TO:

Director,
Preliminary Plan Review Bureau

SUPERSEDED BY EI 92-001
EFFECTIVE 10/22/1992

ENGINEERING INSTRUCTION

NEW YORK STATE DEPARTMENT OF TRANSPORTATION

SUBJECT: PORTLAND CEMENT CONCRETE PAVEMENT JOINT SPECIFICATION

Subject Code: 7.27-1-502

Distribution: [A] Main Office [C] Regions [ ] Special

Code: EI 78-41

Date: 7/25/78

Supersedes:

APPROVED:

Roger H. Edwards
Deputy Chief Engineer (Facilities Design)

Attached to this instruction is Special Specification 18502.4401 Sawing and Sealing Pavement and Shoulder Joints.

This specification supersedes:

18502.44 Sawing & Sealing Pavement and Shoulder Joints.

15502.8199 Constructing and Sealing Longitudinal and Transverse Joints.

502.40 Constructing and Sealing Longitudinal Joints.

502.41 Constructing and Sealing Transverse Contraction Joints.

This specification is applicable to all newly constructed cement concrete pavement, reinforced and unreinforced. The new specification was written to alleviate construction problems with the rigid plastic sheets and bondbreaker used in constructing transverse joints under 15502.8199. It also increased the depth of the first stage saw cut for longitudinal joints in 24' wide pavements to 1/4 of the pavement thickness plus 1/2 inch. This change is intended to eliminate longitudinal cracking problems which have occurred on some projects. This item will remain in force until the Standard Specifications and Standard Sheet 502-2R1, "Preformed Elastic Joint Sealers for Sawed Joints" are revised to allow the use of pourable sealant.

Special Specification 18502.4401 becomes effective with the August 17, 1978 letting. All appropriate projects in the lettings of August 17, September 7 and September 28 will be revised by the Final Plan Review Bureau. Revisions to appropriate projects thereafter will be the responsibility of the Designer.

ITEM 18502.4401 SAWING & SEALING PAVEMENT & SHOULDER JOINTS

I. Description. Under this item the Contractor shall construct and seal longitudinal and transverse joints on newly constructed cement concrete pavement and shoulders in accordance with the plans, specifications and as ordered by the Engineer.

II. Materials.

A. Preformed Elastic Joint Seal. Materials shall meet the requirements specified in the following subsections:

1 1/4" sealer	705-12 Preformed Elastic Transverse Contraction and Expansion Joint Sealers
13/16" sealer	705-09 Preformed Elastic Bridge Joint Sealer
11/16" sealer	705-10 Preformed Elastic Longitudinal Joint Sealer
7/16" sealer	705-10 Preformed Elastic Longitudinal Joint Sealer

Lubricant for Preformed Elastic Joint Sealer 705-13

B. Pourable Sealant. The sealant shall meet the requirements of ASTM D3406; Joint Sealants, Hot-Poured, Elastomeric Type, for Portland Cement Concrete Pavements. Pourable sealant shall be accepted on the basis of the manufacturer's certification that it conforms to the requirements of ASTM D3406.

The bondbreaker used to dam the bottom of the second stage saw cut shall not adhere to the sealant and shall prevent the sealant from leaking around and underneath it. Suggested types of bondbreaker are shown in Figure III. Any alternate bondbreaker proposed should be compatible with the high application temperatures of the sealant.

III. Construction Details. The provisions of Subsection 502-3 pertaining to constructing, curing, repairing and sealing joints shall apply except for the following modifications.

A. General. When unreinforced cement concrete pavement is required by the plans, the Contractor will have the option of using either preformed seal or pourable sealant except that only one type of sealing method will be permitted on the contract for all joint types.

If a cement concrete shoulder is required by the plans, the shoulder joints shall be sealed by the same method as the adjacent pavement.

Prior to the installation of hot-poured joint sealant, (in all types of joints) the joint faces shall be thoroughly cleaned by either sand blasting or high pressure (nominal 8000 psi) water blasting. The cleaning operation is intended to remove all residue from the sawing operation and to slightly roughen the glazed vertical surfaces of the joint. Excessive blasting which damages the joint faces shall be avoided. Any damage to the vertical surfaces of the joint shall be repaired by the Contractor at no expense to the State. Immediately prior to the sealing with the hot-poured joint sealant, the joint shall be blown with compressed air. Minimum air pressure shall be 100 psi.

Table 1 should be used to determine the appropriate figure contained in this specification, or standard sheet to be referenced, in the construction of various sealer and joint combinations.

TABLE 1 - CONSTRUCTION DETAILS FOR SEALER AND JOINT COMBINATIONS

PAVEMENT TYPE					TYPE OF SEALER	
					PREFORMED	POURABLE
PAVEMENT TYPE	UNREINFORCED - 20' SLABS	JOINT TYPE	TRANSVERSE	PAVEMENT OR SHOULDER	FIGURES I & II	FIGURES I & III
			LONGITUDINAL	24' PAV'T PLACED INTEGRAL	SEE STANDARD SHEET 502-2R1 AND FIGURE IV	FIGURES IV & V
				LANES PLACED SEPARATELY	SEE STANDARD SHEET 502-2R1	FIGURE VI
				SHOULDER-PAVEMENT	SEE STANDARD SHEET 502-2R1, LONGITUDINAL JTS. LANES POURED SEPARATELY	FIGURE VI
	REINFORCED - 63' SLABS	JOINT TYPE	TRANSVERSE	PAVEMENT OR SHOULDER	SEE STANDARD SHEET 502-2R1	NOT ALLOWED
			LONGITUDINAL	PAVEMENT-PAVEMENT	SEE STANDARD SHEET 502-2R1 AND FIGURE IV	NOT ALLOWED
				SHOULDER-PAVEMENT	SEE STANDARD SHEET 502-2R1, LONGITUDINAL JTS. LANES POURED SEPARATELY	NOT ALLOWED

B. Transverse Joints. Transverse joints shall be constructed perpendicular to the centerline and shall extend in a straight line across the full width of pavement, and shoulders, when cement concrete shoulders are required by the plans.

1. Sawing of Transverse Joints.

Contraction joints shall be constructed in two stages. The first stage shall consist of sawing not greater than 1/4" wide to a depth of 1/3 the pavement depth as early as sawing can be done in order to prevent random cracking. (See Figure 1) The stage 1 sawing operation shall be done in succession down the pavement. Sawing alternate joints initially and returning later to saw intermediate joints shall not be allowed.

The second stage shall consist of sawing to a width of "w", and to a depth of "d" from the surface of the pavement. (See Figure II or III as applicable) This sawing shall not be done sooner than 72 hours after the concrete at the joint has been placed. Each joint shall have 1/8" nominal, 1/4" maximum beveled edges. These edges may be beveled using a cutting or grinding device attached to the second stage sawing blade, or a cutting or grinding device following the second stage sawing operation. The Contractor shall modify or change his method of producing bevels when undesired results are being obtained, at the order of the Engineer. Other methods shall have the prior approval of the Deputy Chief Engineer (Construction). This second stage sawing may be delayed at the Contractor's convenience except that if this second stage sawing is done after October 15th and the joint to be sawed has opened more than 1/8", as determined by measuring edge cracking, the Contractor shall saw an additional 1/16" in width for each 1/16" of opening over and above the 1/8".

When cement concrete shoulders and preformed elastic joint seal are used, the transverse joint shall be sawn down the side of the exposed shoulder edge to accommodate the joint seal. See the standard sheet for PREFORMED ELASTIC JOINT SEALERS FOR SAWED JOINTS for "Transverse Joint Seal Installation Details At Edge of Pavement", where the word "pavement" is used, substitute "shoulder." If shoulders are not constructed of concrete, the pavement edge shall be sawn according to the standard sheet for PREFORMED ELASTIC JOINT SEALERS FOR SAWED JOINTS.

2. Sealing Transverse Joints.

a. Sealing transverse joints with preformed joint seal.

The provisions of Sub-Section 502-3.14, Sealing Joints shall apply except that the joints shall be sawn to the dimensions shown in Figures I & II in the manner described above, and the sealer dimensions shall correspond to the appropriate saw cut shown in Table II - Sealer and Joint Dimensions (See Figure II).

When concrete shoulders are used, the joint sealer shall b
installed across the full width of pavement and shoulders
and down the full depth of the exposed shoulder edges.

All other details regarding installation, lubricant, tempo
ary fillers and vertical side joints found in Section 502-3
or on the standard sheet for PREFORMED ELASTIC JOINT SEALER
FOR SAWED JOINTS, shall apply.

b. Sealing transverse joints with pourable sealant.

When the joint has been satisfactorily constructed and clear
the bottom of the second stage saw cut shall be sealed with
an appropriate bondbreaker as shown in Figure III. The bond
breaker shall protrude into the first stage cut and be placed
between 7/8 and 1 inch below the concrete surface.

Care should be taken during heating and application of the
sealant that the manufacturer's recommendations are adhered
to. Some of the materials conforming to ASTM D-3406 may be
damaged by heating to too high a temperature, reheating or
by heating for too long a time.

To prevent leakage, the joints should be dammed at the ends
in a manner approved by the Engineer. The joints should then
be filled to between 1/8 and 1/4 inch below the concrete sur-
face across the entire width of pavement.

Any joint to be sealed after October 15th which has opened
more than 1/8" should be filled between 1/4 and 3/8 inch
below the concrete surface.

Sealing shall not be performed when the air or pavement
temperature is below 40°F or when the pavement is wet.

With concrete shoulders the transverse joint in pavement
and shoulders may be sealed in separate operations.

C. Longitudinal Joints.

1. Sawing of Longitudinal Joints. Longitudinal joints shall be
sawn before the end of the curing period and before any equip-
ment or vehicles are allowed on the pavement.

a. Sawing of Longitudinal Joints Using Preformed Sealer. In
both reinforced and unreinforced cement concrete pavement
the longitudinal joints shall be sawn according to the
type and dimensions shown on the standard sheet for PREFORMED
ELASTIC JOINT SEALERS FOR SAWED JOINTS. All provisions of
Section 502-3.08, Joints, shall apply, except that the depth
of the first stage saw cut for all two lane pavements placed
integrally shall be 1/4 of the pavement depth plus 1/2 inch.

b. Sawing of Longitudinal Joints Using Pourable Sealant. This type of joint shall be used only in unreinforced cement concrete pavement and shall be sawn to the dimensions shown in Figure IV, V and VI as applicable. Figures IV and V represent a two-stage sawing method to be used when pavement is placed two lanes wide. Figure VI shows a one-stage sawcut to be used where lanes are placed separately (new construction only).

c. Sawing of Longitudinal Shoulder-Pavement Joints. When preformed sealer is used the joints shall be sawn in the configuration shown for longitudinal joints (lanes poured separately) on the standard sheet for PREFORMED ELASTIC JOINT SEALERS FOR SAWED JOINTS.

When pourable sealant is used the joint shall be saw-cut in one stage to the depth shown in Figure VI.

2. Sealing of Longitudinal Joints.

a. Sealing Longitudinal Joints With Preformed Joint Seal. The provisions of Sub-Section 502-3.14, Sealing Joints, shall apply.

b. Sealing Longitudinal Joints With Pourable Sealant. All longitudinal joints sawed and cleaned as previously described shall be sealed before the pavement is open to traffic.

The sealant material shall be heated and placed in the joint as recommended by the manufacturer. The joint shall be filled between 1/8 and 1/4 inch below the concrete slab surface.

Sealing shall not be performed when the air or pavement temperature is below 40°F or when the pavement is wet.

c. Sealing of Longitudinal Shoulder-Pavement Joints. When preformed sealer is used it shall be installed according to Sub-Section 502-3.14, Sealing Joints. The sealer used shall meet the minimum sizes shown on the standard sheet for PREFORMED ELASTIC JOINT SEALERS FOR SAWED JOINTS.

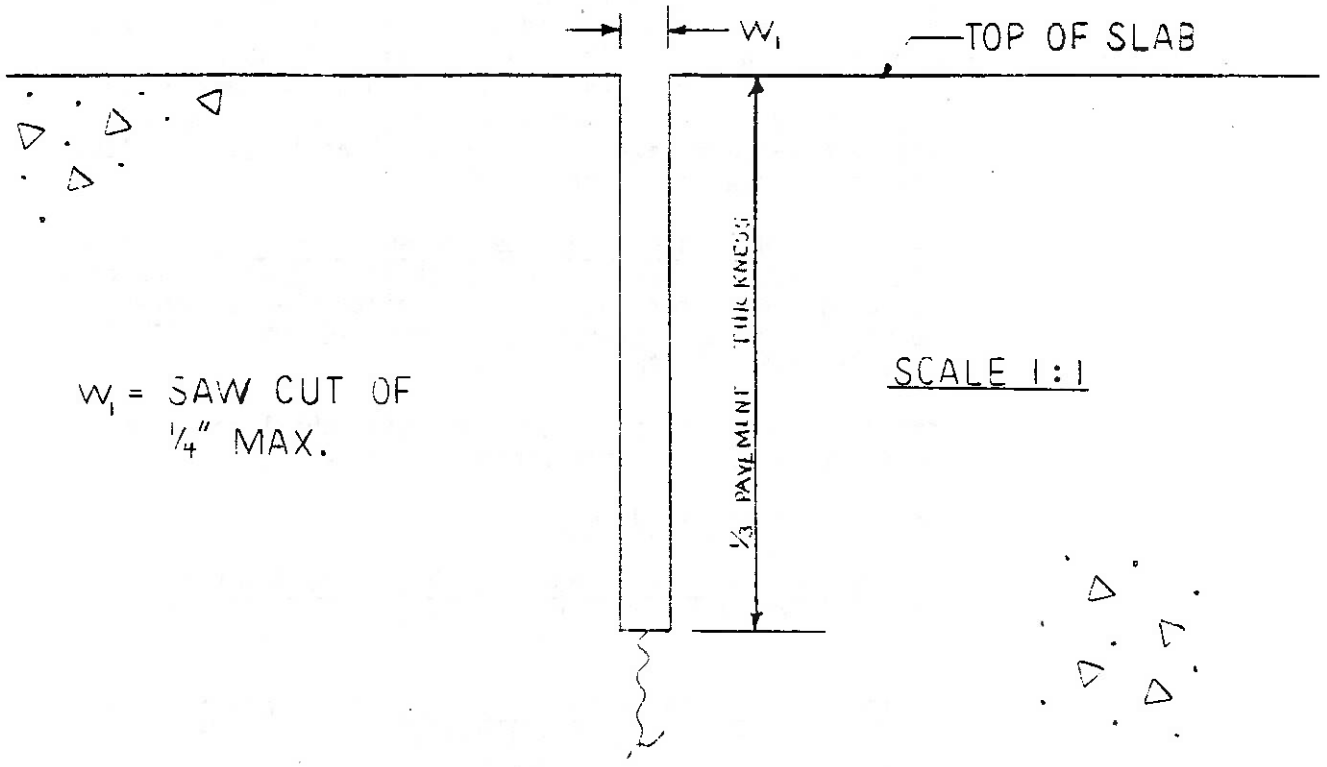
When pourable sealant is used, the joints shall be sawed and cleaned as described previously and filled to between 1/8 and 1/4 inch below the concrete slab surface. See Figure VI.

IV. Method of Measurement. The quantity of transverse contraction and longitudinal joint constructed and sealed shall be measured by the linear foot of sealed joints incorporated into the work in accordance with the contract documents, excluding the sealer turned down at the pavement or shoulder edges.

V. Basis of Payment. The unit price bid for constructing and sealing longitudinal and transverse contraction joints shall include all labor, materials and equipment required for sawing, preparation and sealing.

FIGURE I

ALL TRANSVERSE JOINTS – STAGE 1

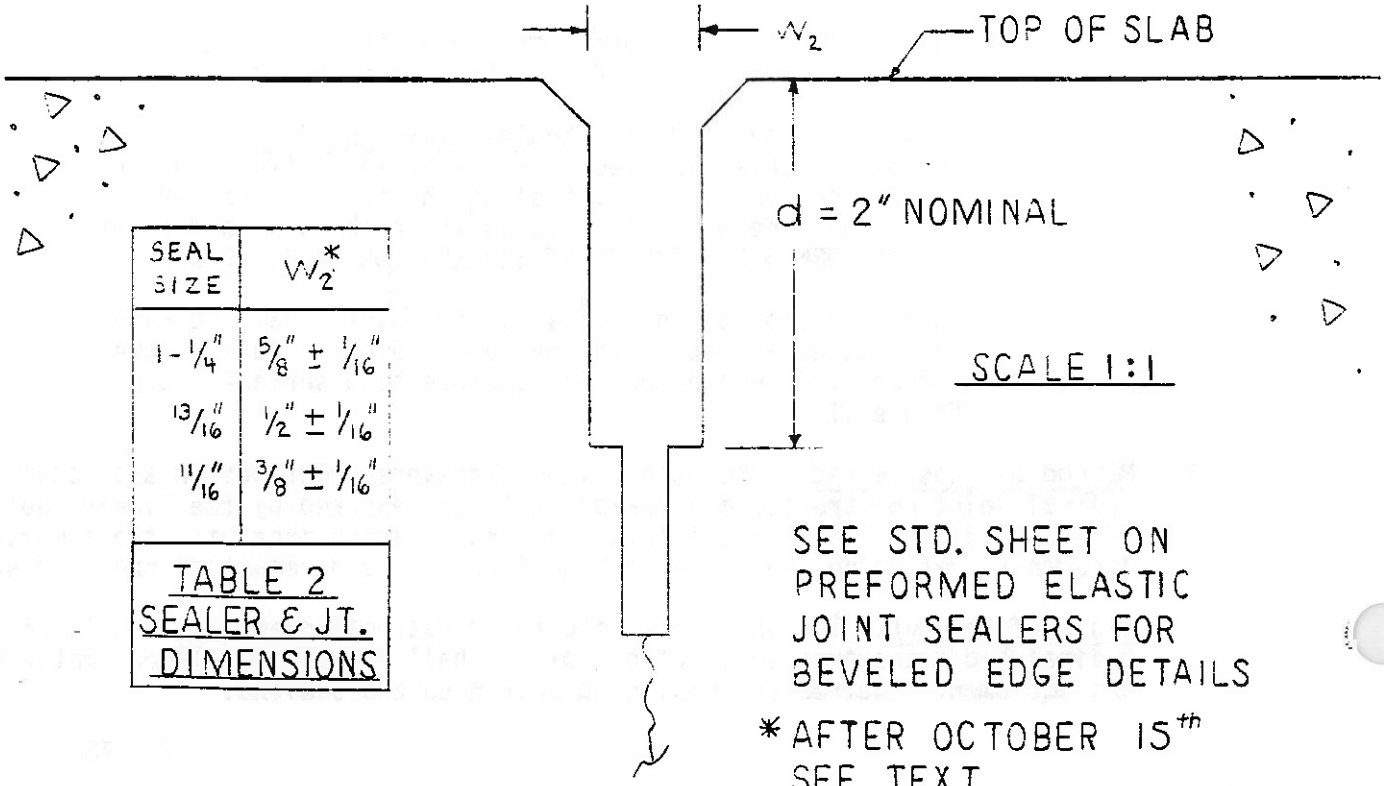


W_1 = SAW CUT OF ¼" MAX.

SCALE 1:1

FIGURE II

TRANSVERSE JOINTS PREFORMED SEAL – STAGE 2



SCALE 1:1

SEAL SIZE	W_2*
1-¼"	⅝" ± 1/16"
13/16"	½" ± 1/16"
11/16"	⅜" ± 1/16"

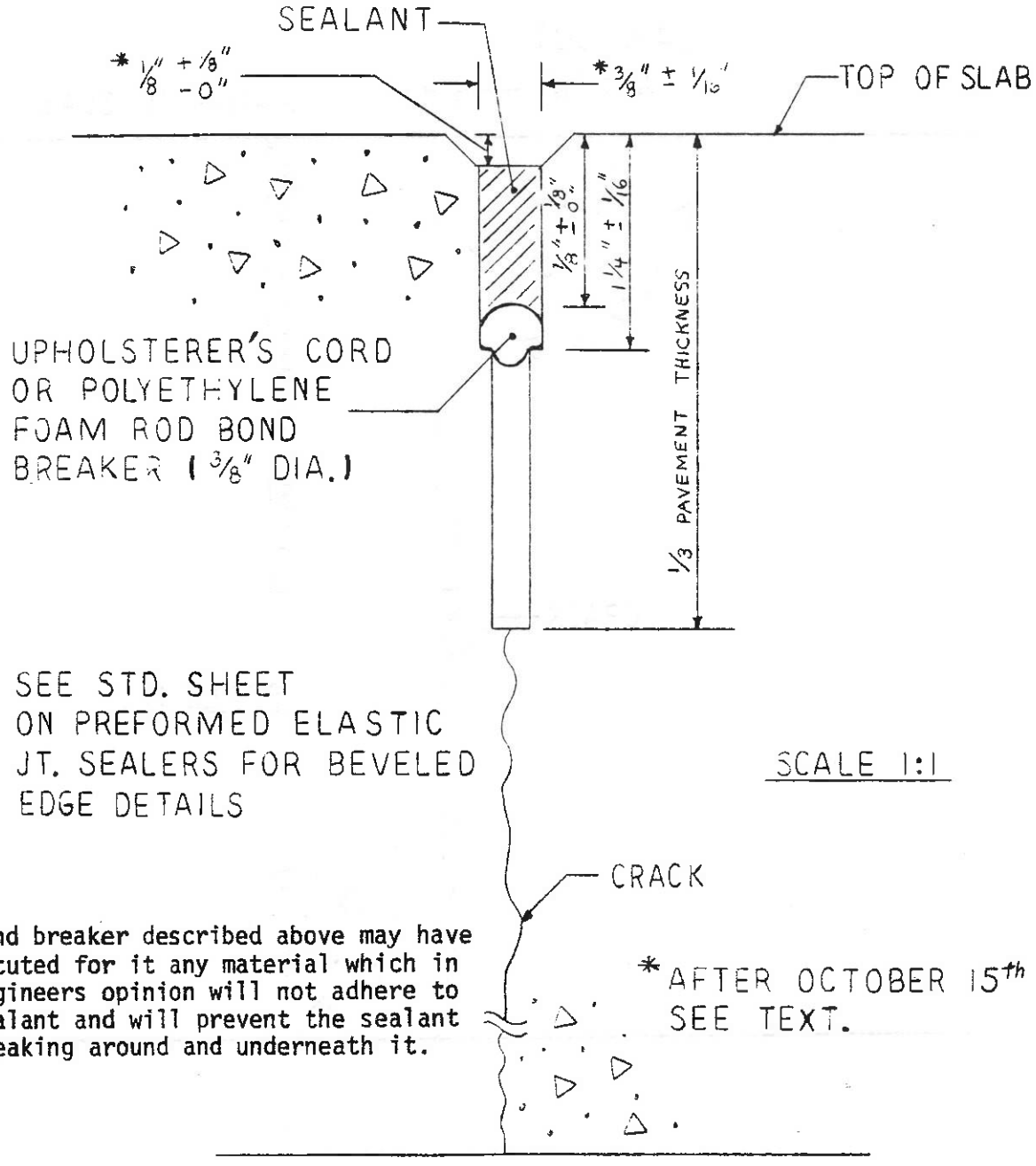
TABLE 2
SEALER & JT. DIMENSIONS

SEE STD. SHEET ON PREFORMED ELASTIC JOINT SEALERS FOR BEVELED EDGE DETAILS

* AFTER OCTOBER 15th SEE TEXT.

FIGURE III

TRANSVERSE JOINTS
POURABLE SEALANT—STAGE 2



Note: The bond breaker described above may have substituted for it any material which in the engineers opinion will not adhere to the sealant and will prevent the sealant from leaking around and underneath it.

FIGURE IV

LONGITUDINAL JOINTS
(24 FT. PAV'T. PLACED INTEGRAL)
PREFORMED SEAL AND PLIABLE SEALANT - STAGE I

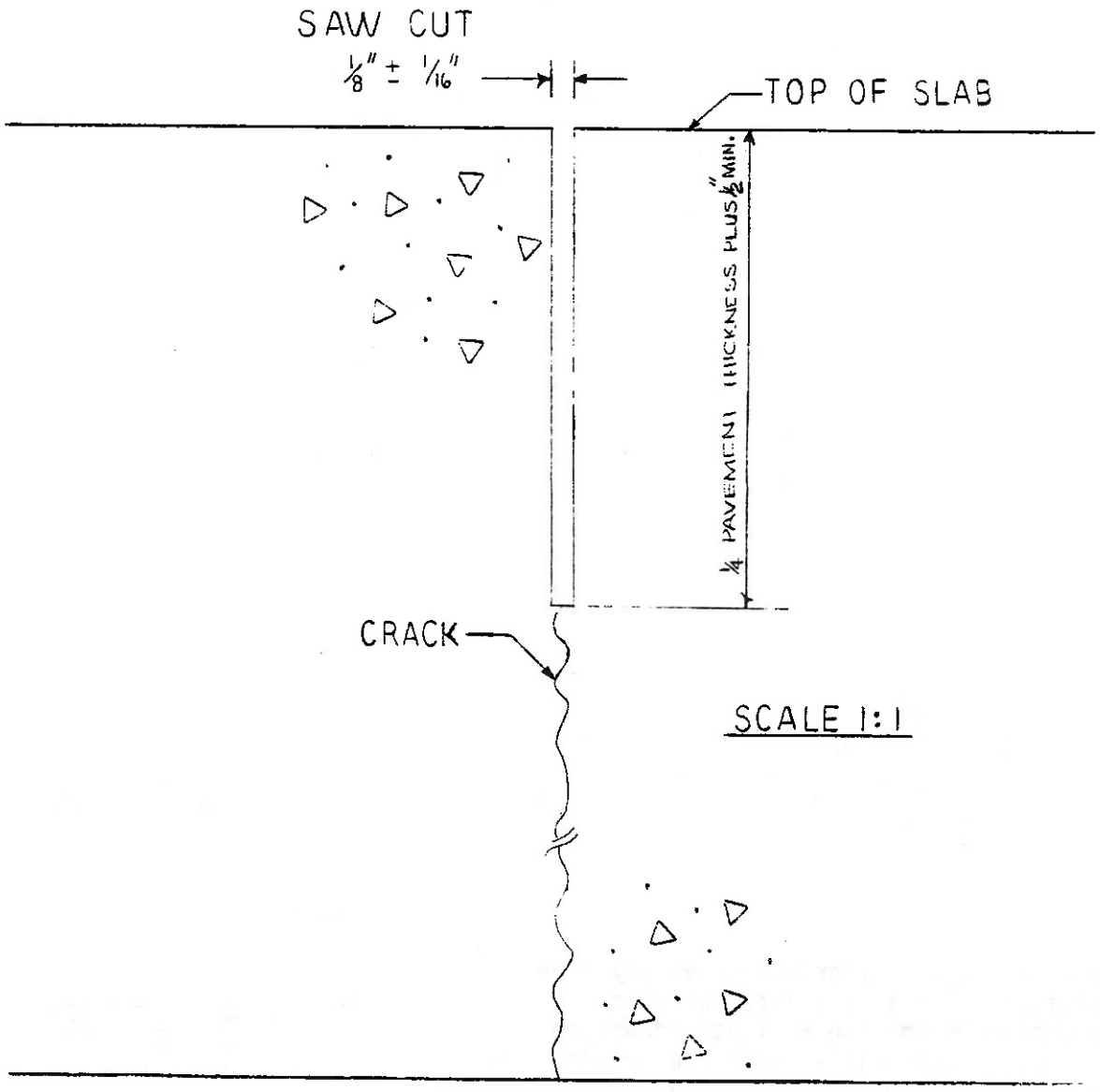


FIGURE V

LONGITUDINAL JOINTS
(24 FT. PAV'T. PLACED INTEGRAL)
POURABLE SEALANT–STAGE 2

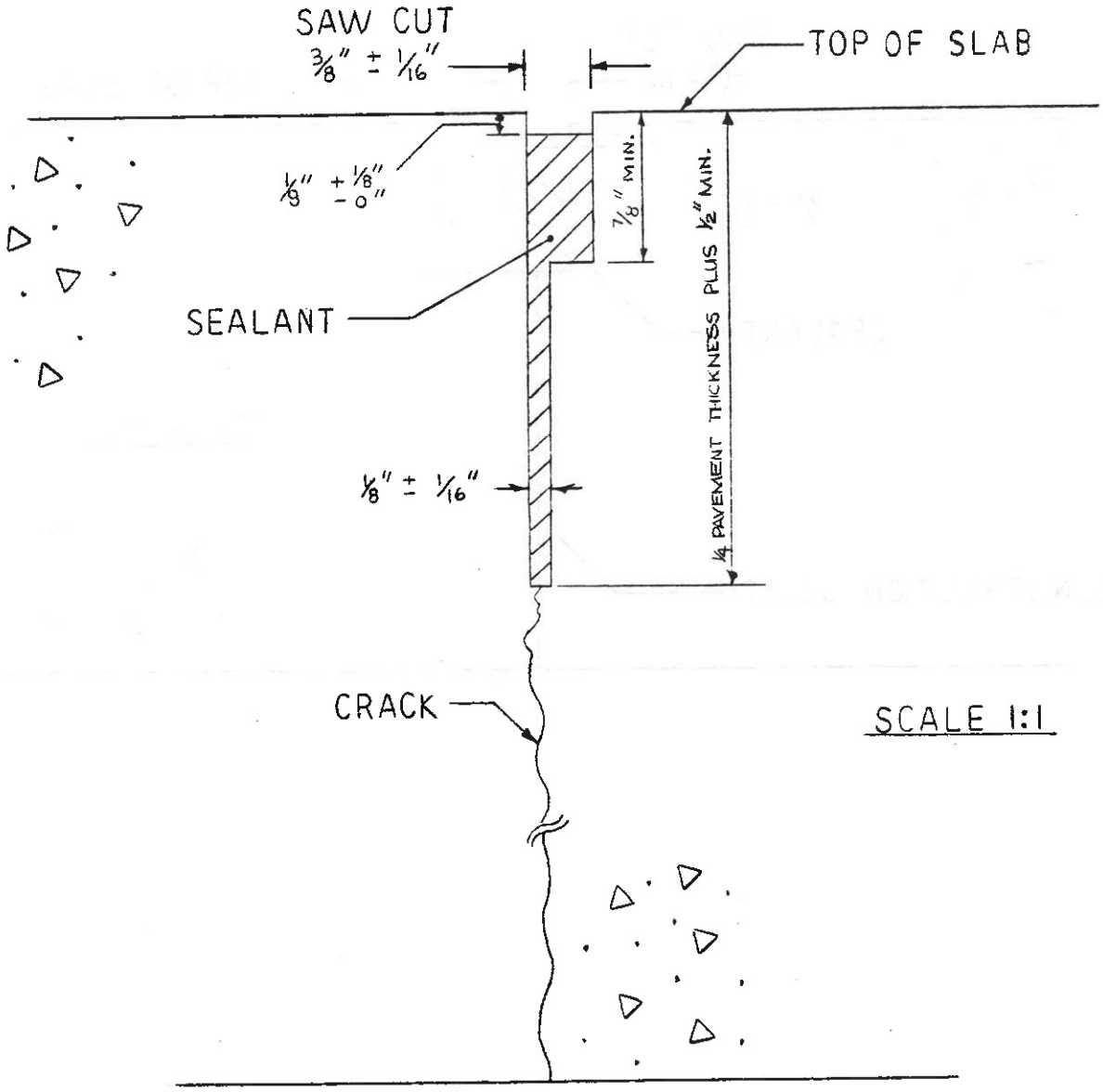


FIGURE VI

LONGITUDINAL JOINTS
PAVEMENT AND PAVEMENT-SHOULDER
(PLACED SEPARATELY)
POURABLE SEALANT