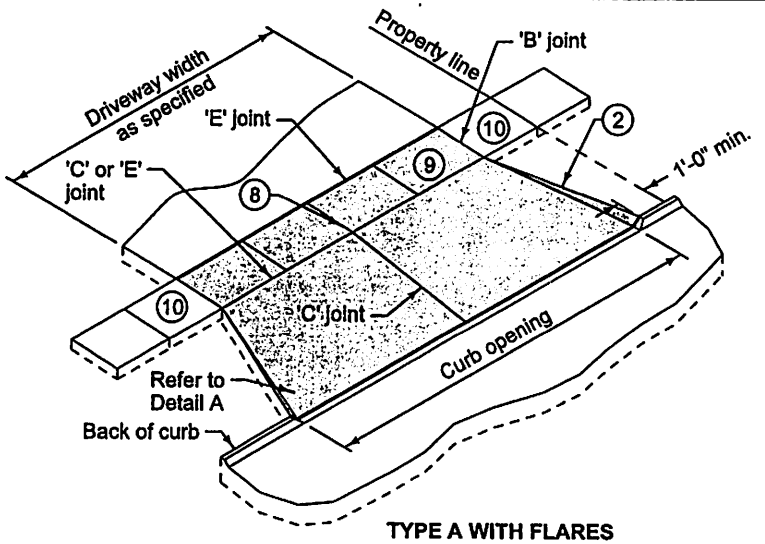
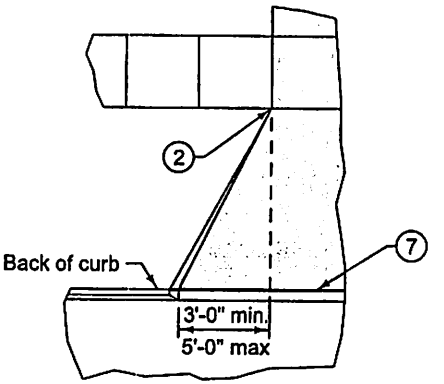
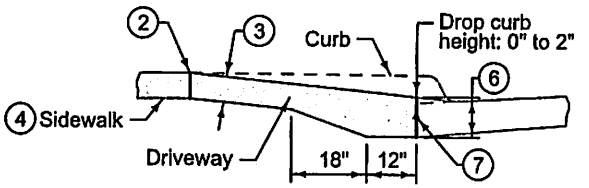


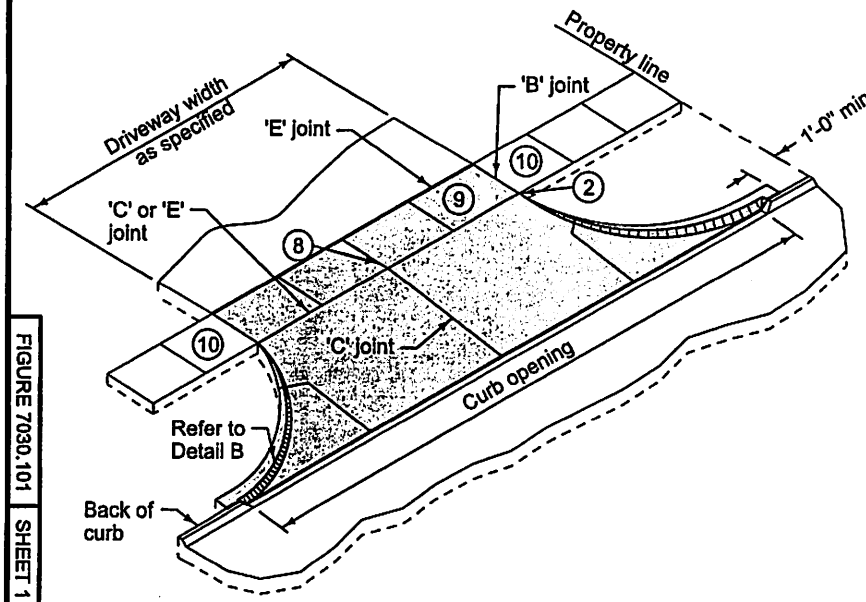

TYPE A WITH FLARES



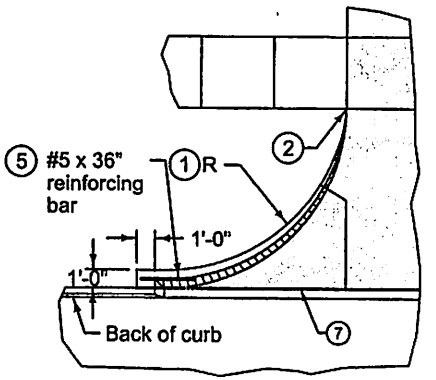

DETAIL A




TYPICAL SECTION




TYPE A WITH RADII




DETAIL B

1. Driveway radius (R).
   Residential: 10 foot minimum, 15 foot maximum.
   Commercial and industrial: As specified in the contract documents.
2. Transition the curb height to 0 inches at end of taper/radius or at the front edge of sidewalk. Do not extend raised curb across sidewalk.
3. Pavement thickness.
   Residential: 6 inches minimum.
   Commercial and industrial: 7 inches minimum.
4. Sidewalk thickness through driveway to match thickness of driveway.
5. Center reinforcing bar vertically in the pavement.
6. Match thickness of adjacent roadway, 8 inches minimum.
7. Provide 'E' joint at back of curb unless 'B' joint is specified.
8. For alleys, invert the pavement crown 2% toward center of alley.
9. Target cross slope of 1.5% with a maximum cross slope of 2.0%. If specified in the contract documents, construct the sidewalk through the driveway 5 feet wide to serve as a passing space.
10. If cross slope of adjacent sidewalk panel exceeds 2.0%, remove and replace to transition from existing sidewalk to sidewalk through driveway. If elevation change requires a curb ramp, comply with Figure 7030.205; verify need for detectable warning panel with Engineer.

SUDAS

| REVISION | |
|---|---|
| 2 | 10-20-15 |

7030.101

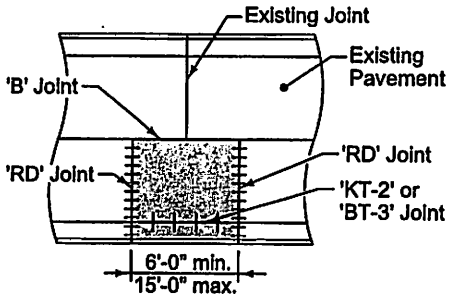
SHEET 1 of 1

SUDAS Standard Specifications

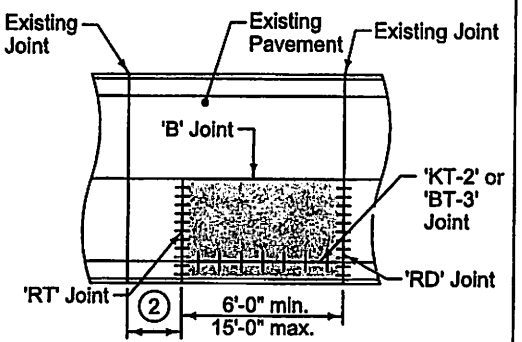
CONCRETE DRIVEWAY, TYPE A

FIGURE 7030.101 | SHEET 1 OF 1

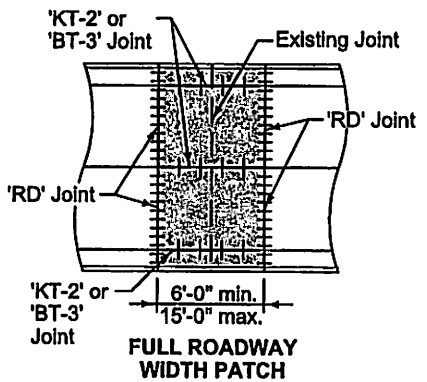
## GUTTERLINE JOINTING




ONE PANEL WIDTH PATCH WITH OPPOSING JOINT

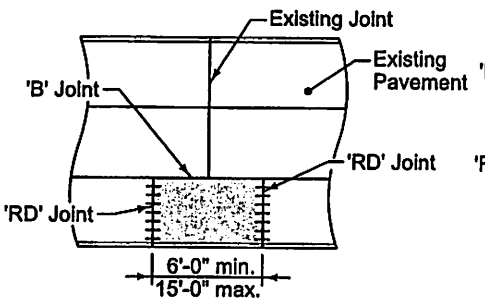



ONE PANEL WIDTH PATCH NO OPPOSING JOINT

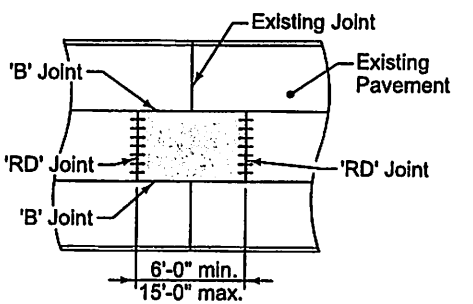



FULL ROADWAY WIDTH PATCH

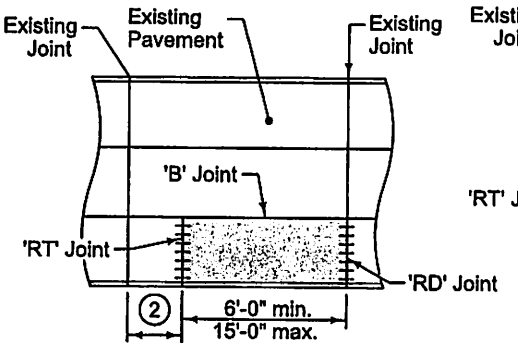
## THIRD POINT JOINTING (1)



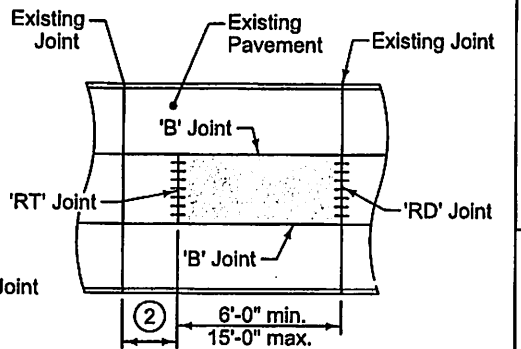

OUTSIDE PANEL PATCH WITH OPPOSING JOINT



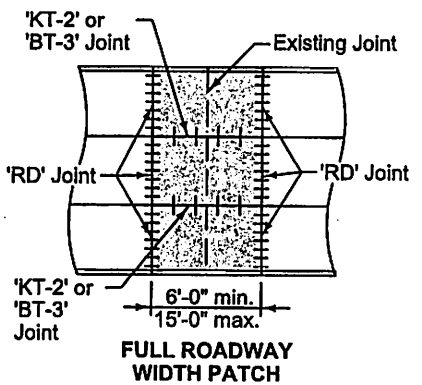

CENTER PANEL PATCH WITH OPPOSING JOINTS



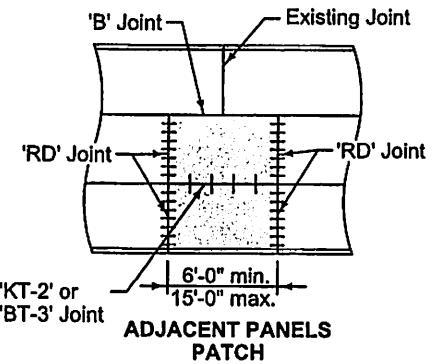

OUTSIDE PANEL PATCH NO OPPOSING JOINT




CENTER PANEL PATCH NO OPPOSING JOINT



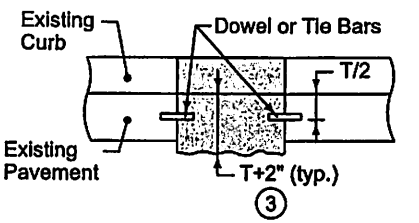

FULL ROADWAY WIDTH PATCH




ADJACENT PANELS PATCH

1. Patches on roadways with quarter point jointing will be similar to third point jointing details.
2. Minimum distance between existing joint and patch is 6 feet. If distance is less than 6 feet, extend patch to existing joint.
3. If subgrade or subbase material is required below patch, bring material to a level 2 inches below bottom of existing pavement.

## LONGITUDINAL SECTION THRU PCC PATCH




SUDAS

| REVISION | |
|---|---|
| 2 | 10-17-17 |

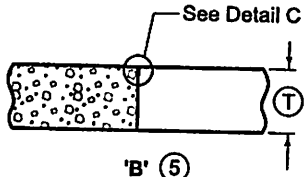
7040.101

SHEET 1 of 1

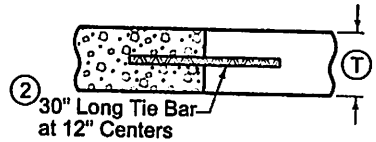
SUDAS Standard Specifications

FULL DEPTH PCC PATCHES LESS THAN OR EQUAL TO 15' LONG

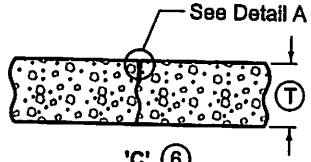
FIGURE 7040.101 | SHEET 1 OF 1



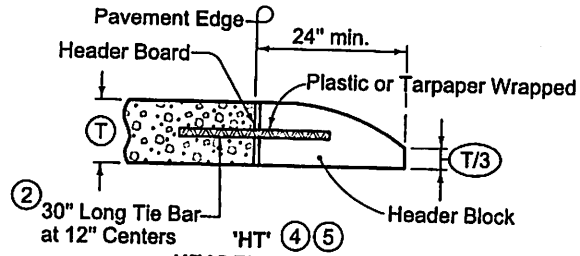

'B' (5)
**PLAIN JOINT**
(Abutting Pavement Slabs)



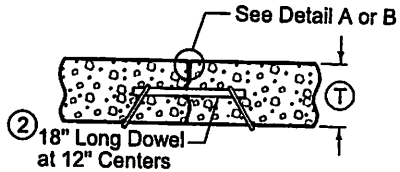

'DW' (3)(4)(7)
**DAY'S WORK JOINT**(Non-working)



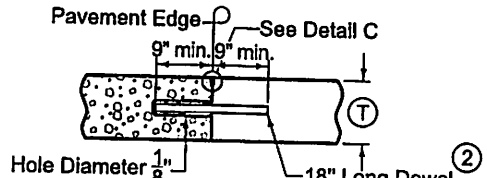

'C' (6)
**CONTRACTION JOINT**



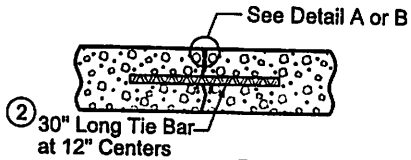

'HT' (4)(5)
**HEADER JOINT**
(End Rigid Pavement)



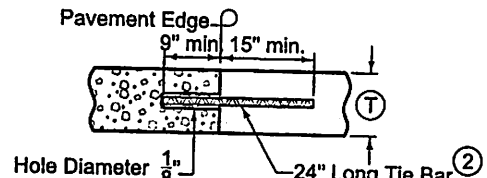

'CD' (1)(4)(6)
**DOWELED CONTRACTION JOINT**




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

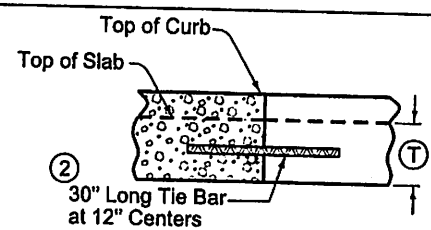



'CT' (4)
**TIED CONTRACTION JOINT**




'RT' (4)
**ABUTTING PAVEMENT JOINT**
**RIGID TIE**

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 | IOWADOT | REVISION 9 04-16-19
FIGURE 7010.101 | STANDARD ROAD PLAN | PV-101 | SHEET 1 of 8

REVISIONS: Added tubular dowel option to transverse contraction joints. Modified circle note 2. Added new circle note 14 and renumbered remaining notes.

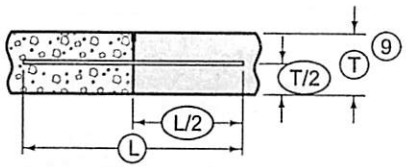
Paul D. Wiegand
SUDAS DIRECTOR

DESIGN METHODS ENGINEER

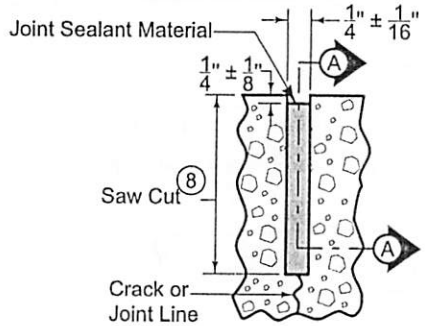
**JOINTS**

**TRANSVERSE CONTRACTION**

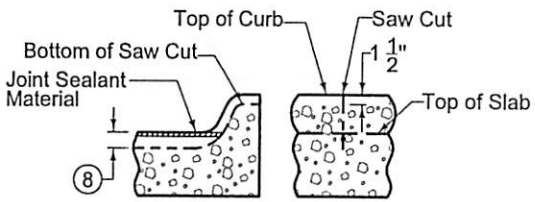
FIGURE 7010.101 | SHEET 1 OF 8



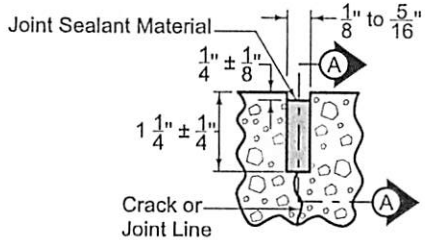

**BAR PLACEMENT**
(Applies to all joints unless otherwise detailed.)



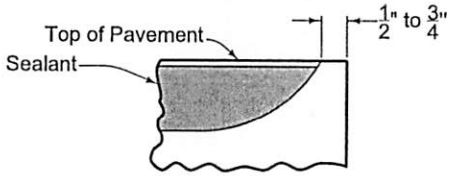

**DETAIL A**
(Saw cut formed by conventional concrete sawing equipment.)



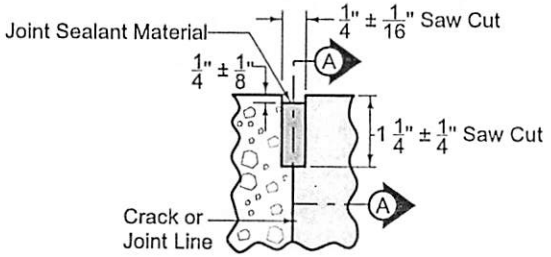

**'C' JOINT IN CURB**
(Match 'CT', 'CD', or 'C' joint in pavement.)




**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" | $\frac{3}{4}$" | $\frac{7}{8}$" | #6 |
| ≥ 8" but < 10" | 1 $\frac{1}{4}$" | 1 $\frac{3}{8}$" | #10 |
| ≥ 10" | 1 $\frac{1}{2}$" | 1 $\frac{5}{8}$" | #11 |
| Tubular Dowel Bars will not be allowed for RD joints. | | | |

LEGEND
Existing Pavement
Proposed Pavement

SUDAS | IOWADOT | REVISION 9 04-16-19

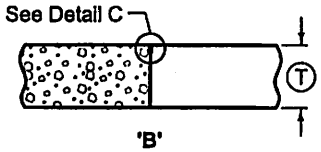
FIGURE 7010.101 | STANDARD ROAD PLAN | PV-101 | SHEET 2 of 8

REVISIONS: Added tubular dowel option to transverse contraction joints. Modified circle note 2. Added new circle note 14 and renumbered remaining notes.

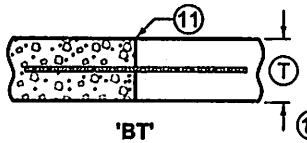
Paul D. Wiegand, SUDAS DIRECTOR — DESIGN METHODS ENGINEER

**TRANSVERSE CONTRACTION JOINTS**

FIGURE 7010.101 | SHEET 2 OF 8

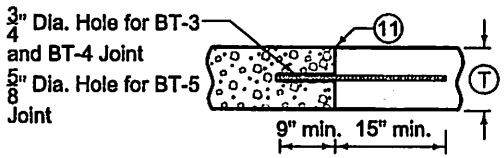



'B'
**PLAIN JOINT**
(Abutting Pavement Slabs)



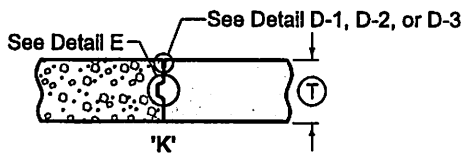

'BT'
**ABUTTING PAVEMENT JOINT - RIGID TIE**

| 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 |

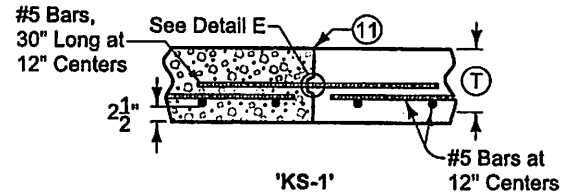



'BT'
**ABUTTING PAVEMENT JOINT - RIGID TIE** (Drilled)

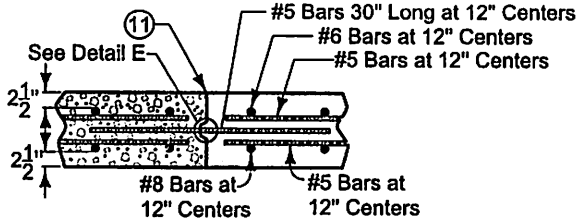
| T | Joint | Bars | Bar Length and Spacing |
|---|---|---|---|
| < 8" | 'BT-5' | #4 | 24" Long at 30" Centers |
| ≥ 8" | 'BT-3' | #5 | 24" Long at 30" Centers |
| | 'BT-4' | | 24" Long at 15" Centers |



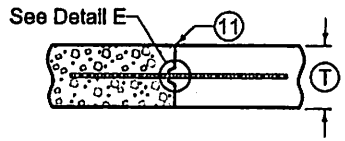

'K'
**KEYED JOINT FOR ADJACENT SLABS**
(Where T is 8" or more)




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




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




'KT' (10)(12)
**ABUTTING PAVEMENT JOINT - KEYWAY TIE**

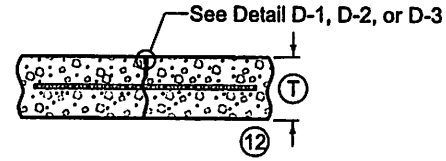
| T | Joint | Bars | Bar Length and Spacing |
|---|---|---|---|
| < 8" | 'KT-1' | #4 | 30" Long at 30" Centers |
| ≥ 8" | 'KT-2' | #5 | 30" Long at 30" Centers |
| | 'KT-3' | | 30" Long at 15" Centers |

**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

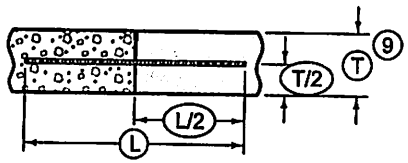
| SUDAS | IOWADOT | REVISION 9 04-16-19 |
|---|---|---|
| FIGURE 7010.101 | STANDARD ROAD PLAN | PV-101 |
| | | SHEET 3 of 8 |

REVISIONS: Added tubular dowel option to transverse contraction joints. Modified circle note 2. Added new circle note 14 and renumbered remaining notes.

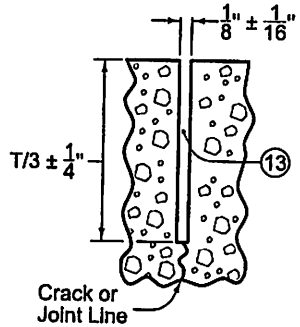
SUDAS DIRECTOR — DESIGN METHODS ENGINEER

**JOINTS**

FIGURE 7010.101 SHEET 3 OF 8



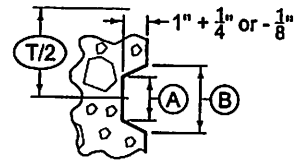

**TIE BAR PLACEMENT**
(Applies to all joints unless otherwise detailed.)




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

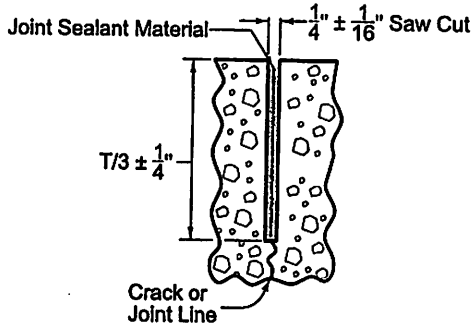
⑨ When tying into old pavement, Ⓣ represents the depth of sound PCC.

⑬ Sealant or cleaning not required.

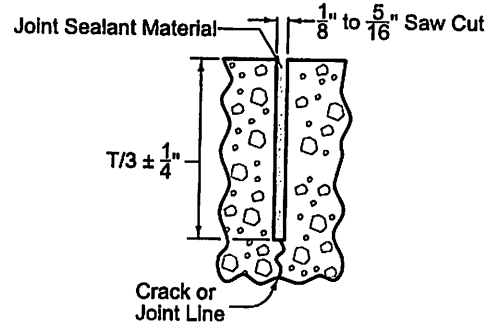



**DETAIL E**

| KEYWAY DIMENSIONS | | | |
|---|---|---|---|
| Keyway Type | Pavement Thickness Ⓣ | Ⓐ | Ⓑ |
| Standard | 8" or greater | 1 3/4" | 2 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 | IOWADOT | REVISION 9 04-16-19

FIGURE 7010.101 | STANDARD ROAD PLAN | PV-101

SHEET 4 of 8

REVISIONS: Added tubular dowel option to transverse contraction joints. Modified circle note 2. Added new circle note 14 and renumbered remaining notes.

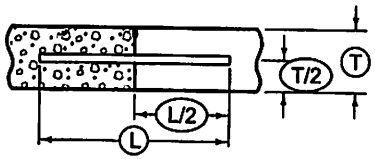
Paul D. Wigant
SUDAS DIRECTOR

Mark Nelson
DESIGN METHODS ENGINEER

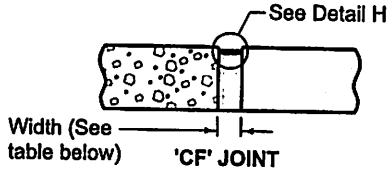
**JOINTS**

FIGURE 7010.101 SHEET 4 OF 8

**LONGITUDINAL CONTRACTION**

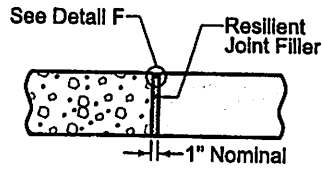



**DOWEL PLACEMENT**
(Applies to all joints unless otherwise detailed.)

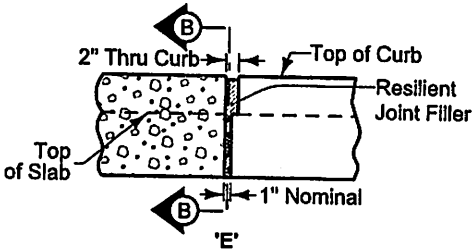



**'CF' JOINT**

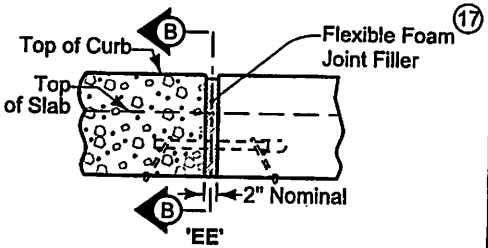
| TYPE | WIDTH |
|---|---|
| CF-1 | 2" |
| CF-2 | 2 1/2" |
| CF-3 | 3" |
| CF-4 | 3 1/2" |



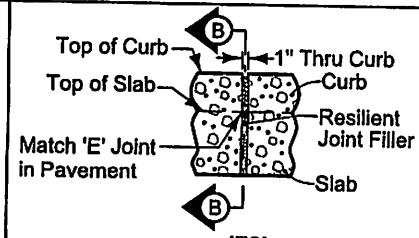

**'E'**
**1" EXPANSION JOINT**



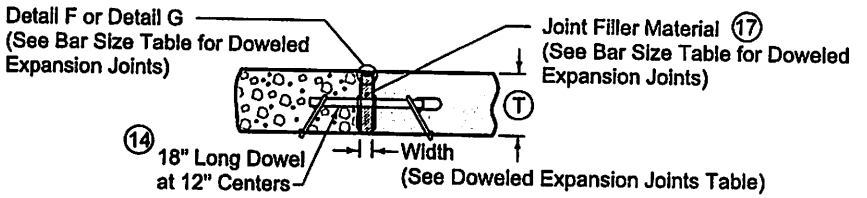

**'E'**
**JOINT IN CURB**
(View at Back of Curb)



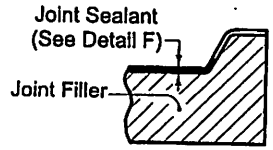

**'EE'**
**JOINT IN CURB**
(View at Back of Curb)



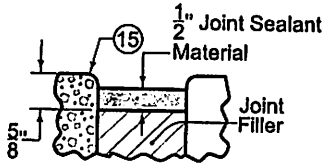

**'ES'**
**JOINT IN CURB**
(View at Back of Curb)



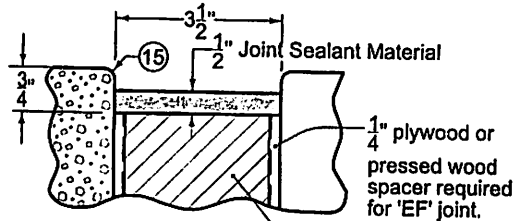

**'ED', 'EE', 'EF' 16**
**DOWELED EXPANSION JOINT**



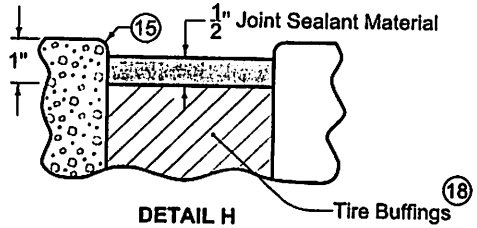

**SECTION B-B**




**DETAIL F**




**DETAIL G**




**DETAIL H**

**EXPANSION JOINTS**

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 1/2" | Flexible Foam (Detail G) |

| BAR SIZE TABLE FOR DOWELED EXPANSION JOINTS | | | |
|---|---|---|---|
| T | < 8" | ≥ 8" but < 10" | ≥ 10" |
| Dowel Diameter | 3/4" | 1 1/4" | 1 1/2" |
| Tubular Dowel Bars will not be allowed for expansion joints. | | | |

LEGEND
Existing Pavement
Proposed Pavement

SUDAS | IOWADOT | REVISION 9 04-16-19
FIGURE 7010.101 | STANDARD ROAD PLAN | PV-101
SHEET 5 of 8

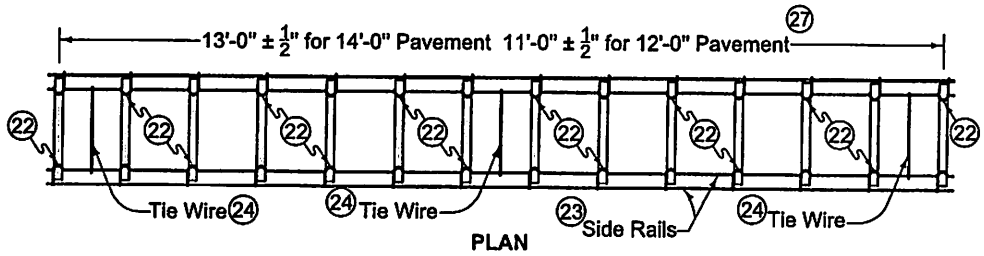
REVISIONS: Added tubular dowel option to transverse contraction joints. Modified circle note 2. Added new circle note 14 and renumbered remaining notes.

Paul D. Wiegand — SUDAS DIRECTOR
Mark Nelson — DESIGN METHODS ENGINEER

JOINTS

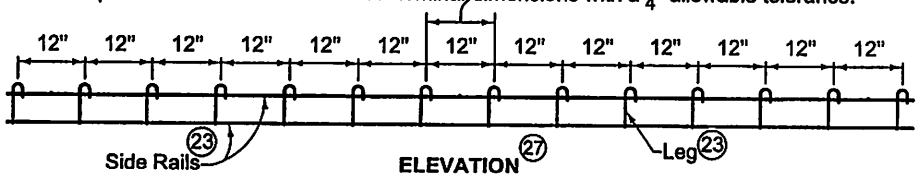
FIGURE 7010.101 SHEET 5 OF 8

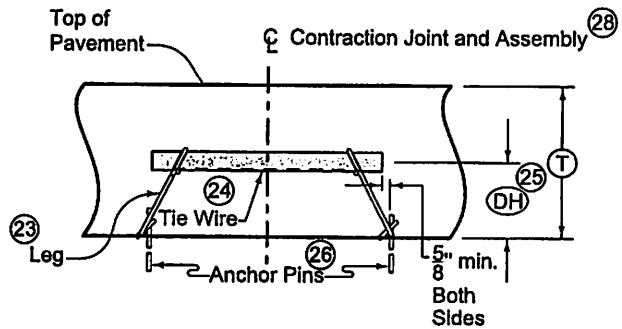
## CONTRACTION JOINTS




PLAN

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




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 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.

| SUDAS | IOWADOT | REVISION 9 04-16-19 |
|---|---|---|
| FIGURE 7010.101 | STANDARD ROAD PLAN | PV-101 |
| | | SHEET 6 of 8 |

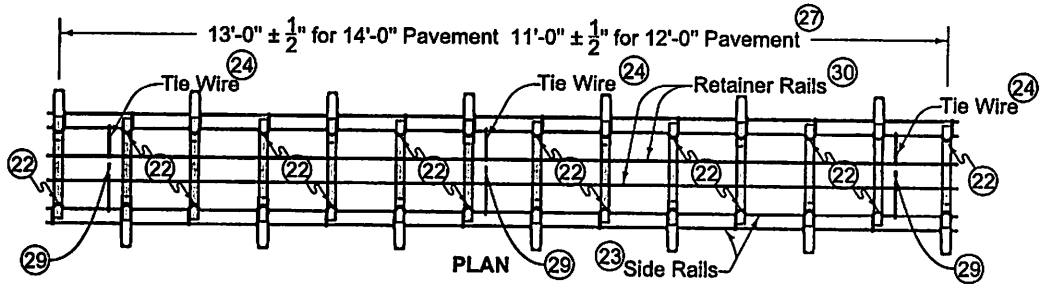
REVISIONS: Added tubular dowel option to transverse contraction joints. Modified circle note 2. Added new circle note 14 and renumbered remaining notes.

Paul D. Wiegand — SUDAS DIRECTOR
Mark Nelson — DESIGN METHODS ENGINEER

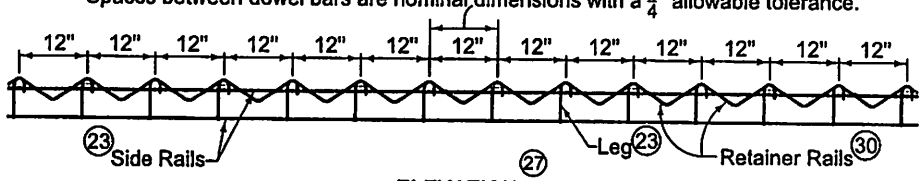
JOINTS

FIGURE 7010.101 | SHEET 6 OF 8

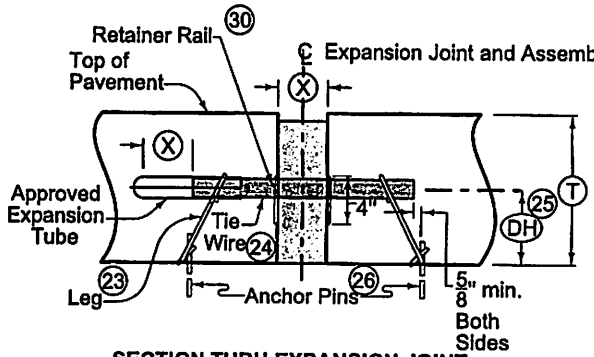
## EXPANSION JOINTS




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 | IOWADOT | REVISION 9 04-16-19

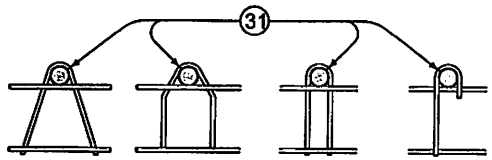
FIGURE 7010.101 | STANDARD ROAD PLAN | PV-101 | SHEET 7 of 8

REVISIONS: Added tubular dowel option to transverse contraction joints. Modified circle note 2. Added new circle note 14 and renumbered remaining notes.

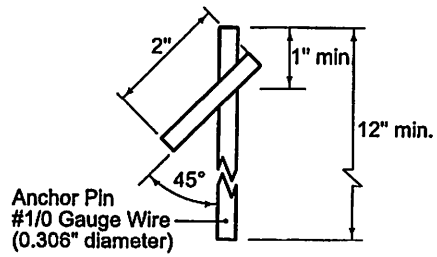
SUDAS DIRECTOR | DESIGN METHODS ENGINEER

JOINTS

FIGURE 7010.101 | SHEET 7 OF 8




OPTIONAL LEG SHAPES




ANCHOR PIN

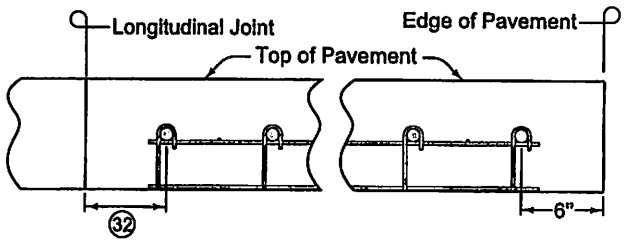
(19) Use 18 inch long dowel bars with a tolerance of ± 1/8 inch. Ensure the centerlines of individual dowels are parallel to the other dowels in the assembly within ± 1/8 inch.

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

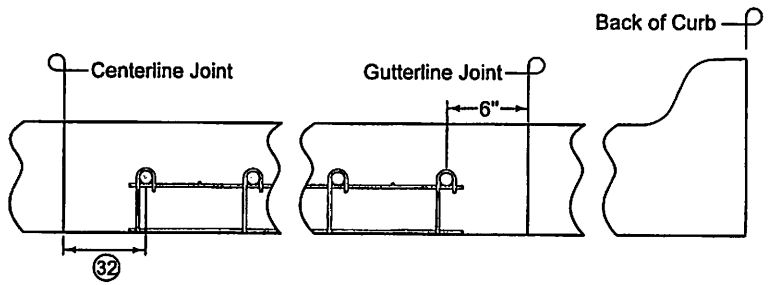
(21) Details apply to both transverse contraction and expansion joints.

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

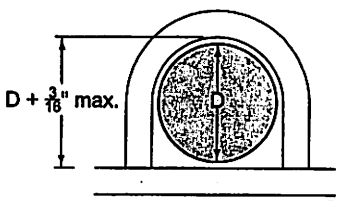
(32) For uniform lane widths: 3" - 6". For taper and variable width pavements: 3" - 12".



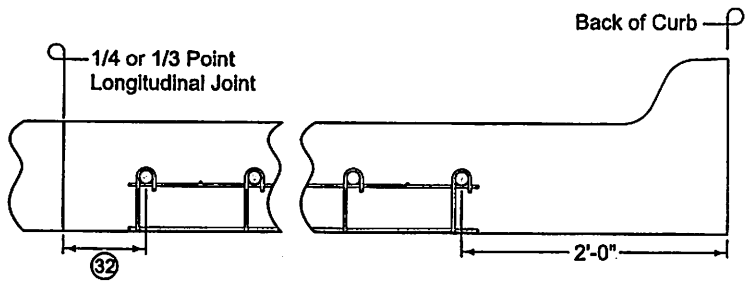

PLACEMENT LIMITS
(Rural Section)




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)

FIGURE 7010.101 | SHEET 8 OF 8

| SUDAS | IOWADOT | REVISION 9 04-16-19 |
|---|---|---|
| FIGURE 7010.101 | STANDARD ROAD PLAN | PV-101 SHEET 8 of 8 |

REVISIONS: Added tubular dowel option to transverse contraction joints. Modified circle note 2. Added new circle note 14 and renumbered remaining notes.

SUDAS DIRECTOR — DESIGN METHODS ENGINEER

JOINTS