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RESEARCH REPORT: RR 25041
(CSI # 02200)

REEVALUATION DUE

DATE: June 01, 2020
Issued Date: June 01, 2018
Code: 2017 LABC

GENERAL APPROVAL – Renewal - Williams All-Thread-Bar ASTM A615 and ASTM A722 Type II for use as concrete reinforcement, micro piles, pre-tensioned and post-tensioned concrete tendons, and for temporary (up to 2 years) tieback earth anchors. C4.6 and C7.6 multi-strand anchorage systems for temporary (up to 2 years) tieback earth anchor tendons.

1. Williams Thread-bars
2. Thread-bar Couplers
3. Stress Proof Hexagonal Nuts
4. C4.6 Wedge Plate
5. C7.6 Wedge Plate
6. 0.6, 3 Piece Wedge (Surelock)

DETAILS

Williams All-Thread-Bar (Grade 75 ksi)

Williams Thread-bars are high-strength, round, continuously threaded steel bars. The threads are rolled on the bars and form the deformations which conform to ASTM A615. The bars can be spliced by use of the coupler and can be anchored by use of the nut. Thread-bar properties are listed below. See attachment for details of hardware.

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Bar Size	Nominal Bar Diameter	Yield Stress (fy-ksi)	Cross Section Area* (A-inches ²)	Nominal Weight (lbs./ft.)	Approx. Thread Major Dia.
#8	1" (26 mm)	75	0.79	2.70	1-1/8"
#9	1-1/8" (29 mm)	75	1.00	3.40	1-1/4"
#10	1-1/4" (32 mm)	75	1.27	4.30	1-3/8"
#11	1-3/8" (36 mm)	75	1.56	5.30	1-1/2"
#14	1-3/4" (45 mm)	75	2.25	7.65	1-7/8"
#18	2-1/4" (57 mm)	75	4.00	13.6	2-7/16"
#20	2-1/2" (65 mm)	75	4.91	16.7	2-3/4"

* Effective cross sectional areas shown are as required by ASTM A615-15. Actual areas may exceed these values.

Williams All-Thread-Bar (Grade 150 ksi)

Williams Thread-bars are high-strength, round, continuously threaded steel bars. The threads are rolled on the bars and form the deformations which conform to ASTM A615. The bars can be spliced by use of the coupler and can be anchored by use of the nut. Thread-bar properties are listed below. See attachment for details of hardware.

Nominal Bar Diameter	Ultimate Stress (fpu-ksi)	Cross Section Area* (inches ²)	Nominal Weight (lbs./ft.)	Approx. Thread Major Dia.
1" (26 mm)	150	0.85	3.09	1-1/8"
1-1/4" (32 mm)	150	1.25	4.51	1-7/16"
1-3/8" (36 mm)	150	1.58	5.71	1-9/16"
1-3/4" (45 mm)	150	2.66	9.06	2"
2-1/4" (65 mm)	150	4.08	14.1	2-1/2"
2-1/2" (65 mm)	150	5.19	18.2	2-3/4"

* Effective cross sectional areas shown are as required by ASTM A722-12. Actual areas may exceed these values.

Note: Williams All-Thread-Bars may be stressed to the allowable limits of ACI 318-11. The maximum jacking stress (temporary) may not exceed 0.80 fpu and the transfer stress (lock-off) may not exceed 0.70 fpu.

C4.6 and C7.6 multi-strand anchorage systems

C4.6 and C7.6 Multi-Strand Anchorage Systems are used in conjunction with .6 inch diameter (7-wire) pre-stressing strands, which conform to ASTM-A416, Grade 270. The anchorages consist of a circular (barrel type) wedge plate of various thickness and truncated cone-shaped wedges. The number of wedges in each anchor corresponds to the number of pre-stressing strands. The C4.6 and C7.6 anchor heads are cast from ASTM A536, Grade 80-55-06 ductile iron. The wedges are placed over the strand inside the wedge plate holes and are used to lock the post-tensioning strand onto the anchorage system. All wedges conform to case-hardened AISI-12L14 or AISI-11L17 steel. See attachment for details of the hardware.

The approval is subject to the following conditions:

1. For each shipment, the manufacturer shall furnish a certificate indicating that the hardware complies to the manufacturer's specifications on file with the Department. Test data to verify the physical and chemical properties of the hardware shall be submitted upon request.
2. Mill test data or test data prepared by a Los Angeles City approved testing agency to verify the material and physical properties of the anchor hardware shall be kept on file with the manufacturer for each shipment of anchors and shall be submitted to Department upon request.
3. All-Thread-bars shall conform to ASTM A722, and ASTM A615. Test data shall be submitted as required by the 2017 Los Angeles City Building Code.
4. Installation of the anchorage systems shall be in accordance with the manufacturer's instructions.
5. Design of the pre-stressed systems shall be in accordance with the 2017 Los Angeles City Building Code.
6. Where pre-stressing strand anchors are used with less than the full number of strands, the strands shall be symmetrically placed within the anchor. The location of the strands within the wedge anchor head shall be clearly detailed on the approved plans.
7. Concrete cover of All-Thread-bars and couplers shall be provided as required by the 2017 Los Angeles City Building Code for fire protection.
8. Where couplers are used or where design $f'c$ exceeds 2,500 psi, continuous inspection by a Deputy Inspector for concrete shall be provided. In addition to normal duties, the Deputy Inspector shall verify that All-Thread-bars couplers are centered at the ends of bars that are spliced.
9. The anchorage systems may be used for temporary tieback earth anchors where the installation conforms to the attached "REQUIREMENTS FOR TEMPORARY TIEBACK EARTH ANCHORS."
10. The anchor system components shall be identified by Manufacture part designations and heat number stamped onto each piece.
11. Bearing stresses on the bearing plates and the piles shall be checked for each installation. Calculations and plans signed by an Engineer or Architect registered in the State of California shall be submitted to Structural Plan Check for approval of the design of the anchorage system.

Williams Form Engineering Corporation

RE: Williams All-Thread-Bar ASTM-722 For Post-Tension & Pre-stressed Systems

DISCUSSION

This report is in compliance with the 2017 City of Los Angeles Building Code.

The approval is based Los Angeles Acceptance Criteria for Temporary Tie-back Anchors of Multi-Strand Pre-Stressing steel and Wedge Plate and other load tests.

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 the Department of Building and Safety Engineers and Inspectors.

This general approval of an equivalent alternate of 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.

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Attachments: “Requirements for Temporary Tieback Earth Anchors” (5 Pages)
“Anchor System Parts Details” (8 Pages)