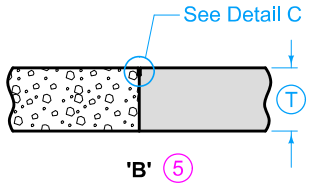
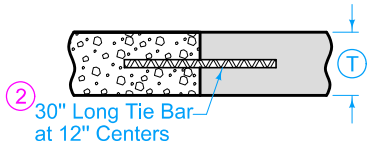
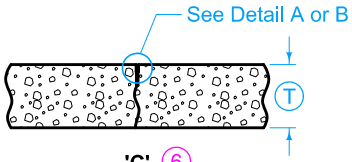


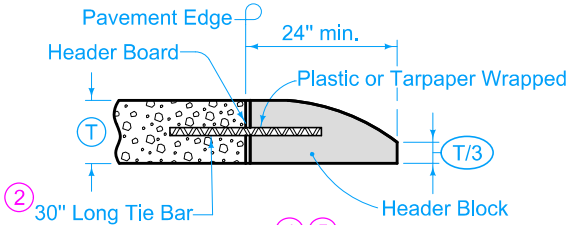
'B' (5)
PLAIN JOINT
(Abutting Pavement Slabs)



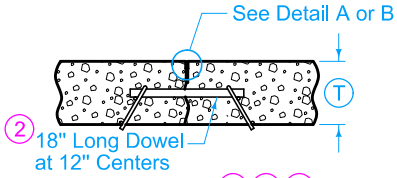
'DW' (3)(4)(7)
DAY'S WORK JOINT(Non-working)



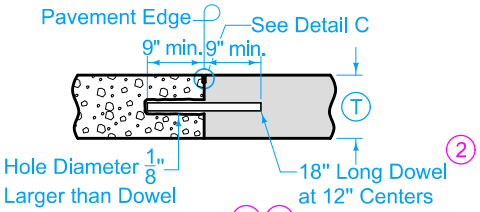
'C' (6)
CONTRACTION JOINT



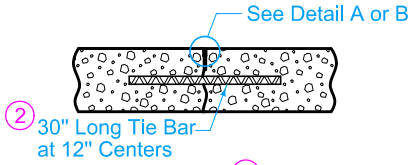
'HT' (4)(5)
HEADER JOINT
(End Rigid Pavement)



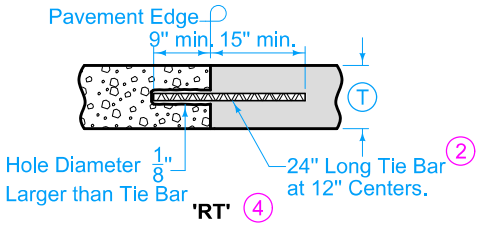
'CD' (1)(4)(6)
DOWELED CONTRACTION JOINT



'RD' (4)(5)
ABUTTING PAVEMENT JOINT



'CT' (4)
TIED CONTRACTION JOINT



'RT' (4)
ABUTTING PAVEMENT JOINT
RIGID TIE

TRANSVERSE CONTRACTION

(1) See dowel assemblies for fabrication details.

(2) See Bar Size Table for Contraction Joints on Sheet 2.

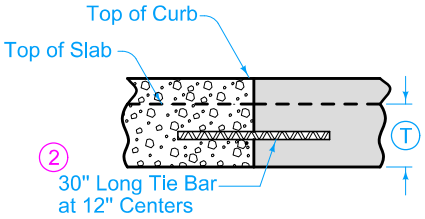
(3) Locate 'DW' joint at a mid-panel location between future 'C' or 'CD' joints. Place no closer than 5 feet to a 'C' or 'CD' joint.

(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.



'DW - CG' (3)(4)
DAY'S WORK JOINT
CURB AND GUTTER UNIT

LEGEND
Existing Pavement
Proposed Pavement

SUDAS | IOWA DOT

REVISION	
10	04-21-20

FIGURE 7010.101 | STANDARD ROAD PLAN | PV-101

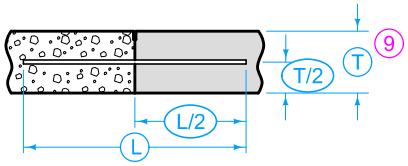
SHEET 1 of 8

REVISIONS: Modified Dowel Assemblies on Sheets 6 and 7 to eliminate reference to 14' pavements.

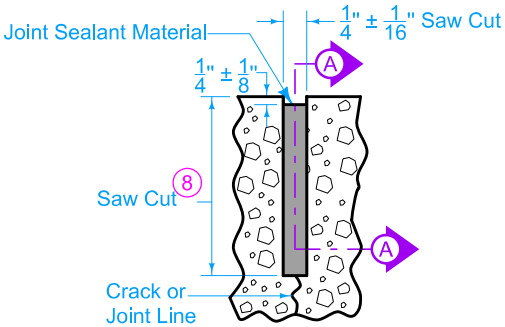
Paul D. Wiegand — SUDAS DIRECTOR
Steven Nichols — DESIGN METHODS ENGINEER

JOINTS

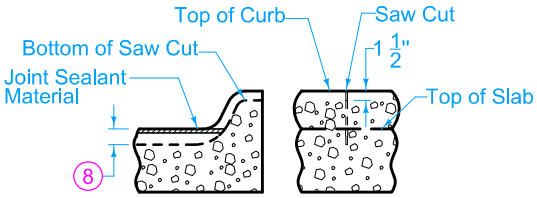
FIGURE 7010.101 | SHEET 1 OF 8



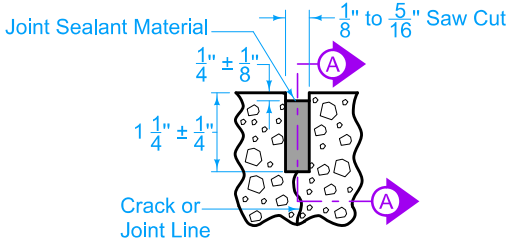
BAR PLACEMENT
(Applies to all joints unless otherwise detailed.)



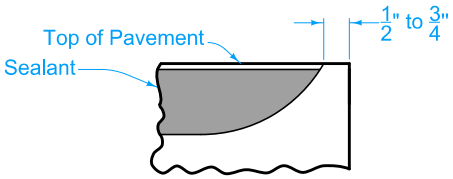
DETAIL A
(Saw cut formed by conventional concrete sawing equipment.)



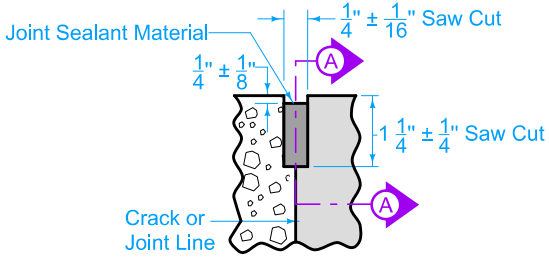
'C' JOINT IN CURB
(Match 'CT', 'CD', or 'C' joint in pavement.)



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



SECTION A-A
(Detail at Edge of Pavement)



DETAIL C

8 Saw 'CD' joint to a depth of T/3 ± 1/4"; saw 'C' joint to a depth of T/4 ± 1/4".

9 When tying into old pavement, T represents the depth of sound PCC.

BAR SIZE TABLE FOR CONTRACTION JOINTS			
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.			

LEGEND
Existing Pavement
Proposed Pavement

TRANSVERSE CONTRACTION

SUDAS | IOWA DOT | REVISION 10 04-21-20

FIGURE 7010.101 | STANDARD ROAD PLAN | PV-101

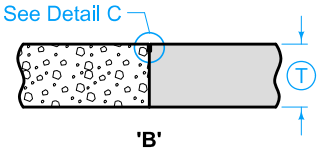
SHEET 2 of 8

REVISIONS: Modified Dowel Assemblies on Sheets 6 and 7 to eliminate reference to 14' pavements.

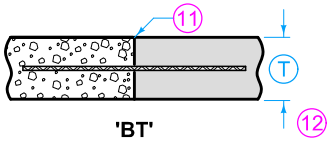
SUDAS DIRECTOR | DESIGN METHODS ENGINEER

JOINTS

FIGURE 7010.101 SHEET 2 OF 8

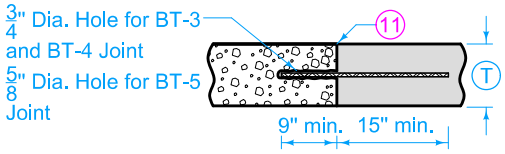


'B'
PLAIN JOINT
(Abutting Pavement Slabs)



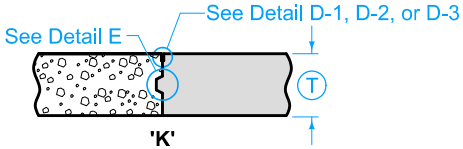
'BT'
ABUTTING PAVEMENT JOINT - RIGID TIE

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

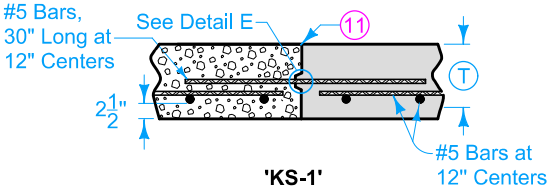


'BT'
ABUTTING PAVEMENT JOINT - RIGID TIE (Drilled)

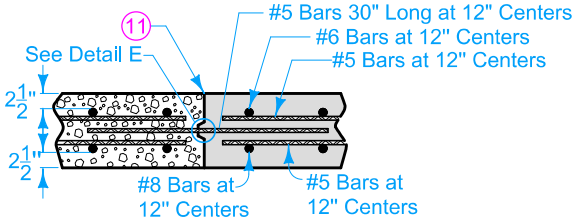
T	Joint	Bars	Bar Length and Spacing
< 8"	'BT-5'	#4	24" Long at 30" Centers
≥ 8"	'BT-3'	#5	24" Long at 30" Centers
	'BT-4'		24" Long at 15" Centers



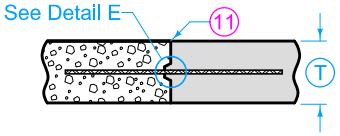
'K'
KEYED JOINT FOR ADJACENT SLABS
(Where T is 8" or more)



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



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



'KT' 10 12
ABUTTING PAVEMENT JOINT - KEYWAY TIE

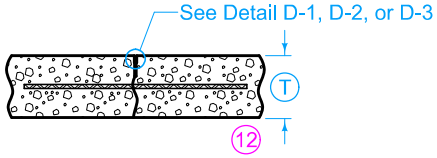
T	Joint	Bars	Bar Length and Spacing
< 8"	'KT-1'	#4	30" Long at 30" Centers
≥ 8"	'KT-2'	#5	30" Long at 30" Centers
	'KT-3'		30" Long at 15" Centers

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

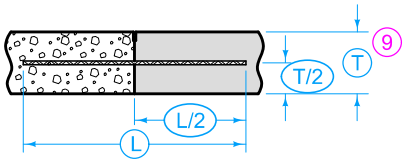
SUDAS | IOWA DOT | REVISION 10 04-21-20
FIGURE 7010.101 | STANDARD ROAD PLAN | PV-101
SHEET 3 of 8

REVISIONS: Modified Dowel Assemblies on Sheets 6 and 7 to eliminate reference to 14' pavements.

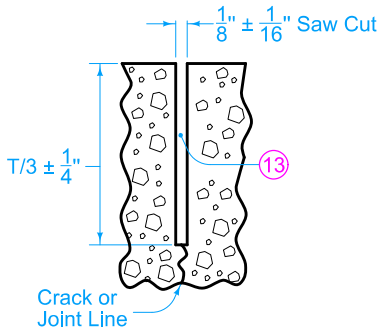
Paul D. Wiegand — SUDAS DIRECTOR
Steven Nichols — DESIGN METHODS ENGINEER

JOINTS

FIGURE 7010.101 | SHEET 3 OF 8



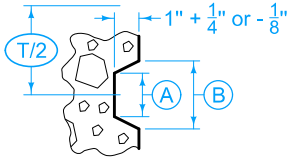
TIE BAR PLACEMENT
(Applies to all joints unless otherwise detailed.)



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

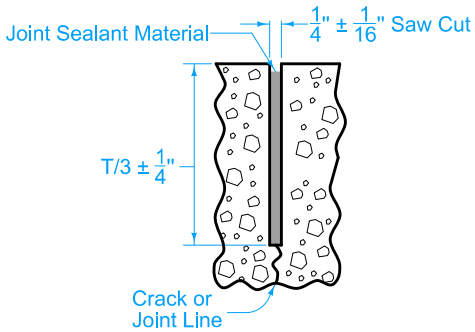
9 When tying into old pavement, T represents the depth of sound PCC.

13 Sealant or cleaning not required.

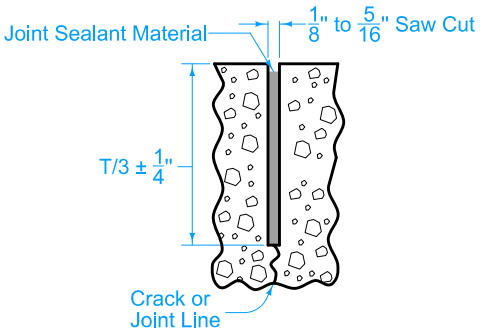


DETAIL E

KEYWAY DIMENSIONS			
Keyway Type	Pavement Thickness T	A	B
Standard	8" or greater	$1\frac{3}{4}$"	$2\frac{3}{4}$"
Narrow	Less than 8"	1"	2"



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)

LEGEND
Existing Pavement
Proposed Pavement

SUDAS | IOWA DOT | REVISION 10 04-21-20

FIGURE 7010.101 | STANDARD ROAD PLAN | PV-101

SHEET 4 of 8

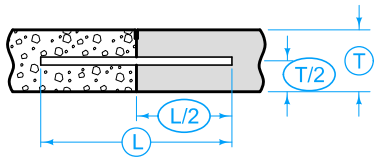
REVISIONS: Modified Dowel Assemblies on Sheets 6 and 7 to eliminate reference to 14' pavements.

SUDAS DIRECTOR | DESIGN METHODS ENGINEER

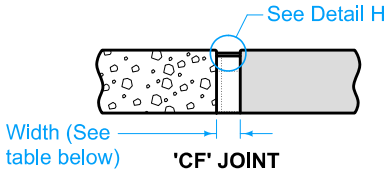
LONGITUDINAL CONTRACTION

JOINTS

FIGURE 7010.101 SHEET 4 OF 8

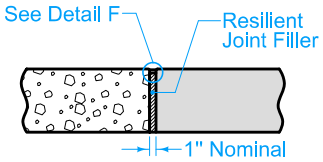


DOWEL PLACEMENT
(Applies to all joints unless otherwise detailed.)

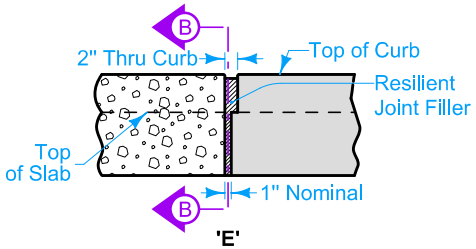


'CF' JOINT

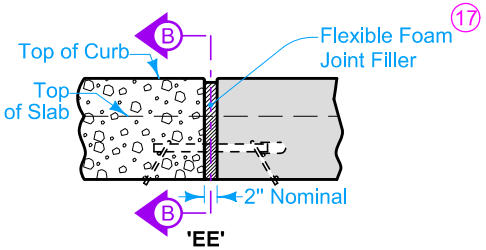
TYPE	WIDTH
CF-1	2"
CF-2	$2\frac{1}{2}$"
CF-3	3"
CF-4	$3\frac{1}{2}$"



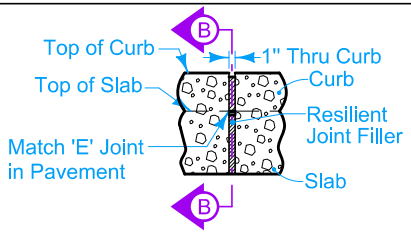
'E'
1" EXPANSION JOINT



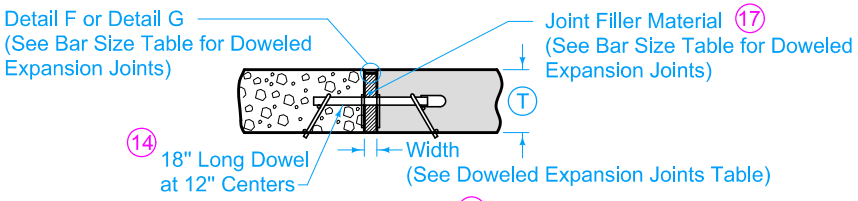
'E'
JOINT IN CURB
(View at Back of Curb)



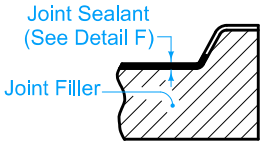
'EE'
JOINT IN CURB
(View at Back of Curb)



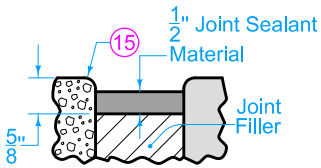
'ES'
JOINT IN CURB
(View at Back of Curb)



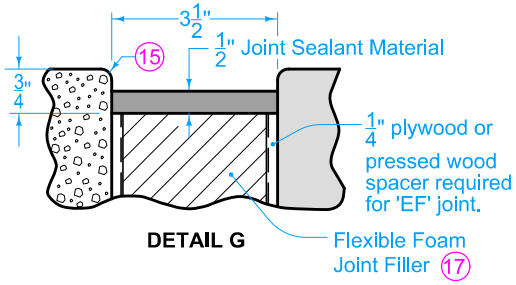
'ED', 'EE', 'EF' 16
DOWELED EXPANSION JOINT



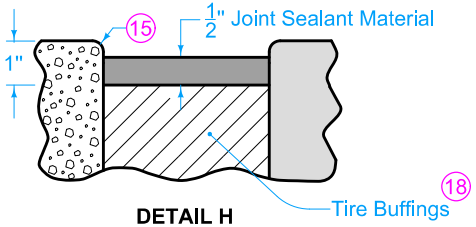
SECTION B-B



DETAIL F



DETAIL G



DETAIL H

EXPANSION

14 See Bar Size Table for Doweled Expansion Joints.

15 Edge with 1/4 inch tool for length of joint indicated if formed; edging not required when cut with diamond blade saw.

16 See Dowel Assemblies for fabrication details and placement limits. Coat the free end of dowel bar to prevent bond with pavement. At intake locations, dowel bars may be cast-in-place.

17 Predrill or preform holes in joint material for appropriate dowel size.

18 Compact tire buffings by spading with a square-nose shovel.

DOWELED EXPANSION JOINTS		
TYPE	WIDTH	FILLER MATERIAL 17
ED	1"	Resilient (Detail F)
EE	2"	Flexible Foam (Detail F)
EF	$3\frac{1}{2}$"	Flexible Foam (Detail G)

BAR SIZE TABLE FOR DOWELED EXPANSION JOINTS			
T	< 8"	≥ 8" but < 10"	≥ 10"
Dowel Diameter	$\frac{3}{4}$"	$1\frac{1}{4}$"	$1\frac{1}{2}$"
Tubular Dowel Bars will not be allowed for expansion joints.			

LEGEND
Existing Pavement
Proposed Pavement

SUDAS | IOWA DOT

REVISION	
10	04-21-20

FIGURE 7010.101 | STANDARD ROAD PLAN | PV-101
SHEET 5 of 8

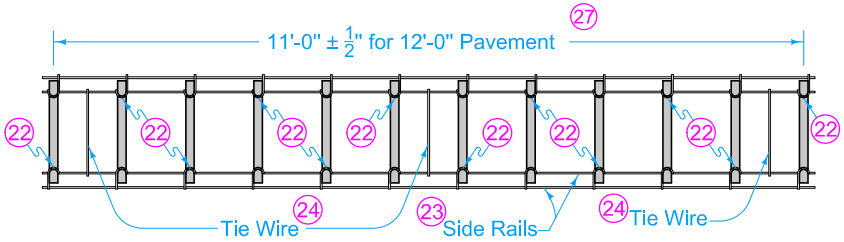
REVISIONS: Modified Dowel Assemblies on Sheets 6 and 7 to eliminate reference to 14' pavements.

SUDAS DIRECTOR | DESIGN METHODS ENGINEER

JOINTS

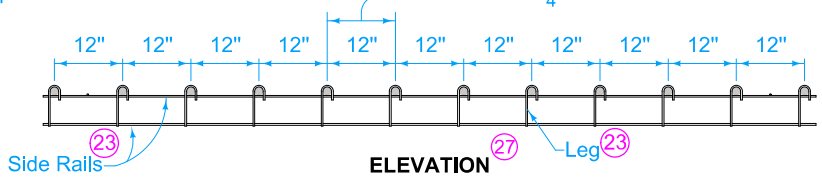
FIGURE 7010.101 | SHEET 5 OF 8

CONTRACTION JOINTS

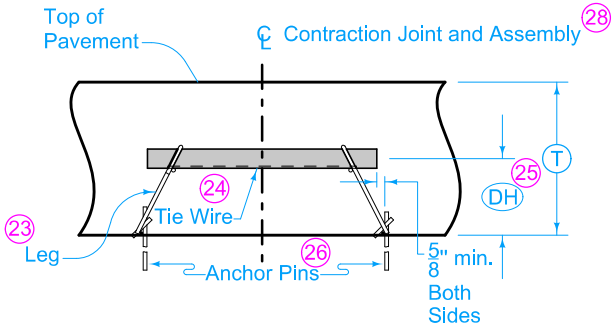


PLAN

Spaces between dowel bars are nominal dimensions with a $\frac{1}{4}$" allowable tolerance.



ELEVATION



LONGITUDINAL SECTION

DOWEL ASSEMBLIES (19) (20) (21)

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

SUDAS	IOWA DOT	REVISION 10	04-21-20
FIGURE 7010.101	STANDARD ROAD PLAN	PV-101	SHEET 6 of 8

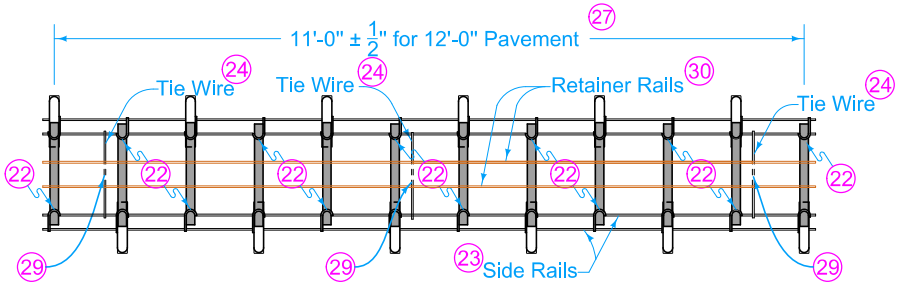
REVISIONS: Modified Dowel Assemblies on Sheets 6 and 7 to eliminate reference to 14' pavements.

SUDAS DIRECTOR — DESIGN METHODS ENGINEER

JOINTS

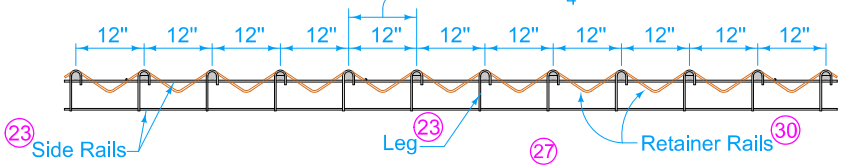
FIGURE 7010.101 | SHEET 6 OF 8

EXPANSION JOINTS

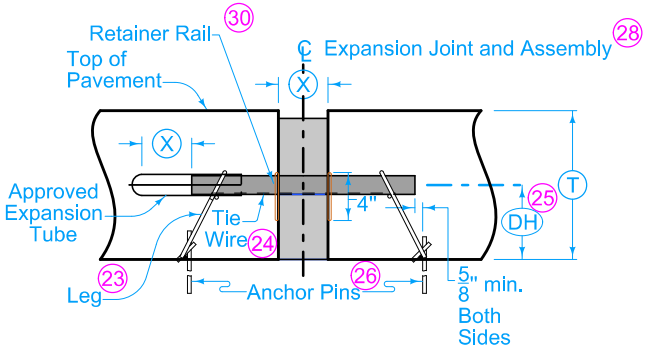


PLAN

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



ELEVATION



SECTION THRU EXPANSION JOINT

JOINT OPENING AND EXPANSION TUBE EXTENSION		
Joint Type	X	Minimum Tube Length
"ED"	1"	6"
"EE"	2"	7"
"EF"	3 1/2"	9"

DOWEL HEIGHT AND DIAMETER FOR DOWELED EXPANSION JOINTS		
T	DH (25)	Diameter
7" to 7 1/2"	3 1/2"	3/4"
8" to 9 1/2"	4 1/4"	1 1/4"
10" to 11 1/2"	5 1/4"	1 1/2"
12" to 13"	6 1/4"	1 1/2"
Tubular Dowel Bars will not be allowed for expansion joints.		

DOWEL ASSEMBLIES (19) (20) (21)

(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.

(29) Clip and remove center portion of tie during field assembly.

(30) 1/4 inch diameter wire.

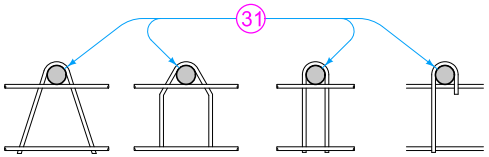
SUDAS	IOWA DOT	REVISION 10 04-21-20
FIGURE 7010.101	STANDARD ROAD PLAN	PV-101 SHEET 7 of 8

REVISIONS: Modified Dowel Assemblies on Sheets 6 and 7 to eliminate reference to 14' pavements.

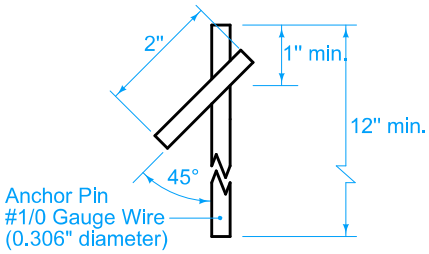
SUDAS DIRECTOR — DESIGN METHODS ENGINEER

JOINTS

FIGURE 7010.101 | SHEET 7 OF 8



OPTIONAL LEG SHAPES



ANCHOR PIN

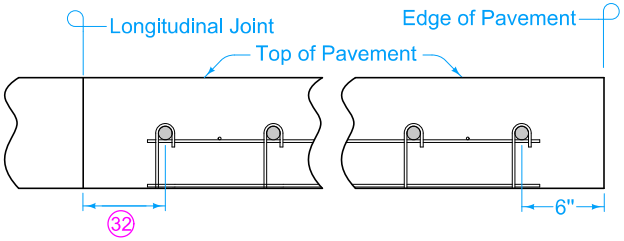
19 Use 18 inch long dowel bars with a tolerance of ± 1/8 inch. Ensure the centerlines of individual dowels are parallel to the other dowels in the assembly within ± 1/8 inch.

20 Use wires with a minimum tensile strength of 50 ksi.

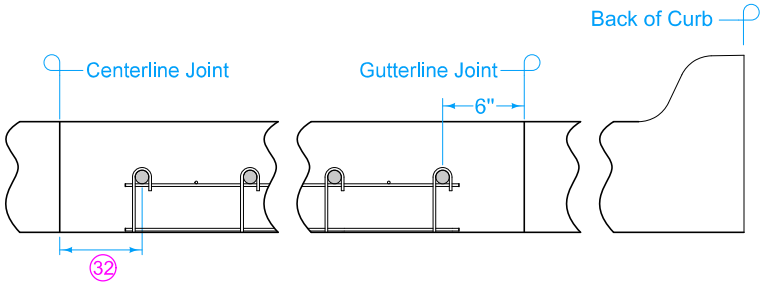
21 Details apply to both transverse contraction and expansion joints.

31 Diameter of bend around dowel is dowel diameter + 1/8 to 3/16 inches.

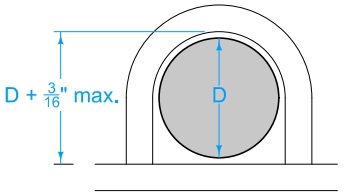
32 For uniform lane widths: 3" - 6". For taper and variable width pavements: 3" - 12".



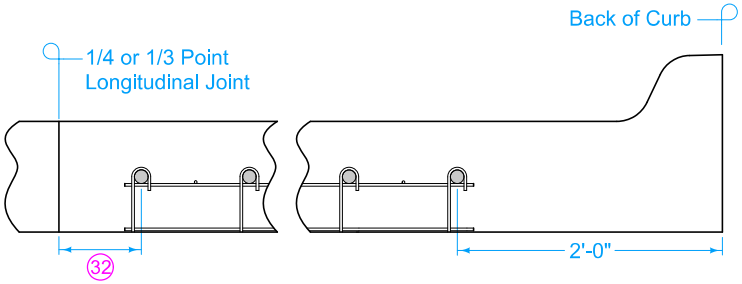
PLACEMENT LIMITS
(Rural Section)



PLACEMENT LIMITS
(Curb and Gutter - Gutterline Jointing)



BEND AROUND DOWEL 31



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

DOWEL ASSEMBLIES 19 20 21

SUDAS	IOWA DOT	REVISION 10 04-21-20
FIGURE 7010.101	STANDARD ROAD PLAN	PV-101 SHEET 8 of 8

REVISIONS: Modified Dowel Assemblies on Sheets 6 and 7 to eliminate reference to 14' pavements.

SUDAS DIRECTOR — DESIGN METHODS ENGINEER

JOINTS

FIGURE 7010.101 | SHEET 8 OF 8