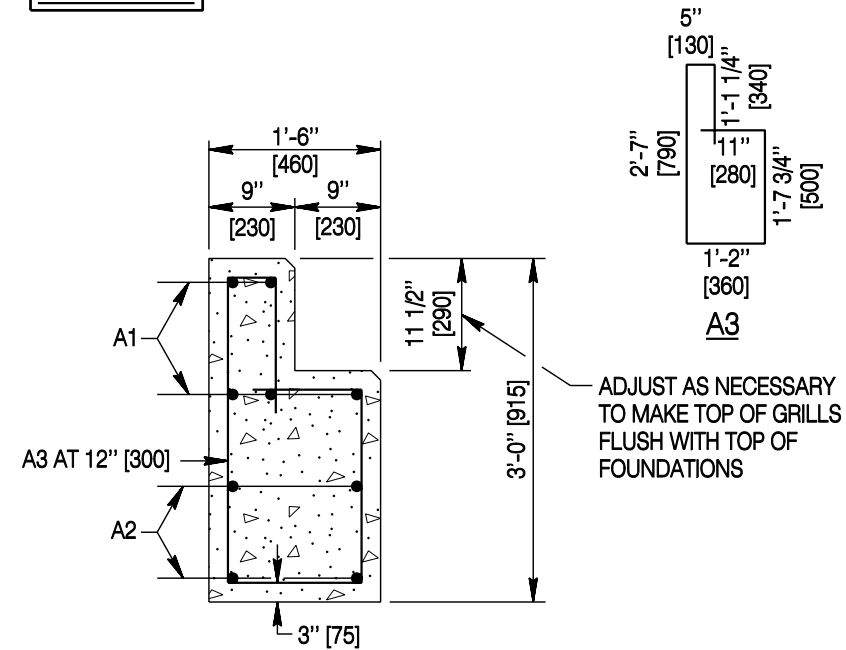
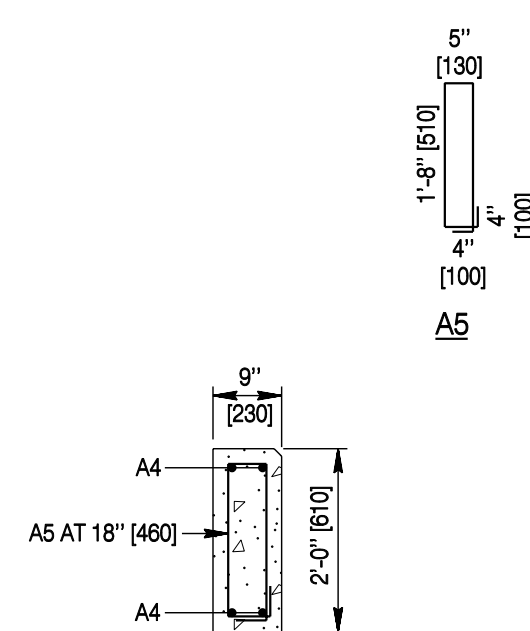


PLAN VIEW



END SUPPORT DETAIL



LATERAL SUPPORT DETAIL

GENERAL NOTES

- Loading: HS 20-44 [MS 18]
- Reinforced Concrete: Class B
- Reinforcing Steel: (Grade 60) [Grade 420]
- Cast a single piece for the end member when $W \leq 24' - 2 \frac{1}{2}''$ [7380]. The engineer will allow a 2 piece end member for $W > 24' - 2 \frac{1}{2}''$ [7380].
- Ensure lateral support members are one piece.
- Chamfer exposed corners 1" [25].
- Provide 1/4" [6] min. to 1/2" [13] max. clearance between units of a multiple unit installation.
- Modify bill of reinforcement when foundation unit is precast.
- Make appropriate modifications in precast foundations for cattle guards placed on center crown or superelevated sections.
- For Section A-A and B-B, see sheet 5.

Designed by: BOS
 Drawn by: GLD
 Checked by: WBW
 Previous Dep. No. 615-01A

CAST-IN-PLACE AND PRECAST FOUNDATION DETAILS

Note: Units shown in brackets [] are metric and are in millimeters (mm) unless other units are shown.



CATTLE GUARDS

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Issued by: ENGINEERING SERVICES

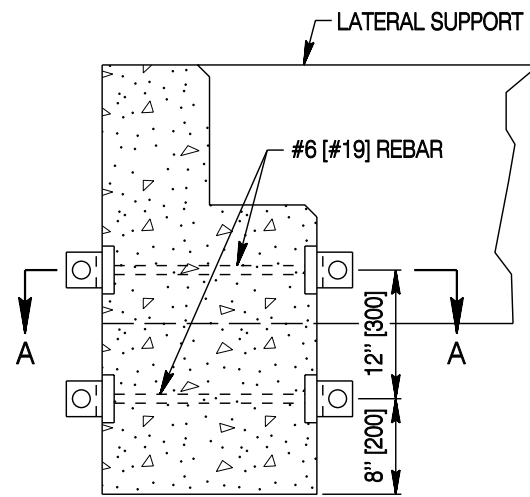
Date Issued: NOVEMBER, 2004

FILE: j:\StanDual_Std_Wrk\6151_01.dgn

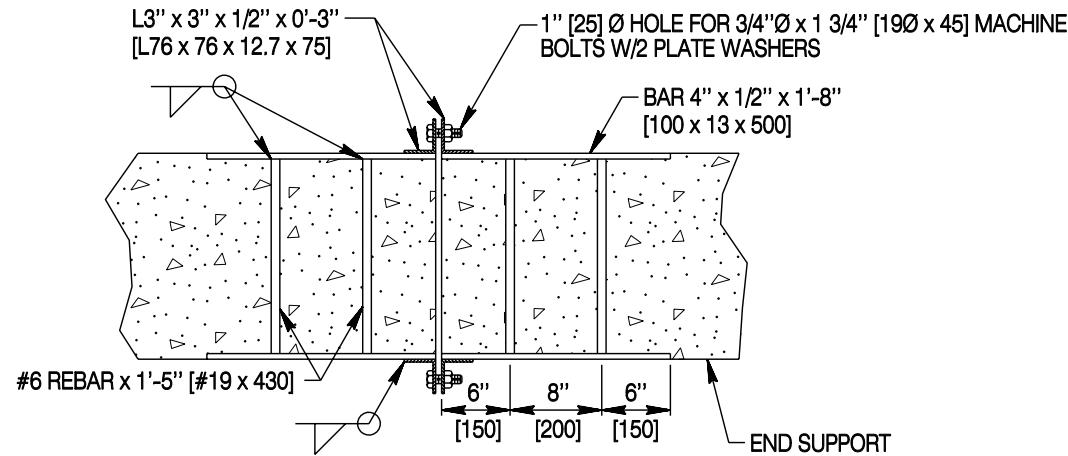
Nominal Cattle guard Width		Roadway Width		Width (W)		No. of Grill Units Req'd.	Quantities and Dimensions Based On Cast In Place Cattle Guard Reinforcing Steel (#4 Bars [#13])										Reinf. Steel		* Structural Steel				Concrete Class B		Number of Anchor Bolts Required							
							A1		A2		A3		A4		A5				Medium Duty		Heavy Duty											
							No. Req'd.	Length	No. Req'd.	Length	No. Req'd.	Length	No. Req'd.	Length	No. Req'd.	Length			lbs	kg	lbs	kg				lbs	kg					
FT	m	FT	m	FT - IN	mm		FT - IN	mm		FT - IN	mm		FT - IN	mm		FT - IN	mm		FT - IN	mm		FT - IN	mm		FT - IN	mm		FT - IN	mm		FT - IN	mm
12	3.6	12	3.6	12 - 1 1/2	3695	2	10	13 - 3	4040	8	11 - 9	3580	26	7 - 10	2390	8	7 - 9	2360	12	4 - 10	1475	370	168	1960	890	2460	1120	4	3.1	8		
18	5.4	16	4.8	18 - 2	5535	3	10	19 - 4	5895	8	17 - 10	5435	38	7 - 10	2390	8	7 - 9	2360	12	4 - 10	1475	508	230	2940	1330	3690	1670	6	4.6	12		
24	7.2	20	6.0 (Ramp)	24 - 2 1/2	7380	4	10	25 - 4	7720	8	23 - 10	7265	50	7 - 10	2390	8	7 - 9	2360	12	4 - 10	1475	644	292	3920	1780	4910	2230	8	6.1	16		
30	9.0	28	8.4	30 - 3	9220	5	10	31 - 5	9575	8	29 - 11	9120	62	7 - 10	2390	8	7 - 9	2360	12	4 - 10	1475	781	354	4900	2220	6140	2790	9	6.9	20		
36	10.8	32	9.6	36 - 3 1/2	11 060	6	10	37 - 5	11 405	8	35 - 11	10 945	74	7 - 10	2390	8	7 - 9	2360	12	4 - 10	1475	918	416	5880	2670	7370	3340	11	8.4	24		
42	12.6	40	12.0	42 - 4	12 900	7	10	43 - 6	13 260	8	42 - 0	12 800	86	7 - 10	2390	8	7 - 9	2360	12	4 - 10	1475	1055	479	6860	3110	8600	3900	13	9.9	28		

Note: Weight for #4 [#13] BARS = 0.668 lbs/ft [0.996 kg/m].

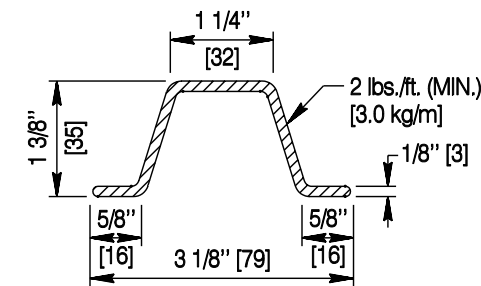
* Does not include weight of anchor bolts or steel in the wings. A wing requires 75 lbs. [34 kg] of structural steel and welded wire fabric.



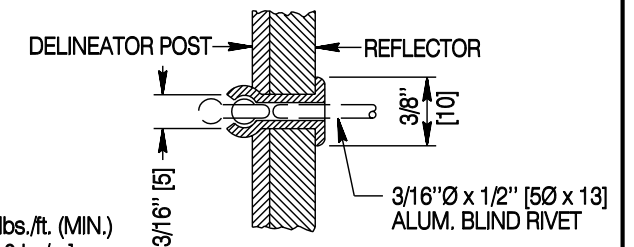
END SUPPORT SIDE VIEW
(OTHER REQUIRED REINFORCEMENT NOT SHOWN)



SECTION A-A



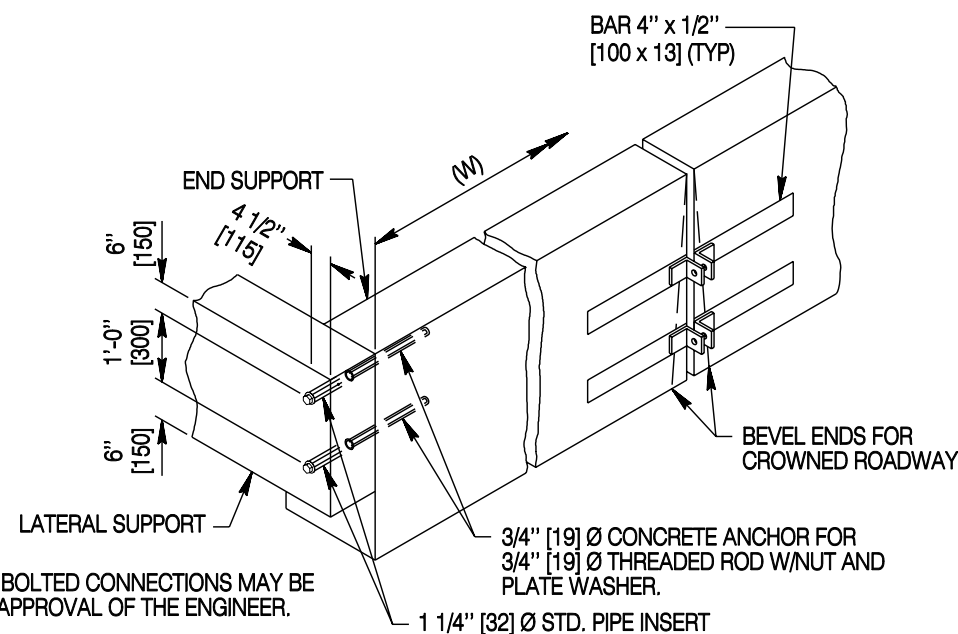
ALTERNATE DELINEATOR POST



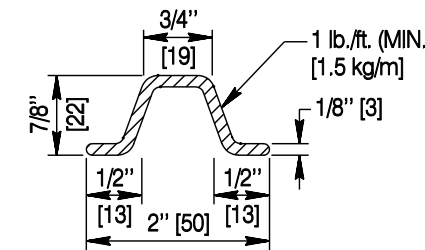
RIVET DETAIL

FOUNDATION CONNECTION DETAILS

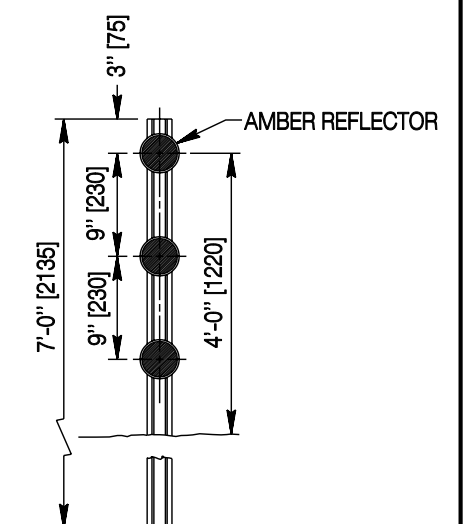
(Provide for connecting precast units. Provide for cast-in-place units which are not monolithic and not fully tied by reinforcement.)



ASSEMBLY DETAILS



DELINEATOR POST



TYPE IV DELINEATOR

(REQUIRED AT EACH CORNER)

Designed by: BOS
Drawn by: GLD
Checked by: WBW
Previous Dep. No. 615-01A

FOUNDATION QUANTITIES, FOUNDATION CONNECTION DETAILS AND DELINEATORS

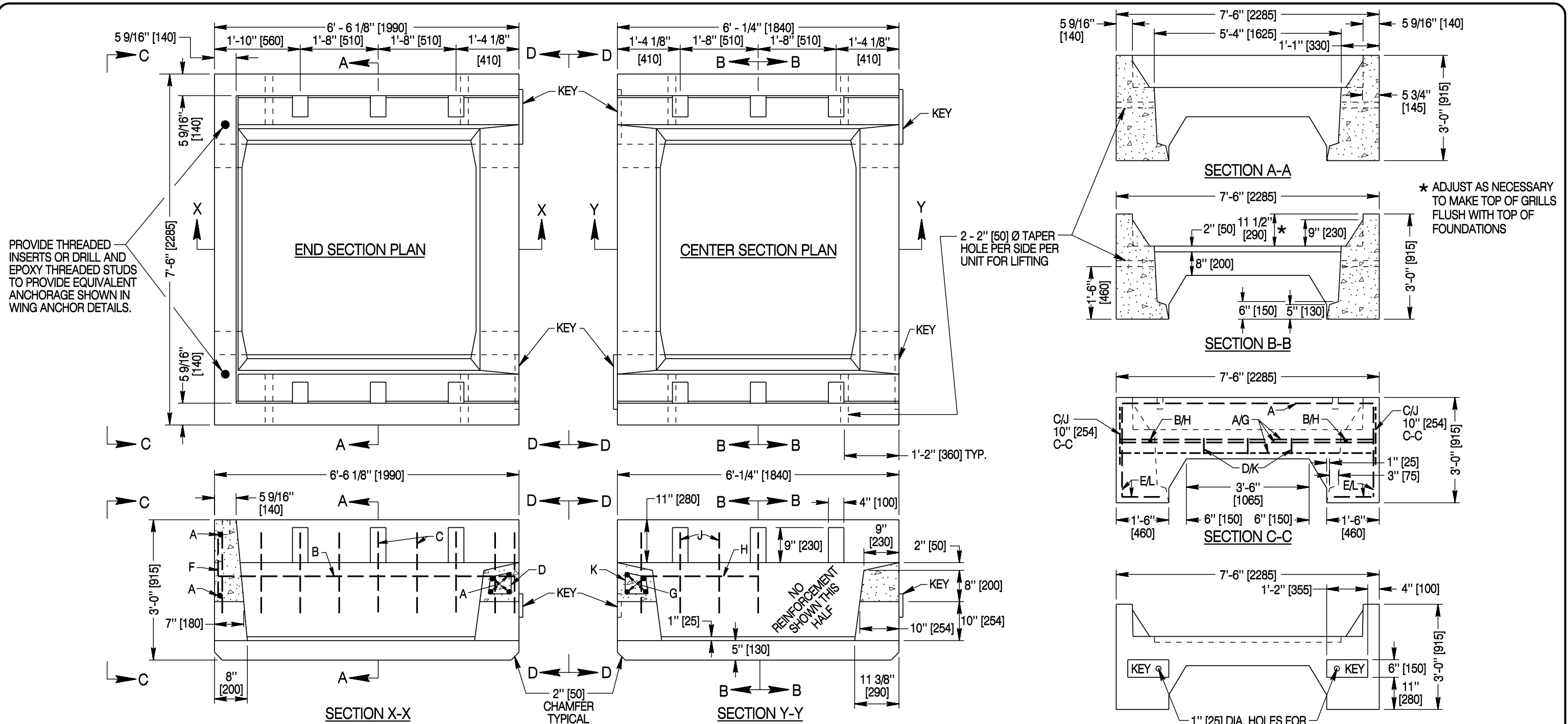
Note: Units shown in brackets [] are metric and are in millimeters (mm) unless other units are shown.



CATTLE GUARDS

STANDARD PLAN

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Issued by: ENGINEERING SERVICES
Date Issued: NOVEMBER, 2004



PROVIDE THREADED INSERTS OR DRILL AND EPOXY THREADED STUDS TO PROVIDE EQUIVALENT ANCHORAGE SHOWN IN WING ANCHOR DETAILS.

* ADJUST AS NECESSARY TO MAKE TOP OF GRILLS FLUSH WITH TOP OF FOUNDATIONS

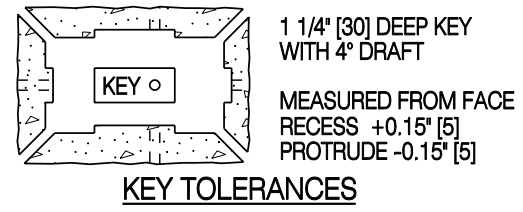
2 - 2" [50] Ø TAPER HOLE PER SIDE PER UNIT FOR LIFTING

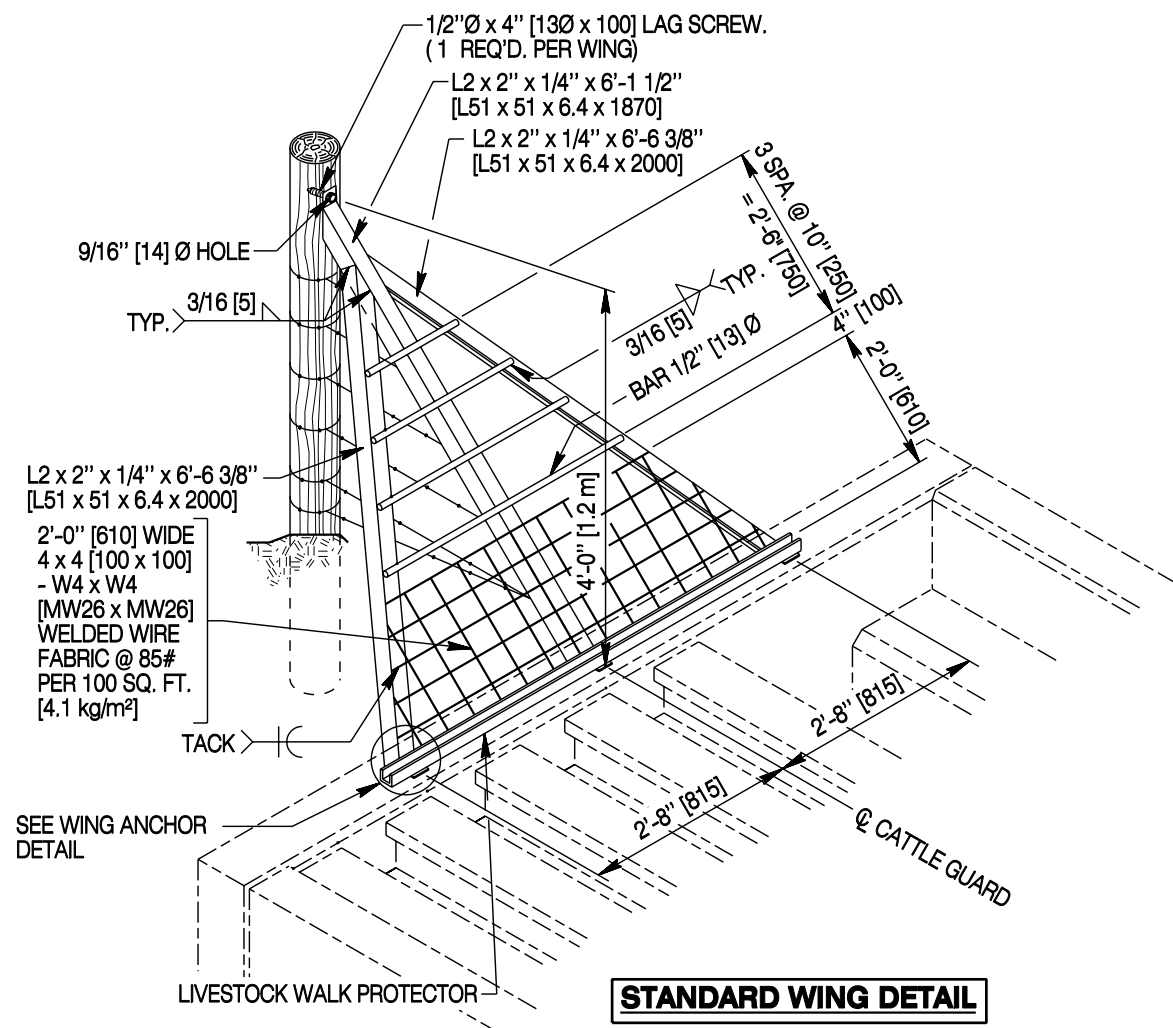
NO REINFORCEMENT SHOWN THIS HALF

REINFORCEMENT FOR END UNIT			
ITEM	REQ'D	SIZE	LENGTH
A HORIZONTAL BAR	6	#4 [#13]	7'-3" [2210]
B HORIZONTAL BAR	2	#6 [#19]	6'-3" [1905]
C VERTICAL BAR	18	#4 [#13]	1'-9" [535]
D STIRRUPS	3	#3 [#10]	6" x 5" [150 x 130]
E W.W.F.	2	4-4,6-6 [102-102, MW19-MW19]	4'-0" x 6'-3" L [1220 x 1905 L]
F W.W.F.	1	4-4,6-6 [102-102, MW19-MW19]	1'-6" x 7'-3" [460 x 2210]

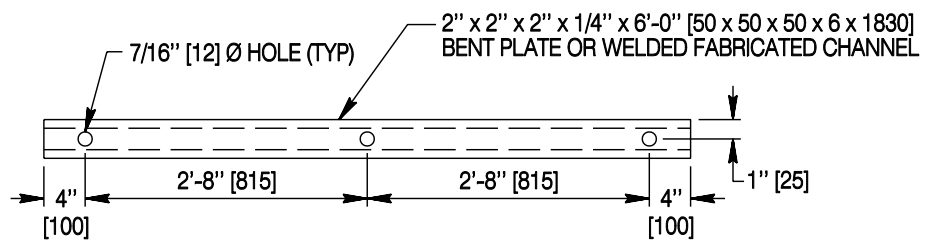
REINFORCEMENT FOR CENTER UNIT			
ITEM	REQ'D	SIZE	LENGTH
G HORIZONTAL BAR	8	#4 [#13]	7'-3" [2210]
H HORIZONTAL BAR	2	#6 [#19]	5'-9" [1750]
J VERTICAL BAR	14	#4 [#13]	1'-9" [535]
K STIRRUPS	6	#3 [#10]	6" x 5" [150 x 130]
L W.W.F.	2	4-4,6-6 [102-102, MW19-MW19]	4'-0" x 5'-9" L [1220 x 1750 L]

UNIT WEIGHT		
TYPE	LBS./EA.	kg/ea.
END UNIT	7040	3200
CENTER UNIT	6340	2900

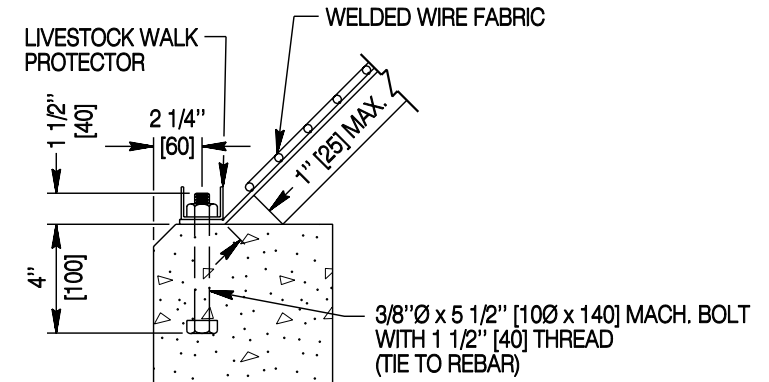




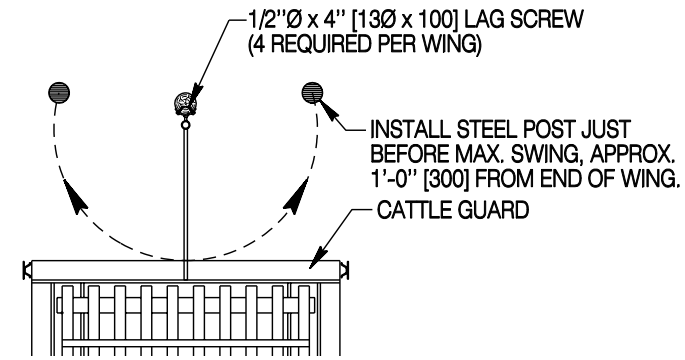
STANDARD WING DETAIL
(2 REQ'D PER CATTLE GUARD)



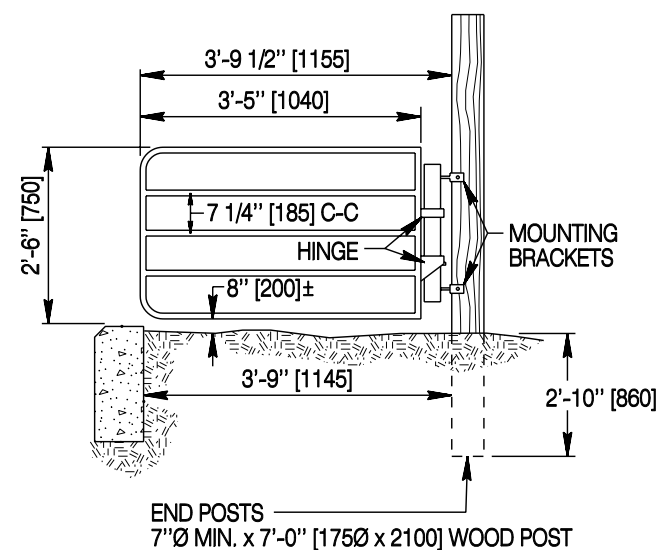
LIVESTOCK WALK PROTECTOR



WING ANCHOR DETAIL



TOP VIEW SWING-WING



SWING-WING DETAIL
(2 Required per Cattle Guard)
Provide only when specified.

Designed by: BOS
 Drawn by: GLD
 Checked by: WBW
 Previous Des. No. 615-01A

WING DETAILS

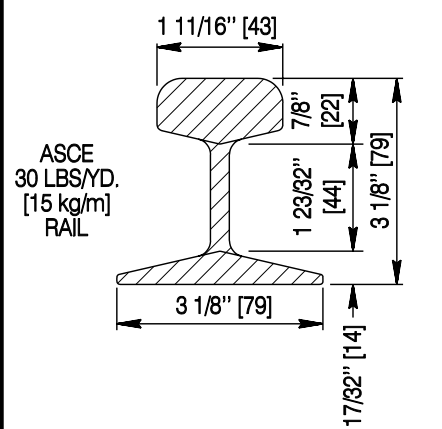
Note: Units shown in brackets [] are metric and are in millimeters (mm) unless other units are shown.



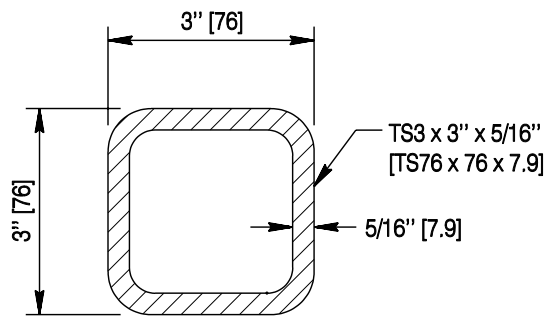
CATTLE GUARDS

STANDARD PLAN

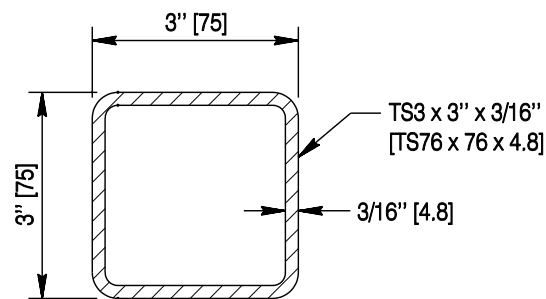
STANDARD PLAN NUMBER
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 Issued by: ENGINEERING SERVICES
 Date Issued: NOVEMBER, 2004
 FILE: j:\StanDual_std_Wrk6151_04.dgn



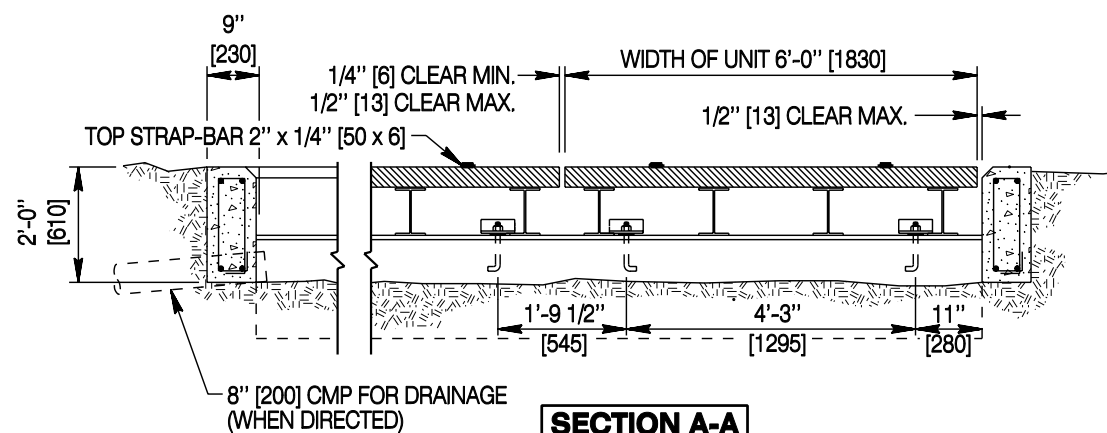
HEAVY DUTY CATTLE GUARD CROSSBAR DETAIL



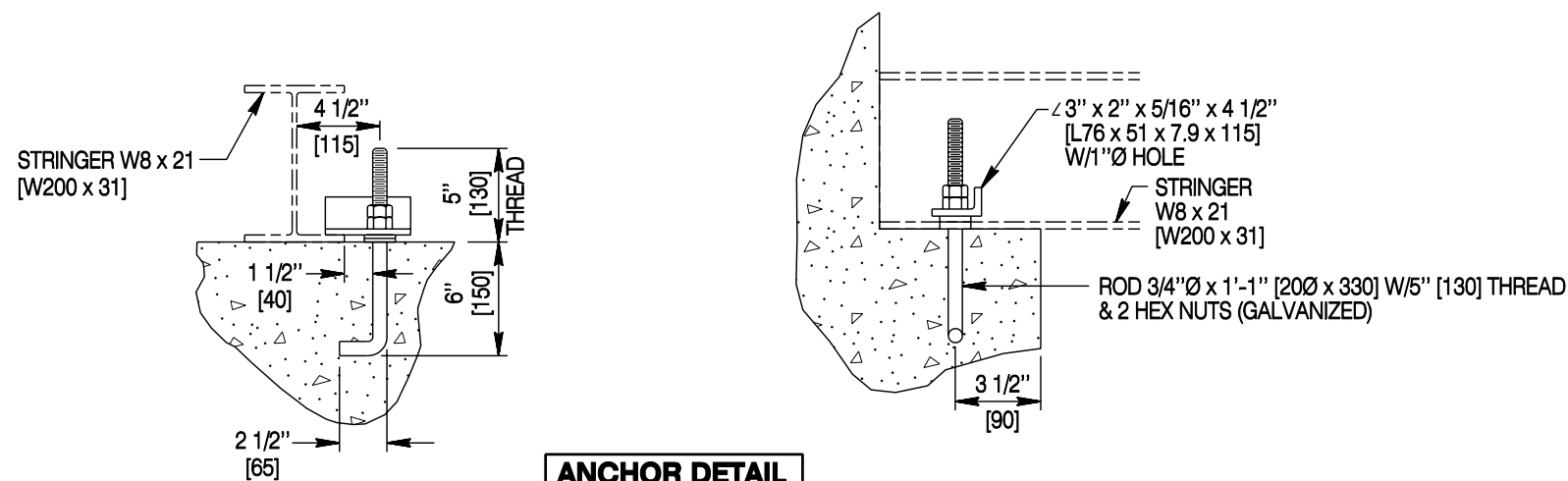
ALTERNATE HEAVY DUTY CATTLE GUARD CROSSBAR DETAIL



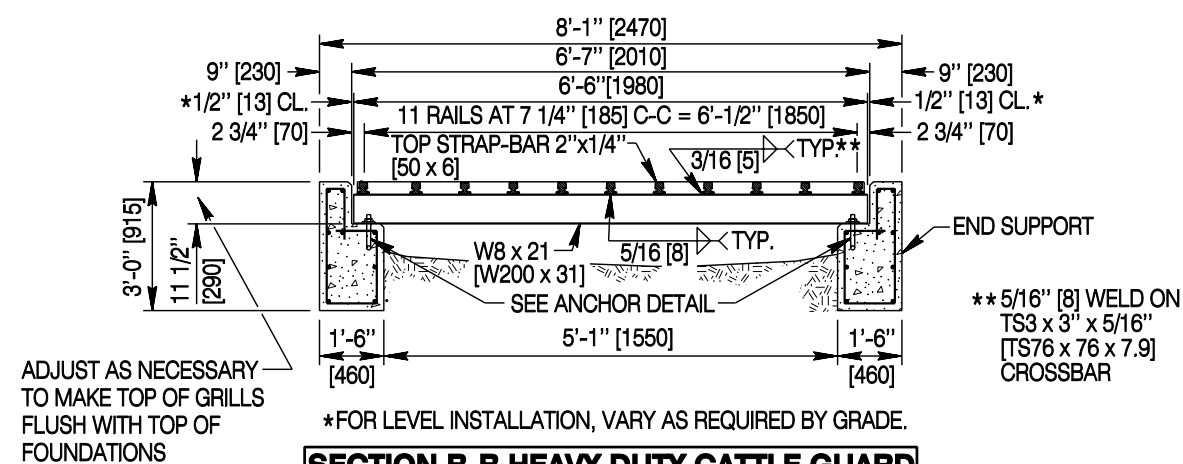
MEDIUM DUTY CATTLE GUARD CROSSBAR DETAIL
(USE ONLY ON MEDIUM DUTY CATTLEGUARDS)



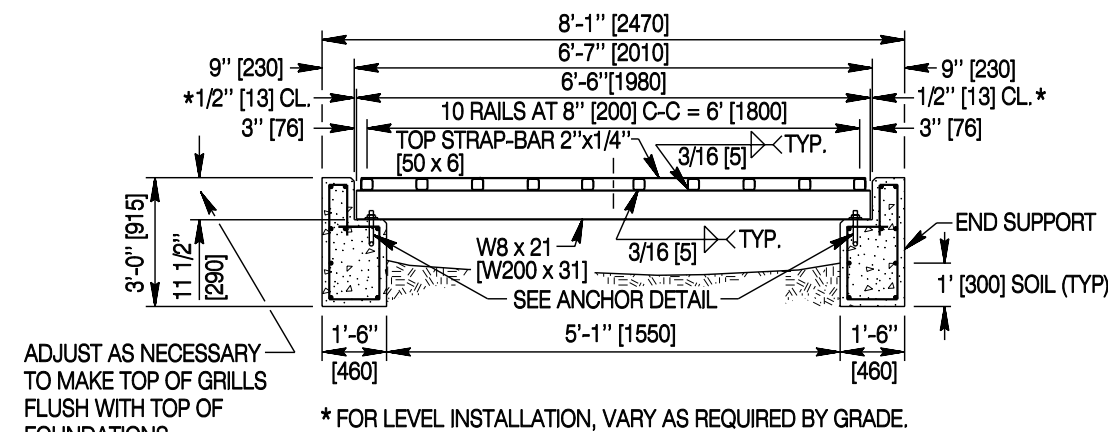
SECTION A-A
(FOR LOCATION, SEE SHEET 1)
(WING NOT SHOWN)



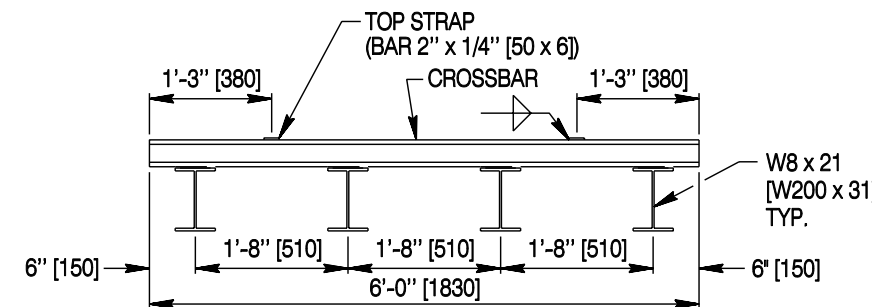
ANCHOR DETAIL



SECTION B-B HEAVY DUTY CATTLE GUARD
(FOR LOCATION, SEE SHEET 1)



SECTION B-B MEDIUM DUTY CATTLE GUARD
(FOR LOCATION, SEE SHEET 1)



STRINGER SPACING DETAIL

Designed by: BOS
Drawn by: GLD
Checked by: WBW
Previous Des. No. 615-01A

GRILL DETAILS

Note: Units shown in brackets [] are metric and are in millimeters (mm) unless other units are shown.



CATTLE GUARDS

STANDARD PLAN

STANDARD PLAN NUMBER

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SHEET 5 of 5

Issued by: ENGINEERING SERVICES

Date Issued: NOVEMBER, 2004

FILE: j:\StanDual_Std_Wrk6151_05.dgn