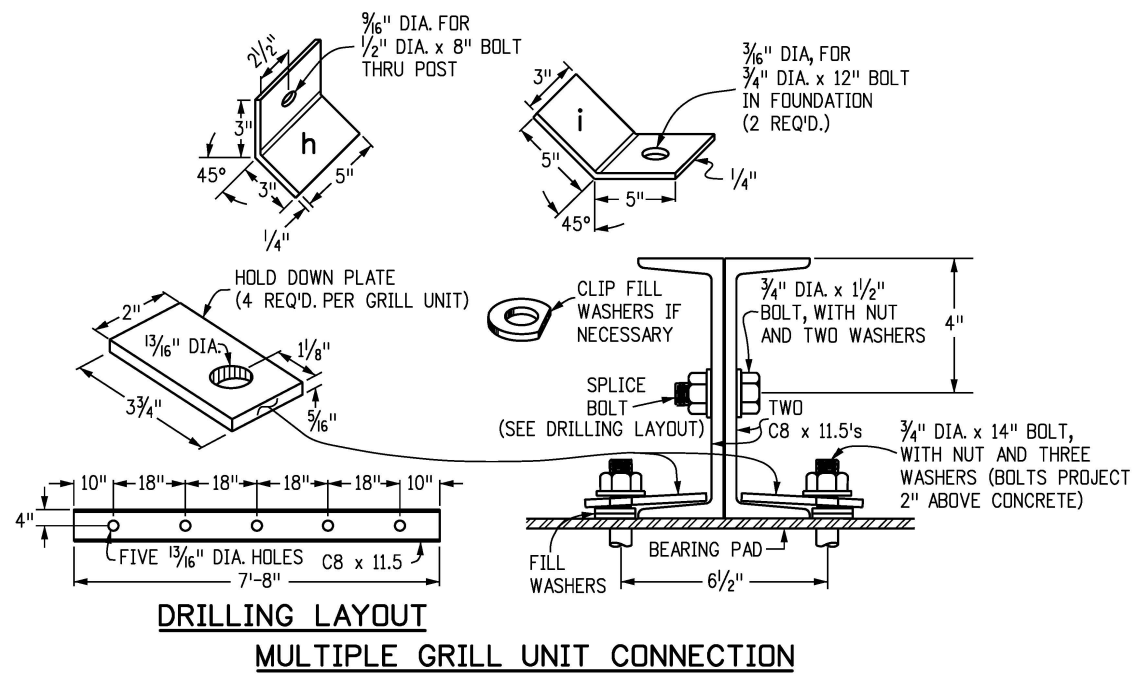
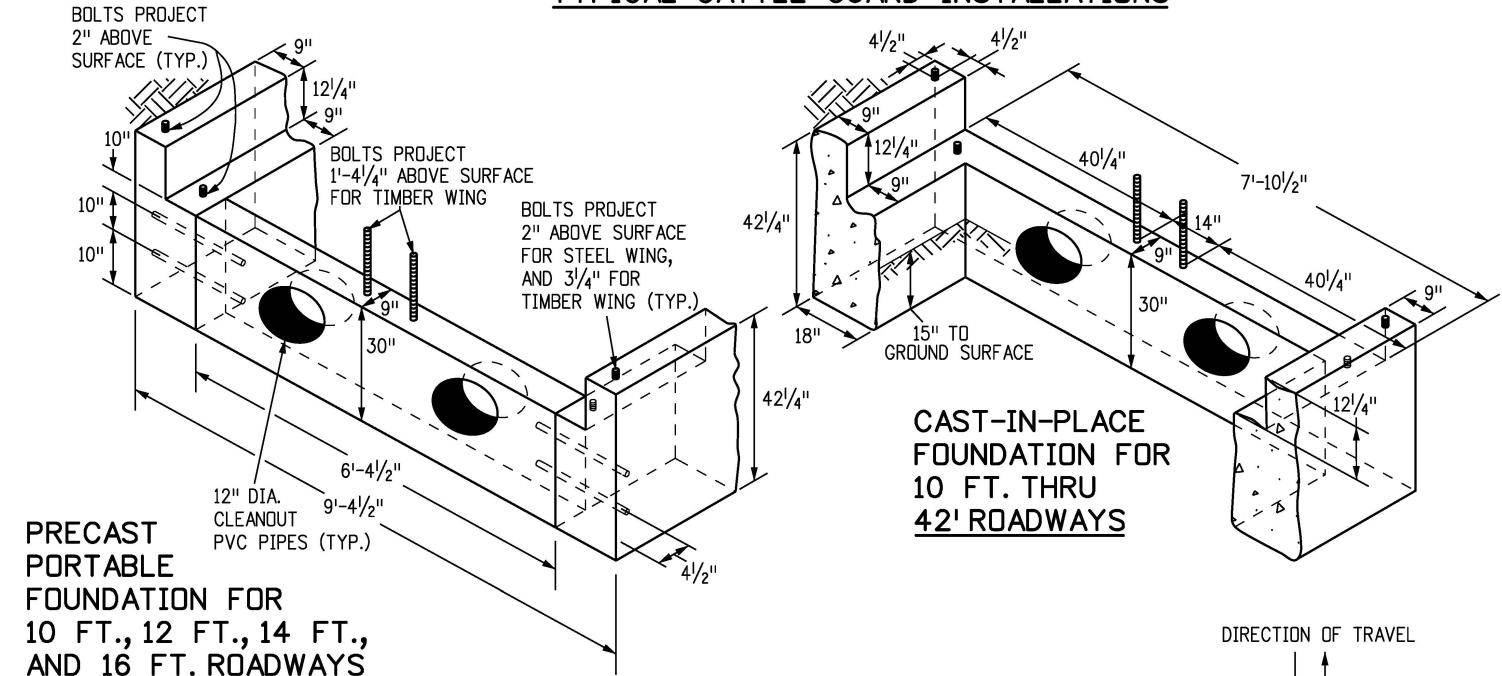


TIMBER WING **STEEL WING**
TYPICAL CATTLE GUARD INSTALLATIONS

- GENERAL NOTES**
1. CONCRETE SHALL BE CLASS B. FOUNDATION MAY BE CAST-IN-PLACE OR PRECAST.
 2. REINFORCING BARS SHALL BE #4, GRADE 60.
 3. ALL TIMBER SHALL BE TREATED IN CONFORMANCE WITH ASSHTO M 133 AND AWPA C14.
 4. WING POSTS MAY BE MADE FROM 8 IN. ROUND NATIVE TIMBER.
 5. ALL STRUCTURAL STEEL SHALL BE FABRICATED AND PAINTED WITH ALUMINUM PAINT IN ACCORDANCE WITH SECTION 509. ALL HARDWARE SHALL BE GALVANIZED IN CONFORMANCE WITH ASSHTO M 111 OR PAINTED WITH ZINC-RICH PAINT MEETING MILITARY SPECIFICATION DDD-P-21035
 6. ALL STRUCTURAL STEEL SHALL CONFORM TO ASSHTO M 270 (ASTM A 709) GRADE 36.
 7. WELDING SHALL CONFORM TO THE AWS STRUCTURAL WELDING CODE AND ASSHTO STANDARD SPECIFICATIONS FOR WELDING OF STRUCTURAL STEEL HIGHWAY BRIDGES.
 8. WHEN A 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. AN OUTLET PIPE MAY BE CONSIDERED.
 9. TYPE OF WING (TIMBER OR STEEL) SHALL BE STEEL UNLESS OTHERWISE SHOWN ON THE PLANS.
 10. STRUCTURE EXCAVATION AND STRUCTURE BACKFILL WILL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
 11. ALTERNATIVE CATTLE GUARDS MAY BE CONSTRUCTED UPON APPROVAL BY THE PROJECT ENGINEER.

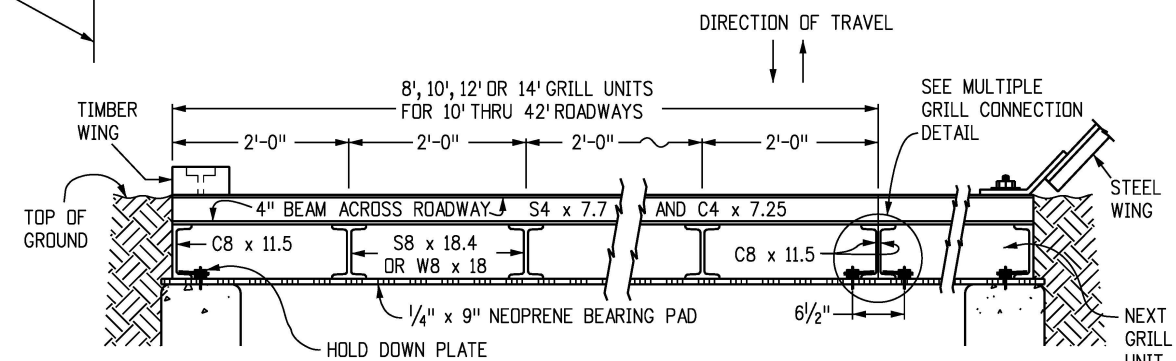


DRILLING LAYOUT
MULTIPLE GRILL UNIT CONNECTION

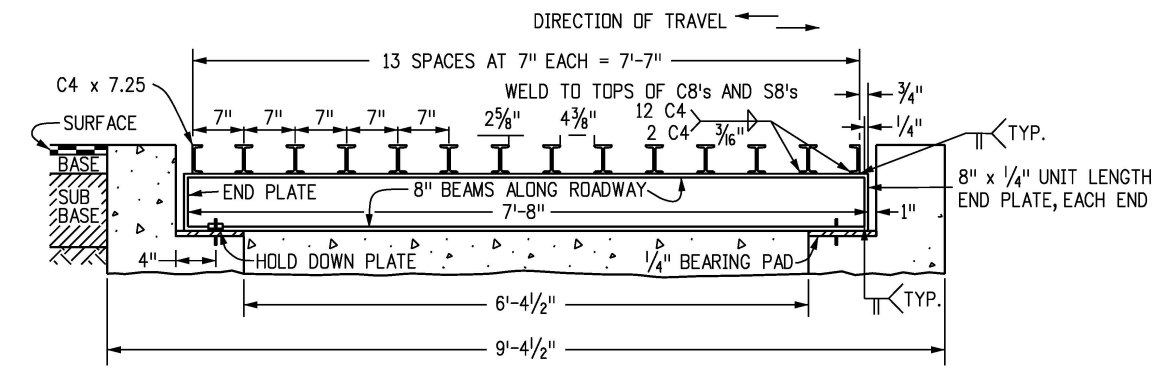


PRECAST PORTABLE FOUNDATION FOR 10 FT., 12 FT., 14 FT., AND 16 FT. ROADWAYS

CAST-IN-PLACE FOUNDATION FOR 10 FT. THRU 42' ROADWAYS



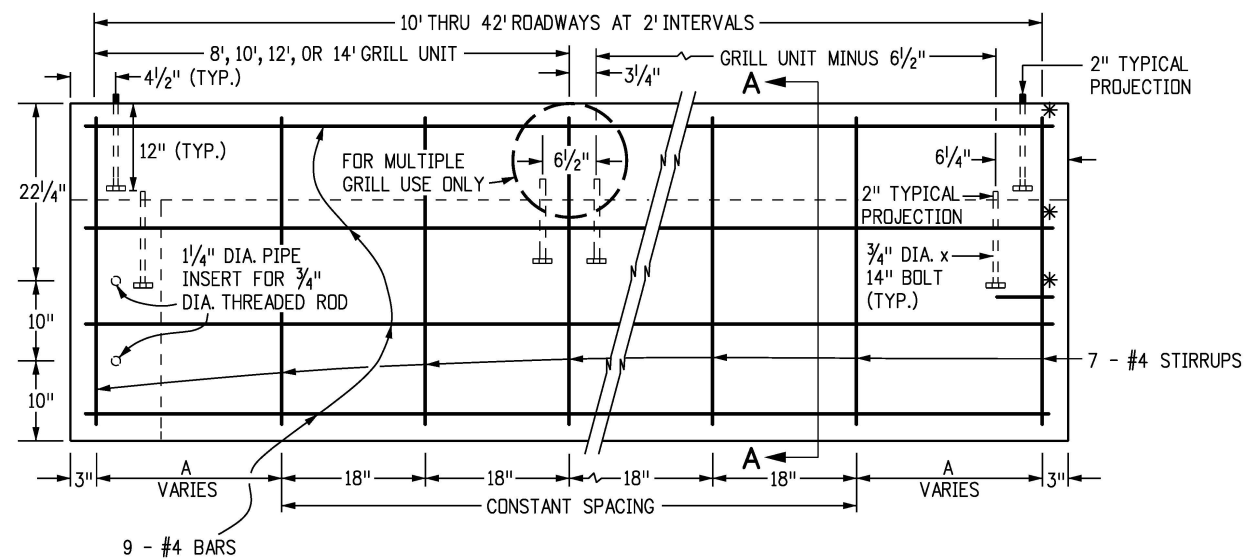
ELEVATION VIEW



SIDE VIEW

WELDED GRILL CROSS SECTIONS

Computer File Information		Sheet Revisions		Colorado Department of Transportation 2829 West Howard Place CDDT HQ, 3rd Floor Denver, CO 80204 Phone: 303-757-9021 FAX: 303-757-9868 Project Development Branch	<h1>CATTLE GUARD</h1>	STANDARD PLAN NO.	
Creation Date: 07/31/19		Date:	Comments:			M-611-1	
Designer Initials: JBK		(R-X)				Standard Sheet No. 1 of 2	
Last Modification Date: 07/31/19		(R-X)					
Detailer Initials: LTA		(R-X)					
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English		(R-X)		Project Development Branch	JBK	Issued by the Project Development Branch: July 31, 2019	
						Project Sheet Number:	



PRECAST PORTABLE FOUNDATION

CAST-IN-PLACE FOUNDATION

ELEVATION OF FOUNDATION

* WHEN CAST IN PLACE, LONGITUDINAL BARS EXTENDING FROM AND INTO THE LATERAL SUPPORT SHALL BE BENT 90° WITH A 2 IN. RADIUS AND CONTINUE PERPENDICULAR 10 IN. FROM THE BEND

- a - 6" x 8" x 7'-4"
- b - 4" x 8" x 9'-4 1/2"
- c - 2" x 6" x 6'-7"
- d - 2" x 6" x 5'-8"
- e - 2" x 6" x 6'-7"
- f - 2" x 6" x 2'-5"
- g - 2" x 6" x 4'-4"
- h - 2" x 6" x 6'-2"
- 16d NAILS (GALV.) - 2 LB.

ONE TIMBER WING

- a - 2" x 2" x 1/4" x 79" } 63.26 LBS.
- b - 2" x 2" x 1/4" x 79" }
- c - 2" x 2" x 1/4" x 84" }
- d - 1/2" x 1/2" x 1/4" x 69" } 36.86 LBS.
- e - 1/2" x 1/2" x 1/4" x 55" }
- f - 1/2" x 1/2" x 1/4" x 40" }
- g - 1/2" x 1/2" x 1/4" x 25" }
- h - 5" x 6" x 1/4" x BAR - 2.13 LBS.
- i - TWO 3" x 10" x 1/4" x BARS - 4.25 LBS.
- 6" x 8" x 7'-8" TIMBER POST
- TOTAL LBS. STEEL = ~106.5

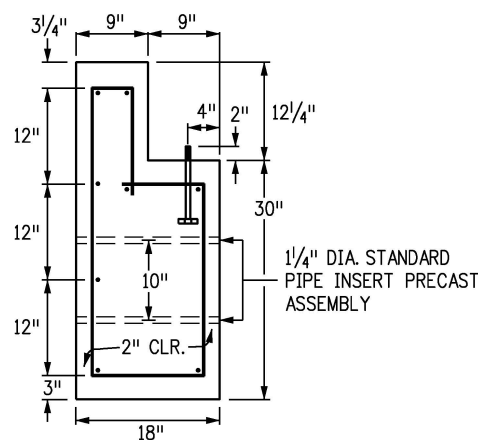
ONE STEEL WING WING QUANTITIES

ROADWAY WIDTH (FT.)	USE GRILL UNITS (FT.)	PRECAST		CAST-IN-PLACE		A (IN.)	TOTAL GRILL WEIGHT (LBS.)
		CONCRETE (CU. YD.)	REINF. STEEL (LBS.)	CONCRETE (CU. YD.)	REINF. STEEL (LBS.)		
10	10	5.6	295	5.6	316	24	1946
12	12	6.5	342	6.5	364	18	2328
14	14	7.4	378	7.4	399	21	2170
16	8 8	8.1	414	8.1	435	24	3128
18	8 10			9.0	482	18	3434
20	10 10			9.8	518	21	3806
22	10 12			10.6	553	24	4274
24	12 12			11.5	601	18	4656
26	12 14			12.3	636	21	5038
28	14 14			13.1	672	24	5420
30	10 10 10			13.9	719	18	5838
32	10 12 10			14.8	755	21	6220
34	12 10 12			15.5	790	24	6602
36	12 12 12			16.4	838	18	6984
38	12 14 12			17.3	873	21	7366
40	14 12 14			18.0	909	24	7748
42	14 14 14			18.9	956	18	8130

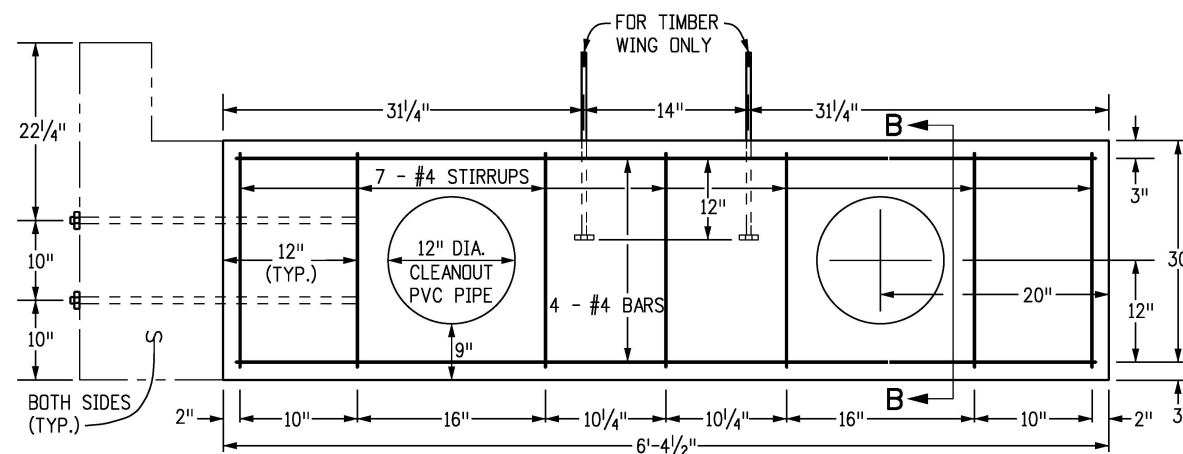
FOUNDATION QUANTITIES

SIZE	WEIGHT (LBS.)
8'	1564
10'	1946
12'	2328
14'	2710

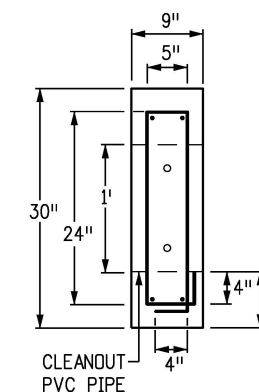
WELDED GRILL UNITS



END SECTION OF FOUNDATION SECTION A-A



ELEVATION OF LATERAL SUPPORT



LATERAL SUPPORT SECTION B-B

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Creation Date: 07/31/19		Date:	Comments	2829 West Howard Place CDDT HQ, 3rd Floor Denver, CO 80204 Phone: 303-757-9021 FAX: 303-757-9868			M-611-1 Standard Sheet No. 2 of 2	Project Sheet Number:
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