EARTHBOUND™

"Holdowns That Work"

The first and only continuous tension holdown system.

CANADA LIMIT STATES EDITION
OCTOBER 2018

Earthbound Seismic and Wind Holdown Systems.
The industry leader in hardware and design technology.

FEATURES AND BENEFITS OF THE EARTHBOUND SYSTEM®

Features:

- ***ChubbySmack™ anchor products now available!***
- Standardized anchor bolt placement.
- Shrinkage and compression compensating devices. See the SlackJack®, HeavyJack™ and the MiniJack™ inside!
- 3-inch travel compensation available for six and seven storey buildings.
- Colour-coded components.
- Continuous connections.
- No welded parts.
- City of Los Angeles Research Report RR#25404.
- IAPMO UES Evaluation Report: ER-429. *Updated*
- The first and only continuous threaded rod holdown to provide tension in the system.

Benefits:

- Higher tolerance to anchor bolt misplacement.
- Holdowns that work after shrinkage and compression occur during the life of a building.
- Fewer devices required means material savings.
- Straight load path to foundation anchor.
- Color-coded plates and components provide straightforward identification and inspection.
- Only one vertical hole drilled per floor
- Installation labor savings.
- No ladder required.
- No eccentric loading.
- Proven corrosion resistance.

EARTHBOUND "Holdowns That Work"

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17361 Tye Street SE
Monroe, WA 98272

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Telephone (360) 863-0722
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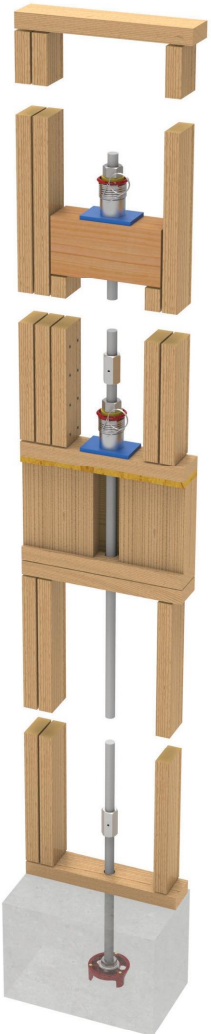
Earthbound System Introduction



The Earthbound System is a patented continuous threaded rod system from a foundation anchor bolt set in the foundation to the uppermost floor of a building on both ends of a shear wall. Threaded rod couplers join the rods at each level. The Earthbound System is the only system that provides tension into the threaded rods.

The advantages of using a continuous threaded rod system in lieu of standard holddowns are higher uplift capacities, easier anchor bolt placement and no horizontal drilling which results in faster installations. The SlackJack®, HeavyJack™ and MiniJack™ are shrinkage compensation devices that are placed at floor plate locations above the first floor and onto an Earthbound color coded bearing plate. Earthbound was the first to implement color coding and aluminum shrinkage devices into the system in which others are following. Steel SlackJacks are available for higher capacities.

The Earthbound System has two main locations for installing shrinkage compensation devices: at the selected floor levels and on a “compression bridge" at mid floor height, on the top floor of each rod run. The compression bridge is a horizontally placed sawn lumber 4x6 or 6x6. The use of the compression bridge will inherently save lumber and other material costs because the rod does not have to extend through the top roof joists.

Earthbound has recently released the ChubbySmack™ anchor product line (Page 6) that replaces standard nut-plate-nut embeds. The ChubbySmack™ assembly is able to achieve higher concrete breakout loads per ACI 318 simply by providing deeper embedment compared to a conventional anchor. Please visit *www.chubbysmack.com* to perform ACI 318 calculations for the new ChubbySmack™ anchor product line!

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COMPENSATION FOR SHRINKAGE AND BUILDING SETTLEMENT

The Earthbound System is proud to feature the new HeavyJack™, SlackJack® and MiniJack™ shrinkage and building settlement compensation devices. These devices are revolutionary to the holddown industry and contain many features and benefits not found in other devices. Available with three inch compensation for six to seven stories.

SlackJack® **MiniJack™**

1" Travel SlackJack® 2" Travel SlackJack® 1" Travel MiniJack™ 1 1/2" Travel MiniJack™

- The SlackJack®, HeavyJack™and MiniJack™ are fully evaluated and tested.
- Installs easier and faster than other take up devices.
- Salt spray tested to verify corrosion resistance and proven capability to continue to actuate.
- The SlackJack® and HeavyJack™ features a patent-pending self-aligning swivel feature for rods out of plumb and keeps device flat on the plate. No one else offers this.
- Can be reset in the field without tools.
- No lag screws to buy separately and install.
- No set screw to forget to remove.
- No baling wire to remove or tie strap to cut.
- Clip is specially designed to not be left behind.
- Heavy duty compression spring to prevent rods from bowing.
- Color coded for threaded rod size and travel distance.
- SlackJacks are available up to 1 1/2" diameter rods in 1 inch through 3 inch shrinkage compensation capacity.
- MiniJacks are available for up to 1/2" dia. rods and up to 2 inches travel.
- IAPMO ES ER-429 and City of Los Angeles Research #25404

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SLACKJACK® DEVICE INSTALLATION

SLIDE

Slide Slackjack® on top of colour bearing plate.

SPIN

Place colour coded washer and spin nut down hand tight.

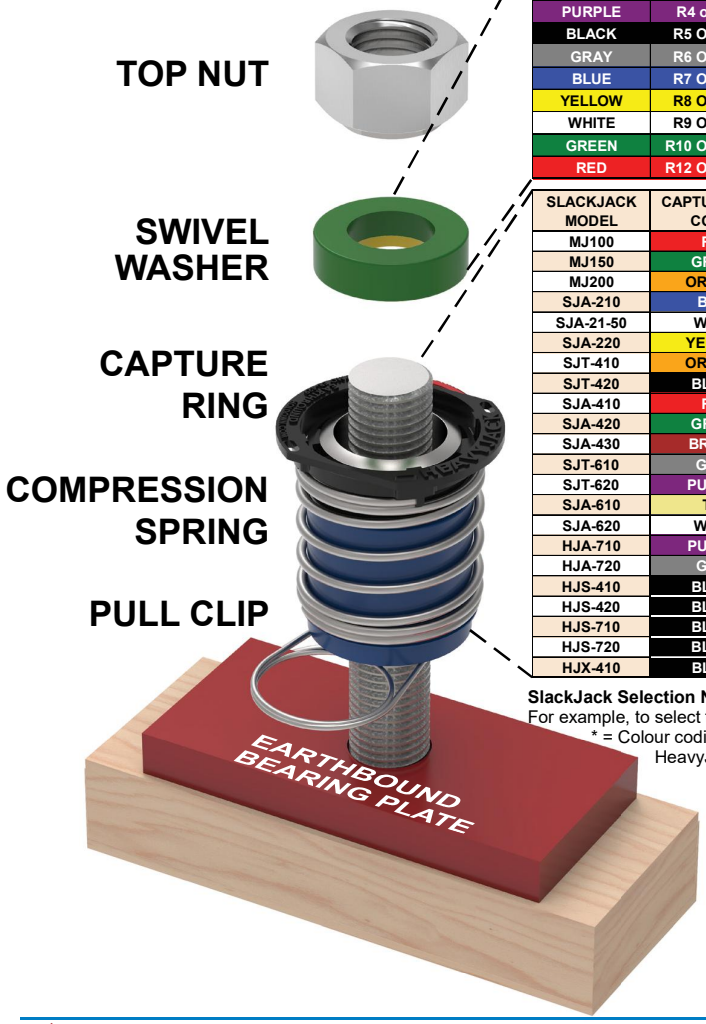
PULL

Pull clip away from device.

FINISHED!

Place clip in capture ring holder to show activation!

MINIJACK™, HEAVYJACK™ & SLACKJACK® DEVICE SELECTION TABLE



SWIVEL COLOR	THREADED ROD APPLICATION	ROD DIAMETER (in)
ORANGE	R3	3/8 in
PURPLE	R4 or R4HS	1/2 in
BLACK	R5 OR R5HS	5/8 in
GRAY	R6 OR R6HS	3/4 in
BLUE	R7 OR R7HS	7/8 in
YELLOW	R8 OR R8HS	1 in
WHITE	R9 OR R9HS	1 1/8 in
GREEN	R10 OR R10HS	1 1/4 in
RED	R12 OR R12HS	1 1/2 in

Swivel Washer Note: Swivel washers are not available for MiniJack™ MJ series.

SLACKJACK MODEL	CAPTURE RING COLOR	ADDITIONAL COLOR CODE	TRAVEL AMOUNT (in)	ALLOWABLE LOAD (lbs)	DEFLECTION AT LOAD (in)
MJ100	RED	N/A	1.00 in	5,000 lbs	0.028 in
MJ150	GREEN	N/A	1.50 in	5,000 lbs	0.030 in
MJ200	ORANGE	N/A	2.00 in	4,900 lbs	0.033 in
SJA-210	BLUE	N/A	1.00 in	7,360 lbs	0.013 in
SJA-21-50	WHITE	N/A	1.50 in	8,000 lbs	0.018 in
SJA-220	YELLOW	N/A	2.00 in	7,730 lbs	0.018 in
SJT-410	ORANGE	N/A	1.00 in	9,000 lbs	0.020 in
SJT-420	BLACK	N/A	2.00 in	9,000 lbs	0.018 in
SJA-410	RED	N/A	1.00 in	14,000 lbs	0.022 in
SJA-420	GREEN	N/A	2.00 in	14,000 lbs	0.030 in
SJA-430	BROWN	N/A	3.00 in	14,750 lbs	0.033 in
SJT-610	GRAY	N/A	1.00 in	15,000 lbs	0.019 in
SJT-620	PURPLE	N/A	2.00 in	15,000 lbs	0.019 in
SJA-610	TAN	N/A	1.00 in	20,340 lbs	0.028 in
SJA-620	WHITE	BLUE*	2.00 in	20,100 lbs	0.038 in
HJA-710	PURPLE	N/A	1.00 in	15,650 lbs	0.015 in
HJA-720	GRAY	N/A	2.00 in	15,590 lbs	0.018 in
HJS-410	BLACK	BLUE*	1.00 in	22,000 lbs	0.020 in
HJS-420	BLACK	YELLOW*	2.00 in	22,000 lbs	0.026 in
HJS-710	BLACK	GREEN*	1.00 in	39,190 lbs	0.029 in
HJS-720	BLACK	ORANGE*	2.00 in	37,770 lbs	0.030 in
HJX-410	BLACK	GOLD*	1.00 in	34,220 lbs	0.035 in

SlackJack Selection Note: For all parts except "MJ" series, replace the last digit "0" with rod size. For example, to select the SJA410 series for 3/4-in rod = SJA416.

* = Colour coding will be painted compression spring or painted HeavyJack™ outer cylinders.

HeavyJack ™ HJS-4110 shown (one inch travel for R10 rod size).

IAPMO ES ER-429

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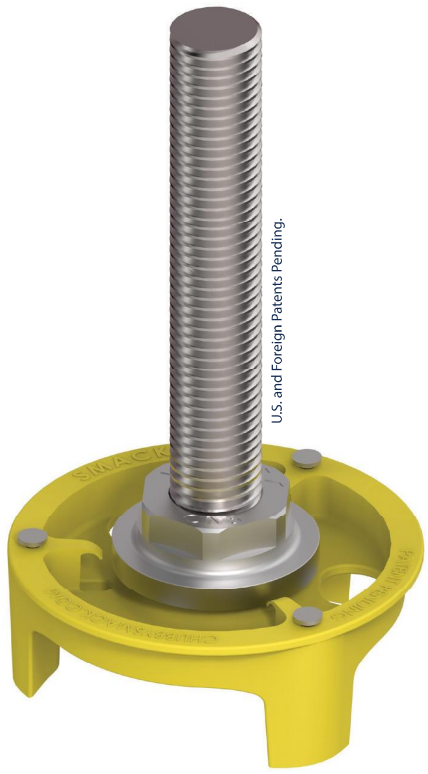
CHUBBYSMACK™ ANCHOR PRODUCTS

ChubbySmack™

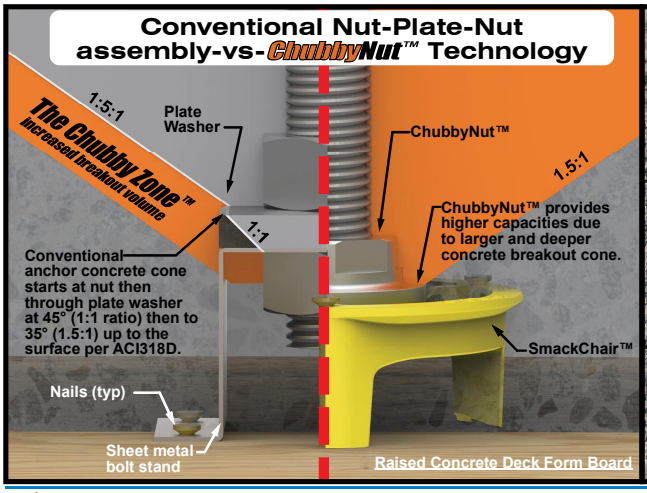
Concrete Anchoring Products for podiums, slabs & foundations



 ChubbyNut™	• Replaces nut-plate-nut anchors and J-bolts. • Use with A36/A307 threaded rod up to 1 1/2".
 HeavySet™	• Replaces high strength nut-plate-nut anchors. • Use with A449, A193B7 threaded rod up to 1 1/2"
 SmackChair™	• Use on raised podium and post tensioned decks. • Allows for required 1 inch concrete cover underneath. • Use in footings and slab on grade. • Color coded for rod size.
 SmackFlat™	• Use on raised decks over walls or where concrete cover is not critical. • Color coded for rod size.

- ***Replaces*** conventional nut-plate-nut embeds
- ***Optimize*** slab design thickness
- ***Simplify*** anchor design in ACI 318
- ***Specify*** with confidence!

ACI 318
Calculations available
at ***chubbysmack.com***



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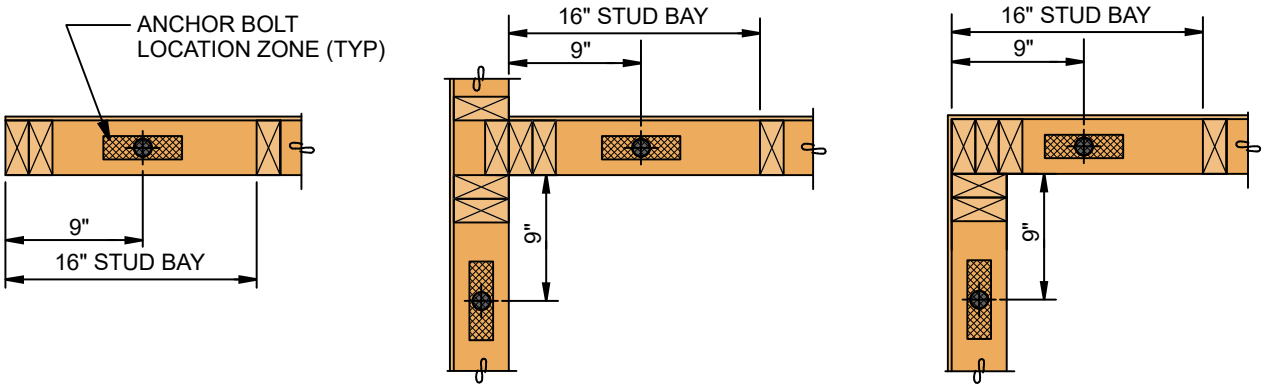
STANDARDIZED EARTHBOUND SYSTEM ANCHOR BOLT LAYOUT



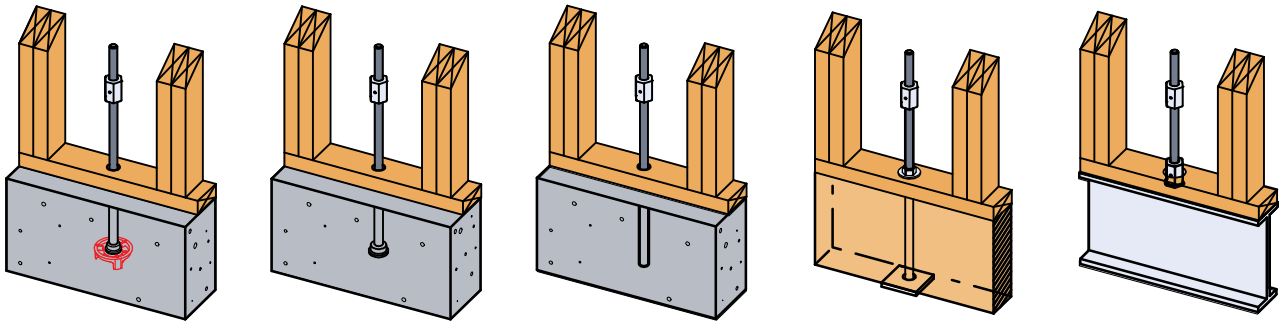
STRAIGHT WALL | WALL INTERSECTION | CORNER INSTALLATION

The Earthbound System features standardized anchor bolt placement.

What does this mean? - We want the anchor to be in the center of the first stud bay at each end of a shear wall. It means that no matter what compression members are required for the rod system holddown run, you can expect the anchor bolt location to remain nine (9") inches away from end of wall as shown above in all scenarios. It also means that your designed tension or overturning loads will not increase if anchor bolts are located further inward like other rod systems. A fixed layout dimension means easier anchor bolt layout before the pour.

How is the compression lumber distributed? - We want the additional compression lumber to occupy the first 16 inch on center stud bay, then start to fill in 2x studs inward away from end of wall. This maintains our maximum distance between anchor bolts in a shear wall and minimizes the calculated overturning load.

TYPICAL ANCHORING TYPES



CHUBBYSMACK™ RAISED PODIUM | CHUBBYNUT™ SLAB ON GRADE | EPOXY ANCHOR | WOOD BEAM CONNECTION | STEEL BEAM CONNECTION

Anchoring Notes: The holddown anchor design is by the design professional. Typically the anchor bolt diameter matches the first wood level threaded rod material specification and size. Earthbound can supply the new ChubbySmack™ anchoring assemblies or include standard embedded plate washers per drawing requirements needed to furnish a complete system package. The wood beam plate shown must be sized to handle the entire run load. For steel beam runs, we recommend our exclusive Earthbound Welded Anchor directly to the beam. Welding requirements is per the design professional. Contact Earthbound for design information.

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EARTHBOUND SYSTEM™ COMPONENT SELECTION TABLES

EARTHBOUND SYSTEM THREADED ROD CAPACITIES

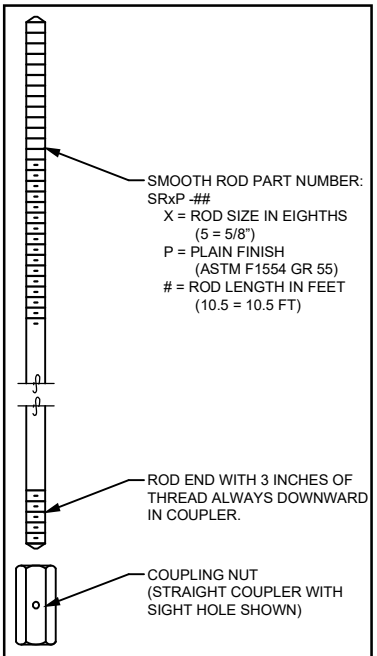
LIMIT STATES FACTORED TENSILE RESISTANCE

ROD NAME	ROD SIZE (in)	Nom. Area A_g or A_b	Net Area A_n	F'y (psi)	F'_u (psi)	FACTORED TENSION LOAD T_r LBS	FACTORED TENSION LOAD T_r kN	ROD SPEC[1,2,3]
R3*	3/8"	0.1104	0.0775	43,000	60,000	3,160 LBS	14.06 kN	ASTM A36 / A307
R4	1/2"	0.1963	0.1419	43,000	60,000	5,790 LBS	25.76 kN	ASTM A36 / A307
R5	5/8"	0.3068	0.2260	43,000	60,000	9,220 LBS	41.01 kN	ASTM A36 / A307
R6	3/4"	0.4418	0.3345	43,000	60,000	13,650 LBS	60.72 kN	ASTM A36 / A307
R7	7/8"	0.6013	0.4617	43,000	60,000	18,840 LBS	83.80 kN	ASTM A36 / A307
R8	1"	0.7854	0.6057	43,000	60,000	24,710 LBS	109.92 kN	ASTM A36 / A307
R9	1 1/8"	0.9940	0.7633	43,000	60,000	31,140 LBS	138.52 kN	ASTM A36 / A307
R10	1 1/4"	1.2272	0.9691	43,000	60,000	39,540 LBS	175.88 kN	ASTM A36 / A307
R12	1 1/2"	1.7671	1.4052	43,000	60,000	57,330 LBS	255.02 kN	ASTM A36 / A307
R14*	1 3/4"	2.4053	1.8995	43,000	60,000	77,500 LBS	344.74 kN	ASTM A36 / A307
R16*	2"	3.1416	2.4982	43,000	60,000	101,930 LBS	453.41 kN	ASTM A36 / A307
SR4	1/2"	0.1963	0.1419	55,000	75,000	7,240 LBS	32.21 kN	ASTM F1554 GR55
SR5	5/8"	0.3068	0.2260	55,000	75,000	11,530 LBS	51.29 kN	ASTM F1554 GR55
SR6	3/4"	0.4418	0.3345	55,000	75,000	17,060 LBS	75.89 kN	ASTM F1554 GR55
SR7	7/8"	0.6013	0.4617	55,000	75,000	23,550 LBS	104.76 kN	ASTM F1554 GR55
SR8	1"	0.7854	0.6057	55,000	75,000	30,890 LBS	137.41 kN	ASTM F1554 GR55
SR9	1 1/8"	0.9940	0.7633	55,000	75,000	38,930 LBS	173.17 kN	ASTM F1554 GR55
SR10	1 1/4"	1.2272	0.9691	55,000	75,000	49,420 LBS	219.83 kN	ASTM F1554 GR55
SR12	1 1/2"	1.7671	1.4052	55,000	75,000	71,670 LBS	318.80 kN	ASTM F1554 GR55
R5HS*	5/8"	0.3068	0.2260	105,000	125,000	19,210 LBS	85.45 kN	ASTM A193 B7
R6HS	3/4"	0.4418	0.3345	105,000	125,000	28,430 LBS	126.46 kN	ASTM A193 B7
R7HS	7/8"	0.6013	0.4617	105,000	125,000	39,250 LBS	174.59 kN	ASTM A193 B7
R8HS	1"	0.7854	0.6057	105,000	125,000	51,490 LBS	229.04 kN	ASTM A193 B7
R9HS	1 1/8"	0.9940	0.7633	105,000	125,000	64,880 LBS	288.60 kN	ASTM A193 B7
R10HS	1 1/4"	1.2272	0.9691	105,000	125,000	82,370 LBS	366.40 kN	ASTM A193 B7
R12HS	1 1/2"	1.7671	1.4052	105,000	125,000	119,450 LBS	531.34 kN	ASTM A193 B7
R14HS*	1 3/4"	2.4053	1.8995	105,000	125,000	161,450 LBS	718.17 kN	ASTM A193 B7

THREADED ROD NOTES:

1. STANDARD STRENGTH ROD / ASTM A36: F'u = 60,000 PSI. AVAILABLE IN 10 AND 12 FOOT LENGTHS.
2. SMOOTH ROD ("SR") / ASTM F1554 GR 55: F'u = 75,000 PSI. AVAILABLE 10, 10.5 AND 12 FT LENGTHS. SEE DIAGRAM.
3. HIGH STRENGTH ROD / ASTM A193B7: F'u = 125,000 PSI. AVAILABLE IN 12 FOOT LENGTH.
4. FACTORED RESISTANCES SHOWN ARE THE LOWER OF 13.2.(a)(i), 13.2.(a)(ii) and 13.12.1.2 of CSA S16-14.
5. "UNC" = UNIFIED NATIONAL COARSE THREADED ROD PITCH.
6. (*) = SPECIAL ORDER ITEM, CHECK WITH EARTHBOUND FOR AVAILABILITY.

SMOOTH ROD ("SR") DIAGRAM:



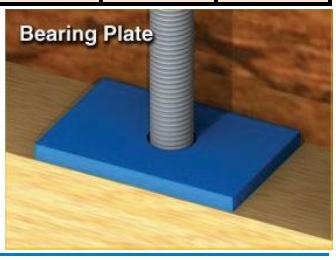
SMOOTH ROD MAY BE INTERCHANGABLE WITH ALL THREAD OF SAME OR SUPERIOR GRADE AND DIAMETER.

EARTHBOUND BEARING PLATE CAPACITIES

PLATE PART NO.	FACTORED BEARING RESISTANCE Q_r DOUG FIR LARCH LBS	DOUG FIR LARCH kN	S-P-F LBS	S-P-F kN	COLOUR CODE	PLATE DIMENSIONS (INCHES) WIDTH	LENGTH	THICK.	HOLE DIA.
P6	9,030 LBS	40.17 kN	7,480 LBS	33.27 kN	GREEN	3"	3 1/2"	1/4"	1 1/16"
P8	9,030 LBS	40.17 kN	9,030 LBS	40.17 kN	BLACK	3-1/4"	5"	1/4"	1 1/16"
P10	15,790 LBS	70.24 kN	11,950 LBS	53.16 kN	BLUE	3-1/4"	5"	3/8"	1 1/16"
P12	17,390 LBS	77.35 kN	13,160 LBS	58.54 kN	GRAY	3-1/4"	6"	5/8"	1 1/16"
P14	20,420 LBS	90.83 kN	15,460 LBS	68.77 kN	RED	3-1/4"	7"	3/4"	1 1/16"
P16	25,330 LBS	112.67 kN	19,170 LBS	85.27 kN	TAN	3-1/2"	8"	3/4"	1 1/16"
P18	28,590 LBS	127.17 kN	21,650 LBS	96.30 kN	YELLOW	3-1/2"	9"	1"	1 1/16"
P20	31,860 LBS	141.72 kN	24,120 LBS	107.29 kN	BROWN	3-1/2"	10"	1"	1 1/16"
P22	35,130 LBS	156.27 kN	26,600 LBS	118.32 kN	WHITE	3-1/2"	11"	1 1/4"	1 1/16"
P24	36,770 LBS	163.56 kN	32,010 LBS	142.39 kN	GOLD	3-1/2"	12"	1 1/2"	1 1/16"

NOTES:

1. PLATE STEEL SHALL BE ASTM A36: F_u = 60,000 PSI. DFL = 1015 psi. SPF = 768 psi. K_D=1.15
2. LARGER PLATE SIZES CAN BE CUSTOM ENGINEERED BY EARTHBOUND.
3. FACTORED RESISTANCES SHOWN ARE LOWER OF THE FOLLOWING:
   A. BENDING CAPACITY PER CSA S16-14 CLAUSE 13.5
   B. BEARING CAPACITY PER CSA O86-14 CLAUSE 5.5.7



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COMPRESSION MEMBER SELECTION TABLES

The following compression member capacity tables are for single stud or post column capacity Based on CSA O86 and is typical wood members used in the Earthbound System. The capacities shown below are calculated individually. The members may be combined in multiples and do not require stitch nailing. The capacities shown is the lower of either compression perpendicular to grain or column buckling which is a function of the stud or post height.

COMPRESSION MEMBER SELECTION - DOUGLAS FIR LARCH

FRAMING	LUMBER SIZE (SINGLE MEMBER)	LUMBER GRADE	PERP. TO GRAIN. Q_r	PARALLEL TO GRAIN, (P_r) OR PERPENDICULAR TO GRAIN (Q_r) LIMITATION - EACH MEMBER STUD OR POST MEMBER HEIGHT IN FT (m)									
				8 FT	2.44 m	9 FT	2.74 m	10 FT	3.05 m	11 FT	3.35 m	12 FT	3.66 m
				LBS	kN	LBS	kN	LBS	kN	LBS	kN	LBS	kN
4-inch Wall	2x4	No. 1/No. 2	6,130	5,235 LBS	23.29 kN	4,089 LBS	18.19 kN	3,204 LBS	14.25 kN	2,530 LBS	11.26 kN	2,018 LBS	8.98 kN
	4x4	No. 1/No. 2	12,929	12,215 LBS	54.34 kN	9,540 LBS	42.44 kN	7,476 LBS	33.26 kN	5,904 LBS	26.26 kN	4,709 LBS	20.94 kN
	4x6	No. 1/No. 2	19,778	19,195 LBS	85.38 kN	14,992 LBS	66.69 kN	11,748 LBS	52.26 kN	9,278 LBS	41.27 kN	7,399 LBS	32.91 kN
	4x8	No. 1/No. 2	23,701	23,701 LBS	105.43 kN	19,762 LBS	87.91 kN	15,487 LBS	68.89 kN	12,230 LBS	54.40 kN	9,753 LBS	43.39 kN
	4x10	No. 1/No. 2	30,240	30,240 LBS	134.51 kN	25,214 LBS	112.16 kN	19,759 LBS	87.89 kN	15,603 LBS	69.41 kN	12,444 LBS	55.35 kN
	4x12	No. 1/No. 2	36,778	36,778 LBS	163.60 kN	30,666 LBS	136.41 kN	24,031 LBS	106.90 kN	18,977 LBS	84.41 kN	15,135 LBS	67.32 kN
6-inch Wall	2x6	No. 1/No. 2	9,632	9,632 LBS	42.85 kN	9,632 LBS	42.85 kN	9,632 LBS	42.85 kN	9,632 LBS	42.85 kN	8,700 LBS	38.70 kN
	6x4	No. 1/No. 2	20,318	20,318 LBS	90.38 kN	20,318 LBS	90.38 kN	20,318 LBS	90.38 kN	20,318 LBS	90.38 kN	20,299 LBS	90.29 kN
	6x6	No. 1/No. 2	31,080	31,080 LBS	138.25 kN	31,080 LBS	138.25 kN	31,080 LBS	138.25 kN	31,080 LBS	138.25 kN	31,080 LBS	138.25 kN
	6x8	No. 1/No. 2	37,245	37,245 LBS	165.67 kN	37,245 LBS	165.67 kN	37,245 LBS	165.67 kN	37,245 LBS	165.67 kN	37,245 LBS	165.67 kN
	6x10	No. 1/No. 2	47,519	47,519 LBS	211.38 kN	47,519 LBS	211.38 kN	47,519 LBS	211.38 kN	47,519 LBS	211.38 kN	47,519 LBS	211.38 kN
	6x12	No. 1/No. 2	57,794	57,794 LBS	257.08 kN	57,794 LBS	257.08 kN	57,794 LBS	257.08 kN	57,794 LBS	257.08 kN	57,794 LBS	257.08 kN

NOTES:

1. TABLE IS BASED ON CSA O86-14.
2. PERPENDICULAR AND PARALLEL TO GRAIN LOADS INCLUDE K_D = 1.15 LOAD INCREASE.
3. PERPENDICULAR TO GRAIN VALUES INCLUDE BEARING FACTOR K_B AND SIZE FACTOR K_{Zcp}.
4. FINAL VALUES SHOWN ARE THE LOWER OF PERPENDICULAR TO GRAIN (Q_r) OR COMPRESSION PARALLEL TO GRAIN (P_r)
5. EFFECTIVE LENGTH OF STUD OR POST HEIGHT USED IS NOMINAL PLATE HEIGHT SUBTRACTING 4.5 INCHES FOR (3) 2x WALL PLATES.
6. PLYWOOD SHEATHING AND NAILING PATTERN REQUIREMENTS PROVIDED BY THE ENGINEER OF RECORD.

COMPRESSION MEMBER SELECTION - SPRUCE PINE FIR (SPF)

FRAMING	LUMBER SIZE (SINGLE MEMBER)	LUMBER GRADE	PERP. TO GRAIN. Q_r	PARALLEL TO GRAIN, (P_r) OR PERPENDICULAR TO GRAIN (Q_r) LIMITATION - EACH MEMBER STUD OR POST MEMBER HEIGHT IN FT (m)									
				8 FT	2.44 m	9 FT	2.74 m	10 FT	3.05 m	11 FT	3.35 m	12 FT	3.66 m
				LBS	kN	LBS	kN	LBS	kN	LBS	kN	LBS	kN
4-inch Wall	2x4	No. 1/No. 2	4,641	4,635 LBS	20.62 kN	3,658 LBS	16.27 kN	2,889 LBS	12.85 kN	2,296 LBS	10.21 kN	1,839 LBS	8.18 kN
	4x4	No. 1/No. 2	9,789	9,789 LBS	43.55 kN	8,534 LBS	37.96 kN	6,741 LBS	29.99 kN	5,356 LBS	23.83 kN	4,292 LBS	19.09 kN
	4x6	No. 1/No. 2	14,975	14,975 LBS	66.61 kN	13,411 LBS	59.66 kN	10,594 LBS	47.12 kN	8,417 LBS	37.44 kN	6,744 LBS	30.00 kN
	4x8	No. 1/No. 2	17,945	17,945 LBS	79.82 kN	17,679 LBS	78.64 kN	13,964 LBS	62.12 kN	11,095 LBS	49.35 kN	8,890 LBS	39.54 kN
	4x10	No. 1/No. 2	22,896	22,896 LBS	101.85 kN	22,555 LBS	100.33 kN	17,817 LBS	79.25 kN	14,156 LBS	62.97 kN	11,342 LBS	50.45 kN
	4x12	No. 1/No. 2	27,846	27,846 LBS	123.87 kN	27,432 LBS	122.02 kN	21,669 LBS	96.39 kN	17,216 LBS	76.58 kN	13,795 LBS	61.36 kN
6-inch Wall	2x6	No. 1/No. 2	7,293	7,293 LBS	32.44 kN	7,293 LBS	32.44 kN	7,293 LBS	32.44 kN	7,293 LBS	32.44 kN	7,293 LBS	32.44 kN
	6x4	No. 1/No. 2	15,383	15,383 LBS	68.43 kN	15,383 LBS	68.43 kN	15,383 LBS	68.43 kN	15,383 LBS	68.43 kN	15,383 LBS	68.43 kN
	6x6	No. 1/No. 2	23,532	23,532 LBS	104.68 kN	23,532 LBS	104.68 kN	23,532 LBS	104.68 kN	23,532 LBS	104.68 kN	23,532 LBS	104.68 kN
	6x8	No. 1/No. 2	28,200	28,200 LBS	125.44 kN	28,200 LBS	125.44 kN	28,200 LBS	125.44 kN	28,200 LBS	125.44 kN	28,200 LBS	125.44 kN
	6x10	No. 1/No. 2	35,979	35,979 LBS	160.04 kN	35,979 LBS	160.04 kN	35,979 LBS	160.04 kN	35,979 LBS	160.04 kN	35,979 LBS	160.04 kN
	6x12	No. 1/No. 2	43,758	43,758 LBS	194.65 kN	43,758 LBS	194.65 kN	43,758 LBS	194.65 kN	43,758 LBS	194.65 kN	43,758 LBS	194.65 kN

NOTES:

1. TABLE IS BASED ON CSA O86-14.
2. PERPENDICULAR AND PARALLEL TO GRAIN LOADS INCLUDE K_D = 1.15 LOAD INCREASE.
3. PERPENDICULAR TO GRAIN VALUES INCLUDE BEARING FACTOR K_B AND SIZE FACTOR K_{Zcp}.
4. FINAL VALUES SHOWN ARE THE LOWER OF PERPENDICULAR TO GRAIN (Q_r) OR COMPRESSION PARALLEL TO GRAIN (P_r)
5. EFFECTIVE LENGTH OF STUD OR POST HEIGHT USED IS NOMINAL PLATE HEIGHT SUBTRACTING 4.5 INCHES FOR (3) 2x WALL PLATES.
6. PLYWOOD SHEATHING AND NAILING PATTERN REQUIREMENTS PROVIDED BY THE ENGINEER OF RECORD.

Earthbound Corporation
17361 Tye Street SE
Monroe, WA 98272

www.holdown.com
Telephone (360) 863-0722
Fax (360) 863-0724

HOW TO SPECIFY THE EARTHBOUND SYSTEM™

1) After the overturning loads (T_r) are calculated per level, the Engineer may choose to round or "consolidate" holdown loads in a vertical, tabular format as indicated in the holdown table below. Holdown Run Type naming is shown as 1A, 2A, etc. Loads may be provided in pounds.

Table 1: Sample Holdown Run Type Table (FACTORED TENSION LOADS (Tr) IN LBS)

RUN TYPE	1A	2A	2B	3A	4A	4B	5A	5B	5C	5G
LEVEL 5							500 LBS	1,500 LBS	5,000 LBS	5,000 LBS
LEVEL 4					1,500 LBS	2,500 LBS	1,500 LBS	5,000 LBS	7,500 LBS	7,500 LBS
LEVEL 3				1,500 LBS	3,000 LBS	5,000 LBS	5,000 LBS	7,500 LBS	10,000 LBS	15,000 LBS
LEVEL 2		1,500 LBS	2,500 LBS	2,500 LBS	5,000 LBS	7,500 LBS	7,500 LBS	10,000 LBS	15,000 LBS	20,000 LBS
LEVEL 1	1,000 LBS	2,500 LBS	5,000 LBS	5,000 LBS	7,500 LBS	10,000 LBS	10,000 LBS	15,000 LBS	20,000 LBS	25,000 LBS
ANCHOR BOLT DIA.	5/8"	5/8"	5/8"	5/8"	5/8"	3/4"	3/4"	7/8"	1"	*3/4" HS
CHUBBYSMACK™ SIZE	CNSCR5	CNSCR5	CNSCR5	CNSCR5	CNSCR5	CNSCR6	CNSCR5	CNSCR6	CNSCR7	HSSCR7

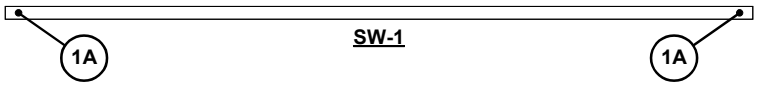
2) All anchoring components (bolt diameter and grade, ChubbySmack™ and embedment depth) are designed by the Engr of Record.

3) "HS" shown in this example indicates "high strength" or Grade ASTM A449/A193B7. “CNSCRx” and “HSSCRx” are ChubbySmack™. anchor model numbers. “CN” = ChubbyNut™, “HS” = HeavySet™, SC = SmackChair™, R = Rod Size x.

4) ChubbySmack™ anchor products shown above for example. Anchoring design per Engineer of Record.

5) Figure 1 below indicates how the holdown run may be specified in plan views. This view may be shown on every floor, or just on the first level floor plan if the floor plans are stacking.

Figure 1: Sample Holdown Plan View Callout



6) Sample Paragraph to include on the drawings:

Earthbound Seismic Holdown System with ChubbySmack™ Anchor Products

The seismic holdown system shall be fully self-compensating or self-tightening for wood shrinkage. The seismic holdown system shall not include holdown straps unless shown by the Engineering plans. The seismic holdown system and ChubbySmack anchor products shall be the Earthbound System and shall be supplied by Earthbound Corporation Monroe, Washington (Phone: 800-944-5669). Substitutions for the Earthbound System must be pre-approved in writing by the Engineer.

7) Additional required information to provide an accurate and fully value-engineered holdown system solution:

- Design Code Requirements (e.g. Canadian National Building Code, British Columbia BC Codes, etc.)
- Wall Heights (exterior elevations, etc)
- Foundation Type (Post-Tensioned, Slab on Grade, Mild Steel Slab, etc.)
- Anchoring details.
- Holdown Locations.
- Wall stud and plate lumber type.
- Shear wall schedules.

8) Given the above information, Earthbound will provide complete installation shop drawings that conform to the plan requirements.

9) Our helpful Engineering staff is available by toll free number at 800-944-5669 or by email at techsupport@holdown.com.

10) For latest engineering information and design criteria, please visit us on the web at http://www.holdown.com.

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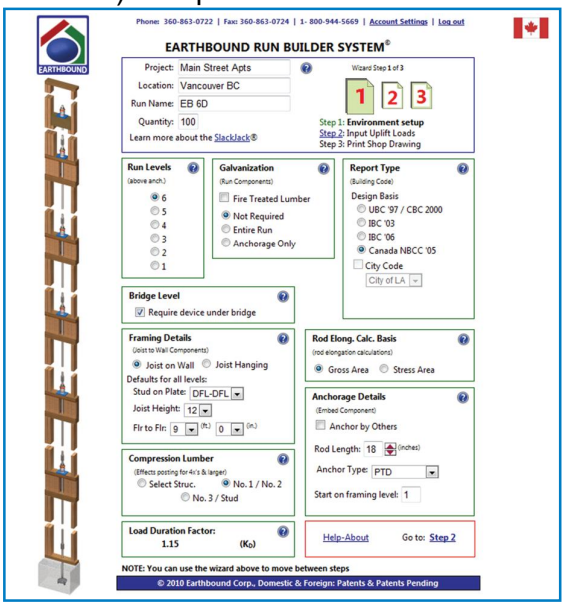
Fax (360) 863-0724

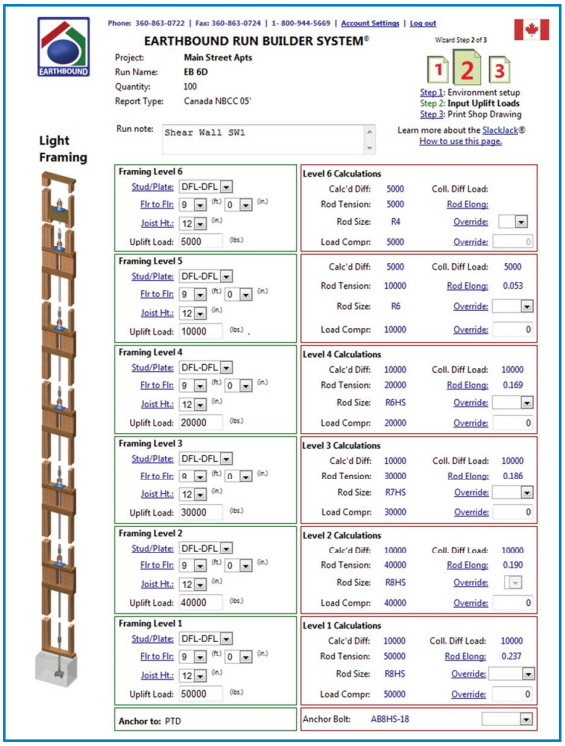
RUNBUILDER.COM - AN ONLINE RUN SYSTEM DESIGN TOOL (US Patent No. 8751206)

- Free online tool to design Earthbound System Runs!
- Supports Canada NBC 2015 Limit States Design with Six Storeys.
- Custom design wood compression members & print calc reports instantly!
- Register at http://www.runbuilder.com and start building runs today!

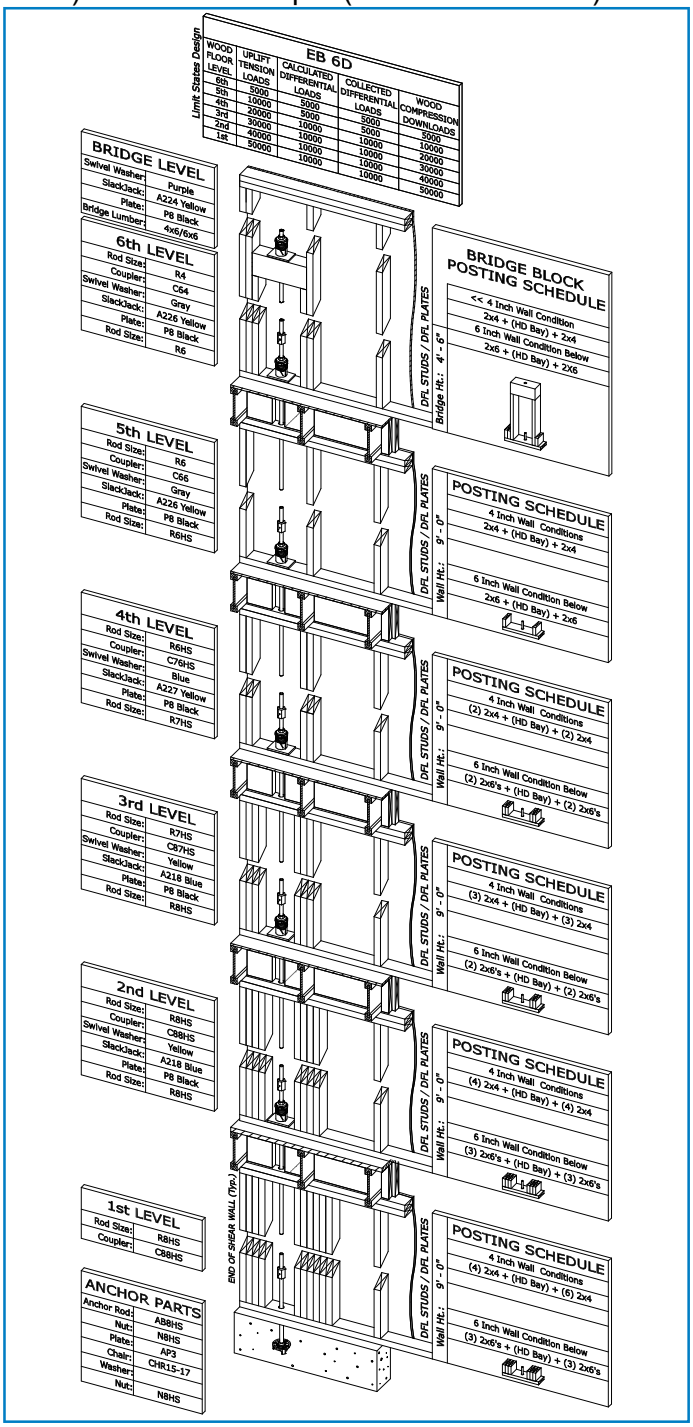
1) Setup Run Parameters



2) Input Design Loads

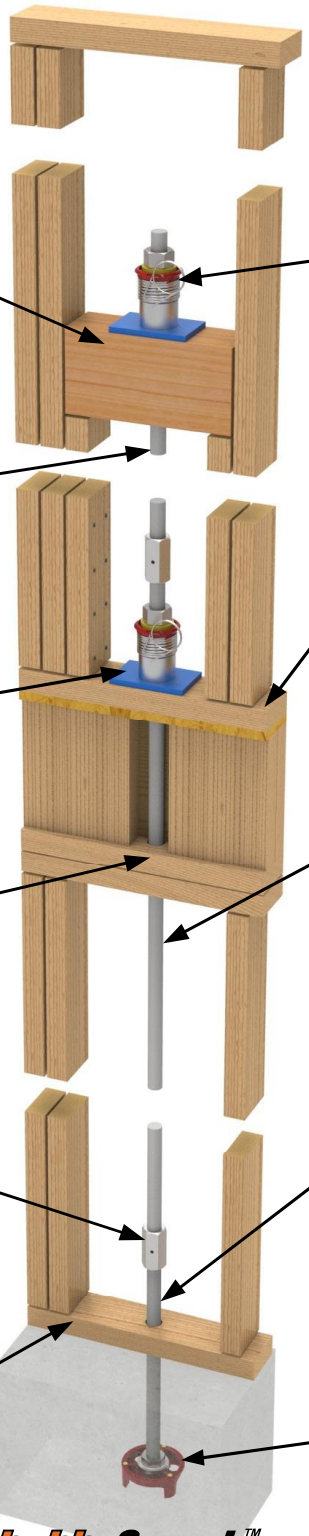


3) Actual Run Output (NBC 2015 Shown)



EARTHBOUND tm

"Holdowns That Work"



Earthbound Compression Bridge:
- Eliminates roof joist interference
- No top plate mounting.
- No ladder work necessary.
- Can be installed during flat framing.
- Patented connection.

Continuous Rod System:
- Rod forms a steel post connection.
- Minimizes rod cutting requirements.
- Simplified rod and coupler assembly.

Bearing Plates:
- Colour coded for easy inspection.
- Sized for differential loading.
- Capacities to 44,160 lbs differential.
- Custom and larger sizes available.

Rod Alignment:
- Allowable rod centerline offset up to 2 inches for 8 foot wall height.

Rod Couplers:
- Couplers meet or exceed the strength of the connecting rods.
- All non-reducing couplers include an inspection hole to verify correct installation.

16" o.c. Framing Design:
- Earthbound System is based on 16" on center stud wall framing design.
- Utilizes and maximizes use of common framing members as part of compression lumber requirements.
- Lumber savings

Slackjack® Shrinkage Device
- Available in 1, 2 and 3 inch travel.
- Corrosion resistant.
- Available up to 1 1/2" rod diameter.
- Each compensator works independent of each other.
- Colour coded for easy inspection.

SlackJack®.com

Upper Floor Bottom Plate:
- Slackjack® Device and Bearing Plate mounted on bottom plate effectively contains uplift of differential load between 1st and 2nd wood levels in this example.

Threaded Rod:
- ASTM A307 to 57,330 lbs (1 1/2" dia). (per Factored Tension CSA S16-14)
- A193B7 to 119,450 lbs (1 1/2" dia). (per Factored Tension CSA S16-14)
- Higher capacities are achieved through double rod holdown runs.

Anchor Rod:
- Standardized anchor placement.
- Same rod diameter size as first level threaded rod.
- Cast-in-place anchor shown
- Epoxy anchors may be used.
- All anchoring designed by Engineer of Record.

ChubbySmack™ Anchor:
- Cast in place raised podium deck application shown
- SmackChair™ bolt stands available

ChubbySmack™.com

U.S. Patents 6,161,350, 6,494,654, 6,688,058, 6,951,078, 7,159,366, 7,340,867, 7,617,642, 7,665,258, 7,762,030 & other U.S. and Foreign Patents Pending.

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