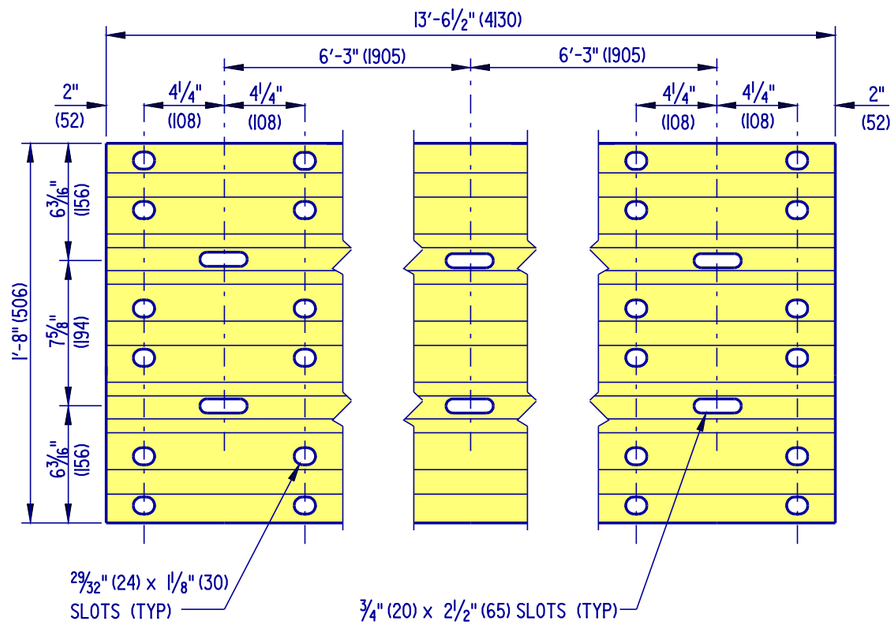
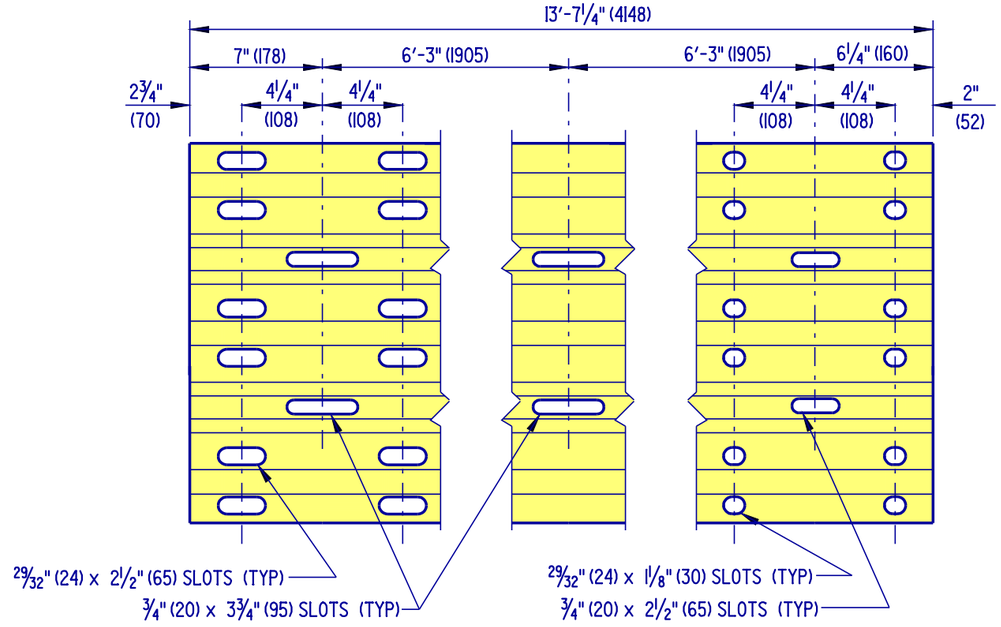
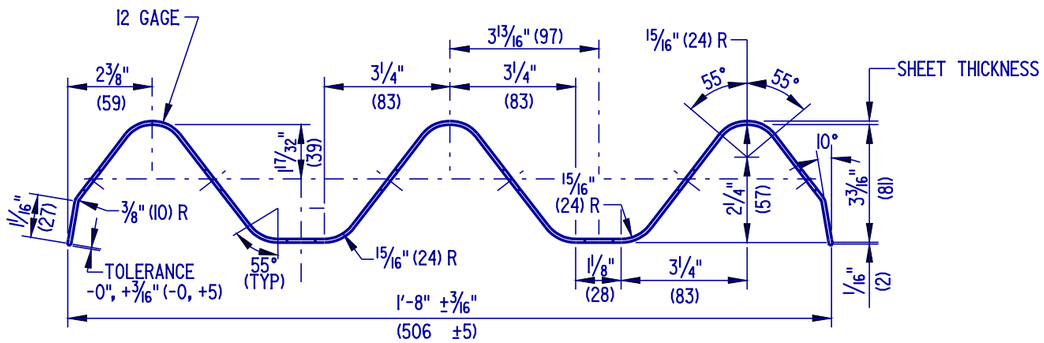
SCALE : N.T.S.



THRIE BEAM ELEVATION



THRIE BEAM EXPANSION ELEMENT

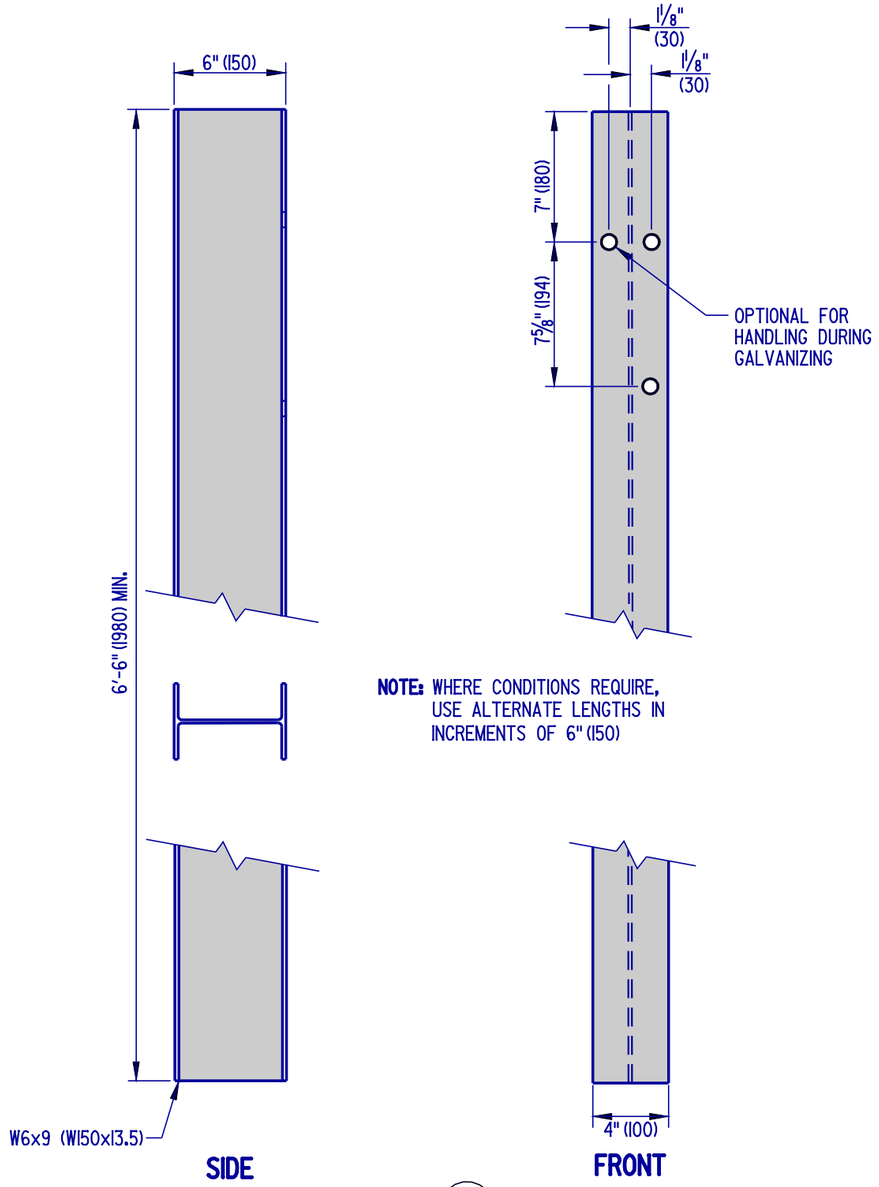


THRIE BEAM SECTION

DELAWARE DEPARTMENT OF TRANSPORTATION	HARDWARE		APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE
	STANDARD NO. B-13 (2004)	SHT. 4 OF 13	RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE

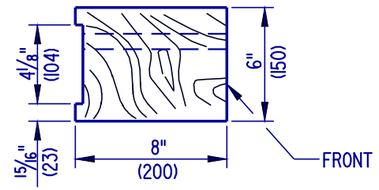
09/28/2004

SCALE : N.T.S.

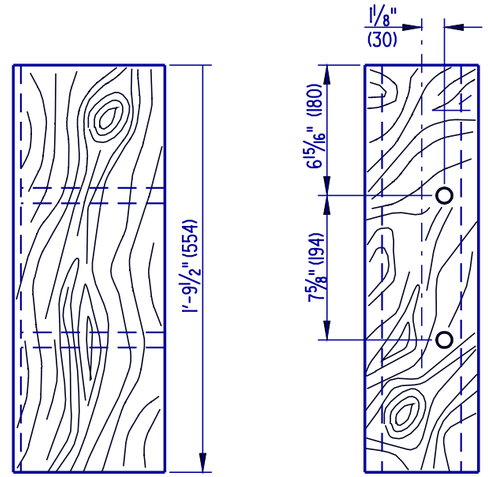


NOTE: WHERE CONDITIONS REQUIRE, USE ALTERNATE LENGTHS IN INCREMENTS OF 6" (150)

POST (2)



TOP



OFFSET BLOCK (3)

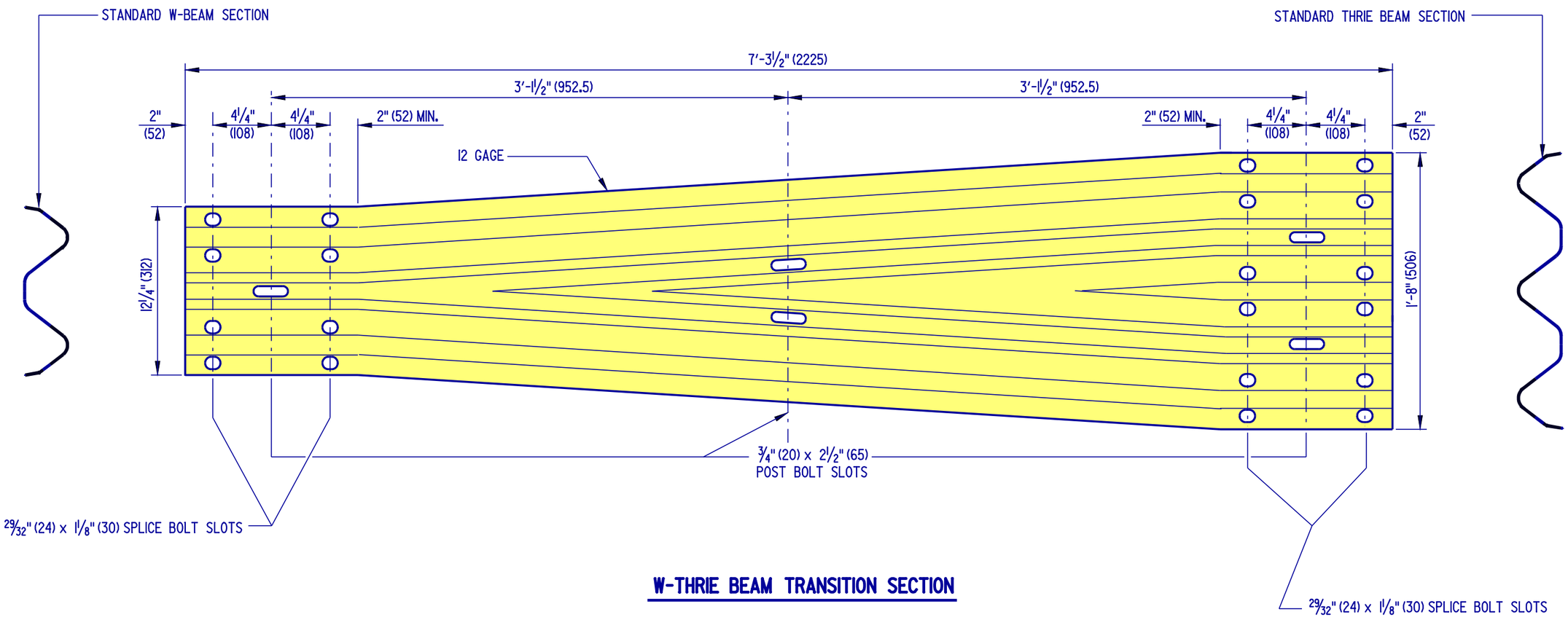
THRIE BEAM STEEL POST AND WOOD OFFSET BLOCK

NOTE :
ALL HOLES SHALL BE 13/16" (20) DIA. BOLT HOLE PATTERN IS SYMMETRICAL WITH RESPECT TO THE VERTICAL AXIS OF THE POST.

DELAWARE DEPARTMENT OF TRANSPORTATION	HARDWARE		APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE
	STANDARD NO. B-13 (2004)	SHT. 5 OF 13	RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE

09/28/2004

SCALE : N.T.S.



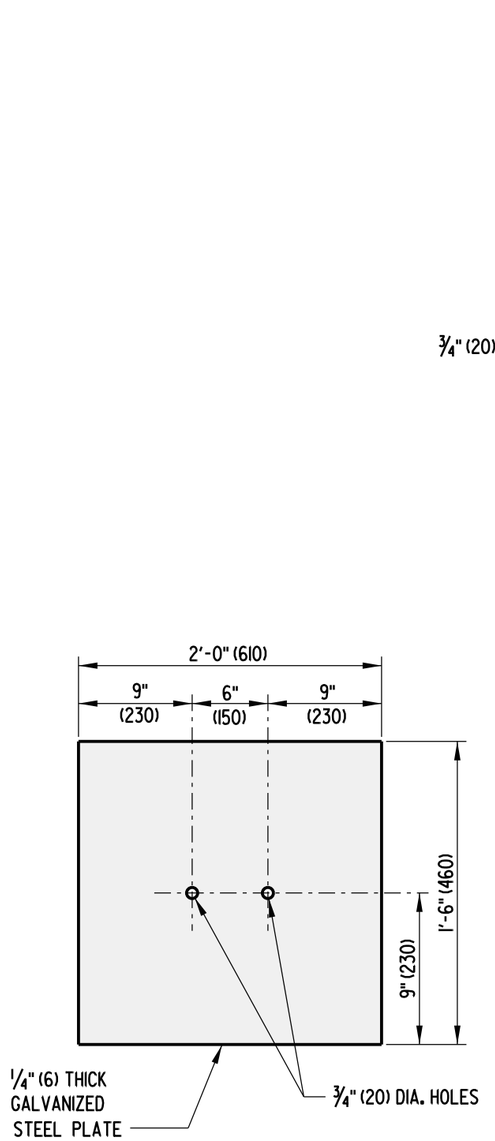
W-THRIE BEAM TRANSITION SECTION

DELAWARE DEPARTMENT OF TRANSPORTATION	HARDWARE		APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE
	STANDARD NO. B-13 (2004)	SHT. 6 OF 13	RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE

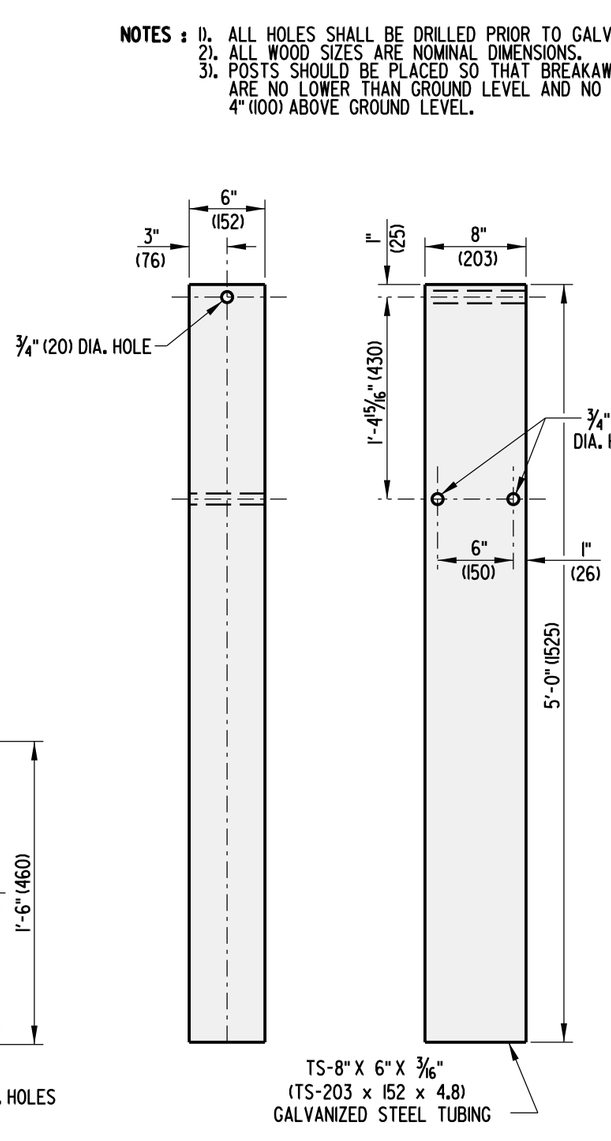
09/10/2004

SCALE : N.T.S.

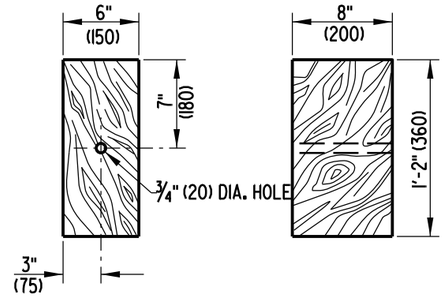
NOTES : 1). ALL HOLES SHALL BE DRILLED PRIOR TO GALVANIZING.
2). ALL WOOD SIZES ARE NOMINAL DIMENSIONS.
3). POSTS SHOULD BE PLACED SO THAT BREAKAWAY HOLES ARE NO LOWER THAN GROUND LEVEL AND NO HIGHER THAN 4" (100) ABOVE GROUND LEVEL.



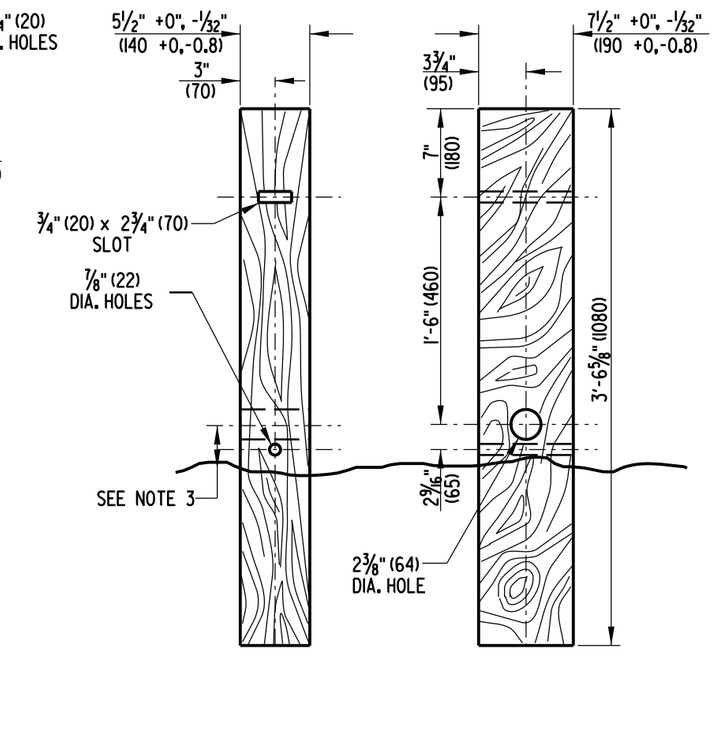
SOIL PLATE



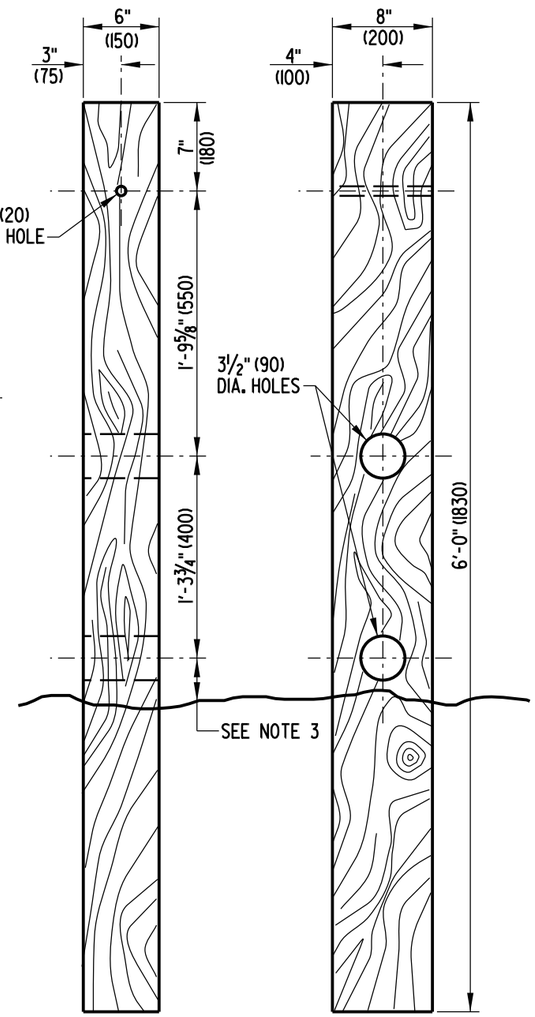
STEEL TUBE



WOOD BLOCK



SHORT WOOD BREAKAWAY POST

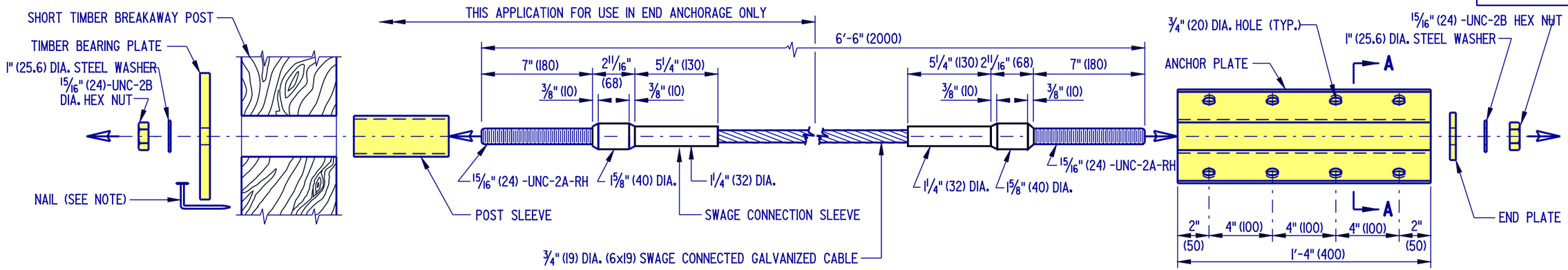


LONG WOOD BREAKAWAY POST

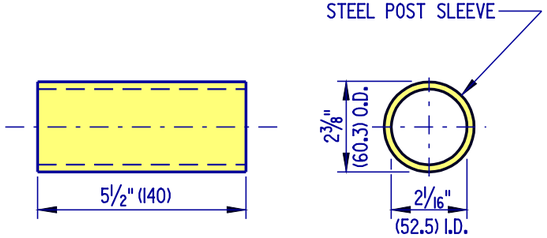
DELAWARE DEPARTMENT OF TRANSPORTATION	HARDWARE		APPROVED CHIEF ENGINEER	11/18/08 DATE
	STANDARD NO. B-13 (2008)	SHT. 7 OF 13	RECOMMENDED DESIGN ENGINEER	11/17/08 DATE

07/14/2008

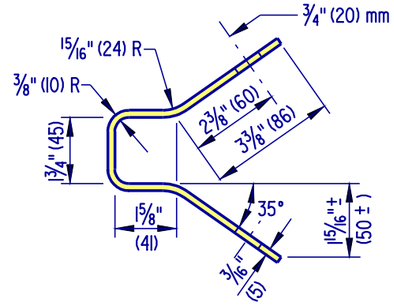
SCALE : N.T.S.



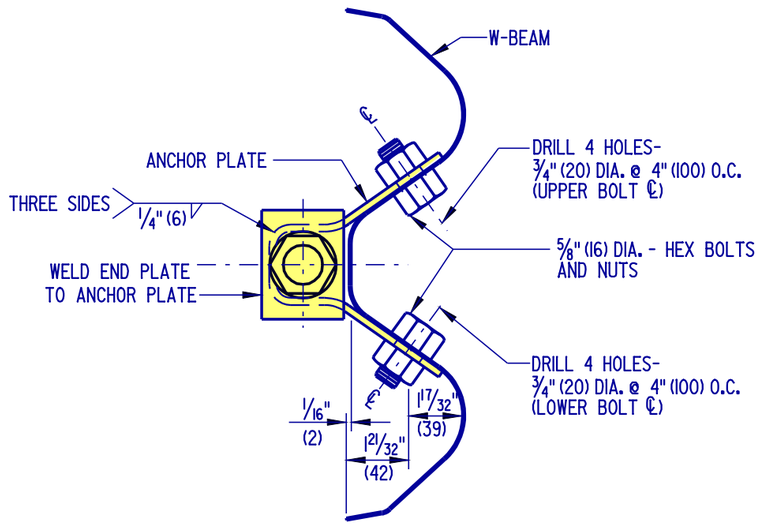
SWAGED CABLE ASSEMBLAGE AND RELATED HARDWARE ASSEMBLY



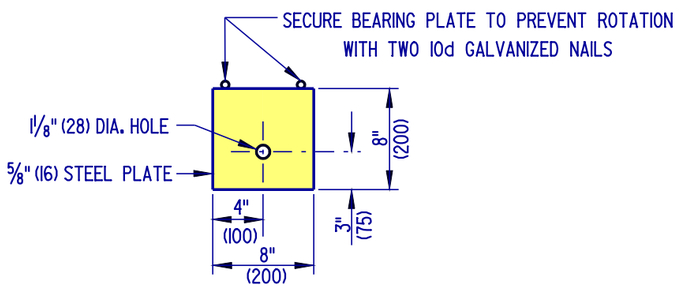
POST SLEEVE



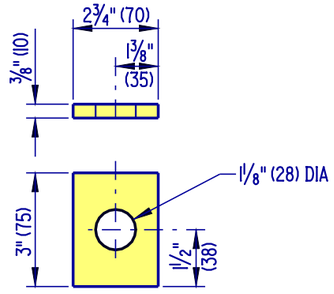
SECTION A-A



ANCHOR PLATE TO W-BEAM CONNECTION DETAIL



TIMBER BEARING PLATE



END PLATE

NOTES: 1). TO ENSURE THAT THE TIMBER BEARING PLATE REMAINS IN POSITION, 2 - 10d GALVANIZED STEEL NAILS SHALL BE DRIVEN IN THE SHORT TIMBER BREAKAWAY POST, AND BENT OVER BEARING PLATE.

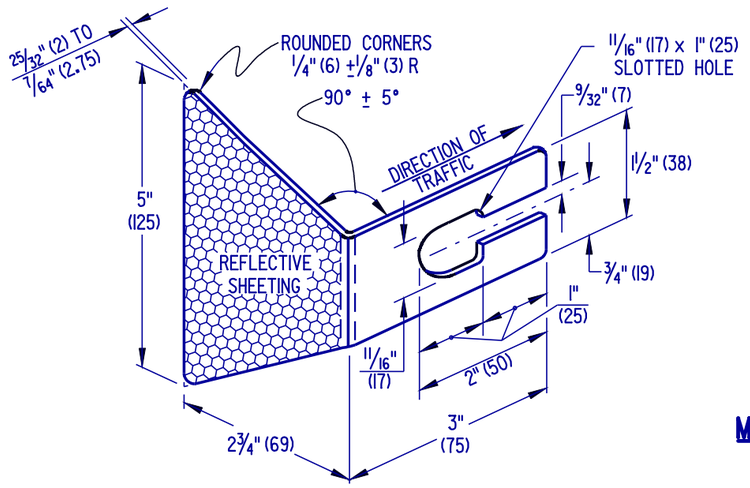
2). TIGHTEN ASSEMBLY UNTIL CABLE IS TAUGHT.

3). ALL HOLES SHALL BE DRILLED PRIOR TO GALVANIZING.

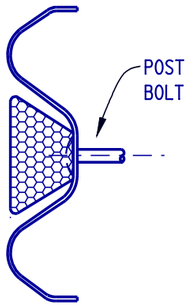
DELAWARE DEPARTMENT OF TRANSPORTATION	HARDWARE			APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE
	STANDARD NO. B-13 (2004)	SHT. 8	OF 13	RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE

09/21/2004

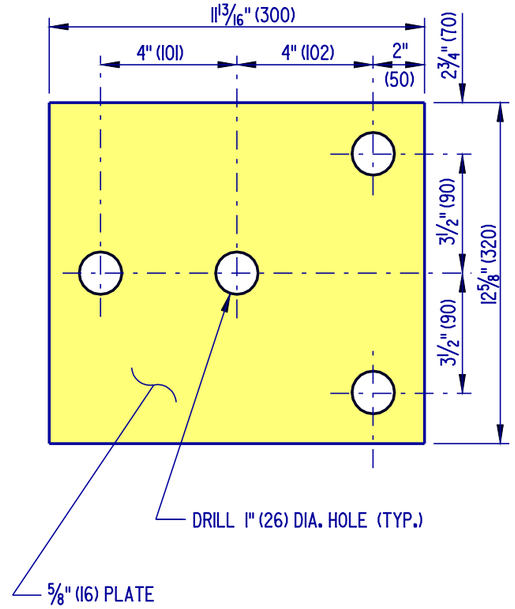
SCALE : N.T.S.



GUARDRAIL REFLECTOR



MOUNTING POSITION

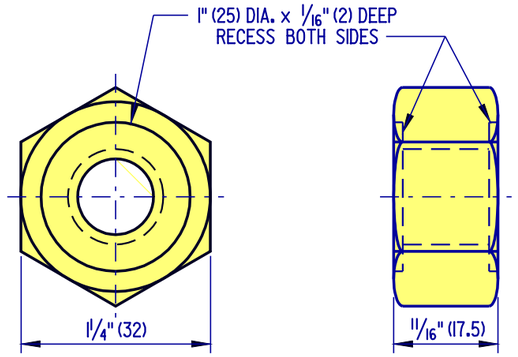


BEARING PLATE DETAIL (II)

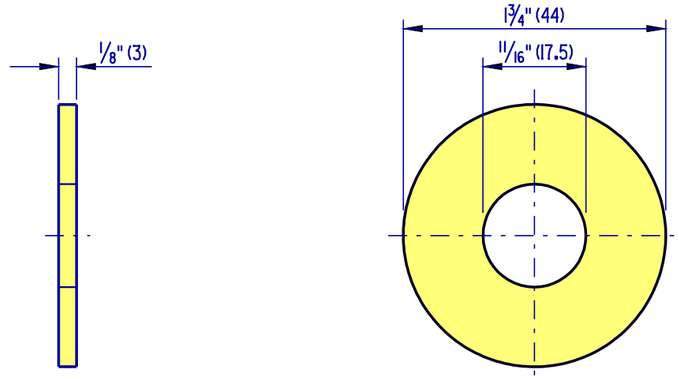
DELAWARE DEPARTMENT OF TRANSPORTATION	HARDWARE		APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE
	STANDARD NO. B-13 (2004)	SHT. 9 OF 13	RECOMMENDED Dennis M. O'Shea DESIGN ENGINEER 1/3/05 DATE

12/08/2004

SCALE : N.T.S.

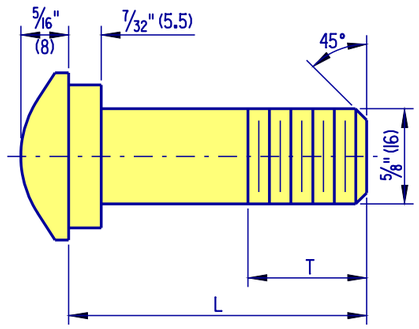


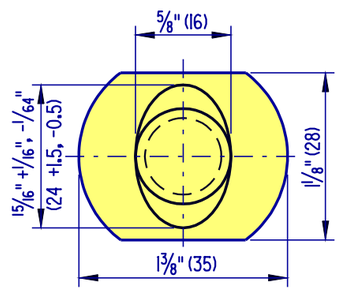
RECESSED NUT (FOR 5/8" (16) GUARDRAIL BOLT)



STEEL WASHER (FOR 5/8" (16) GUARDRAIL BOLT)

NOTE: DIMENSION FOR WASHER THICKNESS IS APPROXIMATE BASED ON METAL THICKNESS.





GUARDRAIL BOLT

L	T (MIN.)
1 1/4" (35)	FULL THREAD LENGTH
2" (50)	FULL THREAD LENGTH
4" (100)	FULL THREAD LENGTH
10" (255)	4" (100) THREAD LENGTH
18" (460)	4" (100) THREAD LENGTH

NOTES : 1. ALL FILLETS SHALL HAVE A MINIMUM RADIUS OF 1/16" (2).
2. IF THE BOLT EXTENDS MORE THAN 1/2" (12) BEYOND THE NUT, THE BOLT SHALL BE TRIMMED BACK AS PER THE DEPARTMENT'S SPECIFICATIONS.

DELAWARE
DEPARTMENT OF TRANSPORTATION

HARDWARE

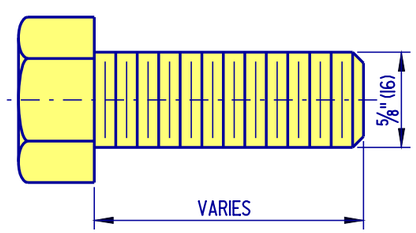
STANDARD NO. B-13 (2004) | SHT. 10 OF 13

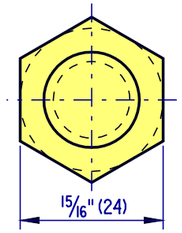
APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE

RECOMMENDED Dennis M. Office DESIGN ENGINEER 1/3/05 DATE

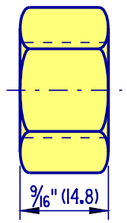
09/23/2004

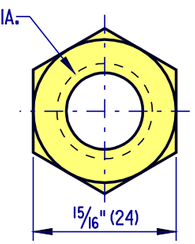
SCALE : N.T.S.



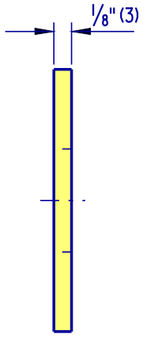


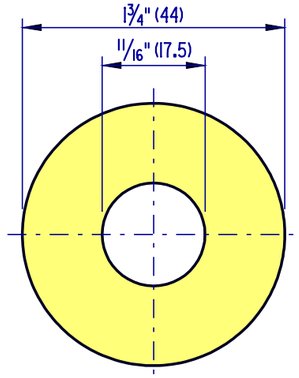
5/8" (16) HEX BOLT





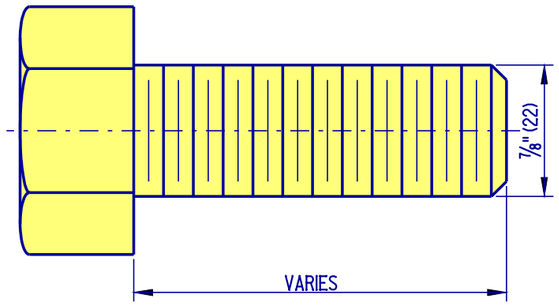
5/8" (16) HEX NUT

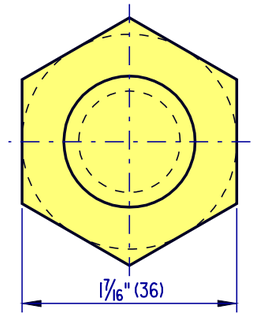




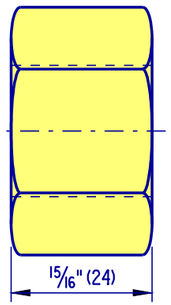
5/8" (16) STEEL WASHER

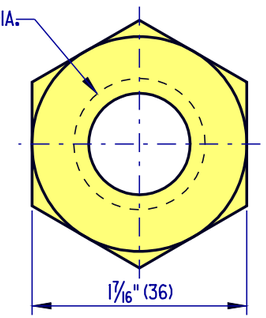
NOTE : DIMENSION FOR WASHER THICKNESS IS APPROXIMATE BASE METAL THICKNESS.





HIGH-STRENGTH STRUCTURAL HEX BOLT



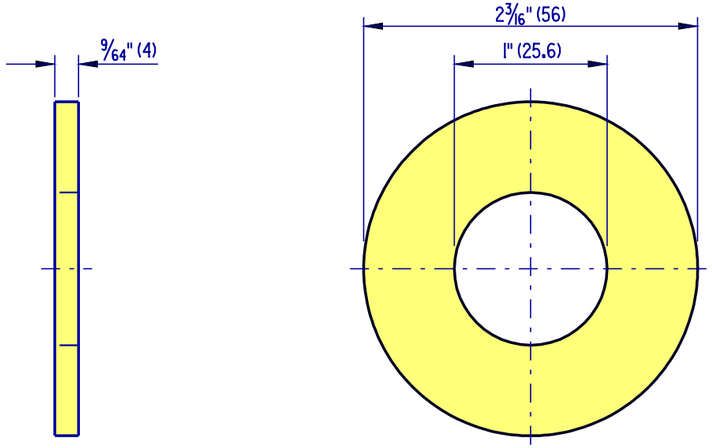


HIGH-STRENGTH STRUCTURAL HEX NUT

DELAWARE DEPARTMENT OF TRANSPORTATION	HARDWARE		APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE
	STANDARD NO. B-13 (2004)	SHT. 11 OF 13	RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE

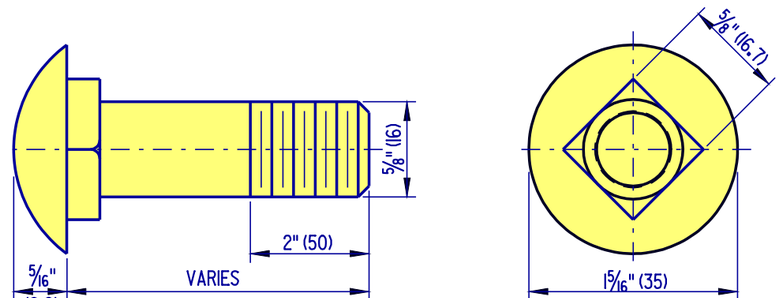
09/21/2004

SCALE : N.T.S.

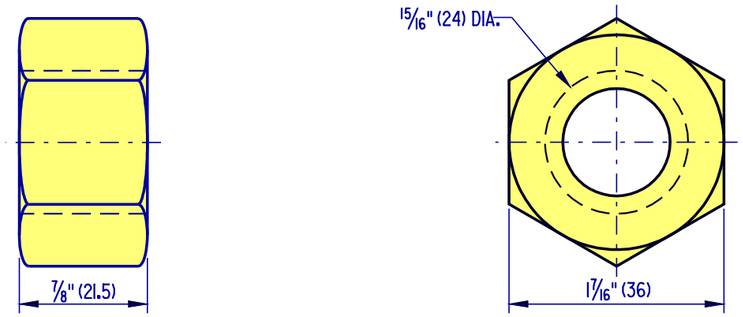


STEEL WASHER

NOTES : 1. FOR USE WITH SWAGED CABLE ASSEMBLAGE.
2. DIMENSION FOR WASHER THICKNESS IS APPROXIMATE BASE METAL THICKNESS.



5/8" (16) CARRIAGE BOLT



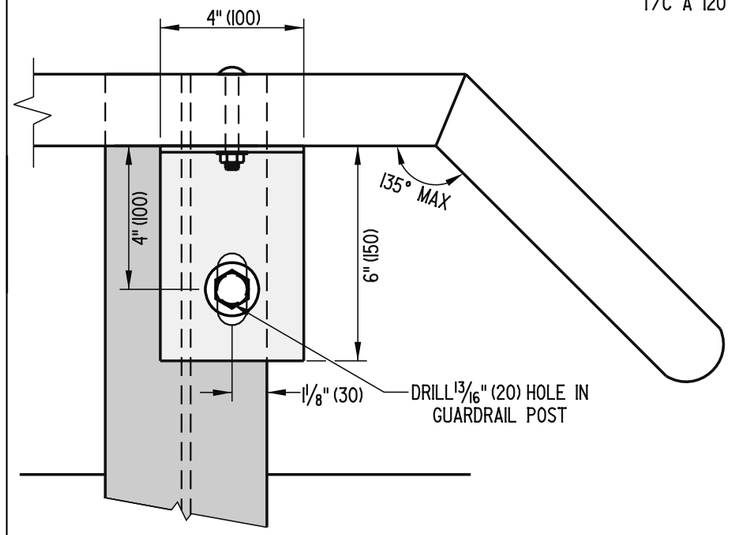
15/16" (24) HEX NUT

NOTE : FOR USE WITH SWAGED CABLE ASSEMBLAGE.

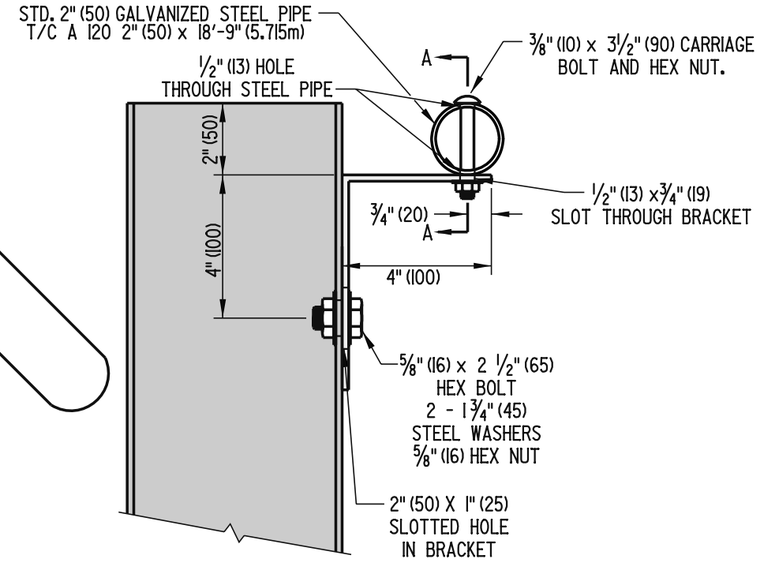
DELAWARE DEPARTMENT OF TRANSPORTATION	HARDWARE		APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE
	STANDARD NO. B-13 (2004)	SHT. 12 OF 13	RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE

09/10/2004

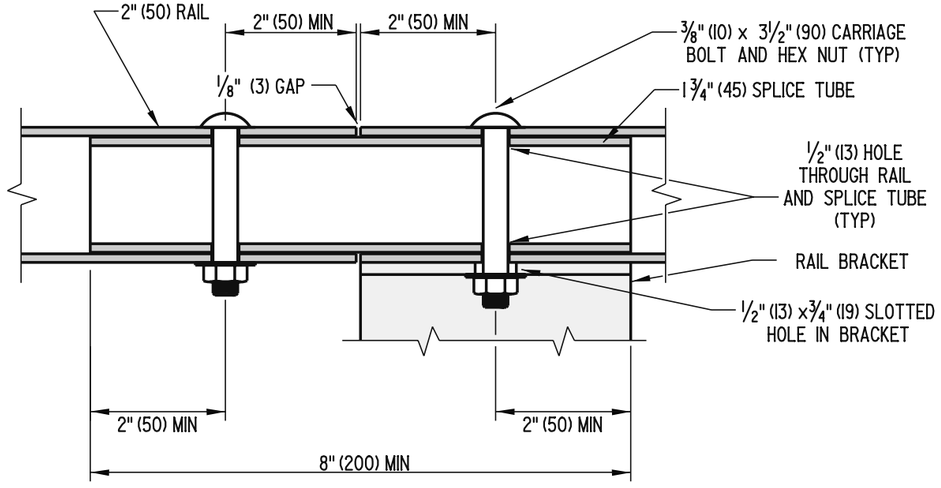
SCALE : N.T.S.



REAR VIEW WITH START & END SECTION



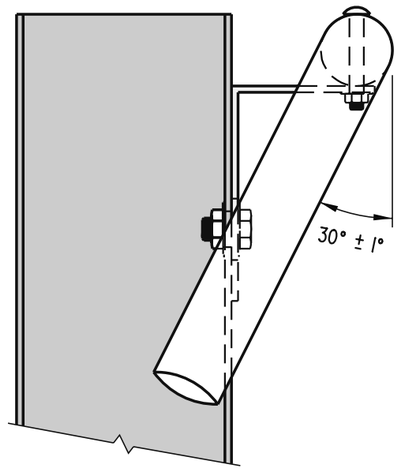
SIDE VIEW



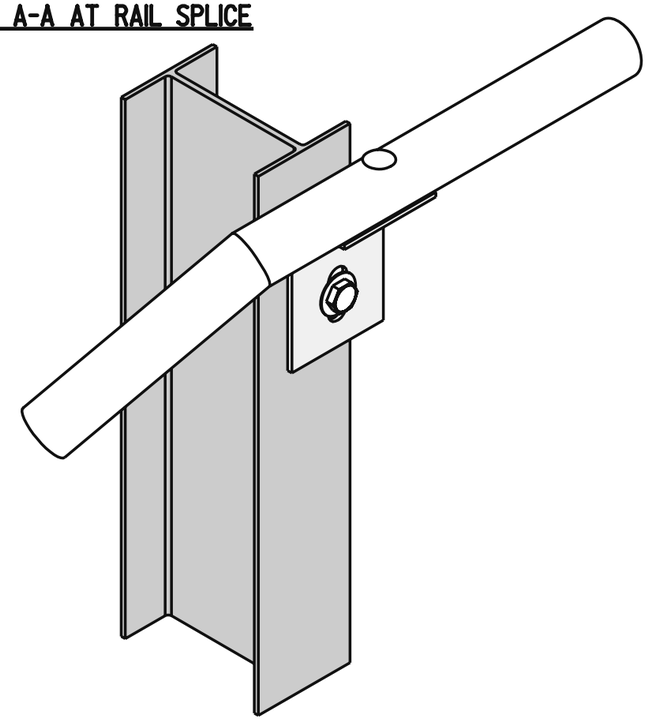
SECTION A-A AT RAIL SPLICE

NOTES:

1). RAIL SHALL BE MOUNTED ON GUARDRAIL ADJACENT TO A BIKEWAY OR SIDEWALK.
2). ALL COMPONENTS OF THE RAIL SHALL BE SHOP FABRICATED. ALL CUTTING AND DRILLING SHALL BE DONE IN THE SHOP.
3). ALL EXPOSED THREADED HARDWARE SHALL BE BURRED.
4). GUARDRAIL POSTS UPON WHICH RAIL IS TO BE INSTALLED SHALL BE SHOP DRILLED FOR THE RAIL BRACKETS DURING FABRICATION.
5). ALL RAIL SPLICES WILL BE AT RAIL SUPPORT BRACKETS, THE SAME BOLT USED TO ATTACH THE RAIL TO THE BRACKET WILL BE USED TO SECURE THE SPLICE TUBE.
6). RAILS SHALL BE INSTALLED ONLY ON STANDARD W-BEAM SECTIONS AND AT LEAST ONE POST AWAY FROM THE PAYMENT LIMITS OF THE END TREATMENT.



SIDE VIEW WITH START & END SECTION

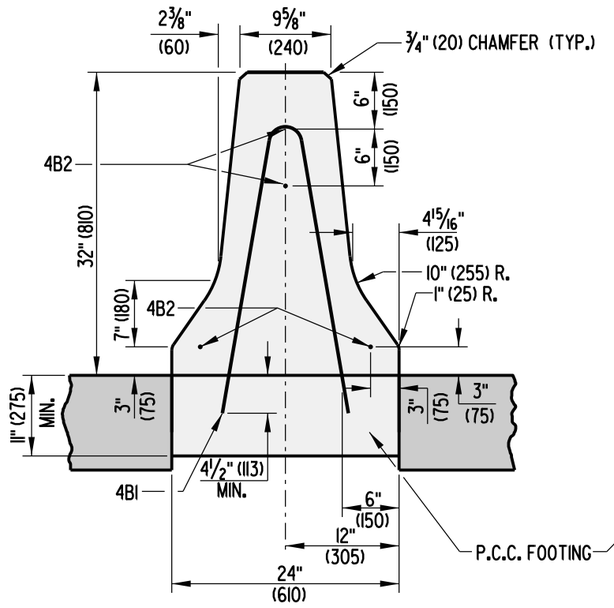


ISOMETRIC VIEW WITH START & END SECTION

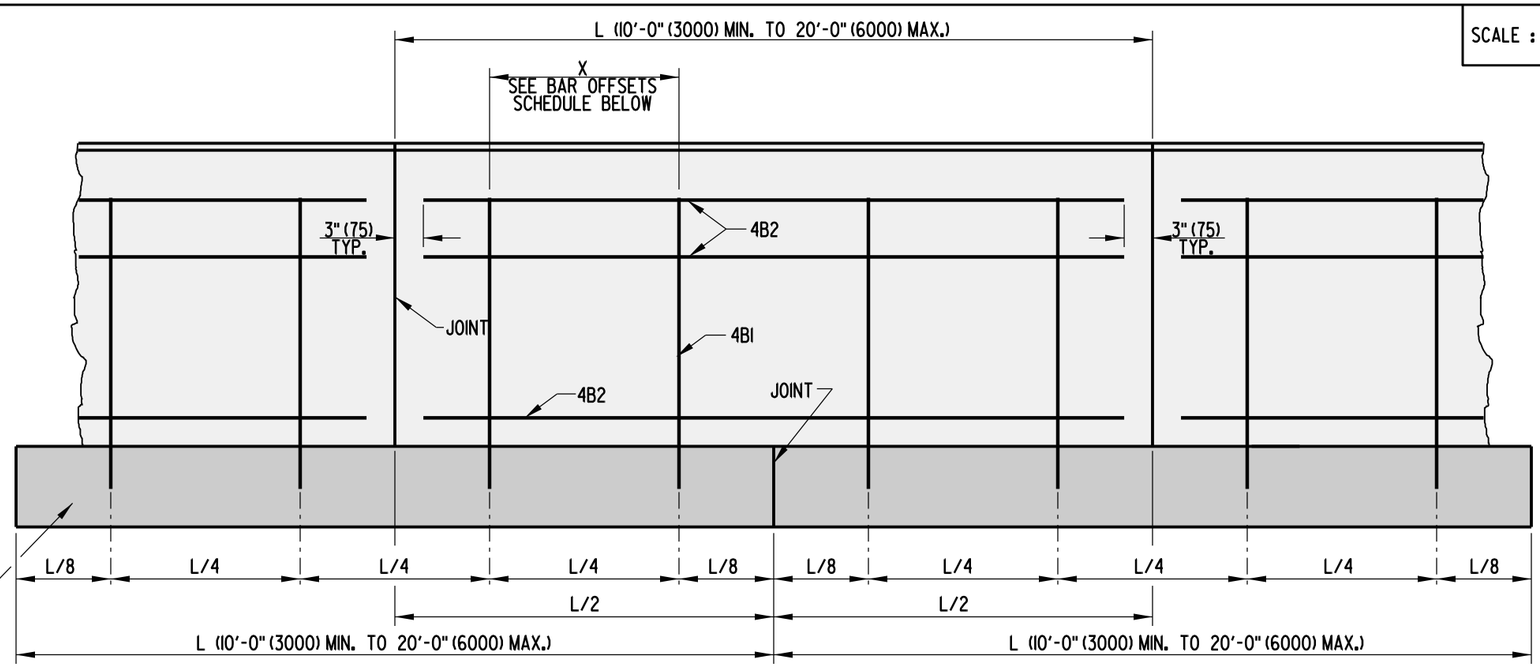
DELAWARE DEPARTMENT OF TRANSPORTATION	GUARDRAIL MOUNTED RAIL		APPROVED Carolann Wicks CHIEF ENGINEER 12/5/05 DATE
	STANDARD NO. B-13 (2005)	SHT. 13 OF 13	RECOMMENDED Jennifer M. O'Mara DESIGN ENGINEER 11/29/05 DATE

01/19/2006

SCALE : N.T.S.

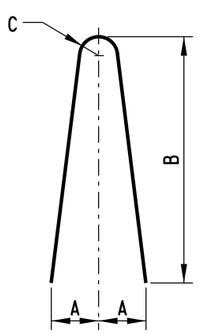


SECTION



ELEVATION

TYPICAL CAST-IN-PLACE OR SLIP-FORM CONSTRUCTION



TYPE 'I' BAR

BAR OFFSETS		
NOMINAL LENGTH OF BARRIER SECTION (L)	X	NO. REQ'D FOR EACH BARRIER SECTION
20' (6000)	5' - 0" (1500)	4
18' (5500)	4' - 6" (1350)	4
16' (5000)	4' - 0" (1200)	4
14' (4500)	3' - 6" (1050)	4
12' (4000)	3' - 0" (900)	4
10' (3000)	2' - 6" (750)	4

BAR LIST							
MARK	SIZE	NUMBER IN EACH SECTION	LENGTH	TYPE	A	B	C
4BI	4 (13)	**	5'-4" (1625)	I	7" (175)	30½" (775)	2" (50)
4B2	4 (13)	4	*	STR.	N/A	N/A	N/A

* THE LENGTH OF BAR 4B2 SHALL BE 6" (150) SHORTER IN LENGTH THAN THE NOMINAL SIZE OF THE BARRIER IN WHICH IT IS USED.

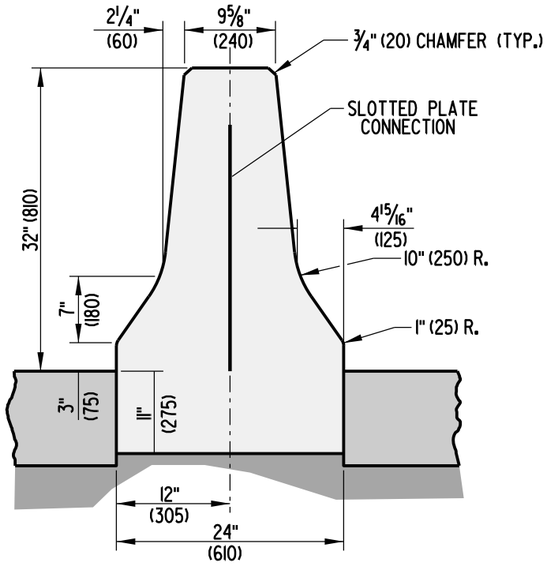
** SEE "BAR OFFSETS" CHART ON THIS SHEET FOR MORE INFORMATION.

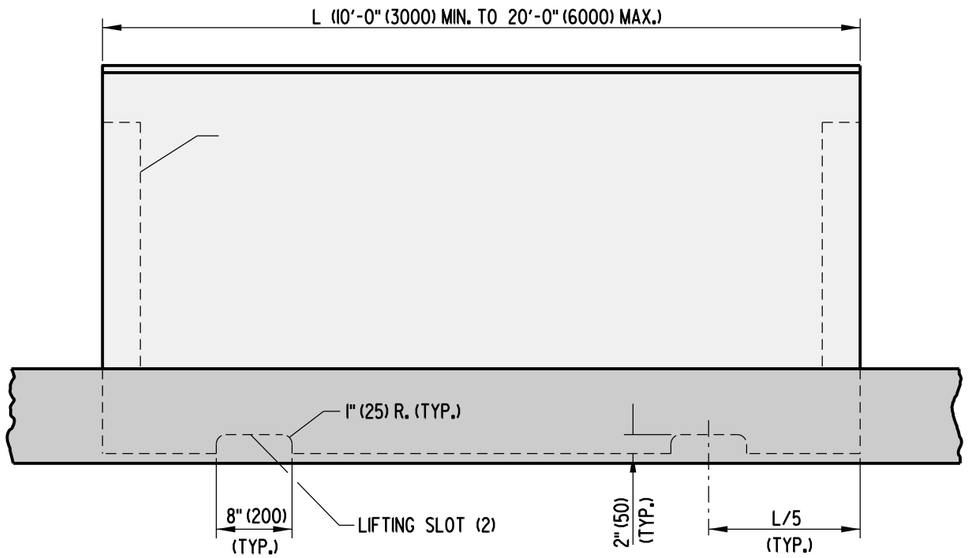
NOTES: 1). CONCRETE CLEAR COVER FOR REINFORCING BARS SHALL BE 1½" (40) MIN.
2). BARS SHALL BE CUT AT EVERY JOINT IF MADE USING CONTINUOUS SLIP-FORM CONSTRUCTION.

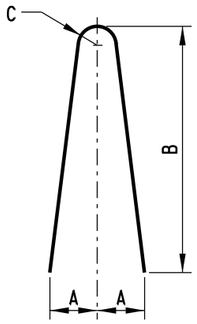
DELAWARE DEPARTMENT OF TRANSPORTATION	32" (960) CONCRETE SAFETY BARRIER (F SHAPE)	APPROVED SIGNATURE ON FILE (CHIEF ENGINEER) 01/19/2010 (DATE)
	STANDARD NO. B-14 (2009) SHT. 1 OF 4	RECOMMENDED SIGNATURE ON FILE (DESIGN ENGINEER) 01/14/2010 (DATE)

12/21/2009

SCALE : N.T.S.



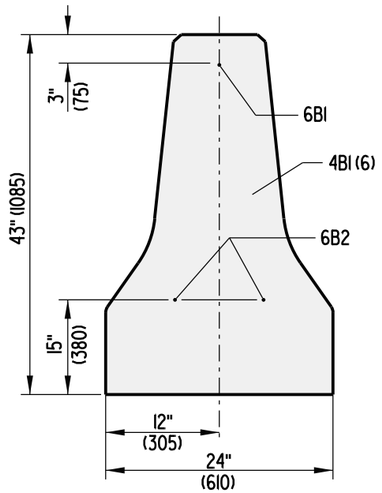




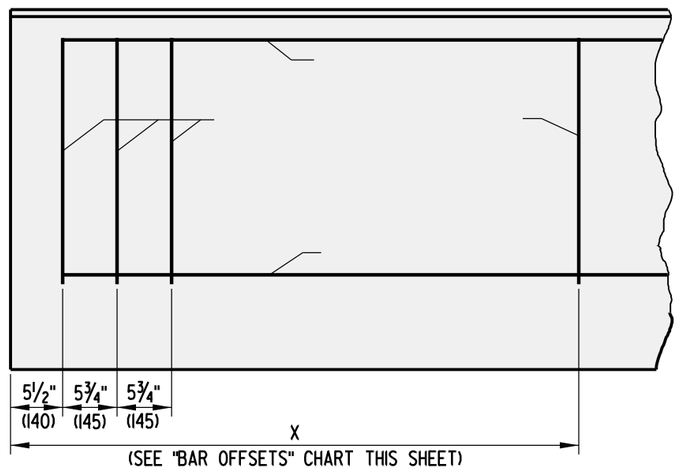
TYPE 'I' BAR

TYPICAL PRE-CAST CONSTRUCTON

BAR OFFSETS		
NOMINAL LENGTH OF BARRIER UNIT	"X"	NO. REQ'D FOR EACH BARRIER UNIT
20' (6000)	6' - 11" (2100)	2
18' (5500)	6' - 5" (1950)	2
16' (5000)	5' - 11" (1800)	2
14' (4500)	7' - 0" (2250)	1
12' (4000)	6' - 0" (2000)	1
10' (3000)	5' - 0" (1500)	1



'F' SHAPE BARRIER SECTION



ELEVATION

BAR LIST							
MARK	SIZE	NUMBER IN EACH SECTION	LENGTH	TYPE	A	B	C
4BI	4 (13)	6	4'-7" (1400)	I	5" (125)	26" (660)	2" (50)
4B2	4 (13)	**	4'-7" (1400)	I	5" (125)	26" (660)	2" (50)
6BI	6 (19)	I	*	STR.			
6B2	6 (19)	2	*	STR.			

* THE LENGTH OF BARS 6BI AND 6B2 SHALL BE 11" (280) SHORTER IN LENGTH THAN THE NOMINAL SIZE OF THE BARRIER IN WHICH IT IS USED.

** SEE "BAR OFFSETS" CHART ON THIS SHEET FOR MORE INFORMATION.

TYPICAL PRE-CAST REINFORCEMENT DETAILS

NOTES: 1). CONCRETE CLEAR COVER FOR REINFORCING BARS SHALL BE 1½" (40) MIN..

DELAWARE
DEPARTMENT OF TRANSPORTATION

32" (960) CONCRETE SAFETY BARRIER (F SHAPE)

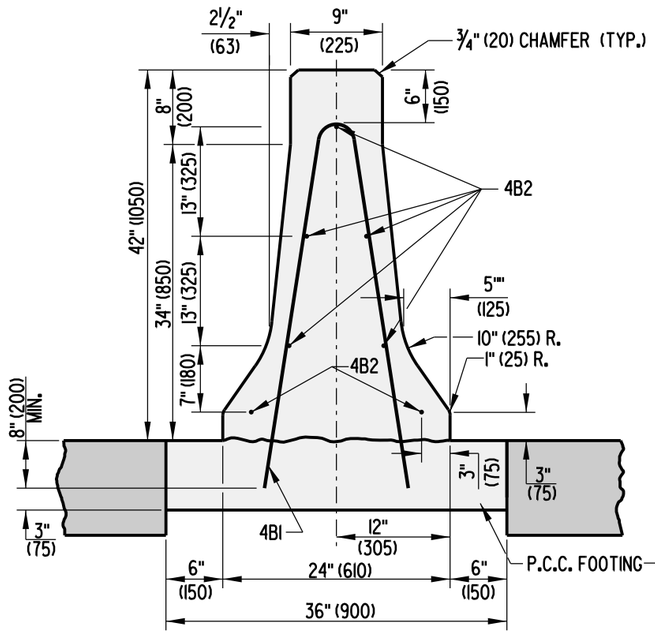
STANDARD NO. B-14 (2009) | SHT. 2 OF 4

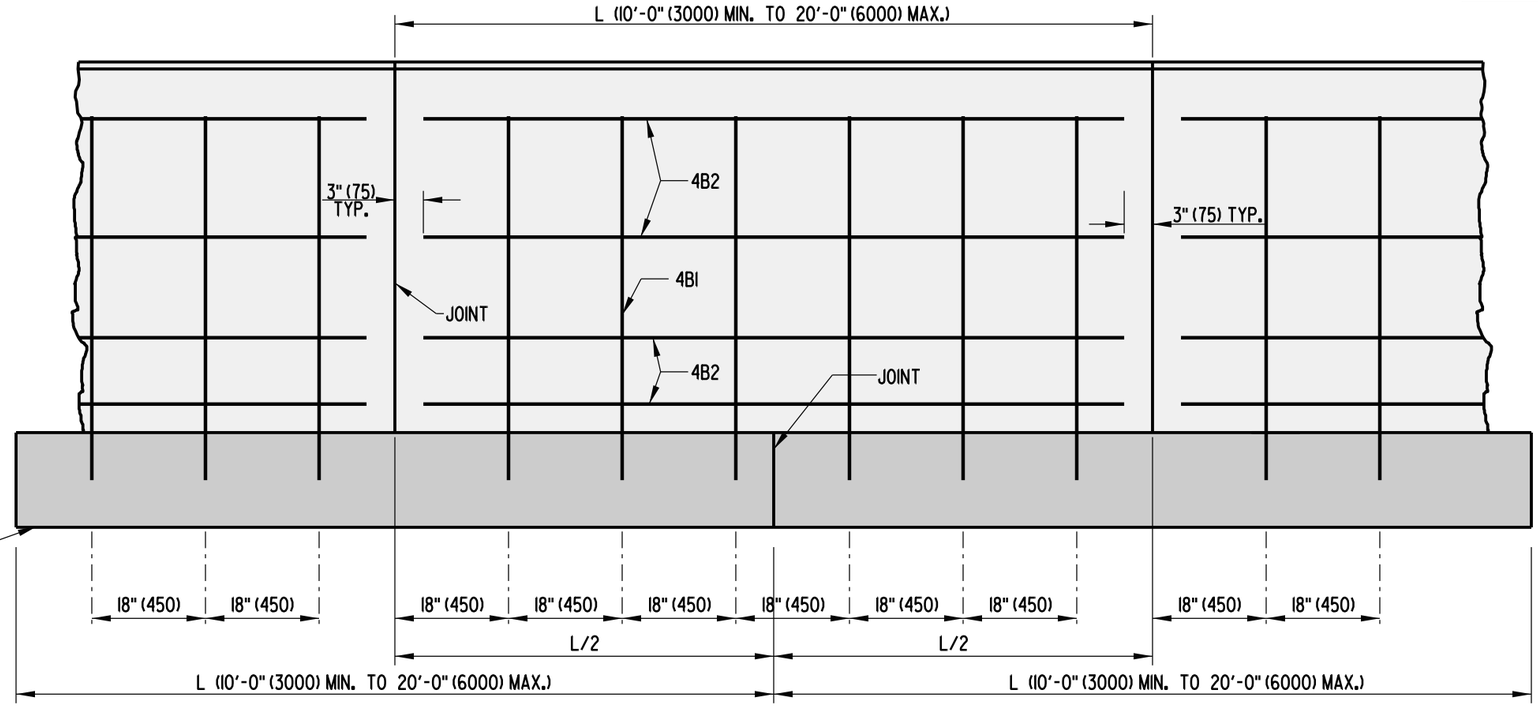
APPROVED SIGNATURE ON FILE (CHIEF ENGINEER) 01/19/2010 (DATE)

RECOMMENDED SIGNATURE ON FILE (DESIGN ENGINEER) 01/14/2010 (DATE)

09/18/2009

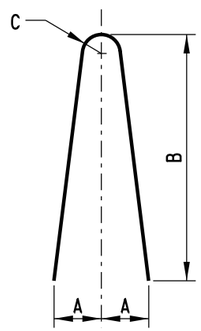
SCALE : N.T.S.





SECTION

ELEVATION



TYPE 'I' BAR

BAR OFFSETS	
NOMINAL LENGTH OF BARRIER SECTION (L)	NO. REQ'D FOR EACH BARRIER SECTION
20' (6000)	13
18' (5500)	12
16' (5000)	10
14' (4500)	9
12' (4000)	8
10' (3000)	6

BAR LIST							
MARK	SIZE	NUMBER IN EACH SECTION	LENGTH	TYPE	A	B	C
4BI	4 (13)	**	7'-6" (2286)	I	6" (150)	44" (1118)	2" (50)
4B2	4 (13)	7	*	STR.	N/A	N/A	N/A

* THE LENGTH OF BAR 4B2 SHALL BE 6" (150) SHORTER IN LENGTH THAN THE NOMINAL SIZE OF THE BARRIER IN WHICH IT IS USED.

** SEE "BAR OFFSETS" CHART ON THIS SHEET FOR MORE INFORMATION.

TYPICAL CAST-IN-PLACE OR SLIP-FORM CONSTRUCTION

NOTES: 1). CONCRETE CLEAR COVER FOR REINFORCING BARS SHALL BE 1½" (40) MIN.
2). BARS SHALL BE CUT AT EVERY JOINT IF MADE USING CONTINUOUS SLIP-FORM CONSTRUCTION.

DELAWARE
DEPARTMENT OF TRANSPORTATION

42" (1050) CONCRETE BARRIER DETAILS (F-SHAPE)

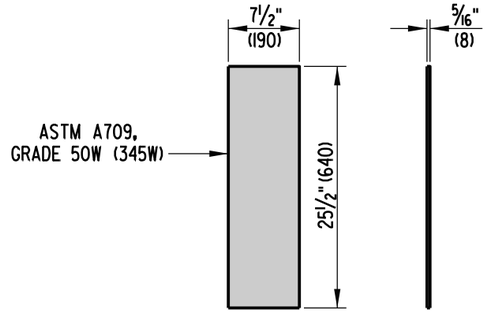
STANDARD NO. B-14 (2009) | SHT. 3 OF 4

APPROVED SIGNATURE ON FILE — CHIEF ENGINEER — 01/19/2010 DATE

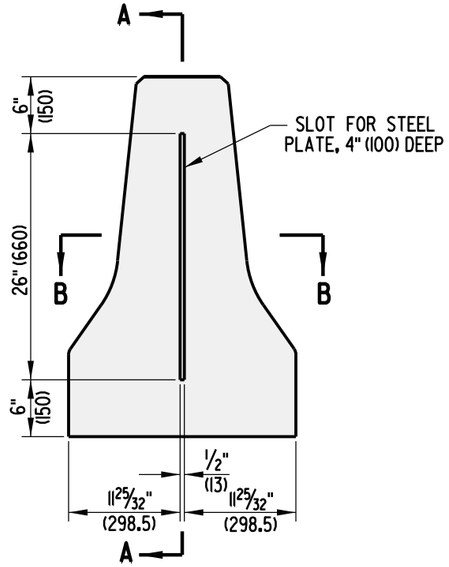
RECOMMENDED SIGNATURE ON FILE — DESIGN ENGINEER — 01/14/2010 DATE

12/21/2009

SCALE : N.T.S.

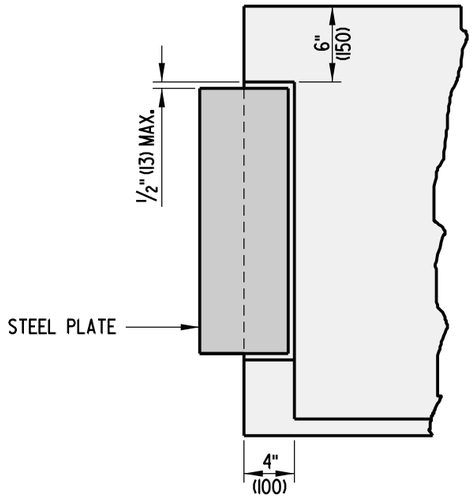


STEEL CONNECTOR PLATE

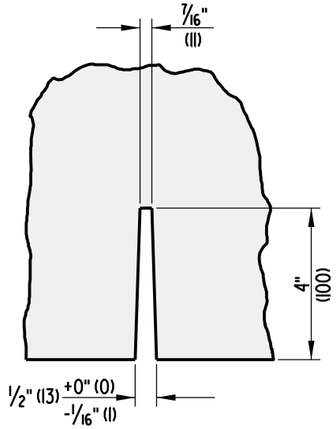


SLOT DIMENSIONS

CONCRETE SAFETY BARRIER, PRECAST CONSTRUCTION
'F' SHAPE BARRIER SECTION



SECTION A-A

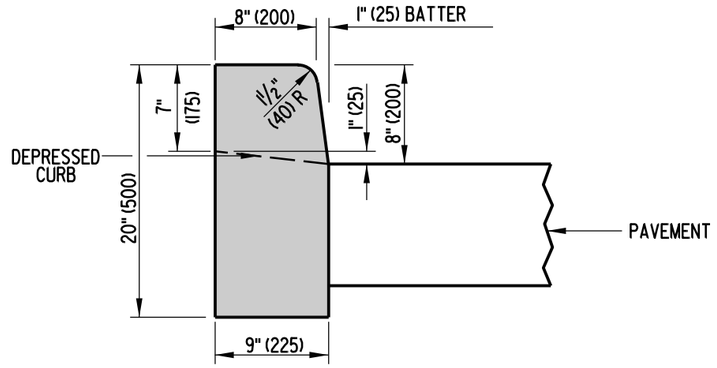


SECTION B-B

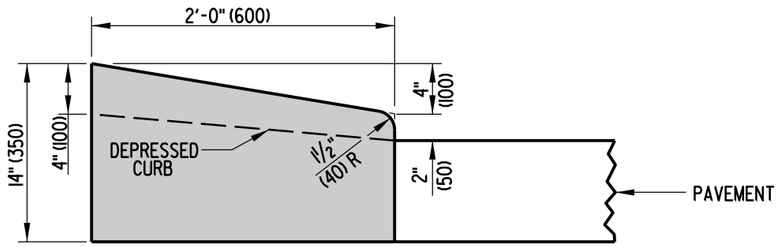
DELAWARE DEPARTMENT OF TRANSPORTATION	SLOTTED PLATE CONNECTION DETAILS		APPROVED SIGNATURE ON FILE (CHIEF ENGINEER) 01/19/2010 (DATE)
	STANDARD NO. B-14 (2009)	SHT. 4 OF 4	RECOMMENDED SIGNATURE ON FILE (DESIGN ENGINEER) 01/14/2010 (DATE)

09/18/2009

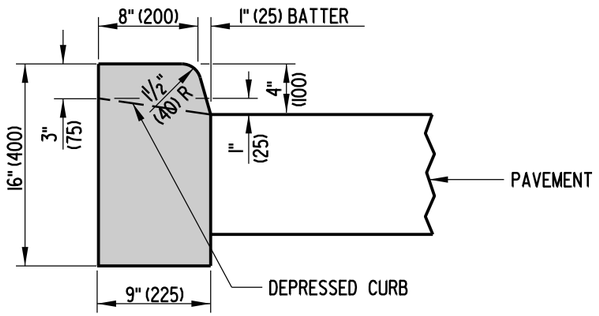
SCALE : N.T.S.



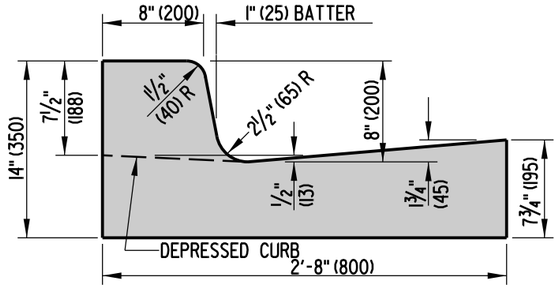
P.C.C. CURB
TYPE 1



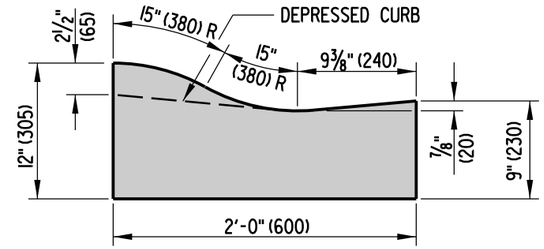
P.C.C. CURB
TYPE 2



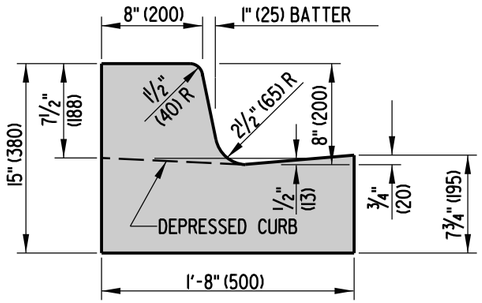
P.C.C. CURB
TYPE 3



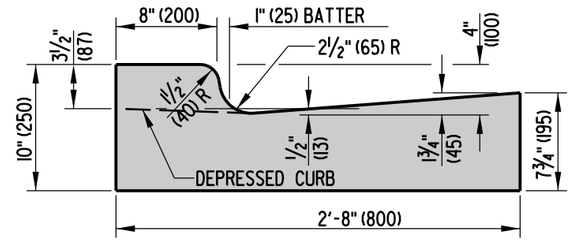
INTEGRAL P.C.C. CURB AND GUTTER
TYPE 1



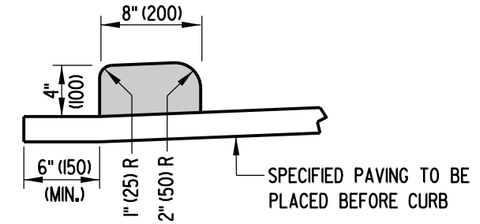
INTEGRAL P.C.C. CURB AND GUTTER
TYPE 2



INTEGRAL P.C.C. CURB AND GUTTER
TYPE 3



INTEGRAL P.C.C. CURB AND GUTTER
TYPE 4



HOT-MIX, HOT LAID BITUMINOUS CONCRETE CURB

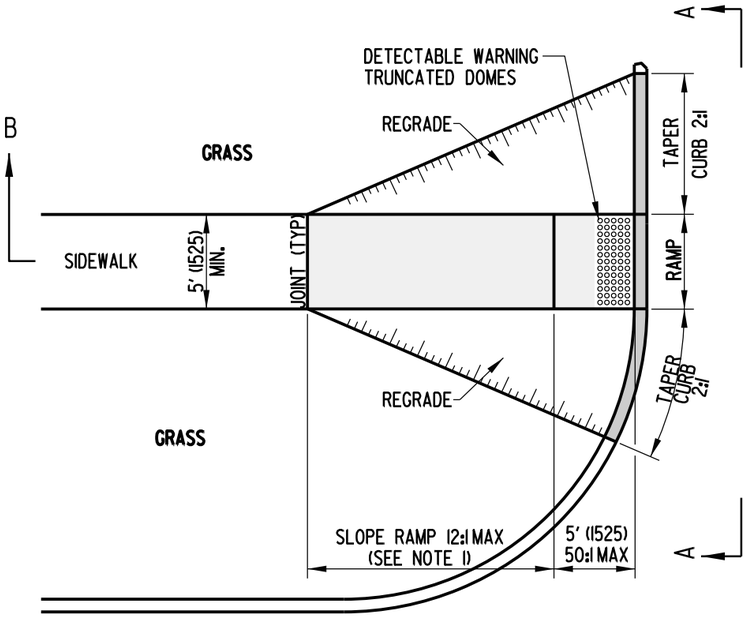
NOTES:

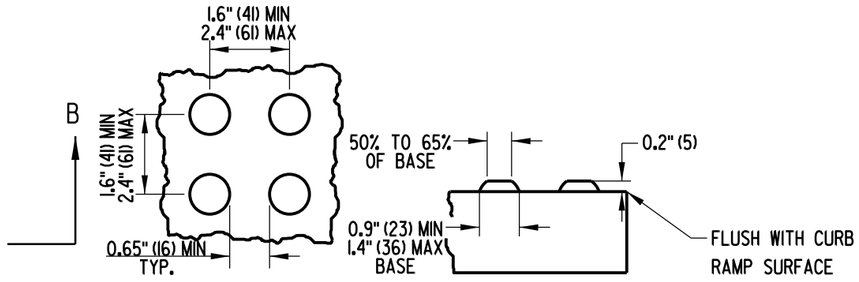
1. WHEN P.C.C. CURB OR INTEGRAL P.C.C. CURB AND GUTTER IS PLACED ADJACENT TO PORTLAND CEMENT CONCRETE PAVEMENT, CONSTRUCT THE JOINT AS PER THE LONGITUDINAL JOINT SEALANT DETAIL ON DETAIL P-2, SHEET 3 OF 5. USE APPROVED JOINT FILLER TO SEAL. WORK TO BE PAID UNDER RESPECTIVE CURB AND GUTTER ITEM.
2. DEPRESS CURB AT ENTRANCES AND CURB RAMPS AS DETAILED ON THIS SHEET.
3. DEPRESS CURB FLUSH WITH PAVEMENT AT CURB RAMPS. MAXIMUM SLOPE OF CURB AT CURB RAMPS IS 20:1 IN THE DIRECTION OF PEDESTRIAN TRAVEL. SEE DETAIL C-2, SHEET 1 OF 4.
4. DEPRESS CURB FLUSH WITH PAVEMENT OR ADJACENT AREA AT NOSE OF ISLANDS, TAPERING BACK TO FULL HEIGHT AT A SLOPE OF 12:1.

DELAWARE DEPARTMENT OF TRANSPORTATION	P.C.C. CURB, P.C.C. CURB & GUTTER, AND HOT-MIX CURB	APPROVED SIGNATURE ON FILE (CHIEF ENGINEER) 01/19/2010 (DATE)
	STANDARD NO. C-1 (2009) SHT. 1 OF 1	RECOMMENDED SIGNATURE ON FILE (DESIGN ENGINEER) 01/14/2010 (DATE)

01/12/2009

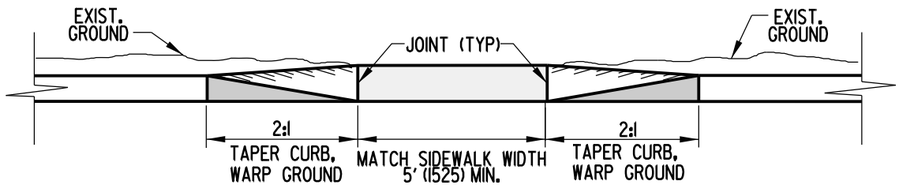
SCALE : N.T.S.



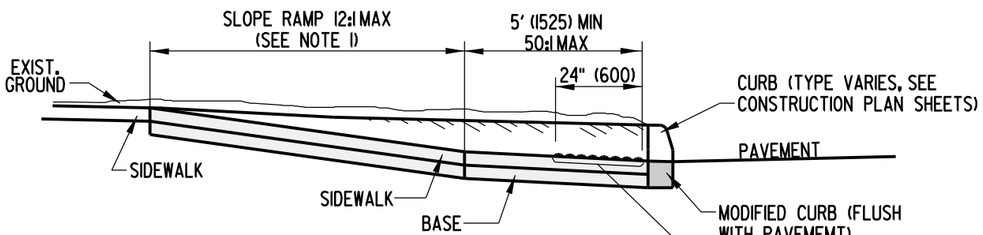


DETECTABLE WARNING TRUNCATED DOME DETAILS

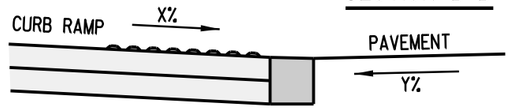
NOTES:
A). THE AREA OF DETECTABLE WARNING TRUNCATED DOMES SHALL BE 24" (600) LONG AND THE FULL WIDTH OF THE RAMP OR DEPRESSED CURB.
B). SEE SPECIFICATION FOR ADDITIONAL INFORMATION.



ELEVATION A-A

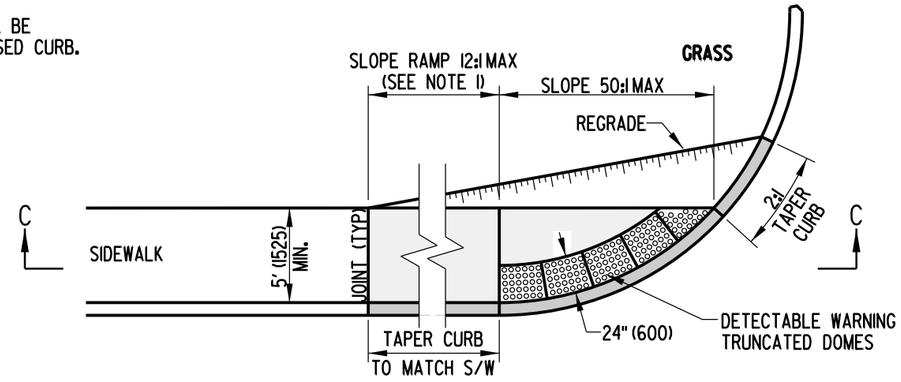


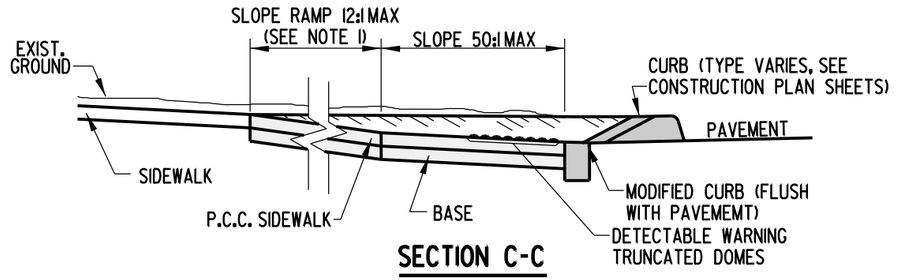
SECTION B-B



MAXIMUM DIFFERENCE IN GRADE

FOR EXAMPLE, IF THE CURB RAMP AND DEPRESSED CURB SLOPE (X) IS 8.1% AND THE PAVEMENT SLOPE (Y) IS 4.0%, THEN TO DETERMINE THE DIFFERENCE IN GRADE, ADD X + Y TO GET 12.1%. WHICH IS GREATER THAN THE 11% PREFERRED BUT LESS THAN THE 13% MAXIMUM.





SECTION C-C

NOTES:
1). WHERE A 12:1 MAXIMUM SLOPE RAMP WILL NOT MEET THE SIDEWALK GRADE WITHIN A LENGTH OF 15' (4570) DUE TO STEEP ADJACENT ROADWAY, THE RAMP LENGTH MAY BE LIMITED TO 15' (4570), AND ALLOWED TO EXCEED 12:1.
2). RAMP AND SIDEWALK CROSS SLOPE SHALL BE 50:1 (2%) MAXIMUM.
3). IF GRADING WILL BE STEEPER THAN 6:1, THEN A TYPE 1 CURB OR RETAINING WALL SHOULD BE USED TO ELIMINATE THE NEED FOR THE STEEP SLOPE.
4). THE MAXIMUM DIFFERENCE IN GRADE BETWEEN THE CURB RAMP OR MODIFIED CURB AND THE PAVEMENT SHALL BE 13%, HOWEVER 11% IS PREFERRED.

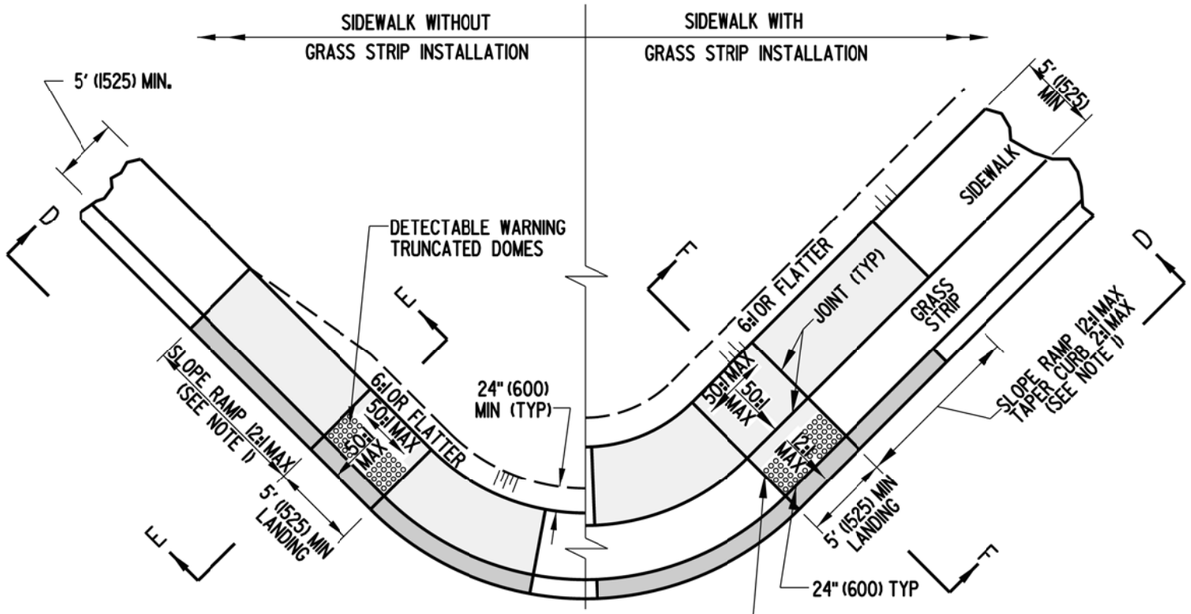
CURB RAMP, TYPE 1

PERPENDICULAR CURB RAMP

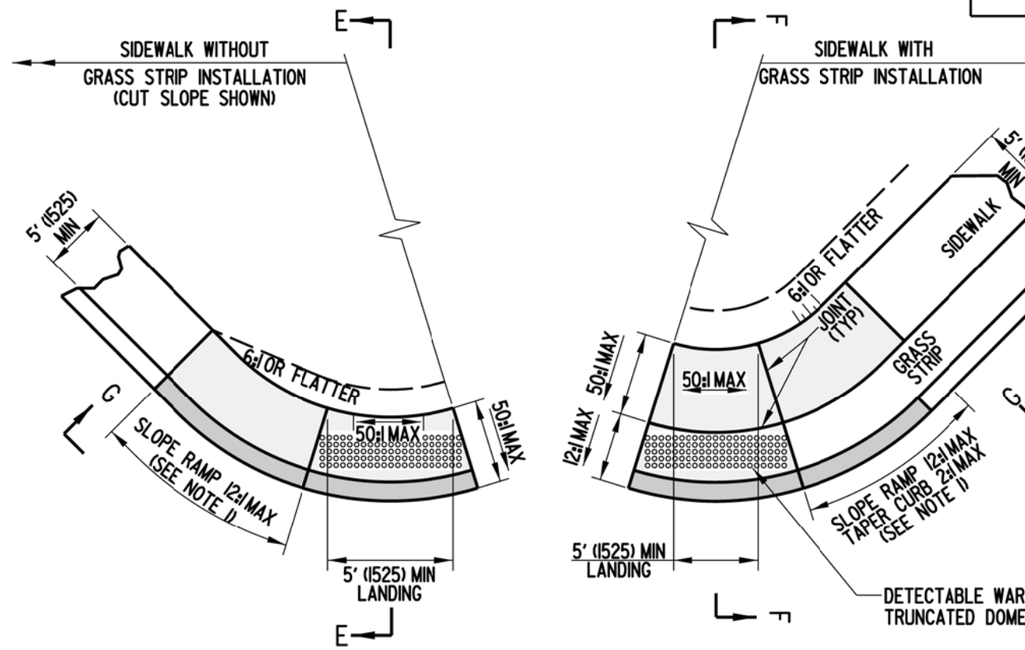
DELAWARE DEPARTMENT OF TRANSPORTATION	CURB RAMP, TYPE 1 AND SECTIONS		APPROVED CHIEF ENGINEER 11/18/08 DATE
	STANDARD NO. C-2 (2008)	SHT. 1 OF 4	RECOMMENDED DESIGN ENGINEER 11/17/08 DATE

10/16/2008

SCALE : N.T.S.

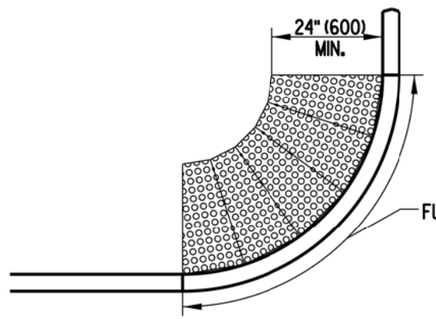


CURB RAMP, TYPE 2



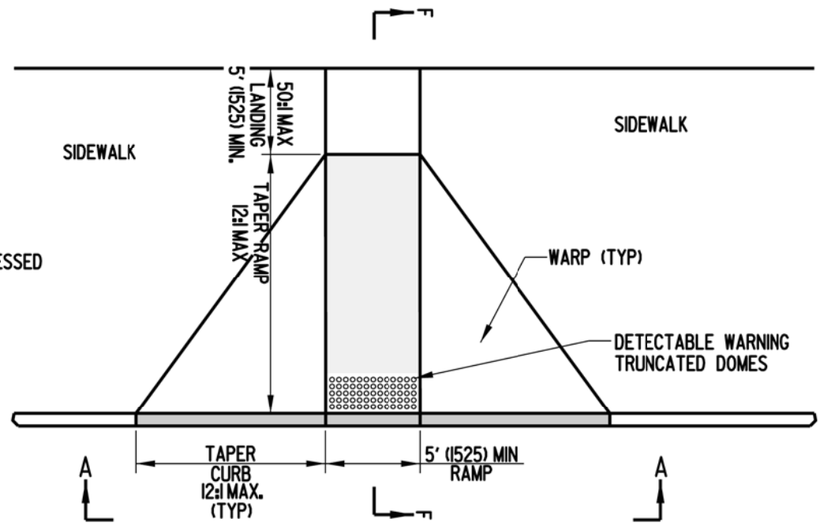
CURB RAMP, TYPE 3

DIAGONAL CURB RAMP



SAMPLE LAYOUT OF DETECTABLE WARNING TRUNCATED DOMES ALONG A CURB RADIUS

DETECTABLE WARNININGS SHALL BE PLACED
THE FULL WIDTH OF THE DEPRESSED CURB.



CURB RAMP, TYPE 4

PERPENDICULAR CURB RAMP

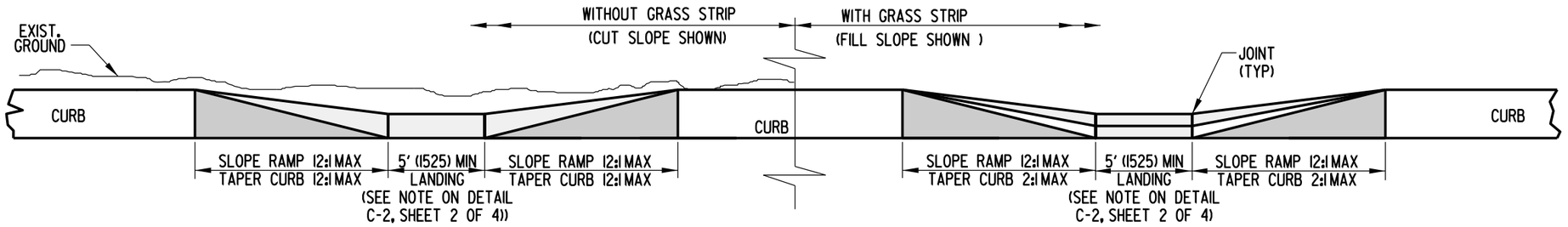
NOTES:

1). WHERE A 12:1 MAXIMUM SLOPE RAMP WILL NOT MEET THE SIDEWALK GRADE WITHIN A LENGTH OF 15' (4570) DUE TO STEEP ADJACENT ROADWAY, THE RAMP LENGTH MAY BE LIMITED TO 15' (4570), AND THE RAMP SLOPE ALLOWED TO EXCEED 12:1.
2). TRANSITION TO EXISTING SIDEWALK WIDTH OVER THE LENGTH OF THE RAMP.
3). RAMP AND SIDEWALK CROSS SLOPE SHALL BE 50:1 (2%) MAXIMUM.
4). IF GRADING WILL BE STEEPER THAN 6:1 ADJACENT TO THE CURB RAMP OR SIDEWALK, THEN A TYPE I CURB OR RETAINING WALL SHOULD BE USED TO ELIMINATE THE NEED FOR THE STEEP SLOPE.
5). FOR THE CURB RAMP, TYPE 3, IF THE WIDTH OF THE FULLY DEPRESSED CURB AT THE STREET IS MORE THAN 5' (1525), THE THE DETECTABLE WARNING TRUNCATED DOMES SHALL FOLLOW THE RADIUS OF THE CURB CONTINUOUSLY WITHOUT GAPS FOR THE ENTIRE LENGTH OF DEPRESSED CURB.
6). THE MAXIMUM DIFFERENCE IN GRADE BETWEEN THE SIDEWALK OR CURB AND THE PAVEMENT SHALL BE 13%, HOWEVER 11% IS PREFERRED. SEE STANDARD NO. C-2, SHEET 1 OF 4.
7). IF THE WIDTH OF THE FULLY DEPRESSED CURVED CURB AT THE STREET IS 5' (1525) OR LESS, THEN A RECTANGULAR PIECE OF DETECTABLE WARNING TRUNCATED DOMES MAY BE USED.

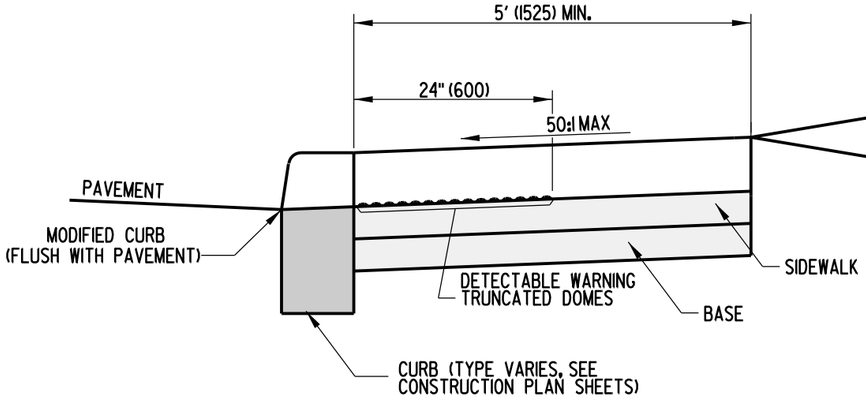
DELAWARE DEPARTMENT OF TRANSPORTATION	CURB RAMPS, TYPES 2, 3, & 4	APPROVED _____ CHIEF ENGINEER 11/18/08 DATE
	STANDARD NO. C-2 (2008) SHT. 2 OF 4	RECOMMENDED _____ DESIGN ENGINEER 11/17/08 DATE

11/16/2008

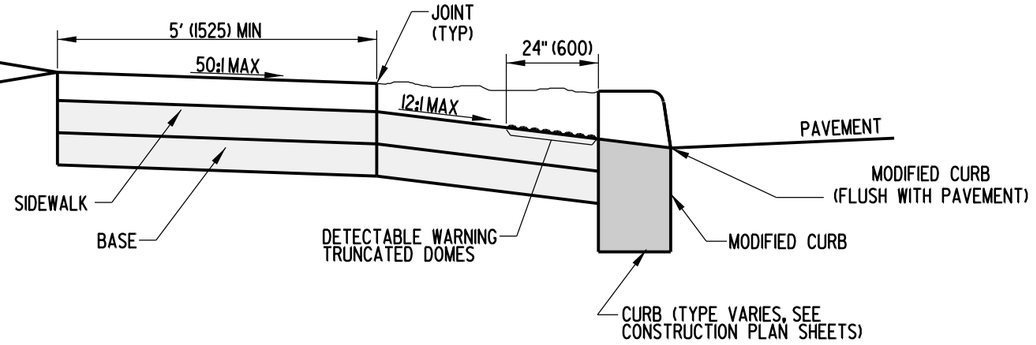
SCALE : N.T.S.



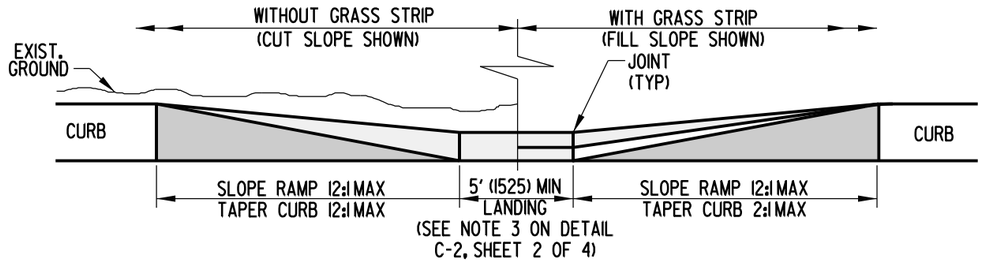
ELEVATION D-D



SECTION E-E



SECTION F-F

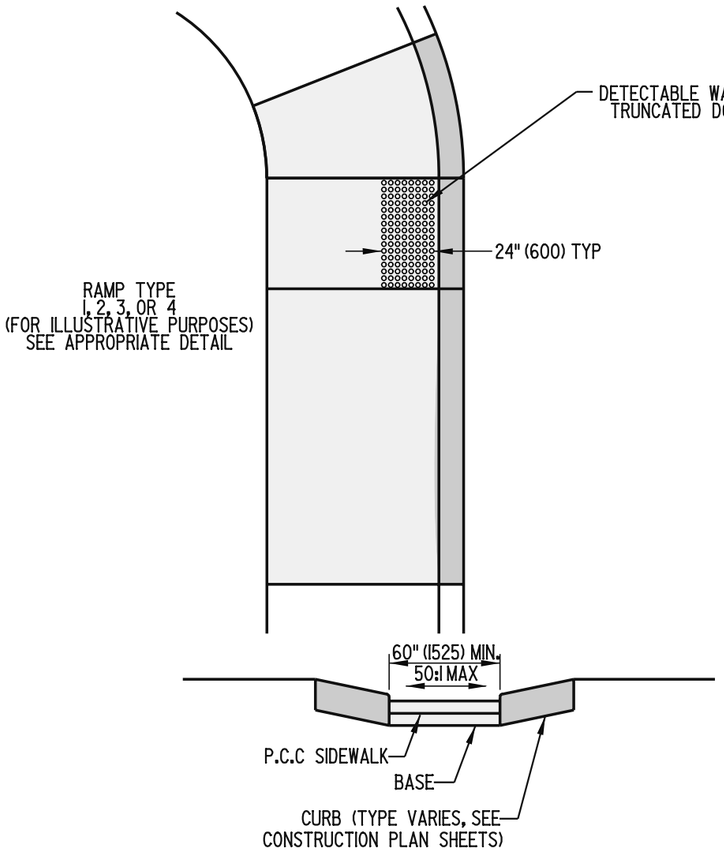


ELEVATION G-G

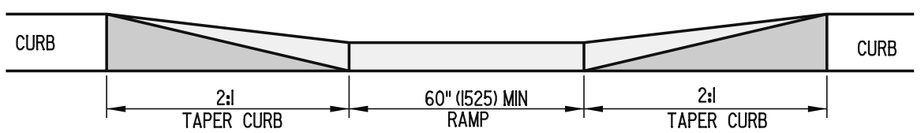
DELAWARE DEPARTMENT OF TRANSPORTATION	CURB RAMP SECTIONS FOR TYPES 2 & 3		APPROVED CHIEF ENGINEER — DATE 11/18/08
	STANDARD NO. C-2 (2008)	SHT. 3 OF 4	RECOMMENDED DESIGN ENGINEER — DATE 11/17/08

08/10/2004

SCALE : N.T.S.



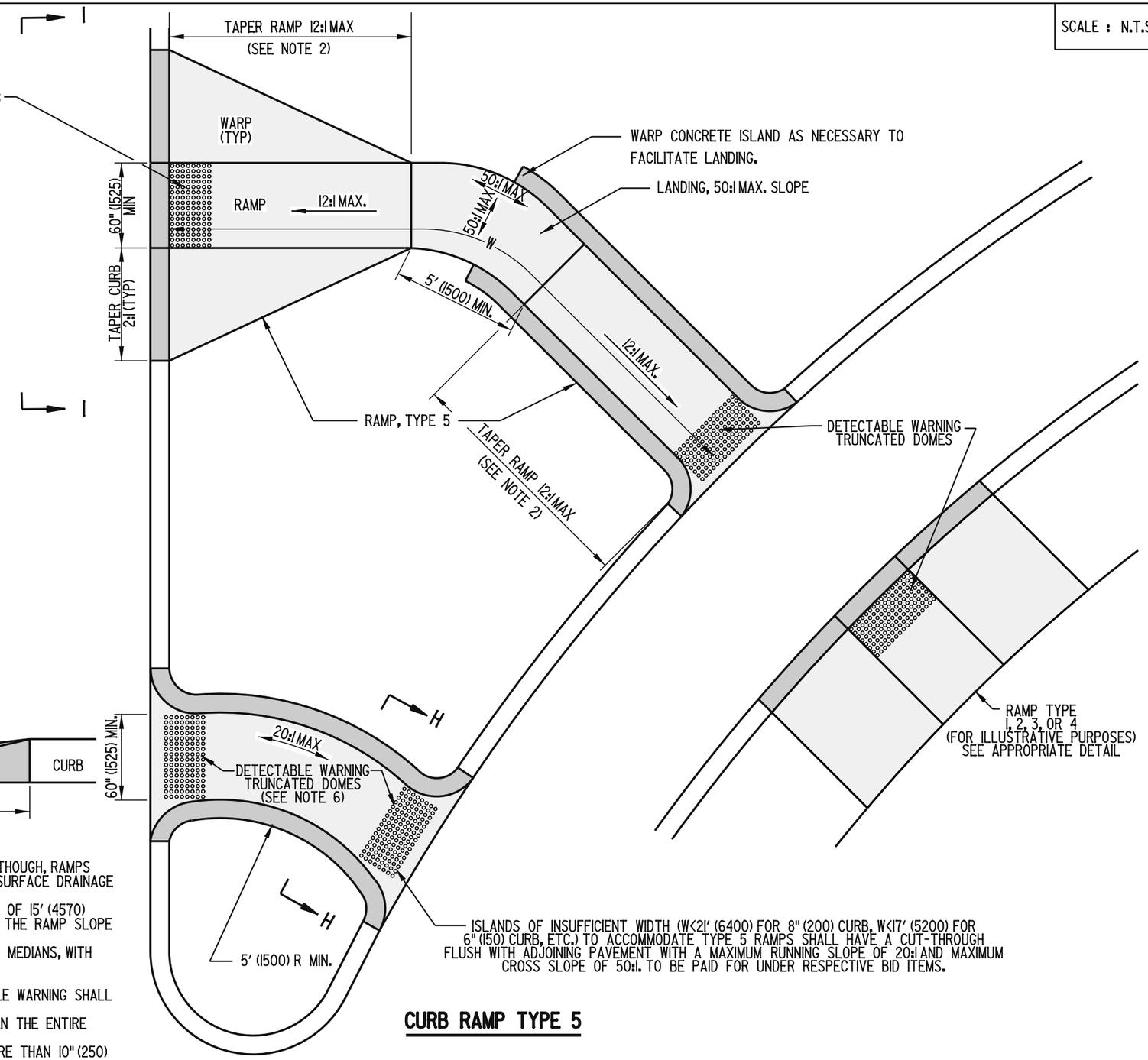
SECTION H-H



ELEVATION I-I

NOTES:

1). A CUT-THROUGH LEVEL WITH THE STREET IS THE PREFERRED TREATMENT FOR ISLANDS, ALTHOUGH, RAMPS CAN BE USED WHERE THE ISLAND WIDTH IS SUFFICIENT TO ACCOMMODATE THEM. POSITIVE SURFACE DRAINAGE MUST BE PROVIDED FOR EITHER TREATMENT. EITHER TREATMENT IS ACCEPTABLE.
2). WHERE A 12:1 MAXIMUM SLOPE RAMP WILL NOT MEET THE SIDEWALK GRADE WITHIN A LENGTH OF 15' (4570) DUE TO STEEP ADJACENT ROADWAY, THE RAMP LENGTH MAY BE LIMITED TO 15' (4570), AND THE RAMP SLOPE ALLOWED TO EXCEED 12:1.
3). A CONTINUOUS PATH MUST BE PROVIDED BETWEEN ADJACENT CURB RAMPS IN ISLANDS AND MEDIANS, WITH A MAXIMUM RUNNING SLOPE OF 20:1.
4). RAMP AND SIDEWALK CROSS SLOPE SHALL BE 50:1 (2%) MAXIMUM.
5). WHERE THERE IS NO DEPRESSED CURB AT A CUT-THROUGH OR CURB RAMP, THE DETECTABLE WARNING SHALL BE INSTALLED 3" (75) FROM THE ROADWAY PAVEMENT.
6). IF THE MINIMUM CLEAR SPACE BETWEEN DETECTABLE WARNINGS IS LESS THAN 2' (600), THEN THE ENTIRE MEDIAN CURB RAMP AREA SHALL BE COVERED WITH DETECTABLE WARNINGS.
7). PEDESTRIAN SIGNALS SHALL BE ACCESSIBLE WITH A LEVEL LANDING, WHOSE EDGE IS NO MORE THAN 10" (250) FROM ALL PEDESTRIAN PUSH BUTTONS.

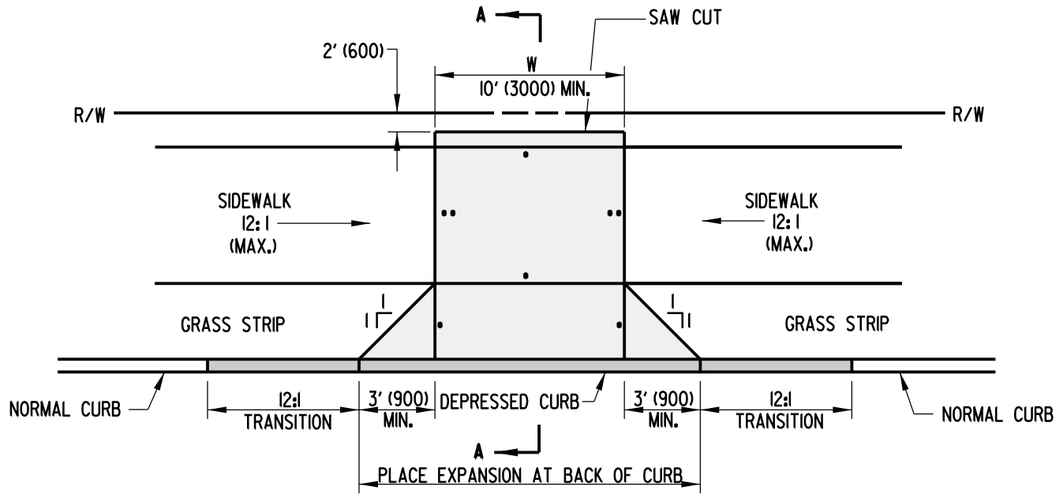


CURB RAMP TYPE 5

DELAWARE DEPARTMENT OF TRANSPORTATION	CURB RAMP TYPE 5 & SECTIONS		APPROVED _____ CHIEF ENGINEER DATE 10/10/06
	STANDARD NO. C-2 (2006)	SHT. 4 OF 4	RECOMMENDED _____ DESIGN ENGINEER DATE 10/9/06

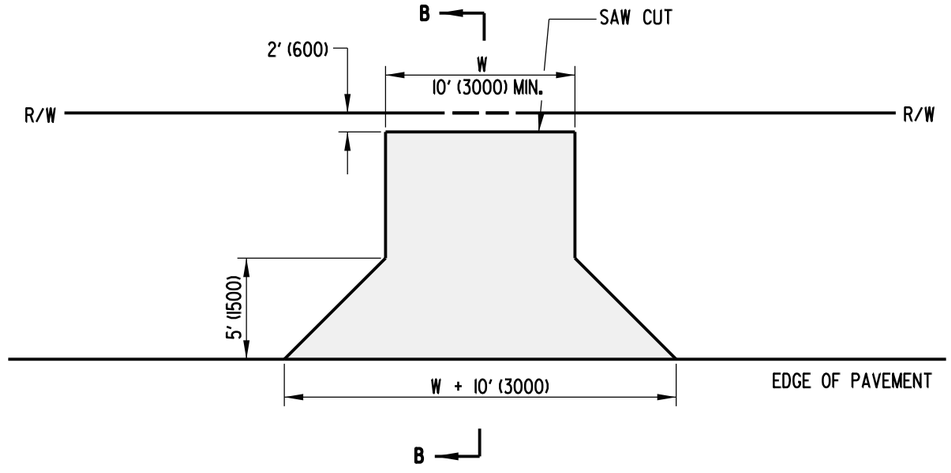
08/03/2006

SCALE : N.T.S.

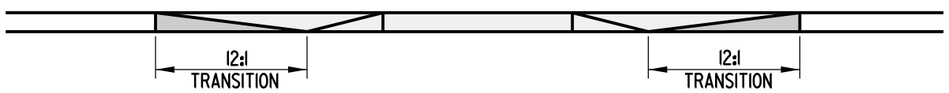


PLAN

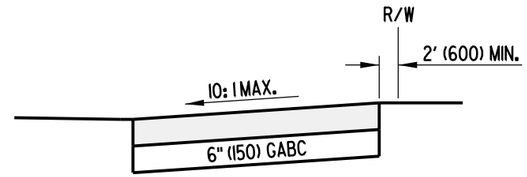
• - JOINT
•• - EXPANSION MATERIAL



PLAN

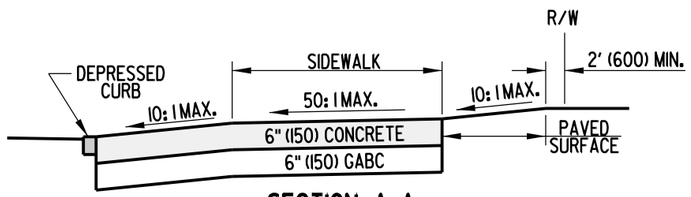


ELEVATION



SECTION B-B

ENTRANCE WITHOUT SIDEWALK



SECTION A-A

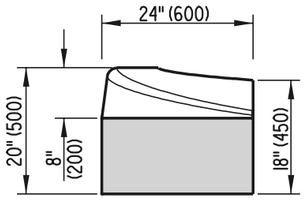
ENTRANCE WITH SIDEWALK

NOTE: IF WIDTH OF DRIVEWAY IS 16' (4870) OR GREATER, THE 1:1 FLARE CAN BE OMITTED.

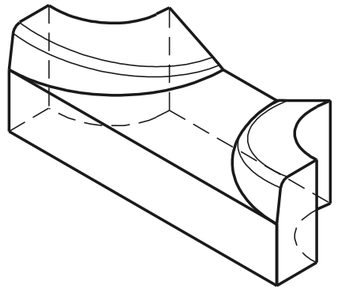
DELAWARE DEPARTMENT OF TRANSPORTATION	ENTRANCES		APPROVED _____ CHIEF ENGINEER DATE 11/18/08
	STANDARD NO. C-3 (2008)	SHT. 1 OF 1	RECOMMENDED _____ DESIGN ENGINEER DATE 11/17/08

09/10/2008

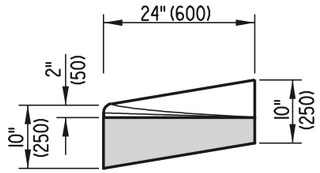
SCALE : N.T.S.



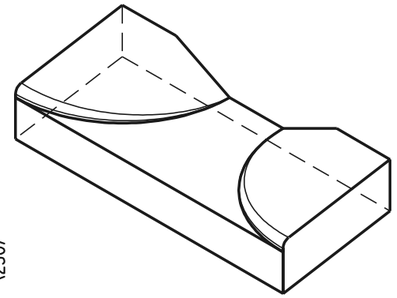
SECTION A-A



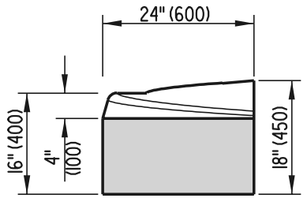
ISOMETRIC VIEW



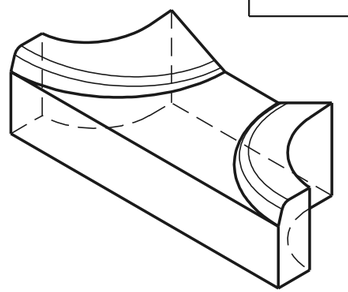
SECTION B-B



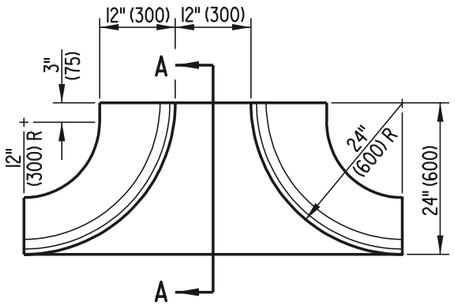
ISOMETRIC VIEW



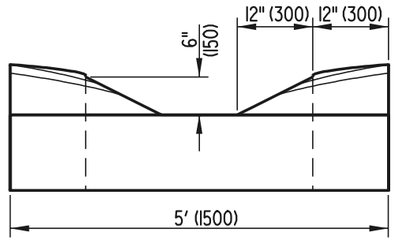
SECTION C-C



ISOMETRIC VIEW



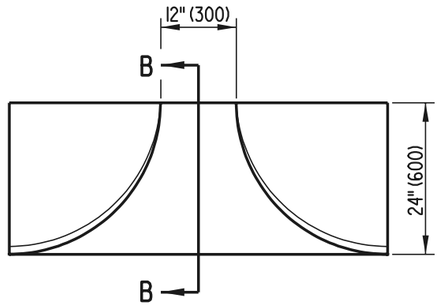
TOP VIEW



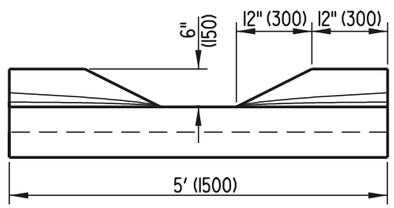
FRONT VIEW

TYPE A

P.C.C. CURB, TYPE 1



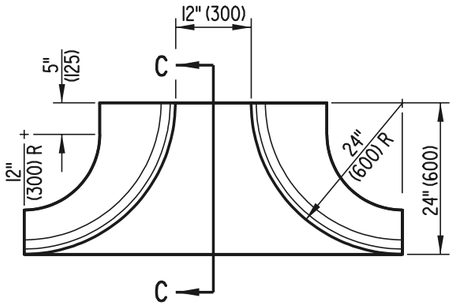
TOP VIEW



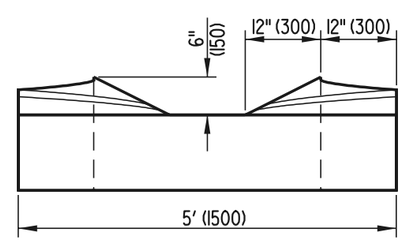
FRONT VIEW

TYPE B

P.C.C. CURB, TYPE 2



TOP VIEW



FRONT VIEW

TYPE C

P.C.C. CURB, TYPE 3

DELAWARE
DEPARTMENT OF TRANSPORTATION

CURB OPENINGS

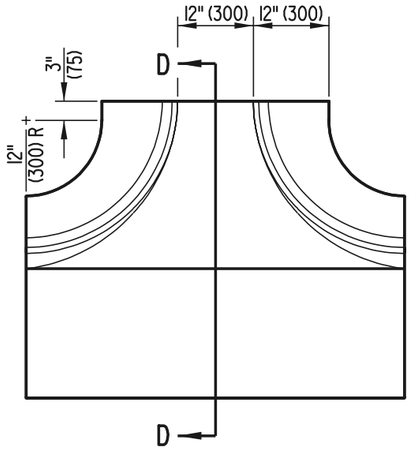
STANDARD NO. C-4 (2001) | SHT. 1 OF 3

APPROVED Lynne M. Hartnett CHIEF ENGINEER 6/18/01 DATE

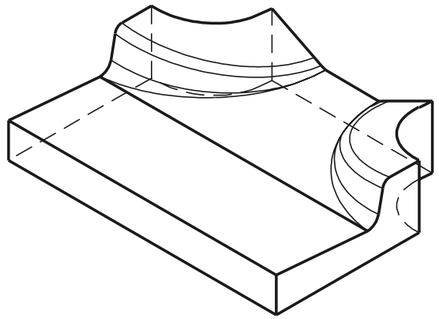
RECOMMENDED [signature] DESIGN ENGINEER 6/15/01 DATE

04/17/2001

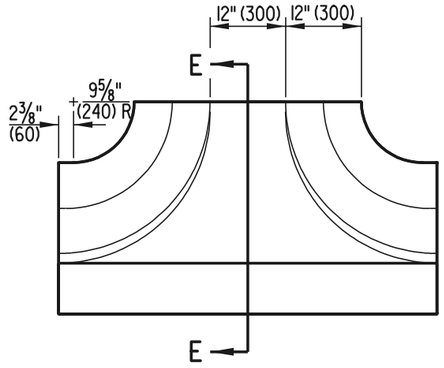
SCALE : N.T.S.



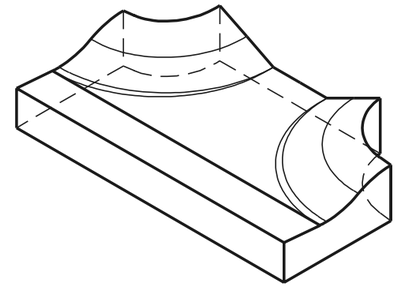
TOP VIEW



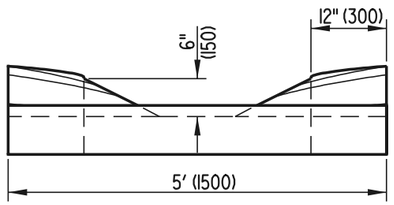
ISOMETRIC VIEW



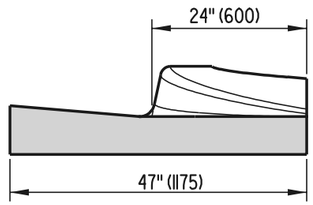
TOP VIEW



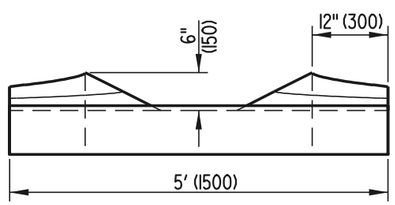
ISOMETRIC VIEW



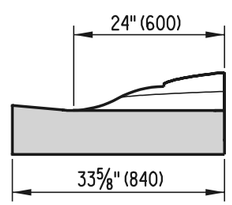
FRONT VIEW



SECTION D-D



FRONT VIEW



SECTION E-E

TYPE D

INTEGRAL P.C.C. CURB AND GUTTER, TYPE 1

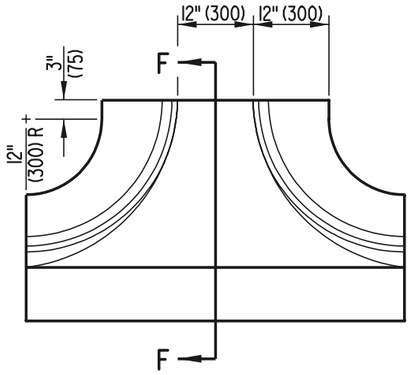
TYPE E

INTEGRAL P.C.C. CURB AND GUTTER, TYPE 2

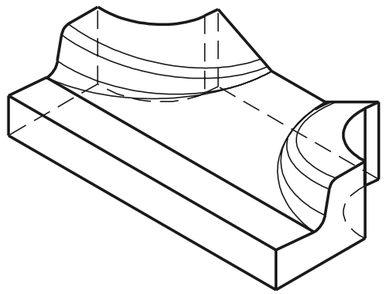
DELAWARE DEPARTMENT OF TRANSPORTATION	CURB OPENINGS		APPROVED Eugene M. Hastings CHIEF ENGINEER 6/18/01 DATE
	STANDARD NO. C-4 (2001)	SHT. 2 OF 3	RECOMMENDED Michael A. Hughes DESIGN ENGINEER 6/15/01 DATE

03/09/2001

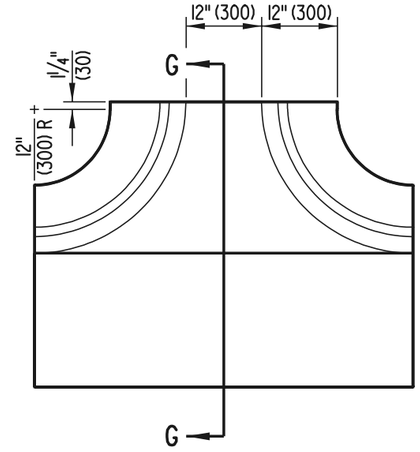
SCALE : N.T.S.



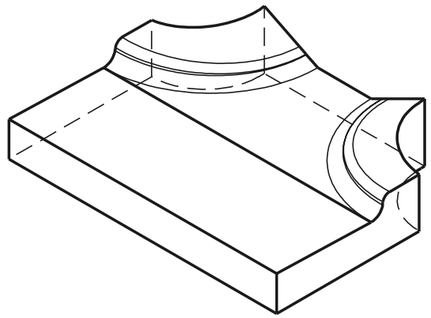
TOP VIEW



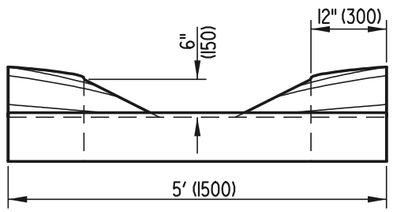
ISOMETRIC VIEW



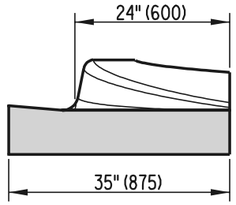
TOP VIEW



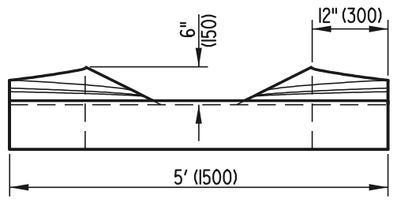
ISOMETRIC VIEW



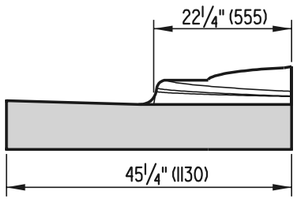
FRONT VIEW



SECTION F-F



FRONT VIEW



SECTION G-G

TYPE F

INTEGRAL P.C.C. CURB AND GUTTER, TYPE 3

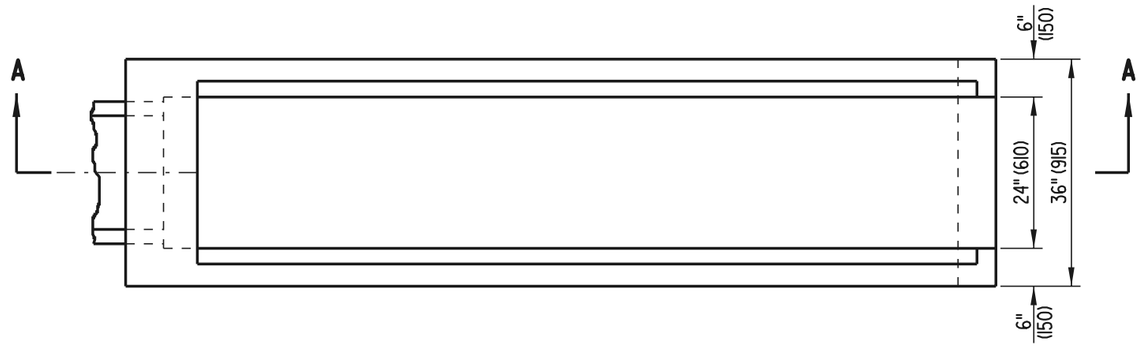
TYPE G

INTEGRAL P.C.C. CURB AND GUTTER, TYPE 4

DELAWARE DEPARTMENT OF TRANSPORTATION	CURB OPENINGS	APPROVED Lynne M. Hartnett CHIEF ENGINEER 6/18/01 DATE
	STANDARD NO. C-4 (2001) SHT. 3 OF 3	RECOMMENDED Michael A. Hahn DESIGN ENGINEER 6/15/01 DATE

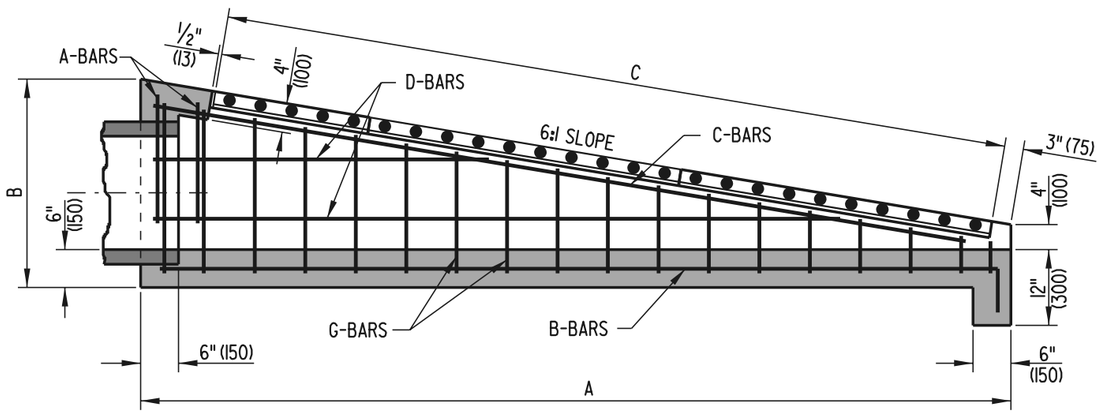
03/09/2001

SCALE : N.T.S.

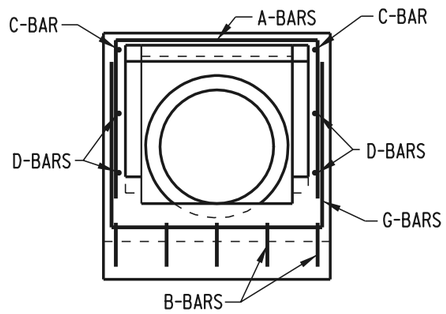


PLAN VIEW
SHOWN WITHOUT GRATE

NOTE: 6:1 SAFETY END STRUCTURE TO BE PRECAST



SECTION A-A



FRONT VIEW

DELAWARE DEPARTMENT OF TRANSPORTATION	6:1 SAFETY END STRUCTURE		APPROVED Lynne M. Hastings CHIEF ENGINEER DATE 6/18/01
	STANDARD NO. D-1 (2001)	SHT. 1 OF 2	RECOMMENDED DESIGN ENGINEER DATE 6/15/01

04/17/2001

SCALE : N.T.S.

DIMENSIONS

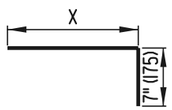
PIPE SIZE	A	B	C
15" (375)	9'-6" (2895)	2'-5" (735)	8'-4" (2540)
18" (450)	11'-6" (3505)	2'-9" (840)	10'-5" (3175)
21" (525) OR 24" (600)	14'-4" (4370)	3'-2⅝" (980)	12'-6" (3810)

APPROXIMATE QUANTITIES

PIPE SIZE	CONCRETE FT³ (m³)		REINF. STEEL LBS. (kg)	NO. OF GRATES	LENGTH TO BE CUT FROM 1 GRATE	WEIGHT OF FULL SIZE GRATE LBS. (kg)	WEIGHT OF CUT GRATE LBS. (kg)
	CONC. PIPE	C.M. PIPE					
15" (375)	25 (0.708)	25.43 (0.720)	121.12 (54.94)	2	--	270.92 (122.89)	--
18" (450)	31.5 (0.892)	32.07 (0.908)	156.7 (71.08)	3	2'-1" (635)	270.92 (122.89)	135.47 (61.45)
21" (525) OR 24" (600)	40.75 (1.154)	39.87 (1.129)	194.0 (88.00)	3	--	270.92 (122.89)	--

BENDING DIAGRAM

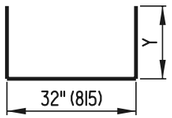
PIPE SIZE	X
15" (375)	9'-2" (2795)
18" (450)	11'-2" (3405)
21" (525) OR 24" (610)	14'-0" (4265)

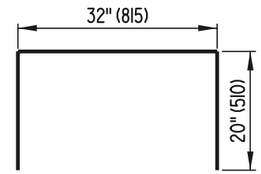


B-BARS

PIPE SIZE	Y
15" (375)	VARIES 25" (635) TO 4" (100)
18" (450)	VARIES 29" (735) TO 4" (100)
21" (525) OR 24" (610)	VARIES 34" (865) TO 4" (100)

G-BARS





A-BARS

SCHEDULE OF REINFORCING STEEL

PIPE SIZE	A-BARS				B-BARS				C-BARS				D-BARS				G-BARS			
	SIZE	NO.	SPA.	LENGTH	SIZE	NO.	SPA.	LENGTH	SIZE	NO.	SPA.	LENGTH	SIZE	NO.	SPA.	LENGTH	SIZE	NO.	SPA.	LENGTH
15" (375)	#4 (#13)	2	8" (200)	72" (1830)	#4 (#13)	5	8" (200)	9'-9" (2970)	#4 (#13)	2	-	9'-3" (2820)	#4 (#13)	4	8" (200)	VARIES 50" (1270) TO 100" (2540)	#4 (#13)	15	8" (200)	VARIES 40" (1015) TO 82" (2085)
18" (450)	#4 (#13)	2	8" (200)	72" (1830)	#4 (#13)	5	8" (200)	11'-9" (3580)	#4 (#13)	2	-	11'-5" (3480)	#4 (#13)	6	8" (200)	VARIES 43½" (1105) TO 130½" (3315)	#4 (#13)	18	8" (200)	VARIES 40" (1015) TO 90" (2285)
21" (525) OR 24" (600)	#4 (#13)	2	8" (200)	72" (1830)	#4 (#13)	5	8" (200)	14'-7" (4445)	#4 (#13)	2	-	14'-3" (4345)	#4 (#13)	6	8" (200)	VARIES 51" (1295) TO 153" (3885)	#4 (#13)	22	8" (200)	VARIES 40" (1015) TO 100" (2540)

DELAWARE
DEPARTMENT OF TRANSPORTATION

6:1 SAFETY END STRUCTURE

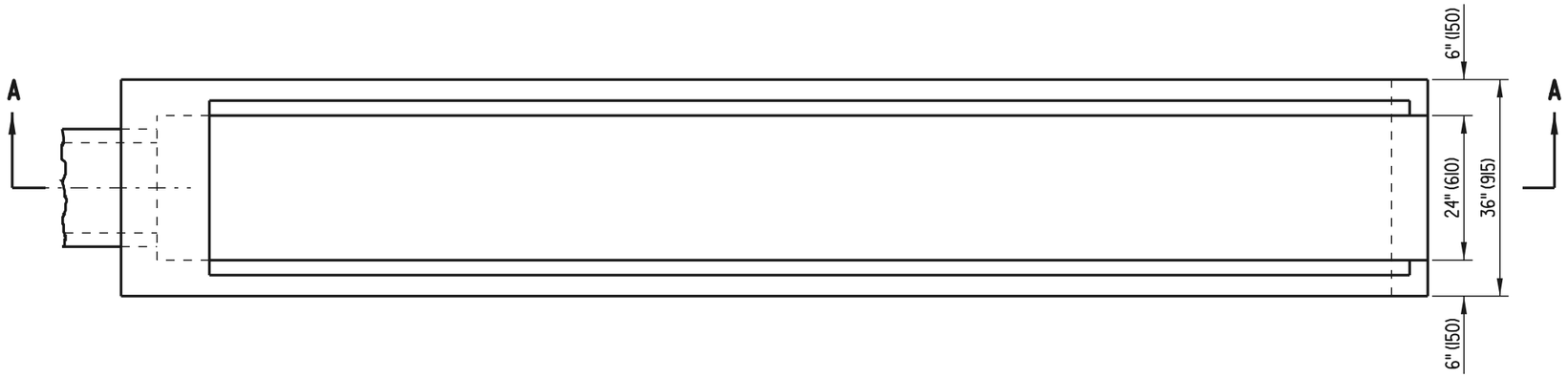
STANDARD NO. D-1 (2001) SHT. 2 OF 2

APPROVED Lynne M. Hastings CHIEF ENGINEER DATE 6/18/01

RECOMMENDED [signature] DESIGN ENGINEER DATE 6/15/01

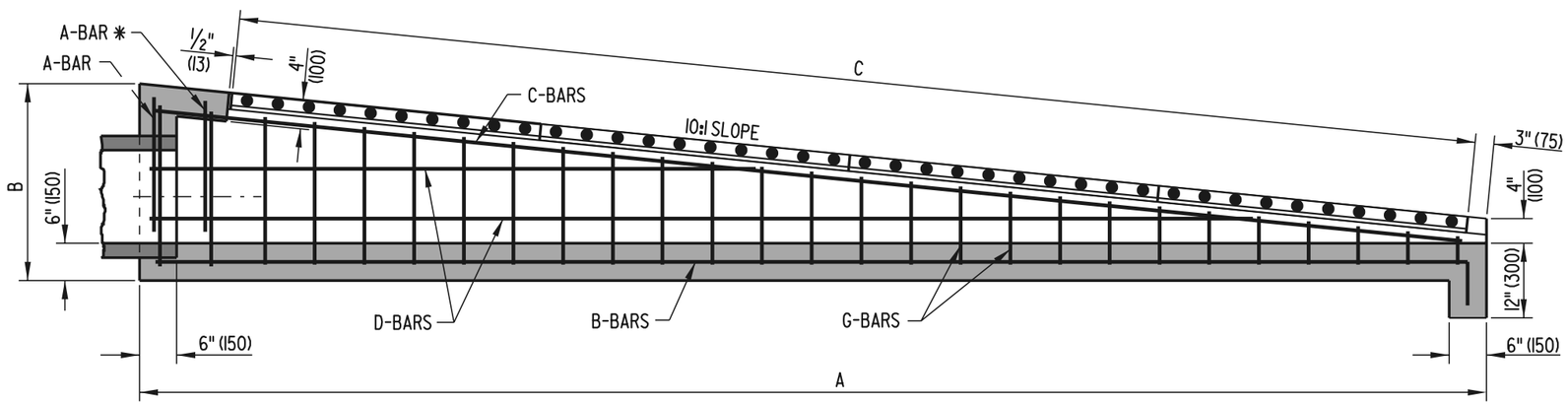
04/17/2001

SCALE : N.T.S.



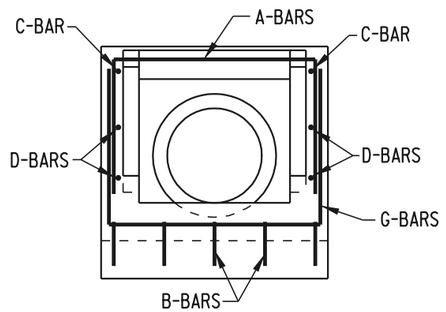
PLAN VIEW
SHOWN WITHOUT GRATE

NOTE: 10:1 SAFETY END STRUCTURE TO BE PRECAST



SECTION A-A

* REQUIRED ONLY FOR PIPE SIZE OF 21" (525) OR 24" (600)



FRONT VIEW

DELAWARE DEPARTMENT OF TRANSPORTATION	10:1 SAFETY END STRUCTURE		APPROVED Lyme M. Hastings CHIEF ENGINEER DATE 6/18/01
	STANDARD NO. D-2 (2001)	SHT. 1 OF 2	RECOMMENDED DESIGN ENGINEER DATE 6/15/01

04/17/2001

SCALE : N.T.S.

DIMENSIONS

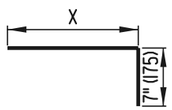
PIPE SIZE	A	B	C
15" (375)	15'-4" (4675)	2'-4 3/8" (720)	14'-7" (4445)
18" (450)	19'-6" (5945)	2'-9 3/8" (850)	18'-9" (5715)
21" (525) OR 24" (600)	24'-0" (7315)	3'-2 13/16" (985)	22'-11" (6985)

APPROXIMATE QUANTITIES

PIPE SIZE	CONCRETE FT³ (m³)		REINF. STEEL LBS. (kg)	NO. OF GRATES	LENGTH TO BE CUT FROM I GRATE	WEIGHT OF FULL SIZE GRATE LBS. (kg)	WEIGHT OF CUT GRATE LBS. (kg)
	CONC. PIPE	C.M. PIPE					
15" (375)	41.35 (1.171)	41.78 (1.183)	175.0 (79.38)	4	2'-1" (635)	270.92 (122.89)	135.47 (61.45)
18" (450)	50.11 (1.419)	50.68 (1.435)	227.0 (102.98)	5	2'-1" (635)	270.92 (122.89)	135.47 (61.45)
21" (525) OR 24" (600)	69.43 (1.966)	70.31 (1.991)	310.4 (140.79)	6	2'-1" (635)	270.92 (122.89)	135.47 (61.45)

BENDING DIAGRAM

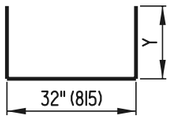
PIPE SIZE	X
15" (375)	15'-0" (4570)
18" (450)	19'-2" (5840)
21" (525) OR 24" (600)	23'-8" (7215)

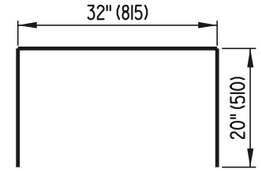


B-BARS

PIPE SIZE	Y
15" (375)	VARIES 21 1/2" (545) TO 4" (100)
18" (450)	VARIES 26 7/16" (670) TO 4" (100)
21" (525) OR 24" (600)	VARIES 31 3/4" (805) TO 4" (100)

G-BARS





A-BARS

SCHEDULE OF REINFORCING STEEL

PIPE SIZE	A-BARS				B-BARS				C-BARS				D-BARS				G-BARS			
	SIZE	NO.	SPA.	LENGTH	SIZE	NO.	SPA.	LENGTH	SIZE	NO.	SPA.	LENGTH	SIZE	NO.	SPA.	LENGTH	SIZE	NO.	SPA.	LENGTH
15" (375)	#4 (#13)	1	-	72" (1830)	#4 (#13)	5	8" (200)	15'-7" (4750)	#4 (#13)	2	-	15'-1 1/16" (4600)	#4 (#13)	4	8" (200)	VARIES 72 13/16" (1850) TO 145 5/8" (3700)	#4 (#13)	24	8" (200)	VARIES 40" (1015) TO 75 11/16" (1920)
18" (450)	#4 (#13)	1	-	72" (1830)	#4 (#13)	5	8" (200)	19'-9" (6020)	#4 (#13)	2	-	19'-3 3/8" (5875)	#4 (#13)	4	8" (200)	VARIES 89 5/8" (2275) TO 179 3/16" (4550)	#4 (#13)	30	8" (200)	VARIES 40" (1015) TO 85 3/4" (2180)
21" (525) OR 24" (600)	#4 (#13)	2	-	72" (1830)	#4 (#13)	5	8" (200)	24'-3" (7390)	#4 (#13)	2	-	23'-9 5/8" (7255)	#4 (#13)	6	8" (200)	VARIES 80 3/4" (2050) TO 242 1/8" (6150)	#4 (#13)	37	8" (200)	VARIES 40" (1015) TO 96 5/16" (2455)

DELAWARE
DEPARTMENT OF TRANSPORTATION

10:1 SAFETY END STRUCTURE

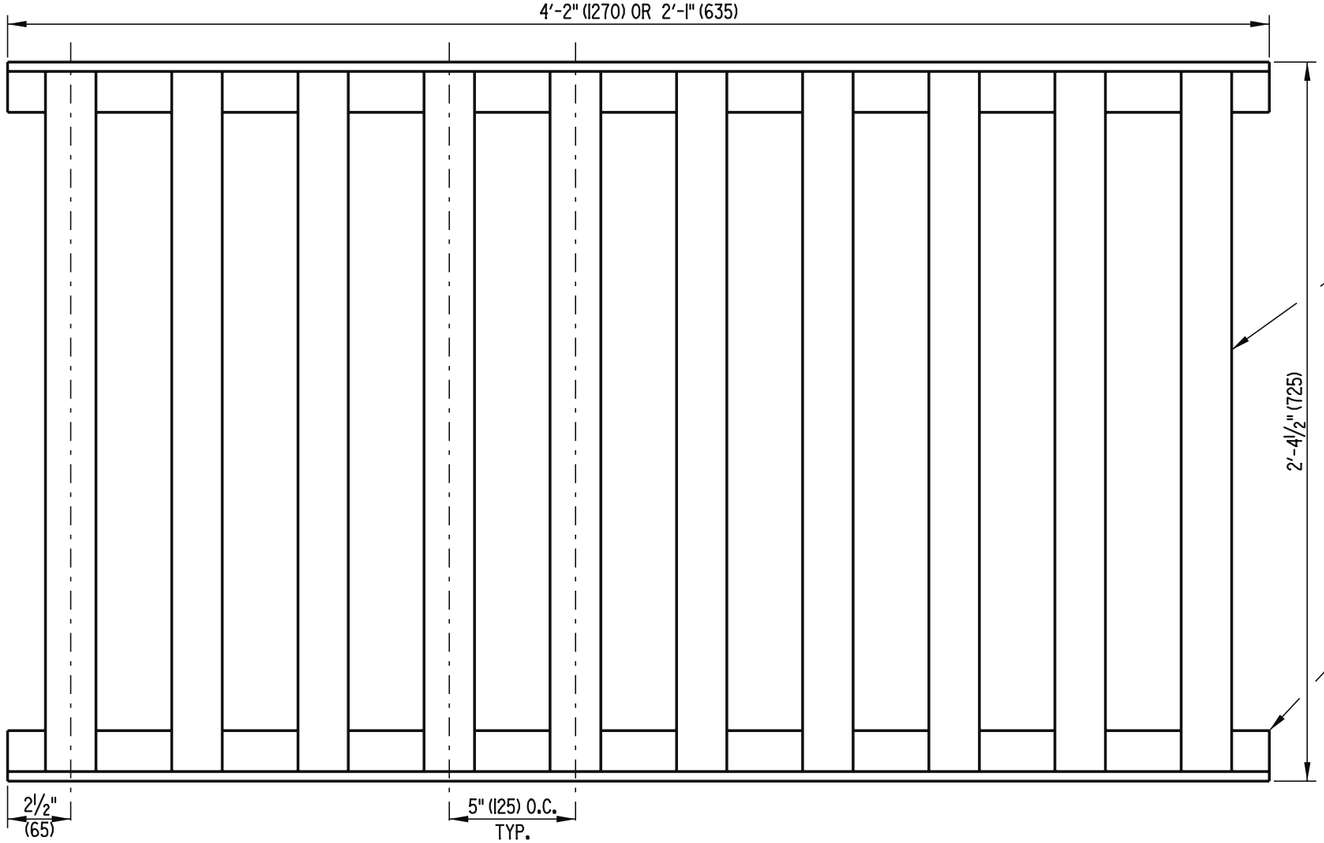
STANDARD NO. D-2 (2001) SHT. 2 OF 2

APPROVED Eugene M. Hastings CHIEF ENGINEER DATE 6/18/01

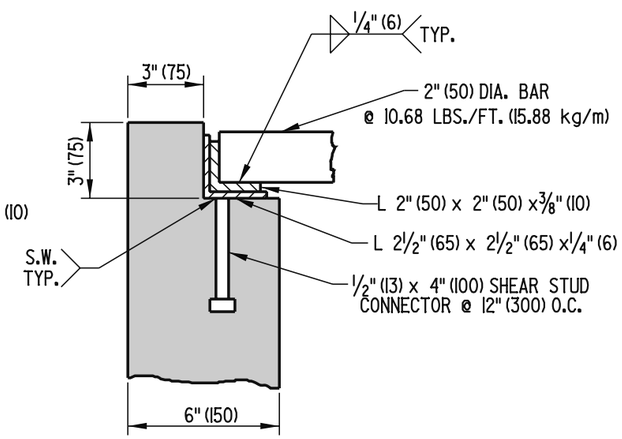
RECOMMENDED Michael A. Pigott DESIGN ENGINEER DATE 6/15/01

04/17/2001

SCALE : N.T.S.



GRATE DETAIL

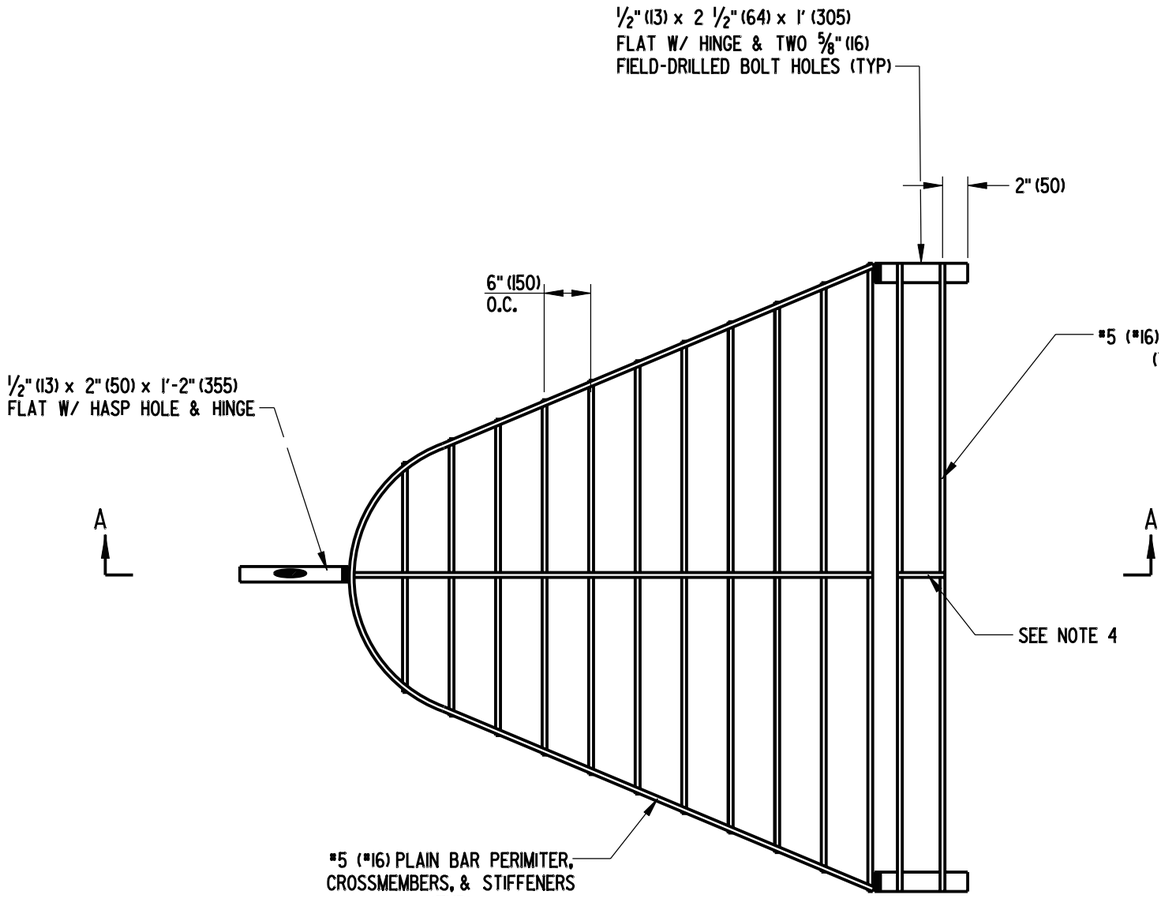


FRAME & GRATE ASSEMBLY DETAIL

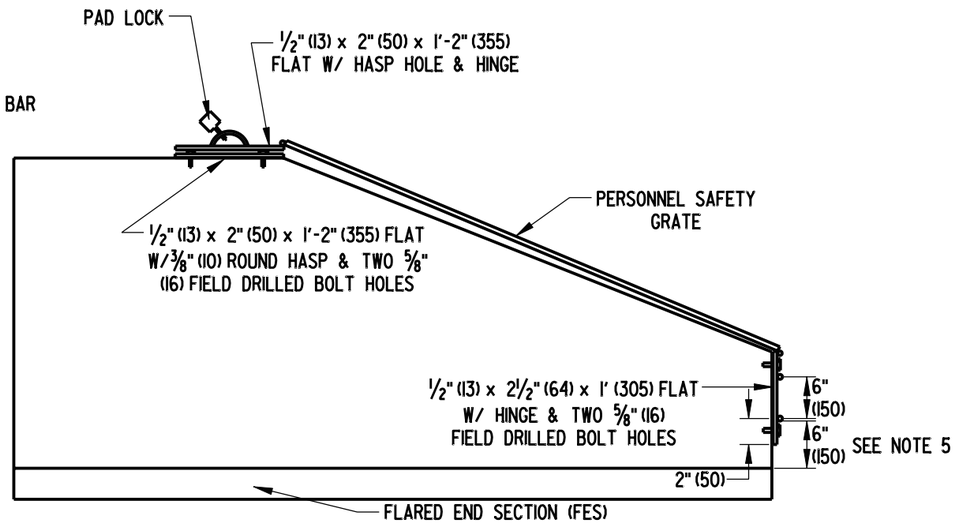
DELAWARE DEPARTMENT OF TRANSPORTATION	SAFETY GRATES		APPROVED Carolann Wicks CHIEF ENGINEER 12/5/05 DATE
	STANDARD NO. D-3 (2005)	SHT. 1 OF 2	RECOMMENDED James M. O'Neill DESIGN ENGINEER 11/29/05 DATE

11/23/2005

SCALE : N.T.S.



PLAN VIEW



SECTION A-A

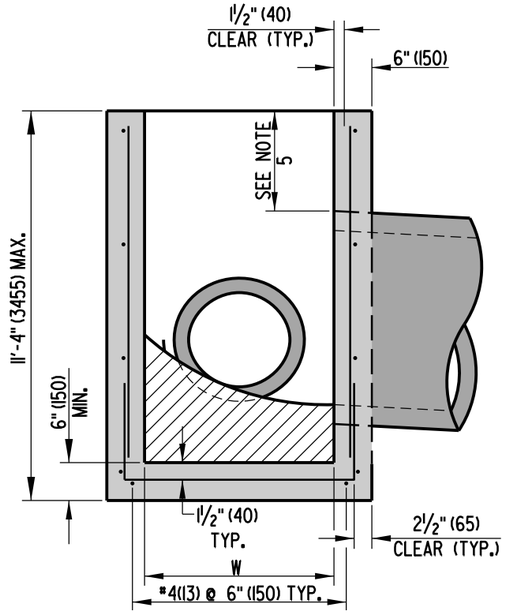
NOTES:

1). PERSONNEL SAFETY GRATES (PSG) SHALL ONLY BE INSTALLED ON THE INLETS OF STORM WATER PIPES 12" (300) OR LARGER IN DIAMETER THAT ARE NOT STRAIGHT FROM THE INLET TO THE OPEN OUTLET, REGARDLESS OF THE LENGTH.
2). THE GRATE SHALL BE MADE TO FIT THE OUTSIDE PERIMETER OF THE FLARED END SECTION (FES) ± ½" (13).
3). ALL BOLT HOLES ARE TO BE DRILLED IN THE FIELD.
4). A STIFFENER IS TO BE INSTALLED WHERE TWO OR MORE BARS ARE USED.
5). BOTTOM BAR SHALL BE 6" (150) ABOVE INVERT OF FES.
6). ALL HARDWARE ATTACHED TO CONCRETE SHALL BE ATTACHED USING APPROVED TAMPER PROOF ANCHORS.

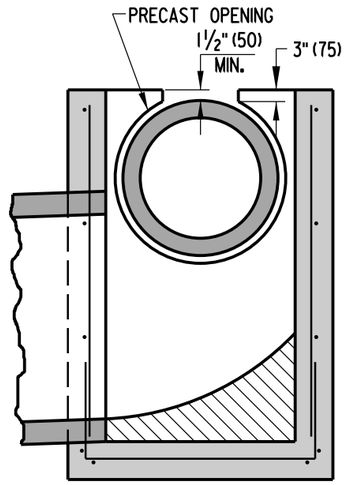
DELAWARE DEPARTMENT OF TRANSPORTATION	SAFETY GRATES		APPROVED CHIEF ENGINEER	10/24/07 DATE
	STANDARD NO. D-3 (2007)	SHT. 2 OF 2	RECOMMENDED DESIGN ENGINEER	10/23/07 DATE

08/01/2007

SCALE : N.T.S.



SECTION A-A



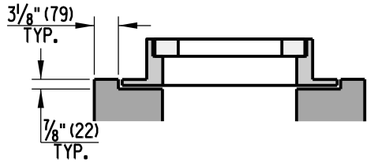
OPTIONAL PIPE OPENING DETAIL

SEE NOTE 5

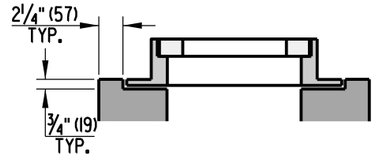
INLET BOX SCHEDULE			
L	W	FABRICATION TOLERANCE	
17⅝" (450)	11⅝" (295)	+1" (25)	*
24" (610)	24" (610)	+1" (25)	*
34" (865)	18" (455)	-1" (25)	
34" (865)	24" (610)	-1" (25)	
48" (1220)	30" (760)	+6" (150)	
48" (1220)	48" (1220)	+6" (150)	
66" (1675)	30" (760)	+6" (150)	
66" (1675)	48" (1220)	+6" (150)	
66" (1675)	66" (1675)	+6" (150)	
72" (1830)	24" (610)	-1" (25)	
72" (1830)	48" (1220)	-1" (25)	
72" (1830)	72" (1830)	-1" (25)	

* - THESE BOXES ARE TO BE USED FOR LAWN INLETS AND ARE NOT INTENDED TO BE USED IN THE TRAVELWAY. THE MAX DEPTH FOR THESE BOXES IS 4' (1220). SEE NOTE 8 FOR REINFORCEMENT.

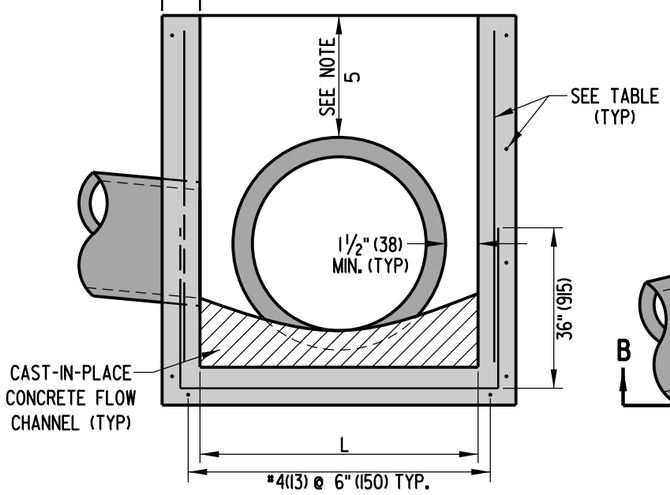
WALL REINFORCEMENT SCHEDULE		
INTERIOR WALL DIMENSION	AREA OF HORIZONTAL REINFORCEMENT PER FOOT (mm^2)	AREA OF VERTICAL REINFORCEMENT PER FOOT (mm^2)
	IN^2 (mm^2)	IN^2 (mm^2)
LESS THAN 4' (1220)	0.132 (85)	0.132 (85)
4' (1220) TO 4.5' (1370)	0.163 (105)	0.132 (85)
4.5' (1370) TO 5' (1525)	0.198 (128)	0.132 (85)
5' (1525) TO 5.5' (1675)	0.239 (154)	0.132 (85)
5.5' (1675) TO 6' (1830)	0.284 (183)	0.132 (85)



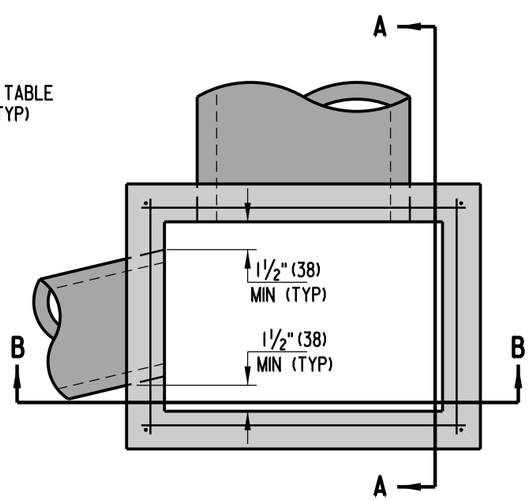
24" (610) x 24" (610) LAWN INLET BOX DETAIL



17⅝" (450) X 11⅝" (295) LAWN INLET BOX DETAIL



SECTION B-B



TOP VIEW

NOTES:

1). INLET BOXES SHALL BE PRECAST OR CAST-IN-PLACE.
2). PIPES SHALL NOT BE INSTALLED THROUGH ANY CORNER OF THE INLET BOX.
3). RISER SECTIONS MAY BE USED FOR DEEP INLET BOXES.
4). PIPES MAY BE INSTALLED NEAR OR THROUGH JOINTS FOR RISER SECTIONS.
5). WHEN THE COVER ABOVE THE PIPE IS LESS THAN 4" (100) TO THE COVER SLAB OR TOP UNIT OPENING, THE PORTION OF BOX WALL ABOVE THE PIPE MAY BE REMOVED AS SHOWN IN THE OPTIONAL PIPE OPENING DETAIL. THE AREA ABOVE THE PIPE SHALL THEN BE FORMED AND FILLED WITH HIGH-STRENGTH, NON-SHRINK GROUT MIXED WITH COARSE AGGREGATE IN A 1:1 RATIO BY WEIGHT.
6). CONCRETE FLOW CHANNEL SHALL BE WARPED FOR POSITIVE DRAINAGE.
7). WHEN INLET BOX IS PRECAST, PIPE OPENING SHALL BE BETWEEN 3" (75) AND 4" (100) LARGER THAN OUTSIDE DIAMETER OF PIPE AND SHALL NOT ENCROACH ON ADJACENT WALL.
8). REINFORCEMENT FOR LAWN INLET BOXES SHALL BE 4" (102) X 4" (102), W4 X W4 (W26 X W26) WELDED WIRE.

DELAWARE
DEPARTMENT OF TRANSPORTATION

INLET BOX DETAILS

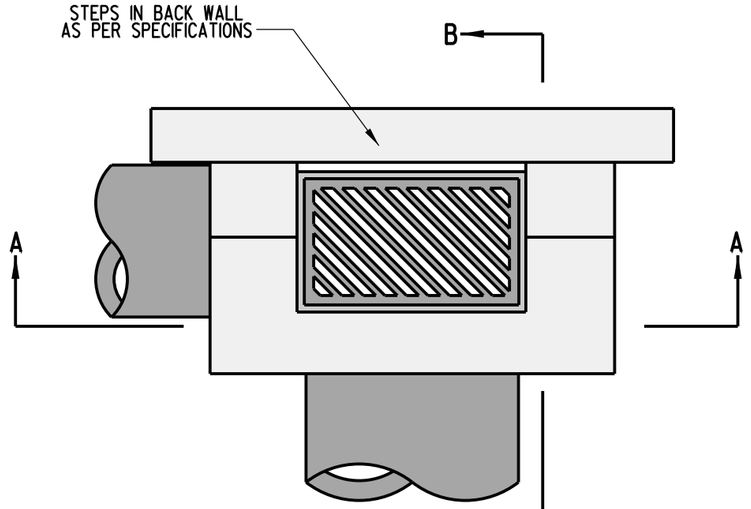
STANDARD NO. D-4 (2009) | SHT. 1 OF 1

APPROVED SIGNATURE ON FILE (CHIEF ENGINEER) 01/19/2010 (DATE)

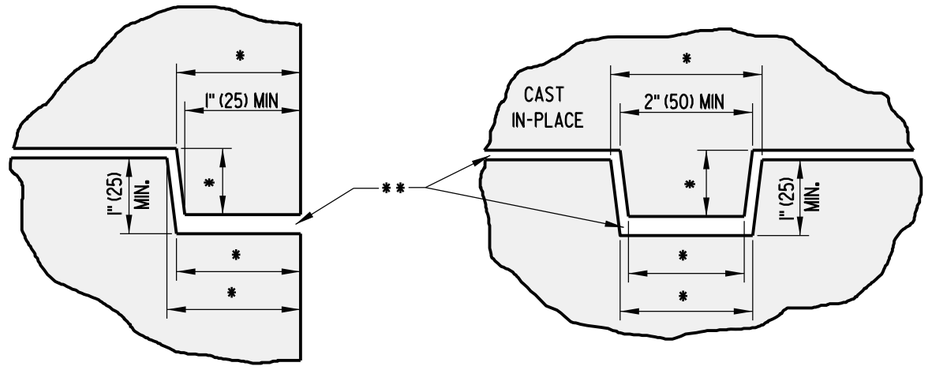
RECOMMENDED SIGNATURE ON FILE (DESIGN ENGINEER) 01/14/2010 (DATE)

08/19/2009

SCALE : N.T.S.

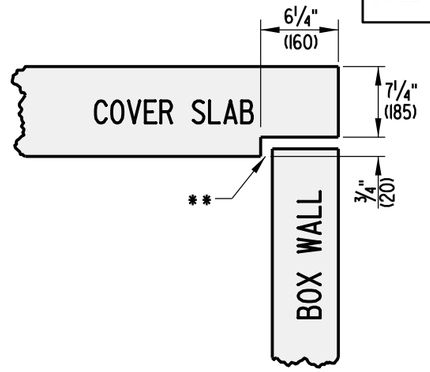


PLAN



TYPE 1 JOINT DETAIL

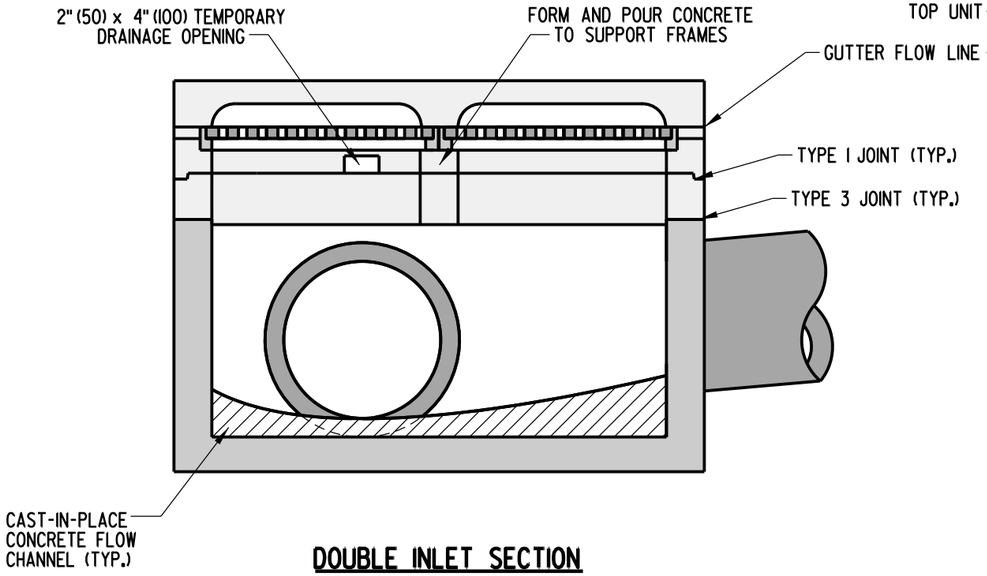
TYPE 2 JOINT DETAIL



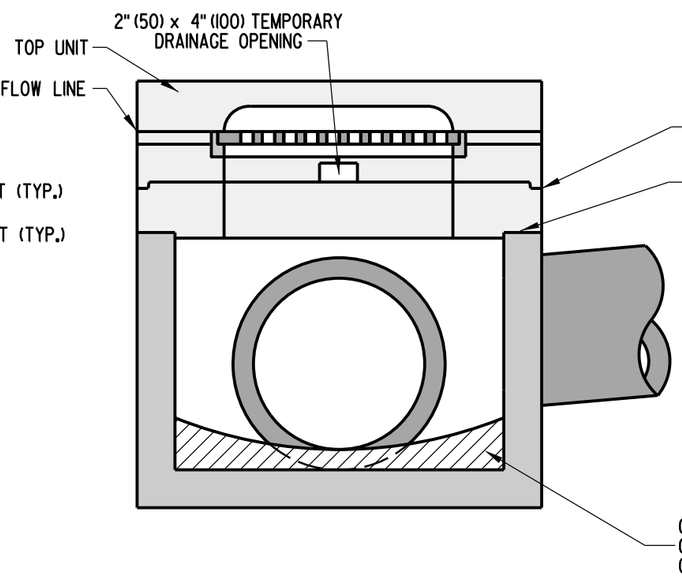
TYPE 3 JOINT DETAIL

* DIMENSIONS WILL VARY

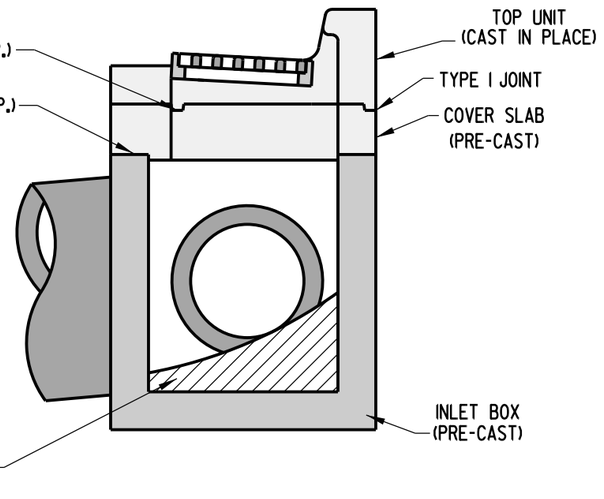
** JOINT SEALANT AS PER SPECIFICATIONS
ONLY BETWEEN 2 PRECAST UNITS



DOUBLE INLET SECTION



SECTION A-A



SECTION B-B

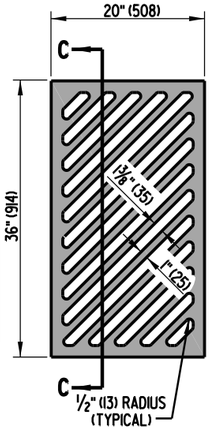
DELAWARE DEPARTMENT OF TRANSPORTATION	DRAINAGE INLET ASSEMBLY		APPROVED SIGNATURE ON FILE (CHIEF ENGINEER) 01/19/2010 (DATE)
	STANDARD NO. D-5 (2009)	SHT. 1 OF 8	RECOMMENDED SIGNATURE ON FILE (DESIGN ENGINEER) 01/14/2010 (DATE)

10/8/2009

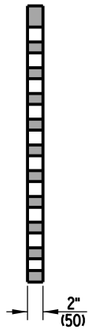
SCALE : N.T.S.

DRAINAGE INLET FRAME AND GRATES

TYPE 1

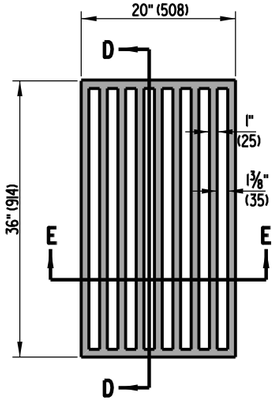


PLAN

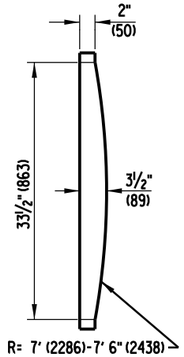


SECTION C-C

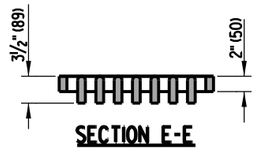
TYPE 2



PLAN

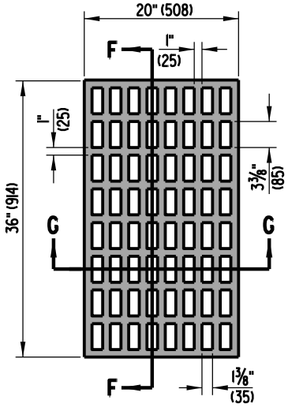


SECTION D-D

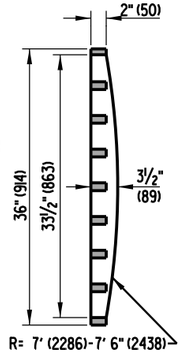


SECTION E-E

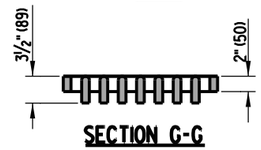
TYPE 3



PLAN

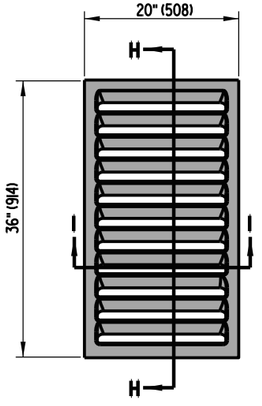


SECTION F-F

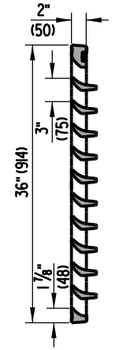


SECTION G-G

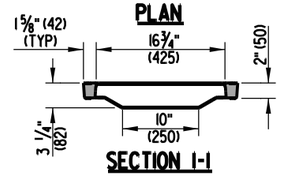
TYPE 4



PLAN

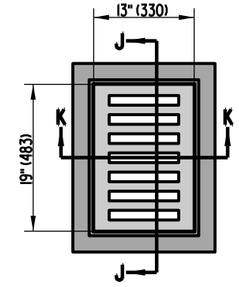


SECTION H-H

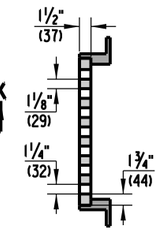


SECTION I-I

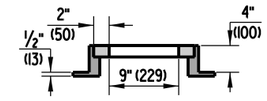
TYPE 5



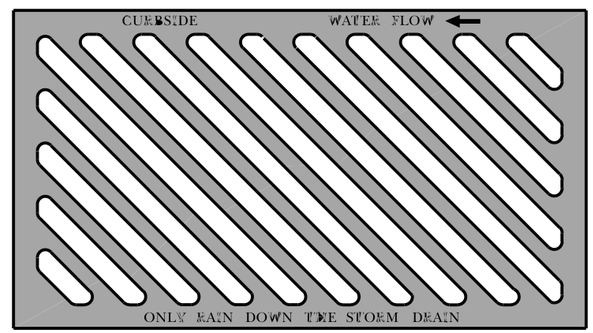
PLAN



SECTION J-J

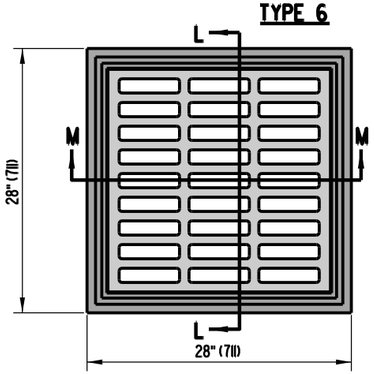


SECTION K-K

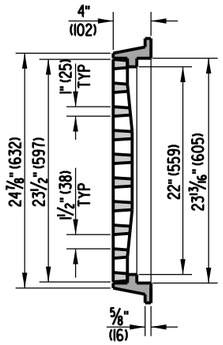


DRAINAGE GRATE LABELING EXAMPLE DETAIL

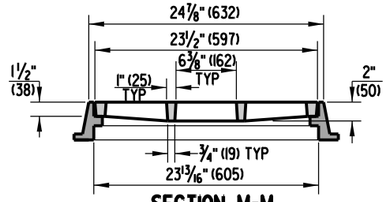
TYPE 6



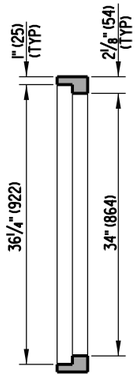
PLAN



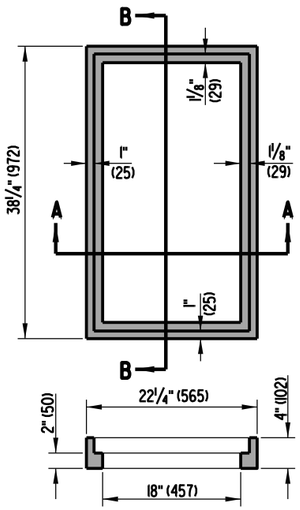
SECTION L-L



SECTION M-M



SECTION B-B



SECTION A-A

DRAINAGE INLET FRAME

THIS FRAME IS TO BE USED WITH TYPES I THROUGH 4 GRATES ONLY.

NOTES:

1). THE TYPE 2 DRAINAGE INLET GRATE SHALL NOT BE INSTALLED WHERE BICYCLE TRAFFIC MAY BE PRESENT.
2). THE TOP OF ALL DRAINAGE INLET GRATES SHALL BE LABELED "ONLY RAIN DOWN THE STORM DRAIN". ALSO, DRAINAGE INLET GRATES TYPE I AND TYPE 4 SHALL BE LABELED WITH "WATER FLOW" AND AN ARROW INDICATING FLOW DIRECTION AS SHOWN IN THE EXAMPLE DETAIL.
3). THE TYPE I DRAINAGE INLET GRATE SHALL BE LABELED WITH "CURBSIDE" AS SHOWN ON THE EXAMPLE DETAIL. ALL LABELING ON THE TYPE I SHALL BE ON BOTH TOP AND BOTTOM SIDES DUE TO THE TYPE I BEING REVERSIBLE.
4). THE TYPE 5 & 6 FRAME AND GRATE COMBINATIONS ARE TO BE USED IN CONJUNCTION WITH LAWN INLET BOXES ONLY. SEE SCHEDULE ON DETAIL D-4, SHEET 1 OF 1, FOR WHICH BOX SIZES ARE CONSIDERED LAWN INLET BOXES.
5). THE TYPE 6 FRAME AND GRATE COMBINATION SHOWN IS THE NEENAH FOUNDRY FRAME AND GRATE COMBINATION MODEL NF-1878-A5G, AN ACCEPTABLE ALTERNATIVE IS THE EAST JORDAN IRON WORKS FRAME AND GRATE COMBINATION MODEL V-5622.

DELAWARE
DEPARTMENT OF TRANSPORTATION

DRAINAGE INLET FRAME AND GRATES

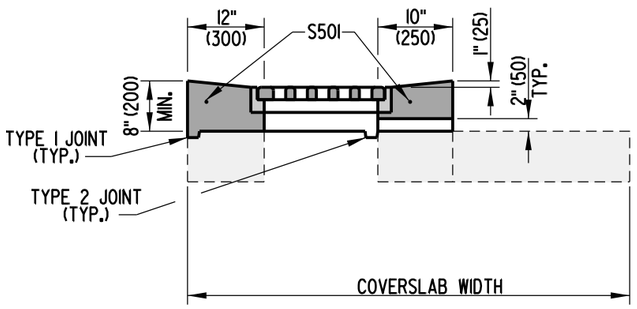
STANDARD NO. D-5 (2009) | SHT. 2 OF 8

APPROVED SIGNATURE ON FILE (CHIEF ENGINEER) 01/19/2010 (DATE)

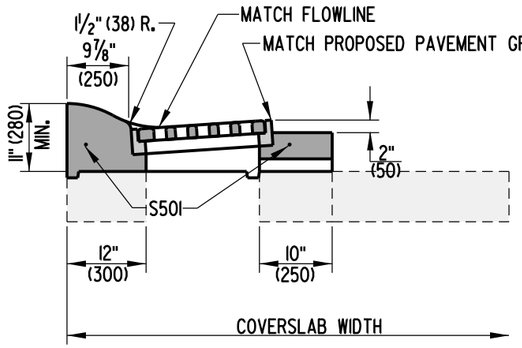
RECOMMENDED SIGNATURE ON FILE (DESIGN ENGINEER) 01/14/2010 (DATE)

12/01/2009

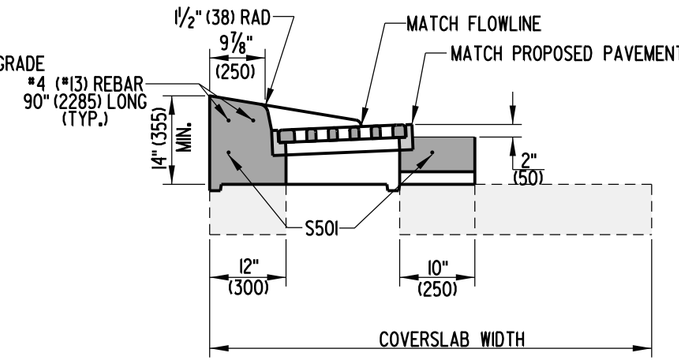
SCALE : N.T.S.



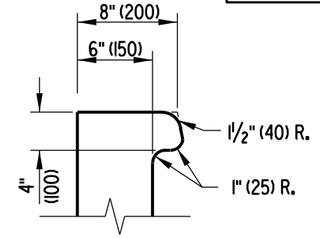
TYPE A



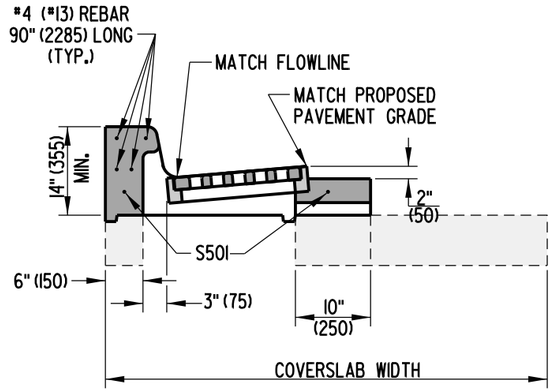
TYPE D



TYPE E

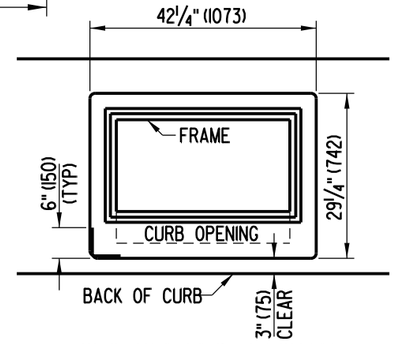


CURB OPENING DETAIL



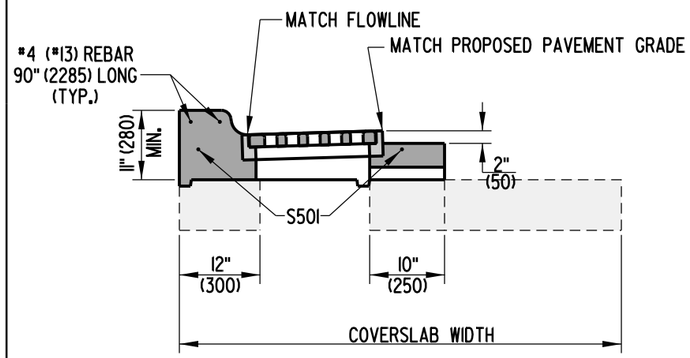
TYPE B

INLET TOP UNIT APPLICATIONS	
TOP UNIT	**CURB**
TYPE A	USE IN DRAINAGE SWALE
TYPE B	INTEGRAL PCC CURB & GUTTER, TYPE 1 & 3, PCC CURB TYPE 1
TYPE C	INTEGRAL PCC CURB & GUTTER, TYPE 4, PCC CURB TYPE 3
TYPE D	INTEGRAL PCC CURB & GUTTER, TYPE 2
TYPE E	PCC CURB TYPE 2

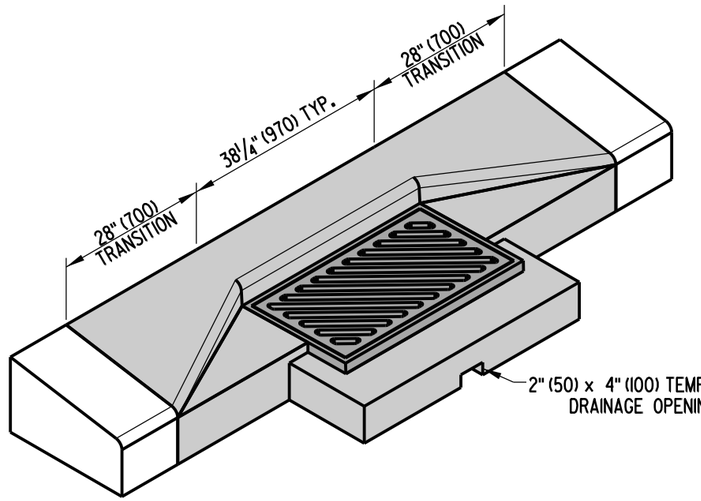


S501 BENDING DIAGRAM

S501 IS NOT REQUIRED TO BE ONE CONTINUOUS BAR. IF MORE THAN ONE BAR IS USED, THERE MUST BE A 12" (300) OVERLAP BETWEEN BARS.

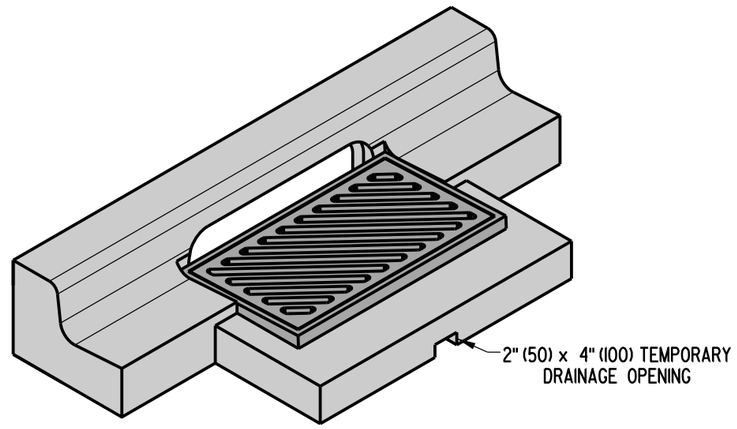


TYPE C



ISOMETRIC VIEW

TYPE E UNIT SHOWN



ISOMETRIC VIEW

TYPE B TOP UNIT SHOWN WITH INTEGRAL CURB & GUTTER TYPE 3

DELAWARE
DEPARTMENT OF TRANSPORTATION

DRAINAGE INLET TOP UNITS

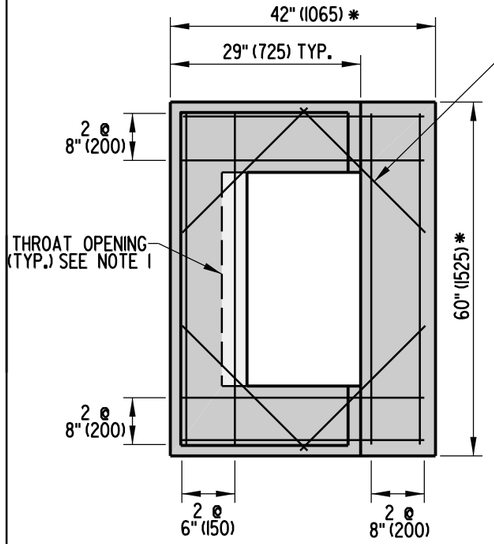
STANDARD NO. D-5 (2009) | **SHT.** 3 **OF** 8

APPROVED SIGNATURE ON FILE — CHIEF ENGINEER — 01/19/2010 DATE

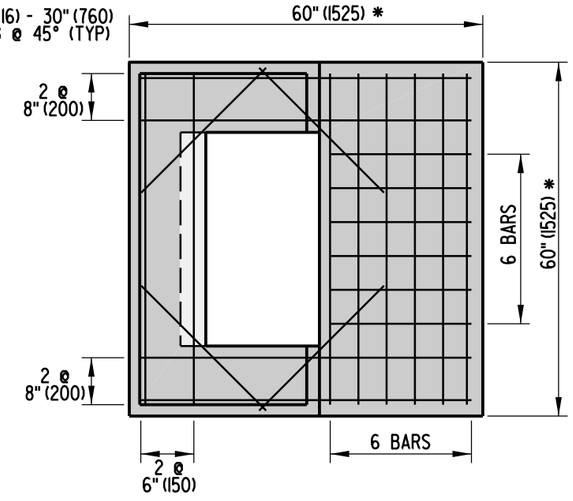
RECOMMENDED SIGNATURE ON FILE — DESIGN ENGINEER — 01/14/2010 DATE

12/22/2009

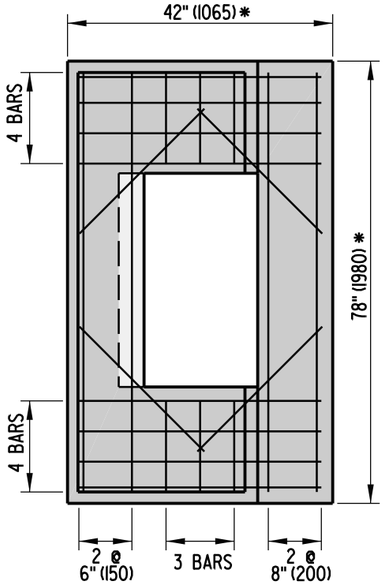
SCALE : N.T.S.



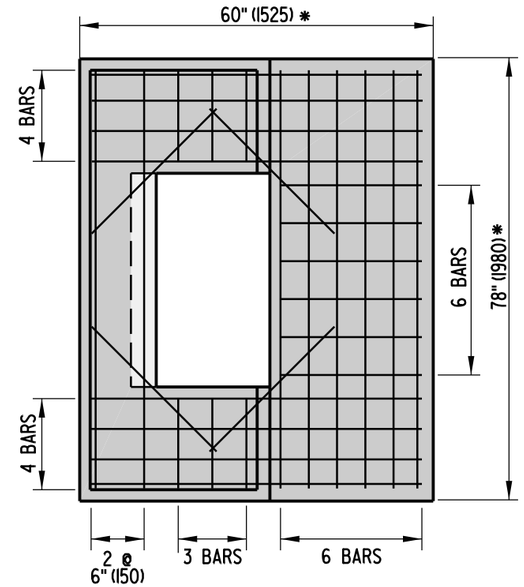
48" (1220) x 30" (760) INLET



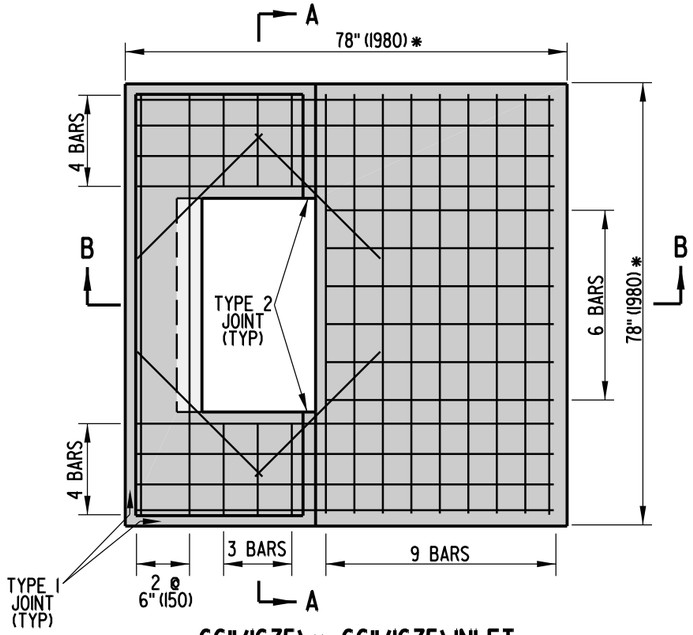
48" (1220) x 48" (1220) INLET



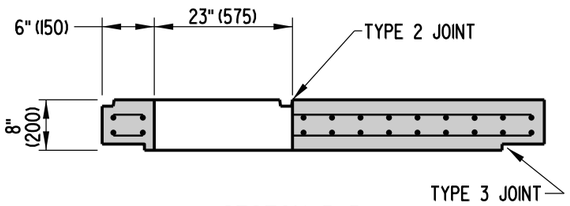
66" (1675) x 30" (760) INLET



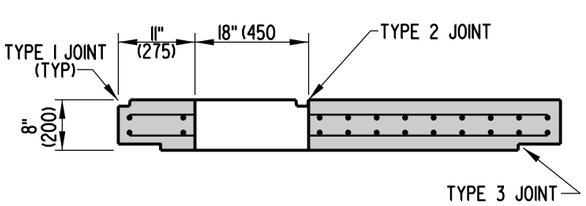
66" (1675) x 48" (1220) INLET



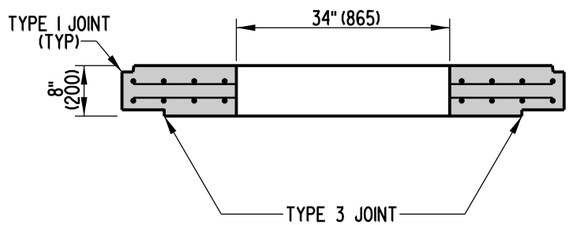
66" (1675) x 66" (1675) INLET



SECTON B-B
FOR TYPE B TOP UNITS



SECTON B-B
FOR TYPES A, C, D, & E TOP UNITS



SECTION A-A

NOTES :

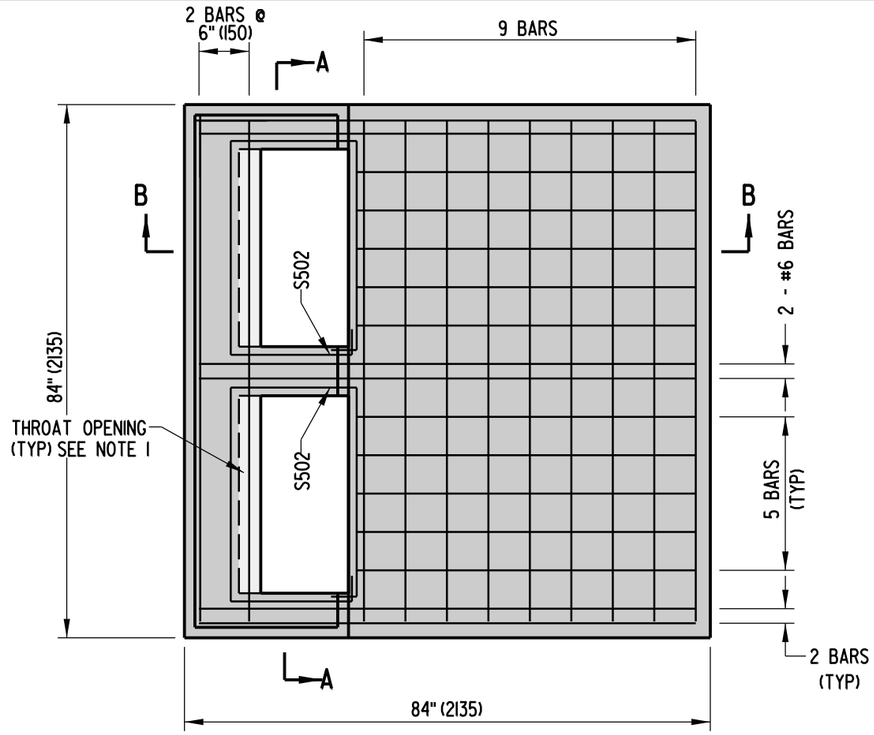
1). RELOCATE ENCROACHING REINFORCING BARS WHEN USING TYPE B UNIT.
2). COVER SLABS SHALL BE PRECAST AND MUST BE SIZED TO FIT INLET BOX DIMENSIONS.
3). ALL BARS ARE TO BE #5 (#16) SPACED @ 6" (150) UNLESS NOTED OTHERWISE. TOP REINFORCEMENT SHALL BE 0.11 IN^2 (70 mm^2) HORIZONTAL REINFORCEMENT PER FOOT IN BOTH DIRECTIONS.
4). MINIMUM BAR COVER = 1½" (38).

* - DIMENSIONS TO MATCH OUTSIDE TO OUTSIDE DIMENSIONS OF BOX.

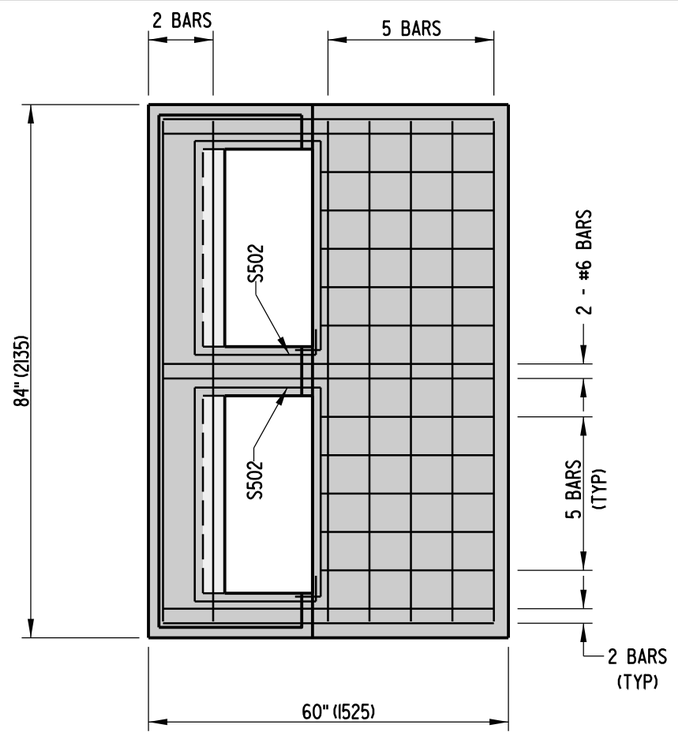
DELAWARE DEPARTMENT OF TRANSPORTATION	DRAINAGE INLET COVER SLAB DETAILS	APPROVED SIGNATURE ON FILE (CHIEF ENGINEER) 01/19/2010 (DATE)
	STANDARD NO. D-5 (2009) — SHT. 4 OF 8	RECOMMENDED SIGNATURE ON FILE (DESIGN ENGINEER) 01/14/2010 (DATE)

12/01/2009

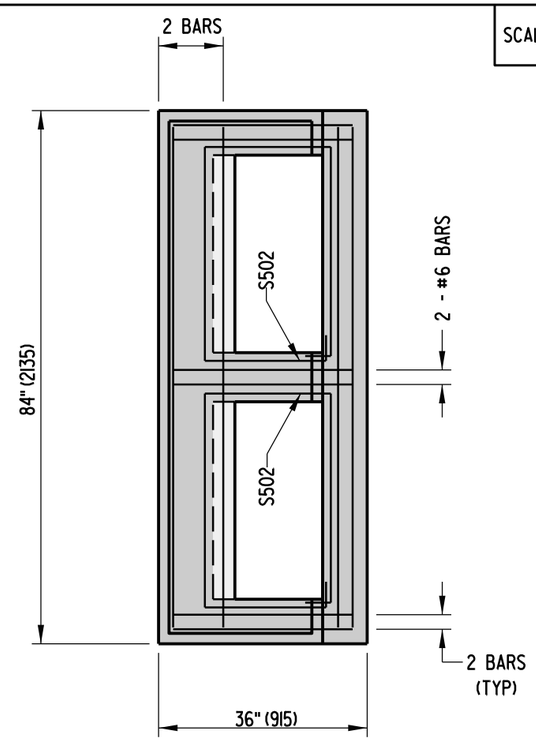
SCALE : N.T.S.



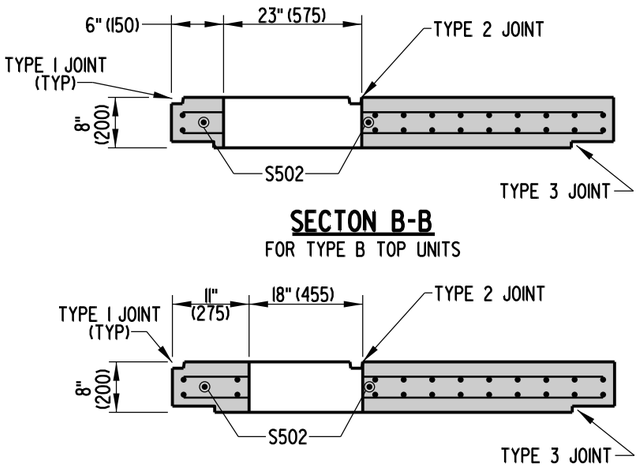
72" (1830) x 72" (1830) INLET



72" (1830) x 48" (1220) INLET



72" (1830) x 24" (610) INLET

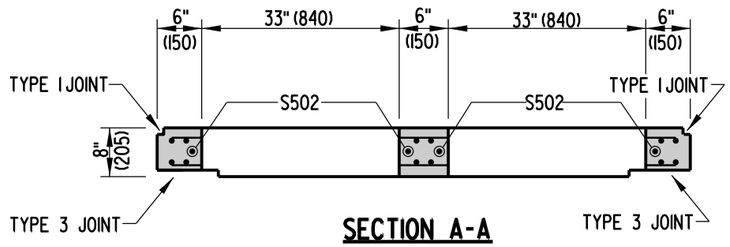


SECTON B-B

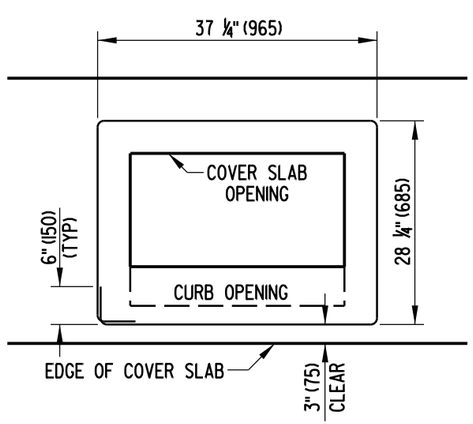
FOR TYPE B TOP UNITS

SECTON B-B

FOR TYPES A, C, D, & E TOP UNITS



SECTION A-A



S502 BENDING DIAGRAM

S502 IS NOT REQUIRED TO BE ONE CONTINUOUS BAR. IF MORE THAN ONE BAR IS USED, THERE MUST BE A 12" (300) OVERLAP BETWEEN BARS.

NOTES :

1). RELOCATE ENCROACHING REINFORCING BARS WHEN USING TYPE B TOP UNIT.
2). COVER SLABS ARE TO BE PRECAST AND MUST BE SIZED TO FIT INLET BOX DIMENSIONS.
3). ALL BARS ARE TO BE #5 (#16) SPACED @ 6" (150) UNLESS NOTED OTHERWISE. TOP REINFORCEMENT SHALL BE 0.11 IN^2 (70 mm^2) MIN. HORIZONAL REINFORCEMENT PER FOOT IN BOTH DIRECTIONS.
4). MINIMUM BAR COVER = 1½" (38).

DELAWARE
DEPARTMENT OF TRANSPORTATION

DOUBLE INLET COVER SLAB DETAILS

STANDARD NO. D-5 (2009) | **SHT. 5 OF 8**

APPROVED SIGNATURE ON FILE — CHIEF ENGINEER — 01/19/2010 DATE

RECOMMENDED SIGNATURE ON FILE — DESIGN ENGINEER — 01/14/2010 DATE

10/8/2009