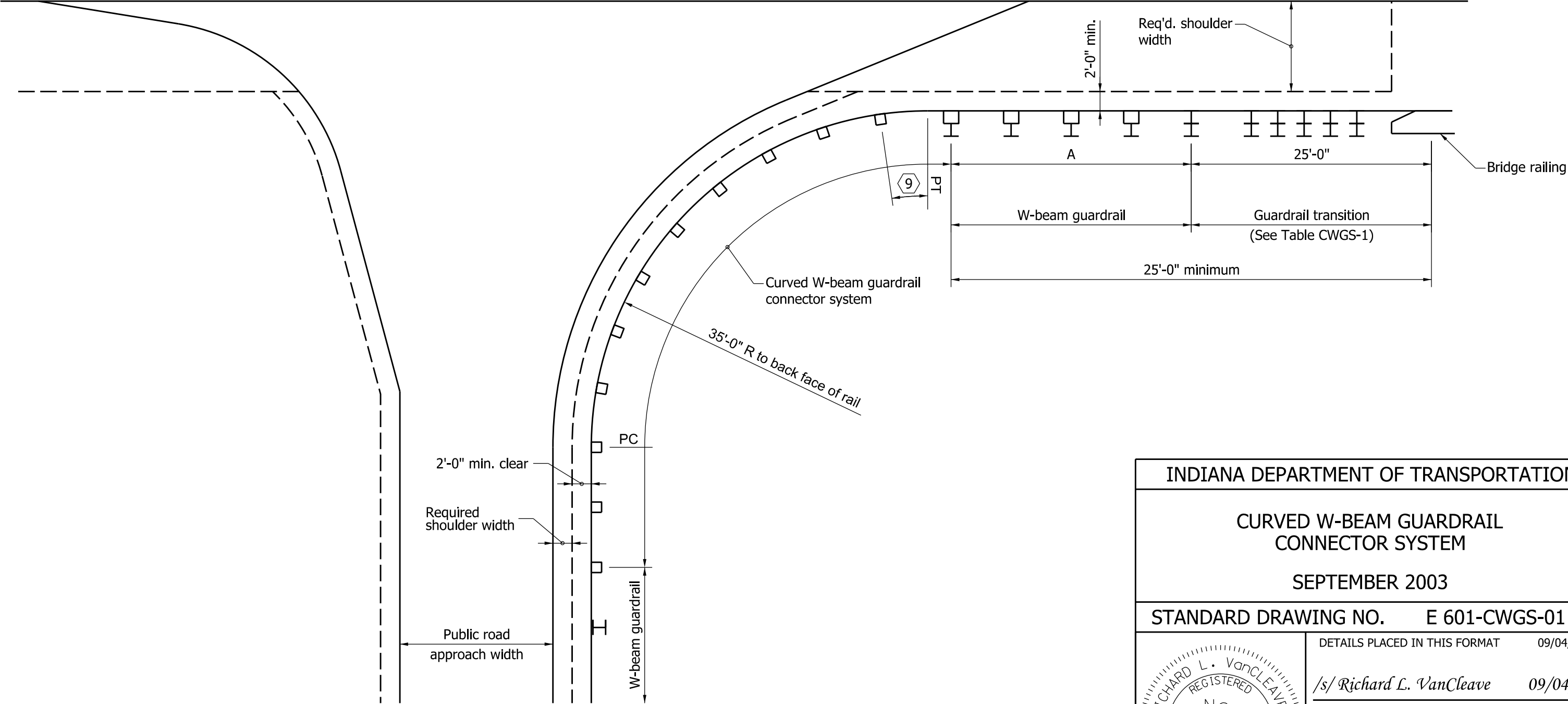


TABLE CWGS-1	
A	GUARDRAIL TRANSITION
< 25'	Type WGB
≥ 25'	Type TGB

NOTES:

1. See Standard Drawing E 601-CWGS-03 for General Notes.



**PUBLIC ROAD APPROACH INSTALLATION
AT BRIDGE END**

INDIANA DEPARTMENT OF TRANSPORTATION	
CURVED W-BEAM GUARDRAIL CONNECTOR SYSTEM	
SEPTEMBER 2003	
STANDARD DRAWING NO. E 601-CWGS-01	
	DETAILS PLACED IN THIS FORMAT 09/04/12
	/s/ Richard L. VanCleave 09/04/12
	SUPERVISOR, ROADWAY STANDARDS DATE
	/s/ Mark A. Miller 09/04/12
CHIEF ENGINEER	DATE

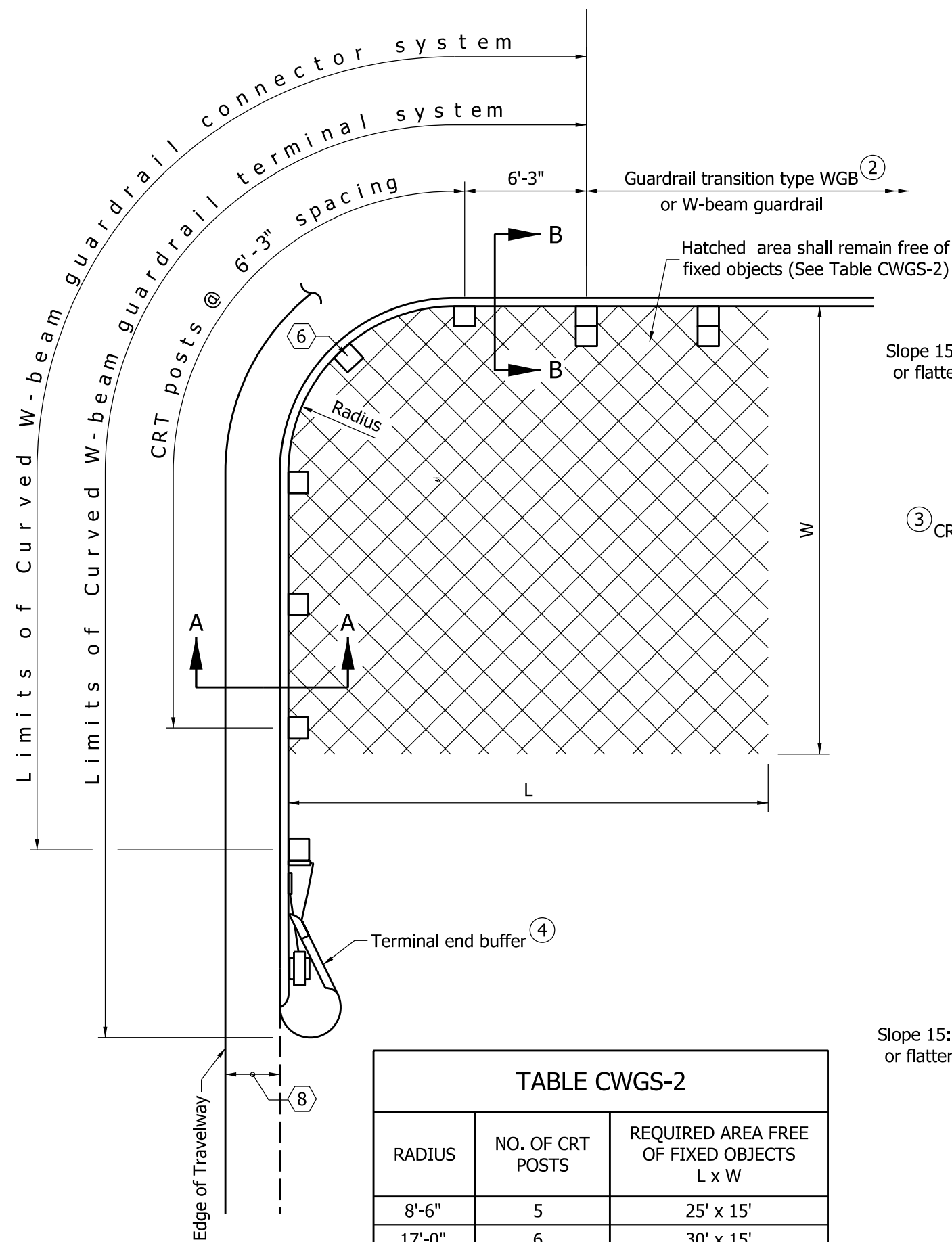
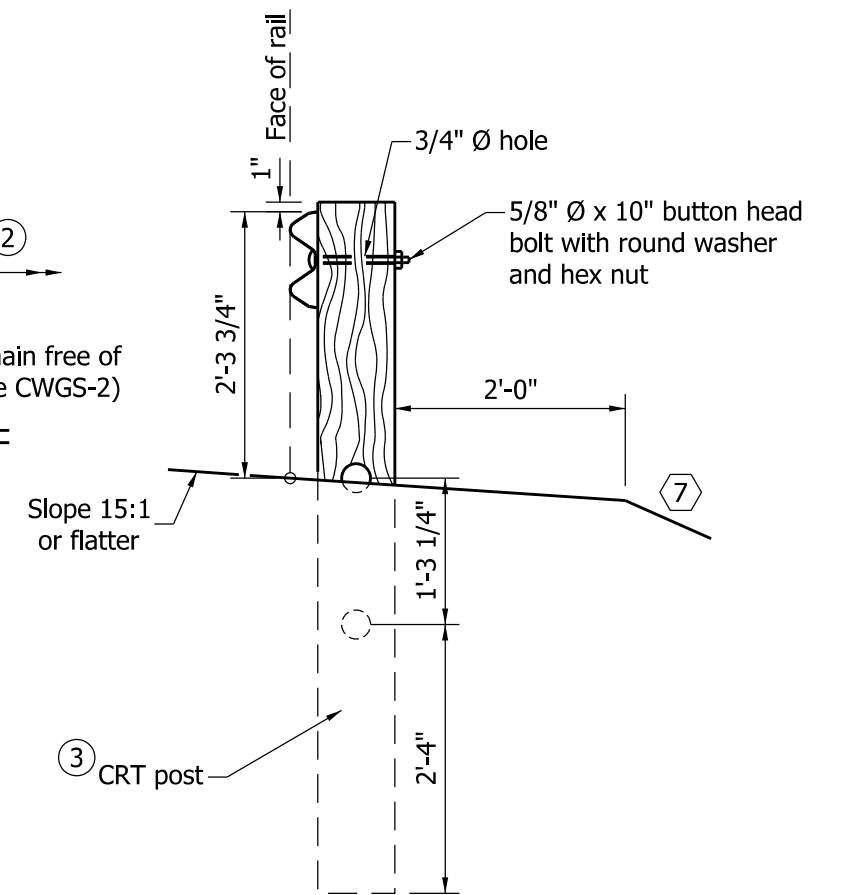
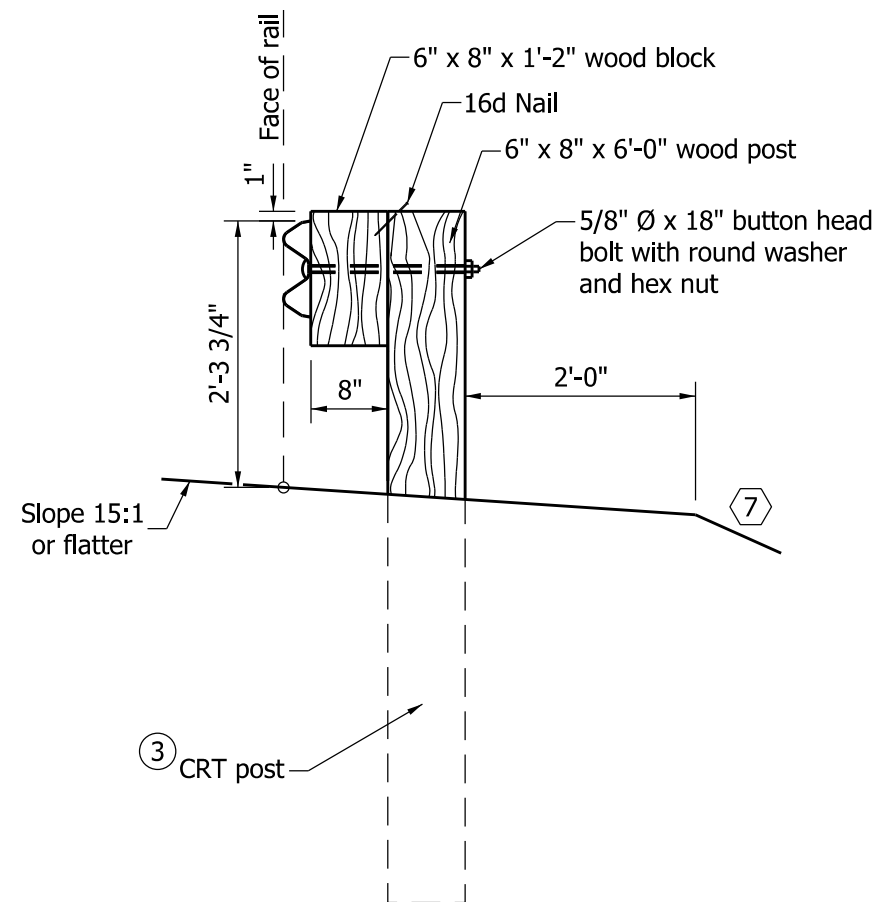


TABLE CWGS-2

RADIUS	NO. OF CRT POSTS	REQUIRED AREA FREE OF FIXED OBJECTS L x W
8'-6"	5	25' x 15'
17'-0"	6	30' x 15'
25'-6"	8	40' x 20'
35'-0"	11	50' x 20'



SECTION A-A



SECTION B-B

NOTES:

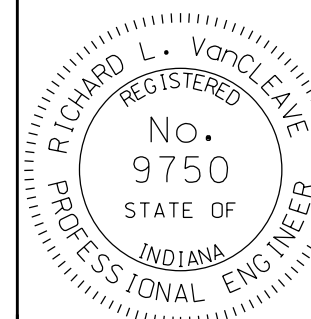
- See Standard Drawing E 601-CWGS-03 for General Notes.
- See Standard Drawing E 601-TWGB-02 for guardrail transition type WBG details.
- See Standard Drawing E 601-CWGS-06 for CRT post details.
- See Standard Drawing E 601-CWGS-04 and 05 for terminal end buffer details.

INDIANA DEPARTMENT OF TRANSPORTATION

CURVED W-BEAM
GUARDRAIL SYSTEM

SEPTEMBER 2011

STANDARD DRAWING NO. E 601-CWGS-02



DETAILS PLACED IN THIS FORMAT 09/04/12

/s/ Richard L. VanCleave 09/04/12

SUPERVISOR, ROADWAY STANDARDS DATE

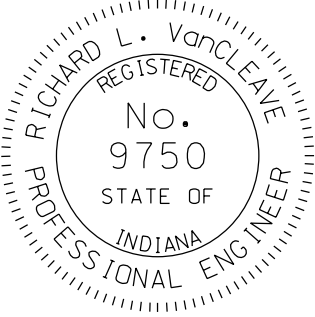
/s/ Mark A. Miller 09/04/12

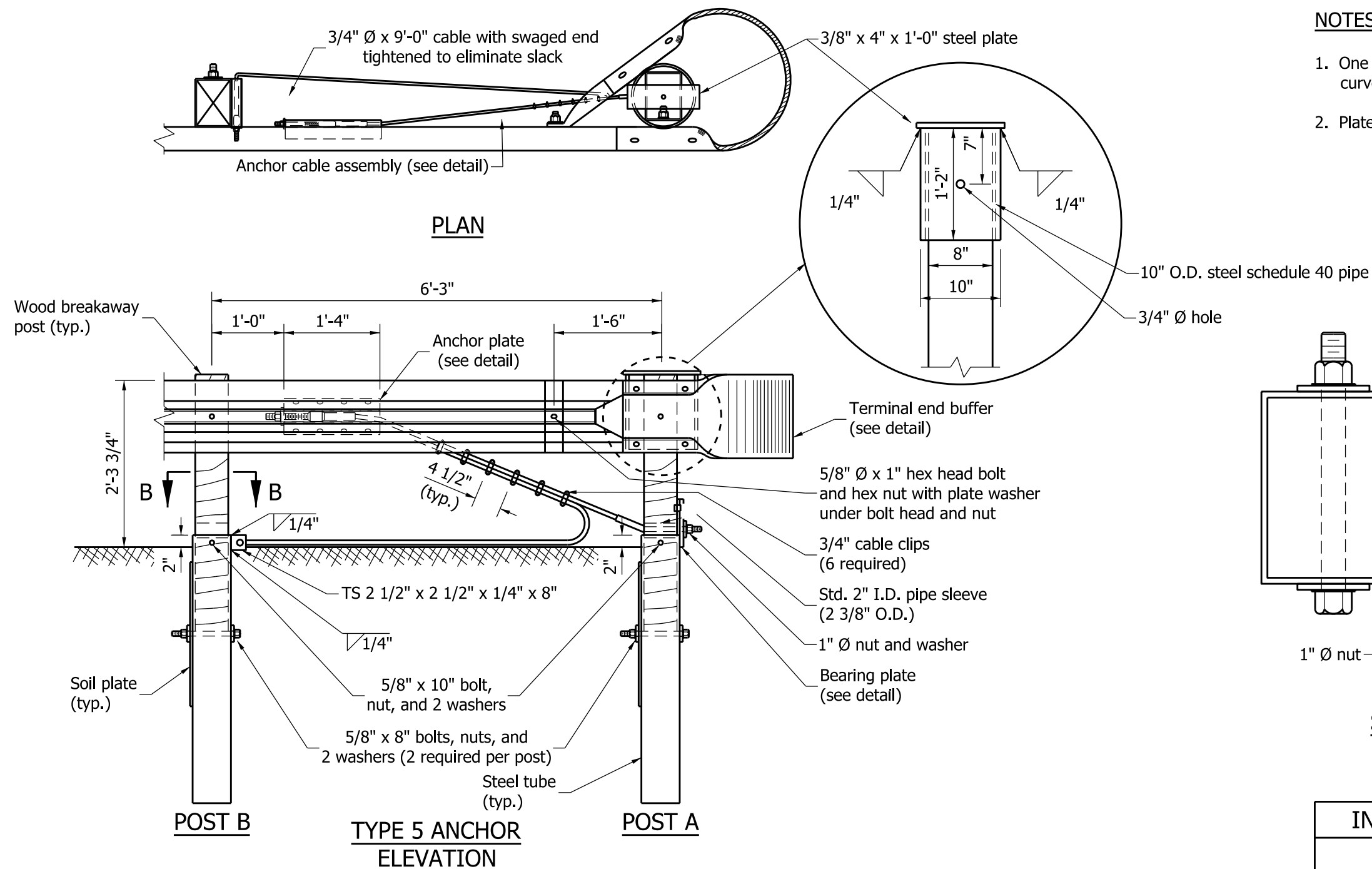
CHIEF ENGINEER DATE

GENERAL NOTES

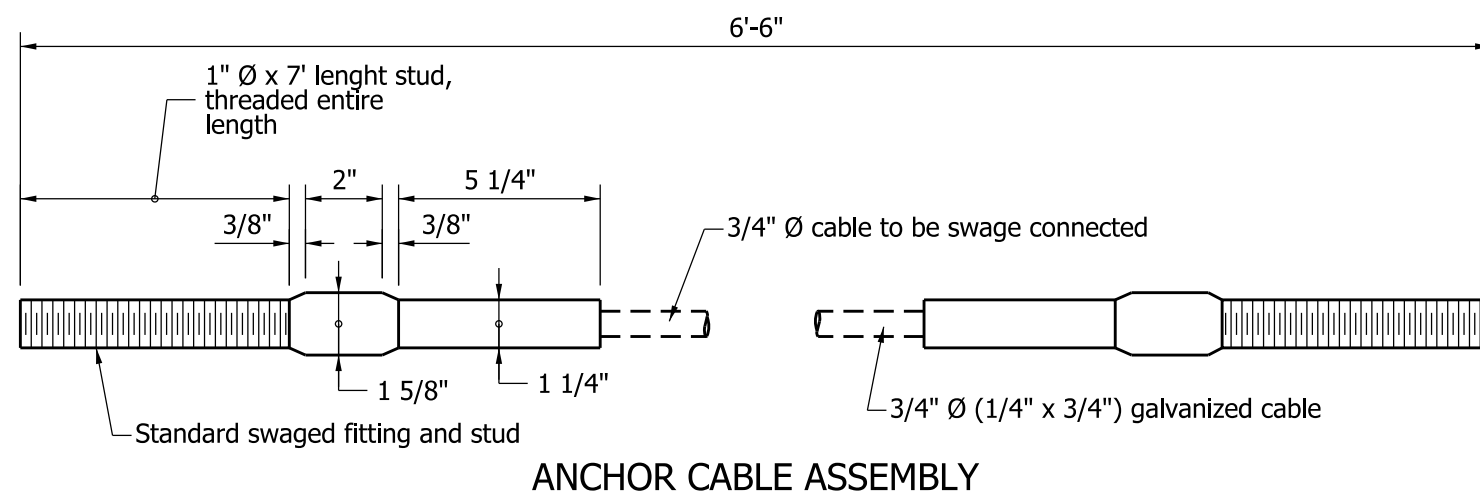
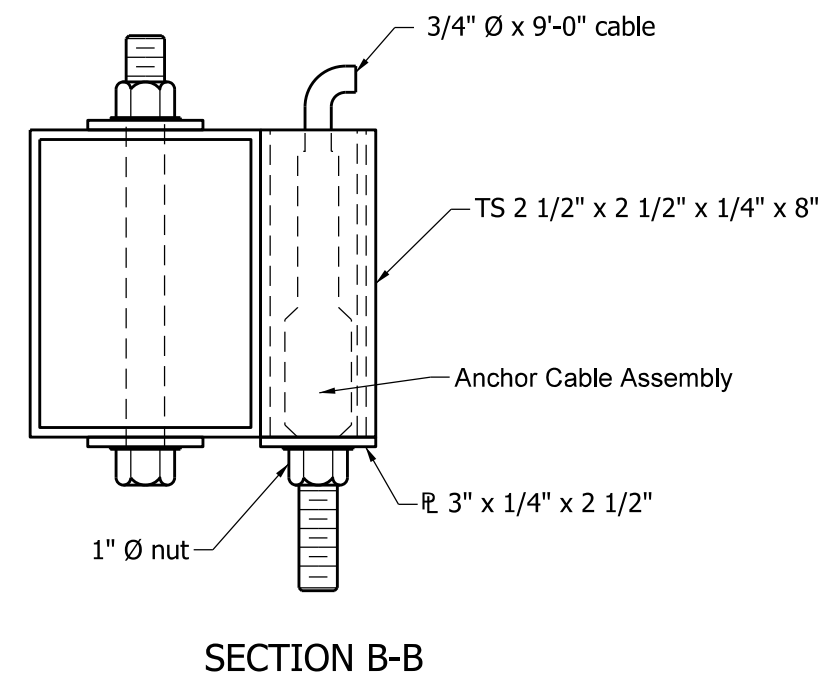
1. This drawing shall be used in conjunction with Standard Drawings E 601-CWGS-01 through -06, and E 601-CWGT-01 and -02 where a curved W-beam guardrail system is specified.
2. The type of curved W-beam guardrail system to be used shall be as shown on the plans in accordance with Table CWGS-3.
3. Except where otherwise shown, all hardware and installation shall be the same as for the guardrail specified for the adjacent run.
4. A curved W-beam guardrail terminal system shall be used to terminate a run of guardrail only at a driveway. For a public road approach, a curved W-beam guardrail connector system shall be used.
5. A maximum of two guardrail panels may be omitted from the curved W-beam guardrail terminal system only where the bridge railing falls outside of the clear zone and the plans specifically state that panels are to be omitted. See Table CWGS-03 for the number of guardrail panels to be removed for each type of curved W-beam guardrail system.
- 6 For the 8'-6" radius curved W-beam guardrail terminal system, guardrail shall not be bolted to this post.
- 7 The embankment slope behind the curved W-beam guardrail system shall be 2:1 or flatter.
- 8 A minimum 4 ft width shoulder shall be used with a 15 ft minimum drive radius.
- 9 This dimension shall be 5 ft for the 35 ft radius curved W-beam guardrail connector system.

TABLE CWGS-3		
CURVED W-BEAM GUARDRAIL SYSTEMS		
TYPE	RADIUS	NUMBER OF 6'-3" PANELS REMOVED
TERMINAL SYSTEM		
1	8'-6"	0
2	8'-6"	1
3	8'-6"	2
4	17'-0"	0
5	17'-0"	1
6	17'-0"	2
7	25'-0"	0
8	25'-0"	1
9	25'-0"	2
CONNECTOR SYSTEM		
1	25'-0"	0
2	35'-0"	0

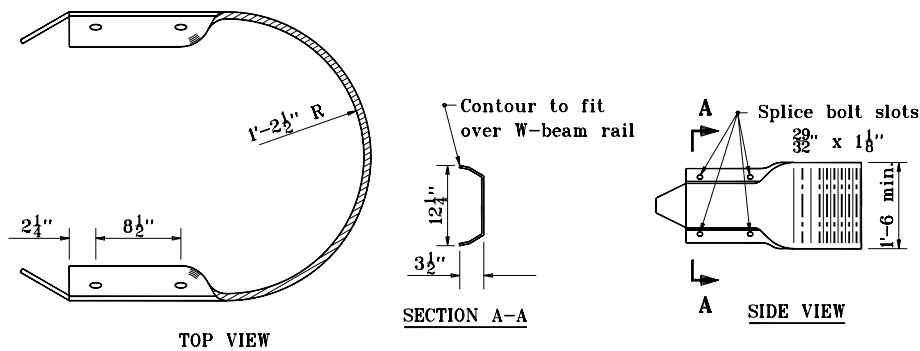
INDIANA DEPARTMENT OF TRANSPORTATION		
CURVED W-BEAM GUARDRAIL SYSTEM		
SEPTEMBER 1999		
STANDARD DRAWING NO.		E 601-CWGS-03
	DETAILS PLACED IN THIS FORMAT 09/04/12	
	/s/ Richard L. VanCleave	09/04/12
	SUPERVISOR, ROADWAY STANDARDS	DATE
	/s/ Mark A. Miller	09/04/12
CHIEF ENGINEER	DATE	



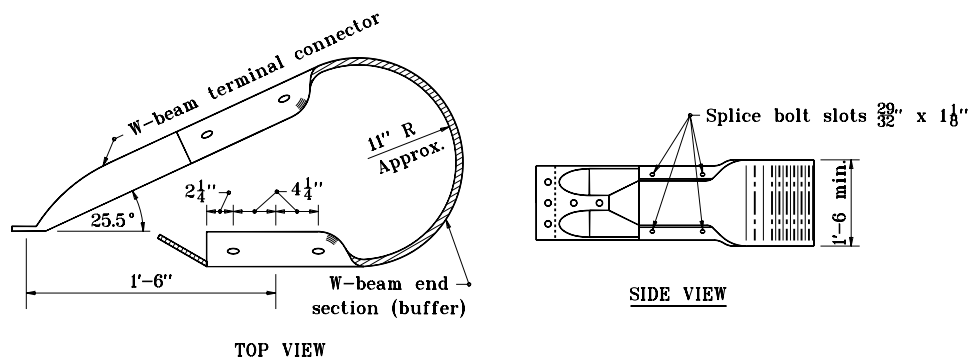
- NOTES:**
1. One 5/8" Ø x 10" bolt with nut and washer is required per curved W-beam steel tube and post.
 2. Plate washers shall be used only where indicated.



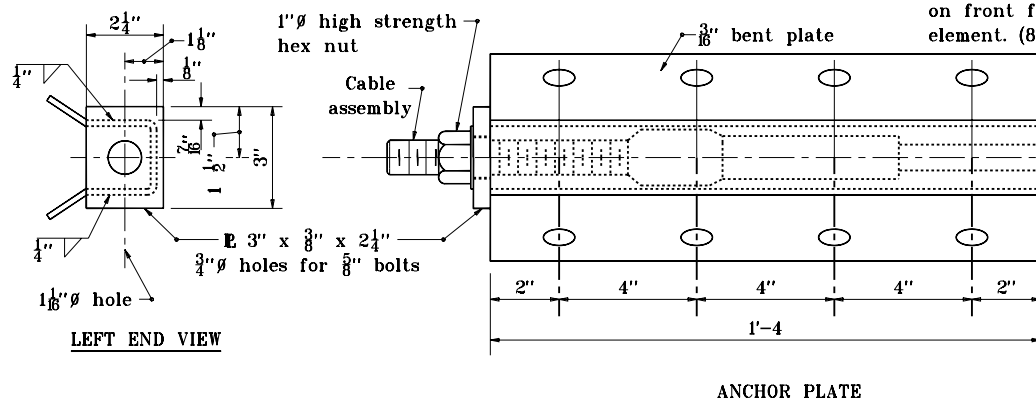
INDIANA DEPARTMENT OF TRANSPORTATION			
CURVED W-BEAM GUARDRAIL SYSTEM			
SEPTEMBER 2011			
STANDARD DRAWING NO.		E 601-CWGS-04	
	/s/ Richard L. VanCleave		09/01/11
	DESIGN STANDARDS ENGINEER		DATE
	/s/ Mark A. Miller		09/01/11
DESIGN STANDARDS ENGINEER	CHIEF HIGHWAY ENGINEER		DATE



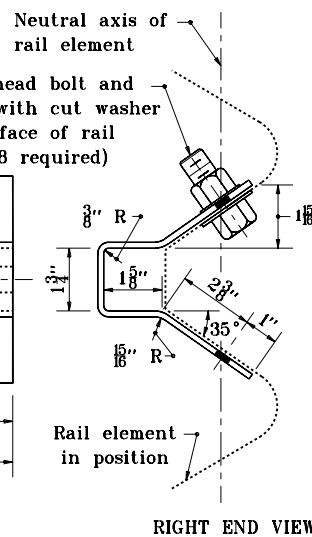
W-BEAM END SECTION (BUFFER)



TERMINAL END BUFFER



M10 hex head bolt and hex nut with cut washer on front face of rail element. (8 required)



GENERAL NOTES

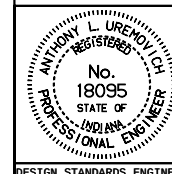
1. This sheet shall be used in conjunction with Standard Drawings E 601-CWGS-01, 02, 03, and 06.
2. An alternate single piece having a similar dimensional shape to the terminal end buffer and mating with the W-beam guardrail may be used.
3. The W-beam terminal connector shall be steel of 0.138 inch thickness (10 gauge).
4. If the W-beam terminal connector is lapped on the outside of the guardrail, a galvanized 1" I.D. 2" O.D., 0.134" thick, narrow plain washer shall be placed under the splice bolt heads.
5. Attach the W-beam to the steel pipe with a $\frac{3}{8}$ " diameter x $1\frac{1}{4}$ " length button head bolt with no washer. No connection to the post is required.
6. Nuts for the anchor cable assembly shall be hand tightened, plus one complete turn at the anchor plate end. All other nuts shall be torqued to 50 ft.-lbs.

INDIANA DEPARTMENT OF TRANSPORTATION

CURVED W-BEAM GUARDRAIL SYSTEM

APRIL 1996

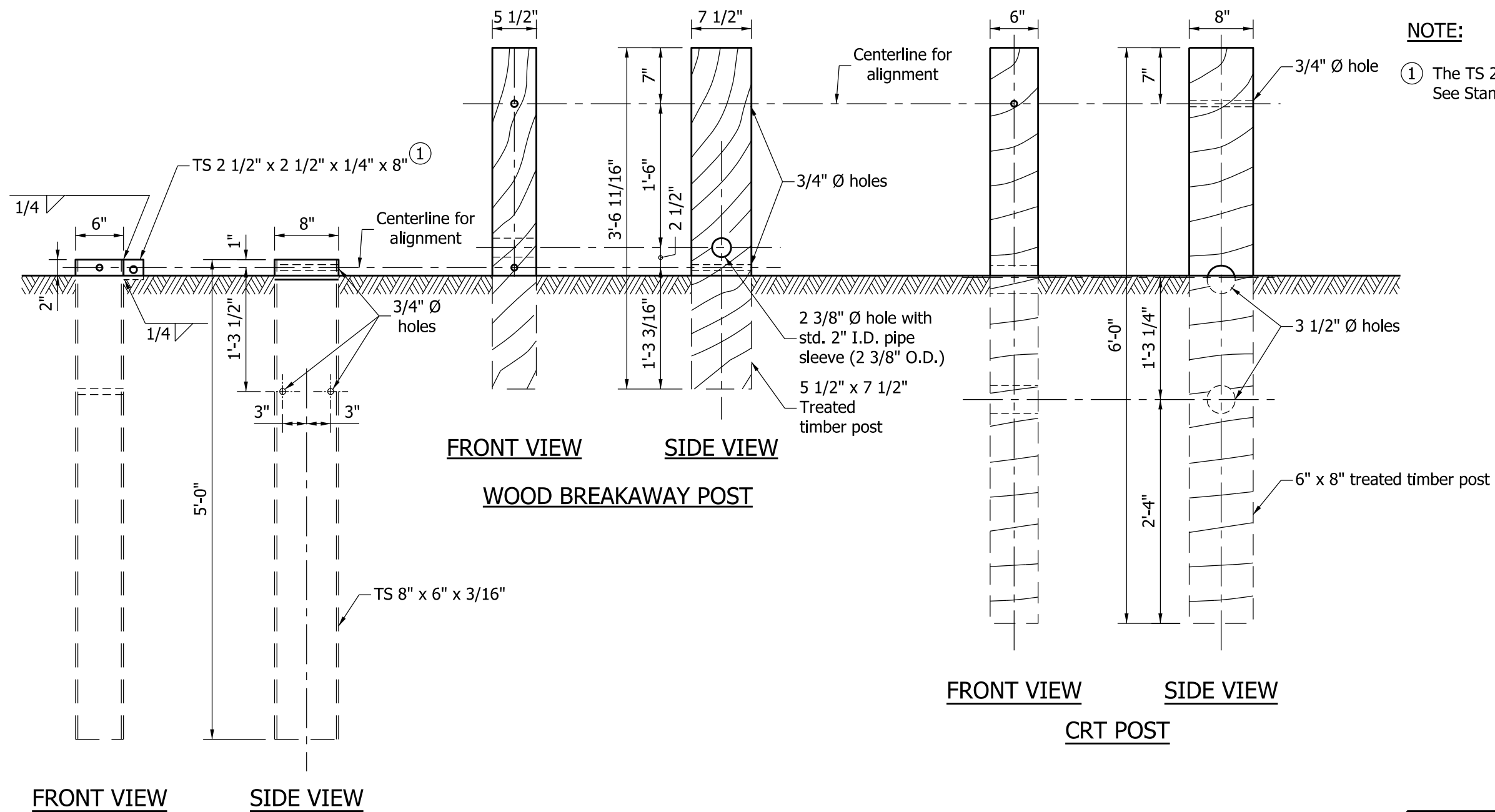
STANDARD DRAWING NO. E 601-CWGS-05



DETAILS PLACED IN THIS FORMAT 11-15-99

/s/ Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi 11-15-99
CHIEF HIGHWAY ENGINEER DATE
ORIGINALLY APPROVED 4-01-96



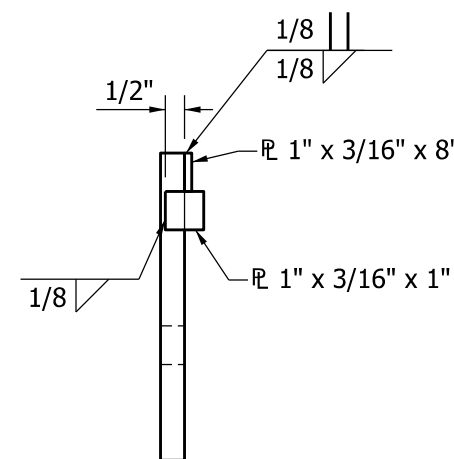
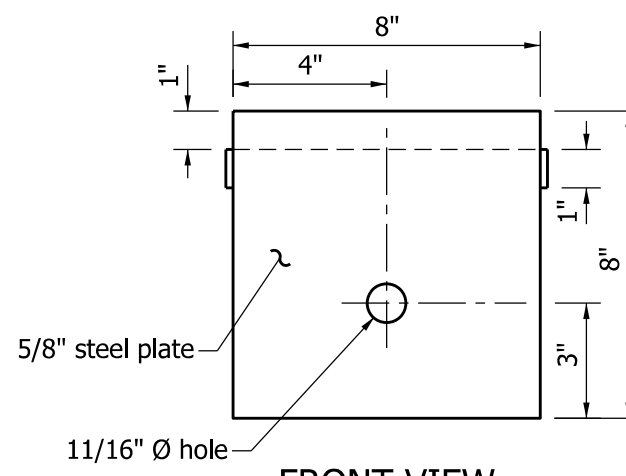
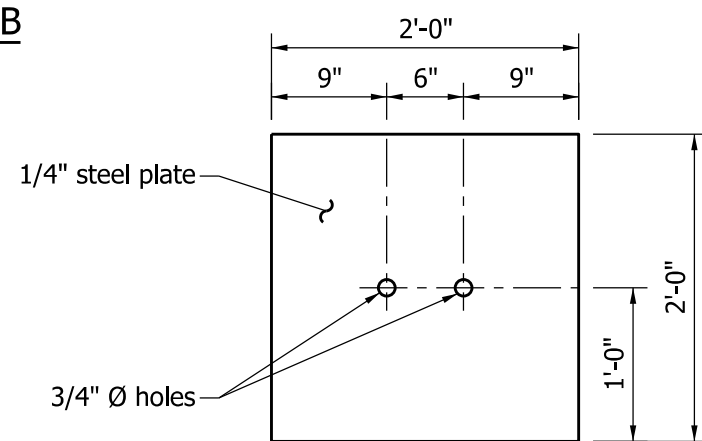
NOTE:

- ① The TS 2 1/2" x 2 1/2" structural tube shall be welded to Post B only. See Standard Drawing E 601-CWGS-04 for location of Post B.

FRONT VIEW

SIDE VIEW

STEEL TUBE POST B



FRONT VIEW

SIDE VIEW

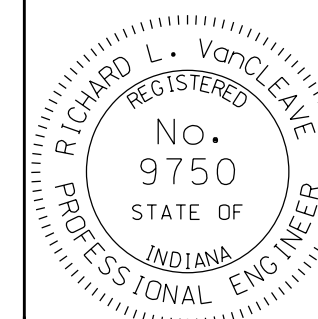
BEARING PLATE

INDIANA DEPARTMENT OF TRANSPORTATION

CURVED W-BEAM
GUARDRAIL SYSTEM

SEPTEMBER 2011

STANDARD DRAWING NO. E 601-CWGS-06



DETAILS PLACED IN THIS FORMAT 09/04/12

/s/ Richard L. VanCleave 09/04/12

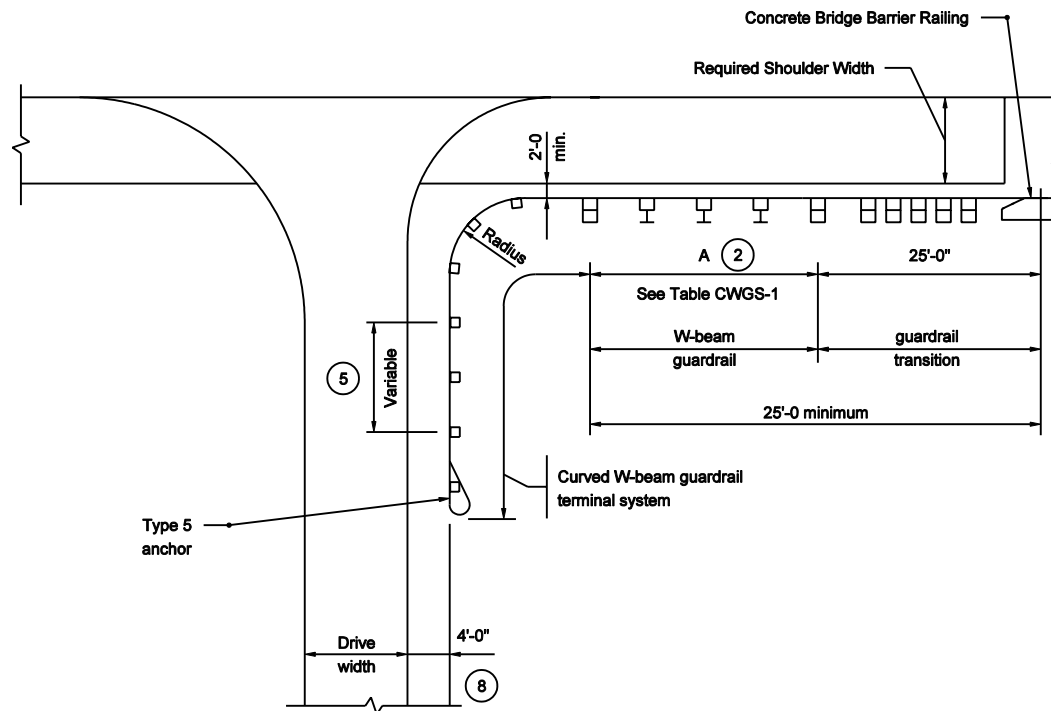
SUPERVISOR, ROADWAY STANDARDS DATE

/s/ Mark A. Miller 09/04/12

CHIEF ENGINEER DATE

NOTES

1. See Standard Drawing E 601-CWGS-03 for other General Notes.
- 2 See Standard Drawing E 601-CWGS-01 for Table CWGS-1.

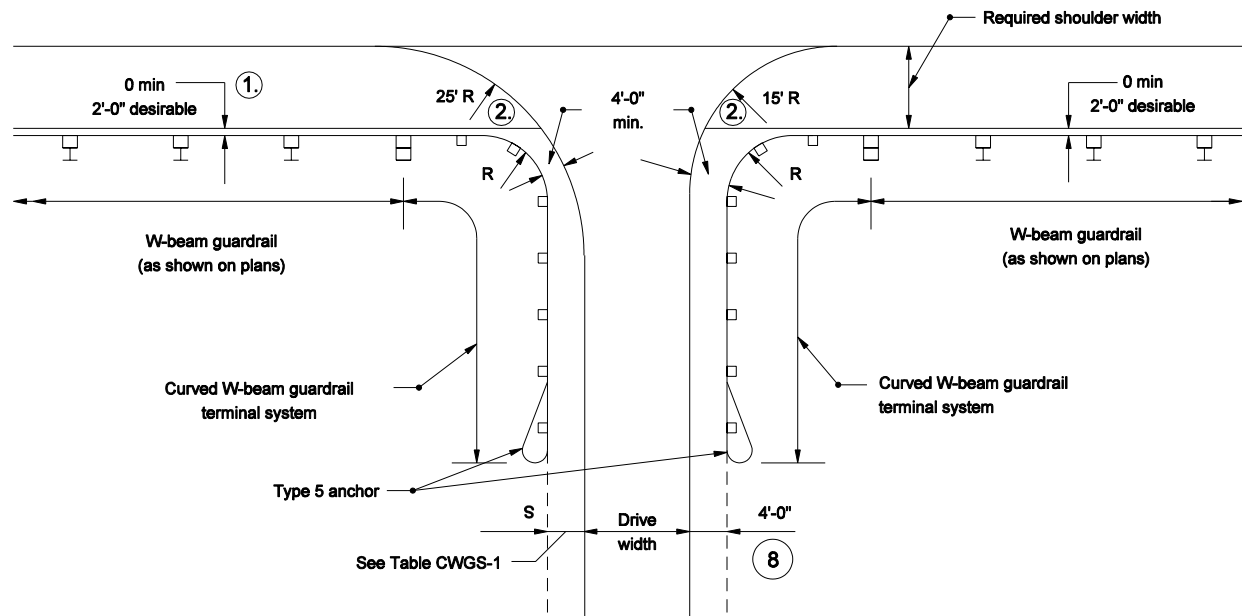


**DRIVE INSTALLATION FOR
W-BEAM GUARDRAIL AT BRIDGE END**

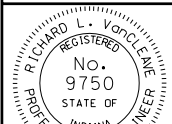
INDIANA DEPARTMENT OF TRANSPORTATION	
CURVED W-BEAM GUARDRAIL TERMINAL SYSTEM	
SEPTEMBER 2003	
STANDARD DRAWING NO. E 601-CWGT-01	
	/s/ Richard L. VanCleave 9-02-03 DESIGN STANDARDS ENGINEER DATE
	/s/ Richard K. Smutzer 9-02-03 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	

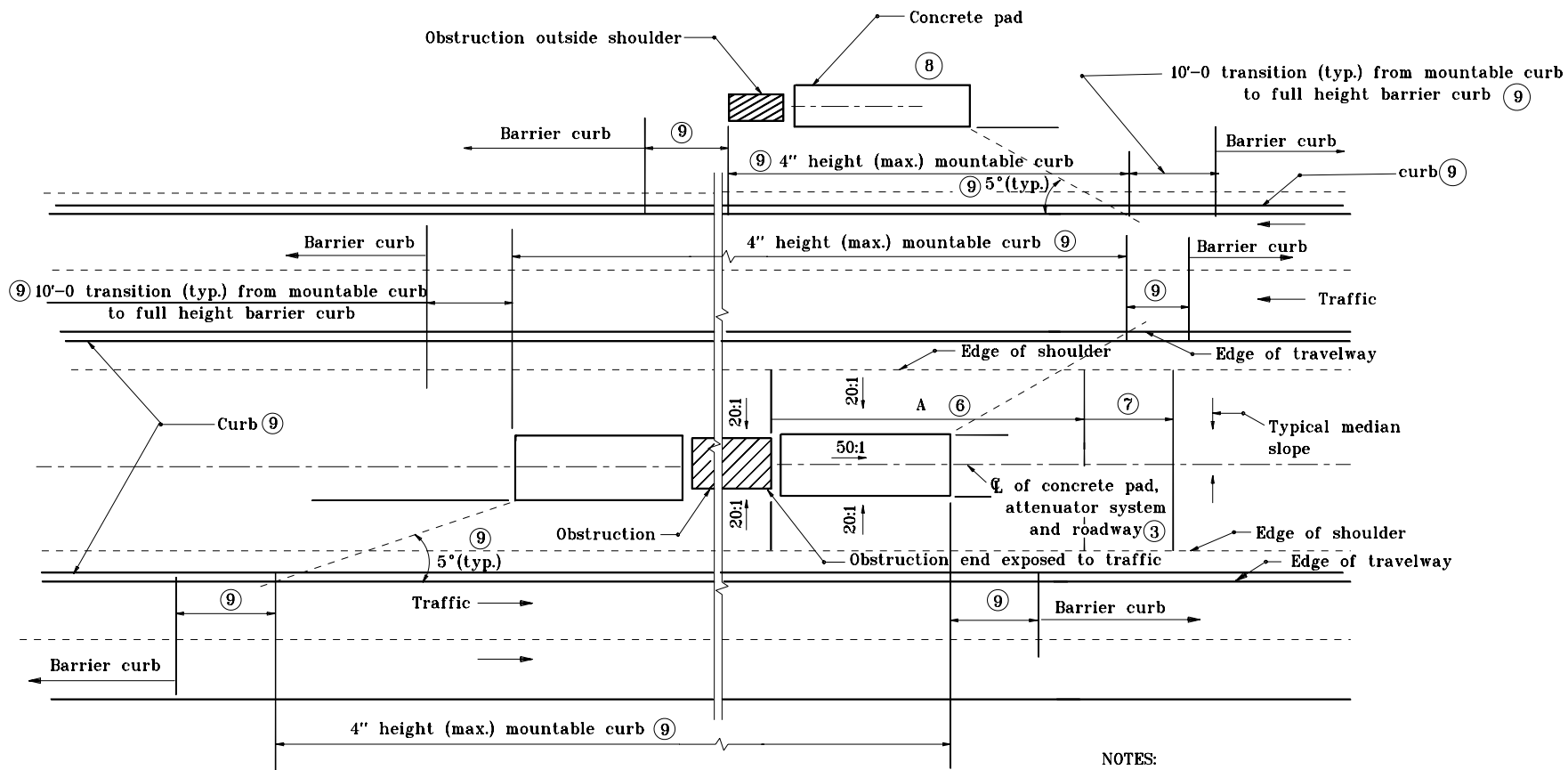
- ① When the face of the guardrail is offset 0'-0 or 1'-0 from the edge of the paved shoulder, the width of the drive shoulder, S, must be increased to maintain the 4'-0 minimum distance between the face of the guardrail and the edge of the drive.
- ② For mainline paved shoulder widths equal to or greater than 8'-0 the drive radii should be referenced from the edge of the mainline paved shoulder rather than as shown
3. See Standard Drawing E 601-CWGS-03 for other General Notes.

TABLE CWGS-1	
DRIVE SHOULDER WIDTH FOR 25' RADIUS	
MAINLINE PAVED SHOULDER WIDTH	DRIVE SHOULDER WIDTH S
10'	5'-0
8'	6'-3
6'	7'-6



DRIVE INSTALLATION FOR W-BEAM GUARDRAIL RUN

INDIANA DEPARTMENT OF TRANSPORTATION	
CURVED W- BEAM GUARDRAIL TERMINAL SYSTEM	
MARCH 2004	
STANDARD DRAWING NO. E 601-CWGT-02	
	<i>/s/ Richard L. VanCleave</i> <i>3-01-04</i> DESIGN STANDARDS ENGINEER DATE
DESIGN STANDARDS ENGINEER	<i>/s/ Richard K. Smutzer</i> <i>3-01-04</i> CHIEF HIGHWAY ENGINEER DATE



ALIGNMENT OF ATTENUATOR, PAD AND ROADWAY

NOTES:

1. See Standard Drawing E 601-GAIA-01A for notes.

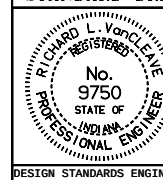
Distance A			Comment
Test Level 3	Test Level 2	Test Level 1	
148'-0	132'-0	100'-0 Desirable	Use appropriate designated impact attenuator test level

INDIANA DEPARTMENT OF TRANSPORTATION

GRADING AT MEDIAN IMPACT ATTENUATOR

MARCH 2002

STANDARD DRAWING NO. E 601-GAIA-01



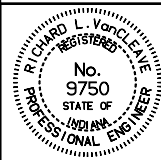
/s/ Richard L. VanCleave 3-01-02
DESIGN STANDARDS ENGINEER DATE

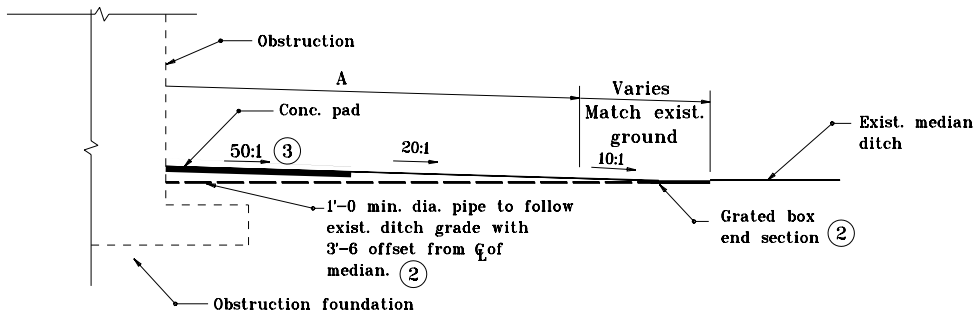
/s/ Richard K. Smutzer 3-01-02
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

NOTES:

1. The pad and grading details shown on these drawings shall be used as applicable to the attenuator system required for either or both ends of the obstruction.
2. Contractor shall follow manufacturer's recommendations for actual pad size for a particular impact attenuator system.
- ③ Align the centerline of attenuator system parallel to centerline of the roadway. A maximum angle of 5°, as measured between the longitudinal centerline of the roadway and an impact attenuator system type ED is allowed for the gravel barrel array. See Standard Drawing E 601-IAED-01 for gravel barrel layout and pad size.
4. Variation in transverse slope over the length of the pad shall not exceed 2%.
5. Attenuator system including pad shall not encroach on usable shoulder of the roadway.
- ⑥ Longitudinal downward slope shall be 20:1 maximum.
- ⑦ Longitudinal transition slope shall be a maximum of 10:1 downward.
- ⑧ For a concrete pad adjacent to the outside shoulder area, a distance of 3'-3" beyond the far edge of concrete pad from the travel lane shall be sloped 20:1 before gradual transition to existing slope.
- ⑨ Transition from full height barrier curb to mountable curb shall be provided where barrier curb exists or is planned.

INDIANA DEPARTMENT OF TRANSPORTATION									
GRADING AT MEDIAN IMPACT ATTENUATOR									
MARCH 2002									
STANDARD DRAWING No.E 601-GA1A-01A									
	<table><tr><td>/s/ Richard L. VanCleave</td><td>3-01-02</td></tr><tr><td>DESIGN STANDARDS ENGINEER</td><td>DATE</td></tr><tr><td>/s/ Richard K. Smutzer</td><td>3-01-02</td></tr><tr><td>CHIEF HIGHWAY ENGINEER</td><td>DATE</td></tr></table>	/s/ Richard L. VanCleave	3-01-02	DESIGN STANDARDS ENGINEER	DATE	/s/ Richard K. Smutzer	3-01-02	CHIEF HIGHWAY ENGINEER	DATE
/s/ Richard L. VanCleave	3-01-02								
DESIGN STANDARDS ENGINEER	DATE								
/s/ Richard K. Smutzer	3-01-02								
CHIEF HIGHWAY ENGINEER	DATE								
DESIGN STANDARDS ENGINEER									

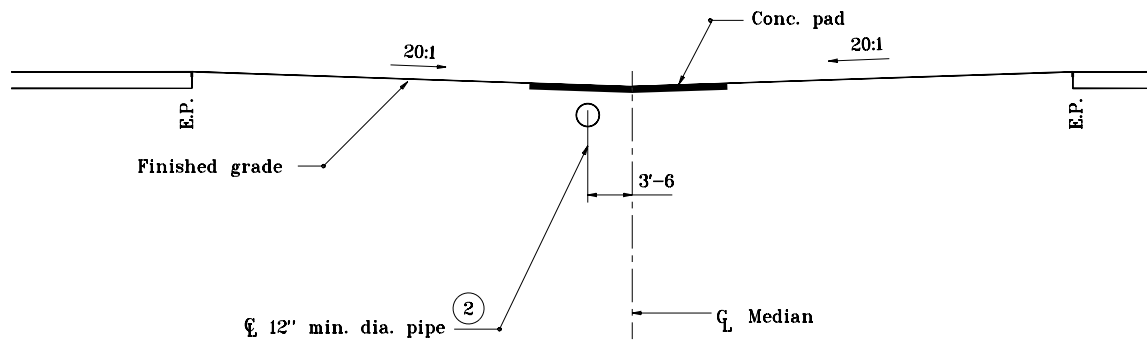


LONGITUDINAL SECTION

NOTES:

1. All slopes from the edge of shoulder to the center of the median and distance A upstation and downstation of the obstruction shall be sloped at 20:1 maximum.
- ② Median drainage is to be determined by field inspection. If drainage is required, a 12" min. grated box end section type II, slope 10:1, and a 12" min. type 1 pipe shall be used.
- ③ Concrete pad slope

Distance A			Comment
Test Level 3	Test Level 2	Test Level 1	
148'-0	132'-0	100'-0 Desirable	Use appropriate designated impact attenuator test level

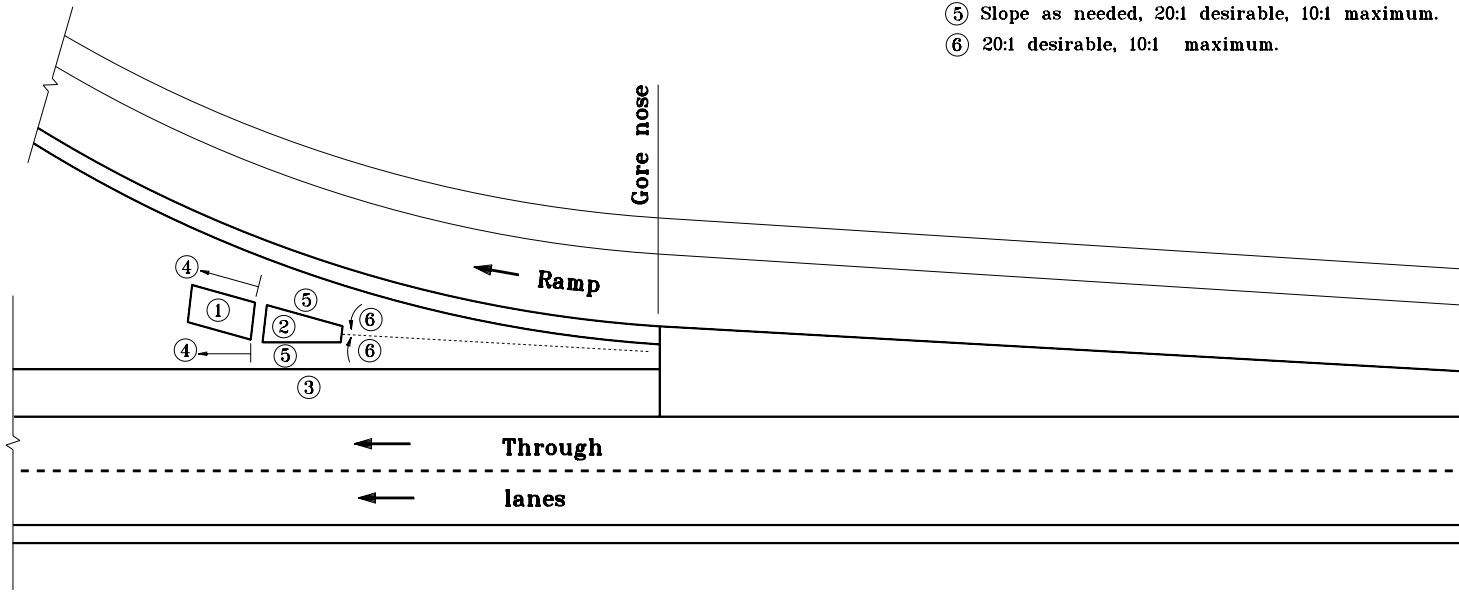


MEDIAN SECTION AT PAD

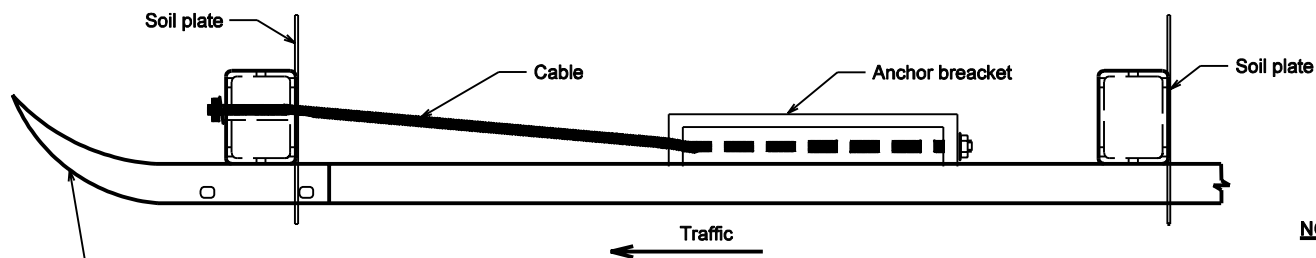
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GRADING AT MEDIAN IMPACT ATTENUATOR	
MARCH 2002	
STANDARD DRAWING NO. E 601-GAIA-02	
	/s/ Richard L. VanCleave 3-01-02 DESIGN STANDARDS ENGINEER DATE
	/s/ Richard K. Smutzer 3-01-02 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	

LEGEND

- ① Obstruction
- ② Impact attenuator pad, transversely as level as conditions permit, maximum slope 20:1. Longitudinally sloping 20:1 maximum, with respect to roadway grade.
- ③ Shoulder slope 4% toward obstruction/impact attenuator pad/swale.
- ④ Transition slope 10:1 maximum transversely.
- ⑤ Slope as needed, 20:1 desirable, 10:1 maximum.
- ⑥ 20:1 desirable, 10:1 maximum.



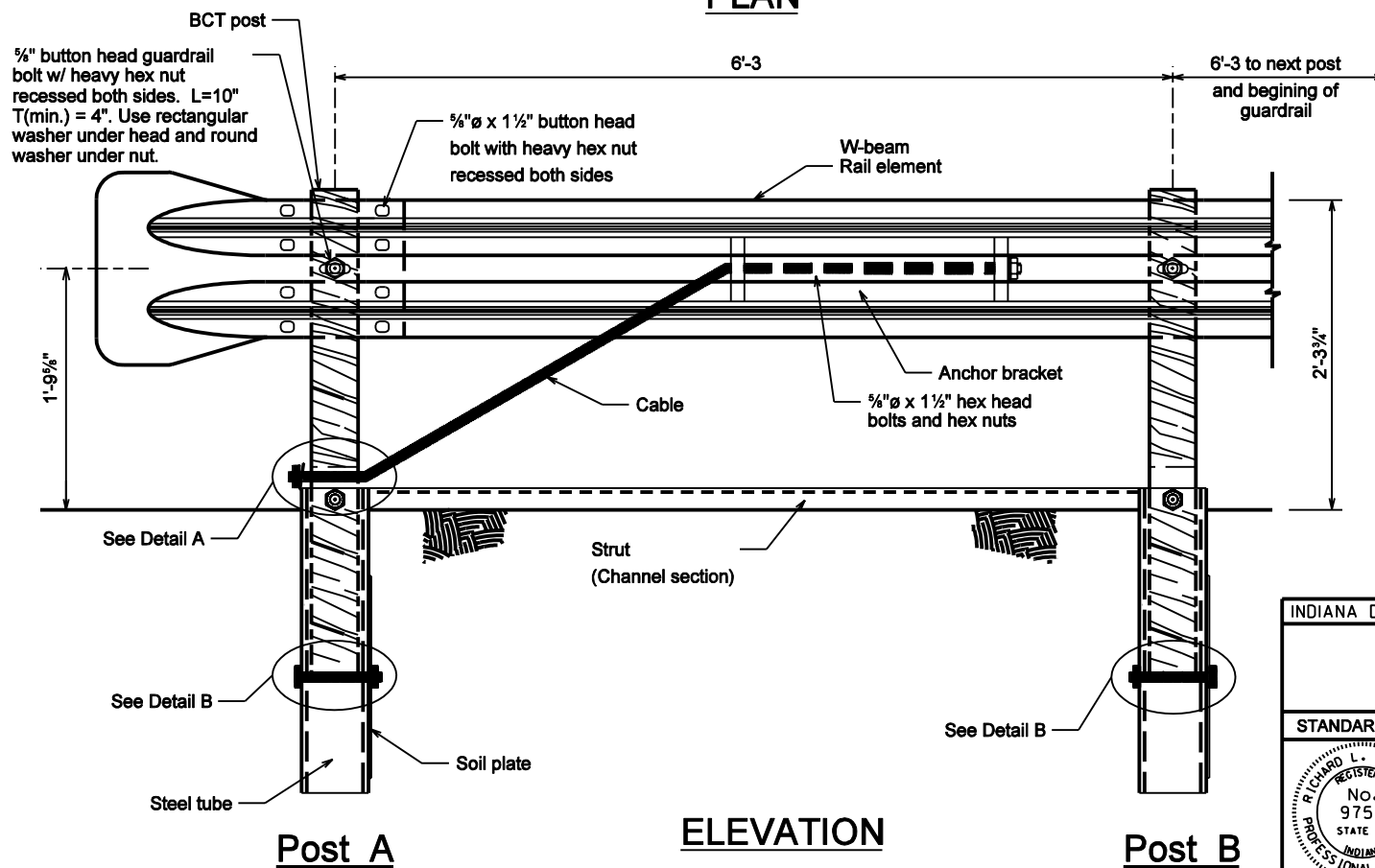
INDIANA DEPARTMENT OF TRANSPORTATION	
GRADING AT IMPACT ATTENUATOR IN GORE AREA	
MARCH 2002	
STANDARD DRAWING NO. E 601-GAIA-03	
	<i>/s/ Richard L. VanCleave</i> 3-01-02 DESIGN STANDARDS ENGINEER DATE
	<i>/s/ Richard K. Smutzer</i> 3-01-02 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	



PLAN

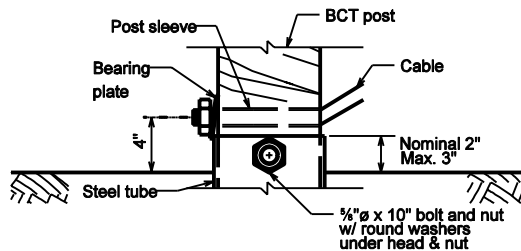
NOTES:

1. See Standards Drawing E 601-GCTA-02 for Details A and B.

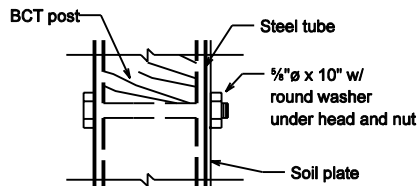


ELEVATION

INDIANA DEPARTMENT OF TRANSPORTATION	
CABLE TERMINAL ANCHOR SYSTEM	
SEPTEMBER 2001	
STANDARD DRAWING NO. E 601-GCTA-01	
	/s/ Richard L. VanCleave DESIGN STANDARDS ENGINEER
	9-04-01 DATE
	/s/ Firooz Zandi CHIEF HIGHWAY ENGINEER
	9-04-01 DATE

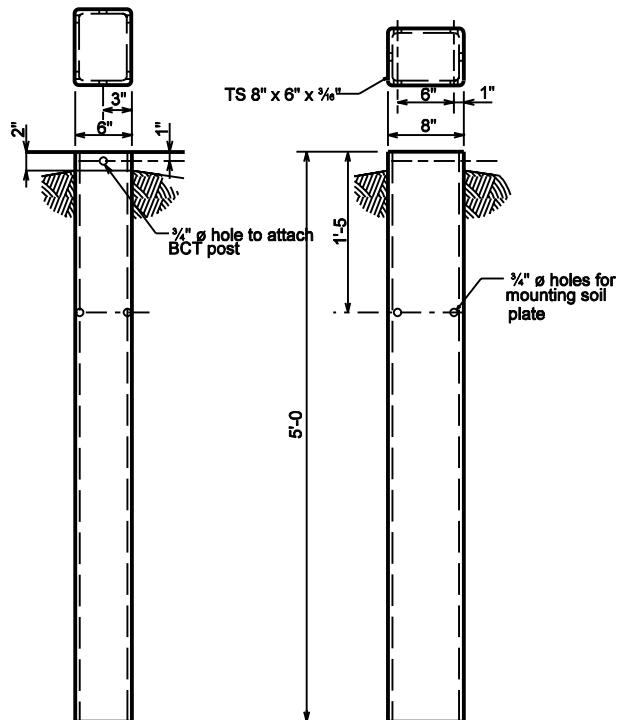


DETAIL A



DETAIL B

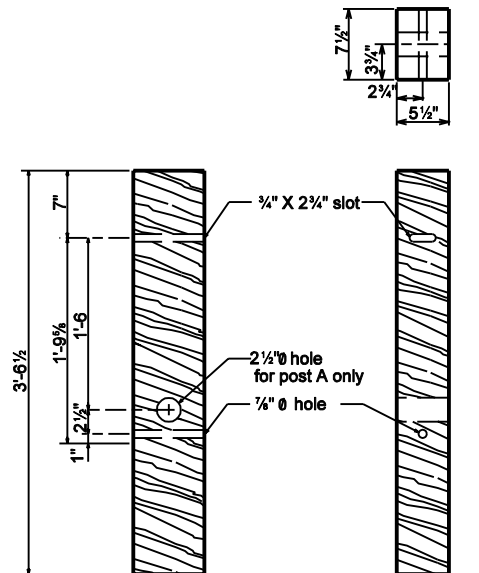
INDIANA DEPARTMENT OF TRANSPORTATION	
CABLE TERMINAL ANCHOR SYSTEM	
SEPTEMBER 2001	
STANDARD DRAWING NO. E 601-GCTA-02	
	/s/ Richard L. VanCleave 9-04-01 DESIGN STANDARDS ENGINEER DATE
	/s/ Firas Zandi 9-04-01 CHIEF HIGHWAY ENGINEER DATE



FRONT

SIDE

GALVANIZED STEEL
FOUNDATION TUBE

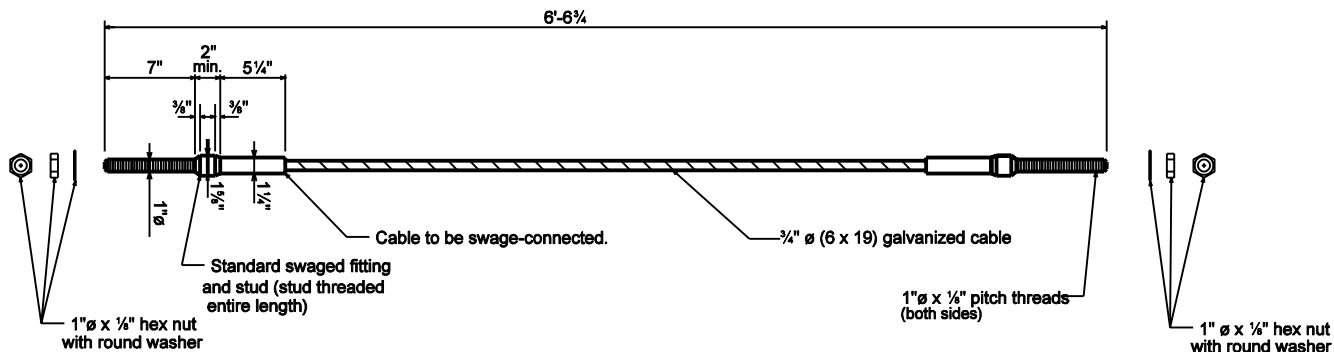


SIDE

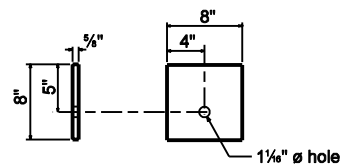
FRONT

BCT TIMBER POST

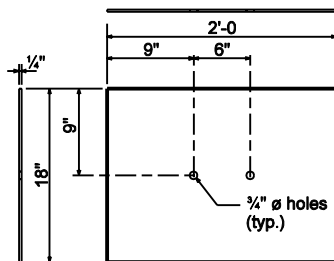
INDIANA DEPARTMENT OF TRANSPORTATION	
CABLE TERMINAL ANCHOR SYSTEM	
SEPTEMBER 2001	
STANDARD DRAWING NO. E 601-GCTA-03	
	/s/ Richard L. VanCleave DESIGN STANDARDS ENGINEER DATE
	/s/ Firat Zandi CHIEF HIGHWAY ENGINEER DATE



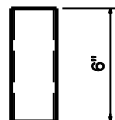
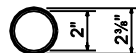
BCT CABLE ANCHOR ASSEMBLY



BCT BEARING PLATE

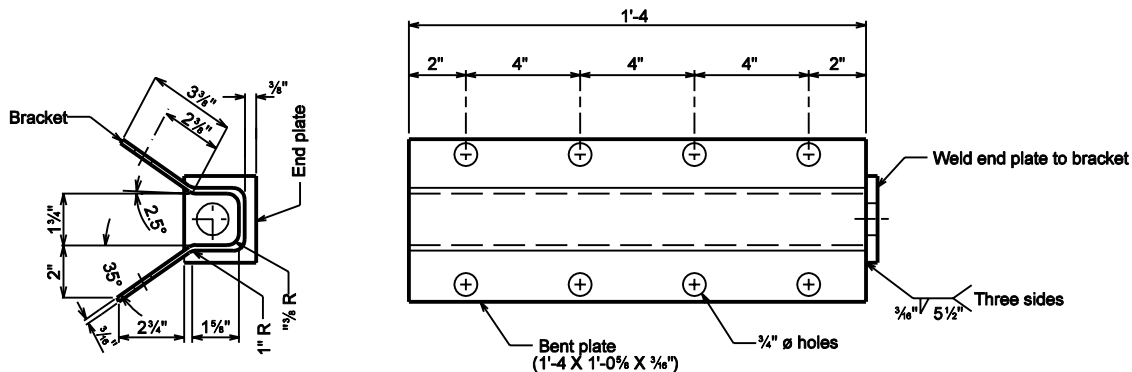


FOUNDATION TUBE SOIL PLATE

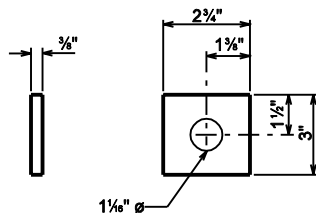


BCT POST SLEEVE

INDIANA DEPARTMENT OF TRANSPORTATION	
CABLE TERMINAL ANCHOR SYSTEM	
SEPTEMBER 2001	
STANDARD DRAWING NO. E 601-GCTA-04	
	/s/ Anthony L. Uremovich 9-04-01 DESIGN STANDARDS ENGINEER DATE
DESIGN STANDARDS ENGINEER	/s/ Firouz Zard 9-04-01 CHIEF HIGHWAY ENGINEER DATE



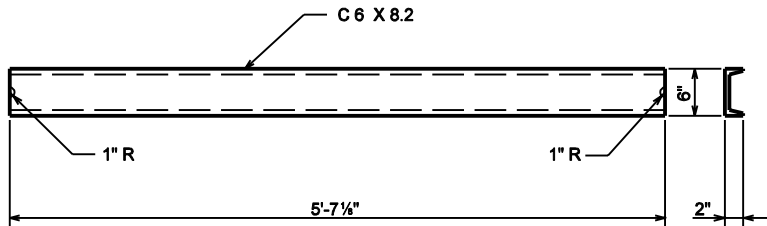
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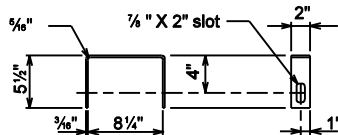
END PLATE

GUARDRAIL ANCHOR BRACKET

INDIANA DEPARTMENT OF TRANSPORTATION	
CABLE TERMINAL ANCHOR SYSTEM	
SEPTEMBER 2001	
STANDARD DRAWING NO. E 601-GCTA-05	
	/s/ Richard L. VanCleave DESIGN STANDARDS ENGINEER DATE
	/s/ Fritz Zandi CHIEF HIGHWAY ENGINEER DATE



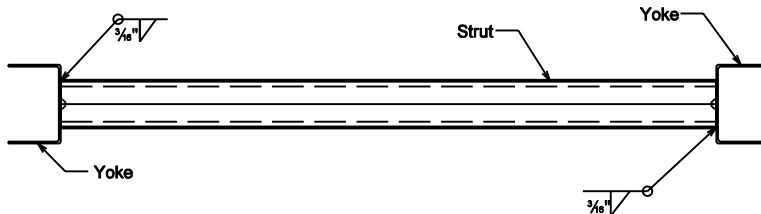
STRUT DETAILS



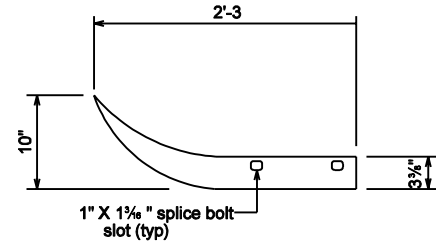
YOKE DETAILS

(2 required)

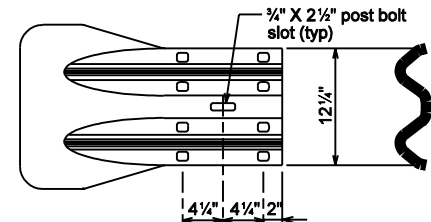
STRUT AND YOKE ASSEMBLY



ASSEMBLY DETAILS



PLAN



ELEVATION

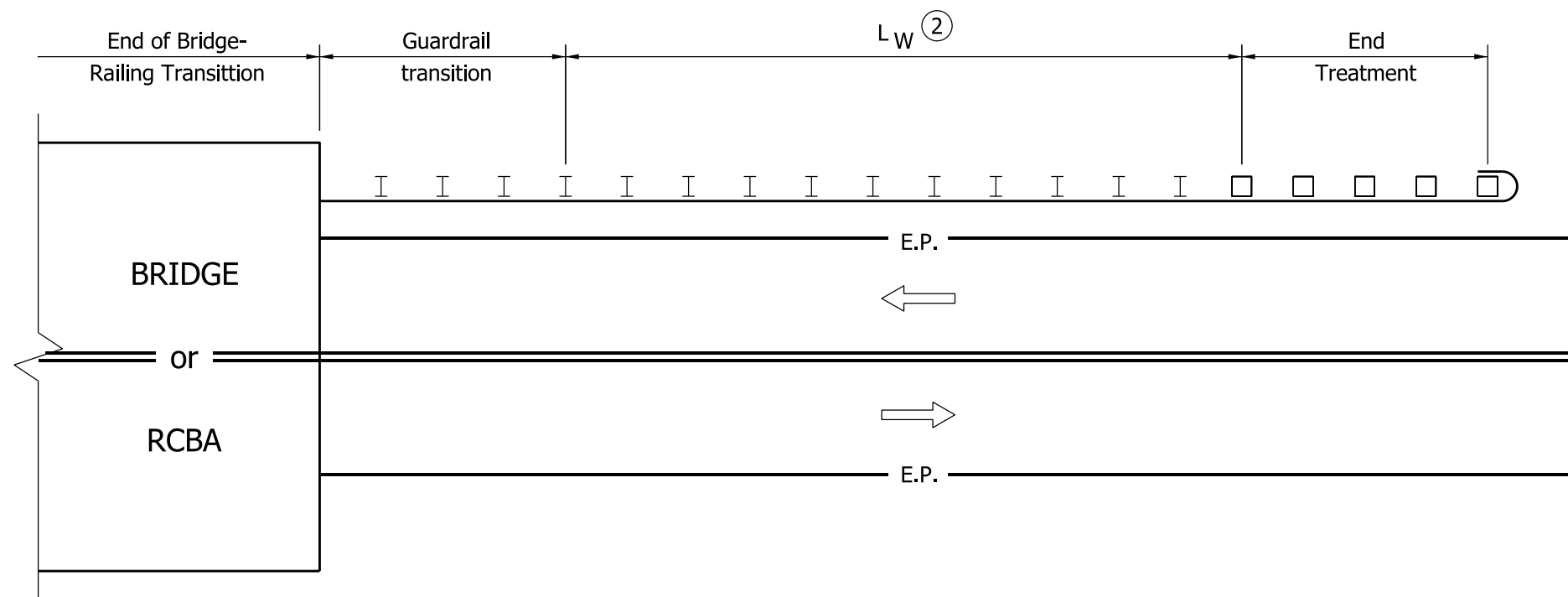
FLARED W-BEAM END SECTION

INDIANA DEPARTMENT OF TRANSPORTATION	
CABLE TERMINAL ANCHOR SYSTEM	
SEPTEMBER 2001	
STANDARD DRAWING NO. E 601-GCTA-06	
	/s/ Richard L. VanCleave DESIGN STANDARDS ENGINEER DATE 9-04-01
	/s/ Firas Zandi CHIEF HIGHWAY ENGINEER DATE 9-04-01

NOTES:

1. This configuration shall be used where W-beam guardrail is specified as the bridge-approach guardrail, and is connected to the bridge railing with guardrail transition type TGB. It shall be typical for all four corners.

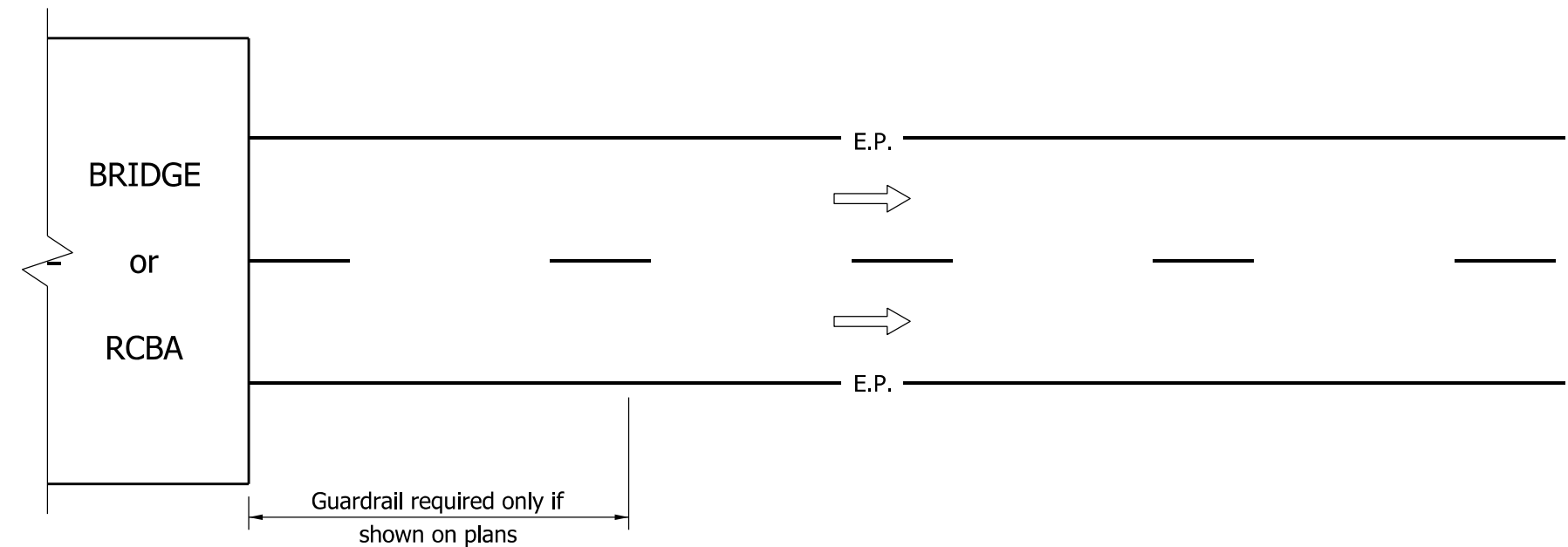
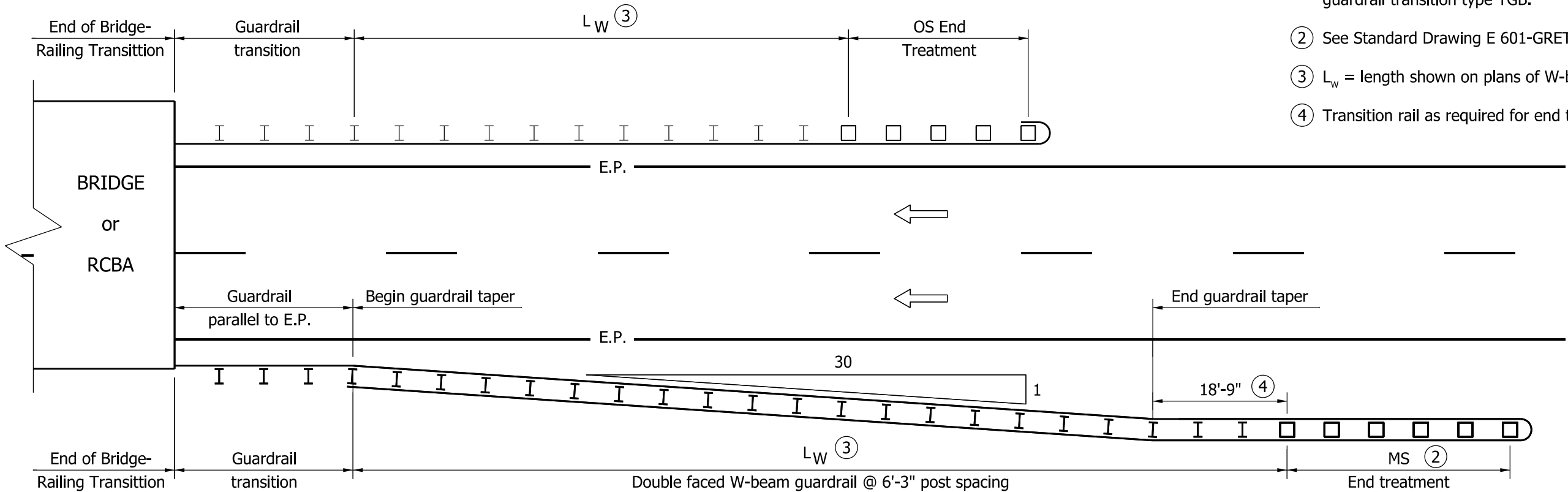
② L_w = length shown on plans of W-beam guardrail at 6'-3" post spacing. ft.



INDIANA DEPARTMENT OF TRANSPORTATION											
BRIDGE-APPROACH GUARDRAIL 2-LANE 2-WAY ROADWAY SEPTEMBER 2011											
STANDARD DRAWING NO. E 601-GRBA-01											
	<table border="0"> <tr> <td><i>/s/ Richard L. VanCleave</i></td> <td><i>09/01/11</i></td> </tr> <tr> <td>DESIGN STANDARDS ENGINEER</td> <td>DATE</td> </tr> <tr> <td colspan="2"> </td> </tr> <tr> <td><i>/s/ Mark A. Miller</i></td> <td><i>09/01/11</i></td> </tr> <tr> <td>CHIEF HIGHWAY ENGINEER</td> <td>DATE</td> </tr> </table>	<i>/s/ Richard L. VanCleave</i>	<i>09/01/11</i>	DESIGN STANDARDS ENGINEER	DATE			<i>/s/ Mark A. Miller</i>	<i>09/01/11</i>	CHIEF HIGHWAY ENGINEER	DATE
<i>/s/ Richard L. VanCleave</i>	<i>09/01/11</i>										
DESIGN STANDARDS ENGINEER	DATE										
<i>/s/ Mark A. Miller</i>	<i>09/01/11</i>										
CHIEF HIGHWAY ENGINEER	DATE										
DESIGN STANDARDS ENGINEER											

NOTES:

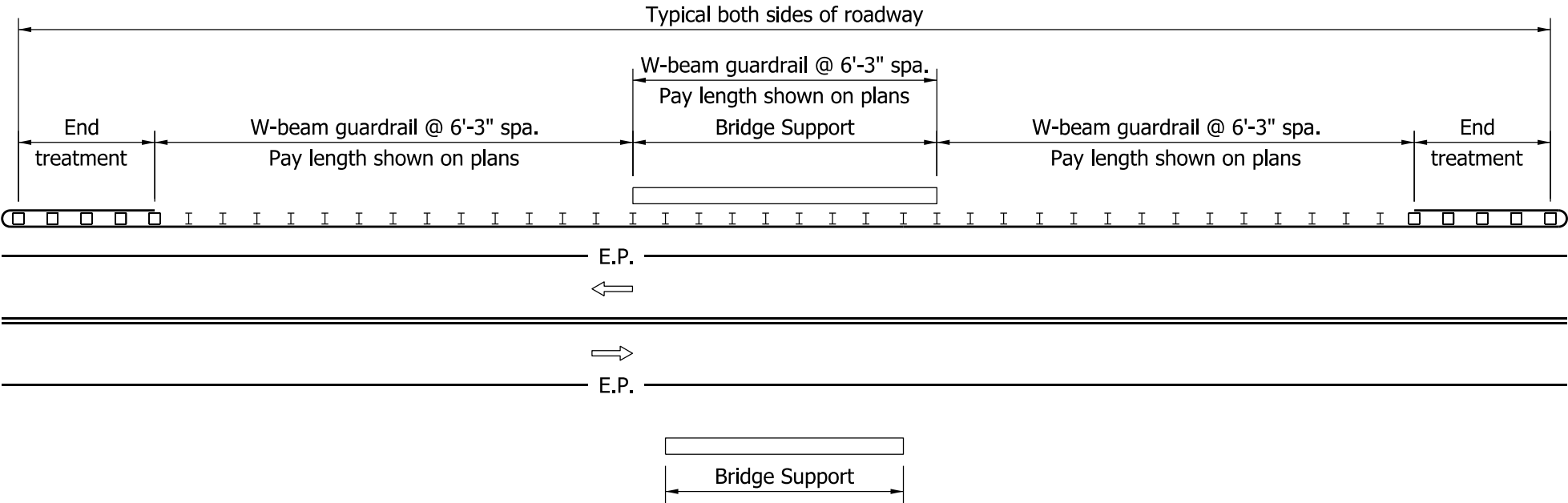
- 1. This configuration shall be used where W-beam guardrail is specified as the bridge-approach guardrail, and is connected to the bridge railing with guardrail transition type TGB.
- ② See Standard Drawing E 601-GRET-07 for alternate placement detail.
- ③ L_W = length shown on plans of W-beam guardrail at 6'-3" post spacing, ft.
- ④ Transition rail as required for end treatment type MS.



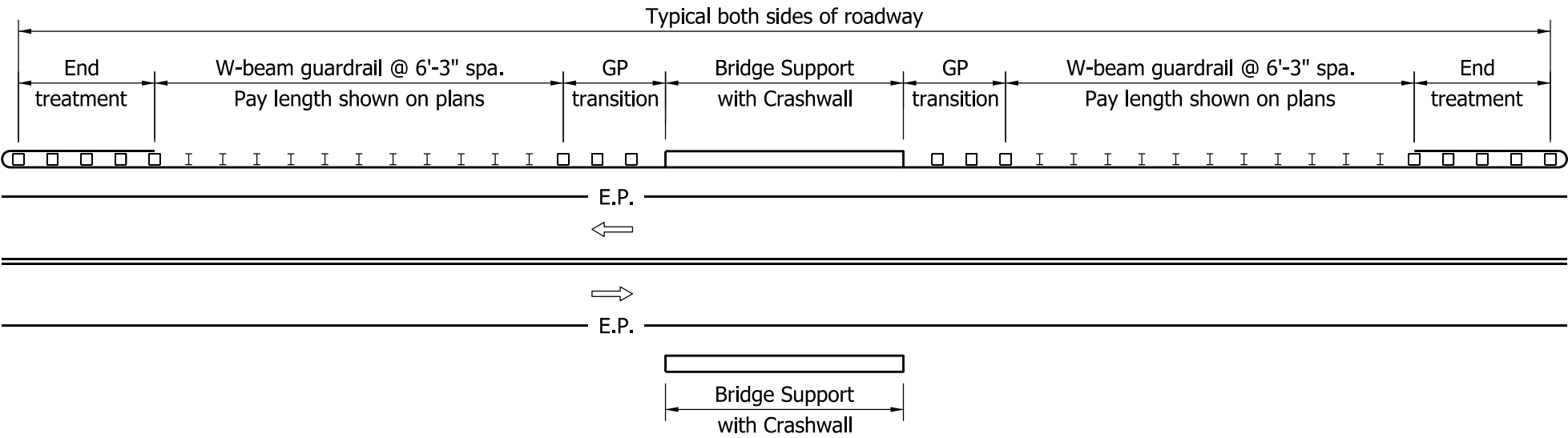
INDIANA DEPARTMENT OF TRANSPORTATION		
BRIDGE-APPROACH GUARDRAIL DIVIDED ROADWAY SEPTEMBER 2011		
STANDARD DRAWING NO.		E 601-GRBA-02
	/s/ <i>Richard L. VanCleave</i>	09/01/11
	DESIGN STANDARDS ENGINEER	DATE
	/s/ <i>Mark A. Miller</i>	09/01/11
	CHIEF HIGHWAY ENGINEER	DATE
DESIGN STANDARDS ENGINEER		

NOTES:

- 1. This configuration shall be used where W-beam guardrail is specified along a two-lane two-way roadway to shield the supports of an overhead structure.
- 2. Dimensions and details not shown hereon shall be as shown on the plans.

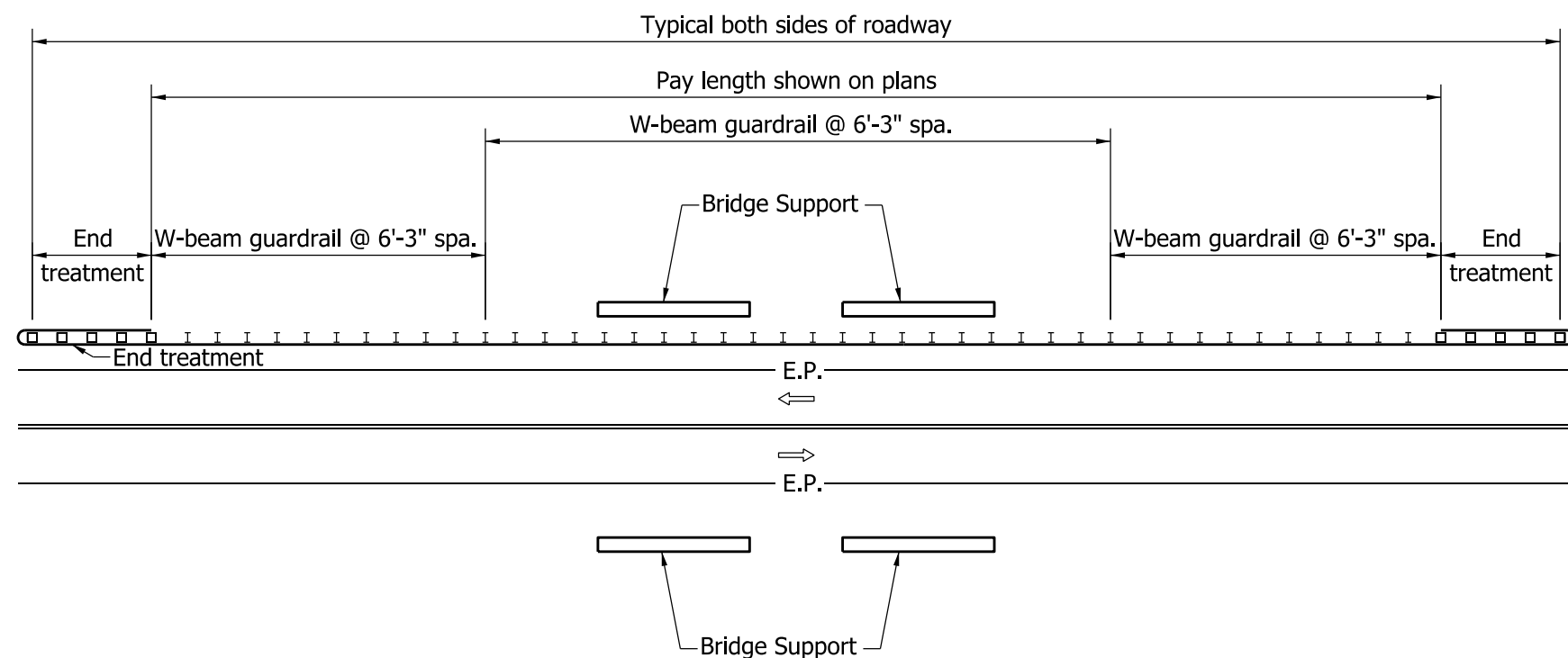


TWO-LANE TWO-WAY ROADWAY WITH SINGLE OVERHEAD STRUCTURE AND BRIDGE-SUPPORT DISTANCE TO E.P.> 16'

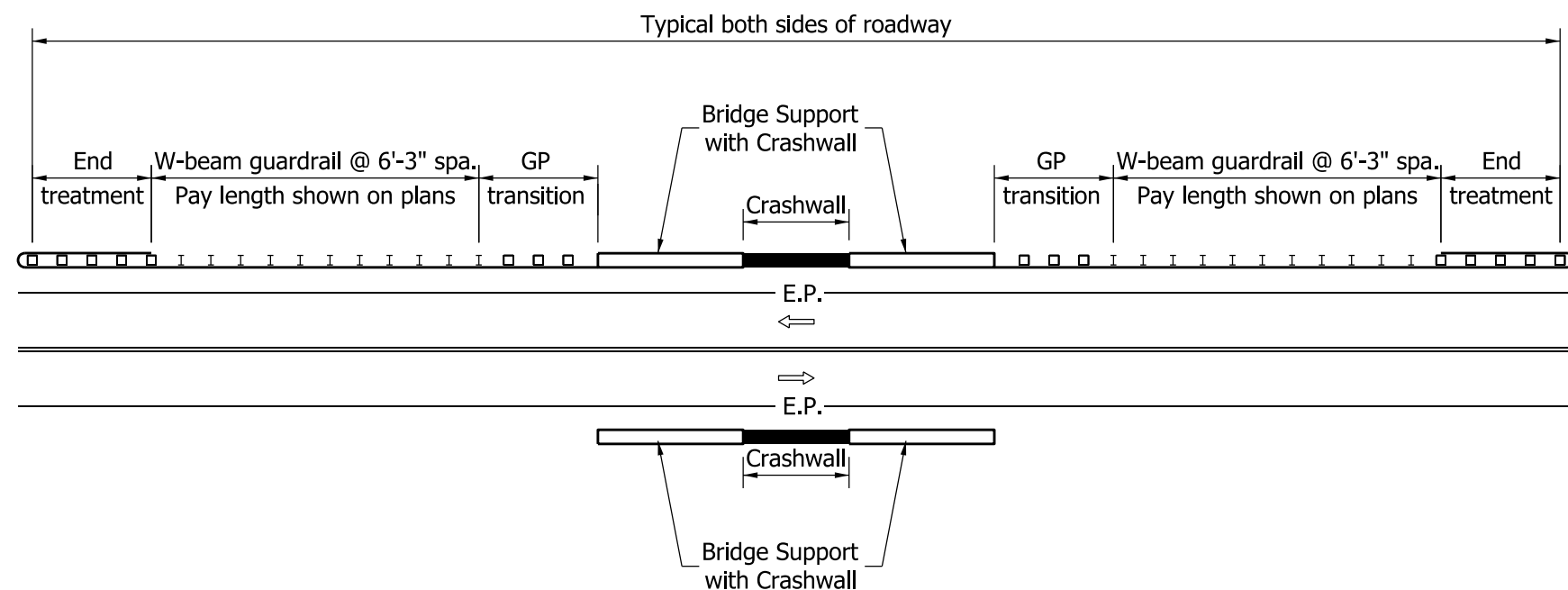


TWO-LANE TWO-WAY ROADWAY WITH SINGLE OVERHEAD STRUCTURE AND BRIDGE-SUPPORT DISTANCE TO E.P. ≤ 16'

INDIANA DEPARTMENT OF TRANSPORTATION			
GUARDRAIL AT ROADSIDE BRIDGE SUPPORT			
SEPTEMBER 2011			
STANDARD DRAWING NO.		E 601-GRBS-01	
	/s/ <i>Richard L. VanCleave</i>	09/01/11	
	DESIGN STANDARDS ENGINEER	DATE	
	/s/ <i>Mark A. Miller</i>	09/01/11	
DESIGN STANDARDS ENGINEER	CHIEF HIGHWAY ENGINEER	DATE	



TWO-LANE TWO-WAY ROADWAY WITH TWIN OVERHEAD STRUCTURES AND BRIDGE-SUPPORT DISTANCE TO E.P. > 16'



TWO-LANE TWO-WAY ROADWAY WITH TWIN OVERHEAD STRUCTURES AND BRIDGE-SUPPORT DISTANCE TO E.P. ≤ 16'

NOTES:

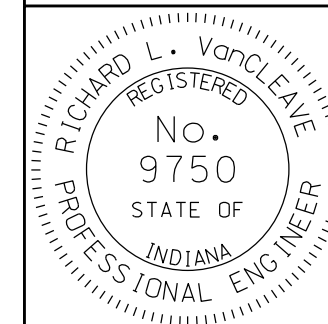
1. This configuration shall be used where W-beam guardrail is specified along a two-lane two-way roadway to shield the supports of twin overhead structures.
2. Dimensions and details not shown hereon shall be as shown on the plans.

INDIANA DEPARTMENT OF TRANSPORTATION

GUARDRAIL AT ROADSIDE
BRIDGE SUPPORTS

SEPTEMBER 2011

STANDARD DRAWING NO. E 601-GRBS-02



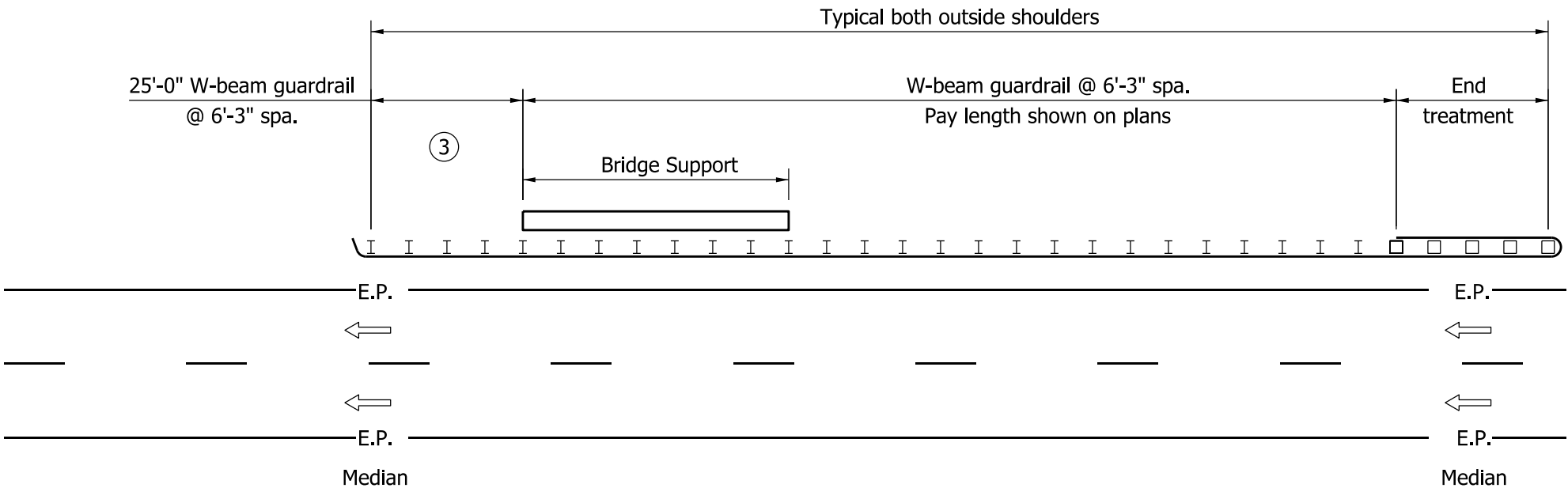
DESIGN STANDARDS ENGINEER

/s/ *Richard L. VanCleave* 09/01/11
DESIGN STANDARDS ENGINEER DATE

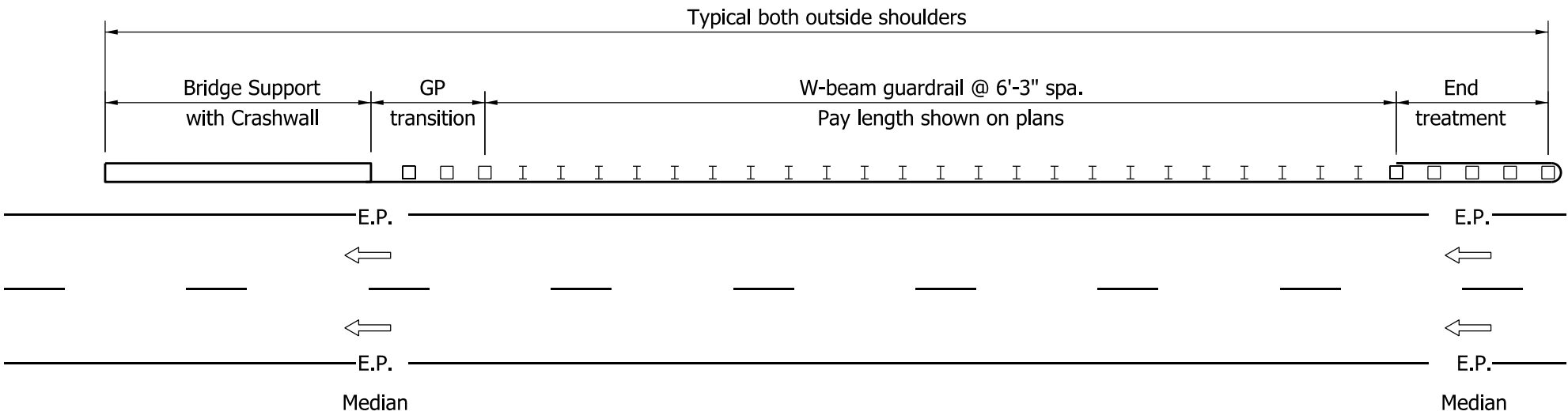
/s/ *Mark A. Miller* 09/01/11
CHIEF HIGHWAY ENGINEER DATE

NOTES:

1. This configuration shall be used where W-beam guardrail is specified along the outside shoulder of a divided roadway to shield the supports of an overhead structure.
2. Dimensions and details not shown hereon shall be as shown on the plans.
- ③ Rectangular plate washers shall be installed at each post along this section. See Standard Drawing E 601-GRBS-08.

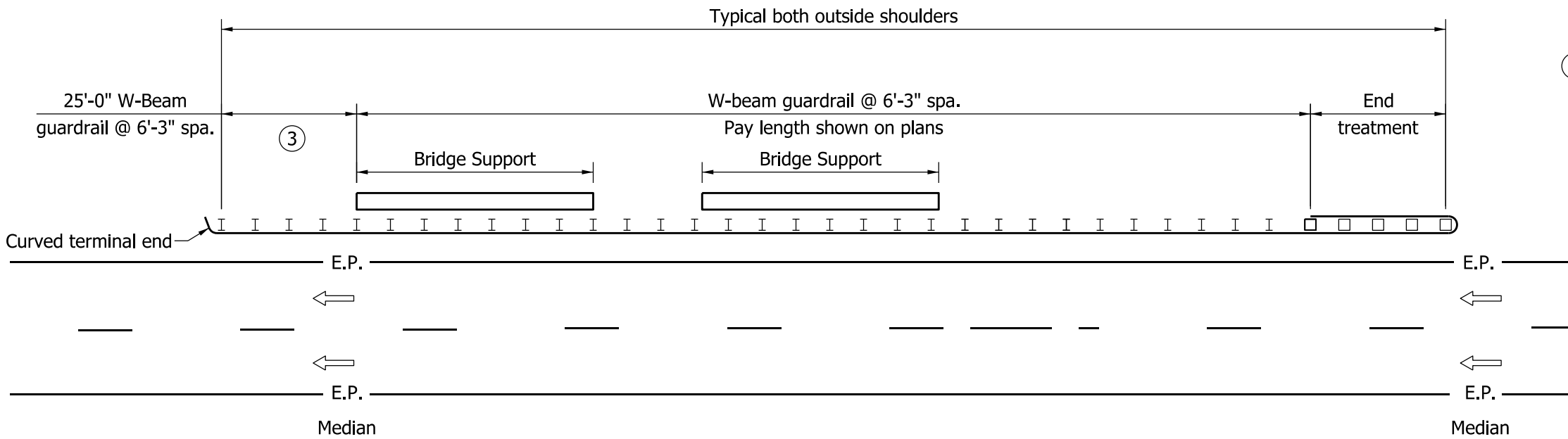


DIVIDED ROADWAY WITH SINGLE OVERHEAD STRUCTURE AND OUTSIDE SHOULDER BRIDGE-SUPPORT DISTANCE TO E.P. > 16'

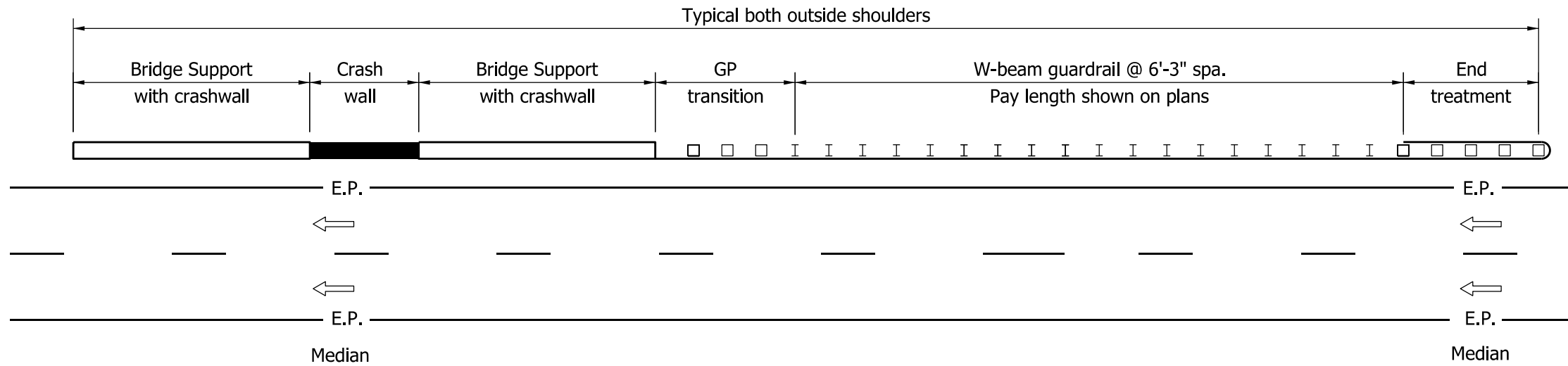


DIVIDED ROADWAY WITH SINGLE OVERHEAD STRUCTURE AND OUTSIDE SHOULDER BRIDGE-SUPPORT DISTANCE TO E.P. ≤ 16'

INDIANA DEPARTMENT OF TRANSPORTATION			
GUARDRAIL AT ROADSIDE BRIDGE SUPPORT			
SEPTEMBER 2011			
STANDARD DRAWING NO.		E 601-GRBS-03	
	/s/ <i>Richard L. VanCleave</i>		09/01/11
	DESIGN STANDARDS ENGINEER		DATE
	/s/ <i>Mark A. Miller</i>		09/01/11
DESIGN STANDARDS ENGINEER	CHIEF HIGHWAY ENGINEER		DATE



DIVIDED ROADWAY WITH TWIN OVERHEAD STRUCTURES AND OUTSIDE-SHOULDER BRIDGE-SUPPORT DISTANCE TO E.P. > 16'



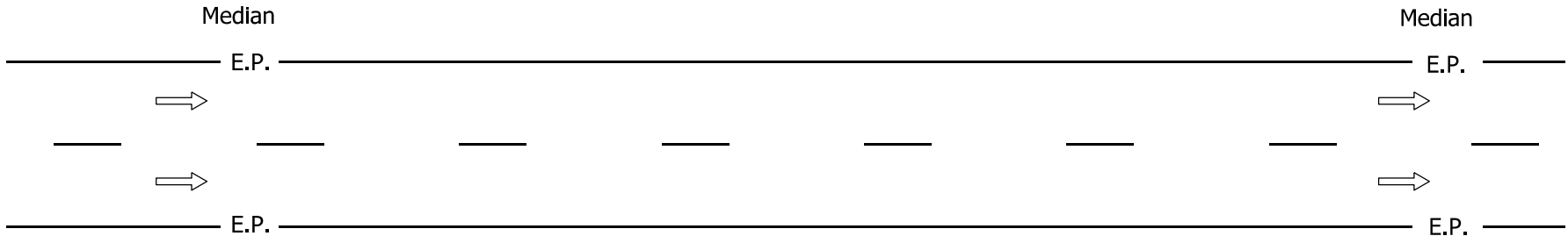
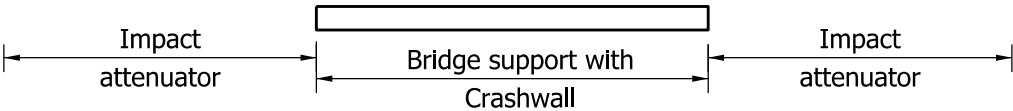
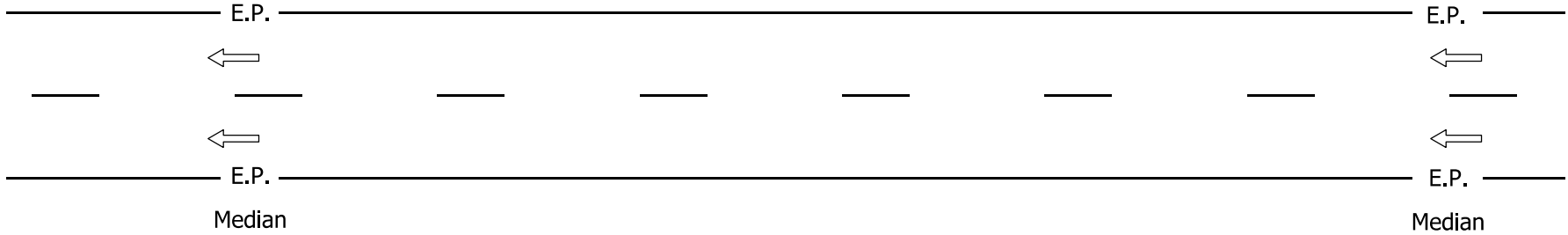
DIVIDED ROADWAY WITH TWIN OVERHEAD STRUCTURES AND OUTSIDE-SHOULDER BRIDGE-SUPPORT DISTANCE TO E.P. ≤ 16'

- NOTES:
1. This configuration shall be used where W-beam guardrail is specified along the outside shoulder of a divided roadway to shield the supports of twin overhead structures.
 2. Dimensions and details not shown hereon shall be as shown on the plans.
 - ③ Rectangular plate washers shall be installed at each post along this section. See Standard Drawing E 601-GRBS-08.

INDIANA DEPARTMENT OF TRANSPORTATION									
GUARDRAIL AT ROADSIDE BRIDGE SUPPORTS									
SEPTEMBER 2011									
STANDARD DRAWING NO. E 601-GRBS-04									
	<table><tr><td>/s/ Richard L. VanCleave</td><td>09/01/11</td></tr><tr><td>DESIGN STANDARDS ENGINEER</td><td>DATE</td></tr><tr><td>/s/ Mark A. Miller</td><td>09/01/11</td></tr><tr><td>CHIEF HIGHWAY ENGINEER</td><td>DATE</td></tr></table>	/s/ Richard L. VanCleave	09/01/11	DESIGN STANDARDS ENGINEER	DATE	/s/ Mark A. Miller	09/01/11	CHIEF HIGHWAY ENGINEER	DATE
/s/ Richard L. VanCleave	09/01/11								
DESIGN STANDARDS ENGINEER	DATE								
/s/ Mark A. Miller	09/01/11								
CHIEF HIGHWAY ENGINEER	DATE								
DESIGN STANDARDS ENGINEER									

NOTES:

- 1. This configuration shall be used where impact-attenuator units are specified in conjunction with a crashwall in the median of a divided roadway to shield the support of an overhead structure.
- 2. Dimensions and details not shown hereon shall be as shown on the plans.

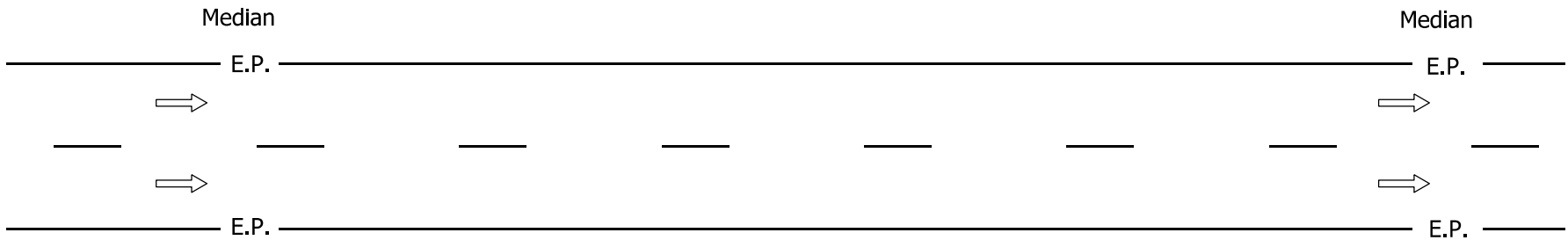
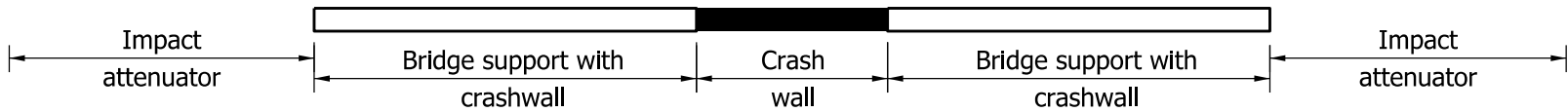
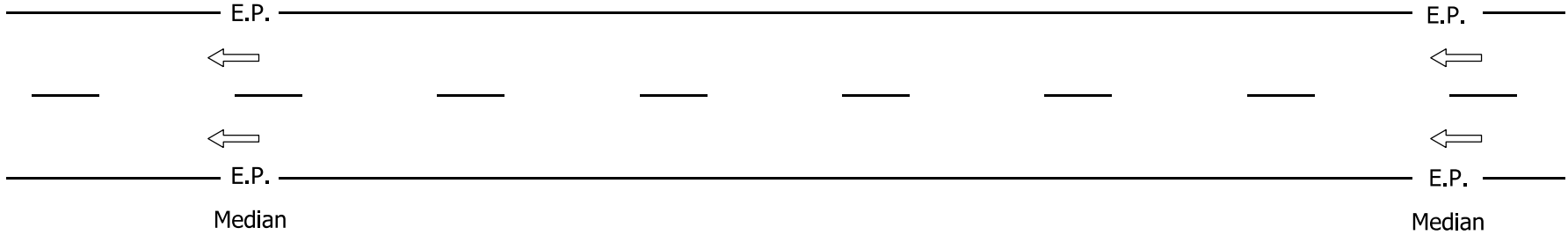


DIVIDED ROADWAY WITH SINGLE OVERHEAD STRUCTURE AND MEDIAN BRIDGE SUPPORT

INDIANA DEPARTMENT OF TRANSPORTATION		
GUARDRAIL AT MEDIAN-SIDE BRIDGE SUPPORT		
SEPTEMBER 2011		
STANDARD DRAWING NO.		E 601-GRBS-05
	<i>/s/ Richard L. VanCleave</i> 09/01/11	
	DESIGN STANDARDS ENGINEER	DATE
	<i>/s/ Mark A. Miller</i> 09/01/11	
	CHIEF HIGHWAY ENGINEER	DATE
DESIGN STANDARDS ENGINEER		

NOTES:

- 1. This configuration shall be used where impact-attenuator units are specified in conjunction with a crashwall in the median of a divided roadway to shield the supports of twin overhead structures.
- 2. Dimensions and details not shown hereon shall be as shown on the plans.

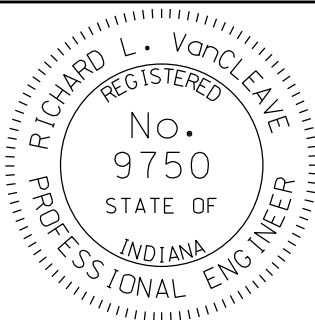


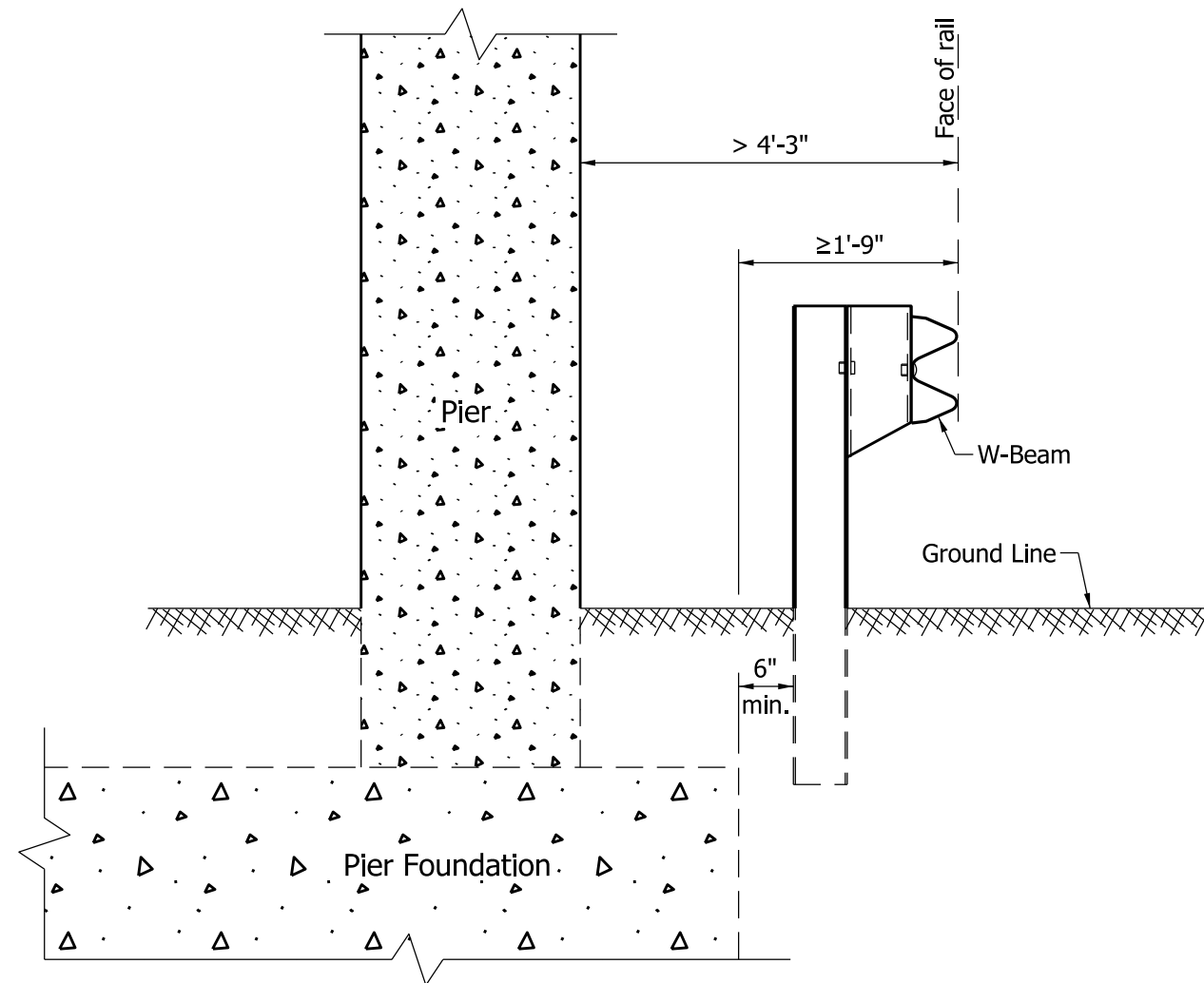
DIVIDED ROADWAY WITH TWIN OVERHEAD STRUCTURES AND MEDIAN BRIDGE SUPPORTS

INDIANA DEPARTMENT OF TRANSPORTATION			
GUARDRAIL AT MEDIAN-SIDE BRIDGE SUPPORTS			
SEPTEMBER 2011			
STANDARD DRAWING NO.		E 601-GRBS-06	
	<i>/s/ Richard L. VanCleave</i>		<i>09/01/11</i>
	DESIGN STANDARDS ENGINEER		DATE
	<i>/s/ Mark A. Miller</i>		<i>09/01/11</i>
DESIGN STANDARDS ENGINEER		CHIEF HIGHWAY ENGINEER	
		DATE	

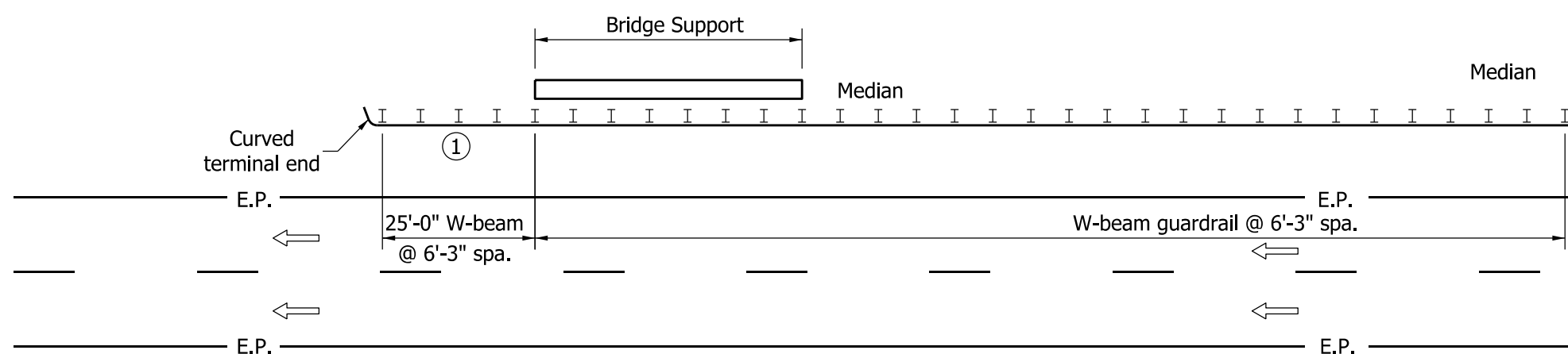


1. This configuration shall be used where W-beam guardrail is specified along the median-side shoulder of a divided roadway to shield the support of a tandem overhead structure.
2. Dimensions and details not shown hereon shall be as shown on the plans.
- ③ Rectangular plate washers shall be installed at each post along this section. See Standard Drawing E 601-GRBS-08.

INDIANA DEPARTMENT OF TRANSPORTATION									
GUARDRAIL AT MEDIAN-SIDE BRIDGE SUPPORT SEPTEMBER 2011									
STANDARD DRAWING NO.	E 601-GRBS-07								
	<table border="0"> <tr> <td><i>/s/ Richard L. VanCleave</i></td> <td><i>09/01/11</i></td> </tr> <tr> <td>DESIGN STANDARDS ENGINEER</td> <td>DATE</td> </tr> <tr> <td> <i>/s/ Mark A. Miller</i></td> <td> <i>09/01/11</i></td> </tr> <tr> <td>CHIEF HIGHWAY ENGINEER</td> <td>DATE</td> </tr> </table>	<i>/s/ Richard L. VanCleave</i>	<i>09/01/11</i>	DESIGN STANDARDS ENGINEER	DATE	 <i>/s/ Mark A. Miller</i>	 <i>09/01/11</i>	CHIEF HIGHWAY ENGINEER	DATE
<i>/s/ Richard L. VanCleave</i>	<i>09/01/11</i>								
DESIGN STANDARDS ENGINEER	DATE								
 <i>/s/ Mark A. Miller</i>	 <i>09/01/11</i>								
CHIEF HIGHWAY ENGINEER	DATE								
DESIGN STANDARDS ENGINEER									



GUARDRAIL-TO-PIER CLEARANCE



DOWNSTREAM GUARDRAIL TREATMENT

NOTE:

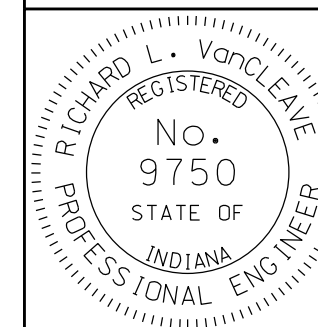
- ① Washers required for each post in this section shall be rectangular plate washers, as shown on Standard Drawing E 601-WBGC-02.

INDIANA DEPARTMENT OF TRANSPORTATION

GUARDRAIL AT BRIDGE SUPPORT

SEPTEMBER 2011

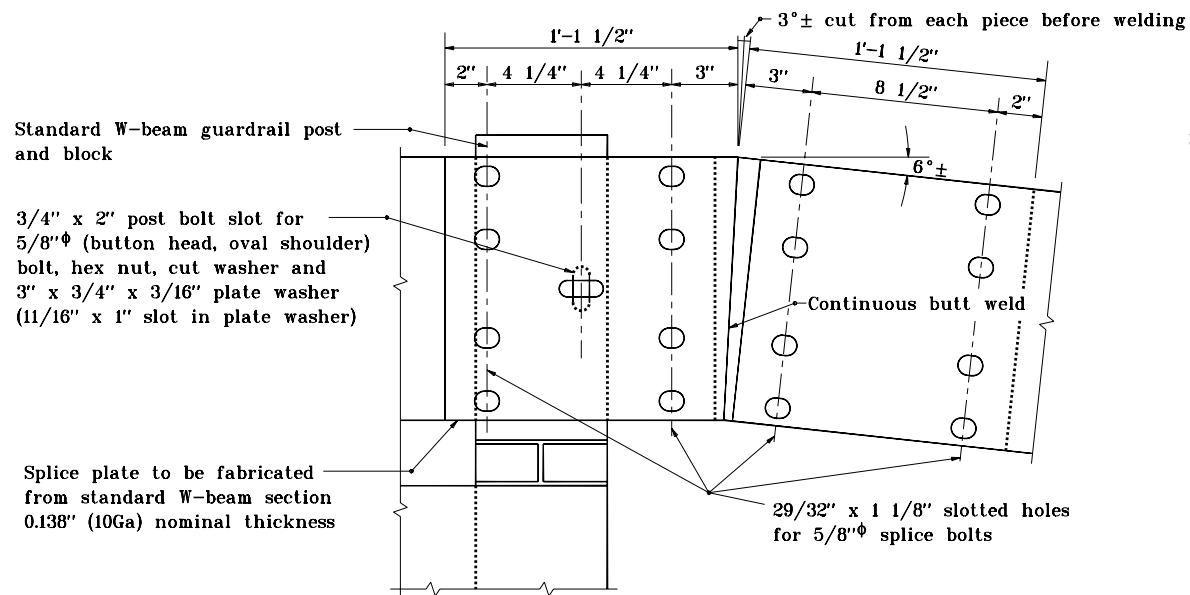
STANDARD DRAWING NO. E 601-GRBS-08



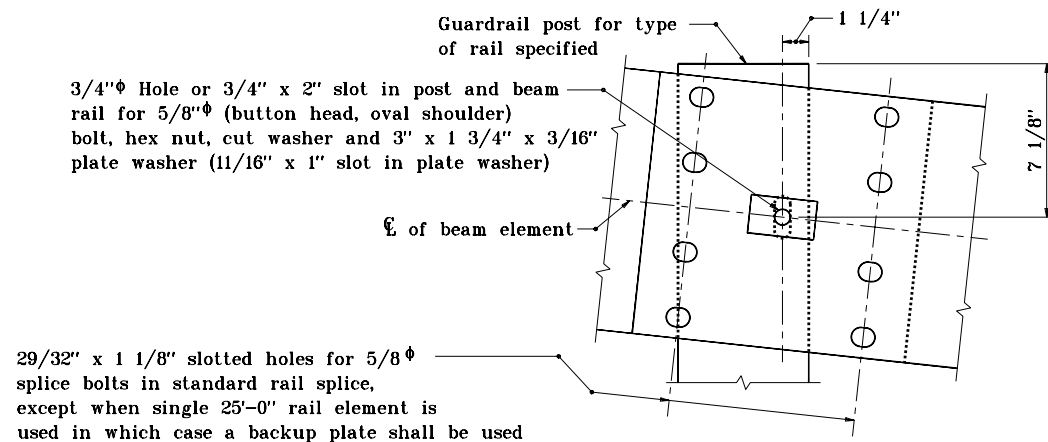
DESIGN STANDARDS ENGINEER

/s/ *Richard L. VanCleave* 09/01/11
DESIGN STANDARDS ENGINEER DATE

/s/ *Mark A. Miller* 09/01/11
CHIEF HIGHWAY ENGINEER DATE



SPLICE PLATE ASSEMBLY DETAIL



POST NO. 2 CONNECTION DETAIL

GENERAL NOTES

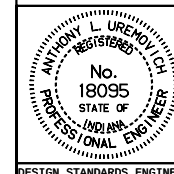
1. This sheet shall be used when guardrail end treatment type I is specified
2. The details on this sheet are for the assembly and the installation of the components of guardrail end treatment type I.

INDIANA DEPARTMENT OF TRANSPORTATION

**GUARDRAIL
END TREATMENT TYPE I**

APRIL 1995

STANDARD DRAWING NO. **E 601-GRET-04**



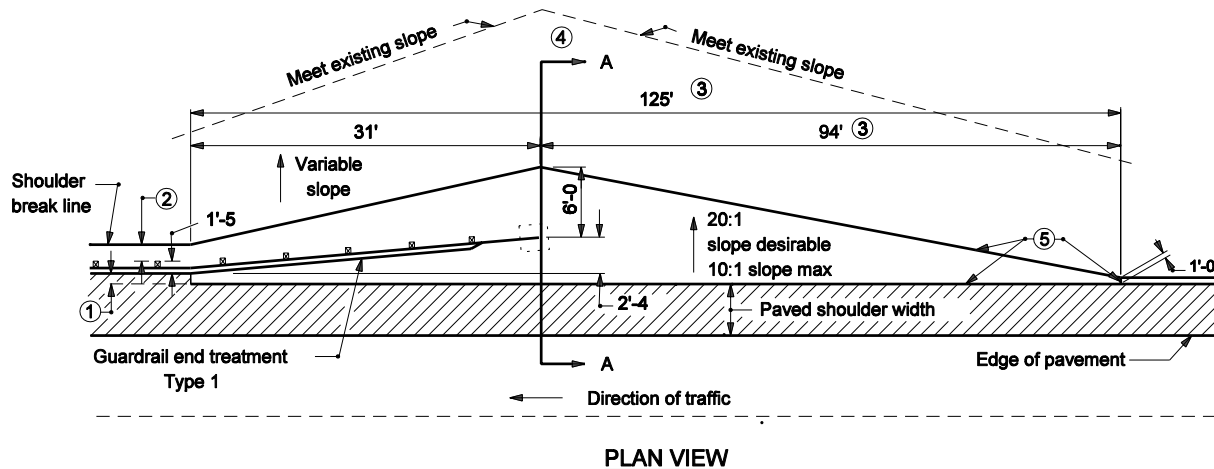
DETAILS PLACED IN THIS FORMAT 11-15-99

/s/ Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

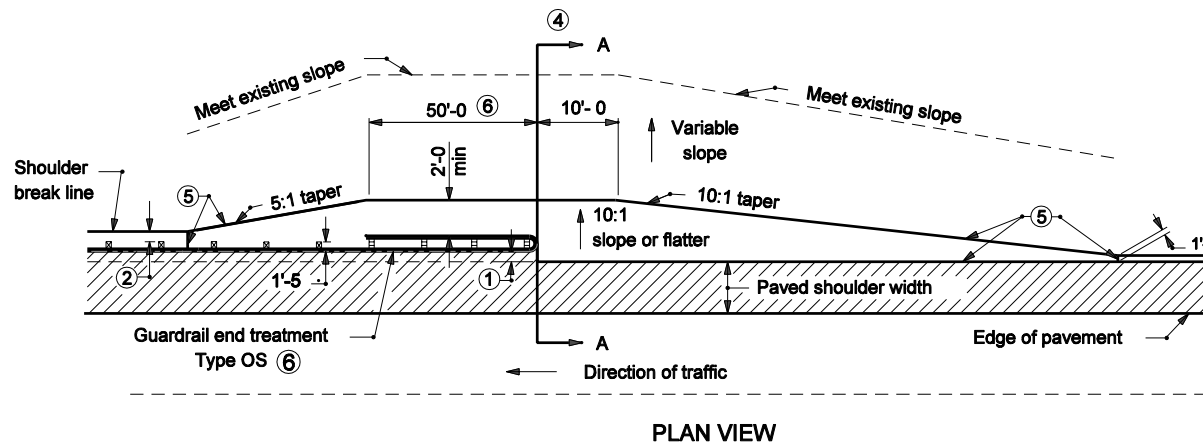
/s/ Firooz Zandi 11-15-99
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

ORIGINALLY APPROVED 4-03-95



GRADING DETAIL FOR GUARDRAIL END TREATMENT TYPE I



GRADING DETAIL FOR GUARDRAIL END TREATMENT TYPE OS

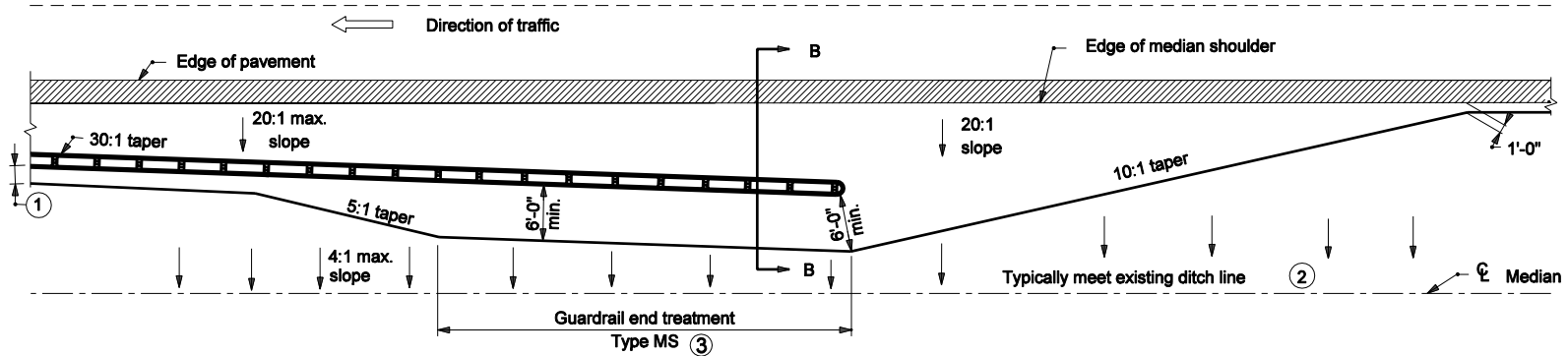
NOTES:

- ① The required guardrail offset shall be 0 to 2'-0" desirable as specified in The plans. The offset used between the the edge of required shoulder and the face of rail shall also be used to establish the berm width at the end of the guardrail end treatment.
- ② This distance may vary from 0 to 2'-0" desirable.
- ③ These dimensions are based on a 2'-0" guardrail offset and must be adjusted for other offset distances to maintain a 10:1 taper.
- ④ Grading profiles at Section A-A for types OS and type I guardrail end treatments are shown on Standard Drawings E 601-GRET-08, and -09.
- ⑤ Limits of compacted aggregate.
- ⑥ Length and width of OS Unit Test Level 3 (TL-3)
Length = 50'-0"
Width = 2'-0"

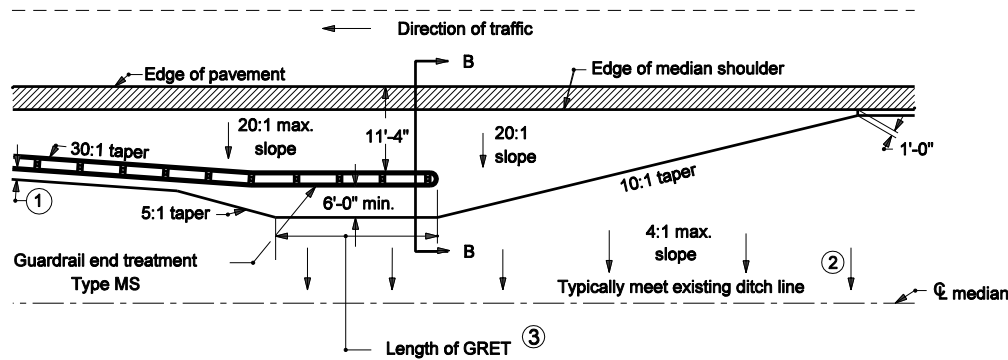
INDIANA DEPARTMENT OF TRANSPORTATION	
GRADING AT GUARDRAIL END TREATMENTS	
March 2004	
STANDARD DRAWING NO. E 601-GRET-06	
	/s/ Anthony L. Uremovitch 3-01-04 DESIGN STANDARDS ENGINEER DATE
	/s/ Richard K. Smutzer 3-01-04 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	

NOTES:

- ① This distance may vary from 0 to 2'-0" desirable.
- ② If necessary, move existing ditch line to obtain a 4:1 slope.
- ③ Length and width of MS Unit Test Level 3 (TL-3) and transition rail where required:
Length = 31'-3" (MS unit) + 12' - 6" (transition rail) = 43' - 9" (typ)
Width = 2'-4"

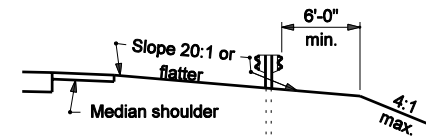


PLAN VIEW - GRADING DETAIL FOR G.R.E.T. TYPE MS ON FLARE



PLAN VIEW

GRADING DETAIL FOR GUARDRAIL END TREATMENT TYPE MS PARALLEL TO SHOULDER



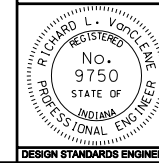
SECTION B-B

INDIANA DEPARTMENT OF TRANSPORTATION

**GRADING AT GUARDRAIL
END TREATMENT**

MARCH 2005

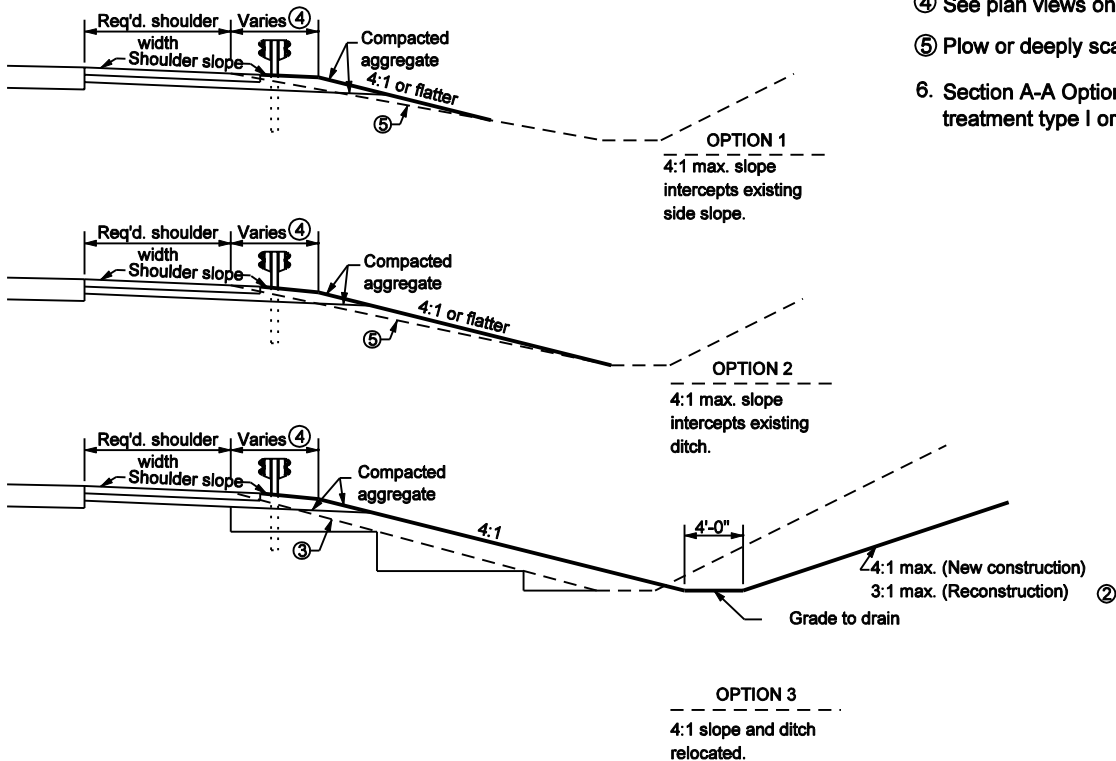
STANDARD DRAWING NO. E 601-GRET-07



/s/ Richard L. VanCleave 3-01-05
DESIGN STANDARDS ENGINEER DATE

/s/ Richard K. Smutzer 3-01-05
CHIEF HIGHWAY ENGINEER DATE

Recoverable Proposed Slopes (Options 1, 2, and 3)



GRADING CROSS SECTIONS AT SECTION A-A

NOTES:

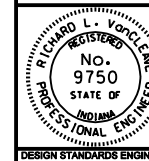
1. Grading cross section Option 1 is most desirable and shall be used on new construction. Option 7 is least desirable. The grading cross section to be used shall be as detailed or specified on the plans. A more desirable option may be used in lieu of the option specified.
- ② The backslope on Option 3 shall not exceed 2:1 on 3R projects.
- ③ Benching required for existing slopes steeper than 4:1.
- ④ See plan views on Standard Drawing E 601-GRET-06.
- ⑤ Plow or deeply scarify for existing slopes 4:1 or flatter.
6. Section A-A Options 1, 2, and 3 may be used with guardrail end treatment type I or OS.

INDIANA DEPARTMENT OF TRANSPORTATION

**GRADING AT GUARDRAIL
END TREATMENT**

SEPTEMBER 2002

STANDARD DRAWING NO. E 601-GRET-08

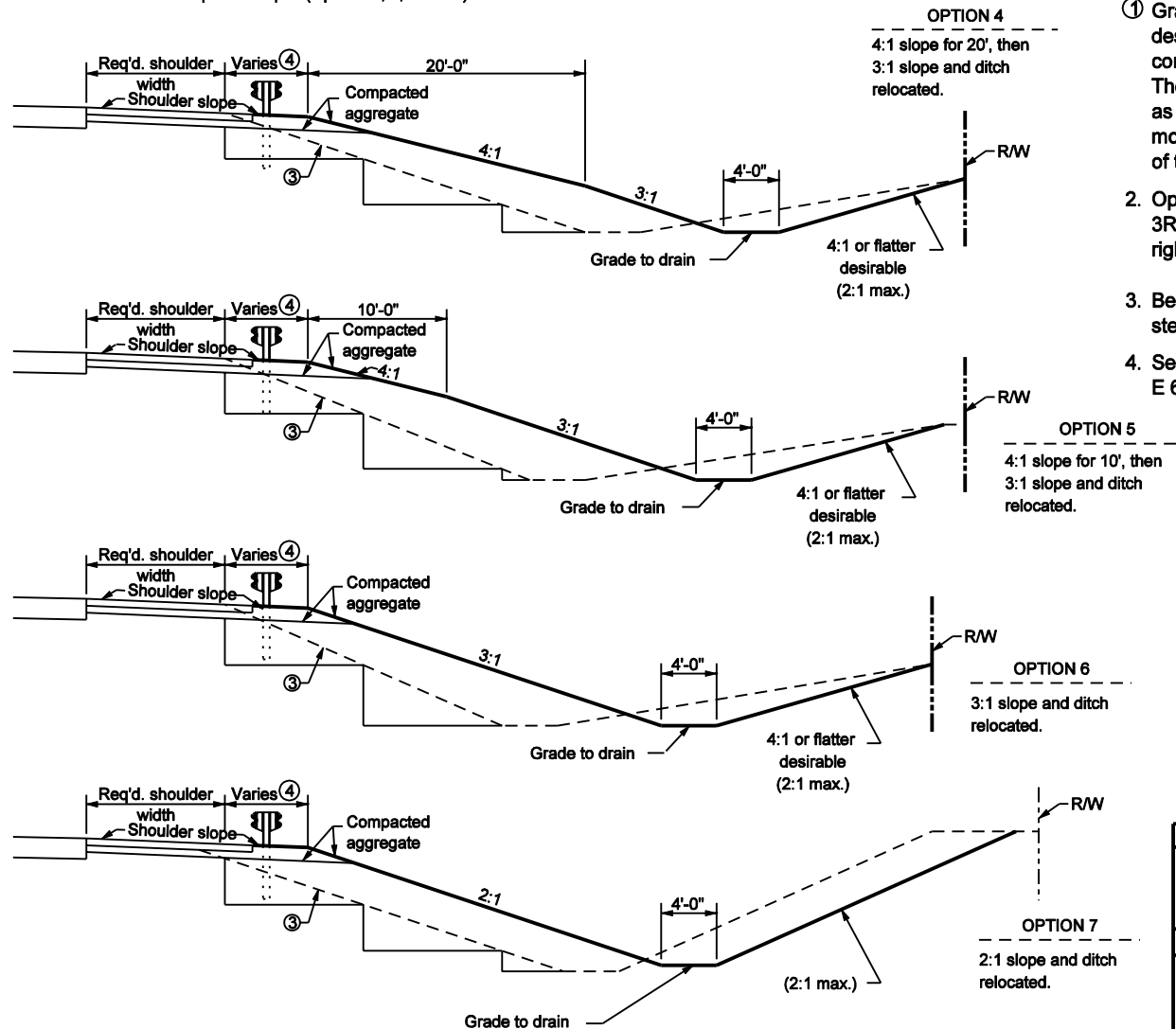


/s/ Richard L. VanCleave 9-03-02
DESIGN STANDARDS ENGINEER DATE

/s/ Richard K. Smutzer 9-03-02
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

Non-Recoverable Proposed Slopes (Options 4, 5, 6 and 7)

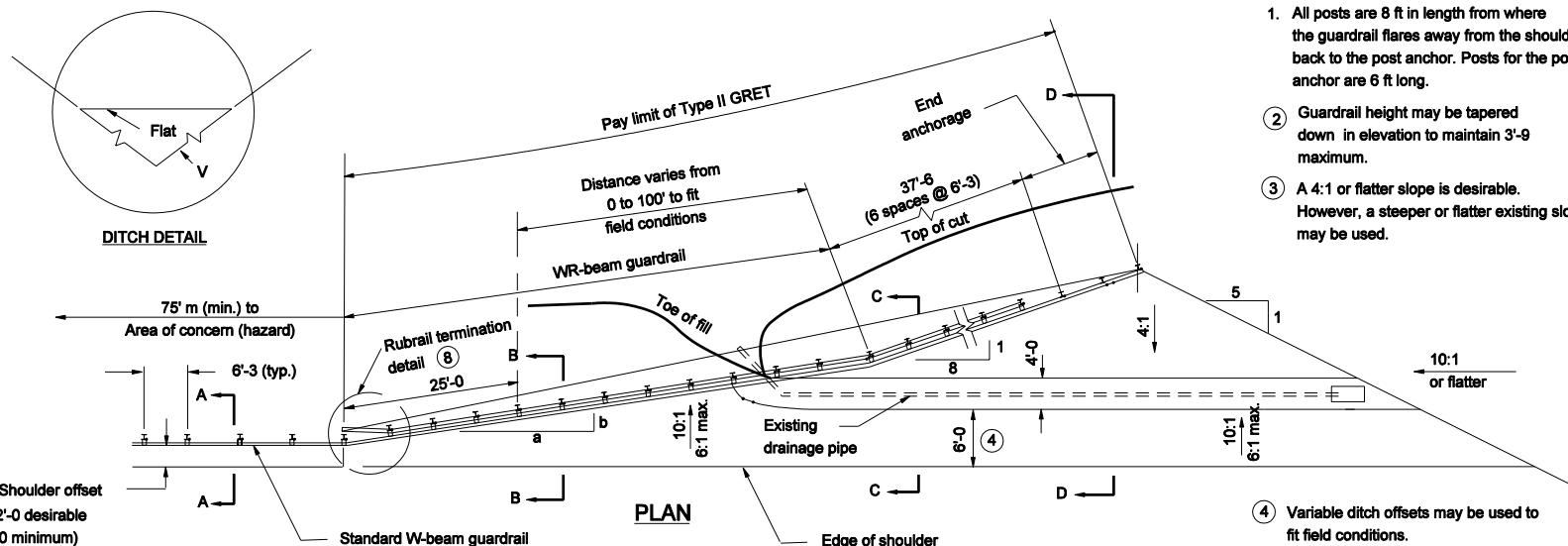


GRADING CROSS SECTIONS AT SECTION A-A

NOTES:

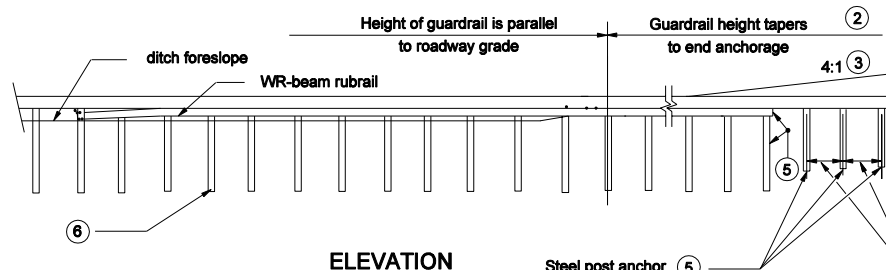
- ① Grading cross section Option 1 is most desirable and shall be used on new construction. Option 7 is least desirable. The grading cross section to be used shall be as detailed or specified on the plans. A more desirable option may be used in lieu of the option specified.
2. Options 4 through 7 may only be used on a 3R/4R partial reconstruction project with right-of-way restrictions.
3. Benching required for existing slopes steeper than 4:1.
4. See Standard Drawing E 601-GRET-06 for plan views.

INDIANA DEPARTMENT OF TRANSPORTATION	
GRADING AT GUARDRAIL END TREATMENTS	
SEPTEMBER 2002	
STANDARD DRAWING NO. E 601-GRET-09	
	/s/ Richard L. VanCleave 9-03-02 DESIGN STANDARDS ENGINEER DATE
	/s/ Richard K. Smutzer 9-03-02 CHIEF HIGHWAY ENGINEER DATE

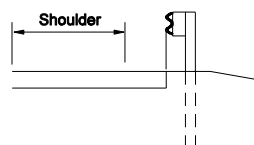


Design speed mph	a:b
≥ 60	13:1
55	12:1
50	11:1
45 or less	10:1

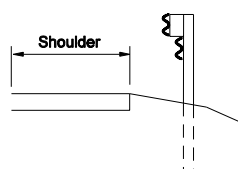
a:b RATIO



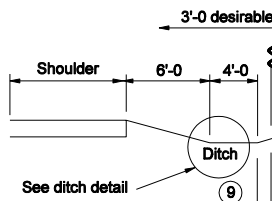
ELEVATION



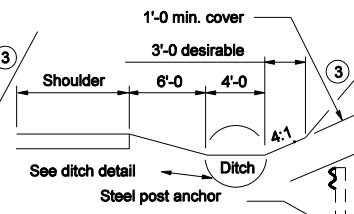
SECTION A-A



SECTION B-B
(WITH RUBRAIL)



SECTION C-C
(WITH RUBRAIL)



SECTION D-D

NOTES:

1. All posts are 8 ft in length from where the guardrail flares away from the shoulder back to the post anchor. Posts for the post anchor are 6 ft long.
2. Guardrail height may be tapered down in elevation to maintain 3'-9" maximum.
3. A 4:1 or flatter slope is desirable. However, a steeper or flatter existing slope may be used.
4. Variable ditch offsets may be used to fit field conditions.
5. See Standard Drawing E 601-GRET-11 for rub rail anchor details and post anchor details.
6. See Standard Drawing E 601-WBGA-06 for steel post and wood block details.
7. Ditch cross section profile should be same as upstream ditch cross section profile and have same or greater hydraulic capacity.
8. See Standard Drawing E 601-WBGA-06 for detail.
9. Posts shall be installed offset from the required ditch cross section to maintain ditch's hydraulic capacity.

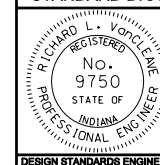
INDIANA DEPARTMENT OF TRANSPORTATION

GUARDRAIL END TREATMENT

TYPE II

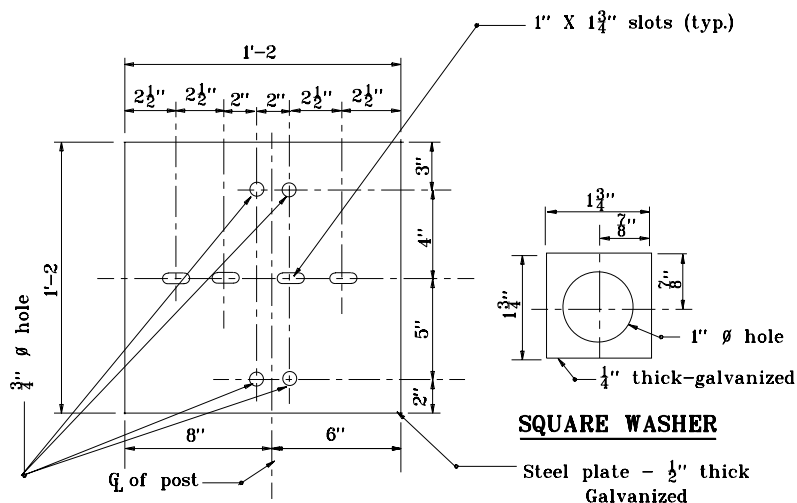
SEPTEMBER 2004

STANDARD DRAWING NO. E 601-GRET-10



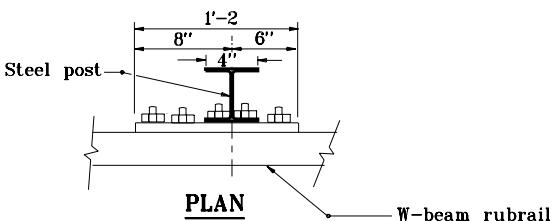
/s/ Richard L. VanCleave 9-01-04
DESIGN STANDARDS ENGINEER DATE

/s/ Richard K. Smutzer 9-01-04
CHIEF HIGHWAY ENGINEER DATE

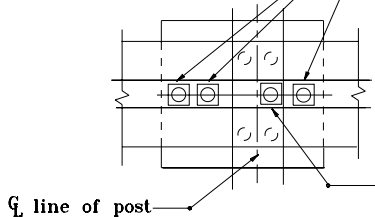


STEEL PLATE DETAIL

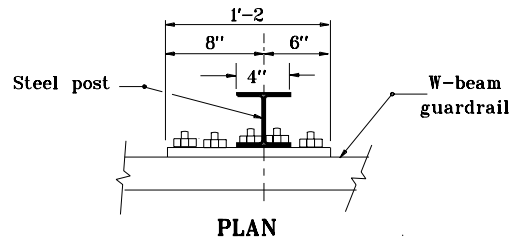
STEEL PLATE AND WASHER DETAILS



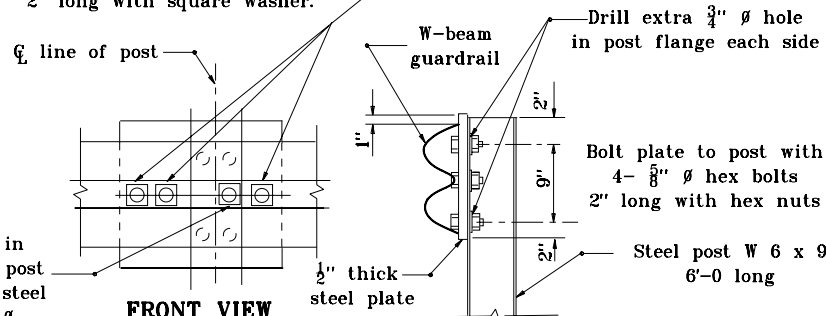
3 - 1" ϕ holes to be field drilled in rail and attached to steel plate with 7/8" ϕ hex bolts 2" long with square washer.



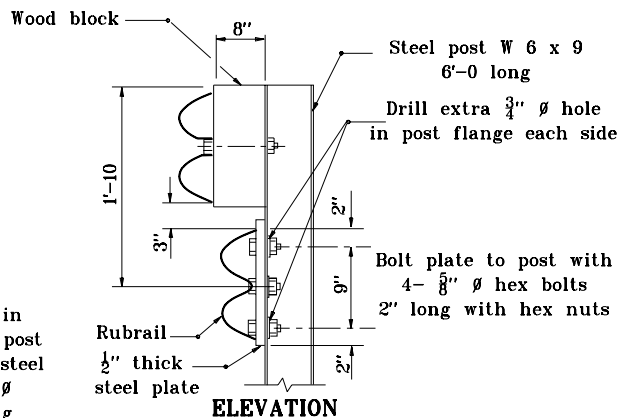
RUBRAIL ANCHOR DETAILS



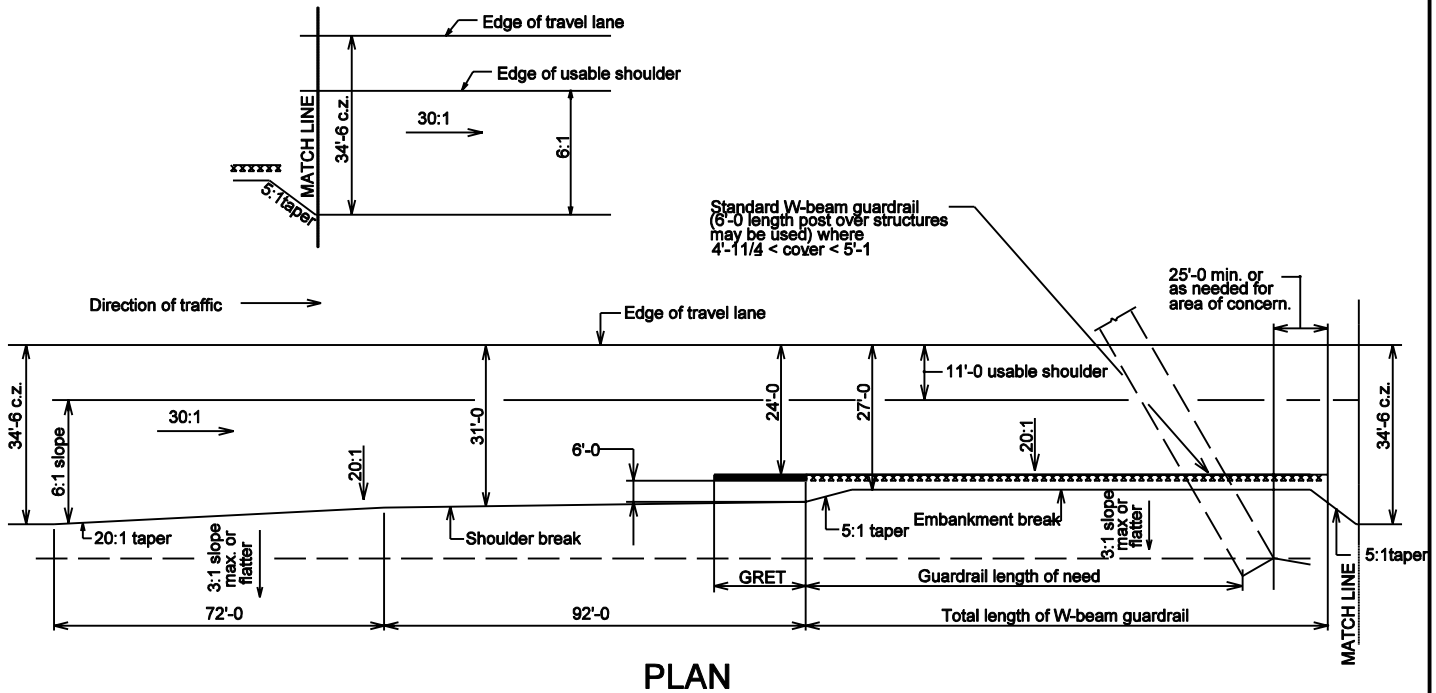
3 - 1" ϕ holes to be field drilled in rail and attached to steel plate with 7/8" ϕ hex bolts 2" long with square washer.



POST ANCHOR DETAILS



INDIANA DEPARTMENT OF TRANSPORTATION	
GUARDRAIL END TREATMENT	
TPPE II-COMPONENTS	
SEPTEMBER 2000	
STANDARD DRAWING NO. E 601-GRET-11	
	/s/ Anthony L. Uremovich 9-01-00 DESIGN STANDARDS ENGINEER DATE
	/s/ Firooz Zandi 9-01-00 CHIEF HIGHWAY ENGINEER DATE



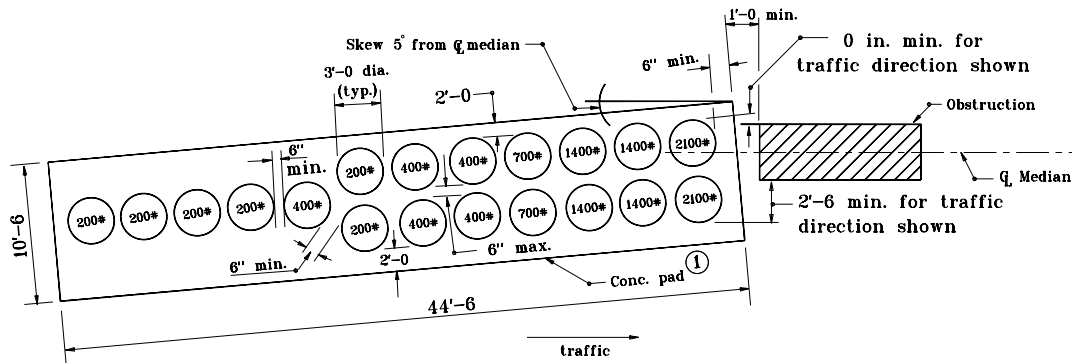
NOTES:

- Grading requirements shown are for 5'-6 or larger structures, and three-sided structures on project constructed on new alignment for design speed of 70 mph rural divided highway.
- Grading shown above is applicable for 25'-0 span nested guardrail also.
- Grading requirements for 5'-6 or larger structures and three sided structures constructed on existing alignments at all design speeds are shown in standard Drawings E 601-GRET 06 through 09.

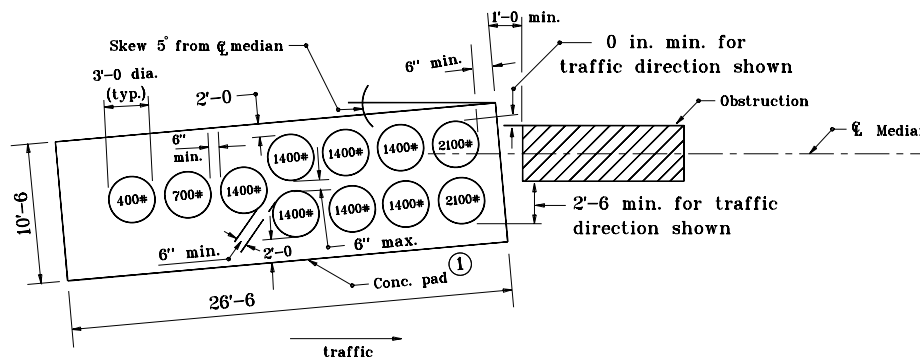
INDIANA DEPARTMENT OF TRANSPORTATION	
GRADING REQUIREMENTS FOR LARGE DRAINAGE STRUCTURE	
SEPTEMBER 2001	
STANDARD DRAWING NO. E 601-GRET-12	
	/s/ Richard L. VanCleave DESIGN STANDARDS ENGINEER DATE 9-04-01
	/s/ Firooz Zandi CHIEF HIGHWAY ENGINEER DATE 9-04-01

NOTES:

- ① Concrete pad shall be 6" thick with welded wire fabric 6" x 6", W3/W3 or equivalent. A clearance of 2" shall be provided between all sides and top of concrete pad and welded wire fabric.
- Appropriate impact attenuator Test Level shall be used to determine the concrete pad size and gravel barrel layout.
- See Standard Drawings E 601-GAIA-01, 01A and 02 for grading details.
- The details shown are for an impact attenuator type ED, gravel barrel array with a maximum obstruction width of 3'-0.

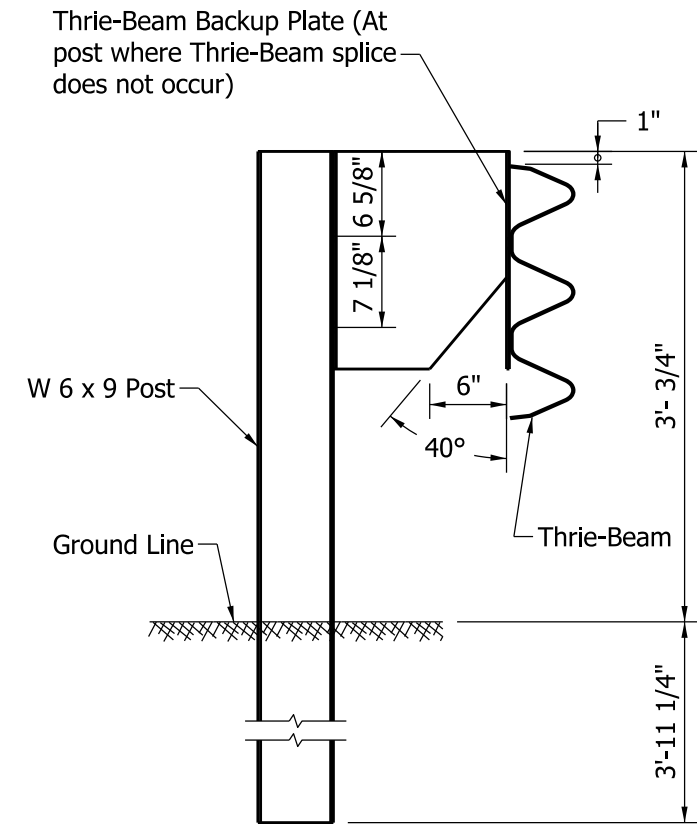


**CONCRETE PAD PLAN IMPACT ATTENUATOR TYPE ED
GRAVEL BARREL ARRAY FOR TEST LEVEL 3**

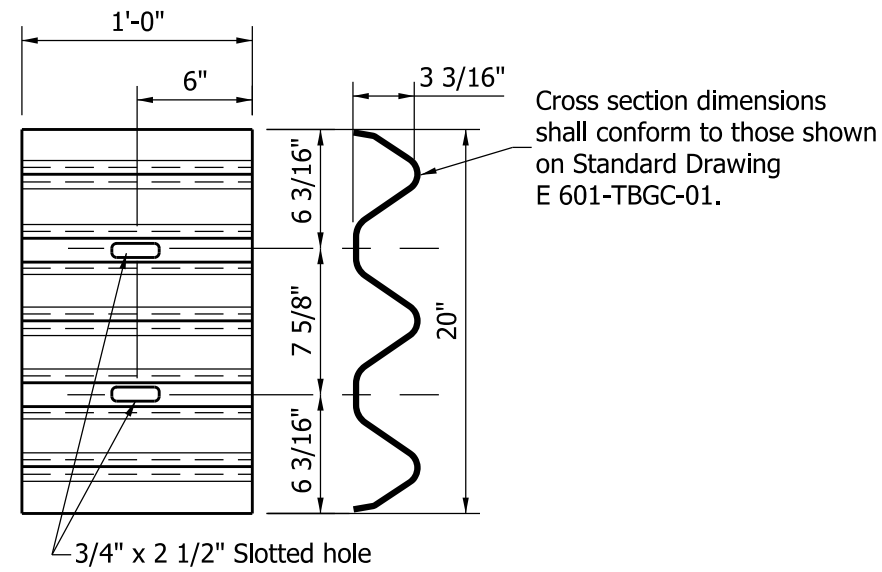


**CONCRETE PAD PLAN IMPACT ATTENUATOR TYPE ED
GRAVEL BARREL ARRAY FOR TEST LEVEL 2**

INDIANA DEPARTMENT OF TRANSPORTATION	
IMPACT ATTENUATOR ED LAYOUT	
MARCH 2002	
STANDARD DRAWING NO. E 601-IAED-01	
	/s/ Richard L. VanCleave 3-01-02 DESIGN STANDARDS ENGINEER DATE
	/s/ Richard K. Smutzer 3-01-02 CHIEF HIGHWAY ENGINEER DATE



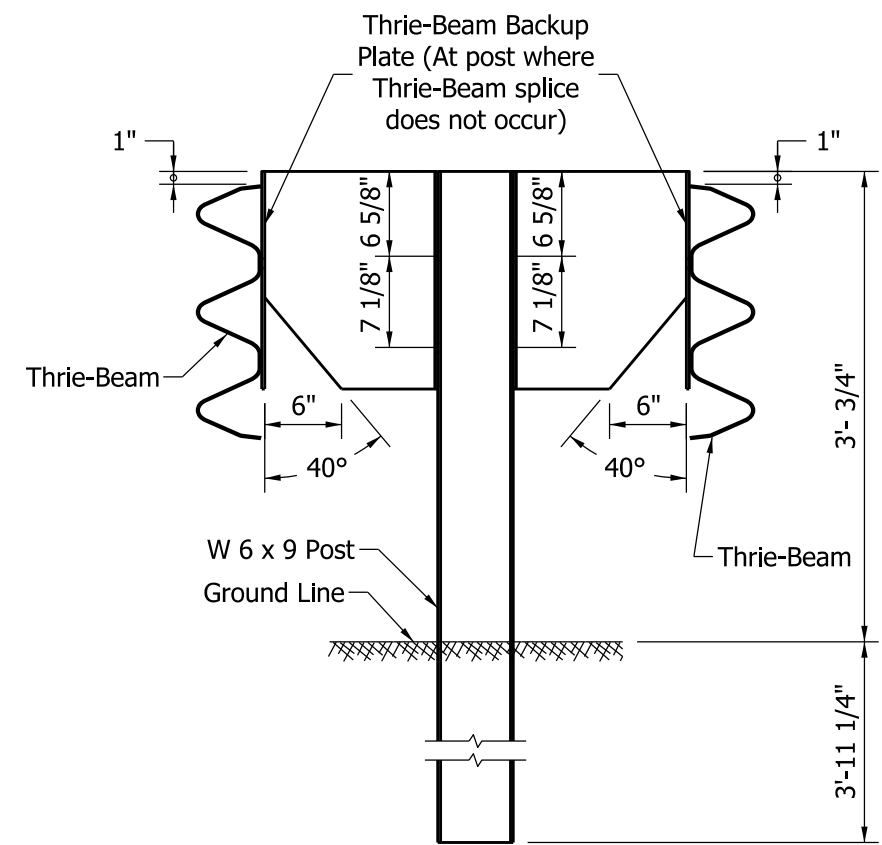
THRIE BEAM GUARDRAIL



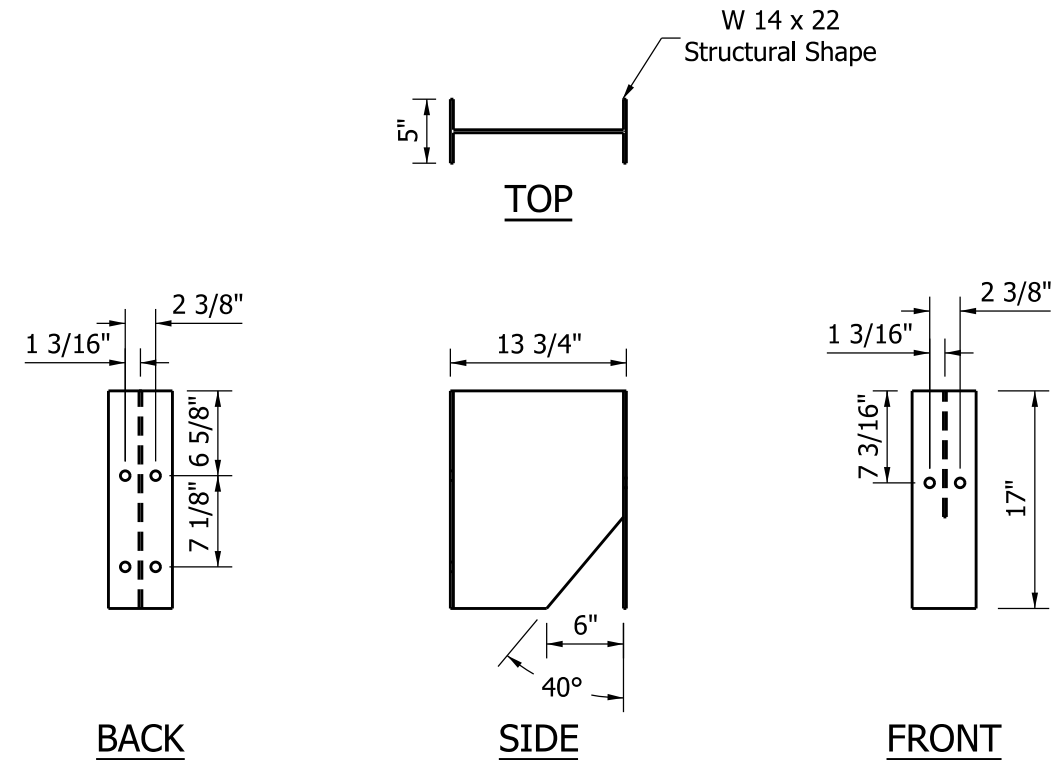
THRIE BEAM GUARDRAIL BACK-UP PLATE
AT LOCATIONS WITHOUT SPLICE

NOTES:

1. See Standard Drawing E 601-TBGC-01 for Thrie Beam rail section details.
2. See Standard Drawings E 601-TTGB-03 and E 601-TTGB-04 for W 6 x 9 post hole pattern details.
3. Typical post spacing for Thrie Beam Guardrail and Double Faced Thrie Beam Guardrail is 6'-3".
4. Only the blockout material shown may be used.

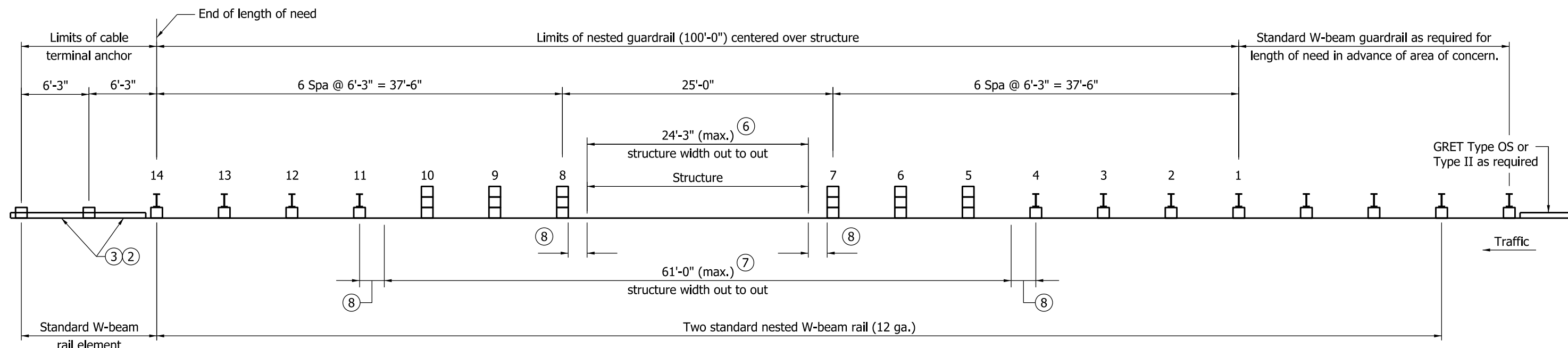


DOUBLE FACED THRIE BEAM GUARDRAIL

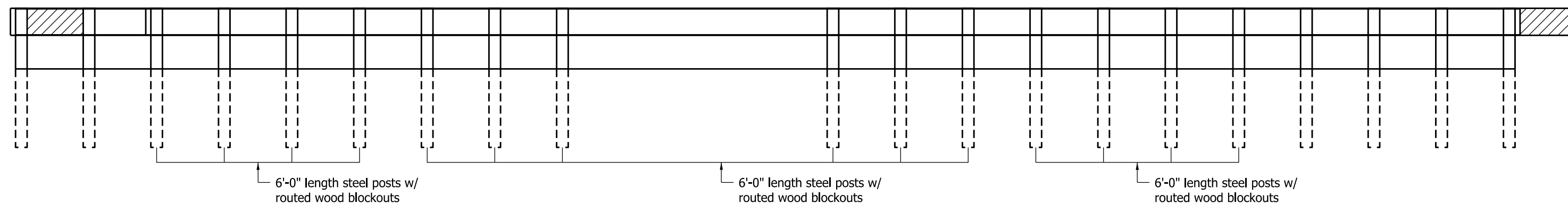


THRIE BEAM GUARDRAIL BLOCKOUT
(STEEL ONLY)

INDIANA DEPARTMENT OF TRANSPORTATION			
THRIE BEAM GUARDRAIL DETAILS			
SEPTEMBER 2011			
STANDARD DRAWING NO.		E 601-MTGR-01	
	/s/ Richard L. VanCleave		09/01/11
	DESIGN STANDARDS ENGINEER		DATE
	/s/ Mark A. Miller		09/01/11
DESIGN STANDARDS ENGINEER		CHIEF HIGHWAY ENGINEER	
		DATE	



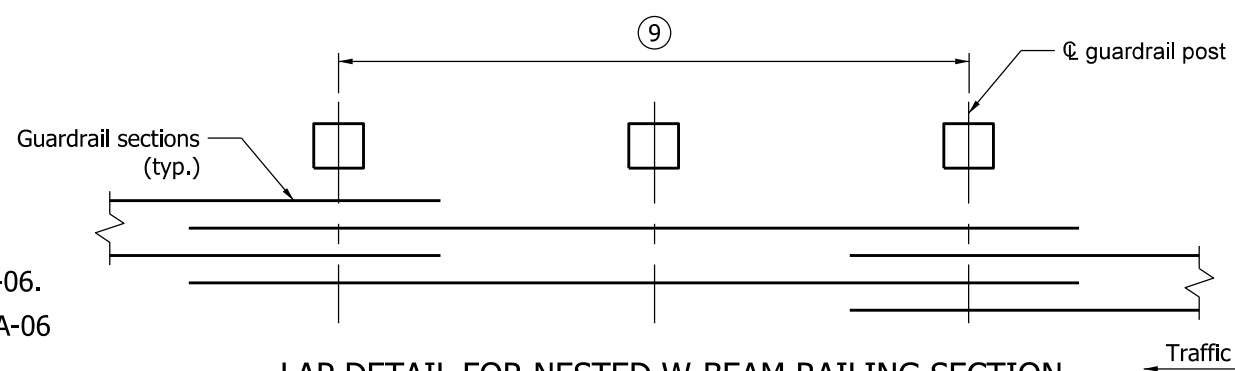
PLAN



ELEVATION

NOTES:

- ② For two-lane two-way operation, use GRET type OS. For structure width > 24'-3", provide three additional spans of standard W-beam guardrail at 6'-3" each before attaching the GRET.
- ③ For multi-lane divided operation, use cable terminal, anchor, See Standard Drawing E 601-GCTA-01 through E 601-GCTA-06.
4. See Standard Drawings E 601-GRET-10, 11 and E 601-WBGA-06 for GRET Type II details.
5. See Standard Drawings E 601-NWGA-02, 03 and 04 for post and block assemblies details.
- ⑥ Maximum structure width shall be 24'-3" out to out of structure(s) parallel to road centerline for skewed or perpendicular structure. In this case posts are not located over portion of structure.
- ⑦ Maximum structure width shall be 61'-0" out to out of structure(s) parallel to roadway centerline for skewed or perpendicular structure. Modified posts (5 through 10) over the structure where required, see Standard Drawing E 601-NWGA-03. The remaining wood posts shall be shown on Standard Drawing E 601-NWGA-02.



NOTES:

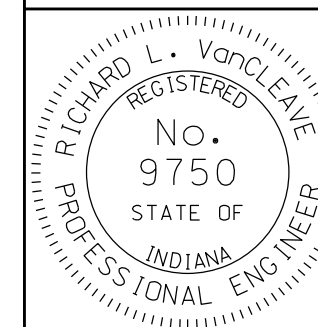
- ⑧ Post shall clear outer structure side by 4" min.
- ⑨ This dimension is 25'-0" between posts 7 and 8. The dimension is 12'-6" or 25'-0" elsewhere.
10. For grading requirements see Standard Drawings E 601-GRET-06 through 09 and E 601-GRET-12.

INDIANA DEPARTMENT OF TRANSPORTATION

25'-0" SPAN NESTED GUARDRAIL
FOR LARGE DRAINAGE STRUCTURE

SEPTEMBER 2010

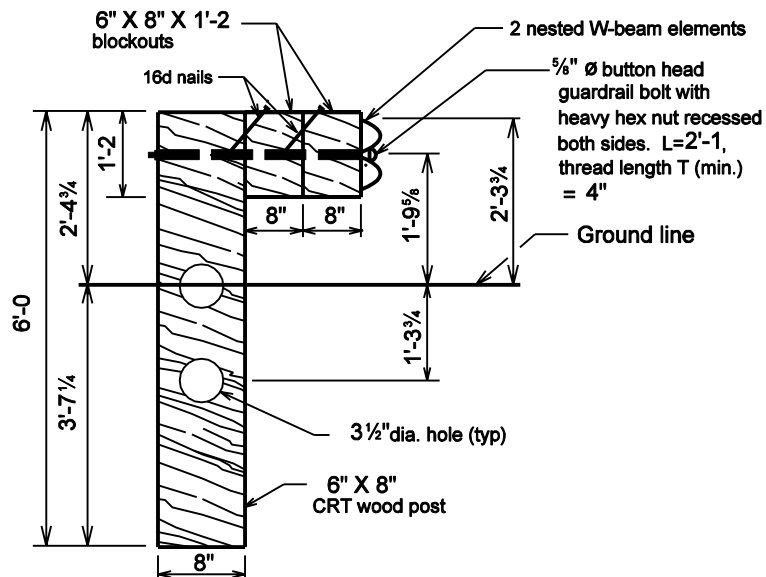
STANDARD DRAWING NO. E 601-NWGA-01



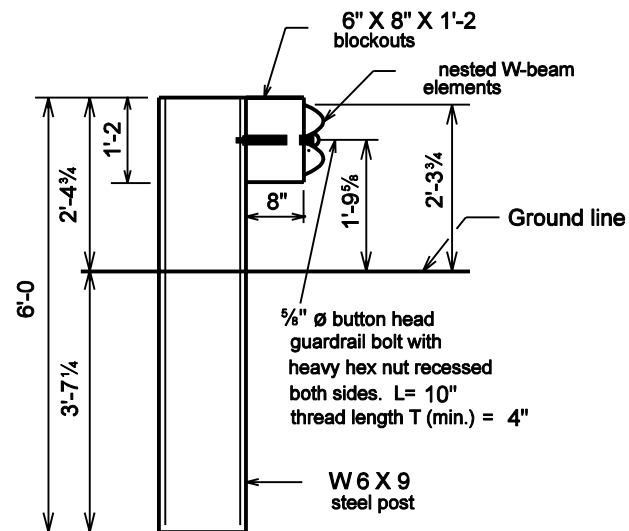
DESIGN STANDARDS ENGINEER

/s/ Richard L. VanCleave 09/01/10
DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 09/01/10
CHIEF HIGHWAY ENGINEER DATE



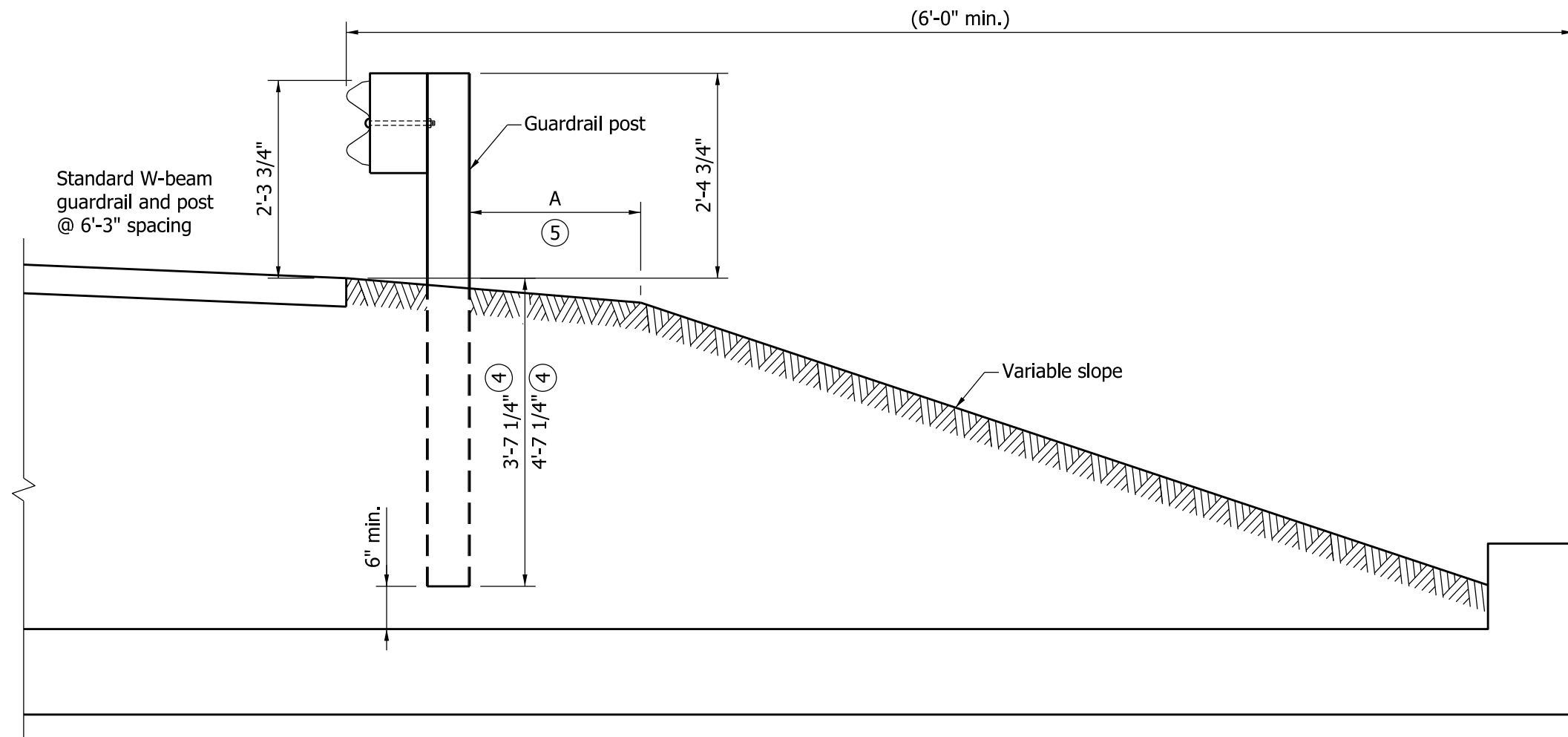
NESTED GUARDRAIL ASSEMBLY.
(Posts 5 to 10)



**STEEL POST AND BLOCK FOR USE WITH
NESTED GUARDRAIL ASSEMBLY**
(Posts 1 to 4 and 11 to 14)

INDIANA DEPARTMENT OF TRANSPORTATION		
NESTED GUARDRAIL ASSY. FOR STRUCTURE WIDTH ≤ 24'-3"		
SEPTEMBER 2001		
STANDARD DRAWING NO. E 601-NWGA-02		
	/s/ Richard L. VanCleave	9-04-01
	DESIGN STANDARDS ENGINEER	DATE
	/s/ Firooz Zandi	9-04-01
	CHIEF HIGHWAY ENGINEER	DATE

INDIANA DEPARTMENT OF TRANSPORTATION	
GUARDRAIL ASSEMBLY FOR STRUCTURE WIDTH > 24'-3" SEPTEMBER 2001 STANDARD DRAWING NO. E 601-NWGA-03	
	<i>/s/ Richard L. VanCleave</i> 9-04-01 DESIGN STANDARDS ENGINEER DATE <i>/s/ Firas Zaghl</i> 9-04-01 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	



GUARDRAIL ASSEMBLY FOR COVER $\geq$ 4'-1 1/4"
FOR ANY STRUCTURE WIDTH

NOTES:

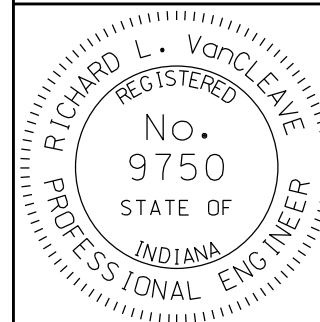
1. This drawing shall be used for any structure width provided cover over structure $\geq$ 4'-1 1/4".
2. The 6'-0" length guardrail post shall be used if 4'-1 1/4" $\leq$ cover $\leq$ 5'-1 1/4".
3. The 7'-0" long guardrail post shall be used if cover $>$ 5'-1 1/4".
- 4 3'-7 1/4" for 6'-0" length post and 4'-7 1/4" for 7'-0" length post.
- 5 A = 2'-0" for 6'-0" length post.
A = 0 (min.) for 7'-0" length post.

INDIANA DEPARTMENT OF TRANSPORTATION

GUARDRAIL ASSEMBLY FOR
ANY STRUCTURE WIDTH

SEPTEMBER 2011

STANDARD DRAWING NO. E 601-NWGA-04



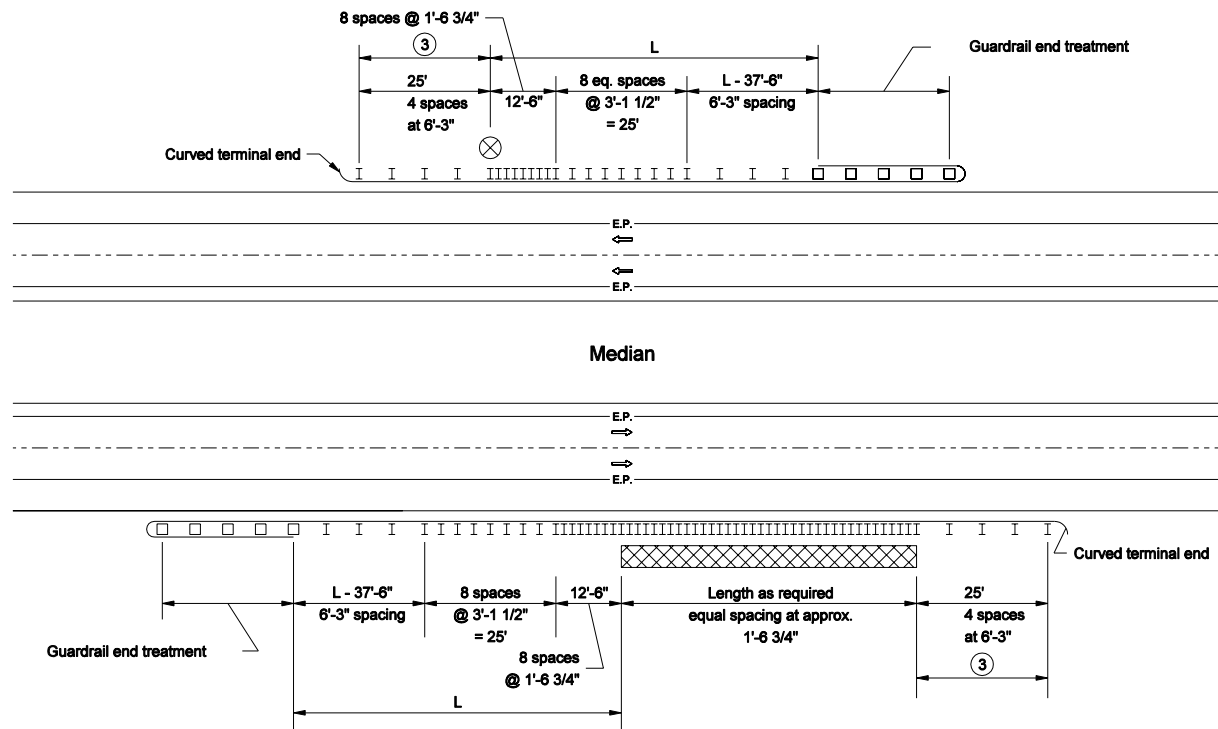
DESIGN STANDARDS ENGINEER

/s/ *Richard L. VanCleave* 09/01/11

DESIGN STANDARDS ENGINEER DATE

/s/ *Mark A. Miller* 09/01/11

CHIEF HIGHWAY ENGINEER DATE



LEGEND

L = Length of need

⊗ Isolated obstruction

⊠ Extended obstruction

MULTI-LANE DIVIDED ROADWAY GUARDRAIL LAYOUT FOR GUARDRAIL FACE TO OBSTRUCTION DISTANCE $\geq 2'-9"$ BUT $< 3'-3"$

GENERAL NOTES

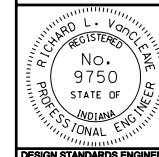
- This configuration shall be used where W-beam guardrail at 1'-6 3/4" post spacing is specified on a divided lane roadway to shield an isolated or extended obstruction.
- Dimensions and details not shown on this drawing shall be as shown on the plans.
- Rectangular plate washers shall be installed at each post along this section.

INDIANA DEPARTMENT OF TRANSPORTATION

ROADSIDE OBSTRUCTION PROTECTION GUARDRAIL

MARCH 2005

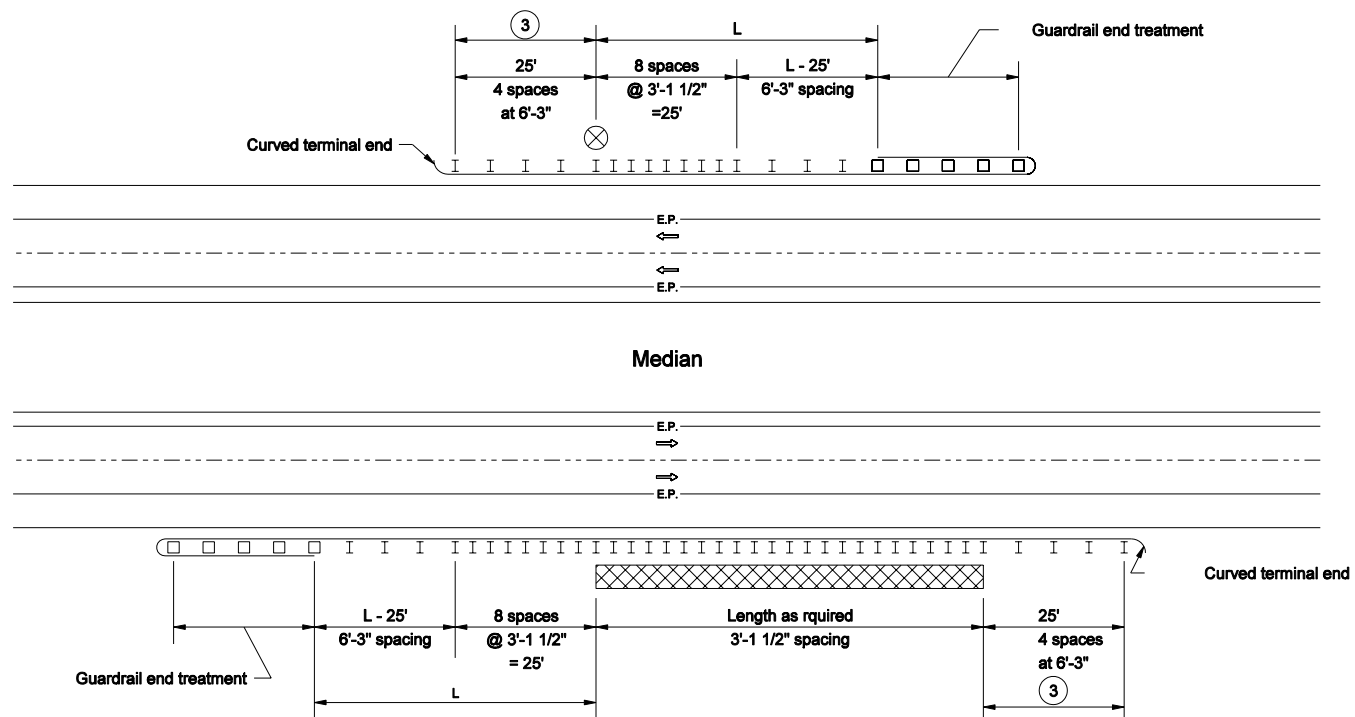
STANDARD DRAWING NO. E 601-RHPG-01



/s/ Richard L. VanCleave 3-01-05
DESIGN STANDARDS ENGINEER DATE

/s/ Richard K. Smutzer 3-01-05
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER



LEGEND

L = Length of need

⊗ Isolated obstruction

⊠ Extended obstruction

MULTI-LANE DIVIDED ROADWAY GUARDRAIL LAYOUT FOR GUARDRAIL FACE TO OBSTRUCTION DISTANCE $\geq 3'-3"$ BUT $< 4'-3"$

GENERAL NOTES

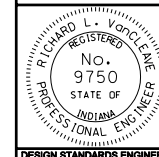
1. This configuration shall be used where W-beam guardrail at 3'-1 1/2" post spacing is specified on a divided lane roadway to shield an isolated or extended obstruction.
2. Dimensions and details not shown on this drawing shall be as shown on the plans.
3. Rectangular plate washers shall be installed at each post along this section.

INDIANA DEPARTMENT OF TRANSPORTATION

ROADSIDE OBSTRUCTION PROTECTION GUARDRAIL

MARCH 2005

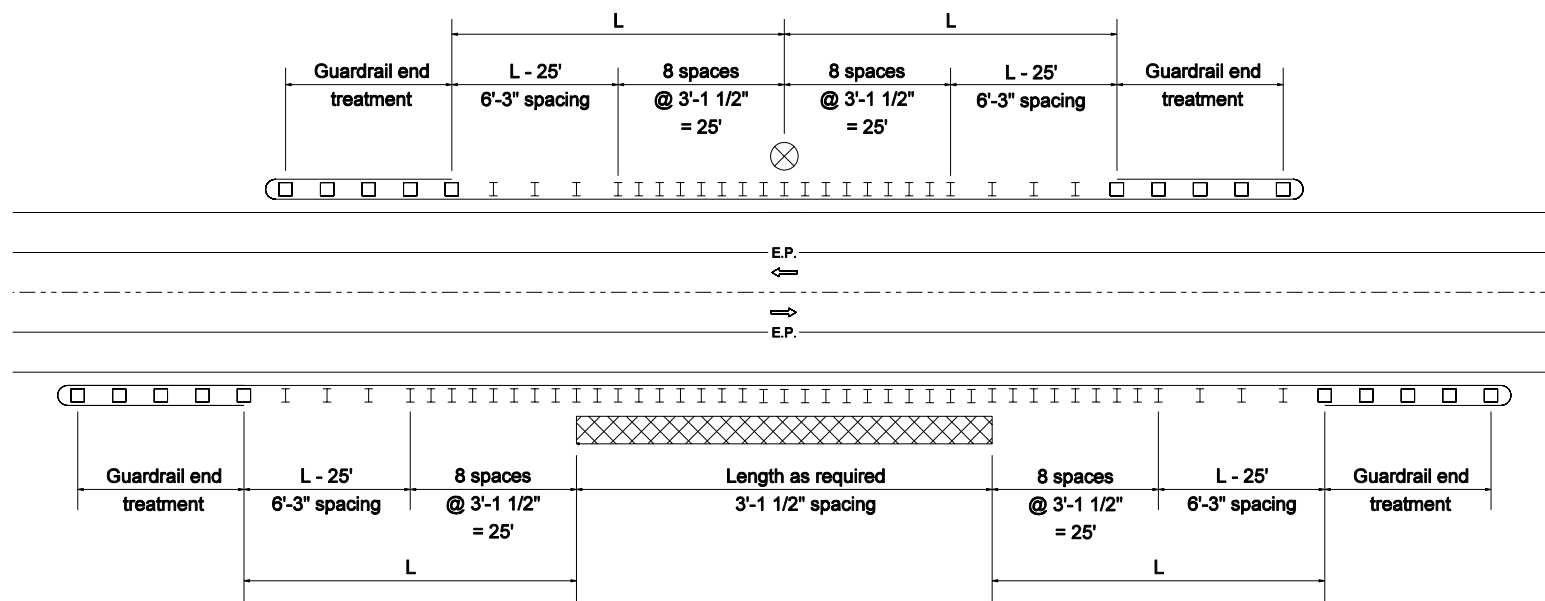
STANDARD DRAWING NO. E 601-RHPG-02



/s/ Richard L. VanCleave 3-01-05
DESIGN STANDARDS ENGINEER DATE

/s/ Richard K. Smutzer 3-01-05
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER



**TWO-LANE TWO-WAY ROADWAY GUARDRAIL LAYOUT FOR
GUARDRAIL FACE TO OBSTRUCTION DISTANCE $\geq$ 3'-3" BUT $<$ 4'-3"**

GENERAL NOTES

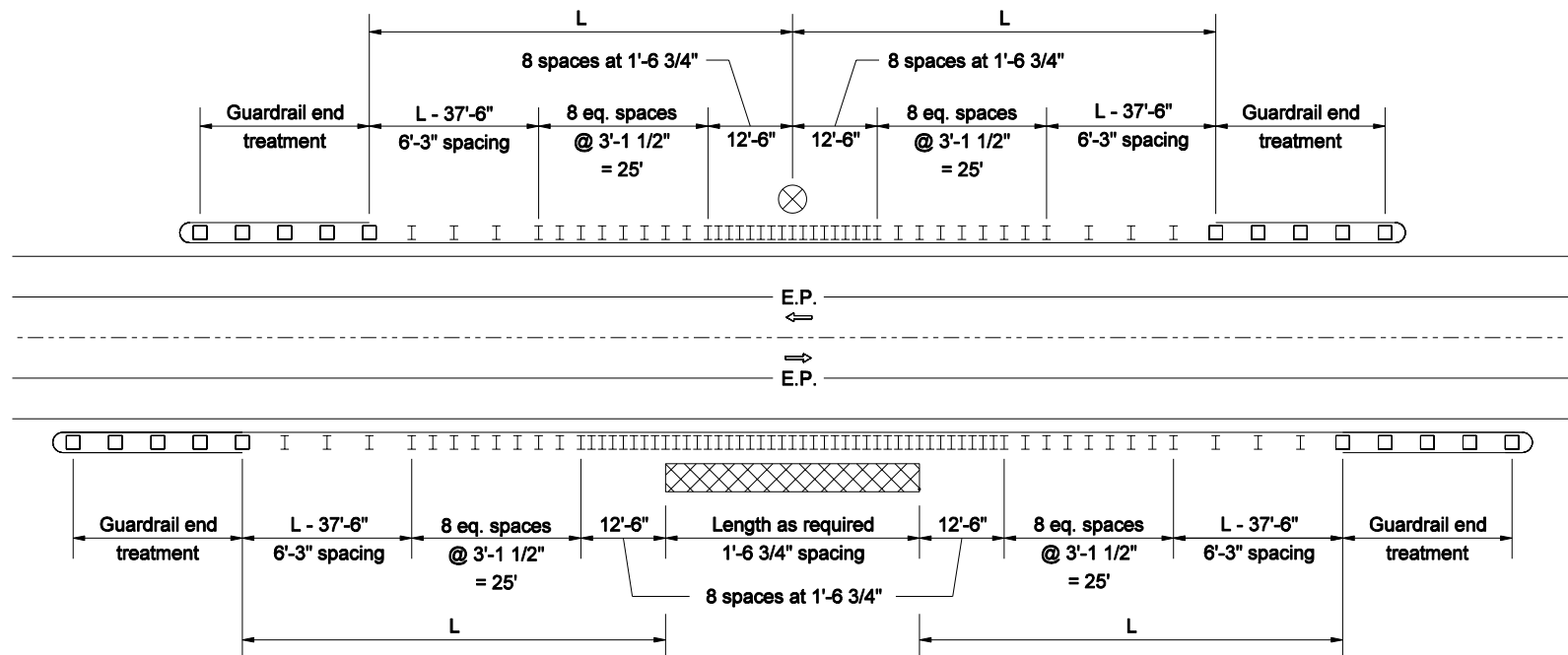
1. This configuration shall be used where W-beam guardrail at 3'-1 1/2" post spacing is specified on a two-lane two-way roadway to shield an isolated or extended obstruction.
2. Dimensions and details not shown on this drawing shall be as shown on the plans.

LEGEND

L = Length of need

- ⊗ Isolated obstruction
 ⊞ Extended obstruction

INDIANA DEPARTMENT OF TRANSPORTATION	
ROADSIDE OBSTRUCTION PROTECTION GUARDRAIL	
MARCH 2005	
STANDARD DRAWING NO. E 601-RHPG-03	
	/s/ Richard L. VanCleave 3-01-05 DESIGN STANDARDS ENGINEER DATE
DESIGN STANDARDS ENGINEER	/s/ Richard K. Smutzer 3-01-05 CHIEF HIGHWAY ENGINEER DATE



**TWO-LANE TWO-WAY ROADWAY GUARDRAIL LAYOUT FOR
GUARDRAIL FACE TO OBSTRUCTION DISTANCE $\geq 2'-9"$ BUT $< 3'-3"$**

GENERAL NOTES

1. This configuration shall be used where W-beam guardrail at 1'-6 3/4" or 3'-1 1/2" post spacing is specified on a two-lane two-way roadway to shield an isolated or extended obstruction.
2. Dimensions and details not shown on this sheet shall be as shown on the plans.

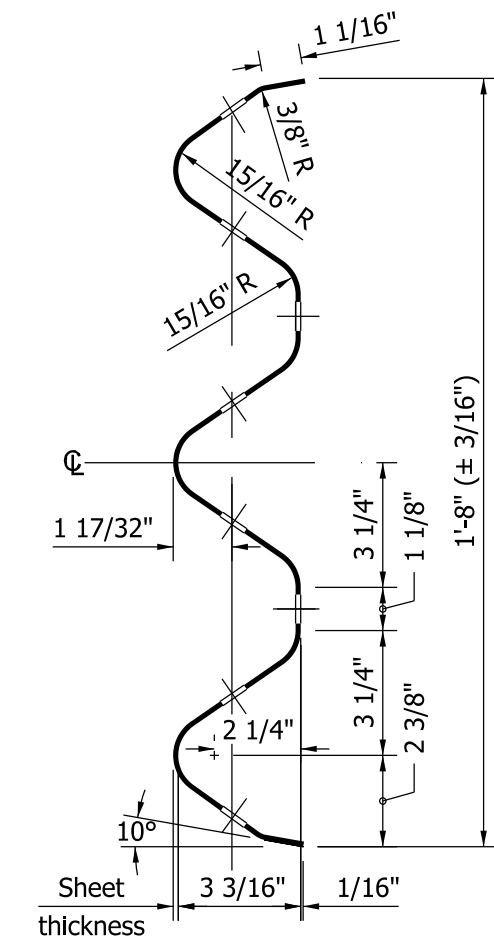
LEGEND

L = Length of need

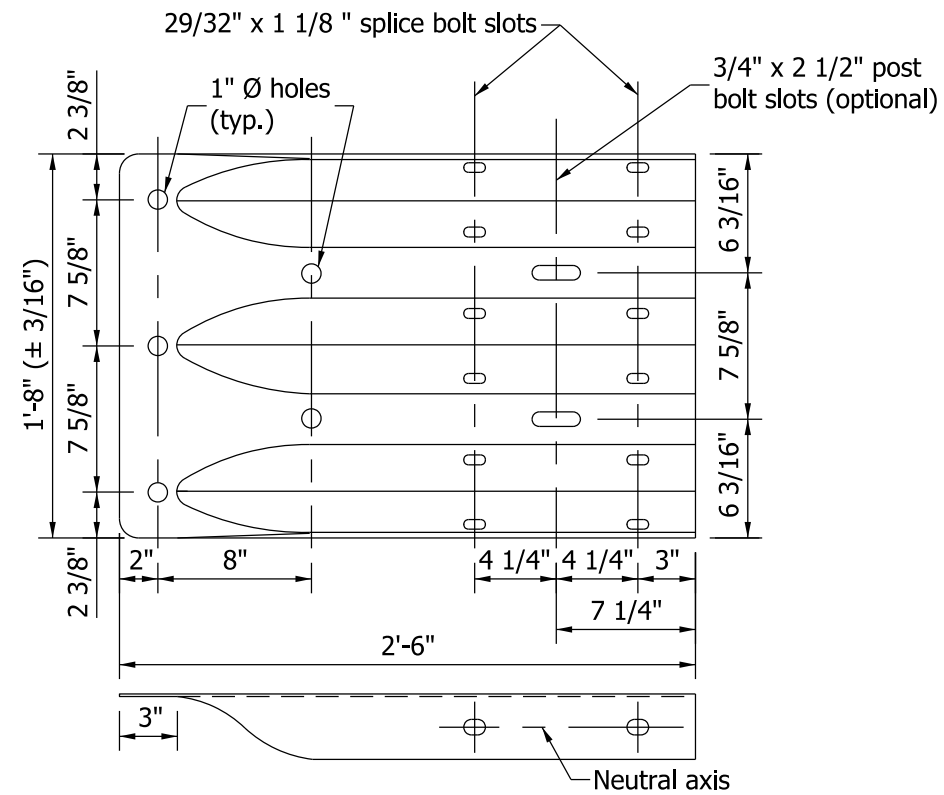
⊗ Isolated obstruction

▨ Extended obstruction

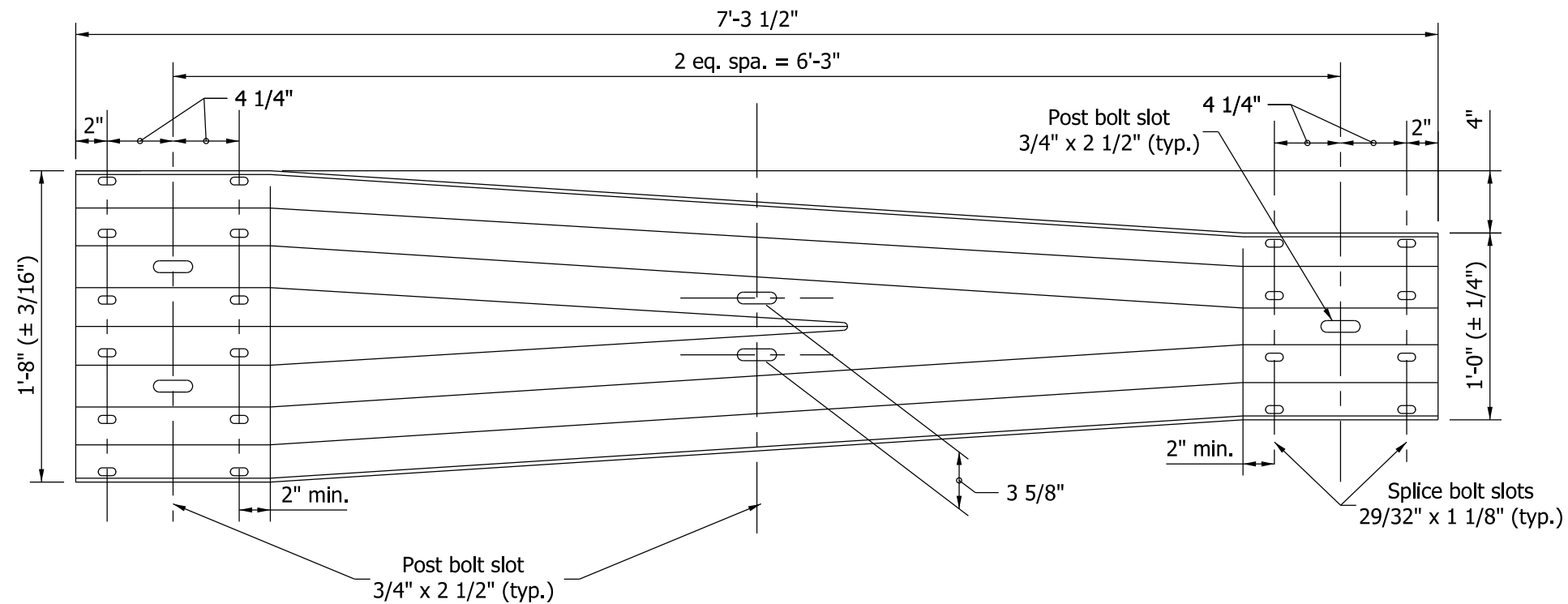
INDIANA DEPARTMENT OF TRANSPORTATION	
ROADSIDE OBSTRUCTION PROTECTION GUARDRAIL	
MARCH 2005	
STANDARD DRAWING NO. E 601-RHPG-04	
	/s/ Richard L. VanCleave 3-01-05 DESIGN STANDARDS ENGINEER DATE
	/s/ Richard K. Smutzer 3-01-05 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	



THRIE BEAM RAIL SECTION

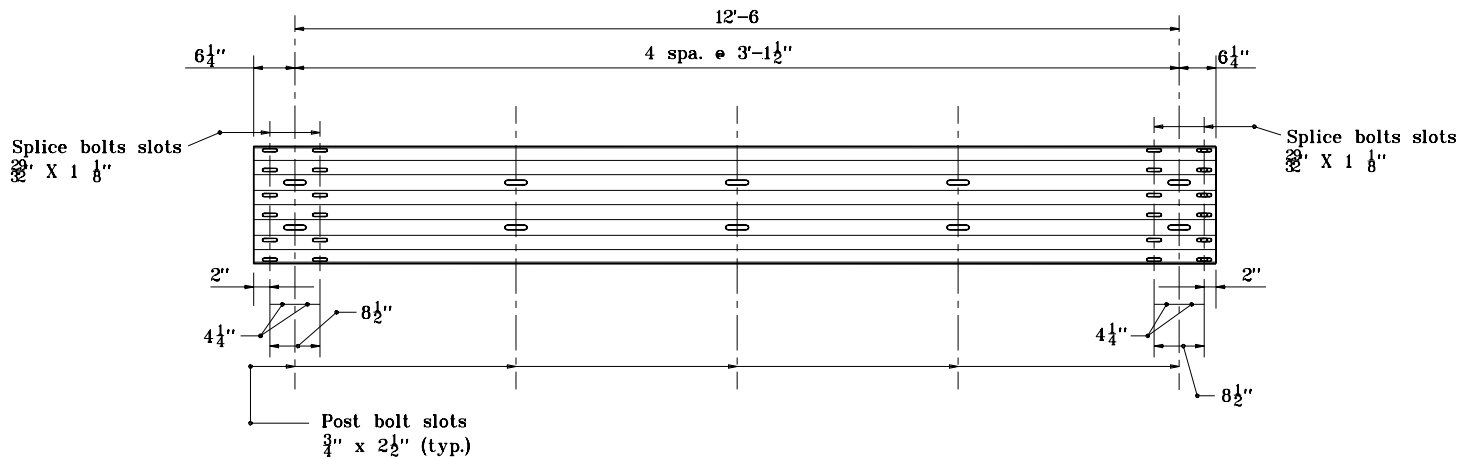


**THRIE BEAM
TERMINAL CONNECTOR**



W-THRIE BEAM TRANSITION SECTION

INDIANA DEPARTMENT OF TRANSPORTATION		
THRIE-BEAM GUARDRAIL COMPONENTS		
SEPTEMBER 2011		
STANDARD DRAWING NO.		E 601-TBGC-01
	/s/ <i>Richard L. VanCleave</i>	09/01/11
	DESIGN STANDARDS ENGINEER	DATE
	/s/ <i>Mark A. Miller</i>	09/01/11
	CHIEF HIGHWAY ENGINEER	DATE
DESIGN STANDARDS ENGINEER		



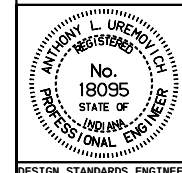
THRIE BEAM RAIL SECTION

INDIANA DEPARTMENT OF TRANSPORTATION

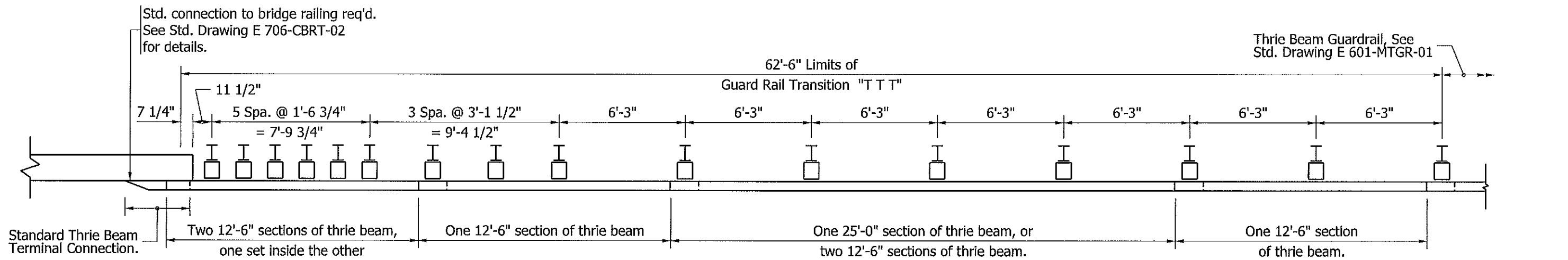
**THRIE-BEAM
GUARDRAIL COMPONENTS**

APRIL 1996

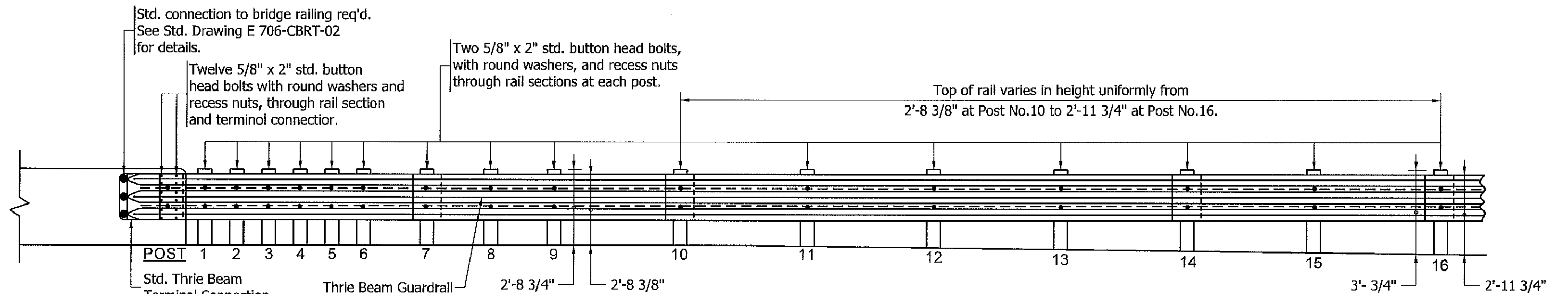
STANDARD DRAWING NO. **E 601-TBGC-02**



DETAILS PLACED IN THIS FORMAT		11-15-99
/s/ Anthony L. Uremovich	11-15-99	DATE
DESIGN STANDARDS ENGINEER		
/s/ Firooz Zandi	11-15-99	DATE
CHIEF HIGHWAY ENGINEER		
ORIGINALLY APPROVED		4-01-96



PARTIAL PLAN



PARTIAL ELEVATION

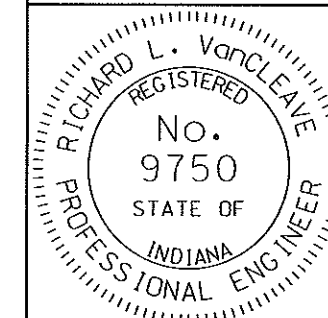
NOTES:

1. See Standard Drawings E 601-TTGB-01 and E 601-TTGB-03 for Thrie Beam Guardrail post and blockout details from bridge rail to Post No. 10.
2. See Standard Drawing E 601-TTGB-03 for Thrie Beam Guardrail post and blockout details with the exception of height above shoulder surface for Posts No. 11 through 16.

INDIANA DEPARTMENT OF TRANSPORTATION

THRIE BEAM GUARDRAIL
TO THRIE BEAM GUARDRAIL
TRANSITION, TTT
SEPTEMBER 2011

STANDARD DRAWING NO. E 601-TMTT-01



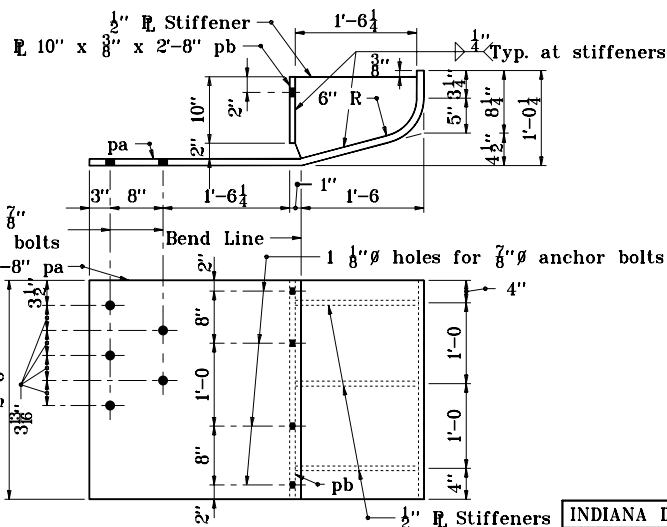
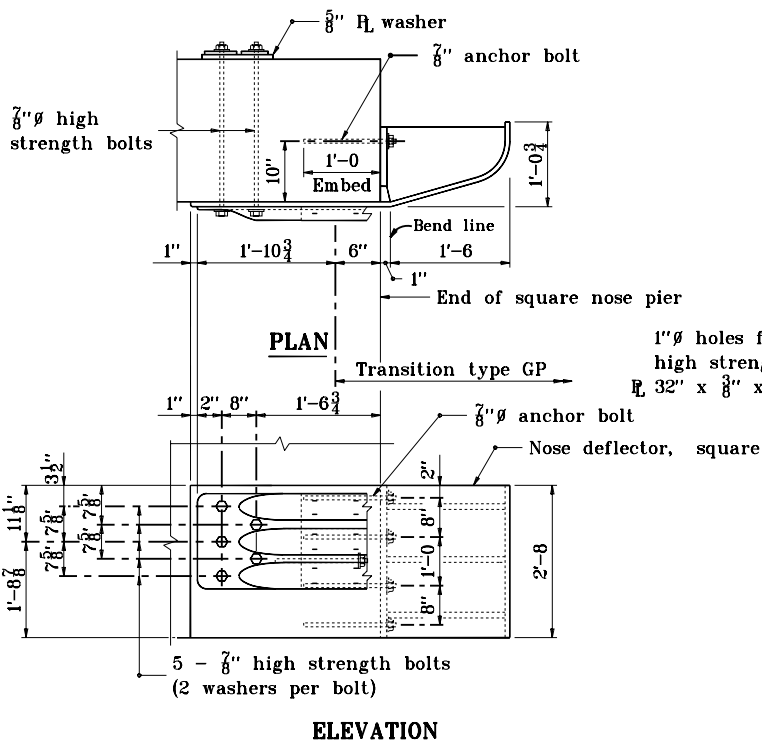
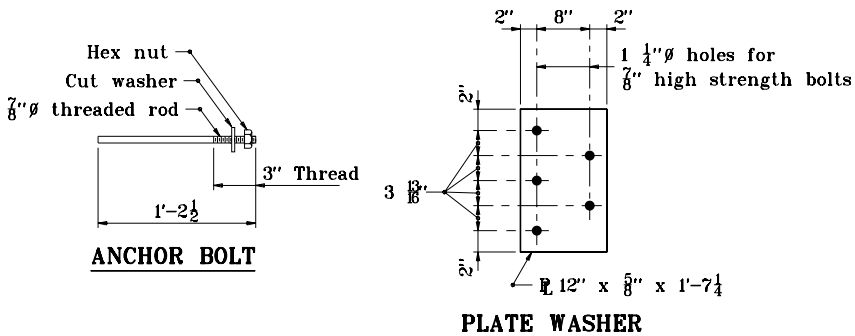
Richard L. Vancleave 9-1-11
DESIGN STANDARDS ENGINEER DATE

Michael J. McElroy 9/1/11
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

GENERAL NOTES

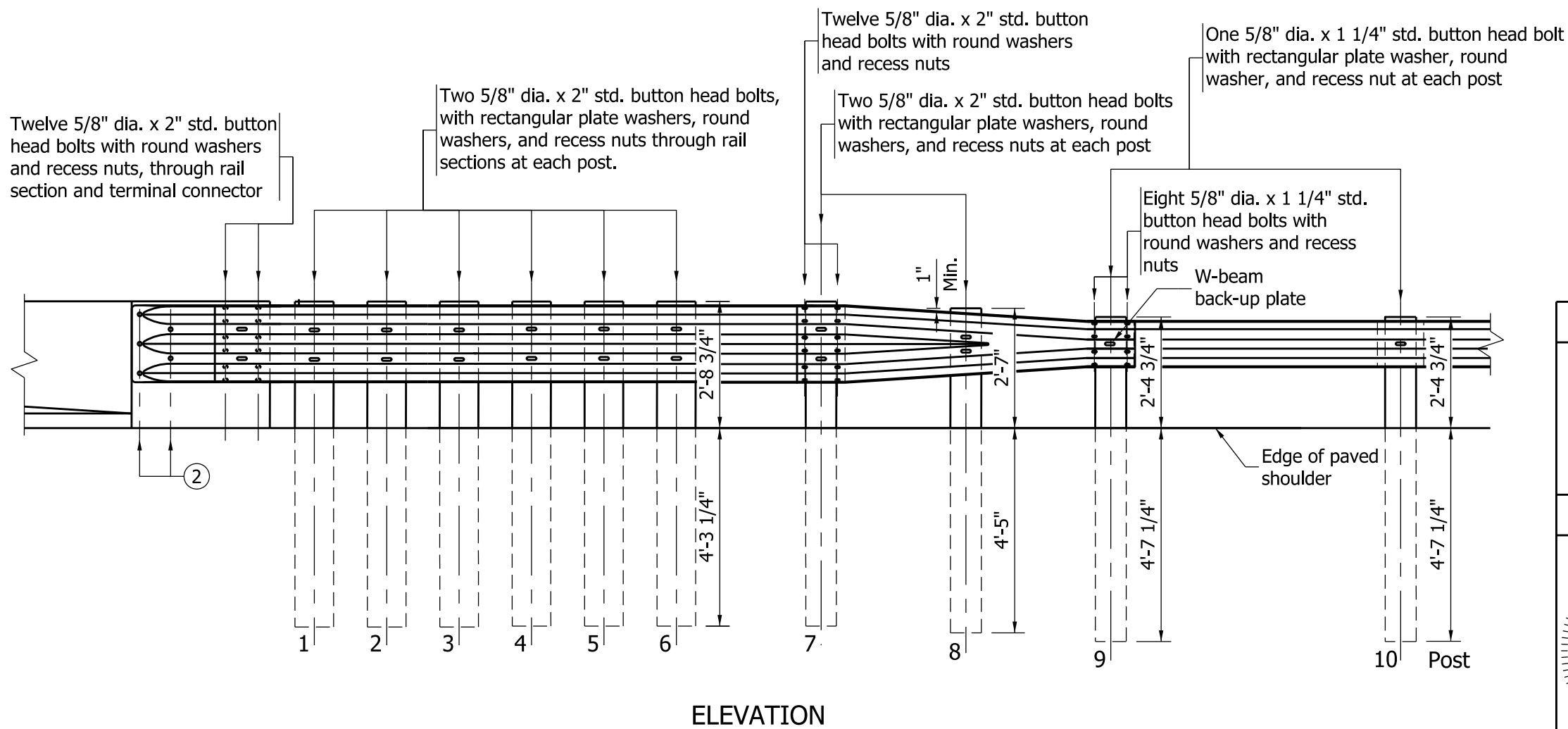
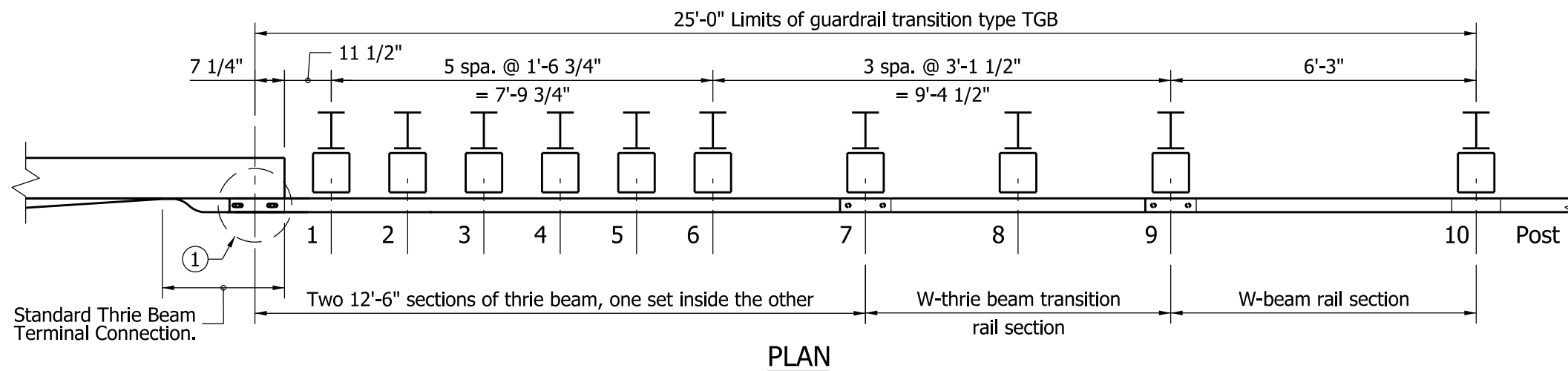
1. This drawing shall be used where guardrail transition type GP is specified to connect W-beam guardrail to a pier or frame bent collision wall.
2. The details on this drawing are for the assembly and installation of the deflector components for connecting guardrail transition type GP to a pier or frame bent collision wall.
3. The anchor bolt shall be anchored with a chemical anchor system shown on the Department's List of Approved Chemical Anchor Systems.



DETAIL OF NOSE DEFLECTOR - SQUARE

ATTACHMENT AT SQUARE NOSE PIER

INDIANA DEPARTMENT OF TRANSPORTATION	
TRANSITION AT PIER TYPE GP SEPTEMBER 1998	
STANDARD DRAWING NO. E 601-TPGP-01	
	DETAILS PLACED IN THIS FORMAT 11-15-99
	<i>/s/ Anthony L. Uremovich</i> 11-15-99 DESIGN STANDARDS ENGINEER DATE
	 <i>/s/ Firooz Zandi</i> 11-15-99 CHIEF HIGHWAY ENGINEER DATE
	ORIGINALLY APPROVED 9-01-98
DESIGN STANDARDS ENGINEER	



NOTES:

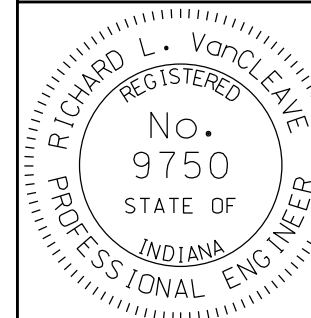
- See Standard Drawing E 601-TTGB-02 for Lap Detail.
- See Standard Drawing E 601-TBGC-01 for connection details.
- See Standard Drawings E 601-TTGB-03 through -05 for post and block details.

INDIANA DEPARTMENT OF TRANSPORTATION

GUARDRAIL TRANSITION
TYPE TGB

SEPTEMBER 2011

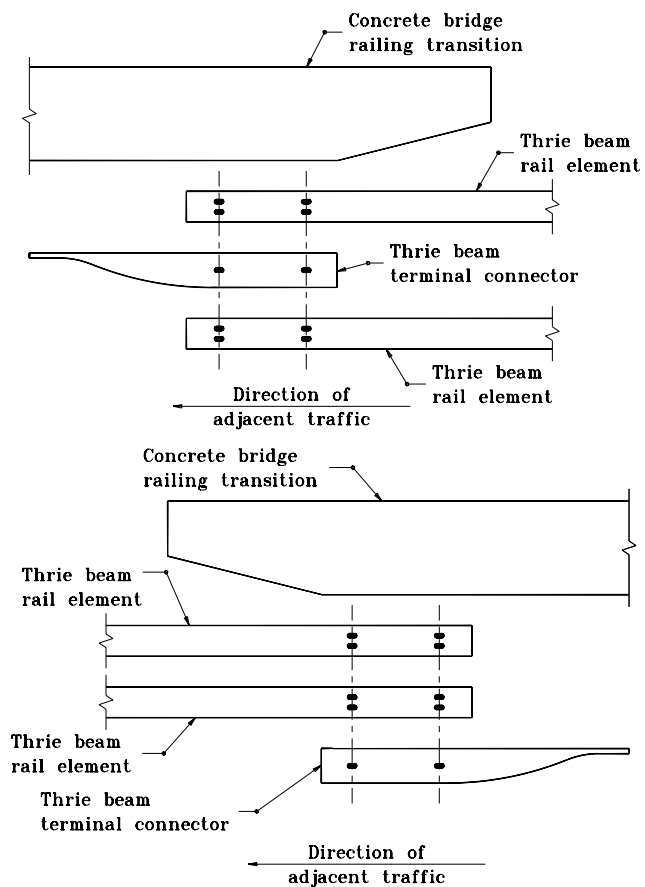
STANDARD DRAWING NO. E 601-TTGB-01



/s/ Richard L. VanCleave 09/01/11
DESIGN STANDARDS ENGINEER DATE

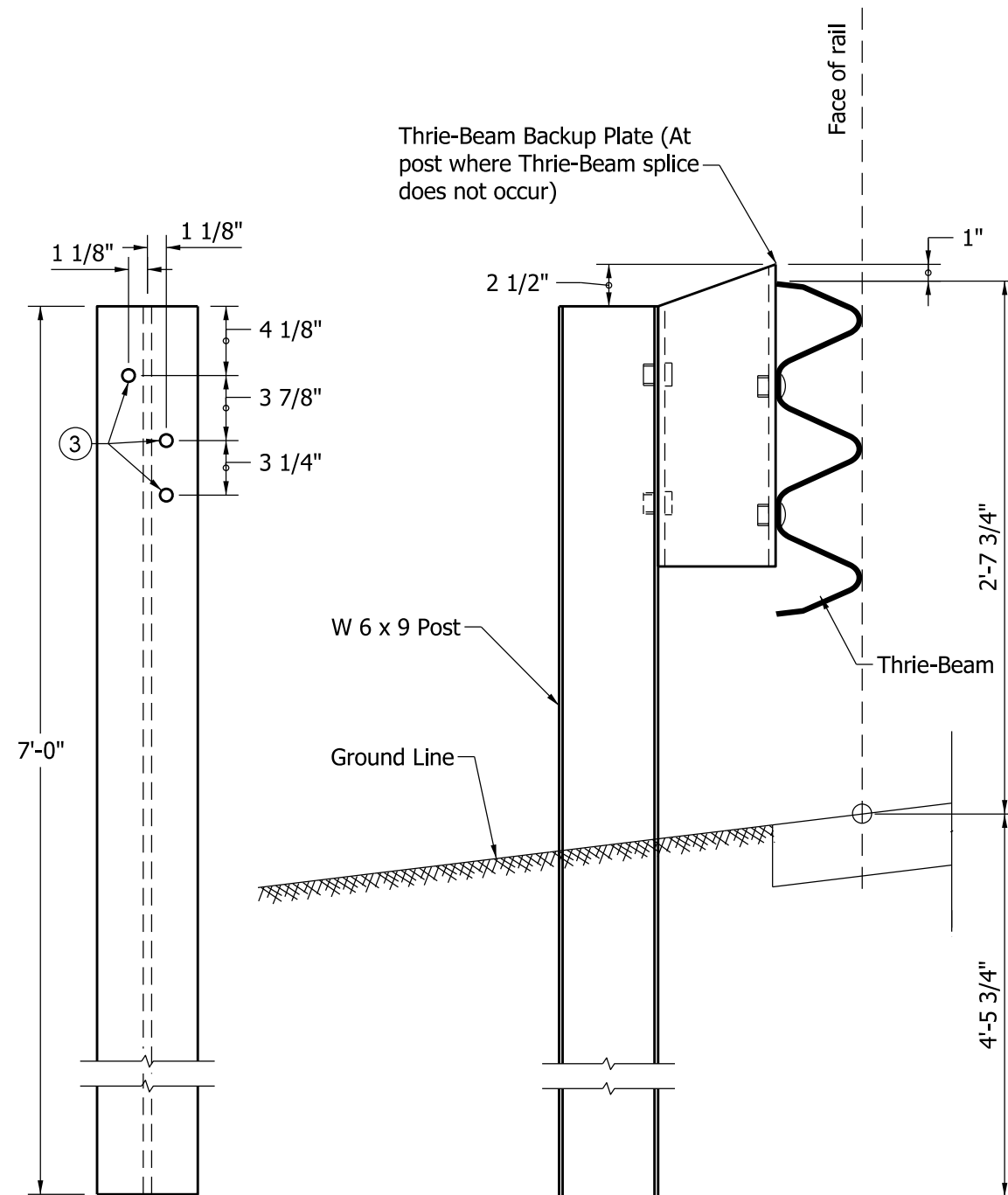
/s/ Mark A. Miller 09/01/11
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER



LAP DETAIL AT BRIDGE RAILING TRANSITION

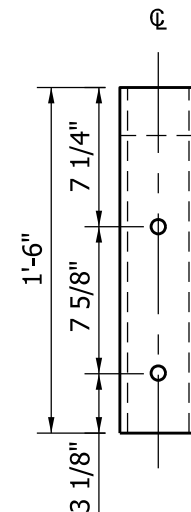
INDIANA DEPARTMENT OF TRANSPORTATION	
GUARDRAIL TRANSITION	
TYPE TGB	
MAY 2000	
STANDARD DRAWING NO. E 601-TTGB-02	
	<i>/s/ Anthony L. Uremovich</i> 5-01-00 DESIGN STANDARDS ENGINEER DATE
	<i>/s/ Firooz Zandi</i> 5-01-00 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	



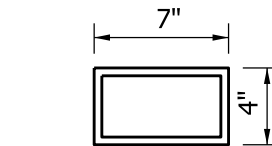
FRONT VIEW

SIDE VIEW

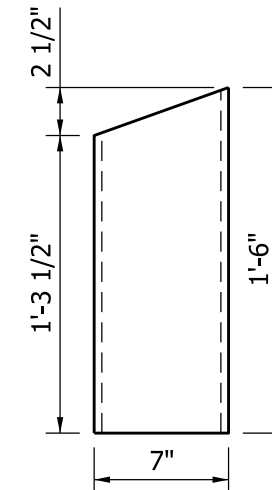
W 6 x 9 POST DETAILS



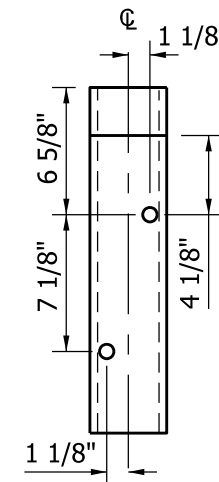
FRONT VIEW



TOP VIEW



SIDE VIEW



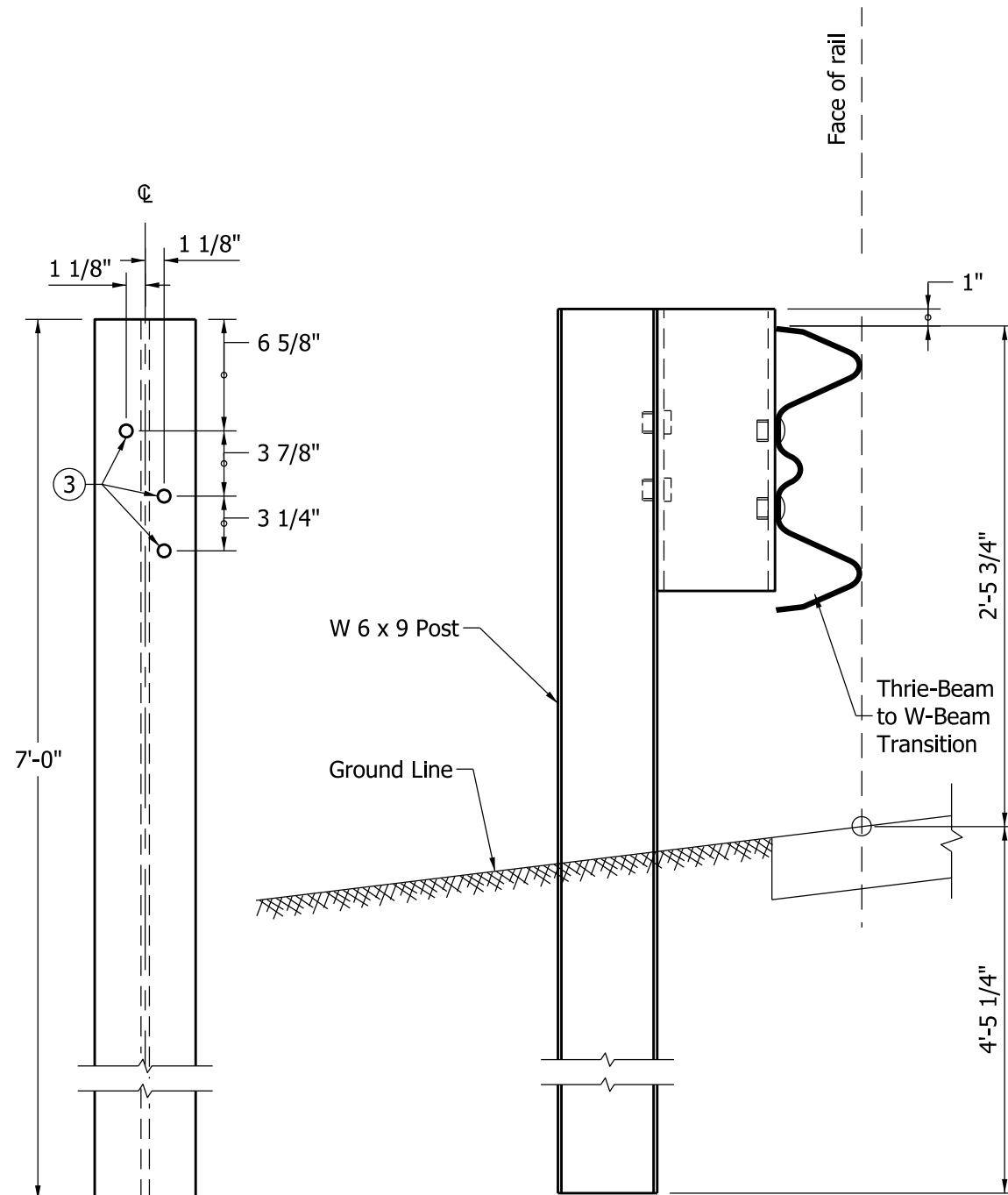
BACK VIEW

TS 7 x 4 x 3/16" BLOCK DETAILS
POSTS 1 THROUGH 7

NOTES:

1. All holes drilled or punched to 3/4" dia.
2. See Standard Drawing E 601-TTGB-01 for post numbers.
- ③ Hole pattern for posts numbers 8 through 10 may be drilled in back flange. See Standard drawing E 601-TTGB-04 or E 601-TTGB-05.

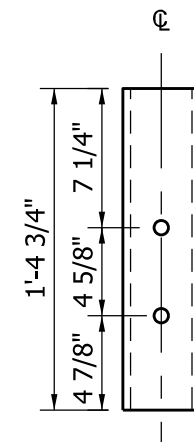
INDIANA DEPARTMENT OF TRANSPORTATION		
GUARDRAIL TRANSITION TYPE TGB		
SEPTEMBER 2011		
STANDARD DRAWING NO.		E 601-TTGB-03
	/s/ <i>Richard L. VanCleave</i>	09/01/11
	DESIGN STANDARDS ENGINEER	DATE
	/s/ <i>Mark A. Miller</i>	09/01/11
	CHIEF HIGHWAY ENGINEER	DATE
DESIGN STANDARDS ENGINEER		



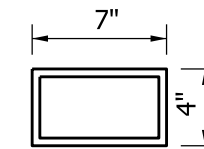
FRONT VIEW

SIDE VIEW

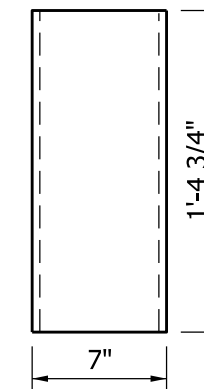
W 6 x 9 POST DETAILS



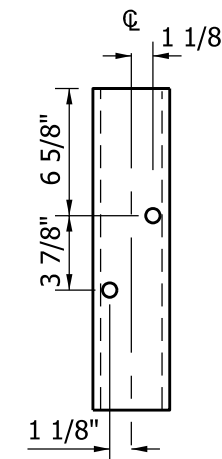
FRONT VIEW



TOP VIEW



SIDE VIEW



BACK VIEW

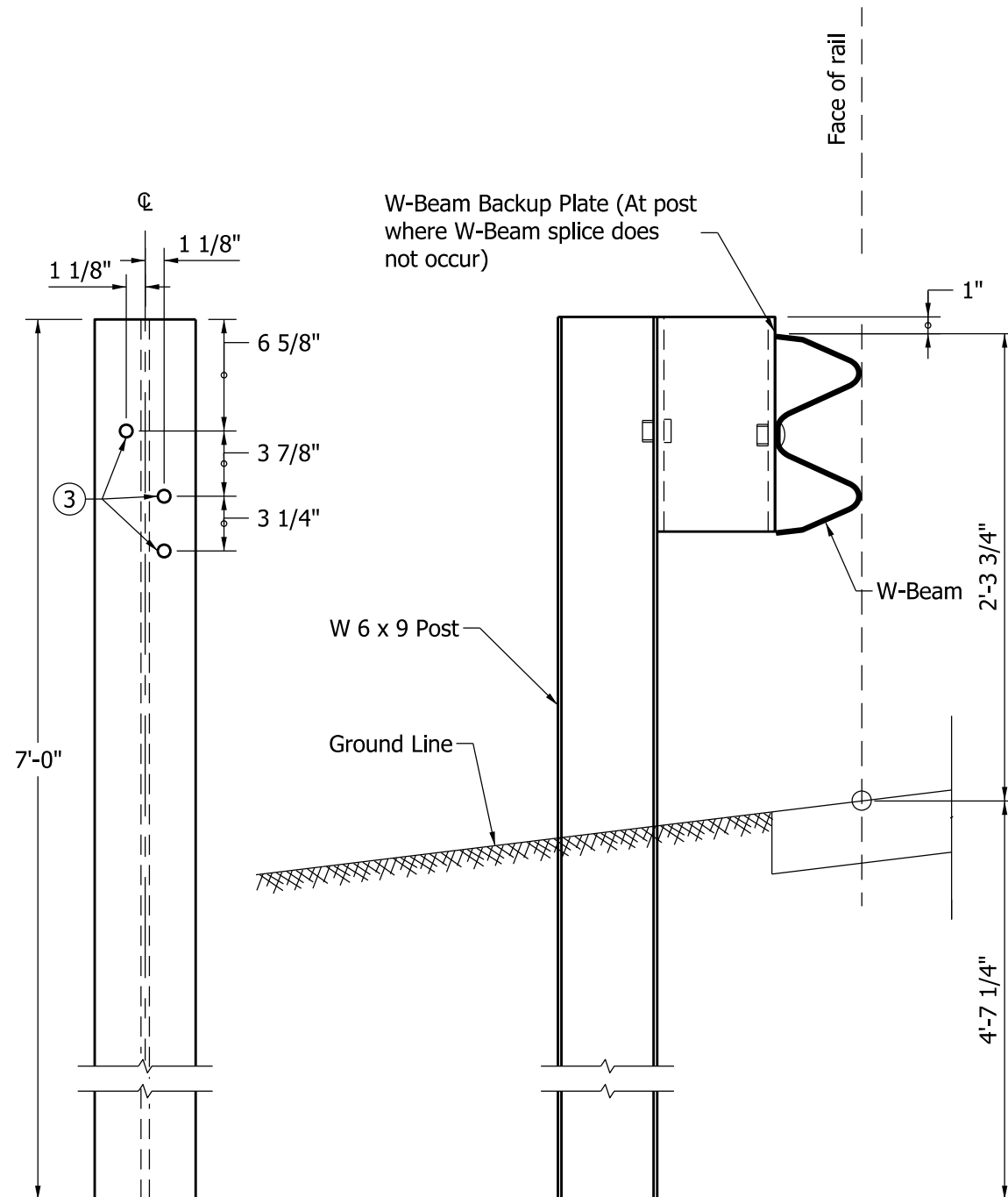
TS 7 x 4 x 3/16" BLOCK DETAILS

POST 8

NOTES:

1. All holes drilled or punched to 3/4" dia.
2. See Standard Drawing E 601-TTGB-01 for post numbers.
- ③ Hole pattern for posts numbers 1 through 7 may be drilled in back flange. See Standard drawing E 601-TTGB-03.

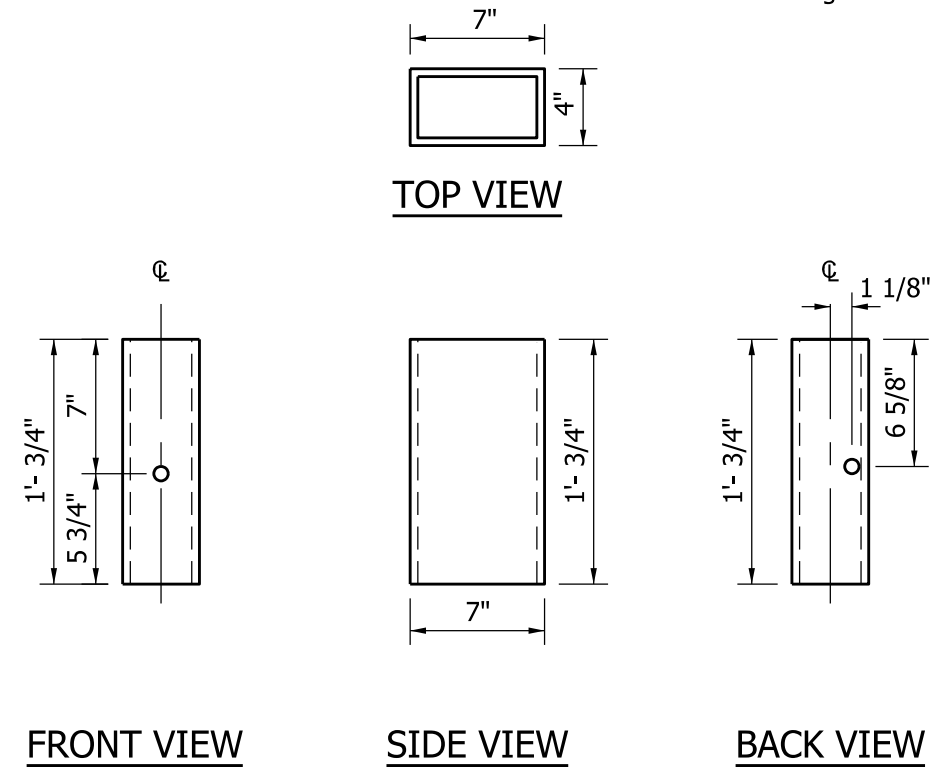
INDIANA DEPARTMENT OF TRANSPORTATION		
GUARDRAIL TRANSITION TYPE TGB		
SEPTEMBER 2011		
STANDARD DRAWING NO.		E 601-TTGB-04
	/s/ <i>Richard L. VanCleave</i>	09/01/11
	DESIGN STANDARDS ENGINEER	DATE
	/s/ <i>Mark A. Miller</i>	09/01/11
	CHIEF HIGHWAY ENGINEER	DATE
DESIGN STANDARDS ENGINEER		



FRONT VIEW

SIDE VIEW

W 6 x 9 POST DETAILS



FRONT VIEW

SIDE VIEW

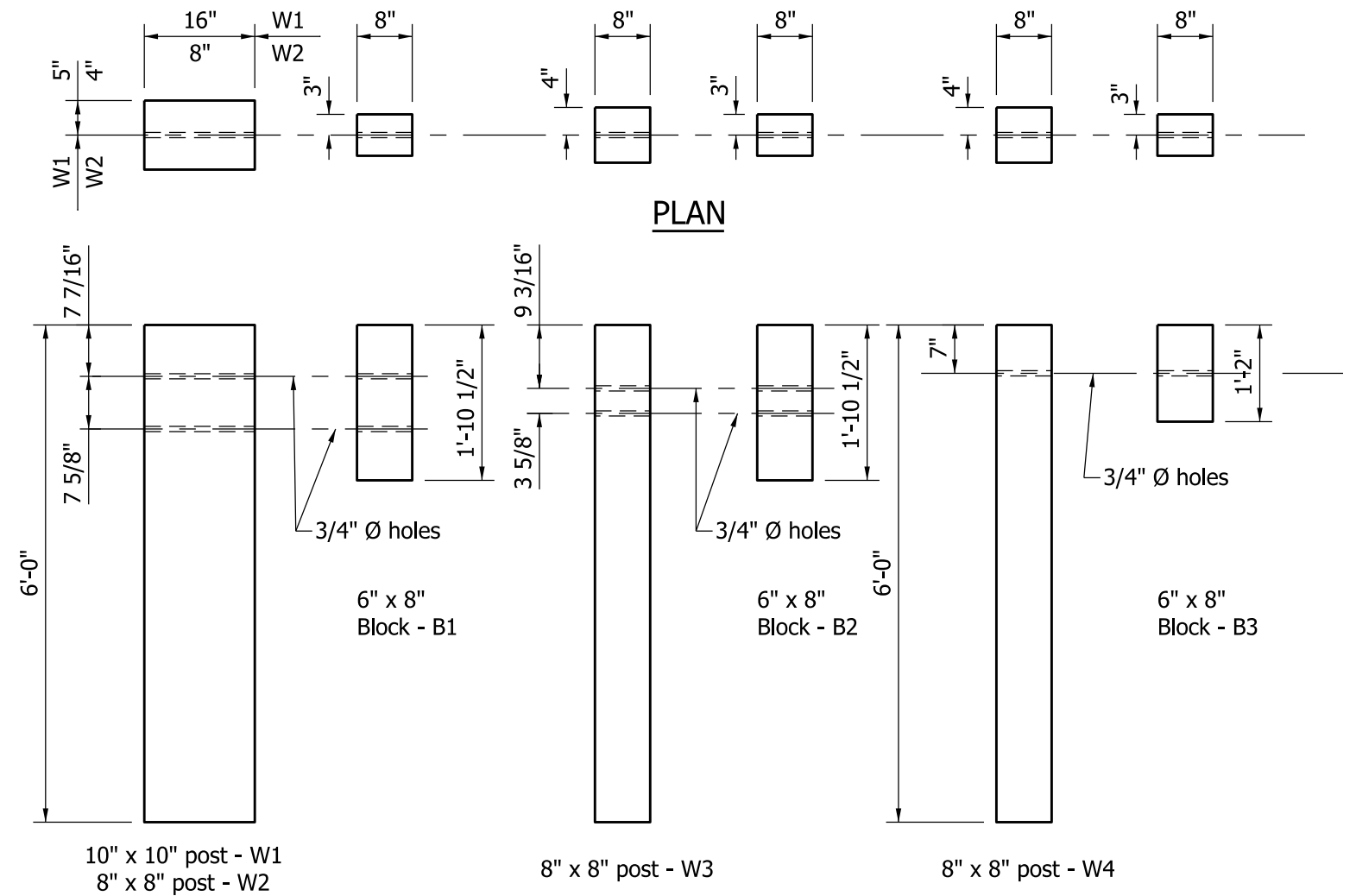
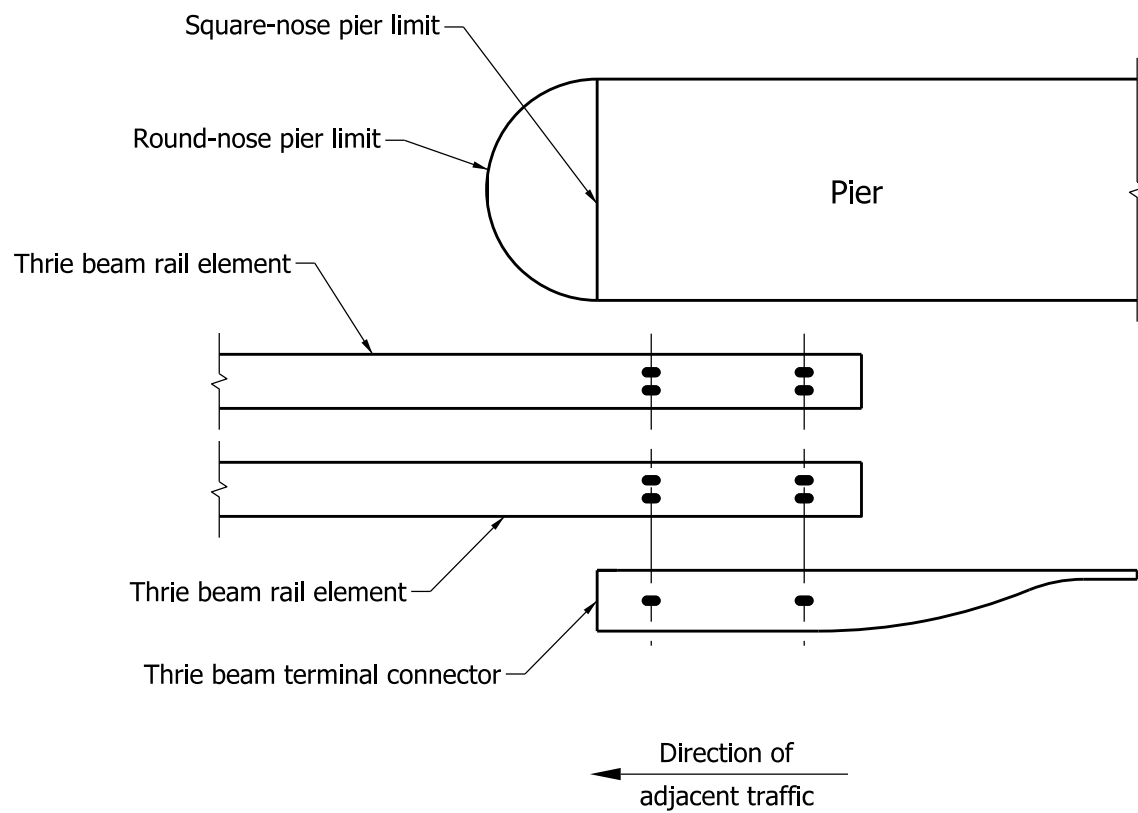
BACK VIEW

TS 7 x 4 x 3/16" BLOCK DETAILS
POSTS 9 and 10

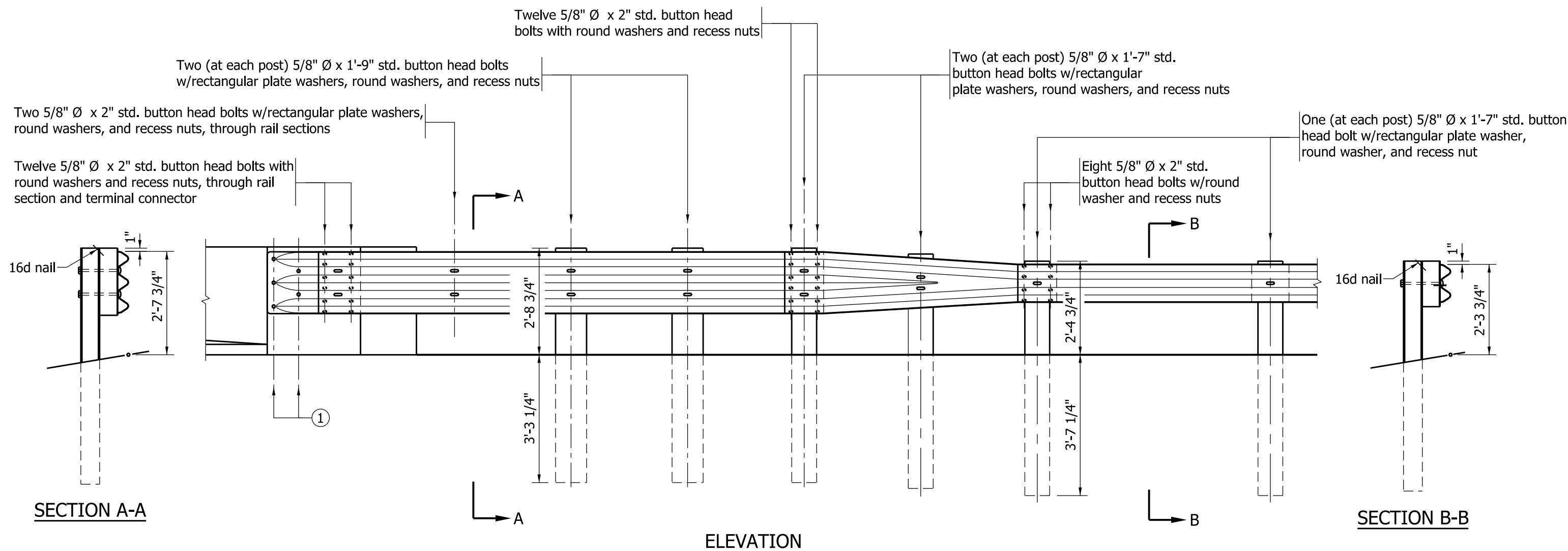
NOTES:

1. All holes drilled or punched to 3/4" dia.
2. See Standard Drawing E 601-TTGB-01 for post numbers.
- ③ Hole pattern for posts numbers 1 through 7 may be drilled in back flange. See Standard drawing E 601-TTGB-03.

INDIANA DEPARTMENT OF TRANSPORTATION		
GUARDRAIL TRANSITION TYPE TGB		
SEPTEMBER 2011		
STANDARD DRAWING NO.		E 601-TTGB-05
	/s/ <i>Richard L. VanCleave</i>	09/01/11
	DESIGN STANDARDS ENGINEER	DATE
	/s/ <i>Mark A. Miller</i>	09/01/11
	CHIEF HIGHWAY ENGINEER	DATE
DESIGN STANDARDS ENGINEER		



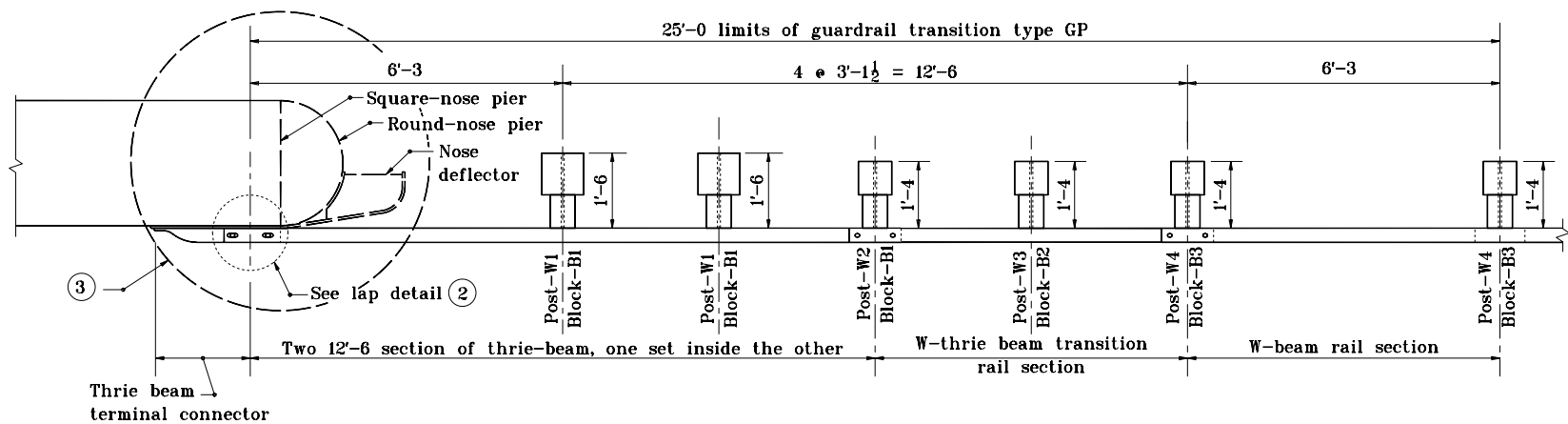
INDIANA DEPARTMENT OF TRANSPORTATION									
GUARDRAIL TRANSITION TYPE GP									
SEPTEMBER 2011									
STANDARD DRAWING NO. E 601-TTGP-01									
	<table><tr><td><i>/s/ Richard L. VanCleave</i></td><td><i>09/01/11</i></td></tr><tr><td>DESIGN STANDARDS ENGINEER</td><td>DATE</td></tr><tr><td><i>/s/ Mark A. Miller</i></td><td><i>09/01/11</i></td></tr><tr><td>CHIEF HIGHWAY ENGINEER</td><td>DATE</td></tr></table>	<i>/s/ Richard L. VanCleave</i>	<i>09/01/11</i>	DESIGN STANDARDS ENGINEER	DATE	<i>/s/ Mark A. Miller</i>	<i>09/01/11</i>	CHIEF HIGHWAY ENGINEER	DATE
<i>/s/ Richard L. VanCleave</i>	<i>09/01/11</i>								
DESIGN STANDARDS ENGINEER	DATE								
<i>/s/ Mark A. Miller</i>	<i>09/01/11</i>								
CHIEF HIGHWAY ENGINEER	DATE								
DESIGN STANDARDS ENGINEER									



NOTE:

- ① See pier connection details for connection of terminal connector. See Standard Drawing E 601-TTGP-01 (use proper end detail).

INDIANA DEPARTMENT OF TRANSPORTATION			
GUARDRAIL TRANSITION TYPE GP			
SEPTEMBER 2011			
STANDARD DRAWING NO.		E 601-TTGP-02	
	/s/ <i>Richard L. VanCleave</i>		09/01/11
	DESIGN STANDARDS ENGINEER		DATE
	/s/ <i>Mark A. Miller</i>		09/01/11
DESIGN STANDARDS ENGINEER		CHIEF HIGHWAY ENGINEER	
		DATE	

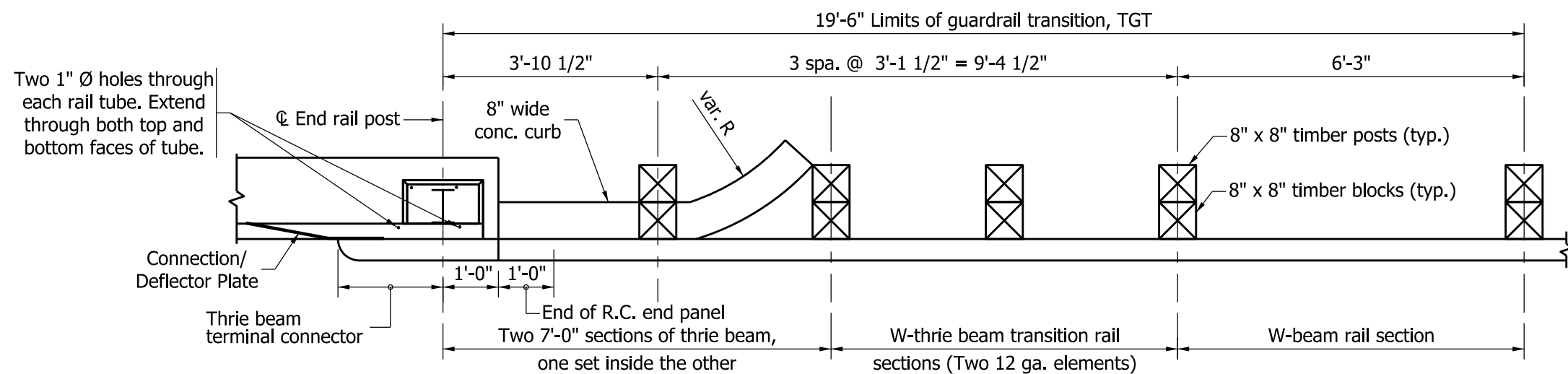


PLAN

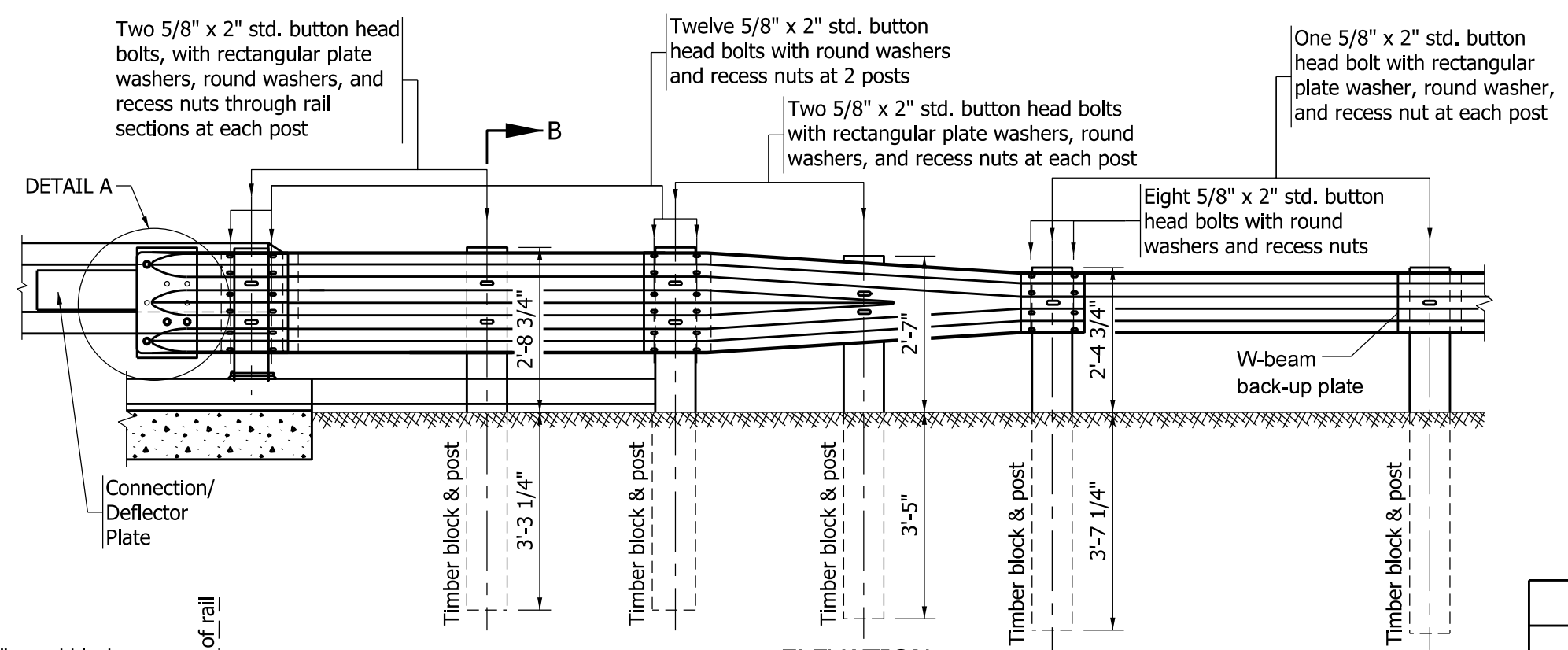
NOTES:

1. This drawing shall be used where guardrail transition type GP is specified to connect W-beam guardrail to a pier or frame bent collision wall.
- (2) See Standard Drawing E 601-TTGP-01 for lap detail at pier connection.
- (3) See Standard Drawings E 601-TPGP-01 and -02 for nose deflector details.

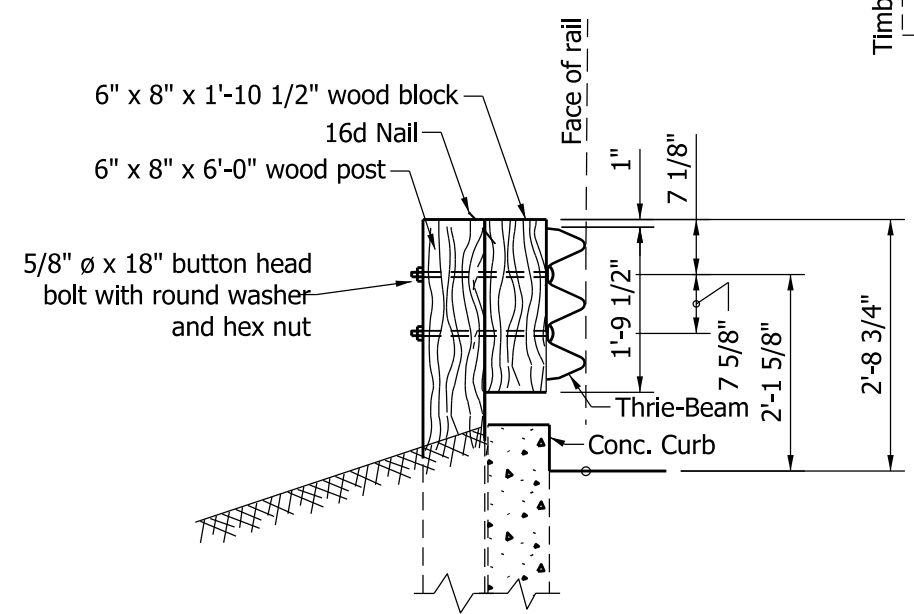
INDIANA DEPARTMENT OF TRANSPORTATION	
GUARDRAIL TRANSITION TYPE GP	
APRIL 1996	
STANDARD DRAWING NO. E 601-TTGP-03	
	DETAILS PLACED IN THIS FORMAT 11-15-99
	/s/ Anthony L. Uremovich 11-15-99 DESIGN STANDARDS ENGINEER DATE
	/s/ Firooz Zandi 11-15-99 CHIEF HIGHWAY ENGINEER DATE
	DESIGN STANDARDS ENGINEER ORIGINALLY APPROVED 4-01-96



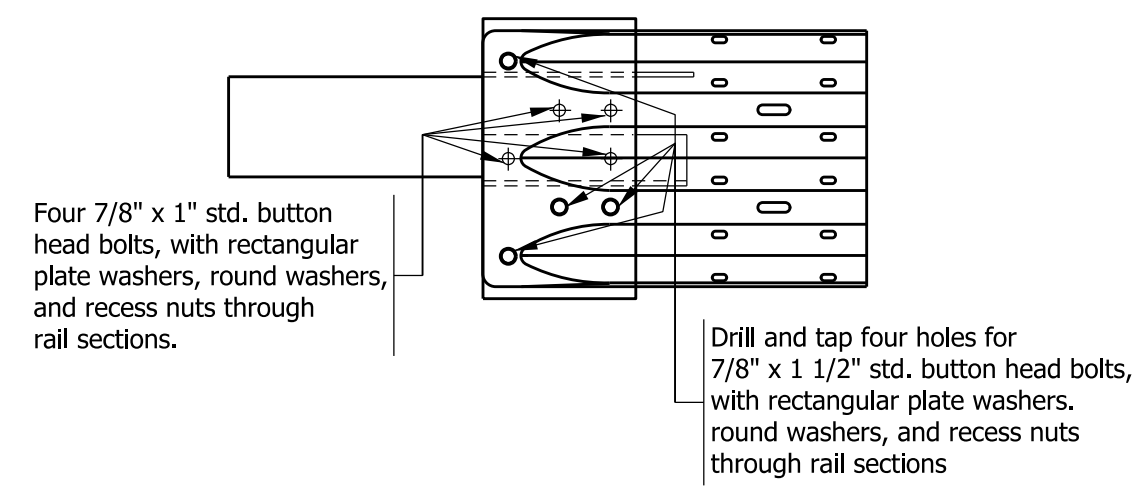
PLAN



ELEVATION



SECTION B-B

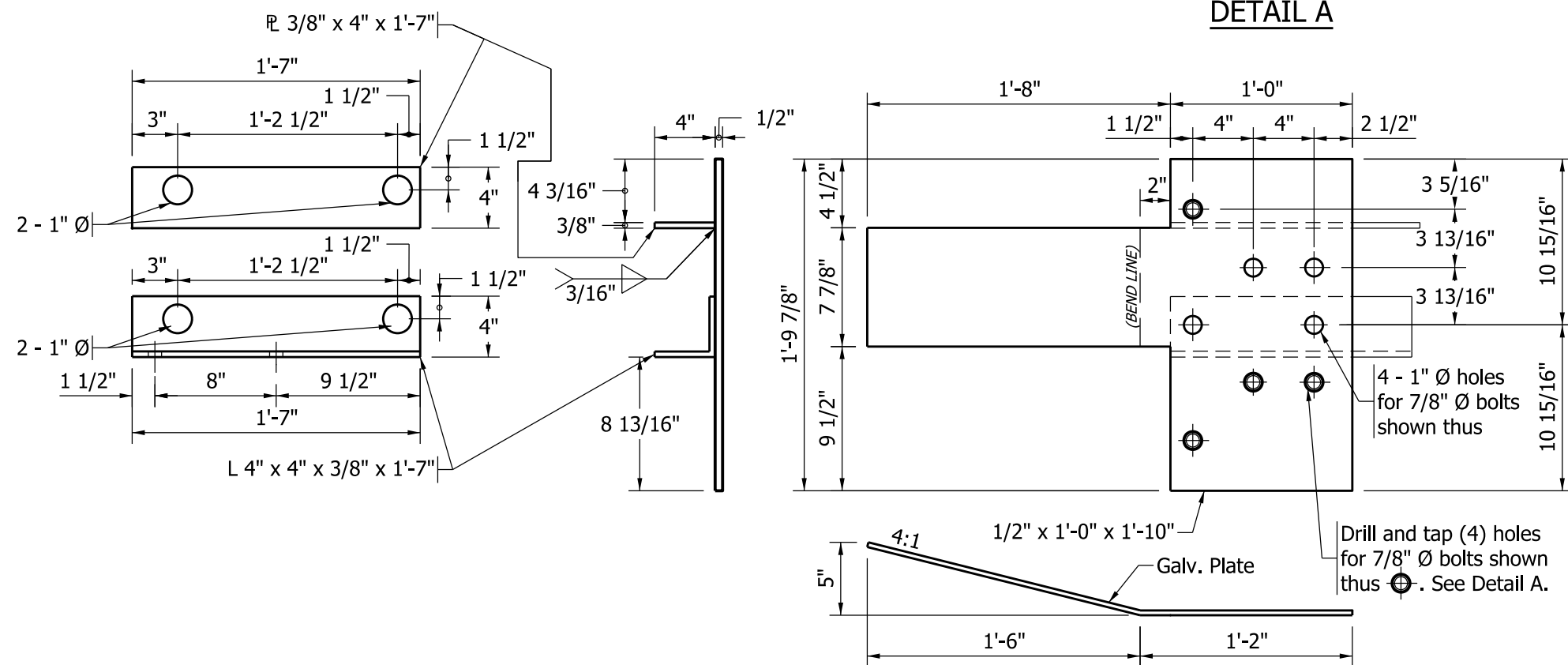
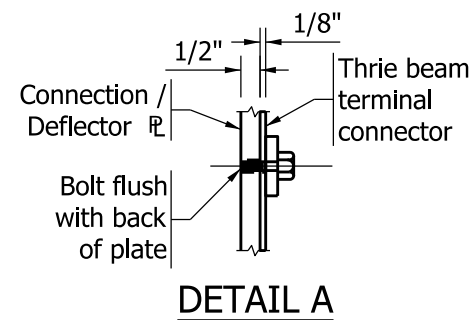
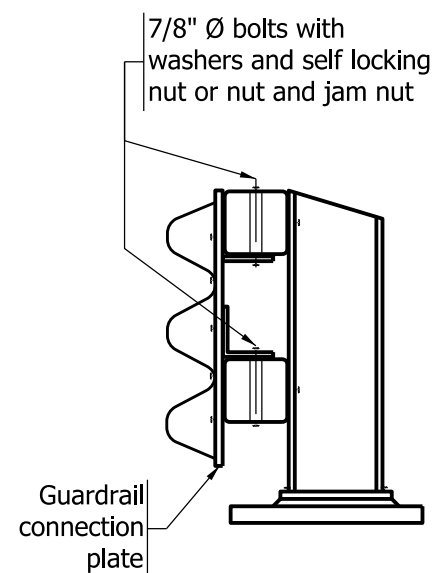


DETAIL A

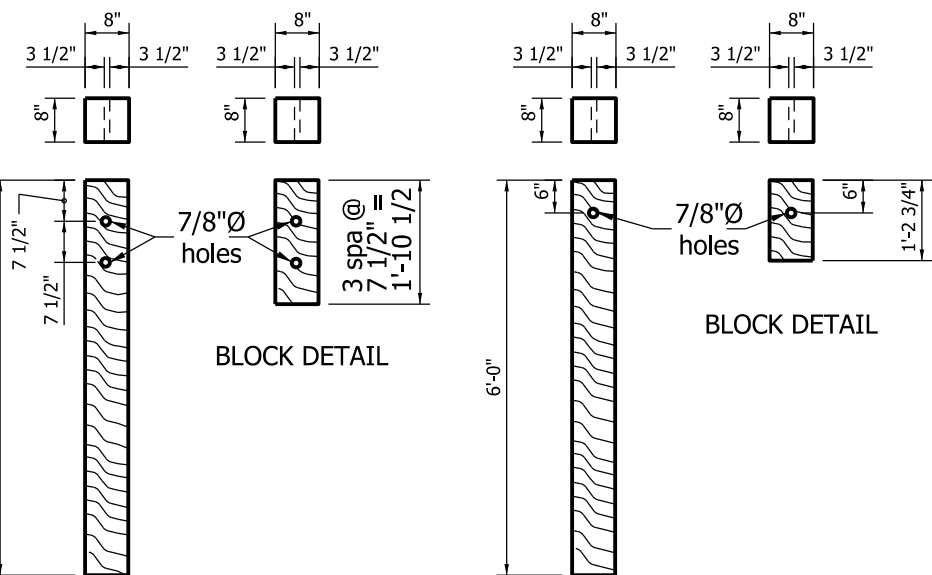
NOTES:

1. See Standard Drawing E 601-TBGC-01 and E 601-TBGC-02 for thrie-beam transition details.
2. See Standard Drawing E 601-TTGT-02 for transition connection detail, timber post detail and timber block detail.

INDIANA DEPARTMENT OF TRANSPORTATION	
GUARDRAIL TRANSITION, TGT	
SEPTEMBER 2011	
STANDARD DRAWING NO.	E 601-TTGT-01
	/s/ <i>Richard L. VanCleave</i> 09/01/11
	DESIGN STANDARDS ENGINEER DATE
	/s/ <i>Mark A. Miller</i> 09/01/11
CHIEF HIGHWAY ENGINEER DATE	
DESIGN STANDARDS ENGINEER	

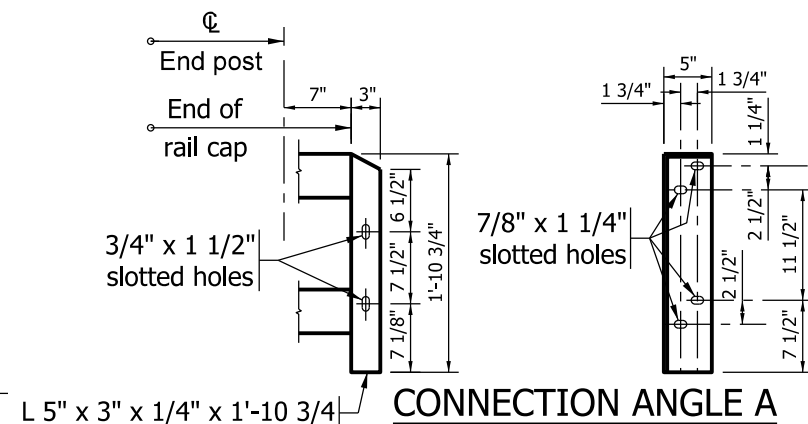


NOTE:



TIMBER POST DETAIL FOR THRIE-BEAM GUARDRAIL CONNECTION

TIMBER POST DETAIL FOR W-BEAM GUARDRAIL CONNECTION



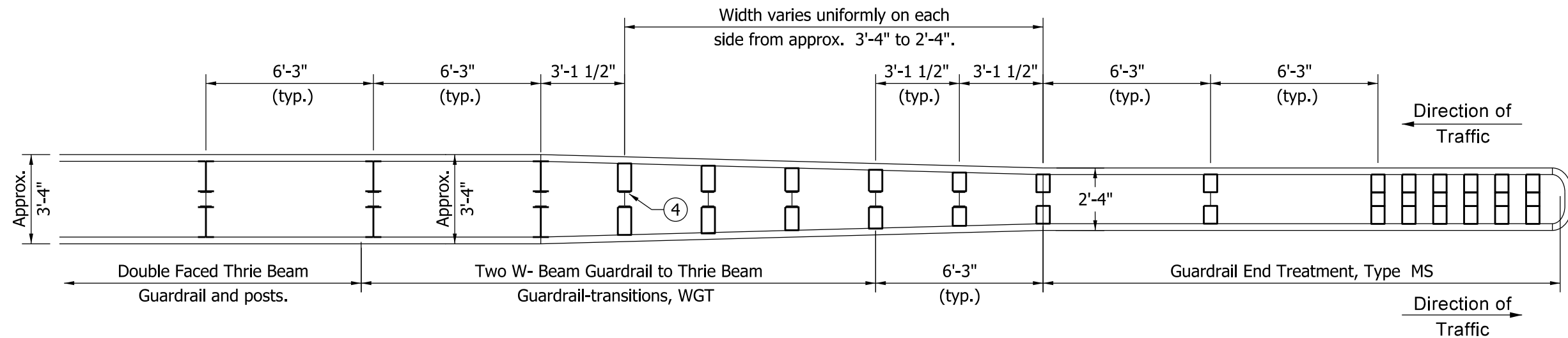
INDIANA DEPARTMENT OF TRANSPORTATION

GUARDRAIL TRANSITION, TGT

STANDARD DRAWING NO. E 601-TTGT-02

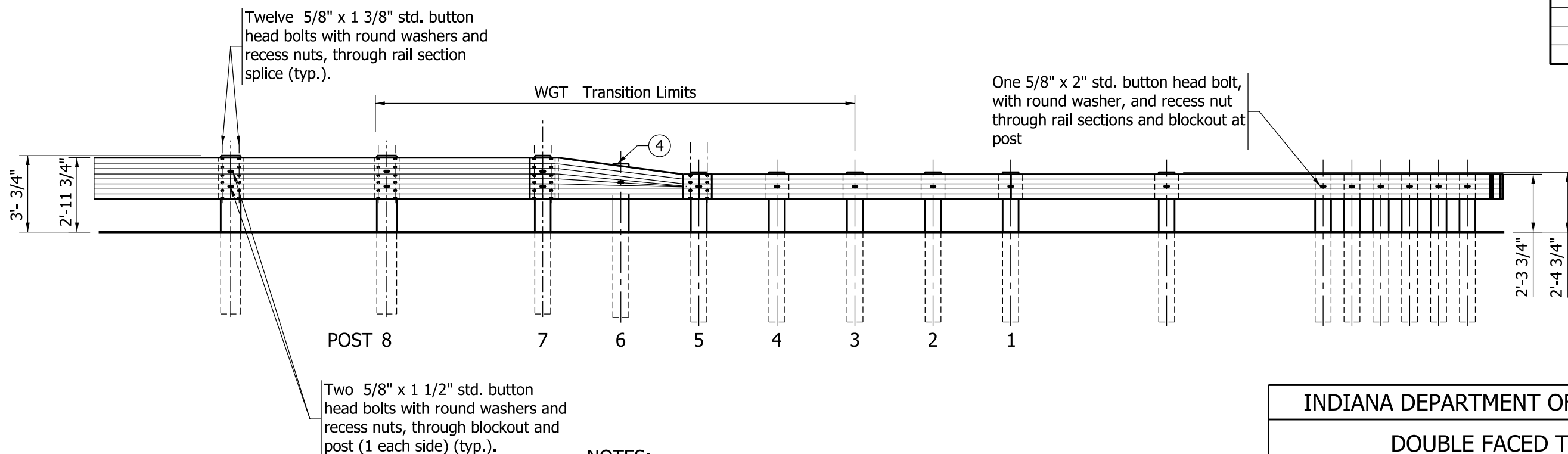
/s/ Richard L. VanCleave	09/01/11
DESIGN STANDARDS ENGINEER	DATE

<i>/s/ Mark A. Miller</i>	<i>09/01/11</i>
CHIEF HIGHWAY ENGINEER	DATE



PARTIAL PLAN VIEW

Post	Blockouts
1	W-Beam
2	9" x 6"
3	10" x 6"
4	11" x 6"
5	12" x 6"
6	13" x 6"
7	W 14 x 22
8	W 14 x 22



LEGEND:

- ┃ - W 6 x 9 Post
- ┃ - W 14 x 22 Blockout
- - Approved W-Beam Blockout

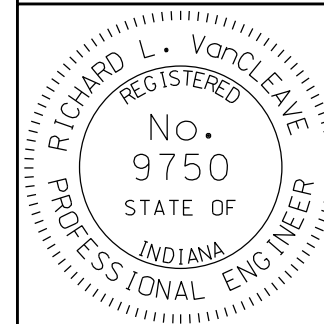
NOTES:

1. See Standard Drawing E 601-MTGR-01 for Thrie Beam Guardrail details.
2. See Standard Drawing E 601-TWGT-01 for Guardrail Transition WGT details.
3. See Standard Drawings E 601-WBGA-01 through -03 and E 601-WBGC-01 through -03 for W- Beam Guardrail details.
- ④ At post 6 on the thrie beam guardrail transition to W-Beam guardrail, the maximum post exposure above the top of the transition rail shall be limited to 1".

INDIANA DEPARTMENT OF TRANSPORTATION

**DOUBLE FACED THRIE BEAM
GUARDRAIL TRANSITION TO
GRET TYPE MS
SEPTEMBER 2011**

STANDARD DRAWING NO. E 601-TTMS-01



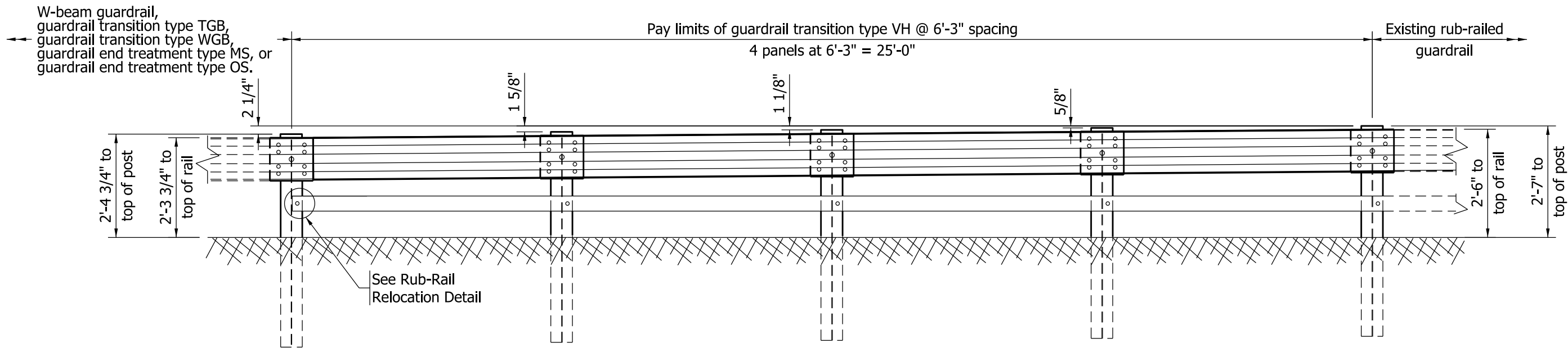
DESIGN STANDARDS ENGINEER

/s/ *Richard L. VanCleave* 09/01/11
DESIGN STANDARDS ENGINEER DATE

/s/ *Mark A. Miller* 09/01/11
CHIEF HIGHWAY ENGINEER DATE

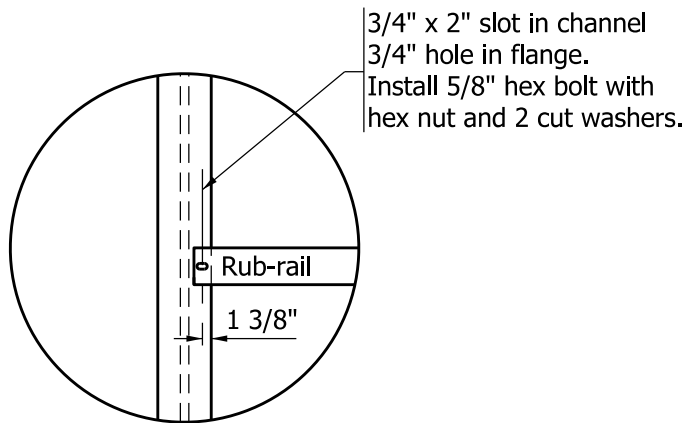
NOTES:

- 1. If rub-rail is not spliced at post, the channel shall be cut and repositioned behind the flange.
- 2. If rub-rail is spliced at post, the splice material shall be removed and the channel shall be repositioned behind the flange.



ELEVATION

GUARDRAIL TRANSITION TYPE VH AT 6'-3" POST SPACING



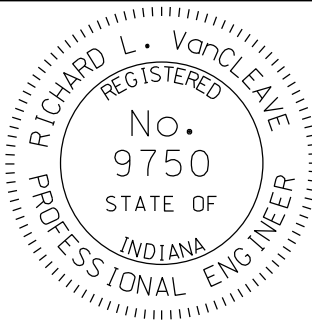
RUB-RAIL RELOCATION DETAIL

INDIANA DEPARTMENT OF TRANSPORTATION

GUARDRAIL TRANSITION
TYPE VH

SEPTEMBER 2011

STANDARD DRAWING NO. E 601-TTVH-01



DESIGN STANDARDS ENGINEER

/s/ Richard L. VanCleave 09/01/11

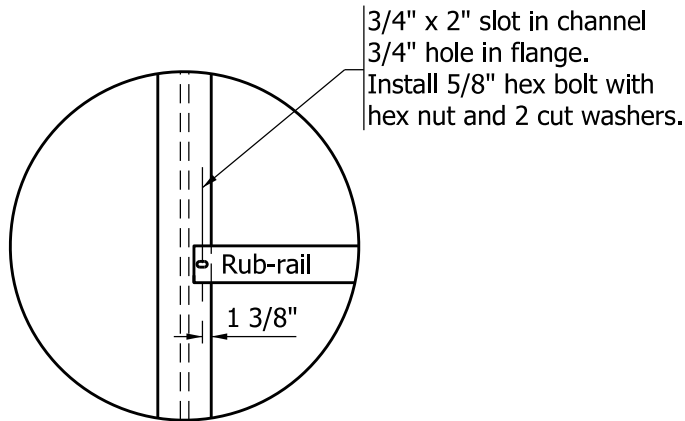
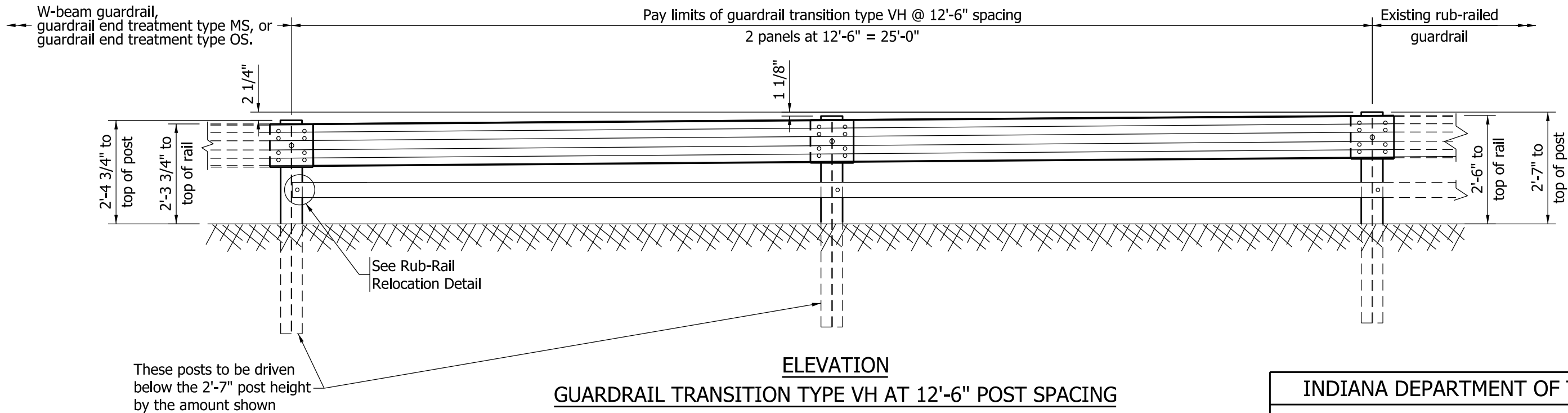
DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 09/01/11

CHIEF HIGHWAY ENGINEER DATE

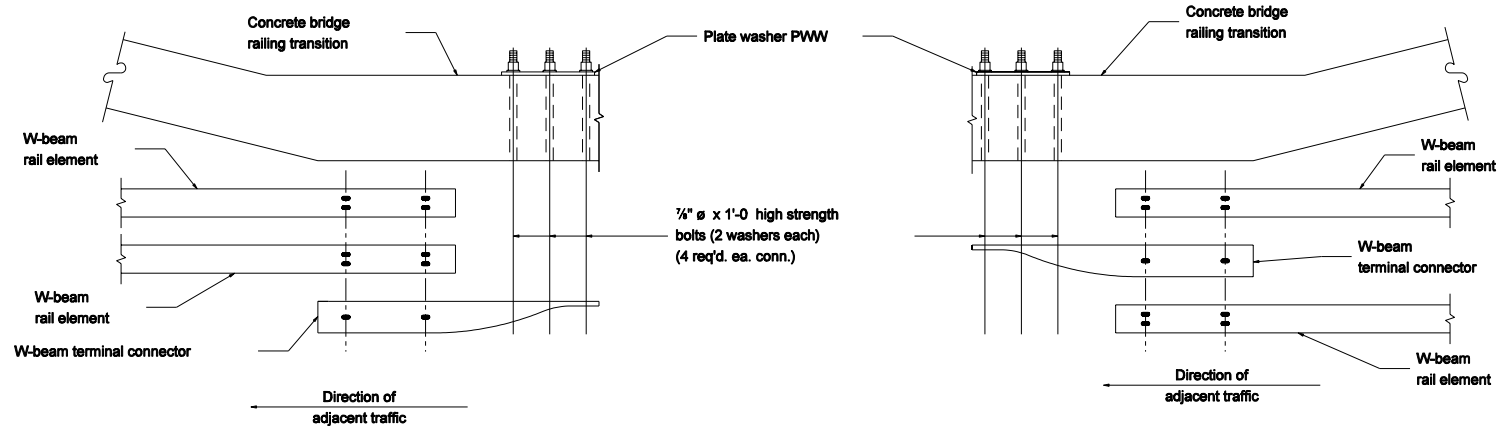
NOTES:

- 1. If rub-rail is not spliced at post, the channel shall be cut and repositioned behind the flange.
- 2. If rub-rail is spliced at post, the splice material shall be removed and the channel shall be repositioned behind the flange.

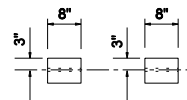


RUB-RAIL RELOCATION DETAIL

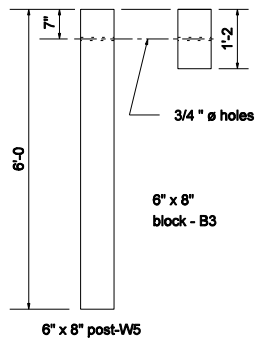
INDIANA DEPARTMENT OF TRANSPORTATION			
GUARDRAIL TRANSITION TYPE VH			
SEPTEMBER 2011			
STANDARD DRAWING NO.		E 601-TTVH-02	
	/s/ <i>Richard L. VanCleave</i>	09/01/11	
	DESIGN STANDARDS ENGINEER	DATE	
	/s/ <i>Mark A. Miller</i>	09/01/11	
DESIGN STANDARDS ENGINEER	CHIEF HIGHWAY ENGINEER	DATE	



LAP DETAIL AT BRIDGE RAILING TRANSITION



PLAN



ELEVATION

POST & BLOCK DETAILS

GENERAL NOTES

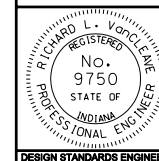
1. This lap shall be used where guardrail transition type WGB is specified to connect to concrete bridge railing transition WBC.

INDIANA DEPARTMENT OF TRANSPORTATION

**GUARDRAIL TRANSITION
TYPE WGB**

MARCH 2005

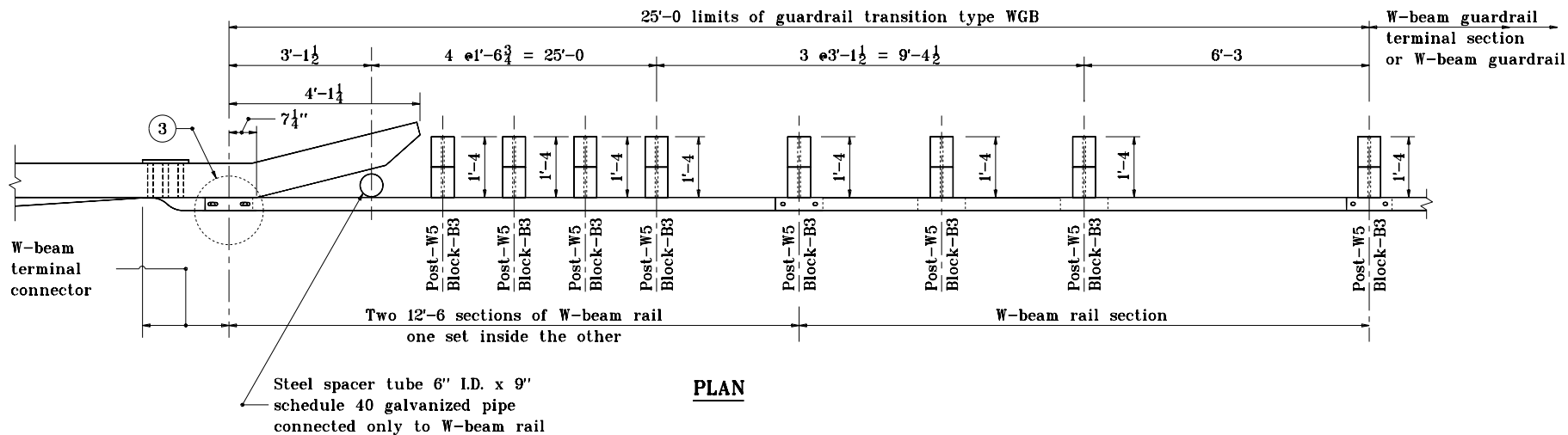
STANDARD DRAWING NO. E 601-TWGB-01



/s/ Richard L. VanCleave 3-01-05
DESIGN STANDARDS ENGINEER DATE

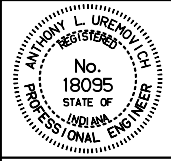
/s/ Richard K. Smutzer 3-01-05
CHIEF HIGHWAY ENGINEER DATE

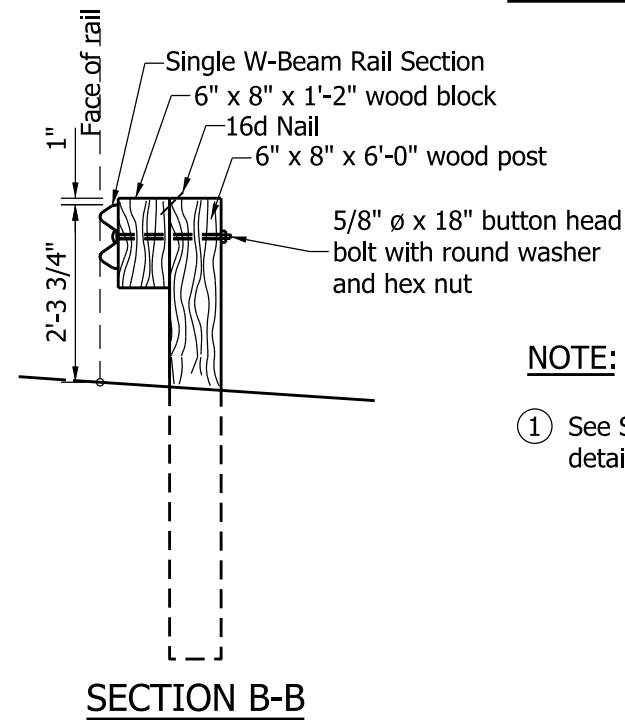
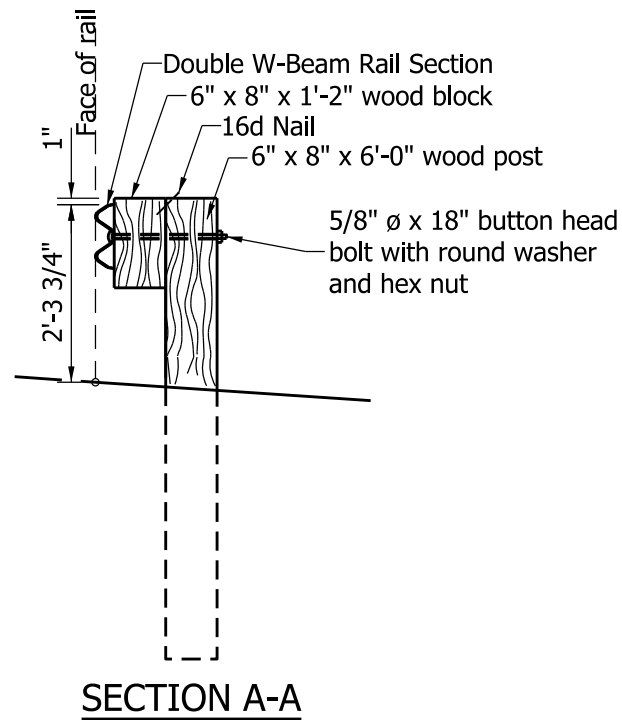
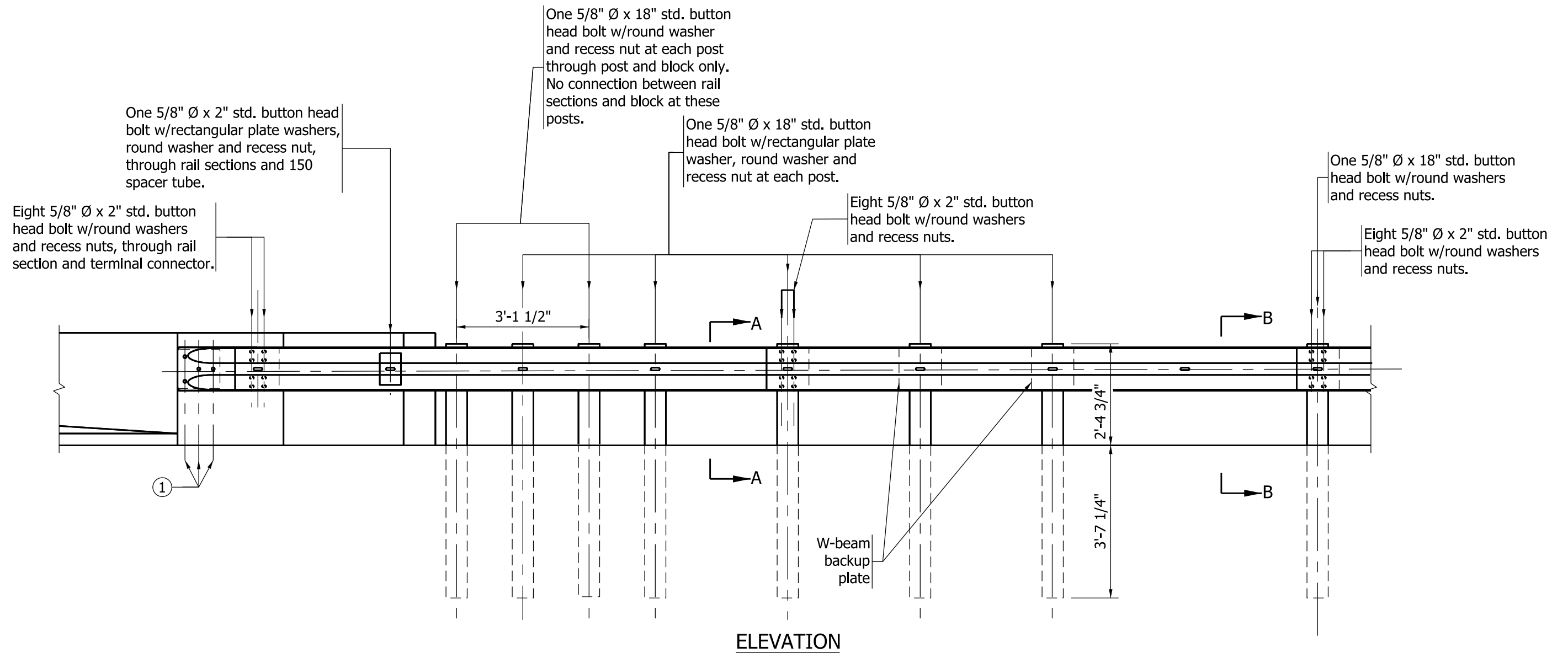
DESIGN STANDARDS ENGINEER



NOTES:

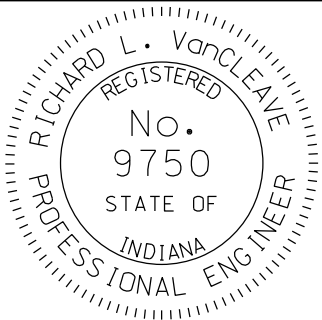
1. This transition shall be used where guardrail transition type WGB is specified to connect W-beam guardrail to concrete bridge railing.
2. See Standard Drawing E 601-TWGB-03 for elevation and assembly details.
- ③ See Standard Drawings E 601-TWGB-01 for lap details.

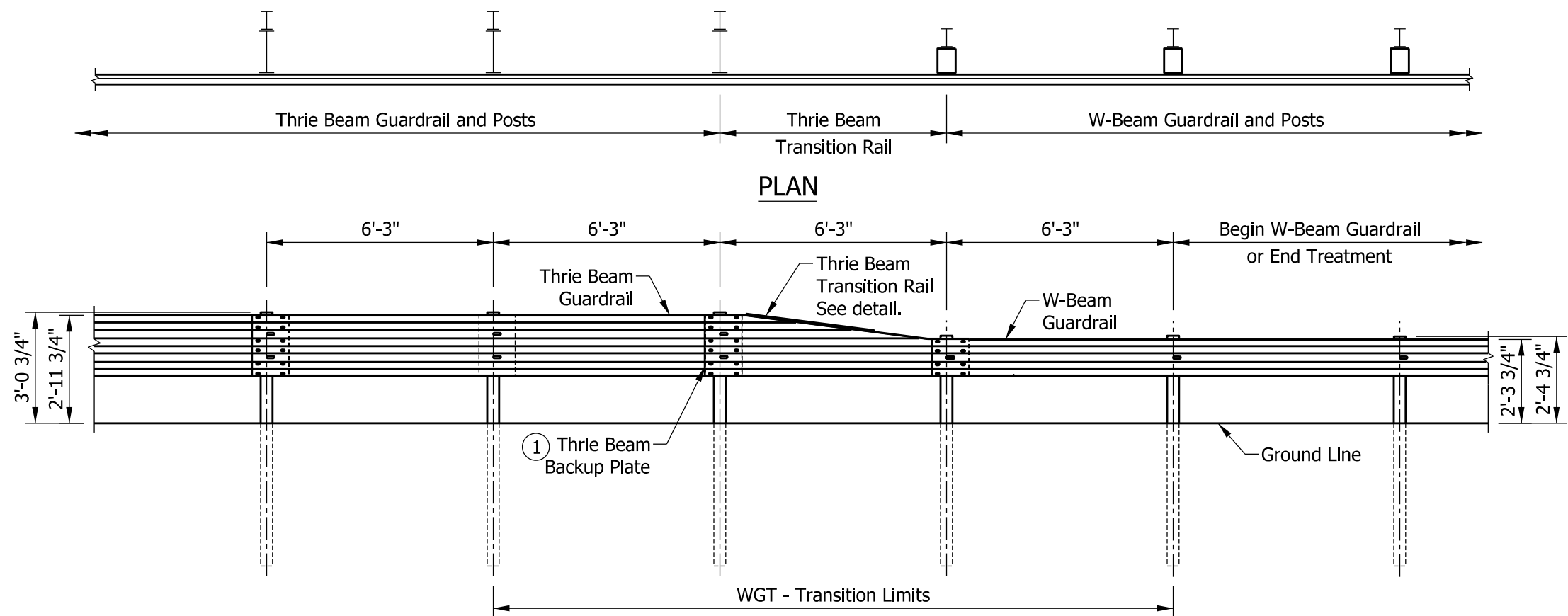
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GUARDRAIL TRANSITION TYPE WGB									
APRIL 1996									
STANDARD DRAWING NO. E 601-TWGB-02									
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DETAILS PLACED IN THIS FORMAT 7-27-99									
/s/ Anthony L. Uremovich DESIGN STANDARDS ENGINEER	7-27-99 DATE								
/s/ Firooz Zandi CHIEF HIGHWAY ENGINEER	7-27-99 DATE								
ORIGINALLY APPROVED 4-01-96									



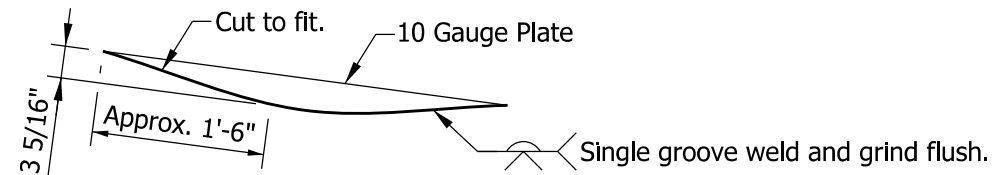
NOTE:

- ① See Standard Drawing E 601-TWGB-01 for lap details.

INDIANA DEPARTMENT OF TRANSPORTATION	
GUARDRAIL TRANSITION TYPE WGB	
SEPTEMBER 2011	
STANDARD DRAWING NO.	E 601-TWGB-03
	/s/ <i>Richard L. VanCleave</i>09/01/11 DESIGN STANDARDS ENGINEERDATE /s/ <i>Mark A. Miller</i>09/01/11 CHIEF HIGHWAY ENGINEERDATE
DESIGN STANDARDS ENGINEER	



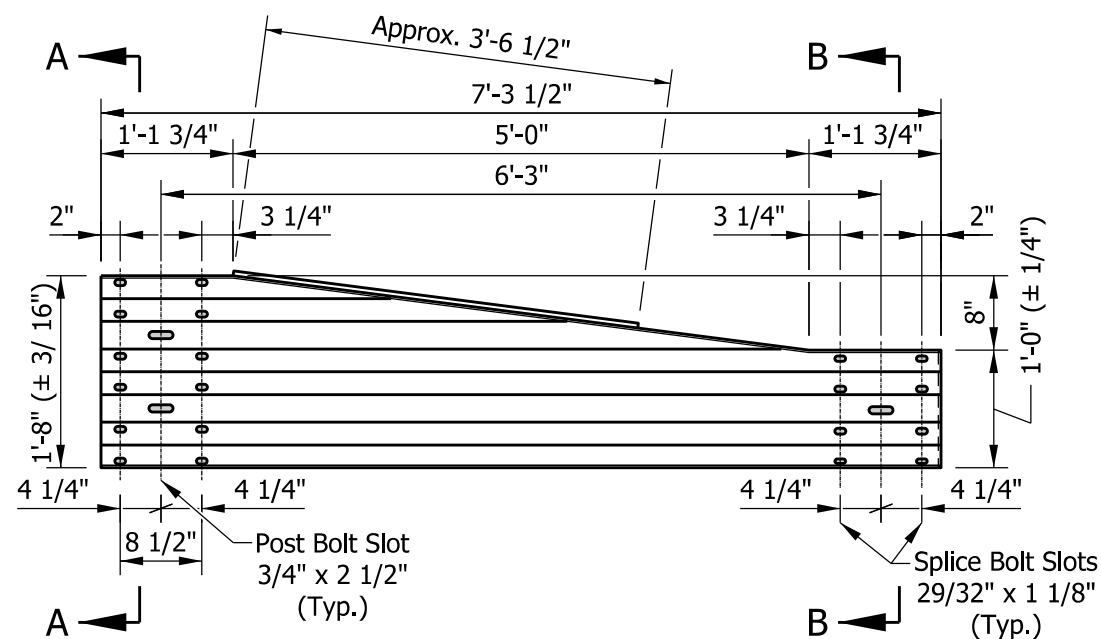
ELEVATION
THRIE BEAM TO W-BEAM GUARDRAIL TRANSITION



CAP PLATE PLAN

⑤ Cross section dimensions match thrie beam typical section.

SECTION A-A



ELEVATION
THRIE BEAM TRANSITION RAIL

Cross section dimensions match W-beam typical section. ②

SECTION B-B

NOTES:

- ① See Standard Drawing E 601-MTGR-01 for Thrie Beam Guardrail details. Thrie beam backup plate required at posts where there is no thrie-beam splice and at other locations as shown.
- ② See Standard Drawing E 601-WBGC-01 for W-Beam Guardrail Components.
3. See Standard Drawings E 601-WBGA-01 through -03 for W-Beam Guardrail Assembly details.
4. Slope on thrie beam transition shall be reversed where thrie beam to W-beam guardrail relative orientation is opposite to that shown hereon.
- ⑤ See Standard Drawing E 601-TBGC-01 for Thrie Beam Rail Section.

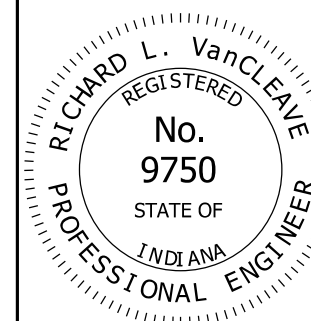
LEGEND:

- - W 6 x 9 Post
- - W 14 x 22 Blockout
- - Timber or Composite W-Beam Blockout

INDIANA DEPARTMENT OF TRANSPORTATION

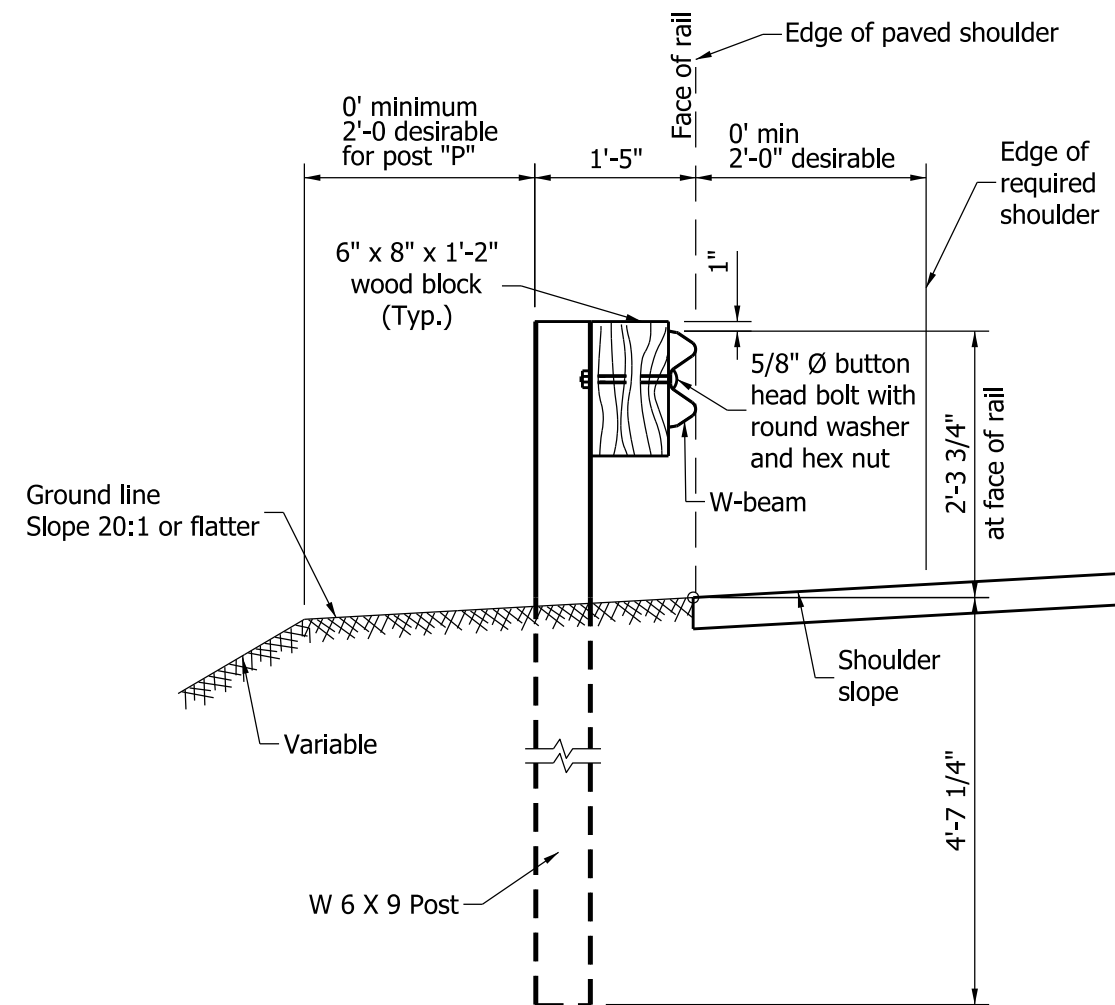
W-BEAM GUARDRAIL TO
THRIE BEAM GUARDRAIL
TRANSITION, WGT
SEPTEMBER 2014

STANDARD DRAWING NO. E 601-TWGT-01

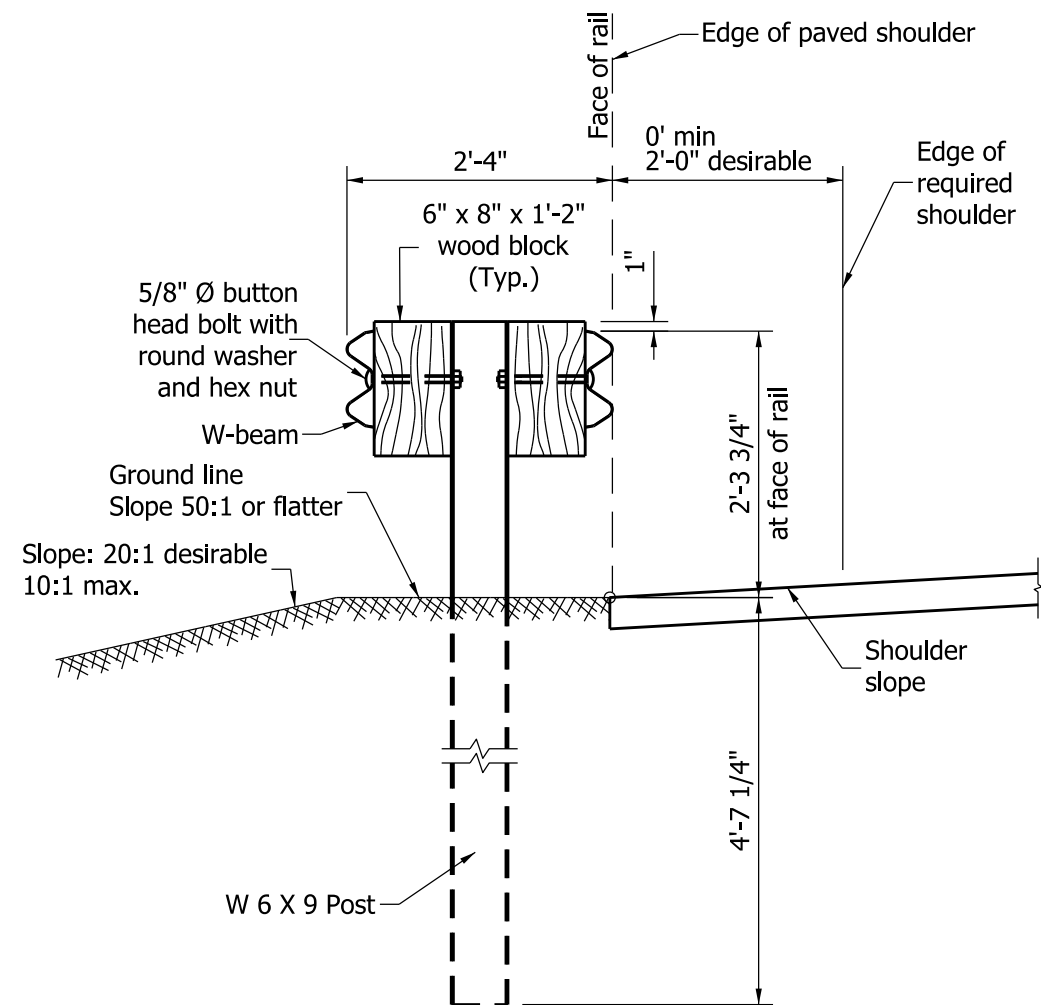


/s/ Richard L. VanCleave 02/20/14
DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 03/03/14
CHIEF ENGINEER DATE

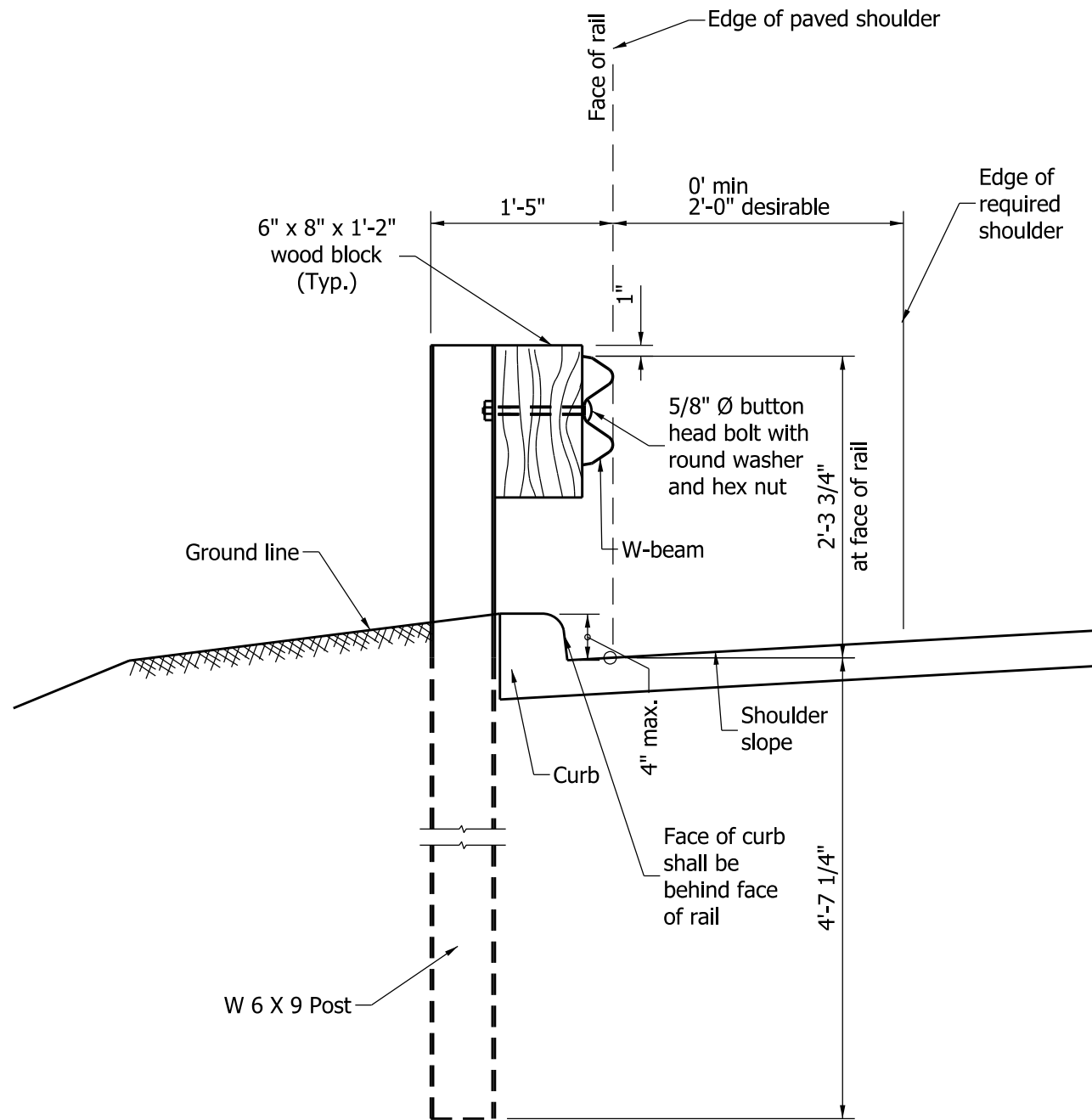


TYPICAL W-BEAM INSTALLATION

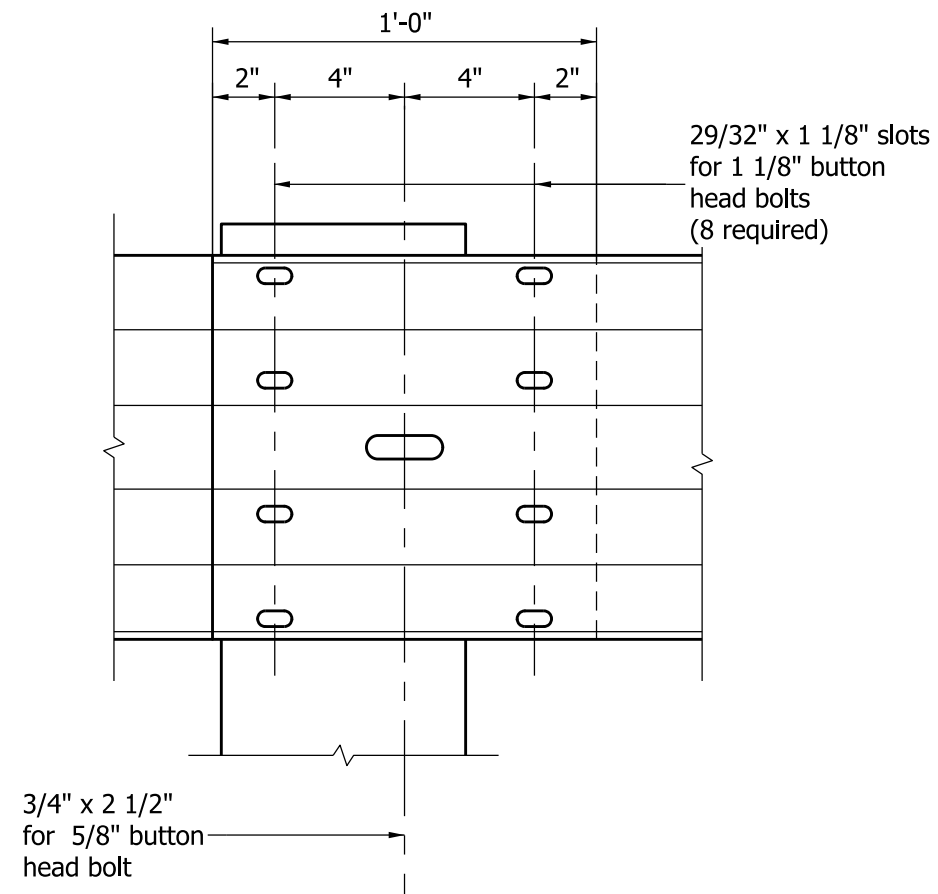


TYPICAL DOUBLE FACED W-BEAM INSTALLATION

INDIANA DEPARTMENT OF TRANSPORTATION			
W-BEAM GUARDRAIL ASSEMBLIES			
SEPTEMBER 2011			
STANDARD DRAWING NO.		E 601-WBGA-01	
	/s/ <i>Richard L. VanCleave</i>		09/01/11
	DESIGN STANDARDS ENGINEER		DATE
	/s/ <i>Mark A. Miller</i>		09/01/11
DESIGN STANDARDS ENGINEER	CHIEF HIGHWAY ENGINEER		DATE

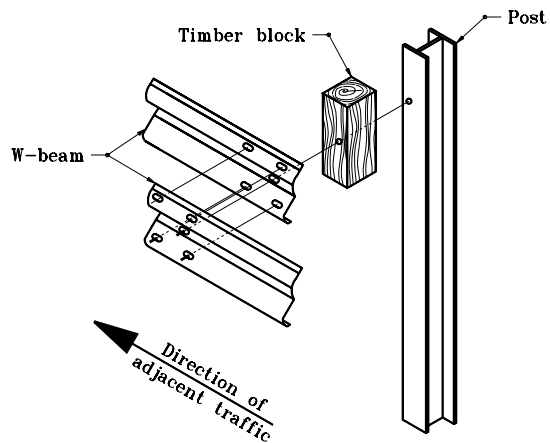


TYPICAL W-BEAM INSTALLATION AT CURB

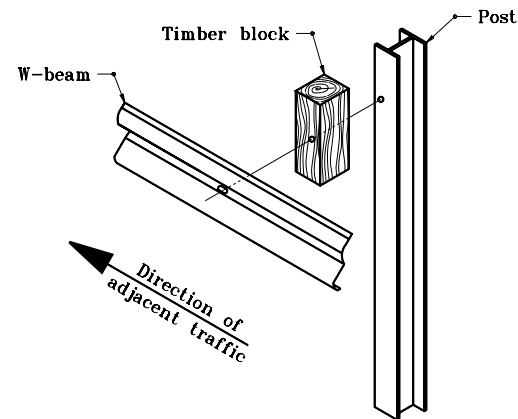


STEEL W-BEAM SPLICE DETAIL

INDIANA DEPARTMENT OF TRANSPORTATION		
W-BEAM GUARDRAIL ASSEMBLIES		
SEPTEMBER 2011		
STANDARD DRAWING NO.		E 601-WBGA-02
	/s/ <i>Richard L. VanCleave</i>	09/01/11
	DESIGN STANDARDS ENGINEER	DATE
	/s/ <i>Mark A. Miller</i>	09/01/11
	CHIEF HIGHWAY ENGINEER	DATE
DESIGN STANDARDS ENGINEER		



**W-BEAM SPLICE CONNECTION
DETAIL AT POST**

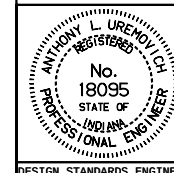


**W-BEAM SPLICE CONNECTION DETAIL
AT POST FOR NON-SPLICE CONNECTIONS**

INDIANA DEPARTMENT OF TRANSPORTATION

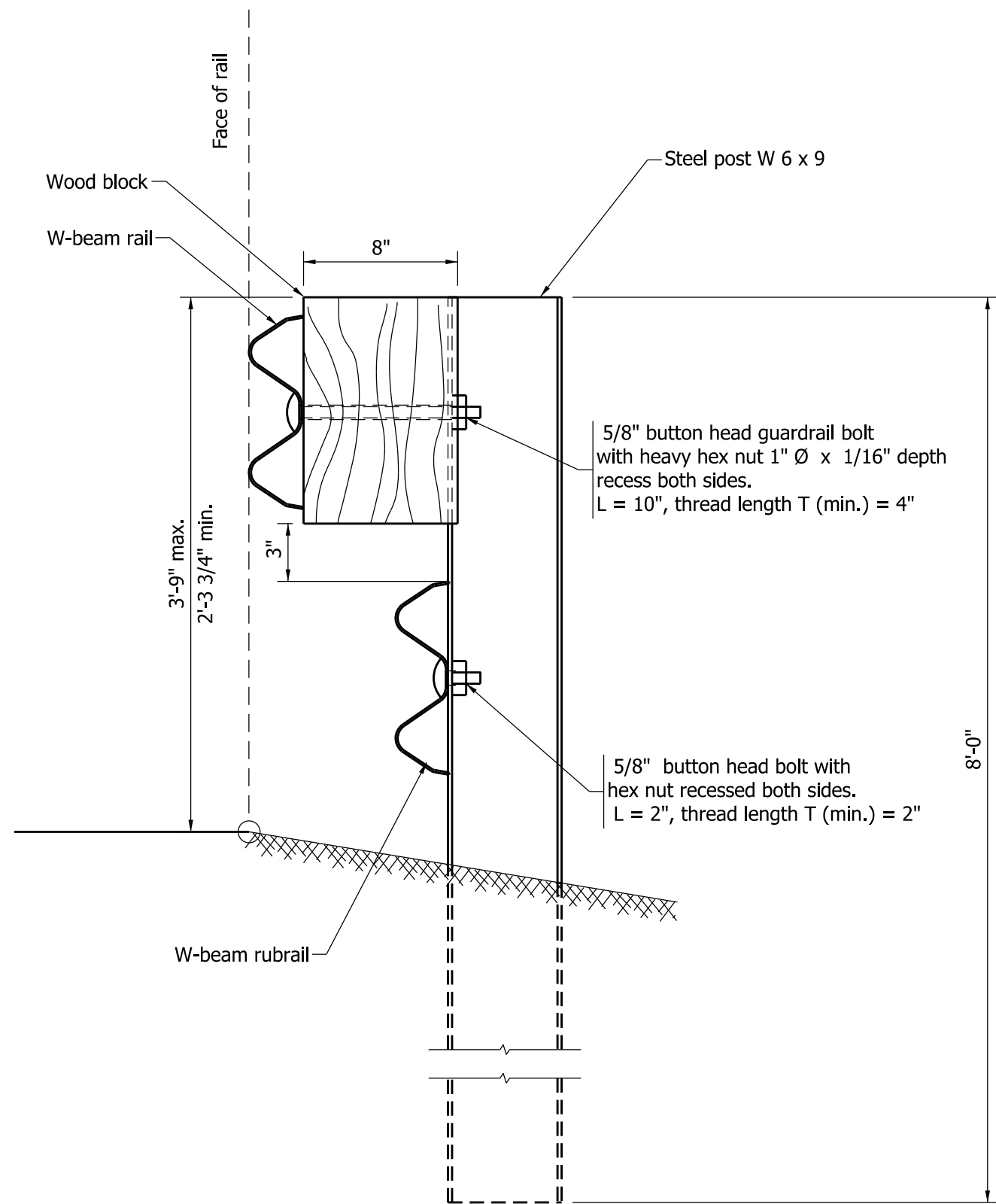
**W-BEAM
GUARDRAIL ASSEMBLIES**
SEPTEMBER 1998

STANDARD DRAWING NO. **E 601-WBGA-03**



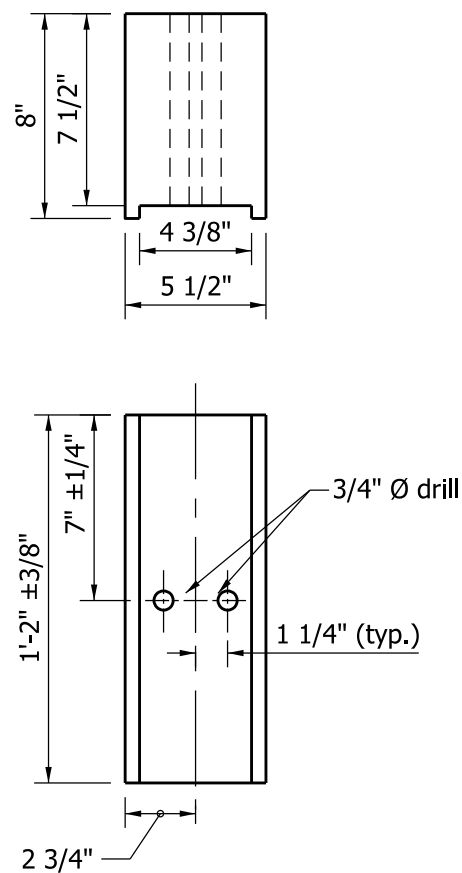
DETAILS PLACED IN THIS FORMAT		11-15-99
/s/ Anthony L. Uremovich	11-15-99	DATE
DESIGN STANDARDS ENGINEER		
/s/ Firooz Zandi	11-15-99	DATE
CHIEF HIGHWAY ENGINEER		
ORIGINALLY APPROVED		9-01-98

DESIGN STANDARDS ENGINEER

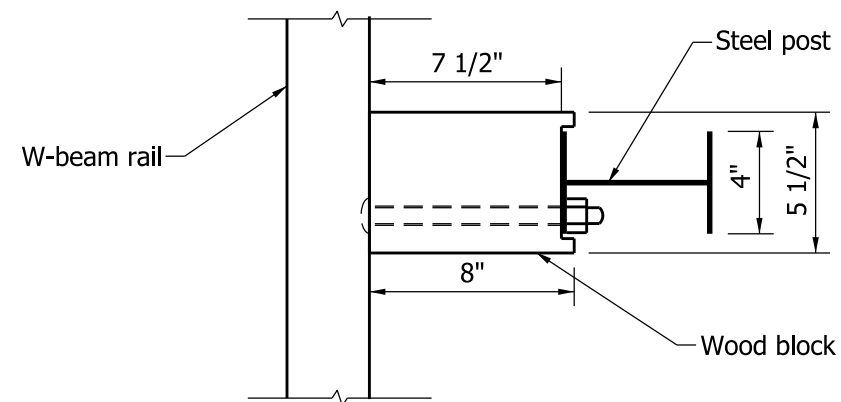


ELEVATION

**STEEL POST AND WOOD BLOCK DETAIL
FOR WR-BEAM GUARDRAIL**



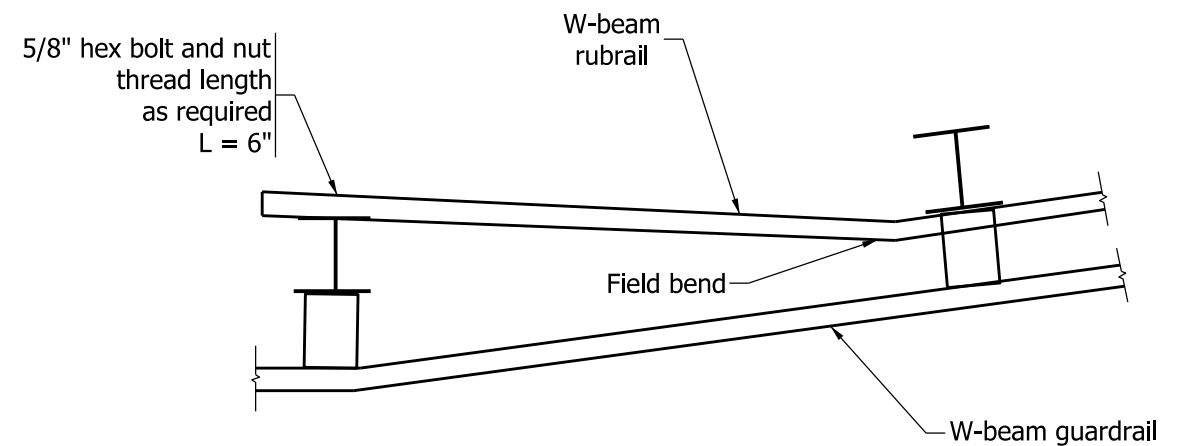
WOOD BLOCK



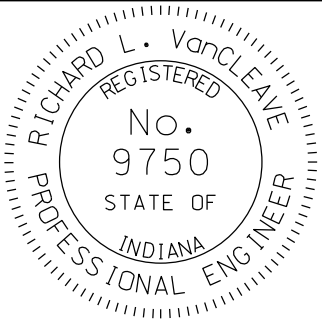
PLAN

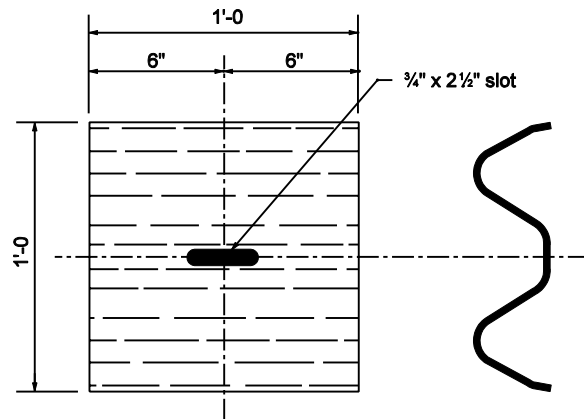
NOTE:

1. All posts shall be 8'-0" length and spaced at 6'-3".

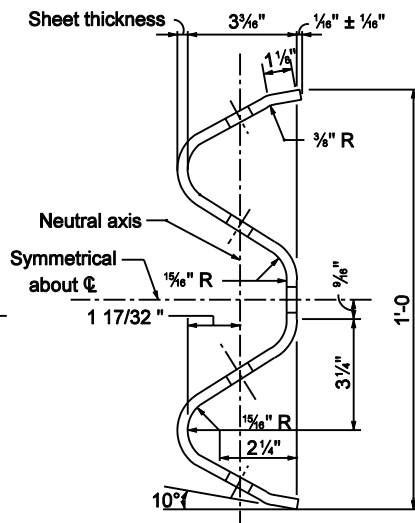


RUBRAIL TERMINATION DETAIL

INDIANA DEPARTMENT OF TRANSPORTATION	
WR-BEAM GUARDRAIL	
SEPTEMBER 2011	
STANDARD DRAWING NO. E 601-WBGA-06	
	<i>/s/ Richard L. VanCleave</i> 09/01/11
	DESIGN STANDARDS ENGINEER DATE
	<i>/s/ Mark A. Miller</i> 09/01/11
	CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	

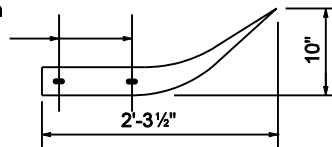


W-BEAM BACKUP PLATE

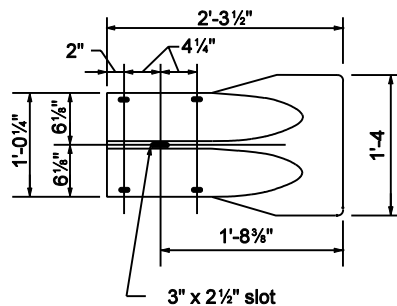


SECTION THROUGH BEAM ELEMENT

29/32" x 1 1/8" slot
for 5/8" button
head bolt

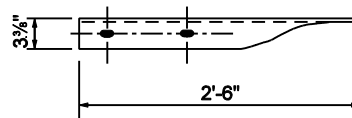


TOP VIEW

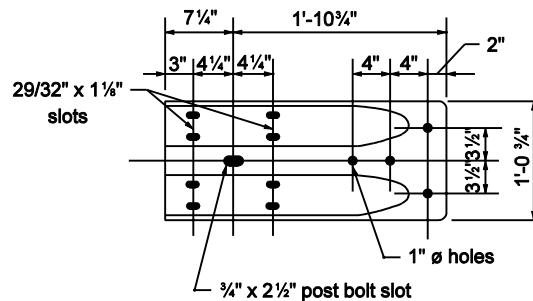


FRONT VIEW

CURVED TERMINAL END



TOP VIEW



FRONT VIEW

W-BEAM TERMINAL CONNECTOR

GENERAL NOTES

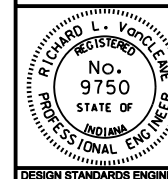
1. This sheet shall be used when W-beam guardrail is specified. This sheet shall also be used when a W-beam guardrail system requires the use of standard W-beam guardrail components.
2. The details on this sheet are for the standard components of W-beam guardrail.

INDIANA DEPARTMENT OF TRANSPORTATION

W-BEAM GUARDRAIL COMPONENTS

MARCH 2003

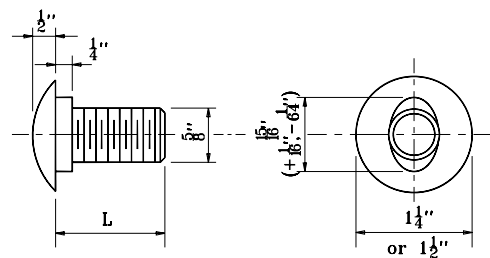
STANDARD DRAWING NO. E 601-WBGC-01



/s/ Richard L. VanCleave 3-03-03
DESIGN STANDARDS ENGINEER DATE

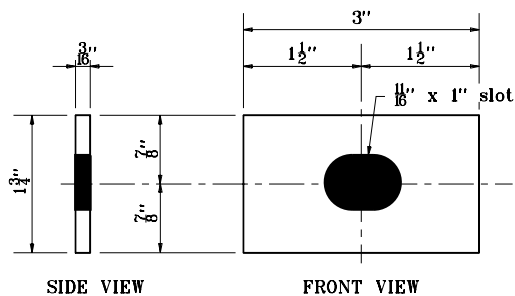
/s/ Richard K. Smutzer 3-03-03
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

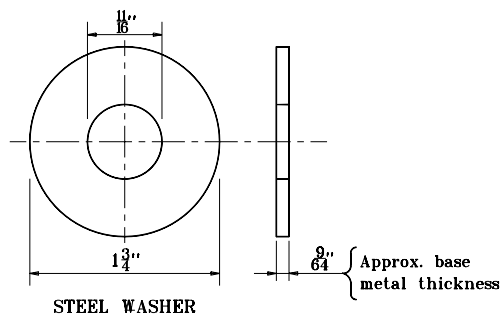


5/8" BUTTON HEAD BOLT

L	THREAD LENGTH
1 1/4"	Full Length Thread
2"	1 1/2" Min. Thread Length
8 1/2"	1 3/4" Min. Thread Length
1'-6	2 1/2" Min. Thread Length
2'-1	2" Min. Thread Length

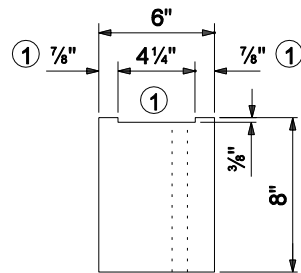


RECTANGULAR PLATE WASHER

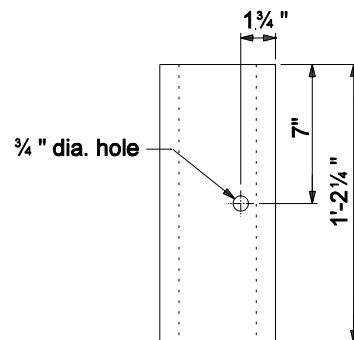


WASHER FOR 5/8" BOLT

INDIANA DEPARTMENT OF TRANSPORTATION	
W-BEAM	
GUARDRAIL COMPONENTS	
MAY 2000	
STANDARD DRAWING NO. E 601-WBGC-02	
	/s/ Anthony L. Uremovich 5-01-00 DESIGN STANDARDS ENGINEER DATE
	/s/ Firooz Zandi 5-01-00 CHIEF HIGHWAY ENGINEER DATE

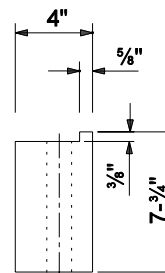


TOP VIEW

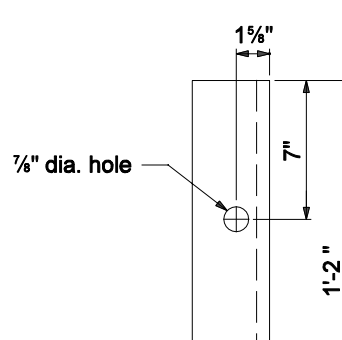


FRONT VIEW

TIMBER BLOCK DETAIL A



TOP VIEW

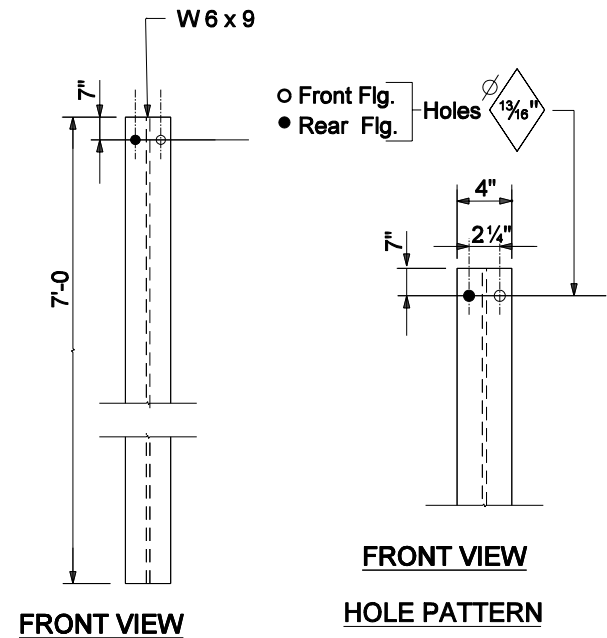


FRONT VIEW

TIMBER BLOCK DETAIL B

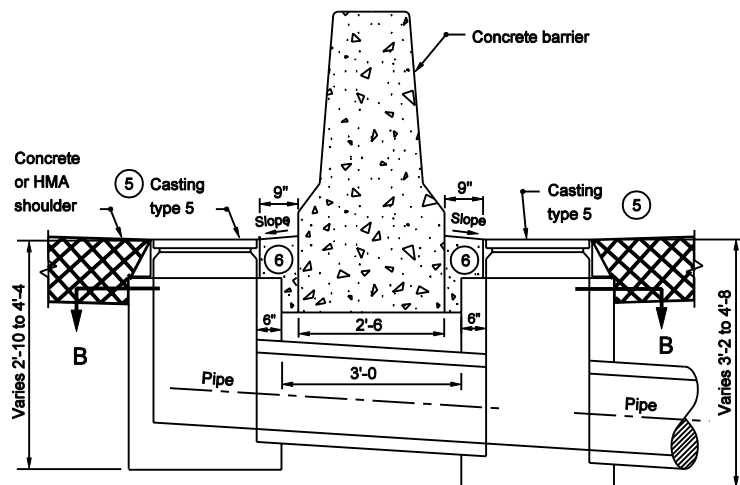
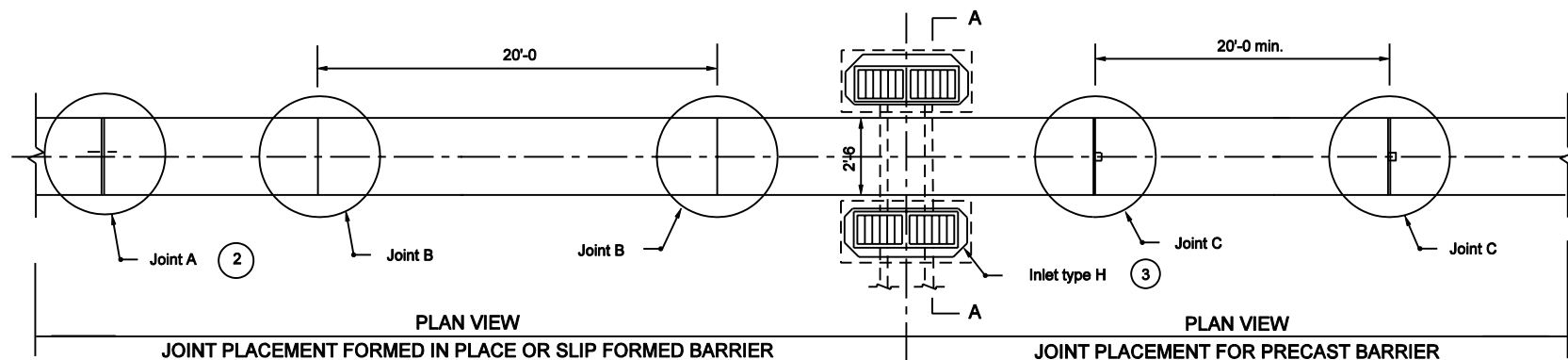
NOTES:

- ① These dimensions shall be adjusted as required to accommodate steel post flange.
- 2 Timber blocks shown in either Detail A or Detail B may be used.



STEEL POST DETAIL

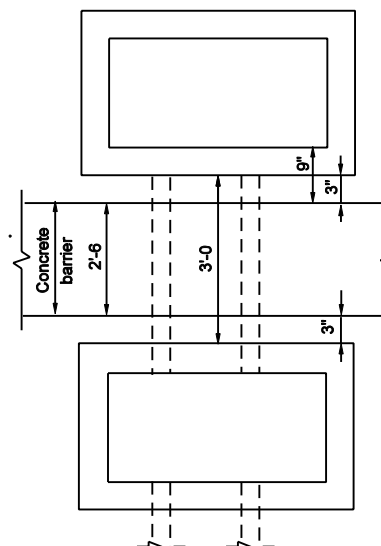
INDIANA DEPARTMENT OF TRANSPORTATION	
W - BEAM GUARDRAIL COMPONENTS	
SEPTEMBER 2004	
STANDARD DRAWING NO. E 601-WBGC-03	
	<i>/s/ Richard L. VanCleave</i> 3-01-04 DESIGN STANDARDS ENGINEER DATE
	<i>/s/ Richard K. Smutzer</i> 3-01-04 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	



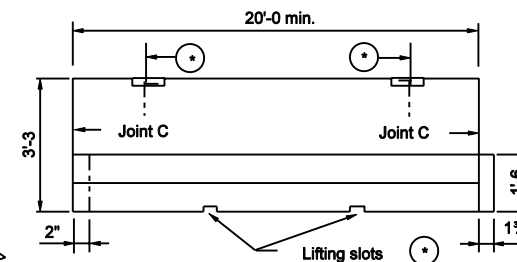
SECTION A-A

GENERAL NOTES :

1. See Standard Drawing E 602-CCMB-02 for joint details.
2. Cast-in-place or slip-formed concrete barrier shall have a joint type A at 10 ft from each end of a median bridge pier or bent. The maximum spacing between type A joints shall be 400 ft. Type A joint shall be placed at the end of each work period pour.
3. Each inlet type H includes two inlet boxes, the connector pipe between the inlet boxes, and two type 5 castings.
4. Type B joint shall be located and spaced as shown.
5. See Standard Drawings E 720-ICCA-01 to E 720-ICCA-03 for casting type 5 details.
6. Concrete shoulder or pavement between type 5 casting and concrete barrier wall.
7. See Standard Drawing E 720-INST-05B for information regarding inlet indicators.



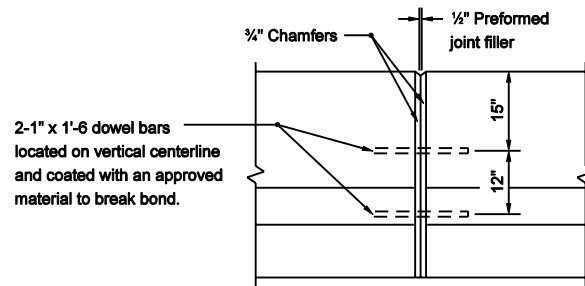
SECTION B-B



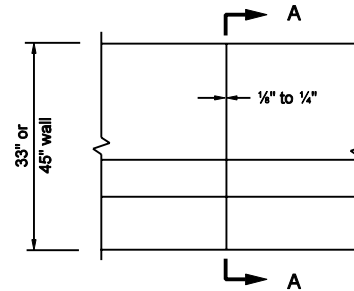
SIDE VIEW OF PRECAST SECTION

- * Precast concrete barrier shall have threaded inserts cast into the top of each section, a minimum of 1/4" below the surface, and embedded to a depth sufficient for safe lifting of the section.
- Lifting slots will be permitted in addition to the inserts. The dimensions and locations of these slots may be adjusted to accommodate variations in handling equipment.

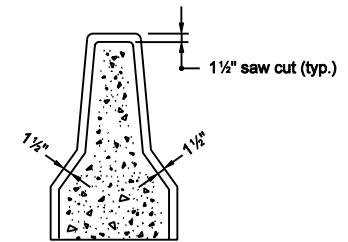
INDIANA DEPARTMENT OF TRANSPORTATION	
CONCRETE BARRIER DRAIN AND JOINT PLACEMENT	
MARCH 2003	
STANDARD DRAWING NO. E 602-CCMB-01	
	/s/ Richard L. VanCleave 3-03-03 DESIGN STANDARDS ENGINEER DATE
	/s/ Richard K. Smutzer 3-03-03 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	



JOINT A

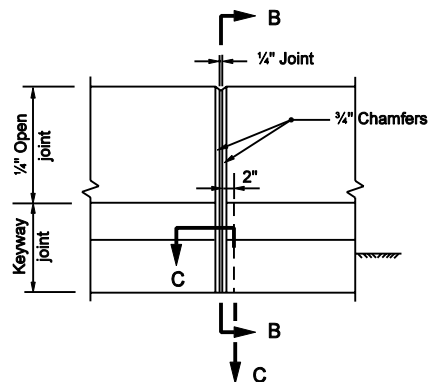


JOINT B

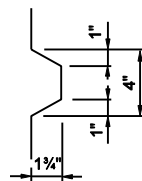


SECTION A-A

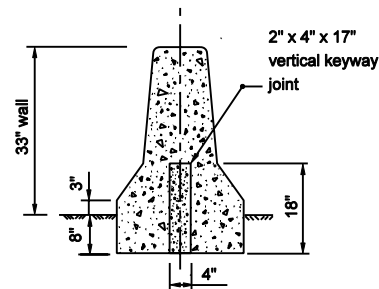
FORMED IN PLACE OR SLIP FORMED JOINTS



JOINT C



SECTION C-C



SECTION B-B

NOTES :

1. See Standard Drawing E 602-CCMB-01 for joint placement.

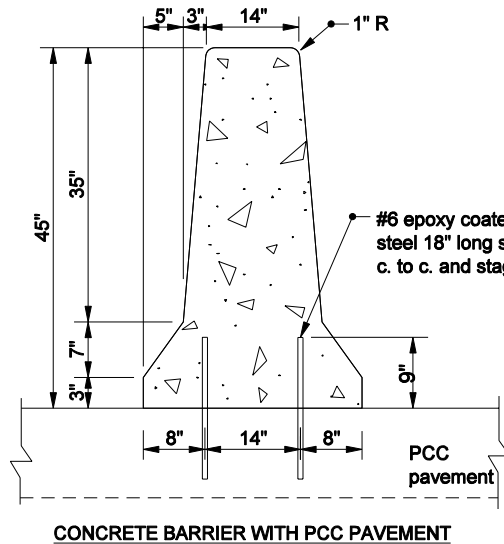
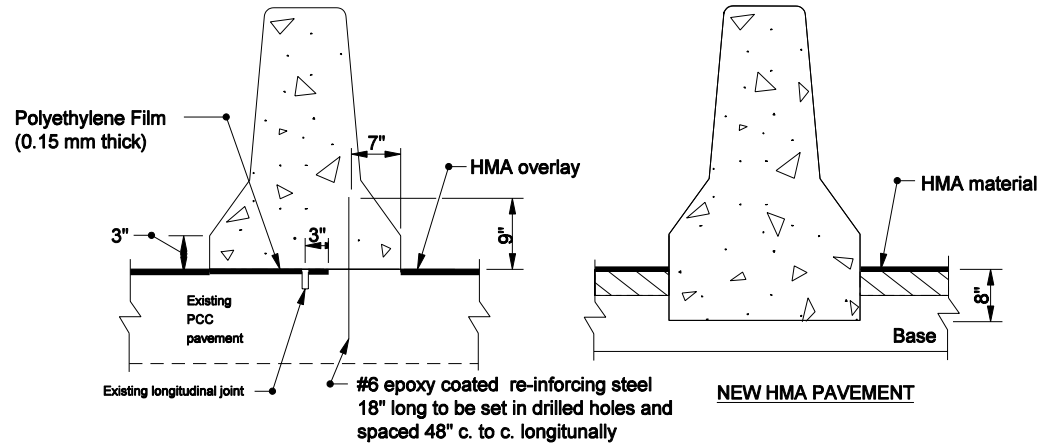
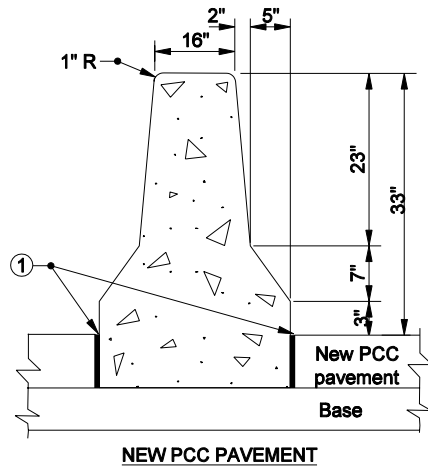
PRECAST JOINT

INDIANA DEPARTMENT OF TRANSPORTATION	
CONCRETE BARRIER JOINT	
MARCH 2003	
STANDARD DRAWING NO. E 602-CCMB-02	
	/s/ Richard L. VanCleave DESIGN STANDARDS ENGINEER
	3-03-03 DATE
	/s/ Richard K. Smutzer CHIEF HIGHWAY ENGINEER
	3-03-03 DATE



1. All integral median foundations shall be constructed as shown.
2. At a bridge pier, the faces of the concrete barrier shall be transitioned at a 30:1 taper to match configuration of the pier stem. At a median bridge bent, the faces of the concrete barrier shall be transitioned at a 30:1 taper to match the configuration of the crash wall. If the height of the crash wall is less than the height of the concrete barrier, the height of the crash wall shall be increased, as detailed elsewhere on the plans, to match the height of the concrete barrier.
3. An appropriate type of impact attenuator shall be designated for the ends of the concrete barrier, when it is exposed to traffic within the roadway clear zone.
4. Use 2" for 33" height concrete barrier wall and 3" for 45" height concrete barrier wall.

INDIANA DEPARTMENT OF TRANSPORTATION	
CONCRETE BARRIER DETAILS	
MARCH 2003	
STANDARD DRAWING NO. E 602-CCMB-03	
	/s/ <i>Richard L. VanCleave</i> 3-03-03 DESIGN STANDARDS ENGINEER DATE
DESIGN STANDARDS ENGINEER	/s/ <i>Richard K. Smutzer</i> 3-03-03 CHIEF HIGHWAY ENGINEER DATE



45" HEIGHT CONCRETE BARRIER WALL

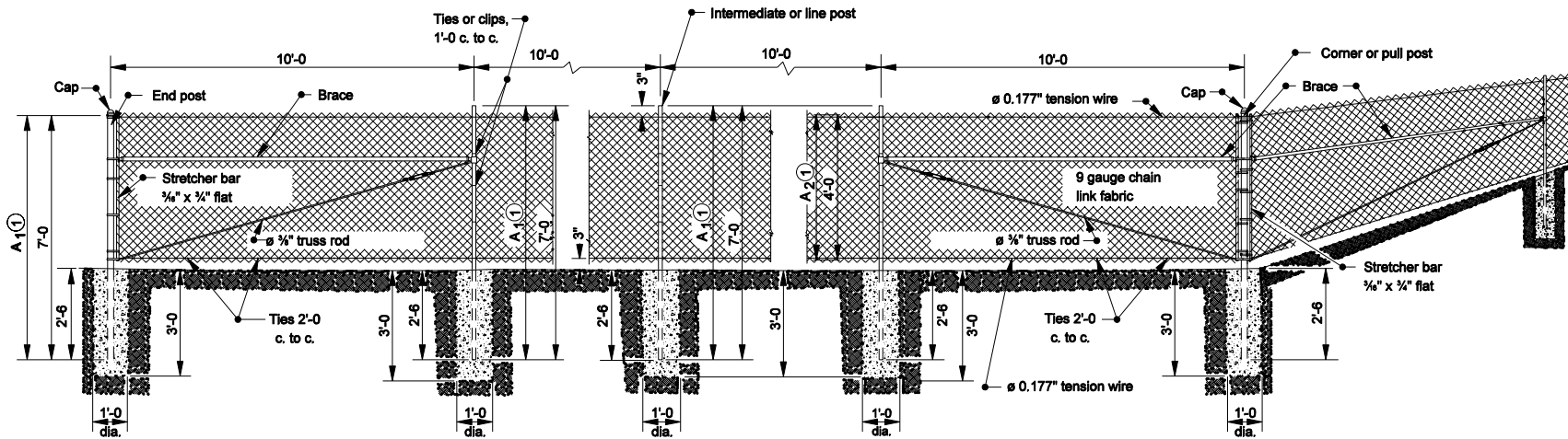
NEW HMA OVERLAY OVER EXISTING PCC PAVEMENT

33" HEIGHT CONCRETE BARRIER WALL

NOTES:

- ① $\frac{1}{2}$ " Preformed Joint Filler.

INDIANA DEPARTMENT OF TRANSPORTATION	
CONCRETE BARRIER DETAILS	
SEPTEMBER 2006	
STANDARD DRAWING NO. E 602-CCMB-04	
	/s/ Richard L. VanCleave 9-01-06 DESIGN STANDARDS ENGINEER DATE
DESIGN STANDARDS ENGINEER	/s/ Richard K. Smutzer 9-01-06 CHIEF HIGHWAY ENGINEER DATE



RIGHT OF WAY FENCE

Steel Chain Link Fence

GENERAL NOTES

- ① For each additional 1'-0" in height increase dimensions A₁ and A₂ by 1'-0".
2. Dimensions as shown are for 4'-0" fence.
3. For chain link type stream crossing or depression detail see Standard Drawing E 603-CLTF-02 for dimensions and installation.

TUBULAR POST CHART

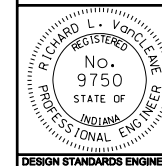
HEIGHT OF FENCE	GROUP 1				GROUP 2			
	< 6'		≥ 6'		< 6'		≥ 6'	
	NOM. DIA.	WEIGHT	NOM. DIA.	WEIGHT	NOM. DIA.	WEIGHT	NOM. DIA.	WEIGHT
	inches	lb/ft	inches	lb/ft	inches	lb/ft	inches	lb/ft
END, CORNER, AND PULL POSTS	2	3.65	2 1/2"	5.79	2	3.12	2 1/2"	4.64
LINE POSTS	1 1/4"	2.27	2	3.65	1 1/4"	1.84	2	3.12
BRACE	1 1/4"	2.27	1 1/4"	2.27	1 1/4"	1.84	1 1/4"	1.84

INDIANA DEPARTMENT OF TRANSPORTATION

CHAIN LINK TYPE FENCE

MARCH 2006

STANDARD DRAWING NO. E 603-CLTF-01

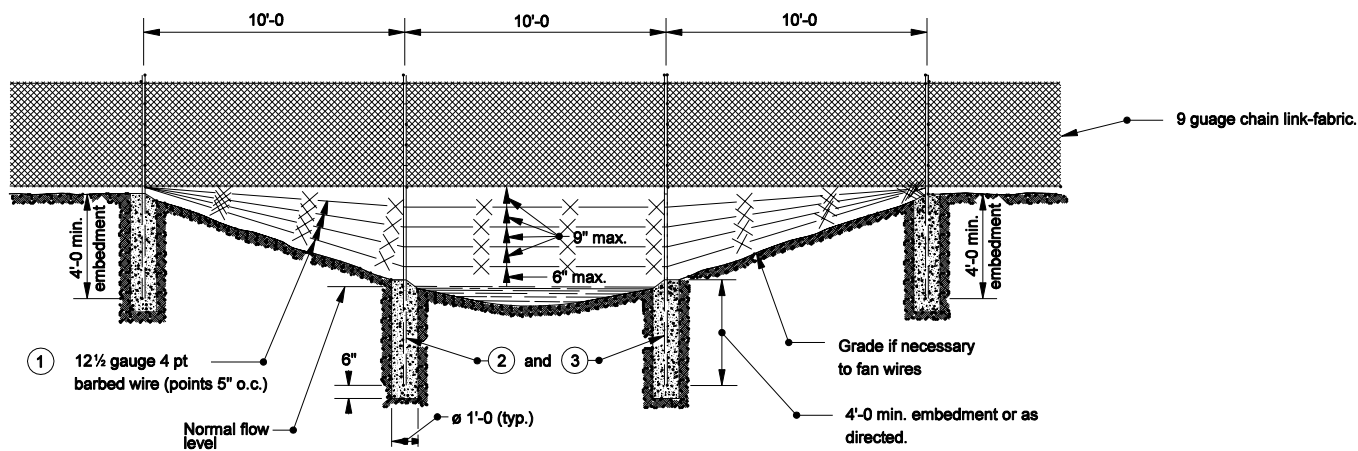


/s/ Richard L. VanCleave 3-01-06
DESIGN STANDARDS ENGINEER DATE

/s/ Richard K. Smutzer 3-01-06
CHIEF HIGHWAY ENGINEER DATE

GENERAL NOTES

- ① This installation to be made only where directed. Barbed wire will not be required at points where such installation would cause the collecting of drift in the channel.
- ② Line posts of 9'-6 or longer for crossing shall be 2" nominal tubing or 3 x 3 x 1/4 angles and shall be set in concrete footings.
- ③ Extra length posts to be used as directed.



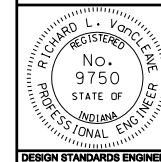
SECTION AT STREAM CROSSING OR DEPRESSION

INDIANA DEPARTMENT OF TRANSPORTATION

CHAIN LINK TYPE FENCE

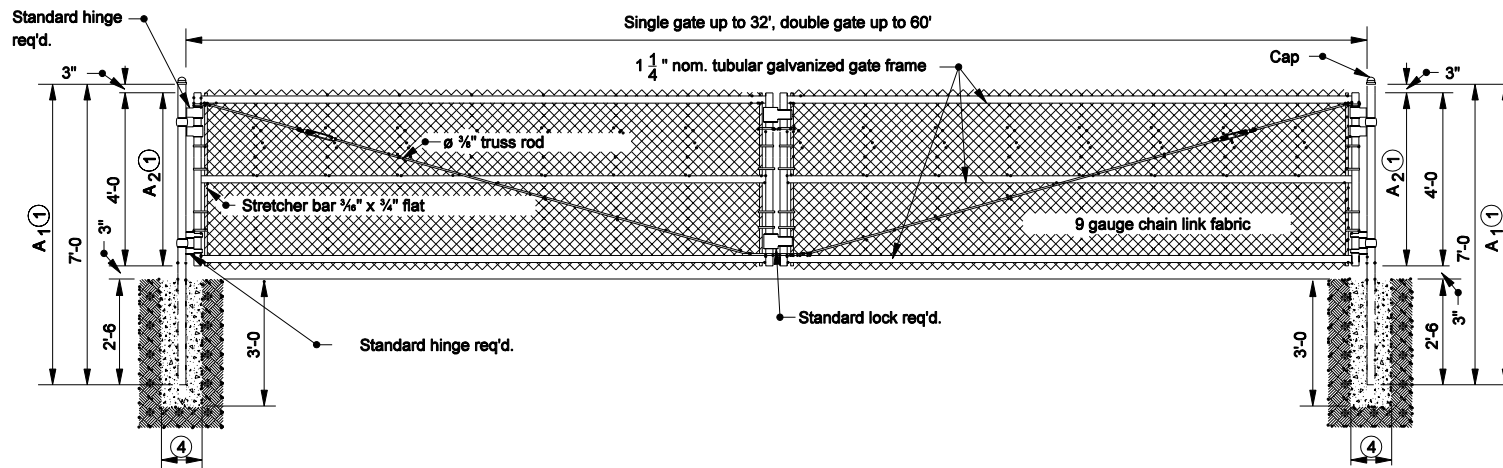
SEPTEMBER 2004

STANDARD DRAWING NO. E 603-CLTF-02



/s/ Richard L. VanCleave 9-01-04
DESIGN STANDARDS ENGINEER DATE

/s/ Richard K. Smutzer 9-01-04
CHIEF HIGHWAY ENGINEER DATE



CHAIN LINK GATE

GENERAL NOTES

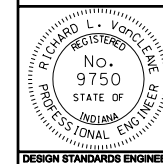
- ① For each additional 1'-0" in height increase dimension A₁ and A₂ by 1'-0".
2. See Standard Drawing E 603-CLTF-01 for the tubular post chart.
3. Dimensions as shown are for 4'-0" fence.
- ④ Diameter equals 10" plus the outside diameter of the post.

INDIANA DEPARTMENT OF TRANSPORTATION

CHAIN LINK TYPE GATE

SEPTEMBER 2004

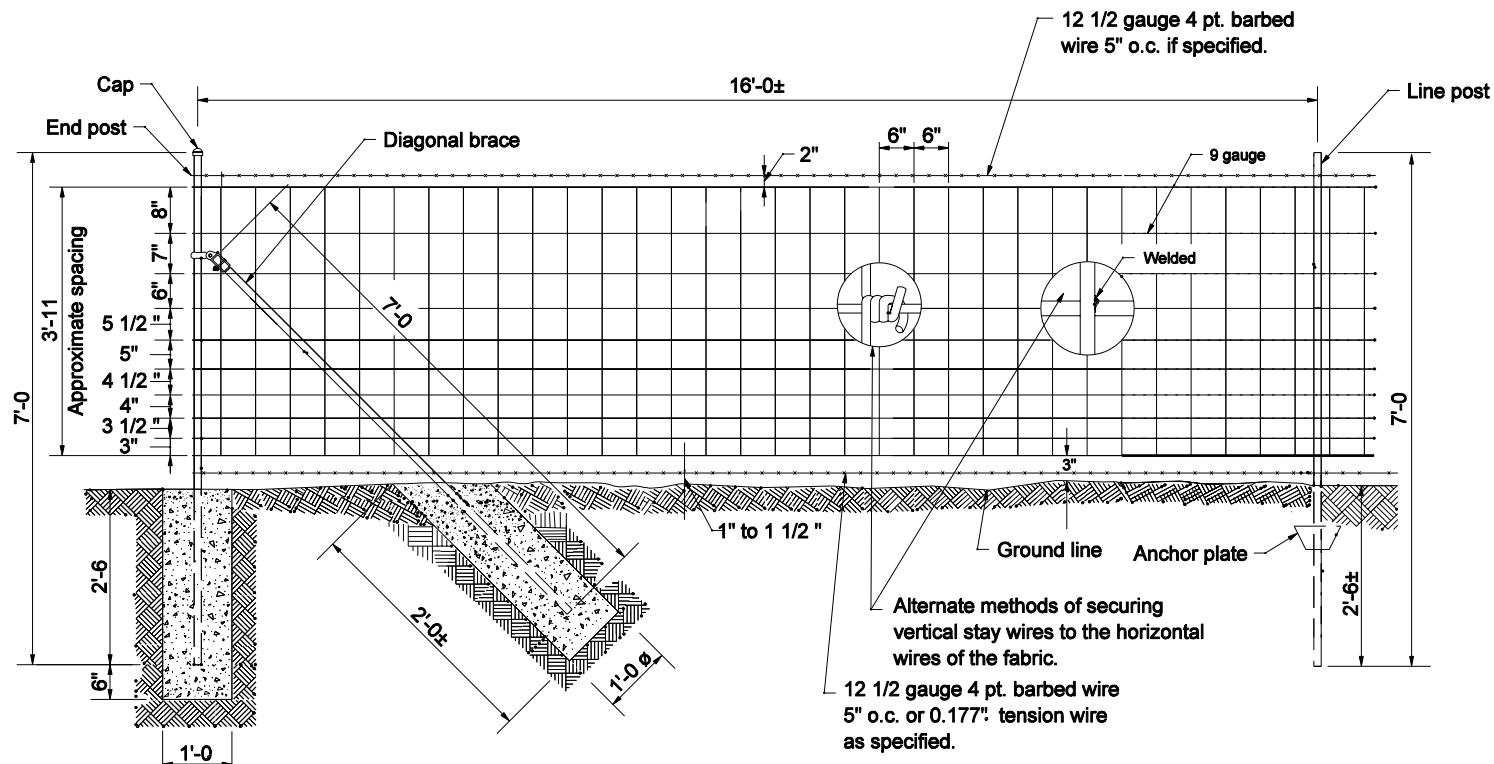
STANDARD DRAWING NO. E 603-CLTF-03



/s/ Richard L. VanCleave 9-01-04
DESIGN STANDARDS ENGINEER DATE

/s/ Richard K. Smutzer 9-01-04
CHIEF HIGHWAY ENGINEER DATE

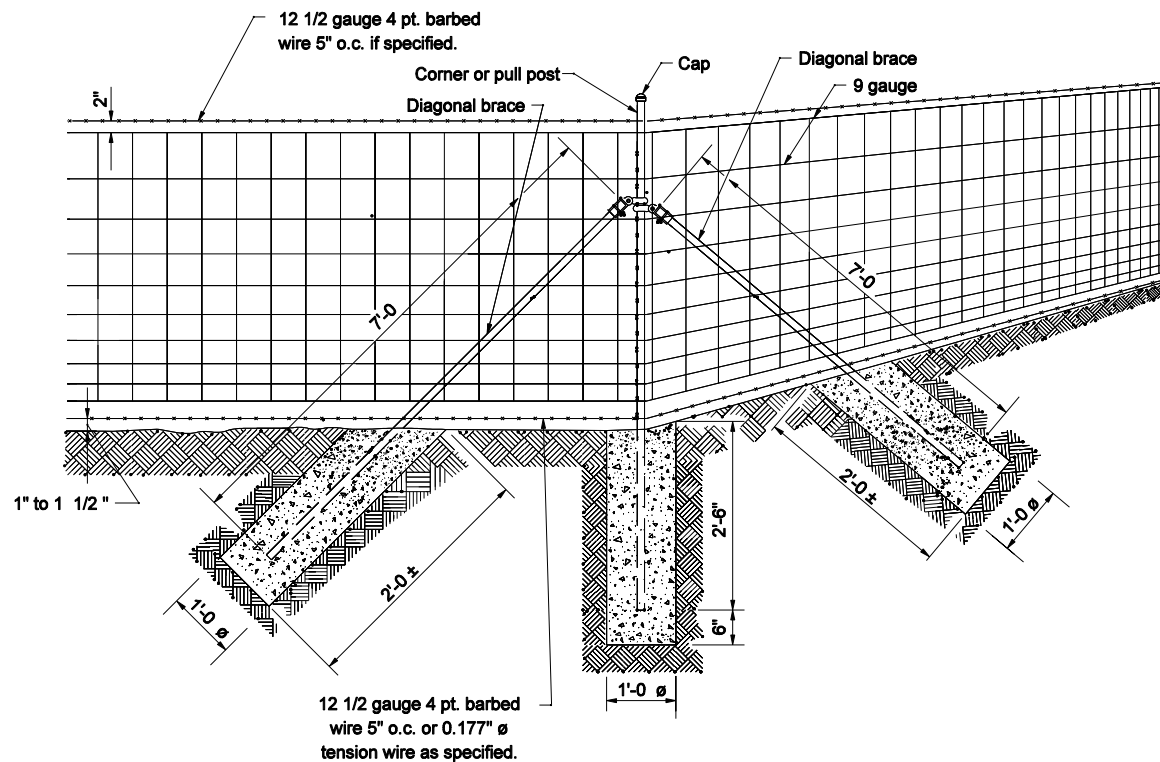
DESIGN STANDARDS ENGINEER



FARM FIELD TYPE FENCE

POST CHART					
4'-0 HEIGHT		GROUP 1		GROUP 2	
		WEIGHT	NOM. DIA.	WEIGHT	NOM. DIA.
		lb/ft	in.	lb/ft	in.
END, CORNER, AND PULL POSTS			2	3.65	2
LINE POSTS	STUDDED "T"	1.33			
	"U"	1.33			
DIAGONAL BRACE			1 1/4	2.27	1 1/4

INDIANA DEPARTMENT OF TRANSPORTATION	
FARM FIELD TYPE FENCE	
SEPTEMBER 2004	
STANDARD DRAWING NO. E 603-FFTF-01	
	/s/ Richard L. VanCleave 9-01-04 DESIGN STANDARDS ENGINEER DATE
	/s/ Richard K. Smutzer 9-01-04 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	



FARM FIELD TYPE FENCE CORNER

GENERAL NOTES

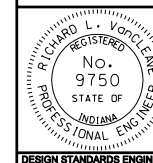
1. See Standard Drawing E 603-FFTF-01 for Post Chart.

INDIANA DEPARTMENT OF TRANSPORTATION

FARM FIELD TYPE FENCE

SEPTEMBER 2004

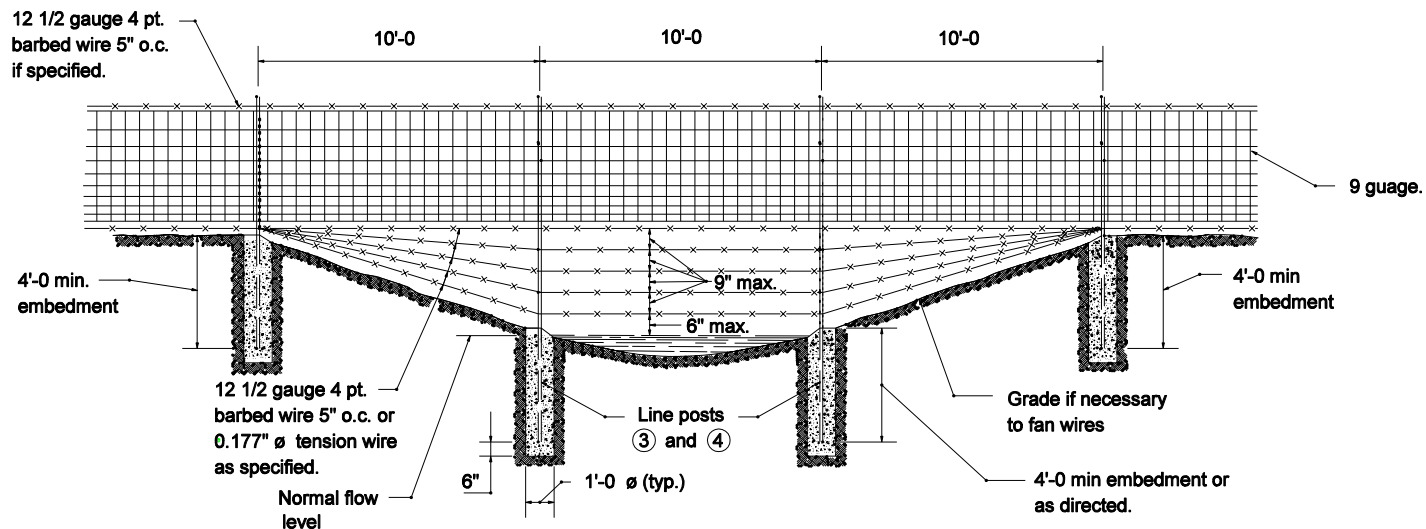
STANDARD DRAWING NO. E 603-FFTF-02



/s/ Richard L. VanCleave 9-01-04
DESIGN STANDARDS ENGINEER DATE

/s/ Richard K. Smutzer 9-01-04
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER



SECTION AT STREAM CROSSING OR DEPRESSION

GENERAL NOTES

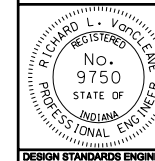
1. For farm field type gate see Standard Drawing E 603-CLTF-03 for dimensions and installation. Substitute farm field type fence for chain link type fence.
2. The placement of fence over a stream crossing or depression shall be as directed.
- ③ Extra length posts shall be used as directed.
- ④ Line posts 9'-6 or longer for crossing shall be 2" nom. dia. ϕ tubing or L 3 x 3 x $\frac{1}{4}$ " angles and shall be set in concrete footings.

INDIANA DEPARTMENT OF TRANSPORTATION

FARM FIELD TYPE FENCE

SEPTEMBER 2004

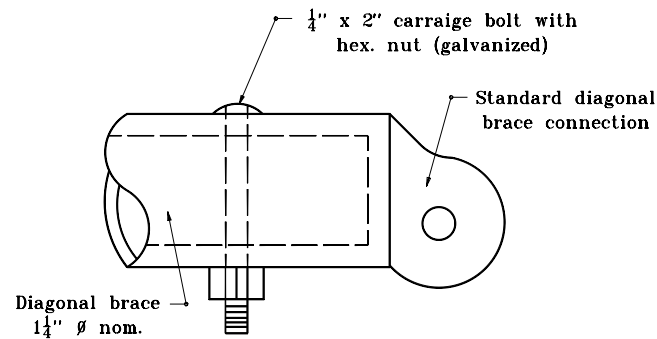
STANDARD DRAWING NO. E 603-FFTF-03



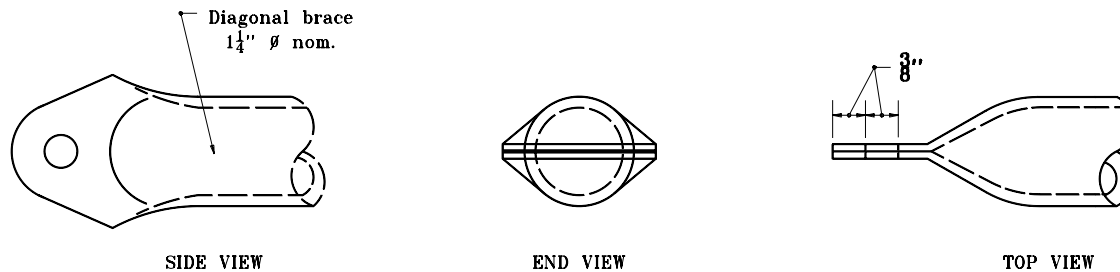
/s/ Richard L. VanCleave 9-01-04
DESIGN STANDARDS ENGINEER DATE

/s/ Richard K. Smutzer 9-01-04
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

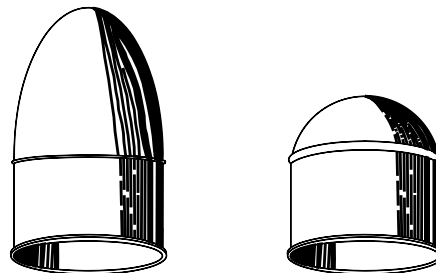


STANDARD METHOD



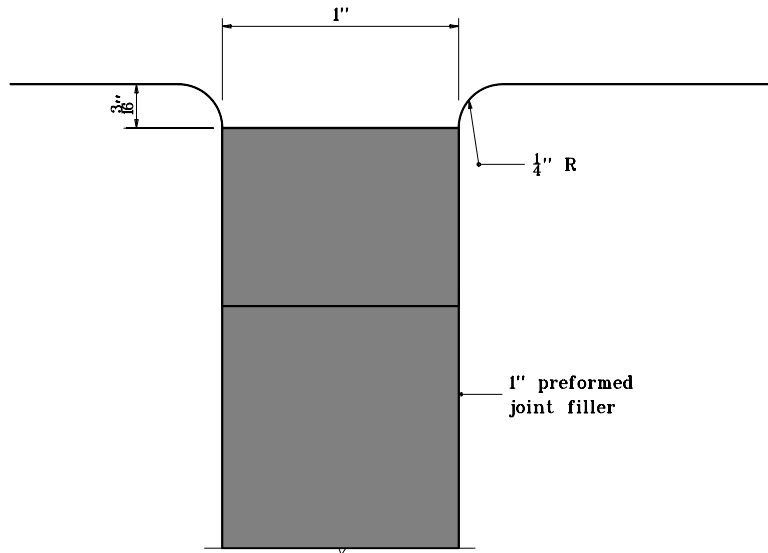
ALTERNATE METHOD

DIAGONAL BRACE CONNECTION

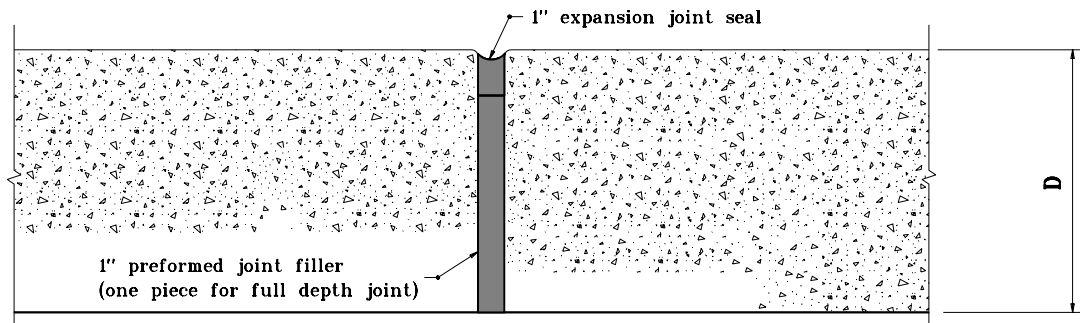


TYPICAL CAPS FOR TUBULAR POSTS

INDIANA DEPARTMENT OF TRANSPORTATION	
BRACE CONNECTIONS AND POST CAPS	
APRIL 1995	
STANDARD DRAWING NO. E 603-FFTF-04	
DETAILS PLACED IN THIS FORMAT	7-27-99
	/s/ Anthony L. Uremovich 7-27-99 DESIGN STANDARDS ENGINEER DATE
	/s/ Firooz Zandi 7-27-99 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	ORIGINALLY APPROVED 4-03-95



SILICONE JOINT SEALANT



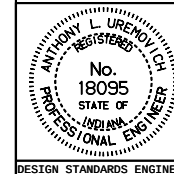
SECTION THROUGH JOINT

INDIANA DEPARTMENT OF TRANSPORTATION

**SIDEWALK
EXPANSION JOINT**

SEPTEMBER 1999

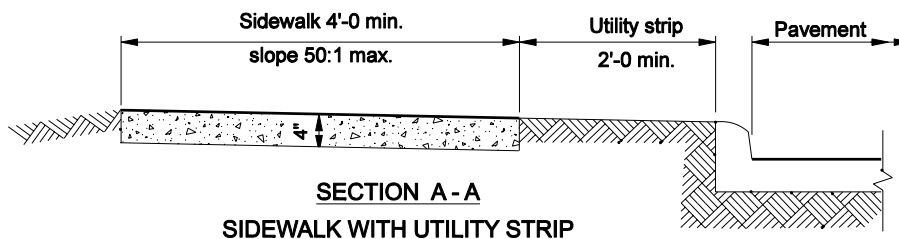
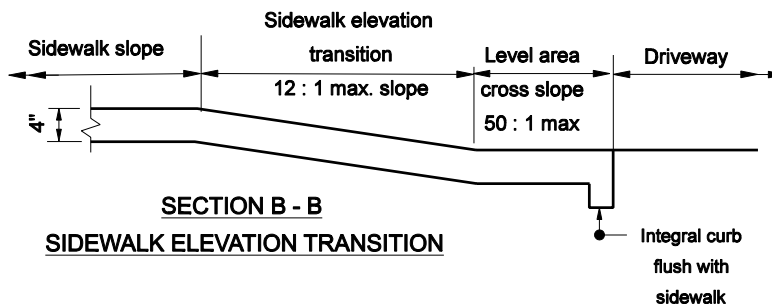
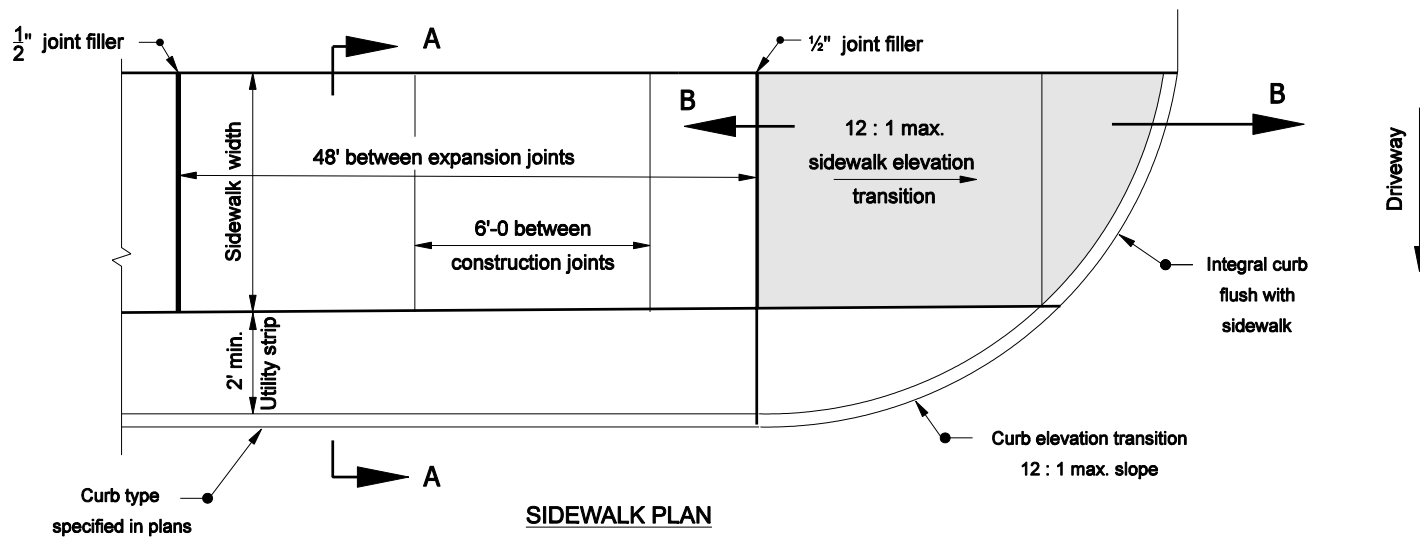
STANDARD DRAWING NO. **E 604-CCSJ-01**



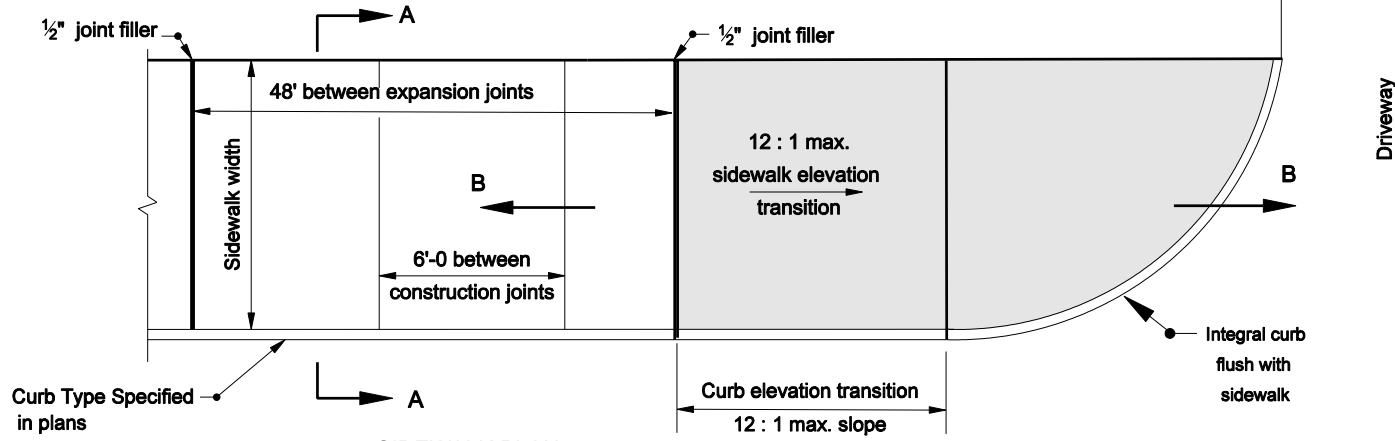
/s/ Anthony L. Uremovich 9-01-99
DESIGN STANDARDS ENGINEER DATE

/s/ Donald W. Lucas 9-01-99
CHIEF HIGHWAY ENGINEER DATE

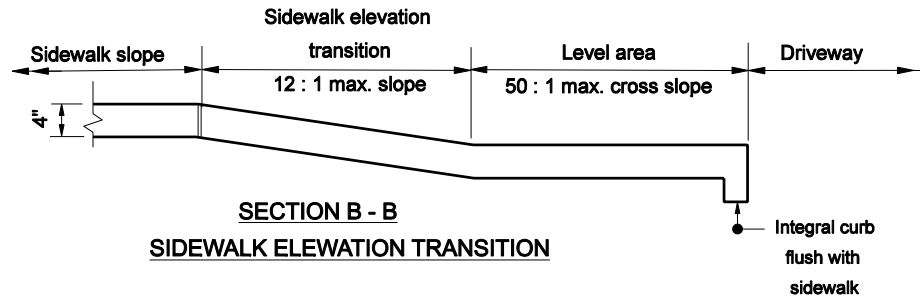
DESIGN STANDARDS ENGINEER



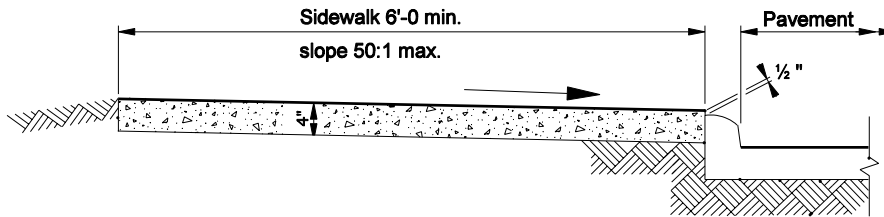
INDIANA DEPARTMENT OF TRANSPORTATION	
SIDEWALK DETAILS	
SIDEWALK WITH UTILITY STRIP	
SEPTEMBER 2005	
STANDARD DRAWING NO. E 604-SDWK-01	
	/s/ Richard L. VanCleave 9-01-05 DESIGN STANDARDS ENGINEER DATE
	/s/ Richard K. Smutzer 9-01-05 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	



SIDEWALK PLAN

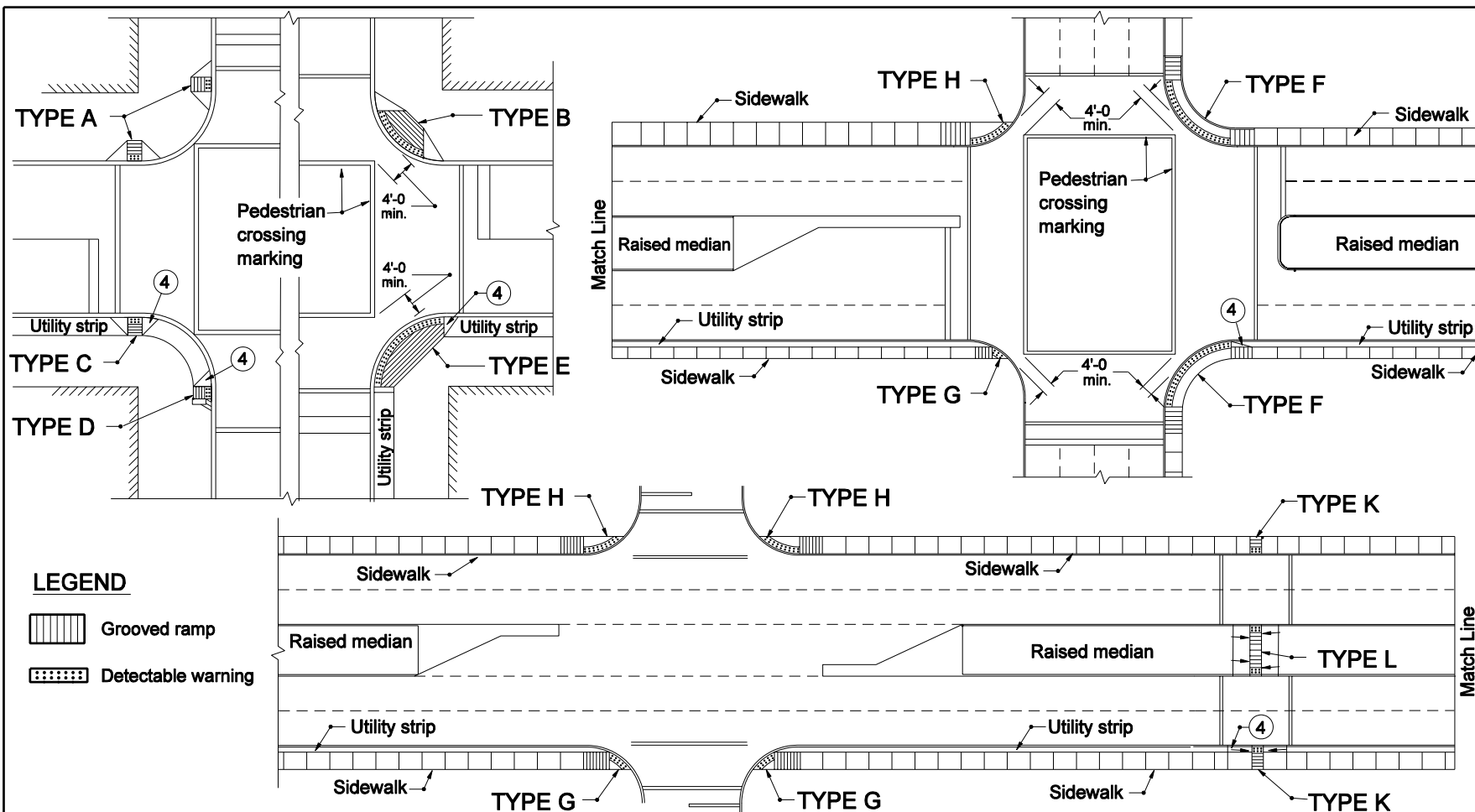


**SECTION B - B
SIDEWALK ELEVATION TRANSITION**



**SECTION A - A
SIDEWALK ADJACENT TO CURB**

INDIANA DEPARTMENT OF TRANSPORTATION	
SIDEWALK DETAILS	
SIDEWALK ADJACENT TO CURB	
SEPTEMBER 2005	
STANDARD DRAWING NO. E 604-SDWK-02	
	/s/ Richard L. VanCleave DESIGN STANDARDS ENGINEER
	9-01-05 DATE
	/s/ Richard K. Smutzer CHIEF HIGHWAY ENGINEER
	9-01-05 DATE



1. The curb ramp type includes the ramp and flared sides as indicated on the details. A level landing shall be provided at the high end of every curb ramp.
2. For details of sidewalk curb ramp types see Standard Drawings E 604-SWCR-03 to -11.
3. The curb ramps shall be placed within the marked crosswalk area.

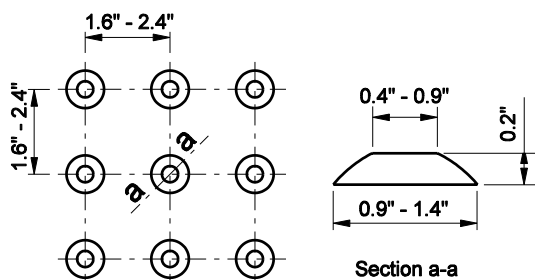
④ Flared side of sidewalk curb ramp next to utility strip shall be sodded.

5. See Standard Drawing E 604-SWCR-02 for General Notes.

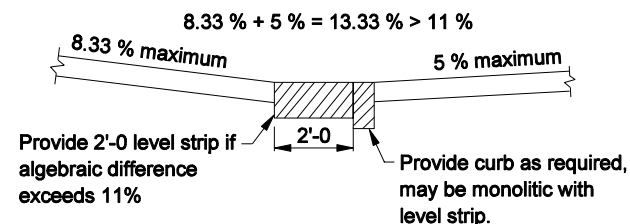
INDIANA DEPARTMENT OF TRANSPORTATION	
LOCATION PLAN FOR SIDEWALK CURB RAMPS	
SEPTEMBER 2005	
STANDARD DRAWING NO. E 604-SWCR-01	
	/s/ Richard L. VanCleave 9-01-05 DESIGN STANDARDS ENGINEER DATE
	/s/ Richard K. Smutzer 9-01-05 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	

GENERAL NOTES :

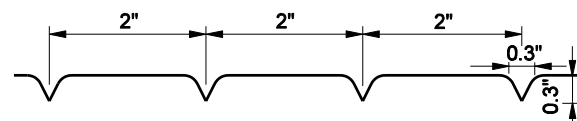
- 1 These dimensions are based on a 6 in. curb height. They shall be proportionally adjusted for other curb heights.
- 2 Where site infeasibility precludes construction to the width shown, such width may be decreased to a minimum of 3'-0.
- 3 The bottom edge of the curb ramp shall be flush with the edge of adjacent pavement and gutter line.
- 4 Landing areas at the top of curb ramps shall have maximum cross slope of 50 : 1 in any direction. When site infeasibility precludes a landing slope of 50 : 1 in any direction, the slope perpendicular to the curb face shall not exceed 50 : 1.
- 5 If site infeasibility precludes construction to the width shown, the landing width may be decreased to 3'-0 minimum. The running slope of the curb ramp may be steepened to a maximum of 10 : 1 for a maximum 6 in. rise.
- 6 Drainage inlets should be located uphill from curb ramps to prevent puddles at the path of travel.
7. See Standard Drawing E 604-SWCR-12 for improved access on narrow sidewalks.
8. Algebraic difference in grade between the base of curb ramp and the gutter shall be limited to less than 11%. If it is not practical, a 2'-0 wide level strip shall be provided. See detail sketch.
9. Minimum recommended width of curb ramp is 4'-0.



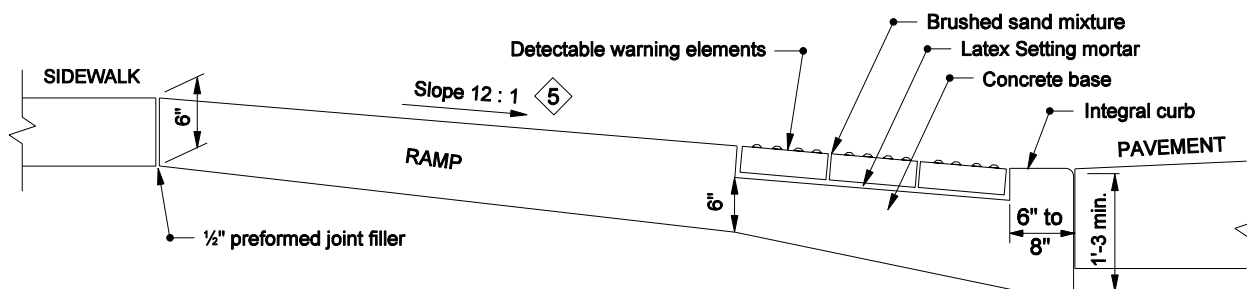
**TRUNCATED DOMES USED
IN DETECTABLE WARNINGS**



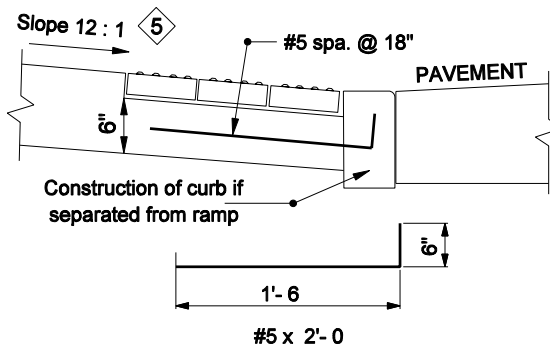
CHANGE OF GRADE



DETAIL OF RAMP GROOVES

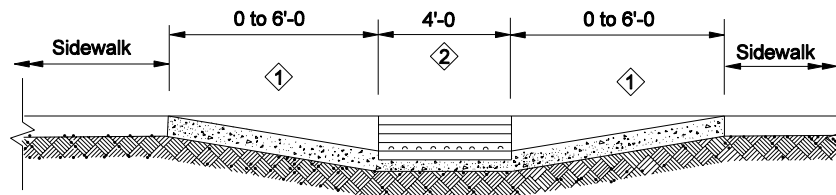
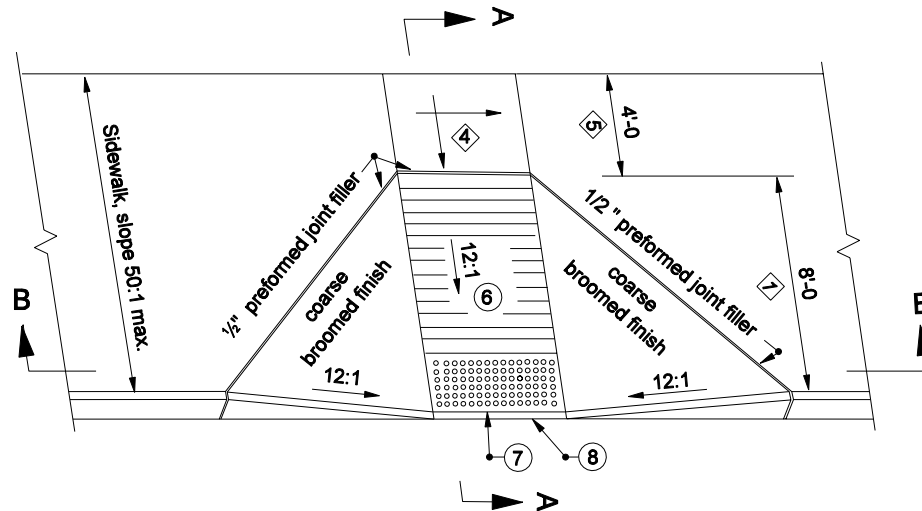


RAMP AND BRICK SURFACE CONSTRUCTION DETAIL

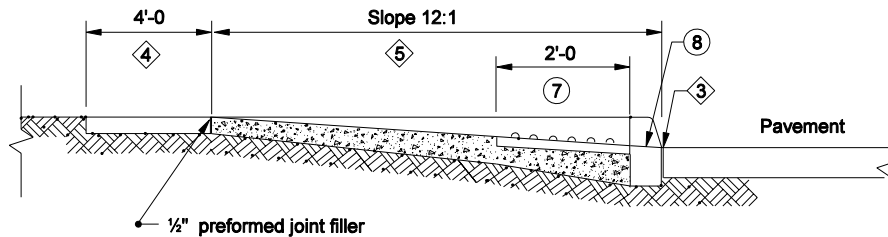


ALTERNATE CURB CONSTRUCTION

INDIANA DEPARTMENT OF TRANSPORTATION	
SIDEWALK CURB RAMPS GENERAL NOTES & DETAILS	
SEPTEMBER 2005	
STANDARD DRAWING NO. E 604-SWCR-02	
	/s/ Richard L. VanCleave 9-01-05 DESIGN STANDARDS ENGINEER DATE
	/s/ Richard K. Smutzer 9-01-05 CHIEF HIGHWAY ENGINEER DATE



SECTION B-B



SECTION A-A

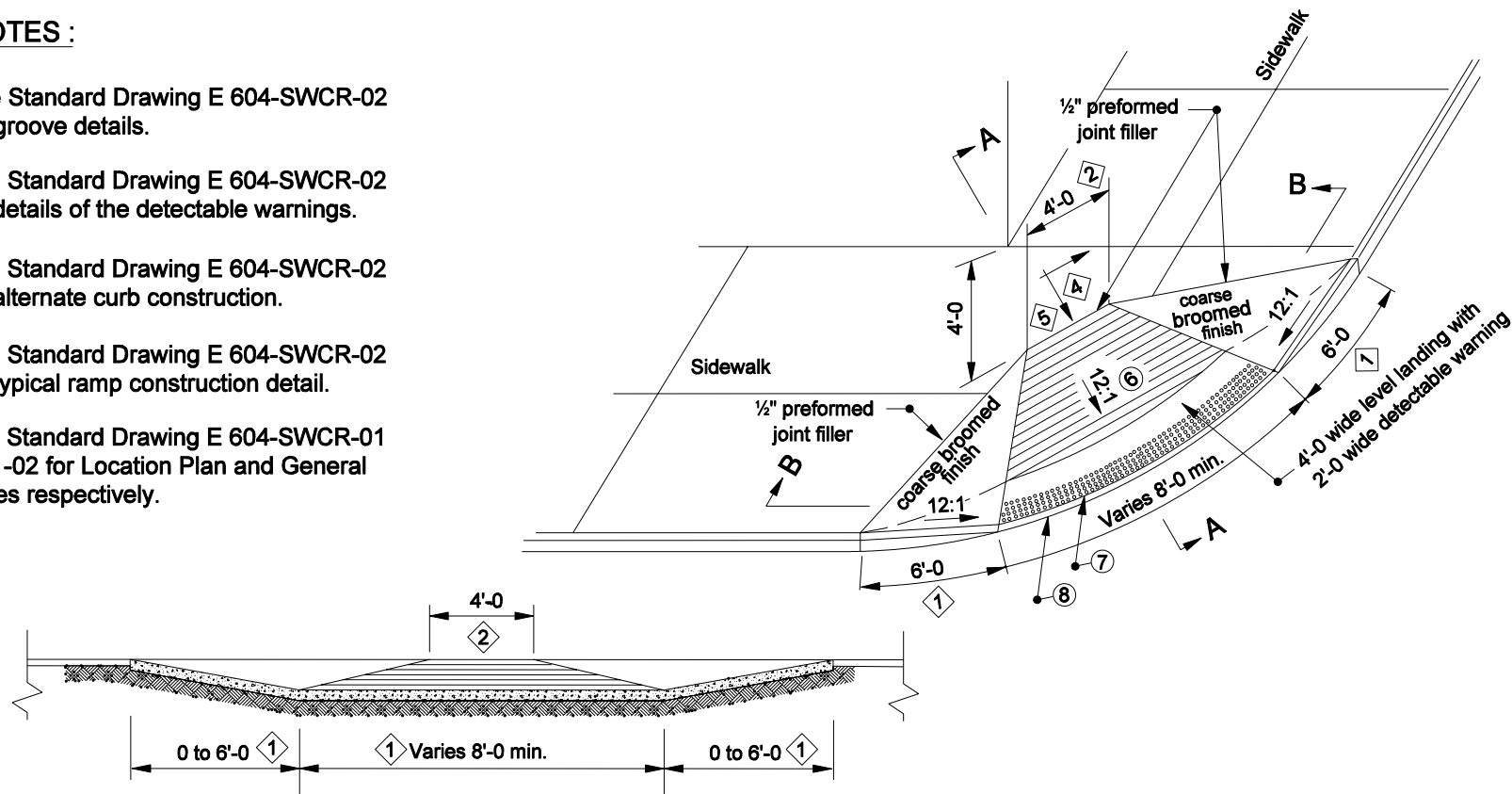
NOTES :

- ⑥ See Standard Drawing E 604-SWCR-02 for groove details.
- ⑦ See Standard Drawing E 604-SWCR-02 for details of the detectable warning.
- ⑧ See Standard Drawing E 604-SWCR-02 for alternate curb construction.
10. See Standard Drawing E 604-SWCR-01 and -02 for Location Plan and General Notes respectively.
11. See Standard Drawing E 604-SWCR-02 for typical ramp construction detail.

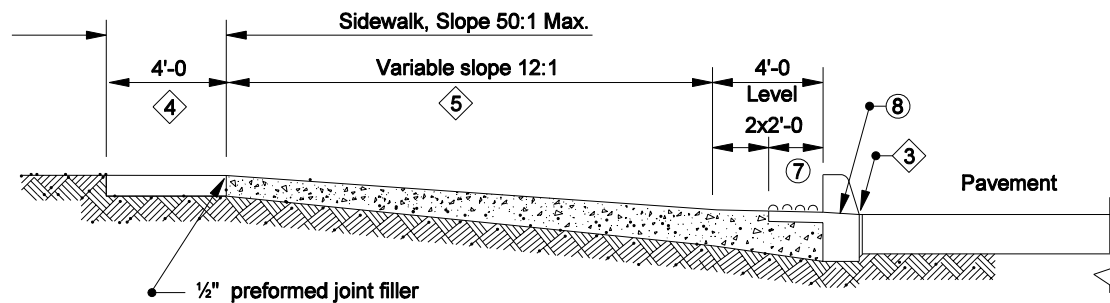
INDIANA DEPARTMENT OF TRANSPORTATION	
SIDEWALK CURB RAMP TYPE A	
SEPTEMBER 2005	
STANDARD DRAWING NO. E 604-SWCR-03	
	/s/ Richard L. VanCleave 9-01-05 DESIGN STANDARDS ENGINEER DATE
	/s/ Richard K. Smutzer 9-01-05 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	

NOTES :

- ⑥ See Standard Drawing E 604-SWCR-02 for groove details.
- ⑦ See Standard Drawing E 604-SWCR-02 for details of the detectable warnings.
- ⑧ See Standard Drawing E 604-SWCR-02 for alternate curb construction.
9. See Standard Drawing E 604-SWCR-02 for typical ramp construction detail.
10. See Standard Drawing E 604-SWCR-01 and -02 for Location Plan and General Notes respectively.

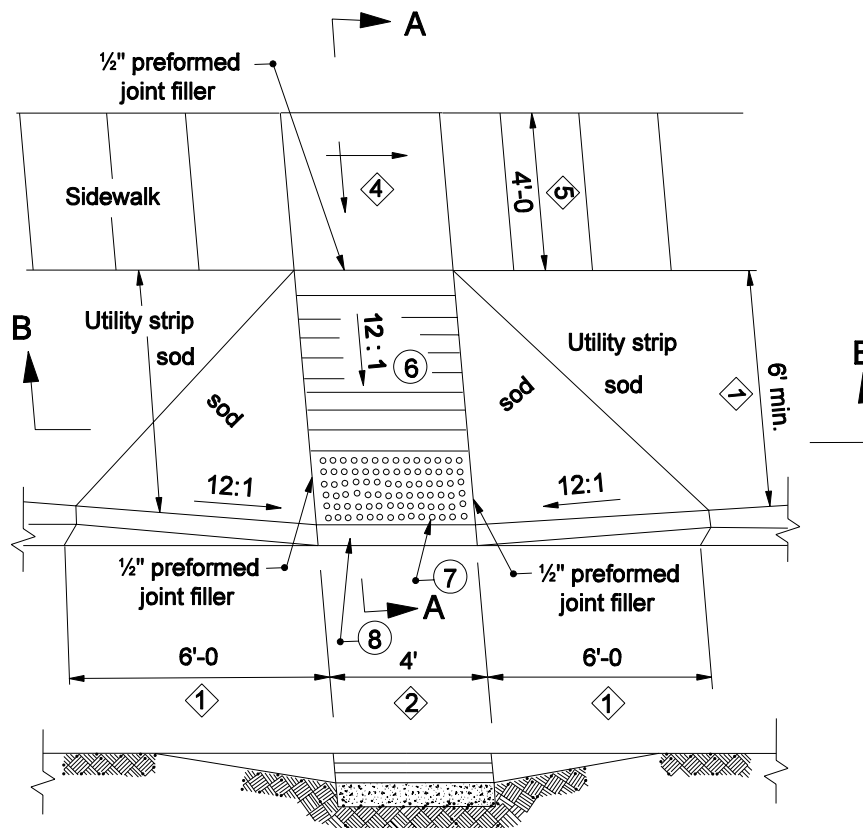


SECTION B-B

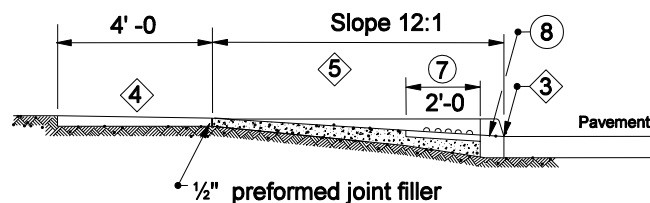


SECTION A-A

INDIANA DEPARTMENT OF TRANSPORTATION											
SIDEWALK CURB RAMP TYPE B SEPTEMBER 2005 STANDARD DRAWING NO. E 604-SWCR-04											
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<i>/s/ Richard L. VanCleave</i>	<i>9-01-05</i>										
DESIGN STANDARDS ENGINEER	DATE										
<i>/s/ Richard K. Smutzer</i>	<i>9-01-05</i>										
CHIEF HIGHWAY ENGINEER	DATE										
DESIGN STANDARDS ENGINEER											



SECTION B-B

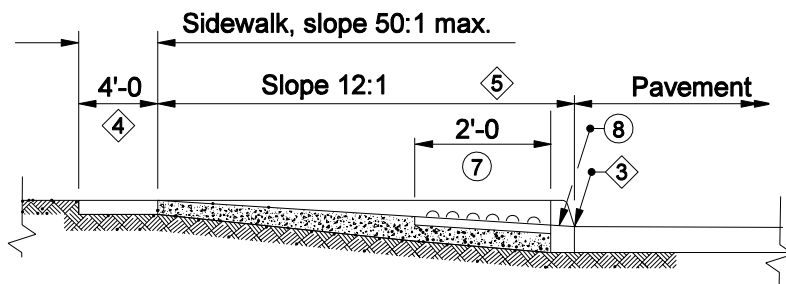
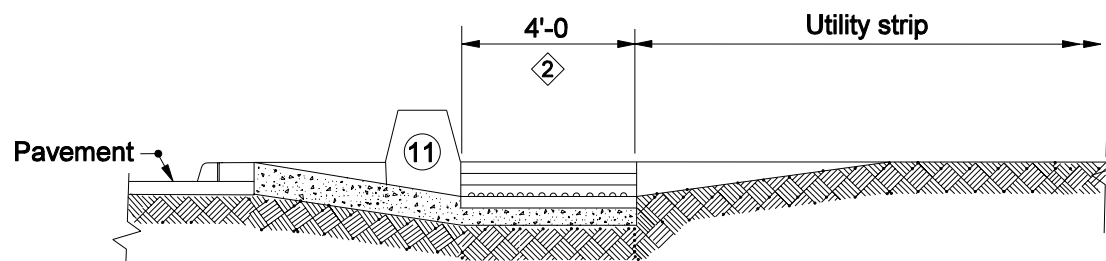


SECTION A-A

NOTES :

- ⑥ See Standard Drawing E 604-SWCR-02 for groove details.
- ⑦ See Standard Drawing E 604-SWCR-02 for details of the detectable warning surface.
- ⑧ See Standard Drawing E 604-SWCR-02 for alternate curb construction.
9. See Standard Drawing E 604-SWCR-02 for typical ramp construction detail.
10. See Standard Drawing E 604-SWCR-01 and -02 for Location Plan and General Notes respectively.

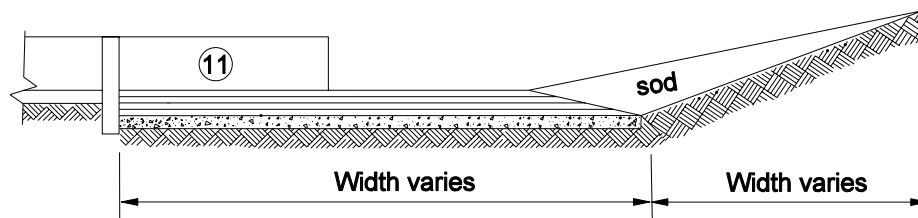
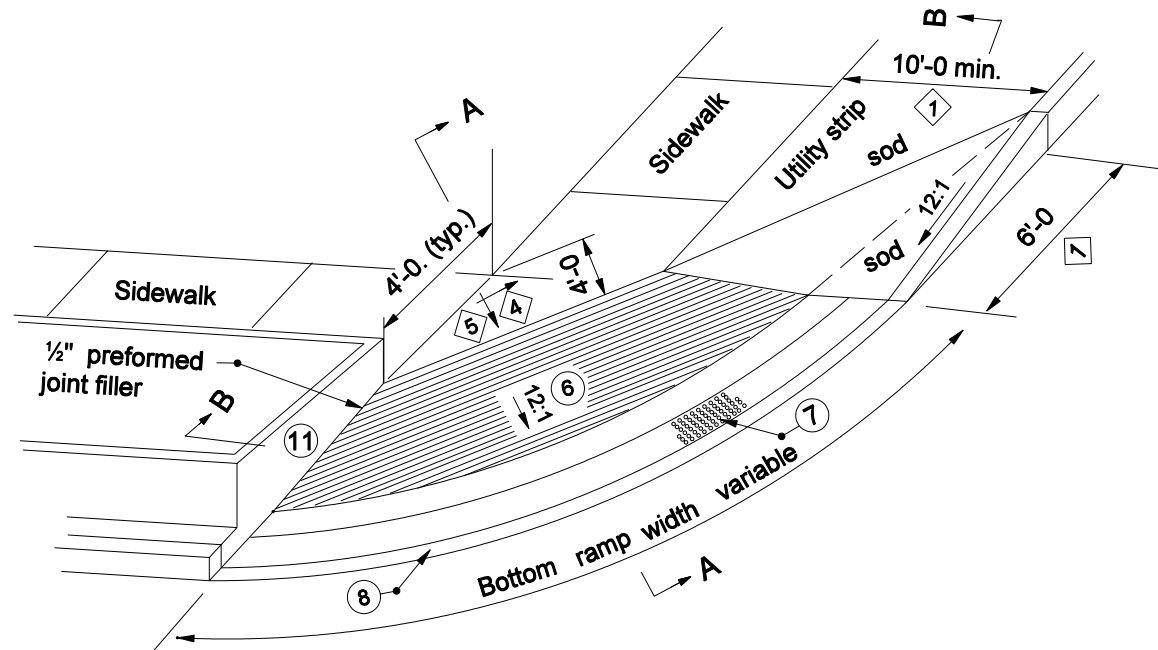
INDIANA DEPARTMENT OF TRANSPORTATION	
SIDEWALK CURB RAMPS TYPE C	
SEPTEMBER 2005	
STANDARD DRAWING NO. E 604-SWCR-05	
	/s/ Richard L. VanCleave 9-01-05 DESIGN STANDARDS ENGINEER DATE
	/s/ Richard K. Smutzer 9-01-05 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	



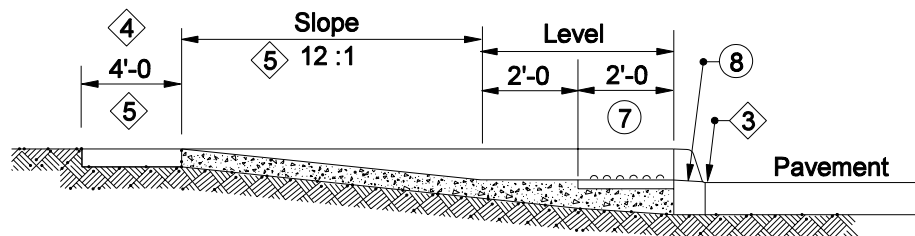
INDIANA DEPARTMENT OF TRANSPORTATION											
SIDEWALK RAMP CURB TYPE D SEPTEMBER 2005 STANDARD DRAWING NO. E 604-SWCR-06											
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<i>/s/ Richard L. VanCleave</i>	<i>9-01-05</i>										
DESIGN STANDARDS ENGINEER	DATE										
<i>/s/ Richard K. Smutzer</i>	<i>9-01-05</i>										
CHIEF HIGHWAY ENGINEER	DATE										
DESIGN STANDARDS ENGINEER											

NOTES :

- ⑥ See Standard Drawing E 604-SWCR-02 for groove details.
- ⑦ See Standard Drawing E 604-SWCR-02 for details of detectable warning surface.
- ⑧ See Standard Drawing E 604-SWCR-02 for alternate curb construction.
9. See Standard Drawing E 604-SWCR-02 for typical ramp construction detail.
10. See Standard Drawing E 604-SWCR-01 and -02 for Plan Location and General Notes respectively.
- ⑪ Street furnishing such as planter, signal base, etc.



SECTION B-B

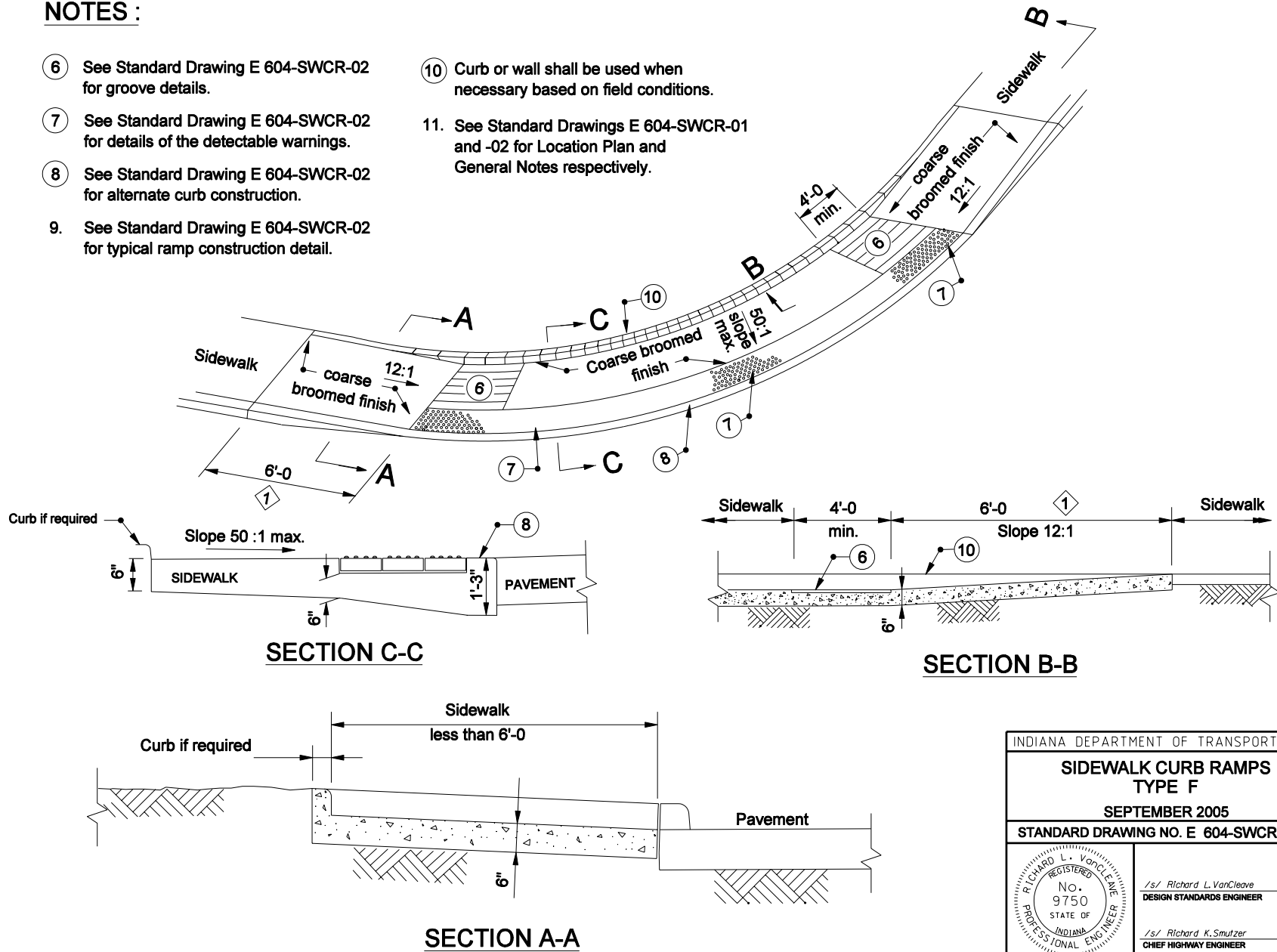


SECTION A-A

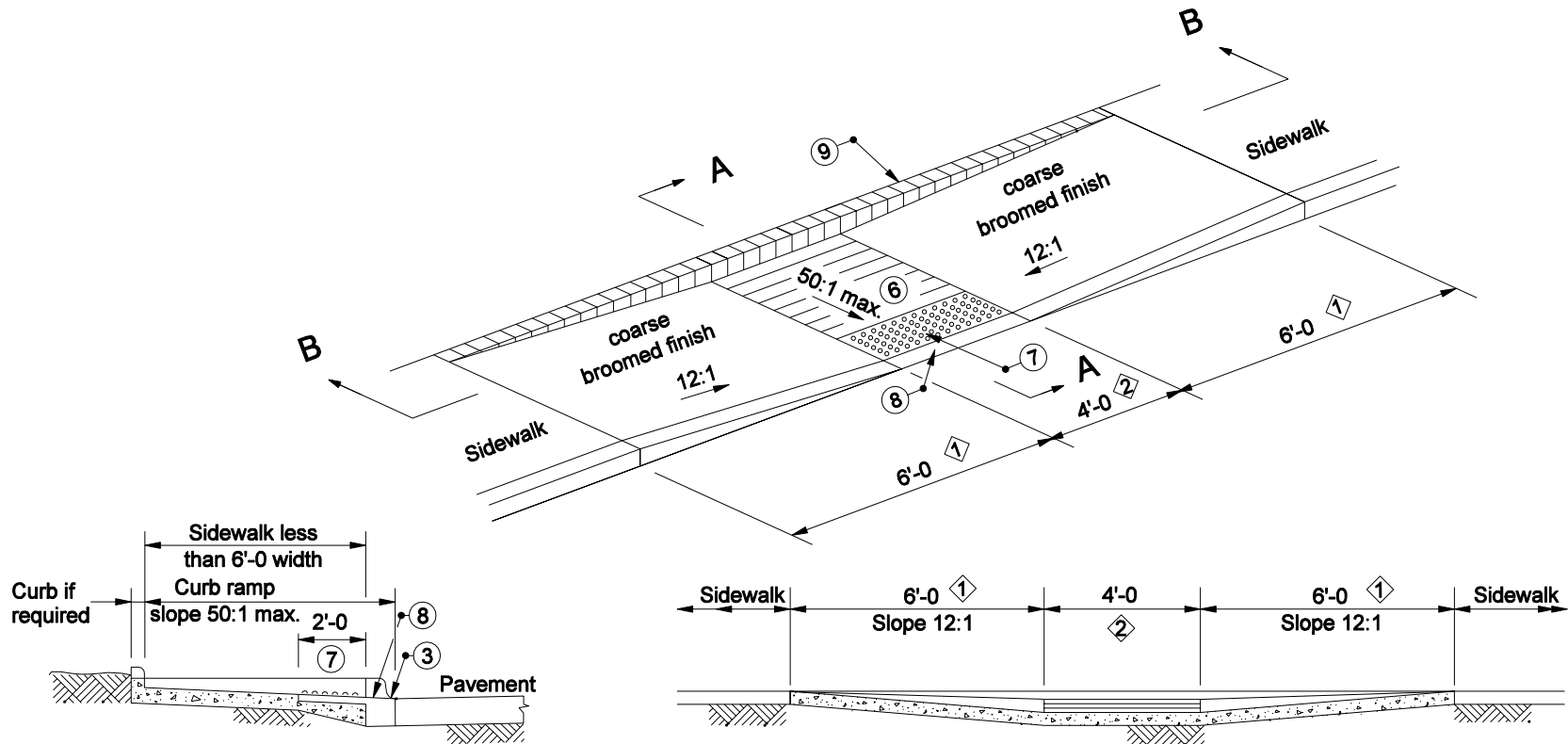
INDIANA DEPARTMENT OF TRANSPORTATION	
SIDEWALK CURB RAMPS TYPE E	
SEPTEMBER 2005	
STANDARD DRAWING NO. E 604-SWCR-07	
	/s/ Richard L. VanCleave DESIGN STANDARDS ENGINEER
	9-01-05 DATE
	/s/ Richard K. Smutzer CHIEF HIGHWAY ENGINEER
	9-01-05 DATE

NOTES :

- ⑥ See Standard Drawing E 604-SWCR-02 for groove details.
- ⑦ See Standard Drawing E 604-SWCR-02 for details of the detectable warnings.
- ⑧ See Standard Drawing E 604-SWCR-02 for alternate curb construction.
- 9. See Standard Drawing E 604-SWCR-02 for typical ramp construction detail.
- ⑩ Curb or wall shall be used when necessary based on field conditions.
- 11. See Standard Drawings E 604-SWCR-01 and -02 for Location Plan and General Notes respectively.



INDIANA DEPARTMENT OF TRANSPORTATION	
SIDEWALK CURB RAMPS TYPE F	
SEPTEMBER 2005	
STANDARD DRAWING NO. E 604-SWCR-08	
	/s/ Richard L. VanCleave 9-01-05 DESIGN STANDARDS ENGINEER DATE
	/s/ Richard K. Smutzer 9-01-05 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	



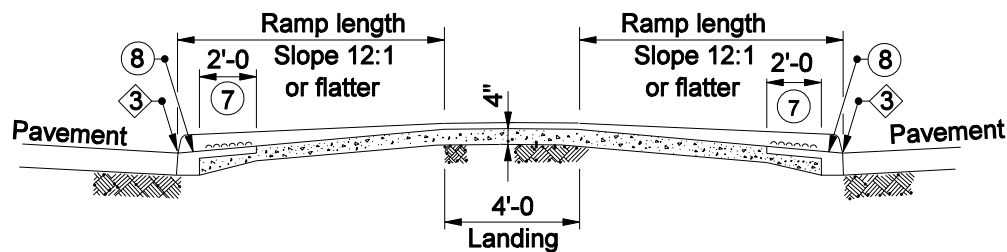
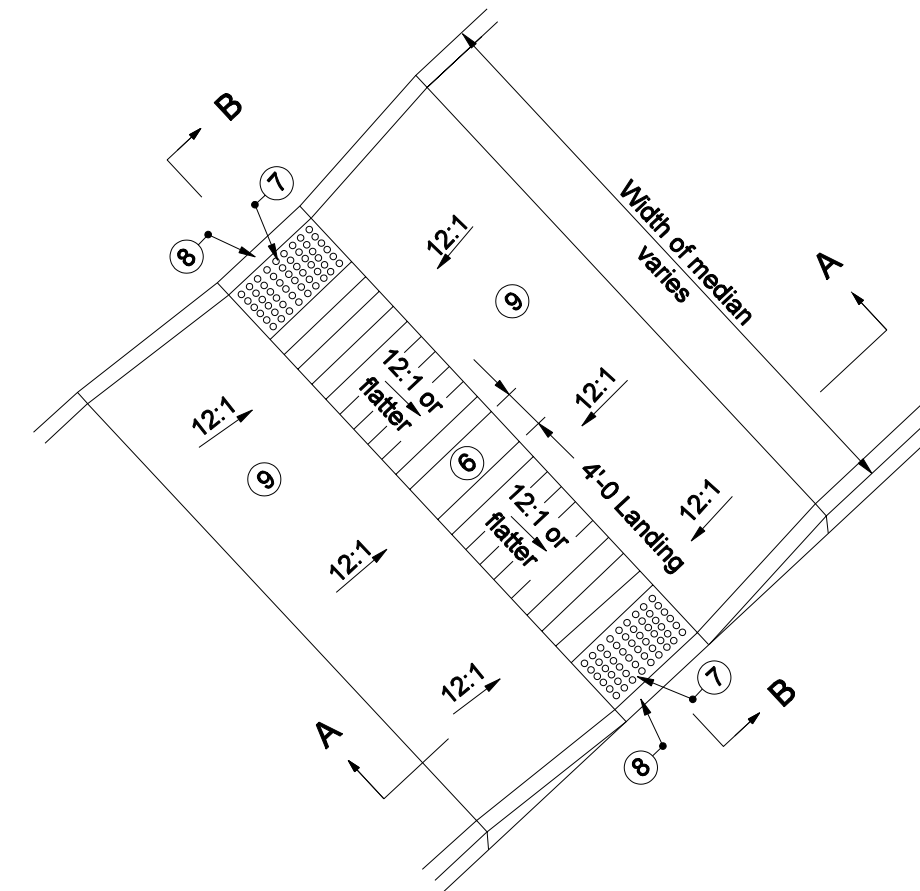
SECTION A-A

SECTION B-B

NOTES :

- ⑥ See Standard Drawing E 604-SWCR-02 for groove details.
- ⑦ See Standard Drawing E 604-SWCR-02 for details of detectable warnings surface.
- ⑧ See Standard Drawing E 604-SWCR-02 for alternate curb construction.
- ⑨ Curb optional. Shall be used when necessary based on field conditions.
- 10. See Standard Drawing E 604-SWCR-02 for typical ramp construction detail.
- 11. See Standard Drawing E 604-SWCR-01 and -02 for Location Plan and General Notes respectively.

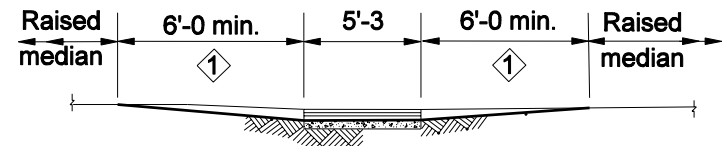
INDIANA DEPARTMENT OF TRANSPORTATION	
SIDEWALK CURB RAMP TYPE K	
SEPTEMBER 2005	
STANDARD DRAWING NO. E 604-SWCR-10	
	/s/ Richard L. VanCleave 9-01-05 DESIGN STANDARDS ENGINEER DATE
	/s/ Richard K. Smutzer 9-01-05 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	



SECTION B-B

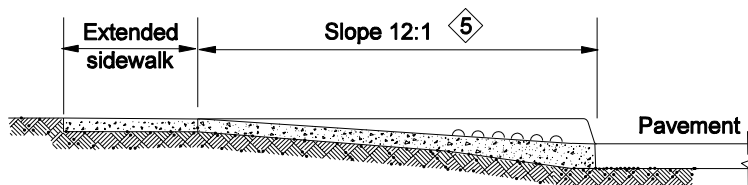
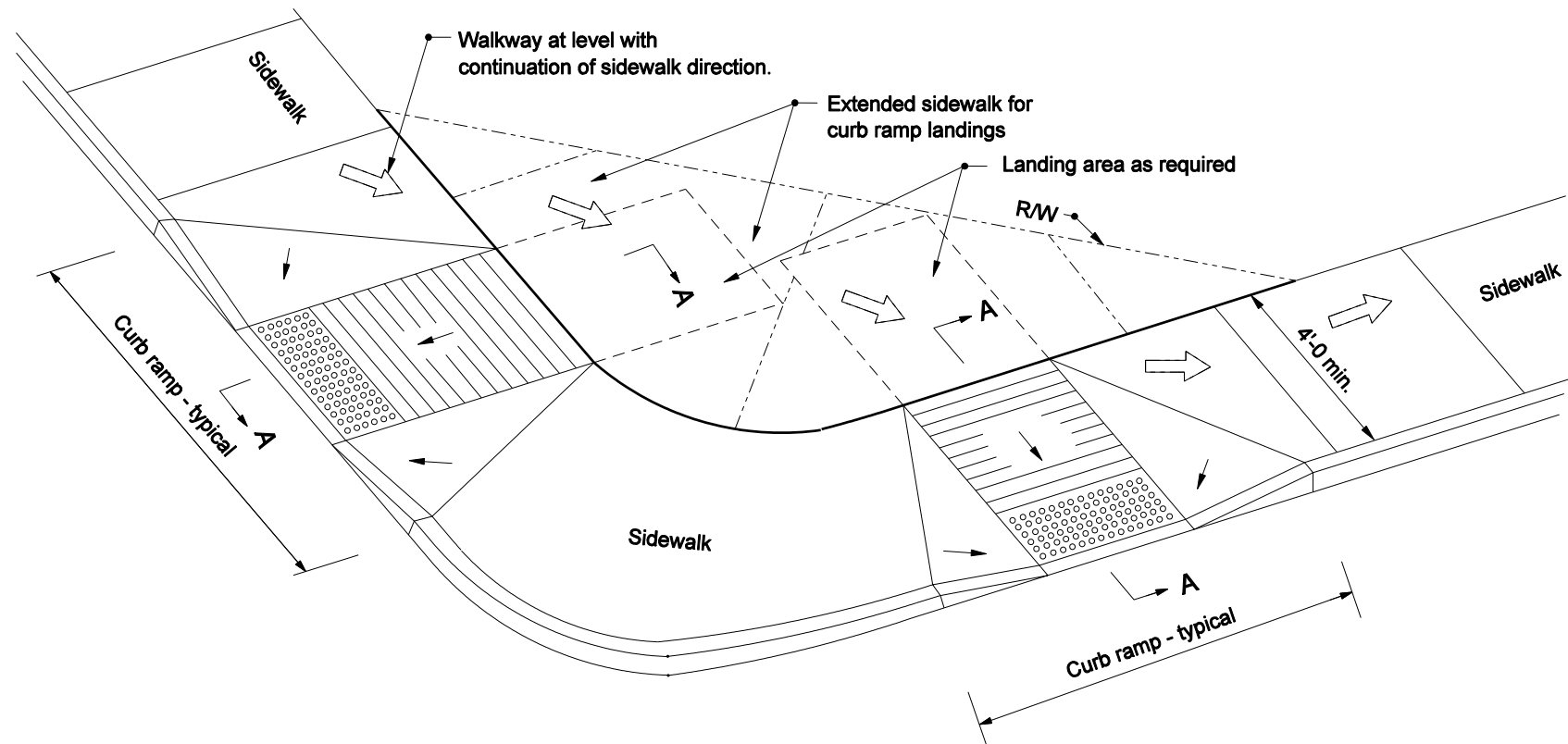
NOTES :

- ⑥ See Standard Drawing E 604-SWCR-02 for groove details.
- ⑦ See Standard Drawing E 604-SWCR-02 for details of the detectable warnings.
- ⑧ See Standard Drawing E 604-SWCR-02 for alternate curb construction.
- ⑨ Match material in place or in plans for median.
- 10. See Standard Drawing E 604-SWCR-02 for typical ramp construction details.
- 11. See Standard Drawing E 604-SWCR-01 and -02 for Location Plan and General Notes respectively.
- 12. Ramp cross slope 50:1 desirable or match grade of roadway.
- 13. Detectable warnings are not required where the roadway crossing is controlled by traffic signals timed to provide full width street crossing by pedestrians.



SECTION A-A

INDIANA DEPARTMENT OF TRANSPORTATION	
SIDEWALK CURB RAMPS TYPE L	
SEPTEMBER 2005	
STANDARD DRAWING NO. E 604-SWCR-11	
	/s/ Richard L. VanCleave DESIGN STANDARDS ENGINEER 9-01-05 DATE
	/s/ Richard K. Smutzer CHIEF HIGHWAY ENGINEER 9-01-05 DATE
DESIGN STANDARDS ENGINEER	

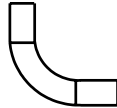


NOTES :

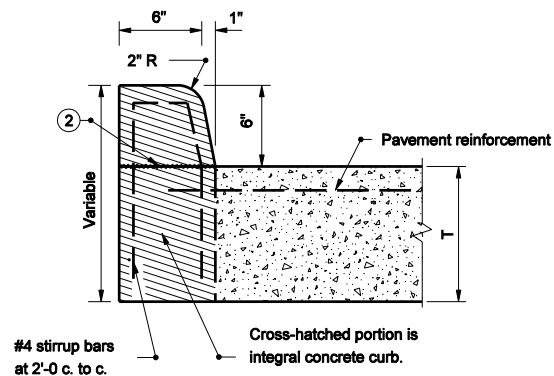
1. Additional right-of-way to widen sidewalks if applicable to improve accessibility on narrow sidewalks.
2. See Standard Drawing E 604-SWCR-02 and -03 to -11 for General Notes and typical curb ramps details respectively.

INDIANA DEPARTMENT OF TRANSPORTATION	
SIDEWALK CURB RAMP'S IMPROVED ACCESS	
SEPTEMBER 2005	
STANDARD DRAWING NO. E 604-SWCR-12	
	/s/ Richard L. VanCleave DESIGN STANDARDS ENGINEER DATE 9-01-05
	/s/ Richard K. Smutzer CHIEF HIGHWAY ENGINEER DATE 9-01-05
DESIGN STANDARDS ENGINEER	

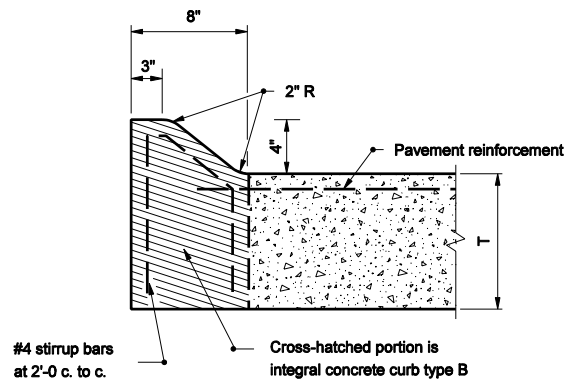
QUANTITY ESTIMATE

Curb Ramp Type	6" curb		8" curb		Pay limits diagram
	Assumptions for calculation purposes (top landing not included in area)	Area sq. yd	Assumptions for calculation purposes (top landing not included in area)	Area sq. yd	
A	10' sidewalk	7.0	12' sidewalk	11.1	
B	R = 10', 13' sidewalk	16.4	R = 10', 15' sidewalk	19.4	
	R = 26', 18' sidewalk	21.4	R = 25', 20' sidewalk	30.6	
C	6' utility strip	2.7	8' utility strip	3.5	
D	6' utility strip	2.7	8' utility strip	3.5	
E	10' utility strip on one side only, 10' radius	10.7	Not possible to construct on 10' utility strip	n / a	
F	R = 15', 4' sidewalk	14.3	R = 15', 4' sidewalk	16.1	
	R = 25', 4' sidewalk	21.6	R = 25', 4' sidewalk	23.3	
G	minimum dimensions	4.9	minimum dimensions	6.0	
H	minimum dimensions	6.3	minimum dimensions	7.7	
K	5' sidewalk	8.9	5' sidewalk	11.1	
L	16' grass median width	9.3	16' grass median width	9.3	

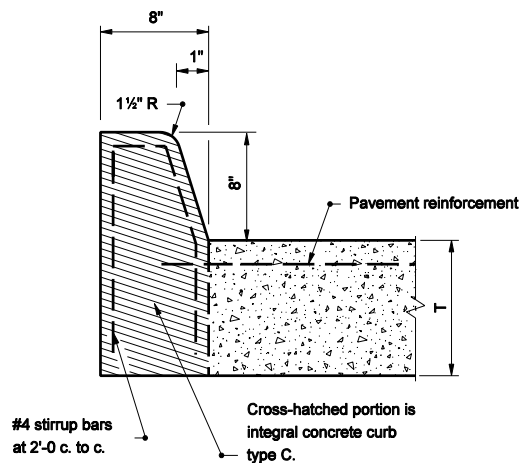
INDIANA DEPARTMENT OF TRANSPORTATION									
SIDEWALK CURB RAMPS QUANTITY ESTIMATE									
SEPTEMBER 2005									
STANDARD DRAWING NO. E 604-SWCR-13									
	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-bottom: 1px solid black; width: 80%;">/s/ Richard L. VanCleave</td> <td style="border-bottom: 1px solid black; width: 20%;">9-01-05</td> </tr> <tr> <td style="font-size: small;">DESIGN STANDARDS ENGINEER</td> <td style="font-size: small;">DATE</td> </tr> <tr> <td style="border-bottom: 1px solid black;">/s/ Richard K. Smutzer</td> <td style="border-bottom: 1px solid black;">9-01-05</td> </tr> <tr> <td style="font-size: small;">CHIEF HIGHWAY ENGINEER</td> <td style="font-size: small;">DATE</td> </tr> </table>	/s/ Richard L. VanCleave	9-01-05	DESIGN STANDARDS ENGINEER	DATE	/s/ Richard K. Smutzer	9-01-05	CHIEF HIGHWAY ENGINEER	DATE
/s/ Richard L. VanCleave	9-01-05								
DESIGN STANDARDS ENGINEER	DATE								
/s/ Richard K. Smutzer	9-01-05								
CHIEF HIGHWAY ENGINEER	DATE								
DESIGN STANDARDS ENGINEER									



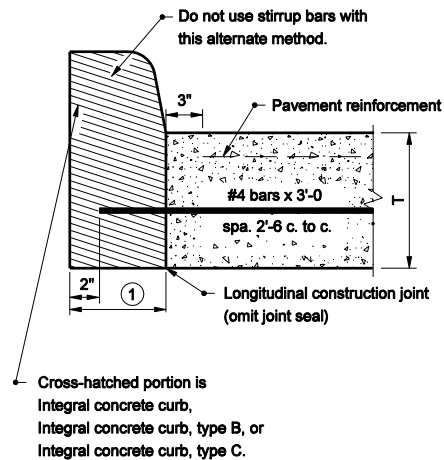
**INTEGRAL CONCRETE CURB
(BARRIER)**



**INTEGRAL CONCRETE CURB
TYPE B
(MOUNTABLE)**



**INTEGRAL CONCRETE CURB
TYPE C
(BARRIER)**



**ALTERNATE METHOD
OF CONSTRUCTION FOR ALL TYPES
OF INTEGRAL CONCRETE CURB**

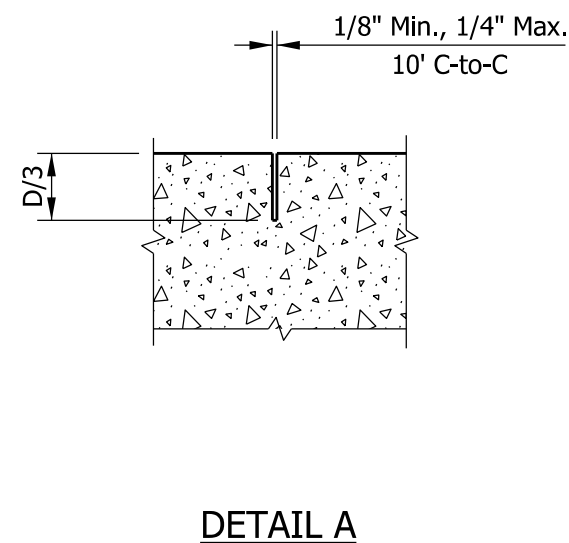
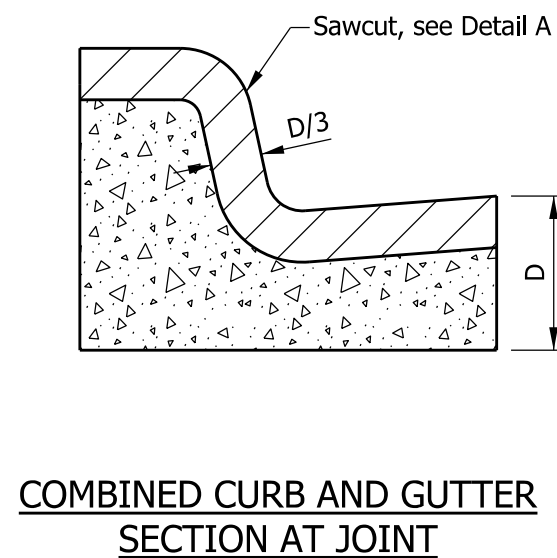
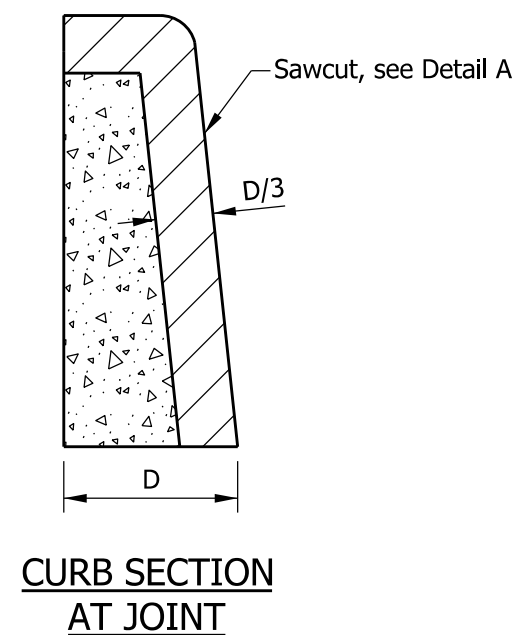
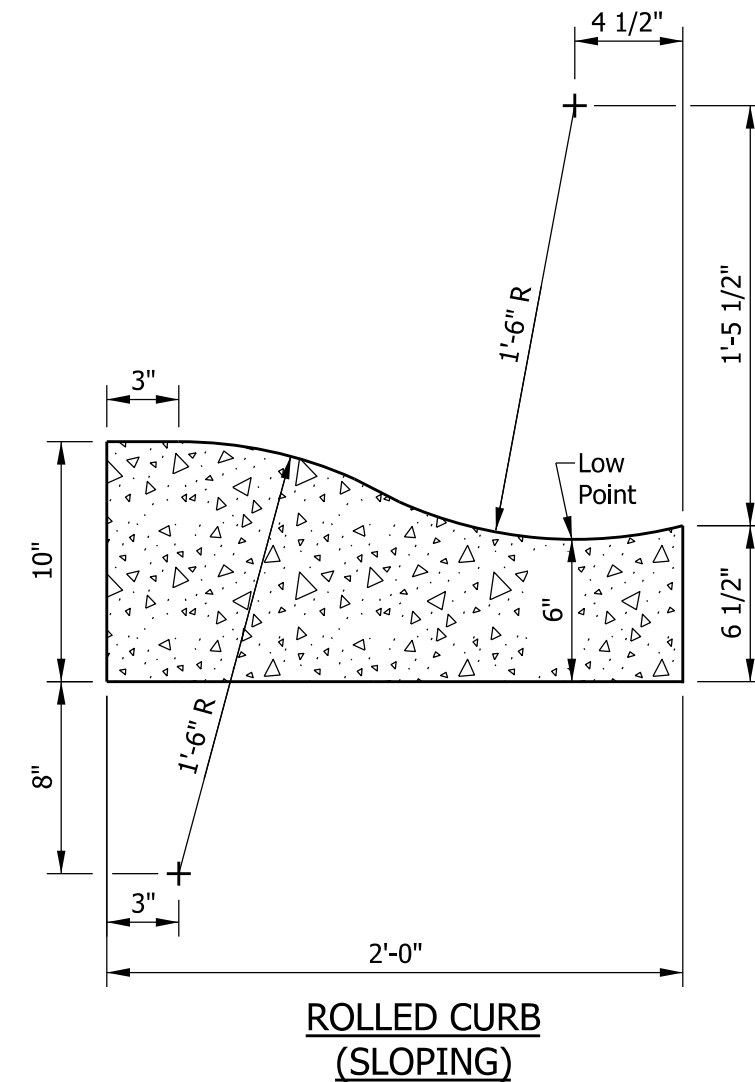
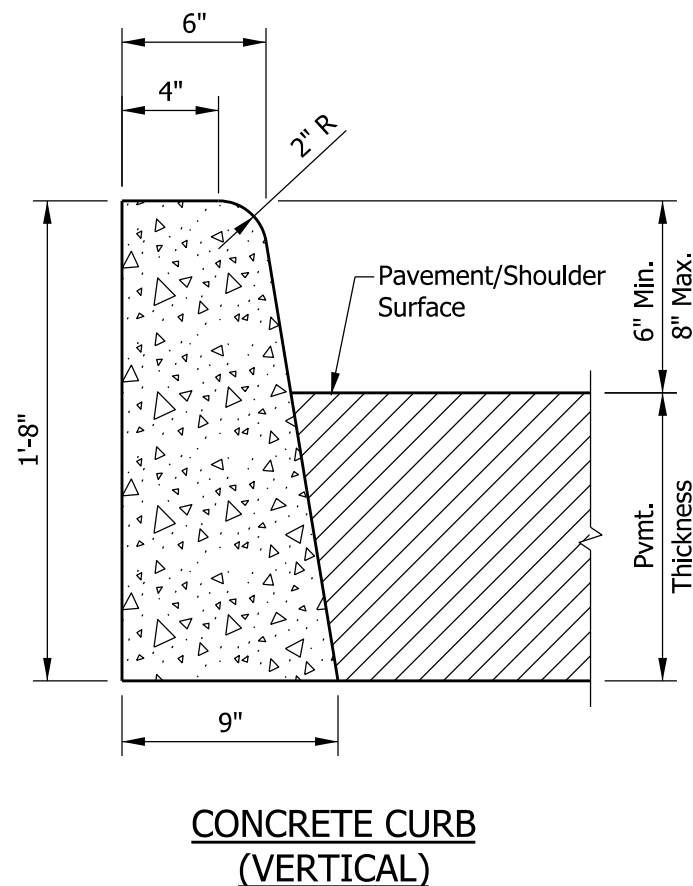
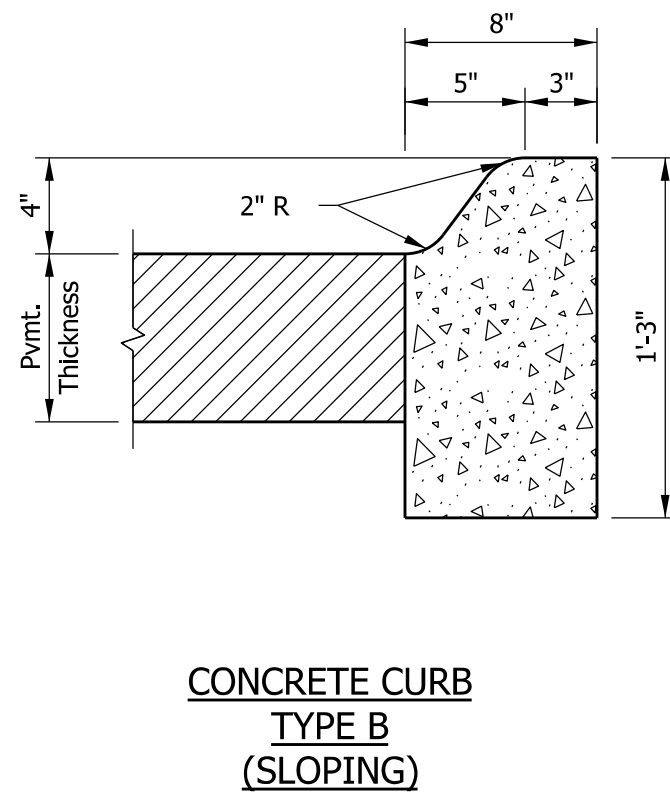
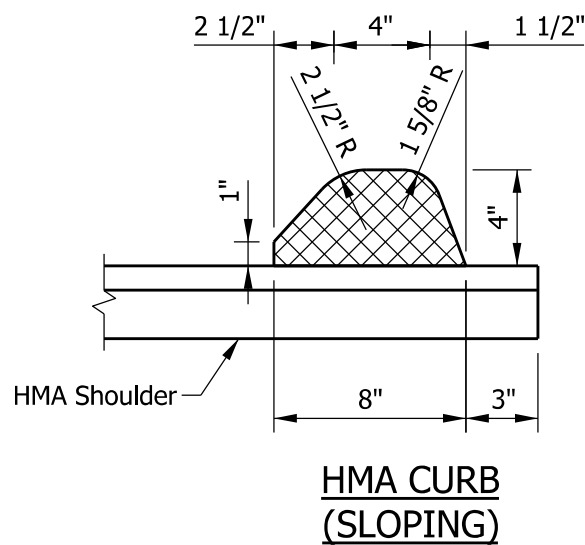
NOTES

- ① 8" for integral concrete curb type B or C and 7" for integral concrete curb.
- ② Concrete below this line may be poured with the pavement.

LEGEND

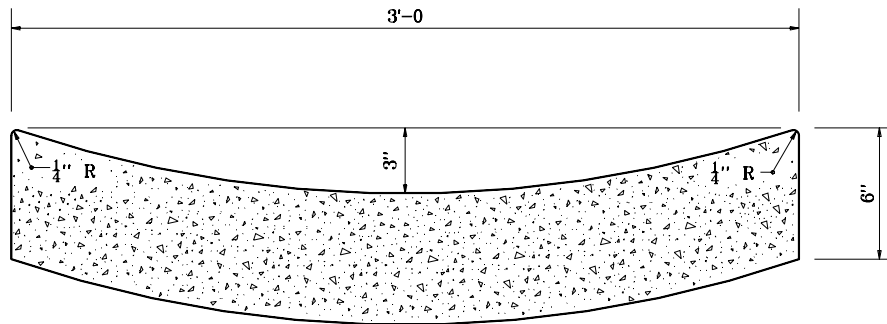
T = Nominal pavement thickness

INDIANA DEPARTMENT OF TRANSPORTATION	
INTEGRAL CONCRETE CURB	
SEPTEMBER 2004	
STANDARD DRAWING NO. E 605-CCIN-01	
	/s/ Richard L. VanCleave 9-01-04 DESIGN STANDARDS ENGINEER DATE
	/s/ Richard K. Smutzer 9-01-04 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	



SAWED CONTRACTION JOINTS FOR CURB AND COMBINED CURB & GUTTER

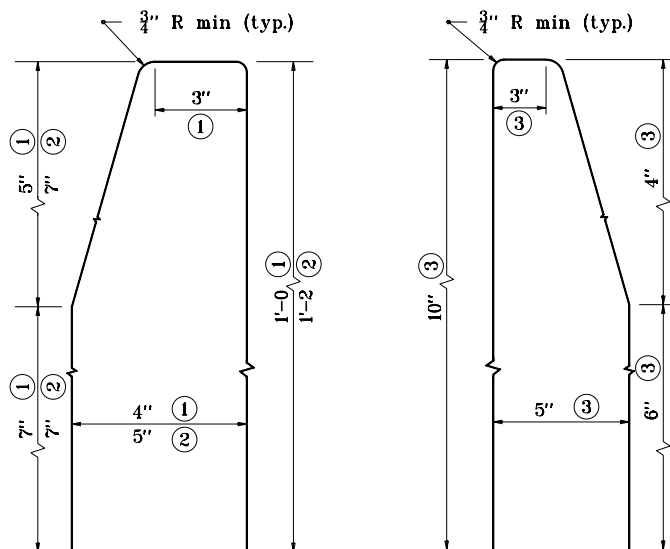
INDIANA DEPARTMENT OF TRANSPORTATION			
CONCRETE AND HMA CURBS AND SAWED JOINTS			
SEPTEMBER 2014			
STANDARD DRAWING NO.		E-605-CCSJ-01	
	/s/ Richard L. VanCleave		06/20/13
	DESIGN STANDARDS ENGINEER		DATE
	/s/ Mark A. Miller		09/26/13
	CHIEF ENGINEER		DATE



CONCRETE GUTTER

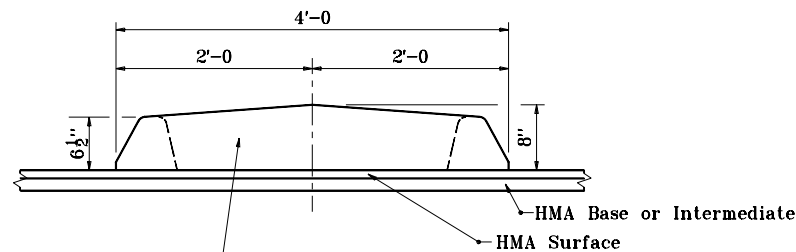
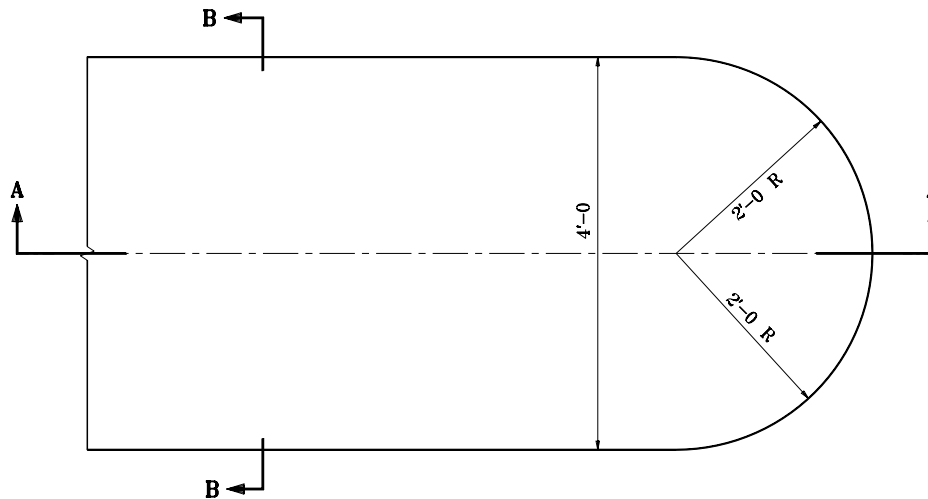
NOTES:

- ① For integral concrete curb
- ② For integral concrete curb Type C
- ③ For integral concrete curb Type B



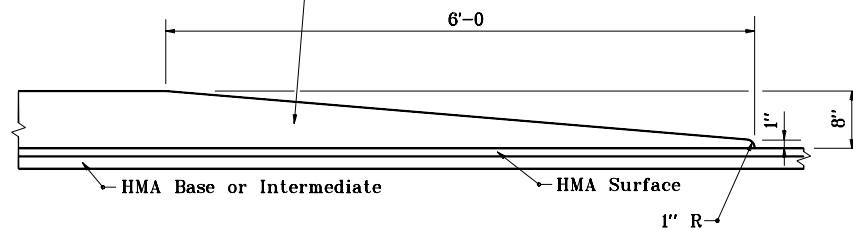
BENDING DIAGRAM FOR STIRRUPS

INDIANA DEPARTMENT OF TRANSPORTATION	
CONCRETE GUTTER AND CURB	
STIRRUP BENDING DIAGRAM	
APRIL 1995	
STANDARD DRAWING NO. E 605-CGCS-01	
	DETAILS PLACED IN THIS FORMAT 11-15-99
	/s/ Anthony L. Uremovich 11-15-99 DESIGN STANDARDS ENGINEER DATE
	/s/ Firooz Zandi 11-15-99 CHIEF HIGHWAY ENGINEER DATE
	DESIGN STANDARDS ENGINEER ORIGINALLY APPROVED 4-03-95



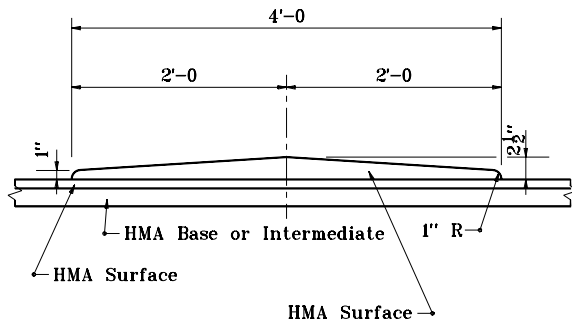
SECTION B-B

This section may be constructed as a monolithic unit or built up with an asphalt filler between two asphalt curbs.

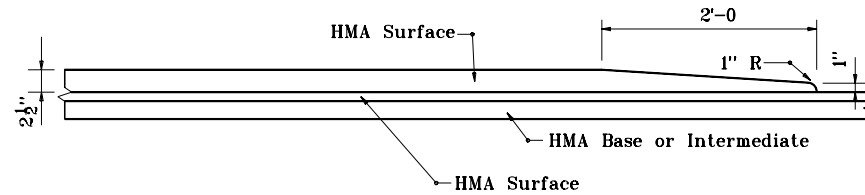


SECTION A-A

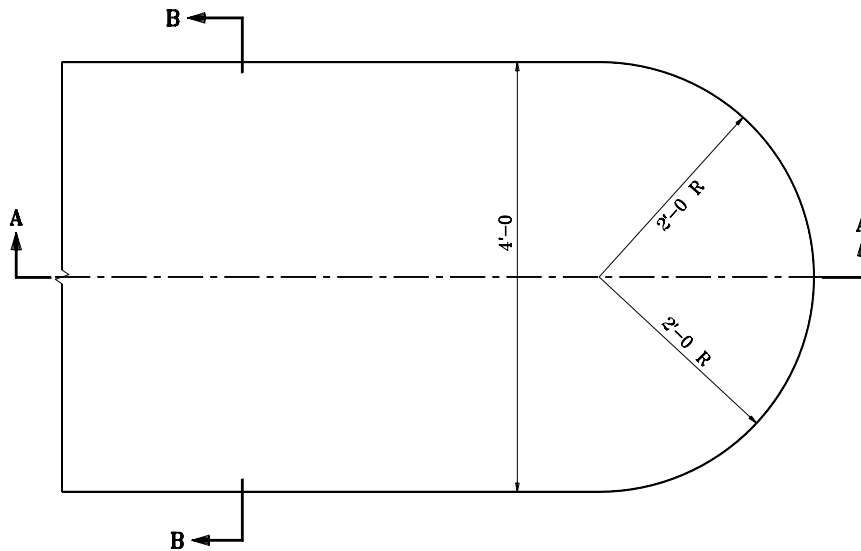
INDIANA DEPARTMENT OF TRANSPORTATION	
HMA CENTER CURB	
TYPE A	
JANUARY 2000	
STANDARD DRAWING NO. E 605-CNCB-01	
	<i>/s/ Anthony L. Uremovich</i> 1-03-00 DESIGN STANDARDS ENGINEER DATE
	<i>/s/ Firooz Zandi</i> 1-03-00 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	



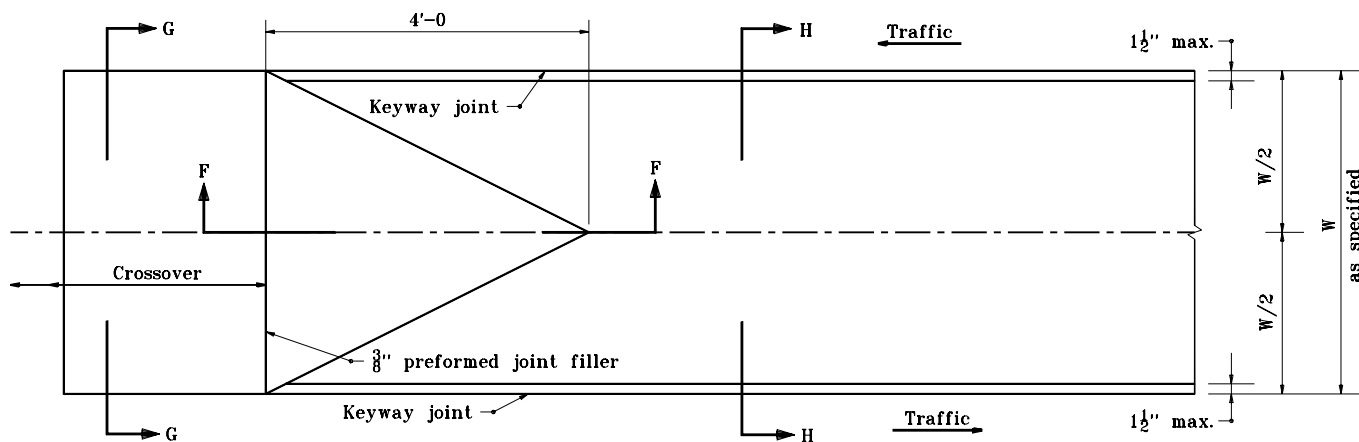
SECTION B-B



SECTION A-A



INDIANA DEPARTMENT OF TRANSPORTATION	
HMA CENTER CURB TYPE B	
JANUARY 2000	
STANDARD DRAWING NO. E 605-CNCB-02	
	/s/ Anthony L. Uremovich 1-03-00 DESIGN STANDARDS ENGINEER DATE
	/s/ Firooz Zandi 1-03-00 CHIEF HIGHWAY ENGINEER DATE



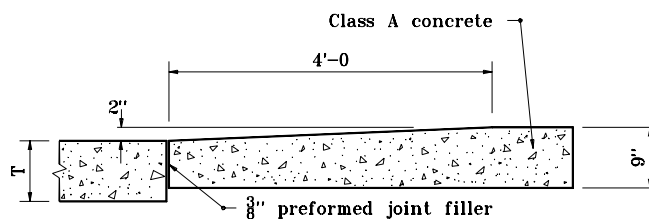
GENERAL NOTES

- ① For W greater than 4'-0 vary slope to hold 2" maximum height.

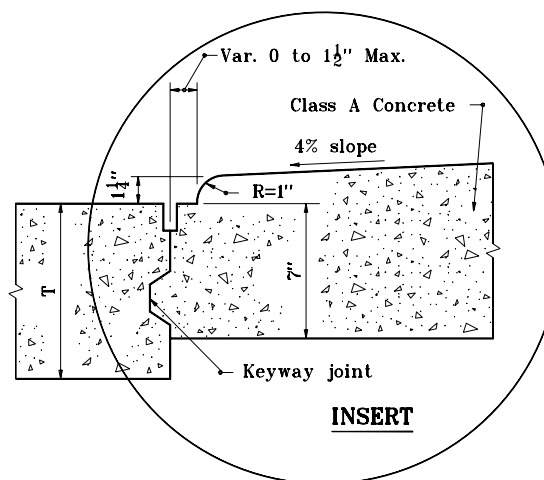
LEGEND

T = Normal pavement depth

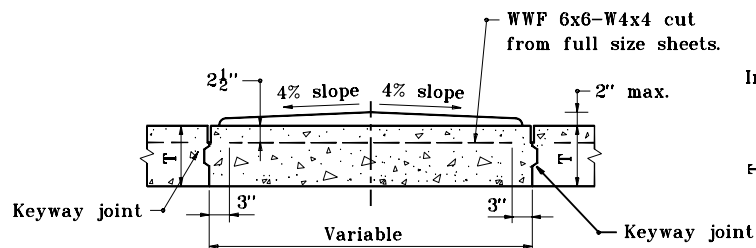
W = Center curb width



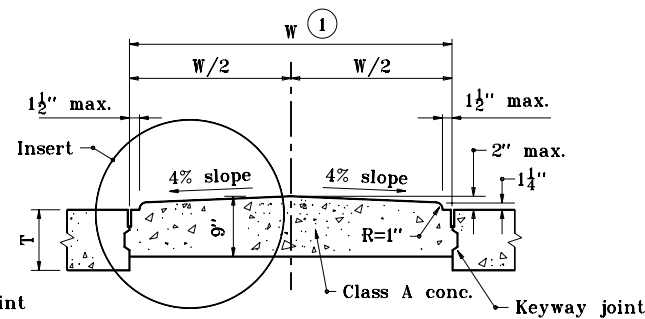
SECTION F-F



INSERT



SECTION G-G



SECTION H-H

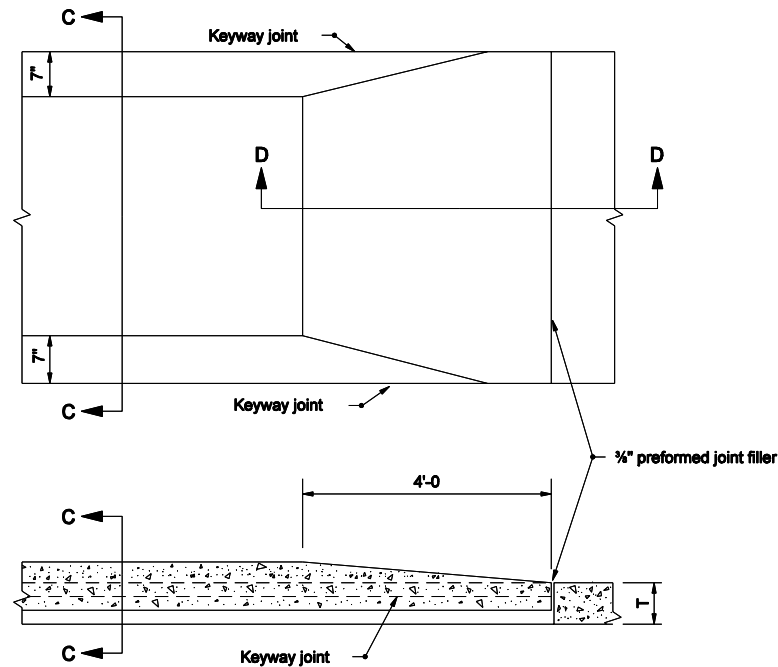
INDIANA DEPARTMENT OF TRANSPORTATION	
CONCRETE CENTER CURB	
TYPE A	
JANUARY 2001	
STANDARD DRAWING NO. E 605-CNCC-01	
	/s/ Anthony L. Uremovich 1-02-01 DESIGN STANDARDS ENGINEER DATE
	/s/ Firooz Zandi 1-02-01 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	

NOTES :

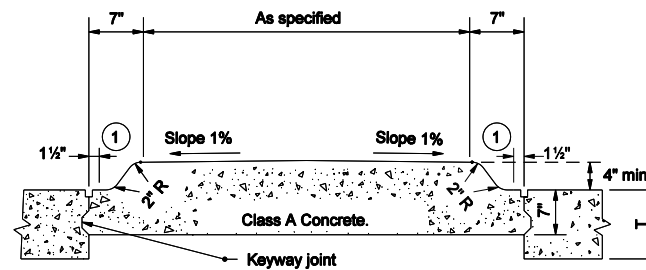
- 1 Curb radii and batter to conform to Type B curb, as shown on Standard Drawing E 605-CCSJ-01.

LEGEND

T = Normal pavement depth

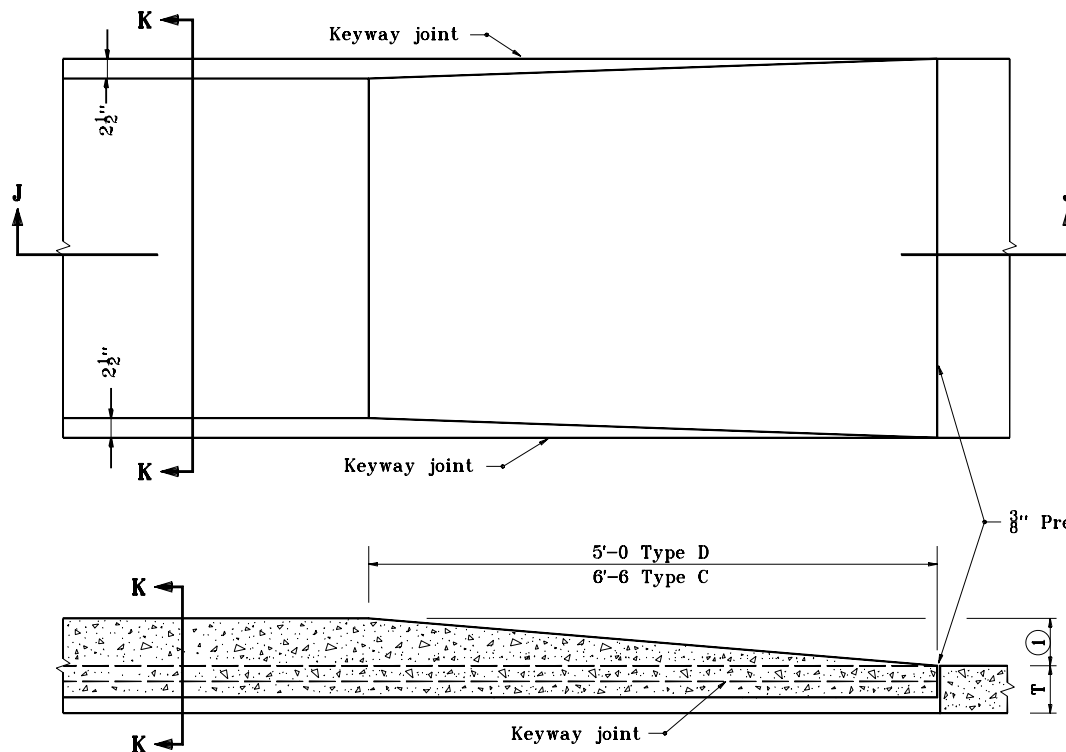


SECTION D-D



SECTION C-C

INDIANA DEPARTMENT OF TRANSPORTATION	
CONCRETE CENTER CURB TYPE B	
MARCH 2004	
STANDARD DRAWING NO. E 605-CNCC-02	
	/s/ Richard L. VanCleave 3/01/04 DESIGN STANDARDS ENGINEER DATE
	/s/ Richard K. Smutzer 3/01/04 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	



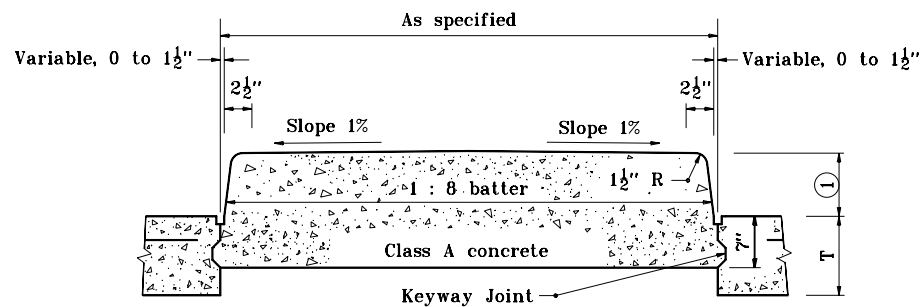
NOTES :

- ① 6" for concrete center curb, type D and 8" for concrete center curb, type C.

LEGEND

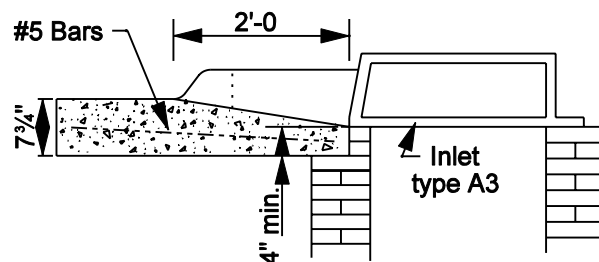
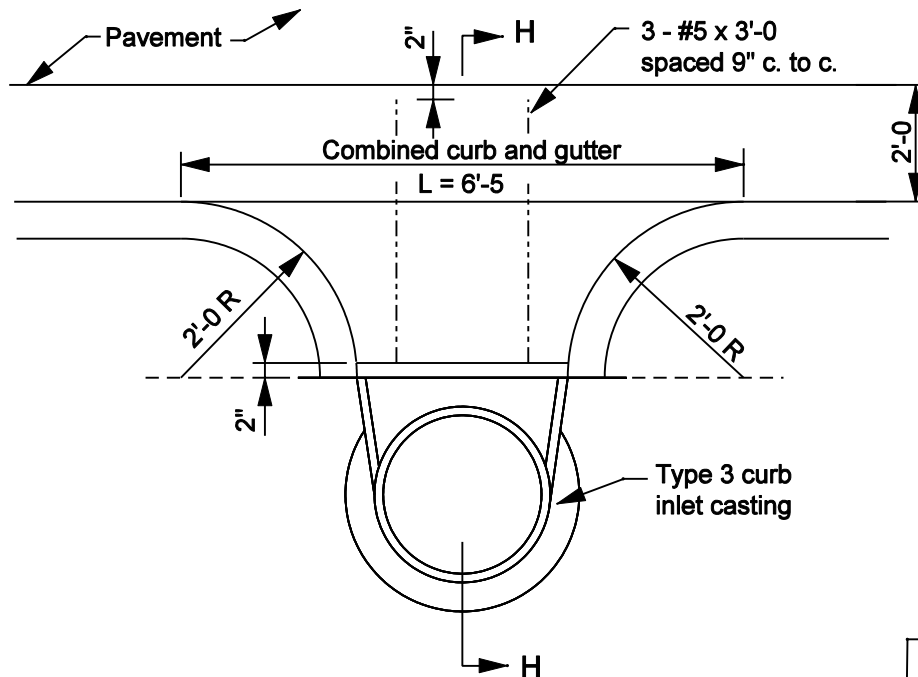
T = Normal pavement depth

SECTION J-J

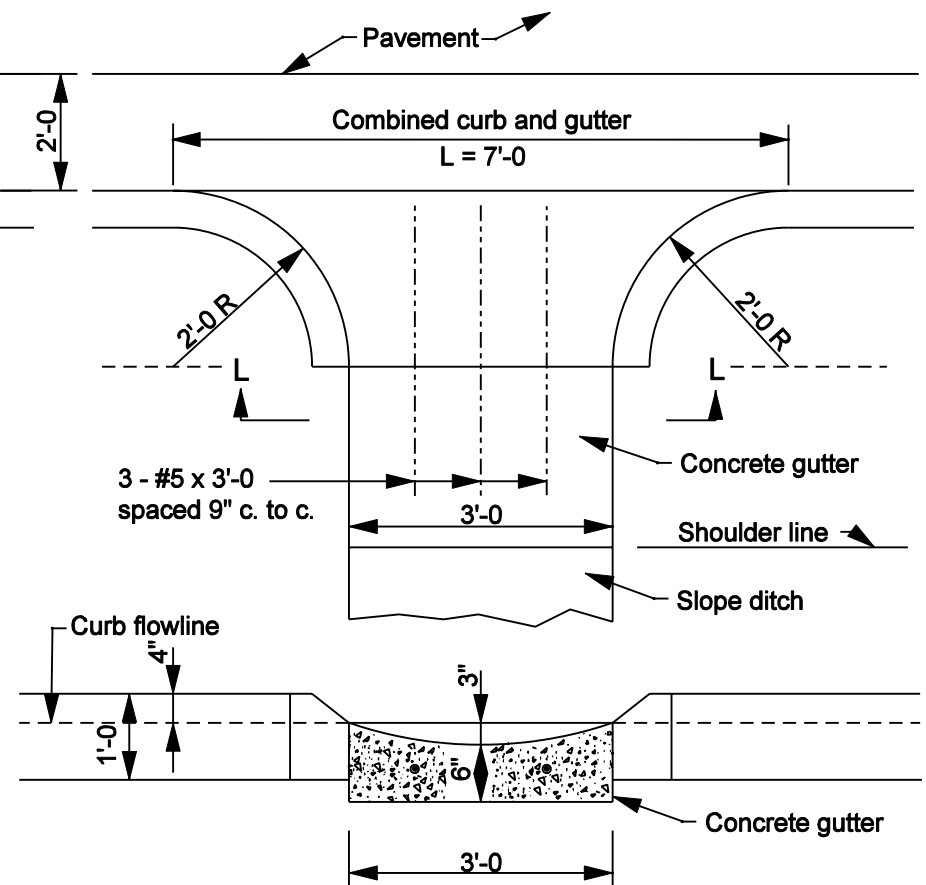


SECTION K-K

INDIANA DEPARTMENT OF TRANSPORTATION	
CONCRETE CENTER CURBS	
TYPE C & D	
APRIL 1995	
STANDARD DRAWING NO. E 605-CNCC-03	
	DETAILS PLACED IN THIS FORMAT 11-15-99 /s/ Anthony L. Uremovich 11-15-99 DESIGN STANDARDS ENGINEER DATE /s/ Firooz Zandi 11-15-99 CHIEF HIGHWAY ENGINEER DATE ORIGINALLY APPROVED 4-03-95

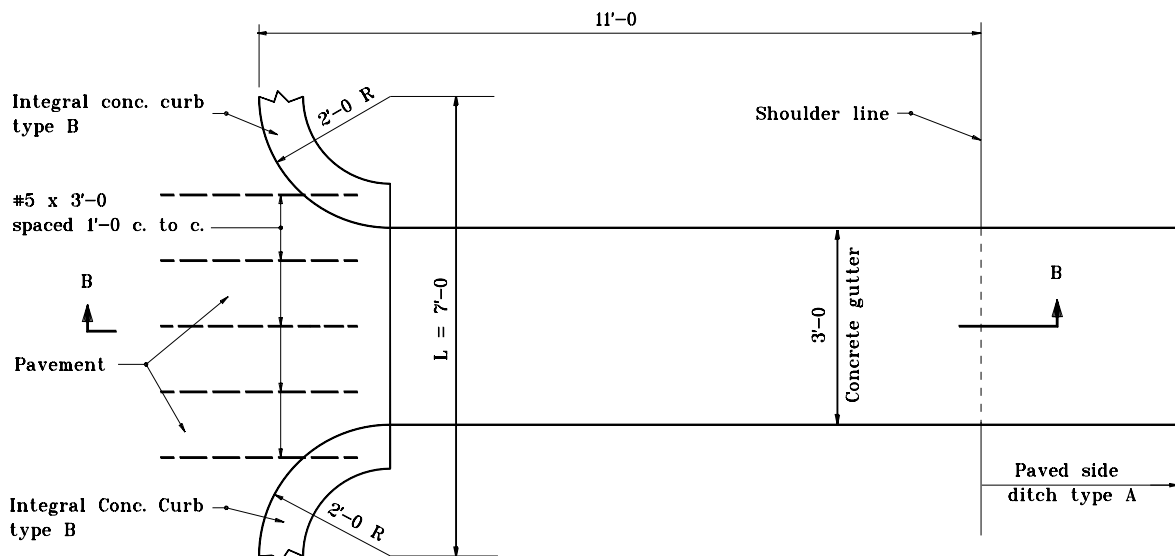


SECTION H-H



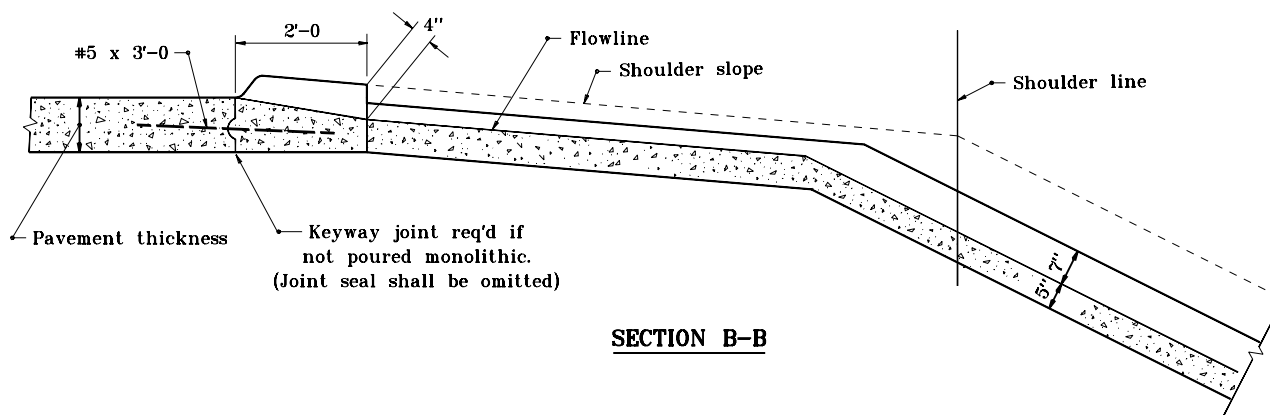
SECTION L-L

INDIANA DEPARTMENT OF TRANSPORTATION			
COMBINED CURB AND GUTTER TURNOUTS			
MARCH 2003			
STANDARD DRAWING NO. E 605-CTCG-01			
	/s/ Richard L. VanCleave	3-03-03	DATE
	DESIGN STANDARDS ENGINEER		
	/s/ Richard K. Smutzer	3-03-03	DATE
	CHIEF HIGHWAY ENGINEER		



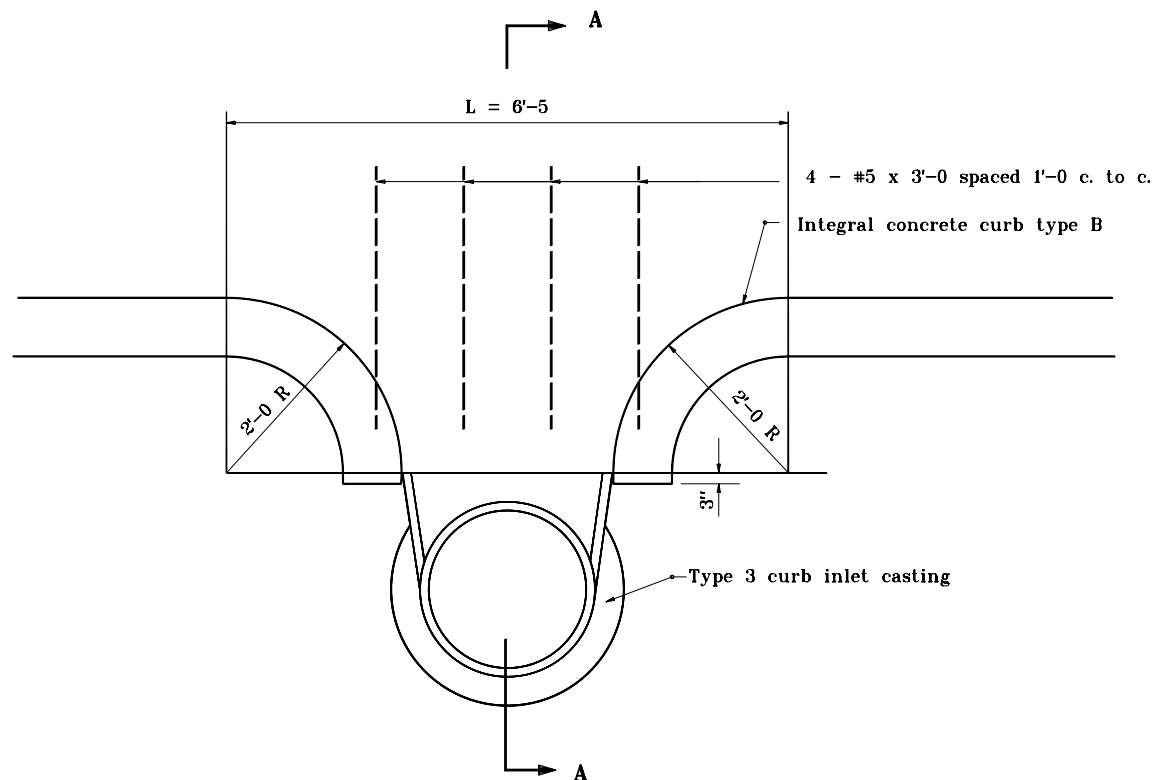
NOTES :

1. See Standard Drawing E 607-PSDT-01 for paved side ditch details.
2. See Standard Drawing E 501-CCPJ-08 for keyway joint details.



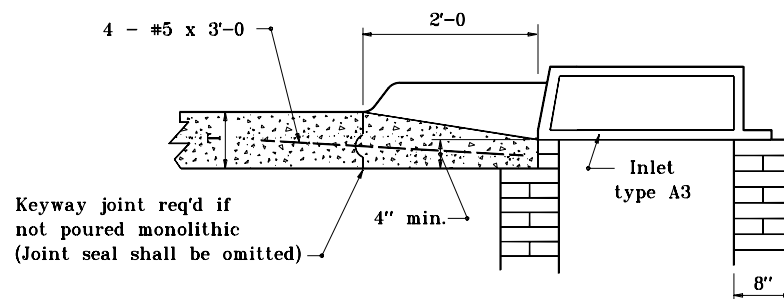
SECTION B-B

INDIANA DEPARTMENT OF TRANSPORTATION	
CURB TURNOUT TO CONCRETE GUTTER & PAVED SIDE DITCH	
SEPTEMBER 1997	
STANDARD DRAWING NO. E 605-CTCG-02	
	DETAILS PLACED IN THIS FORMAT 11-15-99 /s/ Anthony L. Uremovich 11-15-99 DESIGN STANDARDS ENGINEER DATE /s/ Firooz Zandi 11-15-99 CHIEF HIGHWAY ENGINEER DATE DESIGN STANDARDS ENGINEER ORIGINALLY APPROVED 9-01-97



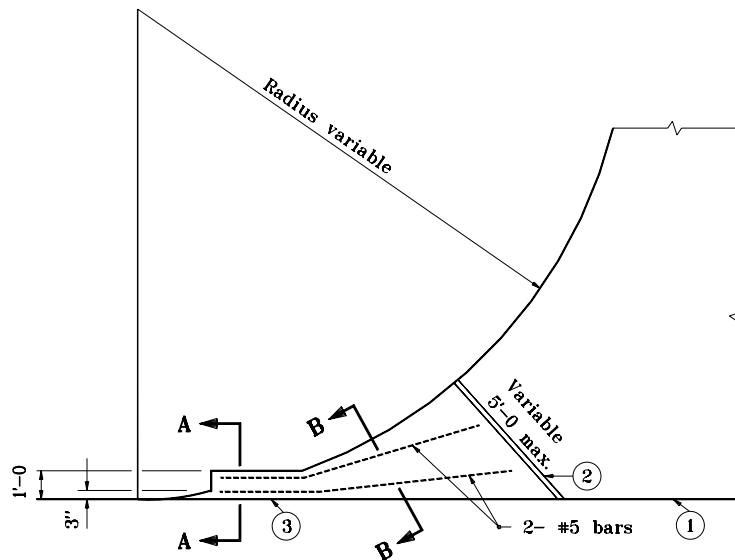
NOTES :

1. See Standard Drawing E 501-CCPJ-08 for keyway joint details.

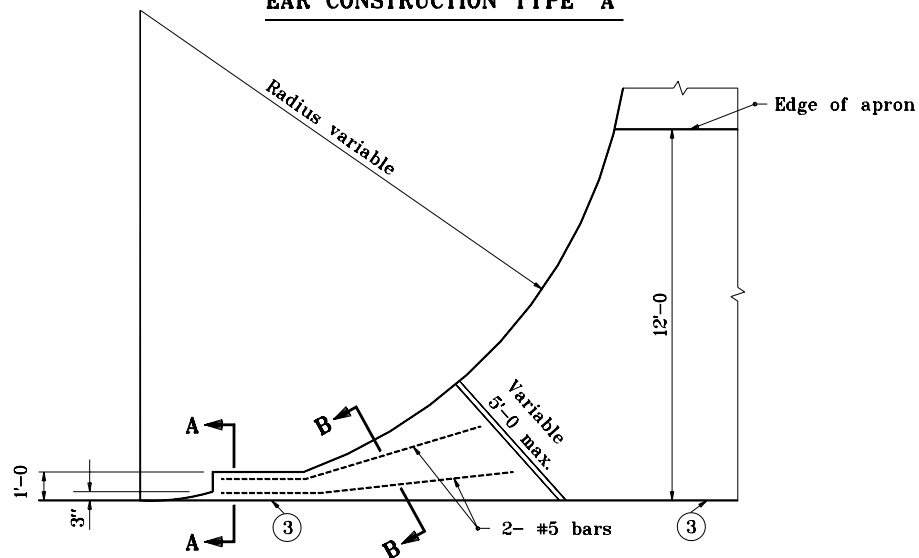


SECTION A-A

INDIANA DEPARTMENT OF TRANSPORTATION	
CURB TURNOUT TO A3 INLET	
SEPTEMBER 1997	
STANDARD DRAWING NO. E 605-CTIN-01	
ANTHONY L. UREMOWICH REGISTERED No. 18095 STATE OF INDIANA PROFESSIONAL ENGINEER	DETAILS PLACED IN THIS FORMAT 11-15-99 /s/ Anthony L. Uremovich 11-15-99 DESIGN STANDARDS ENGINEER DATE
	/s/ Firooz Zandi 11-15-99 CHIEF HIGHWAY ENGINEER DATE
	ORIGINALLY APPROVED 9-01-97
	DESIGN STANDARDS ENGINEER

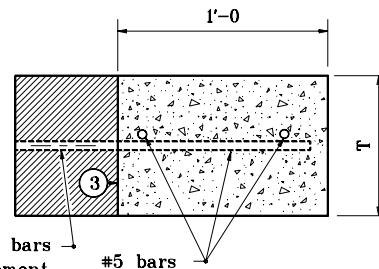


EAR CONSTRUCTION TYPE "A"

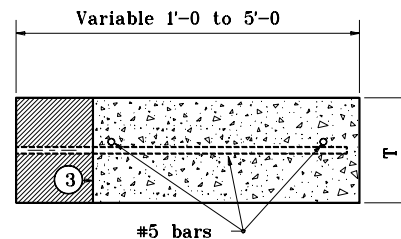


**EAR CONSTRUCTION TYPE "A"
FOR PAVED APRON**

Omit dowel bars
where pavement
is in place.



SECTION A-A



SECTION B-B

LEGEND

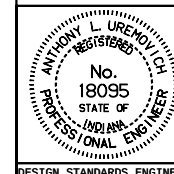
- ① Keyway joint
- ② 1" preformed joint filler
- ③ Longitudinal construction joint
- T = Thickness of pavement

INDIANA DEPARTMENT OF TRANSPORTATION

**EAR CONSTRUCTION
TYPE A**

SEPTEMBER 1997

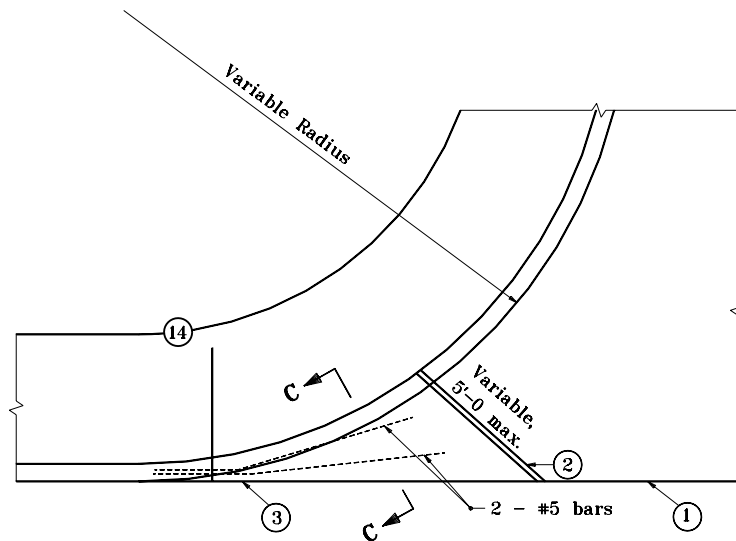
STANDARD DRAWING NO. **E 605-ERCN-01**



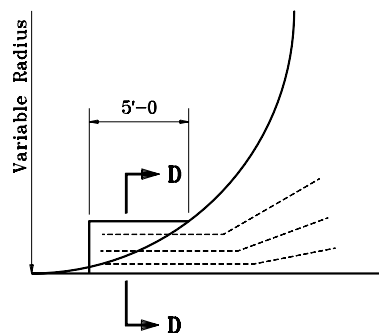
DETAILS PLACED IN THIS FORMAT 11-15-99

/s/ Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi 11-15-99
CHIEF HIGHWAY ENGINEER DATE
ORIGINALLY APPROVED 9-01-97



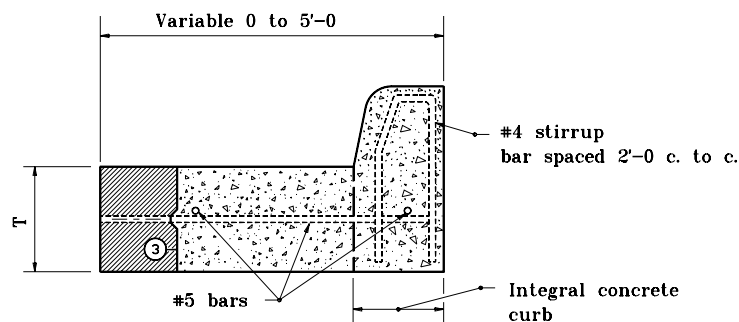
EAR CONSTRUCTION TYPE "B"



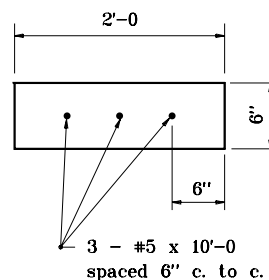
EAR CONSTRUCTION TYPE "C"

LEGEND

- ① Keyway joint
- ② 1' preformed joint filler
- ⑭ Integral concrete curb
- ③ Longitudinal construction joint
- T = Thickness of pavement



SECTION C-C



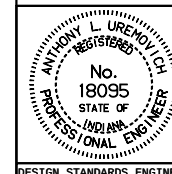
SECTION D-D

INDIANA DEPARTMENT OF TRANSPORTATION

**EAR CONSTRUCTION
TYPE B AND C**

JANUARY 1998

STANDARD DRAWING NO. **E 605-ERCN-02**



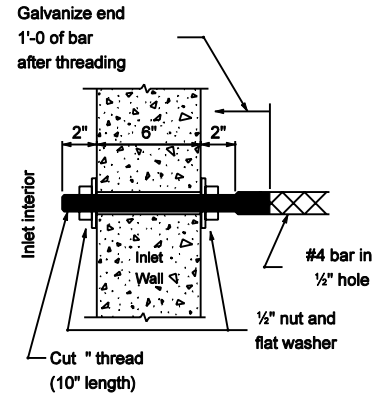
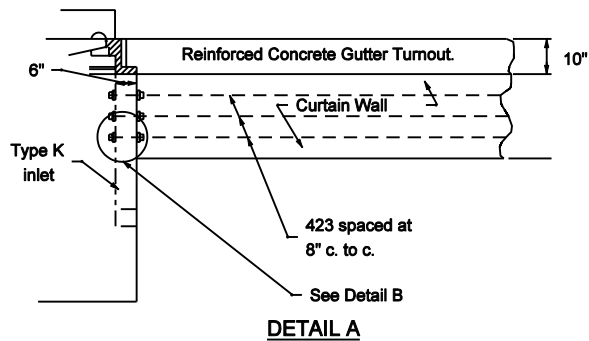
DETAILS PLACED IN THIS FORMAT 11-15-99

/s/ Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi 11-15-99
CHIEF HIGHWAY ENGINEER DATE

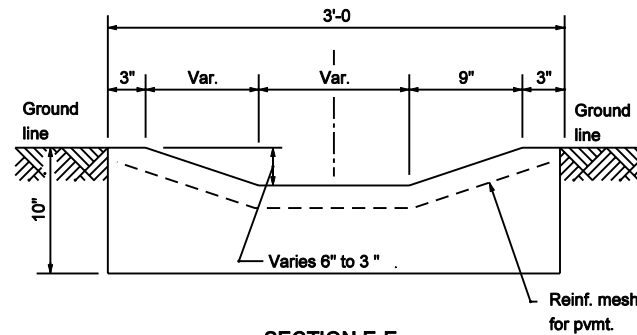
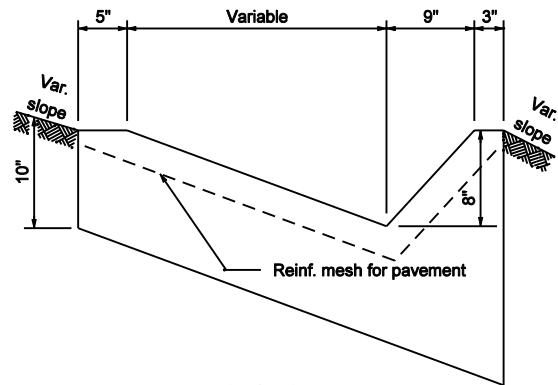
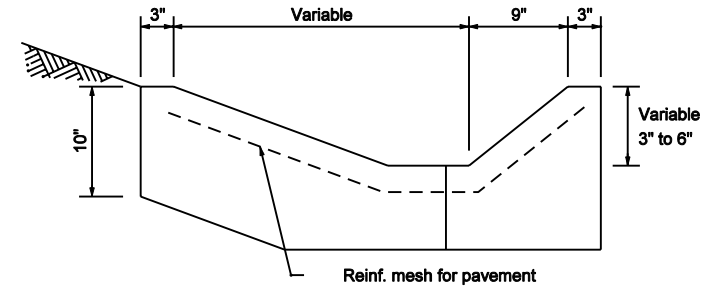
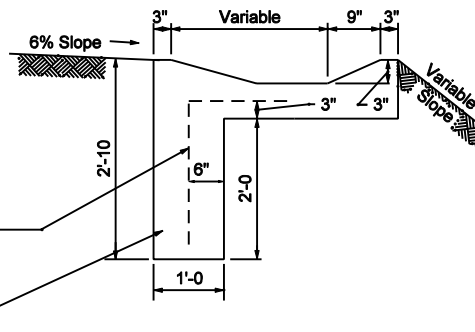
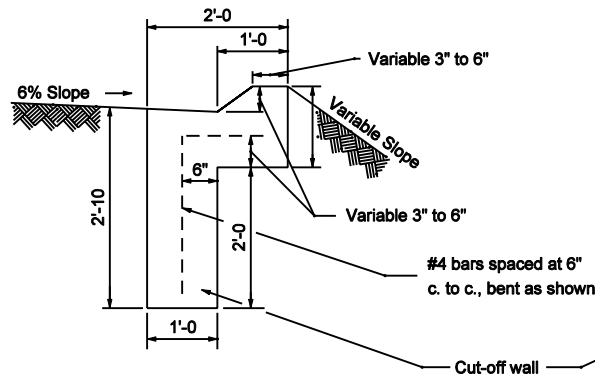
DESIGN STANDARDS ENGINEER

ORIGINALLY APPROVED 1-02-98

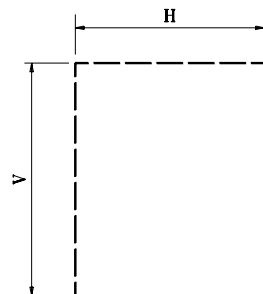


GENERAL NOTES

1. For location of details and sections see Standard Drawing E 605-GTRC-03.



INDIANA DEPARTMENT OF TRANSPORTATION	
REINFORCED CONCRETE GUTTER TURNOUT	
MARCH 2003	
STANDARD DRAWING NO. E 605-GTRC-01	
	/s/ Richard L. VanCleave 3-03-03 DESIGN STANDARDS ENGINEER DATE
	/s/ Richard K. Smutzer 3-03-03 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	

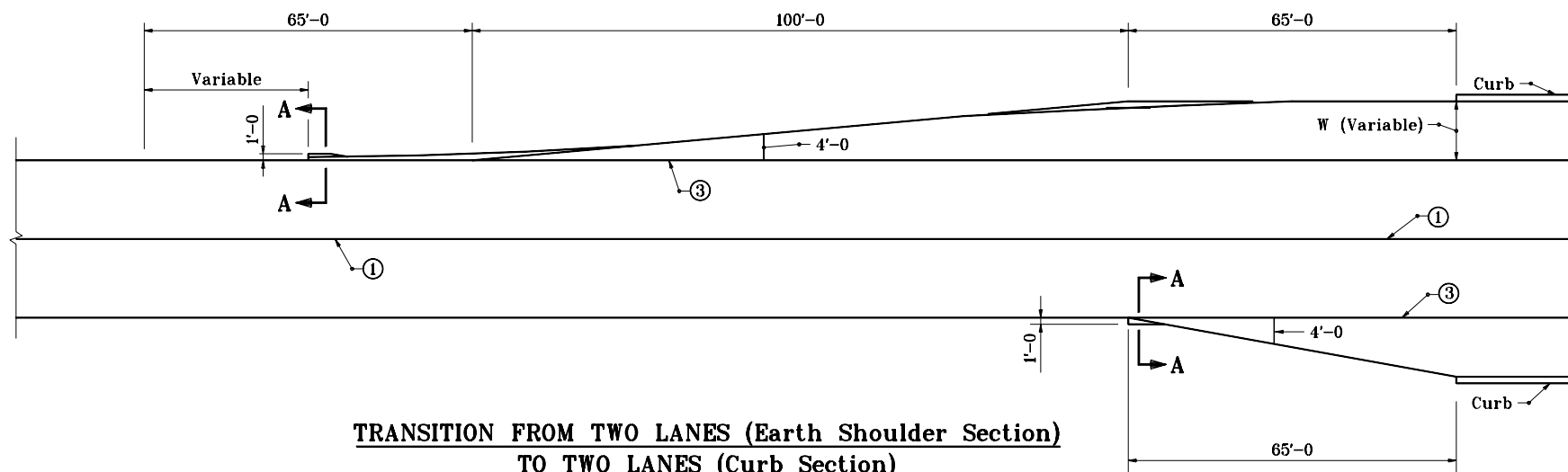


ORIGINALLY APPROVED 9-01-97

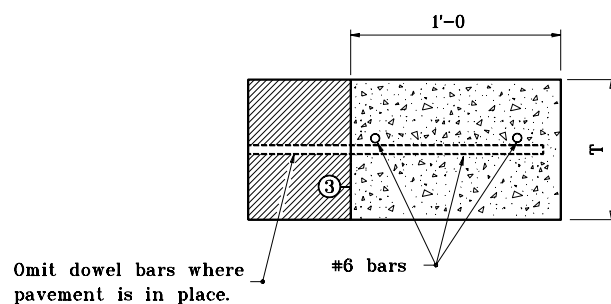
LEGEND

- ① Longitudinal joint
- ③ Longitudinal construction joint
- T = Nominal pavement thickness

Curve data variable
except tangent length = 50'-0



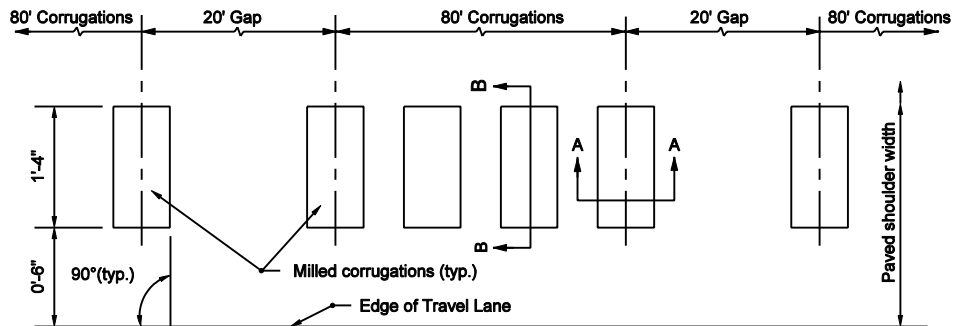
TRANSITION FROM TWO LANES (Earth Shoulder Section) TO TWO LANES (Curb Section)



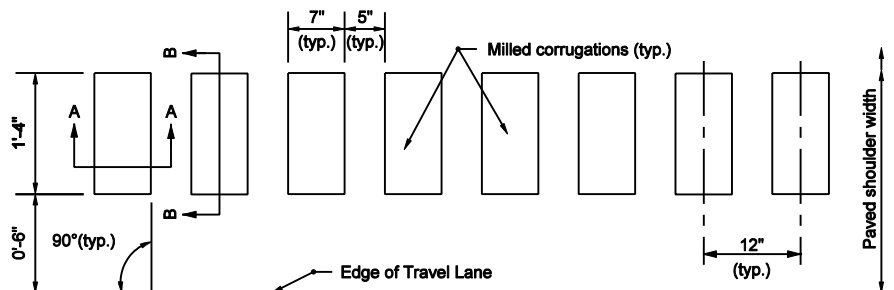
Omit dowel bars where
pavement is in place.

SECTION A-A

INDIANA DEPARTMENT OF TRANSPORTATION	
TRANSITION OF EARTH SHOULDER TO CURB SECTION	
SEPTEMBER 1997	
STANDARD DRAWING NO. E 605-TSCS-01	
	DETAILS PLACED IN THIS FORMAT 11-15-99 /s/ Anthony L. Uremovich 11-15-99 DESIGN STANDARDS ENGINEER DATE
DESIGN STANDARDS ENGINEER	/s/ Firooz Zandi 11-15-99 CHIEF HIGHWAY ENGINEER DATE ORIGINALLY APPROVED 9-01-97



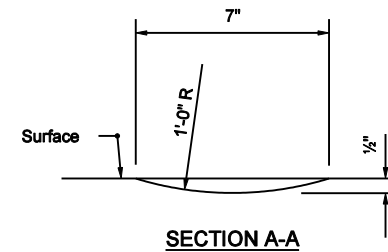
INTERMITTENT INSTALLATION
PLAN VIEW



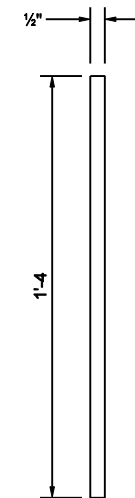
CONTINUOUS INSTALLATION
PLAN VIEW

NOTES

1. Continuous corrugation installation shall be used on Interstates and intermittent installation shall be used on all other facilities.
2. Refer to E 606-SHCG-02 for corrugation instructions for HMA shoulders adjacent to a widened PCCP outside lane.

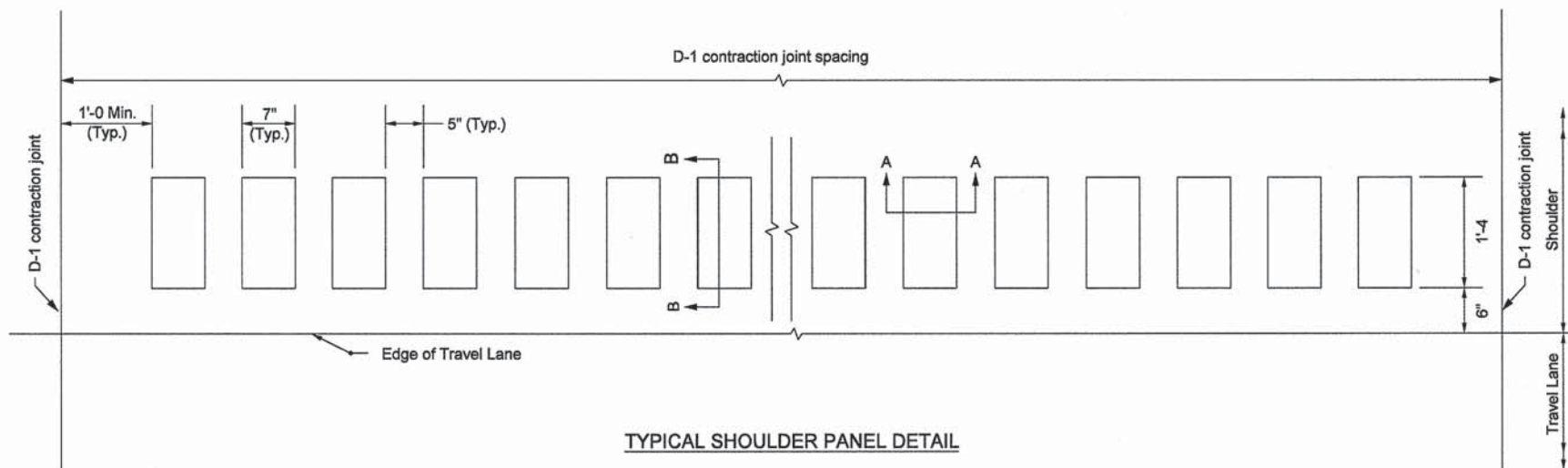


SECTION A-A

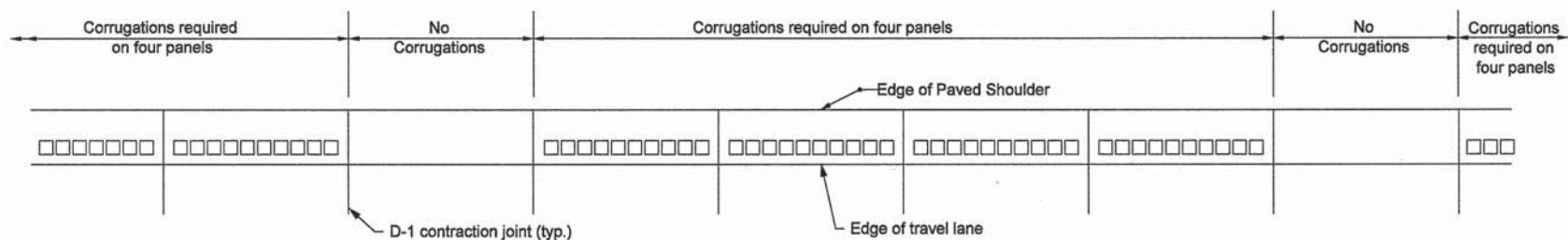


SECTION B-B

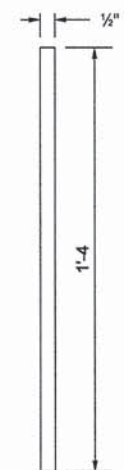
INDIANA DEPARTMENT OF TRANSPORTATION	
MILLED HMA SHOULDER CORRUGATIONS	
MARCH 2003	
STANDARD DRAWING NO. E 606-SHCG-01	
	/s/ Richard L. VanCleave 3-03-03 DESIGN STANDARDS ENGINEER DATE
	/s/ Richard K. Smutzer 3-03-03 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	



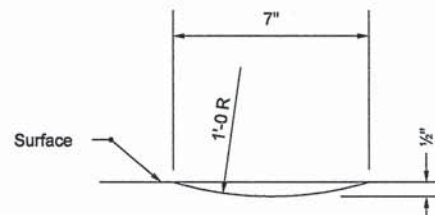
TYPICAL SHOULDER PANEL DETAIL



INTERMITTENT INSTALLATION DETAIL



SECTION B-B

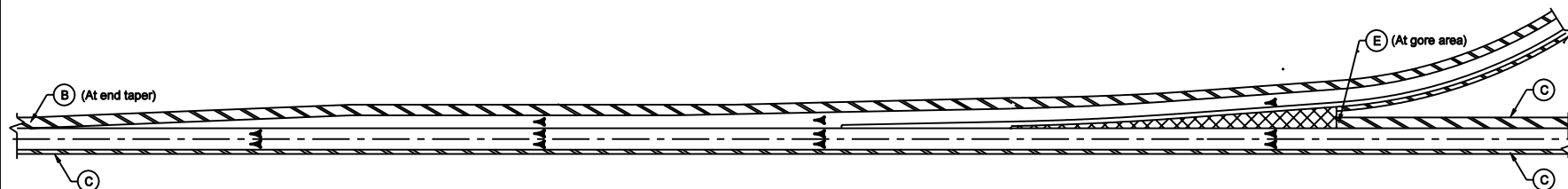


SECTION A-A

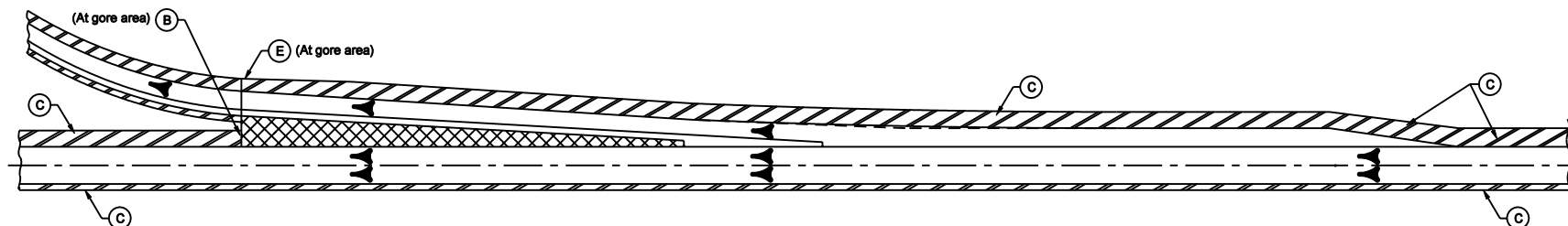
NOTES

1. Continuous corrugations shall be required on every PCCP shoulder panel on Interstates. Intermittent corrugations shall be required for all other facilities.
2. On facilities with a widened outside PCCP lane, the corrugations shall be installed on the portion of the PCCP located outside the edge of travel lane and in accordance with this sheet.

INDIANA DEPARTMENT OF TRANSPORTATION	
MILLED PCCP SHOULDER CORRUGATIONS	
MARCH 2003	
STANDARD DRAWING NO. E 606-SHCG-02	
	3-3-03 DATE
	3-3-03 DATE
DESIGN STANDARDS ENGINEER	CHIEF HIGHWAY ENGINEER



ENTRANCE RAMP



EXIT RAMP

LEGEND

- (B) Begin Shoulder Corrugations
- (C) Shoulder Corrugations
- (E) End Shoulder Corrugations

 Gore Area

 Shoulder

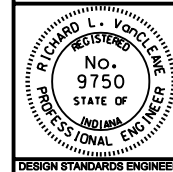
 Direction of Traffic

INDIANA DEPARTMENT OF TRANSPORTATION

SHOULDER CORRUGATION LIMITS

MARCH 2003

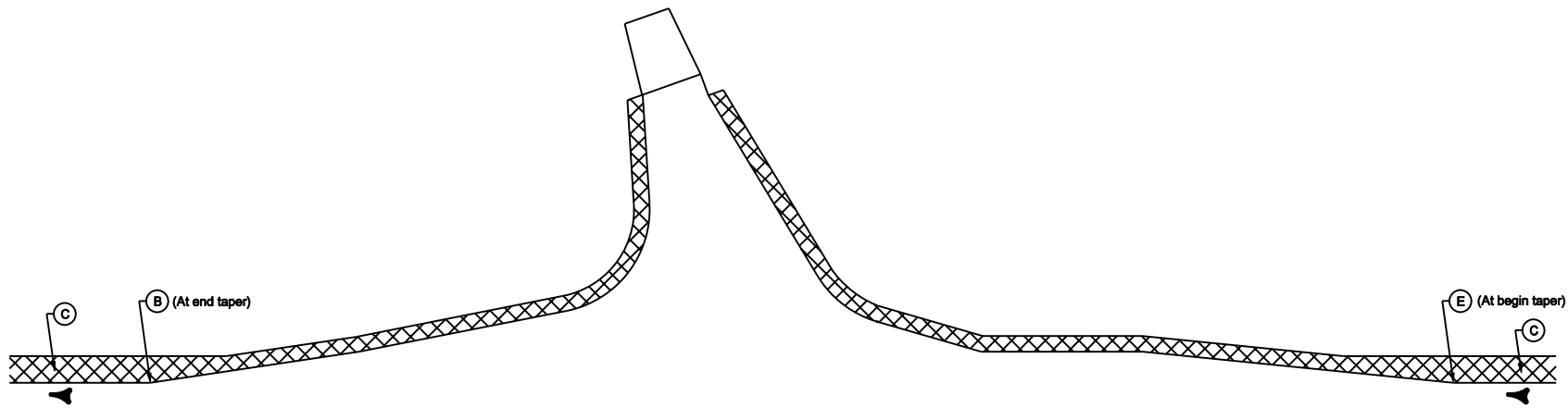
STANDARD DRAWING NO. E 606-SHCG-03



/s/ Richard L. VanCleave 3-03-03
DESIGN STANDARDS ENGINEER DATE

/s/ Richard K. Smutzer 3-03-03
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER



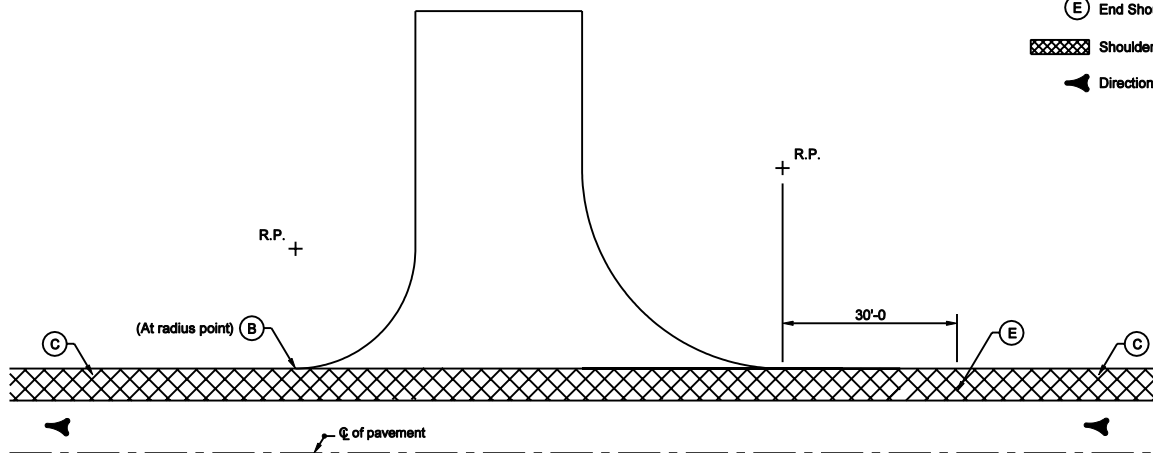
APPROACH WITH TURN LANE

LEGEND

- (B) Begin Shoulder Corrugations
- (C) Shoulder Corrugations
- (E) End Shoulder Corrugations

Shoulder

Direction of Traffic



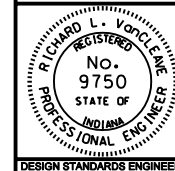
APPROACH WITHOUT TURN LANE

INDIANA DEPARTMENT OF TRANSPORTATION

SHOULDER CORRUGATION LIMITS

MARCH 2003

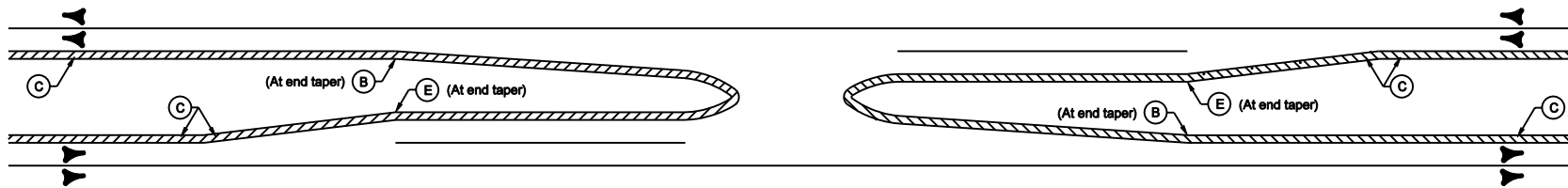
STANDARD DRAWING NO. E 606-SHCG-04



/s/ Richard L. VanCleave 3-03-03
DESIGN STANDARDS ENGINEER DATE

/s/ Richard K. Smutzer 3-03-03
CHIEF HIGHWAY ENGINEER DATE

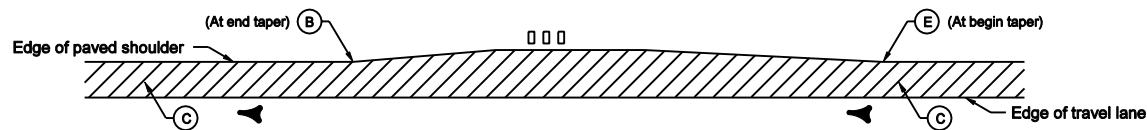
DESIGN STANDARDS ENGINEER



MEDIAN CROSSOVER / LEFT TURN LANE

LEGEND

- (B) Begin Shoulder Corrugations
- (C) Shoulder Corrugations
- (E) End Shoulder Corrugations
-  Shoulder
-  Direction of Traffic



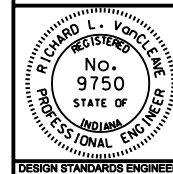
TYPICAL MAILBOX APPROACH

INDIANA DEPARTMENT OF TRANSPORTATION

SHOULDER CORRUGATION LIMITS

MARCH 2003

STANDARD DRAWING NO. E 606-SHCG-05

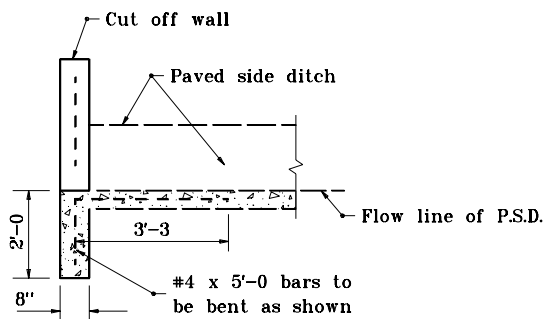


/s/ Richard L. VanCleave 3-03-03
DESIGN STANDARDS ENGINEER DATE

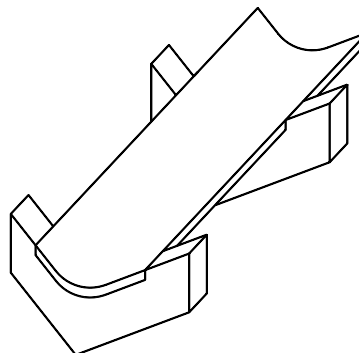
/s/ Richard K. Smutzer 3-03-03
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

INDIANA DEPARTMENT OF TRANSPORTATION	
PAVED SIDE DITCH ELEVATIONS SEPTEMBER 2000	
STANDARD DRAWING NO. E 607-PSDT-01	
	<u>/s/ Anthony L. Uremovich</u> <u>9-01-00</u> DESIGN STANDARDS ENGINEER DATE
	<u>/s/ Firooz Zandi</u> <u>9-01-00</u> CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	

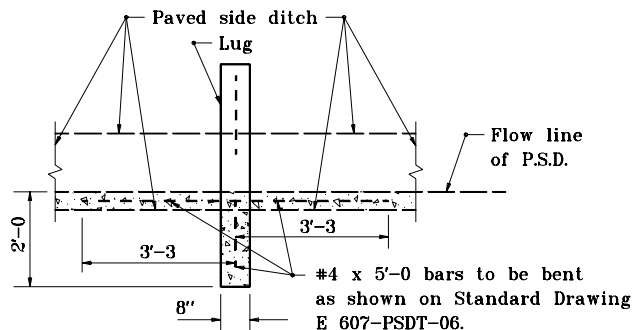


SECTION A-A

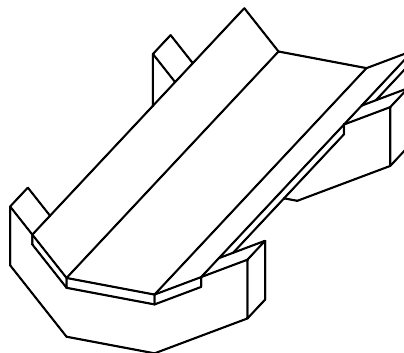


ISOMETRIC VIEW

PAVED SIDE DITCH TYPE A THROUGH D

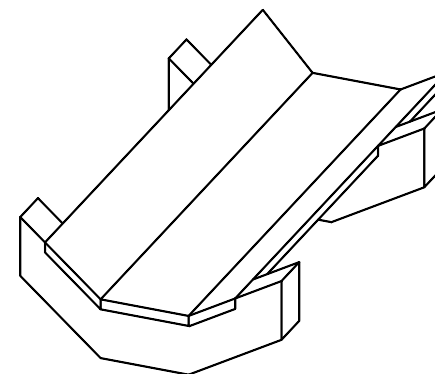


SECTION B-B



ISOMETRIC VIEW

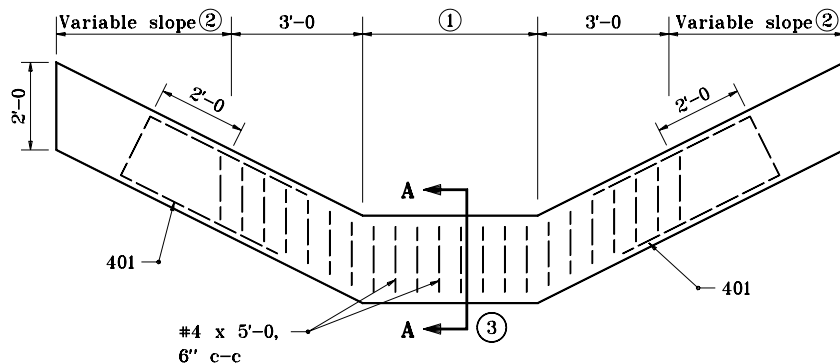
PAVED SIDE DITCH TYPE E THROUGH H



ISOMETRIC VIEW

PAVED SIDE DITCH TYPES J THROUGH M

INDIANA DEPARTMENT OF TRANSPORTATION	
PAVED SIDE DITCH SECTIONS AND ISOMETRICS	
SEPTEMBER 1997	
STANDARD DRAWING NO. E 607-PSDT-02	
	DETAILS PLACED IN THIS FORMAT 11-15-99
	/s/ Anthony L. Uremovich 11-15-99 DESIGN STANDARDS ENGINEER DATE
	/s/ Firooz Zandi 11-15-99 CHIEF HIGHWAY ENGINEER DATE
	DESIGN STANDARDS ENGINEER ORIGINALLY APPROVED 9-01-97

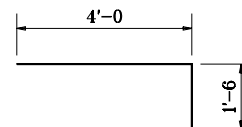


ELEVATION VIEW

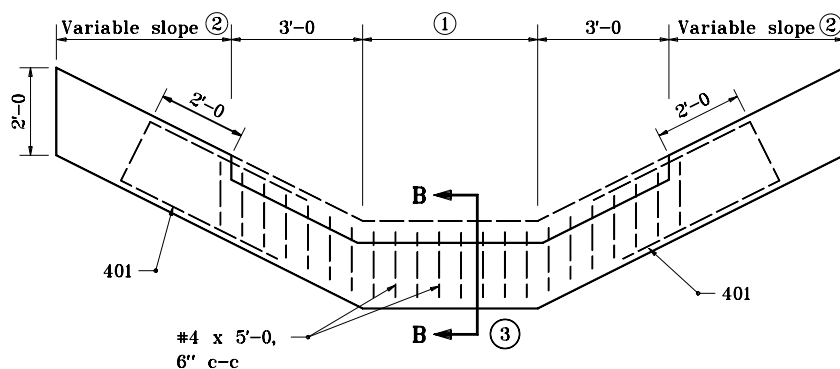
CUT-OFF WALL FOR PAVED SIDE DITCH TYPES E THROUGH H

GENERAL NOTES

- ① 1'-0 For Type E
2'-0 For Type F
3'-0 For Type G
4'-0 For Type H
- ② 3'-0 For Type E & F
4'-0 For Type G & H
- ③ See Standard Drawing E 607-PSDT-02 for Sections A-A and B-B.



401 x 9'-6



ELEVATION VIEW

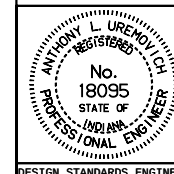
LUG FOR PAVED SIDE DITCH TYPES E THROUGH H

INDIANA DEPARTMENT OF TRANSPORTATION

**PAVED SIDE DITCH
CUT-OFF WALL AND LUG**

SEPTEMBER 1997

STANDARD DRAWING NO. E 607-PSDT-03



DETAILS PLACED IN THIS FORMAT 11-15-99

/s/ Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi 11-15-99
CHIEF HIGHWAY ENGINEER DATE
ORIGINALLY APPROVED 9-01-97

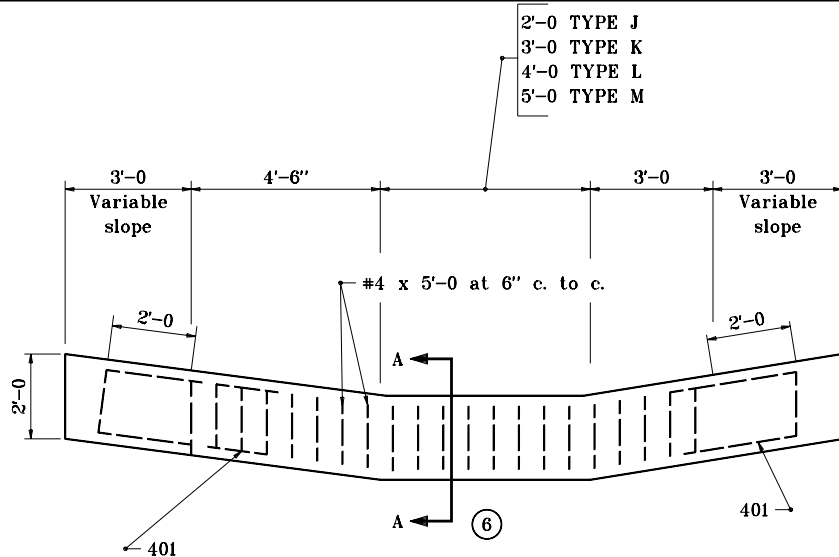
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ELEVATION VIEW

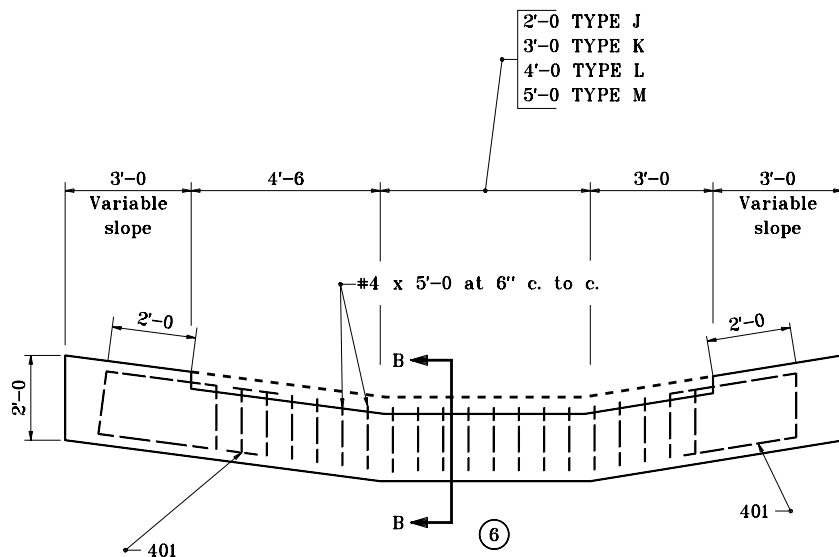
LUG FOR PAVED SIDE DITCH TYPES A THROUGH D

- ① See Standard Drawing E 607-PSDT-02 for Sections A-A and B-B.
2. See Standard Drawing E 607-PSDT-03 for 401 bending diagram.

INDIANA DEPARTMENT OF TRANSPORTATION															
PAVED SIDE DITCH CUT-OFF WALL AND LUG															
SEPTEMBER 1997															
STANDARD DRAWING NO. E 607-PSDT-04															
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DETAILS PLACED IN THIS FORMAT	11-15-99														
<i>s/ Anthony L. Uremovich</i> <i>11-15-99</i>															
DESIGN STANDARDS ENGINEER	DATE														
 <i>s/ Firooz Zandi</i> <i>11-15-99</i>															
CHIEF HIGHWAY ENGINEER	DATE														
ORIGINALLY APPROVED															
DESIGN STANDARDS ENGINEER	9-01-97														



ELEVATION VIEW
CUT-OFF WALL FOR PAVED SIDE DITCH TYPES J THROUGH M



ELEVATION VIEW
LUG FOR PAVED SIDE DITCH TYPES J THROUGH M

GENERAL NOTES

- The 6:1 sloped side shall be placed nearest the roadway.
- Cut-off walls shall be used at the beginning and end of all paved side ditch.
- Lugs shall be used at the following locations:
 - 10 ft downslope from a grade change.
 - 10 ft downslope from the intersection of different types of paved side ditch.
 - At the downslope end of a transition between different types of paved side ditch.
 - At the intervals as follows:

Interval	Grade
200 ft	3% to 5%
150 ft	5% to 8%
100 ft	8% to 10%
50 ft	10% & above

- Paved side ditch transitions shall be required at intersections with earth ditches and pipe culverts. These transitions shall be converted to equivalent lengths of the type of paved side ditch specified at these locations.
- Transitions of 10 ft or less shall be required between two different types of paved side ditch. Such transitions shall be converted to equivalent lengths of the larger type of paved side ditch specified at these locations.

⑥ See Standard Drawing E 607-PSDT-04 for Sections A-A and B-B.

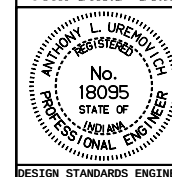
- See Standard Drawing E 607-PSDT-03 for 401 bending diagram.

INDIANA DEPARTMENT OF TRANSPORTATION

P.S.D. CUT-OFF WALL & LUG AND GENERAL NOTES

JANUARY 2000

STANDARD DRAWING NO. **E 607-PSDT-05**

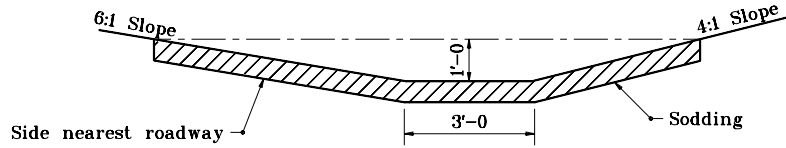


/s/ Anthony L. Uremovich 1-03-00
DESIGN STANDARDS ENGINEER DATE

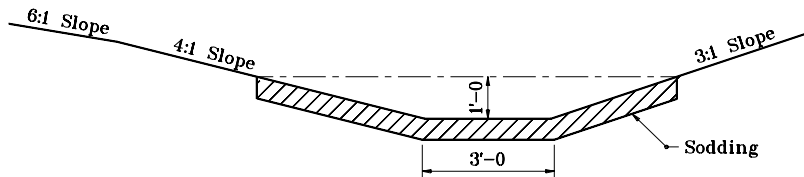
/s/ Firooz Zandi 1-03-00
CHIEF HIGHWAY ENGINEER DATE

GENERAL NOTES

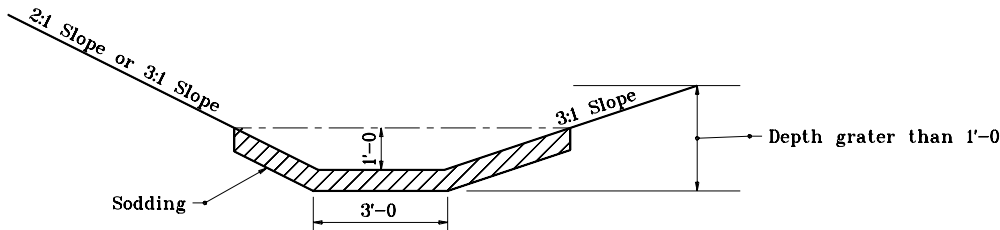
- See Standard Drawing E 607-PSDT-02 for Section B-B.



STANDARD 3' BOTTOM DITCH
(LOCATED WITHIN CLEAR ZONE)

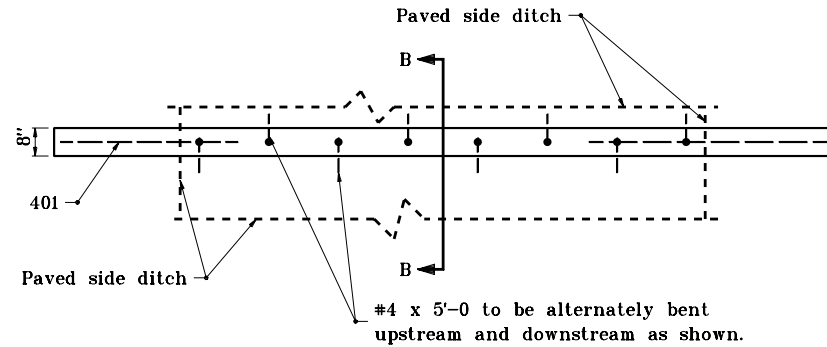


SPECIAL 3' BOTTOM DITCH
(LOCATED BEYOND CLEAR ZONE)



SPECIAL 3' BOTTOM DITCH
(LOCATED BEYOND CLEAR ZONE)

SODDED DITCH DETAILS

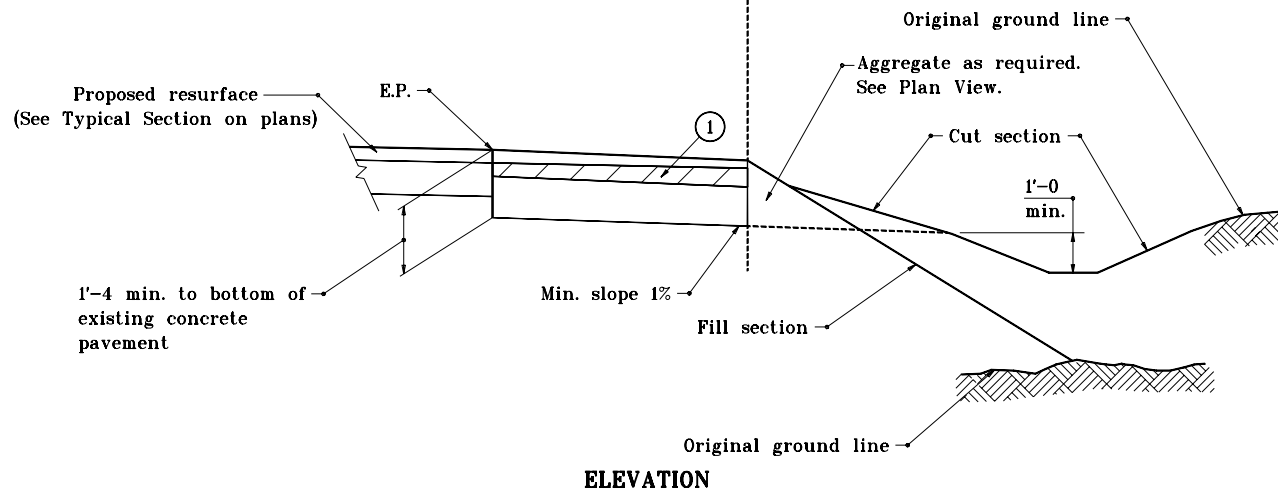
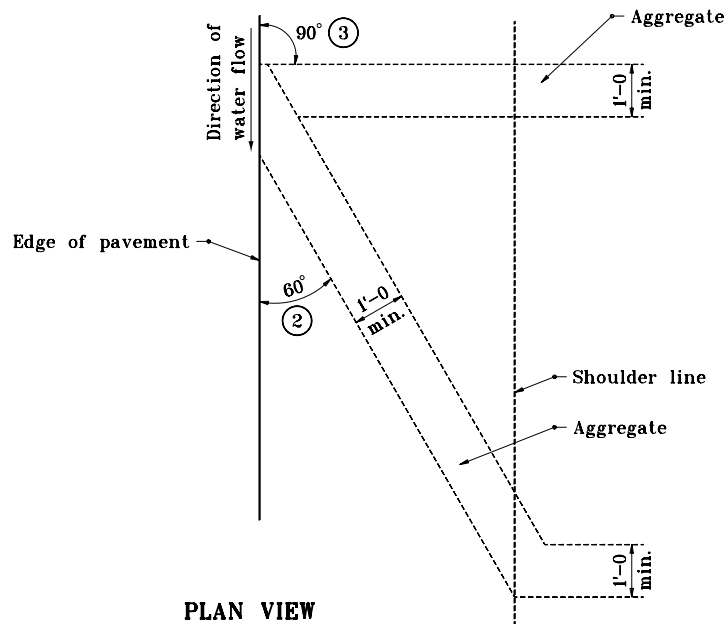


PLAN VIEW OF LUG (TYPICAL FOR ALL TYPES)

INDIANA DEPARTMENT OF TRANSPORTATION	
P.S.D. LUGS & SODDED DITCH DETAILS	
SEPTEMBER 1997	
STANDARD DRAWING NO. E 607-PSDT-06	
	DETAILS PLACED IN THIS FORMAT 7-27-99
	/s/ Anthony L. Uremovich 7-27-99 DESIGN STANDARDS ENGINEER DATE
	/s/ Firooz Zandi 7-27-99 CHIEF HIGHWAY ENGINEER DATE
	DESIGN STANDARDS ENGINEER ORIGINALLY APPROVED 9-01-97

GENERAL NOTES

- ① 660#/syd HMA mixture for patching required. Width of patch to be equal to width of asphalt shoulder in place.
- ② For pavement grades of 1% or steeper.
- ③ For pavement grades of flatter than 1%.



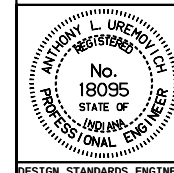
SHOULDER DRAIN

INDIANA DEPARTMENT OF TRANSPORTATION

SHOULDER DRAIN

MAY 1998

STANDARD DRAWING NO. E 608-SHDR-01



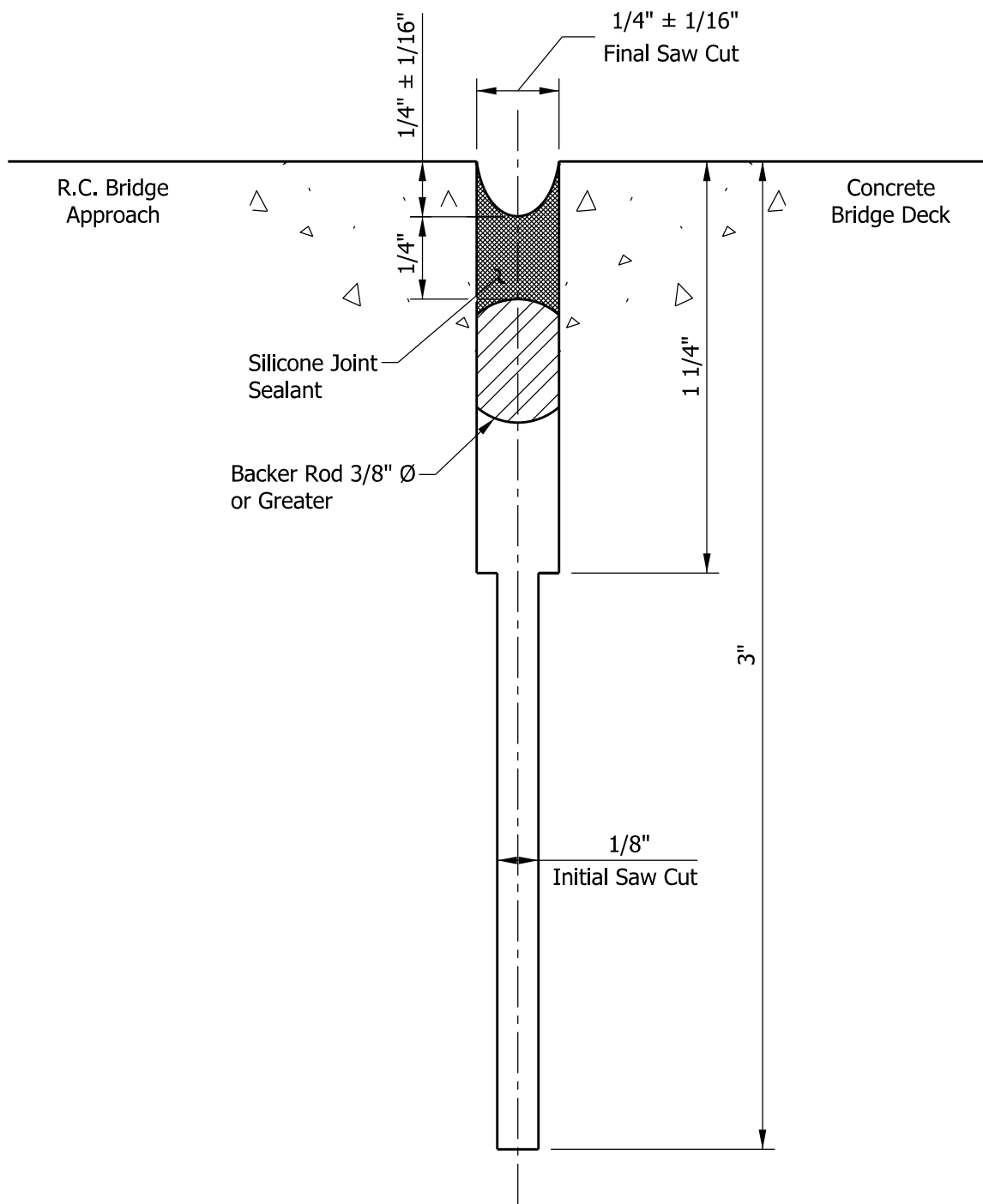
DETAILS PLACED IN THIS FORMAT 11-15-99

/s/ Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi 11-15-99
CHIEF HIGHWAY ENGINEER DATE

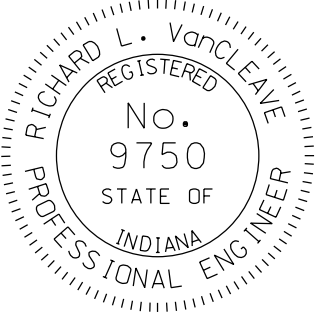
DESIGN STANDARDS ENGINEER

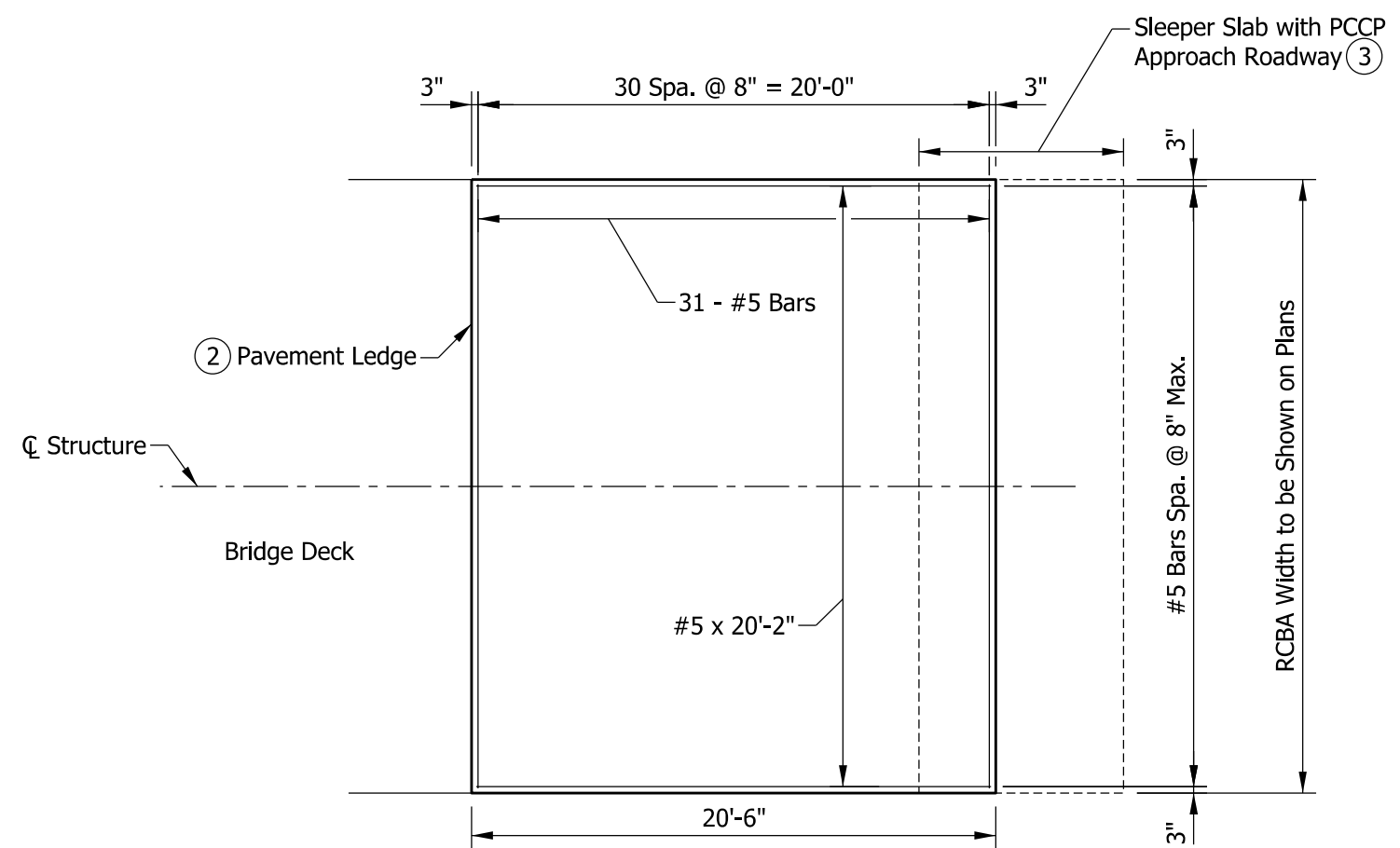
ORIGINALLY APPROVED 5-01-98



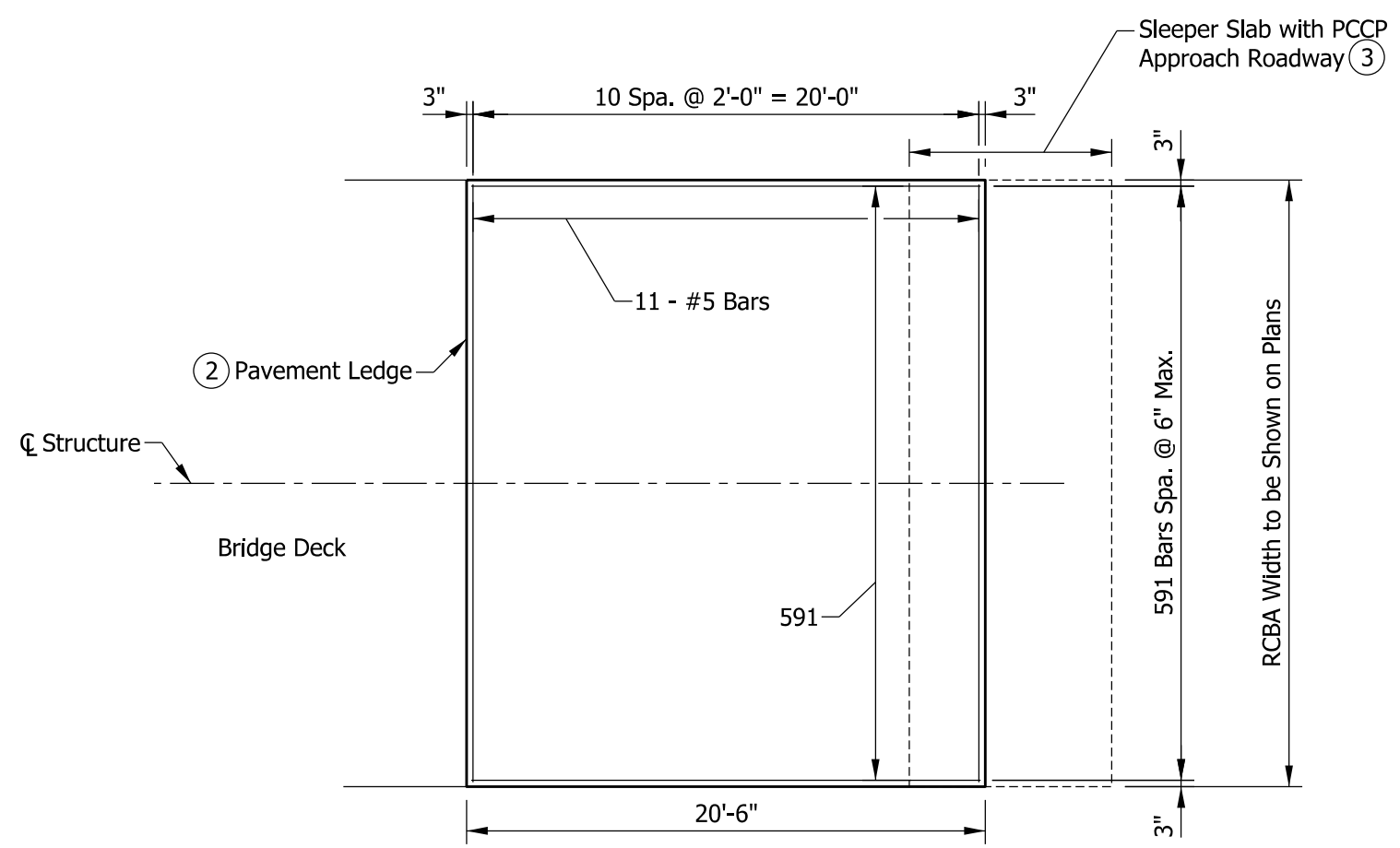
NOTES:

1. See Standard Drawing E-609-RCBA-01 for joint location.

INDIANA DEPARTMENT OF TRANSPORTATION			
TYPE I-A JOINT			
SEPTEMBER 2012			
STANDARD DRAWING NO.		E 609-BRJT-01	
	DETAILS PLACED IN THIS FORMAT		09/04/12
	<i>/s/ Richard L. VanCleave</i>		09/04/12
	SUPERVISOR, ROADWAY STANDARDS		DATE
	<i>/s/ Mark A. Miller</i>		09/04/12
CHIEF ENGINEER		DATE	



PLAN SHOWING TOP REINFORCING



PLAN SHOWING BOTTOM REINFORCING

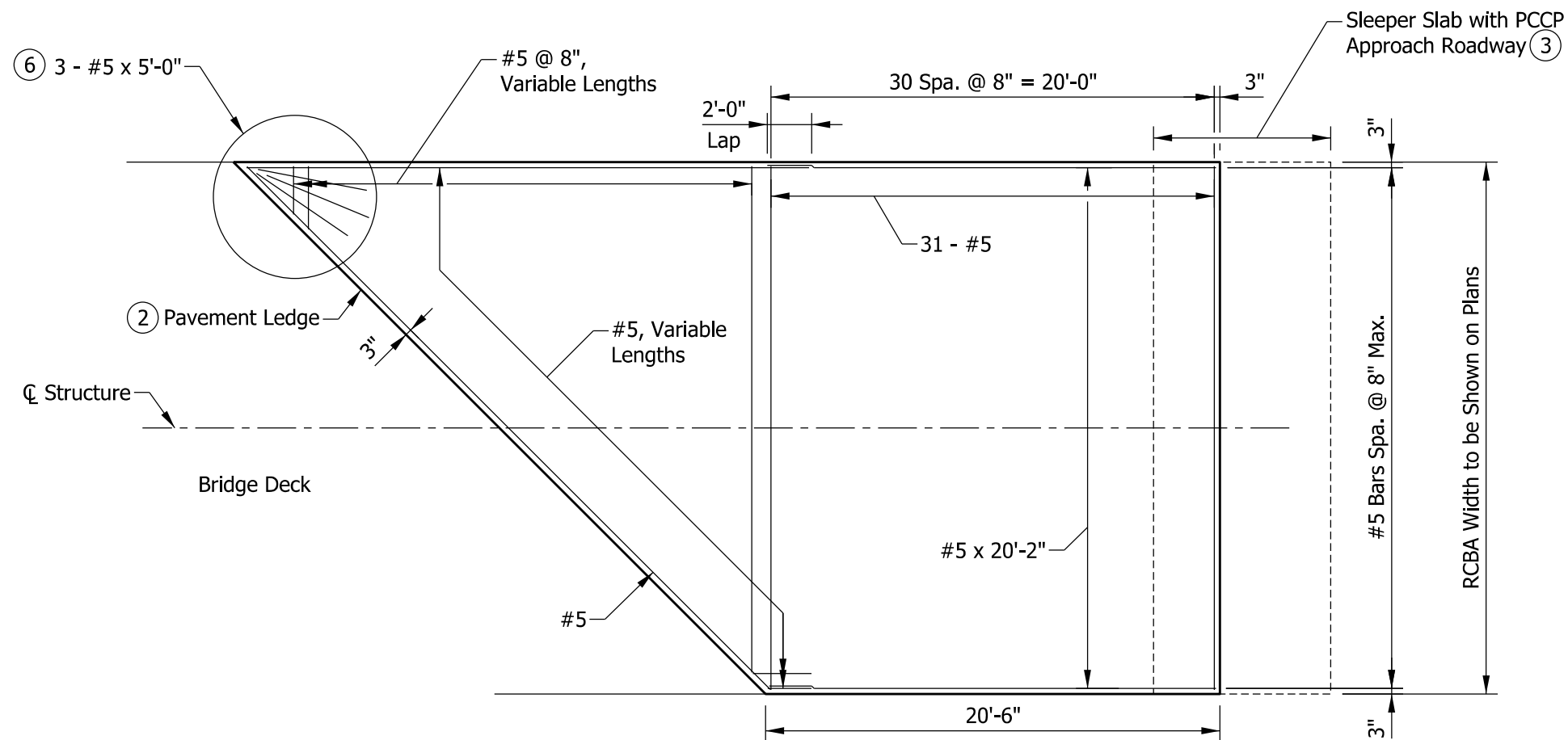
NOTES:

1. All reinforcing bars shall be epoxy-coated.
- 2 See Standard Drawing E 609-RCBA-03 for section, pavement ledge detail, and reinforcing bar bending diagram.
- 3 See Standard Drawing E 503-BATJ-01 for terminal joint and sleeper slab details.
4. See Standard Drawings E 609-TBAE-01 through -04 for RCBA extensions used with bridge railing transitions.
5. RCBA shall be surface sealed.

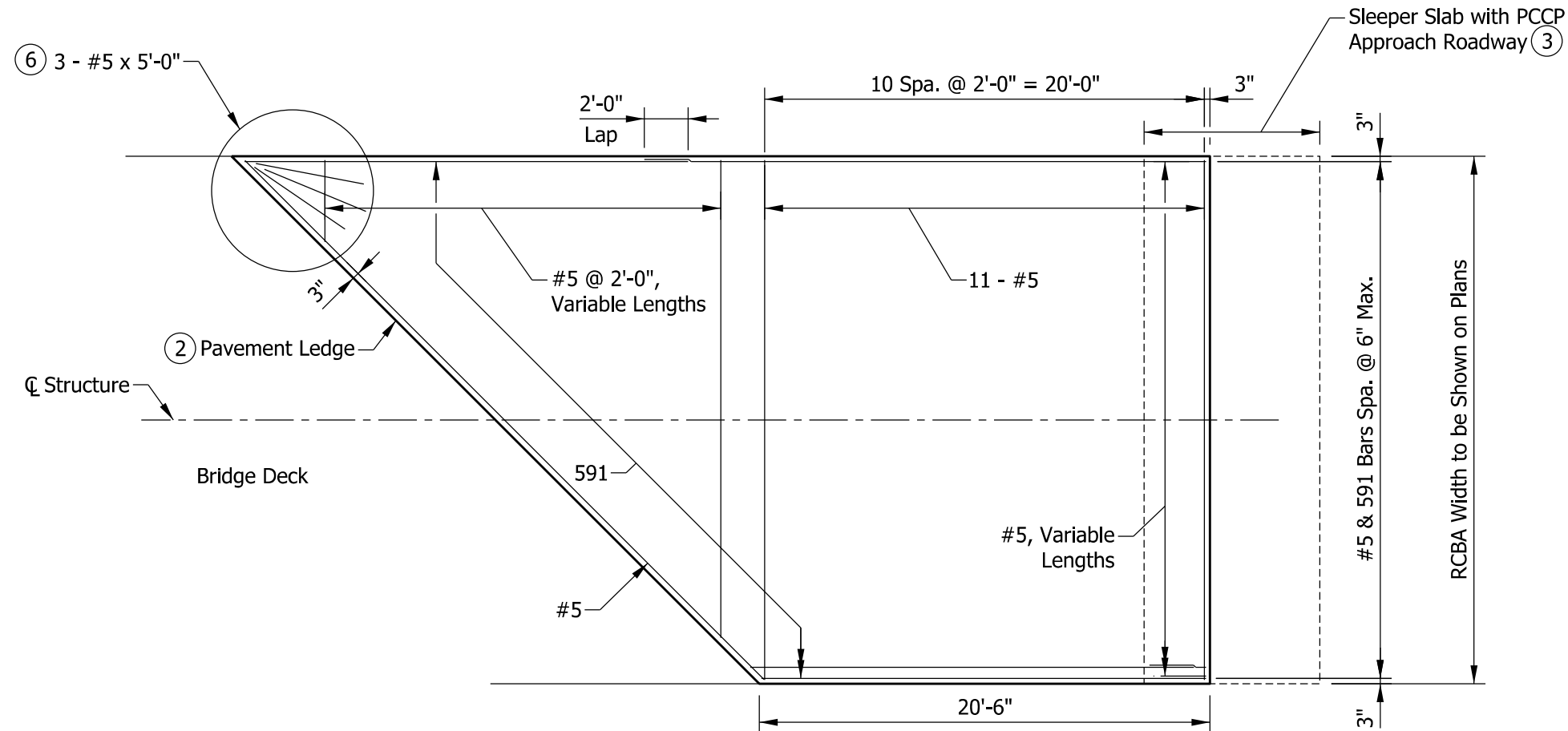
KEY:

- RCBA = Reinforced Concrete Bridge Approach
- PCCP = Portland Cement Concrete Pavement

INDIANA DEPARTMENT OF TRANSPORTATION			
REINFORCED CONCRETE BRIDGE APPROACH SQUARE			
SEPTEMBER 2014			
STANDARD DRAWING NO.		E 609-RCBA-01	
	/s/ Elizabeth W. Phillips	03/04/14	
	DESIGN STANDARDS ENGINEER	DATE	
	/s/ Mark A. Miller	03/04/14	
	CHIEF ENGINEER	DATE	



PLAN SHOWING TOP REINFORCING



PLAN SHOWING BOTTOM REINFORCING

NOTES:

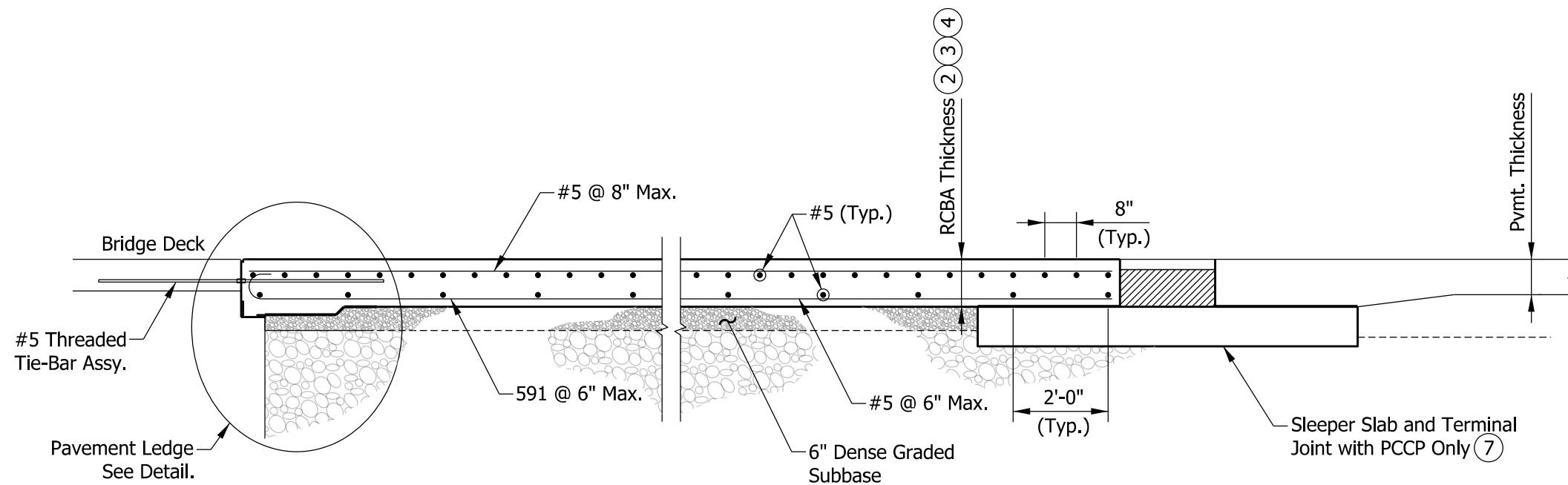
1. All reinforcing bars shall be epoxy-coated.
- ② See Standard Drawing E 609-RCBA-03 for section, pavement ledge detail, and reinforcing bar bending diagram.
- ③ See Standard Drawing E 503-BATJ-01 for terminal joint and sleeper slab details.
4. Variable-length #5 bars shall be detailed by means of cutting diagrams on the plans.
5. See Standard Drawings E 609-TBAE-01 through -04 for RCBA extensions used with bridge railing transitions.
- ⑥ For skew > 15° where variable-length transverse bars would be shorter than 2'-0", a fanned configuration of three #5 x 5'-0" reinforcing bars shall be provided.
7. RCBA shall be surface sealed.

KEY:

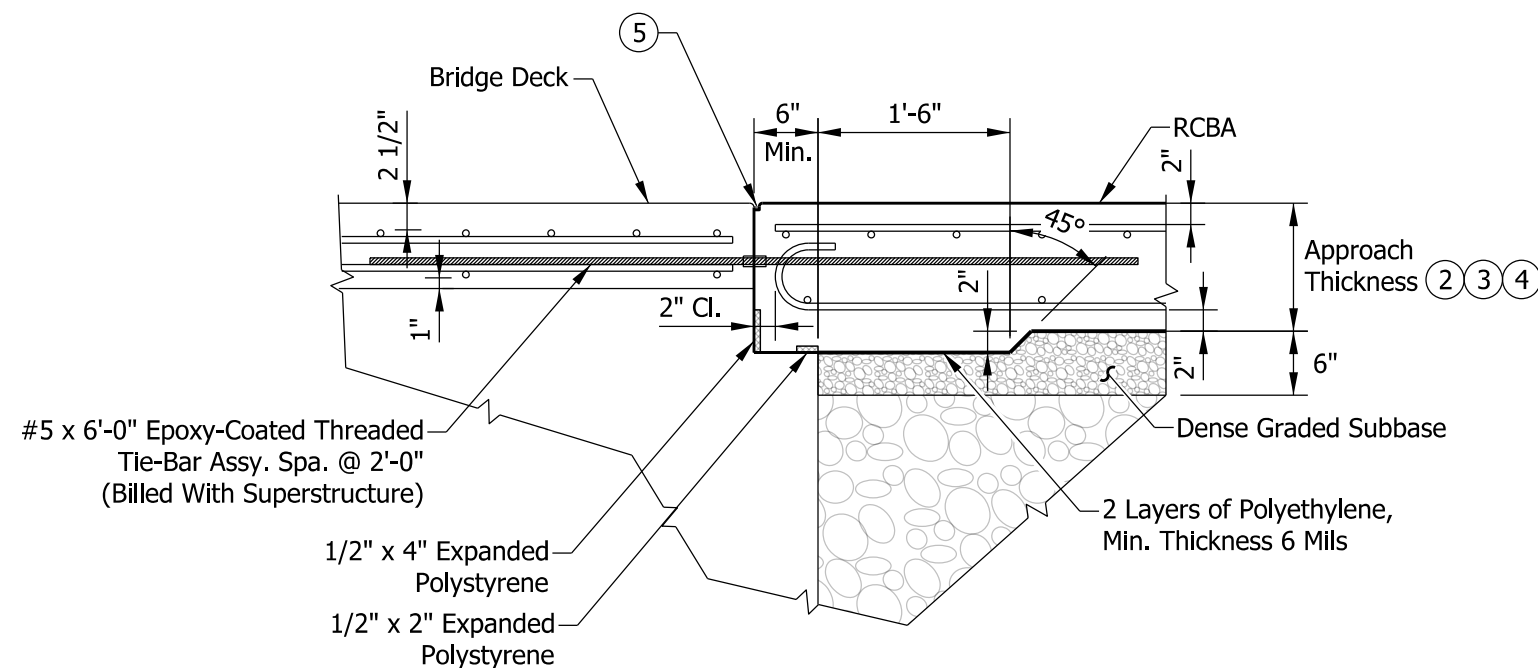
RCBA = Reinforced Concrete Bridge Approach

PCCP = Portland Cement Concrete Pavement

INDIANA DEPARTMENT OF TRANSPORTATION		
REINFORCED CONCRETE BRIDGE APPROACH SKEWED		
SEPTEMBER 2014		
STANDARD DRAWING NO.		E 609-RCBA-02
	/s/ Elizabeth W. Phillips	03/04/14
	DESIGN STANDARDS ENGINEER	DATE
	/s/ Mark A. Miller	03/04/14
	CHIEF ENGINEER	DATE



SECTION THROUGH APPROACH



PAVEMENT LEDGE DETAIL

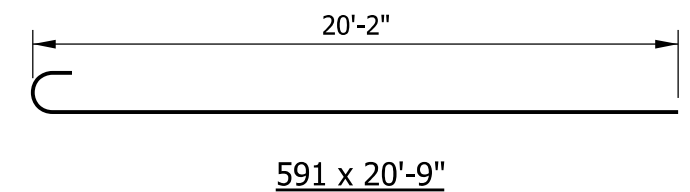
NOTES:

1. All reinforcing bars shall be epoxy-coated.
- 2 See plans for approach thickness.
- 3 For HMA pavement:
10 in. if design year AADT < 1000
12 in. if design year AADT ≥ 1000
- 4 For PCCP:
12 in. if pavement thickness < 12 in.
Same as pavement thickness, if pavement thickness ≥ 12 in.
- 5 Joint type I-A. See Standard Drawing E 609-BRJT-01 for details.
6. See Standard Drawing E 703-BRST-01 for reinforcing-bar bending details and notes.
- 7 See Standard Drawing E 503-BATJ-01 for terminal joint and sleeper slab details.

KEY:

RCBA = Reinforced Concrete Bridge Approach

PCCP = Portland Cement Concrete Pavement

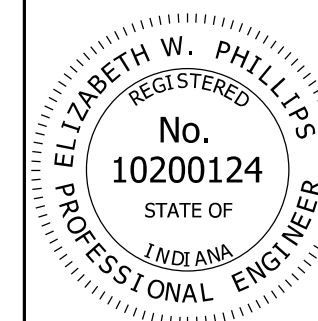


INDIANA DEPARTMENT OF TRANSPORTATION

REINFORCED CONCRETE BRIDGE APPROACH
SECTION AND PAVEMENT LEDGE DETAIL

SEPTEMBER 2014

STANDARD DRAWING NO. E 609-RCBA-03

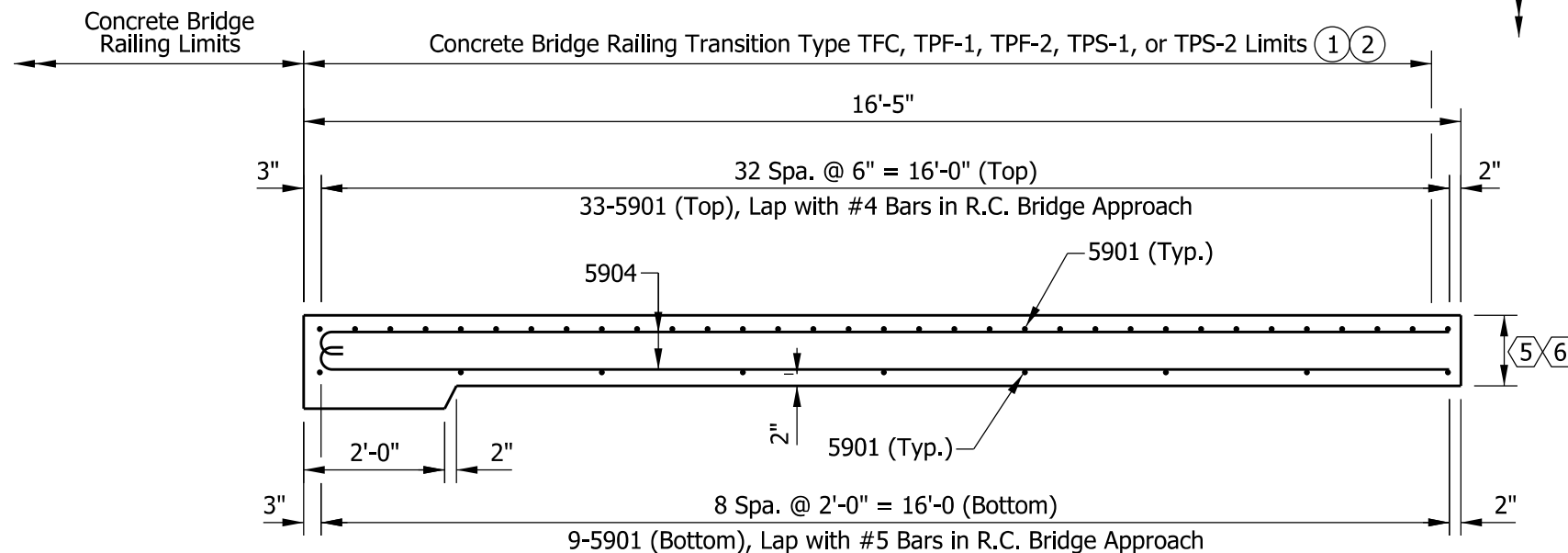
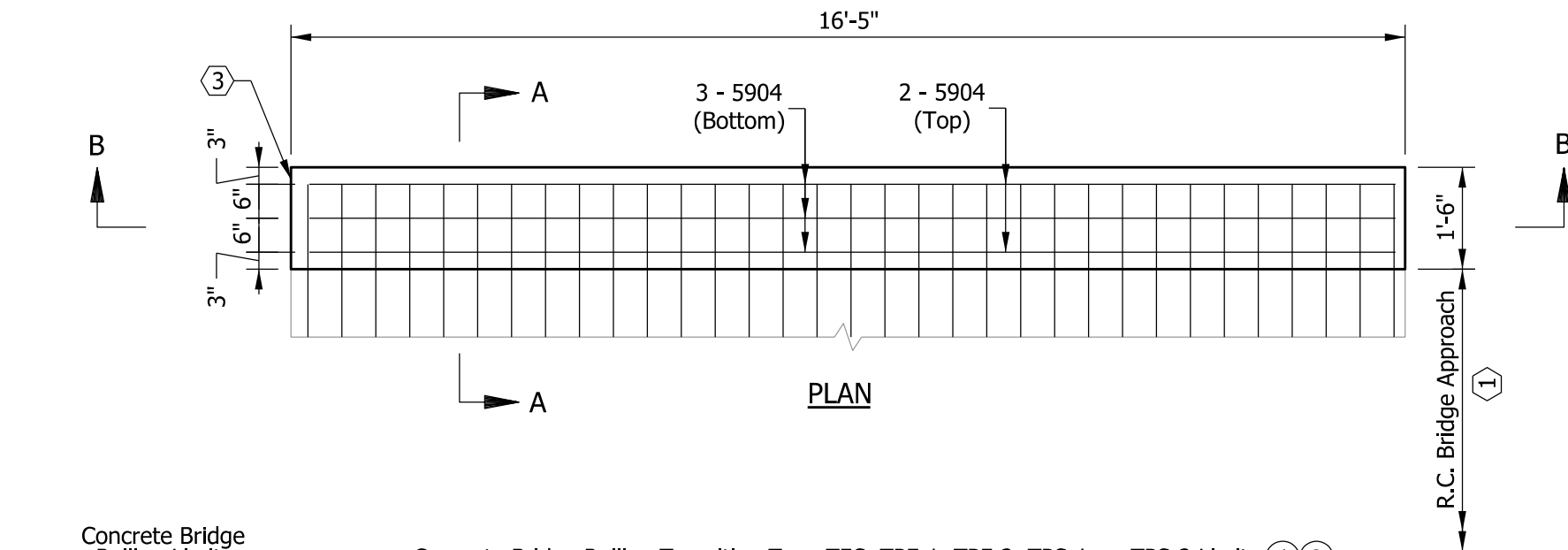


/s/ Elizabeth W. Phillips 02/21/14

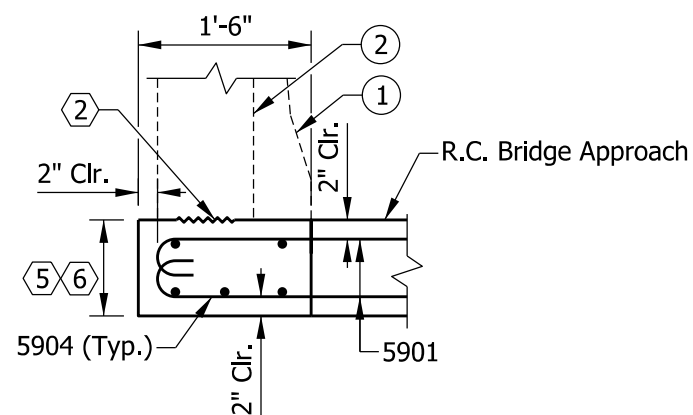
DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 03/03/14

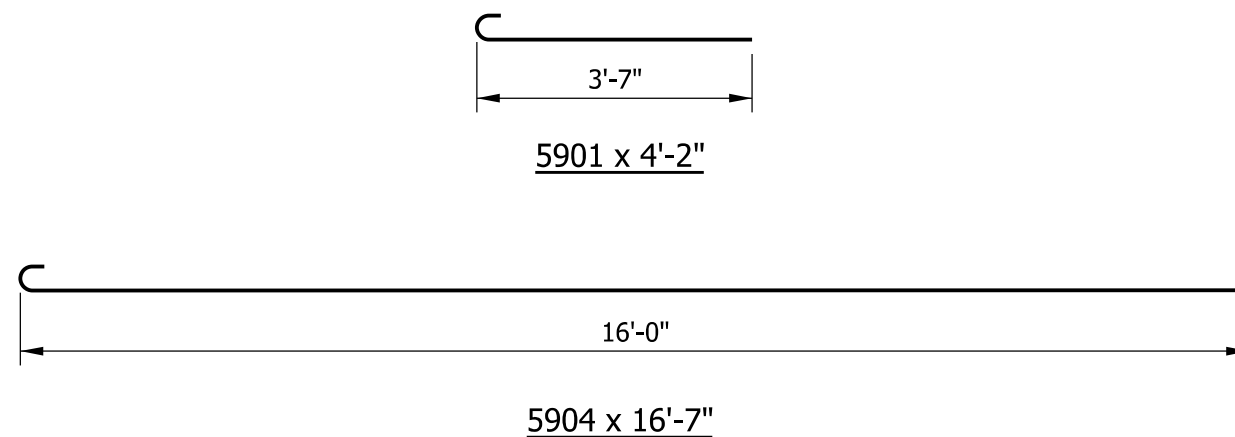
CHIEF ENGINEER DATE



SECTION B-B



SECTION A-A



NOTES

- See Standard Drawings E 706-TTFC-01 through -03 for concrete bridge railing transition type TFC details.
- See Standard Drawings E 706-TTPP-01 and -02 for concrete bridge railing transition type TPF-1 details.
See Standard Drawings E 706-TTPP-03 and -04 for concrete bridge railing transition type TPF-2 details.
See Standard Drawings E 706-TTPP-05 and -06 for concrete bridge railing transition type TPS-1 details.
See Standard Drawings E 706-TTPP-07 and -08 for concrete bridge railing transition type TPS-2 details.
- See Standard Drawing E 609-TBAE-04 for General Notes 5 6.

BILL OF MATERIALS

Quantities are for one RCBA extension

EPOXY-COATED REINFORCING BARS

MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT
5901	42	4'-2"	
5904	5	16'-7"	
Total Epoxy-Coated Reinforcing Bars			269 LBS

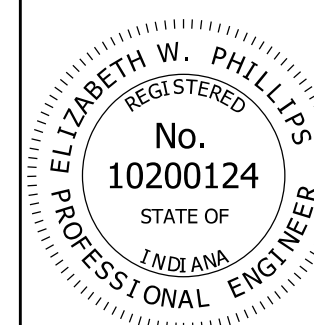
MISCELLANEOUS

RCBA Extension Area	2.7 SYS
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INDIANA DEPARTMENT OF TRANSPORTATION

RCBA EXTENSION FOR BRIDGE RAILING TRANSITION TFC, TPF-1, TPF-2, TPS-1, OR TPS-2 SEPTEMBER 2013

STANDARD DRAWING NO. E 609-TBAE-01

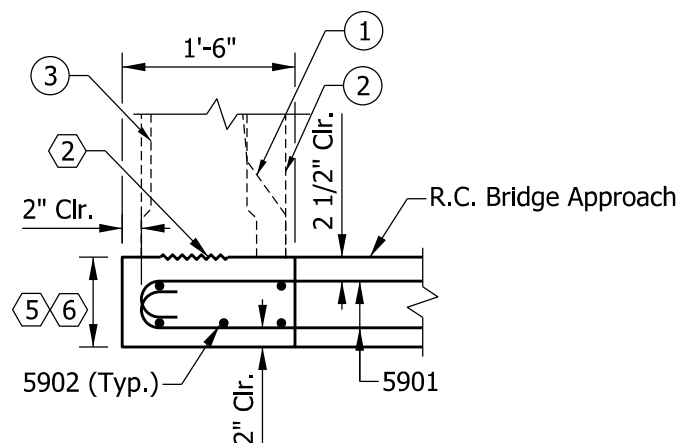
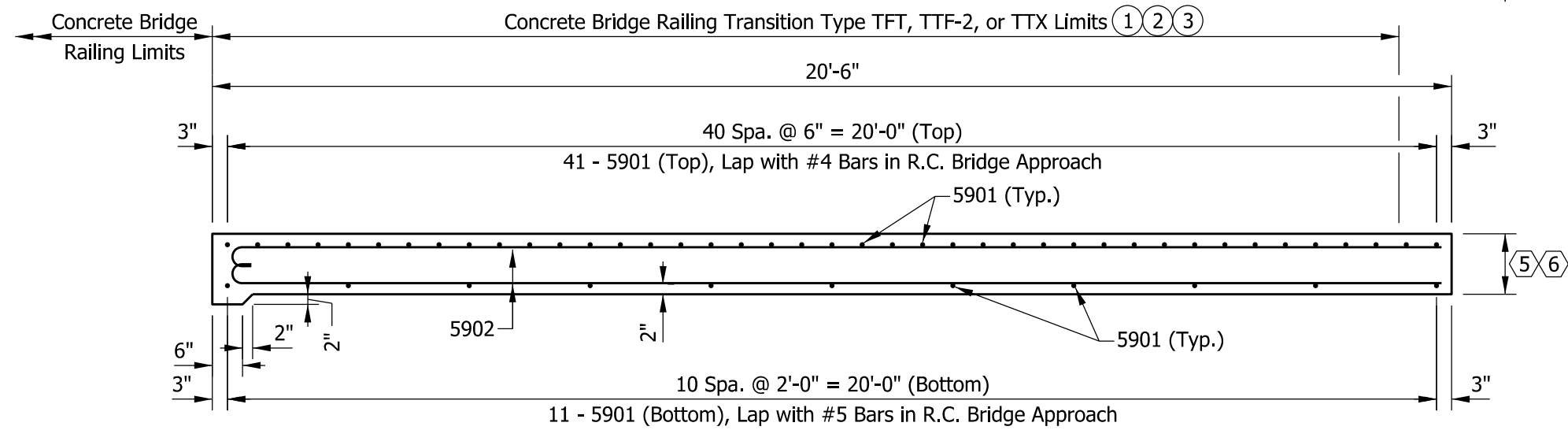
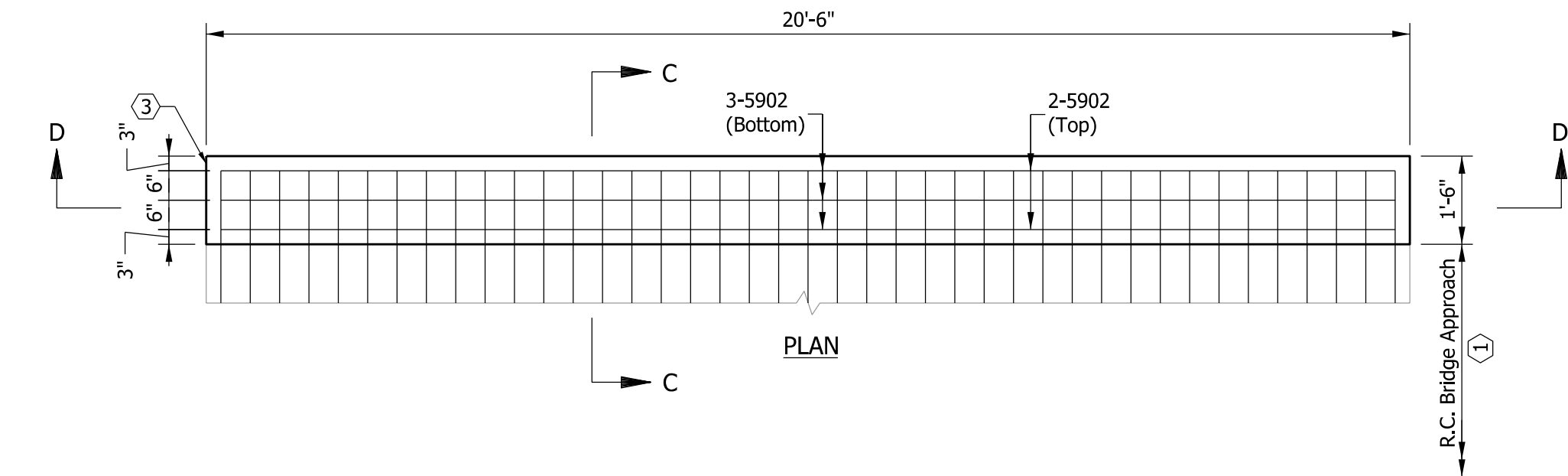


/s/ Elizabeth W. Phillips 02/28/13

DESIGN STANDARDS ENGINEER DATE

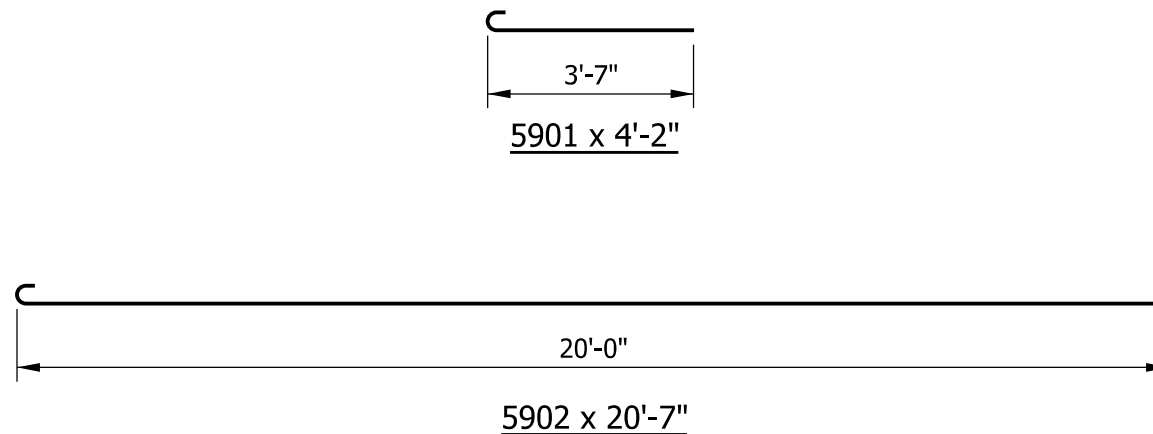
/s/ Mark A. Miller 03/27/13

CHIEF ENGINEER DATE



SECTION D-D

SECTION C-C



NOTES

- ① See Standard Drawing E 706-TTFT-01 through -03 for concrete bridge railing transition type TFT details.
- ② See Standard Drawing E 706-TTTF-01 through -04 for concrete bridge railing transition type TTF-2 details.
- ③ See Standard Drawing E 706-TTTX-01 and -02 for concrete bridge railing transition type TTX details.
4. See Standard Drawing E 609-TBAE-04 for General Notes.

BILL OF MATERIALS

Quantities are for one RCBA extension

EPOXY-COATED REINFORCING BARS

MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT
5901	52	4'-2"	
5902	5	20'-7"	
Total Epoxy-Coated Reinforcing Bars			333 LBS

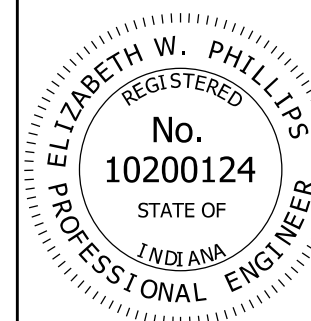
MISCELLANEOUS

RCBA Extension Area	3.4 SYS
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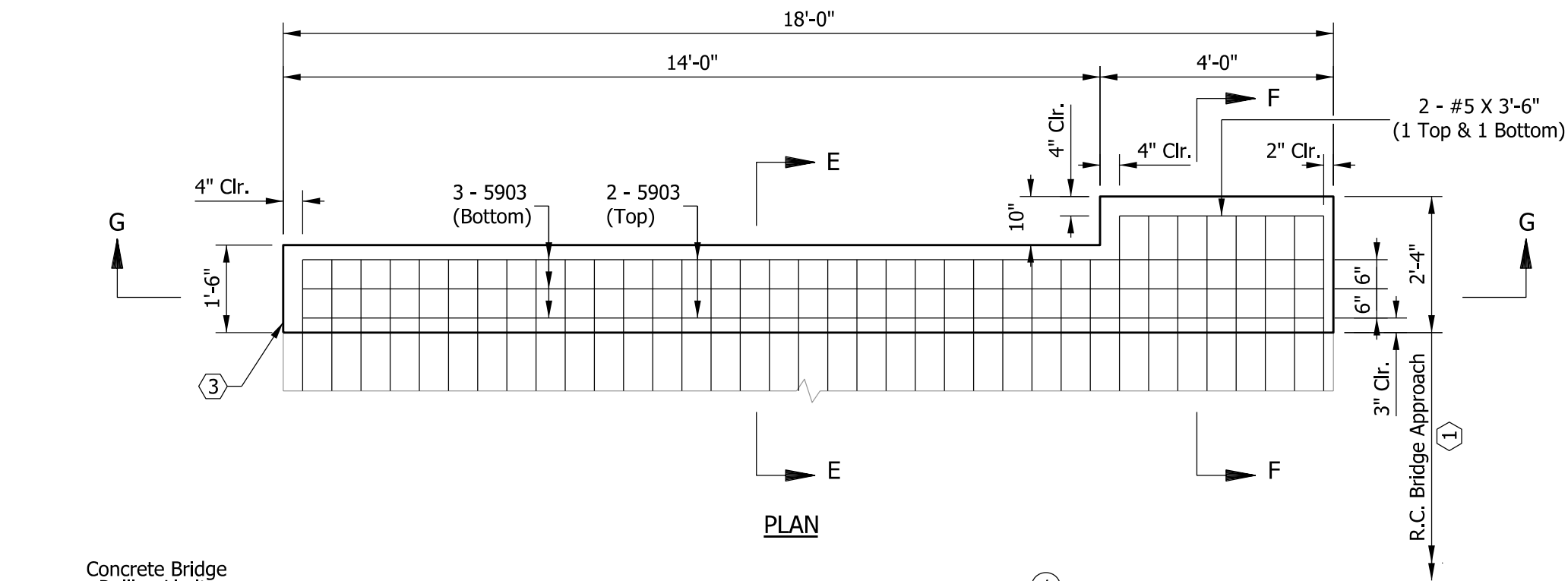
INDIANA DEPARTMENT OF TRANSPORTATION

RCBA EXTENSION FOR
BRIDGE RAILING TRANSITION
TFT, TTF-2, OR TTX
SEPTEMBER 2013

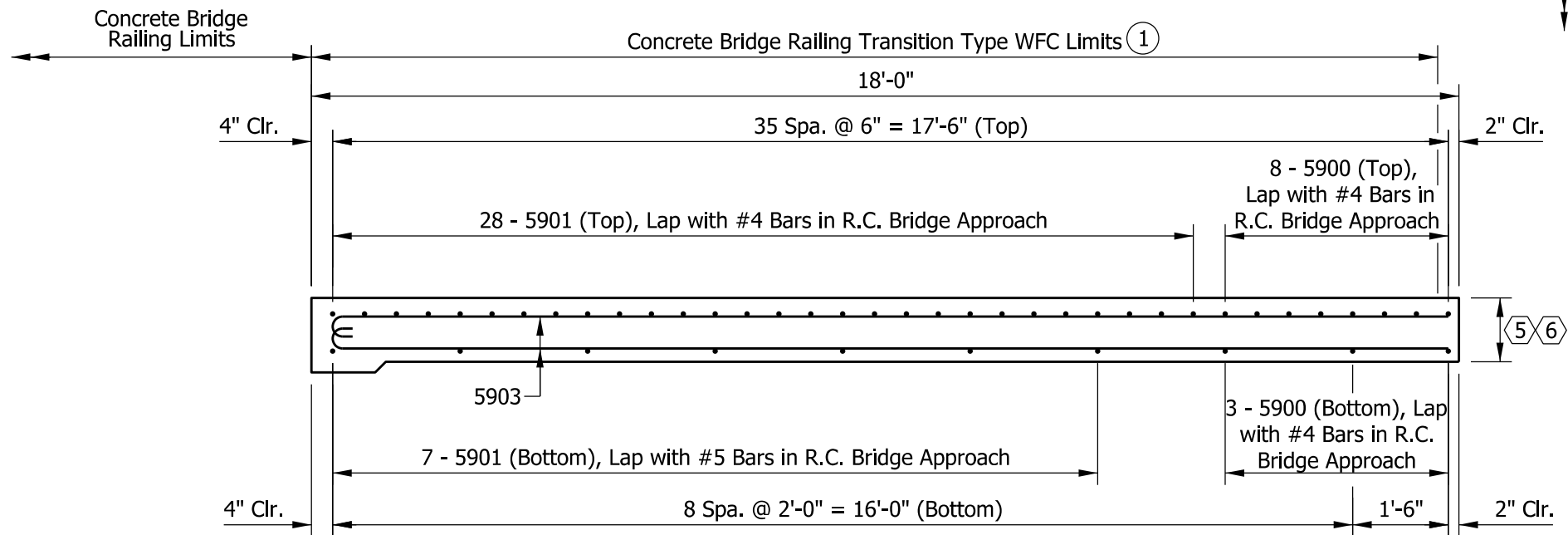
STANDARD DRAWING NO. E 609-TBAE-02



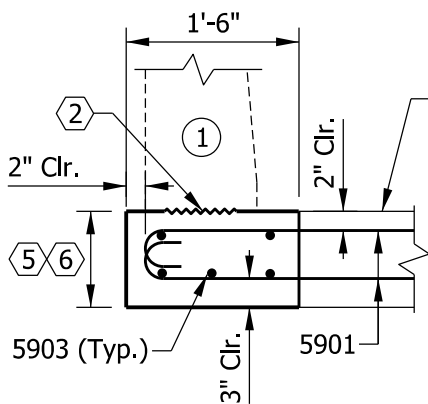
/s/ Elizabeth W. Phillips	02/28/13
DESIGN STANDARDS ENGINEER	DATE
/s/ Mark A. Miller	03/27/13
CHIEF ENGINEER	DATE



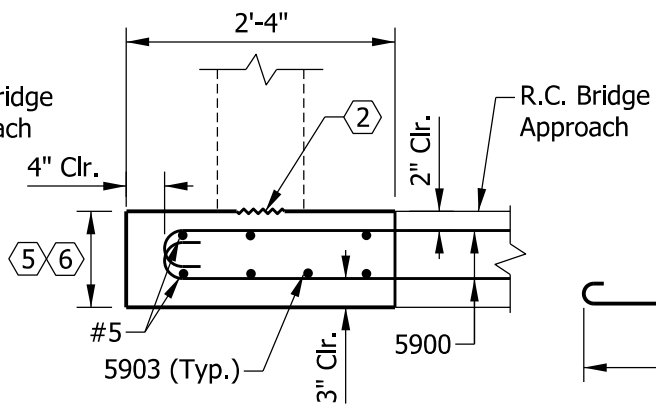
PLAN



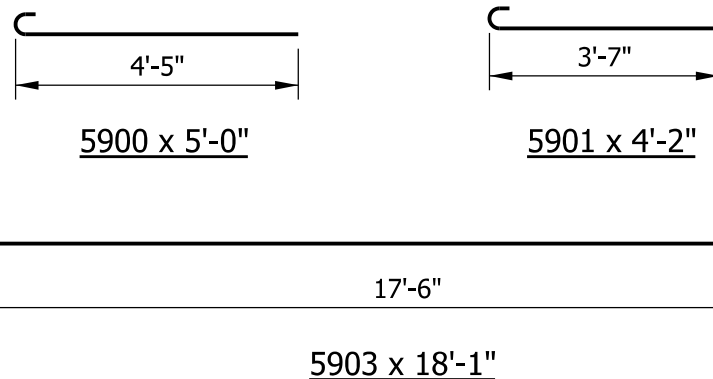
SECTION G-G



SECTION E-E



SECTION F-F



NOTES

- See Standard Drawings E 706-TWFC-01 through -03 for concrete bridge railing transition WFC details.
- See Standard Drawing E 609-TBAE-04 for General Notes.

BILL OF MATERIALS

Quantities are for one RCBA extension

EPOXY-COATED REINFORCING BARS

MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT
5900	11	5'-0"	
5901	35	4'-2"	
5903	5	18'-1"	
#5	2	3'-6"	

Total Epoxy-Coated Reinforcing Bars 312 LBS

MISCELLANEOUS

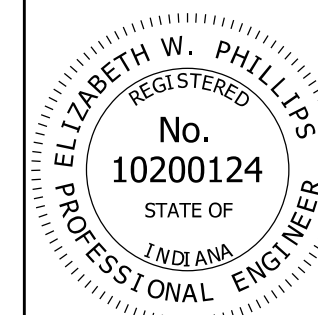
RCBA Extension Area 3.4 SYS

INDIANA DEPARTMENT OF TRANSPORTATION

RCBA EXTENSION FOR BRIDGE RAILING TRANSITION WFC

SEPTEMBER 2013

STANDARD DRAWING NO. E 609-TBAE-03



/s/ Elizabeth W. Phillips 02/28/13

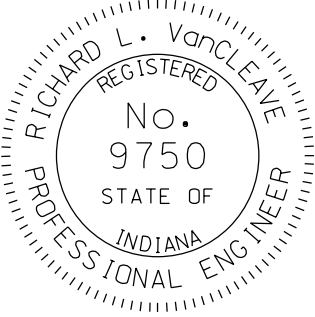
DESIGN STANDARDS ENGINEER DATE

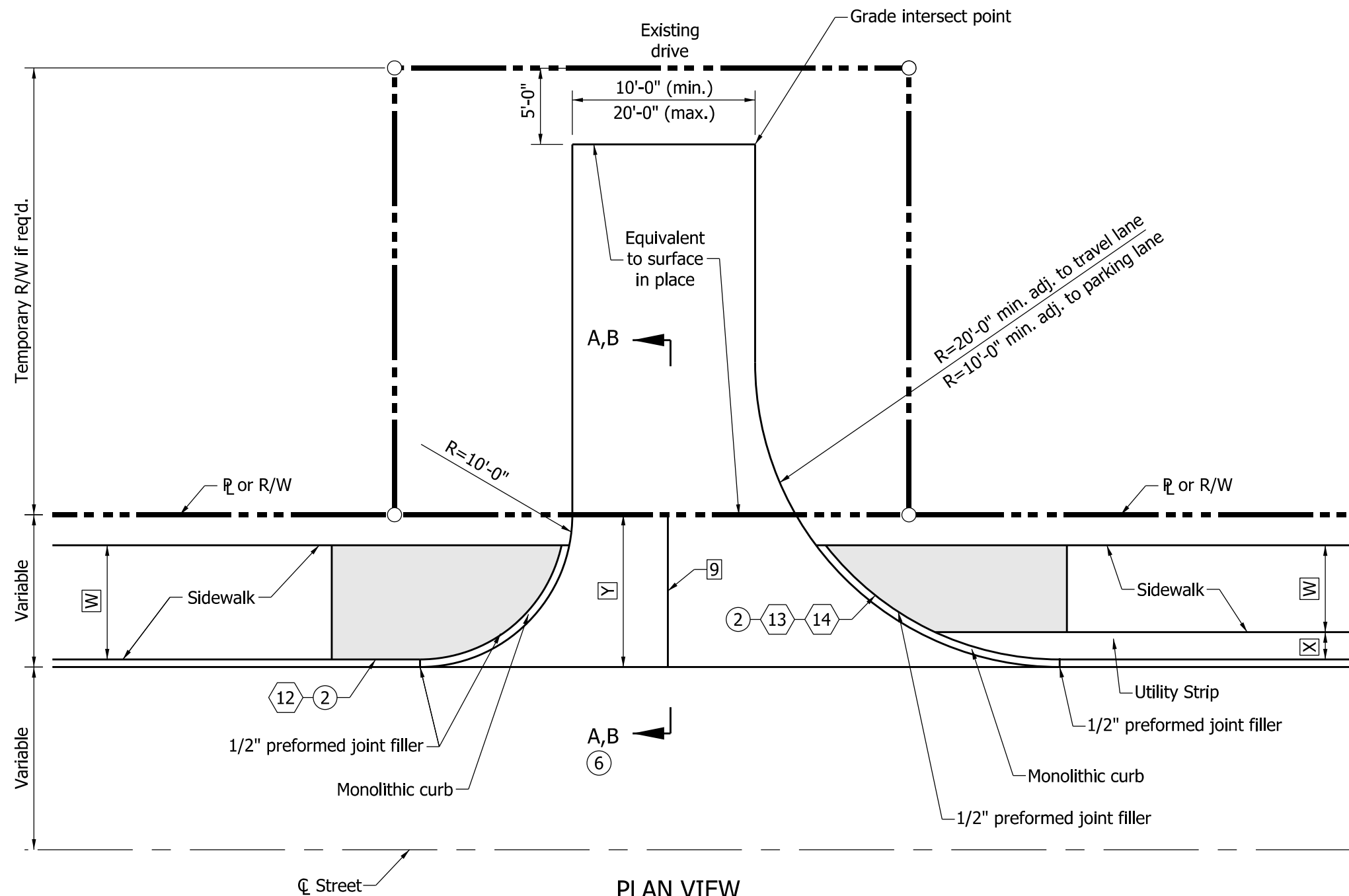
/s/ Mark A. Miller 03/27/13

CHIEF ENGINEER DATE

GENERAL NOTES

- 1
- See Standard Drawing E 609-RCBA-01 and the plans for reinforced concrete bridge approach details.
- 2
- Construction joint type A. See Standard Drawing E 702-CJTA-01 for details.
- 3
- This end of the reinforced concrete bridge approach extension shall match the construction at the bridge end as shown on the plans.
- 4
- See Standard Drawing E 703-BRST-01 for reinforcing-bar bending details and notes.
- 5
- See the plans for thickness of RCBA and its extension to be used with asphalt pavement.
- 6
- See the plans for thickness of RCBA and its extension to be used with a terminal joint and portland cement concrete pavement.

INDIANA DEPARTMENT OF TRANSPORTATION		
RCBA EXTENSION FOR BRIDGE RAILING TRANSITION GENERAL NOTES SEPTEMBER 2012		
STANDARD DRAWING NO. E 609-TBAE-04		
	/s/ Richard L. VanCleave09/04/12	
	SUPERVISOR, ROADWAY STANDARDS	DATE
	/s/ Mark A. Miller09/04/12	
	CHIEF ENGINEER	DATE



NOTES:

- See Standard Drawing E 610-DRIV-13 for General Notes and additional Legend.
- See Standard Drawings E 604-SDWK-01 or E 604-SDWK-02 for sidewalk elevation transition details.
- See Standard Drawings E 610-DRIV-03 for concrete curb and gutter connection detail.
- See Standard Drawings E 610-DRIV-07 for PCCP joint placement detail.
- Pavement shall be PCCP for Approaches, 6 in., on subgrade treatment Type IIIA.
- See Standard Drawing E 610-DRIV-08 for sections A-A and B-B.
- See Standard Drawing E 503-CCPJ-02 for longitudinal joint details.

LEGEND

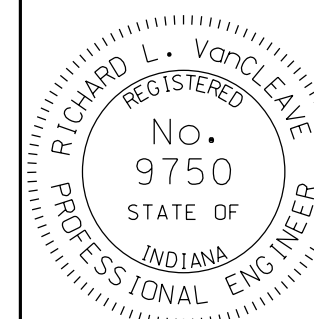
- W = Width of sidewalk
 X = Distance between back face of curb to sidewalk.
 Y = Distance from front face of curb to $\bar{R}$ or R/W.
 = Sidewalk elevation transition.

INDIANA DEPARTMENT OF TRANSPORTATION

CLASS I DRIVE

SEPTEMBER 2012

STANDARD DRAWING NO. E 610-DRIV-01

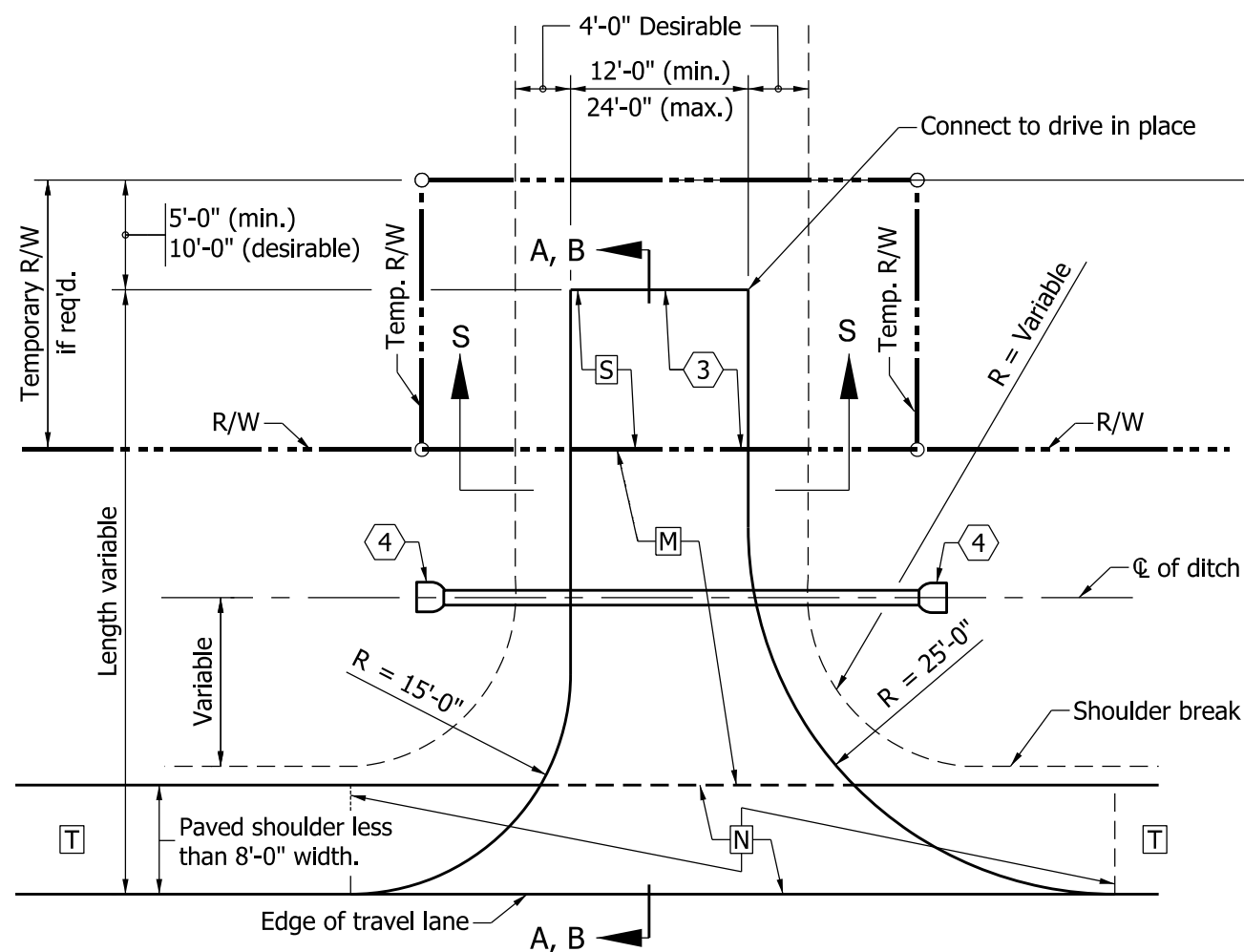


/s/ Richard L. VanCleave 09/04/12

SUPERVISOR, ROADWAY STANDARDS DATE

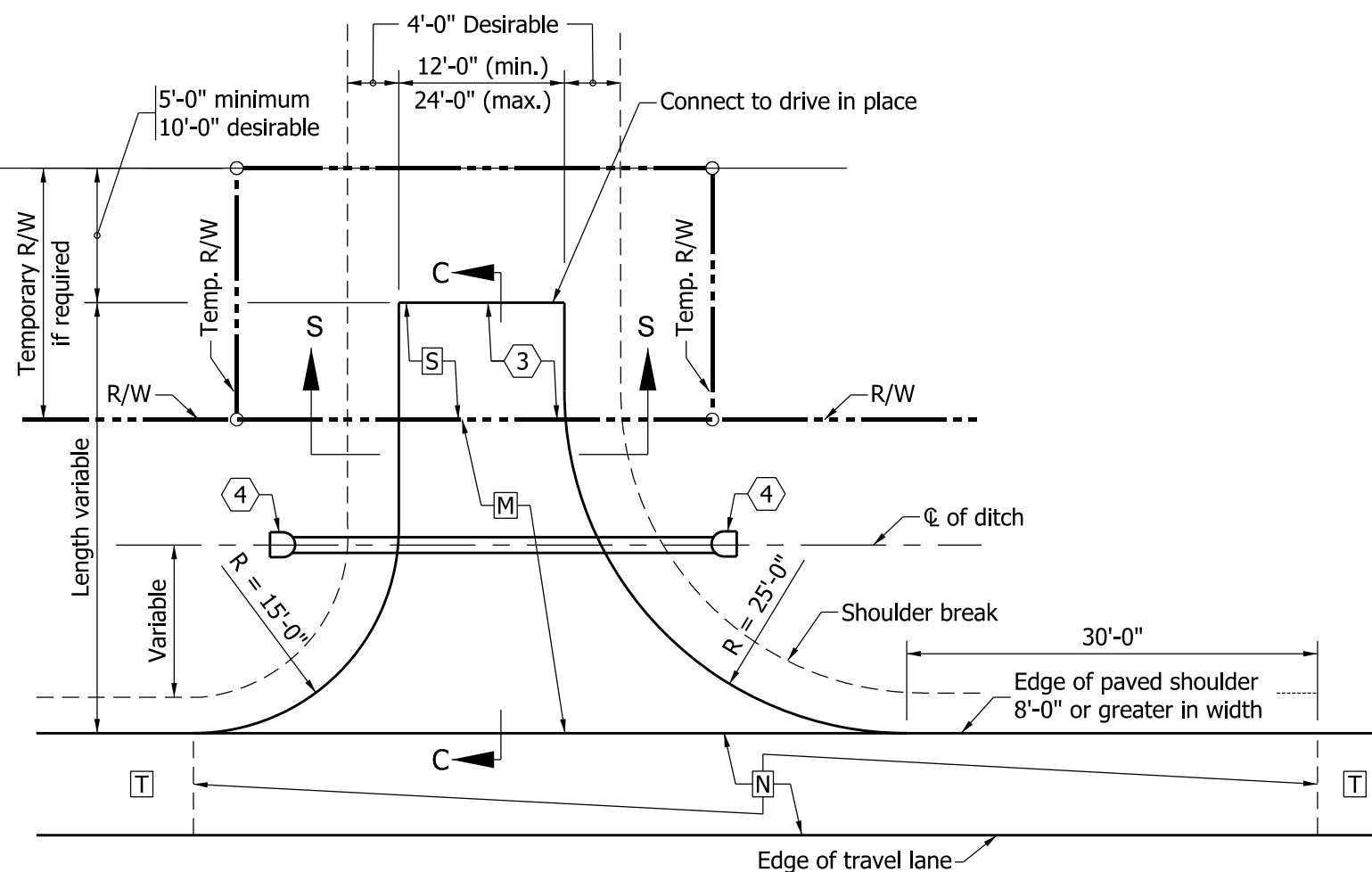
/s/ Mark A. Miller 09/04/12

CHIEF ENGINEER DATE



PLAN VIEW

(PAVED SHOULDER LESS THAN 8'-0" IN WIDTH OR UNPAVED SHOULDER)



PLAN VIEW

(PAVED SHOULDER 8'-0" OR GREATER IN WIDTH)

NOTES:

1. See Standard Drawing E 610-DRIV-13 for General Notes and additional Legend.
2. See Standard Drawings E 610-DRIV-10 for Sections A-A, B-B and C-C.
3. See Standard Drawings E 610-DRIV-10 for approach grades.
4. See Standard Drawings E 610-DRIV-09 for Section S-S.

LEGEND

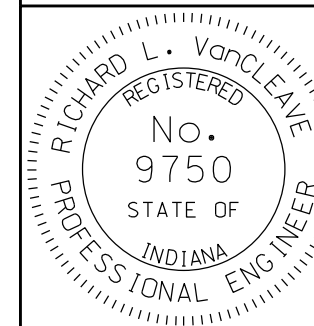
- [M] HMA for Approaches:
165#/syd HMA Surface Type B on
385#/syd HMA Intermediate Type B on
subgrade treatment Type IIIA
or
PCCP for Approaches, 6",
subgrade treatment Type IIIA
- [N] The greater thickness of either the drive [M]
or the paved shoulder [T] section.
- [T] Plan shoulder section.
- [S] For type and thickness equivalent
to surface in place, see plans.

INDIANA DEPARTMENT OF TRANSPORTATION

CLASS II DRIVE

SEPTEMBER 2010

STANDARD DRAWING NO. E 610-DRIV-02



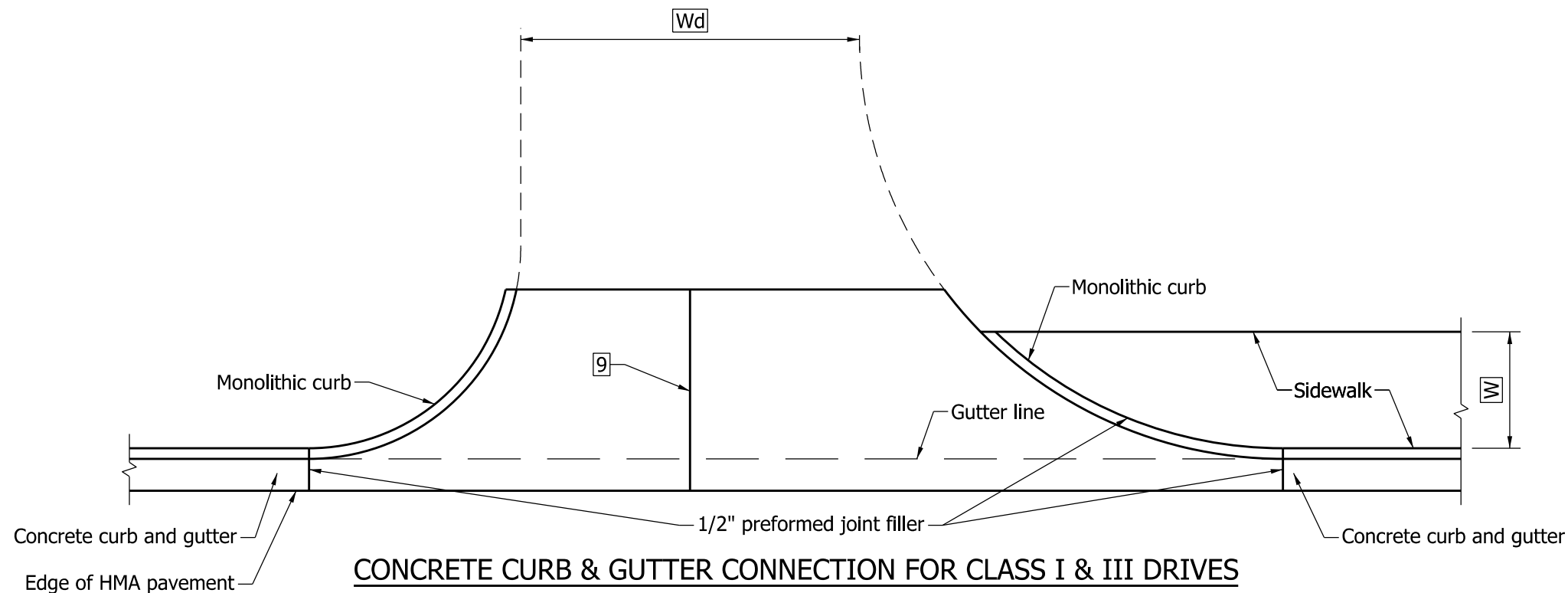
DESIGN STANDARDS ENGINEER

/s/ *Richard L. VanCleave* 09/01/10

DESIGN STANDARDS ENGINEER DATE

/s/ *Mark A. Miller* 09/01/10

CHIEF HIGHWAY ENGINEER DATE

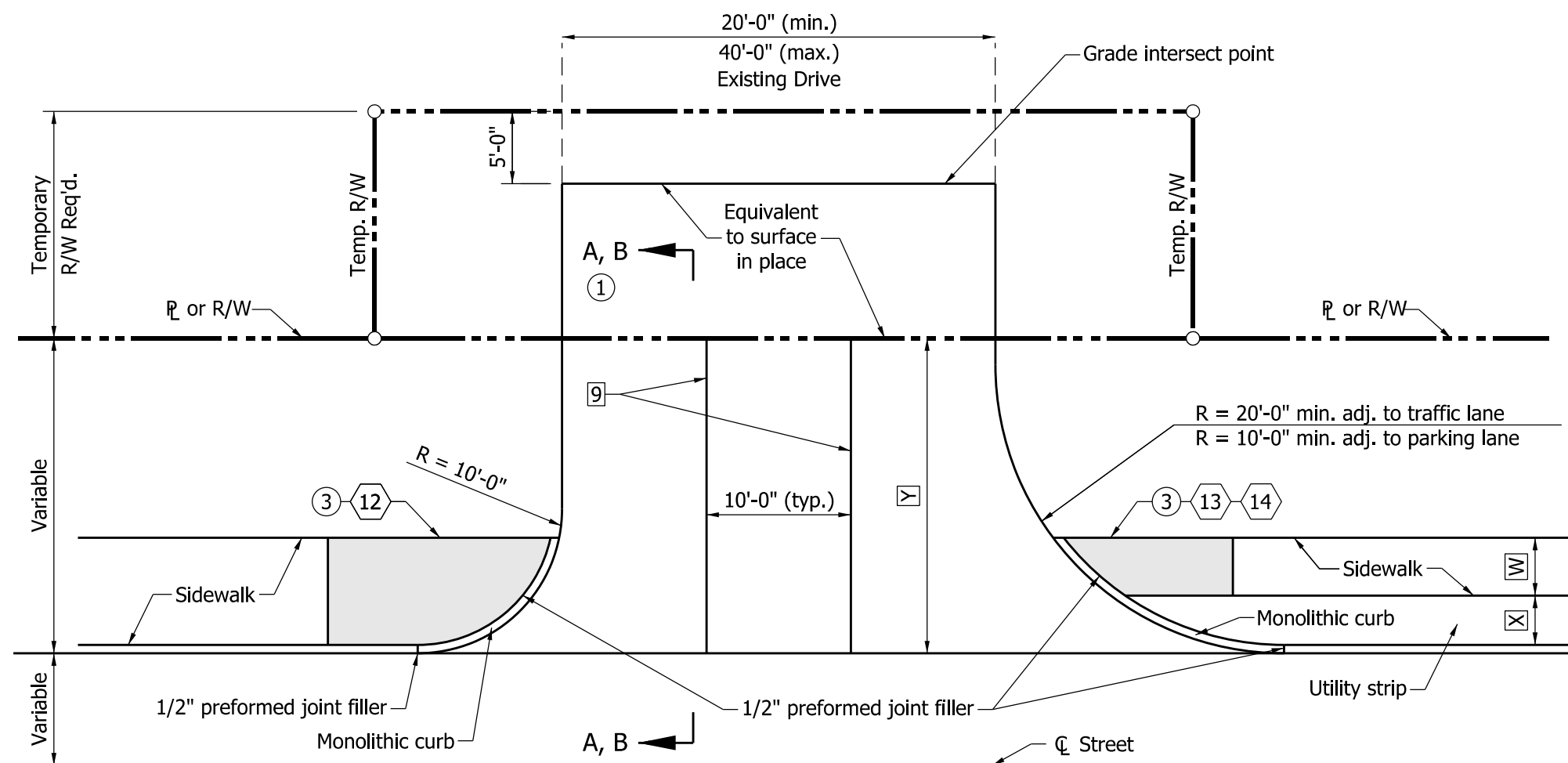


NOTES:

- ① See Standard Drawing E 610-DRIV-08 for Section A-A, and Section B-B.
2. Pavement shall be PCCP for Approaches, 9 in., on subgrade treatment Type IIIA.
- ③ See Standard Drawings E 604-SDWK-01 or E 604-SDWK-02 for sidewalk elevation transition details, or Standard Drawing E 604-SWCR-09 for sidewalk curb ramp details if the drive is signalized.
4. See Standard Drawing E 610-DRIV-07 for joint placement details.
5. See Standard Drawing E 610-DRIV-13 for General Notes and additional Legend.
6. See Standard Drawing 503-CCPJ-02 for longitudinal joint details.

LEGEND

- W = Width of sidewalk
Wd = Driveway width
X = Distance between back face of curb and sidewalk
Y = Distance from front face of curb to $\mathcal{R}$ or R/W
 = Sidewalk elevation transition

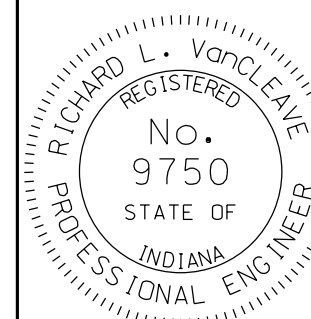


INDIANA DEPARTMENT OF TRANSPORTATION

CLASS III DRIVE

SEPTEMBER 2012

STANDARD DRAWING NO. E 610-DRIV-03

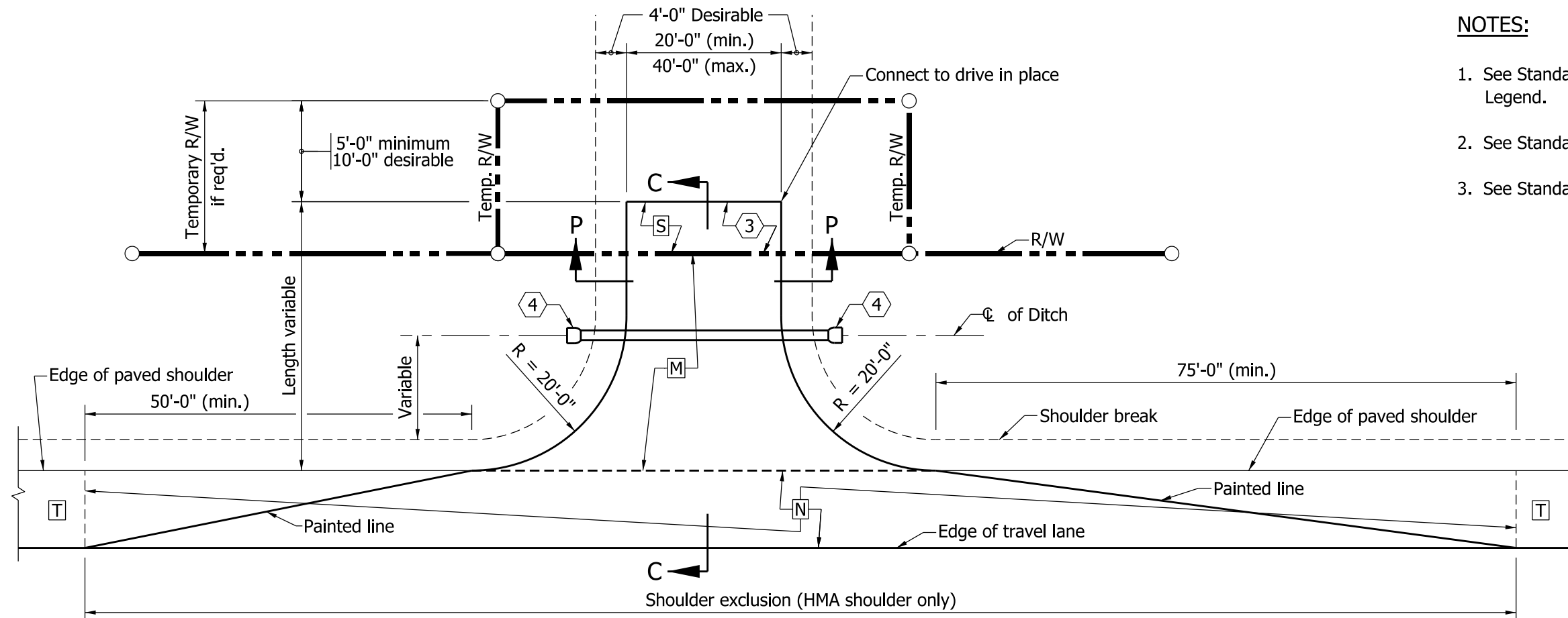


/s/ *Richard L. VanCleave* 09/04/12

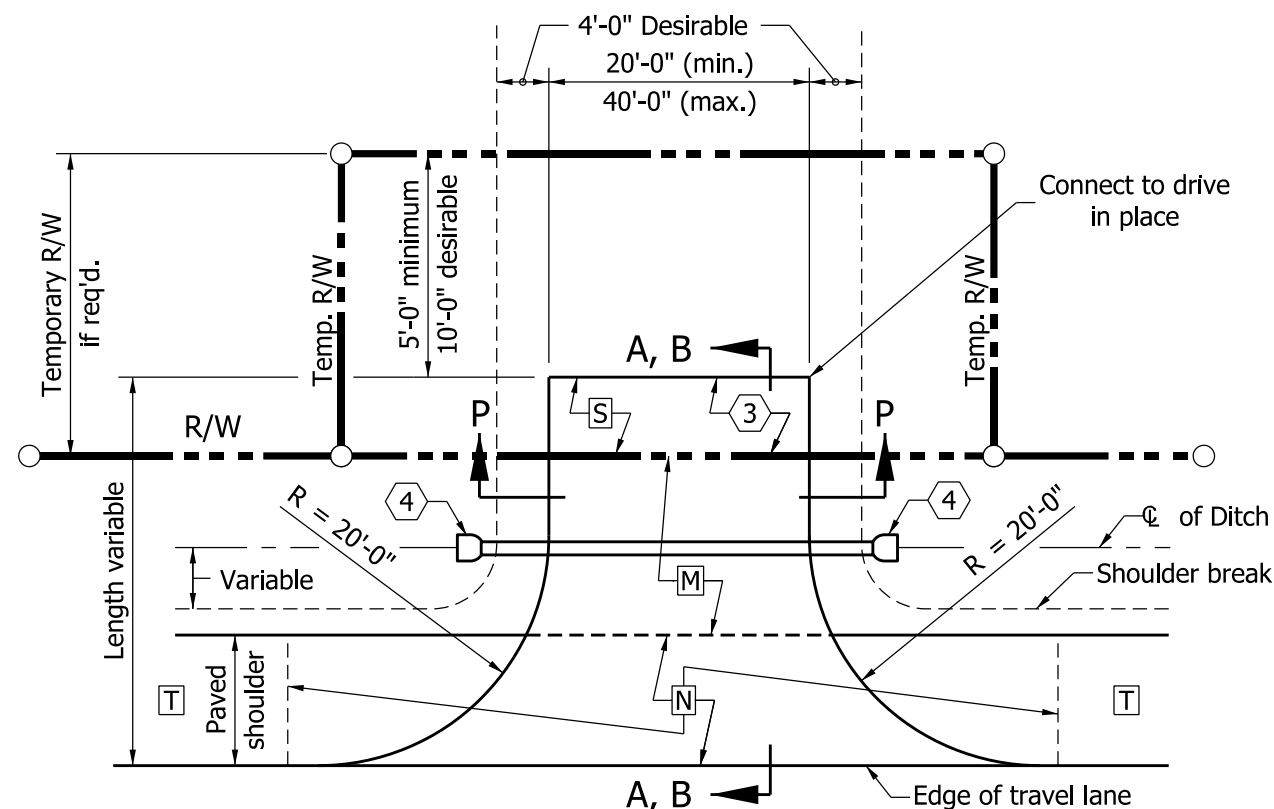
SUPERVISOR, ROADWAY STANDARDS DATE

/s/ *Mark A. Miller* 09/04/12

CHIEF ENGINEER DATE



PLAN VIEW
(PAVED SHOULDER 8'-0" FEET OR GREATER IN WIDTH)



PLAN VIEW
(PAVED SHOULDER LESS THAN 8'-0" IN WIDTH OR UNPAVED SHOULDER)

NOTES:

1. See Standard Drawing E 610-DRIV-13 for General Notes and additional Legend.
2. See Standard Drawings E 610-DRIV-10 for Sections A-A, B-B and C-C.
3. See Standard Drawings E 610-DRIV-09 for Section P-P.

LEGEND

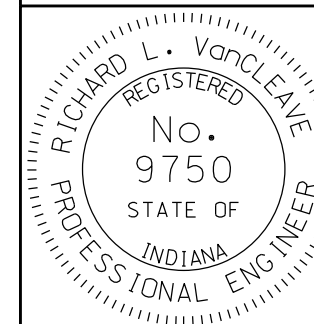
- [M]** HMA for Approaches:
165#/syd HMA Surface Type B on
275#/syd HMA Intermediate Type B on
880#/syd HMA base, Type B on
subgrade treatment Type IIIA
or
PCCP for Approaches, 9", on
subgrade treatment Type IIIA
- [N]** The greater thickness of either the drive **[M]**
or the paved shoulder **[T]** section.
- [T]** Plan shoulder section.
- [S]** For type and thickness equivalent
to surface in place, see plans.

INDIANA DEPARTMENT OF TRANSPORTATION

CLASS IV DRIVE

SEPTEMBER 2010

STANDARD DRAWING NO. E 610-DRIV-04



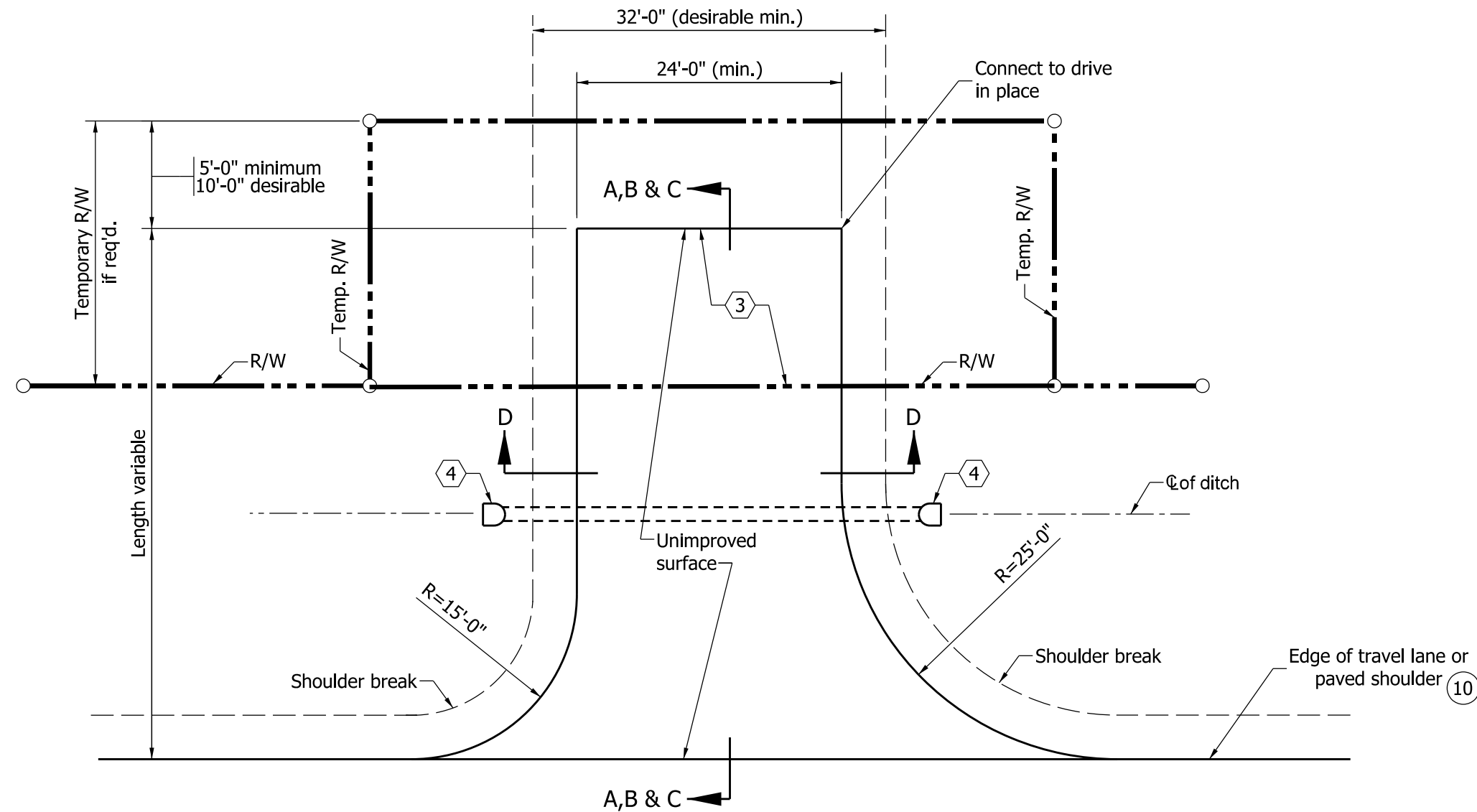
DESIGN STANDARDS ENGINEER

/s/ Richard L. VanCleave 09/01/10

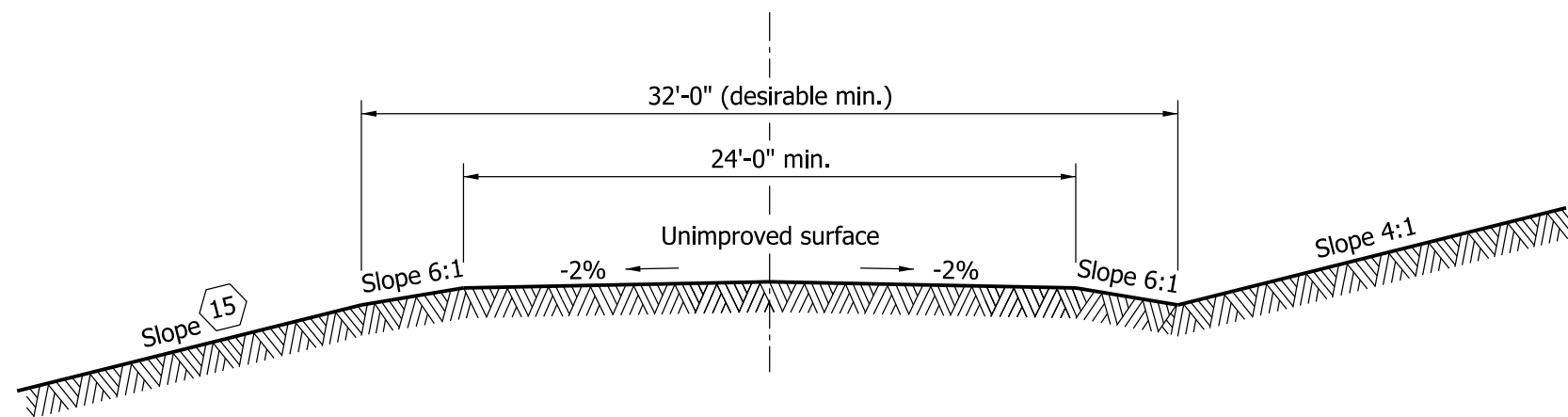
DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 09/01/10

CHIEF HIGHWAY ENGINEER DATE



PLAN VIEW



SECTION D-D

Notes:

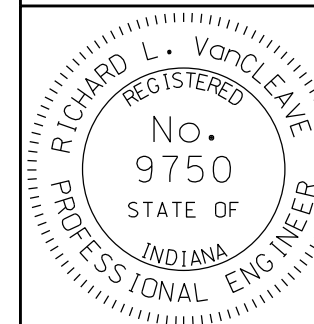
1. See Standard Drawing E 610-DRIV-13 for General Notes.
 2. See Standard Drawing E 610-DRIV-10 for Section A-A, B-B and C-C.
- 10 Where the shoulder is earth or aggregate or the paved width is less than 8'-0", the drive radii shall be tangent to the edge of the travel lane. Where the paved shoulder width is 8'-0" or more, the drive radii shall be tangent to the edge of the paved shoulder.

INDIANA DEPARTMENT OF TRANSPORTATION

CLASS V DRIVE
FIELD ENTRANCE

SEPTEMBER 2010

STANDARD DRAWING NO. E 610-DRIV-05



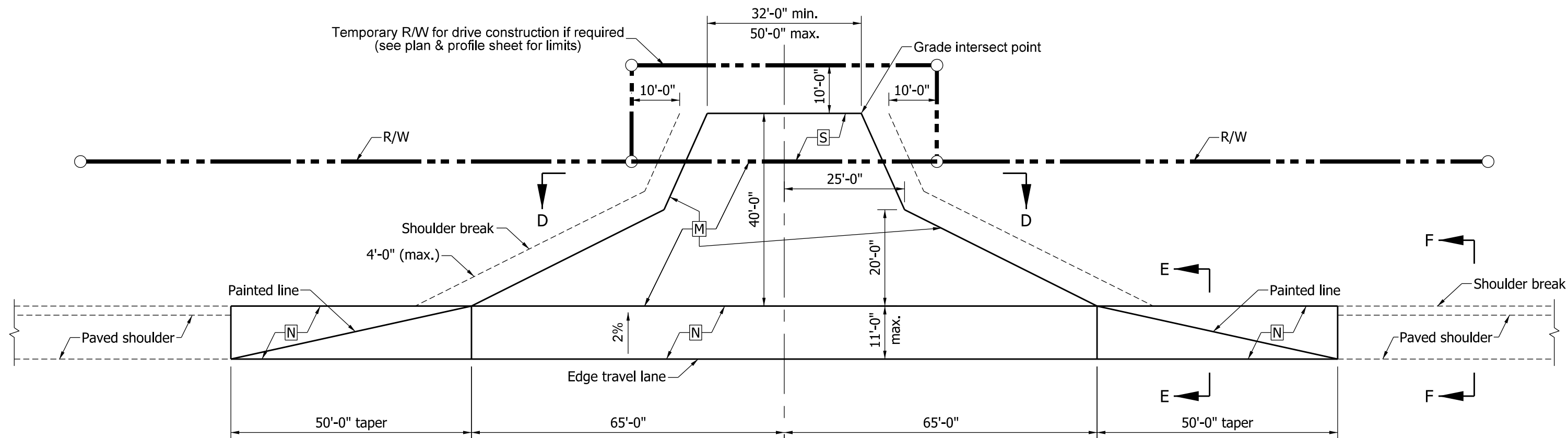
/s/ Richard L. VanCleave 09/01/10

DESIGN STANDARDS ENGINEER DATE

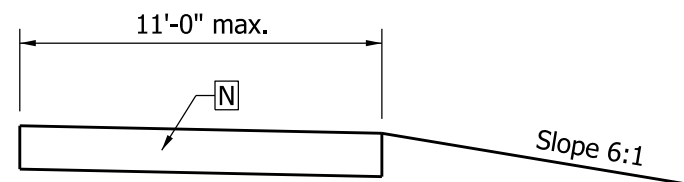
/s/ Mark A. Miller 09/01/10

CHIEF HIGHWAY ENGINEER DATE

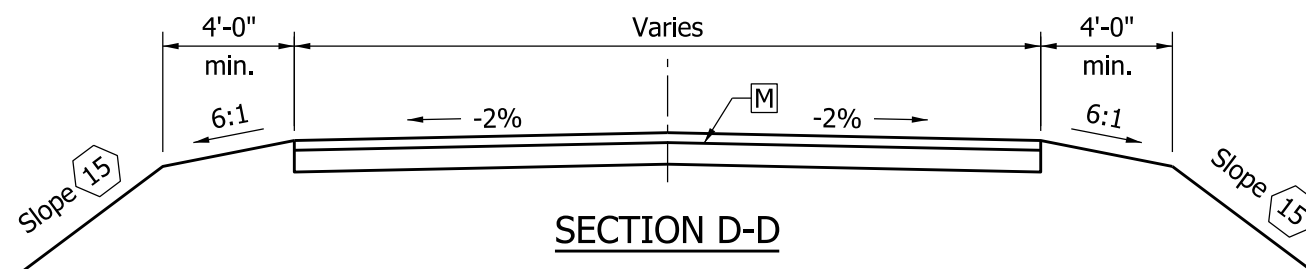
DESIGN STANDARDS ENGINEER



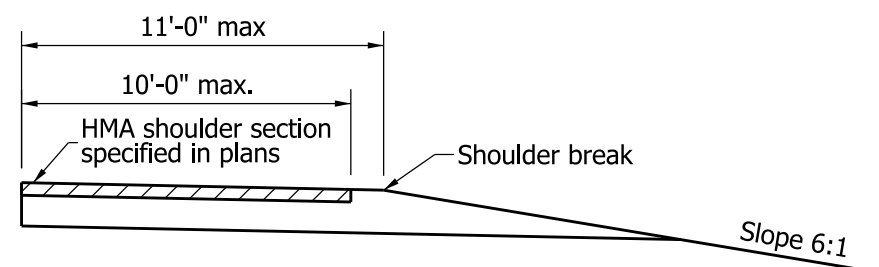
PLAN VIEW



SECTION E-E



SECTION D-D



SECTION F-F

NOTES:

1. See Standard Drawing E 610-DRIV-13 for General Notes and additional Legend.
2. See Standard Drawings E 610-DRIV-11 for drive profile grades.
3. Class VI Drive accommodates a WB-65 (IDV) design vehicle with a 45'-0" turning radius.

LEGEND

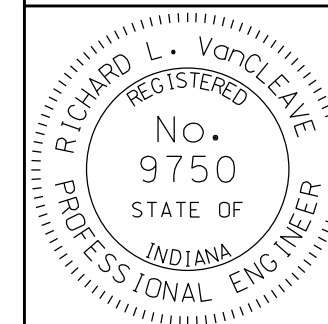
- [M] HMA for Approaches:
165#/syd HMA Surface Type B on
275#/syd HMA Intermediate Type B on
880#/syd HMA base, Type B on
subgrade treatment Type IIIA
or
PCCP for Approaches, 9", on
subgrade treatment Type IIIA
- [N] The greater thickness of either the drive [M]
or the paved shoulder section.
- [S] For type and thickness equivalent
to surface in place, see plans.

INDIANA DEPARTMENT OF TRANSPORTATION

**CLASS VI DRIVE
PLAN AND SECTIONS**

SEPTEMBER 2010

STANDARD DRAWING NO. E 610-DRIV-06



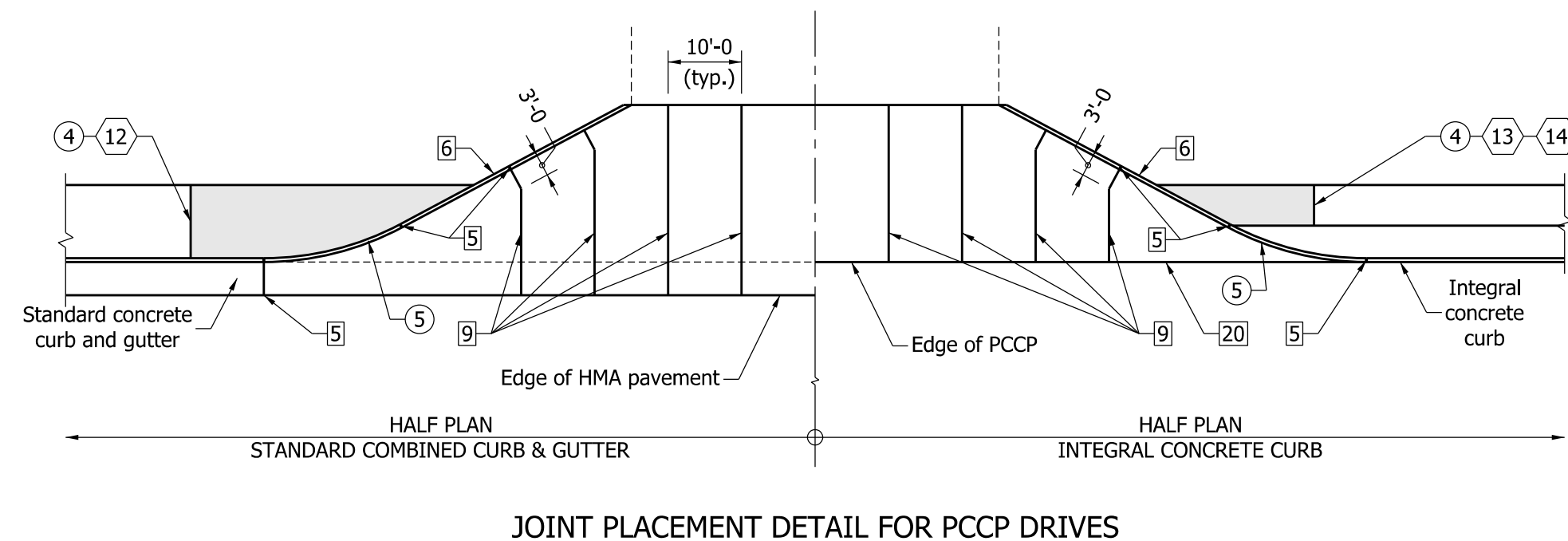
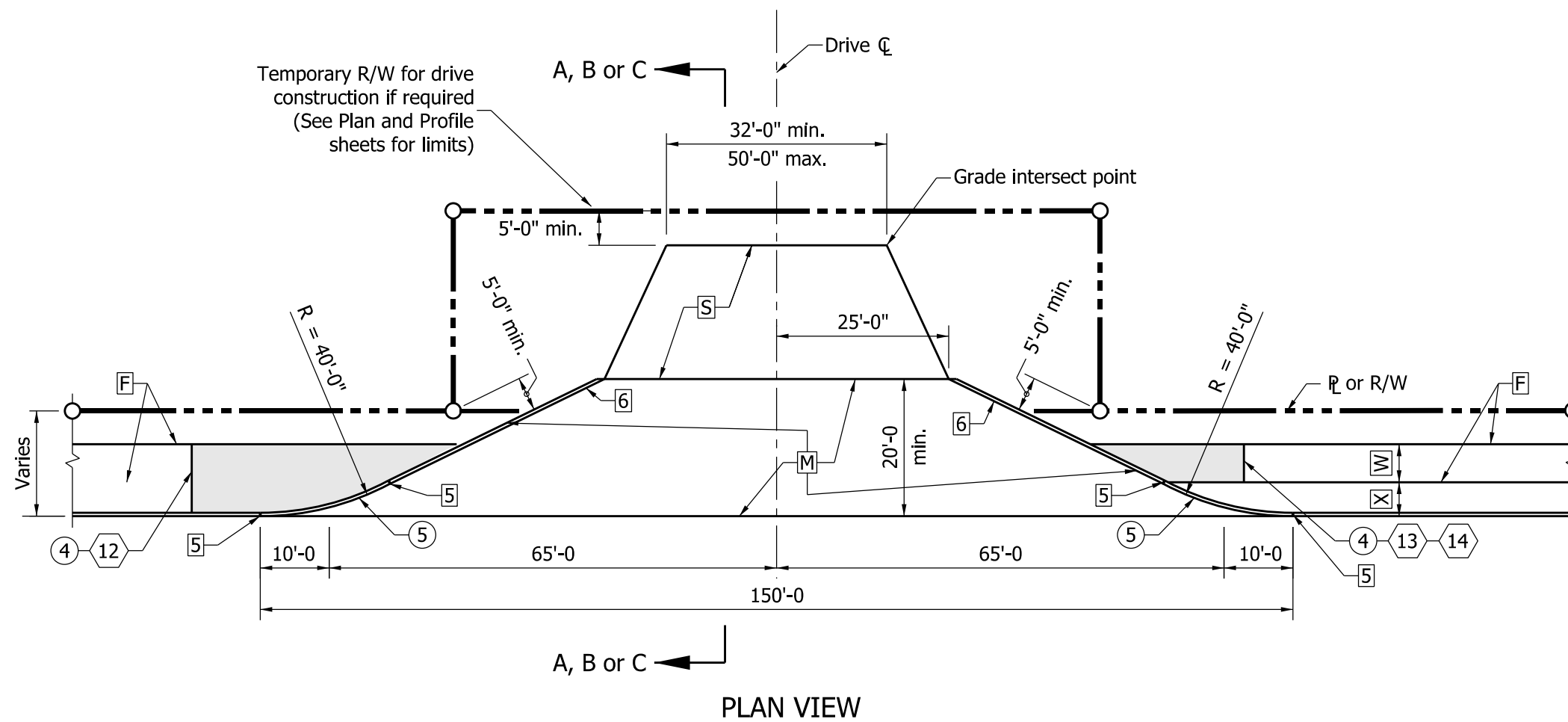
DESIGN STANDARDS ENGINEER

/s/ *Richard L. VanCleave* 09/01/10

DESIGN STANDARDS ENGINEER DATE

/s/ *Mark A. Miller* 09/01/10

CHIEF HIGHWAY ENGINEER DATE



NOTES:

- See Standard Drawings E 610-DRIV-13 for General Notes and additional Legend.
- See Standard Drawing E 610-DRIV-12 for sections A-A, B-B and C-C.
- Joint Placement Detail should be used with Class I, III and VII drives.
- See Standard Drawing E 604-SDWK-01 or E 604-SDWK-02 for sidewalk elevation transition details.
- See Standard Drawing E 610-DRIV-16 for details and corners.
- See Standard Drawing 503-CCPJ-02 for longitudinal joint details.

LEGEND

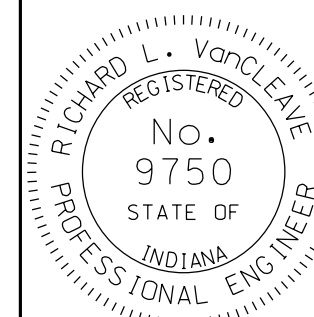
- [M] HMA for Approaches:
165#/syd HMA Surface Type B on
275#/syd HMA Intermediate Type B on
880#/syd HMA base, Type B on
subgrade treatment Type IIIA
or
PCCP for Approaches, 9 in., on
subgrade treatment Type IIIA
- [] Sidewalk elevation transition
- [S] For type and thickness equivalent to surface in place, see plans.

INDIANA DEPARTMENT OF TRANSPORTATION

CLASS VII DRIVE AND JOINT PLACEMENT DETAIL

SEPTEMBER 2012

STANDARD DRAWING NO. E 610-DRIV-07

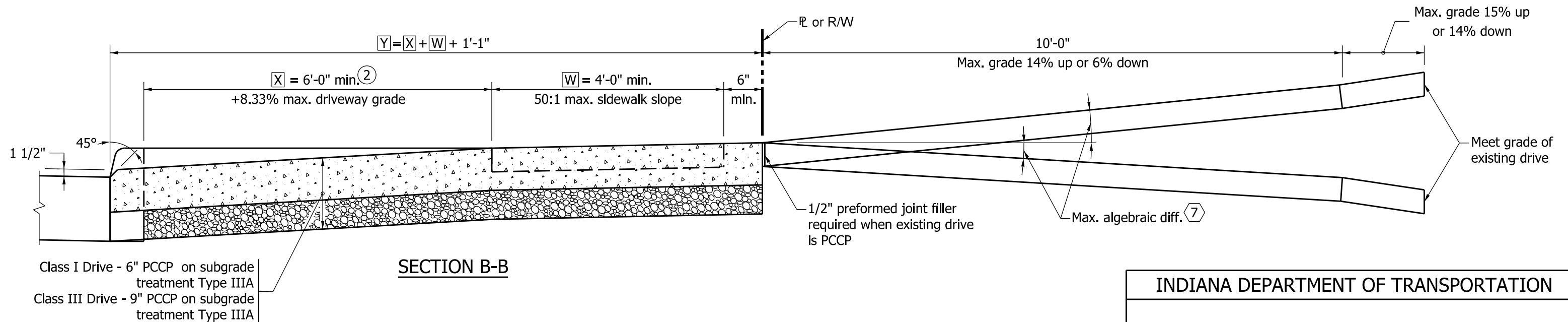
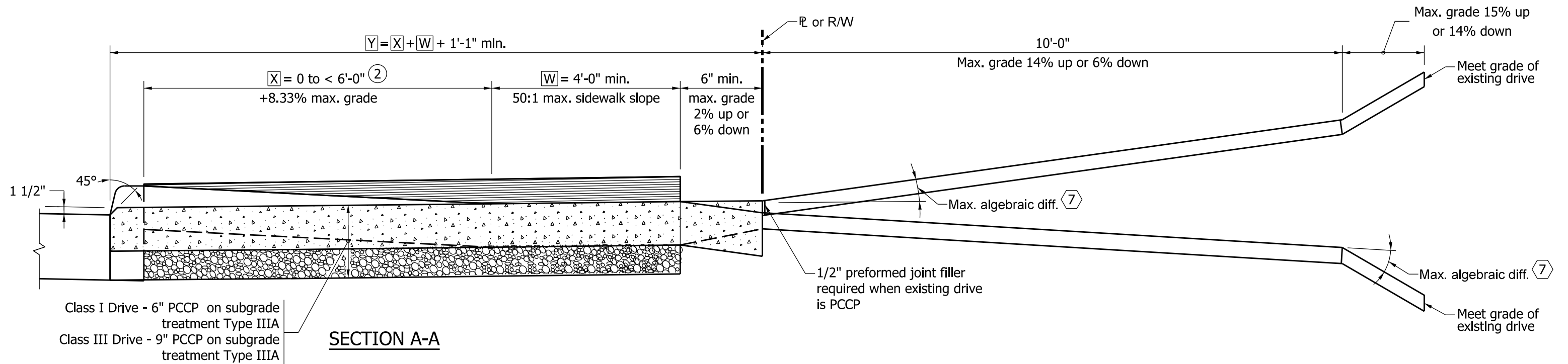


/s/ Richard L. VanCleave 09/04/12

SUPERVISOR, ROADWAY STANDARDS DATE

/s/ Mark A. Miller 09/04/12

CHIEF ENGINEER DATE



NOTES:

- ② The limits for X are based on a 6" curb height. For other curb heights, the limits for X shall be adjusted.
3. See Standard Drawing E 604-SDWK-01 or E 604-SDWK-02 for sidewalk elevation transition details.
4. See Standard Drawing E 610-DRIV-13 for General Notes.

LEGEND

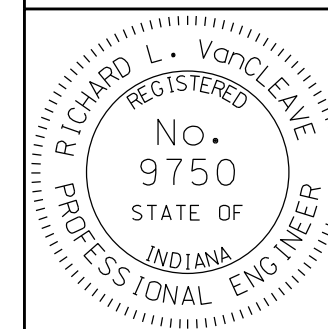
- W = Width of sidewalk
 X = Distance between back face of curb to sidewalk.
 Y = Distance from front face of curb to R or R/W.
= Sidewalk elevation transition section view.
= PCCP

INDIANA DEPARTMENT OF TRANSPORTATION

CLASS I AND CLASS III DRIVE GRADE PROFILES

SEPTEMBER 2010

STANDARD DRAWING NO. E 610-DRIV-08

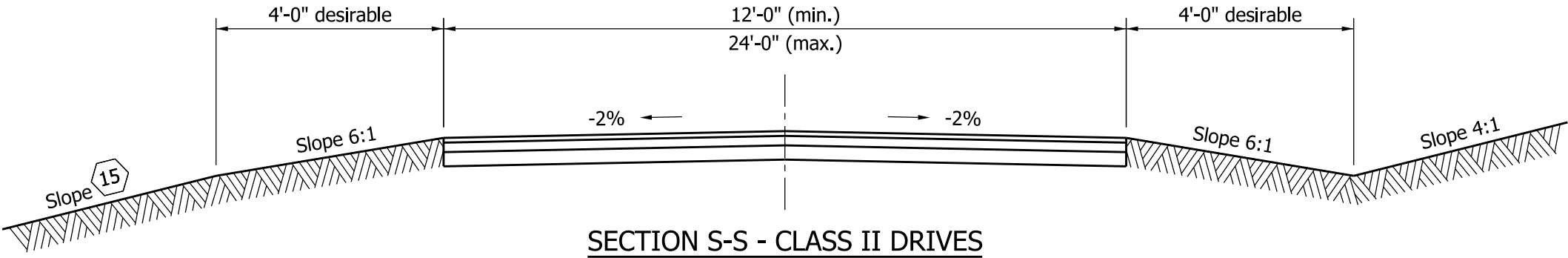
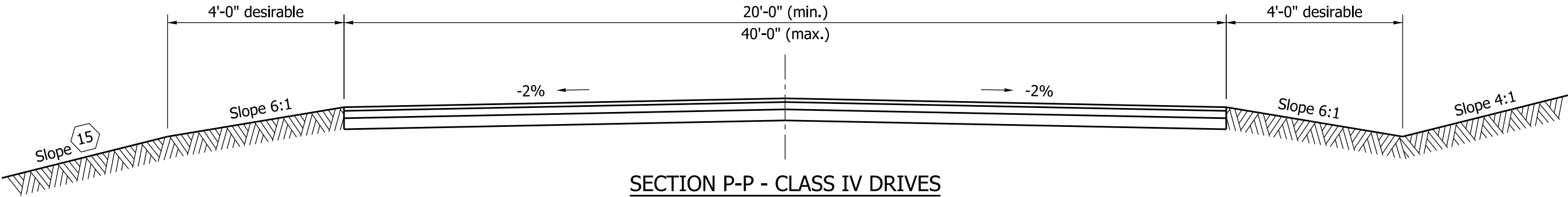


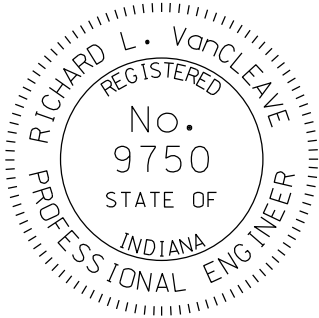
DESIGN STANDARDS ENGINEER

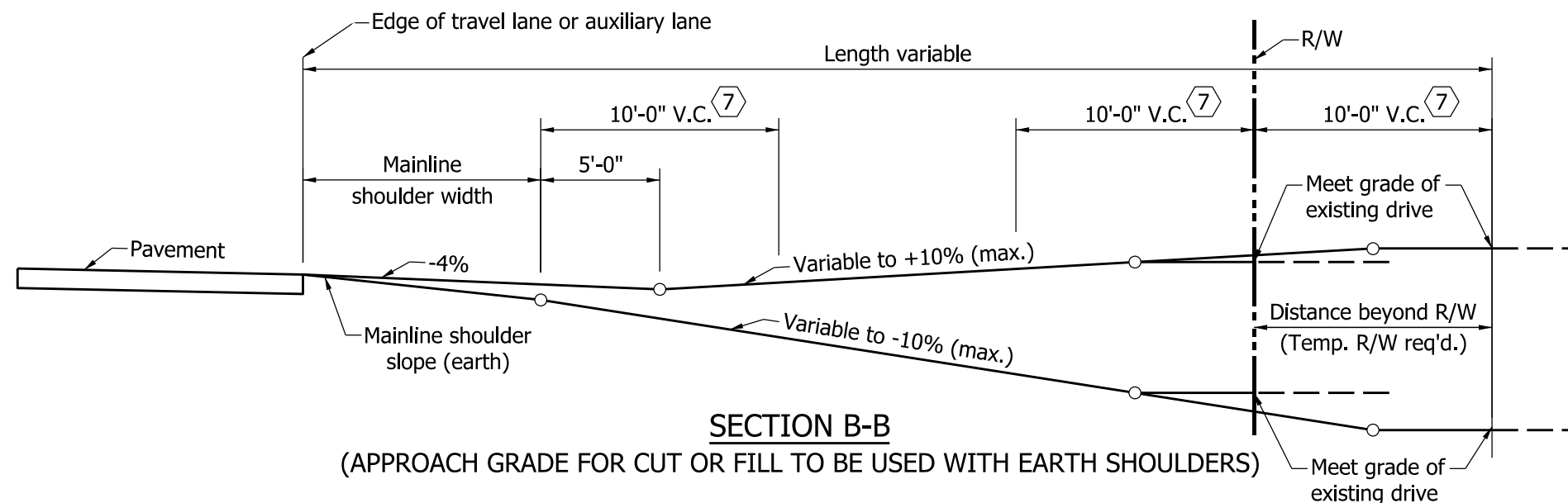
/s/ Richard L. VanCleave 09/01/10
DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 09/01/10
CHIEF HIGHWAY ENGINEER DATE

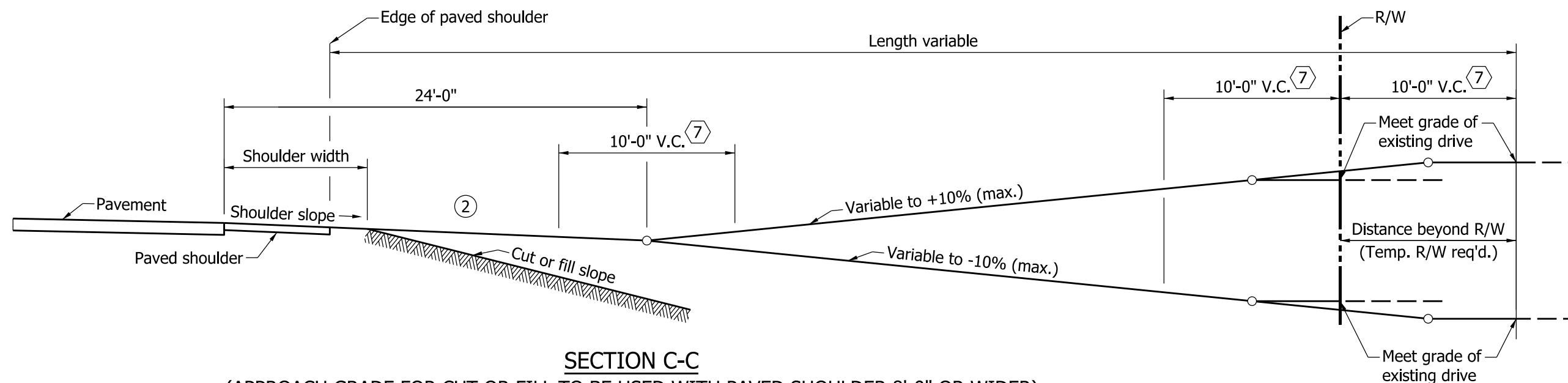
- Notes:
- 1. See Standard Drawing E 610-DRIV-02 for Class II Drive details.
 - 2. See Standard Drawing E 610-DRIV-04 for Class IV Drive details.
 - 3. See Standard Drawing E 610-DRIV-13 for General Notes.



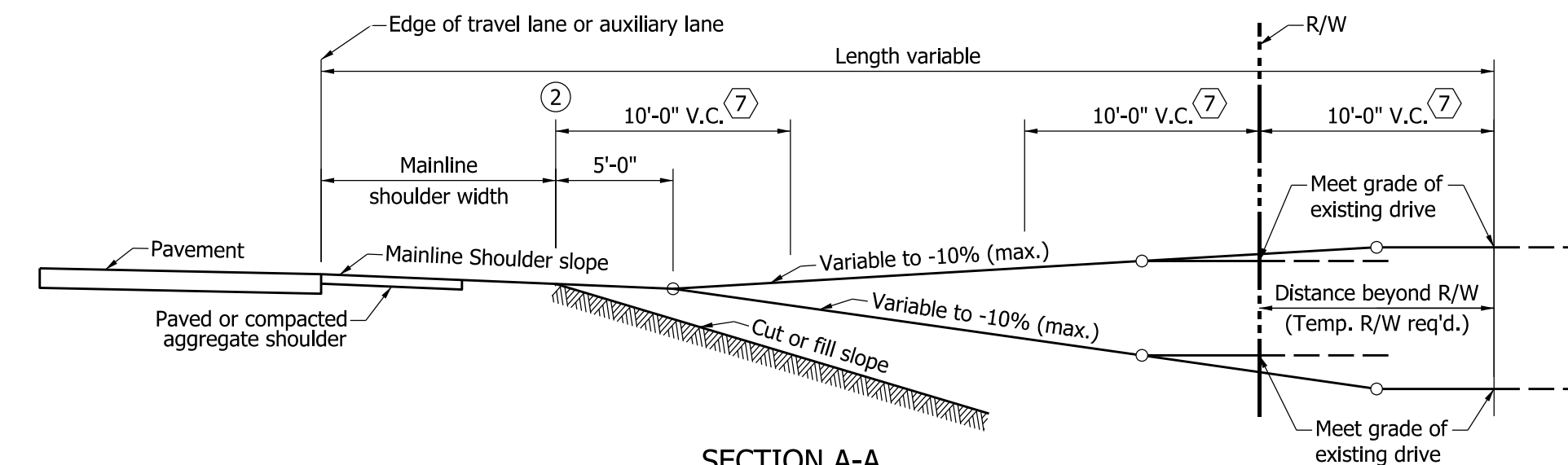
INDIANA DEPARTMENT OF TRANSPORTATION			
CLASS II AND CLASS IV SECTIONS			
SEPTEMBER 2010			
STANDARD DRAWING NO.		E 610-DRIV-09	
	/s/ <i>Richard L. VanCleave</i>	09/01/10	
	DESIGN STANDARDS ENGINEER	DATE	
	/s/ <i>Mark A. Miller</i>	09/01/10	
DESIGN STANDARDS ENGINEER	CHIEF HIGHWAY ENGINEER	DATE	



SECTION B-B
(APPROACH GRADE FOR CUT OR FILL TO BE USED WITH EARTH SHOULDERS)



SECTION C-C
(APPROACH GRADE FOR CUT OR FILL TO BE USED WITH PAVED SHOULDER 8'-0" OR WIDER)



SECTION A-A
(APPROACH GRADE FOR CUT OR FILL TO BE USED WITH LESS THAN 8'-0" WIDTH PAVED OR COMPACTED AGGREGATE SHOULDERS)

Notes:

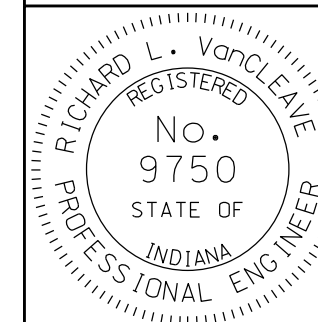
- See Standard Drawing E 610-DRIV-02, -04 and -05 for location of Sections A-A, B-B and C-C.
- Where physical restrictions limit the space available for the construction of a drive from a roadway in an embankment section the downgrade breakpoint of the drive may begin at the edge of the shoulder without a crest vertical curve if the algebraic difference in grades meets the criteria in Note 7 on Standard Drawing E 610-DRIV-13.

INDIANA DEPARTMENT OF TRANSPORTATION

**CLASS II, IV & V DRIVES
APPROACH GRADES**

SEPTEMBER 2010

STANDARD DRAWING NO. E 610-DRIV-10



DESIGN STANDARDS ENGINEER

/s/ *Richard L. VanCleave* 09/01/10

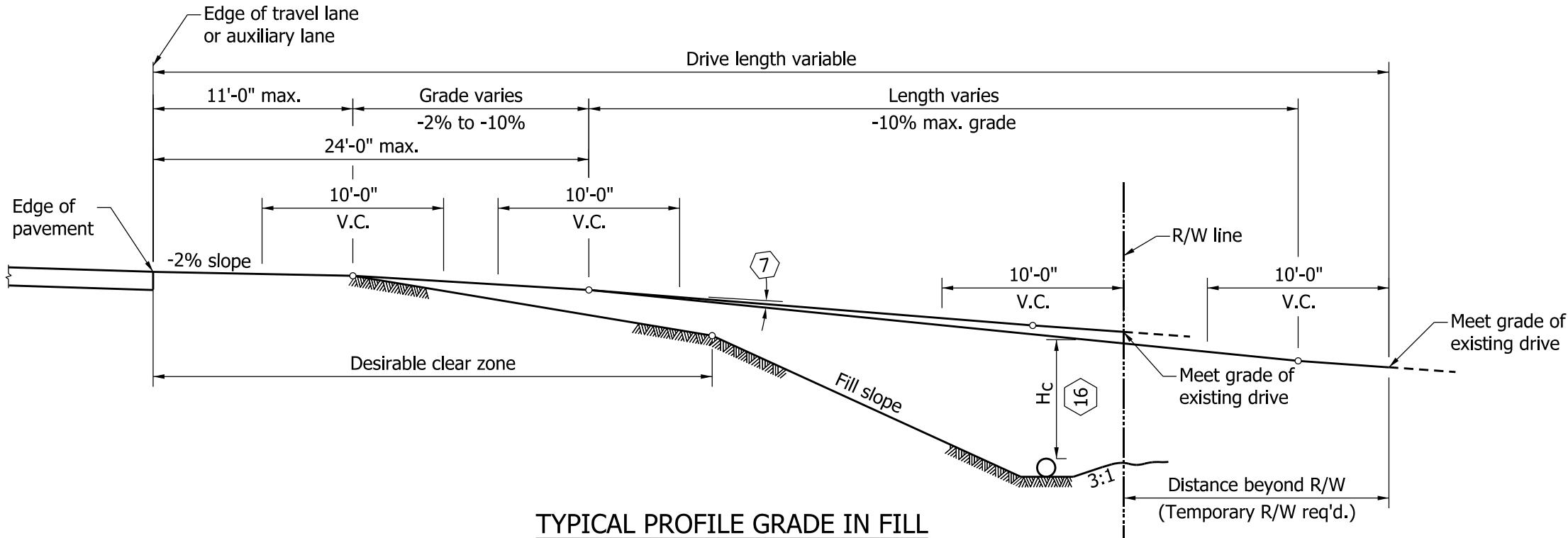
DESIGN STANDARDS ENGINEER DATE

/s/ *Mark A. Miller* 09/01/10

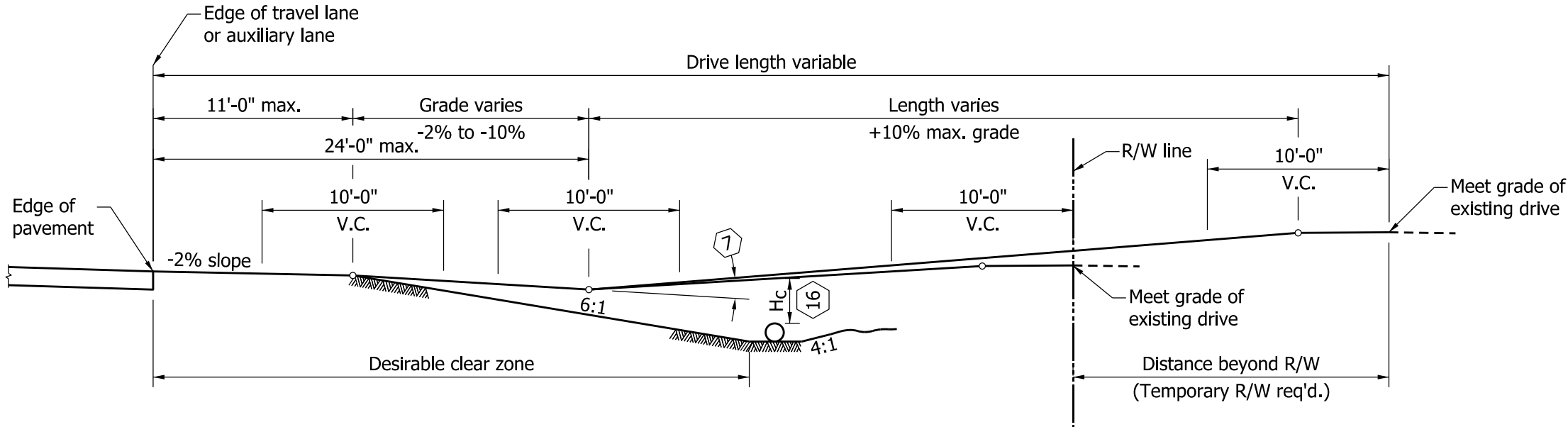
CHIEF HIGHWAY ENGINEER DATE

NOTES

- 1. See Standard Drawing E 610-DRIV-06 for plan and sections of Class VI Drive.
- 2. See Standard Drawings E 610-DRIV-13 for General Notes.



TYPICAL PROFILE GRADE IN FILL



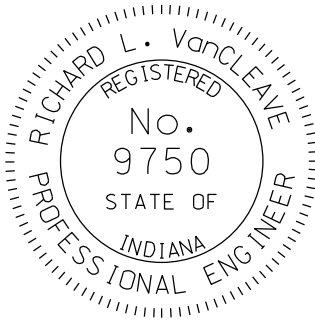
TYPICAL PROFILE GRADE IN CUT

INDIANA DEPARTMENT OF TRANSPORTATION

CLASS VI DRIVE
TYPICAL PROFILE GRADES

SEPTEMBER 2010

STANDARD DRAWING NO. E 610-DRIV-11



DESIGN STANDARDS ENGINEER

/s/ Richard L. VanCleave 09/01/10

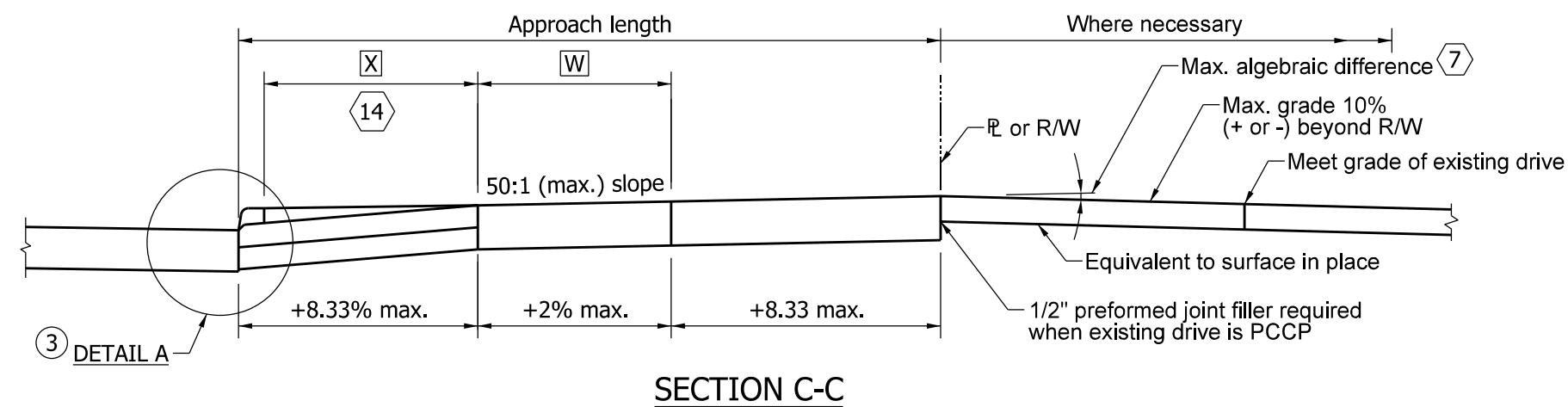
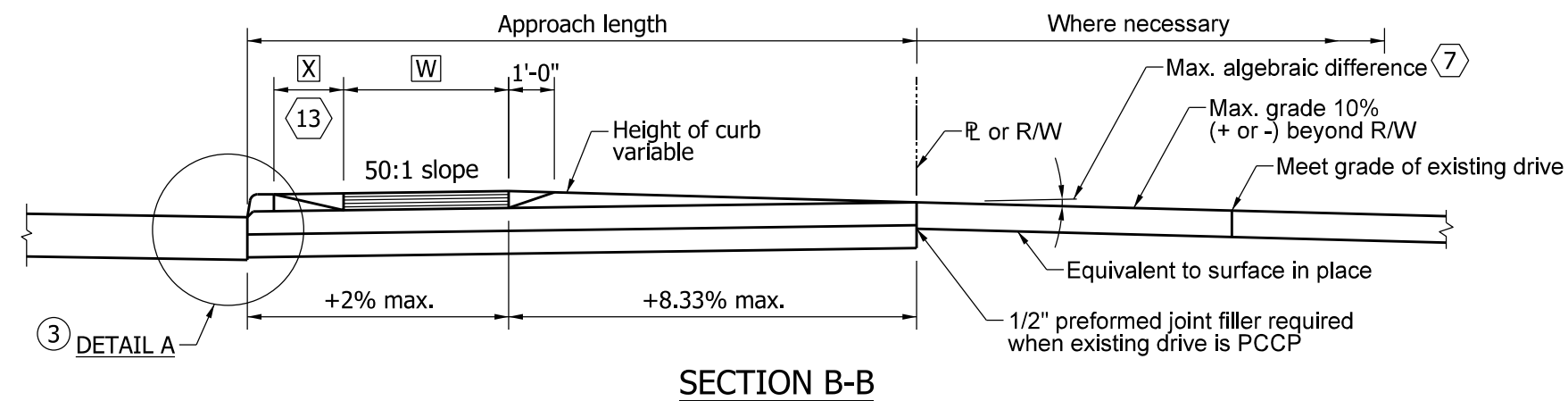
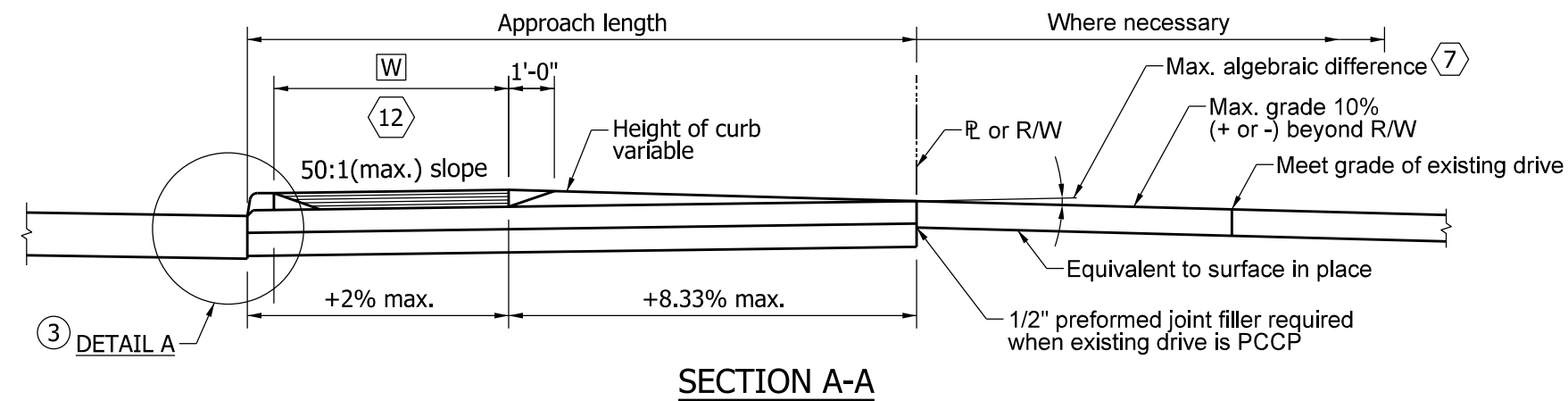
DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 09/01/10

CHIEF HIGHWAY ENGINEER DATE

NOTES

1. See Standard Drawing E 610-DRIV-07 for plan of Class VII Drive.
2. See Standard Drawings E 610-DRIV-13 for General Notes.
- ③ 3. See Standard Drawing E 610-DRIV-16 for keyway joint shown in Detail A and for joint placement and corner reinforcement.



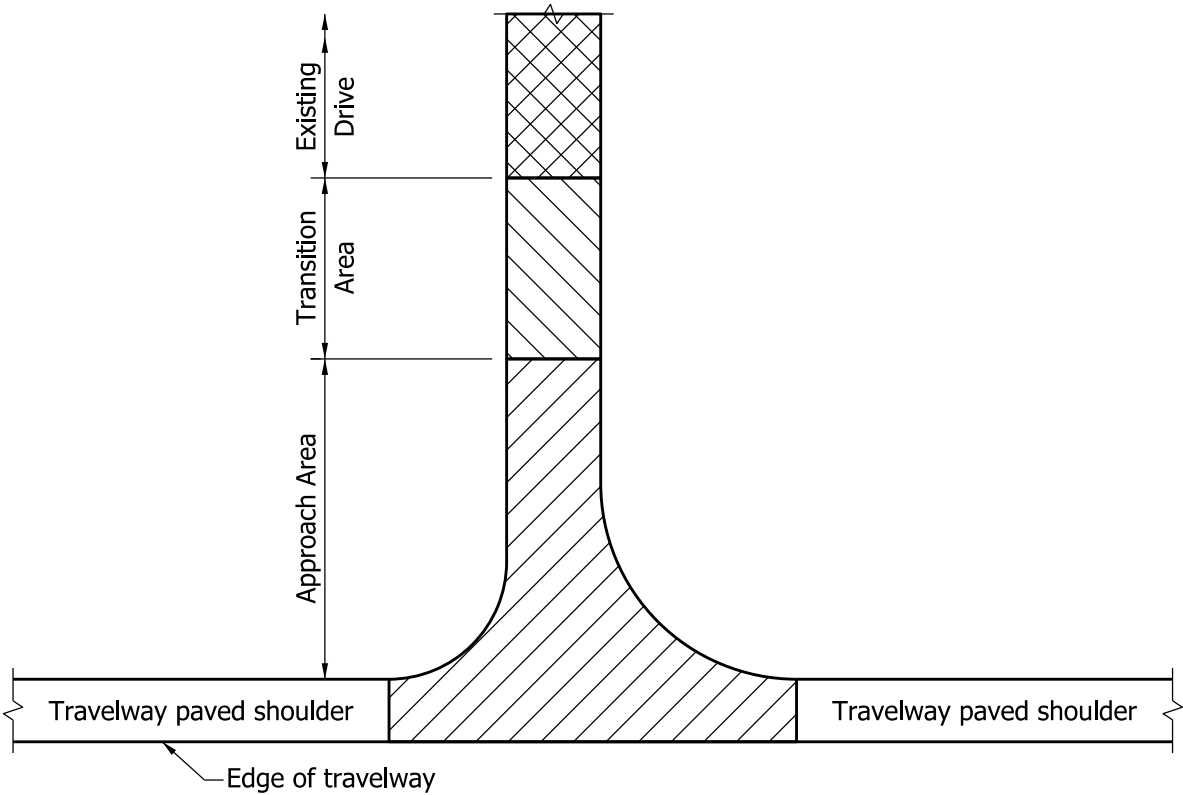
INDIANA DEPARTMENT OF TRANSPORTATION	
CLASS VII DRIVE PROFILE GRADE SEPTEMBER 2010	
STANDARD DRAWING NO. E 610-DRIV-12	
	<i>/s/ Richard L. VanCleave</i> 09/01/10 DESIGN STANDARDS ENGINEER DATE
	<i>/s/ Mark A. Miller</i> 09/01/10 CHIEF HIGHWAY ENGINEER DATE
	DESIGN STANDARDS ENGINEER

GENERAL NOTES

1. These notes apply to Standard Drawings E 610-DRIV-01 through 12.
2. If a PCCP approach is Class III or Class IV, the radii shall be constructed using ear construction Type C as detailed on Standard Drawing E 605-ERCN-02.
3. When the maximum approach grade of ±10% does not meet the grade of the existing drive before the R/W line, the approach grade of ±10% shall extend beyond the R/W to the point of intersection with the existing driveway grade. Construction beyond the R/W line shall be done in temporary R/W.
4. The appropriate pipe end treatment should be provided for pipes located either inside the clear zone or outside the clear zone.
7. The maximum algebraic difference in grades shall not exceed 8% for crested grade nor 12% for sagged grades for Types I and III drives, nor 11% for crested grade and 14% for sagged grades for Types II, IV, and V drives.
8. The minimum driveway pavement sections for Class III, IV, VI and VII Drives have been designed for 400 trucks per day. If the truck traffic count is greater than 400 per day, the required pavement section shall be as shown elsewhere on the plans.
11. See Standard Drawing E 610-DRIV-14 for shoulder treatment at driveways.
12. Curb Ramp Type H, as shown on Standard Drawing E 604-SWCR-09, when the approach is signalized, or a sidewalk elevation transition as shown on Standard Drawing E 604-SDWK-02 shall be used when sidewalk is adjacent to curb.
13. When X is equal to or greater than 2 ft but less than 6 ft, either a Curb Ramp Type G as shown on Standard Drawing E 604-SWCR-09, when the approach is signalized, or a sidewalk elevation transition as shown on Standard Drawing E 604-SDWK-01 shall be used.
14. When X is equal to or greater than 6 ft, no curb ramp or sidewalk elevation transition is required unless the curb height is in excess of 6 inches.
15. Embankment slopes within the mainline clear zone for new construction/reconstruction projects or within the obstruction-free zone for 3R projects should be as shown in the table on Standard Drawing E 610-PRAP-04. Outside the clear zone or the obstruction-free zone, the embankment slopes should desirably be 4:1 but not steeper than 3:1.
16. H_C - earth cover over culvert shall be 1 foot or greater.

LEGEND

- 5 1/2 in. preformed joint filler
- 6 Monolithic curb for PCCP Approaches or concrete curb and gutter for HMA for Approaches.
- 9 Longitudinal joint
- F Concrete sidewalk
- S For type and thickness equivalent to surface in place, see plans.
- 20 Keyway construction joint
- X = Distance between back face of curb and sidewalk.
- W = Width of sidewalk
- PCCP
- Curb ramp, if signalized, or typically, sidewalk elevation transition.
- Curb ramp or sidewalk elevation transition section view.

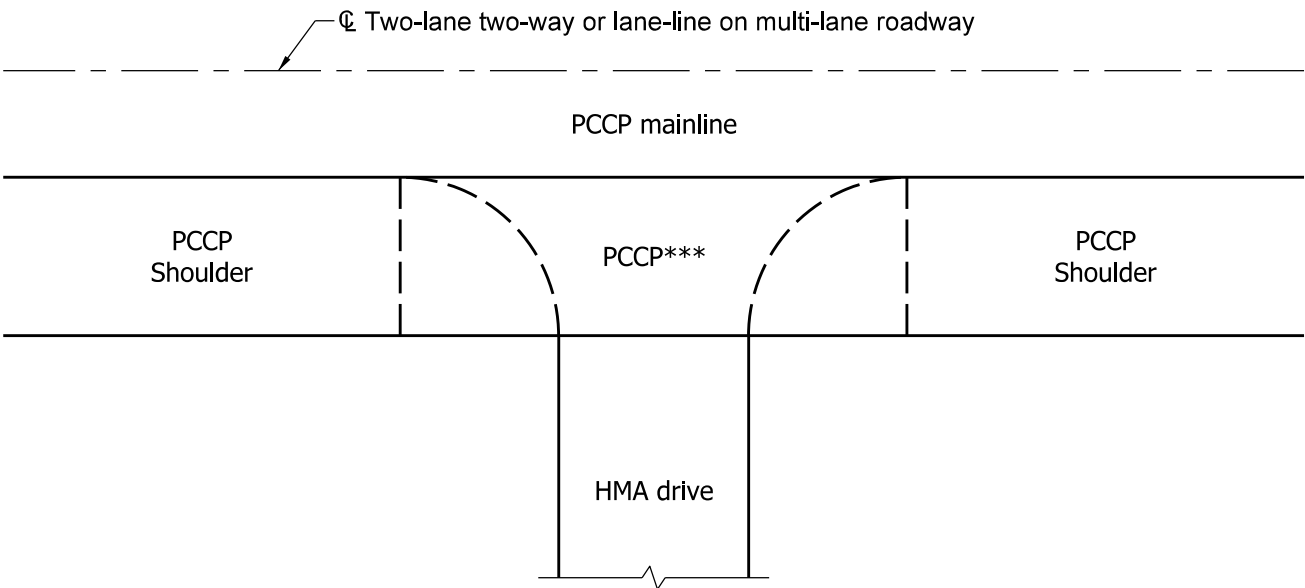
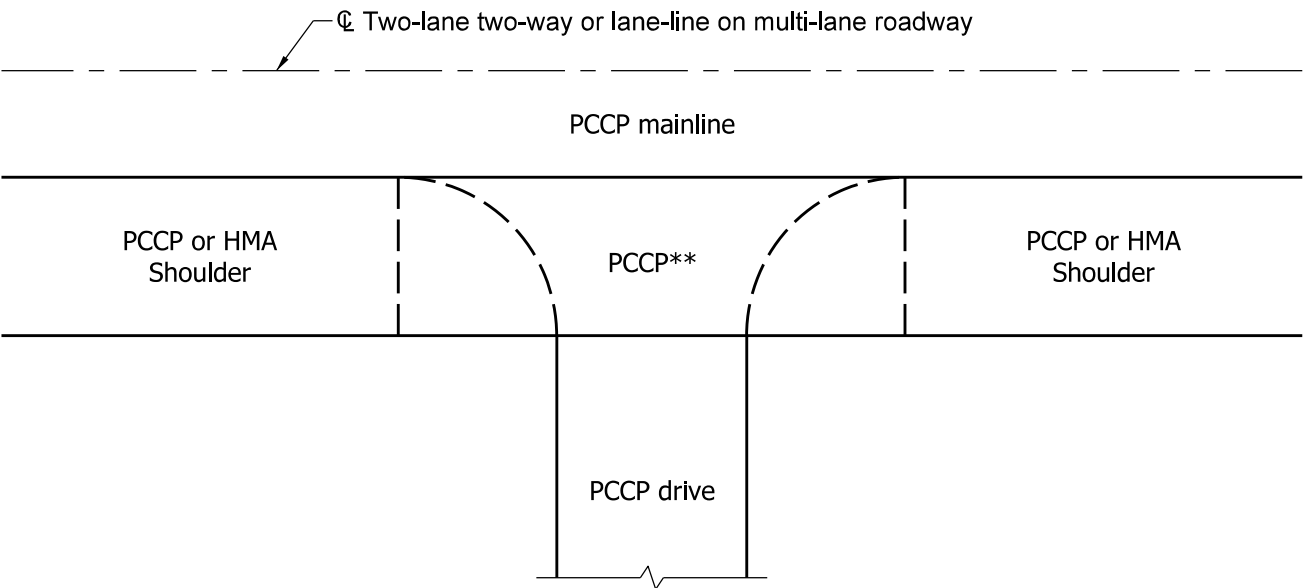
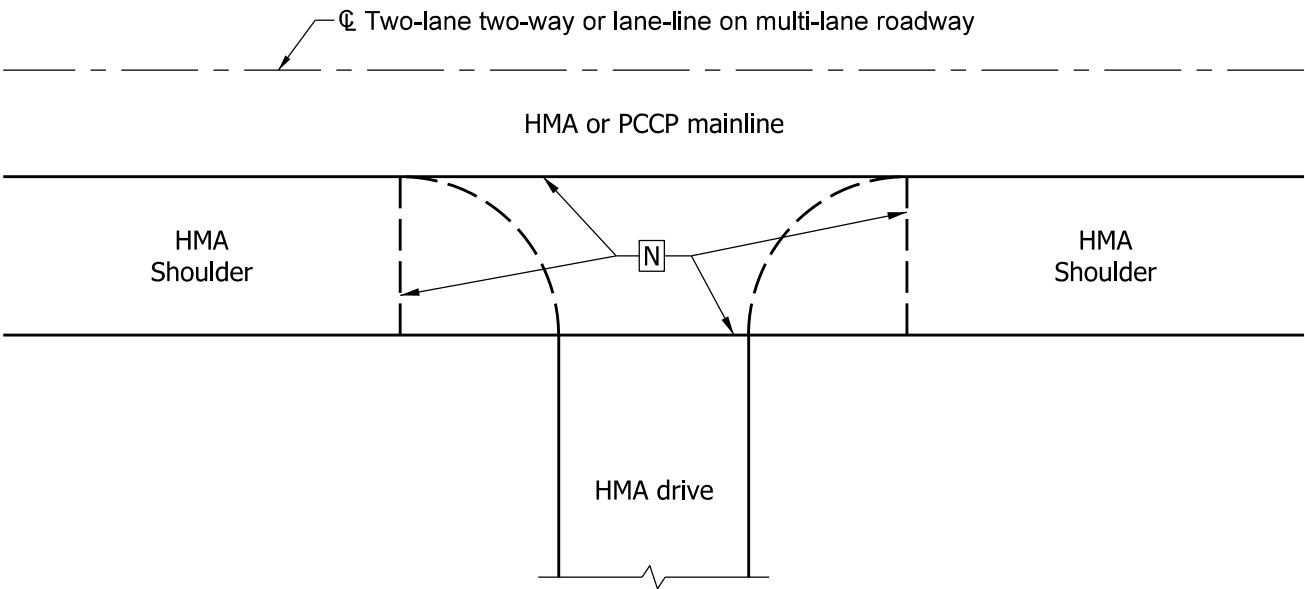
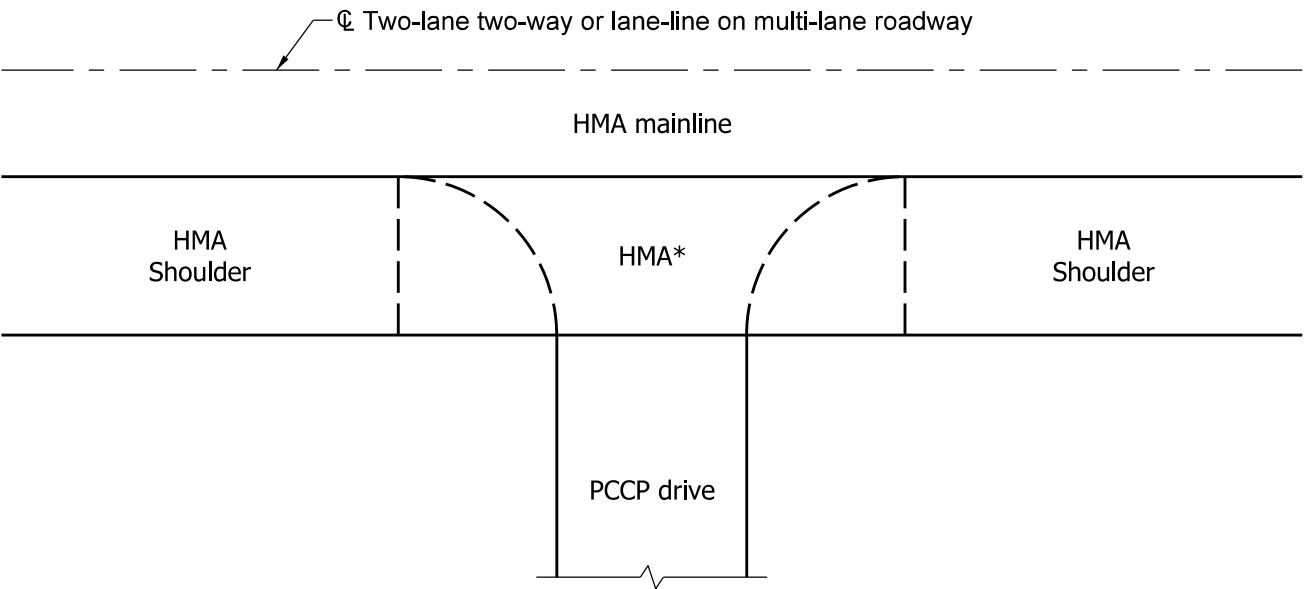


TYPE I, II, III, IV, VI AND VII DRIVES

NOTES

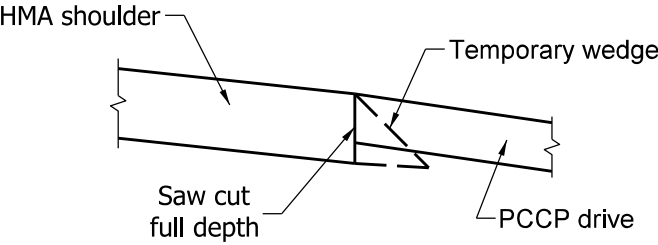
1. The pay limits shown hereon generally apply to Type I, II, III, IV, VI and VII Drives as shown on Standard Drawings E 610-DRIV-01, -02, -03, 04, -06 and -07 respectively.
2. Approach Area - HMA for Approaches or PCCP for Approaches. This area typically extends from the edge of an 8 foot or wider paved travelway shoulder to the right of way or property line or within a few feet of the right of way or property line where the new drive meets the grade of the existing drive, depending on the site-specific conditions. Where the travelway paved shoulder width is less than 8 feet, this area will be measured from the edge of travelway.
3. Transition Area - an equivalent pavement section to the existing drive. This area typically extends from the right of way or property line to a point on the property owner's drive where the new drive grade can match the existing drive grade.

INDIANA DEPARTMENT OF TRANSPORTATION			
DRIVES GENERAL NOTES AND LEGEND			
SEPTEMBER 2010			
STANDARD DRAWING NO.		E 610-DRIV-13	
	/s/ <i>Richard L. VanCleave</i>	09/01/10	
	DESIGN STANDARDS ENGINEER	DATE	
	/s/ <i>Mark A. Miller</i>	09/01/10	
DESIGN STANDARDS ENGINEER		CHIEF HIGHWAY ENGINEER	DATE

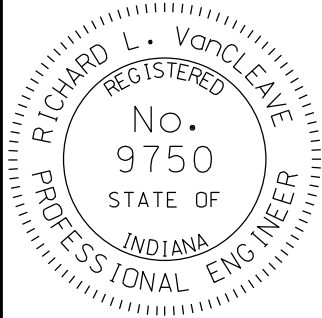


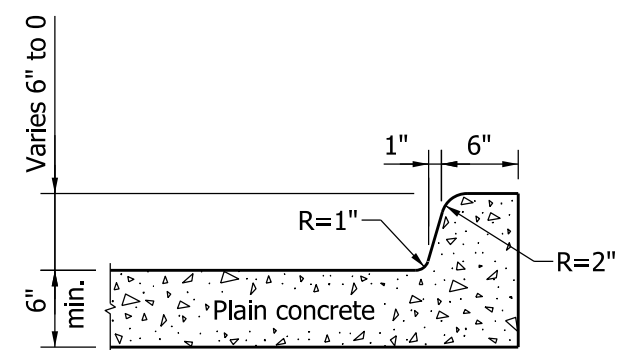
LEGEND

- Ⓢ Greater thickness of drive or shoulder section
- * Mainline pavement section
- ** Greater thickness of PCCP drive or PCCP shoulder
- *** Same section as mainline shoulder

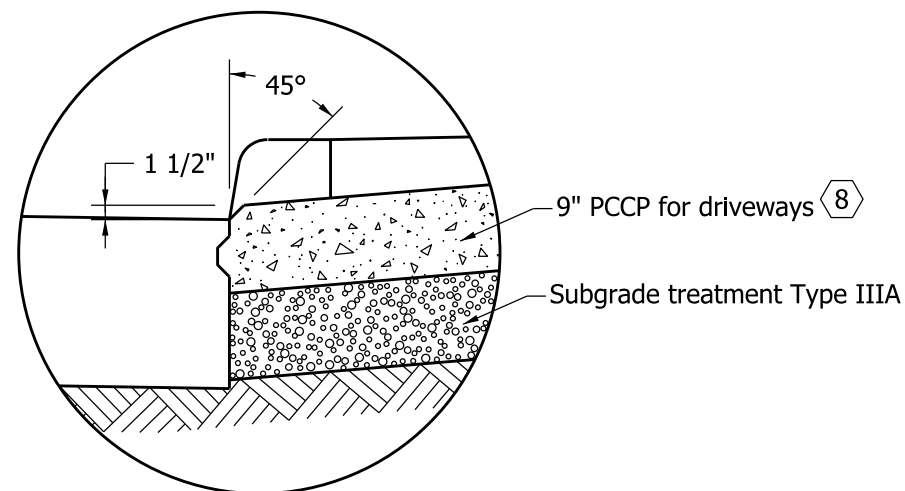


TEMPORARY EDGE OF HMA SHOULDER
(TREATMENT WHERE PCCP DRIVE IS TO BE CONSTRUCTED)

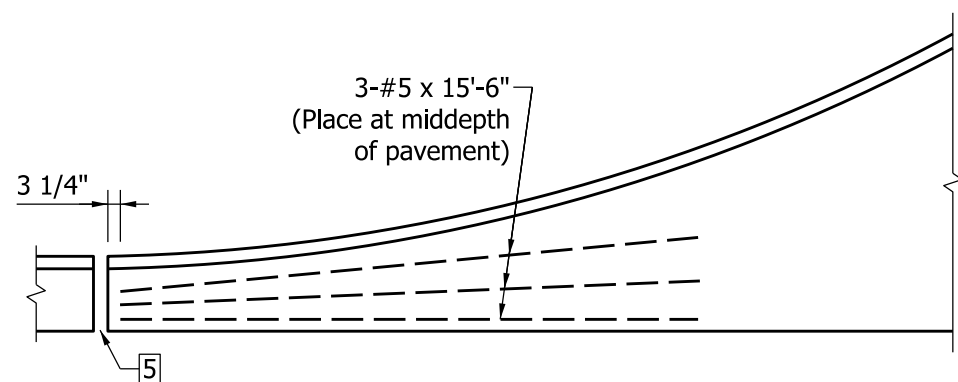
INDIANA DEPARTMENT OF TRANSPORTATION									
SHOULDER TREATMENT AT DRIVEWAYS									
SEPTEMBER 2010									
STANDARD DRAWING NO. E 610-DRIV-14									
	<table><tr><td>/s/ Richard L. VanCleave</td><td>09/01/10</td></tr><tr><td>DESIGN STANDARDS ENGINEER</td><td>DATE</td></tr><tr><td>/s/ Mark A. Miller</td><td>09/01/10</td></tr><tr><td>CHIEF HIGHWAY ENGINEER</td><td>DATE</td></tr></table>	/s/ Richard L. VanCleave	09/01/10	DESIGN STANDARDS ENGINEER	DATE	/s/ Mark A. Miller	09/01/10	CHIEF HIGHWAY ENGINEER	DATE
/s/ Richard L. VanCleave	09/01/10								
DESIGN STANDARDS ENGINEER	DATE								
/s/ Mark A. Miller	09/01/10								
CHIEF HIGHWAY ENGINEER	DATE								
DESIGN STANDARDS ENGINEER									



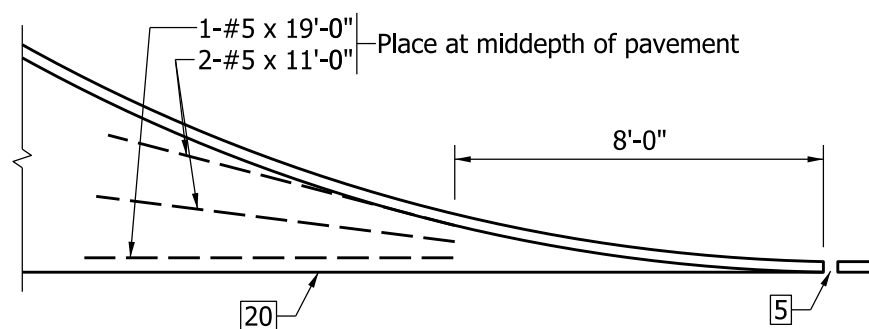
MONOLITHIC CURB



DETAIL A



COMBINED CURB & GUTTER



INTEGRAL CONCRETE CURB

TYPICAL CORNER REINFORCING

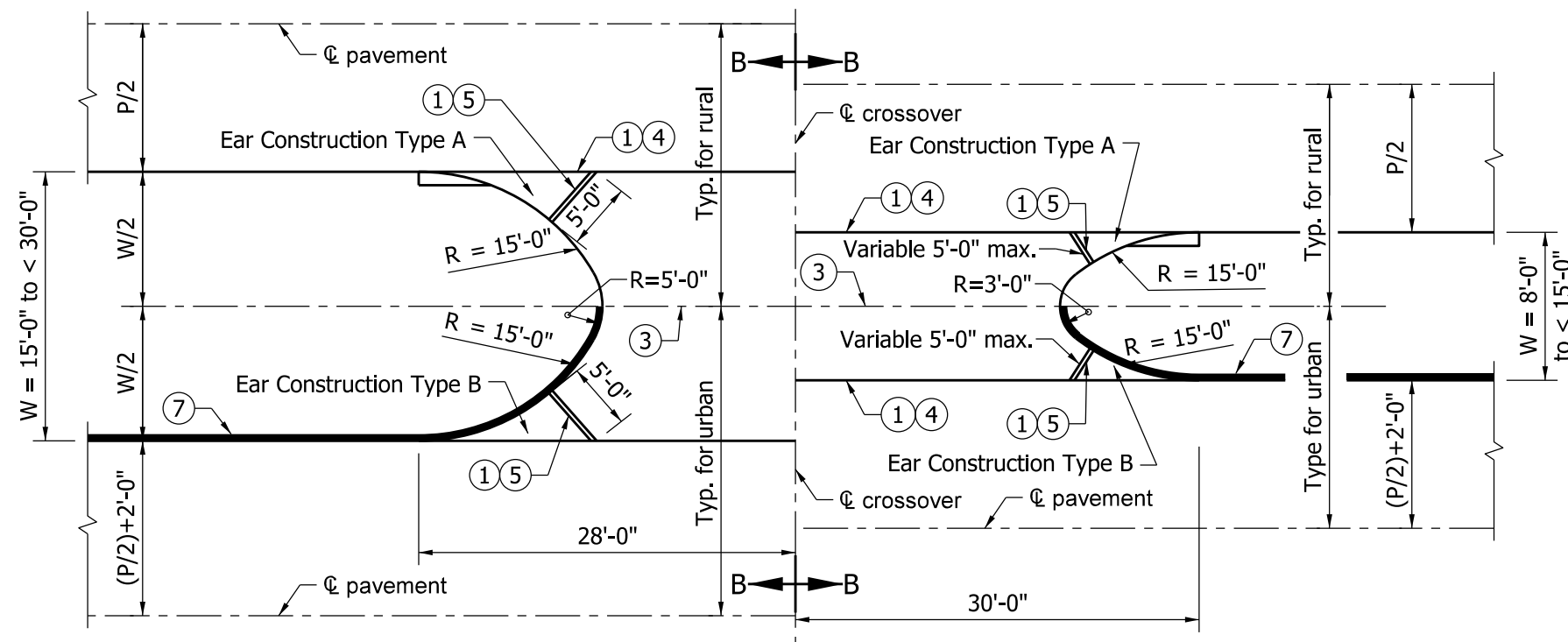
NOTES

1. See Standard Drawing E 610-DRIV-07 for plan and Standard Drawing E 610-DRIV-12 for profile of Class VII drive.
2. See Standard Drawings E 610-DRIV-13 for General Notes and additional Legend.
3. See Standard Drawing E 610-DRIV-07 for keyway joint shown in Detail A and for joint placement and corner reinforcement.
4. See Standard Drawing E 605-ERCN-01 for ear construction Type A. See Standard Drawing E 605-ERCN-02 for ear construction Type B.

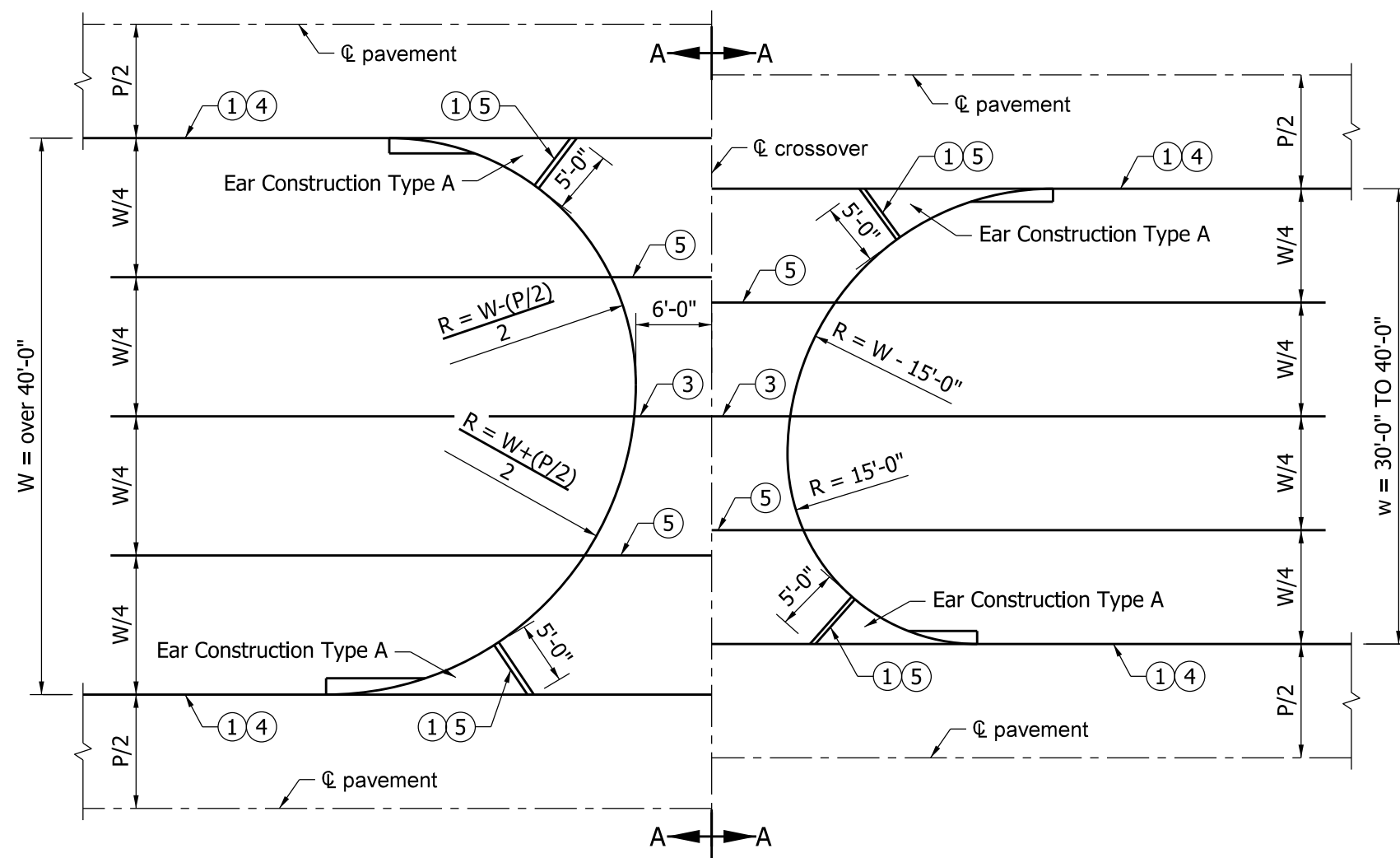
INDIANA DEPARTMENT OF TRANSPORTATION			
CLASS VII DRIVE JOINT PLACEMENT AND CORNERS			
SEPTEMBER 2010			
STANDARD DRAWING NO.		E 610-DRIV-16	
	/s/ <i>Richard L. VanCleave</i>		09/01/10
	DESIGN STANDARDS ENGINEER		DATE
	/s/ <i>Mark A. Miller</i>		09/01/10
DESIGN STANDARDS ENGINEER	CHIEF HIGHWAY ENGINEER		DATE

Notes:

- ① Thickened edge
2. See Standard Drawings:
E 605-ERCN-01 for TYPE "A" Ear Construction
E 605-ERCN-02 for TYPE "B" Ear Construction
E 610-DRIV-18 for sections A-A and B-B
- ③ Contraction Joint Type D-1, see Standard Drawing E 503-CCPJ-01 for details.
- ④ Keyway Construction Joint, see Standard Drawing E 610-DRIV-16 for details.
- ⑤ 1" Preformed Joint Filler.
6. Private drive crossovers shall be constructed of HMA or PCCP as shown on the plans section unless otherwise directed.
- ⑦ Integral Concrete Curb, see Standard Drawing E 605-CCIN-01 for details.



PRIVATE DRIVE CROSSOVER PLAN FOR W = 8'-0" to less than 30'-0"



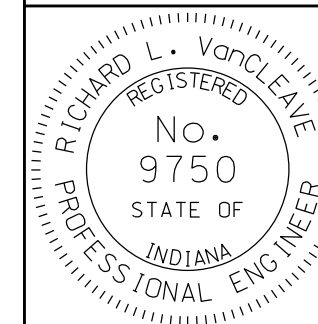
PRIVATE DRIVE CROSSOVER PLAN FOR W = 30'-0" to over 40'-0"

INDIANA DEPARTMENT OF TRANSPORTATION

PRIVATE DRIVE CROSSOVER
PLANS

SEPTEMBER 2010

STANDARD DRAWING NO. E 610-DRIV-17



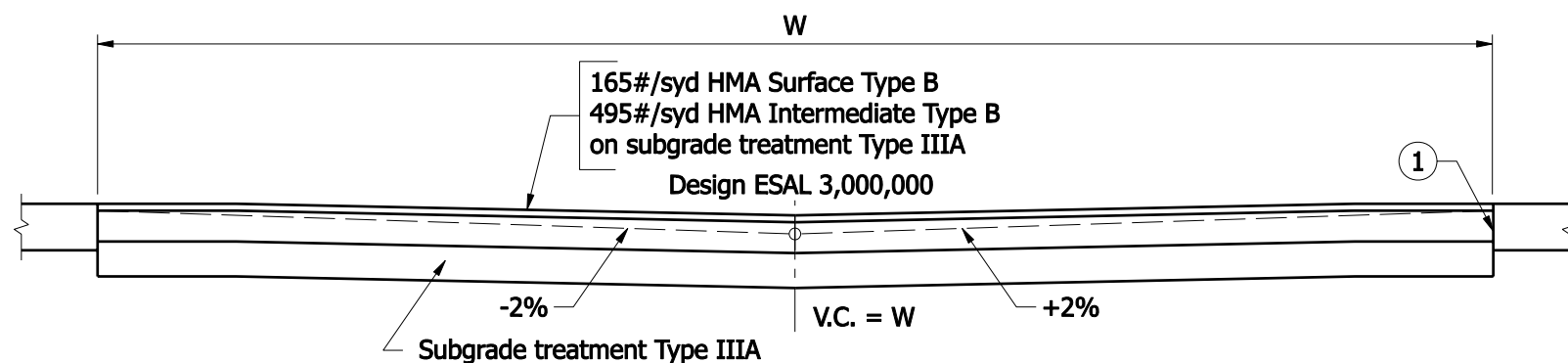
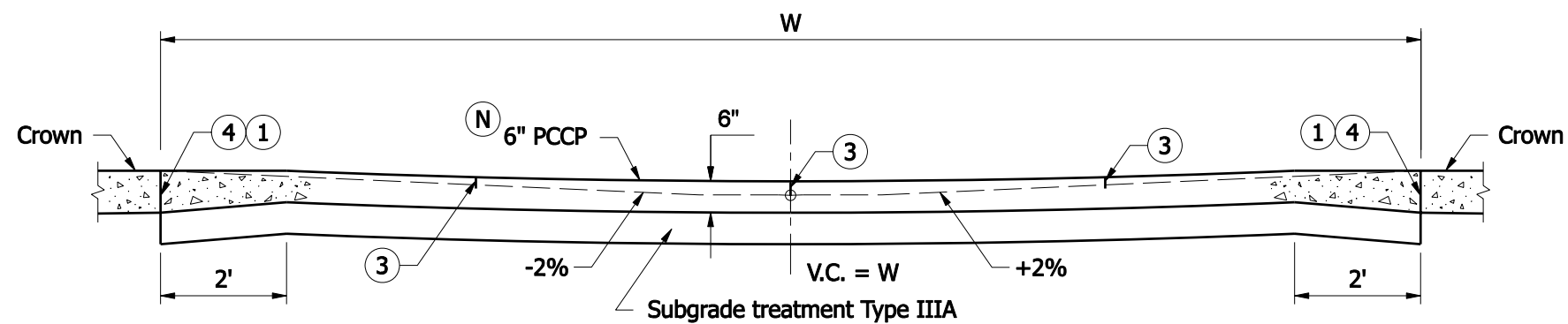
/s/ Richard L. VanCleave 09/01/10

DESIGN STANDARDS ENGINEER DATE

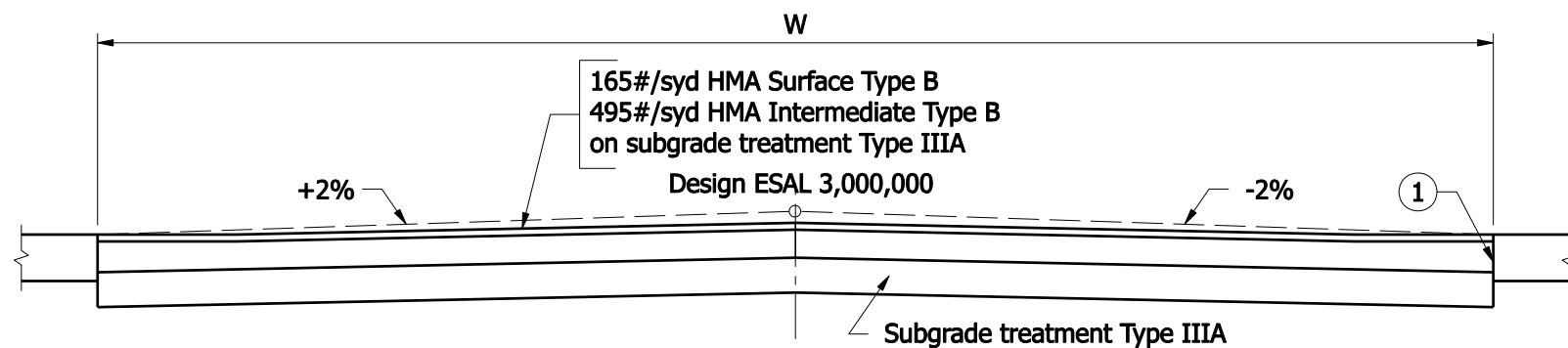
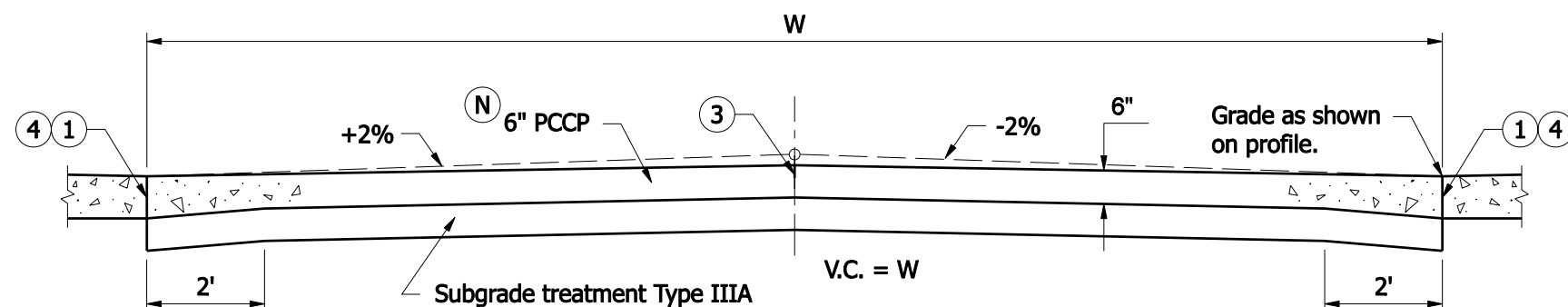
/s/ Mark A. Miller 09/01/10

CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER



SECTION A-A
TO BE USED WITH CROWN PAVEMENTS.



SECTION B-B
TO BE USED WITH 3 in. TILTED PAVEMENTS

NOTES :

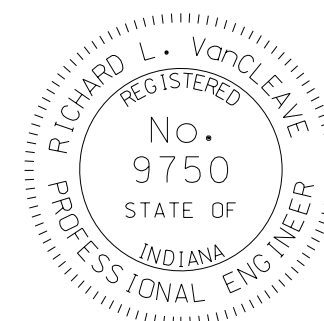
- (N) Private drive crossover shall be constructed of HMA or PCCP as shown on the plans, unless otherwise directed.
- (1) Thickened edge to be same thickness as mainline pavement.
2. For location of cross sections see Standard Drawing E 610-DRIV-17.
- (3) Contraction joint type D-1, see Standard Drawing E 501-CCPJ-06 for details, and Standard Drawing E DRIV-17 for spacing.
- (4) Keyway construction joint, see Standard Drawing E 610-DRIV-16 for details.

INDIANA DEPARTMENT OF TRANSPORTATION

PRIVATE DRIVE CROSSOVERS
CROSS SECTIONS

SEPTEMBER 2007

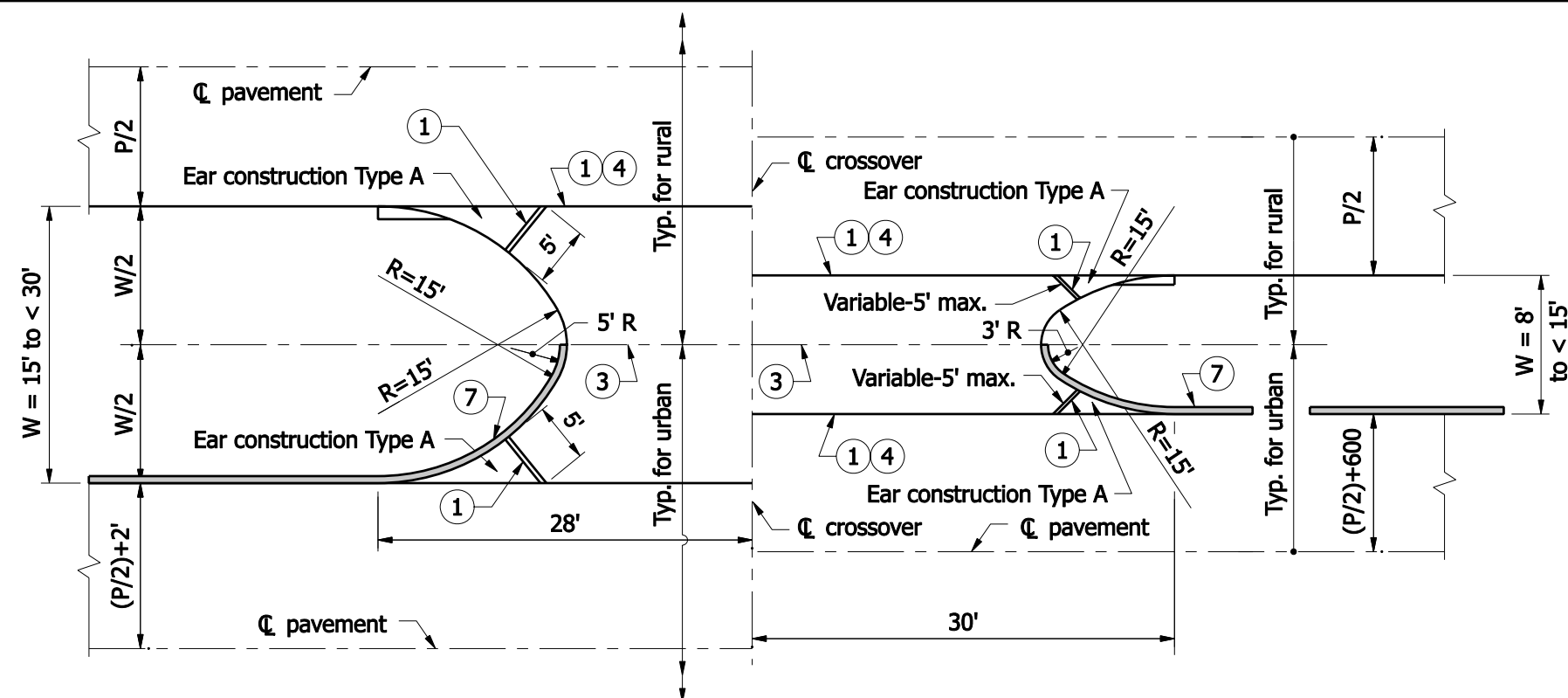
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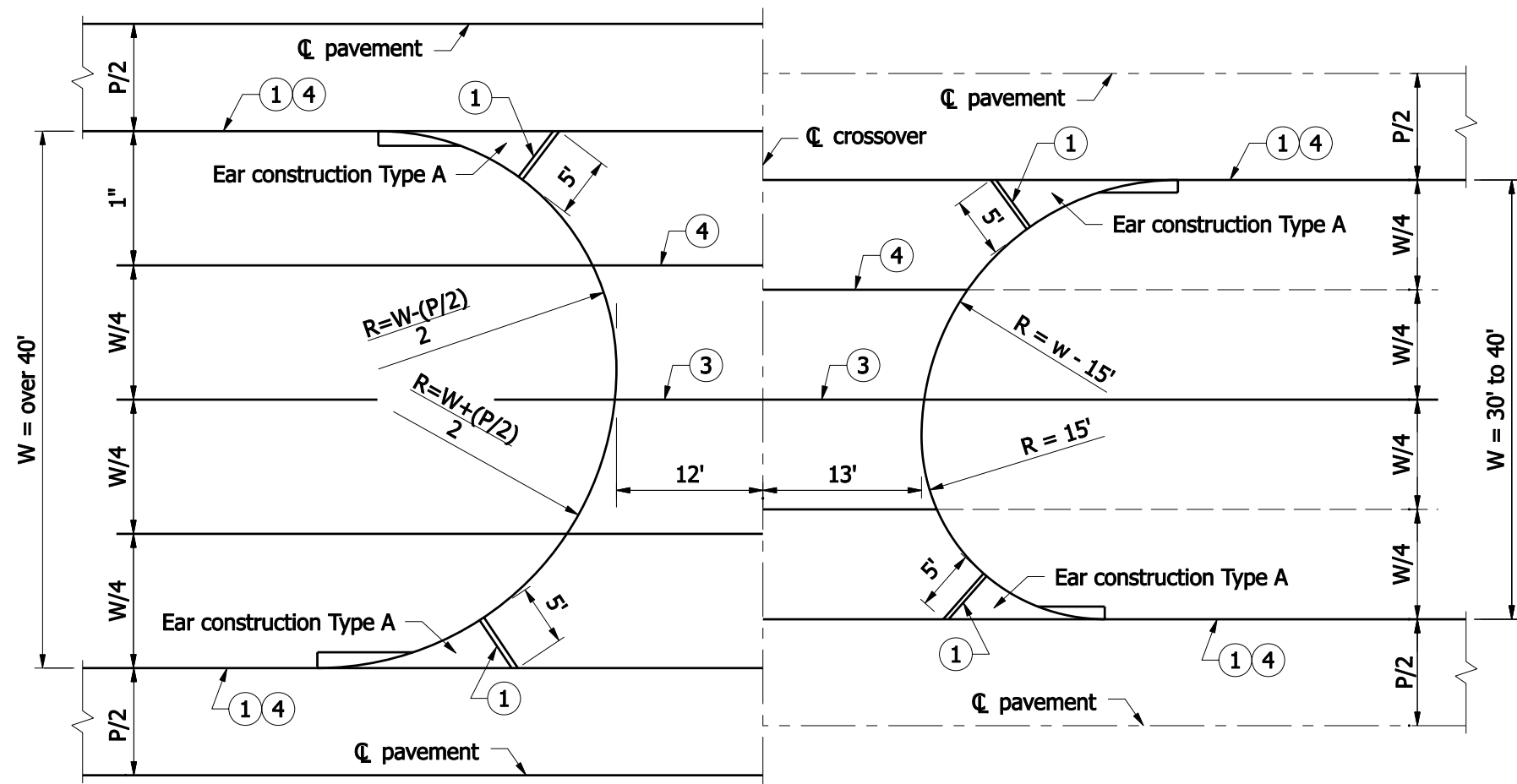
DESIGN STANDARDS ENGINEER

/s/ Richard L. VanCleave 09/04/07
DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 09/04/07
CHIEF HIGHWAY ENGINEER DATE



COMMERCIAL DRIVE CROSSOVER PLAN FOR $W = 8'$ to less than $30'$



COMMERCIAL DRIVE CROSSOVER PLAN FOR $W = 30'$ to over $40'$

NOTES :

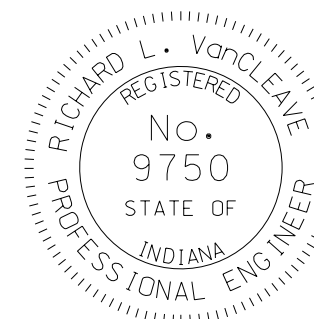
- 1 Thickened edge
- 2 See Standard Drawings :
E 605-ERCN-01 for TYPE "A" ear construction
E 605-ERCN-02 for TYPE "B" ear construction
- 3 Contraction joint type D-1, see Standard Drawing
E 503-CCPJ-01 for details.
- 4 Keyway construction joint - see Drawing
E 610-DRIV-16 for details.
- 6 Grade for commercial drive crossover shall be
the same as for private drive crossover. For cross
sections see Standard Drawing E 610-DRIV-18, except
the PCCP thickness shall be 9 in.
- 7 Integral concrete curb, see Standard Drawing
E 605-CCIN-01 for details.
- 8 Commercial drive crossover shall be constructed
of HMA or PCCP as shown on the plans, unless
otherwise directed by the Engineer.

INDIANA DEPARTMENT OF TRANSPORTATION

COMMERCIAL DRIVE CROSSOVERS
PLANS

SEPTEMBER 2007

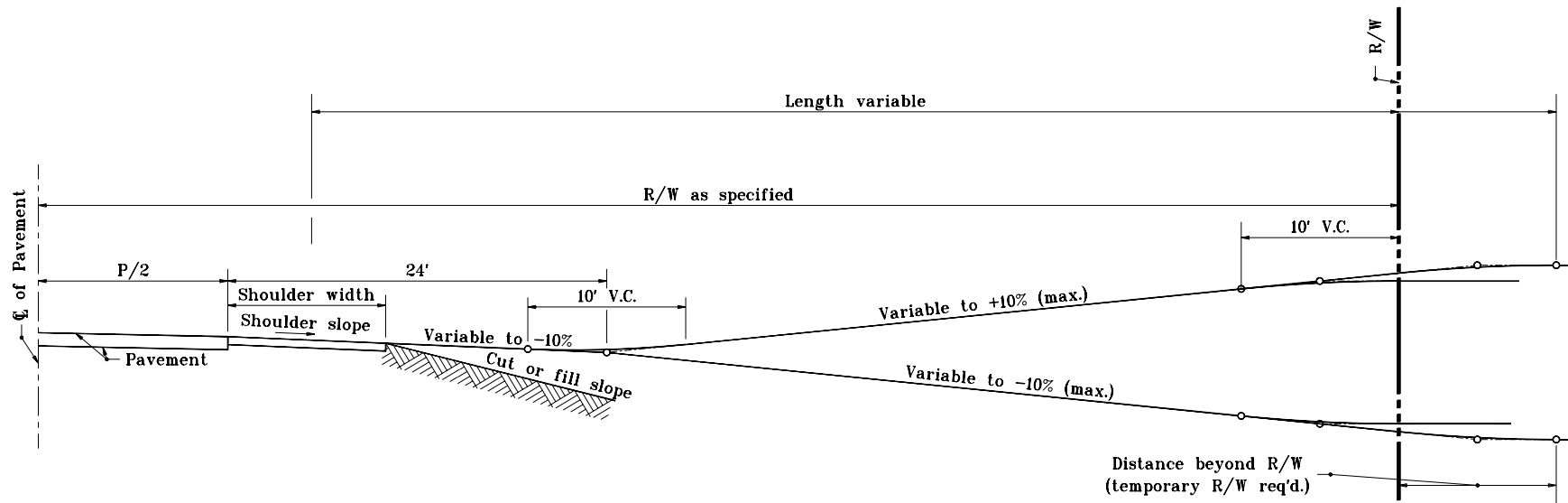
STANDARD DRAWING NO. E 610-DRIV-19



/s/ Richard L. Van Cleave 09/04/07
DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 09/04/07
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

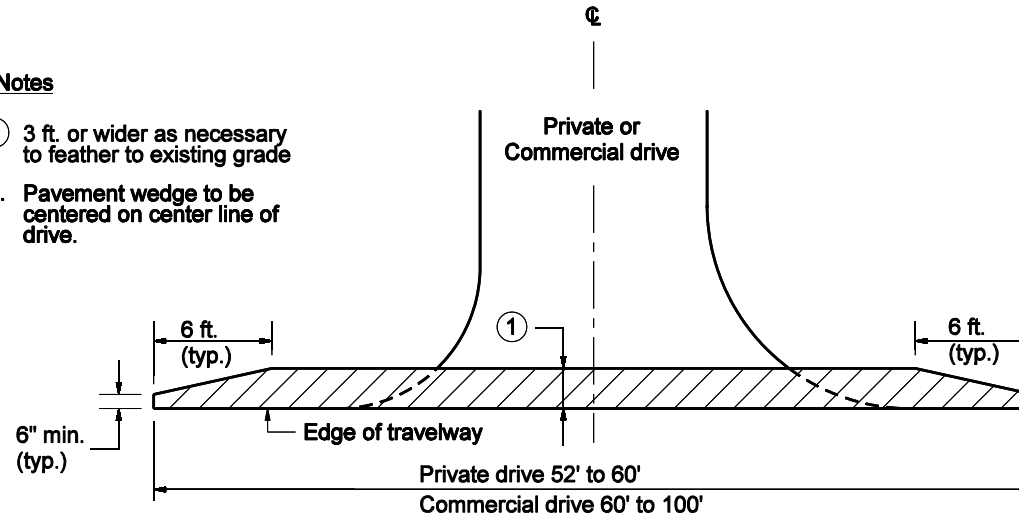


**APPROACH GRADE FOR CUT OR FILL
TO BE USED WITH PAVED SHOULDER**

INDIANA DEPARTMENT OF TRANSPORTATION	
APPROACH GRADE CUT OR FILL	
JANUARY 2000	
STANDARD DRAWING NO. E 610-DRIV-20	
	<i>/s/ Anthony L. Uremovich</i> 1-03-00 DESIGN STANDARDS ENGINEER DATE
	<i>/s/ Firooz Zandi</i> 1-03-00 CHIEF HIGHWAY ENGINEER DATE

Notes

- ① 3 ft. or wider as necessary to feather to existing grade
2. Pavement wedge to be centered on center line of drive.



 Drive area to be treated with HMA for Approaches

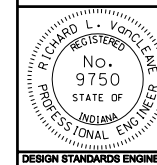
PRIVATE OR COMMERCIAL DRIVE

INDIANA DEPARTMENT OF TRANSPORTATION

PAVEMENT WEDGE LIMITS

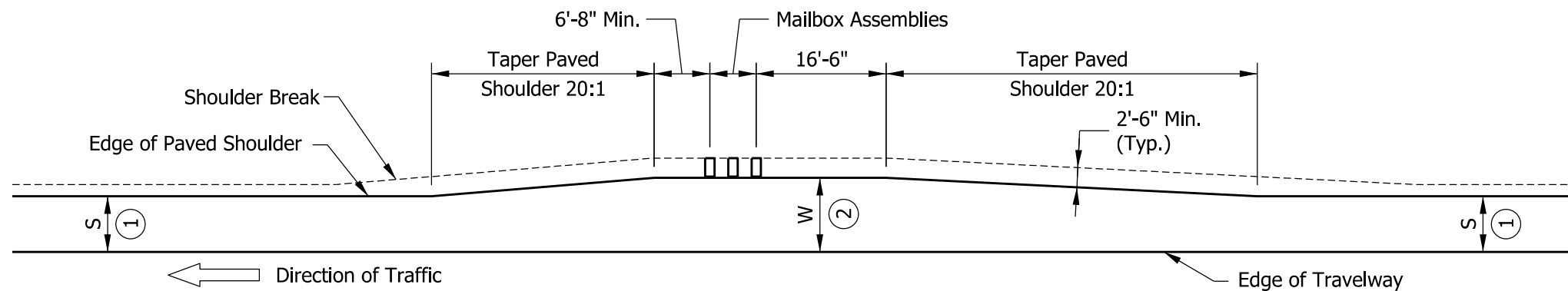
MARCH 2004

STANDARD DRAWING NO. E 610-DRIV-21

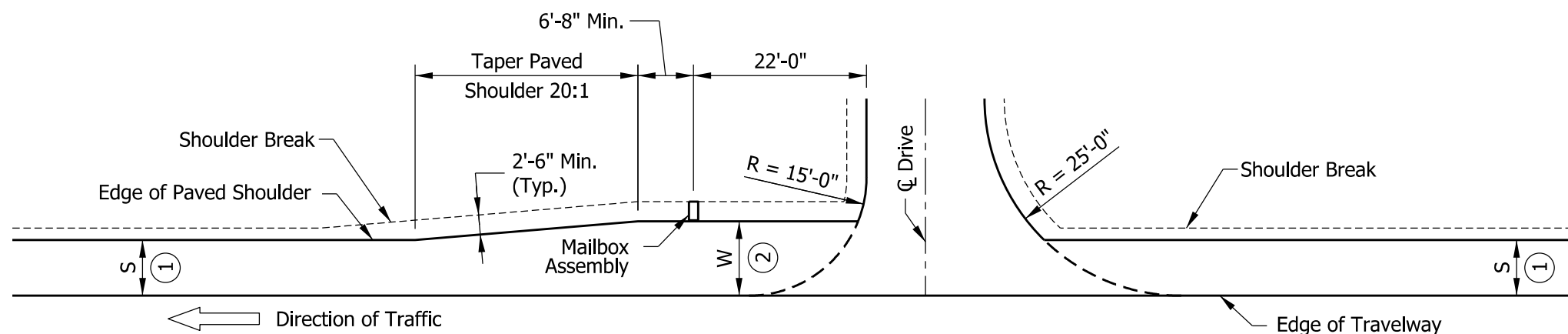


/s/ Richard L. VarCleave	3-01-04
DESIGN STANDARDS ENGINEER	DATE
/s/ Richard K. Smutzer	3-01-04
CHIEF HIGHWAY ENGINEER	DATE

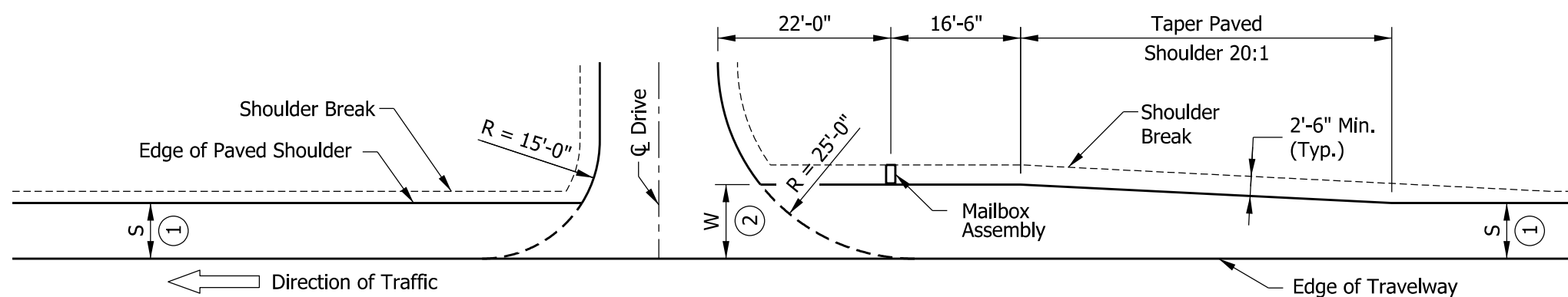
DESIGN STANDARDS ENGINEER



TYPICAL MAILBOX APPROACH



COMBINATION MAILBOX APPROACH & DRIVE
(Mailbox Located Beyond Drive)



COMBINATION MAILBOX APPROACH & DRIVE
(Mailbox Located in Advance of Drive)

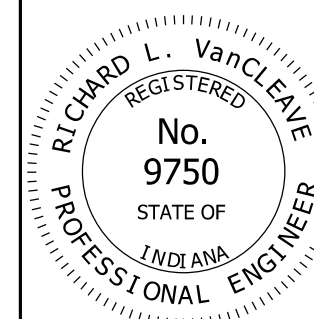
NOTES:

- ① S = Normal width of paved shoulder as shown on plans.
- ② See plans for W.
3. Mailbox approach pavement section shall be the same as the shoulder pavement section.

INDIANA DEPARTMENT OF TRANSPORTATION

MAILBOX APPROACHES
HIGH SPEED ROADWAY
(V ≥ 50 MPH)
SEPTEMBER 2014

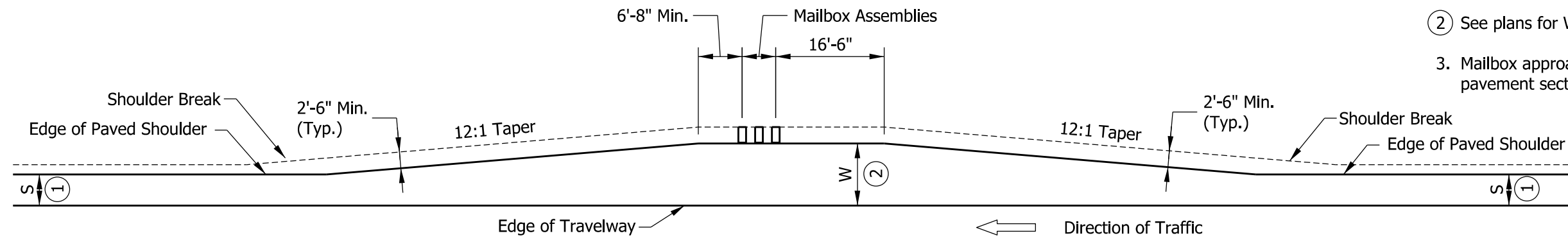
STANDARD DRAWING NO. E 610-MBAP-01



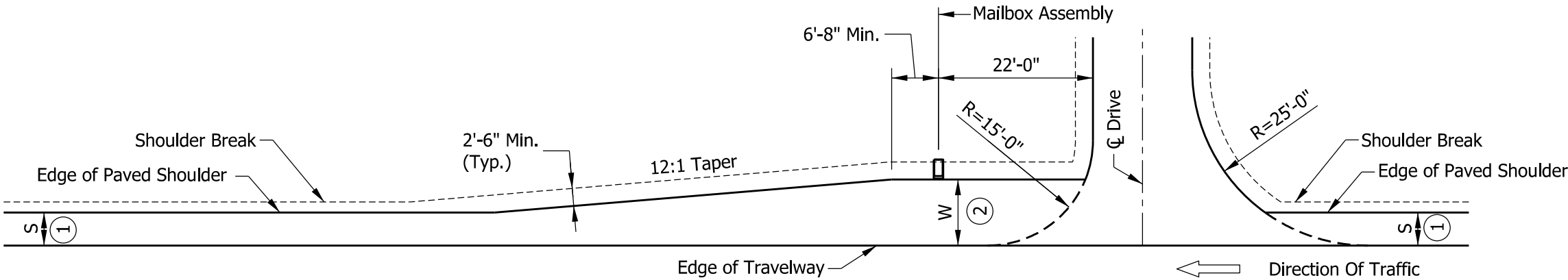
/s/ Richard L. VanCleave	02/20/14
DESIGN STANDARDS ENGINEER	DATE
/s/ Mark A. Miller	03/03/14
CHIEF ENGINEER	DATE

NOTES:

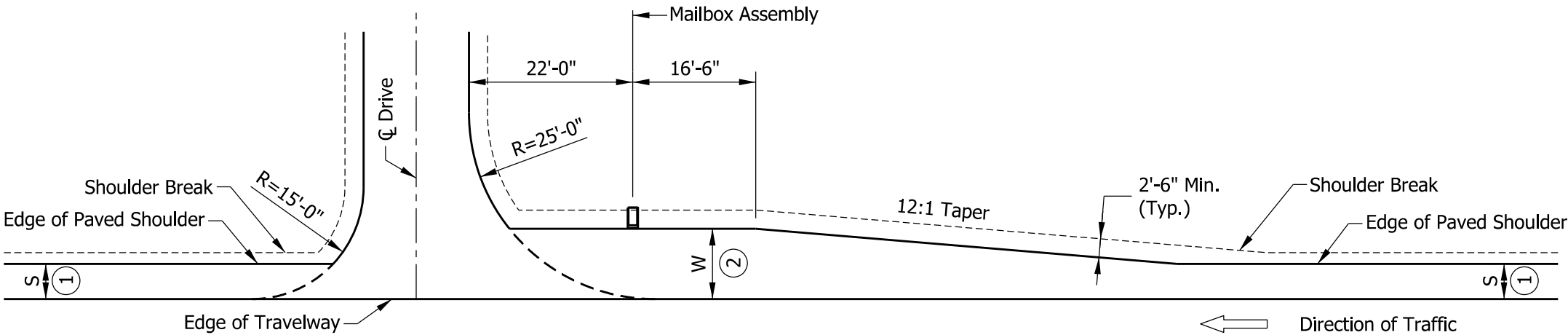
- ① S = Normal width of paved shoulder as shown on plans.
- ② See plans for W.
- 3. Mailbox approach pavement section shall be the same as the shoulder pavement section.



TYPICAL MAILBOX APPROACH

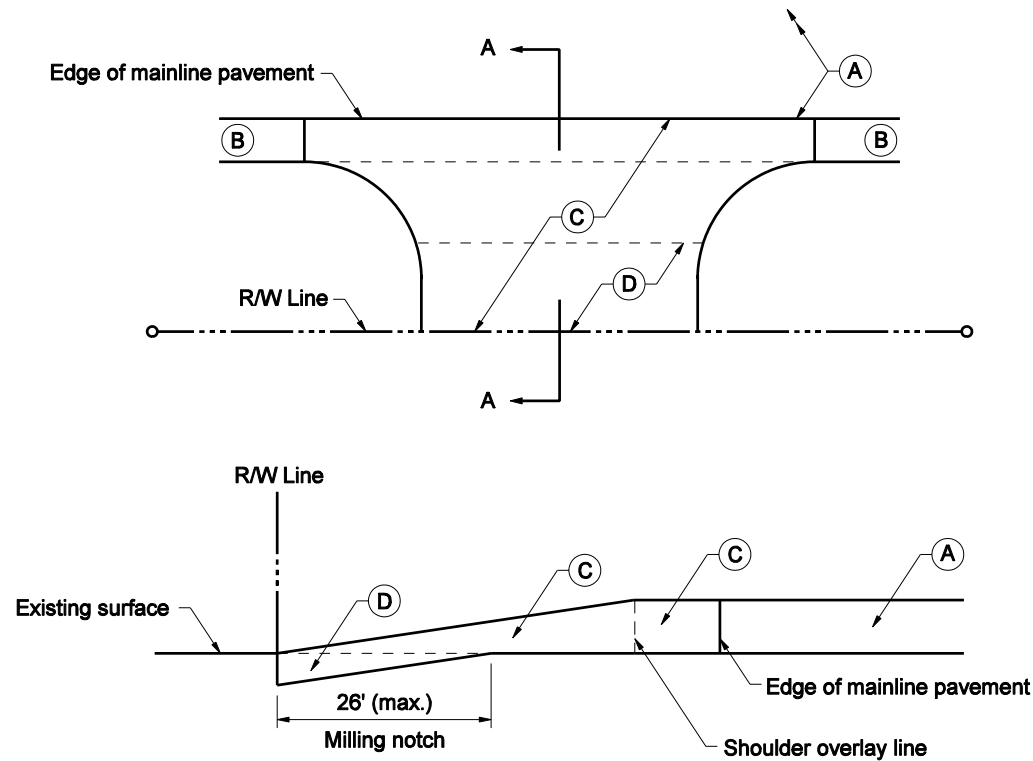


COMBINATION MAILBOX APPROACH & DRIVE
(Mailbox Located Beyond Drive)



COMBINATION MAILBOX APPROACH & DRIVE
(Mailbox Located in Advance of Drive)

INDIANA DEPARTMENT OF TRANSPORTATION		
MAILBOX APPROACHES LOW SPEED ROADWAY (V ≤ 45 MPH) SEPTEMBER 2014		
STANDARD DRAWING NO.		E 610-MBAP-02
	/s/ Richard L. VanCleave	02/20/14
	DESIGN STANDARDS ENGINEER	DATE
	/s/ Mark A. Miller	03/03/14
	CHIEF ENGINEER	DATE



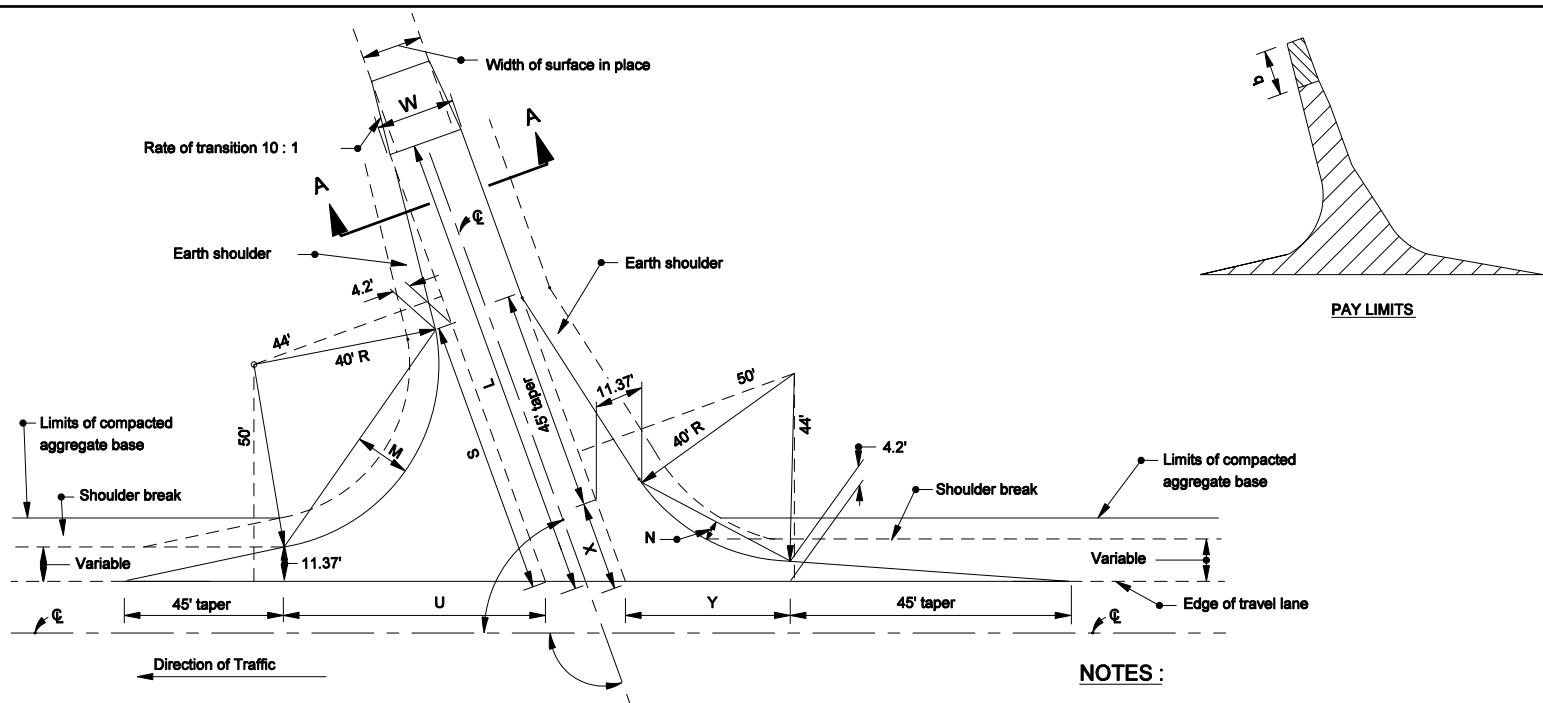
SECTION A-A

LEGEND

- (A) Typical HMA overlay, mainline
- (B) Typical HMA overlay, shoulder
- (C) HMA for approaches
- (D) Surface milling, asphalt

PUBLIC ROAD APPROACH PAVING

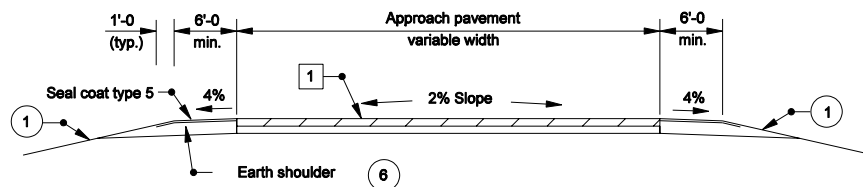
INDIANA DEPARTMENT OF TRANSPORTATION	
PUBLIC ROAD APPROACH PAVING	
MARCH 2004	
STANDARD DRAWING NO. E 610-PRAP-01	
	/s/ Richard L. VanCleave 3-01-04 DESIGN STANDARDS ENGINEER DATE
	/s/ Richard K. Smutzer 3-01-04 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	



PUBLIC ROAD APPROACH TYPE A

NOTES :

1. 165 #/syd. HMA Surface Type A on 275 #/syd. HMA Intermediate Type A on 8" compacted aggregate base #53
2. See General Notes on Standard Drawing E 610-PRAP-04.
3. See Table on Standard Drawing E 610-PRAP-05 for computed values.
4. See Standard Drawing E 610 - PRAP - 07 for pay limit details.



SECTION A-A MINIMUM PAVEMENT SECTION

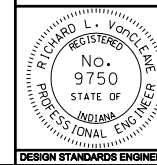
For ADT $\leq$ 1000 7

INDIANA DEPARTMENT OF TRANSPORTATION

PUBLIC ROAD APPROACH TYPE A

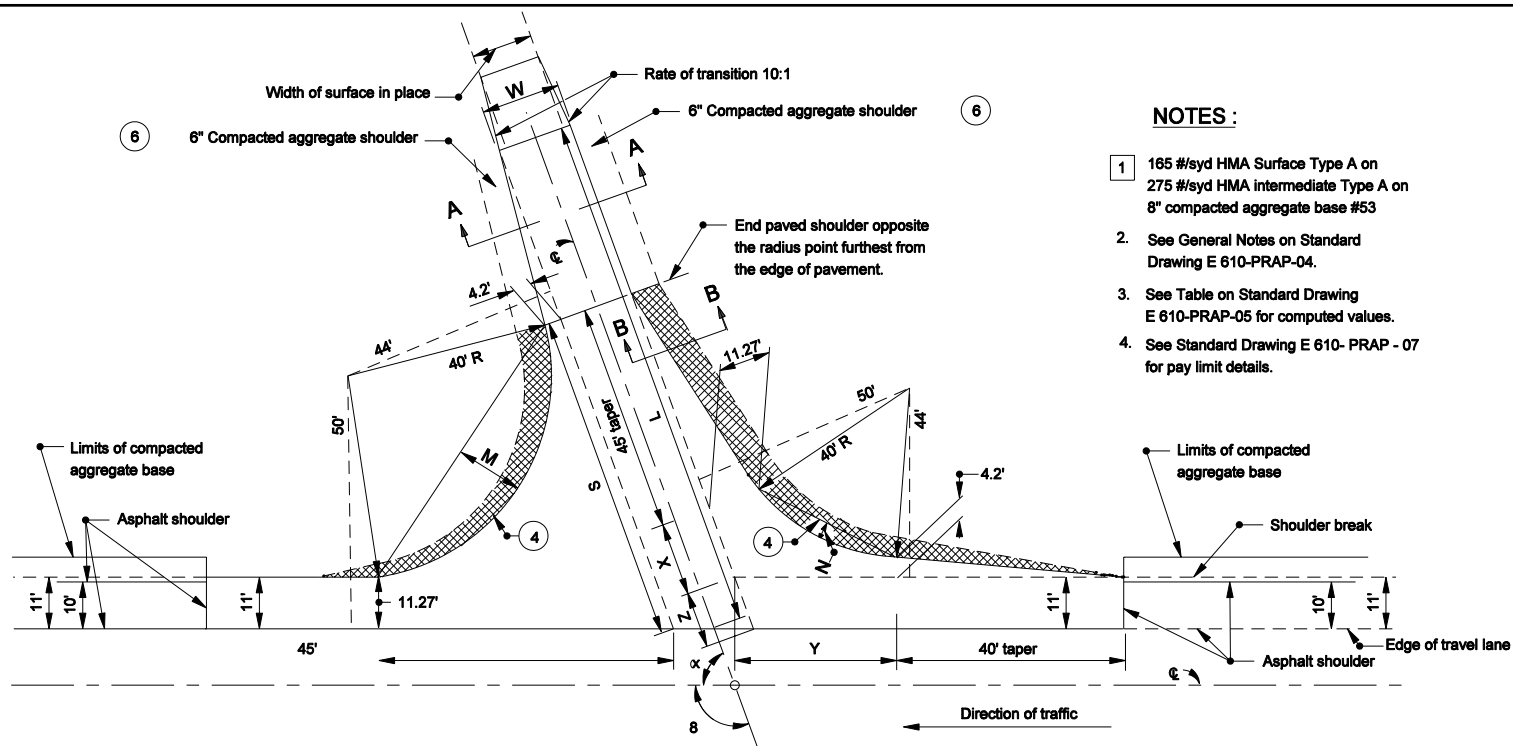
MARCH 2006

STANDARD DRAWING NO. E 610-PRAP-02

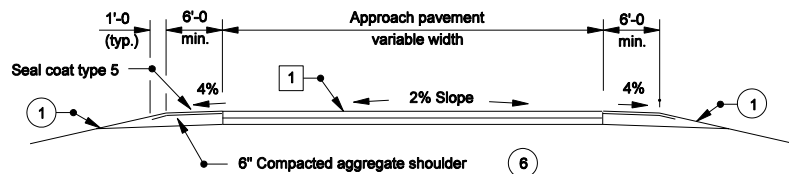


/s/ Richard L. VanCleave 3-01-06
DESIGN STANDARDS ENGINEER DATE

/s/ Richard K. Smutzer 3-01-06
CHIEF HIGHWAY ENGINEER DATE



PUBLIC ROAD APPROACH TYPE "B"

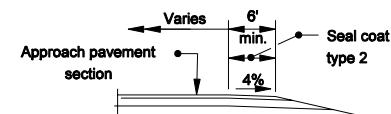


SECTION A-A MINIMUM PAVEMENT SECTION

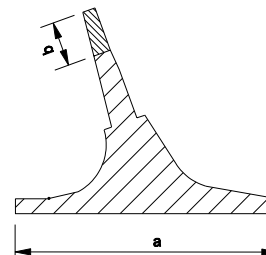
For ADT $\leq$ 1000

NOTES :

1. 165 #/syd HMA Surface Type A on 275 #/syd HMA intermediate Type A on 8" compacted aggregate base #53
2. See General Notes on Standard Drawing E 610-PRAP-04.
3. See Table on Standard Drawing E 610-PRAP-05 for computed values.
4. See Standard Drawing E 610-PRAP - 07 for pay limit details.



SECTION B-B



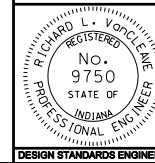
PAY LIMITS

INDIANA DEPARTMENT OF TRANSPORTATION

**PUBLIC ROAD APPROACH
TYPE B**

MARCH 2006

STANDARD DRAWING NO. E 610-PRAP-03



/s/ Richard L. VanCleave 3-01-06
DESIGN STANDARDS ENGINEER DATE

/s/ Richard K. Smutzer 3-01-06
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

GENERAL NOTES

These notes are for Standard Drawings E 610-PRAP-02, -03, and -05.

- 1 Embankment slopes on either side of an approach or drive within the mainline clear zone for new construction/reconstruction projects or the obstruction free zone on 3R projects should conform to the following table:

DESIGN YEAR		High, ≥ 50 mph		Low, ≤ 45 mph
Design Year AADT		≥ 6000	< 6000	All
Multi-Lane Divided, All Functional Class.	Incoming Slope	10:1	10:1	10:1
	Outgoing Slope	4:1	4:1	4:1
Multi-Lane Undivided, All Functional Class.	Incoming Slope	10:1	6:1	6:1
	Outgoing Slope	4:1	4:1	4:1
2-Lane Arterial or collector		6:1	6:1	4:1
2-Lane Local Road		4:1	4:1	4:1

Outside the clear zone or the obstruction free zone, the embankment slopes should desirably be 4:1 but not steeper than 3:1.

2. Cross culverts under the public road approach which cannot be located outside the mainline clear zone will require appropriate end treatments.
- 4 The cross hatched  shoulder area indicates the limits where the shoulder is the same as the approach pavement.
5. If the approach is to be constructed of PCCP, the details shall be as shown elsewhere in the plans for thickness, joint type, and location.
- 6 Earth shoulder shall be used with the Type A public road approach. The Type B public road approach shall have 6 in. compacted aggregate and full approach pavement section shoulders as shown on the Type A approach detail.
- 7 If the ADT for the public road is greater than 1000, the required pavement section shall be as shown elsewhere in the plans.

INDIANA DEPARTMENT OF TRANSPORTATION	
PUBLIC ROAD APPROACH TYPE A & B - GENERAL NOTES	
SEPTEMBER 2007	
STANDARD DRAWING NO. E 610-PRAP-04	
	<i>/s/ Richard L. VanCleave</i> DESIGN STANDARDS ENGINEER <i>09/04/07</i> DATE <i>/s/ Mark A. Miller</i> CHIEF HIGHWAY ENGINEER <i>09/04/07</i> DATE
DESIGN STANDARDS ENGINEER	

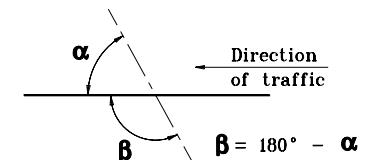
β	U	S	M	X	Y	N	L							TOTAL APPROACH AREA A						Hatched shoulder area	C.A.B. shoulder area	β
							TYPE A			TYPE B				TYPE A			TYPE B					
							W=20	W=22	W=24	W=20	W=22	W=24	Z	W=20	W=22	W=24	W=20	W=22	W=24			
(°)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(SYS)	(SYS)	(SYS)	(SYS)	(SYS)	(SYS)	(SYS)	(SYS)	(SYS)	(°)
110	55.02	65.23	11.66	18.63	33.20	3.72	108.87	109.23	109.60	108.87	109.23	109.60	11.71	531.19	556.20	501.52	645.05	670.14	695.38	112.40	52.60	110
109	53.75	64.04	11.42	19.32	33.74	3.86	107.48	107.82	108.17	107.48	107.48	108.17	11.63	524.90	549.63	574.51	639.55	664.28	689.15	112.50	51.00	109
108	52.51	62.88	11.19	20.02	34.28	4.02	106.12	106.45	106.77	106.12	106.45	106.77	11.57	518.88	543.25	567.78	634.32	658.70	683.22	112.60	49.50	108
107	51.30	61.74	10.94	20.72	34.84	4.17	104.80	105.10	105.41	104.80	105.10	105.41	11.50	513.11	537.15	561.32	629.37	653.40	677.37	112.60	48.00	107
106	50.11	60.64	10.70	21.44	35.40	4.33	103.50	103.79	104.48	103.50	103.79	104.08	11.44	507.60	531.30	555.13	624.67	648.37	672.20	112.80	46.40	106
105	48.95	59.56	10.46	22.16	35.98	4.49	102.24	102.51	102.77	102.24	102.51	102.77	11.39	502.33	525.70	549.20	620.23	643.61	667.10	112.90	45.10	105
104	47.81	58.51	10.23	22.88	36.56	4.65	101.00	101.25	101.50	101.00	102.25	101.50	11.34	497.30	520.35	543.52	616.04	639.10	662.26	112.90	43.60	104
103	46.70	57.48	9.99	23.62	37.16	4.81	99.79	100.02	100.25	99.79	100.02	100.25	11.29	492.50	515.24	538.06	612.10	634.83	657.68	113.00	42.20	103
102	45.81	56.48	9.76	24.36	37.77	4.98	98.60	98.81	99.02	98.60	98.81	99.02	11.25	487.92	510.35	532.88	608.39	630.82	653.34	113.10	40.80	102
101	44.54	55.49	9.54	25.10	38.39	5.15	97.44	97.63	97.83	97.44	97.63	97.83	11.21	483.57	505.69	527.91	604.91	627.04	649.25	113.10	39.40	101
100	43.50	54.54	9.31	25.86	39.02	5.35	96.30	96.47	96.65	96.30	96.47	96.65	11.17	479.42	501.26	523.16	601.66	623.49	645.40	113.10	37.90	100
99	42.47	53.60	9.09	26.63	39.66	5.50	95.18	95.34	95.50	95.18	95.34	95.50	11.14	475.49	497.03	518.64	598.63	620.17	641.78	113.20	36.30	99
98	41.46	52.68	8.87	27.41	40.31	5.68	94.09	94.23	94.37	94.09	94.23	94.37	11.11	471.77	493.02	514.34	595.83	617.08	638.39	113.20	34.90	98
97	40.47	51.78	8.65	28.19	40.98	5.86	93.10	93.13	93.26	93.01	93.13	93.26	11.08	468.25	489.22	510.24	593.24	614.21	635.23	113.20	33.50	97
96	39.50	50.90	8.44	28.99	41.66	6.04	91.96	92.06	92.17	91.96	92.06	92.17	11.06	464.93	485.62	506.36	590.86	611.56	632.29	113.30	32.40	96
95	38.64	50.04	8.22	29.79	42.35	6.22	90.92	91.01	91.10	90.92	91.01	91.10	11.04	461.80	482.21	502.68	588.70	609.12	629.58	113.30	31.00	95
94	37.60	49.20	8.01	30.61	43.05	6.41	89.90	89.97	90.04	89.90	89.97	90.04	11.03	458.87	479.02	499.20	586.74	606.89	627.07	113.30	29.40	94
93	36.68	48.38	7.80	31.44	43.77	6.60	88.90	88.96	89.01	88.90	88.96	89.01	11.02	456.12	476.01	495.91	584.99	604.88	624.79	113.40	28.00	93
92	35.77	47.57	7.60	32.28	44.50	6.80	87.92	87.96	87.99	87.92	87.96	87.99	11.01	453.57	473.19	492.83	583.45	603.07	622.71	113.40	26.80	92
91	34.88	46.78	7.39	33.14	45.24	6.99	86.96	86.97	86.99	86.96	86.97	86.99	11.00	451.20	470.56	489.94	586.57	606.29	626.01	113.40	27.90	91
90	34.00	46.00	7.19	34.00	46.00	7.19	86.00	86.00	86.00	90.00	90.00	90.00	11.00	449.01	468.12	487.23	589.85	609.85	629.85	113.40	29.30	90
89	33.14	45.24	6.99	34.88	46.78	7.39	85.07	85.05	85.04	91.06	91.07	91.09	11.00	447.01	465.87	484.72	593.33	613.61	633.90	113.40	30.60	89
88	32.28	44.50	6.80	35.77	47.57	7.60	84.15	84.12	84.08	92.13	92.16	92.20	11.01	445.18	463.80	482.40	597.03	617.58	638.16	113.30	32.00	88
87	31.44	43.77	6.60	36.68	48.38	7.80	83.24	83.19	83.14	93.22	93.27	93.33	11.02	443.54	461.91	480.26	600.93	621.77	642.64	113.30	33.40	87
86	30.61	43.05	6.41	37.60	49.20	8.01	83.30	83.37	83.44	94.33	94.40	94.47	11.03	444.20	462.79	481.60	605.04	626.18	647.34	113.30	34.80	86
85	29.79	42.35	6.22	38.64	50.04	8.22	84.42	84.51	84.59	95.46	95.55	95.64	11.04	447.35	466.32	485.34	609.37	630.80	652.27	113.30	36.20	85
84	28.99	41.66	6.04	39.50	50.90	8.44	85.55	85.65	85.76	96.61	96.72	96.82	11.06	450.69	469.96	489.27	613.92	635.65	657.42	113.30	37.60	84
83	28.19	40.98	5.86	40.47	51.78	8.65	86.70	86.82	86.94	97.78	97.90	98.03	11.08	454.22	473.79	493.41	618.70	640.72	662.81	113.30	39.00	83
82	27.41	40.31	5.68	41.46	52.68	8.87	87.87	88.01	88.15	98.97	99.11	99.26	11.11	457.95	477.82	497.75	623.70	646.03	668.43	113.30	40.40	82
81	26.63	39.66	5.50	42.47	53.60	9.09	89.05	89.21	89.37	100.19	100.35	100.51	11.14	461.88	482.05	502.30	628.93	651.58	674.30	113.20	41.80	81
80	25.86	39.02	5.35	43.50	54.54	9.31	90.26	90.44	90.61	101.43	101.61	101.78	11.17	466.00	486.49	507.06	634.40	657.37	680.42	113.20	43.20	80
79	25.10	38.39	5.15	44.54	55.49	9.54	91.49	91.68	91.88	102.69	102.89	103.08	11.21	470.34	491.15	512.04	640.11	663.40	686.78	113.10	44.60	79
78	24.36	37.77	4.98	45.61	56.48	9.76	92.74	92.95	93.16	103.96	104.20	104.41	11.25	474.89	496.02	517.24	646.07	669.69	693.41	113.00	46.10	78
77	23.62	37.16	4.81	46.70	57.48	9.99	94.01	94.24	94.47	105.30	105.53	105.76	11.29	479.66	501.11	522.67	652.78	676.24	700.31	113.00	47.50	77
76	22.88	36.56	4.65	47.81	58.51	10.23	95.31	95.56	95.81	106.64	106.89	107.14	11.34	484.65	506.44	528.34	658.75	683.06	707.48	113.00	49.00	76
75	22.16	35.98	4.49	48.95	59.56	10.46	96.63	96.90	97.17	108.02	108.29	108.55	11.39	489.87	511.99	534.24	665.50	690.16	714.94	112.90	50.50	75
74	21.44	35.40	4.33	50.11	60.64	10.70	97.98	98.26	98.55	109.42	109.71	110.00	11.44	495.32	517.79	540.39	672.52	697.54	722.68	112.80	52.00	74
73	20.72	34.84	4.17	51.30	61.74	10.94	99.36	99.66	99.97	110.86	111.16	111.47	11.50	501.01	523.84	546.80	679.82	705.21	730.72	112.80	53.50	73
72	20.02	34.28	4.02	52.51	62.88	11.18	100.76	101.08	101.41	112.33	112.65	112.98	11.57	506.96	530.14	553.47	687.42	713.18	739.08	112.70	55.00	72
71	19.32	33.74	3.86	53.75	64.04	11.42	102.20	102.54	102.88	113.83	114.17	114.52	11.63	513.16	536.71	560.42	695.32	721.46	747.75	112.60	56.60	71
70	18.63	33.20	3.72	55.02	65.23	11.66	103.66	104.03	104.39	115.37	115.73	116.10	11.71	519.62	543.55	567.64	703.54	730.07	756.76	112.50	58.10	70

LEGEND

α = ANGLE OF TURN

The angle through which a vehicle travels on the public road approach toward making a right hand turn. It is measured from the extension of the tangent on which a vehicle approaches the intersecting road to the corresponding tangent on the intersecting road to which the vehicle turns.

β = INTERSECTION CONTROL ANGLE



NOTES :

- See Standard Drawing E 610-PRAP-02 for public road approach type A.
- See Standard Drawing E 610-PRAP-03 for public road approach type B.
- See Standard Drawing E 610-PRAP-04 for General Notes.

INDIANA DEPARTMENT OF TRANSPORTATION	
PUBLIC ROAD APPROACH TYPE A & TYPE B - TABLE OF VALUE	
SEPTEMBER 2001	
STANDARD DRAWING NO. E 610-PRAP-05	
	/s/ Anthony L. Uremovich 9-04-01 DESIGN STANDARDS ENGINEER DATE
	/s/ Firooz Zandi 9-04-01 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	

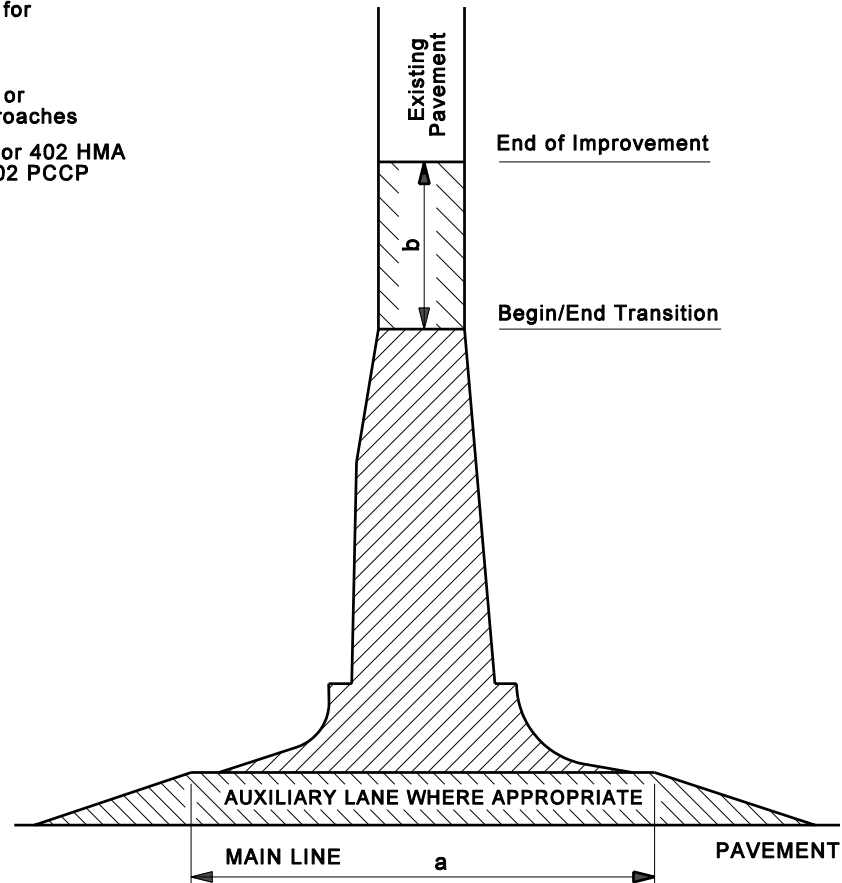
 a < 100', HMA or PCCP for Approaches

a > 100', 401 or 402 HMA
or 501 or 502 PCCP

 HMA or PCCP for Approaches

 b < 100', HMA or PCCP for Approaches

b > 100', 401 or 402 HMA
or 501 or 502 PCCP



NOTES:

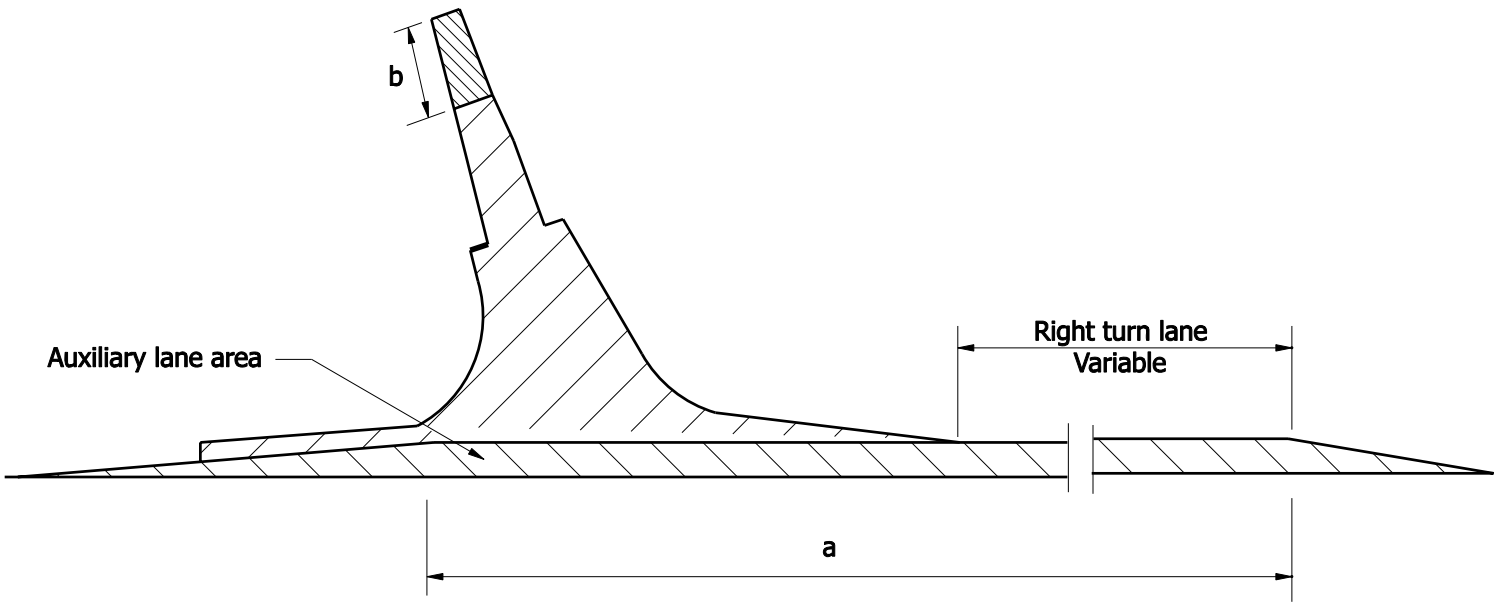
1. The pay limits shown hereon generally apply to Types A, B, C, and D Public Road Approaches as shown on Standard Drawings E 610-PRAP-02, -03, -06, and -10 respectively.

INDIANA DEPARTMENT OF TRANSPORTATION	
PUBLIC ROAD APPROACH PAY LIMITS	
MARCH 2006	
STANDARD DRAWING NO. E 610-PRAP-07	
	/s/ Richard L. VanCleave 3-01-06 DESIGN STANDARDS ENGINEER DATE
	/s/ Richard K. Smutzer 3-01-06 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	

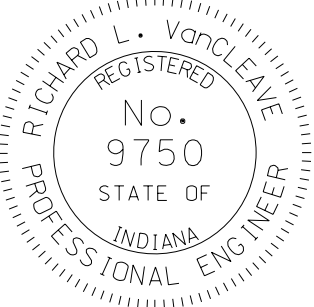
GENERAL NOTES

These notes are for Standard Drawings
E 610-PRAP-06 and E 610-PRAP-09.

- ① See table on Standard Drawing E 610-PRAP-04 for embankment slopes to be built on either side of the approach.
2. Cross culverts under the public road approach which cannot be located outside the mainline clear zone will require appropriate end treatments at each end as shown on the plans.
3. If the approach is to be constructed of concrete, the details shall be as shown elsewhere in the plans for pavement thickness, joint type, and location.
- ④ The cross hatched  shoulder area indicates the limits where the shoulder is the same section as the approach pavement.
- ⑤ The pavement section for the auxiliary lane shall be as detailed elsewhere in the plans.
- ⑥ If the ADT for the public road is greater than 1000, the required pavement section shall be as shown elsewhere in the plans.
7. See Standard Drawing E 610 - PRAP - 07 for pay limit details.



PAY LIMITS

INDIANA DEPARTMENT OF TRANSPORTATION	
PUBLIC ROAD APPROACH TYPE C - GENERAL NOTES	
SEPTEMBER 2007	
STANDARD DRAWING NO. E 610-PRAP-08	
	/s/ <i>Richard L. VanCleave</i>09/04/07 DESIGN STANDARDS ENGINEERDATE /s/ <i>Mark A. Miller</i>09/04/07 CHIEF HIGHWAY ENGINEERDATE
DESIGN STANDARDS ENGINEER	

β degree	L ft.	S ft.	U ft.	X ft.	Y ft.	V ft.	Shoulder gap ft.	Chord		M		Approach Areas			Auxiliary lane part.area ⑦ sys.	β degree
								Lt. ft.	Rt. ft.	Lt. ft.	Rt. ft.	Ⓐ sys.	Ⓑ sys.	Total sys.		
110	98.95	54.59	61.38	18.63	33.20	25.54	330.12	63.16	33.68	15.45	3.72	116.48	85.95	466.32	326.83	110
109	97.59	53.46	60.31	19.32	33.74	25.38	329.43	62.72	34.31	15.17	3.86	112.89	87.65	460.78	325.90	109
108	96.26	52.36	59.26	20.02	34.28	25.24	328.78	62.29	34.94	14.90	4.02	109.42	89.37	455.49	325.04	108
107	94.95	51.28	58.24	20.72	34.84	25.10	328.18	61.85	35.56	14.63	4.17	106.08	91.14	450.43	324.23	107
106	93.68	50.23	57.24	21.44	35.40	24.97	327.61	61.40	36.19	14.36	4.33	102.85	92.95	445.59	323.48	106
105	92.42	49.21	56.27	22.16	35.98	24.85	327.10	60.95	36.81	14.09	4.49	99.72	94.80	440.98	322.79	105
104	91.19	48.20	55.32	22.88	36.56	24.74	326.62	60.50	37.43	13.83	4.65	96.70	96.70	436.58	322.16	104
103	89.99	47.22	54.39	23.62	37.16	24.63	326.18	60.04	38.04	13.56	4.81	93.79	98.65	432.39	321.58	103
102	88.60	46.25	53.48	24.36	37.77	24.54	325.79	60.58	38.66	13.30	4.98	90.96	100.64	428.41	321.05	102
101	87.64	45.31	52.60	25.10	38.39	24.45	325.44	59.11	39.27	13.04	5.15	88.24	102.68	424.62	320.58	101
100	86.50	44.38	51.73	25.86	39.02	24.37	325.12	58.64	39.87	12.79	5.32	85.60	104.77	421.03	320.16	100
99	85.37	43.47	50.88	26.63	39.66	24.30	324.84	58.16	40.48	12.53	5.50	83.05	108.92	417.63	319.79	99
98	84.27	42.58	50.05	27.41	40.31	24.24	324.60	57.68	41.08	12.28	5.68	80.58	109.12	414.41	319.47	98
97	83.18	41.71	49.24	28.19	40.98	24.18	324.40	57.19	41.68	12.03	5.86	78.19	111.38	411.38	319.20	97
96	82.11	40.85	48.45	28.99	41.66	24.13	324.24	56.70	42.27	11.78	6.04	76.87	113.70	408.53	318.98	96
95	81.06	40.01	47.67	29.79	42.35	24.09	324.11	56.21	42.86	11.54	6.22	73.63	116.07	405.86	318.81	95
94	80.02	39.16	46.90	30.61	43.05	24.06	324.01	56.71	43.45	11.29	6.41	71.47	118.51	403.36	318.68	94
93	79.00	38.37	46.16	31.44	43.77	24.03	323.96	55.20	44.03	11.05	6.60	69.37	121.02	401.04	318.61	93
92	77.98	37.57	45.42	32.28	44.50	24.02	323.94	54.70	44.62	10.81	6.80	67.33	123.59	398.88	318.58	92
91	77.92	36.79	44.70	33.14	45.24	24.00	323.94	54.18	45.19	10.57	6.99	65.36	126.23	399.40	318.60	91
90	79.00	36.00	44.00	34.00	46.00	24.00	324.00	53.67	48.77	10.34	7.19	63.48	128.84	403.07	318.67	90
89	80.09	35.24	43.31	34.88	46.78	24.00	324.09	53.15	46.34	10.10	7.39	61.61	131.73	406.91	318.79	89
88	81.19	34.49	42.63	35.77	47.57	24.02	324.22	52.63	46.90	9.87	7.60	59.82	134.60	410.93	318.96	88
87	82.31	33.75	41.96	36.68	48.38	24.03	324.37	52.10	47.47	9.64	7.80	58.08	137.54	415.12	319.17	87
86	83.44	33.03	41.31	37.60	49.20	24.06	324.57	51.57	48.03	9.42	8.01	58.40	140.57	419.49	319.43	86
85	84.59	32.31	40.67	38.54	50.04	24.09	324.80	51.03	48.58	9.20	8.22	54.77	143.68	424.04	319.74	85
84	85.76	31.60	40.04	39.50	50.09	24.13	325.07	50.49	49.14	8.97	8.44	53.20	146.88	428.77	320.10	84
83	86.94	30.94	39.42	40.47	51.78	24.18	325.38	49.95	49.69	8.75	8.65	51.67	150.18	433.69	320.51	83
82	88.15	30.21	38.81	41.46	52.68	24.24	325.73	49.40	50.23	8.54	8.87	50.18	153.57	438.81	320.97	82
81	89.37	29.54	38.21	42.47	53.60	24.30	326.11	48.85	50.77	8.32	9.09	48.74	157.06	444.12	321.48	81
80	90.61	28.86	37.63	43.50	54.54	24.37	326.54	48.30	51.31	8.11	9.31	47.35	160.66	449.04	322.04	80
79	91.88	28.20	37.05	44.54	55.49	24.45	326.99	47.74	51.84	7.90	9.54	46.00	164.36	455.36	322.65	79
78	93.16	27.55	36.48	45.61	58.48	24.54	327.50	47.17	52.38	7.69	9.76	44.69	168.17	461.29	323.32	78
77	94.47	26.90	35.92	46.70	57.48	24.63	328.30	46.61	52.90	7.49	9.99	43.42	172.10	467.44	324.04	77
76	95.81	26.26	35.37	47.81	58.51	24.74	328.82	46.04	53.42	7.29	10.23	42.18	176.15	473.82	324.82	76
75	97.17	25.63	35.83	48.95	59.56	24.85	328.24	45.47	53.94	7.09	10.46	40.99	180.33	480.43	325.65	75
74	98.55	25.00	34.30	50.11	60.64	24.97	329.91	44.89	54.45	6.89	10.70	39.83	184.64	487.28	326.54	74
73	99.97	24.38	33.78	51.30	61.74	25.10	330.62	44.31	54.96	6.70	10.94	38.71	189.08	494.37	327.49	73
72	101.41	23.77	33.27	52.51	62.88	25.24	331.39	43.73	55.47	6.50	11.18	37.62	193.67	501.72	328.50	72
71	102.88	23.16	32.76	53.75	64.04	25.38	332.18	43.14	55.97	6.32	11.42	36.56	198.41	509.33	329.58	71
70	104.39	22.56	32.26	55.06	65.23	25.54	333.03	42.55	56.47	6.13	11.66	35.54	203.30	517.21	330.71	70

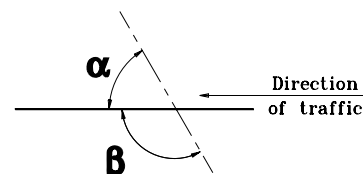
LEGEND

α = ANGLE OF TURN

It is the angle which a vehicle travels on the public road approach toward making a right hand turn. It is measured from the extension of the tangent on which a vehicle approaches the intersecting road to the corresponding tangent on the intersecting road to which the vehicle turns.

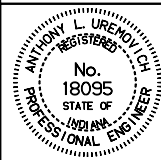
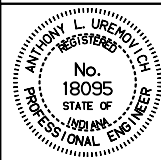
β = INTERSECTION CONTROL ANGLE

$$\beta = 180^\circ - \alpha$$

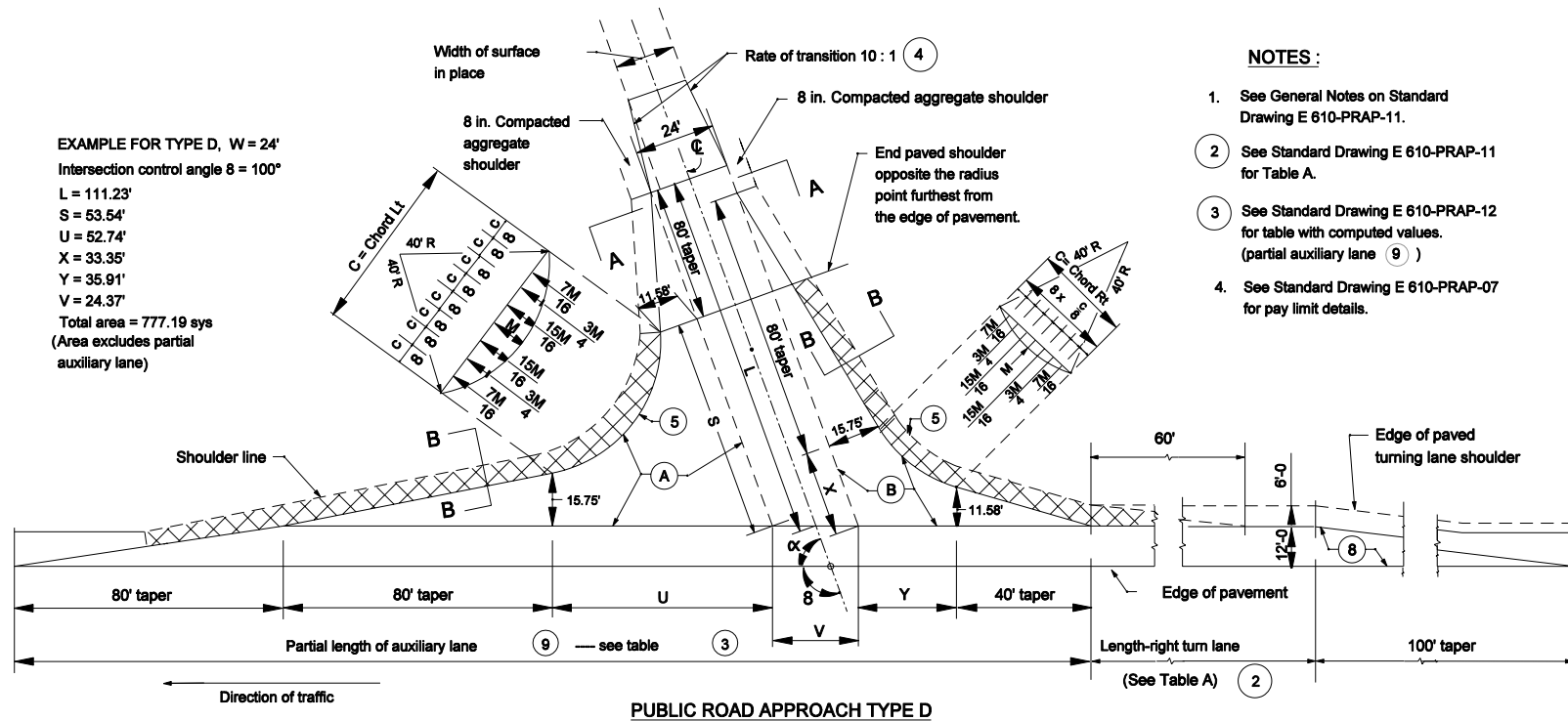


NOTES :

1. See Standard Drawing E 610-PRAP-06 for public road approach type C.
2. See Standard Drawing E 610-PRAP-08 for General Notes.

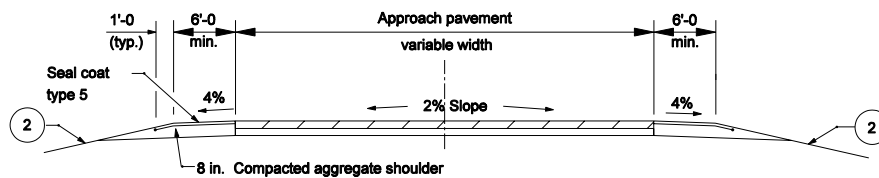
INDIANA DEPARTMENT OF TRANSPORTATION	
PUBLIC ROAD APPROACH TYPE C – TABLE OF VALUES SEPTEMBER 2001	
STANDARD DRAWING NO. E 610-PRAP-09	
	/s/ Anthony L. Uremovich 9-04-01 DESIGN STANDARDS ENGINEER DATE
	/s/ Firooz Zandi 9-04-01 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	

EXAMPLE FOR TYPE D, W = 24'
 Intersection control angle $\delta = 100^\circ$
 $L = 111.23'$
 $S = 53.54'$
 $U = 52.74'$
 $X = 33.35'$
 $Y = 35.91'$
 $V = 24.37'$
 Total area = 777.19 sqs
 (Area excludes partial
 auxiliary lane)



NOTES :

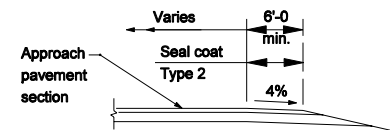
1. See General Notes on Standard Drawing E 610-PRAP-11.
2. See Standard Drawing E 610-PRAP-11 for Table A.
3. See Standard Drawing E 610-PRAP-12 for table with computed values. (partial auxiliary lane (9))
4. See Standard Drawing E 610-PRAP-07 for pay limit details.



SECTION A-A MINIMUM PAVEMENT SECTION

FOR ≤ 50 : TRUCKS, CLASS V OR ABOVE PER DAY

165#/syd HMA Surface 9.5mm Type A on
 495 #/syd HMA Intermediate 19.0 mm Type A on
 8" compacted aggregate base #53

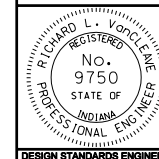


INDIANA DEPARTMENT OF TRANSPORTATION

PUBLIC ROAD APPROACH TYPE D

MARCH 2006

STANDARD DRAWING NO. E 610-PRAP-10



/s/ Richard L. VanCleave 3-01-06
 DESIGN STANDARDS ENGINEER DATE

/s/ Richard K. Smutzer 3-01-06
 CHIEF HIGHWAY ENGINEER DATE

GENERAL NOTES

These notes are for Standard Drawings E 610-PRAP-10 and E 610-PRAP-12.

1.

Standard Drawings E 610-PRAP-10 and -12 are for intersection control angle 70° to 110° .
If intersection control angle is less than 70° or greater than 110° a special design will be required.
- 2

See table on Standard Drawing E 610-PRAP-04 for embankment slopes to be built on either side of the approach
3.

Cross culverts under the public road approach which cannot be located outside the mainline clear zone will require an appropriate end section at each end.
- 4

If the existing pavement is asphalt the transition area shall be the same section as the approach and will be included in the pay limits for HMA for Approaches.
- 5

The cross hatched  shoulder area indicates the limits where the shoulder is the same as the approach pavement.
6.

If the approach is to be constructed of PCCP, the details shall be as shown elsewhere in the plans for pavement thickness, joint type, and location.
7.

If the Class V or above truck count for the public road approach is greater than 50 per day, the required pavement section shall be as provided elsewhere in the plans
- 8

The pavement section for the turn lane shall be as shown elsewhere in the plans.

Design speed (m.p.h.)	TABLE A									
	MINIMUM LENGTH OF TURNING LANES (excluding taper) , ft.									
	Downgrade slope in %					Upgrade slope in %				
	6 to 5	4.99 to 4	3.99 to 3	2.99 to 2.01	2 to 0	0 to 2	2.01 to 2.99	3 to 3.99	4 to 4.99	5 to 6
40	400	380	355	325	295	295	280	265	250	235
50	550	520	485	445	405	405	385	365	345	325
60	675	640	600	555	500	500	475	450	425	400
65	730	690	650	595	540	540	515	485	460	435
70	800	755	710	650	590	590	560	530	505	475

INDIANA DEPARTMENT OF TRANSPORTATION

PUBLIC ROAD APPROACH TYPE D
GENERAL NOTES AND TABLE A

SEPTEMBER 2007

STANDARD DRAWING NO. E 610-PRAP-11



/s/ Richard L. VanCleave

DESIGN STANDARDS ENGINEER

09/04/07

DATE

/s/ Mark A. Miller

CHIEF HIGHWAY ENGINEER

09/04/07

DATE

DESIGN STANDARDS ENGINEER

β degree	L ft	S ft	U ft	X ft	Y ft	V ft	Shoulder gap ft	Chord		M		Approach Areas			Auxiliary lane part area ⑨ sys	β degree
								Lt ft	Rt ft	Lt ft	Rt ft	① sys	② sys	Total sys		
110	109.97	65.61	65.50	25.46	29.21	25.54	320.25	52.66	29.14	9.98	2.75	335.88	174.50	803.64	373.67	110
109	108.40	64.26	64.09	26.22	29.83	25.38	319.31	52.34	29.79	9.75	2.88	329.40	176.97	795.42	372.41	109
108	106.85	62.98	62.72	26.97	30.46	25.24	318.41	51.81	30.43	9.52	3.01	323.11	179.49	787.55	371.22	108
107	105.35	61.68	61.37	27.74	31.11	25.10	317.57	51.27	31.08	9.30	3.14	317.01	182.07	780.00	370.10	107
106	105.08	60.43	60.06	28.52	31.76	24.97	316.78	50.73	31.72	9.07	3.28	311.08	184.70	775.99	369.04	106
105	106.08	59.22	58.77	29.30	32.42	24.85	316.04	50.19	32.36	8.85	3.42	305.33	187.38	775.60	368.06	105
104	107.10	58.03	57.52	30.09	33.10	24.73	315.35	49.65	33.00	8.63	3.56	299.74	190.12	775.45	367.13	104
103	108.12	56.87	56.28	30.89	33.78	24.63	314.70	49.10	33.63	8.42	3.71	294.31	192.92	775.54	366.26	103
102	109.15	55.74	55.08	31.70	34.48	24.54	314.10	48.54	34.26	8.21	3.85	289.03	195.78	775.87	365.46	102
101	110.18	54.63	53.90	32.52	35.19	24.45	313.54	47.99	34.89	8.00	4.01	283.89	198.70	776.42	364.72	101
100	111.23	53.54	52.74	33.35	35.91	24.37	313.02	47.43	35.52	7.79	4.16	278.90	201.68	777.19	364.03	100
99	112.28	52.48	51.61	34.18	36.65	24.30	312.55	46.86	36.14	7.58	4.32	274.04	204.73	778.19	363.40	99
98	113.35	51.45	50.49	35.03	37.39	24.24	312.12	46.30	36.77	7.38	4.47	269.31	207.85	779.42	362.83	98
97	114.42	50.43	49.40	35.89	38.15	24.18	311.73	45.72	37.38	7.18	4.64	264.70	211.04	780.86	362.31	97
96	115.51	49.44	48.33	36.77	38.93	24.13	311.39	45.15	38.00	6.98	4.80	260.21	214.31	782.53	361.85	96
95	116.60	48.46	47.27	37.65	39.71	24.09	311.08	44.57	38.61	6.78	4.97	255.84	217.65	784.42	361.44	95
94	117.71	47.51	46.24	38.55	40.52	24.06	310.82	43.99	39.22	6.59	5.14	251.58	221.01	786.54	361.09	94
93	118.83	46.57	45.22	39.46	41.33	24.03	310.59	43.41	39.83	6.40	5.31	247.43	224.56	788.87	360.79	93
92	119.96	45.66	44.22	40.38	42.17	24.01	310.40	42.82	40.43	6.21	5.48	243.38	228.15	791.43	360.54	92
91	121.11	44.76	43.24	41.32	43.01	24.00	310.26	42.23	41.03	6.03	5.66	239.43	231.82	794.21	360.34	91
90	122.27	43.88	42.27	42.27	43.88	24.00	310.15	41.63	41.63	5.84	5.84	235.58	235.58	797.21	360.20	90
89	123.45	43.01	41.32	43.24	44.76	24.00	310.08	41.03	42.23	5.66	6.03	231.82	239.43	800.44	360.11	89
88	124.64	42.17	40.38	44.22	45.66	24.01	310.06	40.43	42.82	5.48	6.21	228.15	243.38	803.90	360.07	88
87	125.85	41.33	39.46	45.22	46.57	24.03	310.07	39.83	43.41	5.31	6.40	224.56	247.38	807.60	360.09	87
86	127.08	40.52	38.55	46.24	47.51	24.06	310.12	39.22	43.99	5.14	6.59	221.06	251.56	811.52	360.16	86
85	128.32	39.71	37.65	47.27	48.46	24.09	310.21	38.61	44.57	4.97	6.78	217.65	255.84	815.69	360.28	85
84	129.59	38.93	36.77	48.33	49.44	24.13	310.34	38.00	45.15	4.80	6.98	214.31	260.21	820.09	360.45	84
83	130.87	38.15	35.89	49.40	50.43	24.18	310.51	37.38	45.72	4.64	7.18	211.04	264.70	824.74	360.67	83
82	132.18	37.39	35.03	50.49	51.45	24.24	310.72	36.77	46.30	4.47	7.38	207.85	269.31	829.64	360.95	82
81	133.51	36.65	34.18	51.61	52.48	24.30	310.97	36.14	46.86	4.32	7.58	204.73	274.04	834.79	361.29	81
80	134.86	35.91	33.35	52.74	53.54	24.37	311.26	35.52	47.43	4.16	7.79	201.68	278.90	840.20	361.68	80
79	136.23	35.19	32.52	53.90	54.63	24.45	311.59	34.89	47.99	4.01	8.00	198.70	283.89	845.87	362.12	79
78	137.63	34.48	31.70	55.08	55.74	24.54	311.97	34.26	48.54	3.85	8.21	195.78	289.03	851.82	362.63	78
77	139.06	33.78	30.89	56.28	56.87	24.63	312.39	33.63	49.10	3.71	8.42	192.92	294.31	858.04	363.19	77
76	140.51	33.10	30.09	57.52	58.03	24.73	312.85	33.00	49.65	3.56	8.63	190.12	299.74	864.55	363.80	76
75	141.99	32.42	29.30	58.77	59.22	24.85	313.36	32.36	50.19	3.42	8.85	187.38	305.33	871.35	364.48	75
74	143.50	31.76	28.52	60.06	60.43	24.97	313.92	31.72	50.73	3.28	9.07	184.70	311.08	878.44	365.22	74
73	145.04	31.11	27.74	61.37	61.68	25.10	313.92	31.08	51.27	3.14	9.30	182.07	317.01	885.85	366.02	73
72	146.61	30.46	26.97	62.72	62.96	25.24	315.17	30.43	51.81	3.01	9.52	179.49	323.11	893.57	366.89	72
71	148.22	29.83	26.22	64.09	64.26	25.38	315.86	29.79	52.34	2.88	9.75	176.97	329.40	901.63	367.82	71
70	149.87	29.21	25.46	65.50	65.61	25.54	316.61	29.14	52.86	2.75	9.99	174.50	335.88	910.02	368.81	70

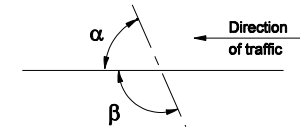
LEGEND

α = ANGLE OF TURN

The angle which a vehicle travels on the public road approach toward making a right hand turn. It is measured from the extension of the tangent on which a vehicle approaches the intersecting road to the corresponding tangent on the intersecting road to which the vehicle turns.

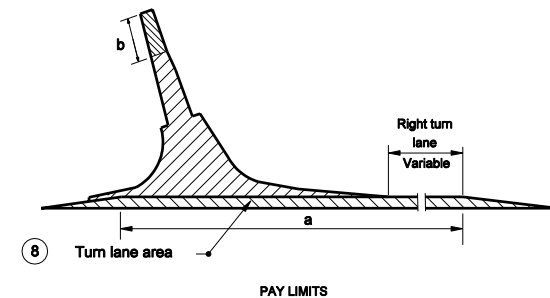
β = INTERSECTION CONTROL ANGLE

$\beta = 180^\circ - \alpha$



NOTES:

- See Standard Drawing E 610-PRAP-10 for public road approach type D.
- See Standard Drawing E 610-PRAP-11 for General Notes.

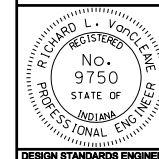


INDIANA DEPARTMENT OF TRANSPORTATION

PUBLIC ROAD APPROACH TYPE D - TABLE OF VALUES

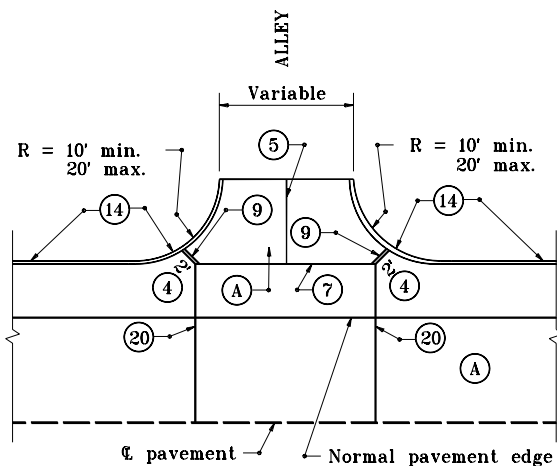
MARCH 2006

STANDARD DRAWING NO. E 610-PRAP-12

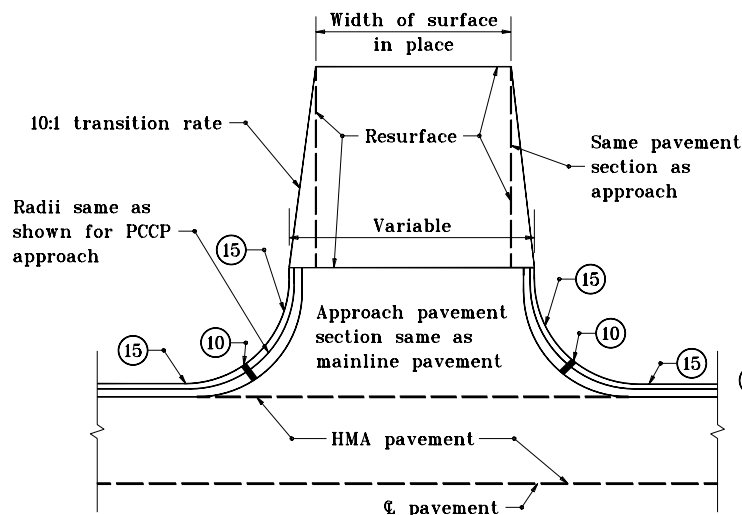


/s/ Richard L. VanCleave 3-01-06
DESIGN STANDARDS ENGINEER DATE

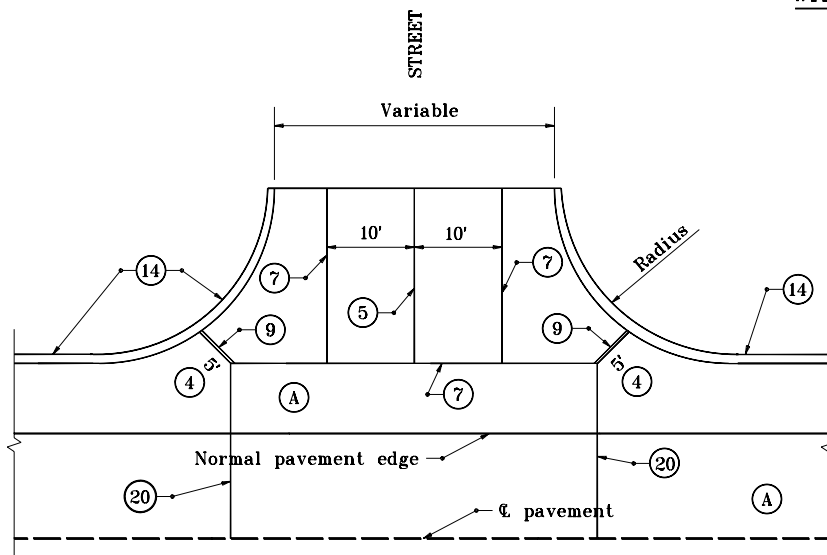
/s/ Richard K. Smutzer 3-01-06
CHIEF HIGHWAY ENGINEER DATE



**ALLEY APPROACH
WITH PCCP MAINLINE PAVEMENT**



**STREET OR ALLEY APPROACH
WITH HMA MAINLINE PAVEMENT**



**STREET APPROACH
WITH PCCP MAINLINE PAVEMENT**

GENERAL NOTES

1. Radii of 25' at minor cross streets shall be provided on new construction and on reconstruction where space permits.
2. Radii of 30' or more at major cross streets shall be provided where feasible so that a truck may turn without encroachment.
3. Radii of 40' or more at major cross streets shall be provided where trucks and buses repeatedly turn.
- ④ Ear construction type B permitted as shown on Standard Drawing E 605-ERCN-02.

LEGEND

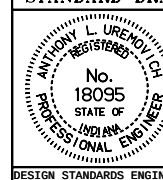
- ④ PCCP
- ⑤ Longitudinal joint
- ⑦ Keyway joint
- ⑨ 1" preformed joint filler
- ⑩ ½" preformed joint filler
- ⑭ Integral concrete curb
- ⑮ Combined curb and gutter
- ⑳ Contraction joint

INDIANA DEPARTMENT OF TRANSPORTATION

STREET or ALLEY APPROACH HMA MAINLINE PAVEMENT

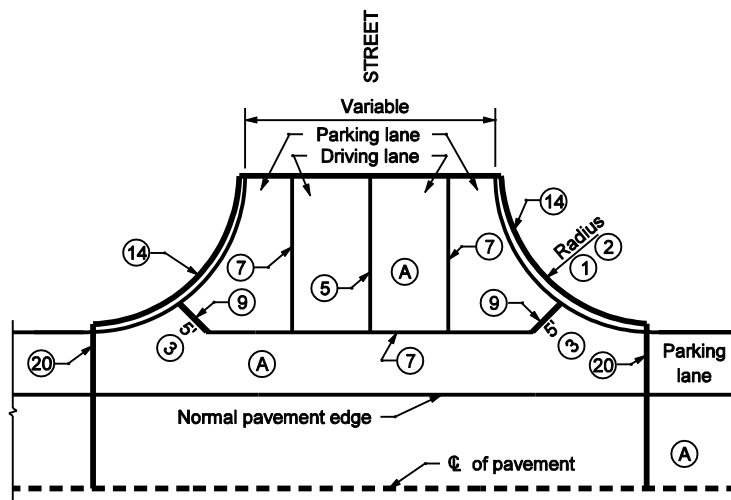
JANUARY 2000

STANDARD DRAWING NO. E 610-PRAP-13

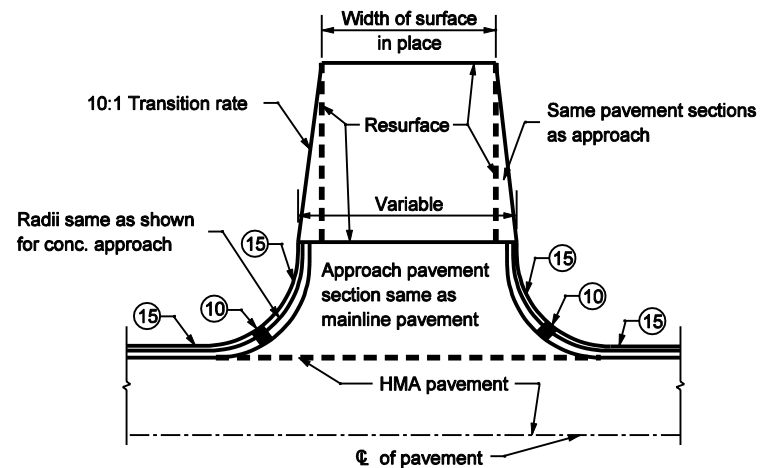


/s/ Anthony L. Uremovich 1-03-00
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi 1-03-00
CHIEF HIGHWAY ENGINEER DATE



**STREET APPROACH
WITH PCCP MAINLINE APPROACH**



**STREET APPROACH
WITH HMA MAINLINE PAVEMENT**

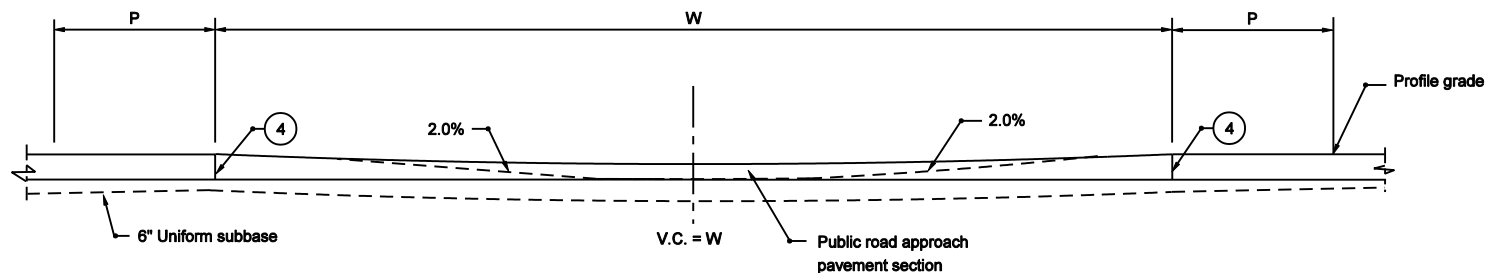
GENERAL NOTES

- ① Provide radii of 30' or more at major cross streets where WB-15 trucks and or buses turn repeatedly.
- ② Provide radii of 60' or more at the intersection of two State or U.S. highways and streets servicing heavy industrial areas requiring repeated turns by the Indiana Single Unit Vehicle.
- ③ Ear construction Type B as shown on Standard Drawing E 605-ERCN-02 will be permitted.
4. See General Notes on Standard Drawing E 610-PRAP-11.

LEGEND

- Ⓐ PCCP
- Ⓚ HMA pavement
- ⑤ Longitudinal joint
- ⑦ Keyway joint
- ⑨ 1" Preformed joint filler
- ⑩ 1/2" Preformed joint filler
- ⑭ Integral concrete curb
- ⑮ Combined curb and gutter
- ⑯ Contraction joint

INDIANA DEPARTMENT OF TRANSPORTATION	
STREET APPROACH WITH PCCP OR HMA MAINLINE PAVEMENT	
SEPTEMBER 2002	
STANDARD DRAWING NO. E 610-PRAP-14	
	/s/ Richard L. VanCleave 9-03-02 DESIGN STANDARDS ENGINEER DATE
	/s/ Richard K. Smutzer 9-03-02 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	



SECTION A-A

LEGEND

- 3 Construction joint type D-1. See Standard Drawing E 503-CCPJ-01 for details.
- 4 Longitudinal keyway joint, if pavement is PCCP. See Standard Drawing E 503-CCPJ-04 for details.
- 8 Longitudinal contraction joint. See Standard Drawings E 503-CCPJ-07 AND -08 for details.
- 9 1" preformed joint filler
- 10 Ear construction type A. See Standard Drawing E 605-ERCN-01 for details.
- 11 Ear construction type B. See Standard Drawing E 605-ERCN-02 for details.
- 14 Integral concrete curb

L = Minimum longitudinal length of crossover

P = Travel lane or turn lane width

W = Width of median

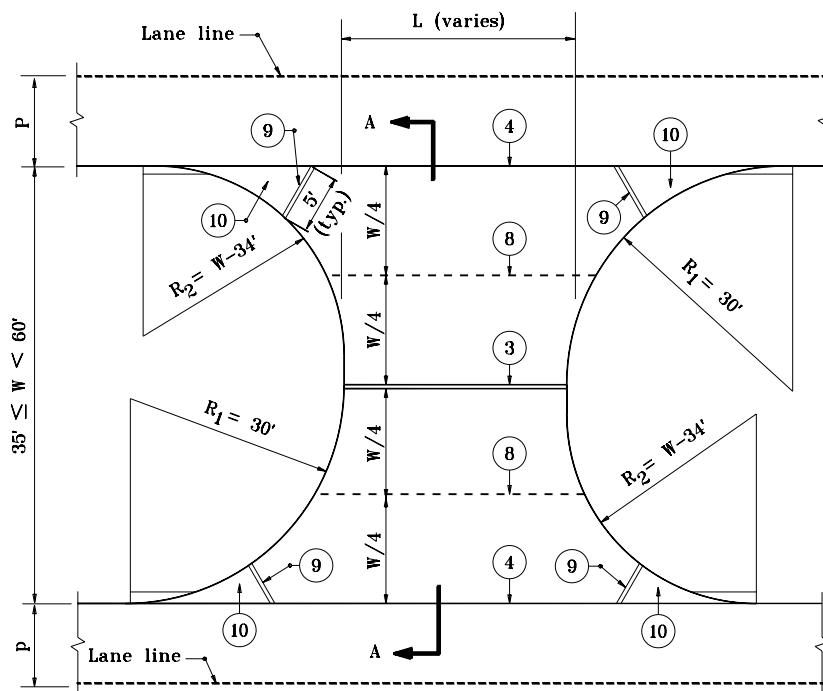
$V.C.$ = Vertical curve length

 = Stabilized shoulder

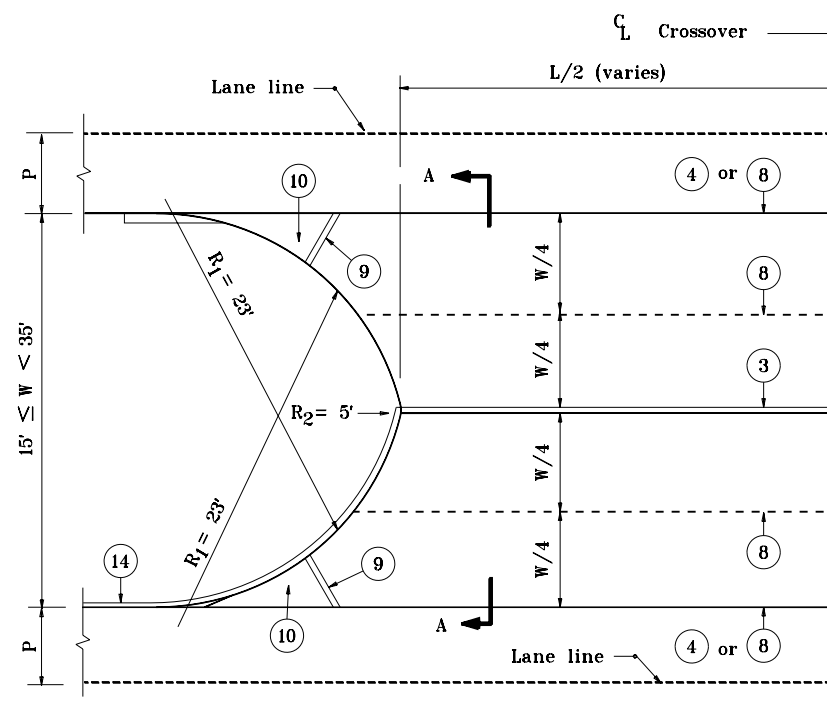
GENERAL NOTES :

1. The crossover length L is based on a 90° road intersection.
2. PCCP crossover shall be constructed if the cross road approach is concrete
HMA crossover shall be constructed if the cross road approach asphalt.
3. See Standard Drawings E 610-PRCO-01A through -07 for crossover plans.

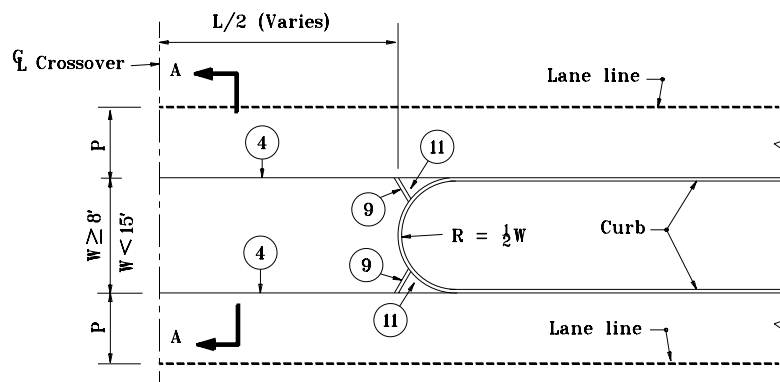
INDIANA DEPARTMENT OF TRANSPORTATION	
PUBLIC ROAD CROSSOVER SECTION	
MARCH 2003	
STANDARD DRAWING NO. E 610-PRCO-01	
	/s/ Anthony L. Uremowich 3-03-03 DESIGN STANDARDS ENGINEER DATE /s/ Richard K. Smutzer 3-03-03 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	



**CROSSOVER PLAN FOR MEDIAN WIDTH OF
35 ft OR GREATER BUT LESS THAN 60 ft**



**CROSSOVER PLAN FOR MEDIAN WIDTH OF
15 ft OR GREATER BUT LESS THAN 35 ft**

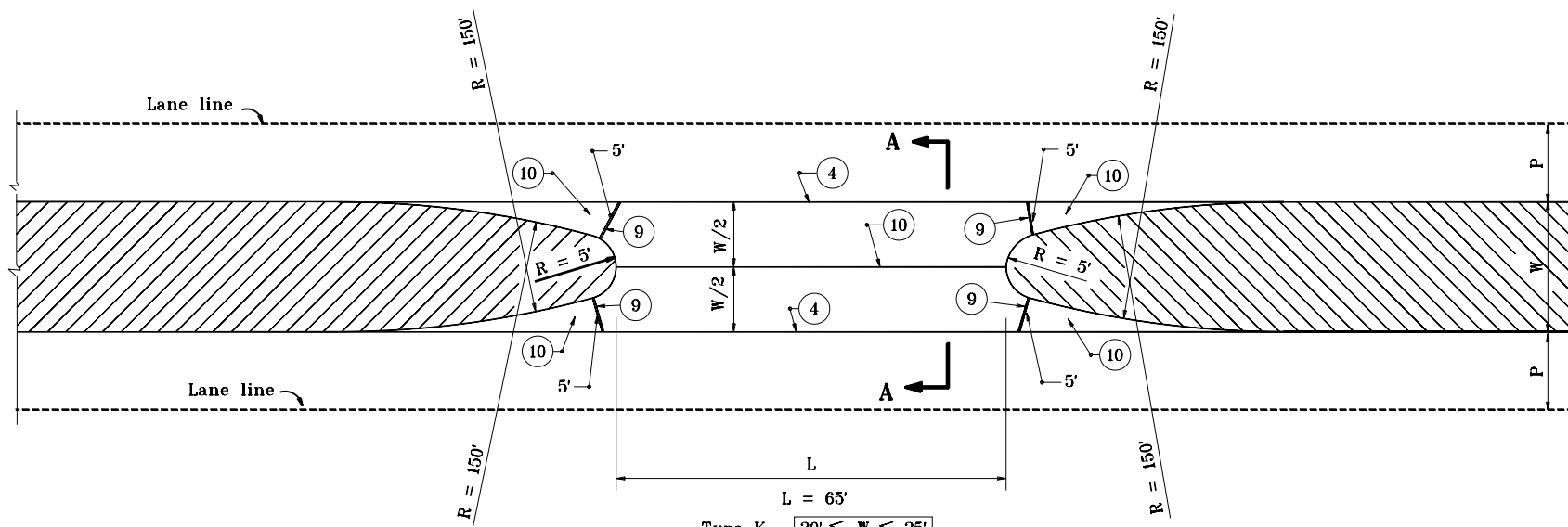


**CROSSOVER PLAN FOR MEDIAN WIDTH OF
8 ft OR GREATER BUT LESS THAN 15 ft**

NOTES :

1. For median width W of 60' or greater, $R = 30'$.
 2. For median width W of less than 8', $L = 100'$ min.
 3. See Standard Drawing E 610-PRCO-01 for Legend and Section A-A.
- ⑧ Use construction joint in place of keyway joint if W is 32' or more.

INDIANA DEPARTMENT OF TRANSPORTATION	
PUBLIC ROAD CROSSOVER	
PLANS	
MAY 2000	
STANDARD DRAWING NO. E 610-PRCO-01A	
	/s/ Anthony L. Uremovich 5-01-00 DESIGN STANDARDS ENGINEER DATE
	/s/ Firooz Zandi 5-01-00 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	



Type K $20' \leq W < 25'$

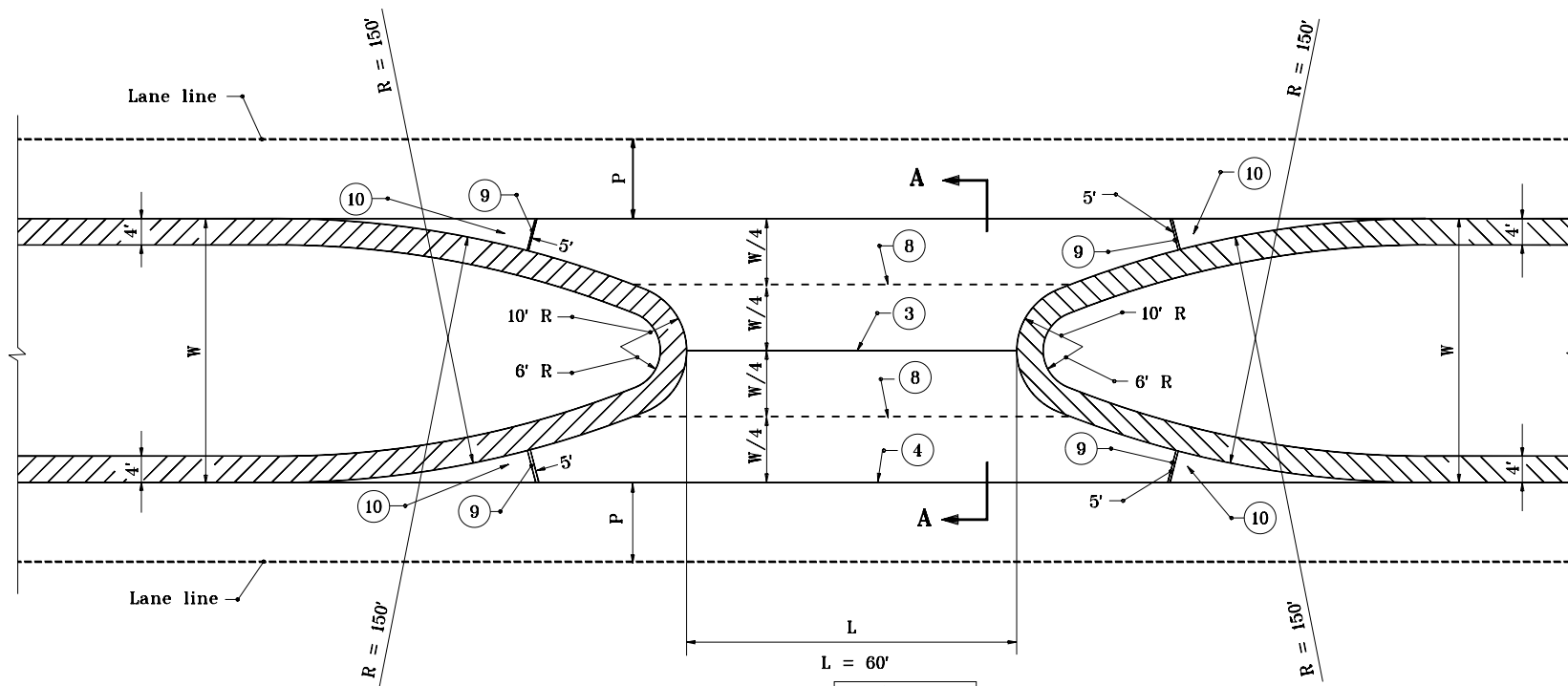
Type L $25' \leq W < 30'$

PLAN

NOTES :

- See Standard Drawing E 610-PRC0-01 for Legend and Section A-A.

INDIANA DEPARTMENT OF TRANSPORTATION	
PUBLIC ROAD CROSSOVERS TYPE K & L MAY 2000	
STANDARD DRAWING NO. E 610-PRC0-02	
	/s/ Anthony L. Uremovich 5-01-00 DESIGN STANDARDS ENGINEER DATE
	/s/ Firooz Zandi 5-01-00 CHIEF HIGHWAY ENGINEER DATE



Type M $30' \leq W < 45'$

L = 50'

Type N $45' \leq W < 65'$

PLAN

NOTES :

1. See Standard Drawing E 610-PRC0-01 for Legend and Section A-A.

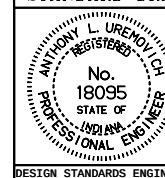
INDIANA DEPARTMENT OF TRANSPORTATION

PUBLIC ROAD CROSSOVERS

TYPE M & N

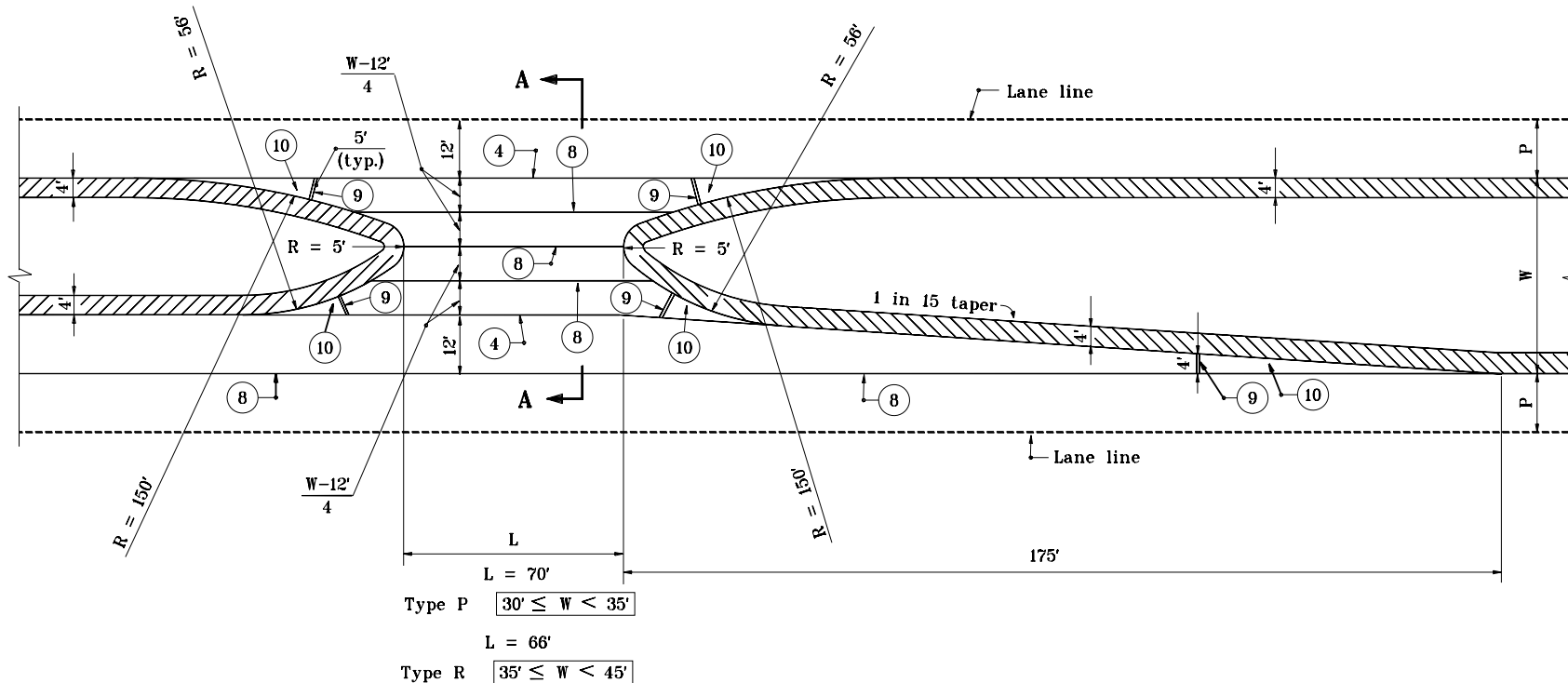
MAY 2000

STANDARD DRAWING NO. E 610-PRC0-03



/s/ Anthony L. Uremovich 5-01-00
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi 5-01-00
CHIEF HIGHWAY ENGINEER DATE

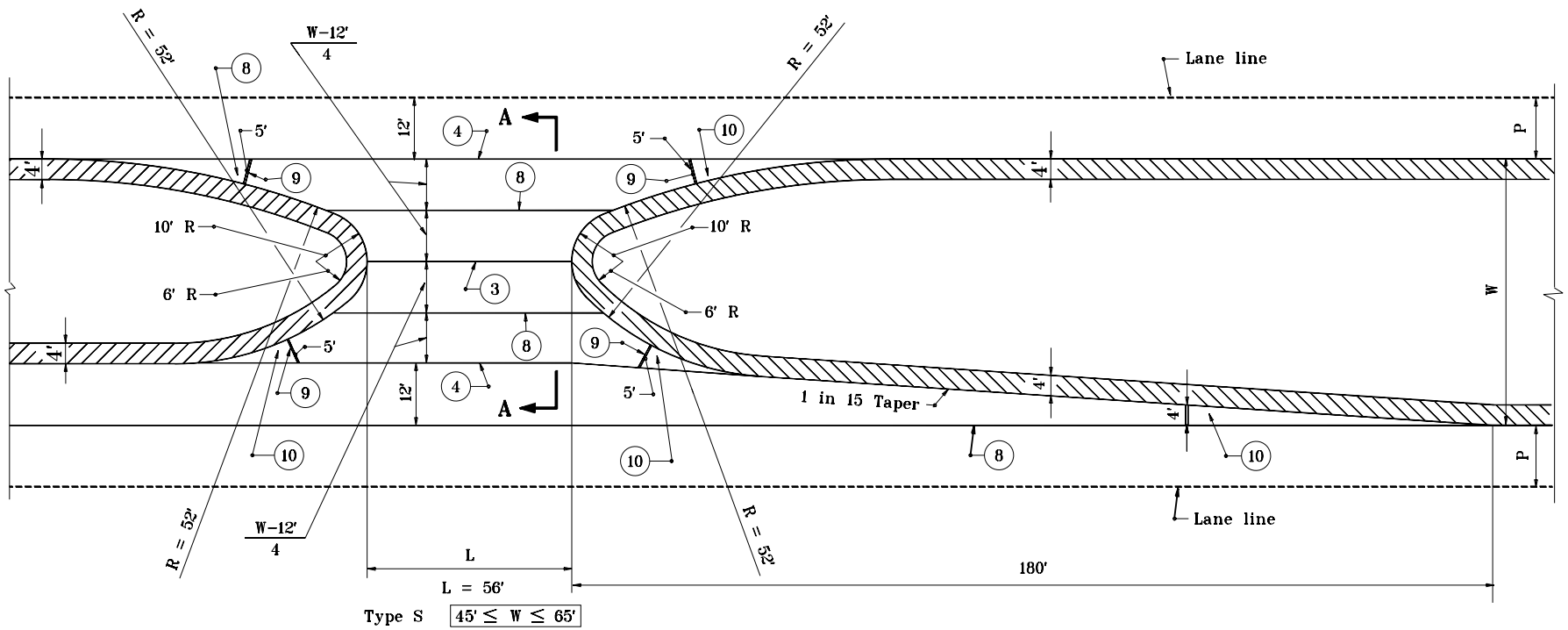


PLAN

NOTES :

1. See Standard Drawing E 610-PRC0-01 for Legend and Section A-A.

INDIANA DEPARTMENT OF TRANSPORTATION	
PUBLIC ROAD CROSSOVERS TYPE P & R	
MAY 2000	
STANDARD DRAWING NO. E 610-PRC0-04	
	/s/ Anthony L. Uremovich 5-01-00 DESIGN STANDARDS ENGINEER DATE
	/s/ Firooz Zandi 5-01-00 CHIEF HIGHWAY ENGINEER DATE

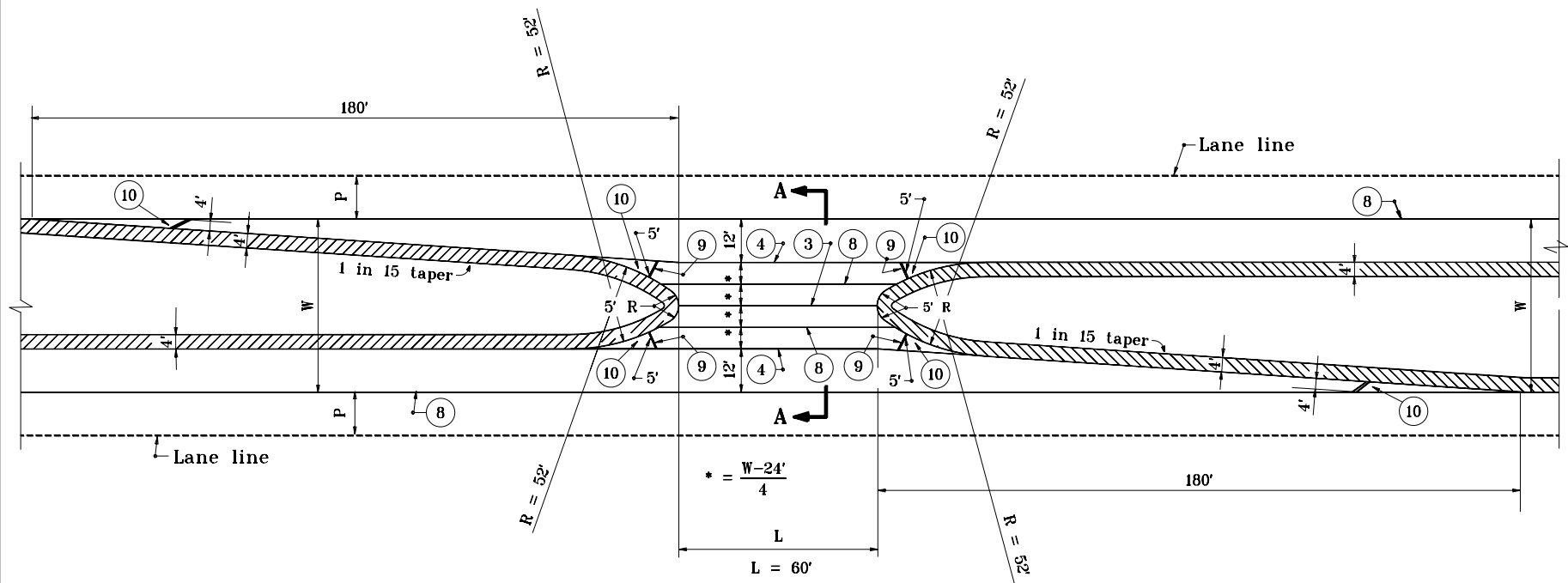


PLAN

NOTES :

1. See Standard Drawing E 610-PRCO-01 for Legend and Section A-A.

INDIANA DEPARTMENT OF TRANSPORTATION	
PUBLIC ROAD CROSSOVER TYPE S	
MAY 2000	
STANDARD DRAWING NO. E 610-PRCO-05	
	/s/ Anthony L. Uremovich 5-01-00 DESIGN STANDARDS ENGINEER DATE
	/s/ Firooz Zandi 5-01-00 CHIEF HIGHWAY ENGINEER DATE



Type T $40' \leq W < 45'$

$L = 56'$

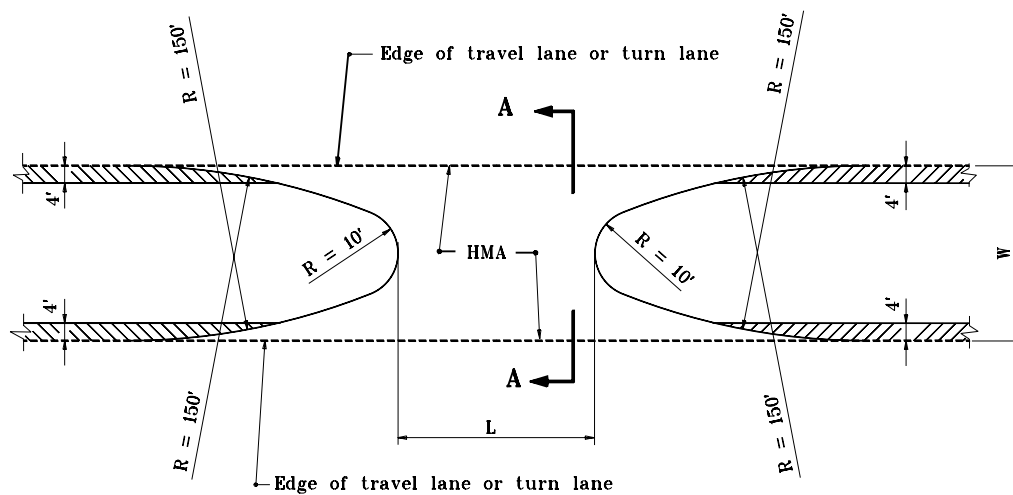
Type U $45' \leq W \leq 65'$

PLAN

NOTES :

- See Standard Drawing E 610-PRCO-01 for Legend and Section A-A.

INDIANA DEPARTMENT OF TRANSPORTATION	
PUBLIC ROAD CROSSOVERS	
TYPE T & U	
MAY 2000	
STANDARD DRAWING NO. E 610-PRCO-06	
	/s/ Anthony L. Uremovich 5-01-00 DESIGN STANDARDS ENGINEER DATE
	/s/ Firooz Zandi 5-01-00 CHIEF HIGHWAY ENGINEER DATE

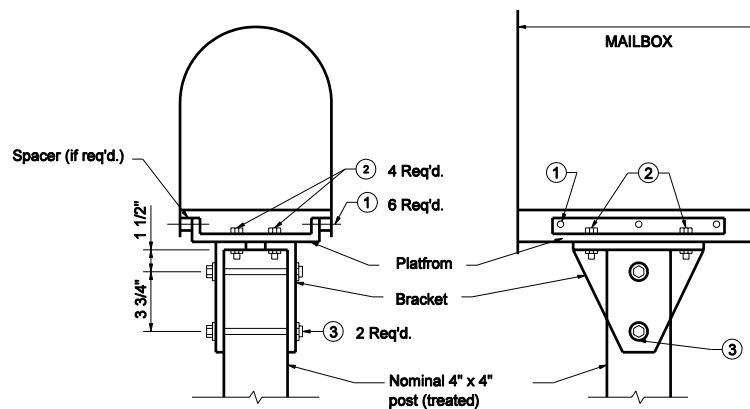


PLAN

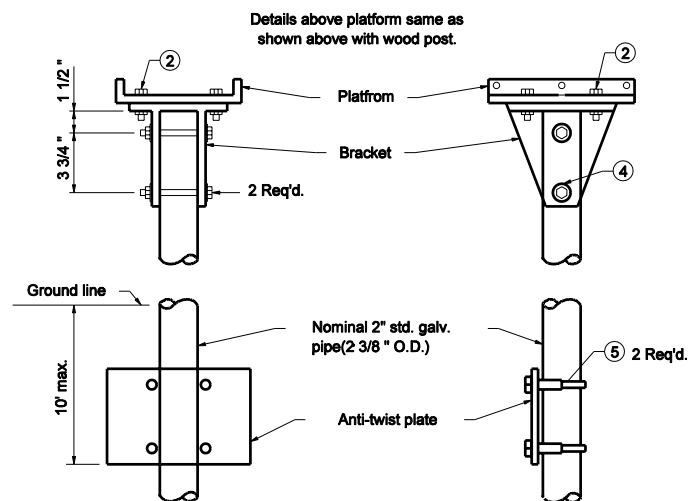
NOTES :

1. Plan dimensions for HMA pavement crossover shall be as shown for PCCP on Standard Drawings E 610-PRCO-01A through -07.
2. See Standard Drawing E 610-PRCO-01 for Legend and Section A-A.

INDIANA DEPARTMENT OF TRANSPORTATION	
PUBLIC ROAD CROSSOVER PLAN FOR HMA PAVEMENT	
MAY 2000	
STANDARD DRAWING NO. E 610-PRCO-07	
	<i>/s/ Anthony L. Uremovich</i> 5-01-00 DESIGN STANDARDS ENGINEER DATE
	<i>/s/ Firooz Zandi</i> 5-01-00 CHIEF HIGHWAY ENGINEER DATE



WITH WOOD POST



WITH PIPE POST

LEGEND

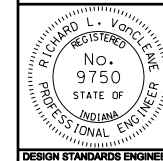
- ① #8-32 x "L" truss head machine screw with two #8 flat washers, #8 lock washers, and #8 hex nut.
- ② 5/16"-18 x 3/4" hex cap screw with two 5/16" flat washers, 5/16" lock washer and 5/16" hex nut.
- ③ 5/16"-18 x 4 1/2" hex cap screw with two 5/16" flat washers, 5/16" lock washer, and 5/16" hex nut.
- ④ 5/16"-18 x 3" hex cap screw with two 5/16" flat washers, 5/16" lock washer, and 5/16" hex nut.
- ⑤ Nominal 2 3/4" muffler clamp
- ⑥ For platform, bracket, shelf, spacer and anti-twist plate details, see Standard Drawing E 611-MBAS-03.

INDIANA DEPARTMENT OF TRANSPORTATION

SINGLE MAILBOX ASSEMBLY

MARCH 2005

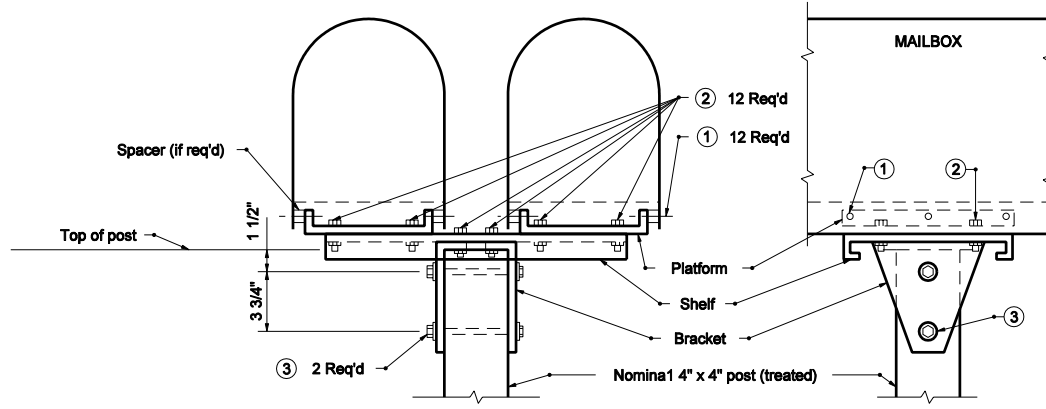
STANDARD DRAWING NO. E 611-MBAS-01



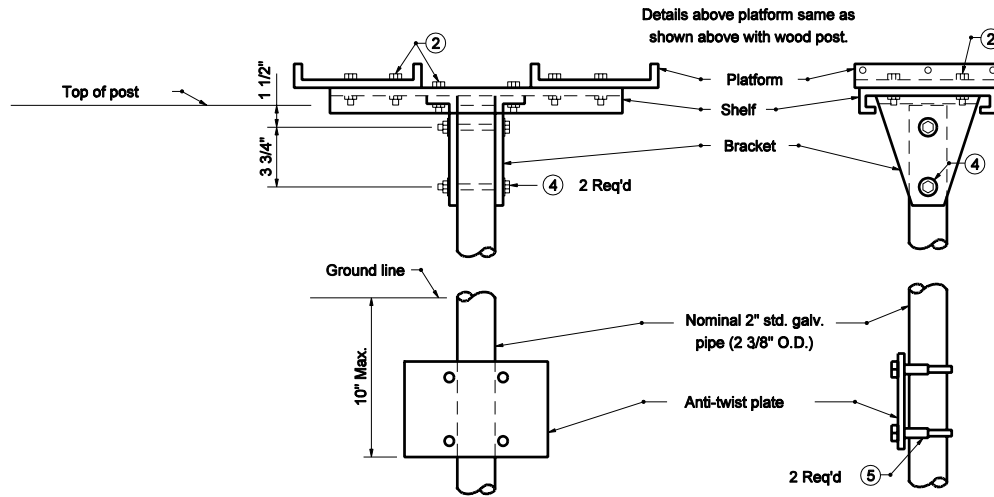
/s/ Richard L. VanCleave 3-01-05
DESIGN STANDARDS ENGINEER DATE

/s/ Richard K. Smutzer 3-01-05
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER



WITH WOOD POST



WITH PIPE POST

LEGEND

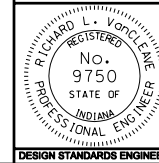
- ① #8-32 x "L" truss head machine screw with two #8 flat washers, #8 lock washers, and #8 hex nut.
- ② 5/16"-18 x 3/4" hex cap screw with two 5/16" flat washers, 5/16" lock washer and 5/16" hex nut.
- ③ 5/16"-18 x 4 1/2" hex cap screw with two 5/16" flat washers, 5/16" lock washer, and 5/16" hex nut.
- ④ 5/16"-18 x 3" hex cap screw with two 5/16" flat washers, 5/16" lock washer, and 5/16" hex nut.
- ⑤ Nominal 2 3/4" muffler clamp
- ⑥ For platform, bracket, shelf, spacer and anti-twist plate details, see Standard Drawing E 611-MBAS-03.

INDIANA DEPARTMENT OF TRANSPORTATION

DOUBLE MAILBOX ASSEMBLY

MARCH 2005

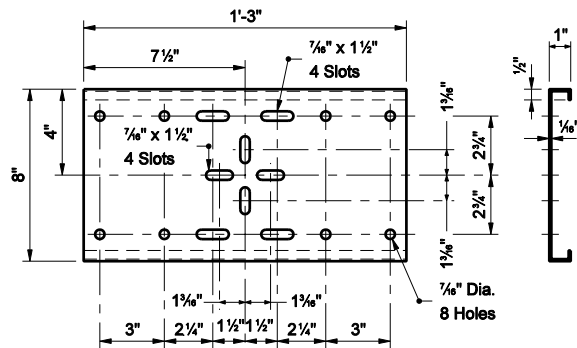
STANDARD DRAWING NO. E 611-MBAS-02



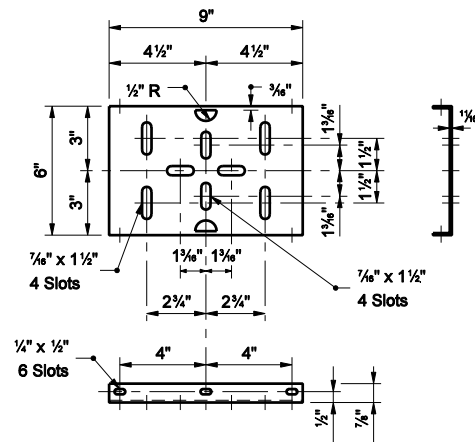
/s/ Richard L. VanCleave 3-01-05
DESIGN STANDARDS ENGINEER DATE

/s/ Richard K. Smutzer 3-01-05
CHIEF HIGHWAY ENGINEER DATE

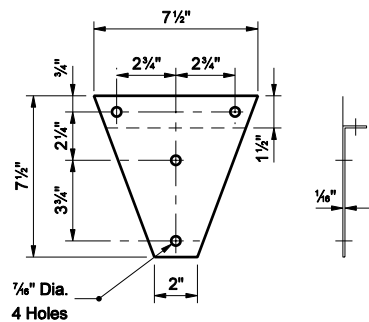
DESIGN STANDARDS ENGINEER



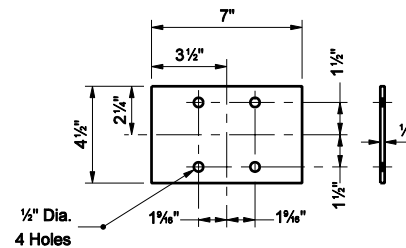
SHELF



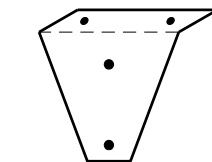
PLATFORM



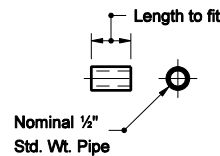
BRACKET



ANTI-TWIST PLATE



**FINISHED BRACKET
ISOMETRIC**



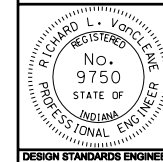
SPACER

INDIANA DEPARTMENT OF TRANSPORTATION

MAILBOX SUPPORT HARDWARE

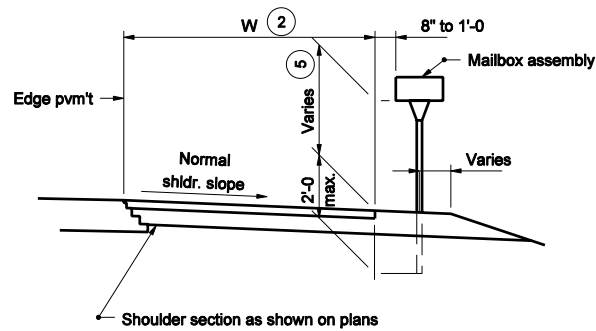
MARCH 2005

STANDARD DRAWING NO. E 611-MBAS-03

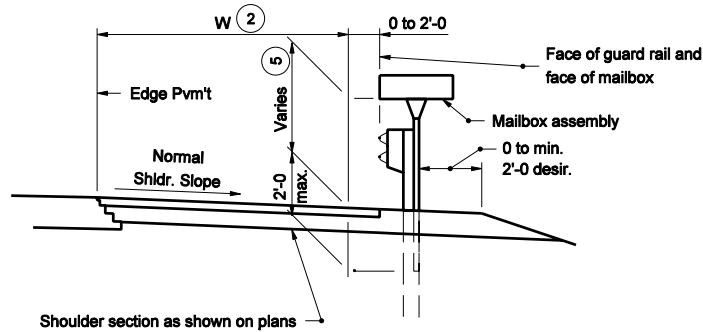


/s/ Richard L. VanCleave	3-01-05
DESIGN STANDARDS ENGINEER	DATE
/s/ Richard K. Smutzer	3-01-05
CHIEF HIGHWAY ENGINEER	DATE

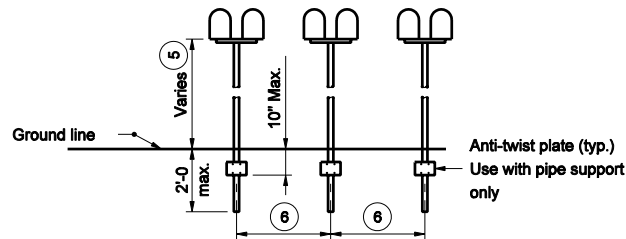
DESIGN STANDARDS ENGINEER



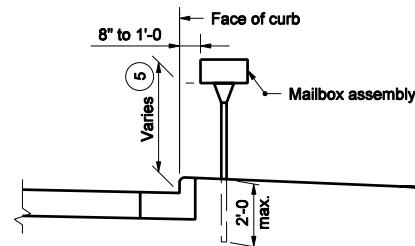
NORMAL SHOULDER SECTION



SHOULDER SECTION WITH GUARDRAIL



SPACING FOR MULTIPLE POST INSTALLATION



CURBED SECTION

GENERAL NOTES

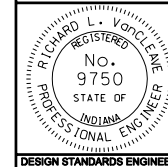
- ② See plans for W
- ⑤ The normal height range is 3'-3 to 3'-11. Contact the local postmaster to establish appropriate installation height.
- ⑥ Established by the U.S. Postal Service, usually 3'-4 to 4'-0.

INDIANA DEPARTMENT OF TRANSPORTATION

**MAILBOX ASSEMBLIES
ELEVATION VIEW**

MARCH 2005

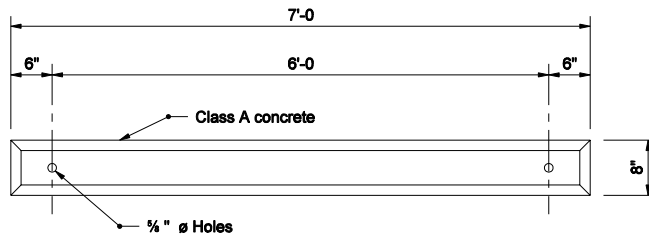
STANDARD DRAWING NO. E 611-MBAS-04



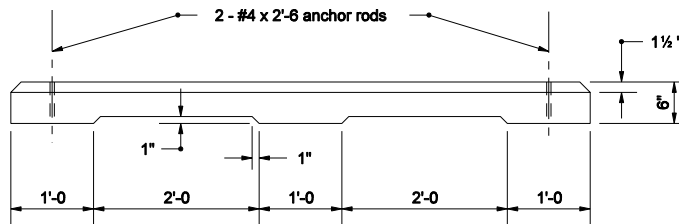
/s/ Richard L. VanCleave 3-01-05
DESIGN STANDARDS ENGINEER DATE

/s/ Richard K. Smutzer 3-01-05
CHIEF HIGHWAY ENGINEER DATE

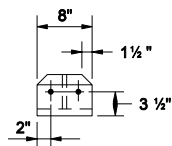
DESIGN STANDARDS ENGINEER



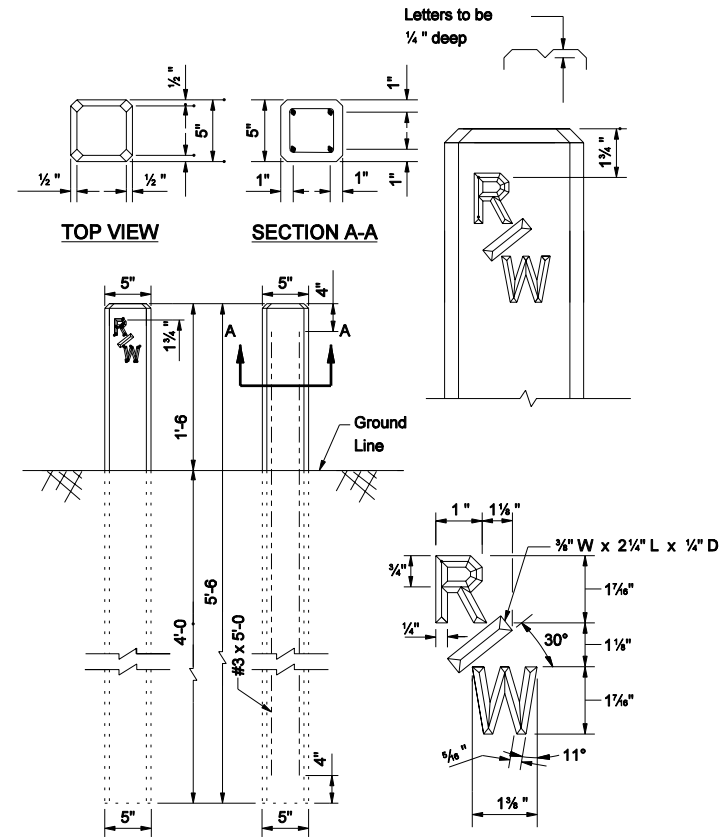
TOP VIEW



SIDE VIEW



END VIEW



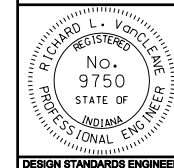
ELEVATION

INDIANA DEPARTMENT OF TRANSPORTATION

**RIGHT-OF-WAY MARKER AND
CONCRETE PARKING BARRIER**

MARCH 2004

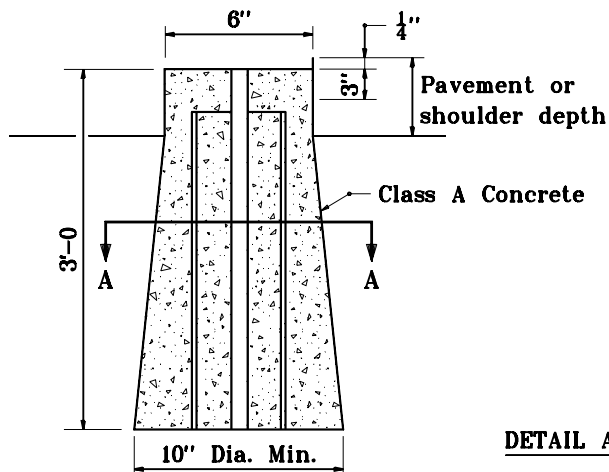
STANDARD DRAWING NO. E 615-RWPB-01



/s/ Richard L. VanCleave X-0X-0X
DESIGN STANDARDS ENGINEER DATE

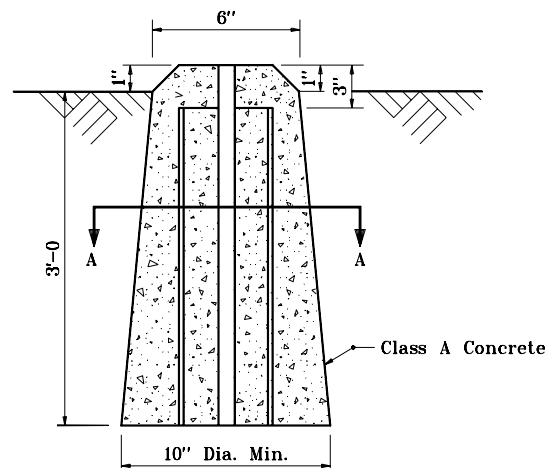
/s/ Richard K. Smutzer X-0X-0X
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER



DETAIL A

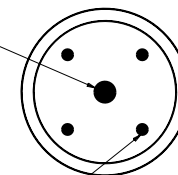
INSIDE PAVEMENT OR SHOULDER AREA



OUTSIDE PAVEMENT OR SHOULDER AREA

1" Smooth round steel bar
(See plans for length)

4-#4 Rebars as req'd. in details
(See plans for length)

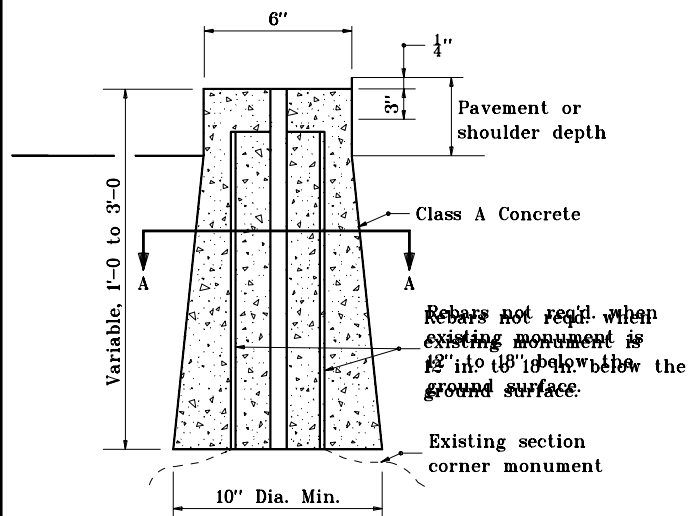


SECTION A-A

NOTES

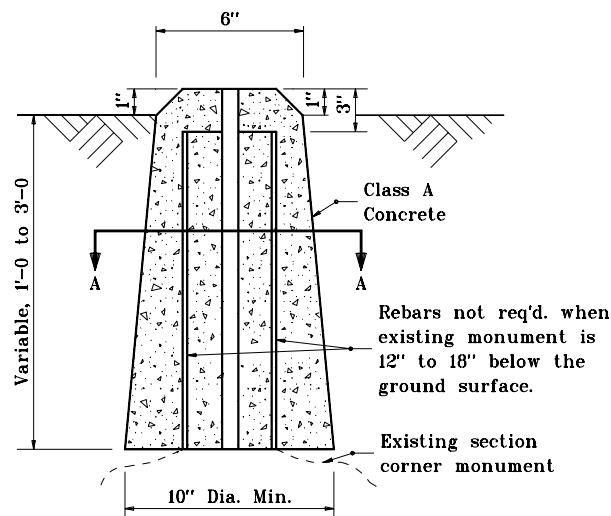
1. If the existing section corner monument is 0 to 1 ft below surface, it shall be removed and replaced as shown in Detail A.
2. If the existing section corner monument is over 1 ft to 3 ft below surface, the county surveyor shall determine whether it shall remain in place or be replaced. If the monument is to be replaced, the installation shall be as shown in Detail A. If the existing monument is to remain in place, it shall be extended as shown in Detail B.

NEW SECTION CORNER MONUMENT INSTALLATION



DETAIL B

INSIDE PAVEMENT OR SHOULDER AREA



OUTSIDE PAVEMENT OR SHOULDER AREA

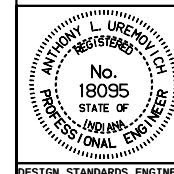
EXTENSION OF EXISTING SECTION CORNER MONUMENT

INDIANA DEPARTMENT OF TRANSPORTATION

SECTION CORNER MONUMENTS

APRIL 1995

STANDARD DRAWING NO. E 615-SCMN-01



DETAILS PLACED IN THIS FORMAT 11-15-99

/s/ Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

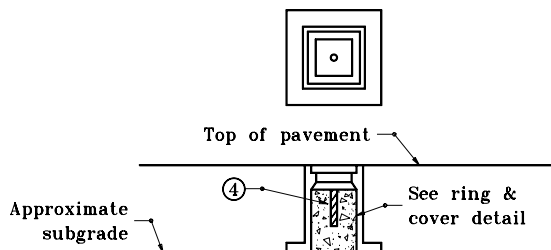
/s/ Firooz Zandi 11-15-99
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

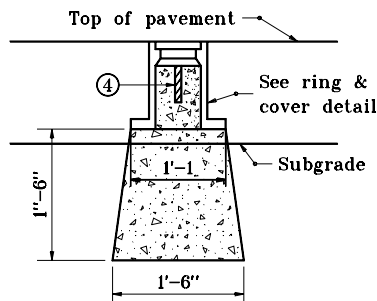
ORIGINALLY APPROVED 4-03-95



INDIANA DEPARTMENT OF TRANSPORTATION	
BENCH MARK POST	
SEPTEMBER 1997	
STANDARD DRAWING NO. E 615-SLBM-01	
	DETAILS PLACED IN THIS FORMAT 11-15-99
DESIGN STANDARDS ENGINEER	/s/ Anthony L. Uremovich 11-15-99 DESIGN STANDARDS ENGINEER DATE
	/s/ Firooz Zandi 11-15-99 CHIEF HIGHWAY ENGINEER DATE
	ORIGINALLY APPROVED 9-01-97

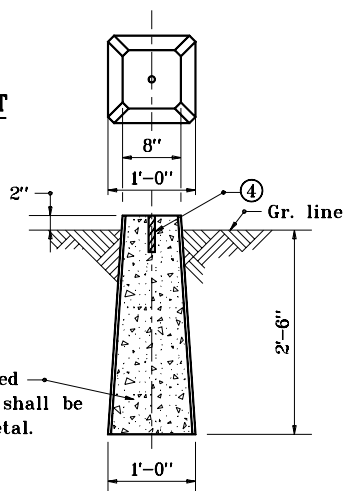


**INSTALLATION FOR VITRIFIED BRICK OR BITUMINOUS SURFACE ON CONCRETE BASE
(TYPE A)**

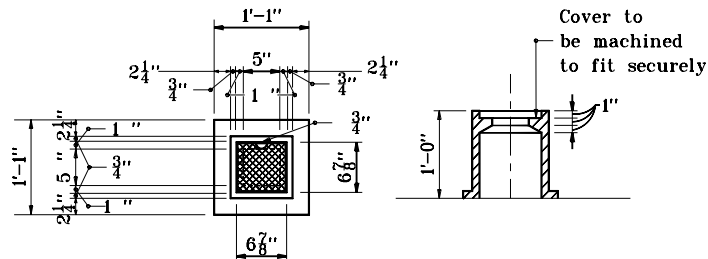


**INSTALLATION FOR FLEXIBLE PAVEMENT
(TYPE B)**

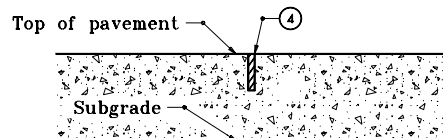
Where monument is required inside of surfaced area it shall be set with the top below metal.



**INSTALLATION OUTSIDE OF PAVEMENT
(TYPE C)**



SURVEY LINE MONUMENT RING & COVER

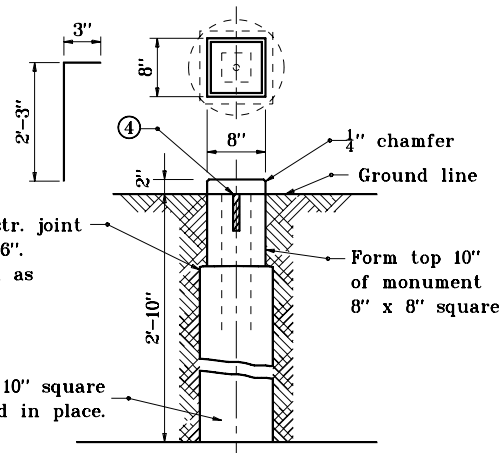


**INSTALLATION FOR CONCRETE PAVEMENT
(TYPE D)**

#4 for optional constr. joint

Optional constr. joint
4 - #4 x 2'-6".
Bend in field as shown.

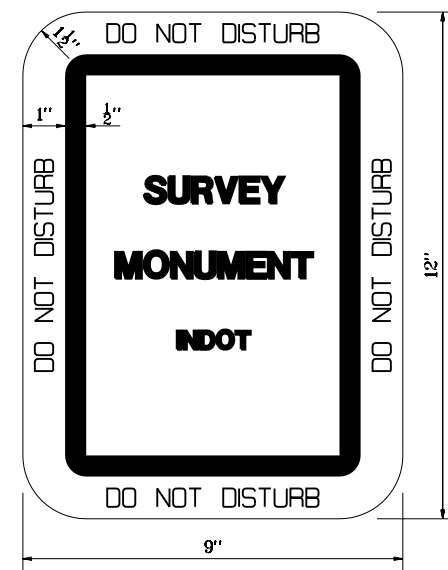
12"Ø or 10" x 10" square hole poured in place.



OPTIONAL INSTALLATION FOR TYPE C MONUMENT

GENERAL NOTES

- Sign shall be white background with black copy.
- One steel type A or 4" x 4" wood post required.
- Letter height shall be as follows:
Border: 1/2" series D
Line 1: 1" series B
Line 2: 1" series B
Line 3: 1" series B
- 1"Ø x 5" steel rod

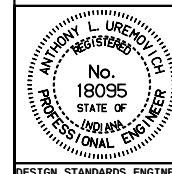


INDIANA DEPARTMENT OF TRANSPORTATION

SURVEY LINE MONUMENTS

SEPTEMBER 1997

STANDARD DRAWING NO. E 615-SLMN-01



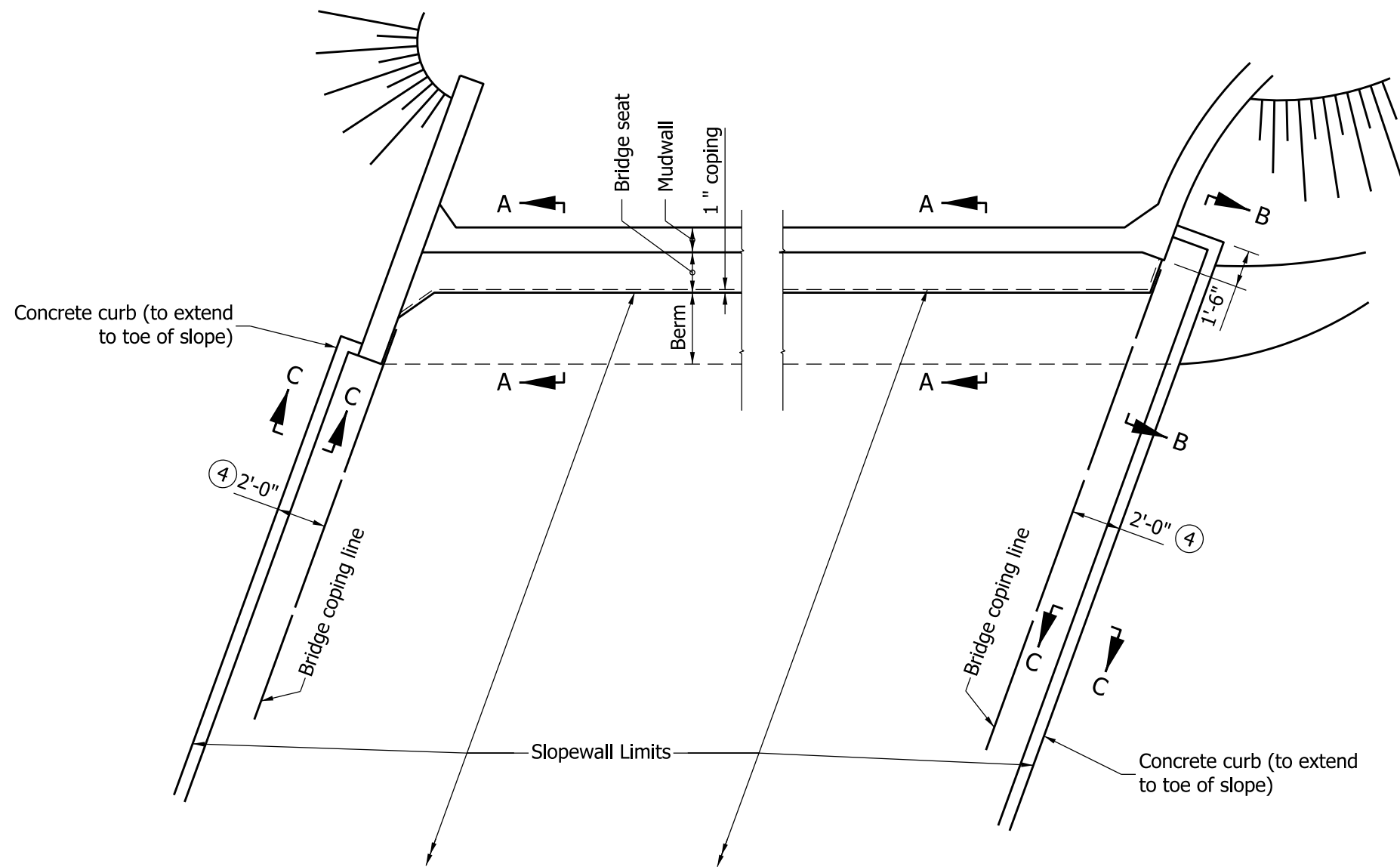
DETAILS PLACED IN THIS FORMAT 11-15-99

/s/ Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi 11-15-99
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

ORIGINALLY APPROVED 9-01-97



STRAIGHT WINGS

FLARED WINGS

NOTES:

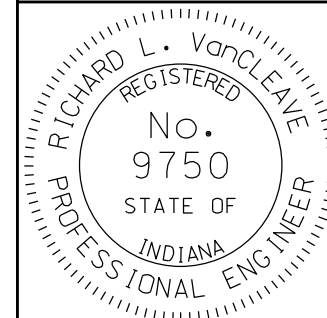
1. See Standard Drawing E 616-SWCO-03 for Sections A-A, B-B, and C-C.
2. When paved sloewall abuts or surrounds columns, piers or other structures, use 1/2" bituminous expansion joint material between sloewall and structure.
3. If sloewall is specified, 1'-0" hand-laid riprap or precast concrete riprap type A may be used.
- ④ This dimension shall be increased to 5'-0" where no curb is used on the bridge.

INDIANA DEPARTMENT OF TRANSPORTATION

CONCRETE SLOEWALL DETAILS

SEPTEMBER 2011

STANDARD DRAWING NO. E 616-SWCO-01



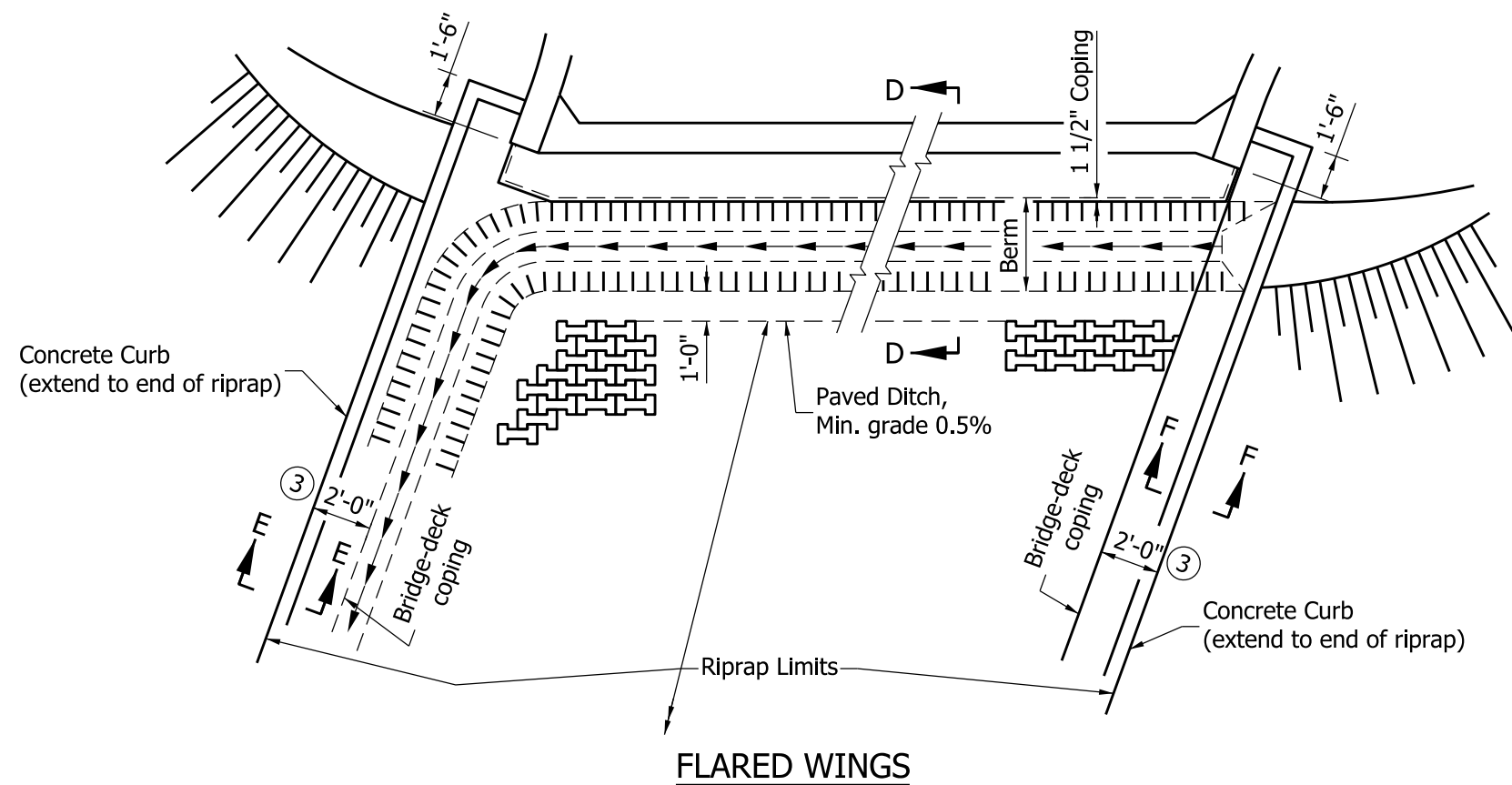
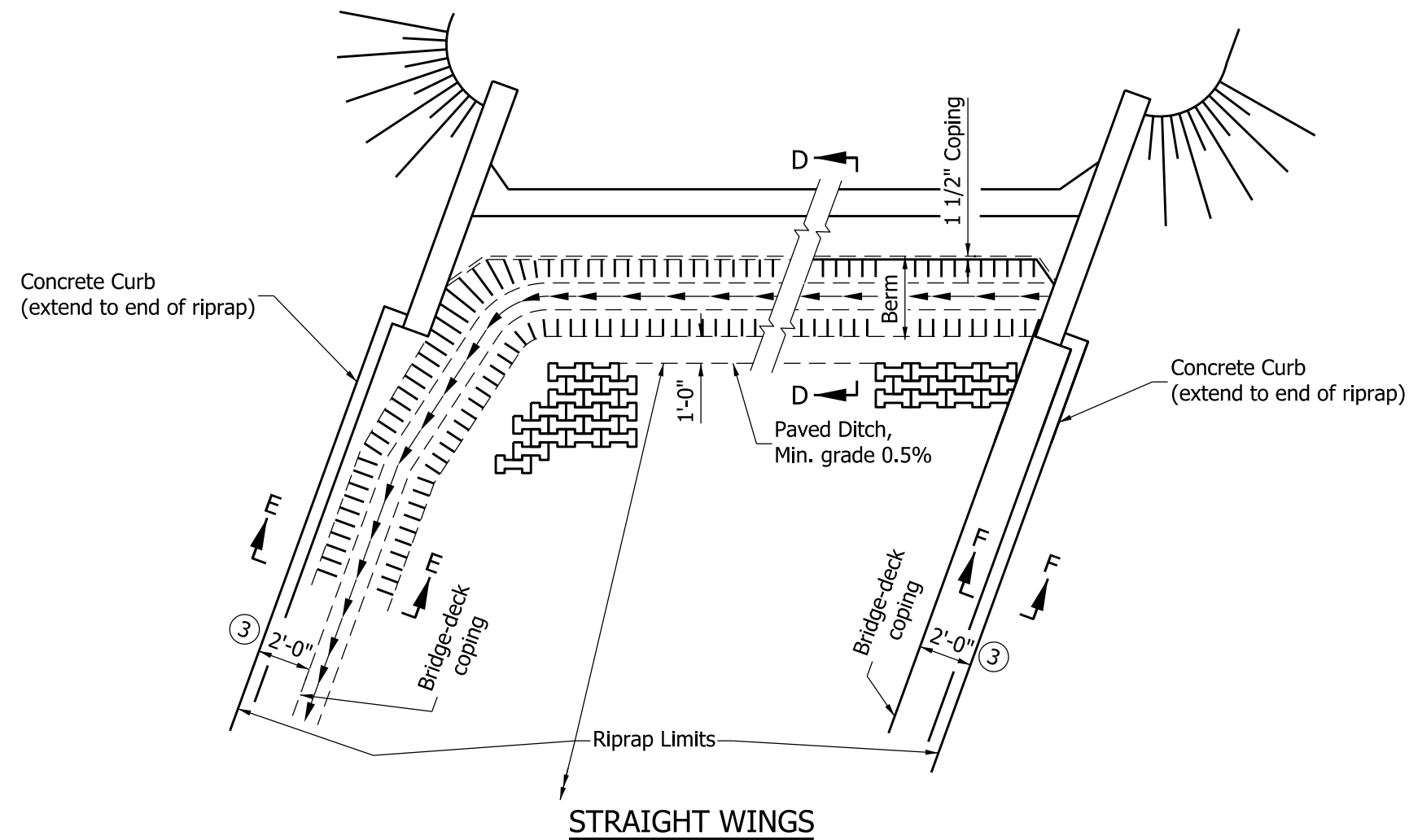
/s/ Richard L. VanCleave 9/01/11

DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 9/01/01

CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER



NOTES:

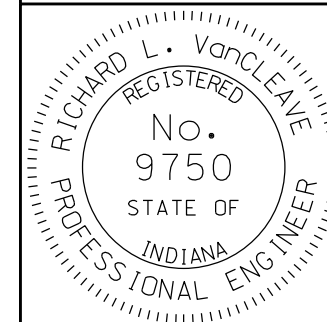
1. These configurations to be used with precast or hand-laid riprap.
2. See Standard Drawing E 616-SWRR-01 for Sections D-D, E-E, and F-F.
- ③ This dimension shall be increased to 5'-0" where no curb is used on the bridge.

INDIANA DEPARTMENT OF TRANSPORTATION

DRAINAGE DETAILS
AT END BENTS

SEPTEMBER 2011

STANDARD DRAWING NO. E 616-SWCO-02



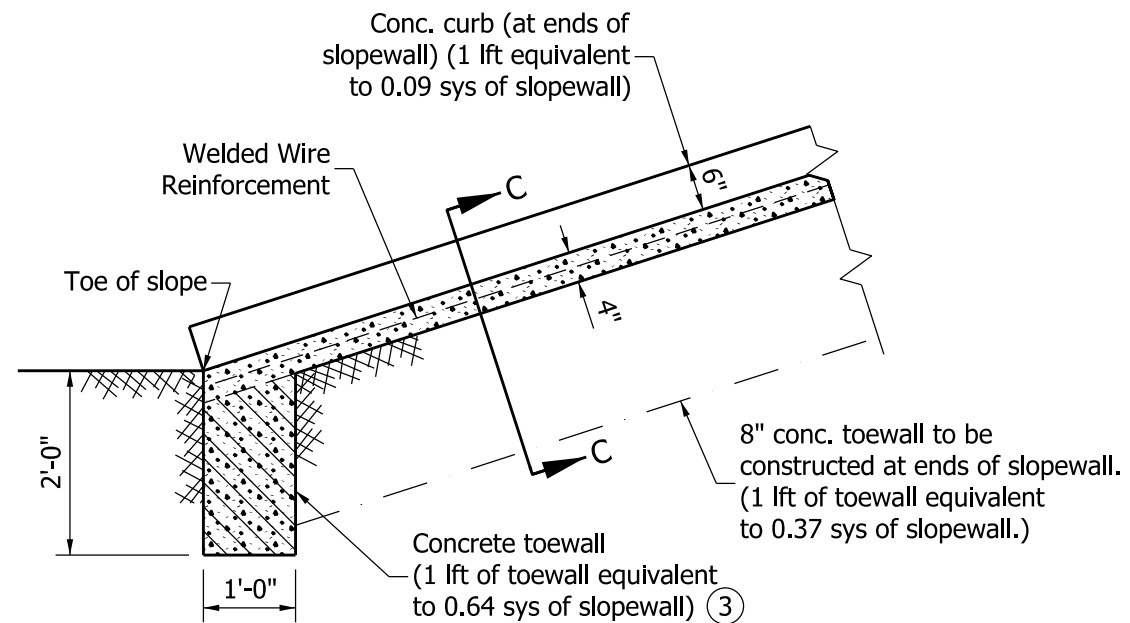
/s/ Richard L. VanCleave 09/01/11
DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 09/01/11
CHIEF HIGHWAY ENGINEER DATE

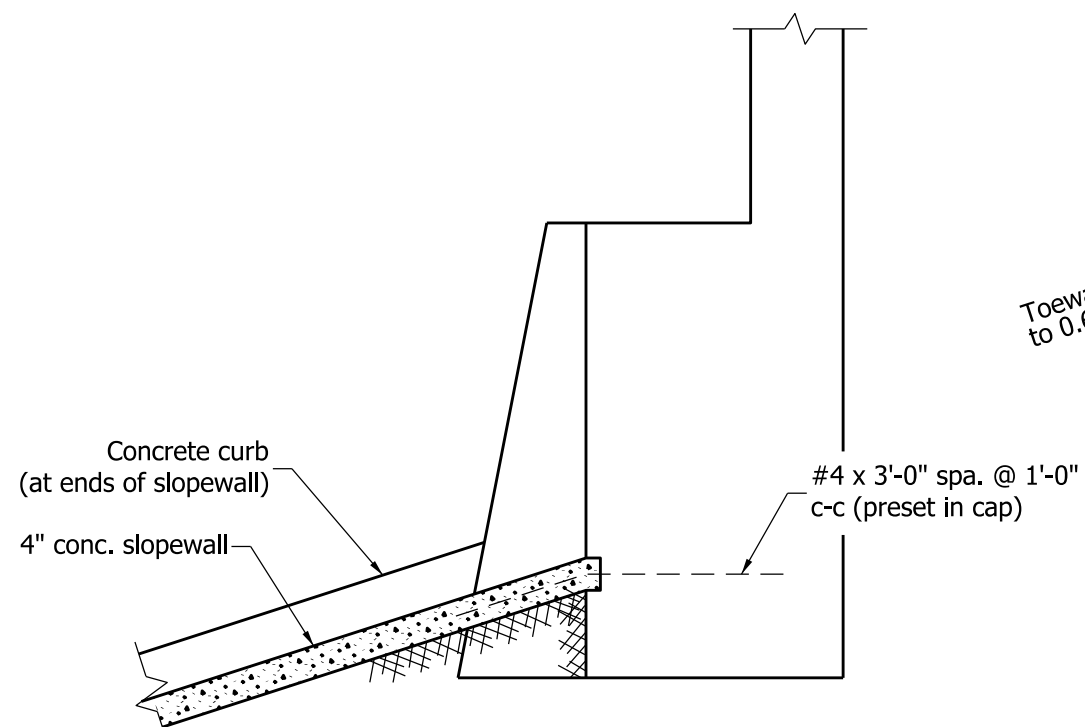
DESIGN STANDARDS ENGINEER



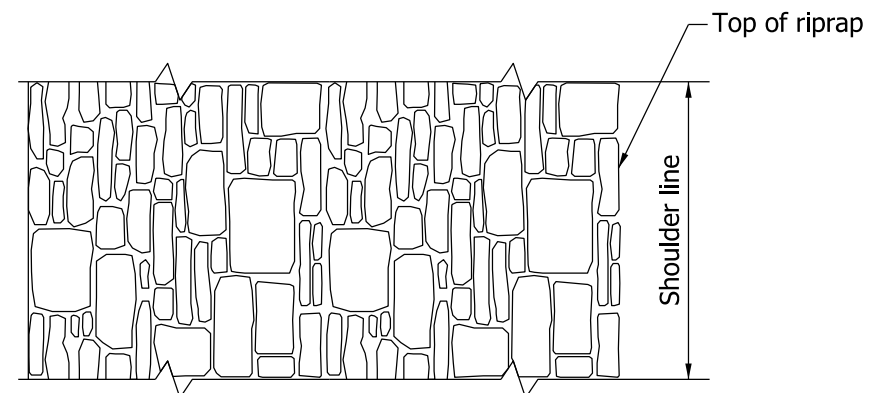
INDIANA DEPARTMENT OF TRANSPORTATION									
CONCRETE SLOPEWALL DETAILS									
SEPTEMBER 2011									
STANDARD DRAWING NO. E 616-SWCO-03									
	<table border="0"> <tr> <td><i>/s/ Richard L. VanCleave</i></td> <td><i>09/01/11</i></td> </tr> <tr> <td>DESIGN STANDARDS ENGINEER</td> <td>DATE</td> </tr> <tr> <td><i>/s/ Mark A. Miller</i></td> <td><i>09/01/11</i></td> </tr> <tr> <td>CHIEF HIGHWAY ENGINEER</td> <td>DATE</td> </tr> </table>	<i>/s/ Richard L. VanCleave</i>	<i>09/01/11</i>	DESIGN STANDARDS ENGINEER	DATE	<i>/s/ Mark A. Miller</i>	<i>09/01/11</i>	CHIEF HIGHWAY ENGINEER	DATE
<i>/s/ Richard L. VanCleave</i>	<i>09/01/11</i>								
DESIGN STANDARDS ENGINEER	DATE								
<i>/s/ Mark A. Miller</i>	<i>09/01/11</i>								
CHIEF HIGHWAY ENGINEER	DATE								
DESIGN STANDARDS ENGINEER									



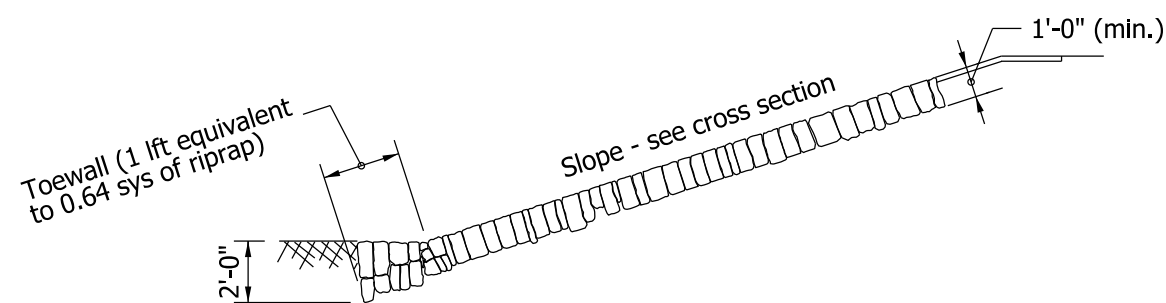
SECTION THROUGH CONCRETE SLOPEWALL



TYPICAL SECTION THROUGH SLOPEWALL AT STRUCTURES WITHOUT BERMS



PLAN



SECTION THROUGH HAND-LAID RIPRAP

NOTES:

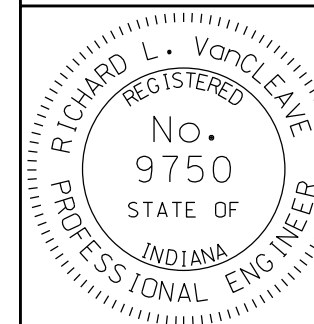
1. See Section F-F on Standard Drawing E 616-SWCO-03 for Section C-C.
2. Where hand-laid riprap is used under a structure, a drainage configuration similar to that shown for precast concrete riprap shall be used. See Standard Drawing E 616-SWRR-02 for such configuration.
- ③ Toewall is not required adjacent to a pier or bent.

INDIANA DEPARTMENT OF TRANSPORTATION

CONCRETE AND RIPRAP
SLOPEWALL DETAILS

SEPTEMBER 2011

STANDARD DRAWING NO. E 616-SWCO-04



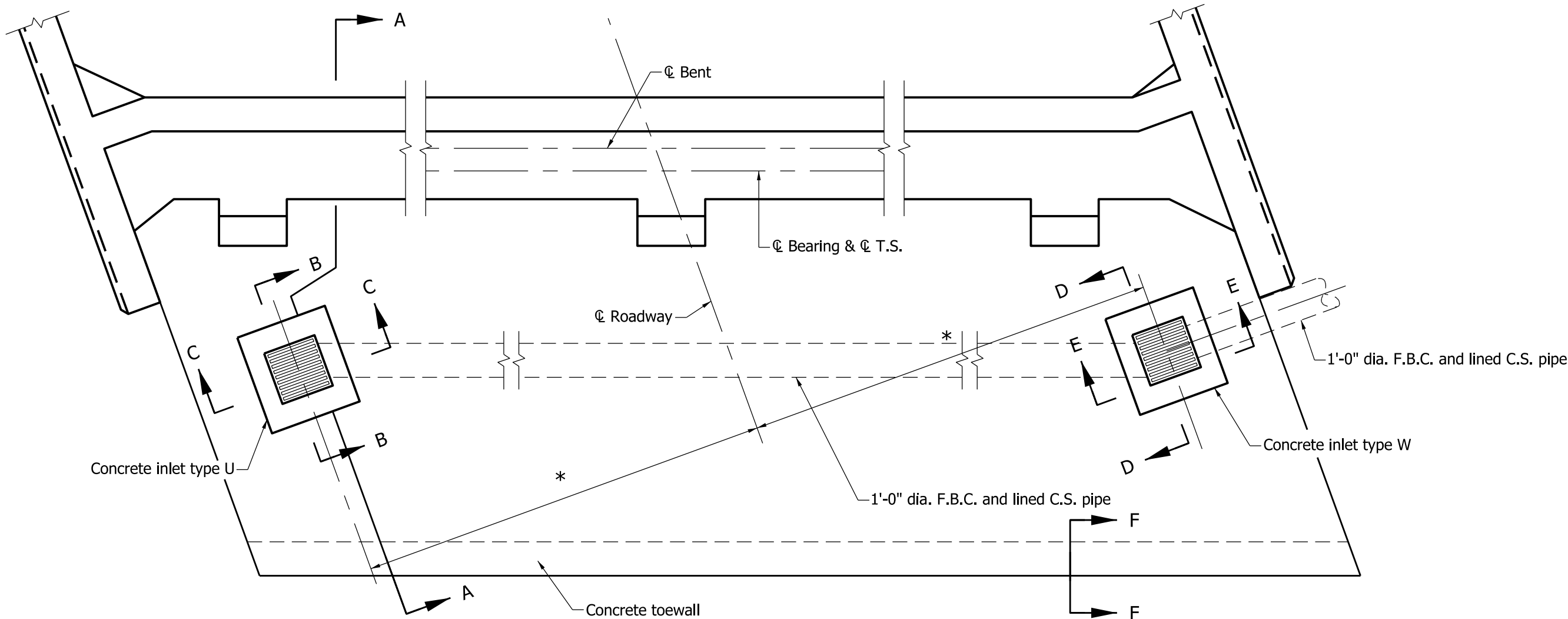
DESIGN STANDARDS ENGINEER

/s/ Richard L. VanCleave 09/01/11
DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 09/01/11
CHIEF HIGHWAY ENGINEER DATE

NOTES:

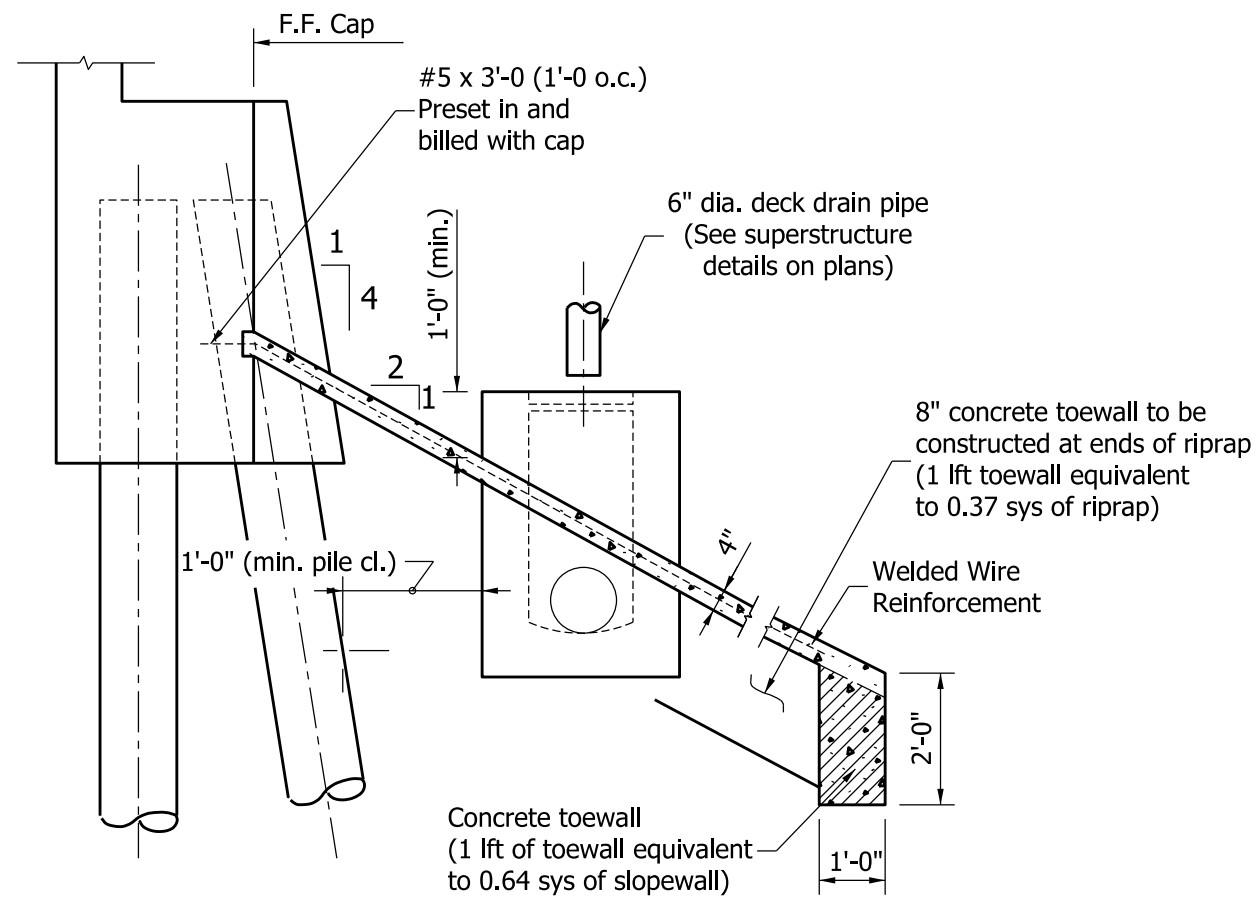
- 1. See Standard Drawing E 616-SWCO-06 for Sections A-A, B-B, C-C, D-D, and E-E.
- 2. See General Plan for stations and locations of inlets and pipe.



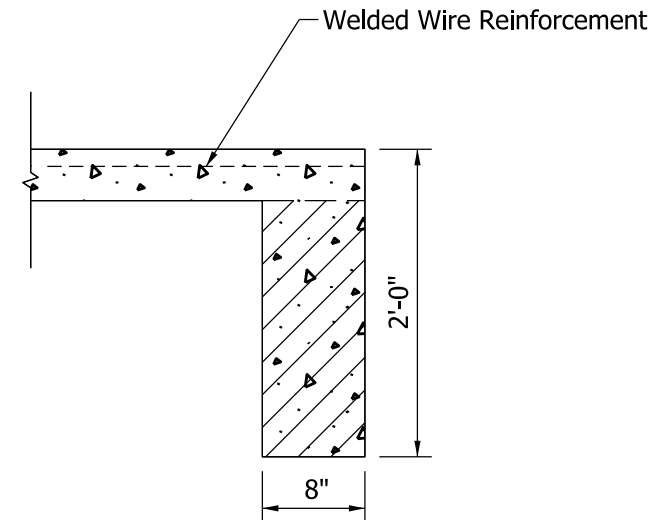
PLAN
(to be used on structures without berms)

* Dimension varies according to roadway width and type of drain used

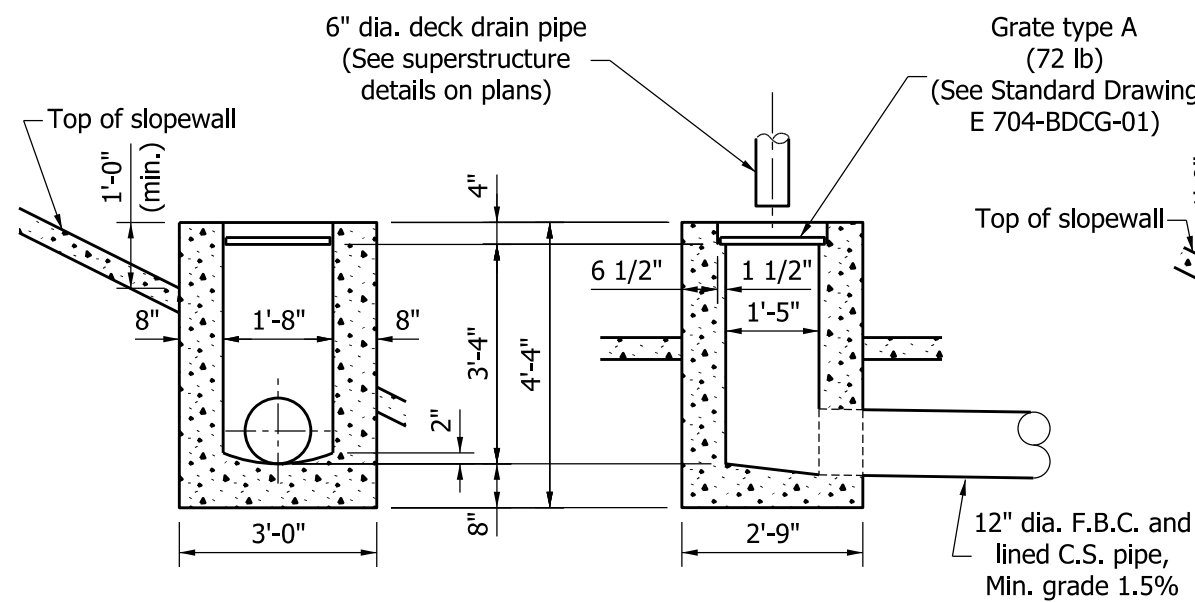
INDIANA DEPARTMENT OF TRANSPORTATION		
SLOPEWALL AND DRAINAGE DETAILS		
SEPTEMBER 2011		
STANDARD DRAWING NO.		E 616-SWCO-05
	/s/ Richard L. VanCleave	09/01/11
	DESIGN STANDARDS ENGINEER	DATE
	/s/ Mark A. Miller	09/01/11
	CHIEF HIGHWAY ENGINEER	DATE
DESIGN STANDARDS ENGINEER		



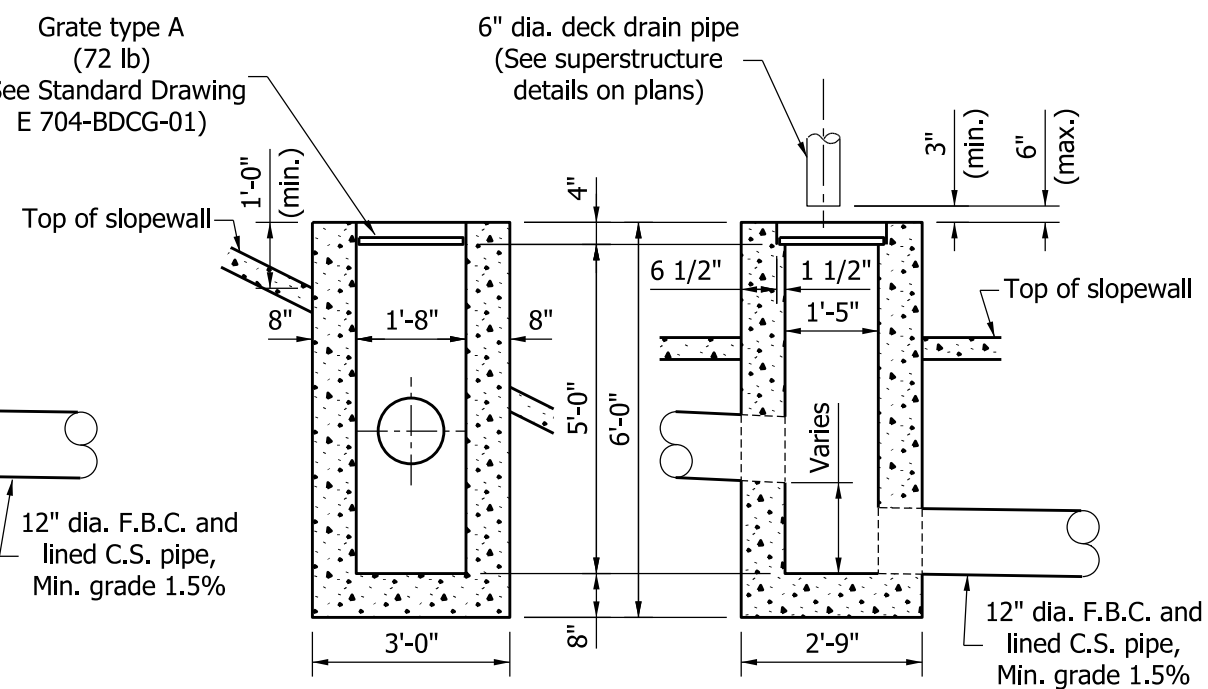
SECTION A-A
TYPICAL ELEVATION THRU SLOPEWALL



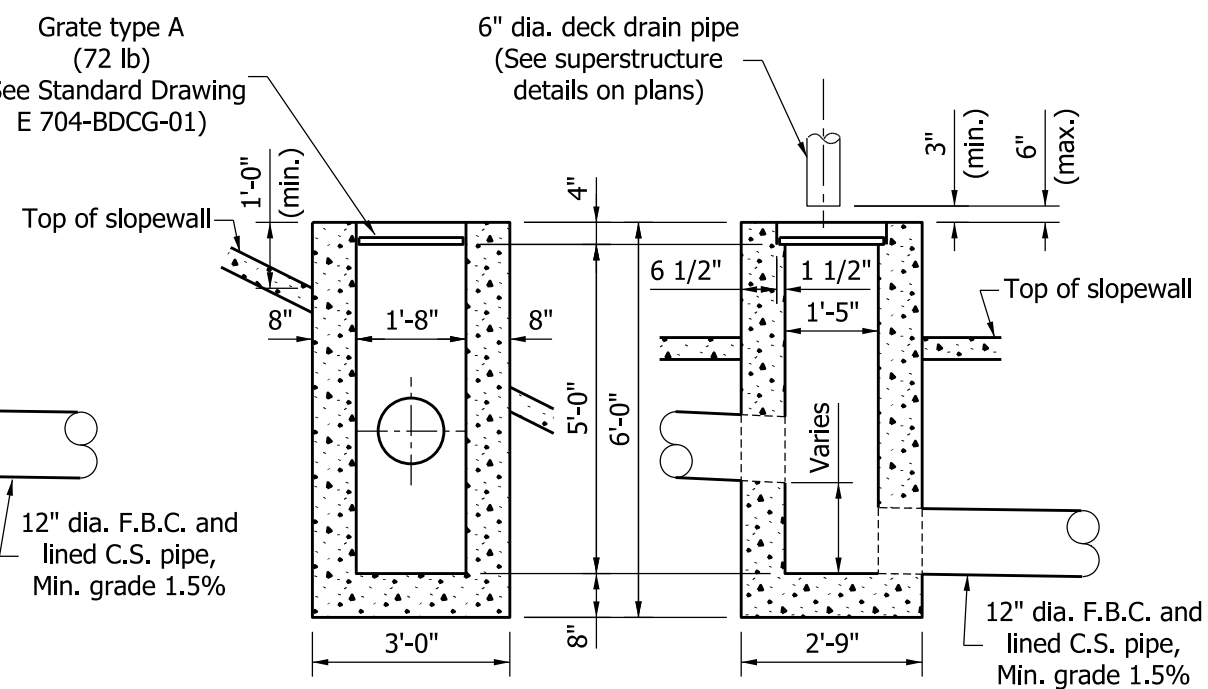
SECTION F-F



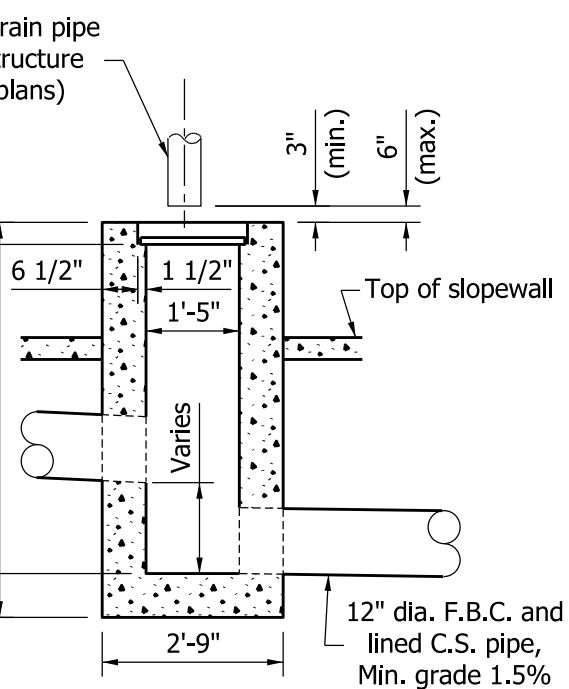
SECTION B-B
DETAIL OF CONCRETE INLET TYPE U



SECTION C-C
DETAIL OF CONCRETE INLET TYPE W

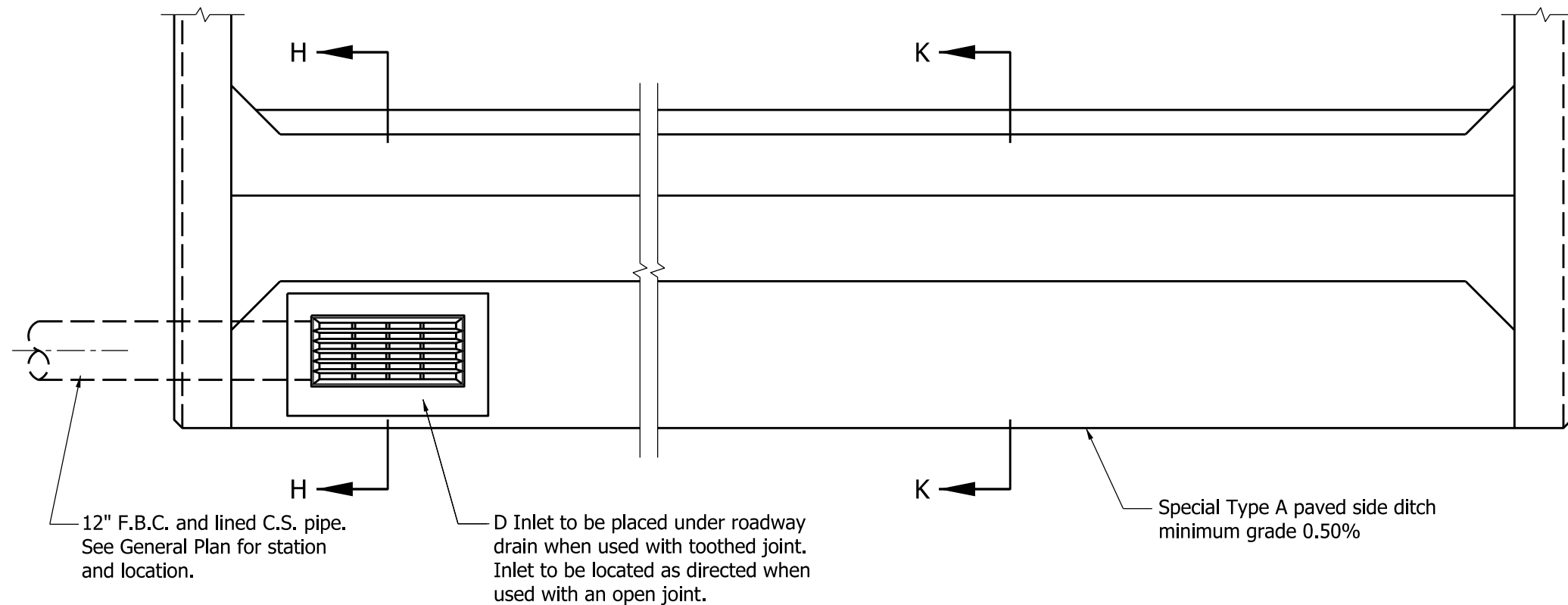


SECTION D-D
DETAIL OF CONCRETE INLET TYPE U

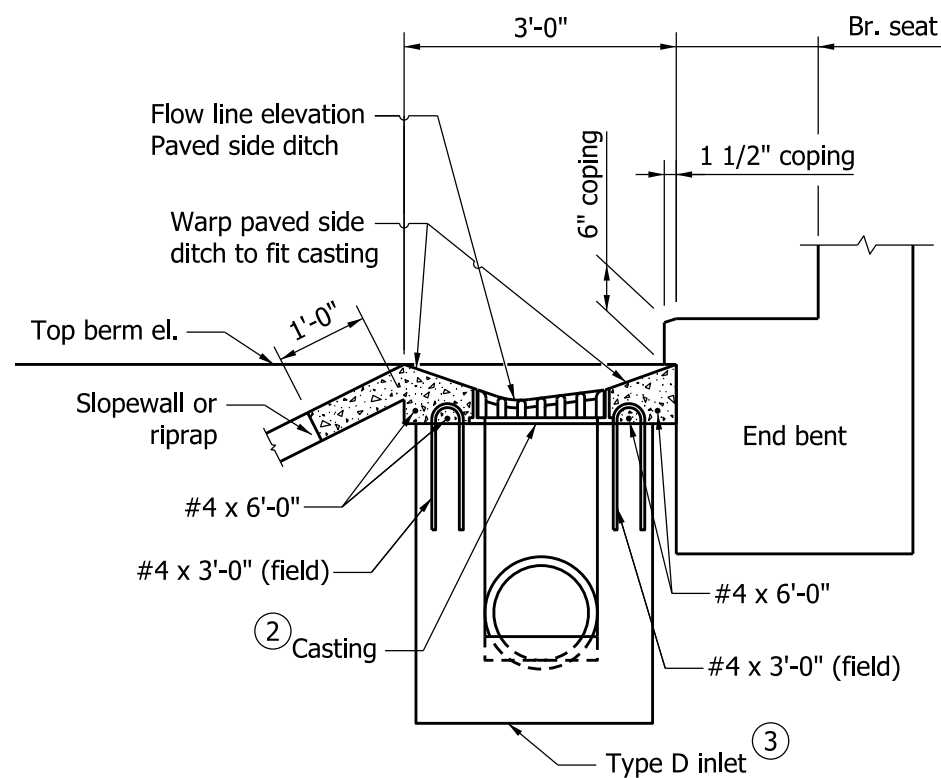


SECTION E-E

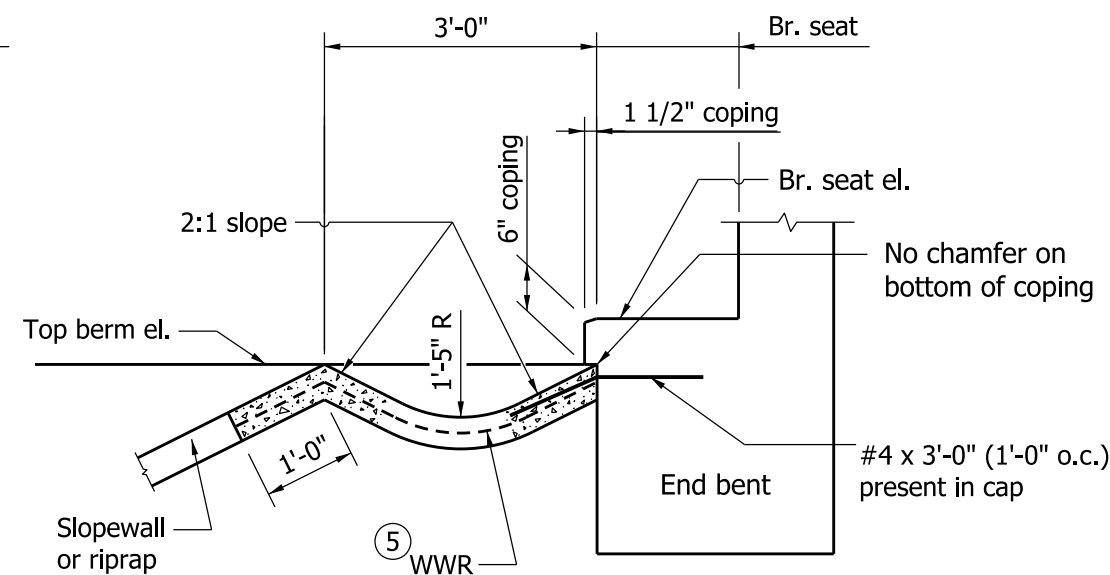
INDIANA DEPARTMENT OF TRANSPORTATION			
SLOPEWALL AND DRAINAGE DETAILS			
SEPTEMBER 2011			
STANDARD DRAWING NO.		E 616-SWCO-06	
	/s/ <i>Richard L. VanCleave</i>		09/01/11
	DESIGN STANDARDS ENGINEER		DATE
	/s/ <i>Mark A. Miller</i>		09/01/11
	CHIEF HIGHWAY ENGINEER		DATE
DESIGN STANDARDS ENGINEER			



PLAN
(to be used on structures with berms)



SECTION H-H



SECTION K-K

NOTES:

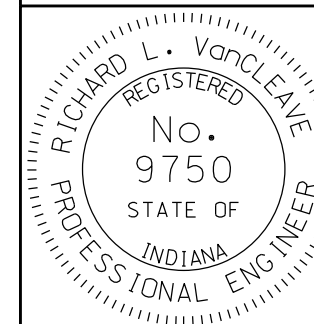
1. Precast concrete riprap may be used as an alternate to concrete sloped side ditch only on a structure having a berm adjacent to a cap.
2. For appropriate casting, see Standard Drawing E 720-CDSC-01.
3. For additional details of type D inlet, see Standard Drawing E 720-INST-03.
4. WWR shall be placed within the middle third of sloped side ditch thickness and shall extend through all construction joints.
5. WWR 6" x 6", W2.9 x W2.9 at 42 lb/100 sq. ft., or equivalent.

INDIANA DEPARTMENT OF TRANSPORTATION

SLOPEWALL AND DRAINAGE
DETAILS

SEPTEMBER 2011

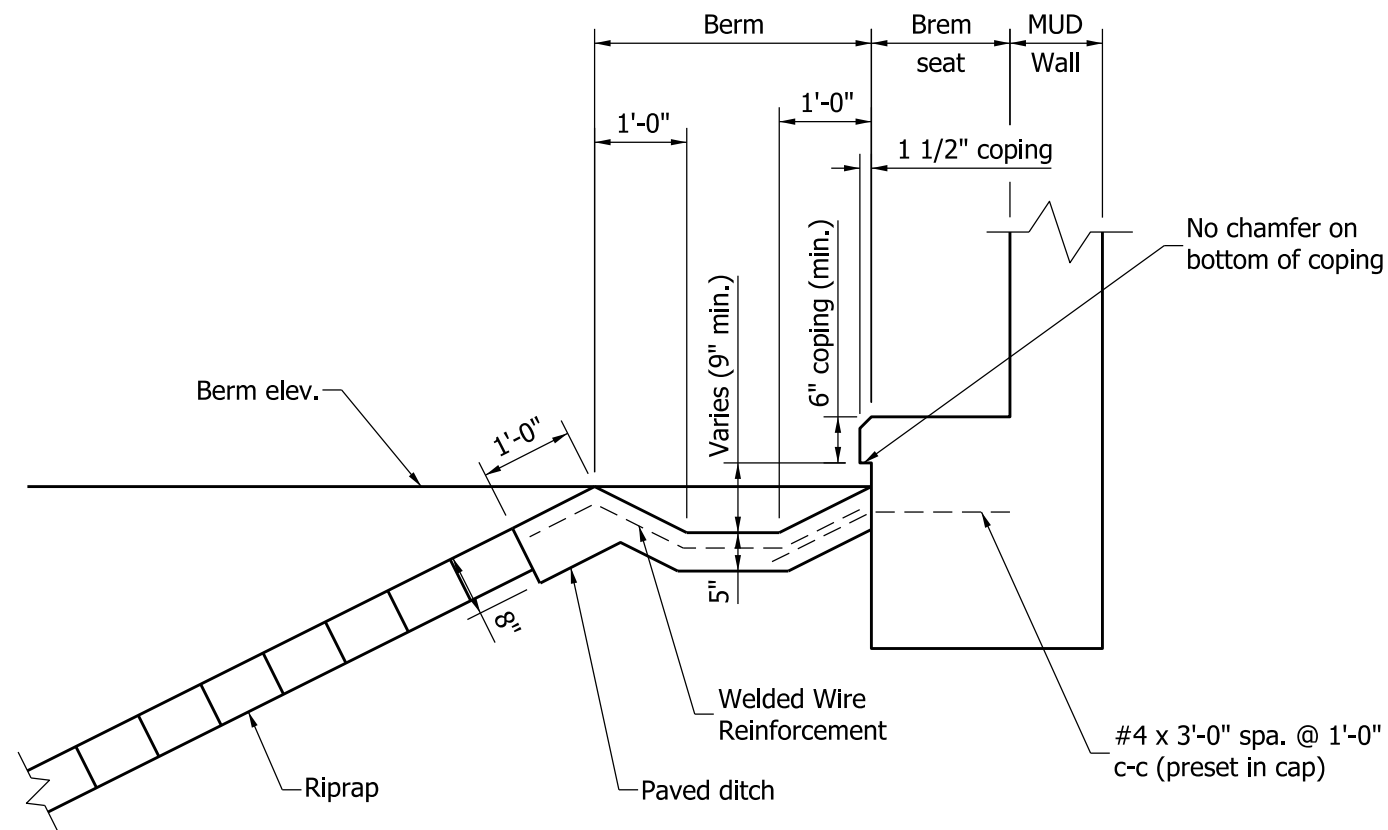
STANDARD DRAWING NO. E 616-SWCO-07



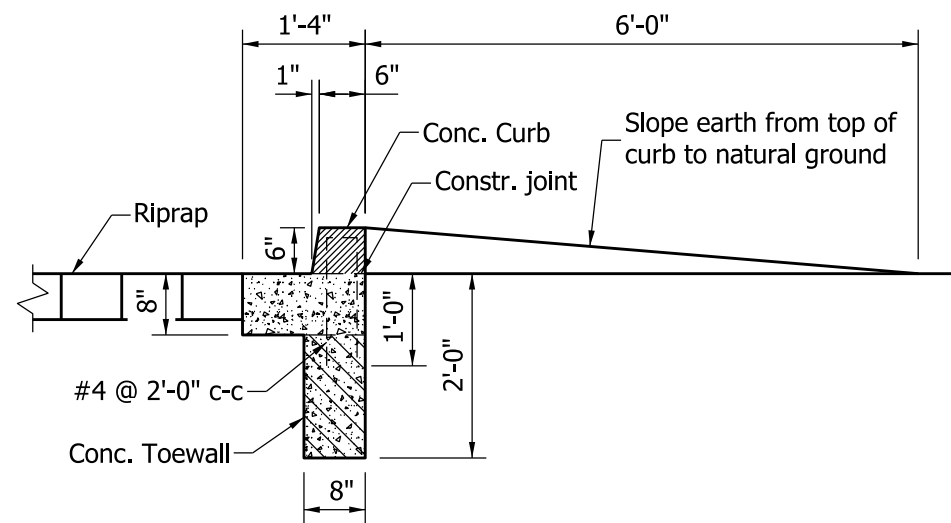
/s/ Richard L. VanCleave 09/01/11
DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 09/01/11
CHIEF HIGHWAY ENGINEER DATE

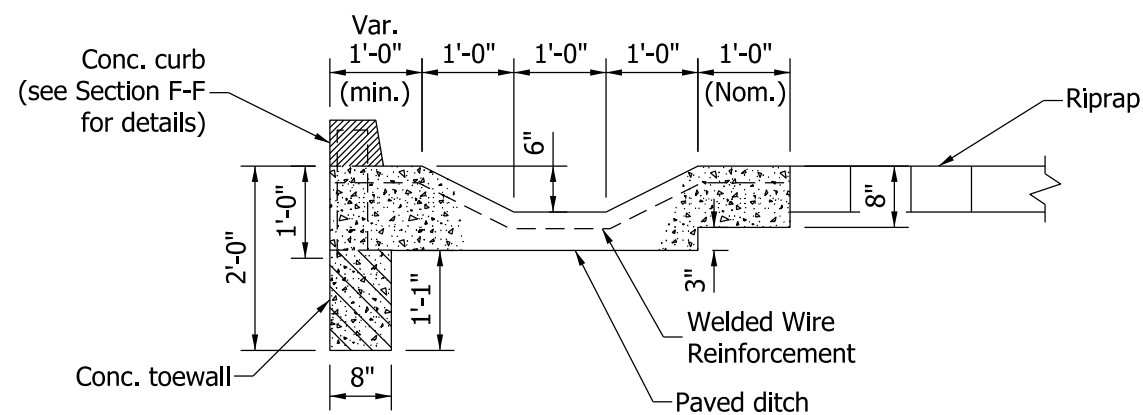
DESIGN STANDARDS ENGINEER



SECTION D-D

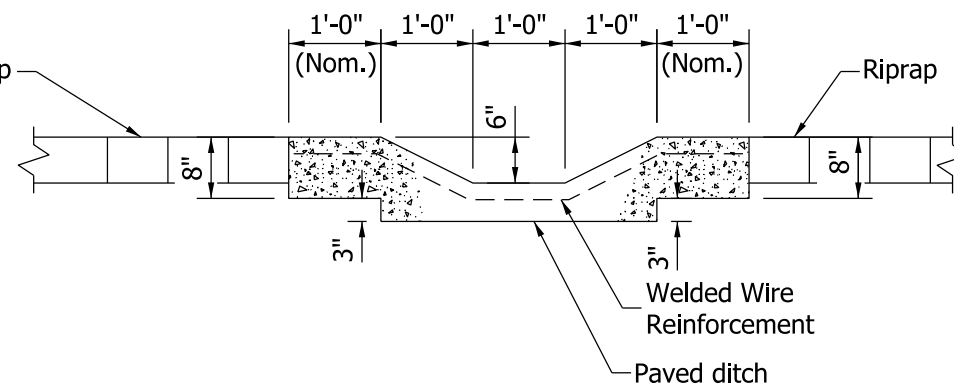


SECTION F-F



SECTION E-E

Where riprap terminates
2'-0" outside of coping line



SECTION E-E

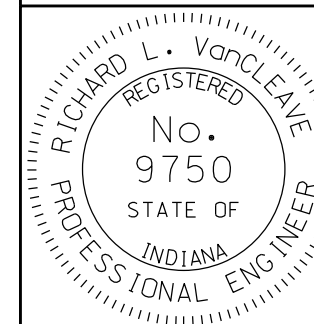
Where riprap terminates more
than 2'-0" outside of coping line

INDIANA DEPARTMENT OF TRANSPORTATION

RIPRAP SLOPEWALL DETAILS

SEPTEMBER 2011

STANDARD DRAWING NO. E 616-SWRR-01



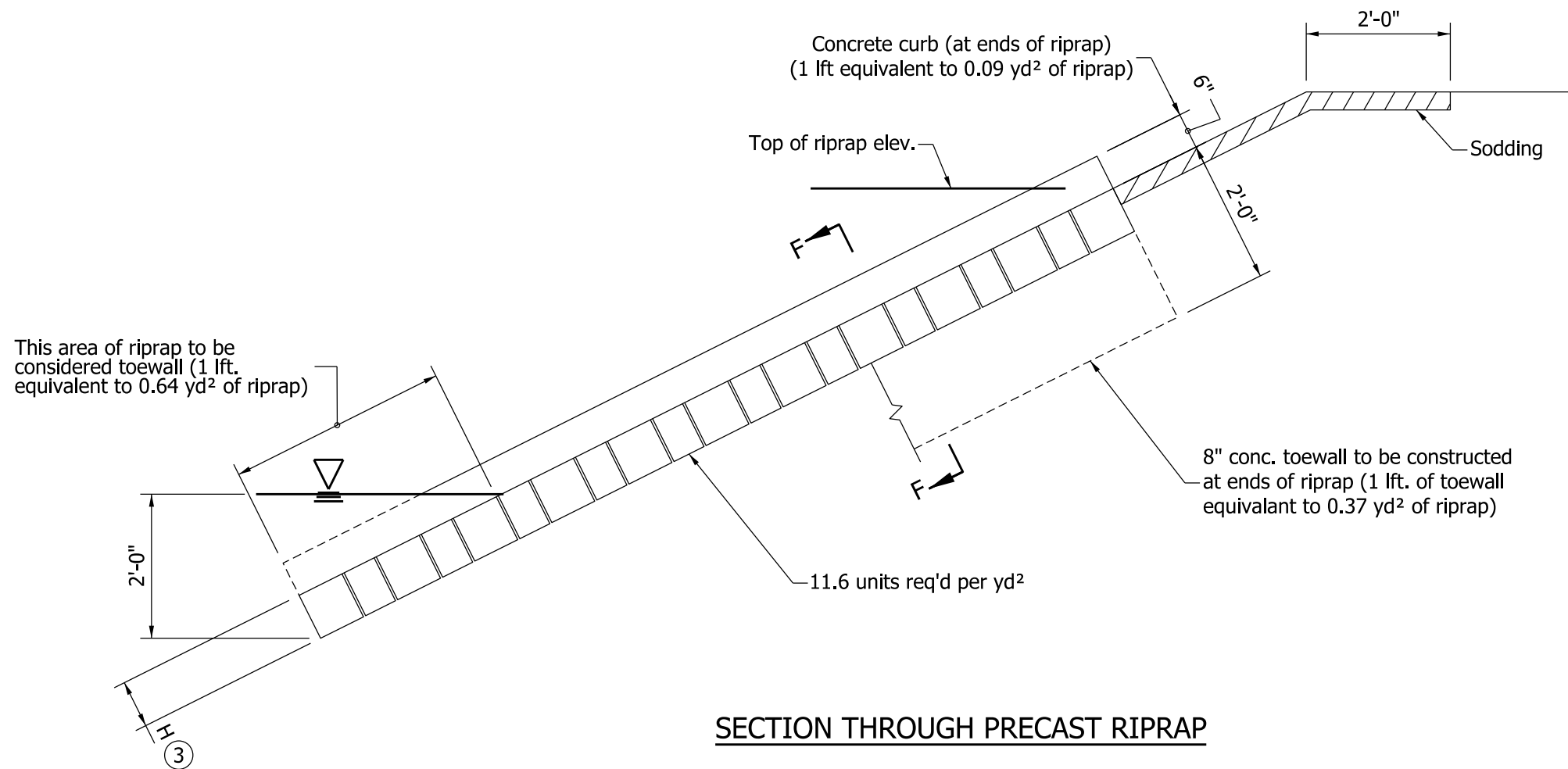
DESIGN STANDARDS ENGINEER

/s/ Richard L. VanCleave 09/01/11

DESIGN STANDARDS ENGINEER DATE

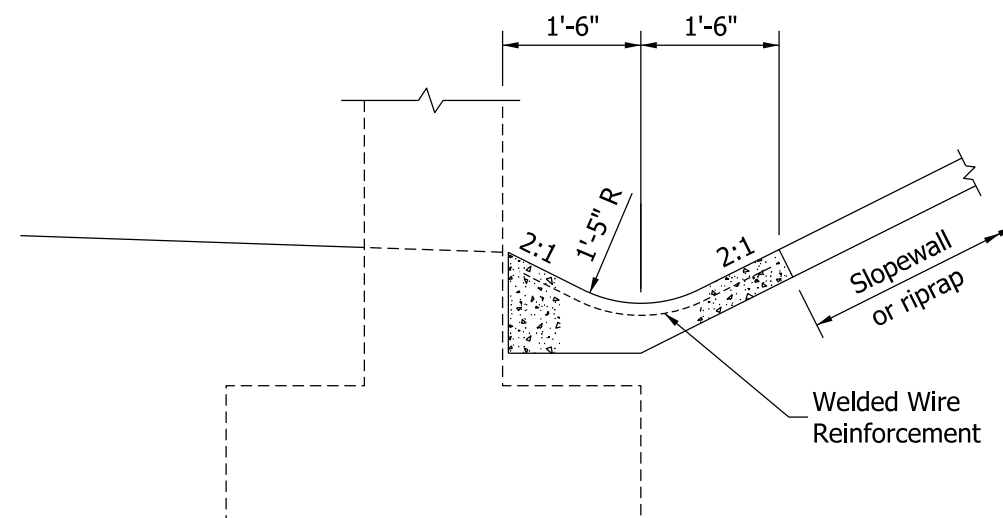
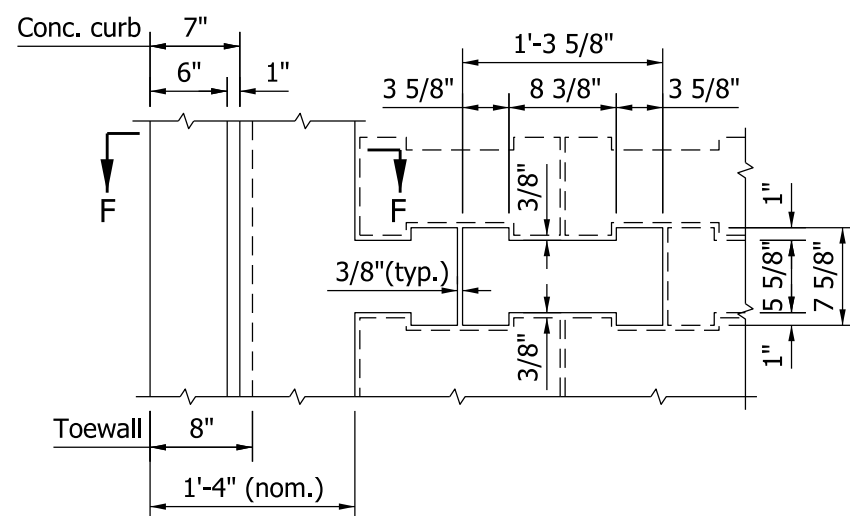
/s/ Mark A. Miller 09/01/11

CHIEF HIGHWAY ENGINEER DATE



NOTES:

1. See Standard Drawing E 616-SWRR-01 for Section F-F.
2. If riprap is specified, 1'-0" hand-laid riprap or precast concrete riprap type A may be used.
- ③ Precast concrete riprap:
Type A: H = 7 5/8" (8" nom.)
Type B: H = 3 5/8" (4" nom.)

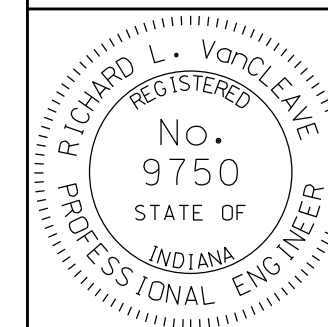


INDIANA DEPARTMENT OF TRANSPORTATION

RIPRAP SLOPEWALL DETAILS

SEPTEMBER 2011

STANDARD DRAWING NO. E 616-SWRR-02



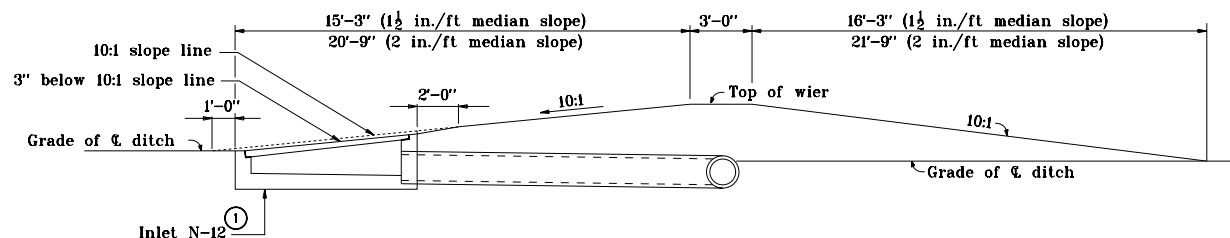
/s/ Richard L. VanCleave 09/01/11

DESIGN STANDARDS ENGINEER DATE

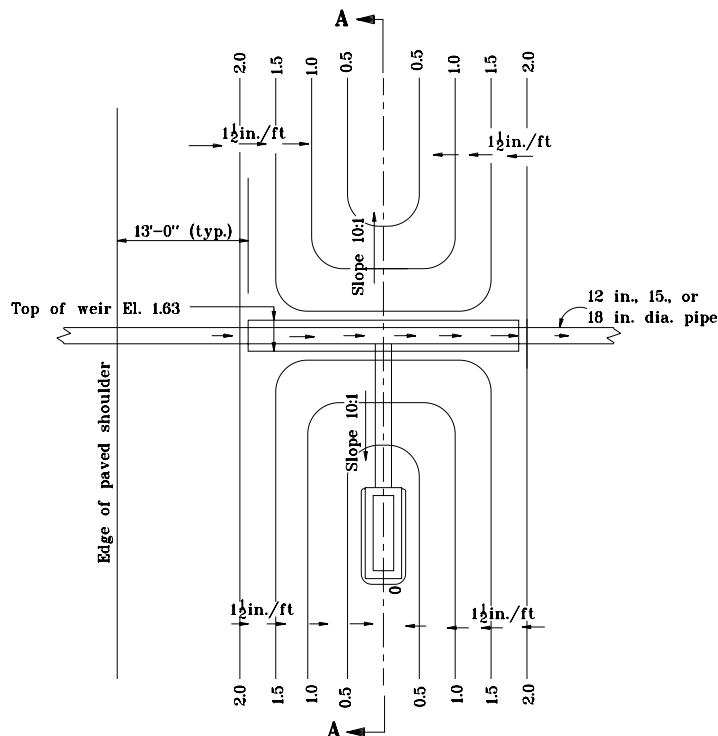
/s/ Mark A. Miller 09/01/11

CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

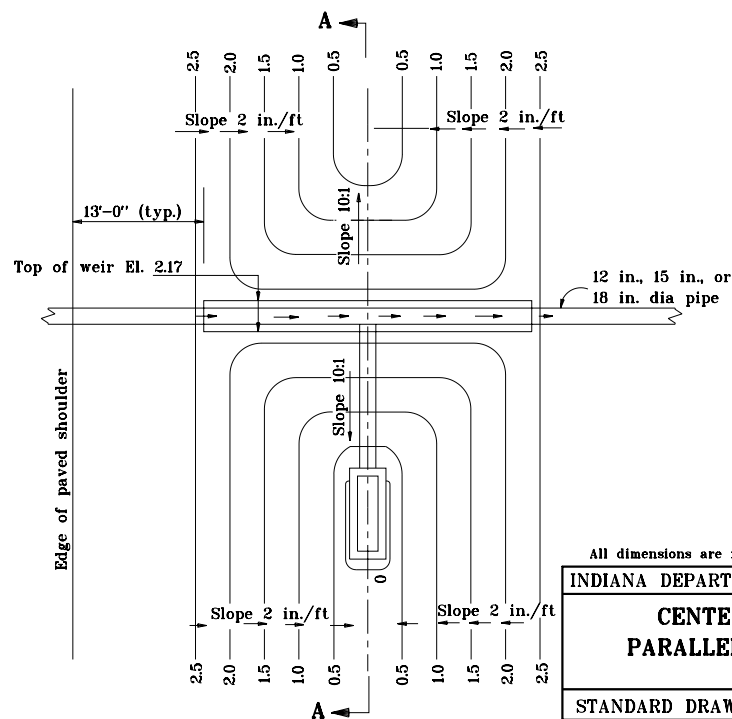


SECTION A-A



PLAN

1 1/2 in./ft MEDIAN SLOPE



PLAN

2 in./ft MEDIAN SLOPE

Source Sheet: MSI

GENERAL NOTES:

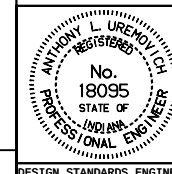
- ① See Standard Drawing MS for inlet type N-12 details.
2. Contours and top of weir elevation shown in Section A-A are in feet relative to the ditch grade.
3. The type N-12 inlet may be placed at the cross pipe structure to eliminate the longitudinal pipe which connects the inlet to the cross pipe.

All dimensions are in mm unless otherwise specified.

INDIANA DEPARTMENT OF TRANSPORTATION

**CENTER DITCH INLET
PARALLEL TO & ROADWAY**
MAY 1998

STANDARD DRAWING NO. **E 617-CDIN-01**

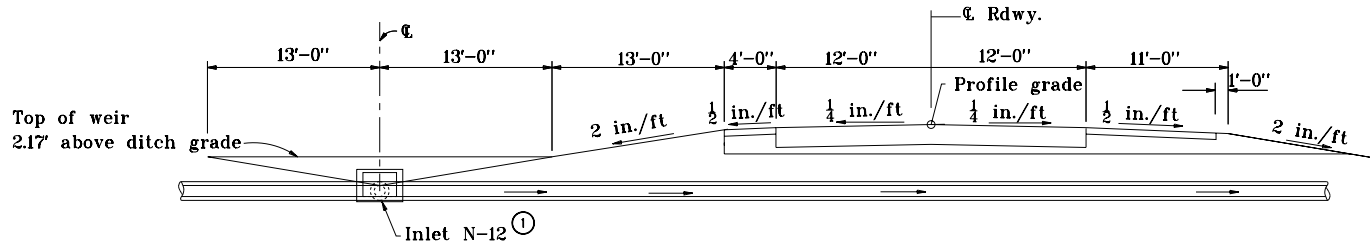


/s/ Anthony L. Uremovich 5-01-98
DESIGN STANDARDS ENGINEER DATE

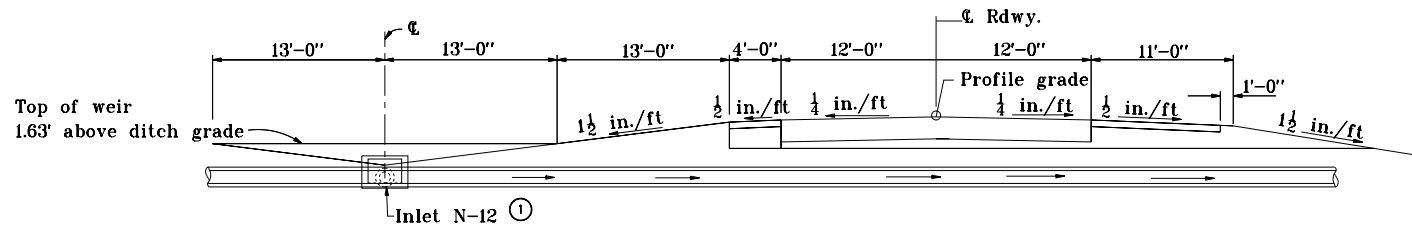
/s/ Donald W. Lucas 5-01-98
CHIEF HIGHWAY ENGINEER DATE

GENERAL NOTES

① See Standard Drawing MS for inlet type N-12 details.



USE WITH MEDIAN SLOPE OF 2 in./ft



USE WITH MEDIAN SLOPE OF 1 1/2 in./ft

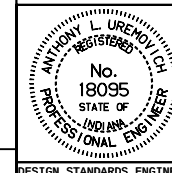
All dimensions are in mm unless otherwise specified.

INDIANA DEPARTMENT OF TRANSPORTATION

CENTER DITCH INLET
PARALLEL TO CL ROADWAY

MAY 1998

STANDARD DRAWING NO. E 617-CDIN-02



/s/ Anthony L. Uremovich 5-01-98
DESIGN STANDARDS ENGINEER DATE

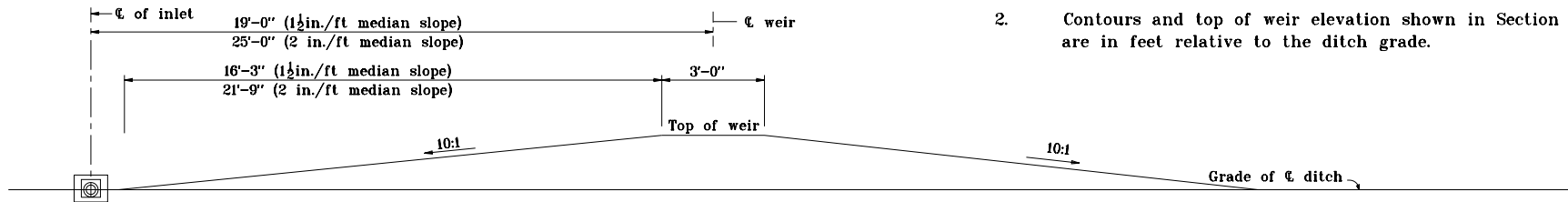
/s/ Donald W. Lucas 5-01-98
CHIEF HIGHWAY ENGINEER DATE

Source Sheet: MS1

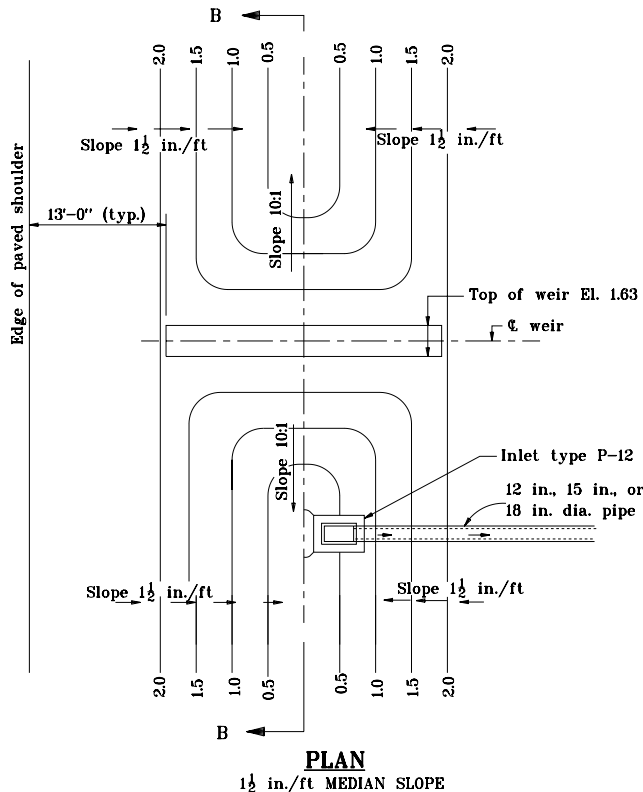
DESIGN STANDARDS ENGINEER

GENERAL NOTES:

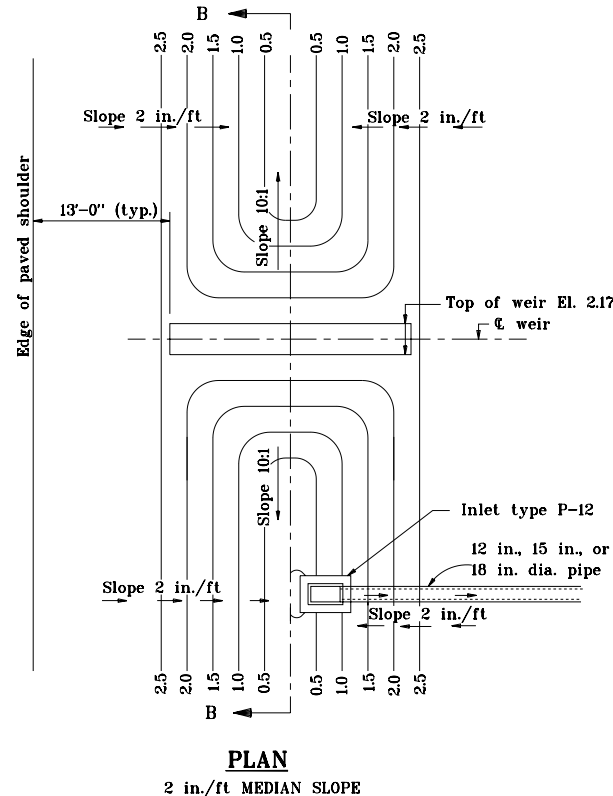
- See Standard Drawing MS for inlet type P-12 details.
- Contours and top of weir elevation shown in Section B-B are in feet relative to the ditch grade.



SECTION B-B



PLAN
1 1/2 in./ft MEDIAN SLOPE



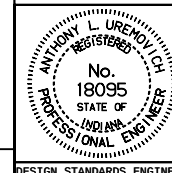
PLAN
2 in./ft MEDIAN SLOPE

All dimensions are in mm unless otherwise specified.

INDIANA DEPARTMENT OF TRANSPORTATION

CENTER DITCH INLET
PERPENDICULAR TO CL ROADWAY
MAY 1998

STANDARD DRAWING NO. E 617-CDIN-03



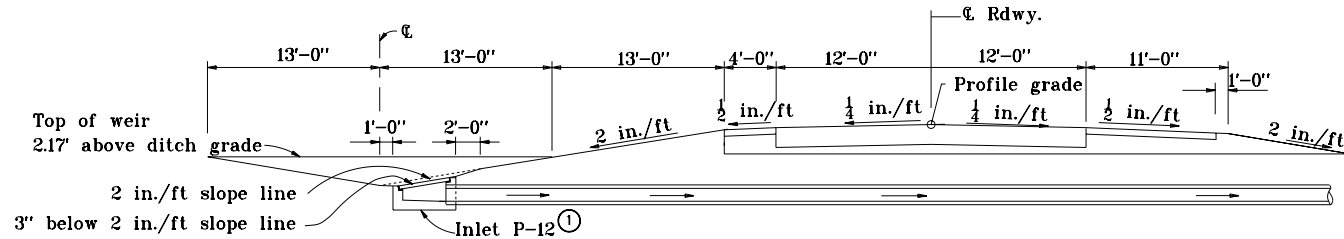
/s/ Anthony L. Uremovich 5-01-98
DESIGN STANDARDS ENGINEER DATE

/s/ Donald W. Lucas 5-01-98
CHIEF HIGHWAY ENGINEER DATE

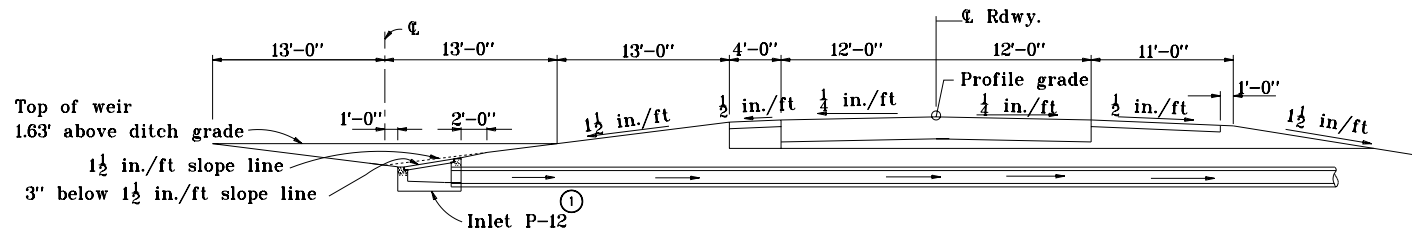
Source Sheet: MS1

GENERAL NOTES

① See Standard drawing MS for inlet type P-12 details.



USE WITH MEDIAN SLOPE OF 2 in./ft



USE WITH MEDIAN SLOPE OF 1 1/2 in./ft

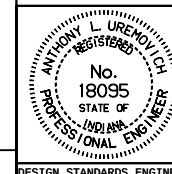
All dimensions are in mm unless otherwise specified.

INDIANA DEPARTMENT OF TRANSPORTATION

CENTER DITCH INLET
PERPENDICULAR TO ℄ ROADWAY

MAY 1998

STANDARD DRAWING NO. E 617-CDIN-04



/s/ Anthony L. Uremovich 5-01-98
DESIGN STANDARDS ENGINEER DATE

/s/ Donald W. Lucas 5-01-98
CHIEF HIGHWAY ENGINEER DATE

Source Sheet: MS1

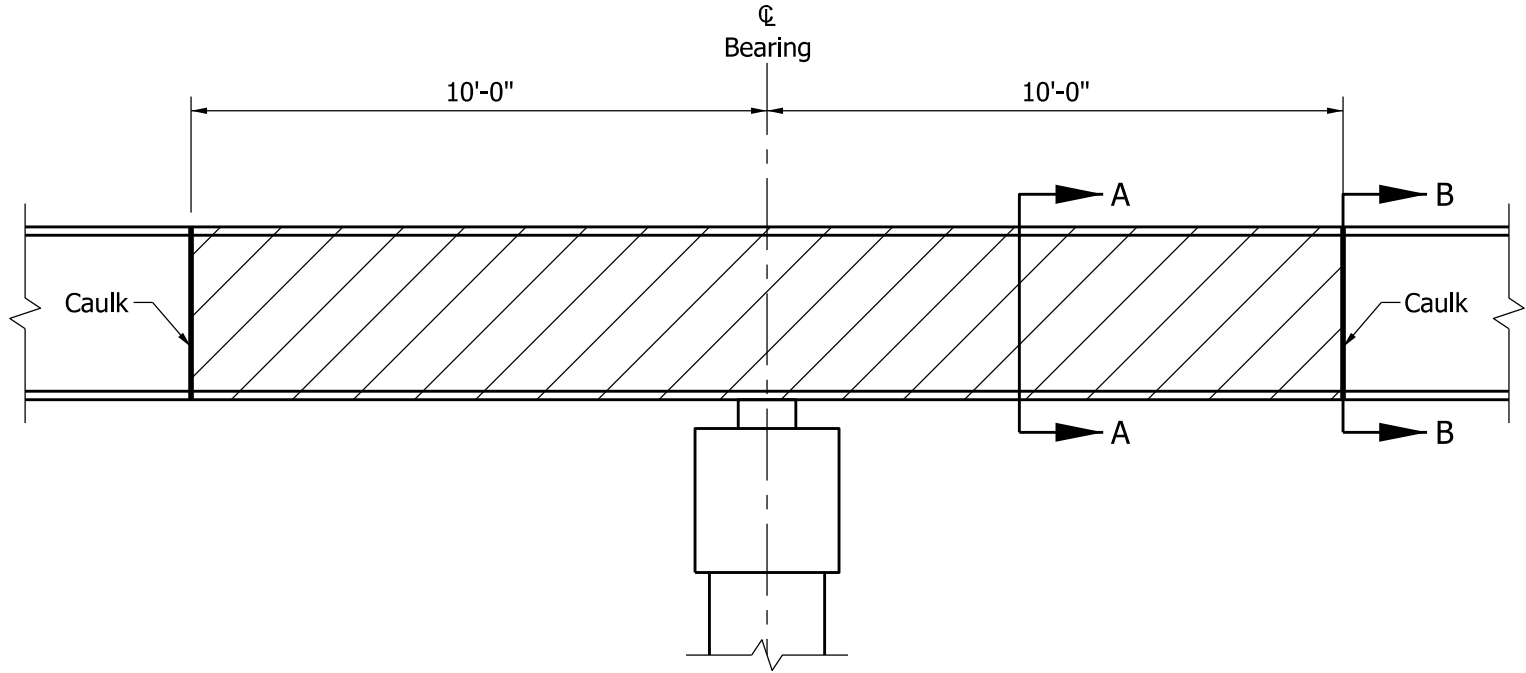
NOTE:

1. Caulk shall be placed on the painted surface at the painted/unpainted interface and is intended to function as a drip bead.

LEGEND:

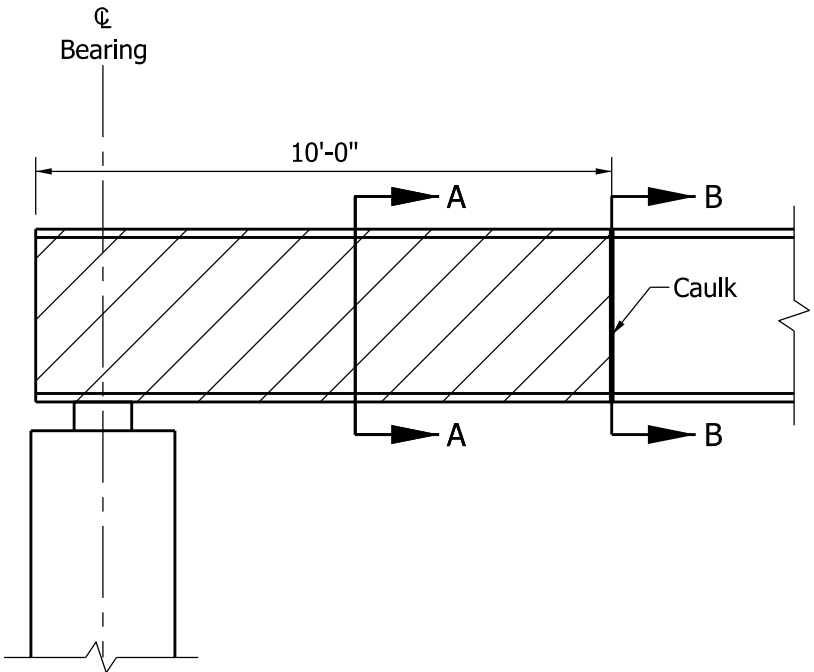
 = Area to be painted

 = Caulk Bead



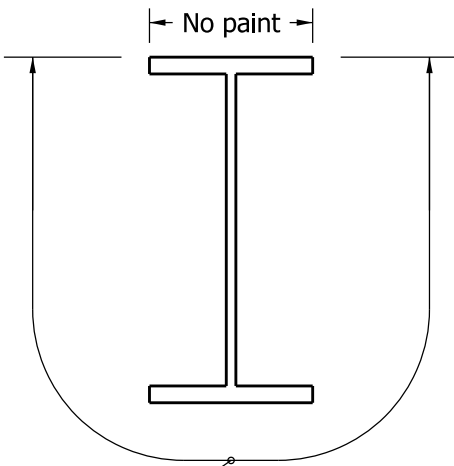
BEAM OR GIRDER AT INTERIOR SUPPORT

ELEVATION VIEW
(Bridge Deck not shown for clarity)

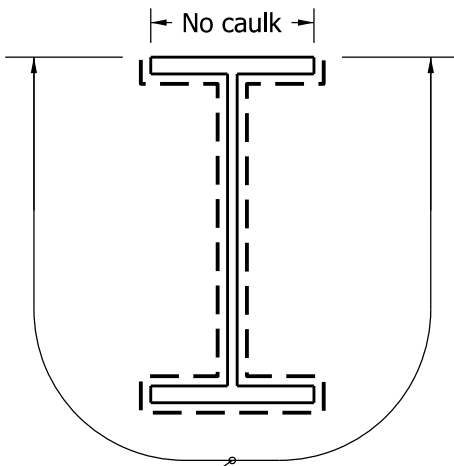


BEAM OR GIRDER AT END-BENT SUPPORT

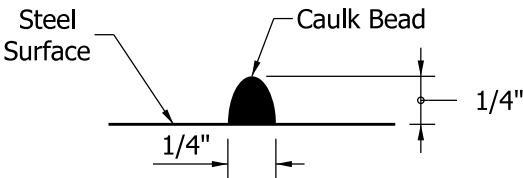
ELEVATION VIEW
(Bridge Deck, Mudwall, and Concrete Encasement not shown for clarity)



SECTION A-A



SECTION B-B



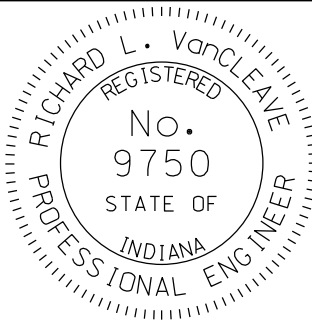
CAULK BEAD DETAIL

INDIANA DEPARTMENT OF TRANSPORTATION

**PAINTING REQUIREMENTS
FOR WEATHERING STEEL**

SEPTEMBER 2011

STANDARD DRAWING NO. E 619-PRWS-01



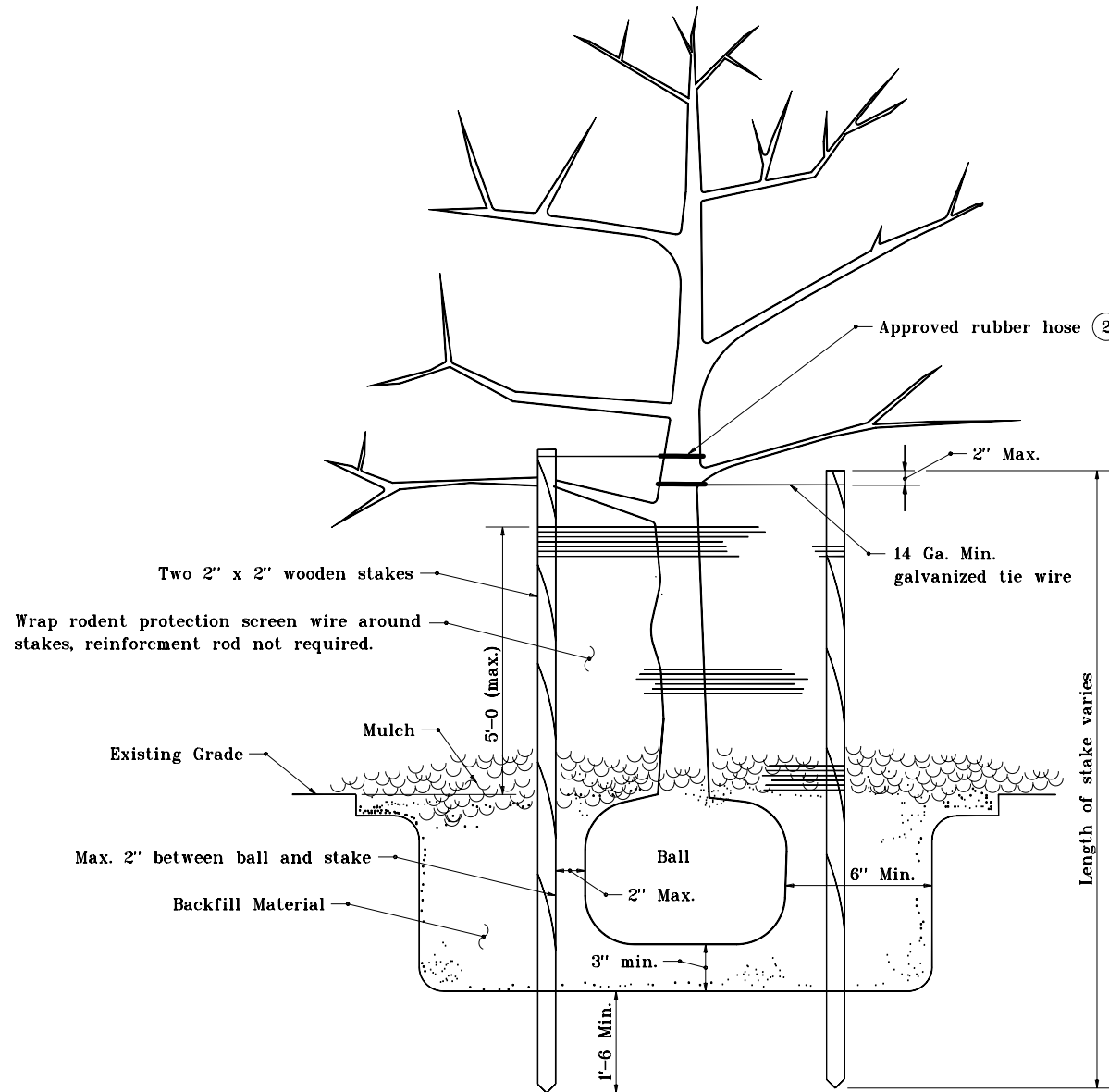
DESIGN STANDARDS ENGINEER

/s/ Richard L. VanCleave 09/01/11
DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 09/01/11
CHIEF HIGHWAY ENGINEER DATE

GENERAL NOTES

1. Tie wire securement points on tree shall be above the first or second main branch.
2. See Standard Drawing E 622-LSPL-04 for Rubber Hose Detail.



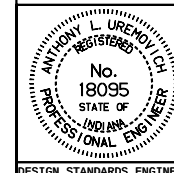
Detail applies to trees less than 1 1/4" caliper.

INDIANA DEPARTMENT OF TRANSPORTATION

PLANTING BALLED AND BURLAPPED TREE

APRIL 1995

STANDARD DRAWING NO. E 622-LSPL-01



DETAILS PLACED IN THIS FORMAT 11-15-99

/s/ Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

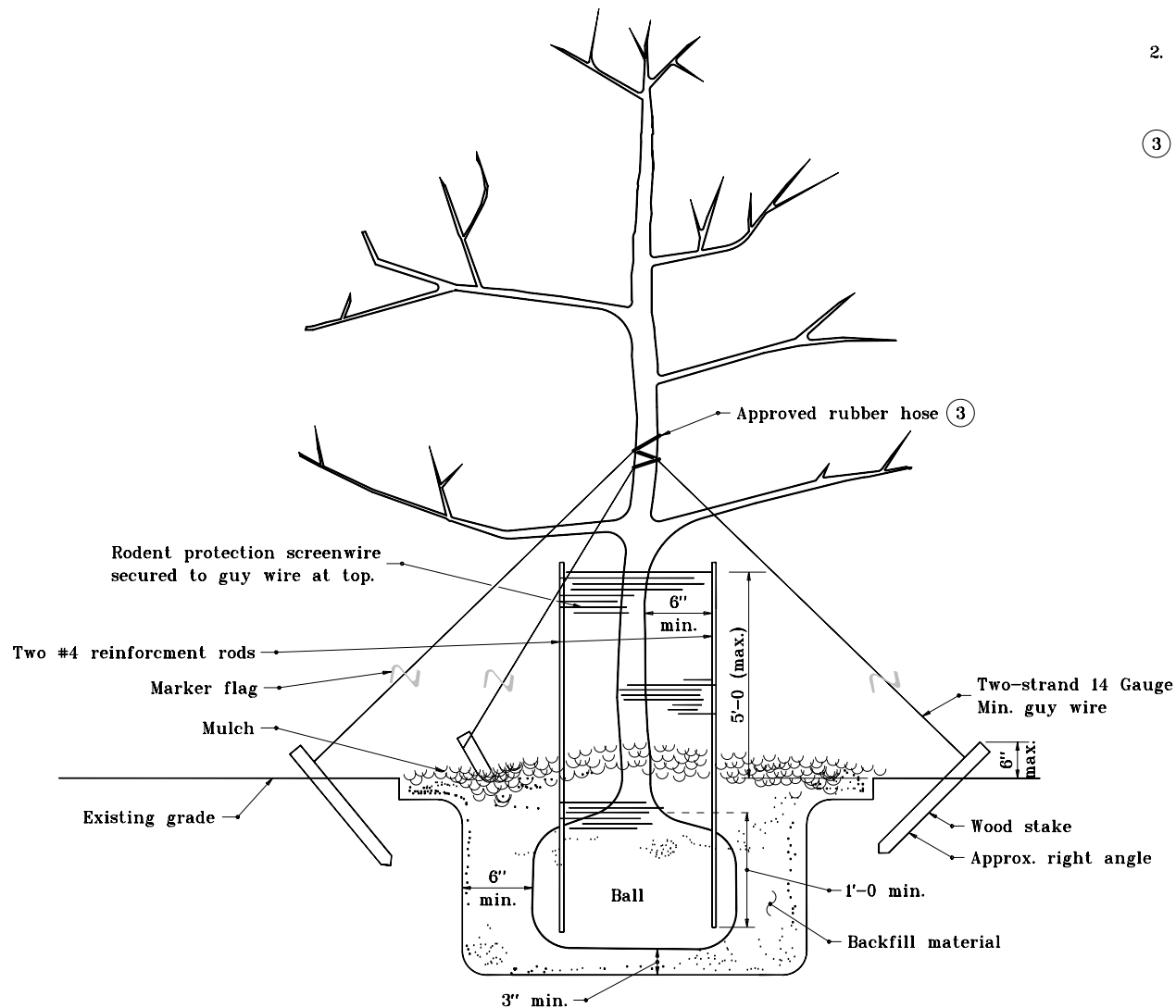
/s/ Firooz Zandi 11-15-99
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

ORIGINALLY APPROVED 4-03-95

GENERAL NOTES

1. This detail applies to Pine Trees (48" and over) with exception that screen wire protection shall not be required.
2. Plastic coil-type protective wrapping is an acceptable alternative to screen wire and reinforcement rod method of tree protection.
- ③ See Standard Drawing E 622-LSPL-04 for Rubber Hose Detail.

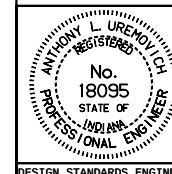


INDIANA DEPARTMENT OF TRANSPORTATION

PLANTING BALLED AND BURLAPPED TREE

APRIL 1995

STANDARD DRAWING NO. E 622-LSPL-02



DETAILS PLACED IN THIS FORMAT 11-15-99

/s/ Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

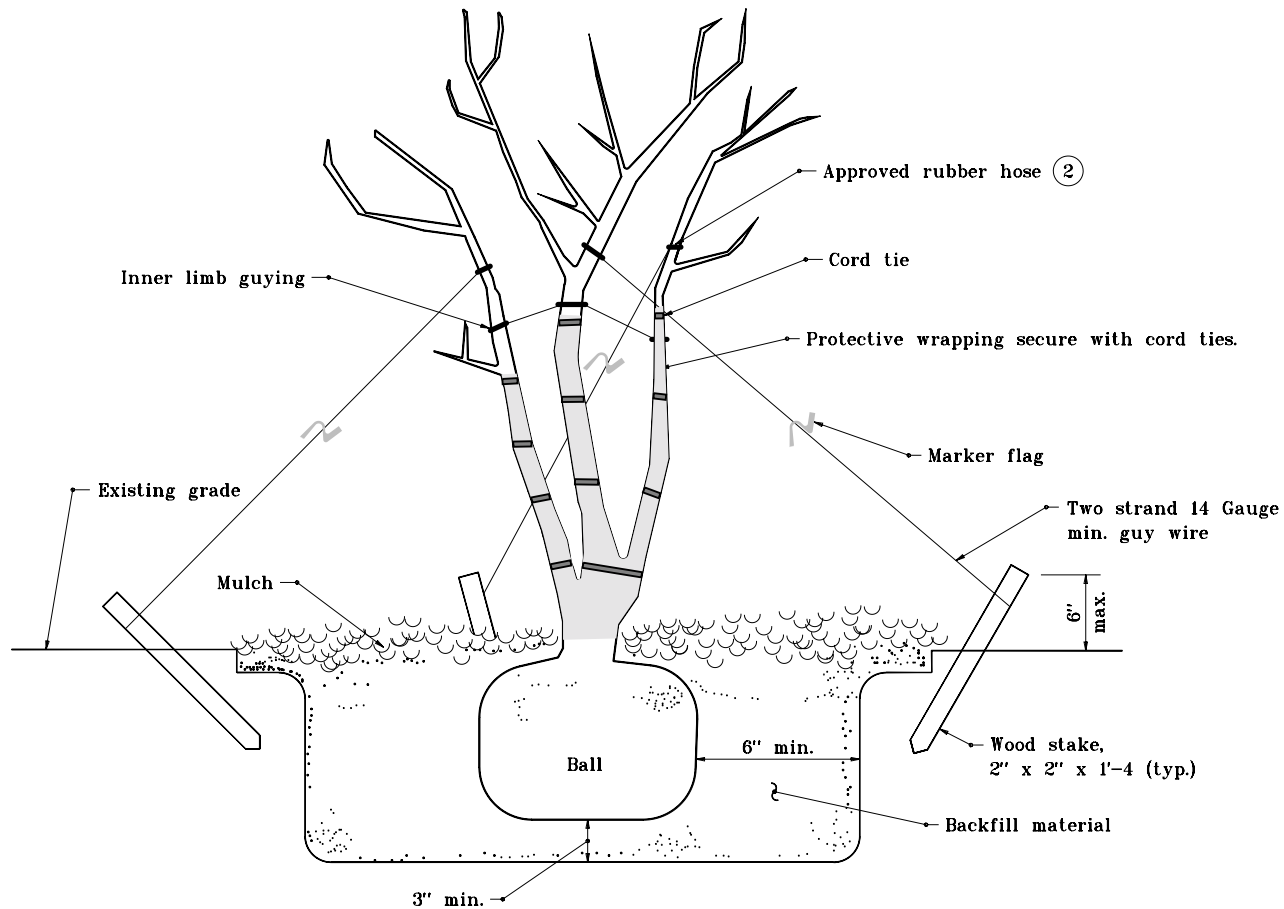
/s/ Firooz Zandi 11-15-99
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

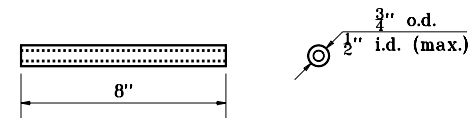
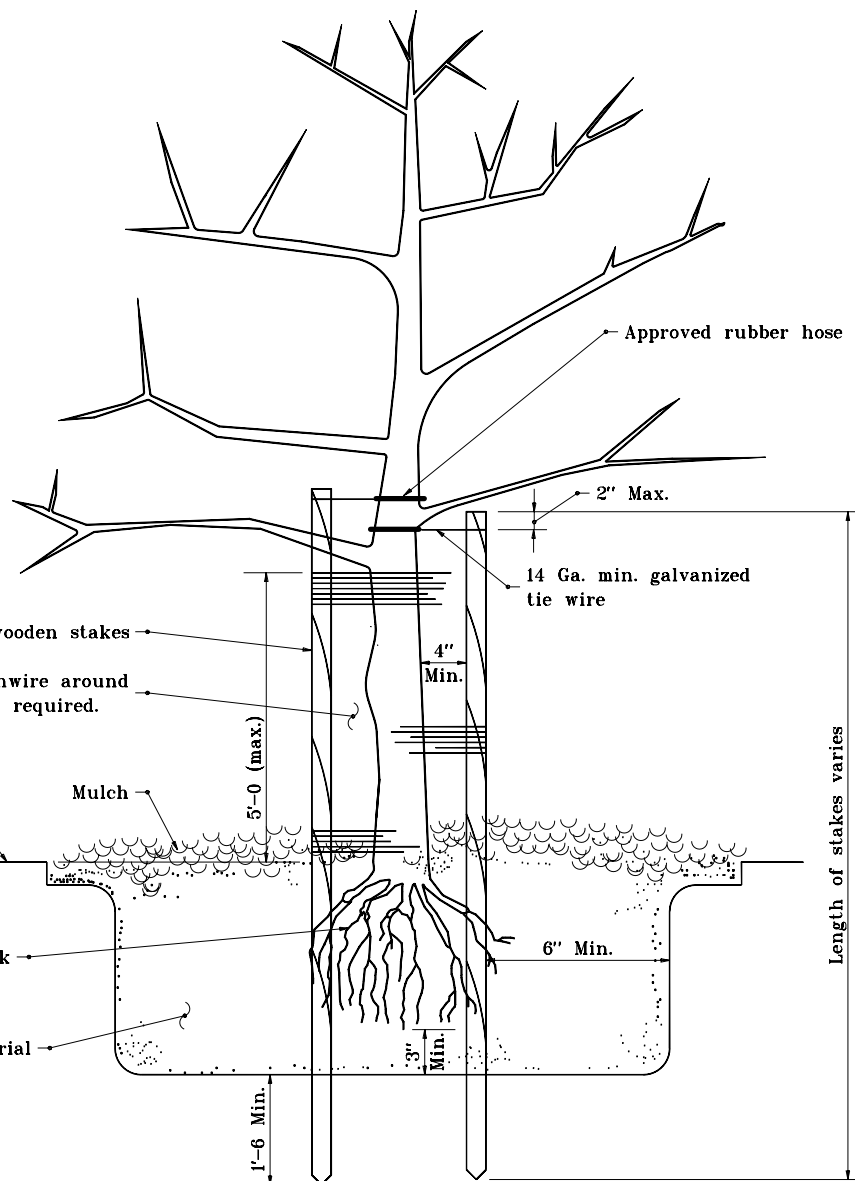
ORIGINALLY APPROVED 4-01-95

GENERAL NOTES

1. This detail applies to trees over 72".
- ② See Standard Drawing E 622-LSPL-04 for Rubber Hose Detail.



INDIANA DEPARTMENT OF TRANSPORTATION	
PLANTING MULTI-STEM TREE	
JANUARY 2000	
STANDARD DRAWING NO. E 622-LSPL-03	
	/s/ Anthony L. Uremovich 4-03-95 DESIGN STANDARDS ENGINEER DATE
	/s/ Donald W. Lucas 4-03-95 CHIEF HIGHWAY ENGINEER DATE

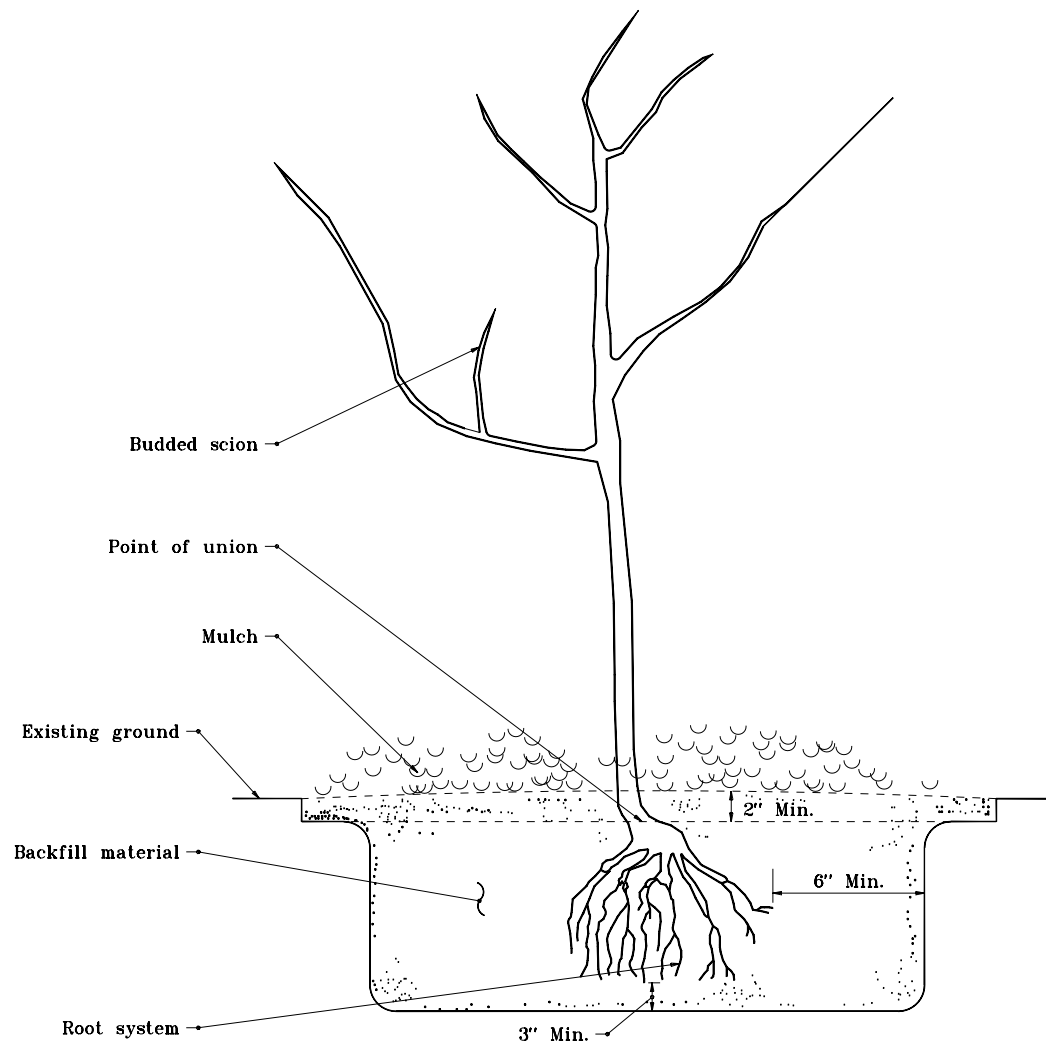


RUBBER HOSE DETAIL

INDIANA DEPARTMENT OF TRANSPORTATION	
PLANTING BARE ROOT TREE	
APRIL 1995	
STANDARD DRAWING NO. E 622-LSPL-04	
	DETAILS PLACED IN THIS FORMAT 11-15-99 /s/ Anthony L. Uremovich 11-15-99 DESIGN STANDARDS ENGINEER DATE
DESIGN STANDARDS ENGINEER	/s/ Firooz Zandi 11-15-99 CHIEF HIGHWAY ENGINEER DATE ORIGINALLY APPROVED 4-01-95

GENERAL NOTES

1. This detail to be followed in the planting of grafted bare root stock.

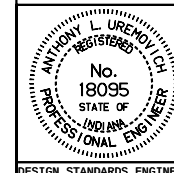


INDIANA DEPARTMENT OF TRANSPORTATION

PLANTING GRAFTED TREE

APRIL 1995

STANDARD DRAWING NO. **E 622-LSPL-05**



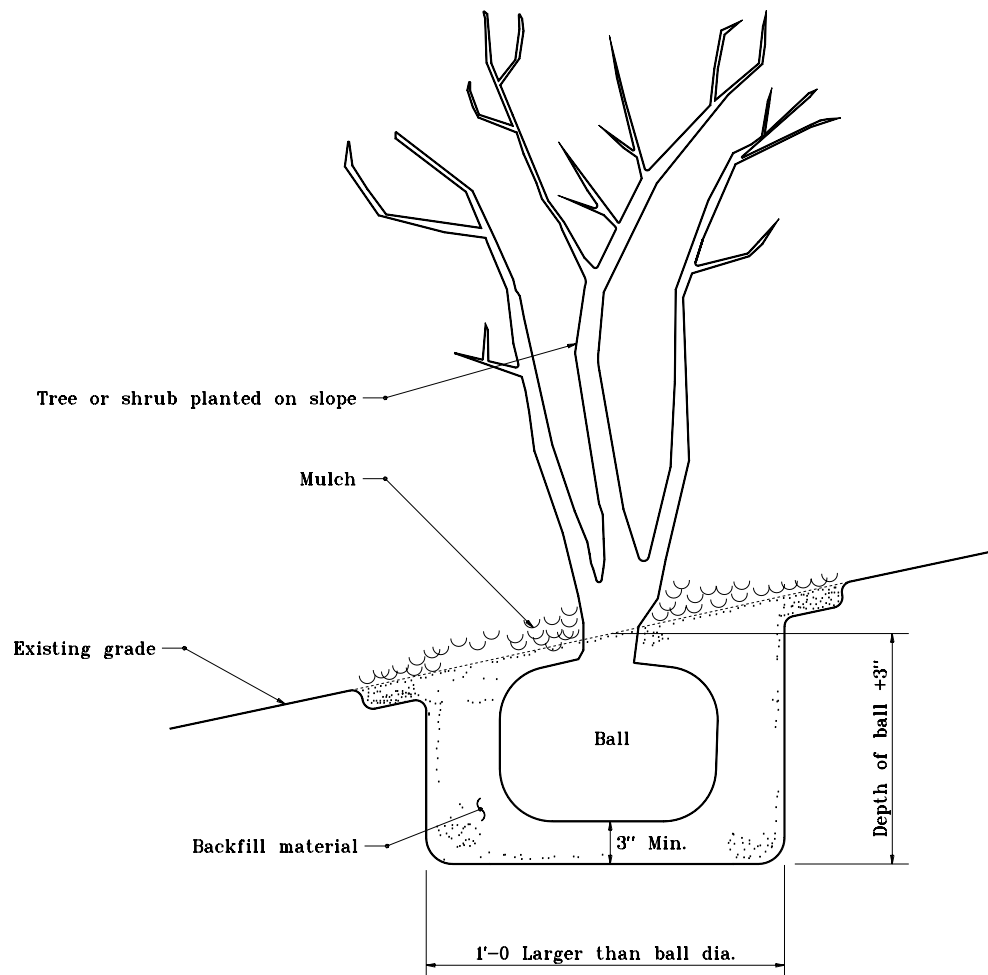
DETAILS PLACED IN THIS FORMAT 11-15-99

/s/ Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi 11-15-99
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

ORIGINALLY APPROVED 4-01-95

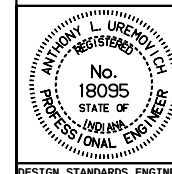


INDIANA DEPARTMENT OF TRANSPORTATION

PLANTING ON SLOPE

APRIL 1995

STANDARD DRAWING NO. **E 622-LSPL-06**



DETAILS PLACED IN THIS FORMAT 11-15-99

/s/ Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

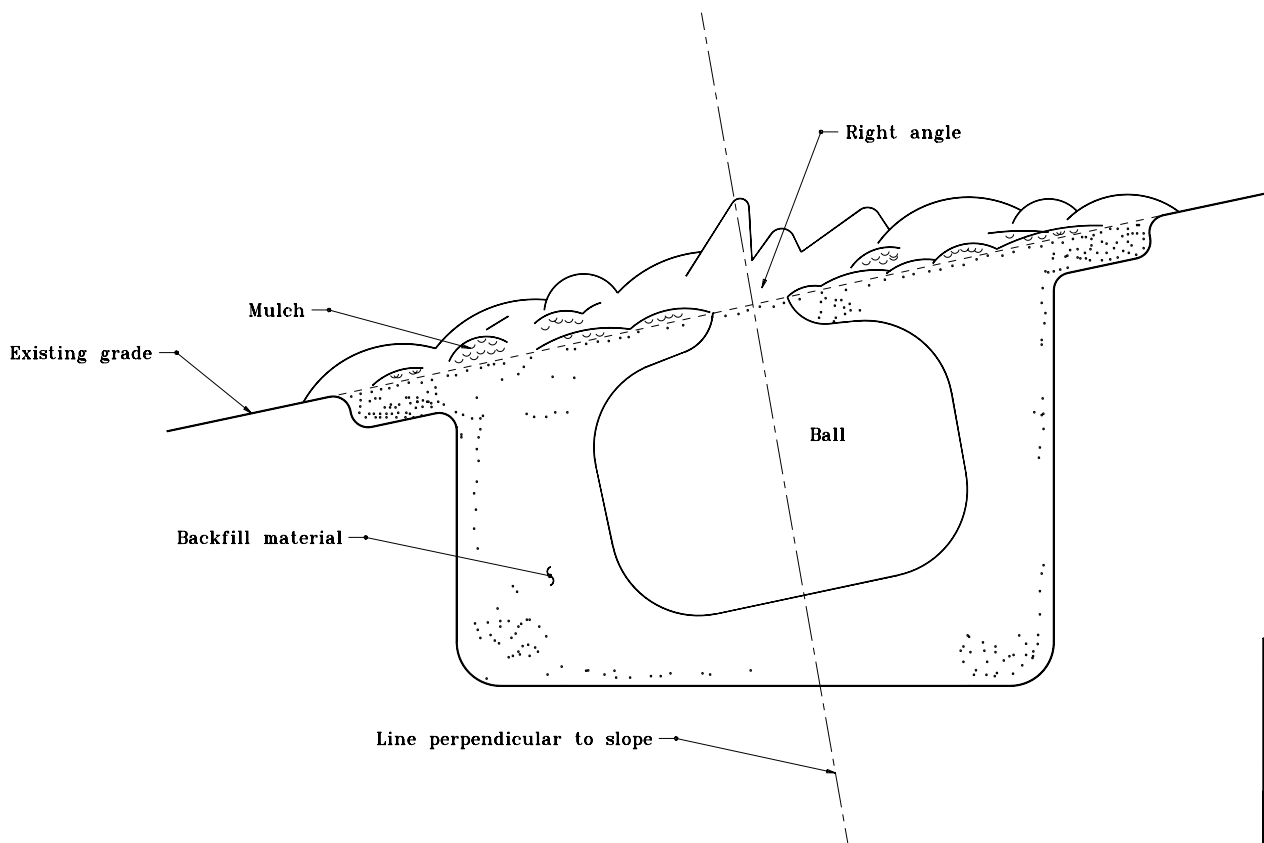
/s/ Firooz Zandi 11-15-99
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

ORIGINALLY APPROVED 4-03-95

GENERAL NOTES

1. Prostrate shrub planted at right angle to slope.

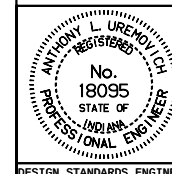


INDIANA DEPARTMENT OF TRANSPORTATION

PLANTING ON SLOPE

APRIL 1995

STANDARD DRAWING NO. **E 622-LSPL-07**



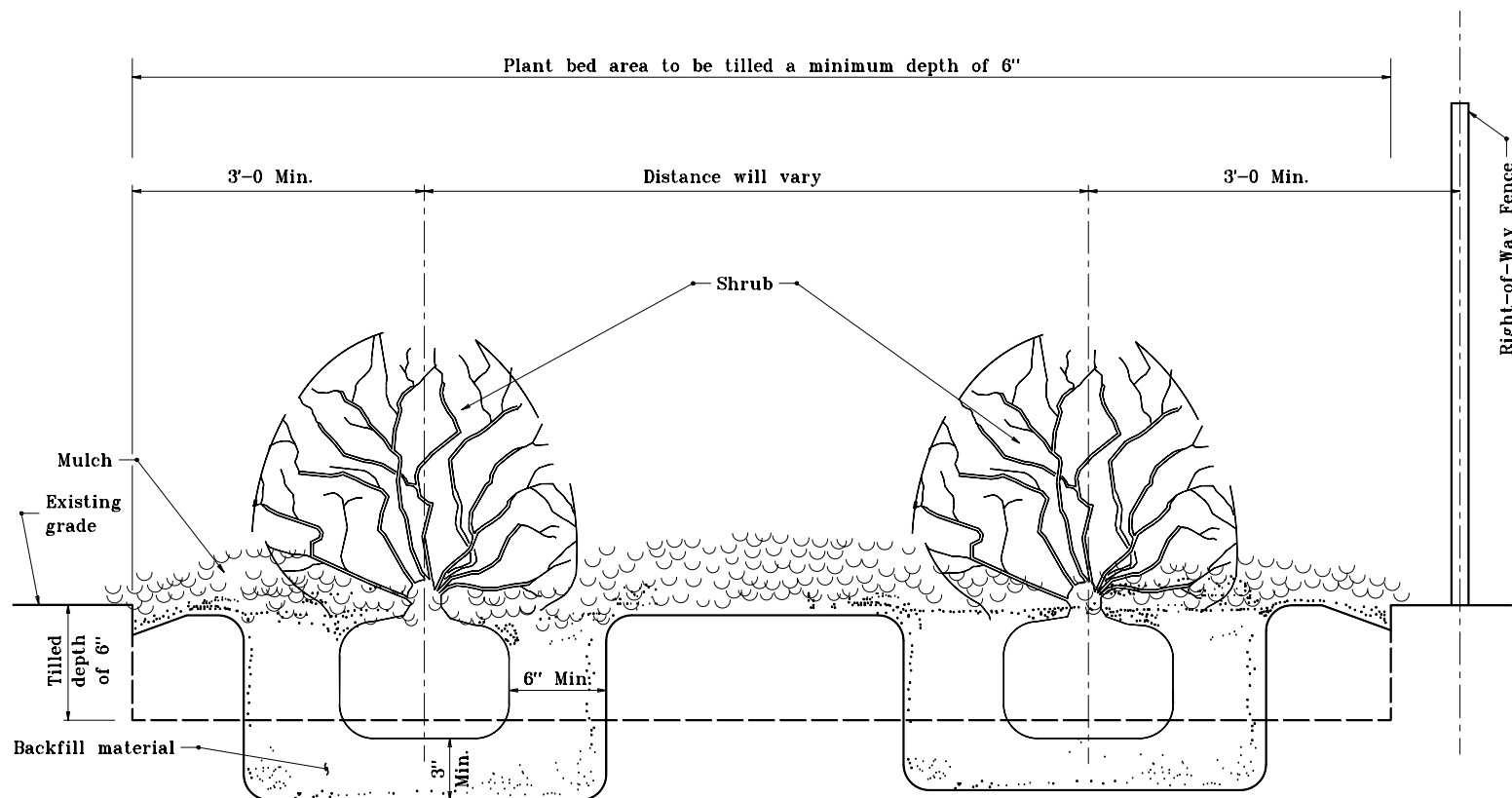
DETAILS PLACED IN THIS FORMAT 11-15-99

/s/ Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi 11-15-99
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

ORIGINALLY APPROVED 4-01-95



GENERAL NOTES

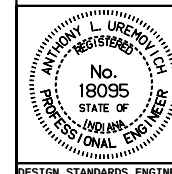
1. Take specified mulch depth to edge of bed over 3'-0 distance from center of outer plant.
2. See Standard Drawing E 622-LSPL-10 for typical plan of shrub bed.

INDIANA DEPARTMENT OF TRANSPORTATION

TYPICAL SECTION OF SHRUB BED

APRIL 1995

STANDARD DRAWING NO. **E 622-LSPL-08**



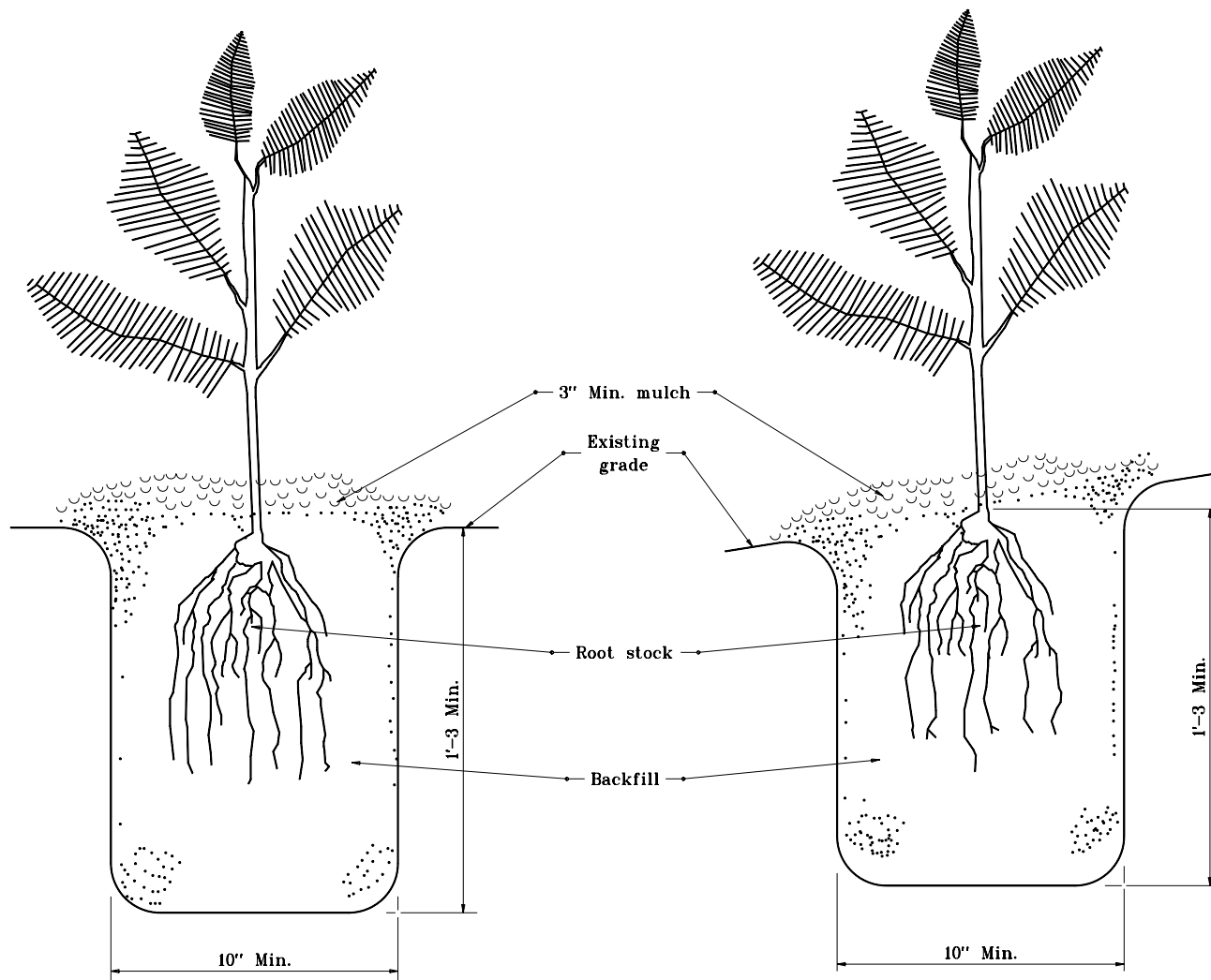
DETAILS PLACED IN THIS FORMAT 11-15-99

/s/ Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi 11-15-99
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

ORIGINALLY APPROVED 4-01-95



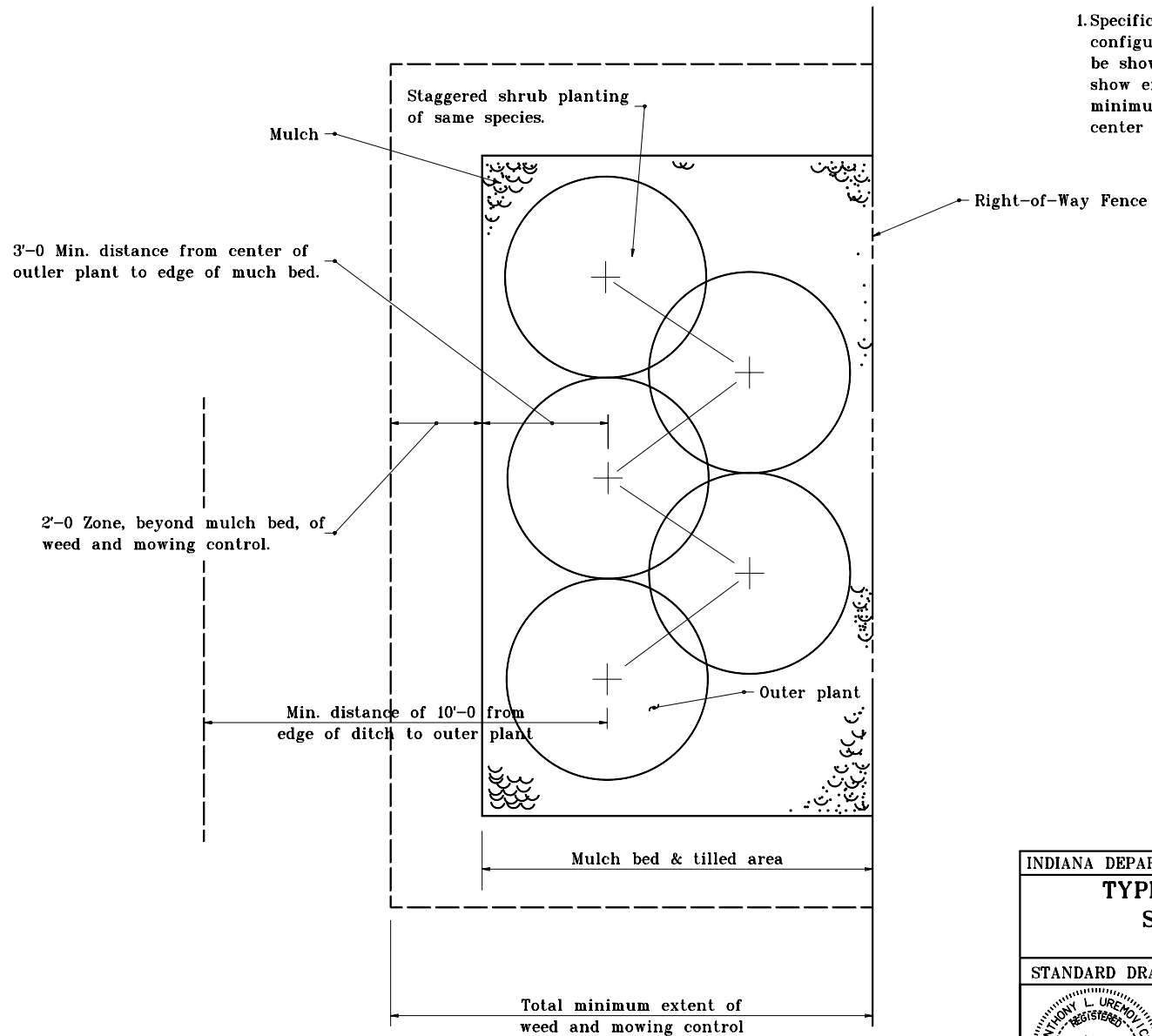
Seedling Variety on Level Land

Seedling Variety on Slope

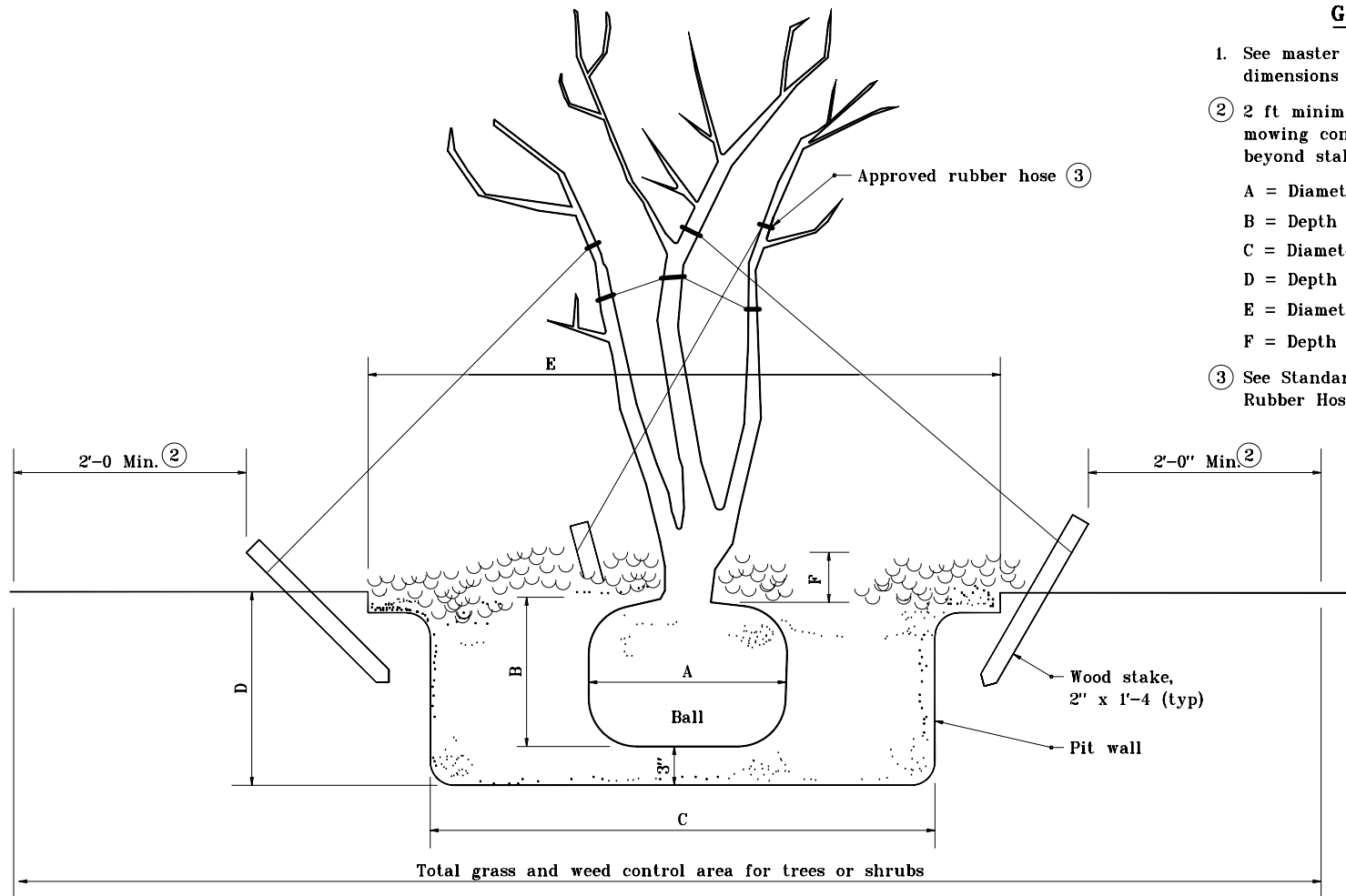
INDIANA DEPARTMENT OF TRANSPORTATION	
PLANTING SEEDLING VARIETIES	
APRIL 1995	
STANDARD DRAWING NO. E 622-LSPL-09	
	DETAILS PLACED IN THIS FORMAT 11-15-99
	/s/ Anthony L. Uremovich 11-15-99 DESIGN STANDARDS ENGINEER DATE
	/s/ Firooz Zandi 11-15-99 CHIEF HIGHWAY ENGINEER DATE
	DESIGN STANDARDS ENGINEER ORIGINALLY APPROVED 4-01-95

GENERAL NOTES

1. Specific variations on shrub bed configurations and layout will be shown on plans. Plans will show exceptions to 10 ft minimum distance from ditch to center of outer plants.



INDIANA DEPARTMENT OF TRANSPORTATION	
TYPICAL PLAN OF SHRUB BED	
APRIL 1995	
STANDARD DRAWING NO. E 622-LSPL-10	
	DETAILS PLACED IN THIS FORMAT 11-15-99
	/s/ Anthony L. Uremovich 11-15-99 DESIGN STANDARDS ENGINEER DATE
	/s/ Firooz Zandi 11-15-99 CHIEF HIGHWAY ENGINEER DATE
	DESIGN STANDARDS ENGINEER ORIGINALLY APPROVED 4-01-95



GENERAL NOTES

1. See master plant list for specific dimensions applied to individual plants.

(2) 2 ft minimum distance for weed and mowing control applies to zone beyond stakes or mulch bed.

A = Diameter of ball

B = Depth of ball

C = Diameter of pit

D = Depth of pit

E = Diameter of mulch bed

F = Depth of mulch bed

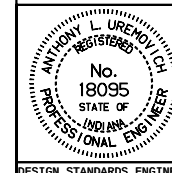
(3) See Standard Drawing E 622-LSPL-04 for Rubber Hose Detail.

INDIANA DEPARTMENT OF TRANSPORTATION

COMMONLY USED DIMENSIONS

APRIL 1995

STANDARD DRAWING NO. E 622-LSPL-11



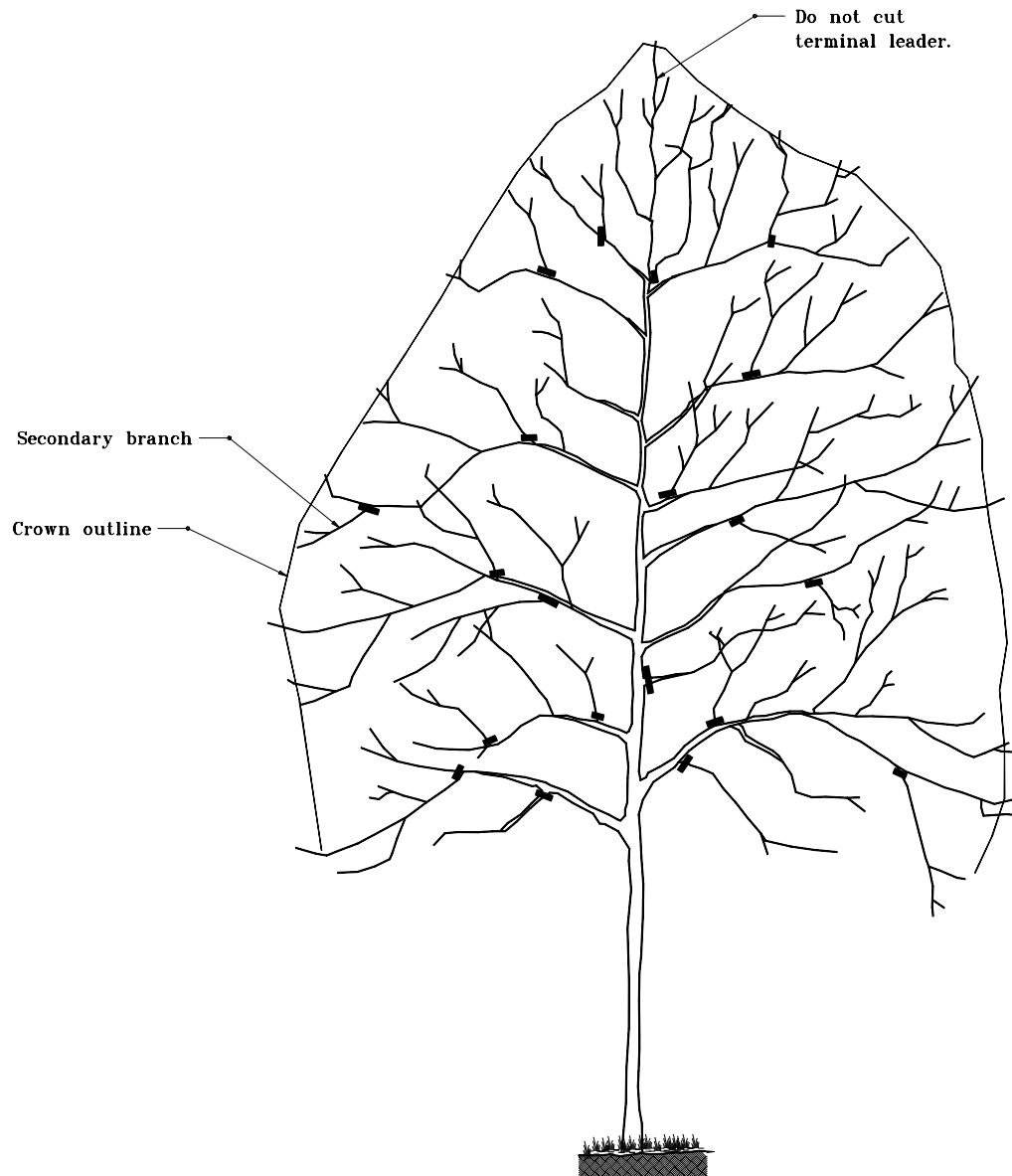
DETAILS PLACED IN THIS FORMAT 11-15-99

/s/ Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi 11-15-99
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

ORIGINALLY APPROVED 4-03-95



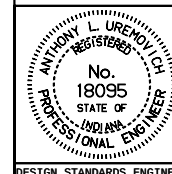
GENERAL NOTES

1. Pruning cuts shall be made as close as possible to remaining branch and in direction of symbol for cuts (■).
2. Cut back secondary branching to reduce foliage by a minimum of $\frac{1}{3}$ to a maximum of $\frac{1}{2}$.

INDIANA DEPARTMENT OF TRANSPORTATION

TREE PRUNING TALL SHADE TREE APRIL 1995

STANDARD DRAWING NO. E 622-LSPR-01



DETAILS PLACED IN THIS FORMAT 11-15-99

/s/ Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

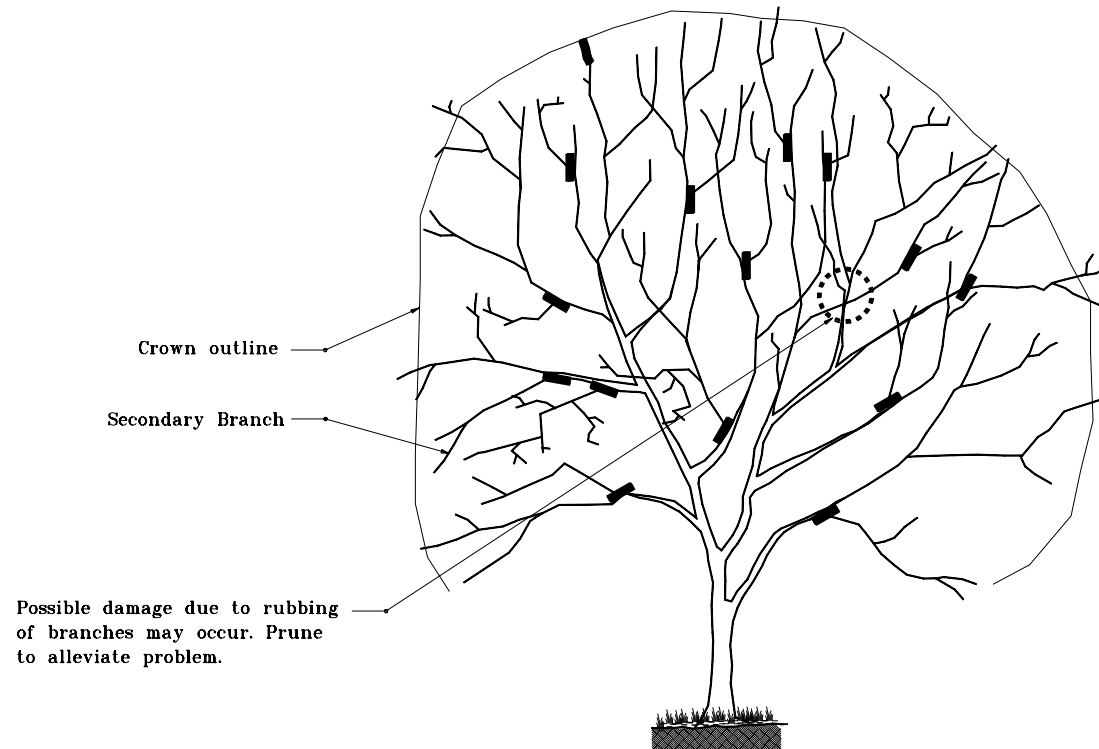
/s/ Firooz Zandi 11-15-99
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

ORIGINALLY APPROVED 4-01-95

GENERAL NOTES

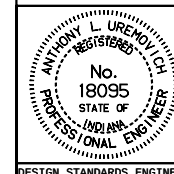
1. Pruning cuts shall be made as close as possible to remaining branch and in direction of symbol for cuts (■).
2. Cut back secondary branching to reduce foliage by a minimum of $\frac{1}{3}$ to a maximum of $\frac{1}{2}$.



INDIANA DEPARTMENT OF TRANSPORTATION

TREE PRUNING INTERMEDIATE TREE—ONE STEM APRIL 1995

STANDARD DRAWING NO. **E 622-LSPR-02**



DETAILS PLACED IN THIS FORMAT 11-15-99

/s/ Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

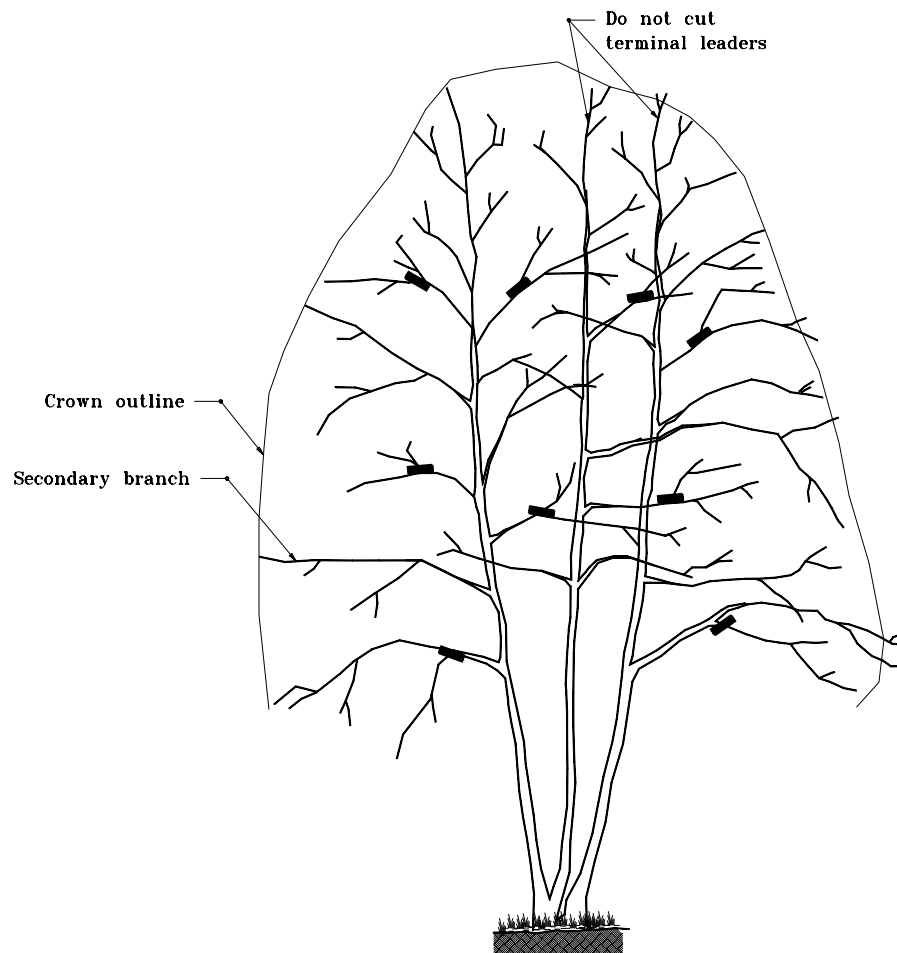
/s/ Firooz Zandi 11-15-99
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

ORIGINALLY APPROVED 4-01-95

GENERAL NOTES

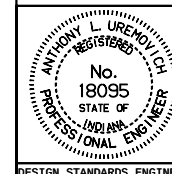
1. Pruning cuts shall be made as close as possible to remaining branch and in direction of symbol for cuts (■).
2. Cut back secondary branching to reduce foliage by a minimum of 1/3 to a maximum of 1/2



INDIANA DEPARTMENT OF TRANSPORTATION

TREE PRUNING INTERMED. TREE-MULT. STEM APRIL 1995

STANDARD DRAWING NO. **E 622-LSPR-03**



DETAILS PLACED IN THIS FORMAT 11-15-99

/s/ Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

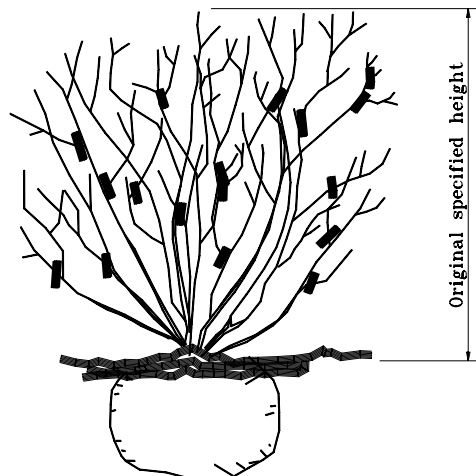
/s/ Firooz Zandi 11-15-99
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

ORIGINALLY APPROVED 4-01-95

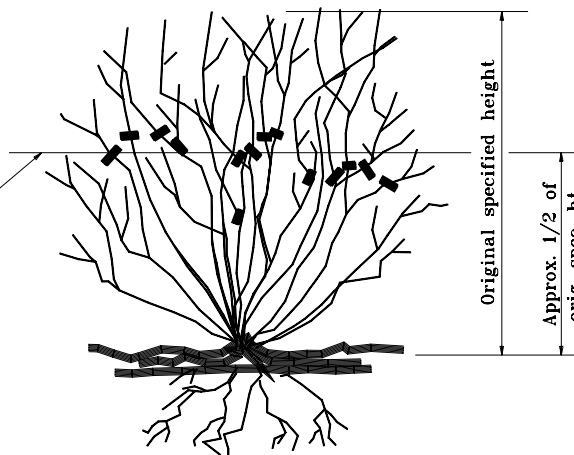
GENERAL NOTES

1. Pruning operations for balled & burlapped stock shall maintain the natural shape and characteristic branching pattern.
2. Cut back secondary branching to reduce foliage by a minimum of $1/3$ to a maximum of $1/2$.
3. Budding variations and different growth characteristic of the various shrub species may alter pruning procedures. See suggested procedure on Standard Drawing E 622-LSPR-05 which applies to most shrub species.



BALLED & BURLAPPED SHRUB

Line designating approx.
 $1/2$ of original height.



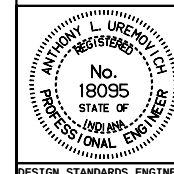
BARE ROOT SHRUB

INDIANA DEPARTMENT OF TRANSPORTATION

SHRUB PRUNING

APRIL 1995

STANDARD DRAWING NO. E 622-LSPR-04



DETAILS PLACED IN THIS FORMAT 11-15-99

/s/ Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

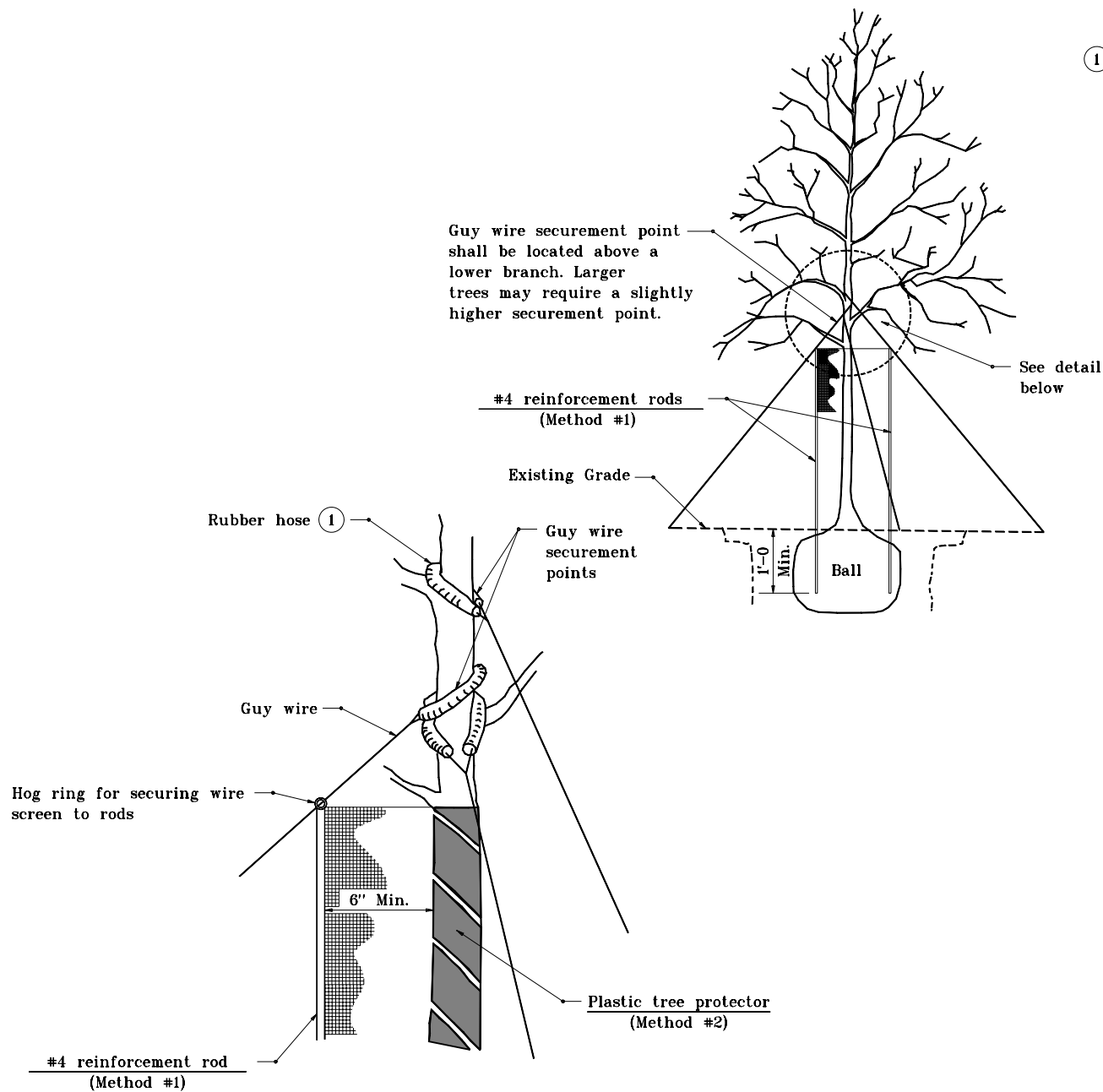
/s/ Firooz Zandi 11-15-99
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

ORIGINALLY APPROVED 4-01-95

GENERAL NOTES

- ① See Standard Drawing E 622-LSPL-04 for Rubber Hose Detail.



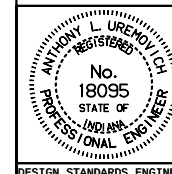
DETAIL APPLIES TO TREES 1½" CALIPER AND GREATER

INDIANA DEPARTMENT OF TRANSPORTATION

TREE PROTECTION

APRIL 1995

STANDARD DRAWING NO. E 622-LSPR-05



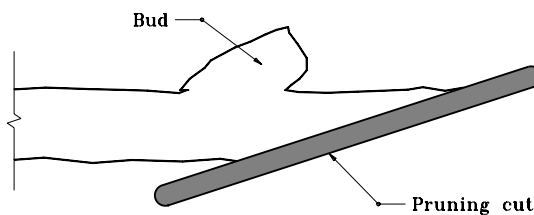
DETAILS PLACED IN THIS FORMAT 11-15-99

/s/ Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi 11-15-99
CHIEF HIGHWAY ENGINEER DATE
ORIGINALLY APPROVED 4-01-95

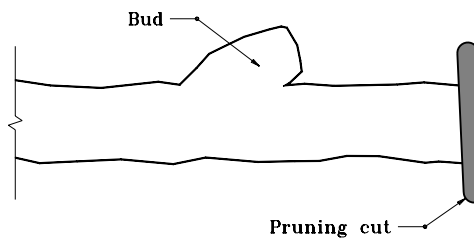
Improper Cut

Pruning cut too slanting (too much heartwood is exposed). Die-back will occur.



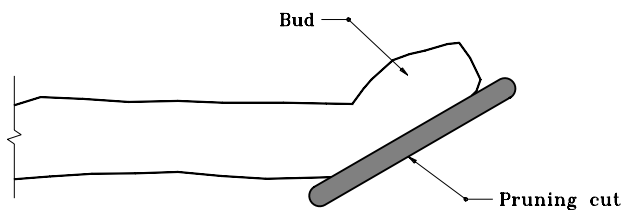
Improper Cut

Pruning cut too far beyond bud. Die-back will occur.

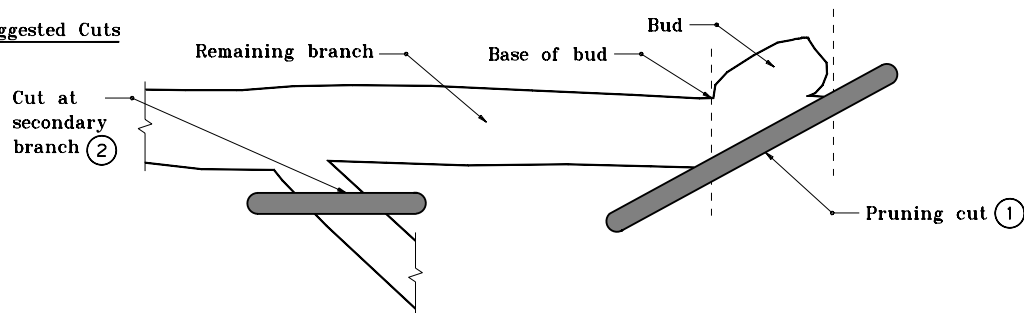


Improper Cut

Pruning cut too close to bud (will interfere with bud growth).



Suggested Cuts



GENERAL NOTES

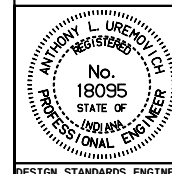
- ① Cut at bud starts opposite the base of bud and slants up toward top of bud.
- ② Cut at secondary branch shall be parallel to remaining branch.

INDIANA DEPARTMENT OF TRANSPORTATION

PRUNING PROCEDURE TREES AND SHRUBS

APRIL 1995

STANDARD DRAWING NO. E 622-LSPR-06



DETAILS PLACED IN THIS FORMAT 11-15-99

/s/ Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi 11-15-99
CHIEF HIGHWAY ENGINEER DATE

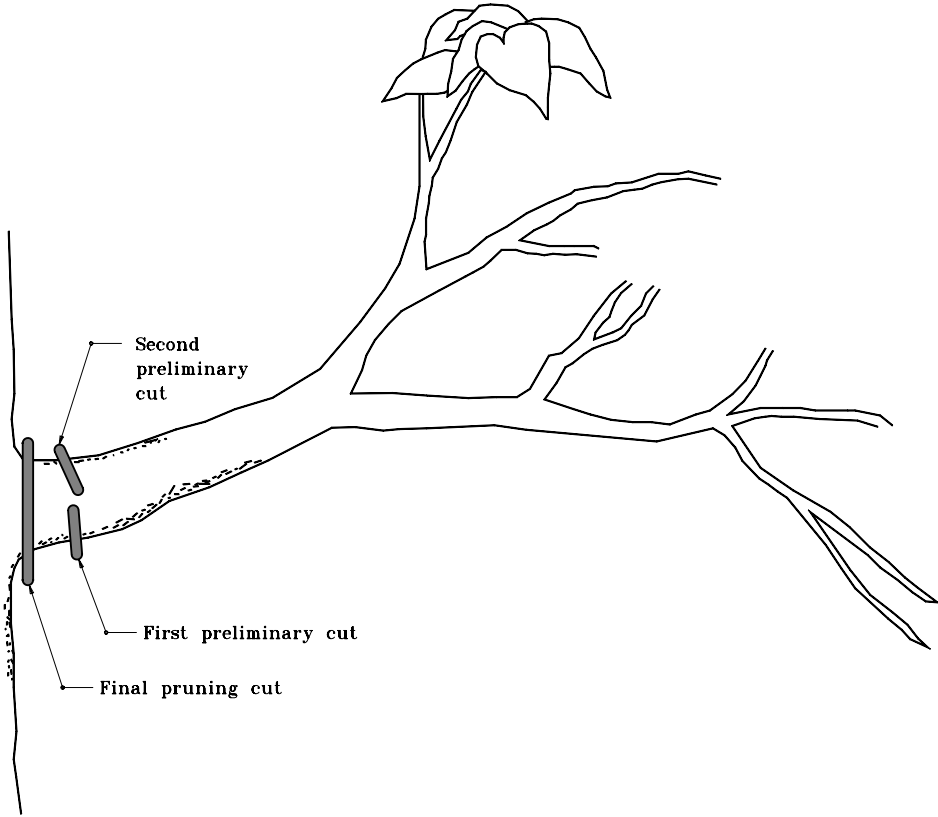
DESIGN STANDARDS ENGINEER

ORIGINALLY APPROVED

4-01-95

GENERAL NOTES

1. This is a suggested method for pruning heavier limbs. If these limbs are not properly cut, damage to adjacent portions of the tree may occur.

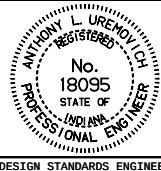


INDIANA DEPARTMENT OF TRANSPORTATION

**PRUNING PROCEDURE
HEAVIER LIMBS**

APRIL 1995

STANDARD DRAWING NO. **E 622-LSPR-07**



DETAILS PLACED IN THIS FORMAT 11-15-99

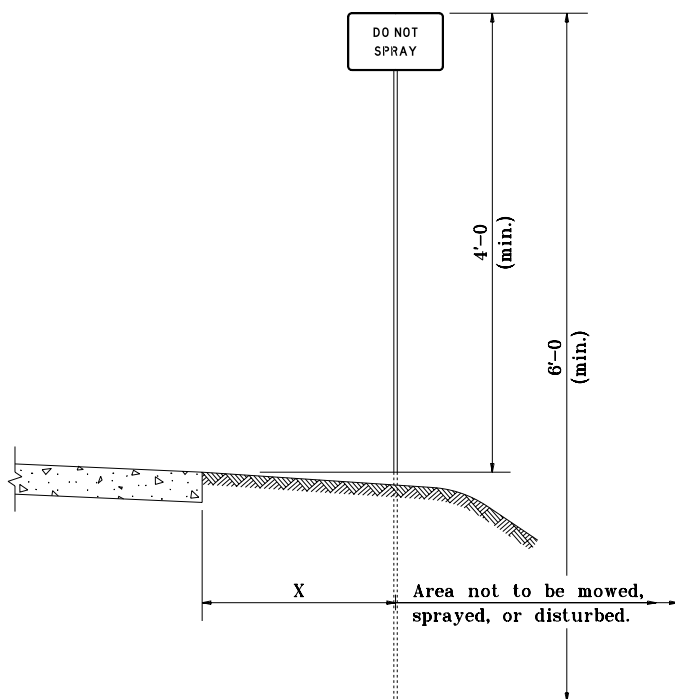
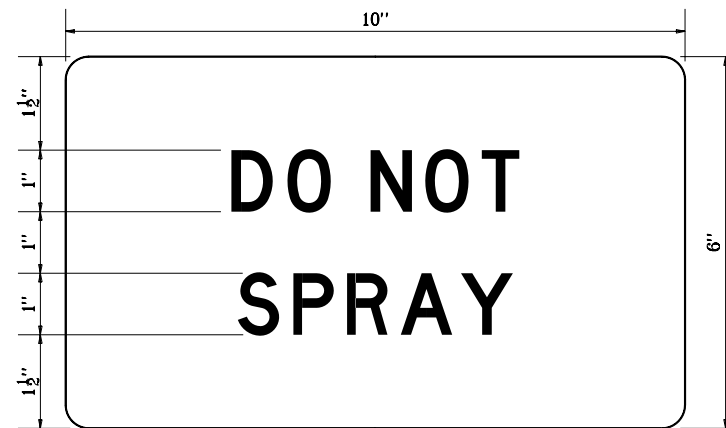
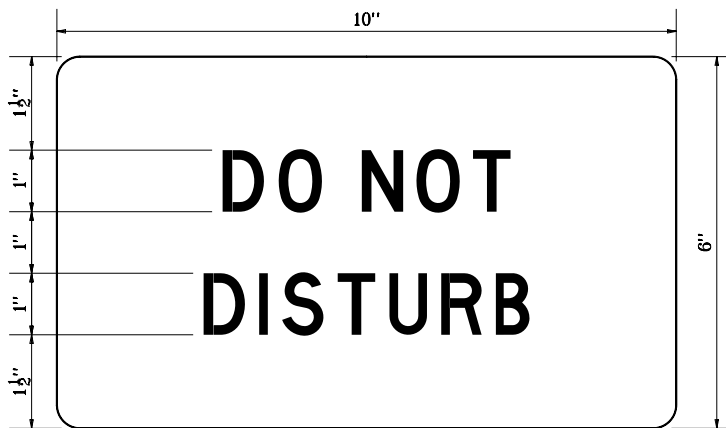
/s/ Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi 11-15-99
CHIEF HIGHWAY ENGINEER DATE

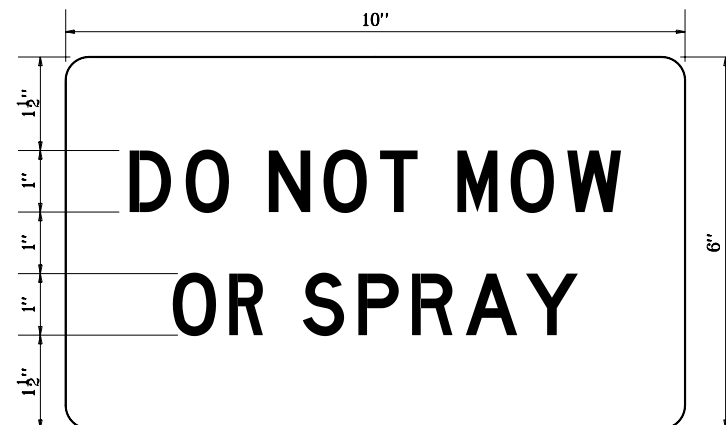
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ORIGINALLY APPROVED

4-01-95



X = Approximate distance from edge of paved shoulder to edge of area not to be mowed, sprayed, or disturbed.



INDIANA DEPARTMENT OF TRANSPORTATION	
LANDSCAPE SIGNS	
JUNE 1996	
STANDARD DRAWING NO. E 622-LSSN-01	
	DETAILS PLACED IN THIS FORMAT 11-15-99 /s/ Anthony L. Uremovich 11-15-99 DESIGN STANDARDS ENGINEER DATE /s/ Firooz Zandi 11-15-99 CHIEF HIGHWAY ENGINEER DATE DESIGN STANDARDS ENGINEER ORIGINALLY APPROVED 6-03-96