

# ICC-ES Evaluation Report

**ESR-2254**

Reissued December 2023

This report also contains:

Subject to renewal December 2025

- CBC Supplement
- CHI Supplement
- FBC Supplement
- LABC Supplement

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<p><b>DIVISION: 03 00 00— CONCRETE</b></p> <p><b>Section: 03 16 00— Concrete Anchors</b></p> <p><b>DIVISION: 05 00 00— METALS</b></p> <p><b>Section: 05 05 19—Post- Installed Concrete Anchors</b></p>	<p><b>REPORT HOLDER: CYW, INC./CHUN YU WORKS (U.S.A.) INC., dba WESTERN STATES FASTENING SYSTEMS</b></p>	<p><b>EVALUATION SUBJECT: POWER BULL WEDGE ANCHORS IN UNCRACKED CONCRETE</b></p>	
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## 1.0 EVALUATION SCOPE

**Compliance with the following codes:**

- 2021, 2018, 2015, 2012 and 2009 [International Building Code® \(IBC\)](#)
- 2021, 2018, 2015, 2012 and 2009 [International Residential Code® \(IRC\)](#)

For evaluation for compliance with codes adopted by Los Angeles Department of Building and Safety (LADBS), see [ESR-2254 LABC and LARC Supplement](#).

**Property evaluated:**

- Structural

## 2.0 USES

Power Bull Wedge Anchors are used to resist static, wind, and earthquake (Seismic Design Categories A and B only) tension and shear loads in uncracked normal-weight concrete and uncracked lightweight concrete having a specified compressive strength,  $f_c$ , of 2,500 psi to 8,500 psi (17.2 MPa to 58.6 MPa).

The Power Bull wedge anchors comply with Section 1901.3 of the 2021, 2018 and 2015 IBC, 1909 of the 2012 IBC, and Section 1912 of the 2009 IBC. The anchors are alternatives to cast-in-place anchors described in Section 1908 of the 2012 IBC and Section 1911 of the 2009 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 Power Bull Anchors:

The Power Bull wedge anchors are torque-controlled expansion anchors. The anchors consist of a stud, nut, washer and expander collar as illustrated in [Figure 1](#). The stud is manufactured from Grade G 10080 cold-finished carbon steel, partially threaded with one end terminating in a flared mandrel. The expander collar is formed around the anchor stud and has three equally spaced extrusions around the periphery to engage the sides of the drilled hole during anchor installation. 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 [Tables 1](#) and [2](#) of this report.

### 3.2 Concrete:

Normal-weight 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 2021 IBC, as well as Section R301.1.3 of the 2021 IRC must be determined in accordance with ACI 318-19 Chapter 17 and this report.

Design strength of anchors complying with the 2018 and 2015 IBC, as well as Section R301.1.3 of the 2018 and 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 parameters are based on the 2021 IBC (ACI 318-19), 2018 and 2015 IBC (ACI 318-14) and the 2012 IBC (ACI 318-11) unless noted otherwise in Sections 4.1.1 through 4.1.12 of this report. The strength design of anchors must comply with ACI 318-19 17.5.1.2, ACI 318-14 17.3.1 or ACI 318-11 D.4.1, as applicable, except as required in ACI 318-19 17.10, ACI 318-14 17.2.3 or ACI 318-11 D.3.3, as applicable. Strength reduction factors,  $\phi$ , as given in ACI 318-19 17.5.3, ACI 318-14 17.3.3 or ACI 318-11 D.4.3, as applicable, must be used for load combinations calculated in accordance with Section 1605.1 of the 2021 IBC or Section 1605.2 of the 2018, 2015, 2012 and 2009 IBC and Section 5.3 of ACI 318 (-19 and -14) or Section 9.2 of ACI 318-11, as applicable. Strength reduction factors,  $\phi$ , described in ACI 318-11 D.4.4 must be used for load combinations calculated in accordance with ACI 318-11, 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 318-19 17.3.1, 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 318-19 17.6.1.2, ACI 318-14 17.4.1.2 or ACI 318-11 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,  $\phi$ , corresponding to a ductile steel element must be used for all anchors.

**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 318-19 17.6.2, ACI 318-14 17.4.2 or ACI 318-11 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 318-19 17.6.2.2, ACI 318-14 17.4.2.2 or ACI 318-11 D.5.2.2, as applicable, using the values of  $h_{ef}$  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 318-19 17.6.2.5, ACI 318-14 17.4.2.6 or ACI 318-11 D.5.2.6, as applicable, with  $\psi_{c,N} = 1.0$ .

**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 318-19 17.6.3.1 and 17.6.3.2.1, ACI 318-14 17.4.3.1 and 17.4.3.2 or ACI 318-11 D.5.3.1 and D.5.3.2, as applicable, in uncracked concrete,  $N_{p,uncr}$ , is given in [Table 1](#). In lieu of ACI 318-19 17.6.3.3, ACI 318-14 17.4.3.6 or ACI 318 D.5.3.6, as applicable,  $\psi_{c,P} = 1.0$  for all design cases. In accordance with ACI 318-19 17.6.3.2.1, ACI 318-14 17.4.3.2 or ACI 318-11 D.5.3, as applicable, the nominal pullout strength in uncracked concrete may be calculated in accordance with the following equation:

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

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

Where values for  $N_{p,uncr}$  are not provided, 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 must be calculated from ACI 318-19 Eq. 17.7.1.2b, ACI 318-14 Eq. 17.5.1.2b or ACI 318-11, Eq. D-29, as applicable, in accordance with ACI 318-19 17.7.1.2, ACI 318-14 17.5.1.2 or ACI 318-11 D.6.1.2, as applicable. The strength reduction factor,  $\phi$ , corresponding to a ductile steel element must be used for all anchors.

**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 318-19 17.7.2, ACI 318-14 17.5.2 or ACI 318-11 D.6.2, as applicable, with modifications as described in this section. The value of  $l_e$  calculated in accordance with ACI 318-19 17.7.2.2.1, ACI 318-14 17.5.2.2 or ACI 318-11 D.6.2.2, as applicable, must be taken as no greater than  $h_{ef}$ , or  $8d_a$ , whichever is less.

**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 318-19 17.7.3, ACI 318-14 17.5.3 or ACI 318-11 D.6.3, as applicable, based on 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 Interaction of Tensile and Shear Forces:** For loadings that include combined tensile and shear forces, the design must be determined in accordance with ACI 318-19 17.8, ACI 318-14 17.6 or ACI 318-11 D.7, as applicable.

**4.1.9 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 318-19 17.6.2, ACI 318-14 17.4.2 or ACI 318-11 D.5.2, as applicable, must be further multiplied by the factor  $\Psi_{CP,N}$  as given by the following equation:

$$\Psi_{cp,N} = \frac{c}{c_{ac}}$$

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

For all other cases,  $\Psi_{CP,N} = 1.0$ . Values for the critical edge distance  $c_{ac}$  must be taken from [Table 1](#). In all cases,  $c$  must not be less than  $c_{min}$  described in [Table 1](#) of this report.

**4.1.10 Requirements for Minimum Member Thickness, Minimum Anchor Spacing and Minimum Edge Distance:** In lieu of using ACI 318-19 17.9.2, ACI 318-14 17.7.1 and 17.7.3 or ACI 318-11 D.8.1 and D.8.3, respectively, 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 318-19 17.9.4, ACI 318-14 17.7.5 or ACI 318-11 D.8.5, as applicable, minimum member thicknesses  $h_{min}$  as given in [Table 1](#) of this report must be used.

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

For ACI 318-19 (2021 IBC), ACI 318-14 (2018 and 2015 IBC), ACI 318-11 (2012 IBC) and ACI 318-08 (2009 IBC),  $\lambda$  shall be determined in accordance with the corresponding version of ACI 318.

## 4.2 Allowable Stress Design (ASD):

**4.2.1 General:** Design values for use with allowable stress design load combinations, calculated in accordance with Section 1605.1 of the 2021 IBC or Section 1605.3 of the 2018, 2015, 2012 and 2009 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)

$\phi N_n$  = Lowest design strength of an anchor or anchor group in tension as determined in accordance with ACI 318 (19 and -14) Chapter 17, 2021, 2018 and 2015 IBC Section 1905.1.8, ACI 318-11 Appendix D, ACI 318-08 Appendix D and 2009 IBC Section 1908.1.9, and Section 4.1 of this report, as applicable (lbf or N). For 2012 IBC, Section 1905.1.9 shall be omitted.

$\phi V_n$  = Lowest design strength of an anchor or anchor group in shear as determined in accordance with ACI 318 (-19 and -14) Chapter 17, 2021, 2018 and 2015 IBC Section 1905.1.8, ACI 318-11 Appendix D, ACI 318-08 Appendix D and 2009 IBC Section 1908.1.9, and Section 4.1 of this report, as applicable (lbf or N). For 2012 IBC, Section 1905.1.9 shall be omitted.

$\alpha$  = Conversion factor calculated as a weighted average of the load factors for the controlling load combination. In addition,  $\alpha$  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.

**4.2.2 Interaction of Tensile and Shear Forces:** The interaction must be calculated and consistent with ACI 318-19 17.8, ACI 318-14 17.6 or ACI 318 (-11, -08) D.7 as follows:

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

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

For all other cases the following equation applies:

$$\frac{T_{applied}}{T_{allowable,ASD}} + \frac{V_{applied}}{V_{allowable,ASD}} \leq 1.2$$

### 4.3 Installation:

Embedment, spacing, edge distance, and concrete requirements must comply with [Table 1](#) and [Figure 2](#). Anchor locations must comply with this report and the plans and specifications approved by the code official. The Power Bull Wedge Anchor must be installed in accordance with the manufacturer's published instructions and this report. In case of conflict, this report governs. To install the wedge anchor, a hole must be drilled into the concrete using a carbide-tipped masonry drill bit complying with ANSI B212.15-1994. The nominal drill bit diameter must be equal to the nominal diameter of the anchor. The hole must be drilled deeper than the required anchor embedment. Before the anchor is driven into the hole using a hammer, dust and other deleterious materials must be removed using a blow-out bulb. The expansion collar must then be set by tightening the nut to the predetermined installation torque values,  $T_{inst}$  in [Table 1](#) using a calibrated torque wrench.

### 4.4 Special Inspection:

Periodic special inspection is required in accordance with Section 1705.1.1 and Table 1705.3 of the 2021, 2018, 2015 or 2012 IBC, Section 1704.15 and Table 1704.4 of the 2009 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".

## 5.0 CONDITIONS OF USE:

The Power Bull 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 are installed in accordance with the manufacturer's published instructions and this report. In case of a conflict, this report governs.
- 5.2 The anchors are installed in uncracked normal-weight concrete and lightweight concrete having a specified compressive strength  $f_c = 2,500$  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 Strength design values must be established in accordance with Section 4.1 of this report.
- 5.6 Allowable stress design values must be established in accordance with Section 4.2.
- 5.7 Anchor spacing(s) and edge distance(s) as well as minimum member thickness must comply with [Table 1](#).
- 5.8 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.
- 5.9 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.
- 5.10 The use of the Power Bull Wedge Anchor is limited to installation in uncracked normal-weight concrete. Anchors may not be installed in regions of a concrete member where cracking has occurred or where analysis indicates cracking may occur at service load levels, subject to the conditions of this report.

**5.11** The anchors may be used to resist short-term loading due to wind or seismic forces limited to structures assigned to Seismic Design Categories A and B under the IBC, subject to the conditions of this report.

**5.12** Where not otherwise prohibited in the code, Power Bull 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.

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

**5.14** Special inspection is provided as set forth in Section 4.4. The Power Bull Wedge Anchors are produced in Ningbo, China, under a 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 2017 (editorially revised December 2020); and quality control documentation.

**7.0 IDENTIFICATION**

**7.1** Anchors are packaged in containers labeled with the company name, address and product name as set forth in [Table A](#) of this report, the product size, and the evaluation report number (ESR-2254).

**7.2** The report holder’s contact information is the following:

**CYW, INC./CHUN YU WORKS (U.S.A.) INC.,**  
**dba WESTERN STATES FASTENING SYSTEMS**  
**1037 WALNUT AVENUE**  
**POMONA, CALIFORNIA 91766**  
**(909) 627-9915**  
[www.westsys.com](http://www.westsys.com)

**TABLE A—CROSS REFERENCE OF PRODUCT NAMES TO COMPANY NAMES**

COMPANY NAME	PRODUCT NAME
CYW, Inc./Chun Yu Works (U.S.A.) Inc, dba Western States Fastening Systems	Power Bull Wedge Anchors

TABLE 1—DATA FOR POWER BULL WEDGE ANCHORS FOR USE IN UNCRACKED CONCRETE<sup>1,2</sup>

CHARACTERISTIC	SYMBOL	UNITS	NOMINAL ANCHOR DIAMETER			
			<sup>3</sup> / <sub>8</sub> inch	<sup>1</sup> / <sub>2</sub> inch	<sup>5</sup> / <sub>8</sub> inch	<sup>3</sup> / <sub>4</sub> inch
<b>Installation Information</b>						
Anchor diameter	$d_a$	in.	<sup>3</sup> / <sub>8</sub>	<sup>1</sup> / <sub>2</sub>	<sup>5</sup> / <sub>8</sub>	<sup>3</sup> / <sub>4</sub>
Minimum diameter of hole clearance in fixture	$d_h$	in.	<sup>1</sup> / <sub>2</sub>	<sup>5</sup> / <sub>8</sub>	<sup>3</sup> / <sub>4</sub>	<sup>7</sup> / <sub>8</sub>
Nominal drill bit diameter	$d_{bit}$	in.	<sup>3</sup> / <sub>8</sub>	<sup>1</sup> / <sub>2</sub>	<sup>5</sup> / <sub>8</sub>	<sup>3</sup> / <sub>4</sub>
Minimum nominal embedment depth	$h_{nom}$	in.	2 <sup>5</sup> / <sub>16</sub>	2 <sup>7</sup> / <sub>8</sub>	3	3 <sup>15</sup> / <sub>16</sub>
Minimum effective embedment depth	$h_{ef}$	in.	2	2 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub>
Minimum hole depth	$h_o$	in.	2 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>2</sub>	4 <sup>1</sup> / <sub>8</sub>
Installation torque	$T_{inst}$	ft-lb	30	80	130	130
Minimum edge distance	$c_{min}$	in.	3	3 <sup>3</sup> / <sub>4</sub>	5 <sup>1</sup> / <sub>4</sub>	5 <sup>1</sup> / <sub>4</sub>
Minimum spacing	$s_{min}$	in.	3	3 <sup>3</sup> / <sub>4</sub>	5 <sup>1</sup> / <sub>4</sub>	5 <sup>1</sup> / <sub>4</sub>
Minimum concrete thickness <sup>3</sup>	$h_{min}$	in.	4	5	6	7
Critical edge distance	$c_{ac}$	in.	4	5	6	7
<b>ANCHOR DATA</b>						
Category number	1, 2 or 3	–	2	3	1	2
Yield strength of anchor steel	$f_{ya}$	lb/in <sup>2</sup>	44,500	44,500	75,000	44,500
Ultimate strength of anchor steel	$f_{uta}$	lb/in <sup>2</sup>	60,200	60,200	85,000	60,200
Effective tensile stress area	$A_{se,N}$	in <sup>2</sup>	0.0597	0.112	0.192	0.285
Steel strength in tension	$N_{sa}$	lb	3,595	6,740	16,320	17,155
Steel strength in shear	$V_{sa}$	lb	2,800	5,125	8,370	12,065
Effectiveness factor for concrete breakout	$k_{uncr}$	–	24	24	24	24
Pull-out resistance	$N_{p,uncr}$	lb	3,021	4,232	N/A <sup>4</sup>	N/A <sup>4</sup>
Coefficient for pryout strength	$k_{cp}$	-	1.0	2.0	2.0	2.0
Axial stiffness in service load range	$\beta$	lb/in	97,589	539,500	741,700	1,413,876
Strength reduction factor, $\phi$ , for tension, steel failure modes <sup>5,6</sup>			0.75			
Strength reduction factor, $\phi$ , for shear, steel failure modes <sup>5,6</sup>			0.65			
Strength reduction factor, $\phi$ , for tension, concrete failure modes <sup>6</sup>			0.55	0.45	0.65	0.55
Strength reduction factor, $\phi$ , for shear, concrete failure modes <sup>6</sup>			0.70			

For **SI**: 1 in = 25.4 mm, 1 in<sup>2</sup> = 6.451×10<sup>-4</sup> m, 1 ft-lb = 1.356 N.m, 1 lb/in<sup>2</sup> = 6.895 Pa.

<sup>1</sup>The information presented in this table must be used in conjunction with the design criteria of ACI 318-19 Chapter 17, ACI 318-14 Chapter 17 or ACI 318 (-11, -08) Appendix D.

<sup>2</sup>Installation must comply with the manufacturer’s published installation instructions

<sup>3</sup>Concrete thickness must be the greater of 2 $h_{ef}$  or the tabulated value.

<sup>4</sup>See Section 4.1.4 of this report. N/A (not applicable) denotes that this value does not govern for design.

<sup>5</sup>Anchors are considered to be manufactured using ductile steel in accordance with ACI 318 (-19 and -14) 2.3 or ACI 318-11 D.1, as applicable.

<sup>6</sup>The strength reduction factor applies when the load combinations from the IBC or ACI 318 are used and the requirements of ACI 318-19 17.5.3, ACI 318-14 17.3.3(c) or ACI 318-11 D.4.3(c), as applicable, for Condition B (supplement reinforcement not present) are met. For installations where complying reinforcement can be verified, the applicable strength reduction factors described in ACI 318-19 17.5.3, ACI 318-14 17.3.3(c) or ACI 318-11 D.4.3(c), as applicable, may be used for Condition A (supplement reinforcement present).

TABLE 2—POWER BULL 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.

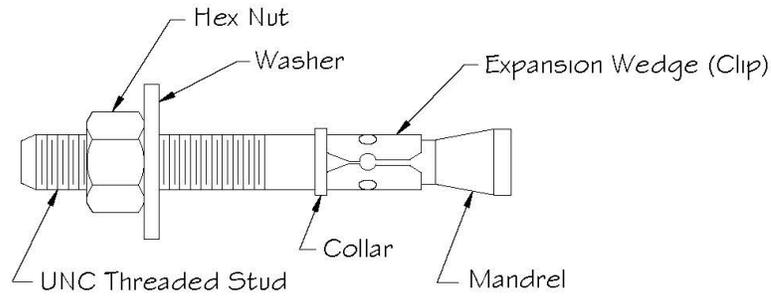


FIGURE 1—POWER BULL WEDGE ANCHOR

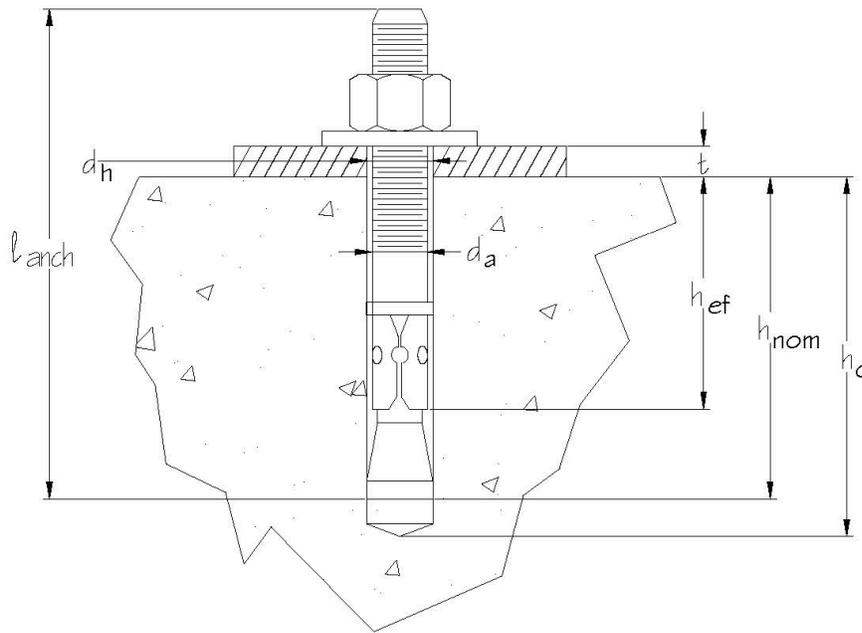


FIGURE 2—POWER BULL WEDGE ANCHOR INSTALLATION

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:

CYW, INC./CHUN YU WORKS (U.S.A.) INC.,  
dba WESTERN STATES FASTENING SYSTEMS

## EVALUATION SUBJECT:

POWER BULL WEDGE ANCHORS IN UNCRACKED CONCRETE

## 1.0 REPORT PURPOSE AND SCOPE

## Purpose:

The purpose of this evaluation report supplement is to indicate that the Power Bull Wedge Anchors for use in uncracked concrete, described in ICC-ES evaluation report [ESR-2254](#), 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:

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

## 2.0 CONCLUSIONS

The Power Bull Wedge Anchors for use in uncracked concrete, described in Sections 2.0 through 7.0 of the evaluation report [ESR-2254](#), 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 Power Bull Wedge Anchors for use in uncracked concrete described in this evaluation report must comply with all of the following conditions:

- All applicable sections in the evaluation report [ESR-2254](#).
- The design, installation, conditions of use and identification of the anchors are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report [ESR-2254](#).
- 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 design strength values listed in the 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).
- For use in wall anchorage assemblies to flexible diaphragm applications, anchors shall be designed per the requirements of City of Los Angeles Information Bulletin P/BC 2020-071.

This supplement expires concurrently with the evaluation report, reissued December 2023.

**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:****CYW, INC./CHUN YU WORKS (U.S.A.) INC.,  
dba WESTERN STATES FASTENING SYSTEMS****EVALUATION SUBJECT:****POWER BULL WEDGE ANCHORS IN UNCRACKED CONCRETE****1.0 REPORT PURPOSE AND SCOPE****Purpose:**

The purpose of this evaluation report supplement is to indicate that the Power Bull Wedge Anchors for use in uncracked concrete, described in ICC-ES evaluation report ESR-2254, have also been evaluated for compliance with the Chicago Construction Codes (Title 14 of the Chicago Municipal Code) as noted below.

**Applicable code edition:**

- 2019 *Chicago Building Code* (Title 14B)

**2.0 CONCLUSIONS**

The Power Bull Wedge Anchors for use in uncracked concrete, described in Sections 2.0 through 7.0 of the evaluation report ESR-2254, comply with Chapter 19 of Title 14B, and are subject to the conditions of use described in this supplement.

**3.0 CONDITIONS OF USE**

The Power Bull Wedge Anchors for use in uncracked concrete described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report ESR-2254.
- The design, installation, conditions of use and identification of the Power Bull Wedge Anchors for use in uncracked concrete are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report ESR-2254.
- The design, installation and inspection are in accordance with additional requirements of Chapters 16 and 17 of Title 14B, as applicable.

This supplement expires concurrently with the evaluation report, reissued December 2023.

**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:**

**CYW, INC./CHUN YU WORKS (U.S.A.) INC.,  
dba WESTERN STATES FASTENING SYSTEMS**

**EVALUATION SUBJECT:**

**POWER BULL WEDGE ANCHORS IN UNCRACKED CONCRETE**

**1.0 REPORT PURPOSE AND SCOPE**

**Purpose:**

The purpose of this evaluation report supplement is to indicate that the Power Bull Wedge Anchors for use in uncracked concrete, described in ICC-ES evaluation report ESR-2254, have also been evaluated for compliance with the codes noted below.

**Applicable code editions:**

- 2019 *California Building Code* (CBC)

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and the Division of the State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

- 2019 *California Residential Code* (CRC)

**2.0 CONCLUSIONS**

**2.1 CBC:**

The Power Bull Wedge Anchors for use in uncracked concrete, described in Sections 2.0 through 7.0 of the evaluation report ESR-2254, comply with CBC Chapter 19 and CRC Section R301.1.3, provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of the CBC Chapters 16 and 17.

**2.1.1 OSHPD:** The applicable OSHPD Sections and Chapters of the CBC are beyond the scope of this supplement.

**2.1.2 DSA:** The applicable DSA Sections and Chapters of the CBC are beyond the scope of this supplement.

**2.2 CRC:**

The Power Bull Wedge Anchors for use in uncracked concrete, described in Sections 2.0 through 7.0 of the evaluation report ESR-2254, complies with CRC Section R301.1.3, provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 16, 17 and 19, as applicable.

This supplement expires concurrently with the evaluation report, reissued December 2023.

**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:****CYW, INC./CHUN YU WORKS (U.S.A.) INC.,  
dba WESTERN STATES FASTENING SYSTEMS****EVALUATION SUBJECT:****POWER BULL WEDGE ANCHORS IN UNCRACKED CONCRETE****1.0 REPORT PURPOSE AND SCOPE****Purpose:**

The purpose of this evaluation report supplement is to indicate that the Power Bull Wedge Anchors for use in uncracked concrete, described in ICC-ES evaluation report ESR-2254, have also been evaluated for compliance with the codes noted below.

**Applicable code editions:**

- 2020 *Florida Building Code—Building*
- 2020 *Florida Building Code—Residential*

**2.0 CONCLUSIONS**

The Power Bull Wedge Anchors for use in uncracked concrete, described in evaluation report ESR-2254, comply with the *Florida Building Code—Building* and the *Florida Building Code—Residential*. The design requirements shall be determined in accordance with the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable. The installation requirements noted in ICC-ES evaluation report ESR-2254 for the 2018 *International Building Code*® meet the requirements of the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable.

Use of the Power Bull Wedge Anchors for use in uncracked concrete for compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* and *Florida Building Code—Residential* has not been evaluated and is outside the scope of this supplemental report.

For products falling under Florida Rule 61G20-3, 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 evaluation report, reissued December 2023.