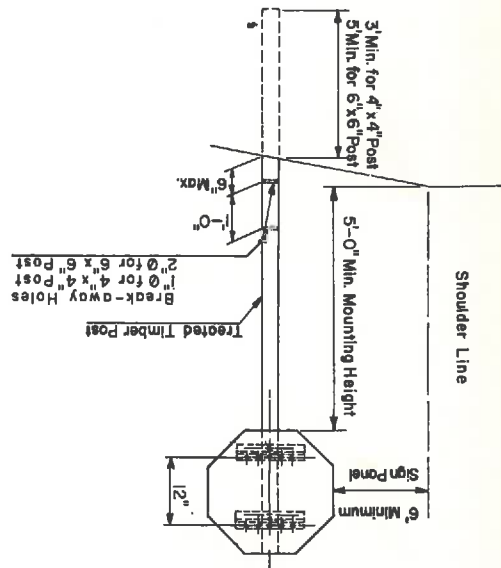
TYPICAL SIGN DIMENSIONS



Note: For this project all signs shall require two backing Zees. Backing Zees shall be at least as long as Dimension A minus 10 inches.
Backing zees are 3" x 2 1/2" x 1/4" at 6.7 lbs. per ft. for steel or 2.33 lbs. per ft. for 6061-T6 aluminum.

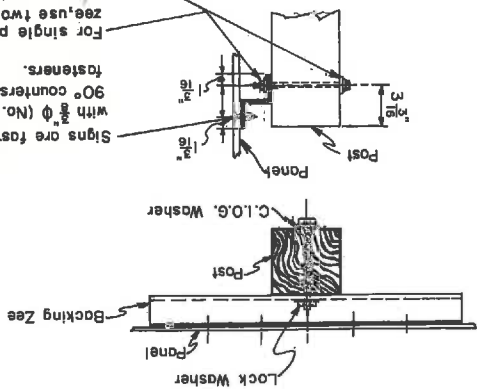
NOTE: Signs larger than 36-inches wide or with areas greater than 10 sq. ft. shall be mounted on two posts.

TYPICAL SIGN
ERECTOR DETAIL



SIGN FASTENING
DETAILS

Signs are fastened to backing Zees with 3/8" (No. 4 thru No. 10, as required) 90° countersunk aluminum lockbolts with 3/8" lock washers.
For single post signs with one backing zee, use two 3/8" machine bolts with lock washers and hex nuts with lock washers at the zee.
For single post signs with two backing zees, use one 3/8" machine bolt with C.I.O.G. washer and hex nut with lock washers at each zee.



* MOUNT 2 SIGNS ON THE SAME POSTS OPPOSITE THE APPROACH ROAD. PAYMENT WILL BE MADE FOR THIS INSTALLATION AS TWO SIGN UNITS.

Sign Assembly No.	Station	Distance From Center Line (ft.)	Type Ref. MUTCD	Message	Dimensions A x B (in)	Post Size
1	1991+00	21 L.C.	R2-56	REDUCED SPEED 30 M.P.H.	24" X 30"	4" X 4" X 14'
2	1997+00	21 L.C.	W8-3	PAYMENT ENDS	30" X 30"	"
3	2048+00	21 R.C.	W1-26		30" X 30"	"
4	2066+00	21 L.C.	W1-22		30" X 30"	"
5	2082+00	21 R.C.	W1-5R		30" X 30"	"
6	2107+00	22 R.C.	W1-5R		30" X 30"	"
7	2112+00	22 L.C.	W1-5L		30" X 30"	"
8	2135+00	21 R.C.	W1-2L		30" X 30"	"
9	2139+00	21 L.C.	W1-5R		30" X 30"	"
10	2154+00	21 R.C.	W1-2R		30" X 30"	"
11	2154+00	21 L.C.	W1-2R		30" X 30"	"
12	2177+00	21 L.C.	W1-2L		30" X 30"	"
13	+2190+50	21 L.C.	D1-2	SPRING CREEK PASS CORRALIS	Var. X 30"	"
14	2190+50	20 R.C.	R-1-K	STOP	30" X 30"	"
15	2209+00	21 R.C.	W1-2L		30" X 30"	"
16	2228+00	21 L.C.	W1-2R		30" X 30"	"

SIGN SCHEDULE

Sign Data