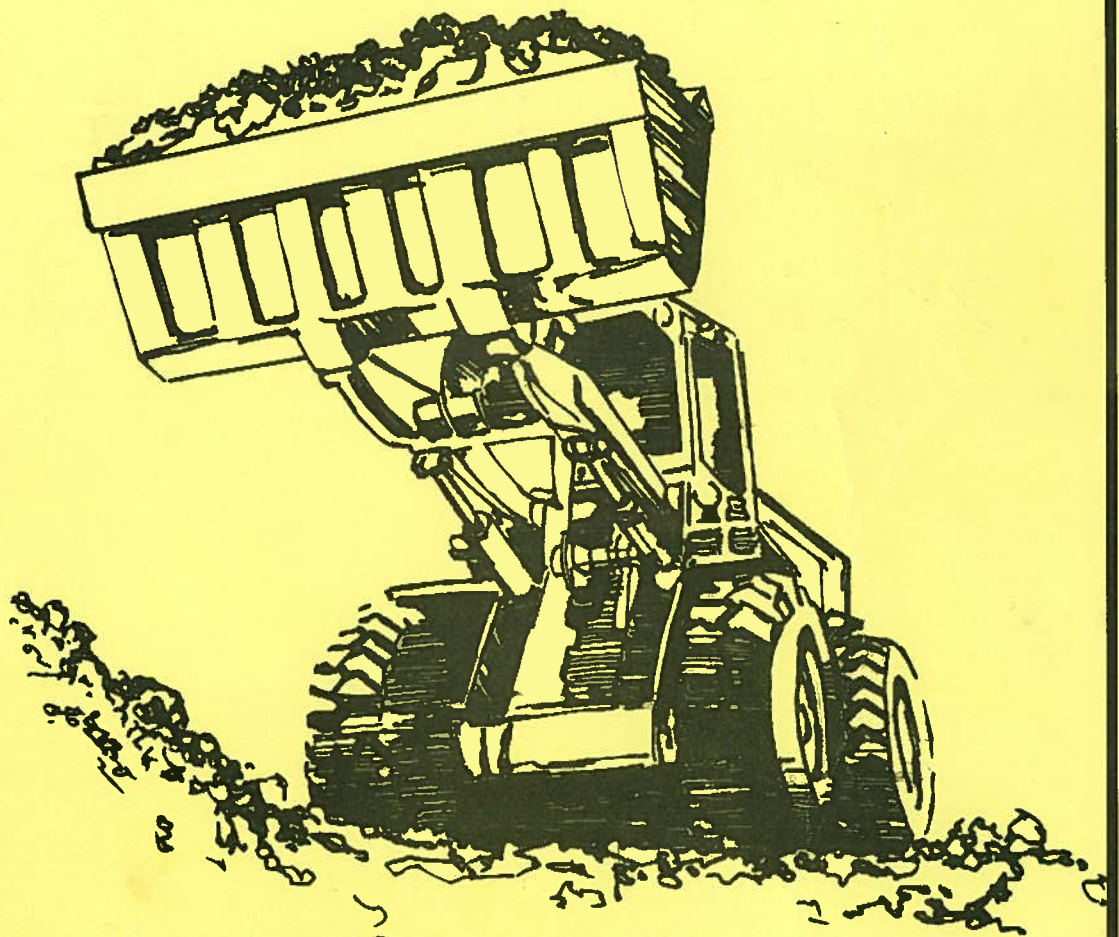


STATE OF NEVADA
STANDARD PLANS
FOR
**ROAD AND BRIDGE
CONSTRUCTION**



JULY 1995

**DEPARTMENT OF TRANSPORTATION
CARSON CITY, NEVADA 89712**



STANDARD PLANS

FOR ROAD AND BRIDGE CONSTRUCTION



DIRECTOR
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STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
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CARSON CITY, NEVADA 89712

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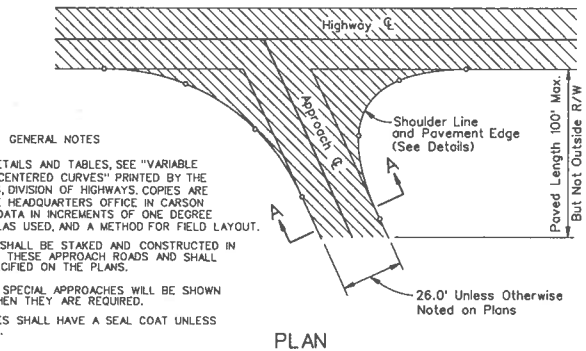
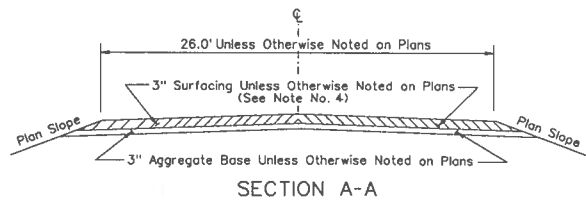
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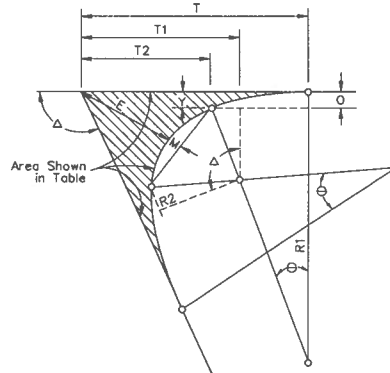
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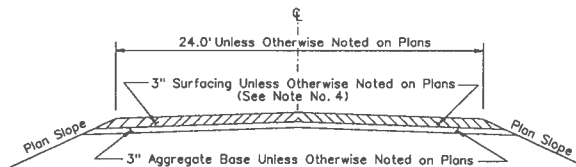


- GENERAL NOTES**
- 1- FOR COMPLETE DETAILS AND TABLES, SEE "VARIABLE DIMENSIONS OF 3-CENTERED CURVES" PRINTED BY THE STATE OF ILLINOIS, DIVISION OF HIGHWAYS. COPIES ARE AVAILABLE AT THE HEADQUARTERS OFFICE IN CARSON CITY AND SHOW DATA IN INCREMENTS OF ONE DEGREE OF ANGLE, FORMULAS USED, AND A METHOD FOR FIELD LAYOUT.
 - 2- ALL APPROACHES SHALL BE STAKED AND CONSTRUCTED IN ACCORDANCE WITH THESE APPROACH ROADS AND SHALL BE THE TYPE SPECIFIED ON THE PLANS.
 - 3- DETAILS FOR THE SPECIAL APPROACHES WILL BE SHOWN ON THE PLANS WHEN THEY ARE REQUIRED.
 - 4- PAVED APPROACHES SHALL HAVE A SEAL COAT UNLESS OTHERWISE NOTED.

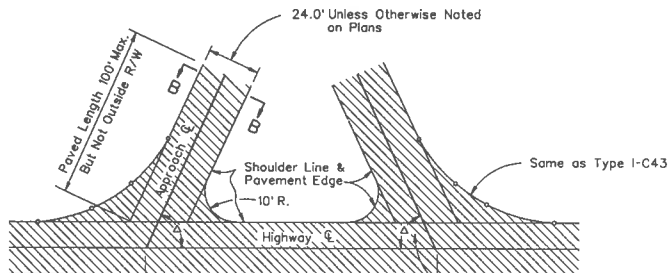


DETAIL OF PAVEMENT EDGE

TYPE 1 APPROACH



SECTION B-B

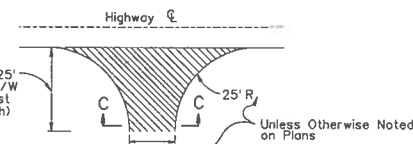


SERVICE TYPE APPROACH

APPROACH TYPES

- Type 2A - Place Base and Surface as Shown
- Type 2B - Place 6" Aggregate Base Course Only
- Type 3 - Grade Approach Area Only

Place Aggregate 25' But Not Outside R/W (See Structure List for Length)



TYPE 2 & 3 APPROACHES

DIMENSIONS FOR 3-CENTERED CURVES

TYPE 1-P APPROACH (PASSENGER)

Δ	Θ	R1	R2	O	Y	T2	T1	T	E	M	AREA*	AREA*	
DEGREE	DEGREE					LENGTH IN FEET						SQ. FT.	SQ. YD.
60	13° 15.66'	100	25	2.0	2.67	9.86	15.59	32.79	6.18	1.06	108.9	12.1	
70	13° 15.66'	100	25	2.0	2.67	13.17	18.91	36.11	7.96	1.78	143.8	16.0	
80	13° 15.66'	100	25	2.0	2.67	16.92	22.66	39.86	10.25	2.67	190.5	21.2	
90	14° 21.72'	100	20	2.5	3.13	17.54	22.50	42.34	11.82	2.79	216.6	24.1	
100	14° 21.72'	100	20	2.5	3.13	21.85	26.81	46.66	15.00	3.75	278.8	31.0	
110	14° 21.72'	100	20	2.5	3.13	27.17	32.13	51.98	19.23	4.82	363.5	40.4	
120	12° 50.34'	100	20	2.0	2.50	33.66	38.11	55.88	24.00	6.40	437.0	48.6	

TYPE 1-SU APPROACH (SINGLE UNIT)

Δ	Θ	R1	R2	O	Y	T2	T1	T	E	M	AREA*	AREA*	
DEGREE	DEGREE					LENGTH IN FEET						SQ. FT.	SQ. YD.
60	13° 15.66'	120	45	2.0	3.20	16.82	27.14	44.34	9.27	1.91	224.0	24.9	
70	13° 15.66'	120	45	2.0	3.20	22.59	32.91	50.11	12.38	3.20	318.7	35.4	
80	13° 15.66'	120	45	2.0	3.20	29.12	39.44	56.64	16.35	4.81	448.8	49.9	
90	12° 50.34'	120	40	2.0	3.00	33.11	42.00	59.78	19.40	6.14	519.0	57.7	
100	17° 28.50'	100	35	3.0	4.62	34.78	45.29	64.81	24.12	5.49	669.1	74.3	
110	17° 28.50'	100	35	3.0	4.62	43.76	54.27	73.79	31.25	7.24	803.6	100.4	
120	21° 47.22'	100	30	5.0	7.14	49.49	60.82	86.60	40.00	6.43	1226.4	136.3	

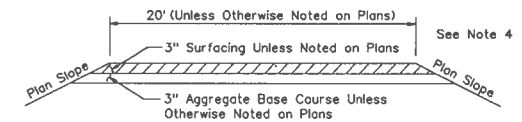
TYPE 1-C43 APPROACH (SEMITRAILER COMBINATION INTERMEDIATE)

Δ	Θ	R1	R2	O	Y	T2	T1	T	E	M	AREA*	AREA*	
DEGREE	DEGREE					LENGTH IN FEET						SQ. FT.	SQ. YD.
60	18° 47.82'	120	45	4.0	6.40	13.79	28.29	52.46	11.58	0.86	350.0	38.9	
70	18° 47.82'	120	45	4.0	6.40	19.81	34.31	58.48	14.82	1.79	468.5	52.1	
80	18° 47.82'	120	45	4.0	6.40	26.82	41.12	65.28	18.97	3.05	628.2	69.5	
90	20° 21.84'	120	40	5.0	7.50	31.08	45.00	72.84	23.64	3.64	812.4	90.3	
100	22° 37.20'	100	35	5.0	7.69	34.21	47.67	72.67	27.23	3.92	873.5	97.1	
110	22° 37.20'	100	35	5.0	7.69	43.66	57.13	82.13	34.74	5.44	1144.8	127.2	
120	22° 51.84'	100	30	5.5	7.86	49.83	61.49	88.69	41.00	6.08	1294.3	143.8	

TYPE 1-C50 APPROACH (SEMITRAILER COMBINATION LARGE)

Δ	Θ	R1	R2	O	Y	T2	T1	T	E	M	AREA*	AREA*	
DEGREE	DEGREE					LENGTH IN FEET						SQ. FT.	SQ. YD.
60	13° 35.40'	200	75	3.5	5.60	27.70	45.32	74.70	15.64	3.05	639.1	71.0	
70	19° 05.46'	150	50	5.5	8.25	22.51	38.86	71.57	17.75	1.92	686.9	76.3	
80	19° 05.46'	150	50	5.5	8.25	30.22	46.57	79.28	22.45	3.29	896.6	99.6	
90	18° 11.70'	150	50	5.0	7.50	39.39	55.00	86.23	27.78	5.37	1114.4	123.5	
100	19° 47.70'	150	40	6.5	8.86	41.87	55.42	92.67	32.34	5.43	1280.0	142.2	
110	19° 47.70'	150	40	6.5	8.86	52.86	66.41	103.66	41.07	7.32	1651.5	183.5	
120	23° 24.90'	120	35	7.0	9.88	58.84	72.75	106.53	49.00	6.90	1860.4	206.7	

*TOTAL APPROACH AREA EQUALS AREA SHOWN IN TABLE FOR Δ PLUS AREA SHOWN FOR 180° MINUS Δ PLUS PAVEMENT AREA FOR RECTANGULAR PORTION OF APPROACH.



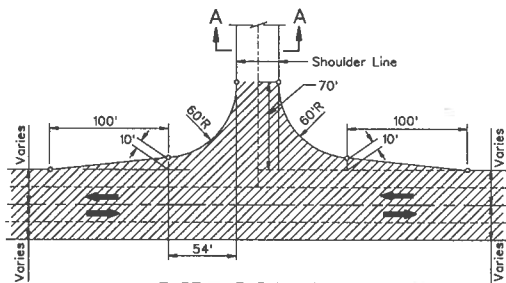
SECTION C-C

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

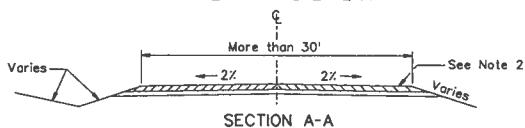
**TYPES 1, 2 AND 3
APPROACH ROADS**

H. R. [Signature]
CHIEF ROAD DESIGN ENGR.

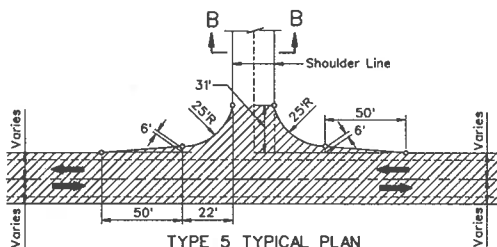
R-S2.1-(000)
ADOPTED: 8/69 REVISION 10/94



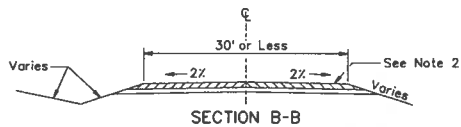
TYPE 4 TYPICAL PLAN



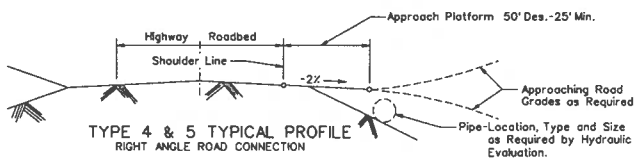
SECTION A-A



TYPE 5 TYPICAL PLAN



SECTION B-B



TYPE 4 & 5 TYPICAL PROFILE
RIGHT ANGLE ROAD CONNECTION

TYPE 4 AND 5 APPROACHES

1. REFER TO STANDARD SHEET R-S.2.1 FOR TYPE 1, 2 AND 3 APPROACH DESIGN.
2. MINIMUM DEPTH OF BASE AND SURFACE SHALL BE 4 INCHES AND 3 INCHES RESPECTIVELY. THICKER LIFTS SHALL BE SHOWN IN THE PLANS.
3. APPROACHES TO BE PAVED TO THE THROAT OR RIGHT-OF-WAY, WHICHEVER OCCURS FIRST, UNLESS OTHERWISE NOTED ON THE PLANS.
4. APPROACHES MAY REQUIRE THE STANDARD STOP SIGNS AND STOP BARS AS DIRECTED BY THE ENGINEER.

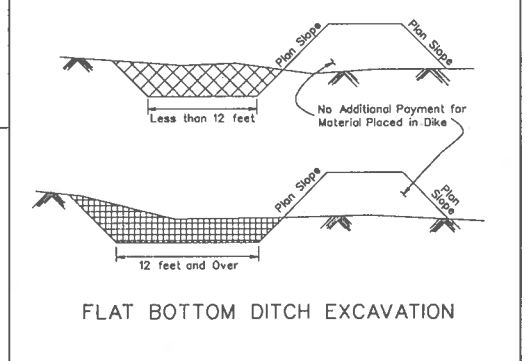
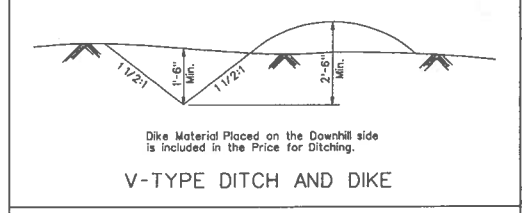
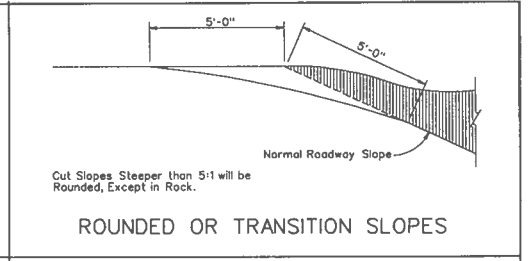
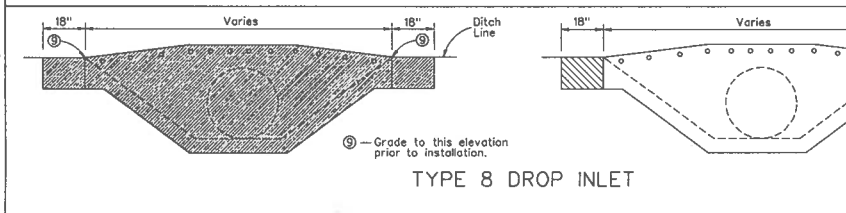
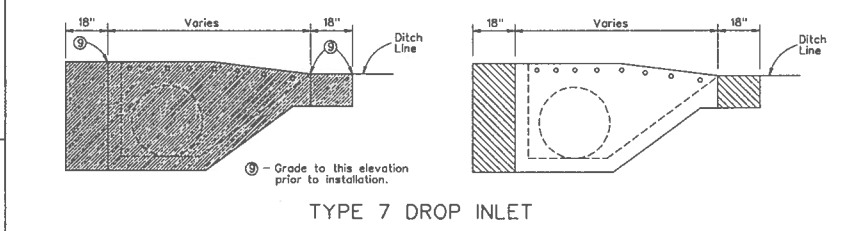
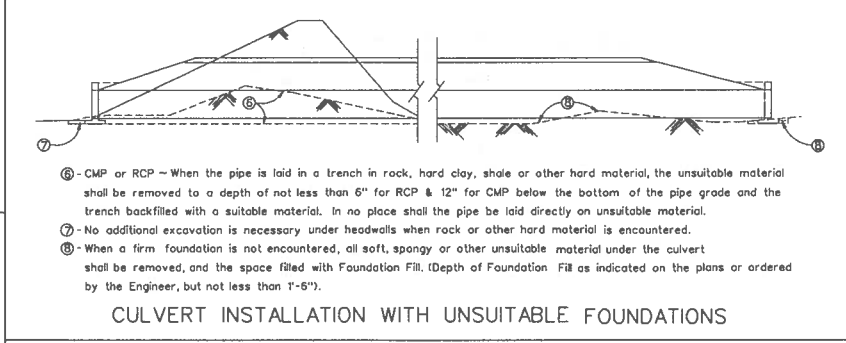
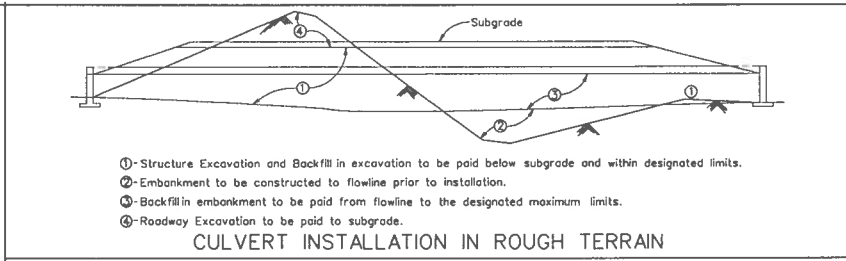
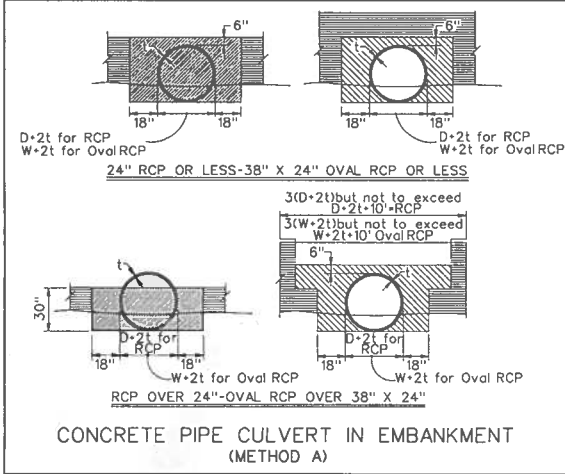
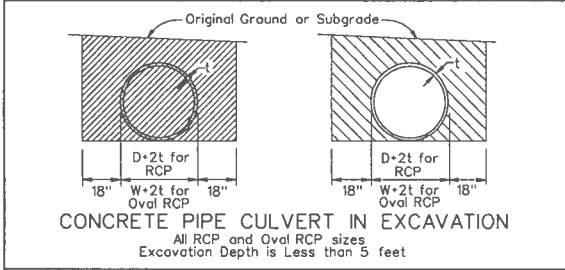
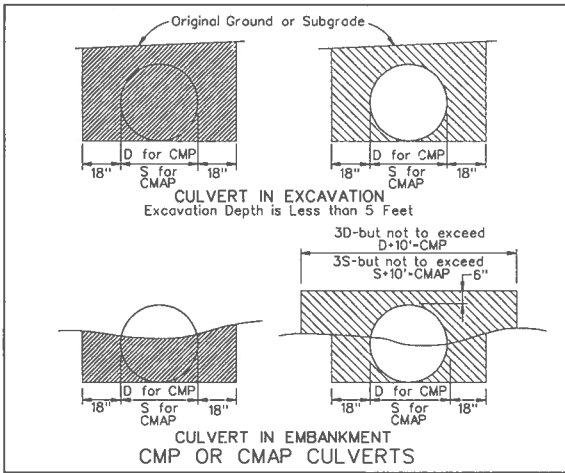
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

TYPE 4 AND TYPE 5
APPROACH ROAD

Eric R. Mely
CHIEF ROAD DESIGN ENGR.

R-S2.2-(000)
ADOPTED: 6/75 REVISION 10/94

R-3



GENERAL NOTES

1. Excavation for Multiple Pipe Installations Exceeding 12 Feet in Width Will Be Paid as Channel or Roadway Excavation.

LEGEND

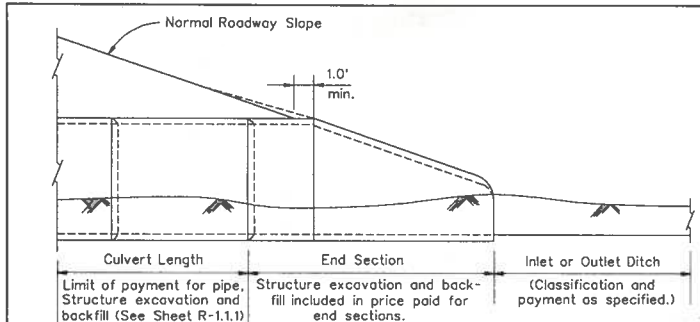
	STRUCTURE EXCAVATION		ROADWAY EXCAVATION		DRAINAGE EXCAVATION
	GRANULAR BACKFILL		CHANNEL EXCAVATION		ROADWAY EMBANKMENT

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

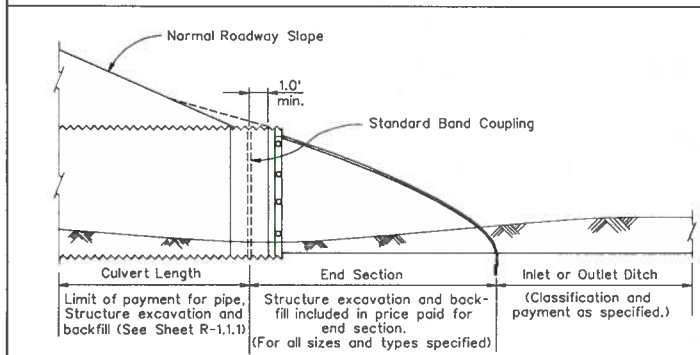
STRUCTURE EXCAVATION & BACKFILL
(METHOD OF MEASUREMENT)

H. R. [Signature]
CHIEF ROAD DESIGN/ENGR.

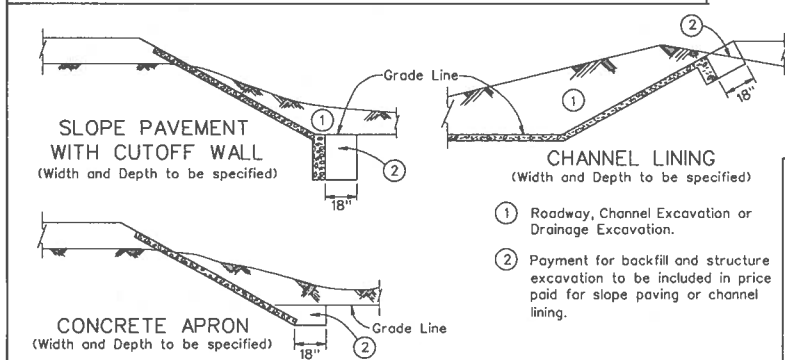
R-1.1.1-(206,207)
ADOPTED: 8/69 REVISION 11-94



PRECAST CONCRETE END SECTIONS



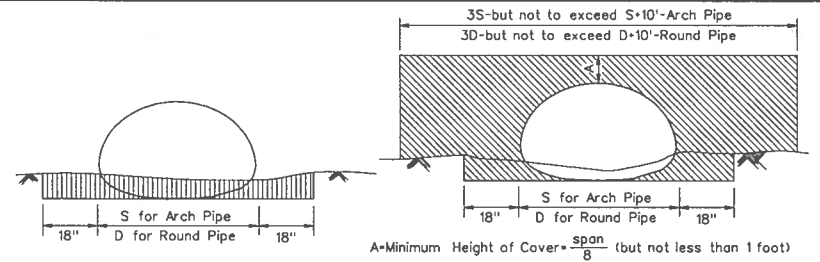
PREFABRICATED METAL END SECTION
(Type 3 Connection)



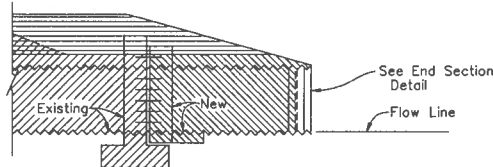
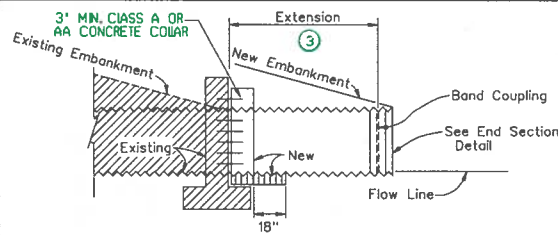
CHANNEL LINING AND SLOPE PAVEMENT

LEGEND

- Granular Backfill
- Structure Excavation
- Limits of Existing
- Drainage or Channel Excavation
- Roadway Embankment



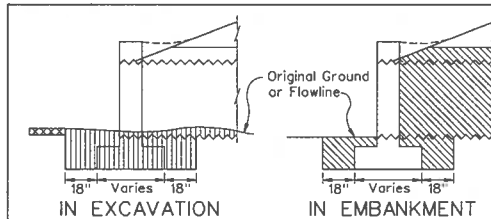
STRUCTURAL PLATE PIPE



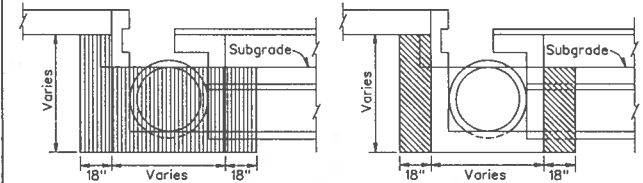
CULVERT EXTENSION OF EXISTING HEADWALL

(See Sheet R-2.1.1 For Pipe Culvert Extension)

- ③ LENGTH OF CULVERT SHALL BE INCREASED AS FOLLOWS: CONSIDER EACH SIDE SEPARATELY, MEASURE PIPE FROM EXISTING HEADWALL TO THE INTERSECTION OF THE TOP OF PIPE AND FLOWLINE. TO THIS DIMENSION ADD 1.0' WHEN COVER AT SHOULDER IS 1.0' TO 10.0'. ADD AN ADDITIONAL 0.5' FOR EACH SUCCEEDING 5.0' OR PORTION THEREOF.

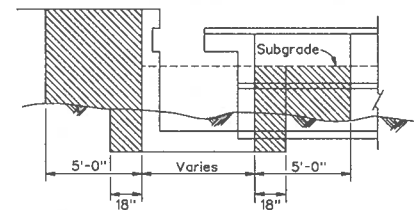
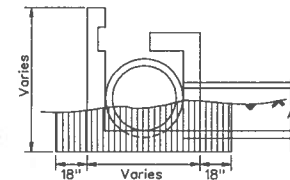


CULVERT HEADWALLS



DROP INLETS IN EXCAVATION
(Type 3 Drop Inlet Illustrated)

See R.1.1.1 for General Notes.

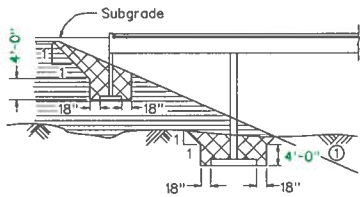
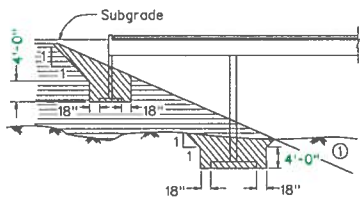


DROP INLETS IN EMBANKMENT
(Type 3 Drop Inlet Illustrated)

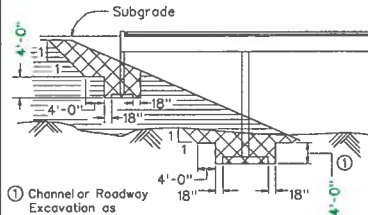
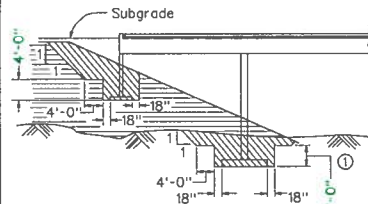
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

STRUCTURE EXCAVATION
AND BACKFILL
(METHOD OF MEASUREMENT)

ADOPTED: 8/69
REVISION
R-1.1.2-(206,207)
CHIEF ROAD DESIGN ENGR.

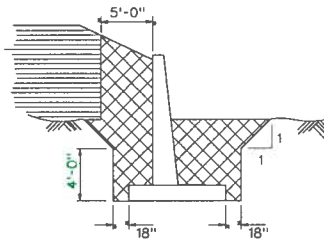
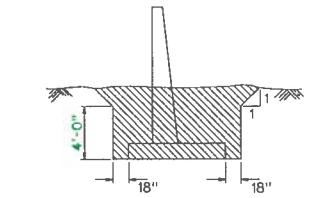


OPEN ABUTMENT BRIDGES
WITH SPREAD FOOTING
FOOTING WIDTH IS 6 FEET OR LESS

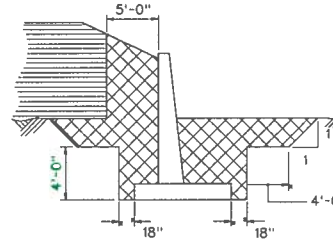
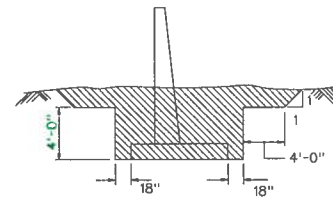


① Channel or Roadway
Excavation as
Indicated on Plans

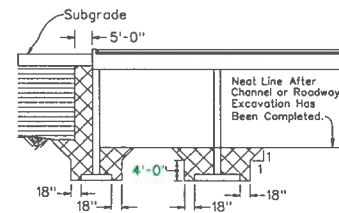
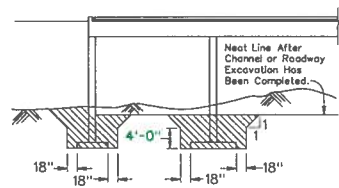
OPEN ABUTMENT BRIDGES
WITH SPREAD FOOTING
FOOTING WIDTH IS GREATER THAN 6 FEET



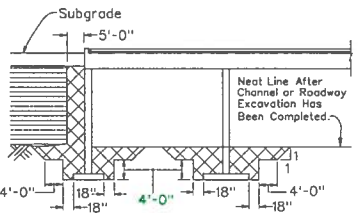
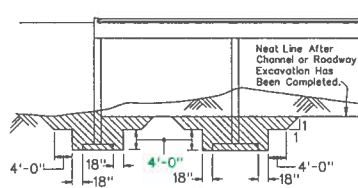
RETAINING WALLS
FOOTING WIDTH IS 6 FEET OR LESS



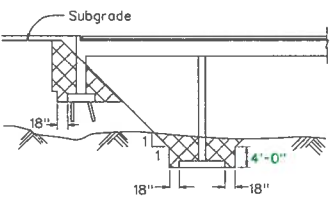
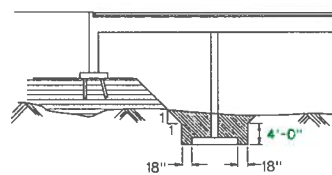
RETAINING WALLS
FOOTING WIDTH IS GREATER THAN 6 FEET



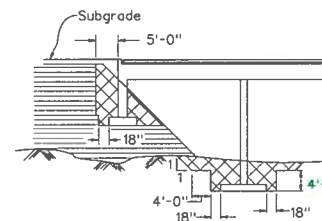
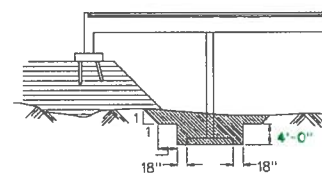
CLOSED ABUTMENT BRIDGES
FOOTING WIDTH IS LESS THAN 6 FEET



CLOSED ABUTMENT BRIDGES
FOOTING WIDTH IS GREATER THAN 6 FEET



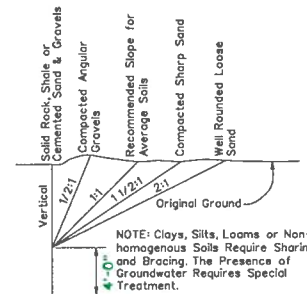
OPEN ABUTMENT BRIDGES
ON PILES
FOOTING WIDTH IS LESS THAN 6 FEET



OPEN ABUTMENT BRIDGES
ON PILES
FOOTING WIDTH IS GREATER THAN 6 FEET

GENERAL NOTES

- Trenches more than 4 feet deep shall be shored, laid back to at least the angle of repose for existing field conditions, or some other means of protection shall be provided.
- If hazardous field conditions indicate ground movement may be expected, trenches less than 4 feet deep shall also be protected as indicated in note 1.
- For the purpose of payment, structure excavation and backfill quantities are based on these standard drawings and no additional payment will be made for shoring.
- If shoring is used, payment will be made for structure excavation and backfill based on these standard drawings and no additional payment will be made for shoring.
- Minimum requirements for shoring are as shown in the table on Sheet R-1.1.4.
- The quantity of structure excavation and backfill measured for payment shall be the number of cubic yards calculated minus any duplication of limits which overlap.
- The limits of structure excavation and backfill shown herein shall be used for the method of measurement and payment only. There shall be no additional compensation for any additional excavation or backfill required for excavations to meet OSHA regulations.

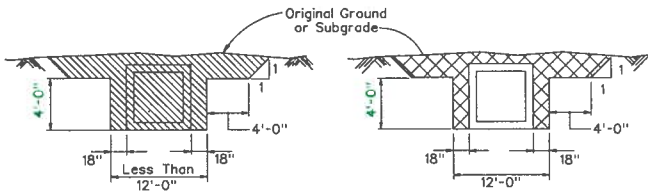


APPROXIMATE ANGLE OF REPOSE
FOR SLOPING OF SIDES OF
EXCAVATIONS

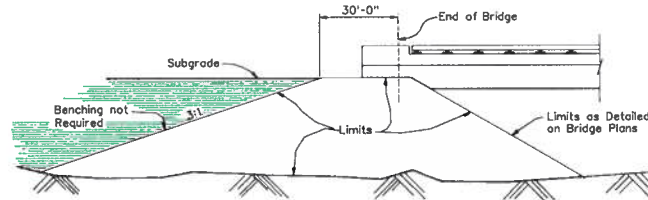
- Structure Excavation
- Granular Backfill
- Roadway Embankment

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
**STRUCTURE EXCAVATION
AND BACKFILL**
(METHOD OF MEASUREMENT)

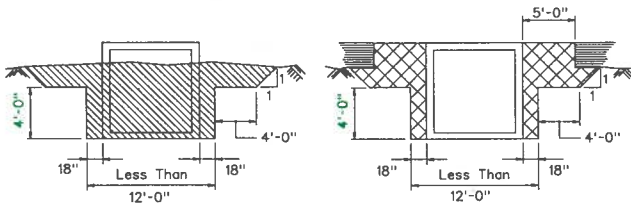
ADOPTED: R-1.1.3 (206,207)
11/73 REVISION 10/94
CHEF ROAD DESIGN ENGR.



CULVERT IN EXCAVATION



LIMITS OF SELECTED BORROW AT BRIDGE ABUTMENTS

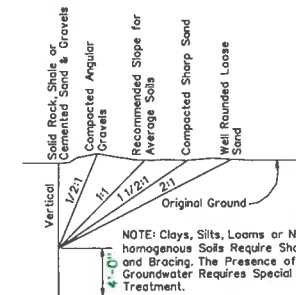


CULVERT IN EMBANKMENT

TRENCH SHORING - MINIMUM REQUIREMENTS

Depth of Trench Feet	Kind or condition of earth	Size and spacing of members										
		Uprights		Stringers		Cross Braces				Maximum Spacing		
		Min. Dim.	Max. Spac.	Min. Dim.	Max. Spac.	Width of Trench				Vert.	Horiz.	
				Up to 3 3 Ft.	3 to 6 6 Ft.	6 to 9 9 Ft.	9 to 12 12 Ft.	12 to 15 15 Ft.	15 to 20 20 Ft.	Feet	Feet	
4 to 10	Hard, compact	3x4 or 2x6	6	---	---	2x6	4x4	4x6	6x6	6x8	4	6
	Likely to crack	3x4 or 2x6	3	4x6	4	2x6	4x4	4x6	6x6	6x8	4	6
10 to 15	Soft, sandy or filled	3x4 or 2x6	Close Sheeting	4x6	4	4x4	4x6	6x6	6x8	8x8	4	6
	Hydrostatic pressure	3x4 or 2x6	Close Sheeting	6x8	4	4x4	4x6	6x6	6x8	8x8	4	6
15 to 20	Hard	3x4 or 2x6	4	4x6	4	4x4	4x6	6x6	6x8	8x8	4	6
	Likely to crack	3x4 or 2x6	2	4x6	4	4x4	4x6	6x6	6x8	8x8	4	6
Over 20	Soft, sandy or filled	3x4 or 2x6	Close Sheeting	4x6	4	4x6	6x6	6x8	8x8	8x10	4	6
	Hydrostatic pressure	3x6	Close Sheeting	8x10	4	4x6	6x6	6x8	8x8	8x10	4	6
Over 20	All kinds or conditions	3x6	Close Sheeting	4x12	4	4x12	6x8	8x8	8x10	10x10	4	6
	All kinds or conditions	3x6	Sheeting	6x8	4	4x12	8x8	8x10	10x10	10x12	4	6

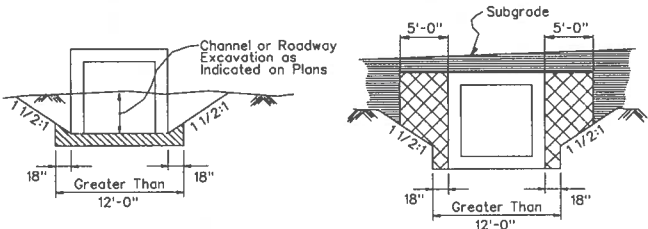
Trench jacks may be used in lieu of, or in combination with cross braces. Shoring is not required in solid rock, hard shale or hard slag, where desirable, steel sheet piling and bracing of equal strength may be substituted for wood.



APPROXIMATE ANGLE OF REPOSE FOR SLOPING OF SIDES OF EXCAVATIONS

GENERAL NOTES

- Trenches more than 4 feet deep shall be shored, laid back to at least the angle of repose for existing field conditions, or some other means of protection shall be provided.
- If hazardous field conditions indicate ground movement may be expected, trenches less than 4 feet deep shall also be protected as indicated in note 1.
- For the purpose of payment, structure excavation and backfill quantities are based on these standard drawings and no additional payment will be made for shoring.
- If shoring is used, payment will be made for structure excavation and backfill based on these standard drawings and no additional payment will be made for shoring.
- Minimum requirements for shoring are as shown in the table on Sheet R-1.1.1.4.
- The quantity of structure excavation and backfill measured for payment shall be the number of cubic yards calculated minus any duplication of limits which overlap.
- The limits of structure excavation and backfill shown herein shall be used for the method of measurement and payment only. There shall be no additional compensation for any additional excavation or backfill required for excavations to meet OSHA regulations.



CULVERT IN EXCAVATION OR EMBANKMENT

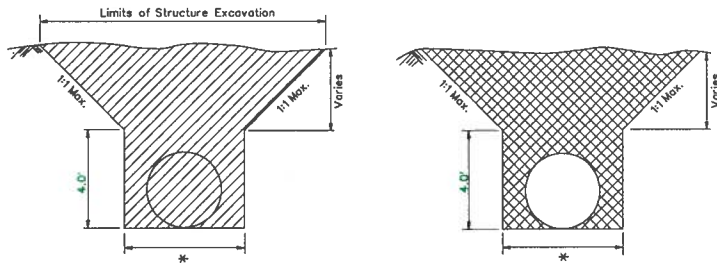
- Structure Excavation
- Granular Backfill
- Roadway Embankment

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

**STRUCTURE EXCAVATION
AND BACKFILL**
(METHOD OF MEASUREMENT)

H. R. Dyer
CHIEF ROAD DESIGN ENGR.

R-1.1.4-(206,207)
ADOPTED: 11/73 REVISION 10/94



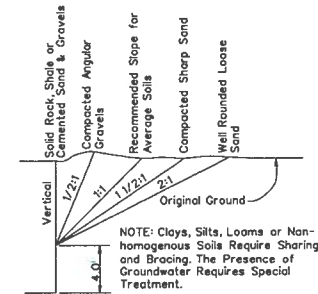
* D+3.0' FOR C.M.P.
 S+3.0' FOR C.M.A.P.
 D+2+3.0' FOR R.C.P.
 W+2+3.0' FOR OVAL R.C.P.

OUTSIDE DIAMETER IS 6 FEET OR LESS

TRENCH SHORING - MINIMUM REQUIREMENTS

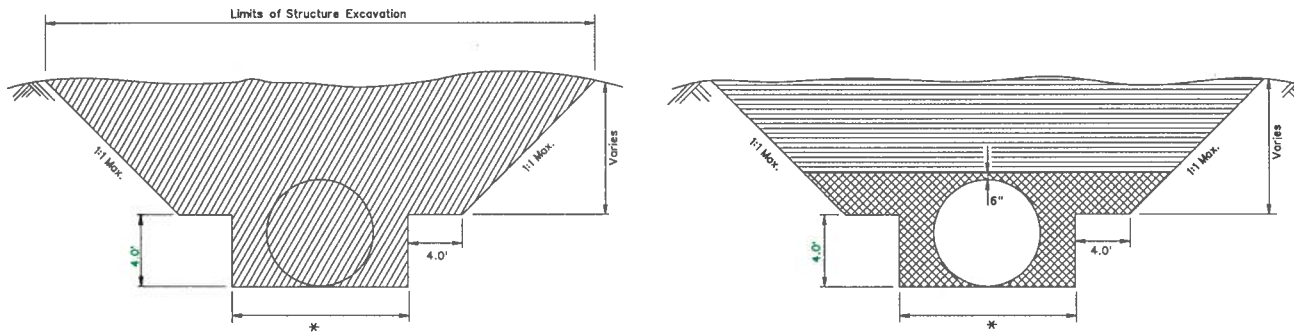
Depth of Trench Feet	Kind or condition of earth	Size and spacing of members										
		Uprights		Stringers		Cross Braces						
		Min. Dim.	Max. Spac.	Min. Dim.	Max. Spac.	Width of Trench				Maximum Spacing		
	Inches	Feet	Inches	Feet	Up to 3 Ft.	3 to 6 Ft.	6 to 9 Ft.	9 to 12 Ft.	12 to 15 Ft.	Vert.	Horiz.	
4 to 10	Hard, compact	3/4 or 2x6	6	---	---	2x6	4x4	4x6	6x6	6x8	4	6
	Likely to crack	3/4 or 2x6	3	4x6	4	2x6	4x4	4x6	6x6	6x8	4	6
	Soft, sandy or filled	3/4 or 2x6	Close Sheeting	4x6	4	4x4	4x6	6x6	6x8	8x8	4	6
	Hydrostatic pressure	3/4 or 2x6	Close Sheeting	6x8	4	4x4	4x6	6x6	6x8	8x8	4	6
10 to 15	Hard	3/4 or 2x6	4	4x6	4	4x4	4x6	6x6	6x8	8x8	4	6
	Likely to crack	3/4 or 2x6	2	4x6	4	4x4	4x6	6x6	6x8	8x8	4	6
	Soft, sandy or filled	3/4 or 2x6	Close Sheeting	4x6	4	4x6	6x6	6x8	8x8	8x10	4	6
	Hydrostatic pressure	3/4 or 2x6	Close Sheeting	8x10	4	4x6	6x6	6x8	8x8	8x10	4	6
15 to 20	All kinds or conditions	3/4 or 2x6	Close Sheeting	4x12	4	4x12	8x8	8x8	8x10	10x10	4	6
	Hydrostatic pressure	3/4 or 2x6	Close Sheeting	6x8	4	4x12	8x8	8x10	10x10	10x12	4	6

Trench jacks may be used in lieu of, or in combination with cross braces. Shoring is not required in solid rock, hard shale or hard clay. Where desirable, steel sheet piling and bracing of equal strength may be substituted for wood.



NOTE: Clays, Silts, Loams or Non-homogenous Soils Require Shoring and Bracing. The Presence of Groundwater Requires Special Treatment.

APPROXIMATE ANGLE OF REPOSE FOR SLOPING OF SIDES OF EXCAVATIONS



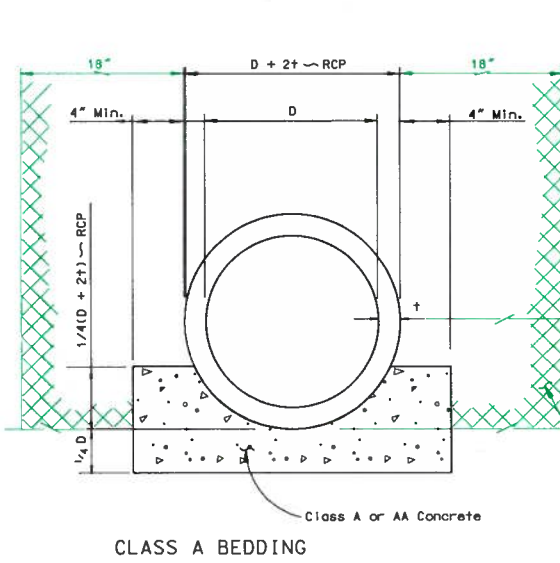
* D+3.0' FOR C.M.P.
 S+3.0' FOR C.M.A.P.
 D+2+3.0' FOR R.C.P.
 W+2+3.0' FOR OVAL R.C.P.

OUTSIDE DIAMETER IS GREATER THAN 6 FEET

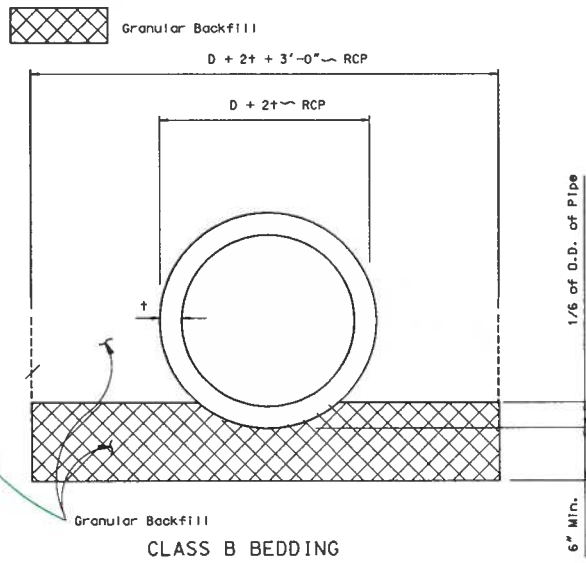
GENERAL NOTES

- Trenches more than 4 feet deep shall be shored, laid back to at least the angle of repose for existing field conditions, or some other means of protection shall be provided.
- If hazardous field conditions indicate ground movement may be expected, trenches less than 4 feet deep shall also be protected as indicated in note 1.
- For the purpose of payment, structure excavation and backfill quantities are based on these standard drawings and no additional payment will be made for shoring.
- If shoring is used, payment will be made for structure excavation and backfill based on these standard drawings and no additional payment will be made for shoring.
- Minimum requirements for shoring are as shown in the table on Sheet R-1.1.4.
- The quantity of structure excavation and backfill measured for payment shall be the number of cubic yards calculated minus any duplication of limits which overlap.
- Granular backfill to be placed for a depth of 6" above the top of the pipe for the width of the trench.
- The limits of structure excavation and backfill shown herein shall be used for the method of measurement and payment only. There shall be no additional compensation for any additional excavation or backfill required for excavations to meet OSHA regulations.

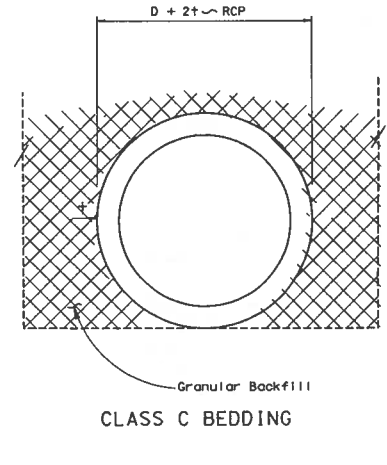
LEGEND		STATE OF NEVADA DEPARTMENT OF TRANSPORTATION	
	Structure Excavation	STRUCTURE EXCAVATION AND BACKFILL (METHOD OF MEASUREMENT)	
	Granular Backfill		
	Roadway Embankment		
		 CHIEF ROAD DESIGN ENGR.	R - 1.1.5 (206,207) ADOPTED: 10/72 REVISION 10/94



PAYMENT FOR EXCAVATED AREA BELOW THE BOTTOM OF THE PIPE GRADE TO BE INCLUDED IN THE UNIT BID PRICE PER CUBIC YARD OF CONCRETE.



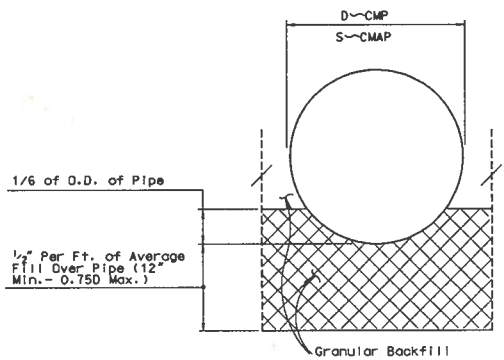
BEDDING SHALL BE CAREFULLY SHAPED TO FIT PIPE PRIOR TO INSTALLATION. NO DIRECT PAYMENT FOR SHAPING THE TRENCH.



BEDDING FOR CONCRETE CULVERT

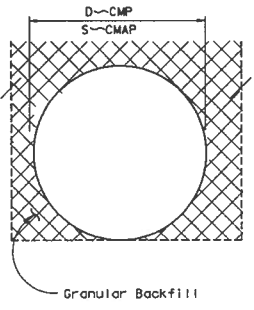
GENERAL NOTES

1. MINIMUM DEPTHS AS SPECIFIED IN "CULVERT INSTALLATION WITH UNSUITABLE FOUNDATIONS" ON SHEET R-1.1.6. NOTES NO. 5 & 6 WILL PREVAIL WHEN THESE CONDITIONS ARE ENCOUNTERED.
2. EXCAVATION FOR MULTIPLE PIPE OR R.C.P. INSTALLATIONS EXCEEDING 12 FEET IN WIDTH SHALL BE PAID FOR AS CHANNEL EXCAVATION OR ROADWAY EXCAVATION.



BEDDING SHALL BE CAREFULLY SHAPED TO FIT PIPE PRIOR TO INSTALLATION. NO DIRECT PAYMENT FOR SHAPING THE TRENCH.

BEDDING FOR C.M.P. OR C.M.A.P.



ALLOWABLE FILL HEIGHT FOR REINFORCED CONCRETE PIPE 24" TO 84"

Pipe Class	CLASS II			CLASS III			CLASS IV			CLASS V		
	A	B	C	A	B	C	A	B	C	A	B	C
24"	---	---	---	22	14	11	30	18	15	46	29	23
30"	---	---	---	22	14	11	32	20	16	47	30	23
36"	---	---	---	22	14	11	32	20	16	47	31	24
42"	---	---	---	22	14	11	32	21	16	47	31	24
48"	17	11	09	22	14	11	32	21	16	48	31	24
54"	17	11	10	22	14	12	32	21	17	49	31	24
60"	17	11	10	22	14	12	33	21	17	49	31	25
66"	17	12	11	22	14	13	33	22	17	49	31	25
72"	17	12	11	22	15	13	33	22	17	49	32	25
84"	17	12	11	22	15	14	33	22	17	50	32	25

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

CULVERT BEDDING & ALLOWABLE FILL HEIGHT FOR R.C.P.

John R. O'Leary
CHIEF ROAD DESIGN ENGR.

R-1.1.6 (603, 604)
ADOPTED: 8/69 REVISION 10/94

*** ROUND CORRUGATED STEEL PIPE**
2 2/3" x 1/2" CORRUGATIONS

PIPE DIAMETER INCHES	** MIN. COVER INCHES	PLATE THICKNESS IN INCHES									
		0.064		0.079		0.109		0.138		0.168	
		R	E	R	E	R	E	R	E	R	E
MAX. FILL HTS. ABOVE TOP OF PIPE IN FEET											
12	12	33	83								
15	12	50	66								
18	12	42	55	84							
24	12	32	42	61		75					
30	12	25	33	49		60		74			
36	12	21	28	41		50		62			
42	12	41	44	48	72	48	76	50	80		
48	12		35	38	45	63	46	67	47	70	
54	12			34	43	56	44	59	45	63	
60	12				42	50	43	53	44	56	
66	12				41	46		42	49	51	
72	12					41		45	42	47	
78	12							43	36	44	
84	12							40	31	42	

R ROUND INSTALLATION
E VERTICAL ELONGATION
(SEE STANDARD SPECIFICATION SEC. 604.03.02) ****

*** CORRUGATED STEEL PIPE ARCH**
5" x 1" & 3" x 1" CORRUGATIONS

PIPE DIMENSIONS SPAN-RISE		** MIN. COVER	EQUIV. DIA.	MIN. THICKNESS	MAX. COVER IN FEET CORNER PRESSURE'S FOR IN TONS PER SQ. FT.	
INCHES	INCHES	INCHES	INCHES	INCHES	2 TONS	*** 3 TONS
60 x 46	12	54	0.064	12	18	
66 x 51	12	60	0.064	12	18	
73 x 55	12	66	0.064	12	18	
81 x 59	12	72	0.064	12	18	
87 x 63	12	78	0.064	16	22	
95 x 67	18	84	0.079	15	21	
103 x 71	18	90	0.079	14	20	
112 x 75	18	96	0.109	13	18	
117 x 79	24	102	0.109	12	17	
128 x 83	24	108	0.109	11	16	
137 x 87	24	114	0.109	10	15	
142 x 91	24	120	0.138	9	14	

MAXIMUM HEIGHT OF COVER
FOR STRUCTURAL STEEL PLATE PIPE (5% ELONGATION)
6" X 2" CORRUGATIONS

DIAMETER IN INCHES	MIN. COVER INCHES	ALLOWABLE FILL HEIGHTS IN FEET						
		12 GAGE	10 GAGE	8 GAGE	7 GAGE	5 GAGE	3 GAGE	1 GAGE
60	12	42	62	80	93			
66	12	39	57	73	85			
72	12	35	52	67	78	94		
78	12	33	48	62	72	87		
84	18	30	45	57	67	80	95	
90	18	28	42	54	62	75	88	96
96	18	27	39	50	58	70	83	90
102	24	25	37	47	55	66	78	85
108	24	24	35	45	51	63	74	80
114	24	22	33	42	49	59	70	76
120	24	21	31	40	47	56	66	72
126	24	20	30	38	45	54	63	69
132	24	19	28	37	43	51	60	66
138	24	18	27	35	41	49	58	63
144	24	18	26	34	39	47	55	60
150	24	17	25	32	38	45	53	58
156	24	16	24	31	36	44	51	56
162	24	16	23	30	35	42	49	54
168	24	15	22	29	34	40	47	52
174	24	15	22	28	32	39	46	50
180	36	14	21	27	31	38	44	48
186	36	14	20	26	30	36	43	47
192	36		20	25	29	35	42	45
198	36		19	25	29	34	40	44

NOTE:
CONTACT HYDRAULICS ENGINEER FOR MATERIALS
OR SIZES NOT LISTED.

* RIVETED OR HELICAL FABRICATION
** TOP OF PIPE TO TOP OF FINISHED GRADE AT SHOULDER LINE FOR 2 TONS PER SQ. FT.
*** SHALL BE USED ONLY AFTER FOUNDATION INVESTIGATION
**** FOR FIELD STRUTTING C.M.P. DETAIL SEE STANDARD SHEET R-2.1.1

MAXIMUM HEIGHT OF COVER
FOR STRUCTURAL STEEL PLATE PIPE ARCH WITH 31" CORNER RADII'S
6" X 2" CORRUGATIONS

SPAN	RISE	MIN. COVER INCHES	ALLOWABLE FILL HEIGHTS IN FEET							
			2 TONS/SO. FT. BEARING PRESSURE		3 TONS/SO. FT. BEARING PRESSURE		4 TONS/SO. FT. BEARING PRESSURE			
			12 GAGE	10 GAGE	8 GAGE	7 GAGE	12 GAGE	10 GAGE	8 GAGE	7 GAGE
			0.109	0.138	0.168	0.188	0.109	0.138	0.168	0.188
13'-3"	9'-4"	36	11				17			
14'-2"	9'-10"	36	11				17			
15'-4"	10'-4"	36		10				16		
16'-3"	10'-10"	36		9				16		
17'-2"	11'-4"	36		9				15		
18'-1"	11'-10"	36				8			14	
19'-3"	12'-4"	36				8			13	
19'-11"	12'-10"	36				7			13	
20'-7"	13'-2"	36				7				12

▲ MAY BE USED ONLY WHEN SUPPORTED BY FOUNDATION STUDY

MAXIMUM HEIGHT OF COVER
FOR STRUCTURAL STEEL PLATE PIPE ARCH WITH 18" CORNER RADII'S
6" X 2" CORRUGATIONS

SPAN	RISE	MIN. COVER INCHES	ALLOWABLE FILL HEIGHTS IN FEET							
			2 TONS/SO. FT. BEARING PRESSURE		3 TONS/SO. FT. BEARING PRESSURE		4 TONS/SO. FT. BEARING PRESSURE			
			12 GAGE	10 GAGE	8 GAGE	7 GAGE	12 GAGE	10 GAGE	8 GAGE	7 GAGE
			0.109	0.138	0.168	0.188	0.109	0.138	0.168	0.188
6'-1"	4'-7"	15								
7'-0"	5'-1"	13								
7'-11"	5'-2"	12							16	
8'-10"	6'-1"	10							16	
9'-8"	6'-7"	9							15	
10'-11"	7'-1"	8							13	
12'-10"	8'-4"	8							11	
14'-1"	8'-9"	7							11	
15'-4"	9'-3"	7								10
16'-7"	10'-1"	7								8

▲ MAY BE USED ONLY WHEN SUPPORTED BY FOUNDATION STUDY

HELICAL RIB LOCK SEAM PIPE
Allowable Fill Heights (Feet) for 3/4" x 1" Ribs
of 1 1/2" to 1/2" Pitch

EQUIVALENT GAGE NUMBERS

GAGE NUMBER	THICKNESS IN INCHES		
	ZN. COAT	UNCOATED	AL.
24	0.064	0.0598	0.060
16	0.079	0.0747	0.075
14	0.109	0.1046	0.105
12	0.138	0.1345	0.135
10	0.168	0.1644	0.164
8	0.188	0.1838	
7	0.218	0.2145	
3	0.249	0.2451	
1	0.280	0.2758	

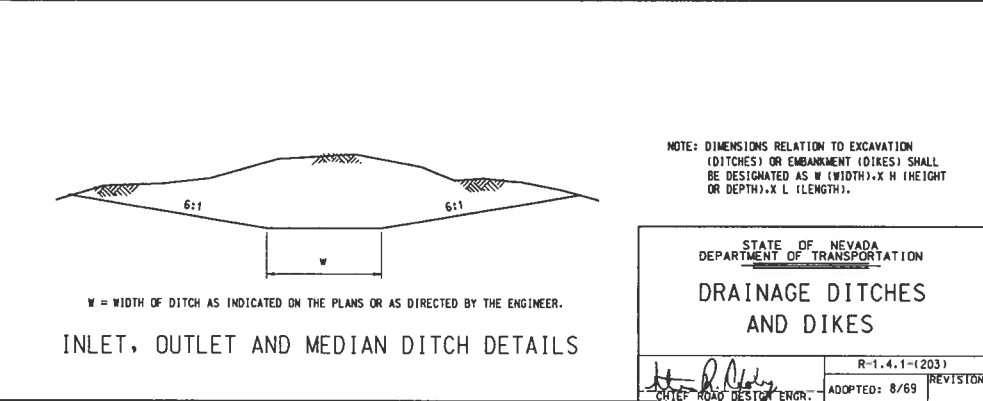
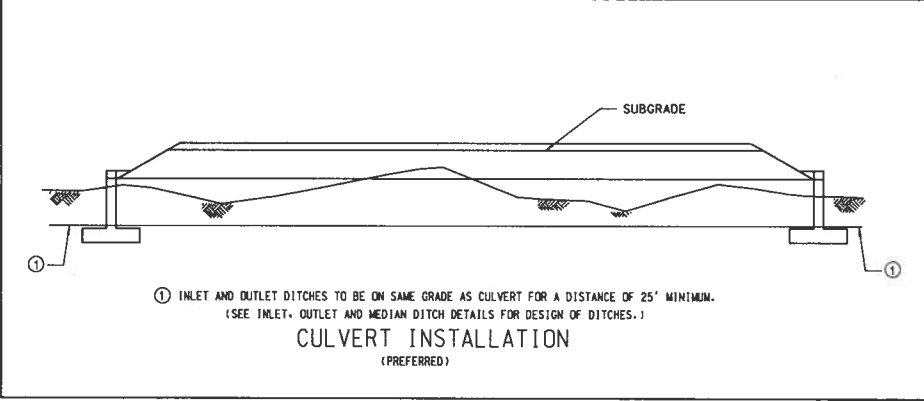
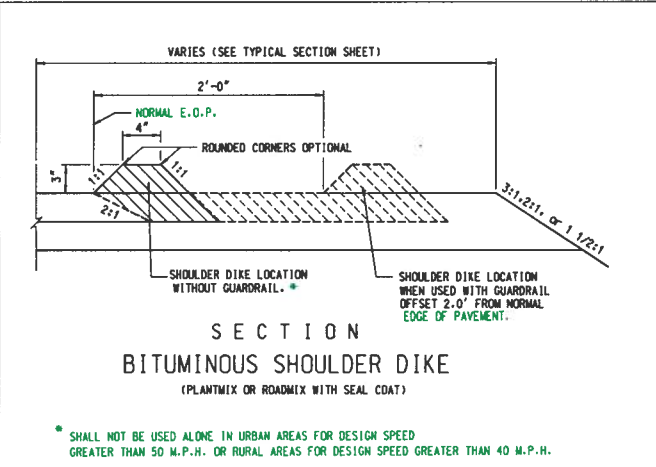
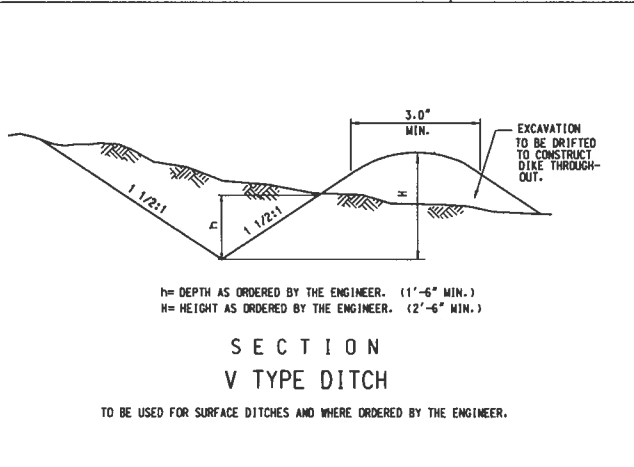
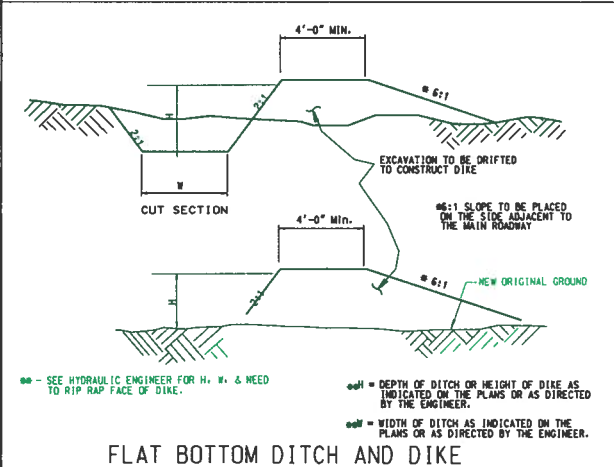
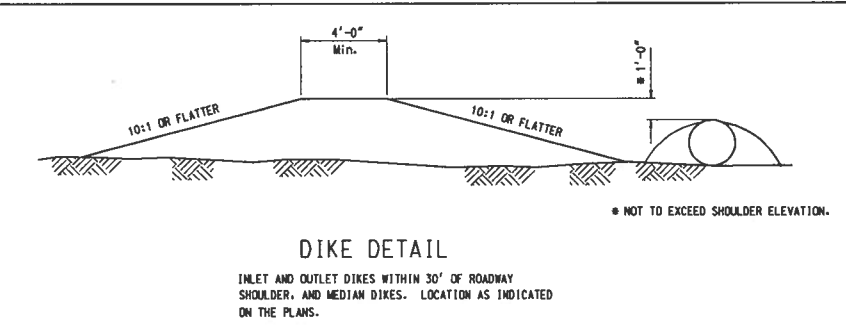
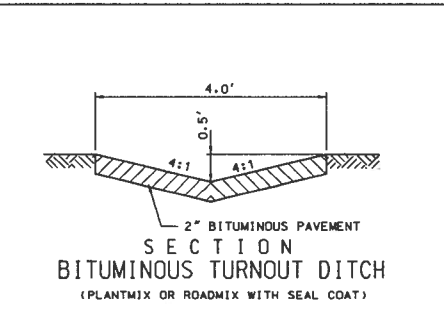
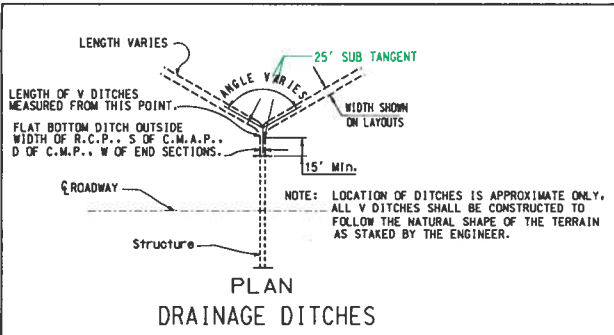
PIPE DIAMETER INCHES	16 GAGE	14 GAGE	12 GAGE
24	46	64	90
30	37	51	72
36	31	43	60
42	26	37	51
48	23	32	45
54	21	29	40
60	19	26	36
66		23	33
72		21	30
84			26
90			24

NOTE: BASED ON H-20 LOADING, MINIMUM FILL HEIGHTS IS ONE-QUARTER (1/4) OF THE DIAMETER FOR PIPE OVER FORTY-EIGHT (48) INCHES IN DIAMETER AND ONE (1) FOOT FOR ALL OTHER DIAMETERS.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

**ALLOWABLE FILL HEIGHTS
FOR STEEL CULVERTS**

R-1.3.1.2 (604, 6061)
ADOPTED: 7/73 REVISION
10-94
H. P. [Signature]
CHIEF ROAD DESIGN ENGR.



STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

**DRAINAGE DITCHES
AND DIKES**

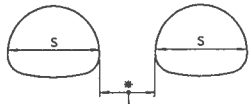
R-1.4.1-(203)
ADOPTED: 8/69 REVISION

[Signature]
CHIEF ROAD DESIGN ENGR.

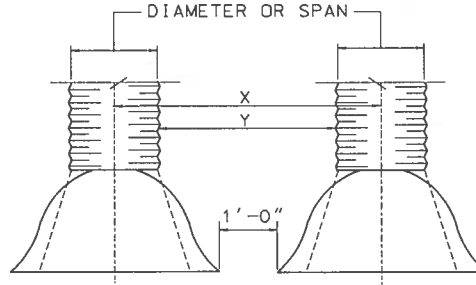
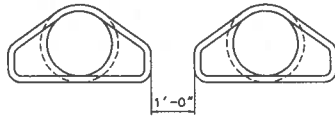
R-11



DIAMETER	MINIMUM SPACE BETWEEN PIPES
12" to 24"	1'-0"
30" to 66"	ONE HALF DIAMETER OF PIPE
72" to 84"	3'-0"



SPAN	MIN. SPACE BETWEEN PIPE ARCHES
17" to 35"	1'-0"
42" to 83"	One Third Span of Pipe Arch



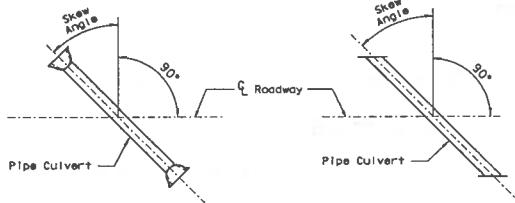
NOTE: WHEN Y DISTANCE EXCEEDS 5'-0", STRUCTURE EXCAVATION AND BACKFILL QUANTITIES SHALL BE CALCULATED FOR EACH CULVERT.

MULTIPLE INSTALLATIONS WITH END SECTIONS

* WHEN HEADWALLS ARE USED OR ANTICIPATED FOR FUTURE USE, SPACE AS PER HEADWALLS STANDARD.

MULTIPLE INSTALLATIONS WITHOUT HEADWALLS

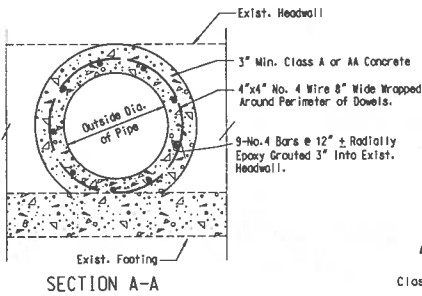
② INTERSECTING POINT OF FILLSLOPE AND TOP OF PIPE CONTROLS THE LENGTH OF PIPE TO BE INSTALLED.



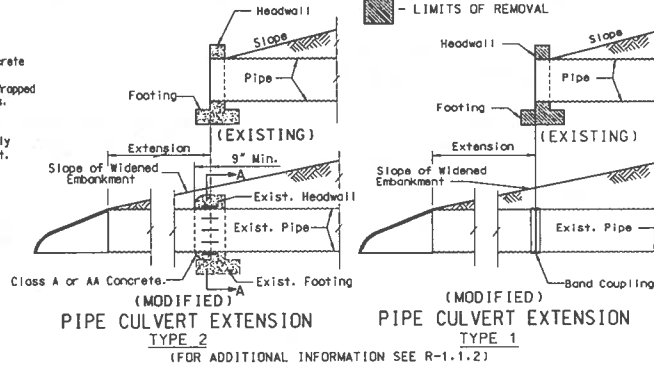
SINGLE CULVERT WITH END SECTIONS

SINGLE CULVERT WITH HEADWALLS

MULTIPLE CULVERT WITH END SECTIONS



SECTION A-A



(MODIFIED) PIPE CULVERT EXTENSION TYPE 2

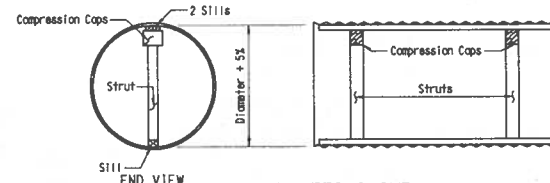
(MODIFIED) PIPE CULVERT EXTENSION TYPE 1

(FOR ADDITIONAL INFORMATION SEE R-1.1.2.)

TABLE OF SEPARATION FOR MULTIPLE INSTALLATIONS

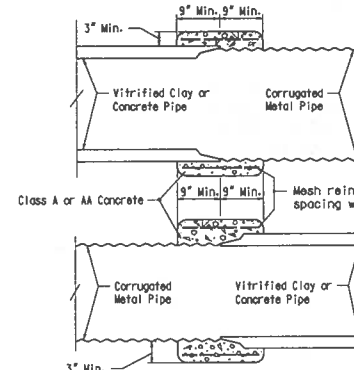
DIA.	CMP		CMAP			RCP		
	X	Y	SPAN	X	Y	DIA.	X	Y
			21"x15"	5'-2"	3'-5"	18"	4'-4"	2'-6"
			24"x18"	5'-10"	3'-10"	24"	5'-5"	3'-0"
			28"x20"	6'-6"	4'-2"	30"	6'-6"	3'-6"
24"	6'-8"	4'-8"	35"x24"	7'-8"	4'-9"	36"	7'-7"	4'-0"
30"	8'-0"	5'-6"	42"x29"	9'-3"	5'-9"	42"	8'-2"	4'-0"
36"	9'-4"	6'-4"	49"x33"	10'-3"	6'-2"	48"	8'-9"	4'-0"
42"	10'-8"	7'-2"	57"x38"	11'-6"	6'-9"	54"	8'-7"	3'-4"
48"	11'-6"	7'-6"	64"x43"	12'-6"	7'-2"			
54"	12'-6"	8'-0"	71"x47"	13'-6"	7'-7"			
60"	13'-6"	8'-6"	77"x52"	14'-6"	8'-1"			
66"	14'-0"	8'-6"	83"x57"	15'-6"	8'-7"			
72"	14'-6"	8'-6"						
78"	15'-0"	8'-6"						
84"	15'-6"	8'-6"						

STRUTS SHALL BE LEFT IN PLACE UNTIL FILL HAS BEEN COMPLETED AND COMPACTED, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.



FIELD STRUTTING CMP

NOTE: FOR STRUT, CAP, SILL SIZE AND SPACING USE MANUFACTURERS RECOMMENDATIONS. STRUTS, CAPS AND SILLS TO BE THE SAME DIMENSION. FOR MAXIMUM FILL HEIGHTS, SEE STANDARD SHEET R-1.3.1.2 UNDER COLUMNS DESIGNATED "E".



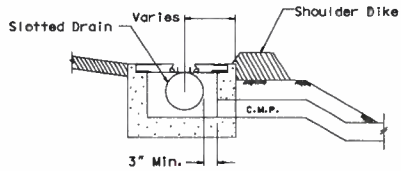
CONCRETE COLLAR

CMP TO RCP OR VITRIFIED CLAY PIPE EXTENSIONS

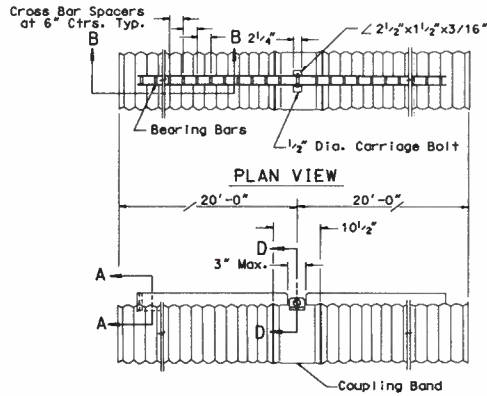
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

CULVERT INSTALLATION

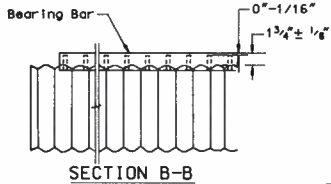
J. R. O'Neil
CHIEF ROAD DESIGN ENGR.
R-2.1.1 (601 THRU 606)
ADOPTED: 8/69
REVISION
11-94



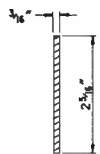
EMBANKMENT PROTECTOR & SLOTTED DRAIN



SLOTTED DRAIN DETAIL

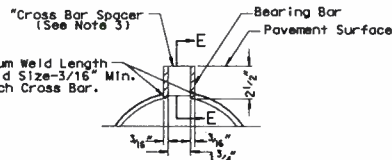


SECTION B-B

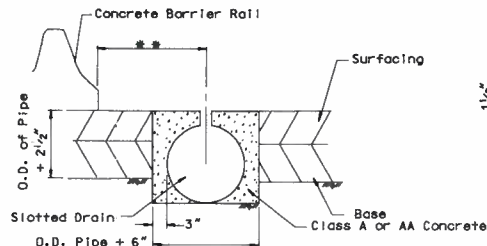


SECTION E-E

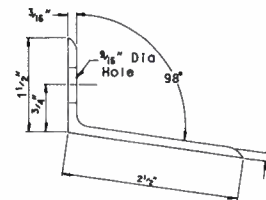
** See Plan Structure List



SECTION A-A (OR ALTERNATE)

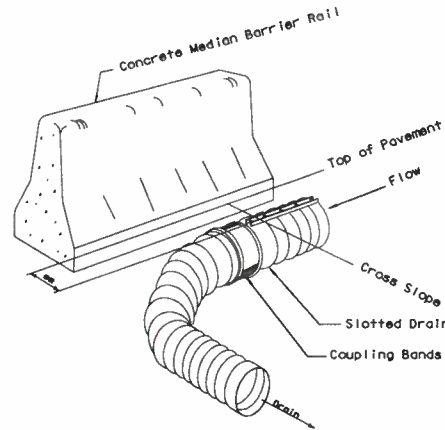


BEDDING DETAIL

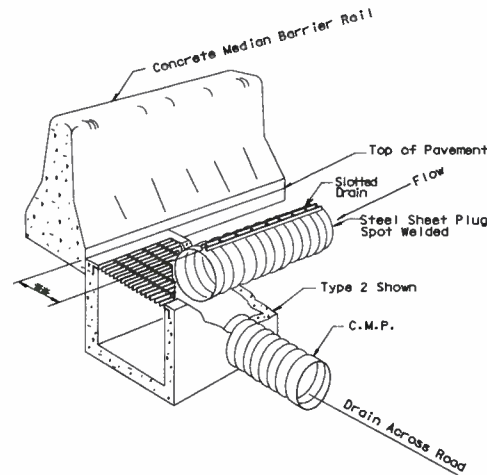


DETAIL "F"

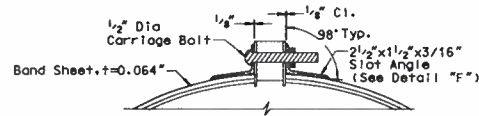
* Attach to Coupling Band with Tack or Fillet Welds or Rivets.



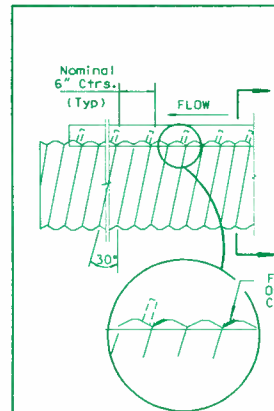
45° ANGLE SLOTTED DRAIN & CONCRETE BARRIER RAIL
(CAN BE USED WITH SHOULDER DIKE)



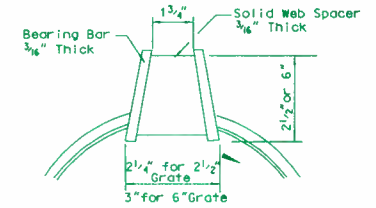
SLOTTED DRAIN, CONCRETE BARRIER RAIL & DROP INLET



SECTION D-D



ALTERNATE



SECTION G-G
STANDARD GRATE DETAIL

NOTE: Parallel Side Grate Also Available

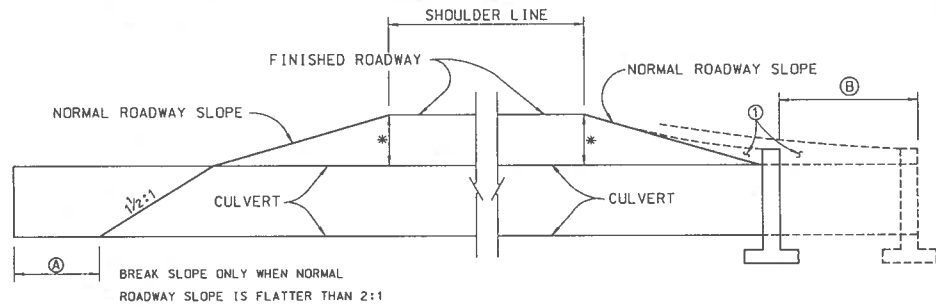
Fillet Weld At Each Side Of Grate At Every Other Corrugation On the Tangent.

GENERAL NOTES

1. DRAIN PIPE SEAMS MAY BE CONTINUOUS HELICAL LOCK SEAM OR HELICAL WELD SEAM.
2. DRAIN SECTIONS SHALL BE ASSEMBLED WITH THE COUPLING BAND SHOWN.
3. THE CROSS BAR SPACER SHALL BE WELDED TO THE BEARING BARS IN SUCH A MANNER AS TO DEVELOP A MINIMUM TENSILE STRENGTH OF 12,000 LBS. NORMAL TO THE LONGITUDINAL AXIS OF THE BEARING BARS.
4. THE MAXIMUM VARIANCE FROM A STRAIGHT LINE BETWEEN THE EXTREME TOP CORNERS OF THE BEARING BARS SHALL BE 1/2" IN 20 FEET.
5. FOR CONTINUOUS RUNS OF 6-C.M.P. IN EXCESS OF 200 FEET, CLEAROUT OR STANDARD FLUSHING INLETS SHALL BE INSTALLED AS SHOWN ON THE PLANS.
6. SPOT WELD SHALL DEVELOP MINIMUM REQUIRED STRENGTH OF STRAP.
7. DIMENSIONS SHOWN ARE MINIMUMS.
8. CONTRACTOR TO PROVIDE AN ADEQUATE METHOD OF KEEPING THE A.C. OUT OF PIPE DURING PAVING OPERATIONS.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
SLOTTED C.M.P. DRAIN
DETAILS

ADOPTED: 6/72
REVISION 1-95

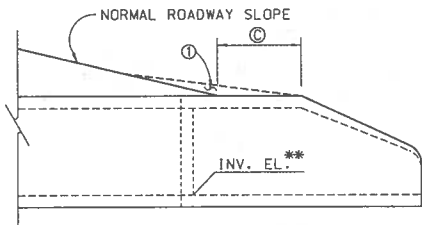


WITHOUT HEADWALL

A—LENGTH OF CULVERT SHALL BE INCREASED AS FOLLOWS: CONSIDER EACH SIDE SEPARATELY. MEASURE PIPE FROM ROADBED CENTERLINE TO THE INTERSECTION OF PIPE FLOW LINE AND FILLSLOPE. TO THIS DIMENSION ADD 2.0' WHEN COVER AT SHOULDER IS 1.0' TO 10.0' ADD AN ADDITIONAL 0.5' FOR EACH SUCCEEDING 5.0' OF COVER OR PORTION THEREOF.

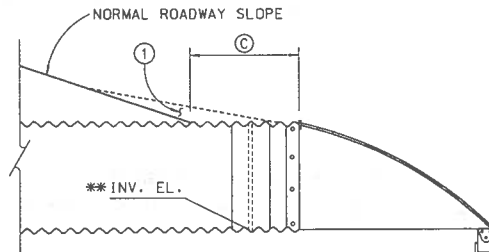
WITH CONCRETE HEADWALL

B—LENGTH OF CULVERTS SHALL BE INCREASED AS FOLLOWS: CONSIDER EACH SIDE SEPARATELY. MEASURE PIPE FROM ROADWAY CENTERLINE TO THE INTERSECTION OF THE TOP OF PIPE AND FILLSLOPE PLUS HEADWALL THICKNESS. TO THIS DIMENSION ADD 1.0' WHEN COVER AT SHOULDER IS 5.0' TO 10.0'. ADD AN ADDITIONAL 0.5' FOR EACH SUCCEEDING 5.0' OF COVER OR PORTION THEREOF.



PRECAST CONCRETE END SECTION

C—LENGTH OF CULVERT SHALL BE INCREASED AS FOLLOWS: CONSIDER EACH SIDE SEPARATELY. MEASURE PIPE FROM ROADWAY CENTERLINE TO THE INTERSECTION OF THE TOP OF PIPE AND FILLSLOPE. TO THIS DIMENSION ADD 1.0' WHEN COVER AT SHOULDER IS 1.0' TO 10.0' ADD AN ADDITIONAL 0.5' FOR EACH SUCCEEDING 5.0' OR PORTION THEREOF.



METAL END SECTION

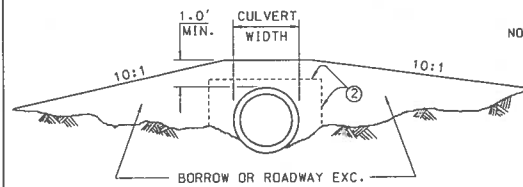
MINIMUM CULVERT INSTALLATION

* RCP: USE 1'6" MIN. WHERE POSSIBLE. IF MINIMUM COVER IS RESTRICTIVE, COMPENSATE BY UTILIZING HIGHER CLASS PIPE OR SELECTIVE BEDDING AS RECOMMENDED BY THE HYDRAULICS SECTION.

ALUMINUM CULVERTS: SEE STANDARD SHEET R-1.3.1.
STEEL CULVERTS: SEE STANDARD SHEET R-1.3.1.2.

** FOR INFORMATIONAL PURPOSES ONLY

①—CONTOUR THIS AREA TO PROVIDE THE MINIMUM AMOUNT OF OBSTRUCTION EXPOSURE.

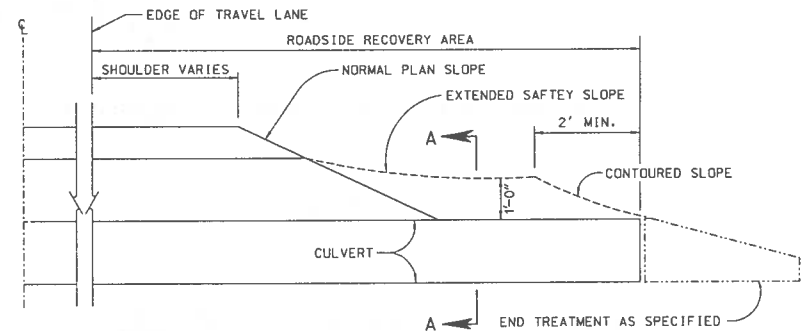
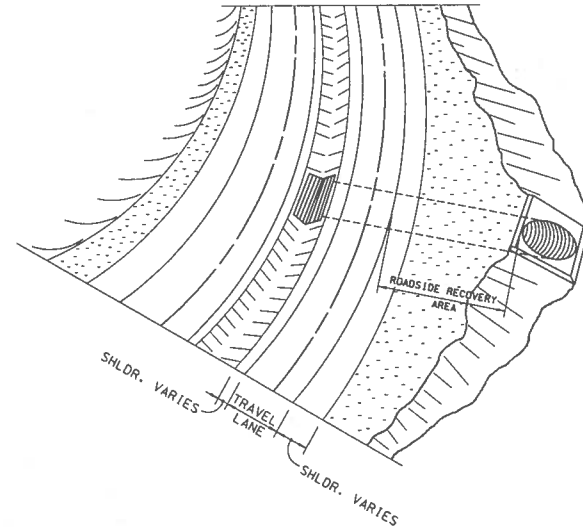


SECTION A-A SAFETY CULVERT INSTALLATION

(TO PROVIDE OBSTRUCTION CLEARANCE)

NOTE:

- ①—IF, AFTER EXTENDING THE CULVERT AND/OR WARPING THE FILLSLOPE FOR SAFETY AND/OR AESTHETICS, THE EXTENSION DOES NOT FULFILL THE REQUIREMENTS FOR A CLEAR ROADSIDE RECOVERY AREA, THEN VEHICULAR TRAFFIC MAY BE PROTECTED BY SOME OTHER MEANS, SUCH AS GUARDRAIL, BARRIER RAIL OR ANOTHER ACCEPTABLE SAFETY FEATURE.
- ②—NORMAL STRUCTURE EXCAVATION AND BACKFILL LIMITS.

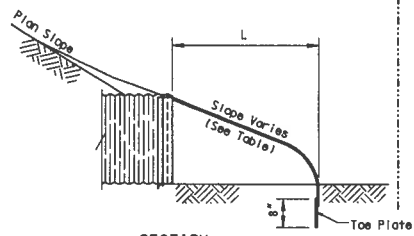


METHOD OF CONTOURING OVER CULVERTS

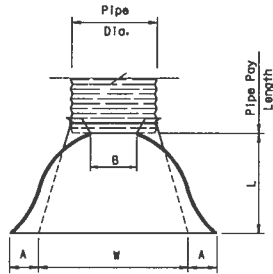
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

CULVERT INSTALLATION

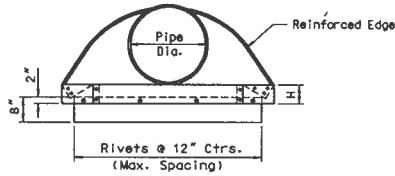
David D. Dally
CHIEF ROAD DESIGN ENGR. R-2.1.4 (601 THRU 606)
ADOPTED: 6/72 REVISION 10/94



SECTION
TYPE 1 OR 2 CONNECTION

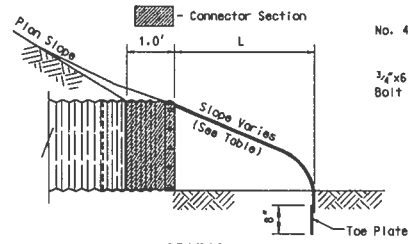


PLAN

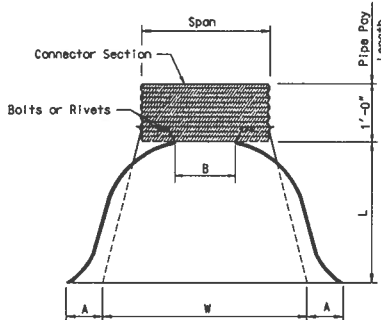


ELEVATION

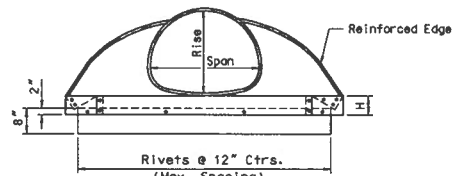
LENGTH OF TOE PLATE TO BE $W + 10"$ MIN. FOR 12" TO 30" DIAMETER PIPE INCLUSIVE AND $W + 22"$ MIN. FOR 36" DIAMETER PIPES AND LARGER.



SECTION
TYPE 3 CONNECTION

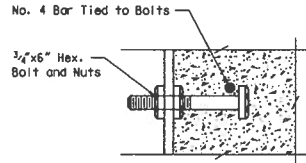


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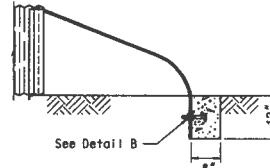


ELEVATION

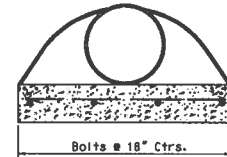
LENGTH OF TOE PLATE TO BE $W + 10"$ MIN. FOR PIPE ARCHES WITH RISE OF 13" TO 29" INCLUSIVE AND $W + 18"$ MIN. FOR PIPE ARCHES WITH RISE OF 33" AND LARGER.



DETAIL B



SECTION



ELEVATION

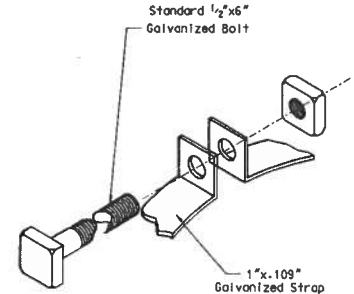
ANCHOR BLOCK DETAIL
(See Notes 6 thru 9)

TYPE CONNECTION	PIPE ARCH DIMENSIONS		GAGE	DIMENSIONS					APPROX. SLOPE	#CONCRETE CU. YD.	
	SPAN	RISE		A 1" TOL.	B MAX.	H 1" TOL.	L 1 1/2" TOL.	W 2" TOL.			
TYPE 2	17"	13"	16	7"	9"	6"	19"	30"	2 1/2:1	0.26	
	21"	15"	16	7"	10"	6"	23"	36"	2 1/2:1		
	24"	18"	16	8"	12"	6"	28"	42"	2 1/2:1		
	28"	20"	16	9"	14"	6"	32"	48"	2 1/2:1		
	35"	24"	14	10"	16"	6"	39"	60"	2 1/2:1		
	42"	29"	14	12"	18"	8"	46"	75"	2 1/2:1		
TYPE 3	49"	33"	12	13"	21"	9"	53"	85"	2 1/2:1	0.29	
	57"	38"	12	18"	26"	12"	63"	90"	2 1/2:1		
	64"	43"	12	18"	30"	12"	70"	102"	2 1/4:1		
	71"	47"	12	18"	33"	12"	77"	114"	2 1/4:1		
	77"	52"	12	18"	36"	12"	77"	126"	2:1	0.31	
	83"	57"	12	18"	39"	12"	77"	138"	2:1		0.34
									2:1		

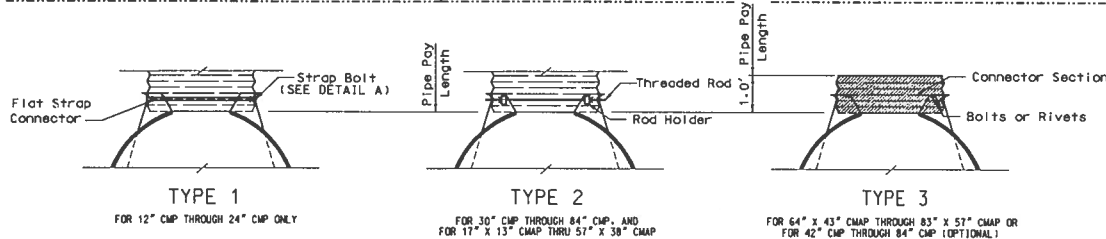
TYPE CONNECTION	PIPE DIAM.	GAGE	DIMENSIONS					APPROX. SLOPE	#CONCRETE CU. YD.
			A 1" TOL.	B MAX.	H 1" TOL.	L 1 1/2" TOL.	W 2" TOL.		
TYPE 1	12"	16	6"	6"	6"	21"	24"	2 1/2:1	
	15"	16	7"	8"	6"	26"	30"	2 1/2:1	
	18"	16	8"	10"	6"	31"	36"	2 1/2:1	
	21"	16	9"	12"	6"	36"	42"	2 1/2:1	
TYPE 2	30"	14	12"	16"	8"	51"	60"	2 1/2:1	
	36"	14	14"	19"	9"	60"	72"	2 1/2:1	
TYPE 2 OR TYPE 3	42"	12	16"	22"	11"	69"	84"	2 1/2:1	0.26
	48"	12	18"	27"	12"	78"	90"	2 1/4:1	
TYPE 3	54"	12	18"	30"	12"	84"	102"	2:1	0.29
	60"	12	18"	33"	12"	87"	114"	1 3/4:1	
	66"	12	18"	36"	12"	87"	120"	1 1/2:1	
	72"	12	18"	39"	12"	87"	126"	1 1/3:1	
	78"	12	18"	42"	12"	87"	132"	1 1/4:1	
	84"	12	18"	45"	12"	87"	138"	1 1/6:1	

GENERAL NOTES

- THE CULVERT LENGTHS SHOWN ON THE PLANS AND STRUCTURE LIST SHALL BE THE PAY LENGTH AS INDICATED ON THE STANDARD SHEET INCLUDING CONNECTOR SECTION LENGTHS WHEN USED.
- PIPE ON SKEW SHALL BE MITERED. SUFFICIENT ADDITIONAL LENGTH OF PIPE SHALL BE ALLOWED TO PROVIDE CLEARANCE FOR END SECTIONS.
- TOE PLATES REQUIRED ON ROUND PIPE 24" AND OVER IN DIAMETER AND ON ARCH PIPE 28" x 20" AND OVER UNLESS OTHERWISE SPECIFIED ON THE PLANS OR IN THE SPECIAL PROVISIONS.
- TOE PLATES SHALL BE PUNCHED WITH 7/16" HOLES TO MATCH HOLES IN LIP OF END SECTION AND BOLTED WITH 3/8" GALVANIZED BOLTS.
- REINFORCED EDGES TO BE SUPPLEMENTED WITH GALVANIZED STIFFENER ANGLES FOR THE 60" THRU 84" ROUND, 77" x 52" AND 83" x 57" PIPE-ARCH SIZES. THE ANGLES WILL BE 2"x 2"x 1/4" FOR THE 60" THRU 72" ROUND, 77" x 52" AND 83" x 57" PIPE-ARCH SIZES AND 2 1/2" x 2 1/2" x 1/4" FOR 78" x 84" ROUND. THE ANGLES TO BE ATTACHED BY 3/8" GALVANIZED NUTS AND BOLTS.
- ANCHOR BLOCK SHALL BE USED ON INLET END ONLY FOR 48" CMP AND OVER AND FOR 57" x 38" CMP AND OVER UNLESS OTHERWISE SPECIFIED (SEE ANCHOR BLOCK DETAILS).
- CONCRETE SHALL BE CLASS A OR AA.
- TOE PLATE TO BE ELIMINATED WHEN ANCHOR BLOCK IS USED.
- REINFORCING STEEL BAR TO CLEAR 2" ON ENDS OF CONCRETE ANCHOR BLOCK.



DETAIL A



STANDARD CONNECTIONS

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

METAL END SECTIONS
12" CMP TO 84" CMP AND
17"x13" CMP TO 83"x57" CMP

R-2.2.1-(604)

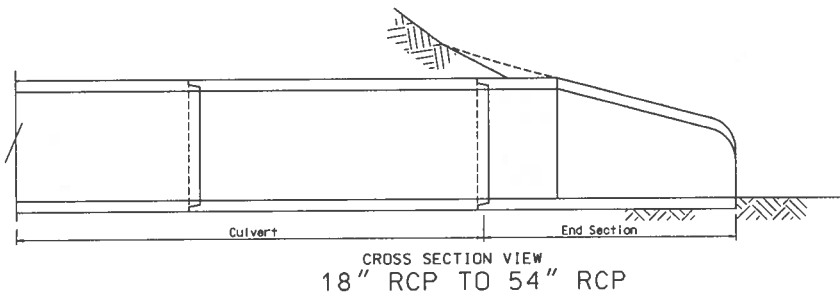
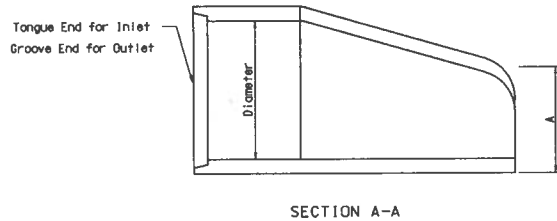
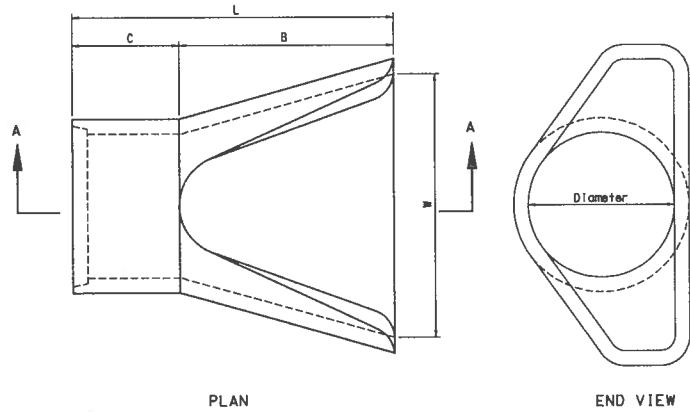
ADOPTED: 8/75 REVISION:
2-6/8

DIAMETER	WEIGHT	A	B	C*	L	W
18"	670	9"	2'-1"	2'-1"	4'-2"	3'-0"
24"	1300	9 1/2"	3'-6"	2'-6"	6'-0"	4'-0"
30"	1850	1'-0"	4'-5"	1'-8"	6'-1"	5'-0"
36"	3500	1'-3"	5'-2"	2'-11"	8'-1"	6'-0"
42"	4950	1'-9"	5'-3"	2'-11"	8'-2"	6'-2"
48"	6700	2'-0"	6'-0"	2'-2"	8'-2"	7'-0"
54"	7150	2'-3"	5'-6"	2'-9"	8'-3"	6'-10"

GENERAL NOTES

1. CLASS AND TYPE OF CONCRETE SHALL BE AS SPECIFIED FOR REINFORCED CONCRETE PIPE.
2. STRUCTURAL DESIGN OF END SECTION SHALL CONFORM TO THAT OF STANDARD REINFORCED CONCRETE CULVERT PIPE.
3. LENGTH OF PIPE SHOWN ON THE PLANS DOES NOT INCLUDE CONNECTOR SECTION (LENGTH C).

* For Reference Only



STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

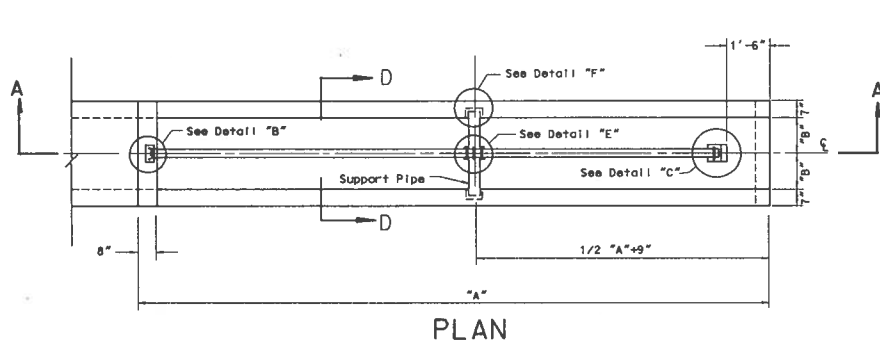
RCP END SECTION
12" RCP TO 54" RCP

R-2.3.1-(603)

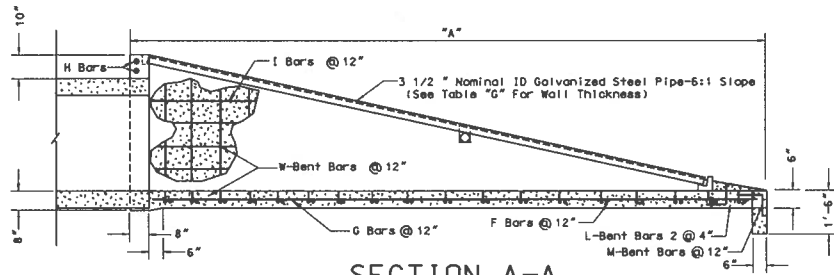
ADOPTED: 1/75

REVISION
1-12/82

CHIEF ROAD DESIGN ENGR.



PLAN



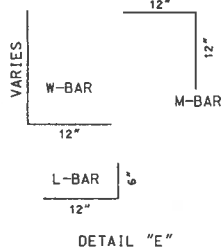
SECTION A-A

LENGTH OF REINFORCING BARS

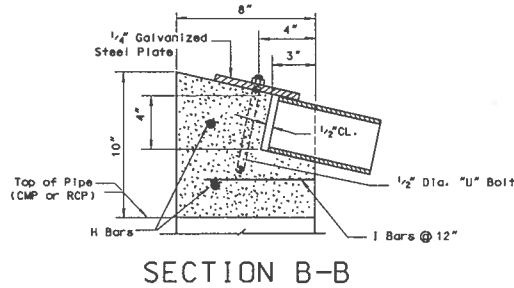
DIA. OF PIPE	F		G		H		I		M		W	
	NO. 4 BARS	NO. 4 BARS	NO. 4 BARS	NO. 4 BARS	NO. 4 BARS	NO. 4 BARS	NO. 4 BARS	NO. 4 BARS	NO. 4 BARS	NO. 4 BARS	NO. 4 BARS	NO. 4 BARS
30"	27'-2"-2"	4-21'-0"	2-3'-3"	3-19'-10" TO 2'-6"	4-2'-0"	18-4'-10" TO 2'-0"						
33"	23'-2"-5"	4-22'-0"	2-3'-3"	3-20'-10" TO 2'-6"	4-2'-0"	20'-2"-2" TO 2'-0"						
36"	24'-2"-8"	5-23'-6"	2-3'-10"	3-22'-4" TO 2'-6"	5-2'-0"	22'-5"-2" TO 2'-0"						
39"	26'-2"-11"	5-24'-6"	2-4'-1"	3-24'-4" TO 2'-6"	5-2'-0"	24'-5"-4" TO 2'-0"						
42"	28'-3"-2"	5-27'-0"	2-4'-1"	3-26'-10" TO 2'-6"	5-2'-0"	26'-5"-8" TO 2'-0"						
48"	29'-3'-4"	6-28'-6"	2-4'-1"	5-27'-4" TO 2'-6"	6-2'-0"	27'-5"-3" TO 2'-0"						
48"	31'-1'-10"	6-30'-0"	2-4'-10"	5-28'-10" TO 2'-6"	6-2'-0"	28'-5"-4" TO 2'-0"						
51"	33'-4'-10"	6-32'-0"	2-5'-0"	6-30'-10" TO 2'-6"	6-2'-0"	30'-5"-10" TO 2'-0"						
54"	34'-5'-4"	6-33'-6"	2-5'-4"	6-32'-4" TO 2'-6"	6-2'-0"	32'-7"-1" TO 2'-0"						
57"	37'-5'-7"	7-35'-0"	2-5'-7"	6-33'-10" TO 2'-6"	7-2'-0"	33'-7"-4" TO 2'-0"						
60"	38'-5'-10"	7-37'-0"	2-5'-10"	7-35'-10" TO 2'-6"	7-2'-0"	35'-7"-8" TO 2'-0"						

TABLE "G"

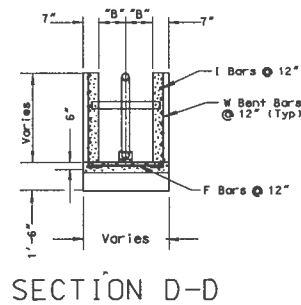
DIA. OF PIPE	DIM. "A"	DIM. "B"	PIPE CLASS
30"	22'-0"	1'-3"	40
33"	23'-0"	1'-4 1/2"	40
36"	24'-6"	1'-6"	40
39"	26'-6"	1'-7 1/2"	40
42"	28'-0"	1'-9"	40
45"	29'-6"	1'-10 1/2"	40
48"	31'-0"	2'-0"	40
51"	33'-0"	2'-1 1/2"	80
54"	34'-6"	2'-3"	80
57"	36'-0"	2'-4 1/2"	80
60"	38'-0"	2'-6"	80



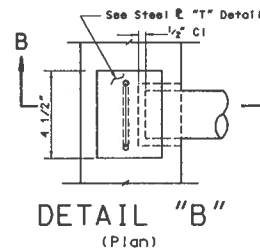
DETAIL "E"



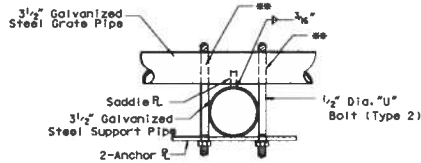
SECTION B-B



SECTION D-D



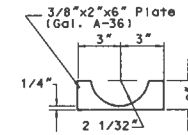
DETAIL "B"
(Plan)



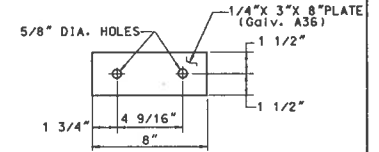
DETAIL "E"

GENERAL NOTES:

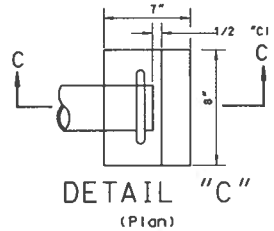
1. CONCRETE SHALL BE CLASS A OR CLASS AA.
2. REINFORCING STEEL SHALL BE DEFORMED BARS WITH THE MAXIMUM SPACING OF 12" SET 2" CLEAR OF SURFACE OF CONCRETE. REINFORCING BARS MAY BE CUT AND BENT IN FIELD.



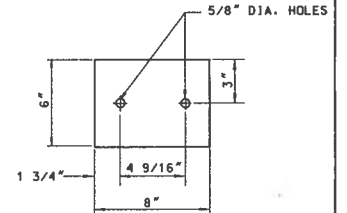
SADDLE R DETAIL



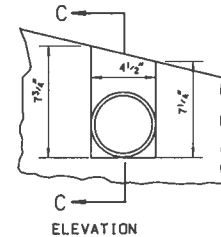
ANCHOR R DETAIL



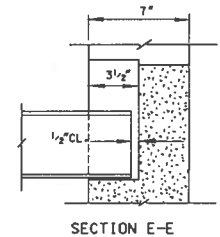
DETAIL "C"
(Plan)



STEEL R "T" DETAIL

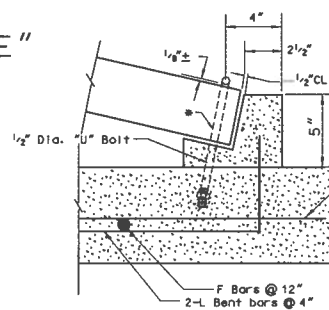


ELEVATION

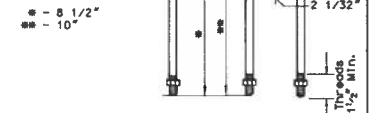


SECTION E-E

DETAIL "F"



SECTION C-C



U-BOLT DETAIL

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

**CULVERT END SAFETY
GRATE
30"-60" CMP OR RCP**

R-2.3 1.1(601)
ADOPTED: 1/1 REVISION 1/1/78

CMP SIZE Dia.	CORR CMP SKR	CMP AREA SQ. FT.	L	SINGLE CMP								DOUBLE CMP							
				0° SKEW		15° SKEW		30° SKEW		45° SKEW		0° SKEW		15° SKEW		30° SKEW		45° SKEW	
				CONC CU. YD.	STEEL LB.	CONC CU. YD.	STEEL LB.	CONC CU. YD.	STEEL LB.	CONC CU. YD.	STEEL LB.	CONC CU. YD.	STEEL LB.	CONC CU. YD.	STEEL LB.	CONC CU. YD.	STEEL LB.	CONC CU. YD.	STEEL LB.
12"		0.79	3'-6"	0.85	35	0.93	37	0.94	37	0.99	39	1.21	46	1.30	49	1.35	50	1.49	53
15"	18"x11"	1.23	4'-3"	1.09	48	1.19	50	1.21	51	1.27	52	1.51	61	1.62	64	1.68	65	1.85	69
18"	22"x13"	1.77	5'-0"	1.36	55	1.48	59	1.51	59	1.57	61	1.83	70	1.96	73	2.05	75	2.24	80
24"	29"x18"	3.14	6'-6"	1.95	78	2.12	83	2.16	84	2.25	86	2.53	95	2.73	100	2.84	103	3.08	108
30"	36"x22"	4.91	8'-0"	2.61	105	2.85	111	2.90	112	3.01	115	3.39	126	3.65	132	3.79	135	4.11	142
36"	43"x27"	7.07	9'-6"	3.36	122	3.66	129	3.72	131	3.86	134	4.34	147	4.68	155	4.85	158	5.25	167
42"	50"x31"	9.62	11'-0"	4.18	167	4.56	177	4.64	179	4.81	182	5.39	196	5.81	206	6.03	210	6.52	220

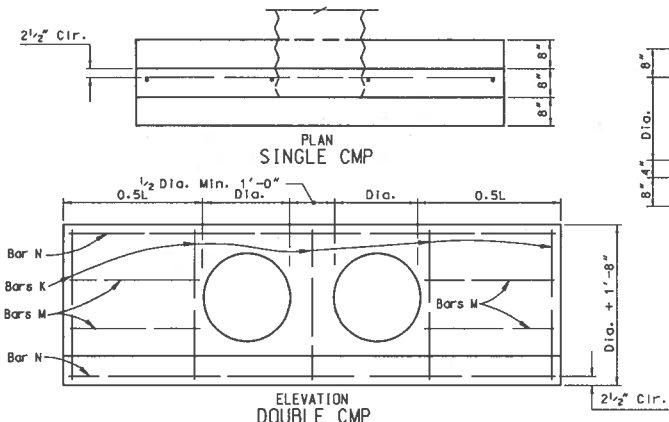
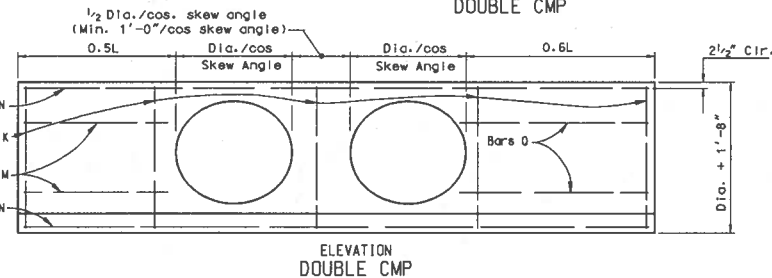
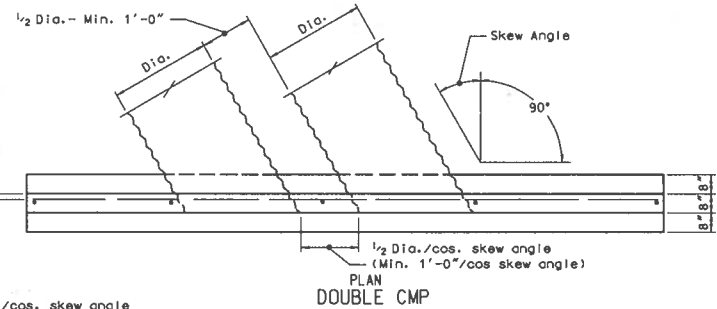
QUANTITIES SHOWN ABOVE ARE FOR TWO HEADWALLS.

QUANTITIES SHOWN BELOW ARE FOR ONE HEADWALL.

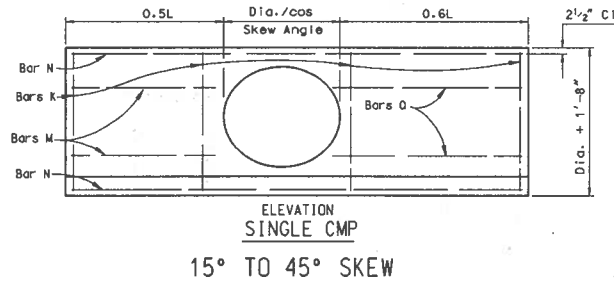
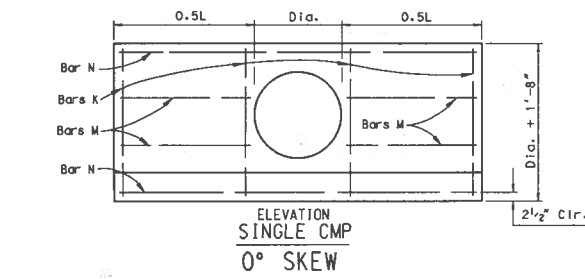
CMP SIZE Dia.	LENGTH OF REINFORCING BARS																
	SINGLE CMP								DOUBLE CMP								
	0°-45°	0°	15°	30°	45°	0°	15°	30°	45°	0°-45°	0°	15°	30°	45°	0°-45°	0°	
12"	4e2'-5"	2e4'-3"	2e4'-8"	2e4'-9"	2e5'-0"	2e1'-6"	1e1'-4"	1e2'-0"	1e1'-3"	1e2'-1"	1e1'-0"	1e2'-4"	5e2'-5"	2e6'-3"	2e6'-9"	2e7'-1"	2e7'-10"
15"	6e2'-8"	2e5'-3"	2e5'-9"	2e5'-11"	2e6'-2"	2e1'-8"	1e1'-6"	1e2'-2"	1e1'-5"	1e2'-3"	1e1'-2"	1e2'-8"	7e2'-6"	2e7'-6"	2e8'-1"	2e8'-6"	2e9'-5"
18"	6e2'-11"	2e6'-3"	2e6'-10"	2e7'-0"	2e7'-4"	2e2'-3"	1e2'-1"	1e2'-11"	1e2'-0"	1e3'-0"	1e1'-9"	1e3'-3"	7e2'-11"	2e8'-9"	2e9'-5"	2e9'-10"	2e10'-11"
24"	6e3'-5"	2e8'-3"	2e8'-9"	2e9'-3"	2e9'-9"	4e3'-0"	2e2'-10"	2e3'-9"	2e2'-9"	2e3'-10"	2e2'-6"	2e4'-1"	7e3'-5"	2e11'-3"	2e12'-1"	2e12'-8"	2e14'-0"
30"	8e3'-11"	2e10'-3"	2e11'-2"	2e11'-5"	2e12'-1"	4e3'-9"	2e3'-7"	2e4'-8"	2e3'-6"	2e4'-9"	2e3'-3"	2e5'-0"	9e3'-11"	2e14'-0"	2e15'-0"	2e15'-9"	2e17'-5"
36"	8e4'-5"	2e12'-3"	2e13'-4"	2e13'-9"	2e14'-5"	4e4'-6"	2e4'-4"	2e5'-7"	2e4'-3"	2e5'-8"	2e4'-0"	2e5'-11"	9e4'-5"	2e15'-9"	2e18'-0"	2e18'-10"	2e20'-10"
42"	10e4'-11"	2e14'-3"	2e15'-6"	2e15'-11"	2e16'-10"	6e5'-3"	2e5'-1"	2e6'-6"	2e5'-0"	2e6'-7"	2e4'-9"	2e6'-10"	11e4'-11"	2e19'-6"	2e20'-11"	2e21'-11"	2e24'-3"

GENERAL NOTES

1. CONCRETE SHALL BE CLASS A OR AA.
2. REINFORCING STEEL SHALL BE DEFORMED BARS WITH MAXIMUM SPACING OF 18" SET 2 1/2" CLEAR OF SURFACE OF CONCRETE EXCEPT AS NOTED. BAR ENDS SHALL BE KEPT 1 1/2" CLEAR OF SURFACE OF CONCRETE. REINFORCING BARS MAY BE CUT AND BENT IN FIELD.
3. FOOTINGS SHOWN ARE OF MINIMUM DEPTH AND SHALL BE EXTENDED IF SOIL IS UNSUITABLE OR LIABLE TO SCOUR.
4. CULVERT PIPES TO BE SET ON A SKEW SHALL BE MITERED WHEN HEADWALLS ARE CONSTRUCTED. WHEN HEADWALLS ARE NOT CONSTRUCTED THE PIPES SHALL NOT BE MITERED EXCEPT IN OVERFLOW SECTION.
5. FOR ESTIMATING HEADWALL QUANTITIES ON SKEWED CULVERTS:
 - 0° to 10° - USE QUANTITIES FOR 0° SKEW.
 - 11° to 25° - USE QUANTITIES FOR 15° SKEW.
 - 26° to 40° - USE QUANTITIES FOR 30° SKEW.
 - 41° to 55° - USE QUANTITIES FOR 45° SKEW.
 - OVER 55° - CALCULATE QUANTITIES REQUIRED. CULVERTS SHOULD BE INSTALLED ON 5° INCREMENTS WHERE IT IS FEASIBLE.



SECTION (FOR ALL HEADWALLS)



STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

CULVERT HEADWALLS
12" CMP TO 42" CMP

R-2.4.1-(502)
CHIEF ROAD DESIGN ENGR. ADAPTED: 8/69 REVISION

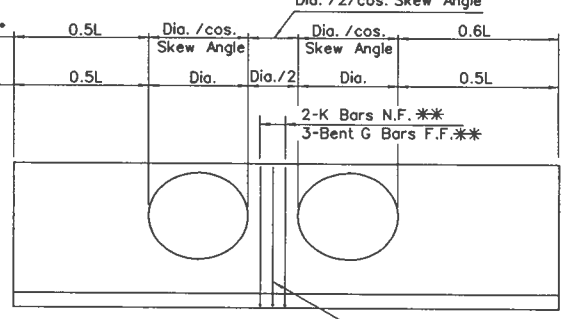
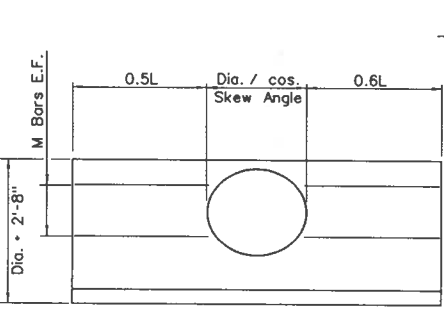
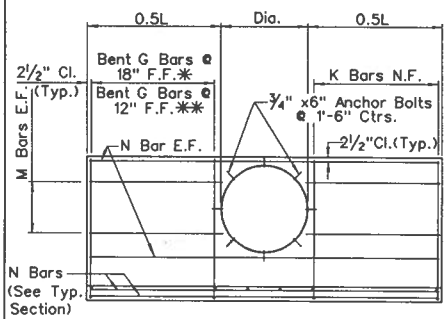
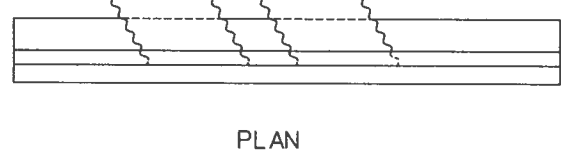
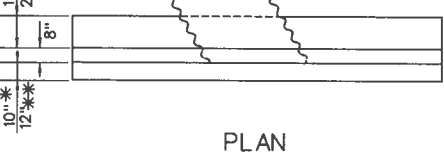
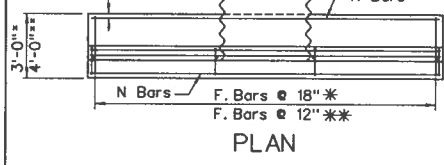
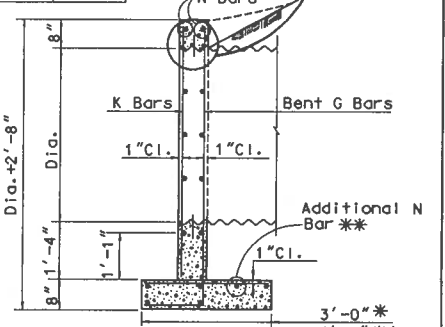
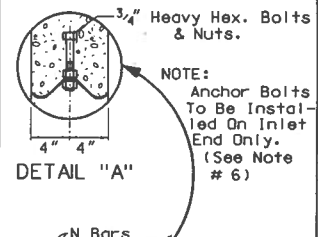
R-18

LENGTH OF REINFORCING BARS

CMP SIZE DIA.	SINGLE CMP																							
	0° SKEW						15° SKEW						30° SKEW						45° SKEW					
	NO. 5		NO. 4		K		NO. 5		NO. 4		K		NO. 5		NO. 4		K		NO. 5		NO. 4		K	
F	G	M	N	K	F	G	M	Q	N	K	F	G	M	Q	N	K	F	G	M	Q	N	K		
48"	12e2'-9"	10e7'-7"	12e6'-0"	9e16'-3"	10e5'-10"	13e2'-9"	11e7'-7"	6e5'-10"	6e 7'- 3"	9e17'-8"	11e5'-10"	13e2'-9"	11e7'-7"	6e5'-8"	6e 7'- 3"	9e18'-2"	11e5'-10"	14e2'-9"	12e7'-7"	6e5'-6"	6e 7'- 3"	9e19'-2"	12e5'-10"	
54"	13e2'-9"	12e8'-1"	12e6'-9"	9e18'-3"	12e6'-4"	14e2'-9"	13e8'-1"	6e6'-7"	6e 8'- 1"	9e19'-10"	13e6'-4"	15e2'-9"	14e8'-1"	6e6'-5"	6e 8'- 1"	9e20'-4"	14e6'-4"	15e2'-9"	14e8'-1"	6e6'-3"	6e 8'- 1"	9e21'-6"	14e6'-4"	
60"	21e3'-9"	18e8'-9"	12e7'-6"	10e20'-3"	12e6'-10"	23e3'-9"	20e8'-9"	6e7'-4"	6e 9'- 0"	10e22'-0"	13e6'-10"	23e3'-9"	20e8'-9"	6e7'-2"	6e 9'- 0"	10e22'-7"	13e6'-10"	24e3'-9"	21e8'-9"	6e7'-0"	6e 9'- 0"	10e23'-11"	14e6'-4"	
72"	25e3'-9"	20e9'-9"	16e9'-0"	10e24'-3"	14e7'-10"	27e3'-9"	22e9'-9"	8e8'-10"	8e10'-10"	10e26'-4"	15e7'-10"	28e3'-9"	23e9'-9"	8e8'-8"	8e10'-10"	10e27'-0"	16e7'-10"	29e3'-9"	24e9'-9"	8e8'-6"	8e10'-10"	10e28'-7"	17e7'-10"	

CMP SIZE DIA.	CORR CMAP SXR	CMP AREA SO FT	L	SINGLE CMP												DOUBLE CMP											
				0° SKEW		15° SKEW		30° SKEW		45° SKEW		0° SKEW		15° SKEW		30° SKEW		45° SKEW									
				CONC CU YD	STEEL LB	CONC CU YD	STEEL LB	CONC CU YD	STEEL LB	CONC CU YD	STEEL LB	CONC CU YD	STEEL LB	CONC CU YD	STEEL LB	CONC CU YD	STEEL LB	CONC CU YD	STEEL LB								
48"	58"x36"	12.57	12'-6"	6.72	597	7.31	651	7.45	656	7.75	696	8.76	715	9.43	772	9.82	815	10.65	874								
54"	65"x40"	15.90	14'-0"	7.90	706	8.60	766	8.76	802	9.10	814	10.28	841	11.07	904	11.51	950	12.47	1045								
60"	72"x44"	19.64	15'-6"	10.17	993	11.07	1089	11.28	1095	11.74	1147	13.28	1229	14.30	1328	14.87	1381	16.13	1547								
72"		28.27	18'-8"	13.13	1265	14.30	1377	14.56	1424	15.12	1481	17.07	1538	18.36	1654	19.11	1753	20.70	1937								

* - For 48"x54" Dia.
 ** - For 60"x72" Dia.



- GENERAL NOTES**
- CONCRETE SHALL BE CLASS A OR AA.
 - REINFORCING STEEL SHALL BE DEFORMED BARS WITH MAXIMUM SPACING OF 18" SET 2 1/2" CLEAR OF SURFACE OF CONCRETE EXCEPT AS NOTED. BAR ENDS SHALL BE KEPT 1 1/2" CLEAR OF SURFACE OF CONCRETE. REINFORCING BARS MAY BE CUT AND BENT IN FIELD.
 - FOOTINGS SHOWN ARE OF MINIMUM DEPTH AND SHALL BE EXTENDED IF SOIL IS UNSUITABLE OR LIABLE TO SCOUR.
 - CULVERT PIPES TO BE SET ON A SKEW SHALL BE MITERED WHEN HEADWALLS ARE CONSTRUCTED. WHEN HEADWALLS ARE NOT CONSTRUCTED THE PIPES SHALL NOT BE MITERED EXCEPT IN OVERFLOW SECTION.
 - FOR ESTIMATING HEADWALL QUANTITIES ON SKEWED CULVERTS:
 0° TO 10° - USE QUANTITIES FOR 0° SKEW.
 11° TO 25° - USE QUANTITIES FOR 15° SKEW.
 26° TO 40° - USE QUANTITIES FOR 30° SKEW.
 41° TO 55° - USE QUANTITIES FOR 45° SKEW.
 OVER 55° - CALCULATE QUANTITIES REQUIRED. CULVERTS SHOULD BE INSTALLED ON 5° INCREMENTS WHERE IT IS FEASIBLE.
 - NO DIRECT PAYMENT FOR ANCHOR BOLTS.

STATE OF NEVADA
 DEPARTMENT OF TRANSPORTATION
CULVERT HEADWALLS
 48" CMP TO 72" CMP

R-2.4.2-(502)
 ADOPTED: 8/69 REVISION

R-19

QUANTITIES SHOWN BELOW ARE FOR TWO HEADWALLS.

RCP SIZE DIA.	RCP AREA SQ. FT.	SINGLE RCP										DOUBLE RCP										x	y	L	h
		0° SKEW		15° SKEW		30° SKEW		45° SKEW		0° SKEW		15° SKEW		30° SKEW		45° SKEW									
		CONC. CU. YD.	STEEL LB.	CONC. CU. YD.	STEEL LB.	CONC. CU. YD.	STEEL LB.	CONC. CU. YD.	STEEL LB.	CONC. CU. YD.	STEEL LB.	CONC. CU. YD.	STEEL LB.	CONC. CU. YD.	STEEL LB.	CONC. CU. YD.	STEEL LB.								
12"	0.79	1.00	46	1.09	49	1.10	49	1.14	50	1.41	59	1.52	62	1.58	64	1.73	67	0'-10"	1'-2"	4'-0"	3'-0"				
15"	1.23	1.32	55	1.45	58	1.47	59	1.52	60	1.80	70	1.93	73	2.01	75	2.18	79	0'-10 1/4"	1'-2 1/4"	5'-0"	3'-3 1/2"				
18"	1.77	1.62	69	1.77	73	1.80	74	1.85	75	2.15	85	2.31	89	2.40	91	2.60	96	0'-10 1/2"	1'-2 1/2"	5'-9"	3'-7"				
21"	2.41	1.95	77	2.13	82	2.16	83	2.23	85	2.59	95	2.79	101	2.90	103	3.13	108	0'-10 3/4"	1'-2 3/4"	6'-6"	3'-10 1/2"				
24"	3.14	2.27	96	2.48	102	2.52	103	2.60	105	3.01	116	3.24	122	3.37	125	3.64	131	0'-11"	1'-3"	7'-3"	4'-2"				
27"	3.98	2.62	105	2.86	111	2.90	112	2.99	114	3.48	128	3.75	134	3.89	137	4.21	144	0'-11"	1'-3"	8'-0"	4'-5"				
30"	4.91	3.08	117	3.37	123	3.41	124	3.44	127	4.07	141	4.38	148	4.55	152	4.90	159	0'-11 1/2"	1'-3 1/2"	9'-0"	4'-9"				
33"	5.94	3.50	125	3.82	132	3.87	134	3.98	137	4.62	153	4.98	160	5.17	164	5.56	172	0'-11 3/4"	1'-3 3/4"	9'-9"	5'-1 1/2"				
36"	7.07	3.93	161	4.29	169	4.34	171	4.47	174	5.19	190	5.59	200	5.80	204	6.24	213	1'-0"	1'-4"	10'-6"	5'-4"				

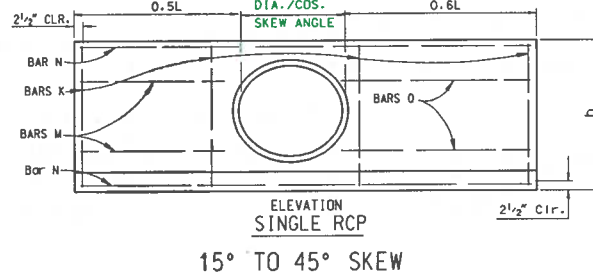
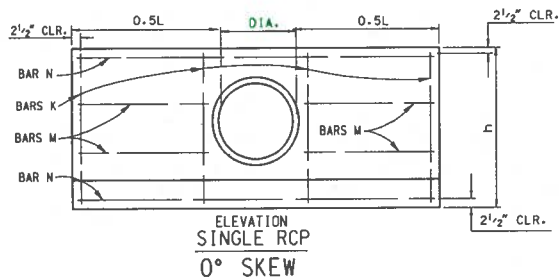
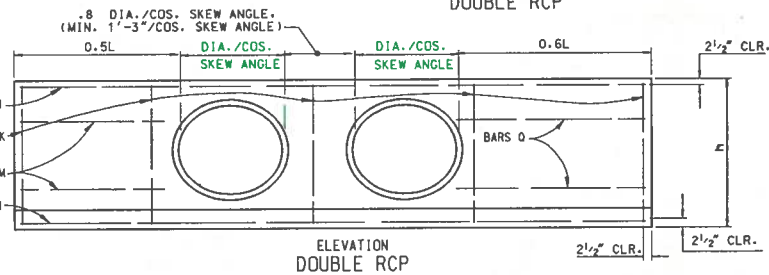
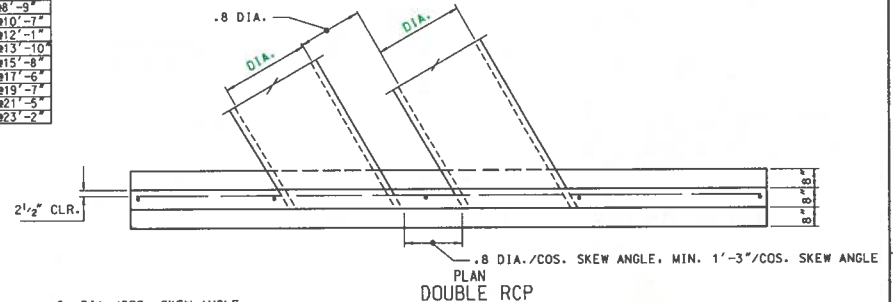
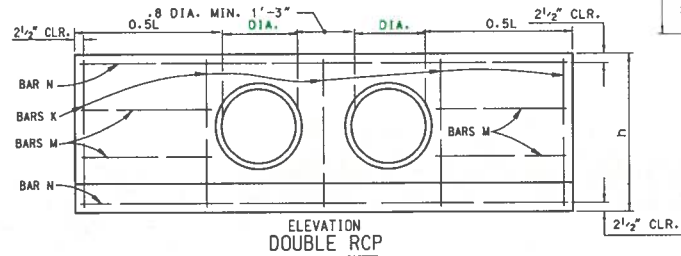
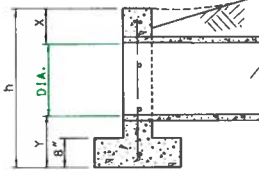
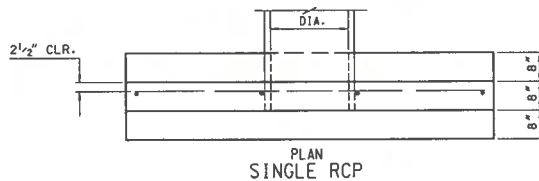
GENERAL NOTES

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 - 26° TO 40° - USE QUANTITIES FOR 30° SKEW.
 - 41° TO 55° - USE QUANTITIES FOR 45° SKEW.
 - OVER 55° - CALCULATE QUANTITIES REQUIRED.
 CULVERTS SHOULD BE INSTALLED ON 5° INCREMENTS WHERE IT IS FEASIBLE.
- DIMENSIONS x, y, L, AND h TO REMAIN CONSTANT REGARDLESS OF MINOR VARIATIONS IN WALL THICKNESS DUE TO CLASS OF PIPE USED.

QUANTITIES SHOWN BELOW ARE FOR ONE HEADWALL.

RCP SIZE DIA.	SINGLE RCP										DOUBLE RCP													
	0°-45°		15°		30°		45°		0°		15°		30°		45°		0°-45°		15°		30°		45°	
	NO. 4	NO. 5	NO. 5	NO. 5	NO. 5	NO. 4	NO. 4	NO. 4	NO. 4	NO. 4	NO. 4	NO. 4	NO. 4	NO. 4	NO. 4	NO. 4	NO. 4	NO. 5	NO. 5	NO. 5	NO. 5	NO. 5	NO. 5	
12"	602-9	204-9	205-2	205-4	205-7	201-7	101-5	102-1	101-4	102-2	101-1	102-5	102-9	207-0	207-6	207-11	208-9	207-0	207-6	207-11	208-9	207-0	207-6	207-11
15"	603-1	205-0	205-5	205-8	207-0	207-11	102-8	101-10	102-9	101-7	103-0	103-1	103-5	207-2	207-8	207-13	209-7	207-2	207-8	207-13	209-7	207-2	207-8	207-13
18"	603-4	207-0	207-9	207-10	208-2	208-5	202-3	203-1	202-2	203-2	201-11	203-5	203-8	209-8	209-14	209-19	210-6	209-8	209-14	209-19	210-6	209-8	209-14	209-19
21"	603-8	208-0	208-9	208-11	209-5	209-9	202-7	203-6	202-6	203-7	202-3	203-10	203-8	211-2	211-8	211-13	212-7	211-2	211-8	211-13	212-7	211-2	211-8	211-13
24"	603-11	209-0	209-10	210-1	210-7	210-11	203-0	204-0	202-11	204-1	202-8	204-4	203-11	212-7	212-13	212-18	214-2	212-7	212-13	212-18	214-2	212-7	212-13	212-18
27"	604-2	210-0	210-11	211-1	211-9	211-13	204-4	204-5	203-0	204-8	204-8	204-8	204-2	214-1	214-7	214-12	215-10	214-1	214-7	214-12	215-10	214-1	214-7	214-12
30"	604-6	211-3	212-3	212-7	213-2	213-6	205-0	205-0	203-9	205-1	203-6	205-4	204-6	215-9	215-15	215-21	217-9	215-9	215-15	215-21	217-9	215-9	215-15	215-21
33"	604-10	212-3	213-4	213-8	214-4	214-8	206-3	206-3	204-0	206-4	203-9	206-7	205-10	217-3	217-9	217-15	219-5	217-3	217-9	217-15	219-5	217-3	217-9	217-15
36"	1005-1	2013-3	2014-5	2014-9	2015-7	2016-8	204-6	204-6	203-9	204-5	203-10	204-2	206-1	218-1	218-8	218-15	220-0	218-1	218-8	218-15	220-0	218-1	218-8	218-15

R-20



STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

CULVERT HEADWALLS
12" RCP TO 36" RCP

R-2.5.1-(502)
ADOPTED: 8/69

REVISION
10/94

QUANTITIES SHOWN BELOW ARE FOR TWO HEADWALLS.

RCP SIZE DIA.	RCP AREA SQ. FT.	SINGLE RCP								DOUBLE RCP								X	Y	L	h
		0° SKEW		15° SKEW		30° SKEW		45° SKEW		0° SKEW		15° SKEW		30° SKEW		45° SKEW					
		CONC. CU. YD.	STEEL LB.	CONC. CU. YD.	STEEL LB.	CONC. CU. YD.	STEEL LB.	CONC. CU. YD.	STEEL LB.	CONC. CU. YD.	STEEL LB.	CONC. CU. YD.	STEEL LB.	CONC. CU. YD.	STEEL LB.	CONC. CU. YD.	STEEL LB.				
42"	9.62	6.10	571	6.66	624	6.76	627	6.98	666	8.18	692	8.80	748	9.15	790	9.91	877	1'-0 1/2"	2'-0 1/2"	12'-0"	6'-6 1/2"
48"	12.57	7.41	688	8.10	745	8.21	781	8.46	792	9.88	829	10.65	889	11.07	935	11.96	1030	1'-1"	2'-1"	13'-9"	7'-2"
54"	15.90	9.81	990	10.71	1091	10.87	1096	11.21	1146	13.11	1236	14.12	1340	14.68	1395	15.86	1562	1'-1 1/2"	2'-1 1/2"	15'-6"	7'-9"
60"	19.64	11.29	1137	12.32	1244	12.50	1250	12.88	1332	15.08	1407	16.25	1537	16.88	1596	18.25	1774	1'-2"	2'-2"	17'-0"	8'-4"
72"	28.27	15.62	1825	17.05	2002	17.30	2045	17.83	2170	20.87	2247	22.49	2464	23.36	2596	25.26	2881	1'-3"	2'-3"	20'-3"	9'-6"

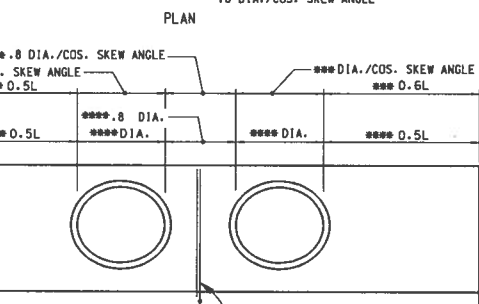
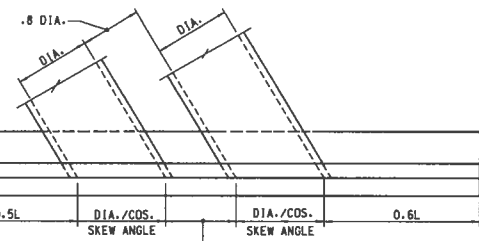
QUANTITIES SHOWN BELOW ARE FOR ONE HEADWALLS.

LENGTH OF REINFORCING BARS

RCP SIZE DIA.	SINGLE RCP																									
	0° SKEW						15° SKEW						30° SKEW						45° SKEW							
	NO. 5	NO. 4	NO. 4	NO. 4	NO. 4	NO. 4	NO. 5	NO. 4	NO. 4	NO. 4	NO. 4	NO. 4	NO. 5	NO. 4	NO. 4	NO. 4	NO. 4	NO. 5	NO. 4	NO. 4	NO. 4	NO. 4	NO. 4	NO. 4	NO. 4	
42"	1202'-9"	1067'-6"	1295'-5"	9815'-3"	1085'-8"	1382'-9"	1187'-6"	695'-3"	695'-6"	9815'-7"	1195'-8"	1382'-9"	1187'-6"	695'-1"	695'-6"	9817'-0"	1195'-8"	1482'-9"	1287'-6"	684'-11"	685'-6"	987'-11"	1295'-8"			
48"	1382'-9"	1288'-1"	1295'-3"	9817'-5"	1286'-3"	1482'-9"	1388'-1"	697'-5"	697'-5"	9819'-0"	1386'-3"	1582'-9"	1488'-1"	695'-11"	697'-5"	9819'-6"	1486'-3"	1582'-9"	1488'-1"	695'-9"	697'-5"	9820'-6"	1486'-3"			
54"	2183'-9"	1689'-1"	1687'-1"	10819'-9"	1286'-10"	2383'-9"	1889'-1"	895'-11"	895'-5"	10821'-6"	1386'-10"	2383'-9"	1889'-1"	895'-9"	895'-5"	10822'-0"	1386'-10"	2483'-9"	1989'-1"	895'-7"	895'-5"	10823'-2"	1486'-10"			
60"	2383'-9"	1889'-8"	1687'-5"	10821'-9"	1487'-5"	2583'-9"	2089'-8"	897'-7"	895'-4"	10823'-8"	1587'-5"	2583'-9"	2089'-8"	897'-5"	895'-4"	10824'-3"	1587'-5"	2783'-9"	2289'-8"	897'-3"	895'-4"	10825'-6"	1687'-5"			
72"	2784'-6"	30811'-7"	2089'-11"	12826'-0"	1688'-7"	2984'-6"	33811'-7"	1089'-2"	10811'-3"	12828'-3"	1888'-7"	3084'-6"	34811'-7"	1089'-0"	10811'-3"	12829'-0"	1888'-7"	3284'-6"	37811'-7"	1088'-10"	10811'-3"	12830'-6"	1988'-7"			

GENERAL NOTES

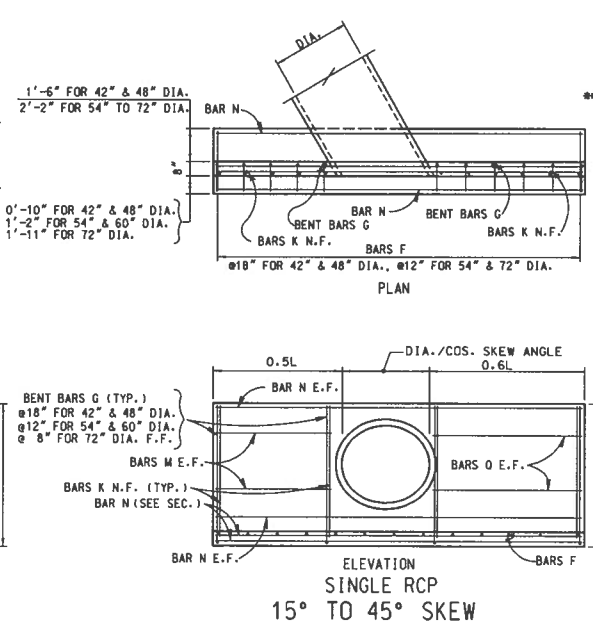
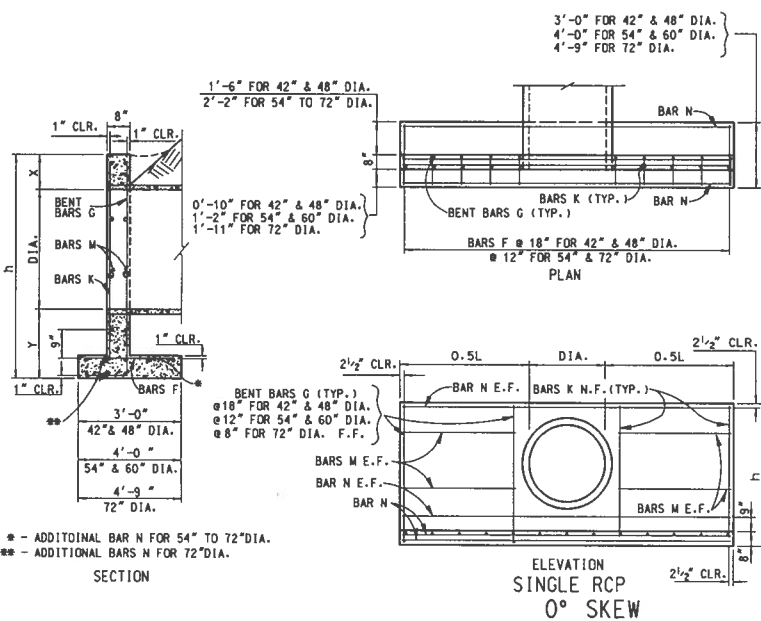
- CONCRETE SHALL BE CLASS A OR AA.
- REINFORCING STEEL SHALL BE DEFORMED BARS WITH MAXIMUM SPACING OF 18" SET 2 1/2" CLEAR OF SURFACE OF CONCRETE EXCEPT AS NOTED. BAR ENDS SHALL BE KEPT 1 1/2" CLEAR OF SURFACE OF CONCRETE. REINFORCING BARS MAY BE CUT AND BENT IN FIELD.
- FOOTINGS SHOWN ARE OF MINIMUM DEPTH AND SHALL BE EXTENDED IF SOIL IS UNSUITABLE OR LIABLE TO SCOUR.
- CULVERT PIPES TO BE SET ON A SKEW SHALL BE MITERED WHEN HEADWALLS ARE CONSTRUCTED. WHEN HEADWALLS ARE NOT CONSTRUCTED THE PIPES SHALL NOT BE MITERED EXCEPT IN OVERFLOW SECTION.
- FOR ESTIMATING HEADWALL QUANTITIES ON SKEWED CULVERTS:
 - 0° to 10° - USE QUANTITIES FOR 0° SKEW.
 - 11° to 25° - USE QUANTITIES FOR 15° SKEW.
 - 26° to 40° - USE QUANTITIES FOR 30° SKEW.
 - 41° to 55° - USE QUANTITIES FOR 45° SKEW.
 - OVER 55° - CALCULATE QUANTITIES REQUIRED.
 - CULVERTS SHOULD BE INSTALLED ON 5' INCREMENTS WHERE IT IS FEASIBLE.
- DIMENSIONS X, Y, L, AND h TO REMAIN CONSTANT REGARDLESS OF MINOR VARIATIONS IN WALL THICKNESS DUE TO CLASS OF PIPE USED.



1 BAR G, 1 BAR K - 42" & 48" DIA.
 3 BARS G, 2 BARS K - 54" & 60" DIA.
 5 BARS G, 3 BARS K - 72" DIA.
 *** - 15° TO 45° SKEW
 **** - 0° TO 14° SKEW

STATE OF NEVADA
 DEPARTMENT OF TRANSPORTATION
 CULVERT HEADWALLS
 42" RCP TO 72" RCP
 R-2.5.2-(502)
 ADOPTED: 8/69
 REVISTION

R-21



QUANTITIES SHOWN BELOW ARE FOR TWO HEADWALLS

CMAP SIZE S X R	CMP DIA.	CMAP AREA SQ. FT.	L	SINGLE CMAP								DOUBLE CMAP							
				0° SKEW		15° SKEW		30° SKEW		45° SKEW		0° SKEW		15° SKEW		30° SKEW		45° SKEW	
				CONC. CU. YD.	STEEL LB.	CONC. CU. YD.	STEEL LB.	CONC. CU. YD.	STEEL LB.	CONC. CU. YD.	STEEL LB.	CONC. CU. YD.	STEEL LB.	CONC. CU. YD.	STEEL LB.	CONC. CU. YD.	STEEL LB.	CONC. CU. YD.	STEEL LB.
17" X 13"	15"	1.1	3'-3"	0.87	35	0.94	37	0.97	38	1.03	39	1.30	48	1.38	51	1.46	53	1.64	57
21" X 15"	18"	1.6	3'-9"	1.05	40	1.13	42	1.17	43	1.24	45	1.54	55	1.64	58	1.74	60	1.94	65
24" X 18"	21"	2.3	4'-9"	1.45	50	1.53	54	1.58	54	1.67	55	1.99	66	2.13	69	2.24	72	2.47	78
28" X 20"	24"	2.9	5'-0"	1.51	59	1.64	63	1.68	64	1.79	66	2.13	77	2.29	81	2.40	84	2.67	90
35" X 24"	30"	4.4	6'-0"	1.93	70	2.09	74	2.15	75	2.28	79	2.67	91	2.86	95	3.00	99	3.32	106
42" X 29"	36"	6.4	7'-3"	2.49	101	2.70	107	2.78	109	2.94	112	3.41	126	3.66	132	3.84	136	4.24	145
49" X 33"	42"	8.5	8'-3"	2.99	114	3.25	120	3.34	122	3.52	127	4.10	143	4.39	150	4.61	155	5.08	165
57" X 38"	48"	11.4	9'-6"	3.69	130	4.00	137	4.10	140	4.33	145	5.03	163	5.39	171	5.66	177	6.24	189
64" X 43"	54"	14.5	10'-6"	4.27	156	4.63	164	4.75	166	5.01	172	5.82	199	6.24	208	6.55	214	7.21	228
71" X 47"	60"	17.5	11'-6"	4.90	184	5.32	194	5.45	197	5.74	204	6.66	231	7.14	242	7.49	249	8.24	265
77" X 52"	66"	21.2	12'-6"	5.83	214	6.33	225	6.48	228	6.82	235	8.35	263	8.46	275	8.88	284	9.74	302
83" X 57"	72"	25.0	13'-6"	6.61	246	7.18	254	7.35	260	7.72	267	9.44	294	9.57	308	10.00	319	10.98	339

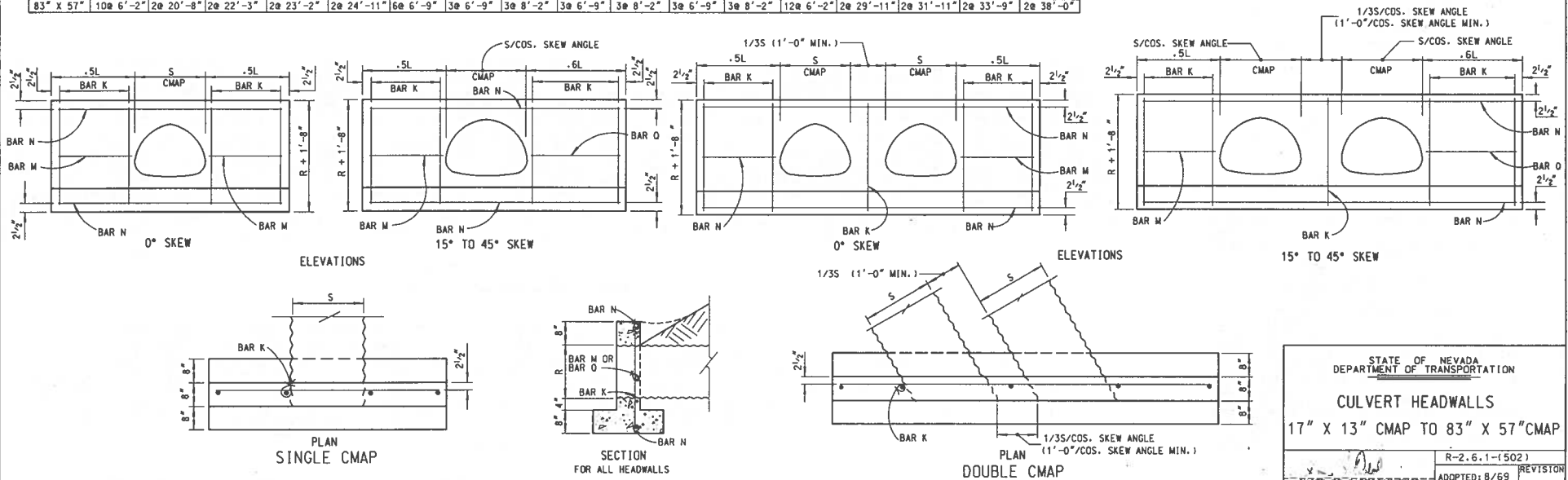
GENERAL NOTES

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 OVER 55°—CALCULATE QUANTITIES REQUIRED.
 CULVERTS SHOULD BE INSTALLED ON 5° INCREMENTS WHERE IT IS FEASIBLE.

QUANTITIES SHOWN BELOW ARE FOR ONE HEADWALL

CMAP SIZE S X R	SINGLE CMAP										SINGLE OR DOUBLE CMAP										DOUBLE CMAP									
	0°-45°		0°		15°		30°		45°		0°		15°		30°		45°		0°-45°		0°		15°		30°		45°			
	NO. 4	NO. 5	NO. 5	NO. 5	NO. 5	NO. 4	NO. 4	NO. 4	NO. 4	NO. 4	NO. 4	NO. 4	NO. 4	NO. 4	NO. 4	NO. 4	NO. 4	NO. 4	NO. 4	NO. 5	NO. 5	NO. 5	NO. 5	NO. 5	NO. 5	NO. 5	NO. 5			
17" X 13"	4@ 2'-4"	2@ 4'-6"	2@ 4'-11"	2@ 5'-1"	2@ 5'-6"	2@ 1'-4"	1@ 1'-2"	1@ 1'-9"	1@ 1'-9"	1@ 1'-10"	1@ 0'-10"	1@ 2'-1"	5@ 2'-4"	2@ 7'-0"	2@ 7'-6"	2@ 7'-11"	2@ 9'-0"													
21" X 15"	4@ 2'-6"	2@ 5'-4"	2@ 5'-9"	2@ 6'-0"	2@ 6'-6"	2@ 1'-7"	1@ 1'-5"	1@ 2'-1"	1@ 1'-4"	1@ 2'-2"	1@ 1'-1"	1@ 2'-5"	5@ 2'-6"	2@ 8'-2"	2@ 8'-8"	2@ 9'-3"	2@ 10'-6"													
24" X 18"	5@ 2'-5"	2@ 5'-6"	2@ 7'-1"	2@ 7'-2"	2@ 7'-9"	2@ 2'-1"	1@ 2'-1"	1@ 2'-7"	1@ 2'-1"	1@ 2'-7"	1@ 2'-7"	1@ 2'-9"	2@ 9'-6"	2@ 10'-1"	2@ 10'-6"	2@ 10'-6"	2@ 11'-6"													
28" X 20"	5@ 2'-11"	2@ 7'-2"	2@ 7'-9"	2@ 8'-0"	2@ 8'-8"	2@ 2'-3"	1@ 2'-4"	1@ 2'-10"	1@ 2'-3"	1@ 2'-11"	1@ 2'-3"	1@ 3'-2"	2@ 11'-4"	2@ 12'-0"	2@ 13'-6"	2@ 13'-6"	2@ 13'-6"													
35" X 24"	6@ 3'-3"	2@ 8'-9"	2@ 9'-5"	2@ 9'-10"	2@ 10'-7"	2@ 2'-9"	1@ 2'-3"	1@ 3'-6"	1@ 2'-5"	1@ 3'-7"	1@ 2'-6"	1@ 3'-10"	2@ 12'-9"	2@ 13'-7"	2@ 14'-5"	2@ 16'-3"	2@ 16'-3"													
42" X 29"	8@ 3'-8"	2@ 10'-7"	2@ 11'-5"	2@ 12'-9"	2@ 12'-9"	2@ 3'-4"	2@ 3'-1"	2@ 4'-2"	2@ 4'-3"	2@ 4'-10"	2@ 4'-6"	2@ 5'-4"	2@ 15'-4"	2@ 16'-5"	2@ 17'-4"	2@ 19'-6"	2@ 19'-6"													
49" X 33"	8@ 4'-0"	2@ 12'-2"	2@ 13'-2"	2@ 13'-8"	2@ 14'-9"	2@ 3'-10"	2@ 3'-8"	2@ 4'-9"	2@ 3'-7"	2@ 4'-10"	2@ 3'-4"	2@ 5'-1"	2@ 17'-8"	2@ 18'-11"	2@ 20'-1"	2@ 22'-7"	2@ 22'-7"													
57" X 38"	8@ 4'-5"	2@ 14'-1"	2@ 15'-2"	2@ 15'-9"	2@ 17'-0"	2@ 4'-6"	2@ 4'-4"	2@ 5'-8"	2@ 4'-3"	2@ 5'-8"	2@ 4'-0"	2@ 5'-11"	2@ 20'-6"	2@ 21'-11"	2@ 23'-3"	2@ 26'-2"	2@ 26'-2"													
64" X 43"	10@ 4'-9"	2@ 15'-8"	2@ 16'-11"	2@ 17'-7"	2@ 19'-0"	2@ 5'-0"	2@ 4'-10"	2@ 6'-2"	2@ 4'-9"	2@ 6'-3"	2@ 4'-6"	2@ 6'-6"	2@ 22'-10"	2@ 24'-5"	2@ 25'-11"	2@ 29'-2"	2@ 29'-2"													
71" X 47"	10@ 5'-1"	2@ 17'-3"	2@ 18'-7"	2@ 19'-4"	2@ 20'-11"	2@ 5'-6"	2@ 5'-4"	2@ 6'-9"	2@ 5'-3"	2@ 6'-10"	2@ 5'-0"	2@ 7'-1"	2@ 25'-3"	2@ 26'-11"	2@ 28'-7"	2@ 32'-3"	2@ 32'-3"													
77" X 52"	10@ 5'-9"	2@ 19'-3"	2@ 20'-8"	2@ 21'-6"	2@ 23'-1"	2@ 6'-3"	2@ 6'-3"	2@ 7'-7"	2@ 6'-3"	2@ 7'-7"	2@ 6'-3"	2@ 7'-7"	2@ 27'-9"	2@ 27'-9"	2@ 31'-4"	2@ 35'-2"	2@ 35'-2"													
83" X 57"	10@ 6'-2"	2@ 20'-8"	2@ 22'-3"	2@ 23'-2"	2@ 24'-11"	2@ 6'-9"	2@ 6'-9"	2@ 8'-2"	2@ 6'-9"	2@ 8'-2"	2@ 6'-9"	2@ 8'-2"	2@ 29'-11"	2@ 31'-11"	2@ 33'-9"	2@ 38'-0"	2@ 38'-0"													

R-22



STATE OF NEVADA
 DEPARTMENT OF TRANSPORTATION
CULVERT HEADWALLS
 17" X 13" CMAP TO 83" X 57" CMAP

CHIEF ROAD DESIGN ENGR.	R-2,6,1-(502)	REVISION
	ADOPTED: 8/69	

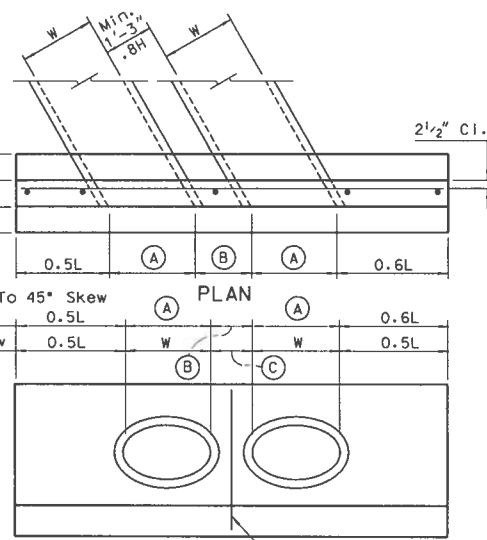
QUANTITIES SHOWN BELOW ARE FOR TWO HEADWALLS.

OVAL RCP SIZE W & H	RCP SIZE	OVAL RCP AREA SQ. FT.	SINGLE OVAL RCP										DOUBLE OVAL RCP										x	y	L	h
			0° SKEW		15° SKEW		30° SKEW		45° SKEW		0° SKEW		15° SKEW		30° SKEW		45° SKEW									
			CONC. CU. YD.	STEEL LB.	CONC. CU. YD.	STEEL LB.	CONC. CU. YD.	STEEL LB.	CONC. CU. YD.	STEEL LB.	CONC. CU. YD.	STEEL LB.	CONC. CU. YD.	STEEL LB.	CONC. CU. YD.	STEEL LB.	CONC. CU. YD.	STEEL LB.								
23"x14"	18"	1.82	1.37	57	1.49	60	1.52	61	1.60	63	1.94	74	2.08	77	2.18	80	2.40	86	10 3/4"	1'-2 3/4"	4'-9"	3'-3 1/2"				
30"x19"	24"	3.21	1.95	79	2.13	82	2.17	83	2.27	86	2.64	98	2.85	103	2.97	106	3.25	113	11 1/4"	1'-3 1/4"	6'-3"	3'-9 1/2"				
34"x22"	27"	4.20	2.30	87	2.50	92	2.55	93	2.66	96	3.11	110	3.34	116	3.49	119	3.81	127	11 1/2"	1'-3 1/2"	7'-0"	4'-1"				
38"x24"	30"	5.15	2.57	93	2.79	99	2.85	100	2.98	104	3.49	119	3.75	125	4.07	129	4.28	137	11 3/4"	1'-3 3/4"	7'-6"	4'-3 1/2"				
42"x27"	33"	6.39	2.94	113	3.20	120	3.26	121	3.40	125	4.00	141	4.30	148	4.49	153	4.91	162	11 3/4"	1'-3 3/4"	8'-3"	4'-6 1/2"				
45"x29"	36"	7.37	3.31	122	3.53	128	3.68	130	3.82	134	4.48	152	4.81	159	5.04	164	5.47	174	1'-0 1/2"	1'-4 1/2"	9'-0"	4'-10"				
53"x34"	42"	10.15	4.06	164	4.42	173	4.50	175	4.68	180	5.48	199	5.90	209	6.14	214	6.69	226	1'-1"	1'-5"	10'-3"	5'-4"				
60"x38"	48"	12.86	4.81	182	5.24	192	5.33	194	5.54	199	6.49	221	6.98	231	7.26	238	7.90	251	1'-1 1/2"	1'-5 1/2"	11'-6"	5'-9"				

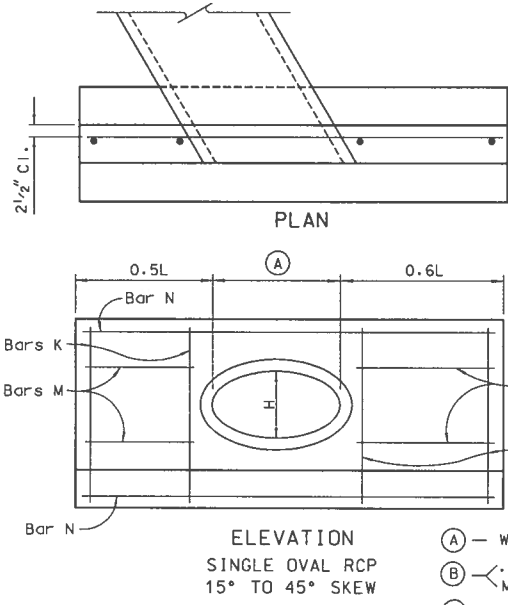
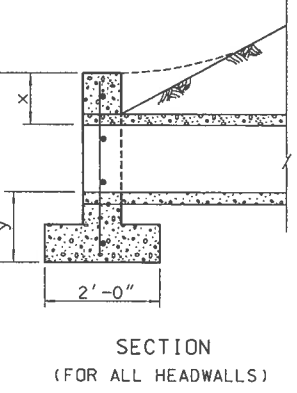
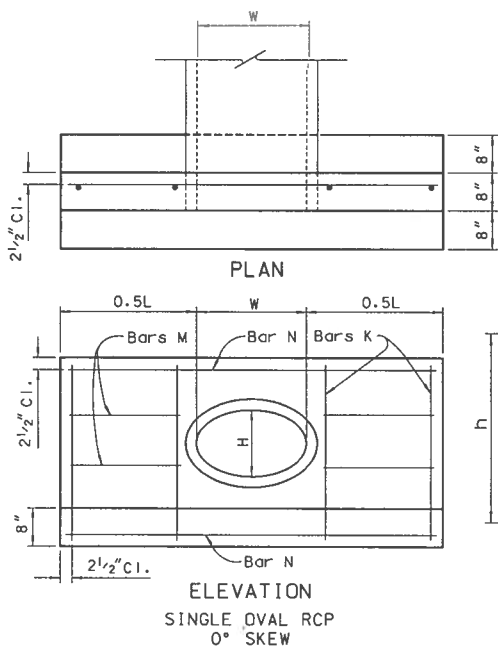
QUANTITIES SHOWN BELOW ARE FOR ONE HEADWALL.

OVAL RCP SIZE W & H	LENGTH OF REINFORCING BARS																			
	SINGLE OVAL RCP										SINGLE OR DOUBLE OVAL RCP									
	0°-45°		0°	15°	30°	45°	0°	15°	30°	45°	0°-45°	0°	15°	30°	45°	0°-45°	0°	15°	30°	45°
	No.4	No.5	No.5	No.5	No.5	No.4	No.4	No.4	No.4	No.4	No.4	No.4	No.4	No.4	No.4	No.4	No.4	No.4	No.4	No.4
23"x14"	6#3'-1"	2#6'-5"	2#7'-0"	2#7'-2"	2#7'-8"	2#1'-11"	1#1'-9"	1#2'-6"	1#1'-8"	1#2'-7"	1#1'-5"	1#2'-10"	7#3'-1"	2#9'-7"	2#10'-3"	2#10'-10"	2#12'-2"			
30"x19"	6#3'-6"	2#6'-6"	2#9'-3"	2#9'-6"	2#10'-2"	4#2'-7"	2#2'-5"	2#3'-3"	2#2'-4"	2#3'-4"	2#2'-1"	2#3'-7"	7#3'-6"	2#12'-3"	2#13'-1"	2#13'-11"	2#15'-6"			
34"x22"	6#3'-10"	2#9'-7"	2#10'-4"	2#10'-9"	2#11'-5"	4#3'-0"	2#2'-10"	2#3'-9"	2#2'-9"	2#3'-10"	2#2'-6"	2#4'-1"	7#3'-10"	2#13'-11"	2#14'-10"	2#15'-8"	2#17'-6"			
38"x24"	6#4'-1"	2#10'-5"	2#11'-3"	2#11'-8"	2#12'-6"	4#3'-2"	2#3'-0"	2#4'-0"	2#2'-11"	2#4'-1"	2#2'-8"	2#4'-4"	7#4'-1"	2#15'-2"	2#16'-3"	2#17'-2"	2#19'-3"			
42"x27"	6#4'-4"	2#11'-6"	2#12'-5"	2#12'-11"	2#13'-9"	4#3'-7"	2#3'-5"	2#4'-6"	2#3'-6"	2#4'-9"	2#3'-3"	2#5'-0"	9#4'-4"	2#16'-10"	2#17'-11"	2#19'-0"	2#21'-3"			
45"x29"	6#4'-7"	2#12'-6"	2#13'-6"	2#14'-0"	2#14'-11"	4#3'-10"	2#3'-8"	2#4'-9"	2#3'-7"	2#4'-10"	2#3'-4"	2#5'-1"	9#4'-7"	2#18'-2"	2#19'-5"	2#20'-7"	2#23'-0"			
53"x34"	10#5'-1"	2#14'-5"	2#15'-7"	2#16'-2"	2#17'-3"	6#4'-6"	3#4'-4"	3#5'-7"	3#4'-3"	3#5'-8"	3#4'-0"	3#5'-11"	11#5'-1"	2#21'-1"	2#22'-6"	2#23'-10"	2#26'-9"			
60"x38"	10#5'-6"	2#16'-3"	2#17'-7"	2#18'-2"	2#19'-6"	6#5'-1"	3#4'-11"	3#6'-3"	3#4'-10"	3#6'-4"	3#4'-7"	3#6'-7"	11#5'-6"	2#23'-9"	2#25'-5"	2#26'-10"	2#30'-2"			

- GENERAL NOTES**
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 - FOOTINGS SHOWN ARE OF MINIMUM DEPTH AND SHALL BE EXTENDED IF SOIL IS UNSUITABLE OR LIABLE TO SCOUR.
 - CULVERT PIPES TO BE SET ON A SKEW SHALL BE MITERED WHEN HEADWALLS ARE CONSTRUCTED. WHEN HEADWALLS ARE NOT CONSTRUCTED THE PIPES SHALL NOT BE MITERED EXCEPT IN OVERFLOW SECTION.
 - DIMENSIONS X, Y, L, AND H TO REMAIN CONSTANT REGARDLESS OF MINOR VARIATIONS IN WALL THICKNESS DUE TO CLASS OF PIPE USED.
 - FOR ESTIMATING HEADWALL QUANTITIES ON SKEWED CULVERTS:
 - 0° to 10° - USE QUANTITIES FOR 0° SKEW.
 - 11° to 25° - USE QUANTITIES FOR 15° SKEW.
 - 26° to 40° - USE QUANTITIES FOR 30° SKEW.
 - 41° to 55° - USE QUANTITIES FOR 45° SKEW.
 - OVER 55° - CALCULATE QUANTITIES REQUIRED.
 CULVERTS SHOULD BE INSTALLED ON 5° INCREMENTS WHERE IT IS FEASIBLE.



R-23



- (A) - W/cos Skew Angle
- (B) - .8H/cos Skew Angle
- (C) - .8H at Right Angle to Pipe

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

CULVERT HEADWALLS
23"x14" OVAL RCP TO
60"x38" OVAL RCP

CHIEF ROAD DESIGN ENGR. *[Signature]* R-2.7.1 (502)
ADOPTED: 8/69 REVISED: 12-94

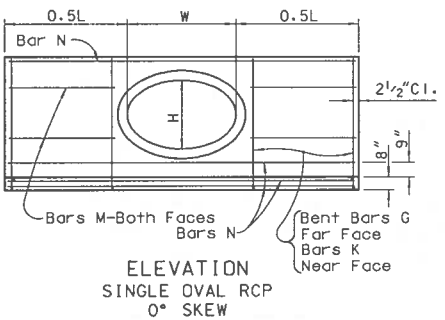
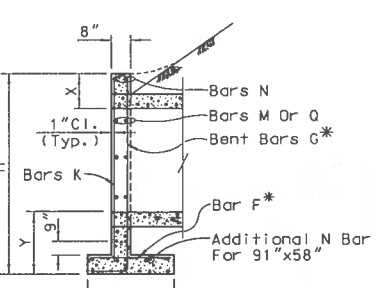
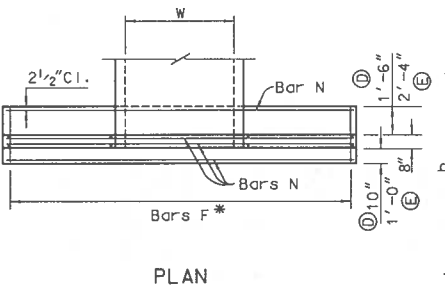
QUANTITIES SHOWN BELOW ARE FOR TWO HEADWALLS.

OVAL RCP SIZE W & H	RCP SIZE	OVAL RCP AREA SQ. FT.	SINGLE OVAL RCP												DOUBLE OVAL RCP												X	Y	L	h
			0° SKEW		15° SKEW		30° SKEW		45° SKEW		0° SKEW		15° SKEW		30° SKEW		45° SKEW													
			CONC.	STEEL	CONC.	STEEL	CONC.	STEEL	CONC.	STEEL	CONC.	STEEL	CONC.	STEEL	CONC.	STEEL	CONC.	STEEL												
68"x43"	54"	16.62	7.19	628	7.82	683	7.98	720	8.34	767	9.86	789	10.58	848	11.07	897	12.11	1031	1'-2 1/2"	2'-2"	12'-9"	6'-11"								
76"x48"	60"	20.55	8.39	746	9.13	805	9.32	813	9.71	889	11.47	921	12.31	985	13.06	1075	15.66	1207	1'-2 1/2"	2'-2 1/2"	14'-3"	7'-5"								
91"x58"	72"	29.71	12.11	1168	13.18	1273	13.43	1321	14.02	1412	16.59	1495	17.82	1616	18.61	1730	20.36	1965	1'-3 1/2"	2'-3 1/2"	17'-0"	8'-5"								

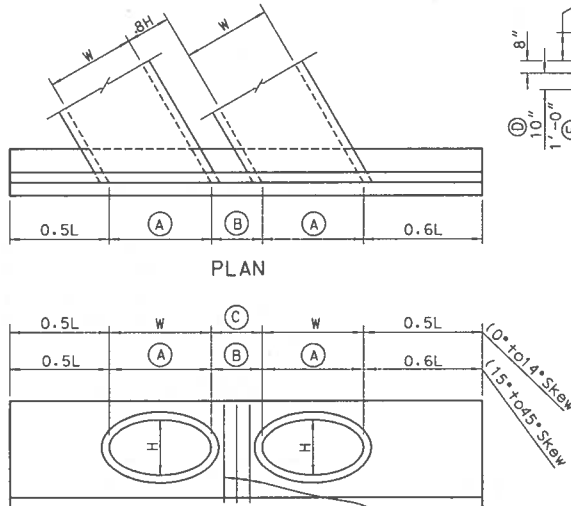
QUANTITIES SHOWN BELOW ARE FOR ONE HEADWALL.

OVAL RCP SIZE W & H	LENGTH OF REINFORCING BARS																							
	SINGLE OVAL RCP																							
	0° SKEW						15° SKEW						30° SKEW						45° SKEW					
	No. 5		No. 4		No. 5		No. 4		No. 5		No. 4		No. 5		No. 4		No. 5		No. 4					
68"x43"	13e2'-9"	10e7'-10"	12e5'-8"	9e18'-2"	10e6'-0"	14e2'-9"	12e7'-10"	6e5'-6"	6e6'-10"	9e19'-8"	11e6'-0"	15e2'-9"	12e7'-10"	6e5'-4"	6e6'-10"	9e20'-4"	12e6'-0"	16e2'-9"	13e7'-10"	6e5'-2"	6e6'-10"	9e21'-10"	13e6'-0"	
76"x48"	15e2'-9"	12e6'-4"	12e6'-4"	9e20'-4"	12e6'-6"	16e2'-9"	13e8'-4"	6e5'-2"	6e7'-7"	9e22'-0"	13e6'-6"	16e2'-9"	13e8'-4"	6e6'-0"	6e7'-7"	9e22'-9"	13e6'-6"	17e2'-9"	15e8'-4"	6e5'-10"	6e7'-7"	9e24'-5"	15e6'-6"	
91"x58"	25e3'-9"	18e9'-8"	16e7'-7"	10e20'-4"	12e7'-6"	27e3'-9"	20e9'-8"	8e7'-5"	8e9'-1"	10e26'-4"	13e7'-6"	28e3'-9"	21e9'-8"	8e7'-3"	8e9'-1"	10e27'-9"	14e7'-6"	30e3'-9"	23e9'-8"	8e7'-1"	8e9'-1"	10e29'-2"	15e7'-6"	
DOUBLE OVAL RCP																								
68"x43"	19e2'-9"	11e7'-10"	12e6'-8"	9e26'-8"	11e6'-0"	20e2'-9"	12e7'-10"	6e5'-6"	6e6'-10"	9e28'-6"	12e6'-0"	21e2'-9"	13e7'-10"	6e5'-4"	6e6'-11"	9e30'-2"	13e6'-0"	24e2'-9"	16e7'-10"	6e5'-2"	6e6'-10"	9e33'-10"	16e6'-0"	
76"x48"	21e2'-9"	13e6'-4"	12e6'-4"	9e29'-10"	13e6'-6"	22e2'-9"	14e8'-4"	6e5'-2"	6e7'-7"	9e31'-10"	14e6'-6"	24e2'-9"	16e8'-4"	6e6'-0"	6e7'-7"	9e34'-2"	13e6'-6"	26e2'-9"	19e8'-4"	6e5'-10"	6e7'-7"	9e37'-10"	19e6'-6"	
91"x58"	37e3'-9"	21e9'-8"	16e7'-7"	10e35'-9"	14e7'-6"	35e3'-9"	23e9'-8"	8e7'-5"	8e9'-1"	10e38'-2"	16e7'-6"	41e3'-9"	26e9'-8"	8e7'-3"	8e9'-1"	10e40'-5"	17e7'-6"	46e3'-9"	31e9'-8"	8e7'-1"	8e9'-1"	10e45'-4"	20e7'-6"	

- GENERAL NOTES
- CONCRETE SHALL BE CLASS A OR AA.
 - REINFORCING STEEL SHALL BE DEFORMED BARS WITH MAXIMUM SPACING OF 18" SET 2 1/2" CLEAR OF SURFACE OF CONCRETE EXCEPT AS NOTED. BAR ENDS SHALL BE KEPT 1 1/2" CLEAR OF SURFACE OF CONCRETE. REINFORCING BARS MAY BE CUT AND BENT IN FIELD.
 - FOOTINGS SHOWN ARE OF MINIMUM DEPTH AND SHALL BE EXTENDED IF SOIL IS UNSUITABLE OR LIABLE TO SCOUR.
 - CULVERT PIPES TO BE SET ON A SKEW SHALL BE MITERED WHEN HEADWALLS ARE CONSTRUCTED. WHEN HEADWALLS ARE NOT CONSTRUCTED THE PIPES SHALL NOT BE MITERED EXCEPT IN OVERFLOW SECTION.
 - DIMENSIONS X, Y, L, AND h TO REMAIN CONSTANT REGARDLESS OF MINOR VARIATIONS IN WALL THICKNESS DUE TO CLASS OF PIPE USED.
 - FOR ESTIMATING HEADWALL QUANTITIES ON SKEWED CULVERTS:
 - 0° TO 10° - USE QUANTITIES FOR 0° SKEW.
 - 11° TO 25° - USE QUANTITIES FOR 15° SKEW.
 - 26° TO 40° - USE QUANTITIES FOR 30° SKEW.
 - 41° TO 55° - USE QUANTITIES FOR 45° SKEW.
 - OVER 55° - CALCULATE QUANTITIES REQUIRED.
 CULVERTS SHOULD BE INSTALLED ON 5' INCREMENTS WHERE IT IS FEASIBLE.



- (A) - W/\cos Skew Angle
- (B) - $.8H/\cos$ Skew Angle
- (C) - $.8H$ at Right Angle to Pipe
- (D) - For 68"x43" & 76"x48"
- (E) - For 91"x58"



NOTE: For Details Of Other Reinforcing Bars. See Single Culvert Headwalls.

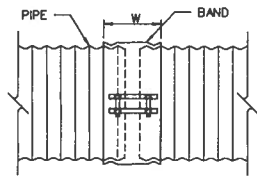
- 0° TO 45° SKEW
- Add 1-G Bar & 1-K Bar for 68"x43" & 76"x48"
 - Add 3-G Bars & 2-K Bars for 91"x58"
- *-@18" ctrs. 68"x43" & 76"x48"
@ 12" ctrs. 91"x58"

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

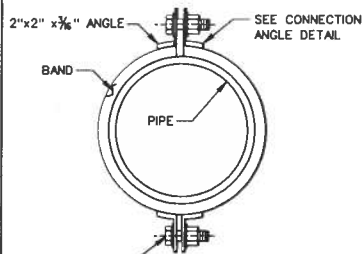
CULVERT HEADWALLS
68"x43" OVAL RCP TO
91"x58" OVAL RCP

R-2.7.2 (5021)
CHIEF ROAD DESIGN, ENGR. ADOPTED: 8/69 REVISION

R-24



SIDE VIEW



END VIEW

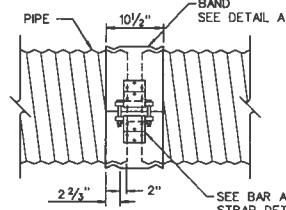
SECOND ANGLE CONNECTION ASSEMBLY IS OPTIONAL FOR PIPE 36" DIA OR LESS, IS REQUIRED FOR PIPE GREATER THAN 36" DIA.

ANNULAR COUPLING BAND

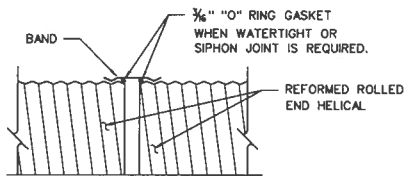


CONNECTION ANGLE DETAIL

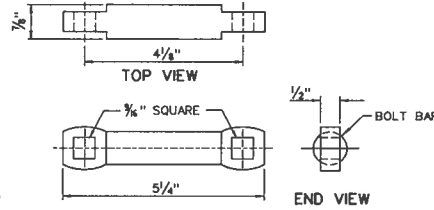
ANNULAR COUPLING BAND			
CORRIGATION	PIPE SIZE	"W" (IN MIN.)	1/2" BOLTS (NO. EACH CONNECTION)
2 2/3" x 1/2"	THRU 30"	7	2
2 2/3" x 1/2"	THRU 60"	12	3
2 2/3" x 1/2"	THRU 84"	24	5
3"x1"	54" THRU 60"	14	3
3"x1"	THRU 96"	26	5



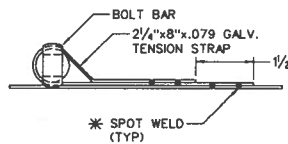
SIDE VIEW



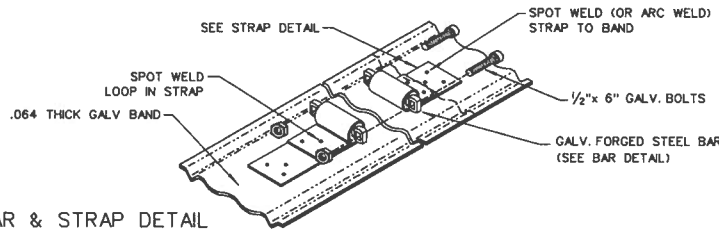
DETAIL A



FRONT VIEW
BAR DETAIL

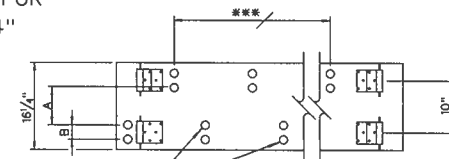


* SPOT WELDS SHALL DEVELOP FULL STRENGTH OF STRAP
STRAP DETAIL



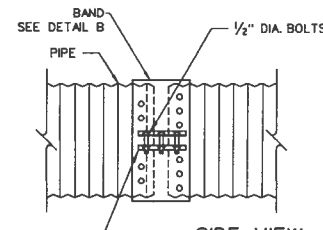
BAR & STRAP DETAIL

ALTERNATIVE ANNULAR COUPLING BAND FOR HCMP THRU 84"

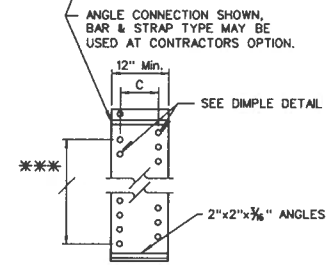


SEE DIMPLE DETAIL

UNIVERSAL COUPLING BAND FOR USE ON 42" THRU 60" CMP INCLUSIVE
DIMENSION A: AS REQUIRED TO FIT HELIX ANGLE, 7" MIN.
DIMENSION B: AS REQUIRED TO FIT HELIX ANGLE, 2 2/3" MIN.
ONE PIECE BAND OPTIONAL ON 42" DIAMETER.
TWO PIECE BAND REQUIRED ABOVE 42" DIAMETER.
COUPLING BAND FOR HELICAL WELD SEAM ONLY

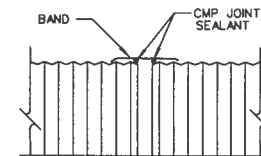


SIDE VIEW



BAND DETAIL

DIMENSION "C": 7" MIN. BETWEEN DIMPLES, AS REQUIRED TO FIT THE HELIX ANGLES.



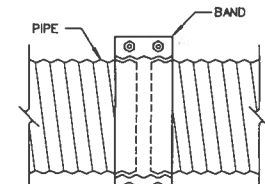
DETAIL B

NOTE: FOR HCMP DOWN DRAINS AND SLOTTED DRAINS

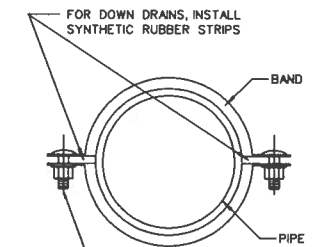
*** UNIVERSAL COUPLING BAND FOR USE ON CMP THRU 36" INCLUSIVE

GENERAL NOTES:

1. ALL COUPLING BAND CONNECTING HARDWARE SHALL BE GALVANIZED.
2. FOR PIPE ARCHES USE SAME WIDTH BAND AS FOR ROUND PIPE OF EQUAL PERIPHERY.
3. FOR WATERTIGHT AND SIPHON JOINTS ON ALTERNATIVE ANNULAR COUPLING BAND, PLACE MASTIC SEALANT STRIP 1/8" THK x 1 1/2" WIDE x 5" LONG IN LAP BETWEEN BANDS.
4. FOR ALTERNATIVE ANNULAR COUPLING BAND, 2 BAR AND STRAP ASSEMBLIES ARE REQUIRED FOR PIPE GREATER THAN 42" DIA., OPTIONAL FOR SIZES LESS THAN 42".

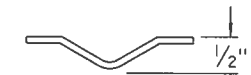


TOP VIEW



END VIEW

*** TWO PIECE INTEGRAL FLANGE DIE FORMED FOR USE ON 6", 8", AND 10" HCMP



DIMPLE DETAIL

*** 8 SPACES AS REQUIRED TO FIT HELIX ANGLE.

*** TO BE USED ONLY FOR EXISTING HELICALLY CORRIGATED PIPES.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

**COUPLING BAND DETAILS
CMP AND PIPE ARCHES**

R-2.B.1-(604)

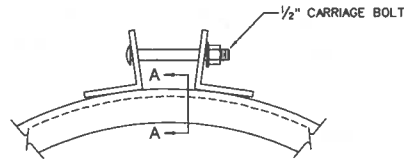
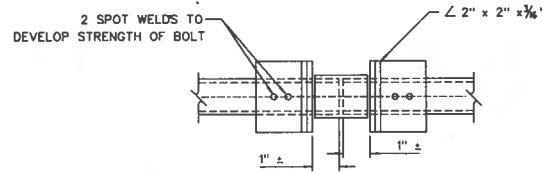
CHIEF ROAD DESIGN ENGR | ADOPED 6/71 | REVISION 1-7/80

* SEE SHEET R-2.8.1 FOR "W" DIMENSION

COUPLING TYPE	CORRUGATION	PIPE SIZE	* W OR A	THICKNESS PIPE WALL	THICKNESS BAND	BAR & STRAP				ANGLE				WEDGE & STRAP	
						THICKNESS STRAP	BOLTS (DIA.)	BAR (DIA.)	BAR YIELD STRENGTH (P.S.I.)	DIMENSIONS	BOLTS	RIVETS ANGLE TO BAND	SPOT WELDS ANGLE TO BAND	THICKNESS STRAP	THICKNESS WEDGE
TWO PIECE INTEGRAL FLANGE	1/2" x 1/4"	6" THRU 10"	7"	0.064 - 0.079	0.064						2 - 3/8"				
UNIVERSAL	2 2/3" x 1/2"	THRU 36"	12"	0.064 - 0.138	0.064									0.079	0.138
		THRU 36"	12"	0.064 - 0.138	0.064	0.079	1/2"	3/8"	32,000	2" x 2" x 3/8"	3 - 1/2"	3 - 3/8"	5 - 1/2"		
		42" THRU 60"	16 1/2"	0.064 - 0.168	0.064	DBL 0.079	1/2"	3/8"	32,000						
ANNULAR	2 2/3" x 1/2"	THRU 36"	12"	0.064 - 0.138	0.064					2" x 2" x 3/8"	3 - 1/2"	3 - 3/8"	5 - 1/2"		
		42" THRU 60"	12"	0.064 - 0.079	0.064					2" x 2" x 3/8"	3 - 1/2"	3 - 3/8"	5 - 1/2"		
		42" THRU 60"	12"	0.064 - 0.168	0.064					2" x 2" x 3/8"	3 - 1/2"	5 - 1/2"	7 - 3/8"		
	3" x 1"	66" THRU 84"	24"	0.109 - 0.168	0.064					2" x 2" x 3/8"	5 - 1/2"	7 - 3/8"	5 - 1/2"		
		48" THRU 60"	14"	0.064 - 0.079	0.064					2" x 2" x 3/8"	3 - 1/2"	3 - 3/8"	5 - 1/2"		
		48" THRU 60"	14"	0.109	0.064					2" x 2" x 3/8"	3 - 1/2"	5 - 3/8"	9 - 3/8"		
CHANNEL	2 2/3" x 1/2"	66" THRU 120"	25"	0.064 - 0.079	0.064					2" x 2" x 3/8"	5 - 1/2"	9 - 3/8"			
		THRU 24"	3/4"	0.064 - 0.079	0.079	0.079	1/2"	3/8"	32,000	2" x 2" x 3/8"	1 - 1/2"	SEE NOTE 8			
		30" THRU 42"	3/4"	0.064 - 0.079	0.079	0.079	1/2"	3/8"	32,000						
		30" THRU 42"	1"	0.109	0.109	0.079	1/2"	3/8"	32,000						
		48" THRU 54"	1"	0.064 - 0.079	0.109	0.079	1/2"	3/8"	32,000						

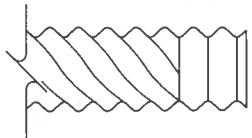
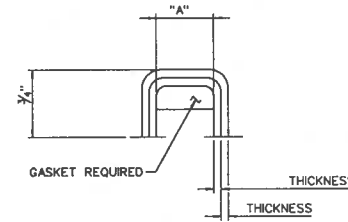
GENERAL NOTES

1. ALL COUPLING BAND CONNECTION HARDWARE SHALL BE GALVANIZED OR ELECTROPLATED IN ACCORDANCE WITH STANDARD SPECIFICATIONS.
2. FOR PIPE ARCHES, USE SAME WIDTH BAND AS FOR ROUND PIPE OF EQUAL PERIPHERY.
3. TWO PIECE BAND IS REQUIRED FOR PIPE GREATER THAN 42" DIAMETER.
4. TENSION STRAP MAY BE CONNECTED TO BAND OR SHEET WITH EITHER SPOT WELDS OR FILLET WELDS THAT DEVELOP MINIMUM REQUIRED STRENGTH OF STRAP.
5. USE 1-1/4" GAGE LINE DIMENSION ON ATTACHED ANGLE LEG FOR RIVETS AND SPOT WELDS.
6. BAND THICKNESS SHALL NOT BE LESS THAN 3 STANDARD THICKNESSES LIGHTER THAN THE THICKNESS OF THE PIPE.
7. DIMENSIONS AND THICKNESS SHOWN ARE MINIMUM.
8. ANGLE 2" LONG WITH 0.064" X 2" STRAP.
9. FILLET WELDS OF EQUIVALENT STRENGTH MAY BE SUBSTITUTED FOR SPOT WELDS OR RIVETS.



CHANNEL COUPLING BAND FOR USE ON FLANGED END CMP

(CHANNEL COUPLING BAND SHALL BE TWO PIECE)

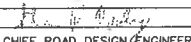


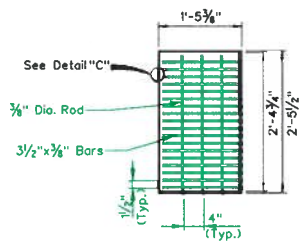
SPIRAL CMP

REFERRED TO ACCEPT UNIVERSAL, ANNULAR, AND CHANNEL COUPLERS

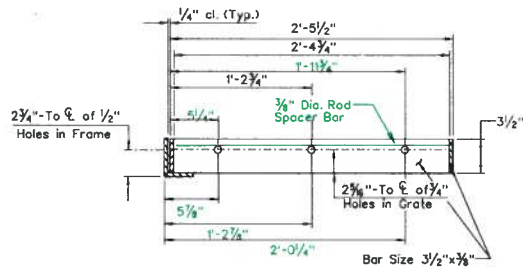
NOMINAL DIMENSIONS		
THICKNESS	"A"	FOR USE WITH CMP
0.079"	3/4"	0.079" THICK OR LIGHTER
0.109"	1"	0.138" THICK OR HEAVIER

SECTION A-A

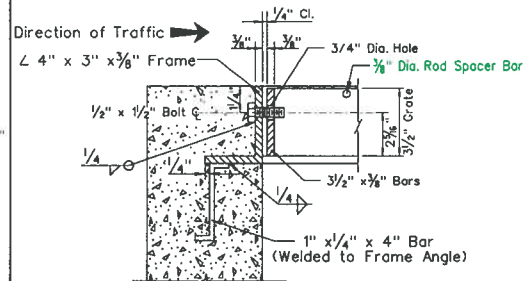
STATE OF NEVADA DEPARTMENT OF TRANSPORTATION		
CMP COUPLING BAND DETAILS		
 CHIEF ROAD DESIGN ENGINEER	R-2.8.2 (604) ADOPTED: 1/78	REVISION 1/10/85



GRATE DETAIL



DETAIL "C"
GRATE HOLE DETAIL
(MAIN BARS NOT SHOWN FOR CLARITY)



DETAIL "D"
GRATE HOLD-DOWN BOLT
(INSTALL ONLY ON APPROACH SIDE OF GRATE & FRAME)

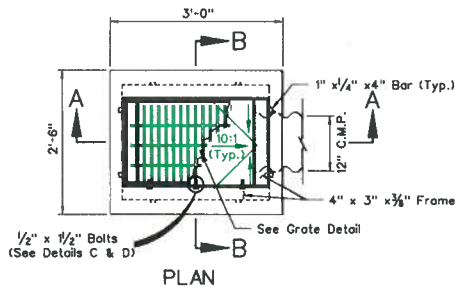
- GENERAL NOTES
1. ALL CONCRETE SHALL BE CLASS A OR AA.
 2. REINFORCING BARS SHALL BE NO. 4 BARS WITH MAXIMUM SPACING AT 18" CENTERS. BARS TO BE EMBEDDED A MINIMUM OF TWO INCHES AND BAR ENDS MUST CLEAR SURFACE BY ONE AND ONE-HALF INCHES.
 3. ALL EXPOSED CONCRETE EDGES SHALL BE CHAMFERED ONE INCH.
 4. GRATE AND FRAME ANGLE TO BE WELDED AT ALL CONTACT POINTS.

QUANTITIES *

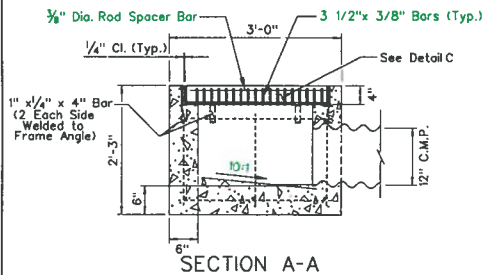
CONCRETE	REINFORCING STEEL	STRUCTURE STEEL
0.4 CU. YD.	25 LBS.	230 LBS. XX

* FOR INFORMATION ONLY
XX (Includes Frame, Welded Angle, Grate & Spacer Bars)

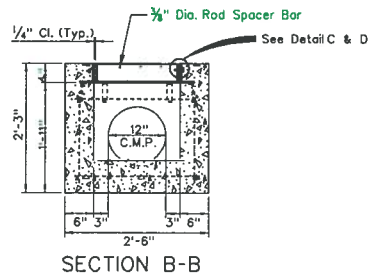
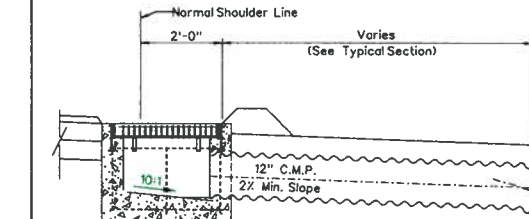
R-27



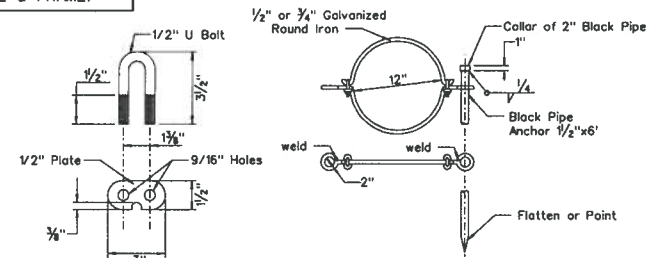
PLAN



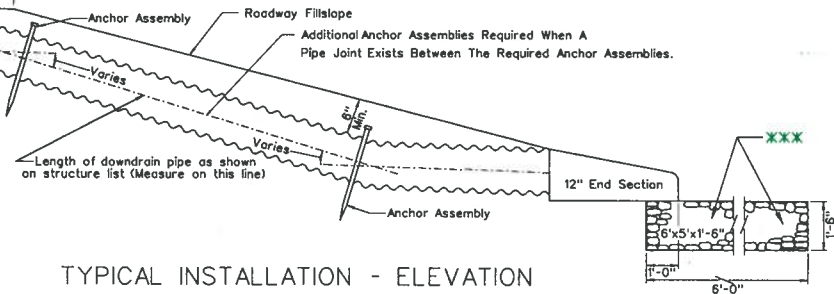
SECTION A-A



SECTION B-B



ANCHOR ASSEMBLY DETAIL



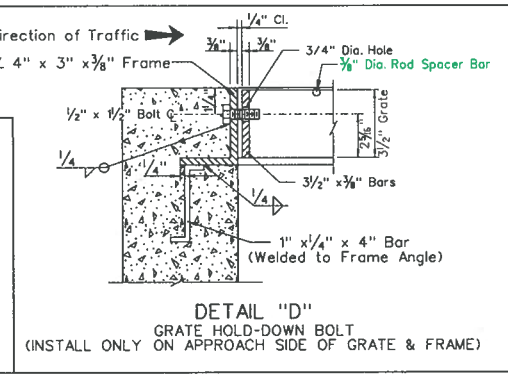
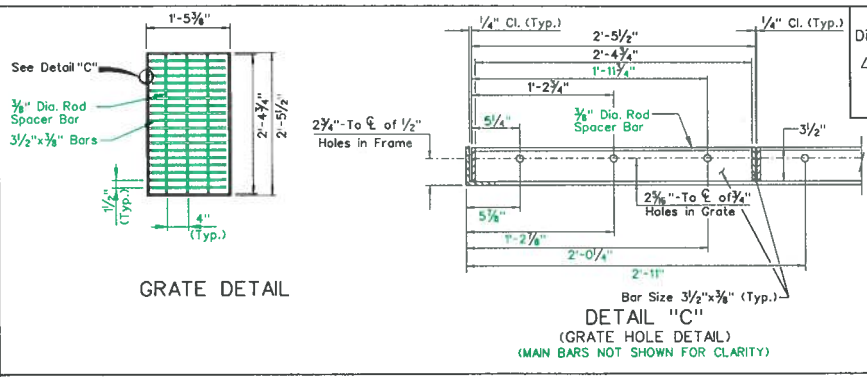
TYPICAL INSTALLATION - ELEVATION

XXX - See Structure List For Size of Riprap.

NOTE:
Catch Basin Floors Shall Have A Minimum Slope of 10:1 From All Directions Toward Outlet Pipe. If Basin Is Used As A Junction, Shape Flowlines To Outlet Pipe, And Provide A Minimum Slope Of 10:1 To Flowlines.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
**EMBANKMENT PROTECTOR
TYPE 5**

R-3.1.2 (608)
ADOPTED 5/79 REVISION: 10/94

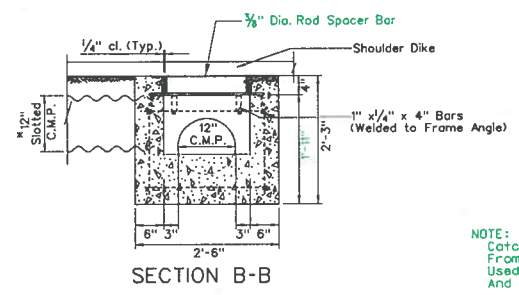
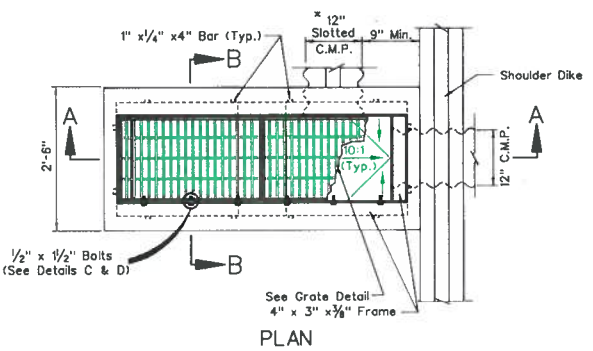
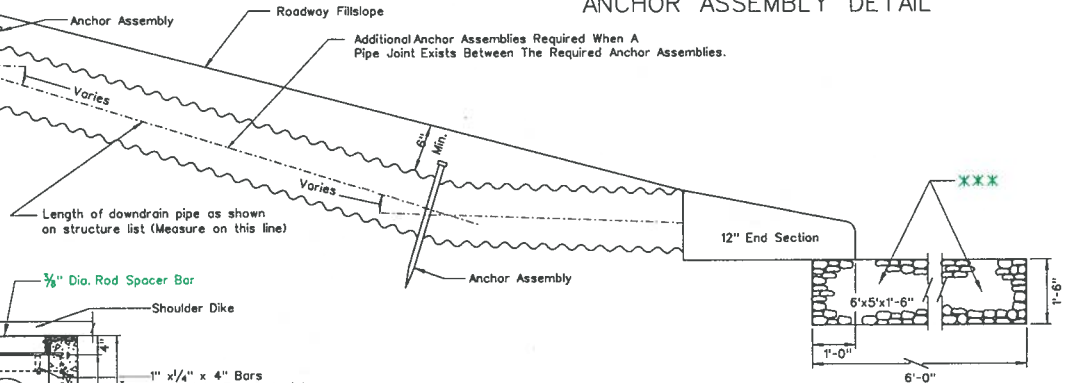
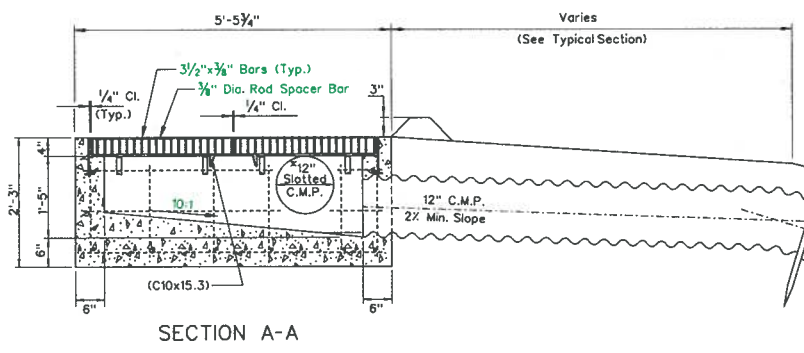
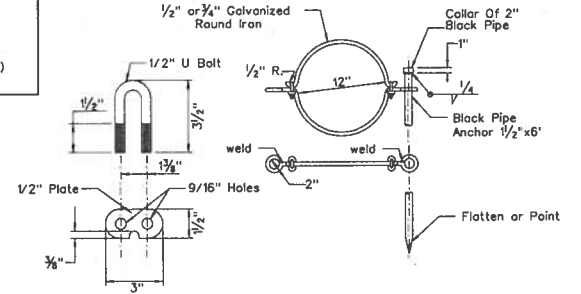


- GENERAL NOTES**
- ALL CONCRETE SHALL BE CLASS A OR AA.
 - REINFORCING BARS SHALL BE NO. 4 BARS WITH MAXIMUM SPACING AT 18" CENTERS. BARS TO BE EMBEDDED A MINIMUM OF TWO INCHES AND BAR ENDS MUST CLEAR SURFACE BY ONE AND ONE-HALF INCHES.
 - ALL EXPOSED CONCRETE EDGES SHALL BE CHAMFERED ONE INCH.
 - GRATE AND FRAME ANGLE TO BE WELDED AT ALL CONTACT POINTS.

QUANTITIES*

CONCRETE	REINFORCING STEEL	STRUCTURE STEEL
0.69 CU. YD	40 LBS.	445 LBS.**

* FOR INFORMATION ONLY
 ** (Includes Frame, Welded Angle, Grate & Spacer Bars)



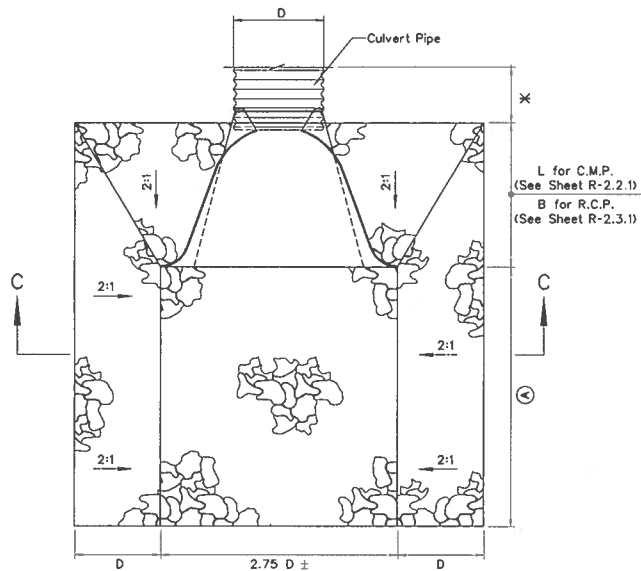
*** Riprap As Determined By The Hydraulic Engineer. (See Structure List For Size of Riprap.)

NOTE:
 Catch Basin Floors Shall Have A Minimum Slope of 10:1 From All Directions Toward Outlet Pipe. If Basin is Used As A Junction, Shape Flowline(s) To Outlet Pipe. And Provide A Minimum Slope Of 10:1 To Flowline(s).

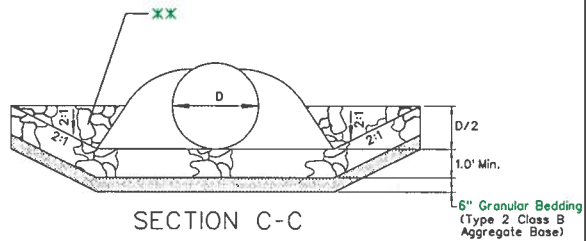
STATE OF NEVADA
 DEPARTMENT OF TRANSPORTATION
EMBANKMENT PROTECTOR (TYPE 5-2G)

R-3.1.3 (608)
 ADOPTED 5/79 (REVISION 10/94)

R-28



PLAN



SECTION C-C

CULVERT SIZE	(A)
18" to 36"	3D
42" to 84"	4D

HYDRAULIC SECTION APPROVAL MUST BE OBTAINED PRIOR TO INCORPORATION INTO PLANS

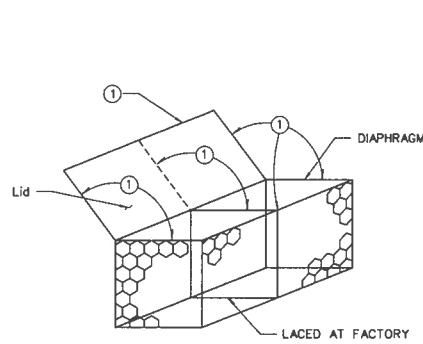
STANDARD RIPRAP BASIN

X— When No End Section is Used, Additional Riprap Shall Be As Required By The Hydraulic Engineer.

XX— Riprap Size As Determined By The Hydraulic Engineer.
(See Structure List For Size of Riprap.)

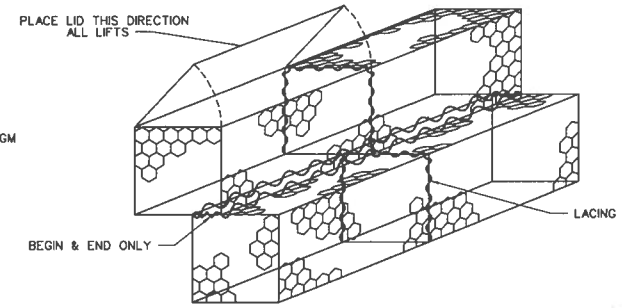
NOTE:

① WHEN FULL, LACED TOGETHER

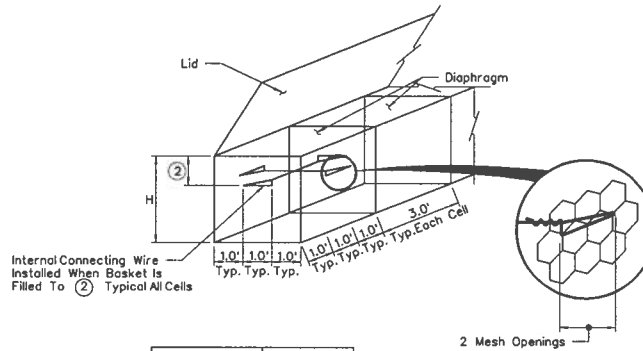


LACING: SINGLE BASKET

NOTE: OPTIONAL WIRE RING FASTENERS ALLOWED AS PER SPECIAL PROVISIONS.



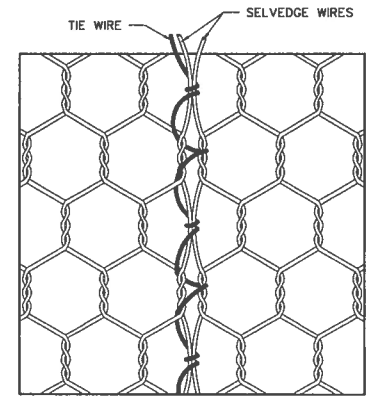
LACING: BASKET TO BASKET



BASKET HEIGHT H	②
3'-0"	1/3H & 2/3H
1'-6"	1/2H
1'-0"	NONE

INTERNAL CONNECTING WIRE DETAIL
FOR WIRE MESH GABIONS

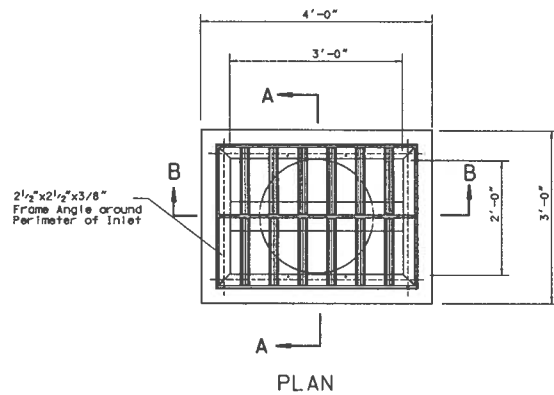
GABIONS LACING DETAIL



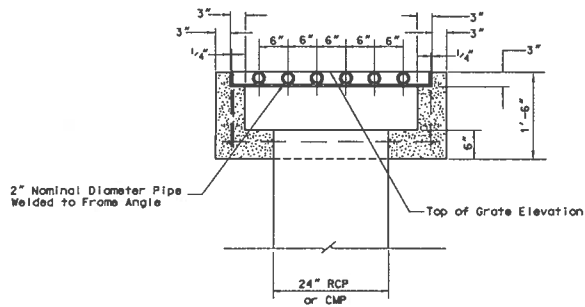
WIRE MESH LACING DETAIL

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
STANDARD RIPRAP BASIN
GABIONS LACING DETAIL

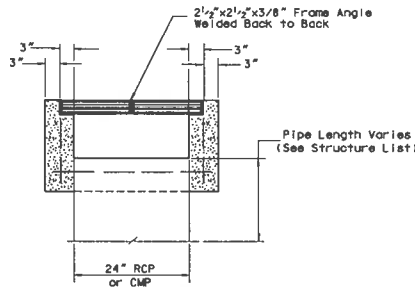
R-3.14 (810)
ADOPTED/07/83 REVISION: 10/94



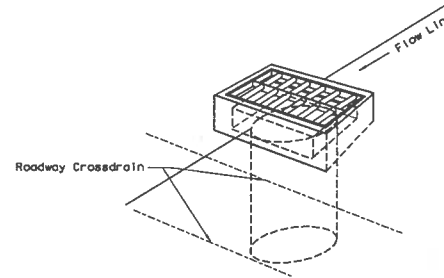
PLAN



SECTION A-A



SECTION B-B



TYPICAL INSTALLATION

GENERAL NOTES

1. ALL CONCRETE SHALL BE CLASS A OR AA.
2. REINFORCING BARS SHALL BE NO. 4 BARS WITH MAXIMUM SPACING AT 18" CENTERS. BARS TO BE EMBEDDED A MINIMUM OF TWO INCHES AND BAR ENDS MUST CLEAR CONCRETE SURFACES BY ONE AND ONE-HALF INCH.
3. ALL EXPOSED CONCRETE EDGES SHALL BE CHAMFERED ONE INCH.
4. STRUCTURAL STEEL WEIGHT INCLUDES THE 2" PIPE AND THE 2 1/2" x 2 1/2" x 3/8" FRAME ANGLES.

QUANTITIES*		
CONCRETE	REINF. STEEL	STRUCT. STEEL
0.36 Cu. Yd.	23 lbs.	170 lbs.

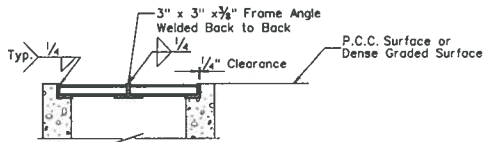
* FOR INFORMATION ONLY

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

**PIPE RISER INLET
(TYPE 3)**

ADOPTED: 8/69 REVISION

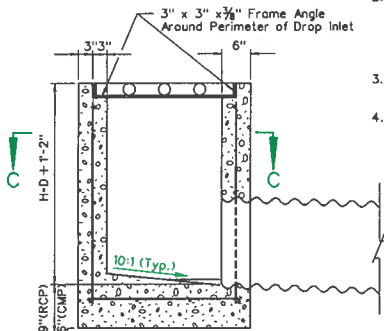
CHIEF ROAD DESIGN ENGR. R-4.1.2 (609)



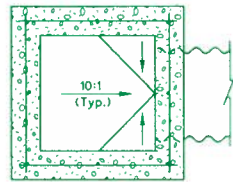
SECTION B-B

GENERAL NOTES

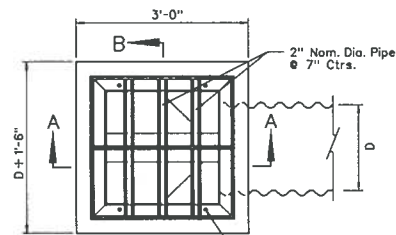
1. ALL CONCRETE SHALL BE CLASS A OR AA.
2. REINFORCING STEEL SHALL BE NO.4 BARS WITH MAXIMUM SPACING AT 18" CENTERS, WIRED TIGHTLY AT ALL INTERSECTIONS AND EMBEDDED 2" CLEAR OF ALL CONCRETE SURFACES.
3. EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 1".
4. STRUCTURAL STEEL WEIGHT INCLUDES THE 2" PIPE AND THE 3"x3"x3/8" FRAME ANGLES.



SECTION A-A



SECTION C-C

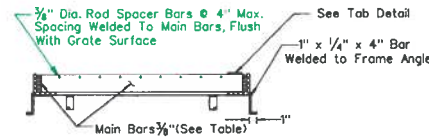


PLAN

Grate & Frame to be Fastened to the Drop Inlet with 1/2" Hexagonal Nuts & Bolts (1/2" x 6" Bolts, Expose Threads 1/2").

C.M.P. SIZE	CONCRETE CU. YD.	REINFORCING LB.	STRUCTURAL STEEL LB.	R.C.P. SIZE	CONCRETE CU. YD.	REINFORCING LB.	STRUCTURAL STEEL LB.
18"	0.62	39	120	18"	0.68	40	120
24"	0.77	44	132	24"	0.84	45	132
30"	0.93	59	145	30"	0.99	60	145
36"	1.11	64	158	36"	1.17	65	158
42"	1.29	69	170	42"	1.35	70	170

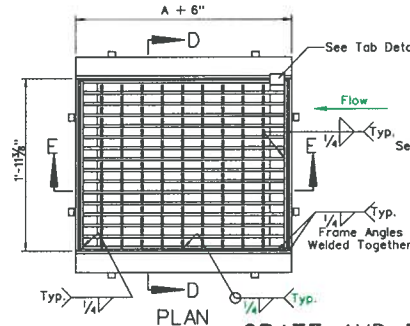
TYPE 2A DROP INLET



SECTION E-E

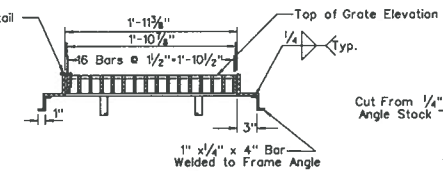
GENERAL NOTES

1. ALL CONCRETE SHALL BE CLASS A OR AA.
2. REINFORCING STEEL SHALL BE NO.4 BARS WITH MAXIMUM SPACING AT 18" CENTERS, WIRED TIGHTLY AT ALL INTERSECTIONS AND EMBEDDED 2" CLEAR OF ALL CONCRETE SURFACES.
3. EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 1".
4. DIMENSIONS MAY BE VARIED TO FIT LOCAL CONDITIONS IF ORDERED BY THE ENGINEER.
5. COMMERCIAL PREFABRICATED GRATINGS APPROVED BY THE BRIDGE DIVISION MAY BE USED IN LIEU OF THE FIELD-WELDED GRATING SHOWN ABOVE.
6. 1'-6" IS MINIMUM COVER FOR PIPE-ASSUMING CLASS III RCP OR 16 GAUGE CMP WITH CLASS C BEDDING.
7. EXTREME LOW COVER SITUATIONS TO BE REVIEWED BY THE HYDRAULICS ENGINEER.

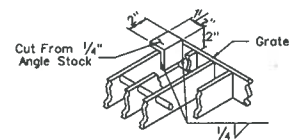


PLAN

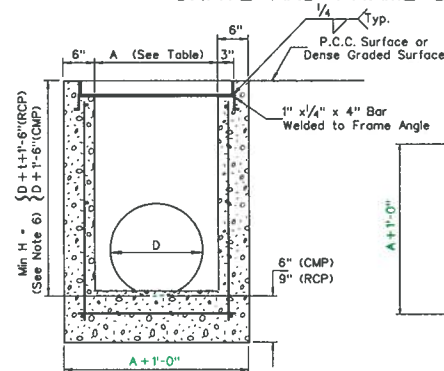
GRATE AND FRAME DETAIL



SECTION D-D



TAB DETAIL



SECTION F-F

TYPE 2 DROP INLET

NOTE: Catch Basin Floors Shall Have a Minimum Slope of 10:1 From All Directions Toward Outlet Pipe. If Basin is Used as a Junction, Slope Flowline(s) To Outlet Pipe, and Provide a Minimum Slope Of 10:1 To Flowline(s).

X(t=Wall Thickness of RCP)

PIPE SIZE (INCH)	A=0+2+X	H (FT.)	CONCRETE CU. YD.	REINF. LB.	MAIN BARS (INCH)	FRAME ANGLES (INCH)	GRATE LB.	FRAME LB.	TOTAL LB.
15	1'-7 1/2"	2.94	0.67	41	3X3/8	3 1/2X3X3/8	152	67	219
18	1'-11"	3.21	0.76	44	3X3/8	3 1/2X3X3/8	170	72	242
24	2'-6"	3.75	0.95	53	3X3/8	3 1/2X3X3/8	204	81	285
30	3'-11"	4.29	1.15	59	3 1/2X3/8	4X3X3/8	279	97	376
36	3'-8"	4.83	1.36	71	4 1/2X3/8	5X3X3/8	422	123	545
42	4'-3"	5.38	1.59	82	4 1/2X3/8	5X3X3/8	478	134	612

CMP

PIPE SIZE (INCH)	A	H (FT.)	CONCRETE CU. YD.	REINF. LB.	MAIN BARS (INCH)	FRAME ANGLES (INCH)	GRATE LB.	FRAME LB.	TOTAL LB.
15	2'-0"	2.75	0.67	36	3X3/8	3 1/2X3X3/8	171	73	244
18	2'-0"	3.00	0.65	37	3X3/8	3 1/2X3X3/8	171	73	244
24	3'-6"	3.50	0.80	51	3X3/8	3 1/2X3X3/8	203	81	284
30	3'-0"	4.00	0.96	66	3 1/2X3/8	4X3X3/8	273	95	368
36	3'-6"	4.50	1.12	60	4 1/2X3/8	5X3X3/8	395	119	514
42	4'-0"	5.00	1.30	77	4 1/2X3/8	5X3X3/8	442	129	571

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

TYPE 2 AND 2A
DROP INLET

R-4.2.1 - (609)
CHIEF ROAD DESIGN ENGINEER
ADOPTED 11/70
REVISION 10-81

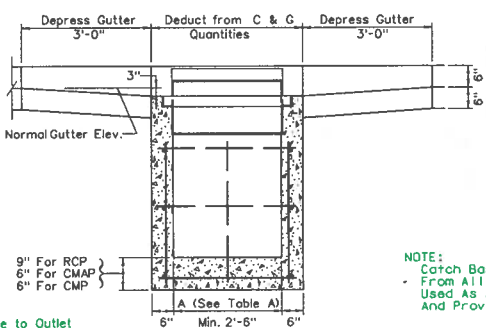
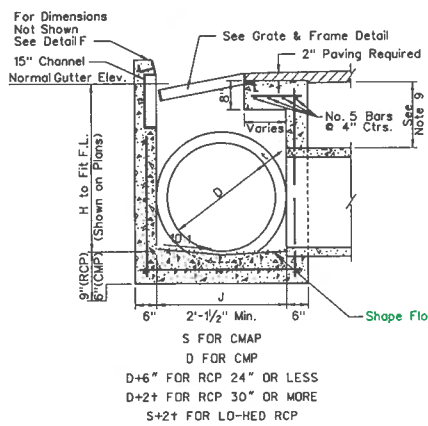
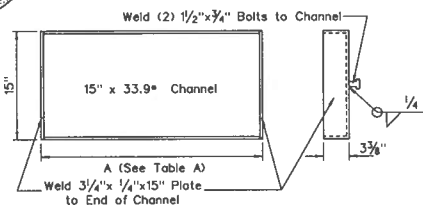
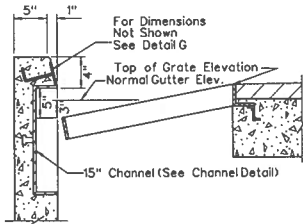
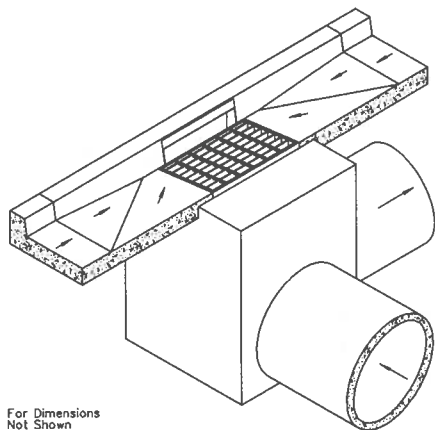
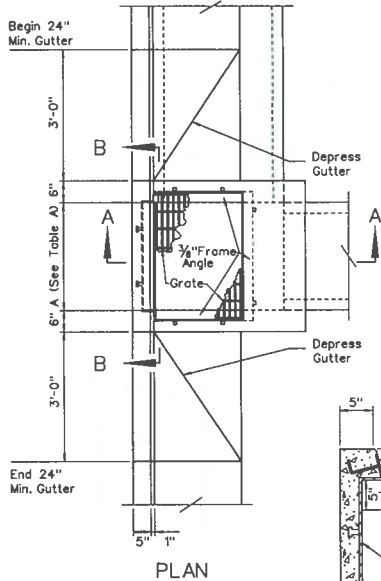
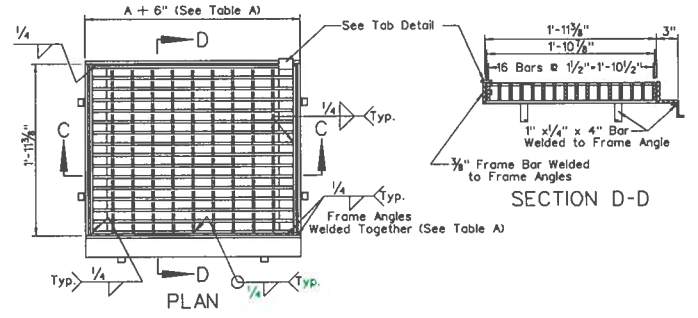
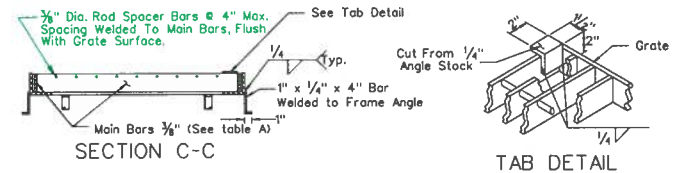


TABLE B

MAXIMUM H		
CMAP	J OR A	H
29" x 18" OR LESS	30" OR LESS	21'-0"
36" x 22"	36"	16'-0"
43" x 27"	42"	12'-0"
	48"	9'-0"
	54"	7'-0"
	60"	7'-0"

(WITH #4 BARS @ 12" CENTERS)



- GENERAL NOTES
- ALL CONCRETE SHALL BE CLASS A OR AA.
 - ALL REINFORCING STEEL SHALL BE TIGHTLY WIRED AND EMBEDDED 1 1/2" CLEAR OF CONCRETE SURFACE. EXCEPT AS NOTED, ALL REINFORCING SHALL BE NO. 4 BARS WITH MAXIMUM SPACING OF 12" CENTERS. FOR ALL VALUES OF H TO THE MAXIMUM AS SHOWN IN TABLE B. IF H EXCEEDS THESE MAXIMUMS, DROP INLET WILL REQUIRE SPECIAL DESIGN.
 - EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED ONE INCH.
 - WHERE PIPE INTERSECTS DROP INLET ON A 12° OR LARGER SKEW INCREASE J TO $\frac{J}{\cos \text{SKEW}}$ REDESIGN FOR SKEWS AT A.
 - WHERE PIPE INTERSECTS DROP INLET ON A 12° OR LARGER SKEW INCREASE S TO $\frac{S}{\cos \text{SKEW}}$ REDESIGN FOR SKEWS AT A.
 - FOR VALUES OF "H" SEE STORM DRAIN SCHEDULE OR STRUCTURE LIST.
 - "H" IS THE DIFFERENCE IN ELEVATION BETWEEN THE OUT FLOW PIPE AND THE NORMAL GUTTER GRADE LINE AT THE CURB FACE.
 - PIPE(S) CAN BE PLACED IN ANY WALL.
 - 1'-6" IS MINIMUM COVER FOR PIPE-ASSUMING CLASS III RCP OR 16 GAUGE CMP WITH CLASS C BEDDING.
 - FOR DROP INLET, CONFIGURATIONS WITH 2 PIPES-INFLOW PIPE INVERT ELEVATION SHALL BE $\geq 0.1'$ ABOVE OUTFLOW PIPE INVERT ELEVATION.
 - EXTREME LOW COVER SITUATIONS TO BE REVIEWED BY THE HYDRAULICS ENGINEER.

NOTE: Catch Basin Floors Shall Have A Minimum Slope of 10:1 From All Directions Toward Outlet Pipe. If Basin is Used As A Junction, Shape Flowlines To Outlet Pipe, And Provide A Minimum Slope Of 10:1 To Flowlines.

STRUCTURAL STEEL TABLE A

PIPE SIZE				A	MAIN BARS	FRAME ANGLES	FRAME BAR	GRATE LBS.	FRAME LBS.	CHANNEL & PLATES, LBS.	TOTAL LBS.
CMAP	CMP	RCP	LO-HED								
29" x 18" OR LESS	30" OR LESS	24" OR LESS	14" x 23" OR LESS	2'-6"	3" x 3/8"	3/2" x 3" x 3/8"	3/2" x 3/8"	203	81	93	377
36" x 22"	36"	30"	19" x 30"	3'-0"	3/2" x 3/8"	4" x 3" x 3/8"	4" x 3/8"	273	95	107	475
43" x 27"	42"	36"	22" x 34"	3'-6"	4/2" x 3/8"	5" x 3" x 3/8"	5" x 3/8"	395	119	126	640
	48"	42"	27" x 34"	4'-0"	4/2" x 3/8"	5" x 3" x 3/8"	5" x 3/8"	442	129	143	714
	54"		29" x 45"	4'-6"	4/2" x 3/8"	5" x 3" x 3/8"	5" x 3/8"	517	144	160	821

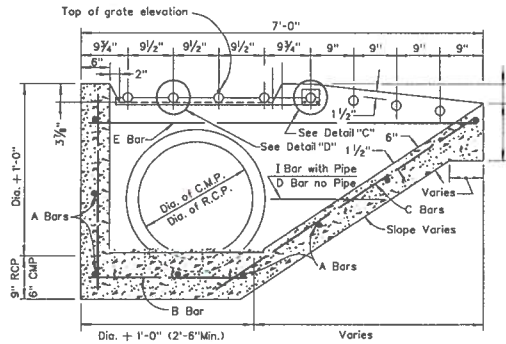
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

TYPE 3 DROP INLET

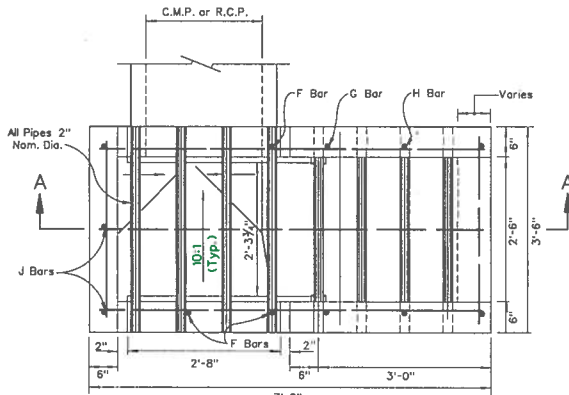
R-4.3.1 (609)

CHEF ROAD DESIGN ENGR ADOPTEED: 10/85 REVISION: 10/88

TYPE 7 DROP INLET



SECTION A-A

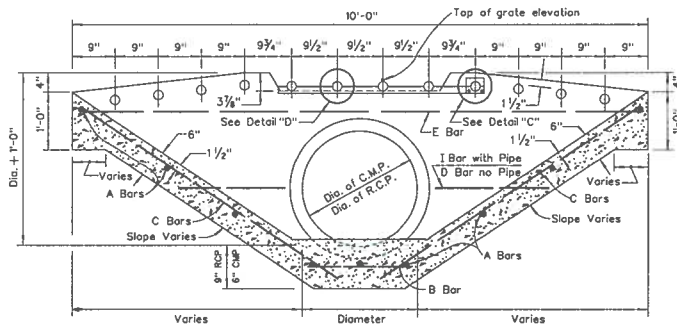


TYPE 7 DROP INLET

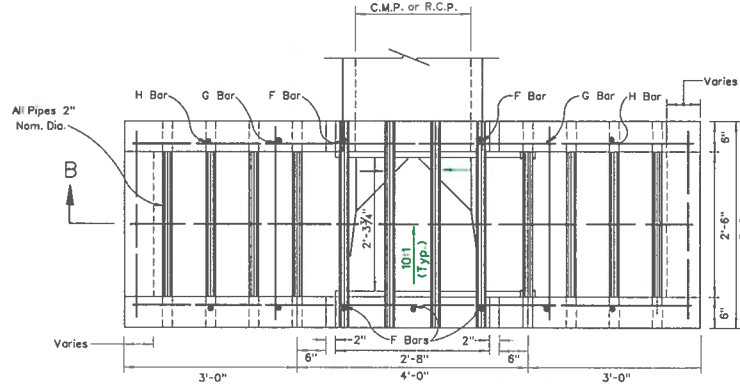
TABLE OF QUANTITIES

NO.	C.M.P.												CONC. (cu. yd.)	REIN. (lb.)	FORM. (sq. ft.)	TOTAL
	A Bars	B Bars	C Bars	D Bars	E Bars	F Bars	G Bars	H Bars	I Bars	J Bars	Pipe					
18"	883'-2"	382'-3"	384'-9"	185'-0"	286'-8"	382'-3"	281'-10"	287'-2"	182'-4"	382'-8"	1.11	61	117			
24"	883'-2"	382'-9"	384'-9"	185'-0"	286'-8"	382'-9"	282'-0"	281'-4"	182'-3"	383'-2"	1.21	63	117			
30"	883'-2"	383'-4"	384'-9"	185'-4"	286'-8"	383'-3"	282'-8"	287'-9"	181'-10"	383'-8"	1.34	67	117			
R.C.P.																
18"	883'-2"	382'-4"	385'-0"	185'-0"	286'-8"	382'-5"	281'-10"	287'-2"	182'-1"	382'-11"	1.18	62	117			
24"	883'-2"	382'-4"	385'-0"	185'-0"	286'-8"	383'-0"	282'-0"	287'-4"	182'-0"	383'-5"	1.27	65	117			
30"	883'-2"	383'-4"	385'-0"	185'-4"	286'-8"	383'-6"	282'-8"	287'-9"	181'-8"	383'-11"	1.41	68	117			

TYPE 8 DROP INLET



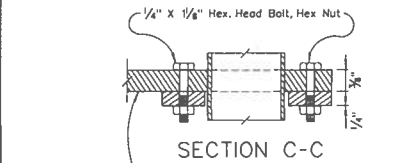
SECTION B-B



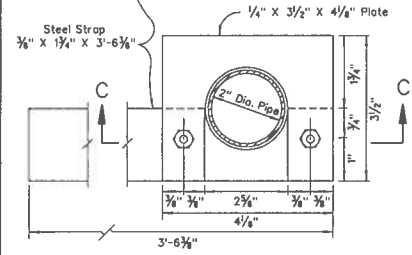
TYPE 8 DROP INLET

TABLE OF QUANTITIES

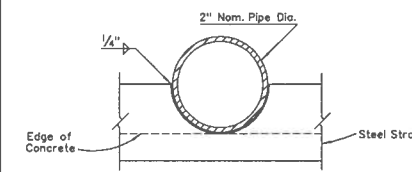
NO.	C.M.P.												CONC. (cu. yd.)	REIN. (lb.)	FORM. (sq. ft.)	TOTAL
	A Bars	B Bars	C Bars	D Bars	E Bars	F Bars	G Bars	H Bars	I Bars	J Bars	Pipe					
18"	883'-2"	382'-0"	884'-9"	186'-10"	289'-8"	582'-3"	481'-0"	481'-2"	282'-4"		1.33	78	168			
24"	883'-2"	382'-6"	884'-9"	186'-10"	289'-8"	582'-9"	482'-0"	481'-4"	282'-3"		1.45	82	168			
30"	883'-2"	383'-0"	884'-9"	187'-0"	289'-8"	583'-3"	482'-8"	481'-9"	281'-0"		1.59	87	168			
R.C.P.																
18"	883'-2"	382'-0"	883'-0"	186'-8"	289'-8"	582'-6"	481'-0"	481'-2"	282'-11"		1.35	80	168			
24"	883'-2"	382'-6"	885'-0"	186'-10"	289'-8"	583'-3"	482'-0"	481'-4"	282'-0"		1.48	84	168			
30"	883'-2"	383'-0"	885'-0"	187'-0"	289'-8"	583'-6"	482'-8"	481'-9"	281'-8"		1.63	89	168			



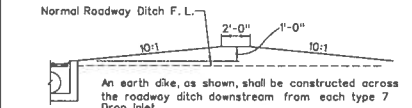
SECTION C-C



DETAIL "C"



DETAIL "D"



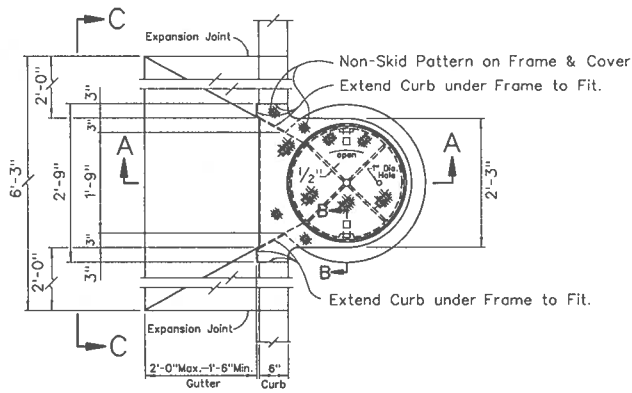
SKETCH OF ROADWAY DITCH DIKE GENERAL NOTES:

- All concrete shall be Class A or AA.
- Reinforcing steel shall be No. 4 bars with maximum spacing of 18" centers, wired tightly at all intersections and embedded at least one and one half inch clear of concrete surface.
- Dimensions may be varied by the Engineer to fit local conditions.
- No deductions in concrete shall be made for the 2" crossbars.
- All exposed edges of concrete shall be chamfered one inch.
- Steel strap and pipe for crossbars are included in the structural steel grate quantities.
- Catch Basin Floors Shall Have A Minimum Slope of 10:1 From All Directions Toward Outlet Pipe. If Basin is Used As A Junction, Shape Flowline(s) To Outlet Pipe, And Provide A Minimum Slope Of 10:1 To Flowline(s).

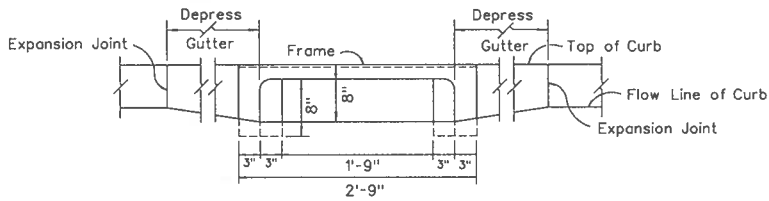
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

**TYPE 7&8
DROP INLETS**

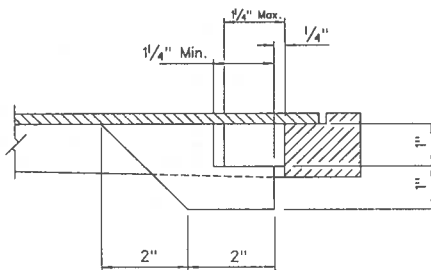
R-4.6.1 (609)
ADOPTED: 8/69 REVISION: 10/94
CHIEF ROAD DESIGN ENGR.



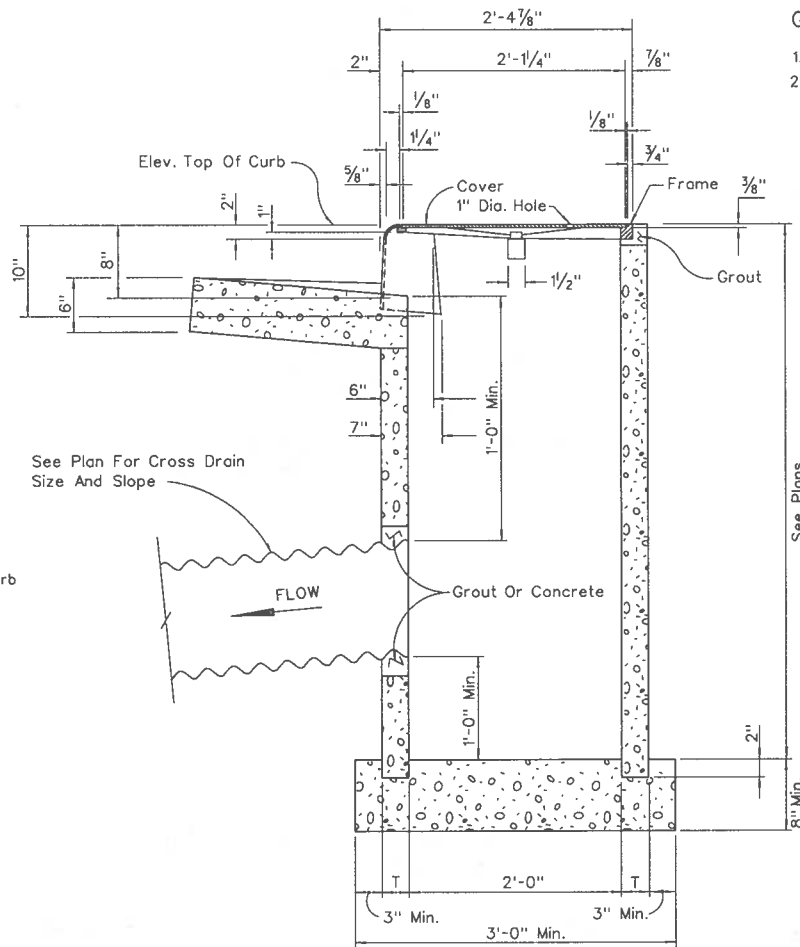
PLAN VIEW



VIEW C-C



SECTION B-B
WEDGE LOCK HOLD DOWN



SECTION A-A

GENERAL NOTES

1. All concrete shall be A or AA.
2. Forming of the base will not be required.

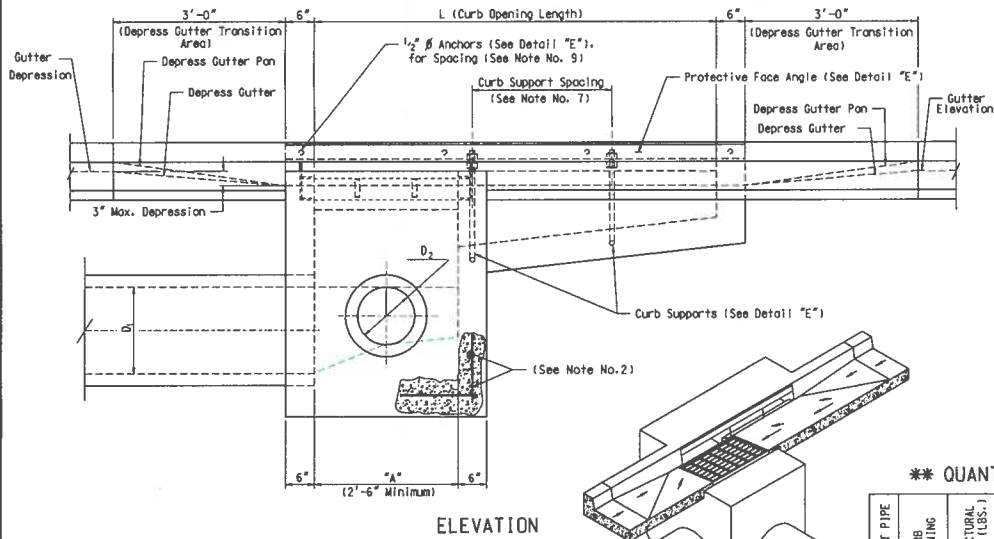
CASTINGS *		
	FRAME	COVER
TYPE 10	90 Lbs.	70 Lbs.

*For info. only

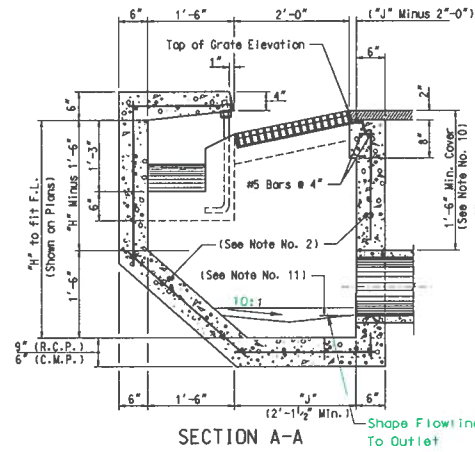
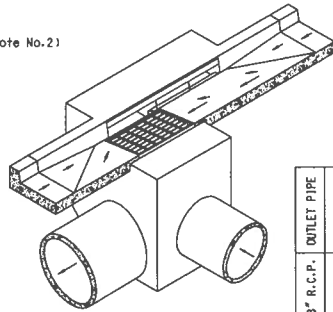
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

**DROP INLET
TYPE 10**

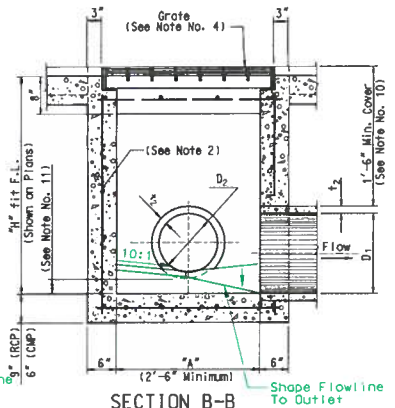
CHIEF ROAD DESIGN ENGR.	R-4.6.1.2 (609) ADOPTED: 11/71	REVISION 1-7/78
-------------------------	-----------------------------------	--------------------



ELEVATION



SECTION A-A

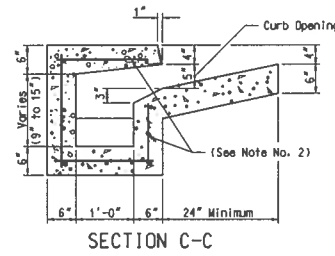


SECTION B-B

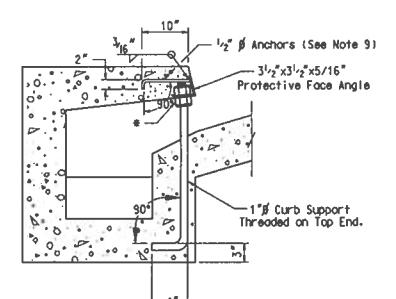
QUANTITIES

OUTLET PIPE CURB OPENING	STRUCTURAL STEEL (LBS.)	REINFORCING STEEL (LBS.)	CONCRETE (CU. YDS.)
7'	325	126	1.64
10'	352	155	2.01
12'	367	176	2.26
15'	394	209	2.72

ASSUMED MINIMUM H 15" INLET PIPE



SECTION C-C

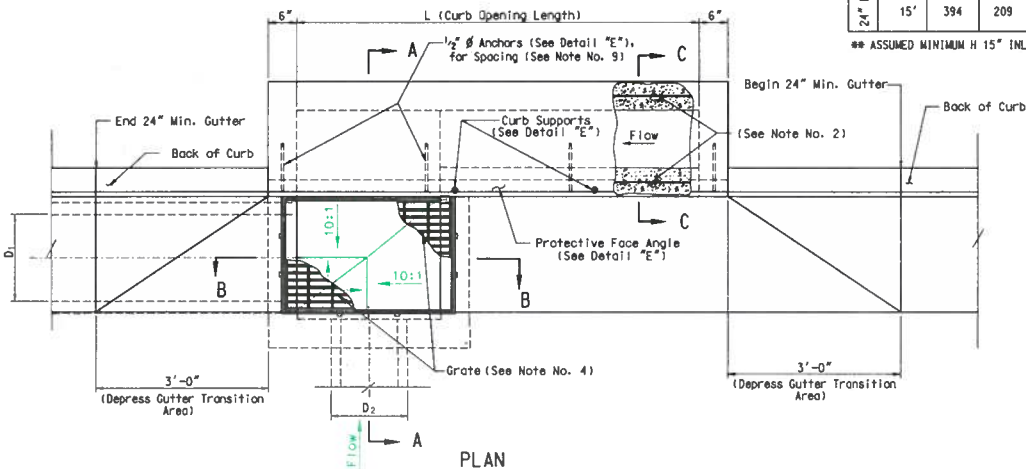


DETAIL E

GENERAL NOTES

- ALL CONCRETE SHALL BE CLASS AA OR A.
- REINFORCING STEEL SHALL BE NO. 4 BARS EXCEPT AS NOTED, WITH MAXIMUM SPACE AT 12" CENTERS, WIRED TIGHTLY AT ALL INTERSECTIONS, AND EMBEDDED AT LEAST 1 1/2" CLEAR OF CONCRETE SURFACE, EXCEPT AS NOTED.
- EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED ONE INCH.
- FOR GRATE AND FRAME DETAIL, SEE STANDARD PLANS SHEET R-4.3.1-(609). (TYPE 3 DROP INLET).
- FOR VALUES OF "H" AND "L" SEE STORM DRAIN SCHEDULE.
- "H" IS THE DIFFERENCE IN ELEVATION BETWEEN THE OUT PIPE FLOW LINE AND THE NORMAL GUTTER GRADE LINE AT THE CURB FACE.
- CURB OPENINGS LONGER THAN 7' SHALL HAVE ONE CURB SUPPORT FOR EACH 7' INCREMENT OR FRACTION THEREOF, EVENLY SPACED.
- PIPE(S) CAN BE PLACED IN ANY WALL.
- ANGLE ANCHORS SHALL BE IMBEDDED MIDPOINT IN EACH ENDWALL AND EVENLY SPACED. (MAXIMUM SPACING OF 5').
- 1'-6" IS MINIMUM COVER FOR PIPE-ASSUMING CLASS III RCP OR 16 GAGE CMP WITH CLASS C BEDDING.
- FOR DROP INLET CONFIGURATIONS WITH 2 PIPES-INFLOW PIPE INVERT ELEVATION SHALL BE ≥ 0.1' ABOVE OUTFLOW PIPE INVERT ELEVATIONS.
- CATCH BASIN FLOORS SHALL HAVE A MINIMUM SLOPE OF 10:1 FROM ALL DIRECTIONS TOWARD OUTFLOW PIPE. IF BASIN IS USED AS A JUNCTION, SHAPE FLOW LINES TO OUTFLOW PIPE, AND PROVIDE A MINIMUM SLOPE OF 10:1 TO FLOW LINES.

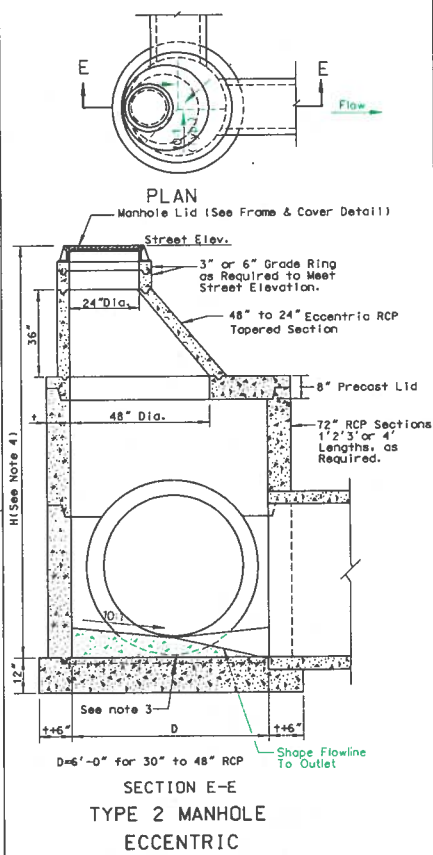
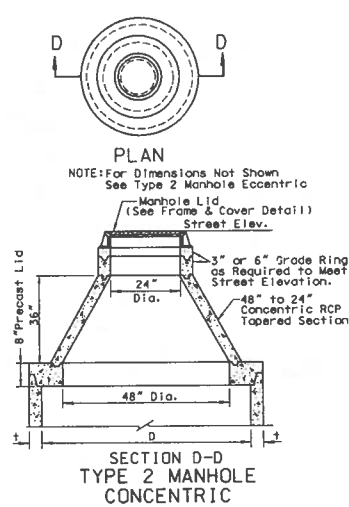
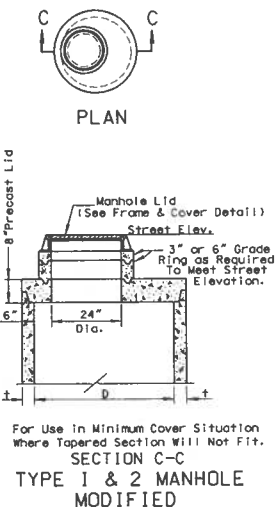
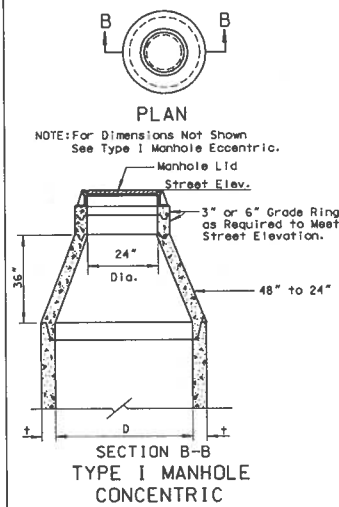
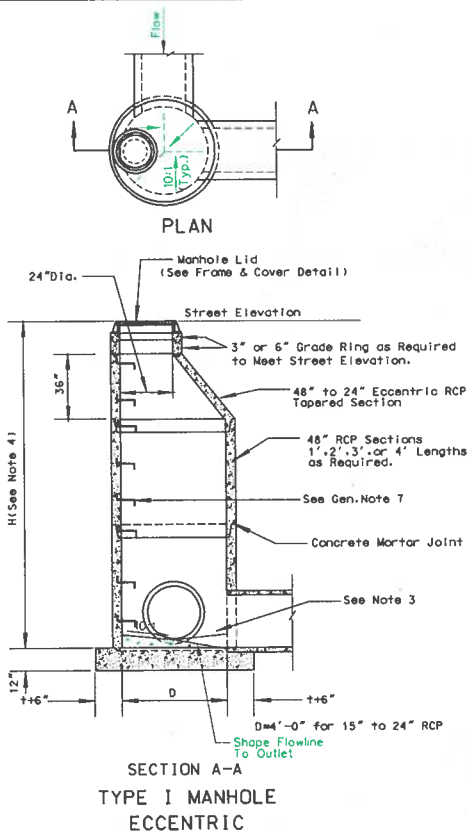
Bottom Nut Tight On Last Thread.



PLAN

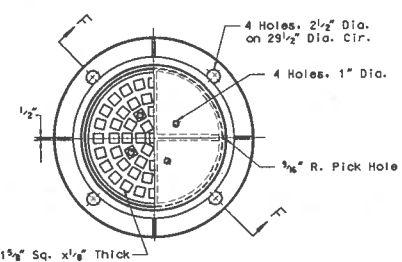
TYPE 11 DROP INLET

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
R-4.6.2(609)
ADOPTED: 5/85
REVISION: 10-84
CHIEF ROAD DESIGN ENGINEER



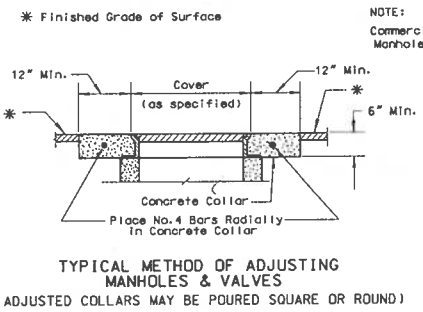
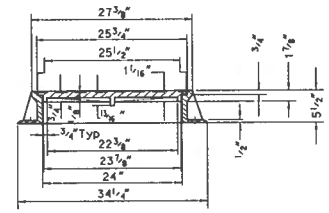
-General Notes-

- 1.) FOR CAST IN PLACE CONCRETE BASE ALL REINFORCING STEEL TO BE NO. 4 BARS AT 18" CENTERS TIGHTLY WOUND AT ALL INTERSECTIONS AND IMBEDDED IN CONCRETE AT LEAST 2" AND BAR ENDS MUST CLEAR CONCRETE SURFACES BY 1 1/2".
- 2.) ALL CONCRETE SHALL BE CLASS A OR AA.
- 3.) MANHOLE WITH MORE THAN ONE PIPE-INFLOW PIPE INVERT ELEVATIONS SHALL BE ≥ 0.1' ABOVE OUTFLOW PIPE ELEVATION.
- 4.) FOR VALUES OF "H" SEE STORM DRAIN SCHEDULE OR STRUCTURE LIST. "H" IS THE DIFFERENCE IN ELEVATION BETWEEN THE OUTFLOW PIPE INVERT ELEVATION AND THE TOP OF MANHOLE ELEVATION AT STREET GRADE.
- 5.) DO NOT PLACE PIPES IN TAPERED SECTION.
- 6.) MANHOLE COVER SHALL BEAR ENTITY IDENTIFICATION AND SYSTEM FUNCTION (IF APPLICABLE).
- 7.) MANHOLE STEPS SHALL CONFORM TO ASTM STANDARD SPECIFICATION C-478 WITH MAXIMUM SPACING OF 16" AND 4" CLEAR DISTANCE FROM THE WALL OF RISER OR CONE SECTION. THE STEP MUST HAVE A 10" MINIMUM WIDTH.
- 8.) SHAPE FLOWLINE IN MANHOLE TO OUTLET PIPE, AND PROVIDE A 10:1 MINIMUM SLOPE FROM ALL DIRECTIONS TOWARD FLOWLINE.



SECTION F-F
TYPICAL TRAFFIC-STRENGTH MANHOLE FRAME & COVER

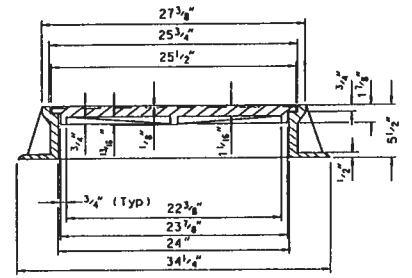
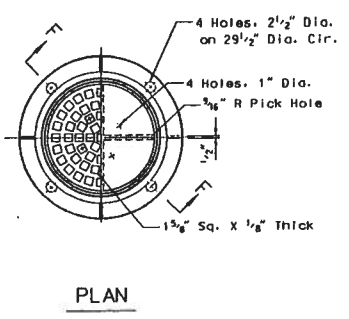
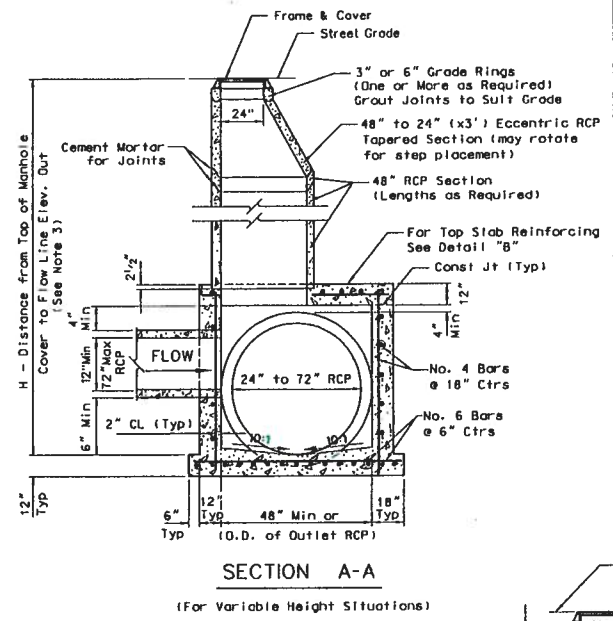
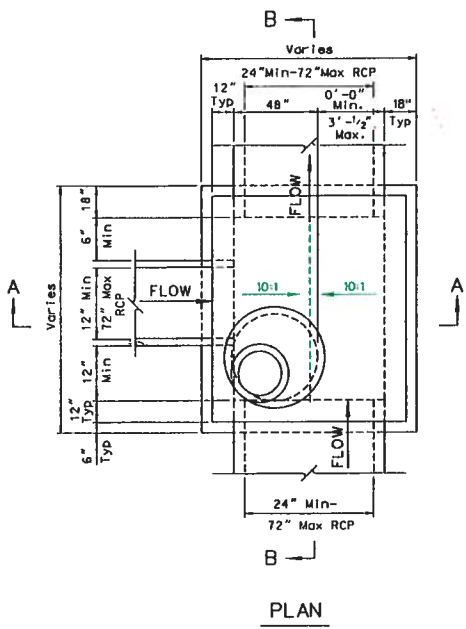
Approx. Weight: Frame 142 lb., Cover 122 lb. Min. Material: Cast Iron.



NOTE:
Commercial Prefabricated Adjustment Rings For Manholes May Be Used When Approved By the Engineer

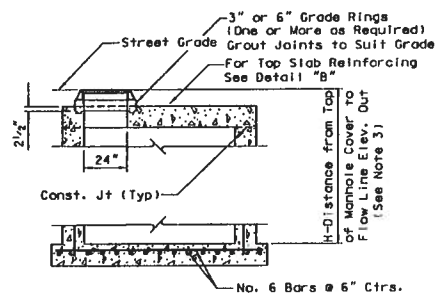
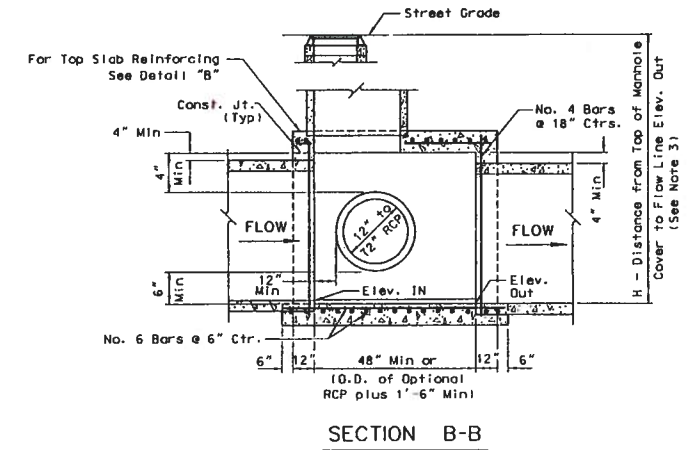
STATE OF NEVADA DEPARTMENT OF TRANSPORTATION	
TYPE 1 & 2 & TYPE 1 & 2 MODIFIED MANHOLES	
R-4.7.1	(609)
CHIEF ROAD DESIGN ENGR.	ADAPTED: 10/85 REVISION 10/94

R-37

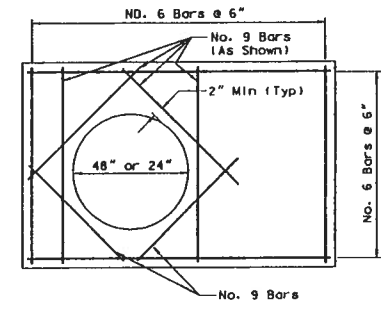


Approx. Weight: Frame 142 lb., Cover: 122 lb Min.
Material: Cast Iron.

TYPICAL TRAFFIC-STRENGTH MANHOLE FRAME & COVER



Notes: Hydraulic Engineer Will Look at Other Options for Extreme Minimum Cover Situations.



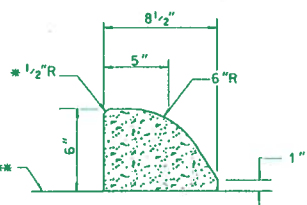
GENERAL NOTES:

- 1) ALL CONCRETE SHALL BE CLASS A OR CLASS AA.
- 2) MANHOLES WITH MORE THAN ONE PIPE: THE INFLOW PIPE INVERT ELEVATIONS SHALL BE GREATER THAN OR EQUAL TO 0.1' ABOVE THE OUTFLOW PIPE INVERT ELEVATION.
- 3) FOR VALUES OF "H", SEE STORM DRAIN SCHEDULE OR STRUCTURE LIST IN CONTRACT PLANS. "H" IS THE DIFFERENCE IN ELEVATION BETWEEN THE OUTFLOW PIPE INVERT ELEVATION AND THE TOP OF MANHOLE ELEVATION AT STREET GRADE.
- 4) MANHOLE STEPS SHALL CONFORM TO ASTM STANDARD SPECIFICATION C-478 WITH MAXIMUM SPACING OF 16" AND 4" CLEAR DISTANCE FROM THE MANHOLE WALL. THE STEP MUST BE A 10" MINIMUM WIDTH.
- 5) MANHOLE COVER SHALL BEAR ENTITY IDENTIFICATION AND SYSTEM FUNCTION (IF APPLICABLE).
- 6) SHAPE FLOWLINE IN MANHOLE TO OUTLET PIPE, AND PROVIDE A 10:1 MINIMUM SLOPE FROM ALL DIRECTIONS TOWARD FLOWLINE.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

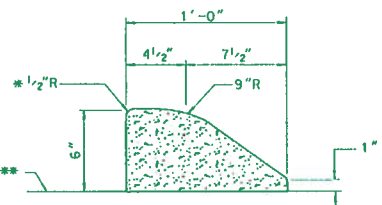
TYPE 4 MANHOLE

CHIEF ROAD DESIGN ENGR.	R-4.7.2	(609)
ADOPTED 10/85	REVISION	10/94



SECTION TYPE A

(0.0108 Cu. Yds. Per Lin. Ft.)



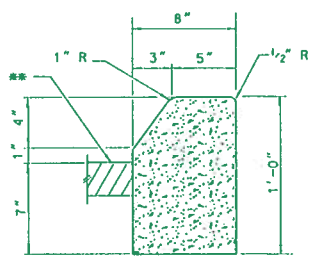
SECTION TYPE B

(0.0185 Cu. Yds. Per Lin. Ft.)

*- Omit Rounding When Curbs Are Back To Back (Epoxy Curb To Plantmix Surface)
 Note: Epoxy Cement May Be Omitted When Installation Is Temporary.

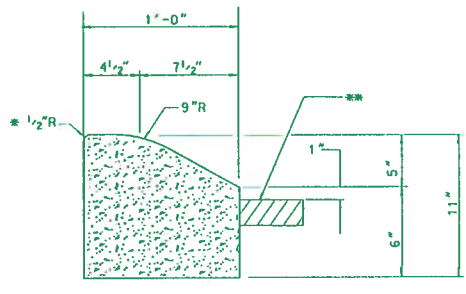
** P.C.C. or Dense Graded

GLUE DOWN CURBS



SECTION TYPE 2

(0.02315 Cu. yd. per ft.)



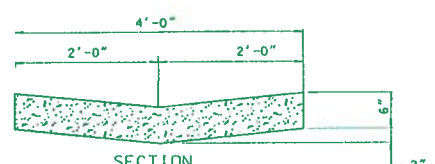
SECTION TYPE 3

(0.02894 cu. yd. per ft.)

** P.C.C. or Dense Graded

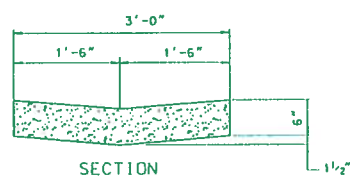
CURB

*- Omit Rounding When Curbs Are Back To Back.



SECTION TYPE 2

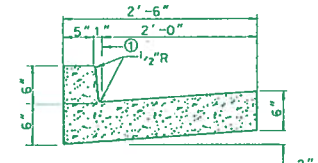
(0.07407 cu. yd. per ft.)



SECTION TYPE 1

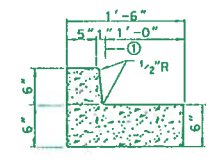
(0.0556 cu. yd. per ft.)

VALLEY GUTTER



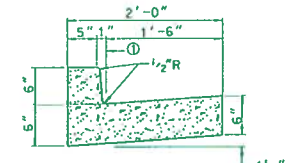
SECTION TYPE 1

(0.05478 cu. yd. per ft.)



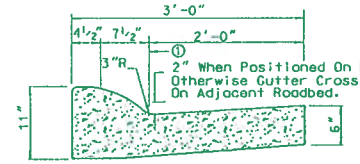
SECTION TYPE 4

(0.03627 cu. yd. per ft.)



SECTION TYPE 5

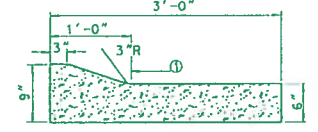
(0.04552 cu. yd. per ft.)



SECTION TYPE 6

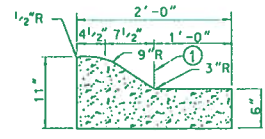
(0.06599 cu. yd. per ft.)

When Positioned On Low Side Of Roadbed
 Otherwise Gutter Cross Slope To Match That
 On Adjacent Roadbed.



SECTION TYPE 7

(0.0813 cu. yd. per ft.)

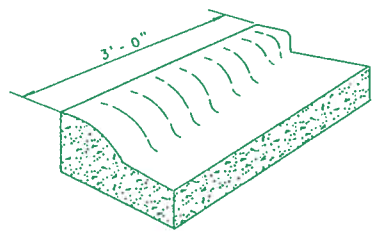


SECTION TYPE 8

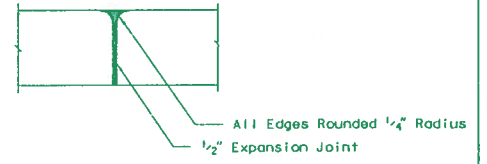
(0.04747 yd. per ft.)

Ⓞ This Line Should Be Used To Dimension Offsets.

CURB AND GUTTER



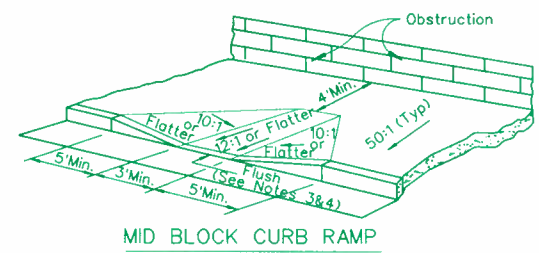
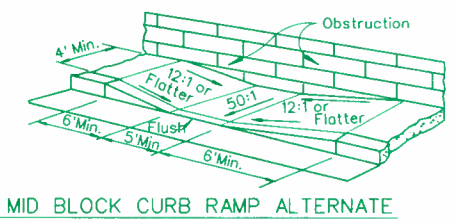
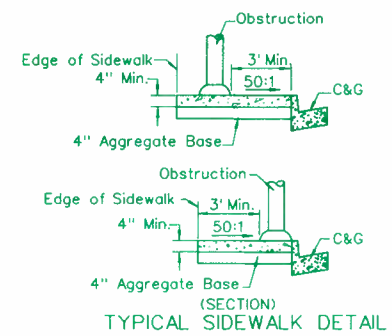
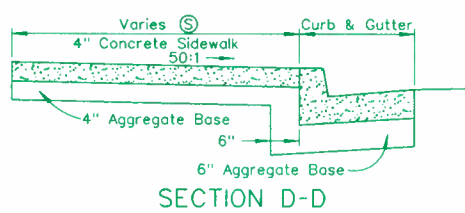
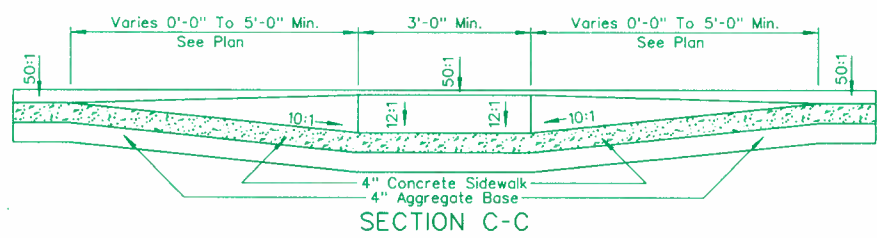
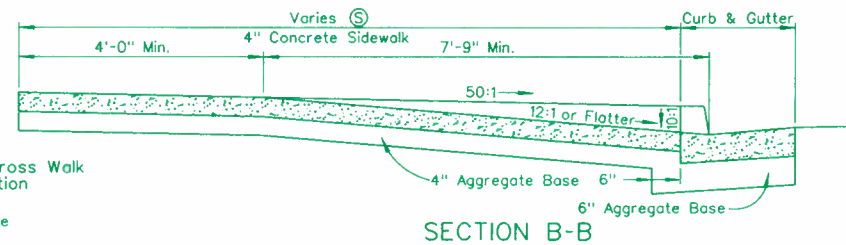
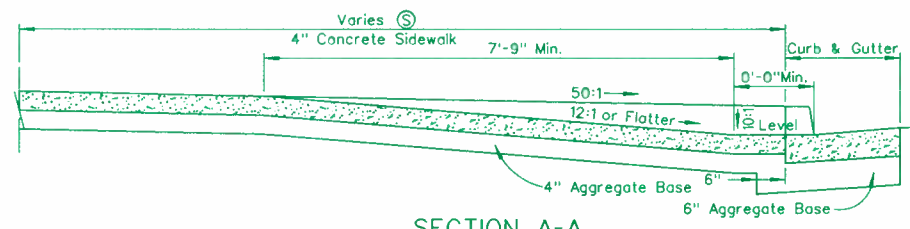
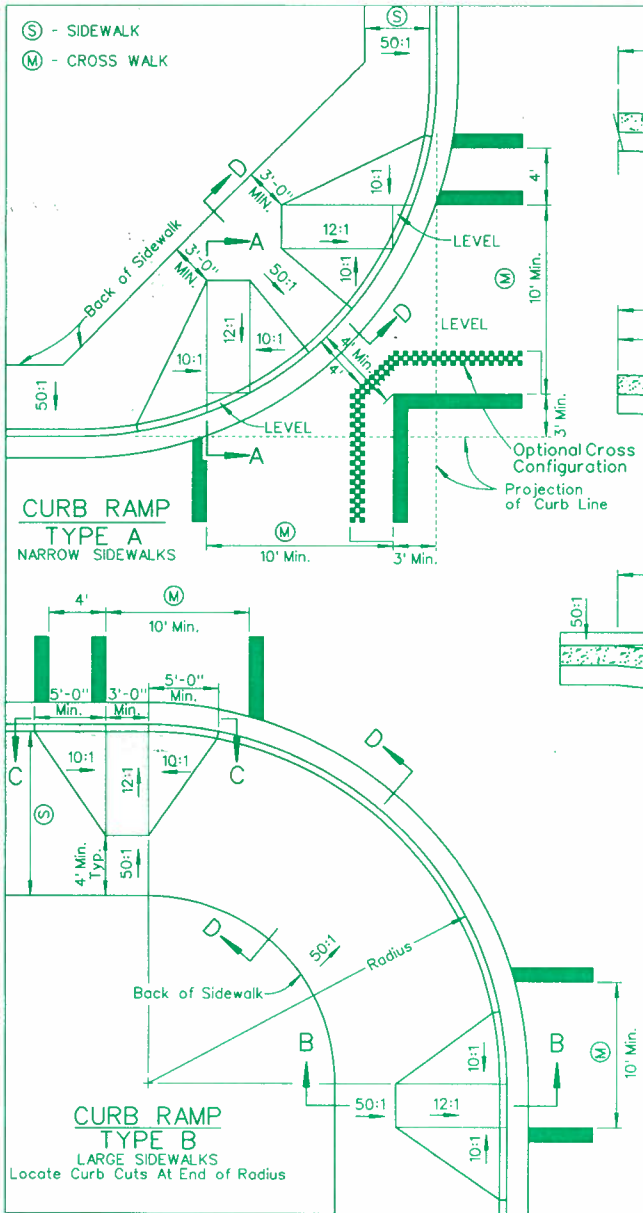
TYPICAL TRANSITION FROM ROLLED CURB TO VERTICAL FACE



ELEVATION
 TYPICAL EXPANSION JOINT DETAIL

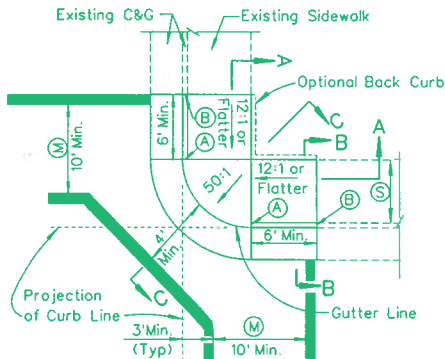
STATE OF NEVADA DEPARTMENT OF TRANSPORTATION	
CURB & GUTTERS	
CHIEF ROAD DESIGN ENGR.	REVISION: 8/69 5 10/90

R-38

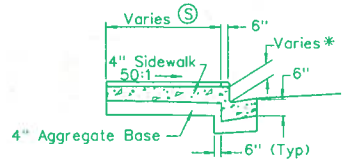


- GENERAL NOTES**
1. SEE STRUCTURE LIST AND PLAN SHEETS FOR (M) AND (S).
 2. GRATINGS OR SIMILAR ACCESSES SHALL NOT BE LOCATED IN AREA AT THE BASE OF THE CURB RAMP OR LANDING AREA.
 3. NO LIP SHALL BE PERMITTED AT THE CURB RAMP SLOPE TO GUTTER PAN.
 4. PLANTMIX BITUMINOUS OPEN-GRADED SURFACE SHALL BE FLUSH WITH THE EDGE OF THE GUTTER PAN IN THE AREA OF THE CURB RAMP.
 5. ROUGH BROOM TEXTURE ON CURB RAMPS AND WINGS. TEXTURE SHALL PROVIDE A VISUAL CONTRAST TO THE SIDEWALK.
 6. CURB RAMP WINGS DO NOT HAVE TO BE WITHIN CROSS-WALK HOWEVER, THE RAMP ITSELF HAS TO BE INSIDE CROSS-WALK.

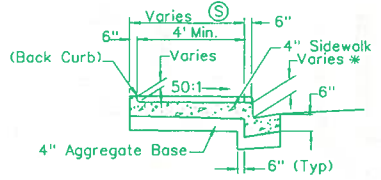
STATE OF NEVADA DEPARTMENT OF TRANSPORTATION		
SIDEWALKS, CURB RAMPS, CROSS WALK MARKINGS (NEW CONSTRUCTION)		
CHIEF ROAD DESIGN ENGR.	ADOPTED: 1/95	REVISION



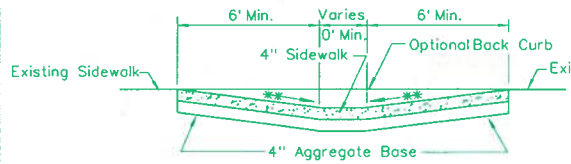
CURB RAMP TYPE C



SECTION B-B

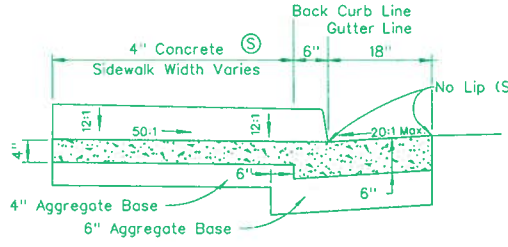


SECTION B-B WITH OPTIONAL BACK CURB

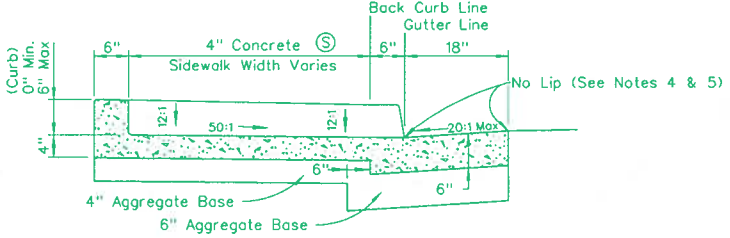


SECTION A-A

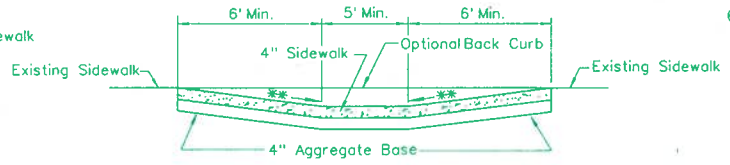
Ⓜ - CROSS WALK
Ⓢ - SIDEWALK
* - FROM 0" AT (A) TO 6" AT (B)
** - 12:1 OR FLATTER



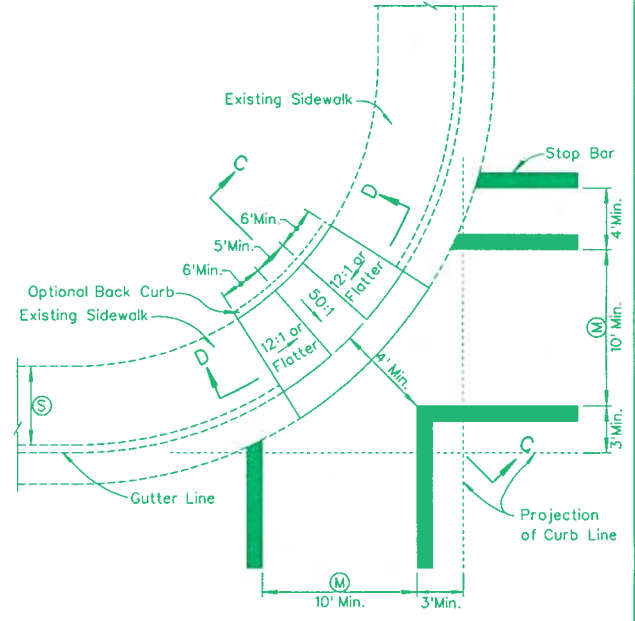
SECTION C-C



SECTION C-C WITH OPTIONAL BACK CURB



SECTION D-D

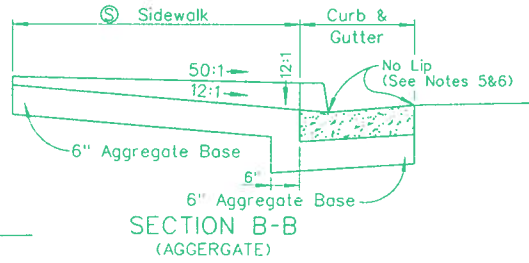
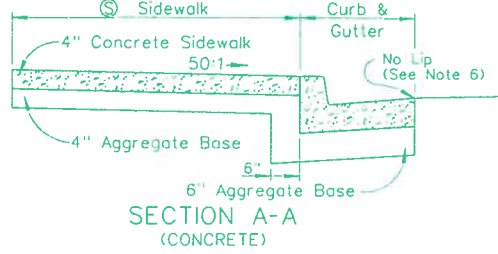
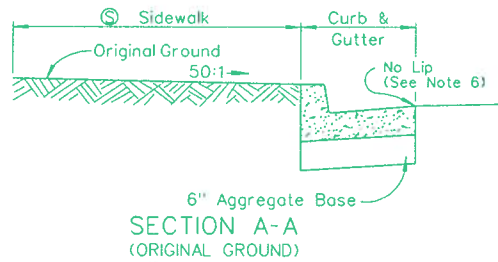
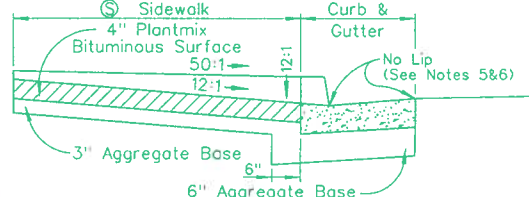
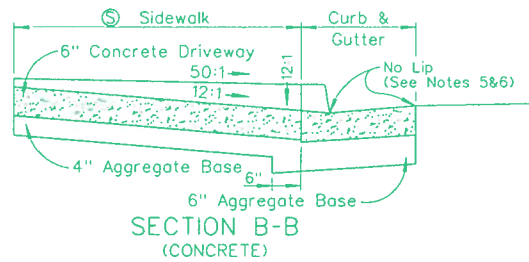
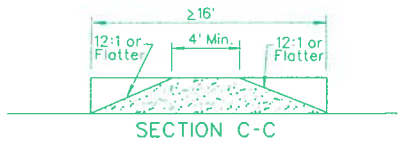
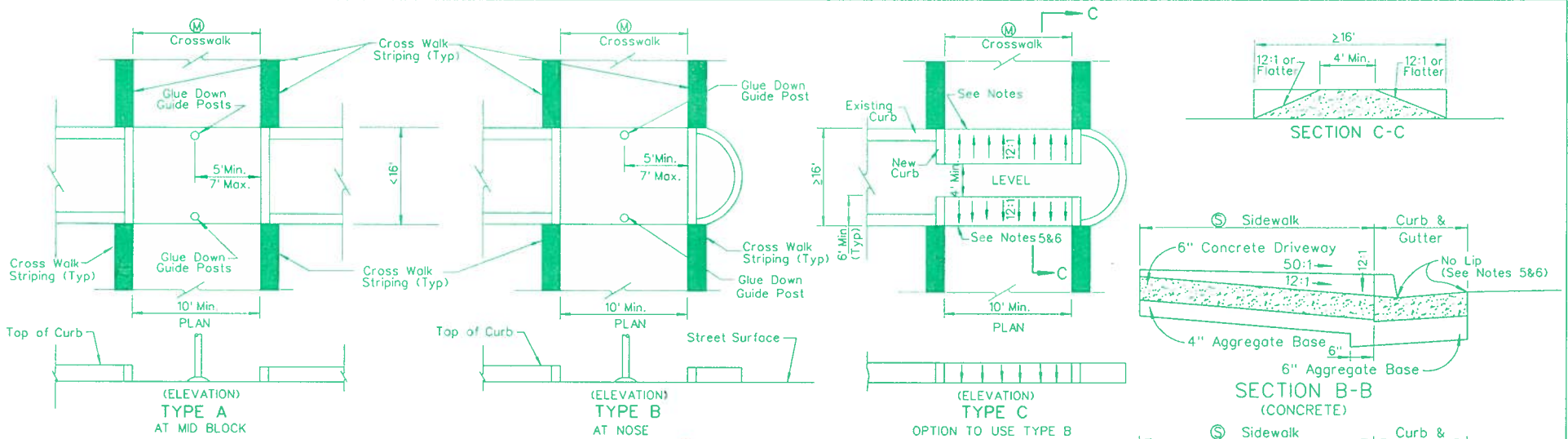


CURB RAMP TYPE D

GENERAL NOTES

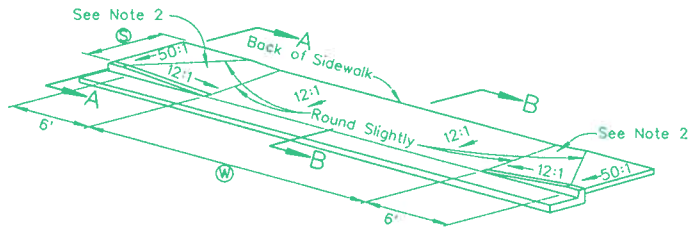
1. IF RIGHT OF WAY IS AVAILABLE, USE TYPE A CURB RAMP.
2. SEE STRUCTURE LIST AND PLAN SHEETS FOR Ⓜ & Ⓢ.
3. GRATINGS OR SIMILAR ACCESSES SHALL NOT BE LOCATED IN AREA AT THE BASE OF THE CURB RAMP OR LANDING AREA.
4. NO LIP SHALL BE PERMITTED AT THE CURB RAMP SLOPE TO GUTTER PAN.
5. PLANTMIX BITUMINOUS OPEN-GRADED SURFACE SHALL BE FLUSH WITH THE EDGE OF THE GUTTER PAN IN THE AREA OF THE CURB RAMP.
6. ROUGH BROOM TEXTURE ON CURB RAMPS AND WINGS. TEXTURE SHALL PROVIDE A VISUAL CONTRAST TO THE SIDEWALK.

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION		
SIDEWALKS, CURB RAMPS, CROSS WALK MARKINGS (EXISTING SIDEWALKS)		
CHIEF ROAD DESIGN ENGR.	ADOPTED: 1/95	REVISION: R-5.1.2-(613)



Ⓢ - SIDEWALK
Ⓜ - CROSS WALK

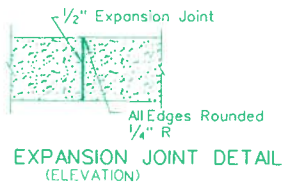
**MEDIAN ISLAND BREAK
(CURB RAMP)**



SINGLE FAMILY DRIVEWAYS ONLY

GENERAL NOTES FOR DRIVEWAYS AND CURB RAMPS

1. ALL CURB RAMPS SHALL BE 12:1 OR FLATTER.
2. SIDE SLOPES FOR DRIVEWAYS SHALL BE 12:1 OR FLATTER UNLESS THERE IS A 3' MINIMUM BETWEEN END OF DRIVEWAY AND BACK OF SIDEWALK IN WHICH CASE THE SIDE SLOPES CAN BE 10:1 OR FLATTER.
3. SEE STRUCTURE LIST AND PLAN SHEETS FOR Ⓜ AND Ⓢ.
4. GRATING OR SIMILAR ACCESSORIES SHALL NOT BE LOCATED IN AREA AT THE BASE OF THE CURB RAMP OR LANDING AREA.
5. NO LIP SHALL BE PERMITTED AT THE CURB RAMP SLOPE TO GUTTER PAN.
6. PLANTMIX BITUMINOUS OPEN-GRADED SURFACE SHALL BE FLUSH WITH THE EDGE OF THE GUTTER PAN IN THE AREA OF THE CURB RAMP.
7. ROUGH BROOM TEXTURE ON CURB RAMPS AND WINGS. TEXTURE SHALL PROVIDE A VISUAL CONTRAST TO THE SIDEWALK.

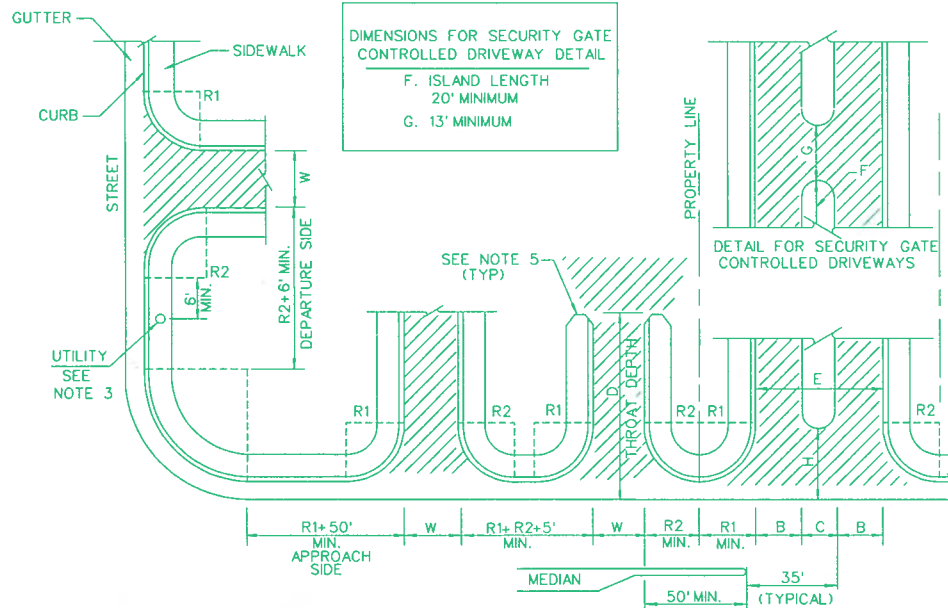


TYPICAL EXPANSION JOINT DETAIL (ELEVATION)

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION	
DRIVEWAYS, CURB RAMPS, CROSS WALK MARKINGS	
CHIEF ROAD DESIGN ENGR.	R-5-1.1.3 (6/13) ADOPTED 1/95 REVISION

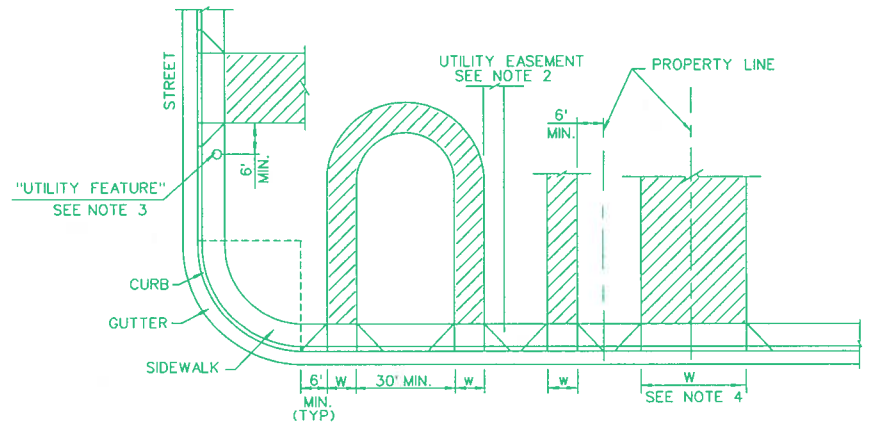
R-41

DIMENSIONS	
W. 12' MINIMUM FOR ONE-WAY DRIVEWAYS 24' MINIMUM FOR TWO-WAY DRIVEWAYS 40' MAXIMUM	D. THROAT DEPTH 25' MINIMUM 35' MINIMUM FOR PARKING LOTS OF > 50 CARS/DRIVE
B. 20' MINIMUM & 25' MAXIMUM	F. 65' MINIMUM FOR PARKING LOTS OF > 150 CARS/DRIVE
C. 7' MINIMUM, FACE TO FACE	H. 100' MINIMUM FOR PARKING LOTS OF > 300 CARS/DRIVE
E. 50' MINIMUM	R1- 15' MIN. & 35' MAX.
H. 8' MINIMUM & 15' MAXIMUM	R2- 25' MIN. & 35' MAX.



- NOTES:
- INDUSTRIAL, AND MULTI-FAMILY DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD DRAWING NUMBERS R-5.1.1.5.
 - THE TOTAL WIDTH "W" OF DRIVEWAY CURB OPENINGS SHALL NOT EXCEED 65% OF FRONT FOOTAGE.
 - NO DRIVEWAY SHALL BE LOCATED WITHIN 6 FEET OF A LIGHT POLE, FIRE HYDRANT, MAIL BOX, ABOVE-GROUND ELECTRICAL TRANSFER BOX, OR BLOCK WALL HIGHER THAN 2 FEET.
 - THE CENTERLINES OF DRIVEWAYS ON OPPOSITE SIDES OF THE STREET AT A MEDIAN OPENING SHOULD BE D ±10 FROM EACH OTHER. WHEN A PROPERTY LINE FALLS IN A MEDIAN OPENING A JOINT DRIVEWAY AGREEMENT SHALL BE REQUIRED OR NO DRIVEWAY WILL BE ALLOWED.
 - HANDICAPPED ACCESSIBLE SIDEWALKS SHALL BE PROVIDED. SEE STANDARD DRAWINGS R-5.1.1.1 TO R-5.1.3.

INDUSTRIAL, COMMERCIAL, AND MULTI-FAMILY DRIVEWAY GEOMETRICS



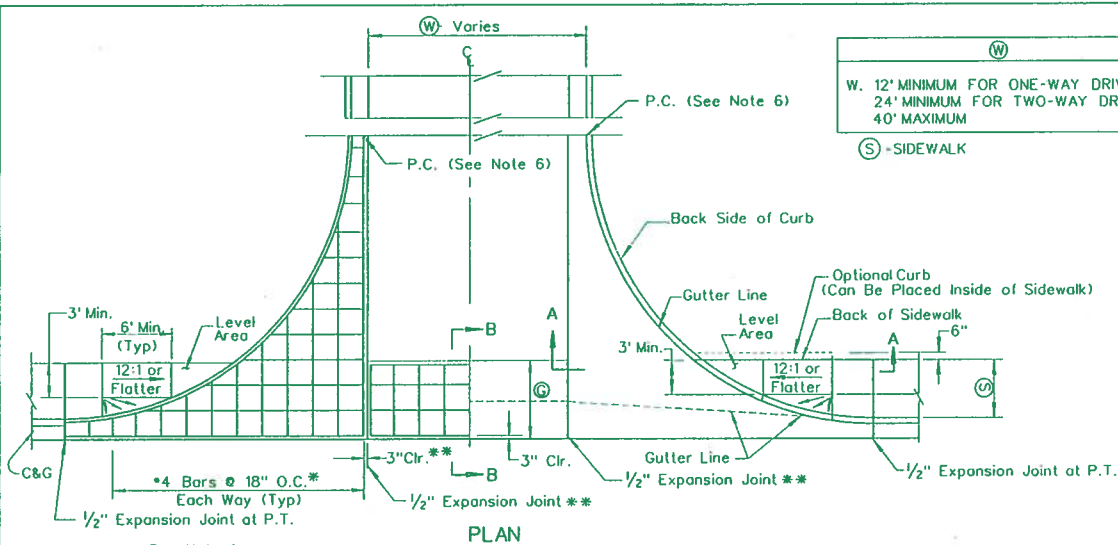
W = WIDTH OF DRIVEWAY = 12' MIN.
16' MAX. FOR 1 OR 2 CAR GARAGE, OR
28' MAX. FOR 3+ GARAGE

GENERAL NOTES:

- ALL RESIDENTIAL PROPERTIES MAY HAVE ONLY ONE CURB CUT EXCEPT CIRCULAR DRIVEWAYS AS SHOWN.
- NO DRIVEWAY SHALL BE LOCATED WHOLLY OR PARTIALLY, ON OR OVER A UTILITY EASEMENT WHICH RUNS PERPENDICULAR TO THE CURB LINE.
- NO DRIVEWAY SHALL BE LOCATED WITHIN 6 FEET OF A LIGHT POLE, FIRE HYDRANT, MAIL BOX, ABOVE-GROUND ELECTRICAL TRANSFER BOX, BLOCK WALL HIGHER THAN 2 FEET, OR THE CURB RETURN AT A STREET INTERSECTION OR ALLEY.
- COMMON DRIVEWAY CONSTRUCTION MAY BE PERMITTED AT ANY TWO RESIDENTIAL PROPERTIES OF 60 FEET IN WIDTH OR LESS. THE WIDTH OF THE JOINT DRIVEWAY SHALL BE A MAXIMUM OF 24 FEET. A JOINT DRIVEWAY AGREEMENT SHALL BE REQUIRED.
- MULTI-FAMILY RESIDENTIAL AND ALL NON-RESIDENTIAL DRIVEWAYS SHALL CONFORM TO THE COMMERCIAL DRIVEWAY STANDARDS.
- ALL DRIVEWAY LOCATIONS SHALL BE SUBJECT TO REVIEW AND APPROVAL BY THE ENGINEER.
- FOR CURB RAMPS AND DRIVEWAY APRON DETAIL, SEE STD. DWGS. NO. R-51.1.1 TO R-5.1.1.3.

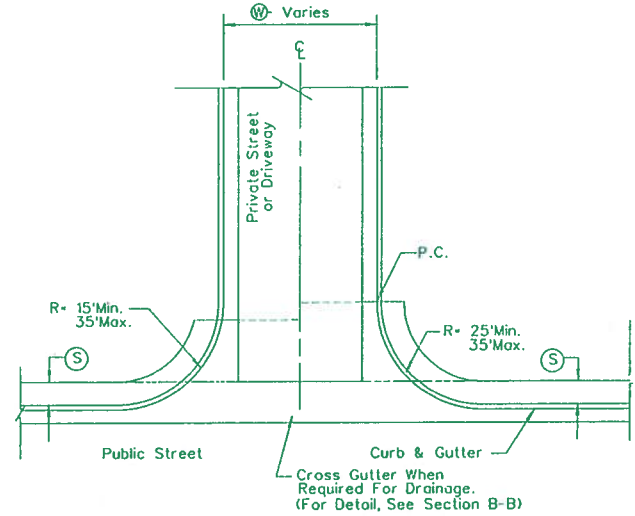
RESIDENTIAL DRIVEWAY GEOMETRICS

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION		
DRIVEWAY GEOMETRICS		
CHIEF ROAD DESIGN ENGR	ADOPTED 1/95	R-5.1.1.4-(613) REVISION

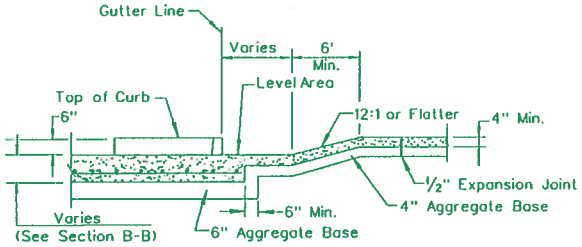


PLAN

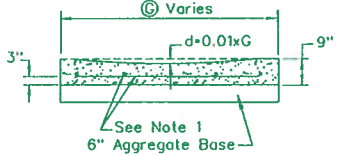
* - See Note 1.
 ** - For Optional Sectional Pour, See Note 2.



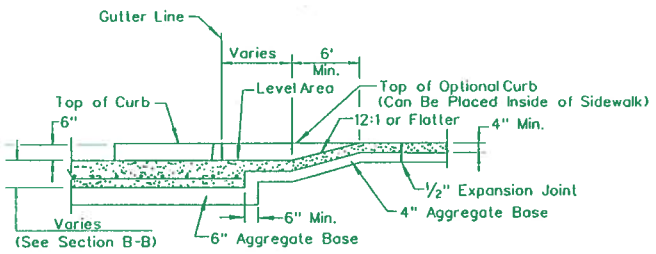
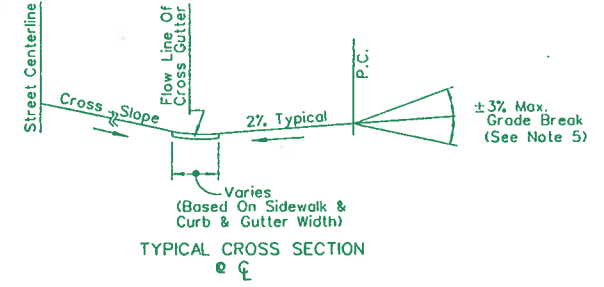
TYPICAL CROSS SECTION



SECTION A-A



SECTION B-B

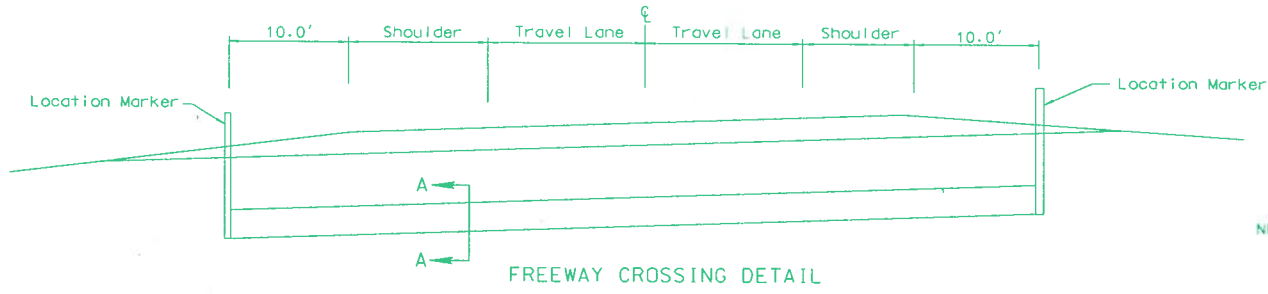


SECTION A-A WITH OPTIONAL CURB

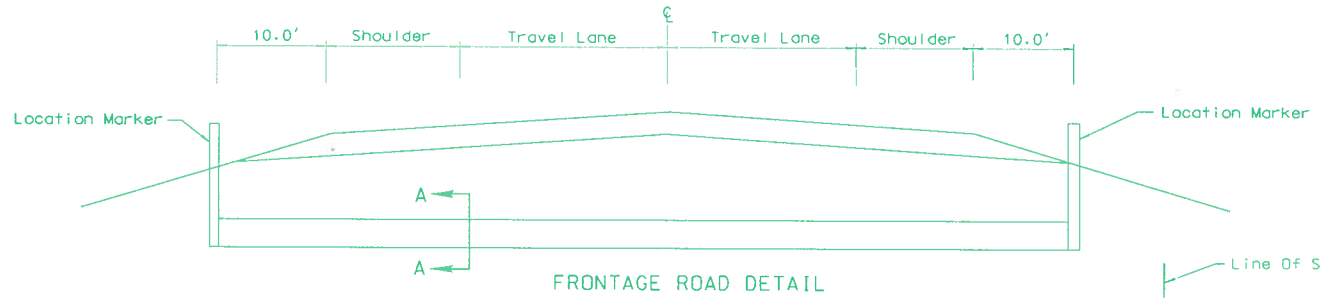
- GENERAL NOTES:
1. SPACING OF NO. 4 BARS LESS THAN 18" TO MEET LOCAL CODES SHALL BE NOTED IN THE STRUCTURE LIST.
 2. WHEN CONSTRUCTING DRIVEWAYS WHERE CURB AND GUTTER EXISTS, COMPLETELY REMOVE EXISTING SECTIONS. DRIVEWAY MAY BE POURED MONOLITHIC TO A.C. LINE, IN WHICH CASE THE BARS SHALL BE CONTINUOUS. IF OPTIONAL SECTIONAL POUR IS USED, EXPANSION JOINTS AND REBAR END CLEARANCE SHALL APPLY AS SHOWN.
 3. CONCRETE SHALL BE CLASS A OR AA CONCRETE.
 4. CURB RAMP SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD DRAWINGS R-5.1.1.1 TO R-5.1.1.3.
 5. FOR GRADE CHANGES GREATER THAN 3%, VERTICAL CURVES OF AT LEAST 10 FEET MUST BE USED.
 6. DRIVEWAY GEOMETRICS SHALL GO TO THE P.C.

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION	
MULTI-FAMILY, COMMERCIAL & INDUSTRIAL DRIVEWAY DETAILS	
	R-5.1.1.5-(613) ADOPTED: 1/95 REVISION
CHIEF ROAD DESIGN ENGR.	

R-43



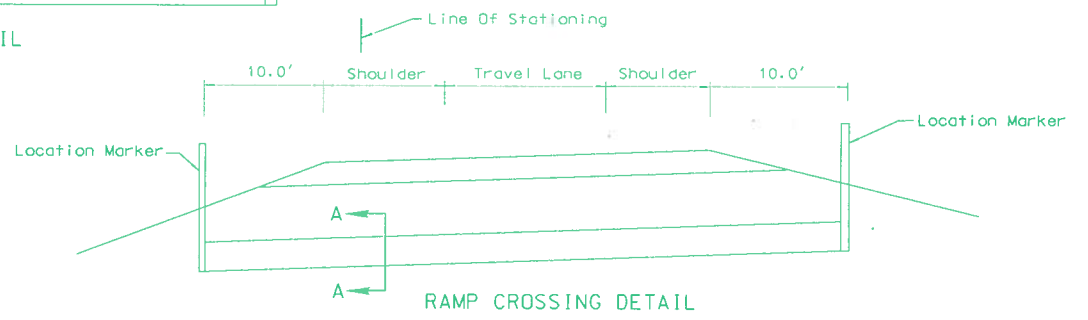
FREeway CROSSING DETAIL



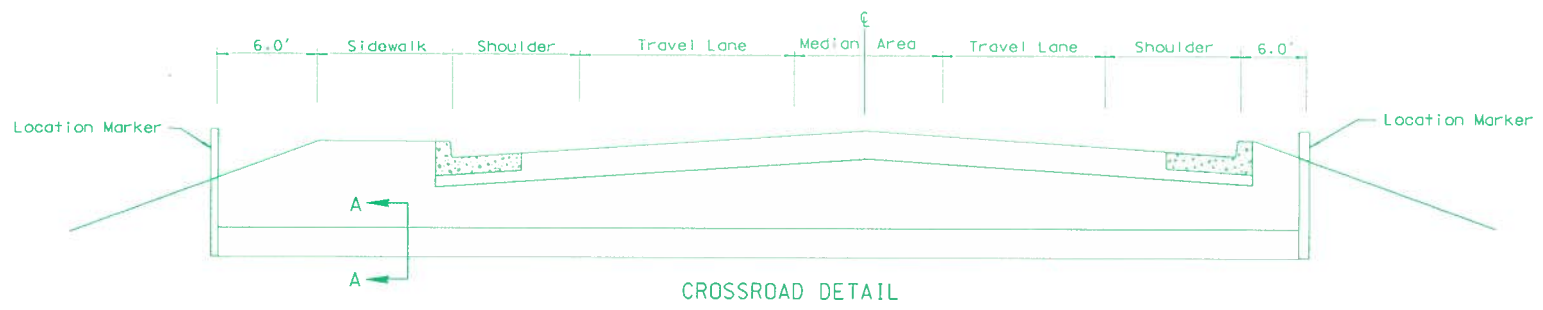
FRONTAGE ROAD DETAIL

GENERAL NOTES

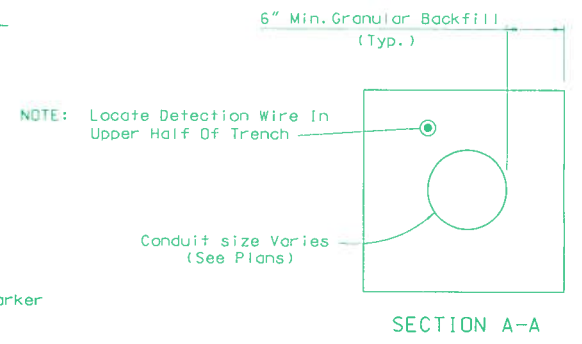
1. MINIMUM 3.0' COVER OVER TOP OF CONDUIT AT SHOULDER LINE.
2. 12 GAUGE BARE COPPER DETECTION WIRE TO LAY IN TRENCH ADJACENT TO CONDUIT AND ATTACH TO LOCATION MARKER AT EACH END.
3. LOCATION MARKER SHALL BE 2" P.V.C. OR 5.0' STEEL FENCE POSTS.



RAMP CROSSING DETAIL



CROSSROAD DETAIL



NOTE: Locate Detection Wire In Upper Half Of Trench

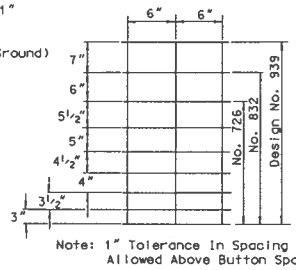
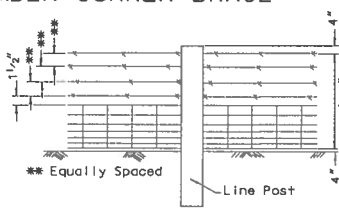
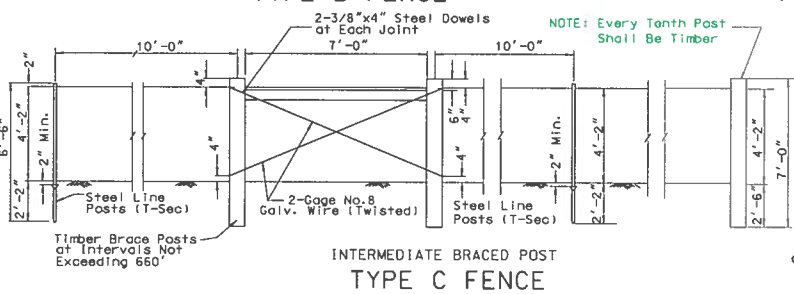
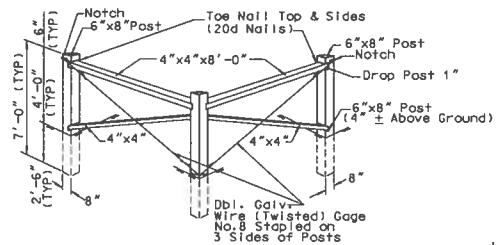
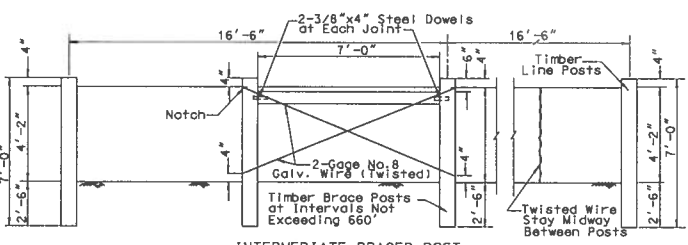
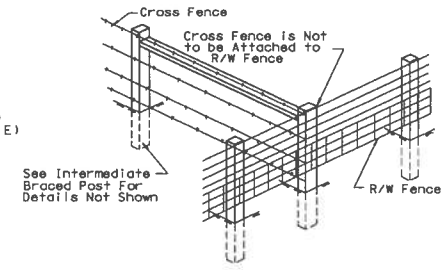
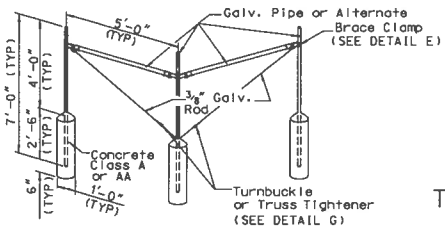
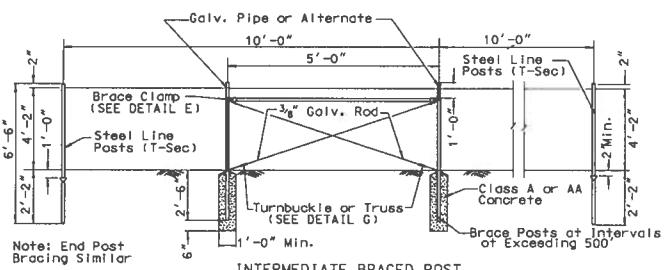
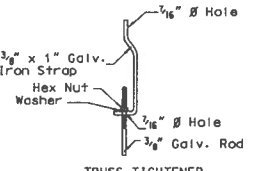
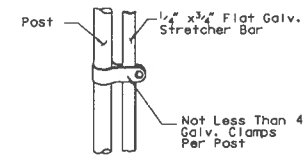
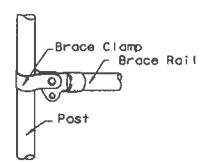
Conduit size Varies (See Plans)

SECTION A-A

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION	
CONDUIT INSTALLATION FOR FUTURE WATER LINES	
A	R-5.1.2
CHIEF ROAD DESIGN ENGR.	ADOPTED: 5/73 REVISION 2 11/82

SIZE OF POSTS—STANDARD FENCING

FENCE HEIGHT	CORNER, END & PULL			LINE		BRACES		
	ROUND PIPE O.D.	MIN. WT. (LBS./L.F.)		T-SECTION	MIN. WT. (LBS./L.F.)	ROUND PIPE O.D.	MIN. WT. (LBS./L.F.)	
		CLASS 1	CLASS 2				CLASS 1	CLASS 2
3' to 6'	2.375"	3.65	2.64		1.30	1.660"	2.27	1.45



TYPICAL DETAIL OF WOVEN WIRE & BARBED WIRE FENCE APPLICABLE TO TYPE A, B & C FENCING

- GENERAL NOTES
- FENCE POSTS AND MATERIALS SHALL CONFORM TO THE REQUIREMENTS OF STANDARD SPECIFICATIONS AND SUPPLEMENTS.
 - STANDARD FENCING SHALL CONSIST OF GALVANIZED BARBED WIRE, GALVANIZED WOVEN WIRE (FARM FENCE) OR A COMBINATION OF BOTH ON WOOD OR METAL POSTS OR COMBINATIONS OF POSTS.
 - BARBED WIRE SHALL BE SPACED AS FOLLOWS:
4 WIRE: BOTTOM WIRE 15 1/2" ABOVE GROUND, OTHER SPACING 11 1/2"
5 WIRE: BOTTOM WIRE 10" ABOVE GROUND, OTHER SPACING 10"
4. STANDARD FENCING WILL BE DESIGNATED BY TYPE, DESIGN OF FABRIC, AND/OR NUMBER OF BARBED WIRES. THUS:
TYPE A-832-3B DESIGNATES METAL POSTS, 32" WOVEN (FARM) WIRE, AND 3 BARBED WIRES;
TYPE B-43 DESIGNATES WOOD POSTS, 4 BARBED WIRES;
TYPE C-728-4B DESIGNATES COMBINATION OF WOOD AND METAL POSTS, 26" WOVEN (FARM) WIRE, 4 BARBED WIRES.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

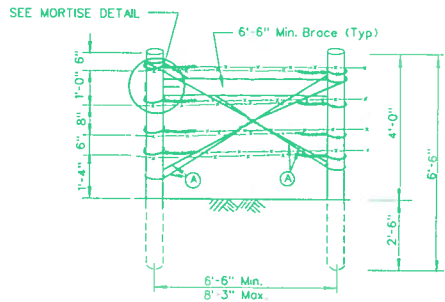
FENCE DETAILS

CHIEF ROAD DESIGN ENGR. [Signature]

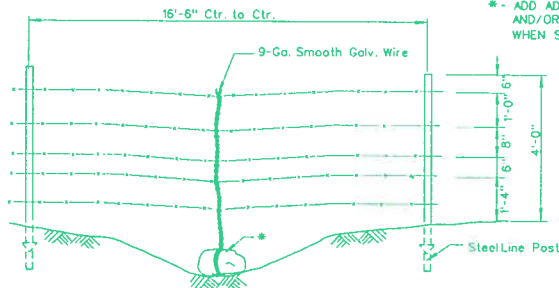
ADOPTED: 8/69

REVISION: 10/94

R-6.1.1 (724)



STRESS PANEL

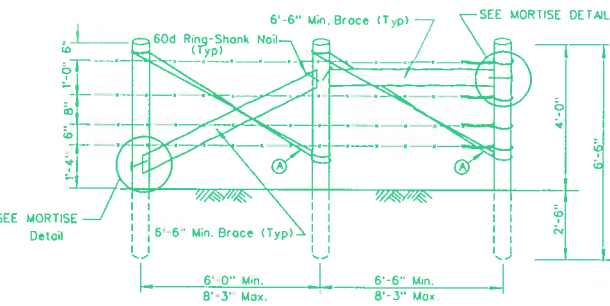


PANEL AT MINOR DEPRESSION OR INTERMITTENT STREAM

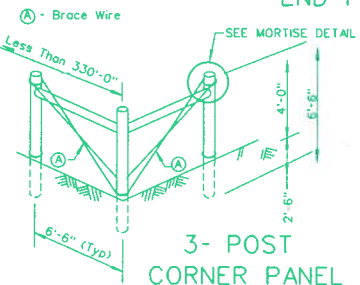
* - ADD ADDITIONAL STRAND OF BARBED WIRE AND/OR A ROCK DEADMAN (MIN. WEIGHT 50 LBS.) WHEN SPACE BETWEEN BOTTOM WIRE AND GROUND EXCEEDS 20".

GENERAL NOTES

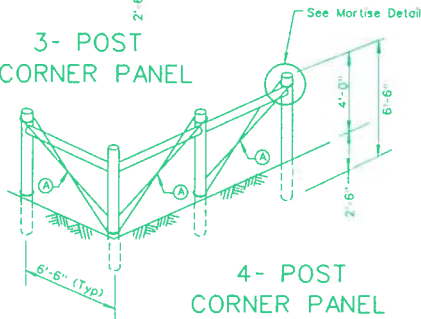
1. STRESS PANELS SHALL BE PLACED EVERY 1320' ON TANGENTS.
2. STRESS PANELS SHALL BE PLACED EVERY 660' ON CURVES.
3. END PANELS SHALL BE USED WHEREVER A BREAK IN THE FENCE OCCURS (I.E. GATES, CATTLEGURDS) AND AT THE BEGINNING AND ENDING OF ALL CURVES.
4. POSTING ON CURVES SHALL BE ONE WOOD POST PER THREE METAL POSTS.
5. BARBLESS WIRE SHALL BE USED FOR BOTTOM STRAND WHEN REQUIRED BY NEV. DEPT. OF WILDLIFE OR BUREAU OF LAND MANAGEMENT.
6. WIRES ARE TO BE TIED OFF AT STRETCH POINTS. WRAP AND SPLICE TO SELF WITH AT LEAST 4 TURNS AT OPPOSITE END OF PANELS.
7. WOOD POSTS SHALL BE 6" NOMINAL DIAMETER.



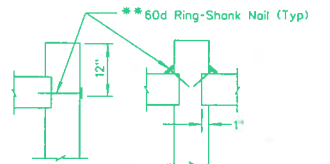
END PANEL



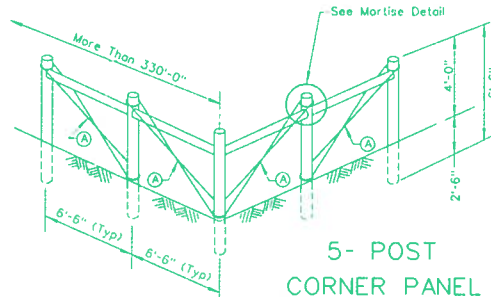
3- POST CORNER PANEL



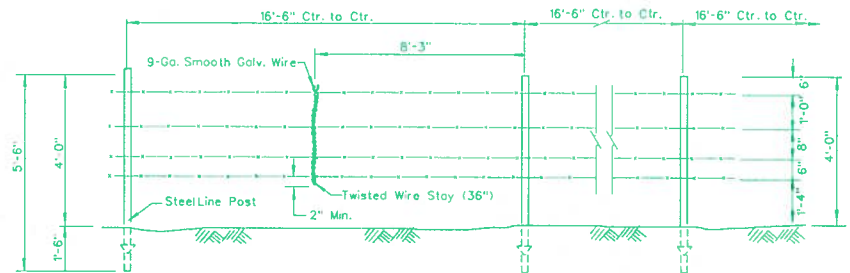
4- POST CORNER PANEL



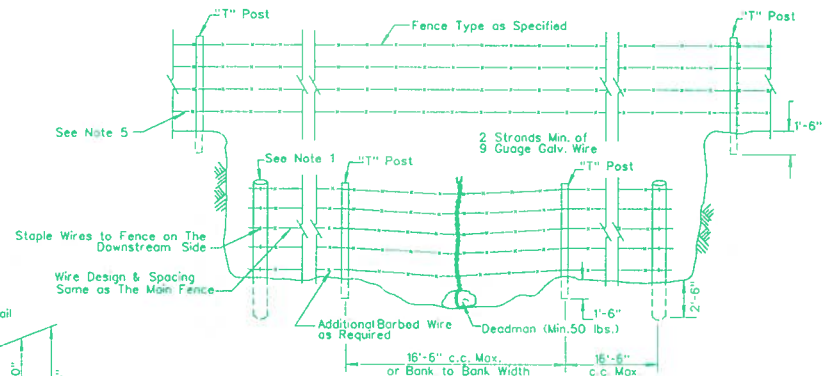
MORTISE DETAIL



5- POST CORNER PANEL

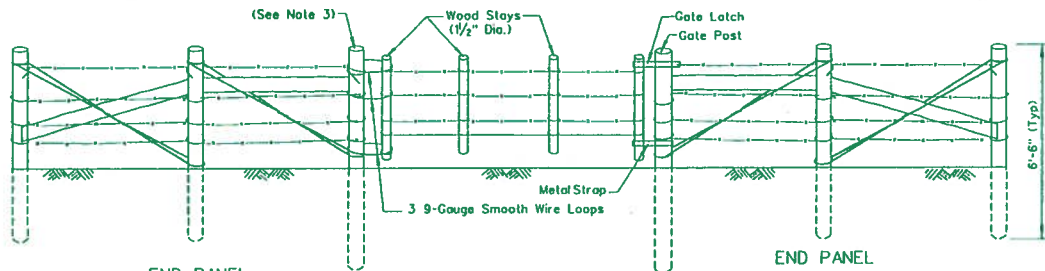


LINE PANELS

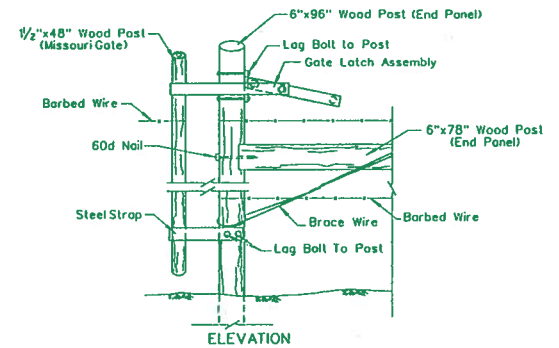
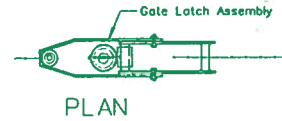


DRAINAGE CROSSING

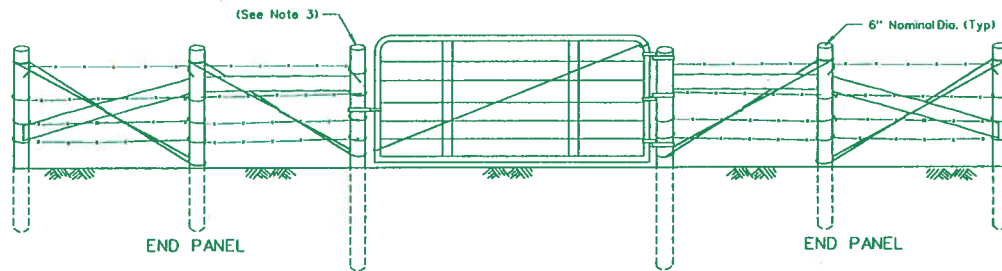
STATE OF NEVADA DEPARTMENT OF TRANSPORTATION		
NEVADA 4-WIRE FENCE PANEL DETAILS (TYPE C-NV-4B)		
CHEF ROAD DESIGN ENGR.	ADOPTED: 1/95	REVISION: 1-95



MISSOURI GATE



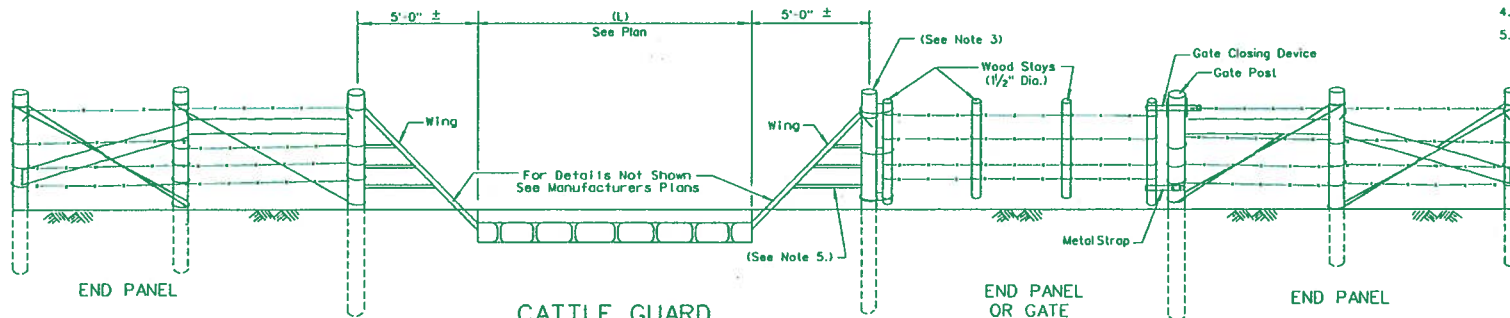
TYPICAL GATE LATCH



METAL DRIVE GATE

GENERAL NOTES

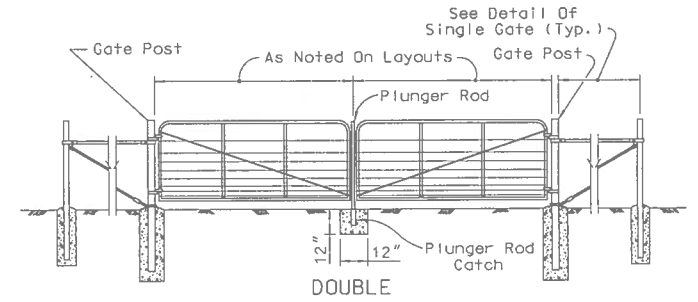
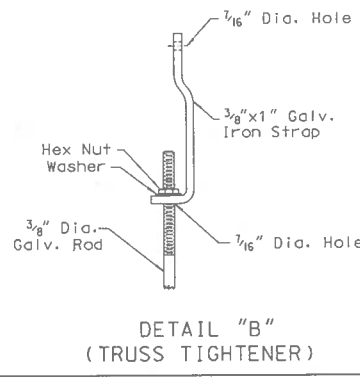
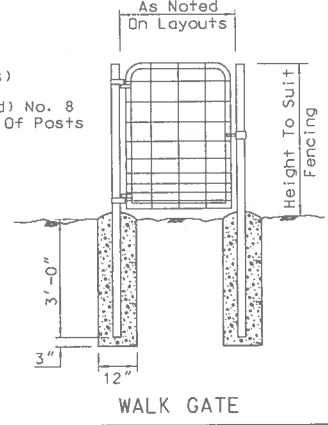
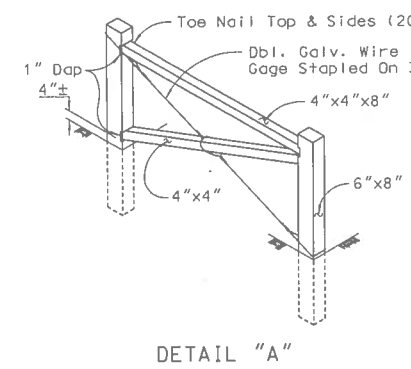
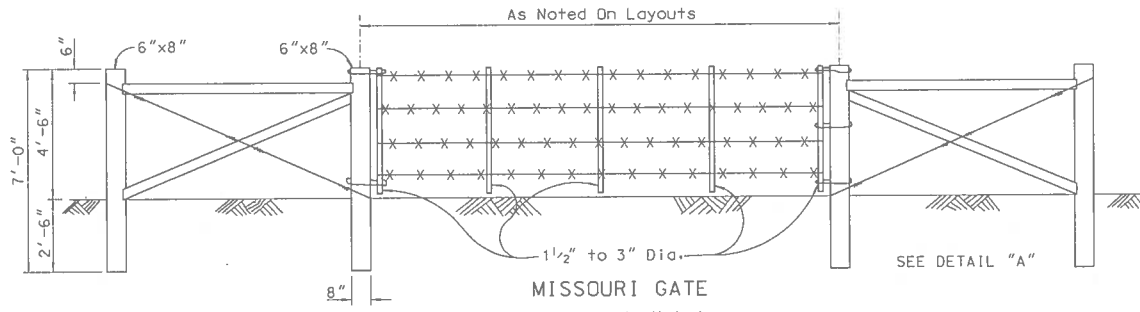
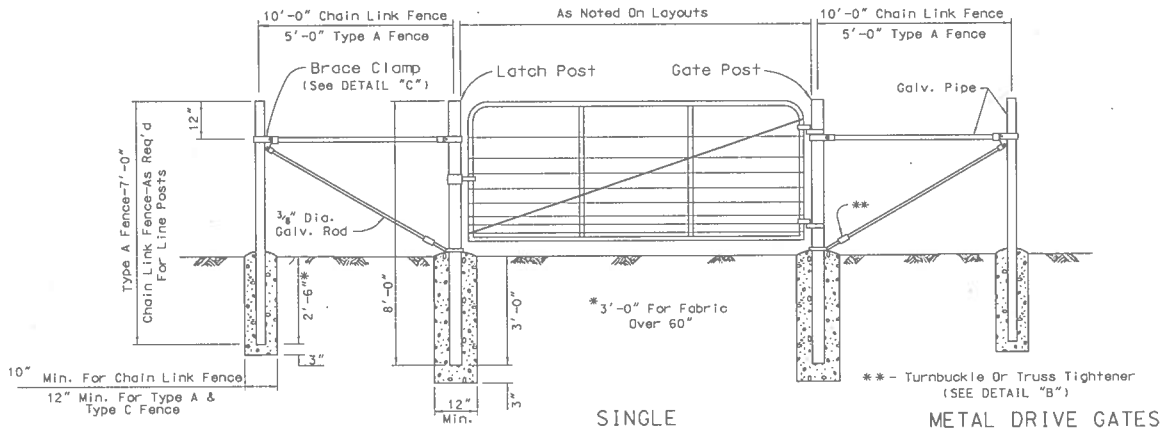
1. SPACING BETWEEN WIRES ON MISSOURI GATE SHALL BE THE SAME AS WIRES ON ADJACENT FENCE.
2. GATE LATCH SHALL BE LAG BOLTED FIRMLY TO THE GATE POST.
3. HINGE POSTS, LATCH POSTS, AND CATTLE GUARD WING ATTACHMENT POSTS SHALL BE 8 FT. IN LENGTH AND SHALL BE BURIED 3 FT. IN GROUND.
4. FOR END PANEL DETAILS, SEE SHEET R 6.1.2.
5. WIRE MAY BE USED IN LIEU OF METAL STRAP FOR CONNECTION OF CATTLEGUARD WING TO FENCE POST.



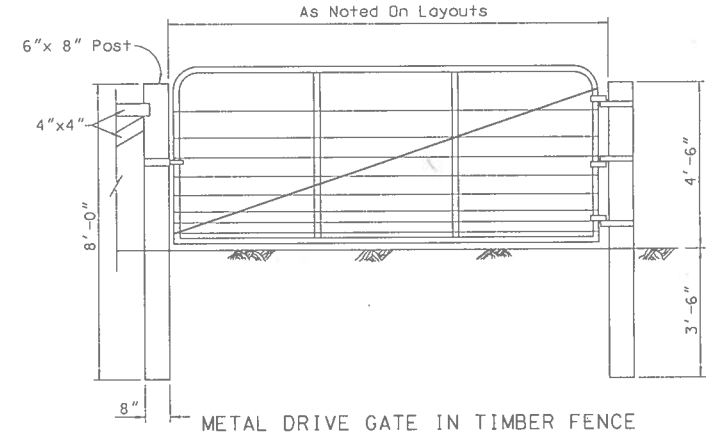
CATTLE GUARD

R-47

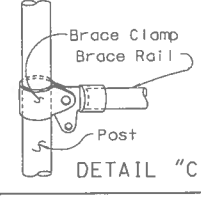
STATE OF NEVADA DEPARTMENT OF TRANSPORTATION		
NEVADA 4-WIRE FENCE GATE DETAILS (TYPE C-NV-4B)		
R-6.1.2.1 (616)		
CHEF ROAD DESIGN ENGR.	ADOPTED: 1/95	REVISION 1-95



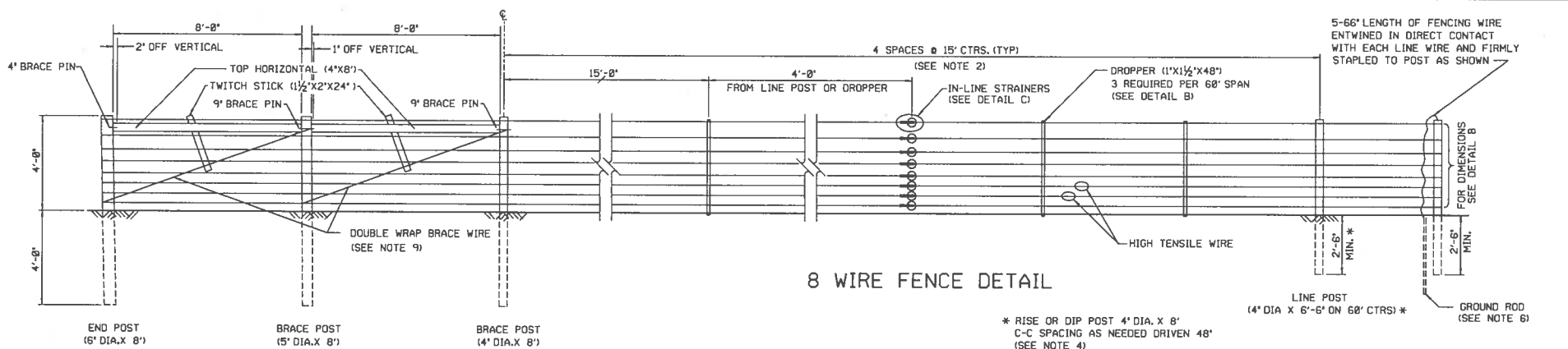
NOTE: Bracing Is For Chain Link Fencing. See Intermediate Braced Post, Type A Fence. For Bracing Detail When Type A Fence Is Specified.



- GENERAL NOTES
1. STANDARD GATES, CHAIN LINK GATES, AND WALK GATES SHALL BE CONSTRUCTED AS SPECIFIED IN THE STANDARD SPECIFICATIONS.
 2. BRACED POSTS AND BRACES SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS.
 3. LUMBER USED IN THE CONSTRUCTION OF TIMBER GATES SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS.



STATE OF NEVADA DEPARTMENT OF TRANSPORTATION	
GATE AND FENCE DETAILS	
R-6.1.3	(616)
CHIEF ROAD DESIGN ENGR.	ADOPTED: 8/69 REVISION 10794



8 WIRE FENCE DETAIL

* RISE OR DIP POST 4' DIA. X 8' C-C SPACING AS NEEDED DRIVEN 48" (SEE NOTE 4)

DOUBLE BRACE END ASSEMBLY

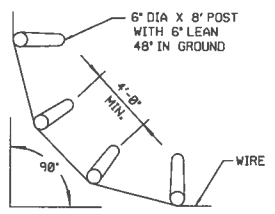
NOTE: FARM GATE 12' OR LESS MAY BE INSTALLED ON POST AFTER FINAL WIRE TENSIONING.



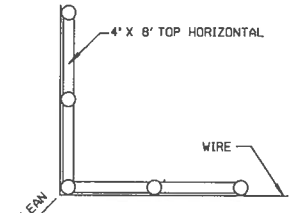
DETAIL C
(IN-LINE WIRE STRAINERS AND TENSION INDICATOR SPRING)

CONSTRUCTION NOTES:

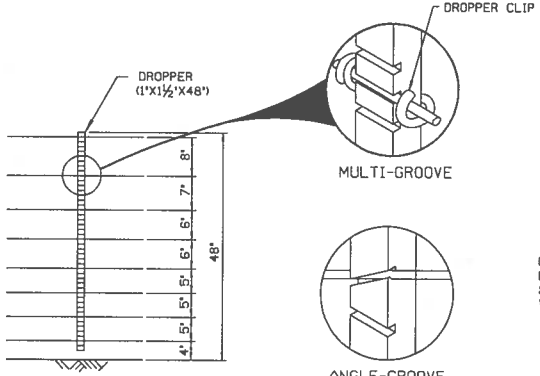
1. END POSTS AND LINE POSTS ARE RECOMMENDED TO BE MECHANICALLY DRIVEN INTO THE GROUND WHERE SOIL CONDITIONS PERMIT, TO BE DETERMINED BY THE ENGINEER.
2. MAXIMUM POST SPACING IS 60' ON LEVEL TERRAIN WITH DROPPERS ON 15' CENTERS. POST SPACING MAY BE DECREASED DUE TO TERRAIN CONDITIONS. DROPPER SPACING WILL REMAIN ON 15' MAX. CENTERS. MINIMUM LINE POST SPACING WILL BE ON 15' CENTERS WITHOUT DROPPERS. WITH 4" DIAMETER SMALL END, LINE POST WHEN NEEDED.
3. PLACEMENT OF IN-LINE STRAINERS SHALL BE AS CLOSE TO THE CENTER OF THE FENCE RUN AS POSSIBLE. PLACEMENT OF TENSION INDICATOR SPRING SHALL BE ON THE SECOND WIRE FROM THE TOP. COMPRESSION OF THE INDICATOR SPRING BY 1 3/4" WILL INDICATE A TENSION OF APPROXIMATELY 250 LBS. (± 10 LBS.).
4. MAXIMUM LENGTH OF WIRE FOR IN-LINE STRAINER ON LEVEL TERRAIN STRAIGHT+5000'; 1-90 DEGREE CORNERS 3000'; 2-90 DEGREE CORNERS 2000'; 3-90 DEGREE CORNERS 1500'; 4-90 DEGREE CORNERS 1000'. FOR UNEVEN TERRAIN REDUCE DISTANCES BY 50% FOR EACH MAJOR RISE AND DIP. DIP OR RISE POSTS SHALL BE A MINIMUM OF 4" DIAMETER SMALL END, 8" LONG, POSITIONED AT HIGH POINTS OF RIDGES AND LOW POINTS OF GULLIES.
5. EXCEPT FOR FASTENING LINE WIRE, WHICH HAS BEEN STRUNG AROUND THE OUTSIDES OF WOOD POSTS IN CORNERS AND CURVES, FENCE STAPLES SHOULD NOT BE DRIVEN VERTICALLY INTO WOOD POSTS. ROTATING STAPLES SLIGHTLY AWAY FROM SLASH CUT POINTS WILL PROVIDE IMPROVEMENT IN RESISTANCE TO PULLOUT.
6. GROUND RODS OF GALVANIZED STEEL (5/8"-8"), SHALL BE PLACED EVERY 150' IN DRY SOILS, OR EVERY 300' IN MOIST SOILS. SPECIFIC ROD POSITIONING TO BE DETERMINED BY THE ENGINEER. FENCE UNDER POWER LINES SHALL BE GROUNDED AT 3 POINTS, ONE DIRECTLY UNDER POWER LINE AND ONE EACH SIDE 25' TO 50' AWAY.
7. IT IS RECOMMENDED FOR TYING OFF WIRES ON END POSTS TO USE TWO (2) MICROPRESS SLEEVES (CAT. NO. FN-2-2) MANUFACTURED BY THE NATIONAL TELEPHONE SUPPLY COMPANY OR ACCEPTABLE EQUAL.
8. IT IS RECOMMENDED FOR SPLICING WIRES TO USE THREE (3) MICROPRESS SLEEVES OR 1 RELIABLE WIRELINC, NUMBER 5857V, MANUFACTURED BY RELIABLE ELECTRIC COMPANY OR ACCEPTABLE EQUAL.
9. PROPER TENSION ON THE BRACE WIRE IN THE END ASSEMBLY IS ACCOMPLISHED BY TWISTING THE BRACE WIRE A MINIMUM OF 6 TURNS, TO A MAXIMUM OF 8 TURNS. THE TWITCH STICK SHOULD BE SECURELY FASTENED TO THE TOP HORIZONTAL BRACE POST.
10. LINE WIRES SHOULD BE STAPLED TO THE LINE POST ONLY AFTER TAKING UP PRELIMINARY TENSION (ABOUT 100 LBS.) ON EACH WIRE. STAPLES SHALL NOT BIND WIRE AFTER STAPLING IS COMPLETED. TENSION EACH WIRE AN ADDITIONAL 100 LBS. FOR A TOTAL OF 250 LBS. INSTALL DROPPERS ONLY AFTER FINAL TENSION IS ON EACH WIRE. SEE CONSTRUCTION NOTE 'C', ABOUT TENSION INDICATOR SPRING.
11. ADDITIONAL CONSTRUCTION NOTES MAY BE FOUND IN UNITED STATES STEEL CATALOG NO. 1111575, 'HOW TO BUILD FENCES WITH UNITED STATES STEEL MAX TEN 200 HIGH-TENSILE FENCE WIRE'.



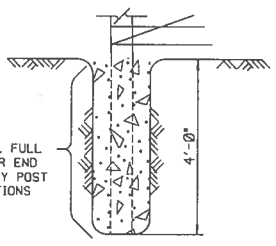
TERNATE FOUR POST CORNER ASSEMBLY
PLAN



DOUBLE BRACE CORNER ASSEMBLY
(FOR DETAILS-SEE ABOVE)
PLAN



DROPPER DETAIL B



DETAIL A
POST WITH CONCRETE FILL

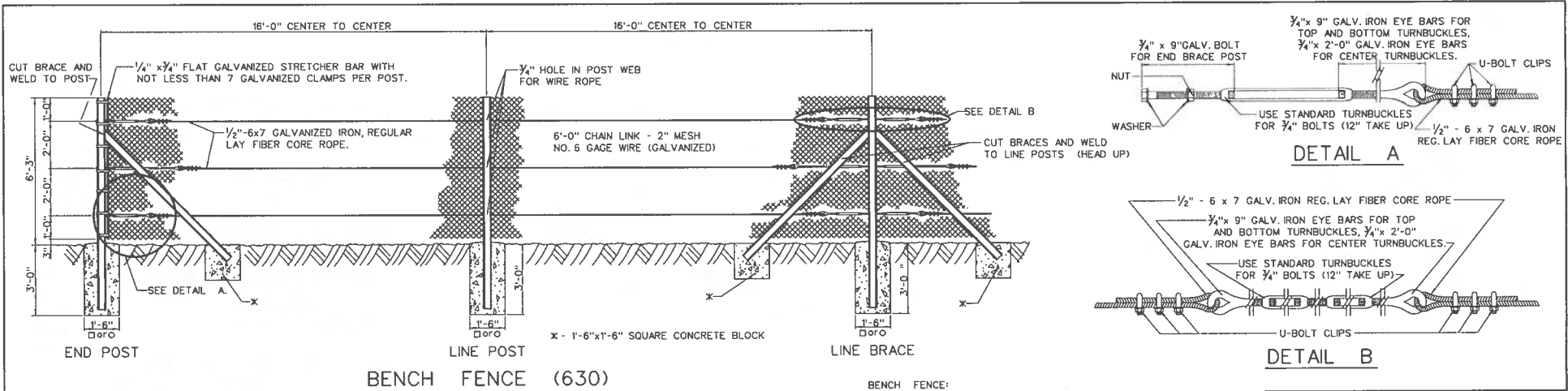
-SPECIFICATION NOTES-

- A ALL WOOD POSTS AND DROPPERS SHALL BE PRESSURE TREATED IN ACCORDANCE WITH AASHTO DESIGNATION OR EQUIVALENT STATE SPECIFICATION.
- B ALL FENCE WIRE, END AND CORNER BRACE ASSEMBLY WIRE SHALL CONSIST OF HIGH TENSILE FENCE WIRE 12 1/2 GA. WITH A MINIMUM OF 280,000 LB/IN TENSILE STRENGTH AND CONFORMS WITH THE REQUIREMENTS FOR CLASS 3 ZINC COATING OF ASTM SPECIFICATION A116.
- C BRACE PINS, DROPPER CLIPS, TENSION INDICATOR SPRINGS, AND IN-LINE STRAINERS SHALL CONFORM WITH THE REQUIREMENTS FOR CLASS 3 ZINC COATING OF ASTM SPECIFICATION A116.
- D STAPLES ARE 13/16 GAUGE WITH SLASH CUT POINTS AND SHALL CONFORM WITH THE REQUIREMENTS FOR CLASS 3 ZINC COATING OF ASTM SPECIFICATION A116.

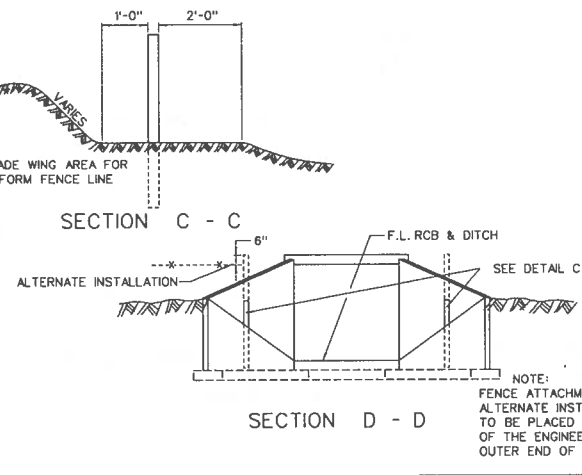
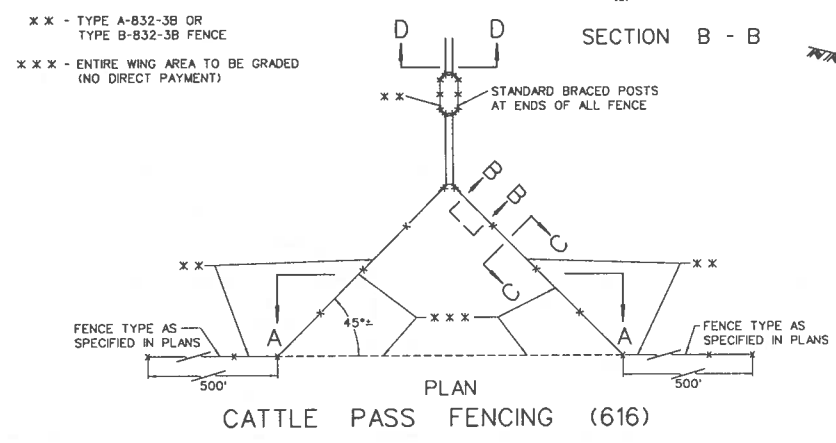
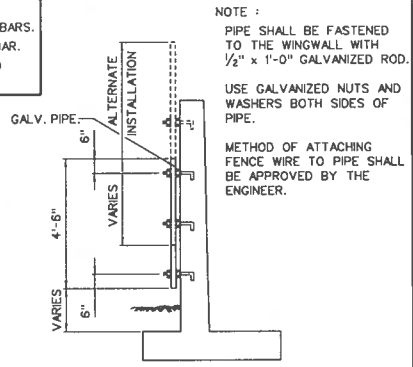
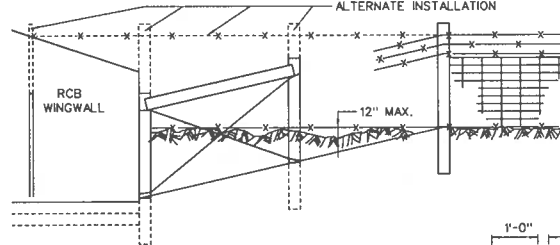
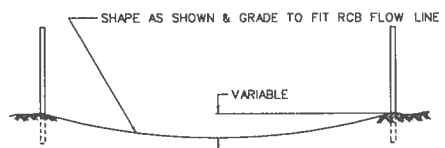
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

**HIGH-TENSILE
8-WIRE RANGE FENCE**

	R-6.1.4 (6/16)
	REVISION
CHIEF ROAD DESIGN, ENGR.	ADOPTED 11/82



- BENCH FENCE:**
1. ALL POSTS AND BRACES SHALL BE 50 POUND CRANE RAIL OR 4"x4"x13 POUND WIDE FLANGE, 9' LONG.
 2. INSTALL LINE BRACES AT INTERVALS NOT EXCEEDING 275'.
 3. ALL POSTS SHALL BE AT 16' CENTERS.
 4. POSTS AND BRACES TO BE SET IN CONCRETE AS SHOWN, EXCEPT IN ROCK THEY MAY BE GROUTED IN DRILL HOLE.
 5. 3 GALVANIZED CROSBY CLIPS OR EQUAL AND 1 GALVANIZED WIRE ROPE THIMBLE SHALL BE USED TO ATTACH WIRE ROPE TO EYE BARS.
 6. CUT GROOVE IN FLANGE OF BRACES FOR WIRE ROPE AND EYE BAR.
 7. SECURE MESH TO LINE POSTS WITH 7 WIRE TIES PER POST, AND TO EACH WIRE ROPE WITH 1 WIRE TIE PER 3 LIN. FEET.



STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

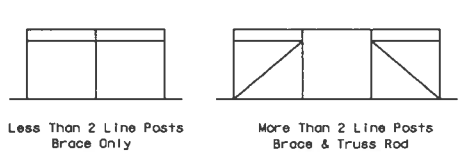
BENCH FENCE AND CATTLE PASS FENCING

R - 6.2.1 (616-630)

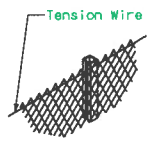
ADOPTED: 8/69 REVISION: 2-11/82

R-50

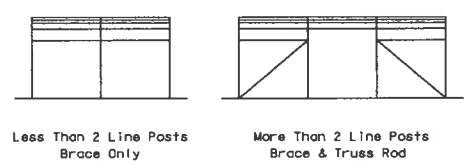
R-51



BRACING ARRANGEMENT

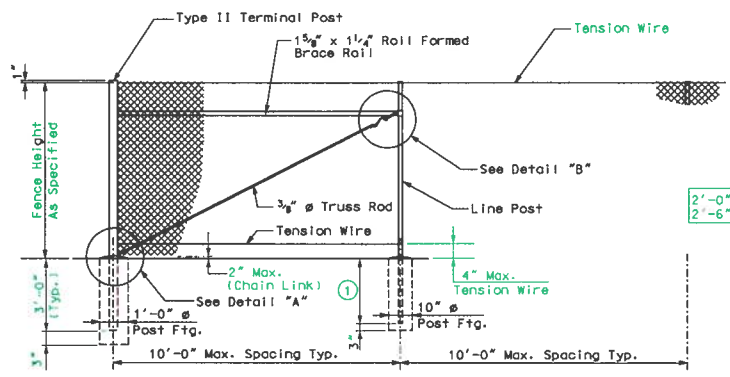


LINE POST TOP

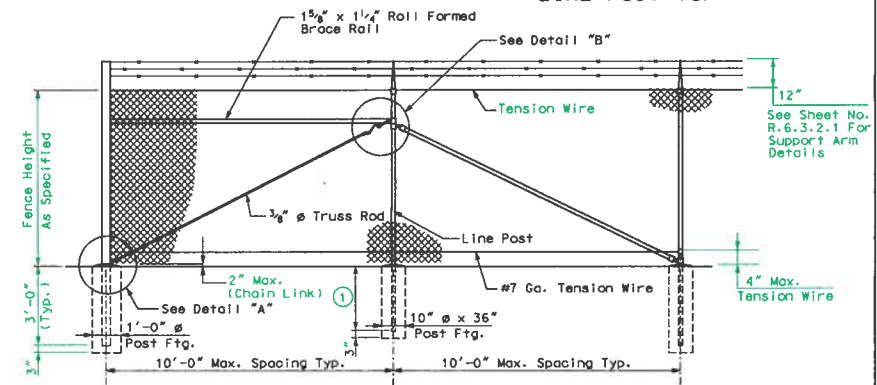


BRACING ARRANGEMENT

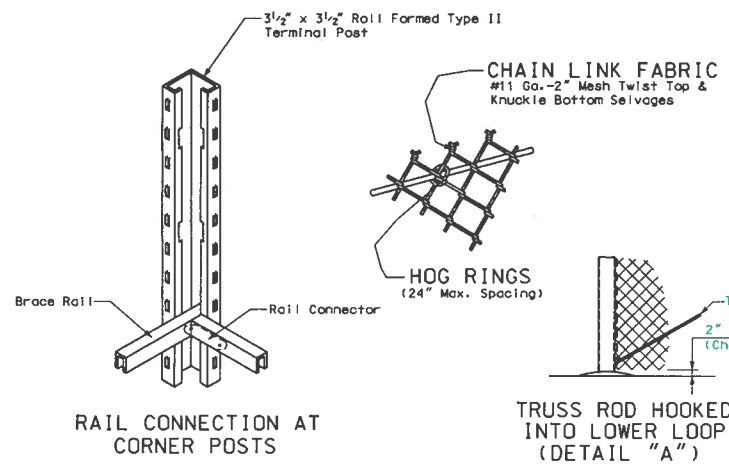
LINE POST TOP



UP TO 72-INCH CHAIN LINK FENCE

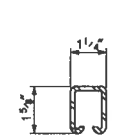


UP TO 72-INCH HEIGHT CHAIN LINK 3B FENCE

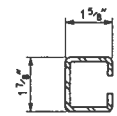


RAIL CONNECTION AT
CORNER POSTS

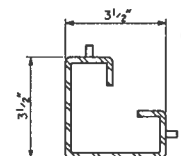
TRUSS ROD HOOKED
INTO LOWER LOOP
(DETAIL "A")



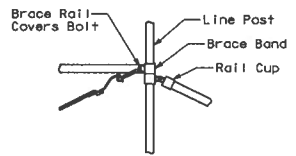
BRACE RAIL



LINE POST



TYPE II TERMINAL POST



BRACE & TRUSS CONNECTION
AT LINE POST
(DETAIL "B")



FABRIC BAND FOR
LINE POST #11 GA.

GENERAL NOTES

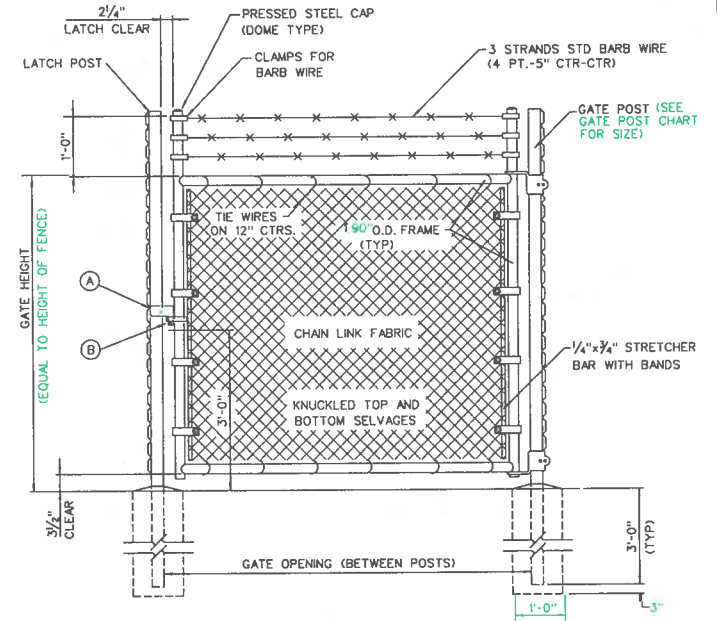
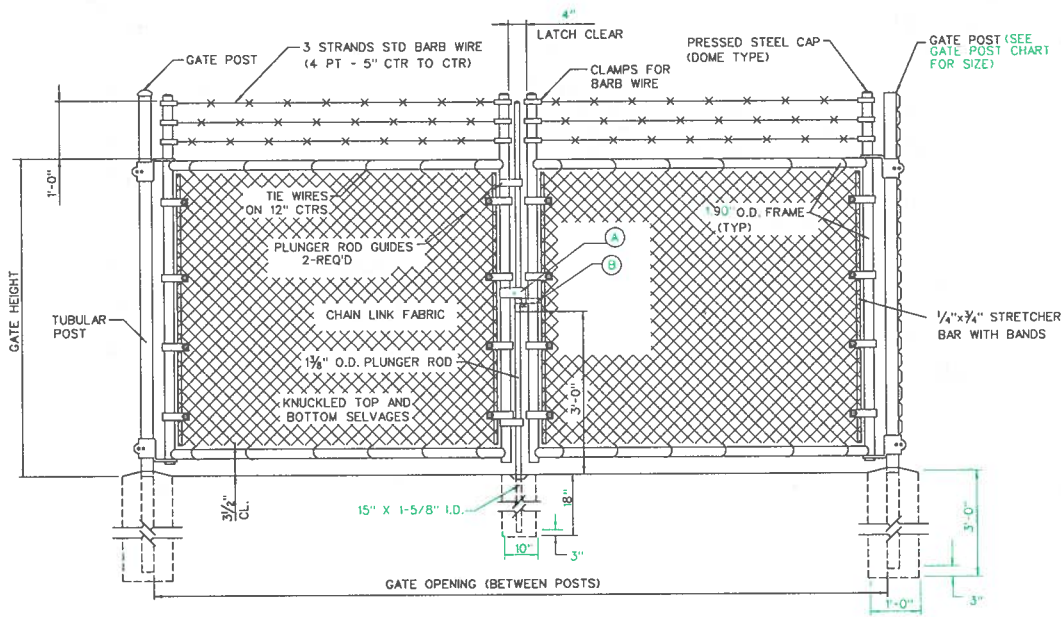
- FENCE POSTS AND MATERIALS SHALL CONFORM TO THE REQUIREMENTS OF STANDARD SPECIFICATIONS AND SUPPLEMENTS.
- CHAIN LINK FENCING SHALL CONSIST OF GALVANIZED CHAIN LINK FABRIC ON STEEL POSTS (TUBULAR OR C-COLUMN).
- (A) ALL POSTS SHALL BE SET IN CLASS A OR AA CONCRETE.
(B) BRACES SHALL BE SPACED APPROXIMATELY 12" BELOW TOP OF TERMINAL POSTS AND SHALL EXTEND FROM END, GATE OR CORNER POSTS TO FIRST ADJACENT LINE POST.
(C) ALL FITTINGS SHALL BE HOT DIPPED GALVANIZED MALLEABLE, CAST IRON, OR PRESSED STEEL.
(D) FABRIC SHALL BE FASTENED TO LINE POSTS WITH FABRIC BANDS SPACED APPROXIMATELY 14" APART, AND TO TOP AND BOTTOM TENSION WIRE WITH HOG RINGS OR 1/2" WIRES SPACED APPROXIMATELY 24" APART.
(E) FOR TUBULAR POST AND BRACERAIL DETAILS, SEE SHEET NO. R-6.1.1.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

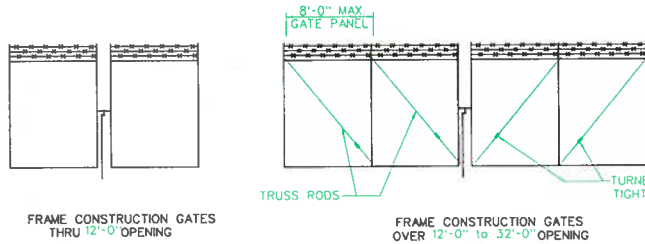
FENCE DETAILS
CHAIN LINK WITH C-TYPE POST

R-6.3.1 (616)

CHIEF ROAD DESIGN ENGR. ADOPTED: 3/79 REV: 5/10

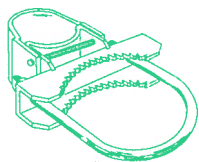
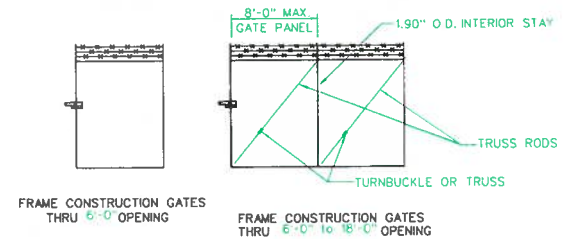


DOUBLE SWING GATE

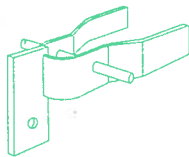


NOTE: 3/8\"/>

SINGLE SWING GATE



HINGE FOR TUBULAR POSTS



A LOCK KEEPER



B LOCK KEEPER GUIDE

GATE POST

GATE OPENING IN FEET		ROUND GATE POSTS O.D. DIA. (INCHES)	MIN WEIGHT POUNDS/LIN. FT.	
SINGLE GATE	DOUBLE GATE		CLASS 1	CLASS 2
UP TO 6	UP TO 12	2.875	5.79	4.64
7 THRU 13	13 THRU 26	4.000	9.11	6.56
14 THRU 18	27 THRU 36	6.625	18.97	—

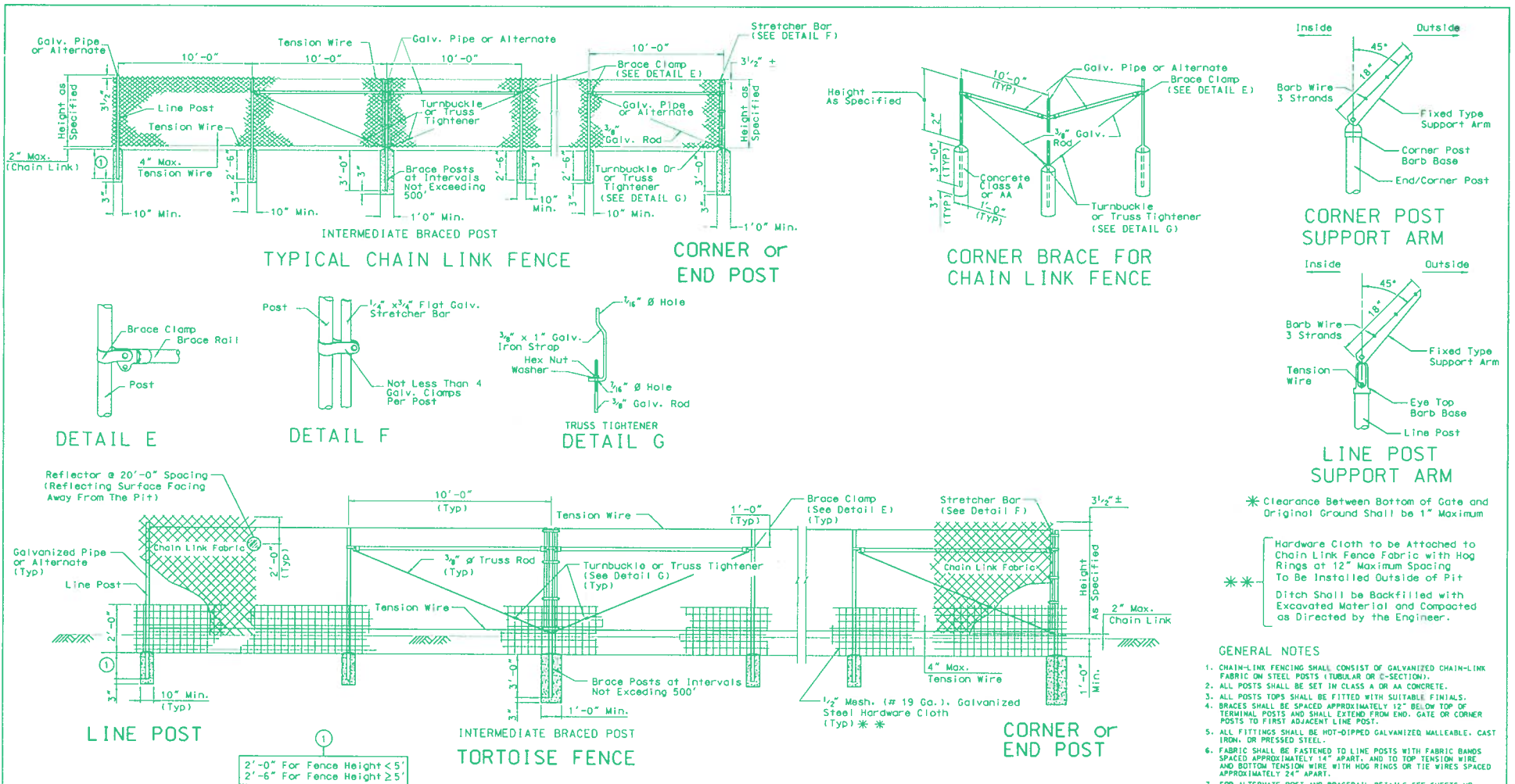
NOTES

- DIAMETERS AND WEIGHTS LISTED ABOVE ARE MINIMUMS. LARGER SIZES MAY BE USED ON APPROVAL OF ENGINEER.
- 3/4" x 3/2" TYPE II POST (4.65 LBS/FT) CAN BE USED IN PLACE OF 2.875" O.D. ROUND GATE POST.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

FENCE DETAILS
SWING GATES FOR UP TO 72 INCH
HEIGHT CHAIN LINK 3B FENCE

 CHIEF ROAD DESIGN ENGR.	R-6.3.2 (616) ADOPTED: 3/79 REVISION: 1/11/82
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SIZE OF POSTS

FENCE HEIGHT	CORNER, END, PULL AND BRACE POSTS				LINE POSTS				BRACE RAIL					
	ROUND PIPE O.D.	MIN. WT. (LBS/L.F.)	TYPE II	MIN. WT. (LBS/L.F.)	ROUND PIPE O.D.	MIN. WT. (LBS/L.F.) CLASS 1	MIN. WT. (LBS/L.F.) CLASS 2	CROSS-SECTION DIMENSIONS	MIN. WT. (LBS/L.F.)	ROUND PIPE O.D.	MIN. WT. (LBS/L.F.) CLASS 1	MIN. WT. (LBS/L.F.) CLASS 2	CROSS-SECTION DIMENSIONS	MIN. WT. (LBS/L.F.)
3' to 6'	2.375"	2.64	3.5"x3.5"	4.85	1.900"	2.72	1.94	1.875"x1.625"	1.60	1.660"	2.27	1.45	1.625"x1.250"	1.35

STATE OF NEVADA
 DEPARTMENT OF TRANSPORTATION

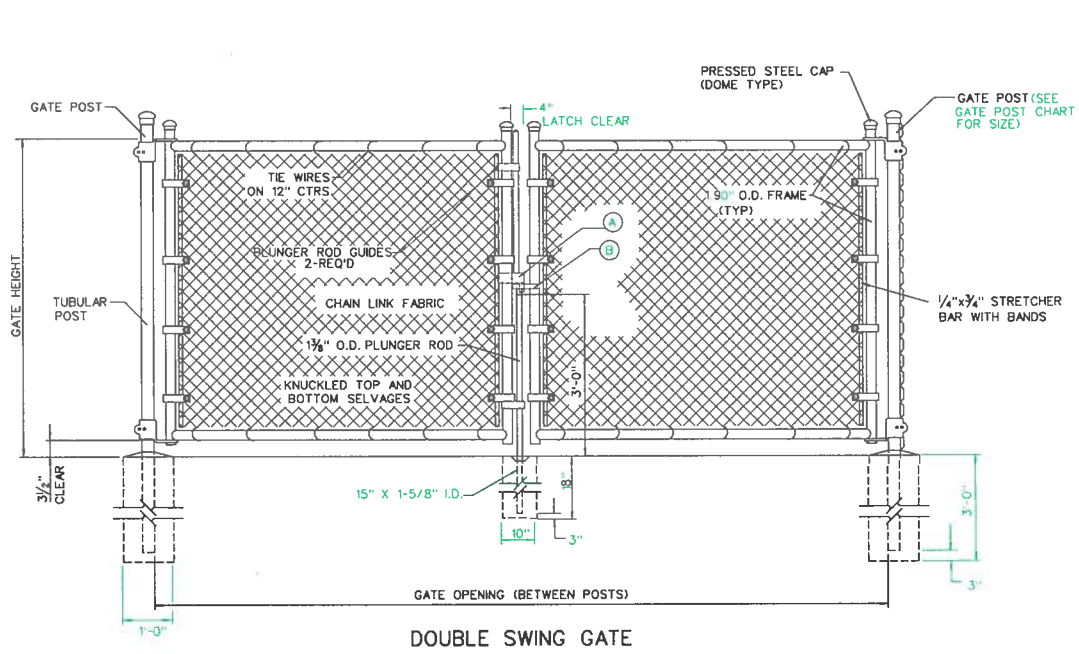
**FENCE DETAILS
 CHAIN LINK FENCE
 UP TO 72" HEIGHT**

R-6.3.2.1

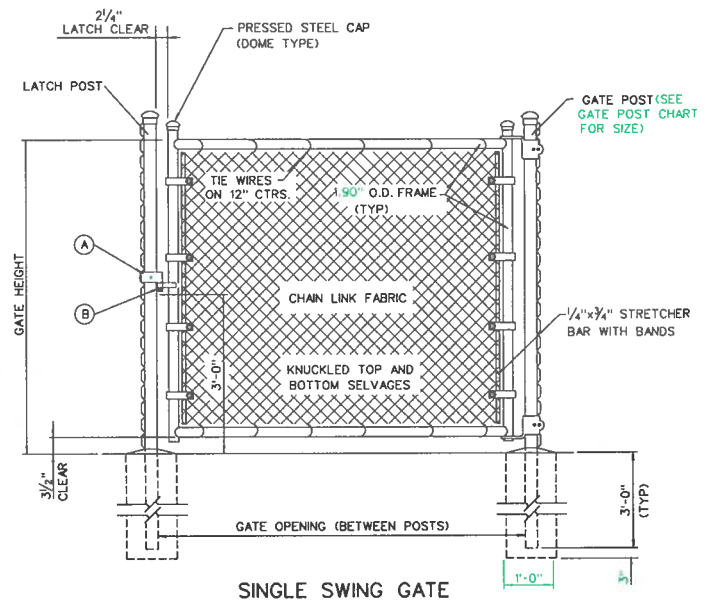
ADOPTED: 10/94

REVISION

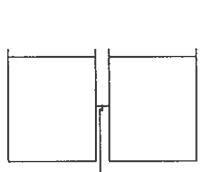
CHIEF ROAD DESIGN ENGR.



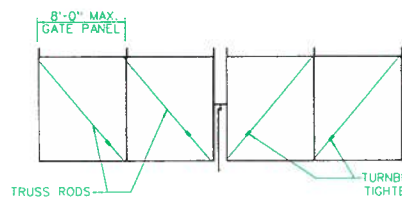
DOUBLE SWING GATE



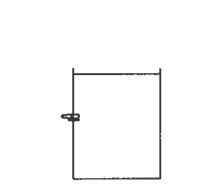
SINGLE SWING GATE



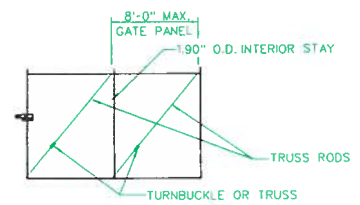
FRAME CONSTRUCTION GATES THRU 12'-0" OPENING



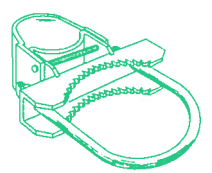
FRAME CONSTRUCTION GATES OVER 12'-0" TO 32'-0" OPENING



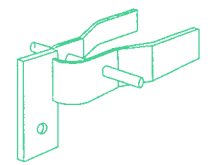
FRAME CONSTRUCTION GATES THRU 8'-0" OPENING



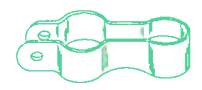
FRAME CONSTRUCTION GATES OVER 8'-0" TO 18'-0" OPENING



HINGE FOR TUBULAR POSTS



A LOCK KEEPER



B LOCK KEEPER GUIDE

GATE OPENING IN FEET		ROUND GATE POSTS O.D. DIA. (INCHES)	MIN. WEIGHT POUNDS/LIN. FT.	
SINGLE GATE	DOUBLE GATE		CLASS 1	CLASS 2
UP TO 6	UP TO 12	2.875	5.79	4.64
7 THRU 13	13 THRU 26	4.000	9.11	6.56
14 THRU 18	27 THRU 36	6.625	18.97	—

- NOTES:
- ① DIAMETERS AND WEIGHTS LISTED ABOVE ARE MINIMUMS. LARGER SIZES MAY BE USED ON APPROVAL OF ENGINEER.
 - ② 3/2" x 3/2" TYPE #POST (4.65 LBS/FT) CAN BE USED IN PLACE OF 2.875" O.D. ROUND GATE POST.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

FENCE DETAILS
SWING GATE FOR UP TO
72-INCH CHAIN LINK FENCE

R-6.3.3 (615)	REVISION 1-11/82
ADOPTED 3/79	CHIEF ROAD DESIGN ENGR.

BILL OF MATERIALS

TIMBER					
ITEM	NO.	REQ'D	SIZE	LENGTH	FT. LBS.
WHEEL GUARDS	2		6"x6"	7'-3"	43.5
WING SLOPE	4		2"x6"	8'-0"	32.0
WING BRACES	2		2"x6"	6'-4 1/2"	12.8
WING BRACES	4		2"x6"	3'-4"	6.7
WING BRACES	4		2"x6"	5'-3"	21.0
WING BRACES	2		2"x6"	7'-3"	14.5
WING BRACES	2		2"x6"	2'-1"	4.2
WING BRACES	2		2"x6"	4'-0"	8.0
WING BRACES	2		2"x6"	3'-0"	10.0
WING POST	2		4"x5"	AS REQUIRED	
NAILING STRIP	2		2"x2"	3'-0"	1.2

GALVANIZED HARDWARE					
ITEM	NO.	REQ'D	SIZE	LENGTH	WT. LBS.
BOLTS	8		3/4"	12"	15
WASHERS	4		3/4"		1 1/2
WASHERS (LOCK)	4		3/4"		1 1/2
NAILED	50		40d		3
NAILED	72		20d		2 1/4
BOLTS	4		3/4"	1 1/2"	1
TOTAL					22 3/4

STRUCTURAL STEEL

12' ROADBED					
ITEM	NO.	REQ'D	SIZE	LENGTH	WT. LBS.
I BEAMS	13		S4x7.7	13'-0"	1,301
I BEAMS	6		S8x18.4	7'-3"	800
SPACERS	72		2 1/2"x5/16"	0'-6 1/2"	109
ANCHOR BOLTS	12		7/8"	1'-0"	12
END PLATES	2		8"x1/2"	13'-0"	177
STEEL STRAPS	3		4"x1/4"	7'-2"	99
TOTAL					2,473

14' ROADBED					
ITEM	NO.	REQ'D	SIZE	LENGTH	WT. LBS.
I BEAMS	13		S4x7.7	15'-0"	1,502
I BEAMS	7		S8x18.4	7'-3"	934
SPACERS	84		2 1/2"x5/16"	0'-6 1/2"	127
ANCHOR BOLTS	2		8"x1/4"	1'-0"	204
END PLATES	4		4"x1/4"	15'-0"	99
STEEL STRAPS	4		4"x1/4"	7'-2"	99
TOTAL					2,879

16' ROADBED					
ITEM	NO.	REQ'D	SIZE	LENGTH	WT. LBS.
I BEAMS	13		S4x7.7	17'-0"	1,702
I BEAMS	8		S8x18.4	7'-3"	1,047
SPACERS	96		2 1/2"x5/16"	0'-6 1/2"	144
ANCHOR BOLTS	14		7/8"	1'-0"	14
END PLATES	2		8"x1/4"	17'-0"	231
STEEL STRAPS	4		4"x1/4"	7'-2"	99
TOTAL					3,239

20' ROADBED					
ITEM	NO.	REQ'D	SIZE	LENGTH	WT. LBS.
I BEAMS	13		S4x7.7	21'-0"	2,102
I BEAMS	9		S8x18.4	7'-3"	1,201
SPACERS	108		2 1/2"x5/16"	0'-6 1/2"	163
ANCHOR BOLTS	18		7/8"	1'-0"	18
END PLATES	2		8"x1/4"	21'-0"	288
STEEL STRAPS	5		4"x1/4"	7'-2"	122
TOTAL					3,892

ALL ROADBED WIDTH					
ITEM	NO.	REQ'D	SIZE	LENGTH	WT. LBS.
CONC. METAL PIPE	1		12"	00d'-0"	20

PIPE LENGTH & DRAINAGE DITCH SHALL BE AS INDICATED ON THE PLANS.
SACKED ROCK AT END OF PIPE WILL NOT BE PERMITTED

REINFORCING

12' ROADBED					
ITEM	NO.	REQ'D	SIZE	LENGTH	WT. LBS.
HORIZONTAL BARS	*12		#12	12'-6"	100
HORIZONTAL BARS	12		#12	4' 7'-0"	56
HORIZONTAL BARS	18		#12	4' 16'-9"	301
VERTICAL BARS	20		#12	4' 2'-9"	37
U-BARS	22		#12	4' 12'-11"	400
HORIZONTAL BARS	4		#12	4' 13'-9"	35
TOTAL					900

14' ROADBED					
ITEM	NO.	REQ'D	SIZE	LENGTH	WT. LBS.
HORIZONTAL BARS	*12		#12	14'-6"	118
HORIZONTAL BARS	13		#12	4' 7'-0"	61
HORIZONTAL BARS	18		#12	4' 18'-9"	225
VERTICAL BARS	22		#12	4' 2'-9"	40
U-BARS	24		#12	4' 12'-11"	436
HORIZONTAL BARS	4		#12	4' 15'-2"	41
TOTAL					1,009

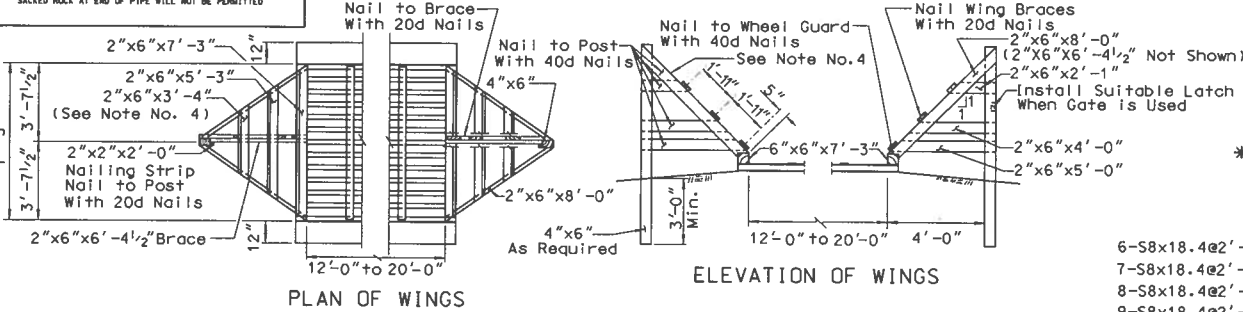
16' ROADBED					
ITEM	NO.	REQ'D	SIZE	LENGTH	WT. LBS.
HORIZONTAL BARS	*12		#12	16'-6"	132
HORIZONTAL BARS	15		#12	4' 7'-0"	70
HORIZONTAL BARS	18		#12	4' 20'-9"	249
VERTICAL BARS	26		#12	4' 2'-9"	48
U-BARS	29		#12	4' 12'-11"	527
HORIZONTAL BARS	4		#12	4' 17'-2"	46
TOTAL					1,125

20' ROADBED					
ITEM	NO.	REQ'D	SIZE	LENGTH	WT. LBS.
HORIZONTAL BARS	*12		#12	20'-6"	164
HORIZONTAL BARS	17		#12	4' 7'-0"	79
HORIZONTAL BARS	18		#12	4' 24'-9"	291
VERTICAL BARS	30		#12	4' 2'-9"	55
U-BARS	36		#12	4' 12'-11"	654
HORIZONTAL BARS	4		#12	4' 21'-2"	57
TOTAL					1,358

* NO. 4 BARS WELDED TO # 1 BEAMS

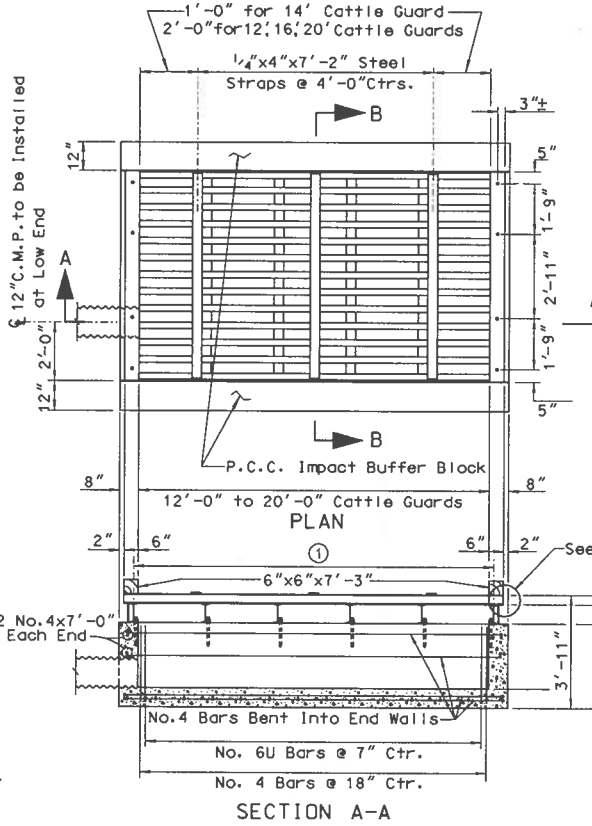
- ALL CONCRETE TO BE CLASS A, OR AA.
- STANDARD METAL OR TIMBER GATES SHALL BE CONSTRUCTED WHEN SHOWN ON PLANS OR ORDERED BY THE ENGINEER.
- ALL CONNECTIONS TO BE WELDED.
- ALL TIMBER SHALL BE PAINTED WHITE PER STANDARD SPECIFICATIONS.
- METAL WINGS ARE OPTIONAL. SEE DETAIL "A". FOR ADDITIONAL DETAILS AND QUANTITIES SEE SHEET R-7.1.3.
- ALL WINGS SHALL BE PAINTED WHITE PER STANDARD SPECIFICATIONS.

NOTE: CATTLE GUARD WIDTH SHALL INCLUDE A 2'SHY DISTANCE FROM THE EDGE OF TRAVEL WAY, EACH SIDE.

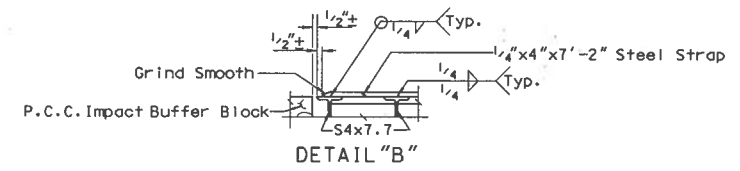


PLAN OF WINGS

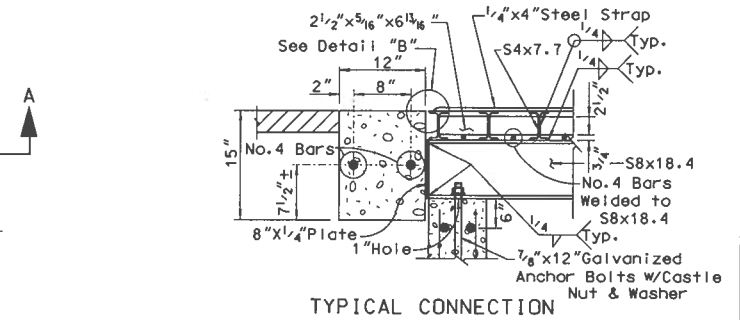
ELEVATION OF WINGS



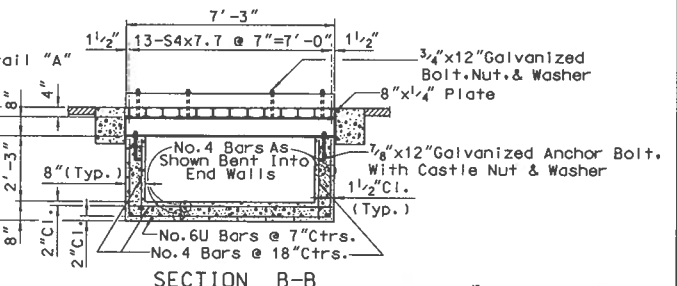
SECTION A-A



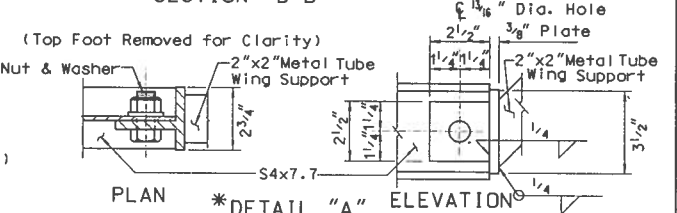
DETAIL "B"



TYPICAL CONNECTION



SECTION B-B



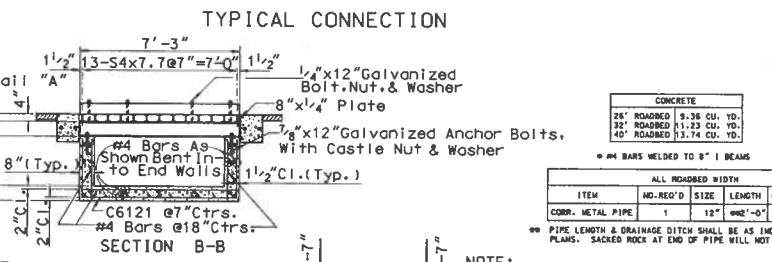
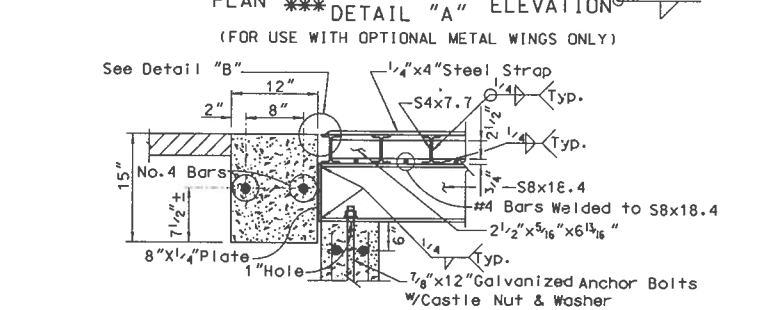
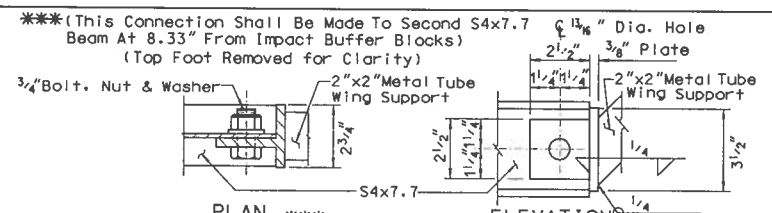
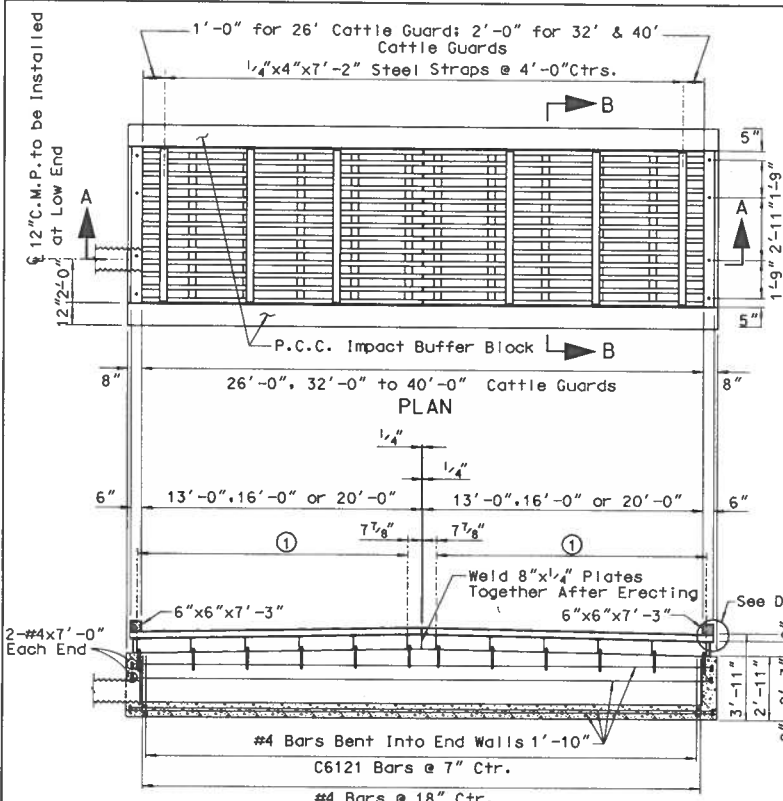
PLAN *DETAIL "A" ELEVATION*

*(FOR USE WITH OPTIONAL METAL WINGS ONLY)
*(This Connection Shall Be Made To Second S4x7.7 Beam At 8.33' From Impact Buffer Blocks)

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION	
STEEL CATTLE GUARD 12' TO 20' ROADBED	
R-7.1.1 - (617)	REVISION 5-1-88
CHIEF ROAD DESIGN ENGR.	ADOPTED - 8/69

R-5

R-56



STRUCTURAL STEEL

26' ROADED					
ITEM	NO.	REQ'D	SIZE	LENGTH	WT. LBS.
I BEAMS	26		S4x7.7	13'-3 1/2"	2,999
I BEAMS	12		S8x18.4	7'-3"	1,331
SPACERS	144		2 1/2" x 3/8"	0'-8 3/4"	217
ANCHOR BOLTS	24		1/2"	1'-0"	23
END PLATES	4		7 1/2" x 14"	13'-6"	320
STEEL STRAPS	7		4" x 1/4"	7'-2"	171
TOTAL					4,567

32' ROADED					
ITEM	NO.	REQ'D	SIZE	LENGTH	WT. LBS.
I BEAMS	26		S4x7.7	20'-5 1/2"	4,100
I BEAMS	14		S8x18.4	7'-3"	1,997
SPACERS	168		2 1/2" x 3/8"	0'-8 3/4"	254
ANCHOR BOLTS	28		1/2"	1'-0"	27
END PLATES	4		7 1/2" x 14"	16'-6"	392
STEEL STRAPS	8		4" x 1/4"	7'-2"	195
TOTAL					8,408

40' ROADED					
ITEM	NO.	REQ'D	SIZE	LENGTH	WT. LBS.
I BEAMS	26		S4x7.7	20'-5 1/2"	4,100
I BEAMS	10		S8x18.4	7'-3"	1,997
SPACERS	216		2 1/2" x 3/8"	0'-8 3/4"	326
ANCHOR BOLTS	36		1/2"	1'-0"	35
END PLATES	4		7 1/2" x 14"	20'-6"	487
STEEL STRAPS	10		4" x 1/4"	7'-2"	264
TOTAL					6,959

REINFORCING

26' ROADED					
ITEM	NO.	REQ'D	SIZE	LENGTH	WT. LBS.
HORIZONTAL BARS	#24	NO. 4	13'-3"	212	
HORIZONTAL BARS	22	NO. 4	7'-0"	103	
HORIZONTAL BARS	18	NO. 4	30'-9"	370	
VERTICAL BARS	40	NO. 4	2'-8"	14	
U-BARS	50	NO. 6	12'-1"	907	
HORIZONTAL BARS	4	NO. 4	27'-2"	72	
TOTAL				1738	

32' ROADED					
ITEM	NO.	REQ'D	SIZE	LENGTH	WT. LBS.
HORIZONTAL BARS	#24	NO. 4	16'-3"	260	
HORIZONTAL BARS	26	NO. 4	11'-0"	122	
HORIZONTAL BARS	18	NO. 4	36'-9"	442	
VERTICAL BARS	48	NO. 4	2'-9"	88	
U-BARS	60	NO. 6	12'-1"	1088	
HORIZONTAL BARS	4	NO. 4	33'-2"	89	
TOTAL				2,089	

40' ROADED					
ITEM	NO.	REQ'D	SIZE	LENGTH	WT. LBS.
HORIZONTAL BARS	#24	NO. 4	20'-3"	325	
HORIZONTAL BARS	31	NO. 4	7'-0"	145	
HORIZONTAL BARS	18	NO. 4	44'-9"	528	
VERTICAL BARS	58	NO. 4	2'-9"	107	
U-BARS	74	NO. 6	12'-1"	1344	
HORIZONTAL BARS	4	NO. 4	41'-2"	110	
TOTAL				2,568	

CONCRETE

ITEM	NO.	REQ'D	SIZE	LENGTH	WT. LBS.
26' ROADED	1		3.36 CU. YD.		
32' ROADED	1		1.23 CU. YD.		
40' ROADED	1		3.74 CU. YD.		

ALL ROADED WIDTH					
ITEM	NO.	REQ'D	SIZE	LENGTH	WT. LBS.
CORR. METAL PIPE	1		12" DIA.	20'	

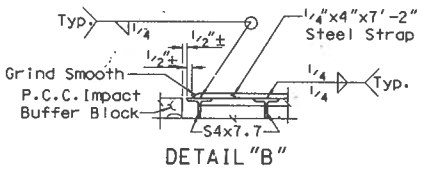
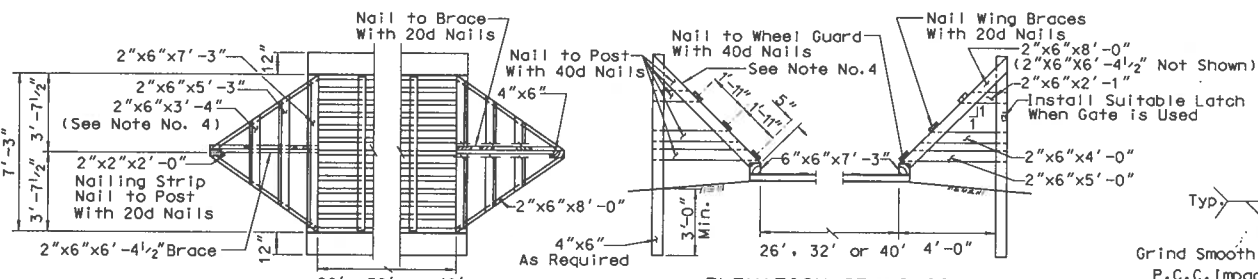
PIPE LENGTH & DRAINAGE DITCH SHALL BE AS INDICATED ON THE PLANS. SACKED ROCK AT END OF PIPE WILL NOT BE PERMITTED.

- NOTE:
- ALL CONCRETE TO BE CLASS A. OR AA.
 - STANDARD METAL OR TIMBER GATES SHALL BE CONSTRUCTED WHEN SHOWN ON PLANS OR ORDERED BY THE ENGINEER.
 - ALL CONNECTIONS TO BE WELDED.
 - ALL TIMBER SHALL BE PAINTED WHITE PER STANDARD SPECIFICATIONS.
 - METAL WINGS ARE OPTIONAL. SEE DETAIL "A". FOR ADDITIONAL DETAILS AND QUANTITIES SEE SHEET R-7.1.3.
 - ALL WINGS SHALL BE PAINTED WHITE PER STANDARD SPECIFICATIONS.

BILL OF MATERIALS

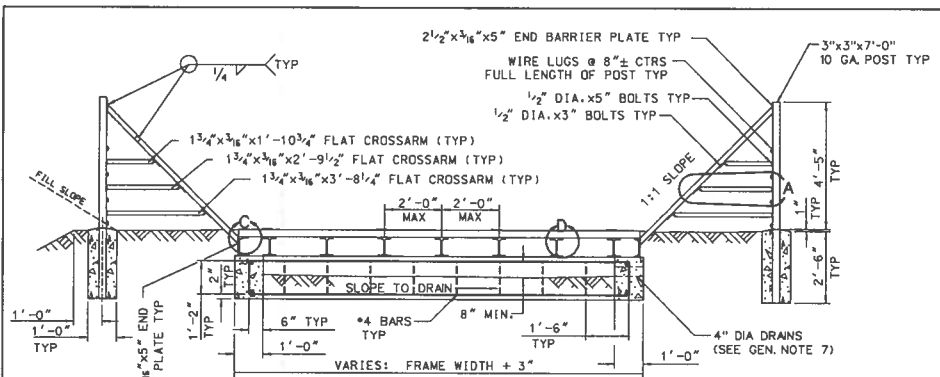
TIMBER					
ITEM	NO.	REQ'D	SIZE	LENGTH	FT. BM
WHEEL GUARDS	2		6"x8"	7'-3"	43.5
WING SLOPE	4		2"x6"	8'-0"	32.0
WING BRACES	2		2"x6"	6'-4 1/2"	12.8
WING BRACES	4		2"x6"	3'-4"	6.2
WING BRACES	2		2"x6"	5'-3"	21.0
WING BRACES	2		2"x6"	7'-3"	14.5
WING BRACES	2		2"x6"	2'-1"	4.2
WING BRACES	2		2"x6"	4'-0"	8.0
WING POST	2		2"x6"	5'-0"	10.0
WALLING STRIP	2		4"x6"	AS REQUIRED	1.3

GALVANIZED HARDWARE					
ITEM	NO.	REQ'D	SIZE	LENGTH	WT. LBS.
BOLTS	8		3/4" # 8	12"	18
WASHERS	8		3/4" # 8		6
WASHERS (LOCK)	4		3/4" # 8		3
NAILS	500		40#		2-1/2
NAILS	72		20d		2-1/2
BOLTS	4		3/4" # 1 1/2		22-3/4
TOTAL					

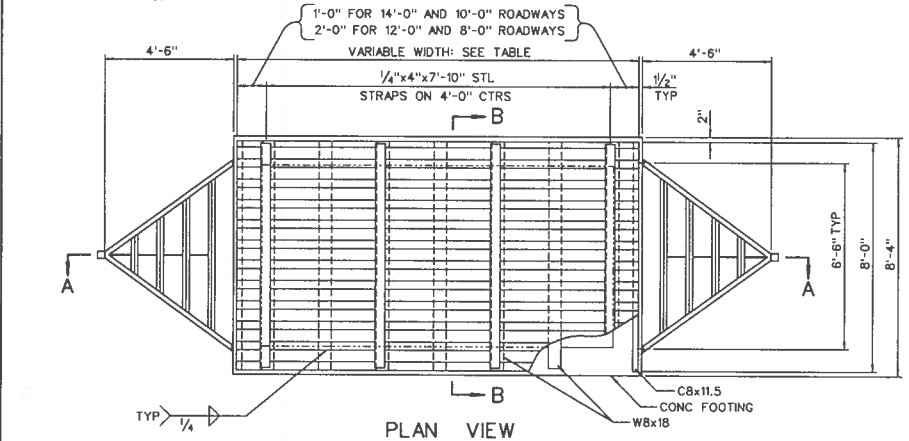


ELEVATION OF WINGS
 NOTE: CATTLE GUARD WIDTH SHALL INCLUDE A 2'SHY DISTANCE FROM THE EDGE OF TRAVEL WAY, EACH SIDE.

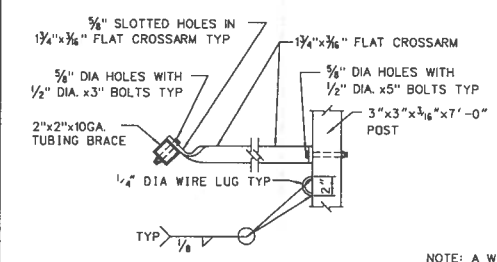
STATE OF NEVADA
 DEPARTMENT OF TRANSPORTATION
STEEL CATTLE GUARD
 26' TO 40' ROADED
 R-7.1.2 - (617)
 CHIEF ROAD DESIGN ENGR. ACCEPTED - 8/69 REVISION 4-1/88



SECTION A-A

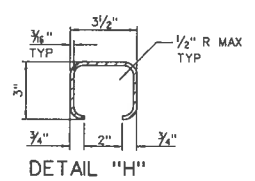


PLAN VIEW

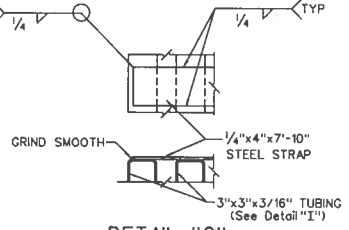


DETAIL "A"

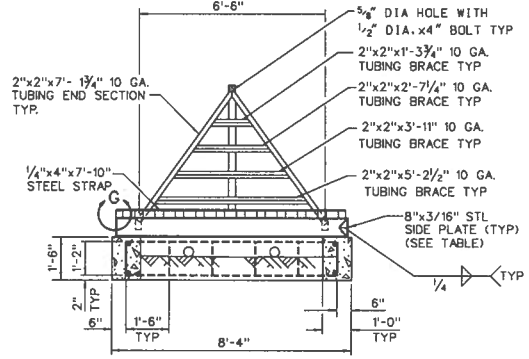
THIS DESIGN IS NOT FOR USE ON MAINLINES, RAMPS, OR CROSSROADS



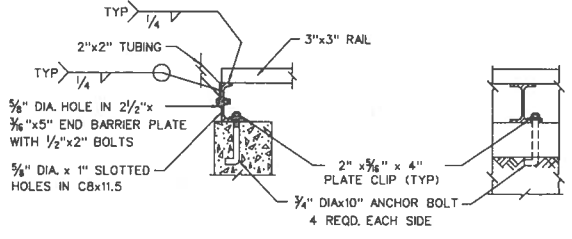
DETAIL "H"



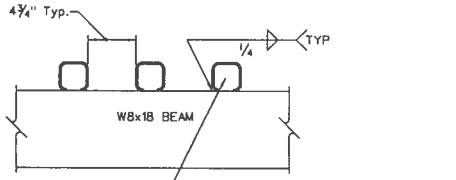
DETAIL "C"



SECTION B-B



DETAILS "C" & "D"



DETAIL "I"

- GENERAL NOTES
1. ALL CONCRETE SHALL BE CLASS A OR AA.
 2. ALTERNATIVE DESIGN MAY BE SUBSTITUTED BY THE CONTRACTOR FOR APPROVAL BY THE ENGINEER.
 3. LIVE LOADS: H=20
 4. CATTLE GUARD SLOPE IS TO CONFORM TO THE ROADWAY CROSS SLOPE AND GRADE.
 5. SEE SPECIAL PROVISIONS FOR PROTECTIVE FINISH.
 6. "FRAME WIDTH" COMBINATIONS MAY BE VARIED TO OBTAIN THE SPECIFIED WIDTH OF CATTLE GUARDS.
 7. EXTEND 4" DRAINS TO FACILITATE DRAINAGE OF STRUCTURE.
 8. ALL WINGS SHALL BE PAINTED WHITE PER STANDARD SPECIFICATION.

BILL OF MATERIALS

FRAME SIZE		LONGITUDINAL STRINGERS			
LENGTH	WIDTH	NO. REOD	SIZE	SPACING	WT. LBS
8'-0"	14'-0"	6	W8x18	EQUAL	859
8'-0"	12'-0"	5	W8x18	EQUAL	716
8'-0"	10'-0"	4	W8x18	EQUAL	573
8'-0"	8'-0"	3	W8x18	EQUAL	430

STRUCTURAL STEEL

ITEM	NO. REOD	SIZE	LENGTH	WT. LBS
RAILS	13	3"x3"x3/16"	14'-0"	1249
SIDE PLATE	2	8"x3/16"	14'-0"	143
RAILS	13	3"x3"x3/16"	12'-0"	1070
SIDE PLATE	2	8"x3/16"	12'-0"	122
RAILS	13	3"x3"x3/16"	10'-0"	892
SIDE RAILS	2	8"x3/16"	10'-0"	102
RAILS	13	3"x3"x3/16"	8'-0"	713
SIDE RAILS	2	8"x3/16"	8'-0"	82

STRUCTURAL STEEL

ROAD WIDTH	ITEM	NO. REOD	SIZE	WT. LBS
14'	STEEL STRAP	4	1/4"x4"x7'-10"	107
12'	STEEL STRAP	3	1/4"x4"x7'-10"	80
10'	STEEL STRAP	3	1/4"x4"x7'-10"	80
8'	STEEL STRAP	2	1/4"x4"x7'-10"	53

MATERIAL LIST FOR ALL SIZES

ITEM	NO. REOD	SIZE	LENGTH	WT. LBS
FLAT CROSSARMS	2	1-3/4"x3/16"	1'-10 3/4"	4
FLAT CROSSARMS	2	1-3/4"x3/16"	2'-9 1/2"	6
FLAT CROSSARMS	2	1-3/4"x3/16"	3'-8 1/4"	8
BRACES	2	2"x2"x10 GA	1'-3 3/4"	11
BRACES	2	2"x2"x10 GA	2'-7 1/4"	23
BRACES	2	2"x2"x10 GA	3'-11"	38
BRACES	2	2"x2"x10 GA	5'-2 1/2"	45
END BARRIER	4	2"x2"x10 GA	7'-1 3/4"	123
END BARRIER PLATE	6	2 1/2"x3/16"	5"	4
UPRIGHT POST	2	3"x3"x 3/16"	7'-0"	96

MATERIAL LIST FOR ALL SIZES

ITEM	NO. REOD	SIZE	LENGTH	WT. LBS
CHANNELS	2	C8x11.5	8'-0"	184
PLATE CLIP	12	2"x3/8"	4 1/2"	9
ANCHOR BOLT CLIP	14	2"x5/16"	4"	10

CONCRETE REINFORCING STEEL

LENGTH	CUBIC YDS.	WT. LBS
14'-0"	2.29	82
12'-0"	2.06	74
10'-0"	1.84	67
8'-0"	1.62	60

GALVANIZED HARDWARE

ITEM	NO. REOD	SIZE	LENGTH
BOLT	6	1/2"	3"
BOLT	16	1/2"	2"
BOLT	6	1/2"	5"
WASHER	56	9 1/16"	-
WASHER	14	13/16"	-
NUT	28	1/2"	-
NUT	14	3/4"	-
ANCHOR BOLT	14	3/4"	-

NOTE: MATERIAL LISTS ARE FOR INFORMATION ONLY.

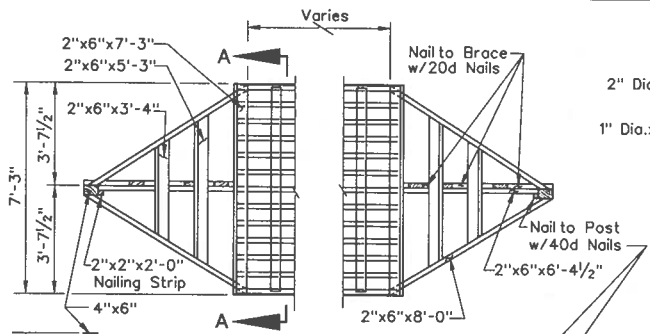
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

STEEL CATTLE GUARD

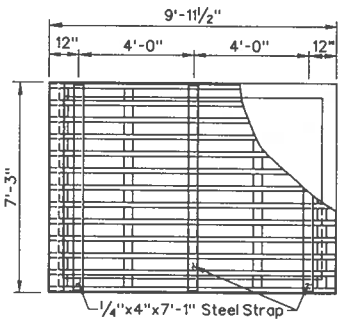
(TYPE B)

R-7.1.3 (617)

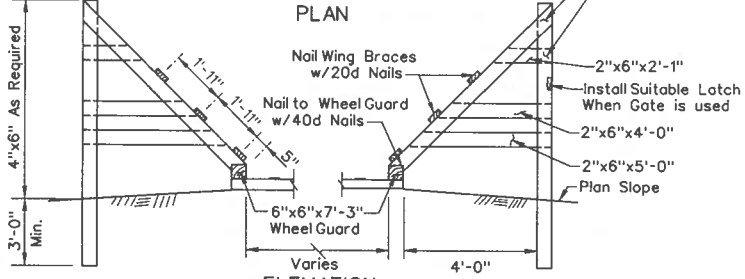
CHIEF ROAD-DESIGN ENGR. ADOPED, 3-71 REVISION 1-18/85



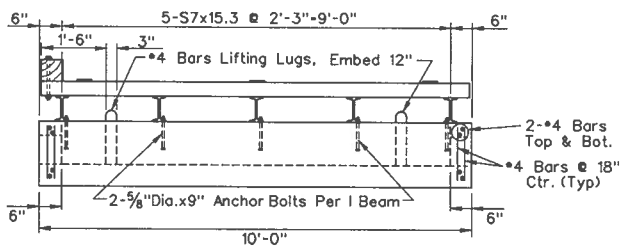
CONNECTION DETAIL



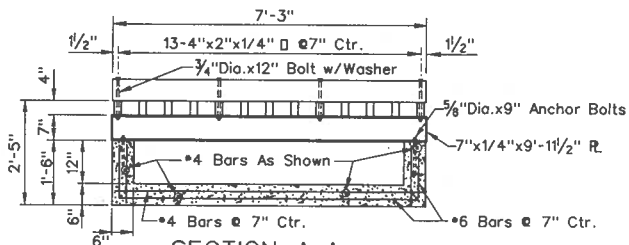
PLAN



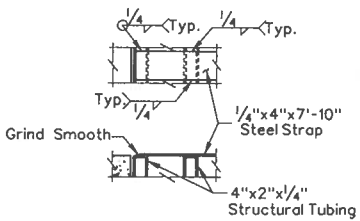
ELEVATION
TIMBER WINGS



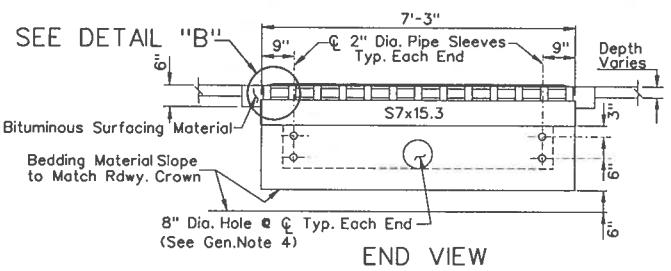
ELEVATION



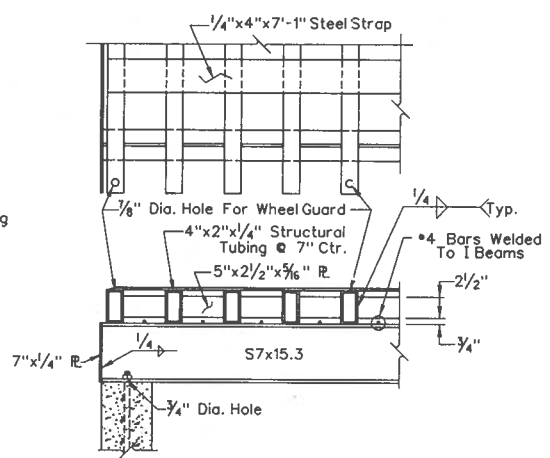
SECTION A-A



DETAIL "B"



END VIEW



TYPICAL CONNECTION

STRUCTURAL STEEL (1-10'-0" COMPONENT)				
ITEM	NO. REQUIRED	SIZE	LENGTH	WT. LBS.
BEAMS	5	5"x15.3	7'-3"	804.6
STRUCTURAL TUBING	13	4"x2"x1/4"	9'-11 1/2"	1138.3
SPACER PLATES	60	2 1/2"x3/8"	0'-5"	67.0
ANCHOR BOLTS	10	5/8"	0'-9"	9.0
STEEL STRAPS	3	4"x1/4"	7'-1"	72.3
END PLATES	2	7"x1/4"	9'-11 1/2"	118.5
PIPE SLEEVES	8	2"	0'-6"	14.6
CONNECTION PLATES	AS REQ'D	9"x4"x1/4"	-	-
CONNECTION BOLTS	AS REQ'D	1"	15"	-

REINFORCING STEEL (1-10'-0" COMPONENT)				
ITEM	NO. REQUIRED	SIZE	LENGTH	WT. LBS.
* HORIZONTAL BARS	12	NO. 4	9'-6"	76
HORIZONTAL BARS	18	NO. 4	9'-0"	117
HORIZONTAL BARS	18	NO. 6	7'-0"	84
VERTICAL BARS	44	NO. 4	1'-3"	37
LIFTING LUGS	4	NO. 4	2'-9"	7
U BARS	18	NO. 6	9'-8"	259
TOTAL				580

TIMBER				
ITEM	NO. REQUIRED	SIZE	LENGTH	BO. FT.
WHEEL GUARDS	2	6"x6"	7'-3"	43.5
WING SLOPE	4	2"x6"	8'-0"	32.0
WING BRACES	2	2"x6"	6'-4 1/2"	12.8
WING BRACES	2	2"x6"	3'-4"	6.7
WING BRACES	4	2"x6"	5'-3"	21.0
WING BRACES	2	2"x6"	7'-3"	14.5
WING BRACES	2	2"x6"	2'-1"	4.2
WING BRACES	2	2"x6"	4'-0"	8.0
WING BRACES	2	2"x6"	5'-0"	17.0
WING POST	2	4"x6"	AS REQUIRED	-
NAILING STRIP	2	2"x2"	2'-0"	1.3

GALVANIZED HARDWARE				
ITEM	NO. REQUIRED	SIZE	LENGTH	WT. LBS.
BOLTS	8	3/4" DIA.	12"	15
WASHERS	8	3/4"	-	6
NAILS	50	40d	-	3
NAILS	72	40d	-	2 1/4
TOTAL				26 1/4

CONCRETE	
1-10'-0" COMPONENT	1.94 CU. YDS.

- GENERAL NOTES**
- ALL CONCRETE TO BE CLASS DA.
 - ALL CONNECTIONS TO BE WELDED.
 - WHEN GATE IS NOT SPECIFIED: INSTALL THE REQUIRED TYPE OF INTERMEDIATE BRACED POST ADJACENT TO THE WING POST. FENCE WIRES TO BE TIED TO BRACED POST ONLY.
 - EXTEND DRAIN PIPES TO FACILITATE DRAINAGE OF STRUCTURE.
 - WINGS SHALL BE PAINTED WHITE PER STANDARD SPECIFICATIONS.

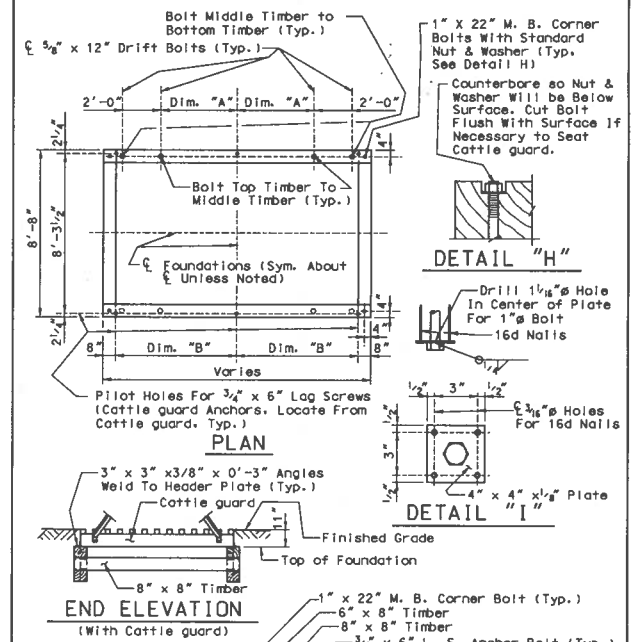
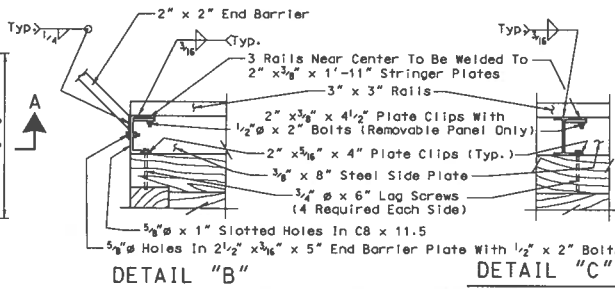
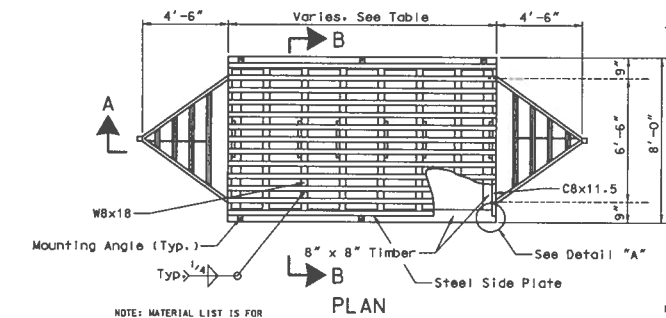
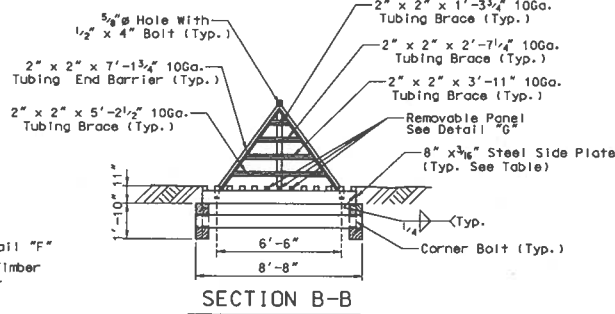
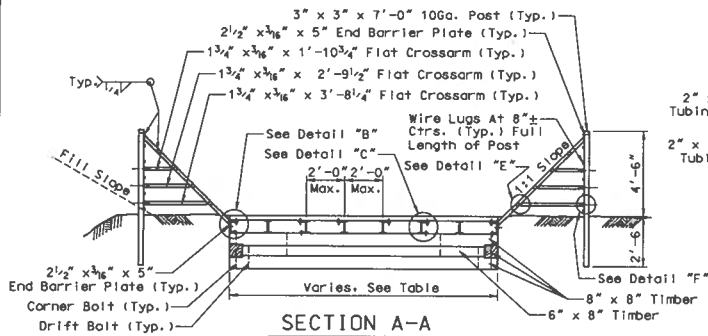
THIS DESIGN IS NOT FOR USE ON MAINLINES, RAMPS, OR CROSSROADS

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

**STEEL CATTLE GUARD
(TYPE C)**

R-7.1.4 (617)

CHIEF ROAD DESIGN ENGR. ADOPTED: 10/70 REVISION: 3/10/85

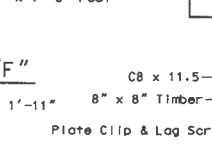
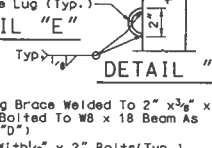
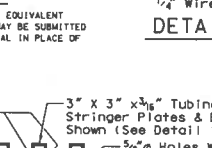
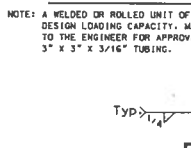
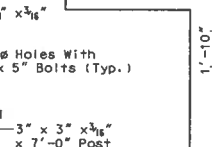
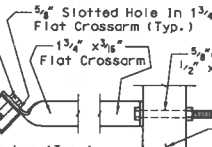
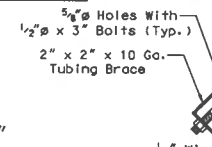
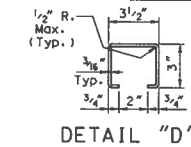


NOTE: MATERIAL LIST IS FOR INFORMATION ONLY.

MATERIAL LIST FOR WINGS				
ITEM	REQD.	SIZE	LENGTH	WT. LBS.
FLAT CROSSARMS	2	1 3/4" x 3/16"	1'-10 3/4"	4
FLAT CROSSARMS	2	1 3/4" x 3/16"	2'-9 1/2"	6
FLAT CROSSARMS	2	1 3/4" x 3/16"	3'-3 1/4"	8
BRACES	2	2" x 2" x 10GA.	1'-3 3/4"	11
BRACES	2	2" x 2" x 10GA.	2'-7 1/4"	23
BRACES	2	2" x 2" x 10GA.	3'-11"	38
BRACES	2	2" x 2" x 10GA.	5'-2 1/2"	45
END BARRIER	4	2" x 2" x 10GA.	7'-1 3/4"	123
END BARRIER PLATES	6	2 1/2" x 3/16"	5"	4
UPRIGHT POST	2	3" x 3" x 3/16"	7'-0"	96

THIS DESIGN IS NOT FOR USE ON MAINLINES, RAMPS, OR CROSSROADS

GALVANIZED HARDWARE			
ITEM	NO. REQD.	SIZE	LENGTH
BOLTS	6	1/2"	3"
BOLTS	6	1/2"	5"
BOLTS	16	1/2"	2"
WASHERS	56	9/16"	
WASHERS	14	13/16"	
NUTS	28	1/2"	
NUTS	14	3/4"	
LAC SCREWS	14	3/4"	6"



BILL OF MATERIALS										
FRAME SIZE		LONGITUDINAL STRINGERS				STRUCTURAL STEEL				
LENGTH	WIDTH	NO. REQD.	SIZE	SPACING	WT. LBS.	ITEM	NO. REQD.	SIZE	LENGTH	WT. LBS.
8'-0"	14'-0"	6	WBX18	EQUAL	859	RAILS	13	3" x 3" x 3/8"	14'-0"	1249
						SIDE PLATES	2	8" x 3/16"	14'-0"	143
8'-0"	12'-0"	5	WBX18	EQUAL	716	RAILS	13	3" x 3" x 3/8"	12'-0"	1070
						SIDE PLATES	2	8" x 3/16"	12'-0"	122
8'-0"	10'-0"	4	WBX18	EQUAL	573	RAILS	13	3" x 3" x 3/8"	10'-0"	892
						SIDE PLATES	2	8" x 3/16"	10'-0"	102
8'-0"	8'-0"	3	WBX18	EQUAL	430	RAILS	13	3" x 3" x 3/8"	8'-0"	713
						SIDE PLATES	2	8" x 3/16"	8'-0"	82

MATERIAL LIST FOR ALL SIZES				
ITEM	NO. REQD.	SIZE	LENGTH	WT. LBS.
CHANNELS	2	CB X 11.5	8'-0"	184
STRINGER PLATES	6	2" x 3/8"	1'-11"	30
PLATE CLIPS	12	2" x 3/8"	4 1/2"	9
ANCHOR BOLT CLIPS	14	2" x 5/16"	4"	10

- GENERAL NOTES
- ALTERNATE DESIGN MAY BE SUBSTITUTED BY THE CONTRACTOR FOR APPROVAL BY THE ENGINEER.
 - LIVE LOADING: H20
 - CATTLE GUARD IS TO BE PLACED ON LEVEL GRADE ACROSS ROADWAY - ROADWAY CROSS SLOPE IS TO TRANSITION FROM NORMAL SECTION TO LEVEL SECTION 25' BACK ON LINE AND 25' AHEAD ON LINE FROM EDGE OF CATTLE GUARD.
 - "FRAME WIDTH" COMBINATIONS MAY BE VARIED TO OBTAIN THE SPECIFIED WIDTH OF CATTLE GUARDS.
 - USE SELF-LOCKING NUTS ON REMOVABLE PANEL.
 - ALL WINGS SHALL BE PAINTED WHITE PER STANDARD SPECIFICATIONS.

FRAME SIZE			
LENGTH	WIDTH	"A"	"B"
8'-8"	14'-0"	4'-0"	6'-4"
8'-8"	12'-0"	3'-0"	5'-4"
8'-8"	10'-0"	2'-0"	4'-4"
8'-8"	8'-0"	1'-0"	3'-4"

- GENERAL NOTES
- USE SINGLE LAYER FOUNDATION UNIT FOR EACH CATTLE GUARD FRAME.
 - TIMBERS USED IN FOUNDATIONS SHALL BE TREATED.

TIMBER FOUNDATION DETAILS

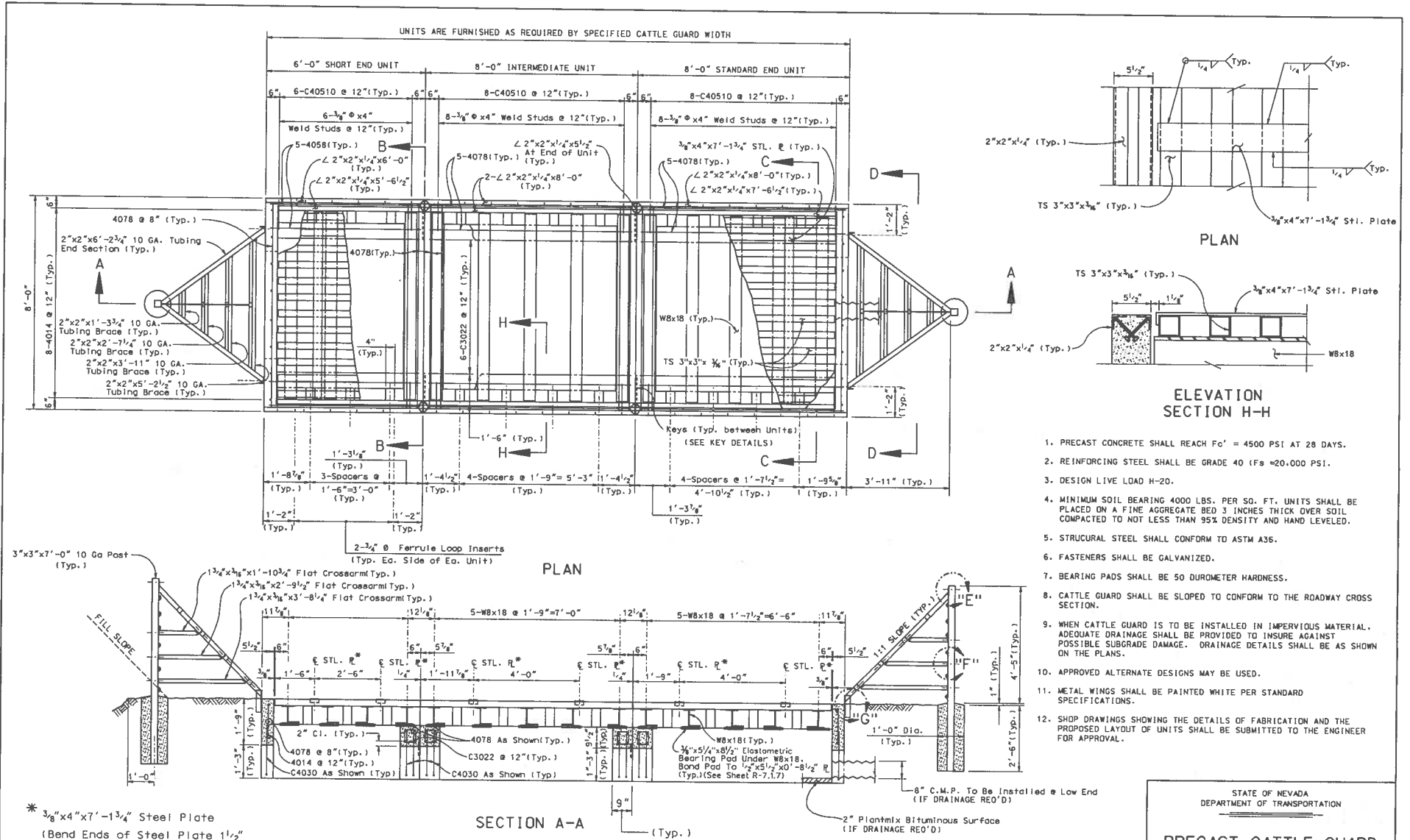
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

STEEL CATTLE GUARD
TIMBER FOUNDATION

R-7.1.5 (617)
REVISION 1-6-89

CHIEF ROAD DESIGN ENGINEER

R-59

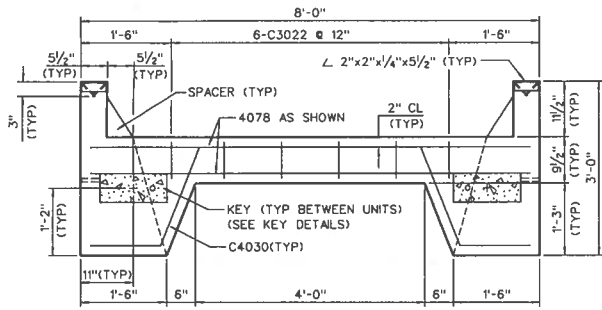


1. PRECAST CONCRETE SHALL REACH $F_c' = 4500$ PSI AT 28 DAYS.
2. REINFORCING STEEL SHALL BE GRADE 40 ($F_y \approx 20,000$ PSI).
3. DESIGN LIVE LOAD H-20.
4. MINIMUM SOIL BEARING 4000 LBS. PER SQ. FT. UNITS SHALL BE PLACED ON A FINE AGGREGATE BED 3 INCHES THICK OVER SOIL COMPACTED TO NOT LESS THAN 95% DENSITY AND HAND LEVELED.
5. STRUCTURAL STEEL SHALL CONFORM TO ASTM A36.
6. FASTENERS SHALL BE GALVANIZED.
7. BEARING PADS SHALL BE 50 DUROMETER HARDNESS.
8. CATTLE GUARD SHALL BE SLOPED TO CONFORM TO THE ROADWAY CROSS SECTION.
9. WHEN CATTLE GUARD IS TO BE INSTALLED IN IMPERVIOUS MATERIAL, ADEQUATE DRAINAGE SHALL BE PROVIDED TO INSURE AGAINST POSSIBLE SUBGRADE DAMAGE. DRAINAGE DETAILS SHALL BE AS SHOWN ON THE PLANS.
10. APPROVED ALTERNATE DESIGNS MAY BE USED.
11. METAL WINGS SHALL BE PAINTED WHITE PER STANDARD SPECIFICATIONS.
12. SHOP DRAWINGS SHOWING THE DETAILS OF FABRICATION AND THE PROPOSED LAYOUT OF UNITS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

* $\frac{3}{8}$ "x4"x7'-1 $\frac{3}{4}$ " Steel Plate
 (Bend Ends of Steel Plate 1 $\frac{1}{2}$ "
 Down Vertical Face of Outside
 TS Members (See Sec. H-H)

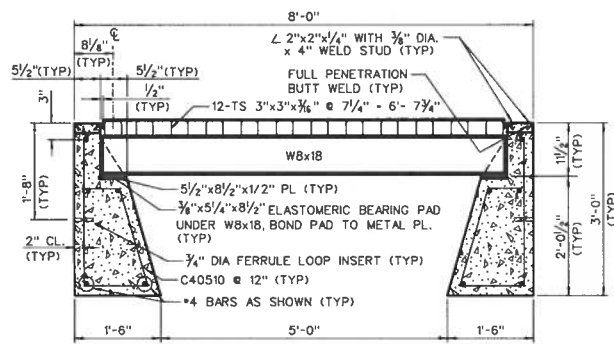
NOTE: For Details B-B, C-C, D-D, E, F, G, Not Shown See Standard Sheet R-7.1.7(617) & R-7.1.8(617)

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION	
PRECAST CATTLE GUARD	
CHIEF ROAD DESIGN ENGINEER	R-7.1.6 (617) ADOPTED: 11/88 REVISION 11-94



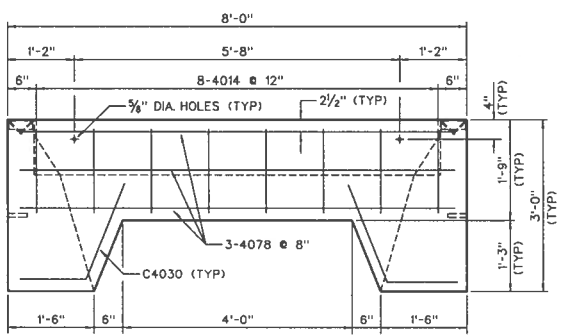
SECTION B-B

(ALL DIMENSIONS, KEYS, REINFORCING & STRUCTURAL STEEL TYPICAL ALL UNITS)



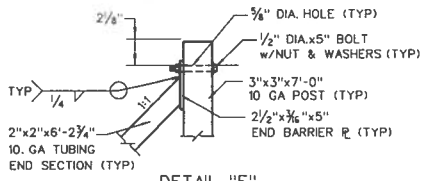
SECTION C-C

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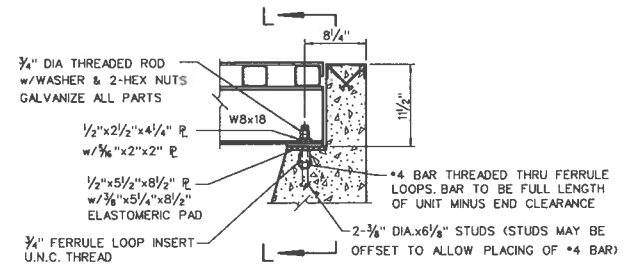


VIEW D-D

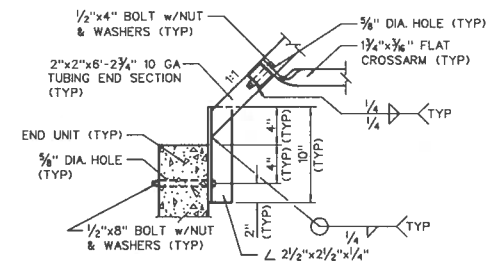
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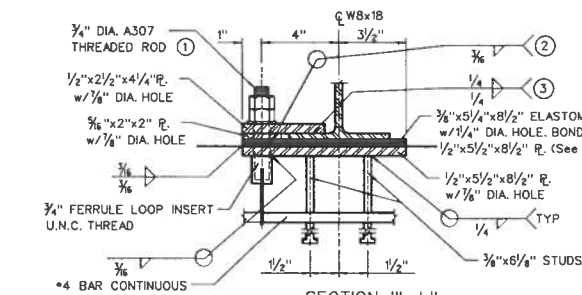
DETAIL "E"



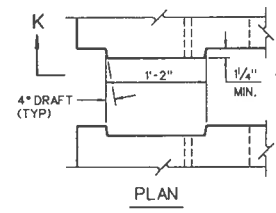
W8x18 ANCHOR ASSY.



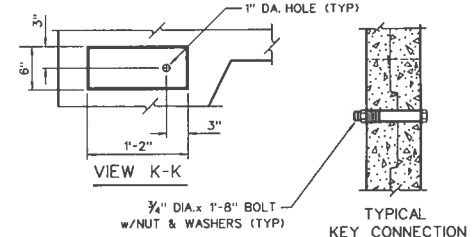
DETAIL "G"



SECTION "L-L"



PLAN

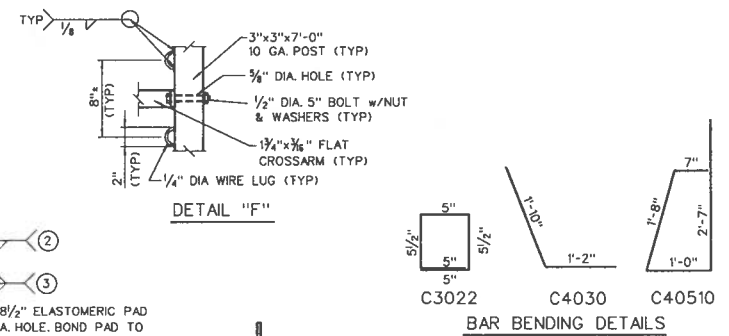


TYPICAL KEY CONNECTION

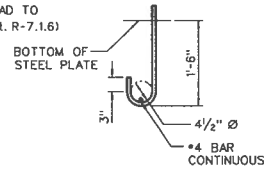
KEY DETAILS

NOTE
 1/2"x5-1/2"x8-1/2" PLATE WITH FERRULE AND STUDS ATTACHED IS TO BE CAST IN THE CONCRETE FRAME. AFTER THE CONCRETE FRAME HAS BEEN MANUFACTURED, THE 3/4" DIA. A307 THREADED ROD (1) IS TO BE TIGHTENED INTO THE FERRULE. THE ROD IS THEN TO BE WELDED (2) TO THE PLATE. THE ELASTOMERIC PAD IS THEN BONDED TO THE PLATE. THE STEEL GRATE IS THEN PLACED AND ADJUSTED TO ITS SPECIFIC POSITION. THE METAL CLAMPS ARE PLACED AND THE NUTS TIGHTENED. THE FIRST NUT IS JUST TO BE SNUG TIGHT. THE SECOND NUT IS TO BE TIGHT AGAINST THE FIRST NUT TO LOCK IT IN PLACE. AFTER A FINAL CHECK THAT THE STEEL GRATE IS STILL IN ITS SPECIFIED POSITION, THE METAL CLAMPING PLATE IS THEN WELDED (3) TO THE FRAME OF THE STEEL GRATE. ALL WELDING SHALL BE DONE AT THE PLACE OF FABRICATION. IF STEEL GRATE AND CONCRETE FRAME ARE SHIPPED SEPARATELY, THEY SHALL BE MATCH MARKED.

NOTE
 ALTERNATE: USE OF "J" BOLT.
 1/2"x5-1/2"x8-1/2" PLATE WITH 3/4" DIA. A307 "J" BOLT (1) AND STUDS ATTACHED IS TO BE CAST IN THE CONCRETE FRAME. THE "J" BOLT IS TO BE WELDED TO BOTH FACES OF THE PLATE (2). THE ELASTOMERIC PAD IS BONDED TO THE PLATE. THE STEEL GRATE IS PLACED AND ADJUSTED TO ITS SPECIFIED POSITION. THE METAL CLAMPS ARE PLACED AND THE NUTS TIGHTENED. THE FIRST NUT IS JUST TO BE SNUG TIGHT. THE SECOND NUT IS TO BE TIGHT AGAINST THE FIRST NUT TO LOCK IT IN PLACE. AFTER A FINAL CHECK THAT THE STEEL GRATE IS IN ITS SPECIFIED POSITION, THE METAL CLAMPING PLATE IS WELDED (3) TO THE FRAME OF THE STEEL GRATE. ALL WELDING SHALL BE DONE AT THE PLACE OF FABRICATION. IF STEEL GRATE AND CONCRETE FRAME ARE SHIPPED SEPARATELY, THEY SHALL BE MATCH MARKED.



DETAIL "F"



"J" BOLT ALTERNATIVE

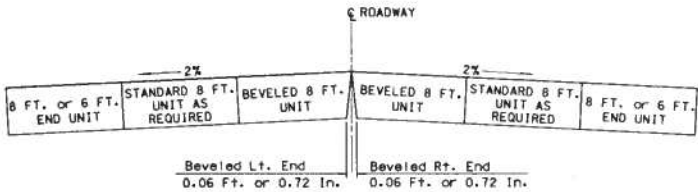
STATE OF NEVADA
 DEPARTMENT OF TRANSPORTATION

PRECAST CATTLE GUARD SECTIONS & DETAILS

CHIEF ROAD DESIGN ENGR. *[Signature]*

R-7.1.7 (617)
 ADOPTED 11/88 REVISION 7-34

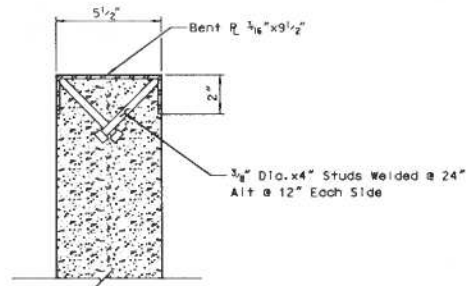
R-61



TYPICAL CATTLE GUARD INSTALLATION ON CROWNED ROADWAYS

NOTE: ALL CATTLE GUARD INSTALLATIONS, ON CROWNED ROADWAYS, SHALL BE INSTALLED USING AN EVEN NUMBER OF UNITS AS SHOWN ABOVE, AND AS INDICATED IN THE TABLE BELOW.

UNITS FOR ROADWAY CROWNED AT					
WIDTH OF ROADWAY	LENGTH OF END UNITS	# FT. UNITS BEVELED	# FT. UNITS STANDARD	LENGTH SUPPLIED BEYOND	LENGTH BEYOND SILOR.
24.0'	2 @ 6.0'	2		28.0'	2.0'
26.0'	2 @ 6.0'	2		28.0'	1.0'
28.0'	2 @ 6.0'	2		28.0'	0.0'
30.0'	2 @ 6.0'	2		32.0'	1.0'
32.0'	2 @ 6.0'	2		32.0'	0.0'
34.0'	2 @ 6.0'	2	2	44.0'	5.0'
36.0'	2 @ 6.0'	2	2	44.0'	4.0'
38.0'	2 @ 6.0'	2	2	44.0'	3.0'
40.0'	2 @ 6.0'	2	2	44.0'	2.0'
42.0'	2 @ 6.0'	2	2	44.0'	1.0'
44.0'	2 @ 6.0'	2	2	44.0'	0.0'
46.0'	2 @ 6.0'	2	2	48.0'	1.0'
48.0'	2 @ 6.0'	2	2	48.0'	0.0'
50.0'	2 @ 6.0'	2	4	60.0'	5.0'
52.0'	2 @ 6.0'	2	4	60.0'	4.0'
54.0'	2 @ 6.0'	2	4	60.0'	3.0'
56.0'	2 @ 6.0'	2	4	60.0'	2.0'
58.0'	2 @ 6.0'	2	4	60.0'	1.0'
60.0'	2 @ 6.0'	2	4	60.0'	0.0'



ALTERNATE ARMOR DETAIL

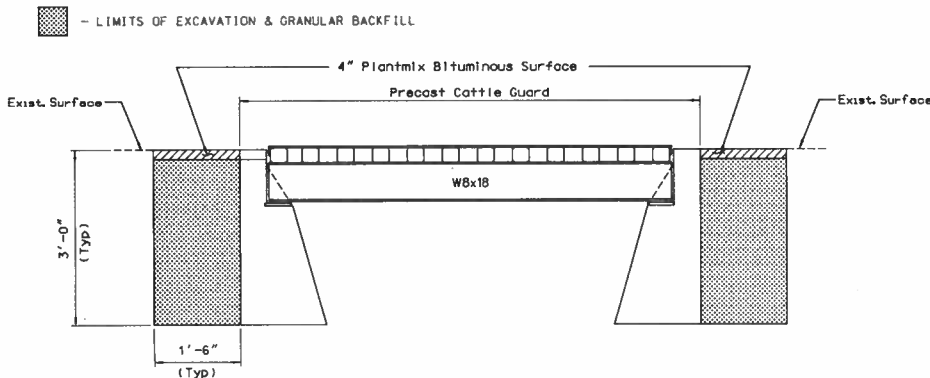
NOTE: The Above Alternate Armor Detail May be Substituted for The 2"x2"x1/4" Armor Angles at The Contractors Option.

STRUCTURAL STEEL				
UNIT	ITEM	REQ'D	LENGTH	WT. LBS.
SHORT END	TS 3"x3"x3/16"	12	5'-6"	878
	WB18	4	7'-0"	504
	L 2"x2"x1/4"	2	0'-5 1/2"	3
	L 2"x2"x1/4"	2	8'-0"	38
	L 2"x2"x1/4"	2	5'-6 1/2"	35
	3/8" DIA. STUD ANCHOR ASSY. 3/8"x4" PLATE	12	0'-4"	2
				90
				13
				1423
INTERMEDIATE	TS 3"x3"x3/16"	12	7'-11 3/4"	984
	WB18	5	7'-0"	630
	L 2"x2"x1/4"	4	0'-5 1/2"	6
	L 2"x2"x1/4"	4	8'-0"	102
	3/8" DIA. STUD ANCHOR ASSY. 3/8"x4" PLATE	14	0'-4"	2
				13
				1910
STANDARD END	TS 3"x3"x3/16"	12	7'-6"	925
	WB18	5	7'-0"	630
	L 2"x2"x1/4"	2	0'-5 1/2"	3
	L 2"x2"x1/4"	2	7'-6 1/2"	48
	3/8" DIA. STUD ANCHOR ASSY. 3/8"x4" PLATE	14	0'-4"	2
				13
				1845

REINFORCING STEEL AND CONCRETE					
UNIT	NO. REQ'D	BAR MARK	WT. LBS.	CONCRETE	
SHORT END	7	4078	36	1.66 C.Y.	
	10	4058	38		
	8	4014	7		
	6	C3022	5		
	12	C40510	47		
	6	C4030	12		
			145		
INTERMEDIATE	18	4078	92	1.76 C.Y.	
	12	C3022	10		
	16	C40510	62		
	8	C4030	18		
					180
STANDARD END	17	4078	87	2.11 C.Y.	
	8	4014	1		
	6	C3022	5		
	16	C40510	62		
	6	C4030	12		
					173

MATERIAL LIST FOR WINGS				
ITEM	REQ'D	SIZE	LENGTH	WT. LBS.
FLAT CROSSBAR	2	1 1/2"x3/4"	1'-10 1/2"	4
FLAT CROSSBAR	2	1 1/2"x3/4"	2'-8 1/2"	6
FLAT CROSSBAR	2	1 1/2"x3/4"	3'-8 1/2"	8
BRACES	2	2"x2"x10 GA	1'-3 3/4"	11
BRACES	2	2"x2"x10 GA	2'-1 1/4"	23
BRACES	2	2"x2"x10 GA	3'-11"	38
BRACES	2	2"x2"x10 GA	5'-2 1/2"	45
END BARRIER	4	2"x2"x10 GA	6'-2 3/4"	107
BARRIER PLATES	2	2"x2"x2 1/2"	0'-5"	1
BARRIER ANGLES	4	2 1/2"x2 1/2"x1/4"	0'-10"	14
UPRIGHT POSTS	2	3"x3"x3/4"	7'-0"	96

NOTE: Material List is For Information Only.



METHOD OF PATCHING AT PRECAST CATTLE GUARDS

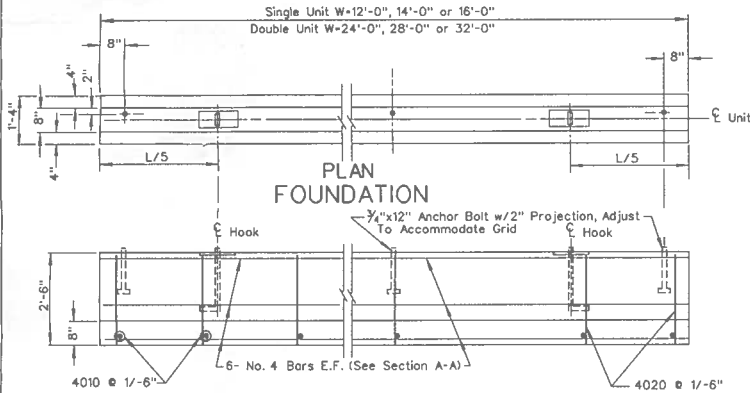
HARDWARE				
LOCATION	ITEM	NO. REQ'D	SIZE	LENGTH
WINGS	BOLTS	4	1/2"	8"
	BOLTS	6	1/2"	4"
PER UNIT CONNECTION	BOLTS	8	1/2"	5"
	WASHERS	36	17/32"	-
	NUTS	18	1/2"	-
	BOLTS	2	3/4"	1'-8"
	WASHERS	4	13/16"	-
	NUTS	2	3/4"	-

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

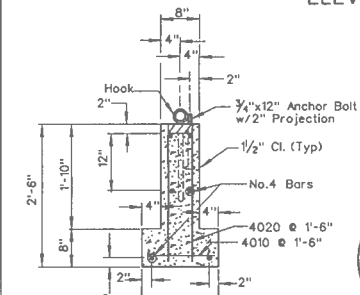
PRECAST CATTLE GUARD SECTIONS & DETAILS

John P. Aubrey
CHIEF ROAD DESIGN ENGR.

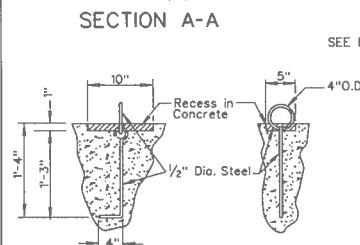
R-7,1,6 (6/17)
ADOPTED: 11/88
REVISION: 12-94



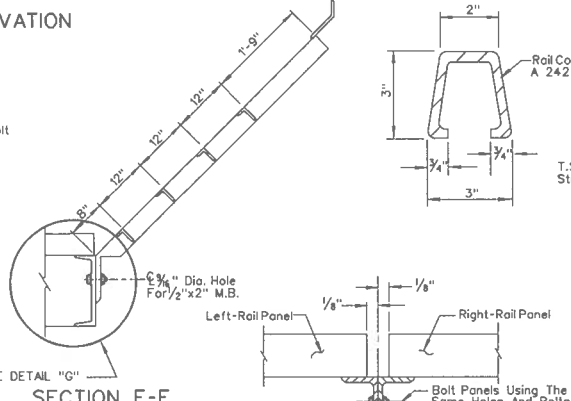
PLAN FOUNDATION



ELEVATION

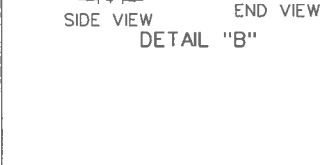


SECTION A-A

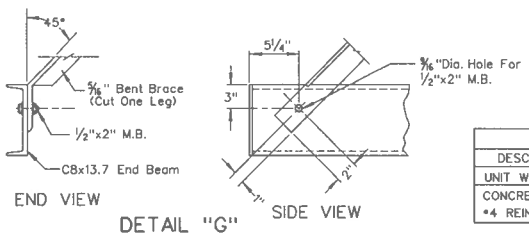


SECTION F-F

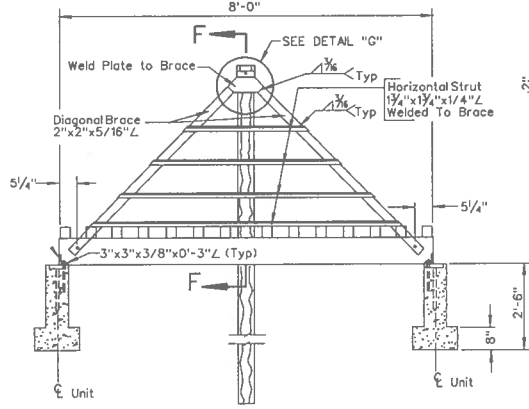
CONNECTION FOR MULTIPLE INSTALLATION



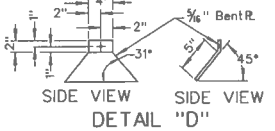
SIDE VIEW DETAIL "B"



DETAIL "G"

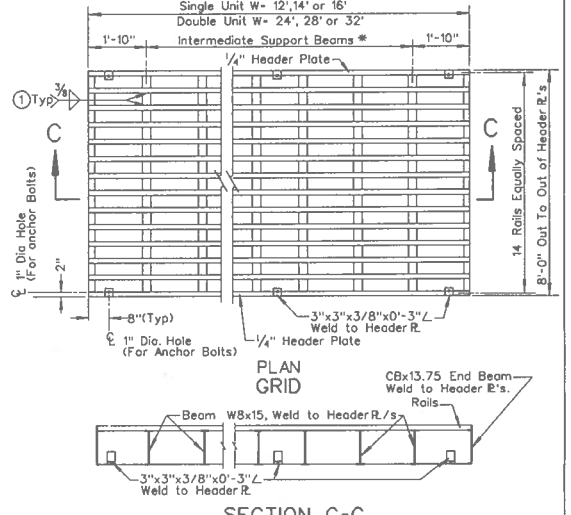


CATTLE GUARD EXCAVATION DETAIL



SIDE VIEW DETAIL "D"

① Weld Rails to Intermediate and End Beams At Junctures
 *- Spacing For W-12' is 1'-6"
 W-14' is 1'-6" 2/3"
 W-16' is 1'-8 1/8"



SECTION C-C

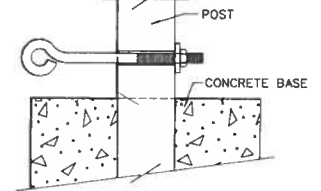
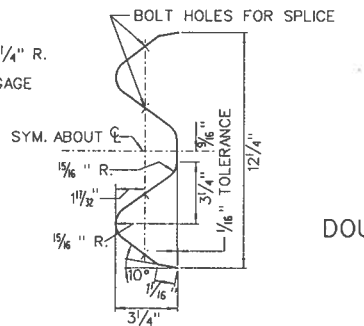
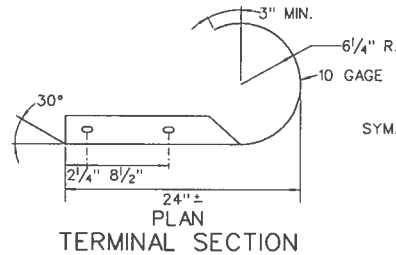
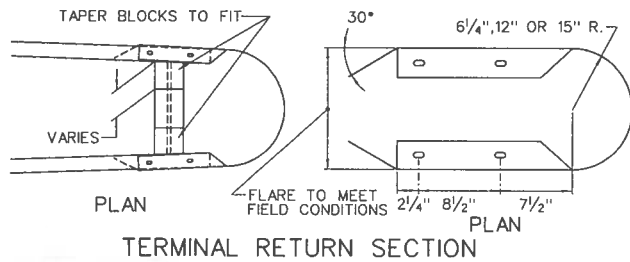
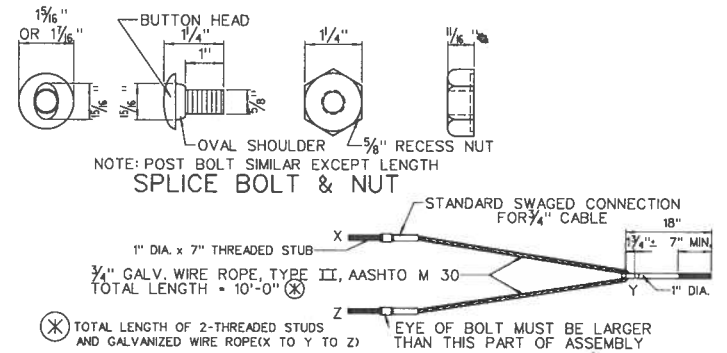
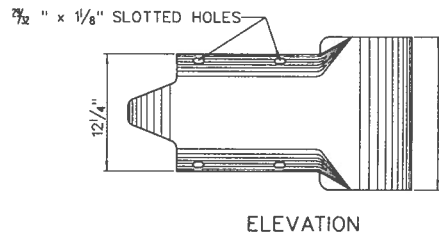
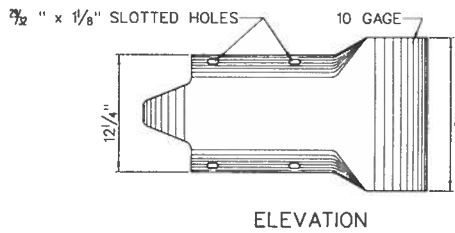
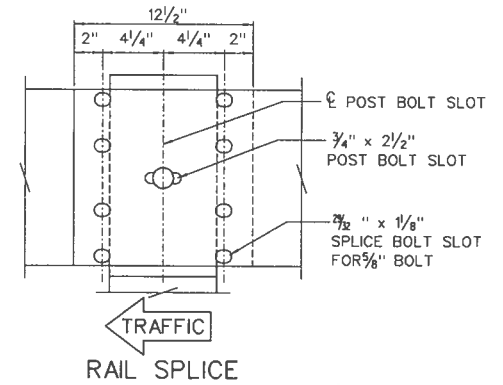
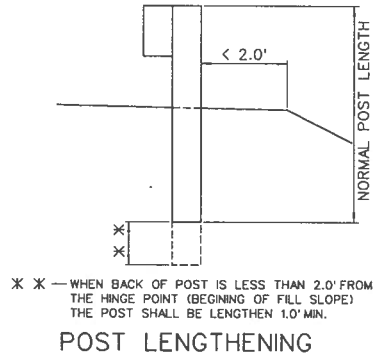
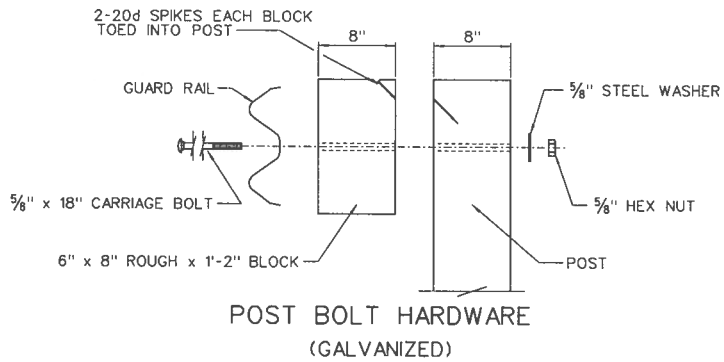
- NOTES:
- SEE SPECIFICATIONS FOR WIDTH (W).
 - STANDARD NUTS & WASHERS SHALL BE FURNISHED WITH EACH FOUNDATION UNIT INCLUDING ANCHOR ANGLES, WELD OR BOLT ANCHOR ANGLES TO CATTLE GUARD.
 - ON EARTH-SURFACED ROADS, SET TOP OF CATTLE GUARD EIGHT INCHES ABOVE SUBGRADE UNLESS PLANS OR STAKES INDICATE ANOTHER ELEVATION. TAPER FILL BACK FROM CATTLE GUARD APPROX. 50' IN BOTH DIRECTIONS.
 - NO. 4 REINFORCEMENT MAY BE SPLICED WITH 24" LAP UNLESS PROHIBITED.
 - SEE BID SCHEDULE FOR WIDTH (W).
 - BOLTS ARE TO BE SUPPLIED WITH STANDARD NUTS AND WASHERS.
 - RAILS SHALL BE PLACED ADJACENT TO THE HEADER PLATES.
 - PROVIDE FOUR 7'-10" x 2" x 1 1/4" TORQUE BARS EQUALLY SPACED, WELDED BY 3/8" FILLET WELDS PERPENDICULAR TO THE TOP OF THE RAILS WHEN ALTERNATE RECTANGULAR TUBE RAILS ARE PROVIDED.
 - STEEL FOR COMPONENTS SHALL BE ASTM A 36, UNLESS INDICATED OTHERWISE ON THE DRAWING.
 - DESIGN LOADING OF GRID SHALL CONFORM TO AASHTO H-20.

DESCRIPTION	ESTIMATED QUANTITIES FOR FOUNDATION				
	QUANTITIES				
UNIT WIDTHS	14'	16'	24'	28'	32'
CONCRETE	2.2 C.Y.	2.5 C.Y.	3.8 C.Y.	4.4 C.Y.	5.0 C.Y.
#4 REINFORCING STEEL	276 L.F.	311 L.F.	471 L.F.	543 L.F.	624 L.F.

STATE OF NEVADA
 DEPARTMENT OF TRANSPORTATION

STEEL CATTLE GUARD
 GRID AND WINGS & CATTLE GUARD
 FOUNDATION (BLM)

CHIEF ROAD DESIGN ENGR. *[Signature]* ADOPTED: 7/19/95 REVISION 1-95



DOUBLE CABLE ASSEMBLY DETAIL
FOR TYPICAL INSTALLATION PLAN, R-8.1.4(CASE 5)

SECTION THRU RAIL ELEMENT

NOTE: FOR REFLECTOR MOUNTING AND SPACING DETAILS, SEE SHEET R-9.2.2

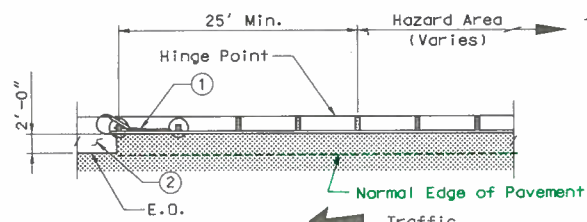
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

GALVANIZED GUARDRAIL ELEMENTS

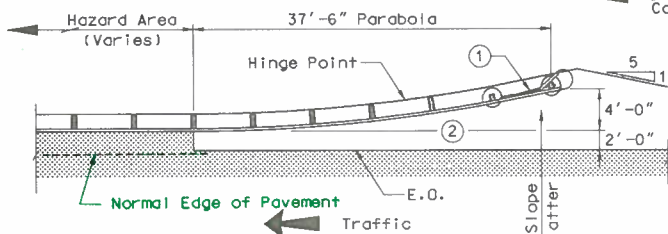
R - 8.1.1 (618)
ADOPTED: 9/73 REVISION: 7-5/89

LEGEND

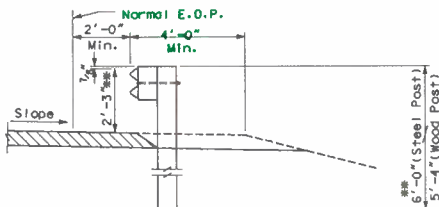
- PAVED AREAS



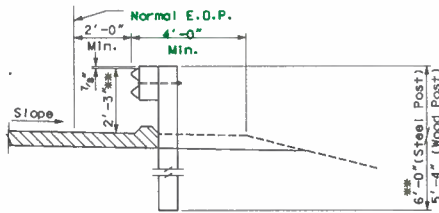
TYPICAL DOWNSTREAM END TREATMENT



CASE 1



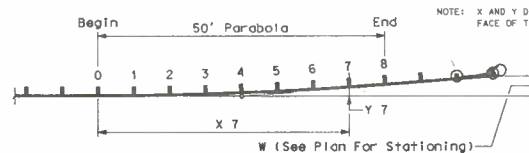
SUPERELEVATED INSTALLATION



SHOULDER DIKE INSTALLATION

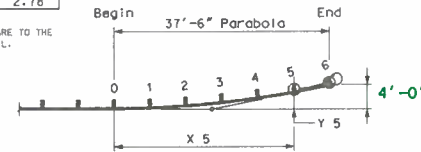
*** GUARDRAIL HEIGHTS ON STAGE CONSTRUCTION PROJECTS SHALL BE GOVERNED BY FINAL SURFACING ELEVATION. THE SECTIONS SHOWN DEPICT W-BEAM INSTALLATIONS. IF TRIPLE CORRUGATION GUARDRAILS ARE SPECIFIED, USE POST AND BLOCK DIMENSIONS SHOWN ON SHEET R-8.1.7.
 *** IF LESS THAN 4', USE LONGER POST PER R-8.1.1.

DESIGN SPEED	FLARE RATE	a:b	X	POST NUMBER								
				1	2	3	4	5	6	7	8	
70	15:1	Y		6.25'	12.50'	18.75'	25.00'	31.25'	37.50'	43.75'	50.00'	
60	13:1	Y		.03"	.12"	.27"	.48"	.75"	1.08"	1.47"	1.92"	
50	11:1	Y		.04"	.14"	.32"	.57"	.89"	1.28"	1.74"	2.27"	
40	9:1	Y		.04"	.17"	.39"	.69"	1.09"	1.56"	2.13"	2.78"	

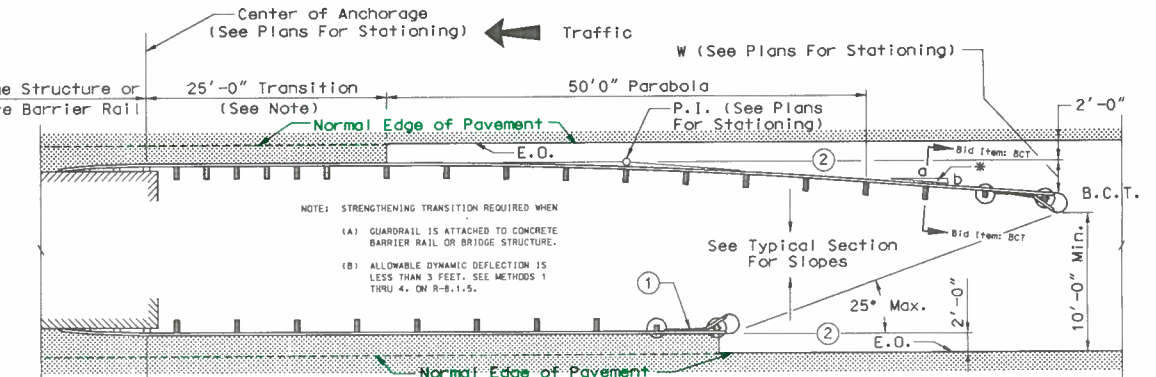


EXAMPLE OF 50' PARABOLA
CASE 2 & 3

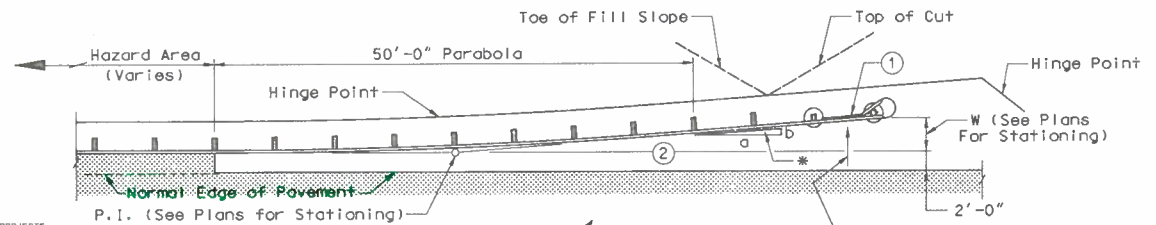
DESIGN SPEED	FLARE RATE	a:b	X	POST NUMBER							
				1	2	3	4	5	6		
70	15:1	Y		6.25'	12.50'	18.75'	25.00'	31.25'	37.50'		
60	13:1	Y		.03"	.12"	.27"	.48"	.75"	1.08"	1.47"	1.92"
50	11:1	Y		.04"	.14"	.32"	.57"	.89"	1.28"	1.74"	2.27"
40	9:1	Y		.04"	.17"	.39"	.69"	1.09"	1.56"	2.13"	2.78"



EXAMPLE OF 37'-6" PARABOLA
CASE 1



CASE 3



CASE 2
(FLARED APPROACH OR CUT SECTION)

NOTE: STRENGTHENING TRANSITION REQUIRED WHEN
 (A) GUARDRAIL IS ATTACHED TO CONCRETE BARRIER RAIL OR BRIDGE STRUCTURE.
 (B) ALLOWABLE DYNAMIC DEFLECTION IS LESS THAN 3 FEET. SEE METHODS 1 THRU 4, ON R-8.1.5.

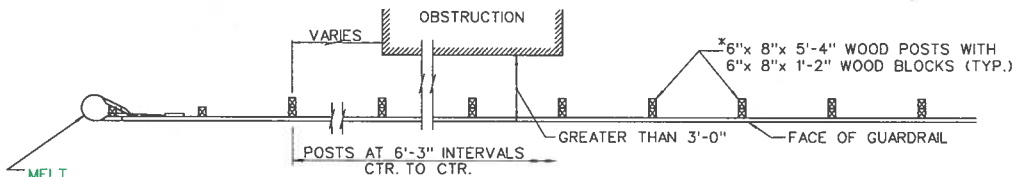
- ① FOR DETAILS OF BREAKAWAY CABLE TERMINAL, SEE STANDARD SHEET R-8.1.6.
- ② AREAS IN THE GUARDRAIL WIDTH TRANSITIONS MAY REQUIRE PAVING IF SHOULDER DIKES AND/OR DOWNDRAINS ARE USED.
- ③ WHEN USING A FOUR FOOT (4') 'W', A 37'-5" PARABOLA (CASE 1) IS THE RECOMMENDED FLARE RATE.

STATE OF NEVADA
 DEPARTMENT OF TRANSPORTATION

**TYPICAL INSTALLATIONS
 GUARDRAIL FLARES**

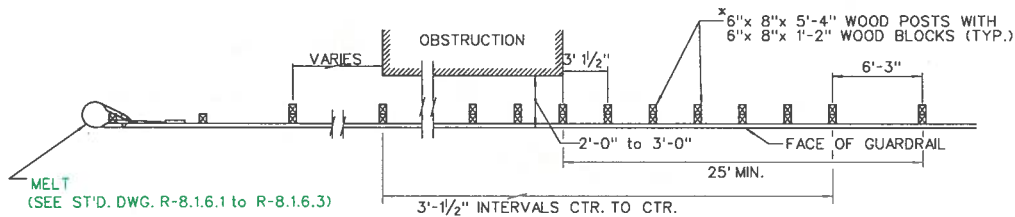
[Signature]
 CHIEF ROAD DESIGN ENGR.

R-8.1.4 (618)
 ADOPTED: 7/82 REVISION 12-94



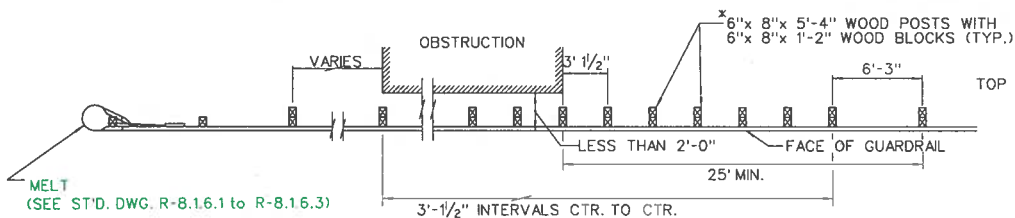
METHOD 1

MELT
(SEE ST'D. DWG. R-8.1.6.1 to R-8.1.6.3)



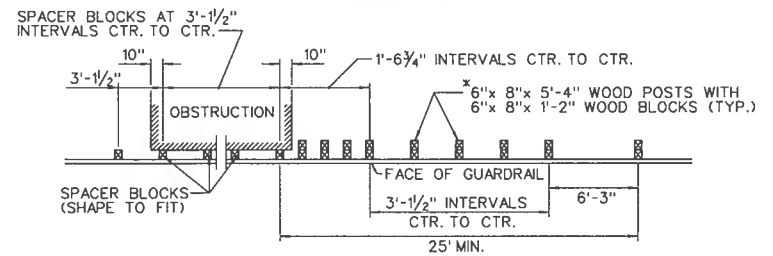
METHOD 2

MELT
(SEE ST'D. DWG. R-8.1.6.1 to R-8.1.6.3)

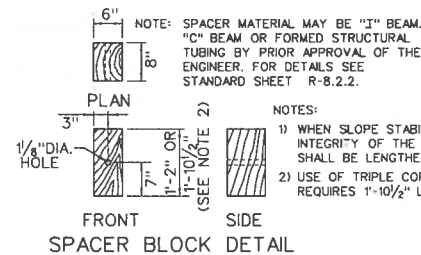


METHOD 3

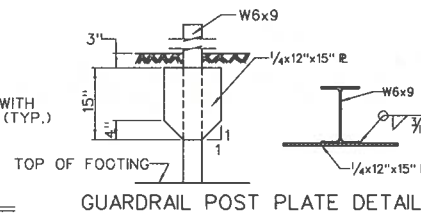
MELT
(SEE ST'D. DWG. R-8.1.6.1 to R-8.1.6.3)



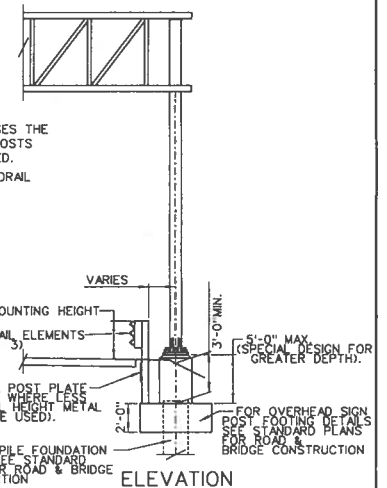
METHOD 4



- NOTES:
- 1) WHEN SLOPE STABILITY COMPROMISES THE INTEGRITY OF THE POSTS - THE POSTS SHALL BE LENGTHENED AS REQUIRED.
 - 2) USE OF TRIPLE CORRUGATED GUARDRAIL REQUIRES 1'-10/16" LENGTH BLOCK



GUARDRAIL POST PLATE DETAIL



STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

TYPICAL
GUARDRAIL - TRANSITION
INSTALLATIONS

ADOPTED: 6/81 REVISION: 12-84

DETAILS
FOR POSTS WITH LESS THAN STANDARD LENGTH

* W-BEAM WOOD POSTS ARE SHOWN. WHEN TRIPLE CORRUGATED GUARDRAIL IS USED, SUBSTITUTE APPROPRIATE POSTS AND BLOCKS LISTED BELOW.

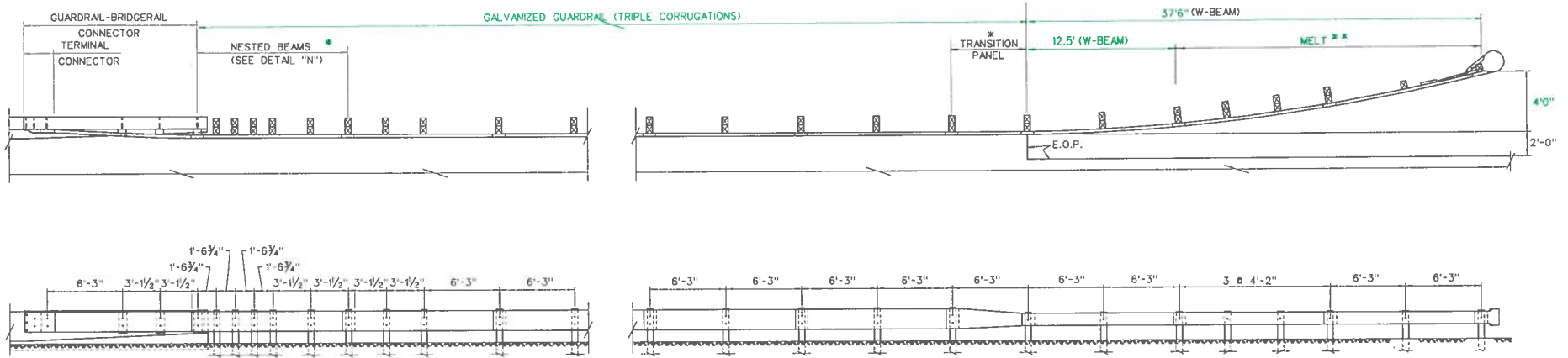
W-BEAM GUARDRAIL

NORMAL INSTALLATION	ACCEPTABLE ALTERNATES
POST: 6"x8"x5'-4" WOOD	W6x8.5(or9.0)x6'-0" STEEL or 4 3/8"x5 7/8"x 3/8"x6'-0" C STEEL
BLOCK: 6"x8"x1'-2" WOOD	W6x8.5(or9.0)x1'-2" STEEL or 4 3/8"x5 7/8"x 3/8"x1'-2" C STEEL

TRIPLE CORRUGATED GUARDRAIL

POST: 6"x8"x6'-0" WOOD	W6x8.5(or9.0)x6'-8" STEEL or 4 3/8"x5 7/8"x 3/8"x6'-8" C STEEL
BLOCK: 6"x8"x1'-10/16" WOOD	W6x8.5(or9.0)x1'-9/16" STEEL or 4 3/8"x5 7/8"x 3/8"x1'-9/16" C STEEL

*-THE LENGTH OF THE TRANSITION PANEL (6'-3") SHALL BE ADDED TO THE ESTIMATED LENGTH OF THREE BEAM GUARDRAIL SEE SHEET R-8.1.7.



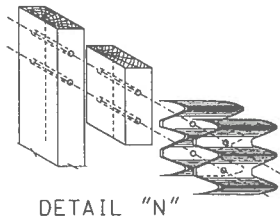
TYPICAL GUARDRAIL INSTALLATION

- NOTE:
- FOR DETAILS AND DIMENSIONS NOT SHOWN SEE SHEETS R-8.1.1 THRU R-8.2.4.1.
 - SEE SHEET T-35.2 FOR SPECIAL GUARDRAIL TERMINAL END FOR RAILROAD CROSSING.

GENERAL NOTES

- MINIMUM INSTALLATION:
 - GUARDRAIL-BRIDGERAIL CONNECTOR - 12.5'
 - NESTED BEAM SECTION - 12.5'
 - THREE BEAM SECTION - 12.5'
 - TRANSITION PANEL - 6.25'
 - "W" BEAM GUARDRAIL - 12.5'
 - MELT - 25.0'
 - 81.25'

MINIMUM LENGTH: ANY OTHER VARIATION THAT REDUCES THE MINIMUM LENGTH SHALL REQUIRE APPROVAL OF CHIEF ROAD DESIGN ENGINEER.



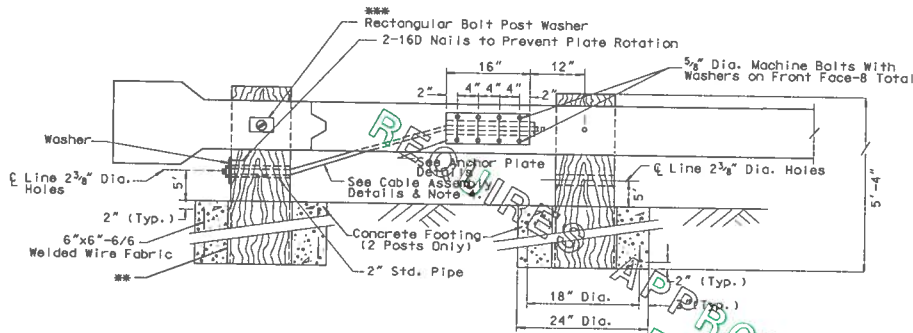
- * NO DIRECT PAYMENT FOR THE ADDITIONAL GUARDRAIL PANEL.
- ** MODIFIED ECCENTRIC LOADER TERMINAL (SEE STD DWG R-8.1.6.1 TO R-8.1.6.3)

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

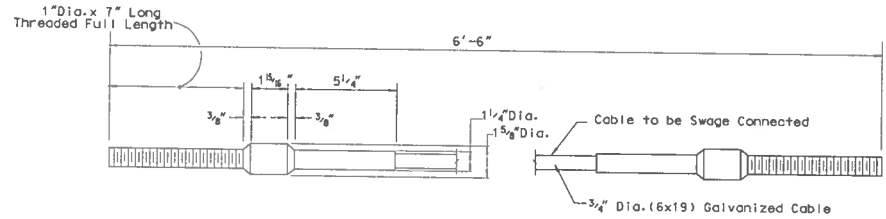
**TYPICAL GUARDRAIL
INSTALLATION**

R - 8.1.5.1 (6/01)
ADOPTED: 1/89 REVISION: 12-04

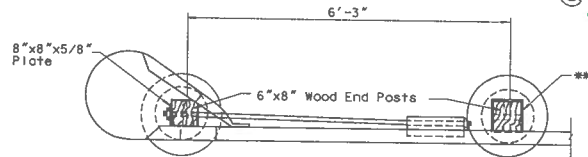
R-68



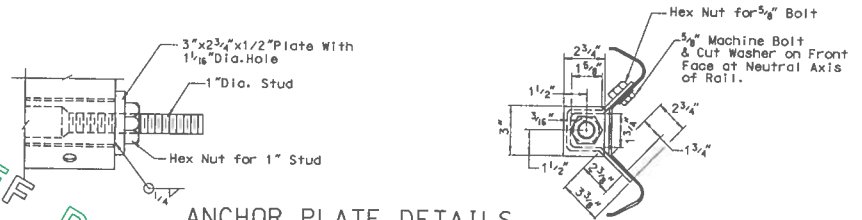
ELEVATION



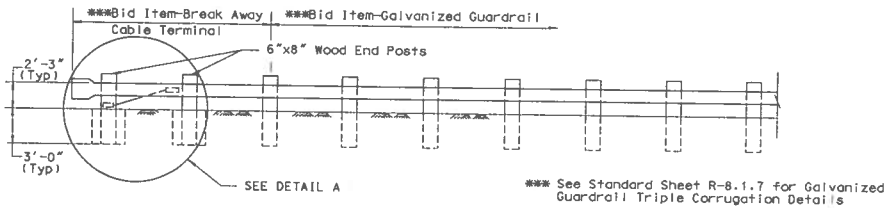
CABLE ASSEMBLY DETAILS



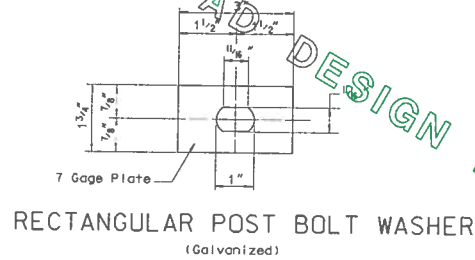
PLAN
DETAIL A



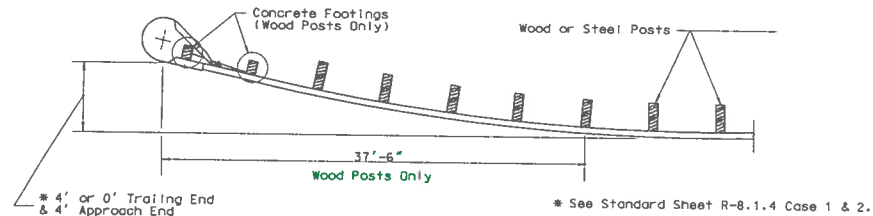
ANCHOR PLATE DETAILS



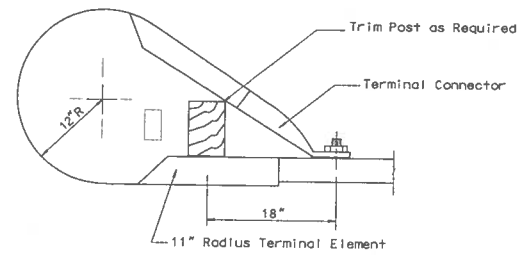
ELEVATION



RECTANGULAR POST BOLT WASHER
(Galvanized)



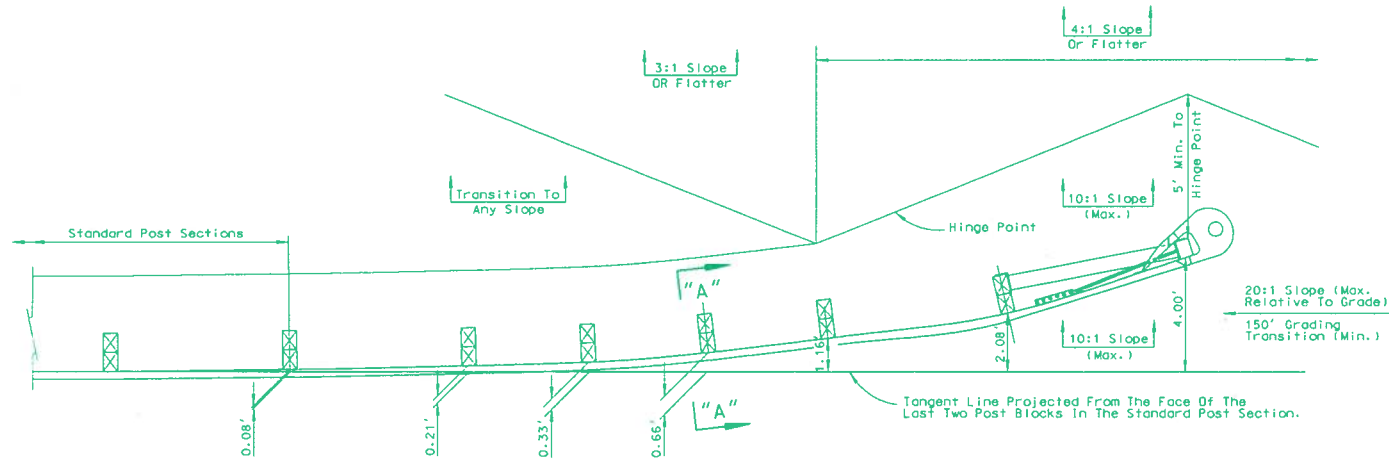
PLAN



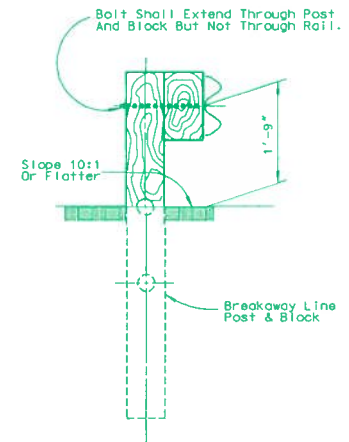
END SECTION

- GENERAL NOTES-
1. Post Spacing Shall be 6'-3" Except as Otherwise Noted.
 2. For Details Not Shown Refer to Standard Guardrail Sheets.
 3. Cable Assembly Should be Taut with No Obvious Slack in Cable.
 - *** 4. Rectangular Post Bolt Washer Shall be Installed on First Post Only.
 5. Steel Posts Shall Not be Substituted for Wood Posts and/or Blocks Where Required.
 6. P.C.C. Shall be Type AA or Type A.

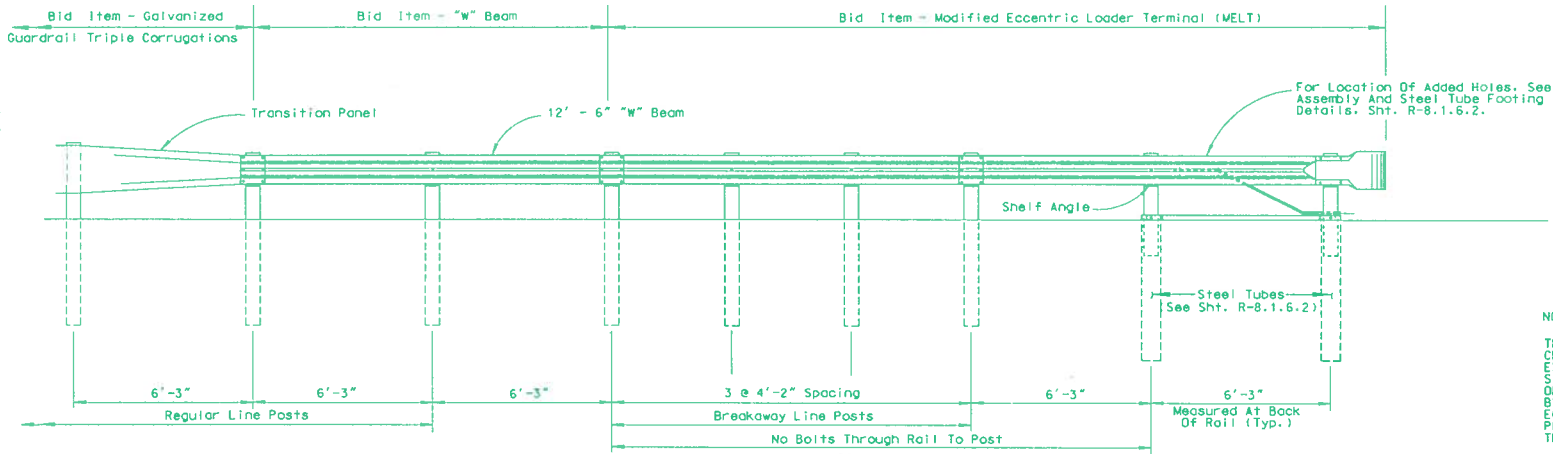
STATE OF NEVADA DEPARTMENT OF TRANSPORTATION	
BREAKAWAY CABLE TERMINAL	
 CHIEF ROAD DESIGN ENGR.	R-8.1.6 (618) ADOPTED: 7/78 REVISION: 11-94



PLAN VIEW



SECTION "A"-"A"

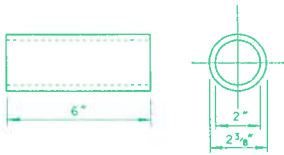


ELEVATION

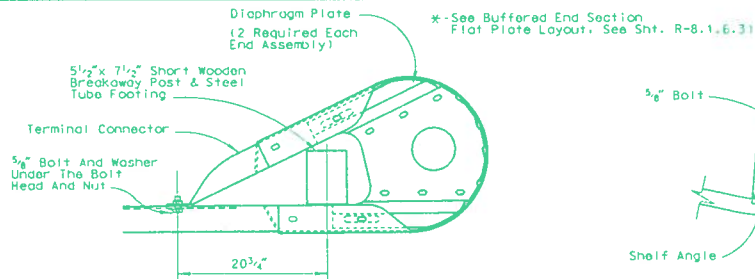
NOTE:
 THE POST OFFSET DIMENSIONS ARE GIVEN TO THE CENTER OF THE TRAFFIC FACE OF THE BLOCKOUTS, EXCEPT AT THE FIRST POST, WHERE THE DIMENSION IS TO THE CENTER OF THE TRAFFIC FACE OF THE POST. OFFSET POINTS ARE TO BE LOCATED BY CHORD MEASUREMENTS AT THE BACK OF RAIL EQUAL TO THE NOMINAL POST SPACINGS SHOWN. POSTS ARE TO BE SET APPROXIMATELY RADIAL TO THE RAILING AT EACH POST LOCATION.

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION	
MODIFIED ECCENTRIC LOADER TERMINAL (MELT) Post Layout	
 CHIEF ROAD DESIGN ENGR.	R 8.1.6.1-(618) ADOPTED: 12/94 REVISION

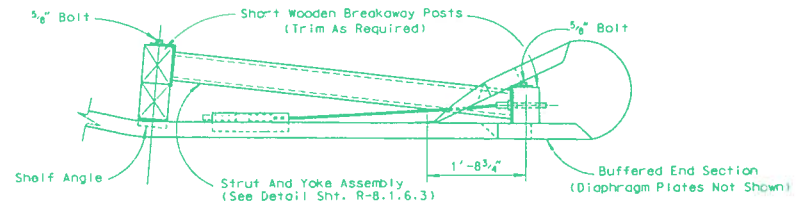
R-69



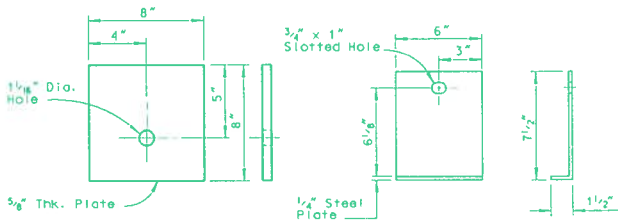
BREAKAWAY TERMINAL POST SLEEVE



BUFFERED END ASSEMBLY

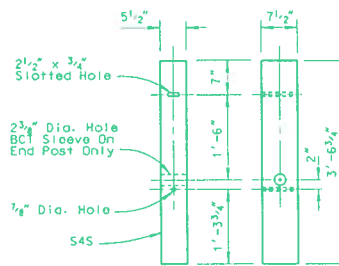


PLAN VIEW

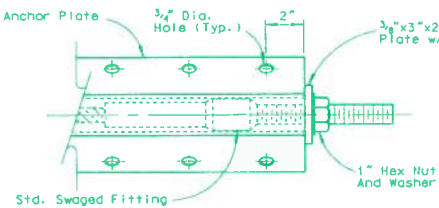


BEARING PLATE

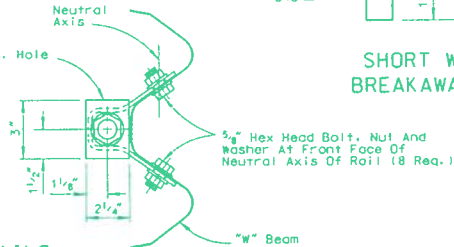
SHELF ANGLE



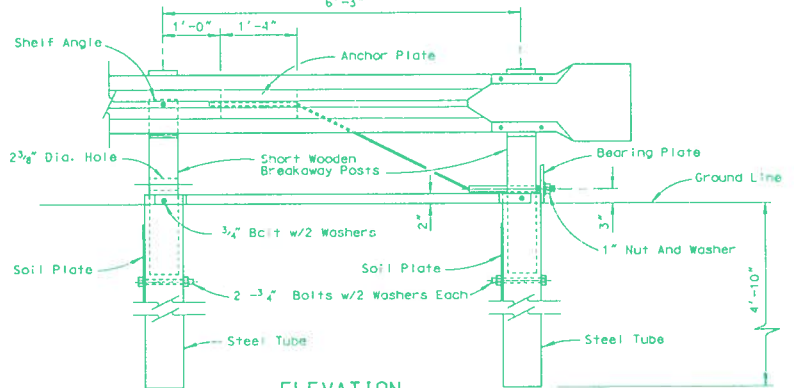
SHORT WOODEN BREAKAWAY POST



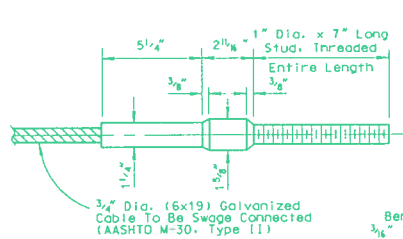
ANCHOR PLATE ASSEMBLY DETAILS



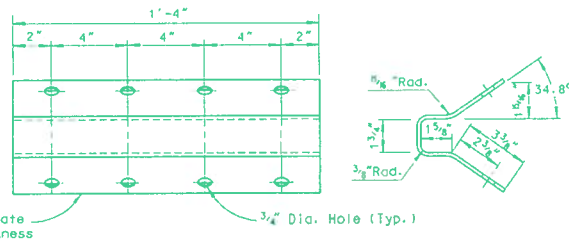
"W" Beam



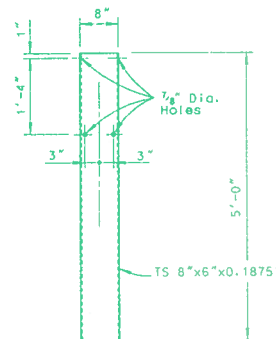
ELEVATION
BUFFERED END AND ANCHORAGE ASSEMBLY



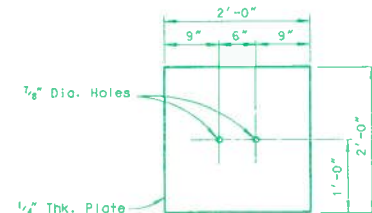
CABLE ASSEMBLY
STANDARD SWAGED FITTING AND STUD



ANCHOR PLATE



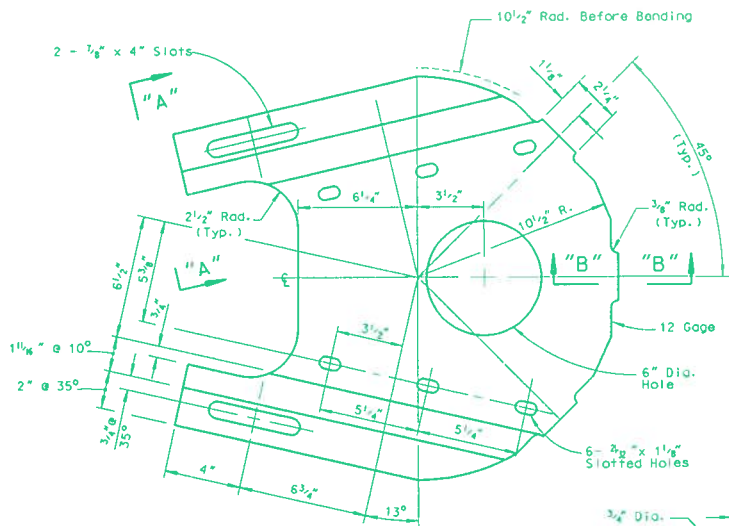
STEEL TUBE



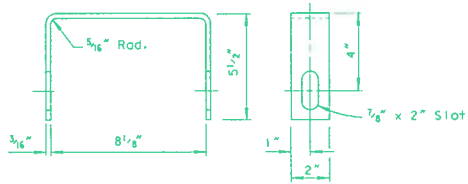
SOIL PLATE

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION	
MODIFIED ECCENTRIC LOADER TERMINAL (MELT) ASSEMBLY AND STEEL TUBE FOOTING DETAIL	
<i>John R. Dwyer</i> CHIEF ROAD DESIGN ENGINEER	R-8-1.6-2-(618) ADOPTED 12/94 REVISION

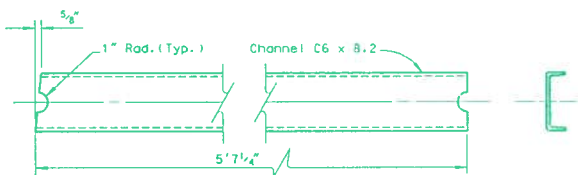
R-70



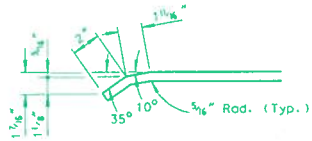
(2 Required Each Terminal)
DIAPHRAGM PLATE DETAIL



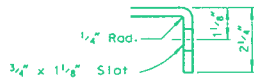
YOKE DETAIL



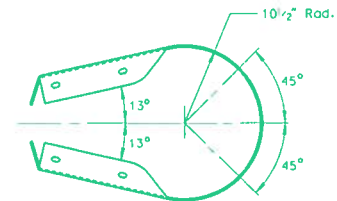
STRUT DETAILS



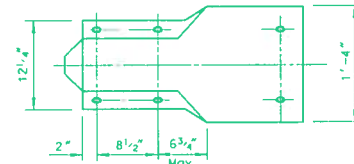
VIEW "A"-"A"



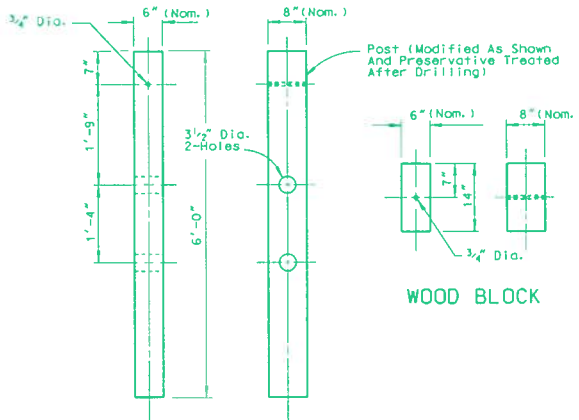
SECTION "B" "B"



PLAN
BUFFERED END SECTION

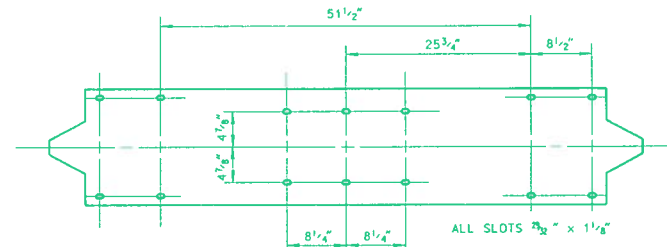


ELEVATION
BUFFERED END SECTION

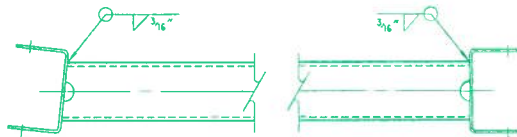


WOOD BLOCK

BREAKAWAY LINE POST



FLAT PLATE LAYOUT
BUFFERED END SECTION



STRUT AND YOKE ASSEMBLY

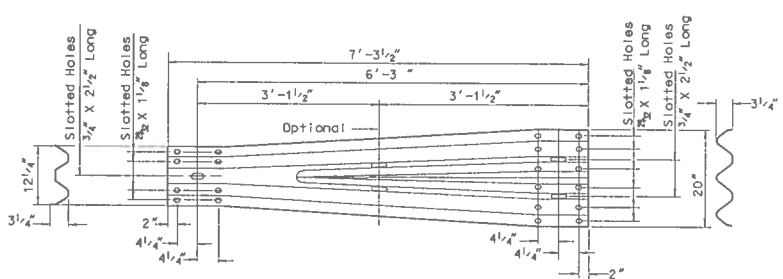
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

MODIFIED ECCENTRIC
LOADER TERMINAL (MELT)
STRUT, BREAKAWAY LINE POST
AND BUFFERED END SECTION
DETAILS

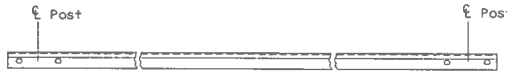
R-8.1.6 3-(618)
ADOPTED 12/94 REVISION

CHIEF ROAD DESIGN ENGR

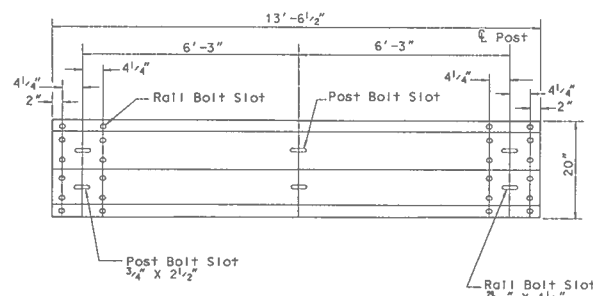
R-72



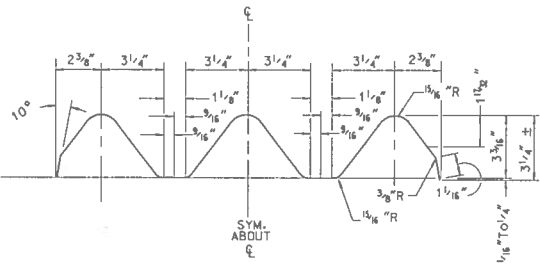
TRANSITION SECTION



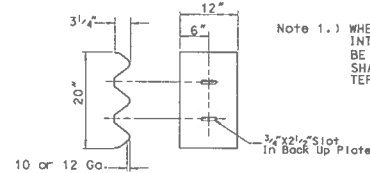
PLAN VIEW



FRONT ELEVATION



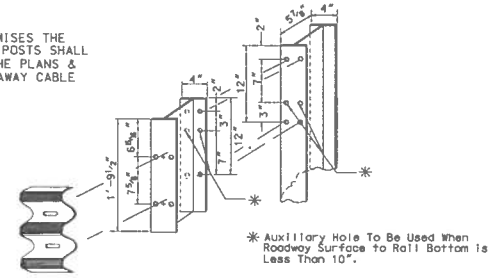
SECTION THROUGH RAIL ELEMENT



BACK-UP PLATE

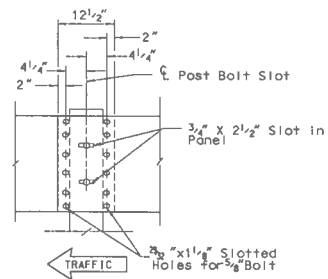
(FOR USE BETWEEN GUARDRAIL AND STEEL BLOCK AT POSTS BETWEEN RAIL SPLICES)

Note 1.) WHEN SLOPE STABILITY COMPROMISES THE INTEGRITY OF THE POSTS, THE POSTS SHALL BE LENGTHENED AS SHOWN ON THE PLANS & SHALL BE CONSTANT FOR BREAKAWAY CABLE TERMINALS ALSO.

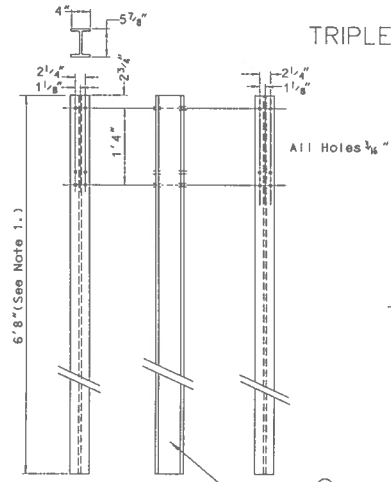


TRIPLE CORRUGATED RAIL-STEEL POST

* Auxiliary Hole To Be Used When Roadway Surface to Rail Bottom is Less Than 10\"/>



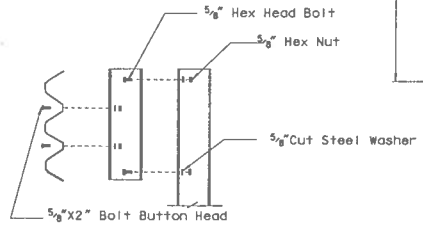
RAIL SPLICE



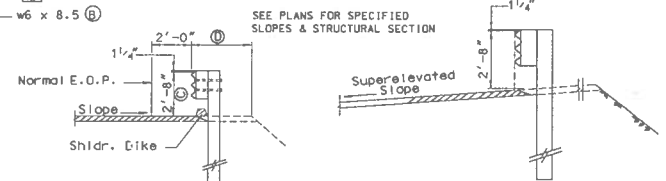
STEEL POST

TRIPLE CORRUGATED RAIL-WOOD POST

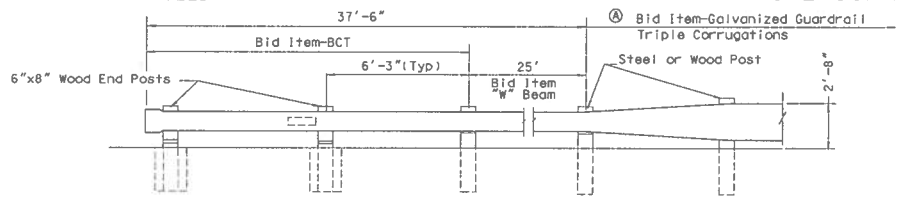
- A. WHEN LENGTH OF GALVANIZED GUARDRAIL IS ESTIMATED, 6'-3" SHALL BE ADDED TO ALLOW FOR TRANSITION PANEL.
- B. W6 X 9.0 STEEL POST OR 6" X 8" X 6'-0" WOOD POST MAY BE SUBSTITUTED.
- C. GUARDRAIL HEIGHTS ON STAGE CONSTRUCTION PROJECTS SHALL BE GOVERNED BY FINAL SURFACING ELEVATION
- D. SEE PROJECT TYPICAL SECTIONS FOR WIDENING (4' MIN.)



POST BOLT HARDWARE (GALVANIZED)



TYPICAL GUARDRAIL INSTALLATIONS



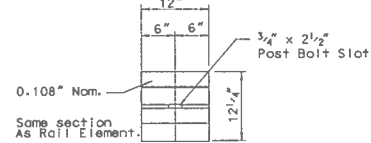
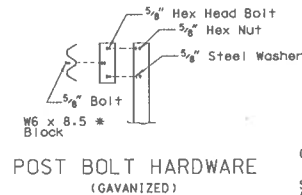
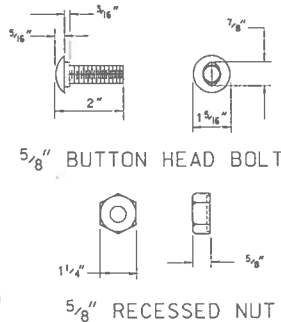
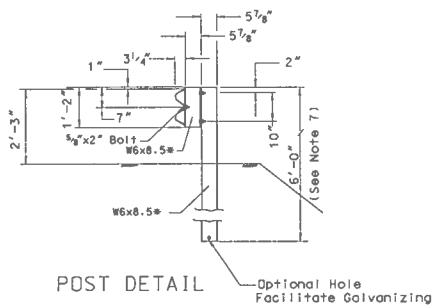
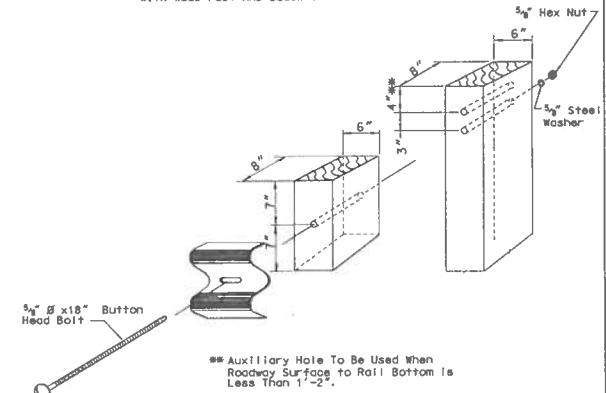
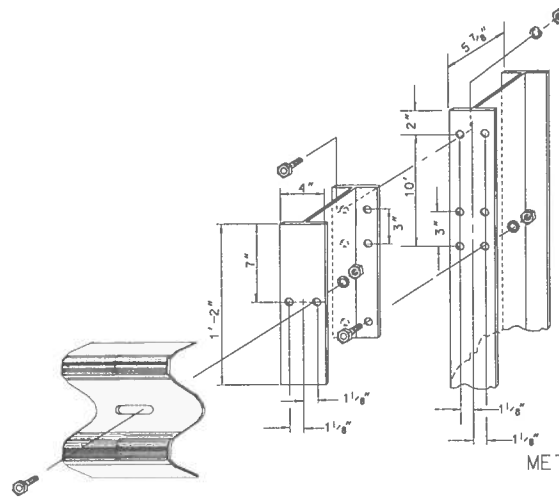
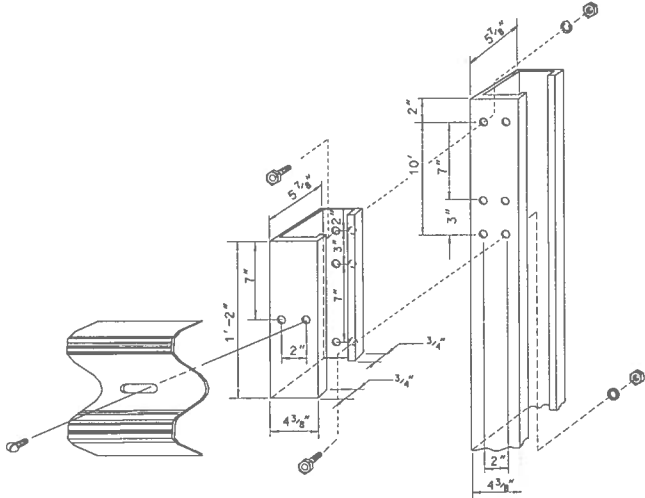
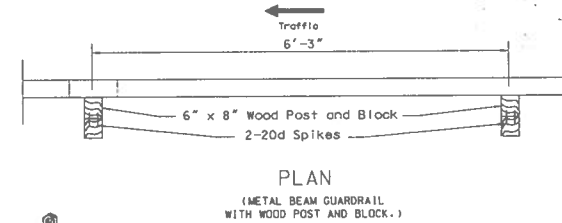
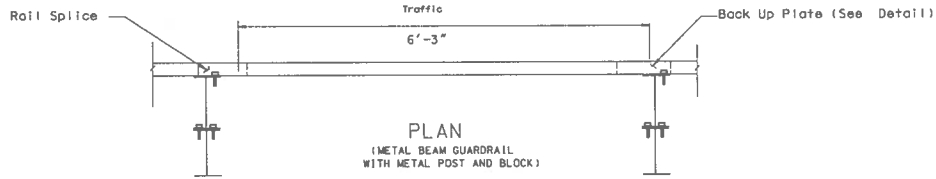
BREAKAWAY CABLE TERMINALS (TRIPLE CORRUGATION)

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

**GALVANIZED GUARDRAIL
(TRIPLE CORRUGATIONS)**

R-8.1.7 (618)
ADOPTED 12/78 REVISION 11-84

R-73



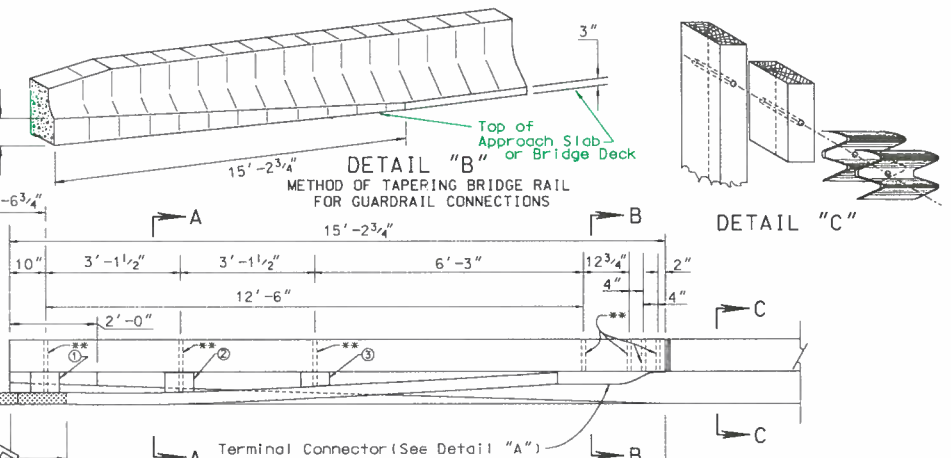
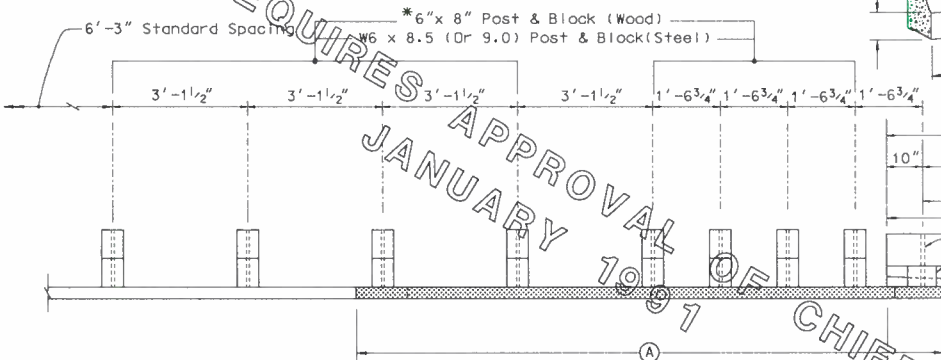
- GENERAL NOTES
1. ALL HOLES 3/4" DIA.
 2. RAIL MOUNTS TO BLOCK WITH BOLT ON APPROACHING TRAFFIC SIDE OF BLOCK AND POST WEB.
 3. BLOCK MOUNTS TO POST WITH 2 BOLTS STAGGERED. LOWER BOLT ON APPROACHING TRAFFIC SIDE OF BLOCK AND POST WEB. (FOR METAL BLOCKS ONLY)
 4. EXCEPT FOR ALTERNATE BOLT PLACEMENT DETAIL. ALL VIEWS SHOW W6 X 8.5 DETAILS. FOR METAL POSTS AND BLOCKS.
 5. ALL "C" TYPE POSTS AND BLOCKS MUST BE ASSEMBLED WITH THE OPEN ENDS IN THE SAME DIRECTION.
 - *6. W6 X 9 STEEL POSTS AND BLOCKS MAY BE SUBSTITUTED.
 7. WHEN SLOPE STABILITY COMPROMISES THE INTEGRITY OF THE POSTS, THE POST SHALL BE LENGTHENED AS SHOWN ON SHEET R-8.1.1. AND SHALL BE CONSTANT FOR BREAKAWAY CABLE TERMINAL ALSO.
- ** Auxiliary Hole To Be Used When Roadway Surface to Rail Bottom Is Less Than 1'-2".

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION	
GALVANIZED GUARDRAIL ("W" BEAM)	
<i>R. D. Dwyer</i>	R-8.2.2 (618)
ADOPTED: 2/79	REVISION: 4-11/86

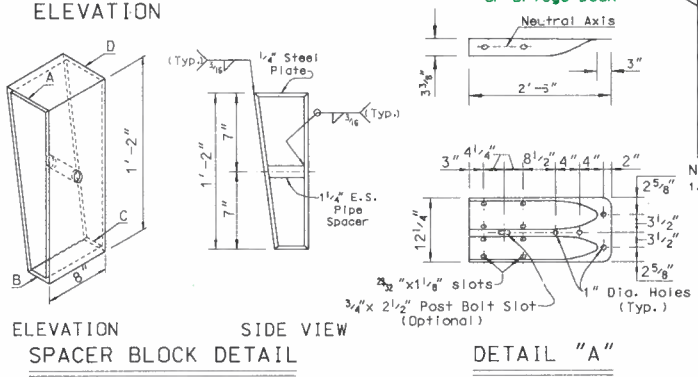
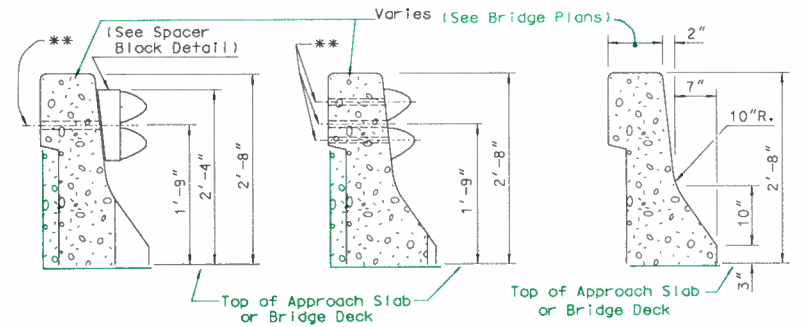
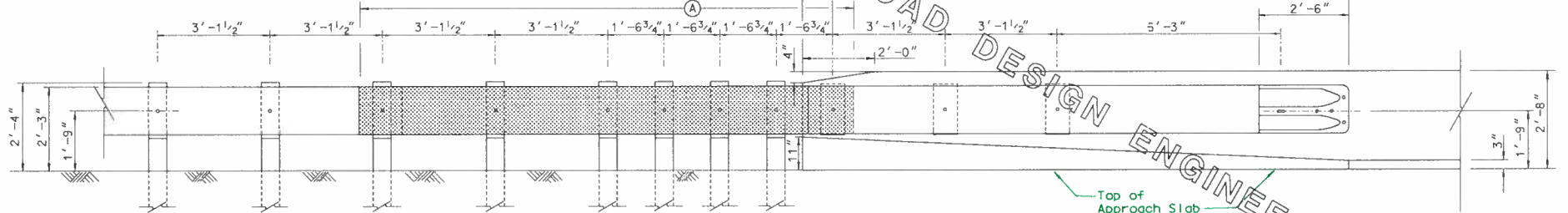
* $\frac{1}{16}$ " Drilled Holes For $\frac{5}{8}$ " Carriage Bolts With Hex Nuts & Flat Plate Washer.

(A) - For This Length The W-Beams Are To Be Nested. (See Detail "C")

REQUIRES APPROVAL OF CHIEF ROAD DESIGN ENGINEER
JANUARY 1997



** $\frac{1}{8}$ " Dia. Core Drilled Holes For $\frac{1}{8}$ " Dia. Galvanized High Strength Hex Bolts & Nuts With 3"x1/4" Sq. Galvanized Steel Washer With 1" Dia. Hole.



SPACER BLOCK TABLE				
SPACER BLOCK	A	B	C	D
①	6"	3 3/4"	3 3/4"	6"
②	5 5/8"	3 3/8"	3 1/8"	5 3/8"
③	4 1/8"	1 7/8"	1 3/8"	3 5/8"

NOTE: 1. Wood Spacer Blocks (Of The Proper Dimensions) May Be Substituted For The Detailed Steel Blocks.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

GUARD RAIL-BRIDGE RAIL CONNECTIONS ("W"-BEAM)

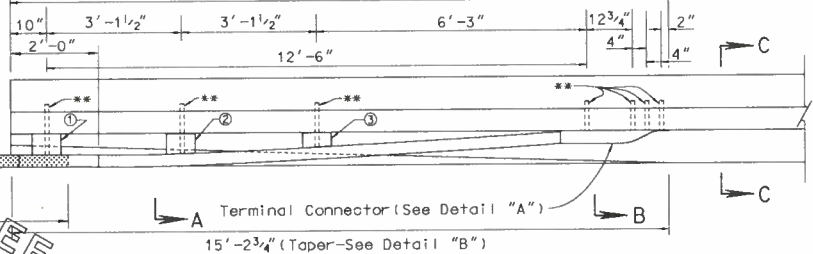
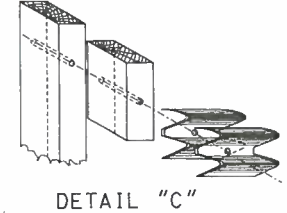
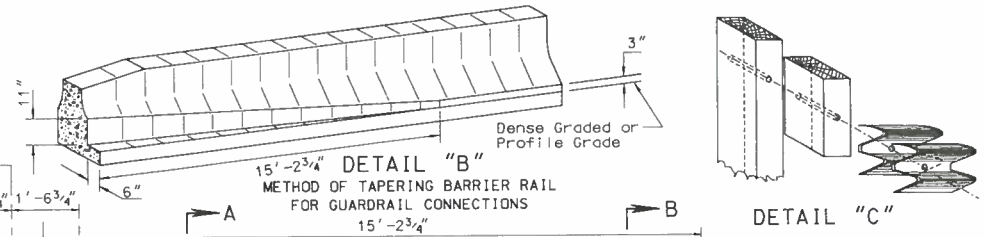
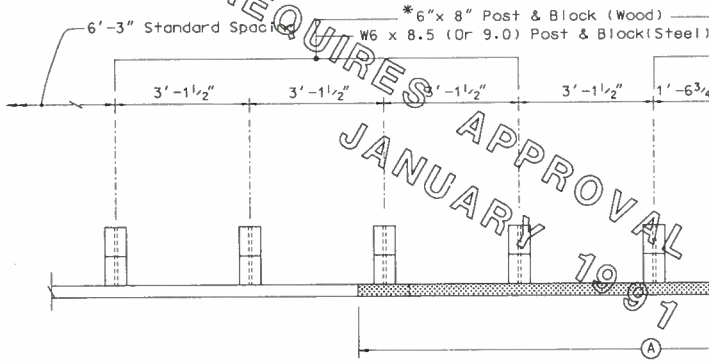
W. B. [Signature]

R-8.2.3 (618)
ADOPTED 11/86 REVISION 11-94

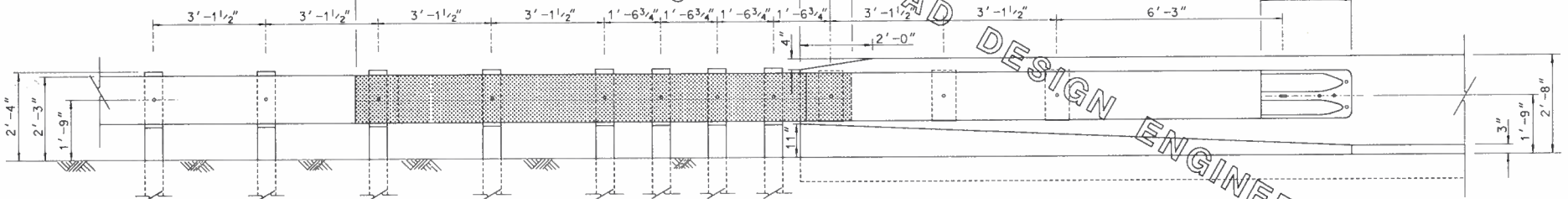
* $\frac{1}{8}$ " Drilled Holes For $\frac{5}{8}$ " Carriage Bolts With Hex Nuts & Flat Plate Washer.

(A) - For This Length The W-Beams Are To Be Nested. (See Detail "C")

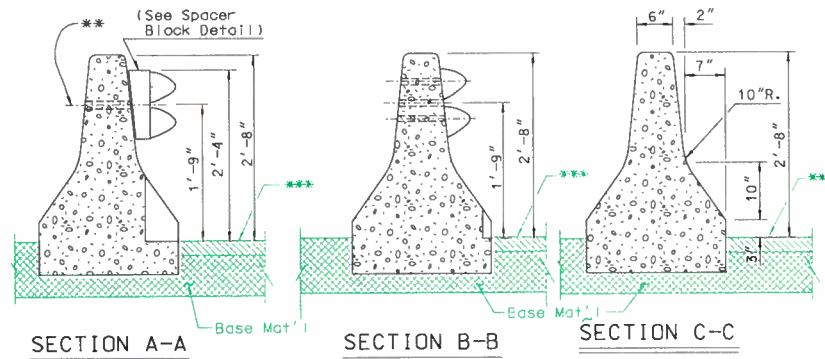
REQUIRES APPROVAL OF CHIEF ROAD DESIGN ENGINEER
JANUARY 1991



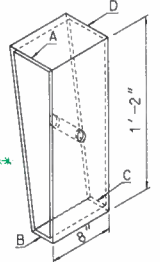
** $\frac{1}{8}$ " Dia. Core Drilled Holes For $\frac{7}{8}$ " Dia. Galvanized High Strength Hex Bolts & Nuts With $3" \times \frac{1}{4}"$ Sq. Galvanized Steel Washer With 1" Dia. Hole.



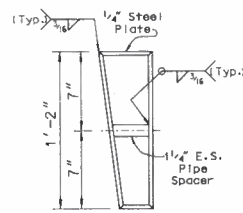
(For Barrier Rail Dimensions Not Shown See Sec. C-C)
*** - Dense Graded or Profile Grade



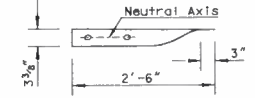
ELEVATION



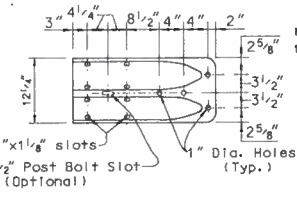
ELEVATION SPACER BLOCK DETAIL



SIDE VIEW



DETAIL "A"



SPACER BLOCK TABLE

SPACER BLOCK	A	B	C	D
①	6"	3 3/4"	3 3/4"	6"
②	5 5/8"	3 3/8"	3 1/8"	5 3/8"
③	4 1/8"	1 7/8"	1 3/8"	3 5/8"

NOTE:
1. Wood Spacer Blocks (Of The Proper Dimensions) May Be Substituted For The Detailed Steel Blocks.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

GUARD RAIL-BARRIER RAIL CONNECTIONS ("W"-BEAM)

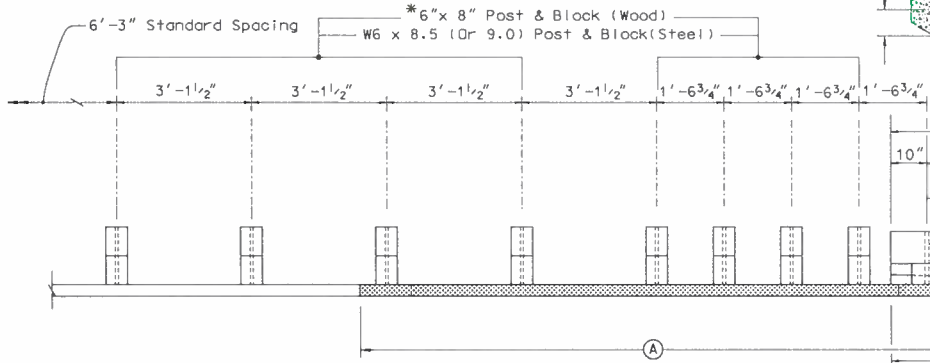
R-8.2.3.1. (618)
ADOPTED: 11/86 REVISION: 11-91

CHIEF ROAD DESIGN ENGINEER

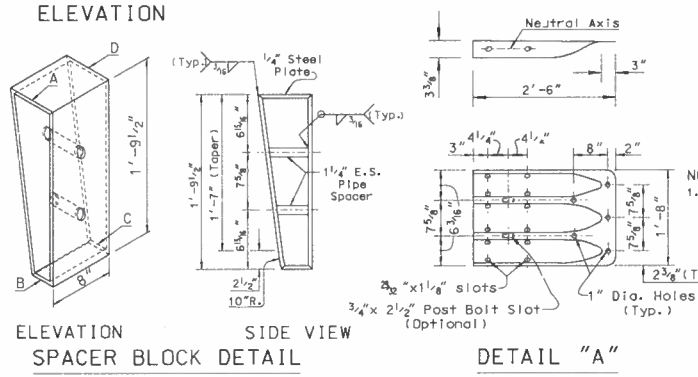
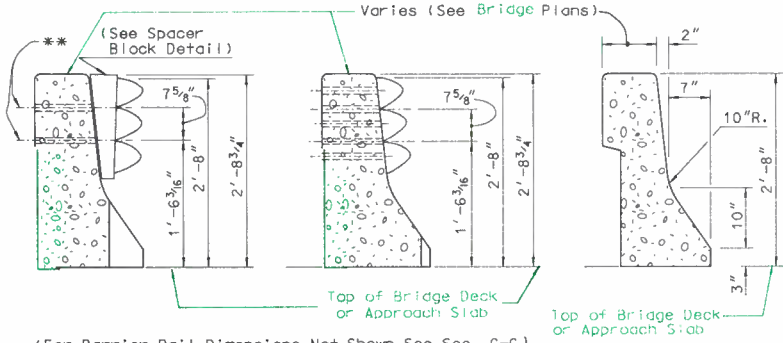
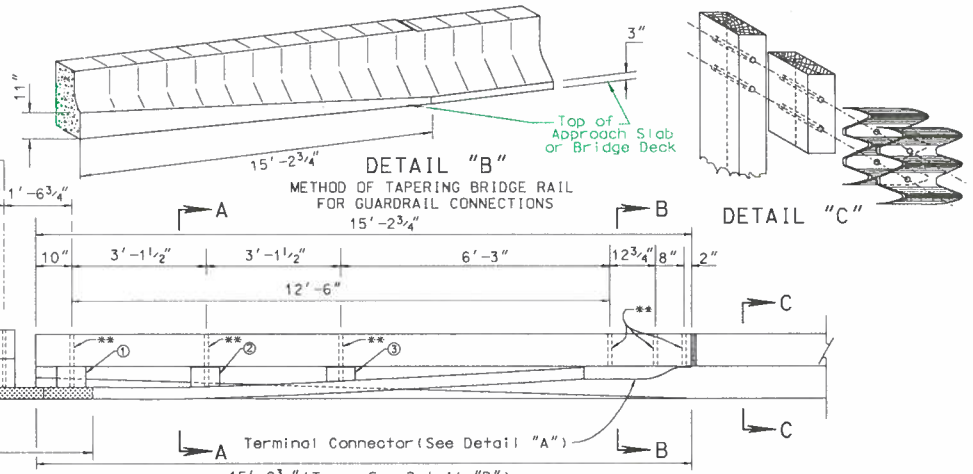
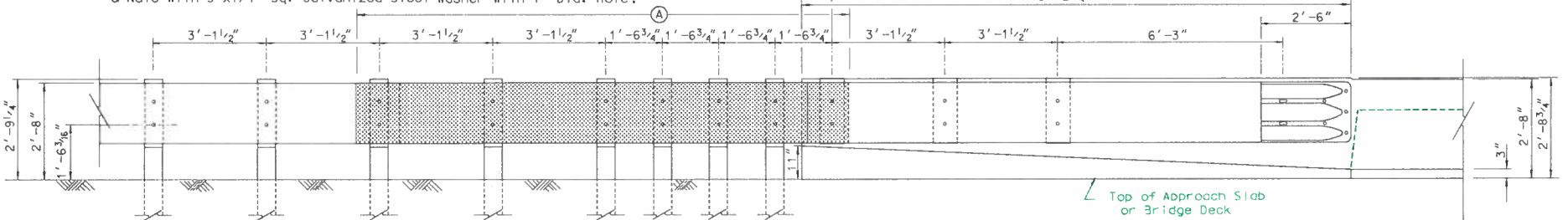
R-75

* $\frac{13}{16}$ " Drilled Holes For $\frac{5}{8}$ " Carriage Bolts With Hex Nuts & Flat Plate Washer.

(A) - For This Length The Tri-Beams Are To Be Nested, (See Detail "C")



** $\frac{1}{8}$ " Dia. Core Drilled Holes For $\frac{1}{8}$ " Dia. Galvanized High Strength Hex Bolts & Nuts With 3"x1/4" Sq. Galvanized Steel Washer With 1" Dia. Hole.



SPACER BLOCK TABLE				
SPACER BLOCK	A	B	C	D
①	6"	3"	3"	6"
②	5 5/8"	2 5/8"	2 3/8"	5 3/8"
③	4 1/8"	1 1/8"	5/8"	3 5/8"

NOTE:
1. Wood Spacer Blocks (Of The Proper Dimensions) May Be Substituted For The Detailed Steel Blocks.

(For Barrier Rail Dimensions Not Shown See Sec. C-C)
SECTION A-A SECTION B-B SECTION C-C

ELEVATION SPACER BLOCK DETAIL SIDE VIEW DETAIL "A"

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

GUARD RAIL-BRIDGE RAIL CONNECTIONS (TRIPLE CORRUGATION)

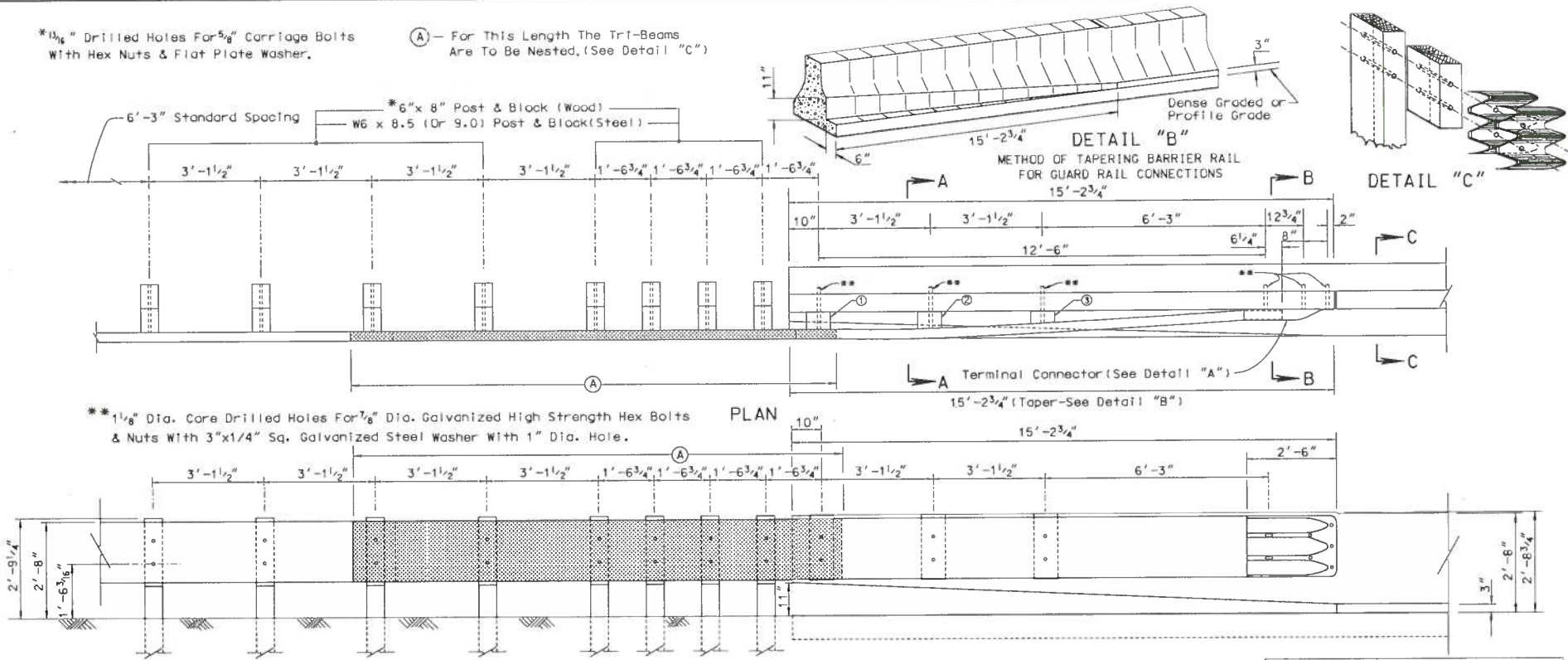
H. R. Dwyer
CHIEF ROAD DESIGN ENGR.

R-8.2.4 (618)
ADOPTED: 11/86 REVISION 1-7-92

R-76

* $\frac{1}{8}$ " Drilled Holes For $\frac{5}{8}$ " Carriage Bolts With Hex Nuts & Flat Plate Washer.

(A) - For This Length The Tr1-Beams Are To Be Nested, (See Detail "C")

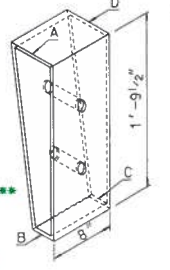
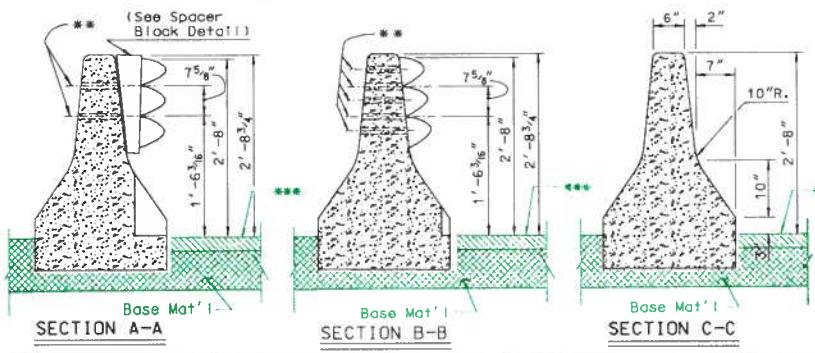


** $\frac{1}{8}$ " Dia. Core Drilled Holes For $\frac{7}{8}$ " Dia. Galvanized High Strength Hex Bolts & Nuts With $3 \times \frac{1}{4}$ " Sq. Galvanized Steel Washer With 1" Dia. Hole.

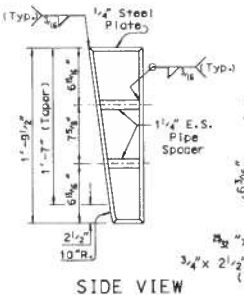
PLAN

ELEVATION

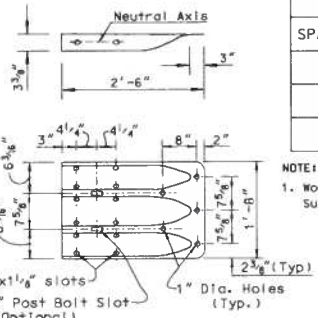
(For Barrier Rail Dimensions Not Shown, See Section C-C)
 *** -Dense Graded or Profile Grade



ELEVATION SPACER BLOCK DETAIL



SIDE VIEW



DETAIL "A"

SPACER BLOCK TABLE				
SPACER BLOCK	A	B	C	D
①	6"	3"	3"	6"
②	5 5/8"	2 5/8"	2 3/8"	5 3/8"
③	4 1/8"	1 1/8"	5/8"	3 5/8"

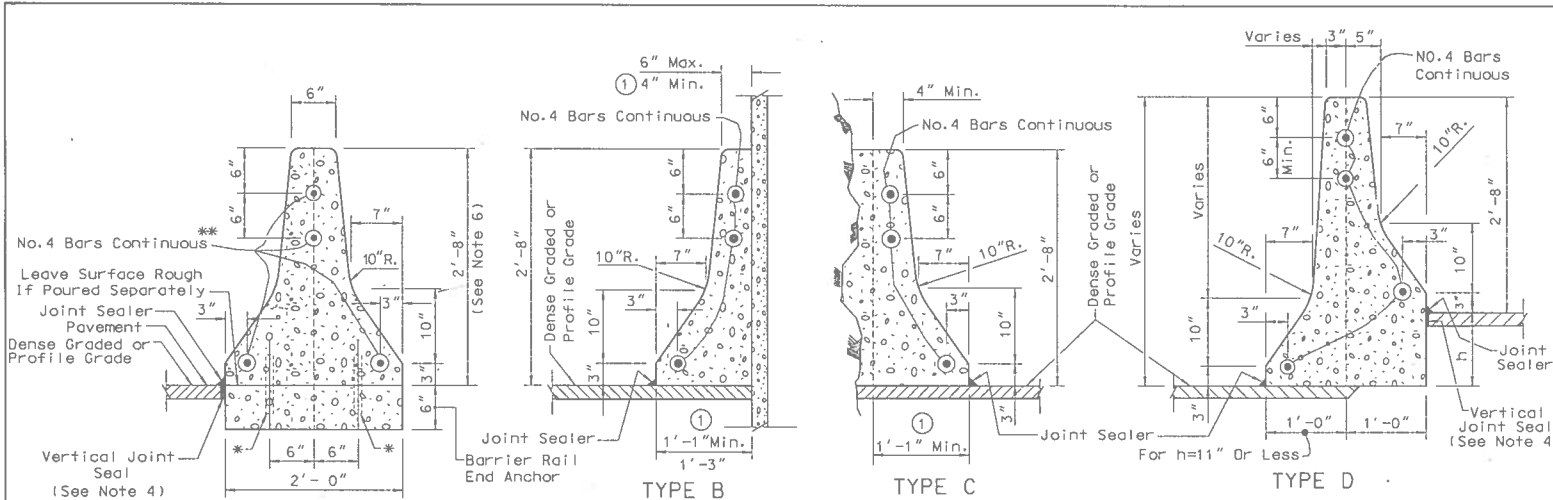
NOTE:
 1. Wood Spacer Blocks (Of The Proper Dimensions) May Be Substituted For The Detailed Steel Blocks.

STATE OF NEVADA
 DEPARTMENT OF TRANSPORTATION

GUARD RAIL-BARRIER RAIL CONNECTIONS (TRIPLE CORRUGATION)

CHIEF ROAD DESIGN ENGR. R-8-2.4.1. (618)
 ADOPTED: 11/86 REVISION 11-84

R-77



GENERAL NOTES

1. CONCRETE SHALL BE CLASS A OR AA.
2. TRANSVERSE JOINTS WITH 1" PREMODULATED EXPANSION JOINT FILLER OR 1" OPEN TRANSVERSE JOINTS SHALL BE PLACED AT STRUCTURES. JOINTS IN BARRIER RAIL OVER A STRUCTURE SHALL BE AT THE SAME LOCATION AND OF THE SAME DIMENSION AS THOSE IN THE STRUCTURE.
3. BITUMINOUS PAVING REQUIRED:
PAVING SHALL BUTT AGAINST THE BARRIER RAIL END ANCHOR SECTION AND SHALL EXTEND FULL WIDTH UNDER THE NORMAL BARRIER RAIL SECTION PLUS 6" MIN. BEYOND THE OUTSIDE EDGE OF THE BARRIER RAIL, FOLLOWED BY 12" MIN. OF GRAVEL BASE MATERIAL (SEE SECTION-K). 6-INCH DEEP BARRIER END ANCHORS SHALL BE CONSTRUCTED IN THE FIRST AND LAST 10 LINEAR FEET OF THE FULL HEIGHT BARRIER RAIL RUN. IF TRANSITIONS ARE USED THE ANCHOR SHALL BE EXTENDED UNDER THE TRANSITION SECTION.
CONCRETE PAVING REQUIRED:
THE NORMAL BARRIER RAIL SECTION MAY BE PLACED ON THE CONCRETE PAVEMENT. DOWELS SHALL BE REQUIRED IN THE FIRST AND LAST 10 LINEAR FEET OF THE FULL HEIGHT BARRIER RAIL AND THROUGH TRANSITION SECTIONS. THE SURFACE OF THE CONCRETE SHALL BE CLEAN PRIOR TO PLACEMENT OF THE BARRIER RAIL. AT THE CONTRACTOR'S OPTION, CONCRETE PAVEMENT AND BARRIER RAIL MAY BE PLACED MONOLITHICALLY. IN WHICH CASE DOWELS MAY BE ELIMINATED.
4. VERTICAL JOINTS SHALL HAVE HOT RUBBERIZED ASPHALT SEALS FULL DEPTH OF THE JOINT.
5. JOINT SEALER SHALL BE HOT RUBBERIZED ASPHALT 1" THICK.
6. THE HEIGHT OF THE BARRIER RAIL SHALL BE MEASURED FROM THE TOP OF THE PROFILE GRADE (ASPHALT SURFACE), OR THE TOP OF THE PROFILE GRADE (P.C.C.P.).
7. JOINT FILLER SHALL BE PLACED IN OPEN JOINTS IN THE BARRIER AS REQUIRED TO MATCH JOINTS IN THE APPROACH SLAB DETAIL. (SEE B-29-1.21).

TYPE A
CONCRETE (INFORMATION ONLY)
0.1032 CU. YD. PER LIN. FT. WITHOUT BASE SLAB
0.1402 CU. YD. PER LIN. FT. WITH BASE SLAB

TYPE B
CONCRETE (INFORMATION ONLY)
4" MIN. 0.0598 CU. YD. PER LIN. FT.
6" MIN. 0.0765 CU. YD. PER LIN. FT.

TYPE C
CONCRETE (INFORMATION ONLY)
4" MIN. 0.0598 CU. YD. PER LIN. FT.
6" MIN. 0.0765 CU. YD. PER LIN. FT.

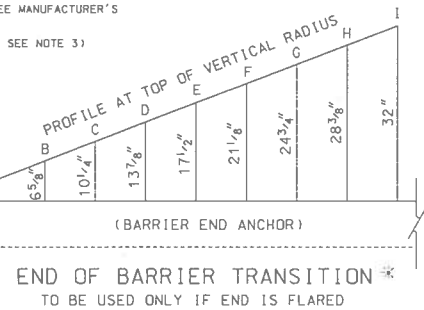
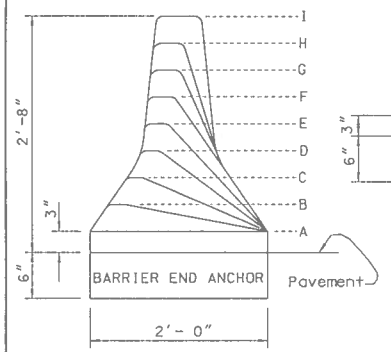
TYPE D
CONCRETE (INFORMATION ONLY)
4" MIN. 0.0598 CU. YD. PER LIN. FT.
6" MIN. 0.0765 CU. YD. PER LIN. FT.

CONCRETE (INFORMATION ONLY)

4" MIN. 0.0598 CU. YD. PER LIN. FT.
6" MIN. 0.0765 CU. YD. PER LIN. FT.

①-Dimension Used When Barrier is Placed Against Rock Or Solid Object Such As A Retaining Wall.

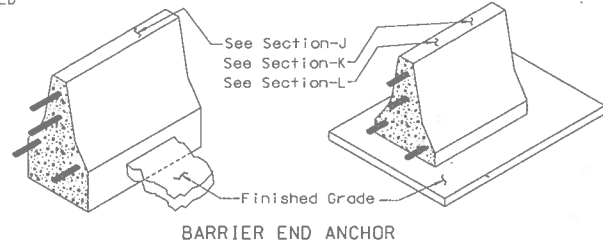
With Each 6" Increase In "h" Elevation, The Base Width Will Increase 2" Over The Normal 1'-0" Dim.



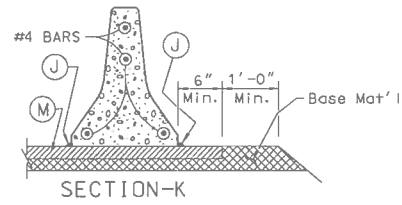
END OF BARRIER TRANSITION*
TO BE USED ONLY IF END IS FLARED

CONCRETE BARRIER RAIL FLARE RATES

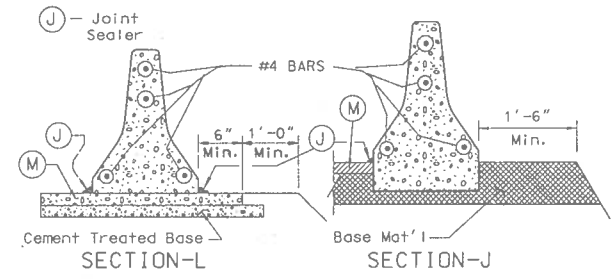
DESIGN SPEED	FLARE RATE
70	20:1
60	17:1
50	14:1
40	11:1



BARRIER END ANCHOR



SECTION-K



SECTION-L

SECTION-J

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

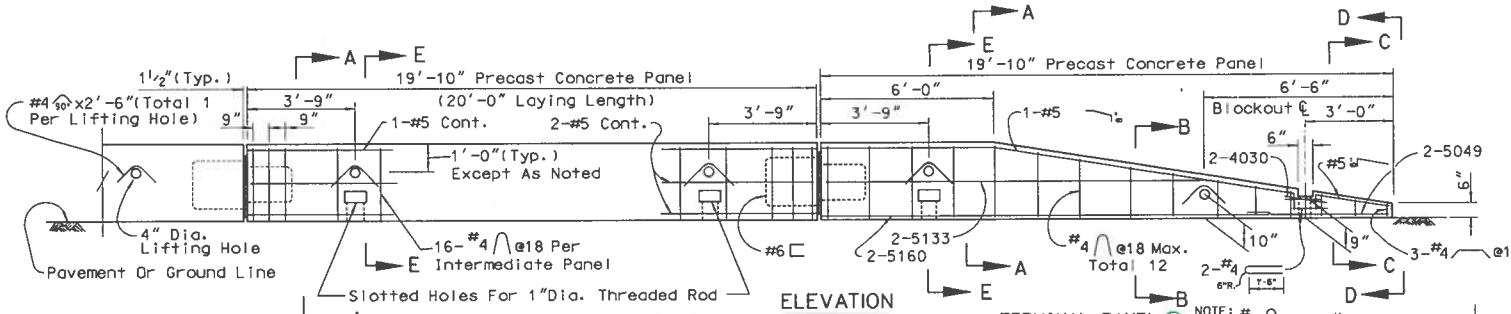
CONCRETE BARRIER RAIL

CHIEF ROAD DESIGN ENGR. *[Signature]* R-8.3.1 (502)
ADOPTED: 11/86 REVISION: 11/84

R-79

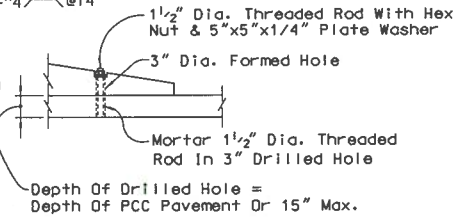
CONCRETE BARRIER RAIL
FLARE RATES

DESIGN SPEED	FLARE RATE
70	20:1
60	17:1
50	14:1
40	11:1



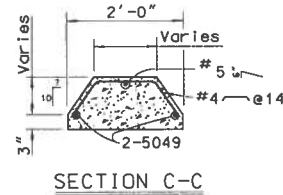
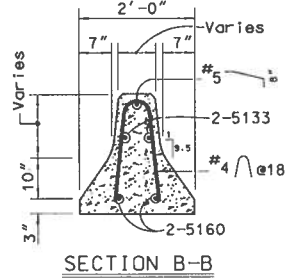
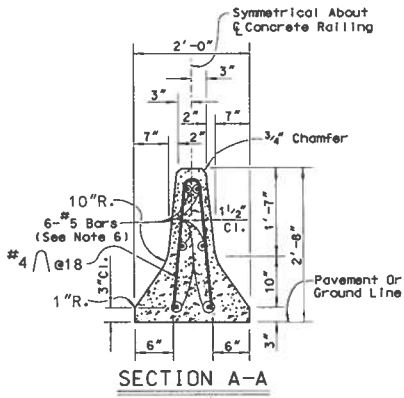
TYPICAL INTERMEDIATE PANEL
Concrete: 1.93 c.y. Per Panel
Reinforcing: 169 lbs. Per Panel
Weight: 3.9 Tons Per Panel

TERMINAL PANEL
Concrete: 1.55c.y. Per Panel
Reinforcing: 144 lbs. Per Panel
Weight: 3.1 Tons Per Panel

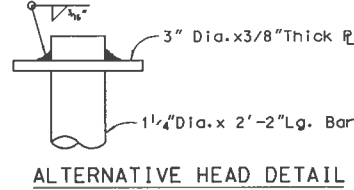


P.C.C. PAVEMENT ANCHORAGE

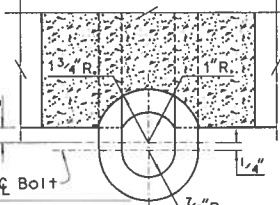
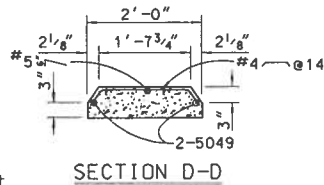
- NOTES:
- SEE PROJECT PLANS OR SPECIAL PROVISIONS FOR LAYOUT OF TEMPORARY RAILINGS.
 - OFFSET FOR TERMINAL SECTIONS AT APPROACH ENDS SHALL BE 6'-0" MIN. FROM EDGE OF ROADWAY, OR AS DIRECTED BY THE ENGINEER.
 - WHERE BARRIERS ARE PLACED ON CURVES AND RADII THAT ARE TOO SEVERE TO MAKE UP JOINTS, BARRIERS ARE TO BE BACKED CONTINUOUSLY WITH EARTH FILL. SEE SECTION H-H.
 - BOLT UNITS TO DECK SLABS WHEN REQUIRED BY BRIDGE PLANS.
 - ATTACH UNITS TO PAVEMENT WHEN REQUIRED IN THE PLANS.
 - THE TWO #5 BARS SHALL BE EQUALLY SPACED FROM THE VERTEX OF THE STIRRUP BARS. ONE #5 BAR SHALL BE TIGHTLY WIRED TO THE STIRRUP BARS AND THE SECOND #5 BAR SHALL BE TACK WELDED TO THE STIRRUP BARS. EACH PROCESS SHALL BE CONTINUOUS FOR EACH #5 BAR.
 - NOT TO BE USED FOR SPEEDS OVER 40 MPH WITHOUT PRIOR APPROVAL OF CHIEF ROAD DESIGN ENGINEER.



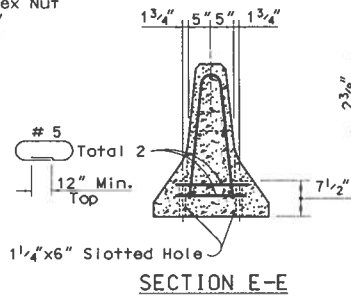
A.C. PAVEMENT ANCHORAGE
(Or Ground)



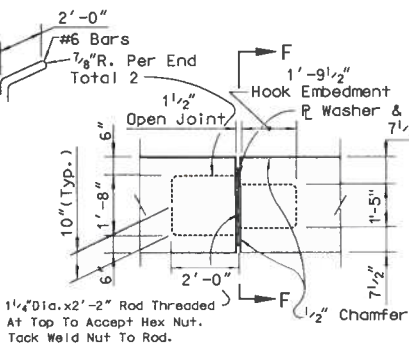
ALTERNATIVE HEAD DETAIL



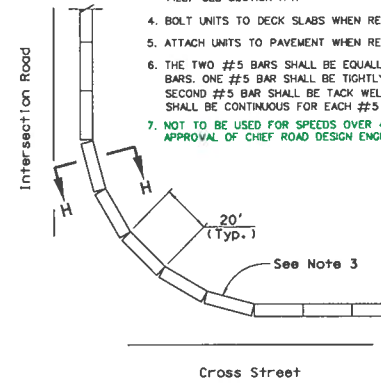
SECTION G-G



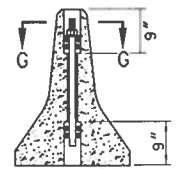
SECTION E-E



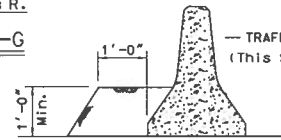
CONNECTION DETAIL



CURVED LAYOUT



SECTION F-F



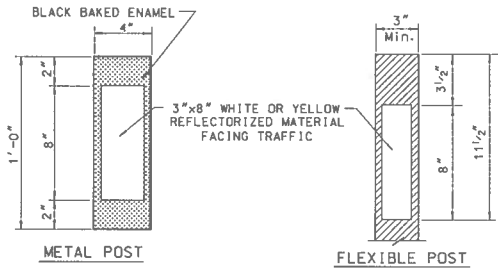
SECTION H-H

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

**PORTABLE PRECAST
CONCRETE
BARRIER RAIL**

CHIEF ROAD DESIGN ENGR. *Handwritten Signature*

R-8-3.3. (502)
ADOPTED: 1/76 REVISION: 11-84



TYPE 1 REFLECTORS
(ROADWAY - RAMP)

MULTI-LANE DIVIDED HIGHWAY, RAMPS, NARROWING ROADWAYS
(FREEWAY STANDARDS)

UNLESS OTHERWISE NOTED ON PLANS, GUIDE POSTS SHALL BE SET AS FOLLOWS:

(A) ON TANGENTS, GUIDE POSTS OF THE APPROPRIATE COLOR SHALL BE INSTALLED ALONG THE SIDES OF THE THROUGH ROADWAYS AT APPROXIMATELY 800-FOOT SPACING ALONG THE MEDIAN SIDE AND 400-FOOT SPACING ON THE OUTSIDE SHOULDER. THE POSTS ON THE MEDIAN SIDE SHALL BE PLACED OPPOSITE THOSE ON THE OUTER SHOULDER.

(B) SEE TABLE 1 FOR SPACING ON CURVES.

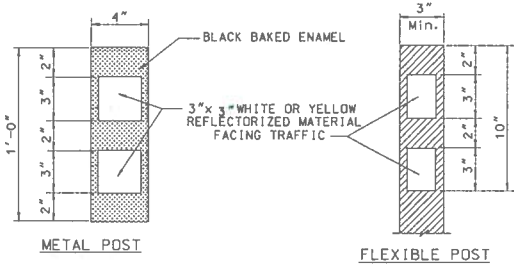
(C) NARROWING PAVEMENTS: GUIDE POSTS OF APPROPRIATE COLOR SHALL BE PLACED ADJACENT TO THE LANE FOR THE FULL LENGTH OF THE CONVERGENCE.

(D) AT INTERCHANGES, GUIDE POSTS WITH APPROPRIATELY COLORED REFLECTORS SHALL BE INSTALLED AT A MAXIMUM SPACING OF 100' ALONG THE ACCELERATION OR DECELERATION LANES AND IN ACCORDANCE WITH TABLE 1 ON TURNING RAMPS.

TWO-LANE AND FOUR-LANE UNDIVIDED HIGHWAYS:

(A) WHITE REFLECTORIZED GUIDE POSTS SHALL BE INSTALLED ON THE RIGHT SIDE OF THE ROADWAY FACING TRAFFIC AT 600-FOOT INTERVALS ON TANGENTS AND ON CURVES HAVING A RADIUS GREATER THAN 10,000 FEET.

(B) SEE TABLE 1 FOR SPACING ON CURVES.



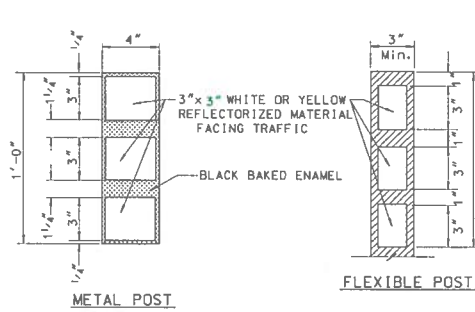
TYPE 2 REFLECTORS
(MEDIAN CROSSOVERS, APPROACHES)

MULTI-LANE DIVIDED HIGHWAYS
(FREEWAY STANDARDS)

(A) IN RURAL AREAS WHERE MEDIAN CROSSOVERS ARE PROVIDED FOR OFFICIAL OR EMERGENCY USE, A SINGLE GUIDE POST WITH AMBER REFLECTORS SHALL BE PLACED ON THE LEFT SIDE OF THE THROUGH ROADWAY ON THE FAR SIDE OF THE CROSSOVER FOR EACH ROADWAY.

ALL APPROACHES:

ALL APPROACHES SHALL BE DELINEATED WITH WHITE TYPE 2 GUIDE POSTS AT THE BEGINNING AND ENDING LIMITS OF THE APPROACHES. TYPE 4 AND 5 APPROACHES WILL HAVE AN ADDITIONAL GUIDE POST AT EACH TAPER SECTION.

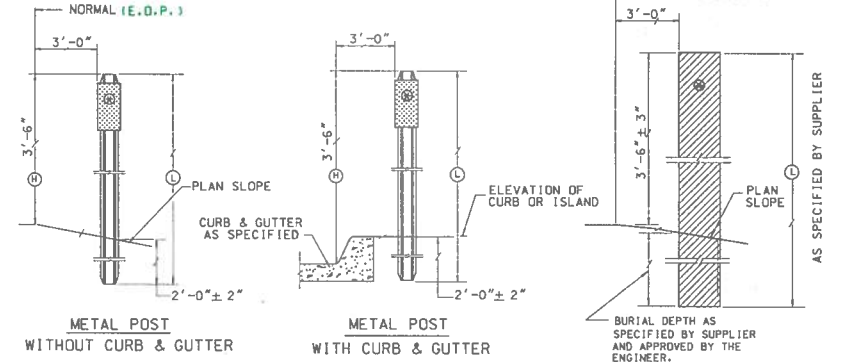


TYPE 3 REFLECTORS
(ISLANDS, CURBS, SHOULDER DIKES)

GENERAL:

(A) AT TRAFFIC ISLANDS, CURBS, SHOULDER DIKES, ETC., A SINGLE GUIDE POST WITH TRIPLE AMBER REFLECTORS SHALL BE INSTALLED.

(B) IN URBAN OR SUBURBAN AREAS WHERE A RAISED AND CURBED MEDIAN IS PROVIDED, EACH PROJECT SHOULD BE INVESTIGATED TO DETERMINE WHETHER OR NOT GUIDE POSTS WILL BE NEEDED IN THE MEDIAN.



TYPICAL INSTALLATION

Ⓢ TYPE AND COLOR OF REFLECTORS ACCORDING TO THEIR LOCATION

Ⓛ VARIES 6'-6" MAX. 5'-6" MIN.
Ⓜ 3'-6" STANDARD HEIGHT FOR ALL ROADWAYS.

TABLE 1				
MAXIMUM SPACING FOR HIGHWAY DELINEATORS ON HORIZONTAL CURVES				
(DISTANCE IN FEET ROUNDED TO THE NEAREST 5 FEET)				
RADIUS OF CURVE (IN FT.)	SPACING ON CURVE (IN FT.)	SPACING IN ADVANCE & BEYOND CURVE (IN FT.)		
		1ST	2ND	3RD
50	20	40	60	120
150	30	40	75	180
200	35	70	105	210
250	40	80	120	240
300	45	100	150	300
400	55	110	185	300
500	65	120	195	300
600	70	140	210	300
700	75	150	225	300
800	80	160	240	300
900	85	170	255	300
1,000	90	180	270	300
1,200	100	200	300	300
1,400	110	220	300	300
1,600	120	240	300	300
1,800	125	250	300	300
2,000	130	260	300	300
2,500	150	300	300	300
3,000	165	300	300	300
4,000	210	300	300	300
5,000	210	300	300	300
10,000	300	300	300	300

SPACING FOR SPECIFIC RADI NOT SHOWN MAY BE INTERPOLATED FROM TABLE OR COMPUTED FROM THE FORMULA $S = \sqrt{R \cdot W}$. THE MINIMUM SPACING SHOULD BE 20 FEET. THE SPACING ON CURVES SHOULD NOT EXCEED 300 FEET. THE SPACING OF THE FIRST DELINEATOR APPROACHING A CURVE IS 25, THE SECOND 35, AND THE THIRD 65 BUT NOT TO EXCEED 300 FEET. IF A SPACING LESS THAN 300 FEET IS USED APPROACHING THE CURVE, THE DISTANCE SHOWN ABOVE SHOULD BE ADJUSTED ACCORDINGLY.

THE COLOR OF DELINEATORS SHALL BE WHITE ON THE RIGHT SHOULDER INSTALLATIONS AND YELLOW ON THE LEFT EDGE OF DIVIDED OR ONE-WAY ROADWAYS. THE COLORS SHALL BE DENOTED BY A LETTER CODE (E.G. TYPE 1-Y FOR SINGLE DELINEATOR, YELLOW) IN THE SUMMARY OF GUIDE POST ONLY.

FOR PLACEMENT OF GUIDE POSTS ALONG GUARDRAIL SEE SHEET R-9.2.2.

PLACEMENT OF GUIDE POST ON CURVES

MULTI-LANE DIVIDED HIGHWAYS
(FREEWAY STANDARDS)

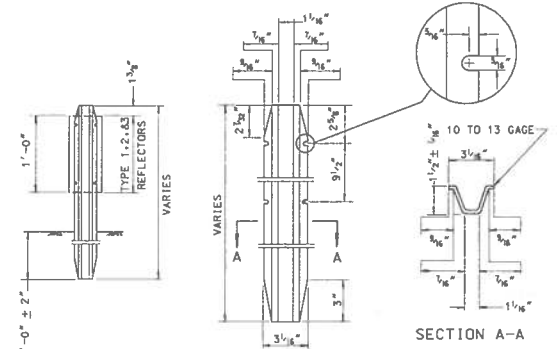
(A) ON CURVES, THEY SHALL BE INSTALLED ALONG BOTH SIDES OF THE THROUGH ROADWAYS AT 400-FOOT SPACING ON THE OUTSIDE SHOULDER AND 800-FOOT SPACING ON THE MEDIAN SHOULDER FOR CURVES HAVING A RADIUS OF MORE THAN 10,000 FEET. FOR CURVES OF 10,000 FEET RADIUS OR LESS, THEY SHALL BE SPACED AS SHOWN IN TABLE 1. THE POSTS ON THE MEDIAN SIDE SHALL BE PLACED DIRECTLY OPPOSITE THOSE ALONG THE OUTER SHOULDER. THE SPACING ON THE MEDIAN SIDE SHALL BE ADJUSTED WHERE APPROACHING OR LEAVING A CURVE TO ACCOMPLISH THE ALTERNATED SPACING TO BE USED ON ALL TANGENTS.

TWO-LANE AND FOUR-LANE UNDIVIDED HIGHWAYS:

(A) ON CURVES HAVING A RADIUS OF 10,000 FEET OR LESS, WHITE GUIDE POSTS SHALL BE INSTALLED ON THE RIGHT SIDE ON THE OUTSIDE OF THE CURVE AT THE SPACING SHOWN IN TABLE 1 AND ON THE INSIDE OF THE CURVE AT DOUBLE THE SPACING SHOWN IN THE TABLE.

(B) POST SPACING ON RECREATIONAL ROADWAYS MAY BE VARIED TO ACCOMMODATE DESIGN CONSIDERATIONS.

NOTE: GUIDE POSTS SHALL BE INSTALLED AT THE BEGINNING AND END OF EACH CURVE AND THE SPACING ADJUSTED, THROUGH THE LENGTH OF THE CURVE, INTO EQUAL SPACING NEAREST TO THAT SPECIFIED IN TABLE 1.

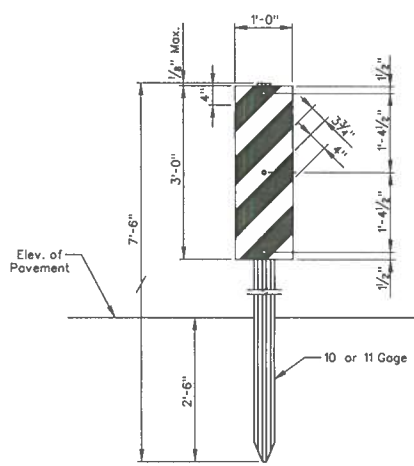


METAL POST DETAILS

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

GUIDE POSTS

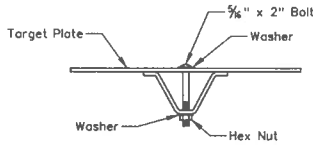
CHIEF ROAD DESIGN ENGR. | R-9.1.1-(619) | ADOPTED: 8/69 | REVISION: 10/94



**TYPE 3
BRIDGES, PIERS, ABUTMENTS**

Front: Facing Traffic, Alternating Black With ReflectORIZED Yellow Stripes Sloping Down at A 45° Angle Toward Edge of Obstruction on Which Traffic Will Pass.

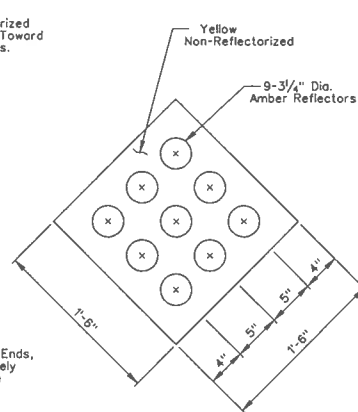
Back: Solid White



(Electroplated Bolts & Nuts & Protective Flat Non-Metallic Washers.)

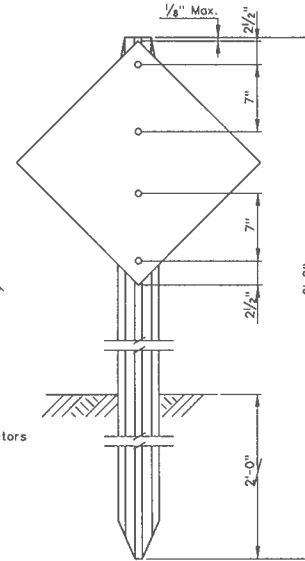
Object Markers Shall be Installed to Delineate Bridge Ends, Underpass Abutments and All Other Obstructions Closely Adjacent to the Edges of the Roadway They May be Omitted When Guardrail or Barrier Rail Protects the Obstruction.

For Post Details See Sheet R-9.11

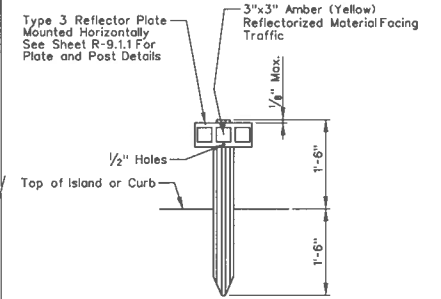


**TYPE 1
MEDIAN OBSTRUCTIONS
OBJECT MARKERS**

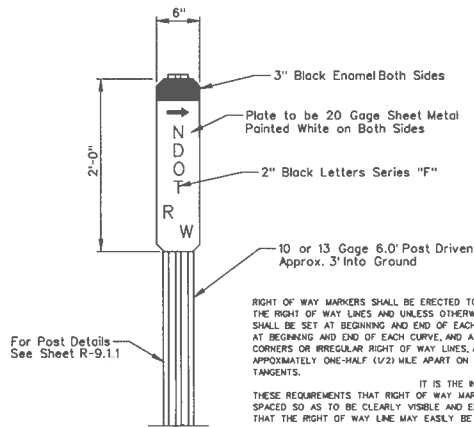
When Used as "End Of Roadway" Marker, Red Reflectors On a Red Background or Type III ReflectORIZED Sheeting Shall be Used.



Type 3 Reflector Plate Mounted Horizontally See Sheet R-9.11 For Plate and Post Details



**TYPE 2
(USE ON APPROACH END OF
MEDIAN ISLANDS ONLY)**



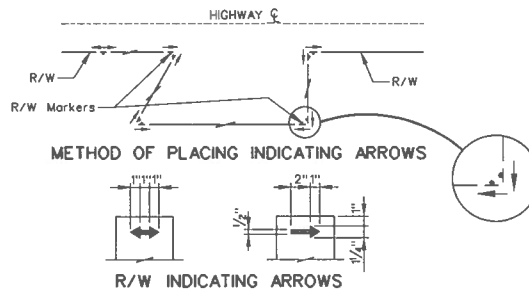
RIGHT OF WAY MARKERS

For Post Details See Sheet R-9.11

RIGHT OF WAY MARKERS SHALL BE ERECTED TO DEFINE THE RIGHT OF WAY LINES AND UNLESS OTHERWISE SPECIFIED, SHALL BE SET AT BEGINNING AND END OF EACH PROJECT, AT BEGINNING AND END OF EACH CURVE, AND AT ALL CORNERS OR IRREGULAR RIGHT OF WAY LINES, AND APPROXIMATELY ONE-HALF (1/2) MILE APART ON LONG TANGENTS.

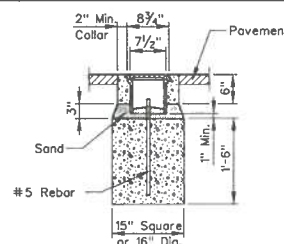
IT IS THE INTENT OF THESE REQUIREMENTS THAT RIGHT OF WAY MARKERS ARE SPACED SO AS TO BE CLEARLY VISIBLE AND ERECTED SO THAT THE RIGHT OF WAY LINE MAY EASILY BE ESTABLISHED.

RIGHT OF WAY MARKERS SHALL BE OMITTED WHERE RIGHT OF WAY LINE IS FENCED.

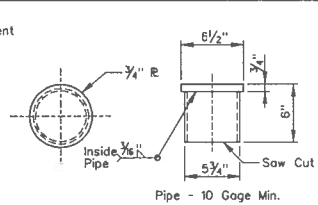


METHOD OF PLACING INDICATING ARROWS

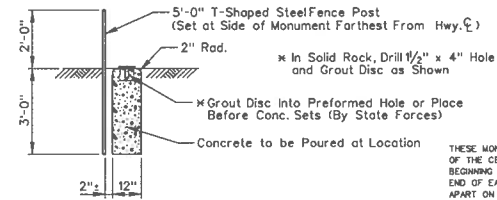
R/W INDICATING ARROWS



**SURVEY COVER & RING
(CAST IRON)**



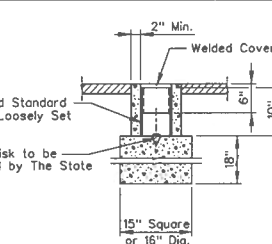
**WELDED COVER DETAIL
(STEEL)
SURVEY MONUMENTS**



REFERENCE MONUMENT AND MARKER POST

THESE MONUMENTS SHALL BE SET TO ASSIST IN RE-ESTABLISHMENT OF THE CENTERLINE FOR FUTURE USE AND SHALL BE SET AT THE BEGINNING AND END OF EACH PROJECT, AT THE BEGINNING AND END OF EACH CURVE, AND APPROXIMATELY ONE-HALF (1/2) MILE APART ON LONG TANGENTS.

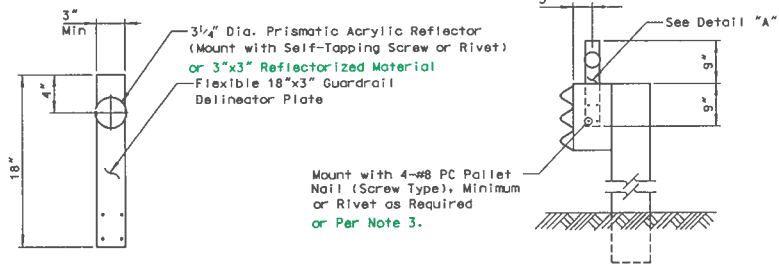
5'-0" T-Shaped Steel Fence Post (Set at Side of Monument Farthest From Hwy. C)
2" Rad.
In Solid Rock, Drill 1 1/2" x 4" Hole and Grout Disc as Shown
Grout Disc Into Preformed Hole or Place Before Conc. Sets (By State Forces)
Concrete to be Poured at Location



**ALTERNATE PLACEMENT
(STEEL)**

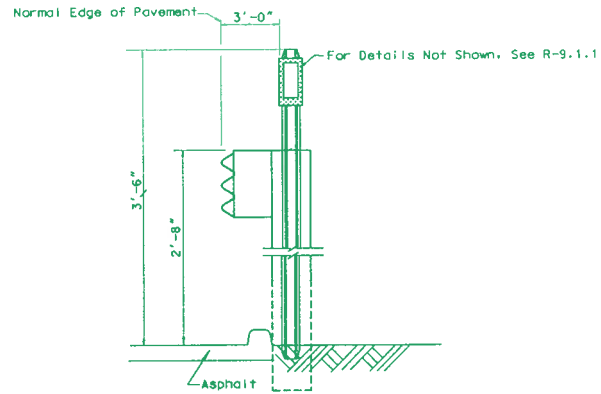
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
**OBJECT MARKERS,
RIGHT OF WAY MARKERS,
SURVEY MONUMENTS AND
REFERENCE MONUMENTS**

R-9.2.1 (619THRU621)
ADOPTED: 8/69 REVISED: 11-94
CHIEF ROAD DESIGN ENGR



DETAIL "A"

TYPICAL GUARDRAIL REFLECTOR
PLATE INSTALLATION
(Flexible Plates)
(Metal or Wood Blocks)



TYPICAL GUARDRAIL REFLECTOR
(GUIDE POST INSTALLATION)

REFLECTOR PLACEMENT SPACING ON GUARDRAIL/BARRIER RAIL

SPACING SHALL BE:

- (a) 50 FEET ON TANGENTS AND ON CURVES OF 300 FOOT RADIUS OR GREATER. IF LESS THAN 300 FOOT RADIUS SEE TABLE "A".
- (b) REFLECTORS SHALL BE OMITTED ON THE FLARED SECTIONS OF GUARDRAIL.
- (c) NO DIRECT PAYMENT FOR REFLECTORS REGARDLESS OF TYPE OF INSTALLATION.

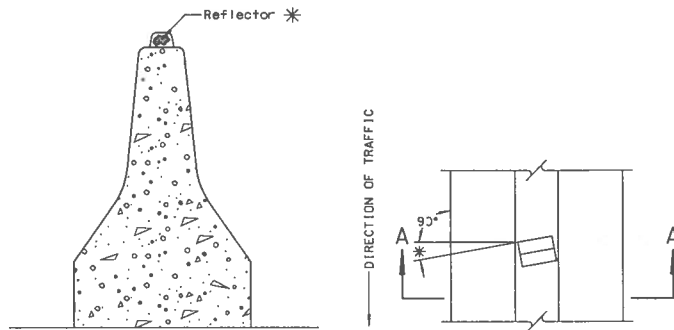
TABLE "A"

Radius of Curve (In Feet)	Reflector Spacing
≤ 50	20 Ft.
150	30 Ft.
200	35 Ft.
250	40 Ft.
≥ 300	50 Ft.

NOTES:

- 1. ALL REFLECTORS SHALL BE SELECTED & INSTALLED PURSUANT TO THE PROJECT PLANS & SPECIFICATIONS OR AT THE DIRECTION OF THE ENGINEER. THE DEPICTED REFLECTORS ARE FOR MOUNTING LOCATION INFORMATION ONLY.
- 2. SPACING: SEE "REFLECTOR PLACEMENT ON GUARDRAIL" NOTES & TABLE "A", OF THIS SHEET.
- * 3. REFLECTORS SHALL BE MOUNTED AS SPECIFIED BY THE MANUFACTURER OR AS DIRECTED BY THE ENGINEER.
- 4. COLOR: SHALL COMPLY WITH THE GUIDELINES ESTABLISHED BY THE M.U.T.C.D., 1988 EDITION AND REVISIONS THERETO.

R-82



SECTION A-A

PLAN

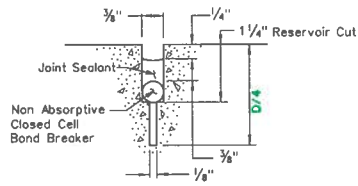
BARRIER RAIL REFLECTOR INSTALLATION

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

REFLECTORS

CHIEF ROAD DESIGN ENGR: *[Signature]* R-9.2.2 (618-619)
ADOPTED: 1-1-83 REVISION 11-94

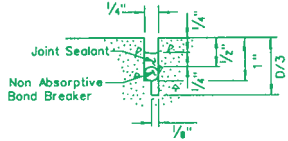
ALL MEASUREMENT \pm 1/8" TOLERANCE



NOTE: RATIO OF DEPTH TO WIDTH OF JOINT SEALANT SHOULD BE 1:1 INITIAL 1/8" WEAK JOINT SAW CUT TO BE DONE WITHIN SPECIFIED TIME LIMIT. RESERVOIR CUT MAY BE DONE AT A LATER TIME.

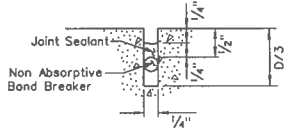
TRANSVERSE WEAKENED PLANE JOINT DOUBLE SAW CUT

ALL MEASUREMENT \pm 1/8" TOLERANCE

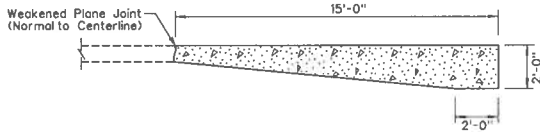


LONGITUDINAL WEAKENED PLANE JOINT DOUBLE SAW CUT

ALL MEASUREMENT \pm 1/8" TOLERANCE

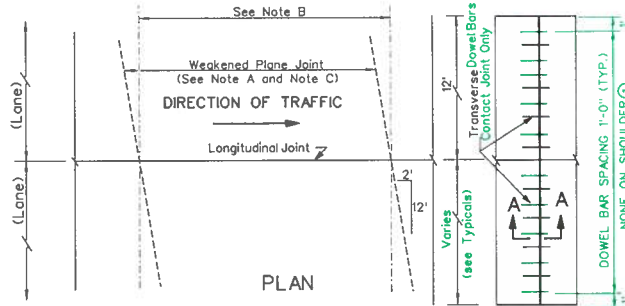


LONGITUDINAL WEAKENED PLANE JOINT SINGLE SAW CUT



PAVEMENT END ANCHOR DETAIL

NOTE: PAVEMENT END ANCHORS SHALL BE CONSTRUCTED AS THE TERMINAL PANELS OF ALL PAVEMENT NOT ABUTTING EXISTING PAVEMENTS OR STRUCTURES, AND ELSEWHERE IF ORDERED BY THE ENGINEER.



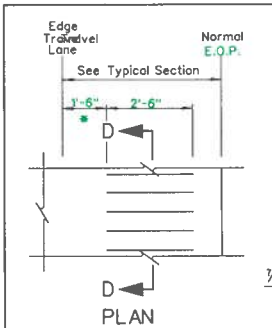
PLAN

NOTE A: ALL WEAKENED PLANE JOINTS SHALL BE SAWED DIAGONALLY AS SHOWN, EXCEPT AS INDICATED IN THE END ANCHOR AND STRUCTURE APPROACH DETAILS. WHEN ONLY ONE LANE IS BEING CONSTRUCTED ALONGSIDE EXISTING LANES, JOINTS SHALL BE SAWED EITHER DIAGONALLY OR AS DIRECTED BY THE ENGINEER. OFFSET - 2' IN 12' AND SKEWED COUNTERCLOCKWISE.

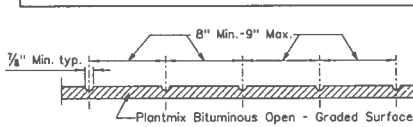
NOTE B: SPACING OF WEAKENED PLANE JOINTS SHALL BE SUCCESSIVELY 15', 13', 14', 12' AND REPEAT, EXCEPT FOR THE FIRST JOINT AT PAVEMENT END ANCHORS AND AT REINFORCED STRUCTURE APPROACHES.

NOTE C: TRANSVERSE WEAKENED PLANE JOINTS SHALL BE CONSTRUCTED AT LEAST 6' FROM ANY TRANSVERSE CONTACT JOINT

NOTE D: LONGITUDINAL WEAKENED PLANE JOINTS SHALL BE CUT AT ALL LANE AND SHOULDER LINES EXCEPT WHERE LANE PLUS ADJACENT SHOULDER WIDTH IS LESS THAN OR EQUAL TO 16'.



PLAN



SECTION D-D

* - WHEN SHOULDER WIDTH IS 6' OR WIDER INCREASE 16' TO 2'-0"

RUMBLE STRIP SHALL BE CONTINUOUS AS DESCRIBED ON PLANS TO BE USED ON ROADS WITH SHOULDERS 4' WIDE AND OVER.

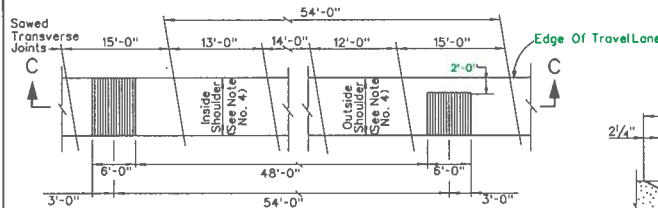
RUMBLE STRIPS ON ASPHALT SHOULDERS (RUMBLE STRIPS SHALL NOT BE USED IN URBAN AREAS)

NOTE: 1) DO NOT SCORE THRU DECELERATION AND ACCELERATION AREAS OF RAMPS AND TAPERED APPROACHES. DO NOT SCORE ACROSS MINOR APPROACHES.

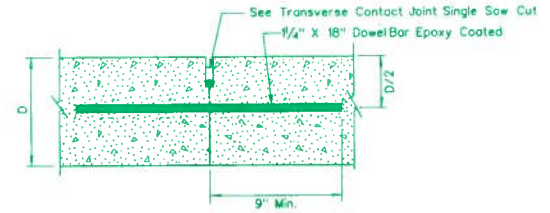
2) SHOULDER TRANSVERSE JOINTS SHALL BE THE SAME PATTERN AS MAIN ROADWAY.

3) 6' RUMBLE STRIPS SHALL BE SCORED BETWEEN THE 15' DIAGONALLY SAWED TRANSVERSE JOINTS.

4) SEE TYPICAL SECTION FOR WIDTH OF SHOULDER AND LONGITUDINAL WEAKENED PLANE JOINT LOCATION



RUMBLE STRIPS ON CONCRETE SHOULDERS (RUMBLE STRIPS SHALL NOT BE USED IN URBAN AREAS)



SECTION A-A (Dowel BAR)

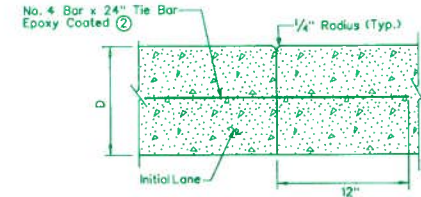
TRANSVERSE CONTACT JOINT WITH DOWEL BARS

NOTE: TRANSVERSE CONTACT JOINTS WITH DOWEL BARS SHALL BE USED AT ALL CONSTRUCTION JOINTS, AND ELSEWHERE IF ORDERED BY THE ENGINEER. DOWEL BARS TO BE PLACED IN THE MIDDLE OF THE SLAB THICKNESS.

ALL MEASUREMENT \pm 1/8" TOLERANCE

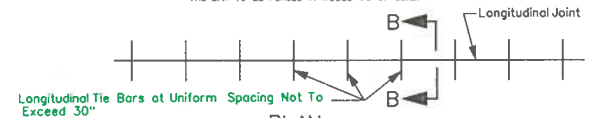


TRANSVERSE CONTACT JOINT SINGLE SAW CUT



SECTION B-B

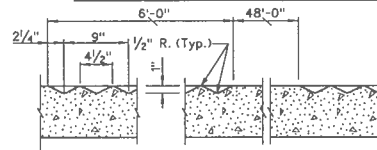
LONGITUDINAL CONTACT JOINT (THE BAR TO BE PLACED IN MIDDLE 1/3 OF SLAB)



PLAN TIE BAR DETAIL

1) ALL TRANSVERSE CONTACT JOINTS SHALL BE SAWED AND JOINT SEALER USED PER RESPECTIVE TRANSVERSE CONTACT JOINT DETAIL THIS SHEET.

2) ALL TIE BARS TO BE EPOXY COATED EXCEPT IN CLARK CO.

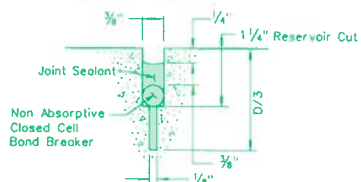


SECTION C-C

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
PLAIN JOINTED CONCRETE & ASPHALT PAVEMENT DETAILS

REVISION 12/94
ADOPTED - 8/69
R-10.1.1 (409)

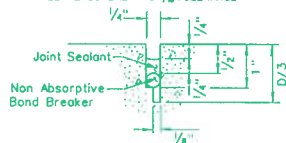
ALL MEASUREMENT $\pm \frac{1}{8}$ TOLERANCE



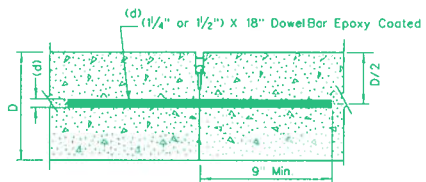
NOTE: RATIO OF DEPTH TO WIDTH OF JOINT SEALANT SHOULD BE 1:1 INITIAL $\frac{1}{8}$ " WEAK JOINT SAW CUT TO BE DONE WITHIN SPECIFIED TIME LIMIT. RESERVOIR CUT MAY BE DONE AT A LATER TIME.

TRANSVERSE WEAKENED PLANE JOINT DOUBLE SAW CUT

ALL MEASUREMENT $\pm \frac{1}{8}$ TOLERANCE

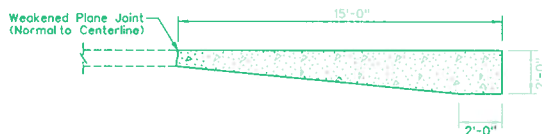


LONGITUDINAL WEAKENED PLANE JOINT DOUBLE SAW CUT



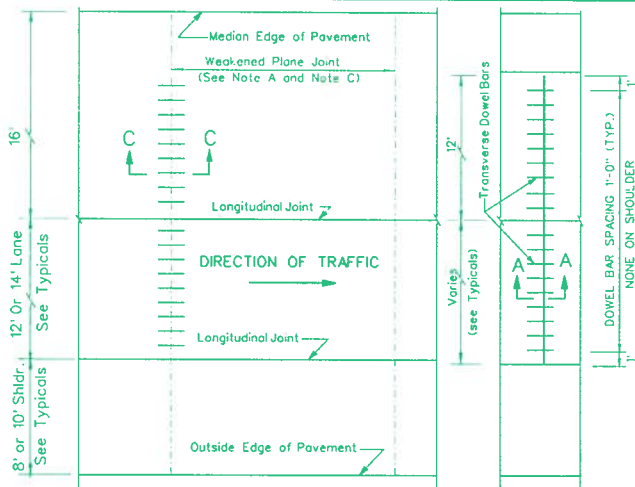
DOWEL BAR PLACEMENT SECTION C-C

- DOWEL BAR NOTES
1. DOWEL BAR SPACING SHALL BE 12"
 2. DOWEL BARS SHALL NOT BE PLACED ON SHOULDERS
 3. DOWEL BARS SHALL NOT BE PLACED WITHIN 12" OF LONGITUDINAL JOINTS



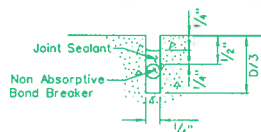
PAVEMENT END ANCHOR DETAIL

NOTE: PAVEMENT END ANCHORS SHALL BE CONSTRUCTED AS THE TERMINAL PANELS OF ALL PAVEMENT NOT ABUTTING EXISTING PAVEMENTS OR STRUCTURES, AND ELSEWHERE IF ORDERED BY THE ENGINEER.



PLAN

ALL MEASUREMENT $\pm \frac{1}{8}$ TOLERANCE



LONGITUDINAL WEAKENED PLANE JOINT SINGLE SAW CUT

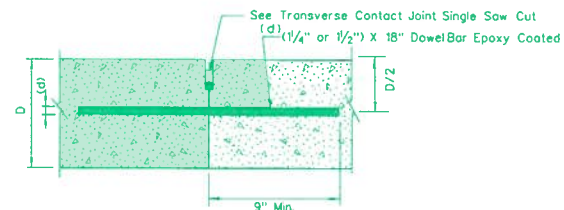
NOTE A: ALL WEAKENED PLANE JOINTS SHALL BE SAWS PERPENDICULAR AS SHOWN, EXCEPT AS INDICATED BY THE END ANCHOR AND STRUCTURE APPROACH DETAILS. WHEN ONLY ONE LANE IS BEING CONSTRUCTED ALONGSIDE EXISTING LANES, JOINTS SHALL BE SAWS AS DIRECTED BY THE ENGINEER.

NOTE B: SPACING OF WEAKENED PLANE JOINTS SHALL BE 10', EXCEPT FOR THE FIRST JOINT AT PAVEMENT END ANCHORS AND AT REINFORCED STRUCTURE APPROACHES.

NOTE C: TRANSVERSE WEAKENED PLANE JOINTS SHALL BE CONSTRUCTED AT LEAST 6' FROM ANY TRANSVERSE CONTACT JOINT.

NOTE D: LONGITUDINAL WEAKENED PLANE JOINTS SHALL BE CUT AT ALL LANE AND SHOULDER LINES EXCEPT WHERE LANE PLUS ADJACENT SHOULDER WIDTH IS LESS THAN OR EQUAL TO 16'.

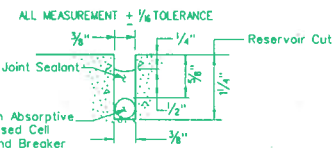
D	d
< 12"	1.25"
≥ 12"	1.50"



SECTION A-A (Dowel BAR)

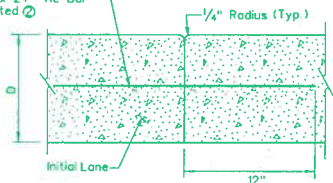
TRANSVERSE CONTACT JOINT WITH DOWEL BARS

NOTE: TRANSVERSE CONTACT JOINTS WITH DOWEL BARS SHALL BE USED AT ALL CONSTRUCTION JOINTS AND ELSEWHERE IF ORDERED BY THE ENGINEER. DOWEL BARS TO BE PLACED IN THE MIDDLE OF THE SLAB THICKNESS.



TRANSVERSE CONTACT JOINT SINGLE SAW CUT

No. 4 Bar x 24" Tie Bar Epoxy Coated



SECTION B-B

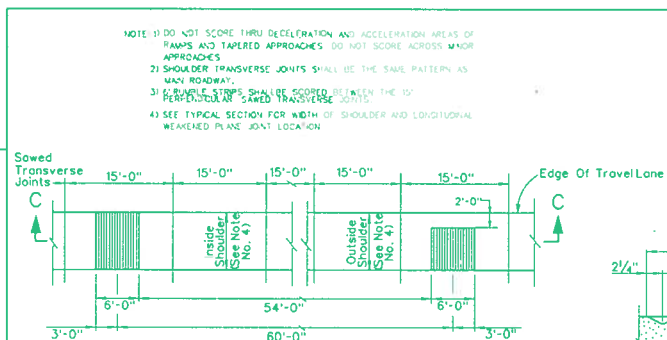
LONGITUDINAL CONTACT JOINT



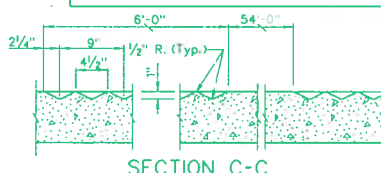
(TIE BAR TO BE PLACED IN MIDDLE 1/3 OF SLAB)

TIE BAR DETAIL

- ALL TRANSVERSE CONTACT JOINTS SHALL BE SAWS AND JOINT SEALER USED PER RESPECTIVE TRANSVERSE CONTACT JOINT DETAIL THIS SHEET.
- TIE BARS TO BE EPOXY COATED EXCEPT IN CLARK CO.
- TIE BARS SHALL NOT BE PLACED WITHIN 12" OF DOWEL BARS



RUMBLE STRIPS ON CONCRETE SHOULDERS (RUMBLE STRIPS SHALL NOT BE USED IN URBAN AREAS)



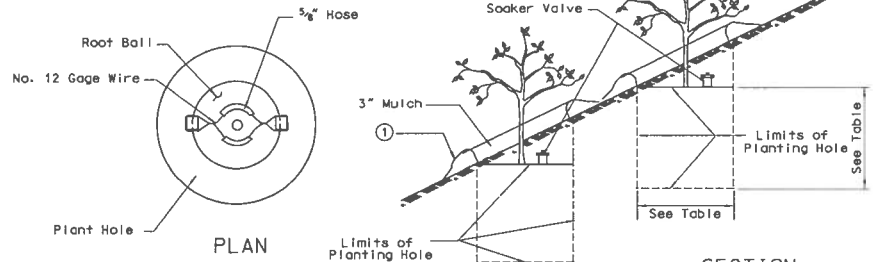
SECTION C-C

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

DOWELED CONCRETE PAVEMENT DETAILS

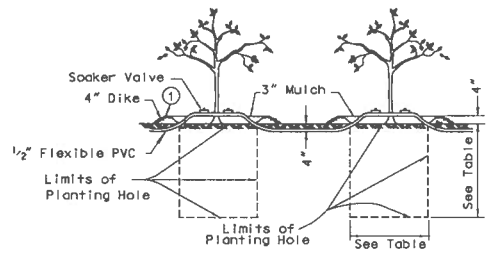
ADOPTED 8/69
REVISION 12/94

R-10.1.2 (40)

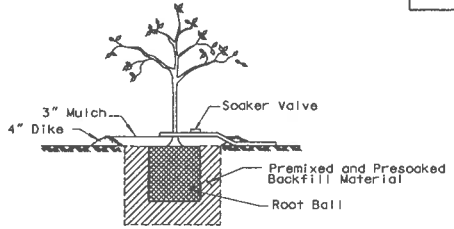


① Basin To be Constructed of Soil From Plant Hole and Shall be 3 Ft. Inside Diameter.

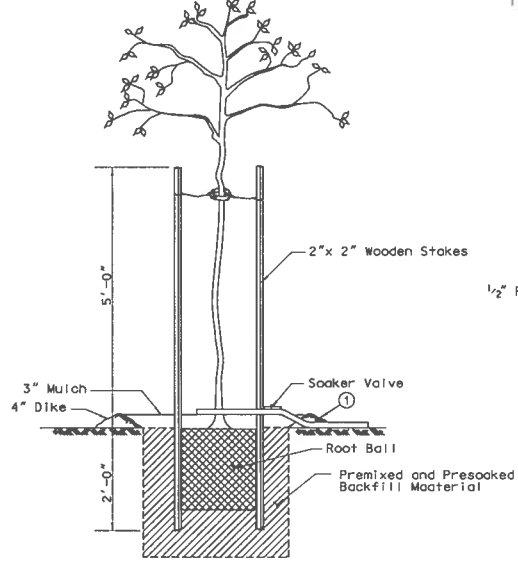
**SLOPING AREAS
PLANTHOLE & SOAKER
IRRIGATION DETAILS**



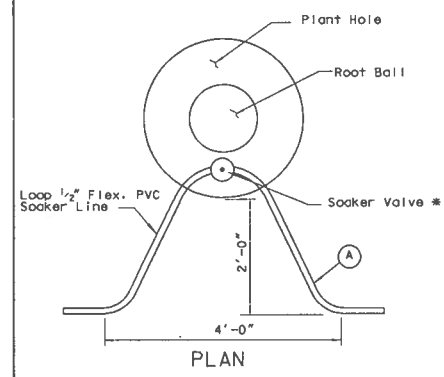
**SECTION
LEVEL AREAS**



**SECTION
PLANTING TECHNIQUES**

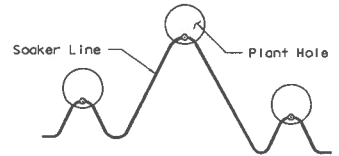


**SECTION
STAKING DETAILS**



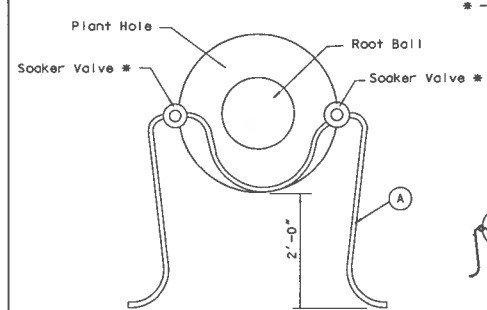
**PLAN
TYPICAL LOOP INSTALLATION
SHRUB**

* - Install One Soaker Valve per Shrub. Set Valve Above Mulch.



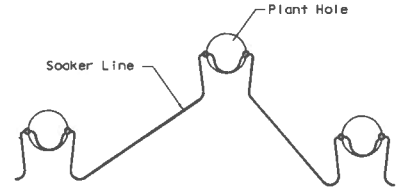
**PLAN
TYPICAL MULTIPLE INSTALLATION
SHRUB**

① Loops Shall Be on Opposite Side of Plant From Travel Way



**PLAN
TYPICAL LOOP INSTALLATION
TREE**

* - Install Two Soaker Valves Per Tree. Set Valves Above Mulch.



**PLAN
TYPICAL MULTIPLE INSTALLATION
TREE**

PLANT PIT SCHEDULE MIN. DIMENSIONS

SIZE	WIDTH	DEPTH	DIGGING METHOD
1 GALLON	1'-0"	1'-6"	AUGER
5 GALLON	1'-6"	3'-0"	AUGER
15 GALLON	3'-0"	3'-0"	AUGER
24" BOX (SQUARE)	4'-0"	2'-6"	HAND/MECHANICAL

SOIL SCHEDULE

BACKFILL MATERIAL SHALL CONSIST OF TWO PARTS TOPSOIL AND ONE PART HUMUS.

PLANT TABLET SCHEDULE

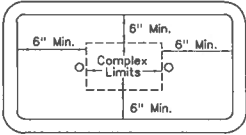
FOR TREES, SHRUBS AND GROUNDCOVERS

1 GALLON	1 TABLET
5 GALLON	2 TABLETS
15 GALLON	3 TABLETS
24" BOX	5 TABLETS

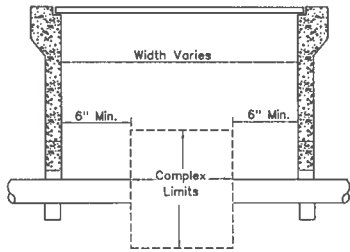
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

PLANTING DETAILS

<i>[Signature]</i> CHIEF ROAD DESIGN ENGR.	R-11.1.1 (212)	REVISION
	ADOPTED: 10/92	10/6/94

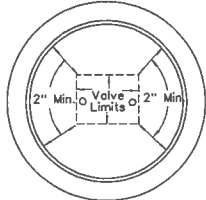


TOP VIEW VALVE BOX

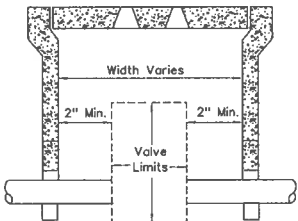


SECTION VALVE BOX

One for Each: Soaker Irrigation Control Unit
Electric Control Valve
Gate Valves 1" & Larger
Filter Unit.

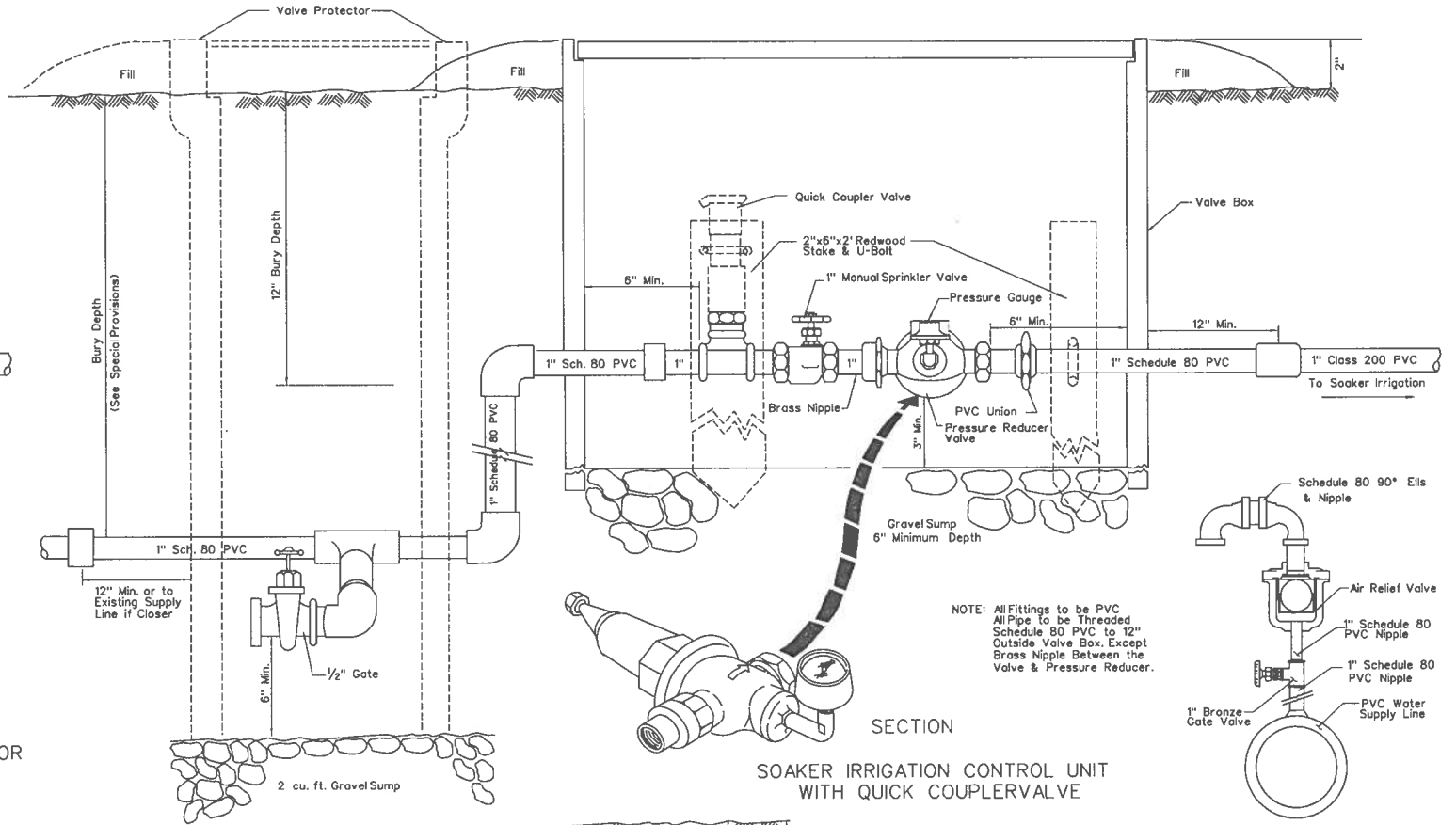


TOP VIEW VALVE PROTECTOR



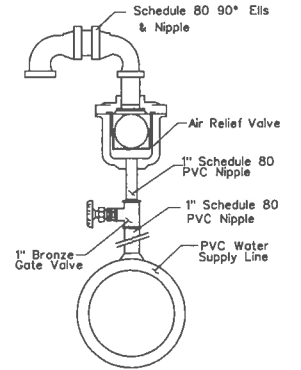
SECTION VALVE PROTECTOR

(One For Each 1/2" Gate Valve)



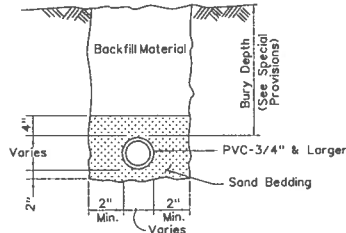
SECTION

SOAKER IRRIGATION CONTROL UNIT WITH QUICK COUPLER VALVE



ELEVATION AIR RELIEF VALVE UNIT

DRAIN DETAIL
(Delete in Las Vegas Area)

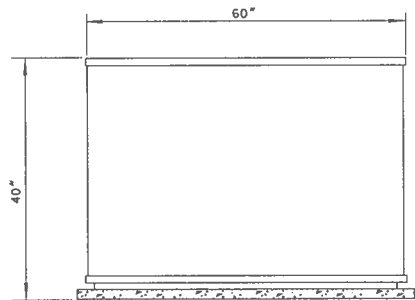


SAND BEDDING

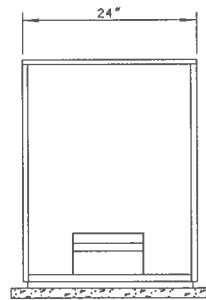
NOTE: All Fittings to be PVC
All Pipe to be Threaded
Schedule 80 PVC to 12"
Outside Valve Box. Except
Brass Nipple Between the
Valve & Pressure Reducer.

R-86

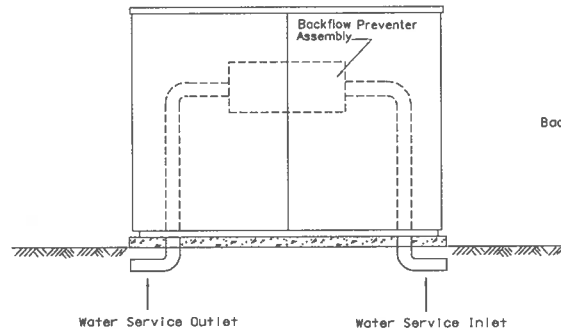
STATE OF NEVADA DEPARTMENT OF TRANSPORTATION		
SOAKER CONTROL & VALVE BOX DETAILS		
<i>John R. Riley</i> CHIEF ROAD DESIGN ENGR.	R-11.1.2 (213) ADDED: 10/92	REVISION 10/6/94



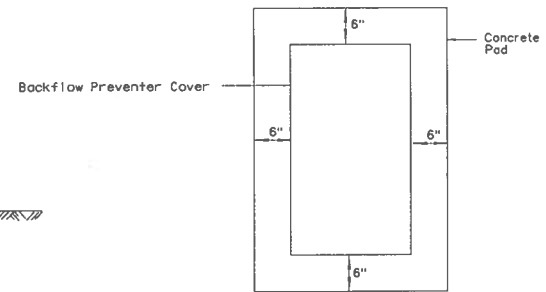
SIDE VIEW



FRONT VIEW



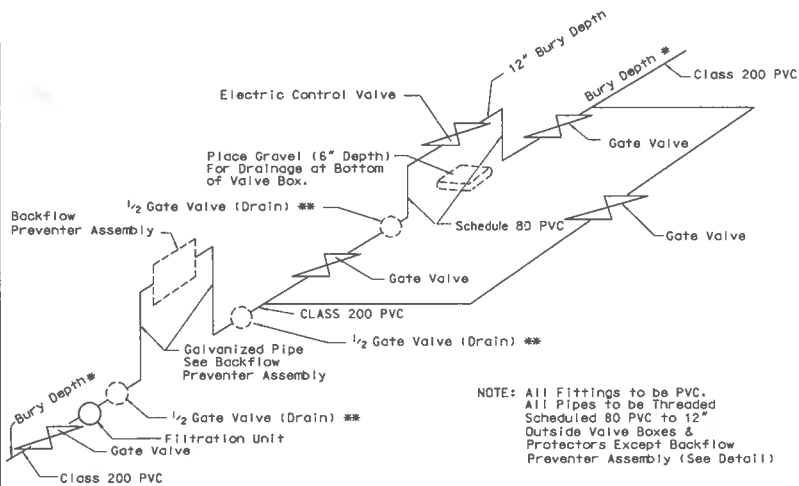
Water Service Outlet Water Service Inlet



BACKFLOW PREVENTER COVER

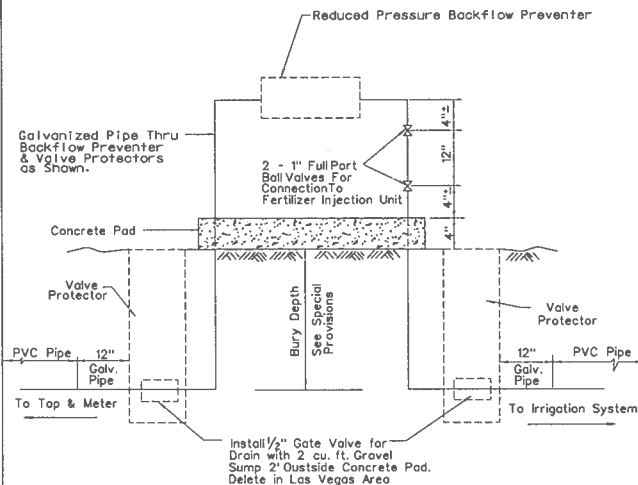
R-87

* Bury Depth. See Special Provisions
 ** Delete in Las Vegas Area

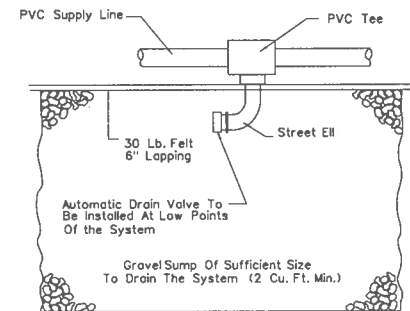


TYPICAL VALVE COMPLEX

NOTE: All Fittings to be PVC.
 All Pipes to be Threaded
 Scheduled 80 PVC to 12"
 Outside Valve Boxes &
 Protectors Except Backflow
 Preventer Assembly (See Detail)



BACKFLOW PREVENTER ASSEMBLY



SECTION
 AUTOMATIC DRAIN VALVE & SUMP
 (Delete in Las Vegas Area)

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION	
BACKFLOW PREVENTER & VALVE COMPLEX DETAILS	
<i>John R. Kelly</i> CHIEF ROAD DESIGN ENGR.	R-11.1.3 (213) ADOPTED: 10/92 REVISION 10/6/94

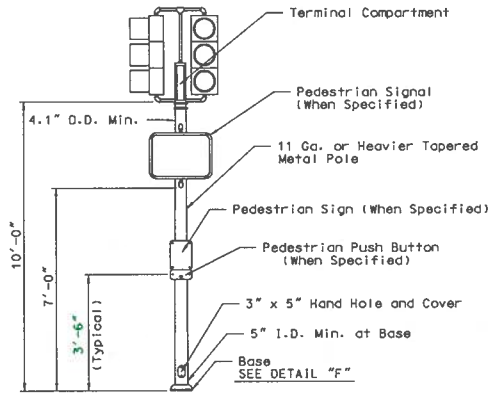
T-1

NEW	EXISTING	DESCRIPTION	NEW	EXISTING	DESCRIPTION	NEW	EXISTING	DESCRIPTION
		Luminaire			Pull Box			Vehicle Detector-Inductive Loop Unless Otherwise Indicated
		Electrolier			Controller Cabinet			Quadrupole Detector Loop
		Underpass Luminaire			Electrical Cabinet			
		Traffic Signal Head, 3 Section, 12" Red, Yellow and Green Sections (Unless Indicated Otherwise)			Service (120-240 V.A.C. Unless Otherwise Specified)			
		Traffic Signal Head With Back Plate			Transformer Pad			
		Traffic Signal Head, Programmed Visibility, 12" Green Arrow, 12" Solid Yellow and Red Sections, With Back Plate			Power Source			
		Traffic Signal Head With 12" Green, Yellow and Red Arrow Sections, With Back Plate			Conduit			
		Most Arm Signal With Back Plate			Conduit (Jacked)			
		Combination Traffic Signal standard With Luminaire and Signal Mast Arms and Attached Signal Heads, With Back Plate PPB=Pedestrian Push Button and Sign			Pole Designation			
		Traffic Signal Head With OPTICAL DETECTOR UNIT			Conduit Run			
		M-5 (Cluster Type Head) 12" GREEN, YELLOW AND RED BALLS WITH 12" GREEN AND YELLOW ARROWS			Junction Box			
		Pedestrian Signal			Wood Power Pole			
					Flashing Beacons "R" Indicates Red Lens, "Y" Indicates Yellow Lens			
					Special Junction Cabinet (For Interconnect Cable)			

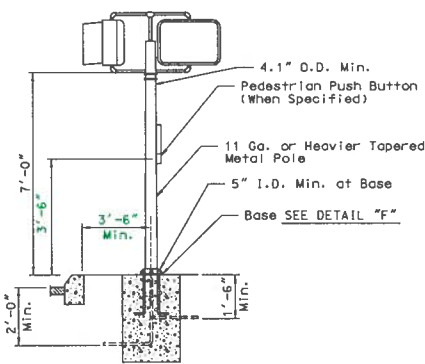
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

SYMBOLS

<i>P.D. Kiser</i> CHIEF TRAFFIC ENGINEER	T-30.1.1 ADOPTED 12/79	(623) REV. 3-10/92
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Foundation Same as Type 1-B

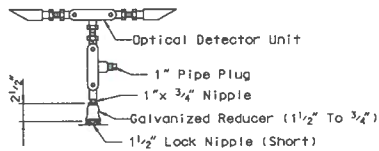


TYPE 1-A

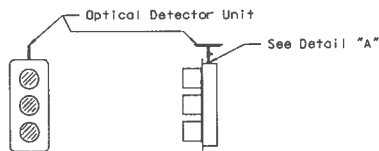
TYPE 1B

SIGNAL STANDARDS

1. For Pedestrian Push Button And Sign See Sheet T-30.1.3
2. For Foundation Details See Sheet T-30.1.13
3. Mounting Heights of Signal And Pedestrian Heads And Pedestrian Push Buttons Shall Be Applicable To Installations on Pole Types 28, 30 & 35.

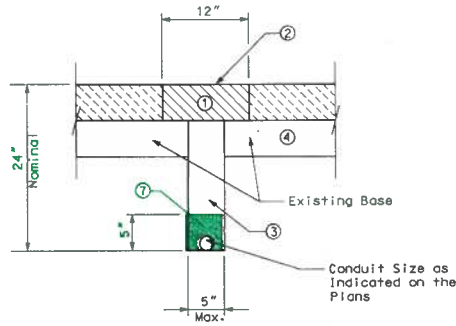


DETAIL "A"



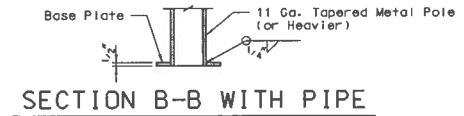
FRONT VIEW SIDE VIEW

**MOUNTING DETAIL
OPTICAL DETECTOR**

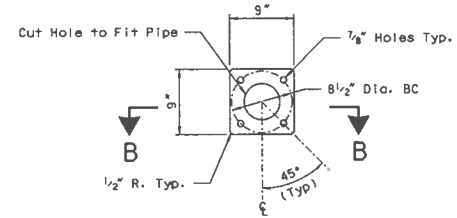


TRENCHING DETAIL

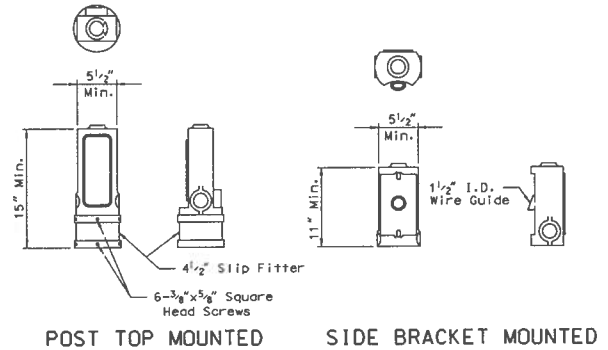
- ① Remove And Replace Existing Surface. New Surface Material Shall Be From An Approved Commercial Source.
- ② Seal And Sand New Surface. (As Directed By The Engineer)
- ③ Two Sack Slurry Mix Cement.
- ④ Recompact Existing Base.
- ⑤ All New Surface And Concrete Material Shall Be Approved By Engineer.
- ⑥ New Material And Trenching Shall Not Be Paid For Directly But Included In The Price For The Conduit.
- ⑦ Sand Bedding.



SECTION B-B WITH PIPE



DETAIL "F"



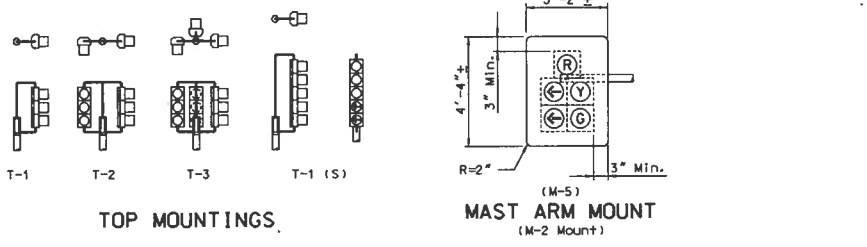
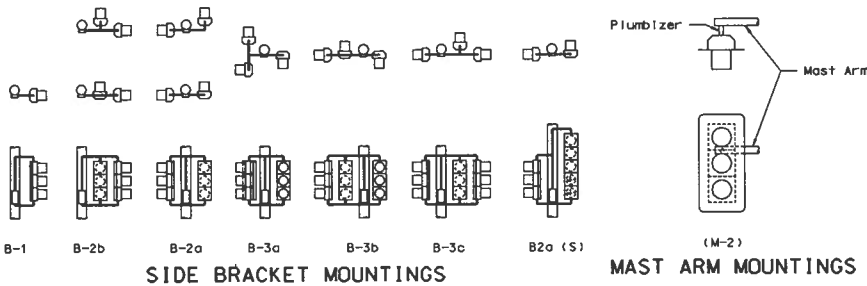
POST TOP MOUNTED

SIDE BRACKET MOUNTED

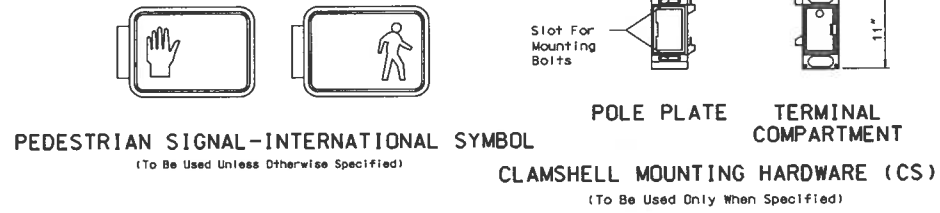
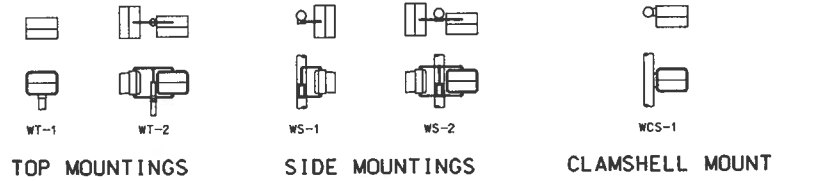
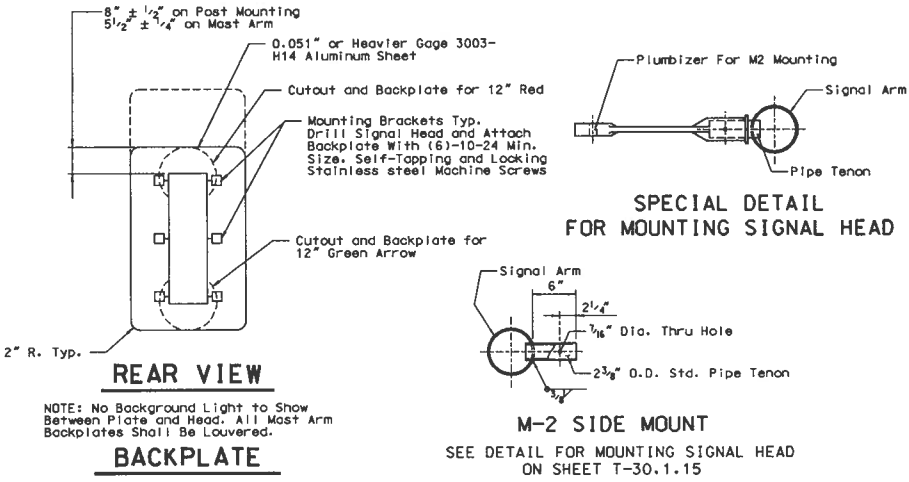
TERMINAL COMPARTMENTS

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION		
TYPE 1A AND 1B POLES, OPTICAL MOUNT AND TERMINAL COMPARTMENTS		
<i>P.D. Kiser</i> CHIEF TRAFFIC ENGINEER	T-30.1.2 ADOPTED 2/11	(623) REVISION 10/17/84

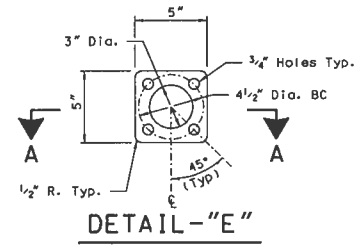
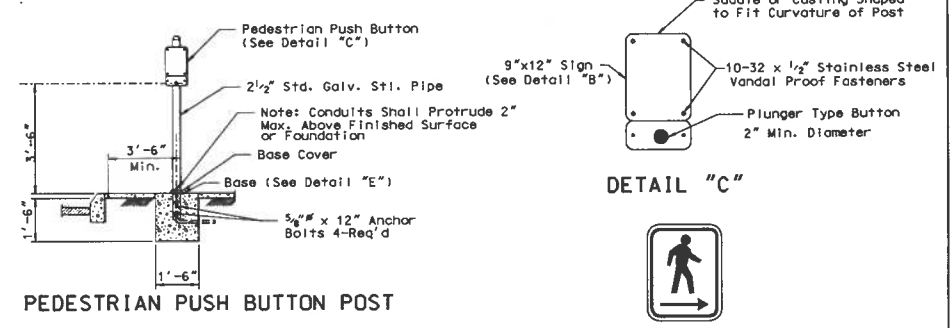
T-3



VEHICULAR SIGNALS AND MOUNTINGS



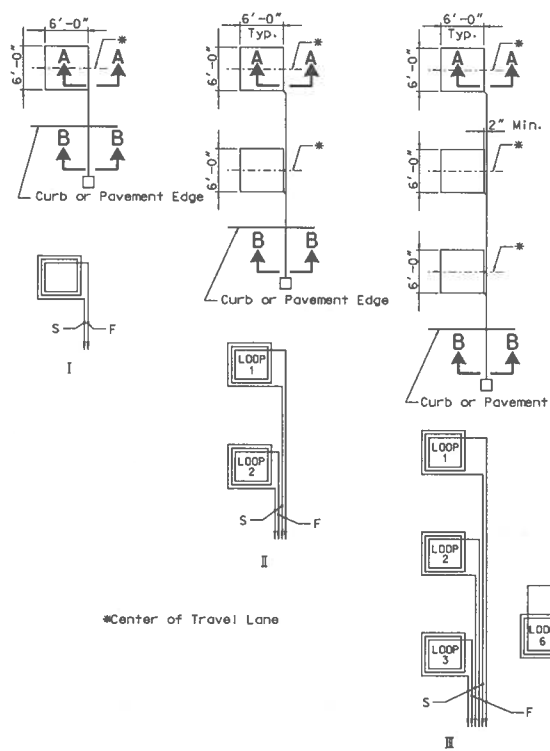
PEDESTRIAN SIGNALS AND MOUNTINGS



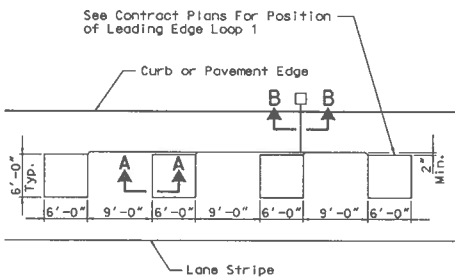
Note: 1. Arrow To Be Left Or Right or Both as Required.
 2. Porcelain Enamelled, 9"x12" Sign, Black Symbols on White Background.

DETAIL "B"

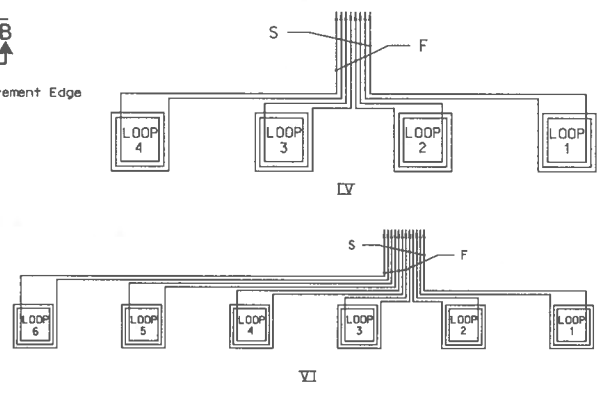
STATE OF NEVADA DEPARTMENT OF TRANSPORTATION		
SIGNAL MOUNTING PEDESTRIAN SIGNALS		
P.D. Kiser CHIEF TRAFFIC ENGINEER	T-30.1.3 ADOPTED 1/83	(623) REVISION 10/7/94



*Center of Travel Lane



See Contract Plans For Position of Leading Edge Loop 1



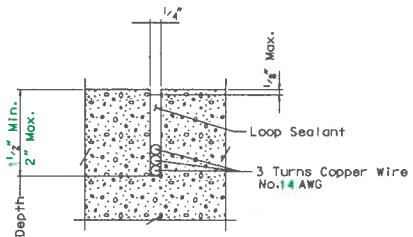
CONDUCTOR IDENTIFICATION IN PULL BOX SHALL INCLUDE THE FOLLOWING:

1. SENSOR NUMBER AND PHASE
2. LOOP NUMBER
3. START (S) AND FINISH (F)

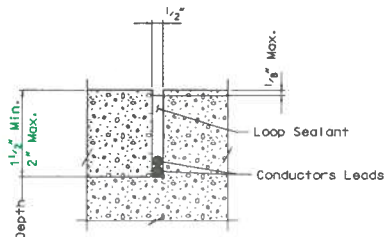
CABLE IDENTIFICATION IN CONTROLLER CABINET SHALL INCLUDE THE FOLLOWING:

1. LOWER CASE LETTER AS SHOWN ON PLANS FOR DETECTOR AMPLIFIER ASSIGNMENT
2. PHASE DESIGNATION

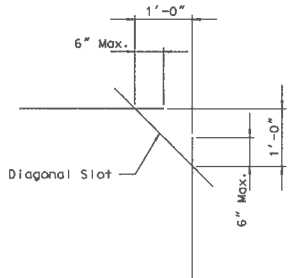
DETECTOR LAYOUTS, DIMENSIONS & WIRING PATTERNS



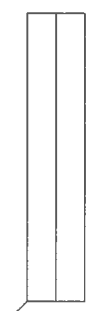
SECTION A-A



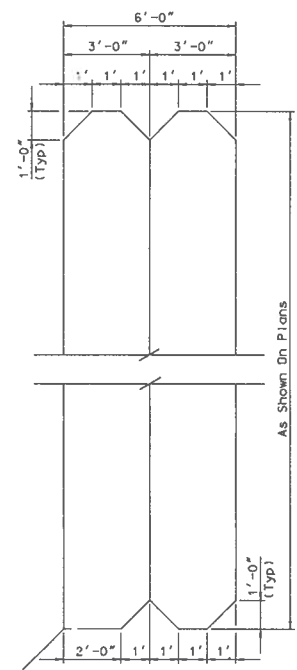
SECTION B-B



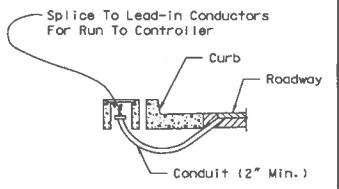
PLAN VIEW OF DIAGONAL SLOT AT CORNERS



SYMBOL

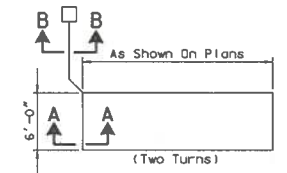


WINDING DETAIL SAWSLOT DETAIL (TWO TURNS)
QUADRAPOLE LOOP DETECTOR



CONDUIT INSTALLATION

NOTE:
AT PULLBOX LOCATIONS WHERE THERE IS NO CURB AND GUTTER THE CONDUIT SHALL EXTEND FROM THE PULLBOX TO THE EDGE OF THE PAVEMENT.



LOOP DETECTOR
6' x 20' AND LONGER

LOOP INSTALLATION PROCEDURE:

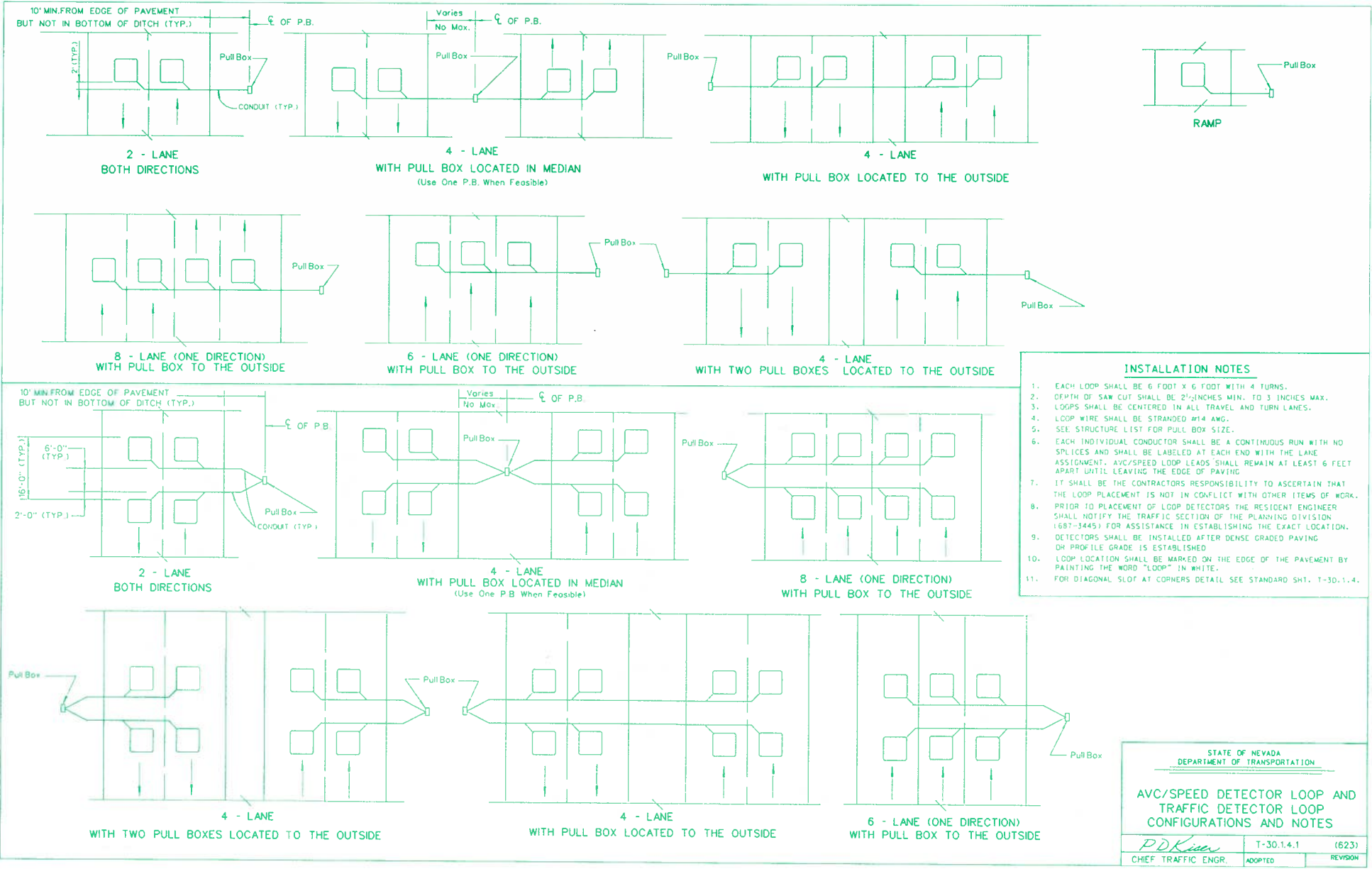
1. SAW SLOTS IN PAVEMENT FOR LOOP CONDUCTORS AS SHOWN IN DETAILS. BLOW OUT AND DRY THOROUGHLY WITH COMPRESSED AIR.
2. INSTALL TERMINATION PULL BOX.
3. INSTALL #14 AWG LOOP CONDUCTOR IN SLOTS USING A 3/8" TO 1/2" THICK WOOD PADDLE (SEE "LOOP WINDING PATTERNS"). ALLOW ADDITIONAL LENGTH FOR THE RUN TO TERMINATION PULL BOX PLUS 5 FEET OF SLACK IN PULL BOX. THIS ADDITIONAL LENGTH OF CONDUCTOR FOR EACH LOOP CIRCUIT SHALL BE TWISTED TOGETHER INTO A PAIR (AT LEAST 5 TURNS PER FOOT) BEFORE BEING RUN TO PULL BOX.
4. IDENTIFY LOOP CIRCUIT PAIRS. IDENTIFY START AND FINISH OF CONDUCTOR.
5. SPLICE LOOP CONDUCTORS TO LEAD-IN CABLE. ALL SPLICES SHALL BE SOLDERED USING 60/40 RESIN CORE SOLDER.
6. ALL SPLICES AND TAPINGS SHALL BE PROVIDED A SOUND ENVIRONMENTAL SEAL.
7. WHERE LOOP CONDUCTORS ARE NOT TO BE SPLICED TO A LEAD-IN CABLE, ENDS OF CONDUCTORS SHALL BE TAPED.
8. FILL SLOTS AS SHOWN IN DETAILS.
9. NO MORE THAN FOUR LOOP DETECTOR CONDUCTORS SHALL BE INSTALLED IN ONE SAWED SLOT. ALL LOOP CONDUCTORS IN SAME SLOT SHALL BE FOR SAME SIGNAL PHASE.
10. LEAD-IN CABLE SHALL NOT BE SPLICED BETWEEN THE TERMINATION PULL BOX AND THE CONTROLLER CABINET.
11. DISTANCE BETWEEN SIDE OF LOOP AND LEAD-IN SAW CUT SHALL BE 2'-0" MINIMUM. DISTANCE BETWEEN LEAD-IN SAW CUTS SHALL BE 6" MINIMUM.
12. WHEN LEAD-IN SAW CUTS ARE FOR SAMPLING DETECTORS OR FOR LEFT TURN LANE DETECTORS WHERE SAW CUTS CROSS OTHER TRAFFIC LANES, CONDUCTORS SHALL BE PAIRED FOR EACH LOOP CIRCUIT AND TWISTED FIVE TURNS PER FOOT BETWEEN LOOP AND PULL BOX.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

LOOP DETECTORS

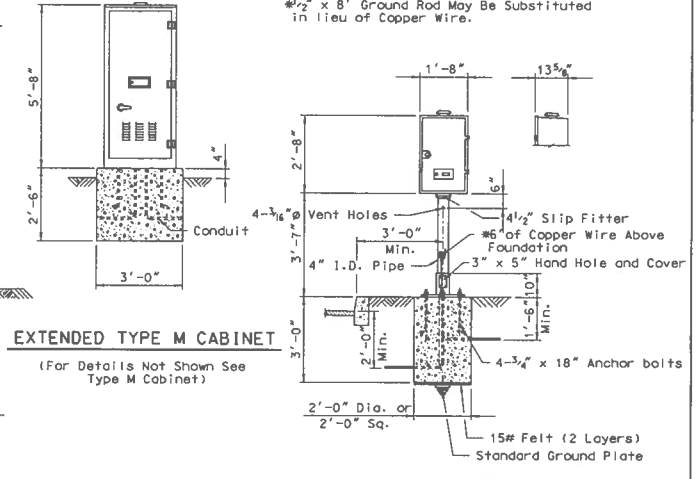
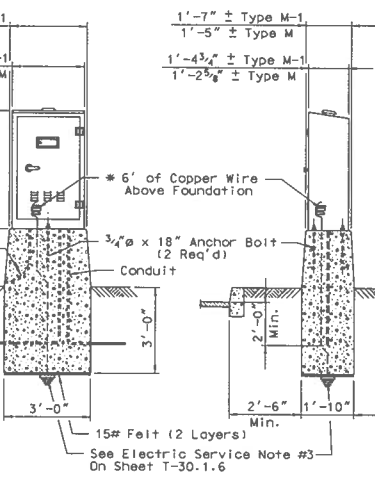
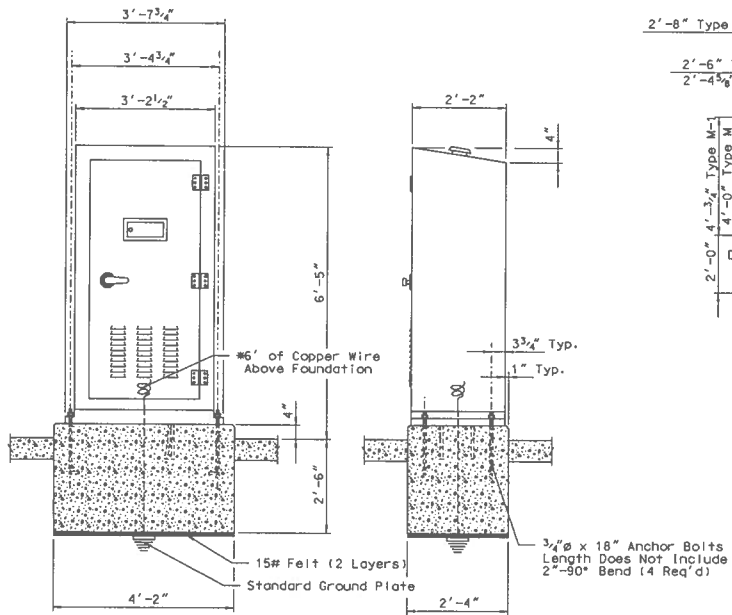
 CHIEF TRAFFIC ENGINEER	T-30.1.4 ADOPTED 12/79	(623) REVISION 11-1/83
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T-5

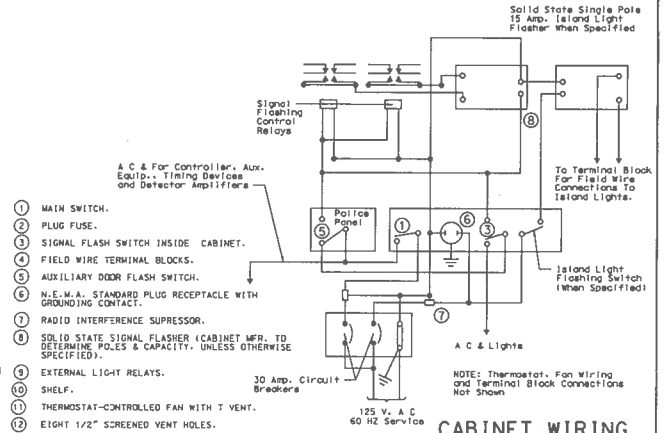
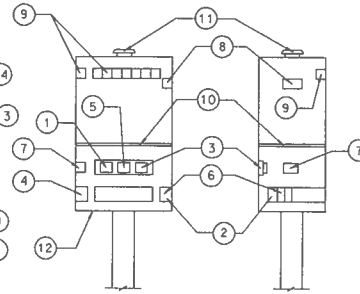
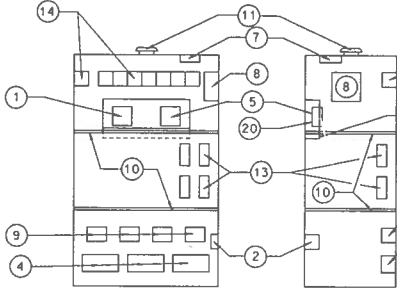
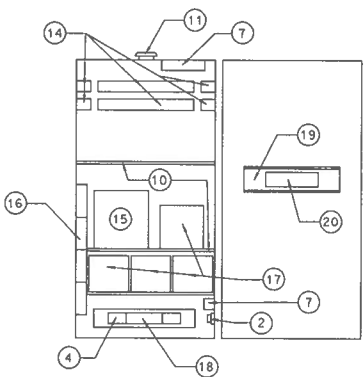


- INSTALLATION NOTES**
1. EACH LOOP SHALL BE 6 FOOT X 6 FOOT WITH 4 TURNS.
 2. DEPTH OF SAW CUT SHALL BE 2 1/2 INCHES MIN. TO 3 INCHES MAX.
 3. LOOPS SHALL BE CENTERED IN ALL TRAVEL AND TURN LANES.
 4. LOOP WIRE SHALL BE STRANDED #14 AWG.
 5. SEE STRUCTURE LIST FOR PULL BOX SIZE.
 6. EACH INDIVIDUAL CONDUCTOR SHALL BE A CONTINUOUS RUN WITH NO SPLICES AND SHALL BE LABELED AT EACH END WITH THE LANE ASSIGNMENT. AVC/SPEED LOOP LEADS SHALL REMAIN AT LEAST 6 FEET APART UNTIL LEAVING THE EDGE OF PAVING.
 7. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO ASCERTAIN THAT THE LOOP PLACEMENT IS NOT IN CONFLICT WITH OTHER ITEMS OF WORK.
 8. PRIOR TO PLACEMENT OF LOOP DETECTORS THE RESIDENT ENGINEER SHALL NOTIFY THE TRAFFIC SECTION OF THE PLANNING DIVISION (687-3445) FOR ASSISTANCE IN ESTABLISHING THE EXACT LOCATION.
 9. DETECTORS SHALL BE INSTALLED AFTER DENSE GRADED PAVING OR PROFILE GRADE IS ESTABLISHED.
 10. LOOP LOCATION SHALL BE MARKED ON THE EDGE OF THE PAVEMENT BY PAINTING THE WORD "LOOP" IN WHITE.
 11. FOR DIAGONAL SLOT AT CORNERS DETAIL SEE STANDARD SHT. T-30.1.4.

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION		
AVC/SPEED DETECTOR LOOP AND TRAFFIC DETECTOR LOOP CONFIGURATIONS AND NOTES		
<i>PDK</i>	T-30.1.4.1	(623)
CHIEF TRAFFIC ENGR.	ADOPTED	REVISION



NOTE:
 ① ALL CONDUITS SHALL EXTEND ABOVE FOUNDATIONS A MINIMUM OF 2 INCHES
 ② ALL CABINETS SHALL BE PAINTED WHITE ON THE INSIDE AND OUTSIDE UNLESS SPECIFIED IN THE SPECIAL PROVISIONS



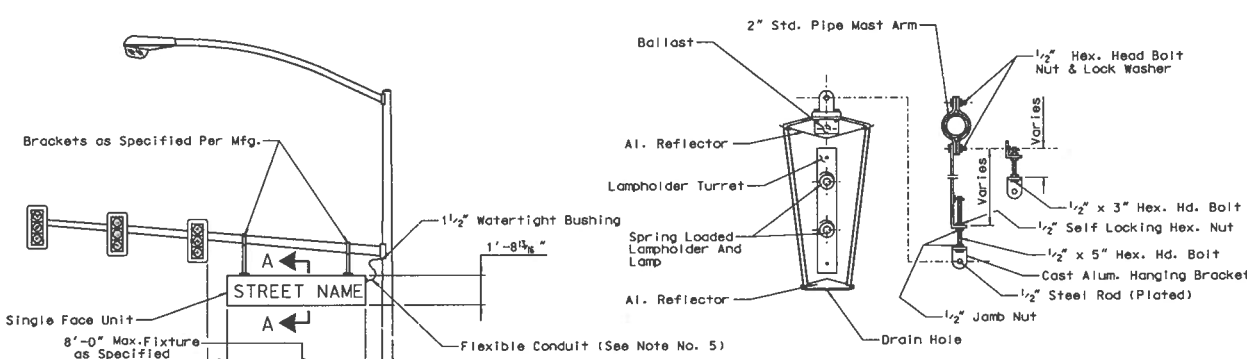
- ① MAIN SWITCH.
- ② PLUG FUSE.
- ③ SIGNAL FLASH SWITCH INSIDE CABINET.
- ④ FIELD WIRE TERMINAL BLOCKS.
- ⑤ AUXILIARY DOOR FLASH SWITCH.
- ⑥ N.E.M.A. STANDARD PLUG RECEPTACLE WITH GROUNDING CONTACT.
- ⑦ RADIO INTERFERENCE SUPPRESSOR.
- ⑧ SOLID STATE SIGNAL FLASHER (CABINET MFR. TO DETERMINE PHASES & CAPACITY, UNLESS OTHERWISE SPECIFIED).
- ⑨ EXTERNAL LIGHT RELAYS.
- ⑩ SHELF.
- ⑪ THERMOSTAT-CONTROLLED FAN WITH T VENT.
- ⑫ EIGHT 1/2" SCREENED VENT HOLES.
- ⑬ INSTRUMENT TERMINAL STRIP.
- ⑭ CONTROL RELAYS.
- ⑮ DISPATCHER UNIT.
- ⑯ INTERNAL INTERCONNECT TERMINAL STRIPS.
- ⑰ MINOR MOVEMENT UNITS.
- ⑱ SLANT PANEL.
- ⑳ POLICE PANEL.
- ㉑ INTERNAL POWER PANEL AND RECALL SWITCHES FOR ALL DETECTED PHASES.

STATE OF NEVADA
 DEPARTMENT OF TRANSPORTATION

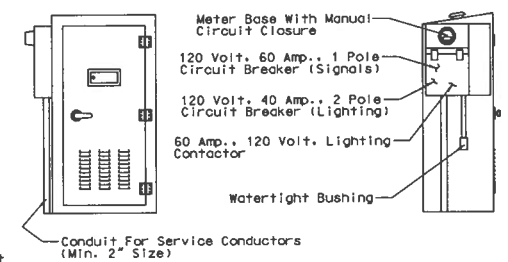
CONTROLLER CABINETS

P.D.K.
 CHIEF TRAFFIC ENGINEER

T-30.1.5 (623)
 ADOPTED 2/71 REVISION 4-1/83



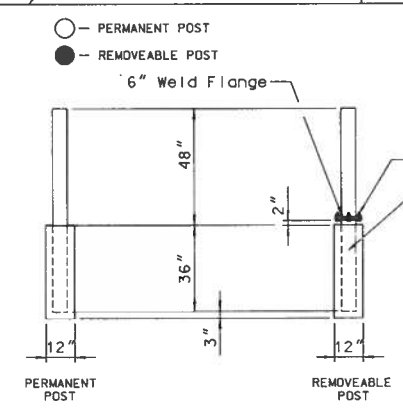
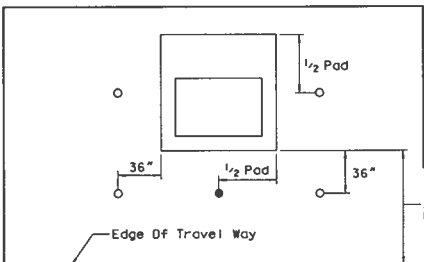
SECTION A-A



CONTROLLER CABINET SERVICE INSTALLATION

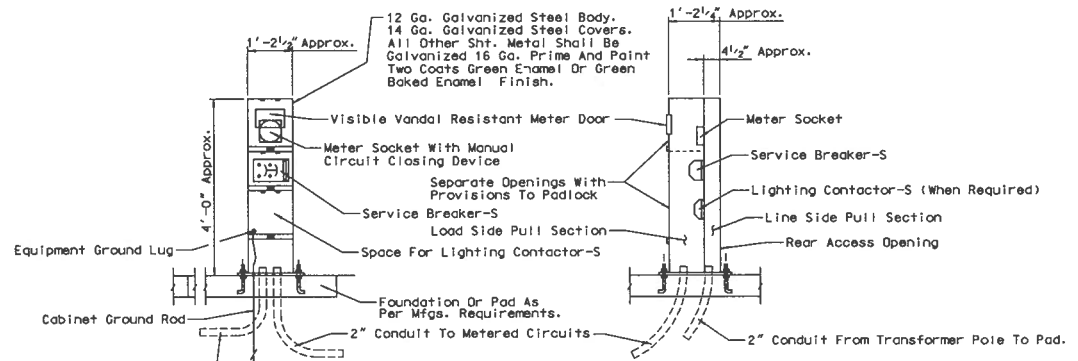
- ELECTRIC SERVICE NOTES
1. MAIN BREAKER SHALL BE 100 AMP. MINIMUM (120/240 V.A.C. 60 HZ. SINGLE PHASE, 3 WIRE). CIRCUIT BREAKERS SHALL BE AS SHOWN ABOVE UNLESS INDICATED OTHERWISE ON PLANS.
 2. PANEL OPENINGS FOR BREAKERS OR SEPARATE ENCLOSURES SHALL HAVE HASPS AND LOCKS AS REQUIRED BY THE UTILITY COMPANY.
 3. GROUNDING FOR SERVICE EQUIPMENT AND ALL CONTROLLER CABINETS SHALL BE AS FOLLOWS:
 - a. GROUND WIRE MUST BE A MINIMUM SIZED NO. 8 FOR 100 AMP. AND NO. 6 FOR 200 AMP AND BE CONTIGUOUS TO THE SERVICE EQUIPMENT.
 - b. MINIMUM GROUND PLATE DIMENSION: AREA = 2 SQUARE FEET (18" x 18" OR 20" DIAMETER ROUND). THICKNESS = 0.25 INCH STEEL, 0.06 INCH COPPER.
 - c. GROUND ROD OF GALVANIZED STEEL OR PIPE OF AT LEAST 3/4" DIAMETER OR 1/2" DIAMETER COPPER IS ACCEPTABLE IN LIEU OF GROUND PLATE AS SHOWN.

- NOTES:
1. LEGEND ON SIGN SHALL BE SERIES "E" B" CAPS AND 6" LOWER CASE.
 2. SIGN PANEL MATERIAL SHALL BE FIBERGLASS (TUFILITE) OR SIMILAR APPROVED MATERIAL.
 3. ALL FASTENERS AND ASSOCIATED HARDWARE SHALL BE STAINLESS STEEL.
 4. LAMPS SHALL BE 300 M.A., T-8 UNITS. BALLAST SHALL BE 120 VOLT 60 CYCLE O2 STARTING.
 5. TWO NO. 12 CONDUCTORS SHALL BE INSTALLED BETWEEN SIGN AND LUMINAIRE. THE SIGN LIGHTING CIRCUIT SHALL BE CONNECTED TO THE STREET LIGHTING CIRCUIT AT THE P.E. CONTROL BY AN APPROVED METHOD.
 6. SIGN CLAMPS SHALL BE SIZED TO FIT RESPECTIVE SIGNAL ARMS.



TRANSFORMER PAD BARRIER POST

- NOTES
1. BARRIER POSTS ARE TO BE USED ONLY WHERE PAD MOUNTED TRANSFORMERS ARE INSTALLED IN AREAS SUBJECT TO DAMAGE BY VEHICULAR TRAFFIC. THE CONTRACTOR SHALL COORDINATE INSTALLATION WITH THE SERVING UTILITY COMPANY TO DETERMINE THE EXACT NUMBER OF POSTS REQUIRED.
 2. FOOTINGS TO BE DRILLED HOLES, AS SHOWN, AND FILLED WITH CLASS "A" OR CLASS "AA" CONCRETE.
 3. POST CONSTRUCTED OF 6" STANDARD PIPE (WELL CASING) PRIMED AND PAINTED YELLOW, AND CONCRETE FILLED.



FRONT VIEW
SIDE VIEW
UNDERGROUND SERVICE PEDESTAL

- NOTES:
1. CONDUIT SHALL EXTEND UP INTO CABINET A MINIMUM OF 2" ABOVE CONCRETE PAD.
 2. SEE PLANS FOR LOAD RATING, PANEL DISTRIBUTION AND CIRCUIT BREAKERS REQUIRED.

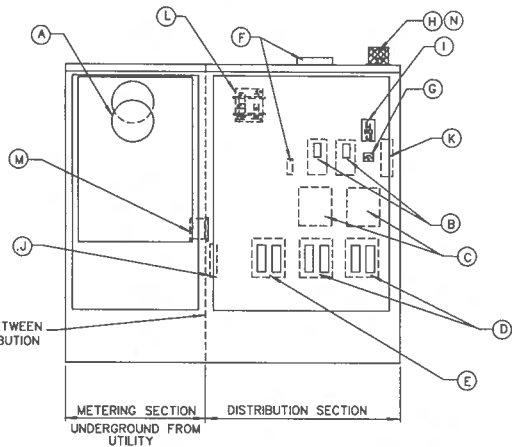
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

**ELECTRICAL SERVICES
INTERNALLY
ILLUMINATED SIGN**

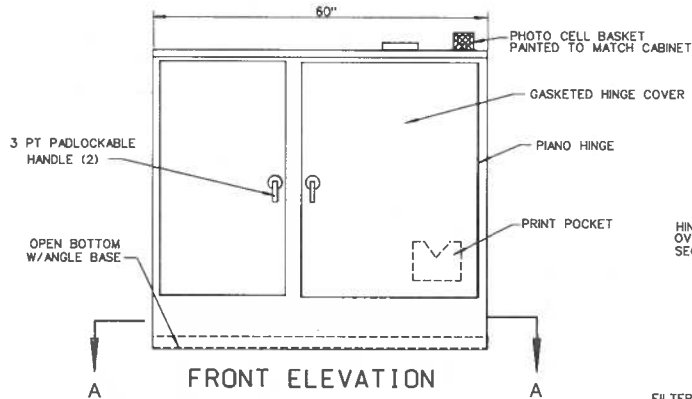
P.D. Kern
CHIEF TRAFFIC ENGINEER

T-30.1.6 (623)
ADOPTED 12/79 REVISION 1- 1/83

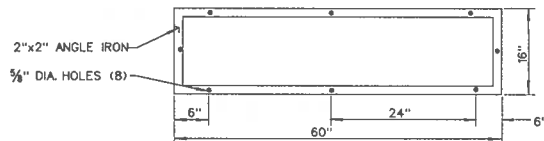
T-7



BACK ELEVATION (60" CABINET)



FRONT ELEVATION

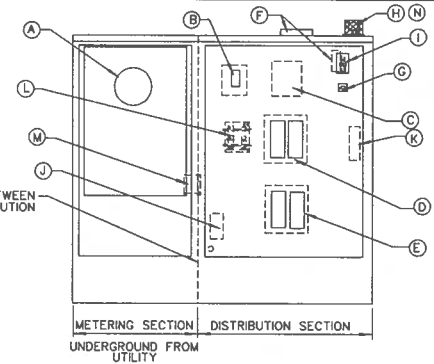


SECTION A-A

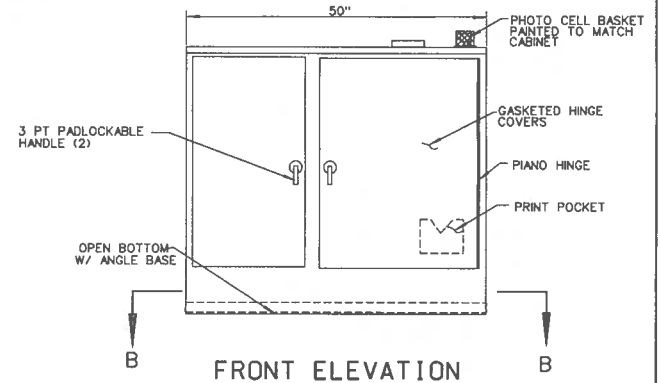
TYPE 3R LIGHTING CABINET NOTES:

LEGEND

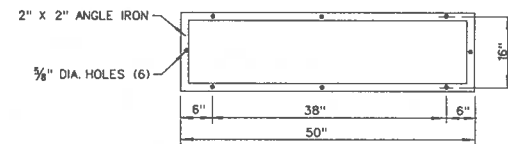
- (A) 400 AMP 10 3W 120/240 VOLT METER SOCKET SELF OPERATED
- (B) 200 AMP 2 POLE CIRCUIT BREAKER.
- (C) 200 AMP 2 POLE CONTACTOR 120 VOLT/COIL ELECTRICALLY HELD.
- (D) 200 AMP 3W MAIN LUG LOAD CENTER WITH 2 POLE CIRCUIT BREAKERS PER REQUIREMENTS.
- (E) 100 AMP 10 SW MAIN LUG LOAD CENTER WITH 1-15 AMP 1 POLE AND 3-20 AM 1 POLE CIRCUIT BREAKERS.
- (F) CABINET FAN WITH T-STAT.
- (G) DPDT TOGGLE SWITCH WITH NAMEPLATE.
- (H) PHOTOELECTRIC CELL WITH RECEPTACLE.
- (I) 15 AMP GFCI DUPLEX RECEPTACLE.
- (J) 6 (200) OR 12 (400) POSITION GROUND BAR.
- (K) 12 POSITION WIRING TERMINAL BLOCK.
- (L) 2 POLE (200) OR 3 POLE (400) DISTRIBUTION BLOCK.
- (M) 2" (200) OR 3" (400) CLOSE NIPPLE WITH LOCKNUT, PLASTIC BUSHING AND BOND BUSHING.
- (N) P.E. MAY BE INTERNALLY MOUNTED BEHIND A GLASS WINDOW.
- (O) FOUNDATION OR PAD PER MGF. REQUIREMENTS.



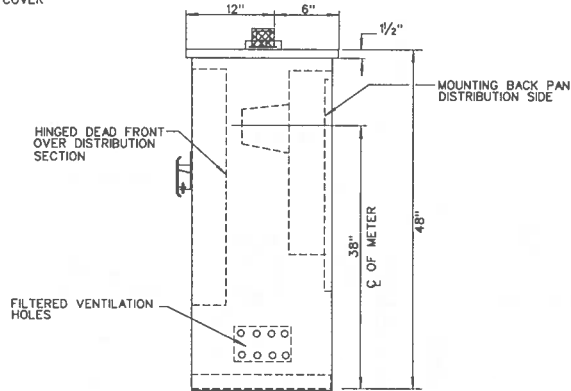
.BACK ELEVATION (50" CABINET)



FRONT ELEVATION



SECTION B-B



SIDE ELEVATION
(50" & 60" CABINET)

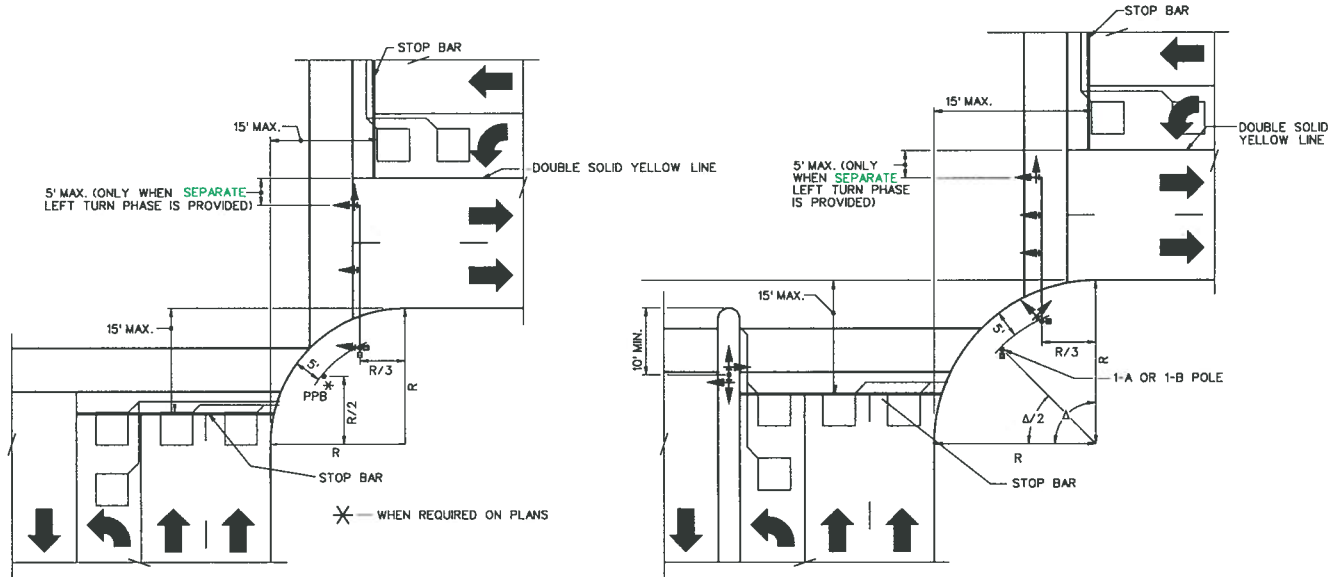
CABINETS SHALL BE CONSTRUCTED FROM 10 GAUGE STEEL - ALL SURFACES CLEANED, PRIMED & PAINTED INSIDE & OUT W/2 COATS WHITE ENAMEL.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

TYPE 3R
LIGHTING CABINET

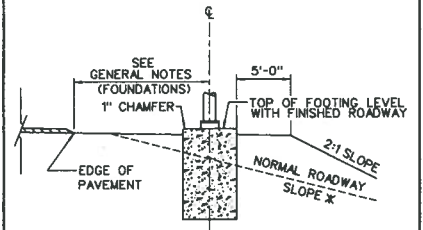
DDK
CHIEF TRAFFIC ENGINEER

T-30.1.7 .1 (623)
ADOPTED: 10/92 REVISION
7/94



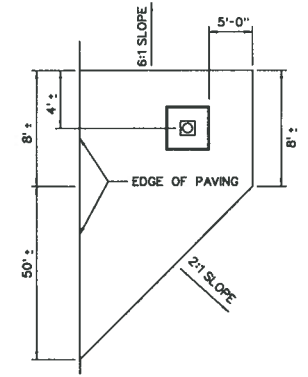
25' AND SMALLER RADI CURB RETURN AND MEDIAN LOCATION

30' AND LARGER RADI CURB RETURN AND MEDIAN LOCATION



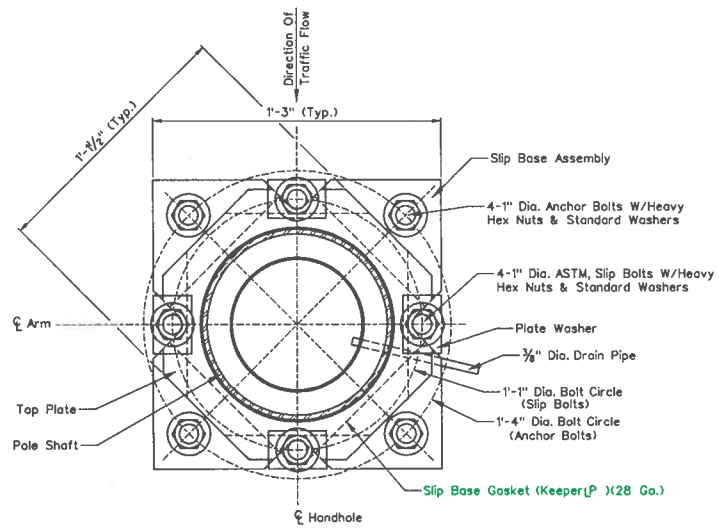
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X - GREATER THAN 10:1

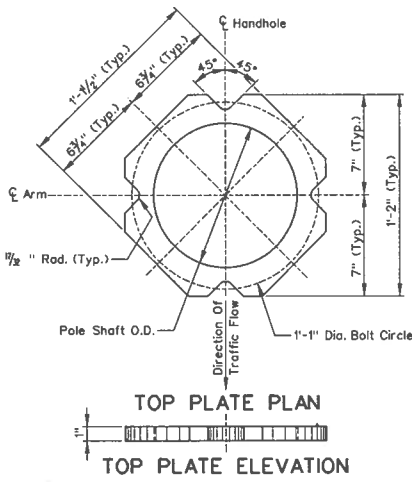


FOUNDATION ISLAND PLAN

STATE OF NEVADA
 DEPARTMENT OF TRANSPORTATION
 SIGNAL POLE AND
 LOOP DETECTOR
 LOCATIONS
 FOUNDATION ISLAND



SAFETY BASE PLAN

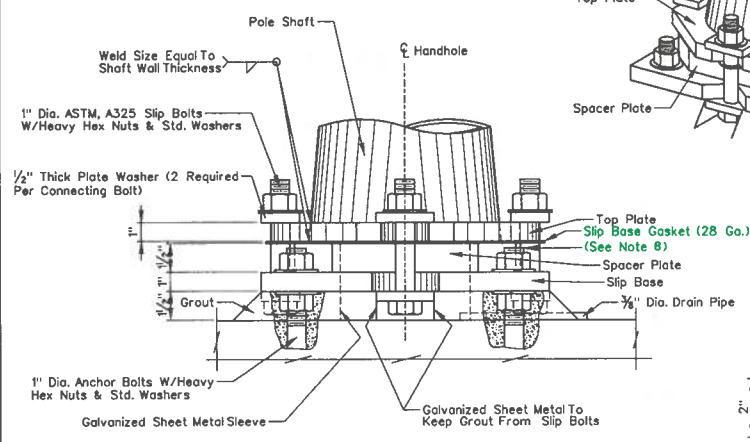


**TOP PLATE PLAN
TOP PLATE ELEVATION**

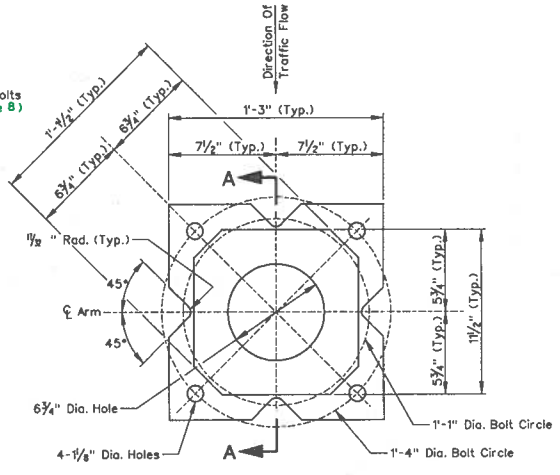
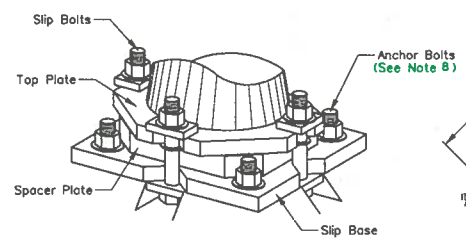
GENERAL NOTES

1. PLACE BOTTOM PLATE WITH SPACER PLATE ON LEVELING NUTS ON ANCHOR BOLTS AND FASTEN IN PLACE.
2. TOP PLATE SHALL BE FURNISHED BY LIGHT POLE FABRICATOR AS LIGHT POLE BASE PLATE WITH DIMENSIONS AS SHOWN IN PLAN VIEW.
3. ALL STEEL PLATE ASSEMBLIES SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION.
4. ALL NUTS, BOLTS AND WASHERS SHALL BE ELECTRO-PLATED CADMIUM IN ACCORDANCE WITH ASTM A-165, TYPE NS.
5. ALL CONTACT AREAS OF PLATES SHALL BE FREE OF GALVANIZING BEADS OR RUNS.
6. SAFETY BASES SHALL BE UTILIZED ON ALL STEEL LIGHT POLES EXCEPT ON STRUCTURES OR IF PLACED BEHIND BARRIER RAIL OR GUARDRAIL.
7. CRUISING SHALL BE DONE AFTER LIGHT POLE HAS BEEN LOCATED IN FINAL POSITION.
8. ANCHOR BOLT SHALL NOT EXTEND ABOVE SLIP BASE GASKET.
9. SLIP BOLT TORQUING REQUIREMENTS
 - A. TORQUE ALL BOLTS TO 80 FT. LBS.
 - B. LOOSEN BOLTS:
 - C. RETIGHTEN TO FINAL TORQUE USING THE FOLLOWING SEQUENCES:

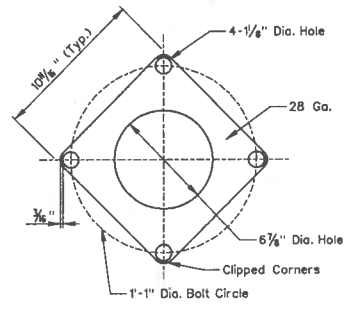
3 1 4
2 1 4
60 FT. LBS., 85 FT. LBS., THEN 70 FT. LBS., RECHECK EACH BOLT FOR 70 FT. LBS.
D. CHECK AREAS AROUND SLIP BASE GASKET. MATERIAL SHALL CONFORM TO FED. SPEC. NO. TT-5-130, TYPE B OR EQUAL.
E. SPRAY CADMIUM BOLTS WITH GALVALITE COLD GALVANIZING COMPOUND OR EQUIVALENT.



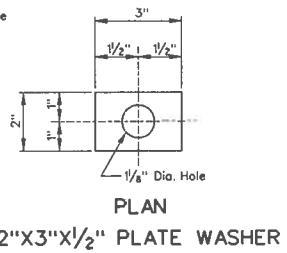
SAFETY BASE ELEVATION



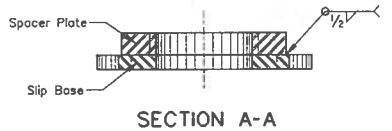
SLIP BASE & SPACER PLATE PLAN




SLIP BASE GASKET



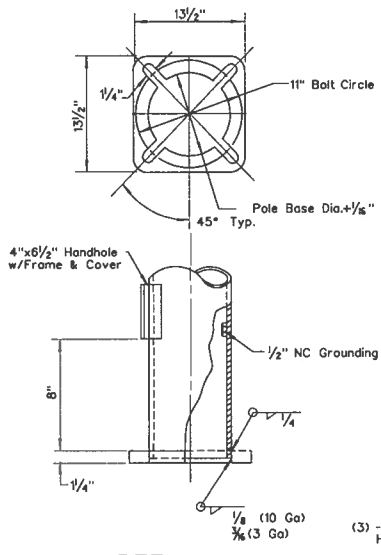
2"X3"X1/2" PLATE WASHER



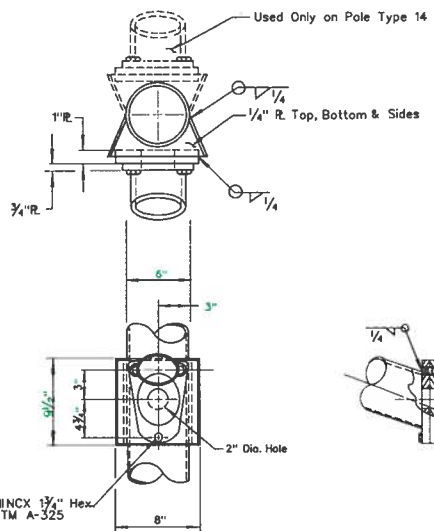
SECTION A-A

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION		
SAFETY BASE		
 CHIEF TRAFFIC ENGINEER		T-30.1.9 (623) ADOPTED 1/91 REVISION 3-18-93

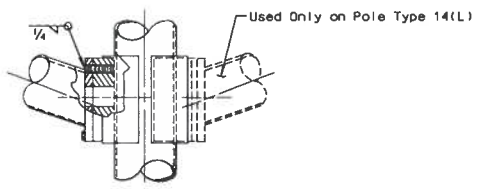
T-11



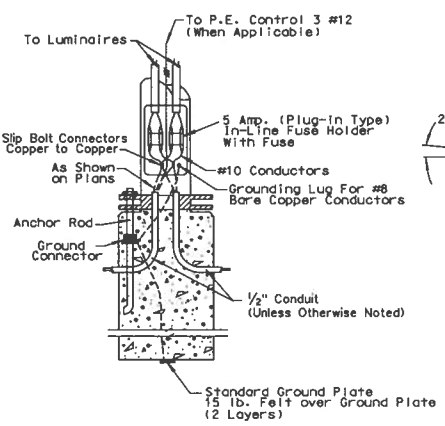
DETAIL "A"
BASE PLATE
(NOT APPLICABLE WHEN SAFETY BASES ARE REQ'D.)



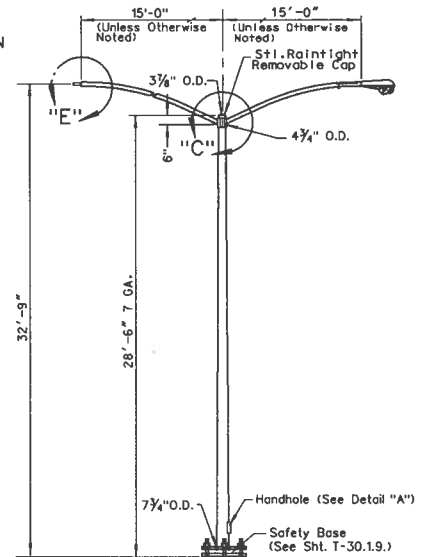
DETAIL "C"
LUMINAIRE ARM CONNECTION



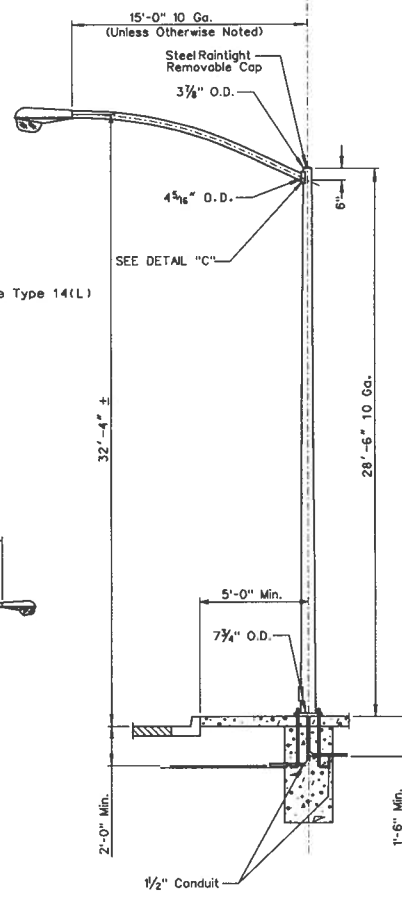
DETAIL "E"
LUMINAIRE TENON DETAIL



WIRING DIAGRAM FOR POLE TYPE 14



POLE TYPE 14



POLE TYPE 7

- GENERAL NOTES FOR ALL POLE TYPES**
- GALVANIZING**
- POLES SHALL BE GALVANIZED AS PER ASTM A-123. HARDWARE SHALL BE GALVANIZED AS PER ASTM A-153.
- STEEL SIGNAL AND LUMINAIRE ARMS**
- THE LAST 3" OF THE LUMINAIRE ARM SHALL BE STRAIGHT AND HORIZONTAL WITH LUMINAIRE ATTACHED.
 - CONNECTION BETWEEN ARMS AND POLES SHALL BE MADE BY MEANS OF A RAIN TIGHT SOCKET OR A DESIGN PERMITTING SIMPLE REMOVAL OF THE ARMS.
- ANCHOR BOLTS**
- 4-ASTM A-307 ANCHOR BOLTS ARE REQUIRED FOR EACH POLE. PROVIDED A HEX NUT, LEVELING NUT AND 2 WASHERS FOR EACH BOLT.
 - THREADS MAY BE CUT OR ROLLED. BOLTS SHALL BE GALVANIZED OR PLATED AFTER THREADS ARE FORMED. EACH BOLT SHALL BE PROVIDED WITH 6" OF THREADS.
 - WHEN USING A SAFETY BASE, ANCHOR BOLTS SHALL NOT EXTEND ABOVE THE SLIP BOLT GASKET.
- STEEL POLES**
- BASE COVERS ARE REQUIRED ON ALL POLES EXCEPT WHERE SAFETY BASE IS SPECIFIED.
 - A REDUCED GAGE FOR SHAFT OF POLE WILL BE ACCEPTABLE ABOVE SIGNAL ARM ATTACHMENT SIMILAR TO POLE TYPE 20.
- WELDS**
- LONGITUDINAL WELDS BY SUBMERGED ARC OR ERW CIRCUMFERENTIAL BUTT WELDS SHALL HAVE PERMANENT BACK-UP RINGS. ALL EXPOSED BUTT WELDS SHALL BE GROUND FLUSH.
 - FOR WELD SIZES NOT SHOWN, USE MINIMUM SIZE WELD AS SPECIFIED BY THE LATEST WELDING CODE.
 - BREAK ALL SHARP EDGES FOR WIRE PROTECTION.
- FOUNDATIONS**
- AT LOCATIONS BEHIND CURB, ALL SIGNAL AND LIGHTING POLES SHALL BE LOCATED AT THE BACK EDGE OF SIDEWALK OR AT THE R/W LINE, TO OBTAIN A MINIMUM SETBACK DISTANCE OF 5' BEHIND THE BACK EDGE OF CURB TO CENTER OF POLE. (SEE SHEET T-30.1.8 FOR TYPICAL LOCATIONS.)
 - AT LOCATIONS WITHOUT CURB, POLES SHALL BE PLACED A MINIMUM DISTANCE OF 8' FROM SHOULDER OR A MINIMUM OF 10' FROM TRAVEL WAY, WHICHEVER IS GREATER.
 - FOR FOUNDATION DETAILS SEE SHEET T30.1.13.
 - FOR FOUNDATION ISLAND SEE SHEET T-30.1.8.
- SAFETY BASES**
- TYPE 7 AND TYPE 14 POLES SHALL REQUIRE SAFETY BASE ASSEMBLIES UNLESS MOUNTED ON STRUCTURE BEHIND BARRIER RAIL OR NOTED OTHERWISE ON THE PLANS. (SEE SHEET T-30.1.8 FOR DETAILS)

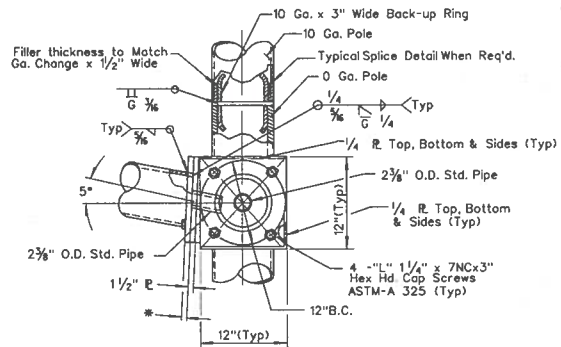
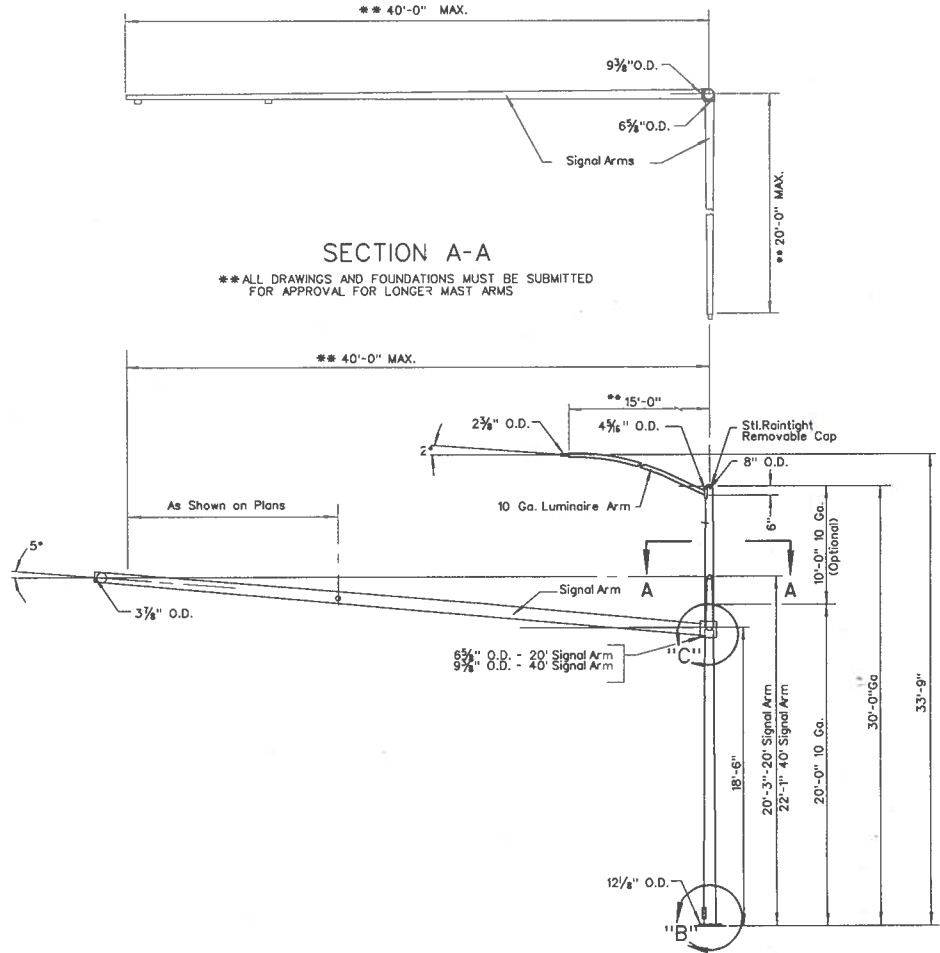
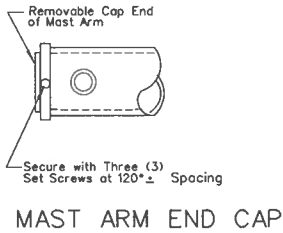
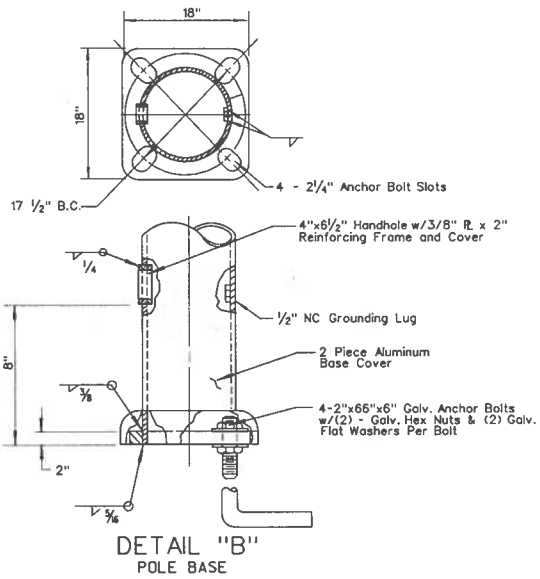
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

TYPE 7 & 14 POLE LIGHTING & SIGNAL LIGHT POLES

T-30.1.10 (623)

P.D. Kiser
CHIEF TRAFFIC ENGINEER

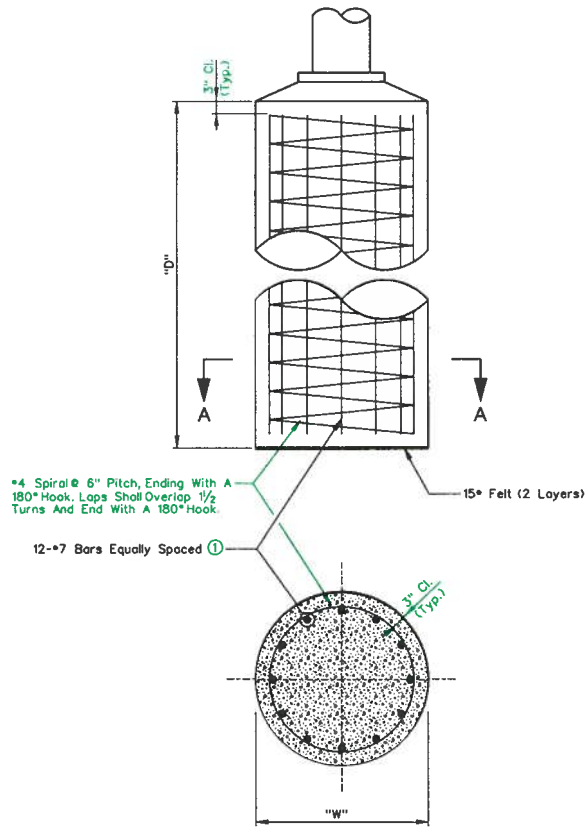
ADOPTED: 12/79 REVISION: 2-10-92



DETAIL "C"
SIGNAL ARM CONNECTION
* 1" R FOR 20' SIGNAL ARM
1 1/4" R FOR 40' SIGNAL ARM

FOR POLE FOUNDATION SEE SHEET T-30.1.13
FOR M-2 SIDEMOUNT DETAIL SEE SHEET T-30.1.3
FOR LUMINAIRE ARM CONNECTION & LUMINAIRE
TENDON DETAIL SEE SHEET T-30.1.10
THE DISTANCE FROM THE ROADWAY SURFACE
TO THE BOTTOM OF THE MAST ARM SIGNAL
HEADS SHALL BE 17'-0".

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION	
TYPE 28 POLE	
<i>P.D. Kiser</i> CHIEF TRAFFIC ENGINEER	T-30.1.12 (623) ADOPTED: 12/79 REVISION 2-10/92

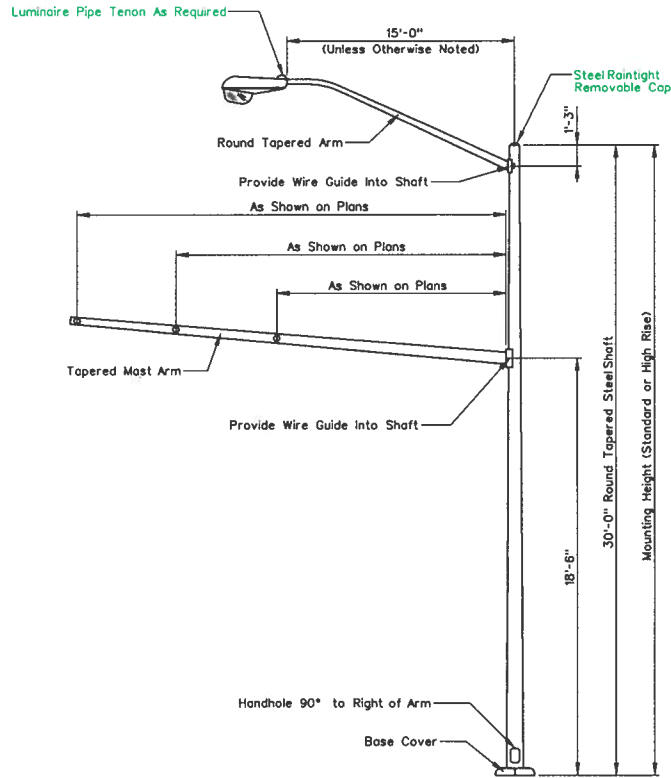


SECTION A-A
PILE FOUNDATION

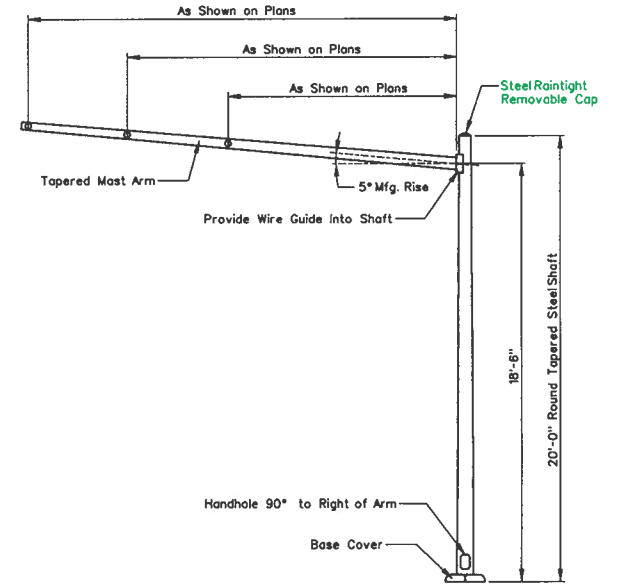
PILE FOUNDATION TABLE

POLE TYPE	MAST ARM LENGTH	**"D"	**"W" ①	ANCHOR BOLTS (4 EACH)
1A & 1B	N/A	3'-0"	2'-0"	3/4" X 18" X 4"
7 AND 14	ALL	5'-0"	2'-6"	*1" X 36" X 4"
28	ALL	12'-0"	3'-0"	2" X 66" X 6"
30 AND 35	≤ 45'	12'-0"	3'-0"	1 3/4" X 60" X 6"
30A AND 35A	> 45'	12'-0"	3'-0"	2" X 66" X 6"

** UNLESS OTHERWISE SHOWN ON PLANS.
 * NOT APPLICABLE WHEN MOUNTED ON STRUCTURES.
 ① WHEN "W" = 2'-0" USE 4-*5 BARS EQUALLY SPACED.
 WHEN "W" = 2'-6" USE 8-*5 BARS EQUALLY SPACED.



POLE TYPE 35 (MAST ARMS 45' AND LESS)
 POLE TYPE 35-A (MAST ARMS 50' AND GREATER)



POLE TYPE 30 (MAST ARMS 45' AND LESS)
 POLE TYPE 30-A (MAST ARMS 50' AND GREATER)

NOTES:

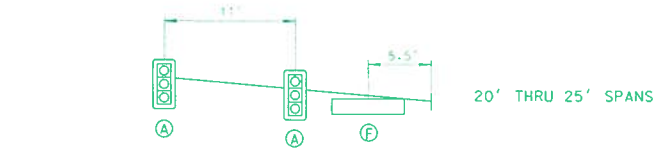
- SHOP DRAWINGS AND STRUCTURAL CALCULATIONS SHALL BE SUBMITTED AND APPROVED BEFORE POLES MAY BE UTILIZED ON PROJECT.
- IF INDICATED IN THE PLANS, ALL POLES SHALL BE PRIME PAINTED BY MANUFACTURER AND FINISH PAINTED BY CONTRACTOR. SEE STANDARD SPECIFICATION SEC. 714.03.01.
- THE DISTANCE FROM THE ROADWAY SURFACE TO THE BOTTOM OF THE MAST ARM SIGNAL HEADS SHALL BE 17'-0".

STATE OF NEVADA
 DEPARTMENT OF TRANSPORTATION

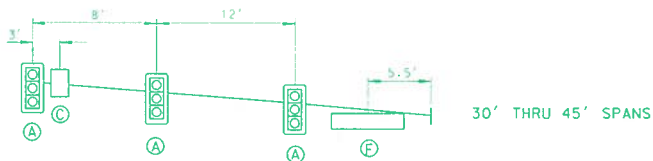
**TYPE 30 AND 35 POLES
 PILE FOUNDATION**

P.D. Kim
 CHIEF TRAFFIC ENGINEER

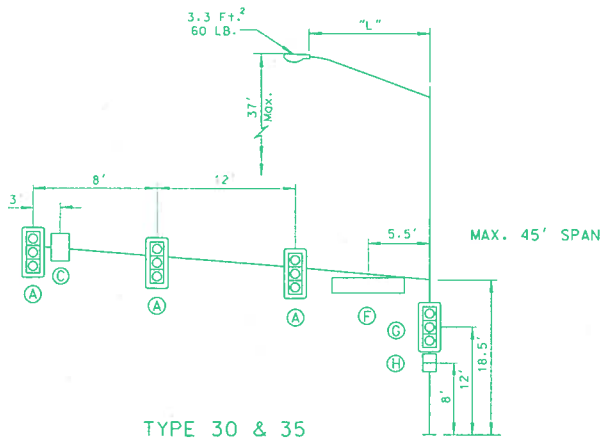
T-30.113 (623)
 ADOPTED: 2/79 REVISION: 10/94



20' THRU 25' SPANS

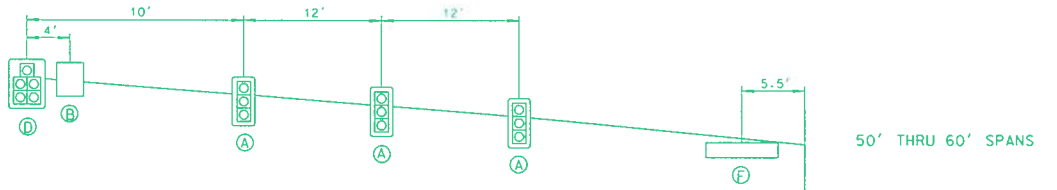


30' THRU 45' SPANS

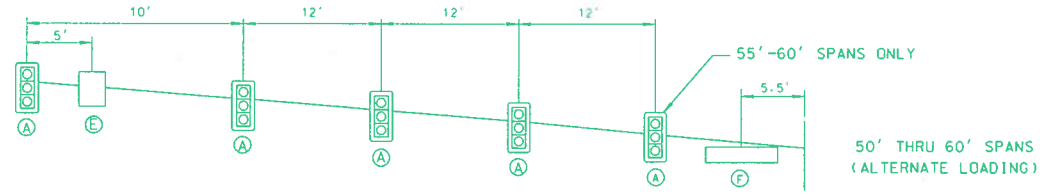


MAX. 45' SPAN

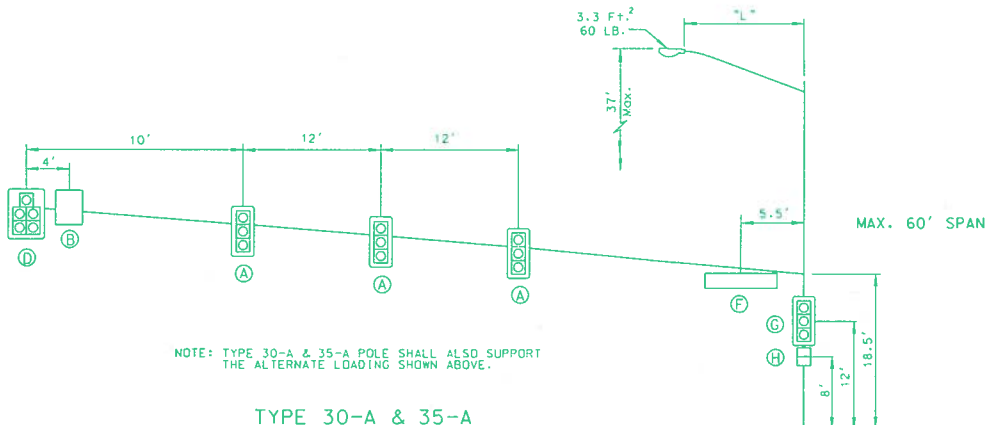
TYPE 30 & 35



50' THRU 60' SPANS



50' THRU 60' SPANS (ALTERNATE LOADING)



MAX. 60' SPAN

NOTE: TYPE 30-A & 35-A POLE SHALL ALSO SUPPORT THE ALTERNATE LOADING SHOWN ABOVE.

TYPE 30-A & 35-A

DEVICE	DESCRIPTION	PROJECT AREA (FT.²)	WEIGHT (LBS.)
(A) SIGNAL	12"-3 Sec. w/Backplates (2M)	9.80	40
(B) SIGN	R10-12 24"x30"	5.00	15
(C) SIGN	R3-4 24" x 24"	4.00	10
(D) SIGNAL	12"-5 Sec. w/Backplates	13.68	80
(E) SIGN	R10-5d S 36" x 45"	11.25	30
(F) SIGN	Street Name-Free Swinging 1.68' x 8'	13.44	100
(G) SIGNAL	Dual-12"-3 Sec. w/Backplates	17.34	80
(H) SIGNAL	Dual-Pedestrian	8.00	60

ARM SPAN "L" (FT.)	FIXED END DIA. (IN.)	FREE END DIA. (IN.)	GAUGE	LUMINAIRE MOUNTING HEIGHT	
				Low Rise	High Rise
				6	3.42
8	3.75	2.38	11	31'-6"	33'-3"
10	4.16	2.38	11	31'-9"	35'-0"
12	4.52	2.38	11	33'-0"	36'-6"
15	4.95	2.38	11	33'-6"	37'-0"

DESIGN CRITERIA:

1985 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS.

MAXIMUM DESIGN MINIMUM YIELD STRENGTH FOR TUBULAR MEMBERS SHALL BE LIMITED TO 48,000 P.S.I. FOR COLD WORKED MATERIALS AND 50,000 P.S.I. FOR NON-COLD WORKED MATERIALS.

WIND VELOCITY:

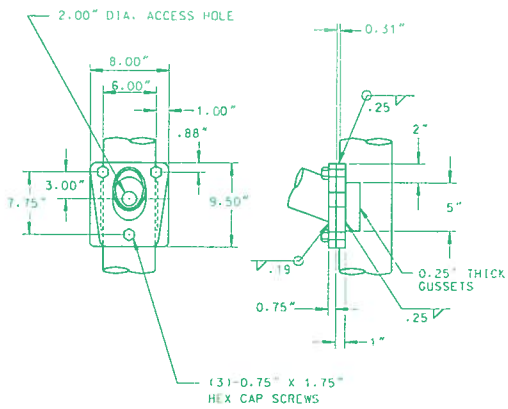
80 M.P.H. ISOTACH

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

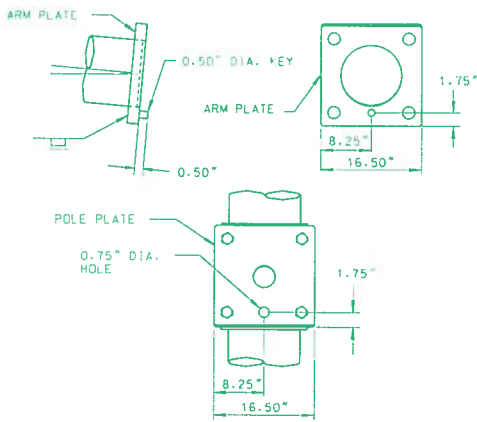
**TYPE 30 & 30A
35 & 35A
LOADING INFORMATION**

P.D. King
CHIEF TRAFFIC DESK

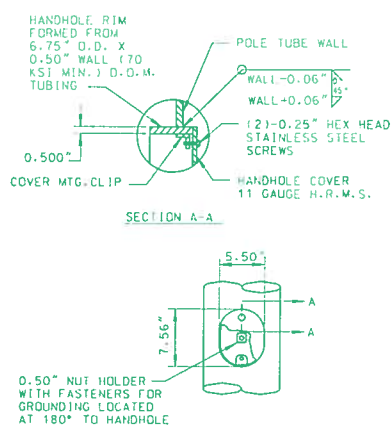
T-30.1.14
ADOPTED REVISION



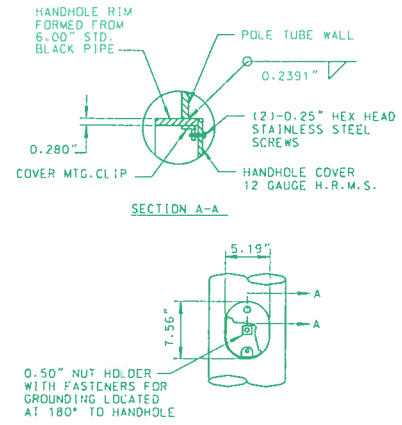
LUMINAIRE ARM ATTACHMENT



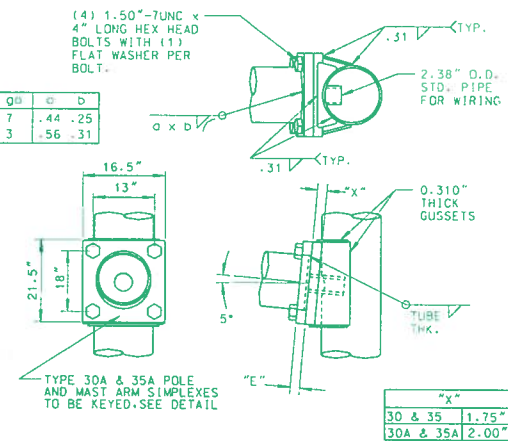
SIGNAL ARM SIMPLEX KEY



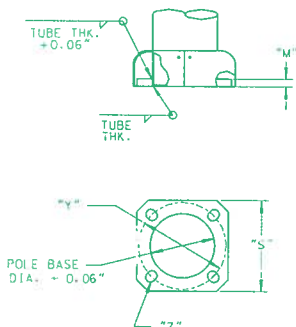
TYPE 30-A & 35-A HANDHOLE



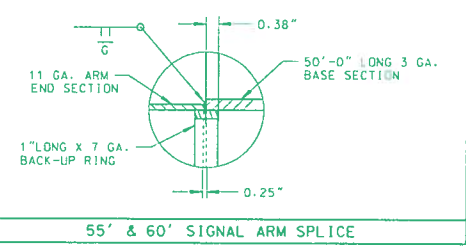
TYPE 30 & 35 HANDHOLE



SIGNAL ARM ATTACHMENT



POLE BASE PLATE



55' & 60' SIGNAL ARM SPLICE

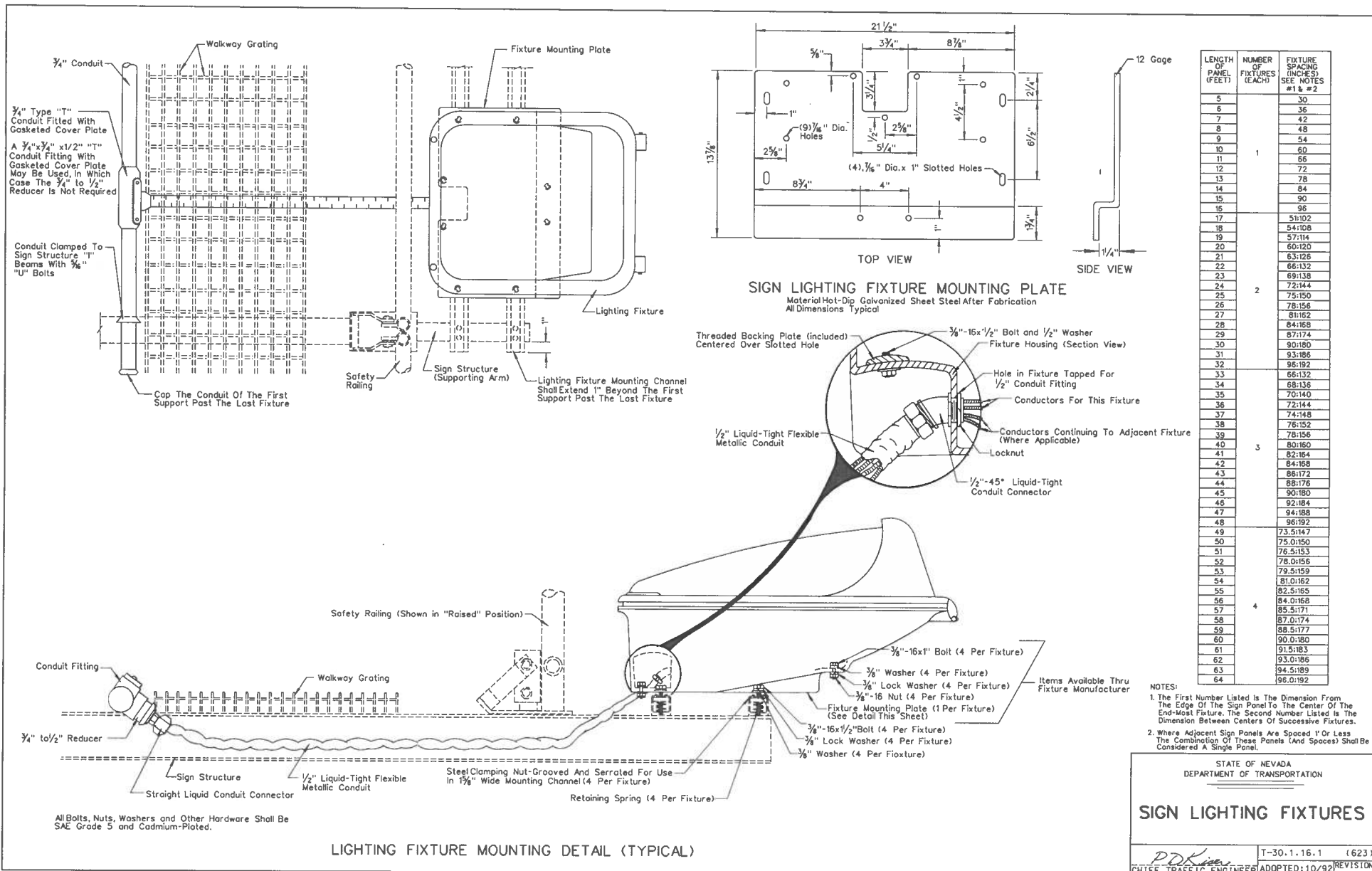
POLE BASE PLATE				
TYPE	SQUARE "S" (In.)	BOLT CIRCLE "P" (In.)	THK. "M" (In.)	HOLE "Z" (In.)
30 & 35	17.00	16.5	1.50	2.00
30A & 35A	19.00	19.00	1.75	2.25

T-15

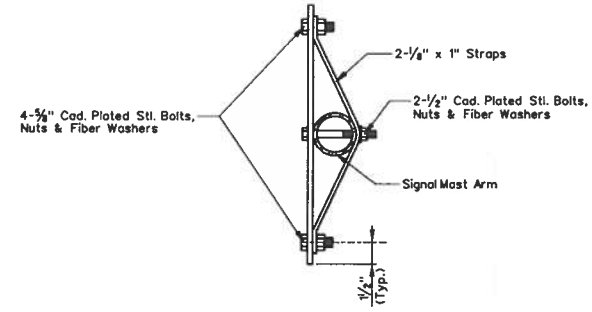
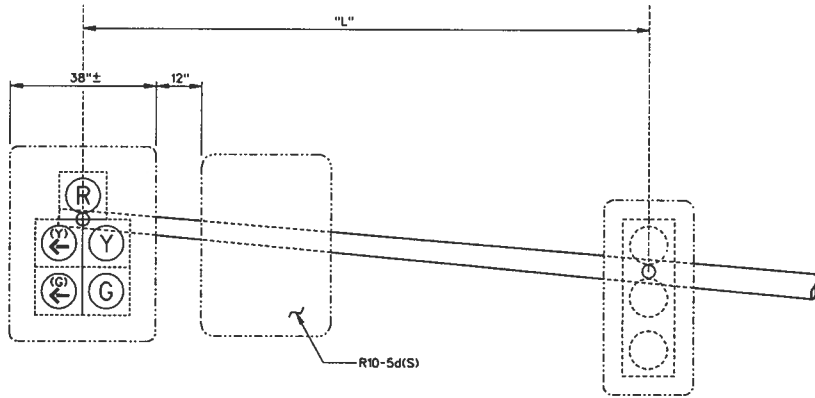
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

**TYPE 30 & 30A
35 & 35A
DETAILS**

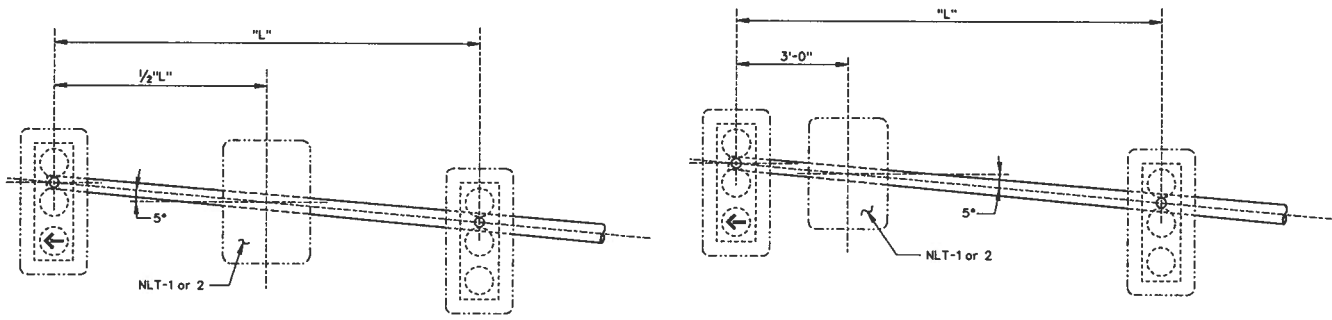
ADOPTED: *PDK* T-30.1.15
REVISION:



LIGHTING FIXTURE MOUNTING DETAIL (TYPICAL)

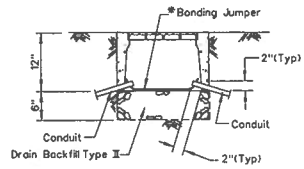


TYPICAL METHOD OF ATTACHMENT



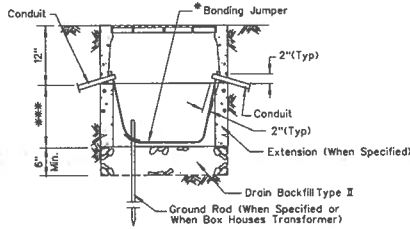
MAST ARM SIGNAL AND SIGN PLACEMENT
"L" - AS SHOWN ON PLANS

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION	
TRAFFIC SIGNAL SIGN PLACEMENT	
<i>PDK</i> CHIEF TRAFFIC ENGINEER	T-30.1.17 (623) ADOPTED: 12/79 REVISION: 4-10/92



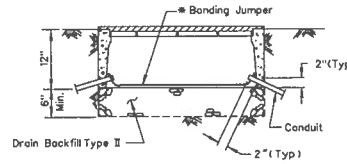
SECTION A-A

*** NOTE: WHEN CONCRETE PULL BOX IS FURNISHED, EXTENSIONS SHALL BE 10" MIN. WHEN PLASTIC PULL BOXES ARE FURNISHED, EXTENSION SHALL BE 8" MIN.



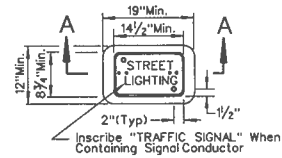
SECTION B-B

* APPLICABLE ONLY WHEN METAL CONDUIT IS USED

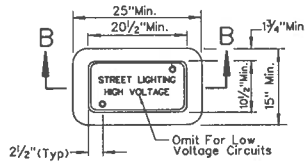


SECTION C-C

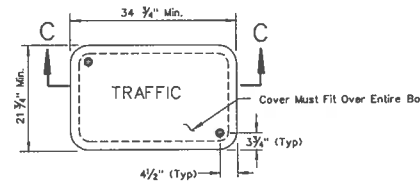
- NOTES FOR PULL BOXES
1. USE STEEL COVER WHEN BOX IS SUBJECT TO VEHICULAR TRAFFIC LOADS. HOWEVER, WHEN THE BOX IS LOCATED IN THE TRAVEL WAY, AN ELECTRICAL MANHOLE FRAME AND COVER SHALL BE INSTALLED.
 2. WHEN THE PULL BOX IS INSTALLED IN A SIDEWALK AREA OR IN A STRUCTURE, THE DEPTH OF THE TOP OF THE PULL BOX SHALL BE ADJUSTED SO THAT THE TOP OF THE BOX IS FLUSH WITH THE TOP OF THE SIDEWALK.
 3. IN AREAS WHERE THE POSSIBILITY OF MATERIAL ERODING FROM AROUND THE PULL BOX EXISTS, THE PULL BOX SHALL BE PLACED IN TYPE II DRAIN BACKFILL MATERIAL (2 FT. DEPTH ON EACH SIDE & 1 FT. DEPTH) AS DIRECTED BY THE ENGINEER.



NO. 3 1/2 PULL BOX

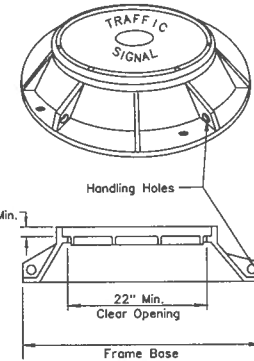


NO.5 PULL BOX



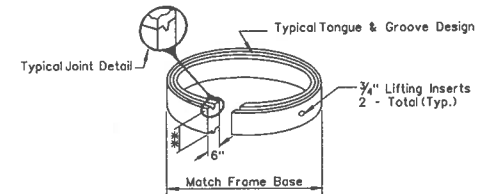
NO.7 PULL BOX

NOTE: BOXES SHALL BE SEALED WITH MORTAR AROUND CONDUIT OPENINGS.



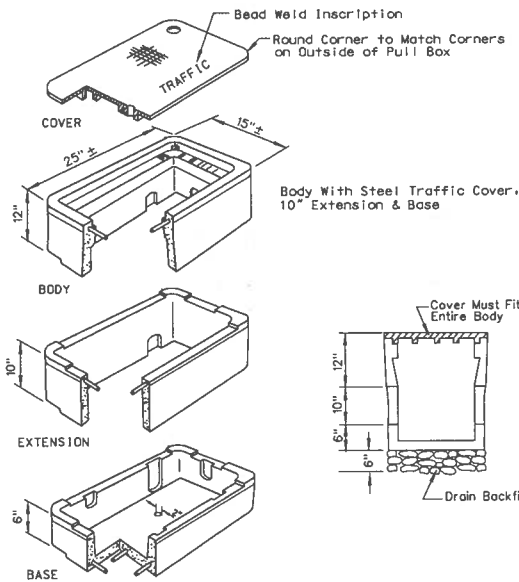
ELECTRICAL MANHOLE FRAME & COVER

- NOTES:
1. A COMPACTED BASE AND A CONCRETE FOOTING SUPPORT SHALL BE CONSTRUCTED PRIOR TO PLACEMENT OF THE CAST IRON FRAME AS DIRECTED BY THE ENGINEER.
 2. ADJUSTMENTS TO ELEVATIONS SHALL BE MADE WITH COLLAR/RISERS AS REQUIRED.

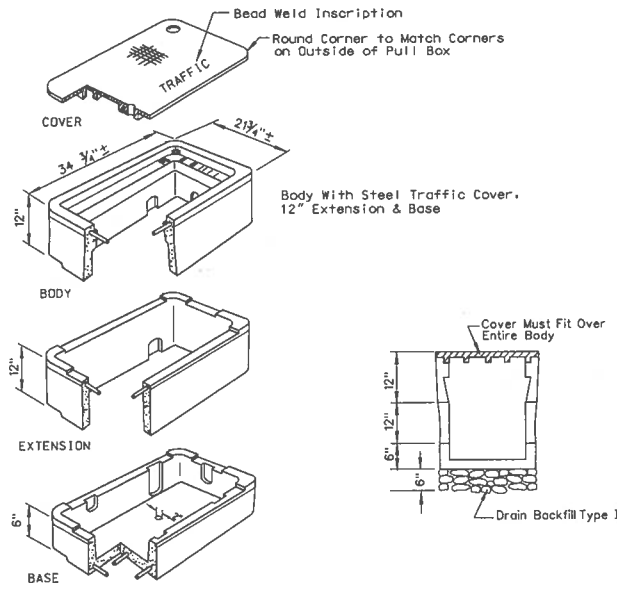


** 3", 6", 12" On Plans To Be Shown

COLLAR RISER



SPECIAL NO.5 PULL BOX



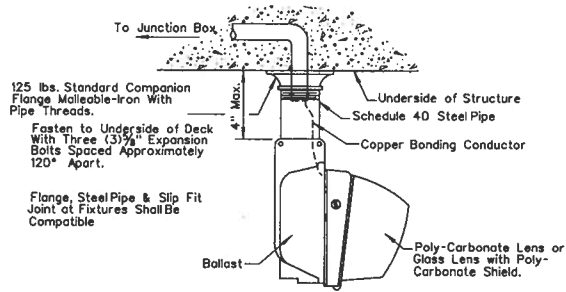
SPECIAL NO.7 PULL BOX

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

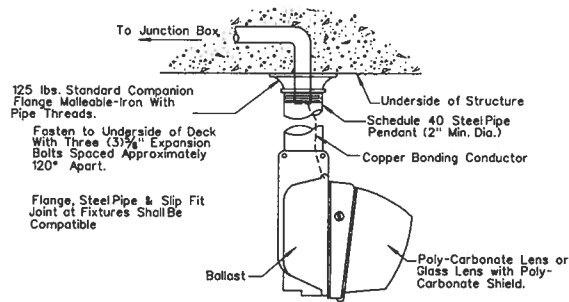
**PULL BOXES & ELECTRICAL
MANHOLE FRAME & COVER**

RDK
CHIEF TRAFFIC ENGINEER

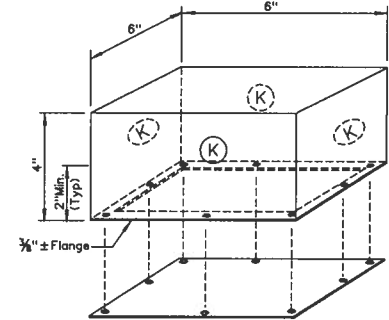
T-30-1-18 (623)
ADOPTED: 1/83 REVISION



TYPE "A" UNDERPASS LUMINAIRE

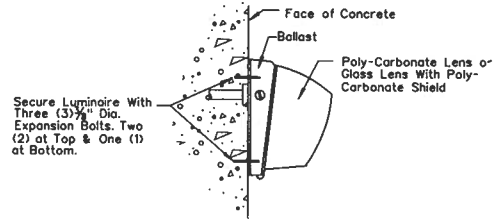


TYPE "C" UNDERPASS LUMINAIRE

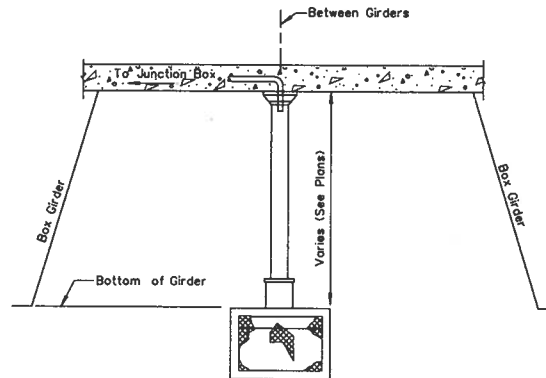


JUNCTION BOX DETAIL (J)

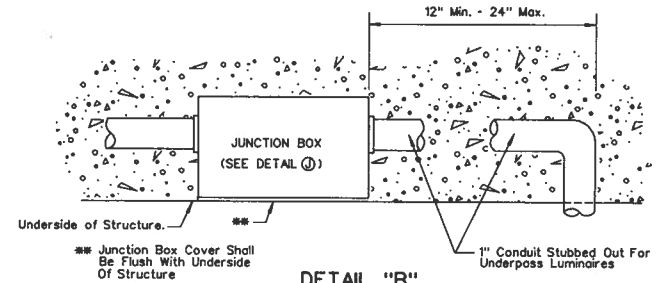
1. JUNCTION BOX AND COVER SHALL BE 16 GA. STEEL.
2. GALVANIZE ASSEMBLY AFTER FABRICATION.
3. BOX SHALL BE FLUSH WITH BOTTOM OF STRUCTURE.
4. FASTEN COVER BY DRILL AND TAP WITH EIGHT (8) #10-24 UNC BRASS SCREWS.
5. COVER SHALL BE ON BOX DURING POURING.
6. AN EQUIVALENT APPROVED MFG. BOX MAY BE USED IN LIEU OF DETAIL (J) JUNCTION BOX.
7. (K) KNOCK OUT FOR 1\"/>



TYPE "B" UNDERPASS LUMINAIRE

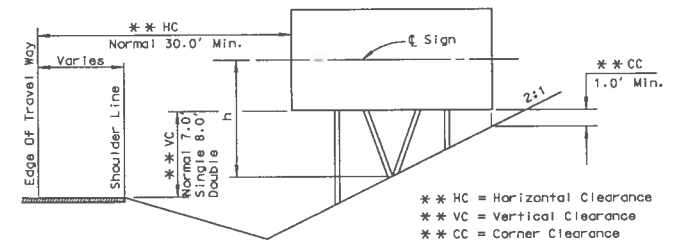
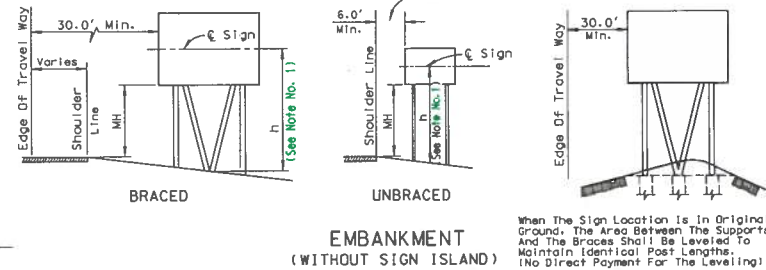
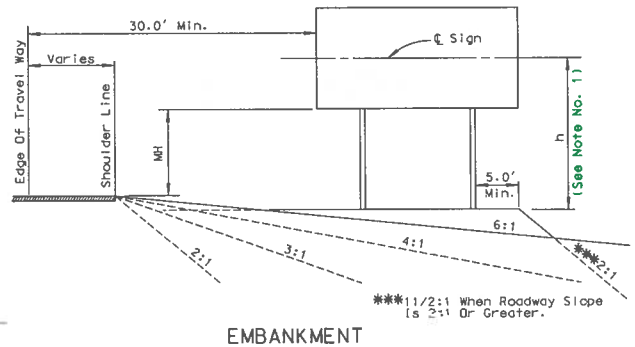
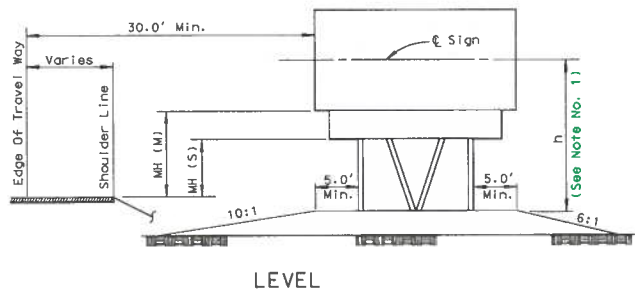
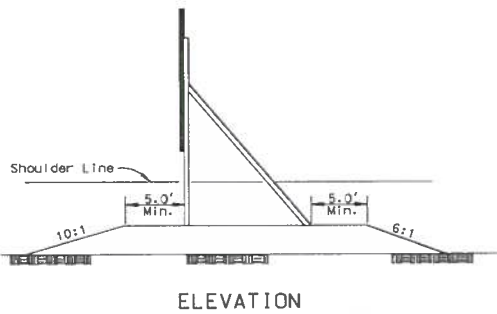
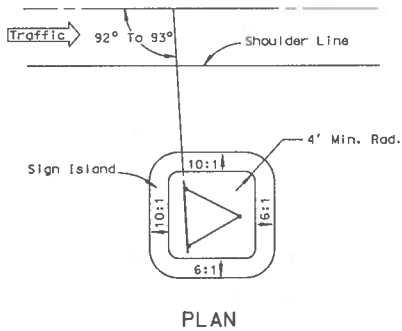


PENDANT INSTALLATION
(TYPE "C" UNDERPASS LUMINAIRE)



DETAIL "B"

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION	
UNDERPASS LUMINAIRE & JUNCTION BOX	
P.D. Kiser CHIEF TRAFFIC ENGINEER	T-30.1.19 (623) ADOPTED: 12/79 REVISION 1-1/83



- NOTE: If CC Is Less Than 1.0' Minimum.
- (1) Raise Sign Until CC=1.0' OR VC=10.0' Max. For Single Sign VC=11.0' Max For Double Sign. Or h=15.0' Max.
 - (2) Maintain VC=10.0' Or 11.0' And Move Sign Toward Shoulder Until CC=1.0'. HC=16.0' Min. Or h=15.0' Max.
 - (3) Special Consideration Is Necessary If Given Limits Are Exceeded

EXCAVATION

GENERAL NOTES:

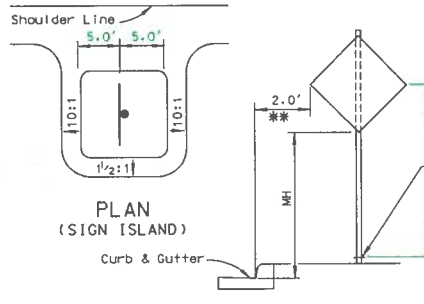
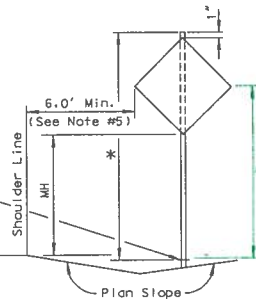
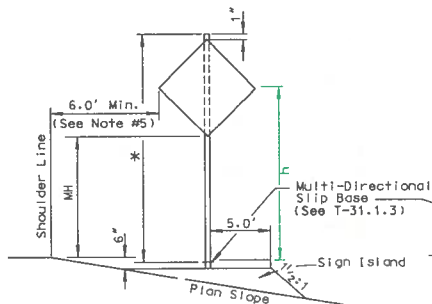
1. SIGN ISLAND FOR TWO POST SIGNS REQUIRED ONLY WHEN h EXCEEDS 15.0'. ISLAND TO BE COMPACTED TO 95%.
2. FOOTING AND SIGN DETAILS SHOWN ON SHEETS T-31.1.2, T-31.1.3 & T-31.1.4.
3. 30.0' MIN. DISTANCE FROM EDGE OF TRAVEL WAY TO EDGE OF SIGN PANEL EXCEPT WHERE PROTECTED BY GUARDRAIL OR BARRIER RAIL.
4. ALL SIGN SUPPORTS SHALL BE OF BREAK-AWAY DESIGN.
5. SIGNS SHOULD NOT BE CLOSER THAN 6.0' FROM THE EDGE OF THE SHOULDER, OR IF NONE, FROM THE EDGE OF THE TRAVELED WAY. IN URBAN AREAS A LESSER CLEARANCE MAY BE USED WHERE NECESSARY.
6. FOR BRACING DETAILS SEE SHEET T-31.1.2.
7. SIGN ISLAND MATERIAL SHALL BE INCLUDED IN THE COST OF THE SIGN.

MINIMUM MOUNTING HEIGHTS (MH) FOR SIGNS

Multi-Directional Slip Base (See T-31.1.3)	Single Guide Signs	Double Guide Signs	Route Markers, Regulatory And Warning Signs
Freeways And Expressways	7'	6' (M) 5' (S)	7'
Commercial, Residential, Curb & Gutter	7'	7' (M) 6' (S)	7'
Rural Roads And Interchange Ramps	7'	7' (M) 6' (S)	7'
Freeway Entrance And Do Not Enter-Wrong Way Assemblies			2'

(M) Major Sign (S) Secondary Sign

NOTE: For Mounting Heights (MH) For Construction Signs And Temporary Signs. (See Sheet T-31.1.5)



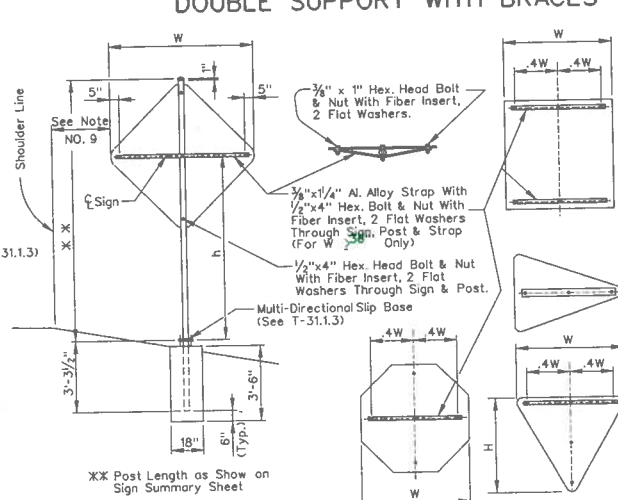
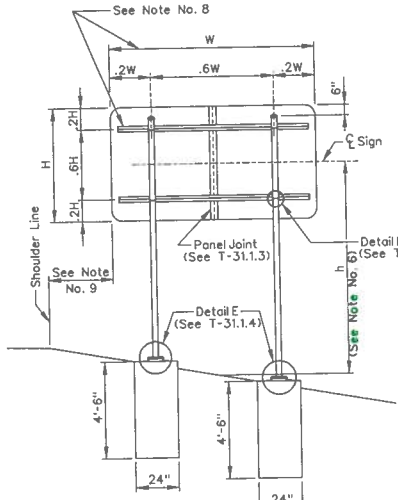
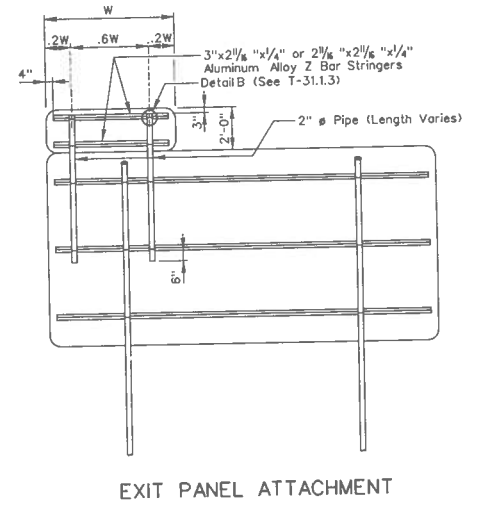
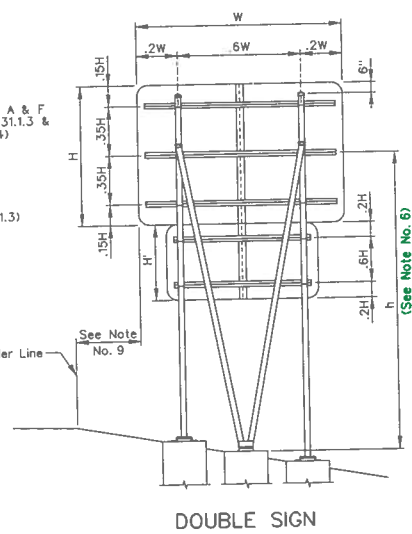
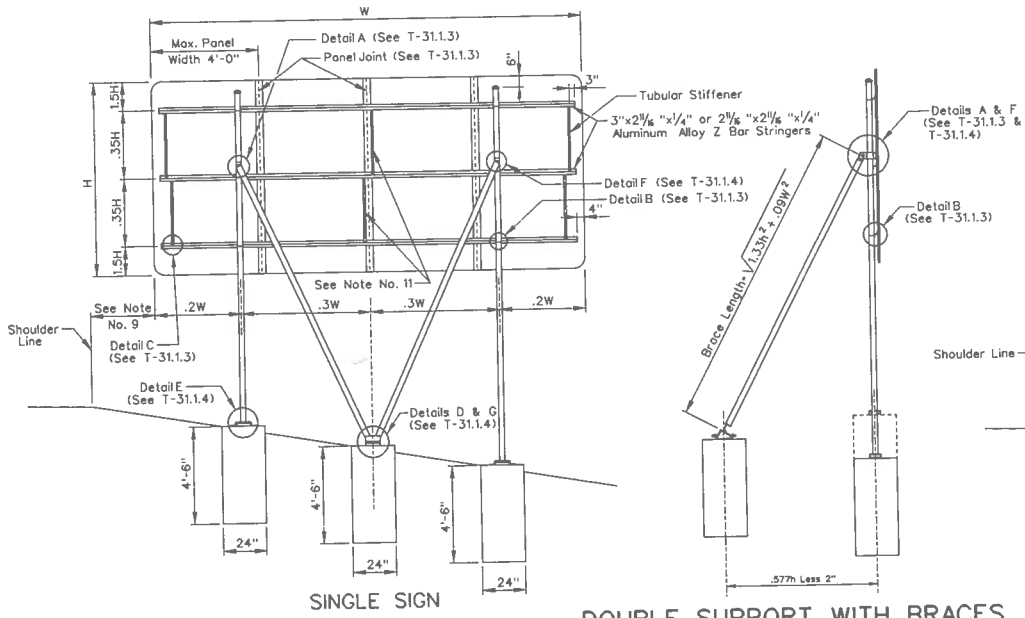
* Post Length As Shown On Sign Summary Sheet Post Length Calculations Are Based On Use Of Sign Island. Sign Island Shall Be Used Except When Signpost Is Located In Backslope Or On Slopes 6:1 Or Flatter.

** Lateral Clearance For All Core Signs Shall Be 2'-0" Either From Curb Face Or Normal Shoulder Line.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

GROUND MOUNTED
SIGN SUPPORTS
(ROUND METAL POSTS)

T-31.1.1-(627)
ADOPTED 8/65 REVISION 10/94



VERTICAL POST SIZE

SIGN AREA SQ. FT.	h				
	0' TO 5'	5' TO 6'	6' TO 10'	10' TO 12'	12' TO 15'
0 TO 70	2"	2"	3"	3"	3"
70 TO 140	2"	2"	3"	3"	3"
140 TO 200	2"	3"	3"	-	-

BRACE SIZE

SIGN AREA SQ. FT.	h						
	0' TO 8'	8' TO 9'	9' TO 11'	11' TO 12'	12' TO 15'	15' TO 17'	17' TO 20'
0 TO 70	2"	2"	2"	3"	3"	3"	3"
70 TO 140	2"	2"	2"	3"	3"	3"	3"
140 TO 200	2"	2"	3"	-	-	-	-

NOTE: WHEN PIPE SIZE FROM TABLES FOR VERTICAL POSTS AND BRACES DIFFER, USE LARGER DIAMETER INDICATED FOR BOTH SUPPORTS.

- GENERAL NOTES
- SIZES AND TYPES OF SIGNS, POSTS AND BRACES ARE AS SHOWN ON SIGN SUMMARY SHEET.
 - FOR MATERIALS NOT DIRECTLY SPECIFIED SEE SPECIAL PROVISIONS.
 - FOOTINGS TO BE DRILLED HOLES, AS SHOWN, AND FILLED WITH CLASS 4 OR CLASS AA CONCRETE.
 - SIGN PANELS TO BE ALUMINUM SHEET CONSTRUCTION.
 - TUBULAR STIFFENERS REQUIRED ONLY WHEN EXCEEDS 2'-0" ALUMINUM SHEET CONSTRUCTION.
 - SIGN ISLAND REQUIRED ONLY WHEN h EXCEEDS 15'-0" ISLAND TO BE COMPACTED TO 95% (SEE T-31-1.1).
 - FOR DOUBLE SIGN, DOUBLE SUPPORT WITH BRACES, AREA FOR TABLES IS TOTAL AREA OF TWO SIGNS. 'H' IS NOT CONSIDERED PART OF H.
 - "2" BAR WILL BE USED ON ALL SIGNS REQUIRING TWO POSTS.
 - SEE T-31-1.1 FOR SIGN PLACEMENT.
 - SEE T-31-1.4 FOR ANCHOR BOLT DETAILS.
 - TUBULAR STIFFENERS TO BE ADDED WHEN "W" EXCEEDS 10'-0".
 - REFER TO THE STANDARD HIGHWAY SIGN MANUAL FOR DRILL HOLE PLACEMENT.
 - SIGN ISLAND MATERIAL SHALL BE INCLUDED IN THE COST OF THE SIGN.

PIPE SIZE DETERMINATION FOR SINGLE POST AND DOUBLE POST WITHOUT BRACE

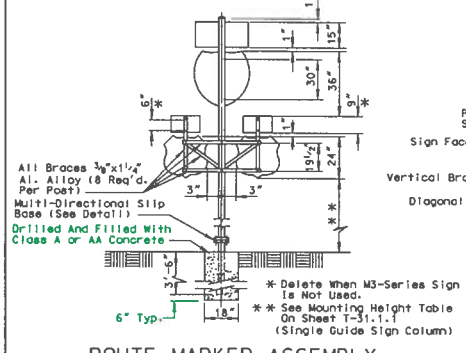
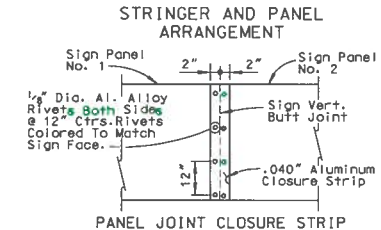
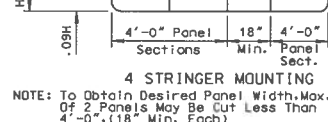
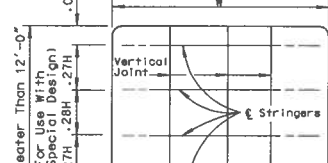
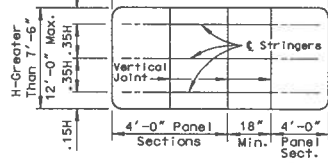
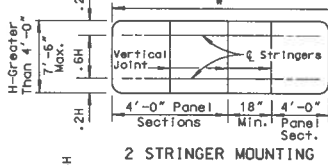
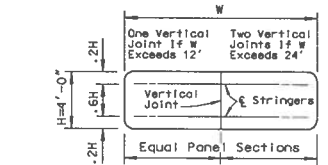
SIGN AREA SQ. FT.	h									
	0' TO 5'	5' TO 8'	8' TO 10'	10' TO 12'	12' TO 14'	14' TO 15'	15' TO 17'	17' TO 20'	20' TO 25'	25' TO 43'
0 TO 5	S 2"	S 2"	S 2"	S 2"	S 2"	S 2"	S 2"	S 2"	S 2"	S 2"
5 TO 7.5	S 2"	S 2"	S 2"	S 2"	S 2"	S 2"	S 2"	S 2"	S 2"	S 2"
7.5 TO 10	S 2"	S 2"	S 2"	S 2"	S 2"	S 2"	S 2"	S 2"	S 2"	S 2"
10 TO 12.5	S 2"	S 3"	S 3"	S 3"	S 3"	S 3"	S 3"	S 3"	S 3"	S 3"
12.5 TO 15	S 3"	S 3"	S 3"	S 3"	S 3"	S 3"	S 3"	S 3"	S 3"	S 3"
15 TO 17.5	S 3"	S 3"	S 3"	S 3"	S 3"	S 3"	S 3"	S 3"	S 3"	S 3"
17.5 TO 20	S 3"	S 3"	S 3"	S 3"	S 3"	S 3"	S 3"	S 3"	S 3"	S 3"
20 TO 25	S 3"	S 3"	S 3"	S 3"	S 3"	S 3"	S 3"	S 3"	S 3"	S 3"
25 TO 43	S 3"	S 3"	S 3"	S 3"	S 3"	S 3"	S 3"	S 3"	S 3"	S 3"

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

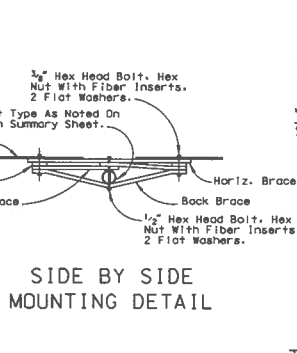
GROUND MOUNTED SIGN SUPPORTS (ROUND METAL POSTS)

T-31.1.2 (627)

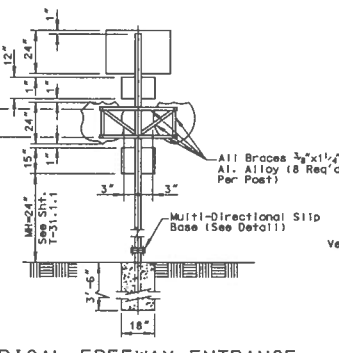
ADOPTED: 8/69 REVISION: 9-94



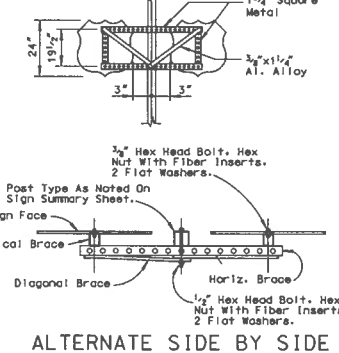
ROUTE MARKER ASSEMBLY



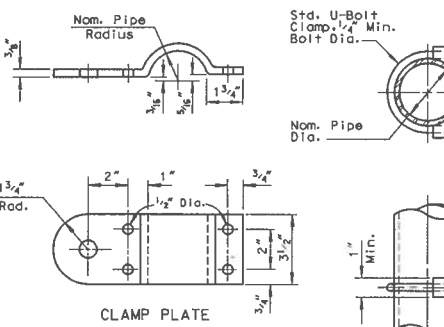
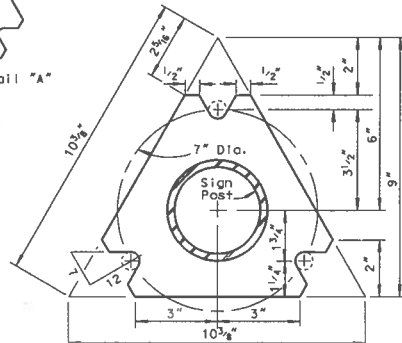
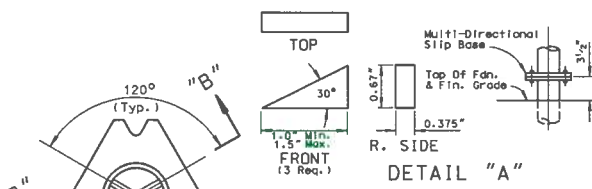
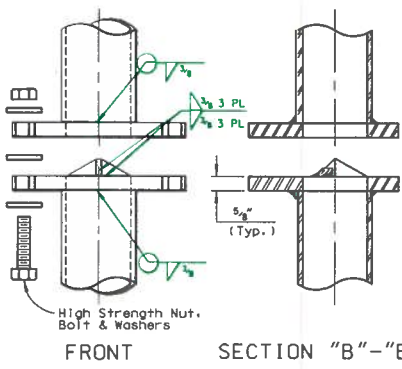
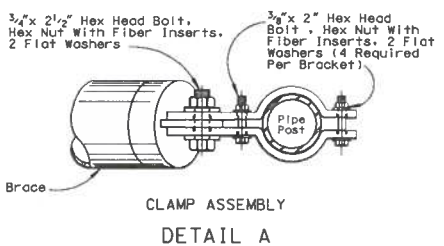
SIDE BY SIDE MOUNTING DETAIL



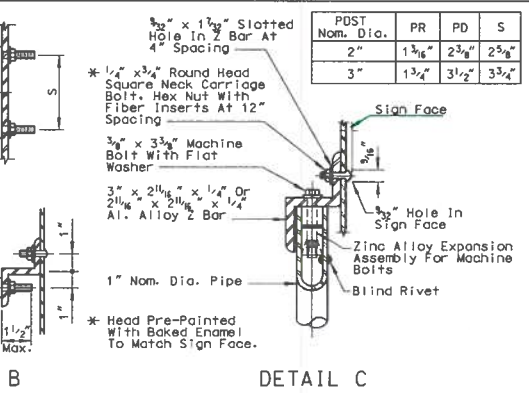
TYPICAL FREEWAY ENTRANCE



ALTERNATE SIDE BY SIDE SIGN MOUNTING DETAIL



GENERAL NOTES:
1. See Standard Sheets T-31.1.1 Through T-31.1.4 For Details Not Shown.

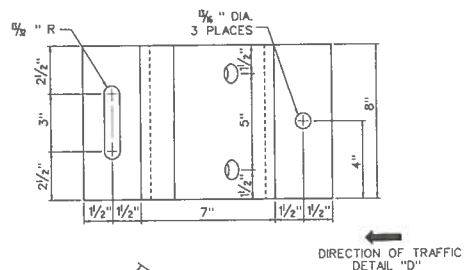


POST Nom. Dia.	PR	PD	S
2"	1 3/16"	2 3/8"	2 5/8"
3"	1 3/4"	3 1/2"	3 3/4"

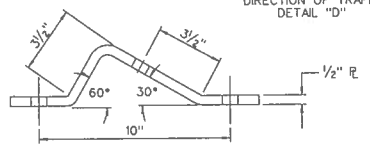
Bolt Size & Torque	Weld Size
5/8" Dia. x 3/4" 450 In. Per Lb.	3/8"

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
GROUND MOUNTED SIGN SUPPORTS (ROUND METAL POSTS)

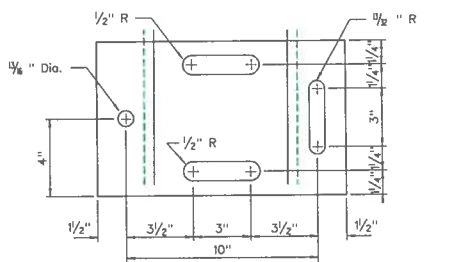
DD King
T-31.1.3 (6/2)
ADOPTED 8/82 REVISION 10/94



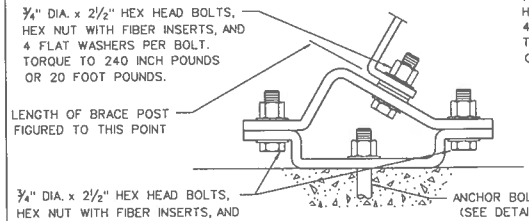
DIRECTION OF TRAFFIC
DETAIL "D"



TOP PLATE

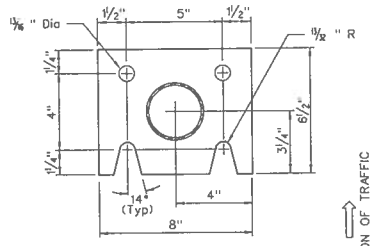


BOTTOM PLATE

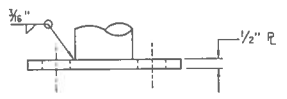


ASSEMBLY

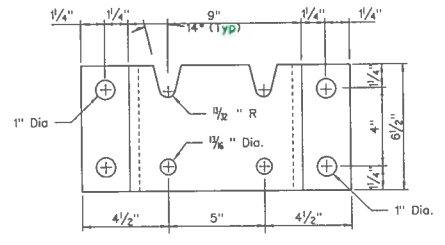
DETAIL "D"



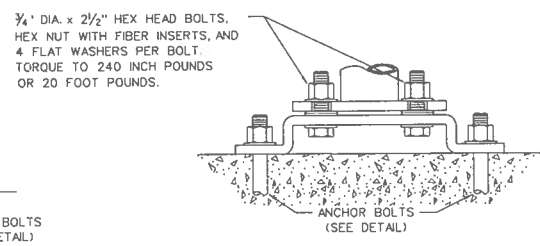
DIRECTION OF TRAFFIC
DETAIL "E"



TOP PLATE



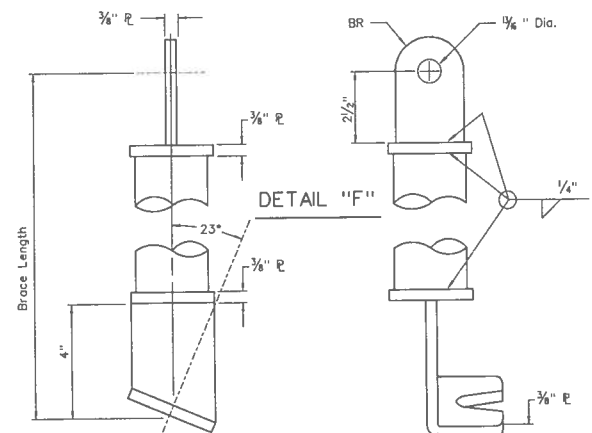
BOTTOM PLATE



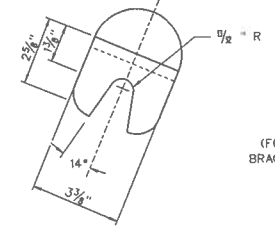
ASSEMBLY

DETAIL "E"

BRACE NOM. DIA.	BR RADIUS
2"	1 3/4"
3"	1 3/4"

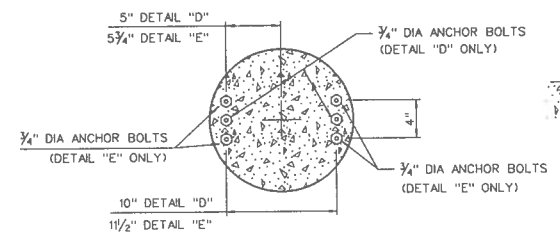


DETAIL "F"

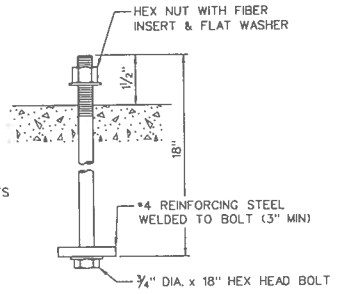


DETAIL "G"

(FOR ONE BRACE; OTHER
BRACE IS OPPOSITE HANDED)



PLACEMENT
ANCHOR BOLTS



DETAIL

GENERAL NOTES:

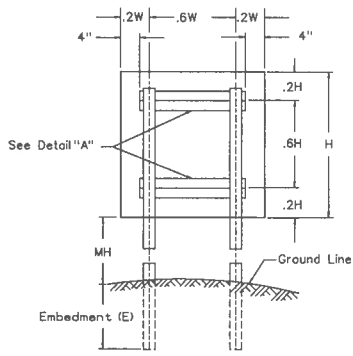
1. FLAT WASHERS REQUIRED AS SHOWN.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

**GROUND MOUNTED
SIGN SUPPORTS
(ROUND METAL POSTS)**

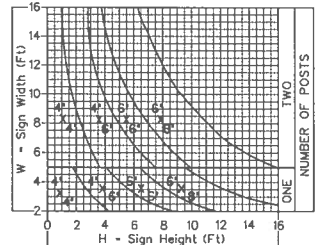
P.D. Kline
CHIEF TRAFFIC ENGINEER

T-31.1.4-(627)
ADOPTED: 8/69 REVISION: 10/84



Sign Post Embedments	
4"x4" - 3ft-0"	4"x6" - 4ft-0"
6"x6" - 5ft-0"	6"x8" - 6ft-0"

RECTANGULAR TIMBER POST SELECTION



MINIMUM MOUNTING HEIGHTS (MH) FOR SIGNS

	SINGLE GUIDE SIGNS	DOUBLE GUIDE SIGNS	ROUTE MARKERS, REGULATORY and WARNING SIGNS
FREEWAYS and EXPRESSWAYS	7 Ft	8 Ft (M) 5 Ft (S)	7 Ft
COMMERCIAL, RESIDENTIAL CURB and GUTTER	7 Ft	7 Ft (M) 6 Ft (S)	7 Ft
RURAL ROADS and INTERCHANGE RAMP	7 Ft	7 Ft (M) 6 Ft (S)	7 Ft
BARRICADE and TRIPOD MOUNTING			1 Ft

(M) MAJOR SIGN (S) SECONDARY SIGN

See note *3

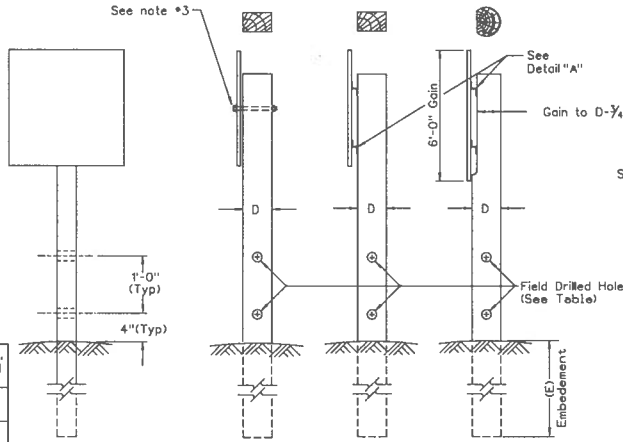
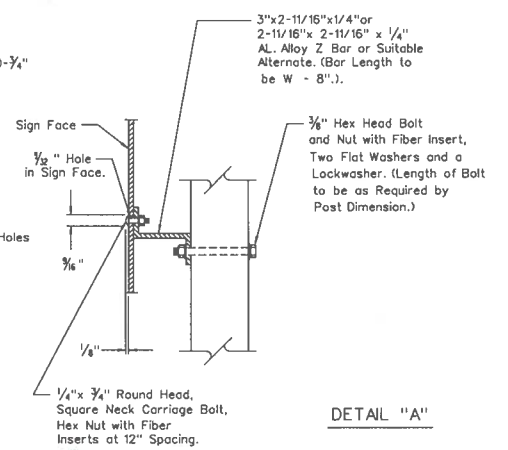
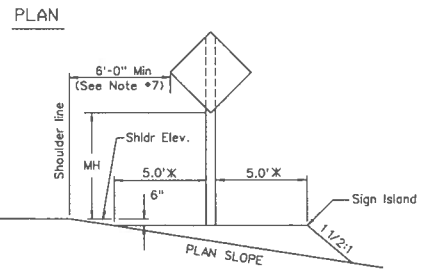
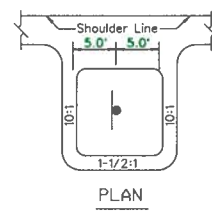


TABLE OF HOLE DIAMETERS		
Post Size (D)	≤ 4" x 4" or 4" Dia.	> 4" x 4" or 4" Dia.
Hole Dia.	No Hole	2"

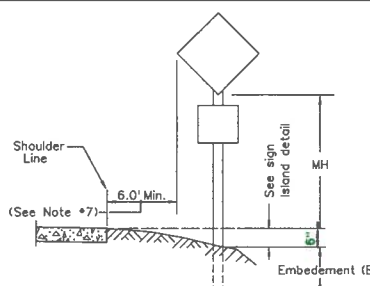


DETAIL "A"

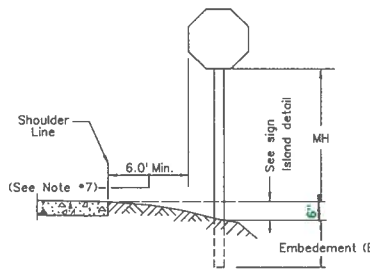


SIGN ISLAND

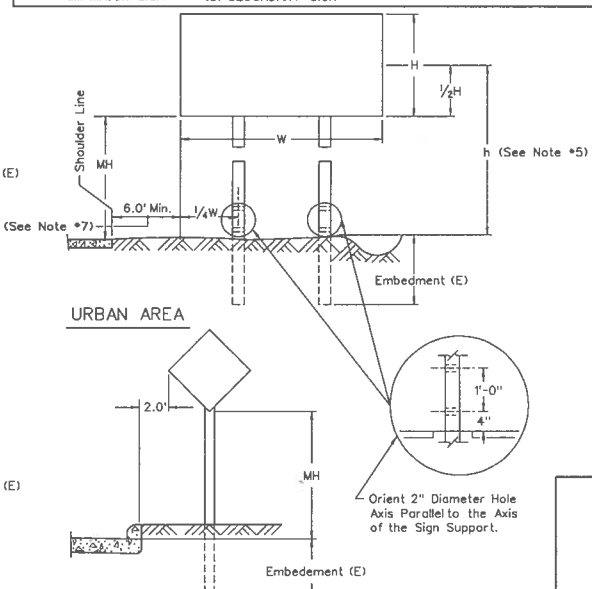
Post Length as Shown on Sign Summary Sheet. Post Length Calculations are Based on use of Sign Island. Sign Island Shall be used Except When Sign Post is Located in a Backslope or on Slopes 6:1 or Flatter. Sign Islands are to be used for all Temporary Signs, and Construction Signs G-20-1, G-20-2, and Informational Signs G-25, G-26, and G-27.
X 5 Ft Chord Distance From Post(s) To Island Slope(s)



RURAL AREA



URBAN AREA



TYPICAL SIGN ERECTION

GENERAL NOTES:

- All Bolts, Nuts, and Washers are to be Galvanized.
- All Posts with Cross Sectional Area Larger than 16 Square Inches are to be Drilled as Shown.
- "Z" Bars Will be used on all Signs Requiring Two Posts.
- Construction Signs Requiring Portability may be Mounted on Tripods.
- Sign Island for Two Post Signs Required Only When "h" exceeds 15'-0", island to be Compacted to 95%.
- For Bracing Details, See Sheet T-31.1.2.
- Signs Should not be Closer Than 6 Ft From the Edge of the Shoulder, or if None, 12 Ft from the Edge of the Traveled Way. In Urban Areas, a Lesser Clearance May be used Where Necessary.
- Sign Island Material Shall Be Included In The Cost Of The Sign.

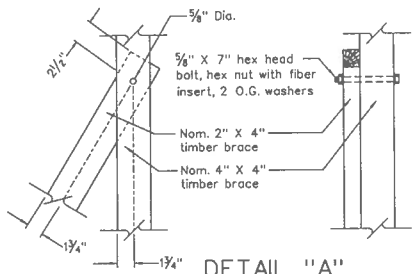
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

GROUND MOUNTED SIGN SUPPORTS (TIMBER POSTS)

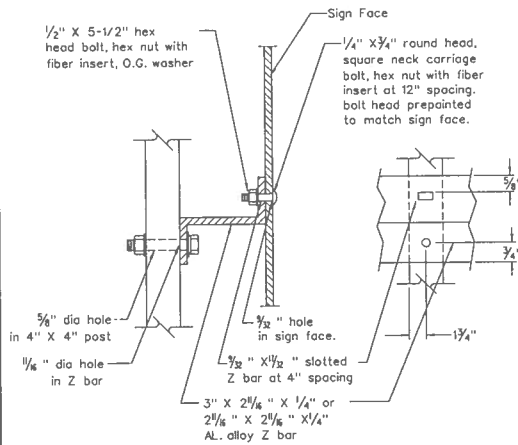
T-31.1.5-(627)

PDK
CHIEF TRAFFIC ENGINEER

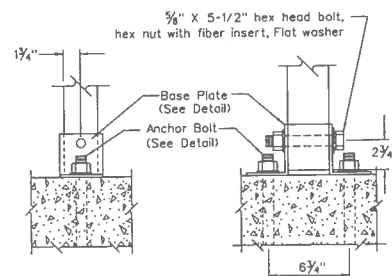
ADOPTED: 8/73 REVISION: 6/84



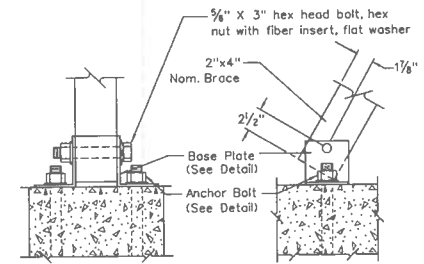
DETAIL "A"



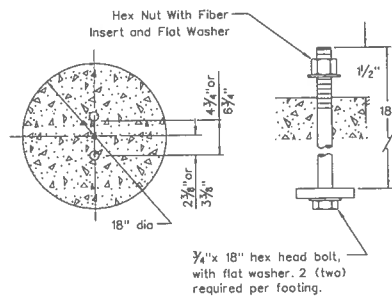
DETAIL "B"



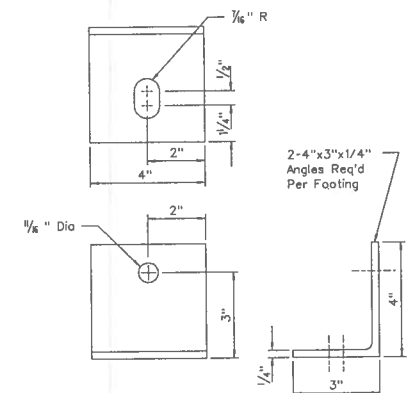
DETAIL "C"



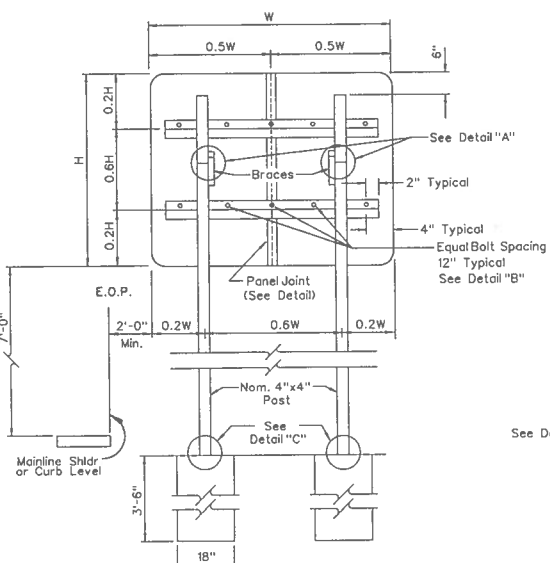
DETAIL "D"



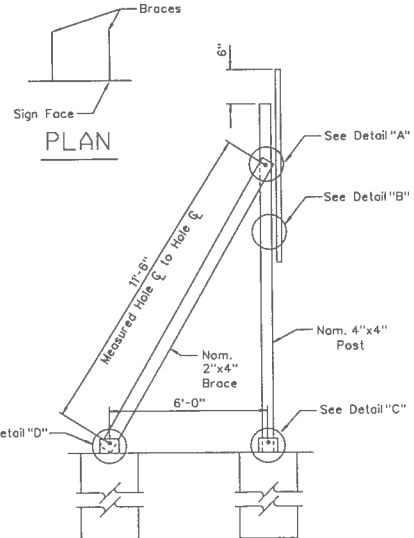
ANCHOR BOLTS DETAIL



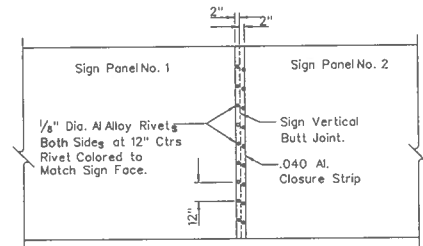
BASE PLATE DETAIL



ELEVATION



PLAN



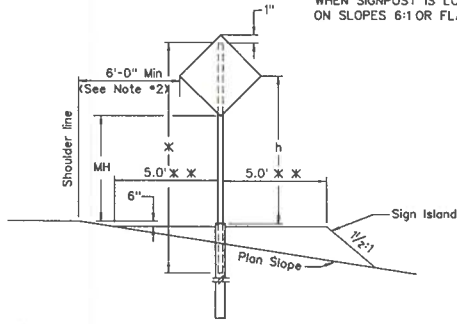
PANEL JOINT CLOSURE STRIP

GENERAL NOTES:

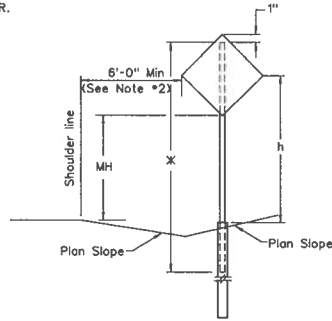
1. All drilled holes in timber to be 5/8" diameter unless otherwise noted.
2. Back brace hole in 4" X 4" post to be drilled and fitted in field. All other holes may be shop drilled in standard position.
3. Footings to be drilled - 18" diameter, 3'-6" deep, filled with class A, or class AA concrete.
4. For Bracing Details, See Sheet T31.1.2.

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION	
GROUND MOUNTED GORE SIGN (TIMBER SUPPORTS)	
T-31.1.6 (627)	
<i>P.D.K. Jones</i> CHIEF TRAFFIC ENGR.	ADOPTED: 10/68 REVISION: 2-10/84

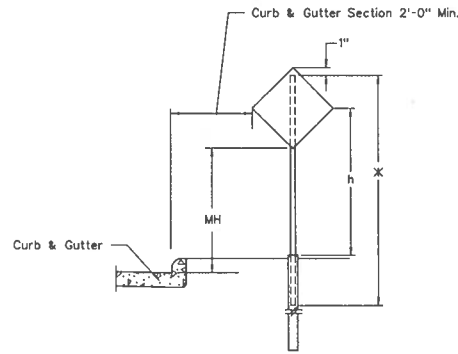
* POST LENGTH AS SHOWN ON SIGN SUMMARY SHEET.
 * POST LENGTH CALCULATIONS ARE BASED ON USE OF
 SIGN ISLAND. SIGN ISLAND SHALL BE USED EXCEPT
 WHEN SIGNPOST IS LOCATED IN A BACKSLOPE OR
 ON SLOPES 6:1 OR FLATTER.



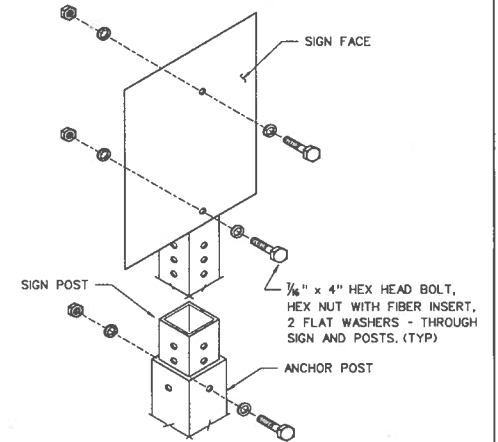
ELEVATION



SIGN ON BACKSLOPE

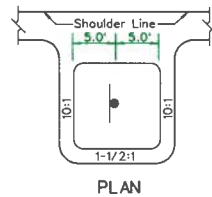


SIGN ON GORE



MINIMUM MOUNTING HEIGHTS (MH) FOR SIGNS	
	ALL SIGNS
FREEWAYS and EXPRESSWAYS	8 Ft (M) 5 Ft (S)
COMERCIAL, RESIDENTIAL CURB and GUTTER	7 Ft (M) 6 Ft (S)
RURAL ROADS and INTERCHANGE RAMPs	7 Ft (M) 6 Ft (S)
FREEWAY ENTRANCE, DO NOT ENTER- WRONG WAY ASSEMBLIES	2.0'

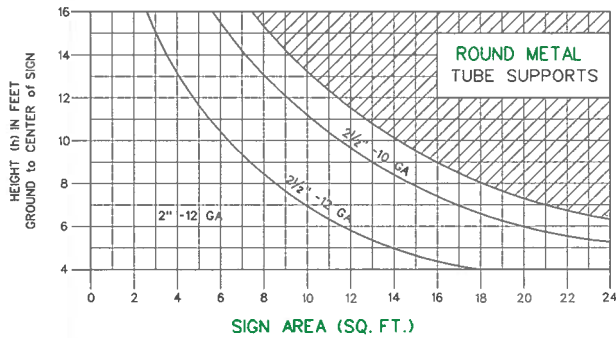
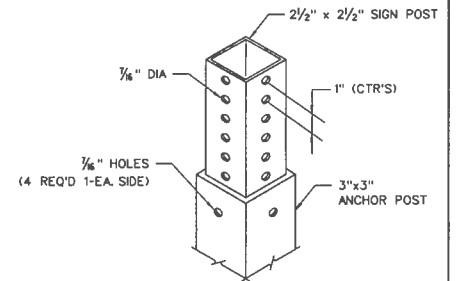
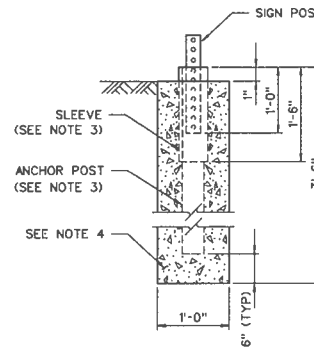
(M) Major Sign (S) Secondary Sign



PLAN

SIGN ON SIGN ISLAND

* * 5 Ft Chord Distance From Post(s)
To Island Slopes(s).



GENERAL NOTES:

- SIGN ISLAND TO BE COMPACTED TO 95%.
- SIGN SHOULD NOT BE CLOSER THAN 6 FT. FROM THE EDGE OF THE SHOULDER, OR IF NONE, 12 FT. FROM THE EDGE OF THE TRAVELWAY. IN AN URBAN AREA, A LESSER CLEARANCE MAY BE USED WHERE NECESSARY.
- ANCHOR POST AND SLEEVE ARE TO BE INCLUDED IN THE COST OF POST LENGTH AS SHOWN ON THE SIGN SUMMARY SHEET.
- THE ANCHOR AND SLEEVE (WHEN USED), SHALL BE DRILLED AS SHOWN, AND FILLED WITH CLASS A OR CLASS AA CONCRETE AT NO EXTRA COST TO THE STATE.
- FOR BRACING DETAILS, SEE SHEET T31.1.2.
- FOR RAILROAD SIGN (W10-1), SEE SHEET T-35.2 FOR DETAILS.
- SIGN ISLAND MATERIAL SHALL BE INCLUDED IN THE COST OF THE SIGN.

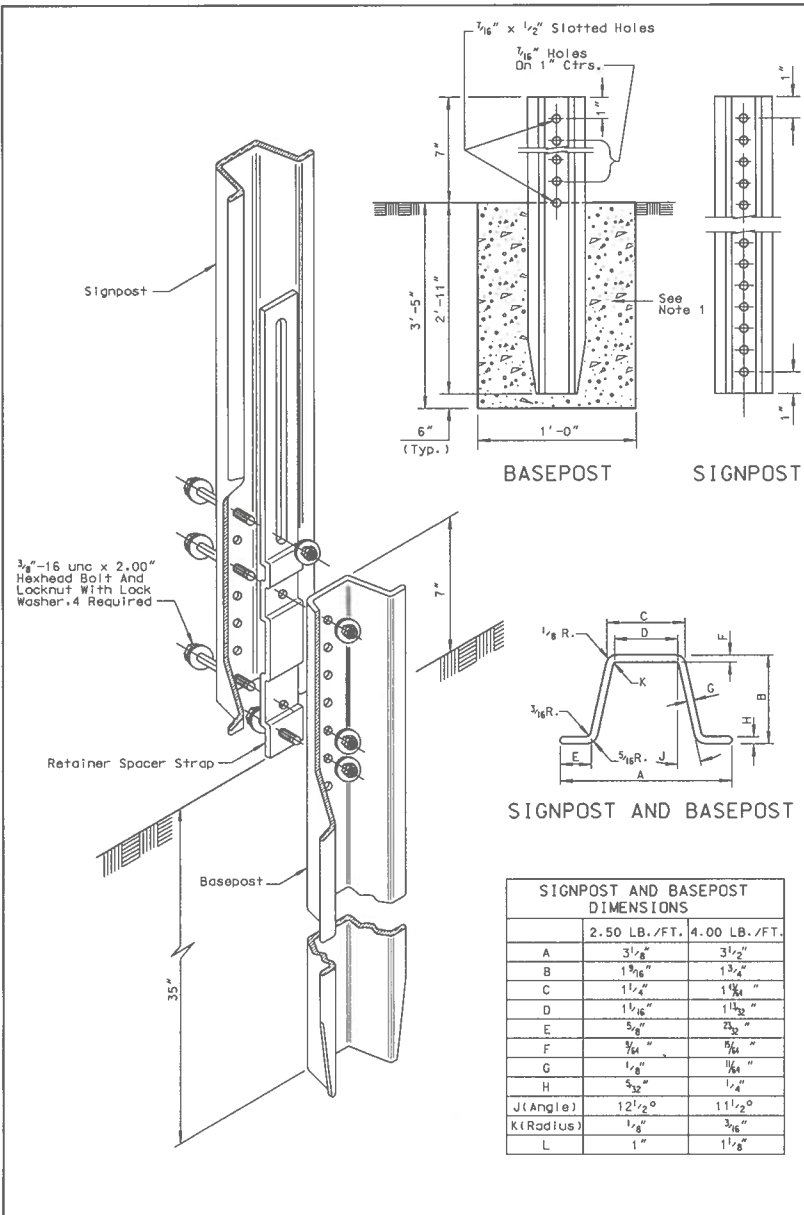
POST SIZE	ANCHOR POST SIZE	SLEEVE SIZE
2"	2 1/4"	2 1/2"
2 1/2"	3"	NOT REQ'D

STATE OF NEVADA
 DEPARTMENT OF TRANSPORTATION

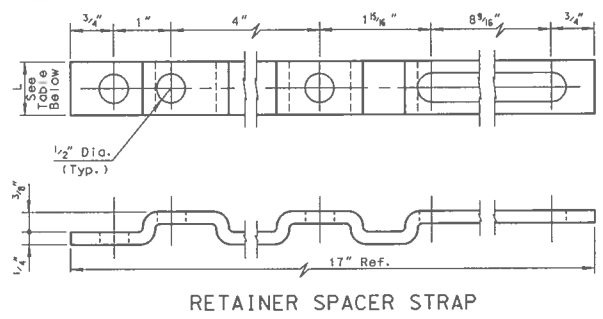
**GROUND MOUNTED
 SIGN SUPPORTS
 (SQUARE METAL POSTS)**

P.D. Kier
 CHIEF TRAFFIC ENGR

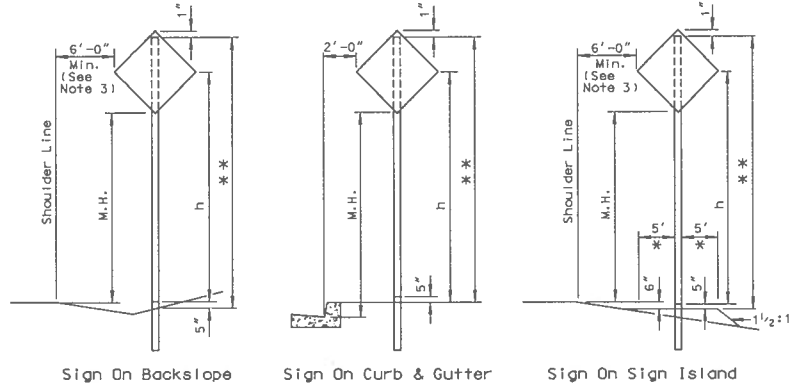
T-31.1.7 (627)
 ADOPTED: 1/76 REVISION 5-10/84



SIGNPOST AND BASEPOST DIMENSIONS		
	2.50 LB./FT.	4.00 LB./FT.
A	3 1/8"	3 1/2"
B	1 3/16"	1 3/4"
C	1 1/4"	1 5/8"
D	1 1/16"	1 1/32"
E	5/8"	3/32"
F	3/64"	5/64"
G	1/8"	1/64"
H	3/32"	1/4"
J (Angle)	12 1/2°	11 1/2°
K (Radius)	1/8"	3/16"
L	1"	1 1/8"

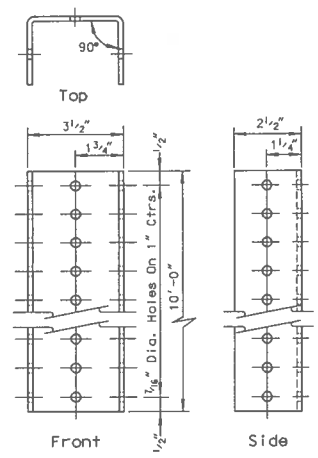
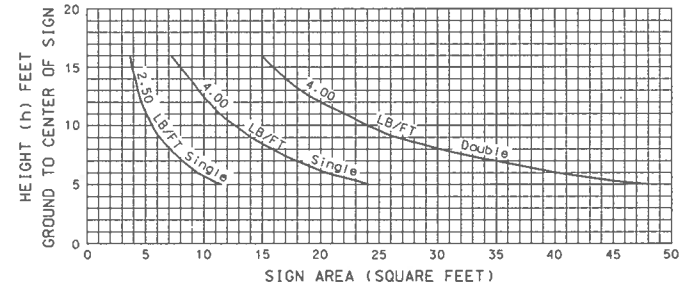


RETAINER SPACER STRAP

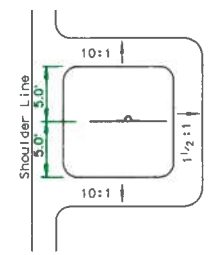


ELEVATIONS

* 5' Chord Distance From Post(s) To Island Slope(s).
 ** Post Length As Shown On Sign Summary Sheet.
 Post Length Calculations Are Based On Use Of Sign Island-Sign Island Shall Be Used Except When Sign Post Is Located In Backslope Or On Slope 6:1 Or Flatter.



FORMED CHANNEL SIGN MOUNT



PLAN

GENERAL NOTES:

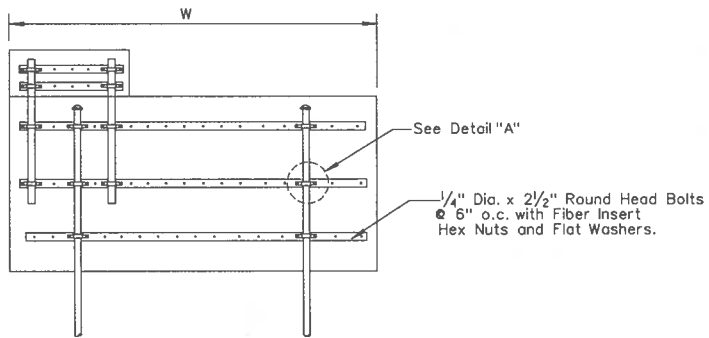
1. The Basepost Shall Be Drilled As Shown And Filled With Class A Or Class AA Concrete At No Extra Cost To The State.
2. For Bracing Details, See Sheet T-31.1.2.
3. Signs Shall Not Be Closer Than 6 Ft. From The Edge Of The Shoulder Or (If None, 12 Ft. From The Edge Of The Traveled Way, In Urban Areas A Lesser Clearance May Be Used Where Necessary).
4. Sign Island Material Shall Be Included In The Cost Of The Sign.

STATE OF NEVADA
 DEPARTMENT OF TRANSPORTATION

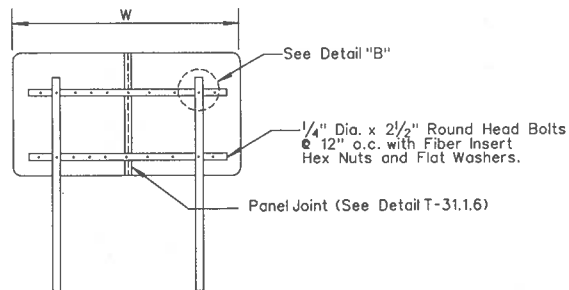
**GROUND MOUNTED
 SIGN SUPPORTS
 FLANGED CHANNEL
 STEEL POSTS**

PDR
 CHIEF TRAFFIC ENGINEER

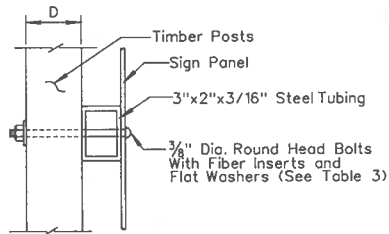
T-31.1.8 (627)
 ADOPTED: 3/79 REVISION: 1-10/94



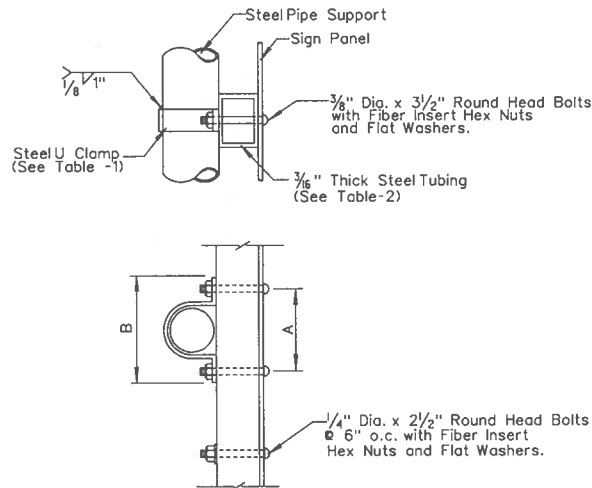
STEEL PIPE POST SUPPORTS



WOOD POST SUPPORTS



DETAIL "B"
WOOD POST MOUNTING



DETAIL "A"
ALTERNATE MOUNTING (STEEL POSTS)

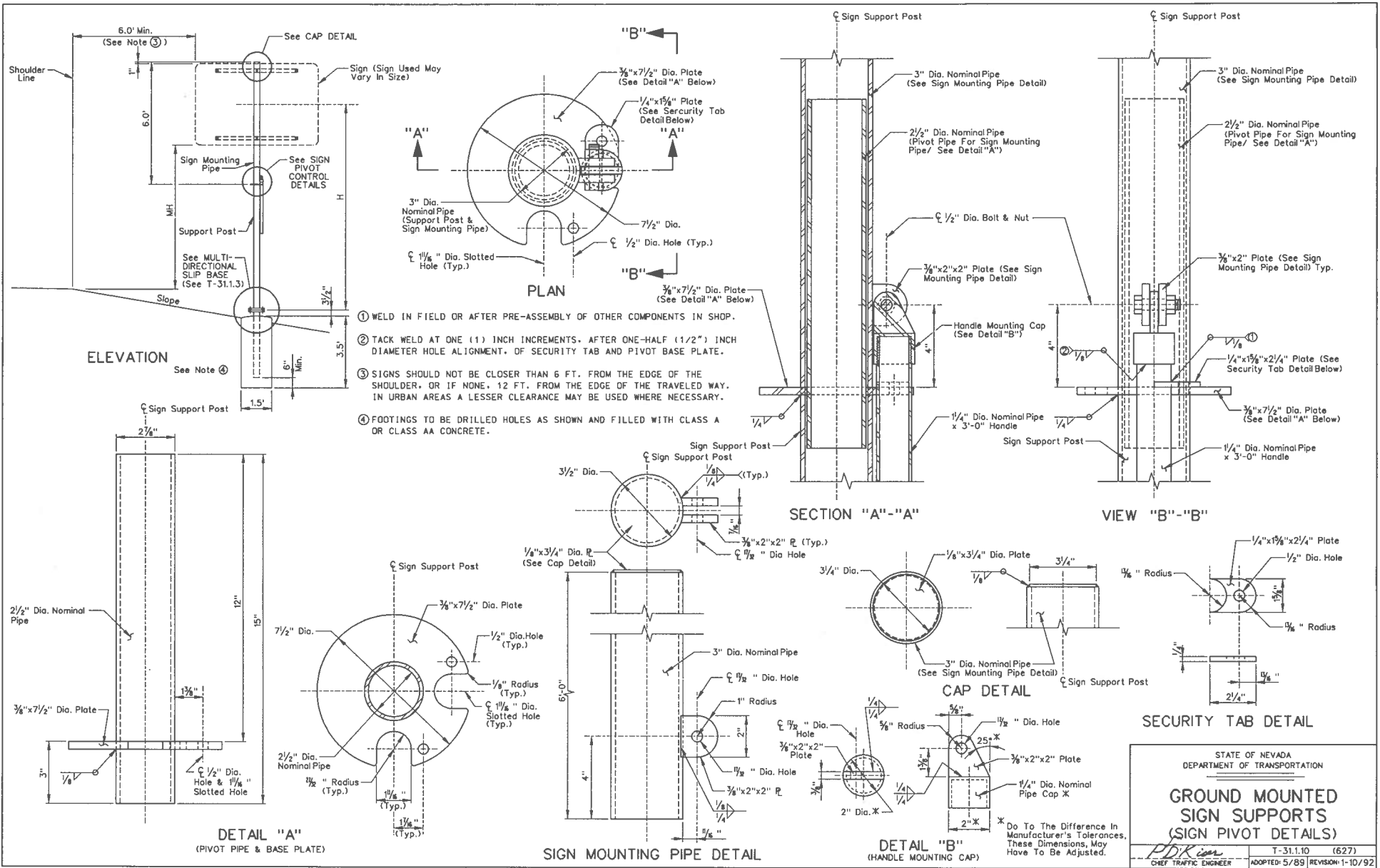
PIPE DIA.	O.D.	A	B	CLAMPSTOCK
2" Nom.	2 3/8"	4 1/16"	5 1/16"	1/4" x 1 1/2"
3" Nom.	3 1/2"	5 3/16"	6 3/16"	1/4" x 1 1/2"

SIGN WIDTH	TUBING SIZE
24' or Less	3"x2"x3/16"
24' to 28'	4"x2"x3/16"

POST SIZE	"D"	BOLT SIZE
4x4"	3 1/2"	3/8" Dia. x 6 1/4"
4x6"	5 1/2"	3/8" Dia. x 6 1/4"
6x6"	5 1/2"	7/8" Dia. x 8 1/4"
6x8"	7 1/2"	3/8" Dia. x 10 1/4"

- GENERAL NOTES
- FOR MOUNTING DETAILS NOT SHOWN, SEE SHEETS T-31.1.1 THROUGH T-31.1.4 FOR ROUND METAL SUPPORTS AND SHEETS T-31.1.5 AND T-31.1.6 FOR TIMBER SUPPORTS.

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION	
ALTERNATE MOUNTING DETAIL	
<i>PDK</i> CHIEF TRAFFIC ENGINEER	T-31.1.9 (627) ADOPTED: 8/82 REVISION 1-10/94



- ① WELD IN FIELD OR AFTER PRE-ASSEMBLY OF OTHER COMPONENTS IN SHOP.
- ② TACK WELD AT ONE (1) INCH INCREMENTS. AFTER ONE-HALF (1/2) INCH DIAMETER HOLE ALIGNMENT. OF SECURITY TAB AND PIVOT BASE PLATE.
- ③ SIGNS SHOULD NOT BE CLOSER THAN 6 FT. FROM THE EDGE OF THE SHOULDER, OR IF NONE, 12 FT. FROM THE EDGE OF THE TRAVELED WAY. IN URBAN AREAS A LESSER CLEARANCE MAY BE USED WHERE NECESSARY.
- ④ FOOTINGS TO BE DRILLED HOLES AS SHOWN AND FILLED WITH CLASS A OR CLASS AA CONCRETE.

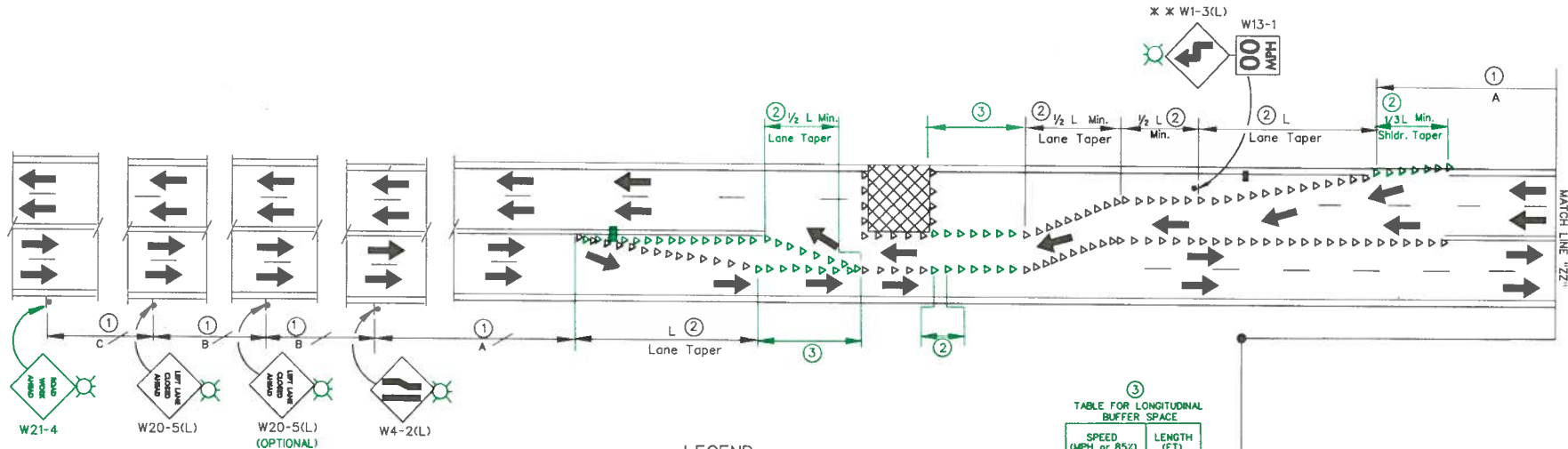
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

**GROUND MOUNTED
SIGN SUPPORTS
(SIGN PIVOT DETAILS)**

PDK
CHIEF TRAFFIC ENGINEER

T-31.1.10 (627)
ADOPTED 5/89 REVISION 1-10/92

Do To The Difference In
Manufacturer's Tolerances,
These Dimensions, May
Have To Be Adjusted.



GENERAL NOTES

1. ALL WARNING SIGNS (W SERIES) SHALL BE BLACK ON REFLECTIVE ORANGE.
2. ADVISORY SPEEDS FOR CURVES OR TURNS SHALL BE DETERMINED BY THE USE OF A BALL BANK INDICATOR OR OTHER APPROVED METHOD. DETERMINATION FOR USE OF EITHER CURVE OR TURN SIGNS SHALL BE IN ACCORDANCE WITH THE M.U.T.C.D.
3. CHANNELIZING DEVICES OR TYPE III B BARRICADES SHALL BE PLACED IN ACCORDANCE WITH THE SPACING AS SHOWN IN THE TABLE OF TAPER LENGTHS AND CHANNELIZING DEVICE SPACING. THESE DEVICES SHOULD BE PLACED NO CLOSER THAN 2'-0" NOR MORE THAN 6'-0" OUTSIDE THE SOLID WHITE OR DOUBLE YELLOW LINES. TYPE OF DELINEATION DEVICE USED SHALL BE AS DIRECTED BY THE ENGINEER.
4. END ROAD WORK SIGNS (W20-2A) WHEN NECESSARY SHALL BE INSTALLED AT EACH END OF THE PROJECT IN ACCORDANCE WITH THE TABLE FOR SPACING OF ADVANCED WARNING SIGNS.
5. THE W1-3 SIGNS SHALL BE USED WHEN THE RECOMMENDED SPEED ON A CURVE IS 30 MPH OR LESS. THE W1-4 SIGNS SHALL BE USED WHEN THE RECOMMENDED SPEED IS GREATER THAN 30 MPH.

LEGEND

- WORK AREA
- TYPE III B BARRICADES
- CHANNELIZING DEVICES
- ARROW BOARD
- TYPE B WARNING LIGHT
- X X - SEE NOTE #5

TABLE FOR SPACING OF ADVANCE WARNING LIGHTS

SPEED 85TH PERCENTILE MPH	DISTANCE BETWEEN SIGNS (FT)		
	A	B	C
	0-20	200	200
20-30	300	300	300
30-40	400	400	400
40-50	600	600	600
50-65	1000	1600	2600

BALL BANK INDICATOR TABLE	
BELOW 20 M.P.H.	14 DEGREES
25 TO 30 M.P.H.	12 DEGREES
35 TO 65 M.P.H.	10 DEGREES

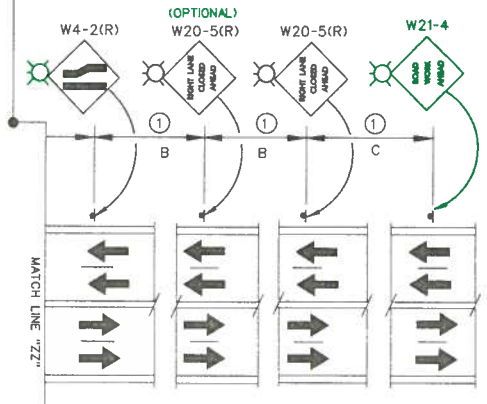
ADVISORY SPEED PLATES SHALL NOT BE POSTED FOR CURVES OVER 50 M.P.H.

TABLE FOR LONGITUDINAL BUFFER SPACE

SPEED (MPH or 85%)	LENGTH (FT)
20	35
25	55
30	85
35	120
40	170
45	220
50	280
55	335
60	415
65	485

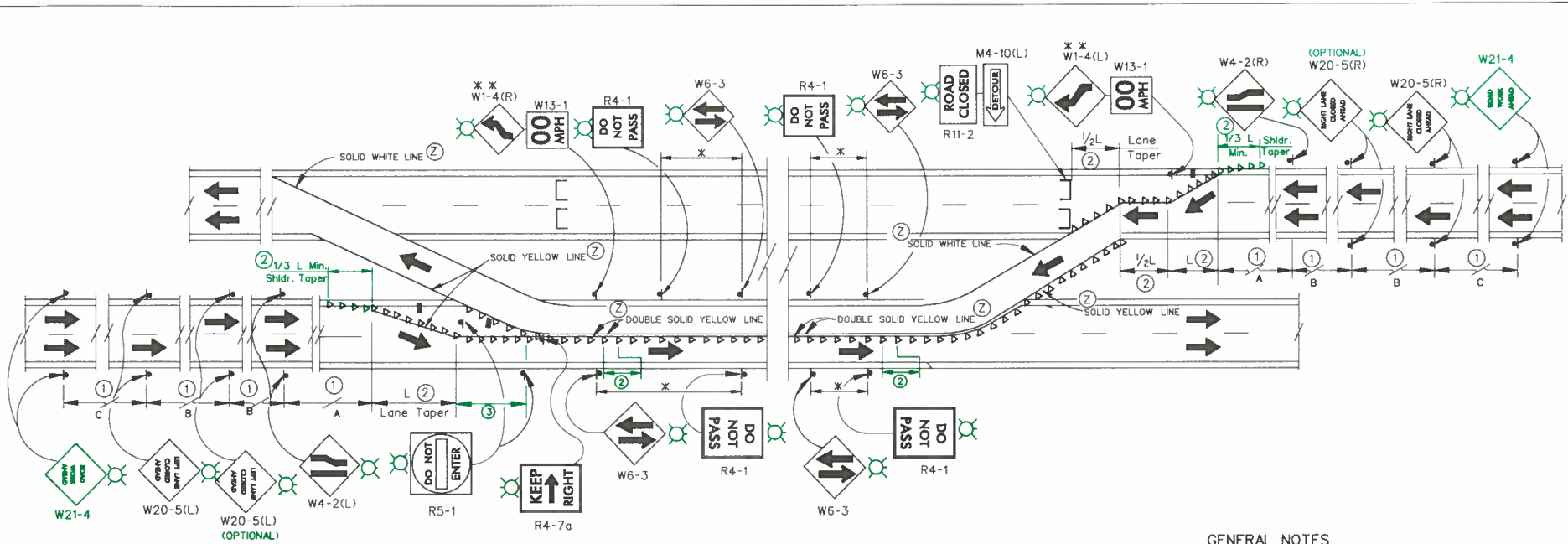
TABLE OF TAPER LENGTHS AND CHANNELIZING DEVICE SPACING

SPEED MILES PER HOUR 85TH PERCENTILE	MINIMUM TAPER LENGTH FOR LANE WIDTH (L)			DEVICE SPACING IN FEET
	10 FT.	11 FT.	12 FT.	
20	70	75	80	20
25	105	115	125	25
30	150	165	180	30
35	205	225	245	35
40	265	295	320	40
45	450	495	540	45
50	500	550	600	50
55	550	605	660	55
60	600	660	720	60
65	650	715	780	65
70	700	770	840	70



STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
**TYPICAL
HALF ROAD CLOSURE
(MULTILANE UNDIVIDED)**

PDK inc. T-35.1.1 (625)
CHEF TRAFFIC ENGR. ADOPTED: 5/79 REVISION 350794



LEGEND

- WORK AREA
- TYPE III B BARRICADES
- CHANNELIZING DEVICES
- ARROW BOARD
- TEMPORARY STRIPING
- * - SEE NOTE #4
- * * - SEE NOTE #6
- TYPE B WARNING LIGHT

TABLE FOR LONGITUDINAL BUFFER SPACE

SPEED (MPH or 85%)	LENGTH (FT)
20	35
25	55
30	85
35	120
40	170
45	220
50	280
55	335
60	415
65	485

TABLE FOR SPACING OF ADVANCE WARNING SIGNS

SPEED MILES PER HOUR 85TH PERCENTILE	DISTANCE BETWEEN SIGNS (FT)		
	A	B	C
0-20	200	200	200
20-30	300	300	300
30-40	400	400	400
40-50	600	600	600
50-65	1000	1600	2600

TABLE OF TAPER LENGTHS AND CHANNELIZING DEVICE SPACING

SPEED MILES PER HOUR 85TH PERCENTILE	MINIMUM TAPER LENGTH FOR LANE WIDTH (L)			DEVICE SPACING IN FEET
	10 FT.	11 FT.	12 FT.	
20	70	75	80	20
25	105	115	125	25
30	150	165	180	30
35	205	225	245	35
40	265	295	320	40
45	450	495	540	45
50	500	550	600	50
55	550	605	660	55
60	600	660	720	60
65	650	715	780	65
70	700	770	840	70

GENERAL NOTES

1. ALL WARNING SIGNS (W SERIES) SHALL BE BLACK ON REFLECTIVE ORANGE.
2. ADVISORY SPEEDS FOR CURVES OR TURNS SHALL BE DETERMINED BY THE USE OF A BALL BANK INDICATOR OR OTHER APPROVED METHOD. DETERMINATION FOR USE OF EITHER CURVE OR TURN SIGNS SHALL BE IN ACCORDANCE WITH THE M. U. T. C. D.
3. CHANNELIZING DEVICES OR TYPE II B BARRICADES SHALL BE PLACED IN ACCORDANCE WITH THE SPACING AS SHOWN IN THE TABLE OF TAPER LENGTHS AND CHANNELIZING DEVICE SPACING. THESE DEVICES SHOULD BE PLACED NO CLOSER THAN 2'-0" NOR MORE THAN 6'-0" OUTSIDE THE SOLID WHITE OR DOUBLE YELLOW LINES. TYPE OF DELINEATION DEVICE USED SHALL BE AS DIRECTED BY THE ENGINEER.
4. THE W6-3 AND R4-1 SIGNS SHALL BE INSTALLED ALTERNATELY AT ONE-HALF MILE INTERVALS WHEN THE LENGTHS OF CROSSOVER EXCEEDS ONE-HALF MILE.
5. END ROAD WORK SIGNS (G20-2A) WHEN NECESSARY SHALL BE INSTALLED AT EACH END OF THE PROJECT IN ACCORDANCE WITH THE TABLE FOR SPACING OF ADVANCED WARNING SIGNS.
6. THE W1-3 SIGNS SHALL BE USED WHEN THE RECOMMENDED SPEED ON A CURVE IS 30 MPH OR LESS. THE W1-4 SIGNS SHALL BE USED WHEN THE RECOMMENDED SPEED IS GREATER THAN 30 MPH.

BALL BANK INDICATOR TABLE

BELOW 20 M.P.H.	14 DEGREES
25 TO 30 M.P.H.	12 DEGREES
35 TO 65 M.P.H.	10 DEGREES

ADVISORY SPEED PLATES SHALL NOT BE POSTED FOR CURVES OVER 50 M.P.H.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
**TYPICAL
MEDIAN CROSSOVER
(MULTI-LANE DIVIDED)**

P.D. Kiser
CHIEF TRAFFIC ENGR.

T-35.1.1.1 (625)
ADOPTED: 5/79
REVISION
3-10/84

LEGEND

- WORK AREA
- CHANNELIZING DEVICES
- ARROW BOARD
- FLAGGER LOCATIONS TO BE DETERMINED BY THE FIELD ENGR.
- TYPE B WARNING LIGHT

GENERAL NOTES

1. ALL WARNING SIGNS (W SERIES) SHALL BE BLACK ON REFLECTIVE ORANGE.
2. TRAFFIC CONES, GUIDE POSTS, VERTICAL PANELS OR TYPE III B BARRICADES SHALL BE PLACED IN ACCORDANCE WITH THE SPACING AS SHOWN ON TABLE OR TAPER LENGTHS AND CHANNELIZING DEVICE SPACING. TYPE OF DELINEATION DEVICE USED SHALL BE AS DIRECTED BY THE ENGINEER.
3. END CONSTRUCTION SIGNS (G20-2) WHEN NECESSARY SHALL BE INSTALLED AT EACH END OF THE PROJECT IN ACCORDANCE WITH THE TABLE FOR SPACING OF ADVANCED WARNING SIGNS.
4. SEE SHT. T-35-1.6.2 FOR "WAIT FOR PILOT CAR" SIGN DETAILS.

③

TABLE FOR LONGITUDINAL BUFFER SPACE

SPEED (MPH of 85%)	LENGTH (FT)
20	35
25	55
30	85
35	120
40	170
45	220
50	280
55	335
60	415
65	485

②

TABLE OF TAPER LENGTHS AND CHANNELIZING DEVICE SPACING

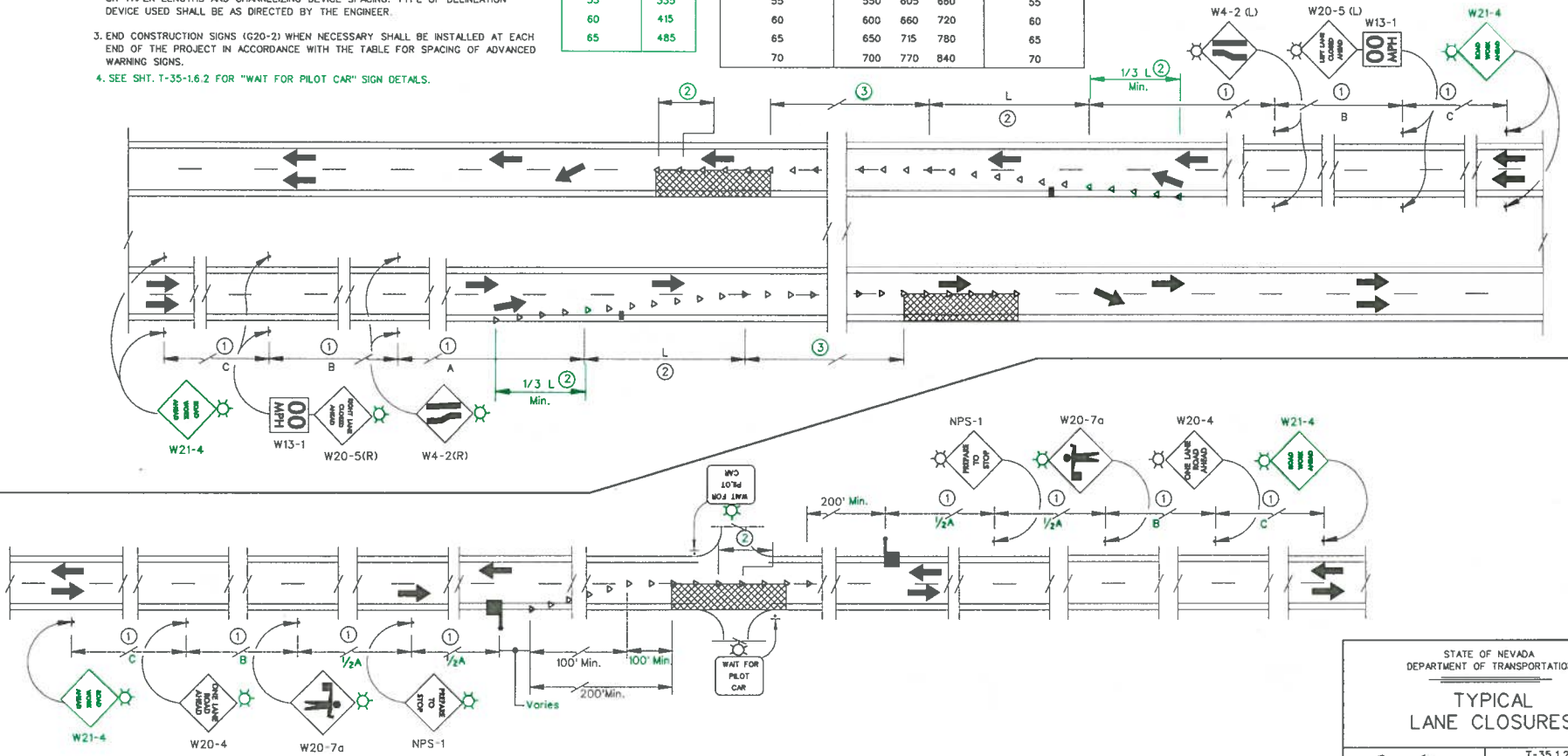
SPEED MILES PER HOUR 85TH PERCENTILE	MINIMUM TAPER LENGTH FOR LANE WIDTH (L)			DEVICE SPACING IN FEET
	10 FT.	11 FT.	12 FT.	
20	70	75	80	20
25	105	115	125	25
30	150	165	180	30
35	205	225	245	35
40	285	295	320	40
45	450	495	540	45
50	500	550	600	50
55	550	605	660	55
60	600	660	720	60
65	650	715	780	65
70	700	770	840	70

①

TABLE FOR SPACING OF ADVANCE WARNING SIGNS

SPEED MILES PER HOUR 85TH PERCENTILE	DISTANCE BETWEEN SIGNS (FT.)		
	A	B	C
0-20	200	200	200
20-30	300	300	300
30-40	400	400	400
40-50	600	600	600
50-65	1000	1600	2600

T-32



STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION








**TYPICAL
LANE CLOSURES**

T-35.1.2 (625)

P.D. K...
CHIEF TRAFFIC ENGR.

ADOPTED: 6/72 REVISION: 7-10/96

LEGEND

-  - WORK ZONE
-  - PORTABLE PRECAST CONC. BARRIER RAIL
-  - CHANNELIZING DEVICES
-  - FLAGGER LOCATIONS (TO BE DETERMINED BY THE FIELD ENGINEER)
-  - TYPE B WARNING LIGHTS
-  - TEMPORARY IMPACT ATTENUATORS
-  - ARROW BOARD

① TABLE FOR SPACING OF ADVANCE WARNING SIGNS

SPEED MILES PER HOUR 85TH PERCENTILE	DISTANCE BETWEEN SIGNS (FT.)		
	A	B	C
0-20	200	200	200
20-30	300	300	300
30-40	400	400	400
40-50	600	600	600
50-65	1000	1600	2600

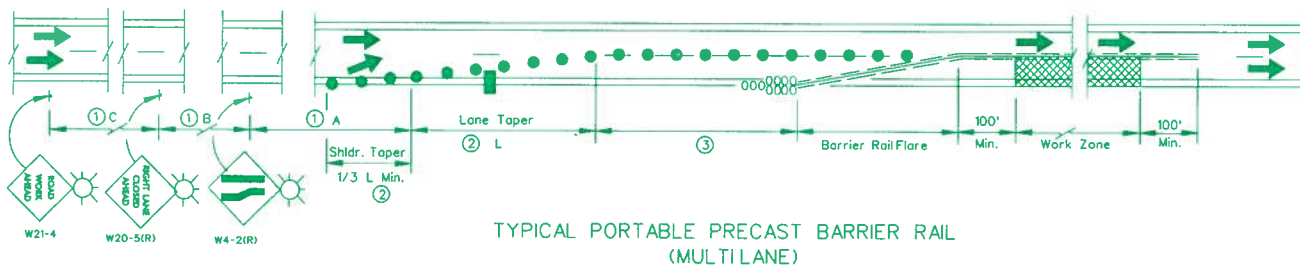
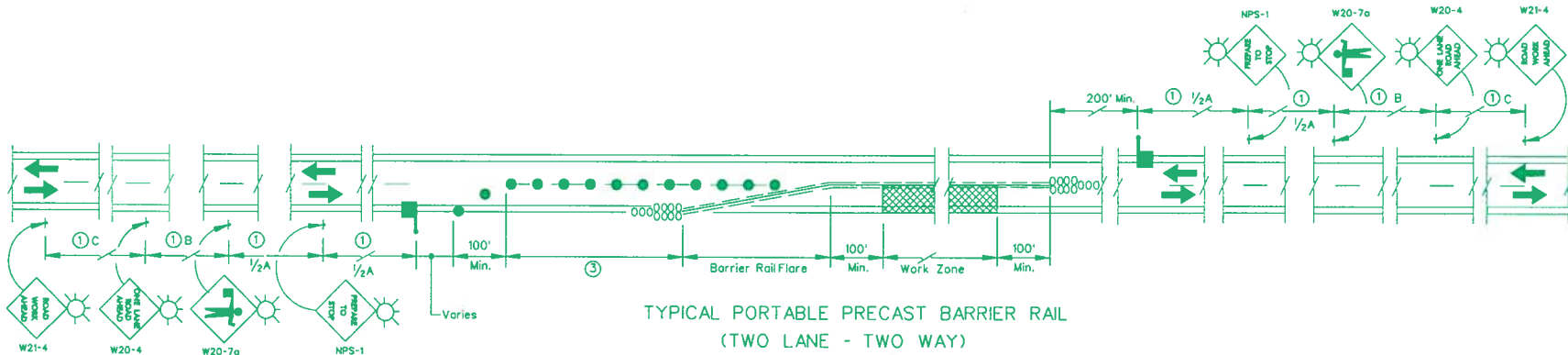
② TABLE OF TAPER LENGTHS AND CHANNELIZING DEVICE SPACING

SPEED MILES PER HOUR 85TH PERCENTILE	MINIMUM TAPER LENGTH FOR LANE WIDTH (L)			DEVICE SPACING IN FEET
	10 FT.	11 FT.	12 FT.	
20	70	75	80	20
25	105	115	125	25
30	150	165	180	30
35	205	225	245	35
40	265	295	320	40
45	450	495	540	45
50	500	550	600	50
55	550	605	660	55
60	600	660	720	60
65	650	715	780	65
70	700	770	840	70

③ TABLE FOR LONGITUDINAL BUFFER SPACE

SPEED (MPH or 85%)	LENGTH (FT.)
20	35
25	55
30	85
35	120
40	170
45	220
50	280
55	335
60	415
65	485

T-33



STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

**TYPICAL
LANE CLOSURES**

T-35.1.2.1

PDK
CHIEF TRAFFIC ENGR. ADOPTED: REVISION:

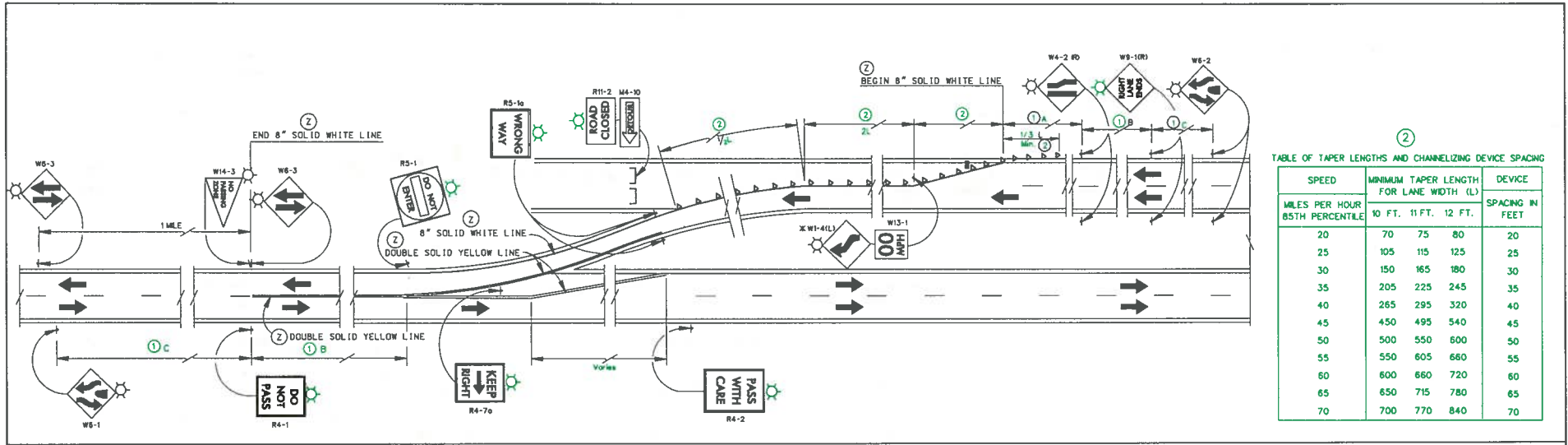


TABLE OF TAPER LENGTHS AND CHANNELIZING DEVICE SPACING

SPEED MILES PER HOUR 85TH PERCENTILE	MINIMUM TAPER LENGTH FOR LANE WIDTH (L)			DEVICE SPACING IN FEET
	10 FT.	11 FT.	12 FT.	
20	70	75	80	20
25	105	115	125	25
30	150	165	180	30
35	205	225	245	35
40	265	295	320	40
45	450	495	540	45
50	500	550	600	50
55	550	605	660	55
60	600	660	720	60
65	650	715	780	65
70	700	770	840	70

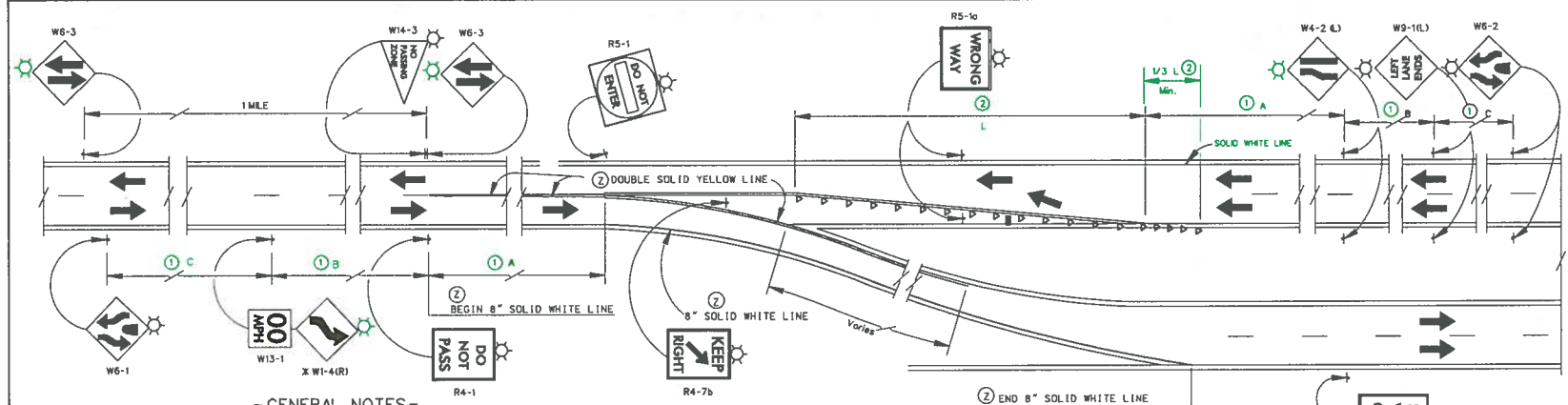


TABLE FOR LONGITUDINAL BUFFER SPACE

SPEED (MPH or 85%)	LENGTH (FT)
20	35
25	55
30	85
35	120
40	170
45	220
50	280
55	335
60	415
65	485

BALL BANK INDICATOR TABLE

BELOW 20 M.P.H.	14 DEGREES
25 TO 30 M.P.H.	12 DEGREES
35 TO 65 M.P.H.	10 DEGREES

ADVISORY SPEED PLATES SHALL NOT BE POSTED FOR CURVES OVER 50 M.P.H.

T-34

-GENERAL NOTES-

- ALL WARNING SIGNS (W SERIES) SHALL BE BLACK ON REFLECTIVE YELLOW FOR SEMI-PERMANENT INSTALLATIONS SUCH AS LONG TERM NON-CONSTRUCTION OR MAINTENANCE ZONE USE. BLACK ON REFLECTIVE ORANGE SHALL BE USED ON TEMPORARY INSTALLATIONS SUCH AS IN A CONSTRUCTION OR MAINTENANCE ZONE.
- TRAFFIC CONES, GUIDE POSTS, VERTICAL PANELS OR TYPE III B BARRICADES SHALL BE PLACED IN ACCORDANCE WITH THE SPACING AS SHOWN IN THE TABLE OF TAPER LENGTHS AND CHANNELIZING DEVICE SPACING. THESE DEVICES SHOULD BE PLACED NO CLOSER THAN 2'-0" NOR MORE THAN 6'-0" OUTSIDE THE SOLID WHITE OR DOUBLE YELLOW LINES. TYPE OF DELINEATION DEVICE USED SHALL BE AS DIRECTED BY THE ENGINEER.
- ADVISORY SPEEDS FOR CURVES OR TURNS SHALL BE DETERMINED BY THE USE OF A BALL BANK INDICATOR OR OTHER APPROVED METHOD. DETERMINATION FOR USE OF EITHER CURVE OR TURN SIGNS SHALL BE IN ACCORDANCE WITH THE M.U.T.C.D.
- EXISTING PAVEMENT MARKINGS MAY REQUIRE REMOVAL IN THE CROSSOVER AREA AND NEW MARKINGS INSTALLED. SEE SPECIAL PROVISIONS FOR TYPE OF REMOVAL AND NEW MARKINGS.
- THE W1-3 SIGNS SHALL BE USED WHEN THE RECOMMENDED SPEED ON A CURVE IS 30 MPH OR LESS. THE W1-4 SIGNS SHALL BE USED WHEN THE RECOMMENDED SPEED IS GREATER THAN 30 MPH.

LEGEND

- ▬ - TYPE III B BARRICADES
- ▴ - CHANNELIZING DEVICES
- ▬ - ARROW BOARD
- * - SEE NOTE #5
- ⊙ - TYPE B WARNING LIGHT
- Ⓢ - TEMPORARY STRIPING

TABLE FOR SPACING OF ADVANCE WARNING SIGNS

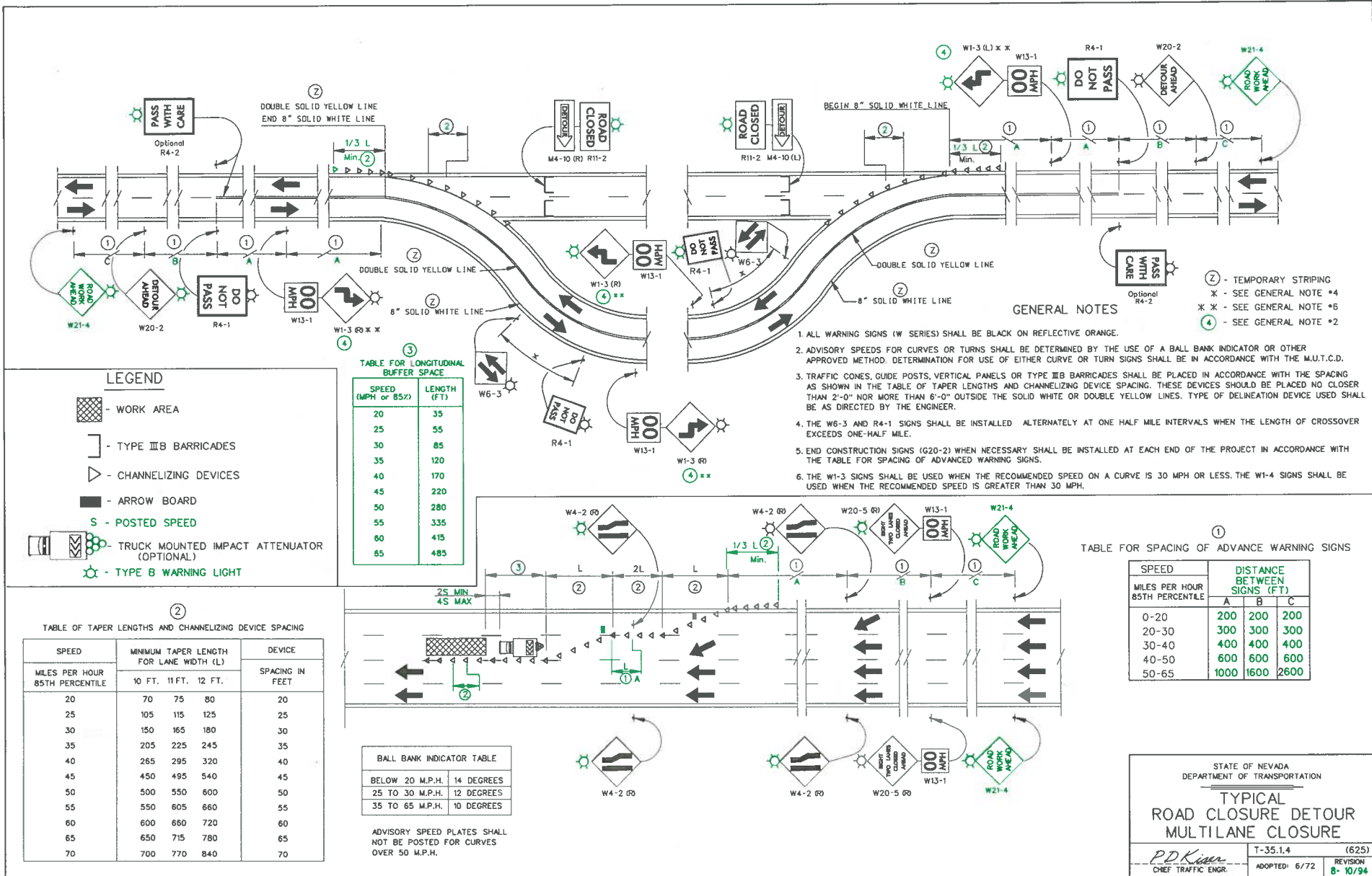
SPEED MILES PER HOUR 85TH PERCENTILE	DISTANCE BETWEEN SIGNS (FT)		
	A	B	C
0-20	200	200	200
20-30	300	300	300
30-40	400	400	400
40-50	600	600	600
50-65	1000	1600	2600

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

**TYPICAL 2 LANE
TO 4 LANE CONNECTION
SIGNING (RURAL)**

T-35-1.3 (625)
ADOPTED: 6/72 REVISION: 8-10/94

P.D. K...
CHIEF TRAFFIC ENGR.



GENERAL NOTES

- ALL WARNING SIGNS (W SERIES) SHALL BE BLACK ON REFLECTIVE ORANGE.
- ADVISORY SPEEDS FOR CURVES OR TURNS SHALL BE DETERMINED BY THE USE OF A BALL BANK INDICATOR OR OTHER APPROVED METHOD. DETERMINATION FOR USE OF EITHER CURVE OR TURN SIGNS SHALL BE IN ACCORDANCE WITH THE M.U.T.C.D.
- TRAFFIC CONES, GUIDE POSTS, VERTICAL PANELS OR TYPE III B BARRICADES SHALL BE PLACED IN ACCORDANCE WITH THE SPACING AS SHOWN IN THE TABLE OF TAPER LENGTHS AND CHANNELIZING DEVICE SPACING. THESE DEVICES SHOULD BE PLACED NO CLOSER THAN 2'-0" NOR MORE THAN 6'-0" OUTSIDE THE SOLID WHITE OR DOUBLE YELLOW LINES. TYPE OF DELINEATION DEVICE USED SHALL BE AS DIRECTED BY THE ENGINEER.
- THE W6-3 AND R4-1 SIGNS SHALL BE INSTALLED ALTERNATELY AT ONE HALF MILE INTERVALS WHEN THE LENGTH OF CROSSOVER EXCEEDS ONE-HALF MILE.
- END CONSTRUCTION SIGNS (G20-2) WHEN NECESSARY SHALL BE INSTALLED AT EACH END OF THE PROJECT IN ACCORDANCE WITH THE TABLE FOR SPACING OF ADVANCED WARNING SIGNS.
- THE W1-3 SIGNS SHALL BE USED WHEN THE RECOMMENDED SPEED ON A CURVE IS 30 MPH OR LESS. THE W1-4 SIGNS SHALL BE USED WHEN THE RECOMMENDED SPEED IS GREATER THAN 30 MPH.

LEGEND

- WORK AREA
- TYPE III B BARRICADES
- CHANNELIZING DEVICES
- ARROW BOARD
- POSTED SPEED
- TRUCK MOUNTED IMPACT ATTENUATOR (OPTIONAL)
- TYPE B WARNING LIGHT

TABLE FOR LONGITUDINAL BUFFER SPACE

SPEED (MPH or 85%)	LENGTH (FT)
20	35
25	55
30	85
35	120
40	170
45	220
50	280
55	335
60	415
65	485

TABLE OF TAPER LENGTHS AND CHANNELIZING DEVICE SPACING

SPEED MILES PER HOUR 85TH PERCENTILE	MINIMUM TAPER LENGTH FOR LANE WIDTH (L)			DEVICE SPACING IN FEET
	10 FT.	11 FT.	12 FT.	
20	70	75	80	20
25	105	115	125	25
30	150	165	180	30
35	205	225	245	35
40	265	295	320	40
45	450	495	540	45
50	500	550	600	50
55	550	605	660	55
60	600	660	720	60
65	650	715	780	65
70	700	770	840	70

BALL BANK INDICATOR TABLE

BELOW 20 M.P.H.	14 DEGREES
25 TO 30 M.P.H.	12 DEGREES
35 TO 65 M.P.H.	10 DEGREES

ADVISORY SPEED PLATES SHALL NOT BE POSTED FOR CURVES OVER 50 M.P.H.

TABLE FOR SPACING OF ADVANCE WARNING SIGNS

SPEED MILES PER HOUR 85TH PERCENTILE	DISTANCE BETWEEN SIGNS (FT)		
	A	B	C
0-20	200	200	200
20-30	300	300	300
30-40	400	400	400
40-50	600	600	600
50-65	1000	1600	2600

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

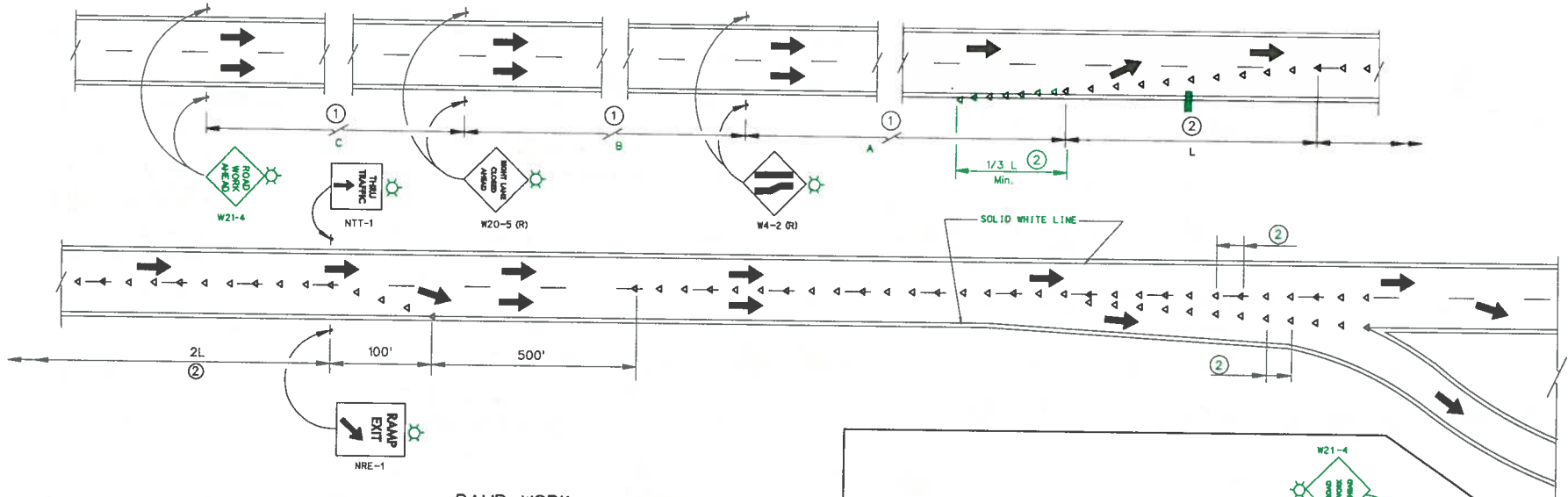
**TYPICAL
ROAD CLOSURE DETOUR
MULTI-LANE CLOSURE**

PDK
CHIEF TRAFFIC ENGR.

T-35.1.4 (625)
ADOPTED: 6/72 REVISION
8-10/94

LEGEND

- ▷ - CHANNELIZING DEVICES
- ⊙ - TYPE B WARNING LIGHT
- - ARROW BOARD



RAMP WORK

②

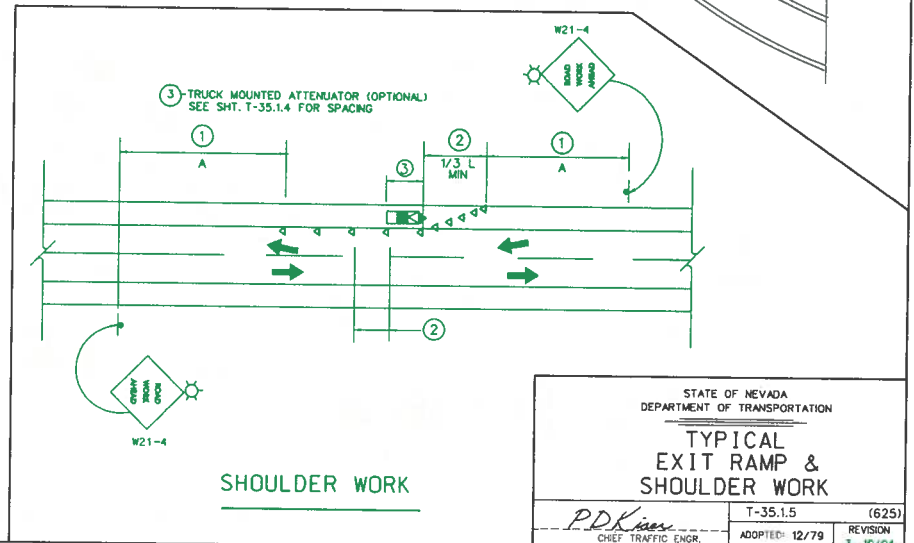
TABLE OF TAPER LENGTHS AND CHANNELIZING DEVICE SPACING

SPEED MILES PER HOUR 85TH PERCENTILE	MINIMUM TAPER LENGTH FOR LANE WIDTH (L)			DEVICE SPACING IN FEET
	10 FT.	11 FT.	12 FT.	
20	70	75	80	20
25	105	115	125	25
30	150	165	180	30
35	205	225	245	35
40	265	295	320	40
45	450	495	540	45
50	500	550	600	50
55	550	605	660	55
60	600	660	720	60
65	650	715	780	65
70	700	770	840	70

①

TABLE FOR SPACING OF ADVANCE WARNING SIGNS

SPEED MILES PER HOUR 85TH PERCENTILE	DISTANCE BETWEEN SIGNS (FT)		
	A	B	C
0-20	200	200	200
20-30	300	300	300
30-40	400	400	400
40-50	600	600	600
50-65	1000	1600	2600



SHOULDER WORK

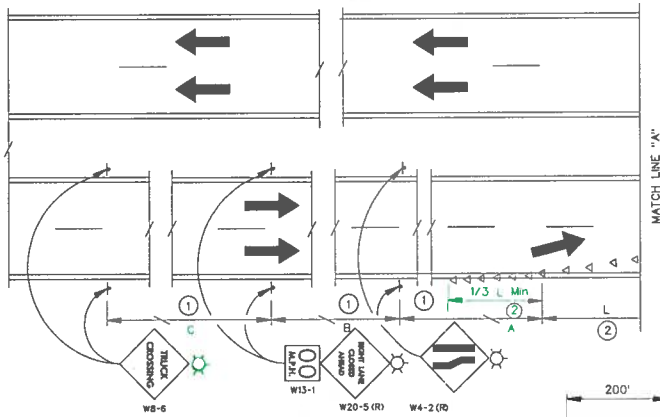
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

**TYPICAL
EXIT RAMP &
SHOULDER WORK**

P.D.K. *Chief Traffic Engr.*
CHIEF TRAFFIC ENGR.

T-35.1.5 (625)

ADOPTED: 12/79 REVISION 3-10/94

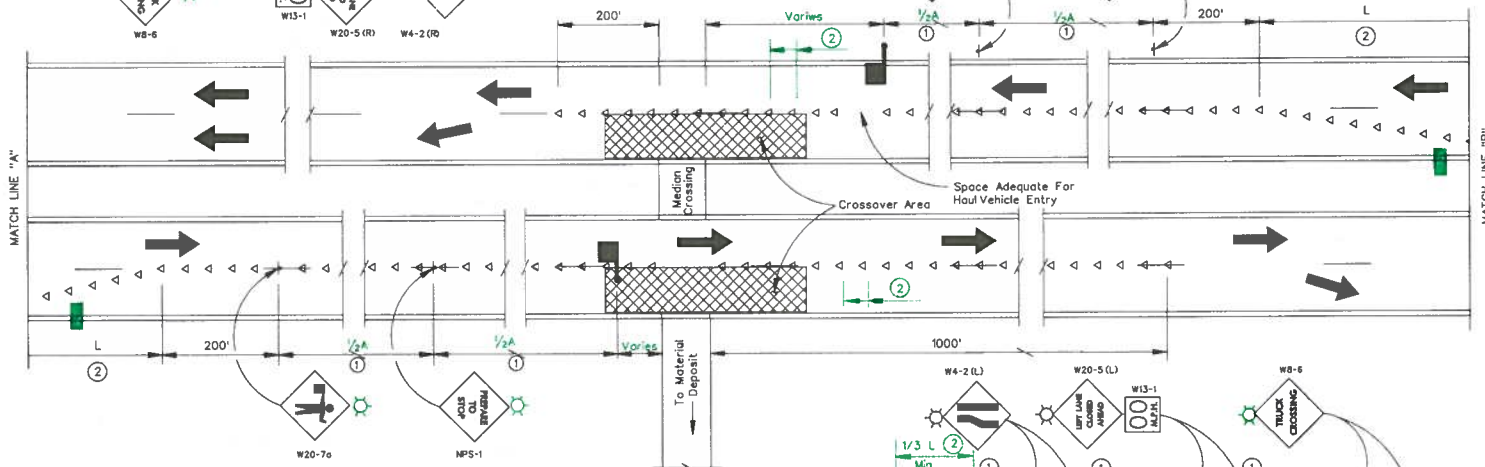


① TABLE FOR SPACING OF ADVANCE WARNING SIGNS

SPEED MILES PER HOUR 85TH PERCENTILE	DISTANCE BETWEEN SIGNS (FT)		
	A	B	C
0-20	200	200	200
20-30	300	300	300
30-40	400	400	400
40-50	600	600	600
50-65	1000	1600	2600

② TABLE OF TAPER LENGTHS AND CHANNELIZING DEVICE SPACING

SPEED MILES PER HOUR 85TH PERCENTILE	MINIMUM TAPER LENGTH FOR LANE WIDTH (L)			DEVICE SPACING IN FEET
	10 FT.	11 FT.	12 FT.	
20	70	75	80	20
25	105	115	125	25
30	150	165	180	30
35	205	225	245	35
40	265	295	320	40
45	450	495	540	45
50	500	550	600	50
55	550	605	660	55
60	600	660	720	60
65	650	715	780	65
70	700	770	840	70

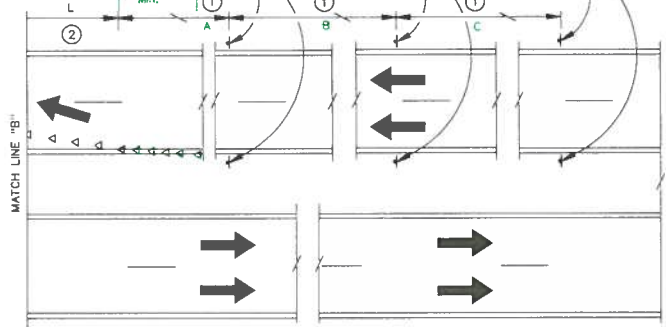


GENERAL NOTES

1. ALL WARNING SIGNS (W SERIES) SHALL BE BLACK ON REFLECTIVE ORANGE.
2. TRAFFIC CONES, DELINEATORS, VERTICAL PANELS OR TYPE III B BARRICADES SHALL BE PLACED IN ACCORDANCE WITH THE SPACING AS SHOWN ON TABLE OF TAPER LENGTHS AND CHANNELIZING DEVICE SPACING. TYPE OF DELINEATION DEVICE USED SHALL BE AS DIRECTED BY THE ENGINEER.
3. END CONSTRUCTION SIGN (G20-2) WHEN NECESSARY SHALL BE INSTALLED AT EACH END OF THE PROJECT IN ACCORDANCE WITH THE TABLE FOR SPACING OF ADVANCE WARNING SIGNS.

LEGEND

- CROSSOVER AREA
- CHANNELIZING DEVICES
- FLAGGER (LOCATIONS TO BE DETERMINED BY THE FIELD ENGR.)
- ARROW BOARD
- TYPE B WARNING LIGHT



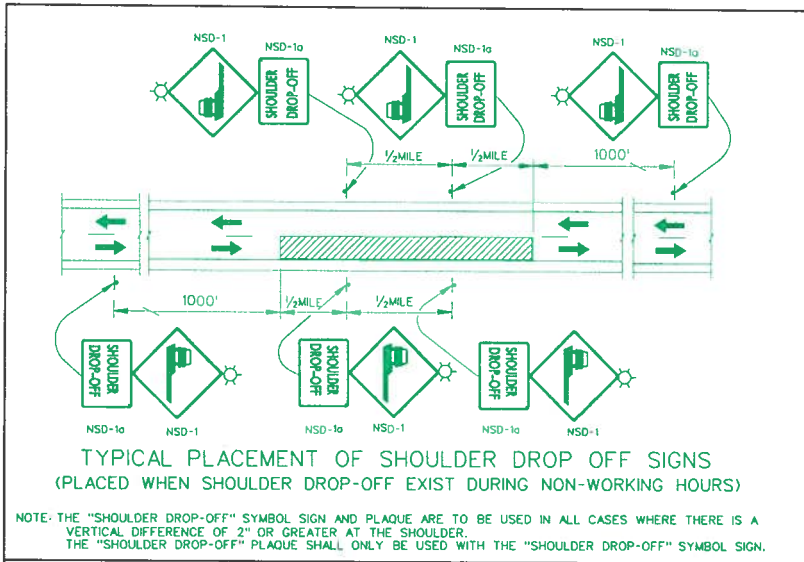
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

**TYPICAL TRAFFIC CONTROL
FOR HAUL ROAD**

T-35.1.6 (625)

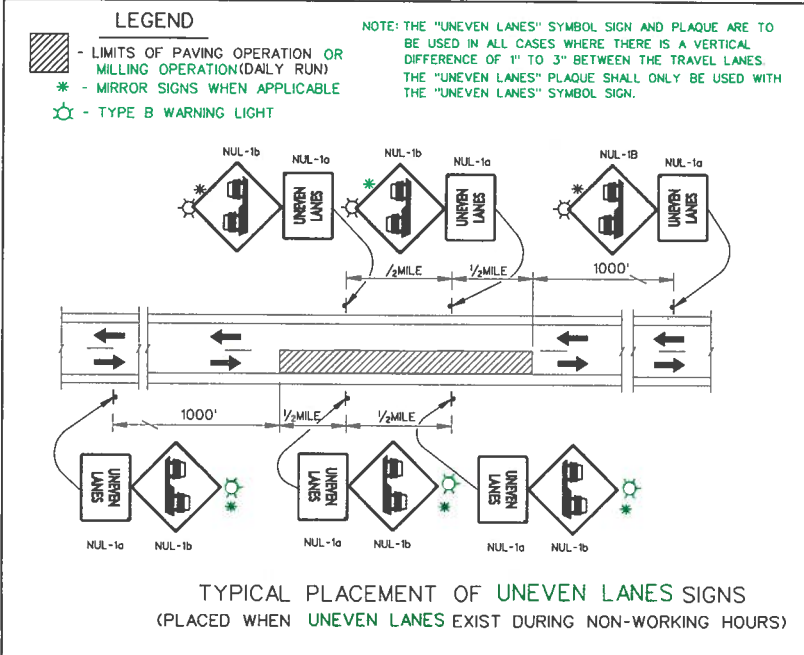
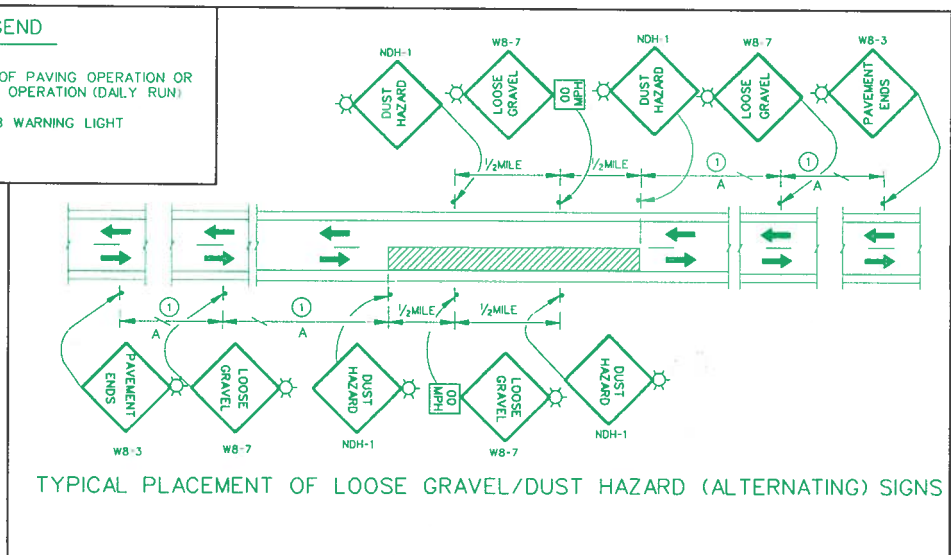
ADOPTED: 8/82 REVISION: 3-10/84

P.D. K...
CHIEF TRAFFIC ENGR.



LEGEND

- [Hatched Box] - LIMITS OF PAVING OPERATION OR MILLING OPERATION (DAILY RUN)
- ☼ - TYPE B WARNING LIGHT



LEGEND

- [Hatched Box] - LIMITS OF PAVING OPERATION OR MILLING OPERATION (DAILY RUN)
- * - MIRROR SIGNS WHEN APPLICABLE
- ☼ - TYPE B WARNING LIGHT
- [Flagger Symbol] - FLAGGER (LOCATIONS TO BE DETERMINED BY THE FIELD ENGR.)
- ☼ - TYPE B WARNING LIGHT

TYPICAL TRAFFIC CONTROL FOR HAUL ROAD (2 LANE ROAD)

TABLE FOR SPACING OF ADVANCE WARNING SIGNS

SPEED MILES PER HOUR 85TH PERCENTILE	DISTANCE BETWEEN SIGNS (FT)		
	A	B	C
0-20	200	200	200
20-30	300	300	300
30-40	400	400	400
40-50	600	600	600
50-65	1000	1600	2600

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

TYPICAL TRAFFIC CONTROL SIGNING

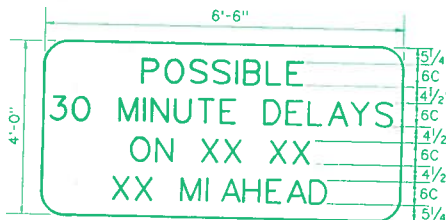
P.D. Kiser
CHIEF TRAFFIC ENGR.

T-35.1.6.1 (825)
ADOPTED: 4/85
REVISION: 4-10/94



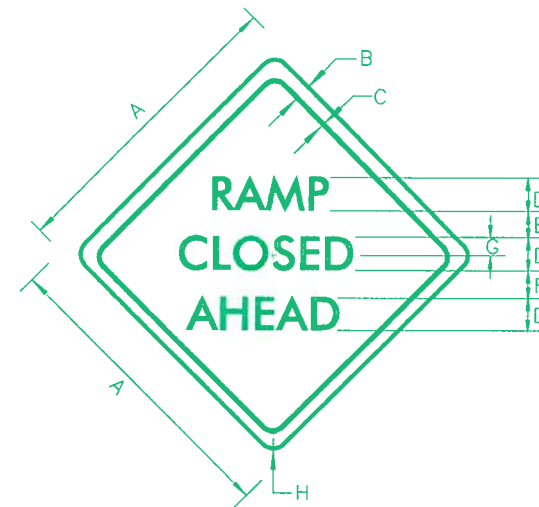
NRW-2

BACKGROUND ORANGE
 LEGEND & BORDER BLACK
 BORDER 1 1/2"
 MARGIN 1 1/4"
 CORNER RADIUS 6"



NDP-2

BACKGROUND ORANGE
 LEGEND & BORDER BLACK
 BORDER 3/4"
 MARGIN 3/4"
 CORNER RADIUS 2"



NRC-1A
 NRC-1B



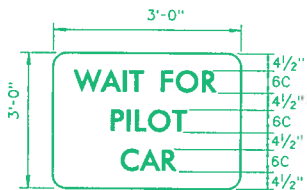
NDP-1

BACKGROUND ORANGE
 LEGEND & BORDER BLACK
 BORDER 1/2"
 MARGIN 3/8"
 CORNER RADIUS 2"



NGP-1

BACKGROUND ORANGE
 LEGEND & BORDER BLACK
 BORDER 1 1/4"
 MARGIN 3/4"
 CORNER RADIUS 3"



NPC-1a

BACKGROUND WHITE
 LEGEND & BORDER BLACK
 BORDER 7/8"
 MARGIN 3/4"
 CORNER RADIUS 2"



NRW-1

BACKGROUND ORANGE
 LEGEND & BORDER BLACK
 BORDER 3/4"
 CORNER RADIUS 1 1/2"
 MARGIN 1 1/2"

SIGN	DIMENSIONS (INCHES)															
	A	B	C	D	E	F	G	H								
NRC-1A	36	5/8	7/8	5D	3/2	3 3/4	3/4	2 1/4								
NRC-1B	48	3/4	1/4	7D	4 3/4	5/4	4/2	3								

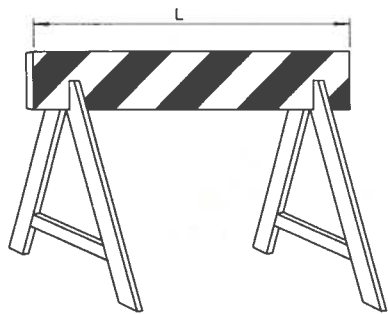
BACKGROUND ORANGE
 LEGEND BLACK

STATE OF NEVADA
 DEPARTMENT OF TRANSPORTATION

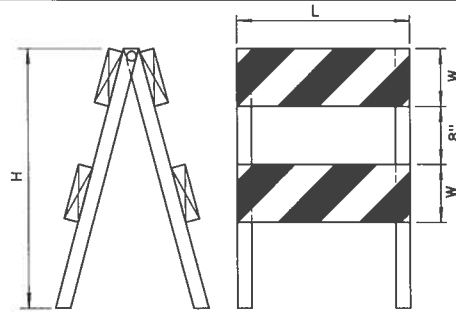
TRAFFIC CONTROL SIGNS

P.D. K...
 CHIEF TRAFFIC ENGR.

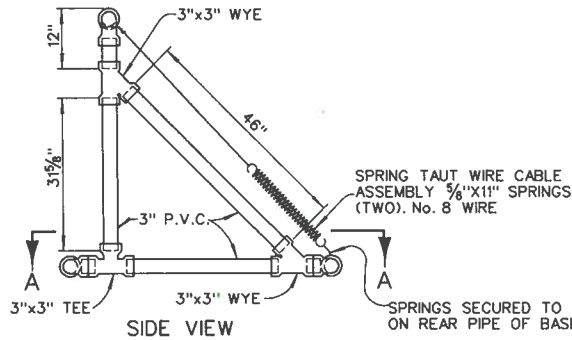
T-35.1.6.2 (625)
 ADOPTED: | REVISION



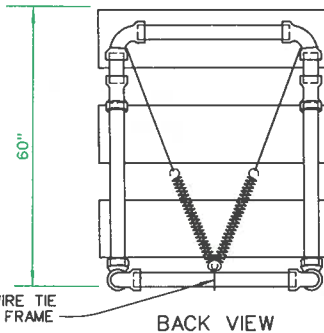
TYPE I BARRICADE



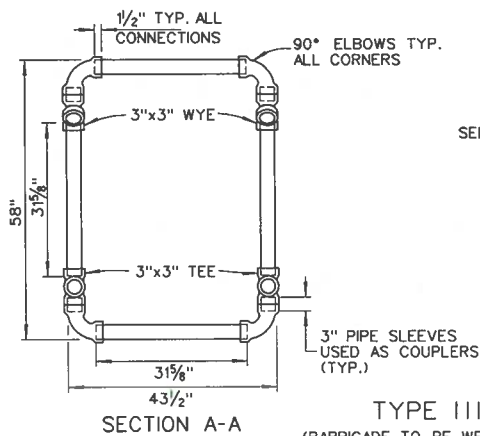
TYPE II BARRICADE
(FRAMEWORK TO BE WHITE)



SIDE VIEW

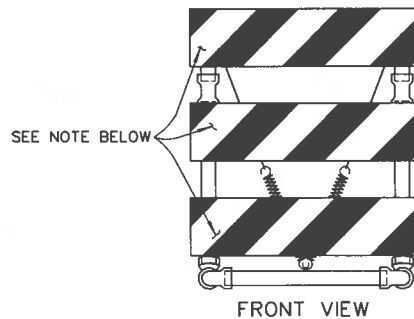


BACK VIEW



SECTION A-A

TYPE III B BARRICADE
(BARRICADE TO BE WEIGHTED DOWN WITH SANDBAGS.)



FRONT VIEW

NOTE: 9"x48" BARRICADE HAZARD PANELS ORANGE AND WHITE RIGHT OR LEFT. (.025" ANODIZED ALUMINUM) PANELS ATTACHED WITH 1" No. 14 PAN HEAD METAL SCREW OR 0.125" POLYETHYLENE WITH PLASTIC RIVETS

NOTE: TYPE III B BARRICADES USED FOR TEMPORARY SIGN SUPPORTS. SIGNS SHALL BE MOUNTED 1.0' MIN. FROM GROUND.

BARRICADE CHARACTERISTICS

	TYPE I BARRICADE	TYPE II BARRICADE
W= Width of Rail	8" Min. - 11" Max.	8" Min. -12" Max.
L= Length of Rail	2' Min.	2' Min.
Width of Stripes	Rail Length < 3' = 4" Rail Length ≥ 3' = 6"	Rail Length < 3' = 4" Rail Length ≤ 3' = 6"
H= Height	3' Min.	3' Min.
Number of Reflectorized Rail faces	2 (One each Direction)	4 (Two each Direction)

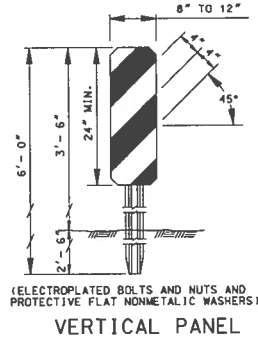
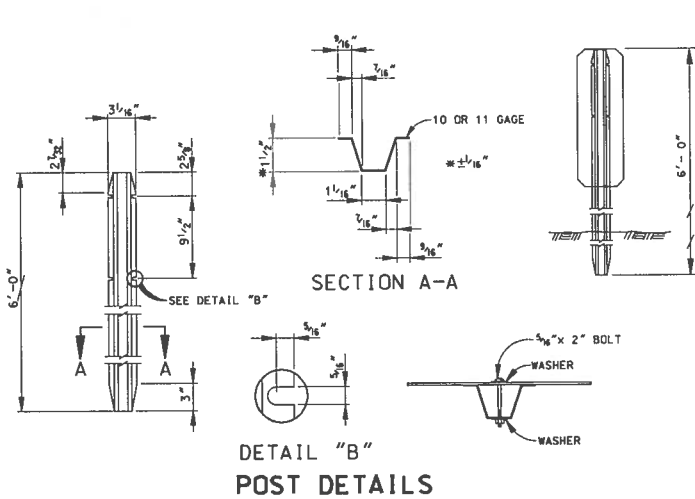
Markings for barrier rails and vertical panels shall be alternate reflectorized orange and reflectorized white stripes sloping downward at an angle of 45 degrees in the direction of traffic.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

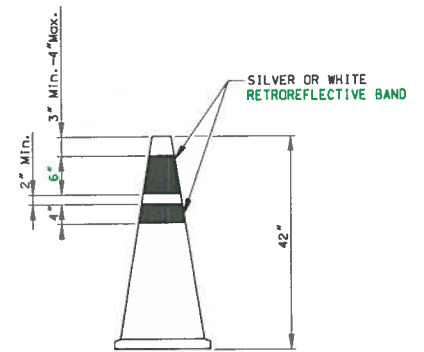
BARRICADES

P.D. K...
CHIEF TRAFFIC ENGR.

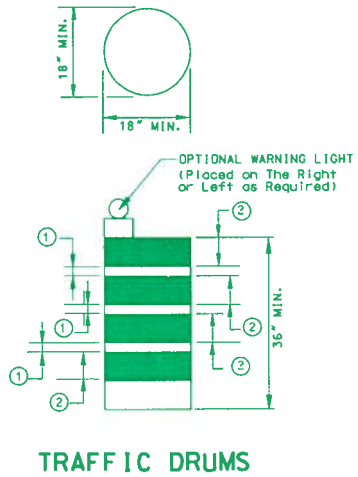
T-35.1.7 (625)
REVISION
ADOPTED 8/82 1-10/94



- TRAFFIC CONES**
1. CONES TO BE PREDOMINATELY ORANGE.
 2. CONES TO BE USED DURING HOURS OF DARKNESS SHALL BE **RETROREFLECTIVE** AS SHOWN ABOVE.
 3. CONES SHALL HAVE WEIGHTED BASES.



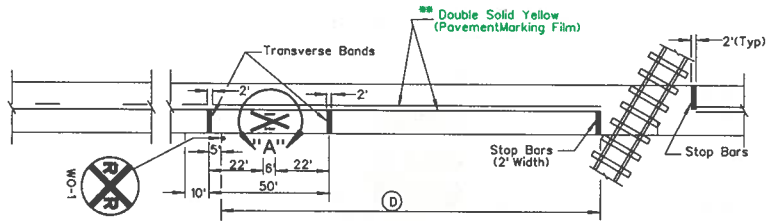
TRAFFIC CONES



- ① - 2" MAX. NON RETROREFLECTIVE MATERIAL
- ② - 4" MIN. - 6" MAX. RETROREFLECTIVE MATERIAL

NOTE: DRUMS/BARRELS SHALL HAVE A MIN. OF 2 WHITE AND 2 ORANGE RETROREFLECTIVE BANDS AND 18" WIDTH REGARDLESS OF ORIENTATION

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION	
TRAFFIC CONES, DRUMS, BARRELS AND VERTICAL PANELS	
<i>P.D. King</i> CHIEF TRAFFIC ENGR.	T-35.1.7.1(625) ADOPTED: 10/92 REVISION 1-10/94

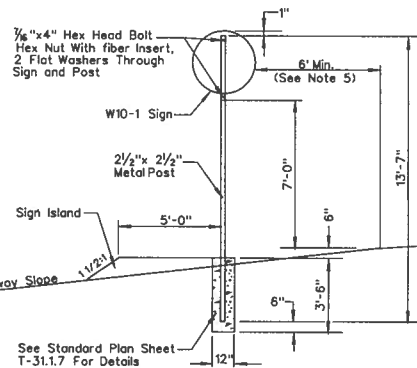


TYPICAL SIGN & MARKING PLAN

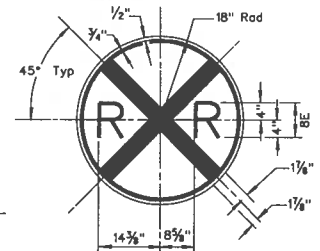
Table For Spacing of Advance Warning Signs and Marking Detail "A"

SPEED	SPACING
20 MPH	100'
25 MPH	100'
30 MPH	100'
35 MPH	150'
40 MPH	225'
45 MPH	300'
50 MPH	375'
55 MPH	450'
60 MPH	550'

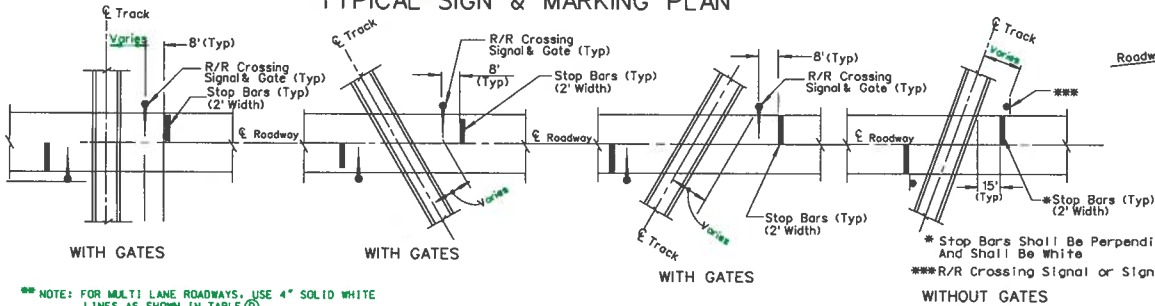
See General Notes



W10-1 SIGN INSTALLATION



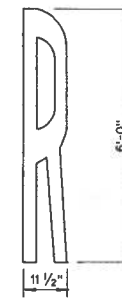
W10-1 SIGN DETAIL
(TYPE III REFLECTIVE SHEETING)
(STANDARD SIZE)



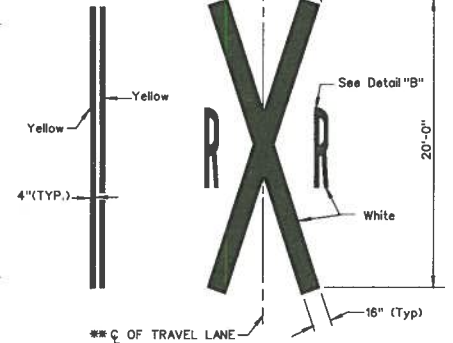
R/R STOP BAR, SIGNAL & GATE PLACEMENT

NOTE: FOR MULTI LANE ROADWAYS, USE 4" SOLID WHITE LINES AS SHOWN IN TABLE (D).

* Stop Bars Shall Be Perpendicular to Rdwy. And Shall Be White
***R/R Crossing Signal or Sign



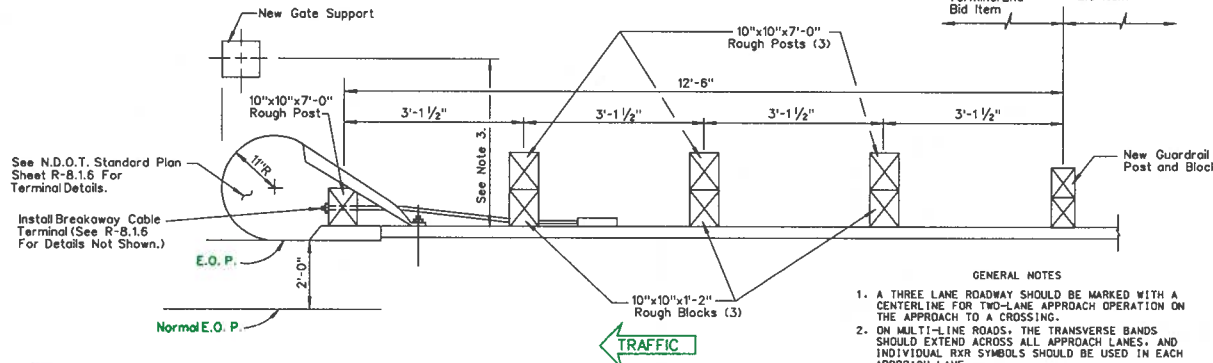
DETAIL "B"



DETAIL "A"
RAILROAD CROSSING KIT

* One Set of Markers Per Travel Lane Excluding Shoulders

NOTE: Attention is Directed To The Fact That Film Needed For The Stop Bar, Transverse Bands And 4" Non-Passing Line Is Not Included In The "Railroad Crossing Kit"



SPECIAL GUARDRAIL
TERMINAL END
FOR
RAILROAD CROSSING

See N.D.O.T. Standard Plan Sheet R-8.1.6 For Terminal Details.

Install Breakaway Cable Terminal (See R-8.1.5 For Details Not Shown.)

SPECIAL GUARDRAIL NOTES

1. SPECIAL GUARDRAIL TERMINAL END TO BE INSTALLED ON GUARDRAIL END NEAREST RAILROAD.
2. NO POST HOLES SHALL BE DRILLED NEXT TO THE SIGNAL APPARATUS WITHOUT FIRST NOTIFYING THE RAILROAD INSPECTOR.
3. UPRR XING - 7'-0" SPTCO XING - 4'-0"

GENERAL NOTES

1. A THREE LANE ROADWAY SHOULD BE MARKED WITH A CENTERLINE FOR TWO-LANE APPROACH OPERATION ON THE APPROACH TO A CROSSING.
2. ON MULTI-LANE ROADS, THE TRANSVERSE BANDS SHOULD EXTEND ACROSS ALL APPROACH LANES, AND INDIVIDUAL R/R SYMBOLS SHOULD BE USED IN EACH APPROACH LANE.
3. REFER TO STANDARD ALPHABET FOR HIGHWAY SIGNS AND MARKINGS FOR R/R SYMBOL DETAILS.
4. WHEN USED, A PORTION OF THE PAVEMENT MARKING SYMBOL SHOULD BE DIRECTLY OPPOSITE THE ADVANCE WARNING SIGN (W10). IF NEEDED, SUPPLEMENTAL PAVEMENT MARKING SYMBOL (S) MAY BE PLACED BETWEEN THE ADVANCE WARNING SIGN AND THE CROSSING, BUT SHOULD BE AT LEAST 50 FEET FROM THE STOP LINE.
5. SIGNS SHOULD NOT BE CLOSER THAN 6 FEET FROM THE EDGE OF THE SHOULDER OR IF NONE, 12 FEET FROM THE EDGE OF THE TRAVELED WAY. IN URBAN AREAS A LESSER CLEARANCE MAY BE USED WHERE NECESSARY.
6. FOR BRACING DETAILS, SEE SHEET T-31.1.1.2.

PAVEMENT MARKING FILM QUANTITIES FOR SPECIFIC DETAILS FOR INFORMATION ONLY. SEE "ESTIMATE OF QUANTITIES" FOR PROJECT TOTALS.

ITEM	SQ. FT.	LIN. FT.
ONE RAILROAD CROSSING R/R	69	12
* ONE STOP BAR	—	24
* TWO TRANSVERSE BANDS	—	240 MIN.
NON-PASSING 4" LINE	—	—

* BASED ON 1-12' TRAVEL LANE IN ONE DIRECTION ONLY

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

RAILROAD SIGN
& MARKING DETAILS

ADOPTED: 1-10-90
REVISION: 3-10-94

T-35.2 (627 634)

CHIEF TRAFFIC ENGINEER

INSTRUCTIONS TO FABRICATOR

FORMAT SHEET SHOWS:

1. Sign Structure Location.
2. Length of Structure Frame.
3. Panel Size and Locations on Structure.
4. Post Type and Height to Bottom of Frame.
5. Base Plate Elevation.
6. Footing Elevation or Location of Alternate Pile Foundation.
7. Photo Electric Cell Location if Required.

REFER TO THE FOLLOWING SHEETS FOR DETAILS NOT SHOWN ON FORMAT SHEET:

- T-36.1.1 - Instructions & Examples
- T-36.1.2 - Post Type I Thru VII
- T-36.1.3 - Post Type I-S Thru VII-S.
- T-36.1.4 - Structural Frame Members (Single Post Type).
- T-36.1.5 - Structural Frame Members (Two Post Type).
- T-36.1.6 - Structural Frame Details.
- T-36.1.7 - Frame Junction Details.
- T-36.1.8 - Removable Sign Panel Frames.
- T-36.1.9 & T-36.1.10 - Walkway Details No. 1 & No. 2.
- T-36.1.11 - Walkway Safety Railing Details.
- T-36.1.12 - Alternate Pile Foundations.

GENERAL NOTES

SPECIFICATIONS:

DESIGN: A.A.S.H.O. Specifications For the Design and Construction of Structural Supports for Highway Signs, Dated 1968.

CONSTRUCTION: Standard Specifications for Road and Bridge Construction, Current Edition and Supplements There To.

LOADING:

WIND LOADING: Normal to Face of Sign: 30 P.S.F.
Transverse to Face of Sign: 0.2 of Normal Force.
WALKWAY LOADING: Dead Load +500 Lbs. Concentrated Live Load.

UNIT STRESSES:

STRUCTURAL STEEL: $F_s = 20,000$ P.S.I.
REINFORCED CONCRETE: $F_s = 20,000$ P.S.I.
 $F_c = 1200$ P.S.I.

FOOTING SOIL PRESSURE: $1\frac{1}{4}$ Tons/Sq.Ft.

MINIMUM CLEARANCE: Vertical Roadway Clearance 18'-0"

WELDING: All Welding Continuous Unless Otherwise Noted on the Plans. All Welding to be Done in Accordance With the Standard Specifications For Road and Bridge Construction.

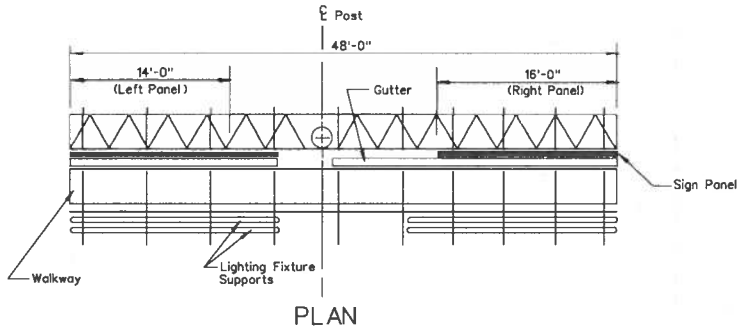
FINISH: All Steel Parts to be Hot-Dipped Galvanized After Fabrication Except As Shown on Plans Or As Called For in Special Provisions.

WALKWAY BRACKETS: Maintain Uniform Spacing Where Possible. Maximum Spacing Shall Not Exceed 5'-6".

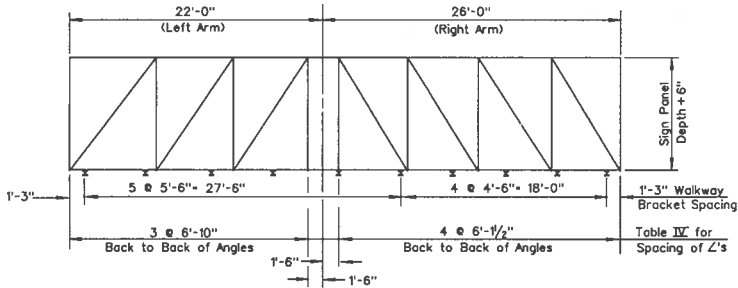
LIGHTING FIXTURE SUPPORTS: Where Distance From Walkway Bracket To End of Sign Panel Exceeds 1'-4", Extend Lighting Fixture Supports to Next Walkway Bracket. See Example No. 2.

WALKWAY AND SAFETY RAILING: Walkway to be Continuous For Entire Length of Frame For Single Post Signs and For 2 Post Signs From the Nearest Post Continuous Across All the Sign Panels. Safety Railing to Protect Entire Walkway, But Continuous For No More Than 11' in One Unit.

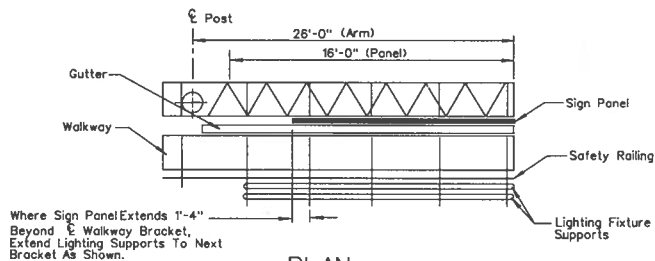
NOTE: Signs Are Shown and Dimensioned Looking in the Direction of Traffic. Double Faced Signs Are Shown and Dimensioned Looking Ahead Along Stationing.



PLAN

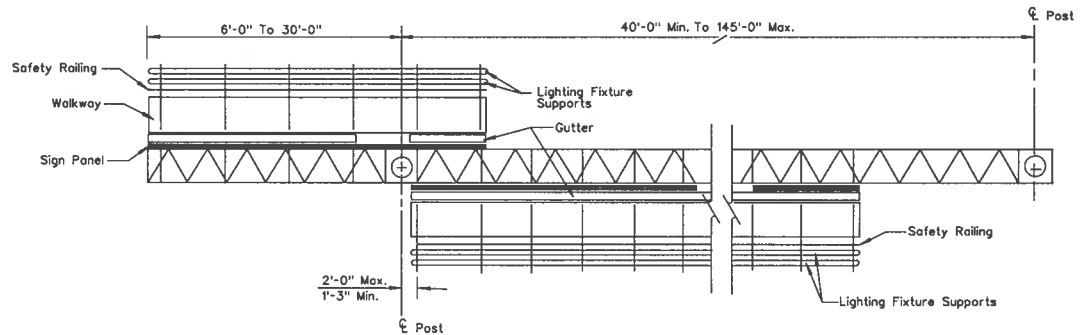


UNBALANCED SINGLE POST TYPE
EXAMPLE NO. 1



Where Sign Panel Extends 1'-4" Beyond \bar{c} Walkway Bracket, Extend Lighting Supports To Next Bracket As Shown.

PLAN
CANTILEVER SINGLE
POST TYPE
EXAMPLE NO. 2



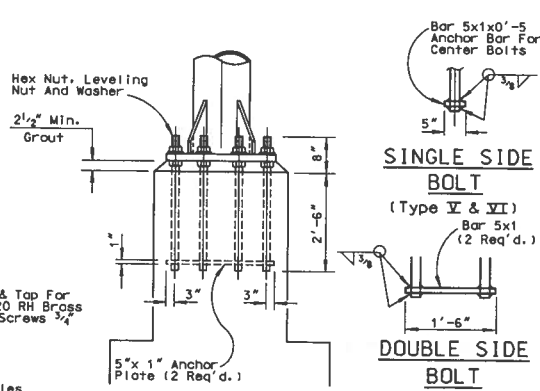
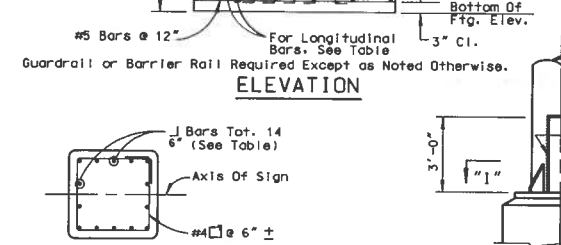
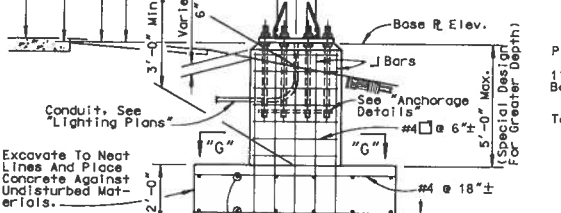
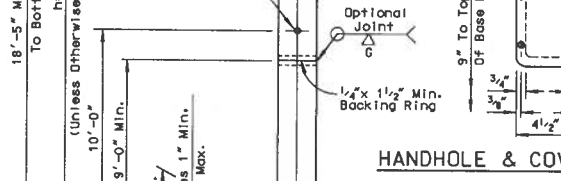
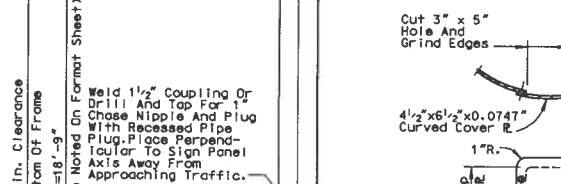
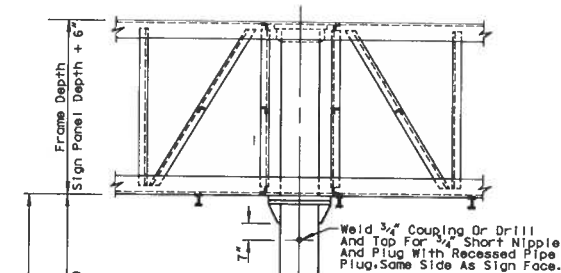
PLAN

TWO POST TYPE WITH CANTILEVER
(PART DOUBLE-FACED)
EXAMPLE NO. 3

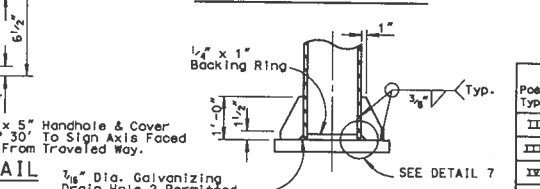
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
OVERHEAD SIGNS
INSTRUCTIONS & EXAMPLES

P.D. Kinn
CHIEF TRAFFIC ENGINEER

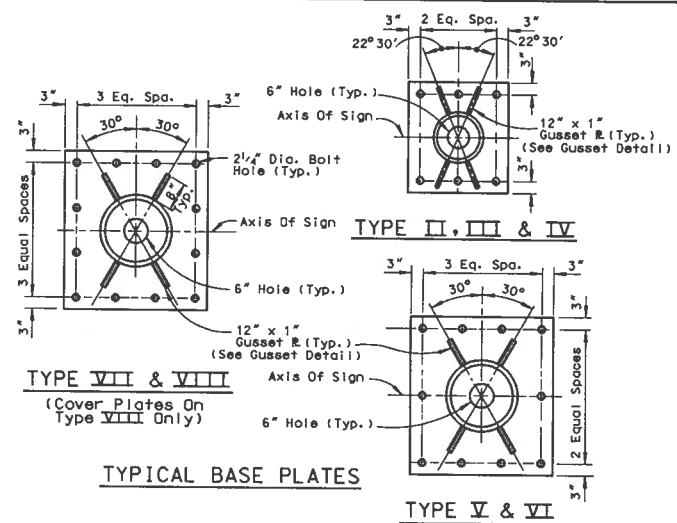
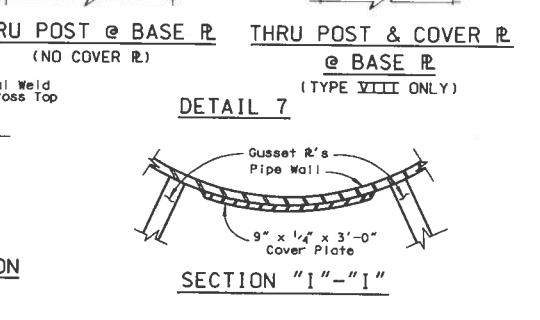
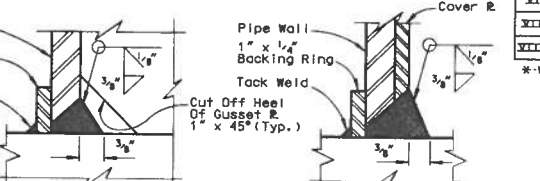
T-36.1.1 (627)
ADOPTED: 8/69
REVISION
2-1/74



ANCHORAGE DETAILS



GUSSET DETAIL



Post Type	Pipe Size	Cap Plate Size	Base Plate Size (Note #2)	2" φ Anchor Bolts	Pedestal Size (Note #2)	Footing Size (Note #2)	Longitudinal Footing Reinforcement		J Bars
							Top	Bottom	
II	12" Std. @ 49.56	1'-7"x1'-7"x 1/8"	2'-4"x2'-1"x2"	6	2'-11"x2'-8"	7'-10"x10'-0"	6-#4 Bars	9-#5 Bars	#5
III	14" O.D. @ 72.09	1'-8"x1'-8"x 1/8"	2'-7"x2'-3"x2"	6	3'-2"x2'-10"	8'-0"x12'-0"	6-#5 Bars	8-#7 Bars	#6
IV	16" O.D. @ 82.77	1'-10"x1'-10"x 1/8"	3'-1"x2'-9"x2"	6	3'-8"x3'-4"	8'-0"x14'-0"	6-#5 Bars	9-#8 Bars	#6
V	18" O.D. @ 93.45	2'-0"x2'-0"x 1/8"	3'-3"x3'-0"x2"	10	3'-10"x3'-7"	9'-0"x15'-0"	6-#5 Bars	9-#9 Bars	#7
VI	20" O.D. @ 104.13	2'-2"x2'-2"x1"	3'-3"x3'-0"x2"	10	3'-10"x3'-7"	9'-0"x16'-0"	6-#6 Bars	8-#10 Bars	#8
VII	24" O.D. @ 125.49	2'-6"x2'-6"x1"	3'-7"x3'-3"x2"	12	4'-3"x3'-11"	10'-0"x17'-0"	7-#6 Bars	10-#10 Bars	#10
VIII	24" O.D. @ 125.49	2'-6"x2'-6"x1"	3'-9"x3'-3"x2"	12	4'-5"x3'-11"	10'-0"x18'-0"	10-#6 Bars	11-#10 Bars	#10

- *-With Cover Plate
- NOTES:**
- For General Notes See "Instructions And Examples" Sheet.
 - Base Plates, Pedestals And Footings Longer Sides Shall Be Normal To Axis Of Sign.
 - Backfill Shall Be In Place Prior To Erection Of Post.
 - Thread Upper 8" Of Anchor Bolts And Galvanize Upper 1'-0".
 - Spread Footing Shown. Alternate Pile Foundation Is Optional.
 - For Reinforcement, Embedment Is Clear To Outside Of Bar And Is 2" To Main Reinforcement, Except As Noted.
 - Anchor Plates May Be Retained With Hex Nut Or Formed Head.
 - On Single Post Sign Structures, The Post Shall Be Raked Out Of Plumb, With The Use Of The Leveling Nuts To Make The Bottom Of The Sign Frame Level.
 - At Final Position Of Post All Top And Bottom Nuts Shall Be Tighter Against Base Plate.
 - When Foundation Is Located On A Steep Slope With Exposed Face Of Concrete Adjacent To Traffic, See Detail On "Pile Foundation" Sheet.
 - Use Post Footing Connection On Top Of Footing where Required To Attach Guardrail Posts.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

**OVERHEAD SIGNS
SINGLE POST
TYPES II THRU VIII**

P.D. King
CHIEF ENGINEER

T-36, 1, 2-(627)
ADOPTED: 8/69 REVISION: 3-2/79

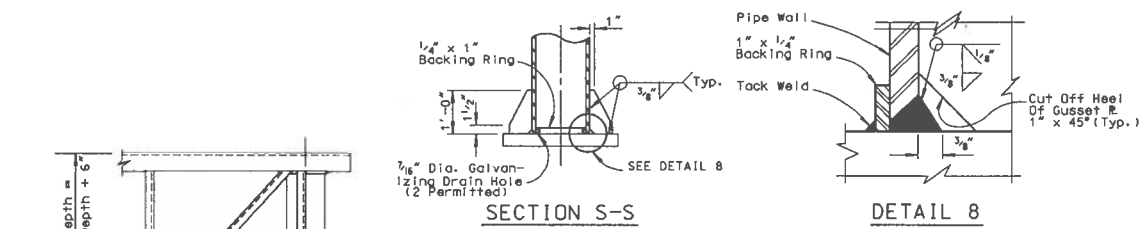
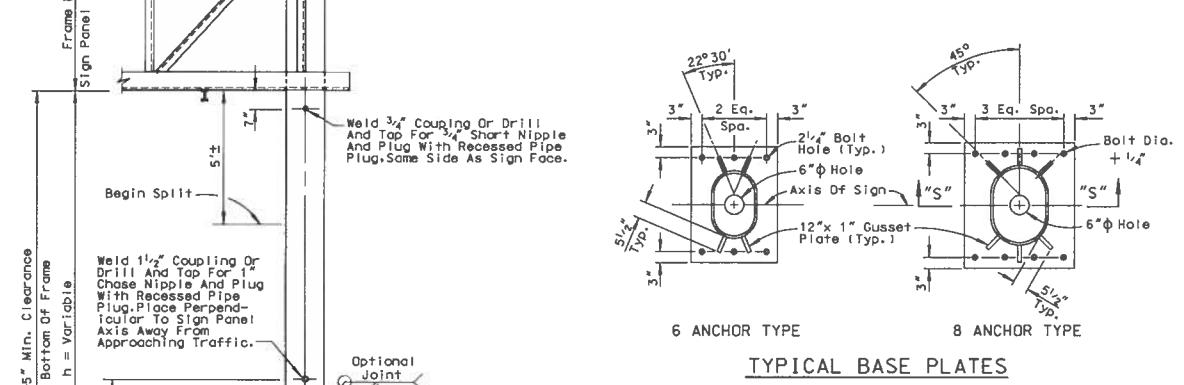
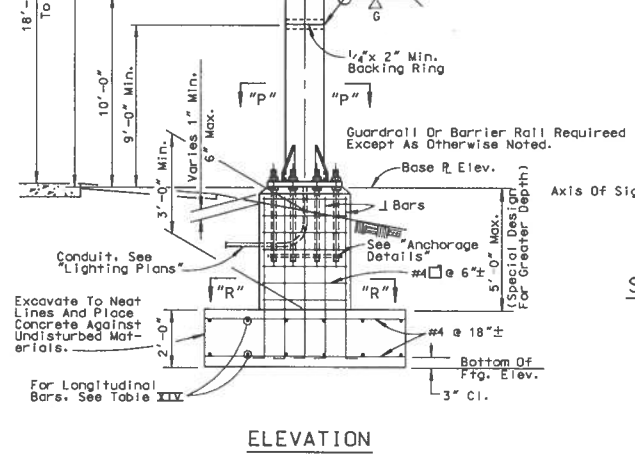


TABLE XIV

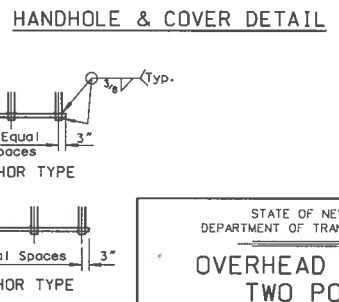
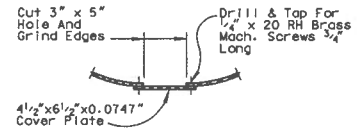
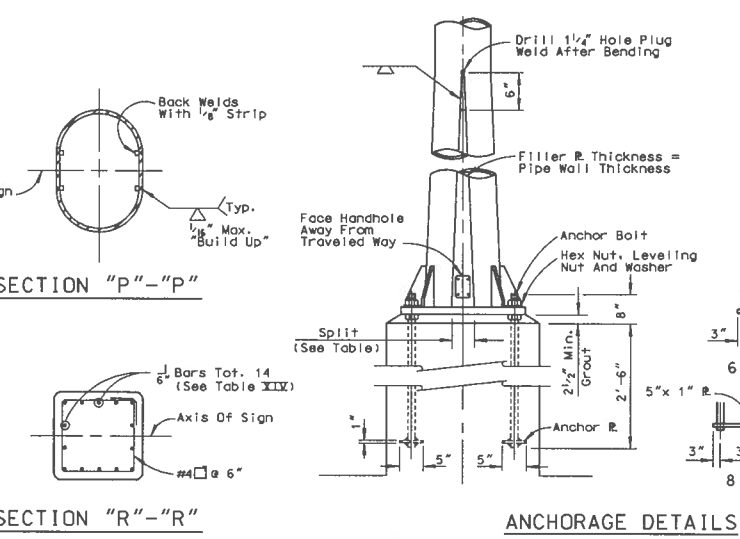
Post Type	Pipe Size	Split	Base Plate Size (Note #2)	Anchor Bolts	Pedestal Size (Note #2)	Footing Size (Note #2)	Longitudinal Footing Reinforcement		┘ Bars
							Top	Bottom	
I-S	10" Std. @ 40.48	4"	2'-3"x1'-9"x 2"	6-2" φ	2'-9"x2'-3"	5'-0"x10'-0"	5-#4 Bars	5-#6 Bars	#6
II-S	12" Std. @ 49.56	5"	2'-6"x1'-11"x 2"	6-2" φ	3'-0"x2'-6"	6'-0"x11'-0"	6-#4 Bars	6-#7 Bars	#6
III-S	14" O.D. @ 72.09	5"	2'-9"x2'-0"x 2"	6-2" φ	3'-4"x2'-7"	7'-0"x13'-0"	7-#4 Bars	7-#8 Bars	#8
IV-S	16" O.D. @ 82.77	6"	2'-11"x2'-7"x 2"	8-2" φ	3'-6"x3'-2"	8'-0"x14'-0"	8-#5 Bars	8-#9 Bars	#8
V-S	18" O.D. @ 93.45	7"	3'-1"x2'-9"x 2"	8-2" φ	3'-8"x3'-4"	8'-0"x16'-0"	8-#5 Bars	8-#9 Bars	#9
VI-S	20" O.D. @ 104.13	8"	3'-5"x2'-9"x 2"	8-2" φ	4'-0"x3'-4"	9'-0"x17'-0"	9-#5 Bars	9-#10 Bars	#10
VII-S	24" O.D. @ 125.49	8"	3'-9"x3'-3"x 2"	8-2 1/4" φ	4'-5"x3'-11"	10'-0"x18'-0"	10-#6 Bars	10-#11 Bars	#11



- NOTES:**
1. For General Notes See "Instructions And Examples" Sheet.
 2. Base Plates, Pedestals And Footings Longer Sides Shall Be Normal To Axis Of Sign.
 3. Backfill Shall Be In Place Prior To Erection Of Post.
 4. Thread Upper 8" Of Anchor Bolts And Galvanize Upper 1'-0".
 5. Spread Footing Shown. Alternate Pile Foundation Is Optional.
 6. For Reinforcement, Embedment Is Clear To Outside Of Bar And Is 2" To Main Reinforcement, Except As Noted.
 7. Anchor Plates May Be Retained With Hex Nut Or Formed Head.
 8. Use Post Footing Connection On Top Of Footing Where Required To Attach Guardrail Posts.



NOTE: Post Without Cantilever Is Shown.

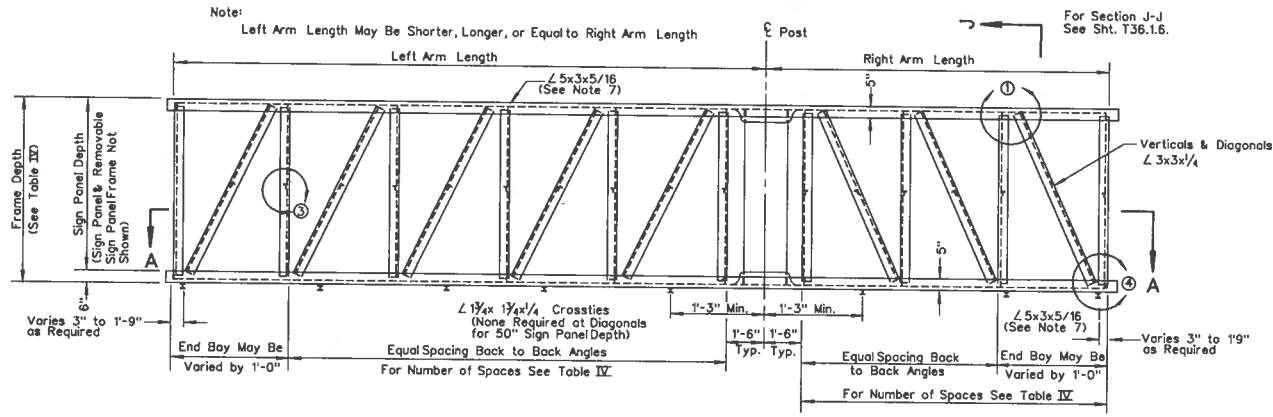


STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

**OVERHEAD SIGNS
TWO POST
TYPES I-S THRU VII-S**

RDK
CHIEF TRAFFIC ENGINEER

T-36.1.3-(627)
ADOPTED 8/69 REVISION: 2-2/79

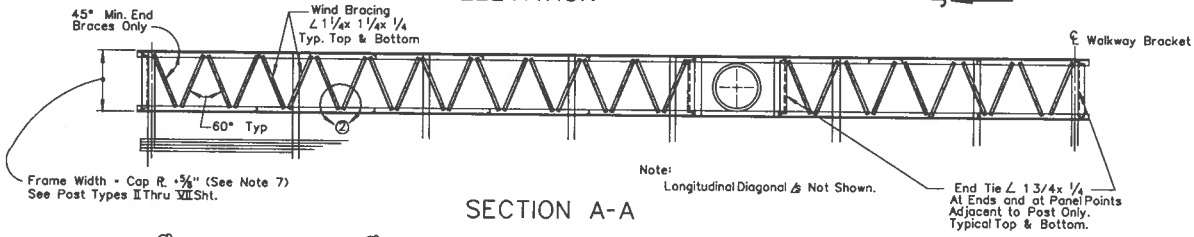


ELEVATION

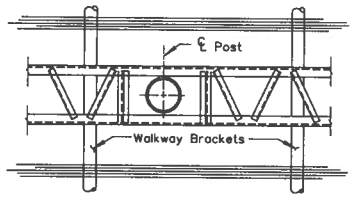
TABLE IV

Sign Panel Depth	Frame Depth	Maximum Vertical \angle Spacing	Arm Length	No. Diagonals Required
60"	5'-6"	5'-0"	4'	
70"	6'-4"	5'-6"	4'	
80"	7'-2"	6'-0"	5'	
90"	8'-0"	7'-0"	5'	
100"	8'-10"	7'-0"	6'	
110"	9'-8"	7'-6"	6'	
120"	10'-6"	7'-6"	6'	

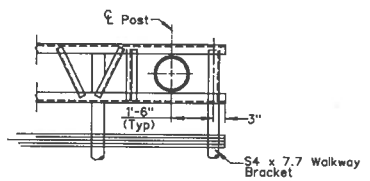
- NOTES:
- FOR DETAILS ① THRU ④ SEE "STRUCTURAL FRAME DETAILS" SHT. T36.1.6.
 - FOR SIGN PANEL FRAMES SEE "REMOVABLE SIGN PANEL FRAMES" SHT. T36.1.8.
 - FOR CONNECTION OF FRAME TO POST SEE "FRAME JUNCTURE DETAILS" SHT. T36.1.7.
 - FOR WALKWAY SEE "STANDARD WALKWAY DETAILS #1 & #2" SHTS. T36.1.8 & T36.1.9.
 - FOR TYPICAL WALKWAY ARRANGEMENT, SPECIAL INSTRUCTIONS AND EXAMPLES, SEE "INSTRUCTIONS AND EXAMPLES" SHT. T36.1.1.
 - MINIMUM LENGTH OF FRAME = 12'-0".
 - FOR ARM LENGTHS 35' TO 40' AND SIGN DEPTHS 80" THRU 120" :
A. USE $5 \times 3 \times 7/8$ CHORD \angle 'S.
B. FRAME WIDTH = COP R + $1/4$ ".
 - ON SINGLE POST SIGN STRUCTURES, THE POST SHALL BE RAKED OUT OF PLUMB, WITH THE USE OF THE LEVELING NUTS TO MAKE THE BOTTOM OF THE SIGN FRAME LEVEL.
 - AT FINAL POSITION OF POST ALL TOP AND BOTTOM NUTS SHALL BE TIGHTENED AGAINST BASE PLATE.



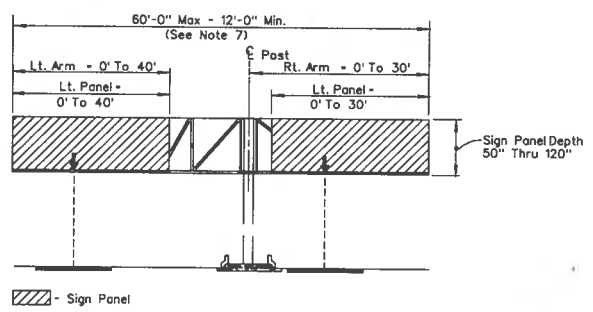
SECTION A-A



PART PLAN OF DOUBLE FACED TYPE AT POST



PART PLAN OF CANTILEVER TYPE AT POST



LIMITING DIMENSIONS OF FRAME & SIGN PANEL

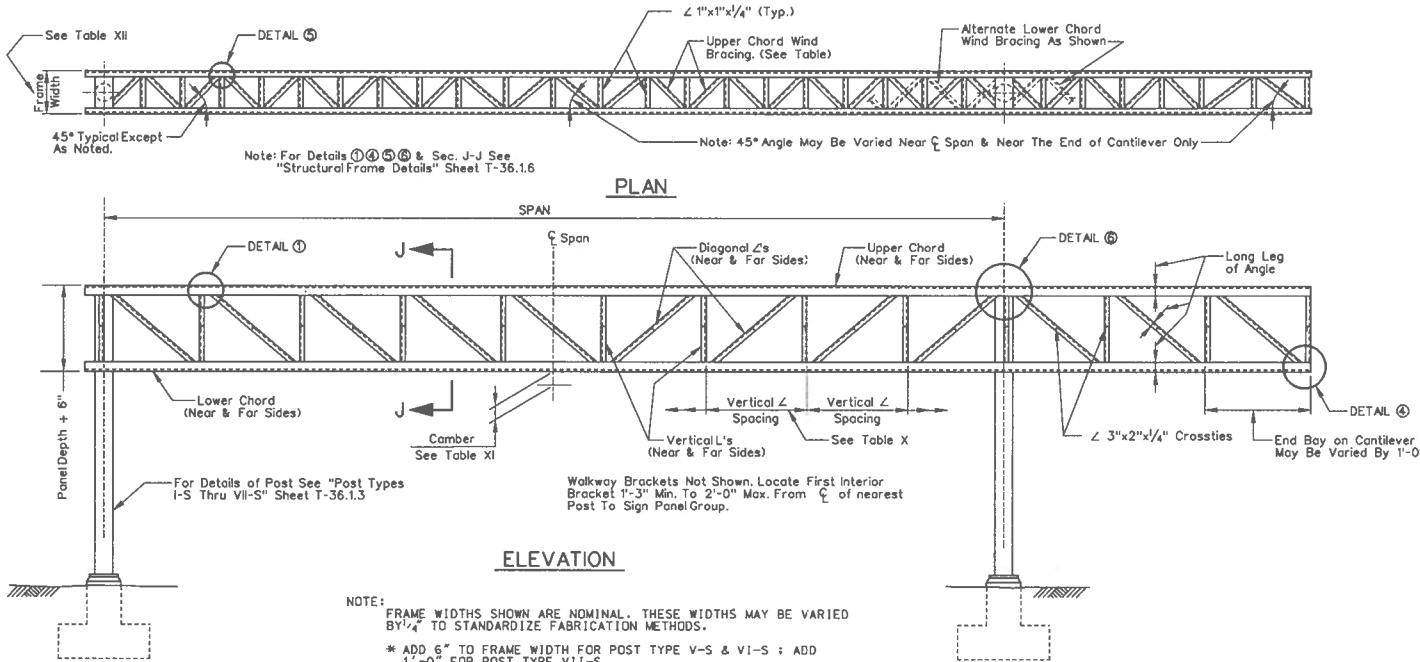
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

**OVERHEAD SIGNS-SINGLE POST
STRUCTURAL FRAME MEMBERS**

P.D. Kim
CHIEF TRAFFIC ENGINEER

T-36.1.4 (627)
ADOPTED: 8/69 REVISION 4-2799

T-49



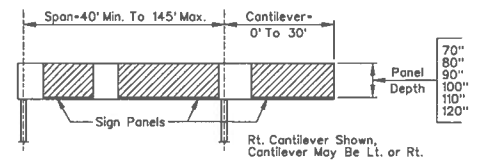
PANEL DEPTH	FRAME DEPTH	MAX VERTICAL L SPACING
70"	6'-4"	72"
80"	7'-2"	75"
90"	8'-0"	80"
100"	8'-10"	90"
110"	9'-8"	120"
120"	10'-6"	120"

TABLE X

CAMBER FOR FABRICATION AT C SPAN	
SPAN	CAMBER
40' - 50'	1/2"
51' - 100'	1 1/2"
101' - 145'	1 1/2"

FABRICATE CAMBER TO APPROXIMATE PARABOLA. CAMBER OF CANTILEVER ARM = +1/2" FOR ARMS GREATER THAN 10'

TABLE XI



RANGE OF STRUCTURE SIZES

NOTE: FRAME WIDTHS SHOWN ARE NOMINAL. THESE WIDTHS MAY BE VARIED BY 1/4" TO STANDARDIZE FABRICATION METHODS.
 * ADD 6" TO FRAME WIDTH FOR POST TYPE V-S & VI-S; ADD 1'-0" FOR POST TYPE VII-S.
 ** ADD 6" TO FRAME WIDTH FOR POST TYPE VII-S.

Span	70" PANEL DEPTH					80" PANEL DEPTH					90" PANEL DEPTH				
	FRAME WIDTH	CHORD L'S	VERTICAL L'S	DIAGONAL L'S	WIND BRACING	FRAME WIDTH	CHORD L'S	VERTICAL L'S	DIAGONAL L'S	WIND BRACING	FRAME WIDTH	CHORD L'S	VERTICAL L'S	DIAGONAL L'S	WIND BRACING
40'-50'	2'-0"	5x3 1/2x5/16	3x3x1/4	3x3x1/4	1 1/4x1 1/4x1/4	2'-0"	5x3 1/2x5/16	3x3x1/4	3x3x1/4	1 1/4x1 1/4x1/4	2'-0"	5x3 1/2x5/16	3x3x5/16	3x3x5/16	1 1/4x1 1/4x1/4
51'-60'	2'-0"	5x3 1/2x5/16			1 1/4x1 1/4x1/4	2'-0"	5x3 1/2x5/16			1 1/4x1 1/4x1/4	2'-0"	5x3 1/2x5/16			1 1/4x1 1/4x1/4
61'-70'	2'-6"	5x3 1/2x5/16			1 1/4x1 1/4x1/4	2'-6"	5x3 1/2x5/16			1 1/4x1 1/4x1/4	2'-6"	5x3 1/2x5/16			1 1/4x1 1/4x1/4
71'-80'	3'-0"	6x4x3/8			1 1/2x1 1/2x1/4	3'-0"	6x4x3/8			1 1/2x1 1/2x1/4	3'-0"	6x4x3/8			1 1/2x1 1/2x1/4
81'-90'	3'-0"	6x4x3/8			1 1/2x1 1/2x1/4	3'-0"	6x4x3/8			1 1/2x1 1/2x1/4	3'-0"	6x4x3/8			1 1/2x1 1/2x1/4
91'-100'	3'-0"	6x4x3/8			1 1/2x1 1/2x1/4	3'-0"	6x4x3/8			1 1/2x1 1/2x1/4	3'-0"	6x4x3/8			1 1/2x1 1/2x1/4
101'-110'	3'-0"	7x4x7/16			1 3/4x1 3/4x1/4	3'-0"	7x4x7/16			1 3/4x1 3/4x1/4	3'-0"	7x4x7/16			1 3/4x1 3/4x1/4
111'-120'	3'-0"	7x4x7/16			1 3/4x1 3/4x1/4	3'-0"	7x4x7/16			1 3/4x1 3/4x1/4	3'-0"	7x4x7/16			1 3/4x1 3/4x1/4
121'-132'	3'-0"	8x4x1/2			1 3/4x1 3/4x1/4	3'-0"	8x4x1/2			1 3/4x1 3/4x1/4	3'-6"	8x4x1/2			2x2x1/4
133'-145'	3'-0"	8x4x1/2			1 3/4x1 3/4x1/4	3'-0"	8x4x5/8			1 3/4x1 3/4x1/4	3'-6"	8x4x5/8			2x2x1/4

Span	100" PANEL DEPTH					110" PANEL DEPTH					120" PANEL DEPTH				
	FRAME WIDTH	CHORD L'S	VERTICAL L'S	DIAGONAL L'S	WIND BRACING	FRAME WIDTH	CHORD L'S	VERTICAL L'S	DIAGONAL L'S	WIND BRACING	FRAME WIDTH	CHORD L'S	VERTICAL L'S	DIAGONAL L'S	WIND BRACING
40'-50'	2'-0"	5x3 1/2x5/16	3x3x5/16	3x3x5/16	1 1/4x1 1/4x1/4	2'-0"	5x3 1/2x5/16	3 1/2x3 1/2x5/16	3 1/2x3 1/2x5/16	1 1/4x1 1/4x1/4	2'-0"	5x3 1/2x5/16	3 1/2x3 1/2x5/16	4x3 1/2x5/16	1 1/4x1 1/4x1/4
51'-60'	2'-0"	5x3 1/2x5/16			1 1/4x1 1/4x1/4	2'-6"	5x3 1/2x5/16			1 1/4x1 1/4x1/4	2'-6"	5x3 1/2x5/16			1 1/2x1 1/2x1/4
61'-70'	2'-6"	5x3 1/2x5/16			1 1/2x1 1/2x1/4	3'-0"	5x3 1/2x5/16			1 1/2x1 1/2x1/4	3'-0"	6x4x3/8			2x2x1/4
71'-80'	3'-0"	6x4x3/8			1 3/4x1 3/4x1/4	3'-6"	6x4x3/8			2x2x1/4	3'-6"	6x4x3/8			2x2x1/4
81'-90'	3'-0"	6x4x3/8			1 3/4x1 3/4x1/4	3'-6"	6x4x3/8			2x2x1/4	3'-6"	6x4x3/8			2x2x1/4
91'-100'	3'-0"	6x4x3/8			1 3/4x1 3/4x1/4	3'-6"	6x4x3/8			2x2x1/4	3'-6"	6x4x3/8			2x2x1/4
101'-110'	3'-0"	7x4x7/16			2x2x1/4	3'-6"	7x4x7/16			2x2x1/4	3'-6"	7x4x7/16			2x2x1/4
111'-120'	3'-0"	7x4x7/16			2x2x1/4	3'-6"	8x4x1/2			2x2x1/4	3'-6"	8x4x1/2			2 1/2x2 1/2x1/4
121'-132'	3'-6"	8x4x1/2			2x2x1/4	3'-6"	8x4x5/8			2 1/2x2 1/2x1/4	3'-6"	8x4x5/8			2 1/2x2 1/2x1/4
133'-145'	3'-6"	8x4x5/8			2x2x1/4	3'-6"	8x4x5/8			2 1/2x2 1/2x1/4	3'-6"	8x4x5/8			2 1/2x2 1/2x1/4

TABLE XII

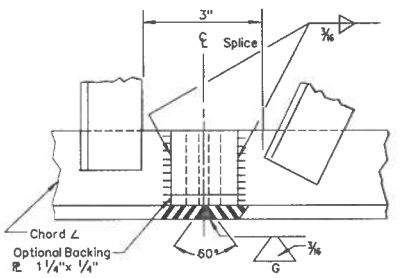
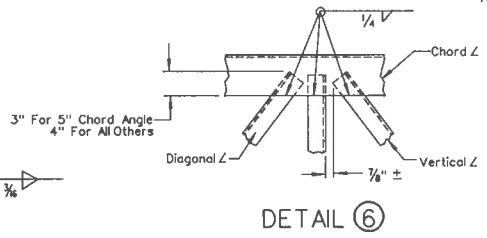
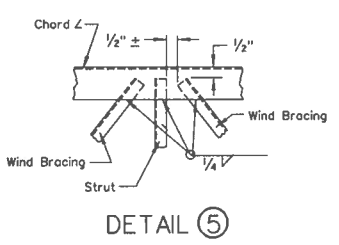
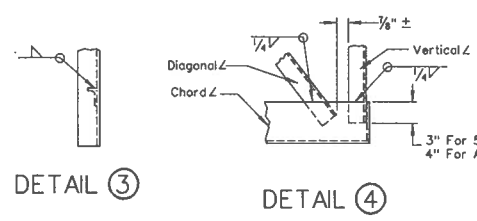
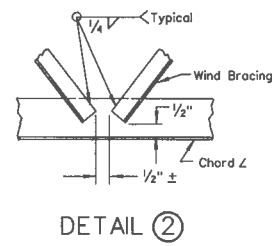
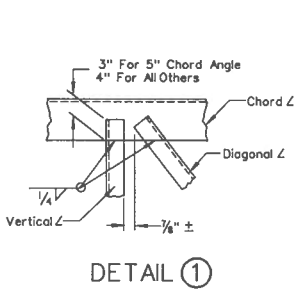
STATE OF NEVADA
 DEPARTMENT OF TRANSPORTATION

**OVERHEAD SIGNS-TWO POST
 STRUCTURAL FRAME MEMBERS**

P.D. Kim
 CHIEF TRAFFIC ENGINEER

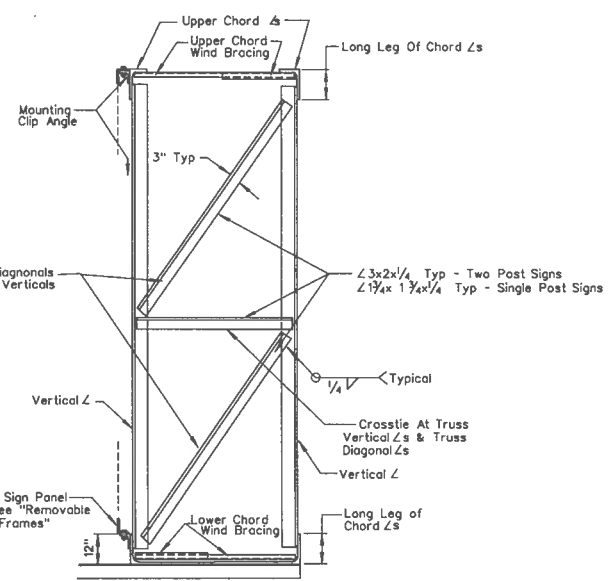
T-36.1.S (627)
 ADOPTED: 8/69 REVISION

T-84B



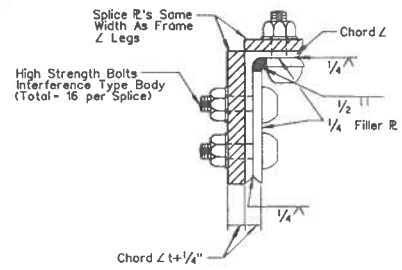
WELDED CHORD SPLICE

- Note:
1. Prepare Edges By Beveling to Angle Shown.
 2. Weld to 100% Full Penetration.
 3. Grind Flush With Base Metal.



TYPICAL SECTION J-J

Note:
Diagonal L's in Plane of Truss, Not Shown. Bracing Shown Is At All Vertical L's Of Truss.



SECTION T-T

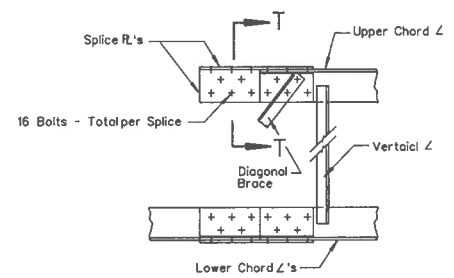
SPLICE NOTES

Specifications:
The Bolted Splice Shall Conform To Current "Specifications For Structural Joints Using ASTM A325 Bolts", Approved By The Research Council On Riveted And Bolted Structural Joints Of The Engineering Foundation.

Location of Splices:
The Splice Shall Be Located So As Not To Interfere With Mounting The Walkway Brackets Or The Clip Angles For The Removable Sign Panel Frame. The Wind Bracing In The Area Of The Bolted Chord Splice Will Be Bolted To The Chord Angles With a 3/8" Unfinished Bolt, With Hex Head and Nut, 2 Cut Washers And Lock Washer.

Bolts:
The Bolts Shall Be High Strength With An Interference Type Body And Torqued To The Required Amount As Stated In The Above Specifications.

Filler R:
The Plates Welded To The Angle Legs On The Inside Shall Be Welded Before Punching The Bolt Holes. They Shall Be The Same Length As The Cover Plates. The Plates Are Not Necessary On The Single Post Signs If The Splice Is Located Over 1/3 Of The Cantilever Length From The Post. Alternative Splice Details May Be Used If Approved By The Engineer.



OPTIONAL BOLTED CHORD SPLICE

BOLTED CHORD SPLICE TWO POST SIGNS	
Chord L	Nominal Bolt Diam.
5x3 1/2 x 3/8	3/4"
6x4 x 3/8	7/8"
7x4 x 1/2	1"
8x4 x 1/2	1 1/8"
8x4 x 3/4"	1 1/4"

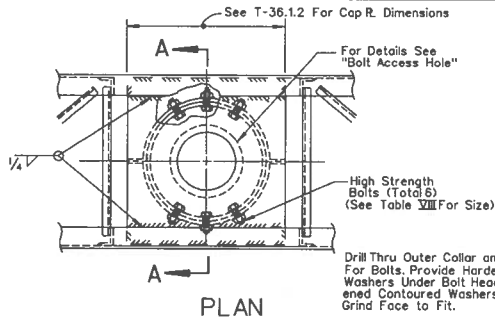
SINGLE POST SIGNS	
Chord L	Nominal Bolt Diam.
5x3 x 3/8	3/2"
5x3 x 1/2	3/4"

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

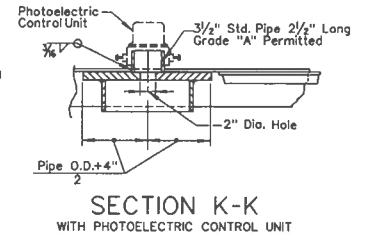
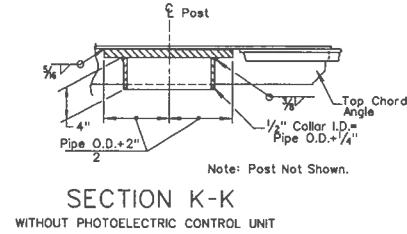
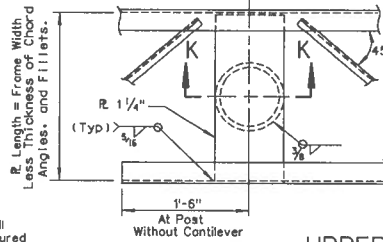
OVERHEAD SIGNS
STRUCTURAL FRAME DETAILS

P.D. Kiers
CHIEF TRAFFIC ENGINEER

T-36.1.6 (627)
ADOPTED: 8/69 REVISION 3-10/94

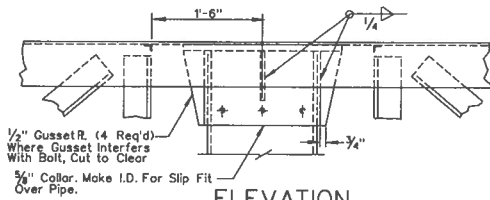


Drill Thru Outer Collar and Post Wall For Bolts. Provide Hardened Contoured Washers Under Bolt Head and Nut. Hardened Contoured Washers to Be 3"x3"x $\frac{3}{16}$ " Min. Grind Face to Fit.

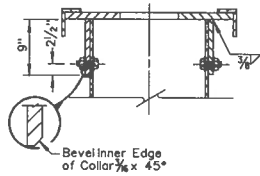


SECTION K-K
WITHOUT PHOTOELECTRIC CONTROL UNIT
UPPER CHORD CONNECTION TO POST
TWO POST TYPE

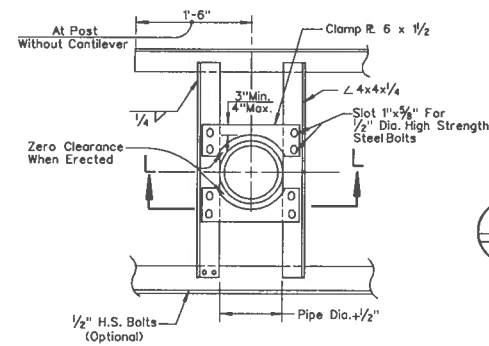
SECTION K-K
WITH PHOTOELECTRIC CONTROL UNIT



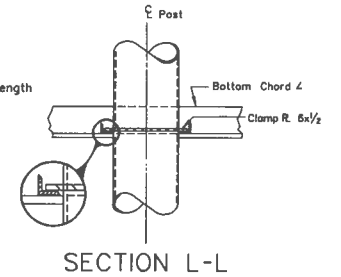
ELEVATION
UPPER JUNCTURE CONNECTION
SINGLE POST TYPE



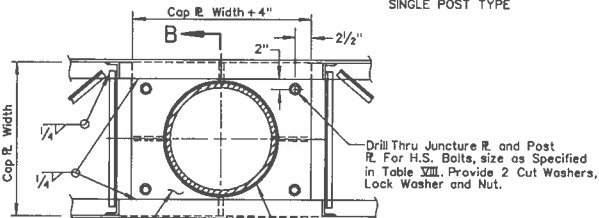
SECTION A-A



LOWER CHORD CONNECTION TO POST
TWO POST TYPE



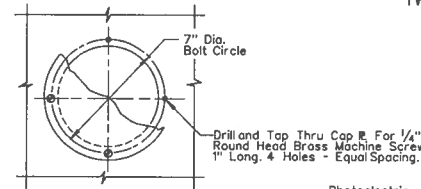
SECTION L-L



Lower Juncture R. Same Thickness as Corresponding Cap R.
Cut or Bore Thru Juncture R. For Post. Hole Diameter = Post O.D. + 1" Max.

PLAN

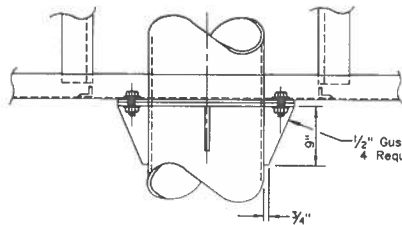
TABLE VIII	
Post Type	Bolt Size
I	3/4"
II	7/8"
III	1"
IV	1 1/8"
V	1 1/4"
VI	1 1/2"
VII	1 3/4"
VIII	2"



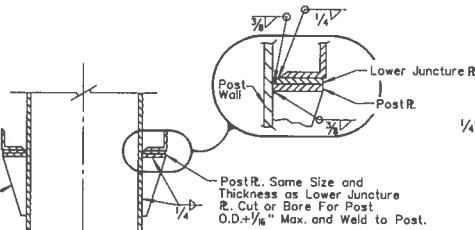
PLAN

Notes: (SINGLE POST TYPE)

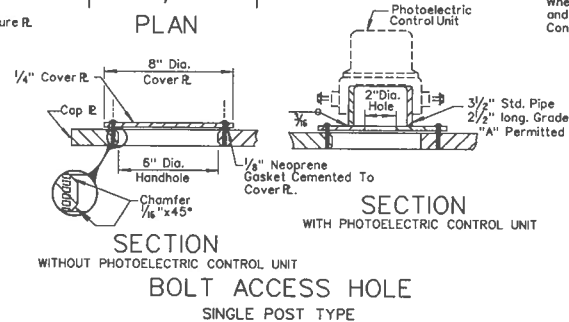
1. Drilled Holes for Unfinished Bolts Shall Not Exceed Nominal Bolt Diameter by More Than $\frac{1}{16}$ ".
2. All Bolts, Nuts and Washers Shall Be Galvanized.
3. In All Cases, Sign Frame Shall Be Supported At Top of Post. Bearing Surface at Top of Post Shall Be Finished True.
4. At Lower Juncture Connection, Shims Shall Be Used Where Any Clearance Exists Between Bottom of Frame and Post R. Prior to Tightening of Bolts in Lower Connection. Shims May Be Galvanized Steel Cut Washers.



ELEVATION
LOWER JUNCTURE CONNECTION
SINGLE POST TYPE



SECTION B-B



SECTION
WITHOUT PHOTOELECTRIC CONTROL UNIT
SECTION WITH PHOTOELECTRIC CONTROL UNIT
BOLT ACCESS HOLE
SINGLE POST TYPE

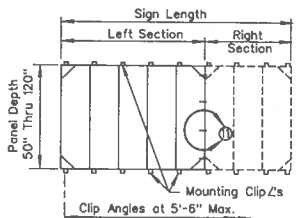
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

**OVERHEAD SIGNS
FRAME JUNCTURE DETAILS**

PDK
CHIEF TRAFFIC ENGINEER

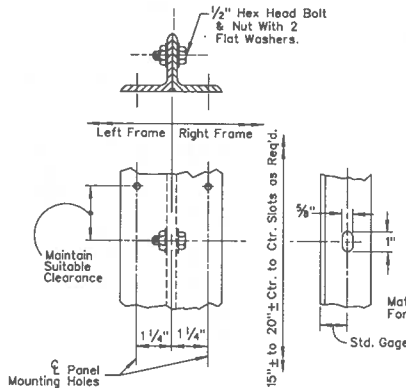
T-36.1.7 (627)
ADOPTED: 8/69 REVISION 2/79

NOTES:
 Frames for Signs Greater than 20'-0" in Length Shall be Fabricated in Two Sections With Left Section A Multiple of 4'-0" in Length. See Table A.
 Sections Shall be Hoisted into Place Individually and Bolted Together As Per Detail (11) Prior to Tightening of Mounting Clip Bolts.
 Bolting Two Sections Together and Hoisting Simultaneously Will Not be Permitted.



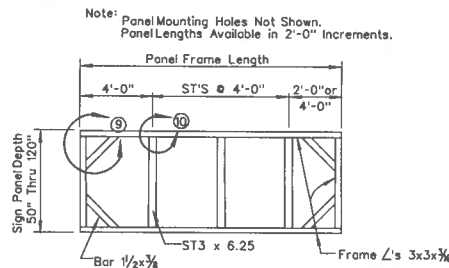
**REMOVABLE FRAME
 GREATER THAN 20'-0"**

Sign Length	Left Section	Right Section
22'-0"	12'	10'
24'-0"	12'	12'
26'-0"	12'	14'
28'-0"	16'	12'
30'-0"	16'	14'
32'-0"	16'	16'
34'-0"	16'	18'
36'-0"	20'	16'
38'-0"	20'	18'
40'-0"	20'	20'

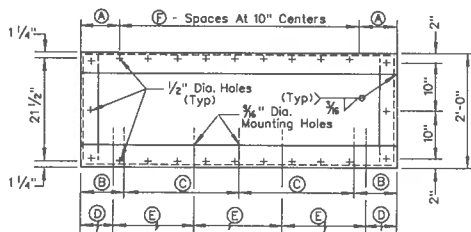


DETAIL (11)

Panel Depth	No. of Slots
50"	2
70"	3
80" & 90"	4
100" & 110"	5
120"	6



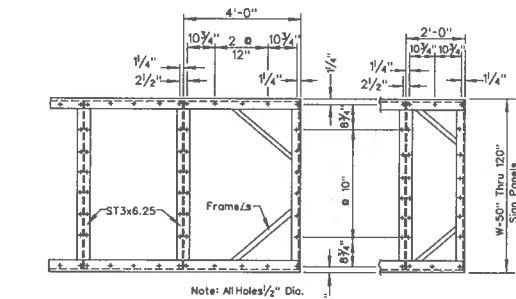
**TYPICAL REMOVABLE FRAME
 (4'-0" THRU 20'-0")**



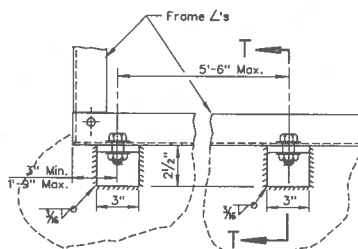
TYPICAL EXIT PANEL FRAMES

Frame Width	A	B	C	D	E	F
5'-6"	0'-8"	0'-9"	2'-0"	—	—	5
7'-0"	0'-7"	—	2'-0"	—	—	7
8'-6"	0'-6"	—	—	1'-3"	2'-0"	9

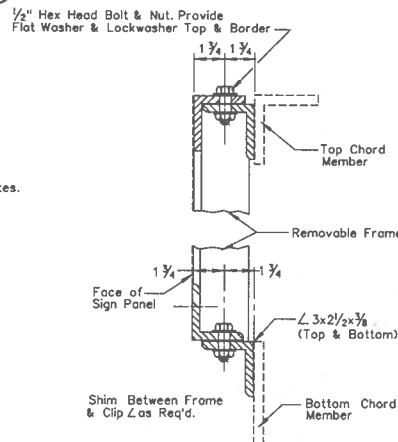
NOTES:
 1. Frame L's Shall Be 3"x3"x3/16" ASTM-A36
 2. 1/2" Panel Mounting Holes Shall Be Drilled With Templates.
 3. Holes For Mounting Sign May Be Slotted 1".
 4. Mount Exit Frame At Right Edge of Removable Frame So Front Faces Are Flush.



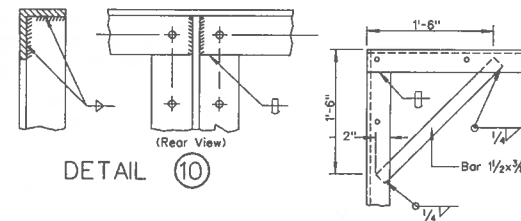
**TYPICAL 4'-0" PANEL
 MOUNTING HOLE SPACING FOR SIGN PANEL & FRAME**



FRAME MOUNTING DETAILS



DETAIL (10)

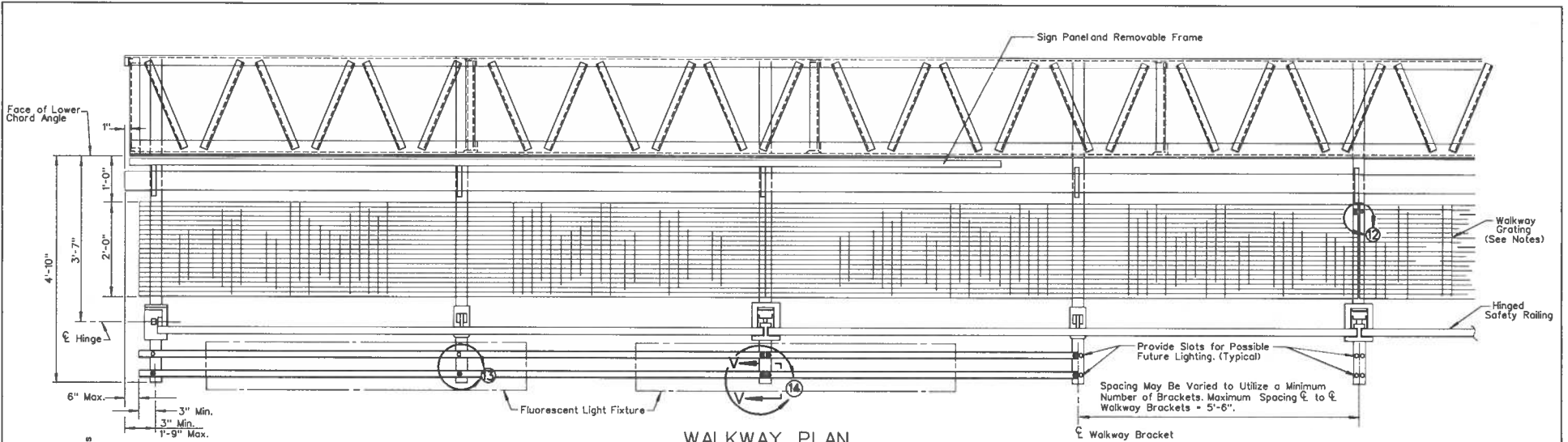


DETAIL (9)

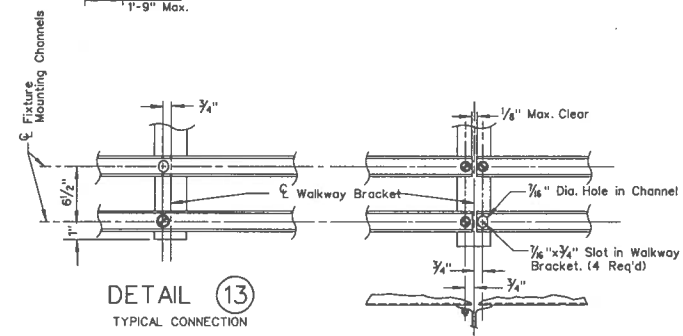
TYPICAL JOINT DETAILS

NOTES:
 1. Frames Shall Be All-Welded Construction
 2. 1/2" Panel Mounting Holes Shall Be Drilled By Template. Sign Panel May Be Considered a Template.
 3. Drilled and Tapped Holes (1/4" -20 N.C.) May Be Used Where Interference Due To Welds or Structural Members Is Encountered.
 4. ST3x6.25 Faces Shall Be Flush With Faces of Frame Angles.
 5. Mounting Clip Angles Shall Be Located Such as to Allow The Top and Bottom Frame Angles of the Removable Sign Panel Frame to Lie On a Straight Horizontal Line.
 6. Holes for Mounting Removable Sign Panel Frame May Be Slotted 1" Maximum Parallel to the Axis of The Sign.
 7. ST3x6.25 May Be Crimped at Ends to Join Frame Angles. Fillet Weld All Around.
 8. Panels Shall Be 2'-0" Minimum and 4'-0" Maximum.

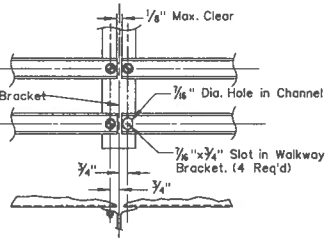
STATE OF NEVADA DEPARTMENT OF TRANSPORTATION	
OVERHEAD SIGNS REMOVABLE SIGN PANEL FRAMES	
<i>PDK</i> CHIEF TRAFFIC ENGINEER	T-36.1.8 (627) ADOPTED: 8/69 REVISION 2-2/79



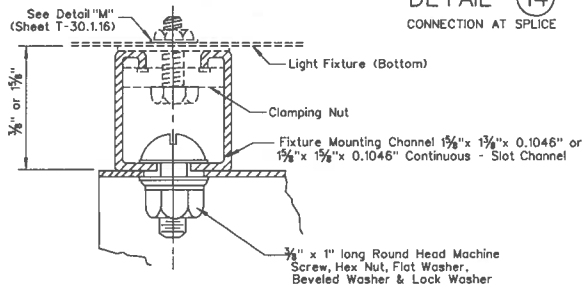
WALKWAY PLAN



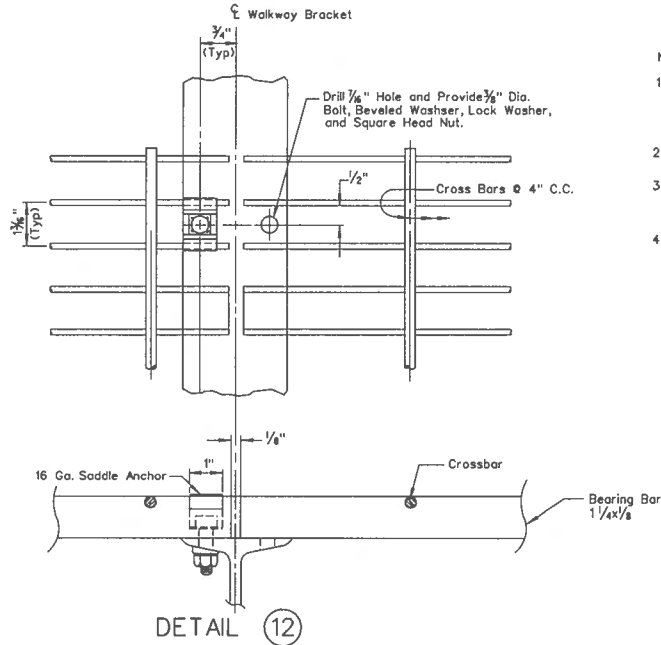
DETAIL 13
TYPICAL CONNECTION



DETAIL 14
CONNECTION AT SPLICE



SECTION V-V

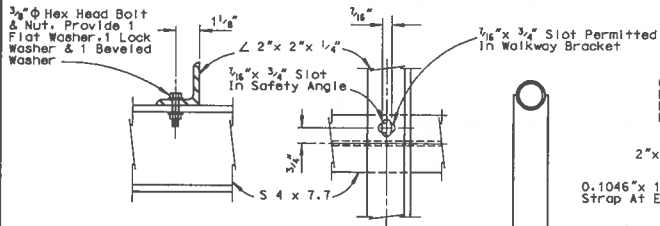


DETAIL 12

Notes:

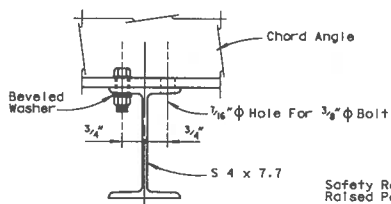
1. Welded-Type Grating Shall Have $1\frac{1}{4}"\times\frac{1}{8}"$ Bearing Bars ϕ $1\frac{1}{8}"$ Centers with $\frac{1}{4}"$ Diameter (or Equal) Cross Bars ϕ 4" Centers. See Detail 12. If Mechanical Lock Grating is Used It Shall Be Equal in Strength To The Welded-Type. Alternate Hold Down Clips May Be Submitted for Approval.
2. For Spacing of Lighting Fixtures See Table of Spacings on "Fluorescent Sign Lighting Equipment" Sheet.
3. Walkway Grating and Light Fixture Mounting Channels to Be Continuous (No Splices) Over As Many Walkway Brackets As Practicable Consistent With Fabrication, Ease of Handling and Assembling.
4. Bolts, Nuts, Washers, Etc. To Be Galvanized.

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION	
OVERHEAD SIGNS WALKWAY DETAILS NO. 1	
<i>P.D. Kiser</i> CHIEF TRAFFIC ENGINEER	T-36-1.9 (627) ADOPTED: 8/69 REVISION 3-27/79



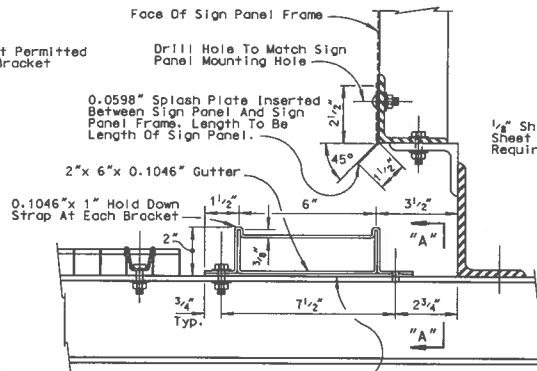
SAFETY ANGLE DETAILS

NOTE: On Structure Mounted Signs Replace Gutter With A $\angle 2" \times 2" \times 1/4"$ Positioned With Gage Line 7 Inches From Mounting Bracket $\angle 5" \times 3" \times 1/4"$.



SECTION "B"-"B"

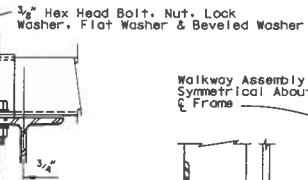
Safety Rail In Raised Position



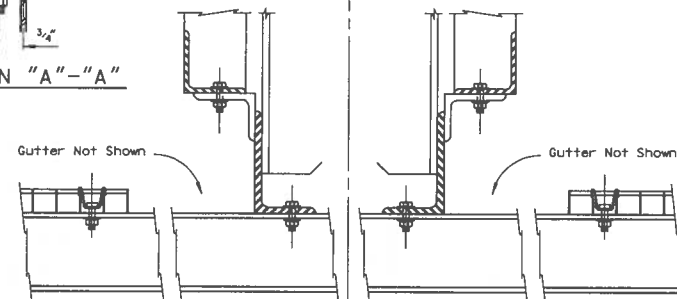
TYPICAL GUTTER SECTION

Shim As Necessary To Provide Slope. No Shims Necessary If Camber is Adequate To Prevent Ponding In Gutter After Erection.

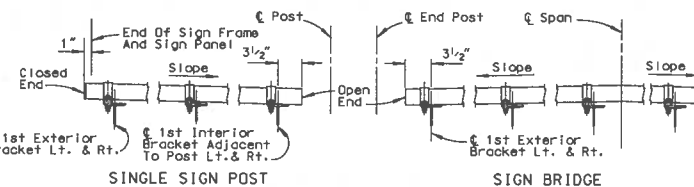
SECTION "A"-"A"



Walkway Assembly Symmetrical About ϵ Frame



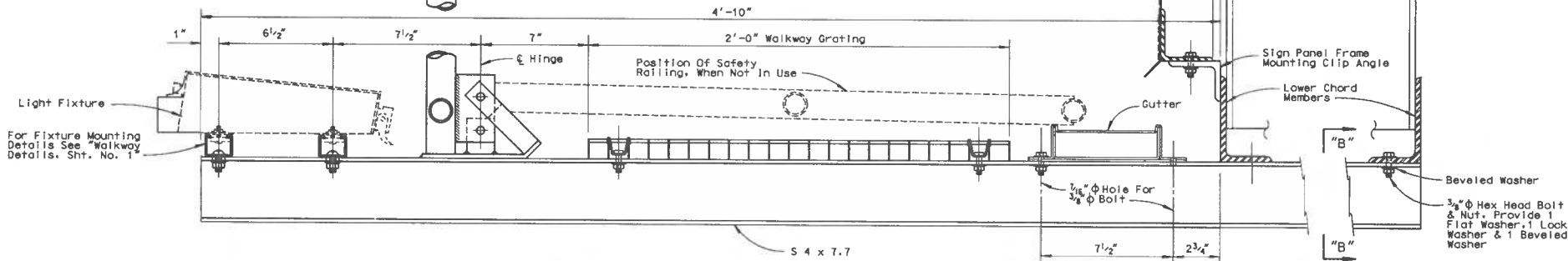
FOR DOUBLE-FACED SIGN FRAMES



GUTTER DETAILS

SINGLE SIGN POST

SIGN BRIDGE



WALKWAY ASSEMBLY

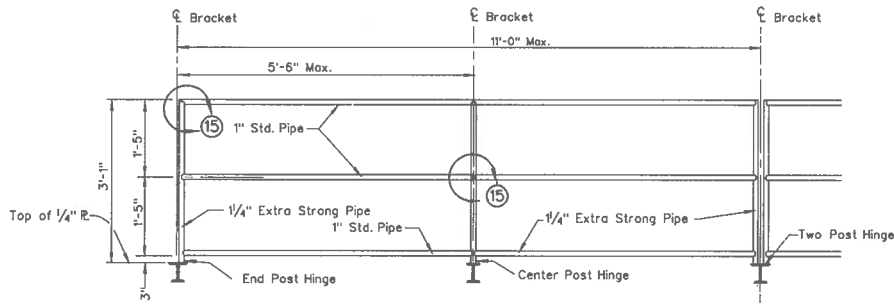
NOTE: For Spacing Of Lighting Fixtures. See Table Of Spacing On "Sign Lighting Equipment" Sheet T-30.1.16

NOTES:
Gutter Sections To Be Made In Convenient Lengths And Welded Or Brazed Together In The Field.
On Sign Bridges Where Panels Face Two Directions End Gutters $1\pm$ Post Edge Of Panels Nearest To ϵ Span.

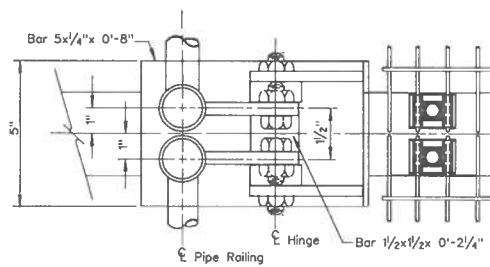
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

OVERHEAD SIGNS
WALKWAY DETAILS NO. 2

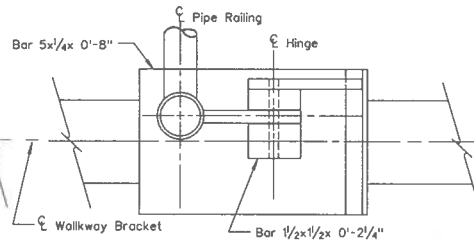
T-36.1.10 (6271)
ADOPTED: 8/69 REVISION: 3-2/79



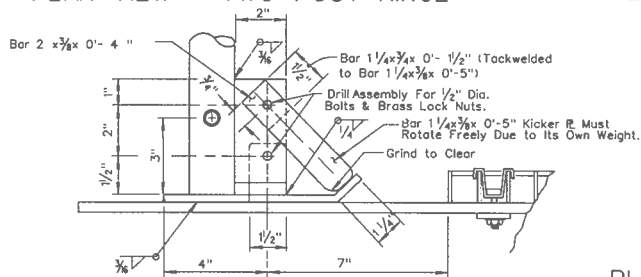
ELEVATION



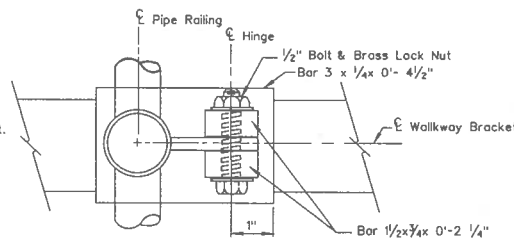
PLAN VIEW - TWO POST HINGE



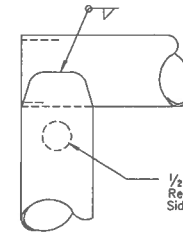
PLAN VIEW - END POST HINGE



ELEVATION

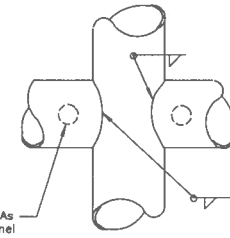


PLAN VIEW - CENTER POST HINGE

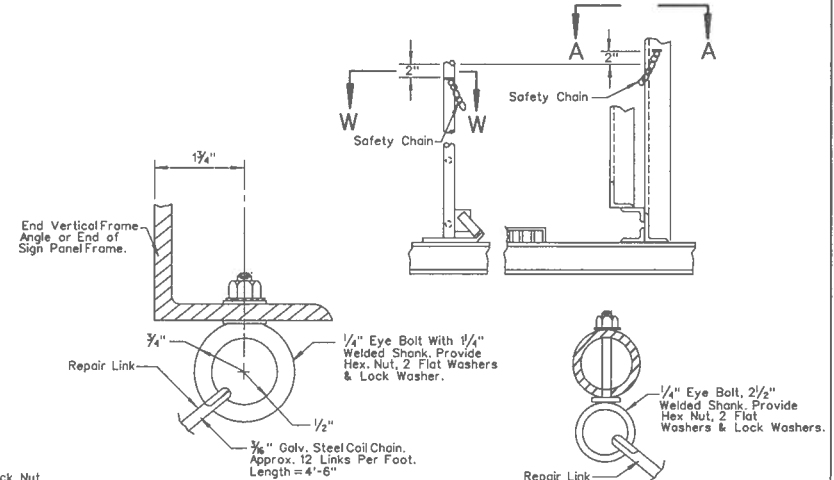


DETAIL 15

Note:
Alternative Venting Methods May Be
Used If Approved by The Engineer.



DETAIL 16



SECTION A-A

SECTION W-W

CHAIN ASSEMBLY

Note:

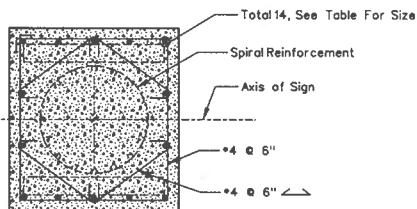
1. Special Care Shall Be Taken to Insure That The Completed Hinge and Latch Assembly Will Hold The Safety Railing In A Steady Manner, Free of Wobble While in the Raised Position. Maximum Allowable Displacement From Vertical at Top of Railing When Latched Shall Be 1".
2. Details For Bolting Hinge Base R. to Walkway Bracket May Be Submitted for Approval.
3. Alternative Details Approved By The Engineer May Be Substituted For The Safety Chain Connections Shown.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

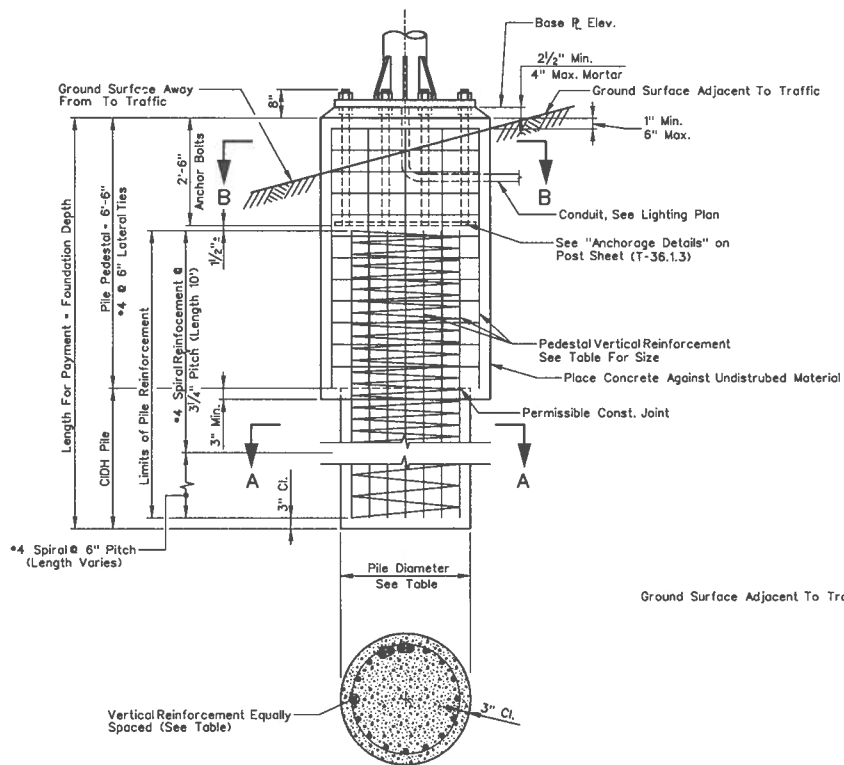
OVERHEAD SIGNS
WALKWAY SAFETY RAILING DETAILS

PDK
CHIEF TRAFFIC ENGINEER

.T-36.1.11 (627)
ADOPTED: 8/69 REVISION
2-2779



SECTION B-B



SECTION A-A

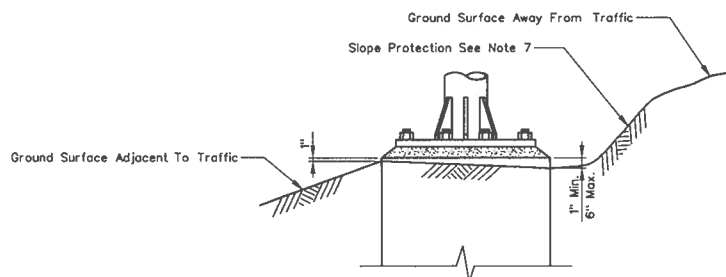
POST TYPE	ANCHOR BOLTS	PEDESTAL SIZE	REINFORCING STEEL VERTICAL	PILE DIAMETER	FOUNDATION DEPTH **
II	6 - 2"	2'-11" X 2'-10"	14 - # 7	30"	14'
III	6 - 2"	3'-2" X 2'-10"	14 - # 8	30"	14'
IV	6 - 2"	3'-8" X 3'-4"	16 - # 8	36"	17'
V	10 - 2"	3'-10" X 3'-7"	16 - # 9	36"	17'
VI	10 - 2"	3'-10" X 3'-7"	16 - #10	36"	18'
VII	12 - 2"	4'-3" X 3'-11"	16 - #11	36"	21'
VIII	12 - 2"	4'-5" X 3'-11"	# 24 - #11	36"	22'
I-S	6 - 2"	2'-10" X 2'-10"	14 - # 7	30"	14'
II-S	6 - 2"	3'-1" X 2'-10"	14 - # 8	30"	16'
III-S	6 - 2"	3'-4" X 2'-10"	14 - #10	30"	18'
IV-S	8 - 2"	3'-6" X 3'-4"	16 - #10	36"	19'
V-S	8 - 2"	3'-9" X 3'-4"	16 - #11	36"	22'
VI-S	8 - 2"	4'-1" X 3'-4"	16 - #11	36"	23'
VII-S	8 - 2 1/4"	4'-5" X 3'-11"	# 24 - #11	36"	25'

** USE FOUNDATION DEPTH SHOWN IN TABLE UNLESS OTHERWISE SHOWN ON THE "FORMAT" SHEET.

* BUNDLED BARS

NOTES:

- FOR ANCHOR BOLT LAYOUT SEE POST SHEET (T36.1.3).
- FOR "BASE R. ELEV." SEE "FORMAT" SHEET.
- PEDESTAL AND PILE SHALL BE CLASS "A" OR CLASS "AA" PCC
- PEDESTALS & BASE PLATES, LONGER SIDES SHALL BE NORMAL TO AXIS OF SIGN.
- PRIOR TO ERECTION OF THE POST, BACKFILL WHICH IS EQUIVALENT TO THE SURROUNDING MATERIAL SHALL BE IN PLACE.
- PEDESTAL SHALL BE FORMED 6" MIN. BELOW GROUND SURFACE. REMAINDER TO BE PLACED AGAINST UNDISTURBED MATERIAL.
- SLOPE PROTECTION REQUIRED WHEN INDICATED ON THE ROAD PLANS.

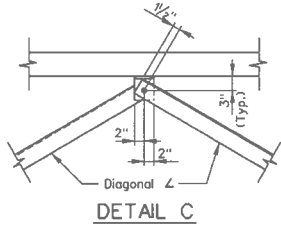
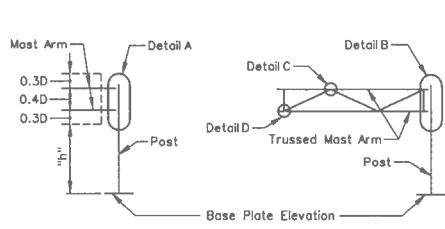


DETAIL C

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

OVERHEAD SIGNS
ALTERNATE PILE FOUNDATION

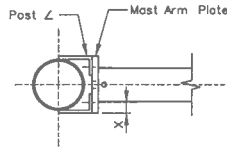
P.D. Kline
CHIEF TRAFFIC ENGINEER
T-36.1.12 (627)
ADOPTED: 8/69 REVISION: 3-4/79



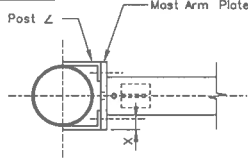
DOUBLE MAST ARM SERIES TRUSSED MAST ARM SERIES

TYPE C1

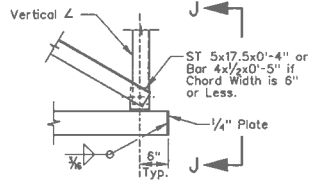
TYPE C2



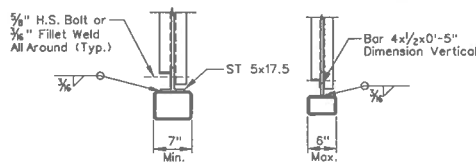
SECTION F-F



SECTION G-G

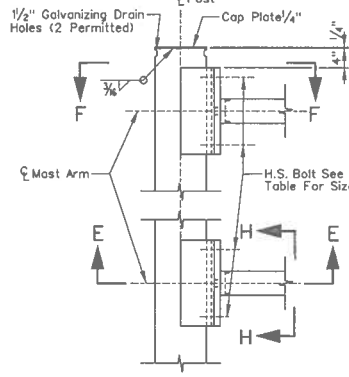


DETAIL D

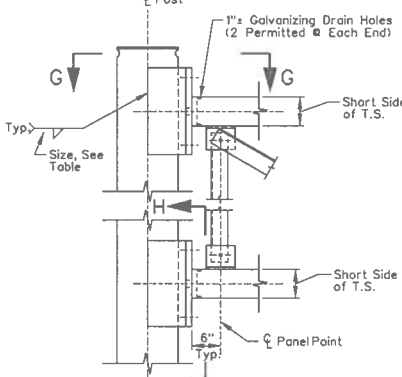


VIEW J-J

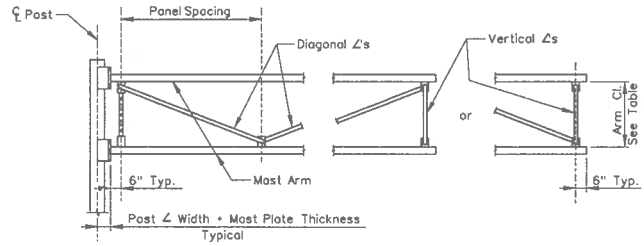
POST ANGLES			
POST SIZE	ANGLE	X	WELD
6	∠ 5X3X1/2	1 3/4"	1/4"
8	∠ 6X4X3/8	2 1/4"	1/4"
10	∠ 7X4X3/8	2 1/4"	1/4"
12	∠ 8X4X3/4	2 1/4"	5/16"
14	∠ 8X4X3/4	2 1/4"	5/16"



DETAIL A



DETAIL B



SIGN DEPTH INCHES	ARM CLEARANCE	MAX. PANEL SPACING	VERTICAL ANGLE	DIAGONAL ANGLE
D=40"-70"	2'-0"	4'-4"	∠ 2X2X1/4	∠ 2X2X1/4
D=80"-100"	3'-0"	6'-6"	∠ 3 1/2X2 1/2X1/4*	∠ 3 1/2X2 1/2X1/4*

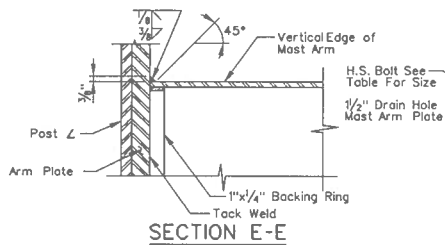
TRUSS FRAMING DATA

* Short Leg Outstanding

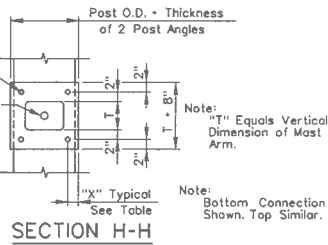
MAST ARM PLATE			
TWO ARMS	TRUSSED ARMS	PLATE	H.S. BOLT
TS 3X3X8-.80		3/4"	1/2"
TS 4X4X12-.02		1"	5/8"
TS 5X5X15-.42		1"	3/4"
TS 6X6X18-.82		1"	3/4"
TS 7X7X22-.04	TS 5X3X16-.84	1 1/4"	3/4"
	TS 6X4X21-.94	1 1/4"	7/8"
	TS 7X5X27-.04	1 1/4"	7/8"
	TS 8X6X31-.73	1 1/4"	7/8"
	TS 10X6X36-.83	1 1/4"	1"

POST TO ARM FRAMING DATA

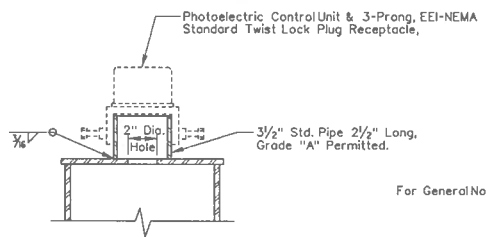
Note: For Post Connection To Base Plate See T-36.116
For Mast Arm Length And Mast Arm To Sign Panel Connections See T-36.114



SECTION E-E



SECTION H-H



PHOTOELECTRIC CONTROL UNIT

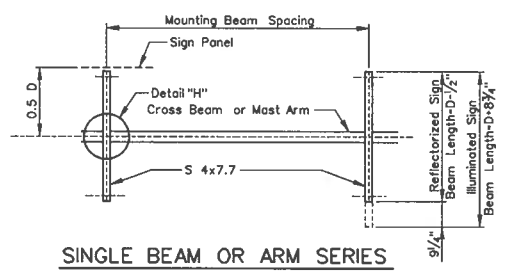
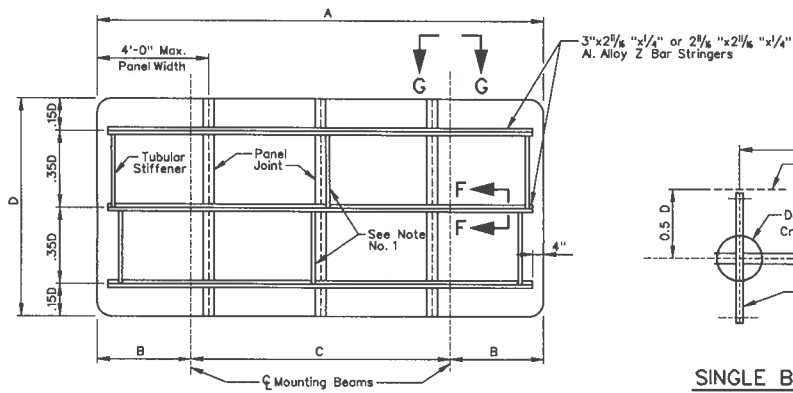
For General Notes See T-36.116

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

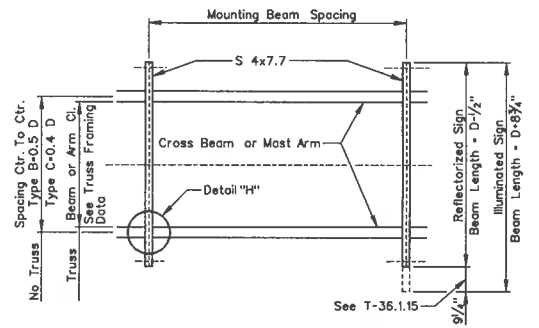
**OVERHEAD SIGNS
LIGHTWEIGHT
TYPE C
CONNECTION DETAILS**

PDK
CHIEF TRAFFIC ENGINEER

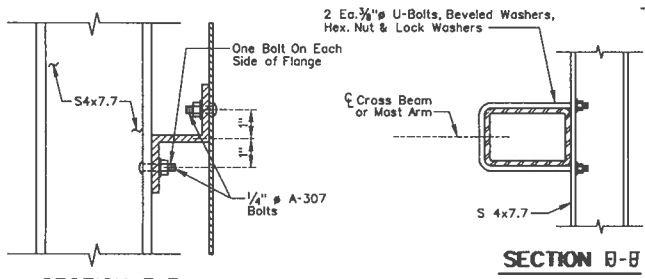
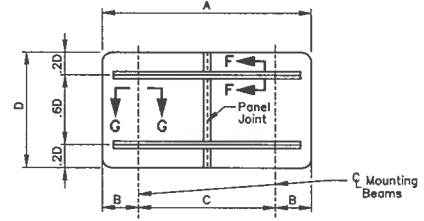
T-36.113 (627)
ADOPTED 8/79 REVISION



SINGLE BEAM OR ARM SERIES



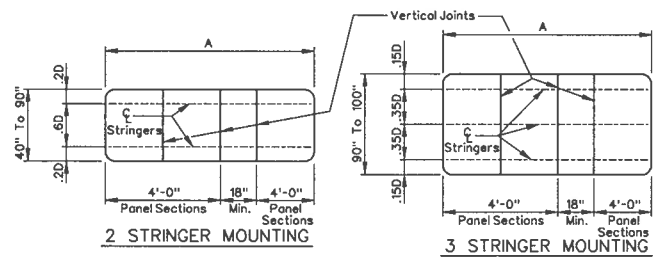
DOUBLE BEAM OR ARM SERIES



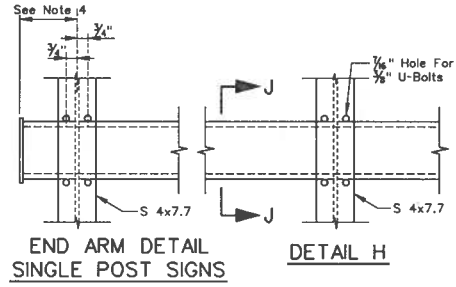
SECTION B-B

SIGN PANEL LENGTH	NUMBER MOUNTING BEAMS	SIGN PANEL OVERHANG		MOUNTING BEAM SPACING
		A	B	
5'-0"	2	9"	3'-6"	
6'-0"	2	12"	4'-0"	
7'-0"	2	15"	4'-6"	
8'-0"	2	18"	5'-0"	
9'-0"	2	21"	5'-6"	
10'-0"	2	24"	6'-0"	
11'-0"	2	27"	6'-6"	
12'-0"	2	30"	7'-0"	
13'-0"	2	30"	8'-0"	
14'-0"	2	30"	9'-0"	
15'-0"	2	36"	9'-0"	
16'-0"	2	36"	10'-0"	
17'-0"	2	39"	10'-6"	
18'-0"	2	42"	11'-0"	

MOUNTING BEAM SPACING



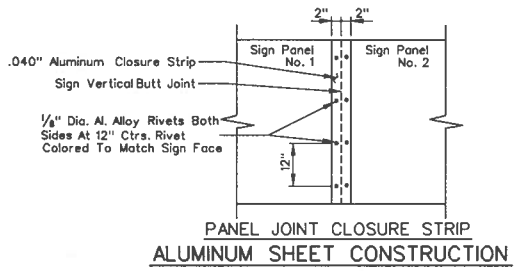
STRINGER AND PANEL ARRANGEMENT



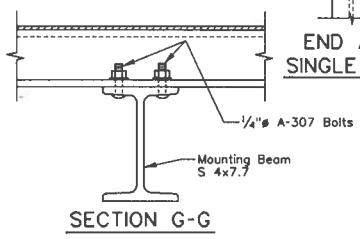
END ARM DETAIL SINGLE POST SIGNS

DETAIL H

- NOTES:
- TUBULAR STIFFENERS TO BE ADDED WHEN "A" EXCEEDS 10'-0".
 - POSITION SIGN PANEL SO THAT MOUNTING BEAMS WILL CLEAR TRUSS CONNECTIONS AND ARM TO POST JOINTS. WHERE INTERFERENCE CANNOT BE AVOIDED, 1/2" HOLES TO PASS THE 3/8" U-BOLTS MAY BE DRILLED THROUGH MAST ARM ANGLES OR TRUSS CONNECTION MEMBERS AS NECESSARY.
 - TORQUE ALUMINUM SIGN PANEL MOUNTING BOLT TO 100 IN.-LBS.
 - 11" FOR TYPE C-1 AND C-2, OTHERS 4".
 - FLAT WASHERS REQUIRED ON ALL BOLTS, 1 OR 2 AS NECESSARY.
 - ALL NUTS TO HAVE FIBER INSERTS.
 - TO OBTAIN DESIRED PANEL WIDTH, MAX. OF 2 PANELS MAY BE CUT LESS THAN 4'-0" (18" MIN. EACH).
 - TUBULAR STIFFENERS REQUIRED ONLY WHEN PANEL OVERHANG EXCEEDS 2'-0".




PANEL JOINT CLOSURE STRIP ALUMINUM SHEET CONSTRUCTION



SECTION G-G

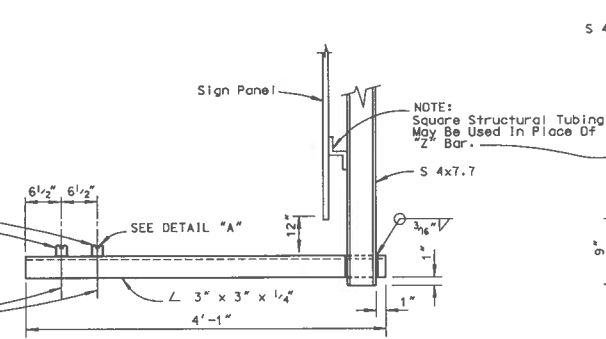
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

**OVERHEAD SIGNS
LIGHTWEIGHT SIGN
PANEL MOUNTING DETAILS**

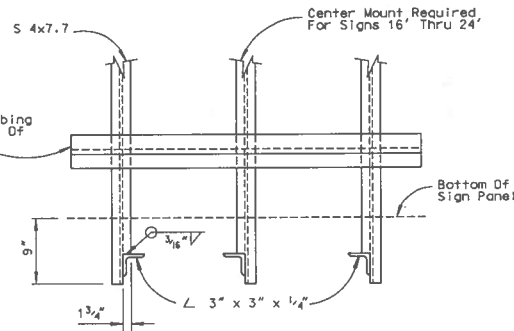
 T-36.114 (627)
 CHIEF TRAFFIC ENGINEER ADOPTED 8/79 REVISION 1-10/94

Light Fixture Mounting Channel
 1 5/8 x 1 3/8 12 Gage Continuous-
 Slot Channel Length As Required;
 Min. C + 4" For 8' Thru 14' Panels.
 C + D + 4" For 15' Thru 18' Panels.
 Max. A - 4"

Drill \angle For Mounting Screws.
 Provide 3/8" x 1" Lg. Machine
 Screws, Hex Nuts, Flat Washers
 And Lock Washers.

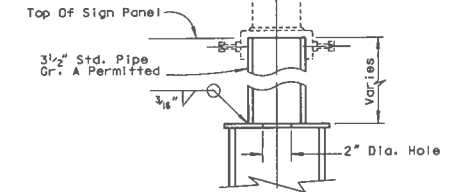


SIDE VIEW - SINGLE FACED SIGN TYPES A, B & C



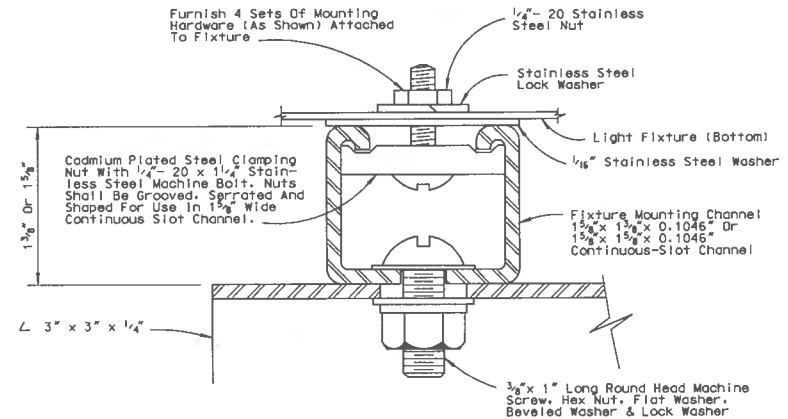
FRONT VIEW

Photoelectric Control Unit
 3-Prong, EE-NEMA Std.,
 Twist Lock Plug Receptacle

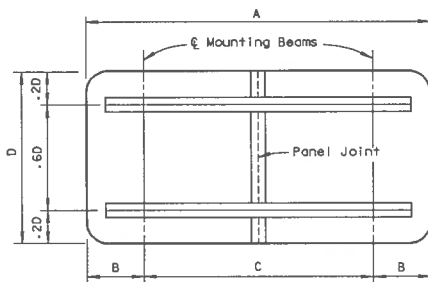


PHOTOELECTRIC
 CONTROL UNIT

LIGHT FIXTURE MOUNTING DETAIL
SIGNS GREATER THAN 5'-6" IN LENGTH



DETAIL "A"

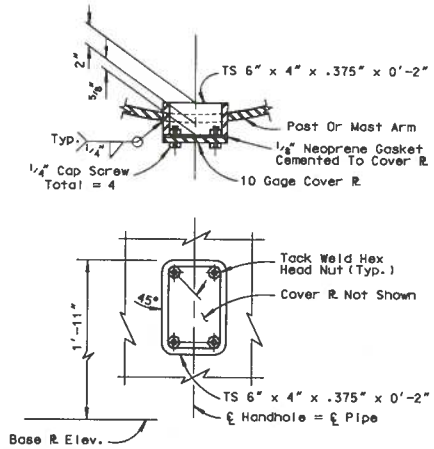
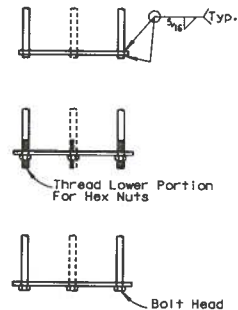
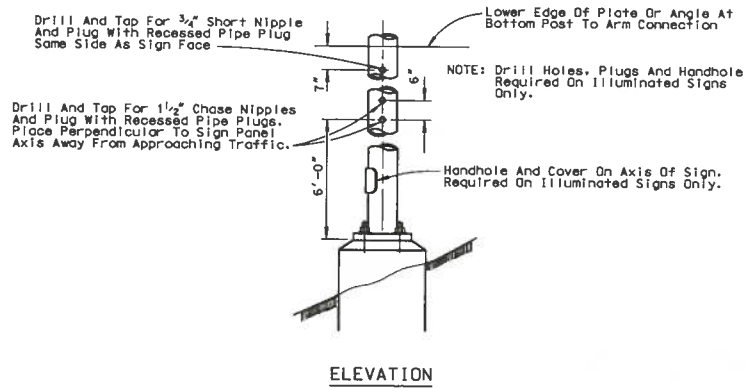


MOUNTING BEAM SPACING

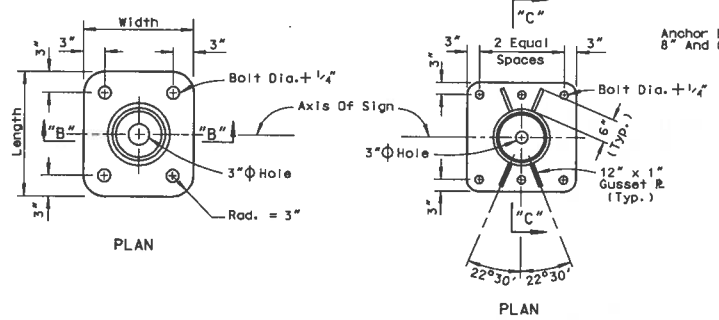
Sign Panel Length	Number Mounting Beams	Mounting Beam Spacing	
		A	C
5'-0"	2	9"	3'-6"
6'-0"	2	12"	4'-0"
7'-0"	2	15"	4'-6"
8'-0"	2	18"	5'-0"
9'-0"	2	21"	5'-6"
10'-0"	2	24"	6'-0"
11'-0"	2	27"	6'-6"
12'-0"	2	30"	7'-0"
13'-0"	2	30"	8'-0"
14'-0"	2	30"	9'-0"
15'-0"	2	36"	9'-0"
16'-0"	2	36"	10'-0"
17'-0"	2	39"	10'-0"
18'-0"	2	42"	11'-0"

STATE OF NEVADA
 DEPARTMENT OF TRANSPORTATION
**OVERHEAD SIGNS
 LIGHTWEIGHT**
 (LIGHT FIXTURE MOUNTING DETAILS)

P. D. Kline T-36.1.15 (627)
 CHIEF TRAFFIC ENGINEER ADOPTED: 8/82 (REVISION 3-10/94)



POST SIZE	BASE PLATE	ANCHOR BOLTS (Min.)
6 @ 18.97	1'-2" x 1'-2" x $1\frac{1}{2}"$	4- $1\frac{1}{2}"$
6 @ 28.57	1'-2" x 1'-2" x $1\frac{1}{2}"$	4- $1\frac{1}{2}"$
8 @ 28.55	1'-6" x 1'-6" x $1\frac{1}{2}"$	4- $1\frac{3}{4}"$
8 @ 43.39	1'-6" x 1'-6" x 2"	4-2"
10 @ 54.74	1'-8" x 1'-8" x 2"	4- $2\frac{1}{4}"$
12 @ 65.42	1'-8" x 1'-8" x 2"	4- $2\frac{1}{2}"$
14 @ 72.09	2'-4" x 2'-4" x 2"	6-2"
14 @ 106.13	2'-4" x 2'-4" x 2"	6- $2\frac{1}{4}"$



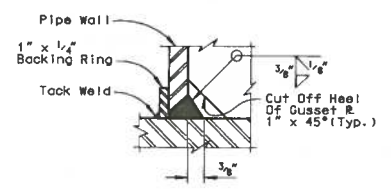
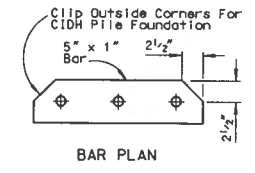
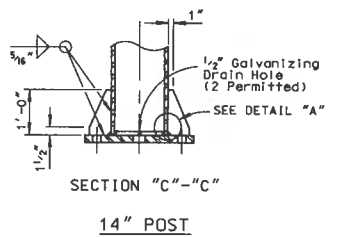
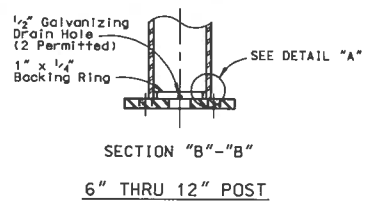
- NOTES:**
- Footings Shall Be Placed With Long Dimensions Normal To Axis Of Sign.
 - On Single Post Signs The Post Shall Be Raked Out Of Plumb With The Use Of The Leveling Nuts To Make The Bottom Of The Sign Frame Level.
 - 2" ϕ Anchor Bolts May Be Substituted For $1\frac{3}{4}"$ ϕ Bolts. $2\frac{1}{2}"$ ϕ Anchor Bolts May Be Substituted For $2\frac{1}{4}"$ ϕ Bolts.

GENERAL NOTES:

DESIGN: A.A.S.H.O. Specifications For The Design And Construction Of Structural Supports For Highway Signs, Luminaires And Traffic Signals, Dated 1975. Revised 1979.

CONSTRUCTION: Standard Specifications For Road And Bridge Construction, Current Edition And Supplements There To.

WELDING: All Welding Continuous Unless Otherwise Noted On The Plans. All Welding To Be Done In Accordance With The Standard Specifications.



BASE PLATE DETAILS

ANCHORAGE DETAILS

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

**OVERHEAD SIGNS
LIGHTWEIGHT
POST DETAILS**

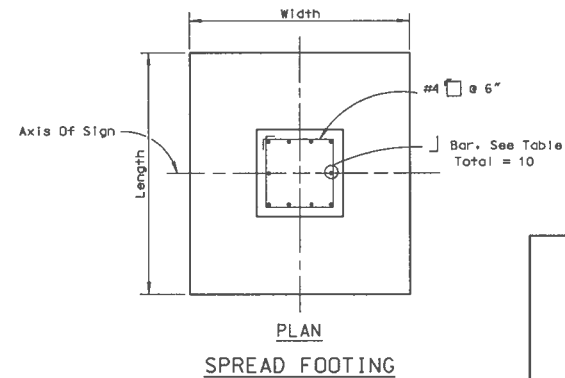
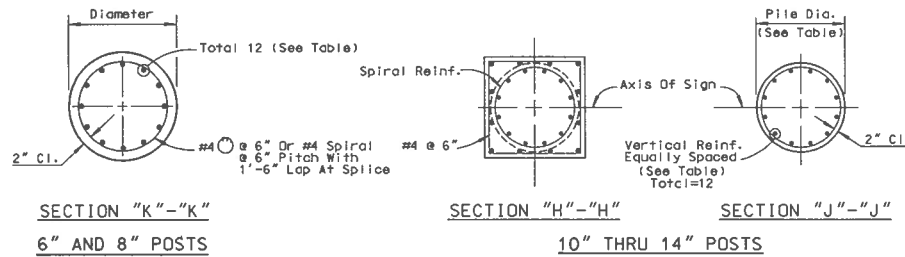
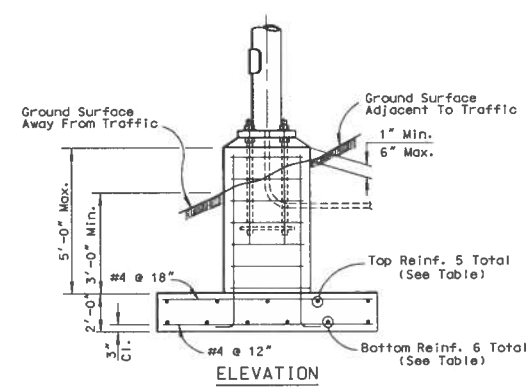
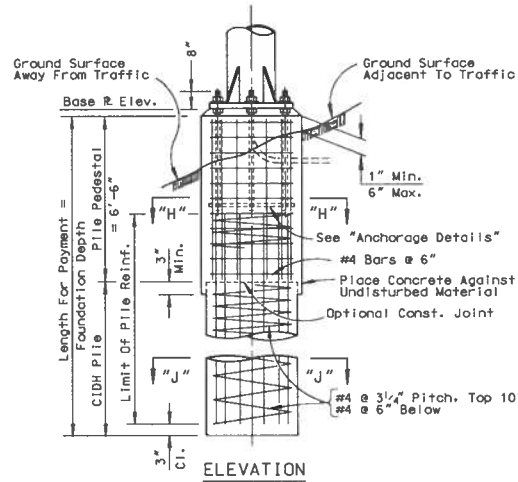
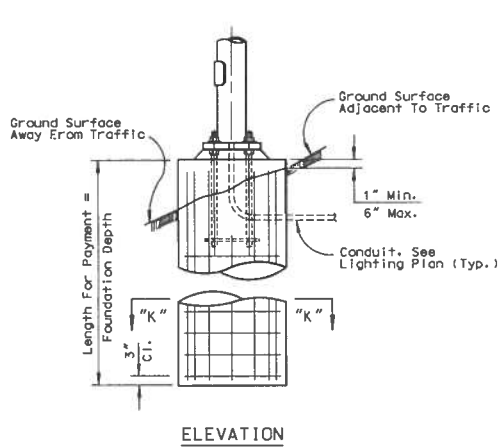
T-36.1.16 (627)

ADOPTED: 8/73 REVISION: 1-84

POST SIZE	PILE FOUNDATION				SPREAD FOOTING			
	Pedestal	Pile Dia.	Fdn. Depth	Reinf. Size	Pedestal	Footing	Reinf.	
							Top	Bot. J Bar
6 @ 18.97		24"	8'	#5	1'-10"x 1'-10"	4'-0"x 6'-0"	#4	#4 #5
6 @ 28.57		24"	9'	#5	1'-10"x 1'-10"	4'-0"x 7'-0"	#4	#4 #5
8 @ 28.55		30"	9'	#6	2'-2"x 2'-2"	5'-0"x 8'-0"	#4	#4 #5
8 @ 43.39		30"	11'	#7	2'-2"x 2'-2"	6'-0"x 9'-0"	#4	#5 #5
10 @ 54.74	2'-10"x 2'-10"	30"	13'	#8	2'-4"x 2'-4"	7'-0"x 10'-0"	#5	#7 #7
12 @ 65.42	2'-10"x 2'-10"	30"	15'	#10	2'-4"x 2'-4"	7'-0"x 12'-0"	#6	#8 #8
14 @ 72.09	3'-4"x 3'-4"	36"	15'	#10	2'-11"x 2'-11"	7'-0"x 13'-0"	#7	#9 #8
14 @ 106.13	3'-4"x 3'-4"	36"	16'	#10	2'-11"x 2'-11"	8'-0"x 14'-0"	#7	#9 #8

NOTES:

1. Backfill Shall Be In Place Prior To Erection Of Post.
2. Slope Protection Required When Indicated On The Plans.
3. Pile Pedestal Shall Be Formed 6" Min. Below Ground Surface. Remainder Shall Be Placed Against Undisturbed Material.

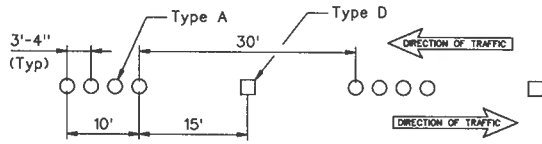


STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

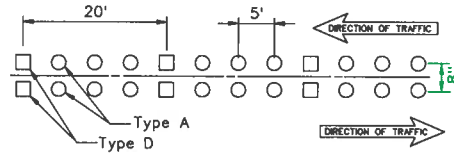
**OVERHEAD SIGNS
LIGHTWEIGHT
FOUNDATION**

P.D. King
CHIEF TRAFFIC ENGINEER

T-36.1.17 (627)
ADOPTED: 8/79 REVISION: 1-10/84

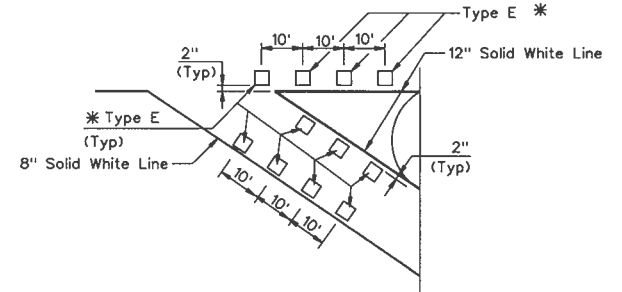


CENTER LANE TWO WAY TRAFFIC

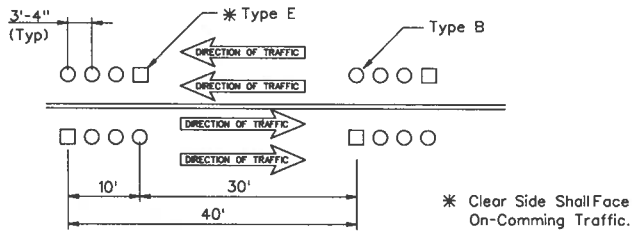


DOUBLE YELLOW CENTER LINE

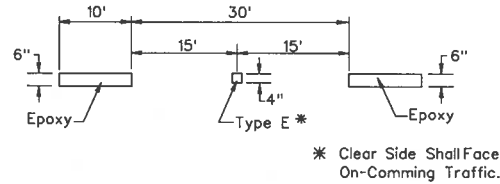
* Clear Side Shall Face On-Coming Traffic.



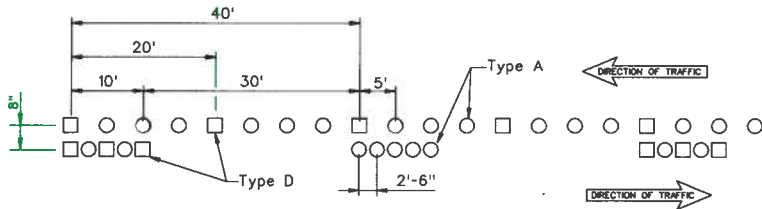
EXIT RAMP GORE STRIPING



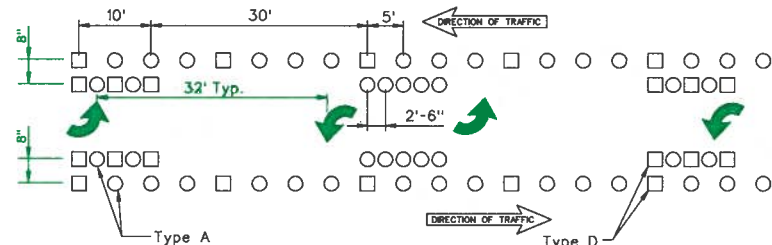
LANE LINE



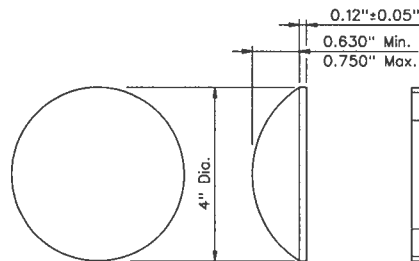
LANE LINE (FREEWAY)



ONE WAY PASSING ZONE



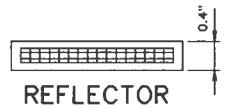
TWO WAY LEFT TURN LANE



NON-REFLECTIVE & REFLECTIVE MARKERS

Type A - Non-Reflective Yellow Marker
Type B - Non-Reflective White Marker

Type C - One Way Clear Reflective Marker
Type D - Two Way Yellow Reflective Marker
Type E - Red/Clear Reflective Marker



REFLECTOR

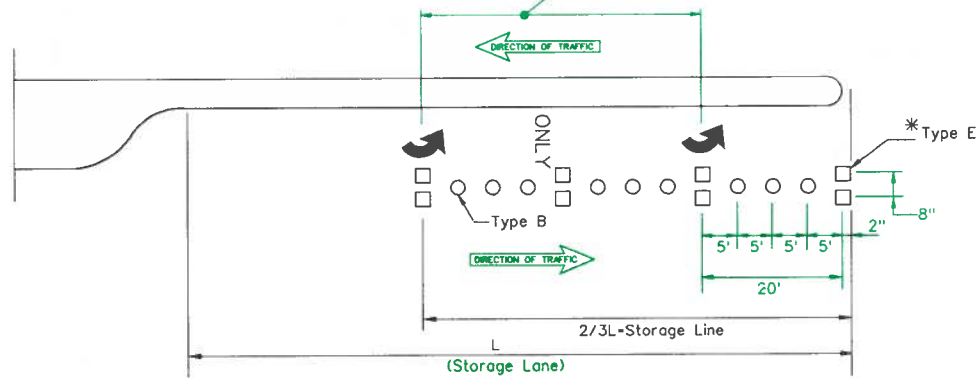
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

RAISED
PAVEMENT MARKERS

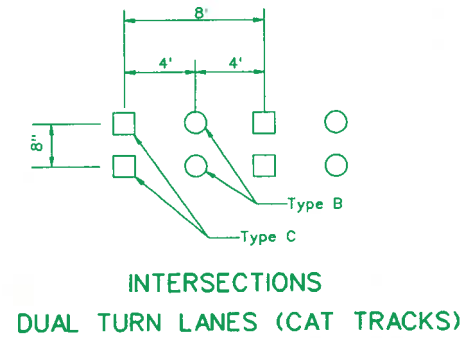
DDK CHIEF TRAFFIC ENGR	T 37.1.1 (633)	REVISION
	ADOPTED 2/78	1-10/84

FOR ARROWS & LEGEND DETAILS SEE SHT. T-38.1

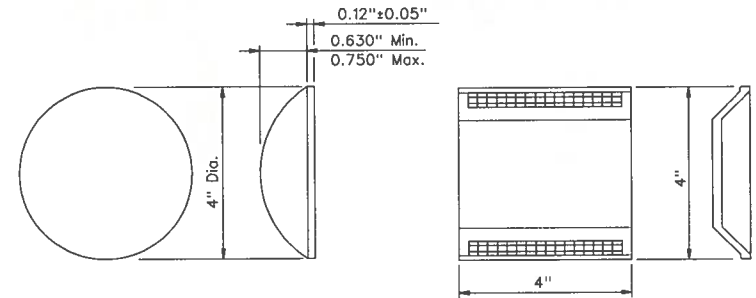
* Clear Side Shall Face On-Comming Traffic.



STORAGE LINE

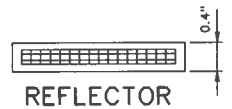


INTERSECTIONS
DUAL TURN LANES (CAT TRACKS)

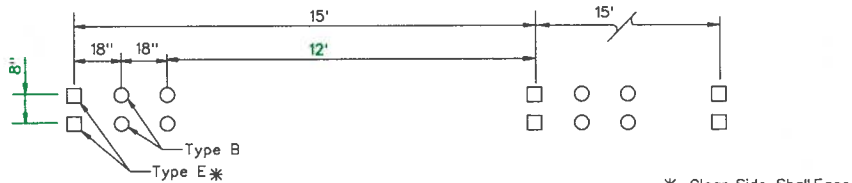


NON-REFLECTIVE & REFLECTIVE MARKERS

- Type A - Non-Reflective Yellow Marker
- Type B - Non-Reflective White Marker
- Type C - One Way Clear Reflective Marker
- Type D - Two Way Yellow Reflective Marker
- Type E - Red/Clear Reflective Marker



REFLECTOR



DOTTED WHITE LINES

T-61

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

RAISED
PAVEMENT MARKERS

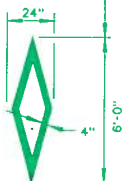
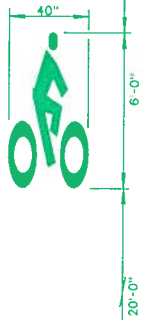
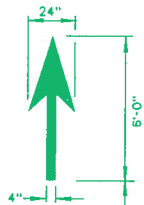
P.D. Kiser
CHIEF TRAFFIC ENGR

T 37.1.2 (6.33)
ADOPTED 2/79 REVISION 3 10/94

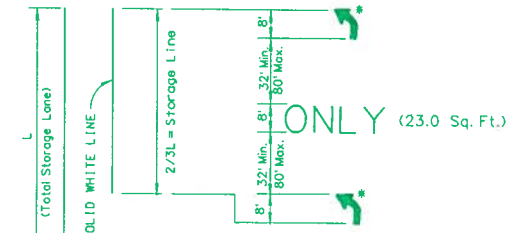
LEGENDS

XING ONLY

NOTE: THESE LEGENDS AS SHOWN ARE FOR BIKE LANE USE.

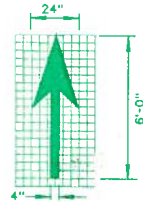


BICYCLE PAVEMENT MARKINGS



DETAIL "A"
(STORAGE LANE)

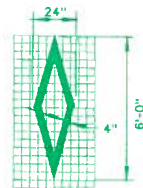
DETAIL "B"
(STORAGE LINE, TURN ARROWS, & LEGEND)



(3.0 Sq. Ft.)



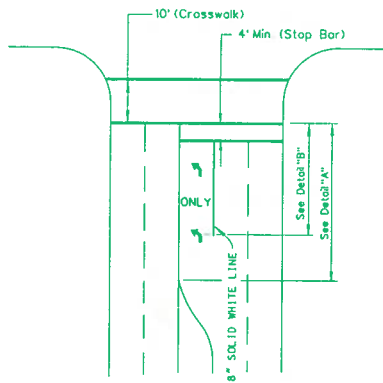
(5.5 Sq. Ft.)



(3.5 Sq. Ft.)

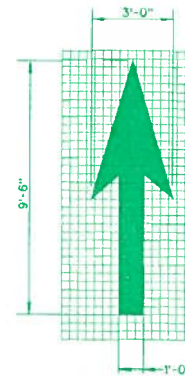
BIKE LANE

NOTE: All Stop Bars and Crosswalk Lines Shall Be 12" Wide Unless Otherwise Noted.



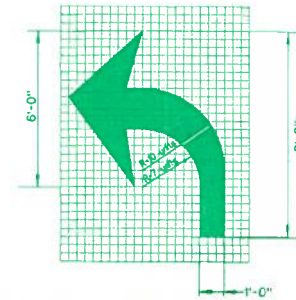
TYPICAL INTERSECTION CROSSWALKS & STOP BARS

NOTE: INSTALLATION OF MARKING FILM SHALL BE PERFORMED BY THE CONTRACTOR UNLESS OTHERWISE NOTED. FOR FINAL LOCATIONS, SEE STRIPING DETAILS.



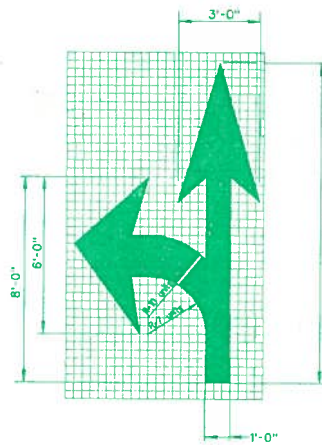
STRAIGHT ARROW

(12.5 Sq. Ft.)



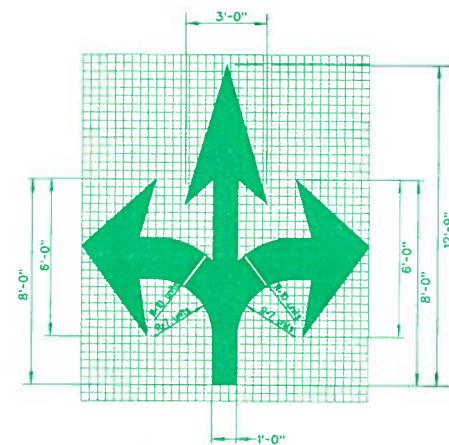
TURN ARROW

(15.5 Sq. Ft.)



LEFT/STRAIGHT ARROW

(27.0 Sq. Ft.)



LEFT/STRAIGHT/RIGHT ARROW

(36.0 Sq. Ft.)

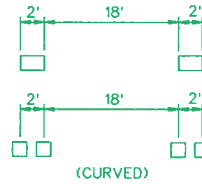
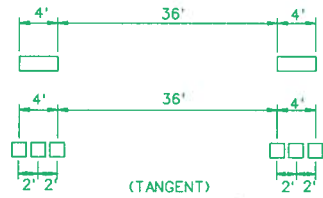
TAPE SECTION

IGRID - 1 UNIT

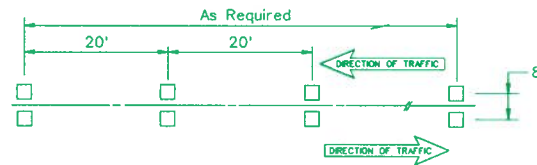
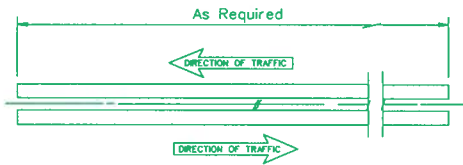
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
PERMANENT PAVEMENT MARKING FILM

PDK
CHIEF TRAFFIC ENGINEER
T-38.1 (634)
ADOPTED: 8-94 REVISION

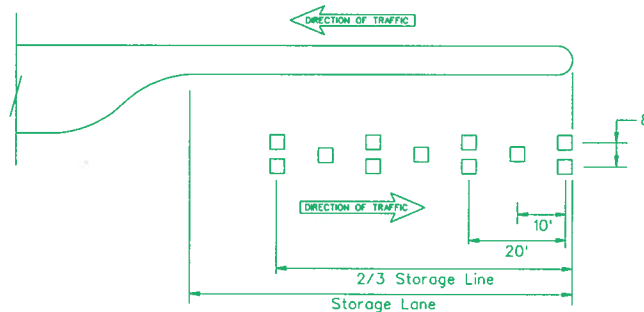
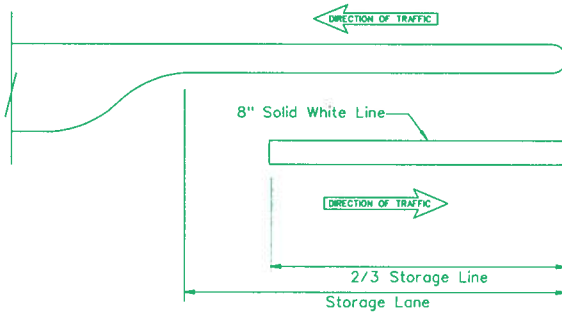
- - TEMPORARY TAPE OR PAINT (4" UNLESS OTHERWISE NOTED)
- - TEMPORARY RAISED MARKERS (4")



CENTER LANE & LANE LINES



DOUBLE YELLOW CENTER LINE

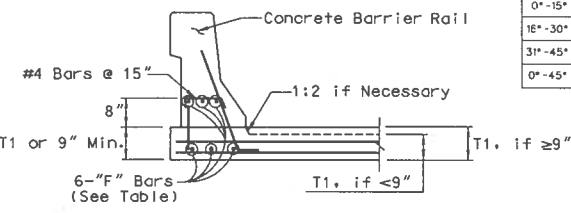
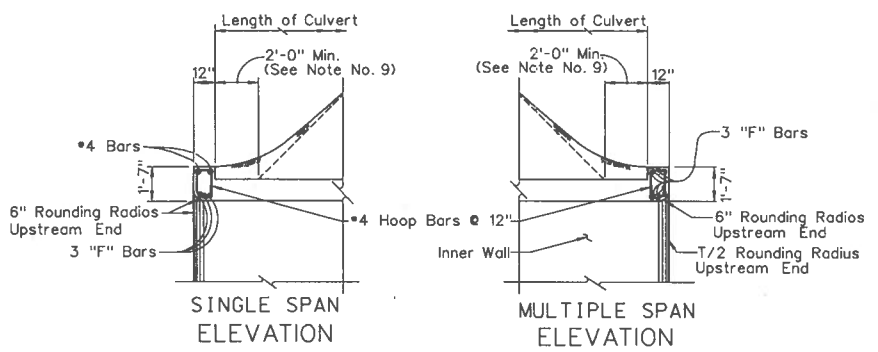
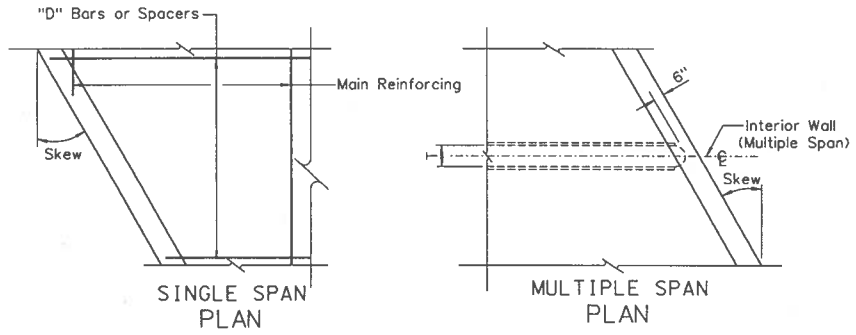


STORAGE LINE

T-63

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION		
TEMPORARY PAVEMENT MARKINGS		
<i>P.D. K...</i> CHIEF TRAFFIC ENGINEER	T-38.1.1 (634) ADOPTED: 8-94	REVISION

B1



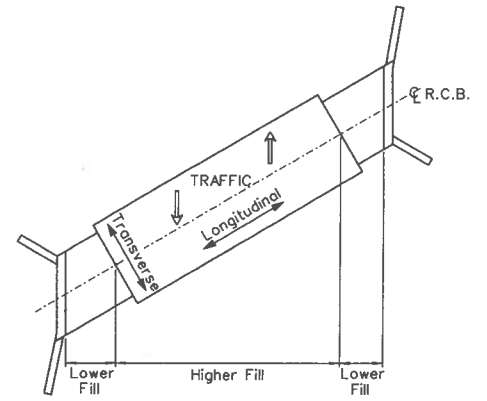
		SKEWED PARAPETS							
SKEW ANGLE	SPAN	F BARS							
		BAR NO.	4	5	6	7	8	8	8
0°-15°	BAR NO.	4	5	5	6	7	8	8	8
16°-30°	BAR NO.	5	6	6	7	8	8	8	8
31°-45°	BAR NO.	6	6	6	7	8	8	8	8
0°-45°	*4 HOOPS	12" CTRS.							

PARAPET DETAILS
COPING REINFORCING INCLUDED IN THE HEADWALL QUANTITIES

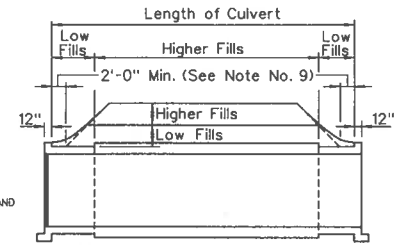
- DESIGN SPECIFICATIONS: AASHTO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, 1977," AND INTERM SPECIFICATIONS THROUGH 1980, EXCEPT AS NOTED BELOW.
- CONSTRUCTION SPECIFICATIONS: STATE OF NEVADA DEPARTMENT OF HIGHWAYS "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION," CURRENT EDITION, AND SPECIAL PROVISIONS THERE TO.
- LOADING: LIVE LOAD: STANDARD HS20-44 OR ALTERNATE FHWA MILITARY LOADING, IMPACT FOR TOP SLAB IS 30% UP TO 3 FT. COVER, NO IMPACT ABOVE 3 FT. COVER. NO IMPACT FOR INVERT. NO SURCHARGE FOR WALLS. EARTH LOAD: EQUIVALENT FLUID PRESSURE FOR TWO CONDITIONS.
1) 140 LBS./CU. FT. VERTICAL, 42 LBS./CU. FT. HORIZONTAL.
2) 140 LBS./CU. FT. VERTICAL, 140 LBS./CU. FT. HORIZONTAL.
LOAD FACTORS: 1.50 + 1.5E + 2.5 (L+H).
- CONCRETE: THE CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3,250 PSI. MAXIMUM ALLOWABLE SHEAR, $V_c = 3.5 F_c$, PSI, TAKEN AT A DISTANCE "d" FROM THE SUPPORTING MEMBER.
- REINFORCING STEEL: ALL REINFORCING STEEL TO BE ASTM A515 GRADE 60. MAIN REINFORCEMENT IS TO BE PLACED IN THE TRANSVERSE DIRECTION. STAGGER SPLICES NOT SHOWN. HOOKS MAY BE ROTATED OR TILTED, AS NECESSARY, FOR CLEARANCE. REINFORCEMENT SHALL HAVE A 2-1/2 INCH CLEARANCE ON BOTTOM OF BOTTOM SLAB AND 2 INCH CLEARANCE ON REMAINDER OF STRUCTURE AND ITS APPURTENANCES UNLESS OTHERWISE NOTED ON THE PLANS.
- FOUNDATION PRESSURE: THE RCB CULVERTS ARE DESIGNED TO THE FOLLOWING SOIL BEARING PRESSURES:

COVER HEIGHTS	10 FT.	20 FT.
	TON/SQ.FT.	
6 FT.	1.0	1.6
8 FT.	1.1	1.7
10 FT.	1.2	1.8
12 FT.	1.3	1.9
14 FT.	1.4	2.0

- SPECIAL DESIGN: CULVERTS WITH CONDITIONS, LOADING, OR SIZES DISSIMILAR TO THOSE GIVEN ON THESE RCB CULVERT SHEETS MAY REQUIRE A SPECIAL DESIGN.
- DESIGNATION: BOX CULVERTS ARE SHOWN ON PLANS AS SPAN TIMES HEIGHT TIMES LENGTH (10' x 8' x 195' RCB).
- ADDITIONAL LENGTH: LENGTH OF CULVERT SHALL BE INCREASED AS FOLLOWS: ADD 2.0 FT. TO EACH END WHEN COVER AT SHOULDER IS 0.0 TO 5.0 FEET. ADD AN ADDITIONAL 1.0 FT. TO EACH END FOR EACH SUCCEEDING 5.0 FT. OF COVER OR PORTION THEREOF.
- HEADWALLS: ALL RCB CULVERTS SHALL HAVE TYPE I HEADWALLS UNLESS OTHERWISE NOTED ON THE PLANS.
- QUANTITIES: QUANTITIES DO NOT INCLUDE "d" BARS, NOR SPLICES IN BARS, NOR TEMPERATURE BARS FOR EXPOSED TOP SLAB, NOR CONCRETE OR REINFORCEMENT FOR PARAPETS OR PAVING LEDGES.
- THREE OR MORE CELLS: FOR CULVERTS WITH MORE THAN TWO CELLS, USE DIMENSIONS AND REINFORCEMENT FOR THE "DOUBLE BOX CULVERT" AND ADJUST THE QUANTITIES ACCORDINGLY.



PLAN - SKEWED



Low Fills = Lowest Table Value for, Given Span
Higher Fills = Slab Increase as Shown in Table

ELEVATION

FILL HEIGHT TRANSITIONS

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

**R.C.B., CULVERTS,
GENERAL NOTES**

<i>Royal J. Morrison</i> CHIEF BRIDGE ENGR.	B-20.1.(1502)	REVISION 2-3/82
	ADOPTED-11/73	

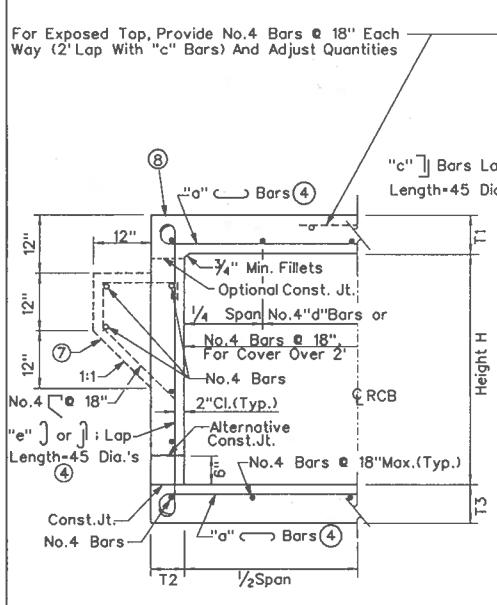
SPAN	FT.		5		6		7		8	
	3	4	5	6	7	8	9	10	11	12
MAXIMUM EARTH COVER	10	20	10	20	10	20	10	20	10	20
ROOF T1	7 1/2	7 1/2	7 1/2	7 1/2	8	8	8	8	8	8
WALLS T2	6	6	7	6 1/2	7 1/2	8	8	8	8	8
INVERT T3	5	6	7	6 1/2	7 1/2	8	8	8	8	8
SPACING	8	8	8	8	8	8	8	8	8	8
"a" BAR #	7	6	6	6	6	6	6	6	6	6
"e" BAR #	4	4	4	4	4	4	4	4	4	4
CONCRETE CF/LF	10.0	10.2	11.0	12.0	12.5	13.7	14.2	14.2	15.9	15.9
REINFORCEMENT LBS/LF	58	68	67	81	82	105	70	81	82	96

SPAN	FT.		5		6		7		8		9		10		11		12		13		14	
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
MAXIMUM EARTH COVER	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20
ROOF T1	8	10 1/2	8	10 1/2	8	10 1/2	8	10 1/2	8	10 1/2	8	10 1/2	8	10 1/2	8	10 1/2	8	10 1/2	8	10 1/2	8	10 1/2
WALLS T2	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
INVERT T3	8	11	8	11	8	11	8	11	8	11	8	11	8	11	8	11	8	11	8	11	8	11
SPACING	13	12	13	12	13	12	13	12	13	12	13	12	13	12	13	12	13	12	13	12	13	12
"a" BAR #	6	7	6	7	6	7	6	7	6	7	6	7	6	7	6	7	6	7	6	7	6	7
"b" DIMENSION "B" FT.-INCH	2-10	2-11	2-10	2-11	2-11	2-11	2-11	2-11	2-11	2-11	2-11	2-11	2-11	2-11	2-11	2-11	2-11	2-11	2-11	2-11	2-11	2-11
"b" DIMENSION "BW" FT.-INCH	2-10	3-0	2-10	3-0	4-10	5-0	4-10	5-0	4-10	5-0	4-10	5-0	4-10	5-0	4-10	5-0	4-10	5-0	4-10	5-0	4-10	5-0
"c" DIMENSION "C" FT.-INCH	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4
"e" BAR #	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
CONCRETE CF/LF	19.1	24.3	20.4	25.6	21.6	26.8	23.0	29.5	24.3	31.0	25.6	34.1	27.8	37.7	32.1	42.3	24.2	34.6	25.5	36.2	26.8	37.7
REINFORCEMENT LBS/LF	161	230	169	237	191	267	233	285	260	325	300	339	314	327	360	373	271	331	278	339	295	362

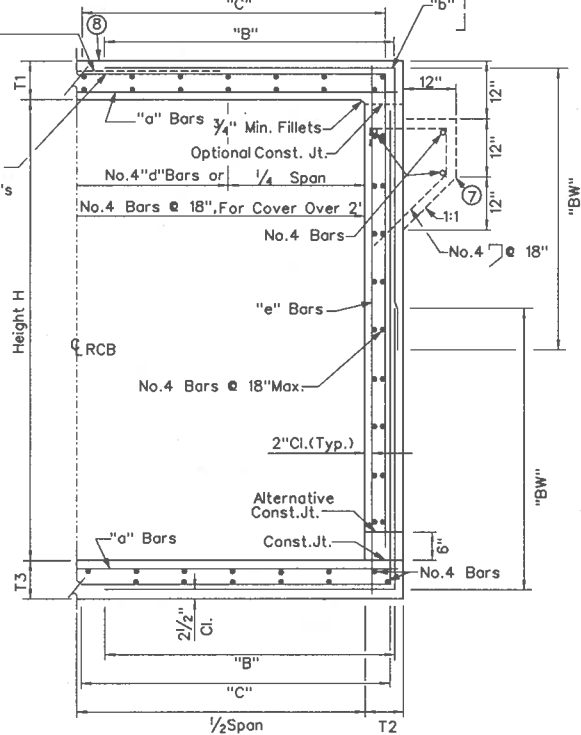
"a" BARS, FOR EARTH COVERS OF 2' AND LESS TO BE PLACED IN TOP SLAB ONLY

SPAN	5'	6'	7'	8'	10'	12'	14'
NUMBER	6	7	8	9	10	12	16

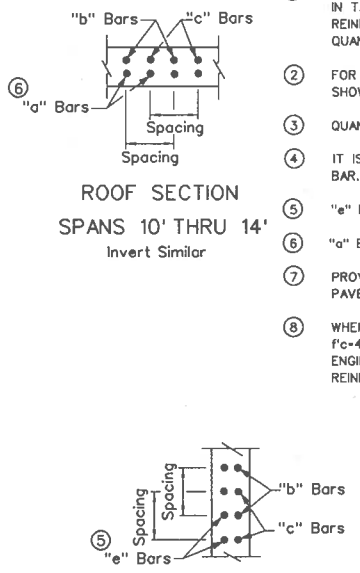
For Exposed Top, Provide No.4 Bars @ 18" Each Way (2' Lap With "c" Bars) And Adjust Quantities



TYPICAL SECTION - SPANS 5' THRU 8'



TYPICAL SECTION - SPANS 10' THRU 14'



NOTES

- FOR BOXES WITH SPAN OR HEIGHT LESS THAN ANY OF THOSE SHOWN IN TABLE, USE NEXT GREATER SIZE BOX CONCRETE DIMENSIONS AND REINFORCEMENT, MAKE NECESSARY CHANGES IN BAR LENGTHS AND QUANTITIES.
- FOR BOXES WITH SPAN OR HEIGHT OR COVER GREATER THAN THOSE SHOWN IN TABLES, A SPECIAL DESIGN IS REQUIRED.
- QUANTITIES ARE APPROXIMATE AND FOR DESIGN PURPOSES ONLY.
- IT IS PERMISSIBLE TO ELIMINATE THE 180° HOOKS ON EVERY OTHER BAR.
- "e" BARS ARE AT HALF SPACING.
- "a" BARS ARE AT HALF SPACING.
- PROVIDE PAVING NOTCH WHEN TOP IS EXPOSED AND WHERE P.C.C. PAVEMENT OR APPROACH SLAB IS USED. ADJUST THE QUANTITIES.
- WHEN TOP IS EXPOSED, THE TOP SLAB CONCRETE SHALL BE "EA", f'c=4500 PSI, OR "A", f'c=4000 PSI, AS DETERMINED BY THE ENGINEER. IF "EA" CONCRETE IS TO BE USED, THE TOP SLAB REINFORCING STEEL SHALL HAVE AN EPOXY COATING.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

SINGLE R C B CULVERTS

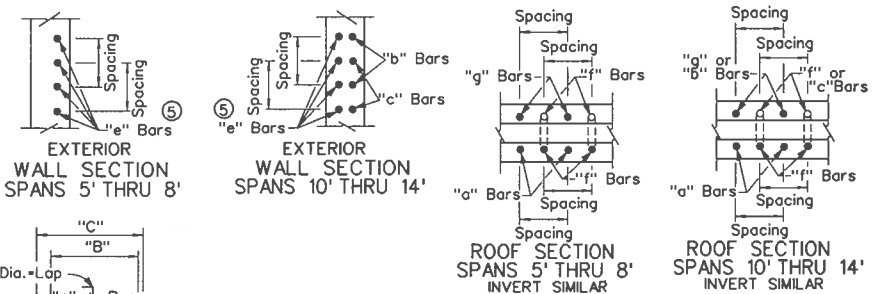
B-20.1.2 (502)
ADOPTED -11/70 REVISION 3-3/82

Floyd S. Manning
CHIEF BRIDGE DESIGN ENGR.

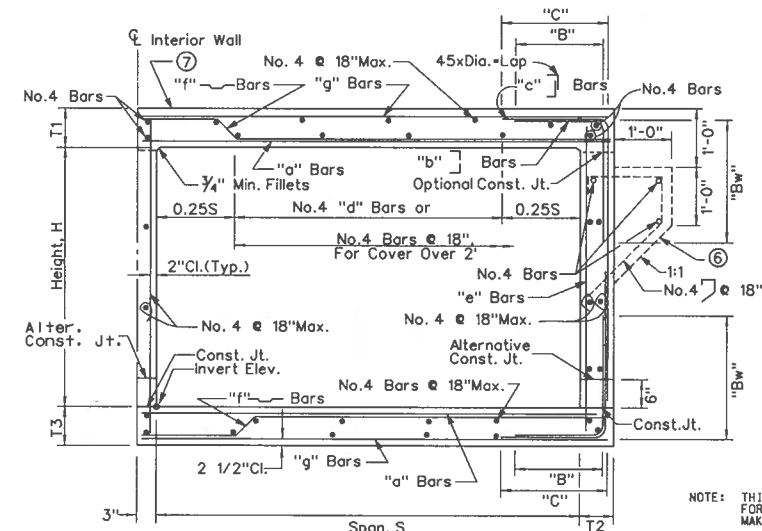
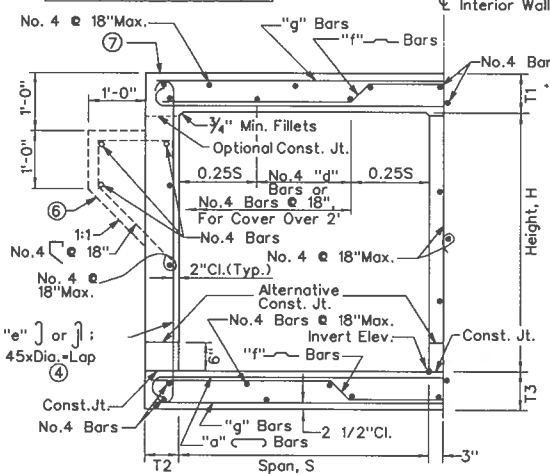
SPAN HEIGHT	FT.		5		6		7		8		10		12		14	
	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20
MAXIMUM EARTH COVER	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12
CONC. ROOF	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12
EXTERIOR WALLS	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12
INVERT	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12
SPACING	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12
BAR #	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12
CONCRETE	CF/LF	17.8	19.3	19.3	21.6	21.3	23.8	20.1	24.6	27.0	23.7	30.8	25.2	33.3	27.2	35.5
REINFORCEMENT	LBS/LF	122	121	134	137	145	162	186	162	192	179	206	180	227	212	267

SPAN HEIGHT	FT.		3		4		5		6		7		8		10		12	
	11 <td>12</td> <td>11</td> <td>12</td> <td>11</td> <td>12</td> <td>11</td> <td>12</td> <td>11</td> <td>12</td> <td>11</td> <td>12</td> <td>11</td> <td>12</td> <td>11</td> <td>12</td> <td>11</td> <td>12</td>	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12
MAXIMUM EARTH COVER	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12
CONC. ROOF	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12
EXTERIOR WALLS	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12
INVERT	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12
SPACING	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12
BAR #	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12
CONCRETE	CF/LF	39.0	51.8	41.0	53.8	42.7	55.5	44.7	58.2	46.7	61.8	48.7	65.6	52.5	70.0	56.3	74.5	61.3
REINFORCEMENT	LBS/LF	339	415	349	428	370	454	381	494	418	494	460	510	486	550	518	568	605

SPAN HEIGHT	FT.		7		8		9		10		11		12		13		14	
	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12
MAXIMUM EARTH COVER	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12
CONC. ROOF	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12
EXTERIOR WALLS	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12
INVERT	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12
SPACING	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12
BAR #	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12
CONCRETE	CF/LF	71.8	99.7	104	133	108	149.0	113	164.2	119	188.8	124	171.1	131	198.1	137	206.8	144
REINFORCEMENT	LBS/LF	662	710	715	783	756	820	807	846	833	873	881	958	884	978	1002	1110	



SPAN	5'	6'	7'	8'	10'	12'	14'
#/CELL	5	8	8	10	11	13	15



- NOTES
- FOR BOXES WITH SPAN OR HEIGHT LESS THAN ANY OF THOSE SHOWN IN TABLE, USE NEXT GREATER SIZE BOX CONCRETE DIMENSIONS AND REINFORCEMENT. MAKE NECESSARY CHANGES IN BAR LENGTHS AND QUANTITIES.
 - FOR BOXES WITH SPAN OR HEIGHT OR COVER GREATER THAN THOSE SHOWN IN TABLES, A SPECIAL DESIGN IS REQUIRED.
 - QUANTITIES ARE APPROXIMATE AND FOR DESIGN PURPOSES ONLY.
 - IT IS PERMISSIBLE TO ELIMINATE THE 180° HOOKS ON EVERY OTHER "e" BAR.
 - "e" BARS ARE AT HALF SPACING.
 - PROVIDE PAYING NOTCH WHEN TOP IS EXPOSED AND WHERE P.C.C. PAVEMENT OR APPROACH SLAB IS USED. ADJUST THE QUANTITIES.
 - WHEN TOP IS EXPOSED, THE TOP SLAB CONCRETE SHALL BE "EA", f'c=4500 PSI, OR "A", f'c=4000 PSI, AS DETERMINED BY THE ENGINEER. IF "EA" CONCRETE IS TO BE USED, THE TOP SLAB REINFORCING STEEL SHALL HAVE AN EPOXY COATING.

NOTE: THIS PLAN SHEET MAY BE USED FOR MULTIPLE CELL CULVERTS BY MAKING NECESSARY ADJUSTMENTS.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

DOUBLE RCB CULVERTS

Floyd J. Mansueti
CHIEF BRIDGE ENGINEER

B-20.3.3(502)
ADOPTED: 11/78 REVISION: 3-3/82

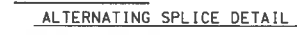
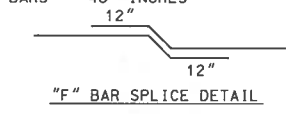
SPAN	FT.		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20						
HEIGHT	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.							
MAXIMUM EARTH COVER	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20							
CONCRETE	CF/LF	7.9	8.6	8.4	9.1	8.9	9.6	9.1	11.3	9.6	11.8	10.1	12.3	10.6	12.8	10.9	14.3	11.4	14.8	11.9	15.3	12.4	15.8	13.2	16.3	12.8	17.4	13.3	17.9	13.8	18.4	14.3	18.9	14.8	19.4	15.3	19.9		
REINF.	LBS/LF	56	54	58	57	60	56	61	68	63	70	66	73	68	75	70	84	74	88	76	90	78	92	80	94	82	96	84	98	86	100	88	102	90	104	92	108	96	112

SPAN	FT.		10		12		14		16		18		20		22		24		26		28		30		32		34		36		38		40																		
HEIGHT	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.																	
MAXIMUM EARTH COVER	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20																	
CONCRETE	CF/LF	18.0	24.2	18.7	24.9	19.3	25.6	20.0	26.2	20.7	26.9	21.3	27.6	22.5	28.2	23.1	28.9	23.8	33.8	24.4	34.5	25.1	35.1	25.8	35.8	26.4	36.5	27.1	37.1	27.8	37.8	28.4	38.5	29.1	39.1	32.8	45.6	33.4	46.3	34.1	46.9	34.8	47.6	35.4	48.3	36.1	48.9	36.8	49.6	37.4	50.3
REINFORCEMENT	LBS/LF	141	160	142	161	144	163	139	165	145	158	147	160	144	162	145	156	196	219	198	221	201	223	201	224	203	216	205	218	196	219	199	210	201	212	246	261	249	264	251	266	252	267	254	269	256	271	246	272	248	274

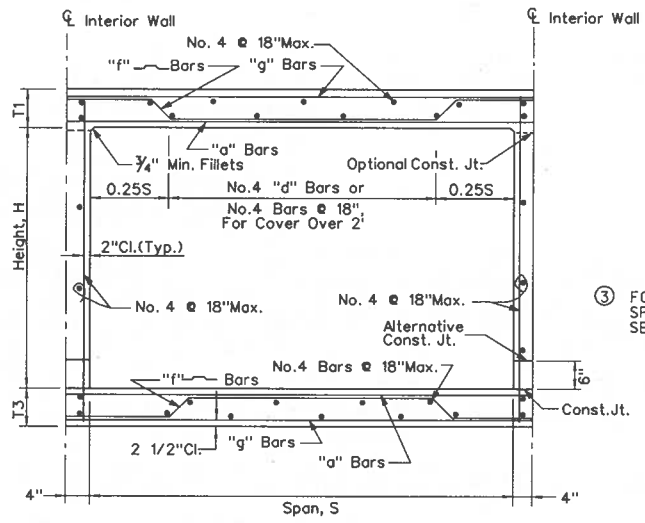
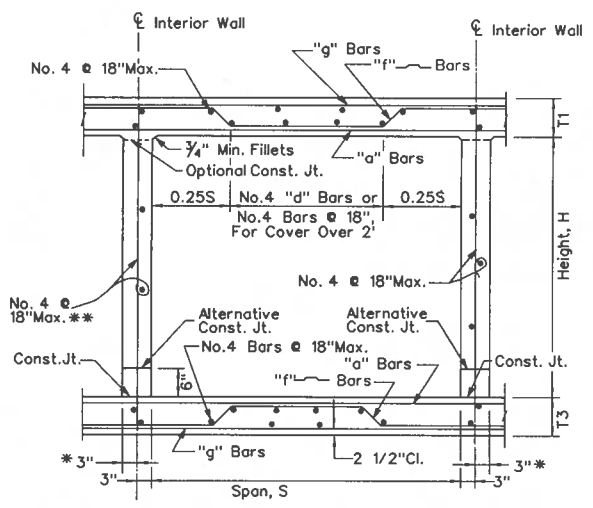
NOTES

- ① NOTES ON ①, ②, ③ & ⑦ OF SHEET B-20.1.3(502) SHALL APPLY.
- ② WHEN THE ADDITION OF CELLS CAUSES THE LENGTHS OF THE "a", "f" AND "g" BARS TO EXCEED 60 FEET, THE BARS WILL REQUIRE SPLICING. SPLICES FOR THE "a" BARS SHALL BE CENTERED ABOUT THE CENTER LINE OF THE INTERIOR WALLS. SPLICES FOR THE "g" BARS SHALL BE CENTERED ABOUT THE CENTER OF THE CELLS. SPLICES FOR THE "f" BARS SHALL BE DONE AT THE 45 DEGREE LEG AND CONFORM TO THE SPLICE DETAIL SHOWN. SPLICE LOCATIONS SHALL BE ALTERNATED FROM BAR TO BAR. SEE DETAIL SHOWN. SPLICE LENGTHS FOR THE "a" AND "g" BARS SHALL BE AS FOLLOWS:

- #4 BARS - 16 INCHES
- #6 BARS - 24 INCHES
- #7 BARS - 31 INCHES
- #8 BARS - 40 INCHES



- ③ FOR DIMENSIONS, BAR SIZES, BAR SPACING, AND ROOF SECTION SPACING DETAIL. SEE SHEET B-20.1.3(502). FOR GENERAL NOTES, SEE SHEET B-20.1.1(502).



* - CONCRETE FOR THIS PORTION IS INCLUDED IN QUANTITIES OF ADJOINING CELLS.
 ** - REINFORCING STEEL INCLUDED IN PREVIOUS CELLS QUANTITIES.

STATE OF NEVADA
 DEPARTMENT OF TRANSPORTATION

ADDITIONAL CELLS TO BE USED
 WITH DOUBLE RCB CULVERTS TO
 PROVIDE FOR MULTIPLE CELL CULVERTS

B-20.1.3.1 (502)

Edward J. Marmon
 CHIEF BRIDGE ENGINEER

ADOPTED: 8/84

REVISION

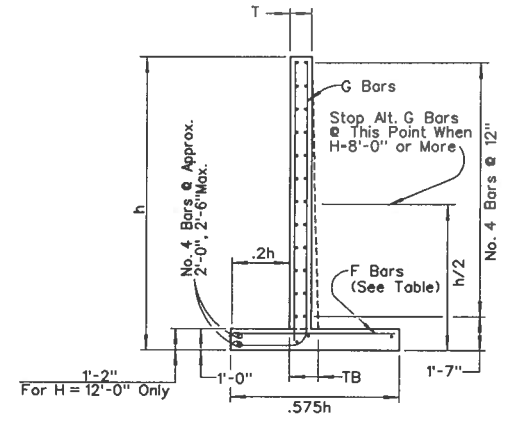
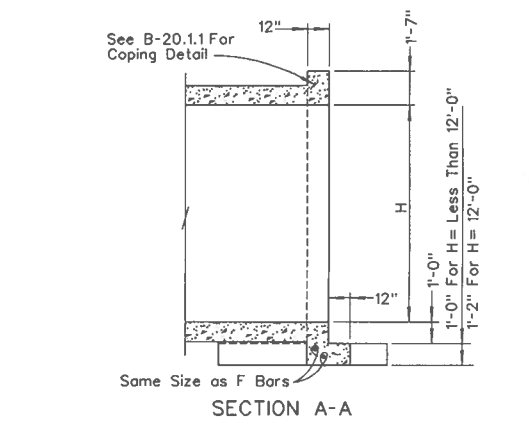
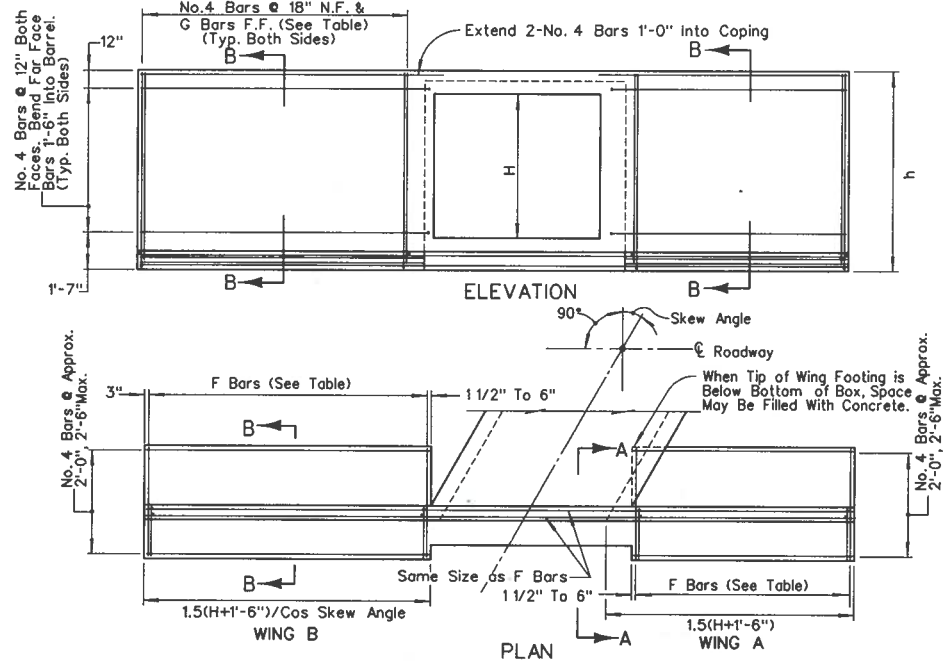
CUBIC YARDS OF CONCRETE AND POUNDS OF REINFORCING FOR TWO TYPE II HEADWALLS

SPAN HEIGHT	CUBIC YARDS OF CONCRETE AND POUNDS OF REINFORCING FOR TWO TYPE II HEADWALLS																								SPAN HEIGHT	
	SINGLE BOX												DOUBLE BOX						TRIPLE BOX							
	0° SKEW		15° SKEW		30° SKEW		45° SKEW		0° SKEW		15° SKEW		30° SKEW		45° SKEW		0° SKEW		15° SKEW		30° SKEW		45° SKEW			
	CONC.	REINF.	CONC.	REINF.	CONC.	REINF.	CONC.	REINF.	CONC.	REINF.	CONC.	REINF.	CONC.	REINF.	CONC.	REINF.	CONC.	REINF.	CONC.	REINF.	CONC.	REINF.	CONC.	REINF.		
3	9.4	871	9.4	888	10.2	947	11.5	1,073	11.4	991	11.6	1,013	12.4	1,085	14.3	1,243										
4	12.8	1,141	12.8	1,163	13.5	1,237	15.6	1,359	14.8	1,261	15.0	1,287	15.9	1,376	18.6	1,568	16.8	1,367	17.0	1,397	18.5	1,498	21.4	1,718		
5	16.4	1,676	16.4	1,707	17.3	1,813	19.8	2,044	18.6	1,795	18.6	1,831	19.9	1,952	22.8	2,214	20.6	1,901	20.8	1,941	22.3	2,074	25.6	2,364		
6	20.4	2,155	20.4	2,198	21.5	2,324	24.4	2,644	22.8	2,155	22.8	2,204	24.1	2,495	28.4	3,019	25.8	2,281	26.0	2,311	27.5	2,500	33.2	3,152		
7	24.8	2,698	24.8	2,754	26.1	2,893	29.4	3,264	27.4	2,698	27.4	2,754	28.8	3,049	34.5	3,456	30.4	2,978	31.1	3,040	33.0	3,247	38.3	3,659		
8	29.6	3,308	29.6	3,376	31.1	3,527	34.8	3,984	32.4	3,308	32.4	3,376	34.1	3,761	41.6	4,248	36.4	3,531	37.0	3,592	39.7	3,881	48.4	4,415		
10	37.2	4,174	37.2	4,254	39.1	4,449	44.4	4,984	41.4	4,174	41.4	4,254	43.1	4,631	52.4	5,319	46.4	4,311	47.6	4,421	50.3	4,127	58.3	5,352		
12	45.2	5,124	45.2	5,216	47.3	5,421	54.4	5,984	50.4	5,124	50.4	5,216	52.1	5,671	63.6	6,669	56.4	5,351	57.0	5,451	61.3	5,257	74.2	6,603		

① - QUANTITIES SHOWN ARE FOR HEADWALLS AT THE INLET AND OUTLET

TABLE

H = HEIGHT	T = INCHES	TB = INCHES	G. BARS	F. BARS
		SIZE NO.	SPACE IN.	SPACE IN.
3	3	5	9 1/2	4 1/2
4	4	5	9 1/2	4 1/2
5	5	6	9 1/2	4 1/2
6	6	7	10	4 6 1/2
7	7	8	11 1/2	5 7 1/2
8	8	9	12 1/2	6 8
9	9	10	13 1/2	7 9 1/2
10	10	11	14 1/2	8 10 1/2
12	12	12	16	9 12 1/2



NOTE: FOR GENERAL NOTES SEE SHEET B-20.1.1

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

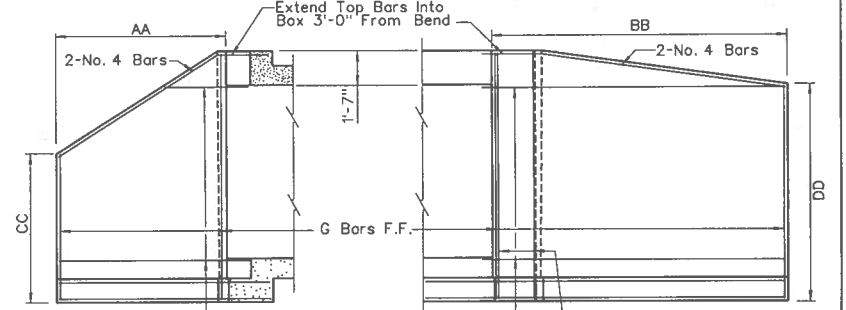
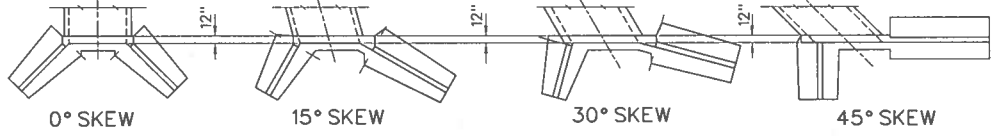
**RCB CULVERTS
TYPE II HEADWALLS**

Floyd J. Mariani
CHIEF BRIDGE DESIGN ENGR.

B-20.1.4-(502)
ADAPTED: 11/78
REVISION

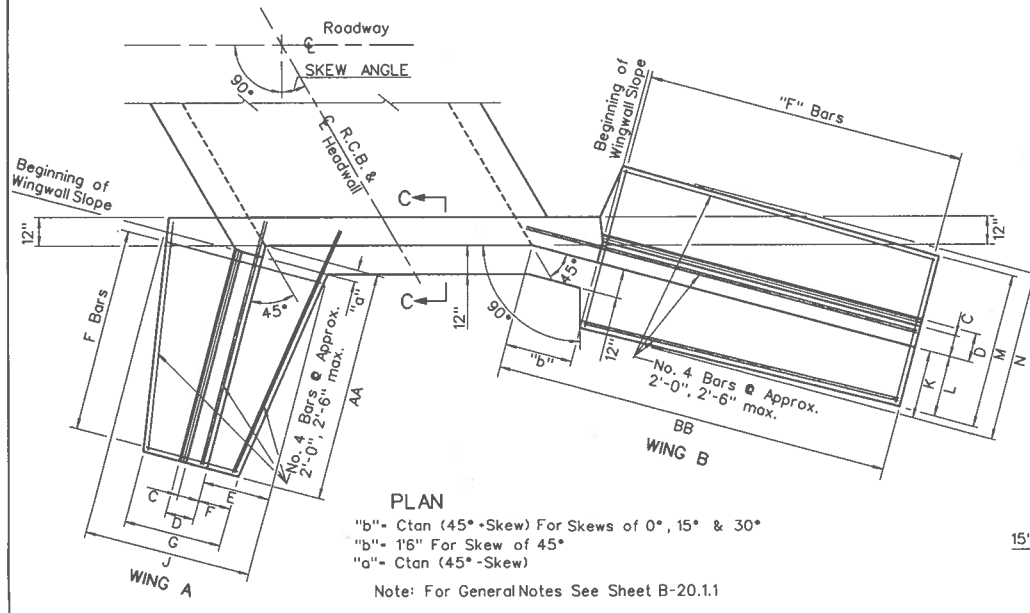
TYPE I HEADWALL DIMENSIONS AND REINFORCING STEEL

Table with columns for H-Height in Feet, Skew Angle (0, 15, 30, 45 degrees), Wing Labels (A, B), and Reinforcing Steel specifications (Bar Size, Spacing, G, F, BARS).

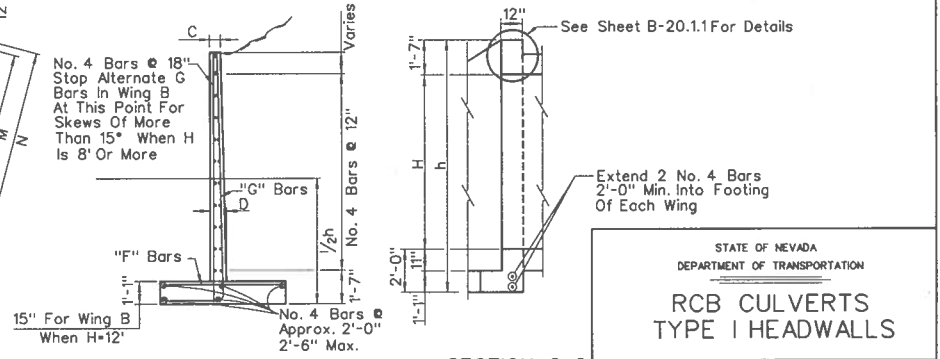


NOTE: For Boxes With 0° Skew Both Wings Are As Shown For Wing A.

SECTION WING A SECTION WING B



PLAN "b" = Ctan (45°-Skew) For Skews of 0°, 15° & 30° "b" = 16" For Skew of 45° "a" = Ctan (45°-Skew) Note: For General Notes See Sheet B-20.11



SECTION OF WINGS A AND B

SECTION C-C

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION RCB CULVERTS TYPE I HEADWALLS B-20.15-(502) ADOPTED-11/70 REVISION 1-12/90

9-B

CUBIC YARDS OF CONCRETE AND POUNDS OF REINFORCING FOR TWO TYPE 1 HEADWALLS ①

SPAN HEIGHT	SINGLE BOX								DOUBLE BOX								TRIPLE BOX								
	0° SKEW		15° SKEW		30° SKEW		45° SKEW		0° SKEW		15° SKEW		30° SKEW		45° SKEW		0° SKEW		15° SKEW		30° SKEW		45° SKEW		
	CONC.	REINF.	CONC.	REINF.	CONC.	REINF.	CONC.	REINF.	CONC.	REINF.	CONC.	REINF.	CONC.	REINF.	CONC.	REINF.	CONC.	REINF.	CONC.	REINF.	CONC.	REINF.	CONC.	REINF.	
5	3	5.6	393	6.4	476	7.2	563	8.9	739	7.7	508	8.5	597	9.5	700	11.8	910								
	4	7.6	609	8.0	644	9.6	774	11.6	946	9.7	726	10.1	767	12.0	912	14.6	1119	11.8	842	12.3	886	14.4	1045	17.6	1280
	5	9.6	705	10.2	782	11.8	942	15.0	1238	11.7	825	12.4	908	14.3	1085	18.0	1414	13.9	944	14.6	1030	16.8	1220	21.0	1578
6	3	6.0	418	6.8	504	7.6	595	9.4	779	8.3	600	9.2	699	10.3	817	12.7	1062								
	4	7.9	637	8.3	673	10.0	807	12.1	985	10.3	821	10.8	869	12.7	1032	15.5	1270	12.6	1004	13.2	1058	15.4	1243	18.8	1525
	5	9.9	730	10.6	809	12.2	974	15.4	1278	12.3	917	13.0	1009	15.0	1203	18.8	1566	14.7	1103	15.5	1199	17.7	1413	22.1	1823
	6	12.4	983	12.6	1106	15.5	1505	20.4	2158	14.8	1173	15.0	1310	18.3	1740	23.7	2449	17.2	1361	17.5	1502	21.0	1951	27.1	2708
	7	15.3	1400	16.0	1601	19.8	2155	26.5	3104																
7	3	6.3	442	7.1	532	8.0	626	9.9	820																
	4	8.3	665	8.7	702	10.4	839	12.6	1025																
	5	10.3	756	10.9	837	12.6	1006	15.9	1319																
	6	12.8	1011	12.9	1137	15.9	1544	20.8	2209																
8	3	6.7	467	7.5	559	8.4	658	10.4	861	7.8	817	10.7	1064	11.8	1109	14.5	1268								
	4	8.6	693	9.1	731	10.8	872	13.1	1065	11.8	1045	12.3	1078	14.3	1238	17.3	1475	14.9	1320	15.5	1365	17.8	1558	21.4	1858
	5	10.6	782	11.3	864	13.0	1038	16.4	1360	13.8	1137	14.5	1216	16.6	1405	20.6	1773	17.0	1414	17.8	1501	20.2	1720	25.0	2159
	6	13.1	1039	13.3	1169	16.3	1583	21.3	2261	16.4	1401	16.6	1525	19.9	1958	25.6	2676	19.6	1677	19.9	1814	23.6	2276	29.9	3065
	7	16.0	1464	16.7	1673	20.6	2242	27.5	3219	19.2	1824	21.0	2133	24.3	2620	31.8	3637	22.5	2107	24.4	2428	28.0	2946	36.1	4029
	8	17.9	1904	20.2	2234	24.2	2778	33.1	3938	21.2	2267	23.6	2552	27.9	3051	39.5	4359	24.5	2552	27.0	2850	31.7	3381	43.9	4753
10	3	7.3	515	8.2	612	9.2	721	11.4	942	11.2	1111	12.2	1227	13.6	1383	16.8	1734								
	4	9.3	749	9.8	789	11.6	936	14.1	1144	13.2	1348	13.8	1396	16.1	1608	19.6	1939								
	5	11.3	833	12.0	920	13.8	1101	17.4	1441	15.2	1434	16.1	1531	18.4	1770	23.0	2239	19.2	1876	20.1	1985	22.9	2274	28.5	2857
	6	13.8	1093	14.0	1233	17.1	1661	22.3	2365	17.8	1697	18.1	1775	21.7	2187	28.0	3165	21.8	2141	22.2	2219	26.3	2666	33.6	3786
	7	16.6	1528	17.4	1745	21.4	2329	28.4	3334	20.7	2135	21.6	2359	26.1	3006	34.1	4137	24.7	2582	25.8	2821	30.7	3519	39.8	4761
	8	18.6	1978	20.9	2314	25.0	2870	34.1	4054	22.7	2587	25.2	2935	29.7	3544	39.9	4860	26.8	3037	29.4	3399	34.4	4057	45.6	5486
12	3	23.2	2117	25.4	2482	31.1	3244	41.4	4597																
	4	29.5	3352	31.6	3598	38.6	4397	51.7	5892	33.7	3967	36.0	4217	43.5	5077	57.6	6703	37.8	4422	40.3	4688	48.3	5598	63.5	7335
	4	10.0	804	10.5	848	12.4	1001	15.1	1224	14.6	1732	15.2	1806	17.6	2090	21.5	2449								
	5	12.0	884	12.7	975	14.6	1165	18.4	1522	16.6	1815	17.5	1941	20.0	2247	24.9	2849								
	6	14.5	1148	14.7	1296	17.9	1738	23.3	2469	19.2	2086	19.6	2244	23.3	2817	29.9	3799	23.9	2744	24.4	2922	28.7	3576	36.5	4733
	7	17.3	1591	18.1	1817	22.2	2416	29.4	3449	22.1	2531	23.0	2775	27.7	3497	36.1	4782	26.8	3195	27.9	3460	33.1	4261	42.8	5719
	8	18.3	1945	21.8	2404	25.8	2962	35.1	4171	23.1	2884	26.7	3396	31.3	4048	41.8	5506	27.8	3554	31.6	4094	36.8	4830	48.6	6446
	9	23.9	2181	26.1	2553	31.9	3327	42.4	4704	28.7	3123	31.1	3522	37.5	4414	49.2	6042	33.5	3796	36.1	4218	43.0	5191	56.1	6984
12	30.2	3429	32.3	3680	39.4	4488	52.7	6003	35.0	4373	37.4	4646	45.1	5580	59.6	7344	39.9	5049	42.4	5341	50.7	6353	66.5	8289	
12	42.8	5137	47.2	5372	56.4	6075	80.1	8124	47.8	6087	52.3	6340	62.2	7141	87.2	9470	52.7	6768	57.5	7045	67.9	7930	94.2	10420	

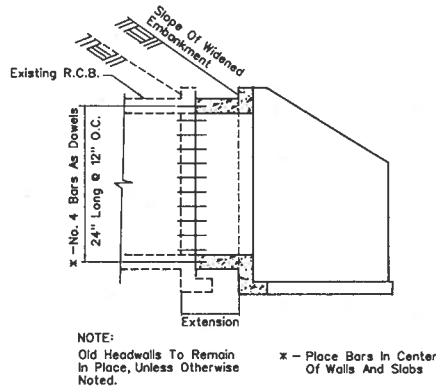
① -QUANTITIES SHOWN ARE FOR HEADWALLS AT THE INLET AND OUTLET

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

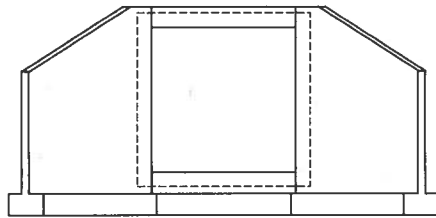
**ESTIMATE OF QUANTITIES
TYPE 1 HEADWALLS**

Floyd J. Mearns
CHIEF BRIDGE ENGINEER

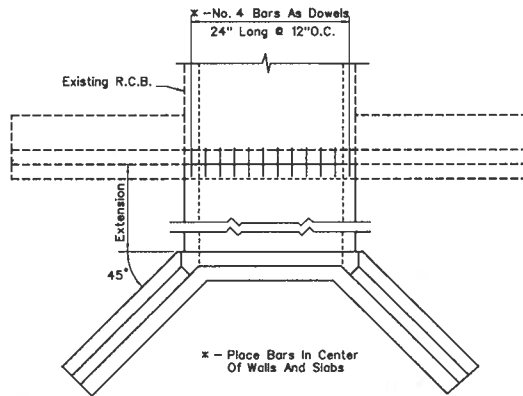
B - 20.16 (502)
ADOPTED: 11/70 REVISION: _____



PART LONGITUDINAL SECTION



ELEVATION

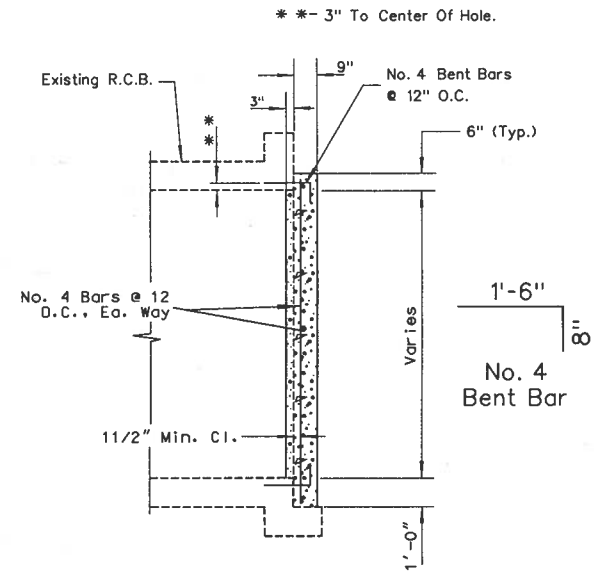


PLAN

R.C.B. CULVERT EXTENSION

NOTES:

1. FOR GENERAL NOTES SEE SHEET B-20.1.1.
2. DOWELLING: DOWEL HOLES SHALL BE DRILLED 12" INTO EXISTING CONCRETE. DIAMETER OF HOLE SHALL BE 1/4" LARGER THAN DIAMETER OF BAR. HOLE MAY BE INCLINED NO MORE THAN 5° OFF THE HORIZONTAL. DOWELS SHALL BE EPOXIED INTO CLEAN HOLES. EPOXY SHALL CONFORM TO THE REQUIREMENT OF SECTION 728 OF THE STANDARD SPECIFICATIONS.

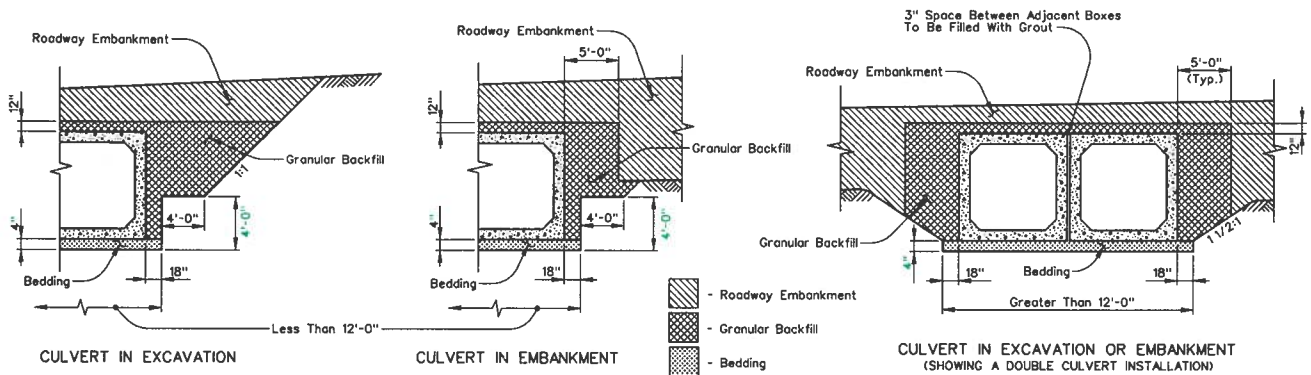


SECTION

METHOD OF PLUGGING R.C.B.

NOTE: Width And Height Varies.

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION	
METHOD OF EXTENDING R.C.B. CULVERTS	
B-20.1.7-(502)	REVISION
ADOPTED-11/70	1-12/90



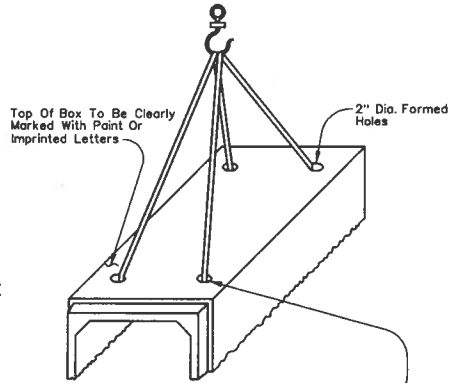
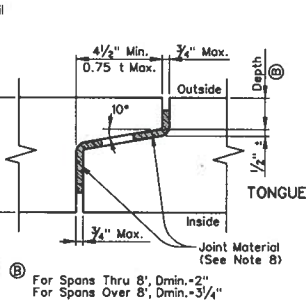
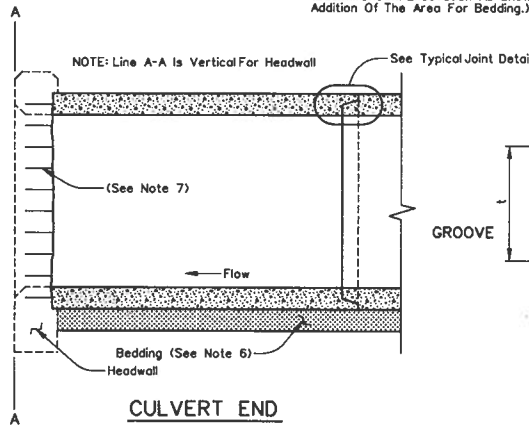
EXCAVATION AND BACKFILL

(Backfill Shown, Excavation As Shown On Sheet R-1.1.4 With The Addition Of The Area For Bedding.)

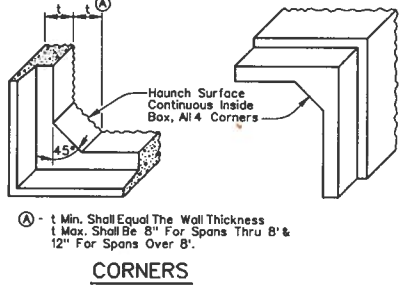
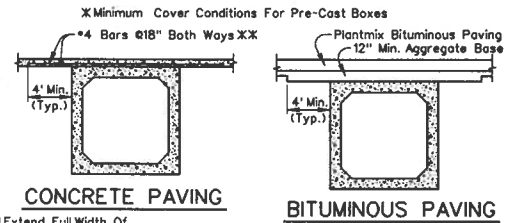
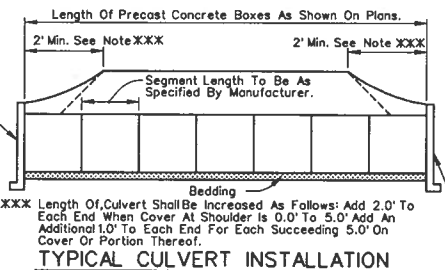
1) Design Specifications: AASHTO "Standard Specifications for Highway Bridges" and AASHTO M259 or M273 (ASTM C789 or C850 as indicated by the following):

Condition	Min. Cover	AASHTO	Equiv. ASTM
2 ft. or more cover	2 ft.	M259, Table 2	C789, Table 2
Less than 2 ft. cover	0 ft.	M273 Table 2	C850, Table 2

- The Specifications noted above show concrete dimensions, reinforcing placement, earth cover, and other details needed to manufacture the box culverts.
- Construction Specifications:** Current edition of the State of Nevada Department of Transportation "Standard Specifications for Road and Bridge Construction", subsection 502.03.24, and Special Provisions thereto.
 - Live Loads:** Interstate loading conditions (Table 2). (Standard HS20-44 and FHWA alternate military loading.)
 - Concrete:** Concrete shall be as specified in AASHTO M259 or M273 (ASTM C789 or C850), or modified in subsection 502.03.24 of the Standard Specifications and the Special Provisions.
 - Reinforcing Steel:** Reinforcing steel shall be AASHTO M31 (ASTM A615) Grade 60. Welded wire fabric shall be AASHTO M55 (ASTM A185) (smooth wire), or AASHTO M22 (ASTM A497) (deformed wire). Reinforcing steel in the top slab shall have an epoxy coating conforming to AASHTO M284 (ASTM D3963), when there is 6 inches or less of cover on the RCBC (Clark County excluded).
 - Bedding:** Bedding material shall be either 4 inches of granular backfill or 2 inches of type 2 class 8 aggregate. Choice of bedding will be at the Contractor's option. Excavation for bedding shall be paid for as 4 inches of structure excavation, and bedding material shall be paid for as 4 inches of granular backfill, regardless of which option the Contractor uses.
 - Headwalls:** Headwall details shall be as shown in the Standard Plans. Exposed reinforcements to the cast-in-place headwall to precast box shall consist of either #4 bars of 12 inch spacing or exposure of the double case of welded wire fabric. The #4 bars shall be case a min. of 18 inches into the precast box segment. Both the #4 bar or welded wire fabric shall extend a min. of 12 inches into the cast in place headwall.
 - Joint Material:** Joint material shall be a preformed joint material meeting AASHTO M38 type B. The material shall be installed in accordance with the manufacturer's recommendations. A double application of joint material shall be used. One application shall be applied to the tongue and the other to the groove. The minimum size of joint material shall be 1-1/4 inches. Any joint material extruding from the interior of the joint shall be removed flush with the box wall.
 - Special Design:** A special design of the precast box shall be required for the following conditions:
 - RCBCs requiring the use of approach slabs.
 - RCBCs requiring the use of bridge roll.
 - RCBCs requiring the use of guardrail where the height of cover is less than the embedment length of the guardrail post.
 - Marking:** In addition to the markings required by the AASHTO and ASTM specifications, each box section shall be marked with appropriate MDOT Contract Number.



LIFTING



XX Reinforcing Steel Shall Extend Full Width Of Concrete Pavement. The Reinforcement Shall Have A Minimum Clearance Of 3" On The Bottom. In Areas Of The State Where Road Salts Are Used, The Reinforcing Shall Be Epoxy Coated. Reinforcing Is To Be Placed Parallel To The Centerline Of Road For Longitudinal Reinforcement And Parallel To The Precast Box For Transverse Reinforcement.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

PRECAST CONCRETE BOX CULVERT

Designer To Investigate The Availability Of The Required Box Size.

Robert J. Morrison
CHIEF BRIDGE ENGINEER

B-20.1.8-(502)
ADOPTED: 4/85 REVISION: 3-10/94

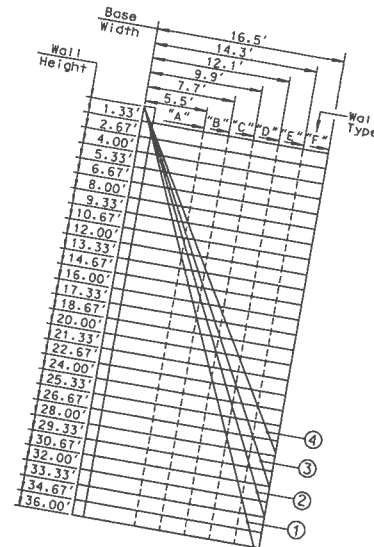
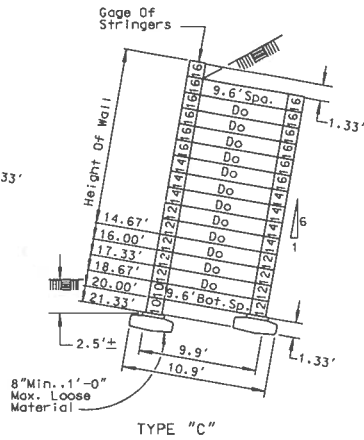
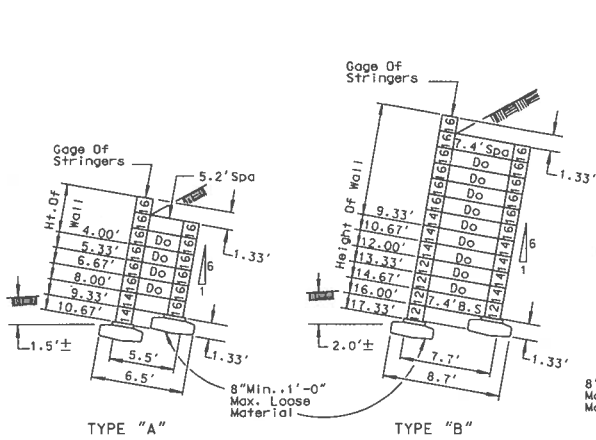


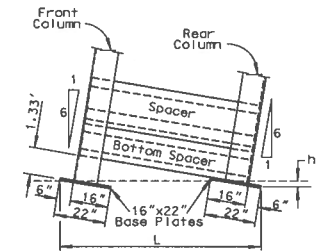
CHART "X"

HOW TO USE: Select Proper Circled Number in Table (Y) According to Batter And Surcharge Conditions. In Chart (X), Determine Where The Line With That Number Intercepts The Desired Height.

EXAMPLE: Wall On 1:6 Batter With Live Load. Wall Height 18 Ft. These Conditions Are Found As (2) In Table. In Chart, Line (2) Intercepts The 18 Ft. Height Line About Midway Of Type "C" Which Has A Base Width Of 9.9 Feet.

Surcharge Batter	Level No Live Load	With Superimposed Load
Wall On 1:6 Batter		
Wall Vertical		

① Curve Number TABLE Y



DETAIL - BASE PLATE PLACEMENT

WALL WIDTH TYPE	h	L
"A"	* 3"	6'-7 ⁵ / ₈ "
"B"	1 ³ / ₈ "	8'-9 ⁵ / ₈ "
"C"	5 ³ / ₈ "	10'-11 ³ / ₈ "
"D"	10 ³ / ₈ "	13'-2 ¹ / ₈ "
"E"	14 ³ / ₈ "	15'-4 ³ / ₈ "
"F"	18 ³ / ₄ "	17'-8 ¹ / ₂ "

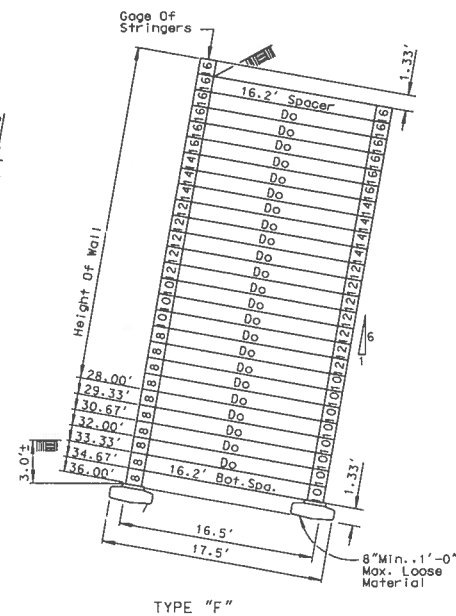
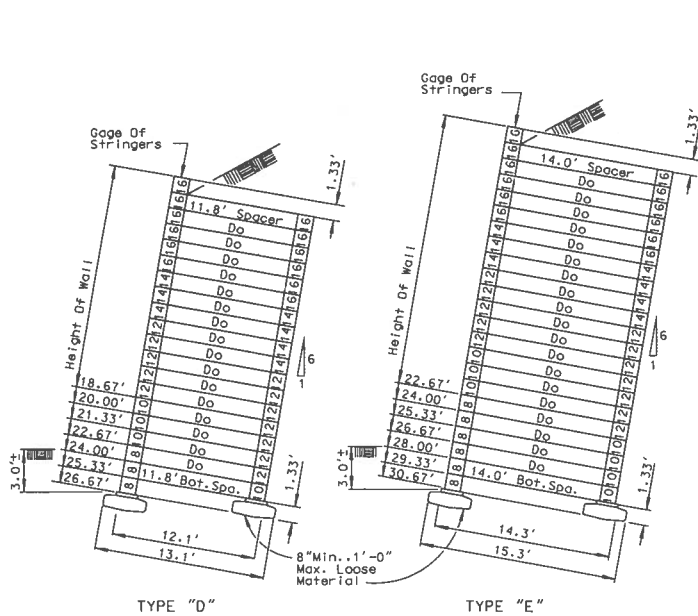
*NOTE: Distance "h" For Type "A" Is A Minus Quantity---That Is, Front Column Base Is LOWER Than Rear Column Base.

All Bolts To Be 5/8" With A Min. Length Of 1¹/₄".

GENERAL NOTES

Design "Type" To Be Shown On All Grid Layouts.

For Design Data See B-21.1.1

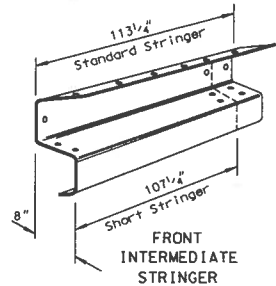


STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

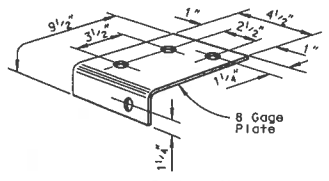
**CONSTRUCTION
DETAILS FOR
METAL RETAINING WALL**

Steel & Masonry
CONSTRUCTION DIVISION

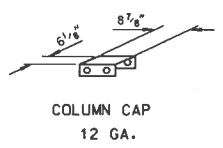
B-21.1.2-(612)
ADOPTED: 8/69 REVISION:



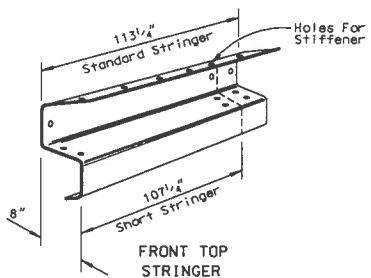
FRONT INTERMEDIATE STRINGER



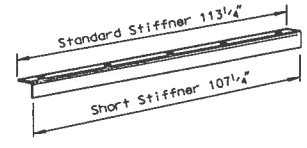
STRINGER CONNECTION PLATES "A" & "B" (TYPE "A" SHOWN, TYPE "B" SIMILAR)



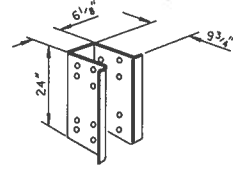
COLUMN CAP 12 GA.



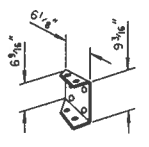
FRONT TOP STRINGER



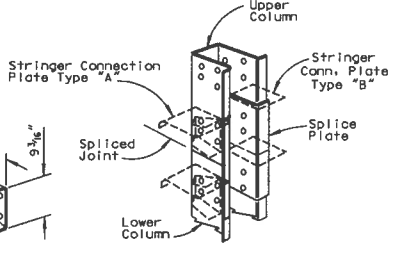
STRINGER STIFFENER - 8 GA.



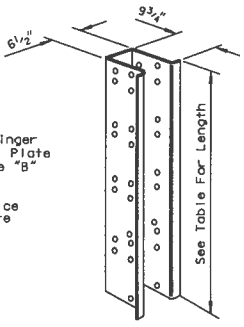
COLUMN SPLICE PLATE - 10 GA.



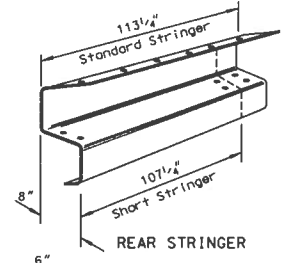
CONNECTING CHANNEL - 8 GA.



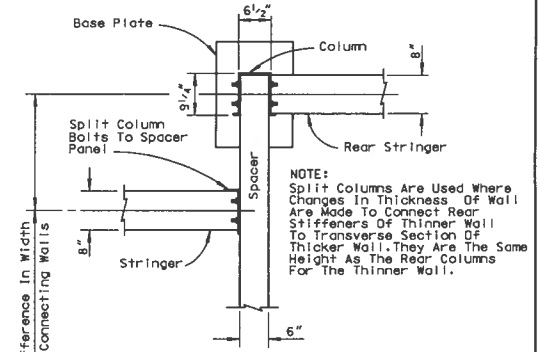
ASSEMBLY AT COLUMN SPLICE



COLUMN 8 GA.

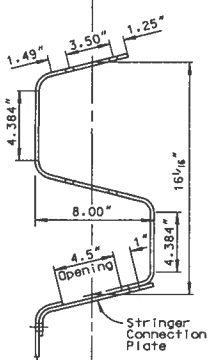


REAR STRINGER

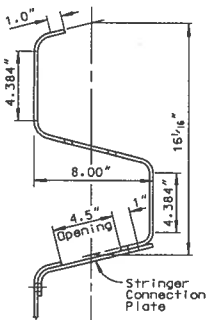


Difference In Width Of Connecting Walls

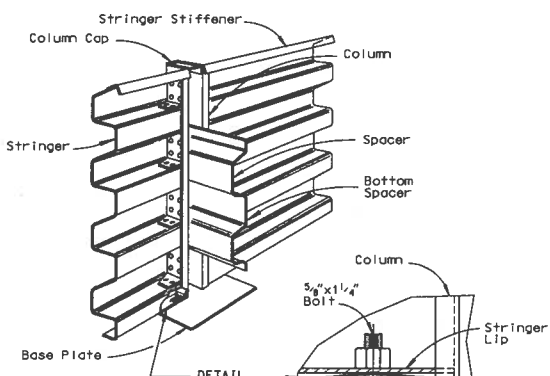
DETAIL SPLIT COLUMN ATTACHMENT



FRONT TOP STRINGER

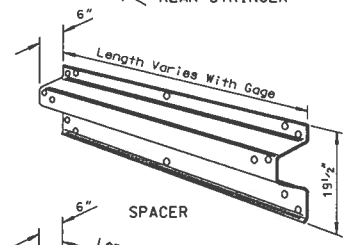


FRONT INTERMEDIATE STRINGER (EXCEPT TOP STRINGER)

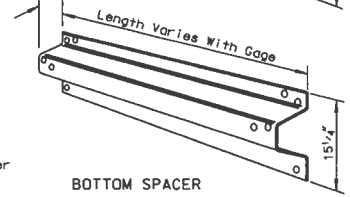


CRIB ASSEMBLY FRONT COLUMN (REAR COLUMN SIMILAR)

NOTE: Before Setting Base Plate, Insert Bolt And Fasten With Spring Nut.

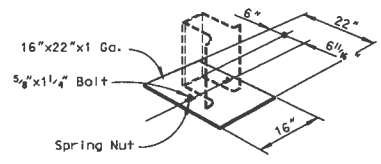


SPACER



BOTTOM SPACER

NOTE: See Table On Sheet 1 For Gage And Length.



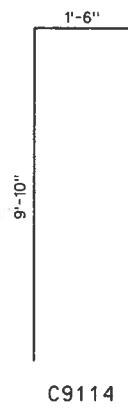
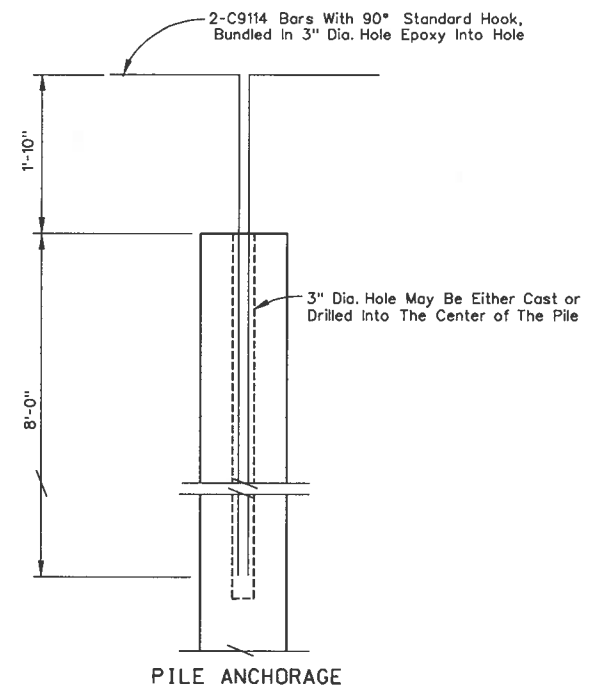
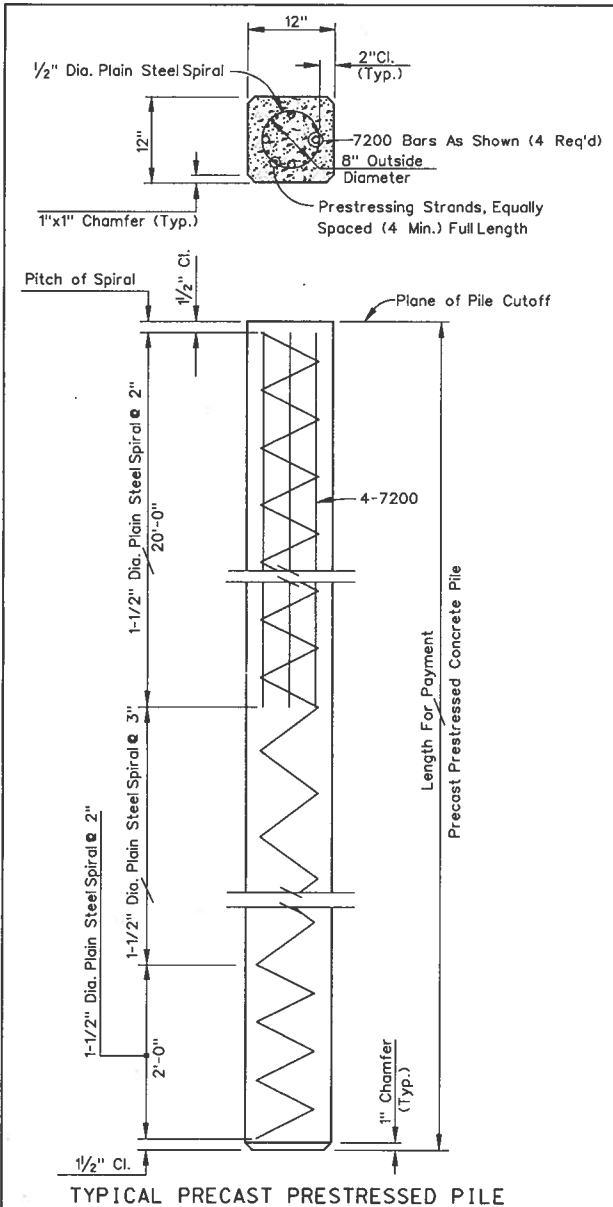
BASE PLATE ARRANGEMENT

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

**CONSTRUCTION
DETAILS FOR
METAL RETAINING WALL**

David J. Morrison
CITY ENGINEER

B-21.1.3-(612)
ADOPTED: 8/6/9 REVISION



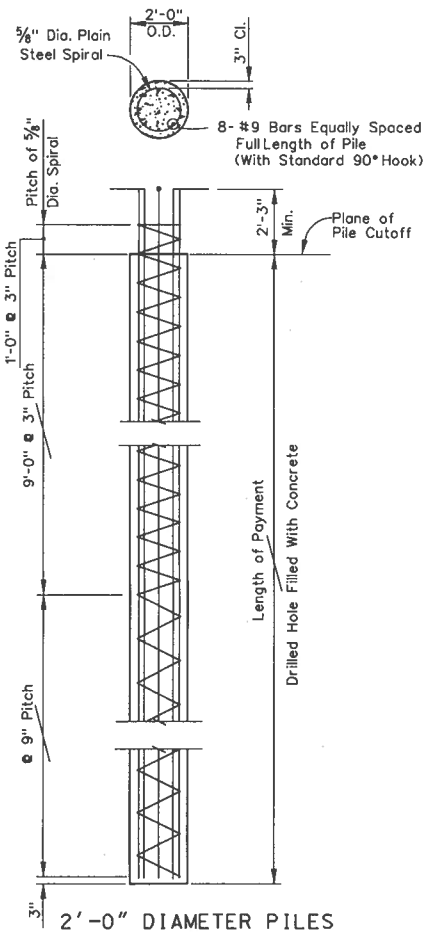
— GENERAL NOTES —

1. CONCRETE: ALL CONCRETE IN PRECAST PRESTRESSED PILES SHALL BE CLASS PAA CONCRETE, EXCEPT THE MIX SHALL CONTAIN NOT LESS THAN 8 SACKS OF CEMENT PER CUBIC YARD. AIR ENTRAINMENT SHALL BE 0% TO 4%. MINIMUM ULTIMATE COMPRESSIVE STRENGTH SHALL BE:
F'c AT TRANSFER - 4000 PSI
F'c AT 28 DAYS - 6000 PSI
2. FINAL FORCE: THE FORCE REMAINING IN THE PILES AFTER ALL LOSSES IN THE PRESTRESSING STEEL SHALL BE 100 KIPS. (700 PSI CONCRETE STRESS). TOTAL LOSSES IN PRESTRESSING STEEL SHALL BE TAKEN AS 40 SKI.
3. PRESTRESSING STEEL: PRESTRESSING STEEL SHALL BE HIGH-TENSILE STRENGTH SEVEN WIRE STRAND CONFORMING TO THE REQUIREMENTS OF ASTM A416.
4. REINFORCEMENT: ALL REINFORCING STEEL SHALL BE AASHTO M31 GRADE 60.

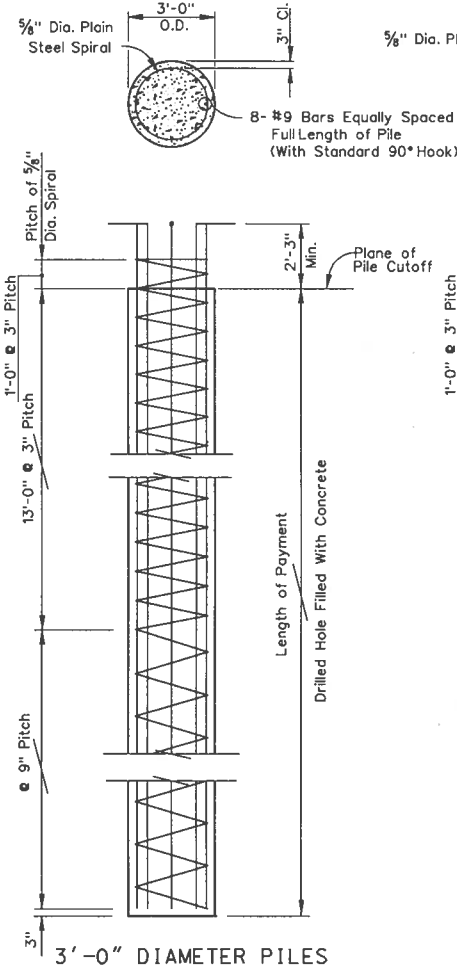
— CONSTRUCTION NOTES —

1. LAPPED SPLICES IN SPIRAL REINFORCEMENT SHALL BE 60 DIAMETERS MINIMUM. ALL SPIRAL REINFORCEMENT AT SPLICES AND AT ENDS OF THE PILE SHALL BE TERMINATED BY A 135° HOOK WITH 6 INCH TAIL HOOKED AROUND A LONGITUDINAL BAR OR STRAND.
2. LOCATION AND TYPE OF LIFTING DEVICES SHALL BE APPROVED BY THE ENGINEER.
3. MAXIMUM CUT-OFF LENGTH AT THE TOP OF PILE IS 10'-0".
4. PRECAST PRESTRESSED CONCRETE PILES SHALL BE SUPPLIED FULL LENGTH. SPLICES SHALL NOT BE ALLOWED.

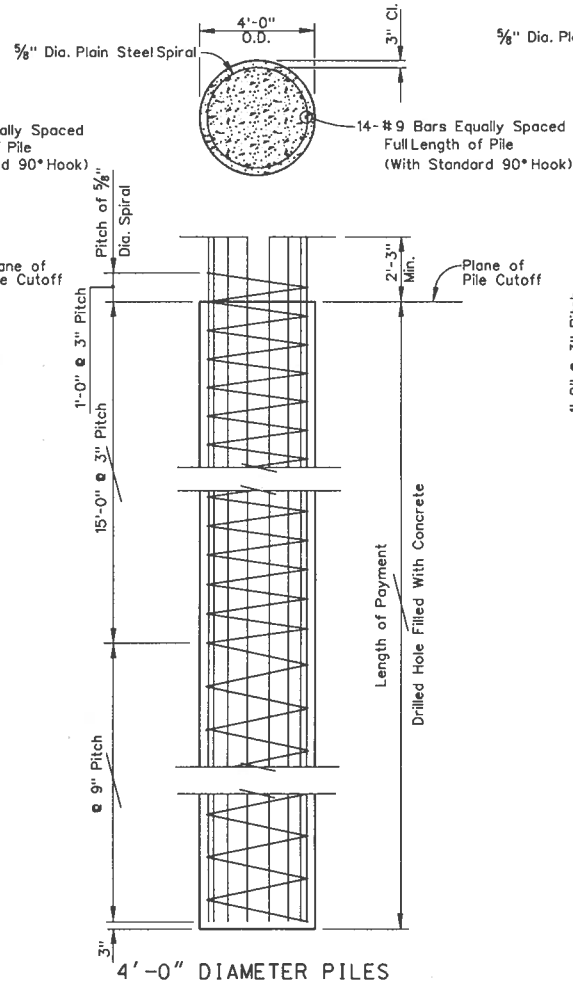
STATE OF NEVADA DEPARTMENT OF TRANSPORTATION	
PRECAST PRESTRESSED CONCRETE PILE DETAILS	
<i>Edward J. Marmasi</i> CHIEF BRIDGE ENGR.	B-23.1.1 - (500) ADOPTED 12-98 REVISION



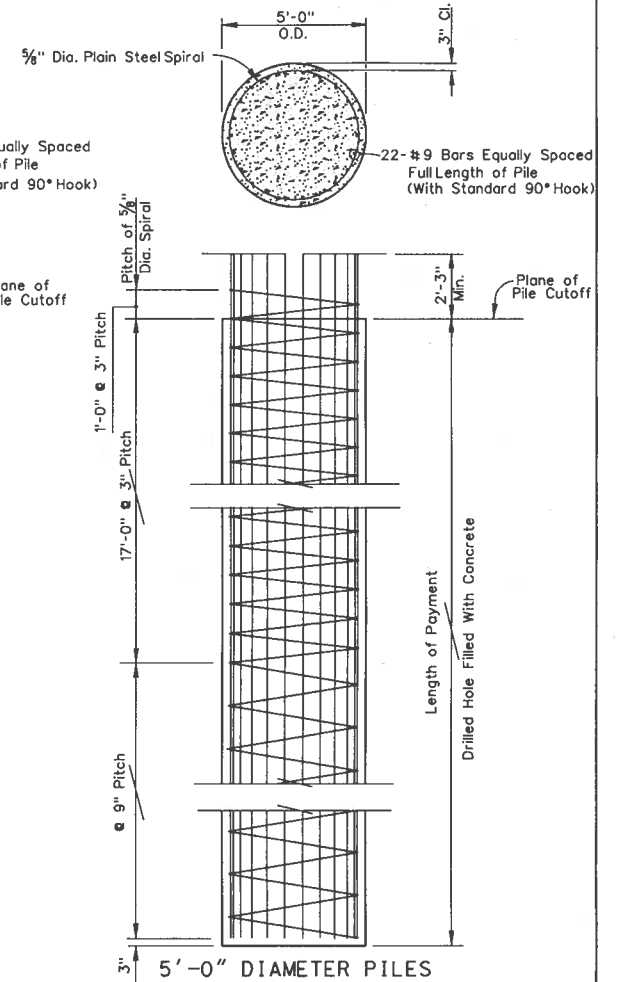
2'-0" DIAMETER PILES



3'-0" DIAMETER PILES



4'-0" DIAMETER PILES

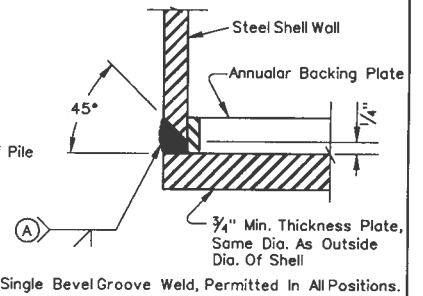
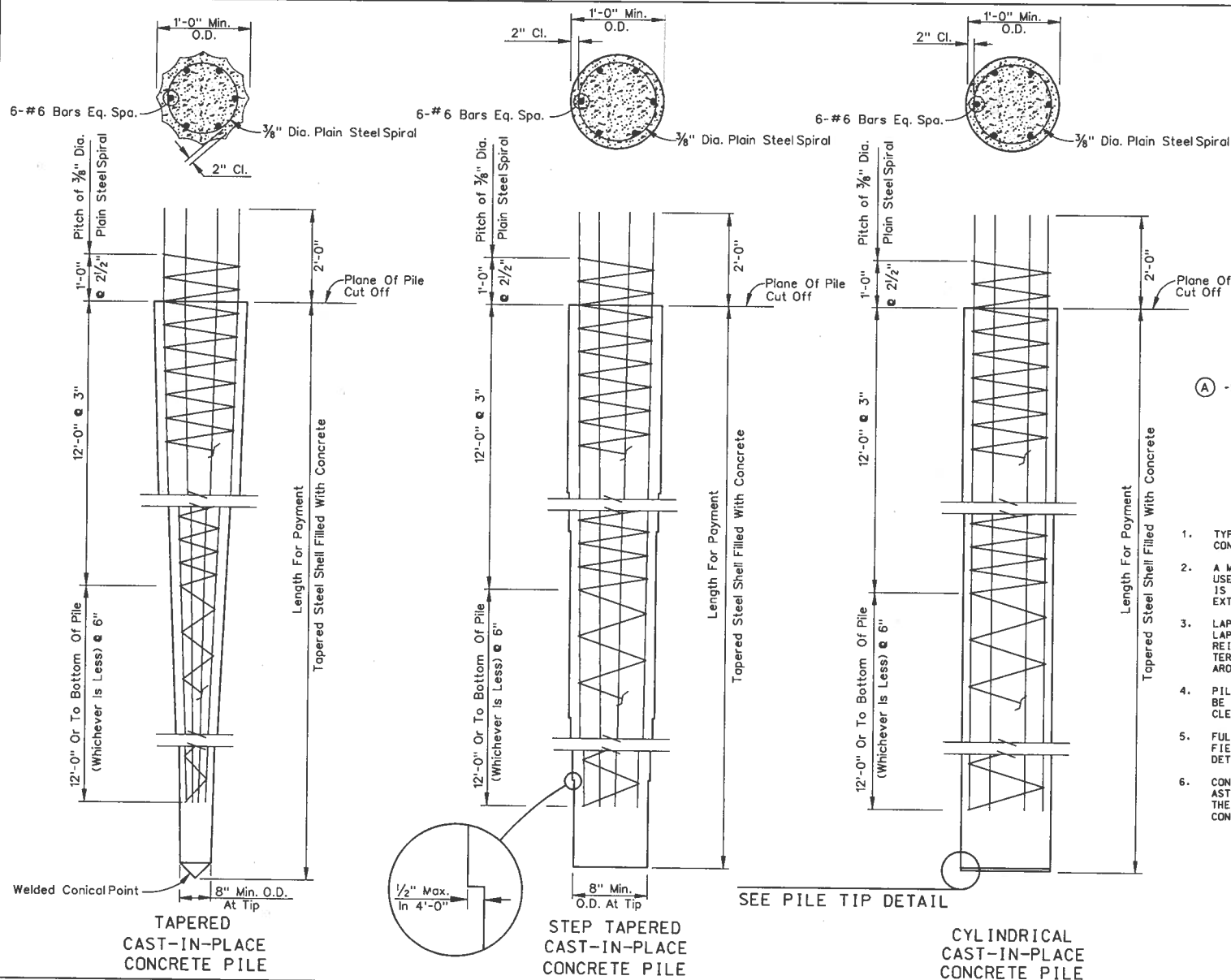


5'-0" DIAMETER PILES

NOTES:

1. SPLICES IN LONGITUDINAL REINFORCEMENT NOT ALLOWED WITHIN UPPER 25 FEET OF PILE. MINIMUM LAP SPLICE FOR #9 BARS IS 5'-5".
2. LONGITUDINAL PILE REINFORCEMENT EXTENDING INTO THE FOOTING SHALL PROVIDE 3 INCHES OF CLEARANCE TO TOP OF FOOTING. A STANDARD 180° HOOK MAY BE USED IN LIEU OF THE 90° HOOK.
3. LAPPED SPLICES IN SPIRAL REINFORCEMENT SHALL BE LAPPED 60 BAR DIAMETERS MINIMUM. ALL SPIRAL REINFORCEMENT AT SPLICES AND AT THEIR ENDS SHALL BE TERMINATED BY A 135° HOOK WITH 8 INCH TAIL HOOKED AROUND A LONGITUDINAL BAR.

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION	
CAST IN DRILLED HOLE CONCRETE PILE DETAILS	
<i>Edward J. Mammari</i> CHIEF BRIDGE ENGR.	B-23.1.2 - (508) ADOPTED: 12-90 REVISION



PILE TIP DETAIL

NOTES

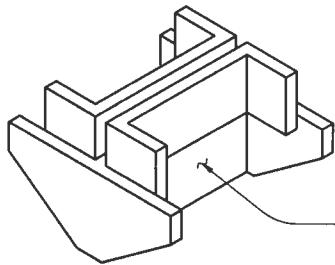
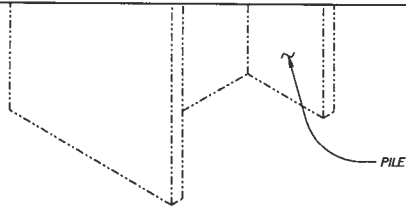
1. TYPE AND THICKNESS OF STEEL SHELL TO BE SHOWN ON CONTRACT PLANS.
2. A MINIMUM 10 INCH DIAMETER PIPE EXTENSION MAY BE USED AT THE TIP OF A STEP TAPERED PILE WHEN TAPER IS 30 FEET OR MORE IN LENGTH. MINIMUM THICKNESS OF EXTENSION IS .250 INCHES.
3. LAPPED SPLICES IN SPIRAL REINFORCEMENT SHALL BE LAPPED 60 DIAMETERS MINIMUM. ALL SPIRAL REINFORCEMENT AT SPLICES AND AT THEIR ENDS SHALL BE TERMINATED BY A 135° HOOK WITH 6 INCH TAIL HOOKED AROUND A LONGITUDINAL BAR.
4. PILE REINFORCEMENT EXTENDING INTO A FOOTING SHALL BE HOOKED AS REQUIRED TO PROVIDE 3 INCHES OF CLEARANCE TO TOP OF FOOTING.
5. FULL PENETRATION BUTT WELDS SHALL BE USED IN ALL FIELD SPLICES OF STEEL SHELLS. CONFORMING TO THE DETAILS ON SHEET B-23.1.4.
6. CONICAL POINTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A27 GRADE 65-35. CONICAL POINTS SHALL HAVE THE SAME OUTSIDE DIAMETER AS THE SHELL AND BE CONNECTED WITH FULL PENETRATION BUTT WELDS.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

**CAST-IN-PLACE
CONCRETE PILE DETAILS**

Edw. J. Marston
CHIEF BRIDGE ENGR.

B-23.1.3 - (500)	REVISION
ADOPTED 12-78	

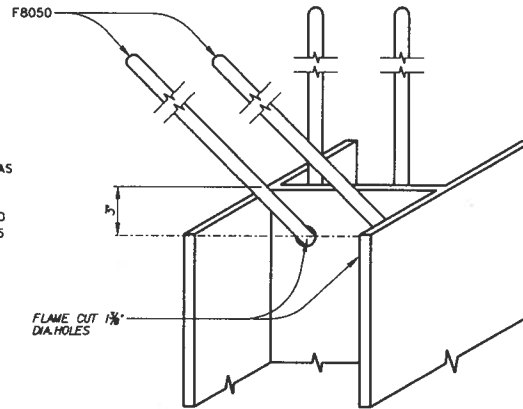


HP PILE POINT ATTACHMENT
(ACTUAL CONFIGURATION MAY VARY)

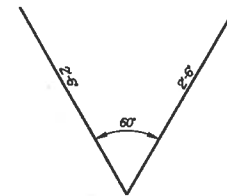
TYPICAL HP PILE POINT DETAIL

HP PILE POINT ATTACHMENT NOTES

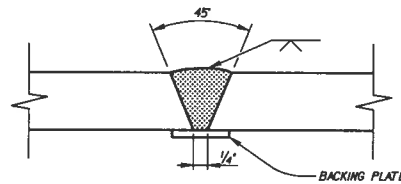
1. HP PILE POINT ATTACHMENTS ARE REQUIRED ONLY WHEN SHOWN ON THE PLANS OR IN THE SPECIAL PROVISIONS.
2. THE PILE POINT CONFIGURATION SHALL BE AS SHOWN ON PLANS.
3. PILE POINT ATTACHMENTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A27 GRADE 65-35 UNLESS NOTED OTHERWISE.
4. WELDS FOR ATTACHMENTS SHALL BE AS RECOMMENDED BY THE MANUFACTURER.



HP PILE ANCHORAGE DETAIL

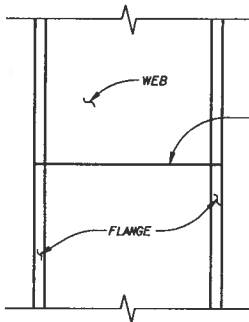


2-F8050



SINGLE VEE-GROOVE BUTT WELD

PERMITTED FOR ALL POSITIONS

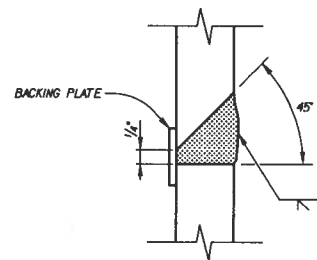


COMPLETE JOINT PENETRATION WELD (SEE WELDING DETAILS FOR APPROVED WELDS)

HP PILE SPLICE DETAIL

PILE SPLICE NOTES

1. PILE SPLICE WELDS SHALL CONFORM TO AWS D1.1.
2. PILE MUST BE STOPPED AT LEAST 3'-0" ABOVE GROUND PRIOR TO SPLICING.



SINGLE BEVEL-GROOVE BUTT WELD

PERMITTED IN HORIZONTAL POSITION ONLY

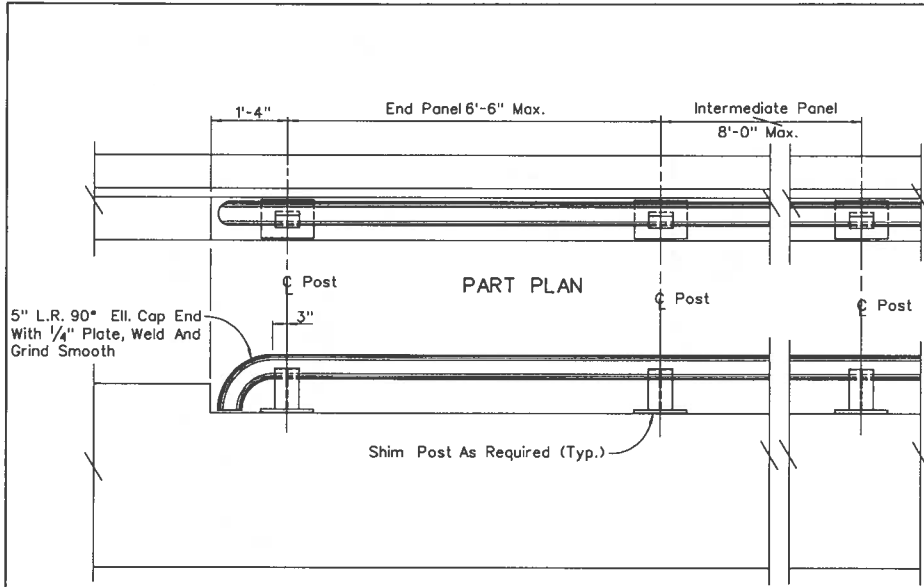
PILE SPLICE WELDING DETAILS

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

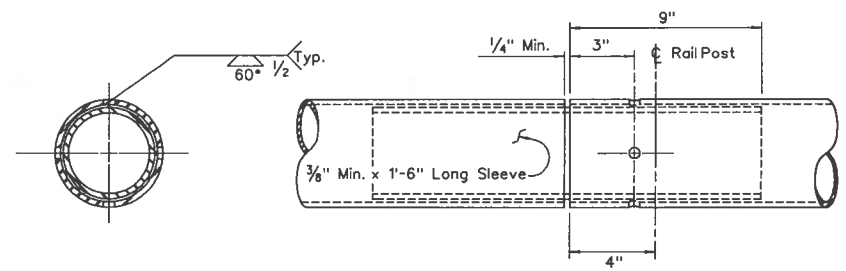
"HP" PILE DETAILS

Richard J. Anderson
CHIEF BRIDGE ENGINEER

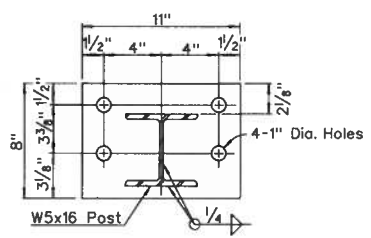
B-23.1.4-(508)
ADOPTED 12/90 REVISION



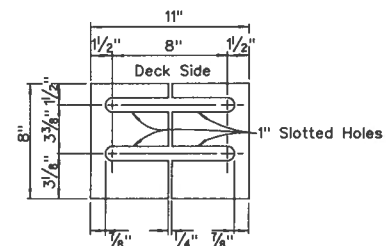
PART ELEVATION



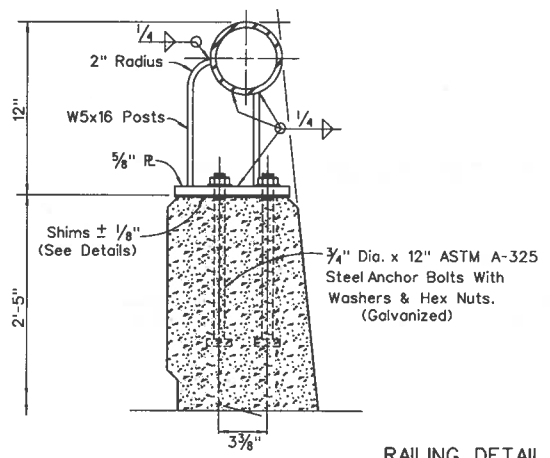
SLIP JOINT DETAIL



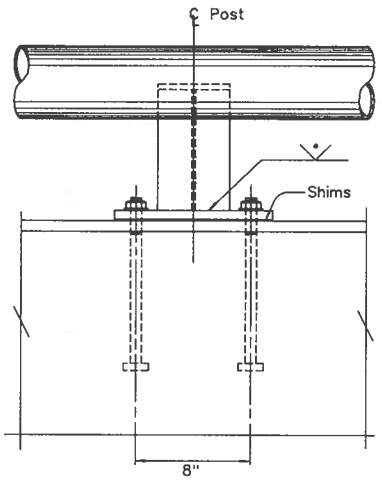
ANCHOR PLATE DETAIL



SHIM DETAIL



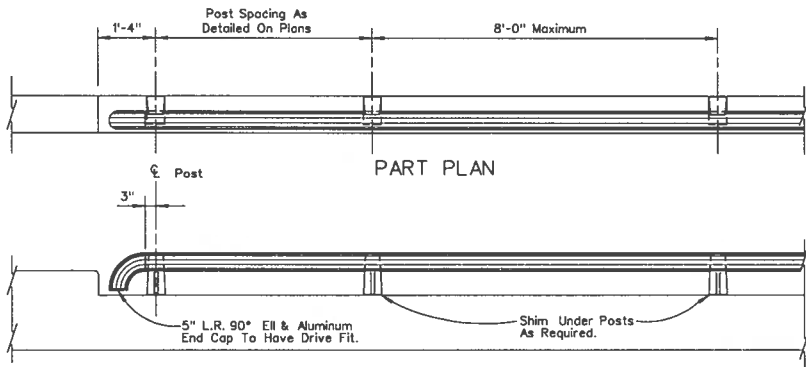
RAILING DETAIL



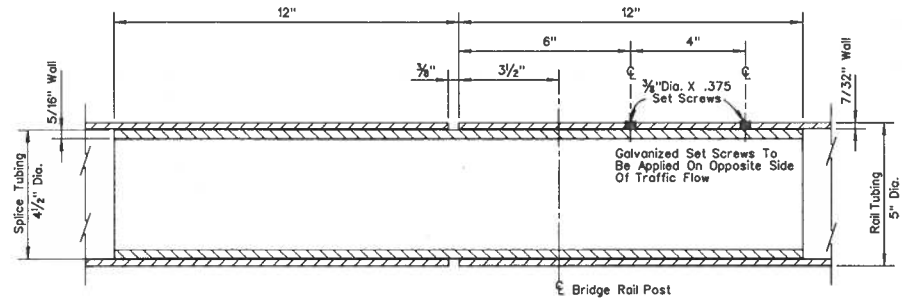
-GENERAL NOTES-

1. RAILING TO CONFORM TO VERTICAL AND HORIZONTAL ALIGNMENT.
2. JOINTS TO BE SPACED 40'-0" CENTER TO CENTER. MAXIMUM.
3. SLIP JOINTS TO BE PLACED IN PANELS TO MATCH EXPANSION JOINTS IN DECK. THE 1/4" FOR MOVEMENT WILL BE CHANGED TO MATCH ALLOWANCE FOR MOVEMENT IN THE DECK AND CURB.
4. DESIGN WEIGHT: 17 LBS. PER FT.
5. RAILING ASSEMBLY SHALL BE GALVANIZED AFTER FABRICATION.
6. ALL EXPOSED SURFACES OF RAILING ASSEMBLY SHALL BE PAINTED WHITE.

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION	
STEEL BRIDGE RAIL TYPE "H"	
<i>Edward J. Mariani</i> CHIEF BRIDGE ENGR.	B-25.1.2-(506) ADOPTED-11/78 REVISION



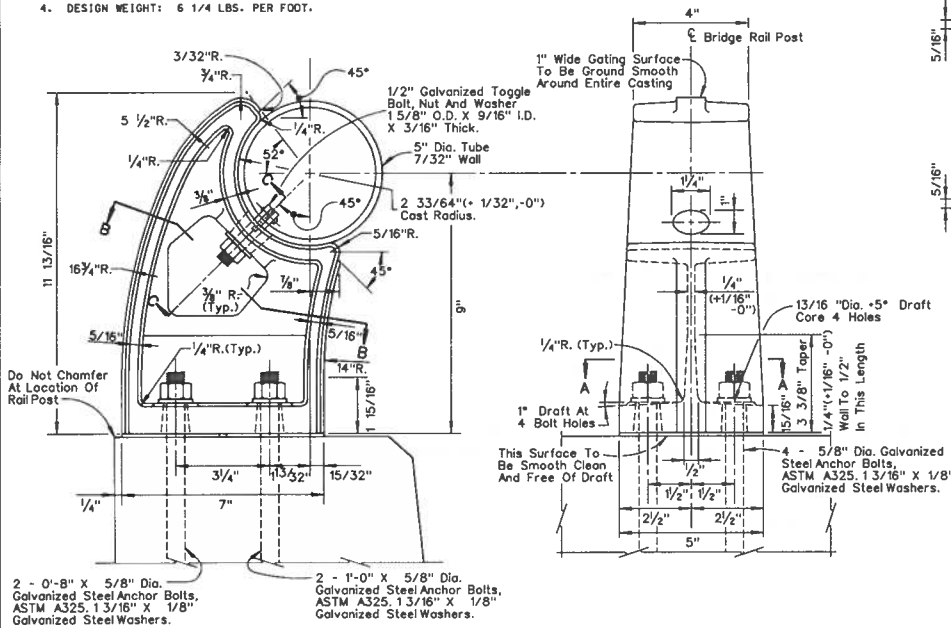
PART ELEVATION



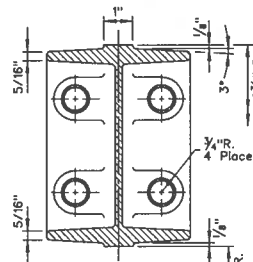
INSIDE SPLICE DETAIL

- GENERAL NOTES—
1. RAILING TO CONFORM TO VERTICAL AND HORIZONTAL ALIGNMENT.
 2. JOINT TO BE PLACED 25' 0" CENTER TO CENTER, MAX.
 3. SLIP JOINT TO BE PLACED IN PANELS TO MATCH EXPANSION JOINTS IN DECK. THE 3/8" FOR MOVEMENT WILL BE CHANGED TO MATCH ALLOWANCES FOR MOVEMENT IN THE DECK AND CURB.
 4. DESIGN WEIGHT: 6 1/4 LBS. PER FOOT.

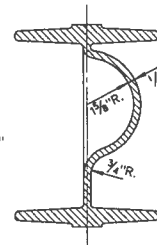
NOTE:
UNLESS OTHERWISE SPECIFIED ALL DRAFT TO BE 3°. ALL UNMARKED RADI TO BE 1/8" R.



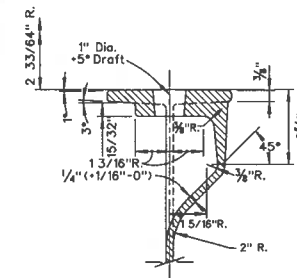
RAILING DETAILS



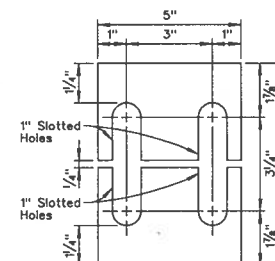
SECTION A-A



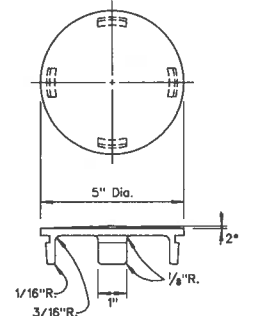
SECTION B-B



SECTION C-C



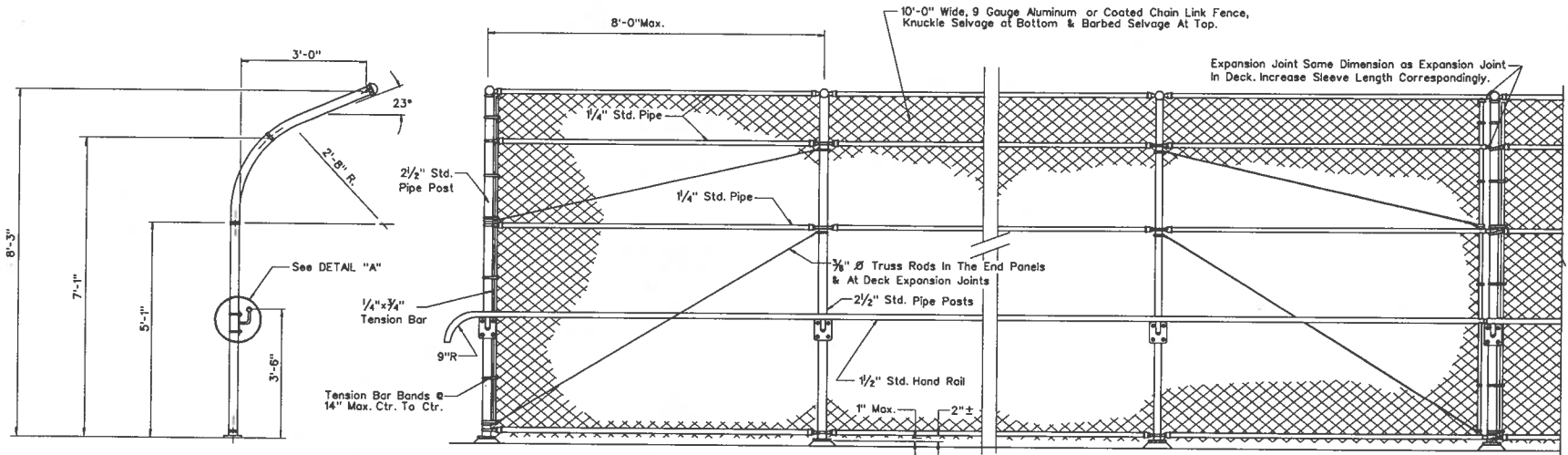
SHIM DETAIL



RAIL END CAP DETAILS

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION	
ALUMINUM BRIDGE RAIL TYPE "H"	
<i>Robert J. Morrison</i> CHIEF ENGINEER	B - 25.1.3 (506) ADOPTED-10/78 (REVISION)

B-18

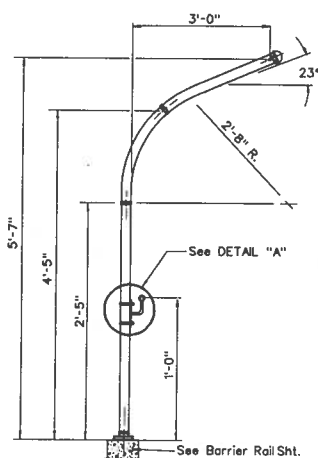


TYPE "M"

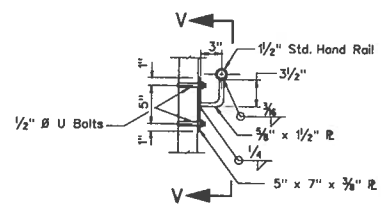
END POST

TYPICAL INTERIOR PANEL

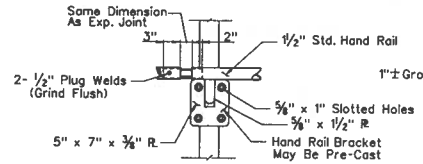
AT EXPANSION JOINT



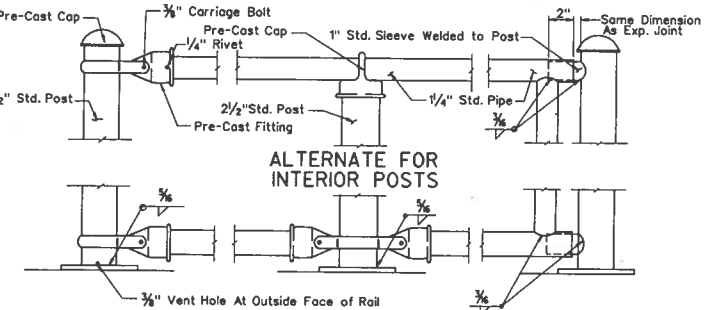
TYPE "M" (MODIFIED)



DETAIL "A"

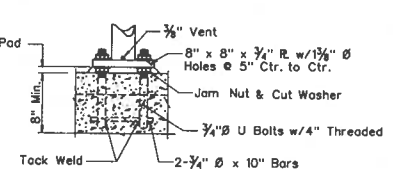


VIEW V-V

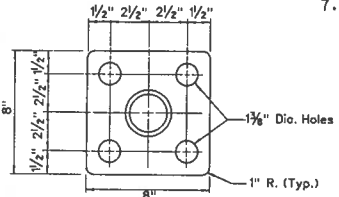


ALTERNATE FOR INTERIOR POSTS

TYPICAL CONNECTION DETAILS



ANCHORAGE DETAILS

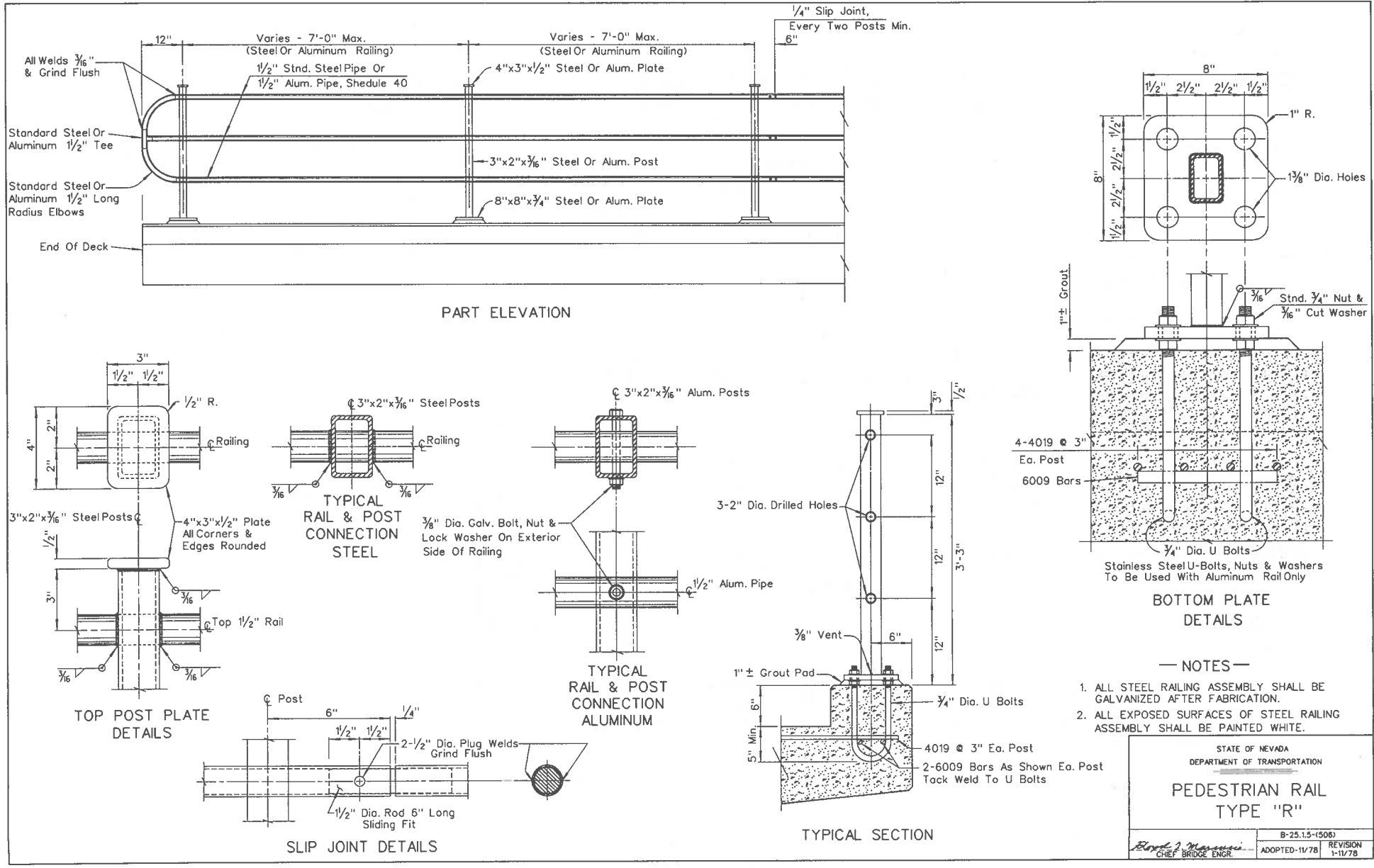


BASE PLATE

GENERAL NOTES

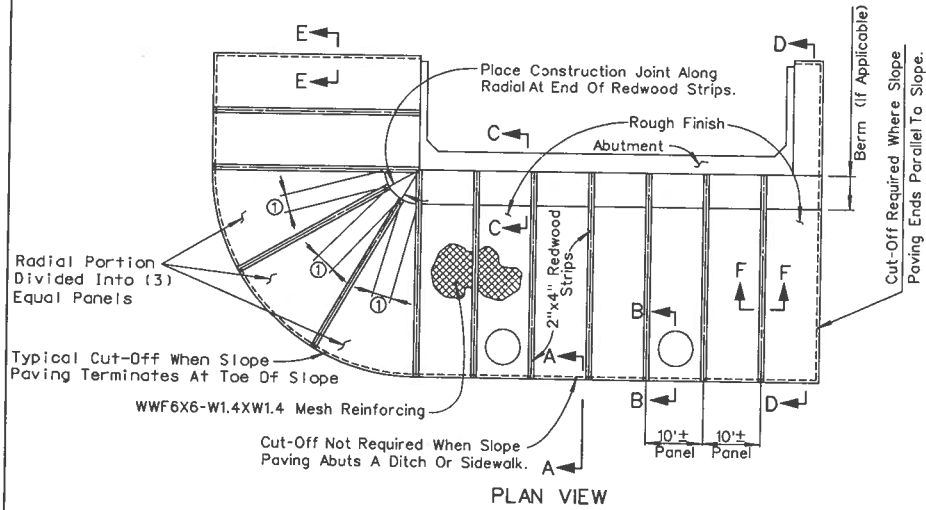
1. RAILING ASSEMBLY EXCEPT CHAIN LINK FABRIC, TO BE GALVANIZED AFTER FABRICATION.
2. RAILING SHALL CONFORM TO HORIZONTAL AND VERTICAL ALIGNMENTS. POSTS SHALL BE VERTICAL. TOP, INTERMEDIATE AND BOTTOM PIPES SHALL BE BENT IF THE RADIUS IS 150' OR LESS: MAY BE ON 8' CHORDS IF RADIUS IS OVER 150'.
3. SPACE POSTS TO CLEAR EXPANSION JOINTS BY 6" MIN. TO CENTERLINE POSTS.
4. ALL EXPOSED CORNERS TO BE SMOOTH.
5. PEEN ALL 3/8" BOLTS.
6. WHEN FENCE IS ON SLOPE THE 10'-0" FABRIC SHALL BE PLACED PARALLEL TO THE SLOPE.
7. ALTERNATIVE DETAILS MAY BE SUBMITTED BY THE CONTRACTOR FOR THE ENGINEERS APPROVAL.

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION		
PEDESTRIAN RAIL TYPE "M"		
<i>Richard A. Anderson</i> CHIEF BRIDGE ENGR.	B-25.1.4-(506) ADOPTED: 6-85	REVISION 1-12-90

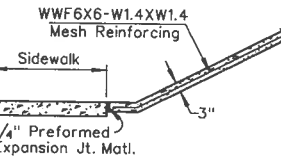
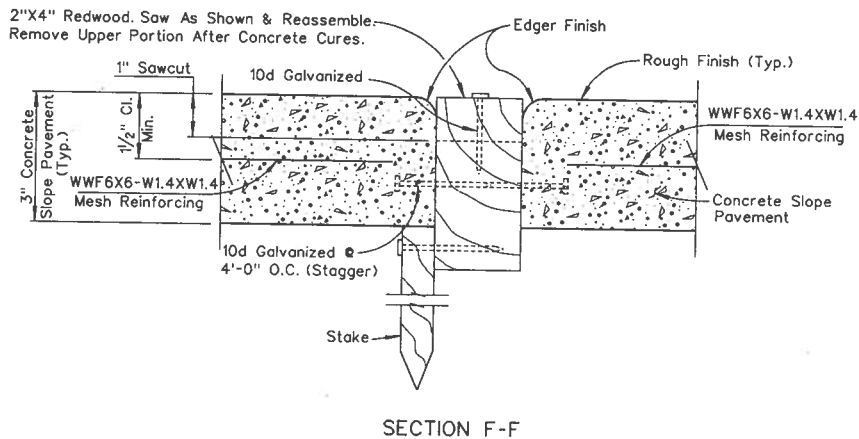


B-20

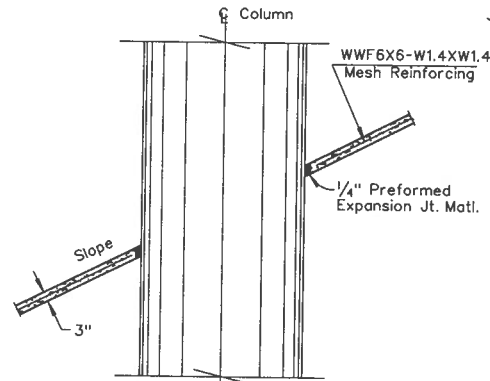
① END REDWOOD STRIPS AT TOP OF RADIAL SECTION WHEN THEIR INTERMEDIATE DISTANCE FROM EACH OTHER REACHES THREE (3') FEET.



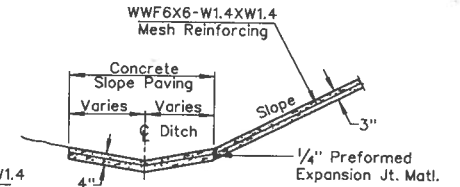
NOTE: 1. SLOPE PAVING IS TO BE DIVIDED INTO EQUALLY SPACED PANELS. THE WIDTH OF EACH PANEL IS TO BE AS NEARLY 10' AS SITE DIMENSIONS WILL PERMIT. 2. THESE DETAILS WILL NOT APPLY IN TOTAL TO ANY ONE SITE, BUT ARE INTENDED TO BE GENERAL ENOUGH TO COVER ALL POSSIBILITIES. TO OBTAIN LIMITS OF SLOPE PAVING FOR A SPECIFIC SITE, CONSULT THE PLAN SHEETS.



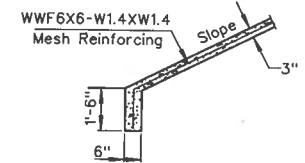
SECTION A-A (WITH SIDEWALK)



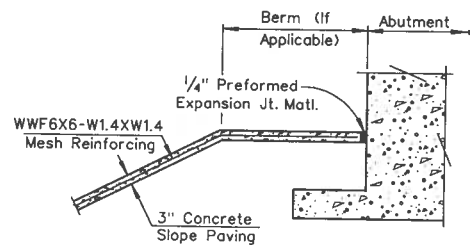
SECTION B-B (AT PIER)



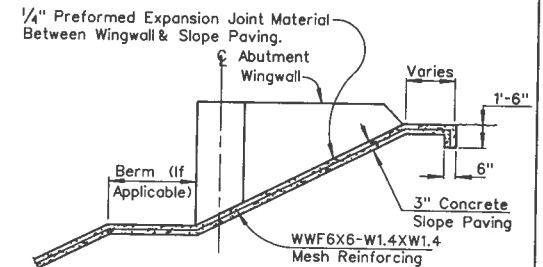
SECTION A-A (WITH DITCH)



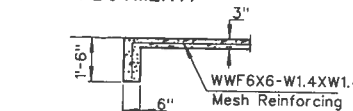
SECTION A-A (TOE OF SLOPE)



SECTION C-C (AT ABUTMENT)



SECTION D-D (AT WINGWALL)

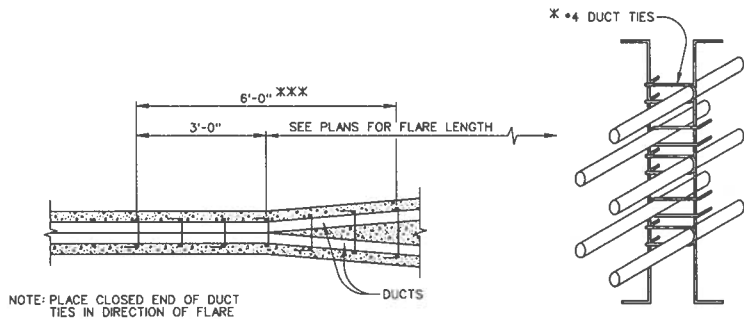


SECTION E-E (EDGE OF SLOPE)

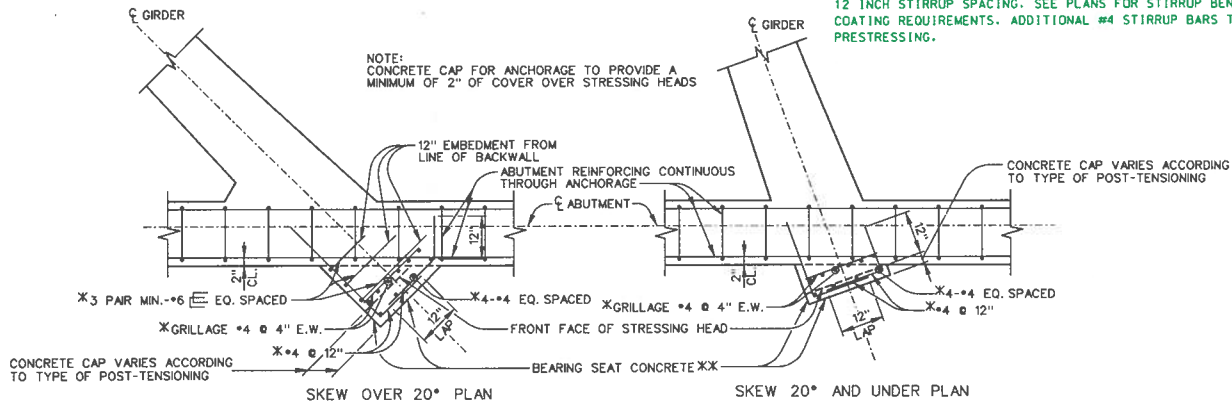
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

CONCRETE SLOPE
PAVING DETAILS

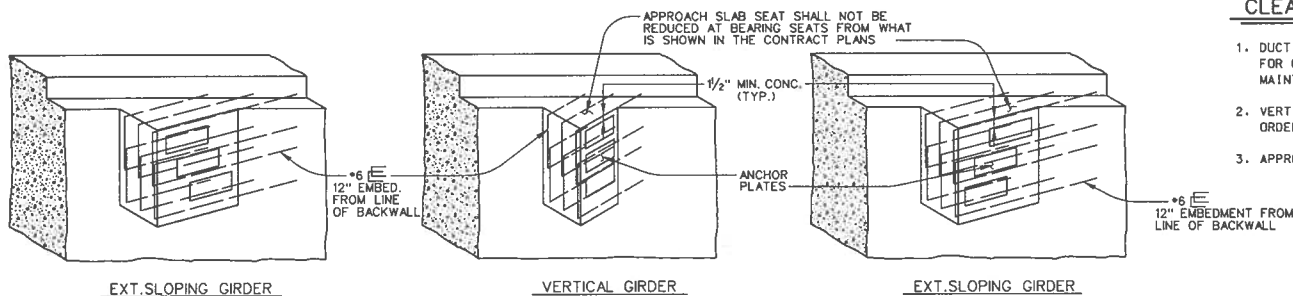
ADOPTED-11/78 REVISION 2-3/85



STIRRUP REINFORCEMENT AT FLARE OF GIRDER STEM



BEARING SEAT FOR PRESTRESSED ANCHORAGE AT DIAPHRAGM TYPE ABUTMENTS



TYPICAL BEARING SEAT ILLUSTRATIONS

DISTRIBUTION OF PRESTRESSING FORCE:

UNLESS OTHERWISE NOTED THE PRESTRESSING FORCE, P JACK OR PF, SHALL BE DISTRIBUTED WITH AN APPROXIMATELY EQUAL AMOUNT IN EACH GIRDER AND SHALL BE PLACED SYMMETRICALLY ABOUT THE CENTERLINE OF THE STRUCTURE. IN SLABS, THE PRESTRESSING FORCE SHALL BE UNIFORMLY DISTRIBUTED ACROSS THE SLAB.

STRESSING SEQUENCE:

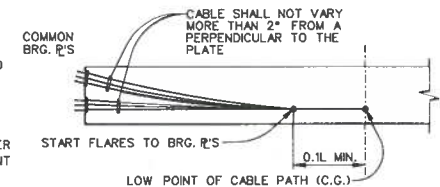
NO MORE THAN 1/2 OF THE PRESTRESSING FORCE IN ANY GIRDER MAY BE STRESSED BEFORE AN EQUAL FORCE IS STRESSED IN THE ADJACENT GIRDERS. AT NO TIME DURING THE STRESSING OPERATIONS WILL MORE THAN 1/6 OF THE TOTAL PRESTRESSING FORCE BE APPLIED ECCENTRICALLY ABOUT THE CENTERLINE OF THE STRUCTURE.

GIRDER STEM SHALL BE FLARED NEAR ANCHORAGE TO PROVIDE A MINIMUM OF 1-1/2" CONCRETE COVERING THE REBAR. FLARE MAY BE ON ONE SIDE OF THE GIRDER ONLY. BAR REINFORCEMENT INTERFERING WITH THE PRESTRESSING TENDON ALIGNMENT SHALL BE ADJUSTED AS APPROVED BY THE ENGINEER.

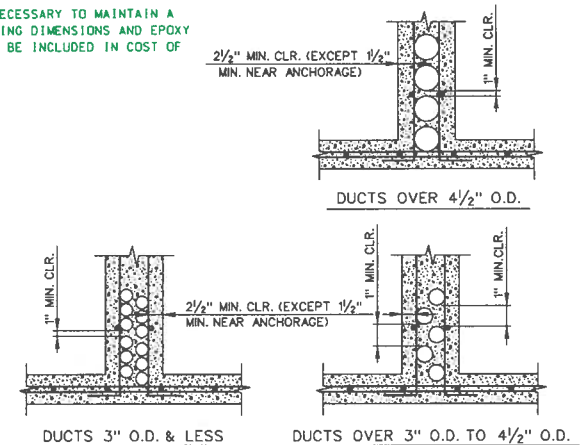
* BARS MARKED THUSLY ARE TO BE INCLUDED IN THE COST OF PRESTRESSING CAST-IN-PLACE CONCRETE.

*X CONCRETE USED IN THE BEARING SEATS IS TO BE INCLUDED IN THE COST OF PRESTRESSING CAST-IN-PLACE CONCRETE.

XXX ADD ADDITIONAL #4 STIRRUP BARS, IN PAIRS, AS NECESSARY TO MAINTAIN A 12 INCH STIRRUP SPACING. SEE PLANS FOR STIRRUP BENDING DIMENSIONS AND EPOXY COATING REQUIREMENTS. ADDITIONAL #4 STIRRUP BARS TO BE INCLUDED IN COST OF PRESTRESSING.



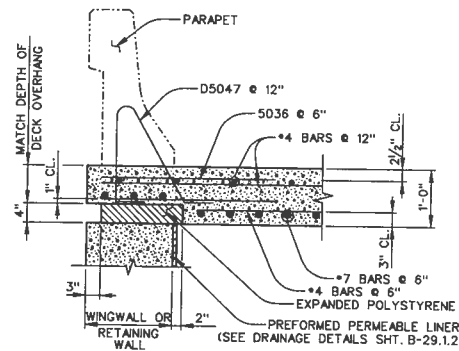
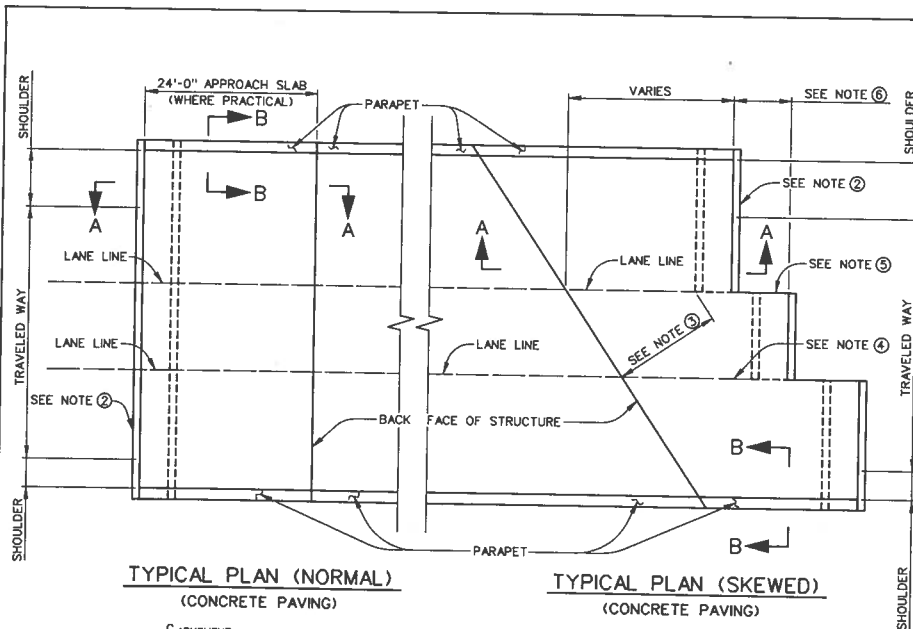
COMMON BEARING PLATE PRESTRESSING PATH



CLEARANCE REQUIREMENTS FOR DUCTS

1. DUCT PATTERNS SHOWN ARE FOR 12" WIDE GIRDER STEM; FOR OTHER WIDTHS THE MINIMUM CLEARANCES MUST BE MAINTAINED.
2. VERTICAL DIMENSIONS AT TENTH POINTS TO BE SHOWN IN ORDER TO FACILITATE THE PLACING OF THE DUCTS ACCURATELY.
3. APPROVAL OF THE ENGINEER IS REQUIRED FOR DEVIATIONS.

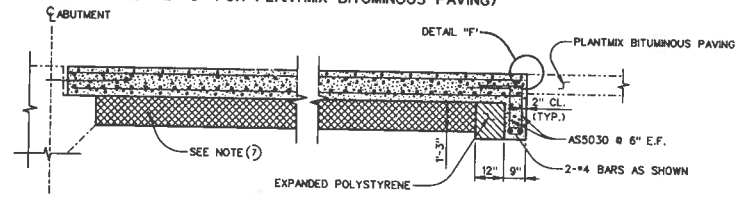
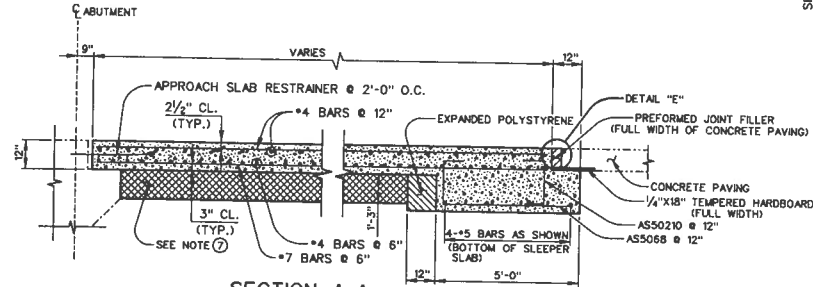
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
CAST-IN-PLACE PRESTRESSED GIRDER DETAILS
B-28.1.1-(503)
ADOPTED: 3/85 REVISION: 1-12/87



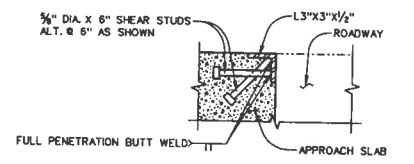
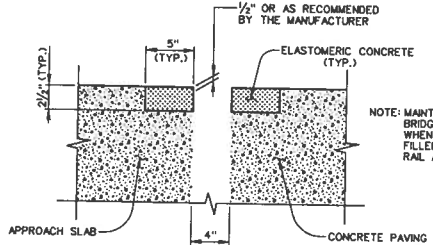
A) WHEN THE APPROACH SLAB EXTENDS BEYOND THE WINGWALLS, EXTEND THE EXPANDED POLYSTYRENE 2 INCHES BEYOND THE WINGWALL ENDS, ADJUST THE APPROACH SLAB TO ITS FULL DEPTH, AND ELIMINATE THE 5036 BARS.

GENERAL NOTES

- ① THE CONCRETE SHALL BE $f'c=4500$ PSI. OR "A" $f'c=4000$ PSI. AS DETERMINED BY THE ENGINEER. WHEN "EA" CONCRETE IS REQUIRED, THE REINFORCING STEEL SHALL HAVE AN EPOXY COATING.
- ② A. THE CONTACT JOINT BETWEEN THE CONCRETE PAVEMENT AND THE APPROACH SLAB SHALL PARALLEL THE BACK FACE OF THE STRUCTURE FOR SKEWS OF 20 DEGREES OR LESS; FOR SKEWS GREATER THAN 20 DEGREES THE CONTACT JOINT SHALL BE NORMAL TO THE ROADWAY ALIGNMENT CONTROL LINE. JOINTS SHALL BE STAGGERED ON LANE LINES FOR SKEWED STRUCTURES. STAGGER LINES SHALL BE AT EACH LANE LINE FOR SKEWS OF 45 DEGREES OR MORE.
- B. THE CONTACT JOINT BETWEEN ASPHALT PAVEMENT AND APPROACH SLAB SHALL PARALLEL THE BACK FACE OF THE STRUCTURE.
- ③ FOR SKEWS GREATER THAN 20 DEGREES THE DISTANCE MEASURED NORMAL TO AND FROM THE BACK FACE OF THE STRUCTURE TO THE END OF THE APPROACH SLAB SHALL BE A MINIMUM OF 15 FEET.
- ④ LONGITUDINAL CONSTRUCTION JOINTS IN THE APPROACH SLAB MAY BE LOCATED ON LANE LINES WHEN PERMITTED BY THE ENGINEER.
- ⑤ PLACE 1/4-INCH EXPANSION JOINT MATERIAL BETWEEN THE CONCRETE PAVEMENT AND THE LONGITUDINAL FACE OF THE APPROACH SLAB. THE EXPANSION JOINT MATERIAL IS TO BE RECESSED 1/2-INCH FROM THE SURFACE AND THE JOINT SEALED IDENTICALLY TO THE "LONGITUDINAL WEAKENED PLANE JOINT" ON SHEET R-76 OF THE STANDARD PLANS.
- ⑥ THE LENGTH OF THE STEPS MUST BE 12'-0" MINIMUM TO 15'-0" MAXIMUM OR INCREMENTAL INTERVALS (24'-0" MIN. TO 30'-0" MAX...) TO MAINTAIN A 12'-0" MINIMUM TO 15'-0" MAXIMUM SPACING OF THE TRANSVERSE WEAKENED PLANE JOINTS IN THE CONCRETE PAVEMENT. SEE SECTION 409.03.09 OF THE SPECIAL PROVISIONS AND SHEET R-76 OF THE STANDARD PLANS FOR SAW-CUTTING DETAILS.
- ⑦ FILL MATERIAL UNDER APPROACH SLABS SHALL BE COMPACTED TO NOT LESS THAN NINETY-FIVE (95) PERCENT OF THE MAXIMUM DENSITY. SEE SECTION 203.03.17 OF THE STANDARD SPECIFICATIONS AND/OR SPECIAL PROVISIONS FOR SPECIFIC TEST METHODS.



NOTE: FOR INFORMATION & DIMENSIONS NOT SHOWN SEE SECTION A-A



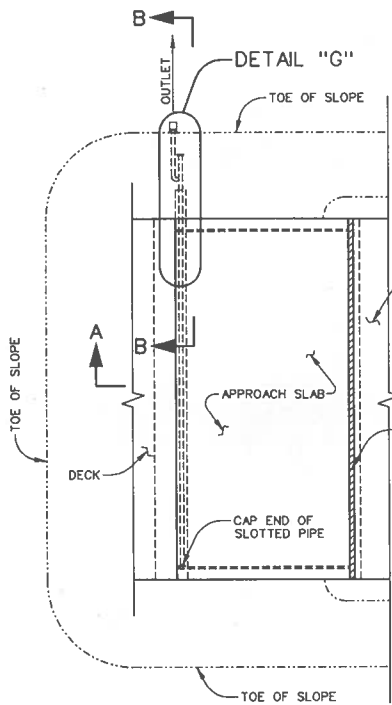
THIS SHEET IS FOR GENERAL INFORMATION FOR ACTUAL DIMENSIONS AND REINFORCING STEEL LAYOUTS, SEE CONTRACT PLANS.

AS50210
AS5030
AS5068
BENT BARS

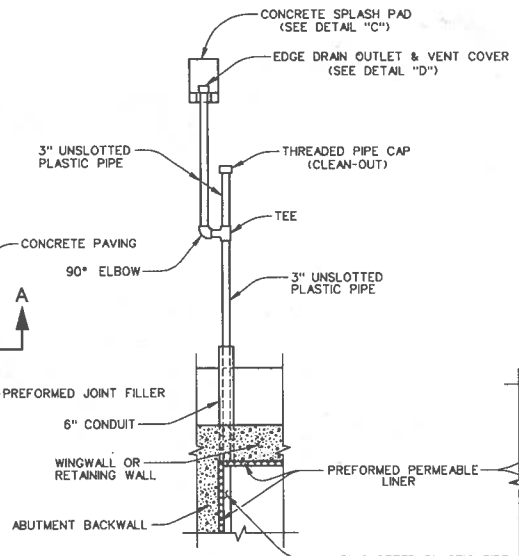
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

APPROACH SLAB

Chief Bridge Engineer
B-29.1.1-(502)
ADOPTED:12/90 REVISION:1-10/92

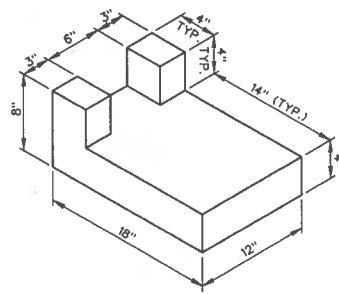


TYPICAL PLAN

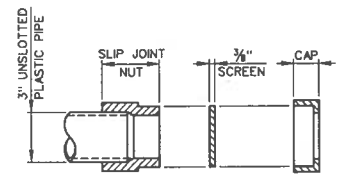


DETAIL "G"

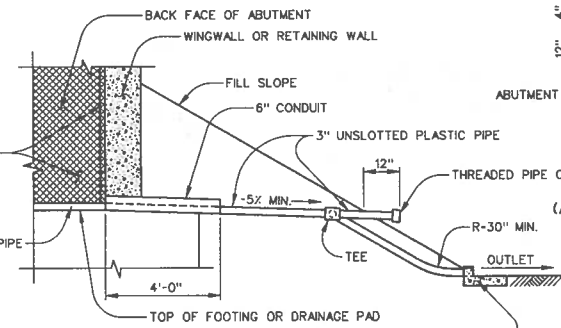
NOTE: APPROACH SLAB & FILL SLOPE NOT SHOWN



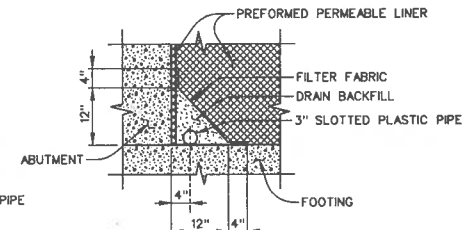
DETAIL "C"
(CONCRETE SPLASH PAD)



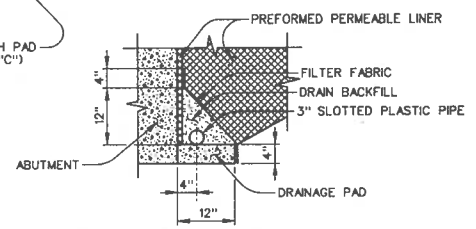
DETAIL "D"
(EDGE DRAIN OUTLET & VENT COVER)



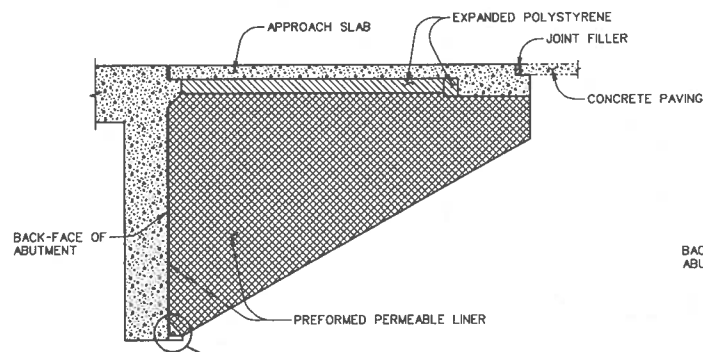
SECTION B-B



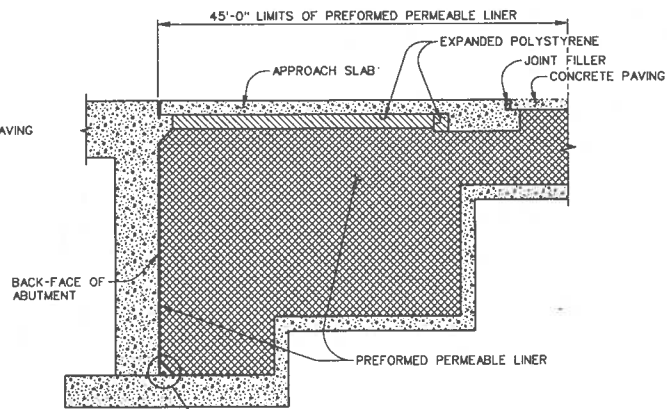
DETAIL "F"
(ABUTMENT DRAINAGE WITH FOOTING)



DETAIL "E"
(ABUTMENT DRAINAGE WITHOUT FOOTING)



SECTION A-A
(CANTILEVER WINGWALL)



SECTION A-A
(RETAINING WALL WINGWALL)

THESE DETAILS ARE ONLY TO BE USED WHEN PAYMENT IS PROVIDED FOR ON THE CONTRACT PLANS

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

ABUTMENT & WINGWALL DRAINAGE DETAILS

Edward J. Manaster
CHIEF BRIDGE ENGINEER

B-29.1.2-(502)
ADOPTED: 11/88 | REVISION: 1-12/90