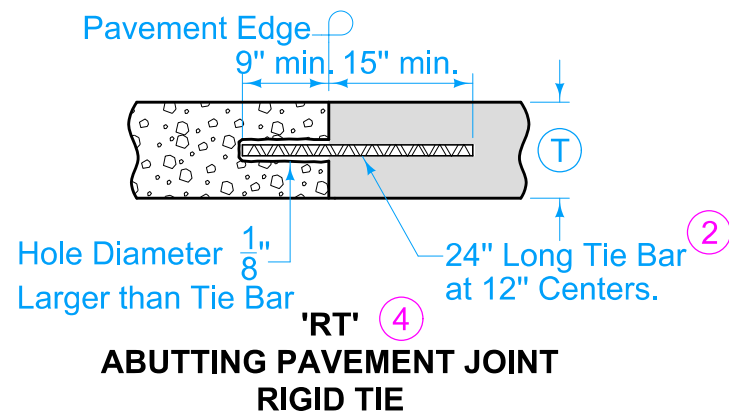
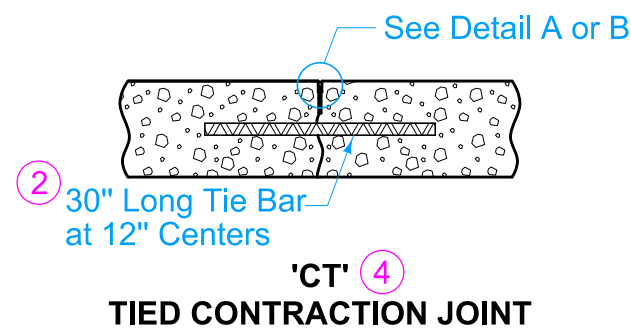
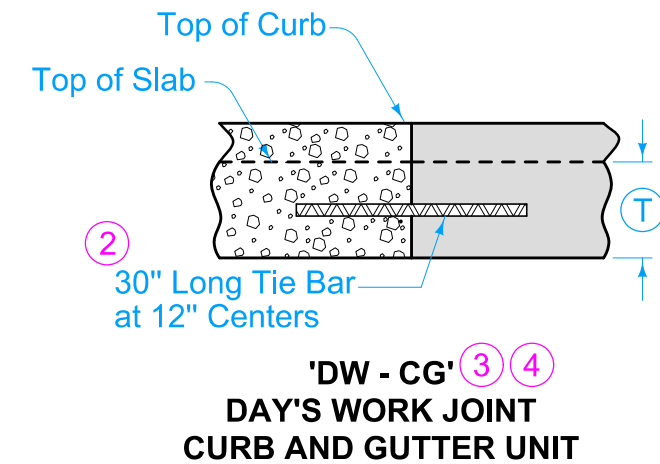


- 1 See dowel assemblies for fabrication details.
- 2 See Bar Size Table for Contraction Joints on Sheet 2.
- 3 Locate 'DW' joint at a mid-panel location between future 'C' or 'CD' joints. Place no closer than 5 feet to a 'C' or 'CD' joint.
- 4 Place bars within the limits shown under dowel assemblies.
- 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.



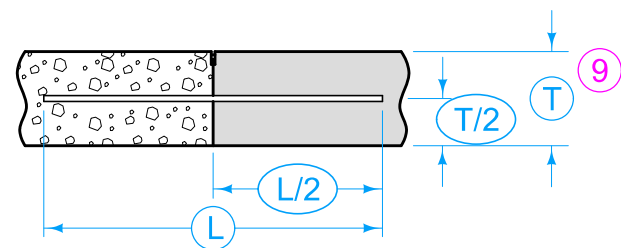
| LEGEND | |
|--------|-------------------|
| | Existing Pavement |
| | Proposed Pavement |

| | | | |
|------------------------|---------------------------|---------------|----------|
| | | REVISION | |
| | | 12 | 04-15-25 |
| FIGURE 7010.101 | STANDARD ROAD PLAN | PV-101 | |
| | | SHEET 1 of 8 | |

| | |
|----------------|---|
| REVISIONS: | Added oval dowel bars, Added BT-6 joint |
| | |
| SUDAS DIRECTOR | DESIGN METHODS ENGINEER |

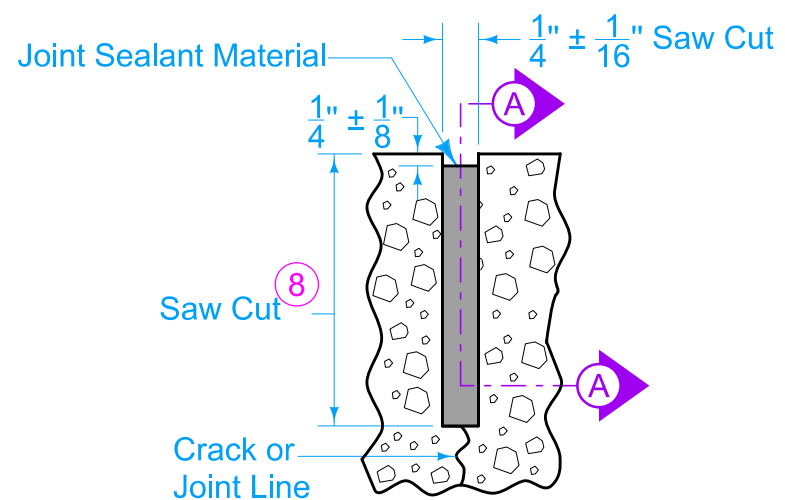
TRANSVERSE CONTRACTION

JOINTS



BAR PLACEMENT

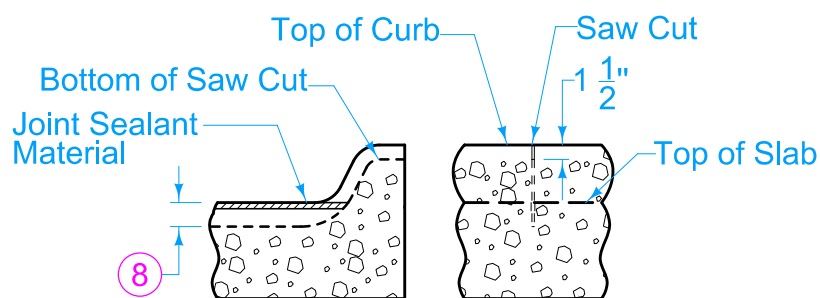
(Applies to all joints unless otherwise detailed.)



DETAIL A

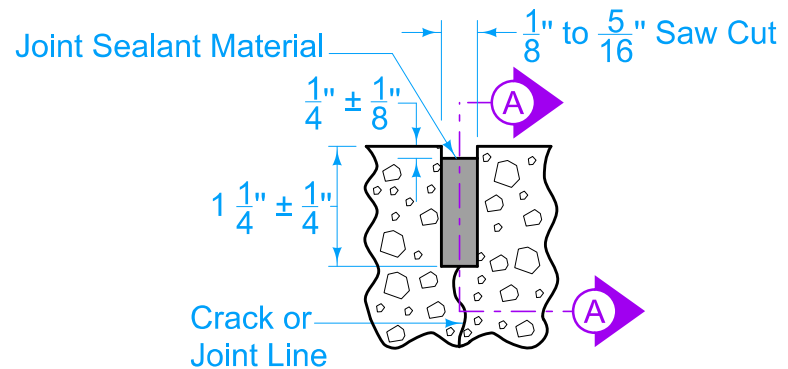
(Saw cut formed by conventional concrete sawing equipment.)

- 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, T represents the depth of sound PCC.



'C' JOINT IN CURB

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

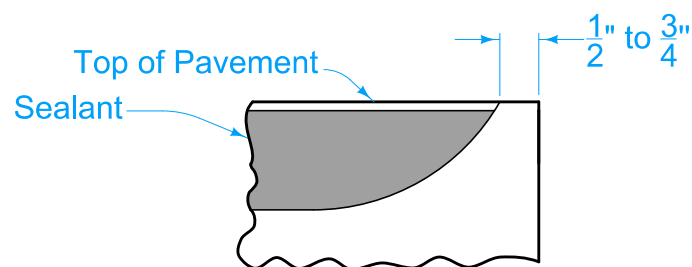


DETAIL B

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

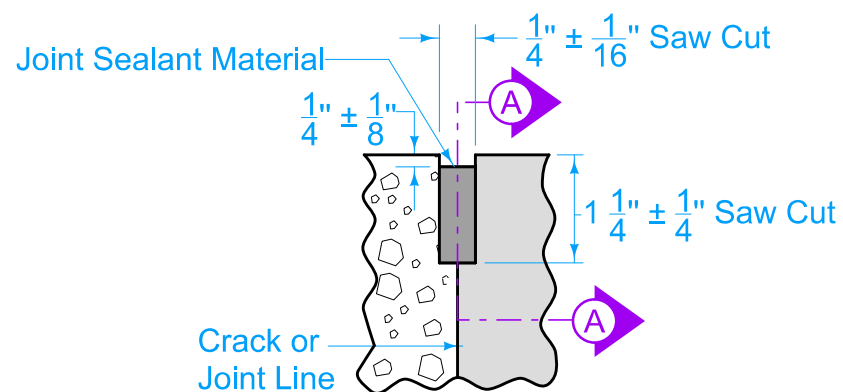
| T | Solid Dowel Diameter | Tubular Dowel Diameter | Elliptical | Tie Bar Size |
|---------------------|----------------------|------------------------|------------|--------------|
| < 8" | $\frac{3}{4}$ " | $\frac{7}{8}$ " | N/A | #6 |
| $\geq 8"$ but < 10" | $1 \frac{1}{4}$ " | $1 \frac{3}{8}$ " | Small | #10 |
| $\geq 10"$ | $1 \frac{1}{2}$ " | $1 \frac{5}{8}$ " | Medium | #11 |

Tubular and Elliptical Dowel Bars will not be allowed for RD joints.



SECTION A-A

(Detail at Edge of Pavement)



DETAIL C

| | |
|--|-------------------|
| | Existing Pavement |
| | Proposed Pavement |

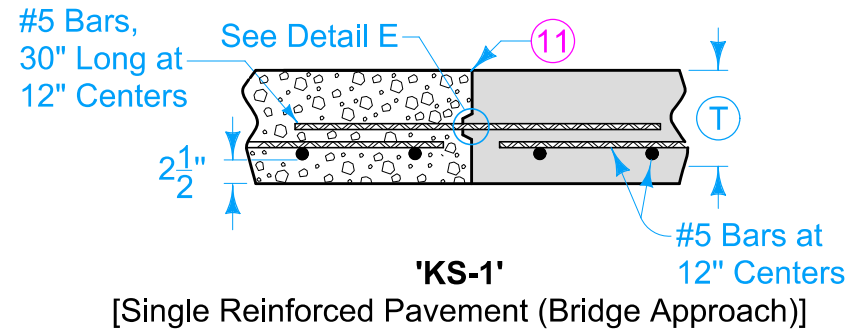
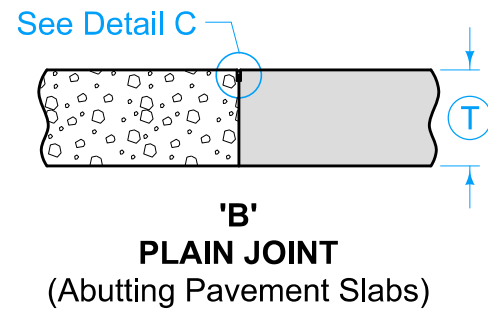
| | |
|-------------------------------|--------------------|
| SUDAS IOWA IDOT | REVISION |
| | 12 04-15-25 |
| FIGURE 7010.101 | STANDARD ROAD PLAN |
| PV-101 SHEET 2 of 8 | |

REVISIONS: Added oval dowel bars, Added BT-6 joint

SUDAS DIRECTOR
 DESIGN METHODS ENGINEER

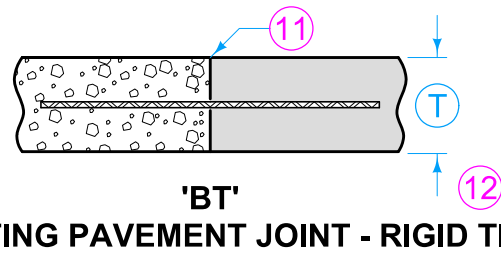
TRANSVERSE CONTRACTION

JOINTS

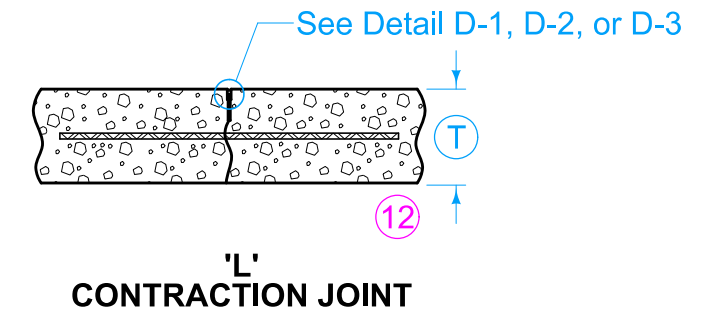
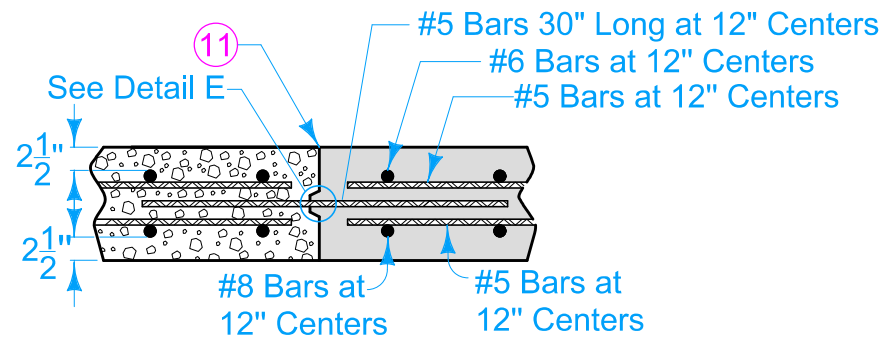


- 10 Bar supports may be necessary for fixed form paving to ensure the bar remains in a horizontal position in the plastic concrete.
- 11 Sawing or sealing of joint not required.
- 12 The following joints are interchangeable, subject to the pouring sequence:
'L-1', 'BT-1', and 'KT-1'
'L-2', 'BT-2', and 'KT-2'
'L-3', 'BT-6', and 'KT-3'

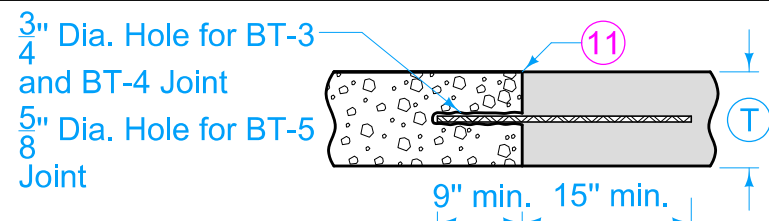
KT joints should not be used when DOT is contracting authority.



| 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-6' | #5 | 36" Long at 15" Centers |

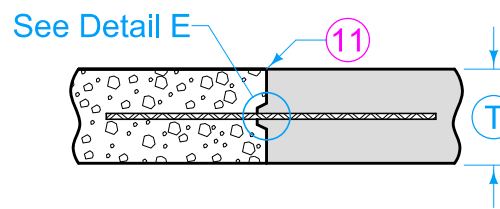


| T | Joint | Bars | Bar Length and Spacing |
|------|-------|------|-------------------------|
| < 8" | 'L-1' | #4 | 36" Long at 30" Centers |
| ≥ 8" | 'L-2' | #5 | 36" Long at 30" Centers |
| | 'L-3' | | 36" Long at 15" Centers |



| 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 |

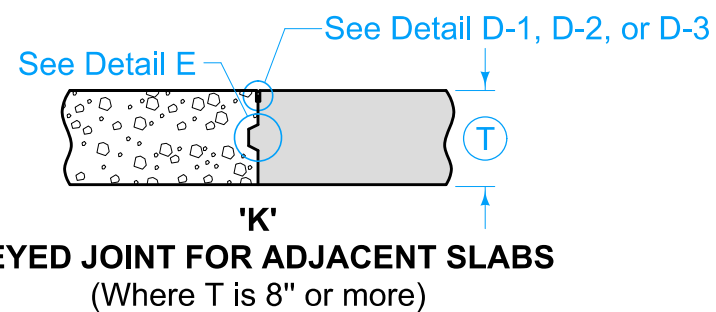
'KS-2'
[Double Reinforced Pavement (Bridge Approach)]



| 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 |

'KT'
ABUTTING PAVEMENT JOINT - KEYWAY TIE

10 12



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

LONGITUDINAL CONTRACTION

LEGEND

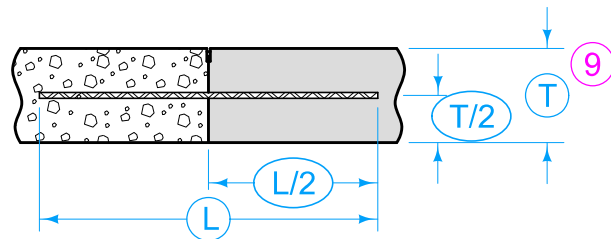
- Existing Pavement
- Proposed Pavement

| | |
|--------------------|--------------------|
| SUDAS IOWA IDOT | REVISION |
| | 12 04-15-25 |
| FIGURE 7010.101 | STANDARD ROAD PLAN |
| PV-101 | |
| SHEET 3 of 8 | |

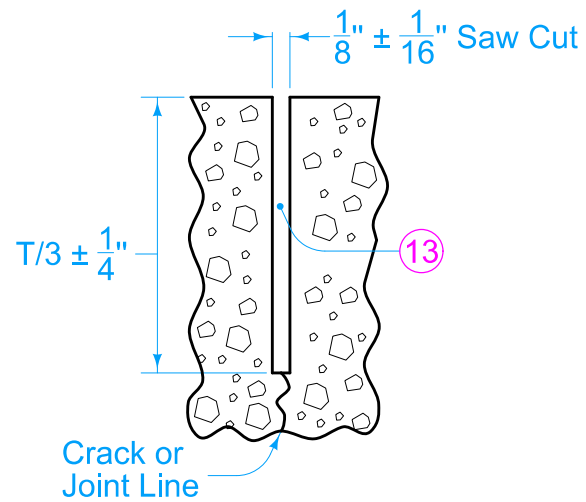
REVISIONS: Added oval dowel bars, Added BT-6 joint

SUDAS DIRECTOR
 DESIGN METHODS ENGINEER

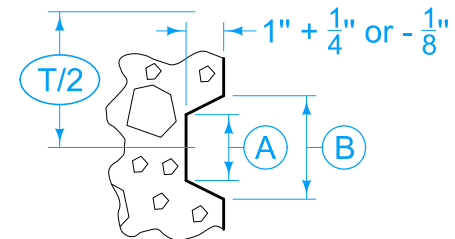
JOINTS



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

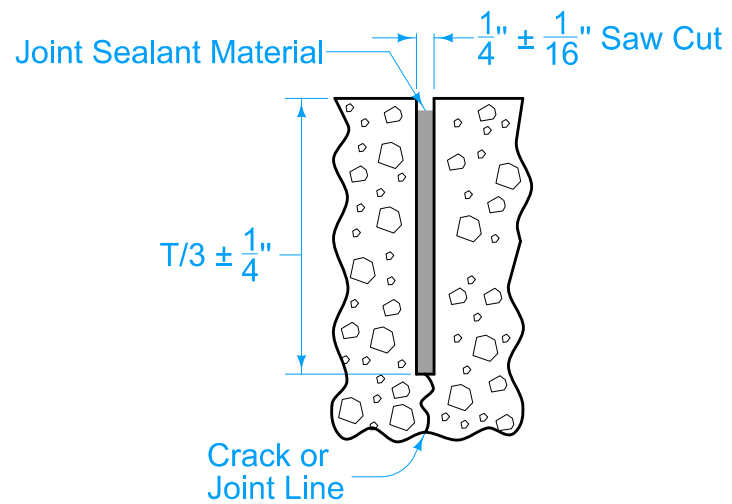


DETAIL D-1
(Required when specified in the contract documents.)

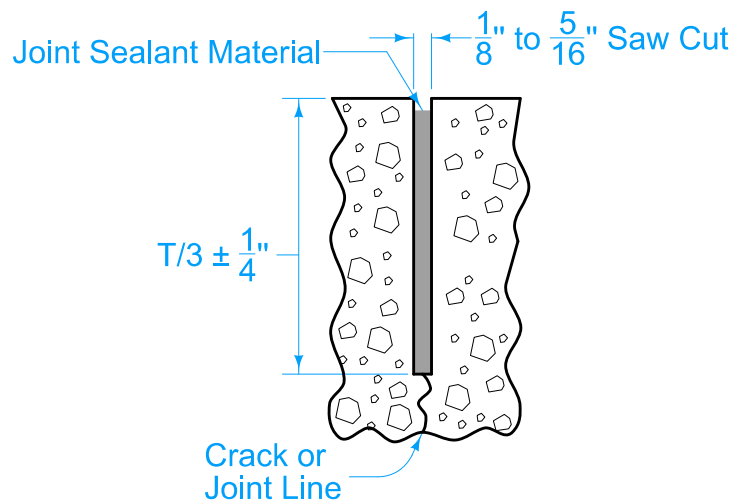


DETAIL E

- 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" |

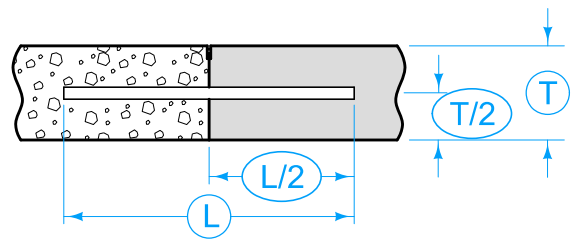
| LEGEND | |
|--------|-------------------|
| | Existing Pavement |
| | Proposed Pavement |

| | |
|--------------------|--------------------|
| SUDAS IOWA IDOT | REVISION |
| | 12 04-15-25 |
| FIGURE 7010.101 | STANDARD ROAD PLAN |
| PV-101 | |
| SHEET 4 of 8 | |

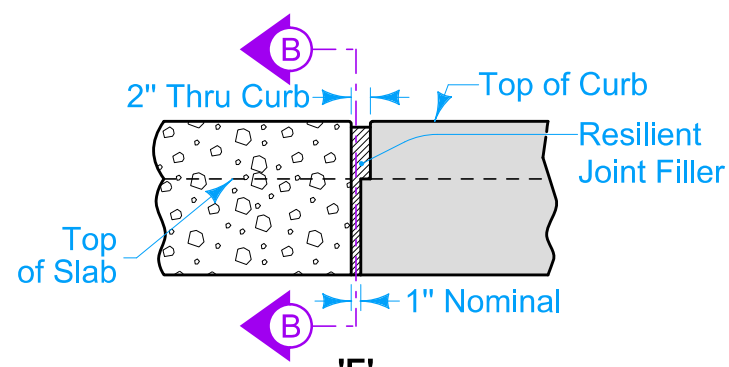
| | |
|----------------|---|
| REVISIONS: | Added oval dowel bars, Added BT-6 joint |
| | |
| SUDAS DIRECTOR | DESIGN METHODS ENGINEER |

LONGITUDINAL CONTRACTION

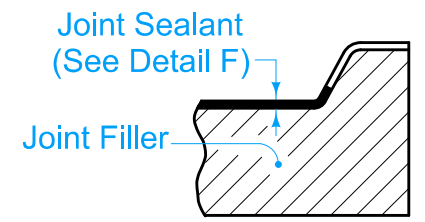
JOINTS



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

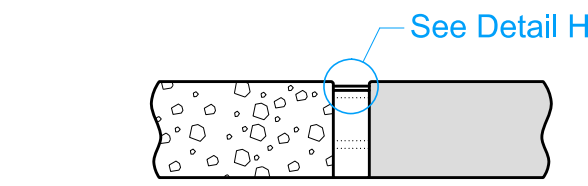


'E'
JOINT IN CURB
(View at Back of Curb)



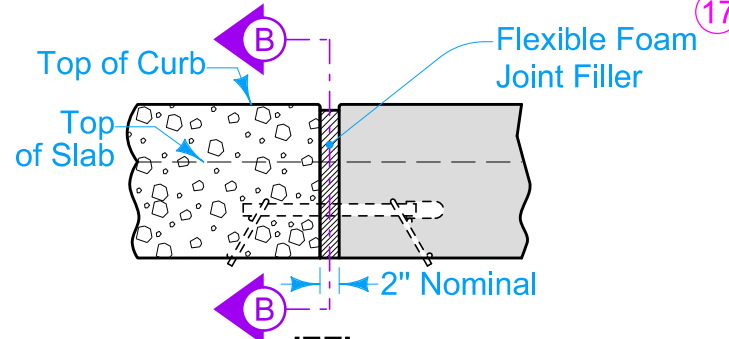
SECTION B-B

- 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.

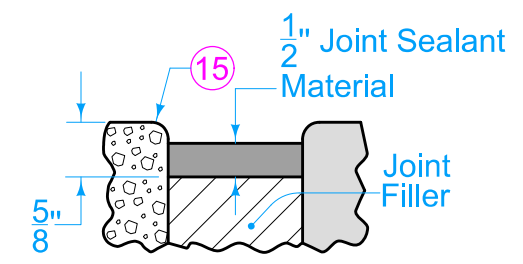


'CF' JOINT
Width (See table below)

| TYPE | WIDTH |
|------|--------|
| CF-1 | 2" |
| CF-2 | 2 1/2" |
| CF-3 | 3" |
| CF-4 | 3 1/2" |

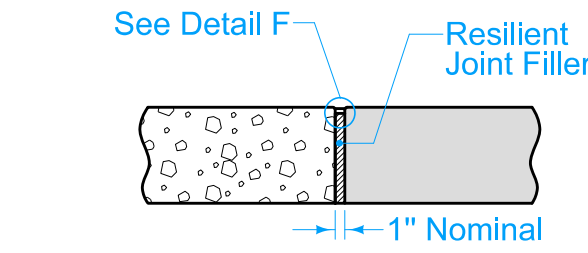


'EE'
JOINT IN CURB
(View at Back of Curb)

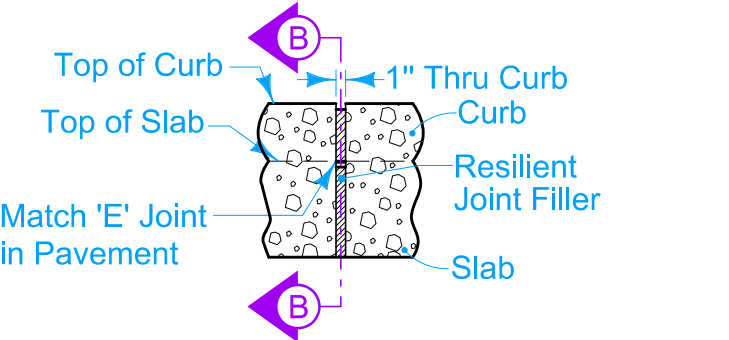


DETAIL F

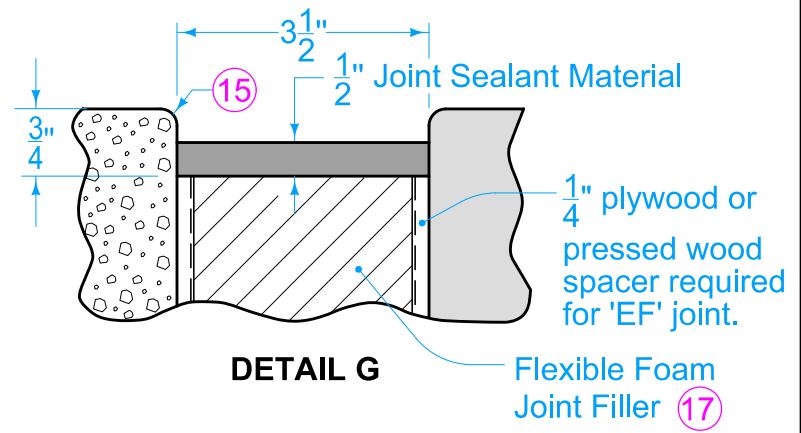
| DOWELED EXPANSION JOINTS | | |
|--------------------------|--------|--------------------------|
| TYPE | WIDTH | FILLER MATERIAL ⑰ |
| ED | 1" | Resilient (Detail F) |
| EE | 2" | Flexible Foam (Detail F) |
| EF | 3 1/2" | Flexible Foam (Detail G) |



'E'
1" EXPANSION JOINT



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

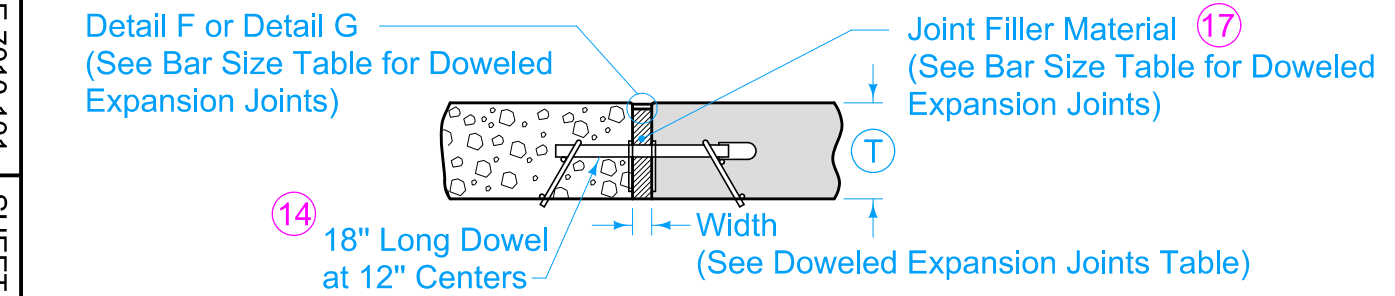


DETAIL G

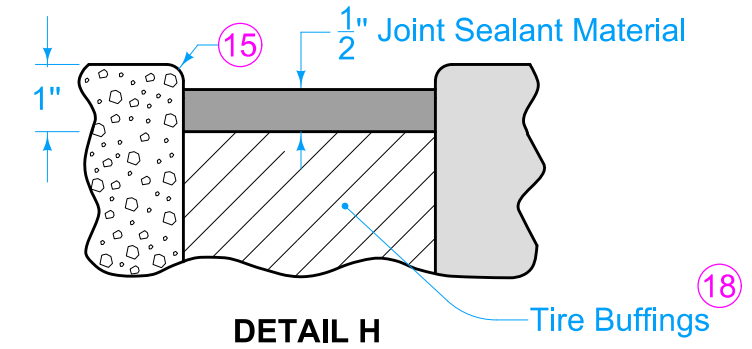
| BAR SIZE TABLE FOR DOWELED EXPANSION JOINTS | | | |
|---|------|----------------|--------|
| Ⓣ | < 8" | ≥ 8" but < 10" | ≥ 10" |
| Dowel Diameter | 3/4" | 1 1/4" | 1 1/2" |

Tubular, GFRP, and Elliptical Dowel Bars will not be allowed for expansion joints.

| LEGEND | |
|--------|-------------------|
| | Existing Pavement |
| | Proposed Pavement |



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



DETAIL H

EXPANSION

| | | |
|-------------------|---|-------------------------------|
| SUDAS IOWA DOT | FIGURE 7010.101 STANDARD ROAD PLAN | REVISION 12 04-15-25 |
| | | PV-101 SHEET 5 of 8 |

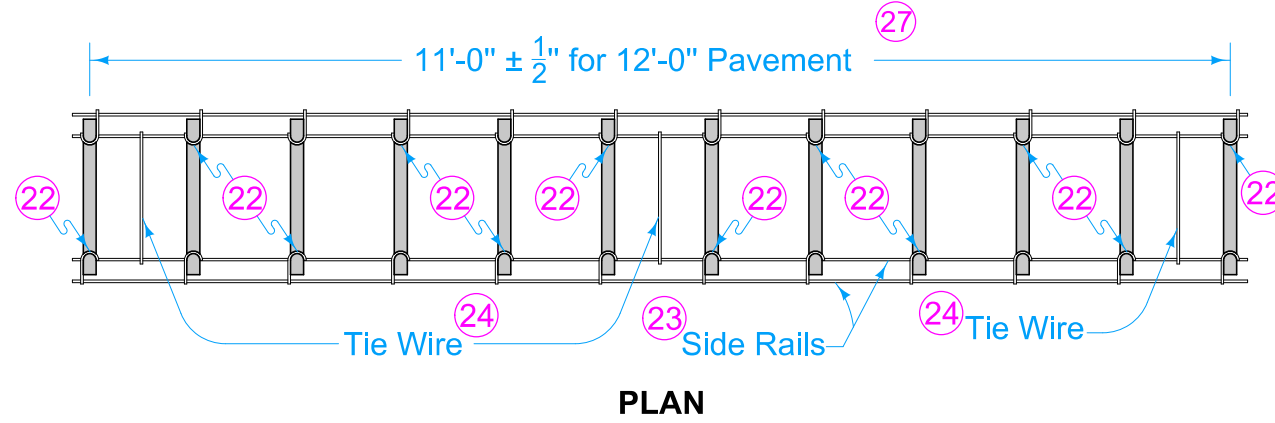
REVISIONS: Added oval dowel bars, Added BT-6 joint

J. P. C.
SUDAS DIRECTOR

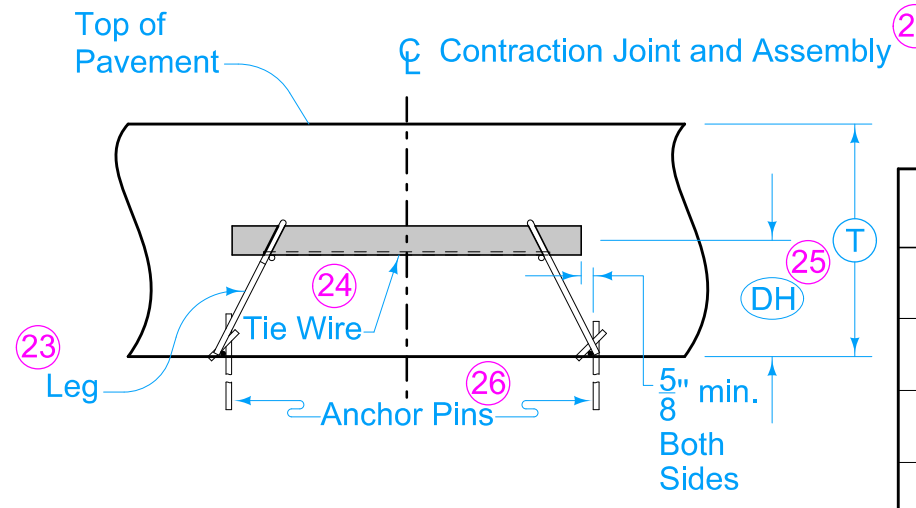
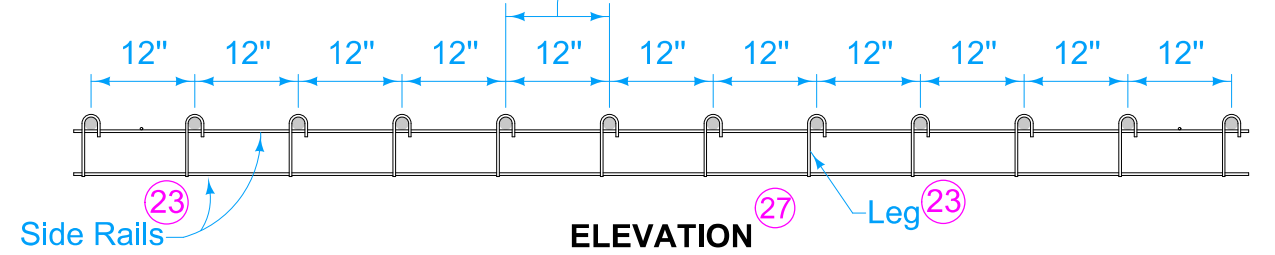
Stuart Miller
DESIGN METHODS ENGINEER

JOINTS

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) | Elliptical |
| 8" to 9 1/2" | 4 1/4" | 1 1/4" | 1 3/8" | Small |
| 10" to 11 1/2" | 5 1/4" | 1 1/2" | 1 5/8" | Medium |
| 12" to 13" | 6 1/4" | 1 1/2" | 1 5/8" | Medium |

Tubular, Elliptical Dowel Bars will not be allowed for RD joints.

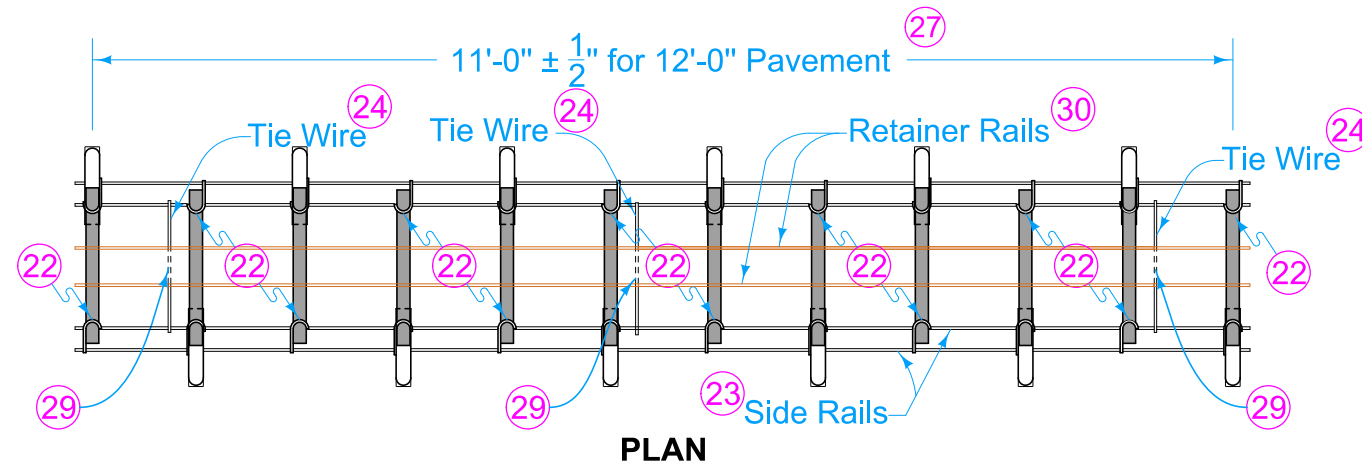
- 19 Use 18 inch long dowel bars with a tolerance of ± 1/8 inch. Ensure the centerlines of individual dowels are parallel to the other dowels in the assembly within ± 1/8 inch.
- 20 Use wires with a minimum tensile strength of 50 ksi.
- 21 Details apply to both transverse contraction and expansion joints.
- 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

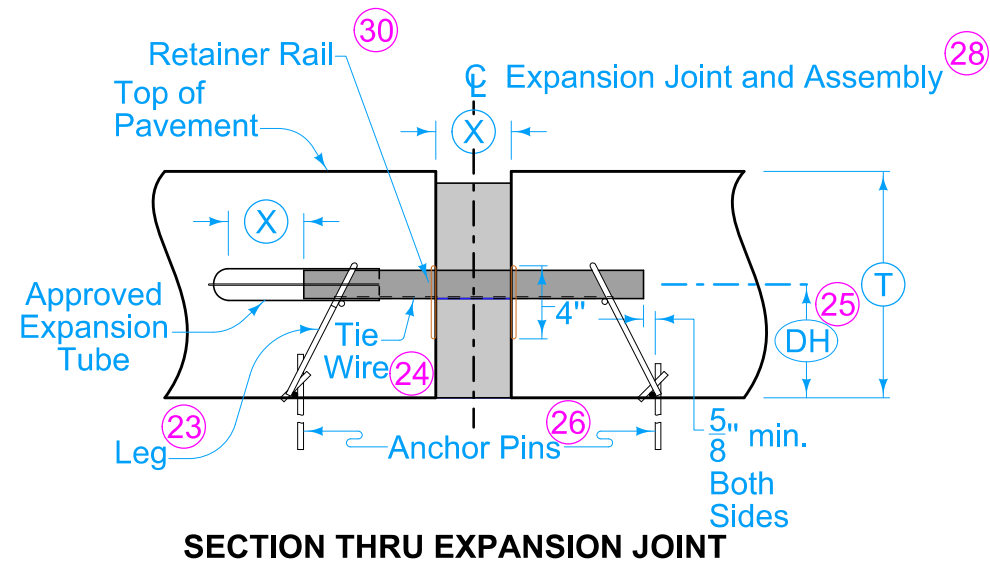
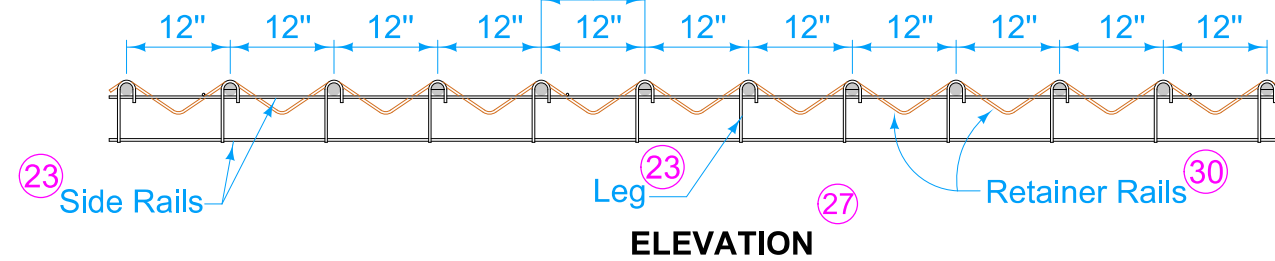
LONGITUDINAL SECTION
DOWEL ASSEMBLIES 19 20 21

| | |
|--|-------------------------------|
| SUDAS IOWA DOT | REVISION 12 04-15-25 |
| | PV-101 SHEET 6 of 8 |
| REVISIONS: Added oval dowel bars, Added BT-6 joint | |
| SUDAS DIRECTOR | DESIGN METHODS ENGINEER |
| JOINTS | |

EXPANSION JOINTS



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



| JOINT OPENING AND EXPANSION TUBE EXTENSION | | |
|--|------------------|---------------------|
| Joint Type | (X) | Minimum Tube Length |
| "ED" | 1" | 6" |
| "EE" | 2" | 7" |
| "EF" | $3\frac{1}{2}$ " | 9" |

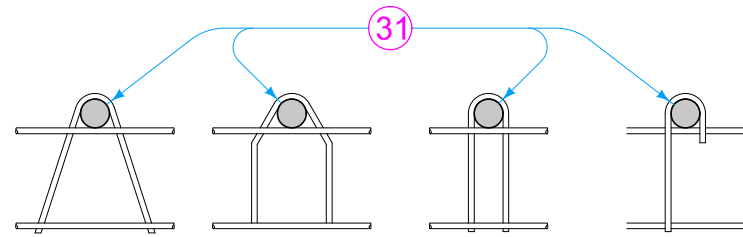
| DOWEL HEIGHT AND DIAMETER FOR DOWELED EXPANSION JOINTS | | |
|--|------------------|------------------|
| (T) | (DH) (25) | Diameter |
| 8" to $9\frac{1}{2}$ " | $4\frac{1}{4}$ " | $1\frac{1}{4}$ " |
| 10" to $11\frac{1}{2}$ " | $5\frac{1}{4}$ " | $1\frac{1}{2}$ " |
| 12" to 13" | $6\frac{1}{4}$ " | $1\frac{1}{2}$ " |

Tubular, GFRP, and Elliptical Dowel Bars will not be allowed for expansion joints.

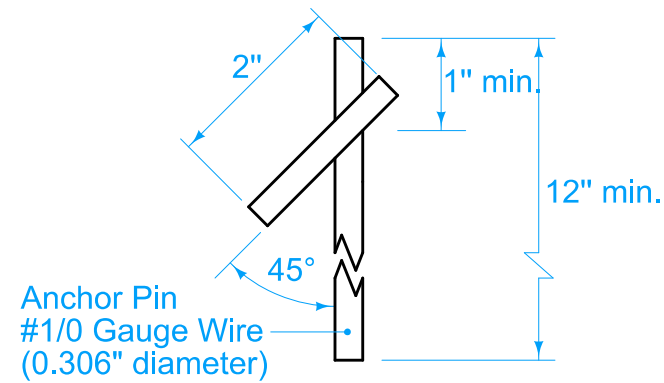
DOWEL ASSEMBLIES

- (19) 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.
- (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 IDOT | REVISION |
| | | 12 04-15-25 |
| FIGURE 7010.101 | STANDARD ROAD PLAN | PV-101 |
| SHEET 7 of 8 | | |
| REVISIONS: Added oval dowel bars, Added BT-6 joint | | |
| SUDAS DIRECTOR | DESIGN METHODS ENGINEER | |
| JOINTS | | |

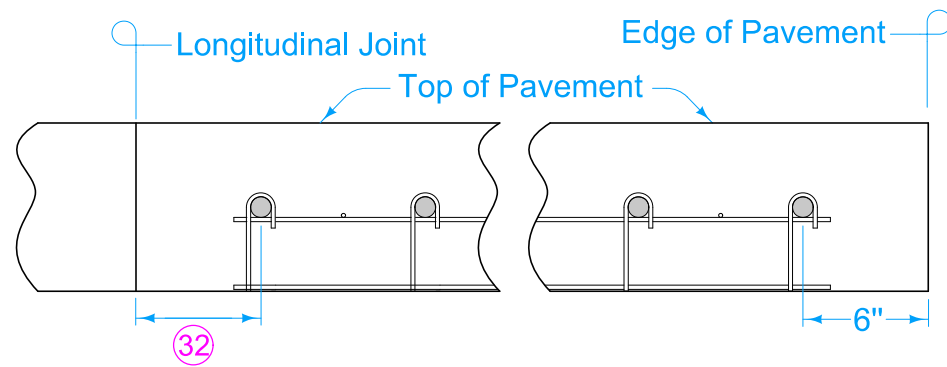


OPTIONAL LEG SHAPES

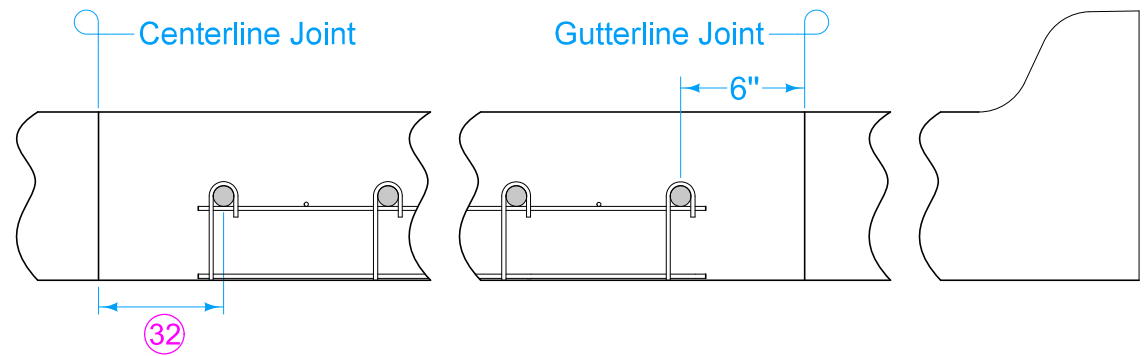


ANCHOR PIN

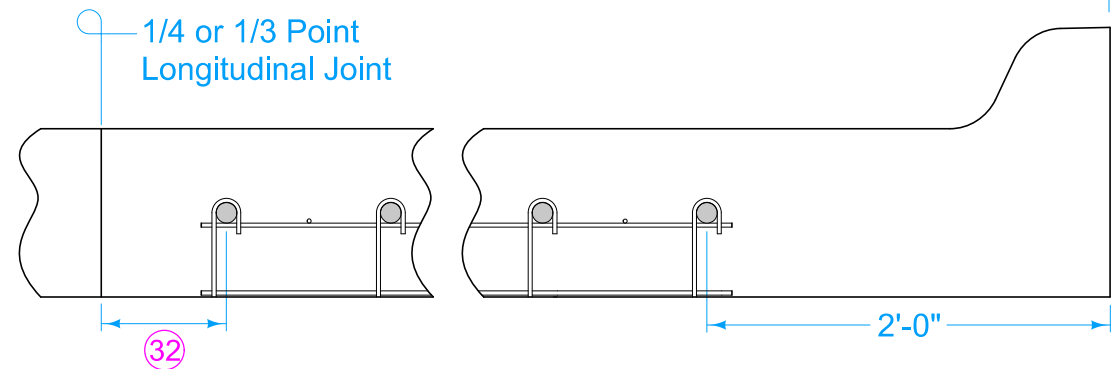
- ⑲ Use 18 inch long dowel bars with a tolerance of $\pm 1/8$ inch. Ensure the centerlines of individual dowels are parallel to the other dowels in the assembly within $\pm 1/8$ inch.
- ⑳ Use wires with a minimum tensile strength of 50 ksi.
- ㉑ Details apply to both transverse contraction and expansion 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.



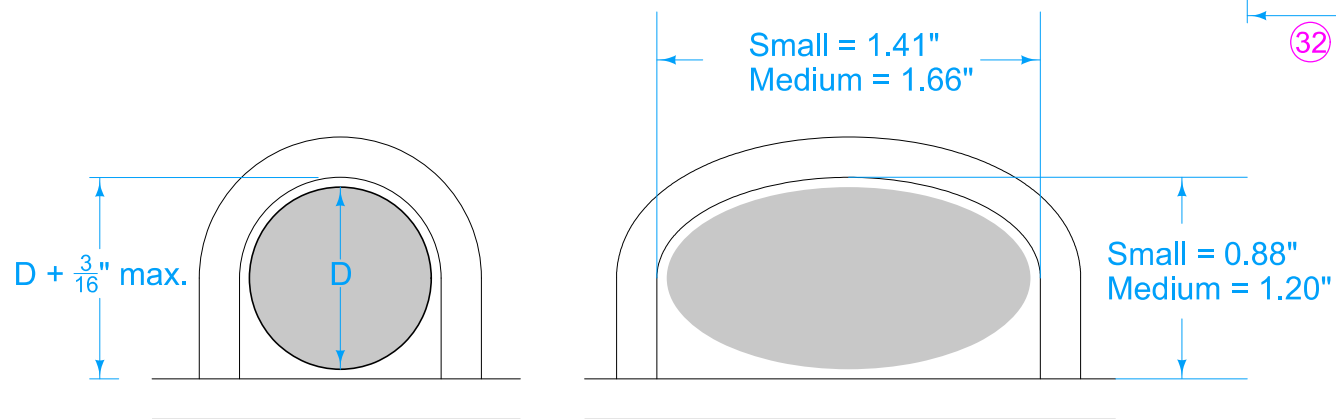
PLACEMENT LIMITS
(Rural Section)



PLACEMENT LIMITS
(Curb and Gutter - Gutterline Jointing)



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



BEND AROUND DOWEL

DOWEL ASSEMBLIES

- ⑲
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| SUDAS | IOWA DOT | REVISION | |
| | | 12 | 04-15-25 |
| FIGURE 7010.101 | STANDARD ROAD PLAN | PV-101 | |
| | | SHEET 8 of 8 | |
| REVISIONS: Added oval dowel bars, Added BT-6 joint | | | |
| SUDAS DIRECTOR | | DESIGN METHODS ENGINEER | |