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RESEARCH REPORT: RR 25270
(CSI #03150)

Expires: September 1, 2012
Date Issued: October 1, 2010
Code: 2002 LABC

GENERAL APPROVAL - Renewal - ITW RED HEAD EPCON Granite 5 Epoxy Anchors installed in stone aggregate concrete.

DETAILS

ITW RED HEAD EPCON Granite 5 is a two component VOC free epoxy paste contained in a disposable cartridge which consists of 2 chambers. The epoxy resin and hardener components are kept separately until dispensing takes place. The components are thoroughly blended by static mixer elements contained in the EPCON System nozzle. The nozzle mixes the components at a accurate 1:1 ratio.

Directions for Anchoring in Stone Aggregate Concrete:

1. Drill hole to specified diameter and depth for the anchor or reinforcing bar to be embedded. For required diameter and depth refer to Table A or B.
2. Drill bits shall meet ANSI Specification B212.15-1994
3. Clean drilled hole using wire brush and compressed air.
4. With motionless mixer nozzle attached to cartridge, fill drilled hole approximately 1/1/2 full. Dispensed epoxy shall be flowing at a uniform rate. The uniform flow shall be a mixed gray paste.
5. Insert thoroughly clean anchor with at least 1/1/2 revolution. Twist to ensure complete coverage of the thread or ribs with epoxy.
6. Allow anchor to harden before bolt-up (see Table D).

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7. Allowable loads shown in Table A and B are approved for installations in stone aggregate concrete, subject to the following conditions:
- a) The values shown in this report shall not be used in repair, retrofit and new construction of tilt-up wall anchorage (in tension) for the connection with the horizontal wood diaphragm.
 - b) These anchors are not approved for masonry applications.
 - c) A 25% reduction in all allowable loads specified in the research report shall be taken in hold-down devices as required by Section 91.2315.5.6 of the 2002 Los Angeles City Building Code.
 - d) Epoxy type anchors shall not be installed into or used to support any fire-resistive construction.
 - e) The tabulated values must be reduced by load factors, as recommended by the manufacturer, when anchors are installed in locations where the concrete temperatures may exceed 70 degrees F. (Table C).
 - f) The values may not be increased by $1/3$ for wind or seismic loads.
 - g) Before installation of the anchor, concrete must have reached its design strength.
 - h) Installations of the anchor shall be in accordance with the manufacturer's instructions except where specified otherwise herein. A copy of the installation instructions shall be provided at each jobsite.
 - I) The tabulated values are for threaded rods of A307 quality or better and deformed reinforcing bars of Grade 60 or better.
 - j) Allowable loads for anchors in concrete subject to combined shear and tension forces are determined by the ratio of the actual shear to the allowable shear plus the ratio of the actual tension to the allowable tension shall not exceed 1.00.
 - k) Values in Table A and B are based on anchor spacing of 12 diameters and minimum edge distance of 6 diameters. Such spacing and edge distance may be reduced 50% with an equal reduction in value. Use linear interpolation for intermediate spacings and edge margins.
 - l) The anchor shall not be installed in overhead applications such as in the soffit of a beam or arch or similar locations or overhead installations.
 - m) A called building inspection shall be requested prior to the installation of the bolts to verify:

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- i) Installer qualification.
 - ii) Component identification.
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8. Anchors are not approved for use where supports will be subject to vibratory or impact loads, such as supports for reciprocating engines or crane rails.
 9. Anchors shall be installed with special inspection requirements.

DISCUSSION

This report is in compliance with the 2002 Los Angeles City Building Code.

This approval is based on tests.

This general approval of an equivalent alternate to the Code is only valid where an engineer and/or inspector of this Department has determined that all conditions of this approval have been met in the project in which it is to be used.

Addressee to whom this Research Report is issued is responsible for providing copies of it, complete with any attachments indicated, to architects, engineers and builders using items approved herein in design or construction which must be approved by Department of Building and Safety Engineers and Inspectors.

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Table A

Allowable Tension and Shear Loads for Threaded Rod Anchors Installed in Concrete with Epcon System Granite 5 Epoxy

Anchor Diameter (in.)	Hole Diameter (in.)	Minimum Embedment (in.)	Allowable Tension Loads (lb.)		Allowable Shear Loads (lb.)	
			Concrete Strength		Concrete Strength (psi)	
			f _c = 2000 psi	f _c = 2500 psi	f _c = 2000 psi	f _c = 2500 psi
3/8	7/16	3 3/8	1000	----	----	1100
1/2	9/16	4 1/2	1900	----	----	1250
5/8	3/4	5 5/8	3000	----	2750	----
3/4	7/8	6 3/4	----	4500	2940	----
1	1 1/8	9	----	6100	----	4125

Table B

Allowable Tension and Shear Loads for Grade 60 (A615) Reinforcement Bar Installed in Concrete with Epcon System Granite 5 Epoxy

Rebar Size	Hole Diameter (in.)	Minimum Embedment (in.)	Allowable Tension Loads (lb.)		Allowable Shear Loads (lb.)	
			Concrete Strength		Concrete Strength (psi)	
			f _c = 2000 psi	f _c = 2500 psi	f _c = 2000 psi	f _c = 2500 psi
#3	7/16	3 3/8	----	1000	----	1100
#4	5/8	6	----	1900	----	1250
#5	3/4	7 1/2	3000	----	2750	----
#6	7/8	9	4500	----	----	3250
#8	1 1/4	12	----	6100	----	4125

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Table C
Concrete Temperature vs. Capacity Reduction for Epcon Granite 5 System

Concrete Temperature (°F)	Capacity Reduction (%)
70	0
85	19
110	50
128	67
180	81

Note: Linear Interpolation is allowed.

Table D
Recommended Hardening Time for Epcon Granite 5 Epoxy

Temperature (°F)	Initial Set (Hours) ¹	Full Cure (Hours) ²
40	36	48
50	29	36
60	20	24
68	18	24
90	17	24

¹ Anchors are to be undisturbed during the initial set time.

² Application of allowable (design) tensile or shear loads shall occur after the full cure time.