



KNEE WALL SUPPORT BRACKET ASSEMBLY



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KNEE WALL INTRODUCTION



Patent Pending

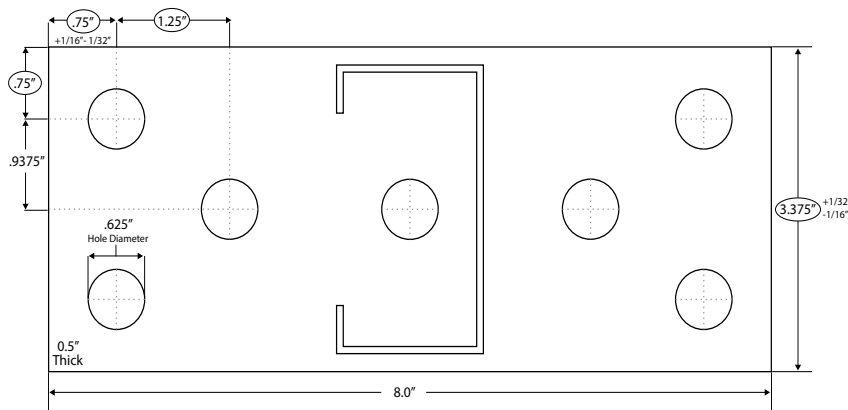
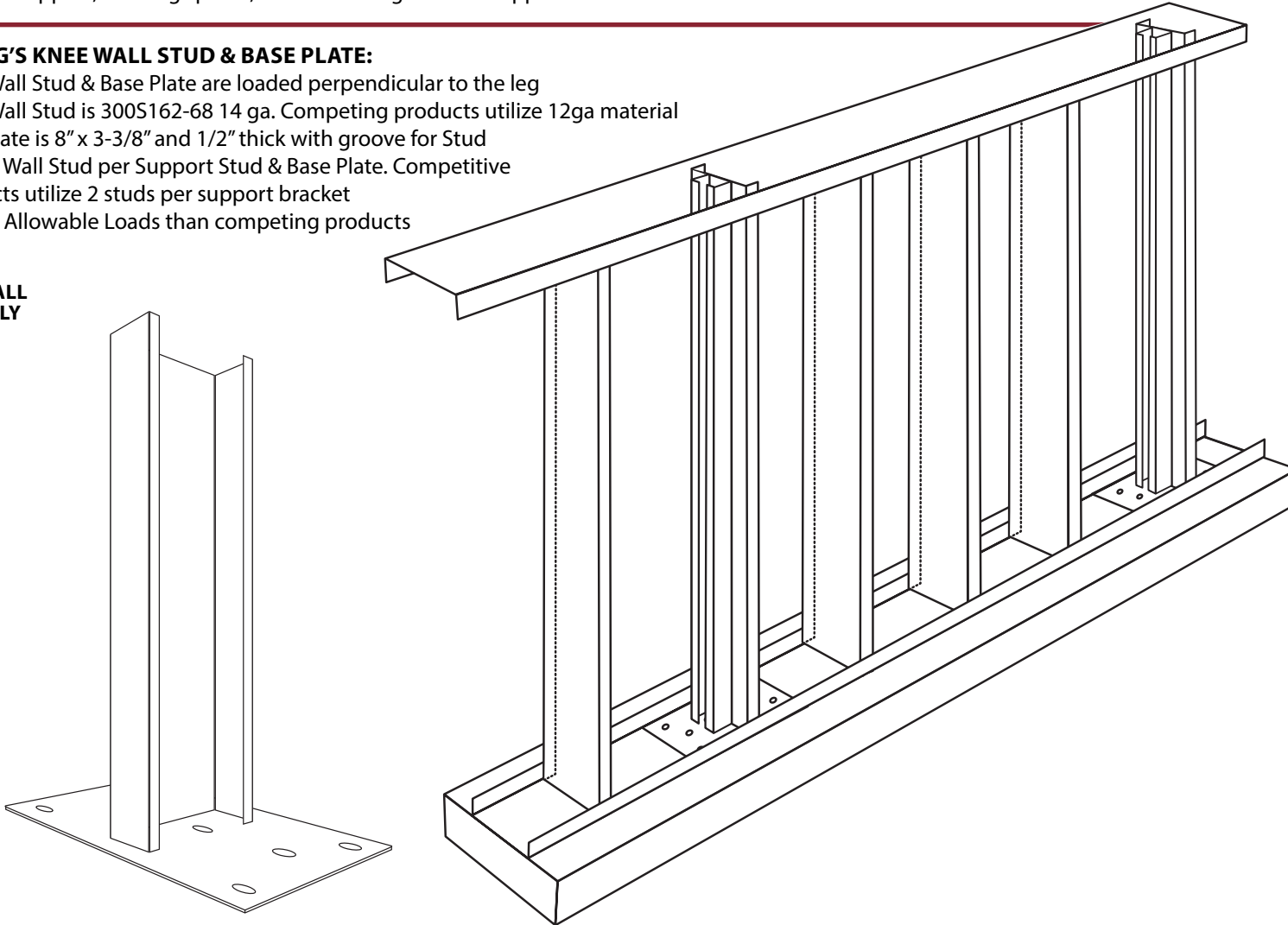
Knee Wall Support Bracket Assembly: What is it? An engineered system compromised of a 1/2" steel base plate welded to a 14ga structural stud.

In the construction industry, a "knee wall" is a term used to describe a short wall that is typically half the height of a full-sized wall. Also known as a "pony wall" or "cripple wall," knee walls are used for various purposes in building design, including providing structural support, dividing spaces, and enhancing aesthetic appeal.

TELLING'S KNEE WALL STUD & BASE PLATE:

- Knee Wall Stud & Base Plate are loaded perpendicular to the leg
- Knee Wall Stud is 300S162-68 14 ga. Competing products utilize 12ga material
- Base Plate is 8" x 3-3/8" and 1/2" thick with groove for Stud
- 1 Knee Wall Stud per Support Stud & Base Plate. Competitive products utilize 2 studs per support bracket
- Higher Allowable Loads than competing products

KNEE WALL ASSEMBLY



BASIC INSTALLATION STEPS:

1. Secure track to floor.
2. Secure knee wall assembly with base plate to floor on top of track with the desired quantity of anchor bolts. Follow anchor bolt manufacturer's installation instructions.
3. Secure knee wall stud to welded knee wall support assembly with at least 3 rows of #10-16 screws in the top, middle, & bottom.
4. Secure top track to top of knee wall studs.



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KNEE WALL 5.5" CONCRETE FLOOR ANCHORS



CHART 1: 5.5" CONCRETE THICKNESS 3000 PSI, 4 ANCHORS

Allowable Bending Capacity (kip-in)				Knee Wall Support Stud: Anchor quantity: Anchor Type: Anchor Size: Concrete Thickness: Concrete Strength (cracked) Embedment: I_{eff}	300S162-68 (50 ksi) 4 at each corner Hilti Kwik-TZ2 1/2 inch 5.5 inches 3000 psi 3.25 inches 0.6720 in ⁴									
Height (in)	Pony Wall Section	Stud to Baseplate Weld	Anchor to concrete											
24	14.04	12.66	12.57											
36	13.69	12.66	12.57											
48	12.50	12.66	12.57											
Allowable Point Load Applied at the Top (lbf)														
Height (in)	Strength Limit State	Combined Strength and Deflection												
		L/90	L/120	L/180	L/240	L/360	L/480	L/600						
24	524	524	524	524	524	524	430	344						
36	349	349	349	349	349	255	191	153						
48	260	260	260	260	215	143	108	86						
Allowable Distributed Load Applied along the Wall (plf)														
Height (in)	Strength Limit State	Combined Strength and Deflection												
		L/90	L/120	L/180	L/240	L/360	L/480	L/600						
24	524	524	524	524	524	524	524	459						
36	233	233	233	233	233	227	170	136						
48	130	130	130	130	130	96	72	57						

CHART 2: 5.5" CONCRETE THICKNESS 3000 PSI, 2 ANCHORS

Allowable Bending Capacity (kip-in)				Knee Wall Support Stud: Anchor quantity: Anchor Type: Anchor Size: Concrete Thickness: Concrete Strength (cracked) Embedment: I_{eff}	300S162-68 (50 ksi) 2 in center Hilti Kwik-TZ2 1/2 inch 5.5 inches 3000 psi 3.25 inches 0.6720 in ⁴									
Height (in)	Pony Wall Section	Stud to Baseplate Weld	Anchor to concrete											
24	14.04	12.66	7.72											
36	13.69	12.66	7.72											
48	12.50	12.66	7.72											
Allowable Point Load Applied at the Top (lbf)														
Height (in)	Strength Limit State	Combined Strength and Deflection												
		L/90	L/120	L/180	L/240	L/360	L/480	L/600						
24	322	322	322	322	322	322	322	322						
36	214	214	214	214	214	214	192	154						
48	161	161	161	161	161	143	108	86						
Allowable Distributed Load Applied along the Wall (plf)														
Height (in)	Strength Limit State	Combined Strength and Deflection												
		L/90	L/120	L/180	L/240	L/360	L/480	L/600						
24	322	322	322	322	322	322	322	322						
36	143	143	143	143	143	143	143	136						
48	80	80	80	80	80	80	72	57						



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KNEE WALL 4" & 5.5" CONCRETE FLOOR ANCHORS



CHART 3: 5.5" CONCRETE THICKNESS 3000 PSI, 1 ANCHOR

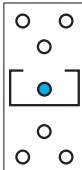
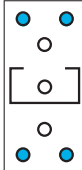
Allowable Bending Capacity (kip-in)				Knee Wall Support Stud: 300S162-68 (50 ksi) Anchor quantity: 1 in center Anchor Type: Hilti Kwik-TZ2 Anchor Size: 1/2 inch Concrete Thickness: 5.5 inches Concrete Strength (cracked): 3000 psi Embedment: 3.25 inches I_{eff} 0.6720 in ⁴					
Height (in)	Pony Wall Section	Stud to Baseplate Weld	Anchor to concrete						
24	14.04	12.66	5.26						
36	13.69	12.66	5.26						
48	12.50	12.66	5.26						
Allowable Point Load Applied at the Top (lbf)									
Height (in)	Strength Limit State	Combined Strength and Deflection							
		L/90	L/120	L/180	L/240	L/360	L/480	L/600	
24	219	219	219	219	219	219	219	219	
36	146	146	146	146	146	146	146	146	
48	110	110	110	110	110	110	108	86	
Allowable Distributed Load Applied along the Wall (plf)									
Height (in)	Strength Limit State	Combined Strength and Deflection							
		L/90	L/120	L/180	L/240	L/360	L/480	L/600	
24	219	219	219	219	219	219	219	219	
36	97	97	97	97	97	97	97	97	
48	55	55	55	55	55	55	55	55	

CHART 4: 4" CONCRETE THICKNESS 3500PSI, 4 ANCHORS

Allowable Bending Capacity (kip-in)				Knee Wall Support Stud: 300S162-68 (50 ksi) Anchor quantity: 4 at each corner Anchor Type: Hilti Kwik-TZ2 Anchor Size: 1/2 inch Concrete Thickness: 4.0 inches Concrete Strength (cracked): 3500 psi Embedment: 2.5 inches I_{eff} 0.6720 in ⁴					
Height (in)	Pony Wall Section	Stud to Baseplate Weld	Anchor to concrete						
24	14.04	12.66	9.80						
36	13.69	12.66	9.80						
48	12.50	12.66	9.80						
Allowable Point Load Applied at the Top (lbf)									
Height (in)	Strength Limit State	Combined Strength and Deflection							
		L/90	L/120	L/180	L/240	L/360	L/480	L/600	
24	408	408	408	408	408	408	408	344	
36	272	272	272	272	272	255	191	153	
48	204	204	204	204	204	143	108	86	
Allowable Distributed Load Applied along the Wall (plf)									
Height (in)	Strength Limit State	Combined Strength and Deflection							
		L/90	L/120	L/180	L/240	L/360	L/480	L/600	
24	408	408	408	408	408	408	408	408	
36	181	181	181	181	181	181	170	136	
48	102	102	102	102	102	96	72	57	



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KNEE WALL 4" CONCRETE FLOOR ANCHORS



CHART 5: 4" CONCRETE THICKNESS 3000PSI, 4 ANCHORS (HILTI KWIK-TZ2)

Allowable Bending Capacity (kip-in)				Knee Wall Support Stud: 300S162-68 (50 ksi) Anchor quantity: 4 at each corner Anchor Type: Hilti Kwik-TZ2 Anchor Size: 1/2 inch Concrete Thickness: 4.0 inches Concrete Strength (cracked) 3000 psi Embedment: 2.5 inches I_{eff} 0.6720 in ⁴				
Height (in)	Pony Wall Section	Stud to Baseplate Weld	Anchor to concrete					
24	14.04	12.66	9.08					
36	13.69	12.66	9.08					
48	12.50	12.66	9.08					
Allowable Point Load Applied at the Top (lbf)								
Height (in)	Strength Limit State	Combined Strength and Deflection						
		L/90	L/120	L/180	L/240	L/360	L/480	L/600
24	378	378	378	378	378	378	378	344
36	252	252	252	252	252	252	191	153
48	189	189	189	189	189	143	108	86
Allowable Distributed Load Applied along the Wall (plf)								
Height (in)	Strength Limit State	Combined Strength and Deflection						
		L/90	L/120	L/180	L/240	L/360	L/480	L/600
24	378	378	378	378	378	378	378	378
36	168	168	168	168	168	168	168	136
48	95	95	95	95	95	95	72	57

CHART 6: 4" CONCRETE THICKNESS 3000PSI, 4 ANCHORS (HILTI HY 200V3)

Allowable Bending Capacity (kip-in)				Knee Wall Support Stud: 300S162-68 (50 ksi) Anchor quantity: 4 at each corner Anchor Type: Hilti-HY 200 V3 Anchor Size: 1/2 inch Concrete Thickness: 4.0 inches Concrete Strength (cracked) 3000 psi Embedment: 2.5 inches I_{eff} 0.6720 in ⁴				
Height (in)	Pony Wall Section	Stud to Baseplate Weld	Anchor to concrete					
24	14.04	12.66	10.67					
36	13.69	12.66	10.67					
48	12.50	12.66	10.67					
Allowable Point Load Applied at the Top (lbf)								
Height (in)	Strength Limit State	Combined Strength and Deflection						
		L/90	L/120	L/180	L/240	L/360	L/480	L/600
24	445	445	445	445	445	445	430	344
36	296	296	296	296	296	255	191	153
48	222	222	222	222	215	143	108	86
Allowable Distributed Load Applied along the Wall (plf)								
Height (in)	Strength Limit State	Combined Strength and Deflection						
		L/90	L/120	L/180	L/240	L/360	L/480	L/600
24	445	445	445	445	445	445	445	445
36	198	198	198	198	198	198	170	136
48	111	111	111	111	111	96	72	57



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KNEE WALL 4" CONCRETE FLOOR ANCHORS



CHART 7: 4" CONCRETE THICKNESS 3000PSI, 2 ANCHORS

Allowable Bending Capacity (kip-in)				Knee Wall Support Stud: 300S162-68 (50 ksi) Anchor quantity: 2 in center Anchor Type: Hilti Kwik-TZ2 Anchor Size: 1/2 inch Concrete Thickness: 4.0 inches Concrete Strength (cracked): 3000 psi Embedment: 2.5 inches I_{eff} 0.6720 in ⁴					
Height (in)	Pony Wall Section	Stud to Baseplate Weld	Anchor to concrete						
24	14.04	12.66	5.71						
36	13.69	12.66	5.71						
48	12.50	12.66	5.71						

Allowable Point Load Applied at the Top (lbf)								
Height (in)	Strength Limit State	Combined Strength and Deflection						
		L/90	L/120	L/180	L/240	L/360	L/480	L/600
24	238	238	238	238	238	238	238	238
36	159	159	159	159	159	159	159	153
48	119	119	119	119	119	119	108	86

Allowable Distributed Load Applied along the Wall (plf)								
Height (in)	Strength Limit State	Combined Strength and Deflection						
		L/90	L/120	L/180	L/240	L/360	L/480	L/600
24	238	238	238	238	238	238	238	238
36	106	106	106	106	106	106	106	106
48	59	59	59	59	59	59	59	57

CHART 8: 4" CONCRETE THICKNESS 3000PSI, 1 ANCHOR

Allowable Bending Capacity (kip-in)				Knee Wall Support Stud: 300S162-68 (50 ksi) Anchor quantity: 1 in center Anchor Type: Hilti Kwik-TZ2 Anchor Size: 1/2 inch Concrete Thickness: 4.0 inches Concrete Strength (cracked): 3000 psi Embedment: 2.5 inches I_{eff} 0.6720 in ⁴					
Height (in)	Pony Wall Section	Stud to Baseplate Weld	Anchor to concrete						
24	14.04	12.66	4.00						
36	13.69	12.66	4.00						
48	12.50	12.66	4.00						

Allowable Point Load Applied at the Top (lbf)								
Height (in)	Strength Limit State	Combined Strength and Deflection						
		L/90	L/120	L/180	L/240	L/360	L/480	L/600
24	167	167	167	167	167	167	167	167
36	111	111	111	111	111	111	111	111
48	83	83	83	83	83	83	83	83

Allowable Distributed Load Applied along the Wall (plf)								
Height (in)	Strength Limit State	Combined Strength and Deflection						
		L/90	L/120	L/180	L/240	L/360	L/480	L/600
24	167	167	167	167	167	167	167	167
36	74	74	74	74	74	74	74	74
48	42	42	42	42	42	42	42	42

Notes:

1. Telling Knee Wall is to support out-of-plane loading of Partial Walls or Pony Walls.
2. Allowable loads are calculated based on Allowable Stress Design (ASD) approach in AISI-S100-16.
3. Allowable loads are based on deflection of the Knee Wall Stud only.
4. Knee Wall allowable bending capacity are the minimum of Knee Wall Stud bending capacity and Knee Wall Stud to base plate weld capacity.
5. Shaded cells in the design tables indicate that the design is controlled by deflection limits.
6. Allowable loads have not been increased for wind, seismic, or other factors.
7. Allowable Bending Capacity for specific anchors, configuration and concrete thickness are listed for quick reference. Other anchors may be used by designers for different conditions.
8. Hilti is the trademark of Hilti Aktiengesellschaft Corporation.
9. Other anchors may be used but must be designed separately.
10. It is the designer's responsibility to check the effects of edge distance, minimum concrete thickness and concrete strength on anchor capacity.
11. Effect of anchor and base plate deformations are not considered in deflection calculations.



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