



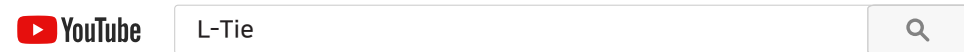
TRAUM
-wood house-



"TRAUM means dream"

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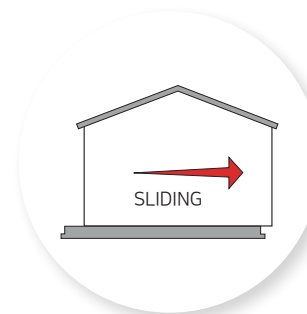
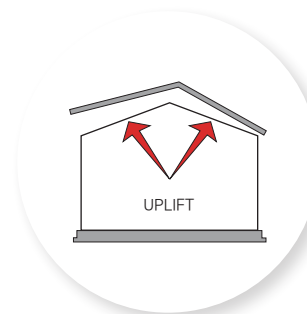
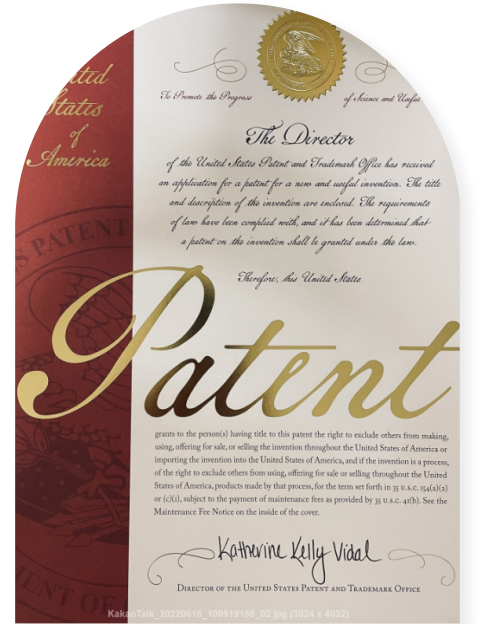


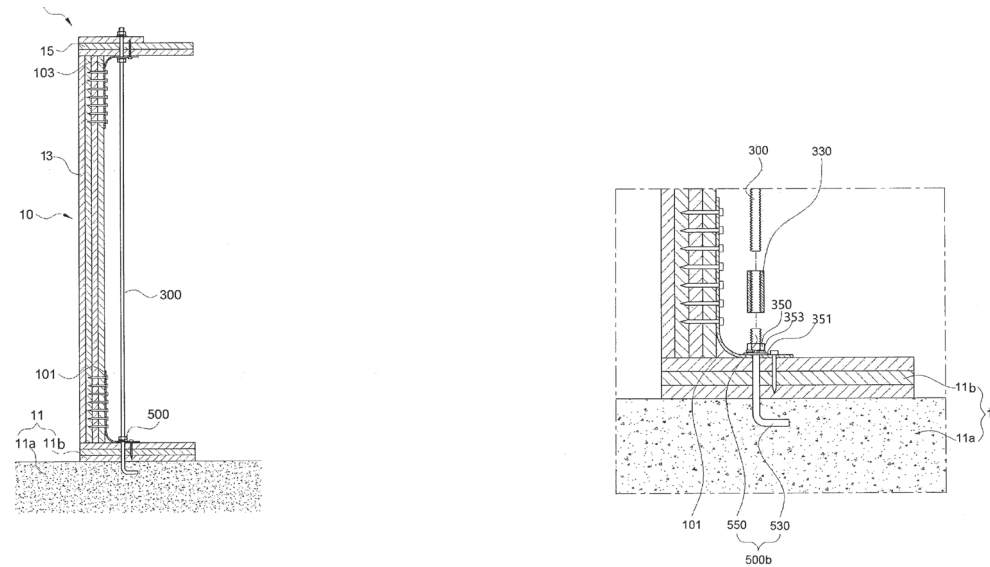
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<http://traum1.com>

L-TIE

The Safety Belt of your House.



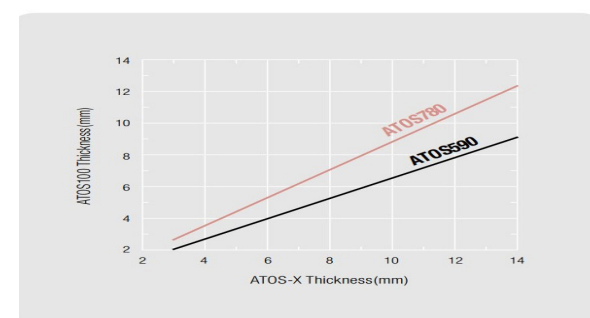


The Bracket is made of 'Carbon Tool Steel' as known as 'ATOS 780' which is mostly used as plate spring.

It has an effect of catching horizontal vibration by supporting walls & floor, and walls & ceiling.

Especially its curved part and shape feature absorb vibration and help restoration by supporting wall structure elastically. Connected roof, a fully thread stud bolt made of stainless steel, supports ceiling structure and disperses concentrated load on wall structure. These two parts are fixed with an anchor and disperse living load and fixed load in normal condition.

The image is to show how and where each parts have been installed. Every measurement has been decided considering standard of structural tree universally used in wood house. The number or a gap(50mm) of screws(Delta Piece) connecting Vertical part and Bracket and the size of L-Anchor connected to the foundation are considered part as well.



(Unit : mm, MPa)

ATOS 590		ATOS 780	
Thickness of original material	Thickness when ATOS 100 used	Thickness of original material	Thickness when ATOS 100 used
14	9.2	14	12.3
12	7.9	12	10.6
10	6.6	10	8.8
9	5.9	9	7.9
8	5.3	8	7.1
7	4.6	7	6.2
6	3.9	6	5.3
5	3.3	5	4.4
4	2.6	4	3.5
3	2.0	3	2.6
(YS 390)	(YS 880)	(YS 700)	(YS 880)
lightening potential 34%		lightening potential 34%	

Construction Method



01.

Positioning into each corner left-right top-bottom part of each floor's framework. (Secure clearance between studs)

02.

Make integrated structure from concrete foundation to roof

: Combine with foundation concrete floor using chemical anchor.

03.

Construction in order of [L-Tie -> Fully thread stud bolt -> Plain washer -> Nut]

04.

Construct 2nd floor connect equally by passing through Long line floor.

05.

Fix until Double Top Plate under the roof: fix with plain washer and nut.

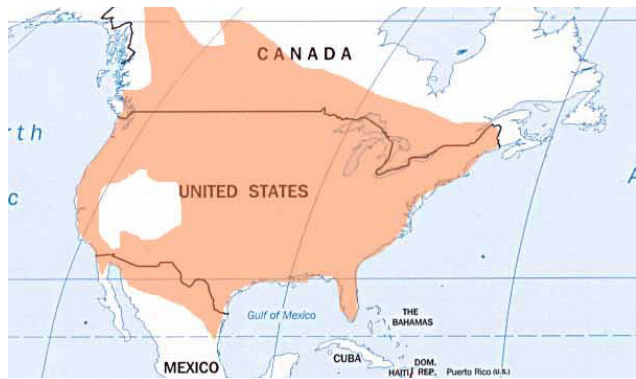


06.

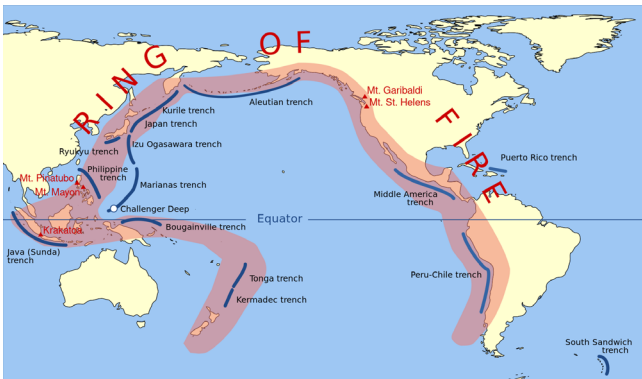
Each corner of the house is tied up into one by construction of L-Tie.

*Ironwork for header: Enhancement of seismic performance of Opening part(Windows and Doors)

Tornado Map



Seismic Risk Map



TEST REPORT

1. NO : CT22-082023E

2. Client

○ Name : TRAUM WOOD HOUSE Co., Ltd

○ Address : SejongCity MannamRo 6611 3

3. Date of Test : 2022.08.25 ~ 2022.09.08

4. Use of Report : Quality Control

5. Test Sample : L-Tie ATOS 780

6. Test Method

(1) Requested by Applicant

2022.09.08

Korea Conformity Laboratories President Jo, Yung Tae

Result Inquiry : 73, Yangcheong 3-gil, Ochang-eup, Cheongwon-Gu, Cheongju-Si, Chungbuk, Korea (82-43-718-9021)

TEST REPORT

No : CT22-082023E

7. Test results

1) L-Tie ATOS 780

Test Items	Unit	Test method	Test Results	Remark	Loc.
Maximum force test	KN	(1)	13.14	(23 ± 2) °C	A

※ Location

A. 73, Yangcheong 3-gil, Ochang-eup, Cheongwon-Gu, Cheongju-Si, Chungbuk, Korea

A. Maximum force test

(1) Test results

Figure 1. Result of maximum force test

Figure 2. Drawing

Photo 1. Status of maximum force test

※ Test speed : 0.1 mm/s

※ Test specimens and jigs are provided by the applicant.

— End of Report —

—Page 2 of 2—

TGP-12-01-04(1)

(12) **United States Patent**
Jeon

(10) Patent No.: **US 11,313,144 B2**
(45) Date of Patent: **Apr. 26, 2022**

(54) **SEISMIC REINFORCEMENT STRUCTURE AND SEISMIC RETROFITTING METHOD**

(71) Applicant: **TRAUM WOOD HOUSE Corp.**, Sejong-si (KR)

(72) Inventor: **Jae Hwan Jeon**, Sejong-si (KR)

(73) Assignee: **TRAUM WOOD HOUSE CORP.**, Sejong-si (KR)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 200 days.

(21) Appl. No.: **16747,583**

(22) Filed: **Jan. 21, 2020**

(65) **Prior Publication Data**
US 2020/0248470 A1 Aug. 6, 2020

(30) **Foreign Application Priority Data**
Feb. 1, 2019 (KR) 10-2019-0013366

(51) Int. Cl.
E04H 9/02 (2006.01)
E01C 11/18 (2006.01)
E04B 1/98 (2006.01)

(52) U.S. Cl.
CPC E04H 9/021 (2013.01); E01C 11/18 (2013.01); E04B 1/98 (2013.01)

(57) **Field of Classification Search**
CPC E04B 1/98; E04B 2001/3583; E04C 11/18; E04H 9/021; E04H 9/0215; E04H 9/0235; E04H 9/0237; E04H 9/14; E04H 9/027
USPC 52/167.4
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,699,547 A * 10/1987 Seegmiller E21D 11/006 405/239.1
5,115,615 A * 5/1992 Miyake E04B 1/98 248/638
5,185,976 A * 2/1993 Miyake F16F 13/007 52/167.6
5,491,935 A * 2/1996 Coxum E04H 9/14 52/92.2
5,531,054 A * 7/1996 Ramirez E04H 9/14 52/741.1

(Continued)

FOREIGN PATENT DOCUMENTS

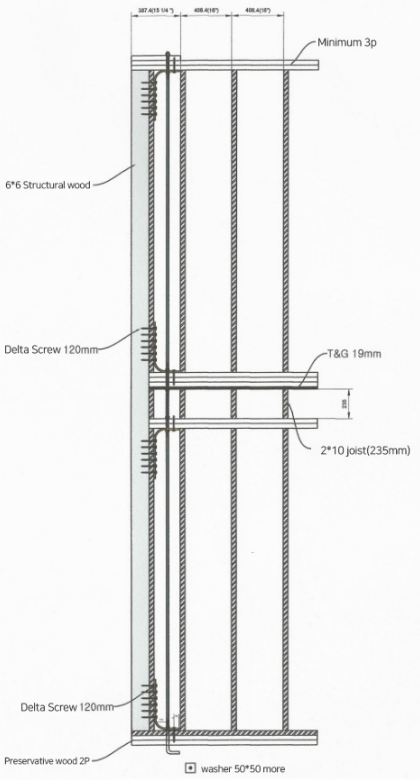
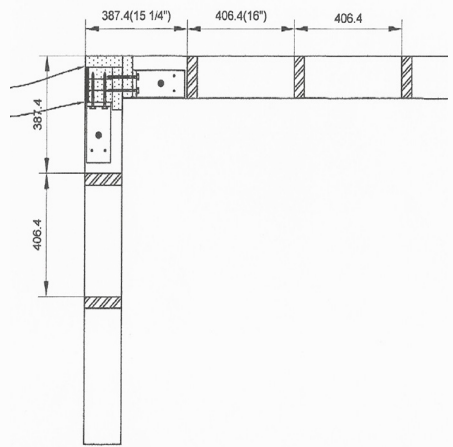
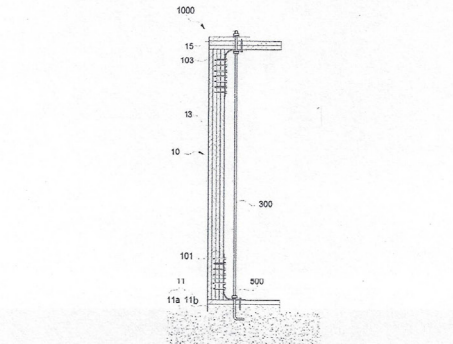
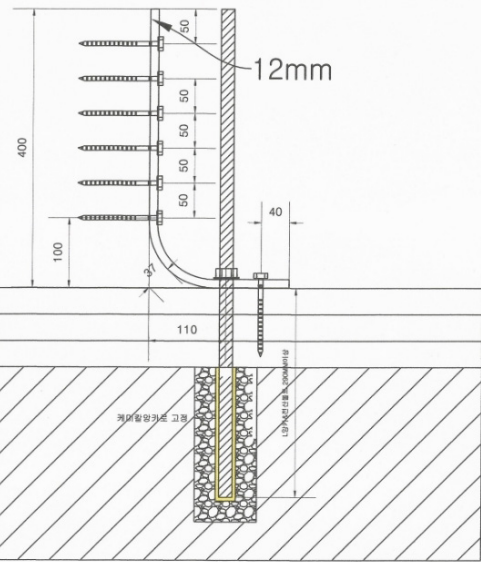
JP H09-189076 A 7/1997
JP 2001-317125 A 11/2001

(Continued)

Primary Examiner — Brian E Glessner
Assistant Examiner — James J Buckle, Jr.
(74) **Attorney, Agent, or Firm** — KORUS Patent, LLC; Seong Il Jeong

(57) **ABSTRACT**
Disclosed is a seismic reinforcement structure and a seismic retrofitting method, including: a first bracket including a horizontal part extending in contact with the bottom surface of the building, and a vertical part formed in connection with the horizontal part and extending in contact with the wall surface of the building; a second bracket including a horizontal part extending in contact with the ceiling of the building, and a vertical part formed in connection with the horizontal part and extending in contact with the wall surface of the building; and a connecting support rod having a vertically long shape and vertically connecting the horizontal part of the first bracket and the second bracket, wherein the relative position to the bottom of the whole building is fixed, thereby preventing the building from collapsing.

12 Claims, 9 Drawing Sheets

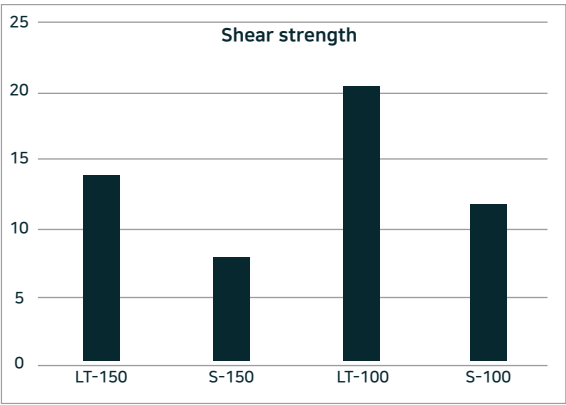


Lateral Load Resistance Performance Evaluation of light-frame wood structure using L-tie

- According to KS F 2154(Shear test method of light-frame wood shear wall), carried out evaluation of lateral resistance performance. (quasi-static repeated load has been loaded during the test)

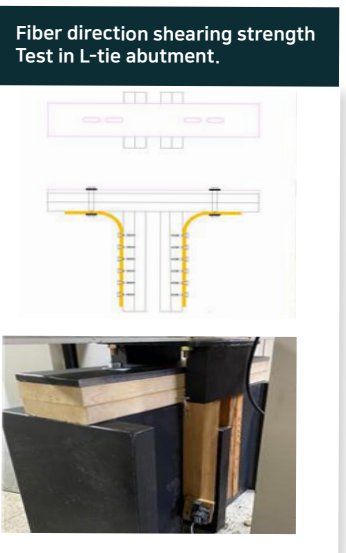
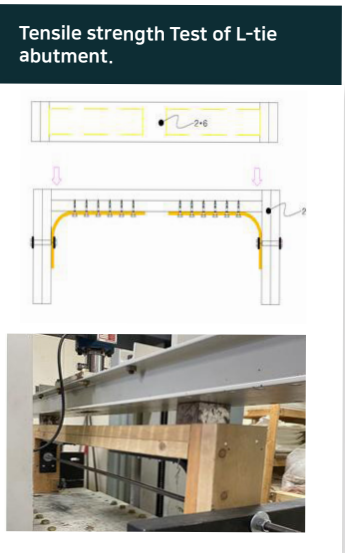
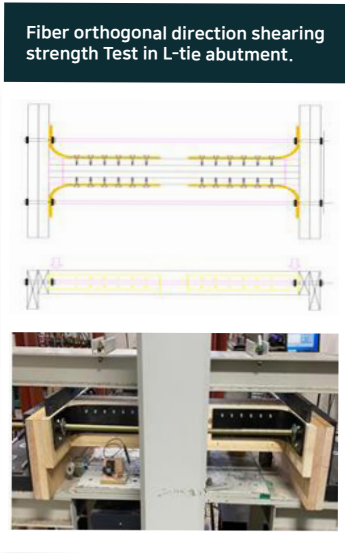
Specimen	Shear Stiffness (N/mm)	Shear Strength (kN/mm)
S=100	2491.17	11.96
S-150	2365.60	7.94
LT-100	3097.72	20.53
LT-150	2858.86	14.01

	Tension Load(kN)	Allowable tension load(kN)
L-tie	17.256	8.028 5.752
S - hold down	2365.60	4.340



Maximum vibratory acceleration	Location of displacement measurement	Horizontal displacement(mm)							
		2-1	4-3	3-2	4-1	6-5	8-7	7-6	8-5
0.22g	Ten	2.44	0.6	0.06	3.1	2.54	0.94	-0.3	3.18
	Comp	2.50	0.16	0.10	2.56	3.60	1.20	0.72	4.08
	Max	2.50	0.6	-	-	3.60	1.20	-	-
0.55g	Ten	7.02	3.26	-0.64	9.64	9.56	2.58	-0.34	11.8
	Comp	9.94	1.62	0.46	12.02	10.08	1.62	-0.28	11.42
	Max	9.94	3.26	-	-	10.08	2.58	-	-
1.0g	Ten	24.86	4.58	-0.20	29.24	22.14	4.12	0.6	26.86
	Comp	35.42	4.64	0.74	40.80	25.14	1.92	2.00	-29.06
	Max	35.42	4.64	-	-	25.14	4.12	-	-
1.3g	Ten	102.96	4.48	-0.1	107.34	49.36	2.12	1.34	52.82
	Comp	87.46	0.06	0.96	88.48	54.44	3.74	-3.16	55.02
	Max	102.96	4.48	-	-	54.44	3.74	-	-

- Displacement of two-story wooden house where the L-tie joint metal has been installed under seismic load from artificial seismic wave containing maximum vibratory acceleration of 0.22g, 0.55g, 1.0g and 1.3g.



Lateral Load Resistance Performance Evaluation of light-frame wood structure using L-tie

- According to KS F 2154(Shear test method of light-frame wood shear wall), carried out evaluation of lateral resistance performance. (quasi-static repeated load has been loaded during the test)

- According to Experimental Result of Lateral Load Resistance Performance, in comparison of general light-frame wood structure, about 3.1 times higher in case of S-150 & LT-150, about 2.3 times higher in case of S-100 & LT-100.

