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201 NORTH FIGUEROA STREET  
LOS ANGELES, CA 90012

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EXECUTIVE OFFICER

Simpson Strong-Tie Co. Inc.  
4120 Dublin Blvd., Suite 400  
Dublin, CA 94568

RESEARCH REPORT: RR 25236  
(CSI #06090)

Expires: September 1, 2004

Attn: Sam Hensen  
(714) 738-2151

**GENERAL APPROVAL** -Renewal/Clerical Modification - ATS System as hold-down anchor in wood shear walls.

**DETAILS**

ATS System consists of threaded rod conforming to ASTM A36 and ASTM449 for high strength rods, coupler nut conforming to ASTM A563, tie down brackets and top bearing plates. Tie down brackets (TDS 2A, 2AD, 2B, 2C and 2D), per Figure 2 and 3, consist of steel tube conforming to ASTM A500 Grade B and steel plate/plate washer conforming to ASTM A36 and TUD, Take Up Device per Figures 4 and 5. The take-up device is manufactured from ASTM A513 steel. The purpose of the device is to keep the ATS Tie-Down System in a tight position by compensating for shrinkage, settlement and compression loading. The maximum size of the all-threaded steel rod used with the take-up device is 1 1/8 " in diameter. The maximum range of movement is 1 inch.

**ATS System is approved for use as a hold-down anchor in wood shear walls subject to the following conditions:**

1. For each shipment, the manufacturer shall furnish a certificate indicating that the hardware complies to the manufacturer's specifications.
2. Installation of the anchorage system shall be in accordance with the manufacturer's instructions.
3. ATS System can be used to resist only tension forces induced by wind or seismic loading
4. Shop welding shall be performed in an Los Angeles City licensed fabricator or under continuous inspection by a Deputy Building Inspector.
5. See attached Tables 3 and 4 for allowable loads for tie down brackets and threaded rods.

RR 25236  
Page 1 of 2

6. Coupler nuts conforming to ASTM A563 Grade A Standard can fully develop the capacity of threaded rods.
7. A 25% reduction in allowable loads specified in the research report shall be taken in hold-down devices including rod capacities and take up device as required by Section 91.2315.5.6 of the 1999 Los Angeles City Building Code.
8. Complete design calculations shall be submitted to the Structural Plan Check for each tie-down system installation. Plans and calculations shall bear the stamp and signature of a California registered civil or structural engineer. Calculations must consider the capacity of the rod, threaded nuts, foundation anchorage and wood components. The analysis must show that shrinkage of the wood framing will not affect the capacity of the tie-down system.
9. The allowable load values shall not be further increased for short duration loading, such as wind and seismic.
10. The TUD take up device shall be installed per the details shown on Figure 5. See Figures 6 and 7 for recommended locations of ATS hardware and Take up devices. The TUD device does not account for the shrinkage of the top plate of the top story. At least one ATS-2B, 2C or 2D bracket with a TUD, take up device is required to account for the shrinkage in wood buildings with more than 2 floors and a roof in accordance with Section 91.2308.

## DISCUSSION

The clerical modification is to change the address of the petitioner, the name and the phone number of the contact person.

This approval is based on tests, and calculations.

Addressee to whom this Research Report is issued is responsible for providing copies of it, complete with any attachments indicated, to architects, engineers and builders using items approved herein in design or construction which must be approved by Department of Building and Safety Engineers and Inspectors.

This general approval of an equivalent alternate to the Code is only valid where an engineer and/or inspector of this Department has determined that all conditions of this approval have been met in the project in which it is to be used.

YEUAN CHOU, Chief  
Engineering Research Section

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5D2/2315.5.6

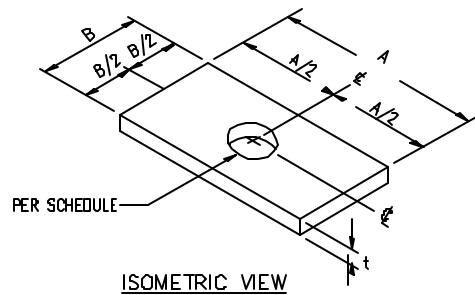
**TABLE 1-PLATE WASHER DIMENSIONS**

TYPE	SIZE T x W x L (inches)	HOLE DIAMETER (inches)	ROD DIAMETER (inches)
ATS-PW4	$\frac{5}{8} \times 2 \times 2\frac{3}{8}$	$\frac{9}{16}$	$\frac{1}{2}$
ATS-PW5	$\frac{5}{8} \times 2 \times 2\frac{3}{8}$	$\frac{11}{16}$	$\frac{5}{8}$
ATS-PW6	$\frac{5}{8} \times 2 \times 2\frac{3}{8}$	$\frac{13}{16}$	$\frac{3}{4}$
ATS-PW7	$\frac{5}{8} \times 2 \times 2\frac{3}{8}$	$\frac{15}{16}$	$\frac{7}{8}$
ATS-PW8	$\frac{5}{8} \times 2 \times 2\frac{3}{8}$	$1\frac{1}{16}$	1
ATS-PW9	$\frac{5}{8} \times 2 \times 2\frac{3}{8}$	$1\frac{3}{16}$	$1\frac{1}{8}$
ATS-DW6	$\frac{3}{4} \times 2\frac{7}{8} \times 3$	$\frac{13}{16}$	$\frac{3}{4}$
ATS-DW7	$\frac{3}{4} \times 2\frac{7}{8} \times 3$	$\frac{15}{16}$	$\frac{7}{8}$
ATS-DW8	$\frac{3}{4} \times 2\frac{7}{8} \times 3$	$1\frac{1}{16}$	1
ATS-DW9	$\frac{3}{4} \times 2\frac{7}{8} \times 3$	$1\frac{3}{16}$	$1\frac{1}{8}$

For SI: 1 inch = 25.4 mm.

**TABLE 2-ATS 3 SERIES PLATE DIMENSIONS**

Model No.	Dimensions (inches)			
	B	A	T	HOLE $\phi$
3B	3	3	1/4	9/16
3C	3	4	3/8	11/16
3D	3	5 1/2	1/2	11/16
3E	3 1/2	5 1/2	1/2	13/16
3G	3 1/2	6	5/8	15/16
3J	3 1/2	8	3/4	15/16
3K	3 1/2	9	7/8	17/16
3U	3 1/2	6 1/2	5/8	9/16
3V	3 1/2	8 1/2	7/8	11/16
3W	3 1/2	10	1	13/16
3WW	3 1/2	10	1	17/16
3X	3 1/2	11	1 1/8	13/16
3Z	3 1/2	13	1 1/2	15/16
3ZZ	3 1/2	13	1 1/2	19/16



**FIGURE 1-ATS 3 SERIES PLATES**

**TABLE 3-ATS SERIES 2 COMPONENT SPECIFICATIONS**

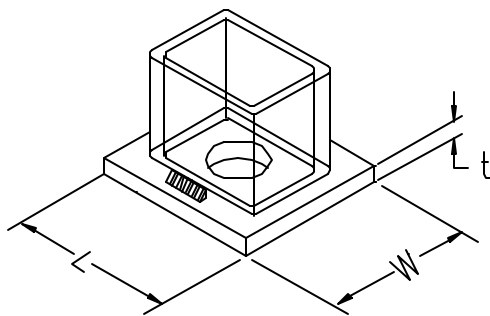
TYPE	COMPONENT	DIMENSIONS (inches)				HOLE DIAMETER (inches)	FILLET WELD (inches)	CAPACITY (pounds)	
		L	W	T	H			Tension	Bearing
2A	Steel Tube	2 1/2	1 1/2	3/16	1 1/2	-	-	-	-
	Plate Washer	2 3/8	2	(1)	-	(1)	-	-	-
	Base	3 1/4	3	1/4	-	13/16	-	-	6,100
2AD	Steel Tube	3	2	1/4	3	-	-	-	-
	Plate Washer	3	2 7/8	(1)	-	(1)	-	-	-
	Base	5	3	3/8	-	1 5/16	-	-	9,170
2B	Steel Tube	2 1/2	1 1/2	3/16	1 1/2	-	3/16	-	-
	Plate Washer	2 3/8	2	(1)	-	(1)	-	-	-
	Base	3 3/4	3	1/4	-	1 1/16	-	-	7,050
	Side Plates	-	2	3/16	11 3/4	-	-	19,400	-
2C	Steel Tube	2 1/2	1 1/2	3/16	2	-	3/16	-	-
	Plate Washer	2 3/8	2	(1)	-	(1)	-	-	-
	Base	4 1/2	3	1/4	-	1 1/16	-	-	8,460
	Side Plates	-	2	1/4	11 3/4	-	-	25,210	-
2D	Steel Tube	3	2	1/4	3	-	1/4	-	-
	Plate Washer	3	2 7/8	(1)	-	(1)	-	-	-
	Base	5	3	3/8	-	1 3/16	-	-	9,170
	Side Plates	-	3	1/4	14 5/8	-	-	40,100	-
TUD118-1	Take-up device	-	-	-	-	-	-	-	39,223

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

<sup>1</sup>See plate washer schedule

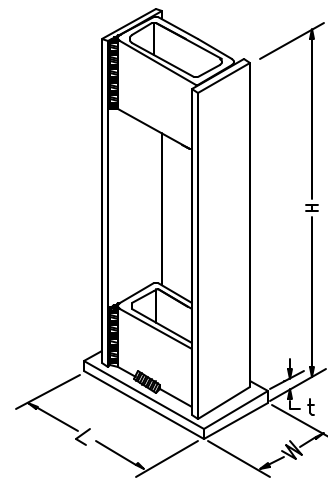
2. Based on Douglas Fir Larch Lumber

3. Values include 133% increase for short term duration. No further increase is allowed.



ATS-2A & 2AD ISOMETRIC

**FIGURE 2-ATS 2A & 2AD BRACKET**



ATS-2B, 2C, & 2D ISOMETRIC

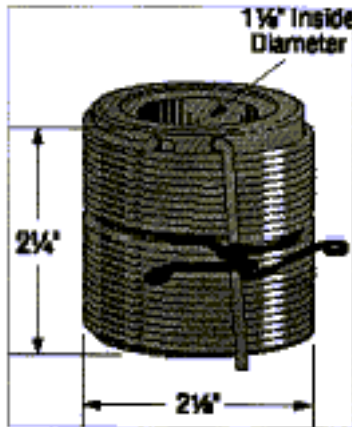
**FIGURE 3-ATS 2B, 2C & 2D BRACKET**

**TABLE 4**

**TENSION CAPACITY FOR THREADED RODS**

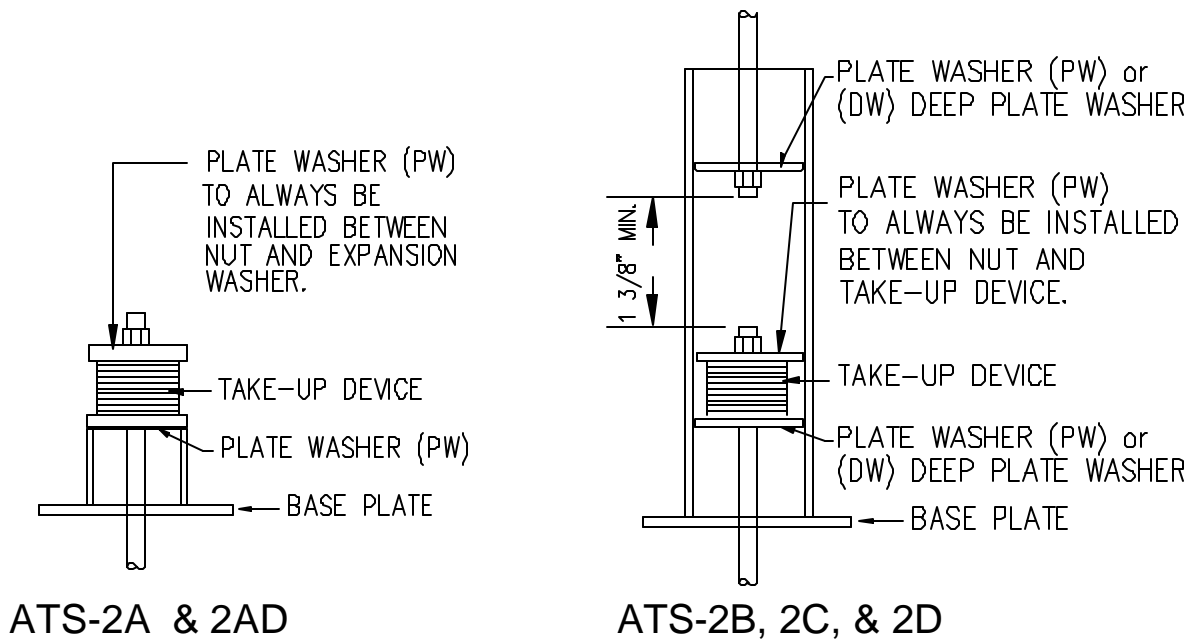
Rod Size	Area	Allowable Tension (kips)	
Dia.	Sq. Inch	A36 Fu = 58	A449 Fu = 120 ksi
1/2"	.1963	4.9	10.4
5/8"	.3068	7.8	16.0
3/4"	.4418	11.2	23.3
7/8"	.6013	15.3	31.7
1"	.7854	20.0	41.4
1 1/8"	.994	25.3	45.9

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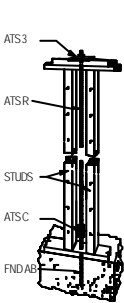
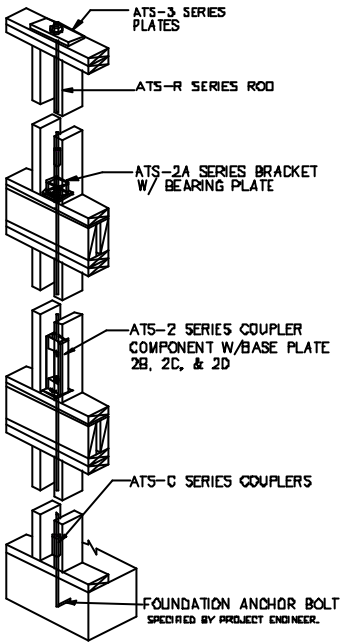


**FIGURE 4-TUD118-1 TAKE-UP DEVICE**

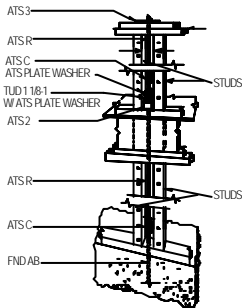
The TUD118-1 take-up device consists of a 2-inch outside diameter by 2-inch long (51 mm by 51 mm) sleeve with internal threads, a 1 3/4-inch outside diameter by 2 1/4-inch long (44.5 mm by 57 mm) sleeve with external threads and a No. 32 gage [0.09 inch (2.3mm)] torsion spring. The take-up device is manufactured from ASTM A513 steel. The purpose of the device is to keep the ATS Tiedown System in a tight position by compensating for shrinkage, settlement and compression loading. The maximum diameter of the all-threaded steel rod used with the take-up device is 1 1/8 inches (35 mm). The maximum range of movement is 1 inch (25.4 mm). Refer to Figures 4 & 5 for details of the TUD118-1 device.



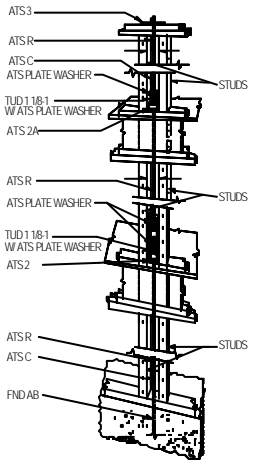
**FIGURE 5-TAKE-UP DEVICE INSTALLATION DETAIL**



TDS 10 SERIES



TDS 20 SERIES



TDS 30 SERIES

FIGURE 6

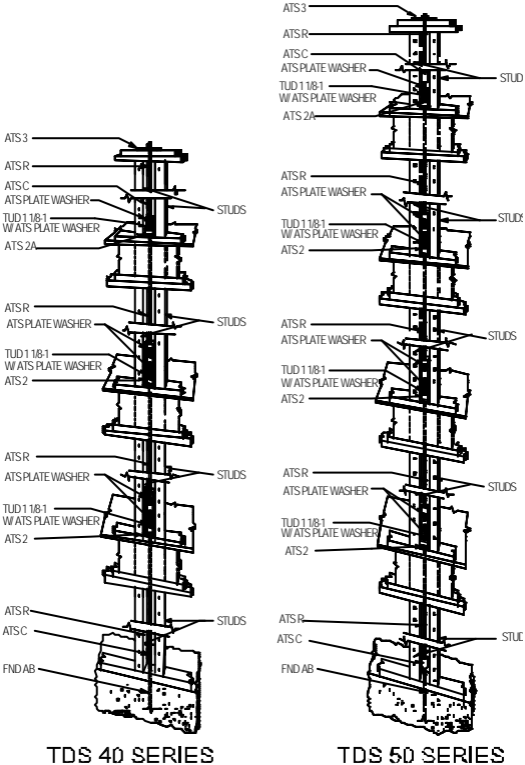


FIGURE 7