TRADE TESTED

ANDREA (11.2m^2) Log Cabin Design Statement

A20130
12 June 2025 – Revision A

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TRADE TESTED LOG CABIN ANDREA (3.9M X 3M)

Trade Tested produce kitset log cabins made of spruce timber that can be constructed on site. Various log cabin sizes and footprints are available. This design statement is specific to the Log Cabin Andrea (11.2m^2).

Richards Consulting Auckland Limited has been engaged by Trade Tested to prepare a standard design statement on the maximum site loadings (wind, earthquake and snow) which the log cabins can withstand.

CABIN STRUCTURAL SYSTEM

The log cabin is a timber structure built up from spruce timber members supporting a spruce timber mono-slope roof. The wall and roof framing resist gravity, wind and snow loads on the structure. The roof is non-trafficable and as such is not designed to carry live loads. Wind and snow loads have been calculated as per AS/NZS1170.2 and AS/NZS1170.3 respectively. Sectional capacities of the timber members have been determined using Timber Structures NZS3603: 1993.

Lateral loads on the structure are resisted by the roof framing which acts at a diaphragm to transfer the loading into the walls along the perimeter of the structure. The wall framing and posts located at each of the corners resist the overturning force produced by the lateral loads. Steel equal angle mullions resist the wind face loads around the openings in both directions.

The log cabin will be founded on a concrete slab with perimeter footings. The slab should be a minimum thickness of 100mm and reinforced with SE62 steel mesh in accordance with NZS 3604:2011. Refer to the typical foundation slab detail attached. The cabin foundation logs should be fixed down to the concrete slab with Hilti HUS 6 Screw Anchors (or equivalent) at 600mm crs. The design of the log cabin within this document are in compliance with the New Zealand Building Code (NZBC) section B1.

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SERVICEABILITY CRITERIA

The following deflection limits were used for the following elements within the log cabin Andrea 11.2m² (3.9m x 3.0m)

- Lateral deflection of wall logs: L/150
- Roof rafters: L/200

DESIGN LOADS AND LOAD CASES

The structure has been designed as an Importance Level 2 structure with design loads corresponding to a Design Working Life of 25 years.

The maximum allowable site loads for the log cabins are:

- Wind: 'Low' Wind Zone (32m/s)
- Earthquake: EQ Zone 3, Soil Class D or EQ Zone 4, Soil Class C
- Ground Snow Load: 1.5kPa

The site loads can be determined from:

- Wind: Local council wind maps found on the relevant council websites or BRANZ.co.nz
- Earthquake Zone can be determined from BRANZ.co.nz
- Snow Load: Maximum altitude for the following regions:
    - Northland, Auckland, Waikato and Bay of Plenty: No altitude limit.
    - Gisborne, Taranaki, Hawke's Bay, Manawatu-Wanganui, Wellington: 600m
    - West Coast: 600m
    - Tasman, Nelson and Marlborough: 600m
    - Canterbury: 200m
    - Otago and Southland: 300m

The following design load cases have been applied to the log cabin members:

- 0.9G + Wu (ULS for wind uplift)
- 1.2G + S (ULS downward load case)
- 1.2G + EQ (ULS for lateral load case)
- 0.9G + W_{lat} (ULS for lateral load case)
- Ws (SLS for wind related deflection)

DESIGN LIMITATIONS

The following design assumptions apply to the design manual:

- The member sizes used will be the same as those checked in the design.
- Spruce timber will be used with an E = 8GPa and f_b = 16MPa.
- The structure will be constructed as per the Trade Tested construction manual.
- The structure will be built on a site that meets the requirements of 'Good Ground' as per NZS3604:2011. 'Good Ground' is determined as firm natural soils on a site with no site stability issues, expansive soils, organic soils (peat) and low risk of liquefaction.

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    - In the Auckland region, expansive soils are reasonably common. Auckland Council practice note AC2208 stipulates a minimum embedment depth of 450mm below cleared ground level for foundations. As such, foundations constructed for Palmako log cabins in the Auckland region should have a minimum embedment depth of 450mm below cleared ground level. Noting that the foundations however are not covered by this manual or PS1.
- No modifications are made to the structure (unless authorized in this manual).
- The cabins are not to be installed within Corrosion Zone D (sea-spray zone). Refer to BRANZ.co.nz for locations.
- The cabin has been designed for a 25-year design life.

BUILDING CONSENT EXEMPTION REQUIREMENTS

The New Zealand Building Act allows for single-storey detached buildings up to 30m^2 in floor area with prefab or kitset components to be constructed without a building consent provided the following requirements are met.

- The building does not contain sanitary facilities or facilities for the storage of potable water.
- The building does not include sleeping accommodation, unless the building is used in connection with a dwelling.
    - If the building includes sleeping accommodation, smoke alarms are required to be installed.
- The building does not include any cooking facilities.
- The building is situated further than its own height from a residential building or to any legal boundary.

DESIGN EXCLUSIONS

The following items are specifically excluded from this design manual:

- Weather and waterproofing of the cabin.
- Electronic services to the cabin.
- Fire and smoke alarms.
- Glazing for the log cabins are not part of this PS1.

MATERIAL AND SECTION PROPERTIES

The log cabins will be made from spruce timber members.

The structural member properties are as follows:

114x44mm wall framing	$I_y = 0.8 \times 10^6$ mm^4, $I_x = 5.4 \times 10^6$ mm^4
70x70mm posts	$I_x = 2.0 \times 10^6$ mm^4
50x5.0 EA door mullions	$I_x = 0.163 \times 10^6$ mm^4, f_y = 320MPa, E = 200GPa
160x60mm roof rafters	$I_x = 20 \times 10^6$ mm^4
Spruce timber	E = 8GPa, f_b = 16MPa

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DURABILITY

The structure has been designed with a life to first maintenance of 10 years. The durable life of the structure can be extended to 25 years with regular maintenance such as repainting the cabin and/or reapplying the timber preservative. The finished floor level of the structure is to be 225mm above adjacent finished ground levels (E1).

Prior to construction of the log cabin, the timber elements should be treated with an appropriate wood preservative i.e. a borate-based project (for example TimberSafe Multi-purpose Wood Preservative) or a Copper Naphthenate based product (for example Metalex Green Concentrated Timber Preservative). After construction, the log cabin should be painted or stained, with the chosen coating reapplied as per the product specifications.

DESIGN MANUAL NOTES

The person or people installing the log cabin should have a good understanding of the construction techniques required and abide by the following:

- Only the attached connection details shall be used.
- No substitution with the products included in this manual is permitted.
- The owner should refer to their local district council plan to ensure they meet planning requirements including, but not exclusive to, site coverage, boundary setbacks, recession planes, etc.
- The timber products used for construction should be treated with an appropriate wood preservative.
- For the log cabin to suitably resist the specified site loads, the additional 50x5 EA mullions must be installed as per the Palmako construction detail.
  For the log cabin to suitably resist the specified site loads, additional Ø5 x 90 screws are needed for fixing the posts to the underlying frame as per the attached details.
- The cabin has a working design life of 25 years and must be demolished or removed at the end of this 25-year period.

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APPENDICIES

- PS1
- Post connection detail

REFERENCES

- AS/NZS1170: 2002
- NZS3603: 1993
- NZS3604: 2011

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Site Loadings Checklist					
Maximum Wind Zone	Low		Y ( )	N[1] ( )	
EQ Zone and Soil Class	Zone 3	Soil Class D	Y ( )	N ( )	NA[2] ( )
	Zone 4	Soil Class C	Y ( )	N ( )	NA ( )
Snow Region and Altitude	Northland Auckland Waikato Bay of Plenty	No altitude limit	Y ( )	N ( )	NA ( )
	Gisborne Taranaki Hawke's Bay Manawatu-Wanganui Wellington	Site altitude < 600m	Y ( )	N ( )	NA ( )
	West Coast	Site altitude < 600m	Y ( )	N ( )	NA ( )
	Tasman Nelson Marlborough	Site altitude < 600m	Y ( )	N ( )	NA ( )
	Canterbury	Site altitude < 200m	Y ( )	N ( )	NA ( )
	Otago Southland	Site altitude < 300m	Y ( )	N ( )	NA ( )
Good Ground[3]			Y ( )	N ( )	
Distance from other buildings and legal boundaries[4]	> 2.6m		Y ( )	N ( )	

[1] If 'no' (N) ticked, then log cabin is not suitable for the proposed site.
[2] If another option has been ticked 'yes' (Y), NA may be ticked.
[3] With consideration of Auckland Council practice note AC2208.
[4] For protection against fire spread, the cabin must be situated further than its own height from another residential structure or from any legal boundary.
Note: There are other local planning requirements that will also have to be reviewed.

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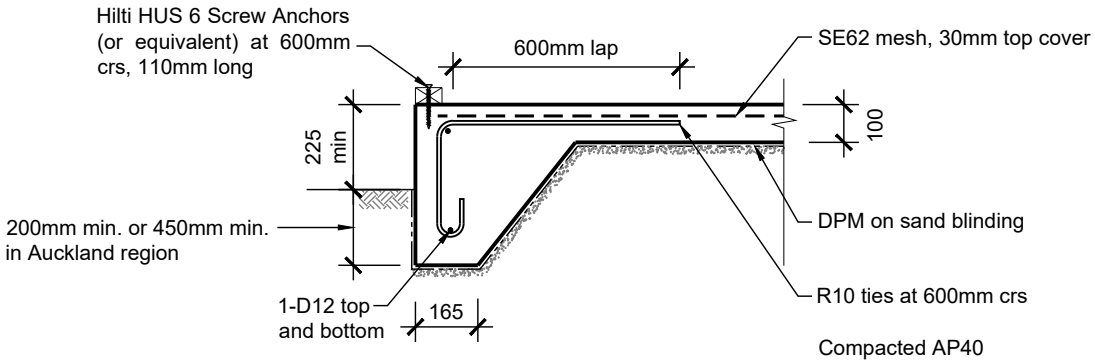
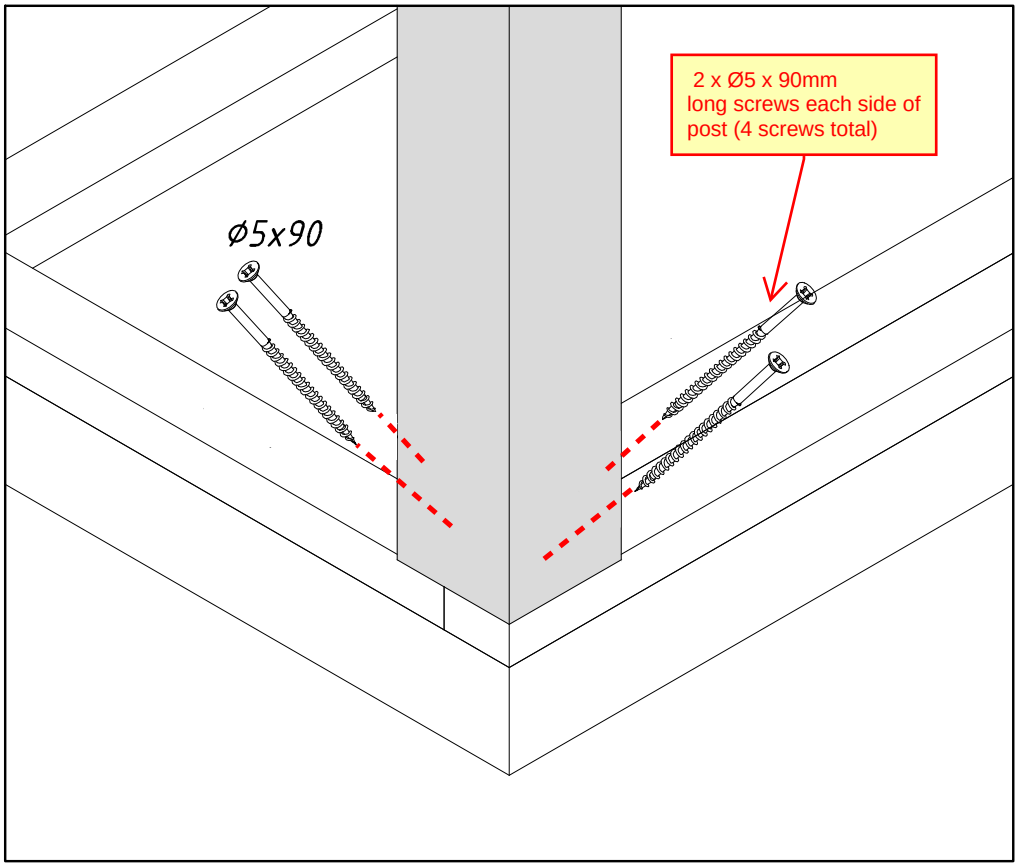
Project: Trade Tested Product Manual Andrea 11.2m²	
Reference: A20130	By: PH
Date: JUNE 2025	Sketch:



001 - CONCRETE PERIMETER FOOTING
SCALE 1:20



002 Post to Bottom Plate Detail
NOT TO SCALE

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	Reference: **A20130**	By: **PH**
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RCE Sketch #01
ANDREA 11.2m² Log Cabin
Mullion Layout
REV 1

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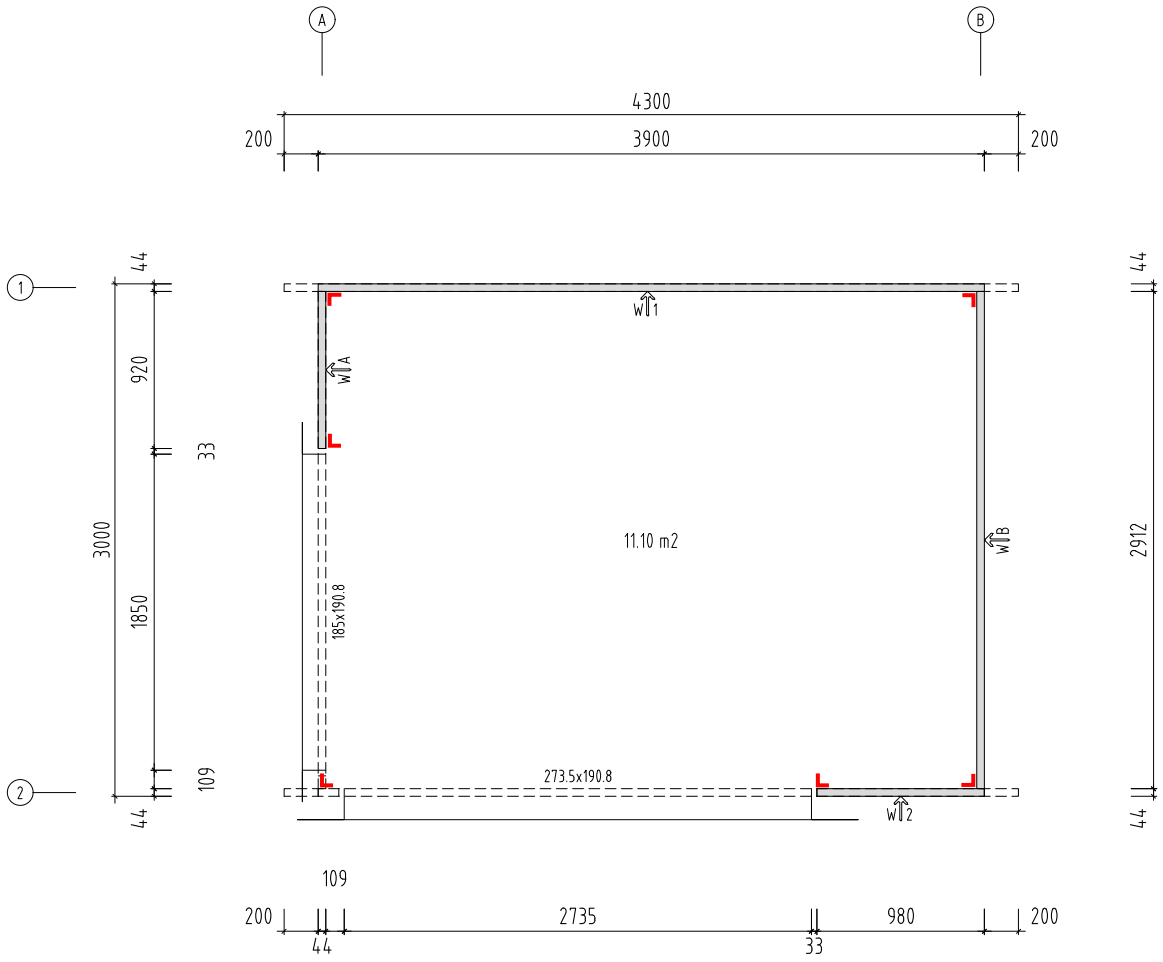

Key:
L - 50x5.0 EA Mullion

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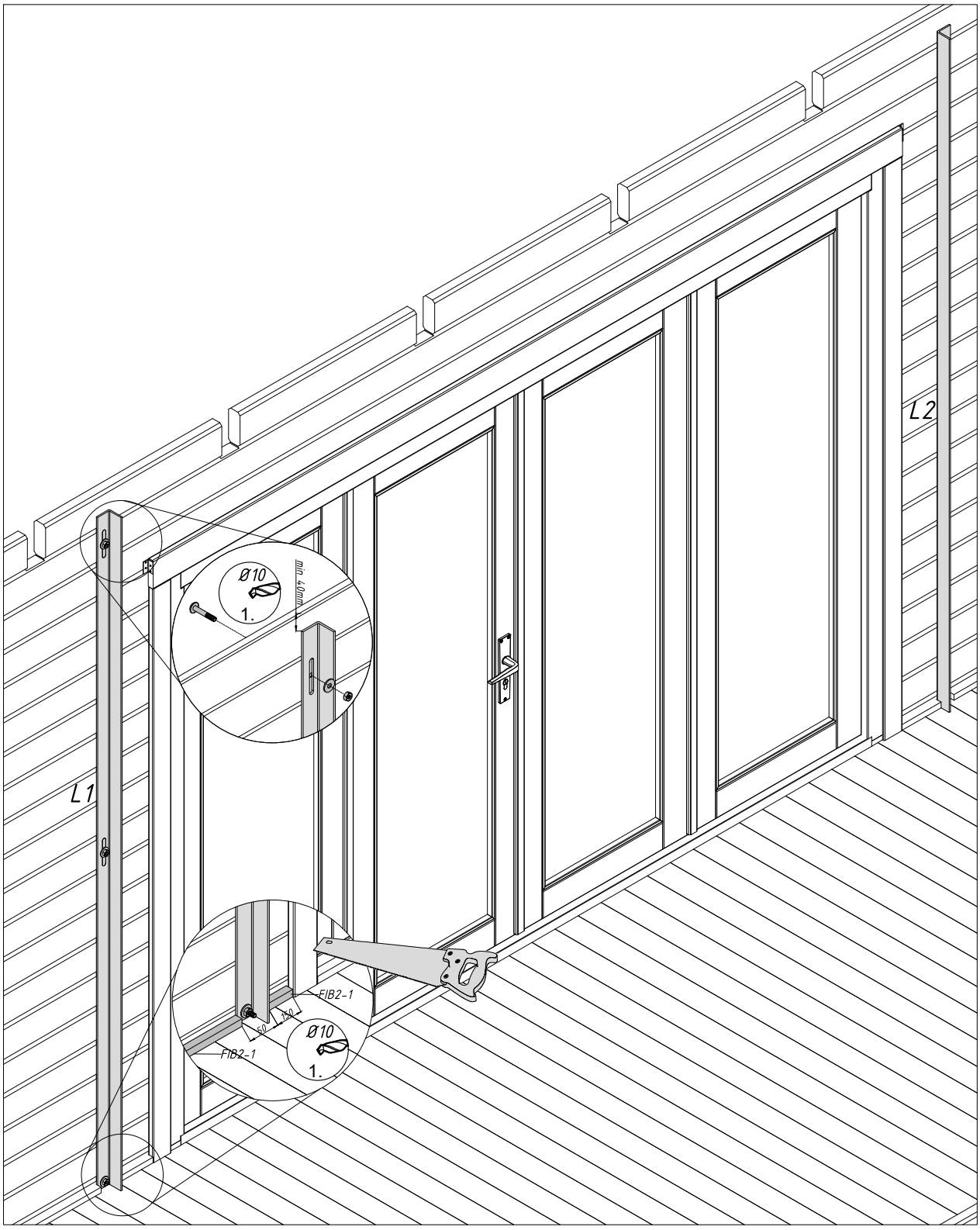
Installation of EA Mullions



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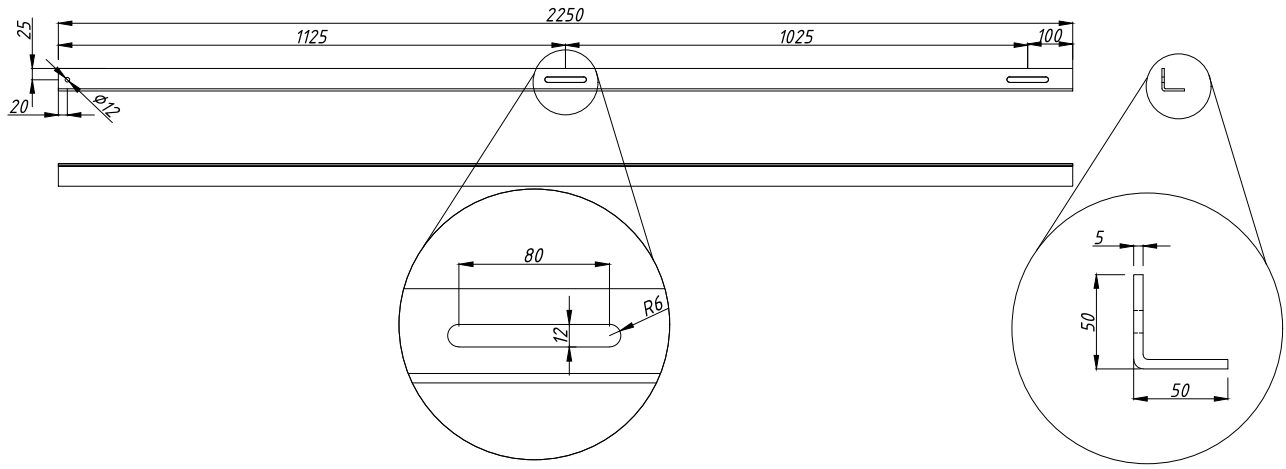
Installation of EA Mullions

Pos	SPECIFICATION-STÜCKLISTE-NOMENCLATURE-ELEMENTI-ESPECIFICATIÓN	Pcs	Profile (mm)	Length (mm)
M10x60	Bolt -Schloss-schraube -Boulon- Bullone- Perno- M10x60mm	6		
M10	Nut- Schraubenmutter- Écrou- Dado- Tuerca- M10mm	6		
10x30	Washer- Dichtscheibe- Joint- Rondella- Arandela- 10x30mm	6		

L1



L2