EVALUATION REPORT Number: 963

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HRC 300 SERIES FORM PROTECTOR

CSI Section:
03 21 00 Reinforcing Steel

1.0 RECOGNITION

The HRC 300 Series recognized in this report has been evaluated for use as mechanically splicing system for deformed steel reinforcing bars (rebar) in concrete structural members complying as a Type 1 or Type 2 designation. The structural properties of the HRC 300 Series comply with the intent of the provisions of the following codes and regulations:

- 2024, 2021, 2018, and 2015 International Building Code® (IBC)
- 2023 Los Angeles Building Code (LABC) – attached Supplement

2.0 LIMITATIONS

Use of the HRC 300 Series recognized in this report is contingent on the limitations listed as follows:

2.1 The installation of the HRC 300 Series shall comply with the IBC or ACI 318, the manufacturer's published installation instructions, and this report. Where discrepancies occur, the most constraining shall prevail.

2.2 The construction documents shall include the type and location of mechanical splices of reinforcement as set forth in Section 1901.5 of the IBC, and ACI 318-19 26.6.1.1. The construction documents shall be approved by the building official.

2.3 When applicable to the IBC 2024 and 2021, the HRC 300 Series in special moment frames (SMF), SMF constructed of precast concrete, special structural walls, intermediate structural wall connections, and other applicable structures are only allowed as permitted in Chapter 18 of ACI 318-19, and as described in Sections 2.3 to 2.9 of this report.

2.4 When applicable to the IBC 2024 and 2021, only Type 2 mechanical splices of ASTM A706 Grade 60 reinforcement or ASTM A615 Grade 60 reinforcement satisfying the requirements of ACI 318-19 20.2.2.5(b), shall be permitted where plastic hinge regions may occur, and located within a distance equal to twice the member depth from the column or beam face for SMF or from critical sections where yielding of the rebar occurs as a result of lateral displacements beyond the linear range of behavior as set forth in ACI 318-19 18.2.7.2. Mechanical splices of other grades of steel reinforcement in SMF and special structural walls are beyond the purview of this report (ACI 318-19 R18.2.7).

2.5 When applicable to the IBC 2024 and 2021, the ability of the included mechanical splice systems, when used on Grade 80 reinforcement, to resist forces and provide yielding in the vicinity of the intermediate precast structural wall connections between precast wall panels, or between wall panels and the foundation, in the plastic region as set forth in ACI 318-19 R18.5, has not been determined, and this use is beyond the purview of this report.

2.6 Under the IBC, HRC 300 Series used in SMF constructed using precast concrete is expected to experience flexural yielding in connection regions in accordance with ACI 318--19 and -14 R18.9, and this use is beyond the purview of this report.

2.7 When applicable to the IBC 2024 and 2021, the HRC 300 Series of Grade 80 reinforcement shall not be used to transfer forces between the diaphragm and the vertical elements of the seismic-force-resisting system as set forth in ACI 318-19 18.12.7.4.

2.8 Under the IBC, deformed steel rebar used with the HRC 300 Series shall comply with ACI 318-19 and -14, as applicable, Section 20.2.2.4 and Table 20.2.2.4(a) for the intended structural usage and application.

2.9 The deformed reinforcement in special seismic systems or structures permitted in Chapter 18 of ACI 318-19 shall comply with ACI 318-19 20.2.2.5, with either ACI 318-19 20.2.2.5 (a) or 20.2.2.5 (b) when used with the HRC 300 Series in conformance with the IBC 2024 and 2021.

2.10 The deformed reinforcement in special seismic systems or structures permitted in Chapter 18 of ACI 318-14 shall comply with ACI 318-14 20.2.2.5, with either ACI 318-14 20.2.2.5 (a) or 20.2.2.5 (b). Mill tests shall comply with 20.2.2.5(b) item (i) and shall be submitted to the building official for approval when used with the HRC 300 Series for conformance with the 2018 and 2015 IBC Section 1905.

2.11 Special inspections shall be conducted following Section 3.4 of this report.

2.12 The minimum specified concrete cover shall comply with IBC Chapters 7 and 19, ACI 318-19 20.5.1 and 25.4, ACI 318-14 20.6.1 when used with the IBC, as applicable. The concrete cover shall be measured from the concrete

surface to the outermost surface of the HRC 300 Series to which the cover requirement applies as set forth in Section 1808.8.2 of the IBC.

2.13 The use of HRC 300 Series with coated rebar as described by ACI 318-19 20.5.2.1 and ACI 318-14 20.6.2.1 is outside the purview of this report. Such uses may be approved by the building official based on the design recommendations of the registered design professional.

2.14 The HRC 300 Series recognized in this report is produced by Headed Reinforcement Corp in Fountain Valley, CA.

3.0 PRODUCT USE

3.1 Broad Use: The HRC 300 Series is used as a mechanical splice system for deformed steel rebar installed in concrete structural systems. The splices provide rebar extension, ensuring the formwork remains intact during removal and minimizing interference in transition areas when adding straight, hooked, or headed dowel rebar after concrete placement. The splices conform to ACI 318-19 and -14 25.5.7.1 and 18.2.7.1, as set forth in Section 1901.2 of the IBC as tension and compression mechanical splices for deformed steel rebar. The HRC 300 Series conforms to the compliance requirements of ACI 318-19 and -14 18.2.7.1 for the IBC, as Type 1 or Type 2 mechanical splices, as applicable. When used as Type 2 splices for Grade 60 reinforcement, the recognized splice systems are permitted within the concrete structural member, as allowed by the IBC and ACI 318, for all seismic design categories, contingent to the limitations in Section 2.0 of this report.

3.2 Design: The HRC 300 Series shall be designed as set forth in the IBC, ACI 318, this report, and the manufacturer's published installation instructions. Where discrepancies occur, the most constraining shall prevail. Section 2.2 of this report addresses documenting the type and location of mechanical splices of reinforcement. Reinforcing bar spacing shall meet the requirements of ACI 318-19 25.2 and 25.4. Splice staggering is optional under ACI 318-19 25.7.3 and required by ACI 318-19 25.7.4. When applicable to the IBC 2024 and 2021, use with the HRC 300 Series in members and structural systems is limited to what is allowed in ACI 318-19 18.2.7.2.

3.3 Installation: The HRC 300 Series shall be installed as set forth in the IBC or ACI 318, the manufacturer's published installation instructions, and this report. Where discrepancies occur, the most constraining shall prevail.

3.3.1 Installation General:

3.3.1.1 The HRC 300 Series Assembly shall be installed as follows:

i. The thread protector is in place prior to mounting to formwork.
ii. The flange plate is against the formwork and attached with nails or other fasteners. The nail heads need to be flush with the face of the flange.
iii. The rebar is properly supported to maintain its position during concrete placement.

3.3.1.2 The HRC 300 Series Threaded Bar shall be installed as follows:

i. After formwork has been removed, the thread protector is detached from the coupler.
ii. The coupler threads and rebar threads need to be clean and free of rust, concrete, or other debris. Cleaning with a wire brush is permitted.
iii. The correct size of the HRC 300 threaded bar shall be selected, and then inserted into the matching HRC 300 coupler. Each threaded bar is tightened to a snug fit by rotating clockwise until the threads are fully engaged. Lubricated threads and the use of a wrench may be necessary to keep the connection locked.

3.4 Special Inspection: Where required, special inspection shall be observed following Chapter 17 of the IBC. The duties of the special inspector include verifying the installation of the HRC 300 Series to the rebar following IBC Section 1705.3 and Table 1705.3, and ACI 318-19 26.13, as applicable.

4.0 PRODUCT DESCRIPTION

4.1 HRC 300 Series: The HRC 300 Series consists of a threaded coupler and two compatible steel rebar that are provided with the HRC 300 threaded ends. The couplers are designed to mechanically join No.4 through No.8, Grade 60 rebar complying with ASTM A615 or ASTM A706 and No.9 through No. 11, Grades 60 and 80 rebar complying with ASTM A615 or ASTM A706. Table 1 of this report illustrates the HRC 300 Series dimensions.

4.1.1 Couplers: The couplers are produced from Grades 1018, 1144, or 1215 steel conforming with ASTM A108.

4.1.2 Steel Rebar: Steel rebar shall be deformed Grade 60 and Grade 80 rebar complying with ASTM A615 or ASTM A706 specifications, as applicable for the sizes mentioned in Section 4.1 of this report. The reinforcement shall satisfy the requirements of ACI 318-19 20.2.2.4 and 20.2.2.5, as applicable.

5.0 IDENTIFICATION

Each coupler is stored in boxes or crates and identified by type (Type I or Type 2 designation), size, heat number, quantity, and HRC specific stock code (HRC 300).

HRC 300 Series is identified by the trademark, product name, and evaluation report number (IAPMO UES ER-963).

The IAPMO Uniform Evaluation Service Mark of Conformity may also be used as shown below:

IAPMO UES ER-963

6.0 SUBSTANTIATING DATA

6.1 Data submitted in accordance with the ICC-ES AC133.

6.2 Test reports are from laboratories in compliance with ISO/IEC 17025.

7.0 STATEMENT OF RECOGNITION

This evaluation report describes the results of research completed by IAPMO Uniform Evaluation Service on HRC 300 Series to assess conformance to the codes shown in the recognition section of this report and serves as documentation of the product certification. Products are manufactured at locations noted in Section 2.14 of this report under a QC program with periodic inspection under the supervision of IAPMO UES.

For additional information about this evaluation report please visit www.uniform-es.org or email us at info@uniform-es.org

TABLE 1 – HRC 300 Series Dimensions

Bar Size	Thread/Coupler Dimensions				Flange Dimensions	
	Thread Information		Length L (inch)	Diameter D (inch)	Thickness X (inch)	E x F (inch x inch)
	Thread Size (UNC)	T (inch)				
#4	1/2"-13 UNC	0.75	1.75	0.88	0.06	2 x 2
#5 / 15M	5/8"-11 UNC	0.75	2.00	1.00	0.06	2 x 2
#6 / 20M	3/4"-10 UNC	1.00	2.13	1.13	0.06	2 x 2
#7	7/8" -9 UNC	1.00	2.50	1.25	0.06	2 x 2
#8 / 25M	1" -8 UNC	1.125	3.00	1.50	0.04	2.18 x 2.75
#9	1 1/8" -7 UNC	1.625	3.50	1.75	0.06	2.5 x 2.5
#10	1 1/4" -7 UNC	1.75	4.00	2.00	0.06	2.5 x 2.5
#11	M36 x 4	2.00	4.50	2.125	0.06	2.5 x 2.5

SI Conversion: 1 inch = 25.4 mm

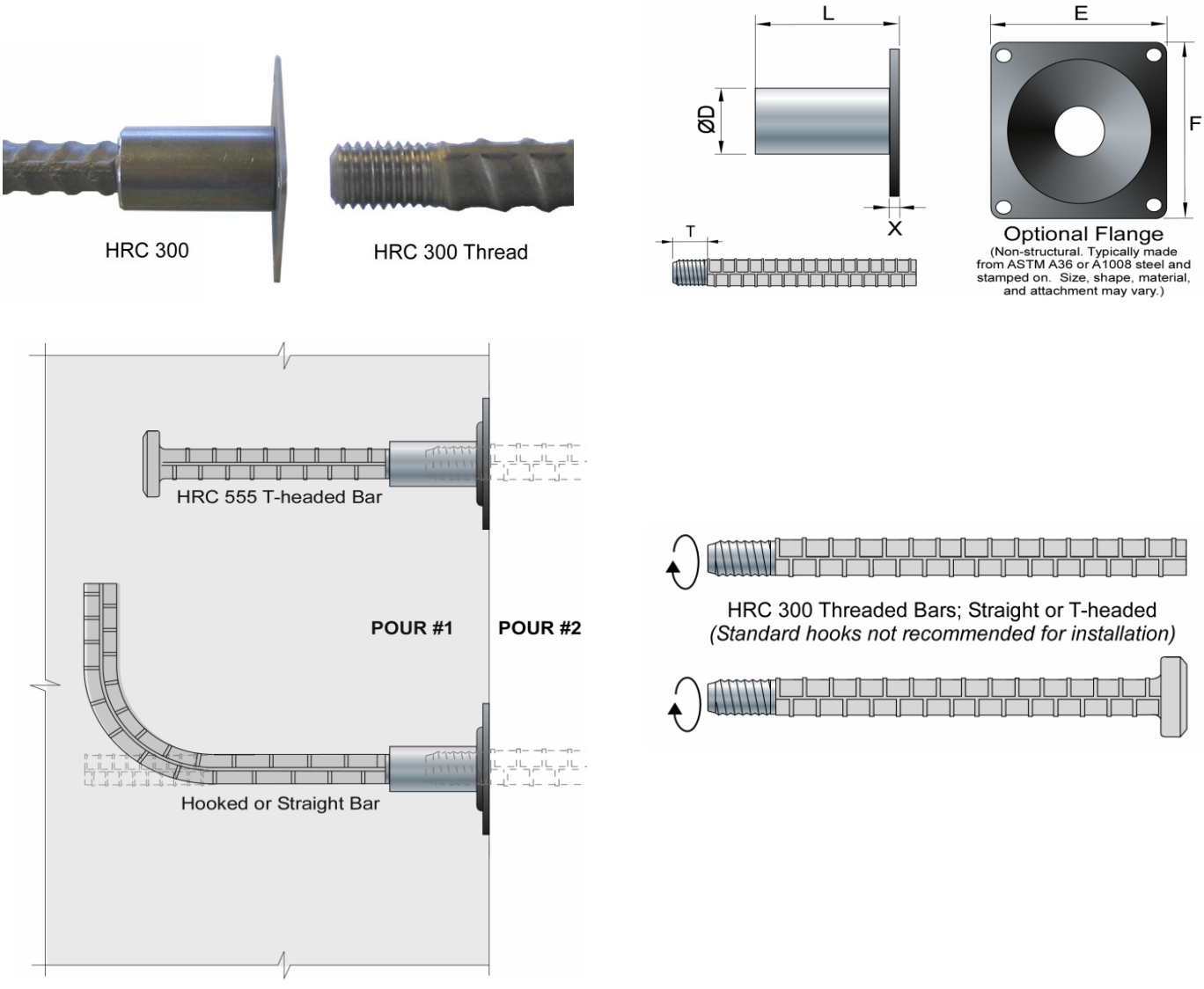

FIGURE 1 – HRC 300 Series Details

CITY OF LOS ANGELES SUPPLEMENT

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HRC 300 SERIES FORM PROTECTOR

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1.0 RECOGNITION

The HRC 300 Series described in IAPMO UES ER-963 and this supplemental report has been evaluated for use as mechanical splices for deformed steel rebar in concrete structural members. The HRC 300 Series has been evaluated for structural performance properties, contingent to the requirements in IAPMO UES ER-963 and this supplemental report. The HRC 300 Series complies with the subsequent codes and regulations:

- 2023 Los Angeles Building Code (LABC)

2.0 LIMITATIONS

Use of the HRC 300 Series recognized in this supplement is contingent to the ensuing limitations:

2.1 The design and installation of the HRC 300 Series shall be in accordance with the LABC and the 2021 IBC as noted in Section 3.0 of IAPMO UES ER-963.

2.2 Continuous special inspections of the HRC 300 Series Assembly during installation shall be provided by Registered Deputy Inspectors as set forth in LABC Section 1705, as applicable. The Registered Deputy Inspector shall verify the following: hardware and equipment; cleaning and condition of the bars following the specifications and the applicable code; and the installation procedures comply with the specifications and the manufacturer's published installation instructions.

2.3 The fabricator of the steel couplers shall be required to maintain a detailed procedure for material control and suitable procedures and records attesting that the specified coupler has been furnished. The applicable splice designation (Type 1 or Type 2) or coating, as applicable, shall be included in each packaging assembly prior to shipment from the fabricator's plant. The fabricator's identification mark designation shall be established and on record prior to fabrication. Couplers that are not identifiable from marking and test records shall be tested to determine conformity to this report. The fabricator shall furnish an affidavit of compliance and test data shall be provided upon request.

2.4 The HRC 300 Series shall be selected at the job site by the Registered Deputy Inspector or by the building inspector and shall be tested by an approved testing agency as set forth in Section 1703 of the LABC. The test shall be conducted on each different rebar size, and the frequency of tests shall be as follows: one out of the first ten splices; one out of the next ninety splices; one out of the next one hundred splices. The splice shall develop in tension or compression, as required, at least 125 percent of the specified yield strength of the bar as per ACI 318-19 and -14 25.5.7.1. The splice shall develop at least 100 percent of the specified tensile strength of the steel rebar when applicable to a Type 2 designation.

For Type 2 splices only, if failure of the tested splice should occur prior to obtaining the 125-percent of the specified yield strength and the 100-percent of the specified tensile strength, then 25 percent of all couplers shall be tested for both specified yield strength and specified tensile strength. If failure of the tested Type 2 splice occurs with testing of the 25 percent requirement, as stated above, then all couplers shall be rejected.

2.5 Minimum concrete cover and spacing between bars or sleeves shall be observed following Section 1808.8.2 of the LABC.

2.6 The HRC 300 Series shall be installed following the applicable code, manufacturer's installation instructions, and this supplement. A copy of the manufacturer's installation instructions or specifications shall be available on-site for all Registered Deputy Inspectors.

2.7 Splice locations shall be noted on the construction documents submitted for the building official's approval. The construction documents shall be prepared, stamped, and signed by a California registered design professional, when required by the LABC.

2.8 Only qualified operators, specified by the manufacturer, completely familiar with the installation procedures and specifications, shall perform the splicing.

2.9 This supplemental report expires together with IAPMO UES ER-963.