afs rediwall®

afs rediwall® Blade Columns

Advanced Blade Column Design with afs rediwall®

CSR

afs rediwall® Overview

Introduction

AFS in conjunction with the Centre for Infrastructure Engineering, Western Sydney University (WSU) evaluated performance of AFS Rediwall® Blade Columns with simplified detailing utilising the standard end **U-bars in lieu of ties**. The elimination of ties within the limitations detailed below **simplifies design**, **detailing** and **installation** of afs rediwall® Permanent Formwork systems. These methods can be used by the designer to minimise construction costs.

AFS Rediwall® Blade Columns offer a simplified design and reinforcement detailing provides flexibility. The use of U-bar reinforcement instead of complex confinement ties significantly increases the speed of installation while continuing to meet the **compliance** requirements of **AS3600-2018** Amendment 2 and the **NCC**.

Benefits of Rediwall® Blade Columns

Advanced Blade Column Design

AFS Rediwall® Blade Columns provide simplified detailing utilising the standard end U-bars in lieu of closed ligatures or intermediate ties. Rediwall® Blade Columns are AS3600-2018 compliant. We have provided an example using the WSU advanced design method.

Architectural Flexibility

AFS Rediwall® advanced Blade Column design method offers greater architectural flexibility to help maximise lettable area by combining walls, columns, blades, and cores.

Build Cost Reductions

The new afs rediwall® advanced design method now allows for reinforcement detailing that greatly reduces the construction time of higher capacity Blade Columns.

- No additional on-site trades
- Faster completion time
- Standard U-Bar (no need for custom reinforcement)
- Standard horizontal and vertical reinforcement
- No need for specialised column formwork bracing
- No need for on-site crane to lift formwork or reinforcement into place

Ease of Installation

The afs rediwall® Blade Column results in a reduction in formwork, labour, and disciplines on site.

Other advantages include:

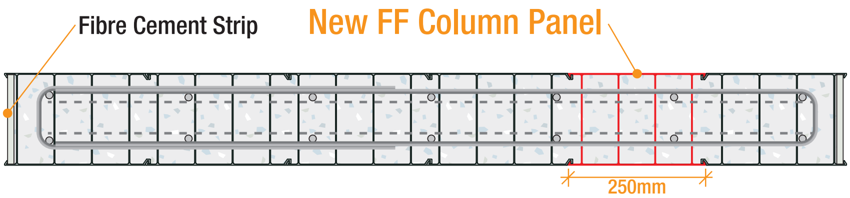
- No requirement for base ligature
- No pre-installation of starter bar ligatures
- Compatible with standard U-bars
- Compatible with the AFS Vertical Bar locator system
- Ease of inspection with open end caps

Best Practice PVC
In accordance with GBCA PVC guidline
GECA CLAIM AUTHENTICATED

AUSTRALIAN MADE AND OWNED

Introducing the new RW200C FF **Column Panel**

The new RW200C (Female Female) FF **Column Panel** can be use to reverse the ends of a panel section. This is particularly useful during column construction when fibre cement end caps are required. Reversing the panel end allows a female clip end to be present at both ends of the column allowing for the **neat** fibre cement end caps.



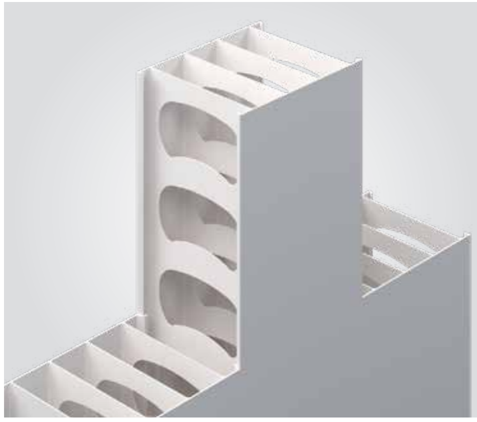
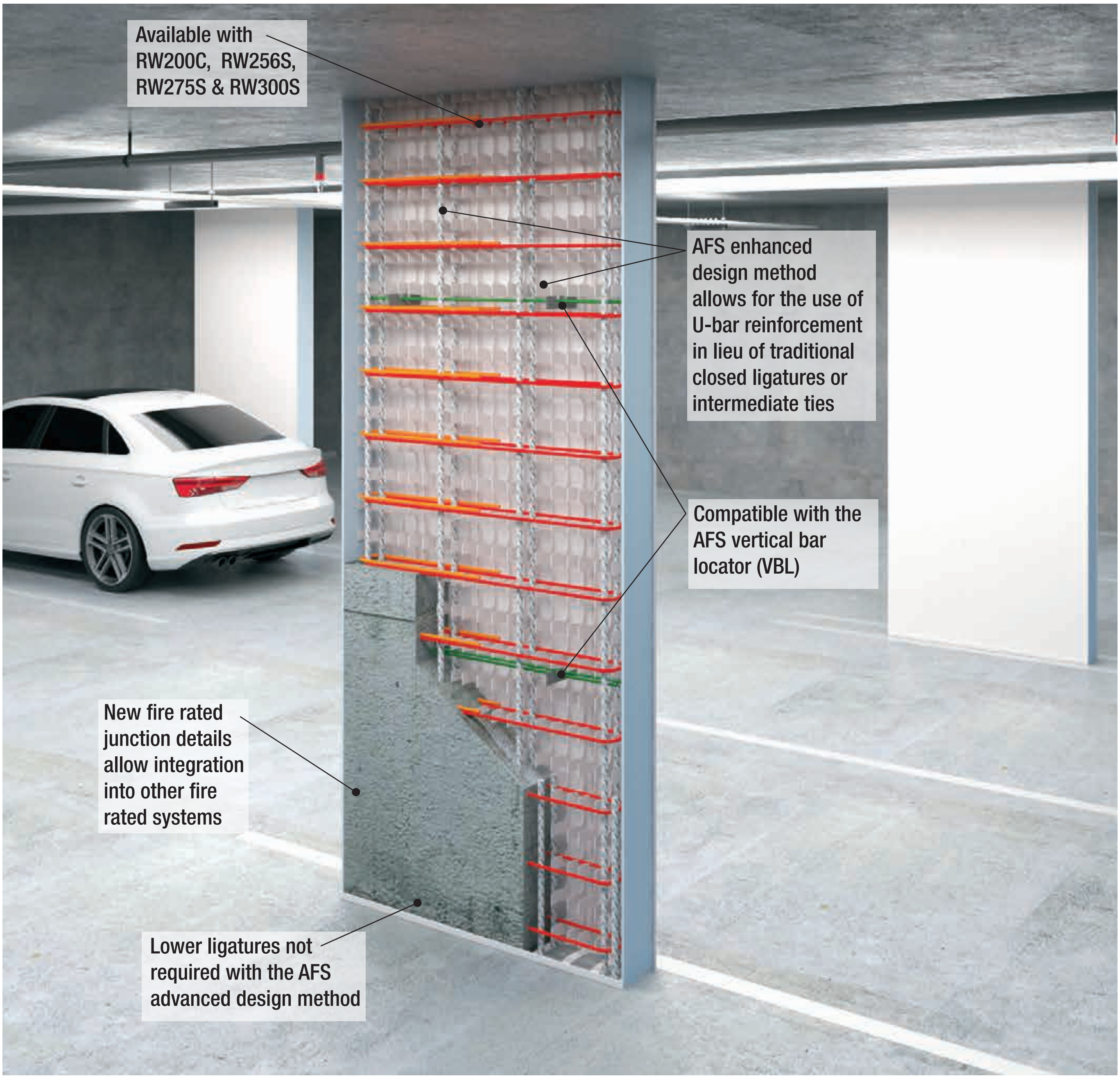


Fig 1. AFS Rediwall® isolated Blade Column



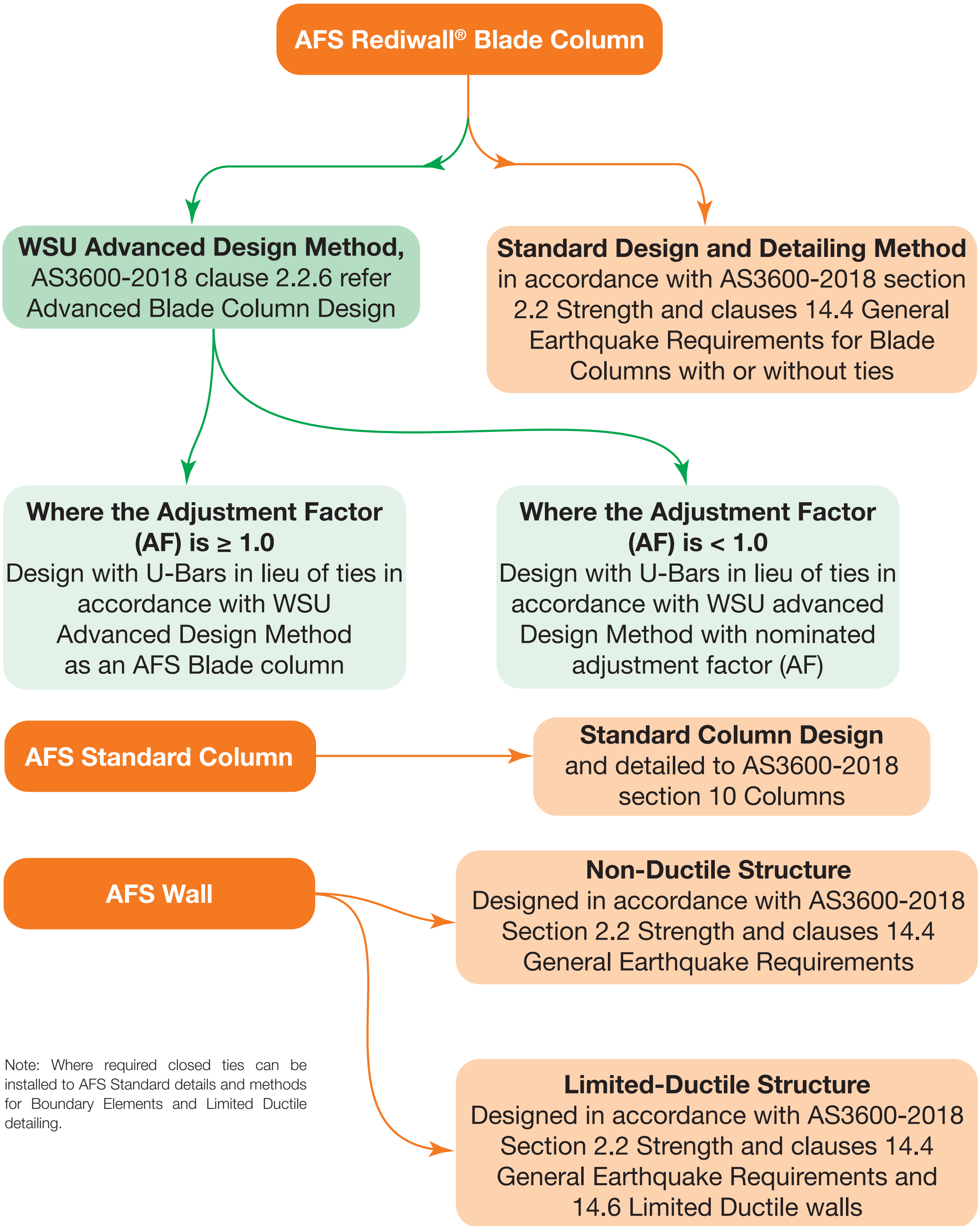
Compliance and Verification

AFS Blade Column capacities have been load tested and verified by Western Sydney University using existing Deemed To Satisfy (DTS) and alternate performance design methods for the performance equivalence U-bars without ties to walls designed as columns with ties in accordance with the AS3600-2018 Strength check procedure for use with non-linear stress analysis.

The Advanced Design for AFS Blade Columns with end U-bars in-lieu of ligatures has been developed to AS3600-2018 clause 2.1.1 Design for strength and serviceability, in accordance with clause 2.2.6 Strength check procedure for use with non-linear stress analysis using Advanced Finite Element non-linear stress analysis (ABAQUS) and comparative physical prototype testing to Appendix B3 Proof Testing of Members and Structures, to evaluate the structural performance of AFS Blade Columns with reduced reinforcing steel tie complexity under eccentric axial load.

Existing AS3600-2018 Design Methods and the new Advanced Design Methods are summarised in the following Design Flowchart:

Fig 2: Design flowchart



The AFS Rediwall® Advance Blade Columns design is in accordance with AS3600-2018 Section 10 provided the restraint provisions are satisfied within the provision of the WSU report[1] referring to clause 11.7.4 (a) & (b) Restraint of Vertical Reinforcement for Walls.

Detailing is as for walls designed as columns in accordance with AS3600-2018 clause14.4.4 General Requirements, Structural Walls with the end U-bars replacing the closed ties.

AS3600-2018 11.7.4 Restraint of Vertical Reinforcement

In addition to providing transverse reinforcement required for any design actions, the following restraint to vertical reinforement provisions shall be satisfied:

(a) For all walls in structures with a structural ductility factor (μ) greater than 1.0, the vertical reinforcement shall be restrained in accordance with Clause 14.6

(b) For walls with concrete strength not exceeding 50MPa and designed as columns in accordance with Section 10, the vertical reinforcement shall be restrained in accordance with Clause 10.7.4 unless one or more of the following conditions is met, in which case no restraint is required:

(i) $N^* \leq 0.5\,ØN_{\mu}$

(ii) The vertical reinforcement is not used as compressive reinforcement.

(iii) The vertical reinforcement ratio is not greater than 0.01 and minimum horizontal reinforcement ratio or 0.0025 is provided.

Non-Ductile AFS Rediwall Blade Columns can be designed to AS3600-2018 as Columns with U-bars in lieu of ties utilising the adjustment factor relevant to various design parameters according to the following WSU findings:

1. For AFS-Rediwall detailed with end U-bars and no ligatures AS3600-2018 reference interaction diagram can be used utilising the adjustment factor relevant to various design parameters in table below

Table 1: WSU adjustment factor table for afs rediwall®

Concrete strength (MPa)	Vertical reinforement (P_{wv})	Wall Length(L_w)		
		≤ 600	≤ 1500	≤ 2500
		Adjustment Factor		
32	< 0.5%	1.00	1.00	0.95
	0.5% to 1.0%	1.00	1.00	0.95
	1.0% to 2.2%	1.00	1.00	1.00
40	< 0.5%	1.00	1.00	0.95
	0.5% to 1.0%	1.00	0.95	0.90
	1.0% to 2.2%	1.00	1.00	1.00
50	< 0.5%	1.00	0.95	0.90
	0.5% to 1.0%	1.00	0.90	0.90
	1.0% to 2.2%	1.00	1.00	1.00

Note: for $\rho > 1\%$ all compressive reinforcement was excluded for calculating interaction curves as per AS3600
- Refer Figure14 p52 WSU Report - Conclusions

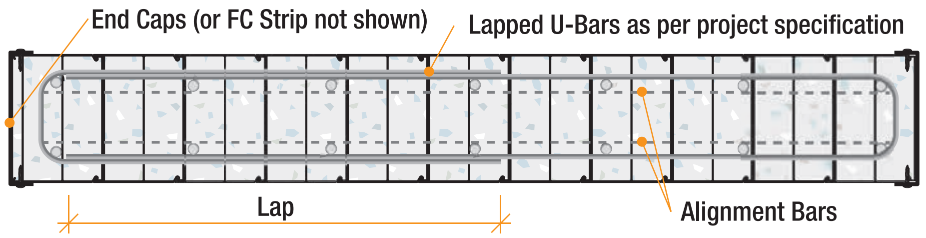
2. The moment magnifier technique of AS3600:2018 can conservatively be used to modify moment capacity for AFS-encased columns for slenderness effects, (refer clause 6.5.3)
3. Since the ratio of the larger to smaller cross-sectional dimension for the majority cases of afs rediwall® columns exceeds 3.0, biaxial bending and compression shall be satisfied as per clause 10.6.4 AS3600, (refer to Section 6.6)
4. For afs rediwall® systems acting as part of seismic-lateral-bearing system with limited ductility criteria as per AS3600-2018 (μ=2 and s_p=0.77), the additional checks for boundary element confinement using strength index method shall be conducted
5. The report is for Non-Ductile Blade Column design only as section 14.6 Limited Ductile Design requirements were not included

Non-Ductile AFS Blade Columns can be designed in accordance with AS3600-2018 clause 14.2.2 for strength for the calculated horizontal drifts. In other words, for the vertical loads with an offset equaling the inter story drift which produces an additional bending moment along the major axis of the element.

Design Examples

The following examples of AFS Blade Column solutions use the WSU AFS Advanced Blade Design methodology. Refer to the appropriate Blade Column Axial Capacity design table found in this document for detailed information.

Fig 4: Typical Blade Column

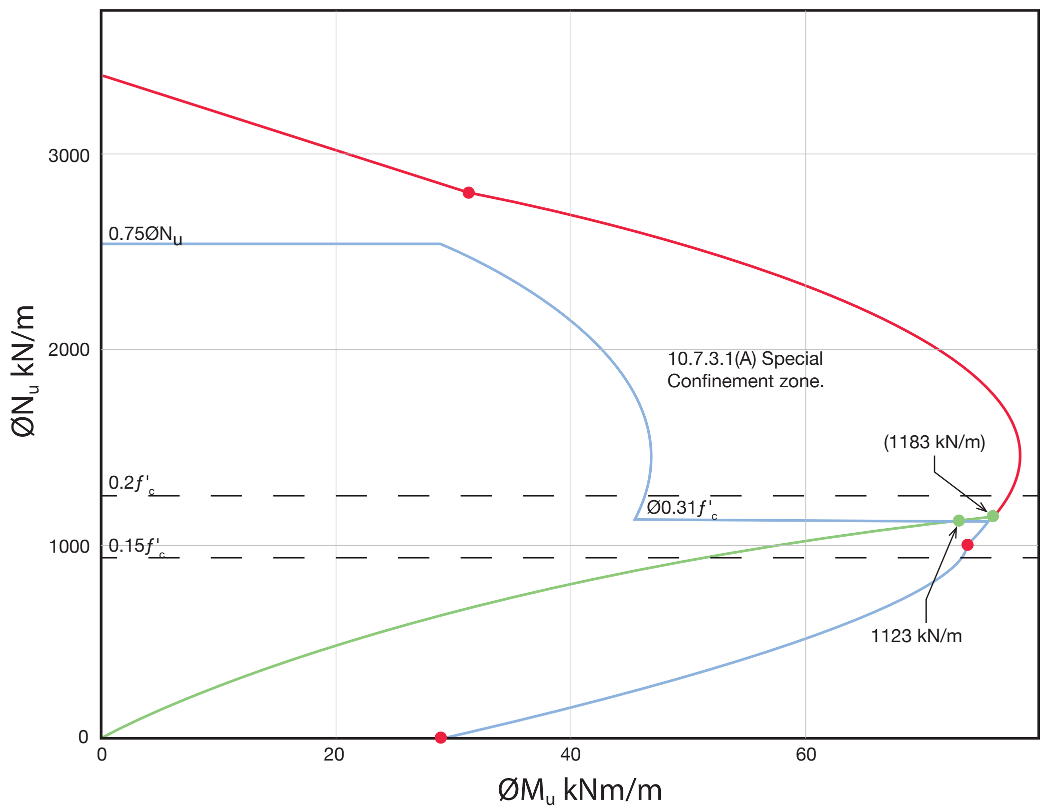


Example 1 – For a RW200C Blade Column 1500 long

From RW200 Design Table $ØN_u$ = 1123 kN/m x 1500mm = 1684 kN

Values in tables were generated from standard moment interaction curves and moment magnifier loading. Check detailing against points 1 to 6 in "WSU AFS Advanced Blade Design" section.

Fig 5: Moment interaction chart: RW200C, H_{wu}=3000mm, k=0.75, 50MPa, 2N20-200 vert, N12-233 horizontal U-bars each side



Note: AS3600-2018 14.6.2.3 Limited Ductile Structures of more than four storeys stress limits for longitudinal reinforcement restraint limits of $0.2f'_c$ and Boundary Elements requirement of 0.15f'c have been shown for comparison.

Table 2: FRP structural adequacy from AS3600-2018 clause 5.7.2

RW200C FRP Structural Adequacy	90 minutes	120 minutes	180 minutes
RW200, exposed one side, built in to fire separating wall	u_{fi} =0.7	u_{fi} =0.7	u_{fi} =0.53
RW200 x:y > 4,exposed two sides not built into fire separating walls	u_{fi} =0.7	u_{fi} =0.62	u_{fi} =0.31

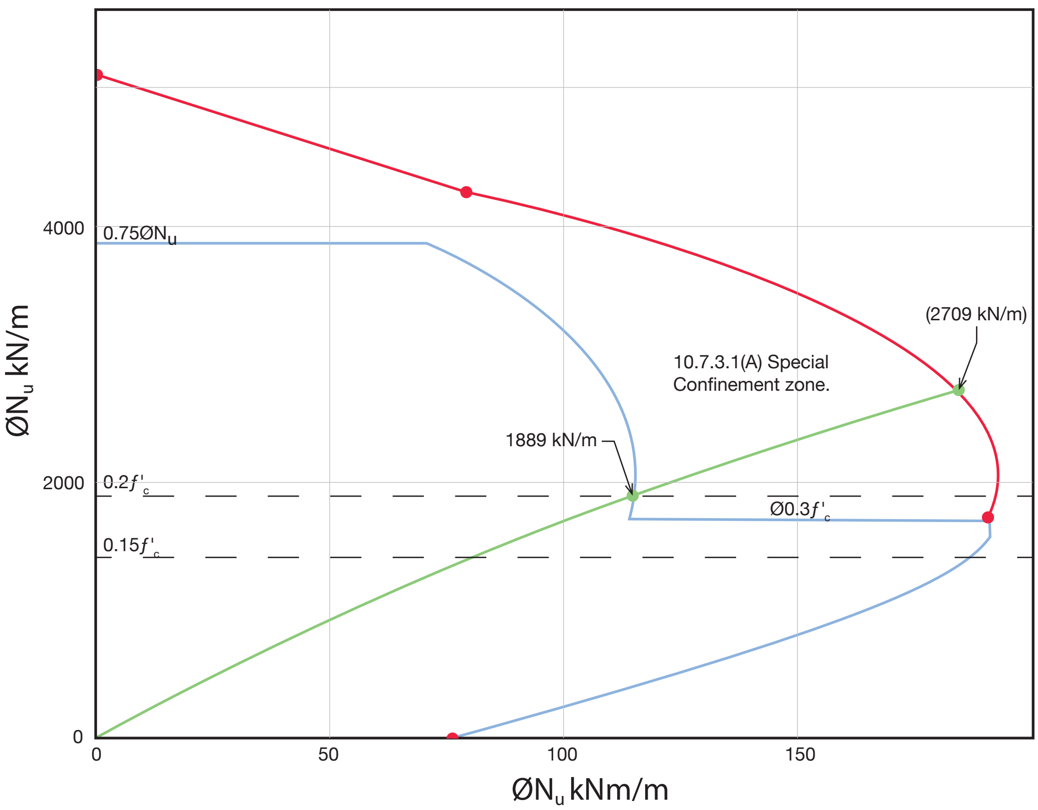
• a_s= 55mm (d_h=41+(N16+N12)/2), D=195mm, H_{we} < 7800, $u_{fi}=N^*_f/ØN_u$

Example 2 – For a RW300S Blade Column 2500 long

From RW300 Design Table $ØN_u$ = 1889 kN/m x 2500mm = 4722 kN

Values in tables were generated from standard moment Interaction curves and moment magnifier loading. Check detailing against points 1 to 6 in "WSU AFS Advanced Blade Design" section.

Fig 6: Moment interaction chart: RW300S x2500long , H_{wu}=3000mm, k=0.75, 32MPa, 2N16-300 vert, N12-233 horizontal U-bars each end



Note: AS3600-2018 14.6.2.3 Limited Ductile Structures of more than four storeys stress limits for longitudinal reinforcement restraint limits of 0.2f'_c and Boundary Elements requirement of 0.15f'c have been shown for comparison.

Table 3: FRP structural adequacy from AS3600-2018 clause 5.7.2

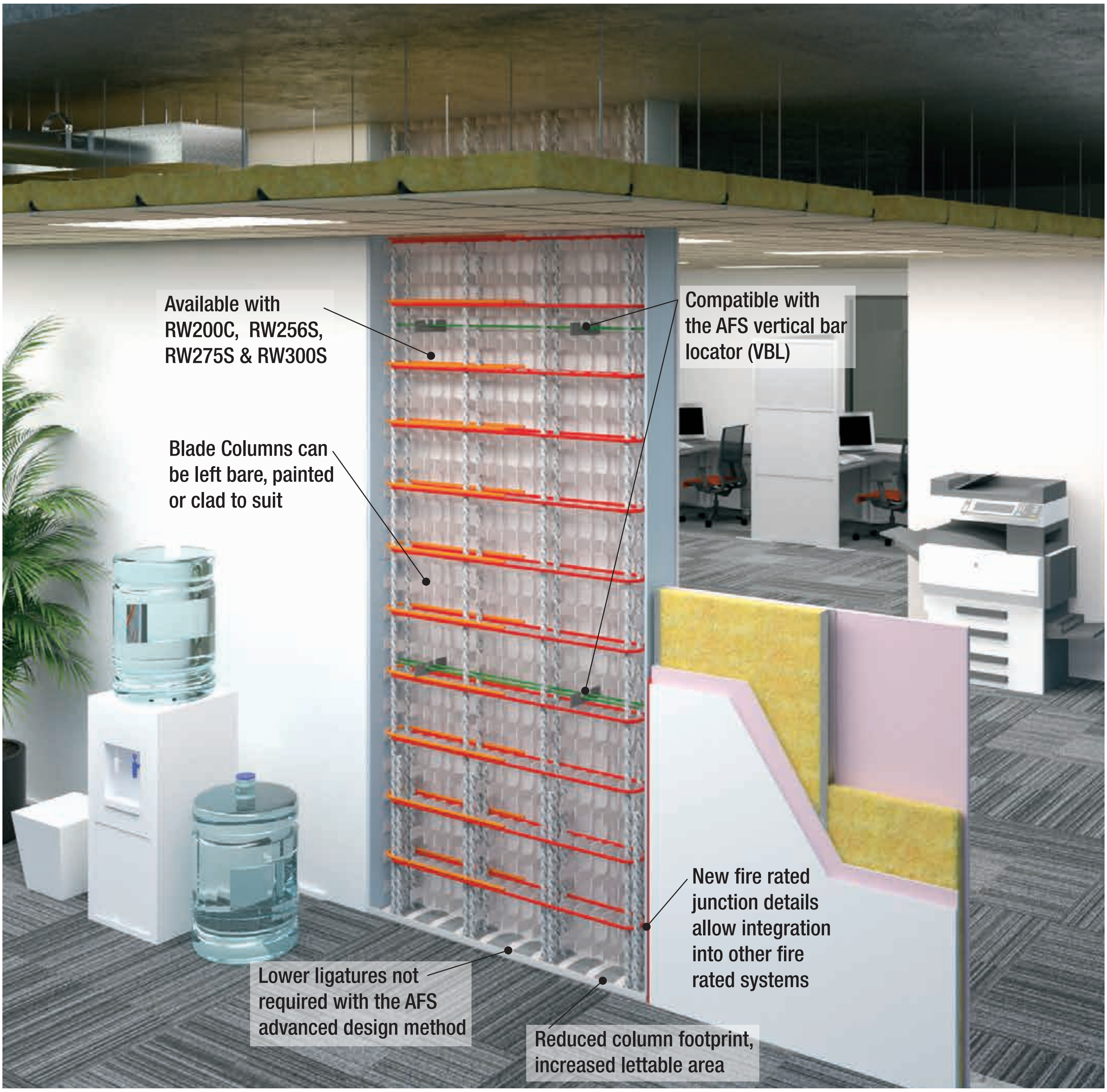
RW300S FRP Structural Adequacy	90 minutes	120 minutes	180 minutes	240 minutes
Built into fire separating wall, exposed one side,	u_{fi} =0.7	u_{fi} =0.7	u_{fi} =0.7	u_{fi} =0.7
Isolated Blade, x:y > 4, B>1200, exposed two sides	u_{fi} =0.7	u_{fi} =0.7	u_{fi} =0.7	u_{fi} =0.54
Isolated Blade, x:y < 4, B<1200, exposed four sides, [Eq 5.6.3(2)]	u_{fi} =0.7	u_{fi} =0.5	u_{fi} =0.15	–

- a_s= 55mm (d_h=41+(N16+N12)/2), D=295mm, H_{we} < 7800, $u_{fi}=N^*_f/ØN_u$

AFS Rediwall® Advanced Column Design Tables

The following afs rediwall® design tables for rediwall have been prepared utilising moment interaction curves and moment magnifier in accordance with the Advanced Design Methods to determine the member capacities for non-ductile vertical load bearing Blade Columns. Other column design tools can also be used provided they account for the adopted clause 11.7.4(b) where for vertical reinforcement ratios exceed 0.01 the vertical reinforcement is not used as compression reinforcement and concrete strength does not exceed 50MPa.

Fig 7: AFS Rediwall® Blade Column integration into a dividing wall



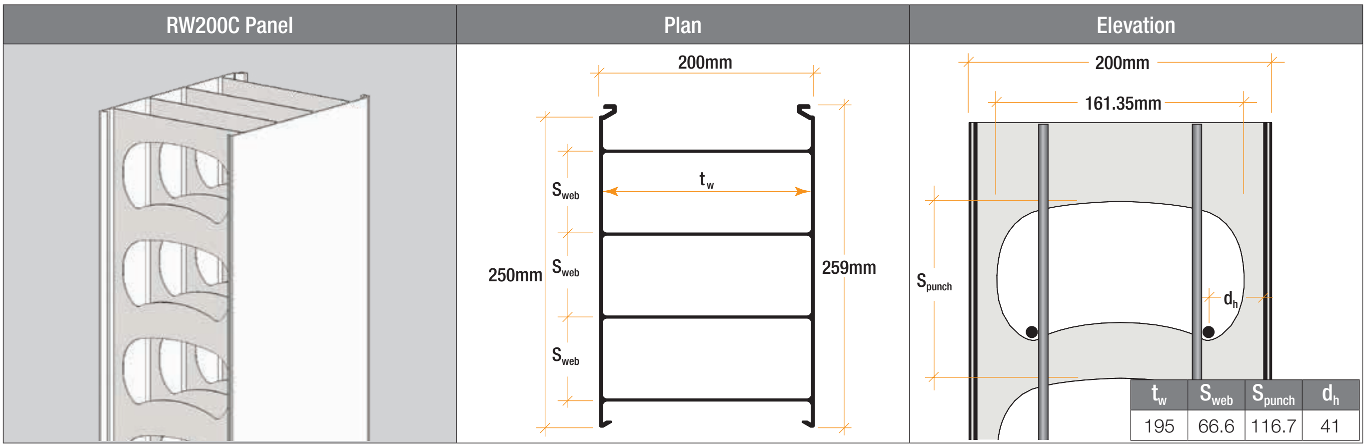
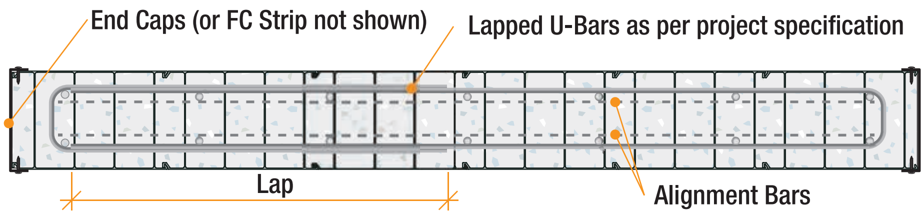


Fig 8: RW200C typical Blade Column



RW200 Blade Column Axial Capacity $ØN_u$ (kN/m) Non-Ductile 2 Layers

AFS Rediwall® Axial Loaded Blade Columns with U-bars in lieu of ties in accordance with "AFS Logicwall® and AFS Rediwall® axial-flexural interaction curve generation numerical and theoretical investigations", Western Sydney University and AS3600-2018 Amdt 2 clause11.7.4(b) Restraint.

		$ØN_u$(kN/m), Vertical Bars, f'_c 32 Mpa			$ØN_u$(kN/m), Vertical Bars, f'_c 40 Mpa			$ØN_u$(kN/m), Vertical Bars, f'_c 50 Mpa		
ecc < $^1/_6$	H_{wu}(k=1.0)	2N12-300	2N20-300	2N20-200	2N12-300	2N20-300	2N20-200	2N12-300	2N20-300	2N20-200
H_{wu}(k=0.75)	H_{we}	0.0039	0.0107[#1]	0.0161[#1]	0.0039	0.0107[#1]	0.0161[#1]	0.0039	0.0107[#1]	0.0107[#1]
5500	4125	486	537	579	575	629	680	679	734	792
5000	3750	567	622	668	672	732	783	794	856	918
4500	3375	670	722	777	795	855	911	940	1006	1066
4000	3000	798	847	907	950	1003	1068	1127	1182	1252
3600	2700	921	967	1030	1100	1148	1217	1309	1357	1431
3200	2400	1062	1106	1123	1271	1319	1387	1516	1565	1639
3000	2250	1123	1123 (1183)	1123 (1243)	1372	1404	1404 (1480)	1640	1681	1754
2800	2100	1123 (1233)	1123 (1263)	1123 (1321)	1404 (1482)	1404 (1513)	1404 (1577)	1755	1755 (1805)	1755 (1876)
0.15f'_c Lateral limit		936			1170			1463		
Max Blade Length[#2]		1500 (0.5 to 1.0%)	2500 (1.0 to 2.2%)		600 (0.5 to 1.0%)	2500 (1.0 to 2.2%)		600 (0.5 to 1.0%)	2500 (1.0 to 2.2%)	

1123 (1233) - lower value where clause 10.7.3.1(2) applies
#1 Compression reinforcement ignored in accordance with clause 11.7.4(b)
#2 Max Blade Length from WSU Report Fig 16 for Standard AFS detailed Blades with U-bars and no ties with Adjustment Factor to AS3600-2018 ≥ 1.0
#3 Clause 14.6.2 Boundary Element limit if acting as part of Lateral System, refer WSU Report p4 Note 6

RW200C Minimum Reinforcement

RW200C	Vertical Bars - Each Face			
Allowable Bars	N12	N16	N20	N24
N12 Horizontal				
N16 Horizontal				

Horizontal Bar Spacing 233/350 Vertical Bar Spacing 150 to 350
Acceptable
With Caution
Not Recommended

RW256S Blade Column

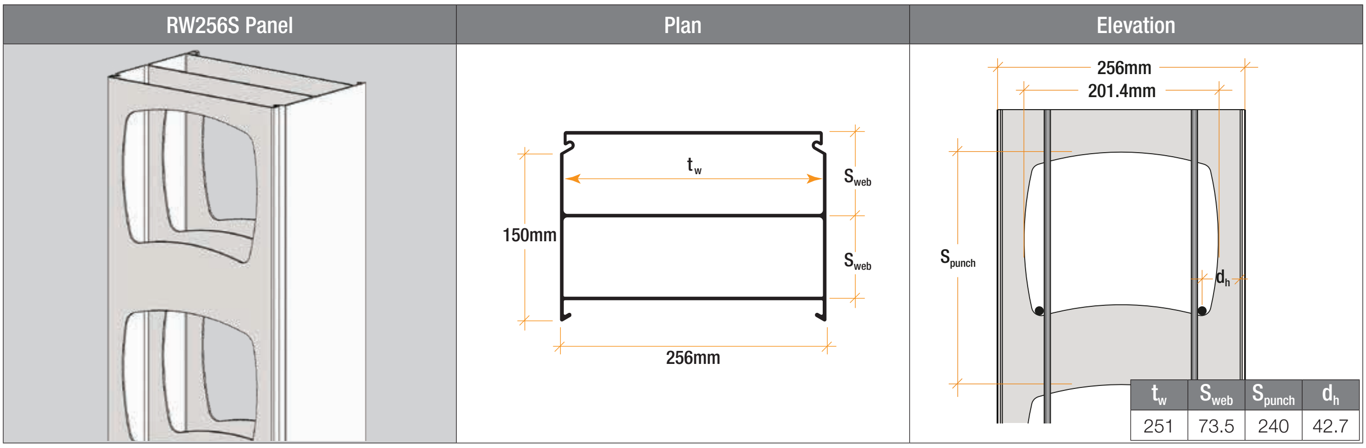
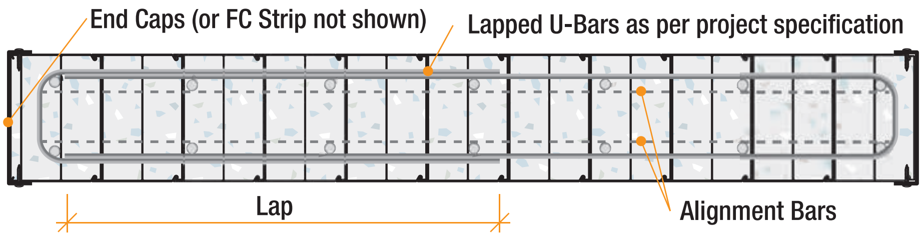


Fig 9: RW256S typical Blade Column



RW256S Blade Column Axial Capacity $ØN_u$ (kN/m) Non-Ductile 2 Layers

AFS Rediwall® Axial Loaded Blade Columns with U-bars in lieu of ties in accordance with "AFS Logicwall® and AFS Rediwall® axial-flexural interaction curve generation numerical and theoretical investigations", Western Sydney University and AS3600-2018 Amdt 2 clause 11.7.4(b) Restraint.

		$ØN_u$(kN/m), Vertical Bars, f'_c 32 Mpa			$ØN_u$(kN/m), Vertical Bars, f'_c 40 Mpa			$ØN_u$(kN/m), Vertical Bars, f'_c 50 Mpa		
ecc < $^1/_6$	H_{wu}(k=1.0)	2N12-300	2N20-300	2N24-200	2N12-300	2N20-300	2N24-200	2N12-300	2N20-300	2N24-200
H_{wu}(k=0.75)	H_{we}	0.0030	0.0084	0.0107#1	0.0030	0.0084	0.0107#1	0.0030	0.0084	0.0107#1
5500	4125	1011	1182	1239	1202	1378	1449	1425	1604	1689
5000	3750	1162	1334	1386	1384	1562	1627	1644	1826	1903
4500	3375	1332	1440 (1515)	1440 (1548)	1592	1775	1800	1895	2079	2145
4000	3000	1440 (1518)	1440 (1720)	1440 (1721)	1800	1800 (2024)	1800 (2042)	2172	2250 (2378)	2250 (2413)
3600	2700	1440 (1693)	1440 (1900)	1440 (1862)	1800 (2034)	1800 (2243)	1800 (2223)	2250 (2437)	2250 (2645)	2250 (2641)
3200	2400	1440 (1878)	1505 (2086)	1504 (2001)	1800 (2263)	1800 (2473)	1800 (2403)	2250 (2721)	2250 (2929)	2250 (2872)
3000	2250	1440 (1970)	1559 (2179)	1546 (2068)	1800 (2379)	1832 (2588)	1844 (2490)	2250 (2865)	2250 (3072)	2250 (2986)
2800	2100	1440 (2062)	1614 (2270)	1587 (2131)	1800 (2493)	1899 (2702)	1897 (2574)	2250 (3007)	2250 (3213)	2255 (3096)
$0.15f'_c$ Lateral limit#3		1200			1500			1875		
Max Blade Length#2		1500 (0.5 to 1.0%)	2500 (1.0 to 2.2%)		600 (0.5 to 1.0%)	2500 (1.0 to 2.2%)		600 (0.5 to 1.0%)	2500 (1.0 to 2.2%)	

1440 (1518) - lower value where clause 10.7.3.1(2) applies
#1 Compression reinforcement ignored in accordance with clause 11.7.4(b)
#2 Max Blade Length from WSU Report Fig 16 for Standard AFS detailed Blades with U-bars and no ties with Adjustment Factor to AS3600-2018 ≥ 1.0
#3 Clause 14.6.2 Boundary Element limit if acting as part of Lateral System, refer WSU Report p4 Note 6

RW256S Minimum Reinforcement

RW256C	Vertical Bars - Each Face			
Allowable Bars	N12	N16	N20	N24
N12 Horizontal				
N16 Horizontal				

Horizontal Bar Spacing 240
Vertical Bar Spacing 150 to 350

Acceptable
With Caution
Not Recommended

RW275S Blade Column

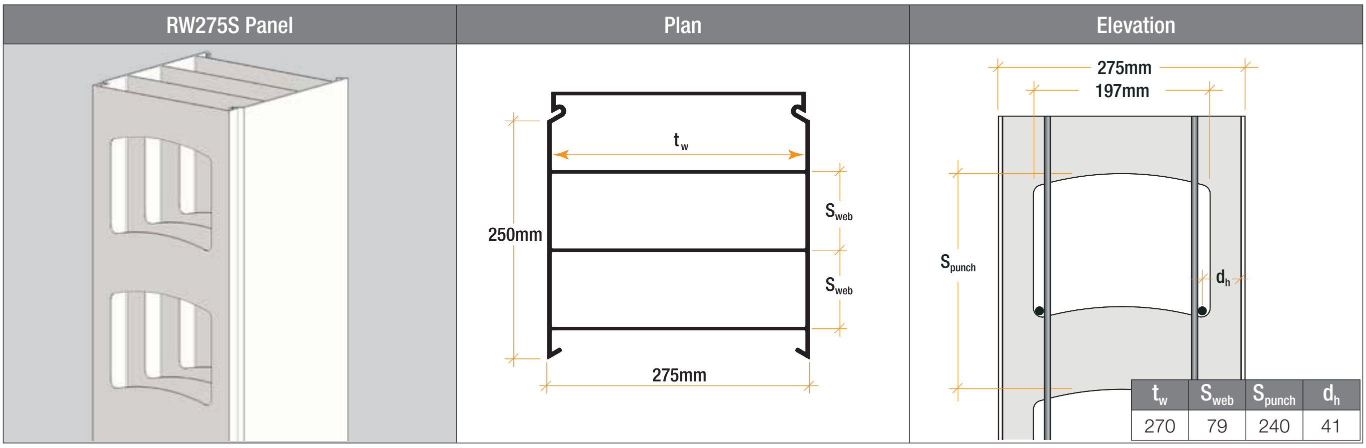
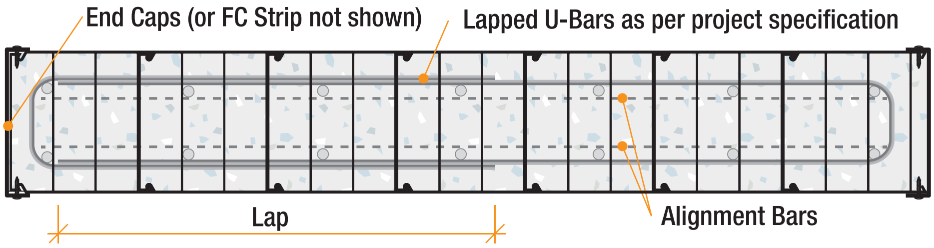


Fig 10: RW275S typical Blade Column



RW275S Blade Column Axial Capacity $ØN_u$ (kN/m) Non-Ductile 2 Layers

AFS Rediwall® Axial Loaded Blade Columns with U-bars in lieu of ties in accordance with "AFS Logicwall® and AFS Rediwall® axial-flexural interaction curve generation numerical and theoretical investigations", Western Sydney University and AS3600-2018 Amdt 2 clause 11.7.4(b) Restraint.

		$ØN_u$(kN/m), Vertical Bars, f'_c 32 Mpa			$ØN_u$(kN/m), Vertical Bars, f'_c 40 Mpa			$ØN_u$(kN/m), Vertical Bars, f'_c 50 Mpa		
ecc < $^1/_6$	H_{wu}(k=1.0)	2N16-300	2N20-300	2N24-200	2N12-300	2N20-300	2N24-200	2N12-300	2N20-300	2N24-200
H_{wu}(k=0.75)	H_{we}	0.005	0.0078	0.0107#1	0.0028	0.0078	0.0107#1	0.0028	0.0078	0.0107#1
5500	4125	1333	1431	1480	1571	1675	1737	1848	1955	2032
5000	3750	1498	1549 (1605)	1549 (1639)	1774	1880	1931	2094	2199	2268
4500	3375	1549 (1687)	1549 (1804)	1549 (1809)	1937 (2000)	1937 (2119)	1937 (2143)	2366	2421 (2487)	2421 (2529)
4000	3000	1549 (1901)	1549 (2023)	1549 (1984)	1937 (2262)	1937 (2385)	1937 (2365)	2421 (2687)	2421 (2811)	2421 (2808)
3600	2700	1549 (2083)	1601 (2206)	1603 (2122)	1937 (2486)	1937 (2611)	1937 (2544)	2421 (2963)	2421 (3088)	2421 (3037)
3200	2400	1591 (2265)	1710 (2388)	1688 (2254)	1937 (2713)	2008 (2838)	2014 (2717)	2421 (3245)	2421 (3370)	2421 (3261)
3000	2250	1645 (2353)	1764 (2476)	1728 (2317)	1949 (2823)	2075 (2948)	2066 (2799)	2421 (3383)	2437 (3507)	2456 (3368)
2800	2100	1698 (2438)	1817 (2561)	1768 (2375)	2014 (2930)	2140 (3054)	2117 (2878)	2421 (3516)	2518 (3640)	2521 (3471)
$0.15f'_c$ Lateral limit#3		1291			1614			2018		
Max Blade Length#2		1500 (0.5 to 1.0%)	2500 (1.0 to 2.2%)		600 (0.5 to 1.0%)	2500 (1.0 to 2.2%)		600 (0.5 to 1.0%)	2500 (1.0 to 2.2%)	

1546 (1687) - lower value where clause 10.7.3.1(2) applies
#1 Compression reinforcement ignored in accordance with clause 11.7.4(b)
#2 Max Blade Length from WSU Report Fig 16 for Standard AFS detailed Blades with U-bars and no ties with Adjustment Factor to AS3600-2018 ≥ 1.0
#3 Clause 14.6.2 Boundary Element limit if acting as part of Lateral System, refer WSU Report p4 Note 6

RW275S Minimum Reinforcement

RW275S	Vertical Bars - Each Face				
Allowable Bars	N12	N16	N20	N24	N28
N12 Horizontal					
N16 Horizontal					

Horizontal Bar Spacing 240
Vertical Bar Spacing 150 to 350

Acceptable
With Caution
Not Recommended

RW300S Blade Column

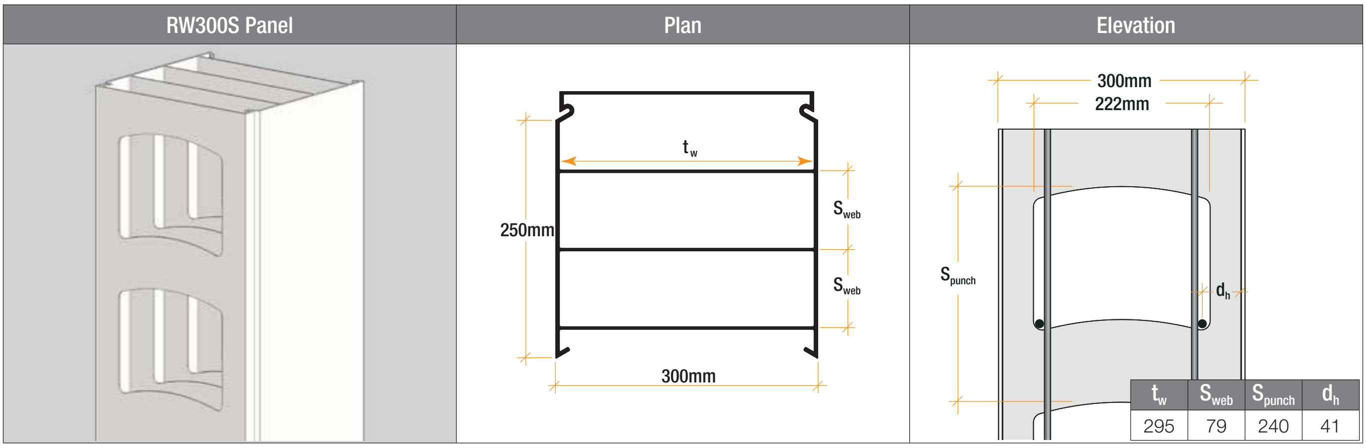
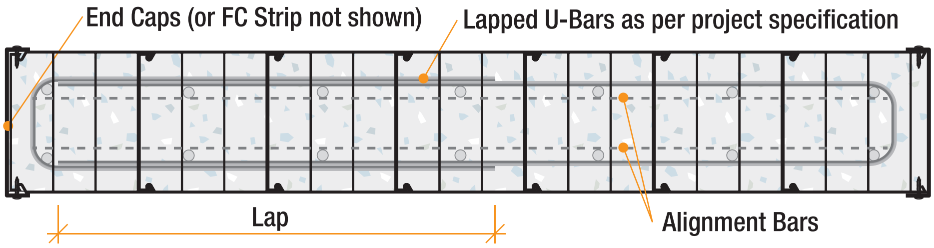


Fig 11: RW300S typical Blade Column



RW300S Blade Column Axial Capacity $\varnothing N_u$ (kN/m) Non-Ductile 2 Layers

AFS Rediwall® Axial Loaded Blade Columns with U-bars in lieu of ties in accordance with "AFS Logicwall® and AFS Rediwall® axial-flexural interaction curve generation numerical and theoretical investigations", Western Sydney University and AS3600-2018 Amdt 2 clause 11.7.4(b) Restraint.

		$\varnothing N_u$(kN/m), Vertical Bars, f'_c 32 Mpa			$\varnothing N_u$(kN/m), Vertical Bars, f'_c 40 Mpa			$\varnothing N_u$(kN/m), Vertical Bars, f'_c 50 Mpa		
ecc < $^1/_6$	H_{wu}(k=1.0)	2N16-300	2N20-300	2N24-200	2N16-300	2N20-300	2N24-200	2N16-300	2N20-300	2N24-200
H_{wu}(k=0.75)	H_{we}	0.0046	0.0071	0.0107#1	0.0046	0.0071	0.0107#1	0.0046	0.0071	0.0107#1
5500	4125	1659	1693 (1779)	1693 (1807)	1963	2083	2117	2318	2437	2504
5000	3750	1693 (1843)	1693 (1976)	1693 (1976)	2117 (2185)	2117 (2321)	2117 (2341)	2585	2646 (2723)	2646 (2763)
4500	3375	1693 (2053)	1693 (2191)	1693 (2150)	2117 (2442)	2117 (2582)	2117 (2561)	2646 (2899)	2646 (3041)	2646 (3039)
4000	3000	1693 (2276)	1758 (2416)	1758 (2322)	2117 (2717)	2117 (2859)	2117 (2783)	2646 (3239)	2646 (3382)	2646 (3322)
3600	2700	1731 (2456)	1866 (2595)	1842 (2454)	2117 (2941)	2189 (3082)	2196 (2955)	2646 (3516)	2646 (3658)	2646 (3544)
3200	2400	1837 (2628)	1972 (2766)	1923 (2575)	2177 (3156)	2320 (3296)	2300 (3116)	2646 (3785)	2727 (3926)	2736 (3754)
3000	2250	1889 (2709)	2024 (2846)	1961 (2632)	2241 (3258)	2385 (3397)	2350 (3191)	2656 (3913)	2807 (4052)	2800 (3853)
2800	2100	1939 (2785)	2075 (2922)	1998 (2685)	2305 (3354)	2448 (3492)	2398 (3261)	2735 (4034)	2885 (4172)	2862 (3945)
$0.15f'_c$ Lateral limit#3		1411.2			1764			2205		
Max Blade Length#2		1500 (0.5 to 1.0%)	2500 (1.0 to 2.2%)		600 (0.5 to 1.0%)	2500 (1.0 to 2.2%)		600 (0.5 to 1.0%)	2500 (1.0 to 2.2%)	

1693 (1843) - lower value where clause 10.7.3.1(2) applies
#1 Compression reinforcement ignored in accordance with clause 11.7.4(b)
#2 Max Blade Length from WSU Report Fig 16 for Standard AFS detailed Blades with U-bars and no ties with Adjustment Factor to AS3600-2018 ≥ 1.0
#3 Clause 14.6.2 Boundary Element limit if acting as part of Lateral System, refer WSU Report p4 Note 6

RW300S Minimum Reinforcement

RW300S	Vertical Bars - Each Face (min. N12-350)				
Allowable Bars	N12	N16	N20	N24	N28
N12 Horizontal					
N16 Horizontal					

Horizontal Bar Spacing 240
Vertical Bar Spacing 150 to 350

Acceptable
With Caution
Not Recommended

AFS Rediwall® Fire Performance

AFS Rediwall® has been fire tested and assessed. Stephen Grubits & Associates (SGA) have analysed the fire-resistance of afs rediwall® to be in accordance with AS 3600-2018 allowing the FRP of afs rediwall® to be determined for structural adequacy, integrity and insulation.

For more details, refer to the SGA report 2013/277.26 R.1.1 Issued 9/9/2019 “Fire-Resistance of Rediwall® – Determination in accordance with AS 3600”[3].

Fire Rated Junctions

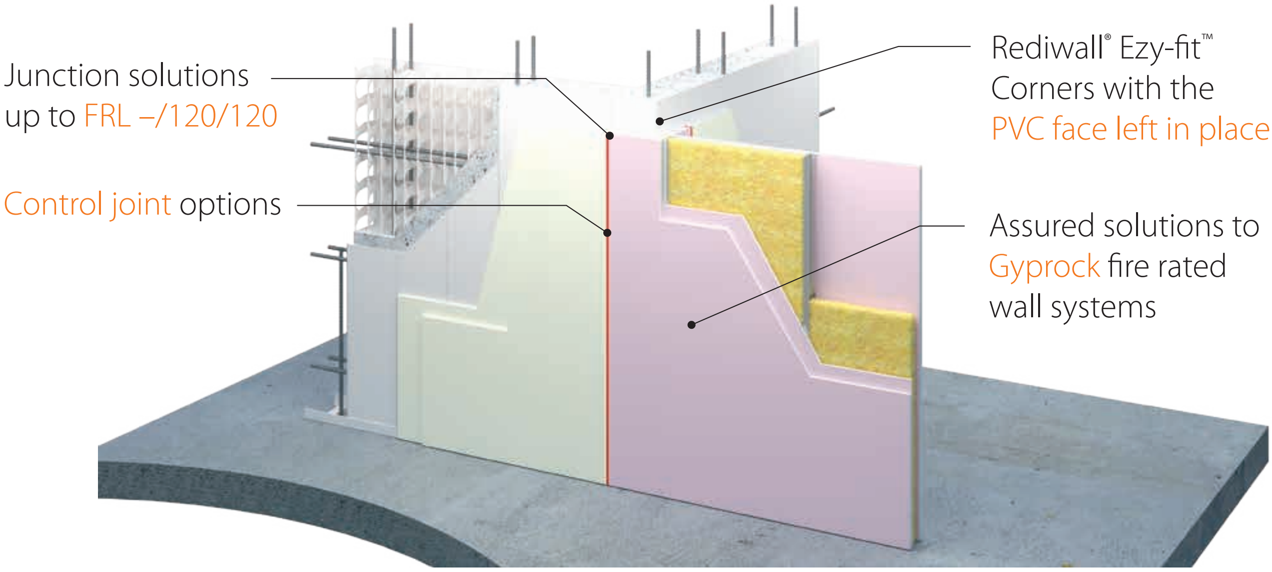
A range of fire junction solutions have been fire tested and assessed to AS1530.4–2014 for the easy integration of various fire rated system and Rediwall®.

The junction details include options to connect afs rediwall® with pvc face left in place, to:

- CSR Gyprock Fyrchek
- CSR Gyprock Shaft Liner Panel
- CSR Hebel
- Concrete and concrete masonry wall systems

For a additional information refer to "afs rediwall® fire rated junction guide" or contact afs.

Fig 12: Example of a fire rated junction



Rediwall® Floor Track and Panel Fixing

1. Position the Rediwall® floor track or angles at the correct column location and fix the track to the slab.

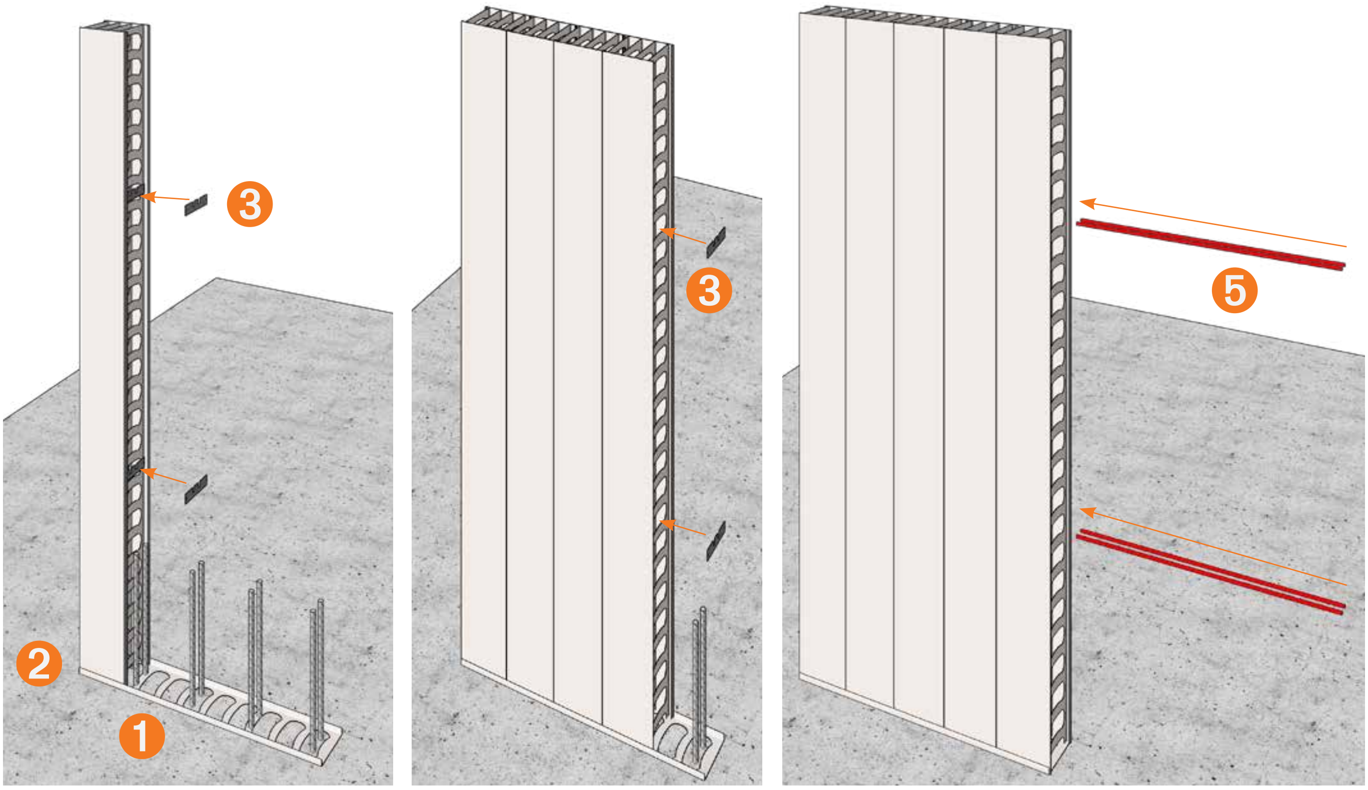
2. Screw fix each Rediwall® panel to the floor track on both sides of the panel.

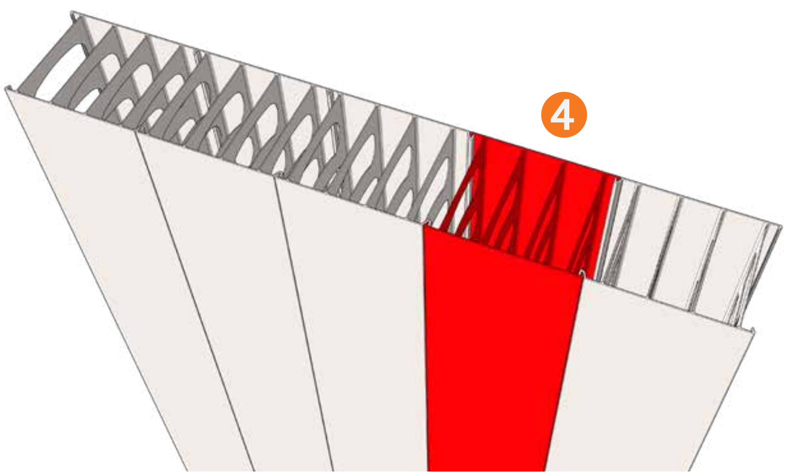
3. Vertical bar locators (VBL) and alignment bars can be used to assist with location and installation of the vertical reinforcement. Once sufficient number of Rediwall® panels are fixed in place, fix the VBL to the inside web face of the afs rediwall® panel at the desired locations of the vertical bar alignment guides.

4. If using the RW200C FF Column Panel, it is recommended that it be used at least 1 full panel from the end of the column. The RW200C FF Column Panel **CANNOT** be use as the end panel.

5. If VBL are used, slide the alignment bar (R10) through the VBL.

Note: These guide bars are **NOT** to be considered as part of the wall structural reinforcement**.**





U-Bar Installation

1 Insert the U-Bars into the Column at the required spacings. Refer to engineers details.

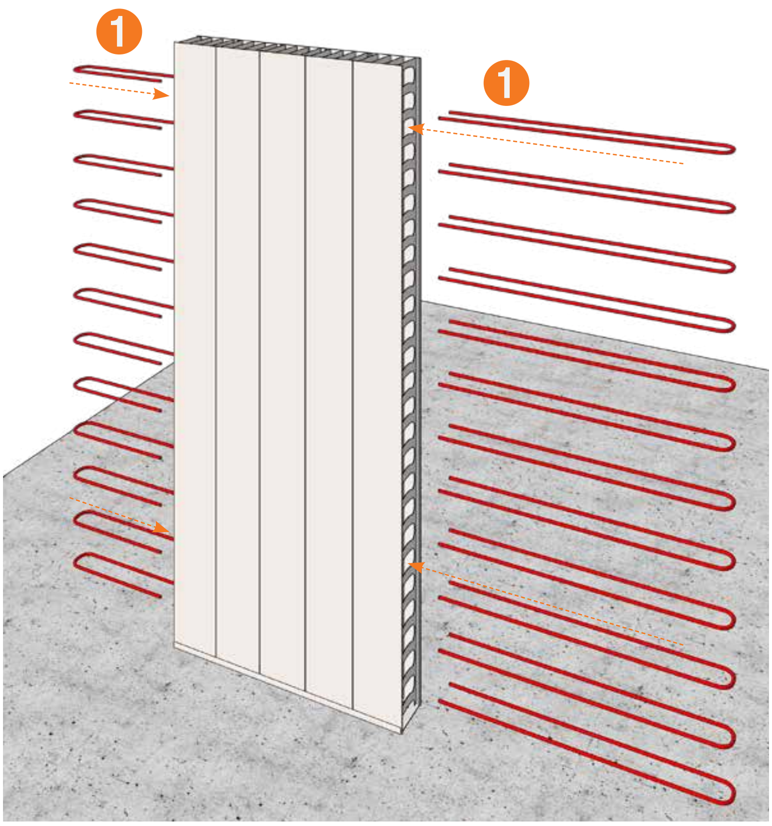
2 The vertical reinforcement bars are then lowered into the Rediwall® panel, at the correct locations. Ensure that the vertical bars are on the internal side horizontal U-bars, and on the outer side of the alignment bars.

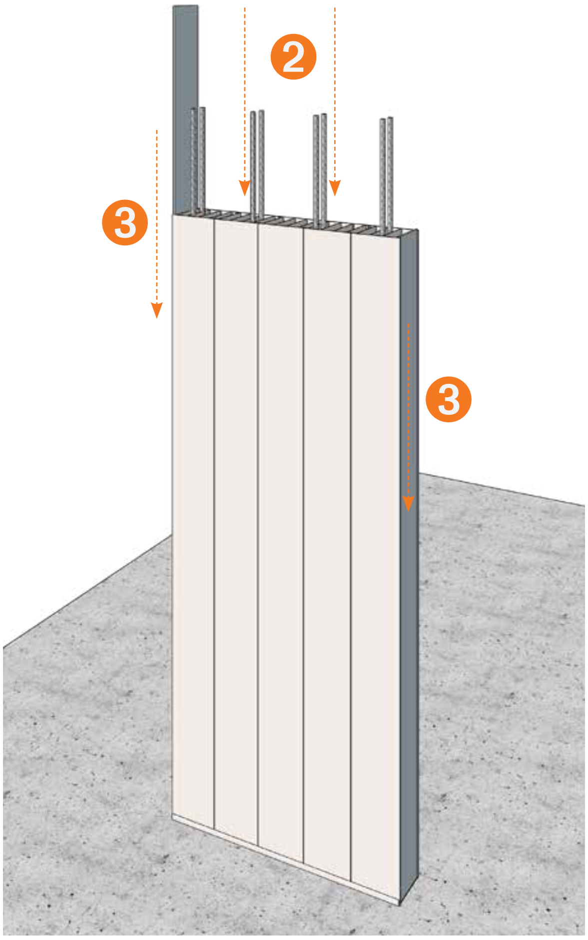
Note: A small 20mm bend at the base of the vertical bar can be used to “joggle” the bar past the horizontal bars.

The offset makes it easy when lowering the vertical reinforcing bars into the wall to weave it in between the locator bars and the outer horizontal reinforcing bars.

A mark on the vertical joggle bars can facilitate locating the alignment bars so that the joggle bars can be paused just above the horizontal locator bar can speed up reinforcement installation.

3 Insert the two fibre cement end caps into the Rediwall® panel clips. Ensure that the column is fully braced.





Definitions

AFS Blade Column	A short Blade Wall designed and detailed with U-bars in lieu of ties to WSU Advanced Design Methods in accordance with AS3600-2018.
AFS Column	A column designed and detailed with ties to AS3600-2018 Section 10 Columns.
AFS Limited Ductile Walls	Walls designed in accordance with AS3600-2018 Section 2.2 Strength and clauses 14.4 General Earthquake Requirements and 14.6 Limited Ductile Walls.
AFS Non-ductile Walls	Walls designed in accordance with AS3600-2018 Section 2.2 Strength and clauses 14.4 General Earthquake Requirements.

Reference

1. "AFS Logicwall® and AFS Rediwall® axial-flexural interaction curve generation numerical and theoretical investigation", Centre for Infrastructure Engineering, Western Sydney University
2. "AS3600-2018 Concrete Structures Code"
3. "Fire-Resistance of Rediwall® – Determination in accordance with AS3600", SGA Report 2013/277.26 R1.1 issued 9/9/2019

Notes

Notes

Disclaimer:
This afs rediwall® document is intended to represent good building practice in achieving structural design of Rediwall®.This section is not intended in any way by AFS to represent all relevant information required on a project. It is the responsibility of those using and designing Rediwall®, including but not limited to builders, designers, consultants and engineers to ensure that the use of Rediwall® complies with all the relevant National Construction Code (NCC) requirements such as, but not limited to structural adequacy, acoustic, fire resistance/combustibility, thermal, and weatherproofing provisions. All diagrams, plans and illustrations used in this section, including any reinforcement shown, are supplied for indicative and diagrammatic purposes only. It remains the responsibility of those using Rediwall® to ensure that reference is made to the project engineer's structural details for all construction and reinforcement requirements.

Important legal statements:
Reasonable efforts have been made to ensure the accuracy of this publication; however, any information or data contained herein is subject to change without notice. To ensure the information you are using is correct, AFS recommends you review the latest technical information available on the AFS website www.afsformwork.com.au, or alternatively call 1300 727 237 to speak to a Technical Representative.

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