1 AutoTight Rod Holdown System Notes

Holdown System Design:
1. Holdown system conforms to 2005 National Building Code Of Canada (NBCC) per local jurisdiction.
2. Required loads and system requirements per structural plans dated XX/XX/20XX.
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 (AT11) 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 AT11 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. The net section, obtained by deducting from the gross section the area of all material removed by boring, grooving, dapping, notching, or other means, shall be checked in calculating the strength capacity of a member, per CAN-CSA-086-01 4.3.8.1
   In no case shall the net section be less than 75% of the gross section. per CAN-CSA-086-01 4.3.8.2

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 AT12.

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

Engineering Firm
Project Engineer
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City, State Zip
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e-mail@com

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
CN(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
N(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"	-9	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 1c
2005 National Building Code of Canada (NBCC)

					Automatic Take-Up Device			
					AT75	AT75-2.5	AT100	AT125
				AT Expansion >	1.1"	2.5"	1.1"	1.1"
Factored Tensile Resistance, T_r		Threaded Rod			3/4"ø	3/4"ø	1"ø	1-1/4"ø
(lbs)	kN	CAT Rod	Dia.-Thread	Material	16,450 lbs.	15,183 lbs.	25,300 lbs.	34,500 lbs.
5,705	25.4	R-4	1/2"-13 NC	A307 or A36	X	X		
9,086	40.4	R-5	5/8"-11 NC		X	X		
13,447	59.8	R-6	3/4"-10 NC		X	X		
18,563	82.6	R-7	7/8"-9 NC				X	
24,353	108.3	R-8	1"-8 NC				X	
30,686	136.5	R-9	1-1/8"-7 NC					
38,961	173.3	R-10	1-1/4"-7 NC					
56,495	251.3	R-12	1-1/2"-6 NC		For Reducing Rod Elongation Only			
76,364	339.7	R-14	1-3/4"-5 NC		For Reducing Rod Elongation Only			
18,172	80.8	R-5H	5/8"-11 NC	A449	X	X		
26,893	119.6	R-6H	3/4"-10 NC		X*	X*		
37,127	165.1	R-7H	7/8"-9 NC				X*	
48,706	216.7	R-8H	1"-8 NC				X*	
18,930	84.2	R-5HS	5/8"-11 NC	A193-B7	X	X		
28,104	124.6	R-6HS	3/4"-10 NC		X*	X*		
38,674	172.0	R-7HS	7/8"-9 NC				X*	
50,735	225.7	R-8HS	1"-8 NC				X*	
63,930	284.4	R-9HS	1-1/8"-7 NC					X*
81,169	361.1	R-10HS	1-1/4"-7 NC					X*
117,698	523.5	R-12HS	1-1/2"-6 NC		For Reducing Rod Elongation Only			
159,092	707.7	R-14HS	1-3/4"-5 NC		For Reducing Rod Elongation Only			

X*-Verify that AT device does not exceed rated capacity

Threaded Rod, Couplers, Nuts and AT Shrinkage Device Notes:
Rod Material:
1. Rod Part Name is the Rod Model followed by the abbreviated alloy name. For example R5A307 or R8B7
2. Alloy Strengths:
   ASTM A307 Fu = 60, Fy = 43 ksi., ASTM A36 Fu = 58, Fy = 36 ksi., ASTM F1554 Grade 36 Fu = 58, Fy = 36 ksi.
   ASTM A108-C1045 Fu = 120, Fy = 92
   ASTM A449 (under 1"dia Fu = 120 Fy = 92 ksi)(1.12"-1.50"dia Fu = 105, Fy = 81 ksi)(1.75"dia Fu = 90, Fy = 58 ksi)
   ASTM A325 (under 1"dia Fu = 120 Fy = 92 ksi)(1.12"-1.50"dia Fu = 105, Fy = 81 ksi)(1.75"dia Fu = 90, Fy = 58 ksi)
   ASTM F1554 Grade 105, Fu = 125, Fy = 105 ksi.,
   ASTM A193-B7, Fu = 125, Fy = 105 ksi., ASTM A354-BD, Fu = 150, Fy = 130 ksi.
3. All threaded rod is Uniform National Coarse (UNC or NC) threaded.
4. High Strength rod is usually marked with Red paint. Consult Factory for additional information.
   Standard Nuts are SAE Grade 2 or ASTM 563-Grade A
5. High Strength Nuts are SAE grade 8, ASTM 563-Grade C or A194-2H and are stamped for identification.
6. Standard couplers conform to SAE Grade 2 or ASTM A-563 grade A.
   High strength (HS) couplers conform to SAE Grade 8, ASTM A563 Grade C or ASTM A194-2H and are notched for identification.
7. Automatic (AT) Take-Up Device by Commins Manufacturing Inc. Rod and Bearing Plates are listed in ICC ES report ESR-1344 issued November 1, 2007.

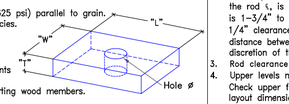
Fabrication:
1. Threaded rod lengths may be adjusted as required, but rod diameter and material type must be the same per the floor/level call out. Cutting of rod on lower levels may result in incorrect (short) top floor termination length.
2. Rod clearance holes between floors shall be 1/4" to 1/2" oversized. Silicone or caulking shall not be used at any time. A fire-rated Rockwool or a non-hardening FireStop (provided by others) shall be used, if required. Rod must move freely after assembly.
3. Recomended 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 AT11.
7. Run locations are per structural plans run call outs or AutoTight holdown run layout sheet(s).
8. Stress increase is not allowed with AISC 13th Edition capacities. (IBC 2006 & later)
9. Other AT Automatic Take-Up devices may be substituted provided:
   The alternate Take-Up is sized to accommodate the threaded rod and has sufficient expansion and load capacity.

3 Bearing Plate Schedule and Allowable Loads

Table 2b
Canada Bearing Plate Schedule

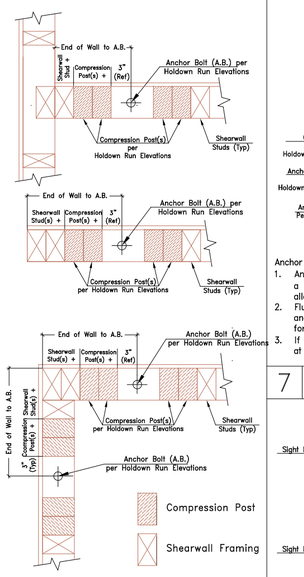
Plate Part #	DFL Value (lbs.)	DFL Value Kn	Width (in.)	Length (in.)	Thickness (in.)	Hole ø (in.)	Wall Size
	12,445	55.4	3-1/4	4	3/8	1	4x or 6x
S10	15,784	70.2	3-1/4	5	1/2		
S12	17,385	77.3	3-1/4	6	5/8		
S14	20,421	90.8	3-1/4	7	3/4		
S16	23,456	104.3	3-1/4	8			
S8L	11,966	53.2	3-1/4	4	3/8	1-1/4	
S10L	15,305	68.1	3-1/4	5	1/2		
S12L	16,949	75.4	3-1/4	6	5/8		
S14L	19,985	88.9	3-1/4	7	3/4		
S16L	23,020	102.4	3-1/4	8			
S19	28,158	125.3	3-1/2	9			
S22	31,427	139.8	3-1/2	10	1-1/4		
S24	34,696	154.3	3-1/2	11	1-1/4		
S26	37,965	168.9	3-1/2	12	1-1/2		
S28	41,234	183.4	3-1/2	13	1-1/2		
L17	26,864	119.5	5	5-1/2	1/2		6x
L21	31,427	139.8	5	7	5/8		
L25	36,097	160.6	5	8	3/4		
L28	40,767	181.3	5	9			
L32	50,107	222.9	5	11			

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 multiplier 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



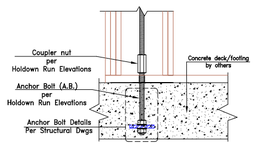
Fabrication:
1. The surface area of all bearing plates must have full contact on the supporting wood members.
2. S series plates fit 4x and 6x walls.
3. L series plates fit 6x walls only.
4. Plates S8 - S16 fit 1" diameter rod and smaller.
5. Plates S8L - S16L, S19 - S28 and L17 - L32 fit 1-1/4" diameter rod and smaller.
6. Bearing plate locations per Holdown Run elevations on AT11.

4 Typ. A. B. - Post Layout



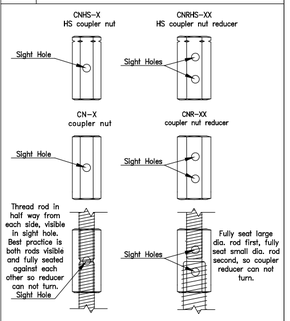
Anchor Bolt - Compression Post(s) Layout Notes:
1. Anchor Bolt (A.B.) layouts above are typical, but may not apply to all locations. Check Structural Plans for other specific Anchor Bolt location details.
2. Typical clearance between the compression post, relative to the rod ℄, is 3" (6" total between post). Minimum clearance is 1-3/4" to the rod ℄ (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 installs with the coupler in the slab, and shall have the threaded rod bottomed in the coupler for proper install.
3. If bolts are HDG the threads must be re-rolled for 6"min at each end.

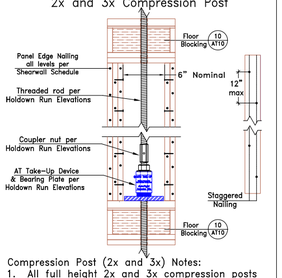
7 Coupler Nuts



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

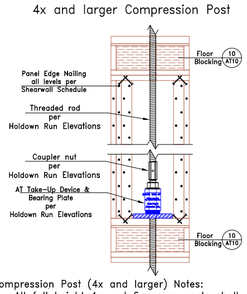
2x and 3x Compression Post



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

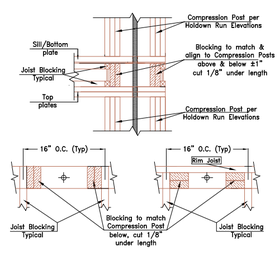
4x and larger Compression Post



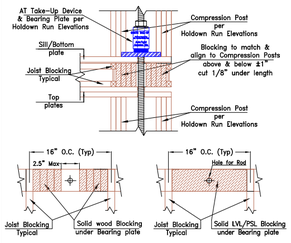
Compression Post (4x and larger) Notes:
1. All full height 4x and 6x comp posts shall receive toe nailing to top and bottom plate and panel edge nailing per structural plans.
2. Panel edge nailing shall be the same as the Shearwall Schedule with an additional row(s) of panel edge nailing located 3" O.C. on compression post x6 and larger.

10 Typ. Floor Blocking

Floor Blocking for Compression Post

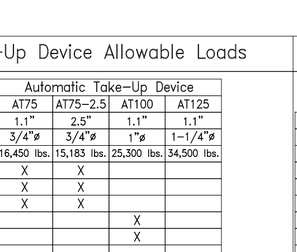


Solid Floor Blocking under Bearing Plate



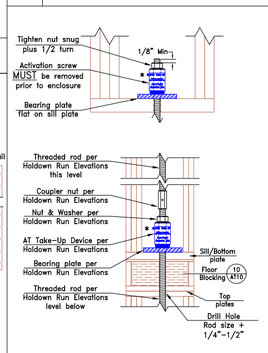
Floor Blocking Notes:
1. All floor blocking shall have 1/8" vertical clearance between wall plates or floors.
2. All floor blocking shall be installed grain vertical.
3. Parallam may be substituted for solid sawn wood. Blocking must match compression post below or be solid blocked when under a bearing 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



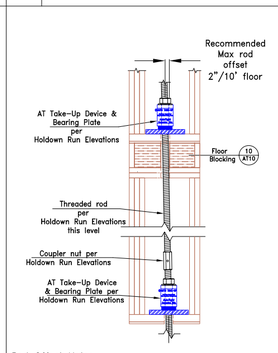
Termination Header Notes:
1. Shear nail compression post next to shear wall stud on each side per Holdown Run Elevations AT11 call out. Face (stitch) nailing per Shear Nailing Detail (4x or 6x) with 16d nails and no splitting of the wood.
2. Shear nailing shall be from the backside for 3x and larger 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



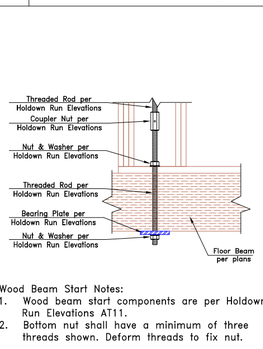
*Removal of activation set screw prior to wall closure is REQUIRED to activate the AT Take-Up Device.

13 Allowable Rod Offset



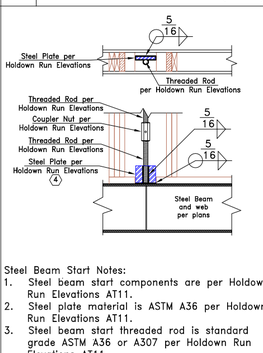
Rod Offset Notes:
1. Rod must move freely through holes after assembly.

14 Wood Beam Start (WBS)



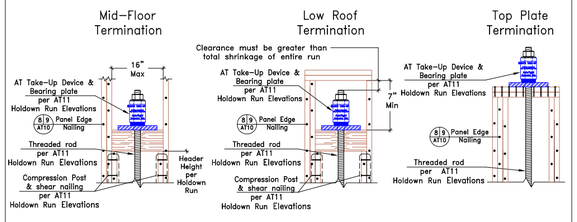
Wood Beam Start Notes:
1. Wood beam start components are per Holdown Run Elevations AT11.
2. Bottom nut shall have a minimum of three threads shown. Deform threads to fix nut.

15 Steel Beam Start (SBS)



Steel Beam Start Notes:
1. Steel beam start components are per Holdown Run Elevations AT11.
2. Steel plate material is ASTM A36 per Holdown Run Elevations AT11.
3. Steel beam start threaded rod is standard grade ASTM A36 or A307 per Holdown Run Elevations AT11.
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 AT11 Holdown Run Elevations 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 3) 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

AutoTight® Holdown System
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DRAFT

No	Revision	Date

Drawn / DWGBY | Check / CHKBY | Date: DWGDATE

CAT ID #
Project Name
Address
City State Zip

Holdown Run Details
Not to Scale
AT10