TO:

ENGINEERING INSTRUCTION

NEW YORK STATE DEPARTMENT OF TRANSPORTATION

SUPERSEDED BY EI 85-015
EFFECTIVE 5/9/1985

SUBJECT: PORTLAND CEMENT CONCRETE PAVEMENT JOINTS-SPECIFICATIONS AND STANDARD SHEETS 502-7;502-8; 502-9

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Supersedes:

APPROVED: Malcolm D. Graham
DEPUTY CHIEF ENGINEER (FACILITIES DESIGN)

We are transmitting herewith the following Special Specifications:

15502.2003 Transverse Joint Supports (Reinforced Pavement)
15502.2004 Transverse Joint Supports (Unreinforced Pavement)

These two specifications supersede 15502.2002 Transverse Joint Supports.

We are also transmitting a special note titled "Longitudinal Joint Ties." This note revises Subsection 502-3.08A, page 235 of the Standard Specifications, to allow approved coatings on longitudianl joint ties and to change the grouting requirements for the grout type longitudinal joint ties.

We are also transmitting, under separate cover, transpariencies and prints of the following standard sheets:

502-7 Corrosion Resistant Longitudinal Joint Ties
502-8 Longitudinal Joint Ties
502-9 Transverse Joint Supports

Standard Sheet 502-7 and 502-8 are new standard sheets and do not supersede any of the existing standard sheets for Longitudinal Joint Ties. They are considered equal alternates and may be used at the Contractor's option.

Standard Sheet 502-9 is a new standard sheet and may be used with the new specifications, 15502.2003 and 15502.2004, transmitted with this instruction.

MDG:WEH:MAK
Attachment

15502.2003 TRANSVERSE JOINT SUPPORTS (REINFORCED PAVEMENT)
15502.2004 TRANSVERSE JOINT SUPPORTS (UNREINFORCED PAVEMENT)

Description. The Contractor shall furnish and incorporate approved corrosion resistant dowels or bar type load transfer devices. The dowels or bar type load transfer devices shall meet the basic requirements stated herein.

Materials. The dowels or bars shall exhibit the following physical characteristics:

1. They shall be at least 18 inches long.
2. Round dowels shall have a diameter of at least 1/8 the thickness of the pavement exclusive of any coating.
3. All load transfer devices shall have a minimum bearing area of 16 square inches.
4. The dowels or bars shall be capable of resisting corrosion and degradation caused by roadway deicing materials and normal highway debris, and capable of resisting abrasion caused by pavement expansion and contraction.
5. They shall develop low bond strength with portland cement concrete. The low bond strength characteristic of the dowel or bar shall be a manufactured characteristic and the use of field applied bond breakers will not be permitted.

Coating used over metal cores to achieve any or all of the preceding characteristics shall be continuous and undamaged for the full length of the dowel or bar. Perforated or cracked coatings or coatings which are otherwise damaged shall be rejected and the dowels or bars shall be removed from the site of the work. The ends of the dowels or bars do not need to be coated and the free ends shall be saw cut and free of burrs or projections which could restrict the movement of the dowels or bars.

To determine the performance of any proposed joint support device the device must perform satisfactorily when subjected to Load-Deflection, Pull-Out, Corrosion-Abrasion and other tests as required by the Department. When basket assemblies are to be used a full basket assembly containing dowels and 12 loose dowels shall be submitted for testing. When implantation is to be used 18 loose dowels shall be submitted for testing. Samples shall be sent to the Materials Bureau at least 90 days prior to their first intended use.

Conventional steel dowel structural design would indicate the use of an 1-1/8" diameter dowel for 9" pavement. Structural and material alternatives to the conventional structure design shall therefore normally be judged on the basis of a section modulus of 0.14 $in.^3$ and a modulus of elasticity of 29,000,000 psi. Either of these two properties can be varied as long as the resulting deflection and fatigue properties of the alternate system are equivalent.

Complete joint support assemblies or implanting procedures with alignment tolerance, not shown on the Standard Sheets, must be approved by the Deputy Chief Engineer Facilities Design. The Contractor shall submit detailed shop drawings, drawn by the manufacturer, for transverse contraction, bulkhead, and expansion joints. The shop drawings shall be neatly drawn and clearly legible and shall be submitted to the Deputy Chief Engineer Facilities Design for approval, on sheets conforming to the following requirements:

An overall length of 36 inches and an overall width of 22 inches with a 1/2 inch margin on the top, bottom, and right hand edges and a 2 inch binding margin on the left, leaving a working space of 21 by 33½ inches. Each drawing shall have a 3 by 11 inch box in the lower right hand corner of the working space for the title and approval signatures, and a 2 by 6 inch box, identical to the box on the Contract Drawings, in the upper right hand corner of the working space. Failure to submit shop drawings of the required size and detail will be cause for their return without examination.

A letter detailing the essentials of the implantation process and the equipment required to perform the work shall be sufficient for approval of the implantation procedure.

Fabrication of the transverse joint assemblies shall not be started prior to the receipt of approval of the shop drawings and implantation procedures.

Construction Details. The details for placing, securing and maintaining the transverse joint assemblies shall be as given in SECTION 502 - PORTLAND CEMENT CONCRETE PAVEMENT. Approval of a type of support in no way relieves the Contractor of his responsibility for placing and maintaining joint supports in their proper position and alignment during paving operations. The dowels shall be spaced at 12" centers transversely and their longitudinal axis aligned midway and parallel to the top and bottom surface of the pavement and parallel to the centerline. Maximum allowable vertical and horizontal displacement of a given dowel or bar in a basket assembly shall be no more than 1/8" per foot. The longitudinal misalignment of one end of a basket with respect to the other end in achieving a perpendicular alignment with the centerline shall be no more than 1".

Stage 1 sawing of the transverse joint shall be a minimum of 1/3 the pavement depth. The first stage sawing shall be centered within 1" of the transverse center line of the dowel or bar assembly. The 1" tolerance shall also apply to implantation procedures. For unreinforced pavement the joint spacing shall be as indicated on the plans. For reinforced pavement the joint spacing shall be 63'-0" when 18" dowels or bars are used. The exact joint spacing for dowels or bars other than 18" in length shall be determined by adding 61'-6" to the out-to-out length of the dowel or bar. The intent is to have 3" between the pavement mesh and the nearest part of the dowel or bar.

Method of Measurement. Transverse joint supports will be measured by the number of linear feet of transverse joints incorporated into the work in accordance with the plans, specifications or directions of the Engineer.

Basis of Payment. The unit price bid per linear foot shall include the cost of furnishing all labor, materials and equipment necessary to complete the work.

3/25/74
8/2/76

LONGITUDINAL JOINT TIES

Page 235 Under Subsection 502-3.08A Longitudinal Joints. Delete the 5th sentence of the 2nd paragraph of this Subsection which reads "They shall not be coated with asphalt or other material." and substitute the following: "Approved coatings shall be continuous and undamaged over the entire coated area of the joint tie. Perforated or cracked coatings or coatings which are otherwise damaged shall be rejected and the joint ties shall be removed from the site of the work."

In the 3rd paragraph of this subsection delete the 5th sentence which reads "When the grout type is used, the hole shall be filled with a grout mixture, approved by the Engineer, using rapid hardening hydraulic cement meeting the requirements of § 701-03 Rapid Hardening Hydraulic Cement," and substitute the following: "When the grout type is used, the hole shall be filled with a grout mixture, approved by the Engineer, using concrete grouting material meeting the requirements of § 701-05."

701-05 CONCRETE GROUTING MATERIAL

SCOPE: This specification covers a grouting material for use in grouting anchor bolts, dowels and other miscellaneous items in concrete.

GENERAL: The material shall be a non-metallic, non-shrink grout which when mixed with water will harden rapidly to produce a permanent anchoring bond. It shall contain no metals nor rust or corrosion promoting agents. The color shall be light gray matching approximately the color of hardened concrete.

MATERIAL REQUIREMENTS: The material when prepared in accordance with the manufacturers instructions, shall be of a trowelable consistency. It shall also have the following properties:

1. The material shall exhibit no shrinkage on setting but may exhibit slight expansion of no more than 0.02%.

2. Compressive Strength - Two-inch cubes of this material when cured as shown shall have the following minimum compressive strengths:

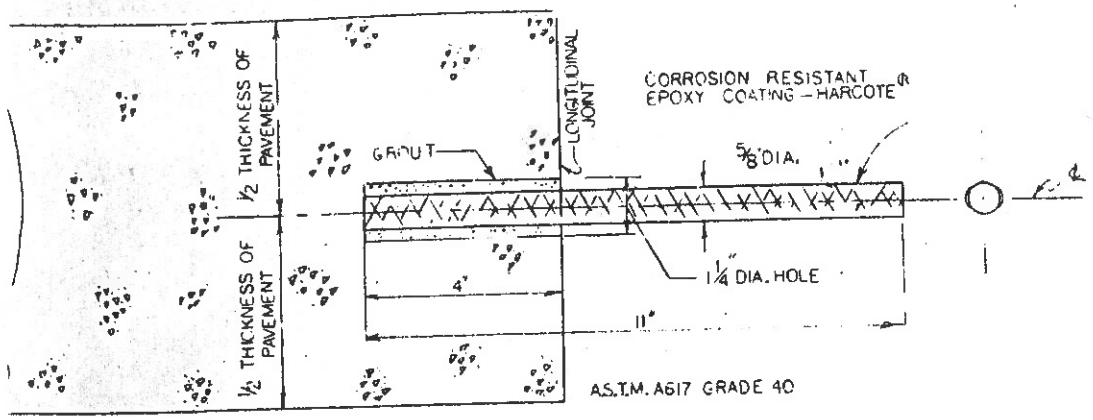
Cure	Strength
24 hour air cure @ 75°F	4000 PSI Min.
7 day air cure @ 75°F	6000 PSI Min.
7 day air, 10-day water submersion	6000 PSI Min.
7 day air, 24-hour water submersion, 25 cycles freeze-thaw	6000 PSI Min.

3. The material shall have a minimum working life of 30 minutes from the time of the water addition.

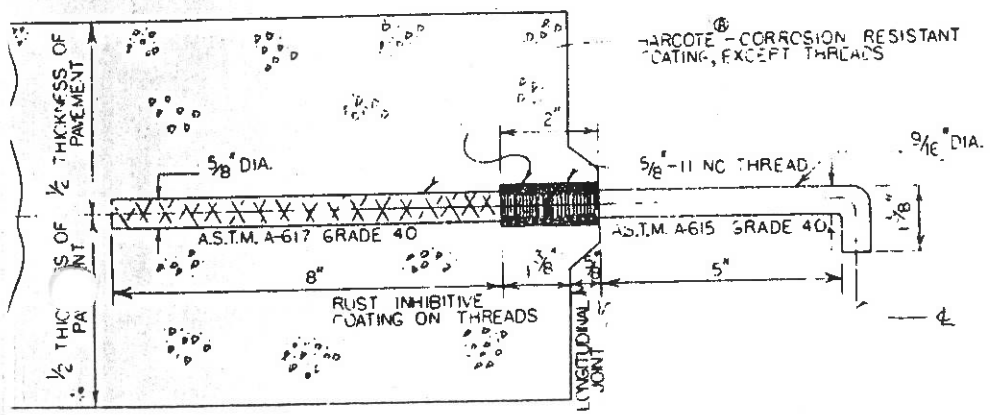
4. Pull-out Strength - a #5 concrete reinforcement bar grouted 6 inches deep in a 7/8 inch diameter hole in saturated surface dried concrete shall have a pull-out strength of 10,000 pounds.

5. The material shall contain not more than 0.05% chlorides or 5% sulfates.

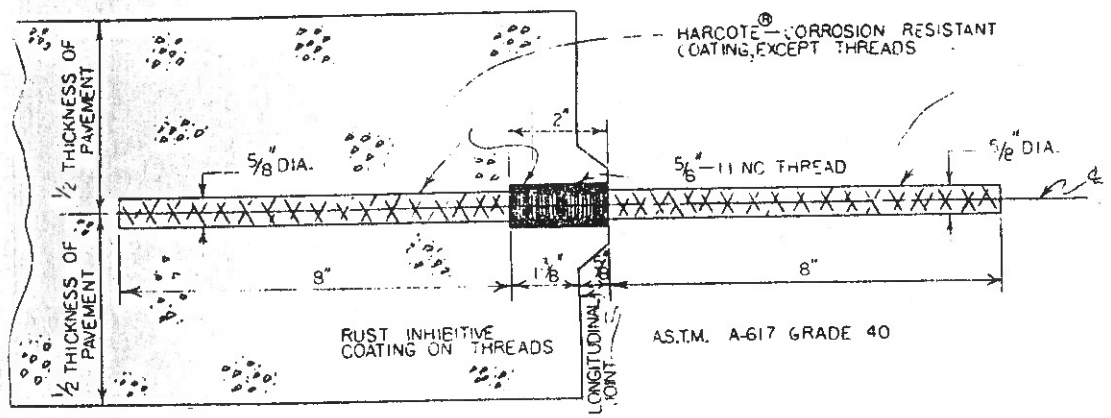
Basis of Acceptance - Application for approval of a Concrete Grouting Material by the producer shall be submitted to the Materials Bureau accompanied by a 50-lb. sample of the product. Upon approval by the Materials Bureau, the name of the product will be placed on an approved list. Such product shall then be accepted on the basis of the brand name labeled on the container.



GROUT TYPE – 502.32 **(See Note 3)**



PUSH IN TYPE WITH HOOK – 502.30



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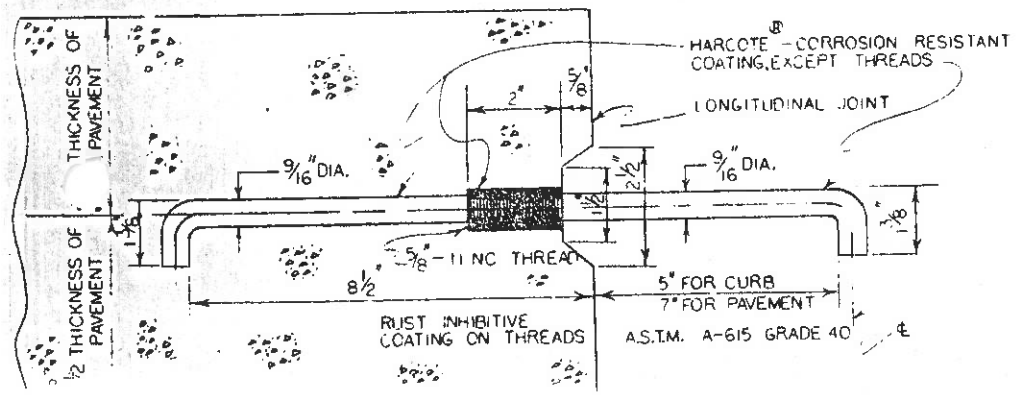
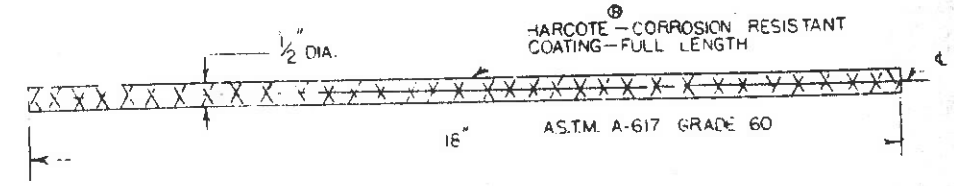
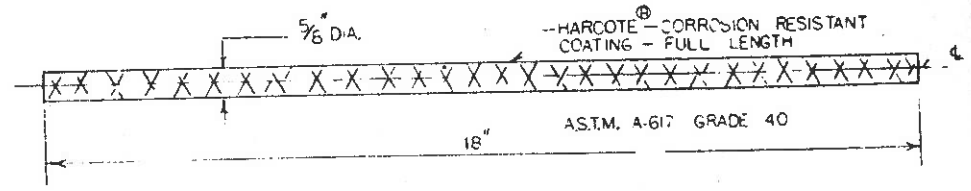




DROP IN TYPE – 502.30



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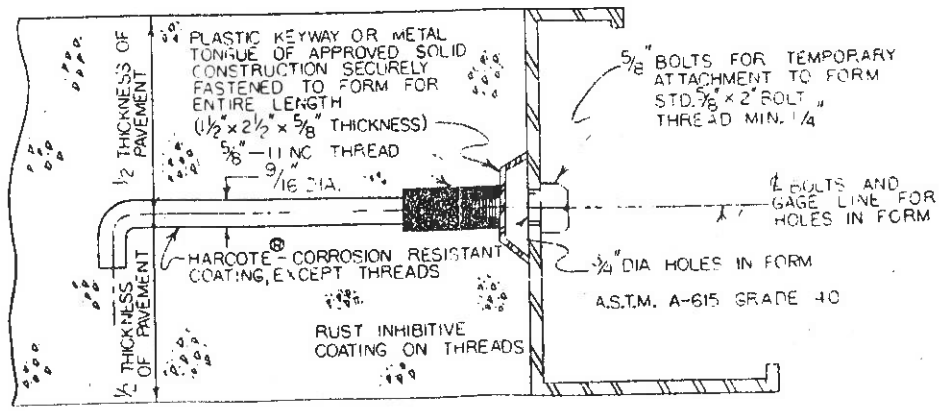


NOTES: 1) HARCOTE – CORROSION RESISTANT COATING TRADE MARK OF A.H. HARRIS EPOXY COATING NOMINAL COATING THICKNESS – 6 MILS. $^{+12}_{-}$

2) RUST INHIBITIVE COATING ON THREADS – APPROVED BY DEPUTY CHIEF ENGR FACILITIES DESIGN

3) GROUT SHALL BE 701-05 CONCRETE GROUTING MATERIAL

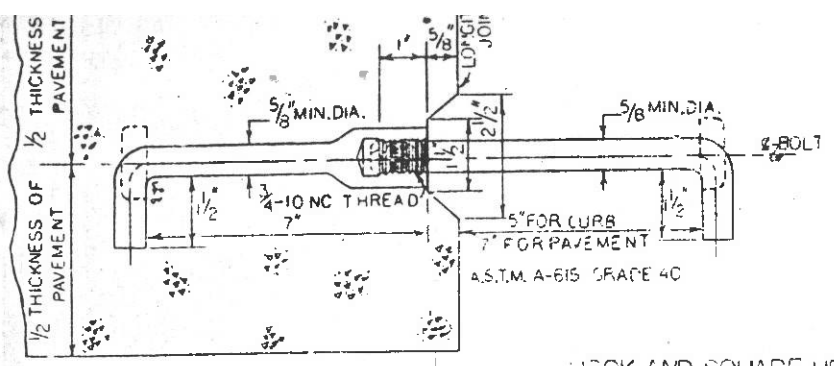
STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

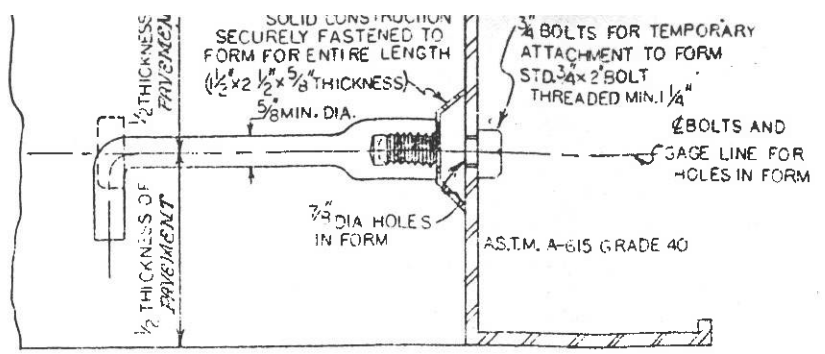
CORROSION RESISTANT LONGITUDINAL JOINT TIES

(Not to Scale)

Approved 5 Aug. 19 76 Approved Aug. 6 19 76

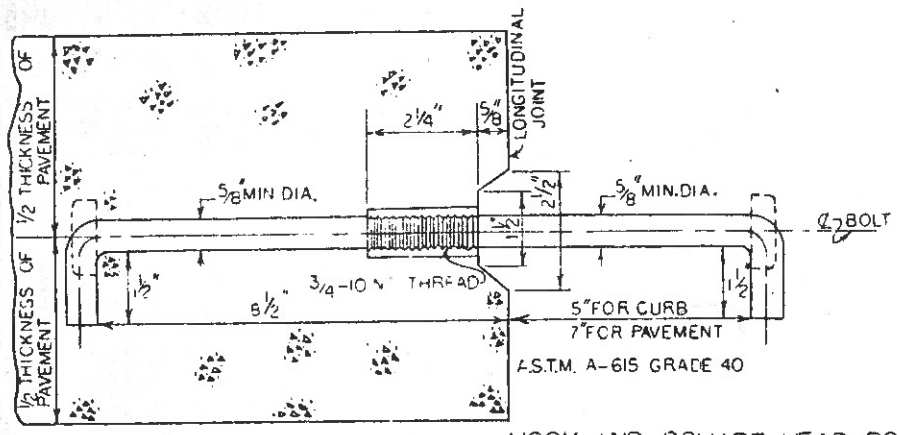
FREDERICK A. ZURMUHLEN — MALCOLM D. GRAHAM

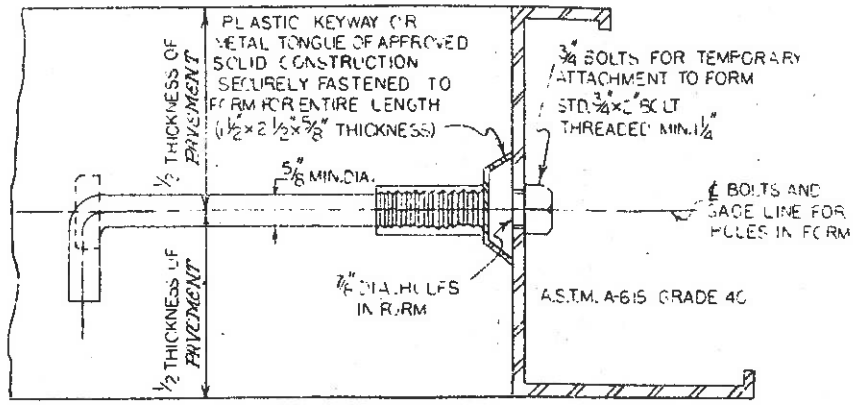




HOOK AND SQUARE HEAD BOLTS

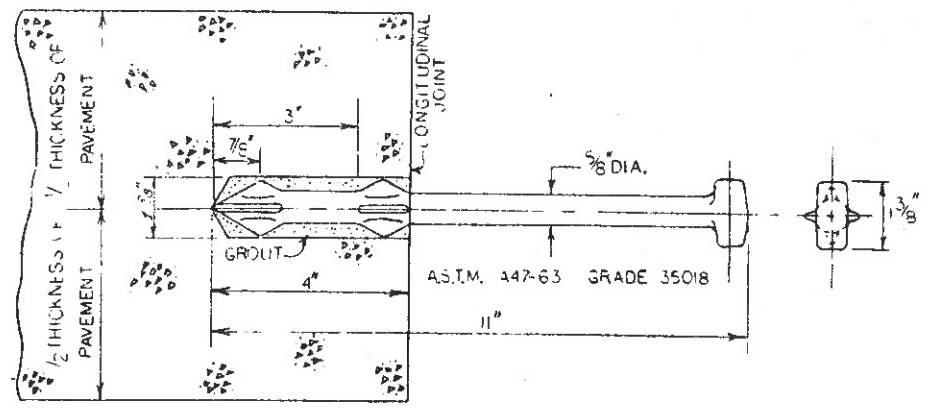
5" FOR CURB — 502.37
7" FOR PAVEMENT — 502.30



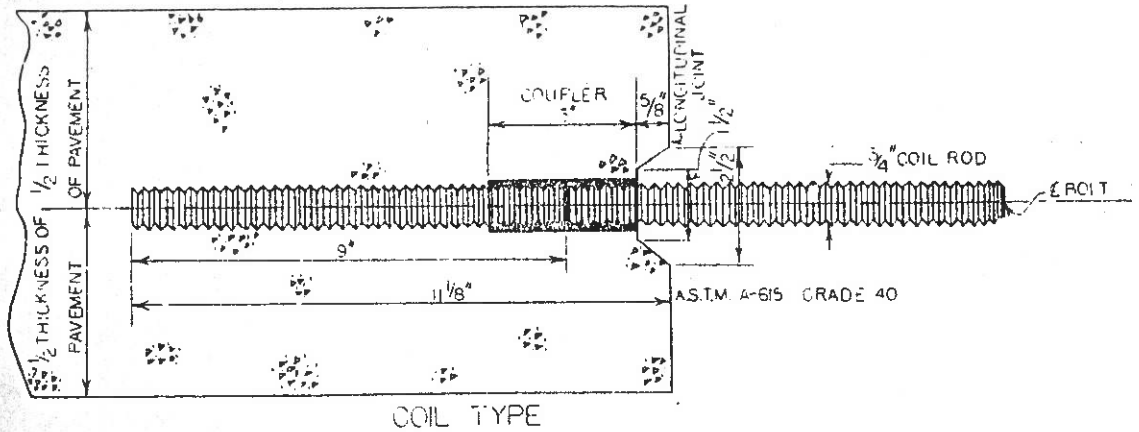


HOOK AND SQUARE HEAD BOLTS W/COUPLER

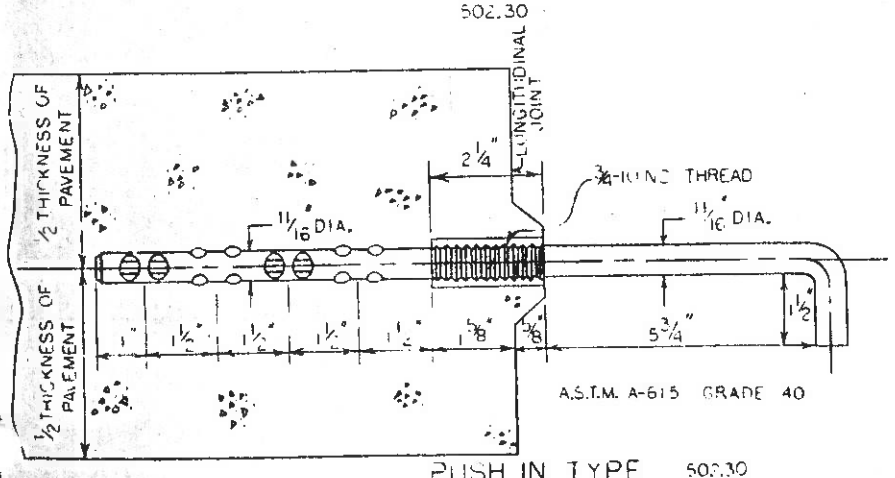
5" FOR CURB — 502.33
7" FOR PAVEMENT — 502.30



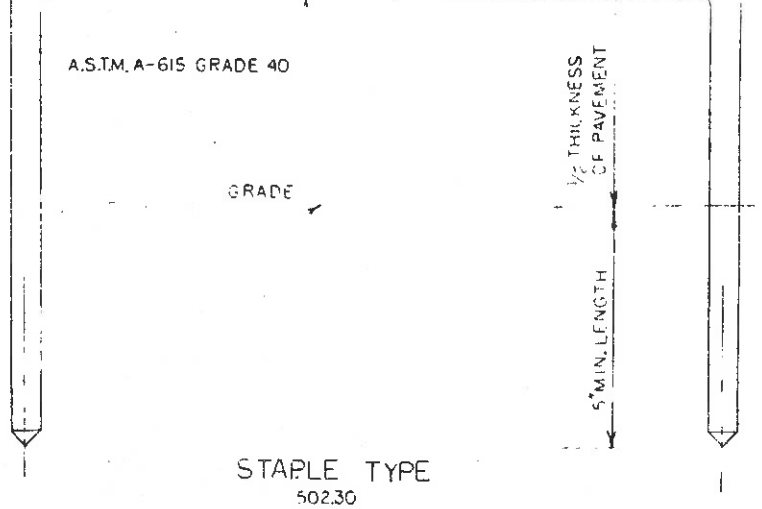
GROUT TYPE (See Note 1)
502.32



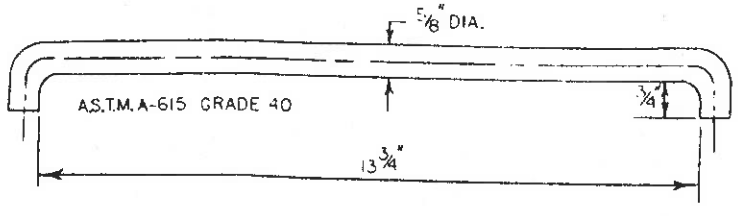
COIL TYPE
502.30



PUSH IN TYPE 502.30



STAPLE TYPE
502.30



DROP IN TYPE
502.30

NOTES:

1) GROUT SHALL BE 701-05 CONCRETE GROUTING MATERIAL.

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

LONGITUDINAL JOINT TIES

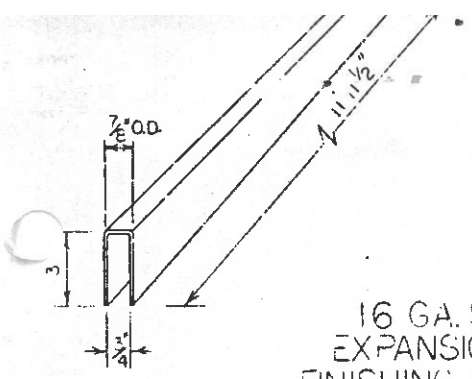
(Not to Scale)

Approved 5 Aug. 1976 Approved Aug 5 1976

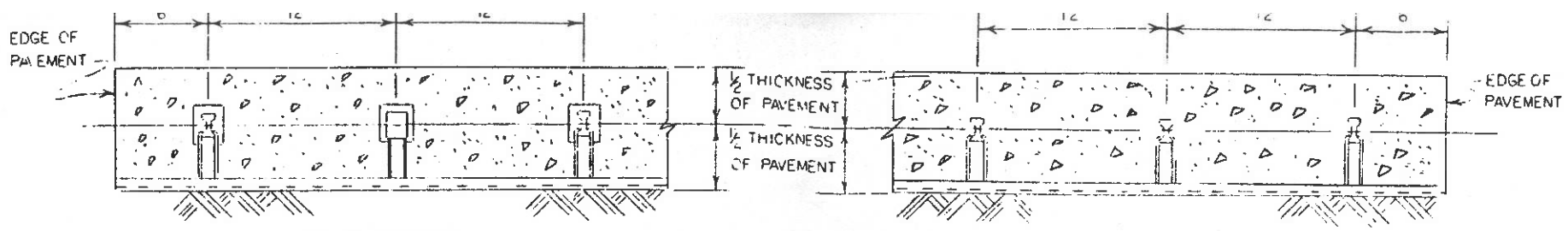
FREDERICK H. ZURMUHLEN
Chief Engineer

MALCOLM D GRAHAM
Deputy Chief Engineer (Facilities Design)

502-8

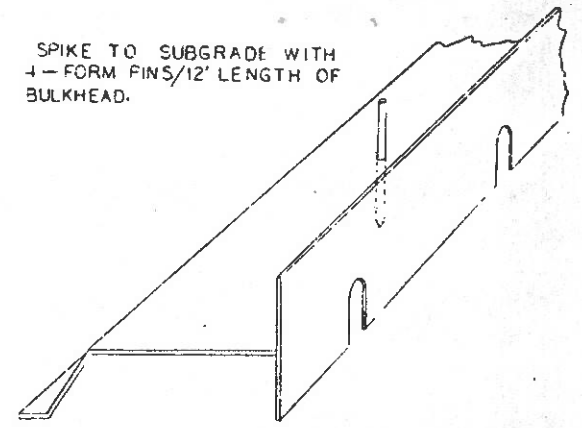


16 GA. STEEL
EXPANSION JOINT
FINISHING CAP

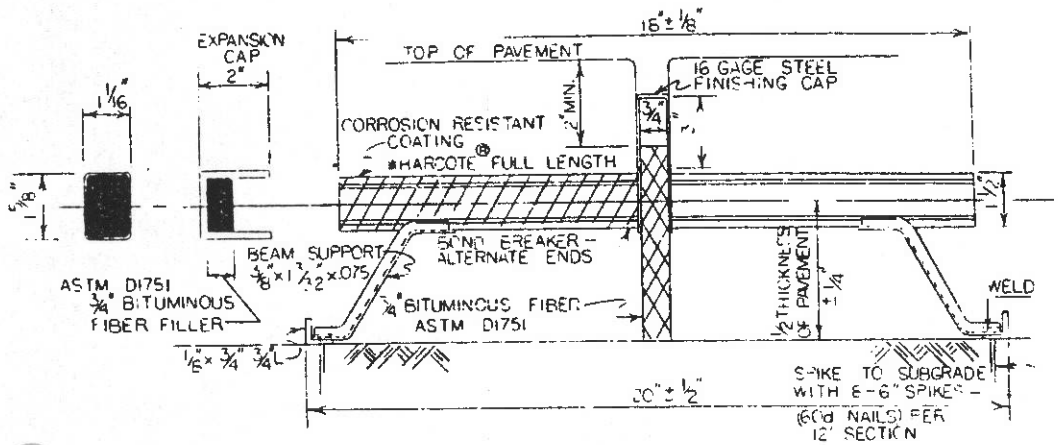


ELEVATION
EXPANSION JOINT

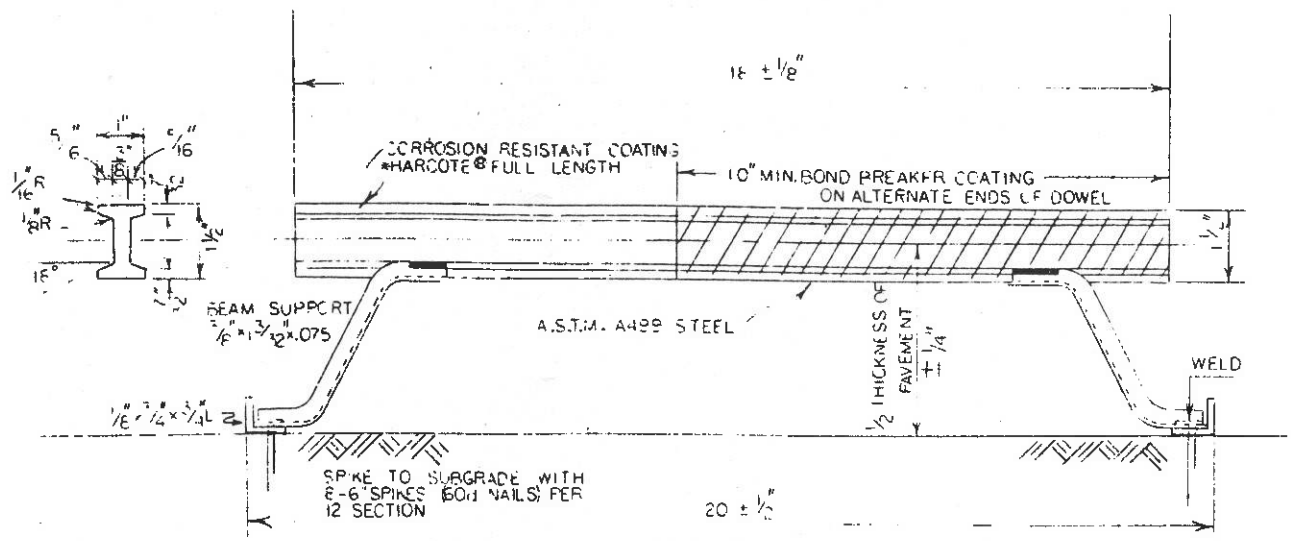
ELEVATION
CONTRACTION JOINT



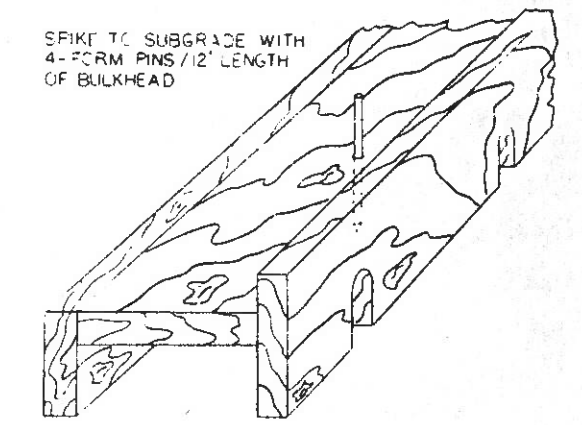
12 GA. STEEL
BULKHEAD



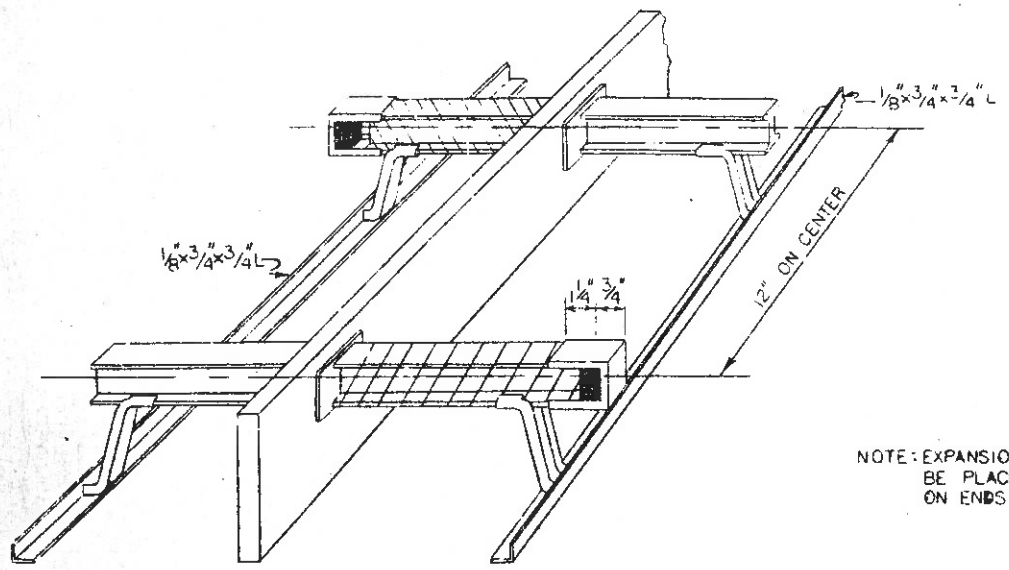
EXPANSION JOINT ASSEMBLY
502.20



CONTRACTION JOINT ASSEMBLY
502.20



WOOD BULKHEAD



EXPANSION JOINT ASSEMBLY
502.20

NOTE: EXPANSION CAPS TO BE PLACED ALTERNATELY ON ENDS W/BOND BREAKER

NOT TO SCALE

HARCOTE® * TRADE MARK OF S.H. HARRIS & SONS, INC.
HARCOTE-EPOXY COATING NOMINAL THICKNESS 8 MILS + 12 OR - 3 MILS
BOND BREAKER AS APPROVED BY DEPUTY CHIEF ENGR. (FACILITIES DESIGN)
NOMINAL THICKNESS 5 MILS + 4 OR - 4 MILS

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

TRANSVERSE JOINT SUPPORT

(Not to Scale)

Approved 5 Aug, 19 76 Approved Aug. 5, 1976

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502-9