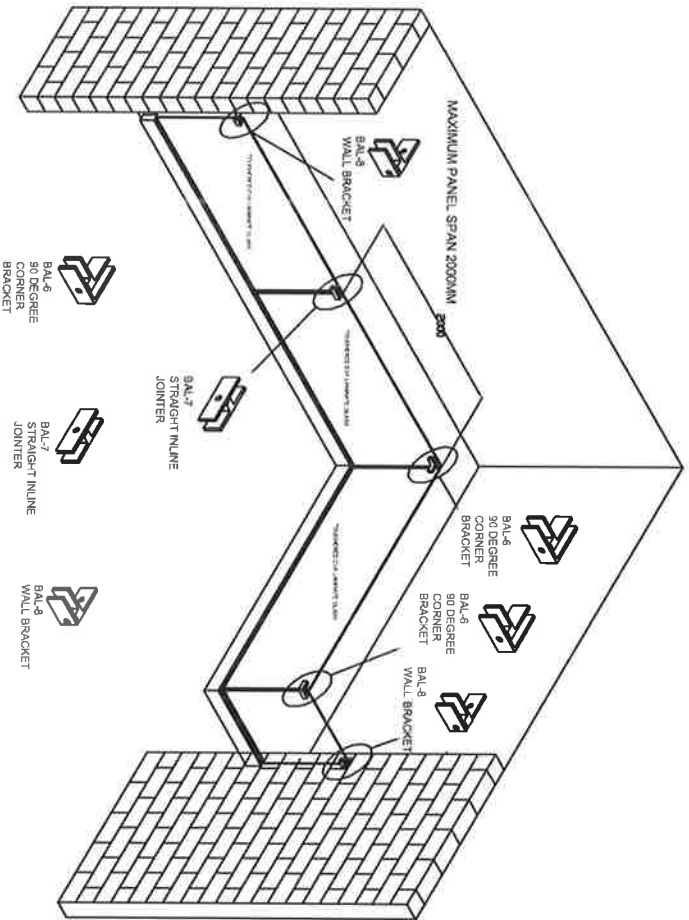


OPUS FRAMELESS INTER LINKING HANDRAIL SYSTEM OHRTS AND THE OPUS BAL-6, BAL-7 & BAL-8 INTER LINKING BRACKETS CONFORMS WITH NZS 4223.3.2016 AND BUILDING CODE B1.3.4

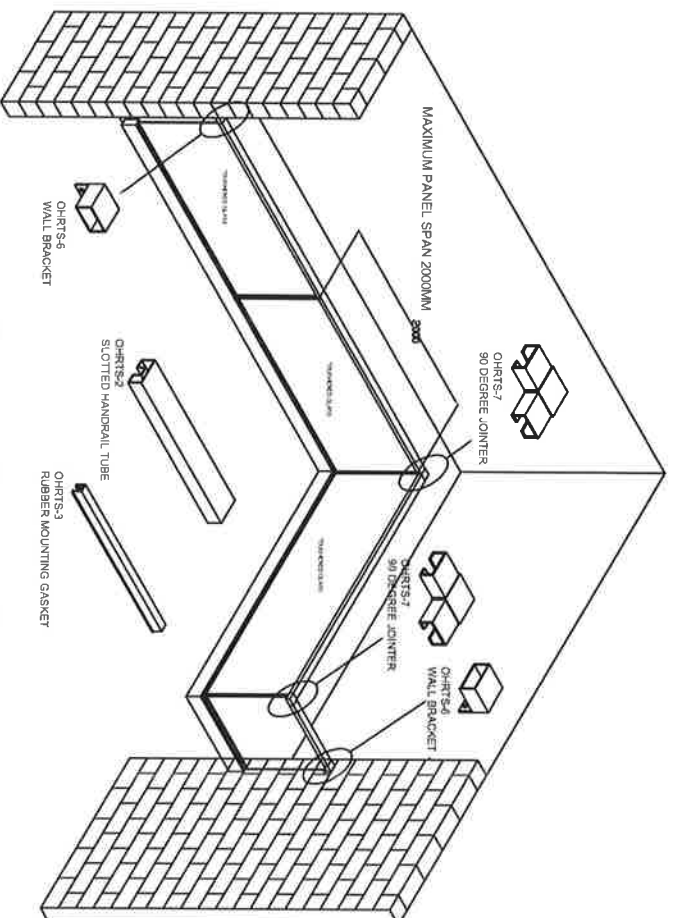


OPUS FRAMELESS INTER LINKING BRACKETS BAL-6, BAL-7 & BAL-8 WHEN USING TOUGHENED EVA LAMINATE GLASS.

NOTE:
NO HANDRAIL IS REQUIRED WHEN USING TOUGHENED GLASS WITH A STIFF INTER LAYER
(Eg SENTRYGLAS)

INTER LINKING HANDRAILS ARE ONLY REQUIRED WHEN ACTING AS A SAFETY BARRIER NOT ON SWIMMING POOL FENCES.

THIS DESIGN HAS BEEN VERIFIED BY AN INDEPENDENT ENGINEERING CONSULTANT AND A PRODUCER STATEMENT PS1 DESIGN IS AVAILABLE.



OPUS FRAMELESS TOUGHENED GLASS INTER LINKING TOP MOUNT HANDRAIL AND FITTINGS USED WHEN USING TOUGHENED GLASS.

NOTE:
ONLY REQUIRED WHEN ACTING AS A SAFETY BARRIER NOT ON SWIMMING POOL FENCES.

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**OPUS INTERLINING HANDRAIL AND BRACKET SYSTEMS USED WHEN
INSTALLING THE OPUS FRAMELESS OBFC FACE FIX CLAP SYSTEM.**

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DRAWING NUMBER: OHR1/4
TECHNICAL MANUAL PAGE 87

NOTES:

RESIDENTIAL OCCUPANCIES A, B, C3 & E TABLE 3.3 SB-1 AS/NZS 1170.1

GLASS PANELS ARE AT LEAST 1000mm WIDE UNLESS CONNECTED BY AN INTER LINKING HANDRAIL.

A HANDRAIL IS REQUIRED FOR STAIRS AND RAMPS EXCEEDING 1:20 SLOPE

HEIGHTS ARE MEASURED FROM THE BASE AT TOP OF CLAMP TO TOP OF GLASS.

OCCUPANCY TYPE:

A - MAXIMUM HEIGHT - 1100mm USING 12MM TOUGHENED GLASS, 1500MM USING 15MM TOUGHENED GLASS OR 1000MM USING 12MM TOUGHENED LAMINATE.

LAMINATE INTERLAYER NOT INCLUDED IN GLASS THICKNESS.

B, E & C3 - MAXIMUM HEIGHT - 1030mm USING 12mm TOUGHENED, 1300MM USING 15MM TOUGHENED GLASS OR 1000MM USING 12MM TOUGHENED LAMINATE.

LAMINATE INTERLAYER NOT INCLUDED IN GLASS THICKNESS.

TIMBER DESIGN IS THE RESPONSIBILITY OF OTHERS. AN ENGINEERS REPORT ON SUITABILITY IS RECOMMENDED

DEFLECTION OF GLASS UNDER SLS LOADS IS RESTRICTED TO A MAXIMUM OF 30mm.

ALL FIXING HARDWARE TO BE GRADE 316 STAINLESS STEEL.

DURATED POWDERCOAT OR 25 MICRON ANODISED FINISH IS RECOMMENDED ON THE COVERS FOR ALL INSTALLATIONS ESPECIALLY WITHIN COASTAL AREAS.

THIS PROPRIETARY BALUSTRADE SYSTEM HAS BEEN DESIGNED IN CONJUNCTION WITH THE GANZ BALUSTRADE DESIGN TABLE SB-1 AND COMPLIES WITH THE NEW ZEALAND BUILDING CODE CLAUSES B1 STRUCTURAL, B2 DURABILITY, F2 HAZARDOUS BUILDING MATERIALS AND F4 SAFETY FROM FALLING THIRD ADDITION, SUBJECT TO:

- ALL PRODUCTS MEETING THEIR PERFORMANCE SPECIFICATION.

- INSTALLATIONS MUST BE IN ACCORDANCE WITH THE INTENT OF THIS DRAWING AND COMPLY WITH NZS 4223.3.2016 REQUIREMENTS.

THE GANZ TABLE SB-1 ALLOWS A MAXIMUM ULS OF 2.1KPa AND SLS OF 1.5KPa DESIGN.

TIMBER FIXING DESIGN NOTE:

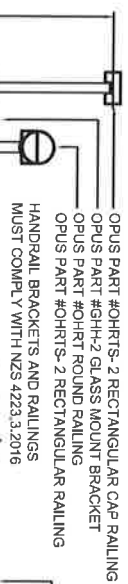
50X50X3MM STAINLESS WASHER ARE TO BE USED ON BALUSTRADES ABOVE 1300MM

DESIGN ASSUMES BASE FIXING INTO DRY MSG-8 TIMBER OR BETTER.

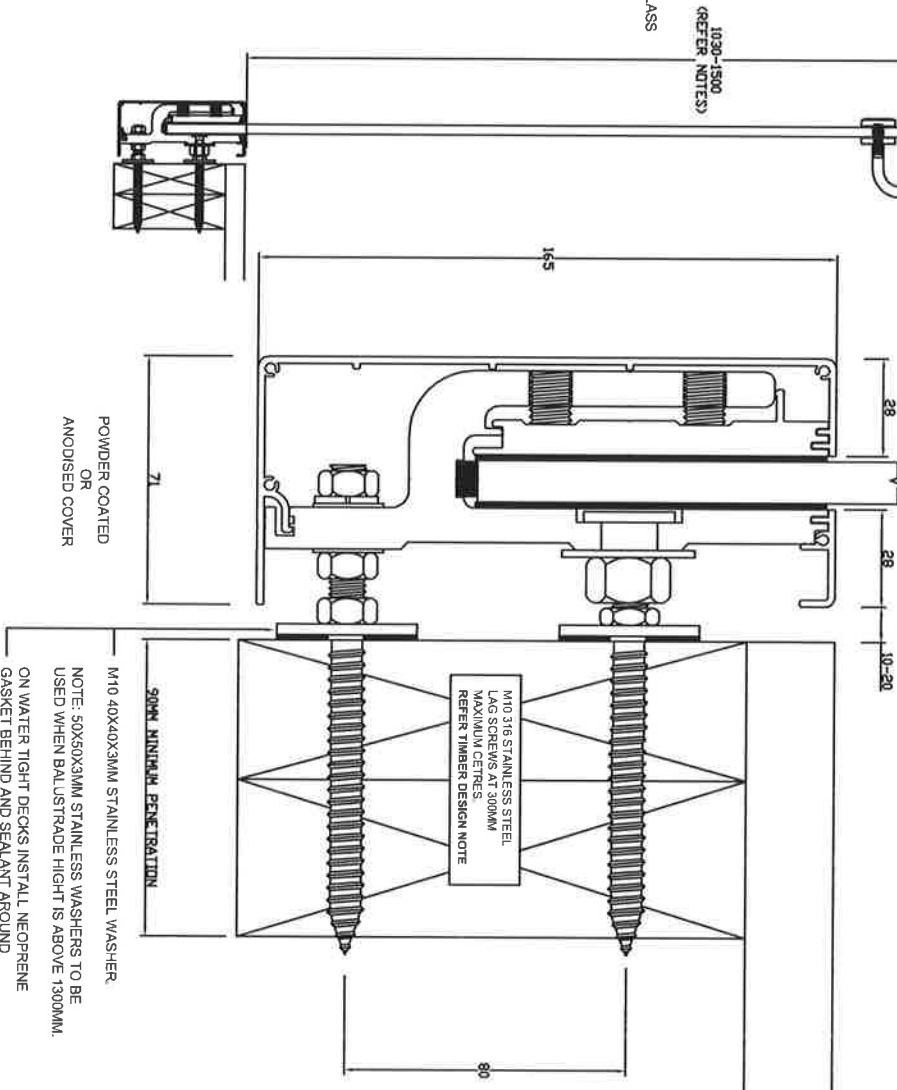
ENGINEERS DESIGN RECOMMENDED FOR WET TIMBER SITUATIONS.

THE DESIGN HAS BEEN VERIFIED BY AN INDEPENDENT ENGINEERING CONSULTANT AND A PRODUCER STATEMENT PS1 DESIGN IS AVAILABLE.

HANDRAIL OPTIONS



NOTE: TO ACHIEVE A 10MM SPACING SET THE TOP STUD LENGTH AT 25MM FROM FINISHED FACE AND THE BOTTOM AT 59MM OR INCREASE ACCORDING TO INDIVIDUAL REQUIREMENT.



M10 40X40X3MM STAINLESS STEEL WASHER
NOTE: 50X50X3MM STAINLESS WASHERS TO BE USED WHEN BALUSTRADE HEIGHT IS ABOVE 1300MM.
ON WATER TIGHT DECKS INSTALL NEOPRENE GASKET BEHIND AND SEALANT AROUND BOLT PENETRATION THROUGH FACE TIMBER.

FIXINGS DETAIL FOR LAG SCREW FIXING AS SHOWN TO BE A MAXIMUM OF 300MM CENTRES. END OF CHANNEL, OR JOINTS TO BE A MAXIMUM 150MM. MAXIMUM BALUSTRADE HEIGHT IN HIGH WIND SITUATIONS - 1200MM AND 1300MM IN MEDIUM WIND SITUATIONS.

DRAWING UPDATED 19/05/14 TO INCLUDE NZS 4223.3.2016 REQUIREMENTS
DRAWING UPDATED 28/11/17 TO CORRECT GLASS TYPES

OPUS™ MANUFACTURING LTD.
OPUS FACE-FIXED BALUSTRADE SYSTEM FOR OCCUPANCIES A, B, C3 & E RECOMMENDED FIXING FOR FACE FIX TIMBER

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DRAWING NUMBER: OBFC/5
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NOTES:

RESIDENTIAL OCCUPANCIES A, B, C3 & E TABLE 3.3 SB-1 AS/NZS 1170.1

GLASS PANELS ARE AT LEAST 1000mm WIDE UNLESS CONNECTED BY AN INTER LINKING HANDRAIL.

A HANDRAIL IS REQUIRED FOR STAIRS AND RAMPS EXCEEDING 1:20 SLOPE

HEIGHTS ARE MEASURED FROM THE BASE AT TOP OF CLAMP TO TOP OF GLASS.

OCCUPANCY TYPE:

A - MAXIMUM HEIGHT - 1100mm USING 12MM TOUGHENED GLASS, 1500MM USING 15MM TOUGHENED GLASS OR 1000MM USING 12MM TOUGHENED LAMINATE.

LAMINATE INTERLAYER NOT INCLUDED IN GLASS THICKNESS.

B, E & C3 - MAXIMUM HEIGHT - 1030mm USING 12mm TOUGHENED, 1300MM USING 15MM TOUGHENED GLASS OR 1000MM USING 12MM TOUGHENED LAMINATE.

LAMINATE INTERLAYER NOT INCLUDED IN GLASS THICKNESS.

TIMBER DESIGN IS THE RESPONSIBILITY OF OTHERS, AN ENGINEERS REPORT ON SUITABILITY IS RECOMMENDED

DEFLECTION OF GLASS UNDER SLS LOADS IS RESTRICTED TO A MAXIMUM OF 30mm.

ALL FIXING HARDWARE TO BE GRADE 316 STAINLESS STEEL.

DURATED POWDERCOAT OR ZN MICRON ANODISED FINISH IS RECOMMENDED ON THE COVERS FOR ALL INSTALLATIONS ESPECIALLY WITHIN COASTAL AREAS.

THIS PROPRIETARY BALUSTRADE SYSTEM HAS BEEN DESIGNED IN CONJUNCTION WITH THE GANZ BALUSTRADE DESIGN TABLE SB-1 AND COMPLIES WITH THE NEW ZEALAND BUILDING CODE CLAUSES B1 STRUCTURAL, B2 DURABILITY, F2 HAZARDOUS BUILDING MATERIALS AND F4 SAFETY FROM FALLING THIRD SUBJECT TO:

- ALL PRODUCTS MEETING THEIR PERFORMANCE SPECIFICATION

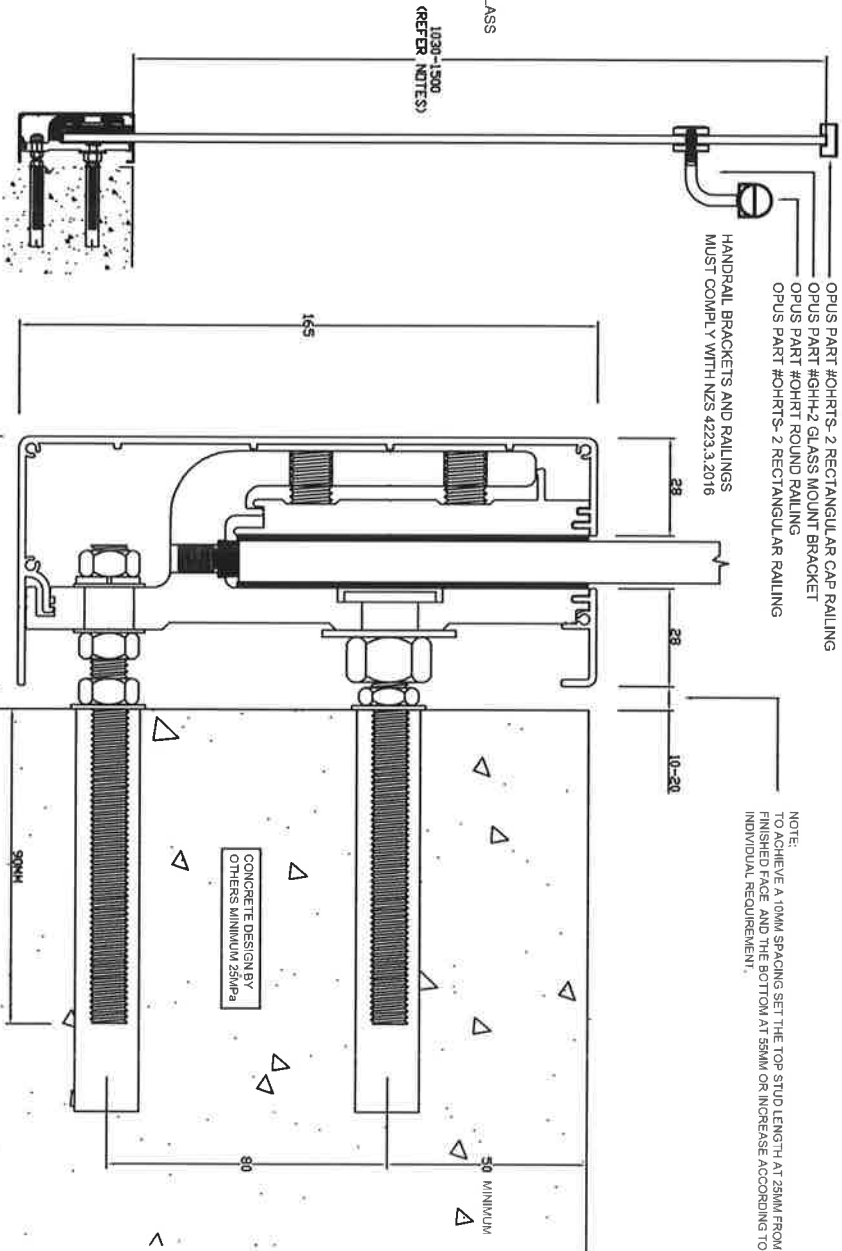
- INSTALLATIONS MUST BE IN ACCORDANCE WITH THE INTENT OF THIS DRAWING AND COMPLY WITH NZS 4223.3.2016 REQUIREMENTS.

THE GANZ TABLE SB-1 ALLOWS A MAXIMUM ULS OF 2.1KPa AND SLS OF 1.5KPa DESIGN.

CONCRETE ANCHOR FIXING NOTE:
BASE FIXING FOR CONCRETE STRENGTH AND EDGE DIMENSIONS AS SHOWN COVERS ALL SITUATIONS AND WIND ACTIONS UP TO 1.76kPa.
ENGINEERS DESIGN OF BASE ANCHORS RECOMMENDED FOR HIGH WIND SITUATIONS.

FIXINGS DETAIL AS SHOWN TO BE A MAXIMUM OF 600MM CENTRES. END OF CHANNEL OR JOINTS TO BE A MAXIMUM 300MM.

THE DESIGN HAS BEEN VERIFIED BY AN INDEPENDENT ENGINEERING CONSULTANT AND A PRODUCER STATEMENT PS1 DESIGN IS AVAILABLE.



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OPUS FACE-FIXED BALUSTRADE SYSTEM FOR OCCUPANCIES A, B, C3 & E RECOMMENDED FIXING FOR FACE FIX CONCRETE

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DRAWING NUMBER: OBFC/4
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DRAWING UPDATED 19/05/16 TO INCLUDE NZS 4223.3.2016 REQUIREMENTS
 DRAWING UPDATED 29/11/17 TO INCLUDE CORRECTED GLASS TYPES

NOTES:

RESIDENTIAL OCCUPANCIES A, B, C3 & E TABLE 3.3 SB-1 AS/NZS 1170.1

GLASS PANELS ARE AT LEAST 1000mm WIDE UNLESS CONNECTED BY AN INTER LINKING HANDRAIL.

A HANDRAIL IS REQUIRED FOR STAIRS AND RAMPS EXCEEDING 1:20 SLOPE

HEIGHTS ARE MEASURED FROM THE BASE AT TOP OF CLAMP TO TOP OF GLASS.

OCCUPANCY TYPE:

A - MAXIMUM HEIGHT - 1100mm USING 12MM TOUGHENED GLASS, 1500MM USING 15MM TOUGHENED GLASS OR 1000MM USING USING 12MM TOUGHENED LAMINATE.

LAMINATE INTERLAYER NOT INCLUDED IN GLASS THICKNESS.

B, E & C3 - MAXIMUM HEIGHT - 1030mm USING 12mm TOUGHENED, 1300MM USING 15MM TOUGHENED GLASS OR 1000MM USING 12MM TOUGHENED LAMINATE.

LAMINATE INTERLAYER NOT INCLUDED IN GLASS THICKNESS.

TIMBER DESIGN IS THE RESPONSIBILITY OF OTHERS, AN ENGINEERS REPORT ON SUITABILITY IS RECOMMENDED

DEFLECTION OF GLASS UNDER SLS LOADS IS RESTRICTED TO A MAXIMUM OF 30mm.

ALL FIXING HARDWARE TO BE GRADE 316 STAINLESS STEEL.

DURATEC POWDERCOAT OR 25 MICRON ANODISED FINISH IS RECOMMENDED ON THE COVERS FOR ALL INSTALLATIONS ESPECIALLY WITHIN COASTAL AREAS. THIS PROPRIETARY BALUSTRADE SYSTEM HAS BEEN DESIGNED IN CONJUNCTION WITH THE GANZ BALUSTRADE DESIGN TABLE SB-1 AND COMPLES WITH THE NEW ZEALAND BUILDING CODE CLAUSES B1, STRUCTURAL, B2 DURABILITY, F2 HAZARDOUS BUILDING MATERIALS AND F4 SAFETY FROM FALLING THIRD ADDITION, SUBJECT TO:

- ALL PRODUCTS MEETING THEIR PERFORMANCE SPECIFICATION.

- INSTALLATIONS MUST BE IN ACCORDANCE WITH THE INTENT OF THIS DRAWING AND COMPL Y WITH NZS 4223.3:2016 REQUIREMENTS.

THE GANZ TABLE SB-1 ALLOWS A MAXIMUM ULS OF 2.1kPa AND SLS OF 1.5kPa DESIGN.

TIMBER FIXING DESIGN NOTE - DRY TIMBER:

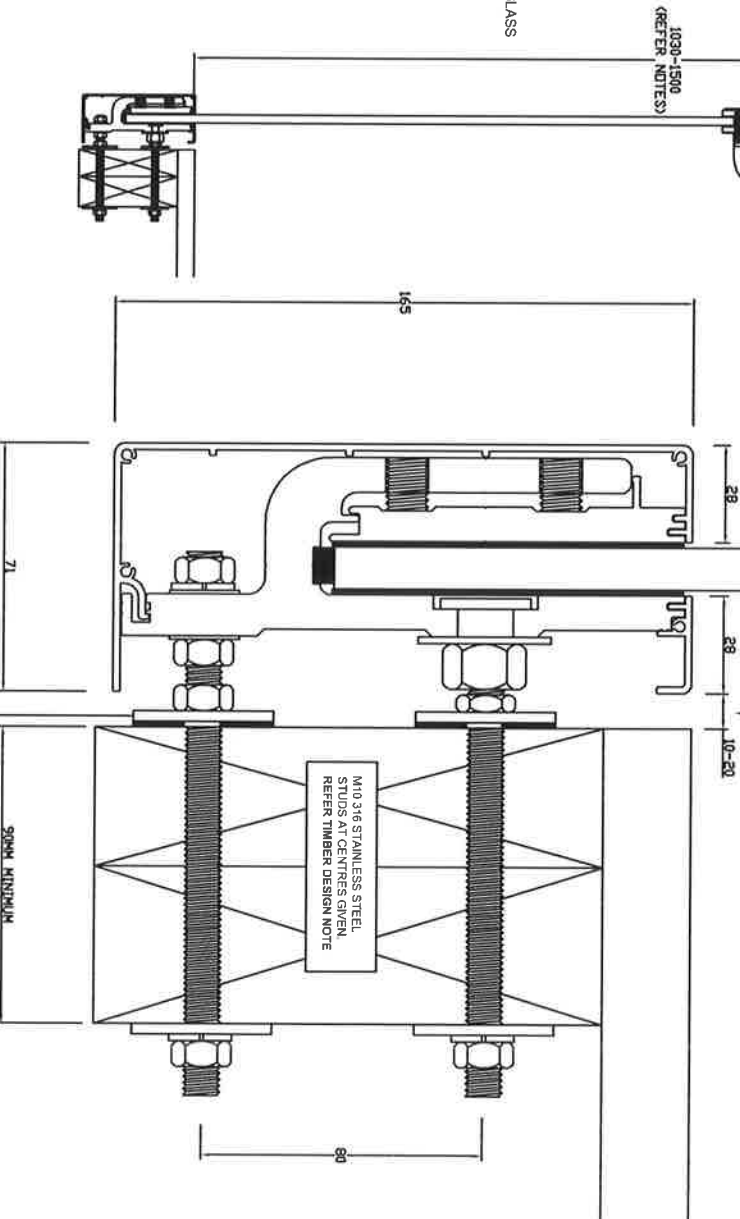
600MM CENTRES FOR HEIGHTS UP TO 1500MM, END OF CHANNEL OR JOINTS TO BE A MAXIMUM 300MM, 50X50X3MM STAINLESS WASHERS ARE TO BE USED ON BALUSTRADES ABOVE 1300MM.

DESIGN ASSUMES BASE FIXING INTO SG-8 TIMBER OR BETTER.

TIMBER FIXING DESIGN NOTE - WETTED TIMBER:

600MM CENTRES FOR HEIGHTS UP TO 1300MM, END OF CHANNEL OR JOINTS TO BE A MAXIMUM 300MM, 450MM CENTRES FOR HEIGHTS 1300MM TO 1500MM, END OF CHANNEL OR JOINTS TO BE A MAXIMUM 225MM, DESIGN ASSUMES BASE FIXING INTO SG-8 TIMBER OR BETTER.

HANDRAIL OPTIONS



POWDER COATED
OR
ANODISED COVER

M10 40X40X3MM STAINLESS STEEL WASHER.
NOTE: 50X50X3MM STAINLESS WASHERS TO BE USED WHEN BALUSTRADE HEIGHT IS ABOVE 1300MM, OR ON ALL FIXINGS WHEN INSTALLED INTO WETTED TIMBER.
ON WATER TIGHT DECKS INSTALL NEOPRENE GASKET BEHIND AND SEALANT AROUND BOLT PENETRATION THROUGH FACE TIMBER.

MAXIMUM FIXINGS CENTRES TO BE AS PER THE DESIGN NOTE ABOVE FOR DRY AND WETTED TIMBER INSTALLATIONS. THE DESIGN HAS BEEN VERIFIED BY AN INDEPENDENT ENGINEERING CONSULTANT AND A PRODUCER STATEMENT P51 DESIGN IS AVAILABLE.
DRAWING UPDATED 19/09/16 TO INCLUDE NZS 4223.3:2016 REQUIREMENTS
DRAWING UPDATED 29/11/17 TO INCLUDE GLASS TYPES.

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