

PLANS OF PROPOSED IMPROVEMENTS TO

# HILL ROAD BRIDGE REPLACEMENT

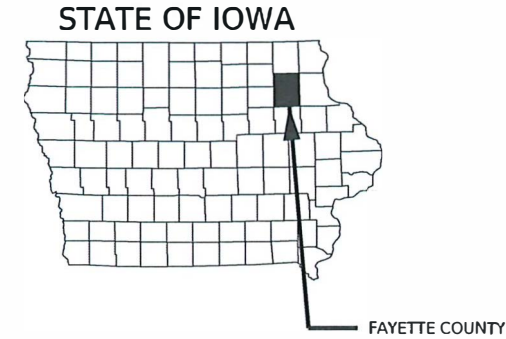
## VOLGA RIVER STATE RECREATION AREA

### FAYETTE, IOWA



WHERE PUBLIC UTILITY FIXTURES ARE SHOWN AS EXISTING ON THE PLANS OR ENCOUNTERED WITHIN THE CONSTRUCTION AREA, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE OWNERS OF THOSE UTILITIES PRIOR TO THE BEGINNING OF ANY CONSTRUCTION. THE CONTRACTOR SHALL AFFORD ACCESS TO THESE FACILITIES FOR NECESSARY MODIFICATION OF SERVICES. UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORD, AND THEREFORE THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. IT IS POSSIBLE THERE MAY BE OTHERS. THE EXISTENCE OF WHICH PRESENTLY NOT KNOWN OR SHOWN. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THEIR EXISTENCE AND EXACT LOCATION AND TO AVOID DAMAGE THERETO. NO CLAIMS FOR ADDITIONAL COMPENSATION WILL BE ALLOWED TO THE CONTRACTOR FOR ANY INTERFERENCE OR DELAY CAUSED BY SUCH WORK.

ALL CONSTRUCTION SHALL CONFORM TO THE IOWA DOT STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2015, INCLUDING GS-23003 REVISIONS, DIVISION 20-26 AND 41.



Utility Contact Information			
Utility	Contact Person	Phone	Email
Allamakee-Clayton Electric	Susan Goodman	(563) 864-7611	sgoodman@aces.coop

INDEX OF SHEETS	
No.	Description
<b>A. Sheets</b>	<b>Title Sheets</b>
A.1	Title Sheet
<b>B. Sheets</b>	<b>Typical Sections and Details</b>
B.1	Typical Sections
B.2 - B.10	Standard Road Plans
<b>C. Sheets</b>	<b>Quantities and General Information</b>
C.1	Estimated Project Quantities
C.2	Estimate Reference Notes
C.3	General Notes
<b>D. Sheets</b>	<b>Mainline Plan and Profile Sheets</b>
D.1	Roadway Plan and Profile
<b>G. Sheets</b>	<b>Survey Control and Alignment Data Sheets</b>
G.1	Survey Control and Alignment Data
<b>U. Sheets</b>	<b>Special Details</b>
U.1	Grading Plan
U.2 - U.2	Existing Bridge Plans
U.4	Soil Boring Logs
<b>V. Sheets</b>	<b>Culvert Plans</b>
V.1	Culvert Situation Plan
V.2 - V.10	Cast-In-Place RCB Culvert Standard Plans
V.11 - V.18	Precast RCB Culvert Standard Plans

PROJECT CONTACTS

ENGINEER  
SHIVE HATTERY  
DAN JENSEN, PE  
DJENSEN@SHIVE-HATTERY.COM  
OFFICE: 515-223-8104  
MOBILE: 641-373-1068

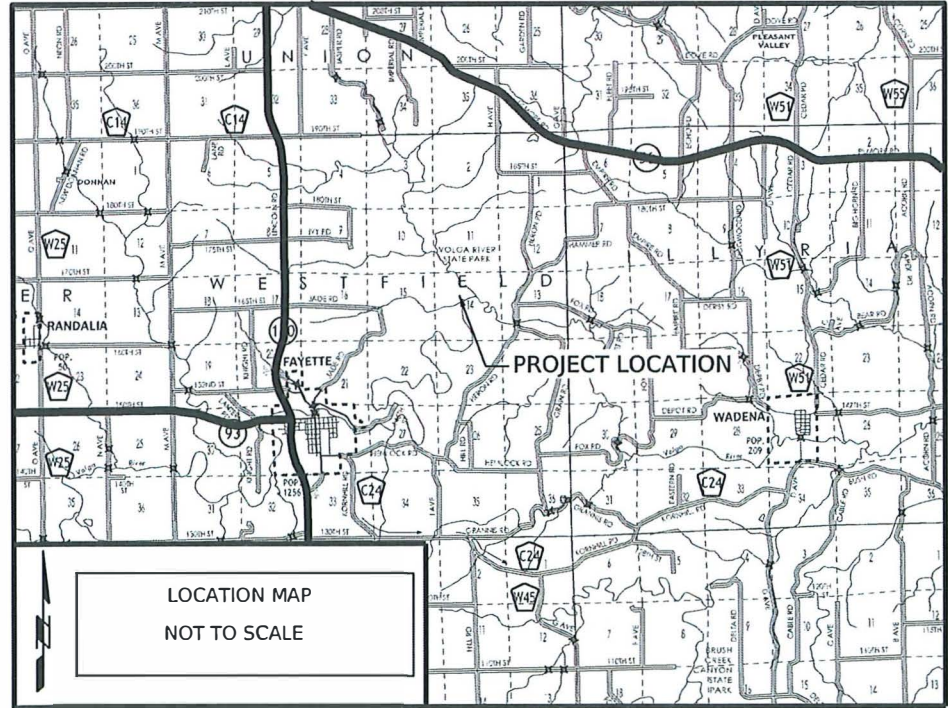
DNR CONTACT  
MANDI LU ALDRICH PETERS, PE  
MANDI.ALDRICH-PETERS@DNR.IOWA.GOV  
MOBILE: 515-205-1698

DNR CONSTRUCTION STAFF CONTACT  
KENNETH HOWE, PE  
KENNETH.HOWE@DNR.IOWA.GOV  
MOBILE: 319-240-3553

PARK MANAGER  
AUSTIN LETTE  
AUSTIN.LETTE@DNR.IOWA.GOV  
MOBILE: 515-975-8819

AUTHORIZATION TO BID

\_\_\_\_\_  
DATE



I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

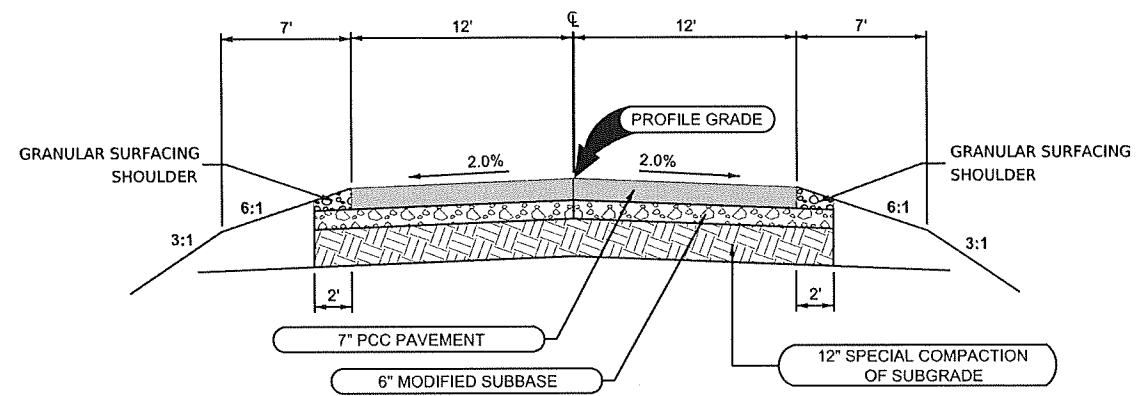
*Dan Jensen* 11-4-2024  
Signature DANIEL JENSEN Date

Printed or Typed Name  
My license renewal date is December 31, 2025

Pages or sheets covered by this seal:  
ALL SHEETS EXCEPT FOR SHEETS B.2-B.10, U.2-U.4, V.2-V.18

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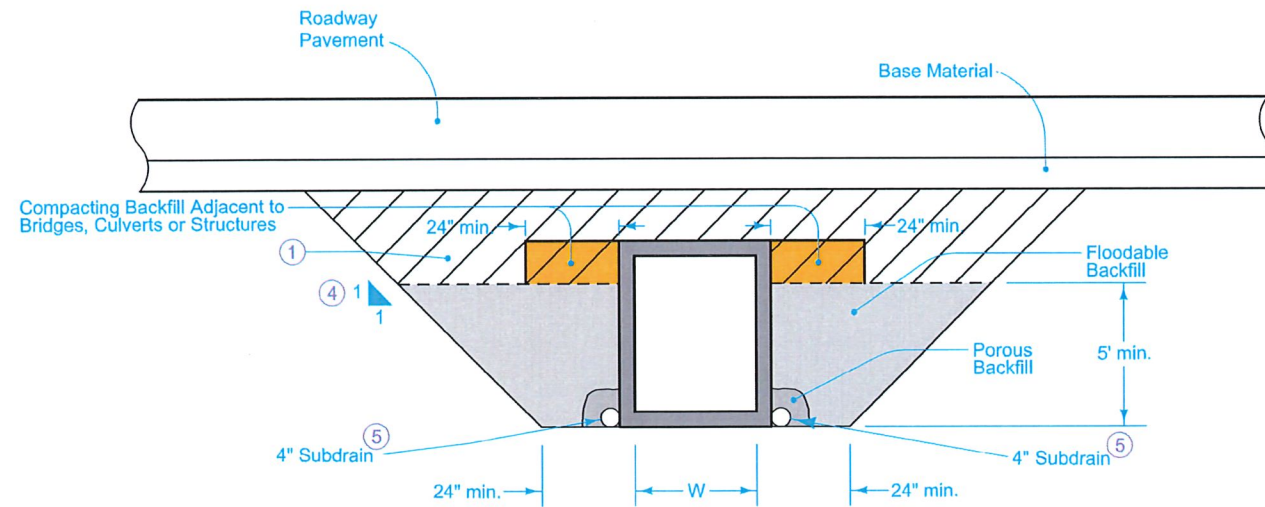
HILL ROAD TYPICAL SECTION

STATION 11+15.92 TO STATION 11+85.03

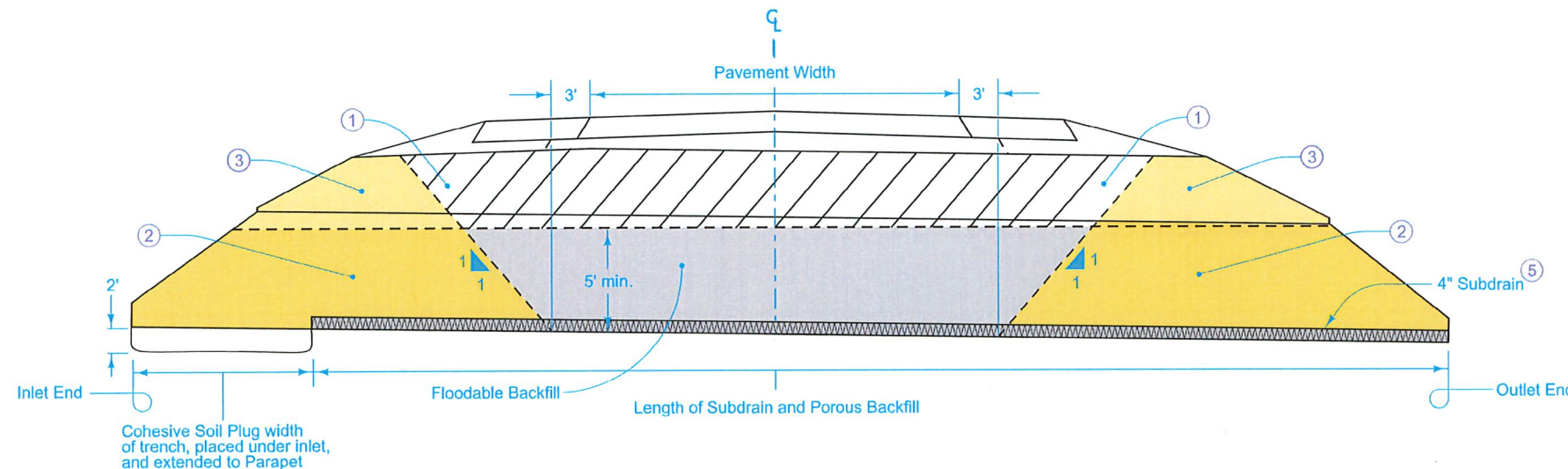
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# DESIGNER INFORMATION



**RCB INSTALLATION**



**TYPICAL SECTION - COHESIVE SOIL PLUG**

Denotes pay limits for flooded backfill

- ① Excavated material meeting the requirements of the Standard Specifications. Compact using moisture control. The Contractor has the option to use Floodable Backfill. No additional compensation will be provided if the Contractor elects to use Floodable Backfill in lieu of suitable soil.
- ② Prior to flooding, place a cohesive soil plug to the height of the floodable backfill at the inlet, outlet and sides of the culvert.
- ③ Excavated material meeting the requirements of the Standard Specifications. Compact using moisture control. If the option to use Floodable Backfill to the top of subgrade is used, extend the cohesive soil plug to the top of subgrade.
- ④ Quantity calculations for payment are based on a 1:1 slope and minimum trench dimension. Actual slope of trench may vary based upon Contractor's operations. No additional payment will be made for additional quantities resulting from use of flatter slopes.
- ⑤ Place at flowline elevation of culvert starting at parapet for inlet and outletting at end of outlet headwall wings. Cover with a minimum of 4 inches of Porous Backfill.

Possible Contract Items:  
 Flooded Backfill  
 Excavation, Class 20  
 Compaction with Moisture Control  
 Compacting Backfill Adjacent to Bridges, Culverts or Structures

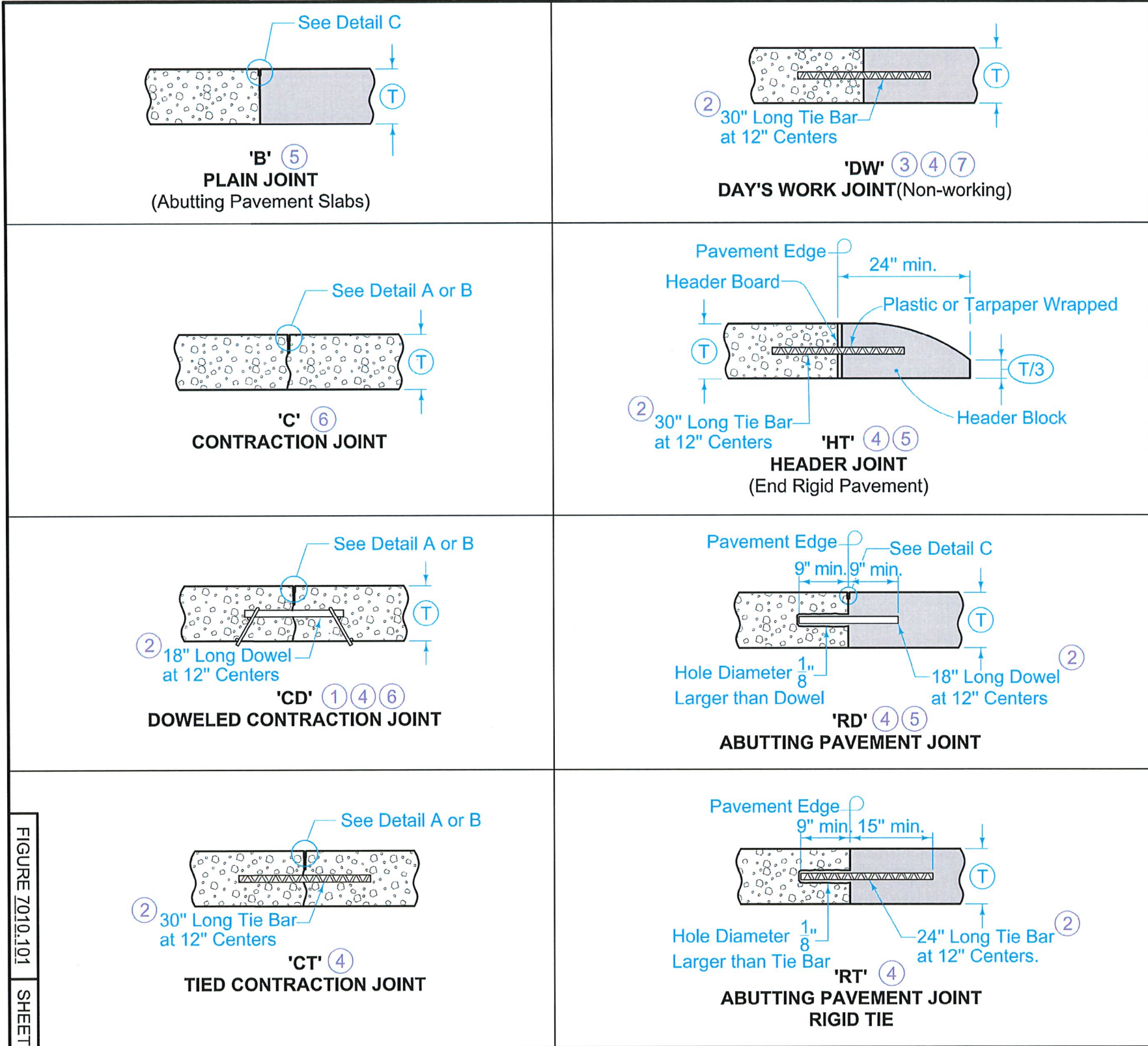
Possible Tabulations:  
 103-6  
 104-4

	REVISION
	2   04-17-18
<b>STANDARD ROAD PLAN</b>	<b>DR-111</b>
	SHEET 1 of 1
REVISIONS: Added Compacting Backfill Adjacent to Bridges, Culverts or Structures to Possible Contract Items and RCB Installation detail. Revised notes 3 and 4.	
APPROVED BY DESIGN METHODS ENGINEER	
<b>BOX CULVERT (BACKFILL)</b>	

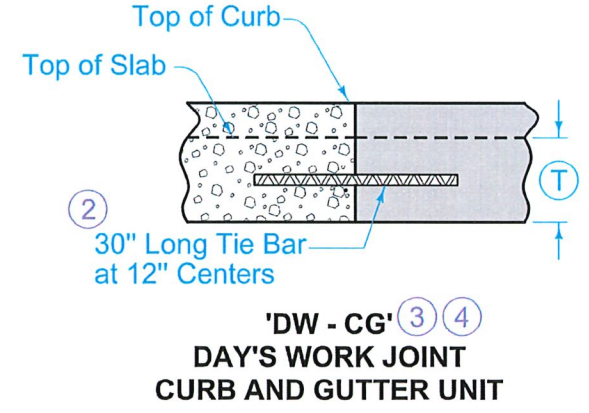
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- ① See dowel assemblies for fabrication details.
- ② See Bar Size Table for Contraction Joints on Sheet 2.
- ③ Locate 'DW' joint at a mid-panel location between future 'C' or 'CD' joints. Place no closer than 5 feet to a 'C' or 'CD' joint.
- ④ Place bars within the limits shown under dowel assemblies.
- ⑤ Edge with 1/8 inch tool for length of joint. For HT joint, remove header block and board when second slab is placed.
- ⑥ Unless specified otherwise, use 'CD' transverse contraction joints in mainline pavement when  $T$  is greater or equal to 8 inches. Use 'C' joints when  $T$  is less than 8 inches.
- ⑦ 'RT' joint may be used in lieu of 'DW' joint at the end of the days work. Remove any pavement damaged due to the drilling at no additional cost to the Contracting Authority.



LEGEND	
	Existing Pavement
	Proposed Pavement

SUDAS IOWA DOT	REVISION 11 04-19-22
	<b>PV-101</b> SHEET 1 of 8
FIGURE 7010.101 STANDARD ROAD PLAN	REVISIONS: Modified circle note 32.
<i>Paul D. Weigand</i> SUDAS DIRECTOR	<i>Steve Miller</i> DESIGN METHODS ENGINEER

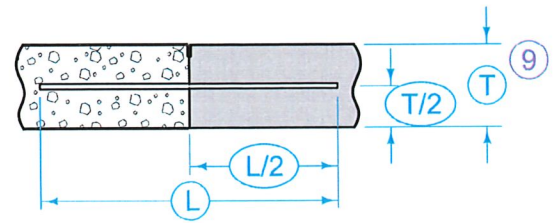
**JOINTS**

**TRANSVERSE CONTRACTION**

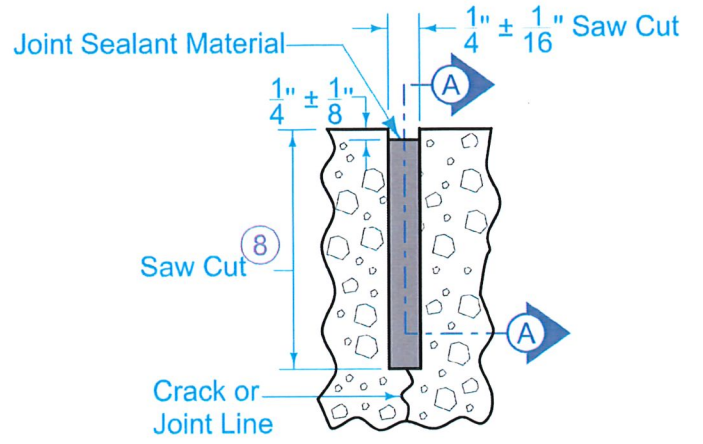
FIGURE 7010.101 SHEET 1 OF 8

NO.	REVISION DESCRIPTION	APPROVED	DATE

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**BAR PLACEMENT**  
(Applies to all joints unless otherwise detailed.)

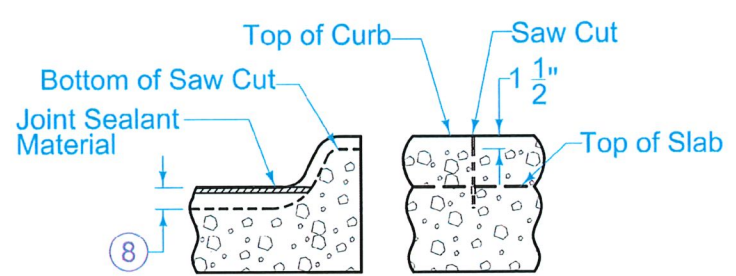


**DETAIL A**  
(Saw cut formed by conventional concrete sawing equipment.)

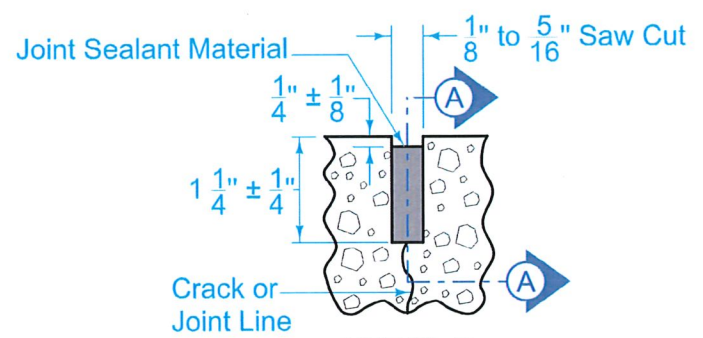
- ⑧ Saw 'CD' joint to a depth of  $T/3 \pm 1/4"$ ; saw 'C' joint to a depth of  $T/4 \pm 1/4"$ .
- ⑨ When tying into old pavement,  $\textcircled{T}$  represents the depth of sound PCC.

BAR SIZE TABLE FOR CONTRACTION JOINTS			
$\textcircled{T}$	Solid Dowel Diameter	Tubular Dowel Diameter	Tie Bar Size
< 8"	3/4"	7/8"	#6
≥ 8" but < 10"	1 1/4"	1 3/8"	#10
≥ 10"	1 1/2"	1 5/8"	#11

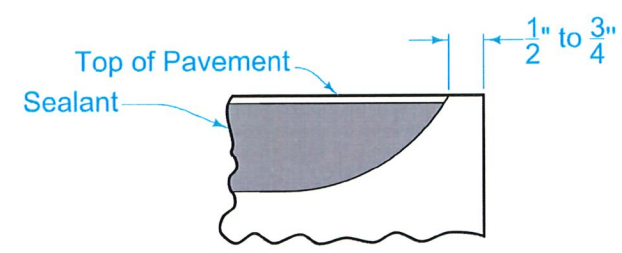
Tubular Dowel Bars will not be allowed for RD joints.



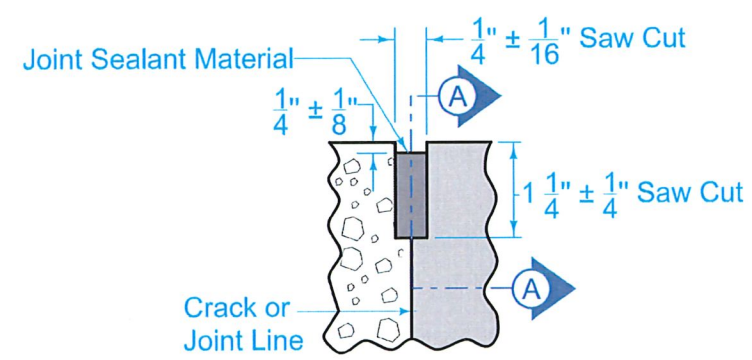
**'C' JOINT IN CURB**  
(Match 'CT', 'CD', or 'C' joint in pavement.)



**DETAIL B**  
(Saw cut formed by approved early concrete sawing equipment.)



**SECTION A-A**  
(Detail at Edge of Pavement)



**DETAIL C**

**TRANSVERSE CONTRACTION**

LEGEND	
	Existing Pavement
	Proposed Pavement

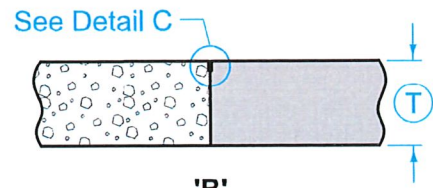
SUDAS IOWA DOT	REVISION
	11 04-19-22
FIGURE 7010.101	STANDARD ROAD PLAN
<b>PV-101</b>	
SHEET 2 of 8	
REVISIONS: Modified circle note 32.	
 SUDAS DIRECTOR	 DESIGN METHODS ENGINEER

**JOINTS**

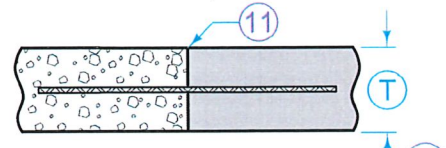
FIGURE 7010.101 SHEET 2 OF 8

NO.	REVISION DESCRIPTION	APPROVED	DATE

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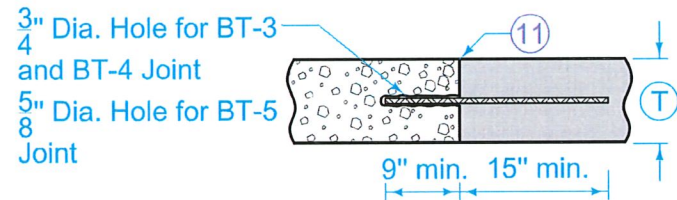


**'B'**  
**PLAIN JOINT**  
(Abutting Pavement Slabs)



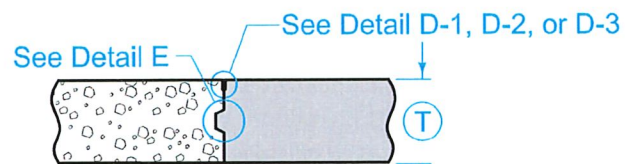
**'BT'**  
**ABUTTING PAVEMENT JOINT - RIGID TIE**

(T)	Joint	Bars	Bar Length and Spacing
< 8"	'BT-1'	#4	36" Long at 30" Centers
>= 8"	'BT-2'	#5	36" Long at 30" Centers

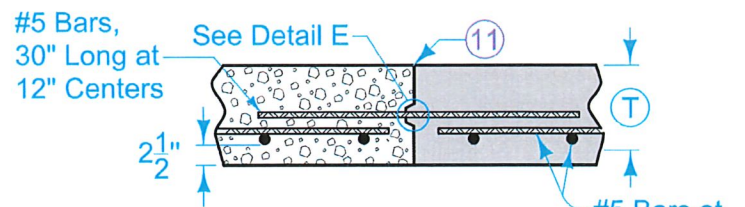


**'BT'**  
**ABUTTING PAVEMENT JOINT - RIGID TIE (Drilled)**

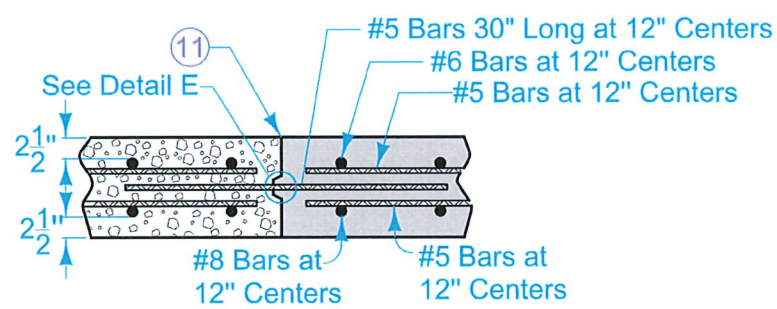
(T)	Joint	Bars	Bar Length and Spacing
< 8"	'BT-5'	#4	24" Long at 30" Centers
>= 8"	'BT-3'	#5	24" Long at 30" Centers
	'BT-4'		24" Long at 15" Centers



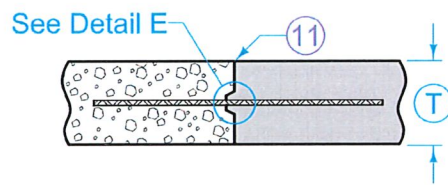
**'K'**  
**KEYED JOINT FOR ADJACENT SLABS**  
(Where T is 8" or more)



**'KS-1'**  
[Single Reinforced Pavement (Bridge Approach)]



**'KS-2'**  
[Double Reinforced Pavement (Bridge Approach)]

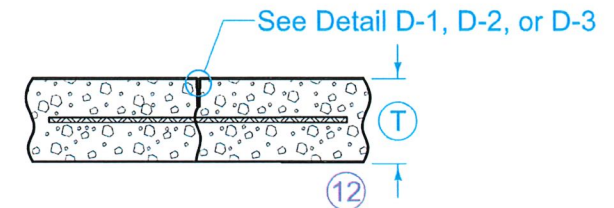


**'KT'**  
**ABUTTING PAVEMENT JOINT - KEYWAY TIE**

(T)	Joint	Bars	Bar Length and Spacing
< 8"	'KT-1'	#4	30" Long at 30" Centers
>= 8"	'KT-2'	#5	30" Long at 30" Centers
	'KT-3'		30" Long at 15" Centers

**LONGITUDINAL CONTRACTION**

- (10) Bar supports may be necessary for fixed form paving to ensure the bar remains in a horizontal position in the plastic concrete.
- (11) Sawing or sealing of joint not required.
- (12) The following joints are interchangeable, subject to the pouring sequence:  
'BT-1', 'L-1', and 'KT-1'  
'KT-2' and 'L-2'  
'KT-3' and 'L-3'



**'L'**  
**CONTRACTION JOINT**

(T)	Joint	Bars	Bar Length and Spacing
< 8"	'L-1'	#4	36" Long at 30" Centers
>= 8"	'L-2'	#5	36" Long at 30" Centers
	'L-3'		36" Long at 15" Centers

**LEGEND**

Existing Pavement

Proposed Pavement

SUDAS	IOWA DOT	REVISION	
		11	04-19-22
<b>FIGURE 7010.101</b>		<b>PV-101</b>	
STANDARD ROAD PLAN		SHEET 3 of 8	

REVISIONS: Modified circle note 32.

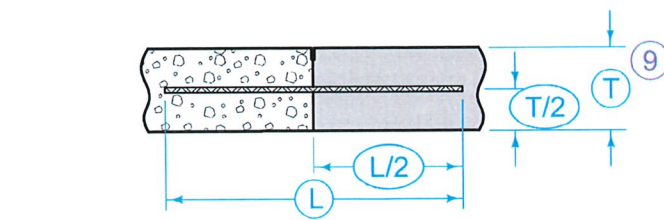
*Paul D. Wrigand* SUDAS DIRECTOR      *Shawn Miller* DESIGN METHODS ENGINEER

**JOINTS**

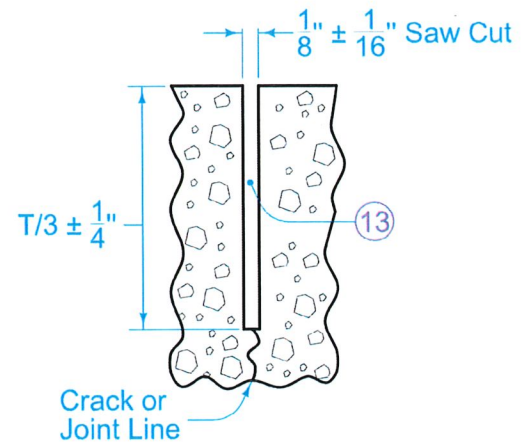
FIGURE 7010.101 SHEET 3 OF 8

NO.	REVISION DESCRIPTION	APPROVED	DATE

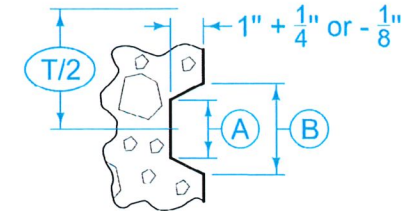
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**TIE BAR PLACEMENT**  
(Applies to all joints unless otherwise detailed.)

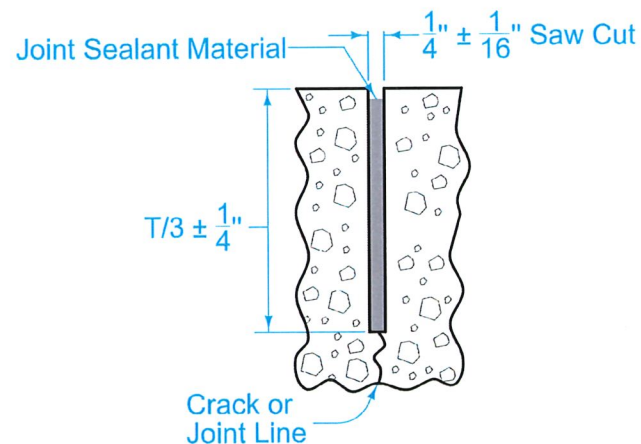


**DETAIL D-1**  
(Required when specified in the contract documents.)

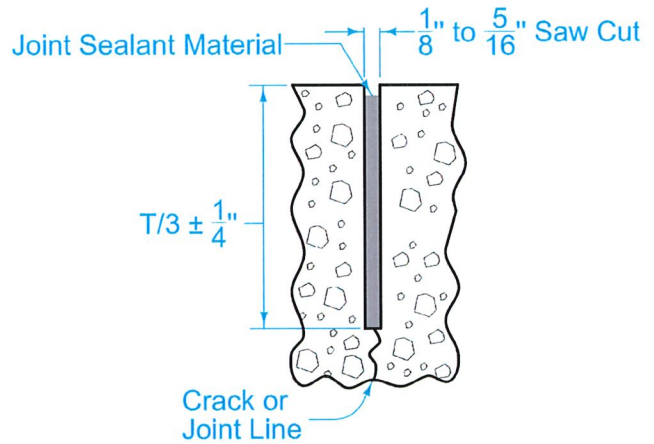


**DETAIL E**

- ⑨ When tying into old pavement, T represents the depth of sound PCC.
- ⑬ Sealant or cleaning not required.



**DETAIL D-2**  
(Required when the Department of Transportation is not the Contracting Authority, or when specified in the contract documents)



**DETAIL D-3**  
(Required when the Department of Transportation is the Contracting Authority, or when specified in the contract documents)

KEYWAY DIMENSIONS			
Keyway Type	Pavement Thickness T	A	B
Standard	8" or greater	1 3/4"	2 3/4"
Narrow	Less than 8"	1"	2"

LEGEND	
	Existing Pavement
	Proposed Pavement

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FIGURE 7010.101	STANDARD ROAD PLAN
<b>PV-101</b>	
SHEET 4 of 8	

REVISIONS: Modified circle note 32.

Paul D. Wigand  
 SUDAS DIRECTOR

Stuart Miller  
 DESIGN METHODS ENGINEER

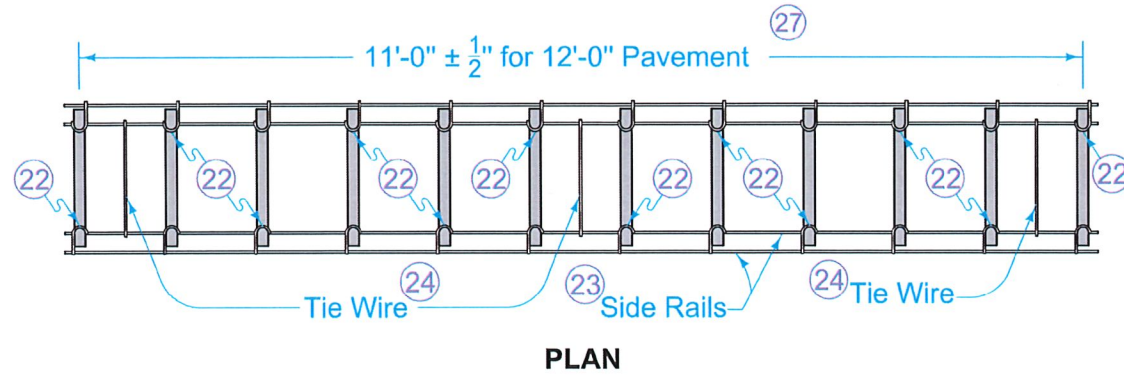
**JOINTS**

**LONGITUDINAL CONTRACTION**

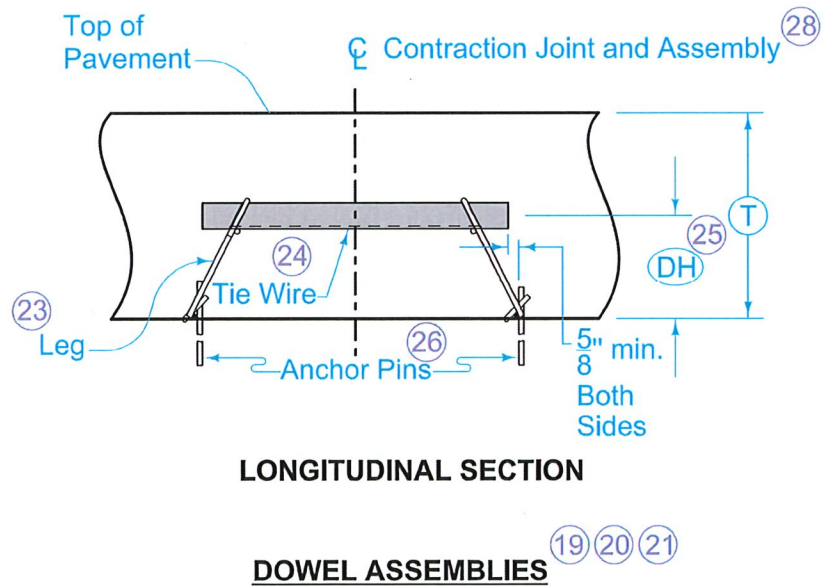
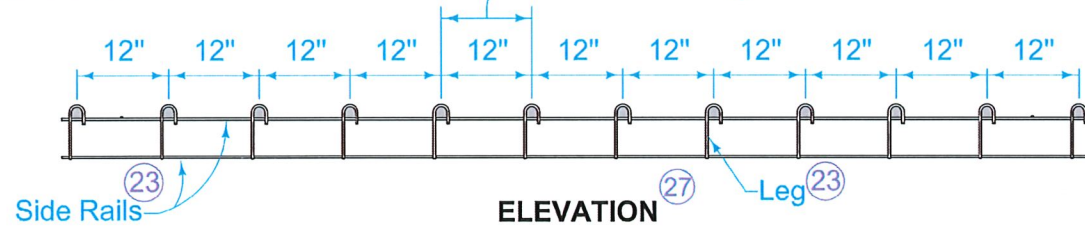
FIGURE 7010.101 SHEET 4 OF 8

NO.	REVISION DESCRIPTION	APPROVED	DATE

**CONTRACTION JOINTS**



Spaces between dowel bars are nominal dimensions with a 1/4" allowable tolerance.



DOWEL HEIGHT AND DIAMETER FOR DOWELED CONTRACTION JOINTS			
T	DH (25)	Diameter (Solid)	Diameter (Tubular)
7" to 7 1/2"	3 1/2"	3/4"	7/8"
8" to 9 1/2"	4 1/4"	1 1/4"	1 3/8"
10" to 11 1/2"	5 1/4"	1 1/2"	1 5/8"
12" to 13"	6 1/4"	1 1/2"	1 5/8"

Tubular Dowel Bars will not be allowed for RD joints.

- (19) Use 18 inch long dowel bars with a tolerance of ± 1/8 inch. Ensure the centerlines of individual dowels are parallel to the other dowels in the assembly within ± 1/8 inch.
- (20) Use wires with a minimum tensile strength of 50 ksi.
- (21) Details apply to both transverse contraction and expansion joints.
- (22) Weld alternately throughout.
- (23) 0.306 inch diameter wire. Wire sizes shown are the minimum required.
- (24) Maximum 0.177 inch diameter wire, welded or friction fit to upper side rail, both sides.
- (25) Measured from the centerline of dowel bar to bottom of lower side rail + 1/4 inch.
- (26) Per lane width, install a minimum of 8 anchor pins evenly spaced (4 per side), to prevent movement of assembly during construction. Anchor assemblies placed on pavement or PCC base with devices approved by the Engineer.
- (27) If dowel basket assemblies are required for curbed pavements, the assembly length is based on the jointing layout. See PV-101, sheet 8.
- (28) Ensure dowel basket assembly centerline is within 2 inches of the intended joint location longitudinally and has no more than 1/4 inch horizontal skew from end of basket to end of basket.

FIGURE 7010.101 SHEET 6 OF 8

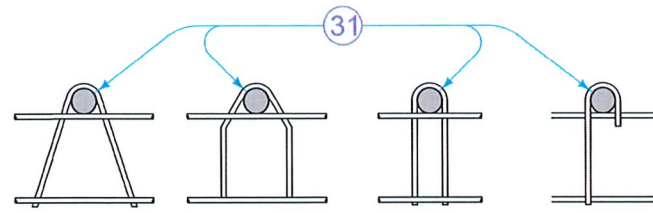
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		11	04-19-22
FIGURE 7010.101	STANDARD ROAD PLAN	PV-101	
		SHEET 6 of 8	
REVISIONS: Modified circle note 32.			
Paul D. Wrigand SUDAS DIRECTOR		Shawn Miller DESIGN METHODS ENGINEER	
<b>JOINTS</b>			

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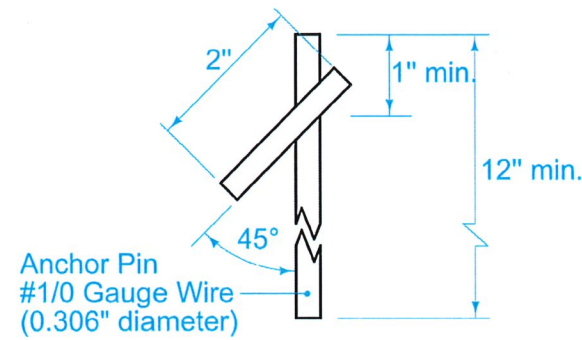
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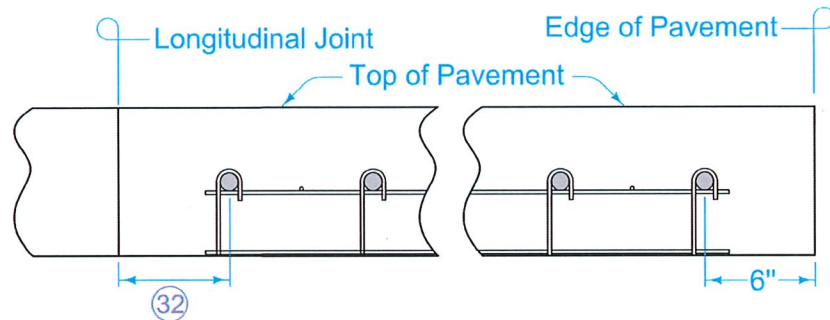


**OPTIONAL LEG SHAPES**

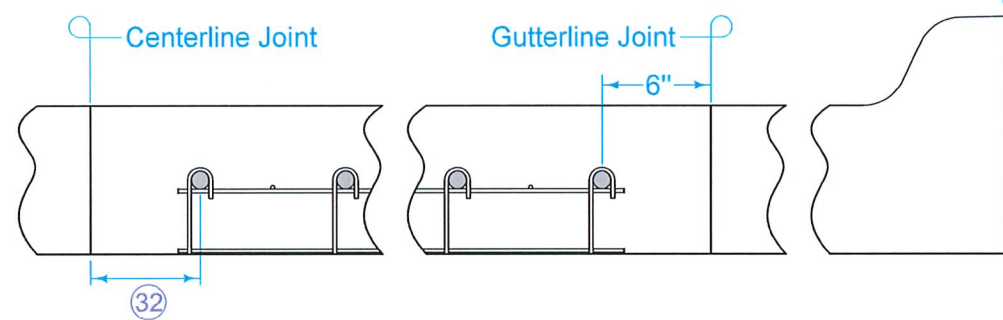


**ANCHOR PIN**

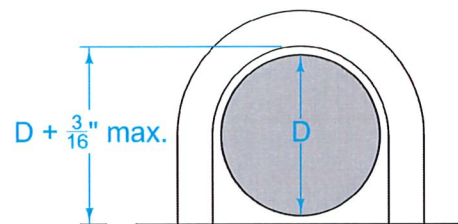
- ⑱ Use 18 inch long dowel bars with a tolerance of  $\pm 1/8$  inch. Ensure the centerlines of individual dowels are parallel to the other dowels in the assembly within  $\pm 1/8$  inch.
- ⑳ Use wires with a minimum tensile strength of 50 ksi.
- ㉑ Details apply to both transverse contraction and expansion joints.
- ㉓ Diameter of bend around dowel is dowel diameter +  $1/8$  to  $3/16$  inches.
- ㉔ For uniform lane widths: 3 to 6 inches. For taper and variable width pavements: 3 to 12 inches.



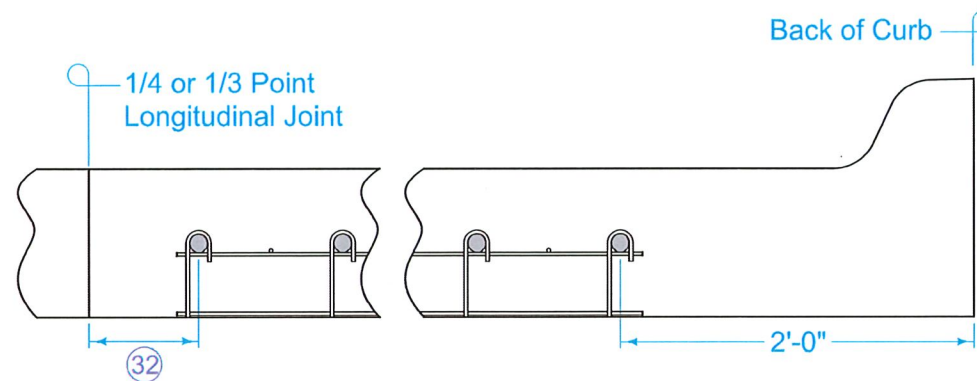
**PLACEMENT LIMITS  
(Rural Section)**



**PLACEMENT LIMITS  
(Curb and Gutter - Gutterline Jointing)**



**BEND AROUND DOWEL**



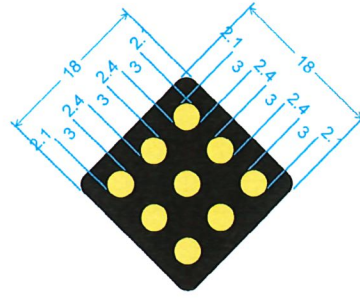
**PLACEMENT LIMITS  
(Curb and Gutter - 1/4 or 1/3 Point Jointing)**

**DOWEL ASSEMBLIES** ⑱ ⑳ ㉑

FIGURE 7010.101 SHEET 8 OF 8

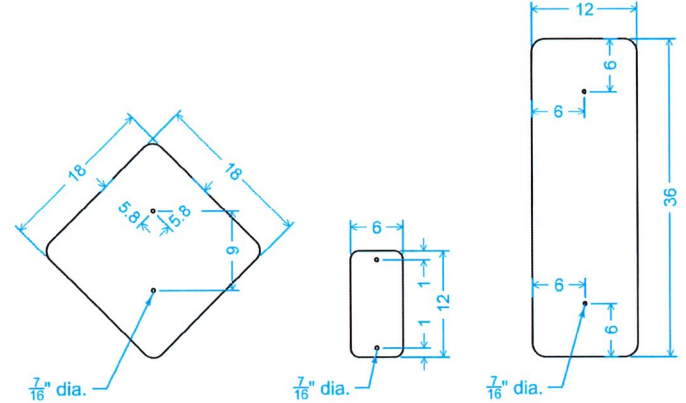
SUDAS	IOWA DOT	REVISION	
		11	04-19-22
FIGURE 7010.101	STANDARD ROAD PLAN	<b>PV-101</b>	
		SHEET 8 of 8	
REVISIONS: Modified circle note 32.			
<i>Paul D. Wigand</i> SUDAS DIRECTOR		<i>Shawn Nicks</i> DESIGN METHODS ENGINEER	
<b>JOINTS</b>			

NO.	REVISION DESCRIPTION	APPROVED	DATE

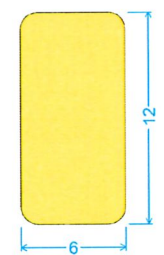


OM1-2;  
1.5" Radius, No border, Black

**TYPE 1 OBJECT MARKER**

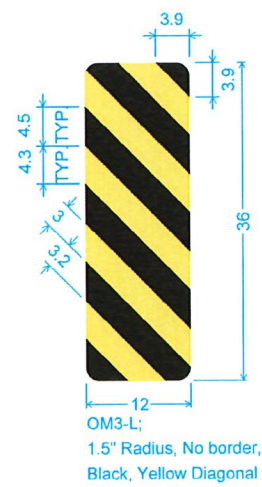


**SIGN BLANKS**

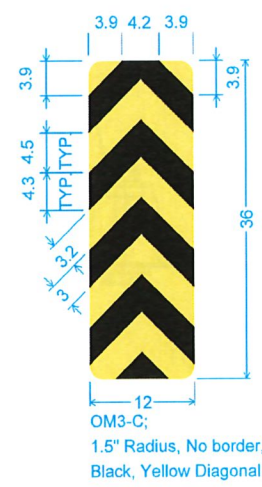


OM2-2;  
1" Radius, No border, Yellow

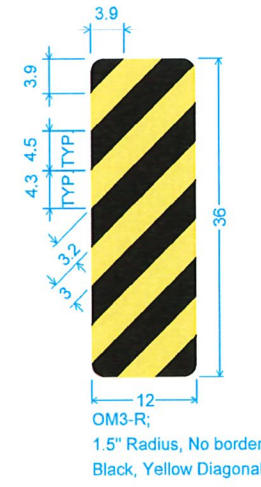
**TYPE 2 OBJECT MARKER**



OM3-L;  
1.5" Radius, No border,  
Black, Yellow Diagonal

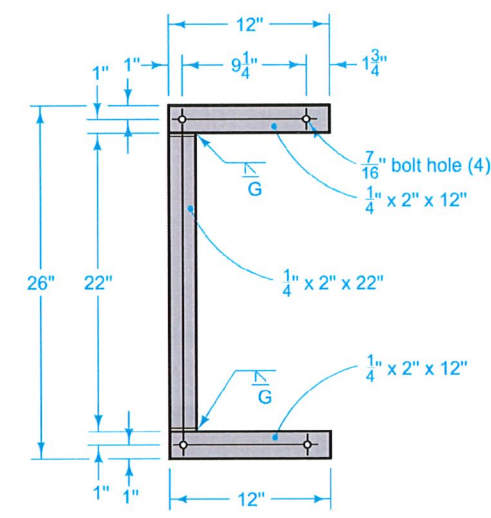


OM3-C;  
1.5" Radius, No border,  
Black, Yellow Diagonal



OM3-R;  
1.5" Radius, No border,  
Black, Yellow Diagonal

**TYPE 3 OBJECT MARKERS**



**OFFSET BRACKET**  
Galvanize in accordance with AASHTO M 111.

Fabricate object markers from materials complying with Section 4186 of the Standard Specifications.

Buttons on Type 1 Object Markers may consist of yellow reflectors or yellow reflective sheeting. Do not mix types on any single object marker. When reflectors are used, attach to sign blank with an aluminum, brazier head, blind rivet of  $\frac{3}{16}$  inch diameter and a grip range of  $\frac{1}{8}$  to  $\frac{3}{8}$  inches.

Install object markers truly vertical.

Ensure top of post does not extend above top of object marker.

Possible Contract Item:  
Object Marker

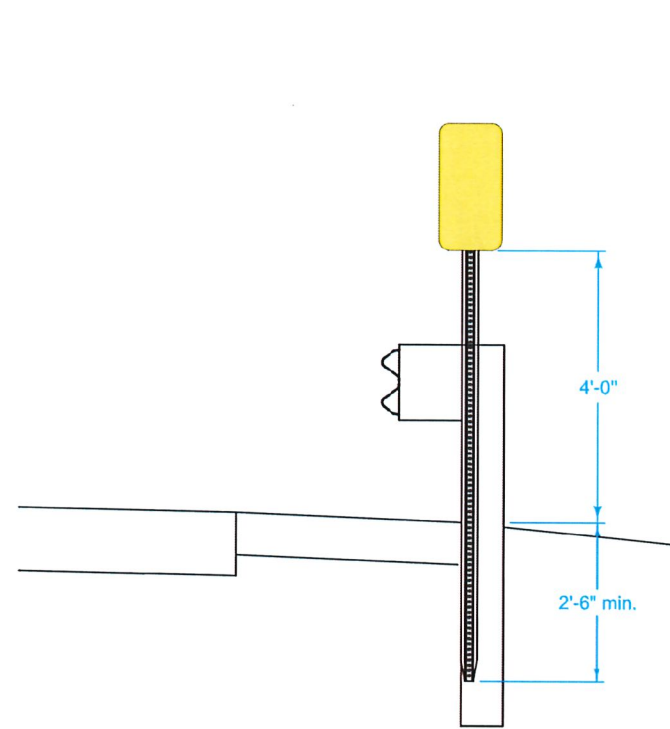
Possible Tabulation:  
190-25

	REVISION	
	1	04-19-16
	<b>SI-173</b> SHEET 1 of 2	
REVISIONS:	Removed OM1-1, OM1-3, and .063" aluminum call out on page 1. Modified general notes, drawing labels, and changed dimensions to 1 pt of accuracy.	
APPROVED BY DESIGN METHODS ENGINEER 		
<b>OBJECT MARKERS</b>		

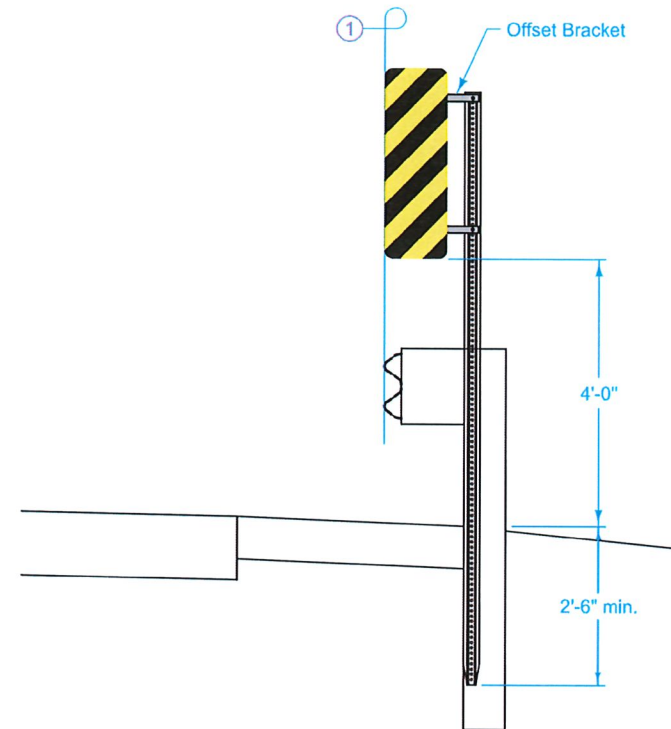
M:\Projects\DM\2142305960\Deliverables\Drawings\1\_Civil\plans\B\_Typical Sections and Details\B-SHEETS.dgn 11/4/2024 2:56:36 PM

NO.	REVISION DESCRIPTION	APPROVED	DATE

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**TYPE 2**



**TYPE 3**

**INSTALLATION AT GUARDRAIL LOCATIONS**

① Install Type 3 Object Markers so the inside edge of the marker is in line with the inner edge of the obstruction.

② Attach object marker or offset bracket to the delineator post at two locations. Use the following per bolt hole location:

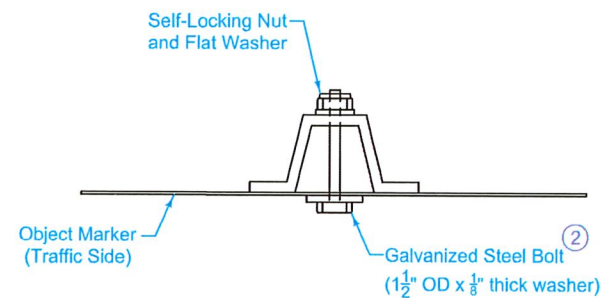
-one galvanized  $\frac{5}{16}$  in. dia x  $2\frac{1}{4}$  in. length hex head bolt with matching self locking nut.

-galvanized steel washer,  $\frac{11}{32}$ " ID,  $1\frac{1}{2}$ " OD,  $\frac{1}{8}$ " thick under the head of the bolt.

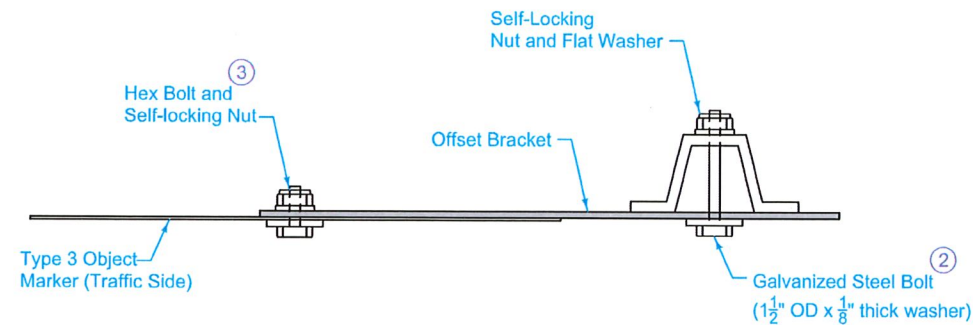
③ When Type 3 Object Marker is installed on an offset bracket, attach marker to bracket at two locations. Use the following per bolt hole location:

-one  $\frac{5}{16}$  in. dia x  $1\frac{1}{2}$  in. length hex head bolt with matching self locking nut.

-galvanized steel washer,  $\frac{11}{32}$ " ID,  $1\frac{1}{2}$ " OD,  $\frac{1}{8}$ " thick under the head of the bolt.



**STANDARD ATTACHMENT**



**OFFSET BRACKET ATTACHMENT**

 <b>STANDARD ROAD PLAN</b>	REVISION	
	1	04-19-16
	<b>SI-173</b> SHEET 2 of 2	
REVISIONS: Removed OM1-1, OM1-3, and .063" aluminum call out on page 1. Modified general notes, drawing labels, and changed dimensions to 1 pt of accuracy.		
 APPROVED BY DESIGN METHODS ENGINEER		
<b>OBJECT MARKERS</b>		

NO.	REVISION DESCRIPTION	APPROVED	DATE