SCAN

City of Portland, Oregon - Bureau of Development Services

1900 SW Fourth Avenue · Portland, Oregon 97201 | 503-823-7300 | www.portlandoregon.gov/bds

Deferred Submittal Requirements and Application

Applicants will provide:

- ☐ A copy of this application
- ☐ Three (3) sets of plans
- ☐ Two (2) set of calculations
- ☐ Two (2) sets of product information

  Drawings and calculations must be stamped and signed by an Engineer registered in Oregon and approved by the Architect/Engineer of record for the building.

- ☐ Permit fee (paid at time of submittal)
- ☐ If the DFS includes exterior elements, plan views and elevations identifying the location(s) as approved by the Architect and Engineer of Record must be submitted.
- ☐ One (1) copy of your main building permit approved plans (NOTE: Approved plans do not need to be submitted if your project has a development liaison assigned.)

Contractor submittal information:

Contact name GARY TROTTER Pro-Teck Const.

Address P.O. Box 311

City Clackamas State OR Zip Code 97015

Phone 503 209-5140 E-mail gary@pro-teckinc.com

Value of deferred submittal $10,000 Issued main building permit # 17-196429-CO

Job site address 826 - SE 3rd, Portland OR

Description/Scope of work TIE-Down System

Fees

Deferred submittal (DFS) fees are collected in addition to the standard building review fee paid on the main building permit. DFS fees cover the cost of the additional processing and review time associated with the design build element.

The DFS fee for processing and reviewing deferred plan submittals is 10 percent of the building permit fee calculated using the value of the particular deferred portion of the project.,

Minimum fee: Residential, one and two family dwelling ... $123 for DFS with valuation of less than or equal to $222,000

Commercial and all other projects ..... $307 for DFS with valuation of less than or equal to $680,000

The Bureau of Development Services (BDS) fee schedule is also available on the BDS web site at ***www.portlandoregon.gov/bds*** | select the Fees tab.

Helpful Information

Bureau of Development Services
1900 SW 4th Avenue, Portland, OR 97201

Submit your plans to:
Development Services Center (DSC), First Floor, For Hours Call 503-823-7310

DEFERRED SUBMITTAL REQUIREMENTS AND APPLICATION

Important Telephone Numbers

BDS main number	503-823-7300
DSC automated information line	503-823-7310
Building code information	503-823-1456
BDS 24 hour inspection request line	503-823-7000
Residential information for one and two family dwellings	503-823-7388
City of Portland TTY	503-823-6868

Information is subject to change.

Structural Checksheet Response

17-196429-DFS01

Permit #: ~~17-121064-DFS-02-CO~~ **Date:** 11/01/2018

Customer name and phone number: Brynn Adkins, WDY Engineering (503) 203-8111

Note: *Please number each change in the '#' column. Use as many lines as necessary to describe your changes. Indicate which reviewer's checksheet you are responding to and the item your change addresses. If the item is not in response to a checksheet, write* **customer** *in the last column.*

#	Description of changes, revisions, additions, etc.	Checksheet and item #
1.	All those holdown types were built as 2x6 walls, so please disregard the 2x4 post counts. The 2x4 post counts were included partly to warn the builders that those should be 2x6 walls. a) ATS10 detail 8. The loads enter and leave the posts through their ends. b) The rod to rod spacing is maximized by having only 2 posts outside of the rods and the remainder of the posts between the rods. This does not change the EOR's original design. c) The load transfer is through the floor blocking. Each upper post is supported by at least 1 lower post, because the upper post count never exceeds the lower post count. 2nd checksheet comment 10/23/18 Reply: I will change the submittal to remove the 2x4 references. Per Commins Mfg	1.
2.	ATS10 detail 1 Note 9 allows for post notching but does not require it. ATS10 detail 1 Note 9 is a direct quote from the building code. No posts were notched as-built because none of the bearing plates exceeded 6" long. If they had been, we would have included a detail calling for tight fitting shims. 2nd checksheet comment 10/23/18 Compression Post Calculations: The strength limit on the posts is the Cross Grain Crushing (CGC) of the bottom plate. The notching/boring is only in areas where Parallel to Grain Compression (Fcparallel) controls. Per NDS 2015: DFL #2 CGC = 625 psi which gives 5156 lbs per 2x6 on bottom plate. DFL #2 Fcparallel = 1350 psi which gives 11,138 lbs per un-notched 2x6. IBC 2308.9.10 allows 25% notching leaving 75% of the material which provides 8353 psi capacity which exceeds the CGC of bottom plate limit. IBC 2308.9.10 allows 40% boring leaving 60% of the material which provides 6683 psi capacity which exceeds the CGC of bottom plate limit. The controlling factor is still the CGC of the bottom plate per Commins original calculations. Per Commins Mfg	2.

WDY **Structural • Civil Engineers** **Submittal Transmittal**

To:	Guerrilla Development 2500 NE Sandy Blvd, Suite C Portland, OR 97232	**From:**	Brynn Adkins
		Date:	November 1, 2018
		Job Name:	Tree Farm
Attn:	**Kevin Cavenaugh**	**Job No.:**	17001.40
cc:	Ben Carr, BSA	**File:**	*17001 trans submit take up 3.docx*

Attached are 1 copies of shop drawings as follows:

Submittal No.: 03
Submitted item: Auto Tight Tie Down
Fabricator / Manufacturer: Commins Manufacturing, Inc.
Date received: 10/23/2018

Reviewed as checked below:

☒ Reviewed as noted ☐ Contains items not reviewed _____

☐ Revise & resubmit ☐ Submit add'l/specified items _____

Sheet numbers reviewed: ATS10, ATS11 Sh1, ATS11 Sh2, ATS12, RL-1, Calcs

Returned via: ☒ E-mail 36 *pages incl. trans* ☐ Messenger _____ ☐ Mail ☐ Express Delivery

Remarks:

☒ No Exception Taken ☐ Make Corrections Noted

☐ Submit Additional/ Specified Items ☐ Revise and Resubmit

Checking by WDY is only for general conformance with the design concept of the project and general compliance with the information given in the contract documents. Any action shown is subject to the requirements of the plans and specifications. The general contractor is responsible for: Dimensions which shall be confirmed at the jobsite; fabrication processes and techniques of construction; coordination of his work with that of all other trades; and the satisfactory performance of his work.

WDY, Inc.

Date: 11-01-2018

By: Brynn Adkins

AutoTight Tie-Down Systems

Commins Manufacturing 360-378-9484

Submittal Cover Sheet with Latest Documents List

Cover Sheet Date:	10/11/18	Rev 3	
Project:	Tree Farm		
Project Number:	18-1789		

Document File Name	Revision	Rev Date	Changed Today?
18-1789 Tree Farm ATS10 Holdown Run Details Rev1 0-04-18.pdf	1	8/3/2018	No
18-1789 Tree Farm ATS11 Holdown Run Elevations Rev2 10-11-18.dwg Sheet 1.pdf	2	10/11/2018	Yes
18-1789 Tree Farm ATS11 Holdown Run Elevations Rev2 10-11-18.dwg Sheet 2.pdf	2	10/11/2018	Yes
18-1789 Tree Farm ATS12 Anchor Bolt Details 06-13-18.pdf	0	6/13/2018	No
RL-1 17-1789 Tree Farm Rev1 10-11-18.pdf	1	10/11/2018	Yes
18-1789 Tree Farm Calc Package Rev2 10-11-18.pdf (incl: Compression Posts, Catalog Pages, ESR-1344)	2	10/11/2018	Yes

AutoTight®

By Commins Manufacturing

Materials and References

Catalog Pages for:

AT Shrinkage Compensation Device
Rod
Bearing Plates
Coupler Nuts
Reducer Couplers
Nuts and Washers

ICC - Evaluation Service Report
ESR-1344

COLA Report RR-25480

Commins Manufacturing
Comminsmfg.com
360-378-9484

AutoTight^® Rod

AutoTight uses a continuous threaded rod. Typical lengths are 2', 3', 6', 10', and 12'. Field cut if needed. Rod may be ordered custom cut with sufficient lead time.

Material Identification: R (Rod) + Dia. (1/8's of an inch) + Alloy
Examples: R5-A307 = 5/8"-11 NC threaded rod, ASTM A307 Steel (Standard Strength)
R9-B7 =1-1/8"-7 NC threaded rod. ASTM A193-B7 Steel (High Strength)

Finish: **Standard** Black or zinc plated. **Optional** Hot Dip Galvanized (HDG)
Note: *HDG rod must be chased to fit standard nuts & couplers*. Or use special nuts and couplers.

Diameter and Thread: Rod is available from 1/2" (R4) to 2" (R16) diameter. Thread is Unified National Coarse (NC or UNC). Other sizes, material and lengths are available.

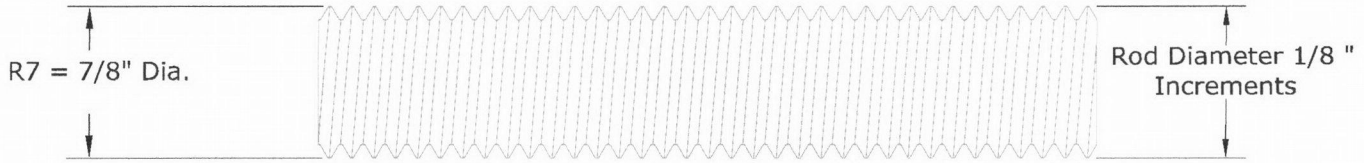
Strength: Rod Strength is per AISC 360 and ICC AC 391-3.2.1.1. Rod strength and elongation are identical for all suppliers (per AISC 360). **Some suppliers overstate strength and understate elongation. Please check!**

Elongation: Elongation for each (10') rod is shown at the maximum allowable tension load per ICC AC 391-3.2.1.1, Eq. 1. Adjust elongation based: on design load and distance between reaction points.

Code Acceptance: Tensile Values per IBC 2012, IBC 2009, IBC 2006 And AISC 360 13th edition.

Rod Basics

Rod is specified by grade, diameter and length.
Rod diameter is specified by the diameter in 1/8" increments. A 7/8" diameter rod is specified as R7.



Calculating Elongation

Both rod strength **and** elongation are critical to shear wall performance. Lower rod elongation results in lower shear wall drift and better performance. Rod is a major contributor to total system elongation. The fastest manual method of determining rod strength and elongation is to use a rod table and adjust to actual conditions.

When using a rod table: 1. select the rod for strength; 2. calculate rod elongation at the required load and rod length. 3. compare the elongation to requirements. 4. increase rod diameter to reduce elongation.

Example: Required Strength 11 kips. Floor Height (carpet-to-carpet) 11' - 4" (136").

Solution: #1 A307 Rod. Select an R7-A307 Rod from the AutoTight Rod table. This is a 7/8"Ø A307 rod with a Strength Capacity = 13,530 pounds, Elongation = 0.121" (for a 10' (120") length).
Calculated adjusted elongation: = 11,000/13,530 * 136"/120" * 0.121" = **0.1115"**

Solution: #2 B7 Rod. Select an R5-B7 Rod from the AutoTight Rod table. This rod is 5/8"Ø- B7 rod with a Strength Capacity = 14,380 pounds, Elongation = 0.263" for a 10' (120") length.
Calculate adjusted elongation = 11,000/14,380 * 136"/120" * 0.263" = **0.2280"**

AutoTight Rod (ASD Allowable Load per AISC 360)

Standard Strength

Diameter & Thread	Rod Size & Alloy	A307		Rod Size & Alloy	F1554 Grade 55	
	Model	Allowable Tension (lb)	Elong in per 10'	Model	Allowable Tension (lb)	Elong in per 10'
1/2"-13 UNC	R4-A307	4,418	0.129	R4-G55	5,522	0.161
5/8"-11 UNC	R5-A307	6,903	0.126	R5-G55	8,629	0.158
3/4"-10 UNC	R6-A307	9,940	0.123	R6-G55	12,425	0.154
7/8"-9 UNC	R7-A307	13,530	0.121	R7-G55	16,912	0.152
1"-8 UNC	R8-A307	17,672	0.121	R8-G55	22,089	0.151
1-1/8"-7 UNC	R9-A307	22,365	0.121	R9-G55	27,957	0.152
1-1/4"-7 UNC	R10-A307	27,612	0.118	R10-G55	34,515	0.147
1-3/8"-6 UNC	R11-A307	33,410	0.120	R11-G55	41,763	0.150
1-1/2"-6 UNC	R12-A307	39,761	0.117	R12-G55	49,701	0.146
1-3/4"-5 UNC	R14-A307	54,119	0.118	R14-G55	67,649	0.147
2"-4.5 UNC	R16-A307	70,686	0.117	R16-G55	88,357	0.146

High Strength

Diameter & Thread	Rod Size & Alloy	C1045		Rod Size & Alloy	A193-B7, F1554 Gr 105	
	Model	Allowable Tension (lb)	Elong in per 10'	Model	Allowable Tension (lb)	Elong in per 10'
1/2"-13 UNC	R4-C1045	8,836	0.258	R4-B7	9,204	0.268
5/8"-11 UNC	R5-C1045	13,806	0.253	R5-B7	14,381	0.263
3/4"-10 UNC	R6-C1045	19,880	0.246	R6-B7	20,709	0.256
7/8"-9 UNC	R7-C1045	27,059	0.242	R7-B7	28,187	0.253
1"-8 UNC	R8-C1045	35,343	0.241	R8-B7	36,816	0.251
1-1/8"-7 UNC	R9-C1045	44,731	0.242	R9-B7	46,595	0.253
1-1/4"-7 UNC	R10-C1045	55,223	0.236	R10-B7	57,524	0.246
1-3/8"-6 UNC	R11-C1045	66,820	0.239	R11-B7	69,604	0.249
1-1/2"-6 UNC	R12-C1045	79,522	0.234	R12-B7	82,835	0.244
1-3/4"-5 UNC	R14-C1045	108,238	0.236	R14-B7	112,748	0.246
2"-4.5 UNC	R16-C1045	141,372	0.234	R16-B7	147,262	0.244

Super Strength

Diameter & Thread	Rod Size & Alloy	A354 BD	
	Model	Allowable Tension (lb)	Elong in per 10'
1-1/8"-7 UNC	R9-A654BD	55,910	0.303
1-1/4"-7 UNC	R10-A654BD	69,030	0.295

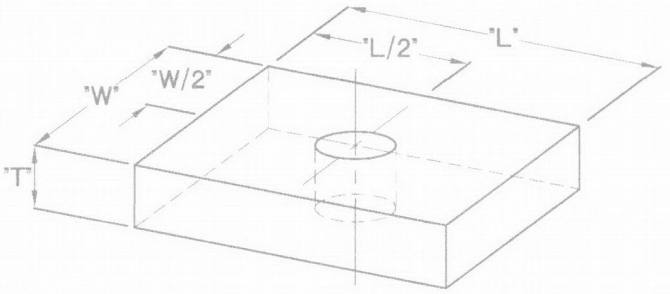
High strength rod is typically identified with a high strength mark. The actual identification varies by specific supplier. Consult factory for more information.

Notes:

1. Material Properties: (Other grades available, consult factory)
   ASTM A307 Fu = 60, Fy = 43 ksi. ASTM F1554 Gr. 55, Fu=75, Fy =55 ksi. ASTM A108-C1045 Fu = 120, Fy = 92
   ASTM A193-B7, Fu=125, Fy=105 ksi. ASTM F1554 Gr. 105, Fu=125, Fy =105 ksi. ASTM A354-BD Fu = 150, Fy = 130 ksi.
2. Strength P = 0.75 x Fu x nominal area / 2 Per AISC 360 13th ed Table 7.2, pg. 7-2, P16.1-108 Eqn J3-1
3. Stress increase not allowed with AISC 13th Ed capacities. (IBC 2006 & later)
4. Rod stretch calculated per AC391 3.2.1.1 as follows:
   ΔRod = PL/AnE where: P=Load, L=length, An=0.7854 (D-0.9743/n)^2,
   D = nominal rod dia, n = threads per inch, E = elastic modulus = 29,000,000.
   Table elongation is 10' rod at allowable load. Depending on jurisdiction stretch limit may be 1/8", 0.179", 0.200", or not specified. Elongation of other length rods may be calculated from this table by length ratio.
5. Large Ø rod (1-3/8" to 2" Ø) used for stretch reduction. Consult factory for advice before using.
6. Tabulated allowable loads are ASD for IBC 2006, 2009 & 2012, CBC 2007 & 2010, OSSC 2007 & 2010, LABC 2008 & 2011.
7. LRFD Strengths are 1.5 x ASD Allowable Loads.

Bearing Plates

Bearing plates distribute compression loads into the structure at reaction points. AutoTight plates exceed the flexural requirements of AISC 360 and the wood-bearing requirements of the 2005 NDS. (ICC ES AC391 Sect 1.4.6, July 1, 2010)



Per 2005 NDS, plates deflect 0.040 inch at the compressive design value with a linear load deformation. (ICC ES AC 391 section 3.2.1.2).

Determining Compression Deflection

AutoTight bearing plates provide a maximum deformation of 0.040" at rated the capacity.

To select:

1. Determine the reaction load.
2. Select the smallest plate that can carry the reaction load.
   Check for: Bearing Capacity, Width (wall fit 4X or 6X Wall) and rod fit.
3. The wood deformation at the actual load is linear.
   With the load-deformation at the design load = 0.040" * design load / rated load.

Example:
Reaction is 11,000 pounds on Douglas Fir. Rod is 1-⅛" Ø.
Select an S11-1-¼" bearing plate with a rated capacity of 11,948 pounds.

Actual deformation (per AC 391, section 3.2.1.2) is 0.040 * 11,000 / 11,948 = 0.037"
For system deformation add the 0.037 to the rod and shrinkage compensator deformation.

Minimizing Total Deformation

To lower deformation increase the size of the bearing plate.

Example:
Reaction load is 11,000 pounds on Douglas Fir.
If an L20-1-¼" plate is selected, the plate deformation will be as follows:

Actual deformation will be 0.040 * 11,000 / 21,016 = 0.021"

Changing the bearing plate is one method to adjust the total deflection (elongation) to achieve a tight system.

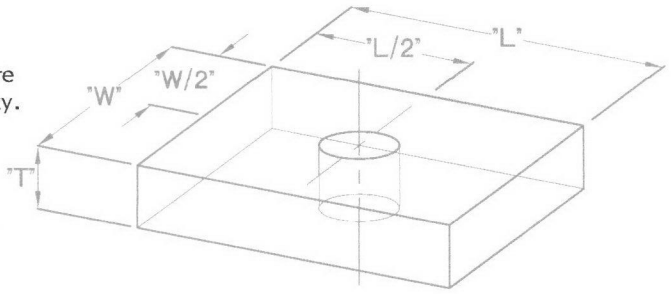
This example shows how to manually adjust components to achieve a desired deflection.
The AutoTight Software allows for a fast, easy change of rod, bearing plates or shrinkage compensators to achieve the the required system deflection.

Bearing Plates

Bearing Plates load the structure at reaction points. Bearing loads are limited by wood crushing at the NDS allowable wood bearing capacity.

Material: Complies with ASTM A36

Identification: Plates or boxes marked with Part #.
Efficiency tip: Minimize the number of sizes used on any single job, i.e. Keep it Simple.



Wall Thickness	Typical Use	Bearing Plates							
		Model No.	Best Sizes	T x W x L	Max Rod Ø	Allowable Load (Cross Grain Crushing)			
						DFL @ 625	SYP @ 565	HF @ 425	SPF @ 405
Fit 4x & 6X walls	AT 75 and AT 6A	S5 -5/8"		1/4" x 3" x 3"	5/8	5,964	5,391	4,055	3,864
		S5 -3/4"	***	1/4" x 3" x 3"	3/4	5,964	5,391	4,055	3,864
		For 1/2" through 1" Rod							
		S7 -1"	***	3/8" x 3-1/2" x 3-1/2"	1"	7,863	7,108	5,347	5,095
		S10 -1"	***	1/2" x 3-1/4" x 5"		10,322	9,331	7,019	6,689
		S11 -1"	***	1/2" x 3-1/2" x 5-1/2"		11,948	10,801	8,125	7,742
		S14 -1"		3/4" x 3-1/4" x 7"		13,665	12,353	9,292	8,855
		S16 -1"		1" x 3-1/4" x 8"		15,696	14,189	10,673	10,171
	AT 100 & 125	For 3/4"- 1-1/4" Rod							
		S7 -1-1/4"	***	3/8" x 3-1/2" x 3-1/2"	1-1/4"	7,540	6,816	5,127	4,886
		S10 -1-1/4"	***	1/2" x 3-1/4" x 5"		10,009	9,048	6,806	6,486
		S11 -1-1/4"	***	1/2" x 3-1/2" x 5-1/2"		11,948	10,801	8,125	7,742
		S14 -1-1/4"		3/4" x 3-1/4" x 7"		13,373	12,089	9,094	8,666
		S16 -1-1/4"		1" x 3-1/4" x 8"		15,404	13,926	10,475	9,982
Fit 6x and larger wallswalls	AT125 & AT 100	L18 -1-1/4"	***	1/2" x 5.5" x 5.5"	1-1/4"	19,292	17,440	13,119	12,501
		L20 -1-1/4"	***	5/8" x 5-1/2" x 6"		21,016	18,998	14,291	13,618
		L25 -1-1/4"		3/4" x 5-1/2" x 7-1/2"		24,936	22,542	16,956	16,158
		L30 -1-1/4"		1" x 5-1/2" x 9"		30,092	27,203	20,462	19,500
		L33 -1-1/4"		1-1/8" x 5-1/2" x 10"		33,529	30,311	22,800	21,727
		L37 -1-1/4"		1-1/4" x 5-1/2" x11"		36,967	33,418	25,137	23,955
		For 1-3/8", 1-1/2", 1-3/4" and 2" Rod							
	AT 200 Only	L18 -2"	***	1/2" x 5.5" x 5.5"	2"	17,965	16,240	12,216	11,641
		L20 -2"	***	5/8" x 5-1/2" x 6"		19,695	17,805	13,393	12,763
		L25 -2"		3/4" x 5-1/2" x 7-1/2"		23,693	21,419	16,111	15,353
		L30 -2"		1" x 5-1/2" x 9"		28,849	26,080	19,618	18,694
		L33 -2"		1-1/8" x 5-1/2" x 10"		32,287	29,187	21,955	20,922
		L37 -2"		1-1/4" x 5-1/2" x11"		35,724	32,295	24,293	23,149

Notes: Plate ID includes maximum rod diameter. Holes are 1/16" oversize.
Bearing Plate bending based on ASTM A36 Steel, Fy = 36 ksi. per AISC 13th ed.
Bearing Capacity per NDS 2005: DFL = 625, SP = 565, HF = 405, SPF = 425 psi.
Bearing area factor, Cb, included in listed capacities.
Allowable bearing capacity is not limited by plate bending. Deflection is 0.040" at Allowable Load.
Allowable Capacity = (Fc perp) * Bearing Area * Bearing Factor (per AC 391 3.2.1.2 May 2012)
S5, S7, S10 and L18 plates may be used on the first floor mudsill for end of wall connection.
Finish: S5, S7, L11 and L18 plates are HDG. All other are black iron except as noted.

Shrinkage compensators require evaluations for: fit, strength, expansion and deflection. Two code defined deflections **(ΔA)** and **(ΔR)** are required.

Load-deflection (ΔA) design load/actual load * Rated ΔA.
Delta R (ΔR) is always added in full to system deflection. Delta R is the product internal slack.

Example:

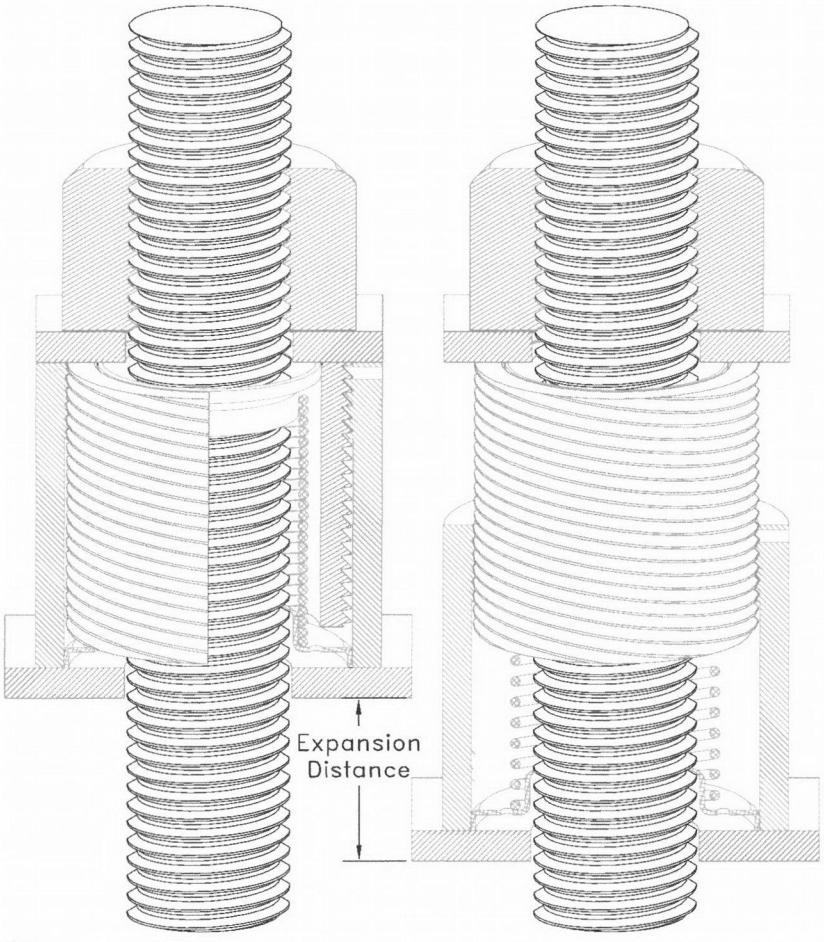
Reaction Load = 11,000 pounds

Shrinkage Compensator AT 100 (Select based on the rod size)
Rated Capacity: 25,300 pounds.
Deflection Maximum: ΔA = 0.032", ΔR = 0.002"
Expansion 1.2" (ICC ESR 1344)

Calculate Deflection: Load Deflection = 0.032 * 11,000/25,300 = 0.014"
Delta R (ΔR) (From Table) = 0.002"
Total Deformation = 0.016"
Add sum to the system elongation per AC 316 and AC 391 section 3.1.1.

Want to know more? Watch a 2 minute video that explains ΔR on our website.

US Patents 6,390,747 6,585,469. Other patents foreign and domestic, pending



AutoTight:

Rod Sizes to 2" Dia!
Larger rod = Lower Deflection

Inside Spring
= Protected Mechanism

Special thread
= 60% Lower Deflecton

Tightest Systems
= Shear Wall Performance

The AutoTight shrinkage compensator automatically expands as the building shrinks and settles.
This expansion helps keep shear walls tight and performing to the code.

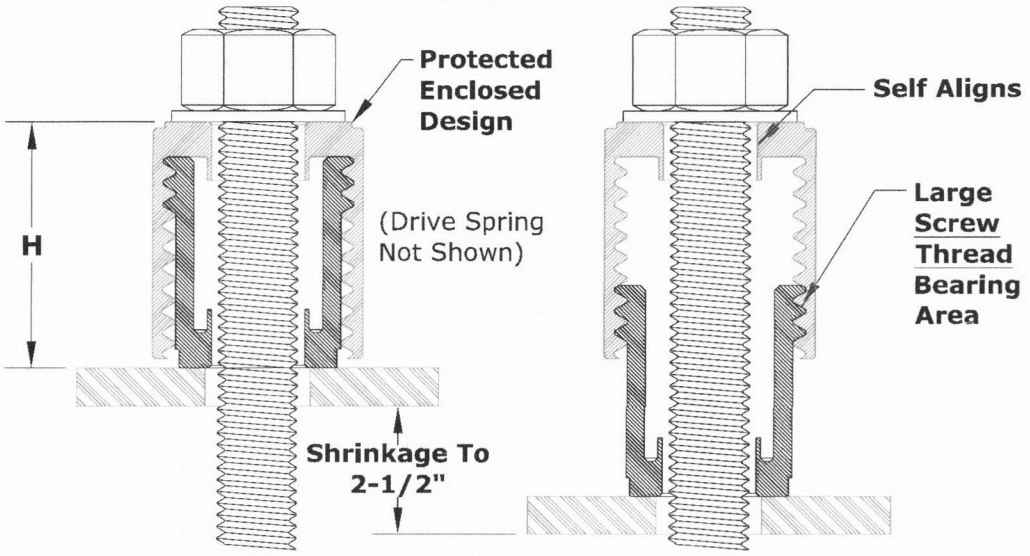
Code Listed: ICC ESR-1344, COLA RR-25480, Tested to AC 316 & AC 391, IBC 2012 Rated

Material: Aluminum - 6061 Alloy, **Finish:** Light Oil
Steel - 12L14, **Finish:** Zinc chromate, moly disulfide lubricant.

Installation: Place a steel bearing plate over the rod and onto the wood
Place the AT over the rod and onto the bearing plate,
Place Washer over the rod and onto the AT, Install and tighten Nut,
Remove the activation screw.
Listen for release

US Patents 6,390,747 6,585,469. Other patents foreign and domestic, pending

Threaded Mechanism = NO Backlash (Δr), No Looseness!



High Capacity, NO Backlash,
"Floating" Take-Up Device = Jam resistant
Tested at 3°out-of-plumb. (3° = 6-1/4" in 10 feet.)
Stackable: Doubles Expansion to 5"
Tested to 3 times rated load.
Fully functional at 2-½ times rated load

No Backlash with AutoTight
=
Much Better Shear Wall Performance

Some shrinkage compensators use ratchets. These ratchets can introduce looseness (backlash) up to 3/16".

This looseness can reduce the shear wall capacity by 40%.

See Videos at
www.comminsmfg.com

	Model Number	Rod Diameter	Matl.	Dimensions (Inches)		Rated Take-Up (Inches)	Allowable Load Pounds	Average Ultimate Pounds	Seating Increment Δ_R*	Deflection at Allowable Load Δ_A"
				Dia.	H					
New	AT4A-1.5	1/2"	Aluminum	1-1/2"	3"	1-1/2"	6,450	24,857	0.000"	0.011
New	AT4A-2.5				4-1/16"	2-1/2"				
New	AT6A-1.5	3/4"		2-1/8"	3-3/16"	1-1/2"	10,550	40,737		0.011
New	AT6A-2.5				4-3/16"	2-1/2"				
	AT 75	3/4"	Steel	2"	3"	1.10"	16,450	50,533	0.002"	0.024
	AT 75-2.5			2"	4"	2-1/2"	15,183	54,728		0.020
	AT 100	1"		2-1/4"	3-1/8"	1.10"	25,300	78,067		0.032
	AT 125	1-1/4"		2-3/4"	3-1/8"	1.12"	34,500	104,683		0.016
New	AT 200-2.0	2"		4"	3-3/4"	2.25"	50,000	150,000		0.024

Note: Δ_R= Average Travel and Seating Increment is the "Lost Motion" with device direction change from advancing to load resistance. This is sometimes called "Backlash".

*The AutoTight Aluminum Shrinkage Compensator has 0.0002" backlash (Δ_r).

Coupler Nuts

Coupler nuts connect threaded rod to form a continuous rod system.

Straight couplers have the same thread on both ends.
Coupler Nut Reducers have different diameter threads on each end.

Thread pitch is Unified National Coarse (NC or UNC).
Coupler nuts are available to fit rod from 1/2"-13 through 2"-4.5 NC.

Identification:

Straight Coupler: Example CN-9
CN = Coupler Nut,
9 = rod Size in $\frac{9}{8}$ inch = 1-$\frac{1}{8}$" dia.

Grade: Standard Coupler Nuts are ASTM A563 Grade A Grade 2
High Strength Couplers are ASTM A563 Grade C
Over 1-$\frac{3}{8}$" are Grade 5

Sighted couplers have one or more holes drilled to aid installation.

Standard Couplers	
Model Number	Rod Ø Both Ends
CN-4	1/2"
CN-5	5/8"
CN-6	3/4"
CN-7	7/8"
CN-8	1"
CN-9	1-1/8"
CN-10	1-1/4"

High Strength Couplers	
Model Number	Rod Ø Both Ends
CNHS-5	5/8"
CNHS-6	3/4"
CNHS-7	7/8"
CNHS-8	1"
CNHS-9	1-1/8"
CNHS-10	1-1/4"
* CNHS-11	1-3/8"
* CNHS-12	1-1/2"
* CNHS-14	1-3/4"
* CNHS-16	2"

Installation:

Thread coupler onto rod until the rod can be seen in the sight hole. Thread the next rod until it can also be seen through the sight hole. A nail inserted into the sight hole can be used for a temporary stop.

Note: Full strength is achieved with thread engagement equal to a standard nut. This is typically one rod diameter

Options:

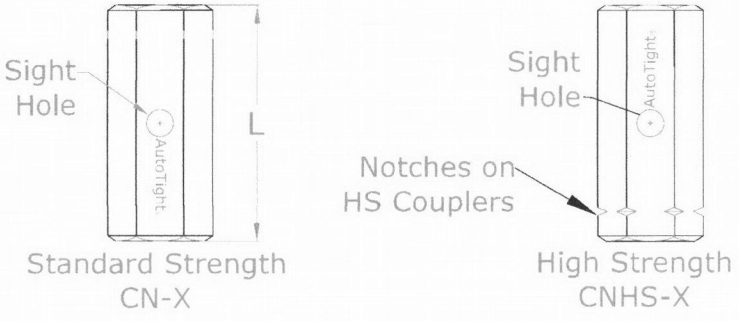
Oversize threads in coupler nuts for use with galvanized rod are available. To specify add a suffix after the product. Example CN-6 FHDG. This provides an oversize end to fit HDG rod. Contact factory for details.

Code Acceptance:

Nuts and coupler nuts shall be grade compatible and conform to ASTM A563 and IFI-128. One or two sight holes are provided to assist installation. Standard strength couplers shall be used with ASTM A307 and equivalent rod; High strength couplers shall be used with ASTM C1045, ASTM A193-B7 and other high strength rod. High strength couplers may be used with standard strength rod. See ICC ES AC 391 section 1.4.5 for additional information.

Coupler elongation is minimal and is not considered in elongation calculations.

Straight Couplers



* Check with factory for availability of these sizes.

Coupler Nut Reducer

Use coupler nut reducers to change rod size. Normally rod is reduced in size. However sometimes the rod is increased from an embedment to a "run".

Identification:

Coupler Nut Reducer

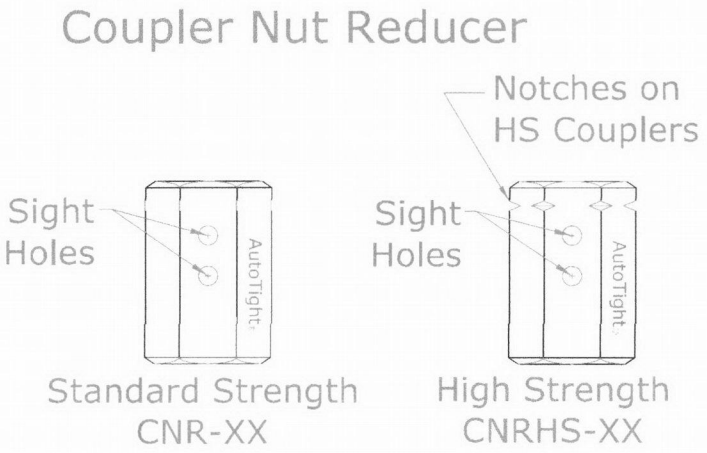
Example: CNR610
CNR = Coupling Nut Reducer,
610 = 3/4" - 10 NC to 1-1/4" - 7 NC Thread.

Grade:

Standard Coupler Nuts are ASTM A563 Grade A.
High strength Couplers are ASTM A563 Grade C.
Over 1-¼" at the big end Grade 5 is supplied
Sight holes are standard.

Installation

Thread coupler onto larger rod, bottom. Thread smaller rod into coupler and bottom on the larger thread. The thread bottoming in the coupler will indicate full engagement, a sight hole is not necessary.



	Model Number	Rod Ø Small	Rod Ø Large
Standard Strength	CNR-45	1/2"	1/2"
	CNR-46		3/4"
	CNR-47		7/8"
	CN-48		1"
	CNR-56	5/8"	3/4"
	CNR-57		7/8"
	CNR-58		1"
	CNR-59		1-1/8"
	CNR-67	3/4"	7/8"
	CNR-68		1"
	CNR-69		1-1/8"
	CNR-610		1-1/4"
	CNR-78	7/8"	1"
	CNR-79		1-1/8"
	CNR-710		1-1/4"
	CNR-89	1"	1-1/8"
	CNR-810		1-1/4"
	CNR-910	1-1/8"	1-1/4"

	Model Number	Rod Ø Small	Rod Ø Large
High Strength	CNRHS-56	5/8"	3/4"
	CNRHS-57		7/8"
	CNRHS-58		1"
	CNRHS-59		1-1/8"
	CNRHS-67	3/4"	7/8"
	CNRHS-68		1"
	CNRHS-69		1-1/8"
	CNRHS-610		1-1/4"
	CNRHS-78	7/8"	1"
	CNRHS-79		1-1/8"
	CNRHS-710		1-1/4"
	CNRHS-89	1"	1-1/8"
	CNRHS-810		1-1/4"
	CNRHS-812 *		1-1/2"
	CNRHS-814 *		1-3/4"
	CNRHS-910	1-1/8"	1-1/4"
	CNRHS-912 *		1-1/2"
	CNRHS-914 *		1-3/4"
	CNRHS-916 *		2"
	CNRHS-1011 *	1-1/4"	1-3/8"
	CNRHS-1012 *		1-1/2"
	CNRHS-1014 *		1-3/4"
	CNRHS-1016 *		2"
	CNRHS-1112 *	1-3/8"	1-1/2"
	CNRHS-1114 *		1-3/4"
	CNRHS-1116 *		2"
	CNRHS-1214 *	1-1/2"	1-3/4"
	CNRHS-1216 *		2"
	CNRHS-1416 *	1-3/4"	2"

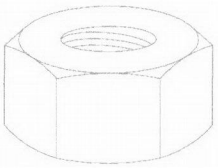
* Check with factory for availability of these sizes.

Nuts

All nuts are Unified National Coarse thread pitch (UNC or NC)

Standard Nuts are SAE Grade 2 or ASTM 563-Grade A

High Strength Nuts are SAE grade 5, ASTM 563-Grade C or A194-2H.



Nuts for HDG

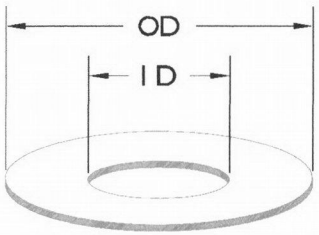
Oversize nuts to fit HDG Hot Dipped Galvanized Rod available.
Consult factory for sizes available.
Rethreading after HD Galvanizing is preferred.

	Standard Nuts	
	Model Number	Diameter & Thread
	N-4	1/2"-13 NC
	N-5	5/8"-11 NC
	N-6	3/4"-10 NC
	N-7	7/8"-9 NC
	N-8	1"-8 NC
	N-9	1-1/8"-7 NC
	N-10	1-1/4"-7 NC
*	N-11	1-3/8"-6 NC
*	N-12	1-1/2"-6 NC
*	N-14	1-3/4"-5 NC
*	N-16	2"-4.5 NC

	High Strength Nuts	
	Model Number	Diameter & Thread
	NHS-4	1/2"-13 NC
	NHS-5	5/8"-11 NC
	NHS-6	3/4"-10 NC
	NHS-7	7/8"-9 NC
	NHS-8	1"-8 NC
	NHS-9	1-1/8"-7 NC
	NHS-10	1-1/4"-7 NC
*	NHS-11	1-3/8"-6 NC
*	NHS-12	1-1/2"-6 NC
*	NHS-14	1-3/4"-5 NC
*	NHS-16	2"-4.5 NC

Washers

Washers supplied are SAE Washers. Common Washers may be substituted.
W-11 thru W-16 are special 3-½" square washers.



	Washers		
	Model Number	Nominal Diameter	Outside Diameter
	W-4	1/2"	1-1/16"
	W-5	5/8"	1-5/16"
	W-6	3/4"	1-1/2"
	W-7	7/8"	1-3/4"
	W-8	1"	2"
	W-9	1-1/8"	2-1/4"
	W-10	1-1/4"	2-1/2"
*	W-11	1-3/8"	3-1/2"
*	W-12	1-1/2"	3-1/2"
*	W-14	1-3/4"	3-1/2"
*	W-16	2"	3-1/2"

* Check with factory for availability of these sizes.

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DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES

SECTION: 06 05 23—WOOD, PLASTIC, AND COMPOSITE FASTENINGS

REPORT HOLDER:

COMMINS MANUFACTURING, INC.

960 B GUARD STREET

FRIDAY HARBOR, WASHINGTON 98250

EVALUATION SUBJECT:

AT AUTOMATIC TAKE-UP™ SHRINKAGE COMPENSATOR

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DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES
Section: 06 05 23—Wood, Plastic, and Composite Fastenings

REPORT HOLDER:

COMMINS MANUFACTURING, INC.
960 B GUARD STREET
FRIDAY HARBOR, WASHINGTON 98250
(360) 378-9484
www.comminsmfg.com

EVALUATION SUBJECT:

AT AUTOMATIC TAKE-UP™ SHRINKAGE COMPENSATOR

1.0 EVALUATION SCOPE

Compliance with the following codes:

2018, 2015, and 2012 *International Building Code®* (IBC)

Property evaluated:

Structural

2.0 USES

The AT Automatic Take-Up™ Shrinkage Compensator device is used to remove slack in hold-down systems due to settlement or wood shrinkage in accordance with IBC Sections 2303.7 and 2304.3.3.

3.0 DESCRIPTION

3.1 General:

The AT Automatic Take-Up™ Shrinkage Compensator is a self-expanding washer used in connections of shearwall hold-down connectors or tension tie connectors incorporating threaded rods or threaded anchor bolts. The shrinkage compensator is available with either a steel body or an aluminum body. The devices automatically expand, axially, to eliminate any gaps between the bearing surface and the nut on the threaded rod that occur due to settlement or wood shrinkage. Sizes, rod diameters, dimensions, maximum expansion (shrinkage compensation capacity), and capacities are listed in Table 1. See Figure 1 for a typical installation.

3.2 Materials:

3.2.1 Auto Take-Up Device (AT Steel and ATA Aluminum): Steel AT's: The outer (body) component of the device has internal threads. The inner (stud) component of the device has matching external threads. The inner components are manufactured from ASTM A108-13 Grade 12L14 steel with minimum yield and tensile strengths of 65 and 75 ksi (448 and 517 MPa), respectively. The outer components are manufactured from either ASTM A108-13 Grade 12L14 steel with minimum yield and tensile strengths of 65 and 75 ksi (448 and 517 MPa), respectively, or DOM 1020/1028 steel tubing with minimum yield and tensile strengths of 84 and 95 ksi (579 and 657 MPa), respectively, for the AT75-2.5, and 71 and 80 ksi (490 and 551 MPa), respectively, for all the other AT devices. For the AT200-2 the outer and inner components are manufactured from ASTM A513-15 Grade 1026 steel with minimum yield and tensile strengths of 75 and 85 ksi (517 and 568 MPa) respectively. A finish and lubricant, specified in the approved quality control manual, is applied to the outer and inner components to resist corrosion. The device has an internal spring manufactured from HDMB steel wire per ASTM A764-07(2017) or high-carbon steel music wire per ASTM A228-16.

3.2.2 Aluminum AT's: The outer (body) component of the device has internal threads. The inner (stud) component of the device has matching external threads. The outer and inner components are manufactured from 6061-T6 aluminum with minimum yield and tensile strengths of 40 and 45 ksi (275 and 310 MPa), respectively. A lubricant, specified in the approved quality control manual, is applied to the outer and inner components to resist corrosion. The device has an internal spring manufactured from HDMB steel wire per ASTM A764-07(2017) or high-carbon steel music wire per ASTM A228-16.

4.0 DESIGN AND INSTALLATION

4.1 Design and Allowable Loads:

The allowable compression loads for the AT Automatic Take-Up™ Shrinkage Compensator designed under allowable stress design are as shown in Table 1. The devices are to be used where the expected shrinkage does not exceed the expansion limit of the devices. Two devices may be used in-line where the expected shrinkage exceeds the expansion limit of one device.

When the devices are used in continuous rod systems that resist light-frame shear wall overturning forces, calculations must be submitted to the code official confirming that the total vertical displacement, which would include steel rod elongation and the shrinkage compensating device deflection, is less than or equal to

0.20-inch (5 mm) for each story, or between restraints, whichever is more restrictive, using allowable stress design (ASD). Shear wall drift limit calculations must consider the 0.20-inch (5 mm) vertical displacement limit. This 0.20-inch (5 mm) vertical displacement limit may be exceeded when it can be demonstrated that the shear wall story drift limit and the deformation compatibility requirements of IBC Section 1604.4 are met when considering all sources of vertical displacement.

4.2 Installation:

The AT Automatic Take-Up™ Shrinkage Compensator must only be used where there is sufficient clearance along the sides of the device to permit the device to expand. The device must be installed over the hold-down or bearing plate with the threaded rod through the axial center of the device. An SAE flat washer and steel nut must be installed on the threaded rod and tightened prior to activation of the device. Activation occurs by removal of a factory-inserted screw from the side of the device. The continuous tie-down system in which the AT Automatic Take-Up™ Shrinkage Compensator is used must be installed plumb, such that the offset angle between the top of the floor and the bottom of the top plates or bridge block above does not exceed 1.33 degrees from vertical.

5.0 CONDITIONS OF USE

The AT Automatic Take-Up™ Shrinkage Compensator described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 subject to the following conditions:

5.1 Calculations, demonstrating that the applied loads do not exceed the allowable loads and that the expected shrinkage does not exceed the expansion limits of the device, must be submitted to the code official for approval. The calculations must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

5.2 The Commins AT Automatic Take-Up™ Shrinkage Compensator must be limited to installations in dry, interior locations.

5.3 No increase in allowable stresses or loads for duration of load is permitted for the Commins AT Automatic Take-Up™ Shrinkage Compensator.

5.4 The AT Automatic Take-Up™ Shrinkage Compensator must not be used to support dead load other than its own weight.

6.0 EVIDENCE SUBMITTED

Data in accordance with ICC-ES Acceptance Criteria for Shrinkage Compensating Devices (AC316), dated June 2013 (editorially revised November 2017).

7.0 IDENTIFICATION

Each AT Automatic Take-Up™ Shrinkage Compensator must bear a label on the device or on the packaging indicating the manufacturer's name (Commins Manufacturing, Inc.), the model number, and the evaluation report number (ESR-1344).

TABLE 1—AT AUTOMATIC TAKE-UP™ SHRINKAGE COMPENSATOR DESCRIPTION AND ALLOWABLE LOADS[1,3]

MODEL NO.	INSIDE DIAMETER (inches)	OUTSIDE DIAMETER (inches)	DEVICE LENGTH (inches)		MAXIMUM EXPANSION (inches)	SEATING INCREMENT[2] Δ_R (inches)	ALLOWABLE AXIAL COMPRESSION LOAD P_A (pounds)	DEFLECTION AT ALLOWABLE LOAD[2] Δ_A (inch)
			Minimum	Maximum				
Aluminum								
AT 4A-1.5	1/2	1 1/2	3.0	4.5	1.50	0.000	6,450	0.011
AT 4A-2.5	1/2	1 1/2	4.06	6.56	2.50	0.000	6,450	0.011
AT 6A-1.5	3/4	2 1/8	3.19	4.69	1.50	0.000	10,550	0.011
AT 6A-2.5	3/4	2 1/8	4.19	6.69	2.50	0.000	10,550	0.011
AT 8A-1.5	1	2 3/4	3.50	5.25	1.75	0.000	20,750	0.004
AT 10A-1.5	1 1/4	3 1/4	3.50	5.12	1.62	0.000	28,050	0.020
AT12A-1.5	1 1/2	3 1/4	3.50	5.12	1.62	0.000	28,050	0.020
AT16A-2.0	2	4	3.50	5.57	2.07	0.001	39,450	0.011
Steel								
AT 75	3/4	2	2.80	3.90	1.10	0.002	16,450	0.024
AT 75-2.5	3/4	2	4.0	6.5	2.50	0.002	15,200	0.021
AT 100	1	2 1/4	2.90	4.00	1.10	0.002	25,300	0.032
AT 125	1 1/4	2 3/4	2.86	3.98	1.10	0.002	34,500	0.016
AT 200-2.0	2	4	3.88	6.06	2.18	0.000	83,200	0.009

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

[1]Listed values are for the AT Automatic Take-Up™ Shrinkage Compensator only. All other components in the system must be designed in accordance with the applicable code.

[2]The device average travel and seating increment, Δ_R, and deflection at allowable load, Δ_A, are additive and describe the total movement of the device at allowable load, Δ_T. For design loads, P_D, less than the allowable load, P_A, the total movement of the device, Δ_T, is calculated as follows: $\Delta_T = \Delta_R + \Delta_A(P_D/P_A)$.

[3]LRFD resistance capacity = ASD allowable load x 1.5.

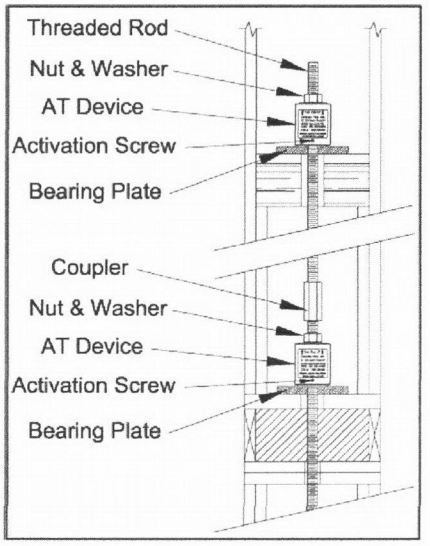

FIGURE 1—TYPICAL INSTALLATION

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ESR-1344 CBC Supplement

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DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES
Section: 06 05 23—Wood, Plastic, and Composite Fastenings

REPORT HOLDER:

COMMINS MANUFACTURING, INC.
960 B GUARD STREET
FRIDAY HARBOR, WASHINGTON 98250
(360) 378-9484
www.comminsmfg.com

EVALUATION SUBJECT:

AT AUTOMATIC TAKE-UP™ SHRINKAGE COMPENSATOR

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the AT Automatic Take-Up™ Shrinkage Compensator, recognized in ICC-ES master report ESR-1344, has also been evaluated for compliance with the code noted below.

Applicable code edition:

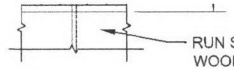
2016 *California Building Code* (CBC)

2.0 CONCLUSIONS

The AT Automatic Take-Up™ Shrinkage Compensator, described in Sections 2.0 through 7.0 of the master evaluation report ESR-1344, complies with CBC Chapter 23, provided the design and installation are in accordance with the 2015 *International Building Code®* (IBC) provisions noted in the master report and the additional requirements of with CBC Chapters 16, 16A, 17, 17A and 23, as applicable.

This supplement expires concurrently with the master report, reissued December 2017 and revised February 2018.

ELONGATION LIMIT PER LEVEL: 0.20 IN



18-1789 Tree Farm
S702 Load Table
10-11-18

Wall or Run ID	Run Start	Anchor Diameter (in.)	Cumulative Tension Load (kips)						Cumulative Compression Load (kips)						Wall Height (ft-in)						Floor Depth (inches)					Run Termination
			6th	5th	4th	3rd	2nd	1st	6th	5th	4th	3rd	2nd	1st	6th	5th	4th	3rd	2nd	1st	6th	5th	4th	3rd	2nd	
EW 2	Concrete Through Slab	SR12				19.86	33.62					33.08	50.26				12'-1/8"		12'-1/8"				11.88	11.88		Straps
EW 6	Concrete Through Slab	SR10H				29.81	48.04					47.32	70.14				12'-1/8"		12'-1/8"				11.88	11.88		Straps
EW 6.5	Concrete Through Slab	SR9H				22.44	34.99					25.75	39.12				12'-1/8"		12'-1/8"				11.88	11.88		Straps
NS B1	Concrete Through Slab	SR9H				23.23	36.17					26.48	40.23				12'-1/8"		12'-1/8"				11.88	11.88		Straps
NS C1	Concrete Through Slab	SR9H				22.38	34.44					23.99	36.46				12'-1/8"		12'-1/8"				11.88	11.88		Straps
NS C2	Concrete Through Slab	SR10				20.42	31.72					22.99	34.94				12'-1/8"		12'-1/8"				11.88	11.88		Straps
NS D	Concrete Through Slab	SR9					26.23						30.43						12'-1/8"					11.88		Straps
NS E	Concrete Through Slab	SR12				27.2	44.57					56.01	80.97				12'-1/8"		12'-1/8"				11.88	11.88		Straps
NS C.3	Concrete Through Slab	SR8					14.55						21.1						12'-1/8"					11.88		Straps