



AutoTight® Rod Holdown System

System Design for
The Sample Project

Prepared for
AutoTight Designer

Input by
Tom Boydston

Commins Project ID # 75-19846

**Includes ICC ES 1344 Code Report,
applicable catalog pages and COLA Report RR25480
as a separate PDF file: "AutoTight Materials and Reference.pdf".**



(1) Key to Calculation Table

AutoTight® System Run Design Calc Sheet: Example Project				Rev 0	Date 06/21/2010		
Project Number:	(6)		Run Qty:	4	CAT ID # 10-0001		
Run Name:	1				Tensile Strength Calc'd		
Run Specifications	Component	Description	Capacity (kips)	Demand (kips)	D/C Ratio	Elong. (in.)	
Required Loads:	Commins AutoTight						
Level = 2							
Differential Load:	4.00 (kips)	AT 125	Shrinkage at Level, Shrinkage Device travel & D/C Ratio (in.)	1.10	0.50	45.5%	-
Tension Load:	20.00 (kips)	AT 125	Shrinkage Device (1-1/4" I.D.) - Allowable Load	34.50	4.00	11.6%	-
Compression:	20.00 (kips)	-	Shrinkage Device - Deflection at Load	-	-	-	0.002
Story Height:	12.50 (ft.)	-	Shrinkage Device - Travel and Seating Increment ΔR	-	-	-	0.002
Plate Height:	11.33 (ft.)	S8L	Bearing Plate at Reaction Point	7.96	4.00	50.2%	0.020
Floor Depth:	14.00 (in.)	R9	1-1/8"-A307 Tension Rod	22.37	20.00	89.4%	0.125
		-	No Stretch Rod	#N/A	20.00	0.0%	n/a
		-	Wood Beam Start Bearing Plate	n/a	n/a	0.00	n/a
		-	Steel Beam Start in Tension	n/a	n/a	0.00	n/a
Limiting Component Tension Load Capacity, Load and D/C Ratio			22.37	20.00	89.4%	-	
Maximum Allowed Level Elongation, D/C Ratio and Total Level Elongation			0.200	-	74.5%	0.149	
Compression Wood	Outer Posts (1) 4x8 (3) 2x6	Inner Posts (1) 4x8 (3) 2x6	4x Wall Post per Side of Rod-Enter by Hand as Needed	32.08	20.00	62.3%	-
			6x Wall Post per Side of Rod-Enter by Hand as Needed	30.93	20.00	64.7%	-
Level = Footing							
Tension Load:	20.00 (kips)	R9	1-1/8"-A307 Anchor Rod	22.37	20.00	89.4%	n/a

Notes:

- (1) All these cells are filled with data from the AutoTight Run Designer spreadsheet's Project Info page and Load Justification Table page.
- (2) The Builder's Name of the project.
- (3) The revision level of the plan set.
- (4) The Bid Date.
- (5) The Commins Mfg. project number.
- (6) The Builder's number for the project.
- (7) The name of this run.
- (8) Commins AutoTight part number.
- (9) The quantity of this type of run.
- (10) This column is the description of the component shown on each row
- (11) This column of the table is the Load Capacities of the various components.
- (12) This column of the table is the Load placed on the various components.
- (13) This column of the table is the Demand / Capacity ratio for each component.
- (14) This column is the contribution of each component to the total elongation for this level, and the total elongation for the level. Elongation numbers are in blue text.
- (15) The name of this level.
- (16) Differential Load applied by this level.
- (17) Total tension in rod at this level.
- (18) Compression load on the compression posts at this level.
- (19) Story Height carpet to carpet.
- (20) Plate to plate height of this level.
- (21) Depth of floor beams.
- (22) This row compares the total shrinkage at this level with the capacity of the AT's to take up this shrinkage.
- (23) This row compares the load capacity of the AT device to the load applied to it. Per AC316 Sec. 1.4.5
- (24) This row shows the deflection of the AT device(s) under the applied load. Per AC316 Sec. 1.4.8
- (25) This row shows the ΔR=Travel and Seating increment of the AT Device(s). Per AC316 Sec. 1.4.7
- (26) This row shows Bearing Plate Load Capacity and compares to its Load also its deflection's contribution to the total Elongation. (unless the calcs call for rod stretch only.) (It sees only the differential load.) Per AF&PA NDS Tbl 4A, 4B incl Cf factor.
- (27) This row shows Tension Rod Load Capacity and compares to its Load, also its deflection's contribution to the total Elongation. Per AISC 360-05
- (28) This row shows Stretch Rod Load Capacity and compares to its Load, also its deflection's contribution to the total Elongation. Only if Stretch Rod is used.
- (29) This row shows the Wood Beam Start's Bearing Plate Load Capacity and compares to its Load, also its deflection's contribution to the total Elongation. (Only if a Wood Beam Start is used.) (It sees the tension load.) Per AF&PA-NDS Tbl 4A, 4B incl Cf factor.
- (30) This row shows the Steel Beam Start's Load Capacity and compares to its Load, also its deflection's contribution to the total Elongation. (Only if a Steel Beam Start is used.) (It sees the tension load.) The rod seats on the steel beam and the weld cross section is greater than the rod cross section so the Steel Beam Start elongation is included in rod elongation. Per ICC ES-1344 & 5889
- (31) This row shows worst case component's Load and compares to its Load Capacity.
- (32) This row shows the maximum allowed Elongation and the total Elongation calculated for this level.
- (33) This row shows the inner and outer compression post required, their load capacities and loads if the wall is 4x. It is used only if Commins Mfg specifies the Compression Posts and is filled in manually. If line is not shown posting is per structural drawing.
- (34) This row shows the inner and outer compression post required, their load capacities and loads if the wall is 6x. It is used only if Commins Mfg specifies the Compression Posts and is filled in manually. If line is not shown posting is per structural drawing.
- (35) This row shows the load capacity of the Anchor Rod embedded in the concrete and compares to its load, if used. (Not the concrete strength)
- (36) Anchor bolt elongation is included in the length of the tension rods.
- (37) Nuts, Coupler Nuts and Reducing Coupler Nuts are not listed individually because they are grade compatible with the Tension Rod.
- (38) Nuts, Coupler Nuts and Reducing Coupler Nuts calculated contribution to elongation is 0.0005 inch or less.

AutoTight® Holdown System

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AutoTight® System Run Design Calc. Sheet for: **The Sample Project**

Rev 0 Date 12/10/2010

Project Number:				CAT ID # 75-19846			
Run Name: 5A		Run Qty: 64	Tensile Strength				Calc'd
Run Specifications		Component	Description	Capacity (kips)	Demand (kips)	D/C Ratio	Elong. (in.)
Required Loads:		Commins AutoTight					
Level = 6th		Component	Description	Capacity	Demand	D/C	Elong.
Differential Load:	5.10 (kips)	AT6A-1.5	Shrinkage at Level, Shrinkage Device travel & D/C Ratio (in.)	1.50"	1.25"	83.3%	-
Tension Load:	5.10 (kips)	AT6A-1.5	Shrinkage Device - 1.5" (3/4" I.D.) - Allowable Load	13.58	5.10	37.6%	-
Compression:	5.10 (kips)	-	Shrinkage Device - Deflection at Load	-	-	-	0.005
Story Height:	10.00 (ft.)	-	Shrinkage Device - Travel and Seating Increment ΔR	-	-	-	0.002
Plate Height:	10.00 (ft.)	S5	Bearing Plate at Reaction Point	5.96	5.10	85.5%	0.034
		R5A307	5/8"-A307 Tension Rod	6.90	5.10	73.9%	0.093
Limiting Component Tension Load Capacity, Load and D/C Ratio				5.96	5.10	85.5%	-
Maximum Allowed Level Elongation, D/C Ratio and Total Level Elongation				0.200	-	67.4%	0.135

Level = 5th		Component	Description	Capacity	Demand	D/C	Elong.
Differential Load:	0.80 (kips)	AT6A-1.5	Shrinkage at Level, Shrinkage Device travel & D/C Ratio (in.)	1.50"	1.00"	66.7%	-
Tension Load:	5.90 (kips)	AT6A-1.5	Shrinkage Device - 1.5" (3/4" I.D.) - Allowable Load	13.58	0.80	5.9%	-
Compression:	5.90 (kips)	-	Shrinkage Device - Deflection at Load	-	-	-	0.001
Story Height:	10.00 (ft.)	-	Shrinkage Device - Travel and Seating Increment ΔR	-	-	-	0.002
Plate Height:	8.95 (ft.)	S4	Bearing Plate at Reaction Point	4.12	0.80	19.4%	0.008
Floor Depth:	12.63 (in.)	R5A307	5/8"-A307 Tension Rod	6.90	5.90	85.5%	0.108
Limiting Component Tension Load Capacity, Load and D/C Ratio				6.90	5.90	85.5%	-
Maximum Allowed Level Elongation, D/C Ratio and Total Level Elongation				0.200	-	59.3%	0.119

Level = 4th		Component	Description	Capacity	Demand	D/C	Elong.
Differential Load:	0.90 (kips)	AT6A-1.5	Shrinkage at Level, Shrinkage Device travel & D/C Ratio (in.)	1.50"	0.75"	50.0%	-
Tension Load:	6.80 (kips)	AT6A-1.5	Shrinkage Device - 1.5" (3/4" I.D.) - Allowable Load	13.58	0.90	6.6%	-
Compression:	6.80 (kips)	-	Shrinkage Device - Deflection at Load	-	-	-	0.001
Story Height:	10.00 (ft.)	-	Shrinkage Device - Travel and Seating Increment ΔR	-	-	-	0.002
Plate Height:	8.95 (ft.)	S4	Bearing Plate at Reaction Point	4.12	0.90	21.8%	0.009
Floor Depth:	12.63 (in.)	R5A307	5/8"-A307 Tension Rod	6.90	6.80	98.6%	0.125
Limiting Component Tension Load Capacity, Load and D/C Ratio				6.90	6.80	98.6%	-
Maximum Allowed Level Elongation, D/C Ratio and Total Level Elongation				0.200	-	68.1%	0.136

Level = 3rd		Component	Description	Capacity	Demand	D/C	Elong.
Differential Load:	0.70 (kips)	AT6A-1.5	Shrinkage at Level, Shrinkage Device travel & D/C Ratio (in.)	1.50"	0.50"	33.3%	-
Tension Load:	7.50 (kips)	AT6A-1.5	Shrinkage Device - 1.5" (3/4" I.D.) - Allowable Load	13.58	0.70	5.2%	-
Compression:	7.50 (kips)	-	Shrinkage Device - Deflection at Load	-	-	-	0.001
Story Height:	10.00 (ft.)	-	Shrinkage Device - Travel and Seating Increment ΔR	-	-	-	0.002
Plate Height:	8.95 (ft.)	S4	Bearing Plate at Reaction Point	4.12	0.70	17.0%	0.002
Floor Depth:	12.63 (in.)	R6A307	3/4"-A307 Tension Rod	9.94	7.50	75.5%	0.093
Limiting Component Tension Load Capacity, Load and D/C Ratio				9.94	7.50	75.5%	-
Maximum Allowed Level Elongation, D/C Ratio and Total Level Elongation				0.200	-	48.8%	0.098

Level = 2nd		Component	Description	Capacity	Demand	D/C	Elong.
Differential Load:	1.70 (kips)	AT6A-1.5	Shrinkage at Level, Shrinkage Device travel & D/C Ratio (in.)	1.50"	0.25"	16.7%	-
Tension Load:	9.20 (kips)	AT6A-1.5	Shrinkage Device - 1.5" (3/4" I.D.) - Allowable Load	13.58	1.70	12.5%	-
Compression:	9.20 (kips)	-	Shrinkage Device - Deflection at Load	-	-	-	0.002
Story Height:	10.00 (ft.)	-	Shrinkage Device - Travel and Seating Increment ΔR	-	-	-	0.002
Plate Height:	8.95 (ft.)	S4	Bearing Plate at Reaction Point	4.12	1.70	41.3%	0.017
Floor Depth:	12.63 (in.)	R6A307	3/4"-A307 Tension Rod	9.94	9.20	92.6%	0.114
Limiting Component Tension Load Capacity, Load and D/C Ratio				9.94	9.20	92.6%	-
Maximum Allowed Level Elongation, D/C Ratio and Total Level Elongation				0.200	-	67.0%	0.134

Level = Footing		Component	Description	Capacity	Demand	D/C	Elong.
Tension Load:	9.20 (kips)	R6A307	3/4"-A307 Anchor Rod	9.94	9.20	92.6%	n/a

Base Design Code: IBC_2009/2009 per the State and Local jurisdiction
 Steel Stress Increase: No
 Takeup Device at Each Level: Yes
 Elongation Limit Required: Yes
 Elongation Limit per Connection: 0.200 (inch) between load reaction points (Typical Range 0.125 to 0.200)
 Elongation Components: System Stretch
 Shrinkage: 0.250 inch per floor (Typical Range 0.250 to 0.500)
 Shearwall Plates Wood Species: DFL Douglas Fir-Larch Shearwall Plates Wood Strength: 625 psi

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AutoTight® System Run Design Calc. Sheet for: **The Sample Project**

Rev 0 Date 12/10/2010

Project Number:				CAT ID # 75-19846			
Run Name: 5B		Run Qty: 8	Tensile Strength				Calc'd
Run Specifications		Component	Description	Capacity (kips)	Demand (kips)	D/C Ratio	Elong. (in.)
Required Loads:		Commins AutoTight					
Level = 6th		Component	Description	Capacity	Demand	D/C	Elong.
Differential Load:	6.50 (kips)	AT6A-1.5	Shrinkage at Level, Shrinkage Device travel & D/C Ratio (in.)	1.50"	1.25"	83.3%	-
Tension Load:	6.50 (kips)	AT6A-1.5	Shrinkage Device - 1.5" (3/4" I.D.) - Allowable Load	13.58	6.50	47.9%	-
Compression:	6.50 (kips)	-	Shrinkage Device - Deflection at Load	-	-	-	0.007
Story Height:	10.00 (ft.)	-	Shrinkage Device - Travel and Seating Increment ΔR	-	-	-	0.002
Plate Height:	10.00 (ft.)	S6	Bearing Plate at Reaction Point	7.00	6.50	92.8%	0.037
		R5A307	5/8"-A307 Tension Rod	6.90	6.50	94.2%	0.119
Limiting Component Tension Load Capacity, Load and D/C Ratio				6.90	6.50	94.2%	-
Maximum Allowed Level Elongation, D/C Ratio and Total Level Elongation				0.200	-	82.4%	0.165
Level = 5th		Component	Description	Capacity	Demand	D/C	Elong.
Differential Load:	4.25 (kips)	AT 100	Shrinkage at Level, Shrinkage Device travel & D/C Ratio (in.)	1.10"	1.00"	90.9%	-
Tension Load:	10.75 (kips)	AT 100	Shrinkage Device (1" I.D.) - Allowable Load	25.30	4.25	16.8%	-
Compression:	10.75 (kips)	-	Shrinkage Device - Deflection at Load	-	-	-	0.005
Story Height:	10.00 (ft.)	-	Shrinkage Device - Travel and Seating Increment ΔR	-	-	-	0.002
Plate Height:	8.95 (ft.)	S8	Bearing Plate at Reaction Point	8.28	4.25	51.3%	0.021
Floor Depth:	12.63 (in.)	R7A307	7/8"-A307 Tension Rod	13.53	10.75	79.5%	0.096
Limiting Component Tension Load Capacity, Load and D/C Ratio				13.53	10.75	79.5%	-
Maximum Allowed Level Elongation, D/C Ratio and Total Level Elongation				0.200	-	62.1%	0.124
Level = 4th		Component	Description	Capacity	Demand	D/C	Elong.
Differential Load:	0.15 (kips)	AT 100	Shrinkage at Level, Shrinkage Device travel & D/C Ratio (in.)	1.10"	0.75"	68.2%	-
Tension Load:	10.90 (kips)	AT 100	Shrinkage Device (1" I.D.) - Allowable Load	25.30	0.15	0.6%	-
Compression:	10.90 (kips)	-	Shrinkage Device - Deflection at Load	-	-	-	0.000
Story Height:	10.00 (ft.)	-	Shrinkage Device - Travel and Seating Increment ΔR	-	-	-	0.002
Plate Height:	8.95 (ft.)	S8	Bearing Plate at Reaction Point	8.28	0.15	1.8%	0.001
Floor Depth:	12.63 (in.)	R7A307	7/8"-A307 Tension Rod	13.53	10.90	80.6%	0.098
Limiting Component Tension Load Capacity, Load and D/C Ratio				13.53	10.90	80.6%	-
Maximum Allowed Level Elongation, D/C Ratio and Total Level Elongation				0.200	-	50.3%	0.101
Level = 3rd		Component	Description	Capacity	Demand	D/C	Elong.
Differential Load:	5.10 (kips)	AT 100	Shrinkage at Level, Shrinkage Device travel & D/C Ratio (in.)	1.10"	0.50"	45.5%	-
Tension Load:	16.00 (kips)	AT 100	Shrinkage Device (1" I.D.) - Allowable Load	25.30	5.10	20.2%	-
Compression:	16.00 (kips)	-	Shrinkage Device - Deflection at Load	-	-	-	0.006
Story Height:	10.00 (ft.)	-	Shrinkage Device - Travel and Seating Increment ΔR	-	-	-	0.002
Plate Height:	8.95 (ft.)	S8	Bearing Plate at Reaction Point	8.28	5.10	61.6%	0.002
Floor Depth:	12.63 (in.)	R7B7	7/8"-B7 Tension Rod	28.19	16.00	56.8%	0.143
Limiting Component Tension Load Capacity, Load and D/C Ratio				8.28	5.10	61.6%	-
Maximum Allowed Level Elongation, D/C Ratio and Total Level Elongation				0.200	-	76.9%	0.154
Level = 2nd		Component	Description	Capacity	Demand	D/C	Elong.
Differential Load:	11.80 (kips)	AT 125	Shrinkage at Level, Shrinkage Device travel & D/C Ratio (in.)	1.10"	0.25"	22.7%	-
Tension Load:	27.80 (kips)	AT 125	Shrinkage Device (1-1/4" I.D.) - Allowable Load	34.50	11.80	34.2%	-
Compression:	27.80 (kips)	-	Shrinkage Device - Deflection at Load	-	-	-	0.005
Story Height:	10.00 (ft.)	-	Shrinkage Device - Travel and Seating Increment ΔR	-	-	-	0.002
Plate Height:	8.95 (ft.)	S12L	Bearing Plate at Reaction Point	12.05	11.80	97.9%	0.039
Floor Depth:	12.63 (in.)	R9B7	1 1/8"-B7 Tension Rod	46.59	27.80	59.7%	0.151
Limiting Component Tension Load Capacity, Load and D/C Ratio				12.05	11.80	97.9%	-
Maximum Allowed Level Elongation, D/C Ratio and Total Level Elongation				0.200	-	98.7%	0.197
Level = Footing		Component	Description	Capacity	Demand	D/C	Elong.
Tension Load:	27.80 (kips)	R9B7	1 1/8"-B7 Anchor Rod	46.59	27.80	59.7%	n/a

Base Design Code: IBC_2009/2009 per the State and Local jurisdiction
 Steel Stress Increase: No
 Takeup Device at Each Level: Yes
 Elongation Limit Required: Yes
 Elongation Limit per Connection: 0.200 (inch) between load reaction points (Typical Range 0.125 to 0.200)
 Elongation Components: System Stretch
 Shrinkage: 0.250 inch per floor (Typical Range 0.250 to 0.500)
 Shearwall Plates Wood Species: DFL Douglas Fir-Larch Shearwall Plates Wood Strength: 625 psi

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AutoTight® System Run Design Calc. Sheet for:

The Sample Project

Rev 0 Date 12/10/2010

Project Number:				CAT ID # 75-19846			
Run Name: 3A		Run Qty: 5	Tensile Strength				Calc'd
Run Specifications		Component	Description	Capacity (kips)	Demand (kips)	D/C Ratio	Elong. (in.)
Required Loads:		Commins AutoTight					
Level = 4th		Component	Description	Capacity	Demand	D/C	Elong.
Differential Load:	8.50 (kips)	AT6A-1.5	Shrinkage at Level, Shrinkage Device travel & D/C Ratio (in.)	1.50"	0.75"	50.0%	-
Tension Load:	4.50 (kips)	AT6A-1.5	Shrinkage Device - 1.5" (3/4" I.D.) - Allowable Load	13.58	8.50	62.6%	-
Compression:	4.50 (kips)	-	Shrinkage Device - Deflection at Load	-	-	-	0.009
Story Height:	10.00 (ft.)	-	Shrinkage Device - Travel and Seating Increment ΔR	-	-	-	0.002
Plate Height:	8.95 (ft.)	S10	Bearing Plate at Reaction Point	10.32	8.50	82.3%	0.033
Floor Depth:	12.63 (in.)	R6A307	3/4"-A307 Tension Rod	9.94	4.50	45.3%	0.199
Limiting Component Tension Load Capacity, Load and D/C Ratio				10.32	8.50	82.3%	-
Maximum Allowed Level Elongation, D/C Ratio and Total Level Elongation				0.200	-	121.5%	0.243
Level = 3rd		Component	Description	Capacity	Demand	D/C	Elong.
Differential Load:	0.00 (kips)	0	Shrinkage at Level, Shrinkage Device travel & D/C Ratio (in.)	#N/A	0.50"	#N/A	-
Tension Load:	8.50 (kips)	0	No Shrinkage Device - Reaction & Elongation on floor above	#N/A	0.00	0.0%	-
Compression:	8.50 (kips)	-	Shrinkage Device - Deflection at Load	-	-	-	n/a
Story Height:	10.00 (ft.)	-	Shrinkage Device - Travel and Seating Increment ΔR	-	-	-	n/a
Plate Height:	8.95 (ft.)	-	Bearing Plate at Reaction Point	#N/A	0.00	0.0%	0.002
Floor Depth:	12.63 (in.)	R6A307	3/4"-A307 Tension Rod	9.94	8.50	85.5%	0.000
Limiting Component Tension Load Capacity, Load and D/C Ratio				9.94	8.50	85.5%	-
Maximum Allowed Level Elongation, D/C Ratio and Total Level Elongation				0.200	-	1.0%	0.002
Level = 2nd		Component	Description	Capacity	Demand	D/C	Elong.
Differential Load:	7.50 (kips)	AT 100	Shrinkage at Level, Shrinkage Device travel & D/C Ratio (in.)	1.10"	0.25"	22.7%	-
Tension Load:	16.00 (kips)	AT 100	Shrinkage Device (1" I.D.) - Allowable Load	25.30	7.50	29.6%	-
Compression:	16.00 (kips)	-	Shrinkage Device - Deflection at Load	-	-	-	0.009
Story Height:	10.00 (ft.)	-	Shrinkage Device - Travel and Seating Increment ΔR	-	-	-	0.002
Plate Height:	8.95 (ft.)	S8	Bearing Plate at Reaction Point	8.28	7.50	90.6%	0.036
Floor Depth:	12.63 (in.)	R8A307	1 "-A307 Tension Rod	17.67	16.00	90.5%	0.109
Limiting Component Tension Load Capacity, Load and D/C Ratio				8.28	7.50	90.6%	-
Maximum Allowed Level Elongation, D/C Ratio and Total Level Elongation				0.200	-	78.5%	0.157
Level = Footing		Component	Description	Capacity	Demand	D/C	Elong.
Tension Load:	16.00 (kips)	R8A307	1 "-A307 Anchor Rod	17.67	16.00	90.5%	n/a

Base Design Code: IBC_2009/2009 per the State and Local jurisdiction
 Steel Stress Increase: No
 Takeup Device at Each Level: Yes
 Elongation Limit Required: Yes
 Elongation Limit per Connection: 0.200 (inch) between load reaction points (Typical Range 0.125 to 0.200)
 Elongation Components: System Stretch
 Shrinkage: 0.250 inch per floor (Typical Range 0.250 to 0.500)
 Shearwall Plates Wood Species: DFL Douglas Fir-Larch Shearwall Plates Wood Strength: 625 psi

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AutoTight® System Run Design Calc. Sheet for:

The Sample Project

Rev 0

Date 12/10/2010

Project Number:				CAT ID #		75-19846	
Run Name:	1ASBS	Run Qty:	4	Tensile Strength			Calc'd
Run Specifications	Component	Description		Capacity	Demand	D/C Ratio	Elong. (in.)
Required Loads:	Commins AutoTight			(kips)	(kips)		
Level = 3rd	Component	Description		Capacity	Demand	D/C	Elong.
Differential Load:	8.20 (kips)	AT6A-1.5	Shrinkage at Level, Shrinkage Device travel & D/C Ratio (in.)	1.50"	0.50"	33.3%	-
Tension Load:	8.20 (kips)	AT6A-1.5	Shrinkage Device - 1.5" (3/4" I.D.) - Allowable Load	13.58	8.20	60.4%	-
Compression:	8.20 (kips)	-	Shrinkage Device - Deflection at Load	-	-	-	0.008
Story Height:	10.00 (ft.)	-	Shrinkage Device - Travel and Seating Increment ΔR	-	-	-	0.002
Plate Height:	8.95 (ft.)	S8	Bearing Plate at Reaction Point	8.28	8.20	99.0%	0.002
Floor Depth:	12.63 (in.)	R6A307	3/4"-A307 Tension Rod	9.94	8.20	82.5%	0.091
		Stl Beam	Steel Beam Start in Tension	9.94	8.20	82.5%	0.000 (3)
Limiting Component Tension Load Capacity, Load and D/C Ratio				8.28	8.20	99.0%	-
Maximum Allowed Level Elongation, D/C Ratio and Total Level Elongation				0.200	-	51.6%	0.103

Base Design Code: IBC_2009/2009 per the State and Local jurisdiction
 Steel Stess Increase: No
 Takeup Device at Each Level: Yes
 Elongation Limit Required: Yes
 Elongation Limit per Connection: 0.200 (inch) between load reaction points (Typical Range 0.125 to 0.200)
 Elongation Components: System Stretch
 Shrinkage: 0.250 inch per floor (Typical Range 0.250 to 0.500)
 Shearwall Plates Wood Species: DFL Douglas Fir-Larch Shearwall Plates Wood Strength: 625 psi