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## 5.5 Top Hat Ceilings

Top Hats are an effective means of providing structural framing behind various ceiling linings. Siniat Top Hats are durable and come with industry leading Zinalume AM150 corrosion protection.

Top Hats are typically installed under purlins or concrete slabs for various ceiling linings when high wind pressures or large spans are required.



# Framing

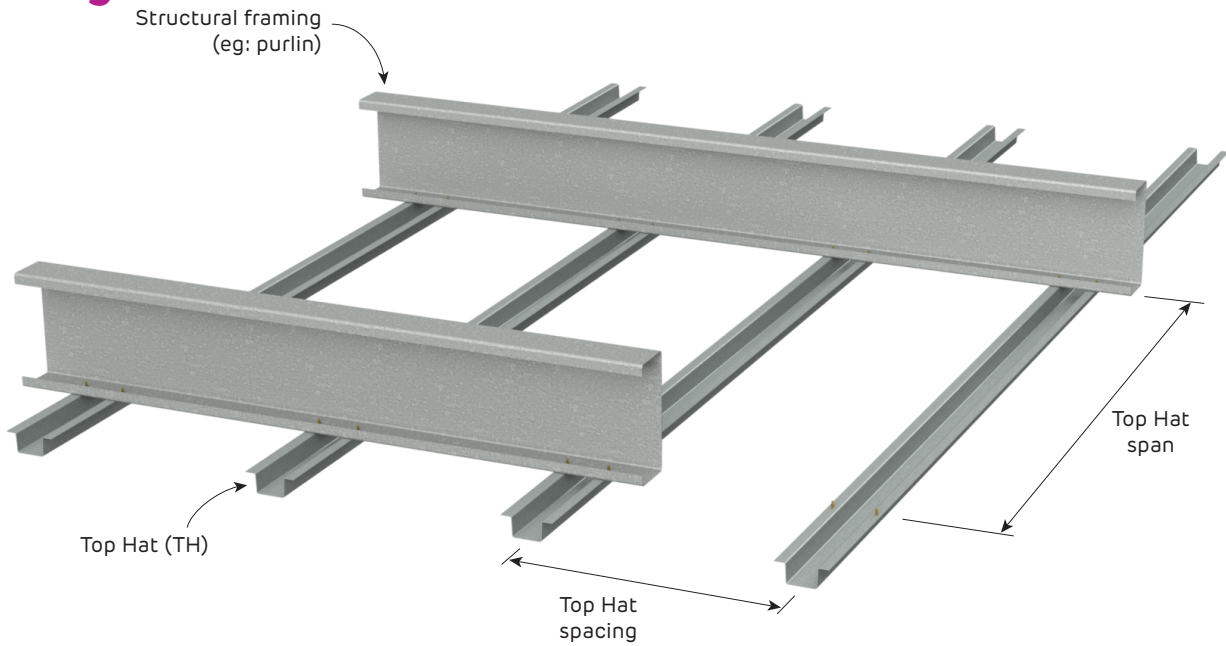


FIGURE 1 Top Hat Span and Spacing

Table 1 Ceiling 50x15x1.15 Top Hat Span Table (mm)

	Span type	Top Hat spacing (mm)	Ultimate Wind Pressure $W_u$ (kPa)									
			1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0	
Serviceability deflection Span / 360	Single span	600	700	630	580	540	510	490	470	440	410	
		450	770	690	640	600	570	540	520	480	460	
		400	800	720	660	620	590	560	540	500	470	
		300	880	790	730	690	650	620	590	550	520	
	2 or more spans	600	870	780	720	670	640	610	580	540	460*	
		450	950	860	790	740	700	670	640	600	570	
		400	990	890	820	770	730	700	670	620	590	
		300	1090	980	910	850	800	770	740	690	650	

Table 2 Ceiling 50x25x1.15 Top Hat Span Table (mm)

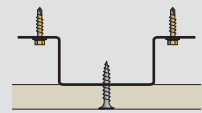
	Span type	Top Hat spacing (mm)	Ultimate Wind Pressure $W_u$ (kPa)									
			1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0	
Serviceability deflection Span / 360	Single span	600	1100	980	910	850	810	770	740	690	650	
		450	1210	1080	1000	940	890	850	810	760	720	
		400	1250	1130	1040	980	920	880	850	790	750	
		300	1380	1240	1150	1070	1020	970	930	870	820	
	2 or more spans	600	1360	1220	1130	1050	890*	770*	680*	550*	460*	
		450	1490	1340	1240	1160	1100	1030*	910*	740*	620*	
		400	1550	1400	1290	1210	1140	1090	1030*	830*	700*	
		300	1710	1540	1420	1330	1260	1200	1150	1080	930*	

\*Limited by 2x10g Hex-head screw connection capacity.



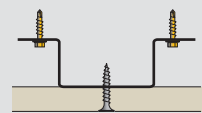
**Table 3 Ceiling 50x35x1.15 or 75x35x1.15 or 120x35x1.15 Top Hat Span Table (mm)**

	Span type	Top Hat spacing (mm)	Ultimate Wind Pressure $W_u$ (kPa)								
			1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0
Serviceability deflection Span / 360	Single span	600	1400	1260	1160	1090	1030	980	940	880	830
		450	1540	1380	1280	1200	1130	1080	1040	970	910
		400	1600	1440	1330	1240	1180	1120	1080	1010	950
		300	1760	1580	1460	1370	1300	1240	1190	1110	1050
	2 or more spans	600	1730	1560	1290*	1060*	890*	770*	680*	550*	460*
		450	1900	1710	1580	1410*	1190*	1030*	910*	740*	620*
		400	1980	1780	1640	1540	1340*	1160*	1030*	830*	700*
		300	2180	1960	1810	1700	1610	1530	1370*	1110*	930*



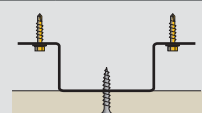
**Table 4 Ceiling 50x50x1.15 Top Hat Span Table (mm)**

	Span type	Top Hat spacing (mm)	Ultimate Wind Pressure $W_u$ (kPa)								
			1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0
Serviceability deflection Span / 360	Single span	600	1890	1700	1570	1470	1390	1330	1280	1190	1120
		450	2080	1870	1730	1620	1530	1460	1400	1310	1240
		400	2160	1950	1800	1680	1590	1520	1460	1360	1290
		300	2380	2140	1980	1850	1760	1680	1610	1500	1420
	2 or more spans	600	2320*	1660*	1290*	1060*	890*	770*	680*	550*	460*
		450	2570	2210*	1720*	1410*	1190*	1030*	910*	740*	620*
		400	2680	2410	1940*	1590*	1340*	1160*	1030*	830*	700*
		300	2950	2650	2450	2120*	1790*	1550*	1370*	1110*	930*



**Table 5 Ceiling 50x15x0.75 Top Hat Span Table (mm)**

	Span type	Top Hat spacing (mm)	Ultimate Wind Pressure $W_u$ (kPa)								
			1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0
Serviceability deflection Span / 360	Single span	600	610	540	500	470	450	420	410	380	360
		450	670	600	550	520	490	470	450	420	400
		400	690	620	580	540	510	490	470	440	410
		300	760	690	630	590	560	540	510	480	450
	2 or more spans	600	750	670	620	580	550	510	480	430	390
		450	830	740	680	640	610	580	560	490	450
		400	860	770	710	670	630	600	580	520	480
		300	950	850	780	740	700	660	640	590	550



\*Limited by 2x10g Hex-head screw connection capacity.

1. Check maximum cladding span and fastener spacing requirements from the manufacturers literature. Maximum cladding weight 22 kg/m<sup>2</sup>.
2. Tables based upon downward (suction) and upward (uplift) pressures.
3. Tables refer to Siniat Top Hats of grade G300 steel with Zinalume™ AM150 corrosion protection.
4. All Top Hats must be supported 150mm maximum from ends.
5. Calculations based upon either single span or 2-or-more spans, designed in accordance with AS/NZS 4600:2018 Cold Formed Steel Structures.
6. Wind pressures determined in accordance with AS/NZS 1170.2 Wind Actions.
7. Ultimate Load Case 1: 1.2G +  $W_u$  (suction), Ultimate Load Case 2: 0.9G +  $W_u$  (uplift)
8. Serviceability Load Case 1: G, with deflection limited to span/500, and Serviceability Load Case 2: G +  $W_s$ , with deflection limited to span/360. Serviceability pressure taken as 65% of ultimate wind pressure suitable for Region A and Region B.
9. Connections checked using 2 x 10g hex-head screws into minimum 1.0mm BMT G550 steel or minimum 1.5mm BMT G450 steel (purlins or girts). Contact Siniat if fixing to a different substrate for the possibility of spanning further.
10. Splicing of Top Hats is not permitted.
11. The nominated lateral pressures and deflection limits must be checked for suitability for a specific project.



Table 6 Ceiling 50x25x0.75 Top Hat Span Table (mm)

	Span type	Top Hat spacing (mm)	Ultimate Wind Pressure $W_u$ (kPa)								
			1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0
Serviceability deflection Span / 360	Single span	600	950	850	790	740	700	670	640	600	560
		450	1050	940	870	810	770	730	700	660	620
		400	1090	980	900	850	800	760	730	680	650
		300	1200	1080	990	930	880	840	810	750	710
	2 or more spans	600	1180	1060	980	900	830	770	680*	550*	460*
		450	1290	1160	1070	1010	950	890	840	740*	620*
		400	1350	1210	1120	1050	990	950	890	800	700*
		300	1480	1330	1230	1150	1090	1040	1000	920	840

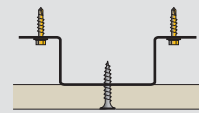


Table 7 Ceiling 50x35x0.75 Top Hat Span Table (mm)

	Span type	Top Hat spacing (mm)	Ultimate Wind Pressure $W_u$ (kPa)								
			1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0
Serviceability deflection Span / 360	Single span	600	1220	1090	1010	950	900	860	820	770	700
		450	1340	1200	1110	1040	990	940	900	840	800
		400	1390	1250	1160	1080	1030	980	940	880	830
		300	1530	1380	1270	1190	1130	1080	1040	970	910
	2 or more spans	600	1510	1350	1190	1060*	890*	770*	680*	550*	460*
		450	1660	1490	1370	1240	1140	1030*	910*	740*	620*
		400	1730	1550	1430	1320	1210	1130	1030*	830*	700*
		300	1900	1710	1580	1480	1400	1300	1220	1100	930*

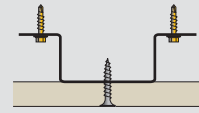
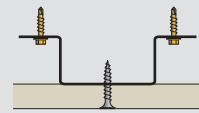


Table 8 Ceiling 50x50x0.75 Top Hat Span Table (mm)

	Span type	Top Hat spacing (mm)	Ultimate Wind Pressure $W_u$ (kPa)								
			1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0
Serviceability deflection Span / 360	Single span	600	1640	1470	1360	1270	1210	1130	1060	950	870
		450	1800	1620	1500	1400	1330	1270	1220	1100	1010
		400	1880	1690	1560	1460	1380	1320	1270	1170	1070
		300	2070	1860	1710	1610	1520	1450	1390	1300	1230
	2 or more spans	600	2030	1660*	1290*	1060*	890*	770*	680*	550*	460*
		450	2230	2010	1720*	1410*	1190*	1030*	910*	740*	620*
		400	2320	2090	1920	1590*	1340*	1160*	1030*	830*	700*
		300	2560	2300	2120	1990	1790*	1550*	1370*	1110*	930*



\*Limited by 2x10g Hex-head screw connection capacity.

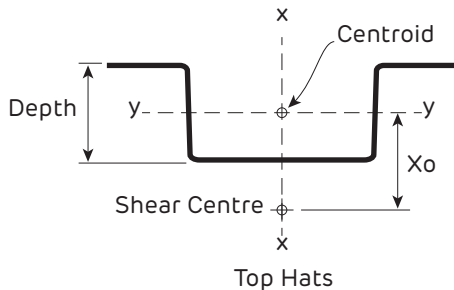
1. Check maximum cladding span and fastener spacing requirements from the manufacturers literature. Maximum cladding weight 22 kg/m<sup>2</sup>.
2. Tables based upon downward (suction) and upward (uplift) pressures.
3. Tables refer to Siniat Top Hats of grade G300 steel with Zinalume™ AM150 corrosion protection.
4. All Top Hats must be supported 150mm maximum from ends.
5. Calculations based upon either single span or 2-or-more spans, designed in accordance with AS/NZS 4600:2018 Cold Formed Steel Structures.
6. Wind pressures determined in accordance with AS/NZS 1170.2 Wind Actions.
7. Ultimate Load Case 1: 1.2G +  $W_u$  (suction), Ultimate Load Case 2: 0.9G +  $W_u$  (uplift)
8. Serviceability Load Case 1: G, with deflection limited to span/500, and Serviceability Load Case 2: G +  $W_s$ , with deflection limited to span/360. Serviceability pressure taken as 65% of ultimate wind pressure suitable for Region A and Region B.
9. Connections checked using 2 x 10g hex-head screws into minimum 1.0mm BMT G550 steel or minimum 1.5mm BMT G450 steel (purlins or girts). Contact Siniat if fixing to a different substrate for the possibility of spanning further.
10. Splicing of Top Hats is not permitted.
11. The nominated lateral pressures and deflection limits must be checked for suitability for a specific project.

## Steel Profile Information

### Material

Manufacturer	Grade	Ultimate	Yield	Coating
Siniat	G300	340 MPa	300 MPa	AM150

1. Steel grade and coating in accordance with AS 1397 *Continuous hot-dip metallic coated steel sheet and strip*

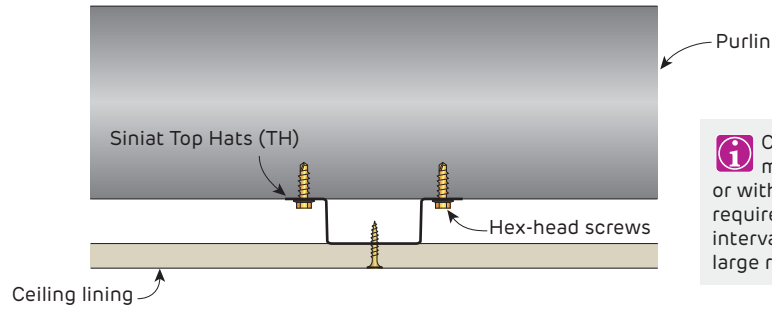


### Section Properties

Profile	Dimensions (mm)		Shear Centre from Centroid (mm)	Area (mm <sup>2</sup> )	Moment of Inertia (mm <sup>4</sup> )		Section Modulus (mm <sup>3</sup> )		Torsion Constant J (mm <sup>4</sup> )	Warping Constant I <sub>w</sub> (mm <sup>6</sup> )
	Depth	BMT			X <sub>o</sub>	I <sub>xx</sub>	I <sub>yy</sub>	Z <sub>xx</sub>		
50x15x0.75	15	0.75	-11.2	75.4	41,268	2,781	1,028	334	14.1	517,040
50x25x0.75	25	0.75	-19.7	99.5	67,737	10,632	1,461	844	18.7	2,482,400
50x35x0.75	35	0.75	-29.6	111.5	69,125	22,319	1,594	1,193	20.9	5,708,900
50x50x0.75	50	0.75	-42.0	140.0	97,829	54,286	2,022	2,178	26.3	17,086,000
50x15x1.15	15	1.15	-11.2	115.5	63,281	4,267	1,568	513	50.9	791,440
50x25x1.15	25	1.15	-19.7	152.6	103,830	16,300	2,229	1,294	67.3	3,799,990
50x35x1.15	35	1.15	-29.0	171.0	108,950	33,724	2,444	1,846	75.4	8,407,000
50x50x1.15	50	1.15	-42.0	214.7	149,990	83,217	3,088	3,339	94.7	26,182,000
120x35x1.15	35	1.15	-24.5	265.3	782,880	48,559	8,889	2,114	116.9	90,681,000

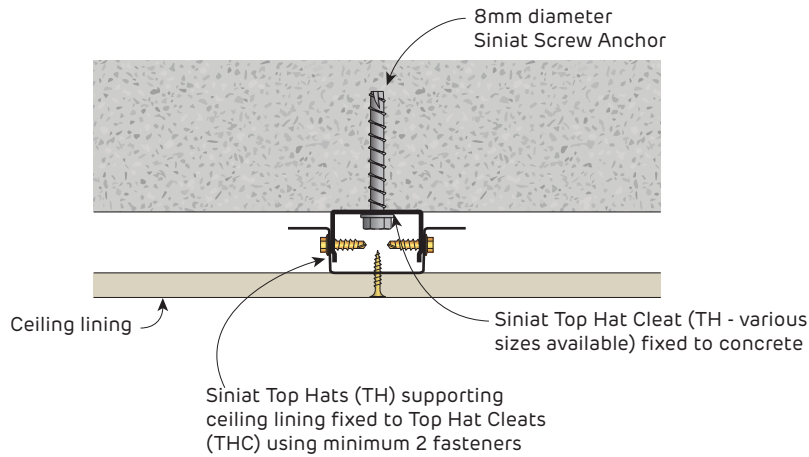


Fire Rated and Non-Fire Rated  
Top Hat Ceilings



**i** Ceilings in close proximity to metal roofs (ie: raked ceiling or with small ceiling cavities) require smaller control joint intervals as they are exposed to large rates of thermal expansion.

**FIGURE 2 Internal or External Top Hat Ceiling under Purlins**  
Horizontal Top Hats under Purlins  
Section



**FIGURE 3 Internal or External Top Hat Ceiling under Concrete**  
Horizontal Top Hats over Top Hat Cleats  
Section