

Strong-Rod™ Systems — Design Tables

PLEASE NOTE: This document must be used in conjunction with Strong-Rod™ Systems — Seismic and Wind Restraint Systems Guide (F-L-SRSAUNZ21)

A RTUD Ratcheting Take-Up Device

RTUD Models

Model No.	Threaded Rod Diameter in. (mm)	Dimensions (mm)			Compatible Bearing Plates	Rated Compensation Capacity (mm)	Resistance, P _r (kN)	Seating Increment Δ _R (mm)	Deflection at Resistance Δ _F (mm)
		Length	Width	Height					
RTUD3B	3/8" (10mm)	70	38	25	BPRTUD3-4B	Unlimited	27	1.12	0.25
RTUD4B	1/2" (13mm)	70	38	25	BPRTUD3-4B	Unlimited	48	1.02	0.08
RTUD5	5/8" (16mm)	98	51	38	BPRTUD5-6	Unlimited	75	1.42	0.18
RTUD6	3/4" (19mm)	98	51	38	BPRTUD5-6	Unlimited	108	1.45	0.28
RTUD7	7/8" (22mm)	114	57	51	BPRTUD7-8, 5-8	Unlimited	147	1.50	0.31
RTUD8	1" (25mm)	114	57	51	BPRTUD7-8, 5-8	Unlimited	192	1.68	0.79

* Refer to BPRTUD table below.

1. Thread specification for threaded rod must be UNC Class 2A, in accordance with ANSE/ASME B1.1.

2. Total device deflection = Δ_T = Δ_R + Δ_F (P_D/P_r)

P_D = Demand Load

P_r = Factored compressive resistance from table

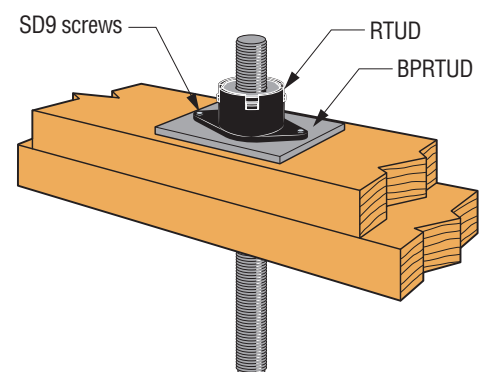
3. RTUD3B and RTUD4B fasten to the timber plate with the BPRTUD bearing plate and (2) #9 x 38mm or 64 mm Strong-Drive SD Connector screws. RTUD5-6 and RTUD7-8 fastens to the wood plate with the BPRTUD bearing plate and (2) #9 x 64mm Strong-Drive SD Connector screws.

BPRTUD Models

Model No.	Dimensions (mm)			Hole Diameter (mm)	Bearing Resistance, Q _r (kN)
	Length	Width	Height		
BPRTUD3-4B	90	76	6	5/8" (16mm)	27
BPRTUD5-6B	140	76	13	1" (25mm)	61
BPRTUD5-6C	190	76	19	1" (25mm)	79
BPRTUD5-8	127	76	6	1 1/16" (30mm)	47
BPRTUD7-8A	140	76	13	2 1/16" (30mm)	59
BPRTUD7-8B	216	76	19	3 1/16" (30mm)	88
BPRTUD7-8C	140	127	13	4 3/16" (30mm)	102

1. Plate bearing area based on rod diameter plus 6 mm diameter drilled hole through timber plate below steel bearing plate. Reduce allowable load per code for larger holes.

2. Bearing plate load capacity is based on the steel plate bearing on the timber bottom plate perpendicular to the grain and steel plate bending in cantilever action.



Ratcheting Take-Up Device Assembly Installation

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B ATUD/TUD Take-Up Device

ATUD/TUD Models

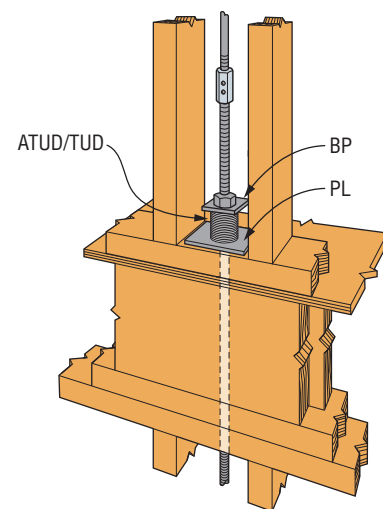
Model No.	Maximum Threaded Rod Diameter in. (mm)	Dimensions (mm)		Rated Compensation Capacity, (mm)	Bearing Plate Above ATUD/TUD	Bearing Plate Below ATUD/TUD	Compressive Resistance, P _r (kN)	Seating Increment Δ _R (mm)	Deflection at Resistance Δ _F (mm)
		Width	Length						
TUD10	¾" - 1 ¼" (19-32mm)	60	57	25	BP	PL10	235	0.03	1.00
ATUD6-2	½" - ¾" (13-19mm)	45	79	51	BP	PL5/PL6	59	0.10	0.64
ATUD9	¾" - 1 ⅛" (19-29mm)	54	57	25	BP	PL9	81	0.05	0.36
ATUD9-2	¾" - 1 ⅛" (19-29mm)	54	98	51	BP	PL9	66	0.05	1.12
ATUD9-3	¾" - 1 ⅛" (19-29mm)	54	127	76	BP	PL9	61	0.05	1.02
ATUD14	1 - 1 ¼" (25-44mm)	73	57	19	BP	PL14	126	0.13	0.43
ATUD14-2	1 - 1 ¼" (25-44mm)	76	98	51	BP	PL14	147	0.05	0.46

- Total device deflection = $\Delta_T = \Delta_R + \Delta_F (P_D/P_r)$
P_D = Demand Load
P_r = Factored compressive resistance from table
- Bearing plate above device to be Simpson Strong-Tie BP.

Bearing Plate Models

Model No.	Dimensions (mm)				Bearing Resistance, Q _r (kN)
	Width	Length	Thickness	Hole Dia.	
BP1/2	51	51	5	14	15
BP5/8	64	64	6	17	23
BP3/4	70	70	8	21	27
BP7/8	76	76	8	24	31
BP1-3	76	76	10	27	31
BP1-1/4	76	76	10	33	29
BP1-1/2	76	76	10	40	26
BP1-3/4	76	76	10	46	23
PL6-3x3.5	76	89	10	21	38
PL6-3x5.5	76	140	13	21	60
PL9-3x5.5	76	140	13	30	58
PL9-3x8.5	76	216	22	30	86
PL14-3x8.5	76	216	22	46	80
PL9-3x12	76	305	32	30	124
PL14-3x12	76	305	32	46	118
PL9-3x15	76	381	38	30	157
PL10-3x15	76	381	38	33	156
PL14-3x15	76	381	38	46	151
PL9-5x5.5	127	140	13	30	100
PL14-5x5.5	127	140	13	46	94
PL9-5x8.5	127	216	22	30	148
PL14-5x8.5	127	216	22	46	142
PL9-5x12	127	305	32	30	211
PL10-5x12	127	305	32	33	210

- Secure BP and PL bearing plates to framing with ATS-N nut over ATUD or TUD take-up device.
- Bearing plate loads are based on a hole through the timber plate below that is 6mm larger than the rod.

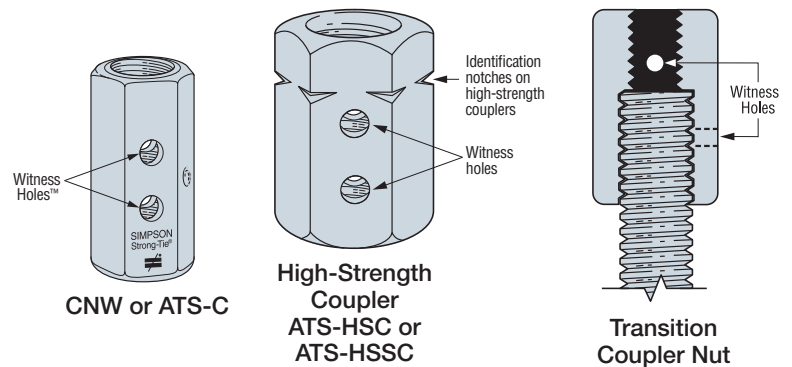


Typical Take-Up Device Assembly Installation

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C Coupler Nuts

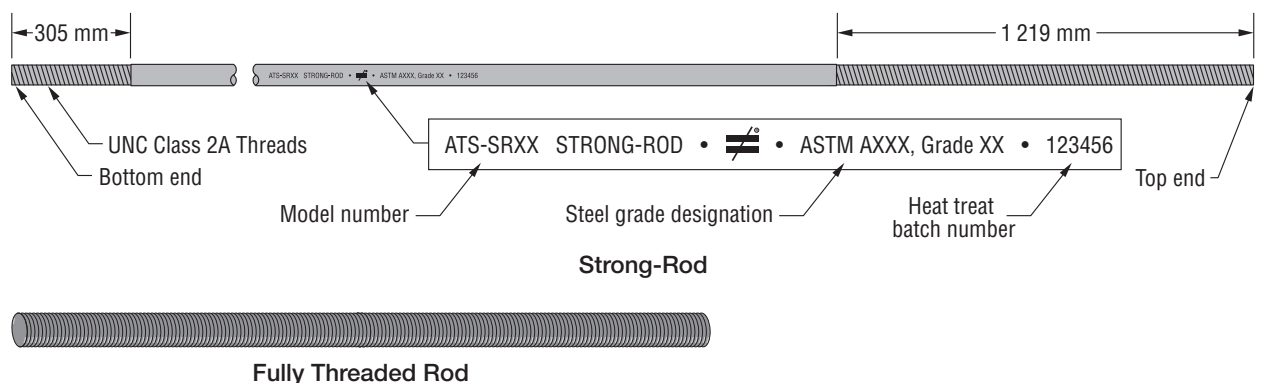
CNW and ATS-C coupler nuts exceed the tensile capacity of the corresponding standard-strength threaded rod. ATS-HSC coupler nuts exceed the tension capacity of the corresponding high-strength threaded rod. All couplers have a testing protocol to ensure that the proper loads are achieved.



D Steel Strong-Rods and Steel Fully Threaded Rods

Rod Diameter (in.)	Approximate Metric Diameter (mm)	Size Colour Code	A _g (mm ²)	A _{ne} (mm ²)	STANDARD STRENGTH		Tensile Resistance, T _r (kN)	HIGH STRENGTH		Tensile Resistance, T _r (kN)	SUPER HIGH STRENGTH	Tensile Resistance, T _r (kN)
					Strong-Rod	Fully Threaded		Strong-Rod	Fully Threaded		Strong-Rod	
½"	13	Yellow	98.7	91.6	ATS-SR4	ATR½	26	ATS-SR4H	ATS-HSR4	56	—	—
⅝"	16	Blue	158.7	145.8	ATS-SR5	ATR⅝	43	ATS-SR5H	ATS-HSR5	91	—	—
¾"	19	Red	234.2	215.5	ATS-SR6	ATR¾	63	ATS-SR6H	ATS-HSR6	134	—	—
⅞"	22	Green	321.3	298.1	ATS-SR7	ATR⅞	86	ATS-SR7H	ATS-HSR7	184	—	—
1"	25	White	419.4	391.0	ATS-SR8	ATR1	112	ATS-SR8H	ATS-HSR8	240	—	—
1 ⅛"	29	Orange	531.6	492.3	ATS-SR9	ATR1-⅛	142	ATS-SR9H	ATS-HSR9	304	ATS-SR9H150	382
1 ¼"	32	Purple	670.3	625.2	ATS-SR10	ATR1-¼	179	ATS-SR10H	ATS-HSR10	383	ATS-SR10H150	486
1 ⅜"	35	—	811.0	745.2	ATS-SR11	ATR1-⅜	217	ATS-SR11H	ATS-HSR11	464	—	—
1 ½"	38	—	981.9	906.4	ATS-SR12	ATR1-½	262	ATS-SR12H	ATS-HSR12	561	—	—
1 ¾"	45	—	1332.9	1225.8	ATS-SR14	ATR1-¾	356	ATS-SR14H	ATS-HSR14	762	—	—
2"	51	—	1810.3	1611.6	ATS-SR16	ATR2	483	ATS-SR16H	ATS-HSR16	1,033	—	—

- References shown are the lower of 13.2.(a)(i) and (iii), and 13.12.1.3 of CSA S16-14.
- Simpson Strong-Tie Strong-Rod and standard all-thread rod are based on minimum F_y = 310 MPa and F_u = 400 MPa.
- Simpson Strong-Tie high-strength Strong-Rod and high-strength fully threaded rod is based on minimum F_y = 635 MPa and F_u = 830 MPa.
- Simpson Strong-Tie ATS-SRxH150 super high-strength Strong-Rod is based on minimum F_y = 900 MPa and F_u = 1035 GPa.
- In accordance with ANSI/ASME B1.1, thread specification for threaded rod must be UNC Class 2A for high strength rod and may be either Class 2A or Class 1A for standard strength rod.



Strong-Rod ATS Components

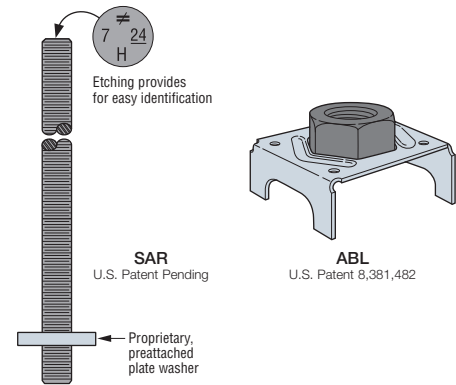
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E Anchor Kit

SAR Shallow Anchor Rod

Rod Diameter (in.)	Approximate Metric Diameter (mm)	Size Colour Code	SAR Model No. for STANDARD STRENGTH ROD	Tensile Resistance, T_r (kN)	SAR Model No. for HIGH STRENGTH ROD	Tensile Resistance, T_r (kN)
1/2"	13	Yellow	SAR4	26	SAR4H	56
5/8"	16	Blue	SAR5	43	SAR5H	91
3/4"	19	Red	SAR6	63	SAR6H	134
7/8"	22	Green	SAR7	86	SAR7H	184
1"	25	White	SAR8	112	SAR8H	240
1 1/8"	29	Orange	SAR9	142	SAR9H	304
1 1/4"	32	Purple	SAR10	179	SAR10H	383

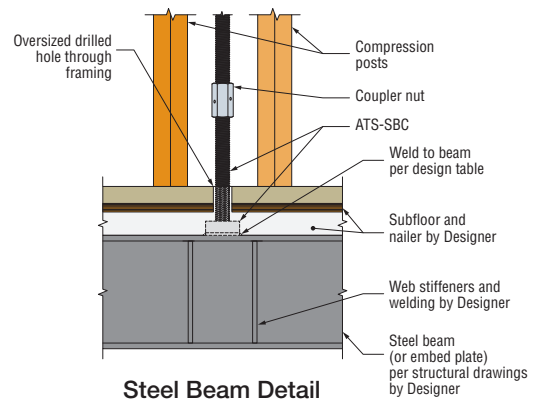
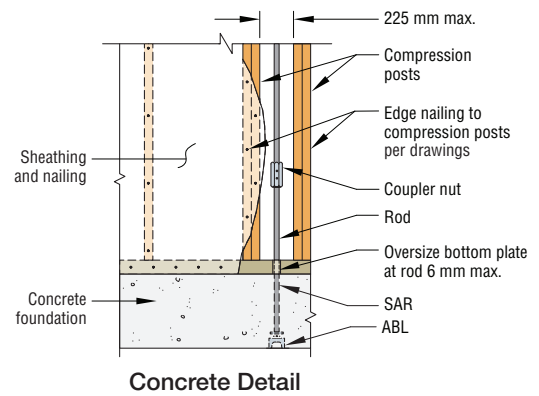
- Resistances have been calculated in accordance with 25.3.2.1 CSA S16-14.
- Anchorage calculation and specification by the Designer
- SAR anchor rods are for use with the ABL anchor bolt locator.
- SAR capacities are based on the full development of the anchor rod. For Shallow Podium Anchorage this is most often achieved while in conjunction with Anchor Reinforcement.
- For Shallow Podium Anchorage Anchor Reinforcement details, go to strongtie.com/SRS



Rod-to-Steel-Beam Connector

Model No.	Rod Diameter in. (mm) ^{3,4}	Rod Height (mm)	Dimensions (mm)			Fillet Weld Size (mm)	Total Weld Length (mm)	Tensile Resistance, T_r (kN)
			Width	Length	Thickness			
ATS-SBC5H	5/8" (16mm)	305 (top of rod to bottom of plate)	76	76	19	6	127	90
ATS-SBC6H	3/4" (19mm)			76	25	8	127	134
ATS-SBC8H	1" (25mm)			76	32	8	254	240
ATS-SBC10H	1 1/4" (32mm)			127	38	8	356	383
ATS-SBC11H	1 3/8" (35mm)			152	38	8	406	441
ATS-SBC12H	1 1/2" (38mm)			178	44	8	457	556

- The weld length for the ATS-SBC5H and ATS-SBC6H requires only two opposing sides of the plate to be fillet welded full length less a 6mm holdback from each of the edges. For the ATS-SBC8H up to the ATS-SBC12H, all four sides must be fillet welded full length less with a 6mm holdback from each of the edges.
- A minimum flange thickness of 6mm is required for the structural steel beam.



Timber-Beam Plate

Model No.	Dimensions (mm)			Compatible Rod Diameter in. (mm)	SDS Screw Length in. (mm) ¹	Bearing Resistance, Q_r (kN)
	Width	Length	Thickness			
WBP4-3X3.5	76	89	13	1/2" (13mm)	76	40
WBP5-3X3.5	76	89	13	5/8" (16mm)	76	39
WBP6-3X5.5	76	140	13	3/4" (19mm)	76	60
WBP7-3X8.5	76	216	22	7/8" (22mm)	114	88
WBP8-3X12	76	305	32	1" (25mm)	114	131
WBP8-3X15	76	381	41	1" (25mm)	114	110
WBP9-5X8.5	127	216	22	1 1/8" (29mm)	114	148
WBP9-5X12	127	305	32	1 1/8" (29mm)	114	211
WBP10-5X12	127	305	32	1 1/4" (32mm)	114	210

- The hole in the center of the WBP is threaded to accept rod with a UNC-2B thread pattern.
- SDS screws (included) are needed to fasten the rod and WBP assembly to the wood beam.

