1 AutoTight Rod Holdown System Notes

Holdown System Design:

1. Holdown system conforms to the International Building Code (IBC) 2009 per local jurisdiction.
2. Required loads and system requirements per structural plans, dated 11/29/2010.
3. Wood shrinkage is estimated at 1/4" per floor, based on structural plans wood specifications.
4. Drawings are not to scale. Holdown Run elevation (AT1.1) drawings are for location of run components only and may not reflect the correct number of compression posts. Check Compression Post call outs to the right of the run elevation.
5. Fabrication shall meet the requirements and specifications per structural plan general notes.
6. Engineer of Record is to review these drawings and upon approval the drawings will replace the holdown system per structural plans, unless noted otherwise (U.N.O.).

Compression Post Notes:

1. Compression post shall be species, grade and size per structural plans (U.N.O.).
2. Compression posts and headers shall have a maximum moisture content of 19%.
3. Compression post or loads not specified, shall be equal to or exceed the required loads on Structural plans.
4. Compression post call outs on AT1.1 are each side of the rod for 4x and 6x wall per holdown run and floor/level (U.N.O.).
5. Compression post are in addition to shearwall framing members. (U.N.O.)
6. Alternate compression post may be acceptable. Consult the factory for possible alternates.
7. Floor blocking stud lengths shall be 1/8" less than in-between floor height for shrinkage.
8. Compression post may be notched to exact thickness of steel bearing plate, if required. A plywood shim of the exact thickness of the steel bearing bearing plate may be used, instead of notching. Additional compression post with required nailing shall be added, if exact notching requirements are not possible.
9. Cutting or notching of compression post is permitted to a depth not to exceed 25% of its width per 2009 IBC – 2308.9.10. Boring of compression post is permitted for a hole not greater than 40% of the width and no nearer than 5/8" to the edge per 2009 IBC – 2308.9.11 See applicable code.

Anchor Bolt Embedments:

1. Contractor/Installer shall verify anchor bolt size, thread pitch and material for correct location per structural plans run call outs or AutoTight holdown run layout sheet(s).
2. Anchor bolt shall be 6" minimum above concrete slab (U.N.O.).
3. AutoTight Anchor Bolt Embedments, if used, are called out on AT1.2.

Shop Drawing Disclaimer

Holdown design is by Commins Manufacturing, Inc. for the holdown system described in these shop drawings only. This design uses the construction plans and calculations provided by the Engineer of Record. No attempt had been made on the part of Commins Manufacturing, Inc. to verify the values given in the calculations or design described by the construction drawings.

The Engineer of Record is responsible for the structural design of the building and the ability of the design to transfer loads imparted to the structure by the holdown system.

Structural Engineer of Record

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Abbreviations

A.B.	Anchor bolt per plan or schedule
Alt	Alternate option
ATXX	AutoTight Take-Up Device (installed with) 75 & 75-2.5 (1/2", 5/8" or 3/4" rod) 100 (7/8" or 1" rod) 125 (1 1/8" or 1 1/4" rod)
CAT	Commins AutoTight
CNR(HS)	Coupler nut (HS are notched)
CNR(HS)	Coupler nut reducer (HS are notched)
Dia	Diameter
DFL	Douglas Fir-Larch
HF	Hemlock Fir
HS	High strength
LXX	Bearing plate, 6x wall only
Min	Minimum
Max	Maximum
H(HS)-XX	Nut (HS have stamp grade ID)
O.C.	On center
R-XX(HS)	Threaded rod, (HS rod is black)
SPF	Spruce-Pine-Fir
STD	Standard strength (STD rod is zinc plated)
SYP	Southern Yellow Pine
SXX	Bearing plate, 4x or 6x wall
Typ	Typical
U.N.O.	Unless noted otherwise
W-XX	SAE Washer
	Rod, Nut & Washer Size
-4	1/2" -8 1-1/8"
-5	5/8" -10 1-1/4"
-6	3/4" -12 1-1/2"
-7	7/8" -14 1-3/4"
-8	1"

2 Threaded Rod and AT Take-Up Device Allowable Loads

Table 1g
2009 International Building Code (IBC)

Rod Size "Diameter (inches)"	Model	"Diameter & Thread"	Allowable Tension (lbs) "A36 or F1554 Gr 36"	A307	"A449 A325"	A108-C1045	"A193-B7 or F1554 Gr 105"	A354-BD
Rod Strength Type:			Standard	Standard	H	H	HS	XHS
3/8	R3	3/8"- 16 NC	2,400	2,490	4,970	4,970	5,180	6,215
1/2	R4	1/2"-13 NC	4,270	4,420	8,840	8,840	9,200	11,045
5/8	R5	5/8"-11 NC	6,670	6,900	13,810	13,810	14,380	17,255
3/4	R6	3/4"-10 NC	9,610	9,940	19,880	19,880	20,710	24,850
7/8	R7	7/8"-9 NC	13,080	13,530	27,060	27,060	28,190	33,825
1	R8	1"- 8 NC	17,080	17,670	35,340	35,340	36,820	44,180
1 1/8	R9	1-1/8" -7 NC	21,620	22,370	39,140	44,730	46,590	55,915
1 1/4	R10	1-1/4" -7 NC	26,690	27,610	48,320	55,220	57,520	69,030
1 1/2	R12	1-1/2" - 6 NC	38,440	39,760	69,580	79,520	82,830	99,400
1 3/4	R14	1-3/4"-5 NC	52,310	54,120	81,180	108,240	112,750	135,295

Model Number***	Rod Diameter (Max.)	Mat.	Dimensions (Inches) Dia.	H	Rated Take-Up (Inches)	Allowable Load Pounds	Average Ultimate Pounds	Δr (Inches) Seating Increment	ΔA (Inches) Deflection at Allowable Load
AT4A-1.5	1/2"	Aluminum	1-1/2"	3"	1-1/2"	7,273	24,857	0.000**	0.014
AT4A-2.5				4-1/16"	2-1/2"				
AT6A-1.5	3/4"		2-1/8"	3-3/16"	1-1/2"	13,579	40,737		0.014
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"	1.12"	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

Threaded Rod, Couplers, Nuts and AT Shrinkage Device Notes:

Rod Material:

1. Standard (S) threaded rod shall be ASTM A307 or A36 with Fu Min=60ksi, Fy Min=43ksi.
   Medium High Strength (H) threaded rod shall be ASTM A449 or ASTM A105-C1045 with Fu Min=120ksi, Fy Min=92ksi.
   High Strength (HS) shall be ASTM A193-B7 with Fu Min=125ksi, Fy Min=105ksi.
   Extra High Strength (XHS) shall be ASTM A354 Class BD with Fu Min=150ksi, Fy Min=130ksi.
2. All threaded rod is Uniform National Course (NC) threaded.
3. High Strength rod is usually marked with Red paint. Consult Factory for additional information.
4. Standard couplers conform to ASTM A-563 grade A (SAE Grade 2).
   High strength (HS) couplers conform to ASTM A563 Grade C (SAE Grade 8) and are notched for identification.
5. Standard nuts conform to ASTM A-563 grade A (SAE Grade 2).
   High strength (HS) nuts conform to ASTM A563 Grade C (SAE Grade 8) and are stamped for identification.
6. Automatic (AT) Take-Up Device by Commins Manufacturing Inc. per ICC ES report ESR-1344 issued November 1, 2007.

Fabrication:

1. Threaded rod lengths may be adjusted as required, but rod diameter and material type must be the same per the floor/level call out. Cutting of rod on lower levels may result in incorrect (short) top floor termination length.
2. Rod clearance holes between floors shall be 1/4" to 1/2" oversized. Silicone or caulking shall not be used at any time. A fire-rated floor/roof or a non-hardening FireStop (provided by others) shall be used, if required. Rod must move freely after assembly.
3. Recommended maximum out of plumb for rod is 2" per 10' floor height (Detail 13) with no permanent bending of installed threaded rod.
4. Coupler nuts shall have the threaded rod visible in the sight hole(s) per Detail 7.
5. The AT Take-Up Device shall be secured with a nut and flat washer snug plus 1/2 turn. At termination level the end of the rod shall be 1/8" minimum beyond the face of the nut. A final nut tightening just prior to closure of the wall is good practice, but not required. The AT Take-Up Device MUST be activated by removing the activation screw prior to wall enclosure per Detail 12.
6. Rod, couplers and AT device locations are per Holdown Run elevations on AT1.1.
7. Run locations are per structural plans run call outs or AutoTight holdown run layout sheet(s).

3 Bearing Plate Schedule and Allowable Loads

Table 2a
2009 International Building Code IBC
Bearing Plate Allowable Loads
(13th Ed. ASD, 2005 NDS)

"Bearing Plate Part #"	Plate Dimensions "Thickness (in)"	"Width (in)"	"Length (in)"	"Hole Dia. (bolt size) (in)"	"Capacity DFL (lbs)"	"Wall Size"
S4	3/16	2 1/2	2 1/2	3/4	4,120	"4x & 6x"
S5	1/4	3	3		5,964	
S6	5/16		3 1/4		7,002	
S8	3/8		4	1	8,281	
S10	1/2		5		10,322	
S12	5/8		6		12,360	
S14	3/4		7		13,665	
S16	1	3 1/4	8		15,696	
S8L	3/8		4	1 1/4	7,962	
S10L	1/2		5		10,009	
S12L	5/8		6		12,051	
S14L	3/4		7		13,373	
S16L	1		8		15,404	
S19			9		18,842	
S22	1 1/4		10		21,029	
S24			11		23,217	
S26			12		25,404	
S28		3 1/2	13		27,592	
S32	1 1/2		15		31,967	
S35			16		34,154	
S39			18		38,529	
S44			20		42,904	
L17	1/2	5	5 1/2		17,282	6x
L20	5/8	5 1/2	6		21,018	
L21	3/4	5	7		21,029	
L25		5 1/2	7 1/2		24,936	
L28	1	5	9		27,279	
L30		5 1/2	9		30,092	
L32		5	11		33,529	

AutoTight Bearing Plate Schedule Notes:

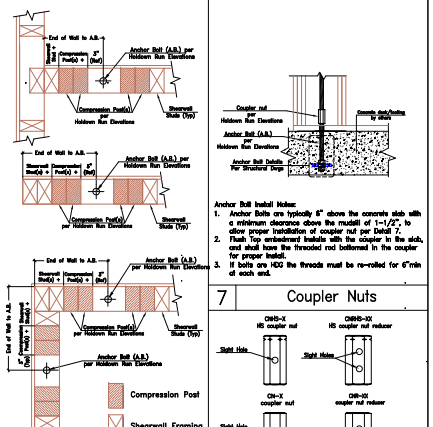
Material:

1. Steel bearing plates are ASTM A36 Steel.
2. Number signifies approximate allowable bearing capacities in kips for DFL (625 psi) parallel to grain.
3. The following multipliers is used to reduce allowable load for other wood species.
   Southern Pine (SYP, 565 psi) x 0.90
   Spruce-Pine-Fir (SPF, 425 psi) x 0.68
   Hemlock-Fir (HF, 405 psi) x 0.65
4. Additional bearing plates sizes may be used for special high load requirements

Fabrication:

1. The surface area of all bearing plates must have full contact on the supporting wood members.
2. S series plates fit 4x and 6x walls.
3. L series plates fit 6x walls only.
4. Plates S8 – S16 fit 1" diameter rod and smaller.
5. Plates S8L – S16L, S19 – S28 and L17 – L32 fit 1-1/4" diameter rod and smaller.
6. Bearing plate locations per Holdown Run elevations on AT1.1.

4 Typ. A. B. – Post Layout



Anchor Bolt – Compression Post(s) Layout Notes:

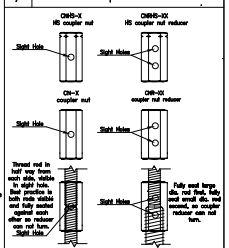
1. Anchor Bolt (A.B.) layouts above are typical, but may not apply to all locations. Check Structural Plans for other specific Anchor Bolt location details.
2. Typical clearance between the compression post, relative to the rod i., is 3" (6" total between post). Minimum clearance is 1-3/4" to the rod i. (3-1/2" total between post) for 1/4" clearance around AT Take-Up Device. Maximum distance between posts can be up to 10" or more at the discretion of the engineer.
3. Rod clearance hole shall be 1/4" to 1/2" oversized.
4. Upper levels may require a bearing plate wider than 6". Check upper floor/level compression post and bearing plates layout dimensions per Holdown Run Elevations to verify Anchor Bolt location.

6 Typ. Anchor Bolt Coupler

Anchor Bolt Install Notes:

1. Anchor Bolts are typically 6" above the concrete slab with a minimum clearance above the mudsill of 1-1/2", to allow proper installation of coupler nut per Detail 7.
2. Flush Top embedment baskets with the coupler in the slab, and shall have the threaded rod bottomed in the coupler for proper install.
3. If bolts are HDU the threads must be re-rolled for 6"min at each end.

7 Coupler Nuts

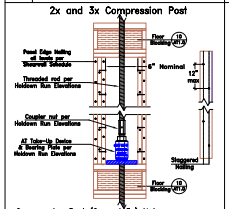


Coupler Nut Notes:

1. The rod shall be threaded in half way from each side and be visible in the sight hole(s).
2. "X" in part # is the size in 1/8's of an inch

8 Comp. Post Nailing

2x and 3x Compression Post

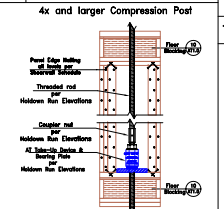


Compression Post (2x and 3x) Notes:

1. All full height 2x and 3x compression posts shall be staggered stitch nailed @ 12" O.C., except at termination header floor/level.
2. Panel (boundary) edge nailing shall be the same as the Shearwall Schedule on each compression post on each side of the rod.
3. Cavity width may vary depending on field conditions.
4. Consult factory for other conditions. Too little space makes bearing plate installation difficult.

9 Comp. Post Nailing

4x and larger Compression Post

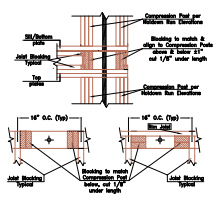


Compression Post (4x and larger) Notes:

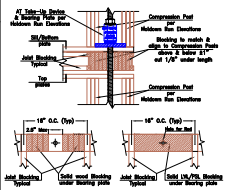
1. All full height 4x and 6x comp posts shall receive toe nailing to top and bottom plate and panel edge nailing per structural plans.
2. Panel edge nailing shall be the same as the Shearwall Schedule with an additional row(s) of panel edge nailing located 3" O.C. on compression post x8 and larger.

10 Typ. Floor Blocking

Floor Blocking for Compression Post



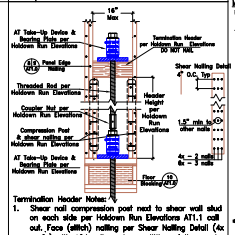
Solid Floor Blocking under Bearing Plate



Floor Blocking Notes:

1. All floor blocking shall have 1/8" vertical clearance between wall plates or floors.
2. All floor blocking shall be installed grain vertical.
3. Parallam may be substituted for solid sawn wood. Blocking must match compression post below or be solid blocked when under a bearing plate. Rod clearance hole for rod shall be rod size plus 1/4" – 1/2" oversized. Rod must move freely through holes after assembly.

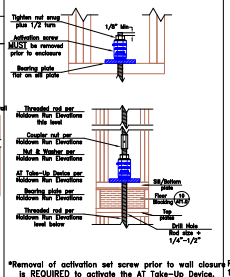
11 Typ. Term. Header Install



Termination Header Notes:

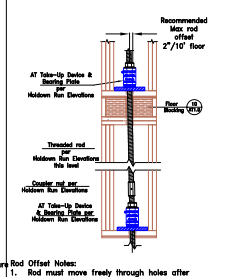
1. Header nail compression post next to shear wall stud on each side per Holdown Run Elevations AT1.1 call out. Face (stitch) nailing per Shear Nailing Detail (4x or 6x) with 16d nails and no splitting of the wood.
2. Shear nailing shall be from the backside for 3x and larger compression post.
3. Contractor/Installer shall verify nailing pattern.
4. Additional compression post/studs shall be stitch nailed per Detail 8.
5. Rod clearance hole shall be 1/4" to 1/2" oversized.

12 Typ. Take-Up Device Install



*Removal of activation set screw prior to wall closure is REQUIRED to activate the AT Take-Up Device.

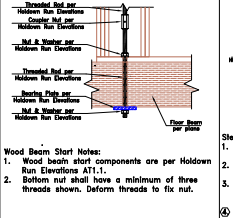
13 Allowable Rod Offset



Rod Offset Notes:

1. Rod must move freely through holes after assembly.

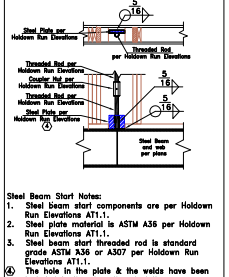
14 Wood Beam Start (WBS)



Wood Beam Start Notes:

1. Wood beam start components are per Holdown Run Elevations AT1.1.
2. Bottom nut shall have a minimum of three threads shown. Deform threads to fix nut.

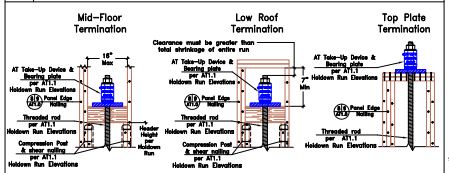
15 Steel Beam Start (SBS)



Steel Beam Start Notes:

1. Steel beam start components are per Holdown Run Elevations AT1.1.
2. Steel plate material is ASTM A36 per Holdown Run Elevations AT1.1.
3. Steel beam start threaded rod is standard grade ASTM A36 or A307 per Holdown Run Elevations AT1.1.
4. The hole in the plate & the welds have been included in the strength calculations.

16 Alternate Run Terminations



Alternate Run Termination Notes:

1. Refer to detail 11 for typical header installation.
2. Refer to Holdown Run Elevations AT1.1 for number of shear nails required.
3. Run terminations that are not mid-floor may require the threaded rod to be cut. Clearance above the top of the rod must be greater than wood shrinkage per floor (detail 1, note 5) times the levels of the run.
4. Change of termination type will change rod length requirements.
5. Rod clearance hole shall be 1/4" to 1/2" oversized.
6. Top Plate Termination: Stitch Top Plates within 12" of rod 2 staggered rows 16d sinkers 4" O.C.

17 18 19 20 21

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Sample Project, 1 of 1, 12/09/2010

See calculations prepared by Zbinden-Carter-Souders, Inc. Dated N.A.

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DRAFT

No	Revision	Date

Drawn:	TB	Check:	NA	Date:	12/09/10

75-19846
The Sample Project
960 Guard Street
Friday Harbor WA 98250

Holdown Run Details

Not to Scale

AT10