



# STRONG-BOLT 2 ENGINEERING REFERENCE

## Wedge Anchor Design Data for Specification & Submittal

SIMPSON® Strong-Bolt® 2 — STB2 — ICC-ES ESR-3037



### ABOUT THE STB2

- Carbon steel and stainless steel
- Code listed for cracked & uncracked concrete
- Seismic categories A through F
- ICC-ES ESR-3037
- Tested per ACI 355.2 and AC193
- Suitable for horizontal, vertical, and overhead applications
- Dual undercutting embossments enable secondary expansion if a crack intersects the anchor

**PRODUCT REFERENCED:**  
STB2 carbon steel zinc-plated and Type 304/316 stainless. See pp. 96–117, Simpson C-A-2023.



### INSTALLATION SPECIFICATIONS — ALL DIAMETERS

Spec	1/4"	3/8"	1/2"	5/8"	3/4"	1"
Drill bit diameter	1/4"	3/8"	1/2"	5/8"	3/4"	1"
Install torque, carbon steel ( $T_{inst}$ )	4 ft-lbf	30 ft-lbf	60 ft-lbf	90 ft-lbf	150 ft-lbf	230 ft-lbf
Install torque, stainless steel	4 ft-lbf	30 ft-lbf	65 ft-lbf	80 ft-lbf	150 ft-lbf	(not stocked)
Min. nominal embedment ( $h_{nom}$ )	1-3/4"	1-7/8"	2-3/4"	2-3/4"	3-3/8"	4-1/8"
Min. effective embedment ( $h_{eff}$ )	1-1/2"	1-1/2"	2-1/4"	2-1/8"	2-5/8"	4-1/2"
Min. hole depth ( $h_{hole}$ )	1-7/8"	2"	3"	3"	3-5/8"	5-1/2"
Min. concrete thickness ( $h_{min}$ )	3-1/4"	3-1/4"	4"	5-1/2"	6"	8-3/4"

Values per Simpson C-A-2023 catalog, pages 99 and 113. Multiple embedment options exist for some diameters; values shown are nominal/minimum. See full Simpson design tables for deeper embedment values that increase load capacity.

### TENSION DESIGN VALUES — STEEL STRENGTH ( $N_{sa}$ )

Diameter	Carbon Steel	Type 304/316 Stainless
1/4"	2,225 lbf	3,060 lbf
3/8"	5,600 lbf	5,140 lbf
1/2"	12,100 lbf	12,075 lbf
5/8"	19,070 lbf	17,930 lbf
3/4"	29,700 lbf	25,650 lbf
1"	36,815 lbf	(N/A)

Steel strength values per ACI 318-19 17.6.1. Strength reduction factor  $\phi_{sa} = 0.75$  (carbon steel and stainless steel). Source: Simpson C-A-2023 pp. 100 (carbon) and 114 (stainless).

### SHEAR DESIGN VALUES — STEEL STRENGTH ( $V_{sa}$ )

Diameter	Carbon Steel	Type 304/316 Stainless
1/4"	965 lbf	1,605 lbf
3/8"	1,800 lbf	3,085 lbf
1/2"	5,285 lbf	7,245 lbf
5/8"	7,235 lbf	10,760 lbf
3/4"	11,035 lbf	12,765 lbf
1"	14,480 lbf	(N/A)

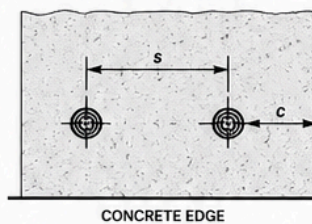
Shear strength values per ACI 318-19 17.7.1. Strength reduction factor  $\phi_{sa} = 0.65$  (carbon steel) / 0.65 (stainless). Values shown are for the longer embedment options where multiple exist. Source: Simpson C-A-2023 pp. 101 (carbon) and 115 (stainless).

### EDGE DISTANCE & SPACING — CONCRETE

Diameter	Critical Edge Distance ( $c_{ec}$ )	Min. Edge Distance ( $c_{min}$ )	Min. Spacing ( $s_{min}$ )
1/4"	2-1/2"	1-3/4"	2-1/4"
3/8"	6-1/2"	6"	3"
1/2"	6"	6"	2-3/4"
5/8"	7-1/2"	6-1/2"	5"
3/4"	6"	4-1/4"	3-1/2"
1"	13-1/2"	8"	8"

Values per Simpson C-A-2023 pp. 99 (carbon) and 113 (stainless). Some diameters have reduced minimums when minimum spacing or edge distance criteria are met simultaneously — see full Simpson tables for adjustment factors.

### PLAN VIEW (TOP-DOWN)



CONCRETE EDGE

### MATERIAL PROPERTIES

	Carbon Steel	Type 304 SS	Type 316 SS
Yield strength ( $f_{ya}$ )	56–92 ksi (varies by dia.)	80–96 ksi	similar to 304
Tensile strength ( $f_{uta}$ )	70–115 ksi	100–120 ksi	similar to 304

### CODE LISTINGS & APPROVALS

- ICC-ES ESR-3037 (concrete)
- City of Los Angeles supplement within ESR-3037
- Florida FL15730 (concrete) / FL16230 (masonry)
- IAPMO UES ER-240 (carbon steel in CMU)
- UL File Ex3605
- FM 3043342 and 3047639
- Multiple DOT listings
- Federal Specifications A-A-1923A, Type 4 (carbon steel)
- ACI 355.2 / AC193 tested

### ENGINEERING DATA — IMPORTANT



**Reference values only.** Strength values shown are catalog reference values per ACI 318 design methodology and do NOT include code-required reduction factors or load combinations. Do not use these values as design loads without independent verification against the current ICC-ES ESR-3037 evaluation report and your project-specific load combinations.



**Code-compliance note.** Some 1/4" anchors stocked in the 1-3/4" length (SIMSTB2-25134, SIMSTB2-251344SS) are below the minimum embedment depth published in the ESR-3037 code report (Simpson dagger† footnote). These are sellable for non-code utility installations but should not be specified for structural, seismic, or any code-required install. Use the 2-1/4" or longer length for code-compliant 1/4" installations.



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