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UNITEC Standard Splice System

CSI Section:
03 21 00 – Reinforcing Steel

1.0 RECOGNITION

UNITEC Standard Splice System recognized in this report has been evaluated for use as mechanical splices for deformed steel reinforcing bars (rebar) in reinforced concrete structural members. The structural properties of the UNITEC Standard Splice System comply with the intent of the provisions of the following codes and regulations:

- 2018, 2015, 2012, and 2009 International Building Code (IBC®)
- 2018, 2015, 2012, and 2009 International Residential Code (IRC®)
- 2020 and 2017 City of Los Angeles Building Code (LABC) – attached Supplement
- 2020 and 2017 City of Los Angeles Residential Code (LARC) – attached Supplement

2.0 LIMITATIONS

Use of the UNITEC Standard Splice System recognized in this report is subject to the following limitations:

2.1 UNITEC Standard Splice System shall be installed in accordance with the applicable code, the manufacturer's instructions, and this report. Where conflict occur, the more restrictive governs.

2.2 Splice locations shall comply with applicable IBC requirements and be noted on plans approved by the building official.

2.3 Special inspections shall be provided in accordance with Section 3.4 of this report.

2.4 Under the 2018 IBC, for structures regulated by Chapter 18 of ACI 318-14 (as required by 2018 IBC Section 1905.1), to splice deformed reinforcing bars resisting earthquake-induced flexure, axial force, or both, in special moment frames, special structural walls, and all components of special structural walls including coupling beams and wall piers, with the UNITEC Standard Splice System, mill certificates of reinforcing bars shall be submitted to the building official as evidence that the steel reinforcing bars comply with ACI 318-14 Section 20.2.2.5.

2.5 Under the 2015 IBC, for structures regulated by Chapter 18 of ACI 318-14 (as required by 2015 IBC Section 1905.1), to splice deformed reinforcing bars resisting earthquake-induced flexure, axial force, or both, in special moment frames, special structural walls, and all components of special structural walls including coupling beams and wall piers, with the UNITEC Standard Splice System, mill certificates of reinforcing bars shall be submitted to the building official as evidence that the steel reinforcing bars comply with ACI 318-14 Section 20.2.2.5.

2.6 Under the 2012 IBC, for structures regulated by Chapter 21 of ACI 318-11 (as required by 2012 IBC Section 1905.1), to splice deformed reinforcing bars resisting earthquake-induced flexure, axial force, or both, in special moment frames, special structural walls, and all components of special structural walls including coupling beams and wall piers, with the UNITEC Standard Splice System, mill certificates of reinforcing bars shall be submitted to the building official as evidence that the steel reinforcing bars comply with ACI 318-11 Section 21.1.5.2.

2.7 Under the 2009 IBC, for structures regulated by Chapter 21 of ACI 318-08 (as required by 2009 IBC Section 1908.1), to splice deformed reinforcing bars resisting earthquake-induced flexural and axial forces in frame members, structural walls and coupling beams, with the UNITEC Standard Splice System, mill certificates of reinforcing bars shall be submitted to the building official as evidence that the steel reinforcing bars comply with ACI 318-08 Section 21.1.5.2.

2.8 UNITEC Standard Splice System recognized in this report is produced in Bangkok, Thailand.

3.0 PRODUCT USE

3.1 General: The UNITEC Standard Splice System is used to mechanically splice deformed steel reinforcing bars (rebar) installed in concrete structural members. The splices conform to ACI 318-14 Section 25.5.7.1 and 18.2.7 (ACI 318-11 and -08 Sections 12.14.3 and 21.1.6), for use as tension and compression mechanical splices for deformed steel reinforcing bar (rebar). The UNITEC Standard Splice System complies with both Type 1 and Type 2 mechanical splice requirements in accordance with ACI 318-14 Section 18.2.7.1 (ACI 318-11 and -08 Section 21.1.6.1).

3.2 Design: The UNITEC Standard Splice System shall be installed in accordance with the IBC, ACI 318, this evaluation report, and manufacturer's published installation instructions. Where conflicts occur, the more restrictive shall govern. Splice locations shall be detailed on the plans and approved by the building official.

The concrete cover and spacing shall be in accordance with IBC Chapters 7 and 19, and ACI 318-14 Section 20.6.1 (ACI 318-11 and -08 Section 7.7) and shall be measured from the outer surface of the splice system or as defined by the registered design professional. Type 2 mechanical splices are permitted in any location within a member as allowed by the IBC, IRC, and ACI 318 in all seismic design categories.

3.3 Installation: Installation instructions are supplied with the product and/or are available on the Dextra web site (www.dextragroup.com/unitec) and as described below.

3.3.1 The Unitec coupler is used to connect two reinforcing bars mechanically. The Unitec coupler is inserted over the end of the first reinforcing bar until contact with the center spring pin. The bolts are then tightened from center to outside by first hand-tightening with a manual wrench for pre-locking, and then tightening with a pneumatic wrench until the heads shear off. Table 1 of this report provides Unitec coupler dimensions and bolt details.

3.3.2 The Unitec coupler is then inserted into the second reinforcing bar until contact with the center spring pin. Repeat the bolt installation as described in Section 3.3.1 of this report.

3.4 Special Inspection

3.4.1 General: Special inspection of the UNITEC Splice System shall be provided at the jobsite as required by Section 1705 of the 2018, 2015 and 2012 IBC (Section 1704 of the 2009 IBC). In addition to verifying placement of reinforcing bar splices, the special inspector shall verify the grade and size of the reinforcing bars, coupler identification, reinforcing bar embedment length to couplers, position of couplers, placement of reinforcing bar splices, as well as installation of the couplers to the reinforcing bars.

4.0 PRODUCT DESCRIPTION

4.1 General

The UNITEC couplers consist of a sleeve that is fitted with one longitudinal row of radial bolts through its wall thickness, and longitudinal studs inside its inner cavity, opposite to the bolts. One or both rebars are inserted into the coupler and the bolts are tightened until their heads shear off. Figure 1 of this report illustrates the UNITEC Splice Assembly. The UNITEC couplers with dimensions shown in Table 1 of this report are designed to mechanically join No. 4 through No. 14 reinforcing bars in accordance with ASTM A615 Grades 60, 75, or 80; or ASTM A706 Grades 80 or 60 specifications.

4.2 Couplers: The Dextra Unitec Couplers are formed from steel complying with GB/T 8162 Grade 45 and equivalent to JIS 4051 Grade S45C. The couplers conform to the requirements specified for ASTM A519 or SAE J403 Grade 1045. Figure 2 of this report illustrates the couplers.

4.3 Steel Reinforcing Bars: Steel reinforcing bars shall be uncoated, deformed reinforcing bars complying with ASTM A615 Grades 60, 75, or 80; or ASTM A706 Grades 60 or 80 specifications.

5.0 IDENTIFICATION

UNITEC Standard Splice System are packaged with a label bearing the manufacturer's name (Dextra Manufacturing Co., Ltd.) or brand name (UNITEC), address, model and size, and the IAPMO Uniform ES Mark of Conformity and the Evaluation Report Number (ER-702) to identify the products recognized in this report. Each Dextra coupler is permanently stamped/labeled with the catalog number, size, heat number, Type 2 designation. Either of the following Marks of Conformity may be used as shown:

or

IAPMO UES ER-702

6.0 EVIDENCE SUBMITTED

Data submitted in accordance with the ICC-ES Acceptance Criteria for Mechanical Connector Systems for Steel Reinforcing Bars (AC133), approved October 2015, (editorially revised May 2018).

7.0 STATEMENT OF RECOGNITION:

This report describes the results of research carried out by the IAPMO Uniform Evaluation Service on UNITEC Standard Splice System to assess its conformance to the codes listed in Section 1.0 and serves as documentation of the product certification. The products are manufactured at the location noted in Section 2.8 of this report under a quality control program with periodic inspections under the supervision of IAPMO UES.

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Uniform Evaluation Service

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

Table 1 – Dimension of Unitec Couplers

Bar Size (US)	Model	Coupler dimensions				Bolt size	Total Number of Bolts
		Outside dimension (D)		Length (L)			
		(mm)	(in)	(mm)	(in)		
#4	Unitec #4-12	48	1 ⅞	140	5 ½	M12	6
#5	Unitec #5-14	48	1 ⅞	140	5 ½	M12	6
#6	Unitec #6-20	52	2 1/16	200	7 ⅞	M12	8
#7	Unitec #7-22	59	2 ¼	180	7 ⅛	M16	6
#8	Unitec #8-25	62	2 ½	240	9 ½	M16	8
#9	Unitec #9-28	76	3	220	8 ⅝	M20	6
#10	Unitec #10-32	83	3 ¼	280	11	M20	8
#11	Unitec #11-36	89	3 ½	360	14 ⅛	M20	10
#14	Unitec #14-43	95	3 ¾	555	21 ⅞	M20	16

Figure 1 – Unitec Standard Splice System

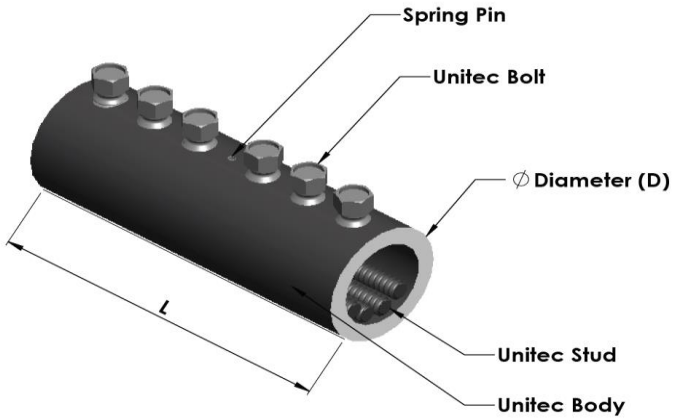

Figure 2 – Unitec Coupler Details

CITY OF LOS ANGELES SUPPLEMENT

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1.0 RECOGNITION

The UNITEC Standard Splice System described in ER-702 and this supplemental report have been evaluated for use as mechanical splices for deformed steel reinforcing bars (rebar) in reinforced concrete structural members. The UNITEC Standard Splice System has been evaluated for structural performance properties, subject to the requirements in ER-702 and this supplemental report. The UNITEC Standard Splice System was evaluated for compliance with the following codes and regulations:

- 2020 and 2017 City of Los Angeles Building Code (LABC)
- 2020 and 2017 City of Los Angeles Residential Code (LARC)

2.0 LIMITATIONS

Use of the UNITEC Standard Splice System recognized in this supplement is subject to the following limitations:

2.1 Continuous special inspections of the UNITEC Standard Splice System during installation shall be provided by Registered Deputy Inspectors as required by Section 1705 of the 2020 and 2017 LABC, as applicable. The Registered Deputy Inspector shall verify the following: hardware and equipment; cleaning and condition of the bars in accordance with the specifications and the applicable code; and the installation procedures comply with the specifications and the manufacturer's published installation instructions.

2.2 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.

2.3 The UNITEC Standard Splice System shall be selected at the jobsite by the Registered Deputy Inspector or by the building inspector and shall be tested by an approved testing agency in accordance with 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 in accordance with Section 25.5.7.1 of ACI 318-14. For Type 2 splices, the splice shall develop at least 100 percent of the specified tensile strength of the steel reinforcing bar.

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.

2.4 Minimum concrete cover and spacing between bars or sleeves shall be provided in accordance Section 1808.8.2 of the LABC.

2.5 The UNITEC Standard Splice System shall be installed in accordance with 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.

2.6 Splice locations shall be noted on the plans approved by the building official.

2.7 Only qualified operators completely familiar with the installation procedures and specifications shall perform the splicing.