

# CITYWIDE INFRASTRUCTURE REHABILITATION AND IMPROVEMENTS



CITY OF  
**Tulsa**  
*A New Kind of Energy™*

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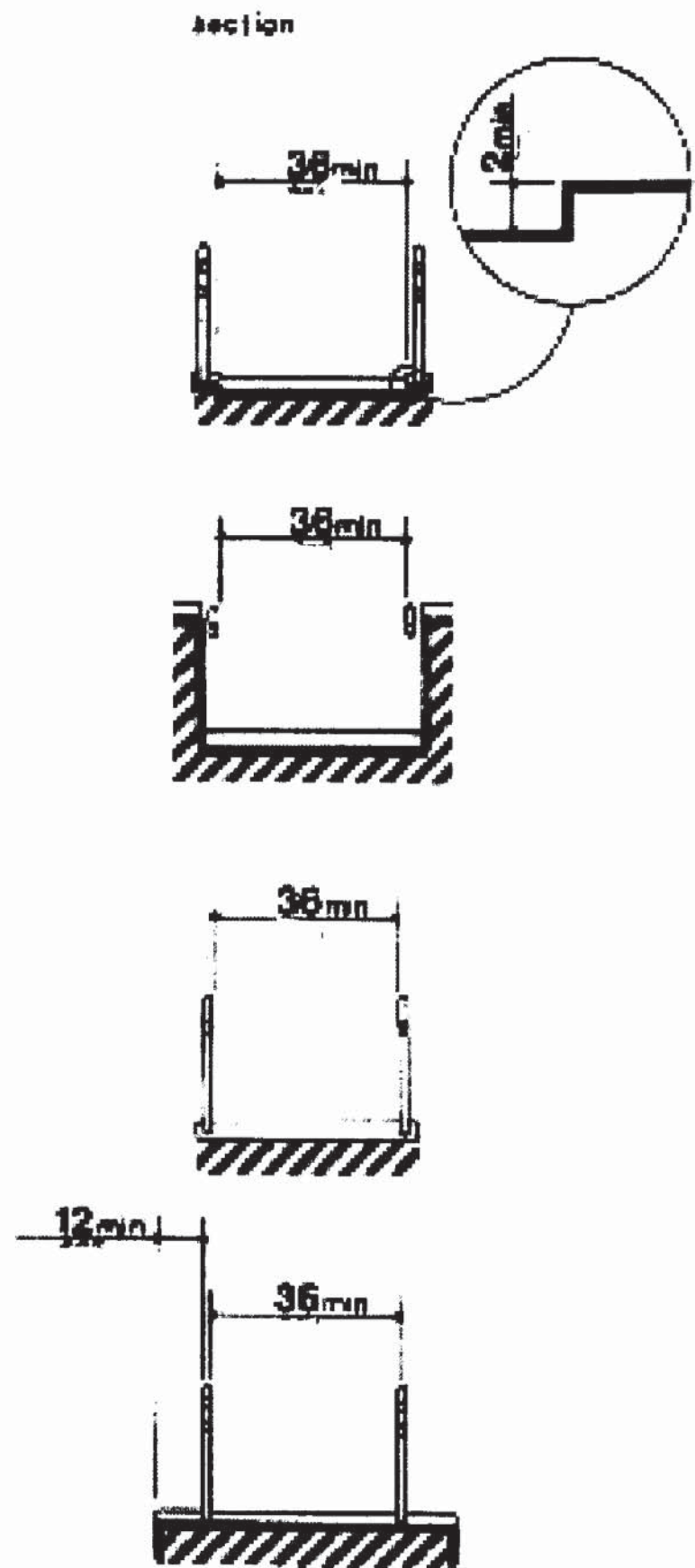
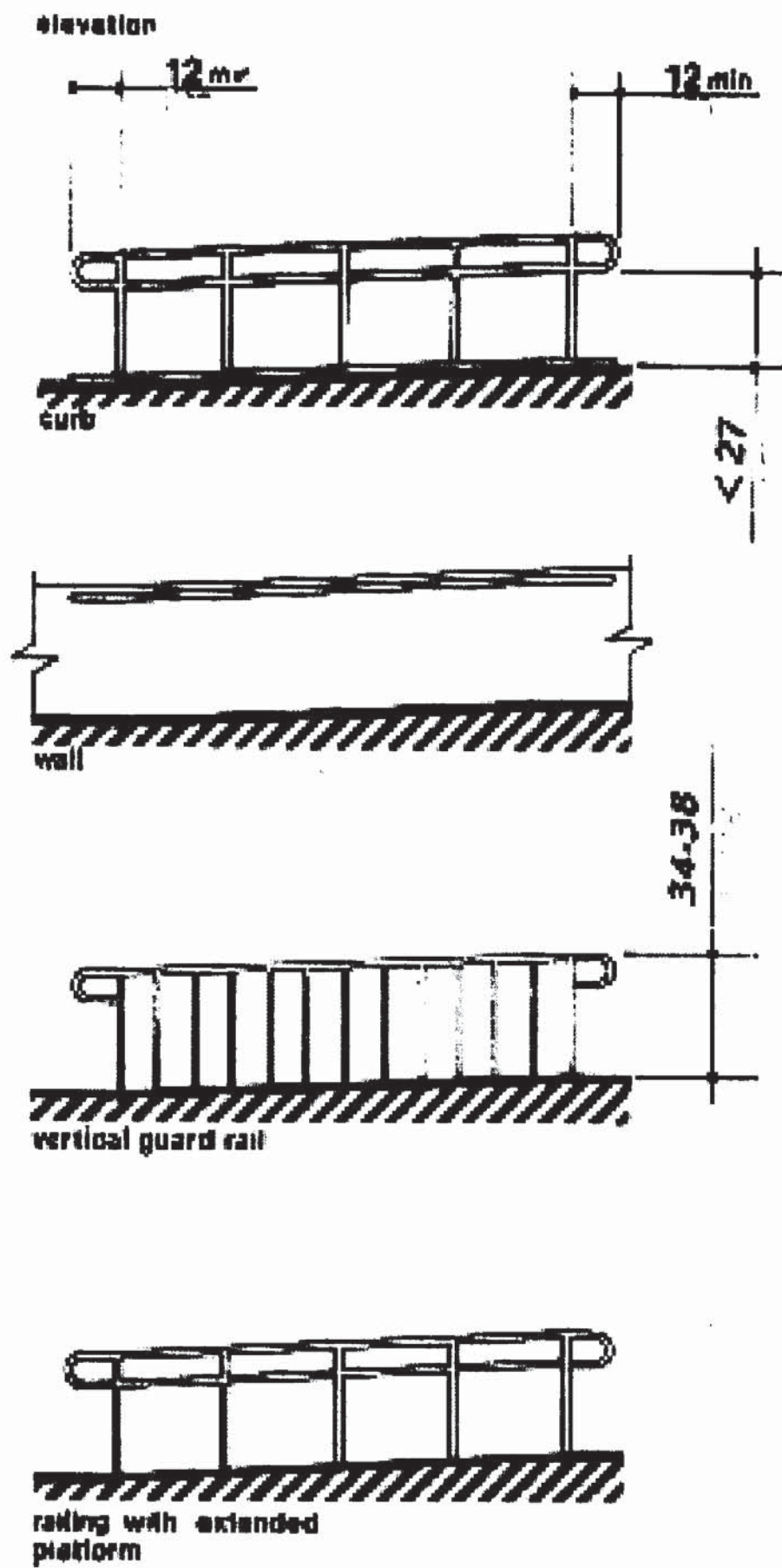
SH-1-2

TDL-1

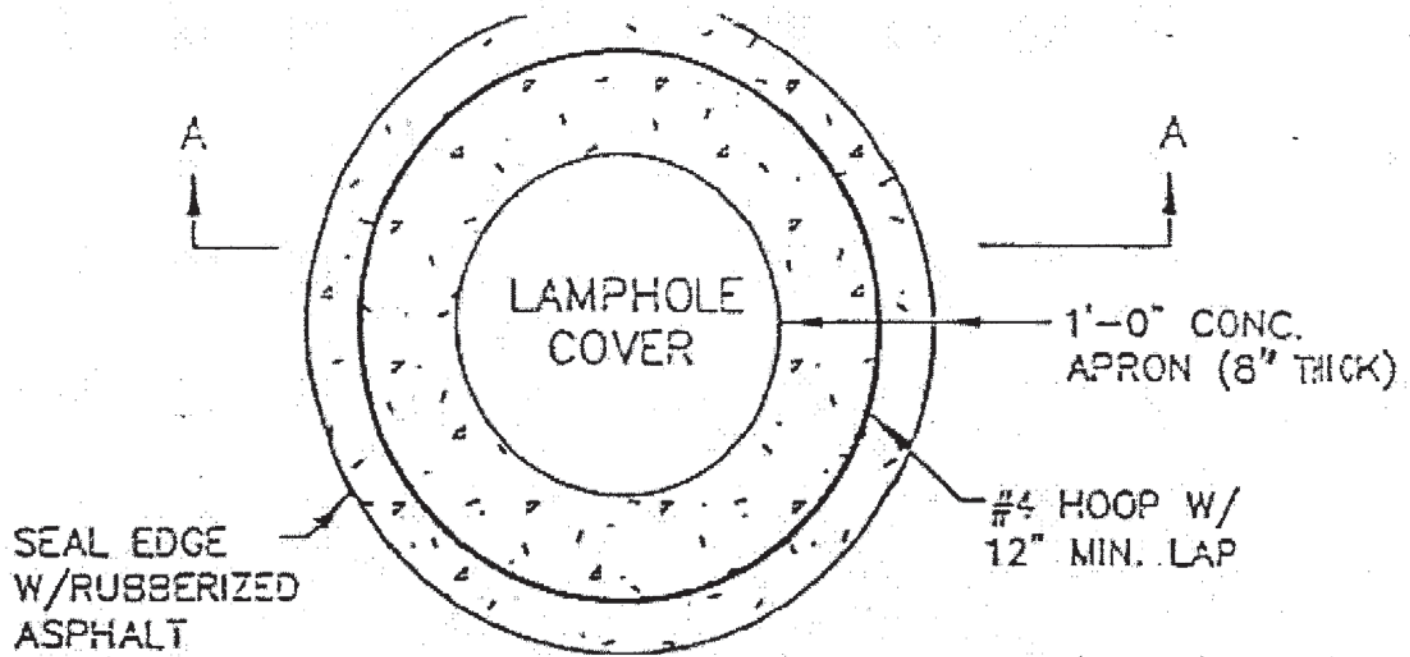
*STREETS & STORMWATER DEPARTMENT*

*4015 NORTH HARVARD AVE  
TULSA, OKLAHOMA 74115  
(918) 596-9621*

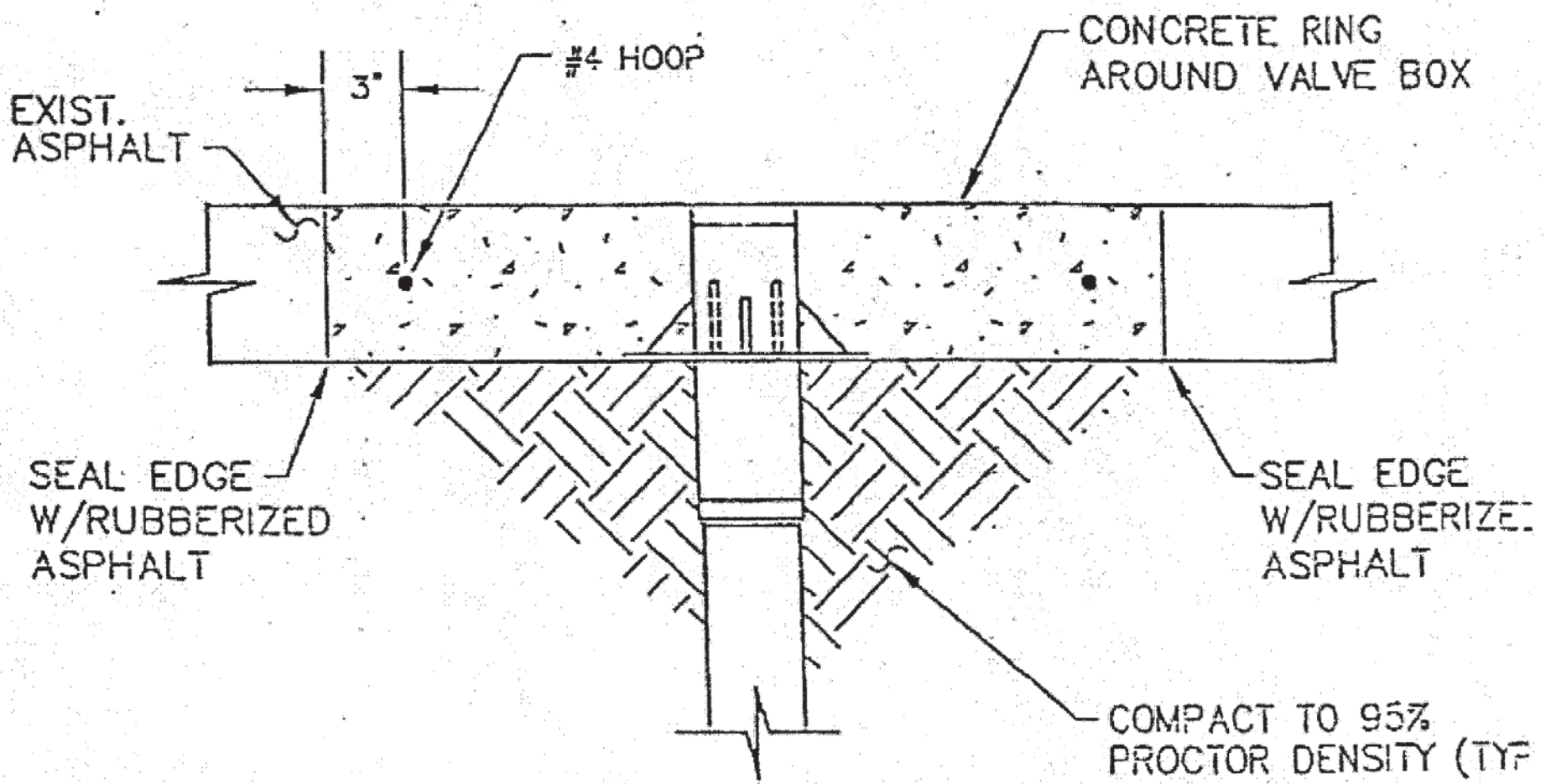
# DRAWINGS



**Examples of Edge Protection and Handrail Extensions**



PLAN VIEW



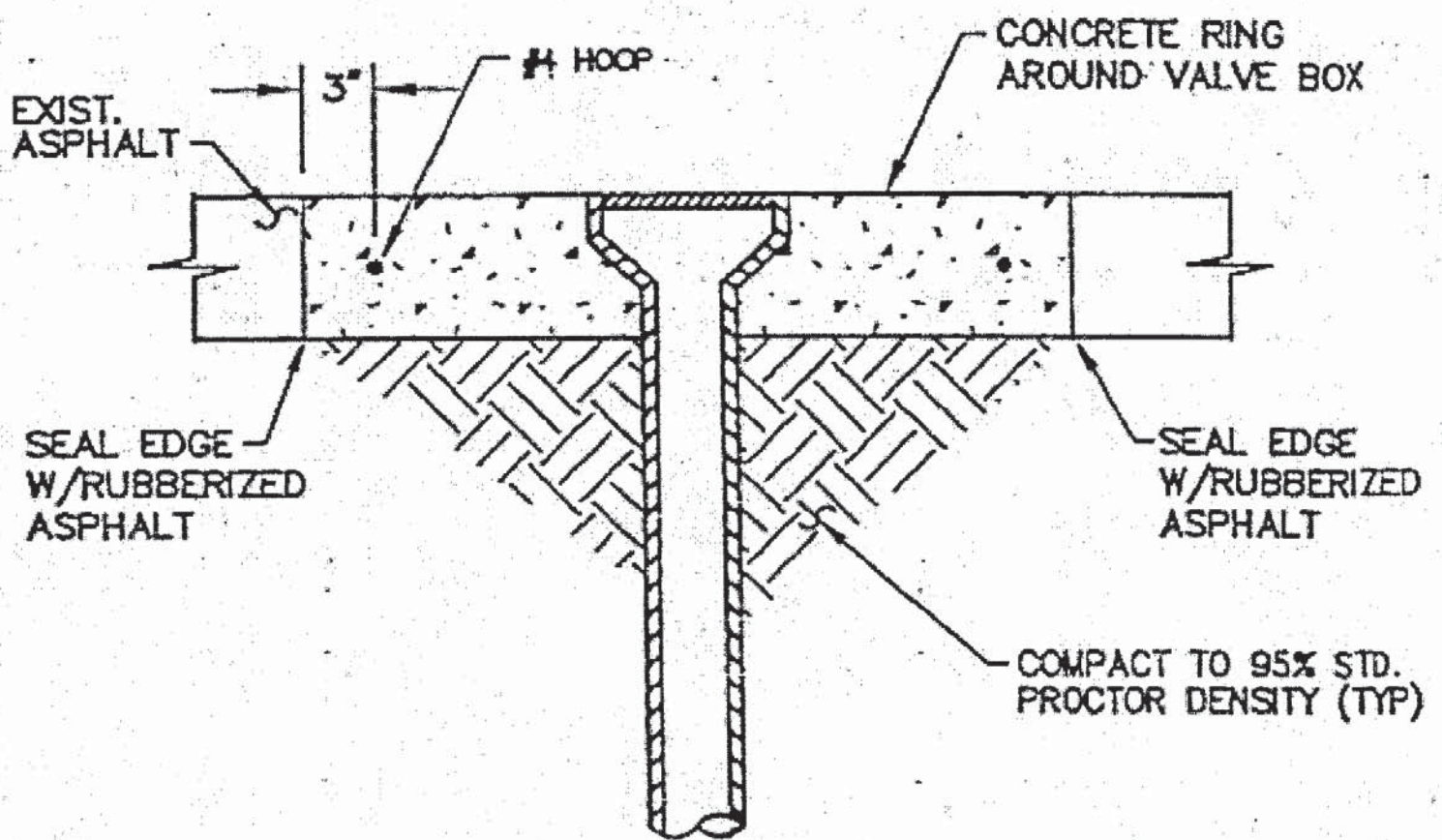
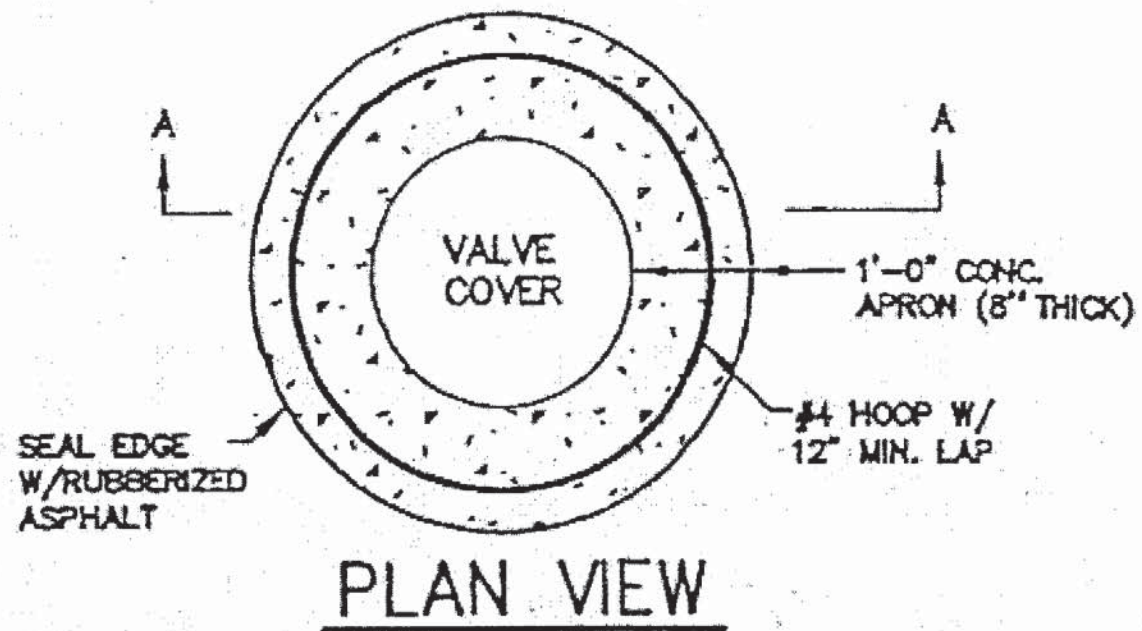
SECTION A

LAMPHOLES IN ASPHALT  
ADJUST TO GRADE

N.T.S.

ARU-2





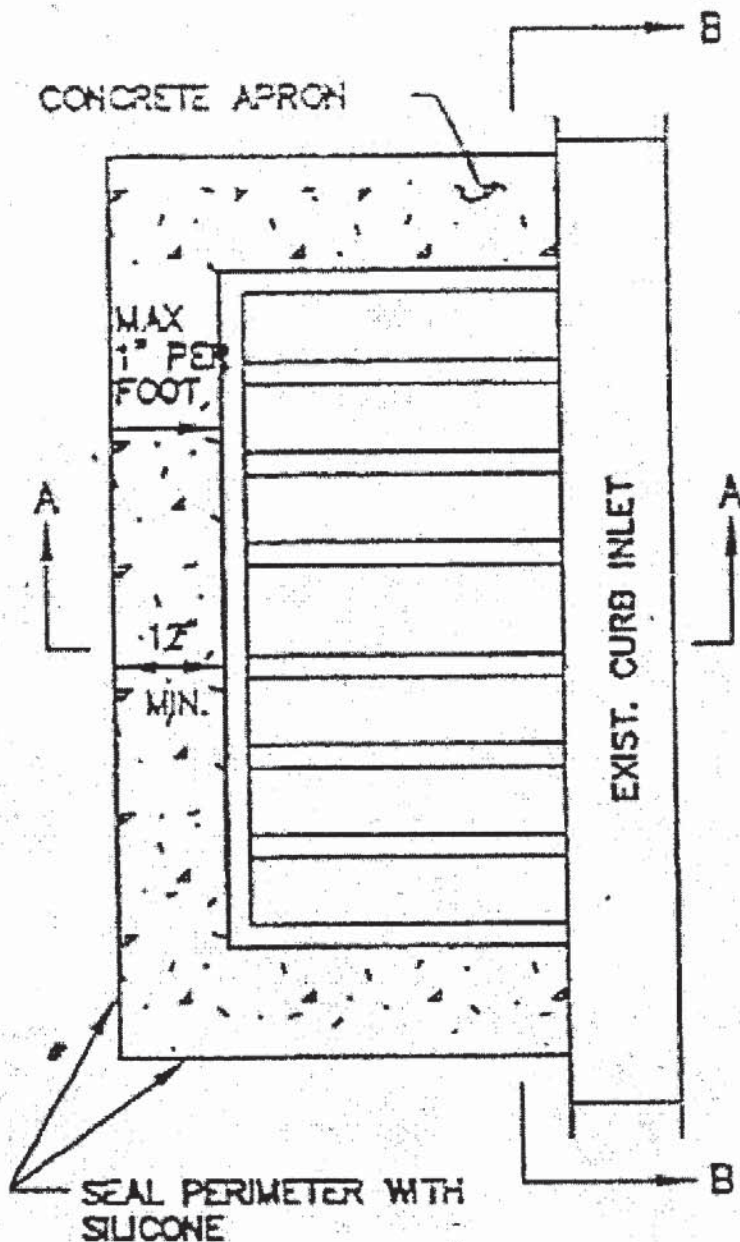
SECTION A

WATER VALVES TO GRADE  
IN ASPHALT STREET

N.T.S.

ARU-3

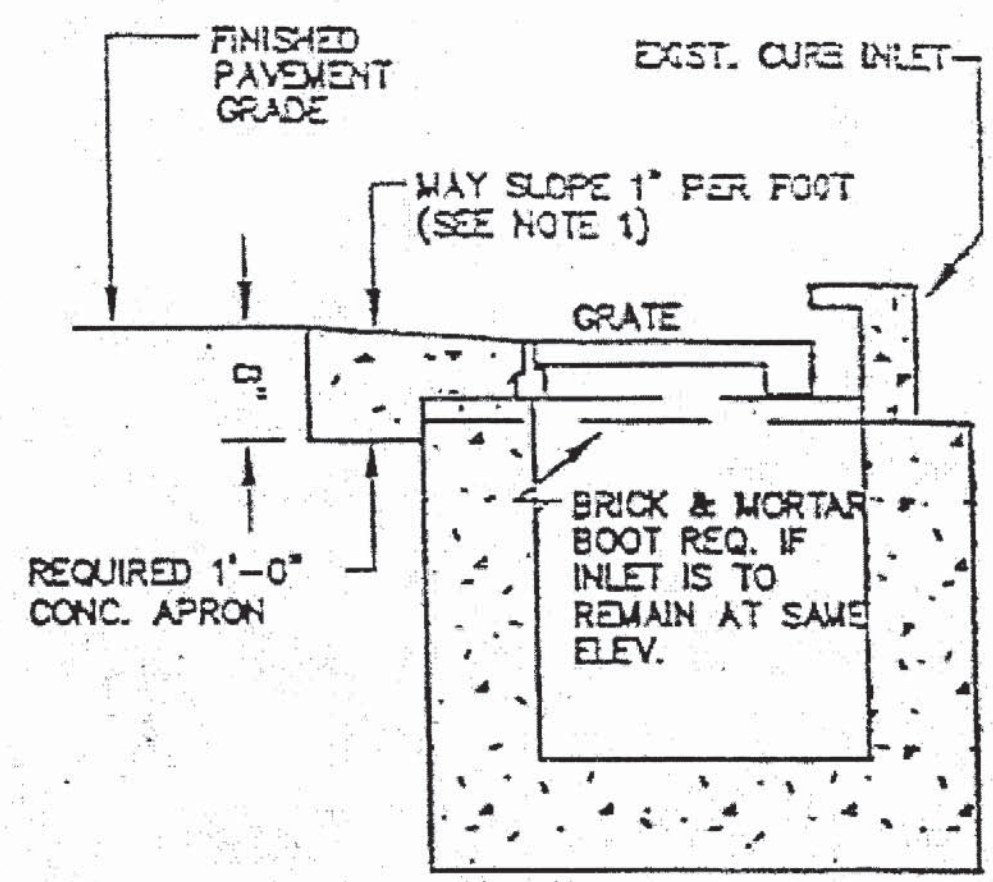




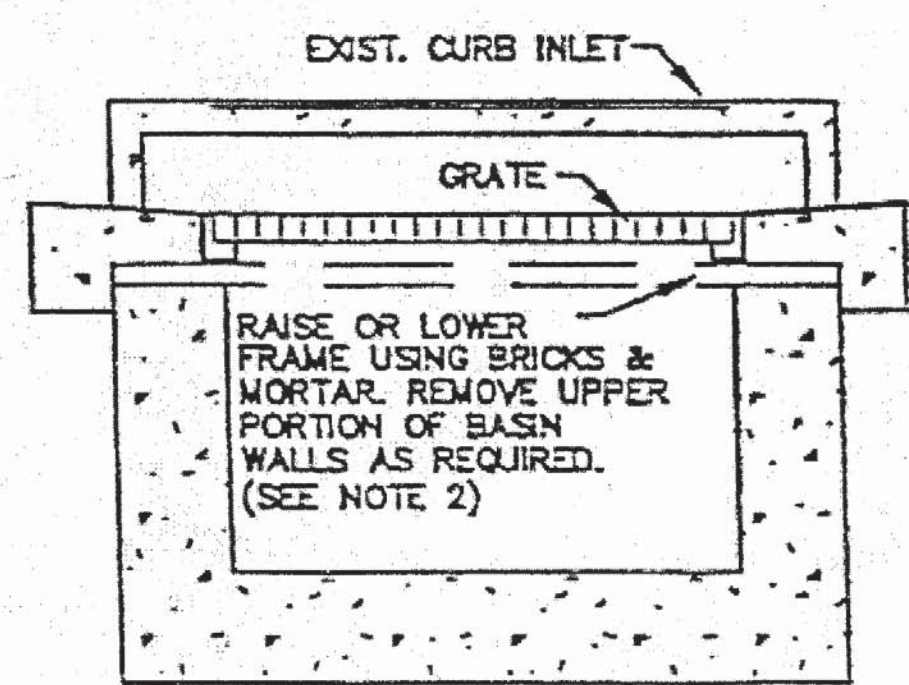
PLAN VIEW

NOTE 1: CONCRETE APRON SHALL BE SLOPED AS REQUIRED; MAX SLOPE IS 1" PER LINEAR FOOT.

NOTE 2: IF BASIN WALLS ARE CONCRETE, MAY DOWEL APRON INTO EXIST. WALL



SECTION A-A



SECTION B-B

INLETS ADJUST TO GRADE

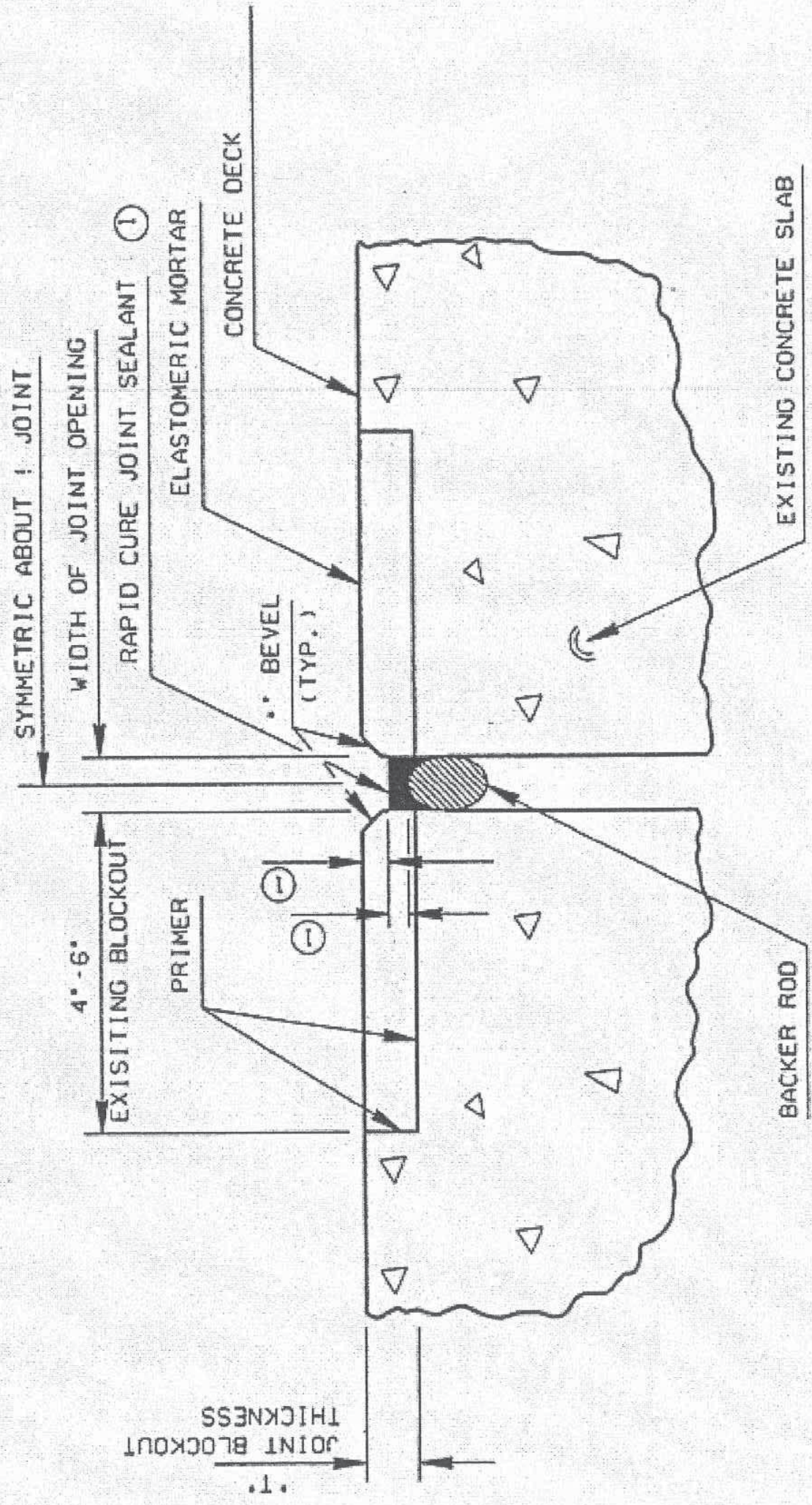
N.T.S.

ARU-4



JOINT REPAIR  
WITH OUT NOSING

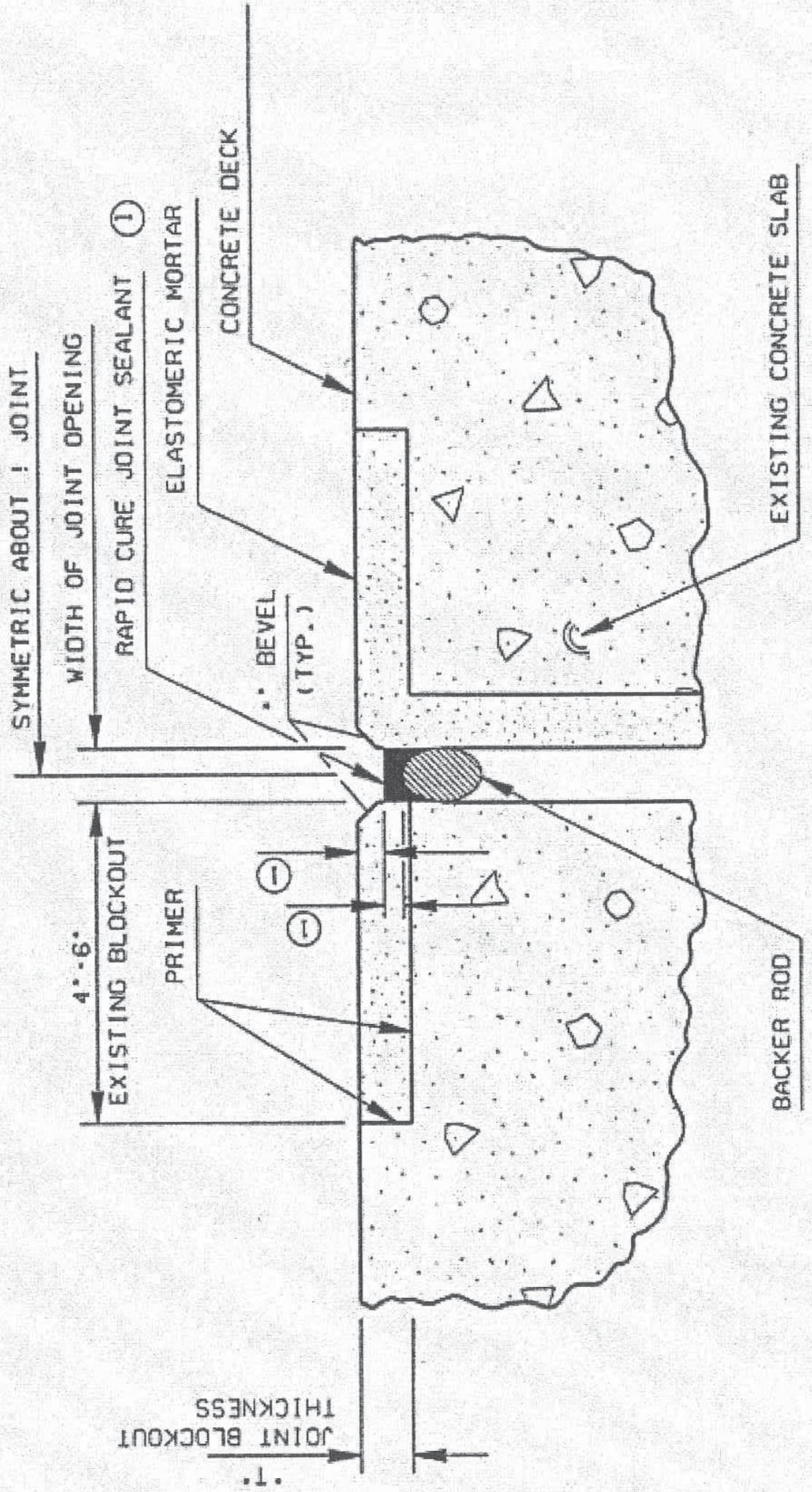
- ① REFER TO TABLE 1
- ② DO NOT BOND ELASTOMERIC MORTAR TO WEAK OR ROTTEN CONCRETE.





JOINT REPAIR  
WITH NOSING (ONE SIDE)

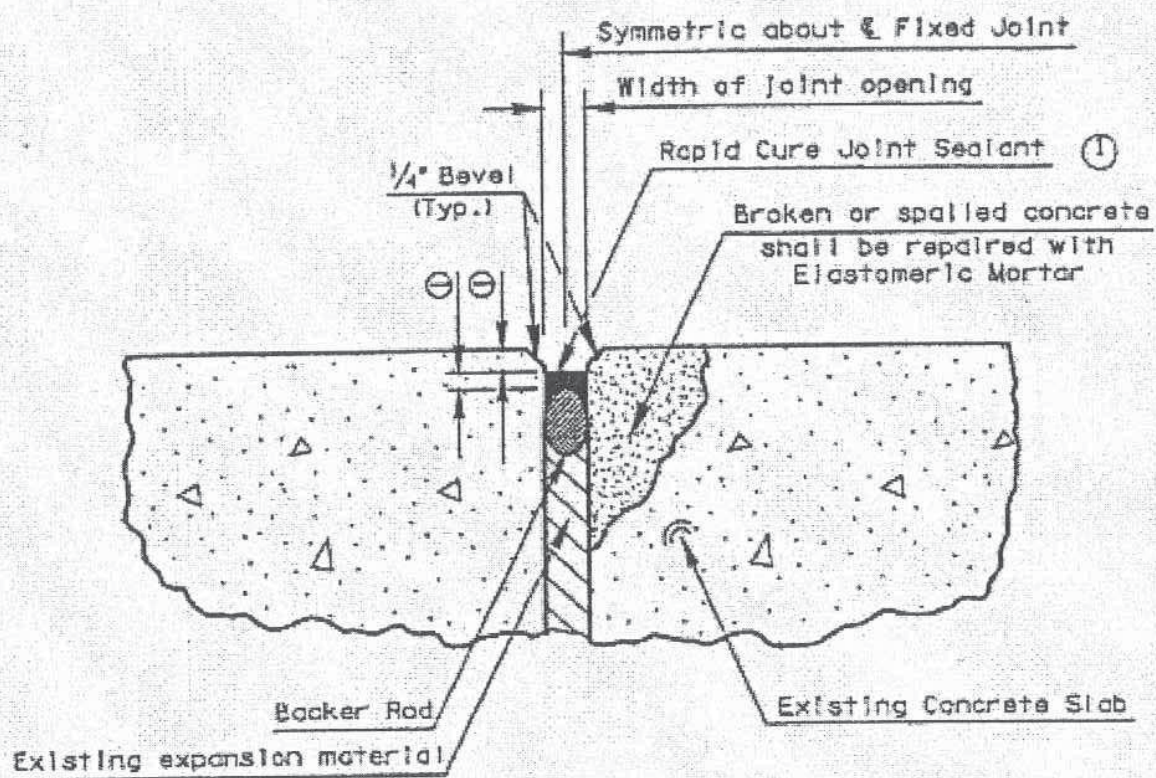
- ① REFER TO TABLE 1
- ② DO NOT BOND ELASTOMERIC MORTAR TO WEAK OR ROTTEN CONCRETE.





JOINT REPAIR FOR FIXED  
JOINTS WITH NO OVERLAY

- ① Refer to Table 1
- ② Do not bond Elastomeric Mortar to weak or rotten concrete.



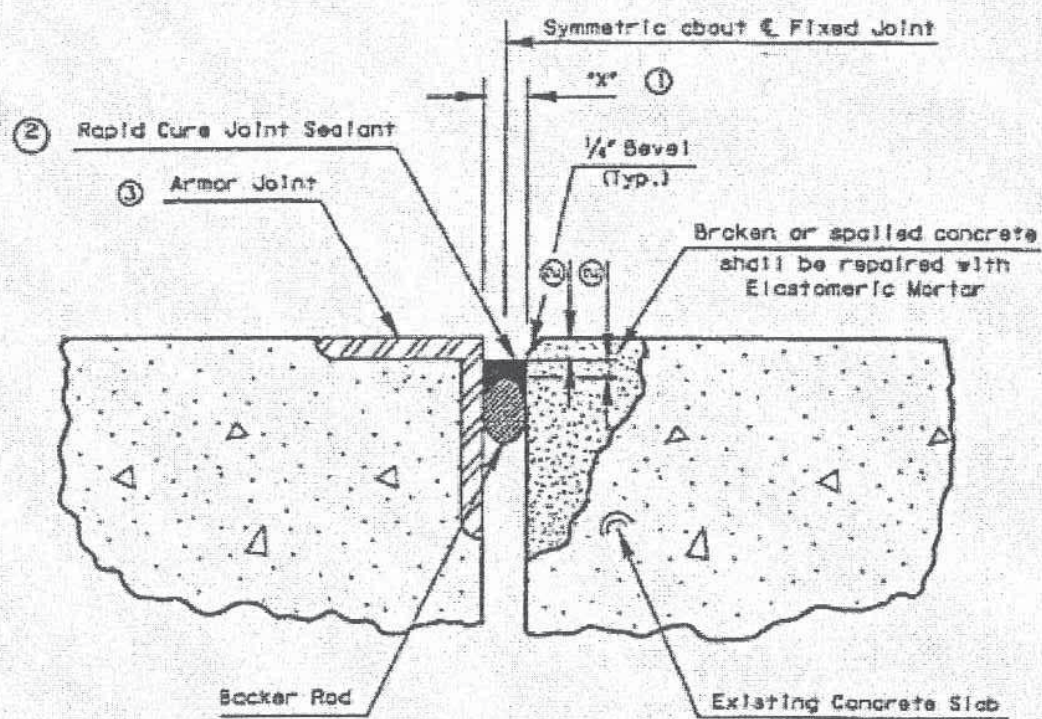
NOTE: Remove broken or spalled concrete to solid material. In some instances the concrete removal may be so extensive that it may be necessary to reinforce the Elastomeric Mortar.

Nosing of sufficient thickness can be ready for traffic in 2-4 hours depending on temperature.



JOINT REPAIR FOR EXPANSION  
JOINTS WITH NO OVERLAY

- ① "X" should be in the range of 1" to 3". See Table 2
- ② Refer to Table 1
- ③ If Armor Joint is loose, removal of the Armor Joint is strongly recommended.
- ④ Do not bond Elastomeric Mortar to weak or rotten concrete.



NOTE: Remove broken or spalled concrete to solid material. In some instances the concrete removal may be so extensive that it may be necessary to reinforce the Elastomeric Mortar.

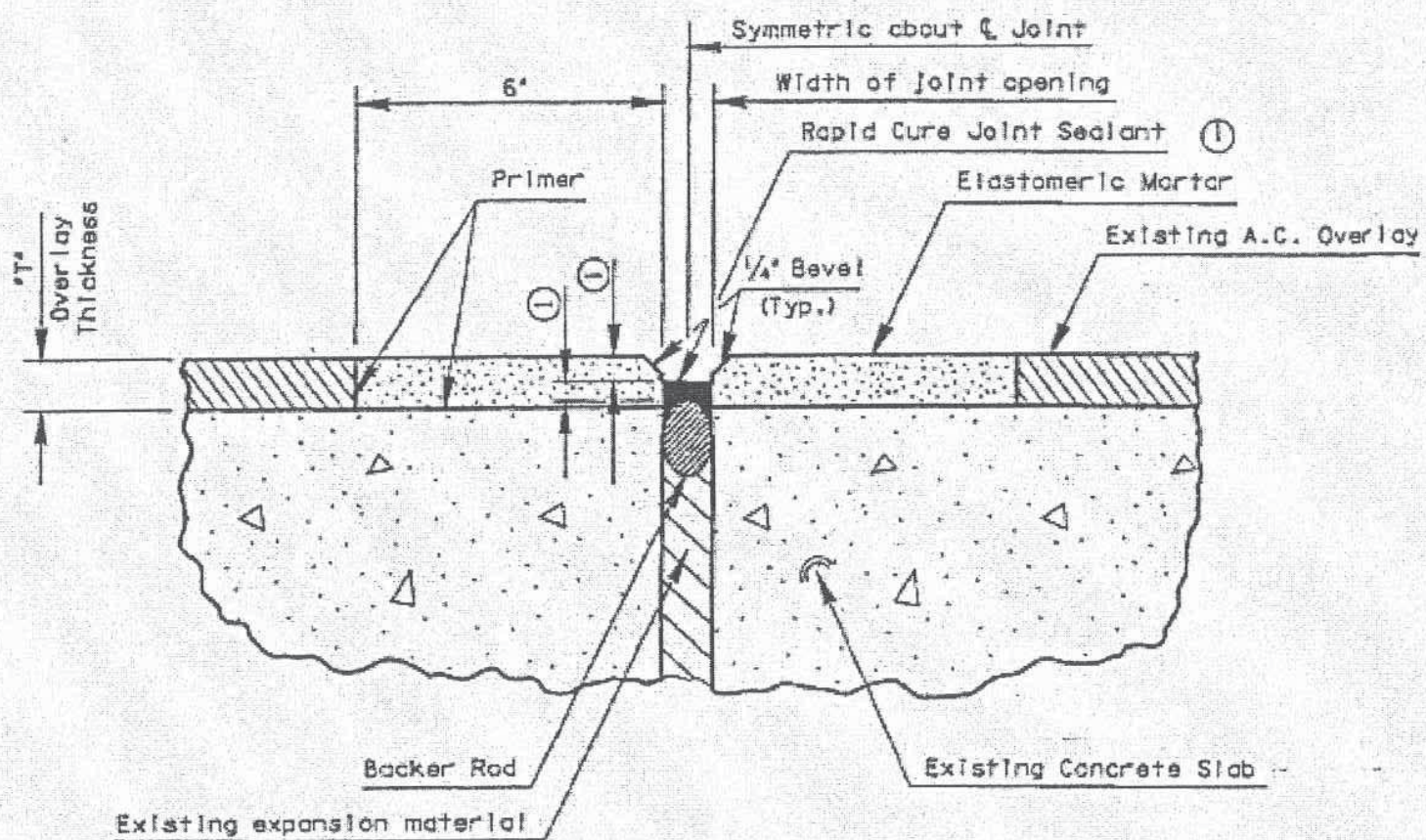
If full depth removal of the deck is required, and the limits of removal extend more than 6 inches back from the joint edge, contact the Bridge Division for recommendations.

Nosing of sufficient thickness can be ready for traffic in 2-4 hours depending on temperature.



JOINT REPAIR FOR FIXED  
JOINTS WITH A.C. OVERLAY

- ① Refer to Table 1  
② Do not bond Elastomeric Mortar to weak or rotten concrete.



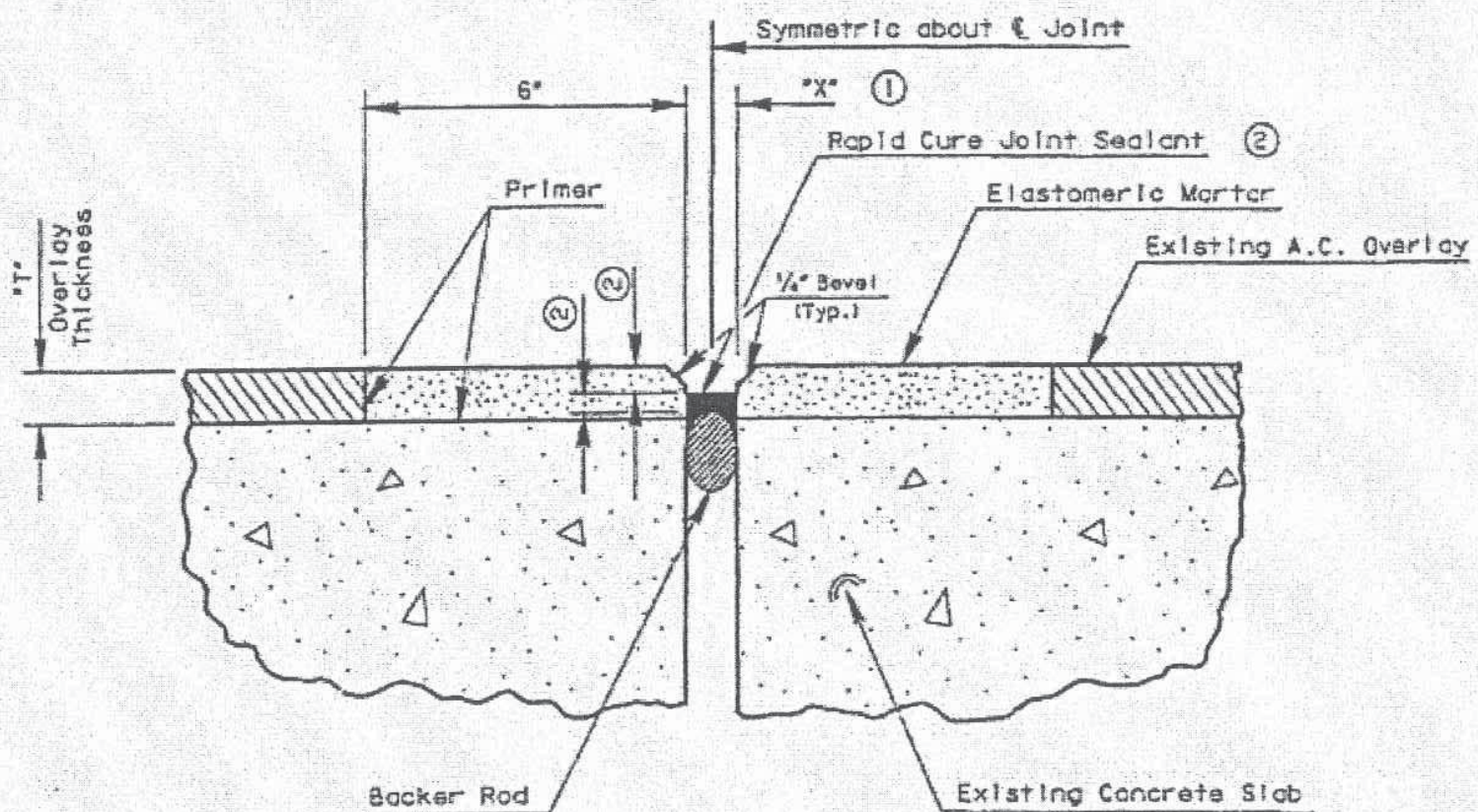
NOTE: Asphalt Concrete Overlay across the bridge deck and the approach slabs at the Joint Sealant Locations shall be cut and removed as detailed and the concrete surface prepared in accordance with the Sealant manufacturers specifications.

Nosing of sufficient thickness can be ready for traffic in 2-4 hours depending on temperature.



JOINT REPAIR FOR JOINTS HAVING  
OVERLAYS AND OPENINGS OF 1' to 3'

- ① "X" should be in the range of 1' to 3'
- ② Refer to Table 1
- ③ Do not bond Elastomeric Mortar to weak or rotten concrete.



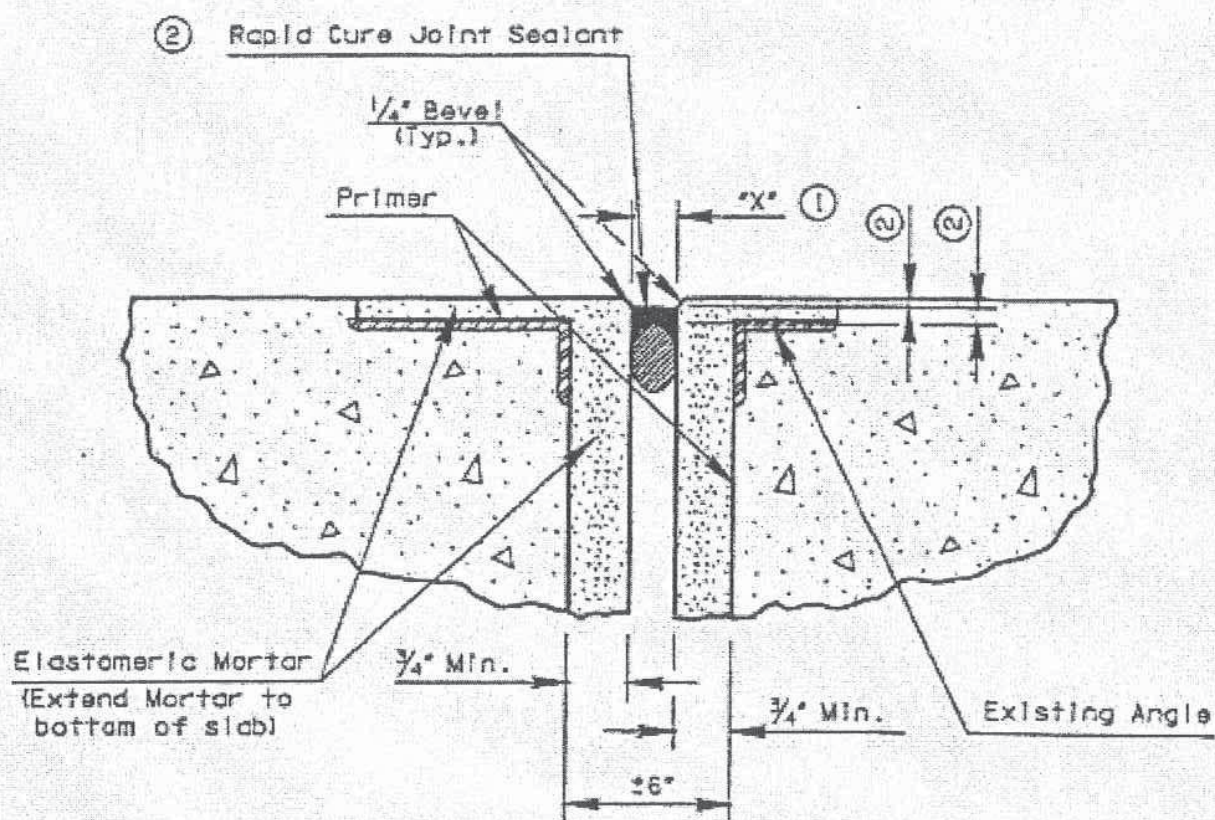
NOTE: Asphalt Concrete Overlay across the bridge deck and the approach slabs at the Joint Sealant Locations shall be cut and removed as detailed and the concrete surface prepared in accordance with the Sealant manufacturers specifications.

Nosing of sufficient thickness can be ready for traffic in 2-4 hours depending on temperature.

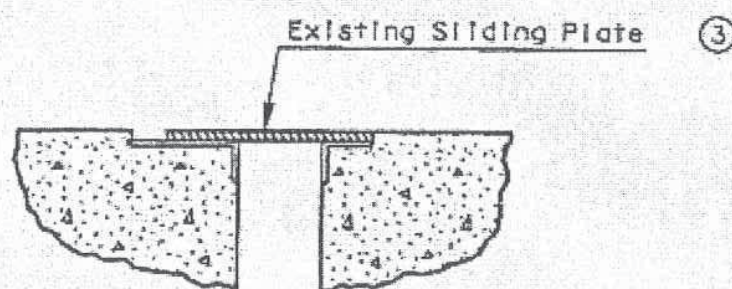


### JOINT REPAIR FOR JOINTS HAVING SLIDING PLATES AND NO OVERLAY

- ① "X" should be in the range of 1" to 3". See Table 2
- ② Refer to Table 1
- ③ If sliding plates are loose, remove the plate and replace with Elastomeric Mortar. If the plate is not loose leave in place.
- ③ Do not bond Elastomeric Mortar to weak or rotten concrete.



DETAIL OF EXPANSION JOINT  
WITH SLIDING PLATE REMOVED



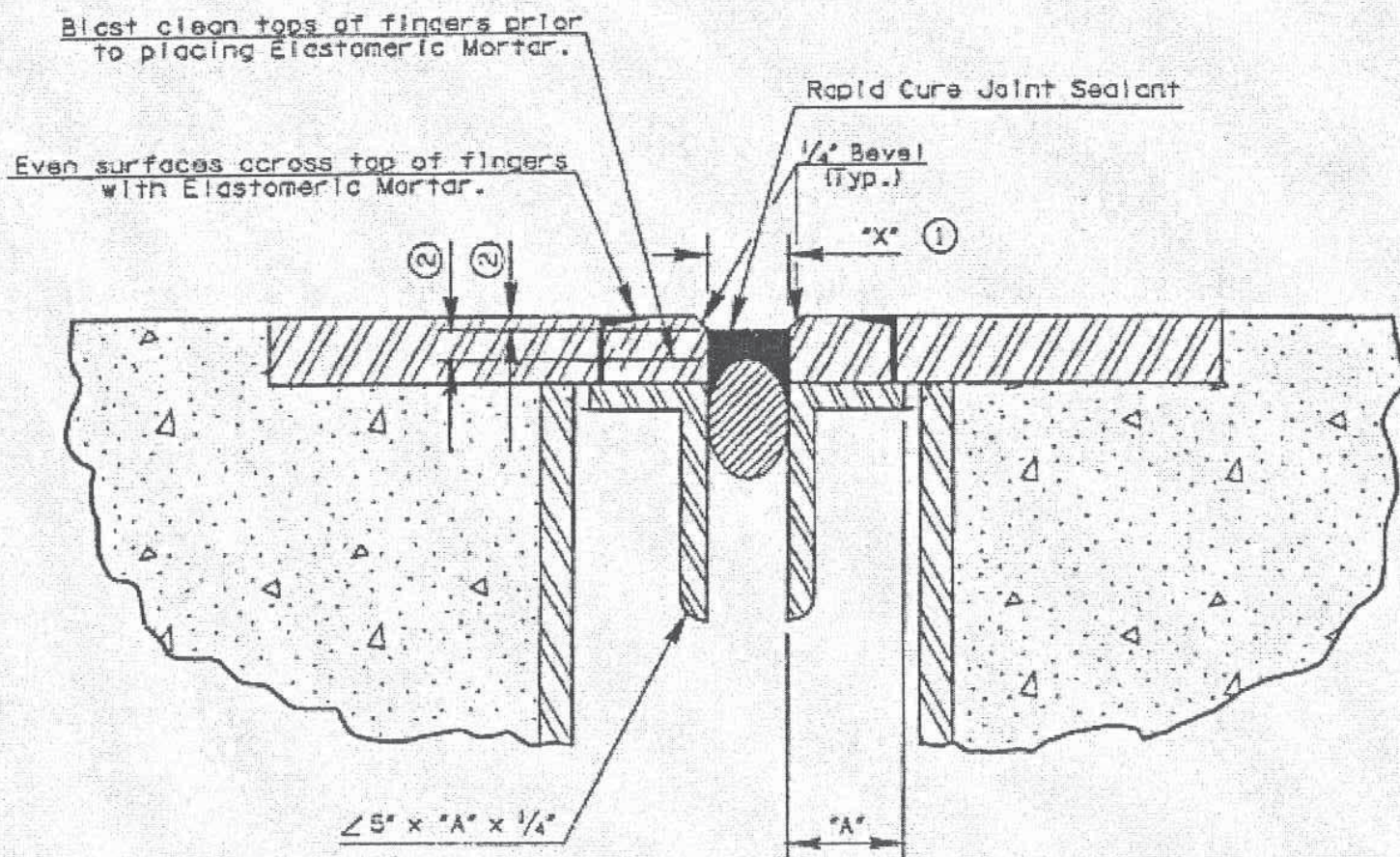
DETAIL OF EXPANSION JOINT  
WITH SLIDING PLATE IN PLACE

Note: Nosing of sufficient thickness can be ready for traffic in 2-4 hours depending on temperature.



### JOINT REPAIR FOR FINGER JOINT HAVING NO OVERLAY

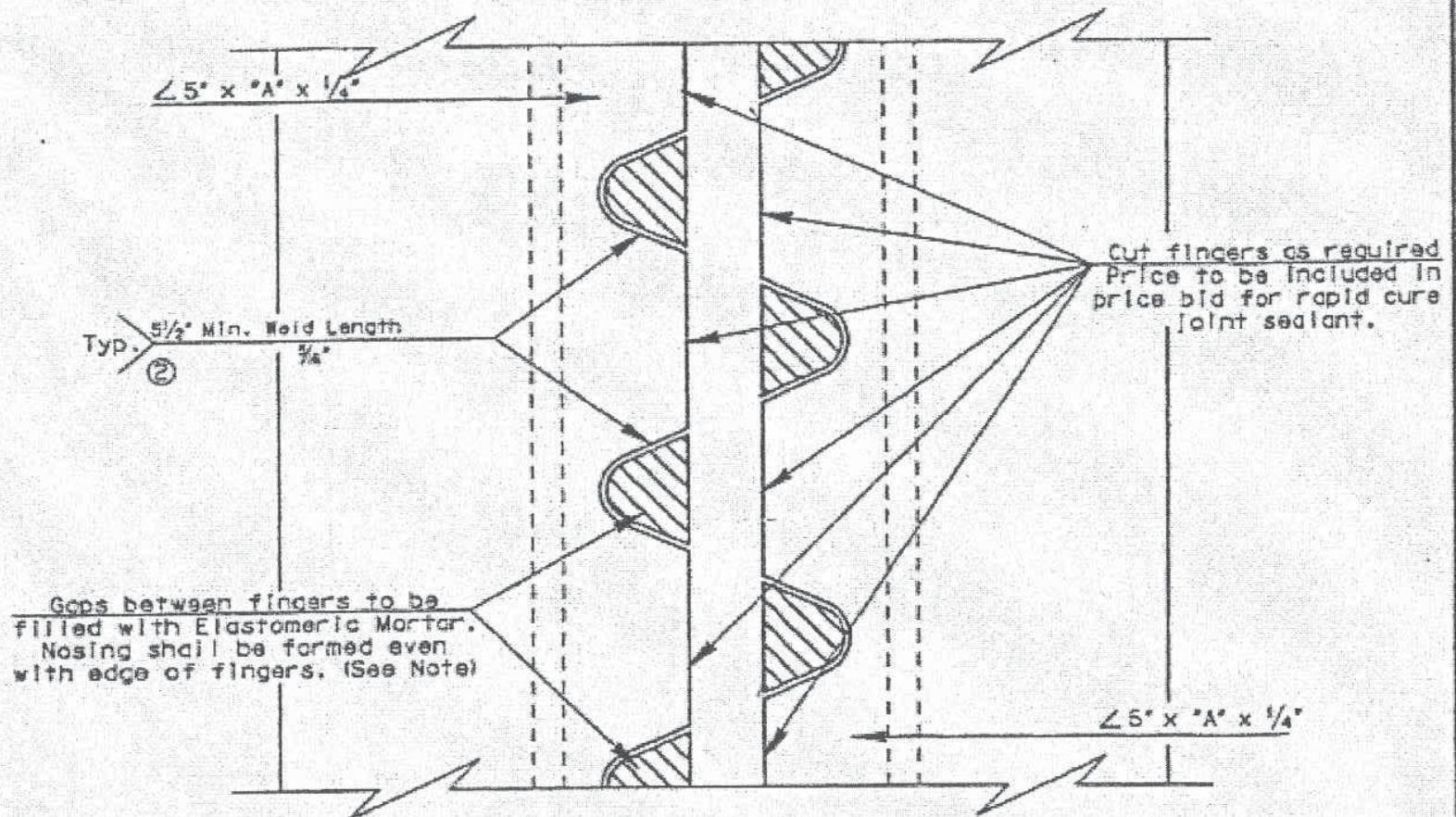
- ① "X" should be in the range of 1" to 3". See Table 2
- ② Refer to Table 1.
- ③ dimension "A" shall be large enough to cover the openings in the fingers. Clip angle as required to fit.





### JOINT REPAIR FOR FINGER JOINT HAVING NO OVERLAY

- ① "X" should be in the range of 1'-3". See Table 2
- ② Cost of welding to be included in price bid for rapid cure joint sealant.

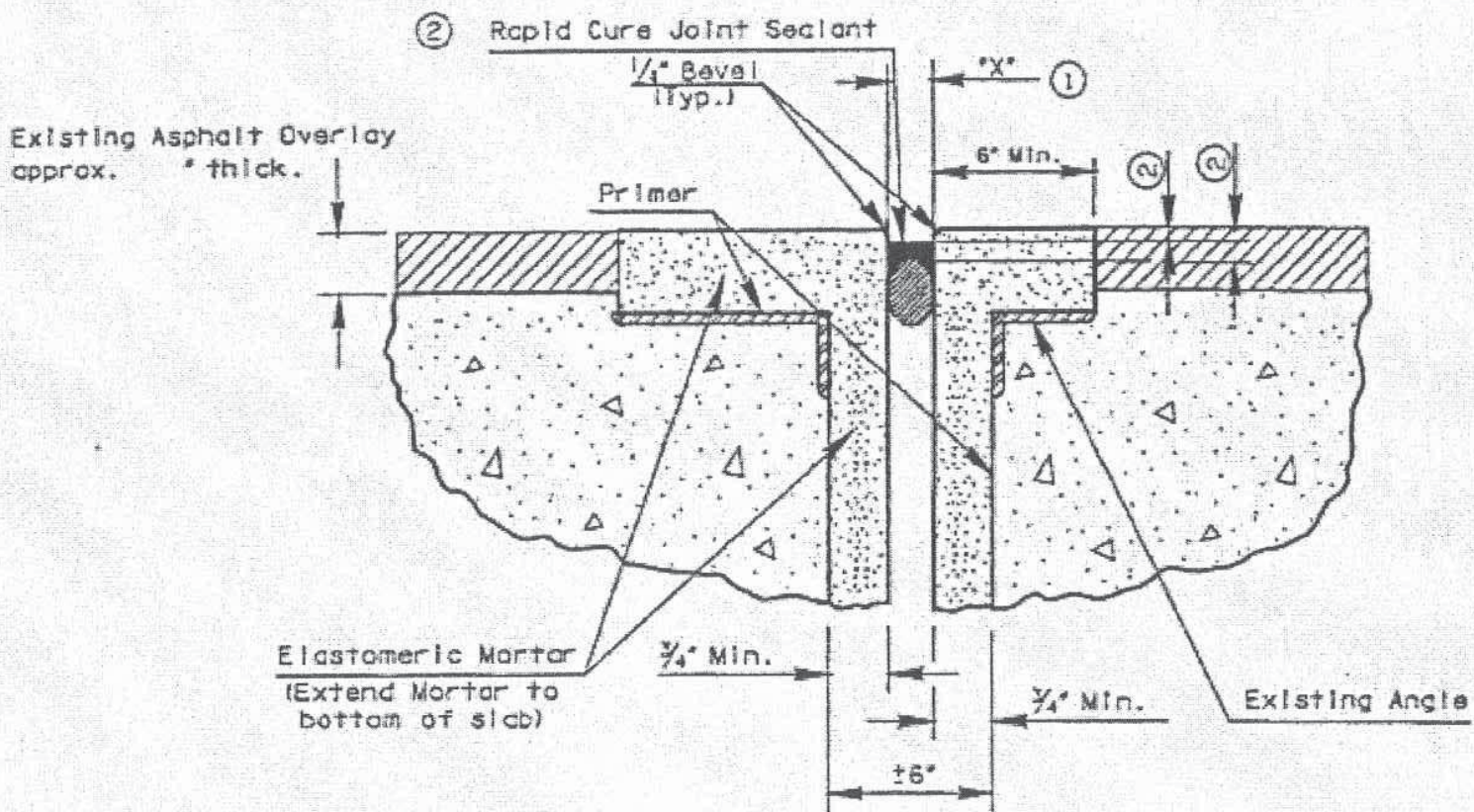


Note: Nosing of sufficient thickness can be ready for Traffic in 2-4 hours depending on temperature.

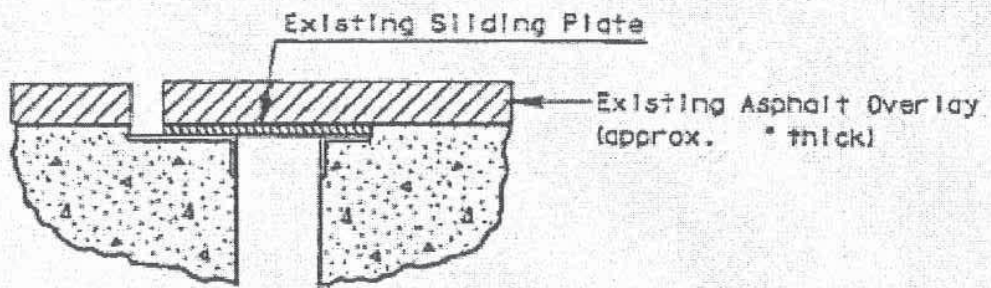


**JOINT REPAIR FOR JOINTS HAVING  
SLIDING PLATES WITH OVERLAY**

- ① "X" should be in the range of 1" to 3". See Table 2
- ② Refer to Table 1
- ③ Do not bond Elastomeric Mortar to weak or rotten concrete.



**DETAIL OF EXPANSION JOINT  
WITH SLIDING PLATE REMOVED**



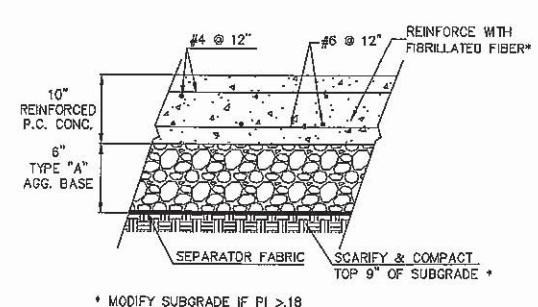
**DETAIL OF EXPANSION JOINT  
WITH SLIDING PLATE IN PLACE**

Note: Nosing of sufficient thickness can be ready for traffic in 2-4 hours depending on temperature.

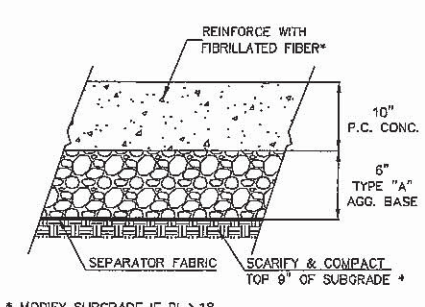




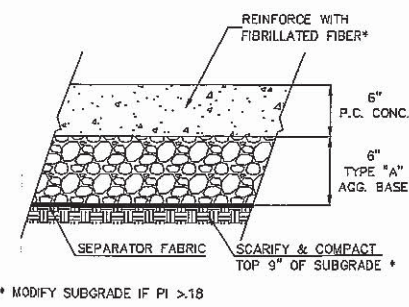




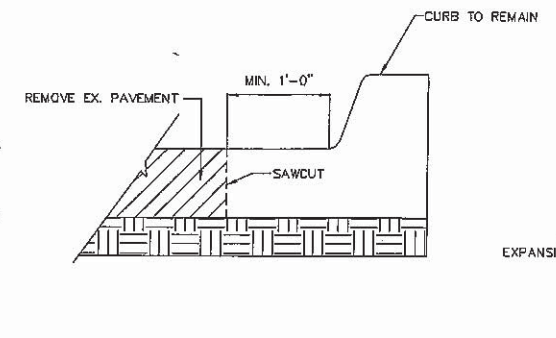
TYPICAL TRAINING PAD SECTION  
NOT TO SCALE



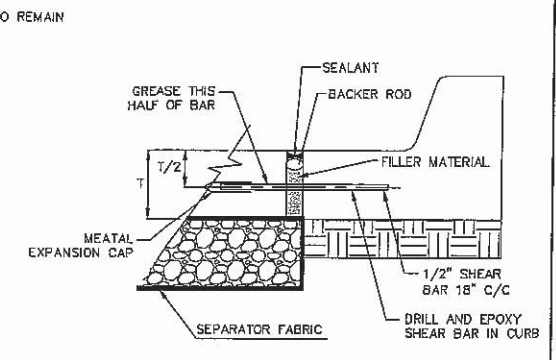
TYPICAL 10" CONCRETE SECTION  
NOT TO SCALE



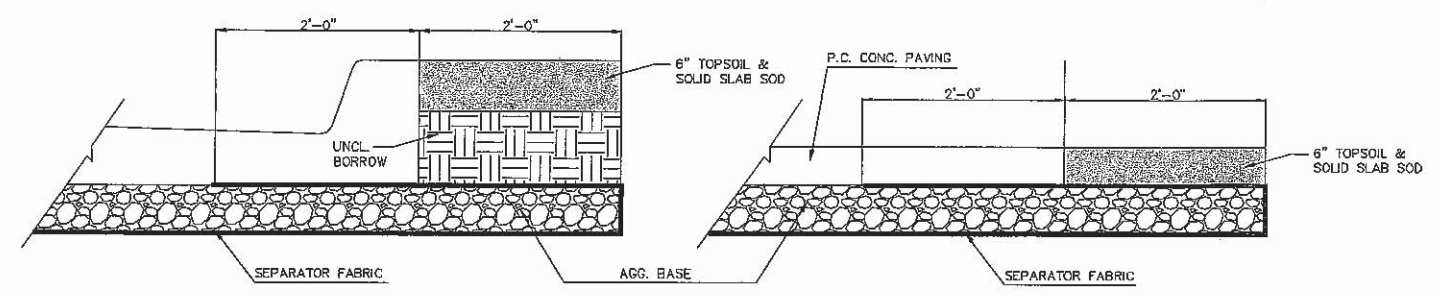
TYPICAL 6" CONCRETE SECTION  
NOT TO SCALE



SAWCUT REMOVAL DETAIL  
NOT TO SCALE

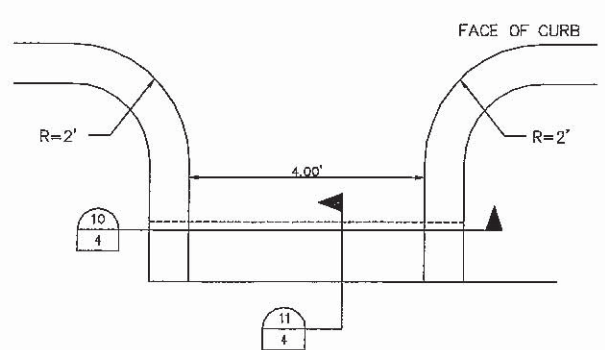


JOINT AT EX. CURB  
NOT TO SCALE

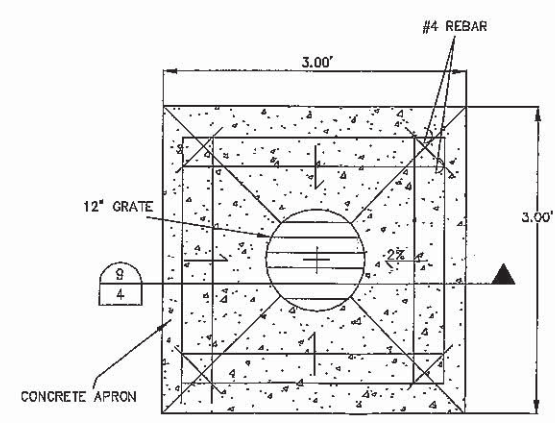


TYPICAL BASE TERMINATION  
NOT TO SCALE

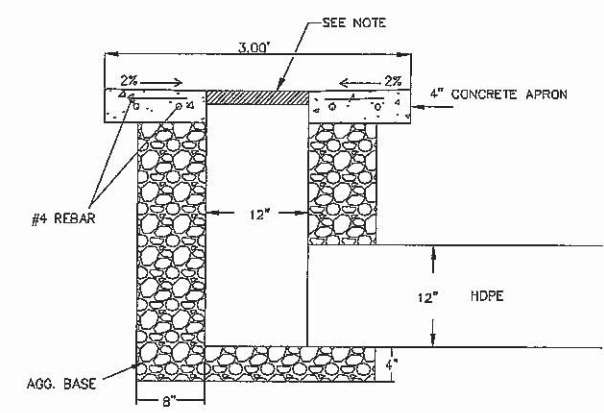
\*NOTE: FIBRILLATED FIBER REINFORCING WILL BE REQUIRED IN ALL NEW CONCRETE PAVEMENT CONSTRUCTION. FIBRILLATED FIBER REINFORCING SHALL CONSIST OF VIRGIN POLYPROPYLENE FIBRILLATED FIBERS CONFORMING TO ASTM C-1116 TYPE III 4.1.3 AND ASTM C-1116 PERFORMANCE LEVEL 1. FIBERS MUST CONTAIN NO REPROCESSED OLEFIN MATERIAL AND MUST BE SPECIFICALLY MANUFACTURED FOR USE AS SECONDARY REINFORCEMENT.  
MANUFACTURED BY: FIBERMIX STEALTH BY FIBERMESH OF CHATTANOOGA, TN OR APPROVED EQUAL.



TYPICAL FLUME SECTION  
NOT TO SCALE

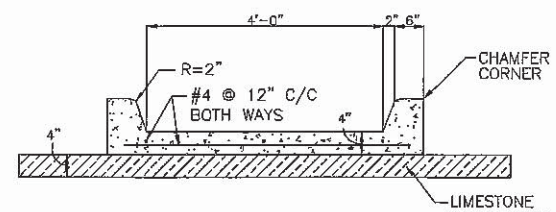


AREA INLET PLAN  
NOT TO SCALE

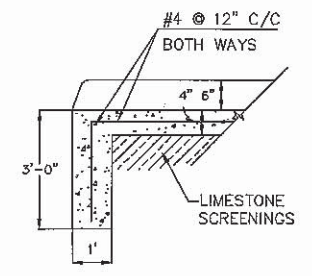


SECTION  
NOT TO SCALE

\*NOTE: AREA INLET TO BE NYLOPLAST DRAIN BASIN PT. NO. 2812AG OR APPROVED EQUAL TO BE INSTALLED PER MAN. SPECIFICATIONS GRATE TO BE NYLOPLAST STANDARD HINGED H-20 RATED PT. NO. 1288CGS OR APPROVED EQUAL TO BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS.



SECTION  
NOT TO SCALE



SECTION  
NOT TO SCALE



REGISTERED PROFESSIONAL ENGINEER SEAL

FIRE STATION DRIVEWAYS  
PROJECT NO. 055250

TYPICAL SECTIONS (1)

CITY OF TULSA, OKLAHOMA  
PUBLIC WORKS DEPARTMENT  
ENGINEERING SERVICES DIVISION

PLANS & ESTIMATE PREPARED BY:  
BKL, INCORPORATED  
8311 E. TECUMSEH TULSA, OKLA. 74115 918-835-9588

REVISION	BY	DATE	PLAN SCALE	DRAWN BY:	DATE	APPROVED
			N/A	SLV	11/06	
				DESIGNED BY:	10/08	
				GDR		
				SURVEY BY:		
				FIELD MNGR.		
				SECT. MNGR.		
				PROJ. MNGR.		
				RECOMMENDED		
				DEPUTY DIRECTOR		
				FILE:	DRAWING:	PUBLIC WORKS DIRECTOR
						DATE: SEPTEMBER 20, 2007
				ATLAS PAGE NO.:		SHEET 4 OF 32 SHEETS

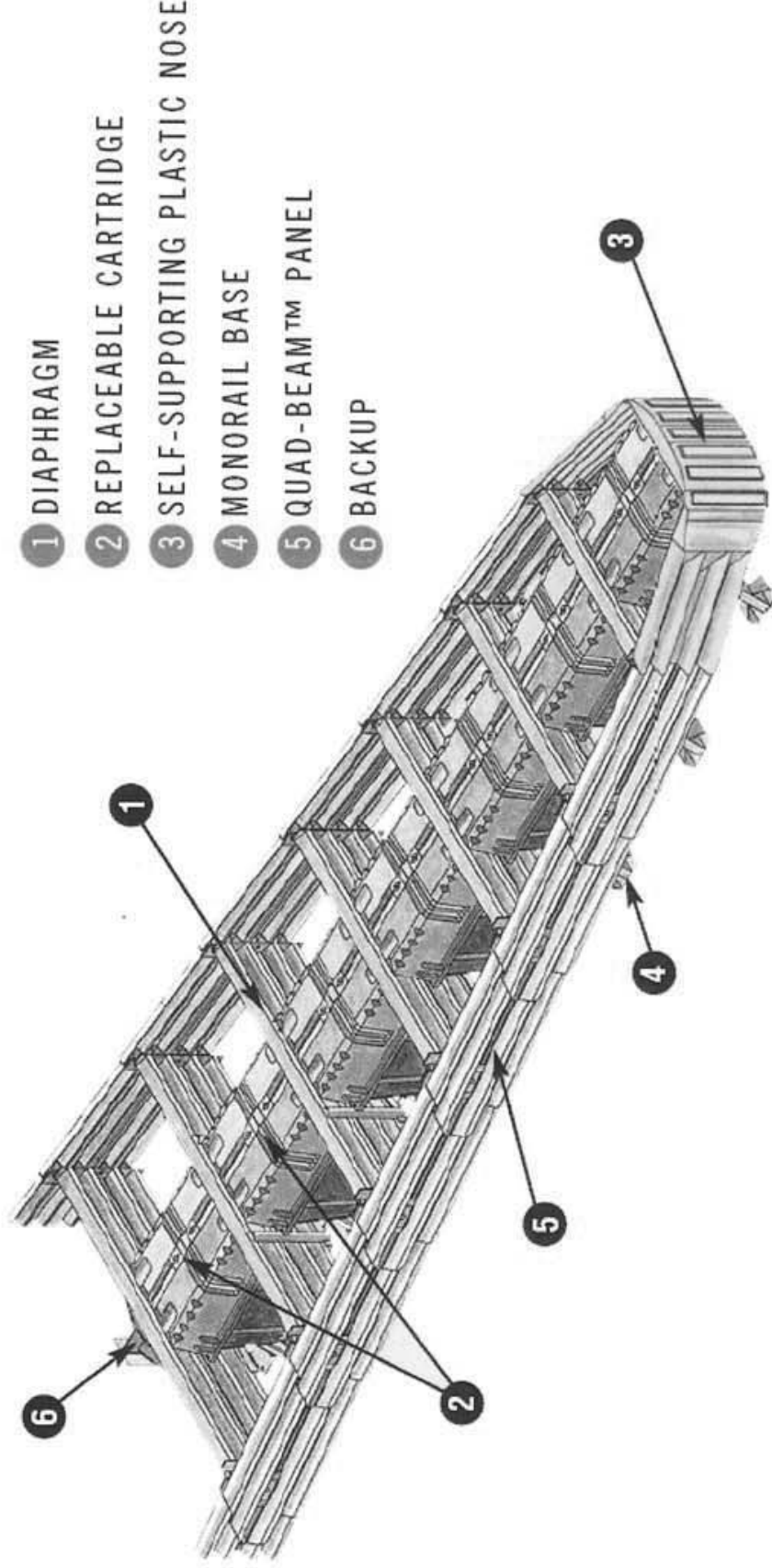
RECORD PLANS  
March 10th, 2009



<b>Name</b>	QuadGuard II™ Wide
<b>Manufacturer</b>	Energy Absorption Systems, Inc.
<b>Website</b>	<a href="http://www.energyabsorption.com/products/products_quadguard_crash.asp">http://www.energyabsorption.com/products/products_quadguard_crash.asp</a>
<b>FHWA Acceptance Letter</b>	HSA-10/CC42-A ( <a href="http://safety.fhwa.dot.gov/roadway_dept/road_hardware/barriers/pdf/cc42a.htm">http://safety.fhwa.dot.gov/roadway_dept/road_hardware/barriers/pdf/cc42a.htm</a> )

**General Characteristics (wide):**

- 6 bay (excluding the nose section bay). First 3 bays use Type I cartridge and last 3 bays use Type II cartridges.
- 10 degree maximum side flare.
- 2 standard backup widths 60 and 90 inches
- Replaceable/crushable cartridges
- Re-directive, bi- and unidirectional, non-gating, non-pocketing
- 20 feet 9 inches long
- This system is not resettable and should be used in areas where minimal impacts are anticipated.



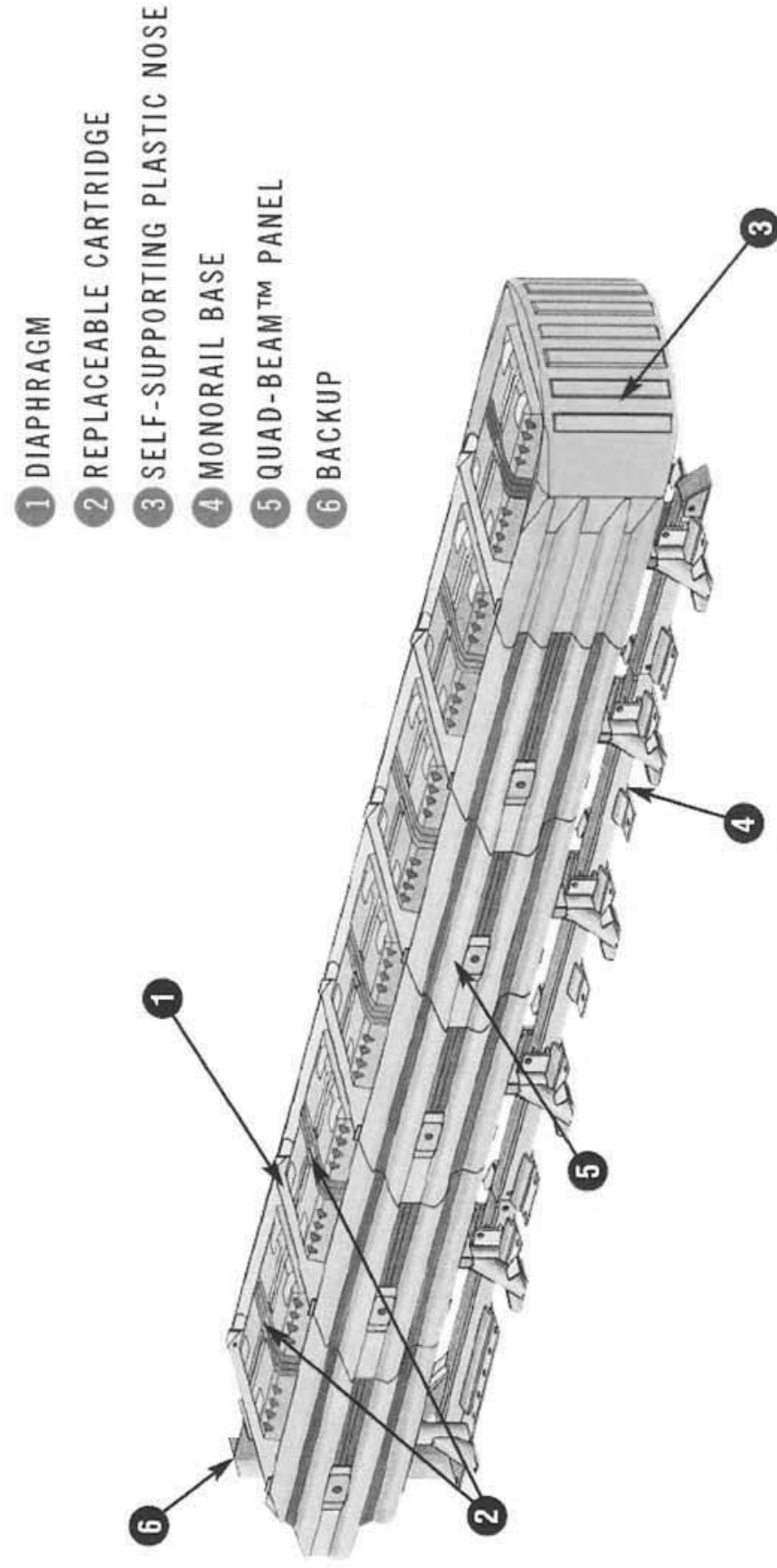
(Revised October 24, 2011)



<b>Name</b>	QuadGuard II™ Narrow
<b>Manufacturer</b>	Energy Absorption Systems, Inc.
<b>Website</b>	<a href="http://www.energyabsorption.com/products/products_quadguard_crash.asp">http://www.energyabsorption.com/products/products_quadguard_crash.asp</a>
<b>FHWA Acceptance Letter</b>	HNG/CC-35 and CC-35B ( <a href="http://safety.fhwa.dot.gov/roadway_dept/road_hardware/barriers/pdf/cc-35.pdf">http://safety.fhwa.dot.gov/roadway_dept/road_hardware/barriers/pdf/cc-35.pdf</a> ) ( <a href="http://safety.fhwa.dot.gov/roadway_dept/road_hardware/barriers/pdf/cc-35b.pdf">http://safety.fhwa.dot.gov/roadway_dept/road_hardware/barriers/pdf/cc-35b.pdf</a> )

**General Characteristics (narrow):**

- 6 bay (excluding the nose section bay). First 3 bays use Type I cartridge and last 3 bays use Type II cartridges.
- Backup width is 90 inches
- Replaceable/crushable cartridges
- Re-directive, bi- and unidirectional, non-gating, non-pocketing
- 22 feet long
- This system is not resettable and should be used in areas where minimal impacts are anticipated.



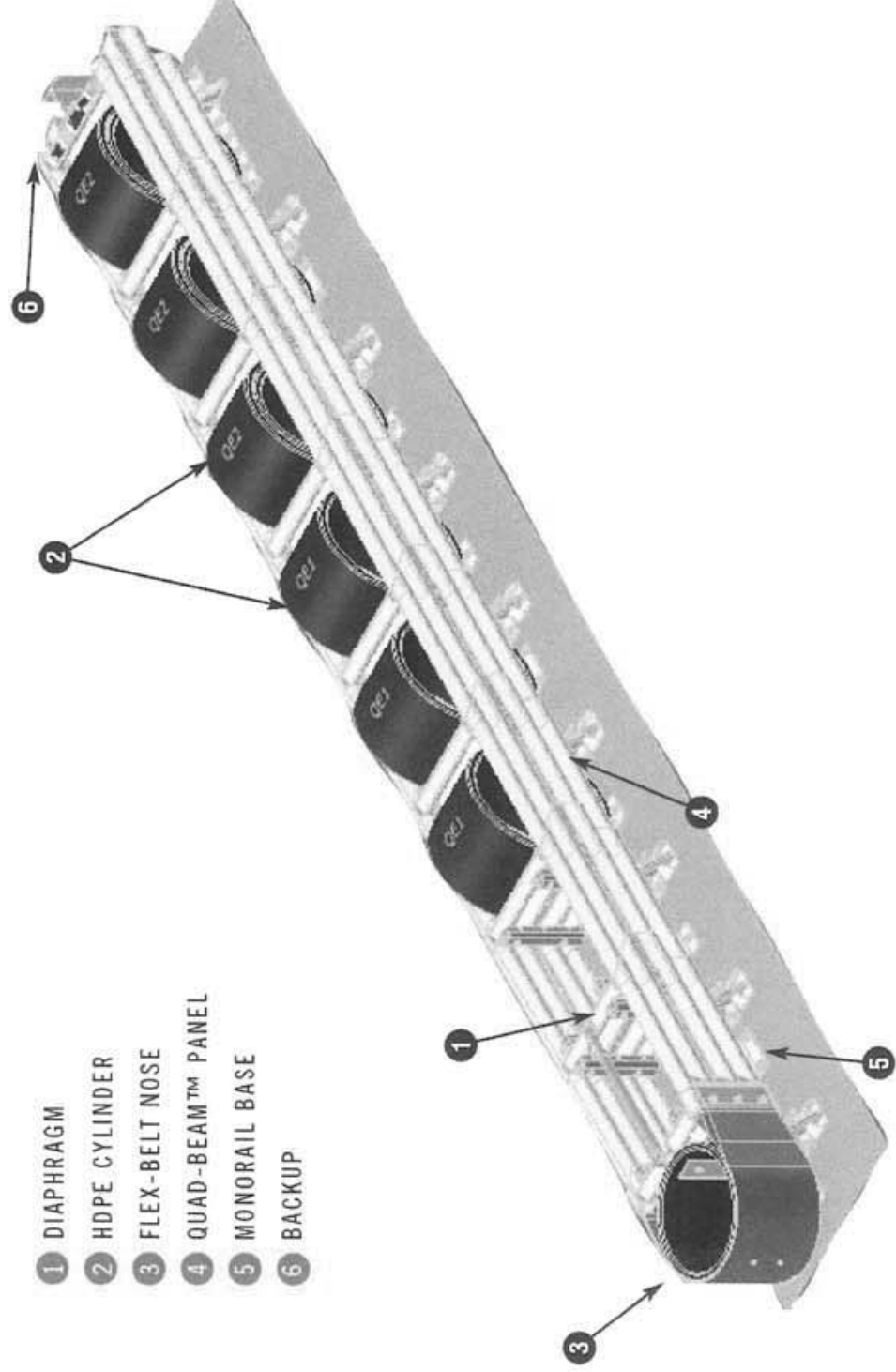
(Revised October 24, 2011)



<b>Name</b>	QuadGuard™ Elite
<b>Manufacturer</b>	Energy Absorption Systems, Inc.
<b>Website</b>	<a href="http://www.energyabsorption.com/products/products_quadguard_elite.asp">http://www.energyabsorption.com/products/products_quadguard_elite.asp</a>
<b>FHWA Acceptance Letter</b>	HNG-14 /CC-57 and CC-57B ( <a href="http://safety.fhwa.dot.gov/roadway_dept/road_hardware/barriers/pdf/cc-57.pdf">http://safety.fhwa.dot.gov/roadway_dept/road_hardware/barriers/pdf/cc-57.pdf</a> ) ( <a href="http://safety.fhwa.dot.gov/roadway_dept/road_hardware/barriers/pdf/cc57b.pdf">http://safety.fhwa.dot.gov/roadway_dept/road_hardware/barriers/pdf/cc57b.pdf</a> )

**General Characteristics:**

- 11 bay (no cylindrical in the first 2 bays). New approved 8-bay is acceptable.
- Backup widths available in 24, 30, 36, 69, or 90 inches. The 60 and 90 inch system flare out to obtain the required width at backup
- HDPE cylinders
- Re-directive, bi- and unidirectional, non-gating, non-pocketing
- This system can withstand multiple impacts with minimal repair
- This resettable system because High Density Poly Ethylene will return to their original shape
- 33 feet 4 inches long (11-bay)
- 26.6 feet (8-bay)

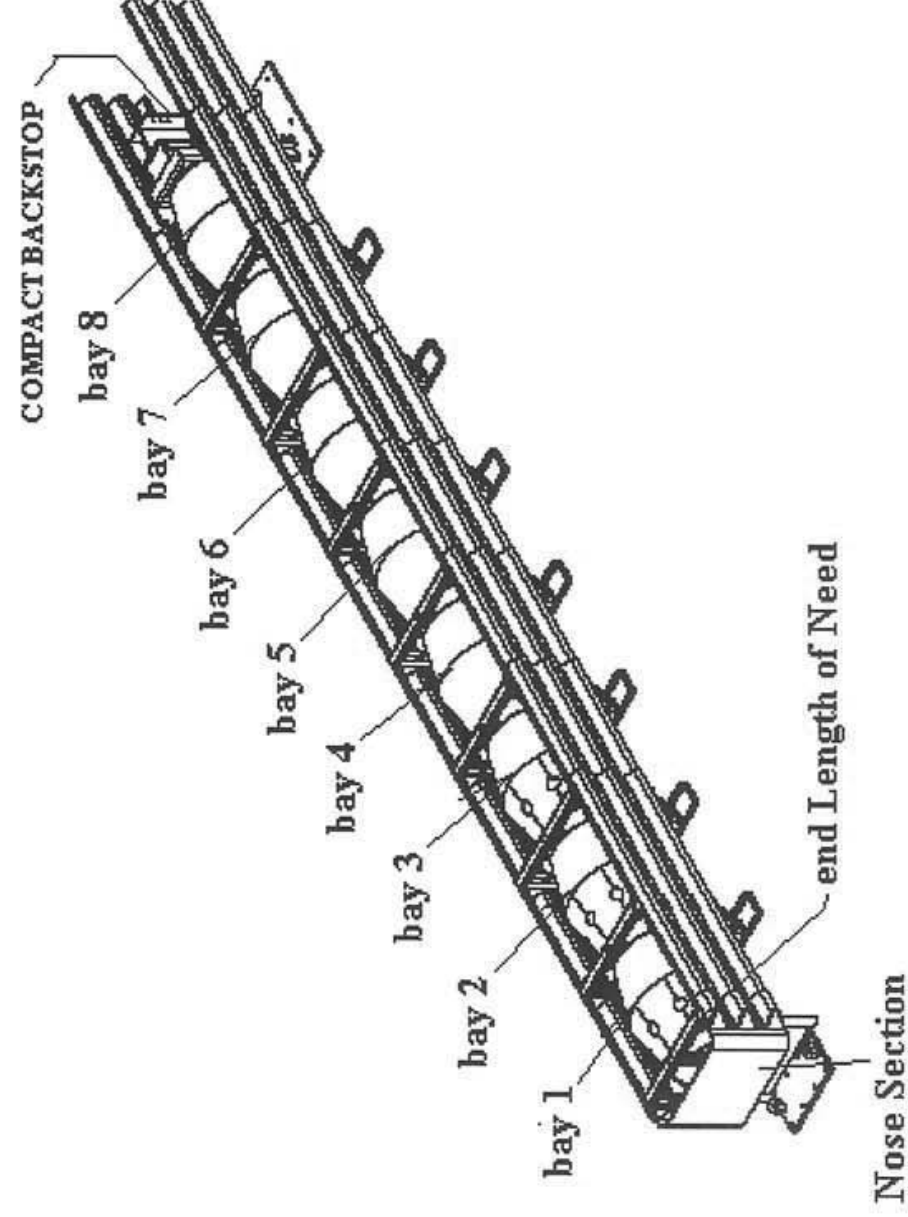




<b>Name</b>	TAU-II™ Family (Parallel, Taper, or Combination)
<b>Manufacturer</b>	Barrier Systems, Inc.
<b>Website</b>	<a href="http://www.barriersystemsinc.com/products/product.asp?key=3&amp;nav_family=2">http://www.barriersystemsinc.com/products/product.asp?key=3&amp;nav_family=2</a>
<b>FHWA Acceptance Letter</b>	HSA-10/CC-75 for Narrow or Parallel System ( <a href="http://safety.fhwa.dot.gov/roadway_dept/road_hardware/barriers/pdf/cc75.pdf">http://safety.fhwa.dot.gov/roadway_dept/road_hardware/barriers/pdf/cc75.pdf</a> ) HSA-10/CC-75B for Combination (variable width) ( <a href="http://safety.fhwa.dot.gov/roadway_dept/road_hardware/barriers/pdf/cc75b.pdf">http://safety.fhwa.dot.gov/roadway_dept/road_hardware/barriers/pdf/cc75b.pdf</a> )

**General Characteristics (For Parallel or Narrow Systems):**

- Backup widths are available in 24, 30, and 36 inches
- 8 bay with 2 types crushable/replace cartridges. First 3 cartridges are Type A and last B cartridges are Type II.
- Re-directive, bi- and unidirectional, non-gating, non-pocketing
- 26.9 feet long
- This system is not resettable and should be used in areas where minimal impacts are anticipated.

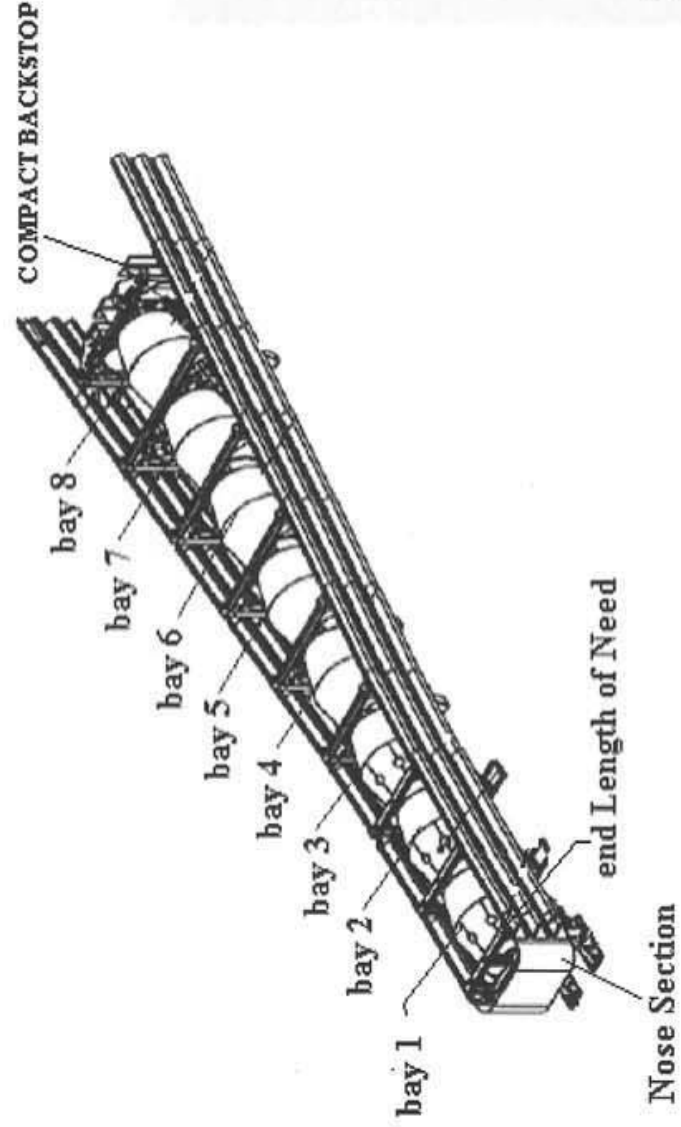


UNIVERSAL TAU II  
TL-3 SYSTEM shown



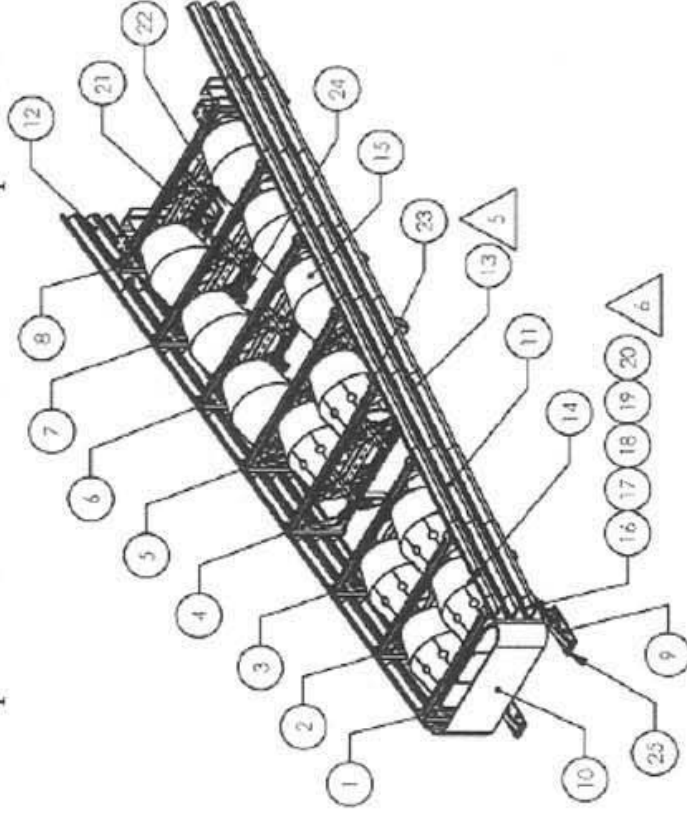
**General Characteristics (Combination Systems):**

- Backup widths could accommodate up to 60 inches
- 8 bay with 2 types crushable/replace cartridges. First 3 rows are Type A cartridges and remainders are Type B cartridges.
- 26.9 feet long
- 5 degree outward flare rate.
- Re-directive, bi- and unidirectional, non-gating, non-pocketing
- This system is not resettable and should be used in areas where minimal impacts are anticipated.



UNIVERSAL TAU II Wide  
TL-3 System shown

- Variations for TAU-II (Taper systems):
- Backup widths could accommodate up to 96 inches



**BACKSTOP WIDTH**

Width	Cartridge Configuration
up to 30" (762 mm)	B B B B B B A A A A
36" (914 mm)	B B B B B B A A A A
42" (1067 mm)	B B B B B B A A A A
48" (1220 mm)	B B B B B B A A A A
54" (1373 mm)	B B B B B B A A A A
60" (1526 mm)	B B B B B B A A A A
66" (1680 mm)	B B B B A A A A
72" (1833 mm)	B B B B A A A A
78" (1986 mm)	B B B A A A A A
84" (2139 mm)	B B B A A A A A
90" (2292 mm)	B B B A A A A A
96" (2445 mm)	B B B A A A A A

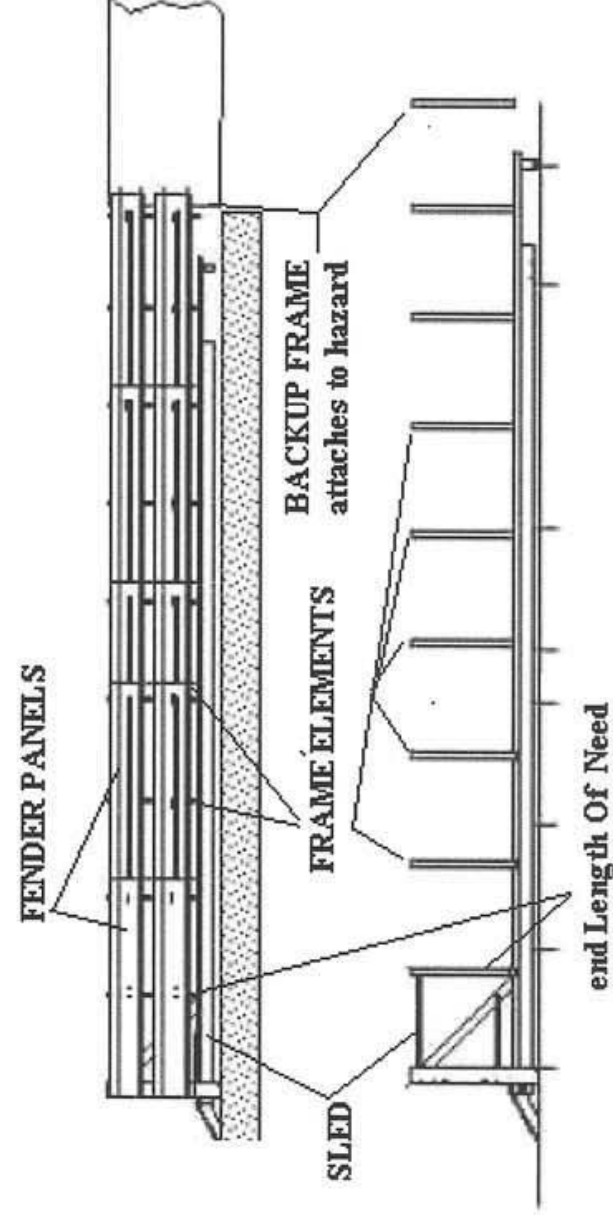
60+ mph\*  
(100 km/h) Test Level-3



<b>Name</b>	TRACC Family (FasTRACC™ and WideTRACC™)
<b>Manufacturer</b>	Trinity Highway Products, LLC.
<b>Website</b>	<a href="http://www.highwayguardrail.com/products/tracc.html">http://www.highwayguardrail.com/products/tracc.html</a>
<b>FHWA Acceptance Letter</b>	HNG-14/CC-54 (for FasTRACC) ( <a href="http://safety.fhwa.dot.gov/roadway_dept/road_hardware/barriers/pdf/cc-54.pdf">http://safety.fhwa.dot.gov/roadway_dept/road_hardware/barriers/pdf/cc-54.pdf</a> ) HSA-10/CC-54D (for WideTRACC) ( <a href="http://safety.fhwa.dot.gov/roadway_dept/road_hardware/barriers/pdf/cc54d.pdf">http://safety.fhwa.dot.gov/roadway_dept/road_hardware/barriers/pdf/cc54d.pdf</a> )

**General Characteristics (FastTRACC or TRACC):**

- Length 21 feet
- Backup width is available in 24 inches
- Re-directive, bi- and unidirectional, non-gating, non-pocketing
- This system is not resettable and should be used in areas where minimal impacts are anticipated.
- No cartridges.
- Consisted of impact “sled”, 2 guidance tracks, and steel frames.



TRACC

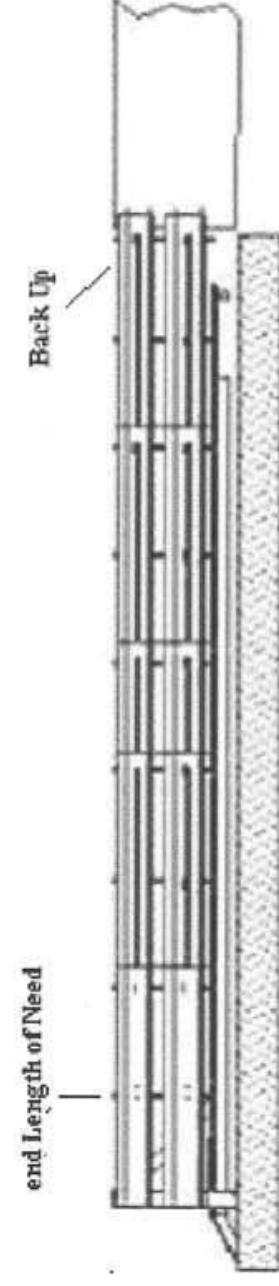


(ISO Drawing is not available)

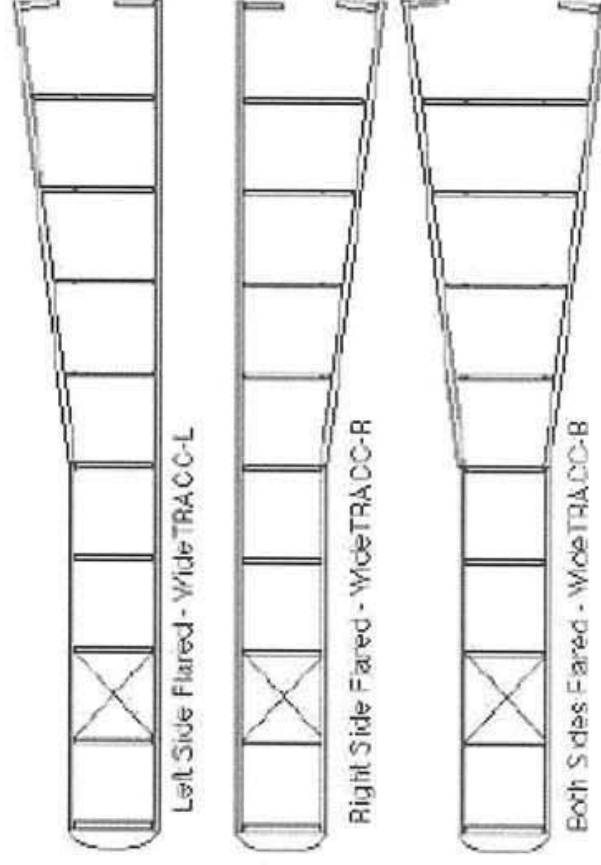


### General Characteristics (WideTRACC):

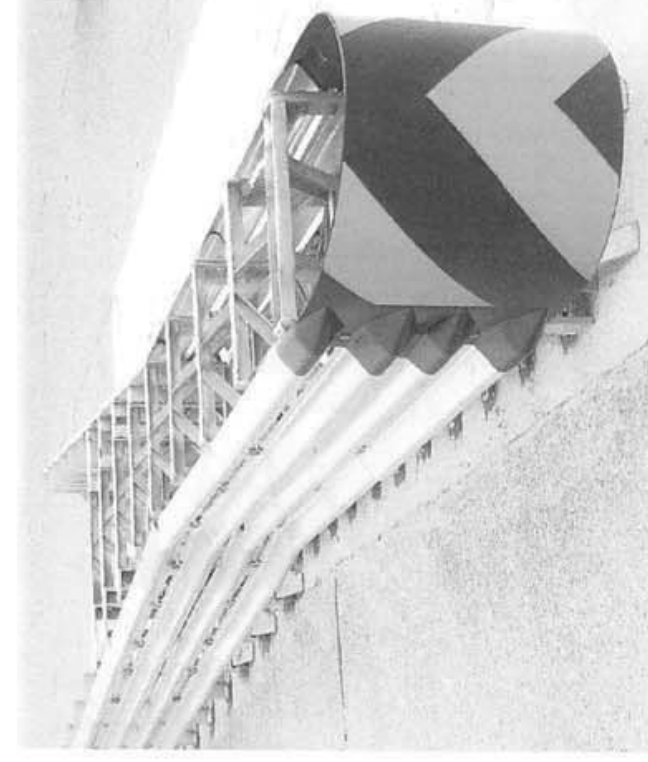
- Length 21 feet
- At 9.5 feet from beginning, the side panels begin to flare outward at 7 degrees. At the length of 21 feet, it could shield the hazardous object of up to 58 inches. To accommodate for larger objects, the attenuators need to move forward and maintaining 7 degrees until it covers the hazardous object.
- Re-directive, bi- and unidirectional, non-gating, non-pocketing
- This system is not resettable and should be used in areas where minimal impacts are anticipated.
- No cartridges.
- Consisted of impact “sled”, 2 guidance tracks, and steel frames



### TRACC

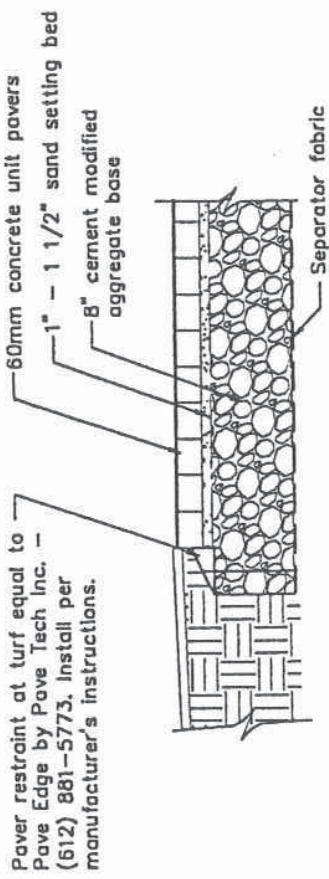


### Basic WideTRACC configurations.



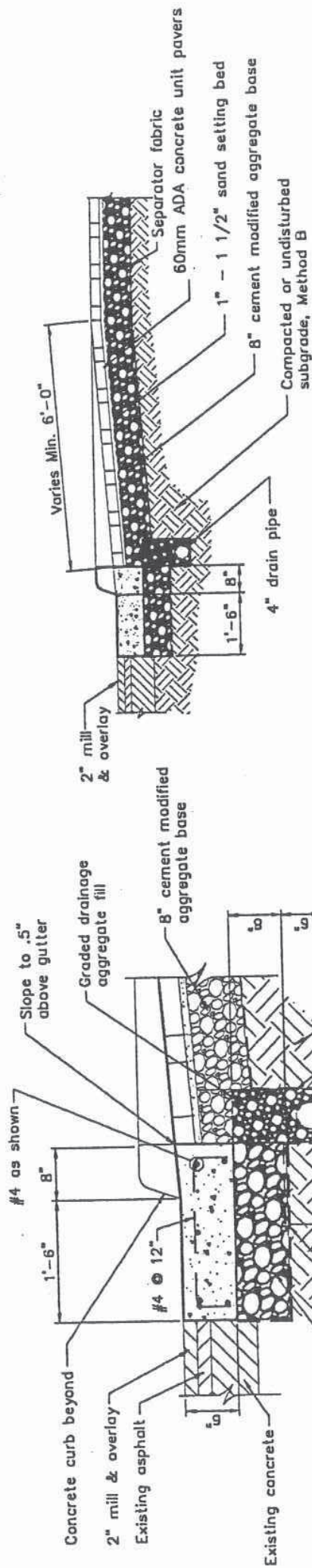
(ISO Drawing is not available)





**CONCRETE UNIT PAVER**

Scale: 1"=1'-0"



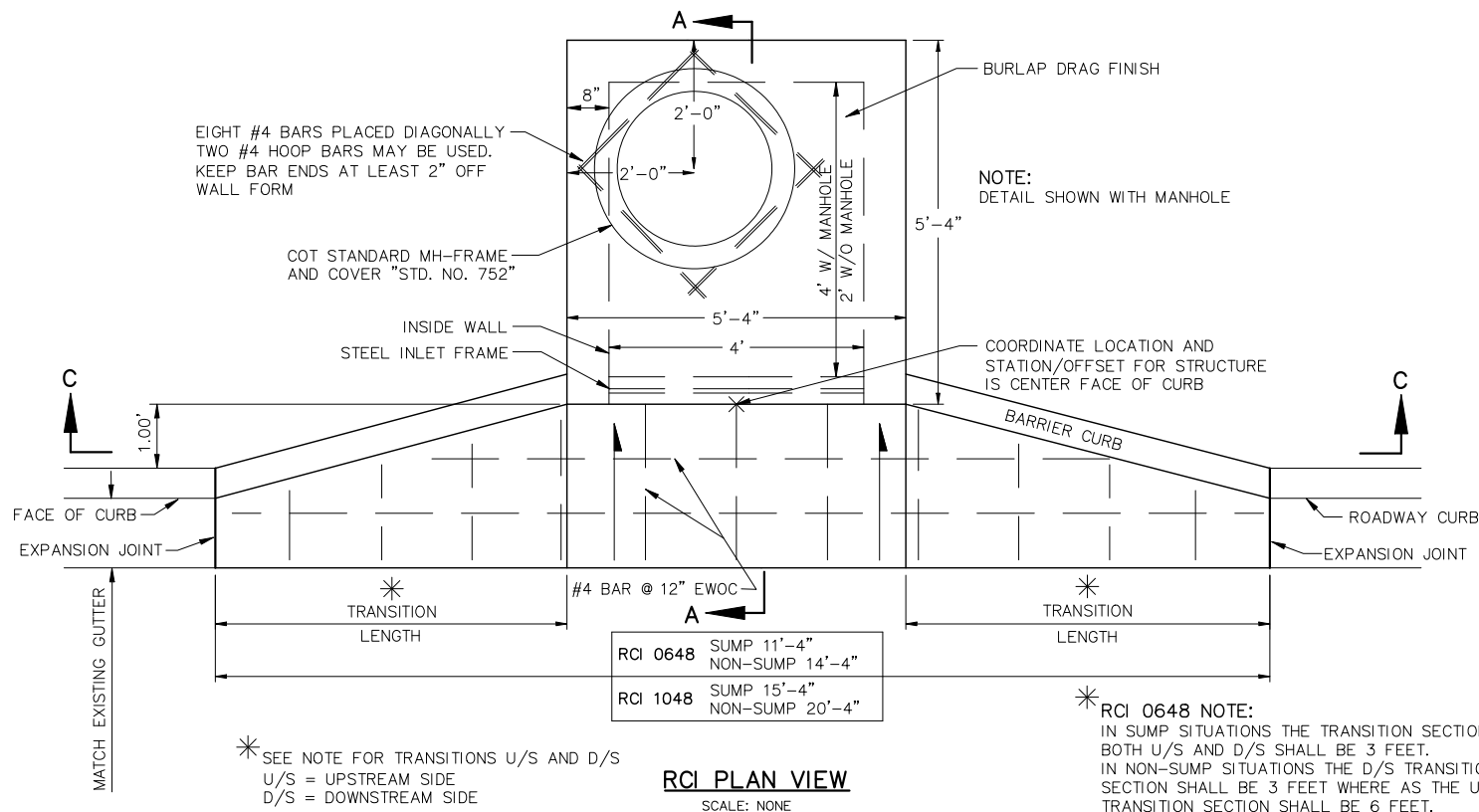
**HANDICAP RAMP SECTION**

Scale: 1/2" = 1'-0"

**SPECIALTY CURB AND EDGE DRAIN**

Scale: 1"=1'-0"





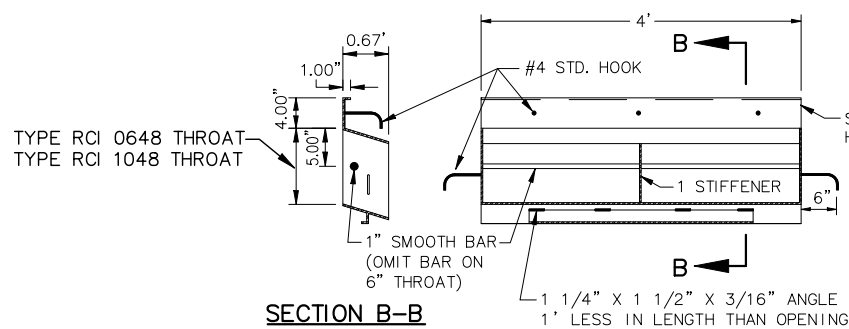
\* SEE NOTE FOR TRANSITIONS U/S AND D/S  
 U/S = UPSTREAM SIDE  
 D/S = DOWNSTREAM SIDE

**RCI PLAN VIEW**  
 SCALE: NONE

NOTE:  
 DETAIL SHOWN WITH MANHOLE

\* **RCI 0648 NOTE:**  
 IN SUMP SITUATIONS THE TRANSITION SECTION BOTH U/S AND D/S SHALL BE 3 FEET.  
 IN NON-SUMP SITUATIONS THE D/S TRANSITION SECTION SHALL BE 3 FEET WHERE AS THE U/S TRANSITION SECTION SHALL BE 6 FEET.

\* **RCI 1048 NOTE:**  
 IN SUMP SITUATIONS THE TRANSITION SECTION BOTH U/S AND D/S SHALL BE 5 FEET.  
 IN NON-SUMP SITUATIONS THE D/S TRANSITION SECTION SHALL BE 5 FEET WHERE AS THE U/S TRANSITION SECTION SHALL BE 10 FEET.



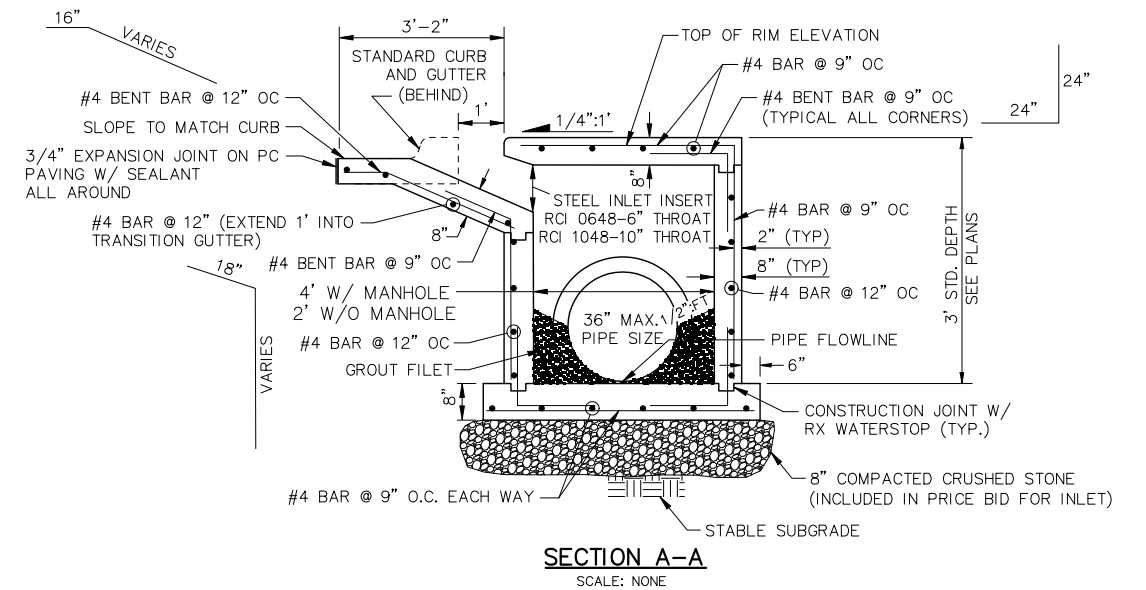
**SECTION B-B**  
 SCALE: NONE

**FRONT VIEW  
 STEEL INLET INSERT DETAIL**  
 SCALE: NONE

**STEEL INLET FRAME NOTES**

1. STEEL INLET INSERT SHALL BE AS MANUFACTURED BY SHAWNEE STEEL & WELDING, INC. OF MERIAM, KS. OR APPROVED EQUAL. REFER TO THE STEEL INLET INSERT DETAIL.
2. COST OF INLET INSERT SHALL BE INCLUDED IN THE PRICE BID FOR INLET.
3. ALL WELDS SHALL BE PERFORMED IN ACCORDANCE WITH APPROPRIATE AWS SPECIFICATIONS AND PROCEDURES.
4. ALL STEEL SHALL BE 7 GAGE OR 3/16" THICK.
5. ALL WELDS ON EXPOSED SURFACES SHALL BE DRESSED SO AS TO PROVIDE A PLEASING FINISHED APPEARANCE.
6. THE ENTIRE FRAME SHALL BE HOT DIP ZINC COATED IN ACCORDANCE WITH ASTM A-123.

- CAST IN PLACE CONCRETE NOTES**
1. ALL CONCRETE SHALL BE CLASS A, AS DESIGNATED IN SECTION 509 OF THE ODOT SPECIFICATIONS, LATEST EDITION.
  2. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 3/4" UNLESS OTHERWISE NOTED.
  3. CLEAR DISTANCES FROM CAST-IN-PLACE CONCRETE SURFACES TO REINFORCING SHALL BE 2" FOR WALLS, 1-1/2" FOR SUPPORTED SLABS, 3" FROM THE BOTTOM OF FOOTINGS AND 2" FROM THE TOP OF SLABS, UNLESS OTHERWISE NOTED.
  4. REINFORCING STEEL SHALL MEET ASTM SPECIFICATION A615, GRADE 60.
  5. ALL BARS SHALL LAP A MINIMUM OF 30 BAR DIAMETERS OR 18", WHICHEVER IS GREATER, UNLESS OTHERWISE NOTED BY THE ENGINEER.
  6. ALL EXPOSED CAST IN PLACE CONCRETE SURFACES SHALL HAVE ALL VOIDS FILLED, BURRS AND FINS REMOVED.
  7. ALL JOINTS SHALL BE SEALED WITH AN APPROVED SILICONE SEALANT.
  8. MINIMUM CONCRETE COVER OF REINFORCING STEEL SHALL CONFORM TO AMERICAN CONCRETE INSTITUTE STANDARD OR BE 2" FOR EXTERIOR WALL STEEL OR 3" FOR THE BOTTOM FLOOR STEEL.



**SECTION A-A**  
 SCALE: NONE

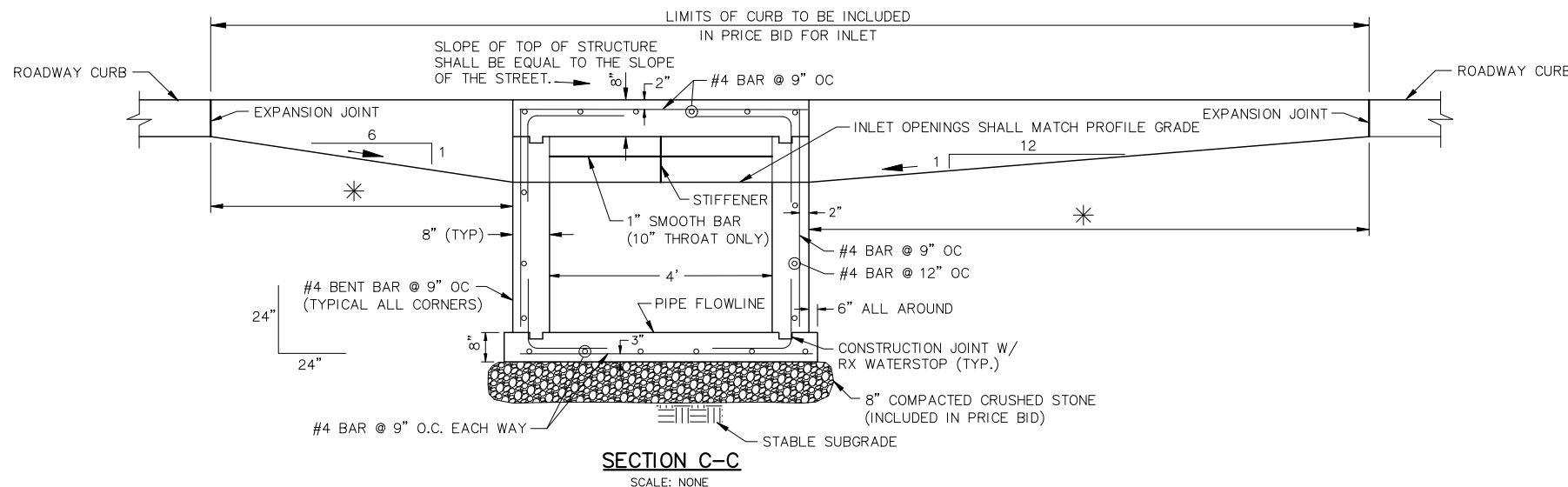
NOTE:  
 RCI STRUCTURES W/O MANHOLES SHOULD BE LIMITED TO CASES WHERE A SINGLE INLET IS EXTENDED BEYOND A JUNCTION BOX.

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
611.06 (G)	INLET, TYPE "RCI 0648 & RCI 1048"	EA.
611.06 (H)	ADDITIONAL DEPTH IN INLET TYPE "RCI 0648 & RCI 1048"	V.F.

NOTE:  
 DETAIL SHOWN WITH MANHOLE

	RCI 0648 (6" THROAT)		RCI 0648 (6" THROAT)		RCI 0648 (6" THROAT)		RCI 0648 (6" THROAT)	
	SUMP W/ MANHOLE CONC. CY	SUMP W/O MANHOLE STL. LBS.	NO SUMP W/ MANHOLE CONC. CY	NO SUMP W/O MANHOLE STL. LBS.	SUMP W/ MANHOLE CONC. CY	SUMP W/O MANHOLE STL. LBS.	NO SUMP W/ MANHOLE CONC. CY	NO SUMP W/O MANHOLE STL. LBS.
STD. DEPTH 3'	3.1	290	2.3	215	3.3	299	2.6	225
ADD. VERT. FT.	1	31	.7	24	1	31	.7	24

	RCI 1048 (10" THROAT)		RCI 1048 (10" THROAT)		RCI 1048 (10" THROAT)		RCI 1048 (10" THROAT)	
	SUMP W/ MANHOLE CONC. CY	SUMP W/O MANHOLE STL. LBS.	NO SUMP W/ MANHOLE CONC. CY	NO SUMP W/O MANHOLE STL. LBS.	SUMP W/ MANHOLE CONC. CY	SUMP W/O MANHOLE STL. LBS.	NO SUMP W/ MANHOLE CONC. CY	NO SUMP W/O MANHOLE STL. LBS.
STD. DEPTH 3'	3.5	295	2.6	221	3.7	307	2.8	236
ADD. VERT. FT.	1	31	.7	24	1	31	.7	24



**SECTION C-C**  
 SCALE: NONE

REVISION	BY	DATE

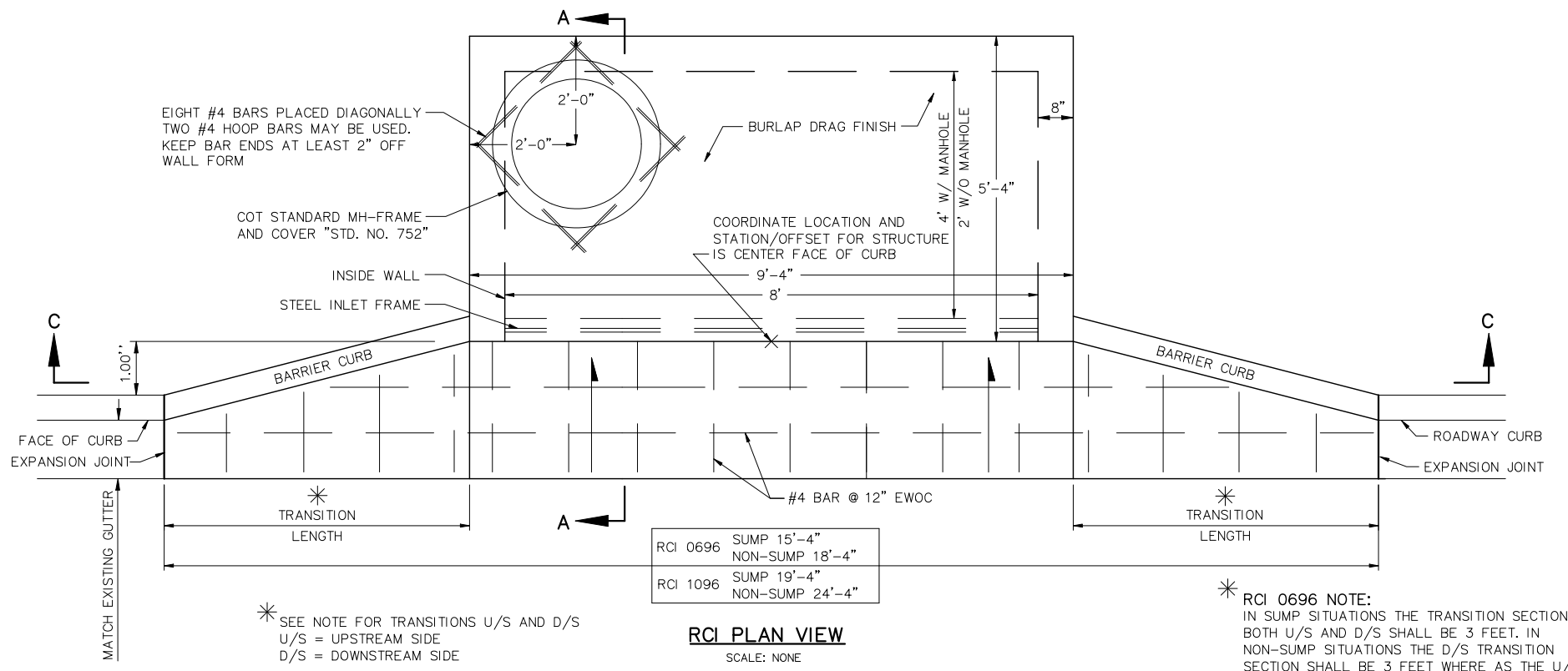
CITY ENGINEER	CITY OF TULSA, OKLAHOMA ENGINEERING SERVICES DEPARTMENT
	DESIGN MANAGER

RECESSED CURB INLET DETAILS  
 RCI 0648 - 6" THROAT  
 RCI 1048 - 10" THROAT

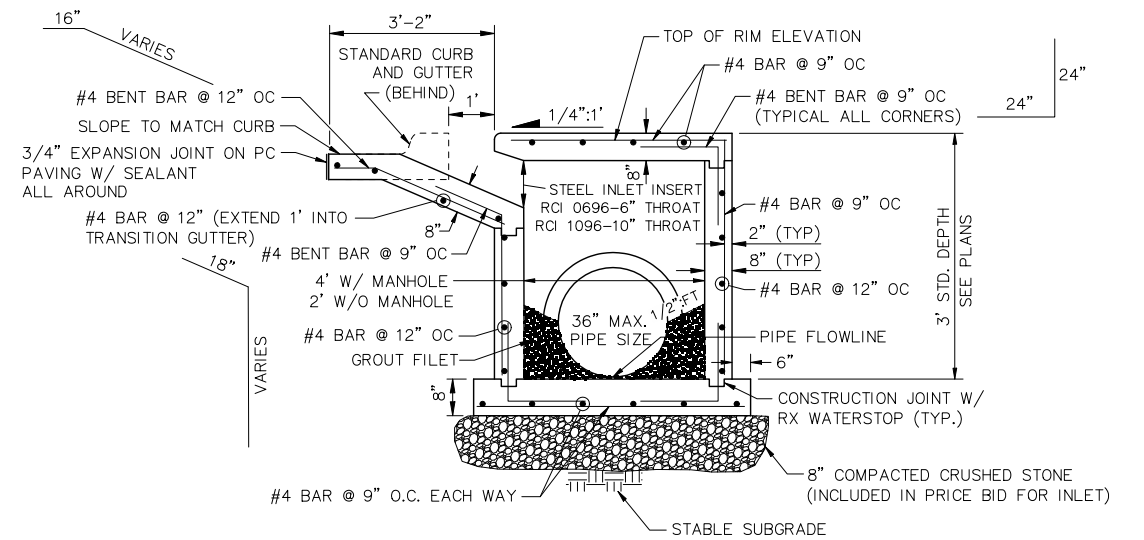
DATE: OCTOBER 2014      STD. 769A



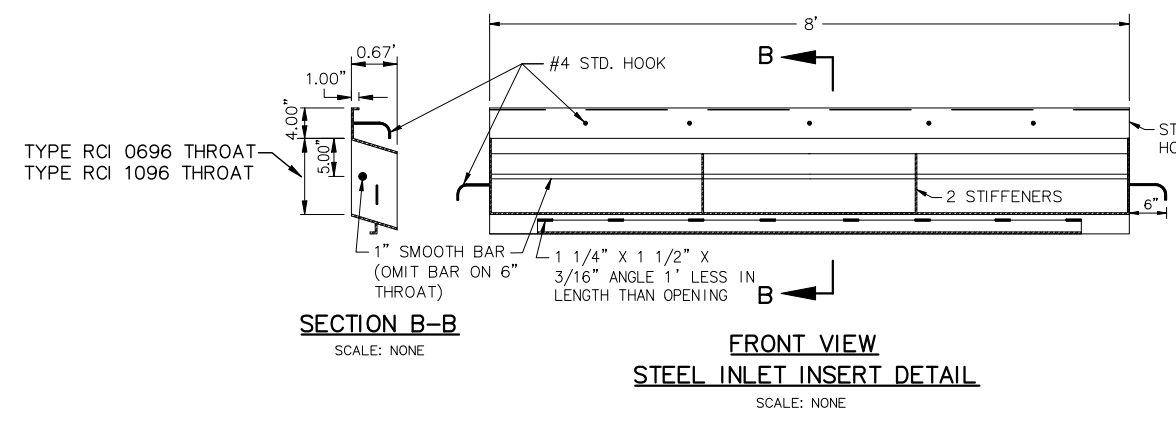
PATH NAME: /E1/PARTS/STD/DGN\_STD/769B-RECESSED-CURB-INLET-8FTWIDE.DGN SBW 10/20/2014



- CAST IN PLACE CONCRETE NOTES**
1. ALL CONCRETE SHALL BE CLASS A, AS DESIGNATED IN SECTION 509 OF THE ODOT SPECIFICATIONS, LATEST EDITION.
  2. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 3/4" UNLESS OTHERWISE NOTED.
  3. CLEAR DISTANCES FROM CAST-IN-PLACE CONCRETE SURFACES TO REINFORCING SHALL BE 2" FOR WALLS, 1-1/2" FOR SUPPORTED SLABS, 3" FROM THE BOTTOM OF FOOTINGS AND 2" FROM THE TOP OF SLABS, UNLESS OTHERWISE NOTED.
  4. REINFORCING STEEL SHALL MEET ASTM SPECIFICATION A615, GRADE 60.
  5. ALL BARS SHALL LAP A MINIMUM OF 30 BAR DIAMETERS OR 18", WHICHEVER IS GREATER, UNLESS OTHERWISE NOTED BY THE ENGINEER.
  6. ALL EXPOSED CAST IN PLACE CONCRETE SURFACES SHALL HAVE ALL VOIDS FILLED, BURRS AND FINS REMOVED.
  7. ALL JOINTS SHALL BE SEALED WITH AN APPROVED SILICONE SEALANT.
  8. MINIMUM CONCRETE COVER OF REINFORCING STEEL SHALL CONFORM TO AMERICAN CONCRETE INSTITUTE STANDARD OR BE 2" FOR EXTERIOR WALL STEEL OR 3" FOR THE BOTTOM FLOOR STEEL.



- \* **RCI 0696 NOTE:**  
IN SUMP SITUATIONS THE TRANSITION SECTION BOTH U/S AND D/S SHALL BE 3 FEET. IN NON-SUMP SITUATIONS THE D/S TRANSITION SECTION SHALL BE 3 FEET WHERE AS THE U/S TRANSITION SECTION SHALL BE 6 FEET.
- \* **RCI 1096 NOTE:**  
IN SUMP SITUATIONS THE TRANSITION SECTION BOTH U/S AND D/S SHALL BE 5 FEET. IN NON-SUMP SITUATIONS THE D/S TRANSITION SECTION SHALL BE 5 FEET WHERE AS THE U/S TRANSITION SECTION SHALL BE 10 FEET.



- STEEL INLET FRAME NOTES**
1. STEEL INLET INSERT SHALL BE AS MANUFACTURED BY SHAWNEE STEEL & WELDING, INC. OF MERIAM, KS. OR APPROVED EQUAL. REFER TO THE STEEL INLET INSERT DETAIL.
  2. COST OF INLET INSERT SHALL BE INCLUDED IN THE PRICE BID FOR INLET.
  3. ALL WELDS SHALL BE PERFORMED IN ACCORDANCE WITH APPROPRIATE AWS SPECIFICATIONS AND PROCEDURES.
  4. ALL STEEL SHALL BE 7 GAGE OR 3/16" THICK.
  5. ALL WELDS ON EXPOSED SURFACES SHALL BE DRESSED SO AS TO PROVIDE A PLEASING FINISHED APPEARANCE.
  6. THE ENTIRE FRAME SHALL BE HOT DIP ZINC COATED IN ACCORDANCE WITH ASTM A-123.

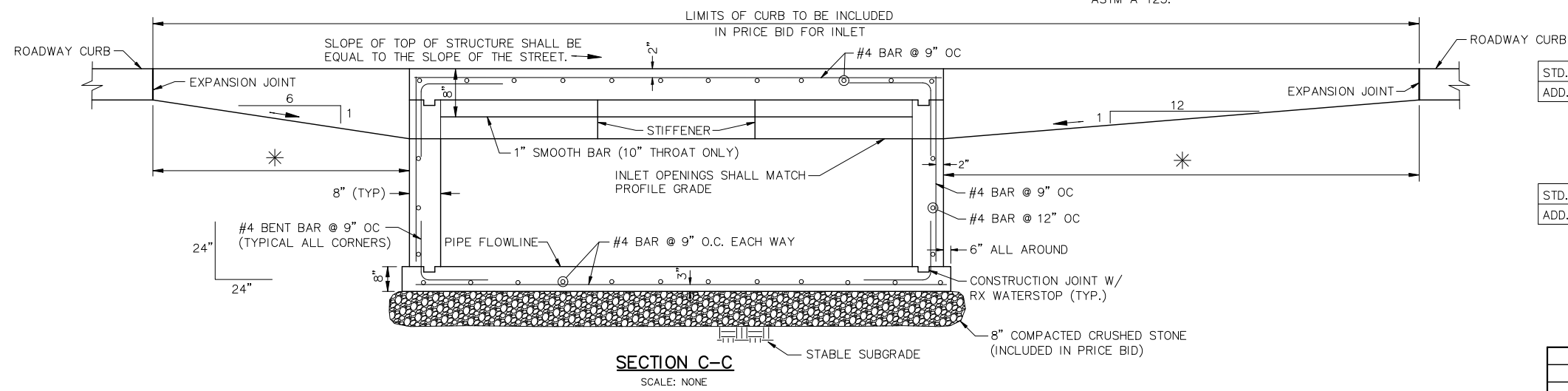
NOTE:  
RCI STRUCTURES W/O MANHOLES SHOULD BE LIMITED TO CASES WHERE A SINGLE INLET IS EXTENDED BEYOND A JUNCTION BOX.

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
611.06 (G)	INLET, TYPE "RCI 0696 & RCI 1096"	EA.
611.06 (H)	ADDITIONAL DEPTH IN INLET TYPE "RCI 0696 & RCI 1096"	V.F.

NOTE:  
DETAIL SHOWN WITH MANHOLE

	SUMP W/ MANHOLE		SUMP W/O MANHOLE		NO SUMP W/ MANHOLE		NO SUMP W/O MANHOLE	
	CONC. CY	STL. LBS.	CONC. CY	STL. LBS.	CONC. CY	STL. LBS.	CONC. CY	STL. LBS.
STD. DEPTH 3'	5.3	451	4	268	5.6	457	4.2	275
ADD. VERT. FT.	1.3	45	.8	38	1.3	45	.8	38

	SUMP W/ MANHOLE		SUMP W/O MANHOLE		NO SUMP W/ MANHOLE		NO SUMP W/O MANHOLE	
	CONC. CY	STL. LBS.	CONC. CY	STL. LBS.	CONC. CY	STL. LBS.	CONC. CY	STL. LBS.
STD. DEPTH 3'	5.7	464	4.3	281	6.1	477	4.7	295
ADD. VERT. FT.	1.3	45	.8	38	1.3	45	.8	38



REVISION	BY	DATE

CITY ENGINEER \_\_\_\_\_

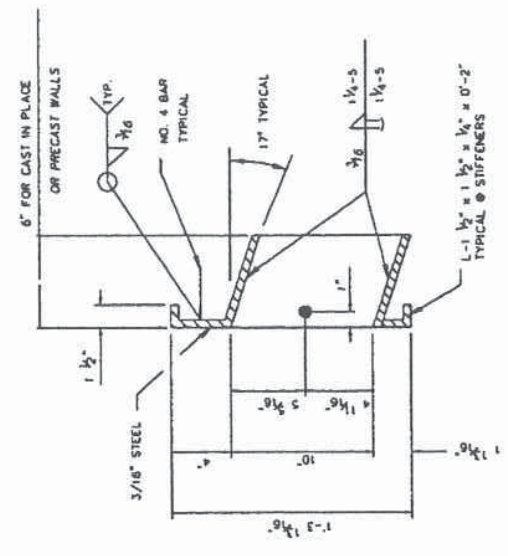
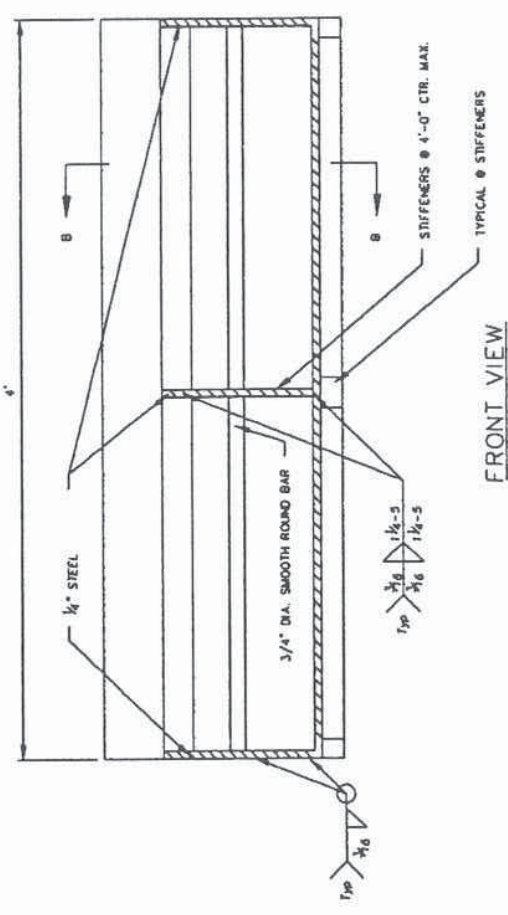
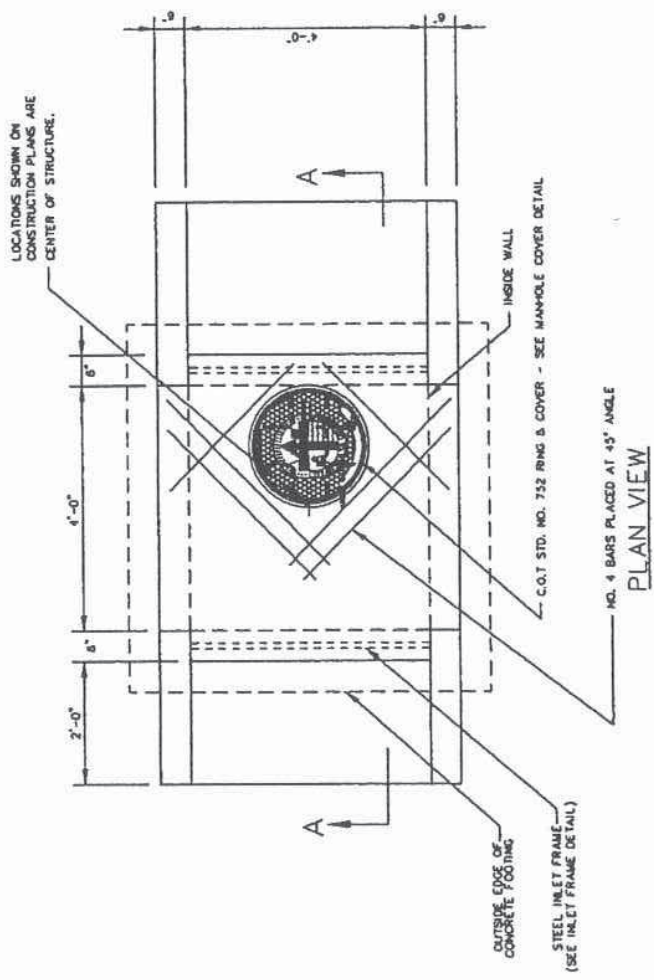
DESIGN MANAGER \_\_\_\_\_

CITY OF TULSA, OKLAHOMA  
ENGINEERING SERVICES DEPARTMENT

RECESSED CURB INLET DETAILS  
RCI 0696 - 6" THROAT  
RCI 1096 - 10" THROAT

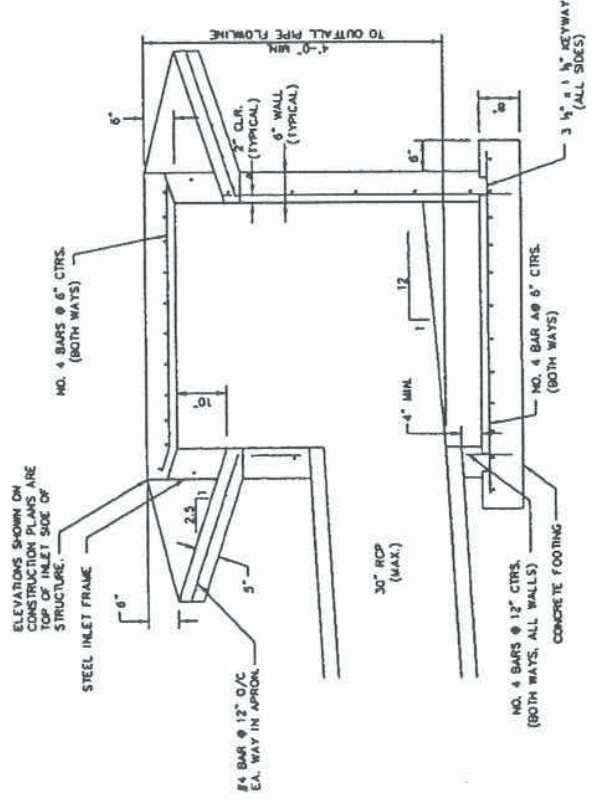
DATE: OCTOBER 2014 STD. 769B





- AREA INLET NOTES:**
1. ALL STORM SEWER STRUCTURES SHALL BE PRECAST OR CAST IN PLACE MASONRY CONSTRUCTION WILL NOT BE ALLOWED.
  2. BERM LOCATION AND ELEVATION MAY VARY. SEE GRADING PLAN FOR EXACT LOCATION.
  3. CONCRETE CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF STANDARD SPECIFICATIONS FOR STATE ROAD AND BRIDGE CONSTRUCTION.
  4. INLET FLOORS SHALL BE SHAPED WITH NON-REINFORCED CONCRETE INVERTS TO PROVIDE SMOOTH FLOW.
  5. BEVEL ALL EXPOSED CONCRETE EDGES WITH 3/4" CHAMFER STRIPS.
  6. REINFORCING STEEL SHALL BE GRADE 60 AS PER ASTM A618 AND SHALL BE BENT COLD.
  7. ALL LAP SPLICES SHALL BE A MINIMUM OF 40 BAR DIAMETERS IN LENGTH.

- STEEL INLET FRAME NOTES:**
1. ALL WELDS SHALL BE PERFORMED WITH APPROPRIATE AWS SPECIFICATIONS AND PROCEDURES.
  2. ALL WELDS ON EXPOSED SURFACES SHALL BE DRESSED SO AS TO PROVIDE A PLEASING FINISHED APPEARANCE.
  3. THE ENTIRE FRAME SHALL BE HOT DIP ZINC COATED IN ACCORDANCE WITH ASTM A-123.



**10" STEEL INLET FRAME**

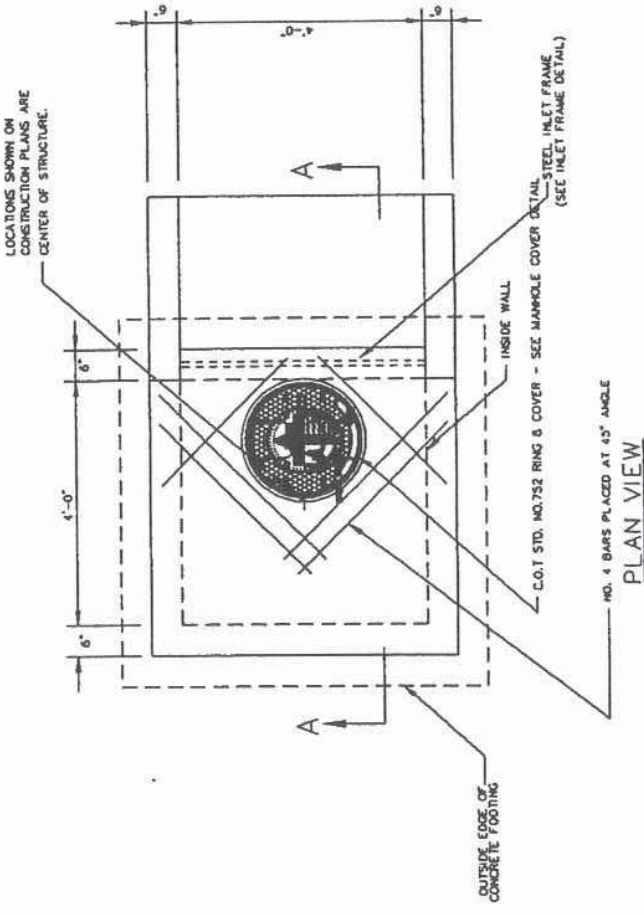
**SECTION A-A**

**SECTION B-B**

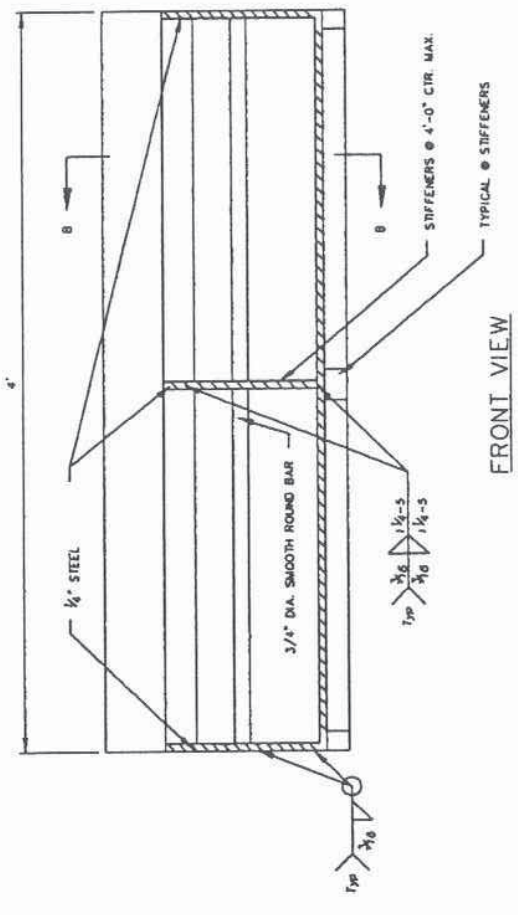
REVISION	BY	DATE

CITY OF TULSA, OKLAHOMA  
 PUBLIC WORKS  
 AND DEVELOPMENT DEPARTMENT  
 PROJECT NO. 2007  
 SPECIAL TYPE I  
 DROP INLET  
 DATE: MAY 2006  
 STD. ????

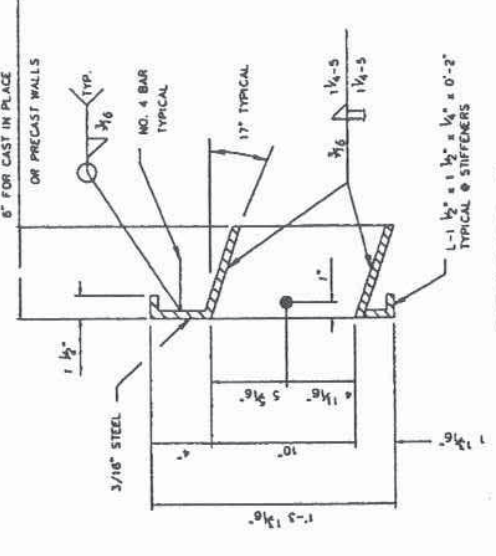




PLAN VIEW



FRONT VIEW



SECTION B-B

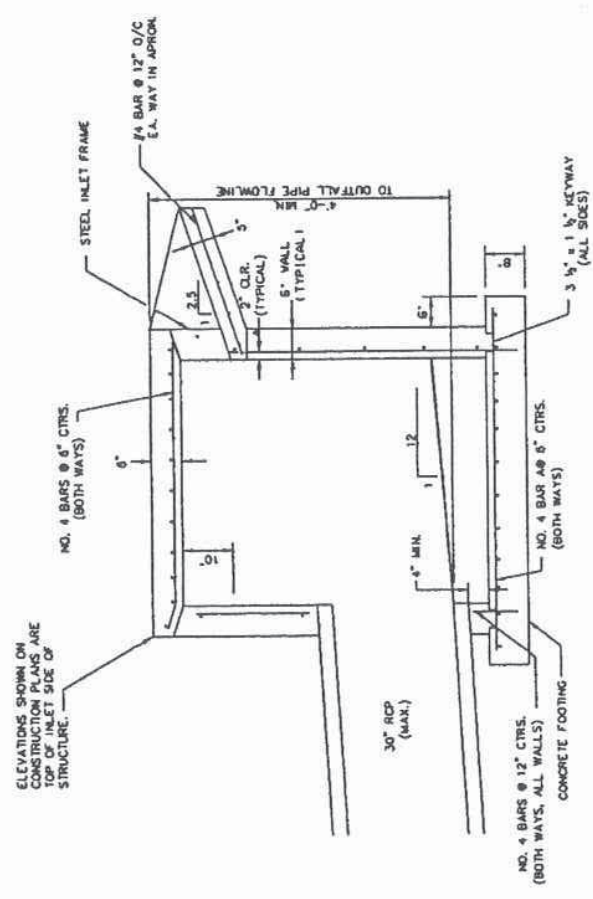
10" STEEL INLET FRAME

AREA INLET NOTES:

1. ALL STORM SEWER STRUCTURES SHALL BE PRE-CAST OR CAST IN PLACE. MASONRY CONSTRUCTION WILL NOT BE ALLOWED.
2. BERM LOCATION AND ELEVATION MAY VARY. SEE GRADING PLAN FOR EXACT LOCATION.
3. CONCRETE CONSTRUCTION SHALL MEET THE REQUIREMENTS OF THE LATEST EDITION OF SPECIFICATIONS FOR STATE ROAD AND BRIDGE CONSTRUCTION.
4. INLET FLOORS SHALL BE SHAPED WITH NON-REINFORCED CONCRETE INVERTS TO PROVIDE SMOOTH FLOW.
5. BEVEL ALL EXPOSED CONCRETE EDGES WITH 3/4" CHAMFER STRIPS.
6. REINFORCING STEEL SHALL BE GRADE 60 AS PER ASTM A618 AND SHALL BE BENT COLD.
7. ALL LAP SPLICES SHALL BE A MINIMUM OF 40 BAR DIAMETERS IN LENGTH.

STEEL INLET FRAME NOTES:

1. ALL WELDS SHALL BE PERFORMED WITH APPROPRIATE AWS SPECIFICATIONS AND PROCEDURES.
2. ALL WELDS ON EXPOSED SURFACES SHALL BE DRESSED SO AS TO PROVIDE A PLEASING FINISHED APPEARANCE.
3. THE ENTIRE FRAME SHALL BE HOT DIP ZINC COATED IN ACCORDANCE WITH ASTM A-123.

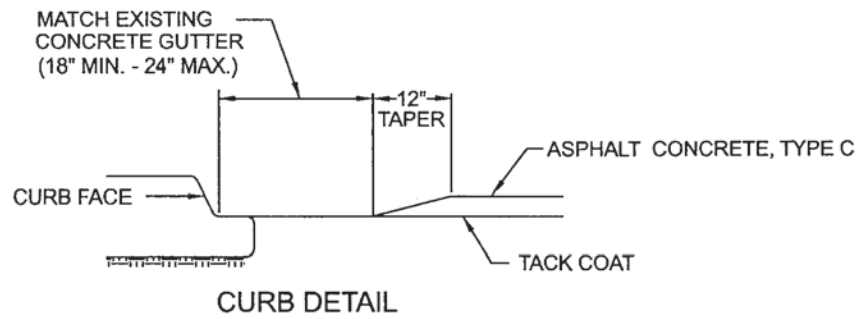


SECTION A-A

REVISION	BY	DATE

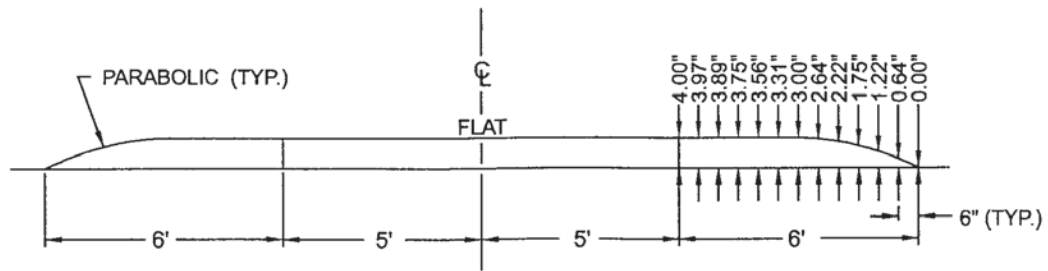
CITY OF TULSA, OKLAHOMA  
PUBLIC WORKS  
AND DEVELOPMENT DEPARTMENT  
PROJECT NO. 2007  
SPECIAL TYPE II  
DROP INLET  
DATE: MAY 2006  
S.D. 777





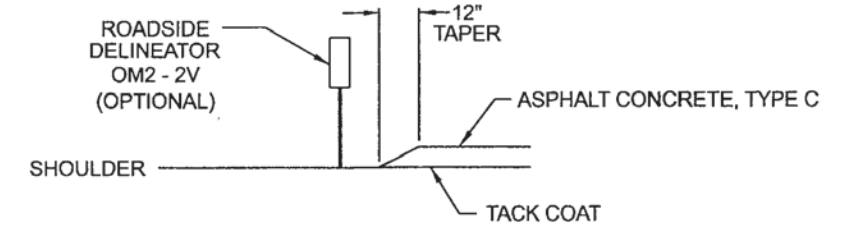
### SECTION B-B

APPLICABLE TO BOTH  
SPEED HUMP DESIGNS

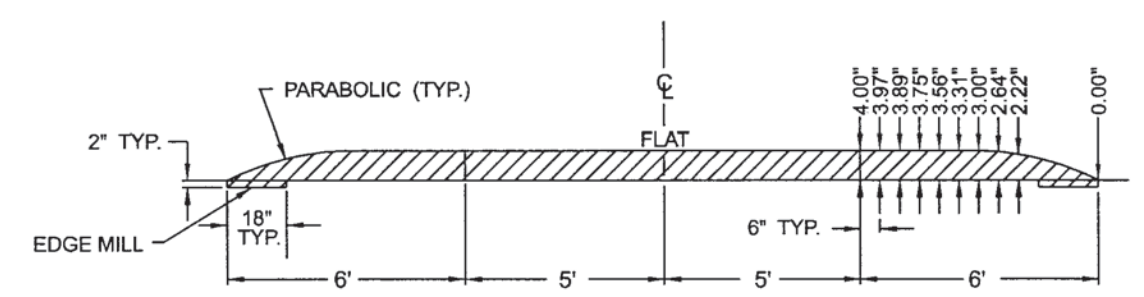
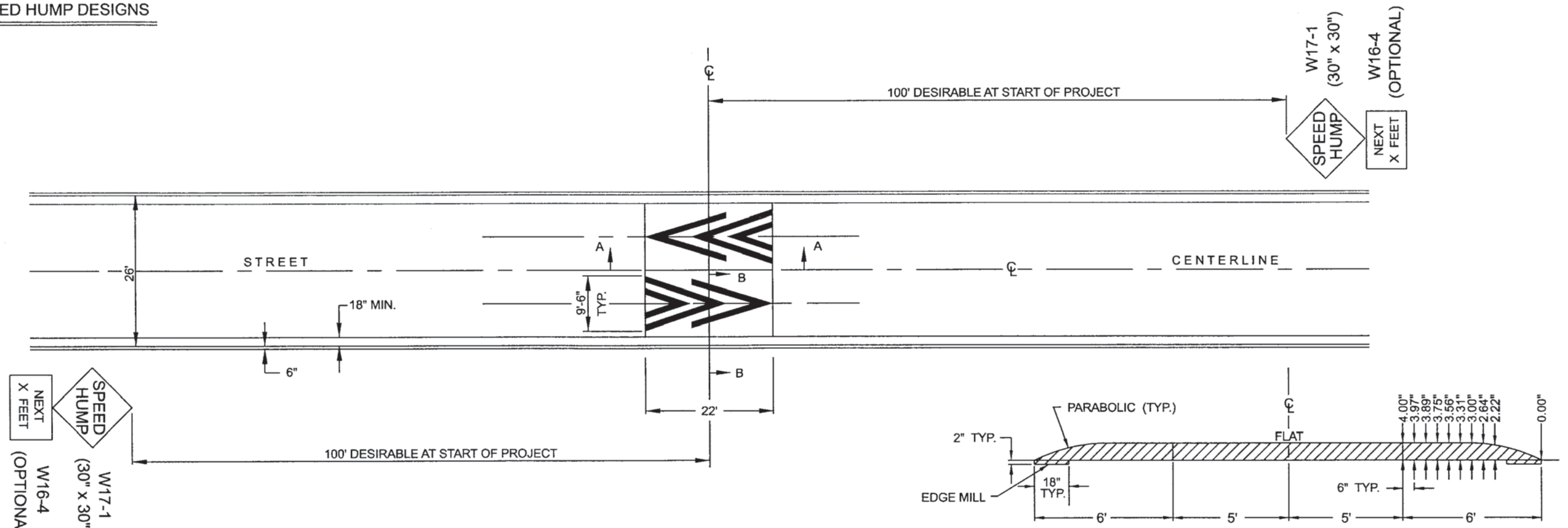


### SECTION A-A

NOT TO SCALE

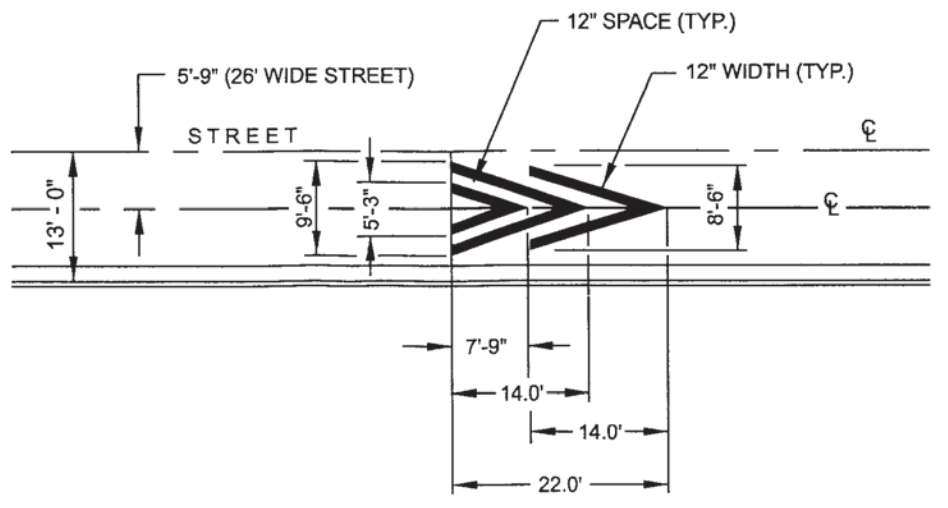


### SHOULDER DETAIL FOR STREETS WITHOUT CURBS



### SECTION A-A

NOT TO SCALE



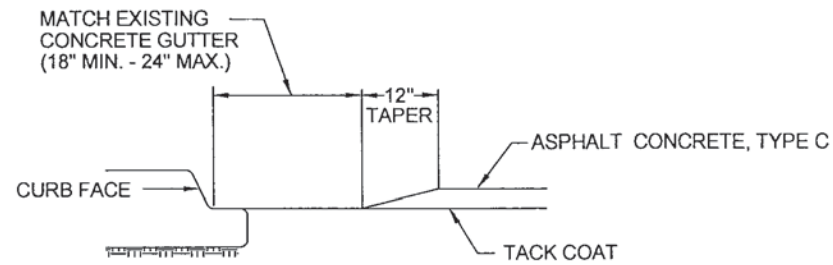
### TYPICAL PAVEMENT MARKING DETAIL

NOT TO SCALE

- NOTES:**
- FABRICATE DELINEATOR AND WARNING SIGNS WITH ENCAPSULATED LENS AND REFLECTIVE SHEETING SPEC. TYPE III STANDARDS.
  - INSTALL WHITE 120 MIL THICK PAVEMENT MARKINGS USING HOT APPLIED THERMOPLASTIC COMPOUND MATERIALS CONFORMING TO 1999 OKLAHOMA DEPT. OF TRANSPORTATION STANDARD SPECIFICATION FOR HIGHWAY CONSTRUCTION.

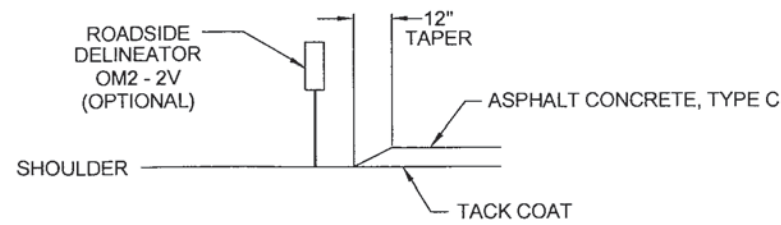
REVISION		CITY OF TULSA, OKLAHOMA	
DATE	BY	PUBLIC WORKS DEPARTMENT TRAFFIC ENGINEERING SECTION	
<b>22' ASPHALT SPEED HUMP</b>			
SCALE	N. T. S.	APPROVED	
DRAWN	C.J.B.	PUBLIC WORKS DIRECTOR	
CHECKED			
RECOMMENDED		DATE 04-11-05	





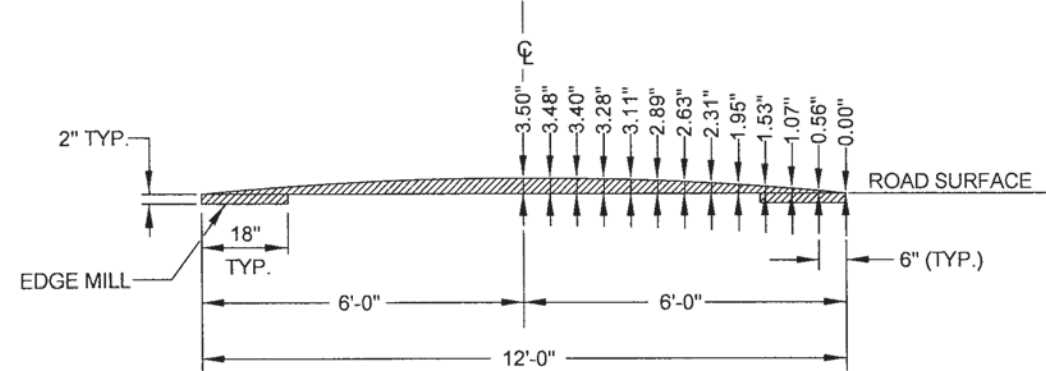
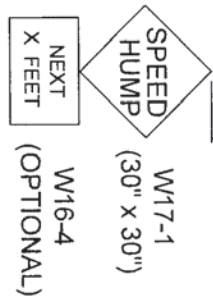
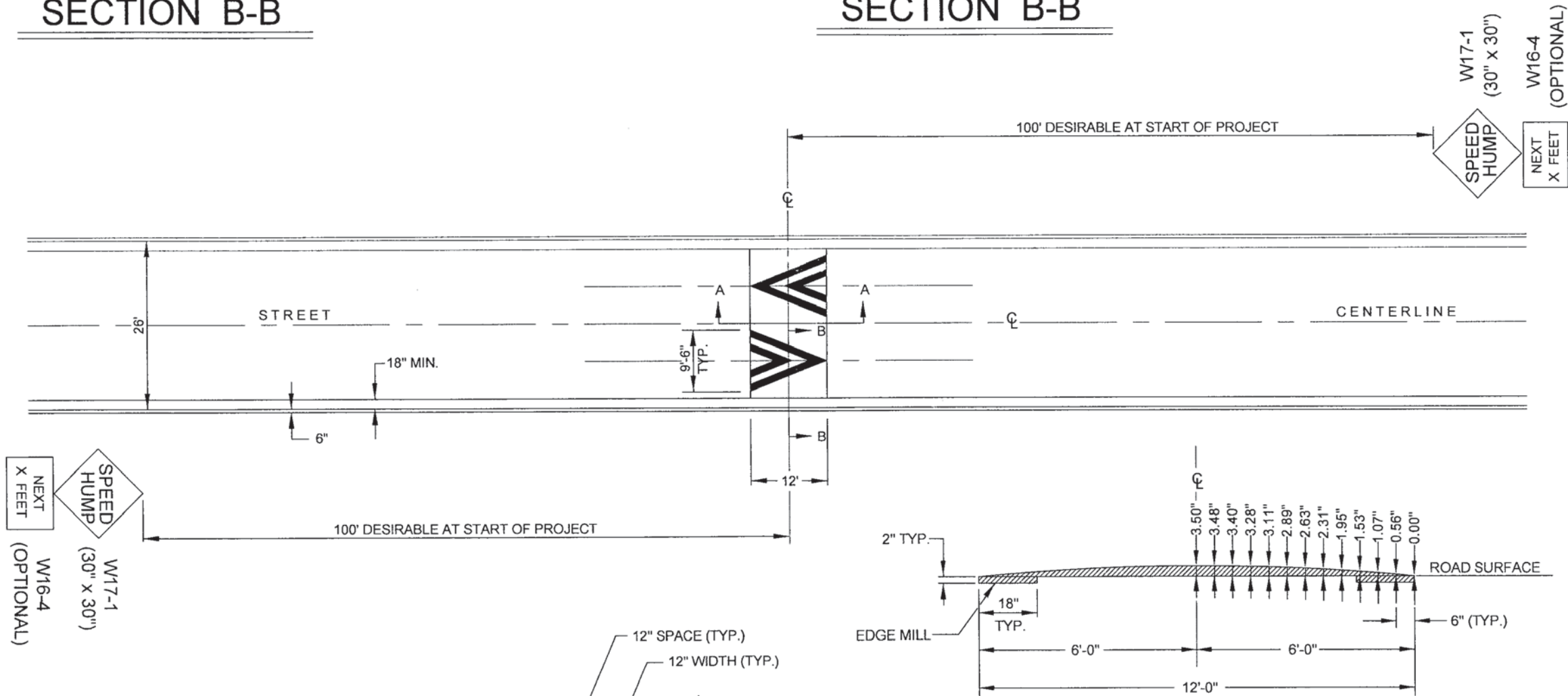
CURB DETAIL

**SECTION B-B**



SHOULDER DETAIL FOR  
STREETS WITHOUT CURBS

**SECTION B-B**



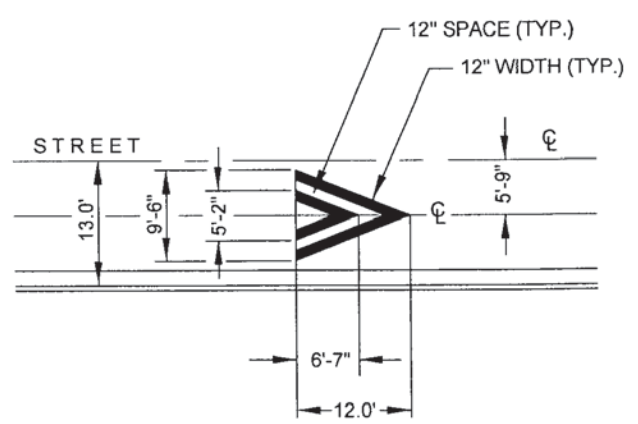
**PARABOLIC CROWN**

**SECTION A-A**

NOT TO SCALE

**NOTES:**

1. FABRICATE DELINEATOR AND WARNING SIGNS WITH ENCAPSULATED LENS AND REFLECTIVE SHEETING SPEC. TYPE III STANDARDS.
2. INSTALL WHITE 120 MIL THICK PAVEMENT MARKINGS USING HOT APPLIED THERMOPLASTIC COMPOUND MATERIALS CONFORMING TO 1999 OKLAHOMA DEPT. OF TRANSPORTATION STANDARD SPECIFICATION FOR HIGHWAY CONSTRUCTION.



TYPICAL PAVEMENT MARKING DETAIL

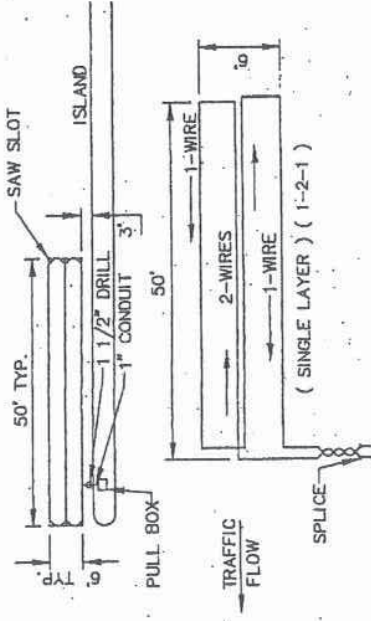
NOT TO SCALE

REVISION		CITY OF TULSA, OKLAHOMA	
DATE	BY	PUBLIC WORKS DEPARTMENT TRAFFIC ENGINEERING SECTION	
		<b>12' ASPHALT SPEED HUMP</b>	
SCALE	N. T. S.	APPROVED  PUBLIC WORKS DIRECTOR	
DRAWN	C.J.B.		
CHECKED			
RECOMMENDED		DATE	11-06-03
TRAFFIC ENGINEER		DRAWING NO.	

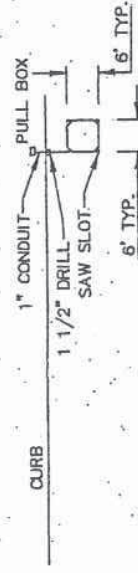


DESIGN SPEED MPH	DISTANCE "X" FT.
30	220
35	256
40	293
45	330

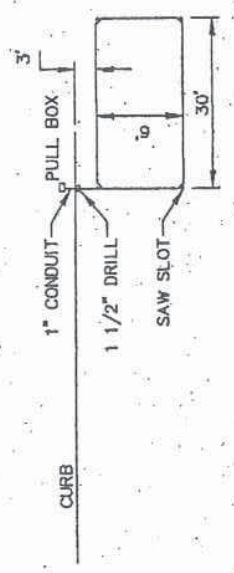
NUMBER OF WIRES	1-2	3	4	5	6
CONCRETE	1 1/4	1 3/4	2	2 1/2	2 3/4
ASPHALT	1 3/4	2 1/4	2 1/2	3	3 1/4



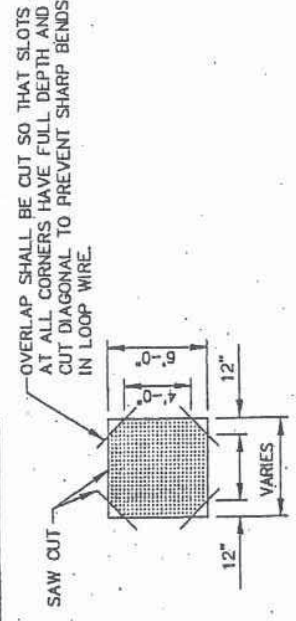
LEFT TURN QUADRUPOLE LOOP  
WINDING INSTRUCTIONS



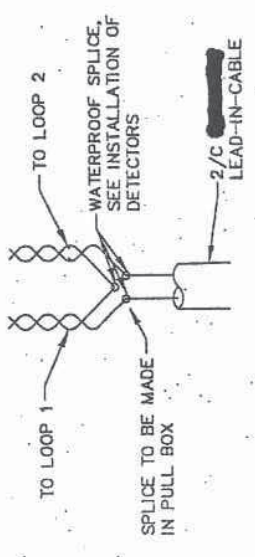
STRAIGHT THROUGH LOOP (SMALL)  
(WITH 4 WRAPS)



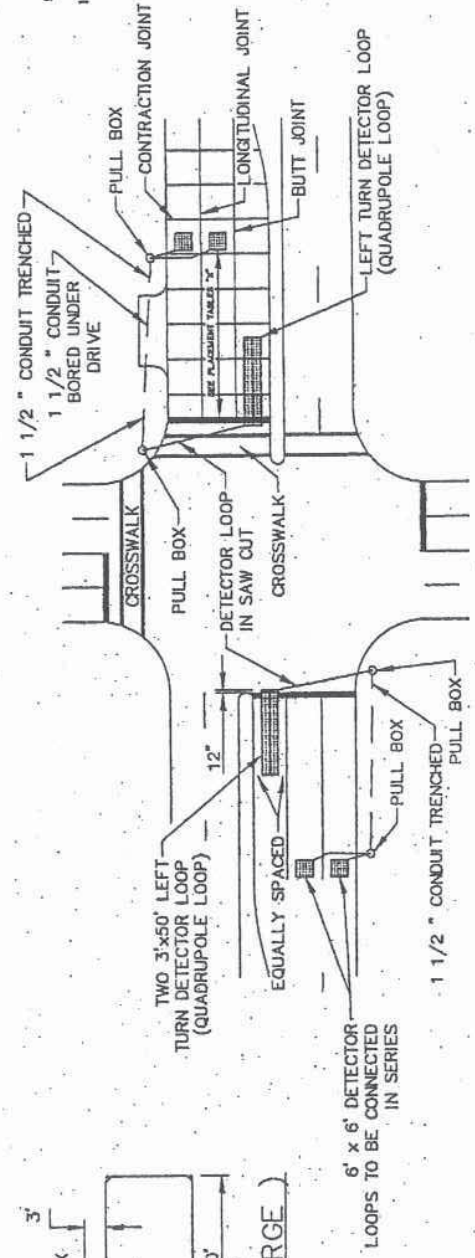
STRAIGHT THROUGH LOOP (LARGE)  
(WITH 4 WRAPS)



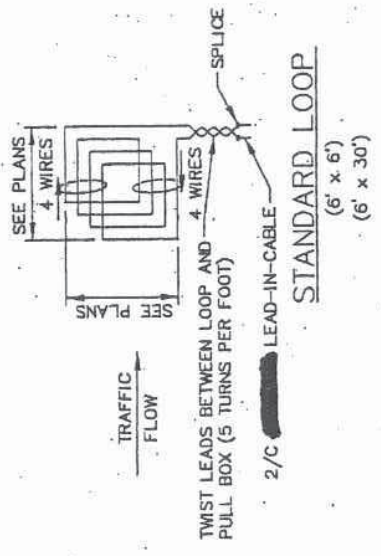
ALL SAW CUT CORNERS - DIAGRAM



TYPICAL LOOP DETECTOR WIRE  
CONNECTION IN SERIES



TYPICAL DETECTOR WIRE AND LOOP PLACEMENT



STANDARD LOOP  
(6' x 6')  
(6' x 30')

NOTE:

1. SAW CUT DEPTH IN CONCRETE OR ASPHALT IS DETERMINED BY NUMBER OF WIRES IN SAW SLOT. SEE SAW CUT DEPTH CHART.
2. SAW CUT WIDTH SHALL BE MADE USING A BLADE THAT IS A MAXIMUM OF 3/8 INCH IN WIDTH. THE MINIMUM WIDTH OF THE CUT SHALL BE 5/16 INCH.
3. ALL LOOP CORNERS SHALL BE CUT AS SHOWN IN THE SAW CUT CORNER DIAGRAM.
4. THE SAW CUT SHALL BE BLOWN CLEAR OF DEBRIS AND WATER BEFORE LOOP WIRE IS INSTALLED.
5. LOOP WIRE SHALL BE #14 STRANDED THIN WIRE-IN-DUCT.
6. ALL NON-QUADRUPOLE LOOPS SHALL BE WOUND IN A CLOCKWISE DIRECTION.
7. THE 'BEGINNING' END OF THE LOOP WINDING SHALL BE MARKED WITH A COLORED THE WRAP. INSIDE THE PULL BOX, THE WRAP SHALL BE MARKED WITH A COLORED THE WRAP. ON THE BEGINNING END OF THE WINDING, THE SECOND LOOP FROM THE PULL BOX SHALL HAVE AN ORANGE TIE WRAP. THE THIRD LOOP SHALL BE MARKED WITH A GREEN TIE WRAP AND THE FOURTH LOOP SHALL HAVE A BLUE TIE WRAP.
8. AFTER THE LOOP HAS BEEN COMPLETED, THE TWO (2) WIRES EXTENDING INTO THE PULL BOX SHALL BE TWISTED TOGETHER WITH FIVE (5) TURNS PER FOOT. THESE WIRES SHALL EXTEND INTO THE PULL BOX A MINIMUM OF SIX (6) FEET, WITH 8 INCHES OF WIRE EXPOSED FROM THE DUCTING.
9. THE LOOP DETECTOR SAW CUT SHALL BE SEALED WITH BOND-O, P-608, 3M, OR APPROVED EQUAL DETECTOR LOOP SEALANT FILLED TO THE TOP OF SAW CUT. DRILL OR FOUR IN PLACE 1\"/>

CITY OF TULSA, OKLAHOMA  
PUBLIC WORKS  
AND DEVELOPMENT DEPARTMENT

INSTALLATION OF  
DETECTORS

DATE: MAY 2005  
STD. 604