

**POST-INSTALLED ANCHOR SYSTEMS FOR STRUCTURAL APPLICATIONS IN CONCRETE ELEMENTS.**

(REV 8-20-24)

SECTION 937 is deleted and the following substituted:

**SECTION 937  
POST-INSTALLED ANCHOR SYSTEMS FOR  
STRUCTURAL APPLICATIONS IN CONCRETE ELEMENTS**

**937-1 General.**

Post-installed anchor systems intended for structural applications in concrete elements consist of adhesive-bonded anchor systems.

**937-2 Adhesive Bonding Material Systems.**

**937-2.1 General:** Adhesive bonding material systems for structural applications shall consist of pre-packaged, 2-part chemical component material systems that automatically proportion and mix the materials for use. Manual proportioning of the components will not be permitted.

The material systems shall be specifically intended for use in structural applications for bonding anchors and dowels to hardened concrete. Applications are limited to anchors and dowels installed in positions ranging from vertically downward to horizontal.

**937-2.2 Approved Product List (APL) Submittal Requirements:** Manufacturers seeking evaluation of products for inclusion on the APL shall submit an application in accordance with Section 6 and include the documentation identified in Table 937-1. Documentation and reports must demonstrate that the product meets the requirements of this Section.

Table 937-1	
Documentation	Requirements
Product Photo	Displays the significant features of the product or each component of the product system.
Technical Data Sheet	Uniquely identifies the product and includes the following information: <ol style="list-style-type: none"> <li>1. Product specifications showing the product meets the requirements in Section 937-2</li> <li>2. Storage instructions</li> <li>3. Recommended installation materials and equipment as applicable</li> </ol>
Product Label	For each component of the product system, containing the following information: <ol style="list-style-type: none"> <li>1. Manufacturer's name and address</li> <li>2. Product Name</li> <li>3. Date of Manufacture</li> <li>4. Expiration Date</li> <li>5. LOT Identification Number</li> <li>6. Storage and Handling Requirements</li> </ol>

Table 937-1	
Documentation	Requirements
Safety Data Sheet (SDS)	<p>SDS meeting OSHA requirements for product and manufacturer recommended installation materials as applicable. Non-Hazardous, per RCRA Subtitle C Table 1 of 40 CFR 261.24 “Toxicity Characteristic” and not exude fumes which are hazardous, toxic, or detrimental to persons or property.</p>
Independent Laboratory Test Report	<p>For product or product system, containing the following information:</p> <ol style="list-style-type: none"> <li>1. Minimum Uniform Bond Stress in accordance with Table 937-2.</li> <li>2. Long Term Load (Creep) in accordance with Section 937-2.3</li> <li>3. Density or Average Weight in accordance with FM 5-569.</li> <li>4. Gel Time or Setting Time in accordance with FM 5-569.</li> <li>5. Bond Strength in accordance with FM 5-569.</li> </ol>
Installation Instructions	<p>Each package shall include the manufacturer’s instructions for anchor and dowel installation. The instructions shall include the following information:</p> <ol style="list-style-type: none"> <li>1. Diameters of drilled holes for applicable anchor and dowel sizes.</li> <li>2. Cleaning procedure for drilled holes, including a description of permitted and prohibited equipment and techniques.</li> <li>3. Allowable temperature ranges for storage, installation and curing.</li> <li>4. Identification of acceptable mixing/dispensing nozzles.</li> <li>5. Fabrication requirements for anchors and dowels.</li> <li>6. Description of tools permitted or required for installation.</li> <li>7. Method of identifying properly proportioned and mixed adhesive materials.</li> <li>8. Time and temperature schedule for initial set and full-strength cure.</li> <li>9. Special requirements for special installation conditions such as damp holes, or horizontal or near horizontal orientation of the anchor or dowel.</li> </ol>
Manufacturer’s Certification Example	Submit an example in accordance with Section 416.
Product Sample	Submit upon request from the Department. If the product is a system, a sample of each component must be submitted.

**937-2.3 Performance Requirements:**

**937-2.3.1 Minimum Uniform Bond Stress:** When tested in accordance with FM 5-568, the adhesive bonding material system, for general use, shall meet the following requirements:

	Type HV	Type HSHV
Confined Tension	2,290 psi	3,060 psi
Damp-Hole Installation	1,680 psi	1,830 psi
Elevated Temperature	2,290 psi	3,060 psi
Horizontal Orientation	2,060 psi	2,060 psi
Short Term Cure	1,710 psi	1,710 psi
Specified Bond Strength	1,080 psi	1,830 psi

Maximum Coefficient of Variation for Uniform Bond Stress: 20%.

**937-2.3.2 Long Term Load (Creep):**

1. The rate of displacement shall decrease during the 42 day application of load.

2. At 42 days, the total displacement due to creep (with load still applied) shall be less than 0.03 inches and during the last 14 days of the 42 day load duration, the total displacement due to creep shall be less than 0.003 inches.

3. After removal of the 42 day load, the uniform bond Stress from a subsequent Confined Tension Test shall not be less than 1,826 psi.

**937-2.4 Product Identification (Fingerprint) Properties:** References for comparison include infrared absorption, density or average weight, gel time or setting time, and bond strength shall be determined in accordance with FM 5-569.

**937-3 Undercut Anchor Systems.**

**937-3.1 General:** The undercut anchor system for permanent applications shall be constructed of Type 316 stainless steel. Undercut anchor systems for temporary applications with an expected service life of less than 3-years, may be zinc-plated or mechanically-galvanized carbon steel.

The undercut anchor sleeve shall form a cone shaped undercut or expand into a preformed cone or reverse cone shaped undercut. Anchors using only self-cutting teeth that are expanded to form the undercut are not permitted.

Undercut anchors with a marked setting indicator not requiring a specified setting torque are permitted. The marked setting indicator shall indicate the displacement of the anchor bolt relative to the anchor sleeve and must be visible above the concrete surface after setting operation is complete.

Requirements provided in this Section are not applicable for anchoring low-weight utility and lighting conduit(s) unless specifically called for in the Plans.

**937-3.2 Approved Product List (APL) Submittal Requirements:** Manufacturers seeking evaluation of products for inclusion on the APL shall submit an application in accordance with Section 6 and include the documentation identified in Table 937-3. Documentation and reports must demonstrate that the product meets the requirements of this Section.

Table 937-3	
Documentation	Requirements
Product Photo	Displays the significant features of the product or each component of the product system.
Technical Data Sheet	Uniquely identifies the product and includes the following information: <ol style="list-style-type: none"> <li>1. Product specifications showing the product meets the requirements in Section 937-3</li> <li>2. Storage instructions</li> <li>3. Recommended installation materials and equipment as applicable</li> </ol>
Product Label	For each component of the product system, containing the following information: <ol style="list-style-type: none"> <li>1. Manufacturer's name and address</li> <li>2. Product Name</li> <li>3. Anchor material grade</li> <li>4. LOT Identification Number</li> </ol>
Safety Data Sheet (SDS)	SDS meeting OSHA requirements for product and manufacturer recommended installation materials as applicable. Non-Hazardous, per RCRA Subtitle C Table 1 of 40 CFR 261.24 "Toxicity Characteristic" and not exude fumes which are hazardous, toxic, or detrimental to persons or property.
Installation Instructions	Each package shall include the manufacturer's instructions. The instructions shall include the following information: <ol style="list-style-type: none"> <li>1. Diameters of drilled holes for applicable anchor and dowel sizes.</li> <li>2. Cleaning procedure for drilled holes, including a description of permitted and prohibited equipment and techniques.</li> <li>3. Description of tools permitted or required for installation.</li> </ol>
Product Sample	Submit upon request from the Department. If the product is a system, a sample of each component must be submitted.

**937-3.3 Minimum Performance Requirements:** Provide undercut anchor systems designed in accordance with ACI CODE-318, Chapter 17. Provide only undercut anchor systems qualified for use in cracked concrete, meeting the assessment criteria of Qualification of Post-Installed Mechanical Anchors in Concrete (ACI CODE-355.2) as specified in ACI CODE-318, Chapter 17. Use only Category 1 undercut anchors as defined in ACI CODE-318, Chapter 17.

#### 937-4 Screw Anchors

**937-4.1 General:** Screw anchors for permanent applications shall be constructed of Type 316 stainless steel or mechanically-galvanized carbon steel. Screw anchors for temporary applications with an expected service life of less than 3-years, may be zinc-plated carbon steel.

**937-4.2 Approved Product List (APL) Submittal Requirements:** Manufacturers seeking evaluation of products for inclusion on the APL shall submit an application in accordance with Section 6 and include the documentation identified in Table 937-4.

Documentation and reports must demonstrate that the product meets the requirements of this Section.

Table 937-4	
Documentation	Requirements
Product Photo	Displays the significant features of the product or each component of the product system.
Technical Data Sheet	Uniquely identifies the product and includes the following information: <ol style="list-style-type: none"> <li>1. Product specifications showing the product meets the requirements of Section 937-4</li> <li>2. Storage instructions</li> <li>3. Recommended installation materials and equipment as applicable</li> </ol>
Product Label	For each component of the product system, containing the following information: <ol style="list-style-type: none"> <li>1. Manufacturer's name and address</li> <li>2. Product Name</li> <li>3. Anchor material grade</li> <li>4. LOT Identification Number</li> </ol>
Safety Data Sheet (SDS)	SDS meeting OSHA requirements for product and manufacturer recommended installation materials as applicable. Non-Hazardous, per RCRA Subtitle C Table 1 of 40 CFR 261.24 "Toxicity Characteristic" and not exude fumes which are hazardous, toxic, or detrimental to persons or property.
Independent Laboratory Test Report	For product or product system, containing the following information: <ol style="list-style-type: none"> <li>1. Minimum Uniform Bond Stress in Accordance with Table 937-2.</li> <li>2. Density or Average Weight in accordance with FM 5-569.</li> <li>3. Gel Time or Setting Time in accordance with FM 5-569.</li> <li>4. Bond Strength in accordance with FM 5-569.</li> </ol>
Installation Instructions	Each package shall include the manufacturer's instructions. The instructions shall include the following information: <ol style="list-style-type: none"> <li>1. Diameters of drilled holes for applicable anchor and dowel sizes.</li> <li>2. Cleaning procedure for drilled holes, including a description of permitted and prohibited equipment and techniques.</li> <li>3. Description of tools permitted or required for installation.</li> </ol>
Product Sample	Submit upon request from the Department. If the product is a system, a sample of each component must be submitted.

**937-4.3 Minimum Performance Requirements:** Use screw anchors designed in accordance with ACI CODE-318, Chapter 17. Use only screw anchors qualified for use in cracked concrete, meeting the assessment criteria of Qualification of Post-Installed Mechanical Anchors in Concrete (ACI CODE-355.2) as specified in ACI CODE-318, Chapter 17.

Do Not Use Without CO Specs Authorization