Proferred®

U.S. ANCHOR

The Quality You Know™

CATEGORY 1

- Seismic Zone Qualification
- Tension Zone
- Cracked Concrete

ICC ES
ICC-ES 3981

ICC ES
ICC-ELC 3981

ESR-3981 - LABC - LARC
ESR-3981 - CBC - CRC
ESR-3981 - FBC

MIAMI-DADE COUNTY APPROVED
NOA 14-0902.09

BRIGHTON BEST
B-RIGHT-ON QUALITY PRODUCTS
FOUNDED 1925®

BRIGHTON-BEST INTERNATIONAL

www.brightonBEST.com | 1-800-275-0050

022018

PROFERRED® U.S. ANCHOR PRODUCTS are manufactured to the highest standards for construction and industrial applications. Our flagship ULTRAWEDGE™+ is manufactured from 1035 cold rolled steel.

It earned the coveted ICC-ES approval (ERS #3981) for cracked and un-cracked concrete and approved by the Canadian National Code (ELC #3981). The Ultrawedge™+ anchor is approved by Miami-Dade County, Florida Building Code, Los Angeles Building and Residential Codes and California Building and Residential Codes.

The PROFERRED® ANCHOR LINE includes a full line of light/medium and heavy duty selections. This broad offering is backed up by a strong inventory commitment via 20+ national warehouses and a trained inside and outside salesforce. Additional testing of our products is ongoing with our in-house QC department as well as bi-annual ICC-ES supervised audits at our Ultrawedge™+ factory.

ANCHOR PRODUCT LINES

WEDGE ANCHORS ULTRAWEDGE™+
- Carbon Steel (BBI# 157)
- Hot Dipped Galvanized (BBI# 158)
- Acoustical (BBI# 157)
- Stainless Steel 304 (BBI# 616)
- Stainless Steel 316 (BBI# 617)

WEDGE ANCHORS
- Carbon Steel (Bulk) (BBI# 279)

SLEEVE ANCHORS
- Acorn Nut Carbon Steel (BBI# 276)
- Hex Nut Carbon Steel (BBI# 278)
- Flat Head Carbon Steel (BBI# 277)
- Round Head Carbon (BBI# 426)
- Hex Nut 303 Stainless (BBI# 618)

SLEEVE ANCHORS ROD HANGER TYPE
- Carbon Steel (BBI# R17)

DROP-IN ANCHORS
- Carbon Steel-US Anchor (BBI# 268)
- Carbon Steel-Shorty Version (BBI# 268)
- Carbon Steel-Commercial (Bulk) (BBI# 269)
- Carbon Steel-Commercial Shorty Version (BBI# 269)
- 304 Stainless-US Anchor (BBI# 618)

MACHINE SCREW ANCHORS
- Setting Tools (BBI# R06)

TAP-KING CONCRETE SCREWS HEX & FLAT HEAD RUSTPERT COATING (Pkg) (BBI# 660)

CONCRETE SCREWS (Bulk)
- Commercial Hex & Flat Head (BBI# 685)

DRILL BITS (SDS, STRAIGHT) FOR CONCRETE SCREWS
(BBI# R62)

TOGGLE BOLTS
- Zinc (BBI# 893)
- Acoustical Zinc (BBI# 143)

TOGGLE WINGS (BBI# 262)

HAMMER DRIVE ANCHORS
- Mushroom Head with Zinc Nails (BBI# 266)
- Mushroom Head with 304 Nails (BBI# 265)

HOLLOW WALL ANCHORS
- Combo (Phil/Slot) Pan (BBI# 267)
- Drive Anchor Combo (Phil/Slot) Pan (BBI# 272)
- Setting Tool (BBI# R05)

LAG SCREW EXPANSION SHIELDS
- Short Zinc Alloy (BBI# 273)
- Long Zinc Alloy (BBI# 274)

SINGLE EXPANSION SHIELDS (BBI# 264)

DOUBLE EXPANSION SHIELDS
(BBI# 263)

SPLIT FAST ANCHOR
(Flat & Round Head) (BBI# 159)

CONICAL PLASTIC ANCHORS
(BBI# 078)

CONICAL PLASTIC ANCHOR KIT (BBI# 079)

NYLON NAIL ANCHORS
(BBI# R14)

EYECOUPLINGS (BBI# R37)

MUNGO
- Nylon Plug (BBI# 156 / R12)
- Universal Plug (BBI# R13)
- Jet Plug Kits (BBI# R11)

FRAMING ANCHORS
(BBI# R08)

HAMMER SCREWS (BBI# R10)

L SHAPED ANCHOR BOLT WITH NUT & WASHER HDG (BBI# 432)

WOOD SCREW ANCHOR LEAD ALLOY (BBI# 280)

PROFERRED® CARBIDE
(BBI# C10)
- SDS+
- SDS Max
- Straight Shank
- Concrete Screw Bits
- Specialty Bits

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Proferred®

U.S. ANCHOR

BRIGHTON QUALITY B-RIGHT-ON PRODUCTS BEST

FOUNDED 1925®

ULTRAWEDGE™ ANCHOR

ULTRAWEDGE™+
CRACKED CONCRETE APPROVED

Part #	Size
157060	3/8”X2 1/4”
157070	3/8”X2 3/4”
157080	3/8”-16X3”
157090	3/8”-16X3 3/4”
157100	3/8”-16X5”
157180	1/2”X2 3/4”
157190	1/2”-13X3 3/4”
157200	1/2”-13X4 1/4”
157210	1/2”-13X4 1/2”
157220	1/2”-13X5 1/2”
157230	1/2”-13X7”
157300	5/8”X3 1/2”
157310	5/8”-11X4 1/2”
157320	5/8”-11X5”
157330	5/8”-11X6”
157340	5/8”-11X7”
157380	3/4”-10X4 1/4”
157390	3/4”-10X4 3/4”
157400	3/4”-10X5 1/2”
157410	3/4”-10X6 1/4”
157420	3/4”-10X7”

Select anchor length to achieve minimum embedment which will depend on the thickness of the fixture being attached.

(SEE ESR# 3981 REPORT FOR MINIMUM EMBEDMENTS & OTHER REQUIREMENTS)

ULTRAWEDGE™
304 STAINLESS

Part #	Size
616010	1/4”-20X1 3/4”
616020	1/4”-20X2 1/4”
616030	1/4”-20X3 1/4”
616040	3/8”-16X2 1/4”
616050	3/8”-16X2 3/4”
616060	3/8”-16X3”
616070	3/8”-16X3 3/4”
616080	3/8”-16X5”
616090	3/8”-16X6 1/2”
616100	1/2”-13X2 3/4”
616110	1/2”-13X3 3/4”
616120	1/2”-13X4 1/4”
616130	1/2”-13X5 1/2”
616140	1/2”-13X7”
616150	1/2”-13X8 1/2”
616160	1/2”-13X10”
616170	1/2”-13X12”
616180	5/8”-11X3 1/2”
616190	5/8”-11X4 1/2”
616200	5/8”-11X5”
616210	5/8”-11X6”
616220	5/8”-11X7”
616230	5/8”-11X8 1/2”
616240	5/8”-11X10”
616250	5/8”-11X12”
616260	3/4”-10X4 1/4”
616270	3/4”-10X4 3/4”
616280	3/4”-10X5 1/2”
616290	3/4”-10X7”
616300	3/4”-10X8 1/2”
616310	3/4”-10X10”
616320	3/4”-10X12”
616330	3/4”-10X6 1/4”
616340	7/8”-9X6”
616350	7/8”-9X8”
616360	1”-8X6”
616370	1”-8X9”
616380	1”-8X12”

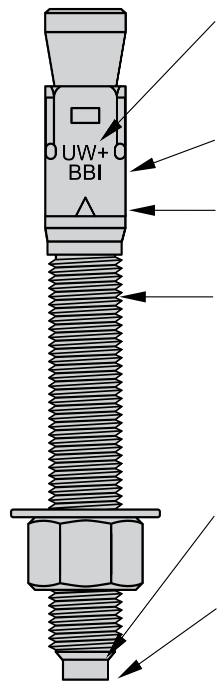
ULTRAWEDGE™
316 STAINLESS

Part #	Size
617010	1/4”-20X1 3/4”
617020	1/4”-20X2 1/4”
617030	1/4”-20X3 1/4”
617040	3/8”-16X2 3/4”
617050	3/8”-16X3”
617060	3/8”-16X3 3/4”
617070	3/8”-16X5”
617080	1/2”-13X2 3/4”
617090	1/2”-13X3 3/4”
617100	1/2”-13X4 1/4”
617110	1/2”-13X5 1/2”
617120	1/2”-13X7”
617130	5/8”-11X3 1/2”
617140	5/8”-11X4 1/2”
617150	5/8”-11X5”
617160	5/8”-11X6”
617170	5/8”-11X7”
617180	5/8”-11X8 1/2”
617190	3/4”-10X4 1/4”
617200	3/4”-10X4 3/4”
617210	3/4”-10X5 1/2”
617220	3/4”-10X6 1/4”
617230	3/4”-10X7”
617240	3/4”-10X8 1/2”

ULTRAWEDGE™
HOT DIP GALV.

Part #	Size
158010	3/8”-16X3 1/2”
158100	1/2”-13X2 3/4”
158110	1/2”-13X3 3/4”
158120	1/2”-13X4 1/4”
158130	1/2”-13X5 1/2”
158140	1/2”-13X7”
158150	1/2”-13X8 1/2”
158160	1/2”-13X10”
158200	5/8”-11X3 1/2”
158210	5/8”-11X5”
158220	5/8”-11X6”
158230	5/8”-11X7”
158240	5/8”-11X8 1/2”
158250	5/8”-11X10”
158300	3/4”-10X4 3/4”
158310	3/4”-10X5 1/2”
158320	3/4”-10X6 1/4”
158330	3/4”-10X8 1/2”
158340	3/4”-10X10”
158400	7/8”-9X6”
158410	7/8”-9X8”
158500	1”-8X6”
158510	1”-8X9”

The newly improved Ultrawedge™+ anchor has been designed for heavy duty applications with impressive performance characteristics. The advanced design of the collar allows for anchoring in the most demanding requirements.



TRADEMARKED
Indicates proprietary product insuring consistent quality.

360 DEGREE COLLAR

1035 COLD ROLLED STEEL

LONGER THREAD LENGTH
Gives greater versatility in anchor embedment depth with one anchor.

IMPRESSIVE PERFORMANCE
Cracked & Un-cracked approved.

BULL NOSE HEAD
Helps to ensure that threads won't be damaged during installation.

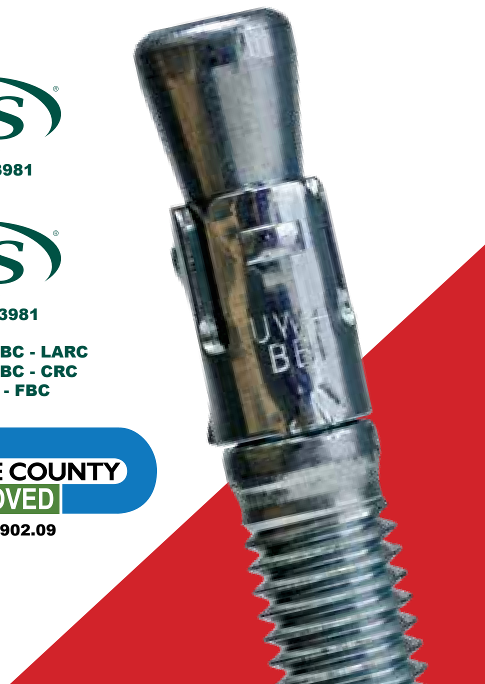
HEAD STAMPED
Helps determine length of anchor after installation.

ICC ES
ICC-ES 3981

ICC ES
ICC-ELC 3981

ESR-3981 - LABC - LARC
ESR-3981 - CBC - CRC
ESR-3981 - FBC

MIAMI-DADE COUNTY APPROVED
NOA 14-0902.09



Proferred®
U.S. ANCHOR

BRIGHTON BEST
FOUNDED 1925®

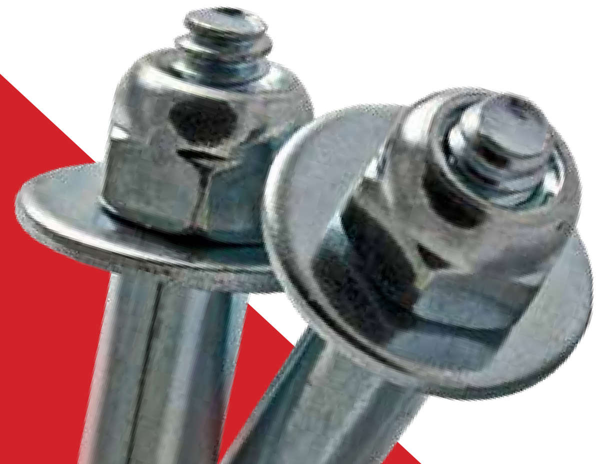
SLEEVE ANCHOR
MEDIUM DUTY SLEEVE ANCHOR PROGRAM

SLEEVE ANCHOR - ACORN HEAD

Part #	Pack	VD	Size
276015	100PCS	P1	**1/4”-20 X 7/8”**
276020	100PCS	P1	**1/4”-20 X 1 3/8”**
276030	100PCS	P1	**1/4”-20 X 2 1/4”**

SLEEVE ANCHOR - HEX NUT

Part #	Pack	VD	Size
278030	100PCS	P1	**5/16” X 1 1/2”**
278040	100PCS	P1	**5/16” X 2 1/2”**
278050	50PCS	P1	**3/8” X 1 7/8”**
278060	50PCS	P1	**3/8” X 3”**
278070	50PCS	P1	**3/8” X 4”**
278080	25PCS	P1	**1/2” X 2 1/4”**
278090	25PCS	P1	**1/2” X 3”**
278100	25PCS	P1	**1/2” X 4”**
278110	25PCS	P1	**1/2” X 6”**
278120	25PCS	P1	**5/8” X 2 1/4”**
278130	25PCS	P1	**5/8” X 3”**
278135	10PCS	P1	**5/8” X 3 7/8”**
278140	10PCS	P1	**5/8” X 4 1/4”**
278150	10PCS	P1	**5/8” X 6”**
278160	10PCS	P1	**3/4” X 2 1/2”**
278180	5PCS	P1	**3/4” X 4 1/4”**
278190	5PCS	P1	**3/4” X 6 1/4”**



SLEEVE ANCHOR - FLAT HEAD

Part #	Pack	VD	Size
277220	100PCS	PK	**1/4” X 2” Threshold**

SLEEVE ANCHOR - ROUND HEAD COMBO

Part #	Pack	VD	Size
426005	100PCS	P1	**1/4” X 1 1/4”**

SLEEVE ANCHOR - ROUND HEAD

Part #	Pack	VD	Size
426010	100PCS	P1	**1/4” X 2”**
426022	100PCS	P1	**1/4” X 2 3/4”**
426020	50PCS	P1	**3/8” X 2 1/2”**
426030	50PCS	P1	**3/8” X 3 3/4”**
426040	50PCS	P1	**3/8” X 4 3/4”**

SLEEVE TYPE ROD HANGERS

Part #	Pack	VD	Size
R17003	50PCS	P1	**5/16” X 1 1/2”**
R17002	50PCS	P1	**3/8” X 1 7/8”**
R17001	25PCS	P1	**1/2” X 2 1/4”**
R17004	20PCS	P1	**5/8” X 2 1/4”**

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U.S. ANCHOR

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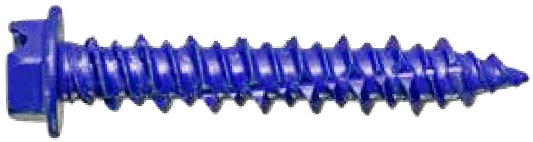
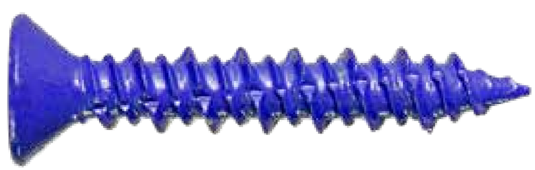
TAPKING™
STANDARD TAPKING™ CONCRETE SCREWS



TAPKING™ CONCRETE SCREWS - HEX HEAD

Part #	Size
660010	3/16" X 1 1/4"
660015	3/16" X 1 3/4"
660020	3/16" X 2 1/4"
660025	3/16" X 2 3/4"
660030	3/16" X 3 1/4"
660035	3/16" X 4"
660050	1/4" X 1 1/4"
660055	1/4" X 1 3/4"
660060	1/4" X 2 1/4"
660070	1/4" X 2 3/4"
660080	1/4" X 3 1/4"
660090	1/4" X 4"
660100	1/4" X 5"
660110	1/4" X 6"



TAPKING™ CONCRETE SCREWS - FLAT HEAD

Part #	Size
660200	3/16" X 1 1/4"
660210	3/16" X 1 3/4"
660220	3/16" X 2 1/4"
660230	3/16" X 2 3/4"
660240	3/16" X 3 1/4"
660250	3/16" X 4"
660260	1/4" X 1 1/4"
660270	1/4" X 1 3/4"
660280	1/4" X 2 1/4"
660290	1/4" X 2 3/4"
660300	1/4" X 3 1/4"
660310	1/4" X 4"
660320	1/4" X 5"
660330	1/4" X 6"

MIAMI-DADE COUNTY APPROVED
NOA 12.0326.1204

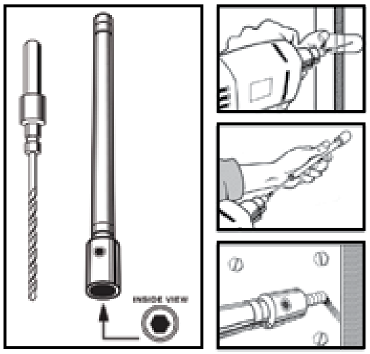
SUITABLE FOR STANDARD CONCRETE BITS AND SDS-HEX ROTARY HAMMER DRILL BITS

Concrete Screw	Length	Drill Bit	Part#
3/16"	1-1/4", 1-3/4"	5/32" x 3-1/2"	R62004
3/16"	2-1/4", 2-3/4"	5/32" x 4-1/2"	R62005
3/16"	3-1/4", 3-3/4", 4"	5/32" x 5-1/2"	R62006
1/4"	1-1/4", 1-3/4"	3/16" x 3-1/2"	R62008
1/4"	2-1/4", 2-3/4"	3/16" x 4-1/2"	R62003
1/4"	3-1/4", 3-3/4", 4"	3/16" x 5-1/2"	R62001
1/4"	5"	3/16" x 6-3/4"	R62002

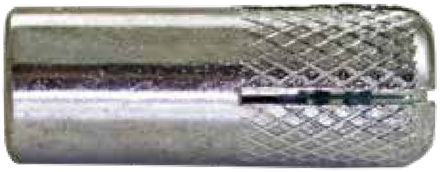
To Insert Drill Bit
Loosen set screw on side of drill adapter with 1/8" hex key. Do not remove completely. Align flat side of concrete drill bit with set screw and tighten screw.

To Drill
Place drill adapter into 3/8" or 1/2" chuck of standard hammer drill. Place drill bit in drill adapter and tighten set screw. Drill hole minimum of 1/4" deeper than TAPKING™ anchor or concrete screw is to be embedded.

To Drive
Slide sleeve over drill bit and snap onto drill adapter. Snap proper socket into end of sleeve. Insert head of TAPKING™ anchor or concrete screw into socket. Drive until anchor is fully embedded.



DROP IN ANCHOR



DROP IN ANCHOR - CARBON STEEL
(INCLUDES FREE SETTING TOOL IN BOX)

Part #	Size
268010	1/4”
268020	3/8”
268030	1/2”
268040	5/8”
268050	3/4”

DROP IN ANCHOR - 304 STAINLESS
(INCLUDES FREE SETTING TOOL IN BOX)

Part #	Size
619010	1/4”
619020	3/8”
619030	1/2”
619040	5/8”
619050	3/4”

SHORTY DROP IN
(INCLUDES FREE SETTING TOOL IN BOX)

Part #	Size
268220	3/8”

ICC-ES Evaluation Report

ESR-3981

ICC-ES | (800) 423-6587 | (562) 699-0543 | www.icc-es.org

Issued 10/2017
This report is subject to renewal 10/2018.

DIVISION: 03 00 00—CONCRETE
SECTION: 03 16 00—CONCRETE ANCHORS
DIVISION: 05 00 00—METALS
SECTION: 05 05 19—POST-INSTALLED CONCRETE ANCHORS

REPORT HOLDER:

BRIGHTON BEST INTERNATIONAL, INC.

12801 LEFFINGWELL AVENUE
SANTE FE SPRINGS, CALIFORNIA 90670

EVALUATION SUBJECT:

US ANCHOR ULTRAWEDGE+ WEDGE ANCHORS IN CRACKED AND UNCRACKED CONCRETE

ICC-ES Evaluation Report

ESR-3981

Issued October 2017
Revised December 2017
This report is subject to renewal October 2018.

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DIVISION: 03 00 00—CONCRETE
Section: 03 16 00—Concrete Anchors

DIVISION: 05 00 00—METALS
Section: 05 05 19—Post-Installed Concrete Anchors

REPORT HOLDER:

BRIGHTON BEST INTERNATIONAL, INC.
12801 LEFFINGWELL AVENUE
SANTE FE SPRINGS, CALIFORNIA 90670
(562) 483-2740
www.brightonbest.com

EVALUATION SUBJECT:

US ANCHOR ULTRAWEDGE+ WEDGE ANCHORS IN CRACKED AND UNCRACKED CONCRETE

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2015, 2012, 2009 and 2006 *International Building Code®* (IBC)
- 2015, 2012, 2009 and 2006 *International Residential Code®* (IRC)

For evaluation for compliance with codes adopted by the Los Angeles Department of Building and Safety (LADBS), see ESR-3981 LABC and LARC Supplement

Property evaluated:

Structural

2.0 USES

US Anchor Ultrawedge+ Wedge Anchors are used as anchorage in cracked and uncracked normalweight concrete and lightweight concrete having a specified compressive strength, f'_c, of 2,500 psi to 8,500 psi (17.2 MPa to 58.6 MPa) to resist static, wind, seismic tension and shear loads.

The US Anchor Ultrawedge+ Wedge Anchors comply with anchors as described in Section 1901.3 of 2015 IBC, Section 1909 of the 2012 IBC, and Section 1912 of the 2009 and 2006 IBC. The anchors are alternatives to cast-in-place anchors described in Section 1908 of the 2012 IBC and Section 1911 of the 2009 and 2006 IBC. The anchors may also be used under the IRC where an engineered design is submitted in accordance with Section R301.1.3.

3.0 DESCRIPTION

3.1 US Anchor Ultrawedge+ Wedge Anchors:

The US Anchor Ultrawedge+ Wedge Anchors are torque-controlled, mechanical expansion anchors. The anchors consist of a stud (anchor body), nut, washer, and expander wedge (clip) as illustrated in Figure 1 of this report. The stud for all sizes is manufactured from cold-drawn carbon steel meeting the requirements of UNS G10350 and is partially threaded with one end terminating in a flared mandrel. The expander wedge (clip) is manufactured from Chinese steel standard GB/T3522 Grade 50 steel subsequently through hardened to Rockwell HRC 28-32 and is formed around the stud mandrel so it is able to move freely. The clip movement is restrained by the mandrel taper and by a collar. The anchor is installed in a predrilled hole with a hammer. When torque is applied to the nut of the installed anchor, the mandrel is drawn into the expansion element, which is in turn expanded against the wall of the drilled hole. All components, including nuts and washers, are zinc-coated in accordance with ASTM B633 classification SC1, Type III. Installation information and dimensions are set forth in Section 4.3 and Table 1 and Table 2 of this report.

3.2 Concrete:

Normalweight and lightweight concrete must comply with Sections 1903 and 1905 of the IBC, as applicable.

4.0 DESIGN AND INSTALLATION

4.1 Strength Design:

4.1.1 General: Design strength of anchors complying with the 2015 IBC, as well as Section R301.1.3 of the 2015 IRC must be determined in accordance with ACI 318-14 Chapter 17 and this report.

Design strength of anchors complying with the 2012 IBC, as well as Section R301.1.3 of the 2012 IRC, must be determined in accordance with ACI 318-11 Appendix D and this report.

Design strength of anchors complying with the 2009 IBC, as well as Section R301.1.3 of the 2009 IRC, must be determined in accordance with ACI 318-08 Appendix D and this report.

Design strength of anchors complying with the 2006 IBC and Section R301.1.3 of the 2006 IRC must be determined in accordance with ACI 318-05 Appendix D and this report.

The strength design of anchors must comply with ACI 318-14 17.3.1 or ACI 318 (-11, -08, -05) D.4.1, as applicable. Strength reduction factors, ϕ, as given in ACI 318-14 17.3.3 or ACI 318-11 D.4.3 or ACI 318 (-08, -05) D.4.4, as applicable, and noted in Table 1 of this report, must be used for load combinations calculated in accordance with Section 1605.2 of the IBC, Section 5.3 of ACI 318-14 and Section 9.2 of ACI 318 (-11, -08, -05), as applicable. Strength reduction factors, ϕ, given in ACI 318-11 D.4.4 or ACI 318 (-08, -05) D.4.5 must be used for load combinations calculated in accordance with ACI 318 (-11, -08, -05), Appendix C. The value of f'_c, used in calculations must be limited to a maximum of 8,000 psi (55.2 MPa), in accordance with ACI 318-14 17.2.7 or ACI 318-11 D.3.7, as applicable.

4.1.2 Requirements for Static Steel Strength in Tension, N_{sa}: The nominal steel strength of a single anchor in tension, N_{sa}, calculated in accordance with ACI 318-14 17.4.1.2 or ACI 318 (-11, -08, -05) D.5.1.2, as applicable, must be calculated based on the information given in Table 1 and must be used for design. The strength reduction factor, ϕ, corresponding to a ductile steel element may be used.

4.1.3 Requirements for Static Concrete Breakout Strength in Tension, N_{cb} or N_{cbg}: The nominal concrete breakout strength of a single anchor or a group of anchors in tension (N_{cb} and N_{cbg}, respectively), must be calculated in accordance with ACI 318-14 17.4.2 or ACI 318 (-11, -08, -05) D.5.2, as applicable, with modifications as described in this section. The basic concrete breakout strength in tension, N_b, must be calculated in accordance with ACI 318-14 17.4.2.2 or ACI 318 (-11, -08, -05) D.5.2.2, as applicable, using the values of h_{ef}, k_{cr} and k_{uncr} as given in Table 1 of this report. The nominal concrete breakout strength in tension in regions of concrete where analysis indicates no cracking at service loads must be calculated in accordance with ACI 318-14 17.4.2.6 or ACI 318 (-11, -08, -05) D.5.2.6, as applicable, with $\Psi_{c,N}$ = 1.0 and k_{uncr} as given in Table 1. The value of f'_c used in the calculations must be limited to 8,000 psi (55.2 MPa), in accordance with ACI 318-14 17.2.7 or ACI 318-11 D.3.7, as applicable.

4.1.4 Requirements for Pullout Strength in Tension, N_{pn}: The nominal pullout strength of a single anchor in tension in accordance with ACI 318-14 17.4.3 or ACI 318 (-11, -08, -05) D.5.3, as applicable, in cracked and uncracked concrete, $N_{p,cr}$ *and* $N_{p,uncr}$, respectively, is given in Table 1. In lieu of ACI 318-14 17.4.3.6 or ACI 318 (-11, -08, -05) D.5.3.6, as applicable, $\psi_{c,P}$ = 1.0 for all design cases. In accordance with ACI 318-14 17.4.3 or ACI 318 -11, -08, -05) D.5.3, as applicable the nominal pullout strength in cracked concrete may be calculated in accordance with the following equation:

$$N_{p,f'_c} = N_{p,cr}\sqrt{\frac{f'_c}{2,500}} \quad \text{(lb, psi)} \qquad \text{(Eq-1)}$$

$$N_{p,f'_c} = N_{p,cr}\sqrt{\frac{f'_c}{17.2}} \quad \text{(N, MPa)}$$

In regions where analysis indicates no cracking in accordance with ACI 318-14 17.4.3.6 or ACI 318 (-11, -08, -05) D5.3.6 as applicable, the nominal pullout strength in tension may be calculated in accordance with the following equation:

$$N_{p,f'_c} = N_{p,uncr}\sqrt{\frac{f'_c}{2,500}} \quad \text{(lb, psi)} \qquad \text{(Eq-2)}$$

$$N_{p,f'_c} = N_{p,uncr}\sqrt{\frac{f'_c}{17.2}} \quad \text{(N, MPa)}$$

Where values for $N_{p,cr}$ or $N_{p,uncr}$ are not provided in Table 1 of this report, the pullout strength in tension need not be evaluated.

4.1.5 Requirements for Static Steel Strength in shear, V_{sa}: The nominal steel strength in shear, V_{sa}, of a single anchor in accordance with ACI 318-14 17.5.1.2 or ACI 318 (-11, -08, -05) D.6.1.2, as applicable, is given in Table 1 of this report and must be used in lieu of the values derived by calculation from ACI 318-14 Eq. 17.5.1.2b or ACI 318 (-11, -08, -05) Eq. D-29, as applicable. The strength reduction factor, ϕ, corresponding to a ductile steel element may be used.

4.1.6 Requirements for Static Concrete Breakout Strength in Shear, V_{cb} or V_{cbg}: The nominal concrete breakout strength of a single anchor or group of anchors in shear (V_{cb} or V_{cbg}, respectively), must be calculated in accordance with ACI 318-14 17.5.2 or ACI 318 (-11, -08, -05) D.6.2, as applicable, with modifications as described in this section. The basic concrete breakout strength in shear, V_b, must be calculated in accordance with ACI 318-14 17.5.2.2 or ACI 318 (-11, -08, -05) D.6.2.2, as applicable, based on the values provided in Table 1 of this report and using the value of l_e according to Table 1 of this report.

4.1.7 Requirements for Static Concrete Pryout Strength of Anchor in Shear, V_{cp} or V_{cpg}: The nominal concrete pryout strength of a single anchor or group of anchors (V_{cp} or V_{cpg}, respectively), must be calculated in accordance with ACI 318-14 17.5.3 or ACI 318 (-11, -08, -05) D.6.3, as applicable, modified by using the value of k_{cp} provided in Table 1 and the value of N_{cb} or N_{cbg} as calculated in Section 4.1.3 of this report.

4.1.8 Requirements for Seismic Design:

4.1.8.1 General: For load combinations including seismic, the design must be performed in accordance with ACI 318-14 17.2.3 or ACI 318 (-11, -08, -05) D.3.3, as applicable. Modifications to ACI 318-14 17.2.3 shall be applied under Section 1905.1.8 of the 2015 IBC. For the 2012 IBC, Section 1905.1.9 shall be omitted. Modifications to ACI 318 (-08, -05) D.3.3 shall be applied under Section 1908.1.9 of the 2009 IBC, or Section 1908.1.16 of the 2006 IBC, as applicable.

The anchors must comply with ACI 318-14 2.3 or ACI 318-11 D.1, as applicable, as ductile steel elements and must be designed in accordance with ACI 318-14 17.2.3.4, 17.2.3.5, 17.2.3.6 or 17.2.3.7; or ACI 318-11 D.3.3.4, D.3.3.5, D.3.3.6 or D.3.3.7; ACI 318-08 D.3.3.4, D.3.3.5 or D.3.3.6; or ACI 318-05 D.3.3.4 or D.3.3.5, as applicable. Strength reduction factors, ϕ, are given in Table 1 of this report. The anchors may be installed in Seismic Design Categories A through F of the IBC.

4.1.8.2 Seismic Tension: The nominal steel strength and nominal concrete breakout strength for anchors in tension must be calculated in accordance with ACI 318-14 17.4.1 and 17.4.2 or ACI 318-11 D.5.1 and D.5.2, as applicable, as described in Sections 4.1.2 and 4.1.3 of this report. In accordance with ACI 318-14 17.4.3.2 or ACI 318-11 D.5.3.2, as applicable, the appropriate pullout strength in tension for seismic loads, $N_{p,eq}$, described in Table 1 must be used in lieu of N_p, as applicable. The value of $N_{p,eq}$ may be adjusted by calculation for concrete strength in accordance with Eq-1 and Section 4.1.4 of this report. If no values for $N_{p,eq}$ are given in Table 1, the static design strength values govern.

4.1.8.3 Seismic Shear: The nominal concrete breakout strength and pryout strength in shear must be calculated in accordance with ACI 318-14 17.5.2 and 17.5.3 or ACI

318-11 D.6.2 and D.6.3, respectively, as applicable, as described in Sections 4.1.6 and 4.1.7 of this report. In accordance with ACI 318-14 17.5.1.2 or ACI 318-11 D.6.1.2, as applicable, the appropriate value for nominal steel strength for seismic loads, $V_{sa,eq}$ described in Table 1 must be used in lieu of V_{sa}, as applicable.

4.1.9 Requirements for Interaction of Tensile and Shear Forces: For anchors or groups of anchors that are subjected to the effects of combined tensile and shear forces, the design must be determined in accordance with ACI 318-14 17.6 or ACI 318 (-11, -08, -05) D.7, as applicable.

4.1.10 Requirements for Critical Edge Distance: In applications where the installed edge distance $c < c_{ac}$ and supplemental reinforcement to control splitting of the concrete is not present, the concrete breakout strength for the anchors loaded in tension for uncracked concrete, calculated in accordance with ACI 318-14 17.4.2 or ACI 318 (-11, -08, -05) D.5.2, as applicable, must be further multiplied by the factor $\Psi_{cp,N}$ as given by Eq-3:

$$\Psi_{cp,N} = \frac{c}{c_{ac}} \qquad \text{(Eq-3)}$$

where the factor $\Psi_{cp,N}$ need not be taken as less than $\frac{1.5h_{ef}}{c_{ac}}$.

For all other cases, $\Psi_{cp,N}$ = 1.0. In lieu of using ACI 318-14 17.7.6 or ACI 318 (-11, -08, -05) D.8.6, as applicable, values of c_{ac} must be taken from Table 1. In all cases, c must not be less than c_{min} described in Table 1 of this report.

4.1.11 Requirements for Minimum Member Thickness, Minimum Anchor Spacing and Minimum Edge Distance: In lieu of using ACI 318-14 17.7.1 and 17.7.3 or ACI 318 (-11, -08, -05) D.8.1 and D.8.3, as applicable, values of s_{min} and c_{min} as given in Table 1 of this report must be used. In lieu of using ACI 318-14 17.7.5 or ACI 318 (-11 -08, -05) D.8.5, as applicable, minimum member thicknesses h_{min} as given in Table 1 of this report must be used.

4.1.12 Lightweight Concrete: For the use of anchors in lightweight concrete, the modification factor λ_a equal to 0.8λ is applied to all values of $\sqrt{f'_c}$ affecting N_n and V_n.

For ACI 318-14 (2015 IBC), ACI 318-11 (2012 IBC) and ACI 318-08 (2009 IBC), λ shall be determined in accordance with the corresponding version of ACI 318.

For ACI 318-05 (2006 IBC), λ shall be taken as 0.75 for all lightweight concrete and 0.85 for sand-lightweight concrete. Linear interpolation shall be permitted if partial sand replacement is used. In addition, the pullout strengths $N_{p,uncr}$, $N_{p,cr}$ and $N_{p,eq}$ shall be multiplied by the modification factor, λ_a, as applicable.

4.2 Allowable Stress Design (ASD):

4.2.1 General: Design values for use with allowable stress design (working stress design) load combinations, calculated in accordance with Section 1605.3 of the IBC, must be established in accordance with the following equations:

$$T_{allowable,ASD} = \frac{\phi N_n}{\alpha}$$

$$V_{allowable,ASD} = \frac{\phi V_n}{\alpha}$$

where:

$T_{allowable,ASD}$ = Allowable tension load (lbf or kN)

$V_{allowable,ASD}$ = Allowable shear load (lbf or kN)

ϕN_n = Lowest design strength of an anchor or anchor group in tension as determined in accordance with ACI 318-14 Chapter 17 and 2015 IBC Section 1905.1.8, ACI 318-11 Appendix D, ACI 318-08 Appendix D and 2009 IBC Section 1908.1.9, ACI 318-05 Appendix D and 2006 IBC Section 1908.1.16, and Section 4.1 of this report as applicable. (lbf or kN).

ϕV_n = Lowest design strength of an anchor or anchor group in shear as determined in accordance with ACI 318-14 Chapter 17 and 2015 IBC Section 1905.1.8, ACI 318-11 Appendix D, ACI 318-08 Appendix D and 2009 IBC Section 1908.1.9, ACI 318-05 Appendix D and 2006 IBC Section 1908.1.16, and Section 4.1 of this report as applicable. (lbf or kN).

α = Conversion factor calculated as a weighted average of the load factors for the controlling load combination. In addition, α must include all applicable factors to account for nonductile failure modes and required over-strength.

The requirements for member thickness, edge distance and spacing, described in this report, must apply. An example of allowable stress design values for illustrative purposes is provided in Table 3 of this report.

4.2.2 Interaction of Tensile and Shear Forces: The interaction must be calculated and consistent with ACI 318-14 17.6 or ACI 318 (-11, -08, -05) D.7, as applicable, as follows:

For shear loads $V_{applied} \le 0.2V_{allowable,ASD}$, the full allowable load in tension must be permitted.

For tension loads $T_{applied} \le 0.2T_{allowable,ASD}$, the full allowable load in shear must be permitted.

For all other cases:

$$\frac{T_{applied}}{T_{allowable,ASD}} + \frac{V_{applied}}{V_{allowable,ASD}} \le 1.2 \qquad \text{(Eq-4)}$$

4.3 Installation:

Installation parameters such as embedment, spacing, edge distance, and concrete requirements, are provided in Table 1 and Figure 2.

Anchor locations must comply with this report, and plans and specifications approved by the code official. US Anchor Ultrawedge+ Wedge Anchors must be installed in accordance with the manufacturer's published installation instructions and this report (see installation instructions at the end of this report). In case of conflict, this report governs.

4.4 Special Inspection:

Periodic special inspection is required in accordance with Section 1705.1.1 and Table 1705.3 of the 2015 IBC and 2012 IBC, Section 1704.15 and Table 1704.4 of the 2009 IBC, or Section 1704.13 of the 2006 IBC, as applicable. The special inspector must make periodic inspections during anchor installation to verify anchor type, anchor dimensions, concrete type, concrete compressive strength, drill bit type, hole dimensions, hole cleaning procedure, concrete member thickness, anchor embedment, anchor spacing, edge distances, tightening torque and adherence to the manufacturer's printed installation instructions. The special inspector must be present as often as required in accordance with the "statement of special inspection."

Under the IBC, additional requirements as set forth in Sections 1705, 1706 and 1707 must be observed, when applicable.

5.0 CONDITIONS OF USE

The US Anchor Ultrawedge+ Wedge Anchors described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 The anchors must be installed in accordance with the manufacturer's published installation instructions and this report. In case of a conflict, this report governs.

5.2 The anchors must be limited to use in cracked and uncracked normal-weight concrete and lightweight concrete having a specified compressive strength, f'_c, of 2,500 psi to 8,500 psi (17.2 MPa to 58.6 MPa).

5.3 Anchor sizes, dimensions, minimum embedment depths, and other installation parameters are as set forth in this report.

5.4 The values of f'_c used for calculation purposes must not exceed 8,000 psi (55.1 MPa).

5.5 The concrete shall have attained its minimum design strength prior to the installation of the anchors.

5.6 Strength design values must be established in accordance with Section 4.1 of this report.

5.7 Allowable stress design values must be established in accordance with Section 4.2.

5.8 Anchor spacing(s) and edge distance(s) as well as minimum member thickness must comply with Table 1.

5.9 Prior to installation, calculations and details demonstrating compliance with this report must be submitted to the code official. The calculations and details must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

5.10 Since an ICC-ES acceptance criteria for evaluating data to determine the performance of anchors subjected to fatigue or shock loading is unavailable at this time, the use of these anchors under such conditions is beyond the scope of this report.

5.11 Anchors may be installed in regions of concrete where cracking has occurred or where analysis indicates cracking may occur ($f_t > f_r$), subject to the conditions of this report.

5.12 The anchors may be used to resist short-term loading due to wind or seismic forces in locations designated as Seismic Design Categories A through F of the IBC, subject to the conditions of this report.

5.13 Where not otherwise prohibited in the code, US Anchor Ultrawedge+ Wedge Anchors are permitted for use with fire-resistance-rated construction provided that at least one of the following conditions is fulfilled:

- The anchors are used to resist wind forces only.
- Anchors that support a fire-resistance-rated envelope or a fire-resistance-rated membrane are protected by approved fire-resistance-rated materials, or have been evaluated for resistance to fire exposure in accordance with recognized standards.
- Anchors are used to support nonstructural elements.

5.14 Use of the anchors is limited to dry, interior locations.

5.15 Special inspection must be provided as set forth in Section 4.4 of this report.

5.16 Anchors are manufactured for Brighton Best International, Inc. under an approved quality-control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Mechanical Anchors in Concrete Elements (AC193), dated October 2015; which incorporates requirements in ACI 355.2-07, for use in cracked and uncracked concrete; including tests 18 and 19 of Table 4.2 of Annex A of AC193 for seismic tension and shear, and quality control documentation.

7.0 IDENTIFICATION

The anchors are identified by packaging labeled with the company name (Brighton Best), product name, anchor diameter and length, part number, production lot number and the evaluation report number (ESR-3981).

TABLE 1—DATA FOR US ANCHOR ULTRAWEDGE+ WEDGE ANCHORS FOR USE IN CRACKED AND UNCRACKED CONCRETE [1,2]

CHARACTERISTIC	SYMBOL	UNITS	Nominal Anchor Diameter			
			$^3/_8$ inch	$^1/_2$ inch	$^5/_8$ inch	$^3/_4$ inch
Installation Information						
Anchor diameter	d_a $(d_o)^3$	in.	$^3/_8$	$^1/_2$	$^5/_8$	$^3/_4$
Minimum diameter of hole clearance in fixture	d_h	in.	$^7/_{16}$	$^9/_{16}$	$^{11}/_{16}$	$^{13}/_{16}$
Nominal drill bit diameter	d_{bit}	in.	$^3/_8$	$^1/_2$	$^5/_8$	$^3/_4$
Minimum nominal embedment depth	h_{nom}	in.	$2^3/_8$	$2^1/_2$	$3^9/_{16}$	$4^1/_8$
Minimum effective embedment depth	h_{ef}	in.	2	2	3	$3^1/_2$
Minimum hole depth	h_o	in.	$2^3/_4$	$2^3/_4$	$3^3/_4$	$4^1/_2$
Installation torque	T_{inst}	ft-lb	35	50	90	125
Minimum edge distance	c_{min}	in.	4	7	6	7
Minimum spacing	s_{min}	in.	6	12	8	9
Minimum concrete thickness	h_{min}	in.	$4^1/_2$	$6^1/_2$		
Critical edge distance	c_{ac}	in.	8	10	13	11
Anchor Design Data						
Category number	1, 2 or 3	–	1	1	1	1
Yield strength of anchor steel	f_{ya}	lb/in^2	87,200	84,000	81,600	81,600
Ultimate strength of anchor steel	f_{uta}	lb/in^2	109,000	105,000	102,000	102,000
Tension						
Effective tensile stress area (neck)	$A_{se,N}$	in^2	0.056	0.103	0.164	0.238
Steel strength in tension	N_{sa}	lb.	6,104	10,815	16,728	24,276
Reduction factor for steel failure modes [5]	ϕ	-	0.75			
Effectiveness factor for concrete breakout, cracked	k_{cr}	-	17	21	21	24
Effectiveness factor for concrete breakout, uncracked	k_{uncr}	-	24	24	27	27
Reduction factor for concrete breakout [6]	ϕ	-	0.65 (Condition B)			
Pull-out resistance, cracked concrete [4]	$N_{p,cr}$	lb.	N/A	N/A	4,037	N/A
Pull-out resistance, uncracked concrete [4]	$N_{p,uncr}$	lb.	3,013	N/A	N/A	N/A
Pull-out resistance, seismic loads [4]	$N_{p,eq}$	lb.	N/A	N/A	4,037	N/A
Reduction factor for pull-out [6]	ϕ	-	0.65 (Condition B)			
Axial stiffness in service load range (cracked)	β_{cr}	lb/in	37,300	44,600	40,300	55,800
Axial stiffness in service load range (uncracked)	β_{uncr}	lb/in	277,400	230,400	105,700	401,200
Shear						
Effective shear stress area (threads)	$A_{se,V}$	in^2	0.078	0.142	0.226	0.334
Load-bearing length of anchor	ℓ_e	in.	2	2	3	$3^1/_2$
Reduction factor for concrete breakout or pryout [6]	ϕ	-	0.70 (Condition B)			
Coefficient for pryout strength	k_{cp}	-	1.0		2.0	
Steel strength in shear, non-seismic [7]	V_{sa}	lb.	2,508	5,500	9,923	18,317
Steel strength in shear, seismic	$V_{sa,eq}$	lb.	2,006	4,400	7,938	16,485
Reduction factor for steel failure [5]	ϕ	-	0.65			

For **SI:** 1 in = 25.4 mm, 1 in^2 = 6.451×10^{-4} m, 1 ft-lb = 1.356 Nm, 1 lb/in^2 = 6.895 Pa.

[1]The information presented in this table must be used in conjunction with the design criteria of ACI 318-14 Chapter 17 or ACI 318 Appendix D, as applicable.
[2]Installation must comply with the manufacturer's published installation instructions.
[3]The notation in parentheses is for the 2006 IBC.
[4]See Section 4.1.4 of this report. N/A (not applicable) denotes that this value does not control for design.
[5]Anchors are considered to be manufactured using ductile steel in accordance with ACI 318-14 2.3 or ACI 318 (-11, -08, -05) D.1. Strength reduction factors are for use with the load combinations of ACI 318-14 Section 5.3, ACI 318 (-11, -08, -05) Section 9.2 or IBC Section 1605.2, as applicable.
[6]Condition B applies where supplementary reinforcement in conformance with ACI 318-14 17.3.3(c) or ACI 318-11 D.4.3(c) or ACI 318 (-08, -05) D.4.4(c) is not provided, or where pull-out or pry-out strength governs. For cases where supplementary reinforcement can be verified, the strength reduction factors associated with Condition A may be used. Strength reduction factors are for use with the load combinations of ACI 318-14 Section 5.3, ACI 318 (-11, -08, -05) Section 9.2 or IBC Section 1605.2.
[7]Tabulated values must be used for design, since these values are lower than those calculated with ACI 318-14 Eq. (17.5.1.2b), ACI 318-11 Eq. (D-29), or ACI 318-08 and ACI 318-05 Eq. (D-20), as applicable.

TABLE 2—US ANCHOR ULTRAWEDGE+ WEDGE ANCHOR LENGTH CODE IDENTIFICATION SYSTEM

Length ID marking on threaded stud head		**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**P**	**Q**	**R**	**S**
Overall anchor length, ℓ_{anch}, (inches)	From	$1^{1}/_{2}$	2	$2^{1}/_{2}$	3	$3^{1}/_{2}$	4	$4^{1}/_{2}$	5	$5^{1}/_{2}$	6	$6^{1}/_{2}$	7	$7^{1}/_{2}$	8	$8^{1}/_{2}$	9	$9^{1}/_{2}$	10	11
	Up to but not including	2	$2^{1}/_{2}$	3	$3^{1}/_{2}$	4	$4^{1}/_{2}$	5	$5^{1}/_{2}$	6	$6^{1}/_{2}$	7	$7^{1}/_{2}$	8	$8^{1}/_{2}$	9	$9^{1}/_{2}$	10	11	12

For **SI**: 1 inch = 25.4 mm.

INSTALLATION INSTRUCTIONS

1. Use a rotary hammer drill in the percussion mode with the correct size carbide drill bit meeting the requirements of ANSI Standard B212-15 to drill the hole perpendicular to the concrete surface and to the required depth.
2. Use a hand pump, compressed air or vacuum to remove debris and dust from the drilling operation.
3. If installation is through a fixture, position the fixture over the hole and install the anchor through the hole in the fixture. Using a hammer, drive the anchor into the hole, insuring that it is installed to the minimum required embedment depth, h_{nom}.
4. Install the washer and nut on the projecting thread, and tighten the nut to the required installation torque value, T_{inst}, using a torque wrench.

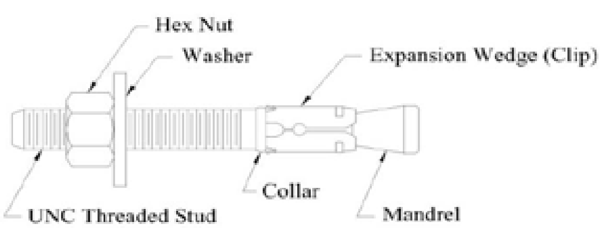

FIGURE 1—US ANCHOR ULTRAWEDGE+ WEDGE ANCHOR COMPONENTS

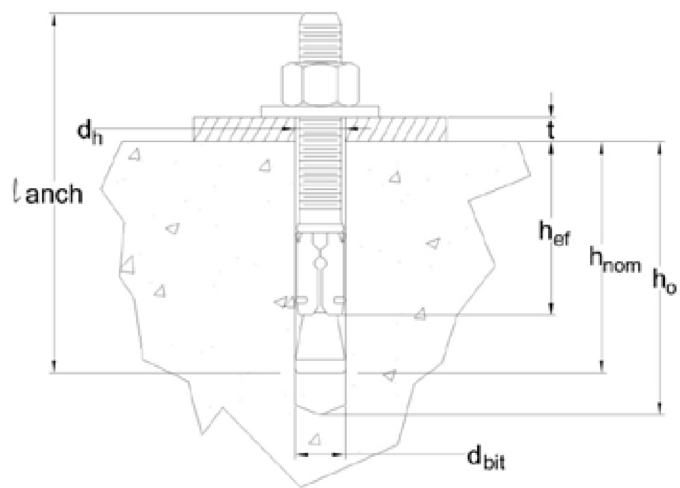

FIGURE 2—US ANCHOR ULTRAWEDGE+ WEDGE ANCHOR INSTALLATION

TABLE 3—EXAMPLE OF ALLOWABLE STRESS DESIGN VALUES FOR ILLUSTRATIVE PURPOSES [1, 2, 3, 4, 5, 6, 7, 8]

Nominal Anchor Diameter, d_a (d_o) (in.)	**Nominal Embedment Depth, h_{nom} (in.)**	**Effective Embedment Depth, h_{ef} (in.)**	**Allowable Tension Load, uncracked (lbs.)**
$^{3}/_{8}$	$2^{3}/_{8}$	2	1323
$^{1}/_{2}$	$2^{1}/_{2}$	2	1491
$^{5}/_{8}$	$3^{9}/_{16}$	3	3081
$^{3}/_{4}$	$4^{1}/_{8}$	$3^{1}/_{2}$	3882

[1]Single anchor with static tension only
[2]Concrete determined to remain uncracked for the life of the anchorage
[3]Load combinations from ACI 318-14 Section 5.3 or ACI 318 (-11, -08, -05) Section. 9.2, as applicable and strength reduction factors from ACI 318 Condition B (supplementary reinforcement not provided)
[4]Controlling load combination 30% dead and 70% live loads, 1.2D+1.6L
[5]Calculation of weighted average $\alpha = 1.2(0.3) + 1.6(0.7) = 1.48$
[6]Normalweight concrete with f'_c = 2,500 psi
[7]$c_{a1} = c_{a2} \geq c_{ac}$
[8]$h \geq h_{min}$

ICC-ES Evaluation Report

ESR-3981 LABC and LARC Supplement

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DIVISION: 03 00 00—CONCRETE
Section: 03 16 00—Concrete Anchors

DIVISION: 05 00 00—METALS
Section: 05 05 19—Post-Installed Concrete Anchors

REPORT HOLDER:
BRIGHTON BEST INTERNATIONAL, INC.
12801 LEFFINGWELL AVENUE
SANTE FE SPRINGS, CALIFORNIA 90670
(562) 483-2740
www.brightonbest.com

EVALUATION SUBJECT:

US ANCHOR ULTRAWEDGE+ WEDGE ANCHORS IN CRACKED AND UNCRACKED CONCRETE

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that US Anchor Ultrawedge+ Wedge Anchors in cracked and uncracked concrete, described in ICC-ES master evaluation report ESR-3981, have also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

Applicable code editions:

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

2.0 CONCLUSIONS

The US Anchor Ultrawedge+ Wedge Anchors in cracked and uncracked concrete, described in Sections 2.0 through 7.0 of the master evaluation report ESR-3981, comply with the LABC Chapter 19, and the LARC, and are subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The US Anchor Ultrawedge+ Wedge Anchors in cracked and uncracked concrete described in this evaluation report must comply with all of the following conditions:

- All applicable sections in the master evaluation report ESR-3981.
- The design, installation, conditions of use and identification of the anchors are in accordance with the 2015 *International Building Code®* (2015 IBC) provisions noted in the master evaluation report ESR-3981.
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16 and 17, as applicable.
- Under the LARC, an engineered design in accordance with LARC Section R301.1.3 must be submitted.
- The allowable and strength design values listed in the master evaluation report and tables are for the connection of the anchors to the concrete. The connection between the anchors and the connected members shall be checked for capacity (which may govern).

This supplement expires concurrently with the master report, issued October 2017 and revised December 2017.

ICC-ES Evaluation Report

ESR-3981 CBC and CRC Supplement

Issued October 2017
Revised December 2017
This report is subject to renewal October 2018.

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DIVISION: 03 00 00—CONCRETE
Section: 03 16 00—Concrete Anchors

DIVISION: 05 00 00—CONCRETE
Section: 05 05 19—Post-Installed Concrete Anchors

REPORT HOLDER:

BRIGHTON BEST INTERNATIONAL, INC.
12801 LEFFINGWELL AVENUE
SANTE FE SPRINGS, CALIFORNIA 90670
(562) 483-2740
www.brightonbest.com

EVALUATION SUBJECT:

US ANCHOR ULTRAWEDGE+ WEDGE ANCHORS IN CRACKED AND UNCRACKED CONCRETE

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the US Anchor Ultrawedge+ Wedge Anchors in cracked and uncracked concrete, recognized in ICC-ES master evaluation report ESR-3981, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- *2016 California Building Code* (CBC)
- 2016 *California Residential Code* (CRC)

2.0 CONCLUSIONS

2.1 CBC:

The US Anchor Ultrawedge+ Wedge Anchors in cracked and uncracked concrete, described in Sections 2.0 through 7.0 of the master evaluation report ESR-3981, comply with CBC Chapters 19 and 19A, provided the design and installation are in accordance with the 2015 *International Building Code®* provisions noted in the master report, and the additional requirements of CBC Chapters 16, 16A, 17, 17A, 19 and 19A, as applicable.

2.2 CRC:

The US Anchor Ultrawedge+ Wedge Anchors in cracked and uncracked concrete, described in Sections 2.0 through 7.0 of the master evaluation report ESR-3981, comply with the CRC, provided the design and installation are in accordance with the 2015 *International Building Code®* provisions noted in the master report, and the additional requirements of CBC Chapters 16, 17, and 19, as applicable.

This supplement expires concurrently with the master report, issued October 2017, revised December 2017.

ICC-ES Evaluation Report

ESR-3981 FBC Supplement

Issued October 2017

Revised December 2017

This report is subject to renewal October 2018.

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DIVISION: 03 00 00—CONCRETE
Section: 03 16 00—Concrete Anchors

DIVISION: 05 00 00—METALS
Section: 05 05 19—Post-Installed Concrete Anchors

REPORT HOLDER:

BRIGHTON BEST INTERNATIONAL, INC.
12801 LEFFINGWELL AVENUE
SANTE FE SPRINGS, CALIFORNIA 90670
(562) 483-2740
www.brightonbest.com

EVALUATION SUBJECT:

US ANCHOR ULTRAWEDGE+ WEDGE ANCHORS IN CRACKED AND UNCRACKED CONCRETE

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the Brighton Best International, Inc. US Anchor Ultrawedge+ Wedge Anchors in cracked and uncracked concrete, recognized in ICC-ES master evaluation report ESR-3981, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2014 *Florida Building Code—Building*
- 2014 *Florida Building Code—Residential*

2.0 CONCLUSIONS

The Brighton Best International, Inc. US Anchor Ultrawedge+ Wedge Anchors in cracked and uncracked concrete, described in master evaluation report ESR-3981, comply with the *Florida Building Code—Building* and the *Florida Building Code—Residential*, when designed and installed in accordance with the 2012 *International Building Code®* provisions noted in the master report, and under the following conditions:

- Design wind loads must be based on Section 1609 of the *Florida Building Code—Building* or Section 301.2.1.1 of the *Florida Building Code—Residential*, as applicable.
- Load combinations must be in accordance with Section 1605.2 or Section 1605.3 of the *Florida Building Code—Building*, as applicable.

Use of the Brighton Best International, Inc. US Anchor Ultrawedge+ Wedge Anchors in cracked and uncracked concrete has also been found to be in compliance with the High-Velocity Hurricane Zone (HVHZ) provisions of the *Florida Building Code—Building* and *Florida Building Code—Residential,* provided that the design wind loads for use of the anchors in the HVHZ are based on Section 1620 of the *Florida Building Code – Building*.

For products falling under Florida Rule 9N-3, verification that the report holder's quality-assurance program is audited by a quality-assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official, when the report holder does not possess an approval by the Commission).

This supplement expires concurrently with the master report, issued October 2017, revised December 2017.

ICC EVALUATION SERVICE

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ICC-ES Listing Report

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ELC-3981

Issued 10/2017
This listing is subject to renewal 10/2018.

DIVISION: 03 00 00—CONCRETE
SECTION: 03 16 00—CONCRETE ANCHORS
DIVISION: 05 00 00—METALS
SECTION: 05 05 19—POST-INSTALLED CONCRETE ANCHORS

REPORT HOLDER:

BRIGHTON BEST INTERNATIONAL, INC.

12801 LEFFINGWELL AVENUE
SANTE FE SPRINGS, CALIFORNIA 90670

EVALUATION SUBJECT:

US ANCHOR ULTRAWEDGE+ WEDGE ANCHORS IN CRACKED AND UNCRACKED CONCRETE

ICC-ES Listing Report

ELC-3981

Issued October 2017

This listing is subject to renewal October 2018.

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CSI: DIVISION: 03 00 00—CONCRETE
Section: 03 16 00—Concrete Anchors

DIVISION: 05 00 00—METALS
Section: 05 05 19—Post-Installed Concrete Anchors

Product Certification System:

The ICC-ES product-certification system includes evaluating reports of tests of standard manufactured products, prepared by accredited testing laboratories and provided by the listee, to verify compliance with applicable codes and standards. The system also involves factory inspections, and assessment and surveillance of the listee's quality system.

Product: US Anchor Ultrawedge+ Wedge Anchors in Cracked and Uncracked Concrete

Listee: BRIGHTON BEST INTERNATIONAL, INC.
12801 LEFFINGWELL AVENUE
SANTE FE SPRINGS, CALIFORNIA 90670
(562) 483-2740
www.brightonbest.com

Compliance with the following standards:

- Annex D, Anchorage of CSA A23.3 (-14, -04), Design of Concrete Structures, CSA Group.

Compliance with the following codes:

US Anchor Ultrawedge+ Wedge Anchors in cracked and uncracked concrete, as described in this listing report, are in conformance with CSA A23.3 (-14, 04), Annex D, as referenced in the applicable section of the following code editions:

- *National Building Code of Canada®* 2015 and 2010
  Applicable Section: Division B, Part 4, Section 4.3.3.

Description of anchors:

The US Anchor Ultrawedge+ Wedge Anchors are torque-controlled, mechanical expansion anchors. The anchors consist of a stud (anchor body), nut, washer, and expander wedge (clip) as illustrated in Figure 1. The stud for all sizes is manufactured from cold-drawn carbon steel meeting the requirements of UNS G10350, and is partially threaded with one end terminating in a flared mandrel. The expander wedge (clip) is manufactured from Chinese steel standard GB/T3522 Grade 50 steel subsequently through hardened to Rockwell HRC 28-32 and is formed around the stud mandrel so it is able to move freely. The clip movement is restrained by the mandrel taper and by a collar. All components, including nuts and washers, are zinc-coated in accordance with ASTM B633 classification SC1, Type III.

The anchor is installed in a predrilled hole with a hammer. When torque is applied to the nut of the installed anchor, the mandrel is drawn into the expansion element, which is in turn expanded against the wall of the drilled hole.

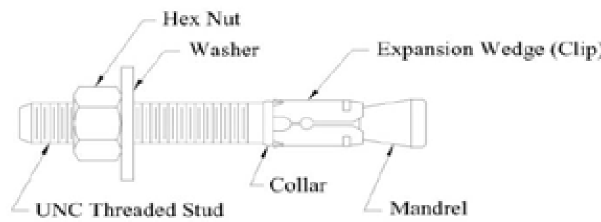


FIGURE 1—US ANCHOR ULTRAWEDGE+ WEDGE ANCHOR COMPONENTS

Identification: The anchors are identified by packaging labeled with the report holder's name (Brighton Best), product name, anchor diameter and length, part number, production lot number, the listing report number (ELC-3981), and the ICC-ES listing mark. Table 2 shows the length code identification system.

Installation: Installation parameters such as, embedment, spacing, edge distance, and concrete requirements, are provided in Table 1 and Figure 2. Installation of the US Anchor Ultrawedge+ Wedge Anchors must be in accordance with the manufacturer's published installation instructions (MPII) as provided below.

MANUFACTURE'S PUBLISHED INSTALLATION INSTRUCTIONS:

1. Use a rotary hammer drill in the percussion mode with the correct size carbide drill bit meeting the requirements of ANSI Standard B212.15-1994 to drill the hole perpendicular to the concrete surface and to the required depth.
2. Use a hand pump, compressed air or vacuum to remove debris and dust from the drilling operation.
3. If installation is through a fixture, position the fixture over the hole and install the anchor through the hole in the fixture. Using a hammer, drive the anchor into the hole, insuring that it is installed to the minimum required embedment depth, h_{nom}.
4. Install the washer and nut on the projecting thread, and tighten the nut to the required installation torque value, T_{inst}, using a torque wrench.

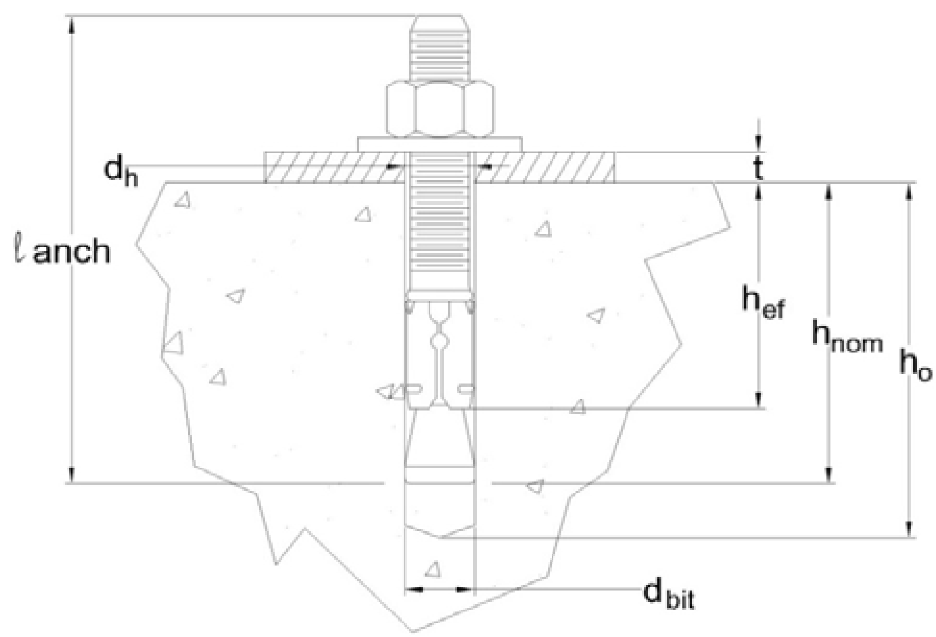


FIGURE 2—US ANCHOR ULTRAWEDGE+ WEDGE ANCHOR INSTALLATION

TABLE 1—DATA FOR US ANCHOR ULTRAWEDGE+ WEDGE ANCHORS FOR USE IN CRACKED AND UNCRACKED CONCRETE [1,2]

CHARACTERISTIC	SYMBOL	UNITS	Nominal Anchor Diameter			
			$^3/_8$ inch	$^1/_2$ inch	$^5/_8$ inch	$^3/_4$ inch
Installation Information						
Anchor diameter	d_a	mm (in.)	9.5 ($^3/_8$)	12.7 ($^1/_2$)	15.9 ($^5/_8$)	19.1 ($^3/_4$)
Minimum diameter of hole clearance in fixture	d_h	mm (in.)	11.1 ($^7/_{16}$)	14.3 ($^9/_{16}$)	17.5 ($^{11}/_{16}$)	20.6 ($^{13}/_{16}$)
Nominal drill bit diameter	d_{bit}	in.	$^3/_8$ ANSI	$^1/_2$ ANSI	$^5/_8$ ANSI	$^3/_4$ ANSI
Minimum nominal embedment depth	h_{nom}	mm	60	64	90	105
Minimum effective embedment depth	h_{ef}	mm	51	51	76	89
Minimum hole depth	h_o	mm	70	70	95	114
Installation torque	T_{inst}	N-m	47	68	122	169
Minimum edge distance	c_{min}	mm	102	178	152	178
Minimum spacing	s_{min}	mm	152	305	203	229
Minimum concrete thickness	h_{min}	mm	114	165		
Critical edge distance	c_{ac}	mm	203	254	330	280
Anchor Design Data						
Category number	1, 2 or 3	–	1	1	1	1
Yield strength of anchor steel	f_{ya}	N/mm^2	601	579	563	563
Ultimate strength of anchor steel	f_{uta}	N/mm^2	752	724	703	703
Tension						
Effective tensile stress area (neck)	$A_{se,N}$	mm^2	36.1	66.5	105.8	153.5
Steel strength in tension	N_{sa}	kN	27.1	48.1	74.4	108.0
Resistance modification factor for steel strength, tension [4]	R	-	0.80			
Effectiveness factor for concrete breakout, cracked	k_{cr}	-	7	9	9	10
Effectiveness factor for concrete breakout, uncracked	k_{uncr}	-	10	10	11	11
Modification factor for cracked and uncracked concrete[5]	$\Psi_{c,N}$	-	1.0 See note 6	1.0 See note 6	1.0 See note 6	1.0 See note 6
Resistance modification factor for tension, concrete failure modes, Condition B [4]	R	-	1.0			
Pull-out resistance, cracked concrete [3,6]	$N_{p,cr}$	kN	N/A	N/A	18.0	N/A
Pull-out resistance, uncracked concrete [3,6]	$N_{p,uncr}$	kN	13.4	N/A	N/A	N/A
Pull-out resistance, seismic loads [3,6,9]	$N_{p,eq}$	kN	N/A	N/A	18.0	N/A
Resistance modification factor for tension, pullout strength, Condition B [4]	R	-	1.0			
Axial stiffness in service load range (cracked)	β_{cr}	kN/mm	6.5	7.8	7.1	9.8
Axial stiffness in service load range (uncracked)	β_{uncr}	kN/mm	48.6	40.3	18.5	70.3
Shear						
Effective shear stress area (threads)	$A_{se,V}$	mm^2	50.3	91.6	145.8	215.5
Load-bearing length of anchor	l_e	mm	51	51	76	89
Resistance modification factor for pryout strength [4]	R	-	1.0			
Coefficient for pryout strength	k_{cp}	-	1.0		2.0	
Steel strength in shear, non-seismic [7]	V_{sa}	kN	11.1	24.5	44.1	81.5
Steel strength in shear, seismic [7,8]	$V_{sa,eq}$	kN	8.9	19.6	35.3	73.3
Resistance modification factor for streel strength, shear, seismic [4]	R	-	0.75			

For **SI:** 1 in = 25.4 mm, 1 in^2 = 6.451×10^{-4} m, 1 ft-lb = 1.356 Nm, 1 lb/in^2 = 6.895 Pa.

[1]The information presented in this table must be used in conjunction with the design provisions of CSA A23.3 (-14,-04) Annex D, as applicable. For anchors resisting seismic load combinations the additional CSA A23.3 (-14, -04) D.4.3, as applicable, must apply.
[2]Installation must comply with the manufacturer's published installation instructions.
[3]N/A (not applicable) denotes that this value does not control for design.
[4]Anchors are considered to be manufactured using ductile steel in accordance with CSA A23.3-14 D.2 or CSA A23.3-04 D.2. All values of R for use with the load combinations of Division B, Part 4, Section 4.1.3 of the 2015 NBCC or 2010 NBCC, CSA A23.3-14 Annex C or CSA A23.3-04 Annex C, as applicable. Condition B applies where supplementary reinforcement in conformance with CSA A23.3-14 D.5.3(c) or CSA A23.3-04 D.5.4(c), as applicable, is not provided, or where pullout or pryout strength governs. For cases where the presence of supplementary reinforcement can be verified, the strength reduction factors associated with Condition A may be used.
[5]For all design cases $\Psi_{c,N}$ =1.0. The appropriate effectiveness factor for cracked concrete (k_{cr}) or uncracked concrete (k_{uncr}) must be used.
[6]For all design cases $\Psi_{c,P}$ =1.0. For the calculation of N_{cpr}, see CSA A23.3 (-14, -04) D.6.3.
[7]Tabulated values for steel strength in shear must be used for design. These tabulated values are lower than calculated results using equation D.31 in CSA A23.3-14.
[8]Tabulated values for steel strength in shear are for seismic applications and based on test results in accordance with ACI 355.2 (Section 9.6), as referenced in CSA A23.3-14 Annex D, Section D.4.3.4.
[9]Tabulated values for pull-out strength in tension are for seismic applications and based on test results in accordance with ACI 355.2 (Section 9.5), as referenced in CSA A23.3-14 Annex D, Section D.4.3.4.

TABLE 2—US ANCHOR ULTRAWEDGE+ WEDGE ANCHOR LENGTH CODE IDENTIFICATION SYSTEM

Length ID marking on threaded stud head		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
Overall anchor length, l_{anch}, (mm)	From	38	51	64	76	89	102	114	127	140	152	165	178	191	203	216	229	241	254	279
	Up to but not including	51	64	76	89	102	114	127	140	152	165	178	191	203	216	229	241	254	279	305

For **SI**: 1 inch = 25.4 mm.

Ultimate Limit States Design:

Design resistance of anchors for compliance with the 2015 NBCC must be determined in accordance with CSA A23.3-14 Annex D, and this listing report.

Design resistance of anchors for compliance with the 2010 NBCC must be determined in accordance with CSA A23.3-04 Annex D, and this listing report.

Design parameters provided in Table 1of this listing report are based on the 2015 NBCC and 2010 NBCC (CSA A23.3-14 and CSA A23.3-04). The limit states design of anchors must comply with CSA A23.3 (-14, -04) D.5.1, except as required in CSA A23.3 (-14, -04) D.4.3.1.

Material resistance factors must be ϕ_c = 0.65 and ϕ_s = 0.85 in accordance with CSA A23.3 (-14, 04) Sections 8.4.2 and 8.4.3, and resistance modification factor, *R,* as given in CSA A23.3-14 Section D.5.3, or CSA A23.3-04 Section D.5.4, and noted in Table 1 of this listing report, must be used for load combinations calculated in accordance with Division B, Part 4, Section 4.1.3 of the 2015 and 2010 NBCC, or Annex C of CSA A23.3 (-14, -04). The nominal steel strength N_{sa} or V_{sa}, in Table 1 of this listing report must be multiplied by ϕ_s and *R* to determine the factored resistance N_{sar} or V_{sar}. The nominal pullout strengths $N_{p,uncr}$, $N_{p,cr}$ or $N_{p,eq}$ in Table 1 of this listing report must be multiplied by ϕ_c and *R* to determine the factored resistance $N_{cpr,uncr}$, $N_{cpr,cr}$, or $N_{cpr,eq}$, respectively.

Conditions of listing:

1. The listing report addresses only conformance with the standards and code sections noted above.
2. Approval of the product's use is the sole responsibility of the local code official.
3. The listing report applies only to the materials tested and as submitted for review by ICC-ES.
4. Anchor sizes, dimensions, minimum embedment depths and other installation parameters are as set forth in this listing report.
5. The anchors must be installed in cracked or uncracked normal-weight or lightweight concrete having a specified compressive strength, f'_c, of 17.2 MPa to 58.6 MPa (2,000 psi to 8,500 psi).
6. The values of f'_c, used for calculation purposes must not exceed 55 MPa (8,000 psi).
7. Limit states design values must be established in accordance with this listing report.
8. The use of fatigue or shock loading for these anchors under such conditions is beyond the scope of this listing report.
9. Anchors may be used to resist short-term loading due to wind or seismic forces in locations designed according to NBCC 2015 and NBCC 2010.
10. Where not otherwise prohibited in the code as referenced in CSA A23.3 (-14, -04), US Anchor Ultrawedge+ Wedge Anchors are permitted for use with fire-resistance-rated construction provided that at least one of the following conditions is fulfilled:
    a. Anchors are used to resist wind or seismic forces only.
    b. Anchors that support a fire-resistance-rated envelope or a fire- resistance-rated membrane are protected by approved fire-resistance- rated materials, or have been evaluated for resistance to fire exposure in accordance with recognized standards.
    c. Anchors are used to support nonstructural elements.
11. Use of anchors is limited to dry, interior locations.

MIAMI-DADE COUNTY
PRODUCT CONTROL SECTION
11805 SW 26 Street, Room 208
Miami, Florida 33175-2474
T (786) 315-2590 F (786) 315-2599
www.miamidade.gov/economy

DEPARTMENT OF REGULATORY AND ECONOMIC RESOURCES (RER)
BOARD AND CODE ADMINISTRATION DIVISION

NOTICE OF ACCEPTANCE (NOA)

Brighton Best International, Inc.
12801 Leffingwell Avenue
Santa Fe Springs, CA 90670

SCOPE:

This NOA is being issued under the applicable rules and regulations governing the use of construction materials. The documentation submitted has been reviewed and accepted by Miami-Dade County RER-Product Control Section to be used in Miami Dade County and other areas where allowed by the Authority Having Jurisdiction (AHJ).
This NOA shall not be valid after the expiration date stated below. The Miami-Dade County Product Control Section (In Miami Dade County) and/or the AHJ (in areas other than Miami Dade County) reserve the right to have this product or material tested for quality assurance purposes. If this product or material fails to perform in the accepted manner, the manufacturer will incur the expense of such testing and the AHJ may immediately revoke, modify, or suspend the use of such product or material within their jurisdiction. RER reserves the right to revoke this acceptance, if it is determined by Miami-Dade County Product Control Section that this product or material fails to meet the requirements of the applicable building code.
This product is approved as described herein, and has been designed to comply with the Florida Building Code, including the High Velocity Hurricane Zone.

DESCRIPTION: US Anchor Ultrawedge Anchor

APPROVAL DOCUMENT: Drawing No. **1**, titled "US Anchor Ultrawedge Anchor", sheets 1 through 3 of 3, dated 11/17/2015, prepared by CEL Consulting, Inc., signed and sealed by Lee W. Mattis, P.E., bearing the Miami-Dade County Product Control approval stamp with the Notice of Acceptance number and approval date by the Miami-Dade County Product Control Section.
MISSILE IMPACT RATING: None
LABELING: Each box shall bear a permanent label with the manufacturer's name or logo, city, state and following statement: "Miami-Dade County Product Control Approved or MDCPCA", unless otherwise noted herein.
RENEWAL of this NOA shall be considered after a renewal application has been filed and there has been no change in the applicable building code negatively affecting the performance of this product.
TERMINATION of this NOA will occur after the expiration date or if there has been a revision or change in the materials, use, and/or manufacture of the product or process. Misuse of this NOA as an endorsement of any product, for sales, advertising or any other purposes shall automatically terminate this NOA. Failure to comply with any section of this NOA shall be cause for termination and removal of NOA.
ADVERTISEMENT: The NOA number preceded by the words Miami-Dade County, Florida, and followed by the expiration date may be displayed in advertising literature. If any portion of the NOA is displayed, then it shall be done in its entirety.
INSPECTION: A copy of this entire NOA shall be provided to the user by the manufacturer or its distributors and shall be available for inspection at the job site at the request of the Building Official.
This NOA consists of this page 1, evidence page E-1, as well as approval document mentioned above.
The submitted documentation was reviewed by **Carlos M. Utrera, P.E.**

MIAMI-DADE COUNTY APPROVED

Utrera
02/17/2016

NOA No: 14-0902.09
Expiration Date: February 25, 2021
Approval Date: February 25, 2016

NOTICE OF ACCEPTANCE: EVIDENCE SUBMITTED

A. DRAWINGS

1. Drawing No. **1**, titled "US Anchor Ultrawedge Anchor", sheets 1 through 3 of 3, dated 11/17/2015, prepared CEL Consulting, Inc., signed and sealed by Lee W. Mattis, P.E.

B. TESTS

1. Test report on Tension and Shear Strength Design Values of 1/2", 5/8" and ¾" diameters US Anchor Ultrawedge Anchors per AC193, ACI 355.2 and ASTM E 488, prepared by CEL Consulting, Inc., Test Report No. **15B269**, dated 03/06/2015, revised on 04/03/2015, signed and sealed by Lee W. Mattis, P.E.
2. Test report on Tension and Shear Strength Design Values of 3/8" diameter US Anchor Ultrawedge Anchors per AC193, ACI 355.2 and ASTM E 488, prepared by CEL Consulting, Inc., Test Report No. **14B256A**, dated 12/08/2014, revised on 12/15/2014 signed and sealed by Lee W. Mattis, P.E.
3. Test report on Corrosion Resistance of 5/8" Ultrawedge Anchors per ASTM G 85, Annex 5 and TAS 114, Appendix E, prepared by Element Materials Technology, Test Report No. **ESP020309P**, dated 07/31/2015, signed by Thomas A. Kolden, P.E.
4. Test report on Corrosion Resistance of 3/8", ½" and ¾" Ultrawedge Anchors per ASTM G 85, Annex 5 and TAS 114, Appendix E, prepared by Element Materials Technology, Test Report No. **ESP019482P**, dated 04/21/2015, signed by Thomas A. Kolden, P.E.

C. CALCULATIONS

1. None.

D. MATERIAL CERTIFICATIONS

1. None.

E. QUALITY ASSURANCE

1. Miami-Dade Department of Regulatory and Economic Resources (RER)

F. STATEMENTS

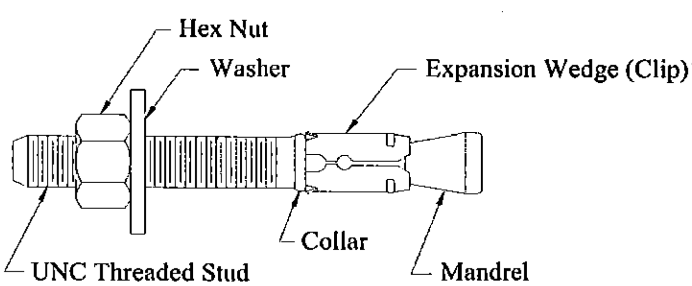
1. Statement letter of code conformance to the 5th edition (2014) FBC and no financial interest issued by CEL Consulting, Inc., dated 11/17/2015, signed and sealed by Lee W. Mattis, P.E.
2. Articles of incorporation of Brighton Best International, Inc., dated 07/19/2010, signed by Glenn Kurosaki.
3. Distributor agreement dated 12/02/2015.

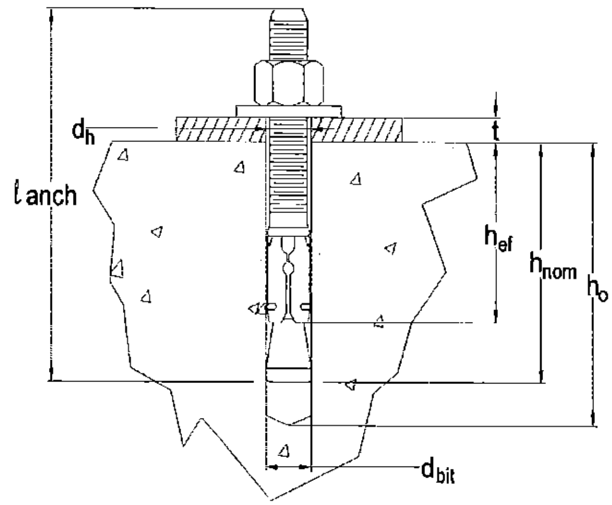
02/17/2016

Carlos M. Utrera, P.E.
Product Control Examiner
NOA No 14-0902.09
Expiration Date: February 25, 2021
Approval Date: February 25, 2016

US Anchor Ultrawedge Anchor

Description: The Ultrawedge Wedge Anchor is a torque-controller wedge anchor consisting of a threaded steel stud with a cone mandrel at the embedded end. A clip expander is fitted on the mandrel. The anchor is installed by driving into a hole drilled with a carbide bit of the same nominal diameter as the anchor. The anchor is set by tightening the nut against an attached fixture, forcing the clip outward against the concrete hole wall with increasing pressure as the cone mandrel is drawn upwards. Resistance to withdrawal is developed by a combination of friction and local crushing of the concrete hole wall. The anchor bodies are manufactured from UNS G10350 steel. The clip for the 3/8" size is manufactured from UNS G001005 steel. The clips for the 1/2" 5/8" and 3/4" sizes are manufactured from UNS G001050 steel. All steels are Chinese-sourced meeting the AISI requirements. The anchor bodies and clips have an electroplated zinc coating in conformance to ASTM B633, SC1, Type III.





INSTALLATION INSTRUCTIONS

1. Drill the hole perpendicular to the surface with a carbide tipped bit that meets ANSI B212.15 specification using a rotary hammer drill with percussion. The drill bit size will be the same as the anchor diameter that is being installed.
2. Drill the hole a minimum of 1/2" deeper than the specified nominal embedment, h_{nom}
3. Blow out the hole with compressed air or a blow-out bulb
4. Assemble the nut and washer on the anchor and insert through the hole in the material to be fastened
5. Drive the anchor into the drilled hole with a hammer to at least the required nominal embedment, h_{nom}
6. Torque to the specified installation torque

Part #	Size x Length (inches)	Part #	Size x Length (inches)
157060	3/8 x 2 1/4	157300	5/8 x 3 1/2
157070	3/8 x 2 3/4	157310	5/8 x 4 1/2
157080	3/8 x 3	157320	5/8 x 5
157090	3/8 x 3 3/4	157330	5/8 x 6
157100	3/8 x 5	157340	5/8 x 7
157110	3/8 x 6 1/2	157350	5/8 x 8 1/2
157180	1/2 x 2 3/4	157360	5/8 x 10
157190	1/2 x 3 3/4	157370	5/8 x 12
157200	1/2 x 4 1/4	157380	3/4 x 4 1/4
157210	1/2 x 4 1/2	157390	3/4 x 4 3/4
157220	1/2 x 5 1/2	157400	3/4 x 5 1/2
157230	1/2 x 7	157410	3/4 x 6 1/4
157240	1/2 x 8 1/2	157420	3/4 x 7
157250	1/2 x 10	157430	3/4 x 8 1/2
157260	1/2 x 12	157440	3/4 x 10
		157450	3/4 x 12

Approved as complying with the Florida Building Code
Date 02/25/2016
NOA# 14-0902.09
Miami Dade Product Control
By [signature]

LEE W. MATTIS
LICENSE
No. 47797
STATE OF FLORIDA
PROFESSIONAL ENGINEER

Lee W. Mattis 11/17/15

Title: US Anchor Ultrawedge Anchor
Drawing No: 1
11/17/15 By: LM

Brighton Best International, Inc.
12801 Leffingwell Avenue
Santa Fe Springs, California 90670

Sheet 1 of 3

TABLE 1—DATA FOR US ANCHOR ULTRAWEDGE ANCHORS FOR USE IN UNCRACKED CONCRETE [1,2]

CHARACTERISTIC	SYMBOL	UNITS	Nominal Anchor Diameter			
			3/8 inch	1/2 inch	5/8 inch	3/4 inch
Installation Information						
Anchor diameter	$d_a (d_o)^3$	in.	3/8	1/2	5/8	3/4
Minimum diameter of hole clearance in fixture	d_h	in.	7/16	9/16	11/16	13/16
Nominal drill bit diameter	d_{bit}	in.	3/8	1/2	5/8	3/4
Minimum nominal embedment depth	h_{nom}	In	2 3/8	2 1/2	3 9/16	4 1/8
Minimum effective embedment depth	h_{ef}	in	2	2	3	3 1/2
Minimum hole depth	h_o	In	2 3/4	3	4	4 1/2
Installation torque	T_{inst}	ft-lb	30	40	60	110
Minimum edge distance	c_{min}	in.	3	7	7	7
Minimum spacing	s_{min}	in.	4	7	7	7
Minimum concrete thickness	h_{min}	in.	4	6	6	8
Critical edge distance	c_{ac}	in.	7	9	9	12
Anchor Design Data						
Category number	1, 2 or 3	–	1	1	1	1
Yield strength of anchor steel	f_{ya}	lb/in²	105,000	92,200	91,200	93,400
Ultimate strength of anchor steel	f_{uta}	lb/in²	119,200	103,700	102,650	105,000
Tension						
Effective tensile stress area (neck)	$A_{se,N}$	in²	0.056	0.110	0.173	0.262
Steel strength in tension	N_{sa}	lb.	6675	11,400	17,760	27,510
Reduction factor for steel failure modes [5]	ϕ	-	0.75			
Effectiveness factor for concrete breakout	k_{uncr}	–	24	24	24	24
Reduction factor for concrete breakout [6]	ϕ	-	0.65 (Condition B)			
Pull-out resistance [4]	$N_{p,uncr}$	lb.	3125	3225	N/A [8]	N/A [8]
Reduction factor for pull-out [6]	ϕ	-	0.65 (Condition B)			
Axial stiffness in service load range	β	lb/in	113,890	363,730	443,850	649,470
Shear						
Effective shear stress area (threads)	$A_{se,V}$	in²	0.078	0.142	0.226	0.334
Load-bearing length of anchor	ℓ_e	in.	2	2	3	3 1/2
Reduction factor for concrete breakout or pryout [6]	ϕ	-	0.70 (Condition B)			
Coefficient for pryout strength	k_{cp}	-	1.0		2.0	
Steel strength in shear [7]	V_{sa}	lb.	3052	4954	9296	14,573
Reduction factor for steel failure [5]	ϕ	-	0.65			

For SI: 1 in = 25.4 mm, 1 in² = 6.451×10⁻⁴ m, 1 ft-lb = 1.356 Nm, 1 lb/in² = 6.895 Pa.

[1] The information presented in this table must be used in conjunction with the design criteria of ACI 318-14 Chapter 17 or ACI 318 Appendix D as applicable.

[2] Installation must comply with the manufacturer's published installation instructions

[3] The notation in parentheses is for the 2006 IBC.

[4] Adjust pullout resistance for concrete strengths greater than 2500 psi using the square root of the actual concrete strength divided by 2500.

[5] Anchors are considered to be manufactured using ductile steel in accordance with applicable ACI 318 provisions. Strength reduction factors are for use with the load combinations of applicable ACI 318 provisions or IBC Section 1605.2.

[6] Condition B applies where supplementary reinforcement in conformance with applicable ACI 318 provisions is not provided, or where pull-out or pry-out strength governs. For cases where supplementary reinforcement can be verified, the strength reduction factors associated with Condition A may be used. Strength reduction factors are for use with the load combinations of applicable ACI 318 provisions or IBC Section 1605.2.

[7] Tabulated values must be used for design since these values are lower than those calculated with applicable ACI 318 provisions.

[8] N/A denotes that pullout resistance is not applicable for these sizes and concrete breakout calculations per ACI 318 are applicable.

LEE W. MATTIS
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Lee W. Mattis 11/17/15

Approved as complying with the Florida Building Code Date 02/25/2016 NOA# 14-0902.09 Miami Dade Product Control By	Title: US Anchor Ultrawedge Anchor Drawing No: 1 11/17/15	By: LM	Brighton Best International, Inc. 12801 Leffingwell Avenue Santa Fe Springs, California 90670 Sheet 2 of 3

TABLE 2—US ANCHOR ULTRAWEDGE ANCHOR LENGTH CODE IDENTIFICATION SYSTEM

Length ID marking on threaded stud head		**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**P**	**Q**	**R**	**S**
Overall anchor length, ℓ_{anch}, (inches)	From	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6	6 1/2	7	7 1/2	8	8 1/2	9	9 1/2	10	11
	Up to but not including	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6	6 1/2	7	7 1/2	8	8 1/2	9	9 1/2	10	11	12

For SI: 1 inch = 25.4 mm.

LEE W. MATTIS
LICENSE
No. 47797
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

Lee W. Mattis 11/17/15

Approved as complying with the
Florida Building Code
Date 02/25/2016
NOA# 14-0902.09
Miami Dade Product Control
By

	Title: US Anchor Ultrawedge Anchor Drawing No: 1 11/17/15 By: LM	Brighton Best International, Inc. 12801 Leffingwell Avenue Santa Fe Springs, California 90670 Sheet 3 of 3

BRIGHTON BEST, INC.
ULTRAWEDGE+ ANCHOR - ENGINEERING DATA SHEET
Allowable Stress Values for Anchorages to Normal-Weight Concrete

ESR-3981 provides design information for load factor and resistance design (LRFD), however allowable stress design (ASD) is still in use by some users. Translation of LRFD to ASD values is possible, however it is dependent on the levels of dead load and live load. Dead load is defined in the ACI 318 Building Code Requirements for Structural Concrete as "the weights of members, supported structure and permanent attachments that are likely to be present on a structure in service". Live load is defined in ACI 318-14 as "load that is not permanently applied to a structure, but is likely to occur during the service life of the structure (excluding environmental loads)". Examples of live loads are traffic on a walkway and nonpermanent loads associated with usage of a structure. Live load values are stipulated in the building code for various loading conditions and parts of structures.

To facilitate the translation of LRFD design values to ASD design values, two scenarios of dead load and live load levels are used to conservatively address the most common applications as follows:

- 100% Dead Load
- 10% Dead Load and 90% Live Load

For 100% dead load, ACI 318-14 Table 5.3 Equation (5.3.1a) provides a conversion factor of 1.4 which is divided into the LRFD design loads and multiplied by a ϕ factor of 0.65 to determine an equivalent ASD load.

For 10% dead and 90% live load, ACI 318-14 Equation (5.3.1b) provides a conversion factor of 1.56 which is divided into the LRFD design loads and multiplied by a ϕ factor of 0.65 to determine an equivalent ASD load.

It is the responsibility of the user to select the appropriate ASD values based on the example loadings shown in this document or alternative dead versus live loading that may be applicable to the specific design.

The ASD values are provided in the following tables for tension and shear for each load scenario. Other installation and design provisions in ESR-3981 must be followed.

BRIGHTON BEST, INC.
ULTRAWEDGE+ ANCHOR - ENGINEERING DATA SHEET
Allowable Stress Values for Attachments to Normal-Weight Concrete

ALLOWABLE TENSION LOADS FOR ULTRAWEDGE+ ANCHORS INSTALLED IN UNCRACKED NORMAL-WEIGHT CONCRETE – 100% DEAD LOAD (Pounds)[1,2,3]

ANCHOR DIAMETER (inches)	MINIMUM NOMINAL EMBEDMENT (inches)[4]	MINIMUM CONCRETE COMPRESSIVE STRENGTH, f_c', psi				
		2500	3000	4000	5000	6000
3/8	2-3/8	1399	1532	1769	1978	2167
½	2-1/2	1576	1726	1993	2229	2441
5/8	3-9/16	3257	3568	4120	4606	5046
¾	4-1/8	4104	4496	5191	5804	6358

ALLOWABLE NON-SEISMIC SHEAR LOADS FOR ULTRAWEDGE+ ANCHORS INSTALLED IN NORMAL-WEIGHT CONCRETE – 100% DEAD LOAD (Pounds)[1,2,3]

ANCHOR DIAMETER (inches)	MINIMUM NOMINAL EMBEDMENT (inches)[4]	MINIMUM CONCRETE COMPRESSIVE STRENGTH, f_c', psi
		2500
3/8	2-3/8	1164
1/2	2-1/2	2554
5/8	3-9/16	4607
3/4	4-1/8	8504

ALLOWABLE TENSION LOADS FOR ULTRAWEDGE+ ANCHORS INSTALLED IN UNCRACKED NORMAL-WEIGHT CONCRETE – 10% DEAD LOAD, 90% LIVE LOAD (Pounds)[1,2,3]

ANCHOR DIAMETER (inches)	MINIMUM NOMINAL EMBEDMENT (inches)[4]	MINIMUM CONCRETE COMPRESSIVE STRENGTH, f_c', psi				
		2500	3000	4000	5000	6000
3/8	2-3/8	1255	1375	1588	1775	1945
1/2	2-1/2	1414	1549	1789	2000	2191
5/8	3-9/16	2923	3202	3697	4134	4528
3/4	4-1/8	3683	4035	4659	5209	5706

ALLOWABLE NON-SEISMIC SHEAR LOADS FOR ULTRAWEDGE+ ANCHORS INSTALLED IN NORMAL-WEIGHT CONCRETE – 10% DEAD LOAD, 90% LIVE LOAD (Pounds)[1,2,3]

ANCHOR DIAMETER (inches)	MINIMUM NOMINAL EMBEDMENT (inches)[4]	MINIMUM CONCRETE COMPRESSIVE STRENGTH, f_c', psi
		2500
3/8	2-3/8	1045
1/2	2-1/2	2292
5/8	3-9/16	4135
3/4	4-1/8	7632

Notes to all tables:
[1] Based on ESR-3981 LRFD values
[2] The tabulated values are for anchors installed in normal-weight concrete that has reached the minimum designated compressive strength at the time of installation.
[3] Other installation and other design provisions in ESR-3981 must be followed
[4] Measured from the concrete surface to the embedded end of the anchor (nominal embedment)

BRIGHTON BEST, INC.
ULTRAWEDGE+ ANCHOR - ENGINEERING DATA SHEET
Allowable Stress Values for Attachments to Normal-Weight Concrete

ALLOWABLE TENSION LOADS FOR ULTRAWEDGE+ ANCHORS INSTALLED IN CRACKED NORMAL-WEIGHT CONCRETE – 100% DEAD LOAD (Pounds)[1,2,3]

ANCHOR DIAMETER (inches)	MINIMUM NOMINAL EMBEDMENT (inches) [4]	MINIMUM CONCRETE COMPRESSIVE STRENGTH, f_c', psi				
		2500	3000	4000	5000	6000
3/8	2-3/8	1116	1223	1412	1579	1729
1/2	2-1/2	1379	1510	1744	1950	2136
5/8	3-9/16	1874	2053	2371	2651	2904
3/4	4-1/8	3648	3996	4615	5159	5652

ALLOWABLE SEISMIC SHEAR LOADS FOR ULTRAWEDGE+ ANCHORS INSTALLED IN NORMAL-WEIGHT CONCRETE – 100% DEAD LOAD (Pounds)[1,2,3]

ANCHOR DIAMETER (inches)	MINIMUM NOMINAL EMBEDMENT (inches) [4]	MINIMUM CONCRETE COMPRESSIVE STRENGTH, f_c', psi
		2500
3/8	2-3/8	931
1/2	2-1/2	2043
5/8	3-9/16	3686
3/4	4-1/8	7654

ALLOWABLE TENSION LOADS FOR ULTRAWEDGE+ ANCHORS INSTALLED IN CRACKED NORMAL-WEIGHT CONCRETE – 10% DEAD LOAD, 90% LIVE LOAD (Pounds)[1,2,3]

ANCHOR DIAMETER (inches)	MINIMUM NOMINAL EMBEDMENT (inches) [4]	MINIMUM CONCRETE COMPRESSIVE STRENGTH, f_c', psi				
		2500	3000	4000	5000	6000
3/8	2-3/8	1002	1097	1267	1417	1552
1/2	2-1/2	1237	1356	1565	1750	1917
5/8	3-9/16	1682	1843	2128	2379	2606
3/4	4-1/8	3274	3586	4141	4630	5072

ALLOWABLE SEISMIC SHEAR LOADS FOR ULTRAWEDGE+ ANCHORS INSTALLED IN NORMAL-WEIGHT CONCRETE – 10% DEAD LOAD, 90% LIVE LOAD (Pounds)[1,2,3]

ANCHOR DIAMETER (inches)	MINIMUM NOMINAL EMBEDMENT (inches) [4]	MINIMUM CONCRETE COMPRESSIVE STRENGTH, f_c', psi
		2500
3/8	2-3/8	836
1/2	2-1/2	1833
5/8	3-9/16	3308
3/4	4-1/8	6869

Notes to all tables:
[1] Based on ESR-3981 LRFD values
[2] The tabulated values are for anchors installed in normal-weight concrete that has reached the minimum designated compressive strength at the time of installation.
[3] Other installation and other design provisions in ESR-3981 must be followed
[4] Measured from the concrete surface to the embedded end of the anchor (nominal embedment)

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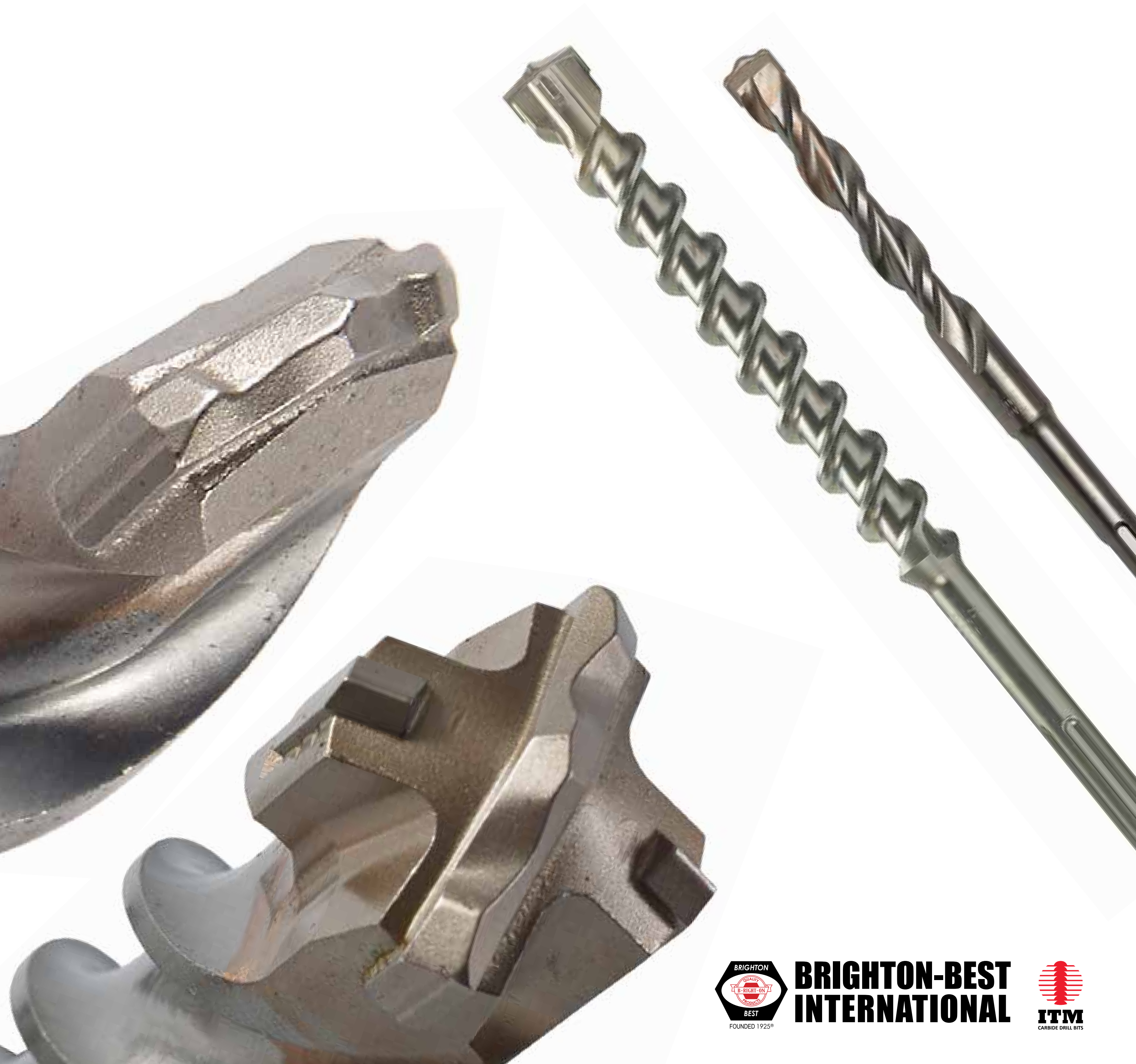

BRIGHTON-BEST INTERNATIONAL

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ITM
CARBIDE DRILL BITS

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ITM CARBIDE DRILL BITS

- Rotary Hammer Drill
- Serrated Head Geometry
- Self Centering Chisel Point
- ANSI Specification
- Tungsten Carbide Tip
- Copper / Silver Brazing
- Fastest Dust Removal
- Fastest Drilling Speeds
- Clean Round Holes
- Less Vibration
- Polished Finish
- Industrial Quality

→ **Concrete**
→ **Brick**
→ **Stone**
→ **Masonry**
→ **Aggregates**

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1 PER CLIP.**

SDS PLUS

SDS-PLUS Rotary Hammer Drills

Part #	Size	X	OAL	Drilling	Head	Qty.
C10009	5/32”	X	4-1/4”	2”	4-PLUS	1
C10010	5/32”	X	6-1/4”	4”	4-PLUS	1
C10020	3/16”	X	4-1/2”	2”	4-PLUS	1
C10030	3/16”	X	6-1/2”	4”	4-PLUS	1
C10031	3/16”	X	8-1/2”	6”	4-PLUS	1
C10032	3/16”	X	12-1/2”	10”	4-PLUS	1
C10033	7/32”	X	6-1/2”	4”	4-PLUS	1
C10034	7/32”	X	8-1/2”	6”	4-PLUS	1
C10035	7/32”	X	10-1/2”	8”	4-PLUS	1
C10036	7/32”	X	16”	14”	4-PLUS	1
C10040	1/4”	X	4-1/2”	2”	4-PLUS	1
C10050	1/4”	X	6-1/2”	4”	4-PLUS	1
C10051	1/4”	X	8-1/2”	6”	4-PLUS	1
C10052	1/4”	X	10-1/2”	8”	4-PLUS	1
C10053	1/4”	X	14”	12”	4-PLUS	1
C10054	1/4”	X	16”	14”	4-PLUS	1
C10060	5/16”	X	6-1/2”	4”	4-PLUS	1
C10070	5/16”	X	12-1/2”	10”	4-PLUS	1
C10080	3/8”	X	6-1/2”	4”	4-PLUS	1
C10090	3/8”	X	10-1/2”	8”	4-PLUS	1
C10100	3/8”	X	12-1/2”	10”	4-PLUS	1
C10101	3/8”	X	18”	16”	4-PLUS	1
C10102	3/8”	X	24”	22”	4-PLUS	1
C10110	7/16”	X	6-1/2”	4”	4-PLUS	1
C10111	7/16”	X	12-1/2”	10”	4-PLUS	1
C10120	1/2”	X	6-1/2”	4”	4-PLUS	1
C10130	1/2”	X	10-1/2”	8”	4-PLUS	1
C10140	1/2”	X	12-1/2”	10”	4-PLUS	1
C10141	1/2”	X	18”	16”	4-PLUS	1
C10142	1/2”	X	24”	22”	4-PLUS	1
C10150	9/16”	X	6-1/4”	4”	4-PLUS	1
C10160	9/16”	X	12-1/4”	10”	4-PLUS	1
C10170	5/8”	X	6-1/4”	4”	4-PLUS	1
C10171	5/8”	X	8-1/4”	6”	4-PLUS	1
C10190	5/8”	X	12-1/4”	10”	4-PLUS	1
C10191	5/8”	X	18”	16”	4-PLUS	1
C10192	5/8”	X	24”	22”	4-PLUS	1
C10193	3/4”	X	8”	6”	4-PLUS	1
C10220	3/4”	X	12”	10”	4-PLUS	1
C10221	3/4”	X	18”	16”	4-PLUS	1
C10222	3/4”	X	24”	22”	4-PLUS	1
C10223	7/8”	X	8”	6”	4-PLUS	1
C10230	7/8”	X	10”	8”	4-PLUS	1
C10231	7/8”	X	12”	10”	4-PLUS	1
C10240	1”	X	10”	8”	4-PLUS	1
C10241	1”	X	18”	16”	4-PLUS	1

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SDS-MAX® Rotary Hammer Drills

SDS max

Part #	Size	X	OAL	Drilling	Head	Qty.
C13100	**3/8"**	X	**13"**	7-1/2"	REGULAR	1
C13102	**1/2"**	X	**13"**	7-1/2"	REGULAR	1
C13104	**1/2"**	X	**21"**	15-1/2"	REGULAR	1
C13106	**9/16"**	X	**21"**	15-1/2"	REGULAR	1
C13108	**5/8"**	X	**13"**	7-1/2"	X-CUTTER	1
C13110	**5/8"**	X	**21"**	15-1/2"	X-CUTTER	1
C13112	**5/8"**	X	**36"**	30-1/2"	X-CUTTER	1
C13114	**11/16"**	X	**21"**	15-1/2"	X-CUTTER	1
C13116	**3/4"**	X	**13"**	8"	X-CUTTER	1
C13118	**3/4"**	X	**21"**	17"	X-CUTTER	1
C13120	**3/4"**	X	**36"**	31"	X-CUTTER	1
C13122	**7/8"**	X	**13"**	8"	X-CUTTER	1
C13124	**7/8"**	X	**21"**	17"	X-CUTTER	1
C13126	**7/8"**	X	**36"**	31"	X-CUTTER	1
C13128	**1"**	X	**13"**	8"	X-CUTTER	1
C13130	**1"**	X	**21"**	17"	X-CUTTER	1
C13132	**1"**	X	**36"**	31"	X-CUTTER	1
C13134	**1-1/8"**	X	**17"**	12"	X-CUTTER	1
C13136	**1-1/8"**	X	**21"**	17"	X-CUTTER	1
C13138	**1-1/8"**	X	**36"**	31"	X-CUTTER	1
C13140	**1-1/4"**	X	**15"**	10"	X-CUTTER	1
C13142	**1-1/4"**	X	**23"**	18"	X-CUTTER	1
C13144	**1-3/8"**	X	**23"**	18"	X-CUTTER	1
C13146	**1-1/2"**	X	**23"**	18"	X-CUTTER	1
C13148	**1-3/4"**	X	**23"**	18"	X-CUTTER	1
C13150	**2"**	X	**23"**	18"	X-CUTTER	1

- Rotary Hammer Drill
- Industrial Quality
- Tungsten Carbide Tip
- Copper / Silver Brazing
- Fastest Dust Removal
- Fastest Drilling Speeds
- Heat Treated Body
- Clean Round Holes
- Less Vibration
- Polished Finish
- ANSI Specification

→ **Reinforced Concrete**
→ **Brick**
→ **Stone**
→ **Masonry**
→ **Aggregates**

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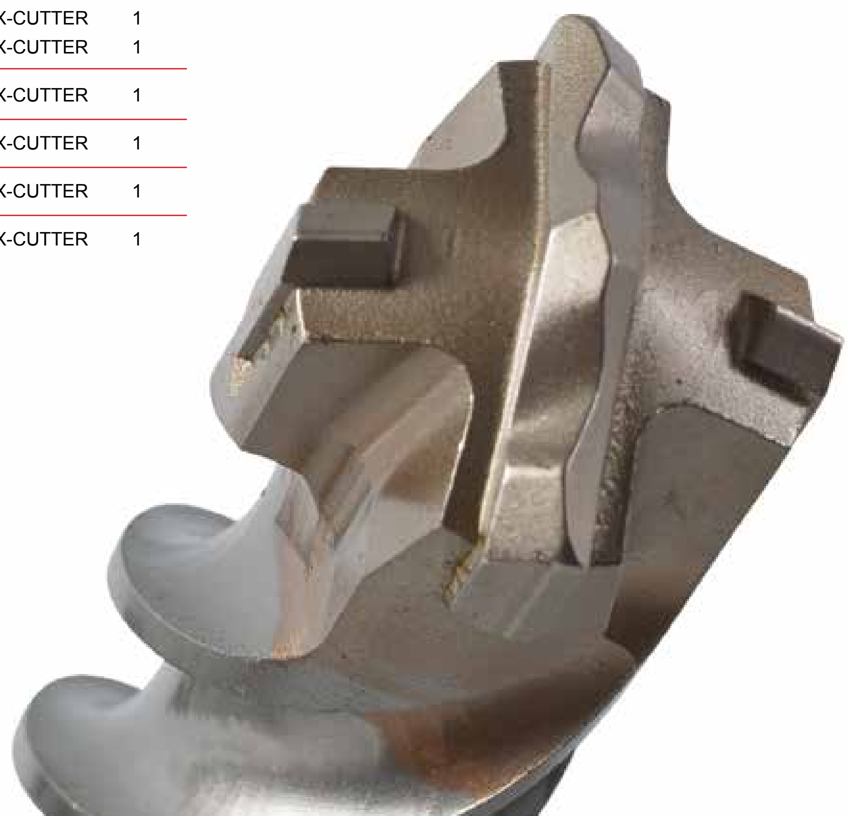
WILL PENETRATE THROUGH REINFORCED CONCRETE



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- Rotary Hammer Drill
- STOP - Lip Prevents Over-Drilling
- Drill Exact Depth For Drop-In Anchor
- Less Likely to Hit Rebar
- ANSI Specification

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→ **Brick**
→ **Stone**
→ **Masonry**
→ **Aggregates**

For Drop-in Anchors

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SDS-PLUS + STOP Rotary Hammer Bit

Part #	Size	Drill Depth	Anchor Size	Qty.
C12100	**3/8”**	1-1/16”	1/4”	1
C12102	**1/2”**	13/16”	3/8” Short	1
C12104	**1/2”**	1-11/16”	3/8”	1
C12106	**5/8”**	1-3/16”	1/2” Short	1
C12108	**5/8”**	2-1/16”	1/2”	1

Half Flat Shank

Concrete Bits - FOR CONCRETE-SCREWS

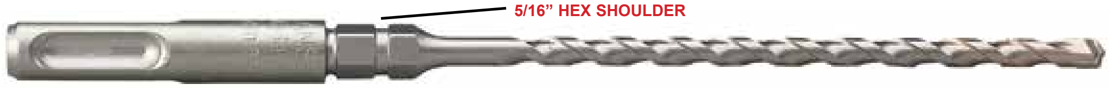
Part #	Size	x	OAL	Screw	Qty.
R62004	**5/32”**	X	**3-1/2”**	12	25
R62005	**5/32”**	X	**4-1/2”**	12	25
R62006	**5/32”**	X	**5-1/2”**	12	25
R62008	**3/16”**	X	**3-1/2”**	14	25
R62003	**3/16”**	X	**4-1/2”**	14	25
R62001	**3/16”**	X	**5-1/2”**	14	25
R62002	**3/16”**	X	**6-3/4”**	14	25
R62009	**3/16”**	X	**7-5/8”**	14	25

- Industrial Quality
- Tungsten Carbide Tip
- Used for 5/32” Screws and 3/16” Screws

FOR USE WITH CONCRETE-SCREW SLEEVE

Each concrete-screw carbide drill bit is precisely ground to match a certain tolerance to assure proper hole diameter and to achieve maximum thread holding power. The flat on the shank fits all drill adapters. The drill bit is specially heat treated to make it very durable.

5/16” HEX SHOULDER



SDS-HEX Bits - FOR CONCRETE-SCREWS

Part #	Size	x	OAL	Drilling	Qty.
C19200	**5/32”**	X	**5”**	2-1/2”	1
C19201	**5/32”**	X	**7”**	4-1/2”	1
C19100	**3/16”**	X	**5”**	2-1/2”	1
C19101	**3/16”**	X	**7”**	4-1/2”	1

SDS PLUS

GERMANY

- Industrial Quality
- Special Tungsten Carbide Tip
- Copper / Silver Brazing
- Polished Finish
- Used for 5/32” Screws and 3/16” Screws

FOR USE WITH CONCRETE-SCREW SLEEVE

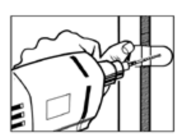
SDS-HEX Rotary Hammer drill bits are specifically designed for concrete-screw installation. These SDS bits have a special 5/16” HEX shoulder for direct use with concrete screw installation sleeves, eliminating the need for drill adapters. The benefit of using an SDS-Plus machine instead of a standard rotation drill is 2-3X faster performance, especially in harder concretes. SEE BELOW FOR INSTALLATION KIT

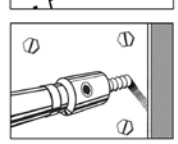
Installation Kit

Part #	Description
C99010	Installation Kit

INCLUDES:

- 5/32” x 7” SDS-PLUS Hex Bit
- 3/16” x 7” SDS-PLUS Hex Bit
- 1/4” Magnetic Driver
- 5/16” Magnetic Driver
- Phillips Bit Adapter
- Masonry Drill Adapter
- 6-1/2” Sleeve
- 1/8” Hex Key
- Phillips #2 x 1” Insert
- Phillips #3 x 1” Insert





- Red Case
- Black Hardware

This Installation Kit is Suitable for both Standard Concrete Bits & SDS-HEX Rotary Hammer Bits.

BRIGHTON-BEST INTERNATIONAL

BRIGHTON QUALITY B-RIGHT-ON PRODUCTS BEST
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www.brightonBEST.com ⬢ 1-800-275-0050

Global Headquarters

Tainan, Taiwan
No.122, Yi-Lin Road,
Rende Township.
Tainan, 71752 Taiwan
Tel. 886-6-270-1756

USA Headquarters

Long Beach, California
5855 Obispo Ave.
Long Beach, CA 90805
Tel. 562-808-8000
Fax: 562-808-8137

U.S.A.

Atlanta, GA
250 Horizon Dr.
Suwanee, GA 30024
Tel. 678-459-3700
Fax: 678-459-3720
WATS: 800-275-0056
atlanta@brightonbest.com

Boston, MA
928 West Chestnut St.
Brockton MA 02301
Tel. 508-857-2808
Fax: 774-296-8685
WATS: 800-275-0037
boston@brightonbest.com

Charlotte, NC
1810 West Pointe Dr., Unit A
Charlotte, NC 28214
Tel. 704-393-6711
Fax: 704-393-6715
WATS: 800-275-0050
charlotte@brightonbest.com

Chicago, IL
940 North Enterprise St.
Aurora, IL 60504
Tel. 630-898-9600
Fax: 630-898-9601
WATS: 800-929-2378
chicago@brightonbest.com

Cleveland, OH
16065 Imperial Pkwy.
Strongsville, OH 44149
Tel. 440-238-1350
Fax: 440-238-2336
WATS: 800-275-0048
cleveland@brightonbest.com

Dallas, TX
3225 Roy Orr Blvd., Ste. 200
Grand Prairie, TX 75050
Tel. 972-790-1201
Fax: 972-790-6265
WATS: 800-275-0054
dallas@brightonbest.com

Denver, CO
9700 E. 56th Ave., Unit 120
Denver, CO 80238
Tel. 303-576-0530
Fax: 303-371-9775
WATS: 800-935-2202
denver@brightonbest.com

Detroit, MI
51251 Fogg Industrial Ct.
Shelby Township, MI 48315
Tel. 586-412-3350
Fax: 586-412-3305
WATS: 800-275-0046
detroit@brightonbest.com

Houston, TX
6911 Fairbanks N. Houston Rd. Ste. 150
Houston, TX 77040
Tel: 713-466-0336
Fax: 713-466-0385
WATS: 800-275-0054
houston@brightonbest.com

Logan Township, NJ
2100 Center Square Rd. Ste. 100
Logan Township, NJ 08085
Tel. 856-241-9494
Fax: 856-241-9477
WATS: 800-935-2378
logan@brightonbest.com

Los Angeles, CA
12801 Leffingwell Ave.
Santa Fe Springs, CA 90670
Tel. 562-483-2740
Fax: 562-404-3999
WATS: 800-275-0028
losangeles@brightonbest.com

Miami, FL
3426 West 84th St., Ste. 203
Hialeah, FL 33018
Tel. 305-512-3446
Fax: 305-512-3450
WATS: 800-275-0035
miami@brightonbest.com

Nashville, TN
446 Metroplex Dr., Ste. A120
Nashville, TN 37211
Tel. 615-834-1154
Fax: 615-834-1157
WATS: 800-275-0029
nashville@brightonbest.com

Portland, OR
13440 NE Jarrett St.
Portland, OR 97230
Tel: 503-261-0660
Fax: 503-252-4093
WATS: 800-275-0686
portland@brightonbest.com

Rogers, MN
21010 Commerce Blvd.
Ste. B
Rogers, MN 55374
Tel. 763-425-9464
Fax: 763-425-9266
WATS: 800-275-0031
minnesota@brightonbest.com

Salt Lake City, UT
2179 S. Commerce Center Dr. Ste. 400
West Valley City, UT 84120
Tel: 801-972-1313
Fax: 801-972-5114
WATS: 800-935-1402
saltlake@brightonbest.com

San Francisco, CA
30964 San Benito Ct.
Hayward, CA 94544
Fax: 562-921-7191
WATS: 800-275-0028
sanfrancisco@brightonbest.com

Sayreville, NJ
200 Kennedy Dr.
Sayreville, NJ. 08872
Tel. 732-525-8400
Fax: 732-525-8408
sayreville@brightonbest.com

Seattle, WA
20308 59th Place South, Bldg. 1A
Kent, WA, 98032
Tel. 253-872-3417
Fax: 253-872-3415
WATS: 800-935-1502
seattle@brightonbest.com

St. Louis, MO
1856 Craig Rd.
St. Louis, MO 63146
Tel. 314-205-8001
Fax: 314-205-0857
WATS: 800-275-0047
stlouis@brightonbest.com

Tampa, FL
4915 Distribution Dr.
Tampa, FL 33605
Tel. 305-512-3446
Fax: 305-512-3450
WATS: 800-275-0035
tampa@brightonbest.com

CANADA

Montreal, Québec
5780 Kieran
Saint-Laurent, Québec H4S 2B5
Tel: 514-336-9888
Fax: 514-336-8865
WATS: 800-361-2076
montreal@brightonbest.com

Toronto, Ontario
7900 Goreway Dr., Unit 1
Brampton, Ontario L6T 5W6
Tel: 905-791-2000
Fax: 905-791-6841
WATS: 800-268-6918
toronto@brightonbest.com

Vancouver, British Columbia
9489 200 St, Unit 103&104
Langley, B.C. V1M 3A7
Tel: 604-513-0311
Fax: 604-513-0312
WATS: 800-663-9106
vancouver@brightonbest.com

AUSTRALIA

Brisbane, Queensland
11 Stradbroke St.
Heathwood, Queensland 4110
Tel. 617-3727-5700
Fax: 617-3714-9821
qldsales@brightonbest.com.au

Melbourne, Victoria
31-33 Canterbury Rd.
Braeside, VIC 3195
Tel. 613-8586-0244
Fax: 613-9587-7255
vicsales@brightonbest.com.au

Perth, Western Australia
Unit 3/420 Victoria Rd.
Malaga, Western Australia 6090
Tel. 618-6240-6800
Fax: 618-9248-4766
wasales@brightonbest.com.au

Sydney, New South Wales
6 Shale Place
Eastern Creek, NSW 2766
Tel. 612-8818-0900
Fax: 612-9620-1050
nswsales@brightonbest.com.au

NEW ZEALAND

Auckland, New Zealand
28B Pavillion Dr. Airport Oaks
Mangere, Auckland 2022
Tel. 649-257-5256
Fax: 649-257-5328
nzsales@brightonbest.co.nz

U.K.

Birmingham, West Midlands
Fastener Complex D1
Cradley Business Park,
Overend Rd., Cradley Heath
West Midlands B64 7DW
Tel. +44 (0) 1384-568144
Fax: +44 (0) 1384-413719
sales@brightonbest.org

BRAZIL

São Paulo, Brazil
Rua Dos Missionários, 410
São Paulo, Brazil 04729-001
Tel. 55 11-5641-4037
Fax: 55 11-5641-2444
luizab@brightonbest.com.br

MEXICO

Mexico
Toll Free: 1(855)-816-9726
Fax: 562-404-3999
mexico@brightonbest.com

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