

# PROVISTA

BALUSTRADE SYSTEMS

## FRAMED GLASS BALUSTRADES



“THE CHOICE IS CLEAR”



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# COMMERCIAL & RESIDENTIAL BALUSTRADE DESIGN

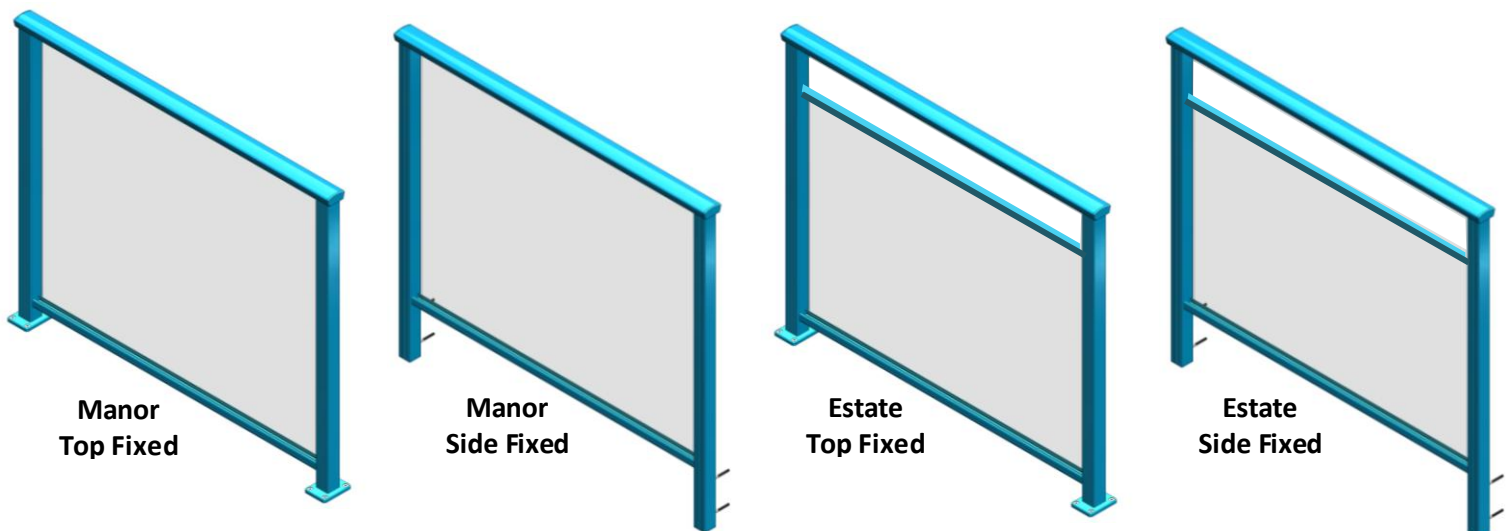
## Framed Glass Balustrades Introduction

### Description:

Provista Balustrade Systems Framed Glass balustrade solutions feature modern aluminium 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 are toughened safety glass. The two main styles are Manor, where the glass is rebated into the upper handrail and a lower rail, and Estate, where there is a gap between the upper handrail and an additional rail. The glass is rebated into this rail and a lower rail.

### Key Features:

- Designed for residential and commercial applications including apartment balconies and decks
- Suitable for both interior or exterior applications
- Hidden-fixings for face-fixed solutions
- The infill is 8mm toughened safety glass in clear or tint
- Designed for all building structures including membrane decks
- 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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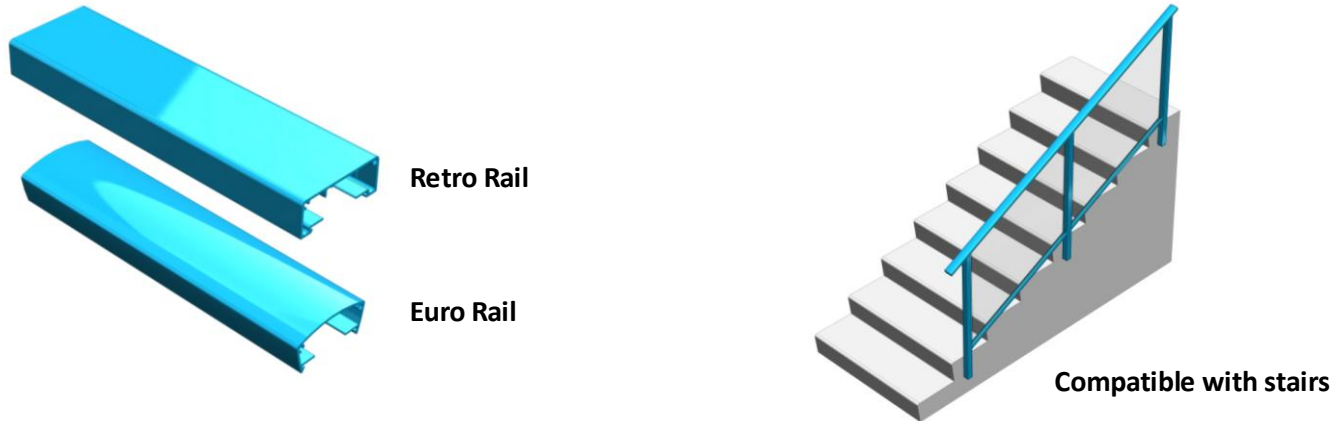
## Scope of Use:

Provista Framed Glass solutions are designed to comply with A, B, E and C3 loadings for residential and commercial occupancy types and are suitable for decks, balconies and stairways.

Suitable building structures can be timber, concrete, steel and typical combinations of each. Provista Framed Glass 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.

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



## Limitations on Use:

- Provista Framed Glass 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 Framed Glass styles have been installed in thousands of homes, apartments, schools, aged care villages etc. Many kilometres of Provista Framed 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
- Manor and Estate Framed Glass 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**

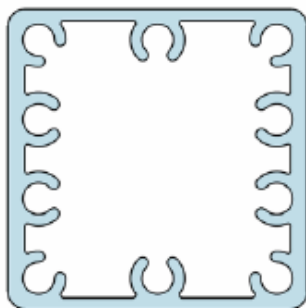
**B2**

**F2**

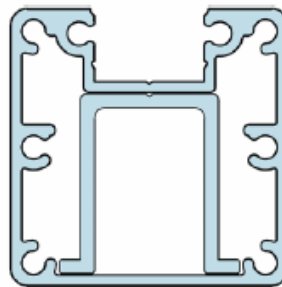
**F4**

Structure   Durability   Hazardous Materials   Safety From Falling

Provista Balustrade Systems Framed Aluminum Post Sections  
50mm x 50mm dedicated top and side fixed post options.



**33143**  
53x53  
Ultra Duty Post



**31742 \*\***  
50x50  
Side Fixed Post

\*\* 31742 profile: The insert shown is only required at the balustrade deck connection point

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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.



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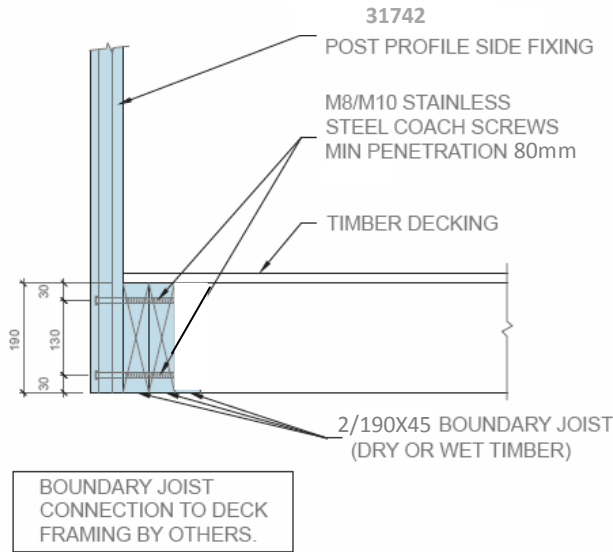
DATE: JULY 2017

PLEASE REFER TO GENERAL NOTES.

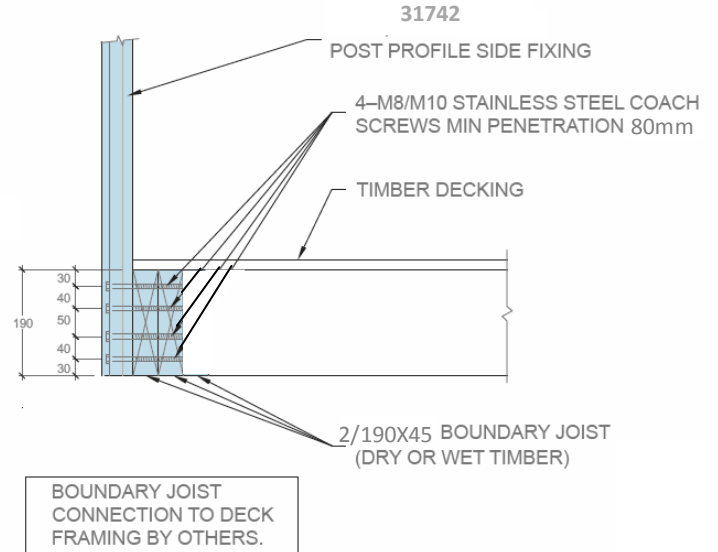
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**FRAMED GLASS BALUSTRADES**

**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

**abd consultants**  
*Timber, Glass & Repairs*

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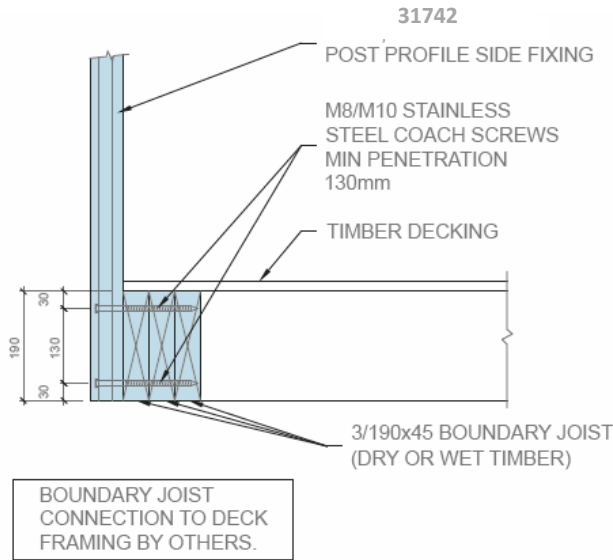
Balustrade Spacing summary Table to NZS:1170 Minimum Imposed Action to Barrier and NZS:3604 Very High Wind

| Balustrade Height | Post Section Model | Fixing Type | Maximum Post Spacing (M)                                     |      |       |      |
|-------------------|--------------------|-------------|--|------|-------|------|
|                   |                    |             | Type 1a & 1b   |      |       |      |
|                   |                    |             | Coach Screw with HIT-RE 500 Epoxy Side Fixing to Timber Deck |      |       |      |
|                   |                    |             | 2/190x45 Boundary Joist                                      |      |       |      |
|                   |                    |             | 2/M10  | 4/M8 | 4/M10 |      |
|                   |                    |             | Dry  | Dry  | Dry   | Wet  |
| 1M                | 31742              | Side        | 0.80   | 0.90 | 1.10  | 0.85 |
| 1.1M              | 31742              | Side        | -  | 0.80 | 1.00  | 0.80 |
| 1.2M              | 31742              | Side        | -  | -    | 0.85  | -    |

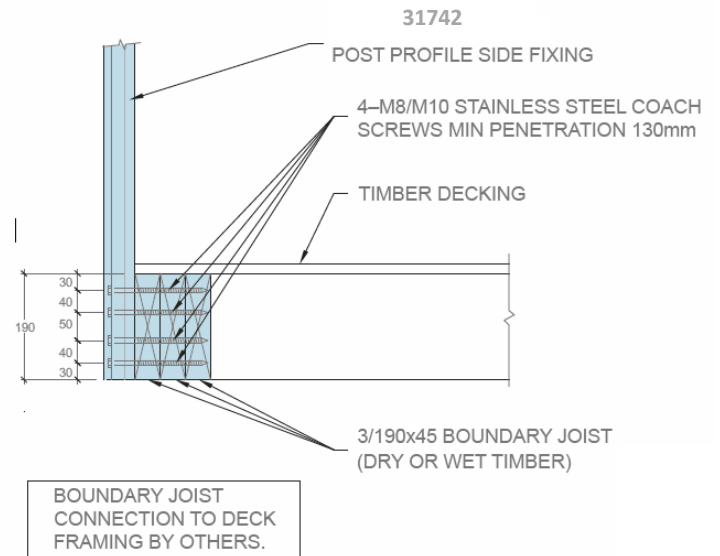
The above table summarises the maximum balustrade post spacing that can be achieved based on balustrade post strength and connection strengths using Hilti HIT-RE Epoxy.

**FRAMED GLASS BALUSTRADES**

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



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



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

**abd consultants**  
*Timber, Glass & Repairs*

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

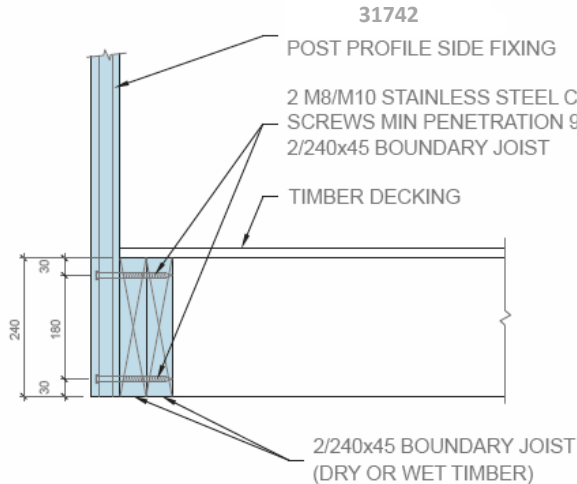
| Balustrade Height | Post Section Model | Fixing Type | Maximum Post Spacing (M)               |       |      |      |      |       |      |  |
|-------------------|--------------------|-------------|--|-------|------|------|------|-------|------|--|
|                   |                    |             | Type 1a & 1b                           |       |      |      |      |       |      |  |
|                   |                    |             | Coach Screw Side Fixing To Timber Deck |       |      |      |      |       |      |  |
|                   |                    |             | 3/190x45 Boundary Joist                |       |      |      |      |       |      |  |
|                   |                    |             | 2/M8                                   | 2/M10 |      | 4/M8 |      | 4/M10 |      |  |
| Dry               | Dry                | Wet         | Dry                                    | Wet   | Dry  | Wet  |      |       |      |  |
| 1M                | 31742              | Side        | 0.95                                   | 1.15  | 0.90 | 1.25 | 1.00 | 1.25  | 1.25 |  |
| 1.1M              | 31742              | Side        | 0.85                                   | 1.05  | 0.80 | 1.20 | 0.90 | 1.15  | 1.15 |  |
| 1.2M              | 31742              | Side        | 0.70                                   | 0.90  | -    | 1.00 | 0.80 | 1.10  | 0.95 |  |

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.



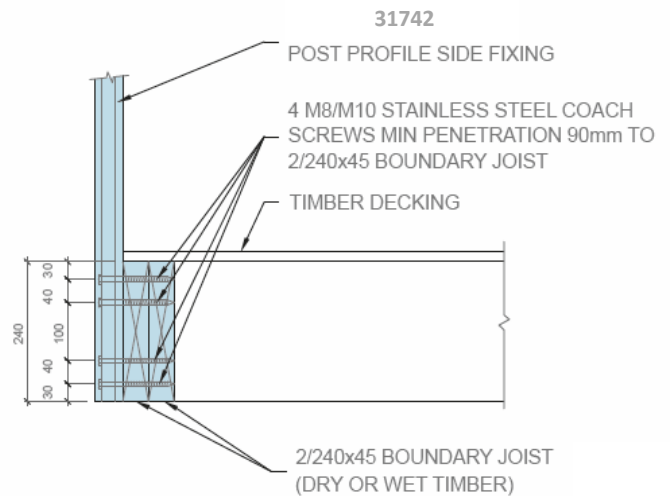
**FRAMED GLASS BALUSTRADES**

**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

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*Construction Engineering & Design*

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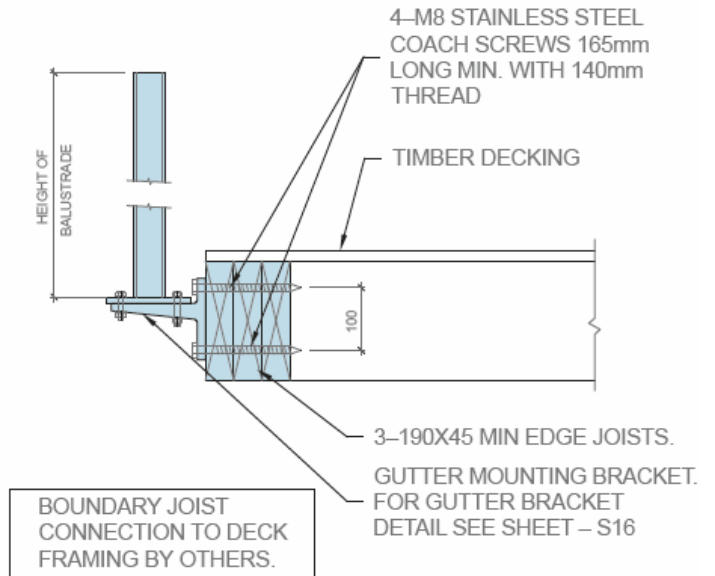
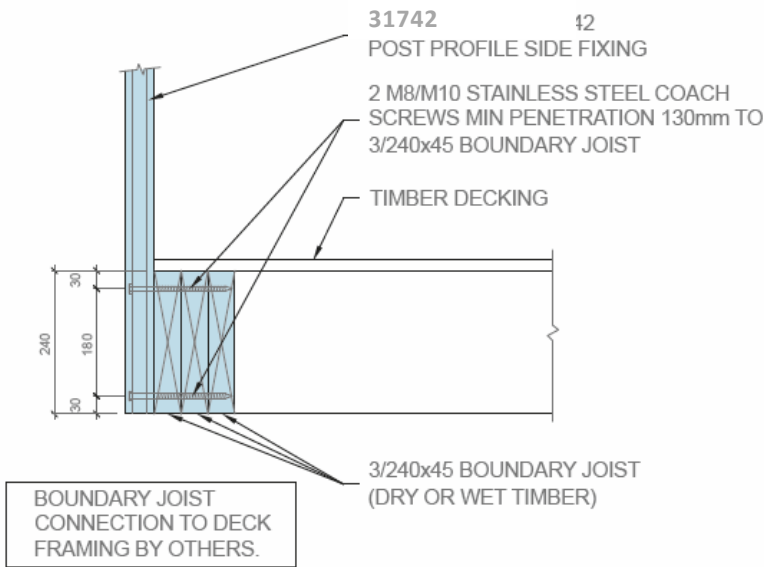
Balustrade Spacing summary Table to NZS:1170 Minimum Imposed Action to Barrier and NZS:3604 Very High Wind Zone Across

| Balustrade Height | Post Section Model | Fixing Type | Maximum Post Spacing (M)                                     |      |       |      |      |      |       |  |
|-------------------|--------------------|-------------|--|------|-------|------|------|------|-------|--|
|                   |                    |             | Type 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               | Wet                | Dry         | Wet  | Dry  | Wet   | Dry  | Wet  |      |       |  |
| 1M                | 31742              | Side        | 0.90   | 1.10 | 0.85  | 1.35 | 1.10 | 1.35 | 1.25  |  |
| 1.1M              | 31742              | Side        | 0.80   | 1.00 | 0.80  | 1.25 | 1.00 | 1.25 | 1.15  |  |
| 1.2M              | 31742              | Side        | -  | 0.85 | -     | 1.15 | 0.85 | 1.15 | 0.95  |  |

The above table summarises the maximum balustrade post spacings that can be achieved based on balustrade post

**FRAMED GLASS BALUSTRADES**

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



**1e**  
CONNECTION TYPE 1E – SIDE FIXING TO 3/240x45 TIMBERS WITH 2 COACH SCREWS  
SCALE 1:10

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

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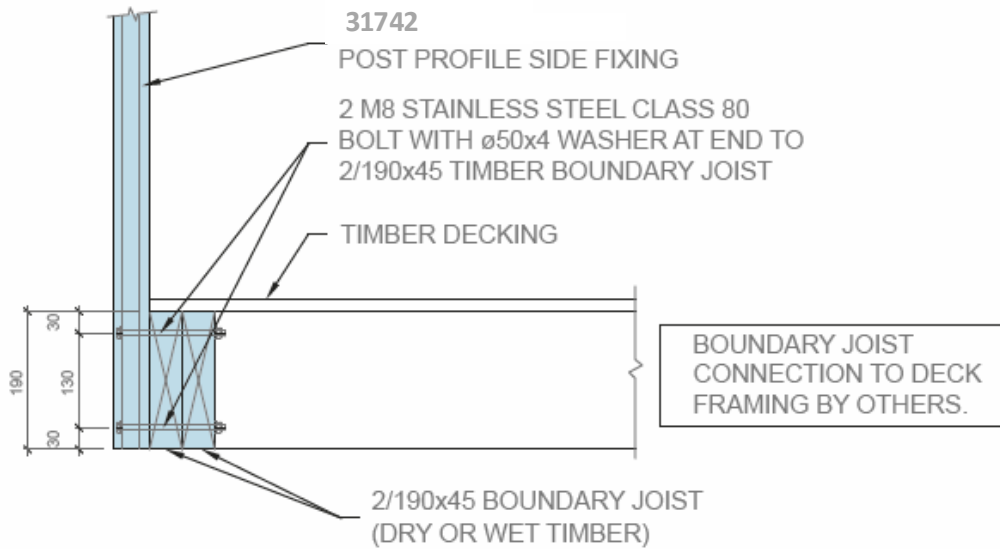
Balustrade Spacing summary Table to NZS:1170 Minimum Imposed Action to Barrier and NZS:3604 Very High Wind

| Balustrade Height | Post Section Model | Fixing Type | Maximum Post Spacing (M)                                     |      |       |      |                           |      |
|-------------------|--------------------|-------------|--|------|-------|------|---------------------------|------|
|                   |                    |             | Type 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                | 31742              | Side        | 1.25   | 1.00 | 1.35  | 1.25 | 1.25                      | 1.00 |
| 1.1M              | 31742              | Side        | 1.15   | 0.90 | 1.25  | 1.15 | 1.15                      | 0.90 |
| 1.2M              | 31742              | Side        | 0.95   | 0.80 | 1.15  | 0.95 | 0.95                      | 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.

FRAMED GLASS BALUSTRADES

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



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*Structural & Engineering Design*

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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

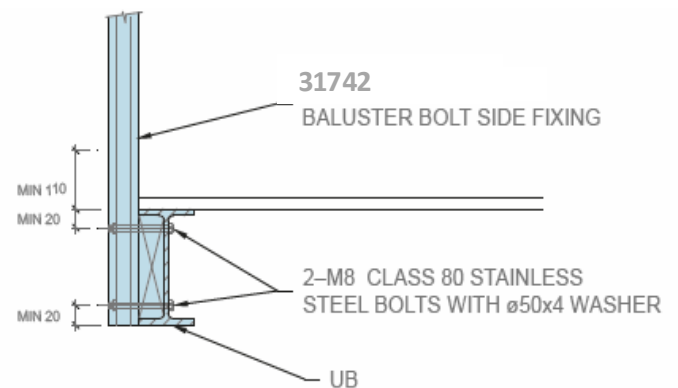
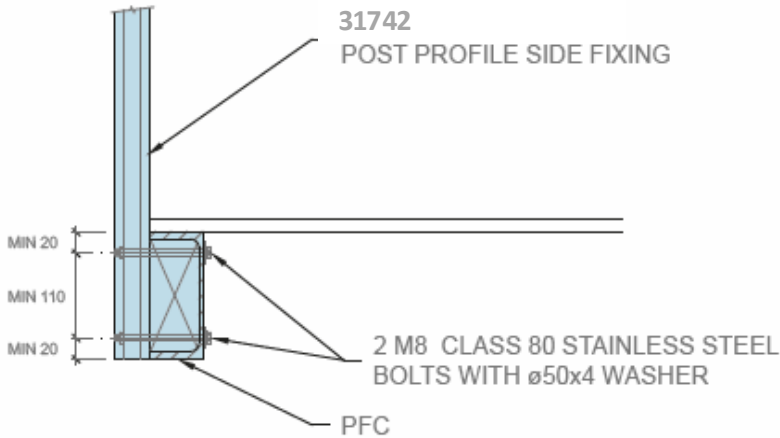
| Balustrade Height | Post Section Model | Fixing Type | Maximum Post Spacing (M)              |
|-------------------|--------------------|-------------|---------------------------------------|
|                   |                    |             | Type 2                                |
|                   |                    |             | Bolt side fixing to timber 2 x 190x45 |
|                   |                    |             | 2/M8                                  |
| 1M                | 31742              | Side        | 1.35                                  |
| 1.1M              | 31742              | Side        | 1.25                                  |
| 1.2M              | 31742              | Side        | 1.15                                  |

The above table summarises the maximum balustrade post spacings that can be achieved based on balustrade post

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FRAMED GLASS BALUSTRADES

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

**obd consultants**  
*Teamwork in Engineering Design*

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

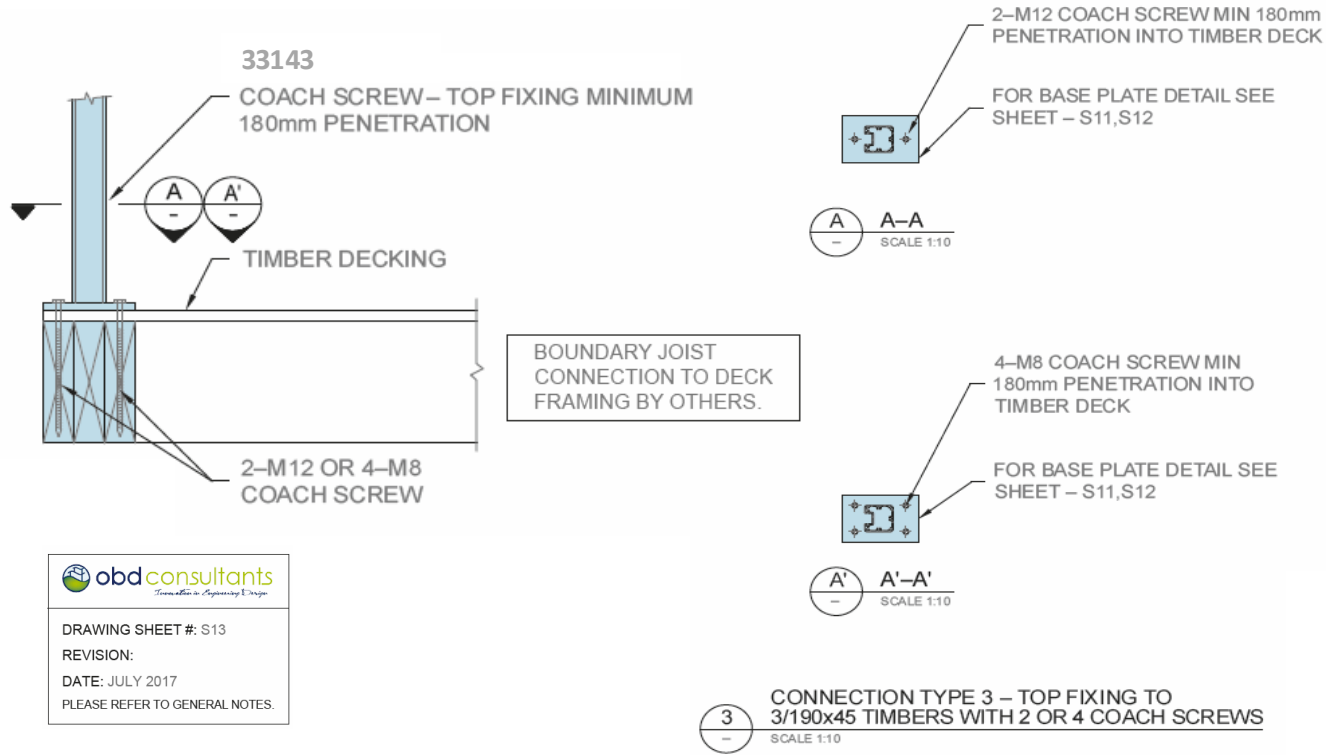
| Balustrade Height | Post Section Model | Fixing Type | Maximum Post Spacing (M) |  |
|-------------------|--------------------|-------------|--------------------------|--|
|                   |                    |             | Type 2                   |  |
|                   |                    |             | Bolt Side Fix Steel Beam |  |
|                   |                    |             | 2/M8                     |  |
| 1M                | 31742              | Side        | 1.35                     |  |
| 1.1M              | 31742              | Side        | 1.25                     |  |
| 1.2M              | 31742              | Side        | 1.15                     |  |

The above table summarises the maximum balustrade post spacings that can be achieved based on balustrade post

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**FRAMED GLASS BALUSTRADES**

**Connection Type 3 – Timber Top-Fix**



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

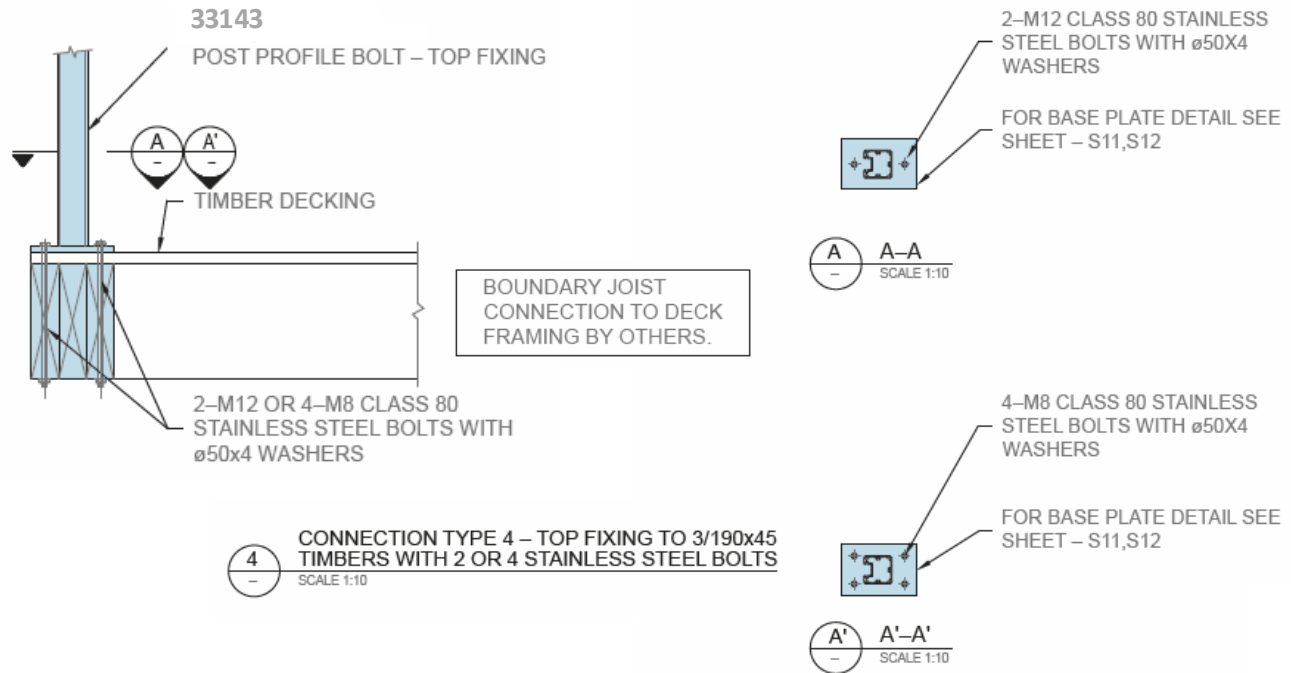
| Balustrade Height | Post Section Model | Fixing Type | Maximum Post Spacing (M)                                    |      |       |      |
|-------------------|--------------------|-------------|---|------|-------|------|
|                   |                    |             | Type 3  |      |       |      |
|                   |                    |             | Coach Screw with HIT-RE 500 Epoxy Top Fixing to Timber Deck |      |       |      |
|                   |                    |             | 4/M8  |      | 2/M12 |      |
|                   |                    |             | Dry   | Wet  | Dry   | Wet  |
| 1M                | 33143              | Top         | 1.55  | 1.55 | 1.55  | 1.20 |
| 1.1M              | 33143              | Top         | 1.40  | 1.40 | 1.40  | 1.10 |
| 1.2M              | 33143              | Top         | 1.25  | 1.25 | 1.25  | 1.00 |

The above table summarises the maximum balustrade post spacings that can be achieved based on balustrade post

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**FRAMED GLASS BALUSTRADES**

**Connection Type 4– Timber Top-Fix**



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*Structural & Engineering Design*

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

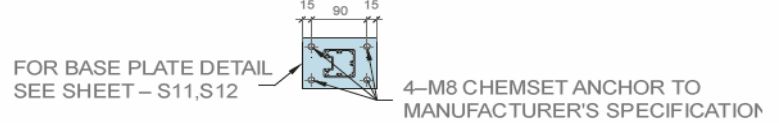
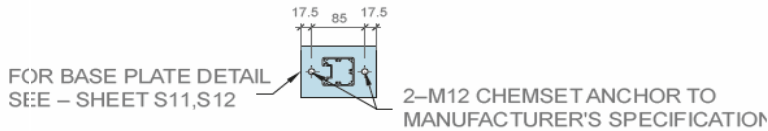
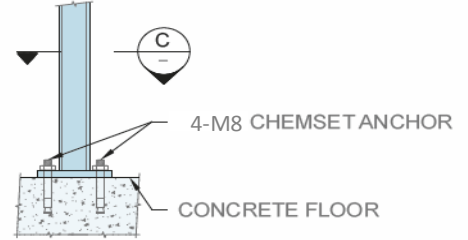
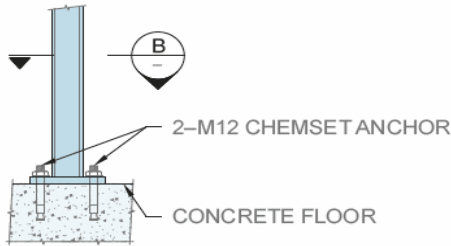
| Balustrade Height | Post Section Model | Fixing Type | Maximum Post Spacing (M)    |       |
|-------------------|--------------------|-------------|-----------------------------|-------|
|                   |                    |             | Type 4                      |       |
|                   |                    |             | Bolt Top Fixing Timber Deck |       |
|                   |                    |             | 4/M8                        | 2/M12 |
|                   |                    |             | Dry & Wet                   |       |
| 1M                | 33143              | Top         | 1.55                        | 1.25  |
| 1.1M              | 33143              | Top         | 1.40                        | 1.15  |
| 1.2M              | 33143              | Top         | 1.25                        | 1.05  |

The above table summarises the maximum balustrade post spacings that can be achieved based on balustrade post

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**FRAMED GLASS BALUSTRADES**

**Connection Type 5 – Concrete Top-Fix**



**B** SECTION  
SCALE

**C** SECTION  
SCALE 1:10

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*Transmission & Engineering Design*

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

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

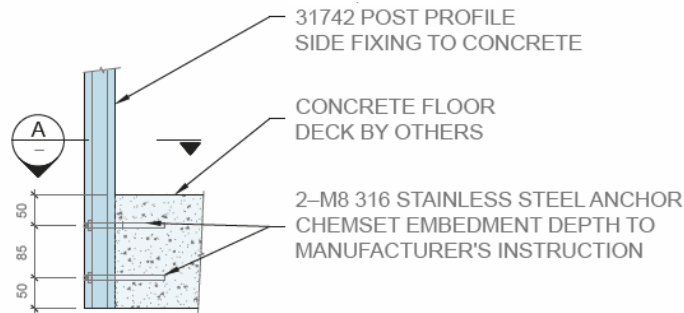
| Balustrade Height | Post Section Model | Fixing Type | Maximum Post Spacing (M)           |
|-------------------|--------------------|-------------|------------------------------------|
|                   |                    |             | Type 5                             |
|                   |                    |             | Chemset Anchor Top Fixing Concrete |
| 1M                | 33143              | Top         | 1.55                               |
| 1.1M              | 33143              | Top         | 1.40                               |
| 1.2M              | 33143              | Top         | 1.25                               |

The above table summarises the maximum balustrade post spacings that can be achieved based on balustrade post

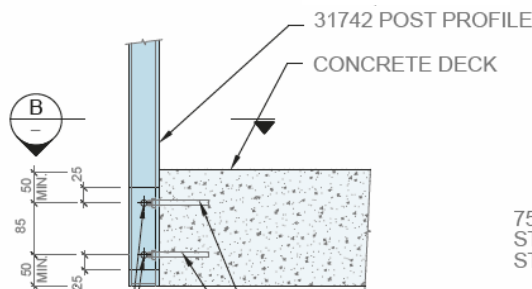
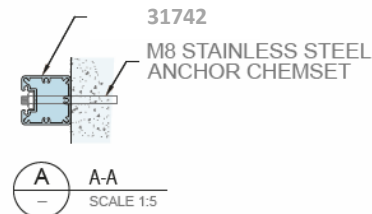
“THE CHOICE IS CLEAR”

**FRAMED GLASS BALUSTRADES**

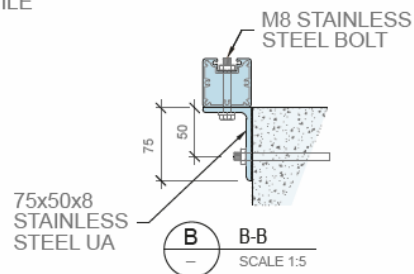
**Connection Type 6 – Concrete Side-Fix**



**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



**obdconsultants**  
*Construction Engineering & Design*

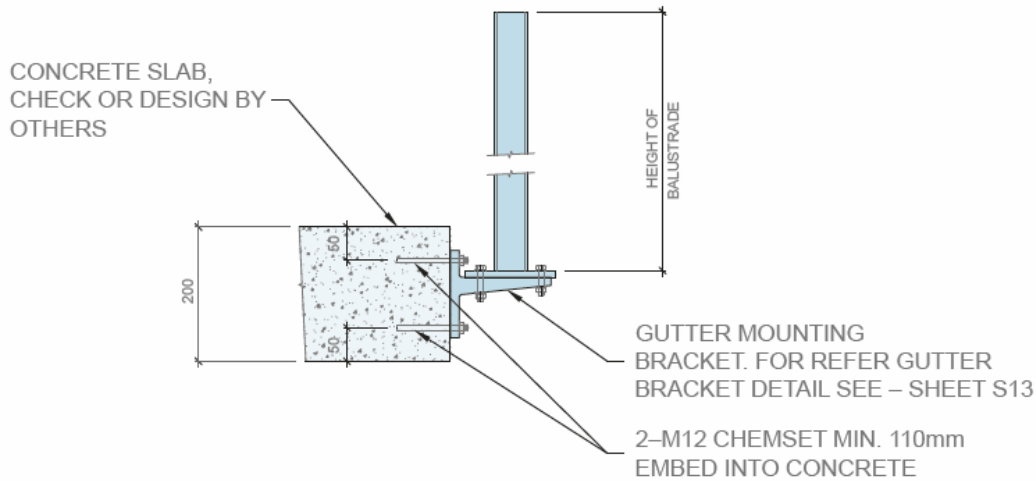
DRAWING SHEET #: S13  
REVISION:  
DATE: JULY 2017  
PLEASE REFER TO GENERAL NOTES.

See Post Spacing table next page



FRAMED GLASS BALUSTRADES

Connection Type 6 – Concrete Side-Fix



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

**obd consultants**  
*Specialists in Engineering Design*

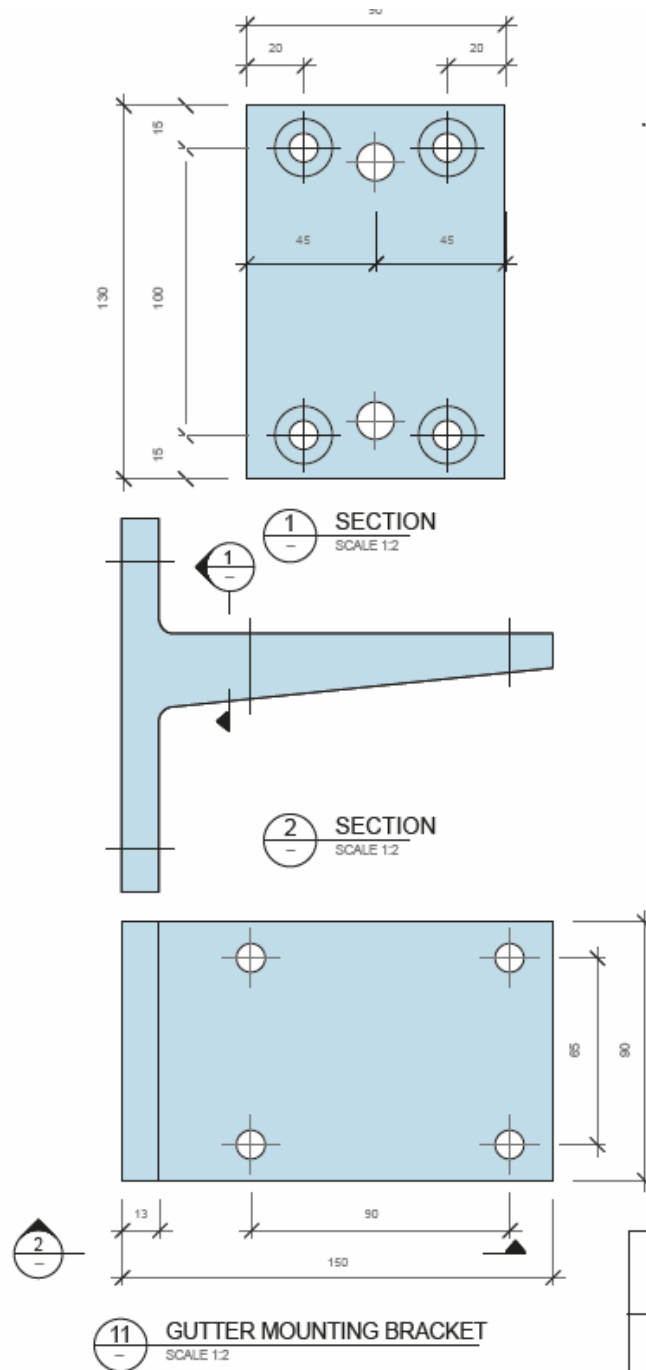
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Balustrade Spacing summary Table to NZS:1170 Minimum Imposed Action to Barrier and NZS:3604 Very High Wind Zone Across

| Balustrade Height | Post Section Model | Fixing Type | Maximum Post Spacing (M) |
|-------------------|--------------------|-------------|--------------------------|
|                   |                    |             | Type 6a & 6b             |
|                   |                    |             | Side Fixing Concrete     |
| 1M                | 31742              | Side        | 1.35                     |
| 1.1M              | 31742              | Side        | 1.25                     |
| 1.2M              | 31742              | Side        | 1.15                     |

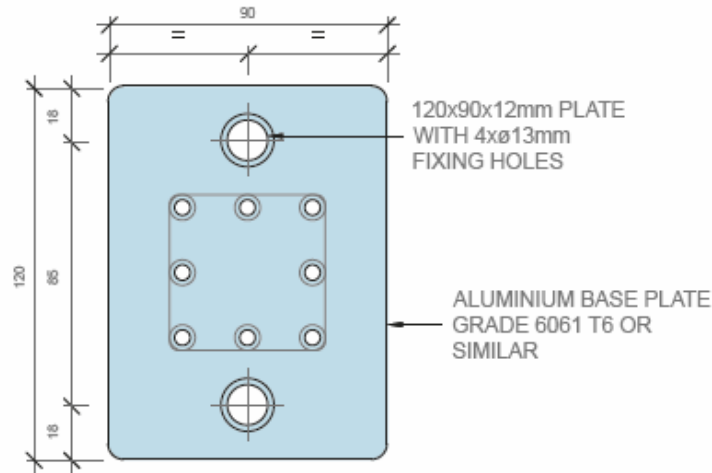
The above table summarises the maximum balustrade post spacings that can be achieved based on balustrade post

## Gutter Bracket Design

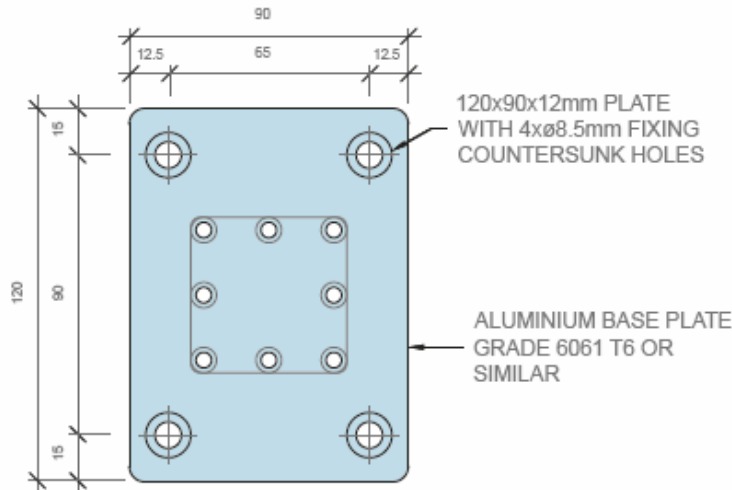


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REVISION: A  
DATE: 10 NOVEMBER 2016  
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### Base Plate Design – Framed Glass Balustrade



9 PART NO. FC213 BASE PLATE  
SCALE 1:2



10 PART NO. FW485 BASE PLATE  
SCALE 1:2

NOTE - BOTH FC213 AND FW485 BASE PLATES  
MATE WITH 33143 POST PROFILE



DRAWING SHEET #: S12

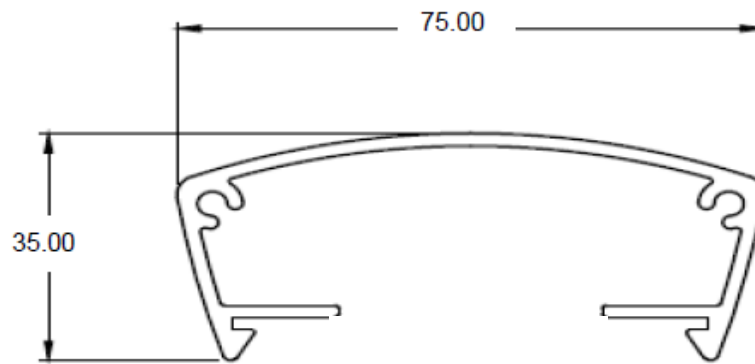
REVISION: A

DATE: 10 NOVEMBER 2016

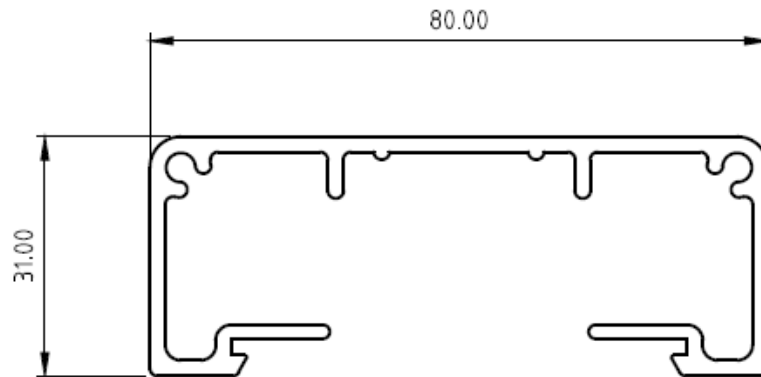
PLEASE REFER TO GENERAL NOTES.

## Handrail Dimensions

**Euro Handrail**



**Retro Handrail**



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