BSE

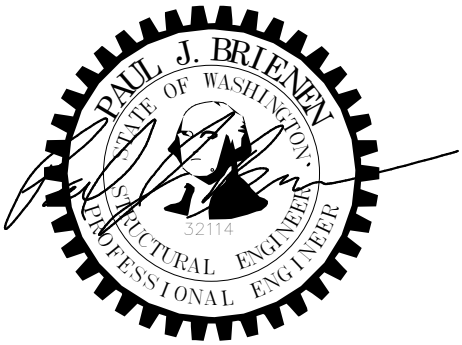
Brienen ***S***tructural ***E***ngineers, P.S.

PRCTI20240438

City of Puyallup
Development & Permitting Services
ISSUED PERMIT
Building | Planning
Engineering | Public Works
Fire | Traffic

CENTERIS VOLTAGE PARK
1023 39th Avenue South East
Puyallup, WA 98374

Exterior CFS Openings
Structural Calculations



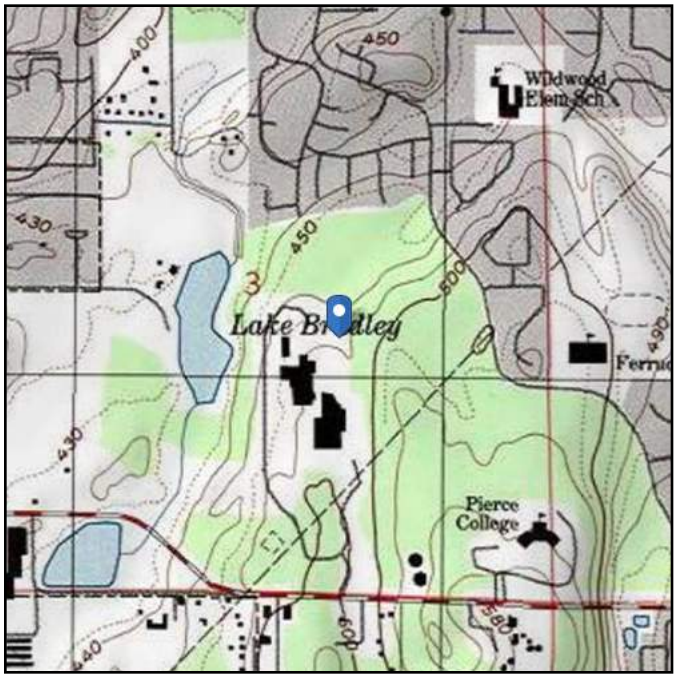
Project Number 24201
March 13, 2024

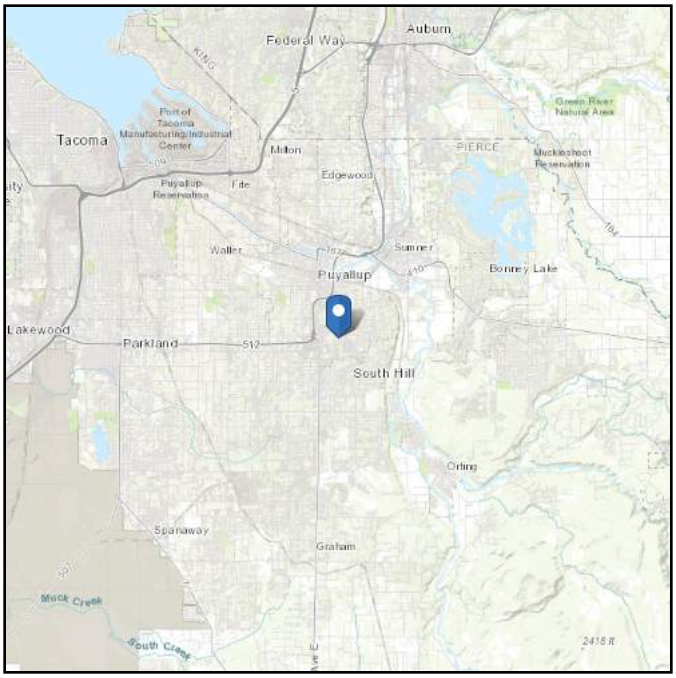
Phone: (206) 397-0000 1316 Central Avenue South, Suite 200, Kent, WA 98032 www.bse-ps.com

ASCE Hazards Report

Address:
1023 39th Ave SE
Puyallup, Washington
98374

Standard:	ASCE/SEI 7-16	**Latitude:**	47.160853
Risk Category:	II	**Longitude:**	-122.279318
Soil Class:	D - Default (see Section 11.4.3)	**Elevation:**	482.88472036372787 ft (NAVD 88)





Wind

Results:

Wind Speed	98 Vmph
10-year MRI	67 Vmph
25-year MRI	73 Vmph
50-year MRI	78 Vmph
100-year MRI	83 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2

Date Accessed: Mon Feb 05 2024

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

Seismic

Site Soil Class: D - Default (see Section 11.4.3)

Results:

S_S :	1.257	S_{D1} :	N/A
S_1 :	0.434	T_L :	6
F_a :	1.2	PGA :	0.5
F_v :	N/A	PGA_M :	0.6
S_{MS} :	1.509	F_{PGA} :	1.2
S_{M1} :	N/A	I_e :	1
S_{DS} :	1.006	C_v :	1.351

Ground motion hazard analysis may be required. See ASCE/SEI 7-16 Section 11.4.8.

Data Accessed: Mon Feb 05 2024

Date Source: USGS Seismic Design Maps

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BSE

B rienen ***S*** tructural ***E*** ngineers, P.S.

Seismic Forces

Wall Type Exterior Walls

Wall Seismic Weight, W

	PSF
• Metal Stud Framing	1.5
• (2) Layers 5/8" Gypsum Wall Board (Multiply weight by actual layers of GWB.)	5
• Insulation & Weather Barrier	2
• EIFS	1
Total =	10 PSF

Wall & Fastener Seismic Force

a_p = 1 R_p = 2.5

S_{DS} = 1.006 I_p = 1 z/h = 1

$$F_d = \frac{0.4 a_p S_{DS} W I_p}{R_p}\left(1 + 2\frac{z}{h}\right)$$

F_d = 0.483W (LRFD)

$E_{ASD} = 0.7F_d$ = 0.338W (ASD)

ASD Force = 3.2 PSF

SIGNIFICANTLY LESS THAN WIND LOAD.

WIND LOAD - ASCE 7-16

98 mph, Exposure B, Mean Roof Height = 47.0 ft

K_{zt} at Base = 1

K_d = 0.85 , Roof Slope 0.0 degrees

Enclosed Building, GC_{pi} = 0.18

(Wind Loads Shown are for Alternate Basic Load Combinations Using Allowable Stress Design and are Multiplied by a Factor of 0.6 to convert to ASD)

WALL COMPONENTS AND CLADDING per ASCE7-16 Figure 30.3-1

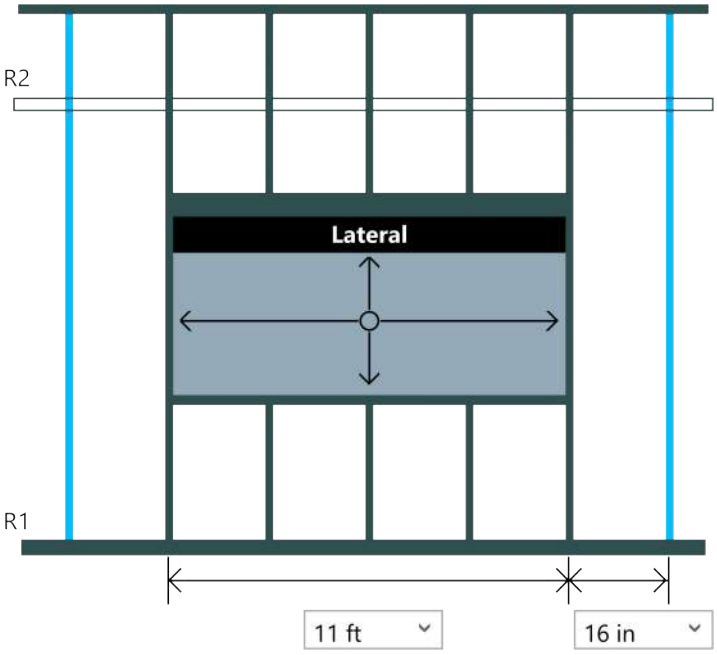
Tributary Area (ft2)	GCp by Zone Zone 4 (+/-)	Zone 5 (+/-)
10 ft^2	0.90/-0.99	0.90/-1.26
50 ft^2	0.79/-0.88	0.79/-1.04
500 ft^2	0.63/-0.72	0.63/-0.72

Height z (ft)	K_z	K_{zt}	K_e	q_z (psf)	Tributary Area (ft2)	Wind Pressures (psf) by Zone () Windward (4,5)	Leeward (4)	Leeward (5)
0 - 47	0.80	1.00	1.00	16.64	10	10.8	-11.7	-14.4
					50	9.7	-10.6	-12.2
					500	9.6	-9.6	-9.6

Project Name: Centeris
Model: (E) 25'-5" Tall 11'-0" Opng
Code: 2012 NASPEC [AISI S100-2012]

8" STUD WALL
OPENING WIDTH = 11'-0"
DESIGN HT = 25'-5"
LATERAL LOAD = 10.3 PSF
DEFLECTION = L/360

Date: 02/29/2024
Simpson Strong-Tie® CFS Designer™ 5.2.2.0



Lateral Pressure to: 4-Ways

Design Loads

Wind Selection :	**C&C Wind, Leeward (5)**
Trib. Area : Span :	**Length^2/3**
Wall Lateral Pressure :	**-10.3 psf**
Parapet Lateral Pressure :	
RO Lateral Pressure :	**4-Ways**
Lateral element force multiplier	
Strength :	**1.0**
Deflection :	**0.7**
Header:	**Box (lateral combined)**
Gravity Load at Header:	**10 psf**

Back-to-Back Member L/6 Interconnection Spacing per AISI S100 D1.1

Member	Span	Cantilever
Jamb Studs	48.8 in	0.0 in

See AISI S100 D1.1 for Add'nl Requirements

Brace Settings

Component(s)	Members(s)	Flexural Bracing	Axial KyLy	Axial KtLt	Distortional K-Phi(lb-in/in)	Distortional Lm	Interconnection Spacing
Jamb Studs	800S162-68(50), Back-To-Back	Full	48 in	48 in	0	None	24 in
Vertical Header	800S162-54(50), Boxed	Full	N/A	N/A	0	None	N/A
Lateral Header	800T150-54(50), Boxed	Full	N/A	N/A	0	None	N/A
Sill	800T150-54(50), Single	Full	N/A	N/A	0	None	N/A

Analysis Results

Component(s)	Members(s)	Axial Load (lb)	Max KL/r	Max. Moment (ft-lb)	Max. Shear (lb)	Bottom Reaction (lb)	Top or End Reaction (lb)
Jamb Studs	800S162-68(50), Back-To-Back	691.9	101	4726.3	503.9	-503.9	-418.9
Vertical Header	800S162-54(50), Boxed	N/A	N/A	1902.7	691.9	N/A	691.9
Lateral Header	800T150-54(50), Boxed	N/A	N/A	1152.7	413.5	N/A	413.5
Sill	800T150-54(50), Single	N/A	N/A	919.0	328.6	N/A	328.6

Design Results

Component(s)	Members(s)	Deflection		A + M Interaction	V + M Interaction	Web Stiffners	Design OK
		Span	Parapet				
Jamb Studs	800S162-68(50), Back-To-Back	L/397	L/0	0.682	0.57	No	Yes
Vertical Header	800S162-54(50), Boxed	L/1052	NA	0.31	0.31	No	Yes
Lateral Header	800T150-54(50), Boxed	L/2080	NA	0.27	0.27	No	Yes
Sill	800T150-54(50), Single	L/1305	NA	0.44	0.44	No	Yes

Simpson Strong-Tie® Connectors @ Jambs

Support	Rx(lb)	Ry(lb)	Simpson Strong-Tie® Connector	Connector Interaction	Anchor Interaction
R2	-418.89	0.00	SCW5.5(3) & Anchorage Designed by Engineer	34.34 %	NA

R1	-503.87	933.50	FCB43.5 Min(4#12-14) & Anchorage Designed by Engineer (Base Clip)	40.80 %	NA

* Reference catalog for connector and anchor requirement notes as well as screw placements requirement

Simpson Strong-Tie® Wall Stud Bridging Connectors @ Jambs

Span/Parapet	Bracing Length(in.)	Design Number of Braces	Pn(lb.)	LSUBH (Min)[1]	LSUBH (Max)[1]	SUBH (Min)[1]	SUBH (Max)[1]	MSUBH (Min)[1]	MSUBH (Max)[1]
Span	Varies	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

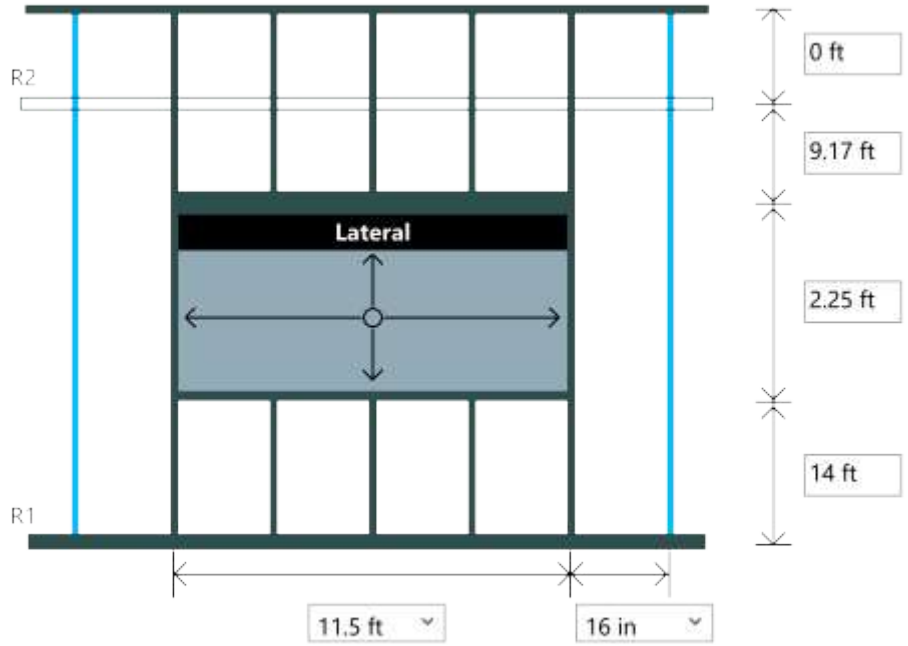
Notes:

1) Values in parentheses are stress ratios.
2) Bridging connectors are not designed for back-back, box, or built-up sections.
3) Reference www.strongtie.com for latest load data, important information, and general notes.
4) CFS Designer will not select bridging connectors unless all flexural and axial bracing settings are the same.
5) If the bracing length is larger than the span length, bridging connectors are not designed.

Project Name: Centeris
Model: (E) 25'-5" Tall 11'-6" Opng
Code: 2012 NASPEC [AISI S100-2012]

8" EXISTING STUD WALL
OPENING WIDTH = 11'-6"
DESIGN HT = 25'-5"
LATERAL LOAD = 10.1 PSF
DEFLECTION = L/360

Date: 03/13/2024
Simpson Strong-Tie® CFS Designer™ 5.2.3.0



Lateral Pressure to: 4-Ways

Design Loads

Wind Selection :	**C&C Wind, Leeward (5)**
Trib. Area : Span :	**Length^2/3**
Wall Lateral Pressure :	**-10.1 psf**
Parapet Lateral Pressure :	
RO Lateral Pressure :	**4-Ways**
Lateral element force multiplier	
Strength :	**1.0**
Deflection :	**0.7**
Header:	**Box (lateral combined)**
Gravity Load at Header:	**10 psf**
Additional Jamb Axial Load :	**600 lbs**

ADDED JAMB LOAD FOR EXISTING OVERHEAD COILING DOOR. ASSUMED TO BE 1200LBS TOTAL BASED ON SIMILARILY SIZED DOORS.

Built-Up Members

Components	Section 1	Section 2	Section 3
Jamb Studs	800S162-43(33)	600T200-97(50)	600S250-97(50)

BUILT-UP JAMB STUD BASED ON EXISTING 800S162-43 STUD

Brace Settings

Component(s)	Members(s)	Flexural Bracing	Axial KyLy	Axial KtLt	Distortional K-Phi(lb-in/in)	Distortional Lm	Interconnection Spacing
Jamb Studs	Built-Up	Full	48 in	48 in	0	None	N/A
Vertical Header	800S162-43(33), Boxed	Full	N/A	N/A	0	None	N/A
Lateral Header	800T150-43(33), Boxed	Full	N/A	N/A	0	None	N/A
Sill	800T150-54(50), Single	Full	N/A	N/A	0	None	N/A

Analysis Results

Component(s)	Members(s)	Axial Load (lb)	Max KL/r	Max. Moment (ft-lb)	Max. Shear (lb)	Bottom Reaction (lb)	Top or End Reaction (lb)
Jamb Studs	Built-Up	1127.3	129	5180.8	557.5	-417.2	-557.4
Vertical Header	800S162-43(33), Boxed	N/A	N/A	1515.9	527.3	N/A	527.3
Lateral Header	800T150-43(33), Boxed	N/A	N/A	951.0	325.2	N/A	325.2
Sill	800T150-54(50), Single	N/A	N/A	1354.2	465.5	N/A	465.5

Design Results

Component(s)	Members(s)	Deflection		A + M Interaction	V + M Interaction	Web Stiffners	Design OK
		Span	Parapet				
Jamb Studs	Built-Up	L/413	L/0	1	0.84	Yes	Yes
Vertical Header	800S162-43(33), Boxed	L/1015	NA	0.45	0.45	R1, R2	Yes
Lateral Header	800T150-43(33), Boxed	L/1896	NA	0.44	0.44	No	Yes
Sill	800T150-54(50), Single	L/847	NA	0.64	0.64	No	Yes

Simpson Strong-Tie® Connectors @ Jambs

Support	Rx(lb)	Ry(lb)	Simpson Strong-Tie® Connector	Connector Interaction	Anchor Interaction
R2	-557.44	0.00	SCW5.5(3) & Anchorage Designed by Engineer	88.48 %	NA
R1	-417.19	1405.08	FCB43.5 Min(4#12-14) & Anchorage Designed by Engineer (Base Clip)	39.54 %	NA

* Reference catalog for connector and anchor requirement notes as well as screw placements requirement

Simpson Strong-Tie® Wall Stud Bridging Connectors @ Jambs

Span/Parapet	Bracing Length(in.)	Design Number of Braces	Pn(lb.)	LSUBH (Min)[1]	LSUBH (Max)[1]	SUBH (Min)[1]	SUBH (Max)[1]	MSUBH (Min)[1]	MSUBH (Max)[1]
Span	Varies	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:

1) Values in parentheses are stress ratios.
2) Bridging connectors are not designed for back-back, box, or built-up sections.
3) Reference www.strongtie.com for latest load data, important information, and general notes.
4) CFS Designer will not select bridging connectors unless all flexural and axial bracing settings are the same.
5) If the bracing length is larger than the span length, bridging connectors are not designed.

RCA Rigid Connector Angles

The Simpson Strong-Tie® rigid connector angle is a general purpose clip angle designed for a wide range of cold-formed steel construction applications. With prepunched holes for fastener attachment, these L-shaped clips save time and labor on the job.

Features:

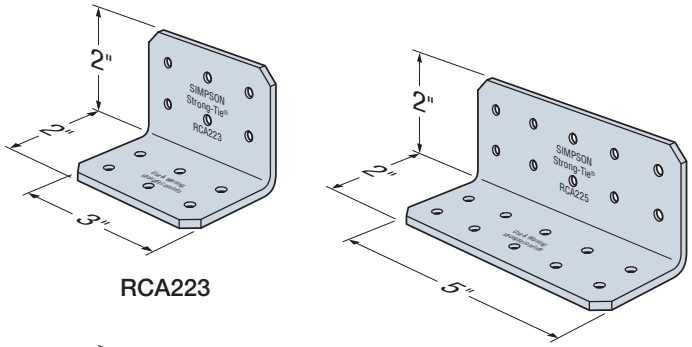
- Use with miscellaneous header/sill connections to jamb studs, jamb stud reinforcement at track, u-channel bridging, stud-blocking, bypass curtain-wall framing, joist connections and other versatile options
- Easy to install, with prepunched holes for quick and accurate fastener attachment

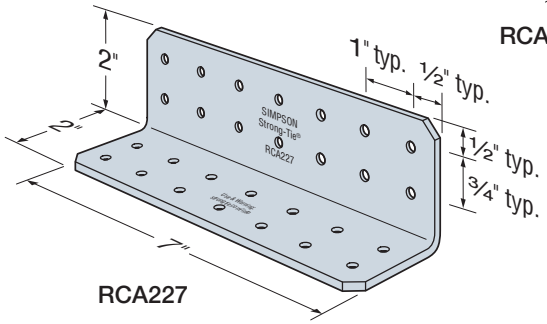
Material: RCAXXX/54 — 54 mil (16 ga.), 50 ksi
RCAXXX/68 — 68 mil (14 ga.), 50 ksi
RCAXXX/97 — 97 mil (12 ga.), 50 ksi
(**Note:** "XXX" is model number shown below.)

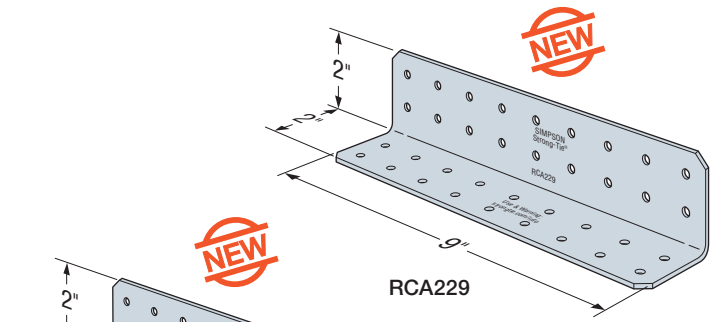
Finish: Galvanized (G90)

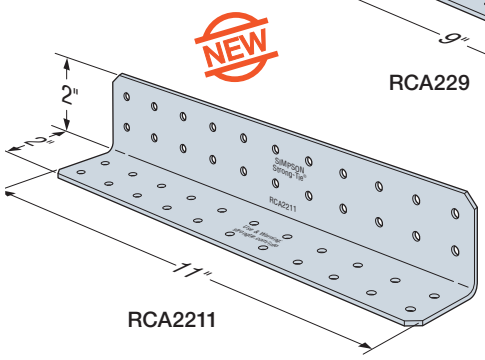
Installation:

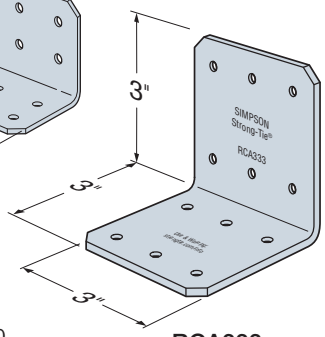
- Use all specified anchors/fasteners

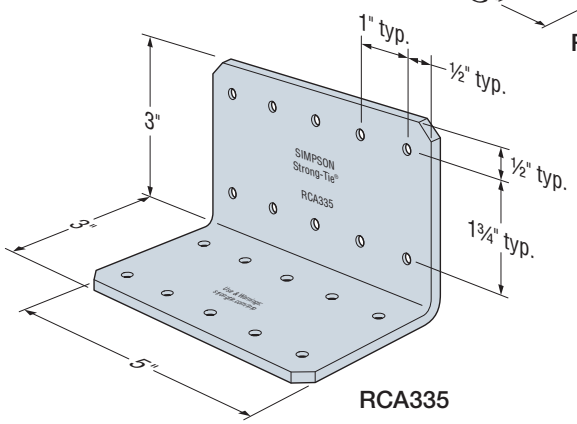












Ordering Information

Model No.	Ordering SKU	Bucket Quantity
RCA223/54	RCA223/54-R150	150
RCA223/68	RCA223/68-R125	125
RCA223/97	RCA223/97-R90	90
RCA225/54	RCA225/54-R90	90
RCA225/68	RCA225/68-R75	75
RCA225/97	RCA225/97-R55	55
RCA227/54	RCA227/54-R65	65
RCA227/68	RCA227/68-R55	55
RCA227/97	RCA227/97-R40	40
RCA229/54	RCA229/54-R50	50
RCA229/68	RCA229/68-R50	50
RCA229/97	RCA229/97-R35	35
RCA2211/54	RCA2211/54-R45	45
RCA2211/68	RCA2211/68-R40	40
RCA2211/97	RCA2211/97-R30	30
RCA333/54	RCA333/54-R100	100
RCA333/68	RCA333/68-R85	85
RCA333/97	RCA333/97-R60	60
RCA335/54	RCA335/54-R60	60
RCA335/68	RCA335/68-R50	50
RCA335/97	RCA335/97-R35	35

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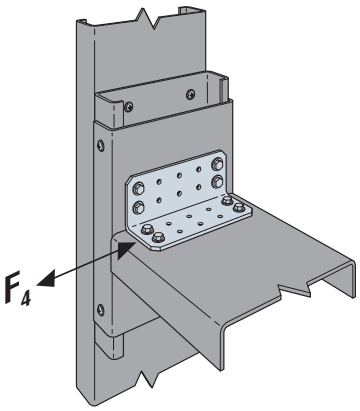
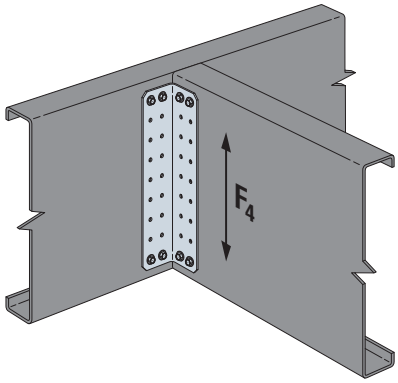
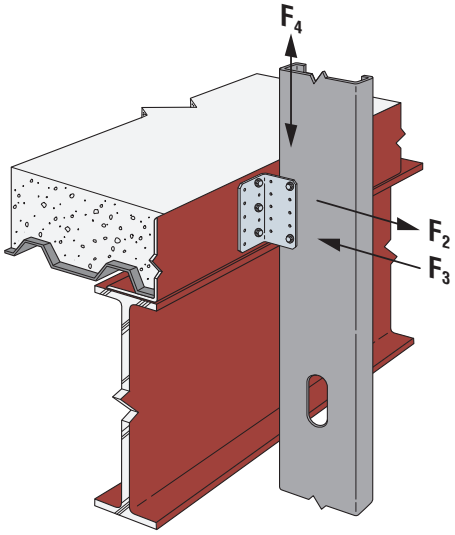
RCA Rigid Connector Angles



Typical RCA225
Installation at Sill/Jamb

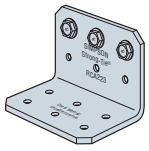
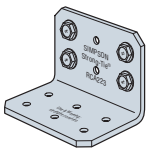
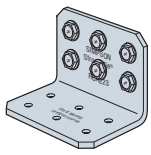


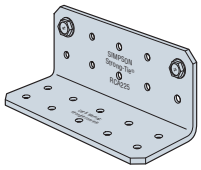
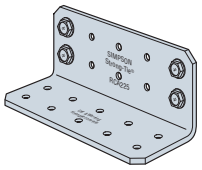
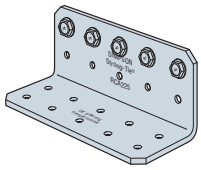
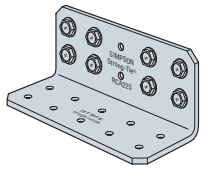
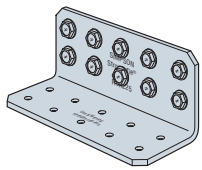
Typical RCA229 Installation
at Joist Connection

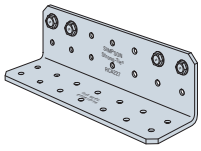
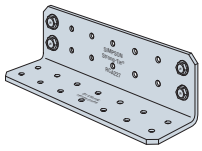
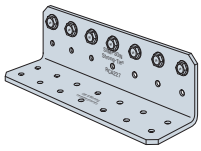
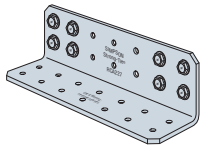
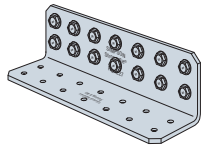


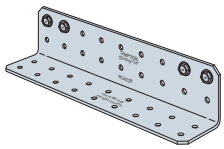
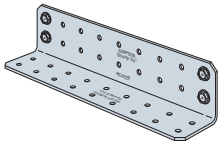
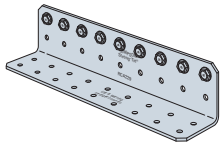
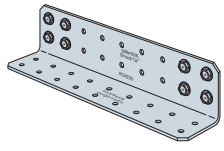
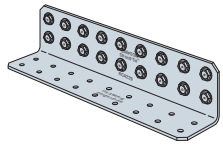
Typical RCA335 Installation
at Bypass Framing

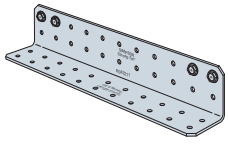
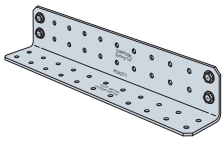
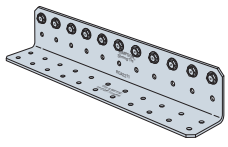
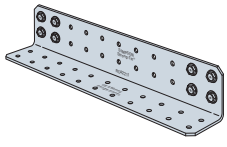
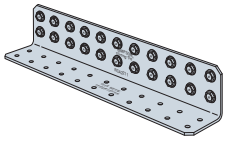
Screw Patterns for Rigid Connector Angles

Models	Pattern 3A	Pattern 3B	Pattern 3C
RCA223/54 RCA223/68 RCA223/97 RCA333/54 RCA333/68 RCA333/97			

Models	Pattern 5A	Pattern 5B	Pattern 5C	Pattern 5D	Pattern 5E
RCA225/54 RCA225/68 RCA225/97 RCA335/54 RCA335/68 RCA335/97					

Models	Pattern 7A	Pattern 7B	Pattern 7C	Pattern 7D	Pattern 7E
RCA227/54 RCA227/68 RCA227/97					

Models	Pattern 9A	Pattern 9B	Pattern 9C	Pattern 9D	Pattern 9E
RCA229/54 RCA229/68 RCA229/97					

Models	Pattern 11A	Pattern 11B	Pattern 11C	Pattern 11D	Pattern 11E
RCA2211/54 RCA2211/68 RCA2211/97					

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RCA Rigid Connector Angles

RCA Rigid Connector Angles Allowable Loads (lb.)

Model	No. of #10 Screws[5,6]	Screw Pattern	Stud Framing Thickness[11]								
			33 mil (20 ga.)			43 mil (18 ga.)			54 mil (16 ga.)		
			F_2	F_3	F_4	F_2	F_3	F_4	F_2	F_3	F_4
RCA223/54	3	3A	205	495	200	205	590	310	205	590	620
	4	3B	205	580	390	205	580	605	205	580	1,095
	6	3C	205	865	480	205	865	740	205	865	1,095
RCA223/68	3	3A	310	495	200	310	765	310	310	815	620
	4	3B	310	660	390	310	805	605	310	805	1,210
	6	3C	310	990	480	310	1,205	740	310	1,205	1,350
RCA223/97	3	3A	495	495	200	630	765	310	630	1,415	620
	4	3B	630	660	390	630	1,020	605	630	1,265	1,210
	6	3C	630	990	480	630	1,530	740	630	1,895	1,485
RCA225/54	2	5A	330	330	265	340	390	410	340	390	815
	4	5B	340	580	535	340	580	830	340	580	1,660
	5	5C	340	825	460	340	980	705	340	980	1,310
	8	5D	340	1,155	915	340	1,155	1,420	340	1,155	1,825
	10	5E	340	1,445	1,035	340	1,445	1,600	340	1,445	1,825
RCA225/68	2	5A	330	330	265	510	510	410	520	545	815
	4	5B	520	660	535	520	805	830	520	805	1,660
	5	5C	520	825	460	520	1,275	705	520	1,360	1,415
	8	5D	520	1,320	915	520	1,605	1,420	520	1,605	2,255
	10	5E	520	1,650	1,035	520	2,010	1,600	520	2,010	2,255
RCA225/97	2	5A	330	330	265	510	510	410	1,020	945	815
	4	5B	660	660	535	1,020	1,020	830	1,050	1,265	1,660
	5	5C	825	825	460	1,050	1,275	705	1,050	2,360	1,415
	8	5D	1,050	1,320	915	1,050	2,040	1,420	1,050	2,525	2,835
	10	5E	1,050	1,650	1,035	1,050	2,550	1,600	1,050	3,155	3,200
RCA227/54	4	7A	475	660	545	475	785	840	475	785	1,675
	4	7B	475	580	595	475	580	920	475	580	1,840
	7	7C	475	1,155	765	475	1,280	1,185	475	1,280	1,685
	8	7D	475	1,155	1,120	475	1,155	1,730	475	1,155	2,555
	14	7E	475	2,025	1,685	475	2,025	2,555	475	2,025	2,555
RCA227/68	4	7A	660	660	545	725	1,020	840	725	1,090	1,675
	4	7B	660	660	595	725	805	920	725	805	1,840
	7	7C	725	1,155	765	725	1,780	1,185	725	1,780	2,370
	8	7D	725	1,320	1,120	725	1,605	1,730	725	1,605	3,155
	14	7E	725	2,310	1,685	725	2,810	2,605	725	2,810	3,155
RCA227/97	4	7A	660	660	545	1,020	1,020	840	1,470	1,890	1,675
	4	7B	660	660	595	1,020	1,020	920	1,470	1,265	1,840
	7	7C	1,155	1,155	765	1,470	1,785	1,185	1,470	3,080	2,370
	8	7D	1,320	1,320	1,120	1,470	2,040	1,730	1,470	2,525	3,460
	14	7E	1,470	2,310	1,685	1,470	3,570	2,605	1,470	4,420	4,490
RCA229/54	4	9A	615	660	595	615	1,020	920	615	1,100	1,840
	4	9B	615	660	620	615	815	960	615	815	1,920
	9	9C	615	1,485	1,105	615	2,295	1,705	615	2,475	3,410
	8	9D	615	1,320	1,210	615	1,630	1,865	615	1,630	3,735
	18	9E	615	2,970	2,375	615	3,665	3,670	615	3,665	4,715
RCA229/68	4	9A	660	660	595	935	1,020	920	935	1,525	1,840
	4	9B	660	660	620	935	1,020	960	935	1,130	1,920
	9	9C	935	1,485	1,105	935	2,295	1,705	935	3,435	3,410
	8	9D	935	1,320	1,210	935	2,040	1,865	935	2,260	3,735
	18	9E	935	2,970	2,375	935	4,590	3,670	935	5,090	5,750
RCA229/97	4	9A	660	660	595	1,020	1,020	920	1,890	2,040	1,840
	4	9B	660	660	620	1,020	1,020	960	1,890	1,610	1,920
	9	9C	1,485	1,485	1,105	1,890	2,295	1,705	1,890	4,590	3,410
	8	9D	1,320	1,320	1,210	1,890	2,040	1,865	1,890	3,220	3,735
	18	9E	1,890	2,970	2,375	1,890	4,590	3,670	1,890	7,240	7,340

See footnotes on p. 106.

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RCA Rigid Connector Angles Allowable Loads (lb.) (cont.)

Model	No. of #10 Screws[5,6]	Screw Pattern	Stud Framing Thickness[11]								
			33 mil (20 ga.)			43 mil (18 ga.)			54 mil (16 ga.)		
			F_2	F_3	F_4	F_2	F_3	F_4	F_2	F_3	F_4
RCA2211/54	4	11A	660	660	620	700	1,020	960	700	1,100	1,915
	4	11B	625	660	635	625	815	980	625	815	1,960
	11	11C	750	1,815	1,450	750	2,805	2,245	750	3,030	4,490
	8	11D	700	1,320	1,250	700	1,630	1,930	700	1,630	3,865
	22	11E	750	3,630	3,075	750	4,480	4,755	750	4,480	5,765
RCA2211/68	4	11A	660	660	620	1,020	1,020	960	1,140	1,530	1,915
	4	11B	660	660	635	1,020	1,020	980	1,140	1,130	1,960
	11	11C	1,140	1,815	1,450	1,140	2,805	2,245	1,140	4,205	4,490
	8	11D	1,140	1,320	1,250	1,140	2,040	1,930	1,140	2,260	3,865
	22	11E	1,140	3,630	3,075	1,140	5,610	4,755	1,140	6,220	7,030
RCA2211/97	4	11A	660	660	620	1,020	1,020	960	2,040	2,040	1,915
	4	11B	660	660	635	1,020	1,020	980	2,040	1,610	1,960
	11	11C	1,815	1,815	1,450	2,310	2,805	2,245	2,310	5,610	4,490
	8	11D	1,320	1,320	1,250	2,040	2,040	1,930	2,310	3,220	3,865
	22	11E	2,310	3,630	3,075	2,310	5,610	4,755	2,310	8,850	9,510
RCA333/54	3	3A	205	440	130	205	440	195	205	440	395
	4	3B	205	580	325	205	580	505	205	580	1,005
	6	3C	205	865	430	205	865	665	205	865	1,095
RCA333/68	3	3A	310	495	130	310	615	195	310	615	395
	4	3B	310	660	325	310	805	505	310	805	1,005
	6	3C	310	990	430	310	1,205	665	310	1,205	1,335
RCA333/97	3	3A	495	495	130	630	765	195	630	1,065	395
	4	3B	630	660	325	630	1,020	505	630	1,265	1,005
	6	3C	630	990	430	630	1,530	665	630	1,895	1,335
RCA335/54	2	5A	330	295	205	340	295	320	340	295	635
	4	5B	340	580	450	340	580	695	340	580	1,390
	5	5C	340	735	305	340	735	475	340	735	835
	8	5D	340	1,155	755	340	1,155	1,170	340	1,155	1,825
	10	5E	340	1,445	860	340	1,445	1,330	340	1,445	1,825
RCA335/68	2	5A	330	330	205	510	410	320	520	410	635
	4	5B	520	660	450	520	805	695	520	805	1,390
	5	5C	520	825	305	520	1,025	475	520	1,025	945
	8	5D	520	1,320	755	520	1,605	1,170	520	1,605	2,255
	10	5E	520	1,650	860	520	2,010	1,330	520	2,010	2,255
RCA335/97	2	5A	330	330	205	510	510	320	1,020	710	635
	4	5B	660	660	450	1,020	1,020	695	1,050	1,265	1,390
	5	5C	825	825	305	1,050	1,275	475	1,050	1,775	945
	8	5D	1,050	1,320	755	1,050	2,040	1,170	1,050	2,525	2,335
	10	5E	1,050	1,650	860	1,050	2,550	1,330	1,050	3,155	2,660

1. As applicable, the tabulated values are calculated based on AISI RP18-4, AISI S100 or generally accepted industry standards.
2. The tabulated values do not account for anchorage to the support. Anchor strength must be calculated separately and may reduce the capacity of the connection when compared to the tabulated values.
3. Tabulated values do not include shear, web crippling, buckling or other local effects in the member. The designer must check member limit states separately.
4. For load combinations that include F_4 and/or F_2 and/or F_3, use an appropriate interaction equation.
5. #10–16 screws shall have $P_{ss} \geq 1{,}620$ lb. Calculated values are per AISI S100. Screws must be installed with three (minimum) exposed threads.
6. The number of screws is for one clip leg that is attached to the supported stud.
7. In addition to calculations of net and gross section tension, F_2 values are also calculated and normally controlled by weak-axis bending of the anchored clip leg with the line of bending at the holes nearest the bend radius of the angle. Moment arm of ¾" is used for F_2 loads. The designer is responsible for calculating pullover, pullout and tension strength of the anchors and this may reduce F_2 strength compared to the tabulated values.
8. F_3 strength values are computed using the plate buckling provisions of AISI RP18-4.
9. For the F_4 strength values it's assumed that all of the connection eccentricity is taken by the screws in the supported stud. F_4 values are also limited by plate shear buckling per AISI RP18-4. The designer is responsible for calculating the shear capacity of the anchorage, which may reduce F_4 strength compared to the tabulated values.
10. In addition to the limit states given in notes 7, 8 and 9, F_2, F_3 and F_4 are also limited by screw shear according to the thinnest connected part of the connector and stud.
11. For 50 ksi studs, 68 mil (14 ga.) and thicker, use the tabulated values for 54 mil (16 ga.) — 50 ksi studs.

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Table 2 — Hilti KH-EZ, KH-EZ P, KH-EZ PM, KH-EZ PL, KH-EZ C and KH-EZ CRC design Strength with concrete / pullout failure in uncracked concrete[1,2,3,4]

Nominal anchor diameter in. (mm)	Nominal Embed. Depth in. (mm)	Tension - ϕN_n				Shear - ϕV_n			
		f'_c = 2,500 psi (17.2 MPa) lb (kN)	f'_c = 3,000 psi (20.7 MPa) lb (kN)	f'_c = 4,000 psi (27.6 MPa) lb (kN)	f'_c = 6,000 psi (41.4 MPa) lb (kN)	f'_c = 2,500 psi (17.2 MPa) lb (kN)	f'_c = 3,000 psi (20.7 MPa) lb (kN)	f'_c = 4,000 psi (27.6 MPa) lb (kN)	f'_c = 6,000 psi (41.4 MPa) lb (kN)
1/4 (6.4)	1-5/8 (41)	585 (2.6)	620 (2.8)	675 (3.0)	765 (3.4)	1,075 (4.8)	1,180 (5.2)	1,360 (6.0)	1,670 (7.4)
	2-1/2 (64)	1,525 (6.8)	1,670 (7.4)	1,930 (8.6)	2,365 (10.5)	2,235 (9.9)	2,450 (10.9)	2,825 (12.6)	3,460 (15.4)
3/8 (9.5)	1-5/8 (41)	910 (4.0)	1,000 (4.4)	1,155 (5.1)	1,415 (6.3)	980 (4.4)	1,075 (4.8)	1,245 (5.5)	1,520 (6.8)
	2-1/8 (54)	1,490 (6.6)	1,635 (7.3)	1,885 (8.4)	2,310 (10.3)	1,605 (7.1)	1,760 (7.8)	2,030 (9.0)	2,485 (11.1)
	2-1/2 (64)	1,980 (8.8)	2,165 (9.6)	2,505 (11.1)	3,065 (13.6)	2,130 (9.5)	2,335 (10.4)	2,695 (12.0)	3,300 (14.7)
	3-1/4 (83)	3,085 (13.7)	3,375 (15.0)	3,900 (17.3)	4,775 (21.2)	6,640 (29.5)	7,275 (32.4)	8,400 (37.4)	10,290 (45.8)
1/2 (12.7)	2-1/4 (57)	1,645 (7.3)	1,800 (8.0)	2,080 (9.3)	2,550 (11.3)	1,770 (7.9)	1,940 (8.6)	2,240 (10.0)	2,745 (12.2)
	3 (76)	2,785 (12.4)	3,050 (13.6)	3,525 (15.7)	4,315 (19.2)	3,000 (13.3)	3,285 (14.6)	3,795 (16.9)	4,645 (20.7)
	4-1/4 (108)	5,070 (22.6)	5,555 (24.7)	6,415 (28.5)	7,855 (34.9)	10,920 (48.6)	11,965 (53.2)	13,815 (61.5)	16,920 (75.3)
5/8 (15.9)	3-1/4 (83)	3,240 (14.4)	3,550 (15.8)	4,100 (18.2)	5,025 (22.4)	3,490 (15.5)	3,825 (17.0)	4,415 (19.6)	5,410 (24.1)
	4 (102)	4,630 (20.6)	5,070 (22.6)	5,855 (26.0)	7,170 (31.9)	9,970 (44.3)	10,920 (48.6)	12,610 (56.1)	15,445 (68.7)
	5 (127)	6,705 (29.8)	7,345 (32.7)	8,485 (37.7)	10,390 (46.2)	14,445 (64.3)	15,825 (70.4)	18,270 (81.3)	22,380 (99.6)
3/4 (19.1)	4 (102)	4,380 (19.5)	4,795 (21.3)	5,540 (24.6)	6,785 (30.2)	9,430 (41.9)	10,330 (45.9)	11,930 (53.1)	14,610 (65.0)
	6-1/4 (159)	9,345 (41.6)	10,235 (45.5)	11,820 (52.6)	14,475 (64.4)	20,125 (89.5)	22,045 (98.1)	25,455 (113.2)	31,175 (138.7)

3.3.6

Table 3 — Hilti KH-EZ, KH-EZ P, KH-EZ PM, KH-EZ PL, KH-EZ C and KH-EZ CRC design Strength with concrete / pullout failure in cracked concrete[1,2,3,4,5]

Nominal anchor diameter in. (mm)	Nominal embed. in. (mm)	Tension - ϕN_n				Shear - ϕV_n			
		f'_c = 2,500 psi (17.2 MPa) lb (kN)	f'_c = 3,000 psi (20.7 MPa) lb (kN)	f'_c = 4,000 psi (27.6 MPa) lb (kN)	f'_c = 6,000 psi (41.4 MPa) lb (kN)	f'_c = 2,500 psi (17.2 MPa) lb (kN)	f'_c = 3,000 psi (20.7 MPa) lb (kN)	f'_c = 4,000 psi (27.6 MPa) lb (kN)	f'_c = 6,000 psi (41.4 MPa) lb (kN)
1/4 (6.4)	1-5/8 (41)	300 (1.3)	315 (1.4)	345 (1.5)	390 (1.7)	765 (3.4)	835 (3.7)	965 (4.3)	1,180 (5.2)
	2-1/2 (64)	760 (3.4)	830 (3.7)	960 (4.3)				2,000 (8.9)	2,450 (10.9)
3/8 (9.5)	1-5/8 (41)	475 (2.1)	520 (2.3)	600 (2.7)				880 (3.9)	1,080 (4.8)
	2-1/8 (54)	1,055 (4.7)	1,155 (5.1)	1,335 (5.9)				1,440 (6.4)	1,760 (7.8)
	2-1/2 (64)	1,400 (6.2)	1,535 (6.8)	1,775 (7.9)	2,170 (9.7)	1,510 (6.7)	1,655 (7.4)	1,910 (8.5)	2,340 (10.4)
	3-1/4 (83)	2,185 (9.7)	2,390 (10.6)	2,765 (12.3)	3,385 (15.1)	4,705 (20.9)	5,155 (22.9)	5,950 (26.5)	7,285 (32.4)
1/2 (12.7)	2-1/4 (57)	1,035 (4.6)	1,135 (5.0)	1,310 (5.8)	1,605 (7.1)	1,115 (5.0)	1,220 (5.4)	1,410 (6.3)	1,725 (7.7)
	3 (76)	1,755 (7.8)	1,920 (8.5)	2,220 (9.9)	2,715 (12.1)	1,890 (8.4)	2,070 (9.2)	2,390 (10.6)	2,925 (13.0)
	4-1/4 (108)	3,190 (14.2)	3,495 (15.5)	4,040 (18.0)	4,945 (22.0)	6,875 (30.6)	7,530 (33.5)	8,695 (38.7)	10,650 (47.4)
5/8 (15.9)	3-1/4 (83)	2,040 (9.1)	2,235 (9.9)	2,580 (11.5)	3,165 (14.1)	2,200 (9.8)	2,410 (10.7)	2,780 (12.4)	3,405 (15.1)
	4 (102)	3,140 (14.0)	3,510 (15.6)	3,845 (17.1)	4,515 (20.1)	6,760 (30.1)	7,560 (33.6)	8,280 (36.8)	9,725 (43.3)
	5 (127)	4,225 (18.8)	4,625 (20.6)	5,340 (23.8)	6,540 (29.1)	9,095 (40.5)	9,965 (44.3)	11,505 (51.2)	14,090 (62.7)
3/4 (19.1)	4 (102)	2,755 (12.3)	3,020 (13.4)	3,485 (15.5)	4,270 (19.0)	5,940 (26.4)	6,505 (28.9)	7,510 (33.4)	9,200 (40.9)
	6-1/4 (159)	5,885 (26.2)	6,445 (28.7)	7,440 (33.1)	9,115 (40.5)	12,670 (56.4)	13,880 (61.7)	16,030 (71.3)	19,630 (87.3)

2(965LBS)(0.6)(0.68)(1.00) = 787LBS > 504LBS REQ'D

1 See PTG Ed. 21 Section 3.1.8 to convert design strength value to ASD value.
2 Linear interpolation between embedment depths and concrete compressive strengths is not permitted.
3 Apply spacing, edge distance, and concrete thickness factors in Tables 6 through 15 as necessary. Compare to the steel values in Table 4. The lesser of the values is to be used for the design.
4 Tabular values are for normal weight concrete only. For lightweight concrete multiply design strength by λa as follows. For sand-lightweight, λa = 0.68. For all-lightweight, λa = 0.60.
5 Tabular values are for static loads only. For seismic tension loads, multiply cracked concrete tabular values in tension by the following reduction factors:
1/4-in diameter by 1-5/8-in nominal embedment depth - $a_{N,seis}$ = 0.60
All other sizes - $a_{N,seis}$ = 0.75
No reduction needed for seismic shear. See PTG Ed. 21 Section 3.1.8 for additional information on seismic applications.

Table 6 — Load adjustment factors for 1/4-in. diameter Hilti KH-EZ, KH-EZ P, KH-EZ PM, KH-EZ PL and KH-EZ C in uncracked concrete[1,2]

1/4-in. KH-EZ uncracked concrete			Spacing factor in tension f_{AN}		Edge distance factor in tension f_{RN}		Spacing factor in shear[3] f_{AV}		Edge distance in shear				Conc. thickness factor in shear[4] f_{HV}	
									⊥ toward edge f_{RV}		II to and away from edge f_{RV}			
Embedment h_{nom}		in.	1-5/8	2-1/2	1-5/8	2-1/2	1-5/8	2-1/2	1-5/8	2-1/2	1-5/8	2-1/2	1-5/8	2-1/2
		(mm)	(41)	(64)	(41)	(64)	(41)	(64)	(41)	(64)	(41)	(64)	(41)	(64)
Spacing (s)/edge distance (c_a)/concrete thickness (h) - in. (mm)	1-1/2	(38)	0.71	0.63	0.78	0.65	0.59	0.56	0.40	0.21	0.78	0.42	n/a	n/a
	2	(51)	0.78	0.67	1.00	0.77	0.62	0.58	0.61	0.33	1.00	0.65	n/a	n/a
	2-1/2	(64)	0.85	0.72		0.90	0.65	0.60	0.86	0.46		0.90	n/a	n/a
	3	(76)	0.92	0.76		1.00	0.68	0.62	1.00	0.60		1.00	n/a	n/a
	3-1/4	(83)	0.96	0.78			0.70	0.63		0.68			0.88	n/a
	3-1/2	(89)	0.99	0.80			0.71	0.64		0.76			0.92	n/a
	4	(102)	1.00	0.85			0.74	0.66		0.92			0.98	n/a
	4-1/8	(105)		0.86			0.75	0.66		0.97			1.00	0.81
	4-1/2	(114)		0.89			0.77	0.68		1.00				0.84
	5	(127)		0.93			0.80	0.70						0.89
	5-1/2	(140)		0.98			0.83	0.72						0.93
	6	(152)		1.00			0.86	0.74						0.97
	7	(178)					0.92	0.78						1.00
	8	(203)					0.98	0.82						
	9	(229)					1.00	0.86						
	10	(254)						0.89						
	11	(279)						0.93						
	12	(305)						0.97						
	14	(356)						1.00						

3.3.6

Table 7 — Load adjustment factors for 1/4-in. diameter Hilti KH-EZ, KH-EZ P, KH-EZ PM, KH-EZ PL and KH-EZ C in cracked concrete[1,2]

1/4-in. KH-EZ cracked concrete			Spacing factor in tension f_{AN}		Edge distance factor in tension f_{RN}		Spacing factor in shear[3] f_{AV}		Edge distance in shear				Conc. thickness factor in shear[4] f_{HV}	
									⊥ toward edge f_{RV}		II to and away from edge f_{RV}			
Embedment h_{nom}		in.	1-5/8	2-1/2	1-5/8	2-1/2	1-5/8	2-1/2	1-5/8	2-1/2	1-5/8	2-1/2	1-5/8	2-1/2
		(mm)	(41)	(64)	(41)	(64)	(41)	(64)	(41)	(64)	(41)	(64)	(41)	(64)
Spacing (s)/edge distance (c_a)/concrete thickness (h) - in. (mm)	1-1/2	(38)	0.71	0.63	0.88	0.65	0.59	0.56	0.40	0.21	0.80	0.43	n/a	n/a
	2	(51)	0.78	0.67	1.00	0.77	0.62	0.58	0.62	0.33	1.00	0.66	n/a	n/a
	2-1/2	(64)	0.85	0.72		0.90	0.65	0.60	0.87	0.46		0.90	n/a	n/a
	3	(76)	0.92	0.76		1.00	0.68	0.62	1.00	0.60		1.00	n/a	n/a
	3-1/4	(83)	0.96	0.78			0.70	0.63		0.68			0.89	n/a
	3-1/2	(89)	0.99	0.80			0.71	0.64		0.76			0.92	n/a
	4	(102)	1.00	0.85			0.74	0.66		0.93			0.98	n/a
	4-1/8	(105)		0.86			0.75	0.66		0.97			1.00	0.81
	4-1/2	(114)		0.89			0.77	0.68		1.00				0.85
	5	(127)		0.93			0.80	0.70						0.89
	5-1/2	(140)		0.98			0.83	0.72						0.93
	6	(152)		1.00			0.86	0.74						0.98
	7	(178)					0.92	0.78						1.00
	8	(203)					0.98	0.82						
	9	(229)					1.00	0.86						
	10	(254)						0.90						
	11	(279)						0.94						
	12	(305)						0.98						
	14	(356)						1.00						

1 Linear interpolation not permitted.

2 When combining multiple load adjustment factors (e.g. for a 4 anchor pattern in a corner with thin concrete member) the design can become very conservative. To optimize the design, use Hilti PROFIS Engineering software or perform anchor calculation using design equations from ACI 318 Chapter 17.

3 Spacing factor reduction in shear, f_{AV}, assumes an influence of a nearby edge. If no edge exists, then $f_{AV} = f_{AN}$.

4 Concrete thickness reduction factor in shear, f_{HV}, assumes an influence of a nearby edge. If no edge exists, then $f_{HV} = 1.0$.

If a reduction factor value is in a shaded cell, this indicates that this specific edge distance may not be permitted with a certain spacing (or vice versa). Check with table 5 and figure 2 of this section to calculate permissable edge distance, spacing and concrete thickness combinations.

SCW Head-of-Wall Slide-Clip Connector

The SCW connectors offer 1" of upward and 1" of downward movement. They are primarily used in head-of-wall applications that require vertical movement relative to the structure. SCW connectors are often used to strengthen window and door jambs for projects that utilize slip or slotted track.

Material: 54 mil (16 ga.)

Finish: Galvanized (G90)

Installation:

- Use the specified type and number of anchors.
- Use the specified number of #14 shouldered screws (included). Install shouldered screws in the slots adjacent to the No-Equal® stamp.
- Use a maximum of one screw per slot.
- For installations to wood framing, see Simpson Strong-Tie® engineering letter L-CF-DEFCLIPW at **strongtie.com**.

Codes: See p. 13 for Code Reference Key Chart

Ordering Information:

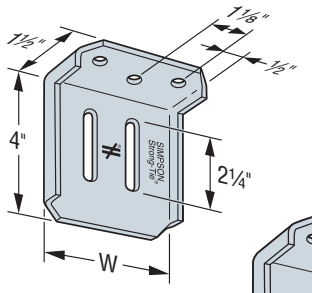
SCW3.25-KT contains:

- Box of 25 connectors
- 55 XLSH34B1414 #14 shouldered screws

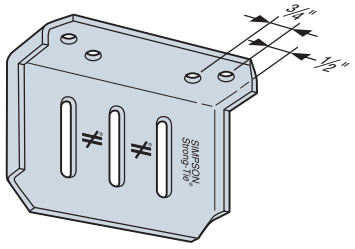
SCW5.5-KT contains:

- Box of 25 connectors
- 83 XLSH34B1414 #14 shouldered screws

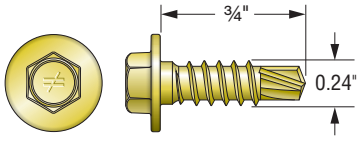
Note: Replacement #14 shouldered screws for SCW connectors are XLSH34B1414-RP83.



SCW3.25



SCW5.5

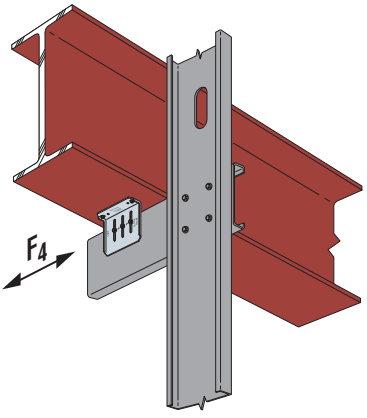


XLSH34B1414
#14 Shouldered Screw for Attachment to Stud Framing
(included)

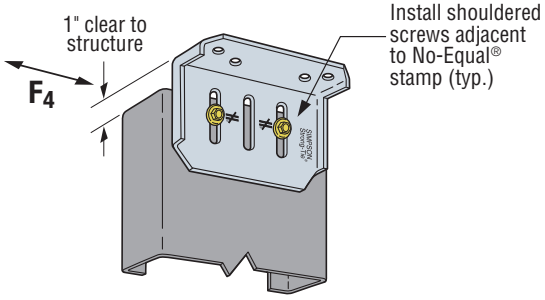
SCW Allowable Connector Loads (lb.)

Model No.	Connector Material Thickness mil (ga.)	W (in.)	No. of #14 Shouldered Screws	Stud Thickness			Code Ref.
				33 mil (20 ga.)	43 mil (18 ga.)	54 mil (16 ga.)	
				F_4	F_4	F_4	
SCW3.25	54 (16)	3¼	2	455	630	755	IBC, FL, LA
SCW5.5	54 (16)	5½	2[1]	455	630	995	
			3	455	630	1,220[3]	

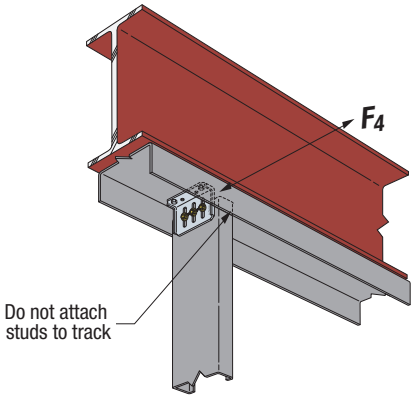
1. When the SCW5.5 connector is used with two shouldered screws, install screws in the outermost slots.
2. Allowable loads are based on clips installed with all holes in the anchor leg filled with #12–14 screws. For other anchorage installations, the capacity of the connection system will be the minimum of the tabulated value and the allowable load from the SCW Allowable Anchorage Loads table on p. 49.
3. Tabulated loads are applicable for the following framing widths:
   SCW3.25 — 3½", 3⅝", 4" and 5½"
   SCW5.5 — 6", 8" (18 ga. min.), 10" and 12" (16 ga. min.)



Typical SCW Installation with Stud Strut



SCW5.5 Installation with Two Shouldered Screws
(three shouldered screws and SCW3.25 similar)



Typical SCW Installation at Stud

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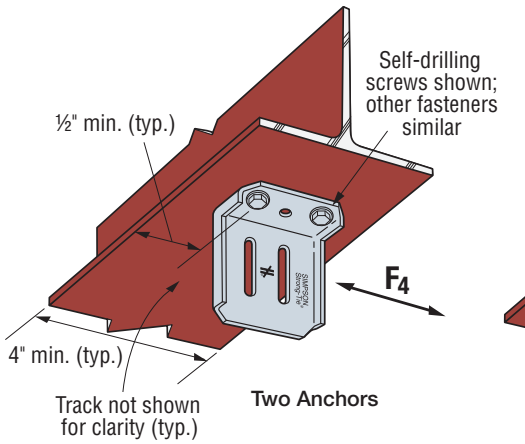
SCW Head-of-Wall Slide-Clip Connector

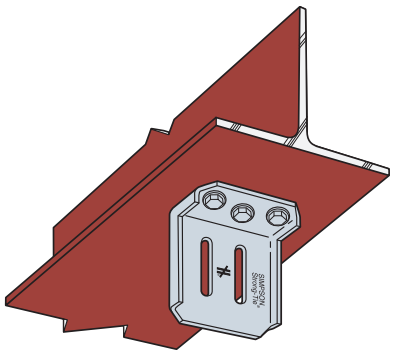
SCW Allowable Anchorage Loads (lb.)

Model No.	Anchorage Type	Minimum Base Material	No. of Anchors	Allowable Load F_4
SCW3.25	#12–24 self-drilling screws	A36 steel 3/16" thick	2	715
			3	1,075
	Simpson Strong-Tie® 0.157" x 5/8" powder-actuated fasteners PDPAT-62KP	A36 steel 3/16" thick	2	715
			3	1,075
	Simpson Strong-Tie 1/4" x 1 3/4" Titen Turbo™[3]	Concrete f'_c = 2,500 psi	2	285
			3	350
SCW5.5	#12–24 self-drilling screws	A36 steel 3/16" thick	2	775
			4	1,550
	Simpson Strong-Tie 0.157" x 5/8" powder-actuated fasteners PDPAT-62KP	A36 steel 3/16" thick	2	745
			4	1,490
	Simpson Strong-Tie 1/4" x 1 3/4" Titen Turbo[3]	Concrete f'_c = 2,500 psi	2	285
			4	775

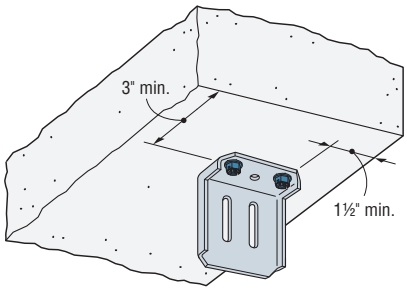
1. For additional important information, see General Information and Notes on p. 26.
2. Allowable loads are for clip anchorage only. The capacity of the connection system will be the minimum of the tabulated value and the allowable load from the SCW Allowable Connector Loads table on p. 48.
3. Tabulated values require a minimum 1½" edge distance for masonry screws in concrete.
4. See the current *Fastening Systems* catalog at **strongtie.com** for more information on Simpson Strong-Tie fasteners.



Two Anchors

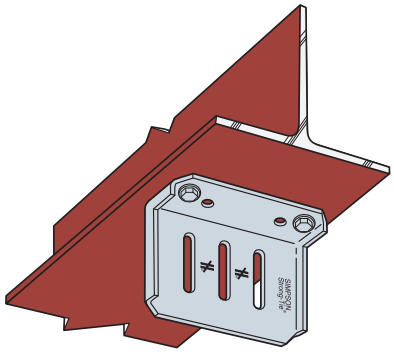


Three Anchors

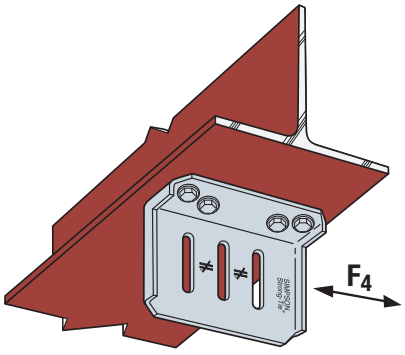


Two Anchors — Concrete
(three anchors — additional screw middle hole)

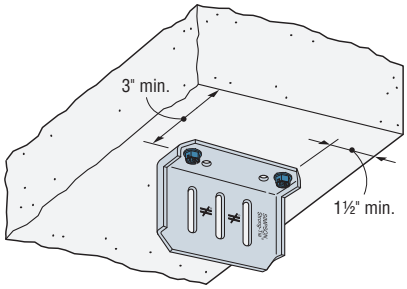
SCW3.25 Anchor Layout



Two Anchors



Four Anchors



Two Anchors — Concrete
(four anchors — additional screws middle holes)

SCW5.5 Anchor Layout

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Table 16 — Hilti KH-EZ, KH-EZ P, KH-EZ PM, KH-EZ PL, KH-EZ C and KH-EZ CRC in the soffit of uncracked lightweight concrete over metal deck[1,2,3,4,5,6]

Nominal anchor diameter in.	Nominal embedment in. (mm)	Installation in lower flute				Installation in upper flute			
		Tension - ϕN_n		Shear - ϕV_n		Tension - ϕN_n		Shear - ϕV_n	
		f'_c = 3,000 psi lb (kN)	f'_c = 4,000 psi lb (kN)	f'_c = 3,000 psi lb (kN)	f'_c = 4,000 psi lb (kN)	f'_c = 3,000 psi lb (kN)	f'_c = 4,000 psi lb (kN)	f'_c = 3,000 psi lb (kN)	f'_c = 4,000 psi lb (kN)
1/4	1-5/8 (41)	545 (2.4)	595 (2.6)	725 (3.2)	725 (3.2)	670 (3.0)	730 (3.2)	725 (3.2)	725 (3.2)
	2-1/2 (64)	1,220 (5.4)	1,410 (6.3)	1,325 (5.9)	1,325 (5.9)	1,275 (5.7)	1,470 (6.5)	1,960 (8.7)	1,960 (8.7)
3/8	1-5/8 (41)	845 (3.8)	975 (4.3)	905 (4.0)	905 (4.0)	970 (4.3)	1,120 (5.0)	2,200 (9.8)	2,200 (9.8)
	2-1/2 (64)	1,455 (6.5)	1,680 (7.5)	905 (4.0)	905 (4.0)	1,900 (8.5)	2,195 (9.8)	3,655 (16.3)	3,655 (16.3)
	3-1/4 (83)	2,550 (11.3)	2,945 (13.1)	2,165 (9.6)	2,165 (9.6)	n/a	n/a	n/a	n/a
1/2	2-1/4 (57)	850 (3.8)	980 (4.4)	965 (4.3)	965 (4.3)	905 (4.0)	1,045 (4.6)	4,710 (21.0)	4,710 (21.0)
	3 (76)	1,990 (8.9)	2,300 (10.2)	1,750 (7.8)	1,750 (7.8)	n/a	n/a	n/a	n/a
	4-1/4 (108)	3,485 (15.5)	4,025 (17.9)	2,155 (9.6)	2,155 (9.6)	n/a	n/a	n/a	n/a
5/8	3-1/4 (83)	2,715 (12.1)	3,135 (13.9)	2,080 (9.3)	2,080 (9.3)	n/a	n/a	n/a	n/a
	5 (127)	6,170 (27.4)	7,125 (31.7)	2,515 (11.2)	2,515 (11.2)	n/a	n/a	n/a	n/a
3/4	4 (102)	2,715 (12.1)	3,135 (13.9)	2,255 (10.0)	2,255 (10.0)	n/a	n/a	n/a	n/a

Table 17 — Hilti KH-EZ, KH-EZ P, KH-EZ PM, KH-EZ PL, KH-EZ C and KH-EZ CRC in the soffit of cracked lightweight concrete over metal deck[1,2,3,4,5,6]

Nominal anchor diameter in.	Nominal embedment in. (mm)	Installation in lower flute				Installation in upper flute			
		Tension - ϕN_n[7]		Shear - ϕV_n[8]		Tension - ϕN_n[7]		Shear - ϕV_n[8]	
		f'_c = 3,000 psi lb (kN)	f'_c = 4,000 psi lb (kN)	f'_c = 3,000 psi lb (kN)	f'_c = 4,000 psi lb (kN)	f'_c = 3,000 psi lb (kN)	f'_c = 4,000 psi lb (kN)	f'_c = 3,000 psi lb (kN)	f'_c = 4,000 psi lb (kN)
1/4	1-5/8 (41)	280 (1.2)	305 (1.4)	725 (3.2)	725 (3.2)	340 (1.5)	370 (1.6)	725 (3.2)	725 (3.2)
	2-1/2 (64)	605 (2.7)	700 (3.1)	1,325 (5.9)	1,325 (5.9)	6[illegible] (2[illegible])	7[illegible]	[illegible]60	1,960 (8.7)
3/8	1-5/8 (41)	525 (2.3)	605 (2.7)	905 (4.0)	905 (4.0)	7[illegible] (3[illegible])	[illegible]00	[illegible]8)	2,200 (9.8)
	2-1/2 (64)	1,035 (4.6)	1,195 (5.3)	905 (4.0)	905 (4.0)	1,345 (6.0)	1,555 (6.9)	3,655 (16.3)	3,655 (16.3)
	3-1/4 (83)	1,805 (8.0)	2,085 (9.3)	2,165 (9.6)	2,165 (9.6)	n/a	n/a	n/a	n/a
1/2	2-1/4 (57)	535 (2.4)	620 (2.8)	965 (4.3)	965 (4.3)	640 (2.8)	740 (3.3)	4,710 (21.0)	4,710 (21.0)
	3 (76)	1,255 (5.6)	1,450 (6.4)	1,750 (7.8)	1,750 (7.8)	n/a	n/a	n/a	n/a
	4-1/4 (108)	2,195 (9.8)	2,535 (11.3)	2,155 (9.6)	2,155 (9.6)	n/a	n/a	n/a	n/a
5/8	3-1/4 (83)	1,710 (7.6)	1,975 (8.8)	2,080 (9.3)	2,080 (9.3)	n/a	n/a	n/a	n/a
	5 (127)	3,885 (17.3)	4,485 (20.0)	2,515 (11.2)	2,515 (11.2)	n/a	n/a	n/a	n/a
3/4	4 (102)	1,710 (7.6)	1,975 (8.8)	2,255 (10.0)	2,255 (10.0)	n/a	n/a	n/a	n/a

2(725LBS)(0.6) = 870LBS > 422LBS REQ'D

1 See PTG Ed. 21 Section 3.1.8 to convert design strength value to ASD value.

2 Linear interpolation between embedment depths and concrete compressive strengths is not permitted.

3 Tabular value is for one anchor per flute. Minimum spacing along the length of the flute is 3 x h_{nom} (nominal embedment).

4 Tabular values are lightweight concrete and no additional reduction factor is needed.

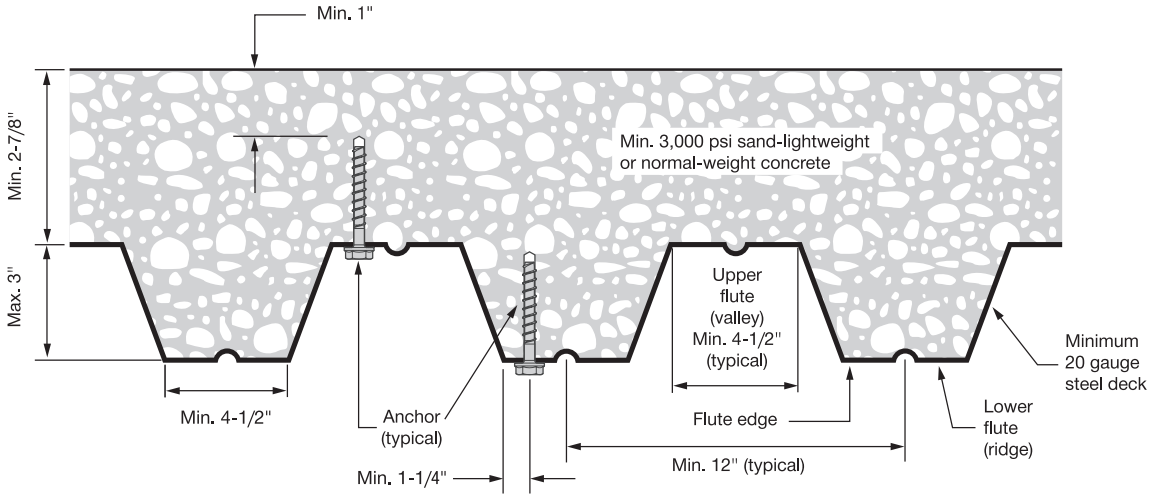
5 No additional reduction factors for spacing or edge distance need to be applied.

6 Comparison to steel values in table 4 is not required. Values in tables 16 and 17 control.

7 Tabular values are for static loads only. Seismic design is not permitted for uncracked concrete. For seismic tension loads, multiply cracked concrete tabular values in tension only by $\alpha_{N,seis}$ = 0.75. See PTG Ed. 21 Section 3.1.8 for additional information on seismic applications.

8 For the following anchor sizes, an additional factor for seismic shear must be applied to the cracked concrete tabular values for seismic conditions:
1/4-inch diameter - $\alpha_{v,seis}$ = 0.75
3/8-inch diameter - $\alpha_{v,seis}$ = 0.60
1/2-inch diameter - $\alpha_{v,seis}$ = 0.60
5/8-inch diameter - $\alpha_{v,seis}$ = 0.60
3/4-inch diameter - $\alpha_{v,seis}$ = 0.70

Figure 3 — Installation of Hilti KH-EZ, KH-EZ P, KH-EZ PM, KH-EZ PL, KH-EZ C and KH-EZ CRC in soffit of concrete over steel deck floor and roof assemblies[1]



1 Anchors may be placed in the upper or lower flute of the steel deck profile provided the minimum concrete cover above the drilled hole is satisfied. Anchors in the lower flute may be installed with a maximum 1-inch offset in either direction from the center of the flute. The offset distance may be increased proportionally for profiles with lower flute widths greater than those shown provided the minimum lower flute edge distance is also satisfied.

Figure 4 — Installation of Hilti KH-EZ, KH-EZ P, KH-EZ PM, KH-EZ PL, KH-EZ C and KH-EZ CRC on the top of sand-lightweight concrete over metal floor and roof assemblies

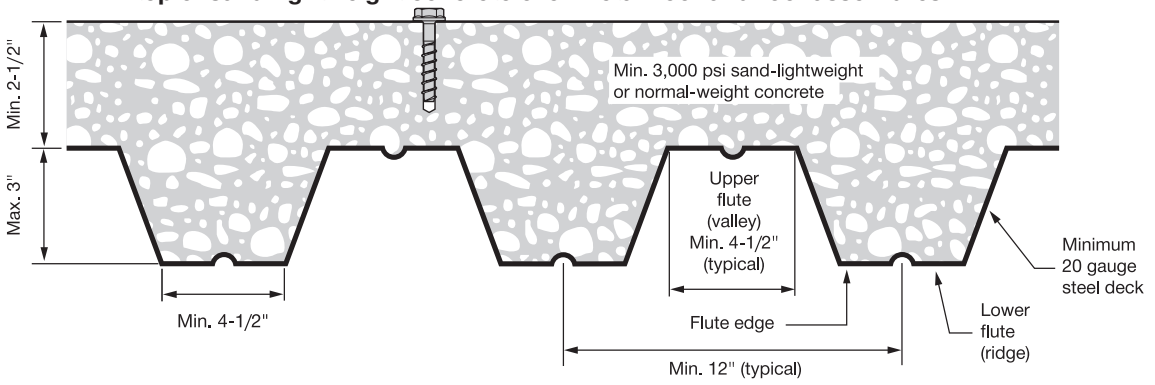


Table 18 — Hilti KH-EZ, KH-EZ P, KH-EZ PM, KH-EZ PL, KH-EZ C and KH-EZ CRC in the top of uncracked concrete over metal deck[1,2,3,4,5]

Nominal anchor diameter in.	Nominal embedment depth in. (mm)	Tension - ϕN_n		Shear - ϕV_n	
		f'_c = 3,000 psi (20.7 MPa) lb (kN)	f'_c = 4,000 psi (27.6 MPa) lb (kN)	f'_c = 3,000 psi (20.7 MPa) lb (kN)	f'_c = 4,000 psi (27.6 MPa) lb (kN)
1/4	1-5/8 (41)	620 (2.8)	675 (3.0)	1,180 (5.2)	1,360 (6.0)
3/8	1-5/8 (41)	1,000 (4.4)	1,155 (5.1)	1,075 (4.8)	1,245 (5.5)

Table 19 — Hilti KH-EZ, KH-EZ P, KH-EZ PM, KH-EZ PL, KH-EZ C and KH-EZ CRC in the top of cracked concrete over metal deck[1,2,3,4,5]

Nominal anchor diameter in.	Nominal embed. depth in. (mm)	Tension - ϕN_n		Shear - ϕV_n	
		f'_c = 3,000 psi (20.7 MPa) lb (kN)	f'_c = 4,000 psi (27.6 MPa) lb (kN)	f'_c = 3,000 psi (20.7 MPa) lb (kN)	f'_c = 4,000 psi (27.6 MPa) lb (kN)
1/4	1-5/8 (41)	315 (1.4)	345 (1.5)	835 (3.7)	965 (4.3)
3/8	1-5/8 (41)	520 (2.3)	600 (2.7)	760 (3.4)	880 (3.9)

1 See PTG Ed. 21 Section 3.1.8 to convert design strength value to ASD value.

2 Linear interpolation between embedment depths and concrete compressive strengths is not permitted.

3 Apply spacing, edge distance, and concrete thickness factors in tables 20 and 21 as necessary. Compare to the steel values in table 4. The lesser of the values is to be used for the design.

4 Tabular values are for normal weight concrete only. For lightweight concrete multiply design strength by λ_a as follows:
for sand-lightweight, λ_a = 0.68; for all-lightweight, λ_a = 0.60

5 Tabular values are for static loads only. Seismic design is not permitted for uncracked concrete. For seismic tension loads, multiply cracked concrete tabular values in tension by the following reduction factors:
1/4-inch diameter - $\alpha_{N,seis}$ = 0.60
3/8-inch diameter- $\alpha_{N,seis}$ = 0.75.
No reduction needed for seismic shear. See PTG Ed. 21 Section 3.1.8 for additional information on seismic applications.