

INDEX OF SHEETS

- 1 SKETCH MAP, TITLE PAGE & TABULATION OF LENGTH & DESIGN DATA.
2 TYPICAL SECTION & GENERAL NOTES.
3 SURFACING PLAN, TIMBER GUARD POSTS & SKETCH MAP OF MATERIAL PIT & SUMMARY OF APPROXIMATE QUANTITIES.
4 STANDARD TIMBER GUARD POSTS.
5-6 STANDARD ROADWAY CONSTRUCTION TRAFFIC SIGNS

M-19-D
M-29-B

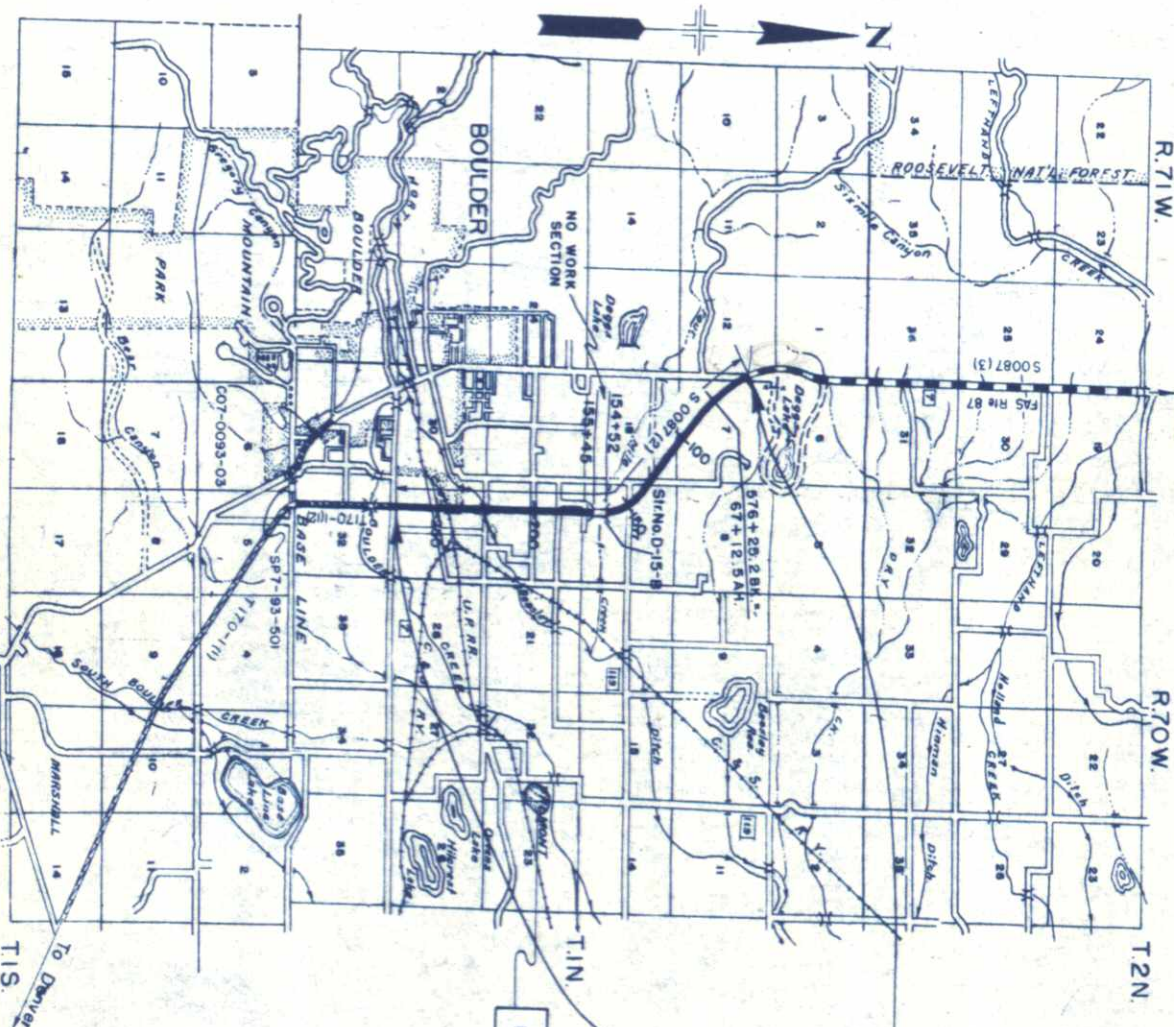
TABULATION OF LENGTH & DESIGN

STATION	ROADWAY		BRIDGE LOADING
	24'	48'	
554+67.5	Begin S 0087(4) = Begin S 0087(2)		NO WORK SECTION
576+29.2	2,161.7		
67+12.5	8,739.5		
154+52		3.0	
154+55.0		89.6	
154+55.4	Equation - Four Mile Creek (S.R. No. D-15-B) Bridge Begin Work Section		S 16-44
155+45	End 24' Roadway = Beginning 48' Roadway		
189+00	3,355.0		
273+37.6	8,437.6		
	End S 0087(4) = End S 0087(2)		
TOTAL	14,256.2	92.6	
SUMMARY			
Total Roadway (24' width)		LIN. FT.	MILES
Total Roadway (48' width)		14,256.2	2.700
NET LENGTH		8,437.6	1.598
No Work Section		22,693.8	4.298
GROSS LENGTH		92.6	.018
		22,786.4	4.316
DESIGN DATA			
Maximum Grade of Curve			2.70%
Minimum N.P.S.D. (Horizontal)			800'
Minimum N.P.S.D. (Vertical)			475'
Maximum Design Speed			60 MPH

COLORADO
DEPARTMENT OF HIGHWAYS
PLAN AND PROFILE OF PROPOSED
FEDERAL AID PROJECT NO. S 0087 (4)
STATE HIGHWAY NO. 7
BOULDER COUNTY

SCALES OF ORIGINAL DRAWINGS

ON PLAN, 1 IN. = 100 FT.
ON PROFILE, 1 IN. = 100 FT. HORIZONTAL
GRADE LINE ON PROFILE IS SHOWN AS GRADE OF FINISHED ROAD
GROSS LENGTH OF PROJECT 22,786.4 FT. = 4.316 MILES
NET LENGTH OF PROJECT 22,693.8 FT. = 4.298 MILES



CONVENTIONAL SIGNS

CENTER LINE
RIGHT OF WAY LINE
COUNTY LINE
TOWNSHIP OR RANGE LINE
LAND LINES
RAILROAD
BARBED WIRE FENCE
COMBINATION WIRE FENCE
SNOW FENCE
TELEPHONE & TELEGRAPH LINES
POWER LINE
DETOUR
PRESENT ROAD (From Sheet)
CITY LIMITS

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO	S 0087(4)	1	

REV. 5/22/57 G.S.



STA. 554+67.5 - BEGIN S 0087(4) =
STA. 554+67.5 Begin S 0087(2)

STA. 273+37.6 - END S 0087(4) =
STA. 273+37.6 End S 0087(2)

NOTICE TO BIDDERS
IT IS RECOMMENDED THAT BIDDERS ON THIS PROJECT GO OVER THE PLAN DETAILS WITH ONE OF THE FOLLOWING FIELD REPRESENTATIVES OF THIS DEPARTMENT:
E. W. Oviatt, Construction Engineer, Greeley, Colorado
D. S. Moore, Resident Engineer, Boulder, Colorado
Home Phone Hillcrest 2-1261

COLORADO
DEPARTMENT OF HIGHWAYS

APPROVED:
Mark L. Walker
CHIEF ENGINEER
DATE 2-28-57

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

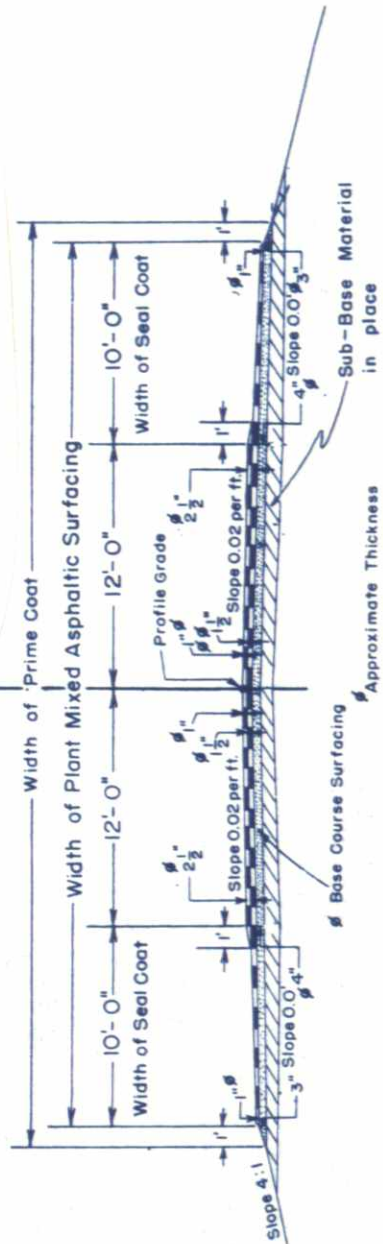
APPROVED

DIVISION ENGINEER

DATE

TYPICAL CROSS SECTIONS OF IMPROVEMENT

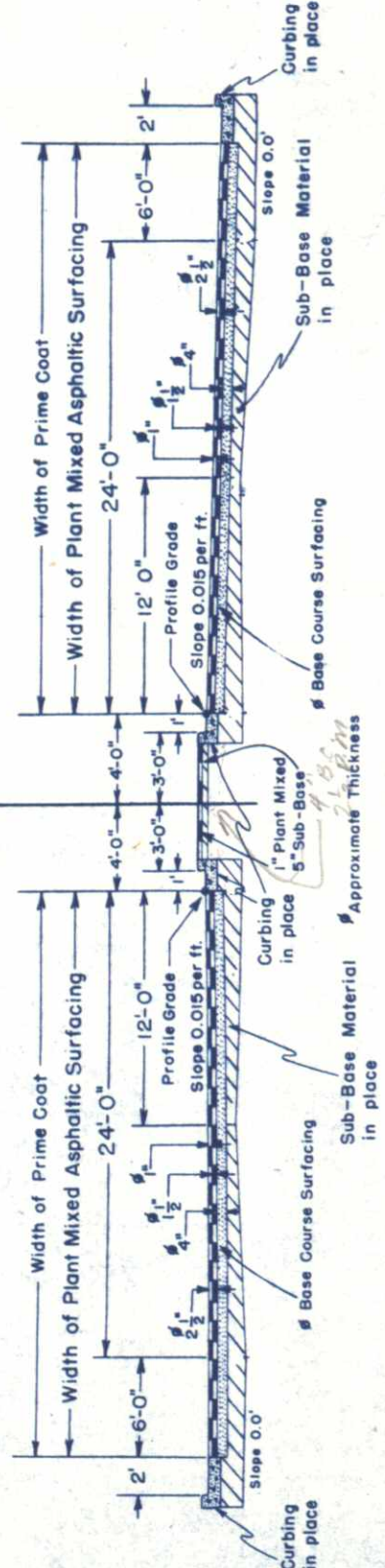
24' ROADWAY
TYPICAL "C"
554 + 67.5 to 180 + 85
180 + 85 to 189 + 00 Transition C to B



Approximate 6 1/2" compacted thickness of Gravel or Crushed Rock Surfacing shall be placed in separate courses at the following rates per 100 lin. ft. of roadway.

PLANT MIXED ASPHALTIC SURFACING (1" TOP LAYER)	16 TONS
PLANT MIXED ASPHALTIC SURFACING (1 1/2" BOTTOM LAYER)	37 TONS
BASE COURSE SURFACING	93 TONS

48' ROADWAY
TYPICAL "A"
241 + 69.2 to 273 + 37.6

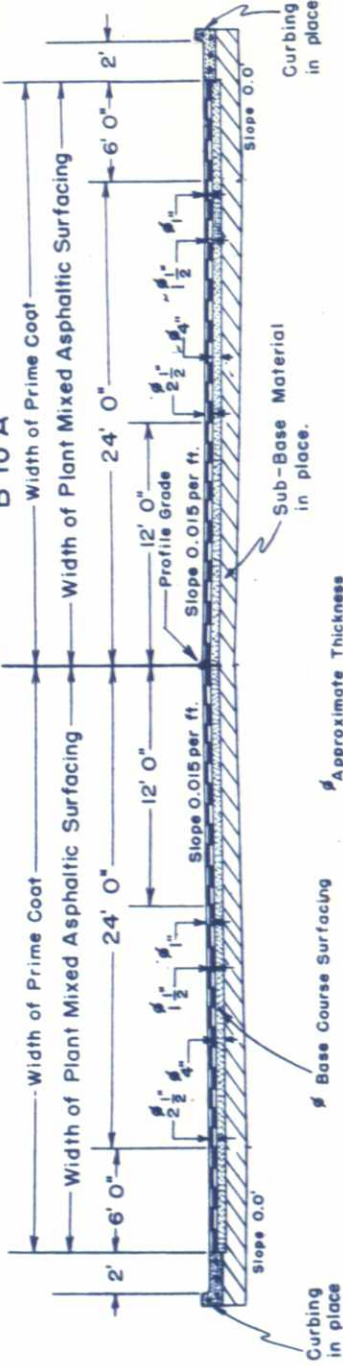


Approximate 6 1/2" compacted thickness of Gravel or Crushed Rock Surfacing shall be placed in separate courses at the following rates per 100 lin. ft. of roadway.

PLANT MIXED ASPHALTIC SURFACING (1" TOP LAYER)	37 TONS
PLANT MIXED ASPHALTIC SURFACING (1 1/2" BOTTOM LAYER)	55 TONS
BASE COURSE SURFACING	134 TONS
PLANT MIXED ASPHALTIC SURFACING (1" MEDIAN)	3 TONS

REV. 5/22/57 G.S.

48' ROADWAY
TYPICAL "B"
189 + 00 to 219 + 58.1
219 + 58.1 to 240 + 00
240 + 00 to 241 + 69.2 Transition B to A



8 Foot Shoulders Without Curb & Gutter

Approximate 6 1/2" compacted thickness of Gravel or Crushed Rock Surfacing shall be placed in separate courses at the following rates per 100 lin. ft. of roadway.

PLANT MIXED ASPHALTIC SURFACING (1" TOP LAYER)	37 TONS
PLANT MIXED ASPHALTIC SURFACING (1 1/2" BOTTOM LAYER)	55 TONS
BASE COURSE SURFACING	134 TONS

GENERAL NOTES

This project is to be constructed in conformity with the Standard Specifications of the Colorado Department of Highways, adopted June 1, 1952.

All quantities on preliminary plans are to be considered approximate only. For alignment and grades see project No. 50087(2)

All side approach roads to the project designated by the Engineer shall have 2 inches of Surfacing to approximately 50 feet out from edge of the Asphaltic Surfacing or to the Right of Way line whichever is less. The following listed approaches shall be primed and asphaltic processed: - Sta. 218+; Sta. 231+29Rt; Sta. 235+; Sta. 239+ Rt; Sta. 243+; Sta. 251+; Sta. 261+; & Sta. 271+.

At Bridge Approaches, the top layer of Asphaltic Surfacing shall be widened to meet the curb width of the bridge and shall take place gradually over a distance of 300 Ft. each way from the bridge ends. The Prime Coat shall be widened beyond Mat as indicated on Typical Section.

For preliminary plan quantities of Asphaltic Road Material and Stone Screenings the following rates of application were used.

PRIME COAT MC @ 0.40 GAL. PER SQ. Yd.
PAVING ASPHALT (100-120 PENETRATION) @ 6.55 Lbs. PER SQ. Yd. PER INCH.
SEAL COAT RC @ 0.30 GAL. PER SQ. Yd.
STONE SCREENINGS (TYPE 1) @ 24 Lbs. PER SQ. Yd.

Rate of application and grade of Asphaltic Material shall be as determined by the Engineer at the time of application.

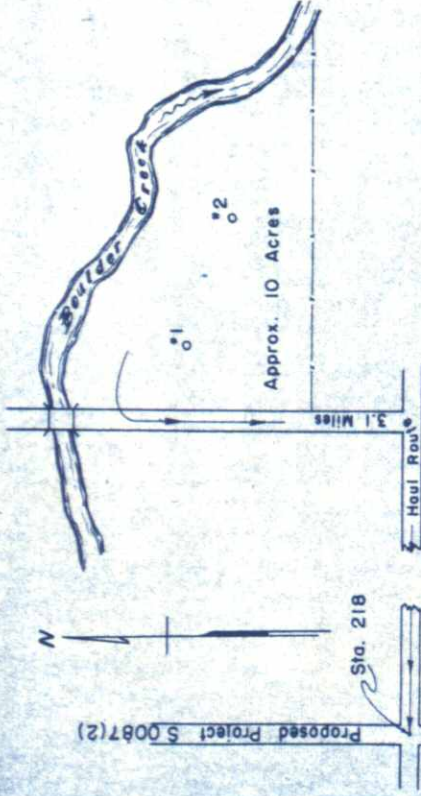
PIT NO. 1

SURFACING PLAN

LOCATION: SW 1/4 NW 1/4 Sec. 23 T. 1 N., R. 70 W.
OWNERS: River Bend Farms Inc.
SAMPLE NO: 1679
AVAILABLE: 200,000 Cu. Yds.

LOG OF PIT

TEST NO.	DEPTH	DESCRIPTION	TEST NO.	DEPTH	DESCRIPTION
1	0.0'-3.0'	Overburden	2	0.0'-2.0'	Overburden
1-A	3.0'-7.0'	Sand, Silt, & Gravel	2-A	2.0'-6.0'	Sand & Gravel
1-B	7.0'-10.0'	Sand & Gravel	2-B	6.0'-11.0'	Sand & Gravel
Water at 4.0'			Water at 5.5'		



Required 1,000 Cu. Yd. for Stripping

TIMBER GUARD POSTS

STATION	SIDE	SPACING	NO. POSTS EACH
568+ (Intersection) 571+20 573+41 81+50		Culvert " "	*27 2 2 2
94+80 101+00 117+00 124+50		" " " "	2 2 2 2
136+50 144+15 146+50 147+41		" " " "	2 2 2 2
149+21 155+ 158+30 164+21		Bridge Culvert "	2 4 2 2

* See Plans for Project S 0087(2) for Location

It is estimated that material for Gravel Surfacing for the Project is available in the vicinity of the Pit indicated in the following tabulation.
Estimated quantities involved in this operation are shown below.
Alteration of the Surfacing Plan as here outlined will be allowed only on written permission from the Department.

SURFACING PLAN

MATERIAL TO BE PLACED	SOURCE	TONS USED GRADING C				TON MILE OVERHAUL	
		PLANT MIXED		BASE COURSE		24' R'dw'y	48' R'dw'y
		24' R'dw'y	48' R'dw'y	24' R'dw'y	48' R'dw'y		
554+67.5 ~ 576+29.2 Bk. 67+12.5 Ah. ~ 154+51.6 155+45 ~ 180+85 180+85 ~ 189+00	Pit No. 1 River Bend Farm Inc. * R = 80	1,146 4,632 1,347 591		2,011 8,128 2,363 925		19,453 65,459 13,768 5,592	
189+00 ~ 218+00 218+00 ~ 240+00 240+00 ~ 241+69.2 241+69.2 ~ 273+37.6			2,668 2,024 159 3,010		3,886 2,948 227 4,246		22,114 16,449 1,364 27,928
Est. for Approaches & Accel. & Decel. Lanes		1,916	1,797	874	1,616	12,281	12,426
TOTAL (24' R'dw'y) TOTAL (48' R'dw'y)		9,632 9,658		14,301	12,923	116,553	80,281

* Base Course Only

SUMMARY OF APPROXIMATE QUANTITIES

ITEM NO.	ITEM	UNIT	ROADWAY		PROJECT TOTAL
			24' WIDTH	48' WIDTH	
13s	Stripping	Cu. Yd.	500	500	1,000
17c	Rolling with Flat Wheeled Roller (Tandem)	Hour	200	200	400
17d	Rolling with Flat Wheeled Roller (Three (3) Wheel)	Hour	10	10	20
17e	Rolling with Rubber Tired Roller (One (1) Unit)	Hour	60	30	90
17ex	Rolling with Rubber Tired Roller (Two (2) Unit)	Hour	10	10	20
17h	Furnishing Flat Wheeled Roller (Tandem)	Each	1.3	0.7	2
17i	Furnishing Flat Wheeled Roller (Three (3) Wheel)	Each	0.5	0.5	1
17j	Furnishing Rubber Tired Roller (One (1) Unit)	Each	0.7	0.3	1
17jx	Furnishing Rubber Tired Roller (Two (2) Unit)	Each	0.5	0.5	1
17k	Wetting	M Gal.	220	200	420
18c	Ton Mile Overhaul	Ton Mile	116,600	80,300	196,900
26c	Gravel or Crushed Rock Surfacing (Grading C)	Ton	14,300	13,000	27,300
29c	Asphalt (100 ~ 120 Penetration)	Ton	650	650	1,300
30x	Asphaltic Road Material MC (Prime)	Gal.	41,300	20,100	61,400
30y	Asphaltic Road Material RC	Gal.	12,900		12,900
31c	Stone Screenings (Type 1)	Ton	520		520
32a	Plant Mixed Asphaltic Surfacing	Ton	9,640	9,660	19,300
92	Timber Guard Posts	Each	74	25	99
	STATE FORCES Signing & Striping Entire Project - Non-Fed. Aid.	Lump Sum			

STATION	SIDE	SPACING	NO. POSTS EACH
167+00 to 170+00 173+ 181+78 184+80 178+	Rt.	150' CBC Culvert " Culverts	3 2 2 2 4
185+00		Culverts	2
191+65 218+ (Intersection)		"	2 *3
243+ (Intersection) 250+85 251+55 270+ (Intersection)		Median "	*9 1 1 *9
TOTAL (24' Roadway) TOTAL (48' Roadway)			74 25

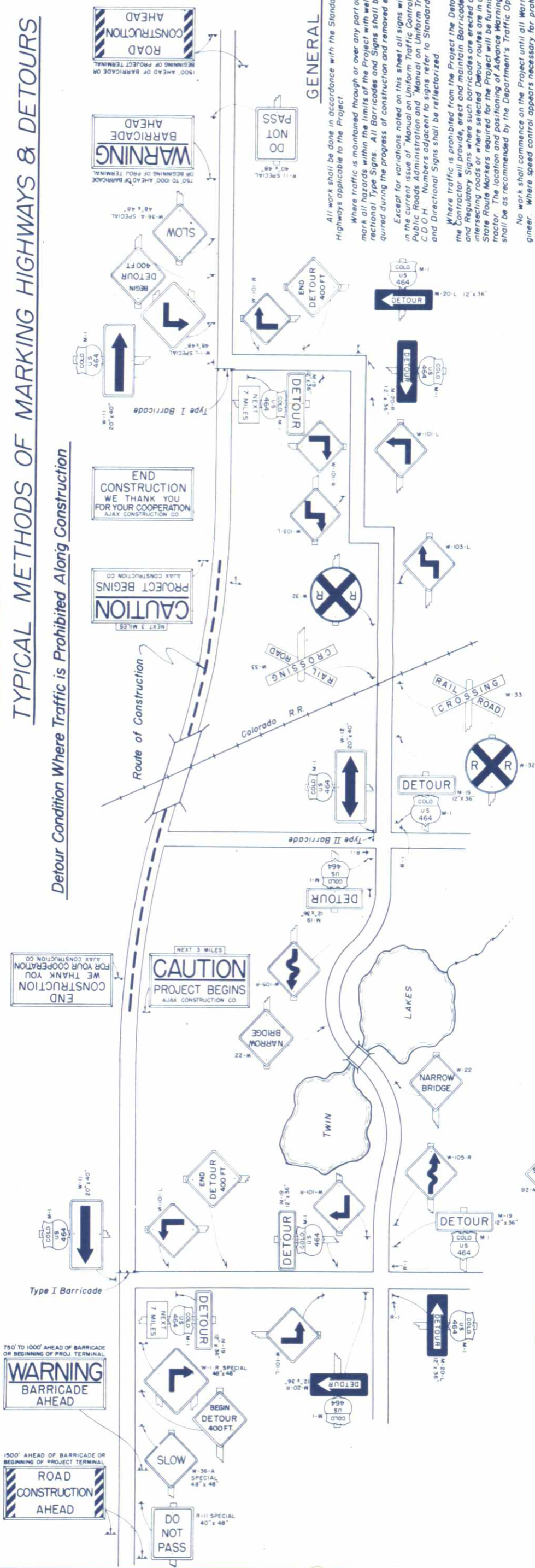
STANDARD ROADWAY CONSTRUCTION TRAFFIC SIGNS

STANDARD M-29-B
(SHEET 1 OF 2 SHEETS)

FILED ROAD DIV. NO.	DISTRICT	SHEET NO.	TOTAL SHEETS
9	COLO.	50037(4)	5

TYPICAL METHODS OF MARKING HIGHWAYS & DETOURS

Detour Condition Where Traffic is Prohibited Along Construction



GENERAL NOTES

All work shall be done in accordance with the Standard Specifications of the Colorado Department of Highways applicable to the Project.

Where traffic is maintained through or over any part of the Project, the Contractor will be required to mark all hazards within the limits of the Project with well maintained Barricades, Warning Signs and Directional Type Signs. All Barricades and Signs shall be moved, added to, changed or removed as required during the progress of construction and removed entirely when project is completed.

Except for variations noted on this sheet all signs will be in conformity with the specification outlined in the current issue of "Manual on Uniform Traffic Control Devices for Streets & Highways" by the U.S. Public Roads Administration. Numbers adjacent to signs refer to Standards in the manual. Standard Warning, Regulatory and Directional Signs shall be reflectorized.

Where traffic is prohibited from the Project the Detour will be marked by the Department except that the Contractor will provide, erect and maintain Barricades complete with approved Directional Arrows and Regulatory Signs where such barricades are erected and maintained at the ends of the Project and intersecting roads or where selected Detour routes are in advance of the actual project terminal. U.S. or State Route Markers required for the Project will be furnished by the Department and installed by the Contractor. The location and positioning of Advance Warning Signs, Barricades and Speed Control Signs shall be as recommended by the Department's Traffic Operations Section.

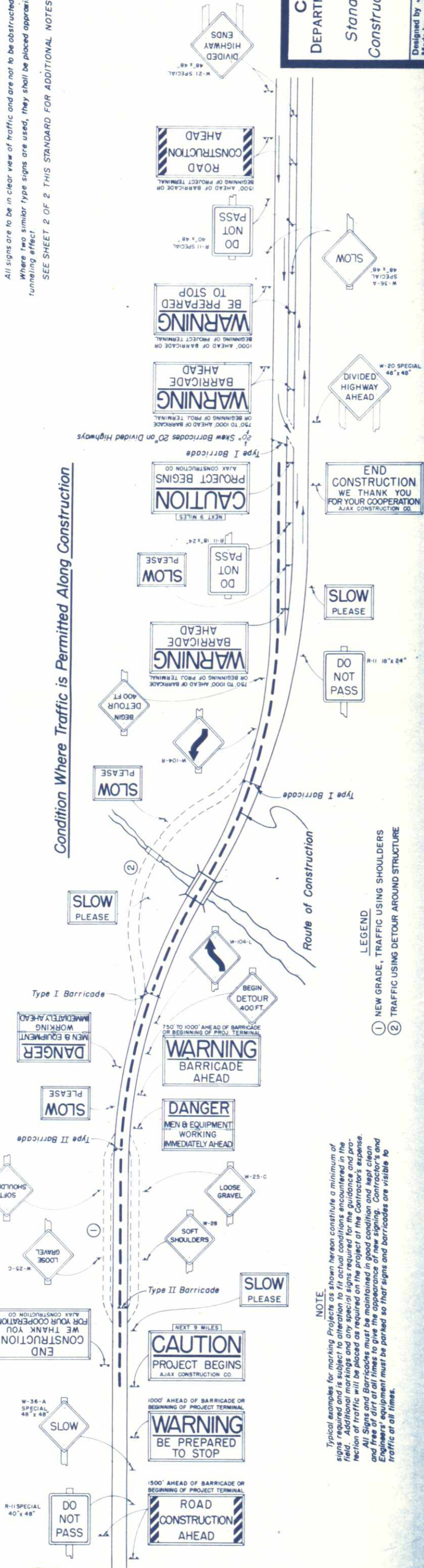
No work shall commence on the Project until all Warning Signs are in place and approved by the Engineer. Where speed control appears necessary for protection of the travelling public, such speed control shall be requested from the Project Engineer by the Contractor.

All signs are to be in clear view of traffic and are not to be obstructed by equipment, weeds or otherwise.

Where two similar type signs are used, they shall be placed approximately 75 feet apart to avoid a tunneling effect.

SEE SHEET 2 OF 2 THIS STANDARD FOR ADDITIONAL NOTES AND DETAILS.

Condition Where Traffic is Permitted Along Construction



- LEGEND
- ① NEW GRADE, TRAFFIC USING SHOULDERS
 - ② TRAFFIC USING DETOUR AROUND STRUCTURE

NOTE

Typical examples for marking Projects as shown hereon constitute a minimum of signs required and is subject to alteration to fit actual conditions encountered in the field. Additional markings and any special signs required for the guidance and protection of traffic will be placed as required on the project at the Contractor's expense. All Signs and Barricades must be maintained in good condition and kept clean and free of dirt at all times to give the appearance of new signing. Contractor's and Engineer's equipment must be parked so that signs and barricades are visible to traffic at all times.

COLORADO
DEPARTMENT OF HIGHWAYS
Standard Roadway
Construction Traffic Signs

Designed by J.C.R. Approved by J.C.R.
Made by J.C.R. Engineer, Surveyor
Checked by J.C.R. Date: July 22, 1955

STANDARD ROADWAY CONSTRUCTION TRAFFIC SIGNS

STANDARD M-29-B
(SHEET 2 OF 2 SHEETS)

FED. ROAD DIV. NO.	DISTRICT	SHEET NO.	TOTAL SHEETS
9	COLO.	50087(9)	6

Rev. 7-10-56, Reflective Materials, L.N.P.

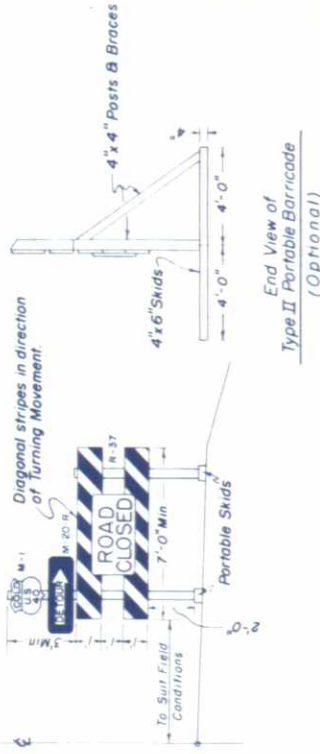
DETAILS OF BARRICADES

Type I
(Road Closed)



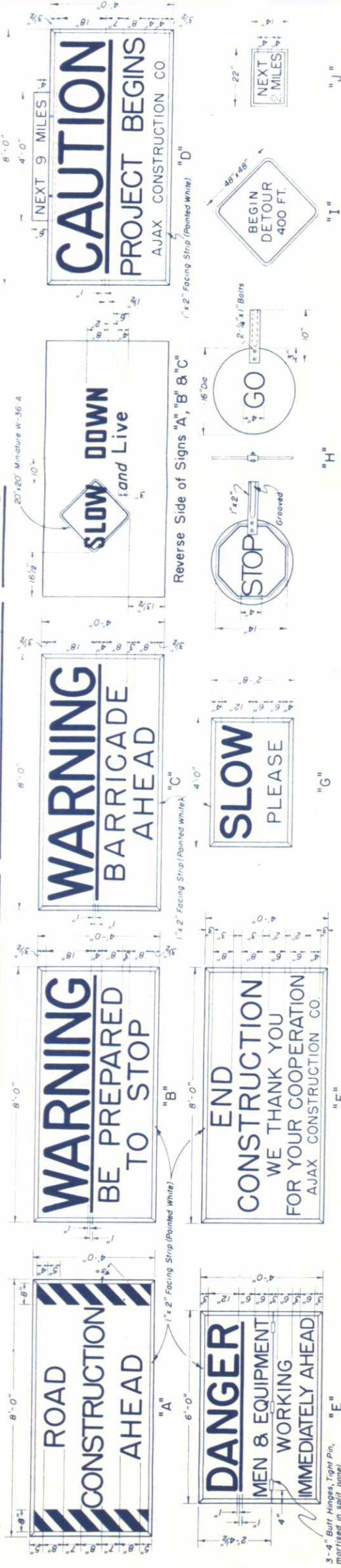
NOTE
The various types & combinations of approved signs for barricades required for each project will be governed by field conditions and subject to approval by the Engineer.

Type II
(Bag of Detour, By-Pass Areas within Proj, Extreme Hazards, etc.)



NOTE: Alternate materials or other reflecting elements on Construction Traffic Signs and Barricades will be permitted only after approval of such material by the Department.

DETAILS OF CONSTRUCTION SIGNS



Construction Signs "A" through and including "G" shall be made of 3/4" Plywood or other material after approval by the Department, and as per details above. Signs shall be reflectorized with reflective sheeting or other reflective materials of types approved by the Department.

CONSTRUCTION SIGN "A" - Wide Angle White background with painted Black lettering. Barricade stripes of 4" Wide Angle White placed over Black painted vertical stripe spaced as shown above. This sign is the First advance warning sign and shall be placed 1500 feet ahead of barricade or beginning of project terminal and on both sides of the travelled way in all cases.

CONSTRUCTION SIGN "B" - The word "WARNING" and 1" underline shall be painted White on a 23" strip of Wide Angle Flat Top Red. Balance of lettering painted Black on a 22" strip of Wide Angle White. This sign is the Second advance warning sign and shall be placed 1000 feet ahead of barricade or beginning of project terminal and on both sides of the travelled way on divided highways and singly on two-lane highways.

CONSTRUCTION SIGN "C" - The word "WARNING" and 1" underline shall be painted White on a 23" strip of Wide Angle Flat Top Red. Balance of lettering painted Black on a 20 1/2" strip of Wide Angle White. This sign will be provided with a detachable 1" material board mounted on back of sign with 2-1/4" x 2" bolts. This board shall be painted White with Black lettering. (Indicate to the nearest Mile). This sign shall be placed to mark the beginning of the Project. To be placed singly and may be placed opposite barricade if desirable.

CONSTRUCTION SIGN "E" - The word "DANGER" and 1" underline shall be painted White on a 17 1/2" strip of Wide Angle Flat Top Red. Balance of lettering painted Black on a

27 1/2" strip of Wide Angle White. The sign is of the hinged and fold type to facilitate the closing down of sign when the need is not prevalent. This sign shall be placed 500 feet ahead of the situation on hand.

CONSTRUCTION SIGN "F" - The words "END CONSTRUCTION" and "CONTRACTORS NAME" shall be painted Black on strips 22 and 6 1/2 respectively of Wide Angle White. Balance of lettering shall be painted White on a 16 1/2 strip of Wide Angle Flat Top Red. This sign shall be placed to mark the Ending of the Project. To be placed singly and may be placed opposite barricade if desirable.

CONSTRUCTION SIGN "G" - The words "SLOW" and "PLEASE" shall be painted Black on a background of Wide Angle Yellow. This sign shall be used frequently within the limits of the Project.

All of the preceding signs shall be fastened to 2-4" x 4" posts set 4 feet in the ground with a minimum of 3-1/4" x 4" nailing strips on the back. Bottom of sign to be not less than 36" above ground.

FLAGMAN WARNING SIGN "H" - This sign shall be made of Plastic or other light-weight material, painted Red background with White lettering on the "STOP" side and painted Green background with White lettering on the "GO" side. Handle to be grooved on one side to indicate reading of sign to flagman. This sign will be used whenever flagmen are necessary. Sign to be reflectorized. To be used to stop traffic at night.

DETOUR WARNING SIGN "I" - To be of 3/4" (Minimum) plywood or No. 16 (Minimum) gauge metal with Black painted letters on a Wide Angle Yellow background.

CONSTRUCTION SIGN "J" - 3/4" x 9" metal slides to be placed between "NEXT" and "MILES", spaced so as to accommodate appropriate size numerals. Required numerals to be furnished by the Department and to be installed by the Contractor. Numerals calculated to the nearest Mile.

All material shall be sound and durable. Barricades, signs, symbols and lettering conforming to styles noted hereon will be of good workmanship and well maintained. Uneven lettering will not be accepted.

Flares and Torches shall be of the oil burning type approved by the Department and

shall be placed 3 feet to 5 feet ahead of the object to be illuminated. Particular care shall be taken to protect all signs and barricades from smoke and smudge arising from the use thereof.

Flashers used on Type I Barricade shall be of the Battery or Electrical Type. The illuminating element in a flashing amber beacon or signal shall be flashed continuously at a rate between 50 or 60 flashes per minute which will be clearly distinguishable to traffic. The duration in which Flashers will be left in operation will be governed by field conditions and subject to approval by the Engineer.

Alternate methods of processing signs or the substitution of pressure sensitive symbols or other reflecting elements for painted symbols will be permitted only after approval of such methods or materials by the Department.

The Department shall furnish and install the following as required outside the limits of the Project:

1. ROAD CONSTRUCTION AHEAD" Minimum 4
2. "WARNING BE PREPARED TO STOP" Minimum 2
3. "WARNING BARRICADE AHEAD" As Required
4. Standard Warning & Directional Signs As Required

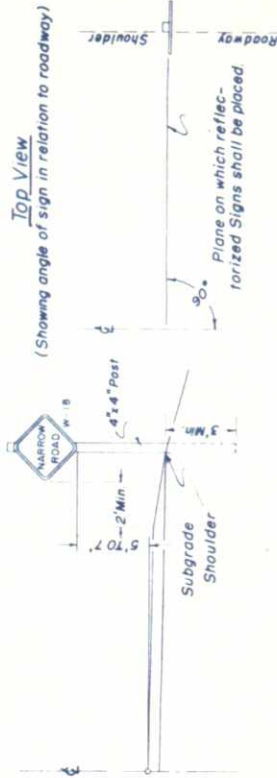
The Contractor shall furnish and install the following as required within the limits of the Project:

1. All Barricades As Required
2. "CAUTION PROJECT BEGINS" Minimum 2
3. "DANGER MEN & EQUIPMENT WORKING IMMEDIATELY AHEAD" As Required
4. "END CONSTRUCTION WE THANK YOU FOR YOUR COOPERATION" Minimum 2
5. "SLOW PLEASE" As Required
6. Standard Warning & Directional Signs As Required
7. Approved Directional Arrows & Regulatory Signs for Barricades As Required
8. Torches and Flares as follows: Type I Barricade Minimum 3, Type II Barricade Minimum 1
9. Flashers - Type I Barricade 2 Required

Details of Reflectorized Arrows



Position of Signs Relative to Roadbed & Hazards



NOTE:
Warning Signs to be made of 3/8" (Min.) plywood or No. 16 Gauge (Min.) metal and shall be reflectorized. Location to be governed by field conditions. Exact location to be staked by the Engineer. In all cases warning signs are to be placed well in advance of hazard, the distance depending on topography, and existing approach speeds.

COLORADO
DEPARTMENT OF HIGHWAYS
Standard Roadway
Construction Traffic Signs

Designed by J.C.R. Approved by J. J. ...
Made by J.C.R. Engineer, Surveys & Plans
Checked by ...
Date: July 22, 1955