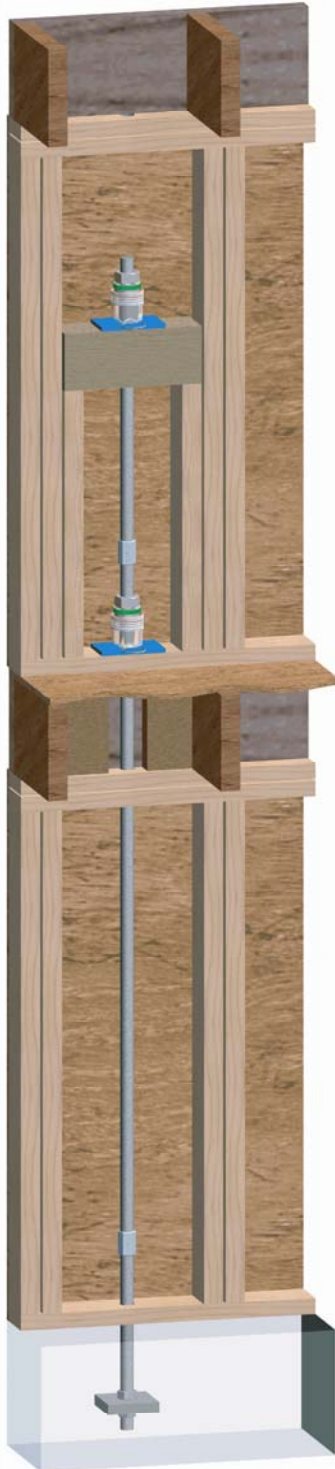
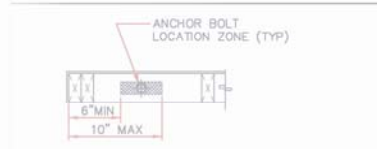


# Continuous Threaded Rod Holddown System for Wood Shrinkage

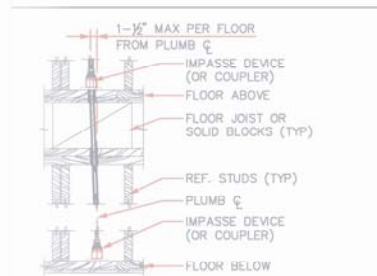


WALL TYPE	MIN. HOLE SIZE	MAX. HOLE SIZE	MIN. HOLE SIZE
1/2" S	1/2"	1/2"	1/2"
3/4" S	1/2"	1/2"	1/2"
7/8" S	1-1/8"	1-1/8"	1-1/8"
1" S	1-1/4"	1-1/4"	1-3/8"
1-1/8" S	1-3/8"	1-3/8"	1-1/2"
1-1/4" S	1-1/2"	1-1/2"	1-5/8"

NOTE: HOLE SIZES INTENDED FOR 6" WALL TYPES ONLY. NUMBER OF RECORD SHALL APPROVE THE USE OF THESE HOLE SIZES FOR 4" WALL TYPES.

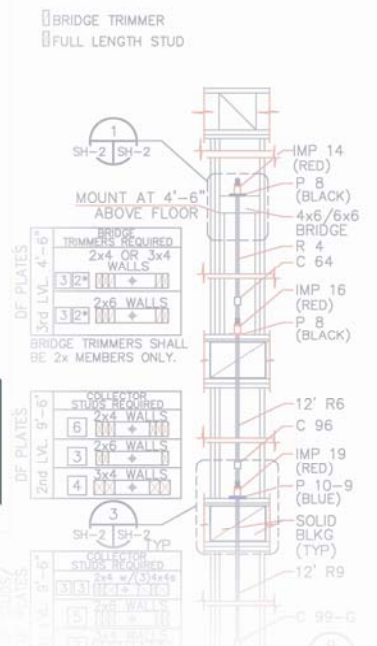


ANCHOR BOLT PLAN  
SCALE: NONE  
SH-1 SH-1



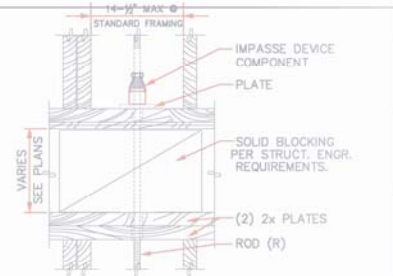
ALLOWABLE ROD OFFSET DETAIL  
SCALE: NONE  
SH-1 SH-1

FLOOR LEVEL	UPLIFT TENSION LOADS	DIFFERENTIAL LOADS	COLLECTED LOAD LOCATIONS	SPECIFIED COMPRESSION LOADS
1st	3,530 #	3,530 #	3,530 #	3,550 #
2nd	11,190 #	7,660 #	7,660 #	10,870 #
3rd	21,080 #	9,890 #	9,890 #	20,090 #



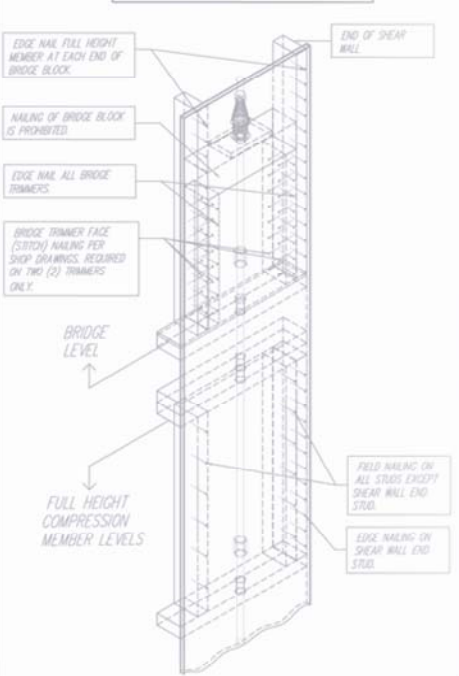
TYP. BRIDGE INSTALLATION DETAIL  
SCALE: NONE  
SH-1 SH-1

NOTE: SOLID BLOCKING, PROVIDE ENOUGH SOLID BLOCKING IN JOIST SPACE TO MATCH WIDTH OF ALL COMPRESSION STUDS OR POSTS OF THE WALL ABOVE AND BELOW.



TYP. IMPASSE INSTALLATION DETAIL  
SCALE: NONE  
SH-1 SH-1

ALL SHEAR PANEL NAIL SPACING IS PER THE SHEAR WALL SCHEDULE.



NOTE: SEE SHOP DRAWING GENERAL NOTES FOR NAILING REQUIREMENTS WHEN POSTS ARE USED.



**"Holdowns That Work"**  
National Edition 2008

**EARTHBOUND™**

PROJECT: EARTHBOUND HOLDOWN SYSTEM  
SHOP DRAWING SUBMITTAL

DATE: 09/16/07

SCALE: NONE

REVISIONS:

NO.	DATE	BY	CHKD.	APP'D.	REVISION

DESIGNED BY: [ ]  
CHECKED BY: [ ]  
APPROVED BY: [ ]

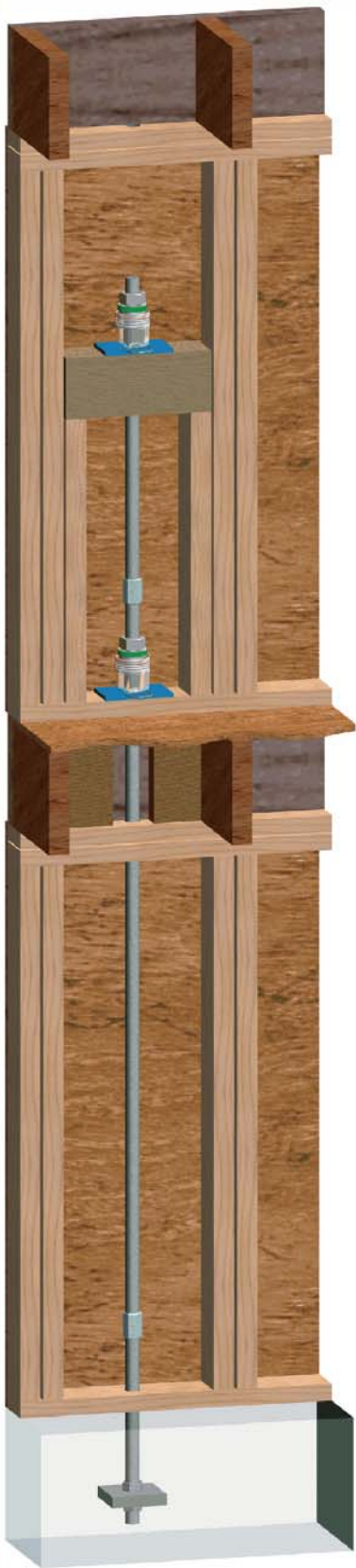
## The Earthbound Seismic Holdown System

### Features

- Standardized anchor bolt placement.
- Shrinkage and compression compensating Devices. See new Slackjack™ inside!
- 2" compensation standard above 3<sup>rd</sup> wood level.
- Color-coded components.
- Continuous connections.
- No welded parts.
- ICC-ES Evaluation Report #ER-5378
- City of Los Angeles Research Report #25404
- U.S. Patents 6,161,350, 6,494,564, 6,688,058, 6,951,078, 7,159,366 and other U.S. & Foreign Patents Pending.

### 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.



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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 advantages of using a continuous threaded rod system in lieu of standard holdowns are higher uplift capacities, easier anchor bolt placement and no horizontal drilling which results in faster installations.

The Impasse Device or the new Slackjack™ is a shrinkage compensation device placed at floor plate locations above the first floor and is placed onto an Earthbound color coded bearing plate.

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. The compression bridge is supported by collector studs that are nailed to both adjacent full height members and shear panel edge nailed per the structural plan shear wall schedules.





New for the Earthbound System:

# SLACKJACK™

A revolutionary new breakthrough in shrinkage fastener technology!

The SLACKJACK™



- Installs faster than other shrinkage take up fasteners.
- Made of aluminum and stainless to resist corrosion.
- Salt spray tested to verify corrosion resistance
- Self-aligning swivel feature for rods out of plumb.
- 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 and tie strap to cut.
- Clip is specially designed to not be forgotten.
- Heavy duty spring to prevent rods from bowing.
- Color coded for threaded rod size and travel distance.
- Available in 1" and 2" travel!



## SLACKJACK DEVICE INSTALLATION

SLIDE



1. Slide Slackjack™ on top of color coded bearing plate.

SPIN



2. Place color coded washer and spin nut down hand tight.

PULL



3. Pull Clip away from device.

FINISHED!



4. All finished! It doesn't get any easier.

## HOW TO SPECIFY THE EARTHBOUND SYSTEM™

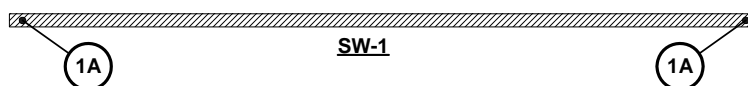
1) After the overturning loads are calculated per level, the Engineer may choose to round or "consolidate" holdown loads in a vertical, tabular format as indicated in the holdown table below. Holdown Run Type naming is shown as 1A, 2A, etc.

**Table 1: Sample Holdown Run Type Table**

RUN TYPE	1A	2A	2B	3A	4A	4B	5A	5B	5C	5D
<b>LEVEL 5</b>							500	1,500	5,000	5,000
<b>LEVEL 4</b>					1,500	2,500	1,500	5,000	7,500	7,500
<b>LEVEL 3</b>				1,500	3,000	5,000	5,000	7,500	10,000	15,000
<b>LEVEL 2</b>		1,500	2,500	2,500	5,000	7,500	7,500	10,000	15,000	20,000
<b>LEVEL 1</b>	1,000	2,500	5,000	5,000	7,500	10,000	10,000	15,000	20,000	25,000
<b>ANCHOR BOLT DIA.</b>	5/8"	5/8"	5/8"	5/8"	5/8"	3/4"	3/4"	7/8"	1"	*7/8" HS
<b>ANCHOR PLATE SIZE</b>	1/2 X 3-1/2	1/2 X 3-1/2	1/2 X 3-1/2	1/2 X 3-1/2	1/2 X 3-1/2	3/4 X 3-1/2	3/4 X 3-1/2	3/4 X 3-1/2	1 X 4	1 X 4

- 2) All anchoring components (bolt diameter and grade, anchor plate and embedment depth) are designed by the Engineer of Record.
- 3) "HS" shown in this example indicates "high strength" or Grade ASTM A193B7.
- 4) Anchoring plates shown are square.
- 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**

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 shall have an ICBO Evaluation on the entire system. Systems that have partial ICBO Evaluation or on components only shall NOT be allowed without prior written approval from the Structural Engineer. The seismic holdown system shall be the Earthbound System (ICC-ES ER 5378) and shall be supplied by Earthbound Corporation (formerly InQuest Engineering), Monroe, Washington (Phone: 800-944-5669) or approved equal. 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. UBC 97 / IBC 2003 / IBC 2006)
  - 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 support@holdown.com.
- 10) For latest engineering information and design criteria, please visit us on the web at <http://www.holdown.com>.

**COMPONENT SELECTION TABLE (IBC 2003-2006)**

**EARTHBOUND THREADED ROD CAPACITIES**

ROD SIZE	ROD SIZE (INCHES)	ALLOWABLE TENSION LOAD			ROD REMARKS	IMPASSE DEVICE (6) SIZE	SLACKJACK™ (7) SIZE
		(100)	(133)-(1C)	IBC 2006-(1D)			
R3	3/8" DIA.	2,140 LBS	2,850 LBS	2,485 LBS	ASTM A 36 (UNC)	IMP 13, 23	----
R4	1/2" DIA.	3,800 LBS	5,060 LBS	4,418 LBS	ASTM A 36 (UNC)	IMP 14, 24	SJA 414, 424
R5	5/8" DIA.	5,930 LBS	7,910 LBS	6,903 LBS	ASTM A 36 (UNC)	IMP 15, 25	SJA 415, 425
R6	3/4" DIA.	8,540 LBS	11,390 LBS	9,940 LBS	ASTM A 36 (UNC)	IMP 16, 26	SJA 416, 426
R7	7/8" DIA.	11,630 LBS	15,500 LBS	13,530 LBS	ASTM A 36 (UNC)	IMP 17, 27	SJA 417, 427
R8	1" DIA.	15,180 LBS	20,240 LBS	17,671 LBS	ASTM A 36 (UNC)	IMP 18, 28	SJA 418, 428
R9	1 1/8" DIA.	19,220 LBS	25,620 LBS	22,365 LBS	ASTM A 36 (UNC)	IMP 19, 29	SJA 419, 429
R10*	1 1/4" DIA.	23,730 LBS	31,630 LBS	27,612 LBS	ASTM A 36 (UNC)	* IMP 110, 210	* SJA 4110, 4210
R12*	1 1/2" DIA.	34,160 LBS	45,540 LBS	39,761 LBS	ASTM A 36 (UNC)	----	----
R14*	1 3/4" DIA.	46,500 LBS	61,990 LBS	54,119 LBS	ASTM A 36 (UNC)	----	----
R6HS	3/4" DIA.	18,410 LBS	24,540 LBS	20,709 LBS	ASTM A 193 B7 (UNC)	IMP 16, 26	SJA 416, 426
R7HS	7/8" DIA.	25,060 LBS	33,400 LBS	28,187 LBS	ASTM A 193 B7 (UNC)	IMP 17, 27	SJA 417, 427
R8HS	1" DIA.	32,720 LBS	43,620 LBS	36,816 LBS	ASTM A 193 B7 (UNC)	IMP 18, 28	SJA 418, 428
R9HS	1 1/8" DIA.	41,420 LBS	55,210 LBS	46,595 LBS	ASTM A 193 B7 (UNC)	IMP 19, 29	SJA 419, 429
R10HS*	1 1/4" DIA.	51,130 LBS	68,160 LBS	57,524 LBS	ASTM A 193 B7 (UNC)	* IMP 110, 210	* SJA 4110, 4210
R12HS*	1 1/2" DIA.	73,630 LBS	98,150 LBS	69,604 LBS	ASTM A 193 B7 (UNC)	----	----

**EARTHBOUND BEARING PLATE CAPACITIES**

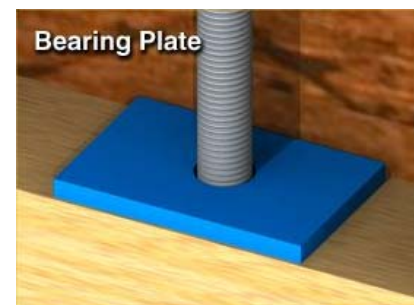
**SJA ROD SIZE CODES**

PLATE SIZE	DIFFERENTIAL LOAD	COLOR CODE	PLATE DIMENSIONS (INCHES)			PART NO.	ROD DIAMETER	ROD SIZE	WASHER COLOR
			WIDTH	LENGTH	THICK.				
P8	8,000 LBS	BLACK	3-1/4"	5"	1/4"	SJA 4x4	1/2"	R4	PURPLE
P10	10,000 LBS	BLUE	3-1/4"	5"	3/8"	SJA 4x5	5/8"	R5	BLACK
P12	12,000 LBS	GRAY	3-1/4"	6"	5/8"	SJA 4x6	3/4"	R6 or R6HS	GRAY
P14	14,000 LBS	RED	3-1/4"	7"	3/4"	SJA 4x7	7/8"	R7 or R7HS	BLUE
P18	18,000 LBS	YELLOW	3-1/2"	9"	1"	SJA 4x8	1"	R8 or R8HS	YELLOW
P20*	20,000 LBS	GREEN	3-1/2"	10"	1"	SJA 4x9	1 1/8"	R9 or R9HS	WHITE
P22*	22,000 LBS	WHITE	3-1/2"	11"	1 1/4"	SJA 4x10	1 1/4"	R10 or R10HS	GREEN
P24*	24,000 LBS	GOLD	3-1/2"	11"	1 1/2"	SJA 4x12	1 1/2"	R12 or R12HS	RED

\*x" = SLACKJACK TRAVEL IN "INCHES"

**NOTES:**

- TENSION LOAD WAS CALCULATED FROM THE FOLLOWING EQUATION:
  - Threaded Rod Capacity Load = [(58,000 psi \* Major Rod Area) / (F. Safety=3)] AISC rod 60,000 psi can be used per EOR.
  - High Strength (HS) rod tension loads calculated similar with 125,000 psi using ASTM A 193 B7.
  - The (133) Column contains 1/3 stress increase for reference. Engineer to verify local building code applicability.
  - The IBC 2006 column is calculated in accordance to AISC 13th Edition per IBC 2006. Engineer to verify local building code applicability.
- STANDARD STRENGTH ROD / ASTM A36: F<sub>u</sub> = 58,000 PSI. "UNC" THREAD PITCH.
- HIGH STRENGTH ROD / ASTM A193B7: F<sub>u</sub> = 125,000 PSI. "UNC" THREAD PITCH.
- PLATE STEEL SHALL BE ASTM A36: F<sub>u</sub> = 60,000 PSI. BEARING PLATE FLOOR CONNECTION SHALL NOT EXCEED 12,000 LBS UNLESS NOTED OTHERWISE.
- SUBSTITUTIONS OF DESIGNATED BEARING PLATE SHALL NOT BE PERMITTED, OBTAIN WRITTEN APPROVAL FROM THE ENGINEER.
- IMPASSE SELECTION NOTES:**  
THE SIZES SHOWN ABOVE ARE FOR BOTH ONE AND TWO INCH TRAVEL ("IMP xy") (x = TRAVEL HEIGHT IN INCHES, y = ROD SIZE). TWO INCH TRAVEL IMPASSE DEVICES ARE REQUIRED ON FOURTH WOOD FRAME LEVELS AND HIGHER.
- SLACKJACK SELECTION NOTES:**  
THE SIZES SHOWN ABOVE ARE FOR BOTH ONE AND TWO INCH TRAVEL ("SJA 4xy") (x = TRAVEL HEIGHT IN INCHES, y = ROD SIZE). TWO INCH TRAVEL SLACKJACKS ARE REQUIRED ON FOURTH WOOD FRAME LEVELS AND HIGHER.
- ASTERISK (\*) DENOTES ROD OR PLATE SIZE IS NOT INCLUDED IN ICC ES-5378. THE ENGINEER OF RECORD SHALL REVIEW AND APPROVE CAPACITIES. THIS TABLE IS FOR REFERENCE ONLY, SOME ROD AND PLATE SIZES MAY NOT BE IN USE.
- ROD COUPLING NUTS ARE RATED AT 135% MINIMUM OF THE CAPACITY OF THE ROD THAT THEY ARE ATTACHED. MILL CERTIFICATES ARE AVAILABLE UPON REQUEST.
- "UNC" = UNIFIED NATIONAL COARSE THREADED ROD PITCH.



## COMPRESSION MEMBER SELECTION TABLES

The following compression member capacity tables are for single stud or post column capacity based on NDS 2005 of 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.	PARALLEL TO GRAIN, Pc (LBS) - SINGLE MEMBER									
				STUD OR POST MEMBER HEIGHT (FT)									
				8 FT		9 FT		10 FT		11 FT		12 FT	
				(133)	(160)	(133)	(160)	(133)	(160)	(133)	(160)	(133)	(160)
4-inch Wall	2x4	NO. 2	3,281	2,427	2,485	1,975	2,009	1,631	1,652	1,366	1,379	1,159	1,168
	3x4	NO. 2	5,469	4,045	4,142	3,292	3,348	2,718	2,753	2,276	2,299	1,931	1,947
	4x4	NO. 1	7,656	7,656	7,656	6,210	6,275	5,090	5,131	4,242	4,269	3,586	3,605
	4x6	NO. 1	12,031	12,031	12,031	9,730	9,838	7,981	8,049	6,654	6,699	5,627	5,658
	4x8	NO. 1	15,859	15,858	15,859	12,784	12,935	10,494	10,589	8,754	8,816	7,406	7,449
	4x10	NO. 1	20,234	20,130	20,234	16,251	16,456	13,352	13,480	11,145	11,229	9,432	9,490
	4x12	NO. 1	24,609	24,482	24,609	19,765	20,015	16,239	16,395	13,554	13,657	11,472	11,542
6-inch Wall	2x6	NO. 2	5,156	5,156	5,156	5,156	5,156	5,156	5,156	4,745	4,916	4,125	4,238
	6x4	NO. 1	12,031	12,031	12,031	12,031	12,031	12,031	12,031	12,031	12,031	12,031	12,031
	6x6	NO. 1	18,906	18,906	18,906	18,906	18,906	18,906	18,906	18,906	18,906	18,906	18,906
	6x8	NO. 1	24,922	24,922	24,922	24,922	24,922	24,922	24,922	24,922	24,922	24,922	24,922
	6x10	NO. 1	31,797	31,797	31,797	31,797	31,797	31,797	31,797	31,797	31,797	31,609	31,797
	6x12	NO. 1	38,672	38,672	38,672	38,672	38,672	38,672	38,672	38,672	38,672	38,444	38,672

COMPRESSION MEMBER SELECTION - HEM FIR													
FRAMING	LUMBER SIZE (SINGLE MEMBER)	LUMBER GRADE	PERP. TO GRAIN.	PARALLEL TO GRAIN, Pc (LBS) - SINGLE MEMBER									
				STUD OR POST MEMBER HEIGHT (FT)									
				8 FT		9 FT		10 FT		11 FT		12 FT	
				(133)	(160)	(133)	(160)	(133)	(160)	(133)	(160)	(133)	(160)
4-inch Wall	2x4	NO. 2	2,126	2,126	2,126	1,969	2,004	1,627	1,649	1,363	1,377	1,157	1,167
	3x4	NO. 2	3,544	3,544	3,544	3,282	3,340	2,712	2,748	2,272	2,296	1,928	1,944
	4x4	NO. 1	4,961	4,961	4,961	4,961	4,961	4,496	4,531	3,746	3,769	3,166	3,182
	4x6	NO. 1	7,796	7,796	7,796	7,796	7,796	7,049	7,108	5,876	5,915	4,968	4,995
	4x8	NO. 1	10,277	10,277	10,277	10,277	10,277	9,270	9,351	7,731	7,784	6,539	6,576
	4x10	NO. 1	13,112	13,112	13,112	13,112	13,112	11,795	11,905	9,842	9,915	8,329	8,379
	4x12	NO. 1	15,947	15,947	15,947	15,947	15,947	14,345	14,479	11,971	12,059	10,130	10,190
6-inch Wall	2x6	NO. 2	3,341	3,341	3,341	3,341	3,341	3,341	3,341	3,341	3,341	3,341	3,341
	6x4	NO. 1	7,796	7,796	7,796	7,796	7,796	7,796	7,796	7,796	7,796	7,796	7,796
	6x6	NO. 1	12,251	12,251	12,251	12,251	12,251	12,251	12,251	12,251	12,251	12,251	12,251
	6x8	NO. 1	16,149	16,149	16,149	16,149	16,149	16,149	16,149	16,149	16,149	16,149	16,149
	6x10	NO. 1	20,604	20,604	20,604	20,604	20,604	20,604	20,604	20,604	20,604	20,604	20,604
	6x12	NO. 1	25,059	25,059	25,059	25,059	25,059	25,059	25,059	25,059	25,059	25,059	25,059





## LEGACY REPORT

ER-5378

Reissued March 1, 2007

**ICC Evaluation Service, Inc.**  
[www.icc-es.org](http://www.icc-es.org)

Business/Regional Office ■ 5360 Workman Mill Road, Whittier, California 90601 ■ (562) 699-0543  
 Regional Office ■ 900 Montclair Road, Suite A, Birmingham, Alabama 35213 ■ (205) 599-9800  
 Regional Office ■ 4051 West Flossmoor Road, Country Club Hills, Illinois 60478 ■ (708) 799-2305

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**Legacy report on the 1997 Uniform Building Code™**


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**DIVISION: 06—WOOD AND PLASTICS**  
**Section: 06090—Wood and Plastic Fastenings**

**EARTHBOUND™ SEISMIC HOLDDOWN SYSTEM USING THE "IMPASSE DEVICE™"**

**EARTHBOUND CORPORATION**  
 17361 TYE STREET SE  
 MONROE, WASHINGTON 98272

**1.0 SUBJECT**

The EARTHBOUND Seismic Holddown System Using the "Impasse Device™."

**2.0 DESCRIPTION**

**2.1 General:**

The EARTHBOUND™ Seismic Holddown System is a holddown system used with wood-framed shear wall systems. The EARTHBOUND™ system, consisting of an Impasse Device™, a threaded steel rod, and a bearing plate, resists uplift in the walls while compensating for settlement, shrinkage, and compression loading by the continual downward actuation of the Impasse Device™.

**2.2 Components:**

**2.2.1 Impasse Device™:** The Impasse Device™ is a cylindrical, high-strength, structural connector that enables axial compression travel along a bolted or sliding connection and that withstands loads in the opposite direction (tension). The Impasse Device™ is available in different strength levels and in travel lengths of one inch, two inches and three inches (25.4 mm, 51 mm and 76 mm). The Impasse Device™ will actuate in increments of 0.070 inch (1.78 mm) or less with 15 to 20 pounds (67 to 89 N) force. See Table 1 for different Impasse Device™ series and allowable load capacities.

The EARTHBOUND™ Seismic Holddown System uses Series 2xx Impasse devices manufactured from the two different materials noted in this report.

Series x10, x20 and x30 include an outer cylinder (IMP cylinder) and an inner cylinder (IMP nut). Cylinders are produced from ASTM A 311 grade steel with a minimum tensile strength of 100,000 psi (689 MPa); or aluminum complying with 6065-T6511.

**2.2.2 Steel Threaded Rods:** The Impasse Device™ is used with steel threaded rods or bolts having nominal diameters ranging from 3/8 inch to 1 1/8 inches (9.5 mm to 28.6 mm) in all load capacities, as shown in Table 2. Standard-grade

threaded rods must comply with ASTM A 36. High-strength rods or bolts must comply with ASTM A 449, or ASTM A 193, Grade B7.

**2.2.3 Bearing Plate:** Bearing plates are used at floor levels or compression bridge conditions, and are manufactured from steel conforming to ASTM A 36, with dimensions and color codes noted in Table 3.

**2.3 Allowable Loads:**

Under allowable stress design, the allowable loads for the holddown system components are as shown in Tables 1 and 2. Allowable loads for bearing plates are shown in Table 3. Calculations considering the capacity of devices listed in this report, capacity of rod and nuts, capacity of bearing plates, anchorage into the concrete foundation, and interaction of the system with wood components of the building, must be submitted to the building official for review and approval for each holddown system installation. Supports shall be designed in accordance with the code to transfer loads into the system.

**2.4 EARTHBOUND™ Seismic Holddown System Installation:**

The Earthbound Seismic Holddown System must be installed in accordance with the building plans approved by the code official. See Figures 1 and 2 for typical installation details.

**2.5 Identification:**

Each package containing all components of the Impasse™ or Slackjack™ Devices bears a label noting the manufacturer's name (Earthbound Corporation) and address, the component model or series number, lot identification number, and the evaluation report number (ER-5378). A portion of the Impasse™ or Slackjack™ devices are color-coded to represent the allowable component travel for each "S" or "A" series. The color codes for the Impasse™ or Slackjack™ devices are indicated in Table 1. Bearing plates are color-coded as noted in Table 3.

**3.0 EVIDENCE SUBMITTED**

Installation instructions, calculations, reports on monotonic and cyclic tests, and a quality control manual.

**4.0 FINDINGS**

**That the EARTHBOUND™ Seismic Holddown System Using the "Impasse Device™" complies with the 1997 Uniform Building Code™ (UBC), subject to the following conditions:**

*ICC-ES legacy reports are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the report or a recommendation for its use. There is no warranty by ICC Evaluation Service, Inc., express or implied, as to any finding or other matter in this report, or as to any product covered by the report.*



- 4.1 Devices are installed and manufactured in accordance with this report and the manufacturer's instructions.
  - 4.2 Allowable loads are as set forth in Tables 1 2 and 3 of this report.
  - 4.3 Structural calculations, demonstrating that the applied loads do not exceed the allowable loads, are submitted to the building official for approval.
  - 4.4 The systems or devices shall be designed to resist load combinations specified in Sections 1612.1, 1612.3, and 1612.4 of the UBC.
  - 4.5 When the Impasse Device™ is used as a standalone fastener, independent of the EARTHBOUND™ Seismic Holddown System, the applied loads do not exceed the allowable loads noted in this report.
  - 4.6 When installation is complete, steel and aluminum Impasse devices are limited to dry, interior locations, except as noted in Section 4.7.
  - 4.7 For extended exterior or wet environment exposures, and when in contact with dissimilar metals, aluminum Impasse devices must comply with Section 2011.6.2 of the UBC. Evidence of compliance must be submitted to the building official for approval.
- This report is subject to re-examination in one year.

TABLE 1—IMPASSE DEVICE SELECTION INFORMATION<sup>1,2,3,4,5</sup>

ASTM A 311 STEEL "S" SERIES			ALUMINUM SLACKJACK™ "SJA" SERIES			TRAVEL INCREMENT (Inches)
Series No. <sup>1,2,3,4,5</sup>	Color Code <sup>6</sup>	Allowable Tension Load (pounds)	Series No. <sup>1,2,3,4,5</sup>	Color Code <sup>6</sup>	Allowable Tension Load (pounds)	
IMP S210	Red	18,750	SJA 210	Blue	7,000	1.00
IMP S220	Green	18,750	SJA 220	Orange	7,000	2.00
IMP S230	Black	18,750	SJA 230	Yellow	7,000	3.00
IMP S410	NA	35,100	SJA 410	Red	15,750	1.00
IMP S420	NA	35,100	SJA 420	Green	15,750	2.00
IMP S610	NA	47,475	SJA 610	NA	—	1.00
IMP S620	NA	47,475	SJA 620	NA	—	2.00
			SJA 630	NA	—	3.00

For SI: 1 inch = 25.4 mm, 1 pound = 4.45 N.

<sup>1</sup>Series 2xx denotes an Impasse Device Slackjack with two total locking C-Rings.

<sup>2</sup>Series 4xx denotes a Slackjack Impasse Device with four total locking C-rings.

<sup>3</sup>Series 6xx denotes a Slackjack Impasse Device with six total locking C-rings.

<sup>4</sup>The Series' center digit "x1x" denotes total travel length, in inches (for example, the "1" denotes 1-inch travel).

<sup>5</sup>The Series' last digit "xx5" denotes threaded rod diameter size in eighths on an inch (5 equals 5/8-inch-diameter rod).

<sup>6</sup>NA = Not available.

TABLE 2—ALLOWABLE THREADED ROD CAPACITIES<sup>1,2</sup>

ROD LABEL	ROD SIZE (inches)	ASTM SPECIFICATION	$F_{ULT}$ (psi)	ALLOWABLE TENSION LOAD <sup>1</sup> (pounds)
R4	1/2	ASTM A 36	58,000	3,800
R5	5/8	ASTM A 36	58,000	5,930
R6	3/4	ASTM A 36	58,000	8,540
R7	7/8	ASTM A 36	58,000	11,630
R8	1	ASTM A 36	58,000	15,180
R9	1 1/8	ASTM A 36	58,000	19,220
R5HS-A449	5/8	ASTM A 449	120,000	12,270
R6HS-A449	3/4	ASTM A 449	120,000	17,670
R7HS-A449	7/8	ASTM A 449	120,000	24,050
R8HS-A449	1	ASTM A 449	120,000	31,420
R9HS_A449	1 1/8	ASTM A 449	105,000	34,790
R5HS-B7	5/8	ASTM A 193 B7	125,000	12,780
R6HS_B7	3/4	ASTM A 193 B7	125,000	18,410
R7HS-B7	7/8	ASTM A 193 B7	125,000	25,060
R8HS-B7	1	ASTM A 193 B7	125,000	32,720
R9HS-B7	1 1/8	ASTM A 193 B7	125,000	41,420

For SI: 1 inch = 25.4 mm, 1 pound = 4.45 N.

<sup>1</sup>Allowable tension load is calculated with safety factor (SF) = 3 from  $F_{ULT} \times$  Gross Rod Area.

<sup>2</sup>Other threaded rod specifications, when substantiated by data determining the allowable tensile loads in accordance with Chapter 22 of the UBC, can be specified on the plans that are approved by the building official.

TABLE 3—BEARING PLATE ALLOWABLE LOAD CAPACITIES<sup>1,2,3,4</sup>

PLATE LABEL	COLLECTED DIFFERENTIAL TENSION LOAD (pounds)	PLATE COLOR CODE	PLATE DIMENSIONS (inches)		
			Width	Length	Thickness
P8	8,000	Black	3 1/4	5	1/4
P10	10,000	Blue	3 1/4	5	3/8
P12	12,000	Gray	3 1/4	6	5/8
P14	14,000	Red	3 1/4	7	3/4
P18	18,000	Yellow	3 1/4	9	1

For SI: 1 inch = 25.4 mm, 1 pound = 4.45 N, 1 psi = 6.89 kPa.

<sup>1</sup>Plate steel must comply with ASTM A 36:  $F_{ULT} = 58,000$  psi.

<sup>2</sup>Substitutions of designated bearing plate shall not be permitted unless approved by a structural designer and building official.

<sup>3</sup>Collected differential tension loads are tension loads resisted by the Impasse Device bearing plate at levels where the Impasse Device and plate are located.

<sup>4</sup>Collected differential tension loads are based on plate placement on lumber with minimum  $F_{c, \perp} = 625$  psi.

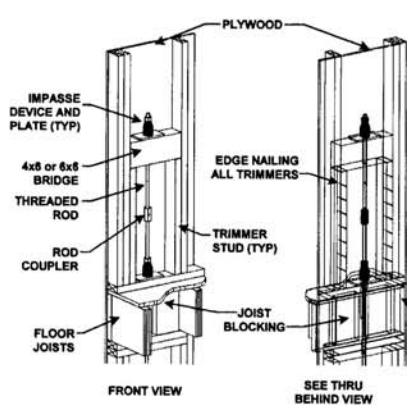


FIGURE 1—TYPICAL SYSTEM INSTALLATION

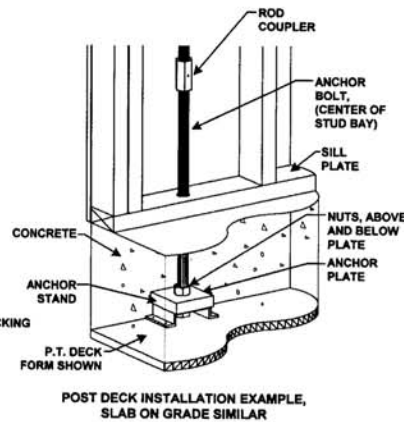
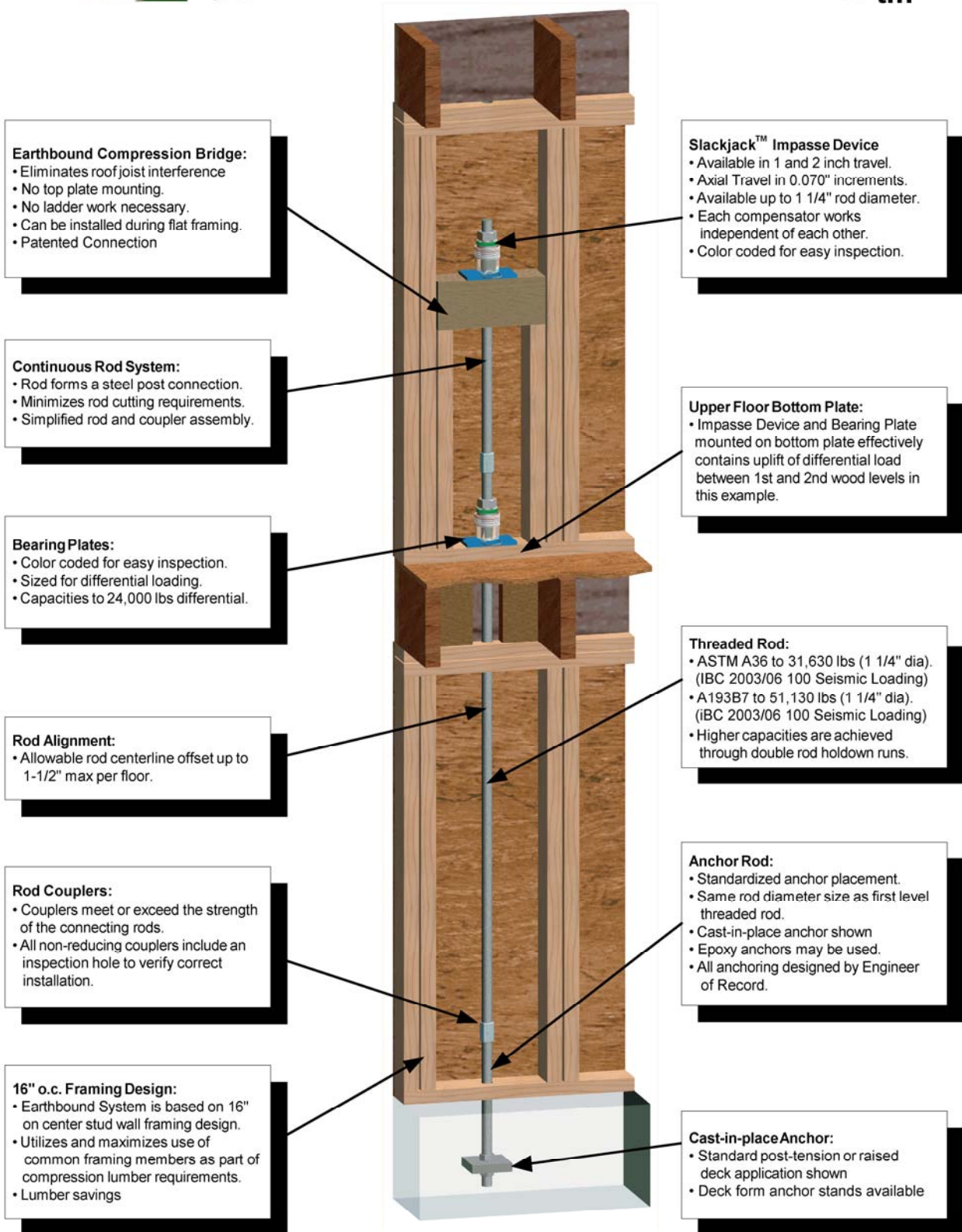


FIGURE 2—TYPICAL ANCHOR INSTALLATION



# EARTHBOUND™



**ICC-ES ER# 5378**

**City of LA Research Report #25404**

**U.S. Patents 6,161,350, 6,494,564, 6,688,058, 6,951,078  
7,159,366 & other U.S. and Foreign Patents Pending.**

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