RCKW

Kneewall Connectors

This product is preferable to similar connectors because of (a) easier installation, (b) higher loads, (c) lower installed cost, or a combination of these features.

The Simpson Strong-Tie RCKW rigid connectors have been developed to resist overturning moment at the base of exterior kneewalls and parapets as well as interior partial-height walls. The RCKWS is a heavy 7-gauge stiffener that nests onto the RCKW clip. The screw holes and anchor holes in the stiffener line up with those in the RCKW clip, making fastener and anchor installation a snap. The RCKW clip and RCKWS stiffener are sold separately.

Features:

- Anchorage legs incorporate stiffened flanges, improving overturning moment resistance
- Large-diameter anchor hole accommodates ½"-diameter concrete screws and wedge anchors, such as the Titen HD® heavy-duty screw anchor and the Strong-Bolt® 2 wedge anchor
- For the RCKWS: 7-gauge stiffeners are secured to the RCKW clip with screws, optimizing overturning moment resistance and stiffness

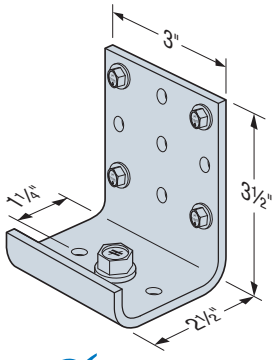
Material: RCKW and RCKWS — 7 gauge

Coating: Galvanized

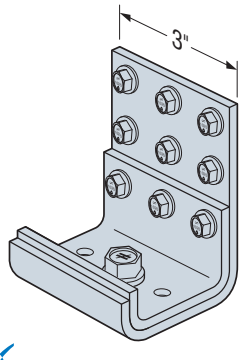
Installation:

- Use all specified screw fasteners.
- When using the RCKWS, secure the stiffener to the clip with the specified screw fasteners.
- Use all specified anchors. To achieve tabulated stiffness values, the installation torque for ½"-diameter anchors shall be at least 17 ft.-lb.
- For installation of the RCKW with 2x6 wood framing members, reference Simpson Strong-Tie engineering letter L-C-RCKW2X6WD at **strongtie.com**.

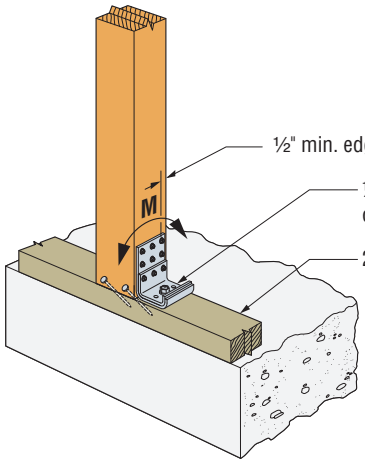
Codes: See p. 11 for Code Reference Key Chart



RCKW3
Screw Pattern No. 1
US Patent 9,938,709



RCKW3 and RCKW3S
Screw Pattern No. 2



RCKW3 and RCKW3S Installation on Concrete

RCKW Allowable Loads for Wood Framing

Model No.	Screw Pattern No.	Fastener(s) to Post and Concrete	Nominal Post Size	Allowable Moment, M DF/SP (in.-lb.)	Anchor Tension, T, at Allow Moment, M (lb.)	Assembly Rotational Stiffness β (in.-lb./rad.)	Connector Rotational Stiffness β_c (in.-lb/rad.)
RCKW3	1	(4) #10 x 2½" SD (1) ½" Ø Anchor	(2) 2x4 or 4x4	2,165	1,695	102,800	111,300
RCKW3 RCKW3S	2	(9) #10 x 2½" SD (1) ½" Ø Anchor	(2) 2x4 or 4x4	3,725	3,635		

1. Designer is responsible for anchorage and framing member design.
2. Tabulated values are based on wood post connected to sill plate in accordance with the fastening schedule IBC Section 2304.
3. Multiply allowable moment and stiffness with an adjustment factor of 0.86 when attaching RCKW connector to SPF/HF wood post.
4. Anchor Tension, T, is the force in the anchor at allowable moment and is based on minimum concrete compressive strength, f'_c of 2500 spi.
5. Tabulated Allowable Moment values correspond to connector strength without consideration of serviceability. Designer must check out-of-plane deflections using tabulated rotational stiffness values.
6. Tabulated Assembly Rotational Stiffness is applicable for studs up to 38" tall and includes connector deflection, fastener slip and bending in the stud. For framing members greater than 38" tall, the designer must consider member deflection due to bending in the stud member in addition to the tabulated Connector Rotational Stiffness. See flier F-CF-RCKW at **strongtie.com** for calculation example.
7. Tabulated rotational stiffness values may be increased by dividing by a factor of 0.42 for deflection checks using component and cladding wind loads in lieu of reducing loads in accordance with 2012, 2015, 2018 and 2021 IBC Table 1604.3.
8. Built-up post (multiple members) must be fastened together to act as one unit to resist the applied load (excluding the connector fasteners). This must be determined by the designer.
9. Anchor bolt nut should be finger tight plus ⅓ to ½ turn with a hand wrench, with consideration given to possible wood shrinkage. Moisture content of wood sill plate shall not exceed 19% at time of installation.
10. **Fasteners:** SD screws are Simpson Strong-Tie® Strong-Drive® SD Connector screws. See pp. 21–22 for fastener information.

RCKW Kneewall Connectors

This product is preferable to similar connectors because of a) easier installation, b) higher loads, c) lower installed cost, or a combination of these features.

The Simpson Strong-Tie® RCKW is a heavy 171 mil (7 ga.) rigid connector that has been developed to resist an overturning moment at the base of exterior kneewalls and parapets as well as interior partial-height walls or overhead ribbon window conditions. These connectors offer a unique small and large anchor-hole pattern that permits anchorage to both concrete and structural steel. The single-anchor RCKW has been redesigned to have all of the same features as the previous model but with an added two-anchor option that accommodates ½"- or ⅜"-diameter concrete anchors. If load requires more capacity, a stiffener, the RCKWS can be added. The RCKWS is a heavy 171 mil (7 ga.) stiffener that nests onto the RCKW clip. The screw holes and anchor holes in the stiffener line up with those in the RCKW clip, making fastener and anchor installation a snap. The RCKW clip and RCKWS stiffener are sold separately.

Features:

- Anchorage legs incorporate stiffened flanges, improving overturning moment resistance.
- Large-diameter anchor holes accommodate ½"-diameter concrete screw anchor and wedge anchors, such as the Simpson Strong-Tie Titen HD® heavy-duty screw anchor and the Strong-Bolt® 2 wedge anchor.
- The RCKW5.5 and RCKW7.5 have three large holes for added versatility. The center large hole is for a one-anchor solution at the edge or center of slab. The outer larger holes are for a two-anchor solution that requires higher capacities at the center of slab. In addition, two ⅜" Titen HD screw anchors have been tested in the outer larger holes for shallower embedment required conditions like fluted deck.
- Additional smaller-diameter anchor holes enable attachment to structural steel with #12 self-drilling screws.
- Attachment to CMU can be achieved with Titen HD or Titen® 2 concrete and masonry screws.
- For the RCKWS: 171 mil (7 ga.) stiffeners are secured to the RCKW clip with screws, optimizing overturning moment resistance and stiffness.

Material: RCKW and RCKWS — 171 mil (7 ga.), 33 ksi

Coating: Galvanized (G90)

Installation:

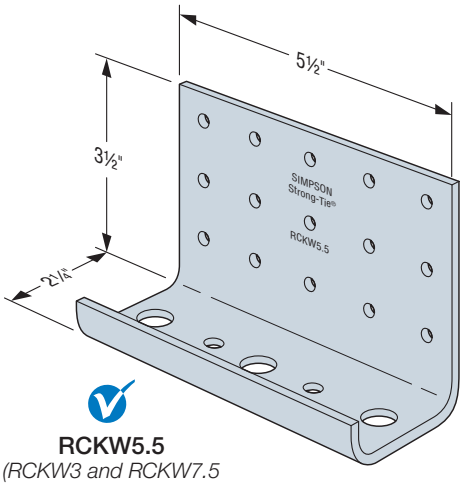
- Use all specified screw fasteners. To achieve tabulated load values, use #12–14 screws according to the fastener patterns on p. 105.
- When using the RCKWS, secure the stiffener to the clip with the specified screw fasteners. Screws must be at least 1" long and extend through the connection with a minimum of three exposed threads.
- Use all specified anchors. To achieve tabulated stiffness values, the installation torque for concrete anchors shall be at least 17 ft.-lb. or the torque requirements of the anchor, whichever is greater.
- When using the larger-diameter anchor holes, the bottom track must be predrilled or punched with a ¾"-diameter hole.

Codes: See p. 11 for Code Reference Key Chart

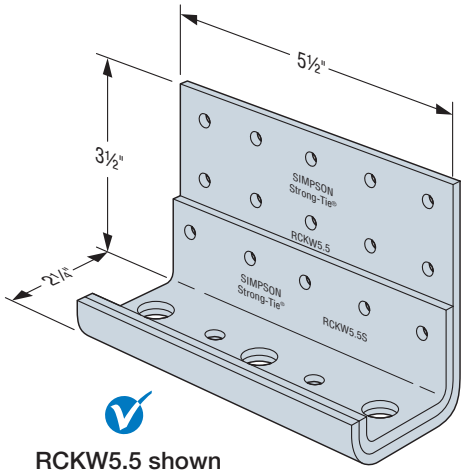
Ordering Information

Model No.	Ordering SKU	Package Quantity
RCKW3	RCKW3-R10	10 RCKW3 clips
RCKW5.5	RCKW5.5-R10	10 RCKW5.5 clips
RCKW7.5	RCKW7.5-R10	10 RCKW7.5 clips
RCKW3S	RCKW3S-R10	10 RCKW3S stiffeners
RCKW5.5S	RCKW5.5S-R10	10 RCKW5.5S stiffeners

NEW DESIGN
- Three large holes for added versatility
- Higher capacity option
- Shallowed embedment option



RCKW5.5
(RCKW3 and RCKW7.5 models also available)



RCKW5.5 shown with RCKW5.5S stiffener
(RCKW5.5S can also be used with the RCKW7.5; RCKW3S can be used with RCKW3)
US Patent 9,938,709

RCKW assembly test with member failure.

Ease of Specification

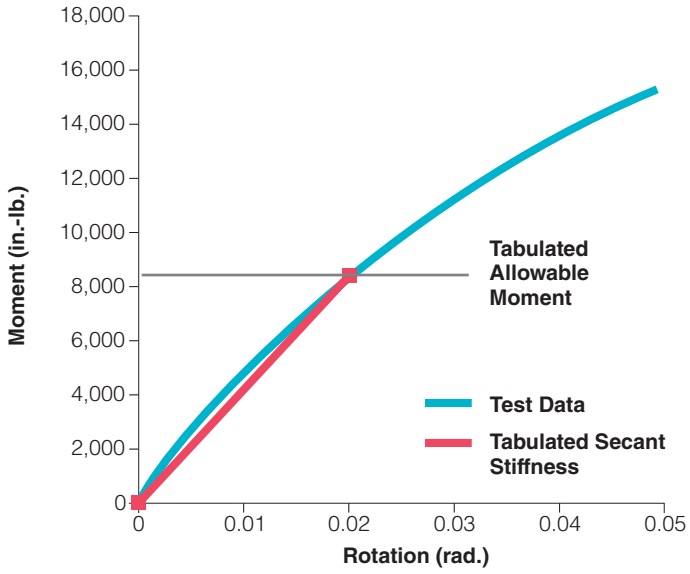
Many cold-formed steel connector manufacturers provide limited technical data for their products. As a result, designers often rely on detailed and time-consuming hand calculations for CFS connection design. This often involves assumptions regarding connection eccentricity, prying and connection stiffness.

Simpson Strong-Tie strives for ease of specification by providing comprehensive load tables based on tests that simulate real-world conditions. These load tables ensure that tabulated values reflect not only the strength of the connector, but also the strength of the fasteners, the anchorage, the member near the connection, and the overall stiffness. The photo to the right is an example of member failure near the connection. Such failures are reflected in our tabulated loads because of our assembly testing.

Simplified Stiffness Calculations

Some manufacturers tabulate stiffness values only for the connector. It's often unknown or unclear if their stiffness includes the screw fastener slip and how this varies with the thickness of the stud. Additionally, with some manufacturers, the deflection of the stud must be added to the deflection from the rotation of the connector in order to arrive at the final deflection for design.

Because we have tested the entire assembly, Simpson Strong-Tie tabulates stiffness that includes connector deflection, fastener slip and stud deflection for walls up to 38" in height. Our stiffness also takes into account the thickness of the stud, making it simple for the designer to calculate deflections: Simply divide the required moment by the tabulated stiffness, and then multiply the result by the stud length (Ref. Example #1 on p. 107). For walls over 38", a different approach is required (Ref. Example #2 on pp. 108–109).



RCKW Kneewall Connectors

Table 1: RCKW Allowable Loads — Concrete Applications

Model No.	Fastener Pattern No.	Anchor Bolt Dia. (in.)	Fasteners to Stud	Framing Members Thickness mil (ga.)	Allowable Moment M (in.-lb.)	Assembly Rotational Stiffness[9,11] β (in.-kip / rad.)	Connector Rotational Stiffness[10,11] β_c (in.-kip / rad.)	Anchor Tension, T, at Allowable Moment (lb.)		Allowable Tension Load F_2 (lb.)	Anchor Tension, T, at Allowable Tension Load, F_2 (lb.)		Allowable Shear Load F_4 (lb.)	Code Ref.
								f'_c = 3,000 psi	f'_c = 4,000 psi		f'_c = 3,000 psi	f'_c = 4,000 psi		
RCKW3	1	(1) ½"	(4) #12	33 (20)	2,425	87	93	1,870	1,790	860	1,080	1,055	620	IBC, LA
				43 (18)	3,080	113	115	2,510	2,355	1,340	1,780	1,705	755	
				54 (16)	4,330	128	137	4,120	3,590	1,850	2,645	2,470	1,120	
				68 (14)	5,150	141	153	6,530[15]	4,570[15]	1,850	2,645	2,470	1,120	
RCKW3 and RCKW3S (stiffener)	2	(1) ½"	(9) #12	33 (20)	3,335	164	175	2,790	2,590	1,310	1,730	1,665	620	
				43 (18)	4,215	164	175	3,935	3,465	1,710	2,390	2,250	795	
				54 (16)	5,160	164	175	6,700[15]	4,585[15]	2,220	3,410	3,085	1,120	
				68 (14)	5,160	164	175	6,700[15]	4,585[15]	2,410	3,875	3,425	1,415	
RCKW5.5	3	(1) ½"	(6) #12	30 (20 DW)[5,6]	3,775	258	280	1,455	1,435	1,030	1,250	1,235	600	
				30 (20 STR)[6]	4,670	260	281	1,830	1,795	1,140	1,395	1,375	665	
				33 (20)	4,670	304	328	1,830	1,795	1,140	1,395	1,375	665	
				43 (18)	6,245	320	338	2,525	2,450	1,440	1,790	1,755	1,035	
				54 (16)	8,225	320	338	3,465	3,320	2,455	3,255	3,125	1,390	
				68 (14)	9,375	417	438	4,065	3,850	2,455	3,255	3,125	1,390	
	3A	(2) ⅜"	(6) #12	30 (20 DW)[5,6]	3,775	258	280	770	765	1,030	1,250	1,235	600	
				30 (20 STR)[6]	4,670	260	281	955	950	1,140	1,395	1,375	665	
				33 (20)	4,670	304	328	955	950	1,140	1,395	1,375	665	
				43 (18)	6,245	333	355	1,285	1,275	1,440	1,790	1,755	1,035	
				54 (16)	8,865	412	439	1,845	1,830	2,455	3,255	3,125	1,390	
				68 (14)	11,620	489	519	2,455[16]	2,420[16]	2,455	3,255	3,125	1,390	
	3B	(2) ½"	(6) #12	30 (20 DW)[5,6]	3,775	258	280	770	765	1,030	1,250	1,235	600	
				30 (20 STR)[6]	4,670	260	281	955	950	1,140	1,395	1,375	665	
				33 (20)	4,670	304	328	955	950	1,140	1,395	1,375	665	
				43 (18)	6,245	333	355	1,285	1,275	1,440	1,790	1,755	1,035	
				54 (16)	9,995	593	651	2,095	2,070	2,455	3,255	3,125	1,390	
				68 (14)	11,630	674	734	2,460	2,420	2,455	3,255	3,125	1,390	
RCKW5.5 and RCKW5.5S (stiffener)	4	(1) ½"	(10) #12	33 (20)	4,855	256	272	1,910	1,870	1,660	2,090	2,040	665	
				43 (18)	8,445	450	490	3,580	3,420	2,165	2,815	2,720	1,035	
				54 (16)	11,575	467	502	5,340[15]	4,930[15]	2,980	4,115	3,895	1,390	
				68 (14)	14,040	511	513	7,105[15]	6,275[15]	2,980	4,115	3,895	1,830	
	4A	(2) ⅜"	(10) #12	33 (20)	4,855	256	272	990	985	1,660	2,090	2,040	665	
				43 (18)	8,445	450	490	1,755	1,740	2,165	2,815	2,720	1,035	
				54 (16)	12,920	530	576	2,750[16]	2,705[16]	2,980	4,115	3,895	1,390	
				68 (14)	14,300	626	678	3,065[16]	3,010[16]	2,980	4,115	3,895	1,830	
	4B	(2) ½"	(10) #12	33 (20)	4,855	256	272	990	985	1,660	2,090	2,040	665	
				43 (18)	8,445	450	490	1,755	1,740	2,165	2,815	2,720	1,035	
				54 (16)	13,455	669	742	2,870	2,820	2,980	4,115	3,895	1,390	
				68 (14)	16,515	867	966	3,585	3,505	2,980	4,115	3,895	1,830	
RCKW7.5	5	(1) ½"	(6) #12	33 (20)	6,445	389	402	1,815	1,790	1,095	1,315	1,300	795	
				43 (18)	8,200	510	536	2,345	2,300	1,280	1,550	1,530	1,200	
				54 (16)	11,400	554	571	3,370	3,275	2,165	2,715	2,655	1,695	
				68 (14)	13,895	605	628	4,225	4,065	2,165	2,715	2,655	1,695	
	5A	(2) ⅜"	(6) #12	33 (20)	6,445	389	402	1,095	1,090	1,095	1,315	1,300	795	
				43 (18)	8,200	510	536	1,400	1,395	1,280	1,550	1,530	1,200	
				54 (16)	12,840	820	868	2,230[16]	2,205[16]	2,165	2,715	2,655	1,695	
				68 (14)	14,920	912	965	2,610[16]	2,575[16]	2,165	2,715	2,655	1,695	
	5B	(2) ½"	(6) #12	33 (20)	6,445	389	402	1,095	1,090	1,095	1,315	1,300	795	
				43 (18)	8,200	510	536	1,400	1,395	1,280	1,550	1,530	1,200	
				54 (16)	13,255	867	927	2,305	2,280	2,165	2,715	2,655	1,695	
				68 (14)	15,640	912	965	2,745	2,705	2,165	2,715	2,655	1,695	
RCKW7.5 and RCKW5.5S (stiffener)	6	(1) ½"	(10) #12	33 (20)	8,705	495	517	2,505	2,450	1,730	2,130	2,095	795	
				43 (18)	10,915	591	623	3,210	3,125	2,255	2,840	2,775	1,200	
				54 (16)	14,045	689	720	4,275	4,115	2,625	3,360	3,265	1,695	
				68 (14)	16,670	689	720	5,245[15]	4,985[15]	2,665	3,420	3,320	2,065	
	6A	(2) ⅜"	(10) #12	33 (20)	8,705	495	517	1,490	1,480	1,730	2,130	2,095	795	
				43 (18)	10,915	591	623	1,885	1,865	2,255	2,840	2,775	1,200	
				54 (16)	17,175	873	930	3,030[16]	2,985[16]	2,625	3,360	3,265	1,695	
				68 (14)	18,370	959	1,011	3,255[16]	3,200[16]	2,665	3,420	3,320	2,065	
	6B	(2) ½"	(10) #12	33 (20)	8,705	495	517	1,490	1,480	1,730	2,130	2,095	795	
				43 (18)	10,915	591	623	1,885	1,865	2,255	2,840	2,775	1,200	
				54 (16)	19,940	923	991	3,550	3,490	2,625	3,360	3,265	1,695	
				68 (14)	22,555	1,040	1,107	4,060	3,975	2,665	3,420	3,320	2,065	

See footnotes on p. 105.

RCKW Kneewall Connectors

RCKW Allowable Load — Concrete Application Footnotes

1. For additional important information, see General Information and Notes on p. 22.
2. The designer is responsible for anchorage design.
3. See illustrations for fastener pattern placement.
4. Tabulated values are based on framing members with track and stud of the same thickness and (1) #10 screw into each stud flange unless otherwise noted.
5. Tabulated values may be used for framing members with track and stud of thickness 20 mil, F_y = 57 ksi (20 EQ).
6. Tabulated values are applicable for framing members with CFS track of thickness 20 mil, F_y = 57 ksi (20 EQ).
7. EQ — equivalent, DW — drywall, STR — structural.
8. Tabulated moment values correspond to maximum connector strength without consideration of serviceability. designer must check out-of-plane deflections using tabulated Rotational Stiffness.
9. Tabulated Assembly Rotational Stiffness is applicable for walls at 38" tall with corresponding framing member depth and thickness. Reference Example #1 on p. 107.
10. Tabulated Connector Rotational Stiffness may be used for any wall heights; the designer must consider member deflection due to bending in the stud member. Reference Example #2 on pp. 108–109.
11. Per IBC 2015 Table 1604.3 footnote f, wind load is permitted to be taken as 0.42 times "component and cladding loads" for deflection checks. For IBC 2009 and earlier, the factor is 0.7 instead of 0.42. Tabulated values have not been adjusted.
12. Anchor tension, T, is the force in the anchor, or both anchors for two-anchor solutions, at maximum allowable, M, or maximum allowable tension, F_2.
13. Tabulated values for anchor tension, T, at allowable tension load, F_2, are provided for total anchor tension for (1) anchor and (2) anchors. See p. 110 for anchorage design tables and illustrations.
14. Anchor tension is calculated using AISC Steel Design Guide 1. The 'Anchor Bolt Design' illustration (Figures A and B) shows the anchor tension, T, based on an applied moment, M. An illustration for the anchor tension, T, based on a vertical tension load, F_2, shown in Figure C.
15. Tabulated allowable tension loads for the connectors with ½"-diameter anchor bolts require ASTM F3125, Grade A325 or ASTM A449 high-strength bolts. For A307 Grade A bolt, anchor tension load is limited to 4,410 lb.
16. Tabulated allowable tension loads for the connectors with ⅜"-diameter anchor bolts require ASTM F3125, Grade A325 or ASTM A449 high-strength bolts. For A307 Grade A bolt, anchor tension load is limited to 2,200 lb.
17. Anchor tension, T, may be interpolated.

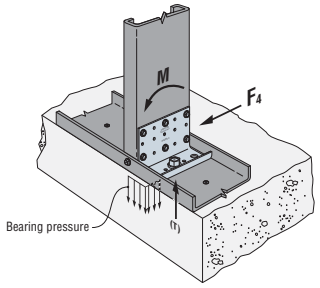


Figure A — Anchor Tension, T, Created from Moment *(one anchor)*

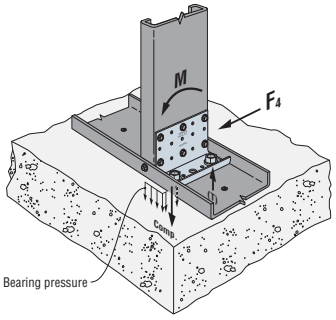


Figure B — Anchor Tension, T, Created from Moment *(two anchors)*

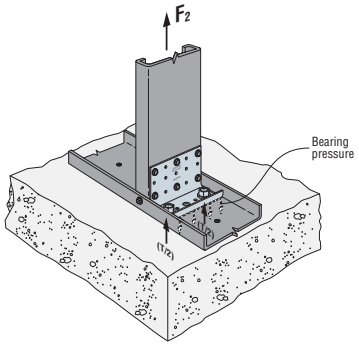
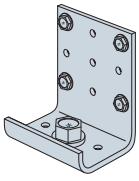
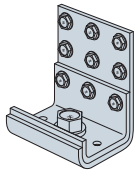


Figure C — Anchor Tension, T, Created from F_2

RCKW3 and RCKW3S Options

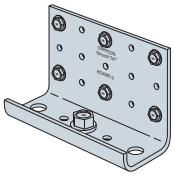


RCKW3
Fastener Pattern 1

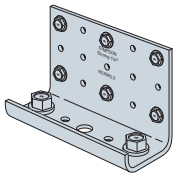


RCKW3 with RCKW3S
Fastener Pattern 2

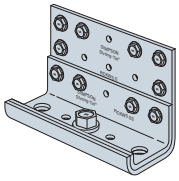
RCKW5.5 and RCKW5.5S Options



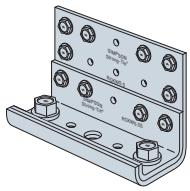
RCKW5.5
Fastener Pattern 3



RCKW5.5
Fastener Pattern 3A, 3B

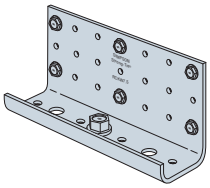


RCKW5.5 with RCKW5.5S
Fastener Pattern 4

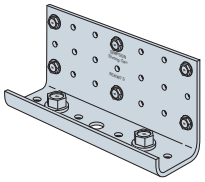


RCKW5.5 with RCKW5.5S
Fastener Pattern 4A, 4B

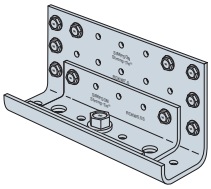
RCKW7.5 and RCKW5.5S Options



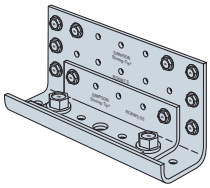
RCKW7.5
Fastener Pattern 5



RCKW7.5
Fastener Pattern 5A, 5B

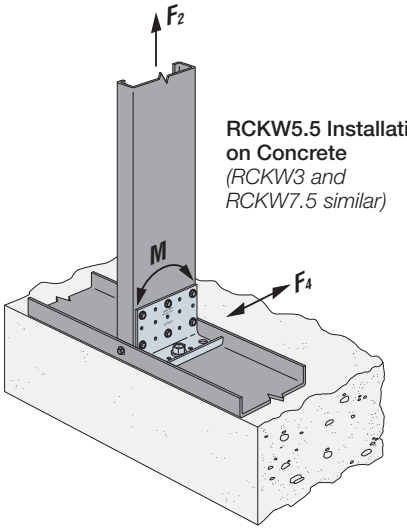


RCKW7.5 with RCKW5.5S
Fastener Pattern 6

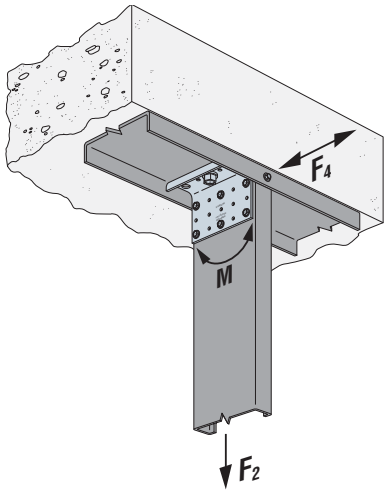


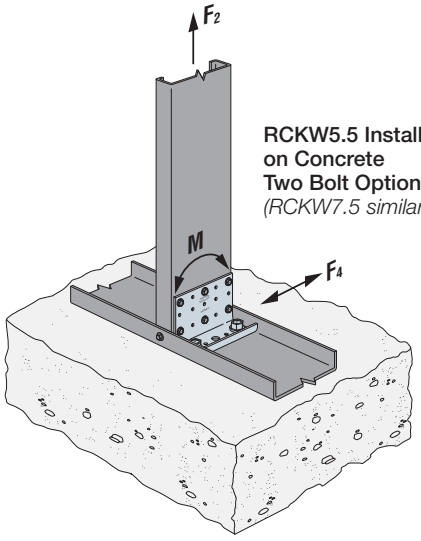
RCKW7.5 with RCKW5.5S
Fastener Pattern 6A, 6B

RCKW Kneewall Connectors

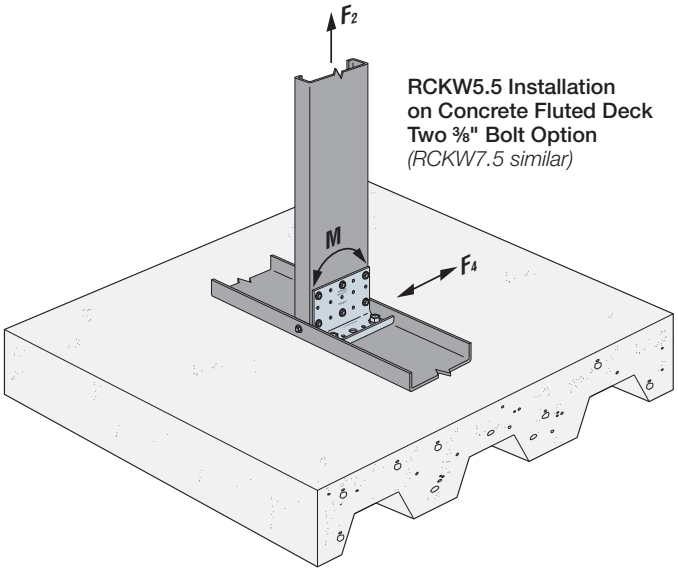


RCKW5.5 Installation on Concrete
(RCKW3 and RCKW7.5 similar)

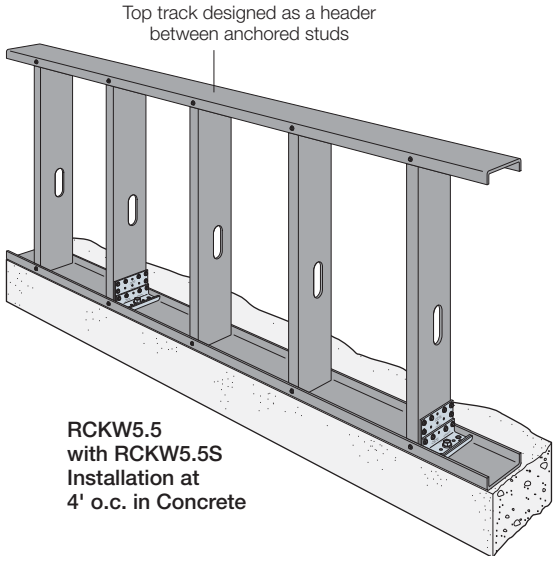




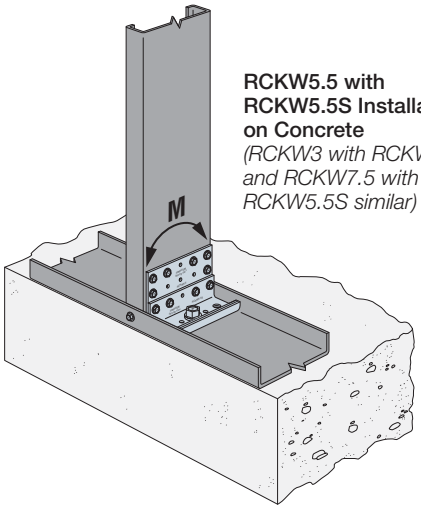
RCKW5.5 Installation on Concrete Two Bolt Option
(RCKW7.5 similar)



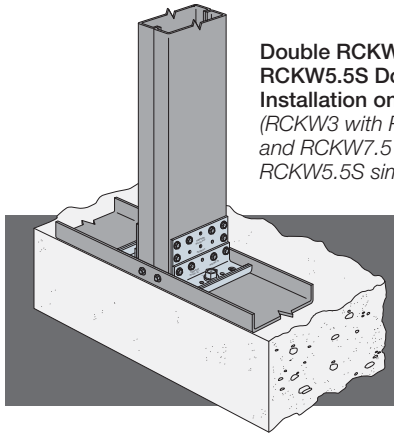
RCKW5.5 Installation on Concrete Fluted Deck Two ⅜" Bolt Option
(RCKW7.5 similar)



RCKW5.5 with RCKW5.5S Installation at 4' o.c. in Concrete



RCKW5.5 with RCKW5.5S Installation on Concrete
(RCKW3 with RCKW3S and RCKW7.5 with RCKW5.5S similar)



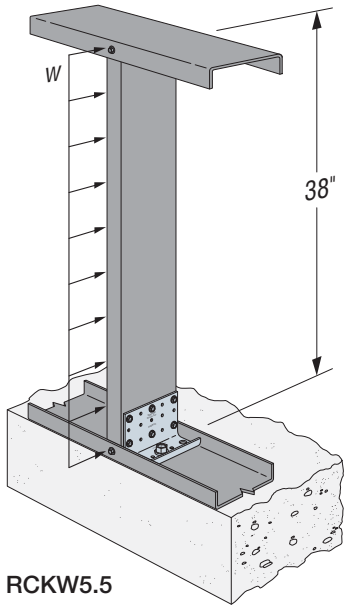
Double RCKW5.5 with RCKW5.5S Double-Stud Installation on Concrete
(RCKW3 with RCKW3S and RCKW7.5 with RCKW5.5S similar)

Need to replace a prefabricated post, or having trouble with concrete anchorage? Consider using this detail.

Example #1: Exterior Parapet Stud

Given:

- 2015 IBC (ASCE 7-10 and AISI S100-2012)
- 600S162-33 (33 ksi) studs @ 16" o.c. supported at the base
- Parapet height, L = 38"-tall studs
- Wind design pressure = 49.67 psf (LRFD)
- Deflection Limits, Δ_{allow} = L/240 (Ref. IBC Table 1604.3)
- 3,000 psi concrete, cracked, SDC A&B, 3" anchor edge



RCKW5.5

Calculations:

Determine ASD wind pressure:

$p = (0.6)(49.67\ psf) = 29.8\ psf$

Note: 2015 IBC load combinations for ASD include a factor of 0.6 for wind loads.

$$w = (29.8\ psf)\frac{16\ in.}{12\ in.} = 39.7\ plf$$

Determine Required Moment:

$$M_{req} = \frac{wL^2}{2} = \frac{(39.7\ plf)(38\ in.)^2}{2\left(12\frac{in.}{ft.}\right)} = 2{,}389\ in.\text{-}lb.$$

From Table 1 (p. 104) for 600S162-33,
6"-deep 33-mil stud:

- Select RCKW5.5 connector, fastener pattern 3, with ½" anchor diameter and (6) #12 self-drilling screws, attaching to each stud @ 16" o.c.
- Allowable Moment = 4,670 in.-lb. > 2,389 in.-lb. **OK**
- Assembly Rotational Stiffness, β = 304,000 in.-lb. / rad. for RCKW5.5 connector at 38" wall height

Check Deflection at Required Moment:

$$\Delta_{req} = \left(\frac{(0.7)(M_{req})}{\beta}\right)L = \left(\frac{(0.7)(2{,}389\ in.\text{-}lb.)}{304{,}000\frac{in.\text{-}lb.}{rad.}}\right)38\ in. = 0.209\ in.$$

Note: Per IBC Table 1604.3 footnote f, 0.42 factor can be used to calculate deflections for components and cladding wind loads for LRFD loads. ASD load conversion is 0.7.

Allowable Deflection:

$$\Delta_{allow} = \frac{2L}{240} = \frac{2(38\ in.)}{240} = 0.317\ in. > 0.209\ in.$$ **OK**

Computer-Assisted Design Note:
Please use kneewall module in Simpson Strong-Tie® CFS Designer™.

Select Anchorage:

Normal weight concrete with f'_c = 3,000 psi
Table 2A (p. 111) — Cracked Concrete, Wind and Seismic in SDC A&B

Titen HD® with 3¼" embedment

V_a = 39.7*38/12=125.7 lb.

N_a = 2,389/4,670*1,830 = 936 (interpolate from Table 1 (p. 104))

V_{al} = 930*0.86 = 799.8

N_{al} = 1,335*0.86 = 1,148.1

***Note:** 0.86 comes from note 11, Table 2A (p. 112) (3,000 psi concrete)

V_a/V_{al} = 125.7/799.8 = 0.16 < 1 **OK**

N_a/N_{al} = 936/1,148.1 = 0.82 < 1 **OK**

Interaction = 0.16 + 0.82 = 0.98 < 1.2 **OK**

Example #2: High Interior Half-Wall — Concrete Slab, No Edge, Two Anchor

Given:

- 2015 IBC (ASCE 7-10 and AISI S100-2012)
- The top track 600T125-54 (50 ksi) spans between 600S162-54 (50 ksi) studs @ spacing, S = 32" o.c. supported at the base
- 6" drywall studs at 16" o.c. as infill between the bottom and top track
- Wall height, L = 48"-tall studs
- Design Load: w = 50 plf or P = 200 lb. concentrated load for guard or handrail applications in accordance with Section 4.5.1 of ASCE (Ref. IBC 1607.8.1 and 1607.8.1.1)
- Deflection Limit, Δ_{allow} = L/120 (Ref. IBC Table 1604.3)
- 4,000 psi NWC, uncracked A&B, no edge, 5" concrete thickness

Calculations:

Design criteria #1 for linear load of 50 lb./ft.

Determine Required Concentrated Load, P_{req}:

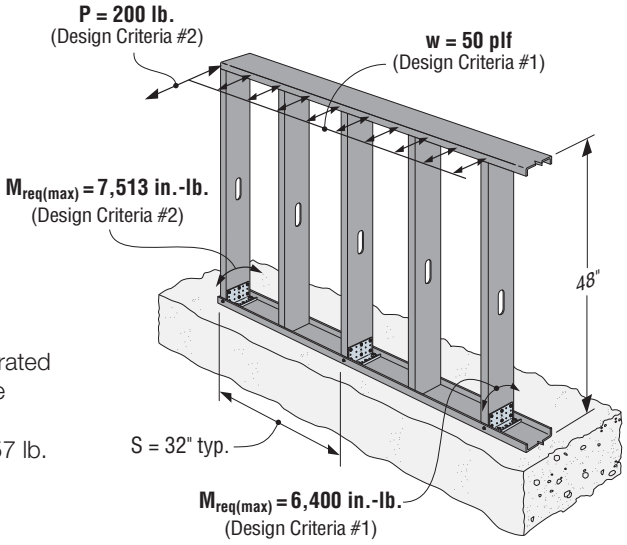
$$P = (w)(S) = (50\ plf)(32\ in.)\left(\frac{1\ ft.}{12\ in.}\right) = 133.3\ lb.$$

Determine Required Moment, M_{req}:

$$M_{req} = (P_{req})(L) = (133.3\ lb.)(48\ in.) = 6{,}400\ in.\text{-}lb.$$

Design criteria #2 for concentrated load of 200 lb.

Note: From a 3D structural analysis with the 200 lb. concentrated load at the end stud, a continuous top track distributes some load to adjacent studs so that the worst-case moment is $M_{req(max)}$ = 7,513 in.-lb. and maximum shear is $V_{req(max)}$ = 157 lb. as indicated in the illustration.



RCKW5.5 Installation on Concrete

From Table 1 (p. 104) for 600S162-54, 6"-deep, 54-mil stud:

- Select a RCKW5.5 connector, screw pattern 3B with (6) #12 self-drilling screws and (2) ½"-diameter anchors
- Allowable Moment = 9,995 in.-lb. > 6,400 in.-lb. (for linear load) **OK**
- Allowable Moment = 9,995 in.-lb. > 7,513 in.-lb. (for concentrated load) **OK**
- Connector Rotational Stiffness β_c = 651,000 in.-lb. / rad.

Check Deflection for Design Criteria #1 at Required Load:

Determine Stud Deflection, Δ_s, at P_{req} = 133.3 lb.

$$\Delta_s = \frac{P_{req}L^3}{3EI_{xe}} = \left(\frac{(133.3\ lb.)(48\ in.)^3}{3(29{,}500{,}000\ psi)(2.86\ in.^4)}\right) = 0.058\ in.$$

Note: Effective moment of inertia for a 600S162-54 stud is I_{xe} = 2.86 in.^{4}

Determine Connector Deflection, Δ_c, at M_{req} = 6,400 in.-lb. by utilizing the Connector Rotational Stiffness, β_c = 651,000 in.-lb. / rad. for RCKW5.5.

$$\Delta_c = \frac{M_{req}}{\beta_c}L = \frac{6{,}400\ in.\text{-}lb.}{651{,}000\ \frac{in.\text{-}lb.}{rad.}}(48\ in.) = 0.472\ in.$$

Note: The Connector Rotational Stiffness may be used for any wall height; the designer must consider member deflection due to bending in the stud member. See footnote 10 of Table 1 (p. 105).

Example #2: High Interior Half-Wall — Concrete Slab, No Edge, Two Anchor (cont.)

Total Deflection is the sum of the Stud Deflection and the Connector Deflection.

$$\Delta_{total} = \Delta_s + \Delta_c = 0.058\ in. + 0.472\ in. = 0.53\ in.$$

Allowable Deflection:

$$\Delta_{allow} = \frac{2L}{120} = \frac{(2)(48\ in.)}{120} = 0.800\ in. > 0.53\ in.$$ **OK**

Check Deflection for Design Criteria #2 at Required Load:

Determine Stud Deflection, Δ_s, at M_{req} = 7,513 in.-lb. from concentrated load.

$$\Delta_s = \frac{M_{req}L^2}{3EI_{xe}} = \left(\frac{(7{,}513\ in.\text{-}lb.)(48\ in.)^2}{3(29{,}500{,}000\ psi)(2.86\ in.^4)}\right) = 0.068\ in.$$

Determine Connector Deflection, Δ_c, at M_{req} = 7,513 in.-lb. by utilizing the Connector Rotational Stiffness, β_c = 651,000 in.-lb. / rad. for RCKW5.5.

$$\Delta_c = \frac{M_{req}}{\beta_c} L = \frac{7{,}513\ in.\text{-}lb.}{651{,}000\ \frac{in.\text{-}lb.}{rad.}} (48\ in.) = 0.554\ in.$$

Total Deflection is the sum of Stud Deflection and Connector Deflection.

$$\Delta_{total} = \Delta_s + \Delta_c = 0.068\ in. + 0.554\ in. = 0.622\ in.$$

Allowable Deflection:

$$\Delta_{allow} = \frac{2L}{120} = \frac{(2)(48\ in.)}{120} = 0.800\ in. > 0.622\ in.$$ **OK**

Select Anchorage:

Normal-weight concrete with f'_c = 4,000 psi
Table 2A (p. 110) — Uncracked Concrete Wind and Seismic in SDC A&B (2) ½"-diameter Titen HD® with 3¼" embedment
V_a = 157 lb.
V_{al} = 3,765 lb. Table 2A (p. 9) two anchors assumed to act in shear with no edge condition.
V_a/V_{al} = 157 lb./3,765 lb. = 0.04 < 1 **OK**
Interpolation of N_a, anchor tension, at M = 7,513 in.-lb.
N_a = 7,513/9,995*2,070 = 1,556 lb. Table 1 (p. 104)
N_{al} = 2,130 lb. Table 2A (p. 110) **Only one-anchor acts in tension with no edge condition.**
N/N_{al} = 1,556 lb. / 2,130 lb. = 0.73 < 1 **OK**
Interaction = 0.04 + 0.73 = 0.77 < 1.2 **OK**

Note: Per ASCE Section 4.5.1, for handrail and guardrail systems, there is no need to apply the 50 plf linear load and the 200 lb. concentrated load concurrently. Example #2 demonstrates the design for both loading cases, and the outermost anchored stud governs when using the 200 lb. concentrated load.

Computer-Assisted Design Note:
Please use kneewall module in Simpson Strong-Tie® CFS Designer™.

RCKW Kneewall Connectors

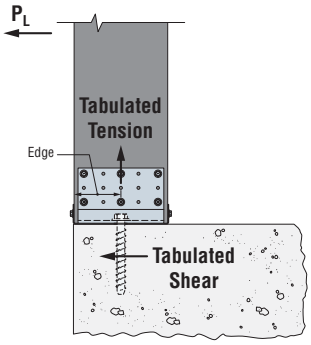


Figure 2A-1
Single Anchor — One Anchor Shear, One Anchor Tension
(tension from moment created from P_L)

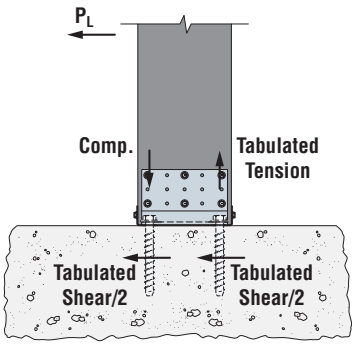


Figure 2A-2
Two Anchors — Two Anchors Shear, One Anchor Tension
(tension from moment created from P_L)

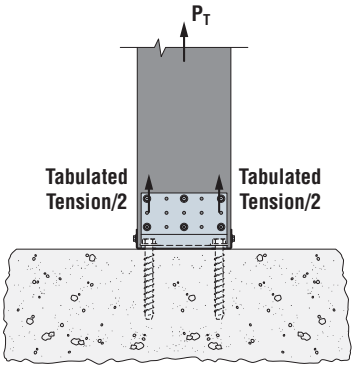


Figure 2A-3
Two Anchors — Two Anchors Tension
(tension created from P_T)

Table 2A: RCKW Allowable Tension and Shear Loads Using ½"-Diameter Anchor

Model No. (Min. Anchor Edge Distance)	Type of Concrete	Load Type	No. of ½"-Diameter Anchor (Acting in Load Type Indicated)	Allowable Tension and Shear Load (lb.)										
				Titen HD®	Titen HD	Strong-Bolt® 2	AT-XP®	SET-XP®	SET-3G™	SET-XP	SET-3G	AT-XP	SET-XP	SET-3G
				Minimum Concrete Thickness, h_{min} (in.)										
				5	6	6	6	6	6	6½	6½	9½	9½	9½
				Nominal Embedment Depth, h_{nom} (in.)										
				3¼	3¾	3⅞	3½	3½	4¾	4	5¼	7	7	8¼
Uncracked Concrete, Wind and Seismic in SDC A and B[8,10] (f'_c = 4,000 psi)														
RCKW3 (Edge = 1⅞")	SLWC	Tension	1	815	910	—	435	525	525	—	—	—	—	—
		Shear	1	410	425	—	445	445	455	—	—	—	—	—
	NWC	Tension	1	1,200	1,340	—	855	960	1,005	—	—	—	—	—
		Shear	1	605	625	—	655	655	675	—	—	—	—	—
RCKW5.5 (Edge = 3")	SLWC	Tension	1	1,270	1,465	—	655	780	760	—	—	—	—	—
		Shear	1	815	915	—	960	960	985	—	—	—	—	—
	NWC	Tension	1	1,865	2,150	—	1,280	1,495	1,435	—	—	—	—	—
		Shear	1	1,305	1,350	—	1,410	1,410	1,450	—	—	—	—	—
RCKW7.5 (Edge = 4")	SLWC	Tension	1	1,450	1,800	1,415	875	1,025	995	—	—	—	—	—
		Shear	1	1,245	1,410	1,465	1,480	1,480	1,520	—	—	—	—	—
	NWC	Tension	1	2,130	2,645	2,080	1,720	1,925	1,870	—	—	—	—	—
		Shear	1	1,830	2,075	2,160	1,880	1,880	1,925	—	—	—	—	—
RCKW All models (no edge)	SLWC	Tension	1	1,450	1,865	1,765	1,470	1,830	2,815	2,090	3,110	2,940	3,660	3,705
			2	2,375	2,875	3,525	2,020	2,445	3,730	2,795	4,120	4,045	4,890	6,480
		Shear	1	1,560	2,685	2,820	1,925	1,925	1,925	1,925	1,925	1,925	1,925	1,925
			2	2,560	5,370	5,645	3,855	3,855	3,855	3,855	3,855	3,855	3,855	3,855
	NWC	Tension	1	2,130	2,745	2,595	2,885	3,355	3,705	3,705	3,705	3,705	3,705	3,705
			2	3,495	4,225	5,185	3,965	4,795	6,985	5,475	7,410	7,410	7,410	7,410
		Shear	1	2,295	2,685	2,820	1,925	1,925	1,925	1,925	1,925	1,925	1,925	1,925
			2	3,765	5,370	5,645	3,855	3,855	3,855	3,855	3,855	3,855	3,855	3,855

Table continued on next page.

Table 2A: RCKW Allowable Tension and Shear Loads Using ½"-Diameter Anchor (cont.)

Model No. (Min. Anchor Edge Distance)	Type of Concrete	Load Type	No. of ½"-Diameter Anchor (Acting in Load Type Indicated)	Allowable Tension and Shear Load (lb.)										
				Titen HD®	Titen HD	Strong-Bolt® 2	AT-XP®	SET-XP®	SET-3G™	SET-XP	SET-3G	AT-XP	SET-XP	SET-3G
				Minimum Concrete Thickness, h_{min} (in.)										
				5	6	6	6	6	6	6½	6½	9½	9½	9½
				Nominal Embedment Depth, h_{nom} (in.)										
				3¼	3¾	3⅞	3½	3½	4¾	4	5¼	7	7	8¼
Cracked Concrete, Wind and Seismic in SDC A and B[8,10] (f'_c = 4,000 psi)														
RCKW3 (Edge = 1⅞")	SLWC	Tension	1	585	645	—	355	—	585	320	645	710	560	1,015
		Shear	1	295	305	—	320	—	325	325	325	325	325	325
	NWC	Tension	1	860	950	—	700	—	1,145	630	1,265	1,395	1,100	1,985
		Shear	1	430	445	—	465	—	480	480	480	480	480	480
RCKW5.5 (Edge = 3")	SLWC	Tension	1	910	1,040	—	535	—	840	465	930	1,065	815	1,460
		Shear	1	635	655	—	685	—	705	705	705	705	705	705
	NWC	Tension	1	1,335	1,530	—	1,045	—	1,650	915	1,820	2,090	1,600	2,815
		Shear	1	930	965	—	1,010	—	1,035	1,035	1,035	1,035	1,035	1,035
RCKW7.5 (Edge = 4")	SLWC	Tension	1	1,025	1,280	1,255	715	—	1,100	615	1,220	1,435	1,075	1,915
		Shear	1	890	1,010	1,050	1,055	—	1,085	1,085	1,085	1,085	1,085	1,085
	NWC	Tension	1	1,510	1,880	1,845	1,405	—	2,160	1,205	2,390	2,810	2,110	3,370
		Shear	1	1,310	1,485	1,540	1,550	—	1,595	1,595	1,595	1,595	1,595	1,595
RCKW All models (no edge)	SLWC	Tension	1	1,025	1,320	1,255	960	—	1,710	925	1,890	1,915	1,615	2,970
			2	1,685	2,035	2,505	1,315	—	2,265	1,240	2,505	2,630	2,170	3,940
		Shear	1	1,105	2,465	2,820	1,925	—	1,925	1,925	1,925	1,925	1,925	1,925
			2	1,815	4,380	5,500	3,350	—	3,855	3,155	3,855	3,855	3,855	3,855
	NWC	Tension	1	1,510	1,945	1,845	1,880	—	3,355	1,810	3,705	3,705	3,170	3,705
			2	2,475	2,990	3,685	2,580	—	4,445	2,430	4,915	5,160	4,250	7,410
		Shear	1	1,625	2,685	2,820	1,925	—	1,925	1,925	1,925	1,925	1,925	1,925
			2	2,665	5,370	5,645	3,855	—	3,855	3,855	3,855	3,855	3,855	3,855
Cracked Concrete, Seismic in SDC C Through F[9,10] (f'_c = 4,000 psi)														
RCKW3 (Edge = 1⅞")	SLWC	Tension	1	205	225	—	105	—	185	110	205	210	195	320
		Shear	1	135	140	—	150	—	150	150	150	150	150	150
	NWC	Tension	1	300	335	—	210	—	360	220	400	415	385	625
		Shear	1	200	210	—	220	—	225	225	225	225	225	225
RCKW5.5 (Edge = 3")	SLWC	Tension	1	320	365	—	160	—	265	165	295	315	285	460
		Shear	1	295	305	—	320	—	330	330	330	330	330	330
	NWC	Tension	1	470	535	—	310	—	520	320	575	620	560	900
		Shear	1	435	450	—	470	—	485	485	485	485	485	485
RCKW7.5 (Edge = 4")	SLWC	Tension	1	360	450	440	215	—	345	215	385	425	375	605
		Shear	1	415	470	490	495	—	505	505	505	505	505	505
	NWC	Tension	1	530	660	645	420	—	680	420	750	835	740	1,180
		Shear	1	610	690	720	725	—	675	700	675	745	700	675
RCKW All models (no edge)	SLWC	Tension	1	360	465	440	285	—	540	325	595	570	565	935
			2	590	710	875	390	—	715	435	790	785	760	1,240
		Shear	1	515	805	1,185	765	—	675	700	675	765	700	675
			2	845	1,610	2,225	1,330	—	1,350	1,405	1,350	1,530	1,405	1,350
	NWC	Tension	1	530	680	645	560	—	1,055	635	1,170	1,115	1,110	1,730
			2	865	1,045	1,290	770	—	1,400	850	1,550	1,535	1,490	2,435
		Shear	1	760	805	1,185	765	—	675	700	675	765	700	675
			2	1,245	1,610	2,370	1,530	—	1,350	1,405	1,350	1,530	1,405	1,350

See footnotes on p. 112.

RCKW Kneewall Connectors

Table 2B: RCKW Allowable Tension and Shear Loads Using (2) ⅜"-Diameter Anchors

Model No. (Min. Anchor Edge Distance)	Type of Concrete	Load Type	No. of ⅜"-Diameter Anchor (Acting in Load Type Indicated)	Allowable Tension and Shear Load (lb.)		
				Titen HD®	Strong-Bolt® 2	SET-3G™
				Minimum Concrete Thickness, h_{min} (in.)		
				4 Slab and 3¼ Top of Metal Deck	4	4
				Nominal Embedment Depth, h_{nom} (in.)		
				2½	2¼	2¾
Uncracked Concrete, Wind and Seismic in SDC A and B[8,10] (f'_c = 4,000 psi)						
RCKW5.5 RCKW7.5 (no edge)	SLWC	Tension	1	905	885	1,410
			2	1,750	1,765	2,010
		Shear	1	1,020	700	1,060
	NWC	Tension	1	1,330	1,300	2,035
			2	2,575	2,595	3,935
		Shear	1	1,500	700	1,060
Cracked Concrete, Wind and Seismic in SDC A and B[8,10] (f'_c = 4,000 psi)						
RCKW5.5 RCKW7.5 (no edge)	SLWC	Tension	1	415	620	820
			2	830	1,245	1,170
		Shear	1	725	700	1,060
	NWC	Tension	1	610	915	1,610
			2	1,220	1,830	2,295
		Shear	1	1,065	700	1,060
Cracked Concrete, Seismic in SDC C Through F[9,10] (f'_c = 4,000 psi)						
RCKW5.5 RCKW7.5 (no edge)	SLWC	Tension	1	145	220	290
			2	290	435	410
		Shear	1	335	330	370
	NWC	Tension	1	215	320	565
			2	425	640	805
		Shear	1	480	330	370

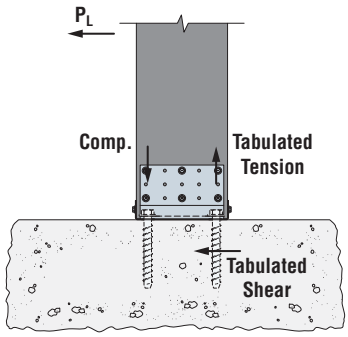


Figure 2B-1
Two Anchors — One Anchor Shear, One Anchor Tension**
(tension from moment created from P_L)
***One anchor acting in shear due to ⅜" anchor in larger hole.*

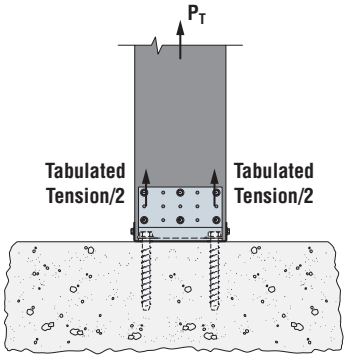
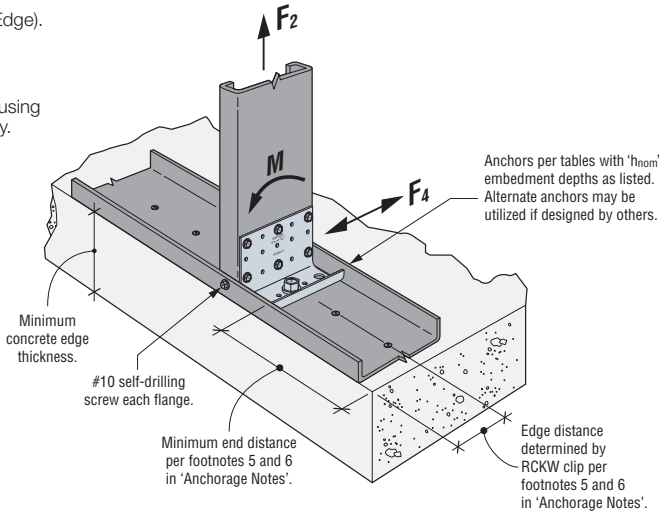


Figure 2B-2
Two Anchors — Two Anchors Tension
(tension created from P_T)

Table 2A and 2B Notes:

1. Anchor Allowable Loads have been determined using ACI 314-14 Chapter 17 anchorage calculations with the minimum concrete compressive strength, f'_c, and slab thickness listed. Sand-Lightweight Concrete is abbreviated as 'SLWC', Normal Weight Concrete is abbreviated as 'NWC'.
2. Load values are for anchor based on ACI 318-14, condition B, load factors from ACI 318 Section 5.3, no supplemental edge reinforcement, $\Psi_{c,V}$ = 1.0 for cracked concrete and periodic special inspection. Reference ICC-ES or IAPMO-UES evaluation reports for further information.
3. Load values are based on short-term temperature range of 150°F, 160°F and 180°F for SET-XP®, SET-3G and AT-XP® adhesives, respectively. Long-term temperature range is assumed to be 110°F for SET-XP, SET-3G and AT-XP adhesives.
4. Allowable Stress Design (ASD) values were determined by multiplying calculated Strength Design values by a conversion factor, Alpha (α), of 0.7 for seismic loads and 0.6 for wind loads. ASD values for other load combinations may be determined using alternate conversion factors.
5. End distances are assumed as 1.5 x Min. Edge Distance in one direction and 'N/A' in the other direction. See figure on this page.
6. Edge and end distances are assumed as 'N/A' in all directions at locations for (No Edge).
7. Tabulated anchorage capacities for RCKW models shown are applied to the same model size with stiffener. For example, a value for model RCKW3 is equivalent to model RCKW3 and RCKW3S.
8. Tabulated allowable ASD loads for Wind and Seismic in SDC A and B are based on using wind conversion factors and may be increased by 1.17 for seismic SDC A and B only.
9. Allowable loads have been divided by an Omega (Ω) seismic factor of 2.5 for brittle failure as required by ACI 318-14 Chapter 17, unless steel failure governs.
10. Tabulated capacities are based on maximum allowable anchorage loads only. The capacity of the connection system shall be the minimum of the tabulated value and the RCKW allowable load value listed on p. 104.
11. Tabulated loads in Tables 2A and 2B are based on f'_c = 4,000 psi. For f'_c = 3,000 psi, use an adjustment factor of 0.86 for the blue shaded values and 1.0 for all other values.
12. For anchor subjected to both tension and shear loads, it shall be designed to satisfy following:
    – For $N_a / N_{al} \le 0.2$, the full allowable load in shear is permitted.
    – For $V_a / V_{al} \le 0.2$, the full allowable load in tension is permitted.
    – For all other cases: $N_a / N_{al} + V_a / V_{al} \le 1.2$.
    where:
    N_a = Applied ASD tension load
    N_{al} = Allowable tension load from Table 2A or 2B
    V_a = Applied ASD shear load
    V_{al} = Allowable shear load from Table 2A or 2B.

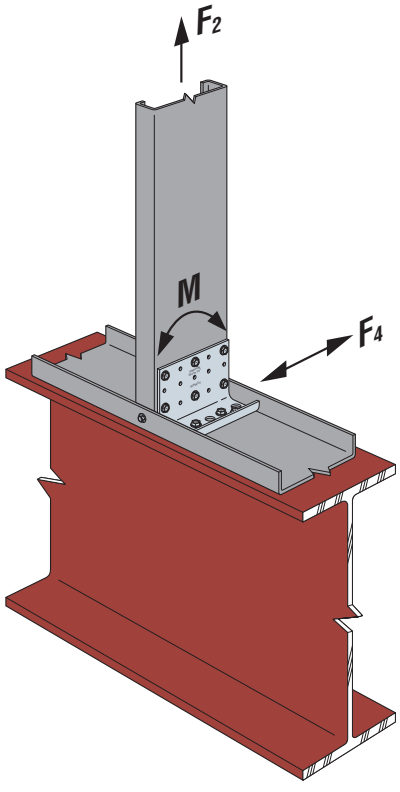


RCKW Kneewall Connectors

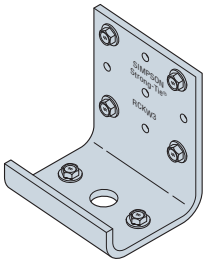
Table 3: RCKW Allowable Loads — Steel Applications with Anchorage

Model No.	Framing Member Depth (in.)	Fastener to Structural Steel[2]	Fastener to Stud[3]	Framing Member Thickness mil (ga.)	Allowable Moment[4,5] M (in.-lb.)	Assembly Rotational Stiffness[6,8] β (in.-lb./rad)	Connector Rotational Stiffness[7,8] β_c (in.-lb./rad)	Allowable Tension Load F_2 (lb.)	Allowable Shear Load F_4 (lb.)	Code Ref.
RCKW3	3.625	(2) #12	(4) #12	33 (20)	2,105	55,500	58,000	850	455	—
				43 (18)	2,570	73,300	76,700	1,225	745	
				54 (16)	2,690	87,260	91,200	1,115	1,115	
RCKW5.5	6.00	(4) #12	(6) #12	33 (20)	5,165	199,200	209,200	1,245	650	
				43 (18)	6,370	272,600	287,100	1,900	1,060	
				54 (16)	6,430	255,900	266,100	2,000	1,295	
RCKW7.5	8.00	(6) #12	(6) #12	33 (20)	7,030	456,700	483,200	965	655	
				43 (18)	9,595	571,600	603,600	1,950	1,135	
				54 (16)	11,320	693,600	731,600	2,185	1,710	

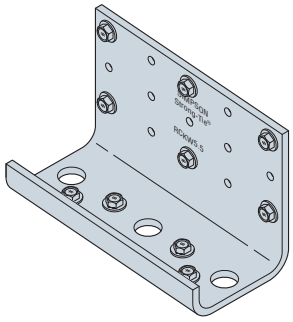
1. For additional important information, see General Information and Notes on p. 22.
2. Designer is responsible for structural steel design.
3. See illustrations for fastener patterns.
4. Tabulated values are based on framing members with track and stud of the same thickness and #10 screws into each stud flange.
5. Tabulated moment values correspond to the maximum connector strength without consideration of serviceability. Designer must check out-of-plane deflections using tabulated Rotational Stiffness.
6. Tabulated Assembly Rotational Stiffness is for walls at 38" tall.
7. The tabulated Connector Rotational Stiffness is for any wall heights. The designer must consider member deflection due to bending in the stud.
8. Per IBC 2015 Table 1604.3 footnote f, wind load is permitted to be taken as 0.42 times "component and cladding loads" for deflection checks. For IBC 2009 and earlier, the factor is 0.7 instead of 0.42.



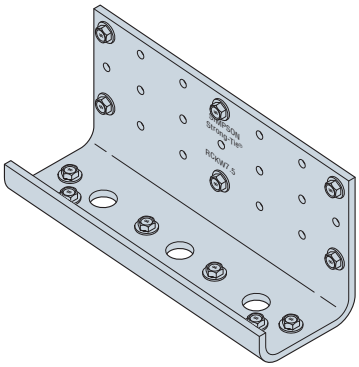
RCKW5.5 Installation on Structural Steel
(RCKW3 and RCKW7.5 similar)



RCKW3 Screw Pattern for Steel Anchorage



RCKW5.5 Screw Pattern for Steel Anchorage

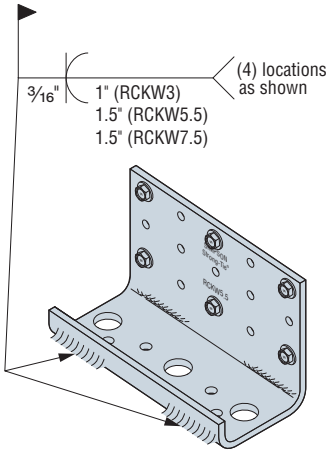


RCKW7.5 Screw Pattern for Steel Anchorage

RCKW Kneewall Connectors

Table 4: RCKW Allowable Loads — Steel Applications with Bolted or Welded Anchorage

Model No.	Fastener Pattern No.	Anchor Bolt Diameter or Weld to Structural Steel	Fasteners to Stud	Framing Members Thickness mil (ga.)	Allowable Moment M (in.-lb.)	Assembly Rotational Stiffness[6,8] β (in.-kip/rad.)	Connector Rotational Stiffness[7,8] β_C (in.-kip/rad.)	Allowable Tension Load F_2 (lb.)	Allowable Shear Load F_4 (lb.)
RCKW3	1	(1) ½" or (4) 1" weld	(4) #12	33 (20)	2,425	87	93	860	620
				43 (18)	3,080	113	115	1,340	755
				54 (16)	4,330	128	137	1,850	1,120
				68 (14)	5,150	141	153	1,850	1,120
RCKW3 and RCKW3S (stiffener)	2	(1) ½"	(9) #12	33 (20)	3,335	164	175	1,310	620
				43 (18)	4,215	164	175	1,710	795
				54 (16)	5,160	164	175	2,220	1,120
				68 (14)	5,160	164	175	2,410	1,415
RCKW5.5	3	(1) ½"	(6) #12	33 (20)	4,670	304	328	1,140	665
				43 (18)	6,245	320	338	1,440	1,035
				54 (16)	8,225	320	338	2,455	1,390
				68 (14)	9,375	417	438	2,455	1,390
	3B	(2) ½" or (4) 1½" weld	(6) #12	33 (20)	4,670	304	328	1,140	665
				43 (18)	6,245	333	355	1,440	1,035
				54 (16)	9,995	593	651	2,455	1,390
				68 (14)	11,630	674	734	2,455	1,390
RCKW5.5 and RCKW5.5S (stiffener)	4	(1) ½"	(10) #12	33 (20)	4,855	256	272	1,660	665
				43 (18)	8,445	450	490	2,165	1,035
				54 (16)	11,575	467	502	2,980	1,390
				68 (14)	14,040	511	513	2,980	1,830
	4B	(2) ½"	(10) #12	33 (20)	4,855	256	272	1,660	665
				43 (18)	8,445	450	490	2,165	1,035
				54 (16)	13,455	669	742	2,980	1,390
				68 (14)	16,515	867	966	2,980	1,830
RCKW7.5	5	(1) ½"	(6) #12	33 (20)	6,445	389	402	1,095	795
				43 (18)	8,200	510	536	1,280	1,200
				54 (16)	11,400	554	571	2,165	1,695
				68 (14)	13,895	605	628	2,165	1,695
	5B	(2) ½" or (4) 1½" weld	(6) #12	33 (20)	6,445	389	402	1,095	795
				43 (18)	8,200	510	536	1,280	1,200
				54 (16)	13,255	867	927	2,165	1,695
				68 (14)	15,640	912	965	2,165	1,695
RCKW7.5 and RCKW5.5S (stiffener)	6	(1) ½"	(10) #12	33 (20)	8,705	495	517	1,730	795
				43 (18)	10,915	591	623	2,255	1,200
				54 (16)	14,045	689	720	2,625	1,695
				68 (14)	16,670	689	720	2,665	2,065
	6B	(2) ½"	(10) #12	33 (20)	8,705	495	517	1,730	795
				43 (18)	10,915	591	623	2,255	1,200
				54 (16)	19,940	923	991	2,625	1,695
				68 (14)	22,555	1,040	1,107	2,665	2,065



1. For additional important information, see General Information and Notes on p. 22.
2. Designer is responsible for structural steel design.
3. See illustrations on p. 105 for stud fastener patterns. For weld pattern to steel beam, see illustration above.
4. Tabulated values are based on framing members with top track and stud of the same thickness and #10 screws into each stud flange.
5. Tabulated moment values correspond to the maximum connector strength without consideration of serviceability. Designer must check out-of-plane deflections using tabulated Rotational Stiffness.
6. Tabulated Assembly Rotational Stiffness is for wall at 38" tall.
7. The tabulated Connector Rotational Stiffness is for any wall heights. The designer must consider member deflection due to bending in the stud.
8. Per IBC 2015 Table 1604.3 footnote f, wind load is permitted to be taken as 0.42 times "component and cladding loads" for deflection checks. For IBC 2009 and earlier, the factor is 0.7 instead of 0.42.