

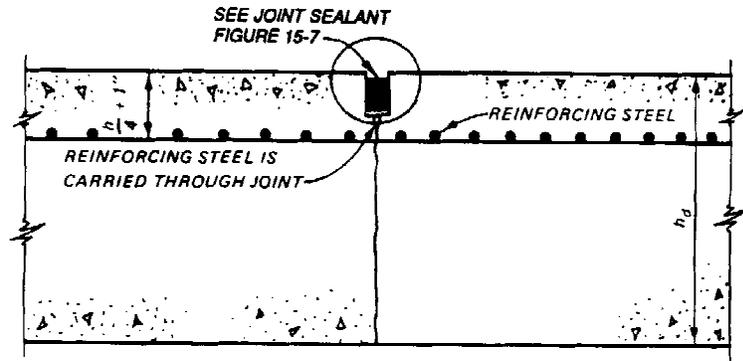
CHAPTER 16

JOINTS FOR REINFORCED CONCRETE

16-1. Requirements.

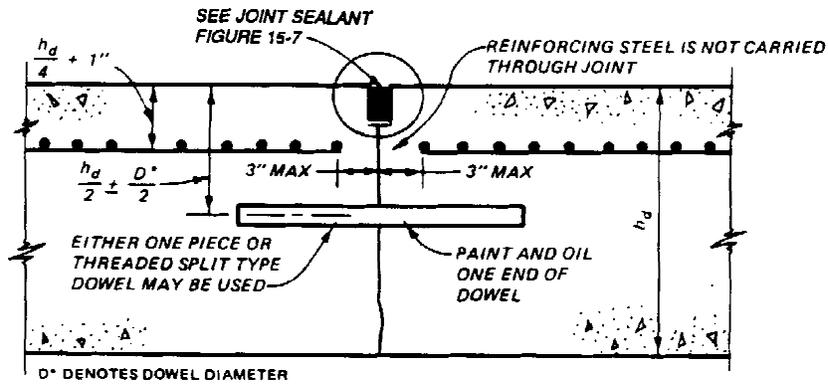
Figures 16-1 through 16-3 present details of the contraction, construction, and expansion joints in reinforced concrete pavements. Joint requirements

and types of reinforced concrete pavements will be the same as for plain concrete pavements (see chap 15) except for those listed below.

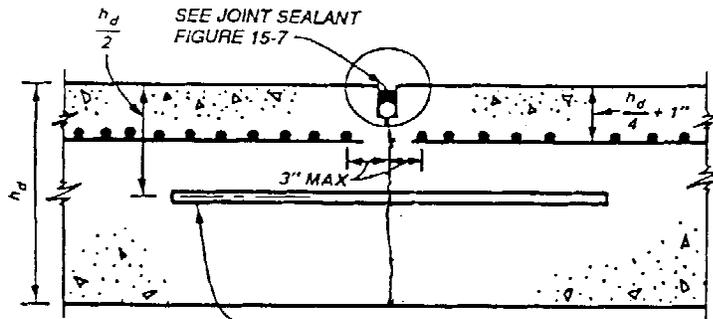


NOTE: SAW CUT WILL NOT EXTEND BELOW STEEL REINFORCING.

a. LONGITUDINAL



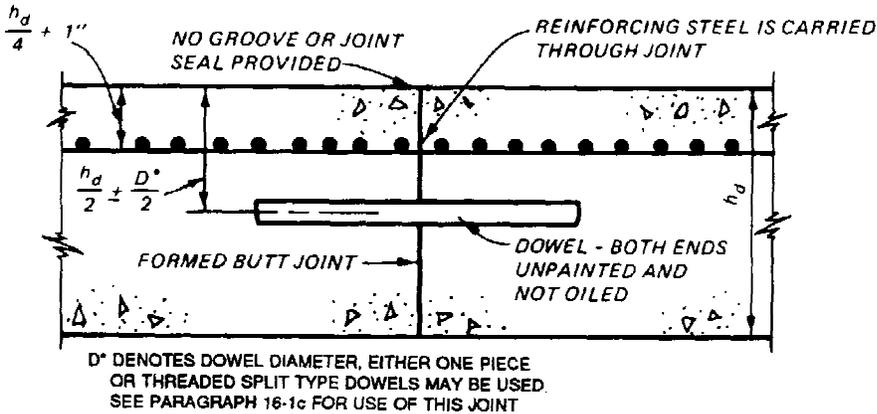
b. TRANSVERSE



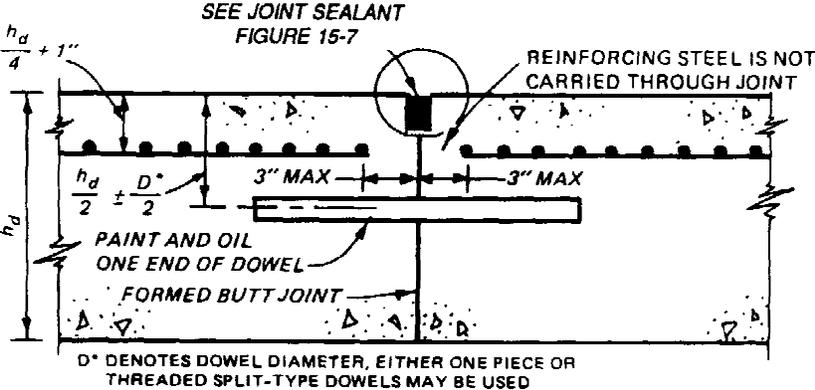
NO. 5 DEFORMED STEEL TIE BARS 2'-6" LONG AND SPACED 2'-6" ON CENTERS

c. TIED LONGITUDINAL

Figure 16-1. Contraction Joints for Reinforced Concrete Pavements.

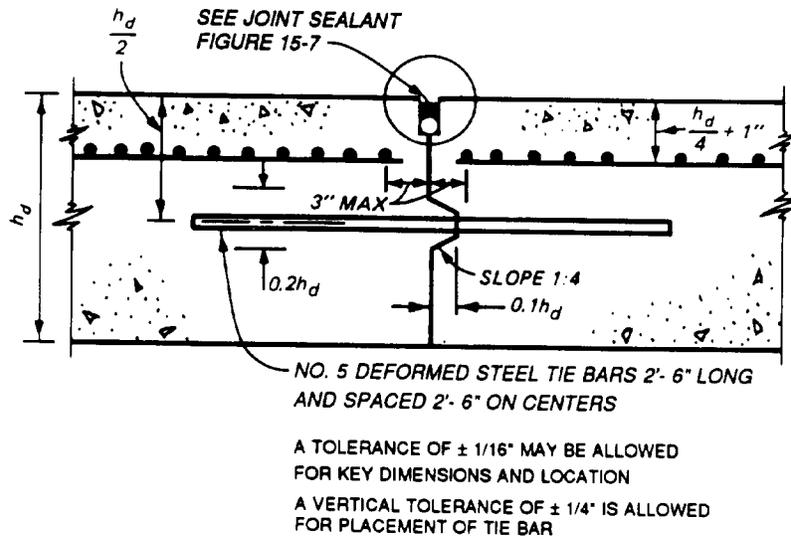


a. DOWELED TRANSVERSE

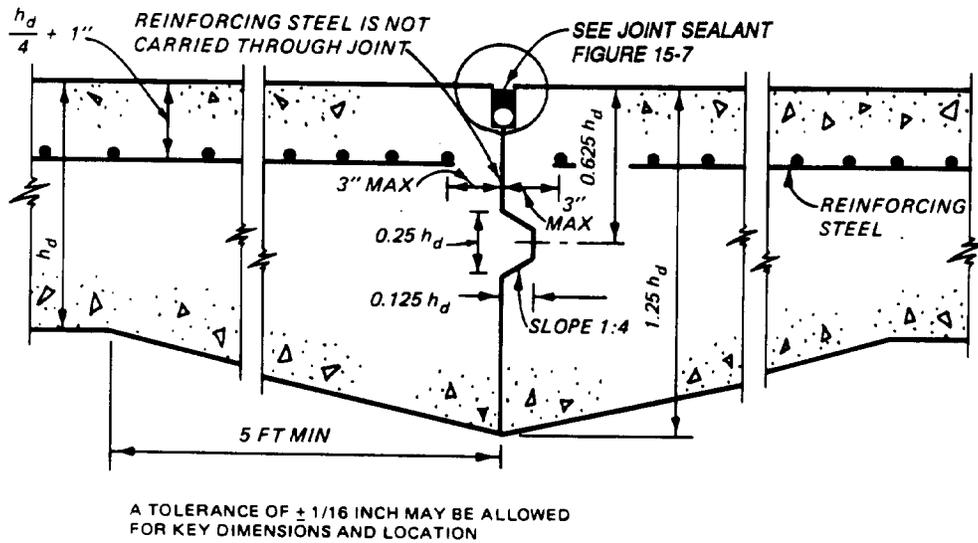


b. DOWELED TRANSVERSE OR LONGITUDINAL

Figure 16-2. Construction Joints for Reinforced Concrete Pavements. (Sheet 1 of 4)

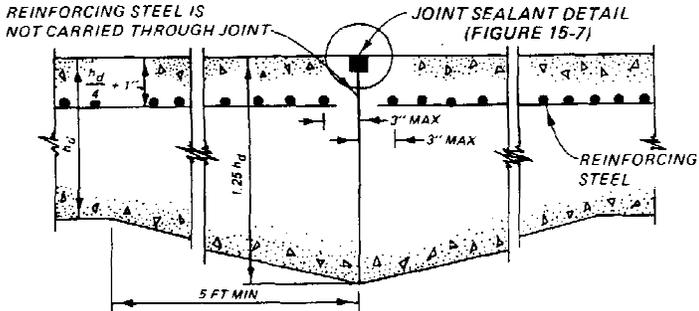


c. KEYED AND TIED LONGITUDINAL

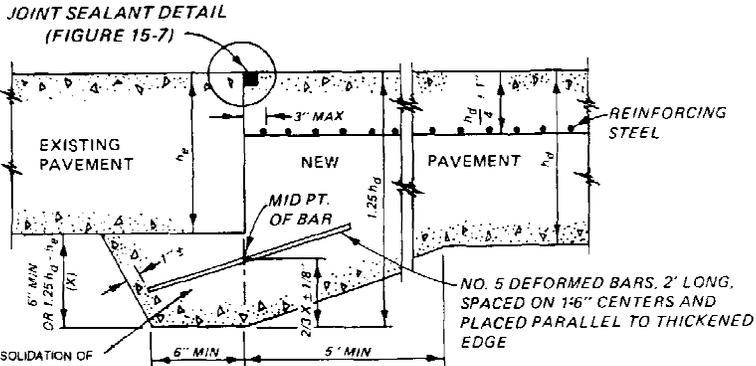


d. KEYED THICKENED EDGE LONGITUDINAL

Figure 16-2. Construction Joints for Reinforced Concrete Pavements. (Sheet 2 of 4)



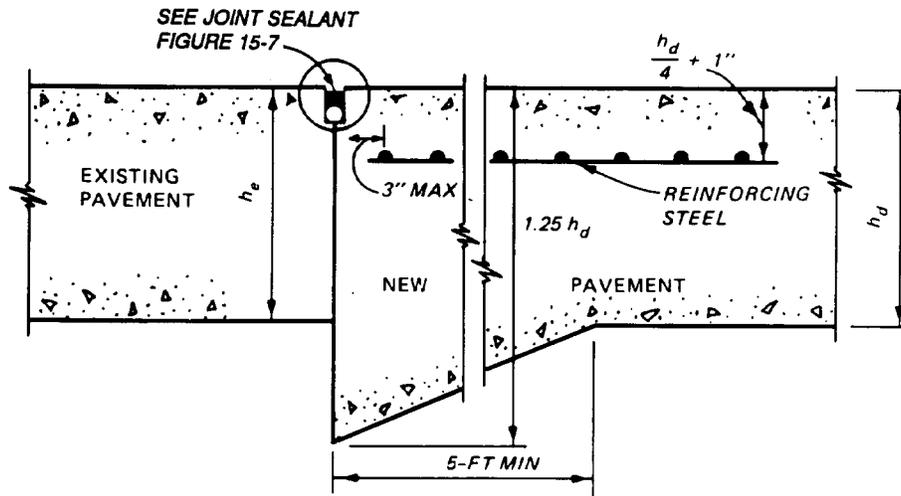
e. THICKENED EDGE LONGITUDINAL



NOTE: PLACEMENT AND CONSOLIDATION OF THE NEW CONCRETE UNDER EXISTING PAVEMENT SHOULD BE CARRIED OUT IMMEDIATELY PRIOR TO CONSTRUCTION OF THE NEW PAVEMENT. PLACEMENT OPERATIONS SHOULD BE TIMED SO THAT THE INITIAL CONCRETE IS STILL PLASTIC WHEN THE REMAINDER OF THE CONCRETE PAVEMENT IS PLACED.

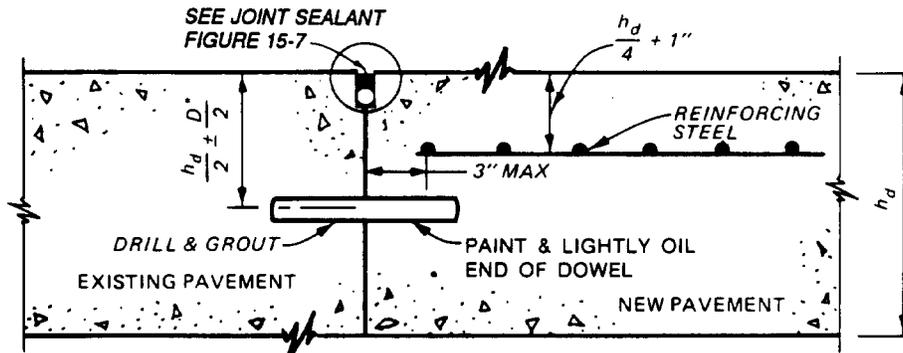
f. SPECIAL JOINT BETWEEN NEW AND EXISTING PAVEMENTS

Figure 16-2. Construction Joints for Reinforced Concrete Pavements. (Sheet 3 of 4)



• NOTE: THIS TYPE JOINT SHOULD BE USED ONLY WHEN EXISTING PAVEMENT IS TO BE REPLACED IN A SHORT PERIOD OF TIME, SINCE WITHOUT LOAD TRANSFER, IT WILL DETERIORATE QUICKLY.

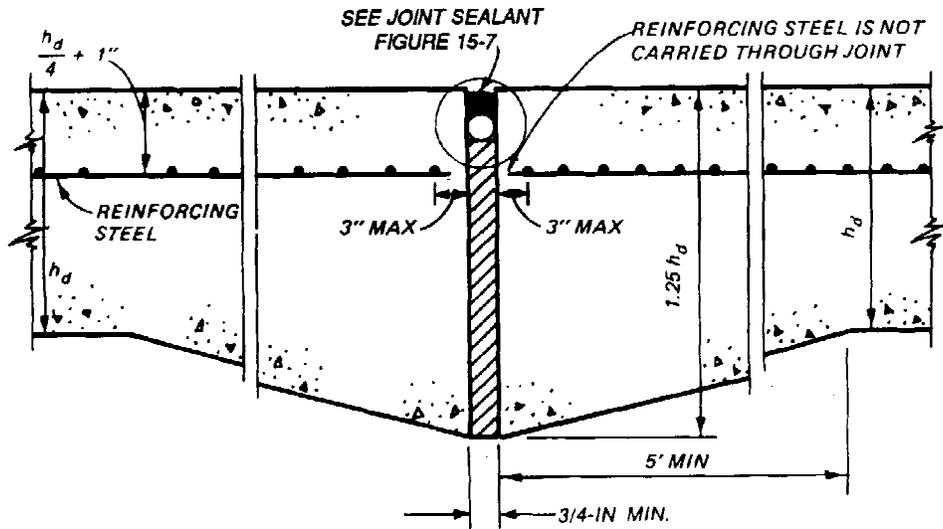
g. THICKENED-EDGE JOINT BETWEEN NEW AND EXISTING PAVEMENT



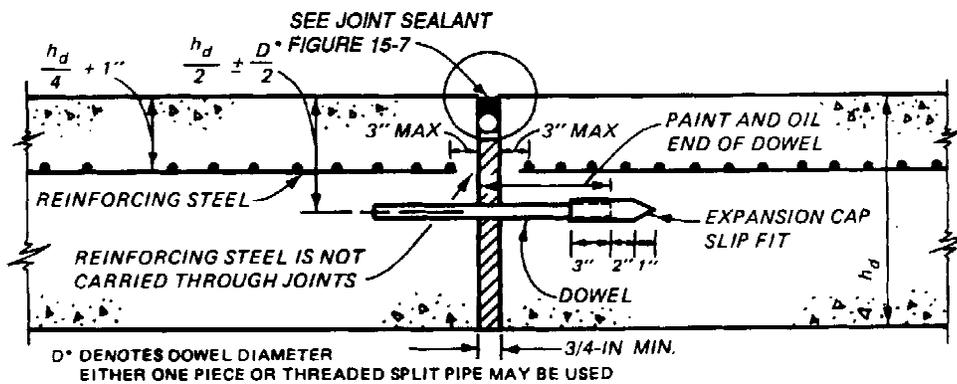
D* DENOTES DOWEL DIAMETER, EITHER ONE PIECE OR THREADED SPLIT TYPE DOWELS MAY BE USED

h. DOWELED JOINT BETWEEN NEW AND EXISTING PAVEMENT

Figure 16-2. Construction Joints for Reinforced Concrete Pavements. (Sheet 4 of 4)



a. LONGITUDINAL



b. TRANSVERSE

Figure 16-3. Expansion Joints for Reinforced Concrete Pavements.

a. *Unscheduled joints.* All joints falling at a point other than a regularly scheduled transverse contraction joint will be doweled with the exception of the thickened-edge type. One end of the dowel will be painted and oiled to permit movement at the joint.

b. *Thickened-edge-type joints.* Thickened-edge-type joints will not be doweled. The edge will be thickened to 125 percent of the design thickness.

c. *Transverse construction joint.* When a transverse construction joint is required within a reinforced concrete slab unit, not at a regularly scheduled contraction joint location, the reinforcing steel will be carried through the joint. In addition, dowels meeting the size and spacing requirements of table

15-2 for the design thickness will be used in the joint.

d. *Transverse contraction joints.* Transverse contraction joints in reinforced concrete pavements should be constructed across each paving lane, perpendicular to the pavement center line, and at intervals of not less than 25 feet nor more than 75 feet. The maximum allowable slab width or length for reinforced concrete pavements is a function of the effective frictional restraint developed at the interface between the slab and subgrade, the percentage of steel reinforcing used in the slab, and the yield strength of the steel reinforcing. Allowable slab widths or lengths can be determined directly from figure 13-2 for yield strengths of 60,000 psi.

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If it is desired to use reinforcing steel having a yield strength other than this value, the maximum allowable slab width or length can be determined from equation 16-1.

$$L = \left[0.00047 h_r (f_s S)^2 \right]^{1/2} \quad (\text{eq 16-1})$$

where

h_r = thickness of reinforced concrete pavement, inches

f_s = yield strength of reinforcing steel, psi

S = percent of reinforcing steel

e. Two traffic lanes. For reinforced concrete pavements where two traffic lanes are placed as a single paving lane, a longitudinal contraction joint should be provided at the center line of the paving lane to control cracking. In these joints, the reinforcing steel is carried through the joint, and tie bars are not required.

f. Pavement center line. Tied longitudinal contraction joints are also required at the center line of reinforced concrete pavements when the width of the pavement exceeds the allowable length of slab L for the percentage of steel reinforcement being used. When such joints are required, the steel reinforcement should be broken at the joint, and 5/8-inch-diameter tie bars 30 inches long and spaced 30-inch center to center are used.

16-2. Joint Sealing.

Joint sealing for reinforced concrete pavements will be the same as for plain concrete pavements (see para 15-5). The use of preformed compression sealants will be required when the joint spacing exceeds 50 feet.