# Fabricators Manual

## Extreme Barriers

BALUSTRADES

HANDRAILS

SCREENS

POOL FENCES

UNEX

ARCHITECTURAL BARRIERS

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ARCHITECTURAL BARRIERS

# CONTENTS


HYUNDAI CENTRE


WAIHI SURF CLUB


MANUREWA NETBALL COURT


CANBERRA HIGH SCHOOL


ST THOMAS PRIMARY SCHOOL

# THE BENEFITS OF EXTREME BARRIERS

## COMPLIANCE

Specifically engineered to comply with the extremely heavy Liveload classes C1/C2 and C5 of AS/NZS 1170.1:2002.

## PRE-ENGINEERED SOLUTIONS

Full specifications available, saving cost and time designing a one-off balustrade.

## AESTHETIC APPEAL

Concealed assembly fasteners, no protruding glazing-lugs, simple clean lines, tidy joints and glazing edges with No welds.

## LOW MAINTENANCE

Aluminium is non rusting. Combined with high performance powdercoat or anodized finishes make it easy to clean.

## COST EFFECTIVE

Glazed options available. Styles with four edge glazing support may achieve significant savings on the glass infill.

## FULL BACK UP

Support from NZ's leading balustrade specialists. In-house engineering expertise provides site-specific solutions.

DIRECT ORDERS OR ENQUIRIES TO:
PHONE: (07) 850 9464 | FAX: (07) 850 9465
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## INTRODUCTION

One of the advantages of Aluminium as a material is that it provides an excellent substrate for surface finishing. Aluminium is therefore the preferred choice of material where coloured coatings are required. The main coating method used is "Powdercoating". Anodizing is also available but with a much more limited choice of colour. Care and maintenance instructions for all finishes are given on Page 6. Warranties are available on extrusions for certain surface finish options. These are limited to those supplied by the supplier and/or applicator, and must be requested at the time of the order.

## 1. POWDERCOATING

Powdercoatings are applied as a powder, electrostatically charged to provide a uniform film thickness, followed by baking and final oven curing, resulting in a tough, smooth, and even coating. This process is performed in factory controlled conditions, and consistently gives a more uniform and superior finish compared to wet coatings. Powdercoatings also have excellent adhesion to pretreated aluminium. The use of solvents for cleaning powdercoated surfaces should be strictly avoided.

## 2. ANODIZING

Anodizing is an induced thickening of the natural protective oxide film on the metal's surface, and not a coating in the usual sense. The resulting film is clear, hard, extremely corrosion resistant, and capable of being coloured. Colour options are however relatively limited, with Satin (natural aluminium colour), Medium Bronze and Dark Bronze being the main colours economically available for balustrades. Some accessories, such as cast end caps, can not be anodized, and must be powdercoated in a coordinating colour. The depth of the anodized film can be varied to suit the application.

The use of abrasives for cleaning should be avoided as they can damage the anodic layer beyond repair.

# CARE & MAINTENANCE OF UNEX BALUSTRADES

It is the Fabricators responsibility to ensure that a copy of these Care and Maintenance Instructions is made available to every purchaser of UNEX Balustrades. It is important that every building owner observes these recommendations to obtain the durability required in the NZ Building Code.

## 1. CARE AND PROTECTION

Protect the balustrades at all times from contact with:

- Wet cement or plaster, household cleaners including bleach, paint splashes, chemicals, solvents, stains and fertilisers are possibly harmful to the surface finish. If contact does occur, remove the contaminant immediately and wash as described below.
- Copper, brass, lead, mild steel, CCA treated timber, cement or concrete less than 1 month old, and water which has contacted any of these substances.

## 2. MAINTENANCE

Safety barriers shall be maintained in a structurally sound condition and, where applicable, self-closing gates and other components required for the protection of children shall be kept operable. Defects should be remedied immediately once they are apparent.

SURFACE FINISH

While surface finishes do not last forever, observance of these instructions will maintain their appearance and significantly extend their useful life. Observance of these instructions is also required to achieve durability performance and for surface finish warranties to be valid (where applicable). They apply to both anodized and powdercoated surfaces.

Powdercoated surfaces will lose some gloss with time. Where desired, powdercoated gloss may be enhanced with 'Dulux Gloss Up', used in accordance with the manufacturer's instructions.

CLEANING

It is recommended most residential balustrades in mild conditions or interior installations be cleaned at least once a year. In areas where pollutants are common such as industrial or geothermal areas, and for all sites within 1 km from the sea or in any sea spray zone identified by Section 4.2 of NZS 3604:1999, cleaning must be carried out more frequently as required, but not more than every three months.

a. Gently remove loose deposits with a wet sponge. Do not dry dust, or the surfaces will be scratched. Remove any moss growth, and ensure that all drain holes are unblocked, particularly those at the base of baluster fins and mounting rail.
b. Using a soft brush and a mild household detergent in warm fresh water, clean the surface to remove any dust, salt, or other deposits. Pay particular attention to any areas not washed naturally by the rain. In the instance of stubborn stains, use ONLY Isopropyl alcohol (IPA) or methylated spirits to help remove these.
c. Always rinse well after cleaning with fresh water to remove any remaining detergent.

******WARNING***: Solvents, household cleaners, bleaches, and abrasive cleaners are possibly harmful to the surface finish and must not be used.

# NZ BUILDING CODE COMPLIANCE

**GENERAL**

The New Zealand Building Code (NZBC) provides mandatory performance criteria for balustrades. The UNEX Balustrade System has been designed to make it easy for Specifiers to ensure that balustrade compliance is achieved. The main building code clauses which affect balustrades are as below. Some areas of the code may not necessarily affect every balustrade application.

B1: STRUCTURE - Structural strength and stability
B2: DURABILITY - Durability requirements
C2: MEANS OF ESCAPE - Fire escape routes
D1: ACCESS ROUTES – Handrails
E2: WATER EGRESS – Water proofing
F2: HAZARDOUS BUILDING MATERIALS - Glazed balustrades
F4: SAFETY FROM FALLING - Barrier heights, opening sizes etc
F9: RESTRICTING ACCESS TO RESIDENTIAL POOLS

The performance criteria contained in the Building Code stipulates what is to be achieved, without prescribing how it is to be achieved. For more specific guidance, the MBIE issues 'Approved Documents' which provide detailed methods of establishing NZBC compliance, in the form of 'Verification Methods' or ' Acceptable Solutions'. While other criteria may be acceptable, the onus is on the designer to demonstrate adequate compliance with the prime requirements of the NZ Building Code. A brief summary of the Building Code clauses relevant to balustrades and handrails, is found on the following pages. A Producer Statement is available on www.unex.co.nz.

Disclaimer: Note that the information provided on the Building Code and other regulations is provided in good faith, and as applicable at the time of writing. However it is provided on a 'no liability' basis, and as these documents are up-dated from time to time, the latest documents should be consulted for full information and checked for subsequent amendments.

**View The NZBC online at**
**www.building.govt.nz**

**CLAUSE B1 - STRUCTURES**

Balustrades are required to be capable of resisting certain loads. These include 'Live Loads' such as being induced by persons leaning on the balustrade. Live Loads vary with the application, eg.: Residential, Public etc. Balustrades with glass or other solid or semi-solid infill panels also need to withstand 'Wind Loads', which will vary with the location and other factors.

UNEX Balustrades have been designed to withstand the various human impact and wind loads as stipulated in the NZBC. This will be achieved if the balustrade heights and spacings between clamps or other fixing points, do not exceed the maximum given for the particular balustrade style's specification and method of fixing as given in Chapters 2 and 3. The maximum post spacings should be determined from these Chapters by the building designer and checked by the fabricator. The building designer must also ensure that an appropriate design of the substrate to adequately resist the loads imposed by the balustrade for the particular spans and fixing methods chosen is included in the drawings and specifications.

HUMAN IMPACT LOADS

These vary with the designated use of the building they are situated in, and are detailed in the loading standards cited in B1/VM1 of the NZBC: AS/NZS 1170.1:2002 Structural Design Actions. For reference, the various loadings have been designated with a "Loading Class" in the UNEX specifications. When using Chapters 2 and 3, the Loading Class must firstly be selected from the table on Page 87. Then the maximum post spacings can be determined for this class (along with the designated wind load if applicable), as indicated on the tables given in Chapters 2 and 3.

WIND LOADS

Balustrades with solid infill such as "glazed" styles must also withstand wind loads imposed, to the degree as stipulated in the New Zealand Building Code. These loads are defined by the Design Wind Speed for the particular project.

**CLAUSE B2 - DURABILITY**

The New Zealand Building Code requires all balustrading to be sufficiently durable so as to remain functional for certain specified periods of time. These periods are given in the Acceptable Solution B2/AS1, which indicates a 'serviceable' durability requirement of 50 years for balustrade posts and top rails, and 15 years for infill members. Note that this durability requirement does not apply to non-serviceable aspects such as the surface finishes (eg. Powdercoating). For further information on these finishes refer to Page 5.

The durability aspect of the UNEX balustrade system has been assessed by a Materials and Corrosion consultant. A brief summary of this report is that in their opinion, UNEX Balustrades will meet these requirements if the balustrades are fabricated, installed and maintained in accordance with UNEX Systems' recommendations, including specific requirements relating to durability as outlined on Page 77-78 Note that this does not cover aesthetics, but only serviceability.

Certain Care and Maintenance procedures to be followed are given on Page 6.

**CLAUSE D1 - ACCESS ROUTES**

Acceptable solution D1/AS1 stipulates requirements for handrails on all stairways, and on ramps steeper than 1:20 on "accessible" routes. The top rail on a balustrade may serve as a handrail on an access route providing it meets certain requirements including; the profile, a minimum distance perimeter of the top of the profile and the height of the top rail above the ramp or pitch line of the stairs is between 900-1000mm.

The VRE rail is the only rail that complies with the handrail profile requirements of D1/AS1 for "Private" and "Common" stairways, but not for "Accessible Stairways or Ramps", for which LRR & LRS rails are the only compliant rails.

Where a top rail of a balustrade on a stairway does not comply with D1/AS1, a compliant auxiliary LRR round side rail can be bracketed to the side of the balustrade.

D1/AS1 also limits the projection of a balustrade or handrail on an escape route including a stairway or ramp, so that it does not reduce the minimum width by more than 100mm. Particular attention should be given to the width of the stairs and ramps on escape routes to ensure there will be the minimum permitted width inside the balustrade(s) or handrail(s). This is particularly where balustrades are "top fixed". It is advisable to coordinate with the balustrade fabricator/installer early in the design process.

In some situations, balustrades may be required to be "imperforate and non-combustible". Whilst UNEX balustrades are not specifically designed to fulfill this requirement, they can usually be adapted to do so. UNEX Systems should be consulted if this is a requirement on any particular project.

*UNEX Systems recommends that the NZBC is sighted in its entirety.*

**CLAUSE E2 - WATER EGRESS**

Where the balustrade attachment to the substrate incorporates water-proofing considerations, clause E2 of the NZ Building Code should be observed. Figure 19 of the Acceptable Solutions (E2/AS1 dated 1 July 2005) shows a detail which could apply to a balustrade. To sight the full details, please refer direct to the original documents in E2/AS1. There are some key points to be noted in figure 19 which must be incorporated in any application;

- The balustrade is side-mounted to a vertical surface (i.e. not top-mounted to a horizontal surface).
- The balustrade post is attached via a spacer which keeps the channel from directly bearing against the wall, and clears the drip edge above by a minimum of 25mm (Smaller clearances are usually accepted by Territorial Authorities).
- It shows a Neoprene or EPDM Washer between the spacer and the cladding.
- It shows the fixing which anchors into the framing, going through a batten in the cavity. It is important that any battens or packers used to transfer the compression loads within the cavity behind the cladding are vertical and extend over the full width and depth of the post, bracket or spacer.
- It shows a layer of sealant between the fixing and the sides of the hole in the cladding through which the fixing passes.

## CLAUSE F2 - HAZARDOUS BUILDING MATERIALS

This clause has particular application to balustrades with glass infill panels, which are required by Acceptable Solution F2/AS1 to comply with NZS 4223.

Effective from 1st June 2016, structural glass barriers need to have an interlinking rail, unless the barrier is laminated safety glass and has features to retain panes of glass or prevent collapse, in the event of breakage. An interlinking rail must be designed to resist serviceability limit state (SLS) loads, specified in AS/NZS 1170 and B1/VM1, in the event that a glass pane of the barrier breaks.

It is the responsibility of the fabricator to ensure that the balustrade glazing design complies with NZS 4223 in all respects; including glass thickness, glass span, panel size, containment, etc. However, the UNEX Balustrade System has been designed to make this easily achievable in most situations.

All glass used in UNEX Balustrades should be safety toughened.

## CLAUSE F4 - SAFETY FROM FALLING

This clause stipulates when barriers such as balustrades are required, and provides generalized requirements for barriers such as: "Barriers shall be of appropriate height". Acceptable Solution F4/AS1 provides more specific information on barriers and pool fences, and covers such things as barrier heights, opening sizes, and restrictions on toeholds.

UNEX Balustrades are entirely versatile, and can be fabricated in virtually any height or configuration. It is therefore, the responsibility of the fabricator to ensure that the finished product complies in all respects to the requirements of Clause F4, with reference to the intended use of the area as obtained from the specifier or owner.

*UNEX Systems recommends that the NZBC is sighted in its entirety.*

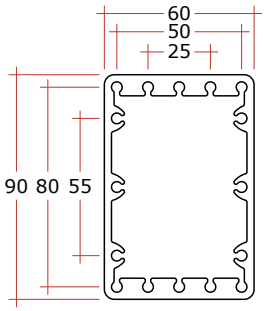
## CLAUSE F9 - RESTRICTING ACCESS TO RESIDENTIAL POOLS

This clause has the requirements to prevent unsupervised access by children under five years of age to residential pools. It requires barriers around pools to restrict unsupervised access by children. Barriers can include gates and suitably constructed doors. Some small heated pools may have a removable cover rather than a surrounding barrier.

F9/AS1 provides the acceptable solution for swimming pool barriers in general. F9/AS2 provides the acceptable solution for covers which may be used on above ground small heated pools.

# CHAPTER 1 - EXTREME BARRIERS EXTRUSIONS & COMPONENTS

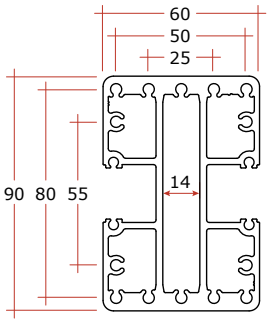
## POSTS




### EPE

**POST, HOLLOW, EXTRA HEAVY DUTY**

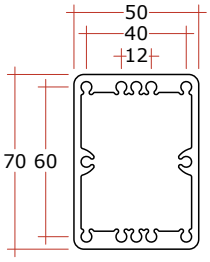
Hollow post for Extra Heavy Duty applications, belonging to the 'X3000 Series'. The 90mm face is transverse to the rail.
10 gauge screwpipes.




### EPU2

**POST, RECESSED, EXTRA HEAVY DUTY**

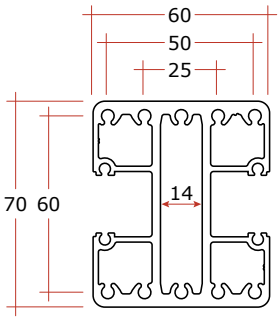
Extra heavy duty post with glazing recess on both sides, belonging to the 'X3000 Series'. Refer to Pages 68-72 for glass support and lower rail attachment methods.
Glazing pocket width = 19.6mm
Glazing pocket depth = 20mm
Accepts AIR2 infill to blank off recess if required. 10 gauge screwpipes.




### HPH

**POST, HOLLOW, HEAVY DUTY**

Hollow post for Heavy Duty applications, belonging to the 'X1500 Series'. The 70mm face is transverse to the rail.
10 gauge screwpipes.



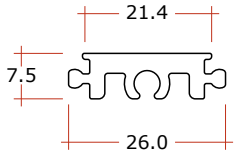

### HPU2

**POST, RECESSED, HEAVY DUTY**

Heavy duty post with glazing recess on both sides, belonging to the 'X1500 Series'. Refer to Pages 68-72 for glass support and lower rail attachment methods.
Glazing pocket width = 19.6mm
Glazing pocket depth = 20mm
Accepts AIR2 infill to blank off recess if required. 10 gauge screwpipes.

## INSERTS & RAILS

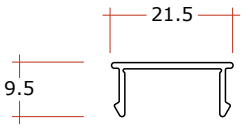
### AIA




**INFILL, GLASS SUPPORT TYPE**

Slides into the glazing recess of the EPU2, and HPU2 post. Can be used in conjunction with AKS or AKSVS plates. Can also be used as a blank infill where required.

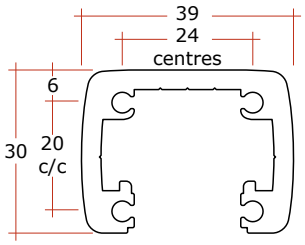
### AIR2




**INFILL, CLIP FIT**

Clips into the glazing recess of the following extrusions ARN, ERZ, and HRZ. Also clips into the glazing recess of EPU2, and HPU2 posts, to blank off where required.

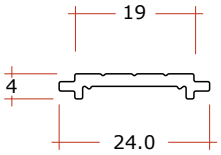
### ARN




**RAIL, LOWER, HEAVY DUTY**

Lower Rail for Baluster styles. Invert for Glazed Lower Rails. Also used as the mid-rail of Double Top Rail Styles. Accepts AIR2 infill, DIA insert and the ANG range of spigots.
Glazing Pocket Width = 19.6mm
Glazing Pocket Depth = 26.4mm
8 gauge screwpipes.

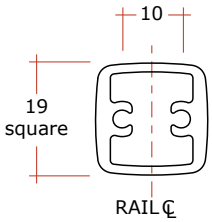
### DIA




**INFILL, ADAPTOR TYPE**

Slides into mouth of ARN, ERZ, and HRZ Rails. Enables balusters to be attached to these extrusions, or used as a blank infill where required. DTH Balusters attach to the surface with groove-lines.

### DTH

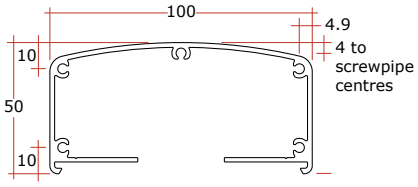



**BALUSTER, HEAVY DUTY**

2 screws per baluster end are required,
1 on each side of the rail centreline.
6 gauge screwpipes.

## INSERTS & RAILS - (CONT'D)

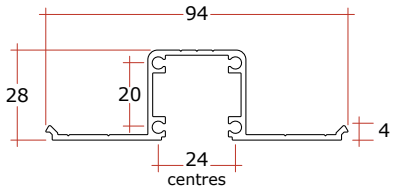
### ERT




**RAIL, TOP OUTER**

Clip fits to the ERZ Rail to form a continuous Top Rail. Belongs to the 'X3000 Series'.
8 gauge screwpipes.

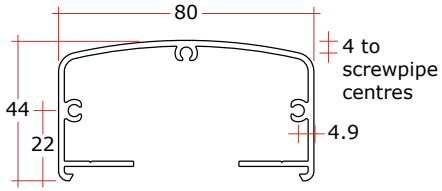
### ERZ




**GLAZING INNER TOP RAIL**

Clip fits to ERT Rail only to form a continuous Top Rail for Glass insertion. Belongs to the 'X3000 Series'.
Glazing Pocket Width = 19.6mm
Glazing Pocket Depth = 26.4mm
Accepts SRD Retained Gasket on both sides.
8 Gauge screwpipes.

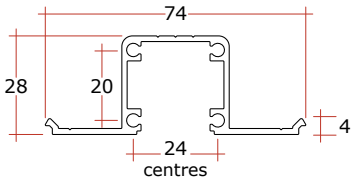
### HRT




**RAIL, TOP OUTER**

Clip fits to the HRZ Rail to form a continuous Top Rail. Belongs to the 'X1500 Series'.
8 gauge screwpipes.

### HRZ



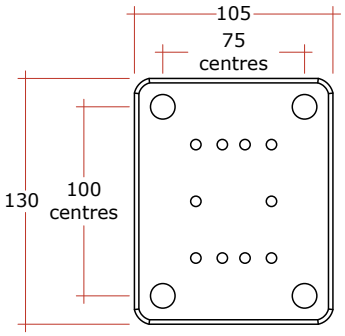

**GLAZING INNER TOP RAIL**

Clip fits to HRT Rail only to form a continuous Top Rail for Glass insertion. Belongs to the 'X1500 Series'.
Glazing Pocket Width = 19.6mm
Glazing Pocket Depth = 26.4mm
Accepts SRD Retained Gasket on both sides.
8 Gauge screwpipes.

**FASTENERS AND FIXINGS**

A wide range of Fastener accessories such as bolts, nuts, nyloc nuts, washers, spring washers and screws are also available from UNEX Systems. Refer to the price list or contact our Customer Support Team on 0800 333 777, or email orders@unex.co.nz

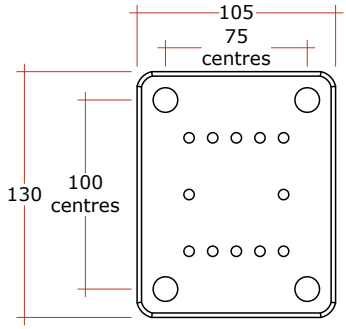
## BASEPLATES & FASCIA PLATES




### BHSP

**BASEPLATE FOR HPH POST**

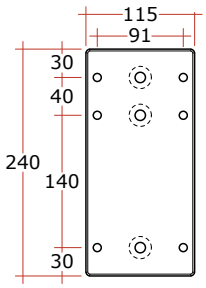
For maximum strength attachment of 50x70mm HPH posts to Concrete and Steel Substrates. 14mm thick plate.
BHSP = 4 off Ø13mm fixing holes.




### BISP

**BASEPLATE FOR HPU2 POST**

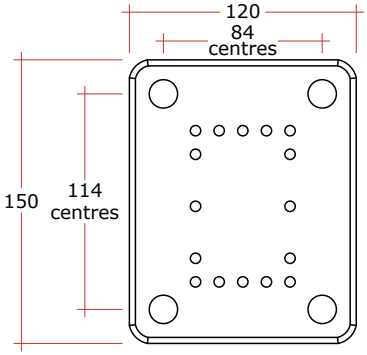
For maximum strength attachment of 60x70mm HPU2 posts to Concrete and Steel Substrates. 14mm thick plate.
BISP = 4 off Ø13mm fixing holes.




### EKT-024

**FASCIA PLATE, FOR HPH AND HPU2 POSTS**

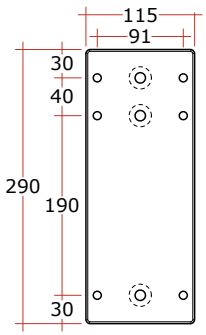
Connector plate required for side mounting HPH & HPU2 posts to 240mm deep timber substrates. The plate is sidefixed centrally to the bottom of the post via M10 S/S CSK bolt sets (FM10-90S). Substrate Fasteners are then fixed through the flanges of the plate on both sides of the post.
12mm thick plate with exposed edge radius.




### BUTV

**BASEPLATE FOR EPE AND EPU2 POSTS**

For maximum strength attachment of 60x90mm EPE and EPU2 posts to Concrete and Steel Substrates. 16mm thick plate.
BUTV = 4 off Ø15mm fixing holes.

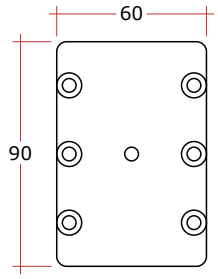



### EKT-029

**FASCIA PLATE, FOR EPE AND EPU2 POSTS**

Connector plate required for side mounting EPE & EPU2 posts to 290mm deep timber substrates. The plate is sidefixed centrally to the bottom of the post via M10 S/S CSK bolt sets (FM10-110S). Substrate Fasteners are then fixed through the flanges of the plate on both sides of the post.
12mm thick plate with exposed edge radius.

## POST BLANKS & CAPS



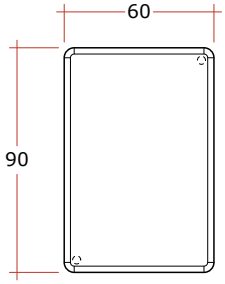

**EAESS**

**BLANK, FOR EPE AND EPU2 POSTS**

To blank off lower ends of side fixed EPE and EPU2 posts. Countersunk holes for 10 gauge screws.
3mm thick plate.

**BLANK, FOR EPE AND EPU2 POSTS, SET**

EAES blank supplied with 6 off FVHT10-50.T1 S/S screws.



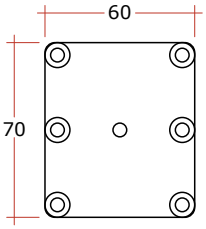

**ECEFS**

**CAP, FOR EPU2 POST, BLANK**

To fit on the EPU2 posts. The grub screws below the cap fit into the screw ports of the post. Secure to post with a small amount of TAS70-03*X* adhesive. 6mm thick plate with top edge radius.

**BLANK, FOR EPE AND EPU2 POSTS, SET**

ECEF blank supplied with 2 off FG4-12 grub screws.



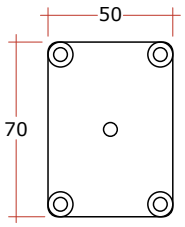

**HAESS**

**BLANK, FOR HPU2 POST**

To blank off lower ends of side fixed HPU2 posts. Countersunk holes for 10 gauge screws.
3mm thick plate.

**BLANK, FOR HPU2 POST, SET**

HAES blank supplied with 6 off FVHT10-50.T1 S/S screws.



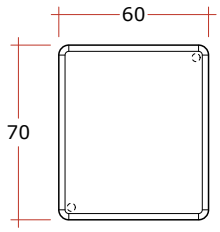

**HAPSS**

**BLANK, FOR HPH POST**

To blank off lower ends of side fixed HPH posts. Countersunk holes for 10 gauge screws.
3mm thick plate.

**BLANK, FOR HPH POST, SET**

HAPS blank supplied with 4 off FVHT10-50.T1 S/S screws.




**HCEFS**

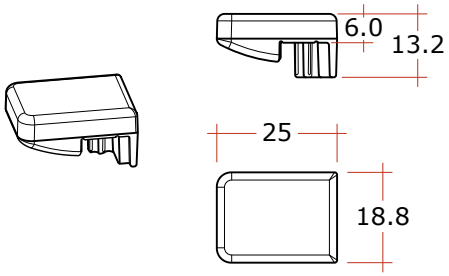
**CAP, FOR HPU2 POST, BLANK**

To fit on the HPU2 post. The grub screws below the cap fit into the screw ports of the post. Secure to post with a small amount of TAS70-03*X* adhesive. 6mm thick plate with top edge radius.

**CAP, FOR HPU2 POST, SET**

HCEF blank supplied with 2 off FG4-12 grub screws.

## END CAPS & GLASS MOUNT PLATES

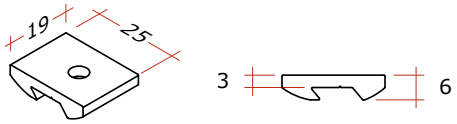



### AKS2

**BRACKET, GLASS SUPPORT**

For attaching to top of AIA insert within the glazing recess of the EPU2 and HPU2 Posts to provide vertical support to the glass.

It is a one-piece Polymer support. Therefore no additional setting block is required.




### AKSV.BK

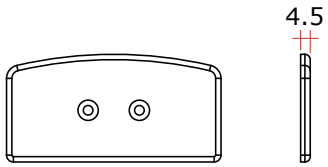
**PLATE, GLASS MOUNT**

Similar to AKS2, except used on stairs & ramps, up to 40° slopes. Plate sits on top of AIA insert which is cut to slope angle. Attach plate with a small amount of adhesive. Use SBC block (not included) to separate glass and aluminium.

### AKSVS.BK

**PLATE, GLASS MOUNT, SET**

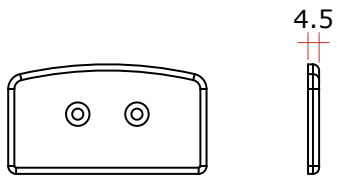
AKSV.BK plate (Black only) supplied with SBC setting block.




### ECG

**CAP, TOP RAIL**

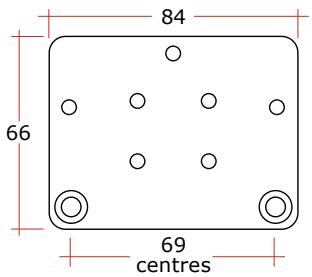
Endcap fro ERT Top Rail with countersunk holes (for 8 gauge screws) for attachment to the Inner Rail.




### HCG

**CAP, TOP RAIL**

Endcap for HRT Top Rail with countersunk holes (for 8 gauge screws) for attachment to the Inner Rail.

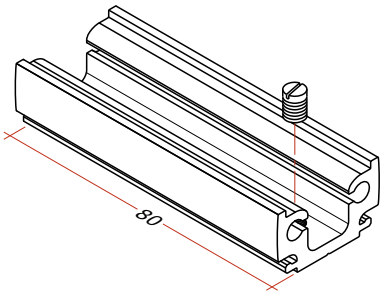



### HWT

**WALLPLATE, TOP RAIL**

Wallplate for HRT Top Rail

## HARDWARE

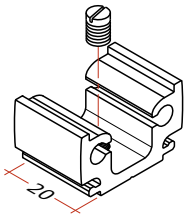



### ANGAG
### ANGAM
### ANGAU

**CONNECTOR, LOWER RAILS**

As per ANGG, ANGM and ANGU except with extra length for trimming to a specific angle.
IMPORTANT: Use strictly as per the instructions given on Pages 67-68.

ANGAG = with Slotted Grub Screw
ANGAM = with Machine Screw. (Not suitable for mid rails)
ANGAU = no fastener or hole, 120mm long. For use on baluster panels.

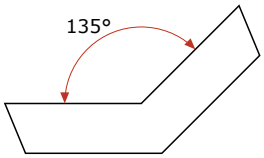



### ANGG
### ANGM
### ANGU

**CONNECTOR, LOWER RAILS**

For attaching ARN Lower Rail extrusion to certain post types.
IMPORTANT: Use strictly as per the instructions given on Pages 67-68.

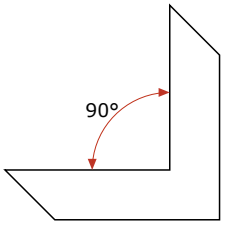
ANGG = with Slotted Grub Screw
ANGM = with Machine Screw. (Not suitable for mid rails)
ANGU = no fastener or hole. For use on baluster panels.




### DNS135

**SUSPENDED CORNER GUSSET.**

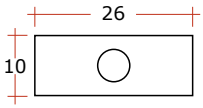
Attach to the top surface of two Top Inner Rails on an suspended corner mitre.
3mm thick flat plate.




### DNS90

**SUSPENDED CORNER GUSSET.**

Attach to the top surface of two Top Inner Rails on an suspended corner mitre.
3mm thick flat plate.

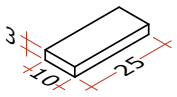



### DSZ

**SPACER, FOR GLAZING INNER TOP RAIL**

Required when attaching EZT and HZT rails to posts with long screws attached along the rail centreline only. The screw must pass through the DSZ Spacer, which fits between the lower screwpipes of the rail.

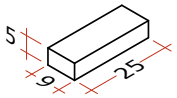
## SETTING BLOCKS, GASKETS, & WEDGES




### SBC

**SETTING BLOCK**

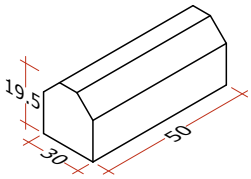
3 x 10 x 25mm, Self Adhesive backing.




### SBG

**SETTING BLOCK**

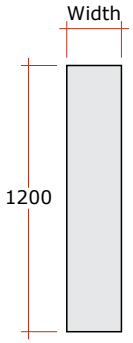
5 x 9 x 25mm, Self Adhesive backing.




### SBH

**SETTING BLOCK, HIGH PROFILE**

Santoprene setting block for supporting glass in ARN Lower Rails.




### SG24-12
### SG36-12
### SG42-12
### SG50-12

**SIDE MOUNTING GASKET**

Gaskets for side-mounting situations. Used to increase durability. Placed between post/bracket face and substrate face. 1.5mm thick Neoprene, with a self adhesive backing. No holes.
SG24-12 = 24mm wide
SG36-12 = 36mm wide
SG42-12 = 42mm wide used on 50mm wide post
SG50-12 = 50mm wide used on 60mm wide post

### SRG70-25
### SRG70R

**RETAINED BACK SEAL**

A Glazing gasket for the outer or inaccessible glass face. Engages the screwpipe in certain rails, by sliding in prior to assembly. For 8 gauge screwpipes only. Typical uses include; in ARN rail or EPU2 or HPU2 type posts with 8mm glass and SWE50 wedge. Compressed thickness = approx 6.8mm
SRG70 applies to purchasing in 25m lengths.
SRG70R applies to purchasing in 100m rolls.

## SETTING BLOCKS, GASKETS, & WEDGES - (CONT'D)

### SRD-25
### SRDR

**RETAINED DOUBLE SEAL**

Use on both sides of glass in certain rails retaining the top edge of glass panels. Inserts in rails prior to assembly. Do not use for glass lower edge. Typical uses include; both sides of glazing rails retaining the top edge of glass, both sides of EPU2 or HPU2 type posts when receiving glass at an angle.
SRD applies to purchasing in 25m lengths.
SRDR applies to purchasing in 100m rolls.

### SRG20-25
### SRG20R

**RETAINED BACK SEAL, YELLOW RETAINER**

A TPE glazing gasket for the outer or inaccessible glass face. Engages the screwpipe in certain rails, by sliding in prior to assembly. For 8 gauge screwpipes only.

Compressed thickness = approx 2.2mm.
SRG20-25 applies to purchasing in 25m lengths.
SRG20R applies to purchasing 100m rolls.


### SWE50-25
### SWE50R

**WEDGE, PURPLE STRIPE**

Santoprene wedge gasket (with a purple stripe) for use with 8mm glass in ARN rails, and EPU2 or HPU2 type posts, in conjunction with SRG70 gasket.

Compressed thickness = approx 5.0mm.
SRE50 applies to purchasing in 25m lengths.
SRE50R applies to purchasing in 100m rolls.


### SWE25-25
### SWE25R

**WEDGE, WHITE STRIPE**

TPE wedge gasket (with a white stripe) for use for use with 15mm glass in ARN rails, and EPU2 or HPU2 type posts, in conjunction with SRG20 gasket.

Compressed thickness = approx 2.5mm.
SWE25-25 applies to purchasing in 25m lengths.
SWE25R applies to purchasing 100m rolls.

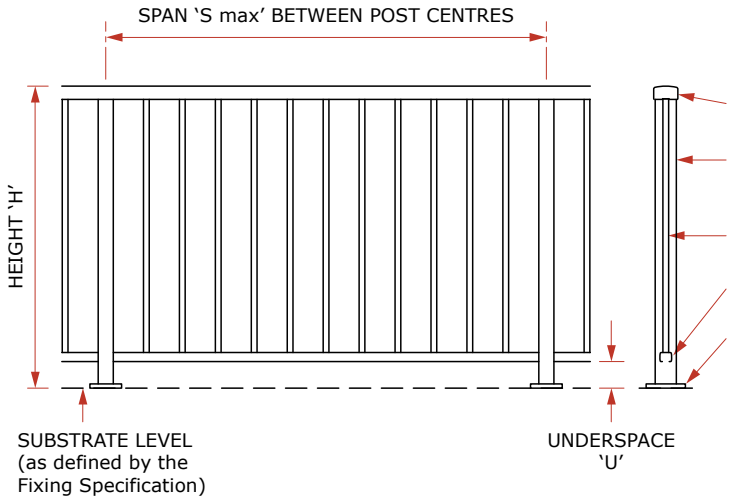
**TYPICAL WEDGES FOR VARIOUS GLASS THICKNESSES**

| Glass Thickness | Retaining gasket | Wedge | Wedge Colour Code | Top Inner retaining gasket |
|---|---|---|---|---|
| 8mm | SRG70 | SWE50 | Purple | SRD (Retained gasket on both sides of glass for push fit) |
| 15mm | SRG20 | SWE25 | White | - |

## CHAPTER 2 - EXTREME BARRIER STYLE SPECIFICATIONS

## 'X1500 SERIES' FRAMED BALUSTER (HRT TOP RAIL) - TOP FIXING

This is a Style Specification for the use of UNEX's Extreme Balustrades, and must only be used in conjunction with a Fixing Specification, the Specification Notes on Page 49, and the Assembly Specification on Page 51. Installation must be completed in accordance with the Installation Guide on Pages 58-87.




The balustrade shall be fabricated from the following items:

- TOP RAIL: HRT / HRZ / DIA
- POSTS: HPH
- BALUSTERS: DTH
- LOWER RAIL: ARN
- BASE PLATE: BHSP

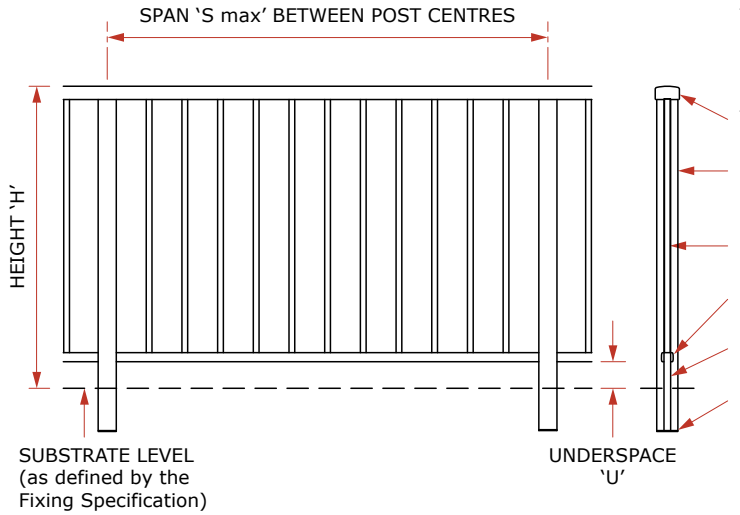
THIS SPECIFICATION IS BASED ON THE ATTACHMENT OF THE BALUSTRADE BEING IN ACCORDANCE WITH ONE OF THE STANDARD TOP FIXING SPECIFICATIONS CONTAINED IN CHAPTER 3. CONTACT UNEX SYSTEMS FOR NON-STANDARD FIXING METHODS.

| MAXIMUM POST CENTRES 'S max' (metres) | | | | |
|---|---|---|---|---|
| HEIGHT(2) | Post Type(3) | Line No. | SPAN 'S max' LOADING CLASS(1) | |
| | | | N15 | N07R & N07C |
| **1.1** | HPH | 1 | 1.03 | 2.00 |
| | RAILS ONLY | 2 | 1.32 | 2.00 |
| **1.2** | HPH | 3 | 0.95 | 1.90 |
| | RAILS ONLY | 4 | 1.32 | 2.00 |

1. LOADING CLASS: Refer to Page 87 of this manual for the scope of the Loading Class designations.
2. HEIGHT 'H': is the overall height of the balustrade above the substrate level shown. Interpolate for Heights between those shown.
3. POST TYPES: Refer to Page 14. "RAILS ONLY" gives the maximum span of the rails when fixed in single panels between posts attached to walls or columns designed to provide adequate support.

# 'X1500 SERIES' FRAMED BALUSTER (HRT TOP RAIL) - SIDE FIXING

This is a Style Specification for the use of UNEX's Extreme Balustrades, and must only be used in conjunction with a Fixing Specification, the Specification Notes on Page 49, and the Assembly Specification on Page 51. Installation must be completed in accordance with the Installation Guide on Pages 58-87.




The balustrade shall be fabricated from the following items:

- TOP RAIL: HRT / HRZ / DIA
- POSTS: HPU2
- BALUSTERS: DTH
- LOWER RAIL: ARN
- INSERT: AIA (Full height of post)
- POST BLANK: HAESS

THIS SPECIFICATION IS BASED ON THE ATTACHMENT OF THE BALUSTRADE BEING IN ACCORDANCE WITH ONE OF THE STANDARD TOP FIXING SPECIFICATIONS CONTAINED IN CHAPTER 3. CONTACT UNEX SYSTEMS FOR NON-STANDARD FIXING METHODS.

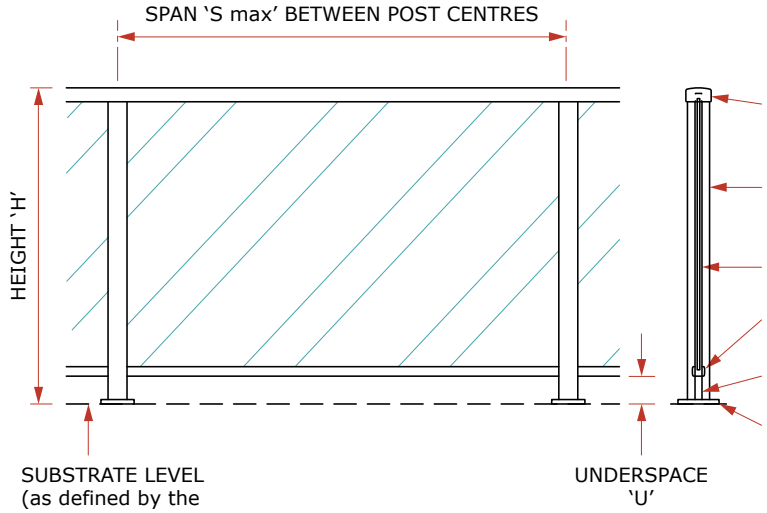
MAXIMUM POST CENTRES 'S max' (metres)

| HEIGHT[2] | Post Type[3] | Line No. | SPAN 'S max' LOADING CLASS[1] N15 | SPAN 'S max' LOADING CLASS[1] N07R & N07C |
|---|---|---|---|---|
| **1.1** | HPU2 | 1 | 1.27 | 2.00 |
| | RAILS ONLY | 2 | 1.32 | 2.00 |
| **1.2** | HPU2 | 3 | 1.17 | 2.00 |
| | RAILS ONLY | 4 | 1.32 | 2.00 |

1. LOADING CLASS: Refer to Page 87 of this manual for the scope of the Loading Class designations.
2. HEIGHT 'H': is the overall height of the balustrade above the substrate level shown. Interpolate for Heights between those shown.
3. POST TYPES: Refer to Page 14. "RAILS ONLY" gives the maximum span of the rails when fixed in single panels between posts attached to walls or columns designed to provide adequate support.

## 'X1500 SERIES' (FRAMED GLASS) - TOP-MOUNTED

This is a Style Specification for the use of UNEX's Extreme Balustrades, and must only be used in conjunction with a Fixing Specification, the Specification Notes on Page 49, and the Assembly Specification on Page 52. Installation must be completed in accordance with the Installation Guide on Pages 58-87.




The balustrade shall be fabricated from the following items:

- TOP RAIL: HRT / HRZ
- POSTS: HPU2
- TOUGHENED GLASS PANELS
- LOWER RAIL: ARN
- INSERT: AIA
- BASE PLATE: BISP

THIS SPECIFICATION IS BASED ON THE ATTACHMENT OF THE BALUSTRADE BEING IN ACCORDANCE WITH ONE OF THE STANDARD TOP FIXING SPECIFICATIONS CONTAINED IN CHAPTER 3. CONTACT UNEX SYSTEMS FOR NON-STANDARD FIXING METHODS.

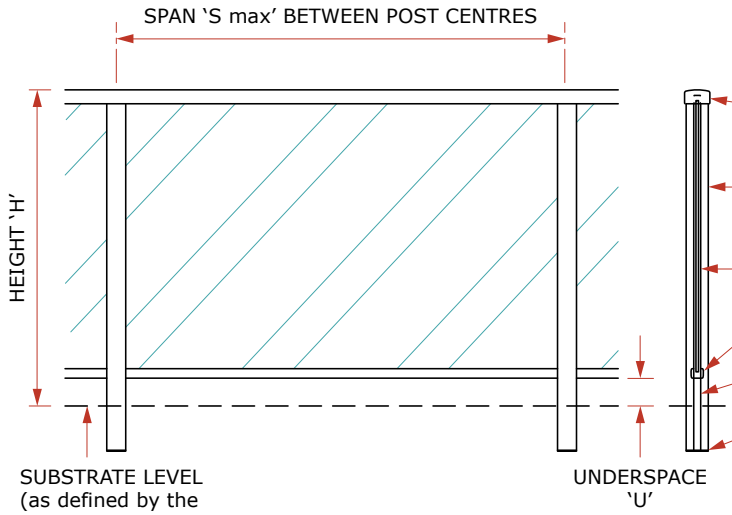
MAXIMUM POST CENTRES 'S max' (metres) &
MINIMUM TOUGHENED GLASS THICKNESS (Millimetres)

| HEIGHT (Note 2) | Post Type (Note 4) | Toughened Glass Thickness | Line No. | SPAN 'S max' 50m/s Max. Design Wind Speed (Note 3) LOADING CLASS (Note 1) | |
|---|---|---|---|---|---|
| | | | | N15 | N07R & N07C |
| **1.1** | HPU2 | 8 | 1 | 1.15 | 2.00 |
| | GLASS ONLY | 8 | 2 | - | - |
| **1.2** | HPU2 | 8 | 3 | 1.05 | 2.00 |
| | GLASS ONLY | 8 | 4 | - | - |

1. LOADING CLASS: Refer to Page 87 of this manual for the scope of the Loading Class designations.
2. HEIGHT 'H': is the overall height of the balustrade above the substrate level shown. Interpolate for Heights between those shown.
3. POST TYPES: Refer to Page 14.
4. DESIGN WIND SPEED: in m/s, Refer to Page 49, note 4 for details of applicable wind codes and the methods for determining the Design Wind Speed for any particular site.

# 'X1500 SERIES' (FRAMED GLASS) - SIDE-MOUNTED

This is a Style Specification for the use of UNEX's Extreme Balustrades, and must only be used in conjunction with a Fixing Specification, the Specification Notes on Page 49, and the Assembly Specification on Page 52. Installation must be completed in accordance with the Installation Guide on Pages 58-87.




The balustrade shall be fabricated from the following items:

- TOP RAIL: HRT / HRZ
- POSTS: HPU2
- TOUGHENED GLASS PANELS
- LOWER RAIL: ARN
- INSERT: AIA
- POST BLANK: HAESS

THIS SPECIFICATION IS BASED ON THE ATTACHMENT OF THE BALUSTRADE BEING IN ACCORDANCE WITH ONE OF THE STANDARD TOP FIXING SPECIFICATIONS CONTAINED IN CHAPTER 3. CONTACT UNEX SYSTEMS FOR NON-STANDARD FIXING METHODS.

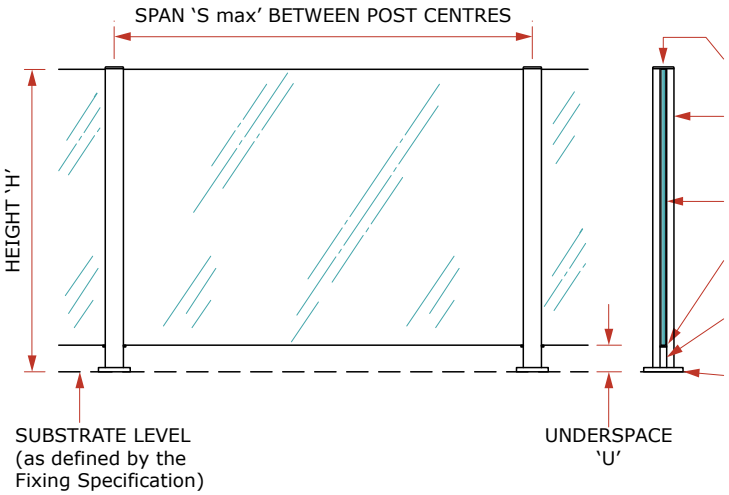
MAXIMUM POST CENTRES 'S max' (metres) &
MINIMUM TOUGHENED GLASS THICKNESS (Millimetres)

| HEIGHT (Note 2) | Post Type (Note 4) | Toughened Glass Thickness | Line No. | SPAN 'S max' 50m/s Max. Design Wind Speed (Note 3) LOADING CLASS (Note 1) | |
|---|---|---|---|---|---|
| | | | | N15 | N07R & N07C |
| **1.1** | HPU2 | 8 | 1 | 1.27 | 2.00 |
| | GLASS ONLY | 8 | 2 | - | - |
| **1.2** | HPU2 | 8 | 3 | 1.17 | 2.00 |
| | GLASS ONLY | 8 | 4 | - | - |

1. LOADING CLASS: Refer to Page 87 of this manual for the scope of the Loading Class designations.
2. HEIGHT 'H': is the overall height of the balustrade above the substrate level shown. Interpolate for Heights between those shown.
3. POST TYPES: Refer to Page 14.
4. DESIGN WIND SPEED: in m/s, Refer to Page 49, note 4 for details of applicable wind codes and the methods for determining the Design Wind Speed for any particular site.

## 'X1500 SERIES' (SEMI-FRAMELESS GLASS) - TOP-MOUNTED

This is a Style Specification for the use of UNEX's Extreme Balustrades, and must only be used in conjunction with a Fixing Specification, the Specification Notes on Page 49, and the Assembly Specification on Page 53. Installation must be completed in accordance with the Installation Guide on Pages 58-87.




The balustrade shall be fabricated from the following items:
POST CAP: HCEF

POSTS: HPU2. See also Note 4.

TOUGHENED GLASS PANELS. See table below

SUPPORT PLATE: AKS2

INSERT: AIA

BASE PLATE: BISP

**ONLY USE THIS STYLE IF THE BALUSTRADE IS NOT PREVENTING A FALL OF 1M OR MORE!**

THIS SPECIFICATION IS BASED ON THE ATTACHMENT OF THE BALUSTRADE BEING IN ACCORDANCE WITH ONE OF THE STANDARD TOP FIXING SPECIFICATIONS CONTAINED IN CHAPTER 3. CONTACT UNEX SYSTEMS FOR NON-STANDARD FIXING METHODS.

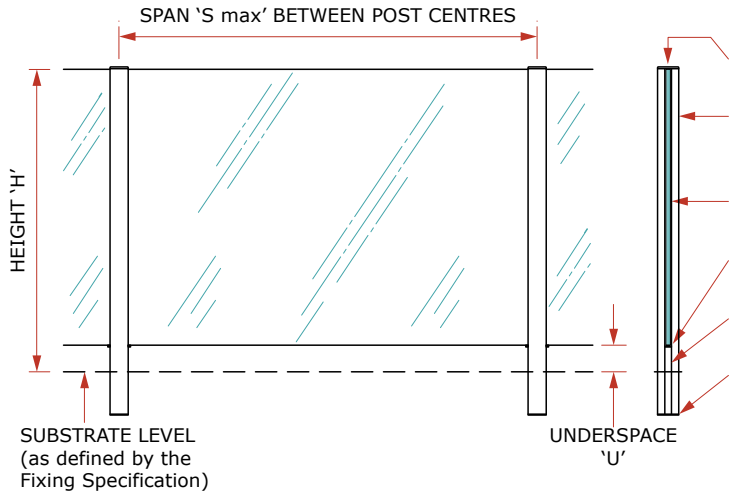
MAXIMUM POST CENTRES 'S max' (metres) & MINIMUM TOUGHENED GLASS THICKNESS (Millimetres)

| HEIGHT (Note 2) | Post Type (Note 4) | Toughened Glass Thickness | Line No. | SPAN 'S max' 50m/s Max. Design Wind Speed (Note 3) LOADING CLASS (Note 1) N15 | SPAN 'S max' 50m/s Max. Design Wind Speed (Note 3) LOADING CLASS (Note 1) N07R & N07C |
|---|---|---|---|---|---|
| **1.1** | HPU2 | 15 | 1 | 1.15 | 2.00 |
| | GLASS ONLY | 15 | 2 | - | - |
| **1.2** | HPU2 | 15 | 3 | 1.05 | 2.00 |
| | GLASS ONLY | 15 | 4 | - | - |

1. LOADING CLASS: Refer to Page 87 of this manual for the scope of the Loading Class designations.
2. HEIGHT 'H': is the overall height of the balustrade above the substrate level shown. Interpolate for Heights between those shown.
3. POST TYPES: Refer to Page 14.
4. DESIGN WIND SPEED: in m/s, Refer to Page 49, note 4 for details of applicable wind codes and the methods for determining the Design Wind Speed for any particular site.

## 'X1500 SERIES' (SEMI-FRAMELESS GLASS) - SIDE-MOUNTED

This is a Style Specification for the use of UNEX's Extreme Balustrades, and must only be used in conjunction with a Fixing Specification, the Specification Notes on Page 49, and the Assembly Specification on Page 53. Installation must be completed in accordance with the Installation Guide on Pages 58-87.




The balustrade shall be fabricated from the following items:
POST CAP: HCEF

POSTS: HPU2. See also Note 4.

TOUGHENED GLASS PANELS. See table below

SUPPORT PLATE: AKS2

INSERT: AIA

POST BLANK: HAESS. Use for side fixed Post

**ONLY USE THIS STYLE IF THE BALUSTRADE IS NOT PREVENTING A FALL OF 1M OR MORE!**

THIS SPECIFICATION IS BASED ON THE ATTACHMENT OF THE BALUSTRADE BEING IN ACCORDANCE WITH ONE OF THE STANDARD TOP FIXING SPECIFICATIONS CONTAINED IN CHAPTER 3. CONTACT UNEX SYSTEMS FOR NON-STANDARD FIXING METHODS.

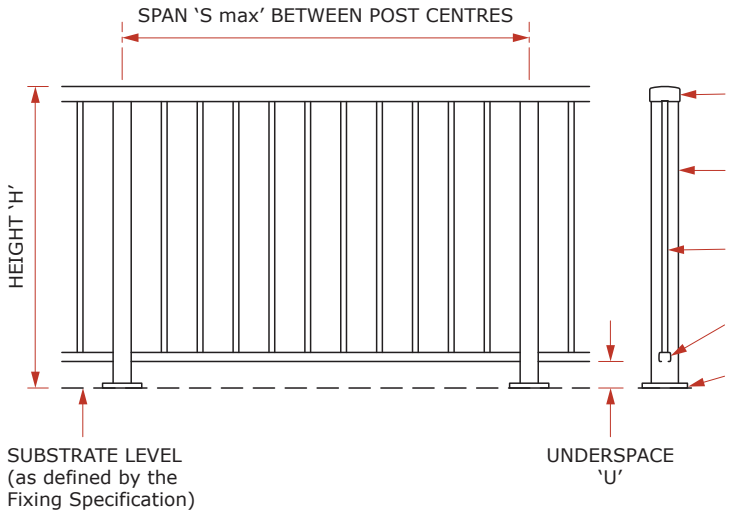
MAXIMUM POST CENTRES 'S max' (metres) &
MINIMUM TOUGHENED GLASS THICKNESS (Millimetres)

| HEIGHT (Note 2) | Post Type (Note 4) | Toughened Glass Thickness | Line No. | SPAN 'S max' 50m/s Max. Design Wind Speed (Note 3) LOADING CLASS (Note 1) | |
|---|---|---|---|---|---|
| | | | | N15 | N07R & N07C |
| **1.1** | HPU2 | 15 | 1 | 1.27 | 2.00 |
| | GLASS ONLY | 15 | 2 | - | - |
| **1.2** | HPU2 | 15 | 3 | 1.17 | 2.00 |
| | GLASS ONLY | 15 | 4 | - | - |

1. LOADING CLASS: Refer to Page 87 of this manual for the scope of the Loading Class designations.
2. HEIGHT 'H': is the overall height of the balustrade above the substrate level shown. Interpolate for Heights between those shown.
3. POST TYPES: Refer to Page 14.
4. DESIGN WIND SPEED: in m/s, Refer to Page 49, note 4 for details of applicable wind codes and the methods for determining the Design Wind Speed for any particular site.

## 'X3000 SERIES' (BALUSTER) - TOP-MOUNTED

This is a Style Specification for the use of UNEX's Extreme Balustrades, and must only be used in conjunction with a Fixing Specification, the Specification Notes on Page 49, and the Assembly Specification on Page 54. Installation must be completed in accordance with the Installation Guide on Pages 58-87.




The balustrade shall be fabricated from the following items:

- TOP RAIL: ERT / ERZ / DIA
- POSTS: EPE
- BALUSTERS: DTH
- LOWER RAIL: ARN
- POST BASE: BUTV

THIS SPECIFICATION IS BASED ON THE ATTACHMENT OF THE BALUSTRADE BEING IN ACCORDANCE WITH ONE OF THE STANDARD TOP FIXING SPECIFICATIONS CONTAINED IN CHAPTER 3. CONTACT UNEX SYSTEMS FOR NON-STANDARD FIXING METHODS.

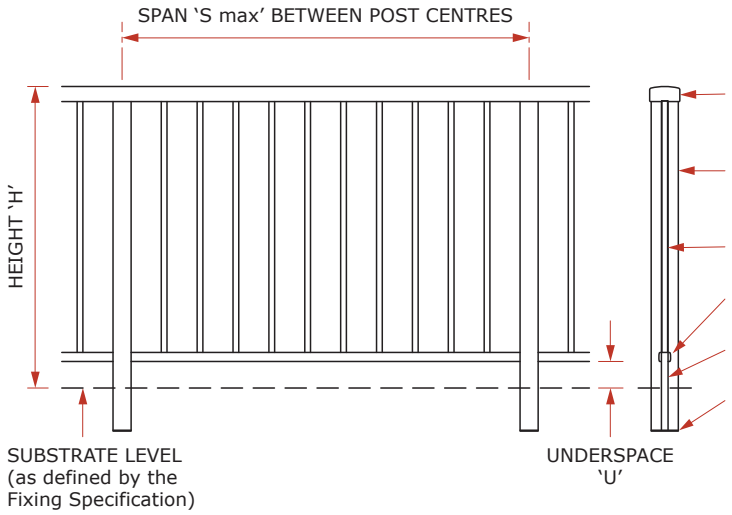
MAXIMUM POST CENTRES 'S max' (metres)

| HEIGHT[2] | Post Type[3] | Line No. | SPAN 'S max' LOADING CLASS[1] | | |
|---|---|---|---|---|---|
| | | | N30 | N20 | N15 |
| **1.1** | EPE | 1 | 1.04 | 1.37 | 1.37 |
| | RAILS ONLY | 2 | 1.32 | 1.32 | 1.32 |
| **1.2** | EPE | 3 | 0.96 | 1.37 | 1.37 |
| | RAILS ONLY | 4 | 1.32 | 1.32 | 1.32 |

1. LOADING CLASS: Refer to Page 87 of this manual for the scope of the Loading Class designations.
2. HEIGHT 'H': is the overall height of the balustrade above the substrate level shown. Interpolate for Heights between those shown.
3. POST TYPES: Refer to Page 14. "RAILS ONLY" gives the maximum span of the rails when fixed in single panels between posts attached to walls or columns designed to provide adequate support.

# 'X3000 SERIES' (BALUSTER) - SIDE-MOUNTED

This is a Style Specification for the use of UNEX's Extreme Balustrades, and must only be used in conjunction with a Fixing Specification, the Specification Notes on Page 49, and the Assembly Specification on Page 54. Installation must be completed in accordance with the Installation Guide on Pages 58-87.




The balustrade shall be fabricated from the following items:

- TOP RAIL: ERT / ERZ / DIA
- POSTS: EPU2
- BALUSTERS: DTH
- LOWER RAIL: ARN
- INSERT: AIA (Full height opf post)
- POST BLANK: EAESS use for side fixed Post

THIS SPECIFICATION IS BASED ON THE ATTACHMENT OF THE BALUSTRADE BEING IN ACCORDANCE WITH ONE OF THE STANDARD TOP FIXING SPECIFICATIONS CONTAINED IN CHAPTER 3. CONTACT UNEX SYSTEMS FOR NON-STANDARD FIXING METHODS.

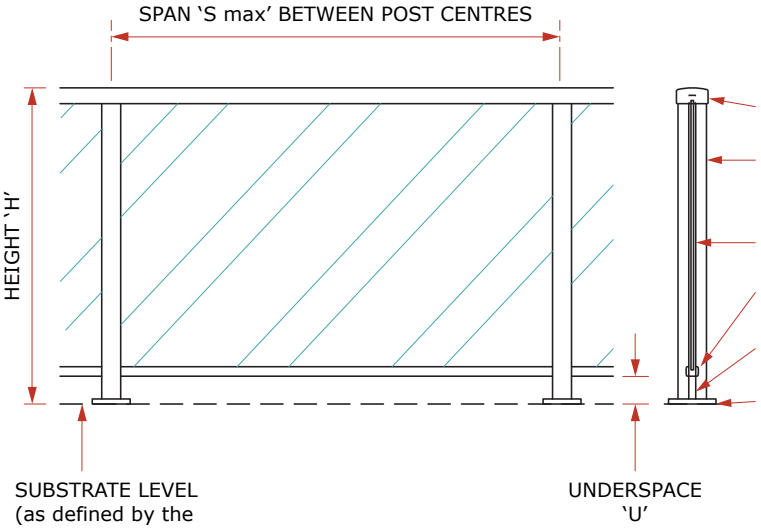
MAXIMUM POST CENTRES 'S max' (metres)

| HEIGHT[2] | Post Type[3] | Line No. | SPAN 'S max' LOADING CLASS[1] N30 | N20 | N15 |
|---|---|---|---|---|---|
| **1.1** | EPU2 | 1 | 1.10 | 1.37 | 1.37 |
| | RAILS ONLY | 2 | 1.32 | 1.32 | 1.32 |
| **1.2** | EPU2 | 3 | 1.01 | 1.37 | 1.37 |
| | RAILS ONLY | 4 | 1.32 | 1.32 | 1.32 |

1. LOADING CLASS: Refer to Page 87 of this manual for the scope of the Loading Class designations.
2. HEIGHT 'H': is the overall height of the balustrade above the substrate level shown. Interpolate for Heights between those shown.
3. POST TYPES: Refer to Page 14. "RAILS ONLY" gives the maximum span of the rails when fixed in single panels between posts attached to walls or columns designed to provide adequate support.

## 'X3000 SERIES' (FRAMED GLASS) - TOP-MOUNTED

This is a Style Specification for the use of UNEX's Extreme Balustrades, and must only be used in conjunction with a Fixing Specification, the Specification Notes on Page 49, and the Assembly Specification on Page 55. Installation must be completed in accordance with the Installation Guide on Pages 58-87.




The balustrade shall be fabricated from the following items:

- TOP RAIL: ERT / ERZ
- POSTS: EPU2
- TOUGHENED GLASS PANELS
- LOWER RAIL: ARN
- INSERT: AIA
- BASE PLATE: BUTV

THIS SPECIFICATION IS BASED ON THE ATTACHMENT OF THE BALUSTRADE BEING IN ACCORDANCE WITH ONE OF THE STANDARD TOP FIXING SPECIFICATIONS CONTAINED IN CHAPTER 3. CONTACT UNEX SYSTEMS FOR NON-STANDARD FIXING METHODS.

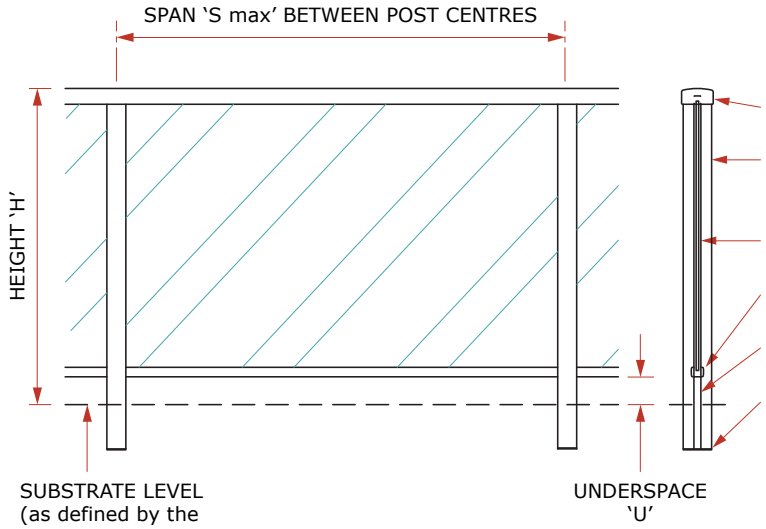
MAXIMUM POST CENTRES 'S max' (metres) & MINIMUM TOUGHENED GLASS THICKNESS (Millimetres)

| HEIGHT[2] | Post Type[4] | Toughened Glass Thickness | Line No. | SPAN 'S max' 60m/s ULS Max. Design Wind Speed LOADING CLASS[1] N30 | N20 | N15 |
|---|---|---|---|---|---|---|
| **1.1** | EPU2 | 8 | 1 | 0.97 | 1.37 | 1.37 |
| | GLASS ONLY | 8 | 2 | - | - | - |
| **1.2** | EPU2 | 8 | 3 | 0.89 | 1.34 | 1.37 |
| | GLASS ONLY | 8 | 4 | - | - | - |

1. LOADING CLASS: Refer to Page 87 of this manual for the scope of the Loading Class designations.
2. HEIGHT 'H': is the overall height of the balustrade above the substrate level shown. Interpolate for Heights between those shown.
3. POST TYPES: Refer to Page 14.
4. DESIGN WIND SPEED: in m/s, Refer to Page 49, note 4 for details of applicable wind codes and the methods for determining the Design Wind Speed for any particular site.

# 'X3000 SERIES' (FRAMED GLASS) - SIDE-MOUNTED

This is a Style Specification for the use of UNEX's Extreme Balustrades, and must only be used in conjunction with a Fixing Specification, the Specification Notes on Page 49, and the Assembly Specification on Page 55. Installation must be completed in accordance with the Installation Guide on Pages 58-87.




The balustrade shall be fabricated from the following items:

- TOP RAIL: ERT / ERZ
- POSTS: EPU2
- TOUGHENED GLASS PANELS
- LOWER RAIL: ARN
- INSERT: AIA
- POST BLANK: EAESS

THIS SPECIFICATION IS BASED ON THE ATTACHMENT OF THE BALUSTRADE BEING IN ACCORDANCE WITH ONE OF THE STANDARD TOP FIXING SPECIFICATIONS CONTAINED IN CHAPTER 3. CONTACT UNEX SYSTEMS FOR NON-STANDARD FIXING METHODS.

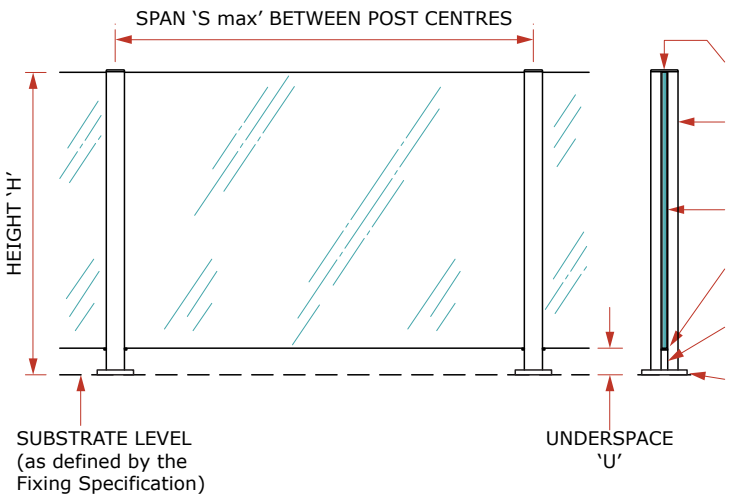
MAXIMUM POST CENTRES 'S max' (metres) &
MINIMUM TOUGHENED GLASS THICKNESS (Millimetres)

| HEIGHT[2] | Post Type[4] | Toughened Glass Thickness | Line No. | SPAN 'S max' 60m/s ULS Max. Design Wind Speed LOADING CLASS[1] | | |
|---|---|---|---|---|---|---|
| | | | | N30 | N20 | N15 |
| **1.1** | EPU2 | 8 | 1 | 1.10 | 1.37 | 1.37 |
| | GLASS ONLY | 8 | 2 | - | - | - |
| **1.2** | EPU2 | 8 | 3 | 1.01 | 1.37 | 1.37 |
| | GLASS ONLY | 8 | 4 | - | - | - |

1. LOADING CLASS: Refer to Page 87 of this manual for the scope of the Loading Class designations.
2. HEIGHT 'H': is the overall height of the balustrade above the substrate level shown. Interpolate for Heights between those shown.
3. POST TYPES: Refer to Page 14.
4. DESIGN WIND SPEED: in m/s, Refer to Page 49, note 4 for details of applicable wind codes and the methods for determining the Design Wind Speed for any particular site.

## 'X3000 SERIES' (SEMI-FRAMELESS GLASS) - TOP-MOUNTED

This is a Style Specification for the use of UNEX's Extreme Balustrades, and must only be used in conjunction with a Fixing Specification, the Specification Notes on Page 49, and the Assembly Specification on Page 56. Installation must be completed in accordance with the Installation Guide on Pages 58-87.




The balustrade shall be fabricated from the following items:
POST CAP: ECEF

POSTS: EPU2. See also Note 4.

TOUGHENED GLASS PANELS. See table below

SUPPORT PLATE: AKS2

INSERT: AIA

BASE PLATE: BUTV

**ONLY USE THIS STYLE IF THE BALUSTRADE IS NOT PREVENTING A FALL OF 1M OR MORE!**

THIS SPECIFICATION IS BASED ON THE ATTACHMENT OF THE BALUSTRADE BEING IN ACCORDANCE WITH ONE OF THE STANDARD TOP FIXING SPECIFICATIONS CONTAINED IN CHAPTER 3. CONTACT UNEX SYSTEMS FOR NON-STANDARD FIXING METHODS.

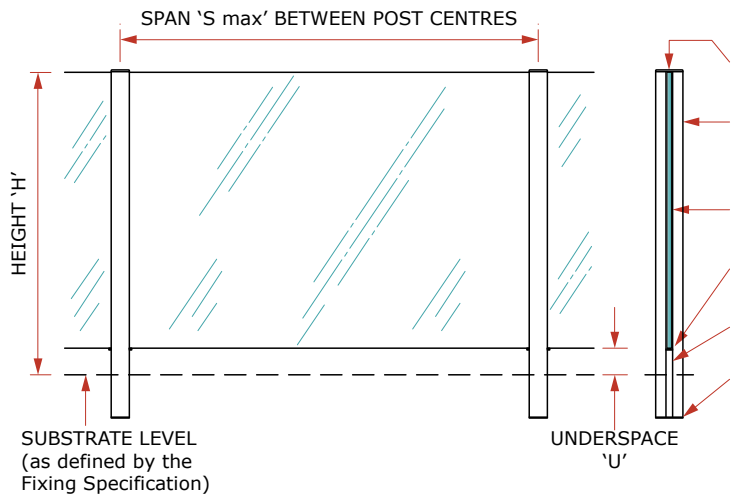
MAXIMUM POST CENTRES 'S max' (metres) &
MINIMUM TOUGHENED GLASS THICKNESS (Millimetres)

| HEIGHT[2] | Post Type[4] | Toughened Glass Thickness | Line No. | SPAN 'S max' 60m/s ULS Max. Design Wind Speed LOADING CLASS[1] | | |
|---|---|---|---|---|---|---|
| | | | | N30 | N20 | N15 |
| **1.1** | EPU2 | 15 | 1 | 0.97 | 1.37 | 1.37 |
| | RAILS ONLY | 15 | 2 | - | - | - |
| **1.2** | EPU2 | 15 | 3 | 0.89 | 1.34 | 1.37 |
| | RAILS ONLY | 15 | 4 | - | - | - |

1. LOADING CLASS: Refer to Page 87 of this manual for the scope of the Loading Class designations.
2. HEIGHT 'H': is the overall height of the balustrade above the substrate level shown. Interpolate for Heights between those shown.
3. POST TYPES: Refer to Page 14.
4. DESIGN WIND SPEED: in m/s, Refer to Page 49, note 4 for details of applicable wind codes and the methods for determining the Design Wind Speed for any particular site.

## 'X3000 SERIES' (SEMI-FRAMELESS GLASS) - SIDE-MOUNTED

This is a Style Specification for the use of UNEX's Extreme Balustrades, and must only be used in conjunction with a Fixing Specification, the Specification Notes on Page 49, and the Assembly Specification on Page 56. Installation must be completed in accordance with the Installation Guide on Pages 58-87.




The balustrade shall be fabricated from the following items:
POST CAP: ECEF

POSTS: EPU2. See also Note 4.

TOUGHENED GLASS PANELS. See table below

SUPPORT PLATE: AKS2

INSERT: AIA

POST BLANK: EAES use for side fixed Post

**ONLY USE THIS STYLE IF THE BALUSTRADE IS NOT PREVENTING A FALL OF 1M OR MORE!**

THIS SPECIFICATION IS BASED ON THE ATTACHMENT OF THE BALUSTRADE BEING IN ACCORDANCE WITH ONE OF THE STANDARD TOP FIXING SPECIFICATIONS CONTAINED IN CHAPTER 3. CONTACT UNEX SYSTEMS FOR NON-STANDARD FIXING METHODS.

MAXIMUM POST CENTRES 'S max' (metres) &
MINIMUM TOUGHENED GLASS THICKNESS (Millimetres)

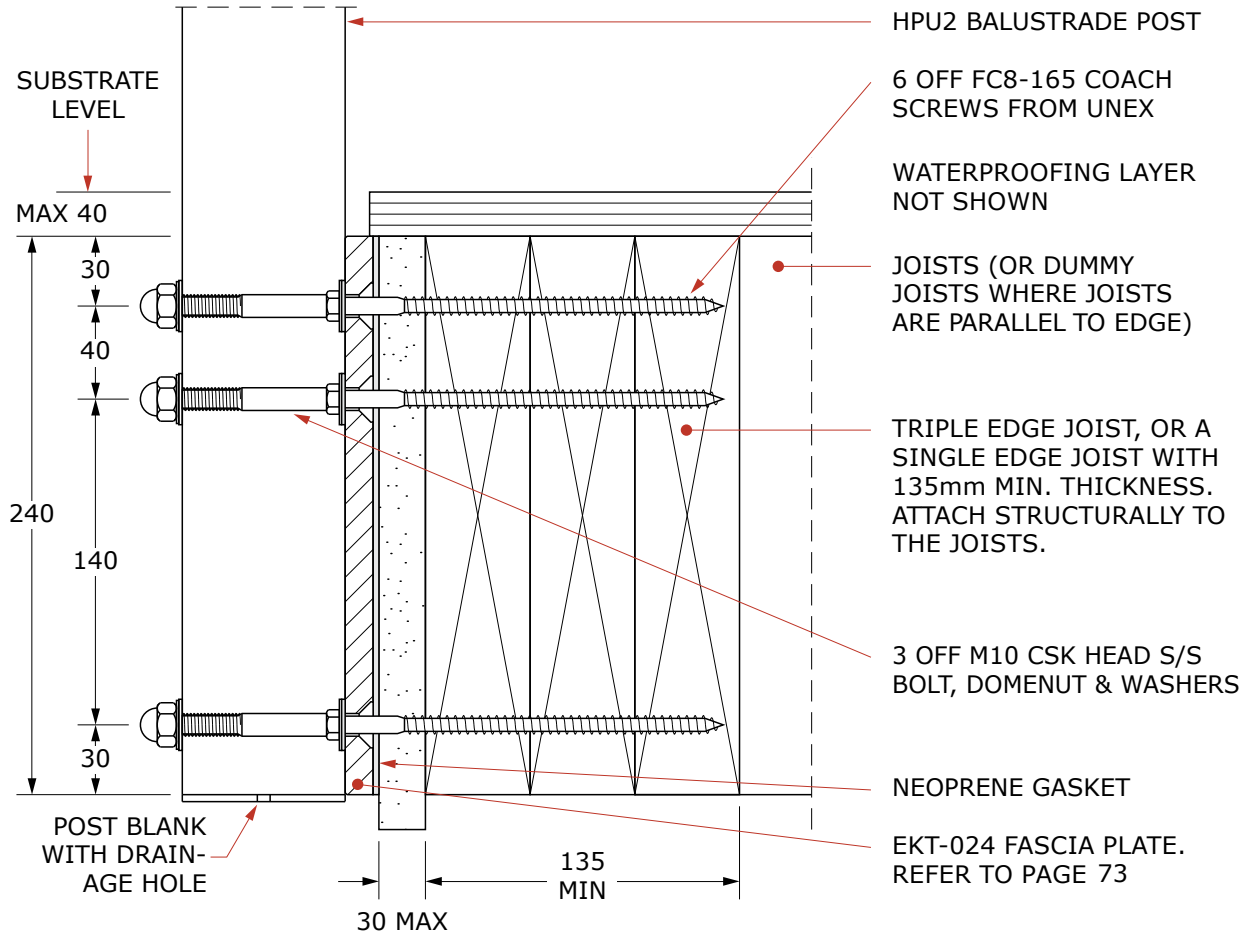
| HEIGHT(2) | Post Type(4) | Toughened Glass Thickness | Line No. | SPAN 'S max' 60m/s ULS Max. Design Wind Speed LOADING CLASS(1) | | |
|---|---|---|---|---|---|---|
| | | | | N30 | N20 | N15 |
| **1.1** | EPU2 | 15 | 1 | 0.97 | 1.37 | 1.37 |
| | GLASS ONLY | 15 | 2 | - | - | - |
| **1.2** | EPU2 | 15 | 3 | 1.01 | 1.37 | 1.37 |
| | GLASS ONLY | 15 | 4 | - | - | - |

1. LOADING CLASS: Refer to Page 87 of this manual for the scope of the Loading Class designations.
2. HEIGHT 'H': is the overall height of the balustrade above the substrate level shown. Interpolate for Heights between those shown.
3. POST TYPES: Refer to Page 14.
4. DESIGN WIND SPEED: in m/s, Refer to Page 49, note 4 for details of applicable wind codes and the methods for determining the Design Wind Speed for any particular site.

## CHAPTER 3 - EXTREME BARRIERS FIXING SPECIFICATIONS

## 'X1500 SERIES' - DRY TIMBER, EKT-240 SIDE-FIXING

This is a Standard Fixing Specification for the use of Extreme Barriers system, and must only be used in conjunction with the Specification Notes on Page 49, and the relevant Style Specification on Pages 24-35. Installation must be completed in accordance with the Installation Guide on Pages 58-87.



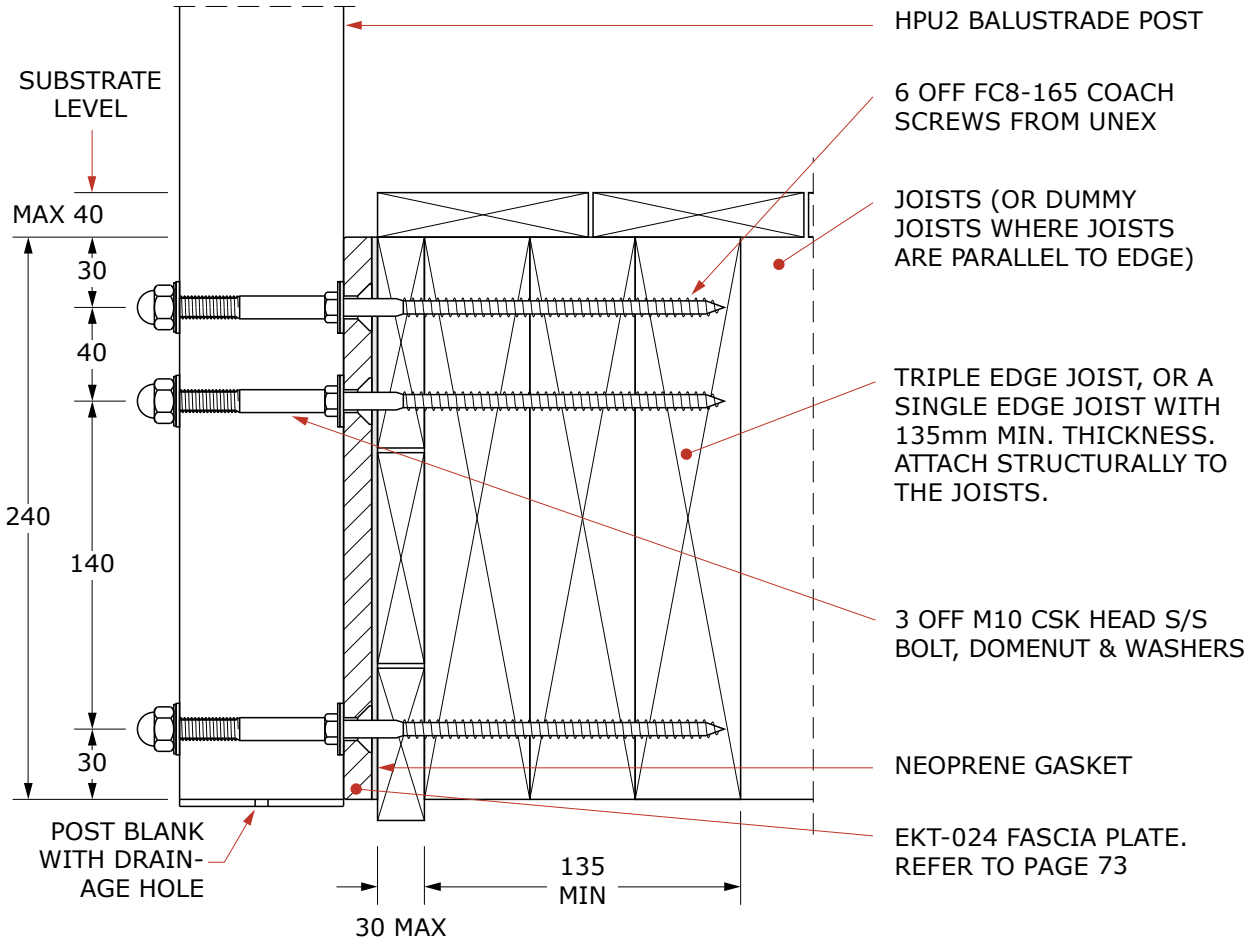

THIS STANDARD SPECIFICATION IS COMPATIBLE WITH THE STYLE SPECIFICATION IN CHAPTER 2. CONTACT UNEX FOR ALTERNATIVE STYLE SPECIFICATIONS AND NON-STANDARD FIXING METHODS.

### NOTES RELATING TO THIS SPECIFICATION

1. Structural timber must be Pinus Radiata VSG8 or MSG8. Maximum in service moisture content = 18%
2. Cavities between the EKT-024 fascia plate and the supporting substrate must be packed solid with No 1 Pinus Radiata or material having an equivalent bearing strength and durability
3. Substrate design including waterproofing and structural design of the timber substrate and its connections are not included in this specification and must be carried out by others.
4. Holes drilled in the side of the post should not exceed Ø10mm fixing holes for the 3 off M10 CSK bolts.

## 'X1500 SERIES' - WET TIMBER, EKT-240 SIDE-FIXING

This is a Standard Fixing Specification for the use of Extreme Barriers system, and must only be used in conjunction with the Specification Notes on Page 49, and the relevant Style Specification on Pages 24-35. Installation must be completed in accordance with the Installation Guide on Pages 58-87.



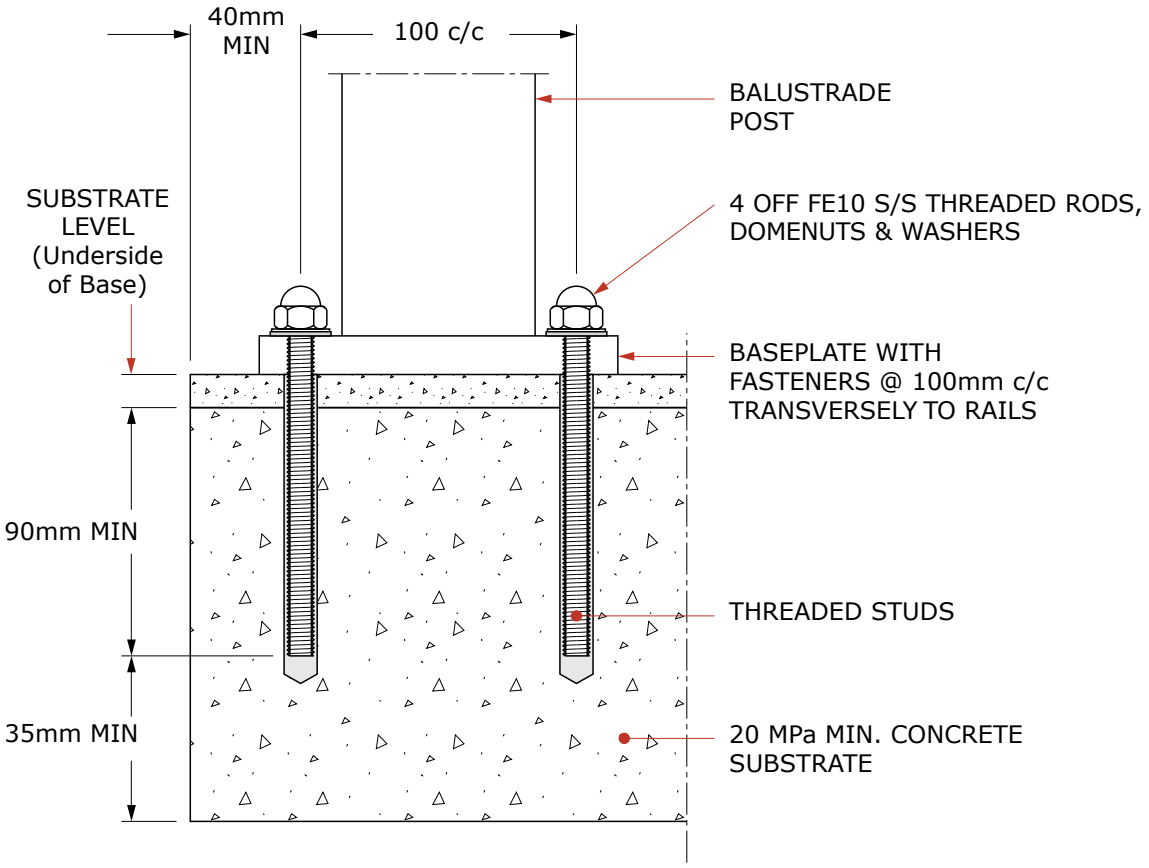

THIS STANDARD SPECIFICATION IS COMPATIBLE WITH THE STYLE SPECIFICATION IN CHAPTER 2. CONTACT UNEX FOR ALTERNATIVE STYLE SPECIFICATIONS AND NON-STANDARD FIXING METHODS.

## NOTES RELATING TO THIS SPECIFICATION

1. Structural timber must be Pinus Radiata VSG8 or MSG8.
2. Cavities between the EKT-024 fascia plate and the supporting substrate must be packed solid with No 1 Pinus Radiata or material having an equivalent bearing strength and durability
3. Substrate design including structural design of the timber substrate and its connections are not included in this specification and must be carried out by others.
4. All FC8-165 coach screws used in this specification, must have fully engaged threads to the structural timber and be embedded with **"Sika Supergrip 2 Hour"** Adhesive. The adhesive is available from UNEX code: TASG and must not be substituted with other adhesives. Insert some adhesive into the pre-drilled hole and liberally apply to the coach screws before insertion.
5. Holes drilled in the side of the post should not exceed Ø10mm fixing holes for the 3 off M10 CSK bolts.

# 'X1500 SERIES' - CONCRETE TOP FIXING, EPOXY-SET ANCHORS, 100MM CRS

This is a Standard Fixing Specification for the use of Extreme Barriers system, and must only be used in conjunction with the Specification Notes on Page 49, and the relevant Style Specification on Pages 24-35. Installation must be completed in accordance with the Installation Guide on Pages 58-87.



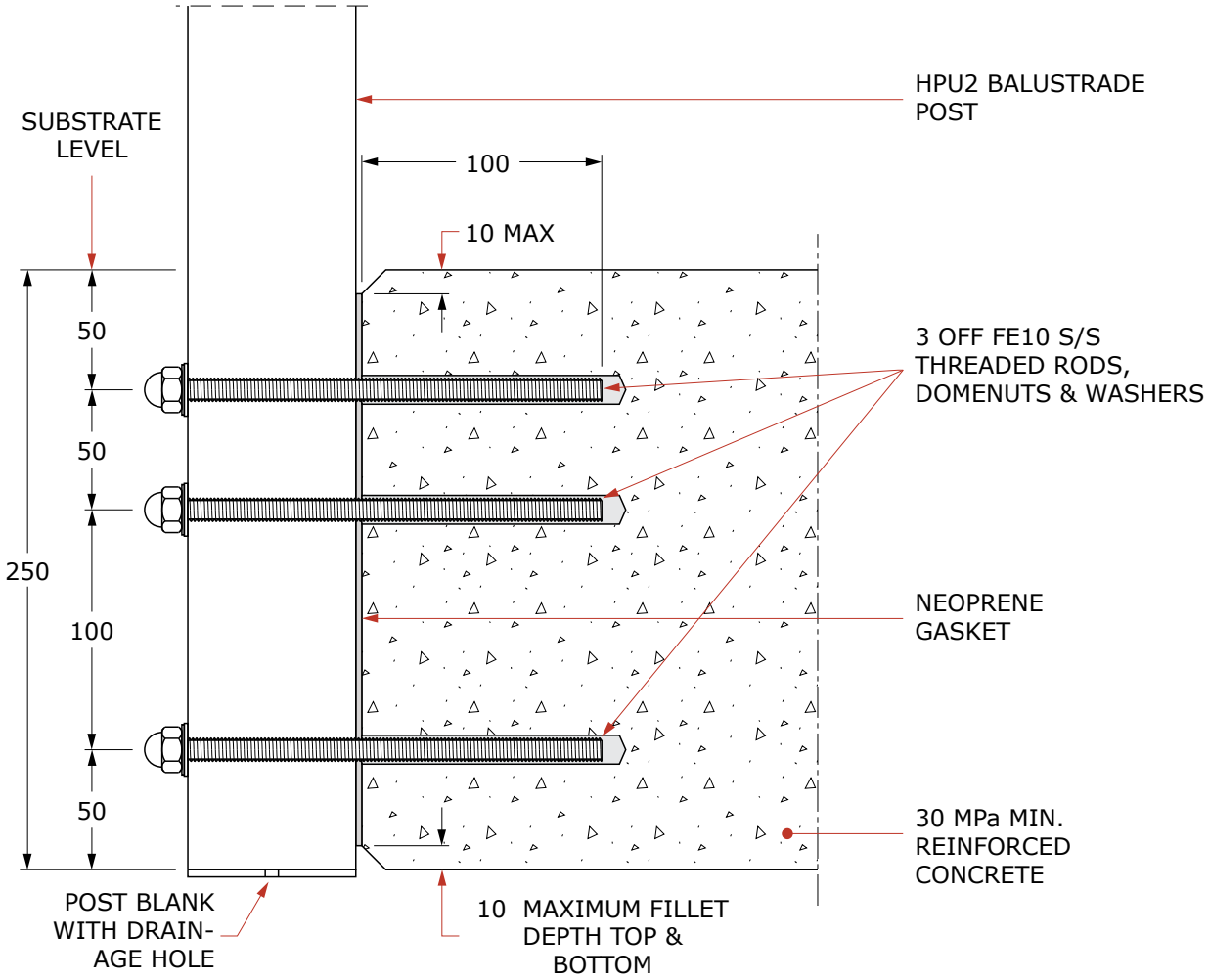

THIS STANDARD SPECIFICATION IS COMPATIBLE WITH THE STYLE SPECIFICATION IN CHAPTER 2. CONTACT UNEX FOR ALTERNATIVE STYLE SPECIFICATIONS AND NON-STANDARD FIXING METHODS.

## NOTES RELATING TO THIS SPECIFICATION

1. M10 threaded rods/studs are manufactured from 316 S/S and supplied by UNEX (M10 threaded rods are UNEX code FE10-XXX where XXX is replaced by the length in mm of the rod e.g. FE10-120 is a 120mm M10 rod). Where a plaster finish, fascia, or other such element is positioned between the baseplate and the substrate, the length of the threaded rod needs to be increased by the same amount to maintain the specified embedment in the structural concrete.
2. FE10-XXX studs as described above shall be installed and anchored into concrete using the Epoxy C6 system (UNEX Code TEC2) in accordance with the manufacturer's instructions.
3. Substrate design including waterproofing and structural design of the concrete substrate and its reinforcing are not included in this specification and must be carried out by others.

## 'X1500 SERIES' - CONCRETE SIDE-FIXING

This is a Standard Fixing Specification for the use of Extreme Barriers system, and must only be used in conjunction with the Specification Notes on Page 49, and the relevant Style Specification on Pages 24-35. Installation must be completed in accordance with the Installation Guide on Pages 58-87.



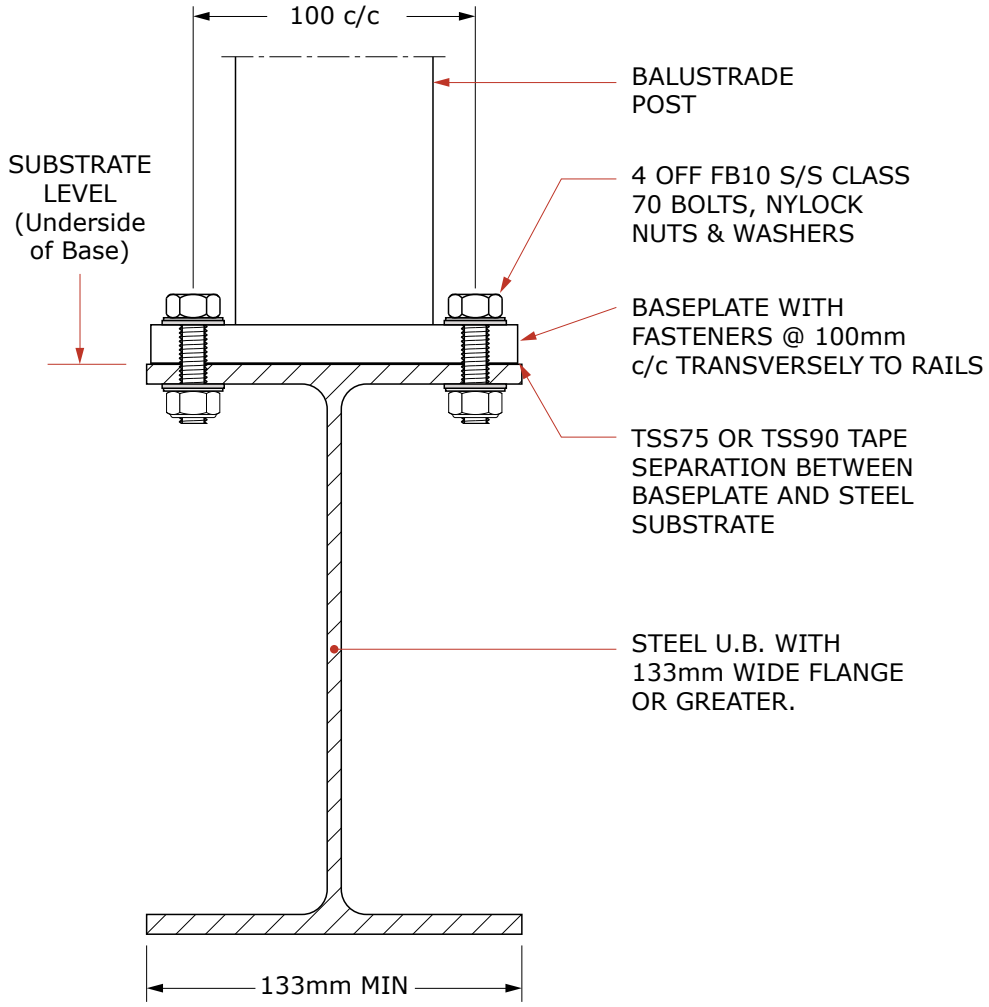

THIS STANDARD SPECIFICATION IS COMPATIBLE WITH THE STYLE SPECIFICATION IN CHAPTER 2. CONTACT UNEX FOR ALTERNATIVE STYLE SPECIFICATIONS AND NON-STANDARD FIXING METHODS.

## NOTES RELATING TO THIS SPECIFICATION

1. M10 threaded rods/studs are manufactured from 316 S/S and supplied by UNEX (M10 threaded rods are UNEX code FE10-XXX where XXX is replaced by the length in mm of the rod e.g. FE10-200 is a 200mm M10 rod). Where a plaster finish, fascia, or other such element is positioned between the post and the substrate, the length of the threaded rod needs to be increased by the same amount to maintain the specified embedment in the structural concrete.
2. FE10-XXX studs as described above shall be installed and anchored into concrete using the Epoxy C6 system (UNEX Code TEC2) in accordance with the manufacturer's instructions.
3. Substrate design including waterproofing and structural design of the concrete substrate and its reinforcing are not included in this specification and must be carried out by others.
4. Holes drilled in the side of the post should not exceed Ø10mm fixing holes for the 3 off M10 threaded rods.

## 'X1500 SERIES' - STEEL 200UB 22.3, TOP FIXING

This is a Standard Fixing Specification for the use of Extreme Barriers system, and must only be used in conjunction with the Specification Notes on Page 49, and the relevant Style Specification on Pages 24-35. Installation must be completed in accordance with the Installation Guide on Pages 58-87.



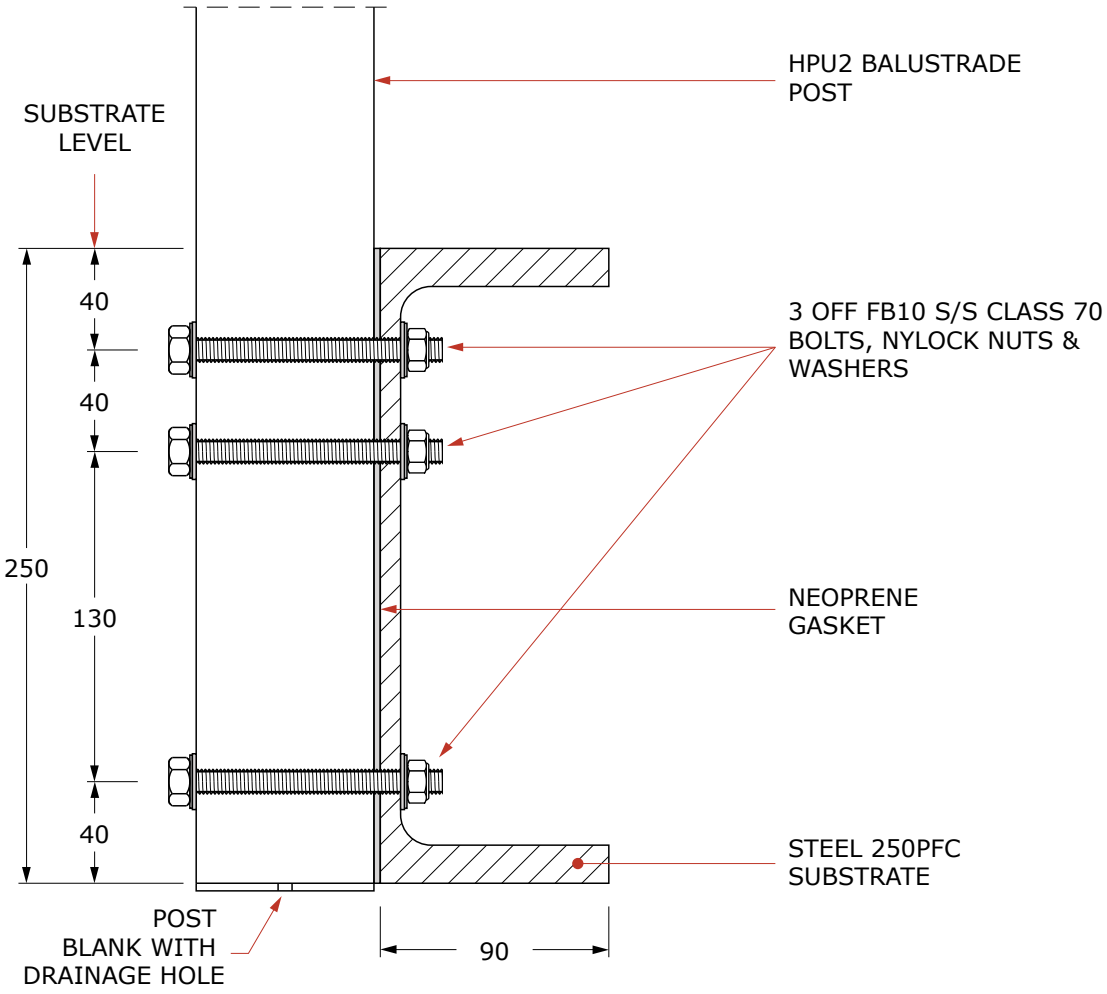

THIS STANDARD SPECIFICATION IS COMPATIBLE WITH THE STYLE SPECIFICATION IN CHAPTER 2. CONTACT UNEX FOR ALTERNATIVE STYLE SPECIFICATIONS AND NON-STANDARD FIXING METHODS.

### NOTES RELATING TO THIS SPECIFICATION

1. M10 bolts are manufactured from 316 S/S and supplied by UNEX (M10 Bolts are UNEX code FB10-XXX where XXX is replaced by the length in mm of the bolt e.g. FB10-40 is a 40mm M10 bolt). Where any element is positioned between the baseplate and the substrate, the length of the bolt needs to be increased by the same amount to maintain enough protrusion to attach the nyloc nut.
2. The balustrade baseplate must be bearing directly and firmly on the supporting substrate. Any element in between must have an equivalent bearing strength and durability as the steel substrate.
3. Substrate design including waterproofing and structural design of the steel substrate and its connections are not included in this specification and must be carried out by others.
4. TSS75 or TSS90 tape is necessary to separate between baseplate and steel substrate.

## 'X1500 SERIES' - STEEL 250PFC, SIDE-FIXING

This is a Standard Fixing Specification for the use of Extreme Barriers system, and must only be used in conjunction with the Specification Notes on Page 49, and the relevant Style Specification on Pages 24-35. Installation must be completed in accordance with the Installation Guide on Pages 58-87.



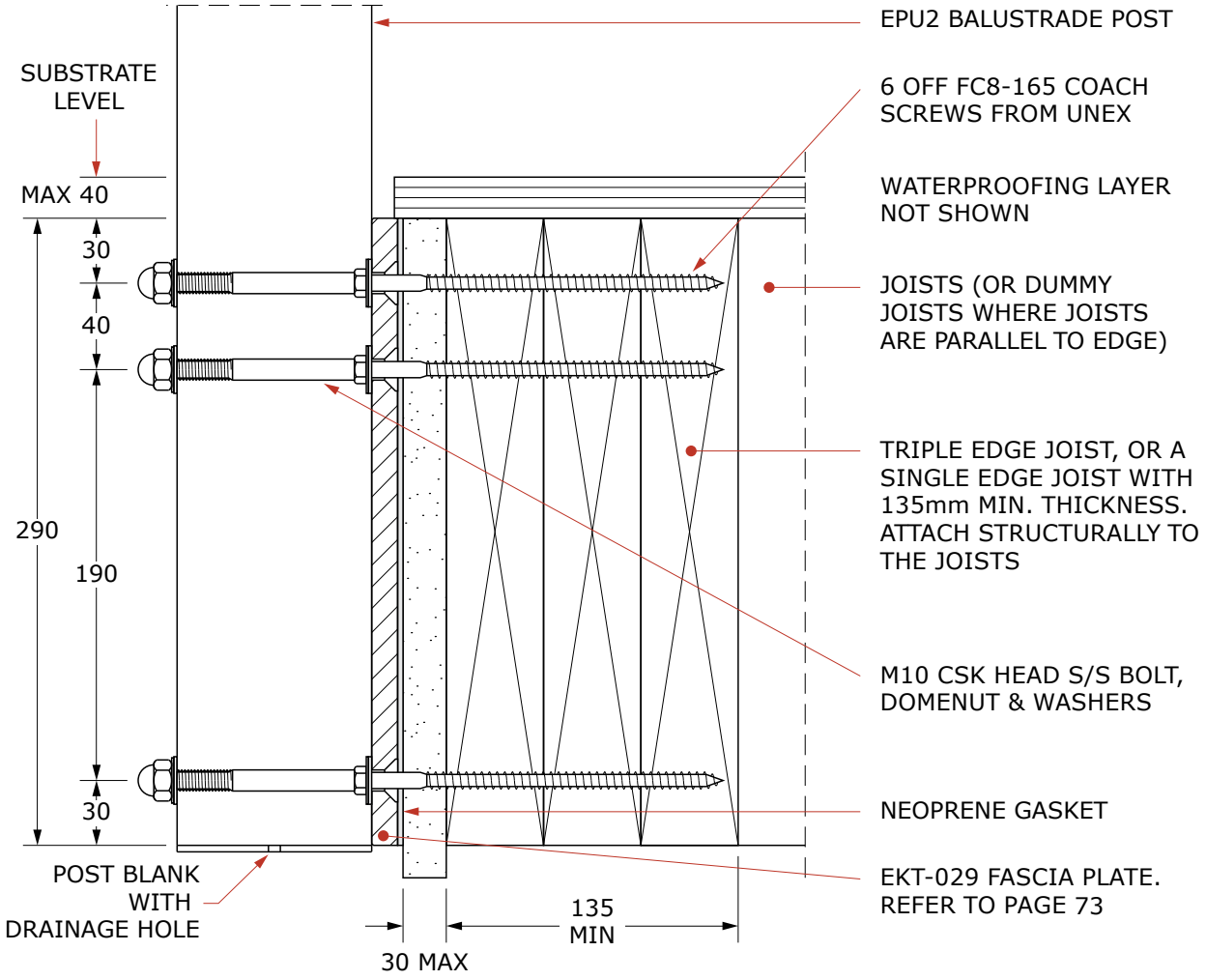

THIS STANDARD SPECIFICATION IS COMPATIBLE WITH THE STYLE SPECIFICATION IN CHAPTER 2. CONTACT UNEX FOR ALTERNATIVE STYLE SPECIFICATIONS AND NON-STANDARD FIXING METHODS.

## NOTES RELATING TO THIS SPECIFICATION

1. M10 bolts are manufactured from 316 S/S and supplied by UNEX (M10 Bolts are UNEX code FB10-XXX where XXX is replaced by the length in mm of the bolt e.g. FB10-100 is a 100mm M10 bolt). Where any element is positioned between the post and the substrate, the length of the bolt needs to be increased by the same amount to maintain enough protrusion to attach the nyloc nut.
2. The balustrade post must be bearing directly and firmly on the supporting substrate. Any element in between must have an equivalent bearing strength and durability as the steel substrate.
3. Substrate design including waterproofing and structural design of the steel substrate and its connections are not included in this specification and must be carried out by others.
4. Holes drilled in the side of the post should not exceed Ø10mm fixing holes for the 3 off M10 bolts.

# 'X3000 SERIES' - DRY TIMBER, EKT-290 SIDE-FIXING

This is a Standard Fixing Specification for the use of Extreme Barriers system, and must only be used in conjunction with the Specification Notes on Page 49, and the relevant Style Specification on Pages 24-35. Installation must be completed in accordance with the Installation Guide on Pages 58-87.



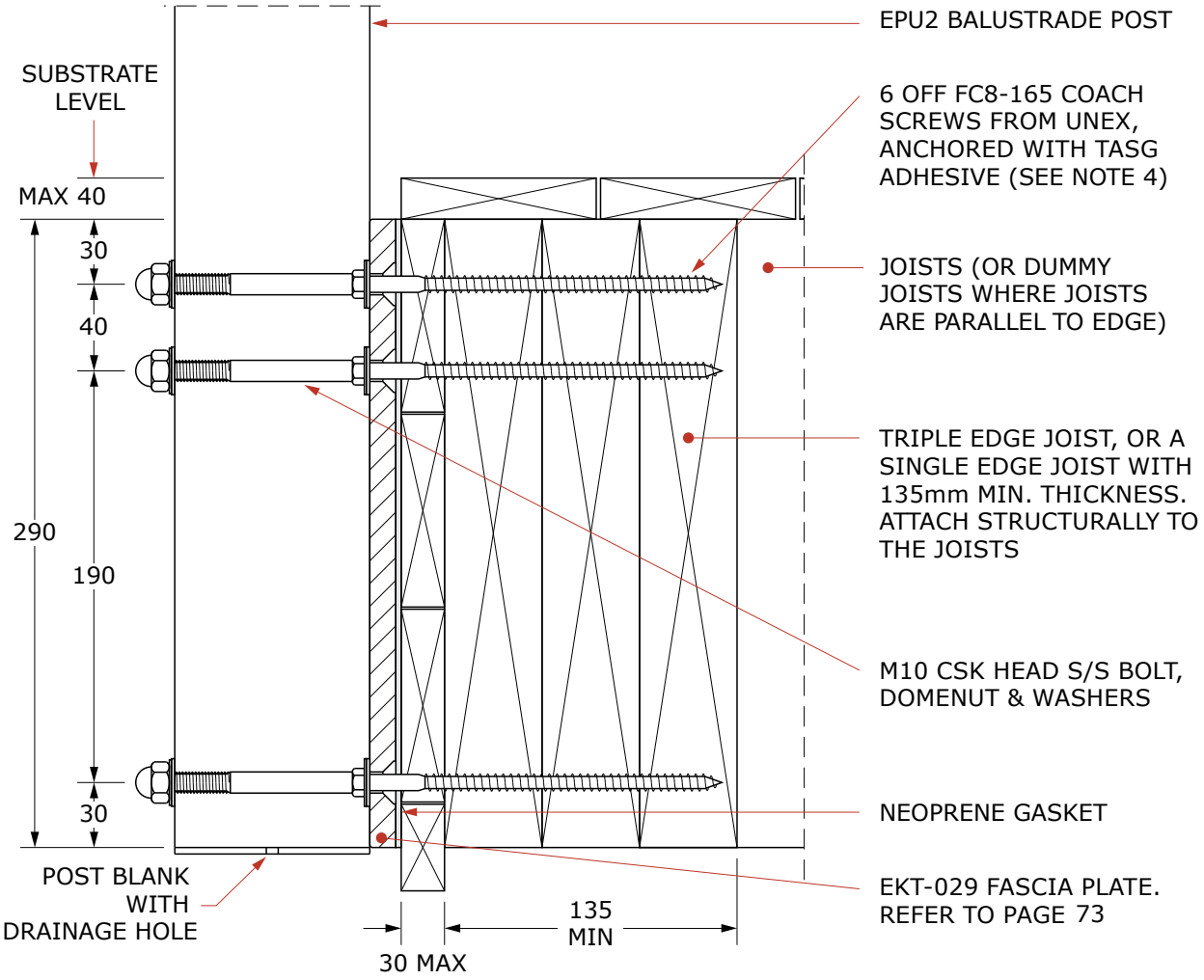

THIS STANDARD SPECIFICATION IS COMPATIBLE WITH THE STYLE SPECIFICATION IN CHAPTER 2. CONTACT UNEX FOR ALTERNATIVE STYLE SPECIFICATIONS AND NON-STANDARD FIXING METHODS.

## NOTES RELATING TO THIS SPECIFICATION

1. Structural timber must be Pinus Radiata VSG8 or MSG8. Maximum in service moisture content = 18%
2. Cavities between the EKT-029 fascia plate and the supporting substrate must be packed solid with No 1 Pinus Radiata or material having an equivalent bearing strength and durability
3. Substrate design including waterproofing and structural design of the timber substrate and its connections are not included in this specification and must be carried out by others.
4. Holes drilled in the side of the post should not exceed Ø10mm fixing holes for the 3 off M10 CSK bolts.

## 'X3000 SERIES' - WET TIMBER, EKT-290 SIDE-FIXING

This is a Standard Fixing Specification for the use of Extreme Barriers system, and must only be used in conjunction with the Specification Notes on Page 49, and the relevant Style Specification on Pages 24-35. Installation must be completed in accordance with the Installation Guide on Pages 58-87.



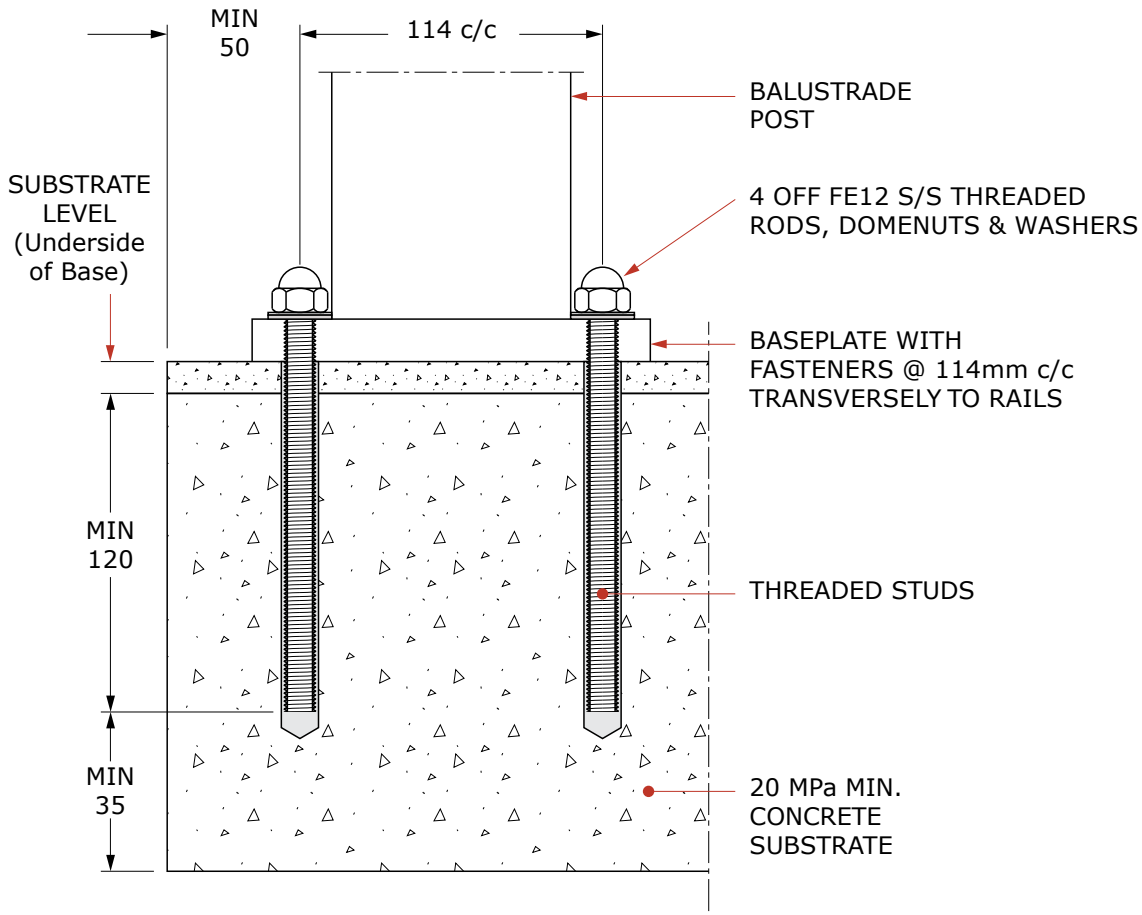

THIS STANDARD SPECIFICATION IS COMPATIBLE WITH THE STYLE SPECIFICATION IN CHAPTER 2. CONTACT UNEX FOR ALTERNATIVE STYLE SPECIFICATIONS AND NON-STANDARD FIXING METHODS.

### NOTES RELATING TO THIS SPECIFICATION

1. Structural timber must be Pinus Radiata VSG8 or MSG8.
2. Cavities between the EKT-029 fascia plate and the supporting substrate must be packed solid with No 1 Pinus Radiata or material having an equivalent bearing strength and durability
3. Substrate design including structural design of the timber substrate and its connections are not included in this specification and must be carried out by others.
4. All FC8-165 coach screws used in this specification, must have fully engaged threads to the structural timber and be embedded with **"Sika Supergrip 2 Hour"** Adhesive. The adhesive is available from UNEX code: TASG and must not be substituted with other adhesives. Insert some adhesive into the pre-drilled hole and liberally apply to the coach screws before insertion.
5. Holes drilled in the side of the post should not exceed Ø10mm fixing holes for the 3 off M10 CSK bolts.

## 'X3000 SERIES' - CONCRETE TOP FIXING, EPOXY-SET ANCHORS, 114MM CRS

This is a Standard Fixing Specification for the use of Extreme Barriers system, and must only be used in conjunction with the Specification Notes on Page 49, and the relevant Style Specification on Pages 24-35. Installation must be completed in accordance with the Installation Guide on Pages 58-87.



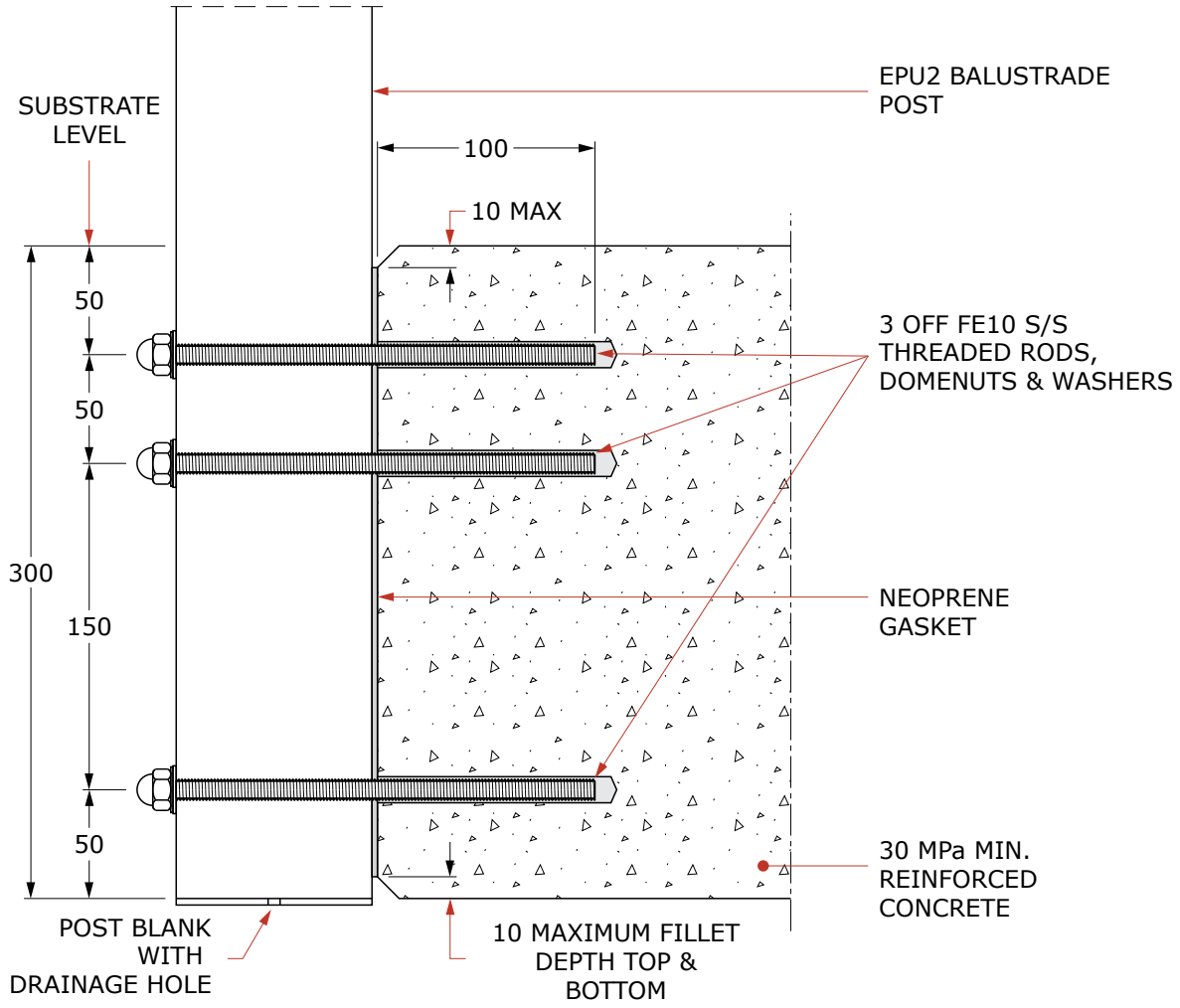

THIS STANDARD SPECIFICATION IS COMPATIBLE WITH THE STYLE SPECIFICATION IN CHAPTER 2. CONTACT UNEX FOR ALTERNATIVE STYLE SPECIFICATIONS AND NON-STANDARD FIXING METHODS.

### NOTES RELATING TO THIS SPECIFICATION

1. M12 threaded rods/studs are manufactured from 316 S/S and supplied by UNEX (M12 threaded rods are UNEX code FE12-XXX where XXX is replaced by the length in mm of the rod e.g. FE12-150 is a 150mm M12 rod). Where a plaster finish, fascia, or other such element is positioned between the baseplate and the substrate, the length of the threaded rod needs to be increased by the same amount to maintain the specified embedment in the structural concrete.
2. FE12-XXX studs as described above shall be installed and anchored into concrete using the Epoxy C6 system (UNEX Code TEC2) in accordance with the manufacturer's instructions.
3. Substrate design including waterproofing and structural design of the concrete substrate and its reinforcing are not included in this specification and must be carried out by others.

## 'X3000 SERIES' - CONCRETE, SIDE-FIXING

This is a Standard Fixing Specification for the use of Extreme Barriers system, and must only be used in conjunction with the Specification Notes on Page 49, and the relevant Style Specification on Pages 24-35. Installation must be completed in accordance with the Installation Guide on Pages 58-87.



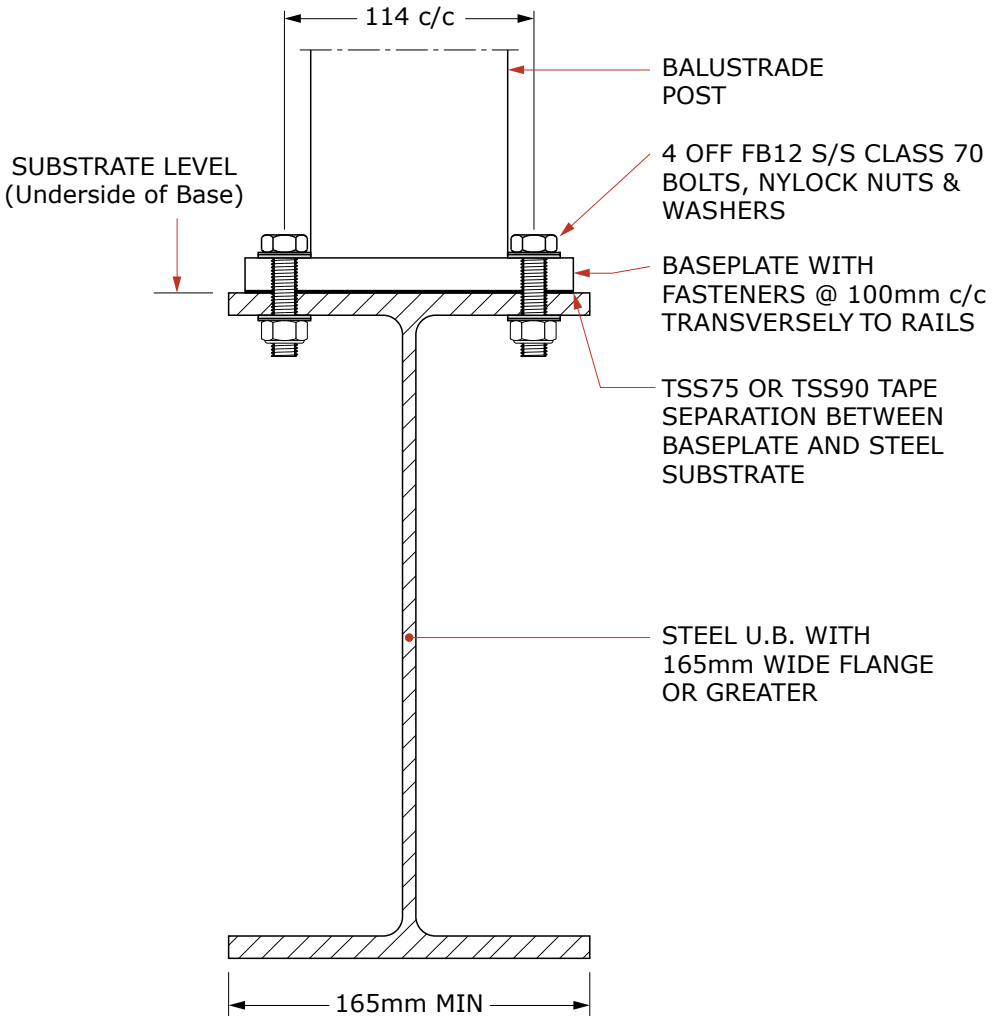

THIS STANDARD SPECIFICATION IS COMPATIBLE WITH THE STYLE SPECIFICATION IN CHAPTER 2. CONTACT UNEX FOR ALTERNATIVE STYLE SPECIFICATIONS AND NON-STANDARD FIXING METHODS.

## NOTES RELATING TO THIS SPECIFICATION

1. M10 threaded rods/studs are manufactured from 316 S/S and supplied by UNEX (M10 threaded rods are UNEX code FE10-XXX where XXX is replaced by the length in mm of the rod e.g. FE10-220 is a 220mm M10 rod). Where a plaster finish, fascia, or other such element is positioned between the post and the substrate, the length of the threaded rod needs to be increased by the same amount to maintain the specified embedment in the structural concrete.
2. FE10-XXX studs as described above shall be installed and anchored into concrete using the Epoxy C6 system (UNEX Code TEC2) in accordance with the manufacturer's instructions.
3. Substrate design including waterproofing and structural design of the concrete substrate and its reinforcing are not included in this specification and must be carried out by others.
4. Holes drilled in the side of the post should not exceed Ø10mm fixing holes for the 3 off M10 threaded rods.

## 'X3000 SERIES' - STEEL 310UB 40.4, TOP FIXING

This is a Standard Fixing Specification for the use of Extreme Barriers system, and must only be used in conjunction with the Specification Notes on Page 49, and the relevant Style Specification on Pages 24-35. Installation must be completed in accordance with the Installation Guide on Pages 58-87.



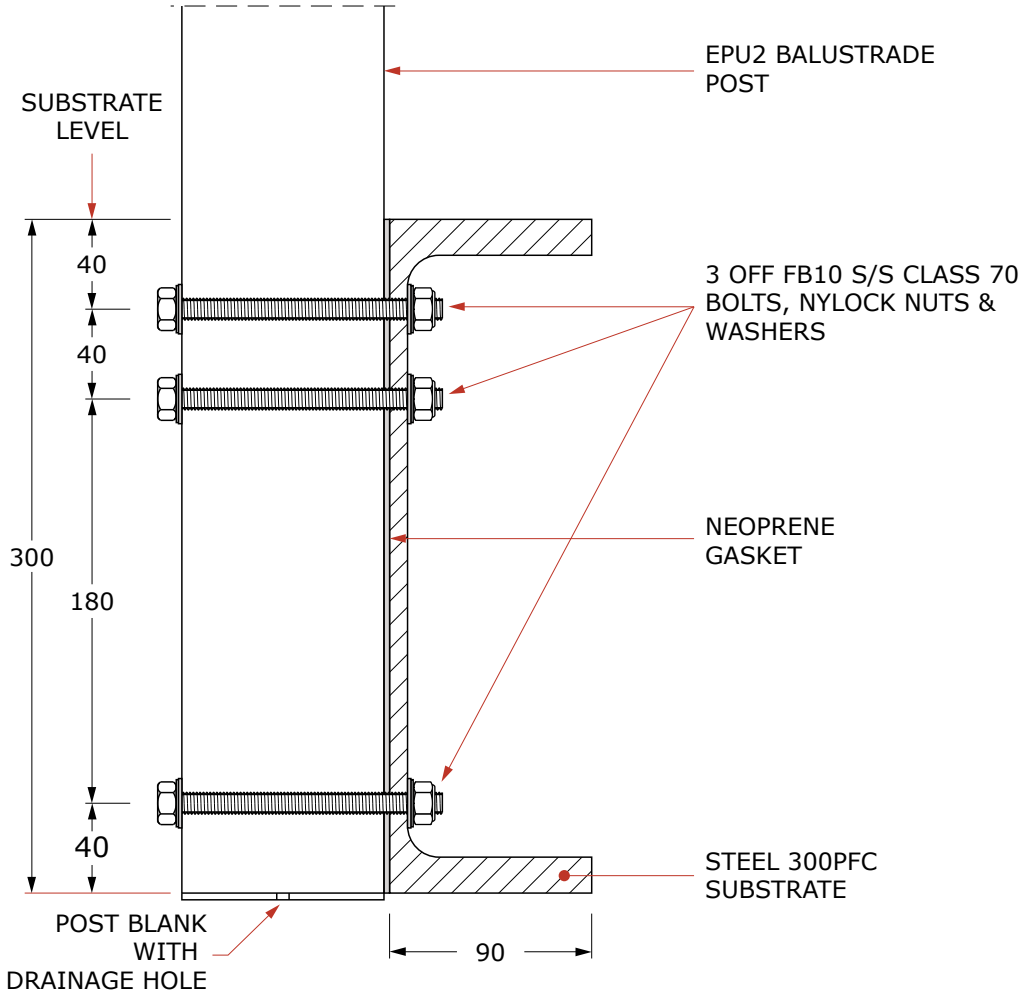

THIS STANDARD SPECIFICATION IS COMPATIBLE WITH THE STYLE SPECIFICATION IN CHAPTER 2. CONTACT UNEX FOR ALTERNATIVE STYLE SPECIFICATIONS AND NON-STANDARD FIXING METHODS.

### NOTES RELATING TO THIS SPECIFICATION

1. M12 bolts are manufactured from 316 S/S and supplied by UNEX (M12 Bolts are UNEX code FB12-XXX where XXX is replaced by the length in mm of the bolt e.g. FB12-45 is a 45mm M12 bolt). Where any element is positioned between the baseplate and the substrate, the length of the bolt needs to be increased by the same amount to maintain enough protrusion to attach the nyloc nut.
2. The balustrade baseplate must be bearing directly and firmly on the supporting substrate. Any element in between must have an equivalent bearing strength and durability as the steel substrate.
3. Substrate design including waterproofing and structural design of the steel substrate and its connections are not included in this specification and must be carried out by others.
4. TSS75 or TSS90 tape is necessary to separate between baseplate and steel substrate.

## 'X3000 SERIES' - STEEL 300PFC, SIDE-FIXING

This is a Standard Fixing Specification for the use of Extreme Barriers system, and must only be used in conjunction with the Specification Notes on Page 49, and the relevant Style Specification on Pages 24-35. Installation must be completed in accordance with the Installation Guide on Pages 58-87.




THIS STANDARD SPECIFICATION IS COMPATIBLE WITH THE STYLE SPECIFICATION IN CHAPTER 2. CONTACT UNEX FOR ALTERNATIVE STYLE SPECIFICATIONS AND NON-STANDARD FIXING METHODS.

## NOTES RELATING TO THIS SPECIFICATION

1. M10 bolts are manufactured from 316 S/S and supplied by UNEX (M10 Bolts are UNEX code FB10-XXX where XXX is replaced by the length in mm of the bolt e.g. FB10-120 is a 120mm M10 bolt). Where any element is positioned between the post and the substrate, the length of the bolt needs to be increased by the same amount to maintain enough protrusion to attach the nyloc nut.
2. The balustrade post must be bearing directly and firmly on the supporting substrate. Any element in between must have an equivalent bearing strength and durability as the steel substrate.
3. Substrate design including waterproofing and structural design of the steel substrate and its connections are not included in this specification and must be carried out by others.
4. Holes drilled in the side of the post should not exceed Ø10mm fixing holes for the 3 off M10 bolts.

# EXTREME BARRIERS SPECIFICATION NOTES

## 1. GENERAL

The Extreme Barriers style specifications are based on the standard fixing specifications shown on Pages 37-48 in this Catalogue.

Non-standard and site-specific specifications supplied by UNEX Systems may be used in conjunction with Extreme Barriers style specification, providing any factors and/or instructions shown in the nonstandard and site-specific specifications are applied.

## 2. GLASS MANUFACTURED TO AS/NZS 2208

All glass used in balustrading shall be Grade A Toughened Safety Glass manufactured by a reputable glass manufacturer to meet the requirements of AS/NZS 2208. Glass shall be selected and used in accordance with the requirements of NZS 4223, which should be referred to for a full guide.

## 3. GLAZING

Glass panes must always be supported on a pair of suitable setting blocks placed adjacent to each end. In some cases these blocks need to be inserted into the aluminium members before balustrade assembly.

Where glass spans between glazing posts, it is recommended that the glass is slid gently in from the top with minimum clearance to the post webs on each side.

## 4. DESIGN WIND SPEED

Design Wind Speeds are ultimate limit state wind speeds and will need to be determined for each installation from AS/NZS 1170:2002. Where buildings come within the scope of New Zealand Standard NZS 3604:2011 Timber-framed buildings, the ultimate wind speed may be determined by using the method given in this standard (NZS 3604:2011).

## 5. FABRICATION AND INSTALLATION

Installation is to be in accordance with the Extreme Barriers installation instructions and comply with all relevant requirements of the NZ Building Code.

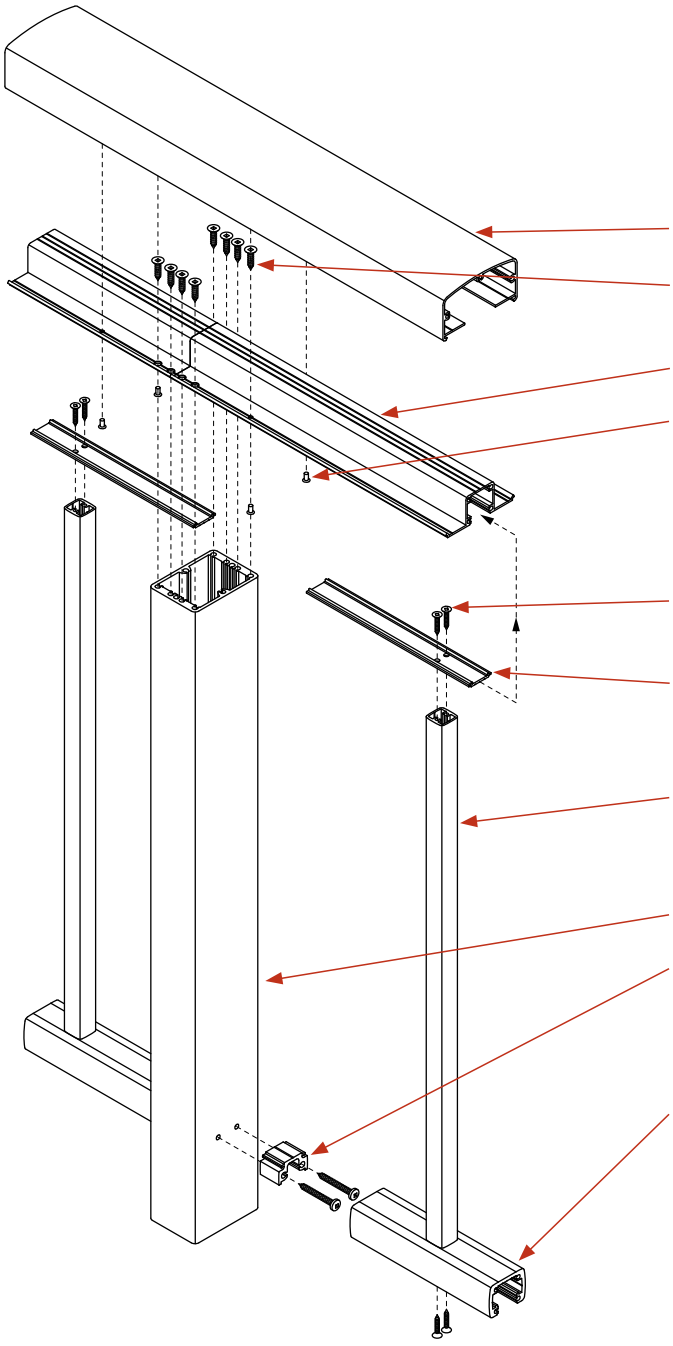
## 6. SUBSTRATE DESIGN

Substrate design including waterproofing and structural design of the supporting members and their connections is beyond the scope of these specifications and must be carried out by others.

## CHAPTER 4 - EXTREME BARRIER ASSEMBLY SPECIFICATIONS

# 'X1500 SERIES' FRAMED BALUSTER (HRT TOP RAIL)

*Refer elsewhere for corners, slopes and other situations not illustrated here.*



HRT TOP RAIL

FV10-19.T1 SCREWS. 8 per post. Drill size = Ø5.5mm.

HRZ INNER GLAZING TOP RAIL

FS4-4 RIVETS. 1 pair within 150mm from panel ends; and at 750mm maximum centres between, and on either side of joints in Outer Top Rail. Drill size = Ø3.3mm.

FV6-19 SCREW. Two per baluster end for DTH Balusters. Drill size = Ø4.1mm.

DIA INFILL Slides within the Inner Glazing Top Rail. The grooved side engages the DTH Balusters.

DTH BALUSTER. The balusters must be orientated so that the screwports are on either side of the rail centreline.

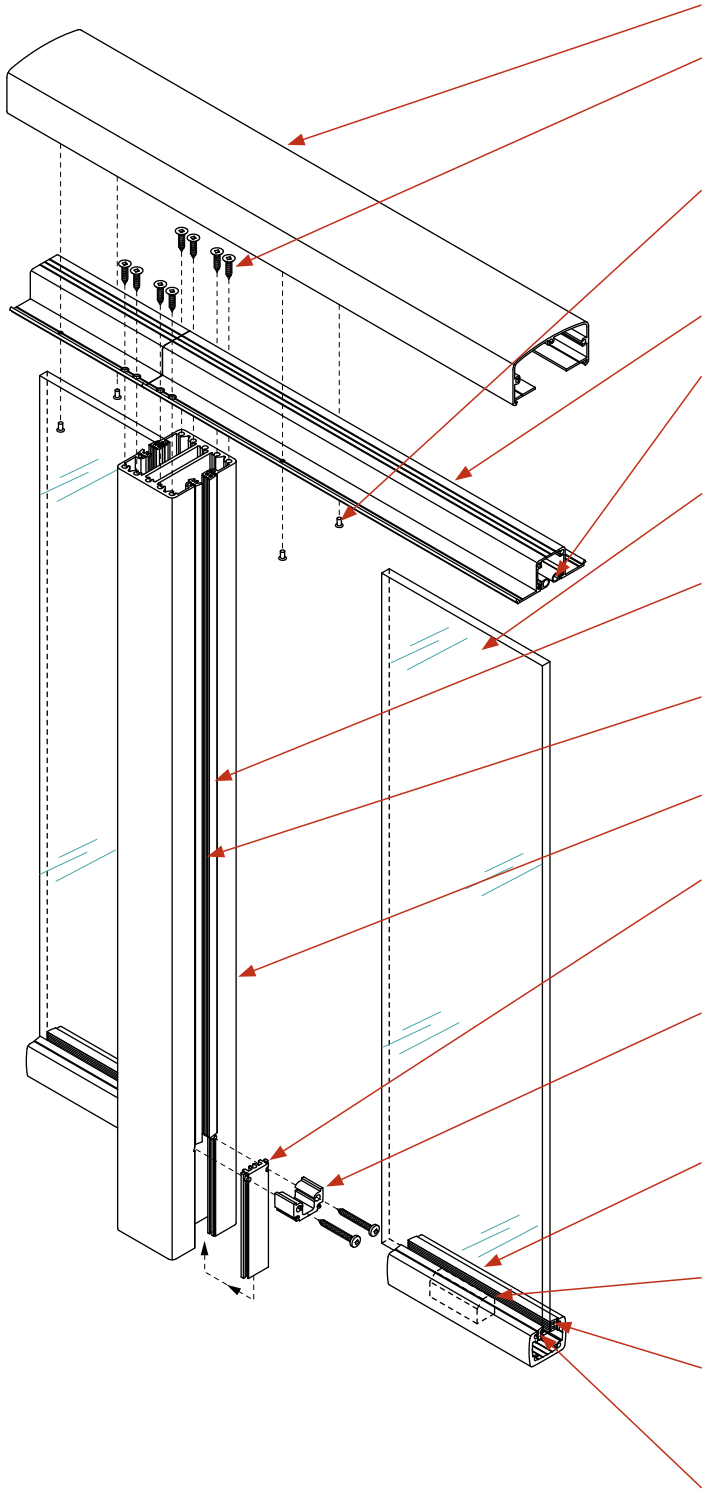
HPH POST. Ensure orientation is as drawn.

ANG CONNECTOR type to Lower Rails, secured to posts with FT10-32.T1 SCREWS, 2 per connector. Drill size into post = Ø4.1mm.

ARN LOWER RAIL

## 'X1500 SERIES' FRAMED GLASS (HRT TOP RAIL)

*Refer elsewhere for corners, slopes and other situations not illustrated here.*



HRT TOP RAIL

FV10-19.T1 SCREWS. 8 per post. Drill size = Ø5.5mm.

FS4-4 RIVETS. 1 pair within 150mm from panel ends, and at 1000mm maximum centres between, and on either side of joints in the Outer Top Rail. Drill size = Ø3.3mm.

HRZ INNER GLAZING TOP RAIL.

SRD RETAINING GASKET both sides of glass. Must be slid into rail prior to assembly

TOUGHENED GLASS, with four edge glazing.

RETAINED GASKET to the outer face of glass, SRG70 for 8mm glass. Must be slid into post prior to assembly.

WEDGE GASKET to the inner face of glass, SWE50 for 8mm glass.

HPU2 RECESSED POST.

AIA INSERT to blank off post recess and receive spigot screw holes. Must be inserted and locked in place before drilling.

ANG CONNECTOR type to lower rails, secured to post with FT10-32.T1 SCREWS. 2 per connector. Drill size into post = Ø4.1mm.

ARN LOWER RAIL. Ø5.5mm drainage hole to be provided at mid span in exterior applications.

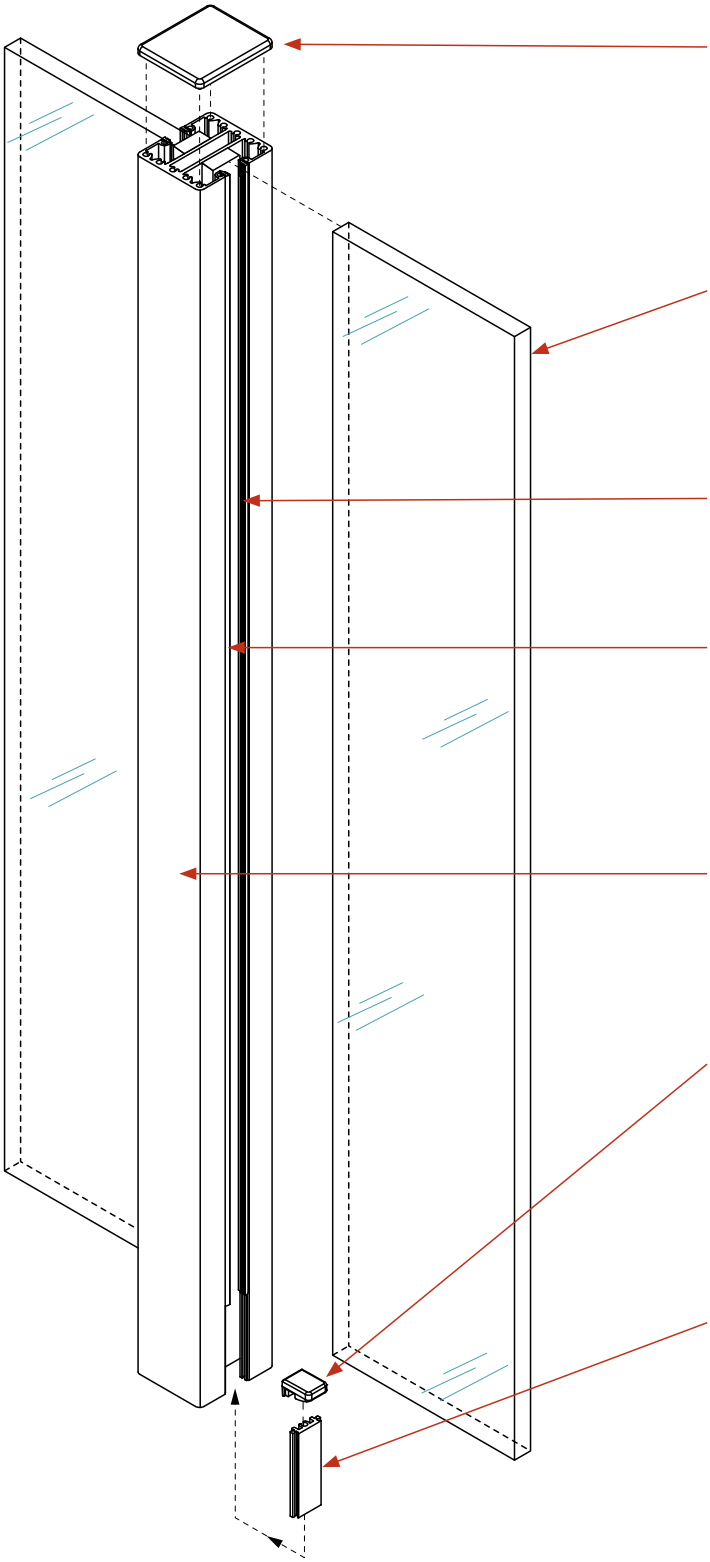
SBH SETTING BLOCKS. Must be 30mm from Lower Rail ends. Insert into rail prior to assembly if using SRG70 Gasket.

SRG70 RETAINED GASKET to outer face of glass. Must be slid into rail before assembly.

GASKETS, as per post.

## 'X1500 SERIES' SEMI-FRAMELESS GLASS BALUSTRADE (NO TOP RAIL)

**ONLY USE THIS STYLE IF THE BALUSTRADE IS NOT PREVENTING A FALL OF 1M OR MORE!**



HCEF POST CAP, push fit prongs to top of Post after installation of glass. Secure to posts with a small amount of TAS70-03*X* adhesive.

TOUGHENED GLASS, 15mm thick with exposed horizontal edges to be flat polished.

RETAINED GASKET to the outer face of glass, SRG20 for 15mm glass.

WEDGE GASKET to the inner face of the glass.
SWE25 for 15mm glass.

HPU2 RECESSED POST.

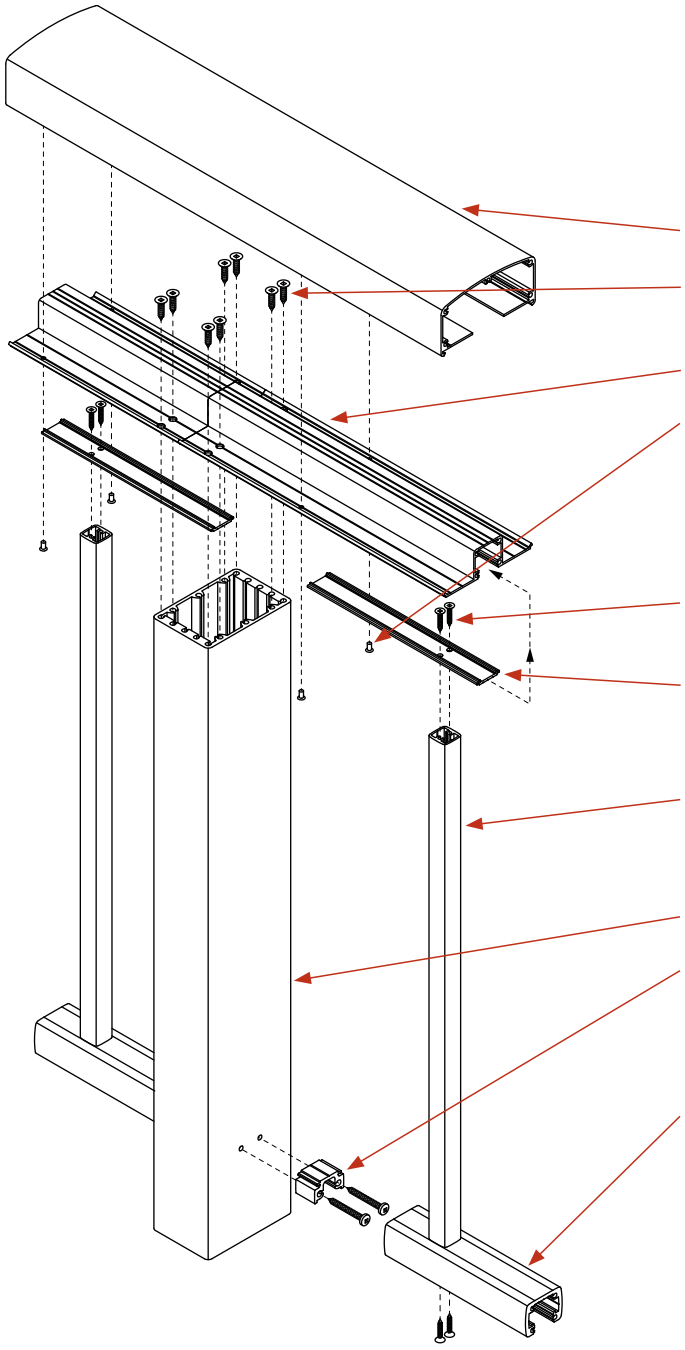
AKS2 BRACKET, to support glass. Attach to AIA insert (press fit). For further detail of bracket attachment for situations, refer to "AKS attachment" Pages 69-71.

AIA INSERT for supporting glass by transferring weight down to base plate or substrate.

*Refer elsewhere for corners, slopes and other situations not illustrated here.*

## 'X3000 SERIES' FRAMED GLASS (ERT TOP RAIL)

*Refer elsewhere for corners, slopes and other situations not illustrated here.*



ERT TOP RAIL

FV10-19.T1 SCREWS. 8 per post. Drill size = Ø5.5mm.

ERZ INNER GLAZING TOP RAIL

FS4-4 RIVETS. 1 pair within 150mm from panel ends; and at 750mm maximum centres between, and on either side of joints in Outer Top Rail. Drill size = Ø3.3mm.

FV6-19 SCREW. Two per baluster end for DTH Balusters. Drill size = Ø4.1mm.

DIA INFILL Slides within the Inner Glazing Top Rail. The grooved side engages the DTH Balusters.

DTH BALUSTER. The balusters must be orientated so that the screwports are on either side of the rail centreline.

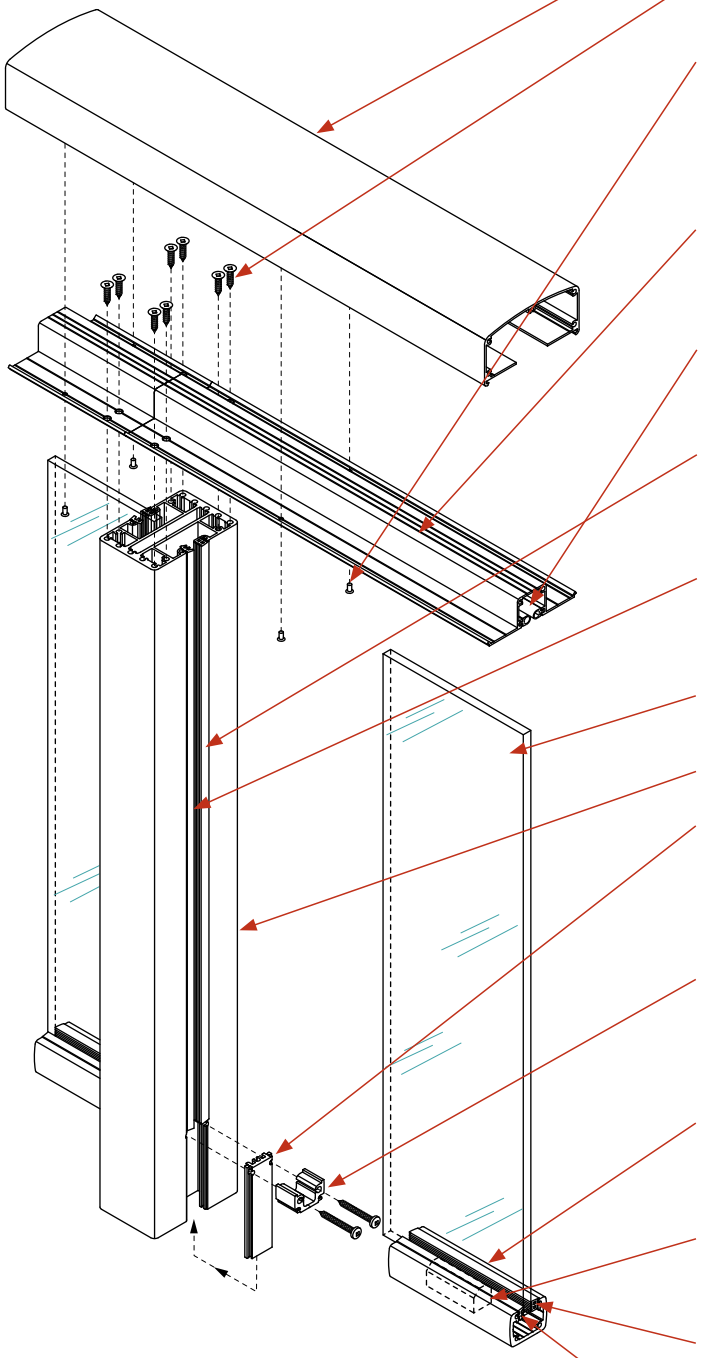
EPE POST. Ensure orientation is as drawn.

ANG CONNECTOR type to Lower Rails, secured to posts with FT10-32.T1 SCREWS, 2 per connector. Drill size into post = Ø4.1mm.

ARN LOWER RAIL

# 'X3000 SERIES' FRAMED GLASS (ERT TOP RAIL)

*Refer elsewhere for corners, slopes and other situations not illustrated here.*



ERT TOP RAIL

FV10-19.T1 SCREWS. 8 per post. Drill size = Ø5.5mm.

FS4-4 RIVETS. 1 pair within 150mm from panel ends, and at 1000mm maximum centres between, and on either side of joints in the Outer Top Rail. Drill size = Ø3.3mm.

ERZ INNER GLAZING TOP RAIL

SRD RETAINING GASKET both sides of glass. Must be slid into rail prior to assembly

RETAINED GASKET to the outer face of glass, SRG70 for 8mm glass. Must be slid into post prior to assembly.

WEDGE GASKET to the inner face of glass, SWE50 for 8mm glass.

TOUGHENED GLASS, with four edge glazing.

EPU2 RECESSED POST

AIA INSERT to blank off post recess and receive spigot screw holes. Must be inserted and locked in place before drilling.

ANG CONNECTOR type to lower rails, secured to post with FT10-32.T1 SCREWS. 2 per connector. Drill size into post = Ø4.1mm.

ARN LOWER RAIL. Ø5.5mm drainage hole to be provided at mid span in exterior applications.

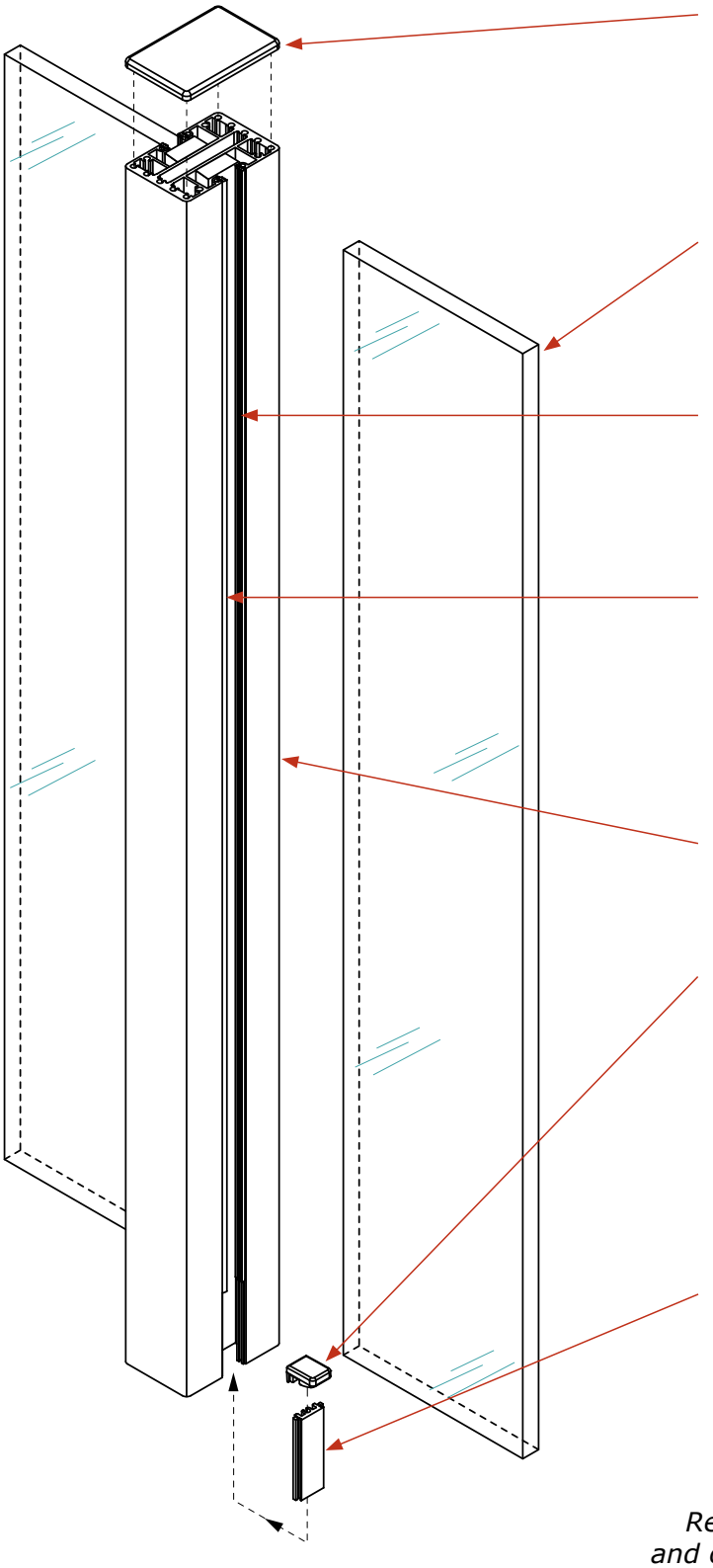
SBH SETTING BLOCKS. Must be 30mm from Lower Rail ends. Insert into rail prior to assembly if using SRG70 Gasket.

SRG70 RETAINED GASKET to outer face of glass. Must be slid into rail before assembly.

WEDGE GASKETS, as per post.

## 'X3000 SERIES' SEMI-FRAMELESS GLASS BALUSTRADE (NO TOP RAIL)

**ONLY USE THIS STYLE IF THE BALUSTRADE IS NOT PREVENTING A FALL OF 1M OR MORE!**



ECEF POST CAP, push fit prongs to top of Post after installation of glass. Secure to posts with a small amount of TAS70-03X adhesive.

TOUGHENED GLASS, 15mm thick with exposed horizontal edges to be flat polished.

RETAINED GASKET to the outer face of glass, SRG20 for 15mm glass.

WEDGE GASKET to the inner face of the glass.
SWE25 for 15mm glass.

EPU2 RECESSED POST.

AKS2 BRACKET, to support glass. Attach to AIA insert (press fit). For further detail of bracket attachment for situations, refer to "AKS attachment" Pages 69-71.

AIA INSERT for supporting glass by transferring weight down to base plate or substrate.

*Refer elsewhere for corners, slopes and other situations not illustrated here.*

## CHAPTER 5 - EXTREME BARRIERS FABRICATION & INSTALLATION

## SITE MEASURING - GENERAL GUIDE

The following guide applies specifically to site measuring which should show the 4 types of information described below, plus any other relevant data.

### 1. PLAN DIMENSIONS

To manufacture a balustrade, the fabricator will need to accurately know the centreline length of the balustrade, and the angle between each run at all corners. Obtaining this centreline length can be achieved by two methods, i.e. "ON-SITE" METHOD, whereby the centreline length is obtained direct from measurements on site; and the "CALCULATION" METHOD, whereby the centreline length is calculated from the deck edge measurements and angles. Below are the procedures for each method. NOTE: the "CALCULATION" METHOD is recommended for all balustrades that are side fixed to the balcony.

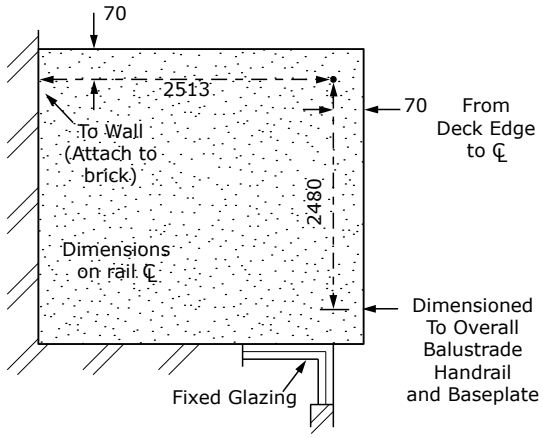



FIG. 1

(i) "ON-SITE" METHOD: It is essential when using this method that the fixing method and baseplate type etc have been finalised. The balustrade centreline can then be marked at an appropriate distance back from the deck edge, ensuring that the fixings will engage with structural joists and nogs on timber decks, or that the fixings will not be less than the minimum edge distance specified for concrete decks. A chalk-line can be useful for marking out the balustrade centreline on the deck. Once this is done, the balustrade centreline lengths can be measured and recorded on a layout plan, along with the angles at all intersection points.

The advantage of this method is that measurements are directly available for the balustrade manufacture, without the need of further calculations, and therefore reducing risk of error etc.

(ii) "CALCULATION" METHOD: Measure and record the length of all deck edges which require balustrades, along with Substrate Details.

Once the fixing method and baseplate type has been finalised, the balustrade centreline "setback" dimension can also be finalised (i.e. the distance the balustrade centreline is set back from the deck edge). Consequent to this, the balustrade centreline length can be calculated.

Where the deck angles are 90 degrees, this can be done by adding or subtracting the set-backs at each end of the run from the deck edge dimension. For other deck angles, a full size or scale drawing may be required to determine the amount to be added or subtracted to each end. This method of site measuring will need to be used for side fixed balustrades.

At ends, carefully record all relevant details, such as: where measurements are to, the presence of doors or windows etc. Figure 1 shows a typical layout plan and dimensions.

*(continued on following Page)*

## SITE MEASURING - GENERAL GUIDE - (CONT'D)

### 2. SUBSTRATE DETAILS

These describe the building structure at all points to which the balustrade attaches. Generally the best presentation of deck structure is given by dimensioned cross-sections of the deck edges; See Figure 2 for a typical cross-section.

Where attaching to walls or columns, ensure adequate solid fixing is available. Check these surfaces for plumb, and record any discrepancy.

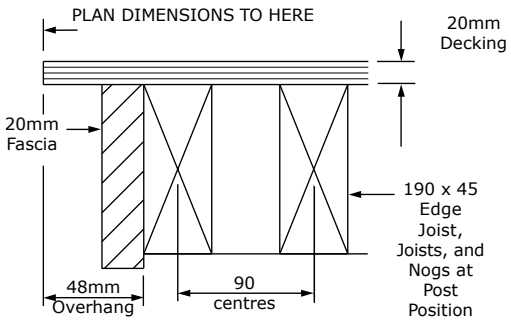



FIG. 2

### 3. CORNER ANGLES

On the layout plan, record the angles of all the corners. Measure these angles using an electronic protractor or similar.

If such an instrument is not available the angle can be determined by measuring a fixed amount (say 500mm) from the corner along both deck edges, marking these points and measuring the distance between them. By recording all three dimensions, the deck angle can then be accurately reproduced in the factory when fabricating the balustrade. Figure 3 shows various methods of recording the corner angle measurements.

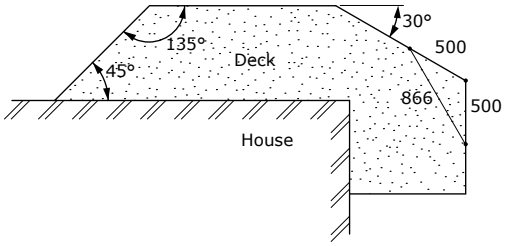
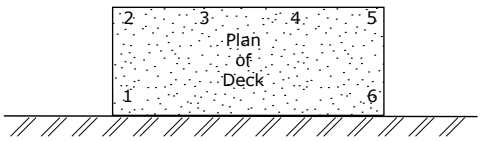



FIG. 3

### 4. CHANGES IN LEVEL

Note and record all changes in level.
(i) MAJOR CHANGES, e.g.-Steps or ramps.
(ii) MINOR CHANGES, e.g.-due to fall, sag in the deck or to general unevenness. These should be allowed for by varying each post length to obtain a straight and level top rail with the minimum specified rail height at the highest point in the deck. This generally necessitates a check on the deck level at every post position, as apparently flat decks can have significant variations in level.
The relative level of different post positions on the deck can be determined with a builders level and staff. Ensure that the zero end of the staff is on the deck. By reading on the staff the distance from the deck to the line of sight of the instrument, and recording at each position, the required length of each post can be determined.




| Point | Staff Reading |
|---|---|
| 1 | 1500 |
| 2 | 1525 |
| 3 | 1520 |
| 4 | 1517 |
| 5 | 1522 |
| 6 | 1495 |

FIG. 4

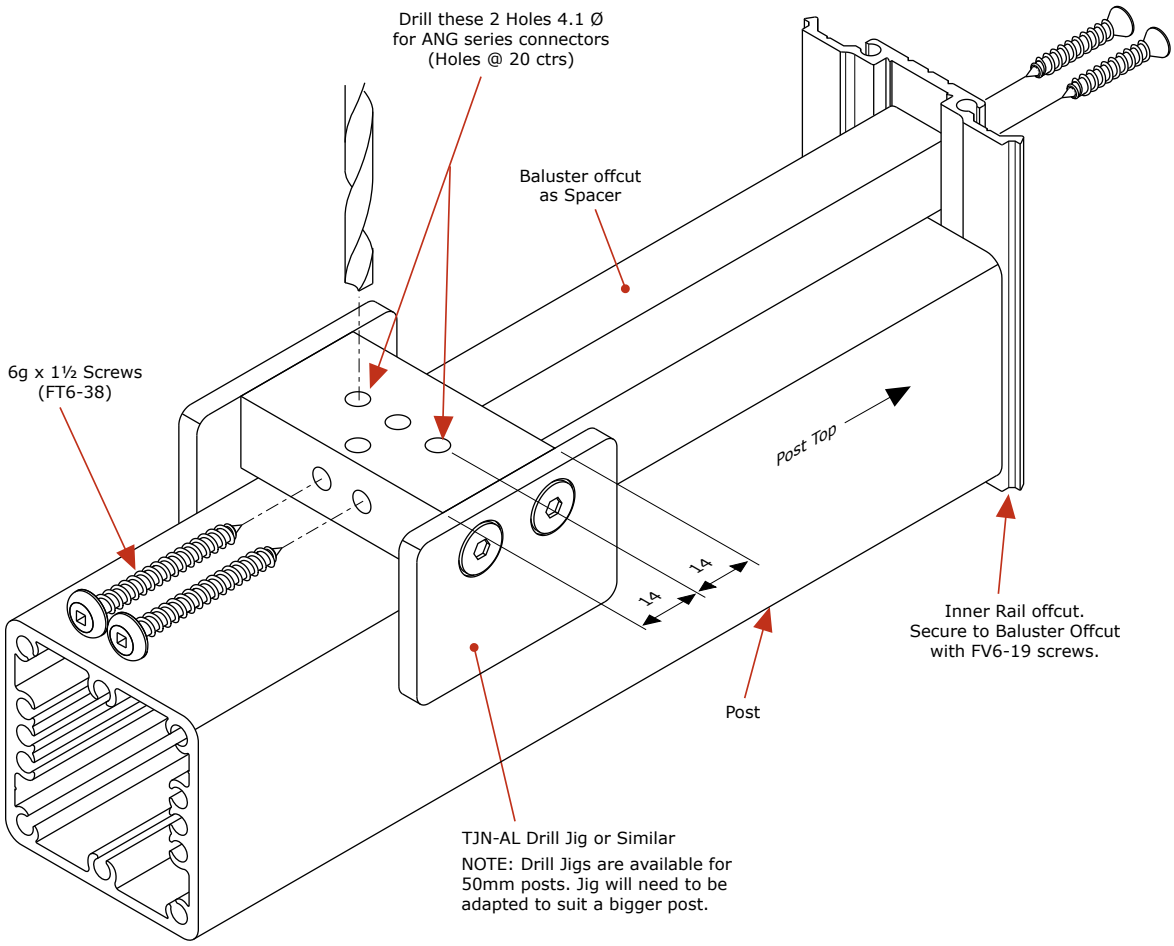
The same procedure can be carried out using a laser level to provide the horizontal line of sight. It is convenient to identify each post position on the layout plan with a number, i.e. 1, 2, 3 etc, and show the staff readings in a table adjacent to each post reference. See Figure 4. In this example, Point 6 is the highest point on the deck, and Point 2 is the lowest, with a difference of 30mm.

# DRILL GUIDE FOR CONNECTORS TO POSTS

This page describes the method of use of Drill Jig Part No. TJN-ALU or similar. This jig may be used to accurately drill square or rectangular 50mm posts, (including VPH2, VPM2 and VPE Posts) for ANG Series lower Rail Connectors. Note that the jig will need to be adapted to suit a bigger post (including EPU2 and HPU2 posts). It can only be used for connectors attaching perpendicularly to the posts.

NOTES ON USE:

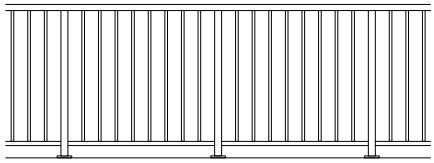
1. The Jig is seated on the Post faces as shown, and the two appropriate holes are drilled, 4.1Ø.
2. The Jig may be used to accurately position the holes from the post top by screwing to the jig as a spacer an off-cut of baluster which has been trimmed to the correct length. Check this length carefully; remembering that balusters protrude above the post top by 4mm with DRI2 Inner Rails and 1mm for DRH Inner Rails.
3. The upper end of the baluster may be positioned on the post top by screwing an off-cut of Inner Rail (DRI2 or DRH) to it. For single top rail baluster styles, if the off-cut is of the type actually used on the job, then the Baluster Spacer length will equal the length of the balustrade balusters where the Lower Rail is VRL2, as the jig depth equals the depth of a VRL2 Rail.
4. The jig may be used for balustrades with a Mid Rail by using a short spacer for the mid rail, and a longer spacer for the lower rail. Remember the balusters protrude up beyond the underside of mid-rails, by 4mm (typically for DTS3 Balusters) or 2mm (for DTH Balusters), depending on the DIA Infill orientation.



# 'X1500 SERIES', FRAMED BALUSTER - VERTICAL DIMENSIONS

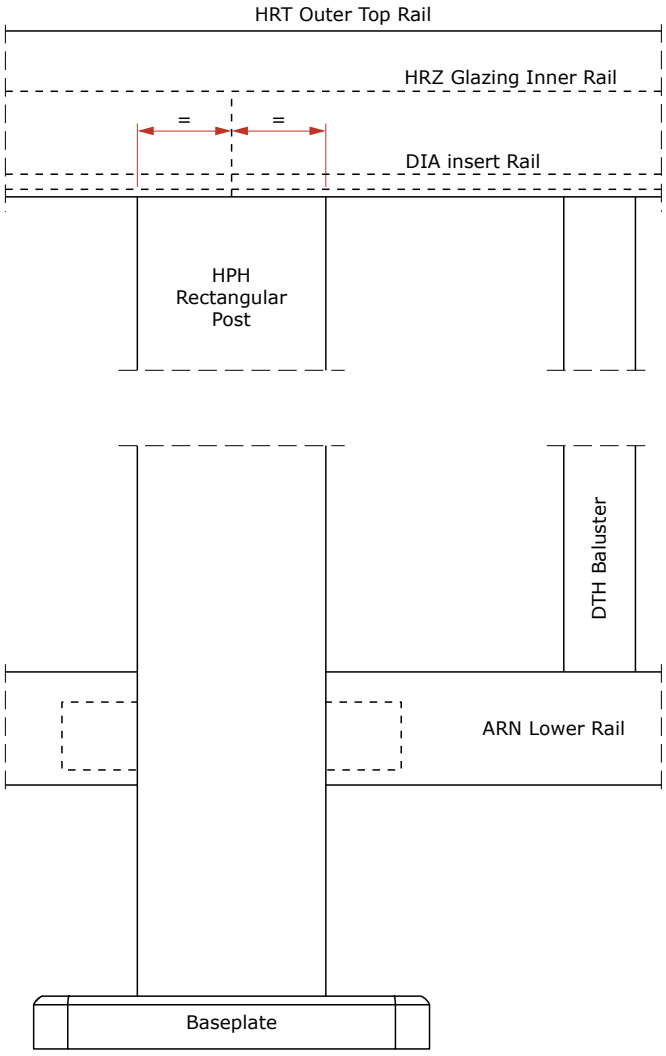
| 'X1500 SERIES' (BALUSTER) - VERTICAL DIMENSIONS[1] | | | | |
|---|---|---|---|---|
| DIMENSION | | FORMULA | TYPICAL VALUES (mm) | |
| HEIGHT | (H) | As specified | 1100 | 1200 |
| UNDERSPACE | (U) | As specified | 88[2] | 88[2] |
| POST HEIGHT | (PH) | H-58mm | 1042 | 1142 |
| LOWER RAIL SET-OUT | (LS) | H-U-58mm | 954 | 1054 |
| BALUSTER HEIGHT | (BH) | LS-14mm | 940 | 1040 |

1. This table applies only with the use of the parts specified below. Post Heights apply only with 14mm thick baseplates for top fixing.
2. A nominal 88mm Underspace enables the Post Height to be increased by up to 12mm to suit deck level variations, without affecting Glass Height, or exceeding a 100mm Underspace.
3. Minor dimensions on the drawings have been rounded to the nearest millimetre.

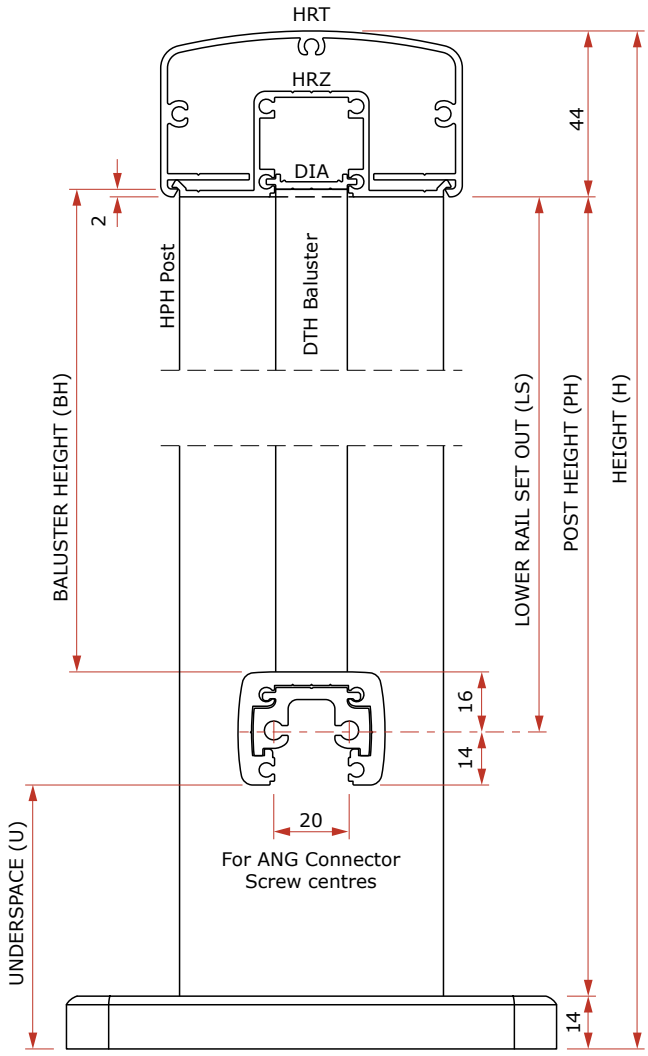


This is a guide for recommended cutting dimensions using the typical extrusions and components illustrated; use of others may require adjustments to the formula and dimensions given here.

Refer to the Assembly Specification for further details.




TYPICAL ELEVATION

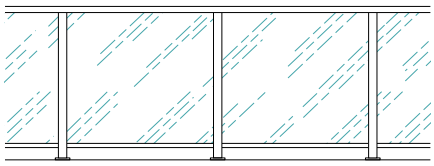



TYPICAL CROSS SECTION

# 'X1500 SERIES', FRAMED GLASS - VERTICAL DIMENSIONS

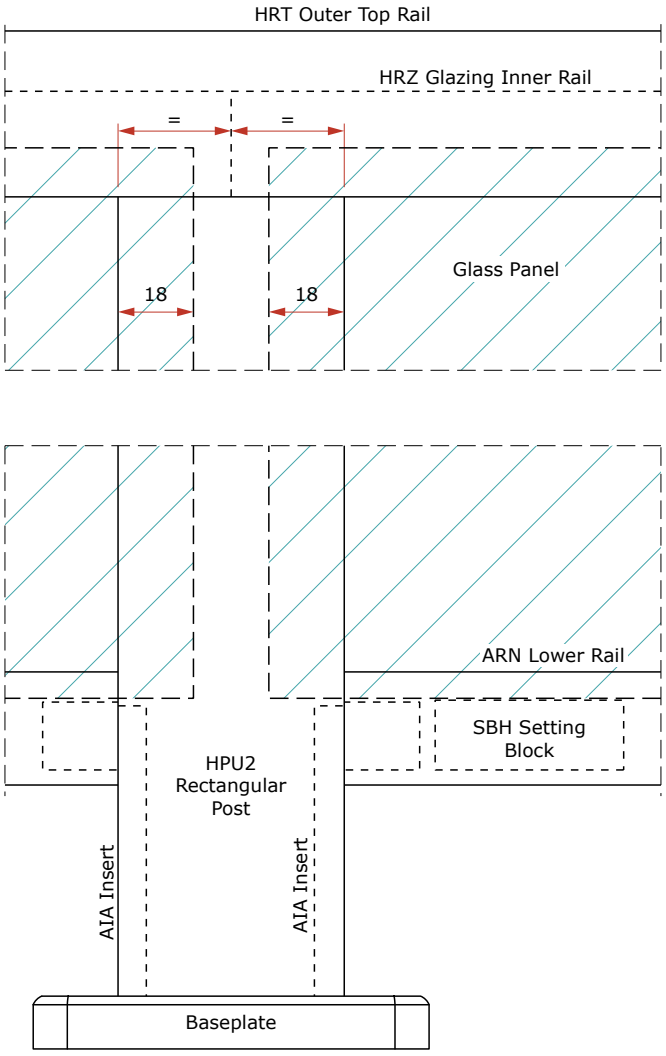
| 'X1500 SERIES' (FRAMED GLASS) - VERTICAL DIMENSIONS[1] | | | | |
|---|---|---|---|---|
| DIMENSION | | FORMULA | TYPICAL VALUES (mm) | |
| HEIGHT | (H) | As specified | 1100 | 1200 |
| UNDERSPACE | (U) | As specified | 88[2] | 88[2] |
| POST HEIGHT | (PH) | H-58mm | 1042 | 1142 |
| LOWER RAIL SET-OUT | (LS) | H-U-60mm | 952 | 1052 |
| INSERT LENGTH LOWER | (ILL) | U+7mm | 95 | 95 |
| BALUSTER HEIGHT | (BH) | LS+6mm (OR OH+20) | 958 | 1058 |

1. This table applies only with the use of the parts specified below. Post Heights apply only with 14mm thick baseplates for top fixing.
2. A nominal 88mm Underspace enables the Post Height to be increased by up to 12mm to suit deck level variations, without affecting Glass Height, or exceeding a 100mm Underspace.
3. Minor dimensions on the drawings have been rounded to the nearest millimetre.

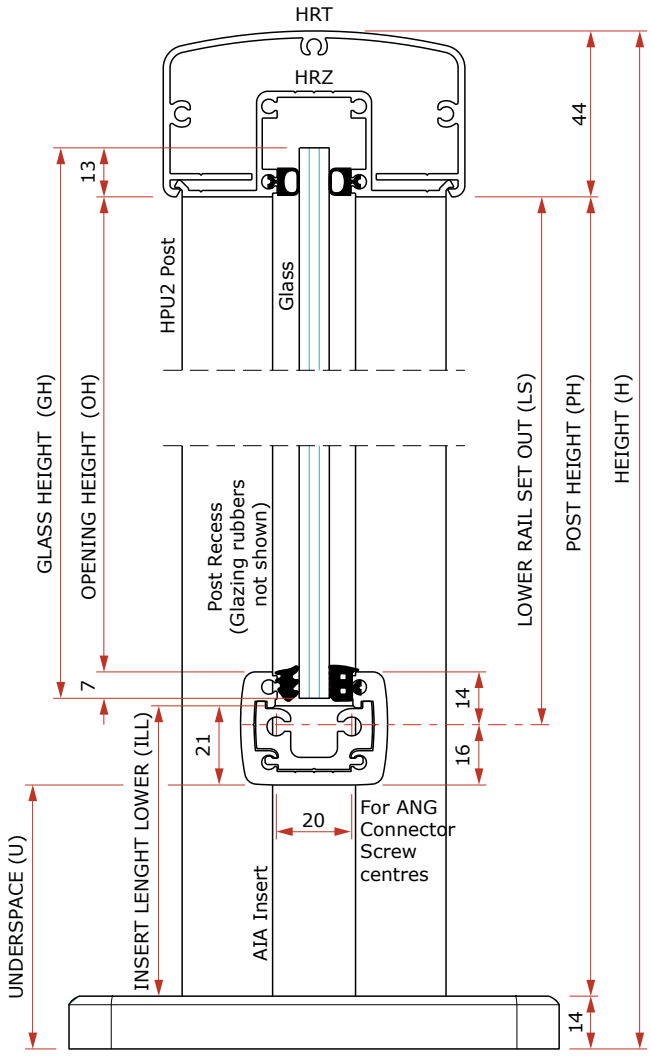


This is a guide for recommended cutting dimensions using the typical extrusions and components illustrated; use of others may require adjustments to the formula and dimensions given here.

Refer to the Assembly Specification for further details.




TYPICAL ELEVATION

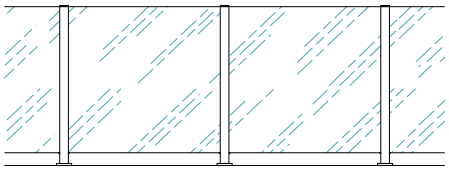



TYPICAL CROSS SECTION

# 'X1500 SERIES', SEMI-FRAMELESS GLASS - VERTICAL DIMENSIONS

| X1500 SERIES (SEMI-FRAMELESS GLASS) - VERTICAL DIMENSIONS(1) | | | | | |
|---|---|---|---|---|---|
| DIMENSION | | FORMULA | TYPICAL VALUES (mm) | | |
| HEIGHT | (H) | As specified | 1100 | 1200 | |
| UNDERSPACE | (U) | As specified | 88(2) | 88(2) | |
| TOP EXTENSION | (TE) | As specified | 2 | 2 | |
| POST HEIGHT | (PH) | H+TE-14mm | 1088 | 1188 | |
| INSERT LENGTH LOWER | (ILL) | U-20mm | 68 | 68 | |
| GLASS HEIGHT | (GH) | H-U | 1012 | 1112 | |

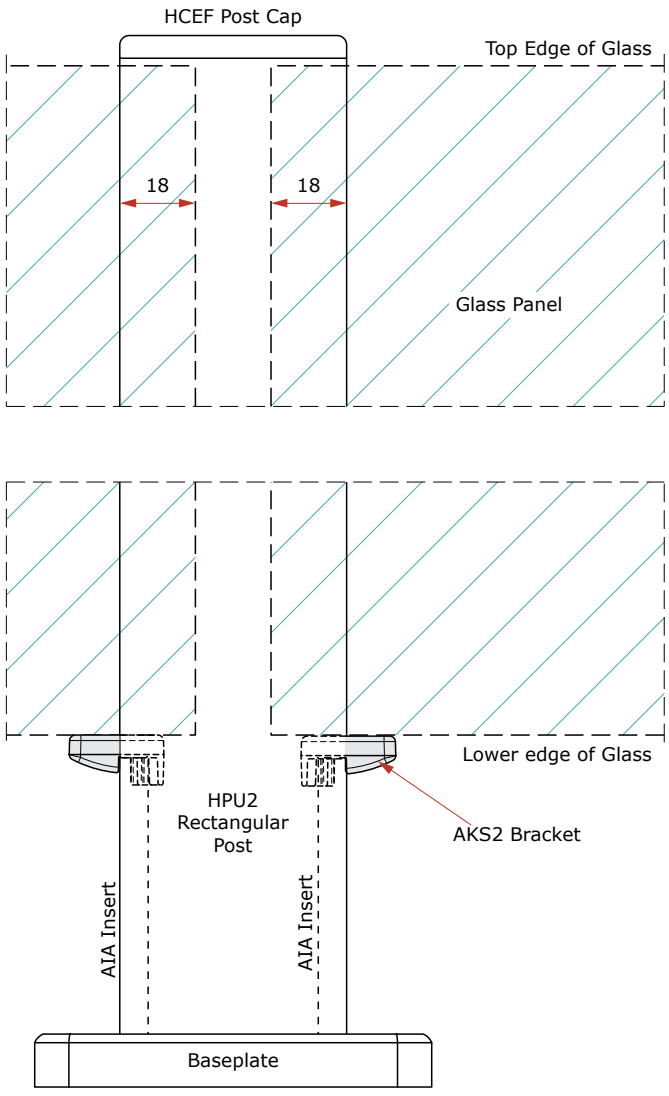
(1) This table applies only with the use of the parts specified below. Post Heights apply only with 14mm thick baseplates for top fixing.
(2) A nominal 88mm Underspace enables the Post Height to be increased by up to 12mm to suit deck level variations, without affecting Glass Height, or exceeding a 100mm Underspace.
(3) Minor dimensions on the drawings have been rounded to the nearest millimetre.



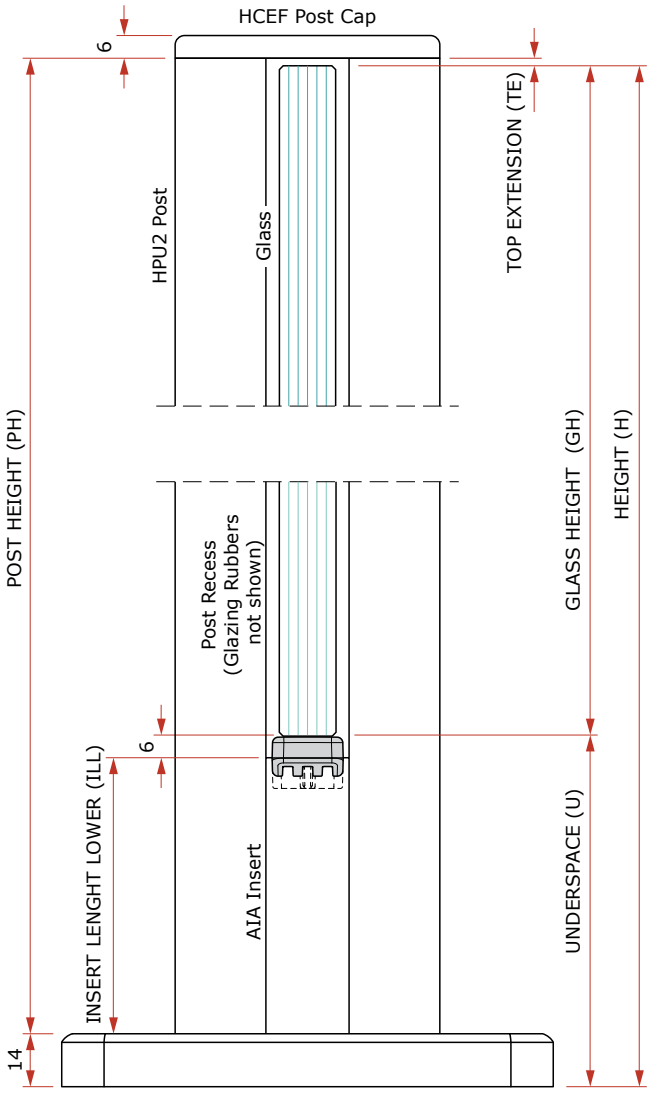
This is a guide for recommended cutting dimensions using the typical extrusions and components illustrated; use of others may require adjustments to the formula and dimensions given here.

Refer to the Assembly Specification for further details.

**ONLY USE THIS STYLE IF THE BALUSTRADE IS NOT PREVENTING A FALL OF 1M OR MORE!**




TYPICAL ELEVATION

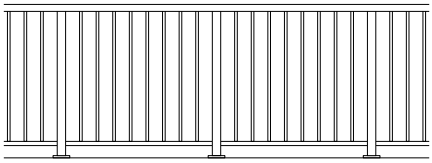



TYPICAL CROSS SECTION

# 'X3000 SERIES', FRAMED BALUSTER - VERTICAL DIMENSIONS

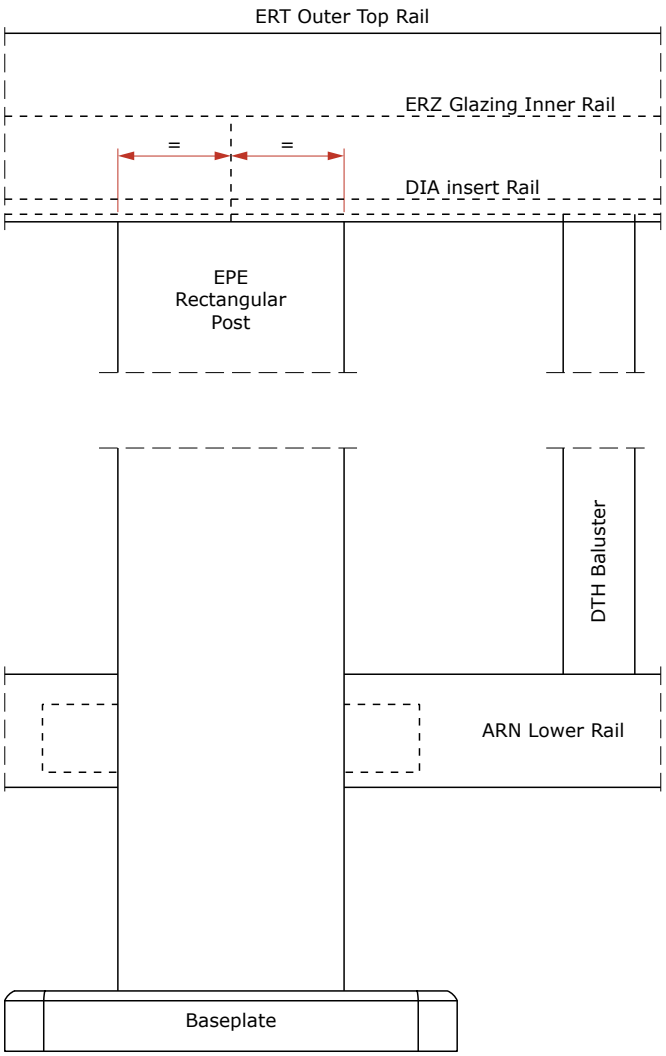
| '3000 SERIES' (BALUSTER) - VERTICAL DIMENSIONS[1] | | | | |
|---|---|---|---|---|
| DIMENSION | | FORMULA | TYPICAL VALUES (mm) | |
| HEIGHT | (H) | As specified | 1100 | 1200 |
| UNDERSPACE | (U) | As specified | 88[2] | 88[2] |
| POST HEIGHT | (PH) | H-66mm | 1034 | 1134 |
| LOWER RAIL SET-OUT | (LS) | H-U-64mm | 948 | 1048 |
| BALUSTER HEIGHT | (BH) | LS-14mm | 934 | 1034 |

1. This table applies only with the use of the parts specified below. Post Heights apply only with 16mm thick baseplates for top fixing.
2. A nominal 88mm Underspace enables the Post Height to be increased by up to 12mm to suit deck level variations, without affecting Glass Height, or exceeding a 100mm Underspace.
3. Minor dimensions on the drawings have been rounded to the nearest millimetre.

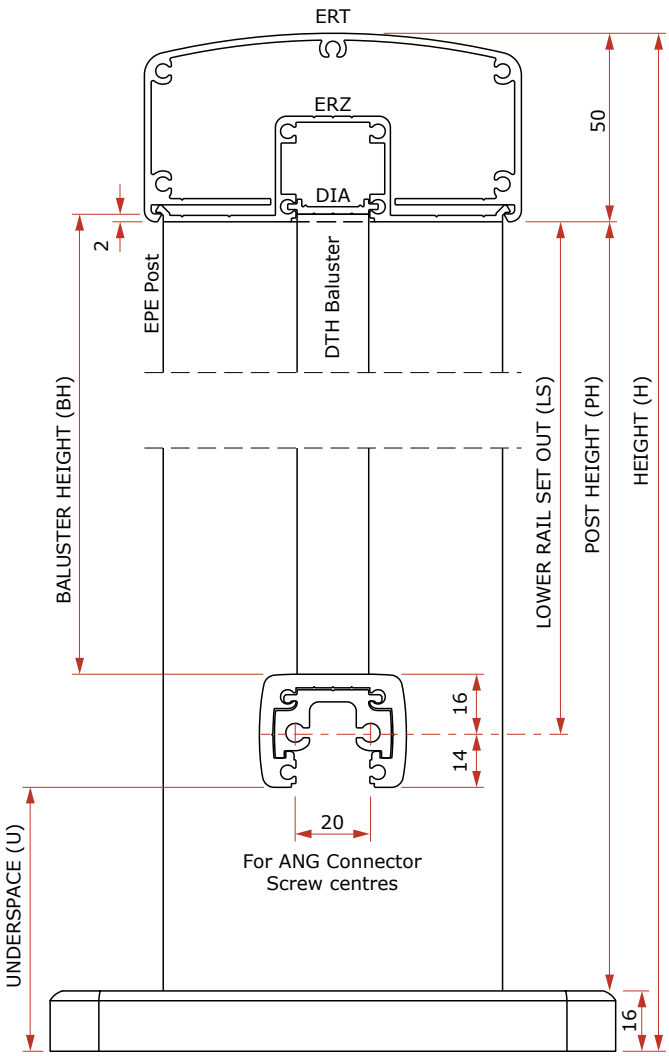


This is a guide for recommended cutting dimensions using the typical extrusions and components illustrated; use of others may require adjustments to the formula and dimensions given here.

Refer to the Assembly Specification for further details.




TYPICAL ELEVATION




TYPICAL CROSS SECTION

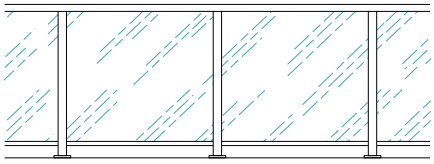


UNEX ARCHITECTURAL BARRIERS

# 'X3000 SERIES', FRAMED GLASS - VERTICAL DIMENSIONS

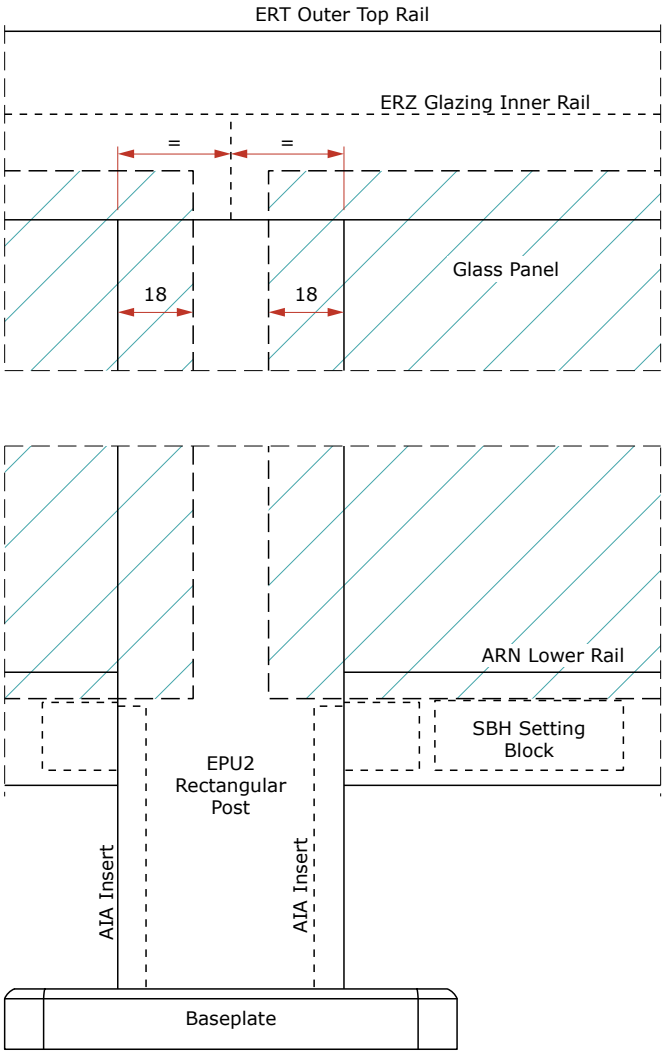
| '3000 SERIES' (FRAMED GLASS) - VERTICAL DIMENSIONS[1] | | | | |
|---|---|---|---|---|
| DIMENSION | | FORMULA | TYPICAL VALUES (mm) | |
| HEIGHT | (H) | As specified | 1100 | 1200 |
| UNDERSPACE | (U) | As specified | 88[2] | 88[2] |
| POST HEIGHT | (PH) | H-66mm | 1034 | 1134 |
| LOWER RAIL SET-OUT | (LS) | H-U-66mm | 946 | 1046 |
| INSERT LENGTH LOWER | (ILL) | U+5mm | 93 | 93 |
| GLASS HEIGHT | (GH) | LS+6mm (OR OH+20) | 952 | 1052 |

1. This table applies only with the use of the parts specified below. Post Heights apply only with 16mm thick baseplates for top fixing.
2. A nominal 88mm Underspace enables the Post Height to be increased by up to 12mm to suit deck level variations, without affecting Glass Height, or exceeding a 100mm Underspace.
3. Minor dimensions on the drawings have been rounded to the nearest millimetre.

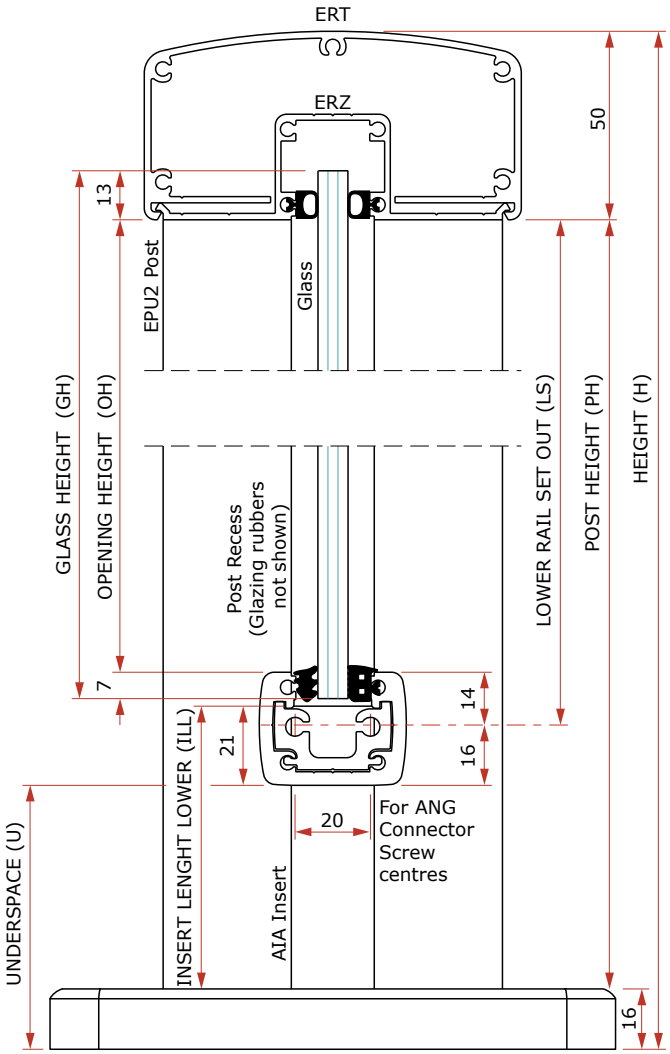


This is a guide for recommended cutting dimensions using the typical extrusions and components illustrated; use of others may require adjustments to the formula and dimensions given here.

Refer to the Assembly Specification for further details.




TYPICAL ELEVATION

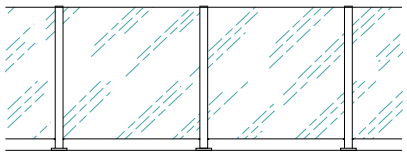



TYPICAL CROSS SECTION

## X3000 GLASS SEMI-FRAMELESS - VERTICAL DIMENSIONS

| '3000 SERIES' (SEMI-FRAMELESS GLASS) - VERTICAL DIMENSIONS[1] | | | | |
|---|---|---|---|---|
| DIMENSION | | FORMULA | TYPICAL VALUES (mm) | |
| HEIGHT | (H) | As specified | 1100 | 1200 |
| UNDERSPACE | (U) | As specified | 88[2] | 88[2] |
| TOP EXTENSION | (TE) | As specified | 2 | 2 |
| POST HEIGHT | (PH) | H+TE-16mm | 1086 | 1186 |
| INSERT LENGTH LOWER | (ILL) | U-22mm | 66 | 66 |
| GLASS HEIGHT | (GH) | H-U | 1012 | 1112 |

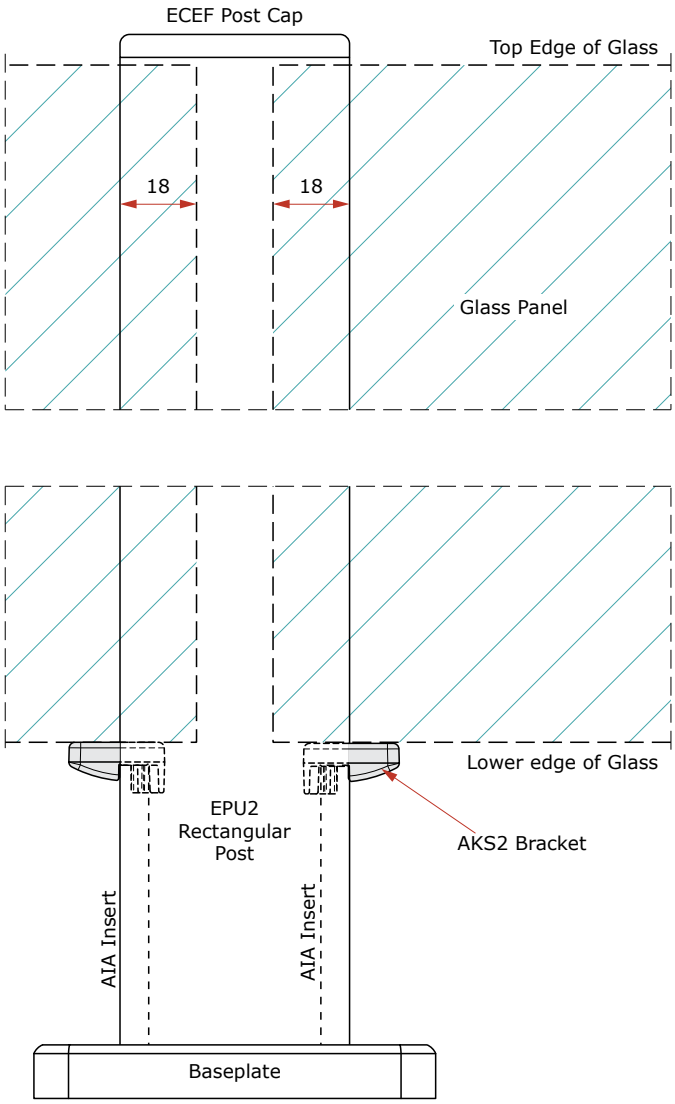
1. This table applies only with the use of the parts specified below. Post Heights apply only with 16mm thick baseplates for top fixing.
2. A nominal 88mm Underspace enables the Post Height to be increased by up to 12mm to suit deck level variations, without affecting Glass Height, or exceeding a 100mm Underspace.
3. Minor dimensions on the drawings have been rounded to the nearest millimetre.



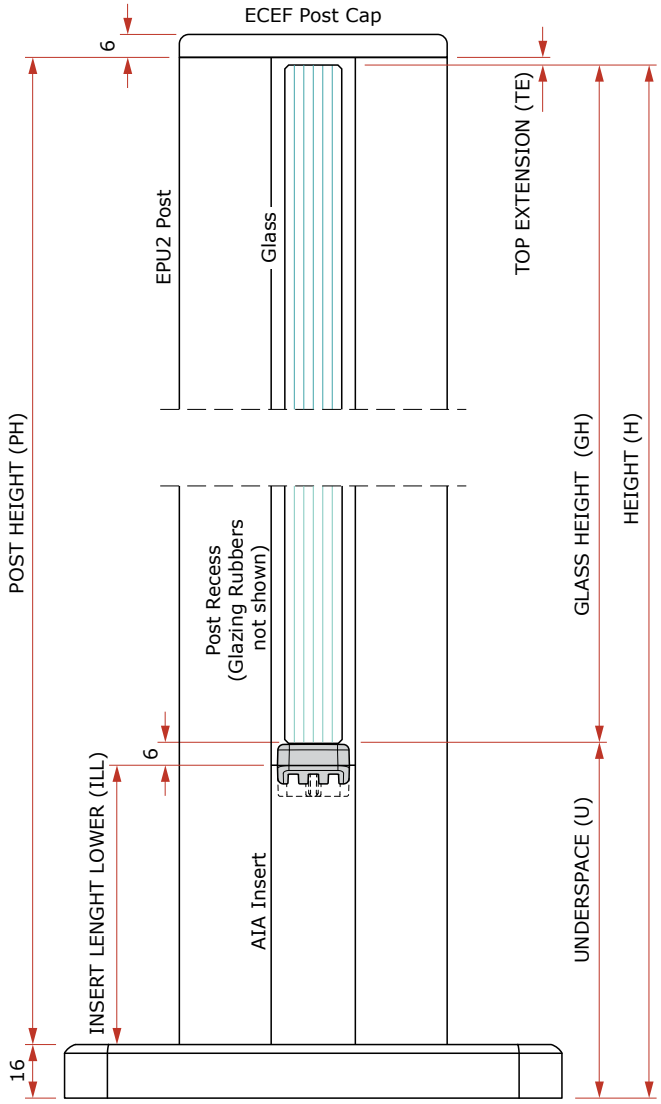
This is a guide for recommended cutting dimensions using the typical extrusions and components illustrated; use of others may require adjustments to the formula and dimensions given here.

Refer to the Assembly Specification for further details.

**ONLY USE THIS STYLE IF THE BALUSTRADE IS NOT PREVENTING A FALL OF 1M OR MORE!**




TYPICAL ELEVATION

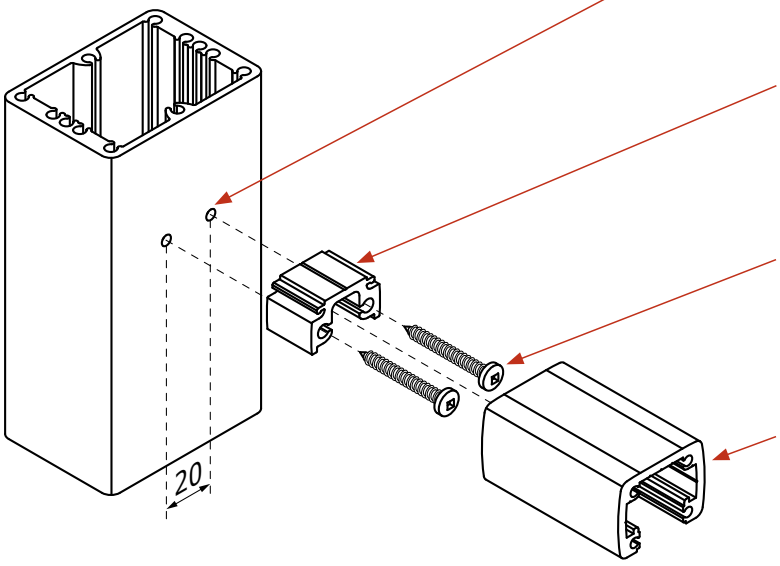



TYPICAL CROSS SECTION

## ANG ATTACHMENT TO STANDARD POSTS

ANG connectors enable ARN lower rail extrusion to be attached to certain hollow extruded POST types.

Customized ANG type connectors may be cut from MANG extrusion, or made by trimming one end of ANGA. The end under the screw heads should remain square cut, the other end cut at required angle (up to 40°). Ensure securing screws have full thread engagement.




Ø4.1mm MAXIMUM holes, 2 off. IMPORTANT: Drill Precisely, Using a drill guide.

ANG Connector type (For some styles, both the rail and the ANG will be inverted from that shown here).

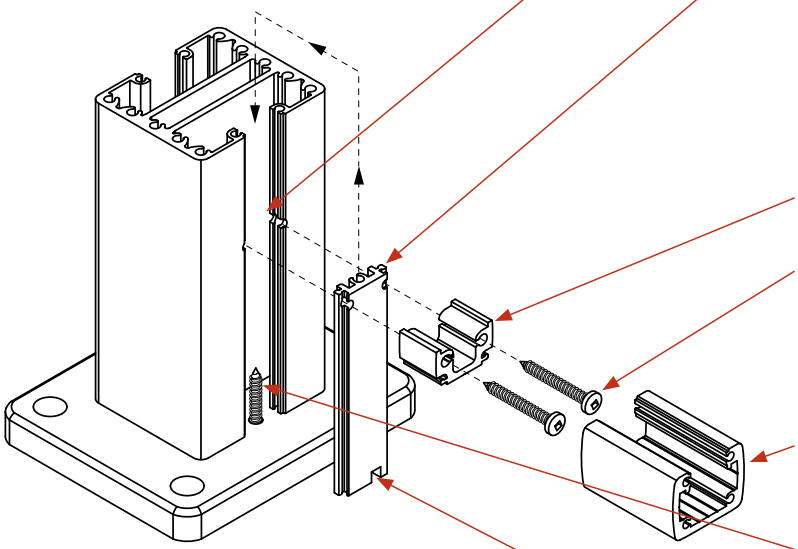
2 off FT10-32.T1 Screws. Always ensure full thread engagement. Once screws have been inserted, do not remove.

ARN Lower Rail, Slides onto the Connector.

## ANG ATTACHMENT TO RECESSED POSTS

This page relates to attaching ANG connectors via AIA inserts to any recessed post (e.g. EPU2 or HPU2), for use only in situations where the post is top mounted via a base plate.

The attachment method is typically used in the 'FRAMED GLASS' styles, for the purpose of attaching the ARN lower rail to the post. An SBH should be inserted into the ARN lower rail and positioned 30mm from the rail end before the rail is inserted onto the ANG spigot to provide a setting block for the glass infill.



Ø4.1mm MAXIMUM holes, 2 off. IMPORTANT: Drill Precisely, Using a drill guide.

AIA Insert. Must be inserted into post before drilling and screwed to base plate to ensure no movement while drilling connector holes. IMPORTANT: Insert height must be precise to prevent interference with the glass

ANG Connector type

2 off FT10-32.T1 Screws. Always ensure full thread engagement. Once screws have been inserted, do not remove.

ARN Lower Rail, Slides onto the Connector.

FVHT10-50.T1 Screw. Used to secure AIA insert before drilling connector holes.

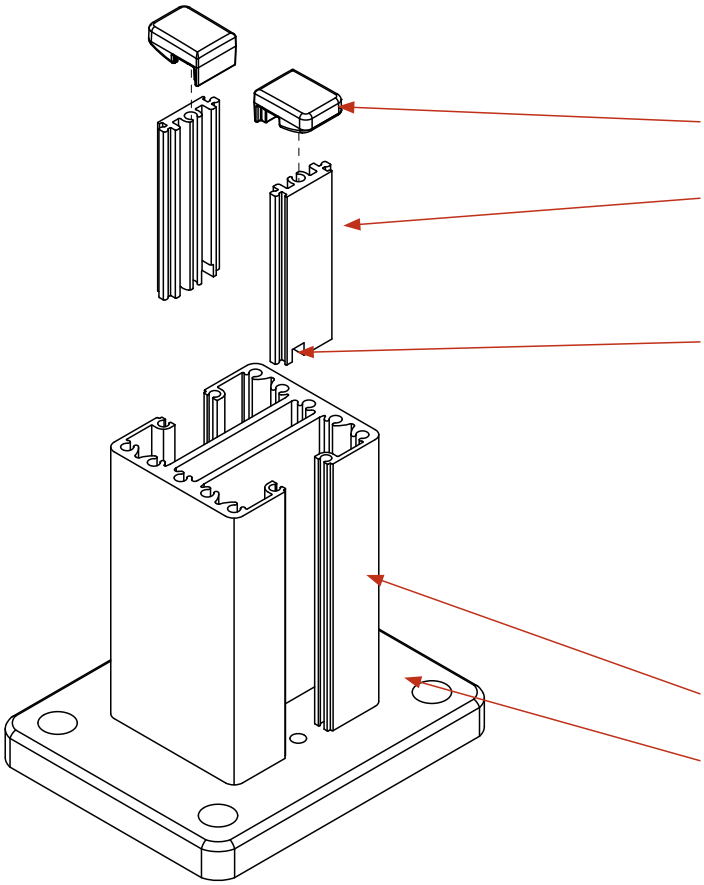
DRAINAGE HOLES

Important Note: Mill out two drainage slots at baseplate level. Slots to be a minimum of 5mm wide x 5mm high. Mill an extra 5mm wide x 5mm high slots in the internal web walls. Alternatively, drill 6.0mm diameter drainage holes. (Refer to Page 72).

# AKS2 ATTACHMENT TO RECESSED POSTS : TOP MOUNTED SITUATION

This page relates to attaching AKS2 plates via AIA inserts to any recessed post (e.g. EPU2 or HPU2), for use only in situations where the post is top mounted via a base plate.

The AKS2 plate is typically used in the 'GLASS SEMI-FRAMELESS' styles, for the purpose of supporting the vertical weight of the glass infill.



GENERAL METHOD

AKS2 Plate. Push fit.

AIA Insert. Slides into post recess and sits on base plate with AKS2 attached to top.

DRAINAGE HOLES

Important Note: Mill out two drainage slots at baseplate level. Slots to be a minimum of 5mm wide x 5mm high. Mill an extra 5mm wide x 5mm high slots in the internal web walls. Alternatively, drill 6.0mm diameter drainage holes. (Refer to page 72)

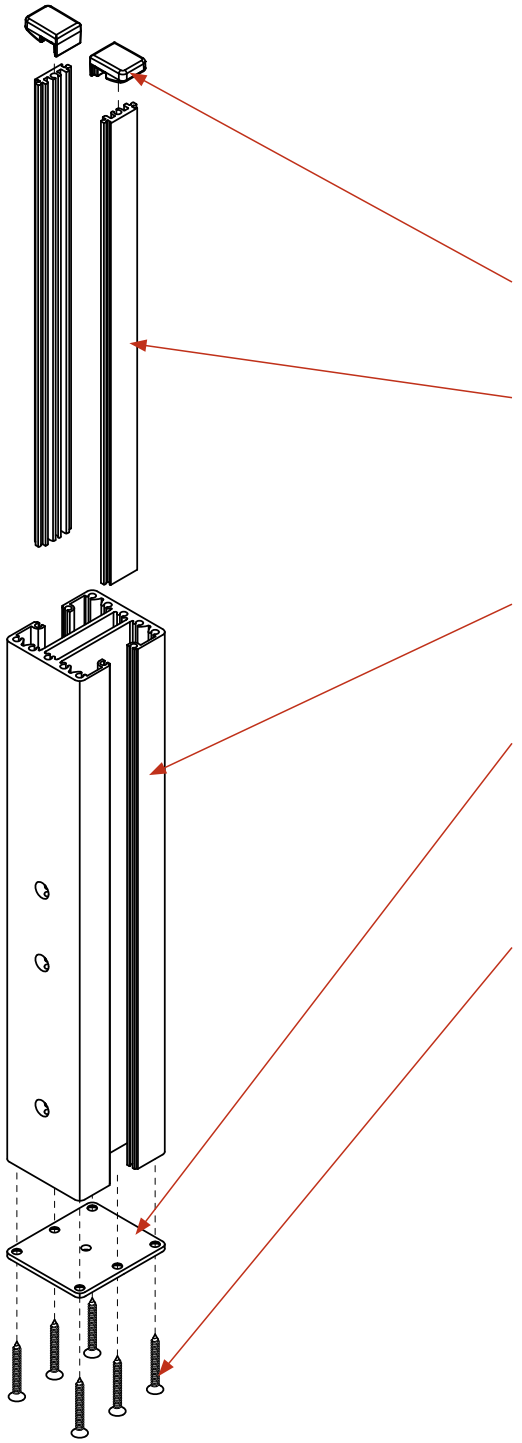
Balustrade Post. HPU2 illustrated.

Baseplate. BISP illustrated.

## AKS2 ATTACHMENT TO RECESSED POSTS : SIDE MOUNTED SITUATION

This page relates to attaching AKS2 plates via AIA inserts to EPU2 or HPU2 recessed posts, for use only in situations where the post is side mounted to the substrate.

The AKS2 plate is typically used in the 'GLASS SEMI-FRAMELESS' styles, for the purpose of supporting the vertical weight of the glass infill.



GENERAL METHOD

AKS2 Plate. Push fit.

AIA Insert. Slides into post recess and sits on post blank with AKS2 attached to top.

Balustrade Post. HPU2 illustrated.

Post Blank. HAES illustrated. Important Note: Must be attached with 6 screws as illustrated.

FV10-45.T1 Screws. Always ensure full thread engagement. Do not remove the screws once they have been inserted.

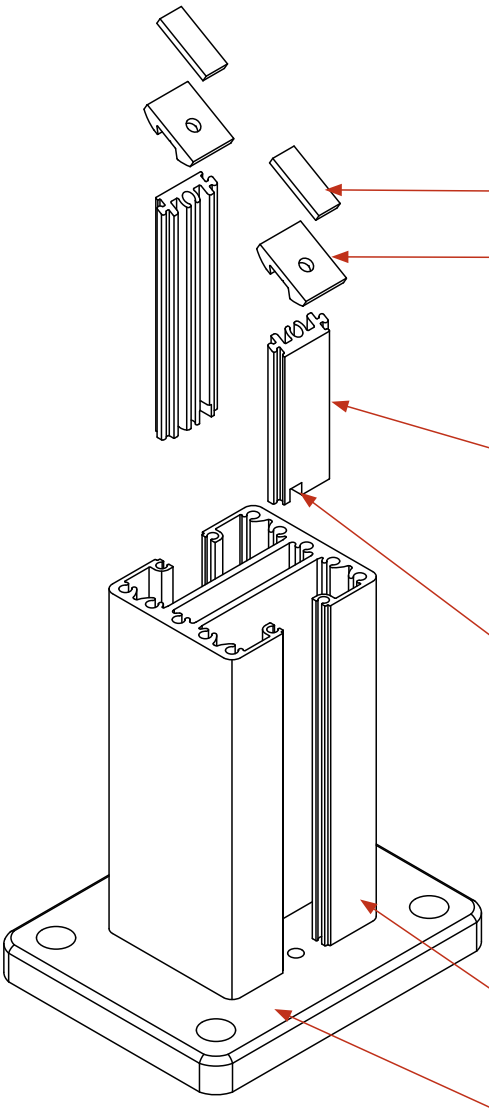
DRAINAGE HOLES

Important Note: Mill out two drainage slots at post blank level. Slots to be a minimum of 5mm wide x 5mm high. Mill an extra 5mm wide x 5mm high slots in the internal web walls. Alternatively, drill 6.0mm diameter drainage holes. (Refer to Page 72).

# AKSV ATTACHMENT TO RECESSED POSTS : STAIR TOP MOUNTED SITUATION

This page relates to attaching AKSV plates via AIA inserts to any recessed post (e.g. HPU2 or EPU2), for use only in situations where the post is top mounted to stair treads via a base plate, with vertically sloping glass panes (40° maximum stair slope).

The AKSV plate is typically used in the 'GLASS SEMI-FRAMELESS' styles, for the purpose of supporting the vertical weight of the glass infill. An SBC should be positioned centrally on top of the plate to provide a setting block for the glass infill.



GENERAL METHOD

SBC Setting Blocks.

AKSVS.BK Plate with grove on underside for attaching to AIA insert. Can be used on up to 40° maximum slope. Attach with small amount of suitable adhesive (e.g. Terostat MS 930 or MS 939).

AIA Insert. Slides into post recess and sits on base plate. Top of extrusion is cut at angle to suit stair slope with AKSV mounted on top. Lengths of insert on either side of post will need to vary to allow for the lower edges of the glass panes to align.

DRAINAGE HOLES

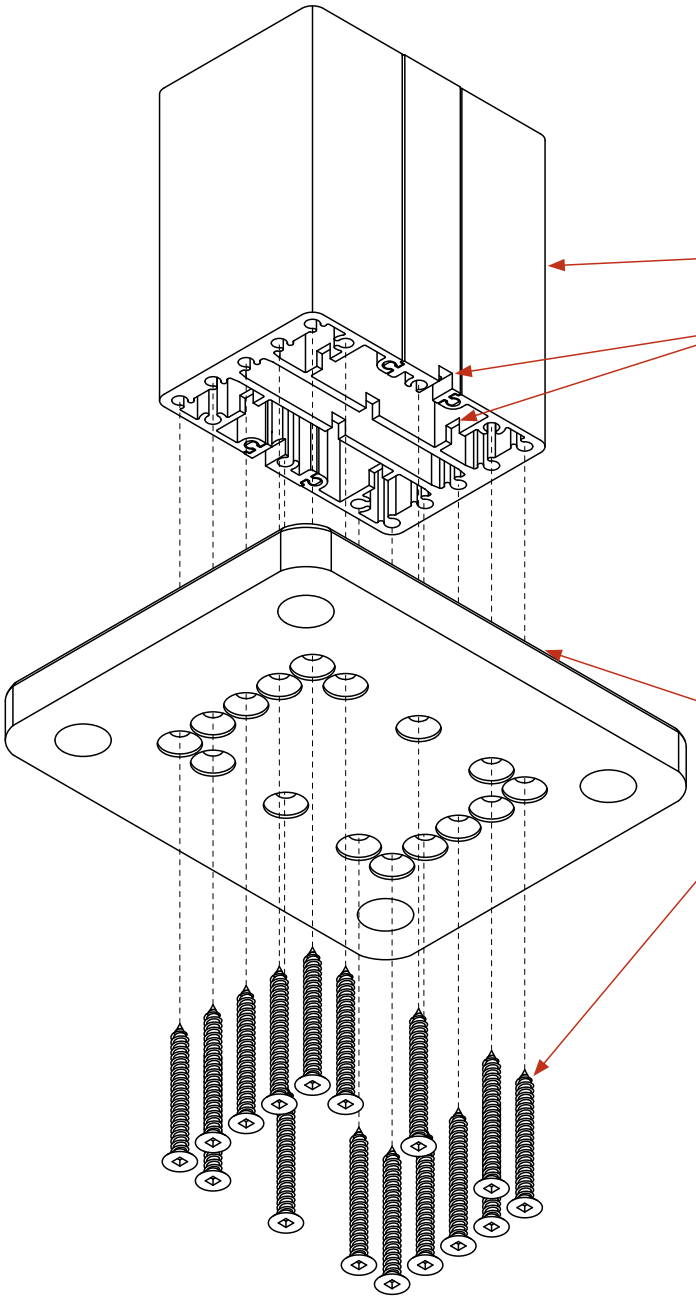
Important Note: Mill out two drainage slots at baseplate level. Slots to be a minimum of 5mm wide x 5mm high. Mill an extra 5mm wide x 5mm high slots in the internal web walls. Alternatively, drill 6.0mm diameter drainage holes. (Refer to Page 72).

Balustrade Post. HPU2 illustrated.

Baseplate. BISP illustrated.

## BASEPLATE TO POST CONNECTIONS AND POST DRAINAGE

This page describes the method of connecting Flat Base-plate types to posts with internal screwports. The illustrations are of typical components only.



BALUSTRADE POST

DRAINAGE HOLES

Important Note: Mill out two drainage slots at baseplate level. Slots to be a minimum of 5mm wide x 5mm high. Mill an extra 5mm wide x 5mm high slots in the internal web walls. Alternatively, drill 6.0mm diameter drainage holes.

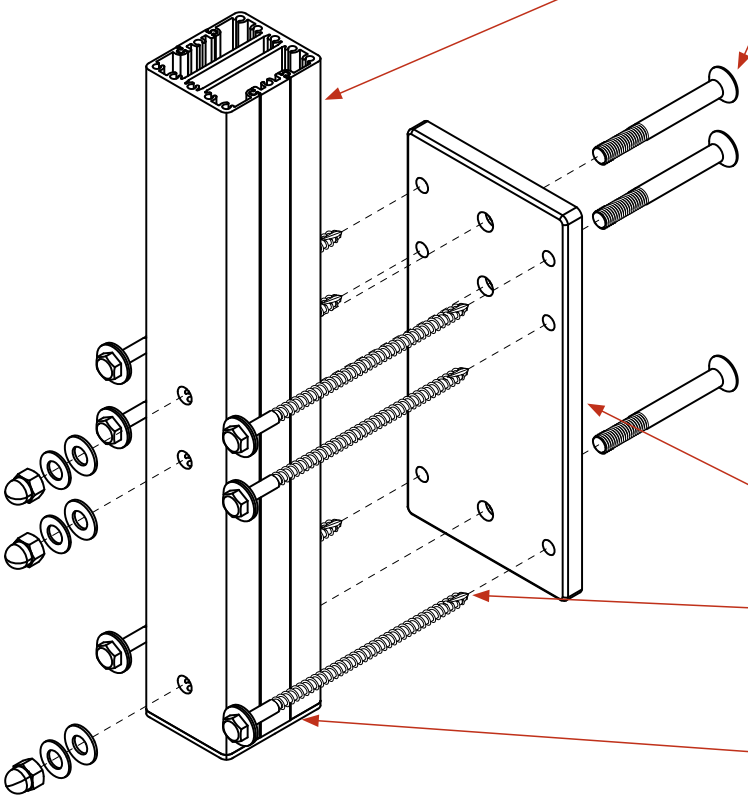
BASEPLATE

FVHT10-50.T1 FASTENERS
Self tapping stainless steel countersunk screws supplied by UNEX. Use of other screws is strictly not permitted and invalidates all Producer Statements and Warranty. Insert screws in all available screwpipes with a power screwdriver, until tight.

## SIDE MOUNTING USING EKT FASCIA PLATES

This page relates to side-mounting posts using the EKT-024 or EKT-029 Fascia plate.

The EKT-024 or EKT-029 Fascia plates are typically used in situations where posts are being side-mounted to a timber substrate. The EKT-024 Fascia plate requires a minimum substrate of 240 x 135mm (3 off 240 x 45mm joists) and the EKT-029 Fascia plate requires a minimum substrate of 290 x 135mm (3 off 290 x 45mm joists). Typically the EKT-024 Fascia plate is used with the 'X1500 series' of posts and the EKT-029 is used with the 'X3000 series'.



Balustrade Post. HPU2 illustrated.

Countersunk Head S/S Bolt Sets. FM10-90S illustrated (or FM10-110S when using 3000 Series posts). Insert through central holes in Fascia plate, from behind, to attach to post (must be inserted before attaching plate to substrate). Screws should be wrapped in Teflon tape, UNEX code TTAM, wherever they end up in contact with the unprotected aluminium of the posts. Ensure polymer washers are against aluminium surfaces.

Fascia Plate. EKT-024 illustrated or EKT-029.

Substrate Fasteners. FC8-165 illustrated. 6 off through holes in Fascia plate on both sides of post.

Post Blank. HAESS illustrated. Attaches with 6x FVHT10-50.T1 screws. Always ensure full thread engagement and do not remove the screws once inserted.

## 'X1500 SERIES' INNER TOP RAILS : CONNECTION TO POSTS

This page applies to Extreme Barriers X1500 series two-piece Top Rails, with an Outer Top Rail ie.- HRT attached to a GLAZED Inner Top Rail ie.- HRZ.

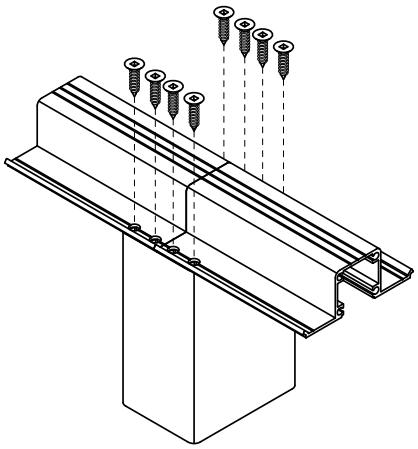


FIG. 1

### 1. CONNECTION TO IN-LINE POSTS

FV10-19.T1 screws required on the side flanges of the rail, 8 per post. Refer to Fig. 1. 5.5mm Ø fixing holes drilled to line up with post screw ports.

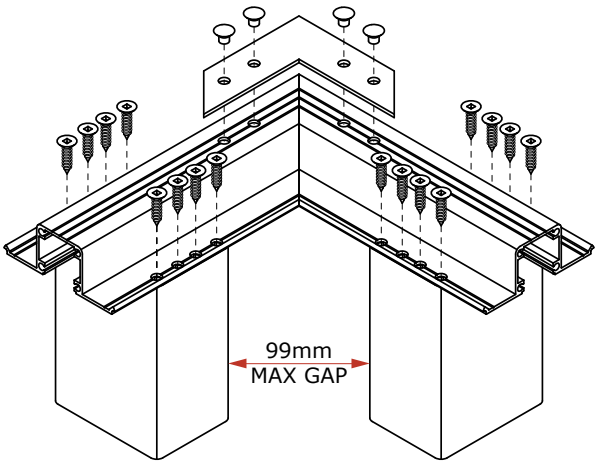



FIG. 2

### 2. CONNECTIONS ON SUSPENDED CORNERS

The corner mitre has 2 posts, 1 on each side of the mitre. The gap between these posts **must be less than 99mm**. The top inner rail then cantilevers over the post for a suspended mitre.

FV10-19.T1 screws are required on the side flanges of the top inner rail, 8 per post. Refer to Fig 2.

A strip connector is used to tie the top inner rails together. UNEX systems has 2 version available. The DNS90 to suit 90° corners and the DNS135 to suit 45° corners (ie. 135° internal angle). These are usually attached with 4 off FS5-4 CSK rivets.

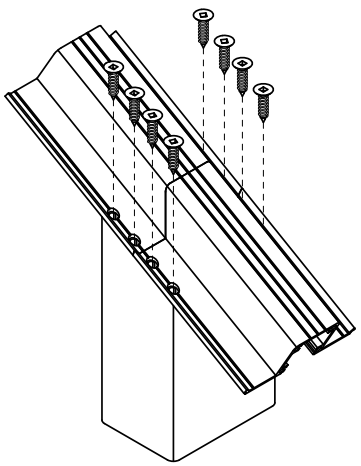


FIG. 3

### 3. CONNECTION OF SLOPING RAILS

FV10-19.T1 Screws required, 8 per post. Drill 5.5mm Ø fixing holes at the correct angle to the rail. Refer to Fig. 3. Grind off protruding side of the screw head to allow the Top Rail to clip on.

(Note: Countersunk screws are used for this application to improve the bearing on the screw head, but the hole does not need to be countersunk).

# 'X3000 SERIES' INNER TOP RAILS : CONNECTION TO POSTS

This page applies to Extreme Barriers 'X3000 series' two-piece Top Rails, with an Outer Top Rail ie.- ERT attached to a Glazed Inner Top Rail ie.- ERZ.

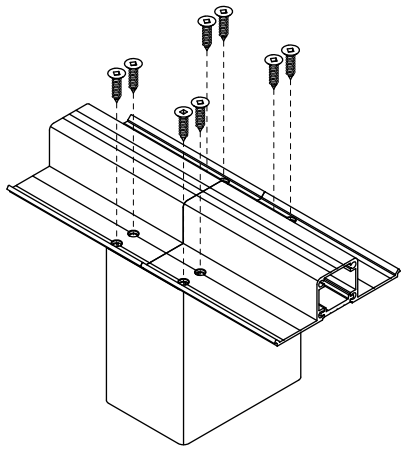


FIG. 1

## 1. CONNECTION TO IN-LINE POSTS

FV10-19.T1 screws required on the side flanges of the rail, 8 per post. Refer to Fig. 1.
Drill Ø5.5mm fixing holes to line up with post screw ports.

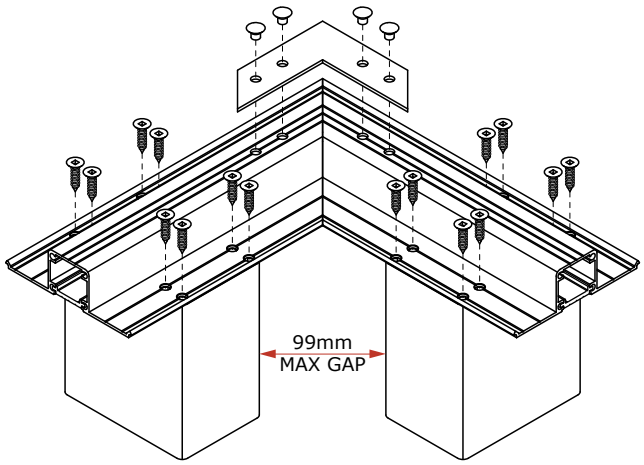



FIG. 2

## 2. CONNECTIONS ON SUSPENDED CORNERS

The corner mitre has 2 posts, 1 on each side of the mitre. The gap between these posts **must be equal to or less than 99mm**. The top inner rail then cantilevers over the post for a suspended mitre.

FV10-19.T1 screws are required on the side flanges of the top inner rail, 8 per post. Refer to Fig 2.

A strip connector is used to tie the top inner rails together. UNEX has 2 version available. The DNS90 to suit 90° corners and the DNS135 to suit 45° corners (ie. 135° internal angle). These are usually attached with 4 off FS5-4 CSK rivets.

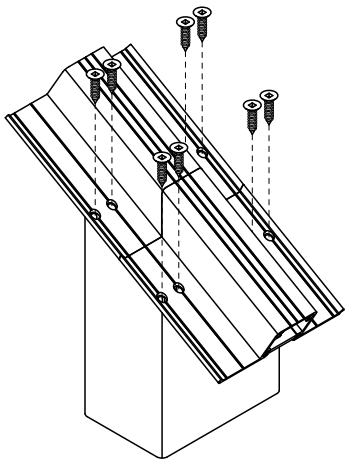


FIG. 3

## 3. CONNECTION OF SLOPING RAILS

FV10-19.T1 Screws required, 8 per post. Drill Ø5.5mm fixing holes at the correct angle to the rail. Refer to Fig. 3. Grind off protruding side of the screw head to allow the Top Rail to clip on.

(Note: Countersunk screws are used for this application to improve the bearing on the screw head, but the hole does not need to be countersunk).

# EPOXY-SET ANCHOR STUDS - INSTALLATION SPECIFICATION

## 1. GENERAL

This is a specification for fixing Stainless Steel studs into structural concrete i.e.- FE10 and FE12 studs. The method used throughout this manual utilizes the Epcon C6 system, and must not be substituted with other epoxies or chemset injection methods without an independent structural assessment of its adequacy to carry the design loads. Note that the Epcon C6 system may be sold under other names in countries other than New Zealand.

## 2. MATERIALS

Studs shall be threaded 316 stainless steel studs having a minimum yield stress of 400MPa and a minimum tensile stress of 700 MPa (Grade 70). Typical designations are FE10-115 = an 10mm diameter stainless steel threaded stud of 115mm overall length. Washers, nuts and dome nuts shall be stainless steel and separated from baseplate with a polymer washer.

## 3. FIXING MATERIALS

- Cartridges: (TEC2) of Epoxy resin. 1 Cartridge does approx 45 FE10-115 studs or 36 FE12-150 studs.
- Disposable Nozzles: (TEN2) Allow at least 2 nozzles per cartridge.
- Dispensing Handgun: (TEG2)
- Hole Brushes: (TEB)

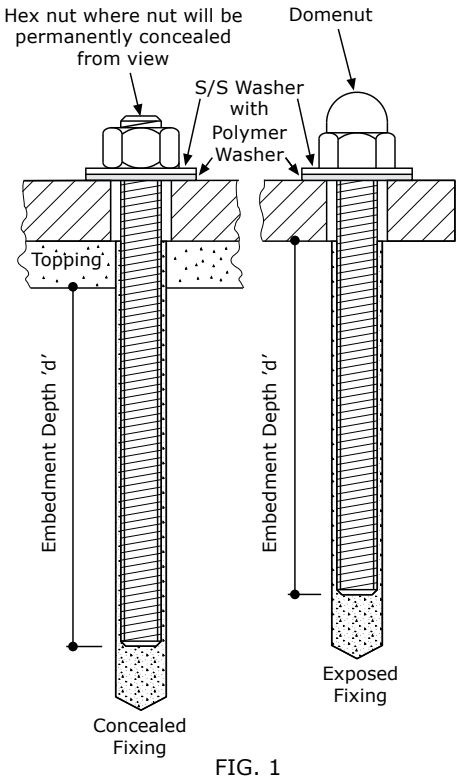



FIG. 1

## 4. EDGE DISTANCES

Studs must not be installed closer to the edge of the structural concrete, excluding any thickness of plaster or finishing, than shown on the Fixing Specifications in Chapter 4. Where no edge distance is stipulated use the following minimum distances: FE10 – 40mm, FE12 - 50mm.

## 5. PROCEDURE

5.1. For M10 studs, drill Ø12mm holes. For M12 studs, drill Ø14mm holes. Drill all holes with a carbide tipped drill. Check slab and topping thickness when choosing stud length. Drill holes approx 10mm deeper than stud depth.

5.2. Hole Cleaning: This procedure is very important for successful adhesion and must be carefully carried out.
(a) Blow dust and debris from hole using oil free compressed air with a tube "end fitting" or the TEW hand operated blower. In either case, insert tube to bottom of hole before blowing.
(b) Brush the hole sides thoroughly.
(c) Blow the hole clean a second time.

5.3. Place balustrade in its final position before injecting resin, ensuring posts are vertical. Ensure studs are on-hand with domenuts and washers pre-attached, as resin may set very quickly once dispensed. Studs should initially protrude 5-6mm for M10 studs, or 6-7mm for M12 studs, into domenuts.

5.4. Remove cartridge cap, attach nozzle. (Retain the cap) Dispense resin to waste until it is evenly mixed to correct colour (see colour sample supplied with cartridge). Insert nozzle into hole and dispense resin. Due to possibility of air pockets, the only reliable indicator of sufficient resin in hole is to insert stud and watch for some surplus resin to be forced from the hole. Wipe surplus resin off immediately.

5.5. As each hole is resin injected, insert the stud with a slow twisting motion, before injecting the next hole. Do not pause more than 2 minutes during injection or a new nozzle may be required. Cap cartridge after use. Do not allow loads on balustrade, install glass, or tighten nuts, until fully cured. Refer to curing times on cartridge.

5.6. Do not install studs if temperature is less than 5°C. In all events carefully read and adhere to all instructions contained on the product packet etc.

# DURABILITY

The New Zealand Building Code requires all balustrading to be sufficiently durable so as to remain functional for specified periods of time. These periods are given in the Acceptable Solution B2/AS1, which indicates a 'serviceable' durability requirement of 50 years for balustrade posts and top rails, and 15 years for infill members.

Whilst specific details to achieve these requirements for the common situations are given throughout this manual, it is essential that they are applied to all exterior balustrade installations regardless. These issues may be placed under two general areas as follows;

## 1. DRAINAGE

Water entrapped in members can potentially be detrimental to the durability of a balustrade, and provision for moisture to drain must therefore be made. Common areas where such provision is necessary, and how it can be achieved is as follows;

1.1 TOP FIXED HOLLOW POSTS
Mill two drainage slots 5mm x 5mm at base-plate level, one on each side of the post 10mm off the post centreline. Alternatively, provide two 6.0mm diameter drainage holes in these positions, centred 3mm above the bottom of the post.

1.2 FACE FIXED POSTS
Drill a central 6mm drainage hole in the bottom post blank of each post. Standard base blanks from UNEX Systems will generally have these holes already drilled. With the EPU2 and HPU2 posts, mill out drainage slots at post blank level in all internal web walls. Slots to be a minimum of 5mm wide x 5mm high or alternatively drill a 6.0mm diameter drainage hole.

1.3 GLAZED LOWER RAILS
Drill a 5.5mm dia hole mid span on glazed lower rails that are horizontal, or at the lower end of lower rails that are sloping.

1.4 INNER TOP RAILS
To minimise entrance of moisture into posts, any Inner Top Rails (e.g. ERZ, HRZ) should be continuous over the posts wherever possible. Where joints are required, these shall be centred on a post with a minimum gap between rails.

## 2. SEPARATION OF MATERIALS

Dissimilar materials can react with each other in varying degrees if in contact with each other. This can potentially reduce the durability of a balustrade and measures must be taken to minimise this occurring. This means that aluminium members must be separated from other materials, including stainless steel fixings, as outlined below;

2.1 TOP FIXED POSTS
A polymer washer shall be inserted between the top of the base-plate and the underside of all stainless steel washers used for substrate fasteners. UNEX Product codes are FWP10-22G and FWP12-24G for M10 and M12 respectively. Note for FC8-165 coach screws, the standard washers supplied with rubber seals will be adequate.

2.2 SIDE FIXED POSTS
(a) A polymer washer shall be placed between the stainless steel washer adjacent to the head of the fixing screw and the side of the post. UNEX product codes are FWP10-22G and FWP12-24G for M10 and M12 respectively. Note for FC8-165 coach screws, the standard washers supplied with rubber seals will be adequate.

*(continued on following Page)*

## DURABILITY - (CONT'D)

(b) A strip of neoprene gasket shall be placed between the side of the post and the adjacent substrate. This may also assist with waterproofing issues if required. These are available from UNEX in four widths of 24mm, 36mm, 42mm and 50mm in 1.2 metre lengths. UNEX product code example SG42-12 is 42mm wide (for 50mm post) and 1.2 metres long.

- For 50mm wide posts use SG42-12
- For 60mm wide posts use SG50-12

Cut strips to the length required to obtain contact over the full depth of bearing surface.

(c) Where the stainless steel fixings pass through the post, the fixing shall be wrapped with approximately three turns of Teflon tape where it would otherwise be in contact with the aluminium post. UNEX product code is TTAM.

### 3. STAINLESS STEEL ASSEMBLY SCREWS

The following stainless steel assembly fasteners must be specially treated to minimise any reaction with the aluminium members. This process is carried out by UNEX Systems, and these screws must therefore be purchased from them.

- All screws connecting posts to the post base-plates, or post blanks.
- All lower rail or mid rail spigot screws connecting the spigot to the post.
- All screws connecting the inner top rails or inner top glazing rails to the top of the posts.

### 4. GRADES OF STAINLESS STEEL

All stainless steel fixings and substrate fasteners must be grade 316 stainless steel for maximum durability.

### 5. OTHER

For situations not covered above; EPDM or Neoprene may be a useful product to provide separation between dissimilar materials, and Lanolin grease (available from UNEX Systems – code TGL-05L) can be a useful product to place around areas of contact between aluminium and stainless steel fasteners.

# GENERAL FABRICATION GUIDE FOR EXTREME BARRIERS

## APPLICATION

This Installation Guide covers the general fabrication of all the Extreme Barrier styles. These consist of: Baluster and Framed Glass Styles in both the '1500 Series' and '3000 Series'. Refer to Table 1 for a summary of pages.

| TABLE 1 - PAGE GUIDE SUMMARY FOR INSTALLATION GUIDE | | |
|---|---|---|
| GENERAL FABRICATION GUIDE | INSTALLATION GUIDE (STEPS 4, 5, 6, & 7 WHERE APPLICABLE) | |
| All Styles (steps 1, 2, & 3)<br>Pages 79-81 | Framed Baluster | Pages 82-83 |
| | Framed Glass | Pages 84-86 |

This Guide is intended only to cover details applicable to a common and straightforward deck configuration. For any other situation, or for details not covered below, refer to UNEX.

## 1. BALUSTRADE DESIGN

This section covers the measuring and design of the balustrade.

### 1.1 SITE MEASURE

Refer to "Site Measuring - General Guide" Pages 58-59 for a guide of appropriate measurements that will need to be taken from the site.

### 1.2 BALUSTRADE SPECIFICATIONS

Ensure adequate instructions have been received from customer to ensure the balustrade is designed to New Zealand Building Code requirements. Such details could include; fixing methods, design wind speeds, building class designations, barrier heights, maximum opening widths, etc.

### 1.3 POST SPACINGS

Use the "Maximum Post Centres" value from the Style Specification when using any of the Standard fixing methods shown in this manual. Any variation in the balustrade height caused by deck falls must be taken into account for this step. Interpolate between values on the specification tables where necessary.

### 1.4 OVERALL CENTRELINE DIMENSIONS

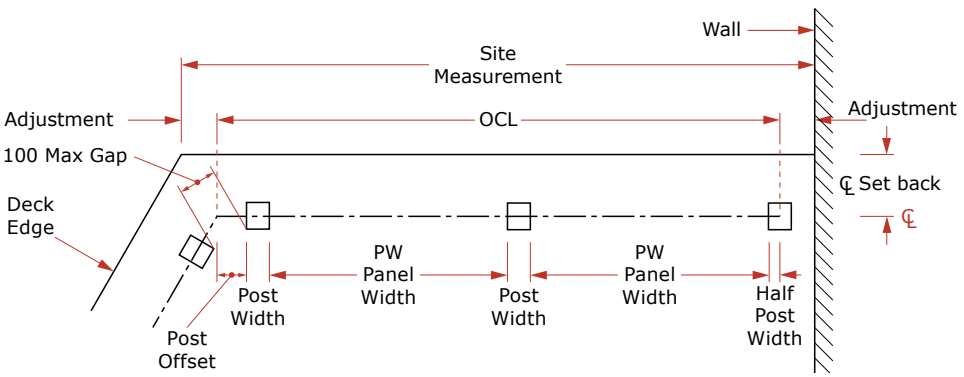



FIG. 1

*(continued on following Page)*

## GENERAL FABRICATION GUIDE FOR EXTREME BARRIERS - (CONT'D)

1.5 PANEL WIDTH DIMENSIONS
The Panel Width (PW) is a dimension between the faces of adjacent posts, measured along the rail centreline (see Fig. 1 previous Page).

From the OCL, and the maximum post centres determined in step 1.3, calculate the PW of each panel (see Fig. 1 previous Page), taking into account the post width and the post offsets on the corners.

1.6 VERTICAL DIMENSIONS
Calculate the balustrade heights, post lengths and lower rail or glass edge positions to ensure the balustrade will meet all New Zealand Building Code requirements, taking into account any deck falls and changes in deck levels. The relevant Vertical Dimensions on Pages 61-66 will provide some useful formula to calculate this data.

1.7 MATERIAL REQUIREMENTS
Optimise the various member types into available purchasing lengths, taking into account the additional lengths needed for mitre points, saw cuts and saw clamps etc. Any joins in the Outer Top Rail should be ¼ of the way across a panel. Produce a Summary of materials required and order from UNEX.

## 2. FABRICATION

This section covers the cutting of the members to the required length, and the drilling of most holes required. Ensure staff are provided with tools and machinery that are safe, and that they are given full instructions in how to use them.

2.1 CUTTING TO LENGTH
Cut all members to their required length, as calculated in step 1.7. Ensure all mitres are cut at the correct angle and orientation. Remove all burrs with a light file.

2.2 DRILLING OF HOLES
Drill holes in post for Lower Rail connectors, see Fig. 2. Drill Ø4.1mm maximum holes, which must be drilled precisely using a drill guide. Do not use a worn or oversize drill bit. Do not use a hole that is oversize, or from which a screw has been previously withdrawn.

Drill Ø5.5mm holes in the top Inner rail for attaching these rails to the posts. Take care on mitres.

Drill Ø3.3mm top rail rivet holes in Top Inner Rail at the spacing indicated on the appropriate Assembly Specification on Pages 51-56. Countersunk carefully with Ø5.5mm drill bit from the underside.

For baluster styles, drill Ø4.1mm holes in rails to ensure that balusters have equal gaps, and that no gap exceeds the maximum allowable space. (It is recommended that spaces are kept at least 2mm less than the maximum space allowance). De-burr all holes as required.

2.3 PROVISION FOR DRAINAGE
If the balustrade is for exterior use provide drainage holes at the base of all posts. Refer to Page 68-73 for size and position.

Framed Glass styles only, lower rails are to have a central Ø5.5mm drainage hole in the underside. For sloping panels this should be positioned at the lower end of the lower rail.

*(continued on following Page)*

## GENERAL FABRICATION GUIDE FOR EXTREME BARRIERS - (CONT'D)

### 3. PRE-ASSEMBLY

This part of the installation process would normally be completed in the factory, prior to site installation.

3.1 BASEPLATE ATTACHMENT
For top mounted posts, attach the baseplates using 10g x 50mm CSK (FVHT10-50.T1) screws sourced from UNEX. Use of other screws invalidates all warranty and Producer Statements. For side mounted posts, attach base blanks using 10g x 50mm CSK (FVHT10-50.T1) screws.

3.2 LOWER RAIL CONNECTOR ATTACHMENT (FRAMED BALUSTER & FRAMED GLASS)
Attach connectors using screws as required to ensure full thread engagement.

3.3 END POST INFILL BLANK (AIR2)
Recessed end posts will require an AIR2 infill on one side, inserted for the full height of the post glazing recess (AIA may also be used).

3.4 TOP RAIL ENDCAP ATTACHMENT
Once top rail is secured to inner top rail, end caps are screwed to the top inner glazing rails with 2 off 8g x 19mm Csk head (FV8-19) screws.

3.5 PANEL ASSEMBLY (FRAMED BALUSTER STYLES ONLY)
Attach balusters to the rails using 4 off 6g x 19mm CSK (FV6-19) screws. Ensure correct orientation of rails. Insert DIA into top inner glazing rail.

3.6 RETAINED GLAZING GASKET (FRAMED GLASS STYLES ONLY)
Install the correct retained glazing gasket. On a typical installation this would be SRD on both sides of the Inner Top rail, and SRG70 on the outside of the posts and lower rail.

Further steps continued on the relevant 'Installation Guide' pages; refer to Table 1 on Page 79.

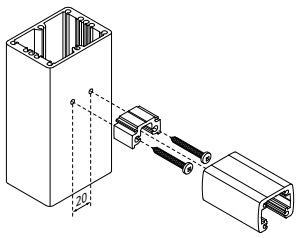


FIG. 2

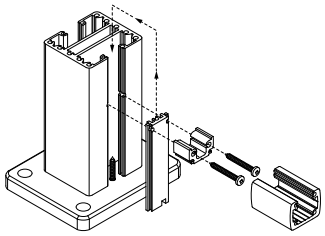


FIG. 3

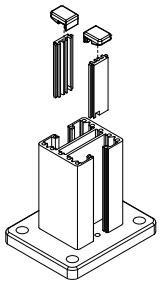


FIG. 4

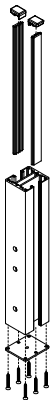


FIG. 5

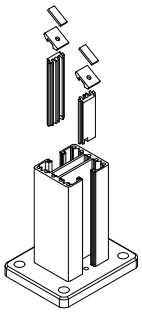
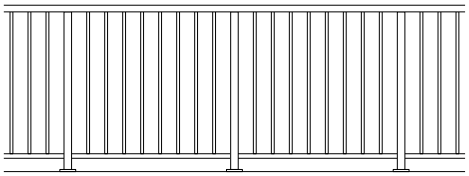


FIG. 6

## INSTALLATION GUIDE FOR BALUSTER STYLE EXTREME BARRIERS

APPLICATION

The following sections cover the site installation of the Extreme Barrier Baluster styles. Refer to the general fabrication guide on Page 79-81, for all sections prior to section 4 below.



### 4. SITE ASSEMBLY

This section covers the site assembly of balustrade panels to form a continuous balustrade run, before fixing to the building. Prior to commencing, ensure the Builder has completed all work necessary to support the balustrade and that all nogs and solid blocking for the fixing of posts and fascia plates are in place.

4.1. STARTING POST / LOWER RAIL

Starting with an end or corner post, first insert the DIA into the Top Inner Glazing rail of the adjacent panel then attach the lower rail to the post via the connector. Attach the next post to the other end of the lower rail in the same manner.

4.2. INNER TOP RAILS

Attach the Top Inner Glazing rail (ERZ or HRZ) of the same panel to the posts, using 10g x 19mm CSK (FV10-19.T1) screws on the sides of both, in-line horizontal rails (see Fig. 1 & 2) and sloping rails (see Fig. 3 & 4). Attach the other end of the Top Inner Glazing rail in the same manner to the next post.

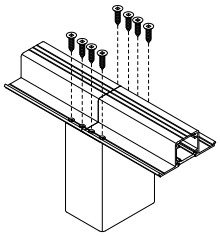


FIG. 1

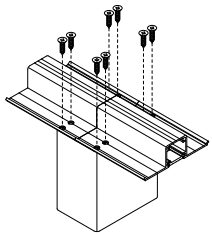


FIG. 2

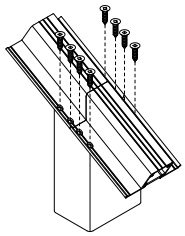


FIG. 3

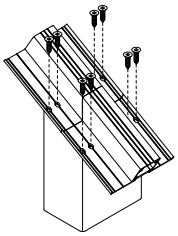


FIG. 4

4.3. RUN ASSEMBLY

Continuing onto the next panel, repeat steps 4.1 and 4.2 above, until a continuous balustrade run has been assembled.

4.4. MITRES

At each corner the Top Inner Glazing Rail ends should form an exact mitre with two posts used to form a Cantilevered Corner Joint, see Fig.5&6), the Top Inner Glazing Rails are joined by riveting a small aluminium gusset such as DNS90 to the top of both Top Inner Glazing Rails meeting at that corner.

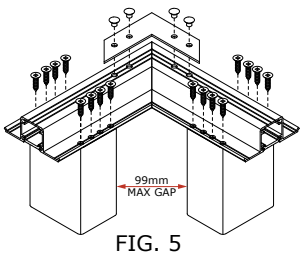



FIG. 5

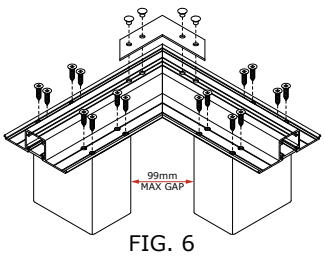



FIG. 6

4.5. NO LOWER RAIL GAPS

Ensure there are no gaps between the Lower Rail ends and the posts. A light duty load-binder can be useful, if used with care, to reduce any such gaps and temporarily 'hold' the whole run together.

4.6. OUTER TOP RAILS

Clip on the Outer Top Rails, but do not fasten them at this stage. Some situations may require adjusting the effective overall length of the Inner Top Rails to match the Outer Top Rail. This can be achieved by removing the Inner Top rail, cutting it over a post, then elongating the holes in the appropriate direction, and re-installing the screws. The Outer Top Rail rivets installed in step 6.1 will later hold this joint from further movement.

## INSTALLATION GUIDE FOR BALUSTER STYLE EXTREME BARRIERS - (CONT'D)

### 5. ATTACHMENT TO BUILDING

This section covers attachment of the balustrade to the deck and walls if applicable. It is essential that posts are fastened in accordance with the Fixing Specification selected from this Catalogue, for which the post spacing has been designed. All fixings must be Stainless Steel 316 Class 70 or greater.

5.1 FINAL POSITIONING
Move the assembled balustrade run into its final position. On concrete decks ensure outer fixing is not less than the minimum edge distance (e) shown on the relevant fixing specification.

5.2 FASTEN POSTS
Secure all posts to the substrate. Refer to the relevant Fixing Specification Pages for more details on the selected fixing method. A string line should be used to ensure the posts are aligned. The fixings should finally be firm, but not over-tightened. Seal fastener holes as necessary.
Ensure polymer washers are inserted between all stainless steel washers used for the substrate fasteners and the aluminium baseplate (top-mounted) or outside face of the posts (side-mounted).
Where balustrades are side fixed to the face of the deck, take into account the effect of any fall in the deck to ensure the top rail will be horizontal and the required minimum height will be achieved at all positions. A strip of neoprene gasket (SG42-12 or SG50-12) should be placed between the side of the post and the adjacent substrate to provide a separation.
Check posts for verticality, rails for level, and panels for square. Pack posts or baseplates (whichever is applicable) to achieve this.

5.3 COMPLETE MITRES
If necessary remove the top rails and again ensure the Inner Top Rails mitre neatly at corners.

### 6. FINISHING

This section covers the finishing touches of the aluminium frame;

6.1 ATTACH TOP RAILS
Attach the top rails, using a Ø3.3mm (1/8") drill bit, drill up through pre-drilled holes on the underside of the Inner Top Rail. Install CSK rivets (FS4-4) to secure the Outer Top Rail. Refer to the relevant Assembly Specification Pages. Place additional rivets on both sides of joints in the Outer Top Rail.

6.2 MITRES
Mitred corners may be lightly filed to remove sharp edges. Small joint imperfections may be silicon-filled if necessary and colour matched with touch-up dab-sticks to obtain a neat appearance.

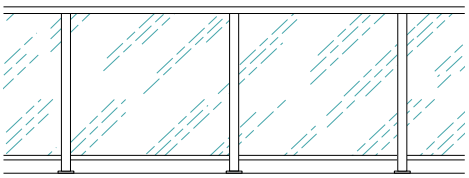
6.3 CLEANING
Clean the balustrade frame with a soft sponge and a mild household detergent mixed in warm fresh water. Remove any debris from the deck, paying particular attention to any iron filings, swarf or rivet shanks that may cause rust spots.

### IMPORTANT NOTES

A. All assembly fasteners must be supplied by UNEX as they are specially treated to enhance their durability to meet the New Zealand Building Code requirements.
B. A balustrade should not be attached to a substrate that is not adequately designed or constructed for the service loads that will be placed upon it by the balustrade. Any issue, problem or defect etc must be remedied prior to balustrade installation.
C. Any waterproofing issues are outside the scope of this guide. Advice should be sought from waterproofing specialists in such circumstances.
D. Ensure the building owner or purchaser is given a copy of the Care & Maintenance instructions, available from www.unex.co.nz.

# INSTALLATION GUIDE FOR FRAMED GLASS STYLE EXTREME BARRIERS

## APPLICATION



The following sections cover the site installation of the UNEX's 'Framed Glass' style of Extreme Barriers. Refer to the general fabrication guide on Pages 79-81, for all sections prior to section 4 below.

## 4. SITE ASSEMBLY

This section covers the site assembly of balustrade panels to form a continuous balustrade run, before fixing to the building. Prior to commencing, ensure the Builder has completed all work necessary to support the balustrade and that all nogs and solid blocking for the fixing of posts and fascia plates are in place.

### 4.1 STARTING POST / LOWER RAIL

Starting with an end or corner post, insert two setting blocks the correct way up (see Fig. 1) into the lower rail of the adjacent panel and attach to the post via the connector. Attach the next post to the other end of the lower rail in the same manner.

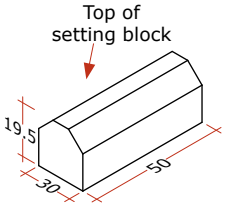



FIG. 1

### 4.2 INNER TOP RAILS

Attach the Top Inner Glazing rail (ERZ or HRZ) of the same panel to the posts, using 10g x 19mm CSK (FV10-19.T1) screws on the sides of both, in-line horizontal rails (see Fig. 2 & 3) and sloping rails (see Fig. 4 & 5). Refer to Pages 74-75.
Attach the other end of the Top Inner Glazing rail in the same manner to the next post.

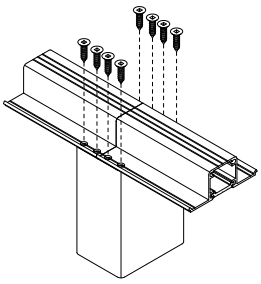


FIG. 2

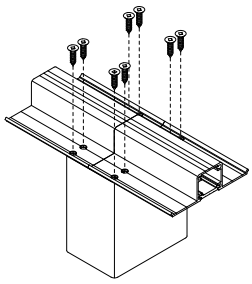


FIG. 3

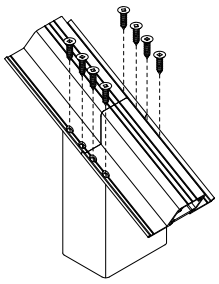


FIG. 4

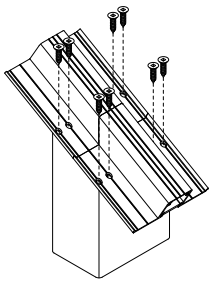


FIG. 5

### 4.3 RUN ASSEMBLY

Continuing onto the next panel, repeat steps 4.1 and 4.2 above, until a continuous balustrade run has been assembled.

### 4.4 MITRES

At each corner the Top Inner Glazing Rail ends should form an exact mitre with two posts used to form a Cantilevered Corner Joint (see Pages 74-75, see Fig. 6 & 7), where **the gap between the posts must be equal to or less than 99mm**. The Top Inner Glazing Rails are joined by riveting a small aluminium gusset such as a DNS90 to the top of both Top Inner Glazing Rails meeting at that corner.

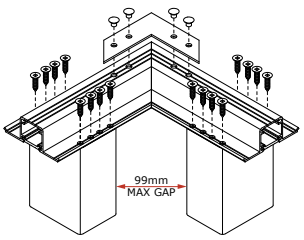



FIG. 6

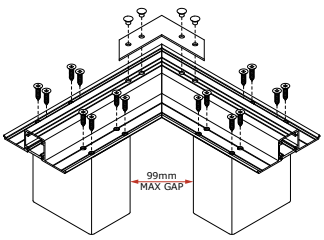



FIG. 7

*(continued on following Page)*

## INSTALLATION GUIDE FOR FRAMED GLASS STYLE EXTREME BARRIERS - (CONT'D)

4.5 NO LOWER RAIL GAPS
Ensure there are no gaps between the Lower Rail ends and the posts. A light duty load-binder can be useful, if used with care, to reduce any such gaps and temporarily 'hold' the whole run together. Tighten the grub screws in the lower rail connectors ANGG just sufficiently to secure the rail during handling. Do not over tighten, or allow the rail surface to become indented.

4.6 OUTER TOP RAILS
Clip on the Outer Top Rails, but do not fasten them at this stage.

Some situations may require adjusting the effective overall length of the Inner Top Rails to match the Outer Top Rail. This can be achieved by removing the Inner Top rail, cutting it over a post, then elongating the holes in the appropriate direction, and re-installing the screws. The Outer Top Rail rivets installed in step 6.1 will later hold this joint from further movement.

### 5. ATTACHMENT TO BUILDING

This section covers attachment of the balustrade to the deck and walls if applicable. It is essential that posts are fastened in accordance with the Fixing Specification selected from this Catalogue, for which the post spacing has been designed. All fixings must be Stainless Steel 316 Class 70 or greater.

5.1 FINAL POSITIONING
Move the assembled balustrade run into its final position. On concrete decks ensure outer fixing is not less than the minimum edge distance (e) shown on the relevant fixing specification.

5.2 FASTEN POSTS
Secure all posts to the substrate. Refer to the relevant Fixing Specification for more details on the selected fixing method. A string line should be used to ensure the posts are aligned. The fixings should finally be firm, but not over-tightened. Seal fastener holes as necessary. Ensure polymer washers are inserted between all stainless steel washers used for the substrate fasteners and the aluminium baseplate (top-mounted type) or outside face of the posts (side-mounted type).

Where balustrades are side fixed to the face of the deck, take into account the effect of any fall in the deck to ensure the top rail will be horizontal and the required minimum height will be achieved at all positions. A strip of neoprene gasket (SG50-12) should be placed between the side of the post and the adjacent substrate to provide a separation.

Check posts for verticality, rails for level, and panels for square. Pack posts or baseplates (whichever is applicable) to achieve this.

5.3 COMPLETE MITRES
If necessary remove the top rails and again ensure the Inner Top Rails mitre neatly at corners.

### 6. GLAZING

This section covers the measuring and installation of the glass panes. Ensure the correct thickness of toughened glass is used.

*(continued on following Page)*

## INSTALLATION GUIDE FOR FRAMED GLASS STYLE EXTREME BARRIERS - (CONT'D)

6.1 MEASURE GLASS
It is generally advisable for aluminium framework to be completely installed (except for the Top Outer Rail) prior to ordering glass. Suggested glass sizing for square panels is as follows:

Glass height = Opening height plus 20mm.
Glass width = Opening width plus 36mm.

For sloping panes, the use of a full sized template made from rigid material is recommended.

6.3 INSTALL GLASS
Before installing the glass, remove Top Outer Rail (which should only be clipped on) and ensure setting blocks are at 30mm in from lower rail ends. On sloping rails the setting blocks will need to be glued in position. Remove Top Inner Glazed rail then lift glass above posts and slide down post cavities onto the setting blocks in the lower rail. Re-attach Top Inner Glazed rail. Cut the inside glazing wedges, leaving slightly over length. Ensure the fins of glazing gaskets are inserted towards the face of the glass. Compress gaskets lengthwise during insertion. Use a glazier's roller to ensure a neat finish.

6.4 CLEAN GLASS
Remove any glazing stickers and clean the glass with a suitable cleaner.

### 7. FINISHING

This section covers the finishing touches of the aluminium frame after glazing;

7.1 ATTACH TOP RAILS
Attach the Top Outer rails, using a Ø3.3mm (1/8") drill bit, drill up through pre-drilled holes on the underside of the Top Inner Glazed Rail. Install CSK rivets (FS4-4) to secure the Outer Top Rail. Refer to the relevant Assembly Specification on pages 51-56. Place additional rivets on both sides of joints in the Outer Top Rail.

7.2 MITRES
Mitred corners may be lightly filed to remove sharp edges. Small joint imperfections may be silicon-filled if necessary and colour matched with touch-up dab-sticks to obtain a neat appearance.

7.3 CLEANING
Clean the balustrade frame with a soft sponge and a mild household detergent mixed in warm fresh water. Remove any debris from the deck, paying particular attention to any iron filings, swarf or rivet shanks that may cause rust spots.

### IMPORTANT NOTES

A. All assembly fasteners must be supplied by UNEX as they are specially treated to enhance their durability to meet the New Zealand Building Code requirements.

B. A balustrade should not be attached to a substrate that is not adequately designed or constructed for the service loads that will be placed upon it by the balustrade. Any issue, problem or defect etc must be remedied prior to balustrade installation.

C. Any waterproofing issues are outside the scope of this guide. Advice should be sought from waterproofing specialists in such circumstances.

D. Ensure the building owner or purchaser is given a copy of the Care & Maintenance instructions, available from www.unex.co.nz.

# UNEX LOADING CLASSIFICATION

Below is an extract from AS/NZS 1170:2011.1:2002, a standard which is cited in the NZBC. This table gives the minimum imposed actions on barriers for various occupancy types. To the right hand side of this table are the applicable UNEX Loading Classifications (ULC) which are stated in the specifications contained in this manual.

## AS/NZS 1170.1:2002 TABLE 3.3
## MINIMUM IMPOSED ACTIONS FOR BARRIERS

| Type of occupancy for part of the building or structure | | Specific Uses | Top Edge | | | Infill | | ULC (UNEX Loading Classifi-cations) |
|---|---|---|---|---|---|---|---|---|
| | | | Horizontal kN/m | Vertical kN/m | Inwards, Outwards, Downwards kN | Horizontal kPa | Any Direction kN | |
| **A** | **Domestic and residential activities** | All areas within or serving exclusively one dwelling including stairs, landings, etc., but excluding external balconies and edges of roofs (see C3) | 0.35 | 0.35 | 0.6 | 0.5 | 0.25 | **N03R** |
| | | Other residential (see C3) | 0.75 | 0.75 | 0.6 | 1.0 | 0.5 | **N07R** |
| **B, E** | **Offices and work areas not included elsewhere including storage areas** | Light access stairs and gangways not more than 600mm wide | 0.22 | 0.22 | 0.6 | N/A | N/A | **N02** |
| | | Fixed platforms, walkways, stairways and ladders for access | 0.35 | 0.35 | 0.6 | N/A | N/A | **N03C** |
| | | Areas not susceptible to overcrowding in office and institutional buildings also industrial and storage buildings | 0.75 | 0.75 | 0.6 | 1.0 | 0.5 | **N07C** |
| **AREAS WHERE PEOPLE MAY CONGREGATE** | | | | | | | | |
| **C1/C2** | **Areas with tables or fixed seating** | Areas with fixed seating adjacent to a Balustrade, restaurants, bars. etc. | 1.5 | 0.75 | 0.6 | 1.5 | 1.5 | **N15** |
| **C3** | **Areas without obstacles for moving people and not susceptible to over-crowding** | Stairs, landings, external balconies, edges of roofs, etc. | 0.75 | 0.75 | 0.6 | 1.0 | 0.5 | **N07C** |
| **C5** | **Areas susceptible to over-crowding** | Theatres, cinemas, grandstands, discotheques, bars, clubs, auditoriums, shopping malls (see also D), assembly areas, studios, etc | 3.0* | 0.75 | 0.6 | 1.5 | 1.5 | **N30**<br>**N20(1)** |
| **D** | **Retail areas** | All retails areas including public areas of banks/building societies (see C5 for areas where over-crowding may occur) | 1.5 | 0.75 | 0.6 | 1.5 | 1.5 | **N15** |
| **F/G** | **Vehicular** | Pedestrian areas in car parks including stairs, landings, ramps, edges of internal floors, footways, edge of roofs | 1.5 | 0.75 | 0.6 | 1.5 | 1.5 | **N15** |
| | | Horizontal loads imposed by vehicles | Requires site specific UNEX design | | | | | |

(1) N20 is only applicable where 2.0kN/m horizontal top edge load is acceptable by the Building Consent Authorities.

## EXTREME BARRIERS – NOTES, DISCLAIMERS AND EXCLUSION OF LIABILITY

1. The purpose of this catalogue is to provide balustrade fabricators, assemblers, specifiers, builders and installers ("The User"), the information they require for using the product for its intended purpose and within its structural limitations.
2. This catalogue is to remain in the possession of the receiver, as intended by UNEX Systems at the time of issue. It is not to be copied, nor passed on to others other than for the purpose stated above. This catalogue remains the property of UNEX Systems and must be returned to UNEX Systems when no longer required or on the written request of UNEX Systems.
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5. Specialist advice must be sought from qualified sources for any information or requirement not specifically covered in this manual.
6. Any request for specific structural design requirements outside the scope of this catalogue must be made in writing to UNEX Systems and include all relevant information such as substrate details, proposed fixing methods, design wind speeds, etc.
7. This catalogue must only be used in conjunction and compliance with all other current applicable building standards or requirements.
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# PRODUCER STATEMENT – PS1 - DESIGN

**Issued By:** **ALAN H. THOMAS – CONSULTING ENGINEER**

**Issued To:** **TO WHOM IT MAY CONCERN**

**Date:** .....

**Project**: .....

**Site Address:** .....

**Legal Description**: .....

This statement applies to the **Extreme Barriers** balustrading supplied by Unex Systems (NZ) Ltd for the

(1) .....

Construction details are to be in accordance with the **Extreme Barriers Technical Catalogue NZEXT-12.0**. The maximum post spacing must not exceed the distance given on the following Catalogue pages, copies enclosed.

(2) .....

I, Alan H Thomas hold a current Professional Indemnity Insurance policy for no less than $200,000 and have been engaged by Unex Systems (NZ) Ltd to provide design services for their **Extreme Barriers** balustrading in respect of Clauses B1 and F2 of the Building Regulations. The design has been prepared in accordance with Clauses B1/VM1 and B1/AS1.The design of the load carrying members and their connections have been verified by load testing where applicable.

Materials and corrosion consultants have been engaged by Unex Systems (NZ) Ltd to provide a Durability Appraisal in respect of the requirements of clause B2 of the New Zealand Building Code. The appraisal has been prepared in accordance with verification method B2/VM1 of the approved documents issued by the Department of Building and Housing, compliance with Clause B2 relies entirely on this appraisal.

I believe on reasonable grounds that subject to:

1. All proprietary products meeting their performance specification requirements.
2. The general arrangement and dimensions of the balustrade members, post spacing, fixing details and assembly methods being in accordance with the instructions in the current **Extreme Barriers Technical Catalogue NZEXT-12.0** and the above details,

the design of the balustrade and its fixings (excluding the supporting structure) complies with clauses B1, B2, F2 and F4 of the New Zealand Building Code.



**Signed by ALAN H THOMAS** .....
(Qualifying Engineer in accordance with Clause 1.0.3(e) of B1/VM1). Auckland Council registration number 1838.
CONSULTING ENGINEER Southern Building Controls Group Author number PSA/2010/45.

42 Bryant Road, Te Rapa, HAMILTON 3200
PO Box 92, HAMILTON 3240
Telephone: 07 850 9464

***Note: This Producer Statement must be accompanied by the relevant Style Specification, Fixing Specification and Assembly Specification pages when submitted for Building Consent purposes.***

# BUILDING CONSENT APPLICATION DOCUMENTS

Following are the 5 recommended pages for submitting a Building Consent Application.

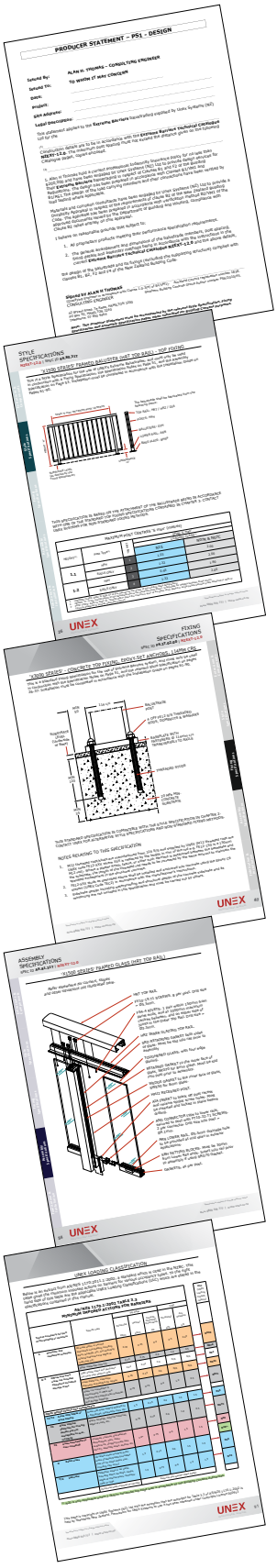
1. Fill out a PS1 Producer Statement page

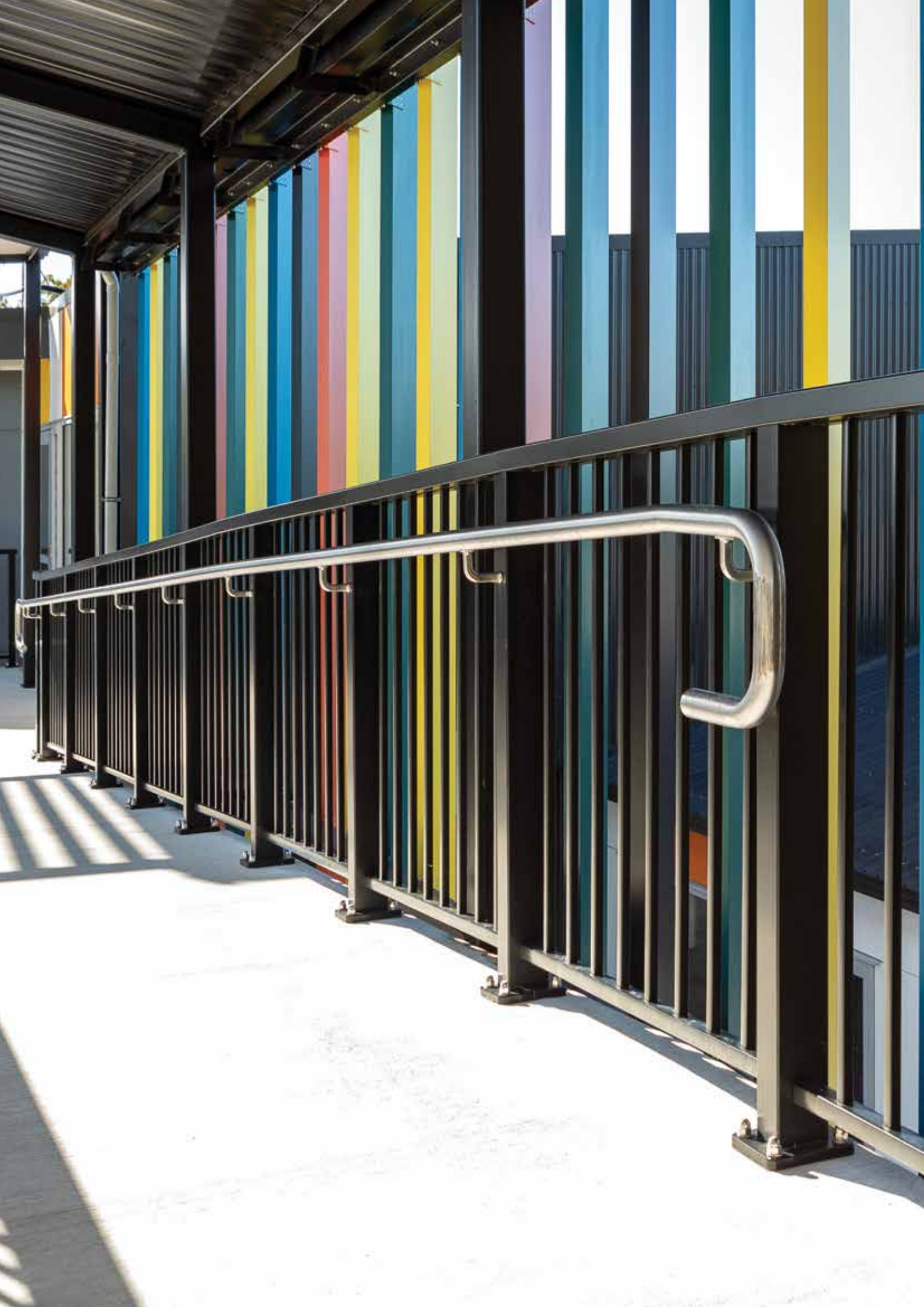
2. The relevant Style Specification page

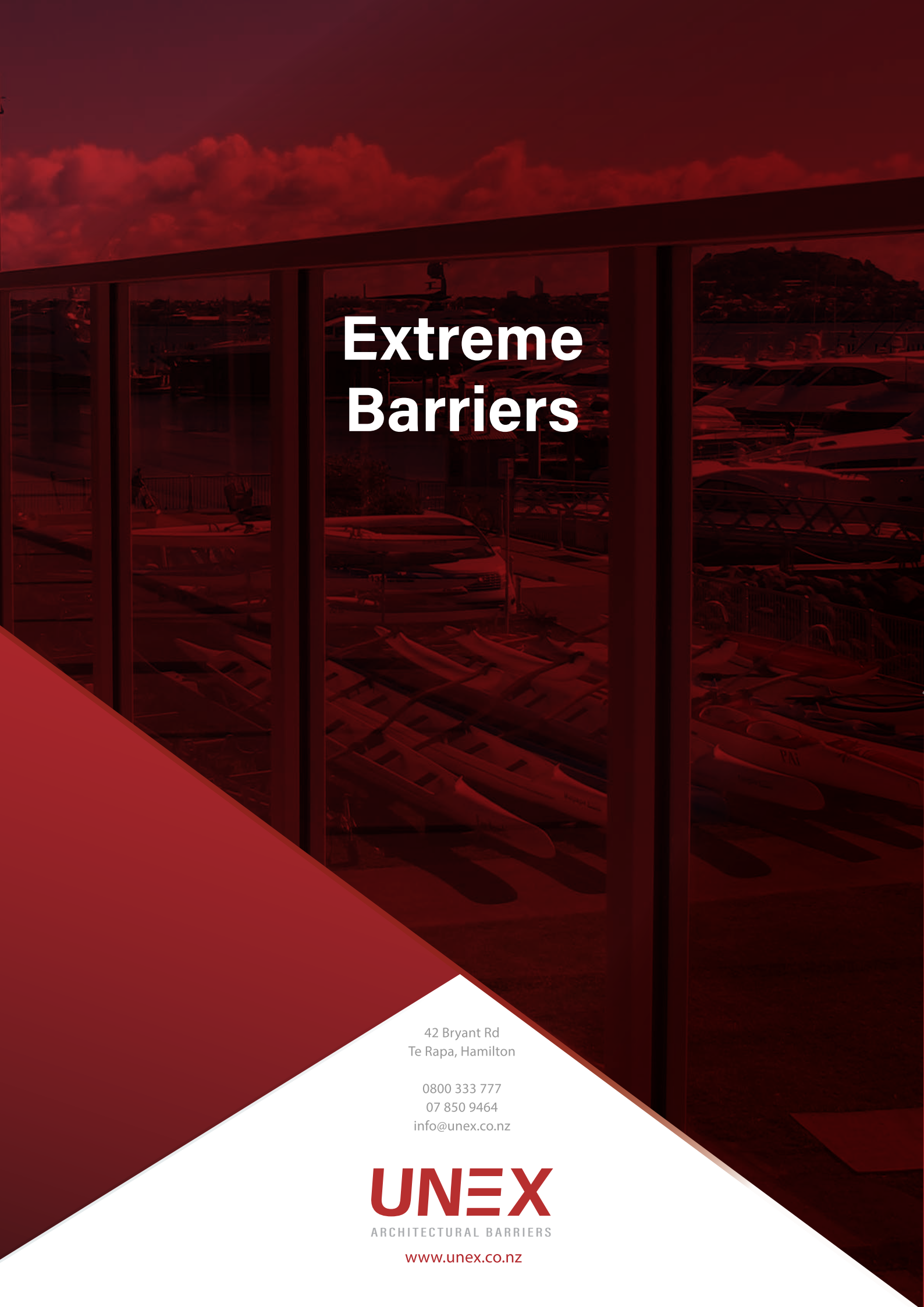
3. The relevant Fixing Specification page

4. The relevant Assembly Specification page

5. The UNEX Loading Classifications page







# Extreme Barriers

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