

# SECTION I - BARRIER

SHEET NO.	NAME
B-L (2001)	– BARRIER LEGEND .....
B-1	– GUARDRAIL APPLICATIONS .....
	(2002) - 1 PLANS - (TYPE 1, TYPE 2, AND TYPE 3) .....
	(2004) - 2 ELEVATIONS AND SPLICE DETAIL .....
	(2002) - 3 SECTION VIEWS .....
	(2007) - 4 GRADING FOR GUARDRAIL END TREATMENT, TYPE 1 .....
	(2007) - 5 GRADING FOR GUARDRAIL END TREATMENT, TYPE 2 .....
	(2007) - 6 GRADING FOR GUARDRAIL END TREATMENT, TYPE 3 .....
B-2 (2002)	– GUARDRAIL OVER CULVERTS, TYPE 1 .....
B-3 (2002)	– GUARDRAIL OVER CULVERTS, TYPE 2 .....
B-4 (2007)	– CURVED GUARDRAIL SECTION .....
B-5 (2002)	– END ANCHORAGE .....
B-6	– BURIED END SECTION .....
	(2002) - 1 BURIED END SECTION .....
	(2002) - 2 BURIED END SECTION .....
	(2002) - 3 POST, CONCRETE BLOCK, & RUBRAIL ANCHOR DETAILS .....
B-7	– GUARDRAIL TO BARRIER CONNECTION, APPROACH TYPE 1 .....
	(2005) - 1 PLAN, ELEVATION, AND SECTIONS .....
	(2001) - 2 WOOD BLOCKOUT, RUB RAIL WOOD BLOCKS, BEARING PLATE, RUB RAIL TO BARRIER CONNECTION DETAILS .....
	(2001) - 3 BENT PLATE RUB RAIL DETAILS .....
B-8	– GUARDRAIL TO BARRIER CONNECTION, APPROACH TYPE 2 .....
	(2005) - 1 PLAN, ELEVATION, AND SECTIONS .....
	(2001) - 2 NOTES, BENT RAIL DETAILS, BLOCK SCHEDULE .....
B-9 (2002)	– GUARDRAIL TO BARRIER CONNECTION, EXIT TYPE .....
B-10 (2002)	– BRIDGE RAIL RETROFIT, TYPE 1 .....
B-11	– BRIDGE RAIL RETROFIT, TYPE 2 .....
	(2002) - 1 PLAN, SECTION A-A, BASE PLATE DETAIL .....
	(2001) - 2 BASE PLATE DETAIL AND STEEL GUARDRAIL POST .....
B-12 (2001)	– BRIDGE RAIL RETROFIT, TYPE 3 .....
B-13	– HARDWARE .....
	(2004) - 1 W-BEAM DETAILS .....
	(2004) - 2 W-BEAM STEEL POST AND OFFSET BLOCK .....
	(2004) - 3 W-BEAM TERMINAL CONNECTOR .....
	(2004) - 4 THRIE BEAM DETAILS .....
	(2004) - 5 THRIE BEAM STEEL POST AND OFFSET BLOCK .....
	(2004) - 6 W-THRIE BEAM TRANSITION SECTION .....
	(2004) - 7 WOOD BLOCK, SOIL PLATE, SHORT WOOD BREAKAWAY POST, STEEL TUBE, LONG WOOD BREAKAWAY POST .....
	(2004) - 8 SWAGED CABLE AND RELATED HARDWARE ASSEMBLY .....
	(2004) - 9 REFLECTORIZED WASHER AND BEARING PLATE DETAIL .....
	(2004) - 10 GUARDRAIL BOLT & RECESSED NUT .....
	(2004) - 11 5/8" (16) HEX BOLT, HEX NUT, & STEEL WASHER, HIGH-STRENGTH STRUCTURAL HEX BOLT & HEX NUT .....
	(2004) - 12 15/16" (24) HEX NUT & STEEL WASHER, 5/8" (16) CARRIAGE BOLT, HEX NUT, & STEEL WASHER .....
	(2005) - 13 GUARDRAIL MOUNTED RAIL •DETAIL ON HOLD• .....
B-14	– CONCRETE SAFETY BARRIER (F SHAPE) .....
	(2001) - 1 TYPICAL CAST IN PLACE OR SLIP FORM CONSTRUCTION .....
	(2001) - 2 TYPICAL PRE-CAST CONSTRUCTION .....
	(2001) - 3 SLOTTED PLATE CONNECTION DETAILS .....



## SECTION I - BARRIER (CONT'D)

SHEET NO.	NAME
B-15	— PORTABLE CONCRETE SAFETY BARRIER (F SHAPE).....
	(2001) - 1 PLAN, ELEVATION, AND SECTION VIEW •DETAIL DELETED - SEE SPECIFICATIONS•.....
	(2001) - 2 CURVE SECTION •DETAIL DELETED - SEE SPECIFICATIONS•.....
	(2001) - 3 TAPERED END SECTION •DETAIL DELETED - SEE SPECIFICATIONS•.....
	(2001) - 4 TYPICAL REINFORCEMENT DETAILS •DETAIL DELETED - SEE SPECIFICATIONS•.....
	(2001) - 4 JOINT CONNECTION DETAILS •DETAIL DELETED - SEE SPECIFICATIONS•.....

## SECTION II - CURB & GUTTER

SHEET NO.	NAME
C-1 (2007)	— P.C.C. CURB, P.C.C. CURB & GUTTER, AND HOT-MIX CURB.....
C-2	— CURB RAMPS.....
	(2006) - 1 TYPE 1.....
	(2006) - 2 TYPES 2, 3, & 4.....
	(2006) - 3 SECTIONS FOR TYPES 2, 3, & 4.....
	(2006) - 4 TYPE 5.....
C-3 (2005)	— ENTRANCES.....
C-4	— CURB OPENINGS.....
	(2001) - 1 TYPES A, B, & C.....
	(2001) - 2 TYPES D & E.....
	(2001) - 3 TYPES F & G.....

## SECTION III - DRAINAGE

SHEET NO.	NAME
D-1	— 6' SAFETY END STRUCTURE.....
	(2001) - 1 DETAIL VIEWS.....
	(2001) - 2 SCHEDULES.....
D-2	— 10' SAFETY END STRUCTURE.....
	(2001) - 1 DETAIL VIEWS.....
	(2001) - 2 SCHEDULES.....
D-3	— SAFETY GRATES.....
	(2005) - 1 SAFETY END STRUCTURE GRATE & ASSEMBLY DETAIL.....
	(2007) - 2 PERSONNEL SAFETY GRATE FOR PIPE INLET DETAIL.....
D-4 (2007)	— INLET BOX DETAILS.....
D-5	— DRAINAGE INLET DETAILS.....
	(2002) - 1 DRAINAGE INLET ASSEMBLY.....
	(2007) - 2 DRAINAGE INLET FRAME AND GRATES.....
	(2004) - 3 DRAINAGE INLET TOP UNITS.....
	(2006) - 4 DRAINAGE INLET COVER SLAB DETAILS.....
	(2006) - 5 DOUBLE INLET COVER SLAB DETAILS.....
	(2004) - 6 DRAINAGE INLET 34" (865) x 24" (610) DETAILS.....
	(2002) - 7 DRAINAGE INLET 34" (865) x 18" (455) DETAILS.....
	(2002) - 8 LAWN INLET DETAIL.....



## SECTION III - DRAINAGE (CONT'D)

SHEET NO.	NAME
D-6	— MANHOLE DETAILS .....
	(2007) - 1 BOX MANHOLE ASSEMBLY .....
	(2001) - 2 ROUND MANHOLE ASSEMBLY .....
	(2001) - 3 MANHOLE FRAME AND COVER .....
	(2007) - 4 BOX MANHOLE COVER SLAB .....
D-7	— JUNCTION BOX DETAILS .....
	(2007) - 1 JUNCTION BOX ASSEMBLY .....
	(2007) - 2 JUNCTION BOX COVER SLAB .....
D-8 (2001)	— PIPE BEDDING .....
D-9 (2006)	— PERFORATED PIPE UNDERDRAIN .....
D-10 (2007)	— PIPE PLUGGING DETAIL .....

## SECTION IV - EROSION

SHEET NO.	NAME
E-1 (2001)	— INCREMENTAL STABILIZATION .....
E-2 (2006)	— SILT FENCE .....
E-3 (2005)	— DRAINAGE INLET SEDIMENT CONTROL .....
E-4 (2006)	— CURB INLET SEDIMENT CONTROL .....
E-5 (2006)	— STONE CHECK DAM .....
E-6 (2005)	— SEDIMENT TRAP .....
E-7 (2005)	— SEDIMENT TRAP, USING DRAINAGE INLET AS OUTLET .....
E-8	— RISER PIPE ASSEMBLY FOR SEDIMENT TRAP .....
	(2006) - 1 ELEVATION .....
	(2006) - 2 TRASH HOOD DETAILS .....
E-9 (2005)	— EROSION CONTROL BLANKET APPLICATIONS .....
E-10 (2005)	— RIPRAP DITCH .....
E-11 (2005)	— TEMPORARY SWALE .....
E-12 (2005)	— PERIMETER DIKE/SWALE .....
E-13 (2005)	— EARTH DIKE .....
E-14 (2005)	— TEMPORARY SLOPE DRAIN .....
E-15 (2005)	— STILLING WELL .....
E-16 (2005)	— SUMP PIT, TYPE 1 & 2 .....
E-17 (2005)	— DEWATERING BASIN .....
E-18 (2005)	— GEOTEXTILE-LINED CHANNEL DIVERSION .....
E-19 (2005)	— SANDBAG DIVERSION .....
E-20 (2005)	— SANDBAG DIKE .....
E-21 (2005)	— STABILIZED CONSTRUCTION ENTRANCE .....
E-22 (2006)	— SKIMMER DEWATERING DEVICE .....
E-23	— TURBIDITY CURTAIN .....
	(2005) - 1 FLOATING TURBIDITY CURTAIN .....
	(2005) - 2 STAKED TURBIDITY CURTAIN .....
E-24 (2005)	— PORTABLE SEDIMENT TANK .....
E-25 (2005)	— TURF REINFORCEMENT MAT APPLICATIONS .....
E-26 (2006)	— RIPRAP ENERGY DISSIPATOR DETAIL .....

## SECTION V - LANDSCAPING

SHEET NO.	NAME
L-1	— PLANTING DETAILS .....
(2006) - 1	ROADSIDE SHRUB PLANTING DETAIL .....
(2006) - 2	TREE PLANTING DETAILS .....
(2006) - 3	PERENNIAL/GROUND COVER PLANTING DETAIL .....

## SECTION VI - MISCELLANEOUS

SHEET NO.	NAME
M-1 (2001)	— RIGHT-OF-WAY FENCE .....
M-2 (2001)	— CONCRETE MONUMENT .....
M-3 (2005)	— REMOVABLE BOLLARD .....
M-4 (2007)	— BIKE RACK .....
M-5 (2004)	— WOOD RAIL FENCE .....
M-6 (2004)	— PATTERNED HOT-MIX OR CONCRETE & BRICK PAVER .....
M-7 (2006)	— CHAIN LINK FENCE DETAILS .....
M-8 (2007)	— P.C.C. PARKING BUMPER .....

## SECTION VII - PAVEMENT

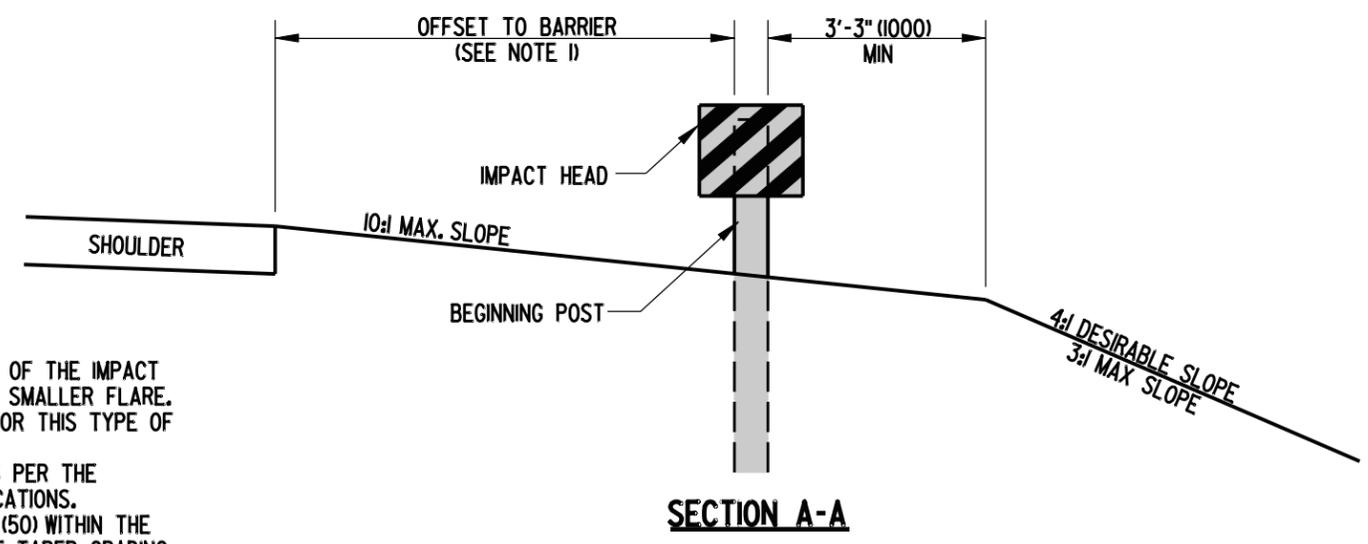
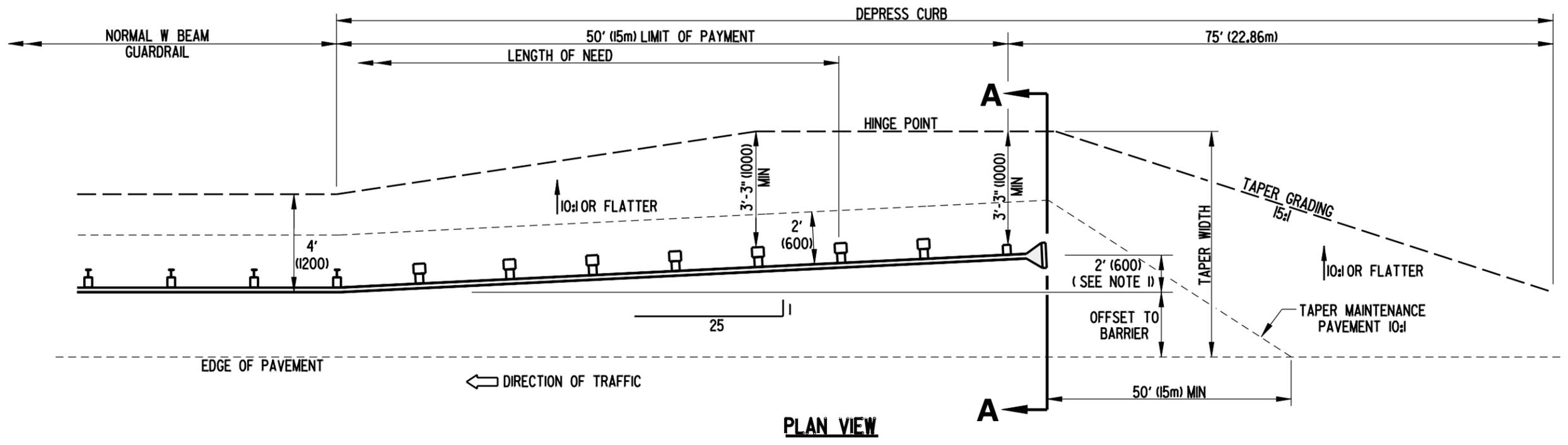
SHEET NO.	NAME
P-1	— P.C.C. PAVEMENT .....
(2001) - 1	SLAB PLAN (WITH DOWEL AND TIE LOCATIONS) .....
(2004) - 2	JOINT AND SEALANT DETAILS .....
(2001) - 3	W BOLT, HOOK BOLT, DOWEL & TIE BAR .....
(2001) - 4	DOWEL SUPPORT BASKET .....
(2001) - 5	DOWEL & TIE BAR PLACEMENT TOLERANCES .....
P-2	— P.C.C. PAVEMENT PATCHING .....
(2001) - 1	FULL DEPTH PATCH, PLAN VIEW .....
(2004) - 2	FULL DEPTH PATCH, SECTION VIEWS .....
(2004) - 3	FULL DEPTH PATCH, SEALANT DETAILS, GROUT RETENTION DISK, AND DOWEL BAR .....
(2001) - 4	FULL DEPTH PATCH, DOWEL BAR PLACEMENT TOLERANCES .....
(2001) - 5	PARTIAL DEPTH PATCH, PLAN AND SECTION VIEWS .....



## SECTION VIII - TRAFFIC

SHEET NO.	NAME
T-1 (2005)	— CONDUIT JUNCTION WELL, TYPES 1, 2, AND 3 .....
T-2 (2005)	— CONDUIT JUNCTION WELL, TYPE 4 .....
T-3 (2005)	— CONDUIT JUNCTION WELL, TYPE 5 .....
T-4 (2005)	— CABINET BASES (TYPES "M" AND "P") .....
T-5	— POLE BASES .....
	(2005) - 1 ROUND BASE, SQUARE BASE .....
	(2005) - 2 TYPICAL SECTION (BASES 1, 2, 2A, 2B, 3, 3A, 3B, AND 7), TYPICAL SECTION (BASE 4), TYPICAL INSTALLATION (BASES 1, 2, 2A, 2B, 3, 3A, 3B, 4, AND 7) .....
	(2005) - 3 TYPICAL SECTION (BASES 5 AND 6), ANCHOR BOLT DATA CHART AND DETAILS .....
T-6 (2005)	— SPECIAL POLE BASE .....
T-7 (2005)	— SIGN FOUNDATION .....
T-8 (2005)	— LOOP DETECTOR TO CONDUIT JUNCTION WELL CONNECTION .....
T-9 (2005)	— TYPE #1 LOOP DETECTOR .....
T-10 (2005)	— TYPE #2 LOOP DETECTOR .....
T-11	— MESSENGER WIRE ATTACHMENT .....
	(2005) - 1 INTERMEDIATE MESSENGER WIRE ATTACHMENT ON WOOD POLES .....
	(2005) - 2 ANGULAR INTERMEDIATE MESSENGER WIRE ATTACHMENT .....
T-12	— MESSENGER WIRE ATTACHMENT .....
	(2005) - 1 SPAN WIRE ATTACHMENT BETWEEN POLES .....
	(2005) - 2 DEAD END MESSENGER WIRE ATTACHMENT .....
T-13	— CONDUIT JUNCTION WELLS .....
	(2005) - 1 TYPE 4 .....
	(2006) - 2 TYPE 7 .....
	(2006) - 3 TYPES 8 & 10 .....
T-14	— EMERGENCY PREEMPTION RECEIVER .....
	(2006) - 1 UPRIGHT MOUNT .....
	(2005) - 2 INVERTED MOUNT .....





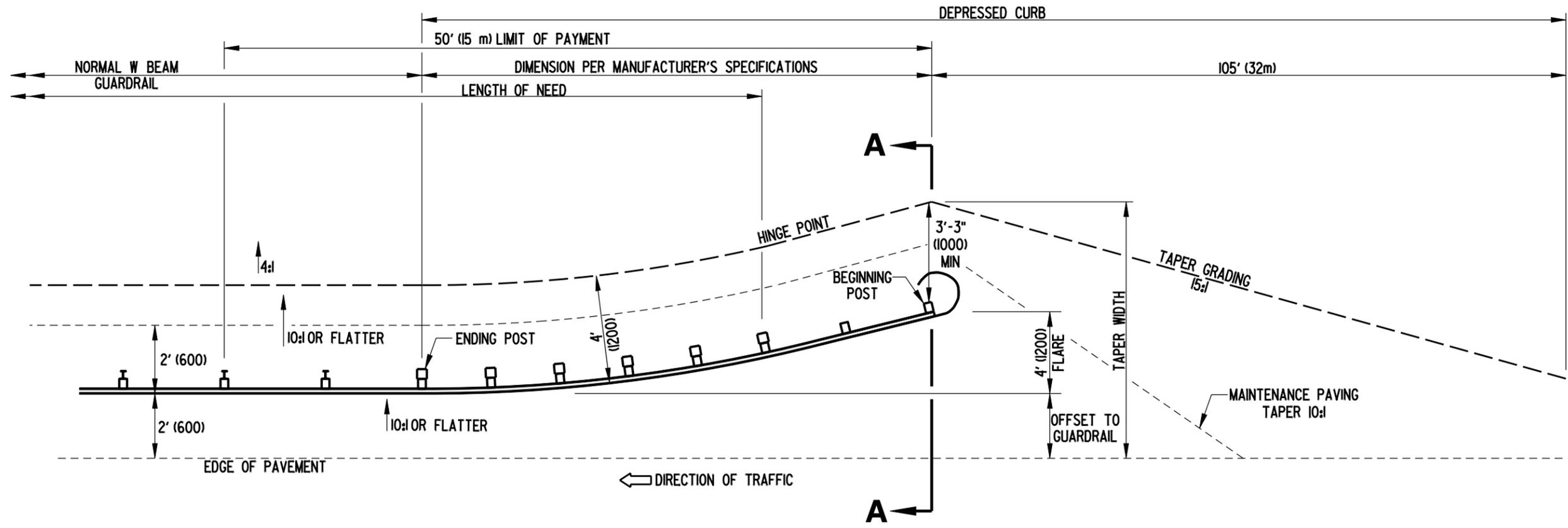
**NOTES:**

1. FLARE THE END TREATMENT AT 25:1 BEGINNING 50' (15 m) FROM THE END OF THE IMPACT HEAD, UNLESS THE CONSTRUCTION PLANS OR SPECIFICATIONS SPECIFY A SMALLER FLARE.
2. THIS DETAIL WAS SOLELY CREATED TO SHOW THE GRADING REQUIRED FOR THIS TYPE OF ATTENUATOR.
3. THE GUARDRAIL END TREATMENT ATTENUATOR SHALL BE INSTALLED AS PER THE MANUFACTURER'S AND THE DEPARTMENT OF TRANSPORTATION'S SPECIFICATIONS.
4. IF CURB IS PRESENT, DEPRESS THE CURB TO A MAXIMUM HEIGHT OF 2" (50) WITHIN THE LIMITS OF THE END TREATMENT AND THROUGHOUT THE LENGTH OF THE TAPER GRADING.

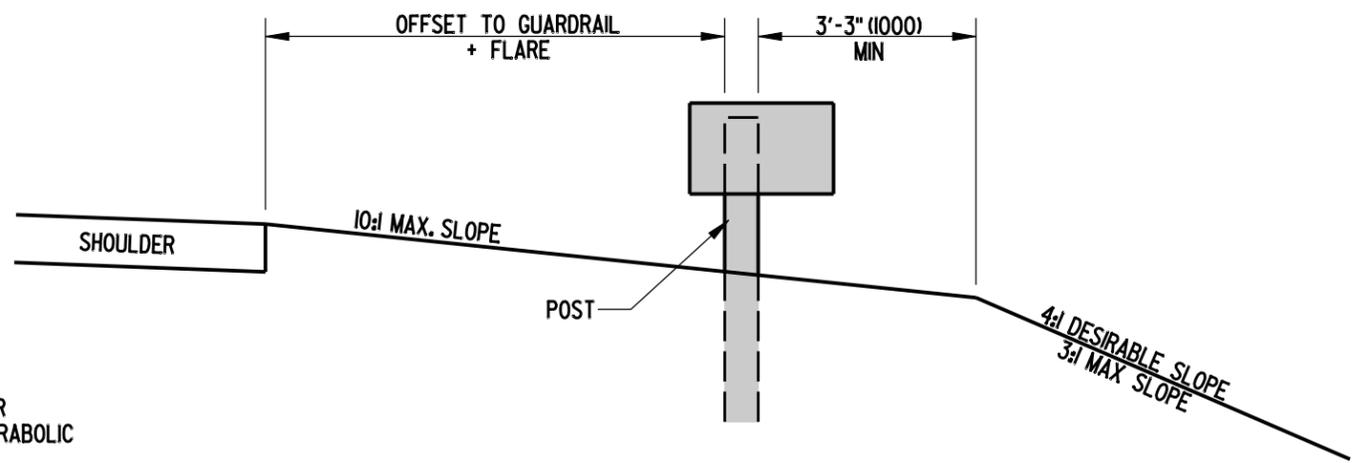
**GRADING FOR GUARDRAIL END TREATMENT ATTENUATOR, TYPE I**

 <b>DELAWARE</b> <b>DEPARTMENT OF TRANSPORTATION</b>	<b>GUARDRAIL APPLICATIONS</b>			<b>APPROVED</b>  <b>10/24/07</b> <small>CHIEF ENGINEER DATE</small>
	STANDARD NO. <b>B-1 (2007)</b>	SHT. <b>4</b> OF <b>6</b>		<b>RECOMMENDED</b>  <b>10/23/07</b> <small>DESIGN ENGINEER DATE</small>

SCALE : N.T.S.



**PLAN VIEW**

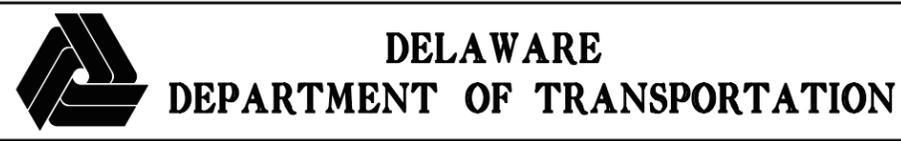


**SECTION A-A**

**GRADING FOR GUARDRAIL END TREATMENT ATTENUATOR, TYPE 2**

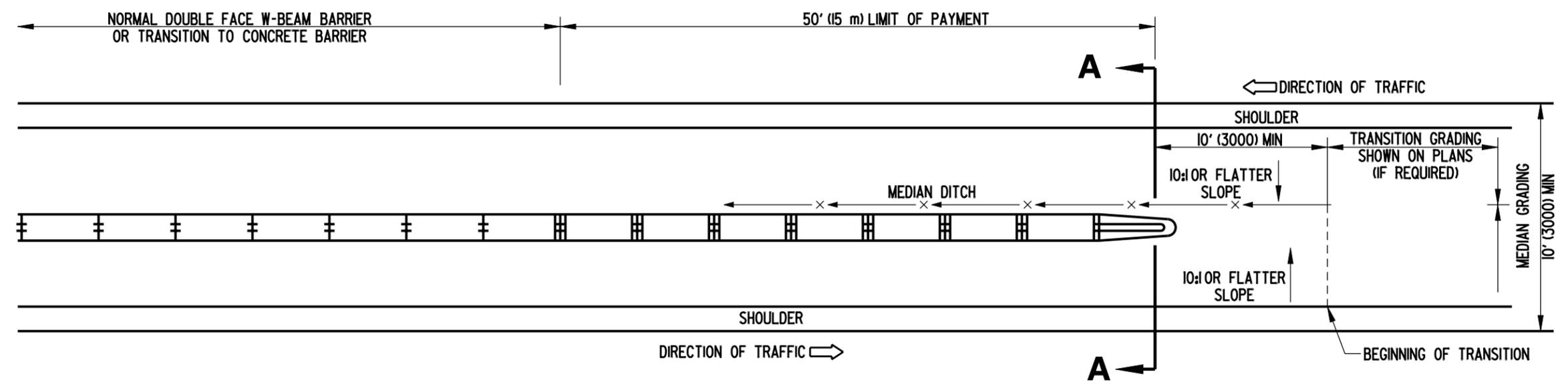
**NOTES:**

1. FLARE SHALL BE 4' (1200) UNLESS THE CONSTRUCTION PLANS OR SPECIFICATIONS SPECIFY A SMALLER FLARE. FLARE MAY BE PARABOLIC OR STRAIGHT BASED ON MANUFACTURE'S SPECIFICATIONS.
2. THIS DETAIL WAS SOLELY CREATED TO SHOW THE GRADING REQUIRED FOR THIS TYPE OF ATTENUATOR. THE GUARDRAIL END TREATMENT ATTENUATOR SHALL BE INSTALLED AS PER THE MANUFACTURER'S AND THE DEPARTMENT OF TRANSPORTATION'S SPECIFICATIONS.
3. IF CURB IS PRESENT, DEPRESS THE CURB TO A MAXIMUM HEIGHT OF 2" (50) WITHIN THE LIMITS OF THE END TREATMENT AND THROUGHOUT THE LENGTH OF THE TAPER GRADING.

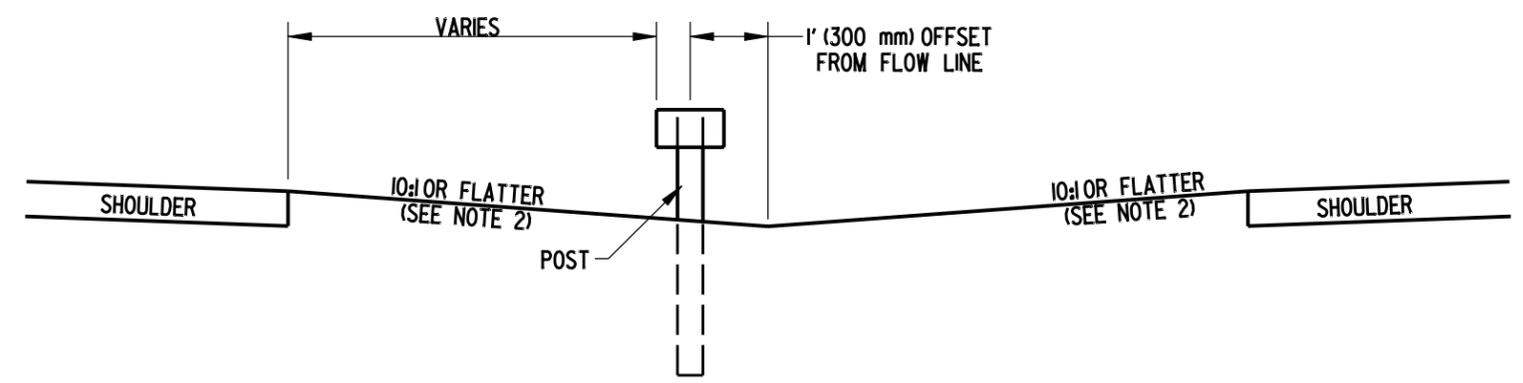


<b>GUARDRAIL APPLICATIONS</b>			
STANDARD NO.	B-1 (2007)	SHT.	5 OF 6

APPROVED	<i>[Signature]</i> CHIEF ENGINEER	10/24/07 DATE
RECOMMENDED	<i>[Signature]</i> DESIGN ENGINEER	10/23/07 DATE



**PLAN VIEW**



**SECTION A-A**  
**GRADING FOR END TREATMENT ATTENUATOR, TYPE 3**

**NOTES:**

1. THIS DETAIL WAS SOLELY CREATED TO SHOW THE GRADING REQUIRED FOR THIS TYPE OF ATTENUATOR.
2. 6:1 OR FLATTER GRADING IS ALLOWABLE WHEN THE BARRIER IS LOCATED 12' (3650 mm) OR MORE FROM THE OUTSIDE EDGE OF THE SHOULDER.
3. THIS END TREATMENT CAN ALSO BE USED IN RAMP GORES OR OTHER AREAS WHERE 2 RAILS OF W-BEAM COME TOGETHER AND TERMINATE WITH ONE END TREATMENT.
4. WHEN OPPOSING ROADWAYS HAVE EQUAL ELEVATIONS THE TRAFFIC BARRIER SYSTEM SHOULD BE PLACED ON THE OPPOSITE SIDE OF THE DITCH LINE FROM APPROACHING TRAFFIC.
5. THE GUARDRAIL END TREATMENT ATTENUATOR SHALL BE INSTALLED AS PER THE MANUFACTURER'S AND THE DEPARTMENT OF TRANSPORTATION'S SPECIFICATIONS.
6. IF CURB IS PRESENT, DEPRESS THE CURB TO A MAXIMUM HEIGHT OF 2" (50) WITHIN THE LIMITS OF THE END TREATMENT AND THROUGHOUT THE LENGTH OF THE TAPER GRADING.



**DELAWARE**  
**DEPARTMENT OF TRANSPORTATION**

<b>GUARDRAIL APPLICATIONS</b>			
STANDARD NO.	B-1 (2007)	SHT. 6	OF 6

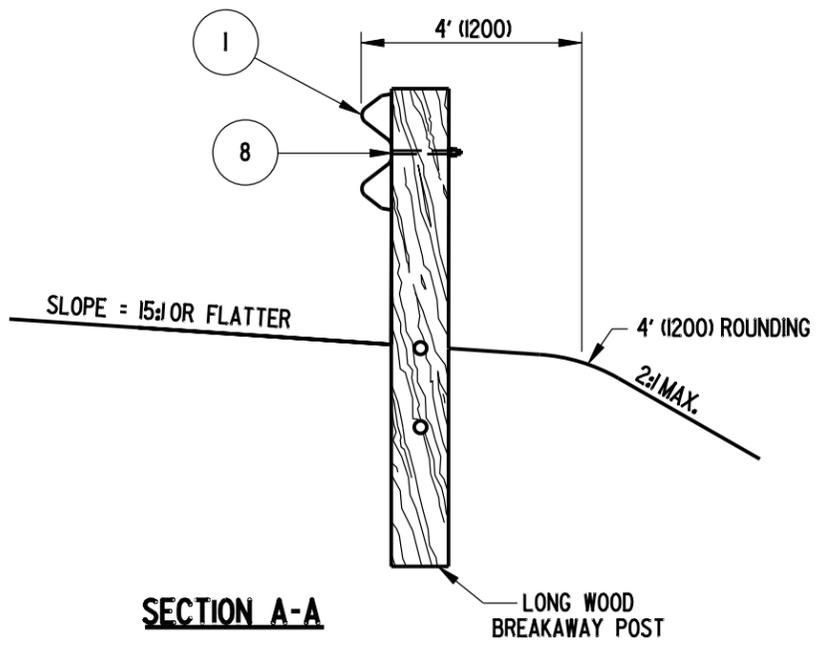
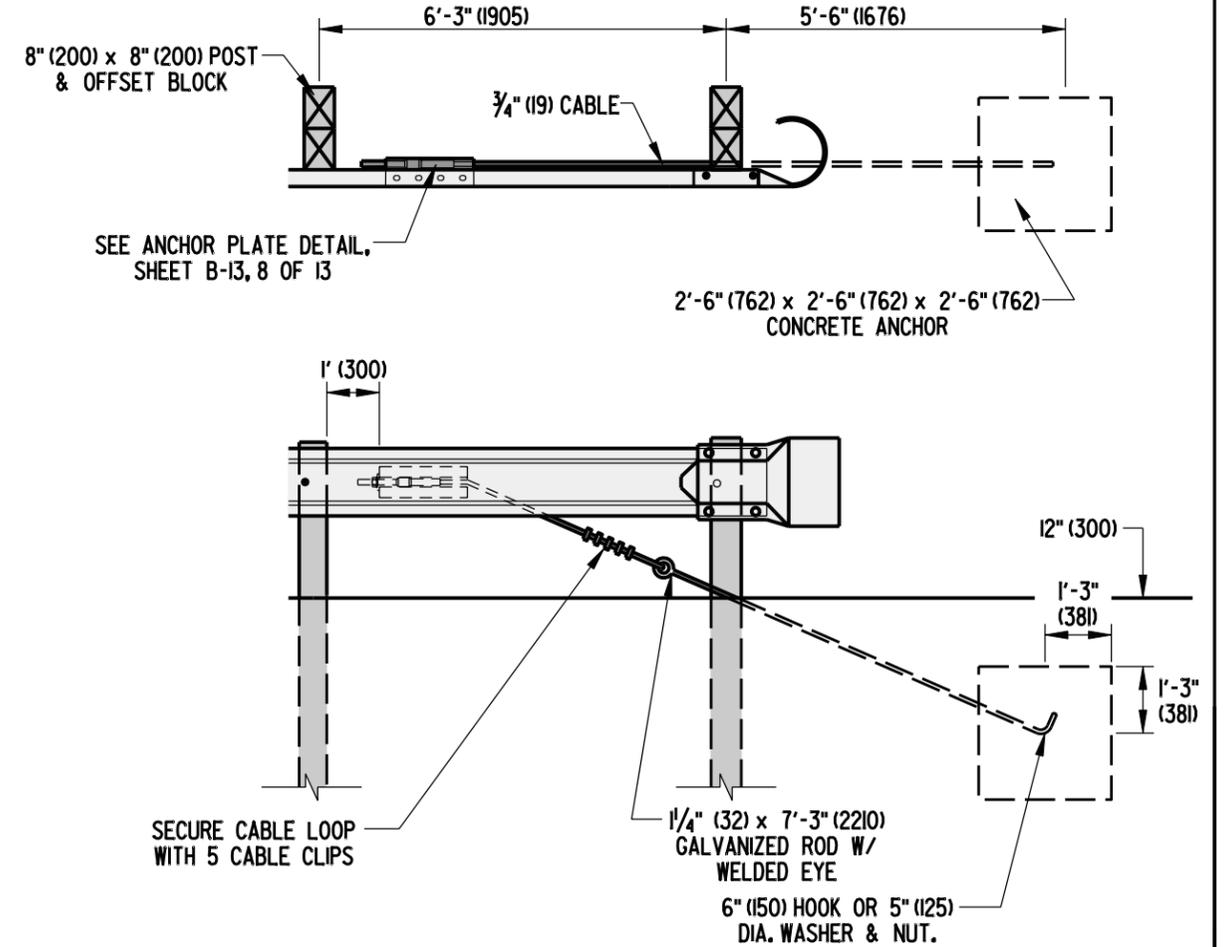
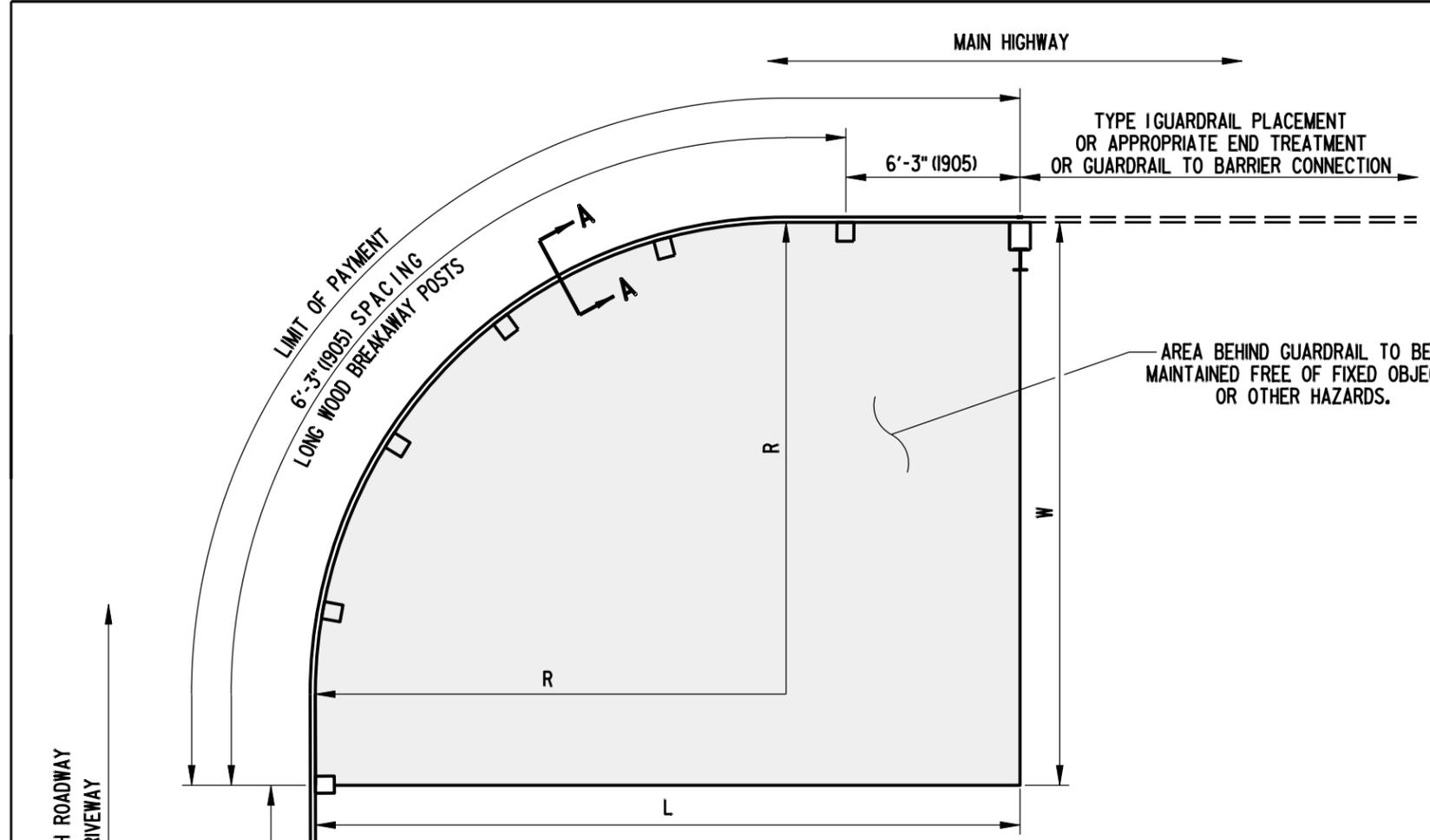
<b>APPROVED</b>	<i>[Signature]</i> CHIEF ENGINEER	10/24/07 DATE
<b>RECOMMENDED</b>	<i>[Signature]</i> DESIGN ENGINEER	10/23/07 DATE

SCALE : N.T.S.

RADIUS	MIN. REQUIRED AREA FREE OF FIXED OBJECTS
	L x W
8'-6" (2600)	25' x 15' (7600 x 4500)
17'-0" (5200)	30' x 15' (9144 x 4500)
25'-6" (7800)	40' x 20' (1200 x 6000)
35'-0" (10700)	50' x 20' (15200 x 6000)

**NOTES:**

- 1). NO WASHERS ARE USED ON THE RAIL SIDE OF THE LONG WOOD BREAKAWAY POSTS.
- 2). THE CURVED GUARDRAIL SECTION SHALL BE SHOP BENT.
- 3). PLACE GUARDRAIL REFLECTOR EVERY FIFTH POST.
- 4). IF CURB IS USED IN CONJUNCTION WITH CURVED GUARDRAIL SECTION, THE CURB CANNOT BE HIGHER THAN 2" (50).
- 5). ON THE 8'6" (2600) RADIUS SYSTEM ONLY, THE RAIL IS NOT TO BE BOLTED TO THE CENTER POST.



PLAN

SECTION A-A

**ENTRANCE SPECIAL END ANCHORAGE**

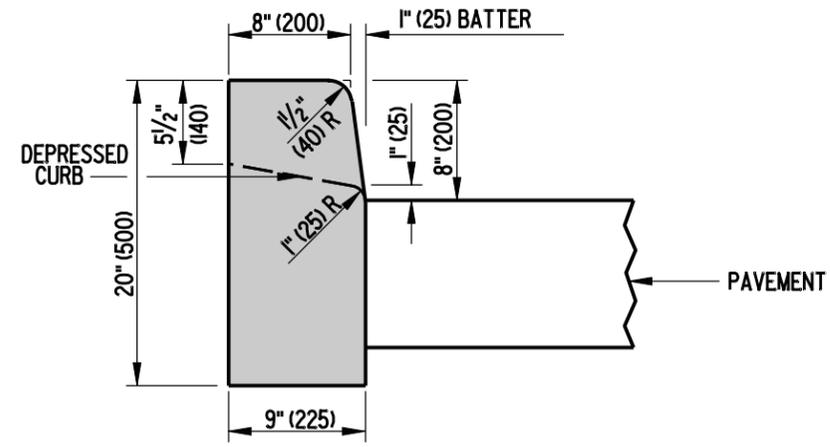
**DELAWARE**  
**DEPARTMENT OF TRANSPORTATION**

**CURVED GUARDRAIL SECTION**

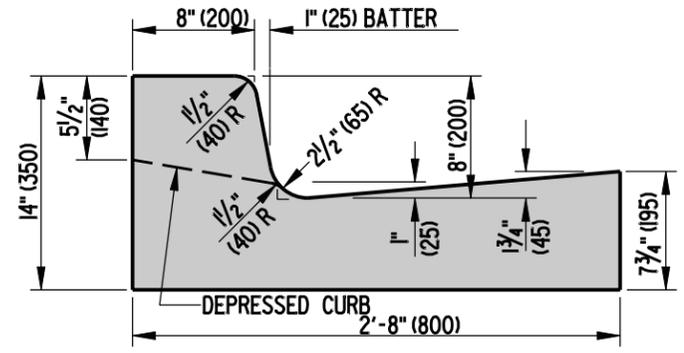
STANDARD NO. **B-4 (2007)** SHT. **1** OF **1**

**APPROVED** *[Signature]* **10/24/07**  
CHIEF ENGINEER DATE

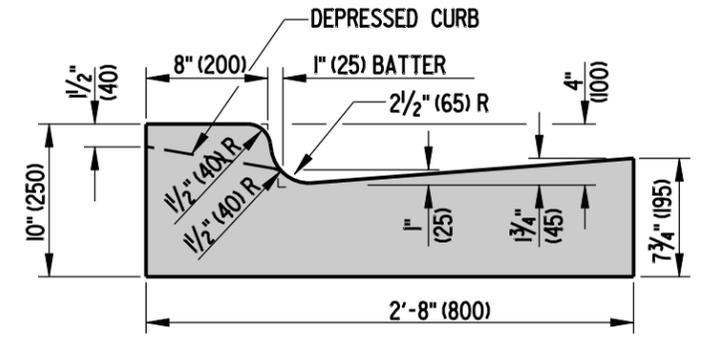
**RECOMMENDED** *[Signature]* **10/23/07**  
DESIGN ENGINEER DATE



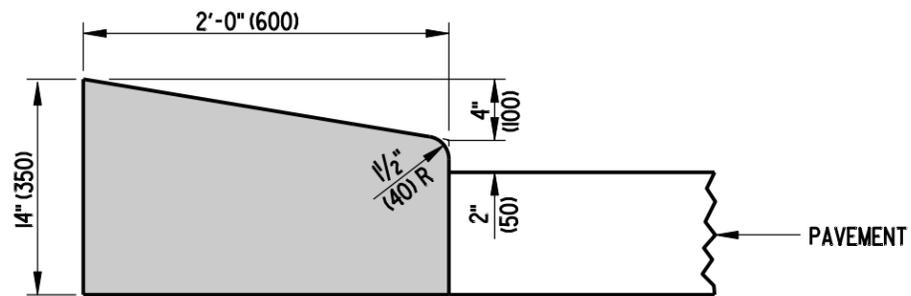
**P.C.C. CURB**  
TYPE 1



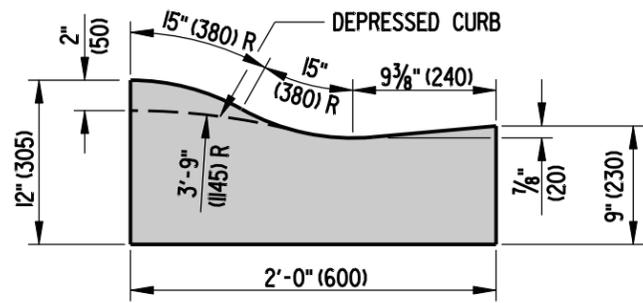
**INTEGRAL P.C.C. CURB AND GUTTER**  
TYPE 1



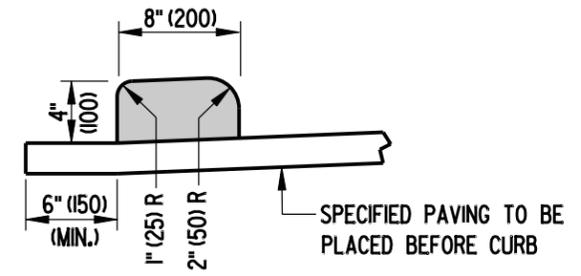
**INTEGRAL P.C.C. CURB AND GUTTER**  
TYPE 4



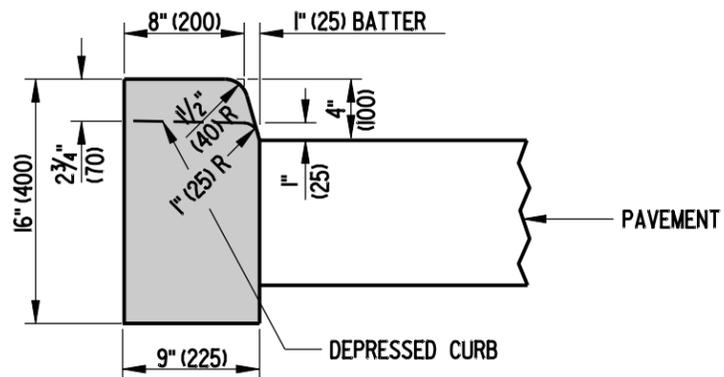
**P.C.C. CURB**  
TYPE 2



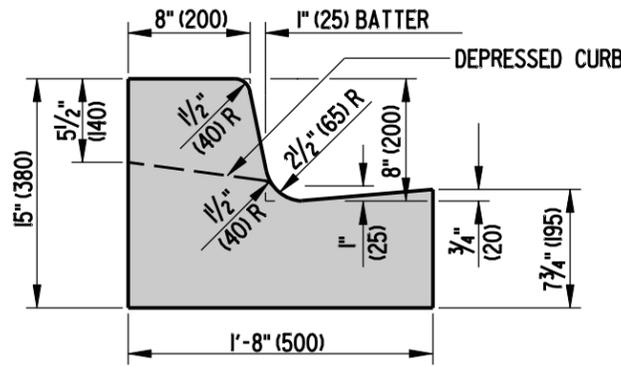
**INTEGRAL P.C.C. CURB AND GUTTER**  
TYPE 2



**HOT-MIX, HOT LAID BITUMINOUS CONCRETE CURB**



**P.C.C. CURB**  
TYPE 3



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

**NOTES:**

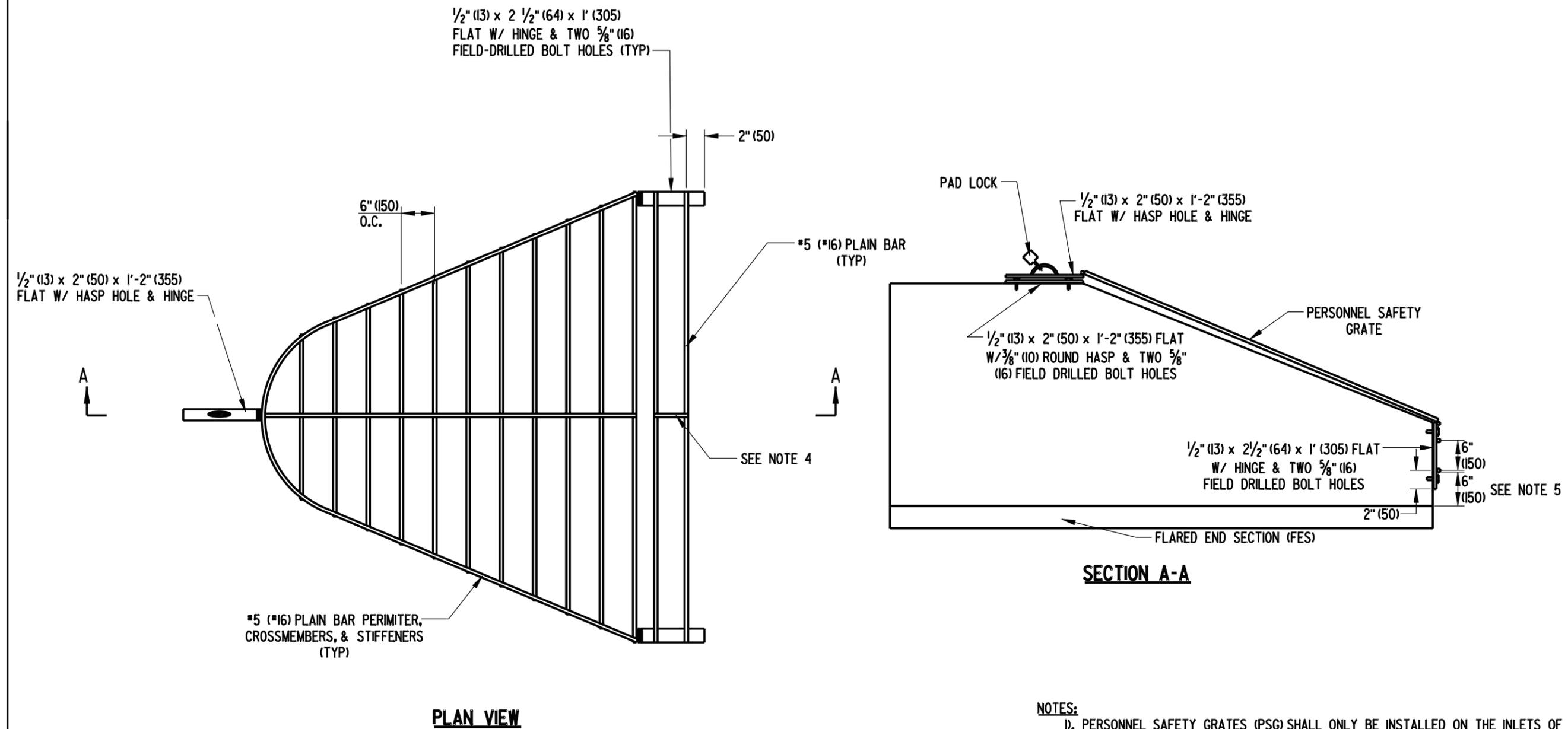
1. WHEN P.C.C. CURB OR INTEGRAL P.C.C. CURB AND GUTTER IS PLACED ADJACENT TO PORTLAND CEMENT CONCRETE PAVEMENT, CONSTRUCT THE JOINT AS PER THE LONGITUDINAL JOINT SEALANT DETAIL ON STANDARD P-2, SHEET 3 OF 5. USE APPROVED JOINT FILLER TO SEAL. WORK TO BE PAID UNDER RESPECTIVE CURB AND GUTTER ITEM.
2. DEPRESS CURB AT ENTRANCES 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 STANDARD NO C-2, 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**

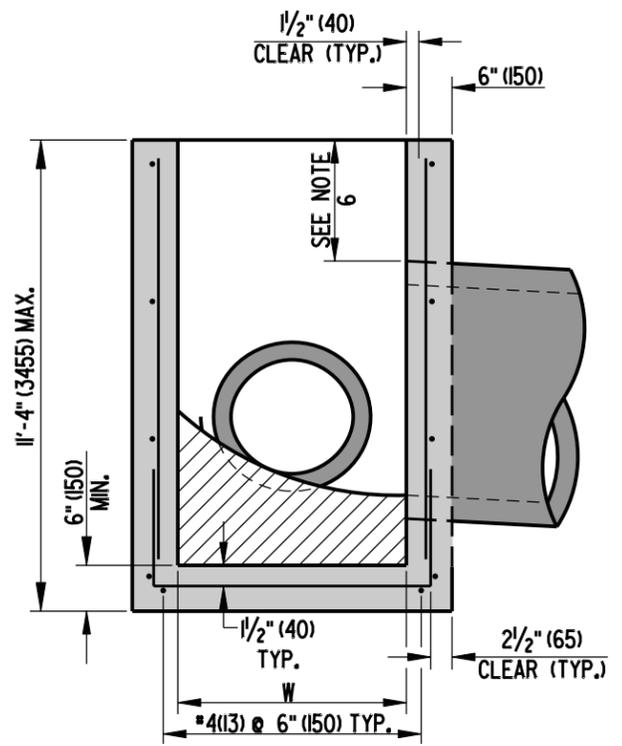
<b>P.C.C. CURB, P.C.C. CURB &amp; GUTTER, AND HOT-MIX CURB</b>			
STANDARD NO.	C-1 (2007)	SHT.	1 OF 1

<b>APPROVED</b>	<i>[Signature]</i> CHIEF ENGINEER	10/24/07 DATE
<b>RECOMMENDED</b>	<i>[Signature]</i> DESIGN ENGINEER	10/23/07 DATE

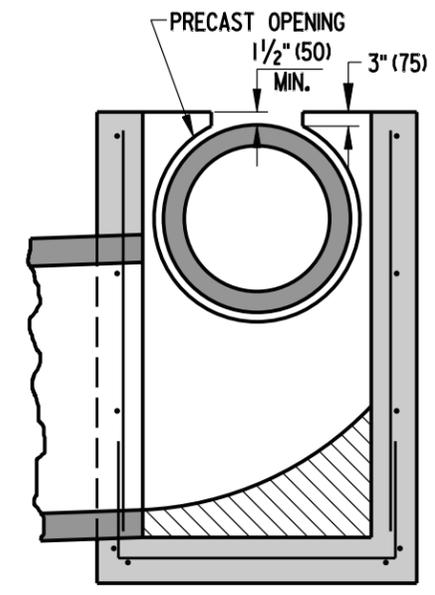


- NOTES:**
- 1). PERSONNEL SAFETY GRATES (PSG) SHALL ONLY BE INSTALLED ON THE INLETS OF STORM WATER PIPES 12" (300) OR LARGER IN DIAMETER THAT ARE NOT STRAIGHT FROM THE INLET TO THE OPEN OUTLET, REGARDLESS OF THE LENGTH.
  - 2). THE GRATE SHALL BE MADE TO FIT THE OUTSIDE PERIMETER OF THE FLARED END SECTION (FES) ± 1/2" (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.

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



**SECTION A-A**

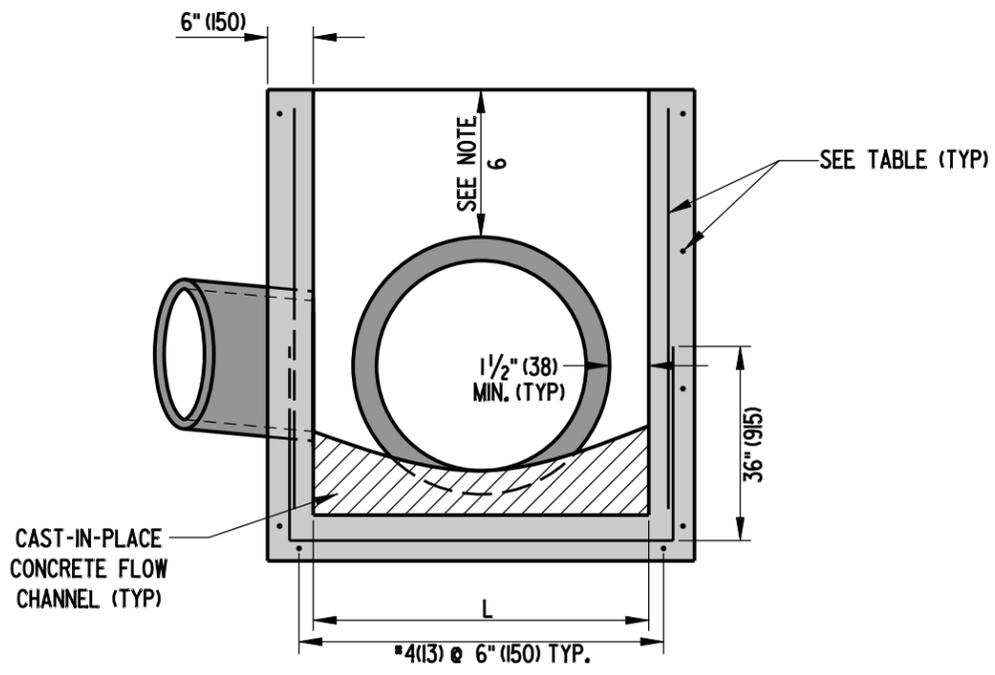


**OPTIONAL PIPE OPENING DETAIL**

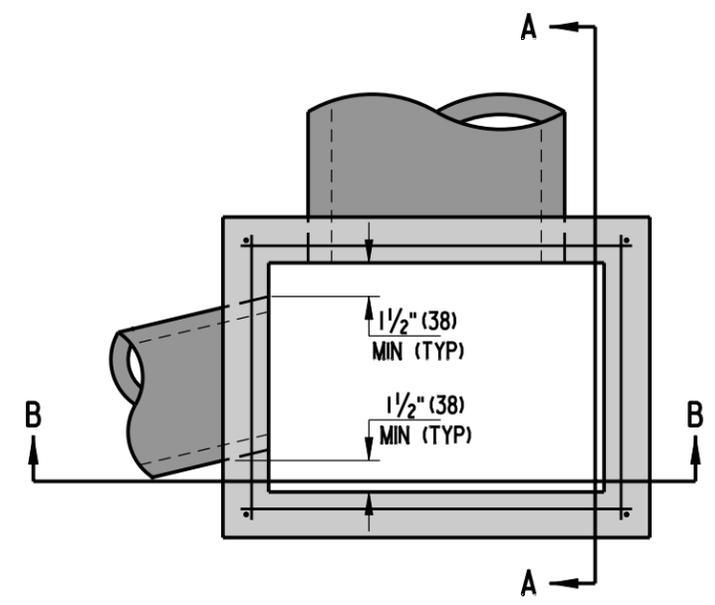
SEE NOTE 6

INLET BOX SCHEDULE		
L	W	FABRICATION TOLERANCE
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)

WALL REINFORCEMENT SCHEDULE		
INTERIOR WALL DIMENSION	AREA OF HORIZONTAL REINFORCEMENT PER FOOT (mm <sup>2</sup> )	AREA OF VERTICAL REINFORCEMENT PER FOOT (mm <sup>2</sup> )
	IN <sup>2</sup> (mm <sup>2</sup> )	IN <sup>2</sup> (mm <sup>2</sup> )
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)



**SECTION B-B**



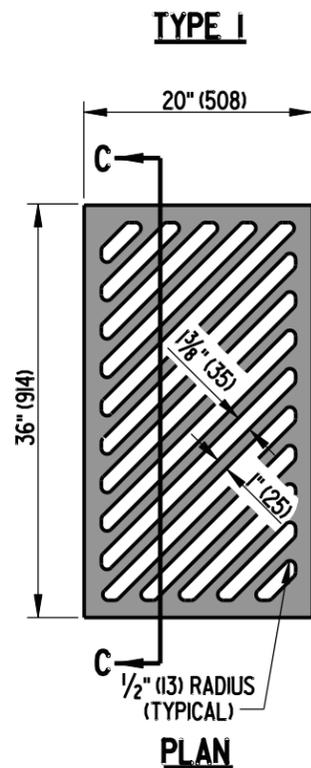
**TOP VIEW**

**NOTES:**

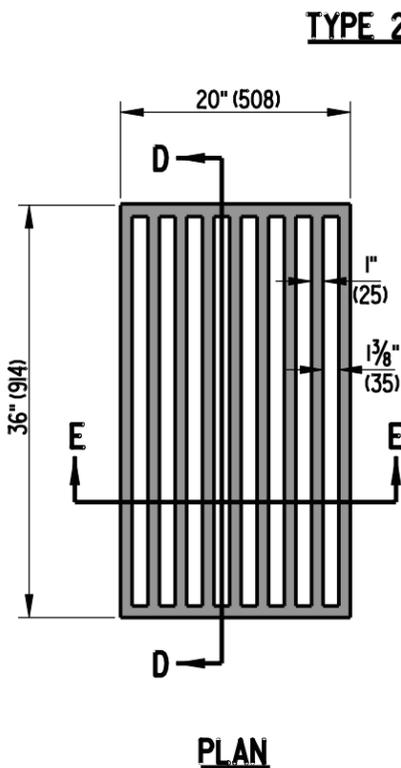
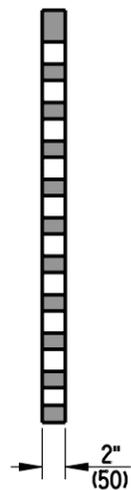
- 1). INLET BOXES SHALL BE PRE-CAST OR CAST-IN-PLACE.
- 2). PIPES SHALL NOT BE INSTALLED THROUGH ANY CORNER OF THE INLET BOX.
- 3). RISER SECTIONS MAY BE USED FOR DEEP INLET BOXES.
- 4). PIPES MAY BE INSTALLED NEAR OR THROUGH JOINTS FOR RISER SECTIONS.
- 5). WHEN THE COVER ABOVE THE PIPE IS LESS THAN 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 ENCRONCH ON ADJACENT WALL.

**DRAINAGE INLET FRAME AND GRATES**

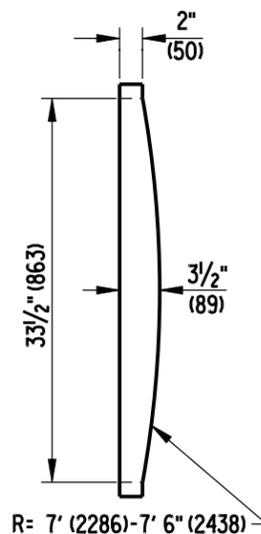
SCALE : N.T.S.



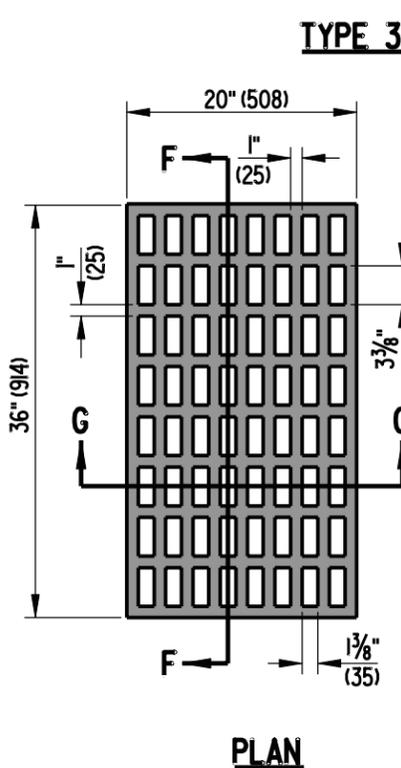
SECTION C-C



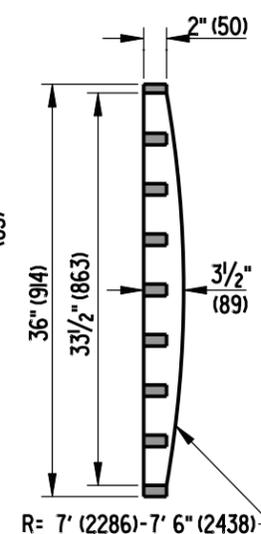
PLAN



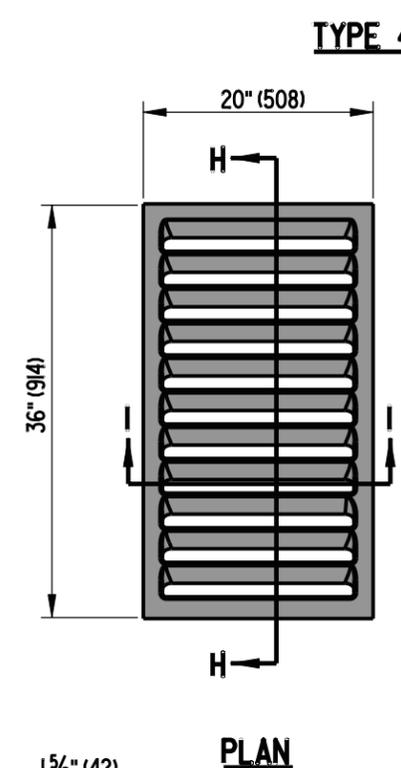
SECTION D-D



PLAN



SECTION F-F



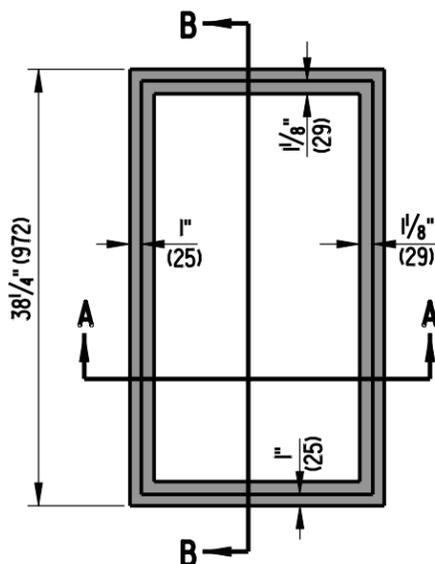
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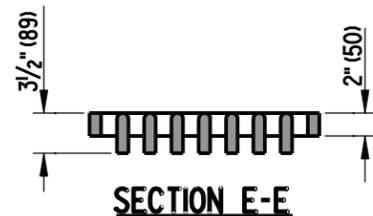
SECTION H-H



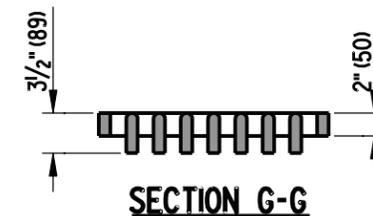
SECTION B-B



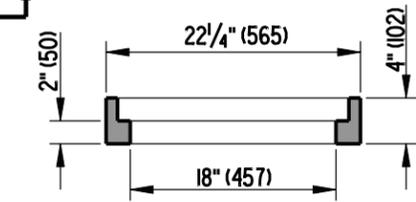
DRAINAGE INLET FRAME



SECTION E-E



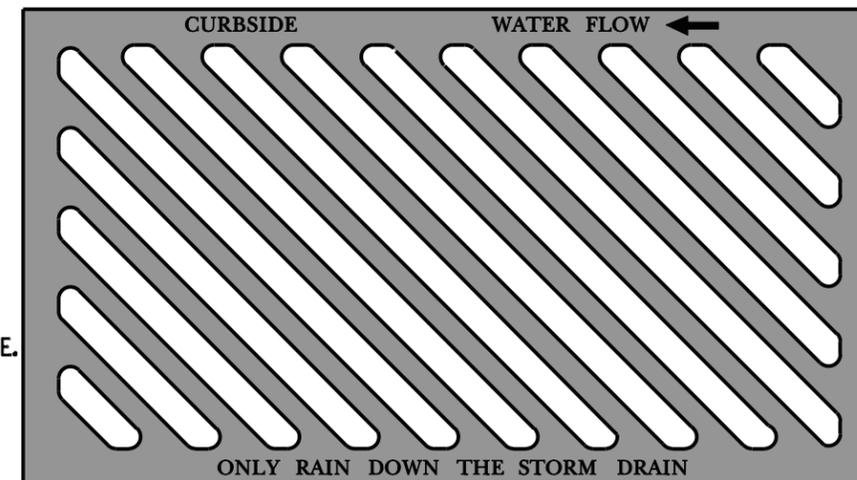
SECTION G-G



SECTION A-A

**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 1 AND TYPE 4 SHALL BE LABELED WITH "WATER FLOW" AND AN ARROW INDICATING FLOW DIRECTION AS SHOWN IN THE EXAMPLE DETAIL.
- 3). THE TYPE 1 DRAINAGE INLET GRATE SHALL BE LABELED WITH "CURBSIDE" AS SHOWN ON THE EXAMPLE DETAIL. ALL LABELING ON THE TYPE 1 SHALL BE ON BOTH TOP AND BOTTOM SIDES DUE TO THE TYPE 1 BEING REVERSIBLE.



**DRAINAGE GRATE LABELING EXAMPLE DETAIL**



**DELAWARE  
DEPARTMENT OF TRANSPORTATION**

**DRAINAGE INLET DETAILS**

STANDARD NO. D-5 (2007)

SHT. 2 OF 9

APPROVED

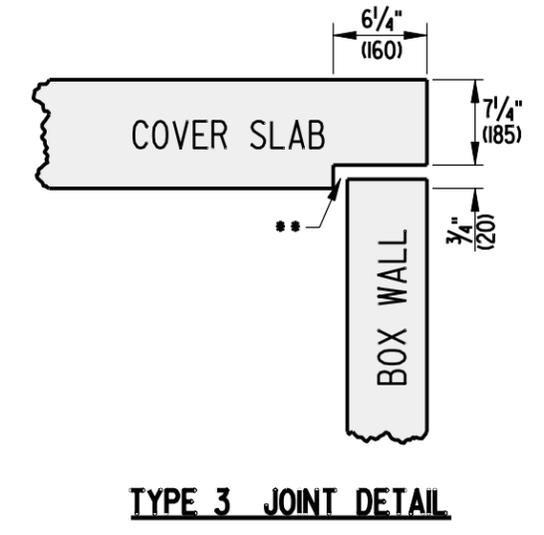
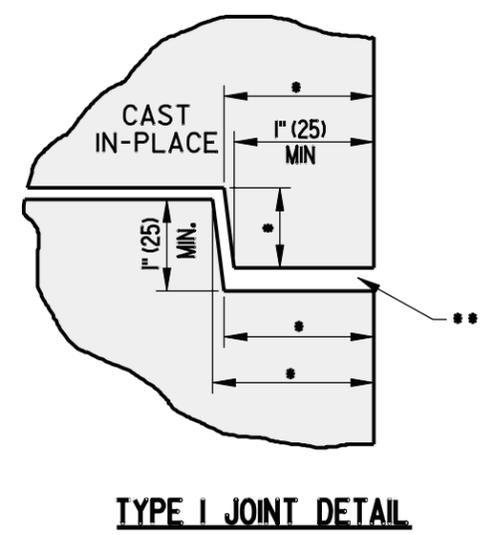
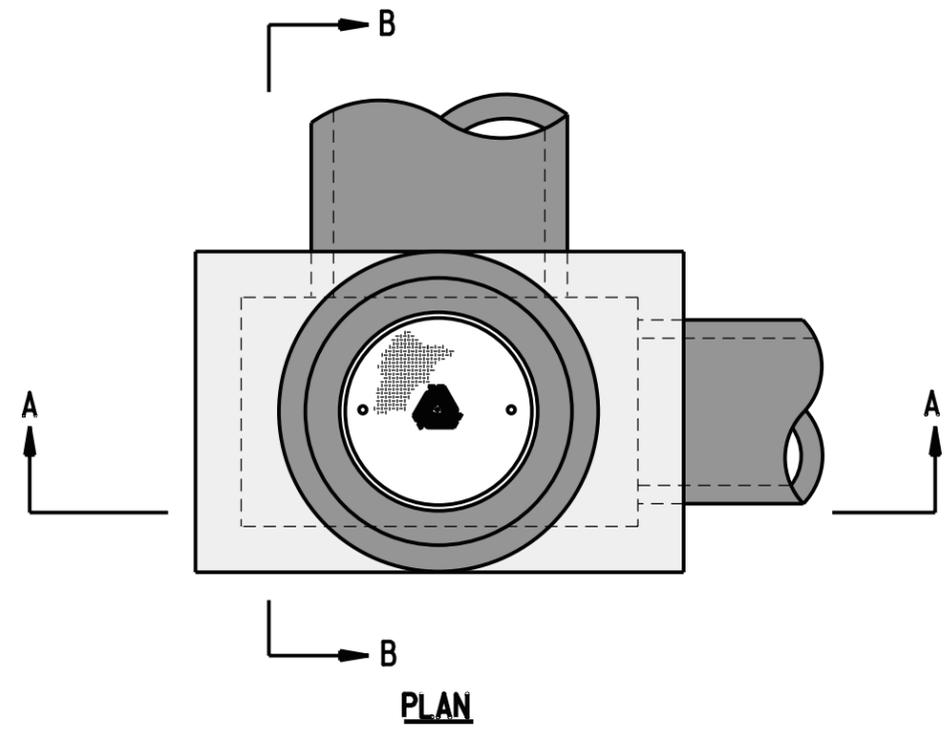
*[Signature]*  
CHIEF ENGINEER

10/24/07  
DATE

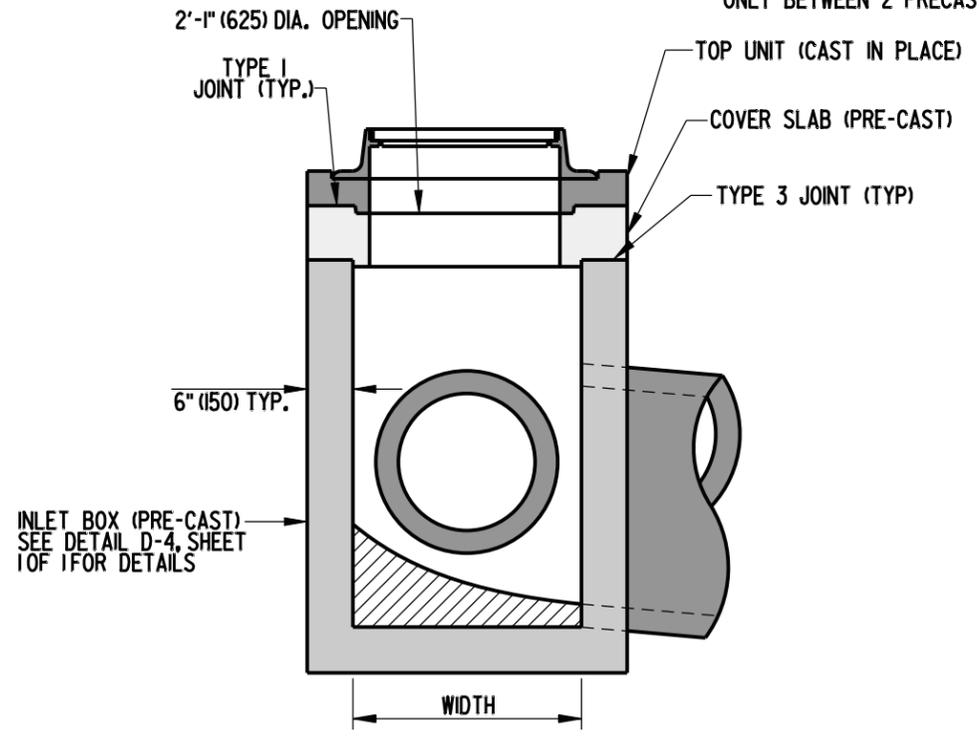
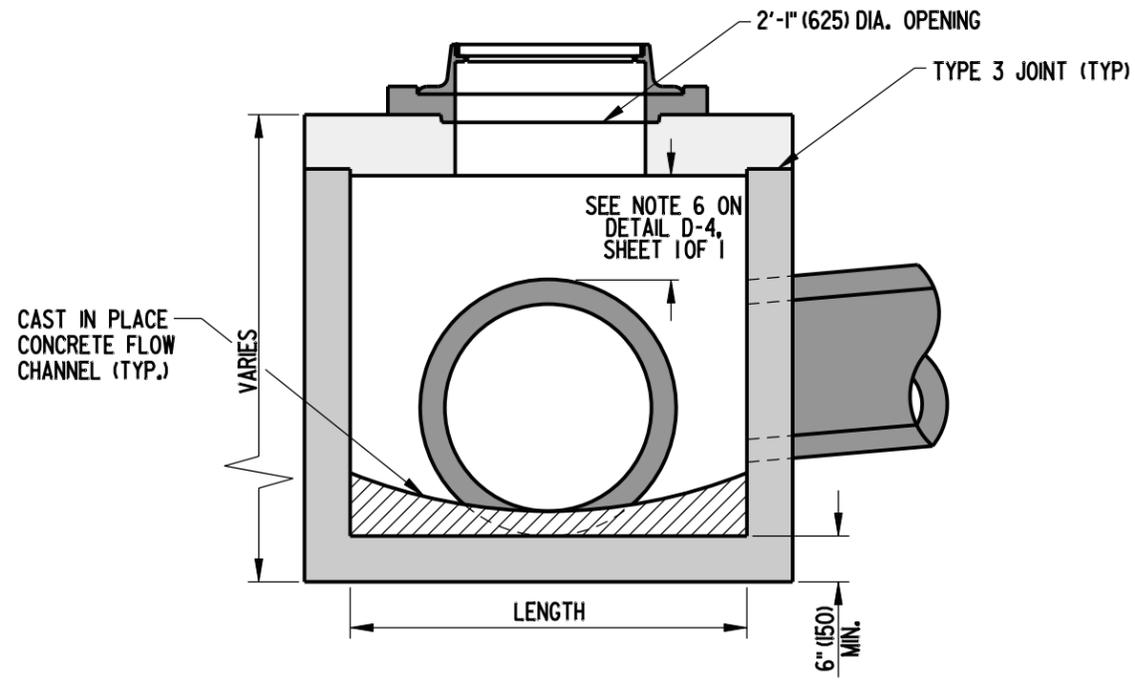
RECOMMENDED

*[Signature]*  
DESIGN ENGINEER

10/23/07  
DATE



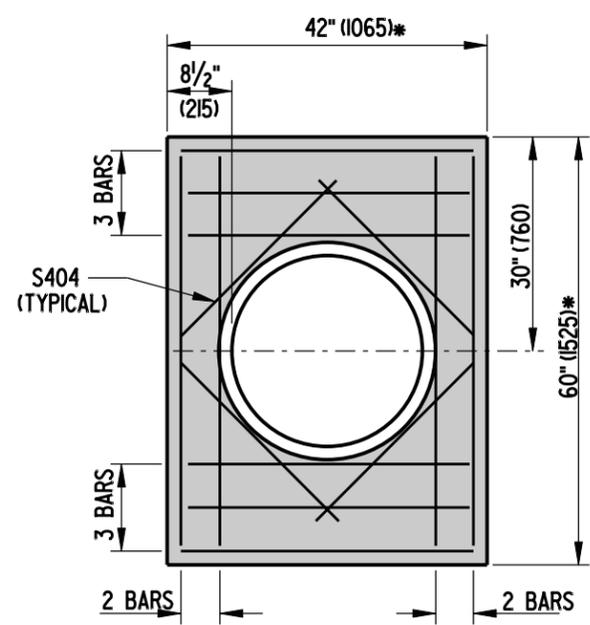
• DIMENSIONS MAY VARY  
 \*\* JOINT SEALANT AS PER SPECIFICATIONS ONLY BETWEEN 2 PRECAST UNITS



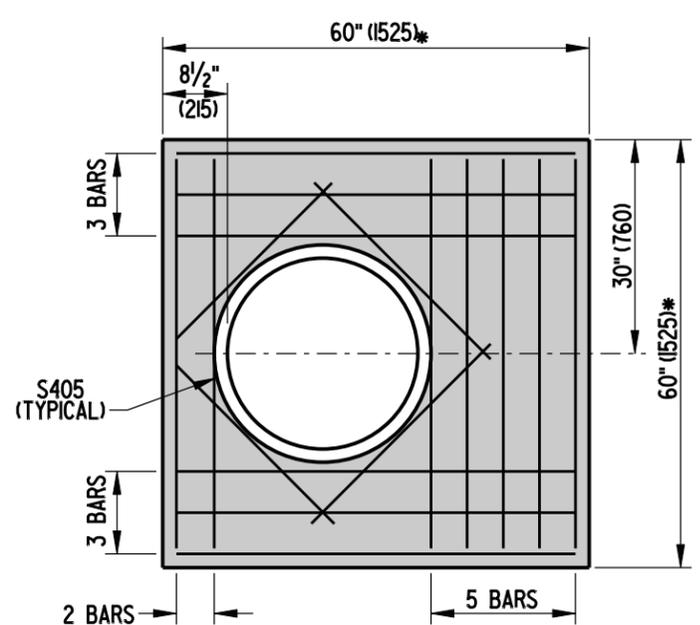
• - SEE OPTIONAL PIPE OPENING DETAIL ON STANDARD D-4, SHEET 1 OF 1.

**BOX MANHOLE ASSEMBLY**

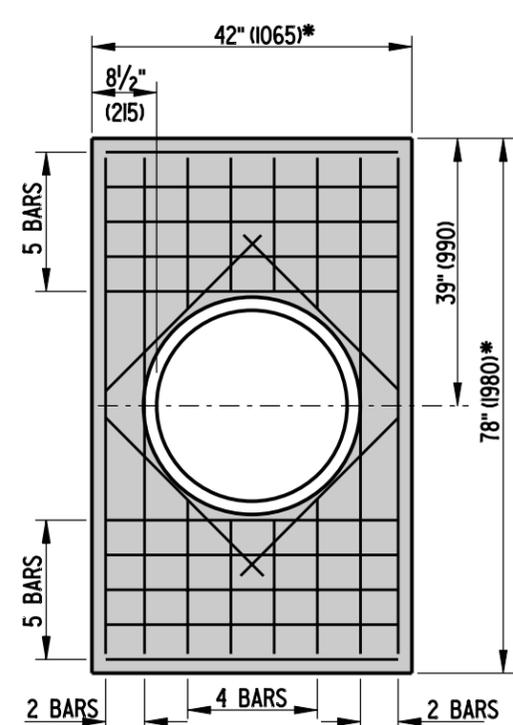
 <b>DELAWARE</b> <b>DEPARTMENT OF TRANSPORTATION</b>	<b>MANHOLE DETAILS</b>			<b>APPROVED</b>  <b>10/24/07</b> <small>CHIEF ENGINEER DATE</small>
	STANDARD NO. <b>D-6 (2007)</b>	SHT. <b>1</b>	OF <b>4</b>	<b>RECOMMENDED</b>  <b>10/23/07</b> <small>DESIGN ENGINEER DATE</small>



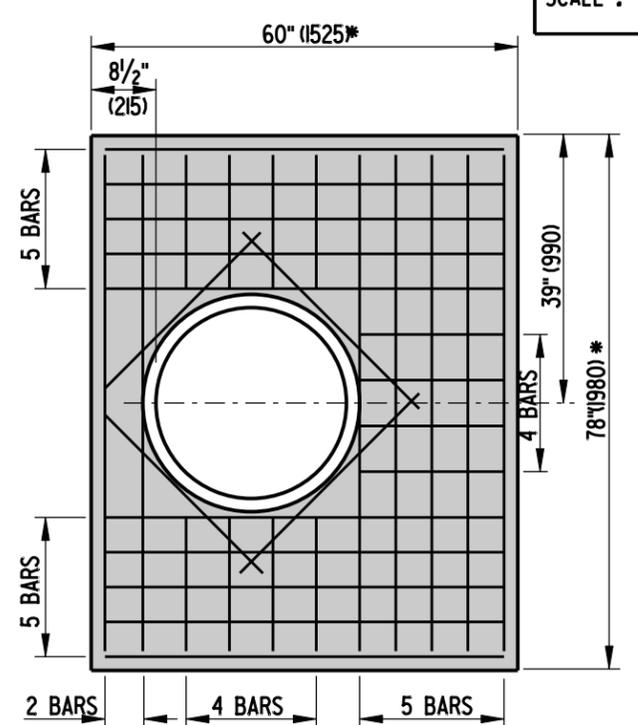
**48" (1220) X 30" (760) MANHOLE**



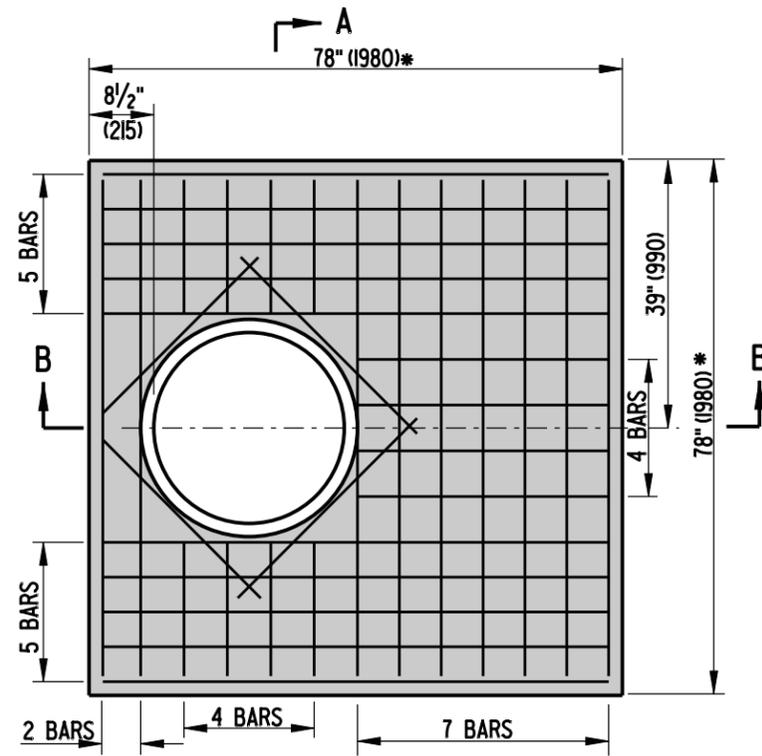
**48" (1220) X 48" (1220) MANHOLE**



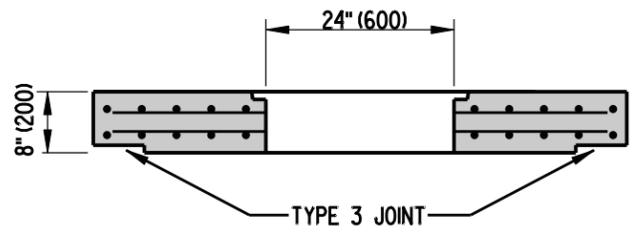
**66" (1675) X 30" (760) MANHOLE**



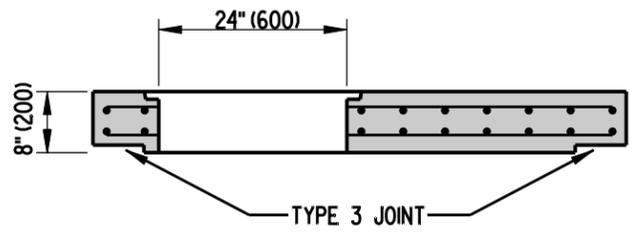
**66" (1675) X 48" (1220) MANHOLE**



**66" (1675) X 66" (1675) MANHOLE**



**SECTION A-A**



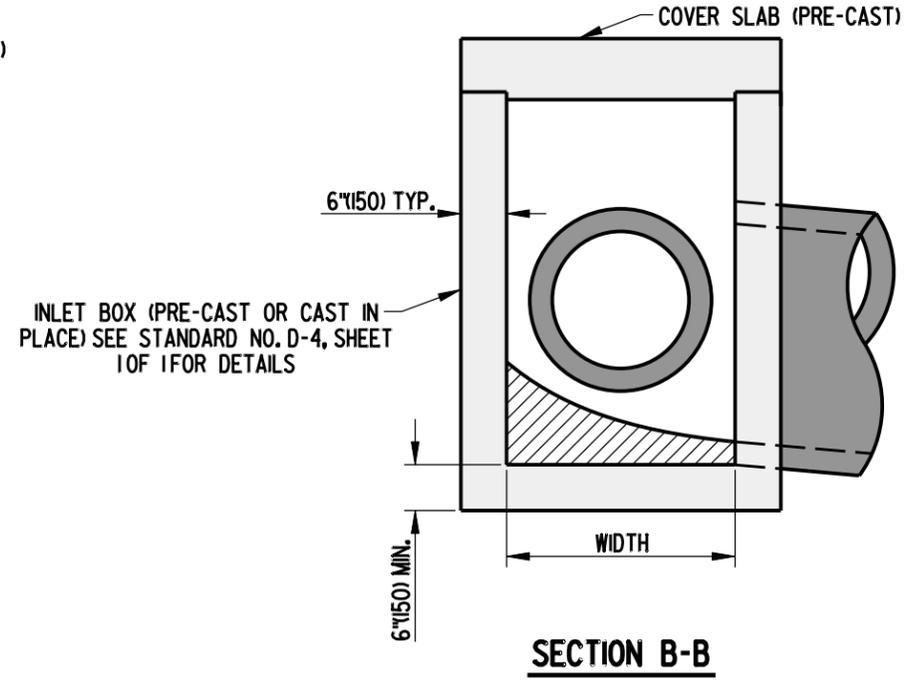
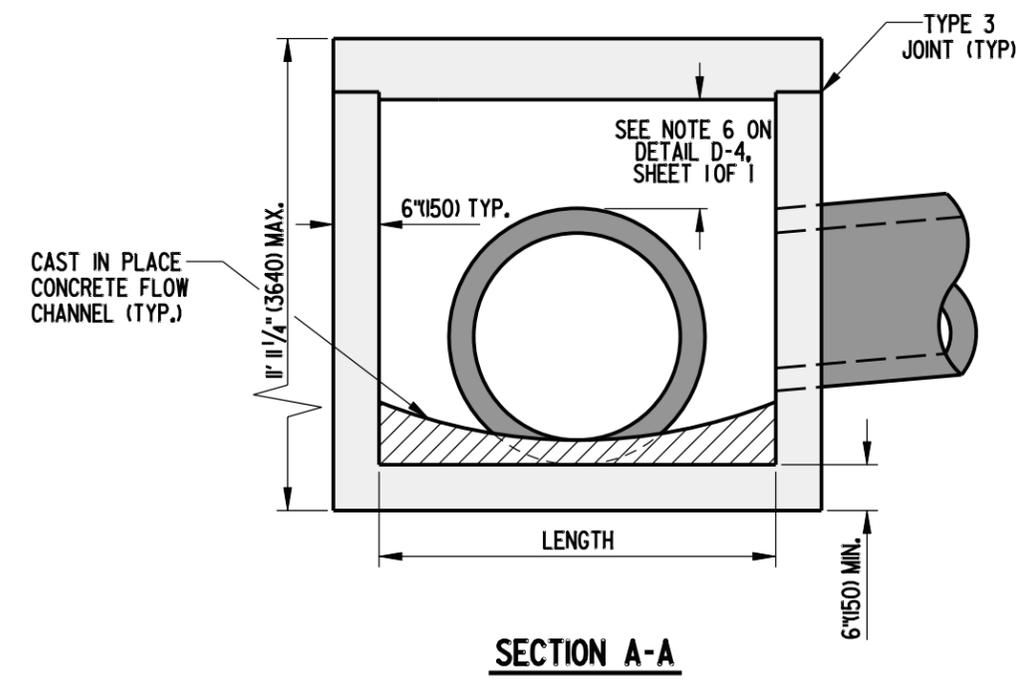
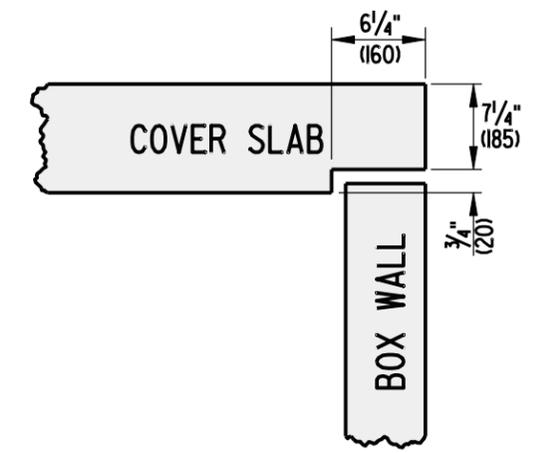
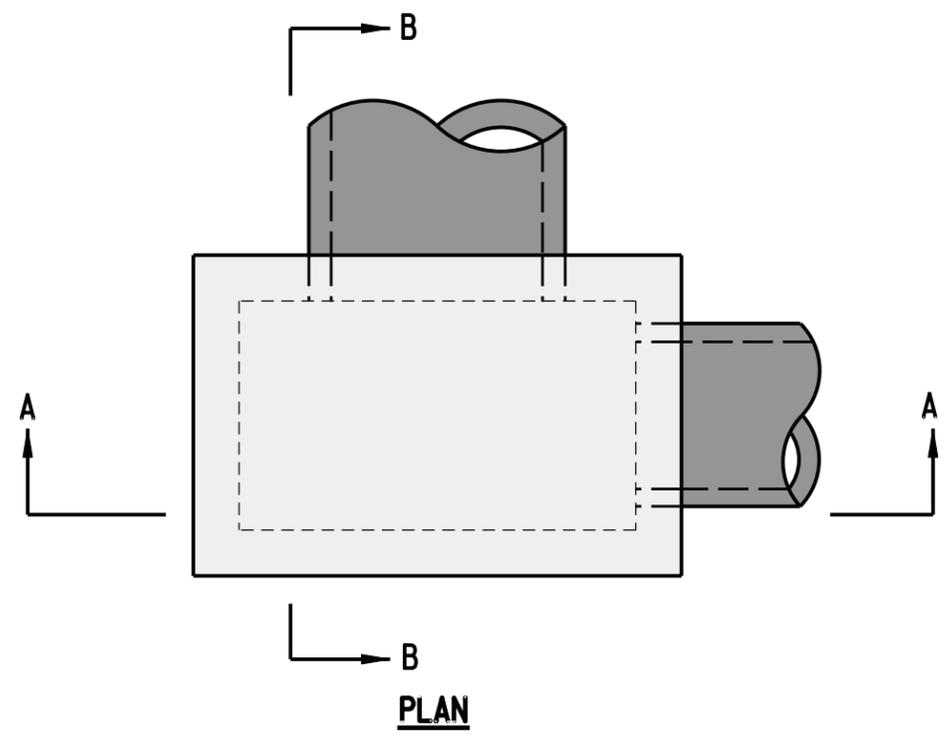
**SECTION B-B**

**BOX MANHOLE COVER SLAB DETAILS**

**NOTES:**

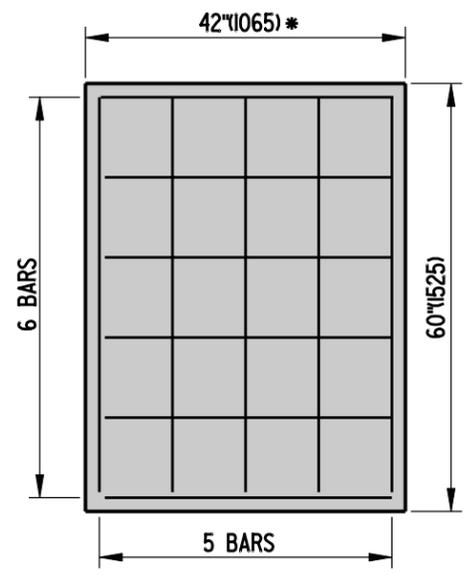
1. COVER SLABS SHALL BE PRE-CAST.
2. ALL BARS SHALL BE #5 (#16) SPACED AT 6" (150) ± UNLESS NOTED OTHERWISE.
3. MINIMUM BAR COVER = 1/2" (38).

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

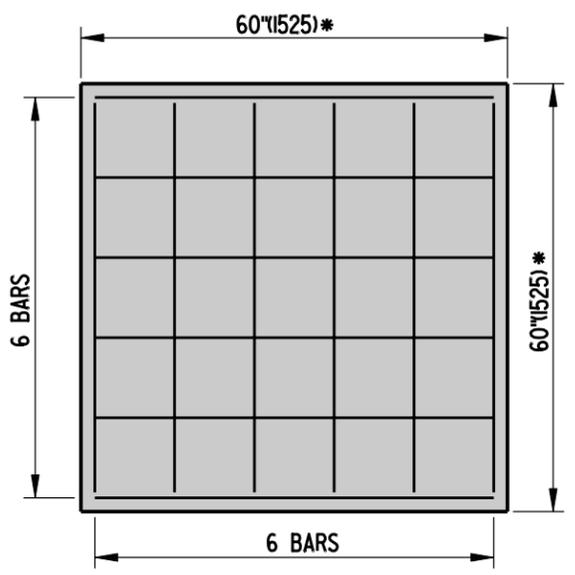


• - SEE OPTIONAL PIPE OPENING DETAIL ON STANDARD NO. D-4, SHEET 1 OF 1.

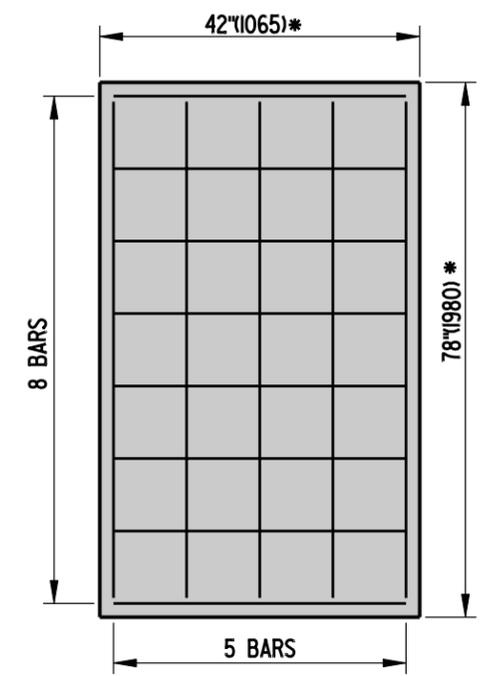
**JUNCTION BOX ASSEMBLY**



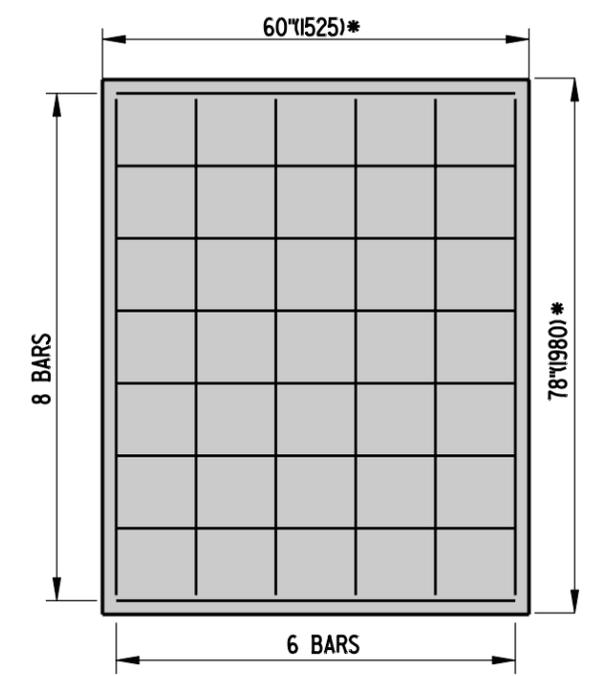
**48" (1220) x 30" (760)  
JUNCTION BOX**



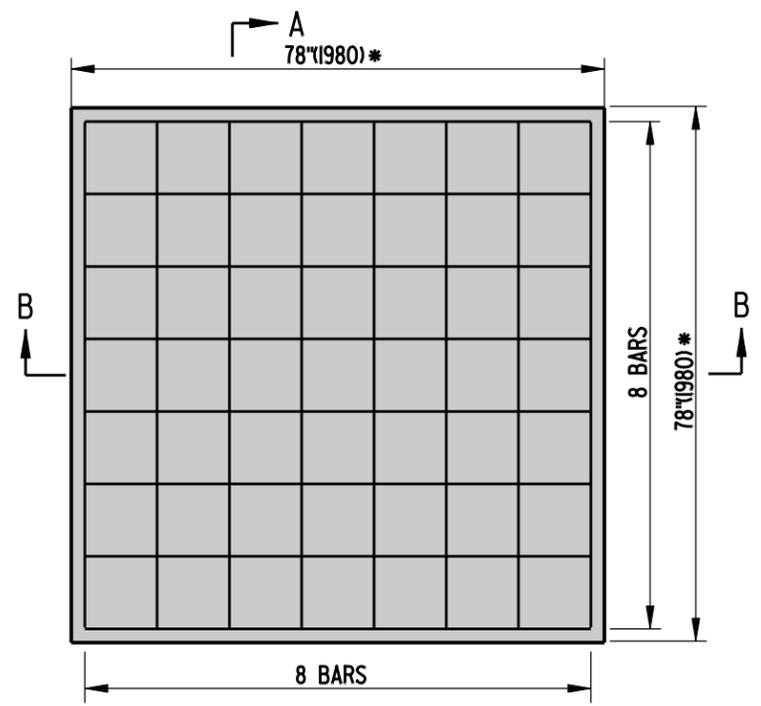
**48" (1220) x 48" (1220)  
JUNCTION BOX**



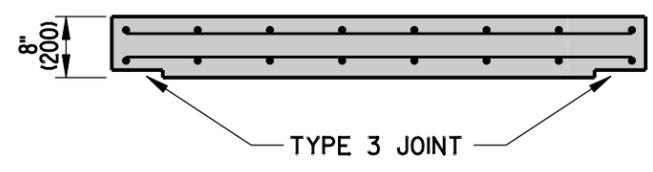
**66" (1675) x 30" (760)  
JUNCTION BOX**



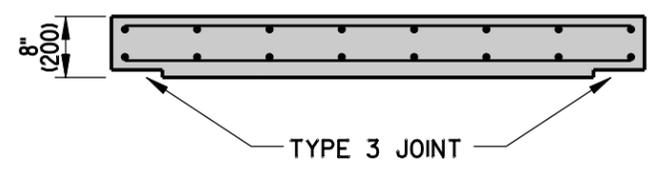
**66" (1675) x 48" (1220)  
JUNCTION BOX**



**66" (1675) x 66" (1675)  
JUNCTION BOX**



**SECTION A-A**

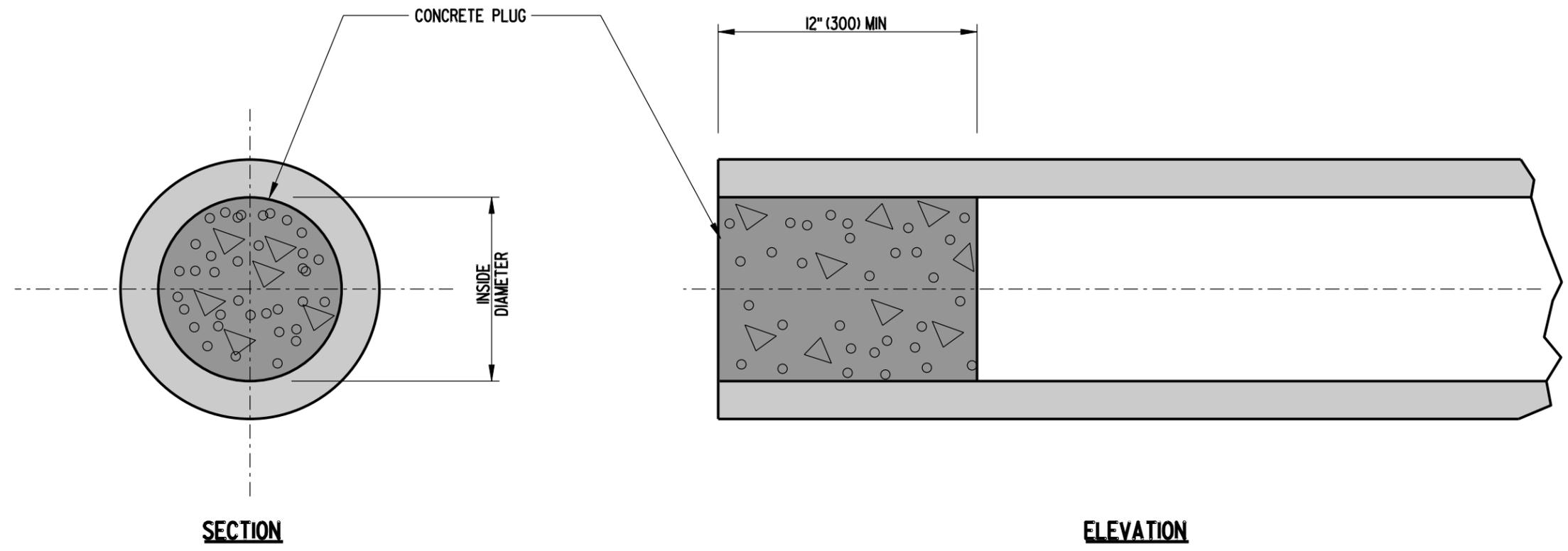


**SECTION B-B**

**JUNCTION BOX COVER SLAB DETAILS**

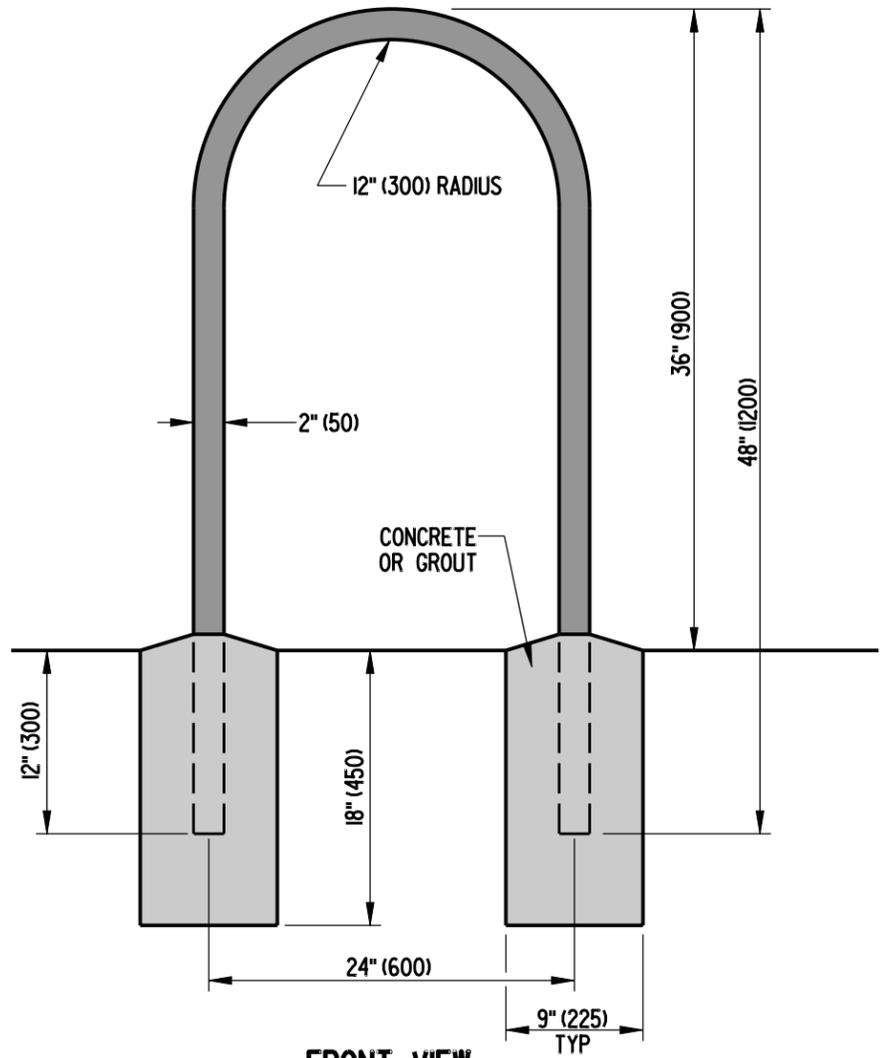
**NOTES:**

1. COVER SLABS ARE TO BE PRE-CAST.
  2. ALL BARS ARE TO BE #5 (#16) SPACED @ 12" (305) ± UNLESS NOTED OTHERWISE.
  3. MINIMUM BAR COVER = 1 1/2" (38).
- \* - DIMENSIONS TO MATCH OUTSIDE TO OUTSIDE DIMENSIONS OF BOX.

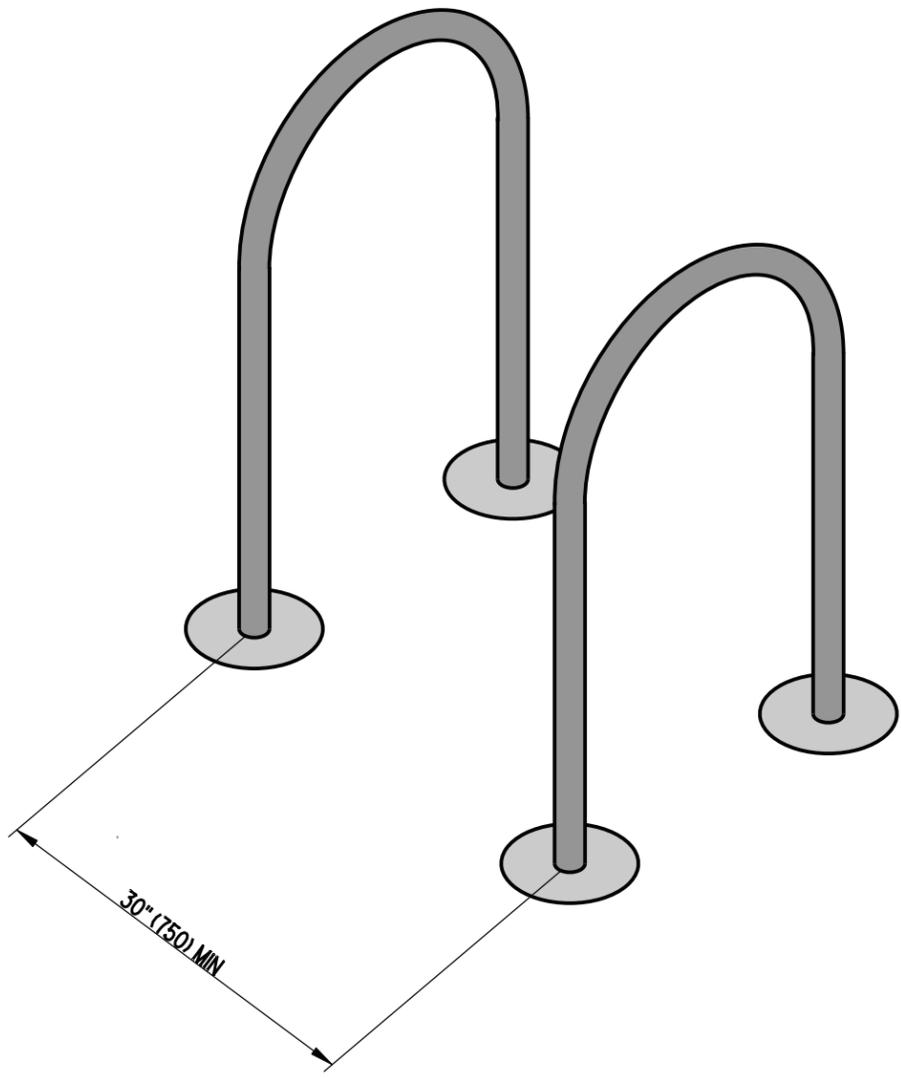


**NOTE:**  
 THE CONTRACTOR SHALL FURNISH MATERIAL AND PLUG ABANDONED DRAINAGE PIPES WITH CONCRETE AS DIRECTED BY THE ENGINEER.

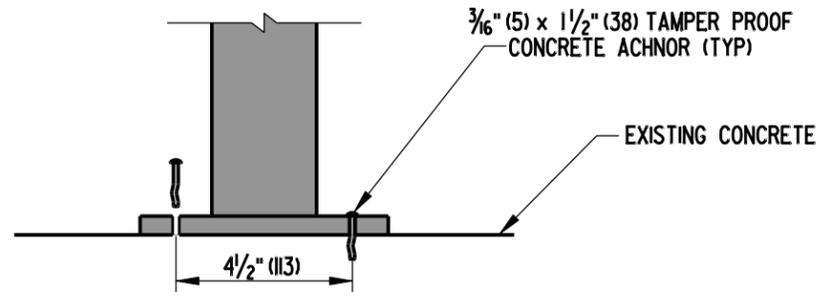
 <b>DELAWARE</b> <b>DEPARTMENT OF TRANSPORTATION</b>	<b>PIPE PLUGGING DETAIL</b>			<b>APPROVED</b>  <u>10/24/07</u> <small>CHIEF ENGINEER</small> <small>DATE</small>
	<b>STANDARD NO.</b> D-10 (2007)	<b>SHT.</b> 1	<b>OF</b> 1	<b>RECOMMENDED</b>  <u>10/23/07</u> <small>DESIGN ENGINEER</small> <small>DATE</small>



**FRONT VIEW**

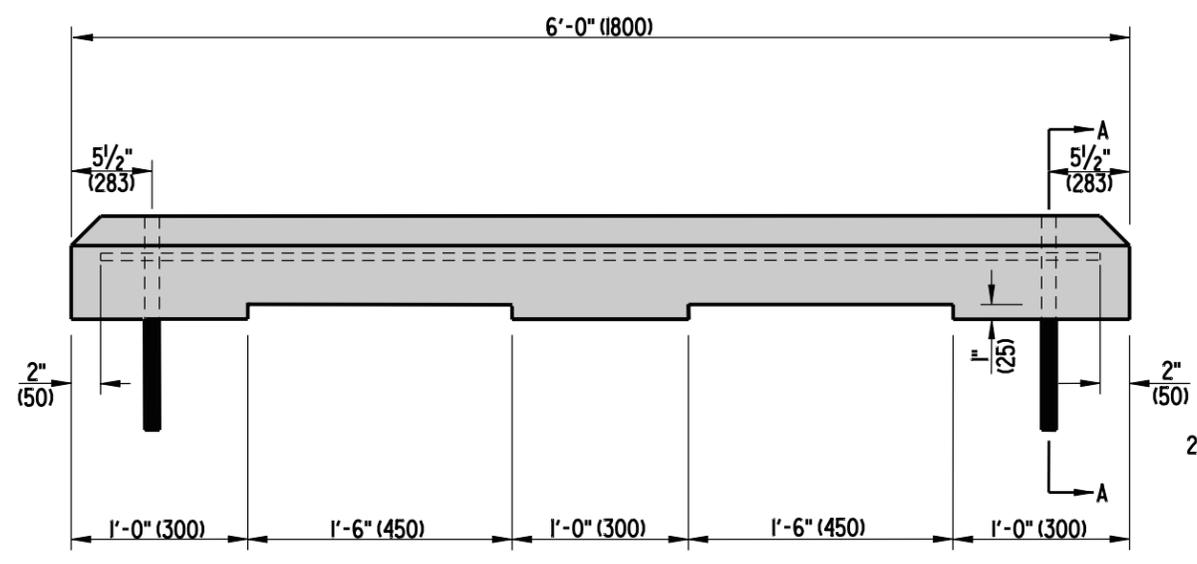


**ISOMETRIC VIEW**  
4 BIKE INSTALLATION

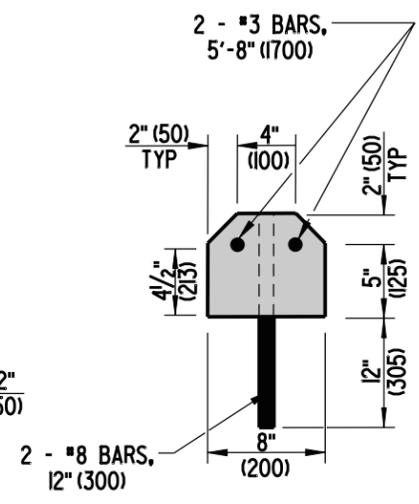


**ALTERNATE ANCHOR OPTION SECTION VIEW**

 <b>DELAWARE</b> <b>DEPARTMENT OF TRANSPORTATION</b>	<b>BIKE RACK DETAILS</b>				<b>APPROVED</b>  <small>CHIEF ENGINEER</small>	<b>10/24/07</b> <small>DATE</small>
	<b>STANDARD NO.</b> M-4 (2007)	<b>SHT.</b> 1	<b>OF</b> 1	<b>RECOMMENDED</b>  <small>DESIGN ENGINEER</small>	<b>10/23/07</b> <small>DATE</small>	



**ELEVATION**



**SECTION A-A**



**DELAWARE  
DEPARTMENT OF TRANSPORTATION**

<b>P.C.C. PARKING BUMPER</b>			
<b>STANDARD NO.</b>	<b>M-8 (2007)</b>	<b>SHT.</b>	<b>1 OF 1</b>

**APPROVED** *[Signature]* 10/24/07  
CHIEF ENGINEER DATE

**RECOMMENDED** *[Signature]* 10/23/07  
DESIGN ENGINEER DATE