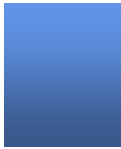


# PROVISTA

BALUSTRADE SYSTEMS

## SEMI FRAMELESS GLASS



"THE CHOICE IS CLEAR"



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- 2.** General Notes
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- 10.** Gutter Bracket Design
- 11.** Base Plate Design – Semi Frameless
- 12.** Handrail Dimensions

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# COMMERCIAL & RESIDENTIAL BALUSTRADE DESIGN

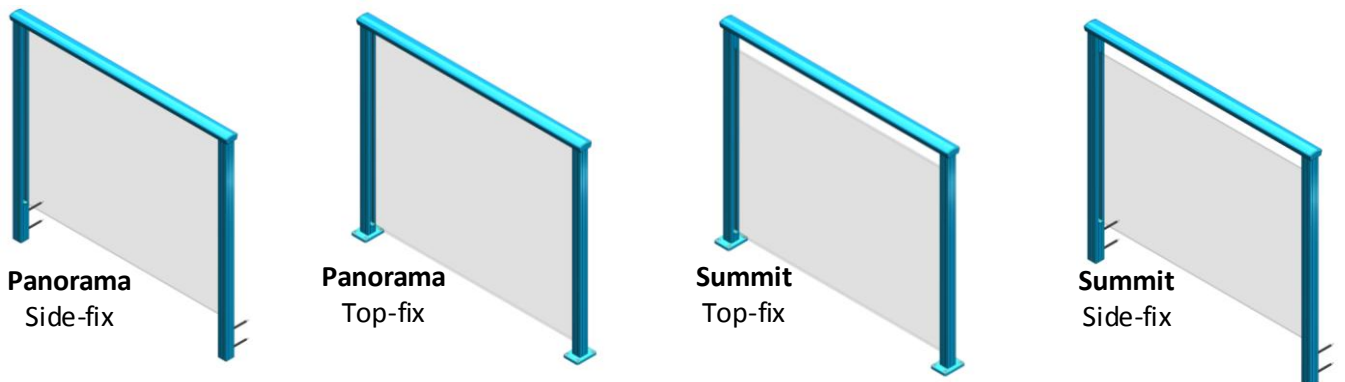
## Semi Frameless Glass Balustrade

### Description:

Provista Balustrade Systems Semi-frameless balustrade systems feature modern aluminum post and handrail profile designs suiting both classic and contemporary building design. Hidden post-fixings when face-fixing to a deck structure provide an ultra-dean look. There's a choice of flat or rounded handrail profiles and infill panels can be toughened or laminated safety glass. The two main styles are Summit, providing a gap between top edge of the glass and the handrail, and Panorama, where the glass continues into the handrail rebate.

### Key Features:

- Designed for residential and commercial applications including apartment balconies and decks
- Suitable for both interior or exterior applications, including pool fencing and gates
- Hidden-fixings for face-fixed solutions
- Choice of 10 or 12mm toughened or >15mm laminated safety glass
- Designed for all building structures including membrane decks
- Provista Euro Slat screening can also be used as the infill panel
- T6 Temper Grade alloy used for all profiles, providing approx. 20% increased strength for greater post spacings
- Multiple finish options – can be powder-coated or anodised in all available NZ colours, including Dulux Duratec powder coating for high-corrosion zones
- National design service to assist with project specific design and detailing
- National network of fabricators and installers
- Complies with AS/NZS 1170, NZS3603, AS/NZS 1664, AS/NZS 2208 and NZS 4223.3 2016
- 5 year warranty on balustrade, 10 year warranty on Dulux Duralloy powder-coating, 20 year warranty on Dulux Duratec powder-coating



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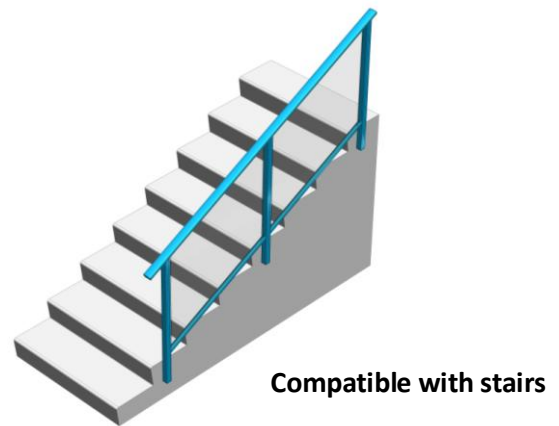
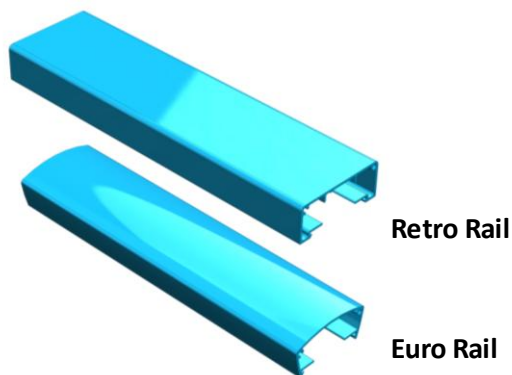
## Scope of Use:

Provista Semi-frameless solutions are designed to comply with A, B, E and C3 loadings for residential and commercial occupancy types and are suitable for decks, balconies, stairways, pool fences and gates.

Suitable building structures can be timber, concrete, steel and typical combinations of each. Provista Semi-frameless solutions can also be used in conjunction with the Provista Gutter Bracket – a robust stainless steel product designed to be specified where membrane decks and gutters are required.

A rectangular ('Retro') handrail and rounded ('Euro') handrail options are available or a stainless interlinking rail could be used if required, affixed directly to the top edge of the glass. The Provista Semi-frameless solutions can include a glass infill panel, or euro Slat screening, or combination of both.

Address or Site-specific design and Producer Statements can be arranged as required.



## Limitations on Use:

- Provista Semi-frameless solutions should only be used in accordance with the Provista Technical Manual. The Manual confirms post spacings and fixing methods available
- Not suitable for Commercial Occupancy Type C5
- 1<sup>st</sup> Grade Toughened Safety Glass must be minimum 100Mpa
- Specified for use in Very High Wind Zones but Site Specific PS1 and Calculations can be provided for Extreme Wind Zones
- For high corrosion zones use Dulux Duratec powder-coating

## NZS 3604 MAXIMUM SUITABILITY



## Very High Wind Zone

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## In-service History:

Provista has over 10 years of balustrade and pool fence design, development and installation experience across New Zealand. Provista products are designed and manufactured for NZ conditions. The Provista Semi-frameless styles have been installed in thousands of homes, apartments, schools, aged care villages etc. Many kilometres of Provista Semi-frameless glass solutions are installed across the length and breadth of NZ.

## Statement of Building Code Compliance:

- Provista Balustrade Systems solutions have been designed and tested by independent engineers to comply with:
  - o AS/NZS 1170 Structural Design Actions
  - o NZS3603 Timber Structures Standard
  - o AS/NZS 1664 Aluminium Structures – allowable stress design
  - o AS/NZS 2208 Safety Glazing Materials in Buildings
  - o NZS 4223.3 2016 Glazing in Buildings – Human Impact Safety Requirements
- Summit and Panorama Semi-frameless styles are designed for Occupancy A, B, E and C3
- Designs are engineered to comply with B1, B2, F2 and F4 of the NZ Building Code
- For applications outside the Provista Technical Manual specifications a Site Specific PS1 can be prepared upon request

## NZBC DESIGNED TO COMPLY

**B1**

**B2**

**F2**

**F4**

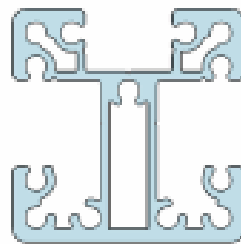
Structure Durability Hazardous Materials Safety From Falling

Exclusive to Provista Balustrade Systems

Standard and heavy duty Ultra 3 way posts for unparalleled Strength and Versatility.  
50mm x 50mm Standard post or 53mm x 53mm Ultra post for maximum post spacings.



**31557**  
**Standard post**  
**50x50**



**33142**  
**Ultra post**  
**53x53**

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## General Notes

### GENERAL NOTE :

- (1) THE BALUSTRADE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE ARCHITECTS AND ENGINEERS DRAWINGS.
- (2) ALL DIMENSIONS AND LEVELS ARE TO BE CHECKED ON SITE AGAINST THE ARCHITECTS AND ENGINEERS DRAWINGS PRIOR TO COMMENCING WORK – ANY VARIATIONS OR DISCREPANCIES ARE TO BE REFERRED TO THE CONSULTANT FOR RESOLUTION.
- (3) ALL WORK IS TO COMPLY WITH THE NZ BUILDING CODE.
- (4) REMOVE ALL EXCESS MATERIALS AND RUBBISH FROM SITE AND REINSTATE ANY DAMAGE ON COMPLETION OF WORK.
- (5) THE CONSULTANTS ARE TO BE GIVEN 24 HOURS NOTICE FOR ANY SITE INSPECTIONS AS REQUIRED – A PS4 CANNOT BE PROVIDED (PRODUCER STATEMENT FOR CONSTRUCTION REVIEW) IF THE CONSULTANT IS NOT INFORMED OF AND INSPECTS ANY WORK REQUIRING A SPECIFIC INSPECTION AS REQUIRED BY THE LOCAL TERRITORIAL AUTHORITY.

### EXISTING SUPPORT STRUCTURE:

- (1) THE EXISTING DECK, BALCONY OR PAVING STRUCTURE MUST HAVE BEEN CONSTRUCTED TO COMPLY WITH THE LOCAL TERRITORIAL AUTHORITY REGULATIONS AND REQUIREMENTS. THE NZ BUILDING CODE AND NZS 3604.
- (2) ALL CONCRETE USED IS TO HAVE A CRUSHING STRENGTH OF 20 MPA AT 28 DAYS AND IS TO COMPLY WITH NZS 3109.
- (3) ALL WELDS ARE TO BE 5MM FILLET WELDS ALL ROUND UNLESS NOTED OTHERWISE – ALL WELDING TO BE CARRIED OUT BY WELDERS QUALIFIED IN ACCORDANCE WITH NZS4711.
- (4) ALL BOLTS AND BRACKETS ARE TO BE HOT DIP GALVANISED UNLESS NZS 3604: 1999 CORROSION ZONE TABLES REQUIRE A BETTER PROTECTION.
- (5) ALL CHEMSET ANCHORS TO BE FIXED TO MANUFACTUR'S SPECIFICATION.
- (6) ALL STEELWORK IS TO BE PROTECTED AS REQUIRED BY THE NZ BUILDING CODE.

### NEW CONSTRUCTION NOTES:

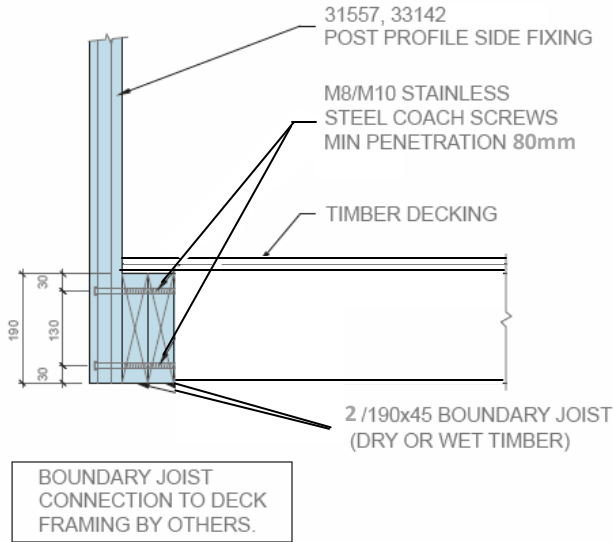
- (1) THE EXISTING SUPPORTING STRUCTURE DETAILS ARE NOT COVERED BY THESE DRAWINGS.
- (2) THESE DRAWINGS ONLY COVER INSTALLATION DETAILS OF THE NEW STAINLESS STEEL BALUSTRADE AND GLASS FENCE/HANDRAIL.
- (3) ALL BOLTS CLASS 80 AND BRACKETS ARE TO BE 316 STAINLESS STEEL.
- (4) ALL DYNABOLTS OR CHEMSET CONCRETE ANCHORS TO BE CLASS 80 STAINLESS STEEL AND FIXED TO MANUFACTURER'S SPECIFICATION.
- (5) ALL DAMAGE TO EXISTING STRUCTURE CAUSED BY CONSTRUCTION TO BE REINSTATED.
- (6) PREVENT CONTACT BETWEEN ALL DISSIMILAR MATERIALS IE: GALVANISED STEEL AND ALUMINIUM BY SEPARATING WITH NEOPRENE WASHERS.
- (7) ALL GLASS PANELS ARE TO BE TOUGHENED GLASS TO COMPLY WITH THE NZ BUILDING CODE.
- (8) ALL GLASS PANELS ARE TO BE SEATED ON NYLON WASHERS OR BUSHES AT ALL SUPPORT BRACKETS AND BOLTS.
- (9) ALL SEALANTS ARE TO COMPLY WITH THE REQUIREMENTS FOR THE SPECIFIC USE INTENDED DURING CONSTRUCTION.



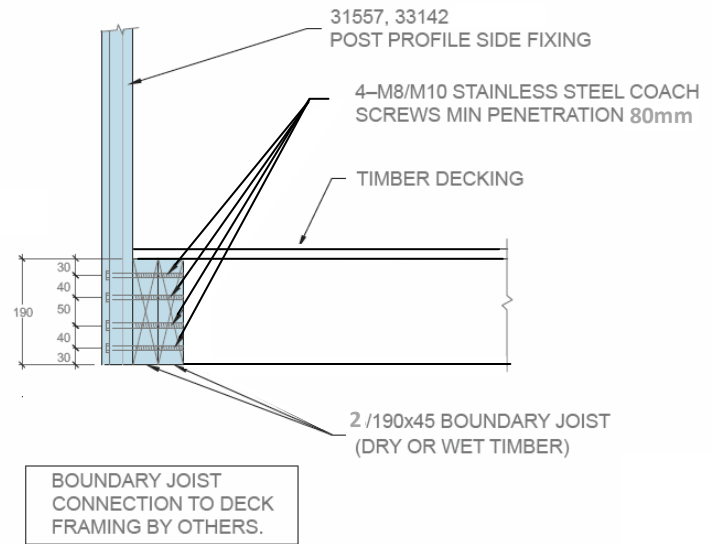
DRAWING SHEET #: G01  
REVISION: A  
DATE: 10 NOVEMBER 2016

SEMI FRAMELESS GLASS

Connection Type 1– Timber Side-Fix 2 x 190x45 (Coach Screws)



1a CONNECTION TYPE 1A – SIDE FIXING TO 2/190X45 TIMBERS WITH 2 COACH SCREWS  
SCALE 1:10



1b CONNECTION TYPE 1B – SIDE FIXING TO 2/190X45 TIMBERS WITH 4 COACH SCREWS  
SCALE 1:10

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*Structural & Engineering Design*

DRAWING SHEET #: S02  
REVISION: A  
DATE: 29 August 2017  
PLEASE REFER TO GENERAL NOTES.

Balustrade Spacing summary Table to NZS:1170 Minimum Imposed Action to Barrier and NZS:3604 Very High Wind

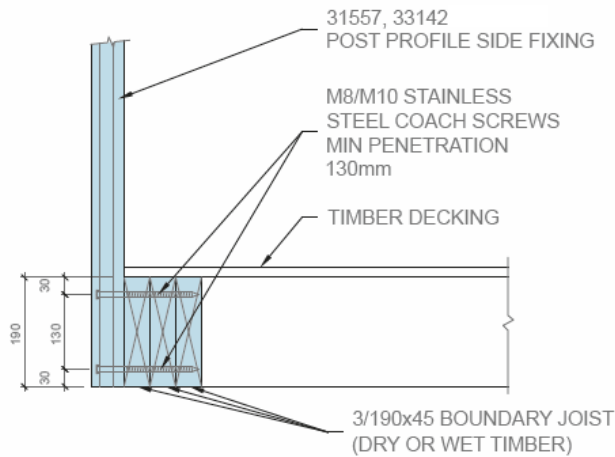
Balustrade Height	Post Section Model	Fixing Type	Maximum Post Spacing (M)			
			Type 1a & 1b			
			Coach Screw with HIT-RE 500 Epoxy Side Fixing to Timber Deck			
			2/190x45 Boundary Joist			
			2/M10 Dry	4/M8 Dry	4/M10	
		Dry	Wet			
1M	31557 Standard	Side	0.80	0.90	1.10	0.85
	33142 Ultra	Side	0.80	0.90	1.10	0.85
1.1M	31557 Standard	Side		0.80	1.00	0.80
	33142 Ultra	Side		0.80	1.00	0.80
1.2M	31557 Standard	Side			0.85	
	33142 Ultra	Side			0.85	

The above table summarises the maximum balustrade post spacing that can be achieved based on balustrade post strength and connection strengths using Hilti HIT-RE Epoxy.

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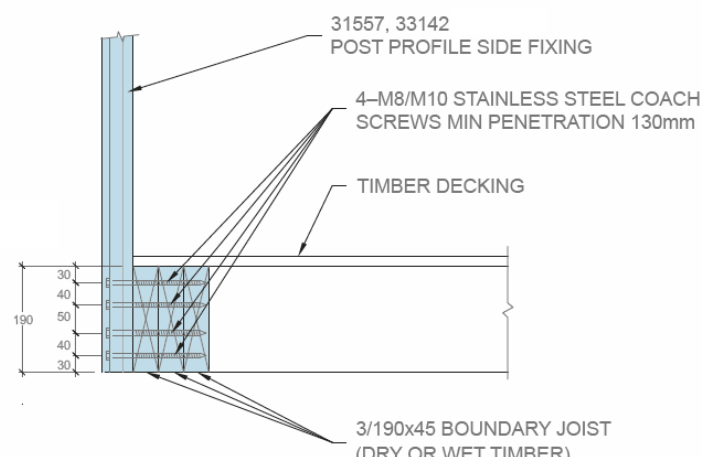
**SEMI FRAMELESS GLASS**

**Connection Type 1 – Timber Side-Fix 3 x 190x45 (Coach Screws)**



BOUNDARY JOIST  
CONNECTION TO DECK  
FRAMING BY OTHERS.

**1a** CONNECTION TYPE 1A – SIDE FIXING TO  
3/190x45 TIMBERS WITH 2 COACH SCREWS  
SCALE 1:10



BOUNDARY JOIST  
CONNECTION TO DECK  
FRAMING BY OTHERS.

**1b** CONNECTION TYPE 1B – SIDE FIXING TO  
3/190x45 TIMBERS WITH 4 COACH SCREWS  
SCALE 1:10

DRAWING SHEET #: S02  
REVISION: A  
DATE: 29 August 2017  
PLEASE REFER TO GENERAL NOTES.

Balustrade Spacing summary Table to NZS:1170 Minimum Imposed Action to Barrier and NZS:3604 Very High Wind

Balustrade Height	Post Section Model	Fixing Type	Maximum Post Spacing (M)					
			Type 1a & 1b					
			Coach Screw with HIT-RE 500 Epoxy Side Fixing to Timber Deck					
			3/190x45 Boundary Joist					
			2/M8	2/M10	4/M8		4/M10	
Dry	Dry	Dry	Wet	Dry	Wet			
1M	31557 Standard	Side	0.95	1.15	1.30	1.00	1.30	1.25
	33142 Ultra	Side	0.95	1.15	1.30	1.00	1.45	1.25
1.1M	31557 Standard	Side	0.85	1.05	1.15	0.90	1.15	1.15
	33142 Ultra	Side	0.85	1.05	1.20	0.90	1.30	1.15
1.2M	31557 Standard	Side	0.70	0.90	1.00	0.80	1.00	1.00
	33142 Ultra	Side	0.70	0.90	1.00	0.80	1.10	1.10

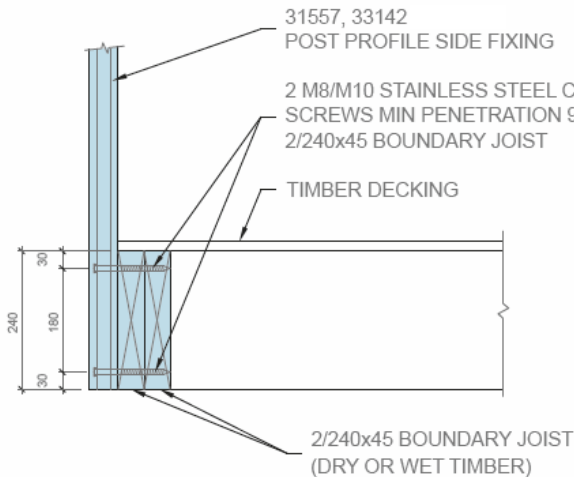
The above table summarises the maximum balustrade post spacing that can be achieved based on balustrade post strength and connection strengths using Hilti HIT-RE Epoxy.

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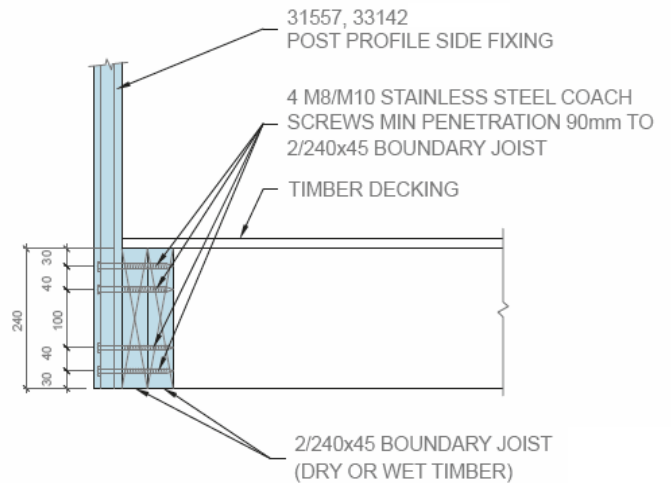
**SEMI FRAMELESS GLASS**

**Connection Type 1 – Timber Side-Fix 2 x 240x45 (Coach Screws)**



BOUNDARY JOIST CONNECTION TO DECK FRAMING BY OTHERS.

**1c** CONNECTION TYPE 1C – SIDE FIXING TO 2/240x45 TIMBERS WITH 2 COACH SCREWS  
SCALE 1:10



BOUNDARY JOIST CONNECTION TO DECK FRAMING BY OTHERS.

**1d** CONNECTION TYPE 1E – SIDE FIXING TO 2/240x45 TIMBERS WITH 4 COACH SCREWS  
SCALE 1:10

DRAWING SHEET #: S03  
REVISION: A  
DATE: 29 August 2017  
PLEASE REFER TO GENERAL NOTES.

Balustrade Spacing summary Table to NZS:1170 Minimum Imposed Action to Barrier and NZS:3604 Very High Wind

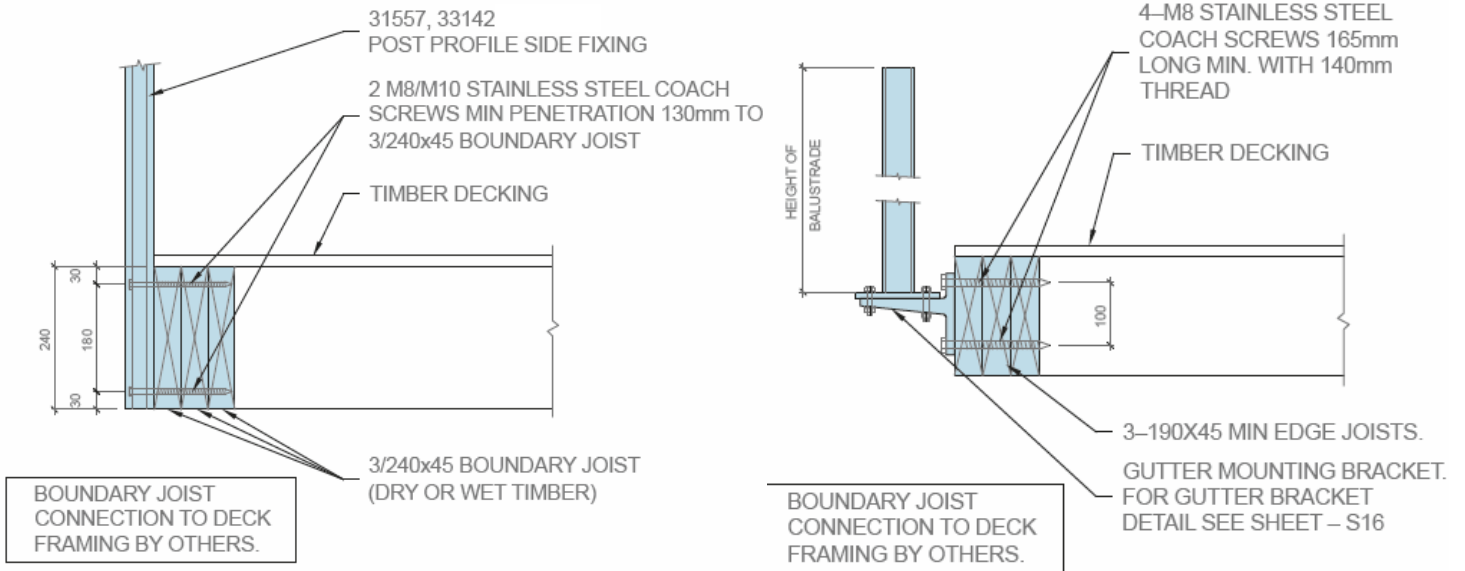
Balustrade Height	Post Section Model	Fixing Type	Maximum Post Spacing (M)							
			Type 1c & 1d							
			Coach Screw with HIT-RE 500 Epoxy Side Fixing to Timber Deck							
			2/240x45 Boundary Joist							
			2/M8	2/M10		4/M8		4/M10		
Dry	Dry	Wet	Dry	Wet	Dry	Wet				
1M	31557 Standard	Side	0.90	1.10	0.85	1.30	1.10	1.30	1.30	
	33142 Ultra	Side	0.90	1.10	0.85	1.40	1.10	1.45	1.35	
1.1M	31557 Standard	Side	0.80	1.00	0.80	1.15	1.00	1.15	1.15	
	33142 Ultra	Side	0.80	1.00	0.80	1.25	1.00	1.30	1.25	
1.2M	31557 Standard	Side		0.85		1.00	0.85	1.00	1.00	
	33142 Ultra	Side		0.85		1.10	0.85	1.10	1.05	

The above table summarises the maximum balustrade post spacing that can be achieved based on balustrade post strength and connection strengths using Hilti HIT-RE Epoxy.

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**SEMI FRAMELESS GLASS**

**Connection Type 1 – Timber Side-Fix 3 x 240x45 (Coach Screws)**



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DATE: 29 August 2017  
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Balustrade Spacing summary Table to NZS:1170 Minimum Imposed Action to Barrier and NZS:3604 Very High Wind

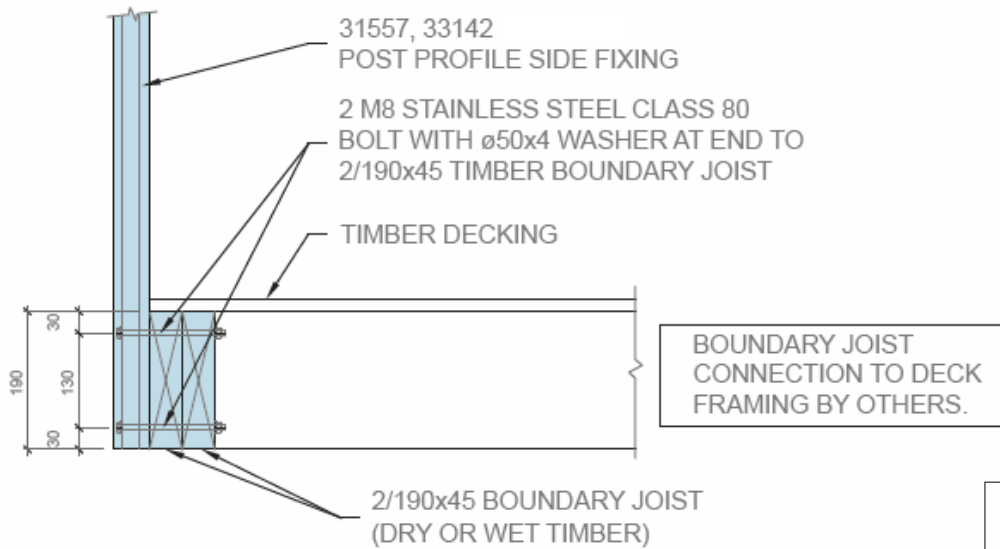
Balustrade Height	Post Section Model	Fixing Type	Maximum Post Spacing (M)					
			Type 1e & 1f					
			Coach Screw with HIT-RE 500 Epoxy Side Fixing to Timber Deck					
			3/240x45 Boundary Joist				3 x 190x45 Boundary joist	
			2/M8		2/M10		4/M8 Gutter Bracket	
			Dry	Wet	Dry	Wet	Dry	Wet
1M	31557 Standard	Side	1.30	1.00	1.30	1.25	1.30	1.00
	33142 Ultra	Side	1.30	1.00	1.45	1.25	1.40	0.90
1.1M	31557 Standard	Side	1.15	0.90	1.15	1.15	1.10	0.90
	33142 Ultra	Side	1.20	0.90	1.30	1.15	1.30	1.15
1.2M	31557 Standard	Side	1.00	0.80	1.00	1.00	1.00	0.80
	33142 Ultra	Side	1.00	0.80	1.10	1.00	1.10	0.80

The above table summarises the maximum balustrade post spacing that can be achieved based on balustrade post strength and connection strengths using Hilti HIT-RE Epoxy.

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SEMI FRAMELESS GLASS

Connection Type 2 – Bolt Side-Fix 2 x 190x45



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**2a** CONNECTION TYPE 2A – SIDE FIXING TO 2/190x45 TIMBERS WITH 2 BOLTS WASHERS & NUTS  
SCALE 1:10

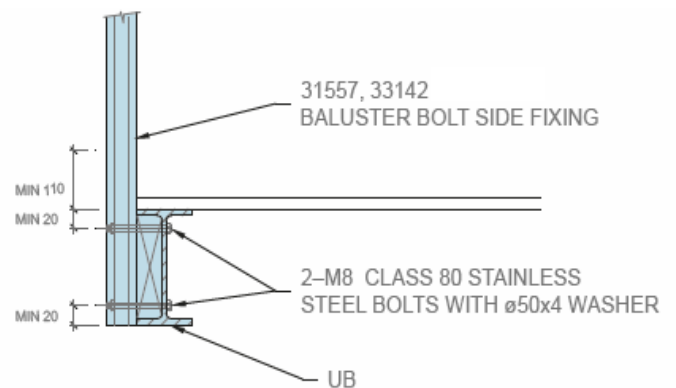
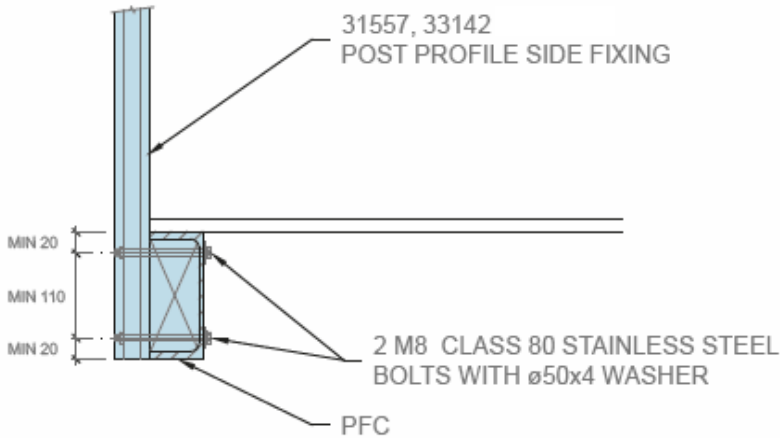
Balustrade Spacing summary Table to NZS:1170 Minimum Imposed Action to Barrier and NZS:3604 Very High Wind

Balustrade Height	Post Section Model	Fixing Type	Maximum Post Spacing (M)	
			Type 2	
			Bolt side fixing to timber 2 x 190x45	
			2/M8	
1M	31557 Standard	Side	1.25	
	33142 Ultra	Side	1.45	
1.1M	31557 Standard	Side	1.15	
	33142 Ultra	Side	1.30	
1.2M	31557 Standard	Side	1.00	
	33142 Ultra	Side	1.10	


The above table summarises the maximum balustrade post spacing that can be achieved based on balustrade post strength and connection strengths.

SEMI FRAMELESS GLASS

Connection Type 2 – Bolt Side Fix Steel Beam



**2b**  
-  
CONNECTION TYPE 2B – SIDE FIXING TO  
STEEL BEAMS WITH 2 BOLTS WASHERS & NUTS  
SCALE 1:10

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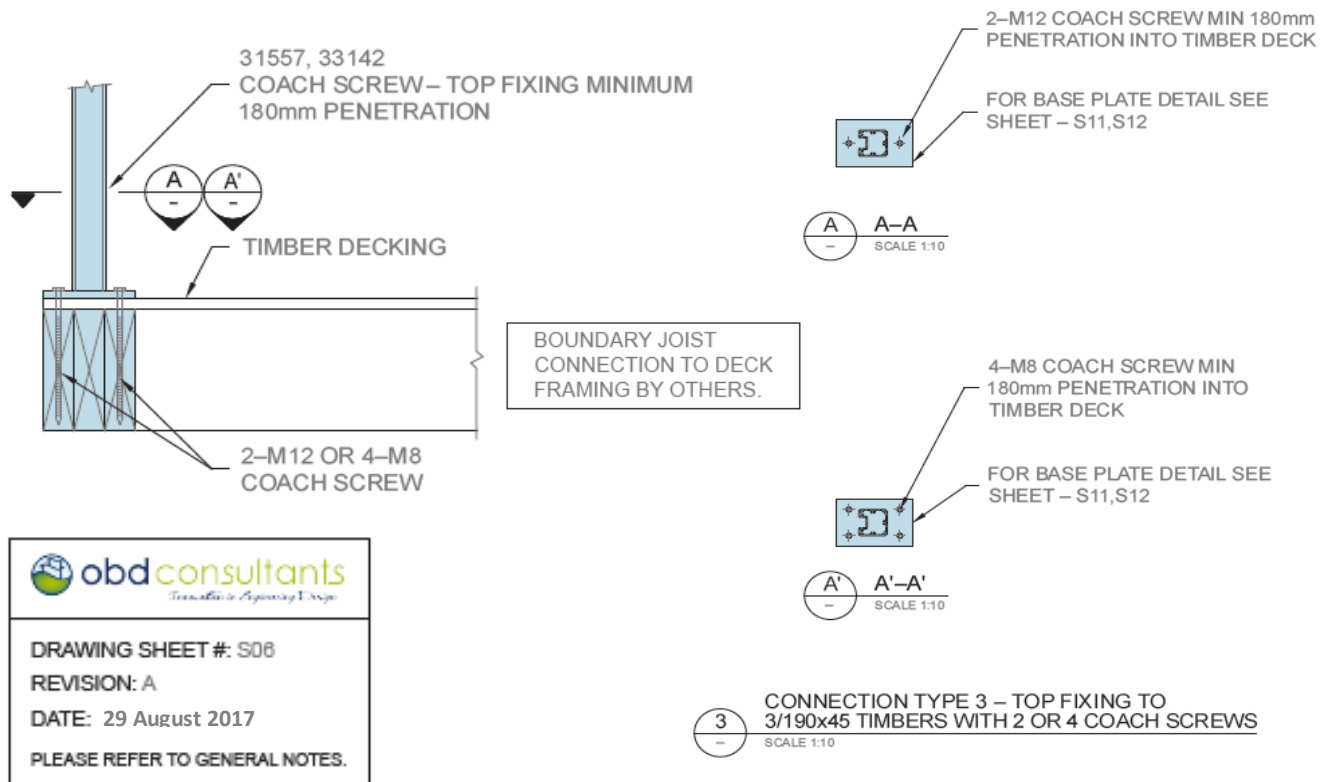
Balustrade Spacing summary Table to NZS:1170 Minimum Imposed Action to Barrier and NZS:3604 Very High Wind

Balustrade Height	Post Section Model	Fixing Type	Maximum Post Spacing (M)	
			Type 2	
			Bolt Side Fix Steel Beam	
			2/M8	
1M	31557 Standard	Side	1.25	
	33142 Ultra	Side	1.45	
1.1M	31557 Standard	Side	1.15	
	33142 Ultra	Side	1.30	
1.2M	31557 Standard	Side	1.00	
	33142 Ultra	Side	1.10	

The above table summarises the maximum balustrade post spacing that can be achieved based on balustrade post strength and connection strengths.

SEMI FRAMELESS GLASS

Connection Type 3 – Timber Top-Fix



Balustrade Spacing summary Table to NZS:1170 Minimum Imposed Action to Barrier and NZS:3604 Very High Wind

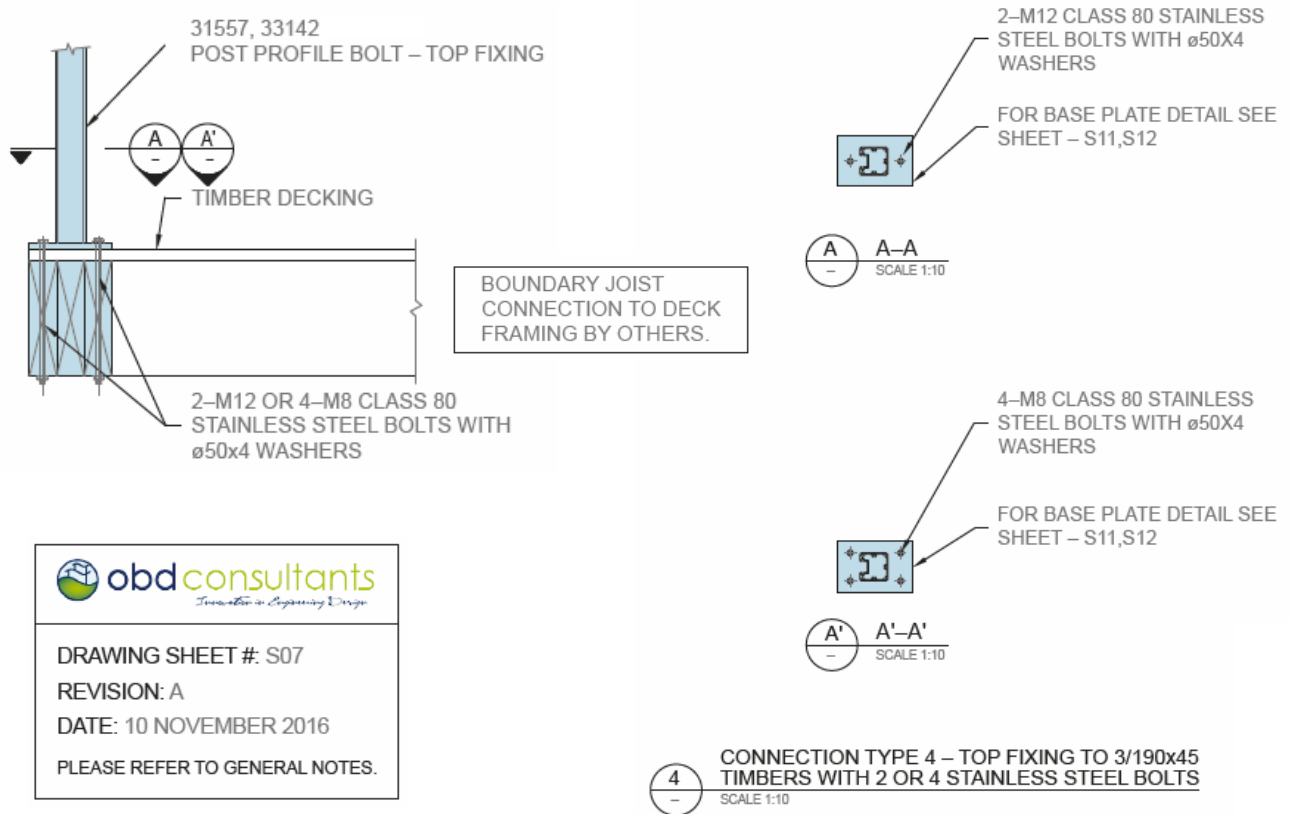
Balustrade Height	Post Section Model	Fixing Type	Maximum Post Spacing (M)			
			Type 3			
			Coach Screw with HIT-RE 500 Epoxy Top Fixing to Timber Deck			
			4/M8		2/M12	
			Dry	Wet	Dry	Wet
1M	31557 Standard	Top	1.05	1.05	1.05	1.05
	33142 Ultra	Top	1.45	1.45	1.45	1.20
1.1M	31557 Standard	Top	0.95	0.95	0.95	0.95
	33142 Ultra	Top	1.30	1.30	1.30	1.10
1.2M	31557 Standard	Top	0.85	0.85	0.85	0.85
	33142 Ultra	Top	1.20	1.20	1.20	1.00

The above table summarises the maximum balustrade post spacing that can be achieved based on balustrade post strength and connection strengths using Hilti HIT-RE Epoxy.

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**SEMI FRAMELESS**

**Connection Type 4 – Timber Top-Fix**



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Balustrade Spacing summary Table to NZS:1170 Minimum Imposed Action to Barrier and NZS:3604 Very High Wind

Balustrade Height	Post Section Model	Fixing Type	Maximum Post Spacing (M)	
			Type 4	
			Bolt Top Fixing Timber Deck	
			4/M8	2/M12
			Dry & Wet	
1M	31557 Standard	Top	1.00	1.00
	33142 Ultra	Top	1.45	1.25
1.1M	31557 Standard	Top	0.95	0.95
	33142 Ultra	Top	1.30	1.15
1.2M	31557 Standard	Top	0.85	0.85
	33142 Ultra	Top	1.20	1.05

The above table summarises the maximum balustrade post spacing that can be achieved based on balustrade post strength and connection strengths.

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SEMI FRAMELESS

Connection Type 5 – Concrete Top-Fix



**5** CONNECTION TYPE 5  
TOP FIXING TO CONCRETE  
SCALE 1:10

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REVISION: A  
DATE: 10 NOVEMBER 2016  
PLEASE REFER TO GENERAL NOTES.

Balustrade Spacing summary Table to NZS:1170 Minimum Imposed Action to Barrier and NZS:3604 Very High Wind

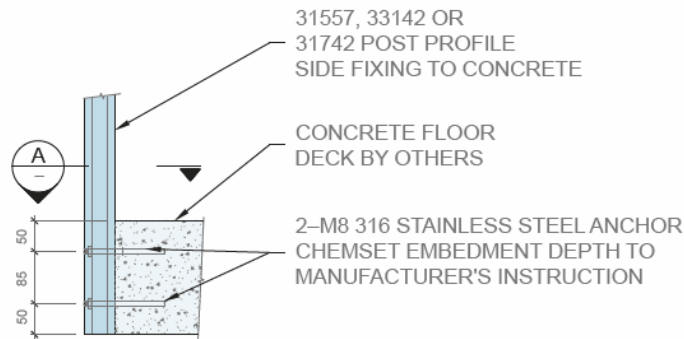
Balustrade Height	Post Section Model	Fixing Type	Maximum Post Spacing (M)	
			Type 5	
			Chemset Anchor Top Fixing Concrete	
1M	31557 Standard	Top	1.00	
	33142 Ultra	Top	1.45	
1.1M	31557 Standard	Top	0.95	
	33142 Ultra	Top	1.30	
1.2M	31557 Standard	Top	0.85	
	33142 Ultra	Top	1.20	

The above table summarises the maximum balustrade post spacing that can be achieved based on balustrade post strength and connection strengths.

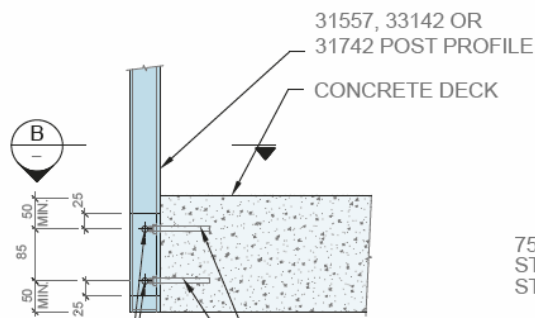
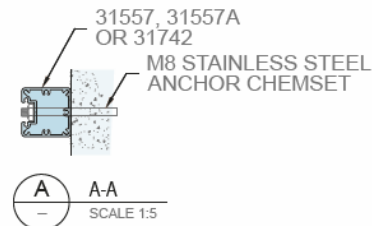
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SEMI FRAMELESS

Connection Type 6 – Concrete Side-Fix



**6a**  
CONNECTION TYPE 6a – SIDE FIXING TO  
CONCRETE WITH STEEL ANCHOR CHEMSET  
SCALE 1:10



**6b**  
CONNECTION TYPE 6b – SIDE FIXING TO  
CONCRETE WITH 75x50x8 STAINLESS STEEL UA  
SCALE 1:10

See Post Spacing table S10

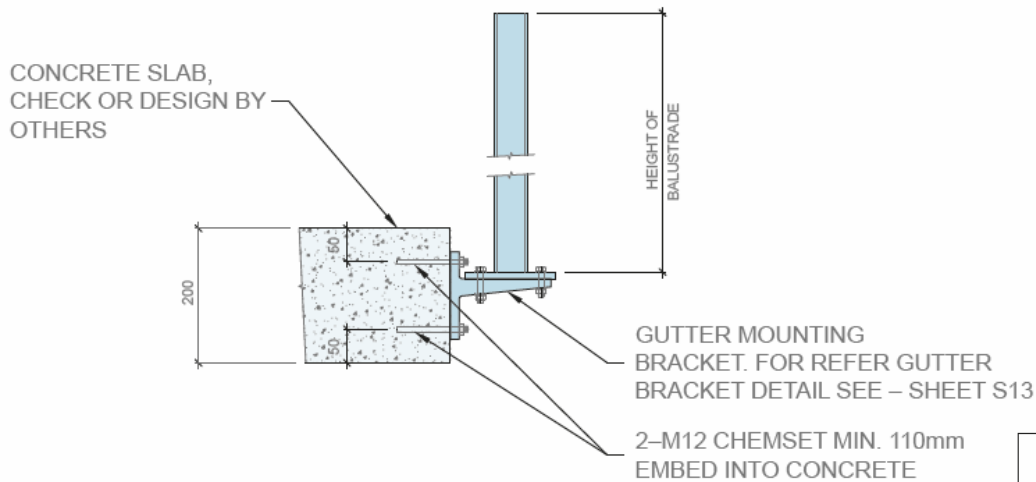
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DRAWING SHEET #: S09  
REVISION: A  
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PLEASE REFER TO GENERAL NOTES.



SEMI FRAMELESS

Connection Type 6 – Concrete Side-Fix



**6c**  
CONNECTION TYPE 6c – SIDE FIXING TO CONCRETE WITH GUTTER MOUNTING BRACKET  
SCALE 1:10

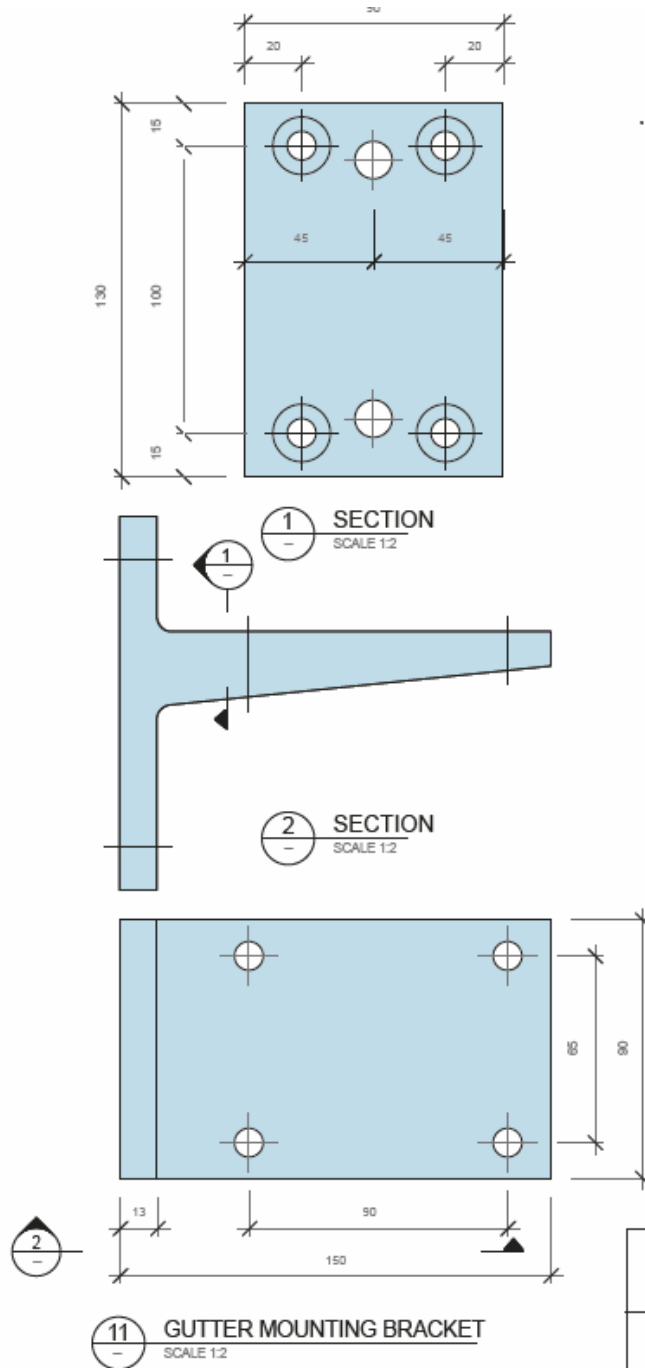
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Balustrade Spacing summary Table to NZS:1170 Minimum Imposed Action to Barrier and NZS:3604 Very High Wind Zone Across

Balustrade Height	Post Section Model	Fixing Type	Maximum Post Spacing (M)	
			Type 6	
			Side Fixing Concrete	
1M	31557 Standard	Side	1.25	
	33142 Ultra	Side	1.45	
1.1M	31557 Standard	Side	1.15	
	33142 Ultra	Side	1.30	
1.2M	31557 Standard	Side	1.00	
	33142 Ultra	Side	1.10	

The above table summarises the maximum balustrade post spacing that can be achieved based on balustrade post strength and connection strengths.

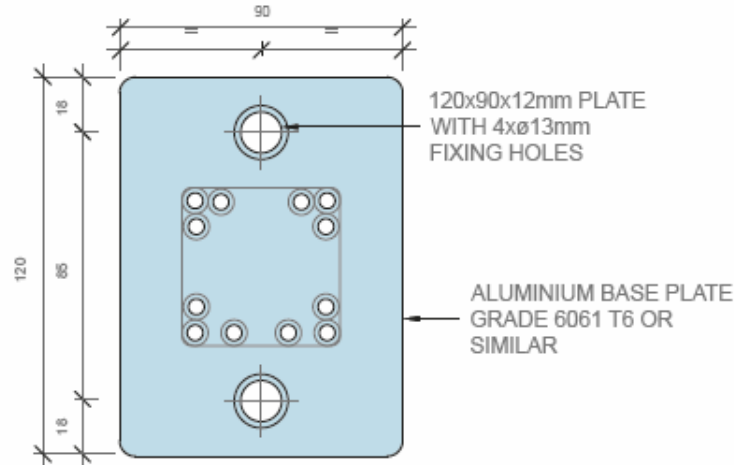
### Gutter Bracket Design



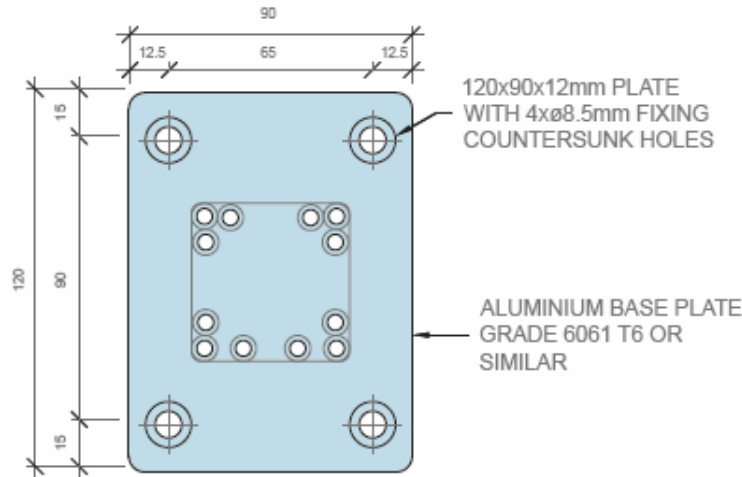
  
*Translating in Engineering & Design*

DRAWING SHEET #: S13  
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Base Plate Design – Semi Frameless



7 PART NO. SC213 BASE PLATE  
SCALE 1:2



8 PART NO. SW485 BASE PLATE  
SCALE 1:2

NOTE - BOTH SC213 AND SW385 BASE PLATES MATE WITH 31557 AND 33142 POST PROFILES

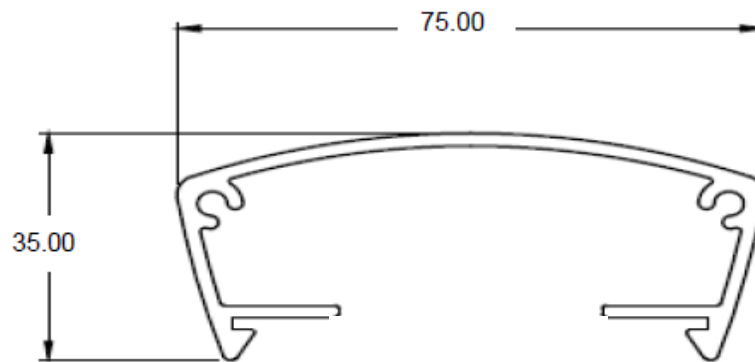


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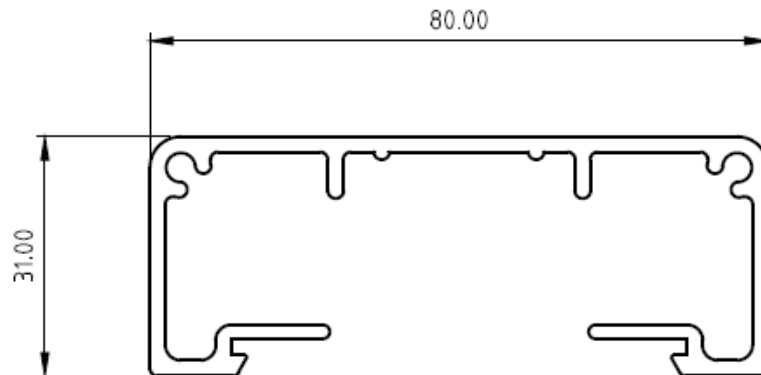
## Handrail Dimensions

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**Euro Handrail**



**Retro Handrail**



“THE CHOICE IS CLEAR”