FOURTH EDITION

TERRAÇADE XP™ TECHNICAL MANUAL

terraçade™

TERRACOTTA FAÇADE SYSTEMS

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SYSTEM DESCRIPTION

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SYSTEM DESCRIPTION:
OVERVIEW

TERRAÇADE™ IS AN INNOVATIVE TERRACOTTA FAÇADE SYSTEM DEVELOPED TO PROVIDE THE NATURAL BEAUTY AND AESTHETIC APPEAL OF TERRACOTTA TO YOUR PROJECT.

Terraçade XP™ is a durable system that provides a superb finish to both architectural developments and residential projects. Terraçade XP has been designed in consultation with one of Australia's leading architects to act as a rain screen system. Terraçade XP has been fully tested for structural integrity and weather tightness. The system can also be used in cyclonic regions as it has been successfully tested at the Cyclone Testing Station. The combination of the natural, durable properties of terracotta and the system's modern appeal make Terraçade XP an ideal choice.

SYSTEM ASSEMBLY

The Terraçade XP tiles are easily captured and supported by the purpose designed aluminium horizontal rails. The horizontal railings are generally fixed to a vertical frame over a framed, concrete or masonry structure.

The secondary framing structure is designed to transfer loads to the main structural frame. The suitability of the back up wall and railing system and the type of fixing should be confirmed with a structural engineer.

The Terraçade XP tiles are available in a smooth or linear format and are available in a variety of natural clay colours.

The Terraçade XP tiles may be separated by a jointing strip to accentuate the modular nature of the system.
The Terraçade XP system is comprised of:

- An aluminium horizontal rail purposely designed to capture and support the tiles
- Premium, durable fired clay tiles designed to fit securely onto the fixing rails,
- An aluminium vertical jointing strip,
- A fitment gasket.

In addition, a full range of trims in mill, anodised or powder coated finish are available to complement or highlight your design, including:

- Internal and external corners,
- A surround for windows and doors for when the system is directly attached to a structural wall,
- A surround for windows and doors for when the system attached to secondary rails,
- A base surround for when the system is directly attached to a structural wall,
- A base surround for when the system attached to secondary rails.

BENEFITS OF TERRAÇADE XP

Terraçade XP is a rain screen system, which creates an airspace outside the load-bearing wall. This minimises thermal transfer to the building structure improving comfort levels and providing energy savings. The airspace provides natural ventilation with a chimney effect, which facilitates the removal of heat, humidity and condensation away from the building structure.

Terraçade XP tiles are classified exposure grade so they can be used in all environments including severe marine environments and areas subject to heavy industrial pollution. Terracotta tiles are robust and extremely durable and have an extremely long service life. Terraçade XP provides the natural beauty, low maintenance and longevity of real terracotta.

Terraçade XP also offers design flexibility as individual tiles can be replaced at any stage for ease of maintenance or to facilitate changes to update the buildings appearance. The tiles can also be secured by mechanical means to prevent vandalism.

TESTED PERFORMANCE

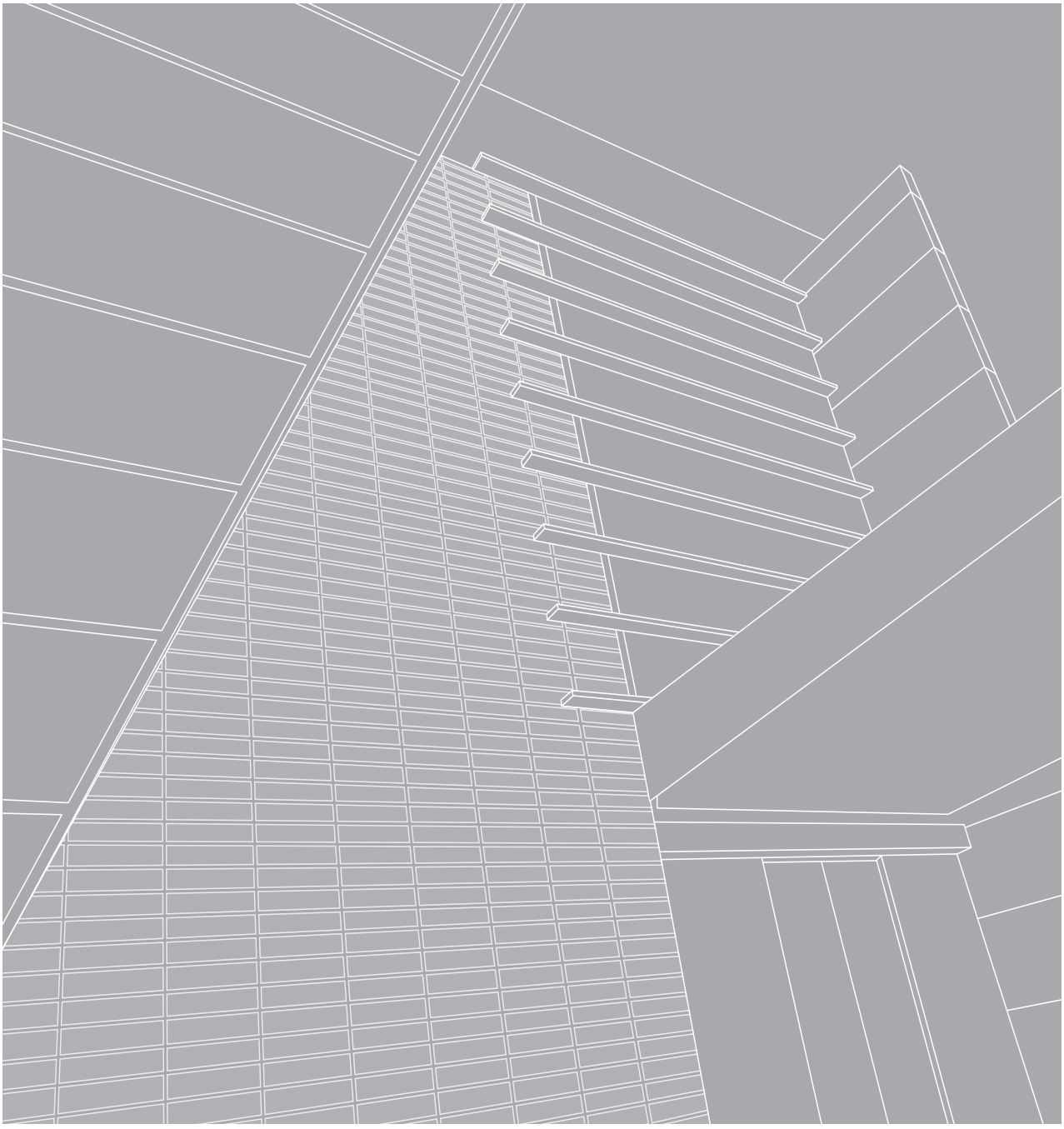
The terracotta tile acts as part of a rain screen system, where the tile is the first line of defence against water penetration and must be used in conjunction with a waterproofed and drained backup wall. (pressure equalising membrane system)

The system has been fully tested in accordance with AS4284 for static and dynamic water penetration up to a design wind load of 2.2 kPa. Terraçade XP has also been fully tested at Ian Bennie & Associates Pty. Ltd. As stated in Test Report 6039XP2 the system is sufficient to support an equivalent strength limit state design wind suction pressure of 9.20kPa in cyclonic areas.

In addition to the standard Terraçade XP system, the aluminium horizontal rails can be anodised to ensure that the system will stand the test of time in marine environments. The performance of the Terraçade XP tiles has been extensively tested in Austral Bricks' NATA accredited laboratory to AS/NZS 4455 and AS/NZS 4456 or in independent NATA accredited laboratories.

The natural properties of terracotta ensure that the natural colour of the product will last for its lifetime. The minimal maintenance, lasting properties and thermal benefits of the rain screen system make Terraçade XP an excellent choice when designing low maintenance unique facades.

COMPONENTS



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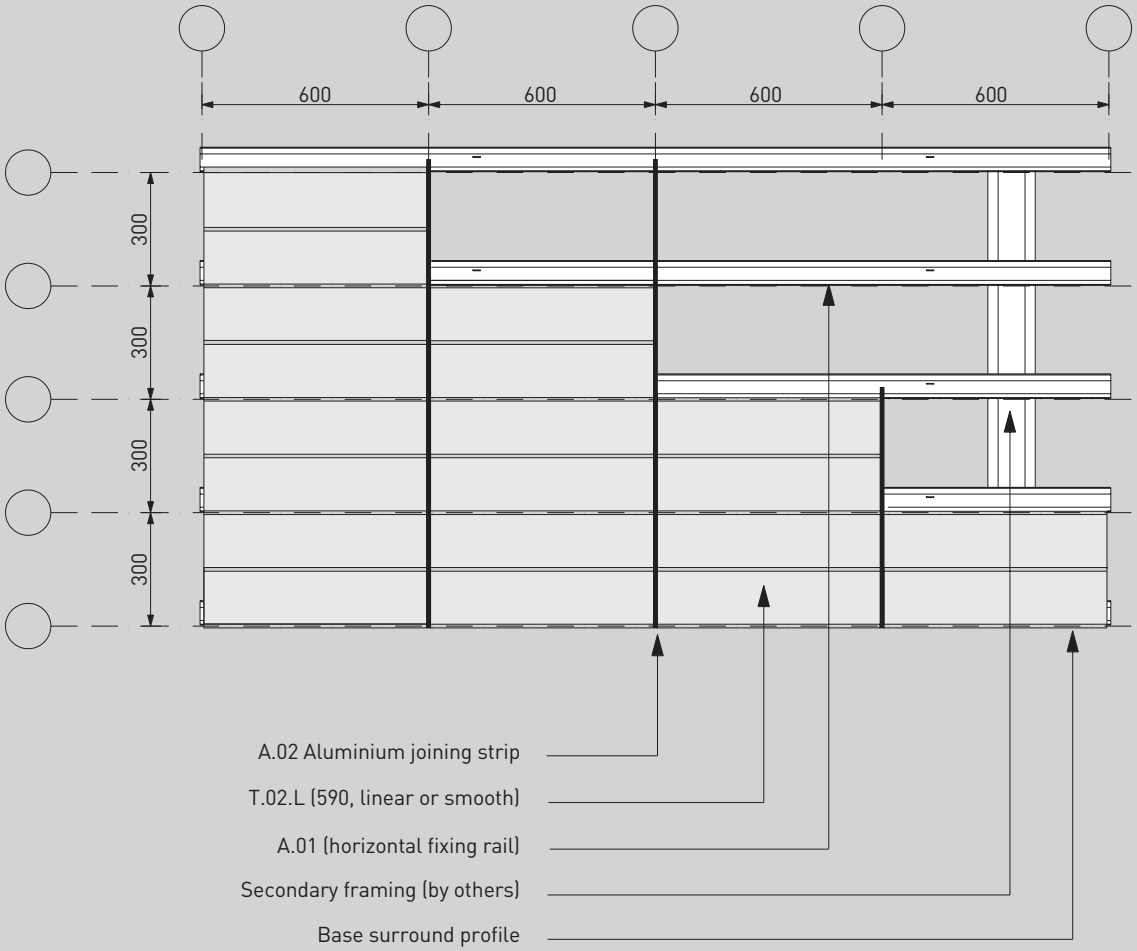
COMPONENTS:

TERRAÇADE XP SYSTEM MODULE

ISSUE D-0411

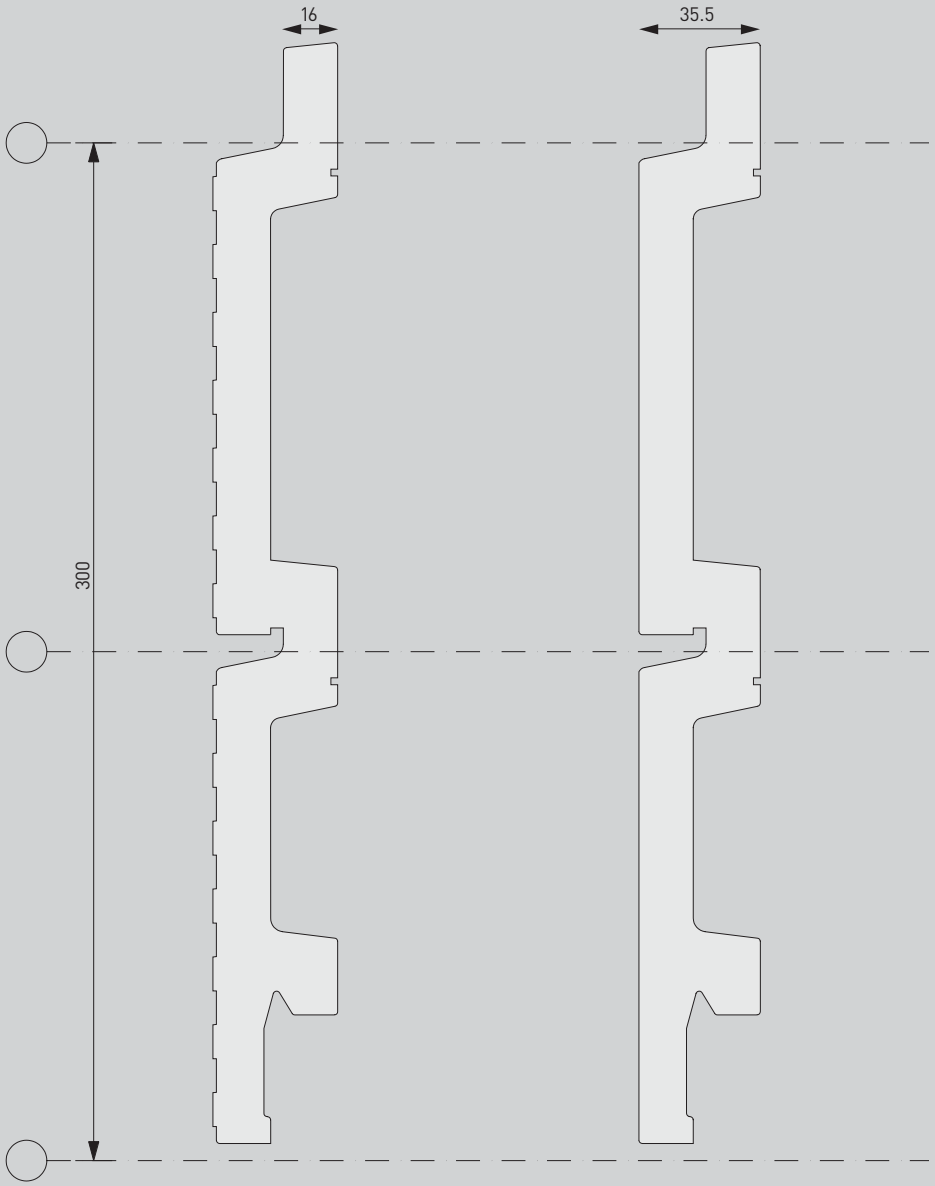
COMPONENTS:

TERRAÇADE XP SYSTEM COMPONENTS



COMPONENTS:

TERRAÇADE XP TILE PROFILE

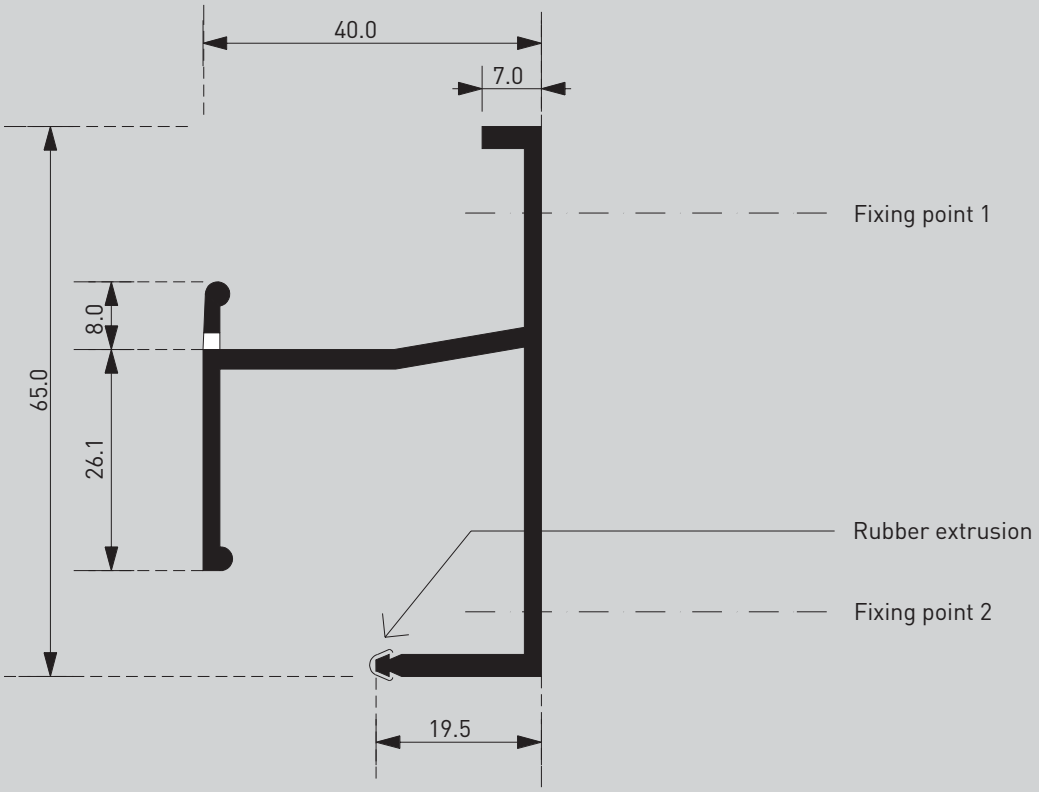


T.02.L
300mm tile, linear

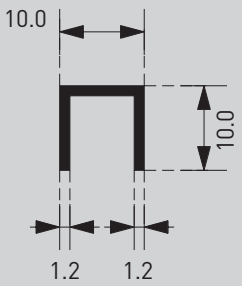
T.02.S
300mm tile, smooth

GENERAL TOLERANCES FOR TILES: +/- 1% ON ALL DIMENSIONS

COMPONENTS:
TERRAÇADE XP SYSTEM COMPONENTS



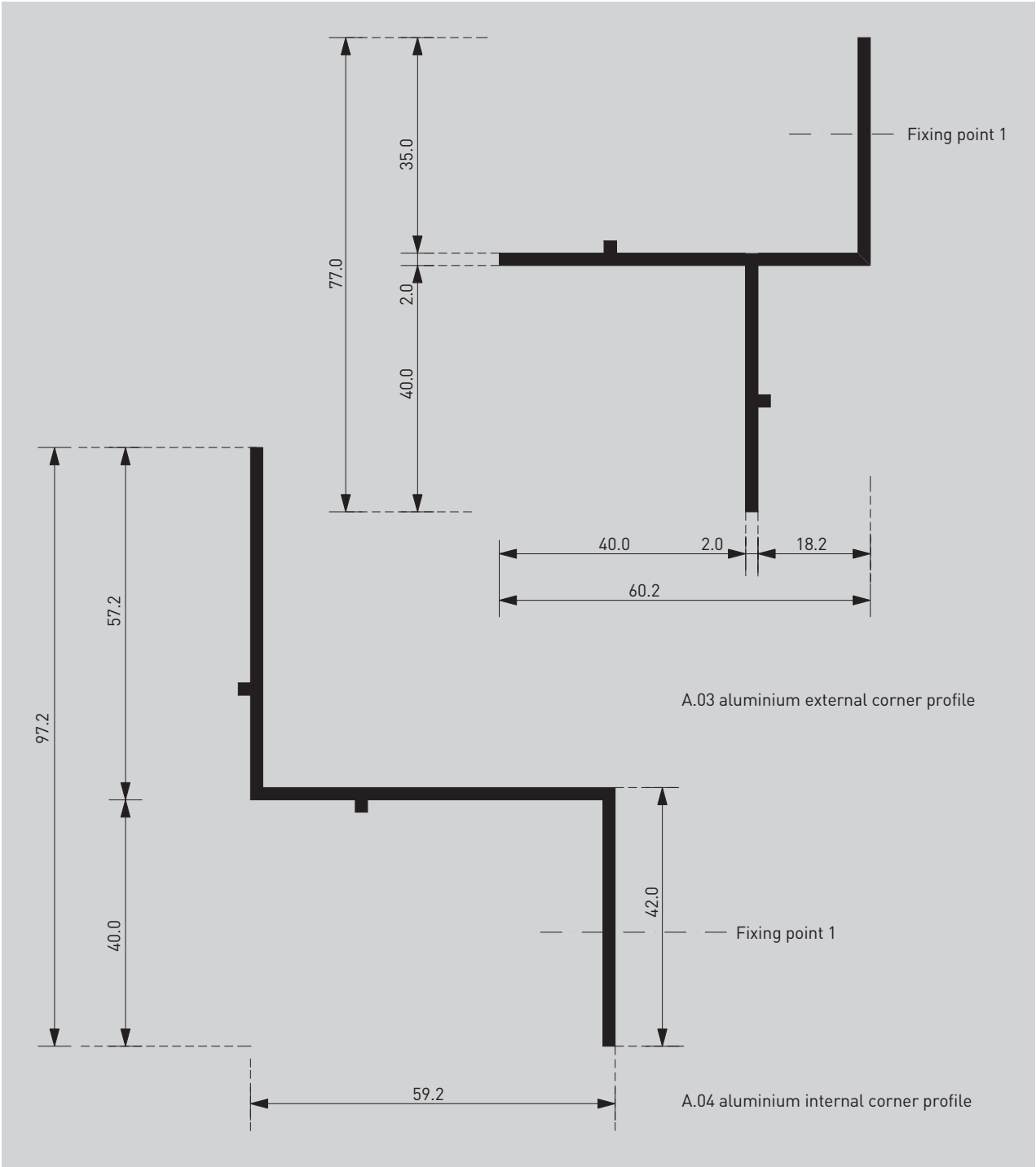
A.01 aluminium horizontal fixing rail



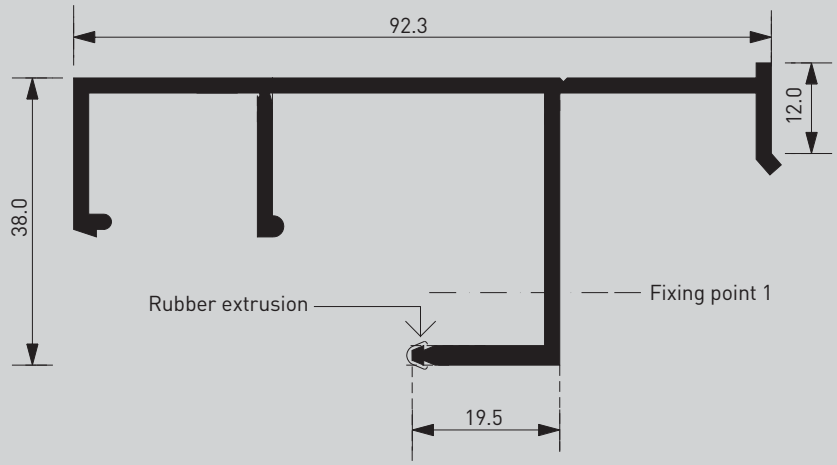
A.02 aluminium jointing strip

COMPONENTS:

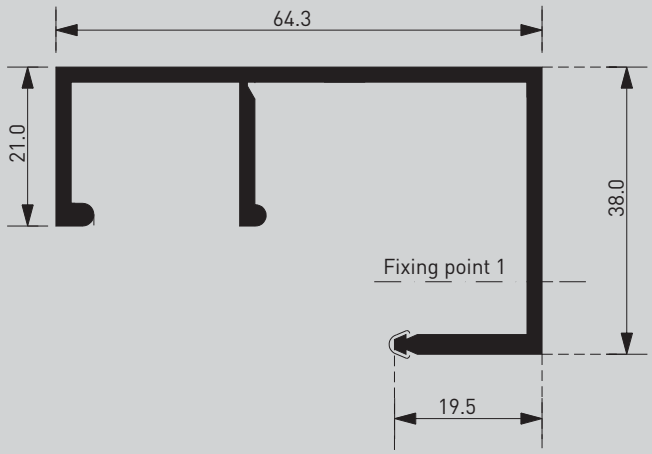
TERRAÇADE XP SYSTEM COMPONENTS



COMPONENTS:
TERRAÇADE XP SYSTEM COMPONENTS

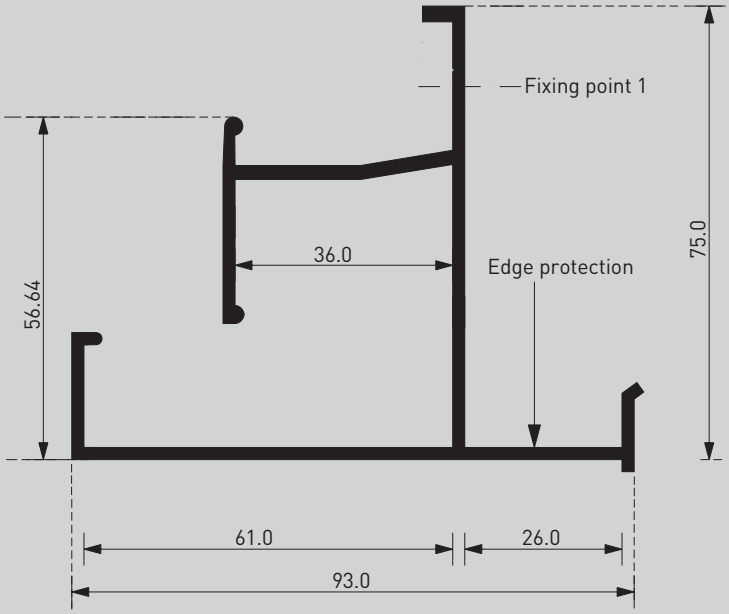


A.05 aluminium door/window surround profile

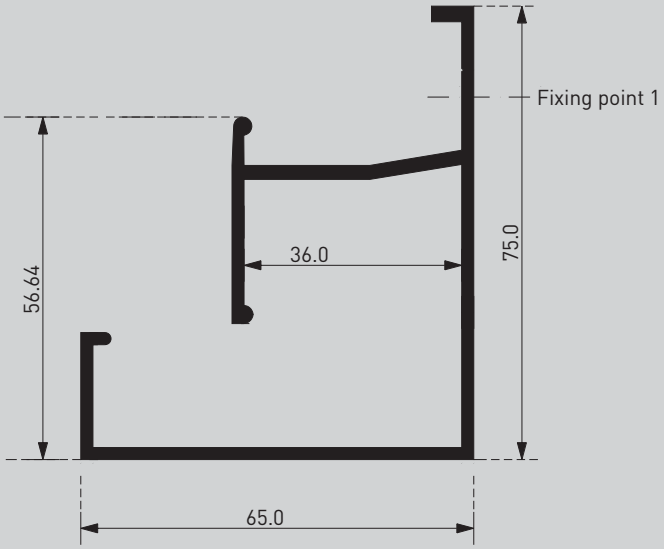


A.06 modified aluminium door/window surround profile

COMPONENTS:
TERRAÇADE XP SYSTEM COMPONENTS



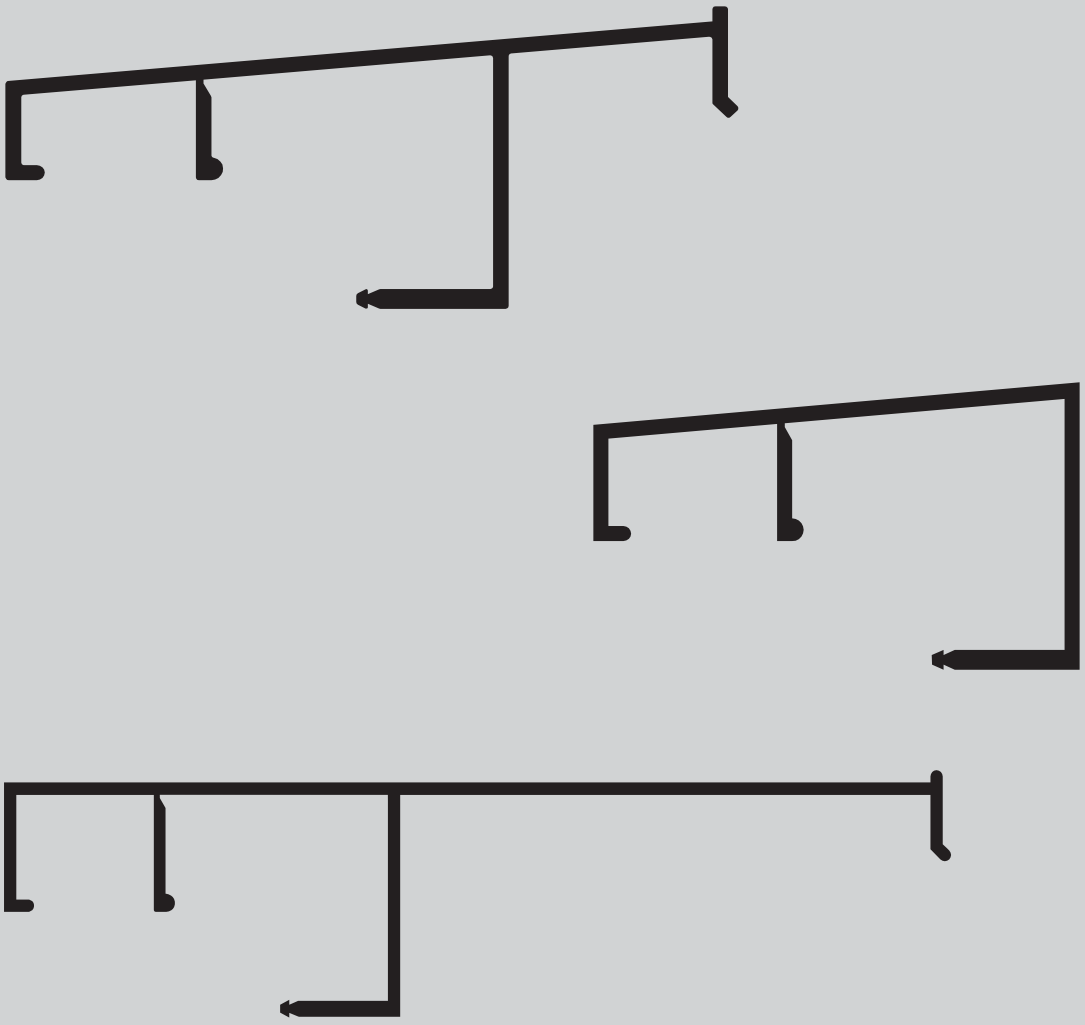
A.07 aluminium base surround profile



A.08 modified aluminium base surround profile

COMPONENTS:

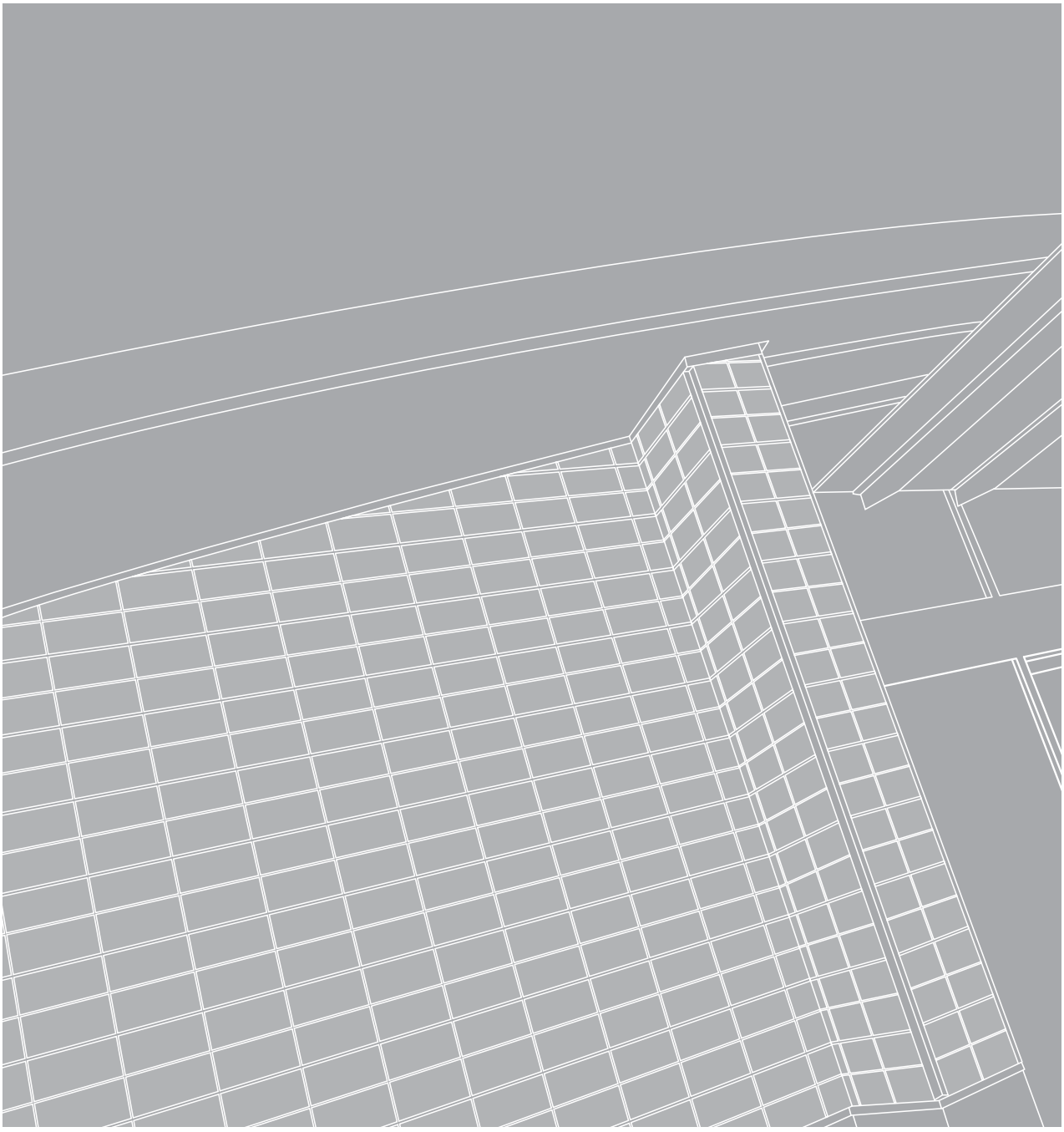
TERRAÇADE XP SYSTEM COMPONENTS - CUSTOMISED FOR SPECIFIC PROJECTS



HANDY HINT

• We can modify existing components or design new ones to suit larger projects.

TECHNICAL SPECIFICATIONS



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TECHNICAL SPECIFICATIONS:
MATERIALS SCHEDULE AND PROPERTIES

A list of the materials used in the Terraçade XP system is given below.

COMPONENT	MATERIAL
01. Tiles	Fired extruded clay tile
02. Horizontal Rail	Aluminium Grade 6063-T5 and are produced to Australian Standard AS 1866 (Aluminium and Aluminium Alloys – Extruded Rod, Bar, Solid and Hollow Shapes).
03. Visible Trims and Vertical Jointing Strip	All extrusions are aluminium Grade 6063-T5 and are produced to Australian Standard AS 1866 (Aluminium and Aluminium Alloys – Extruded Rod, Bar, Solid and Hollow Shapes). Trims are available in: • Mill finish, which is expected to have a design life in excess of twenty-five years for moderate environments (as defined in AS/NZS 2312) • Anodised finish in clear and black, which can have a design life in excess of forty years • Powder coated finish to AS 3715 in various colours, which can come with a guarantee of ten years
04. Waterproof Membrane	For framed systems a waterproof membrane is supplied as part of the system's tested performance. The membrane is a spunbonded polypropylene material that allows the egress of vapour from within the frame but restricts the ingress of rain and moisture.
05. Substructure	The system can be: • Directly fixed onto a timber frame, metal frame, masonry blockwork, masonry brickwork, pre-cast concrete panels and formed concrete panels. • Fixed to a secondary framing structure (vertical fixing rails) designed to transfer loads to the main structural frame. The suitability of the back up wall or railing system and the type of fixing should be confirmed with a structural engineer. The back wall is required to support the weight of the Terraçade XP system, which is approximately 50 kg/m^2.

TILE PROPERTIES

All testing is carried out in Austral Bricks' ISO 13006 (AS 4662) accredited laboratory to Australian Standards AS/NZS 4455 and AS/NZS 4456 and in independent NATA accredited laboratories.

Nominal Tile Dimensions	300 x 590mm
Mass	~9 kg
Cold Water Absorption	4-6 %
Modulus of Rupture (Longitudinal)	29.5 MPa
Modulus of Rupture (Transverse)	16.6 MPa
Breaking Load (Longitudinal)	>4.0 kN
Breaking Load (Transverse)	>3.0 kN
Coefficient of Thermal Expansion	5-10 x 10^{-6} /°C
Durability Class	Exposure
Impact Breaking Load	>85 J

PROPERTIES OF THE HORIZONTAL RAIL

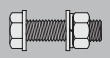
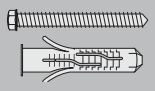
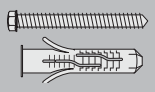
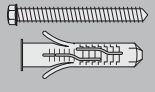
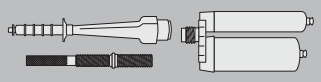
The standard properties of the extruded horizontal rail are given below.

Lengths (m)	COEFFICIENT OF THERMAL EXPANSION (/°C)	I_{XX} (mm^4)	I_{YY} (mm^4)	E (GPa)
3.6	2.34 x 10^{-5}	1.09 x 10^5	7.13 x 10^5	69

* Brickworks Building Products reserves the right to change specifications without notice – October 2015. Check www.terracade.com.au for updated results.

TECHNICAL SPECIFICATIONS:
FASTENERS

The fasteners specified below should be used in accordance with the allowable pressures of the system. Design documentation should accommodate the allowable pressures and fastener specifications for a particular project.

SUBSTRATE	PRIMARY ANCHOR	RECOMMENDED MINIMUM EMBEDMENT	FASTENER DIAGRAMS
TIMBER	2 options		
	01. #12 A4/70 screws Fastener in side grain	45mm into supporting timber	
	02. A4/70 Tek Screw Type M		
STEEL	2 options		
	01. M6 A4/70 bolts	Min. thickness of base plate 1mm	
	02. #14 A4/70 Tek screws		
PRECAST OR REINFORCED CONCRETE WALLS	3 Options		
	01. M8 A4/70 chemical bolts	Min. 60mm embedment depth	
	02. M6 A4/70 mechanical anchors.	Min. 55mm embedment depth	
	03. Load rated 60 mm long plastic plug anchors, with #12 A4/70 screws*	Min. 60mm embedment depth	
MASONRY			
Solid/Pressed brick	Load rated plastic plug anchors minimum 60 mm long with #12 A4/70 screws*	Min. 60mm embedment depth	
Concrete filled hollow block.	3 Options		
	01. M8 A4/70 chemical bolts	Min. 65mm embedment depth	
	02. M8 A4/70 mechanical bolts.	Min. 35mm embedment depth	
	03. Load rated plastic plug anchors minimum 60 mm long with #12 A4/70 screws*	Min. 60mm embedment depth	
Extruded hollow brick	M8 Chemical injection resin with mesh sleeves and 12 mm A4/70 threaded rods.	Min. 65mm embedment depth	

The above table is a guide to anchorage selection and does not alleviate the installers' responsibility to ensure the anchorage chosen is fit for purpose. Specifiers should review the maximum reaction section of the load span tables and review the design accordingly. If in doubt advice should be sought by the product design engineers.

All screws and bolts are to be manufactured to AS 1111 and AS 3566.

* Note: Refer to the load span table (allowable pressures) for reaction output.

A4/70 indicates that the material required is cold worked, austenitic stainless steel.

M6, M8, #12 and #14 indicate the gauge or fastener diameter required.

These descriptions should be confirmed with the fastener manufacturer.

TECHNICAL SPECIFICATIONS:
SYSTEM PERFORMANCE

THE TERRAÇADE XP SYSTEM IS ENVISAGED AS BEING A FACING LAYER OVER A BACK-UP WALL. THE OVERALL PERFORMANCE OF THE WALL IS THUS DEPENDENT NOT ONLY ON THE TILE BUT ALSO ON THE NATURE OF THE BACK-UP WALL.

Overall performance values have been provided for the system with typical light weight or solid masonry walls. It is recommended that these preliminary values be validated by the project Consultant Team.

SUPPLY STATEMENT

System and structural engineering advice has been received from Hyder Consulting (Australia) Pty Limited. Hyder also supervised the execution of the prototype testing.

STRUCTURAL ANALYSIS

The allowable pressures specified below should be used in accordance with the fastener table specifications. Design documentation should accommodate the allowable pressures and fastener specifications for a particular project. Terraçade XP system has been tested to an ultimate state wind pressure of 12.00 kPa, and passed the deflection criteria under serviceable limit state pressure of 6.30 kPa. Applications above this limit should be referred to Brickworks Building Products.

The tiles must be captured and supported by one of the purpose designed aluminium extrusions which are supplied by Brickworks Building Products as part of the system. The spanning capacity of these extrusions is shown on the following graph. The maximum distance between supports may also be derived from first principles using the section properties listed in the Technical Specifications section. Deflections should be limited to 3 mm for self weight and to span 290 under serviceability wind loads.

Extrusions may be directly fixed to the back-up wall; however the suitability of this wall to accept loads and the types of fixings should be confirmed with the project Structural Engineer. Alternatively, extrusions may be fixed to a secondary framing structure designed to transfer loads to the main structural frame. It is recommended that all proposals be reviewed by the project Structural Engineer. The spanning capacity of the extrusions is shown in the charts on pages 23-34.

WEATHER TESTING

The Terraçade XP tile is part of a rain screen system where the tile is the first line of defence against water penetration and must be used in conjunction with an air tight back up wall. Small quantities of water will pass the first line of defence (as seen in the prototype testing) and the system must be detailed to allow effective drainage of the cavity.

The system has been successfully tested in accordance with AS4284 for static and dynamic penetration up to a design wind pressure of 2.2 kPa.

It is recognised that each application will be different to that tested, however equivalent resistance to water penetration can be expected provided the overall system complies with the following:

- Tile system installed in accordance with design details using only approved extrusions.
- Back-up wall with an air-infiltration rate of less than 1.0 L/m^2/s at 300 Pa.
- Back-up wall is structurally adequate to withstand design wind pressure.
- Cavity between back of tile and back-up wall is not less than 50 mm.
- A vertical flashing is provided at all external corners to prevent air flowing to adjacent cavities.
- A horizontal flashing is installed at 2 storey intervals (max 8m) to drain accumulated water to the outside

CYCLONE TESTING

It is important to note in the context of cyclone testing that Terraçade XP will only be subjected to external wind pressure as the system is constructed on the outer wall surface of buildings and the supporting wall should be designed to support any internal pressure applied.

A test panel of Terraçade XP was subjected to a test program of cyclic simulated wind load strength testing at Ian Bennie & Associates Pty. Ltd. in accordance with AS4040.3 (Methods of Testing Sheet Roof and Wall Cladding, Method 3: Resistance to Wind Pressures for Cyclone Regions). The test panel successfully supported the test loads and was sufficient to support and equivalent Strength Limit State design wind suction pressure of 9.20kPa applied to the walls of buildings that are located in cyclonic areas.

EARTHQUAKE PERFORMANCE – AUS

Statement supplied by Connell Wagner and updated by CPC (September 2015).

The Terracade XP system has been checked for compliance with AS 1170.4–2007: Minimum Design Loads on Structures (known as the SAA Loading Code) – Earthquake loads.

From analysis of AS 1170.4–2007 the derived acceleration imparts load which is less than 50% of the cladding self weight. When such loads are compared to the systems allowable wind pressures it is evident that wind load is by far the dominating load case.

As the Terracade XP system develops small forces from the action of inertia during seismic events, the horizontal directions of movement are accommodated by the inherent strength of the system. No further action is therefore necessary to resist such movements, and the system is acceptable to AS/NZS 1664.2–2007: Aluminium Structures – Part 2: Allowable Stress Design.

Movement however in a true vertical direction does require restraint against the tiles lifting directly off the rail system under such an action.

We therefore confirm that for installation in Australia, the Terracade XP system requires an anti–lift screw to be installed along its top edge, as shown on Page 53, to ensure the tiles under the action of true vertical seismic events, are unable to lift and thus detach from their supporting rail.

If this precaution is undertaken, the system is suitable for installation against Earthquakes in Australia. However, this precaution does not alleviate any additional requirements that may exist for installation against wind load.

EARTHQUAKE PERFORMANCE – NZ

Statement supplied by Connell Wagner and updated by CPC (September 2015).

The Terraçade XP system has been checked for compliance with NZS 1170.5-2004: Structural design actions - Earthquake actions in New Zealand

TECHNICAL SPECIFICATIONS:
SYSTEM PERFORMANCE

for buildings of importance level 2 and a design life of 50 years in accordance with AS/NZS 1170.0-2002 Structural Design Actions.

From analysis of NZS 1170.5, Terraçade XP tiles may be used for buildings with any site with a hazard factor Z less than or equal to 0.6, for any subsoil class, when supported on suspension rails fixed to the structure with single or double span configurations 3 to 5. Note. Single and double span configurations 1 and 2 are not recommended for use without further engineering advice.

Contact Brickworks Building Products for further engineering advice for buildings that are outside the above criteria.

The Terraçade XP system develops forces on the support rails from the action of inertia during seismic events which are less than or equal to the maximum ultimate wind pressure for each support rail fastener span configuration stated above. The horizontal directions of movement are accommodated by the inherent strength of the system. No further action is therefore necessary to resist such movements.

Movement in a true vertical direction requires restraint against the tiles lifting directly off the rail system under such an action. For installation in New Zealand, the Terraçade XP system requires mechanical fixing or trim installed along its top edge to ensure tiles are unable to detach from their supporting rail under the action of vertical seismic events.

When the anti-lift block or trim is installed, the system is suitable for installation against earthquakes in New Zealand. This precaution does not alleviate the system's requirements for installation against wind load.

Aluminium Horizontal Rail Span (mm)	900
Type of Test	Cyclic
Comments	**Pass.** Supported cyclic load sequence. Equivalent Strength design pressure 5.77 kPa. Test described in Report No. TS605

ACOUSTIC PERFORMANCE

The acoustic performances for particular wall constructions have been calculated by professional engineers from Hyder Consulting (Australia) Pty Ltd. The table below lists the weighted sound reduction value (R_w) for the wall constructions.

Back Up Wall	Acoustic Performance (R_w)
Lapped and taped sarking on timber stud wall with 50 mm insulation and 12 mm internal gyprock	41
Lightweight comprising 1.0 mm zincanneal sheet externally on 100 mm deep metal stud with 50 mm insulation on 6 mm internal gyprock sheet	44
110 mm thick solid masonry blockwork with 12 mm internal render	47
190 mm thick hollow concrete blockwork with 12 mm internal render	47

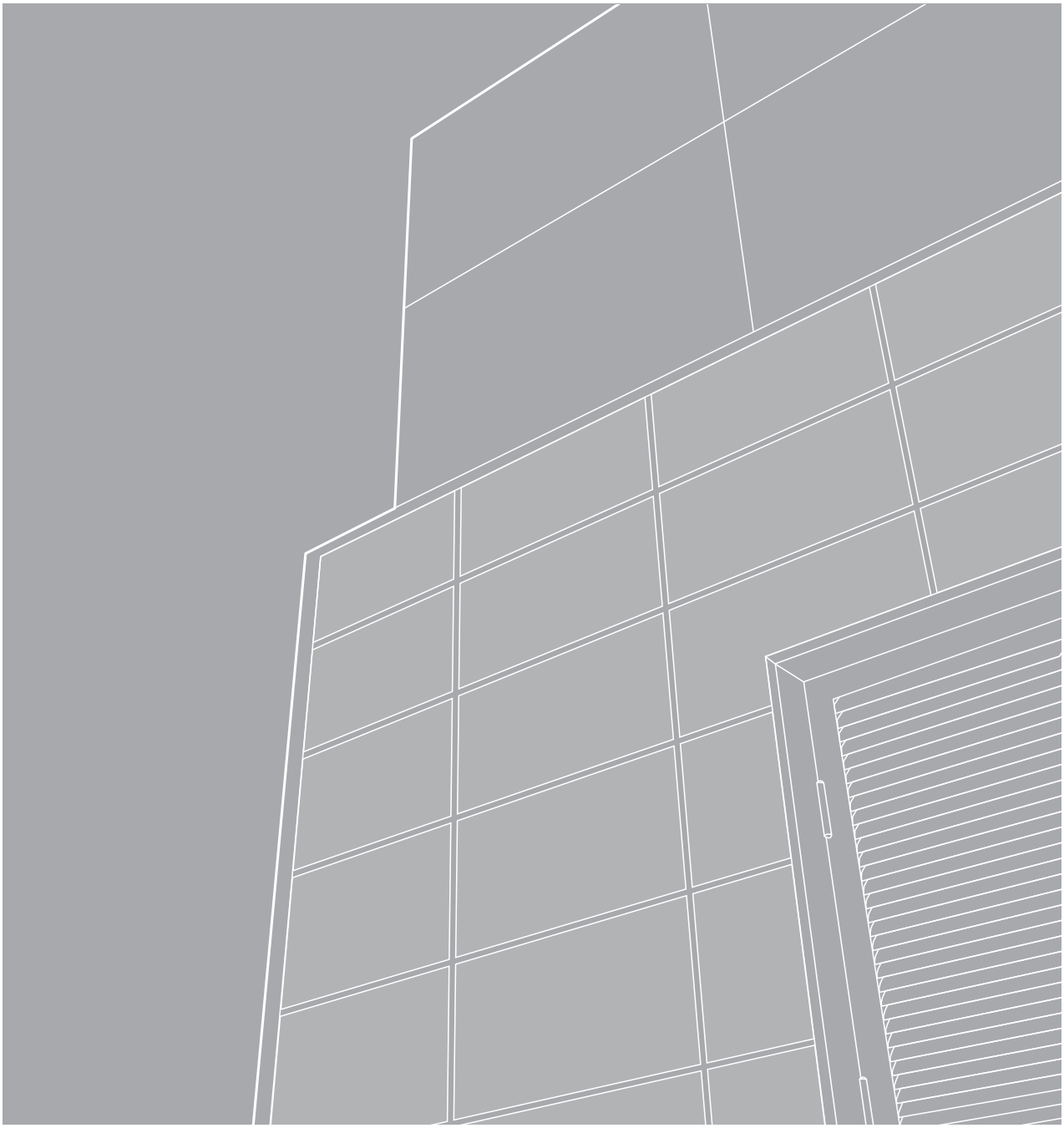
THERMAL RESISTANCE

The thermal resistance (R-value) values for particular wall constructions have been calculated by professional engineers from Hyder Consulting (Australia) Pty Ltd. The table below lists the R-value for the wall constructions.

Back Up Wall	Overall U-Value ($W/m^2.K$)	Overall R-Value (m^2K/W)
Lapped and taped sarking on timber stud wall with 50 mm insulation and 12 mm internal gyprock	0.55	1.81
Lightweight comprising 1.0 mm zincanneal sheet externally on 100 mm deep metal stud with 50 mm insulation on 6 mm internal gyprock sheet	0.55	1.81
110 mm thick solid masonry blockwork with 12 mm internal render	2.05	0.49
190 mm thick hollow concrete blockwork with 12 mm internal render	1.73	0.58

TECHNICAL SPECIFICATIONS:

SYSTEM PERFORMANCE FOR WIND LOADS AUSTRALIA



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TECHNICAL SPECIFICATIONS:
SYSTEM PERFORMANCE FOR WIND LOADS AUSTRALIA

DETERMINING SPAN CONFIGURATIONS USING THE STRUCTURAL DESIGN CODE

The following wind load requirements on Terraçade XP only apply to buildings that comply with Australian Standard AS/NZS 1170.2 (Structural design actions, Part 2: Wind actions). The applicability of AS/NZS 1170.2 and subsequent compliance of individual projects should be verified.

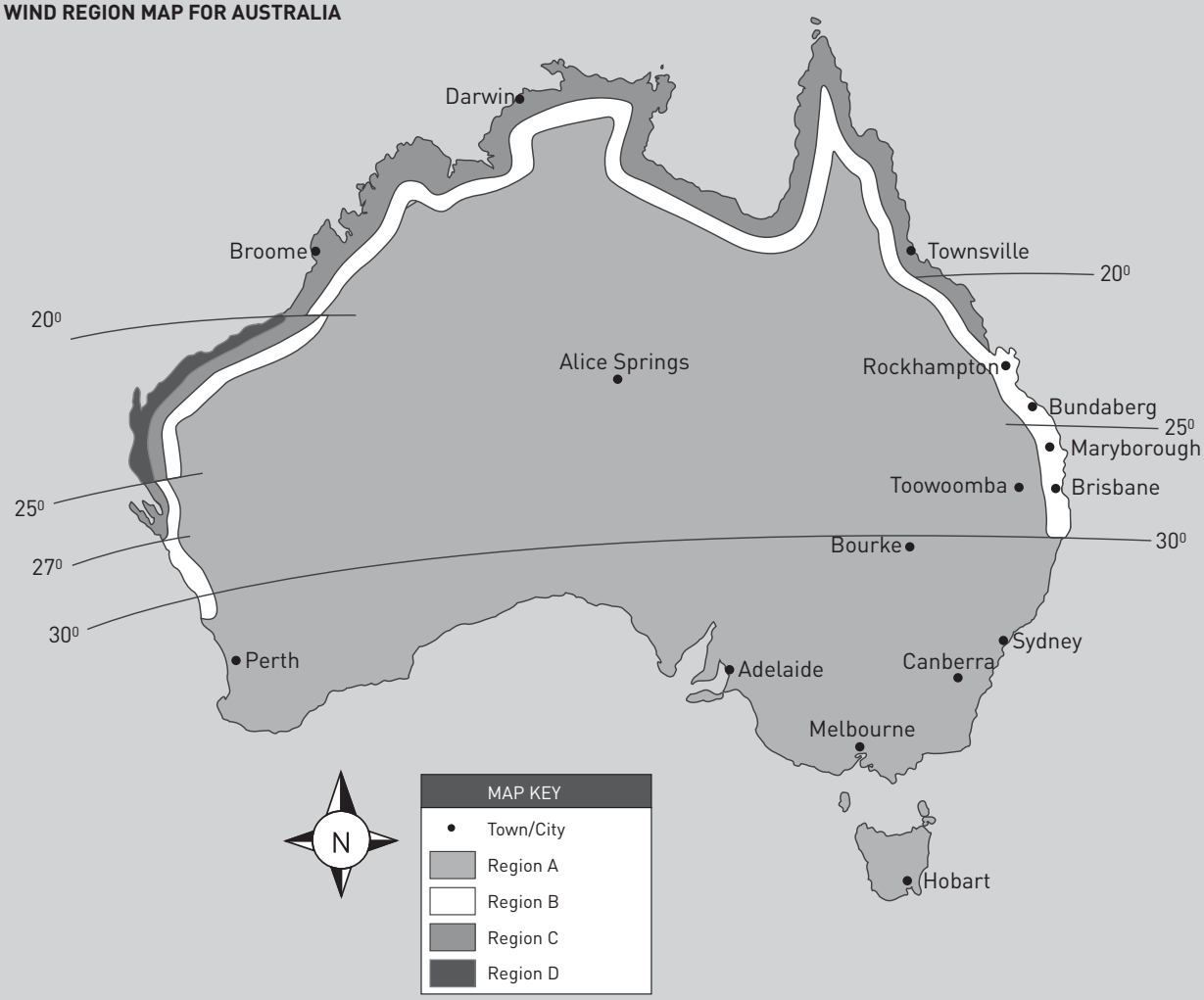
AS/NZS 1170.2 identifies four main wind regions pertinent to Australia as shown in the map below.

Leading engineers at CPC have considered the wind pressure requirements for Terraçade XP and have derived the following procedure for determining the minimum span configurations required for buildings complying with AS1170.2.

Note: Shielding was not considered in the analysis.

Note: Topography can affect wind pressure if a building is located high on a steep slope or escarpment. Brickworks Building Products should be contacted in such circumstances.

WIND REGION MAP FOR AUSTRALIA



TECHNICAL SPECIFICATIONS:
SYSTEM PERFORMANCE FOR WIND LOADS AUSTRALIA

STEP 1: WIND REGION

Identify the wind region that the project is located in. If the wind region has not been specified, it should be determined in accordance with AS/NZS 1170.2. The map on page 22 indicates the wind regions for Australia. It is important to note that regions C and D are affected by cyclones and Terraçade XP installed in these regions has an additional installation requirement (refer to Page 22).

STEP 2: HEIGHT

Determine the height above ground level to which the Terraçade XP will be installed. AS/NZS 1170.2 outlines the method of determining reference heights. The wind pressure requirements have been categorised by specific limiting heights. Always select the limiting height that is larger or equal to the project installation height.

STEP 3: TERRAIN CATEGORY

Identify the terrain category for the project. The terrain will affect the wind flow that a project is subjected to. The four terrain categories defined in AS/NZS 1170.2 are:

- **Category 1:** Very few or no obstructions and an exposed open terrain.
- **Category 1.5:** Open water surfaces subjected to shoaling waves, e.g. near-shore ocean water; large unenclosed bays on seas and oceans; lakes; and enclosed bays extending greater than 10 km in the wind direction.
- **Category 2:** Limited and well-spread obstructions in an open terrain. Typical terrains include grasslands and water surfaces.
- **Category 2.5:** Terrain with a few trees or isolated obstructions, typical of developing outer urban areas with scattered houses, or large acreage developments with fewer than ten buildings per hectare.
- **Category 3:** Numerous low (3-5 m) obstructions that are closely spaced. A typical terrain is a suburban housing estate.
- **Category 4:** High number of large and tall (10-30 m) obstructions that are closely spaced. A typical terrain is a large city centre.

Note: The terrain category should be determined in accordance with AS/NZS 1170.2 and obstructions should have permanence during a wind event.

STEP 4: WIND PRESSURE

A wind pressure table (Table A1 on page X) has been provided as a reference. The wind pressure for an individual project can be determined from the table using the information determined in the preceding steps.

Example:

A typical project in a suburban area of Brisbane (i.e. Terrain Category 3, Region B) installed to a height of 4m. For this case using the limiting height of 5m, the wind pressure for Terraçade XP is 1.63 kPa (using Table A1 on page X).

STEP 5: CORNER WIND PRESSURE

The corners of tall, slender buildings experience higher wind pressures than the rest of the building. When Terraçade XP is installed in this corner region, a different support rail span configuration may be required.

To determine the span configuration requirement, calculate the aspect ratio (r) of the building by dividing its average roof height (h) by its smallest plan dimension (b or d). If the aspect ratio is less than or equal to 1, no additional requirements are necessary for Terraçade XP being installed the corner of a building. (Note: AS/NZS 1170.2-2011 has equalised the worst-case magnitudes of positive and negative wind pressure coefficients and factors for permeable cladding on buildings with an aspect ratio of less than or equal to 1).

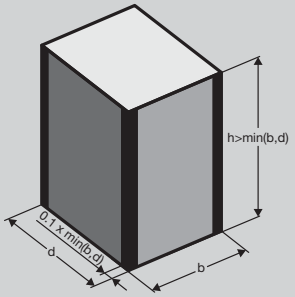
If the aspect ratio is greater than 1, then check whether any Terraçade XP is being installed on the building corners. The length of the corner region requiring additional support is one-tenth of the shortest plan dimension (refer to below diagram).

Example:

AA six storey building has plan dimensions of 32 metres and 16 metres, and has an average roof height of 24 metres. The aspect ratio found by dividing the height of 24 m by the smallest plan dimension i.e., 16 m, which equals 1.5. Since the aspect ratio is greater than 1, additional fixings for the Terraçade XP support rails are required at the corners of the building due to the increased wind load.

The distance from the corners of the building requiring additional fixings for the Terraçade XP support rails is one-tenth of the shortest plan dimension, which in this example is 0.1 x 16 = 1.6 metres.

When Terraçade XP is installed in this a corner region, a different span



configuration may be required. A wind pressure table (Table A2 on Page X) has been provided as a reference for the wind pressure at the building corners.

Example:

A medium-rise project in an inner urban area of Brisbane (i.e. Terrain Category 3, Region B) is installed to a height of 24 m, with an aspect ratio of greater than one. The wind pressure for general areas of Terraçade XP to a limiting height of 30 m is 2.37 kPa (using Table A1 on page X), and the wind pressure on at the corners is 3.38 kPa (using Table A2 on page X).

Example:

A typical project has been determined to be:

- in the B region,
- in an areas classified as Terrain Category 3,
- installed at a height of 24 m, and
- an aspect ratio of greater than 1.

According to Table A3 and A4 the required span is Span 3 for general areas and Span 4 at the corners. It should be noted that these spans are based on two different configurations.

It may be worthwhile for the project to specify the higher rated Span 4 for the entire project to simplify installation. .

TECHNICAL SPECIFICATIONS:
SYSTEM PERFORMANCE FOR WIND LOADS AUSTRALIA

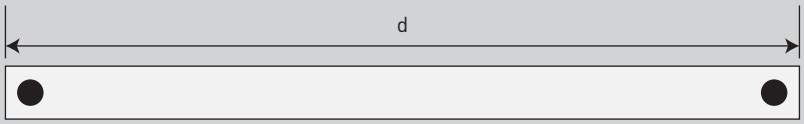
ULTIMATE WIND PRESSURES

The ultimate wind pressure tables have been characterised by a particular span configuration. The pressures listed refer to the span configuration above it.

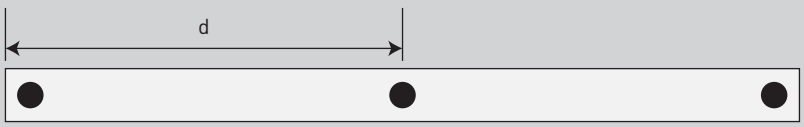
Note: The ultimate wind pressures specified in the span configuration tables below should be used in accordance with the fastener table specifications given on Page 17. Design documentation should accommodate the allowable pressures and fastener specifications for a particular project.

ULTIMATE WIND PRESSURES FOR SUSPENSION RAIL

	SPAN CONFIGURATION				
	1	2	3	4	5
	MAXIMUM SPAN (mm)				
	1800	1500	1200	900	600
	ULTIMATE WIND PRESSURE (kPa)				
SINGLE SPAN	0.6	1.2	3	5.3	12
DOUBLE SPAN	1.3	1.9	3	5.3	12



Single Span



Double Span

TECHNICAL SPECIFICATIONS:
SYSTEM PERFORMANCE FOR WIND LOADS AUSTRALIA

TABLE A1: General Wind Pressure

Wind Region	Limiting Height (m)	Terrain Category 1	Terrain Category 2	Terrain Category 3	Terrain Category 4
A	5	1.65	1.24	1.03	0.84
	10	1.88	1.50	1.03	0.84
	20	2.12	1.75	1.32	0.84
	40	2.30	2.01	1.62	1.08
	50	2.34	2.08	1.71	1.21
	75	2.41	2.23	1.88	1.44
	100	2.49	2.30	2.01	1.59
B	5	2.61	1.96	1.63	1.33
	10	2.97	2.37	1.63	1.33
	20	3.35	2.76	2.09	1.33
	40	3.64	3.19	2.56	1.71
	50	3.70	3.30	2.71	1.92
	75	3.82	3.53	2.97	2.27
	100	3.94	3.64	3.19	2.51
C	5	3.93	2.95	2.46	2.01
	10	4.48	3.57	2.46	2.01
	20	5.05	4.16	3.15	2.01
	40	5.49	4.80	3.86	2.58
	50	5.57	4.97	4.08	2.89
	75	5.75	5.31	4.48	3.43
	100	5.94	5.49	4.80	3.78
D	5	6.27	4.71	3.92	3.20
	10	7.14	5.69	3.92	3.20
	20	8.06	6.64	5.03	3.20
	40	8.75	7.66	6.15	4.11
	50	8.89	7.92	6.51	4.61
	75	9.18	8.47	7.14	5.46
	100	9.47	8.75	7.66	6.04

TABLE A2: Wind Pressure for Tall Building Corners (Aspect Ratio >1)

Wind Region	Limiting Height (m)	Terrain Category 1	Terrain Category 2	Terrain Category 3	Terrain Category 4
A	10	2.68	2.14	1.47	1.20
	15	2.87	2.35	1.69	1.20
	20	3.02	2.49	1.89	1.20
	40	3.28	2.87	2.31	1.54
	50	3.34	2.97	2.45	1.73
	75	3.44	3.18	2.68	2.05
	100	3.55	3.28	2.87	2.27
B	10	4.24	3.38	2.40	1.90
	15	4.55	3.73	2.68	1.90
	20	4.79	3.94	2.99	1.90
	40	5.20	4.55	3.66	2.44
	50	5.28	4.71	3.87	2.74
	75	5.45	5.03	4.24	3.25
	100	5.62	5.20	4.55	3.59
C	10	6.39	4.71	3.51	2.86
	15	6.85	5.61	4.03	2.86
	20	7.21	5.94	4.50	2.86
	40	7.83	6.85	5.51	3.68
	50	7.95	7.09	5.83	4.12
	75	8.21	7.58	6.39	4.89
	100	8.47	7.83	6.85	5.40
D	10	10.18	8.12	5.59	4.57
	15	10.92	8.95	6.43	4.57
	20	11.50	9.47	7.17	4.57
	40	12.48	10.92	8.78	5.87
	50	12.69	11.30	9.30	6.58
	75	13.09	12.08	10.18	7.80
	100	13.51	12.48	10.92	8.61

TECHNICAL SPECIFICATIONS:

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SINGLE SPAN:

TABLE A3: General Installation

Wind Region	Limiting Height (m)	Terrain Category 1	Terrain Category 2	Terrain Category 3	Terrain Category 4
A	5	Span 3	Span 3	Span 2	Span 2
	10	Span 3	Span 3	Span 2	Span 2
	20	Span 3	Span 3	Span 3	Span 2
	40	Span 3	Span 3	Span 3	Span 2
	50	Span 3	Span 3	Span 3	Span 3
	75	Span 3	Span 3	Span 3	Span 3
	100	Span 3	Span 3	Span 3	Span 3
B	5	Span 3	Span 3	Span 3	Span 3
	10	Span 3	Span 3	Span 3	Span 3
	20	Span 4	Span 3	Span 3	Span 3
	40	Span 4	Span 4	Span 3	Span 3
	50	Span 4	Span 4	Span 3	Span 3
	75	Span 4	Span 4	Span 3	Span 3
	100	Span 4	Span 4	Span 4	Span 3
C	5	Span 4	Span 3	Span 3	Span 3
	10	Span 4	Span 4	Span 3	Span 3
	20	Span 4	Span 4	Span 4	Span 3
	40	Span 5	Span 4	Span 4	Span 3
	50	Span 5	Span 4	Span 4	Span 3
	75	Span 5	Span 5	Span 4	Span 4
	100	Span 5	Span 5	Span 4	Span 4
D	5	Span 5	Span 4	Span 4	Span 4
	10	Span 5	Span 5	Span 4	Span 4
	20	Span 5	Span 5	Span 4	Span 4
	40	Span 5	Span 5	Span 5	Span 4
	50	Span 5	Span 5	Span 5	Span 4
	75	Span 5	Span 5	Span 5	Span 5
	100	Span 5	Span 5	Span 5	Span 5

TABLE A4: Corner Installation for Tall Buildings (Aspect Ratio >1)

Wind Region	Limiting Height (m)	Terrain Category 1	Terrain Category 2	Terrain Category 3	Terrain Category 4
A	10	Span 3	Span 3	Span 3	Span 3
	15	Span 3	Span 3	Span 3	Span 3
	20	Span 4	Span 3	Span 3	Span 3
	40	Span 4	Span 3	Span 3	Span 3
	50	Span 4	Span 3	Span 3	Span 3
	75	Span 4	Span 4	Span 3	Span 3
	100	Span 4	Span 4	Span 3	Span 3
B	10	Span 4	Span 4	Span 3	Span 3
	15	Span 4	Span 4	Span 3	Span 3
	20	Span 4	Span 4	Span 3	Span 3
	40	Span 4	Span 4	Span 4	Span 3
	50	Span 4	Span 4	Span 4	Span 3
	75	Span 5	Span 4	Span 4	Span 4
	100	Span 5	Span 4	Span 4	Span 4
C	10	Span 5	Span 4	Span 4	Span 3
	15	Span 5	Span 5	Span 4	Span 3
	20	Span 5	Span 5	Span 4	Span 3
	40	Span 5	Span 5	Span 5	Span 4
	50	Span 5	Span 5	Span 5	Span 4
	75	Span 5	Span 5	Span 5	Span 4
	100	Span 5	Span 5	Span 5	Span 5
D	10	Span 5	Span 5	Span 5	Span 4
	15	Span 5	Span 5	Span 5	Span 4
	20	Span 5	Span 5	Span 5	Span 4
	40	N/A	Span 5	Span 5	Span 5
	50	N/A	Span 5	Span 5	Span 5
	75	N/A	N/A	Span 5	Span 5
	100	N/A	N/A	Span 5	Span 5

*N/A equals Not Available

TECHNICAL SPECIFICATIONS:
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DOUBLE SPAN:
TABLE A5: General Installation

Wind Region	Limiting Height (m)	Terrain Category 1	Terrain Category 2	Terrain Category 3	Terrain Category 4
A	5	Span 2	Span 1	Span 1	Span 1
	10	Span 2	Span 2	Span 1	Span 1
	20	Span 3	Span 2	Span 1	Span 1
	40	Span 3	Span 3	Span 2	Span 1
	50	Span 3	Span 3	Span 2	Span 1
	75	Span 3	Span 3	Span 2	Span 2
	100	Span 3	Span 3	Span 3	Span 2
B	5	Span 3	Span 3	Span 2	Span 2
	10	Span 3	Span 3	Span 2	Span 2
	20	Span 3	Span 3	Span 2	Span 2
	40	Span 3	Span 4	Span 3	Span 2
	50	Span 4	Span 4	Span 3	Span 3
	75	Span 4	Span 4	Span 3	Span 3
	100	Span 4	Span 4	Span 4	Span 3
C	5	Span 4	Span 3	Span 3	Span 3
	10	Span 4	Span 4	Span 3	Span 3
	20	Span 4	Span 4	Span 4	Span 3
	40	Span 5	Span 4	Span 4	Span 3
	50	Span 5	Span 4	Span 4	Span 3
	75	Span 5	Span 5	Span 4	Span 4
	100	Span 5	Span 5	Span 4	Span 4
D	5	Span 5	Span 4	Span 4	Span 4
	10	Span 5	Span 5	Span 4	Span 4
	20	Span 5	Span 5	Span 4	Span 4
	40	Span 5	Span 5	Span 5	Span 4
	50	Span 5	Span 5	Span 5	Span 4
	75	Span 5	Span 5	Span 5	Span 5
	100	Span 5	Span 5	Span 5	Span 5

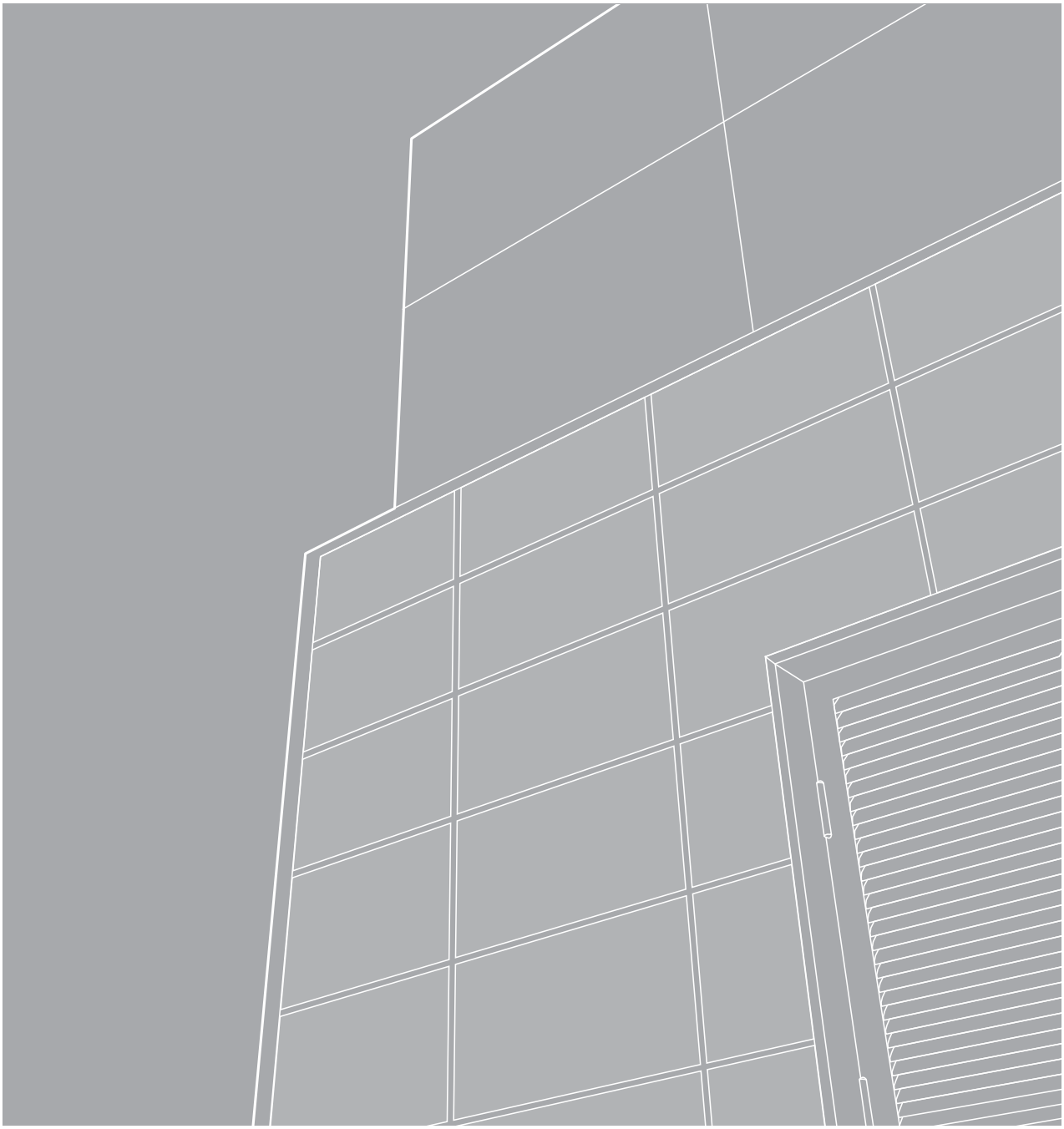
TABLE A6: Corner Installation for Tall Buildings (Aspect Ratio >1)

Wind Region	Limiting Height (m)	Terrain Category 1	Terrain Category 2	Terrain Category 3	Terrain Category 4
A	10	Span 3	Span 3	Span 2	Span 1
	15	Span 3	Span 3	Span 2	Span 1
	20	Span 4	Span 3	Span 2	Span 1
	40	Span 4	Span 3	Span 3	Span 2
	50	Span 4	Span 3	Span 3	Span 2
	75	Span 4	Span 4	Span 3	Span 3
	100	Span 4	Span 4	Span 3	Span 3
B	10	Span 4	Span 4	Span 3	Span 3
	15	Span 4	Span 4	Span 3	Span 3
	20	Span 4	Span 4	Span 3	Span 3
	40	Span 4	Span 4	Span 4	Span 3
	50	Span 4	Span 4	Span 4	Span 3
	75	Span 5	Span 4	Span 4	Span 4
	100	Span 5	Span 4	Span 4	Span 4
C	10	Span 5	Span 4	Span 4	Span 3
	15	Span 5	Span 5	Span 4	Span 3
	20	Span 5	Span 5	Span 4	Span 3
	40	Span 5	Span 5	Span 5	Span 4
	50	Span 5	Span 5	Span 5	Span 4
	75	Span 5	Span 5	Span 5	Span 4
	100	Span 5	Span 5	Span 5	Span 5
D	10	Span 5	Span 5	Span 5	Span 4
	15	Span 5	Span 5	Span 5	Span 4
	20	Span 5	Span 5	Span 5	Span 4
	40	N/A	Span 5	Span 5	Span 5
	50	N/A	Span 5	Span 5	Span 5
	75	N/A	N/A	Span 5	Span 5
	100	N/A	N/A	Span 5	Span 5

*N/A equals Not Available

TECHNICAL SPECIFICATIONS:

SYSTEM PERFORMANCE FOR WIND LOADS NEW ZEALAND



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TECHNICAL SPECIFICATIONS:
SYSTEM PERFORMANCE FOR WIND LOADS NEW ZEALAND

DETERMINING SPAN CONFIGURATION FOR WIND LOAD REQUIREMENTS

The following wind load requirements on Terraçade XP only apply to buildings that comply with New Zealand Standard AS/NZS 1170.2 (Structural design actions, Part 2: Wind actions). The applicability of AS/NZS 1170.2 and subsequent compliance of individual projects should be verified.

AS/NZS 1170.2 identifies three wind regions pertinent to New Zealand as shown in the map. In addition, some projects will require a multiplying factor to be taken into consideration when located in an area affected by the Lee Multiplier (as shown in the map).

Two methods of determining the span configuration are available, depending on the information available on a particular project.
Please apply the following checklist to each project to determine which method to use:

	Yes	No
Is the wind region known?	○	○
Is the terrain category known?	○	○
Is the height of the installation known?	○	○
The project is not affected by a Lee Multiplier?	○	○

(This information should be determined in accordance with AS/NZS 1170.2)

If **all** of these answers were "Yes" then please use the tables provided on pages 41 and 42 (Specialised Engineering Method) to quickly determine the span configuration. If **any** of these answers were "No" then please use the following Step-By-Step Method. It is especially important that any projects located in an area affected by the Lee Multiplier use the Step-By-Step Method.

Note: Shielding was not considered in the analysis.

Note: Topography can affect wind pressure if a building is located high on a steep slope or escarpment. Austral Façades should be contacted in such circumstances.

STEP-BY-STEP METHOD

Leading engineers at CPC have considered the wind pressure requirements for Terraçade XP and have derived the following procedure for determining the minimum span configurations required.

STEP 1: WIND REGION

Identify the wind region that the project is located in. If the wind region has not been specified, it should be determined in accordance with AS/NZS 1170.2. Please note whether the particular project falls into an area affected by a Lee Multiplier.

STEP 2: HEIGHT

Determine the height the Terraçade XP will be installed to above the ground level. AS/NZS 1170.2 outlines the method of determining reference heights.

WIND REGION MAP FOR NEW ZEALAND

TECHNICAL SPECIFICATIONS:
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STEP 3: TERRAIN CATEGORY

Identify the terrain category for the project. The terrain affects the wind flows that a project is subjected too. The four terrain categories defined in AS/NZS 1170.2 are:

- **Category 1:** Very few or no obstructions and an exposed open terrain.
- **Category 1.5:** Open water surfaces subjected to shoaling waves, e.g. near-shore ocean water; large unenclosed bays on seas and oceans; lakes; and enclosed bays extending greater than 10 km in the wind direction.
- **Category 2:** Limited and well-spread obstructions in an open terrain. Typical terrains include grasslands and water surfaces.
- **Category 2.5:** Terrain with a few trees or isolated obstructions, typical of developing outer urban areas with scattered houses, or large acreage developments with fewer than ten buildings per hectare.
- **Category 3:** Numerous low (3-5 m) obstructions that are closely spaced. A typical terrain is a suburban housing estate.
- **Category 4:** High number of large and tall (10-30 m) obstructions that are closely spaced. A typical terrain is a large city centre.

Note: The terrain category should be determined in accordance with AS/NZS 1170.2 and obstructions should have permanence during a wind event.

STEP 4: WIND PRESSURE

Use the wind pressure table (refer to Table B1 on page 32) to determine the wind pressure for the individual characteristics determined. Always select the limiting height that is larger or equal to the project installation height.

Example:

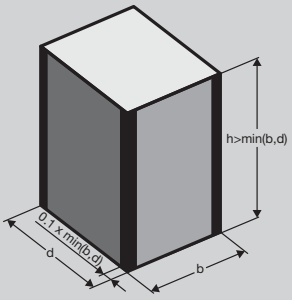
A typical project in a suburban area (Terrain Category 3) in Wellington is in the W region. If the project is installed to a height of 4 m, the 5 m limiting height column should be used. The ultimate wind pressure for Terraçade XP in this case is 1.08 kPa (using Table B1 on page 32).

STEP 5: CORNER WIND PRESSURE

The corners of tall, slender buildings experience higher wind pressures than the rest of the building. When Terraçade XP is installed in a corner region of a building, a different support rail span configuration may be required.

To determine the span configuration requirement, calculate the aspect ratio (r) of the building by dividing its average roof height (h) by its smallest plan dimension (b or d).

If the aspect ratio is less than or equal to 1, the span configuration determined in Step 4 is applicable at the building corners. (Note: AS/NZS 1170.2-2011 has equalised the worst-case magnitudes of positive and negative wind pressure coefficients and factors for permeable cladding on buildings with an aspect ratio of less than or equal to 1).



If the aspect ratio is greater than 1, then check whether any Terraçade XP is being installed on the building corners. Refer to Table A2 for the relevant ultimate wind pressure. The length of the corner region requiring additional support is one-tenth of the shortest plan dimension for all corners (refer to below diagram).

Example:

A six storey building has plan dimensions of 32 metres and 16 metres, and has an average roof height of 24 metres. The aspect ratio found by dividing the height of 24 m by the smallest plan dimension i.e., 16 m, which equals 1.5. Since the aspect ratio is greater than 1, additional fixings for the Terraçade XP support rails are required at the corners of the building for the increased wind pressure.

The distance from the corners of the building requiring additional fixings for the Terraçade XP support rails is one-tenth of the shortest plan dimension, which in this example is 0.1 x 16 = 1.6 metres.

STEP 6: LEE MULTIPLIER ADJUSTMENT

If the project is located in a Lee Multiplier area (as identified from the wind region map) an additional factor of 1.35 must be applied to the wind pressure for Terraçade XP (for both the general pressure and the corner pressure).

Example:

A typical low-rise project in a suburban area (Terrain Category 3) in New Plymouth is in the A7 region and has a Lee Multiplier of 1.35. If the project installed at a height of 4 m, the ultimate wind pressure for Terraçade XP in this case is 1.33 kPa x 1.35 = 1.80 kPa. The aspect ratio is found to be less than 1, so no change in the span configuration is required (from Steps 4 and 5).

TECHNICAL SPECIFICATIONS:
SYSTEM PERFORMANCE FOR WIND LOADS NEW ZEALAND

STEP 7: SPAN DETERMINATION

To determine the span configuration from the wind pressures found in the preceding steps, use the tables in the Ultimate Wind Pressures section (page 37). The span configuration tables show the ultimate wind pressure of the Terraçade XP system at different span configurations. Using the wind pressure determined, identify the span configuration that has a greater ultimate wind pressure than the requirement. If Terraçade XP is to be installed at a corner, the span configuration for this situation should also be determined. The span configurations determined should be specified along with the fastener requirements (refer to the Technical Specifications - Fasteners Section) in all project documentation.

Example:

A typical project in a suburban area (Terrain Category 3) in Wellington is in the W region and does not have a Lee Multiplier. The aspect ratio of the building is greater than 1, therefore corner wind pressures must be checked. If the project is installed at a height of 20 m, the ultimate wind pressure for Terraçade XP in general areas is 1.71 kPa (using Table B1 on page X), and 2.43 kPa (using Table B2 on page X) at the corners (from Steps 4 and 5).

The pressure values determined are compared to the maximum allowed pressures on the Ultimate Wind Pressures table on Page X. For general areas, the support rail fastener configuration is less than 1.9 kPa, so "double span configuration 2" may be used. For the corner areas, the pressure is less than 3 kPa, therefore single or double span configuration 3 must be used. It may be worthwhile for the project to specify the higher rated Span 3 for the entire project to simplify installation.

TABLE B1: General Wind Pressure

Wind Region	Limiting Height (m)	Terrain Category 1	Terrain Category 2	Terrain Category 3	Terrain Category 4
A6	5	1.65	1.24	1.03	0.84
	10	1.88	1.50	1.03	0.84
	20	2.12	1.75	1.32	0.84
	40	2.30	2.01	1.62	1.08
	50	2.34	2.08	1.71	1.21
	75	2.41	2.23	1.88	1.44
	100	2.49	2.30	2.01	1.59
A7	5	1.65	1.24	1.03	0.84
	10	1.88	1.50	1.03	0.84
	20	2.12	1.75	1.32	0.84
	40	2.30	2.01	1.62	1.08
	50	2.34	2.08	1.71	1.21
	75	2.41	2.23	1.88	1.44
	100	2.49	2.30	2.01	1.59
W	5	2.13	1.60	1.33	1.09
	10	2.42	1.93	1.33	1.09
	20	2.73	2.25	1.71	1.09
	40	2.97	2.60	2.09	1.39
	50	3.02	2.69	2.21	1.56
	75	3.11	2.87	2.42	1.85
	100	3.21	2.97	2.60	2.05

TECHNICAL SPECIFICATIONS:
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TABLE B2: Wind Pressure for Tall Bulding Corners (Aspect Ratio >1)

Wind Region	Limiting Height (m)	Terrain Category 1	Terrain Category 2	Terrain Category 3	Terrain Category 4
A6	10	2.68	2.14	1.47	1.20
	15	2.87	2.35	1.69	1.20
	20	3.02	2.49	1.89	1.20
	40	3.28	2.87	2.31	1.54
	50	3.34	2.97	2.45	1.73
	75	3.44	3.18	2.68	2.05
	100	3.55	3.28	2.87	2.27
A7	10	2.68	2.14	1.47	1.20
	15	2.87	2.35	1.69	1.20
	20	3.02	2.49	1.89	1.20
	40	3.28	2.87	2.31	1.54
	50	3.34	2.97	2.45	1.73
	75	3.44	3.18	2.68	2.05
	100	3.55	3.28	2.87	2.27
W	10	3.45	2.75	1.90	1.55
	15	3.71	3.04	2.18	1.55
	20	3.90	3.21	2.43	1.55
	40	4.23	3.71	2.98	1.99
	50	4.30	3.83	3.15	2.23
	75	4.44	4.10	3.45	2.65
	100	4.58	4.23	3.71	2.92

THIS SECTION ONLY PROVIDES A GENERAL INDICATION OF THE SPAN CONFIGURATION FOR PROJECTS THAT COMPLY WITH AS/NZS 1170.2 AND THAT ARE NOT BUILT IN A LEE MULTIPLIER REGION (REFER TO WIND LOAD MAP)

SPECIALISED ENGINEERING METHOD

To use this method the following information should be known about the project:
(This information should be determined in accordance with AS/NZS 1170.2)

	Yes
Wind region	○
Terrain category	○
Height of the installation	○
The project is not affected by a Lee Multiplier	○

Otherwise, each project should follow the procedure outlined in the Step-By-Step Method. This is especially necessary for projects that are located in a Lee Multiplier as the spans stated in these tables will be inadequate for those areas. Minimum span configuration requirements (for buildings complying with AS/NZS 1170.2) have been determined for the Terraçade XP system in accordance with the procedure outlined by Core Project Consulting.

The ultimate wind pressure tables (refer to page X) were used to determine the minimum span configuration requirements for the wind pressure determined. These requirements are summarised in Table B3-B6 on pages X and Y.

The span number given in the tables indicates the lowest span number at which the system must be installed. For example Span 4 indicates that the maximum span is 900 mm for single and double span. The single span and double span configurations are shown on Page X.

Any lower numbered spans, such as Span 3 which has the maximum span of 1200 mm, cannot be used.

The minimum span configuration requirement for general installations of Terraçade XP is given in Table A3 or A5. If Terraçade XP is required to be installed on a building corner (refer to Step 5) refer to Table A4 or A6.

Example:
A typical project has been determined to be:

- In the W region,
- In an areas classified as Terrain Category 2.5,
- Does not have a Lee Multiplier,
- Installed at a height of 24 m, and
- An aspect ratio of greater than 1.

According to Table B3 and B4 the required support rail fastening configuration is Span 3 for general areas and Span 4 at the corners. It should be noted that these spans are based on two different configurations. It may be worthwhile for the project to specify the higher rated Span 4 for the entire project to simplify installation.

Note: The corners of tall, slender buildings experience higher wind pressures than the rest of the building. If the average roof height is greater than either of the buildings plan dimensions (i.e. aspect ratio greater than 1), a different support rail span configuration will be required at the corners of the building over a distance from the corners of one-tenth of the minimum plan dimension.

TECHNICAL SPECIFICATIONS:
SYSTEM PERFORMANCE FOR WIND LOADS NEW ZEALAND

ULTIMATE WIND PRESSURES

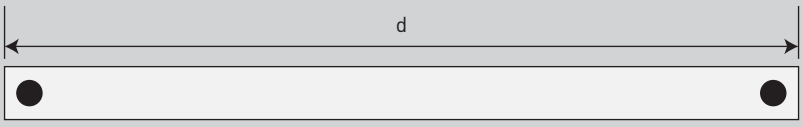
The ultimate wind pressure tables have been characterised by a particular span configuration. The pressures listed refer to the span configuration above it.

Note: The ultimate wind pressures specified in the span configuration tables below should be used in accordance with the fastener table specifications given on Page 17. Design documentation should accommodate the allowable pressures and fastener specifications for a particular project.

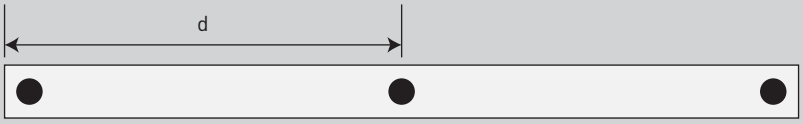
ULTIMATE WIND PRESSURES

	SPAN CONFIGURATION				
	1*	2*	3	4	5
	MAXIMUM SPAN (mm)				
	1800	1500	1200	900	600
	ULTIMATE WIND PRESSURE (kPa)				
SINGLE SPAN	0.6	1.2	3	5.3	12
DOUBLE SPAN	1.3	1.9	3	5.3	12

* Span configurations 1 and 2 are governed by horizontal earthquake loading. Contact Brickworks Building Products for further engineering advice before nominating these configurations.



Single Span



Double Span

TECHNICAL SPECIFICATIONS:
SYSTEM PERFORMANCE FOR WIND LOADS NEW ZEALAND

SINGLE SPAN
TABLE B3: General Installation

Wind Region	Limiting Height (m)	Terrain Category 1	Terrain Category 1.5	Terrain Category 2	Terrain Category 2.5	Terrain Category 3	Terrain Category 4
A6	5	Span 3	Span 3	Span 3	Span 2*	Span 2*	Span 2*
	10	Span 3	Span 3	Span 3	Span 3	Span 2*	Span 2*
	20	Span 3	Span 3	Span 3	Span 3	Span 3	Span 2*
	50	Span 3	Span 3	Span 3	Span 3	Span 3	Span 3
	75	Span 3	Span 3	Span 3	Span 3	Span 3	Span 3
	100	Span 3	Span 3	Span 3	Span 3	Span 3	Span 3
A7	5	Span 3	Span 3	Span 3	Span 2*	Span 2*	Span 2*
	10	Span 3	Span 3	Span 3	Span 3	Span 2*	Span 2*
	20	Span 3	Span 3	Span 3	Span 3	Span 3	Span 2*
	50	Span 3	Span 3	Span 3	Span 3	Span 3	Span 3
	75	Span 3	Span 3	Span 3	Span 3	Span 3	Span 3
	100	Span 3	Span 3	Span 3	Span 3	Span 3	Span 3
W	5	Span 3	Span 3	Span 3	Span 3	Span 3	Span 2
	10	Span 3	Span 3	Span 3	Span 3	Span 3	Span 2
	20	Span 3	Span 3	Span 3	Span 3	Span 3	Span 2
	50	Span 4	Span 3	Span 3	Span 3	Span 3	Span 3
	75	Span 4	Span 3	Span 3	Span 3	Span 3	Span 3
	100	Span 4	Span 4	Span 3	Span 3	Span 3	Span 3

TABLE B3: Corner Installation for Tall Buildings (Aspect Ratio >1)

Wind Region	Limiting Height (m)	Terrain Category 1	Terrain Category 1.5	Terrain Category 2	Terrain Category 2.5	Terrain Category 3	Terrain Category 4
A6	10	Span 3	Span 3	Span 3	Span 3	Span 3	Span 3
	15	Span 3	Span 3	Span 3	Span 3	Span 3	Span 3
	20	Span 4	Span 3	Span 3	Span 3	Span 3	Span 3
	50	Span 4	Span 4	Span 3	Span 3	Span 3	Span 3
	75	Span 4	Span 4	Span 4	Span 3	Span 3	Span 3
	100	Span 4	Span 4	Span 4	Span 4	Span 3	Span 3
A7	10	Span 3	Span 3	Span 3	Span 3	Span 3	Span 3
	15	Span 3	Span 3	Span 3	Span 3	Span 3	Span 3
	20	Span 4	Span 3	Span 3	Span 3	Span 3	Span 3
	50	Span 4	Span 4	Span 3	Span 3	Span 3	Span 3
	75	Span 4	Span 4	Span 4	Span 3	Span 3	Span 3
	100	Span 4	Span 4	Span 4	Span 4	Span 3	Span 3
W	10	Span 4	Span 4	Span 3	Span 3	Span 3	Span 3
	15	Span 4	Span 4	Span 4	Span 3	Span 3	Span 3
	20	Span 4	Span 4	Span 4	Span 3	Span 3	Span 3
	50	Span 4	Span 4	Span 4	Span 4	Span 4	Span 3
	75	Span 4	Span 4	Span 4	Span 4	Span 4	Span 3
	100	Span 4	Span 4	Span 4	Span 4	Span 4	Span 3

TECHNICAL SPECIFICATIONS:
SYSTEM PERFORMANCE FOR WIND LOADS NEW ZEALAND

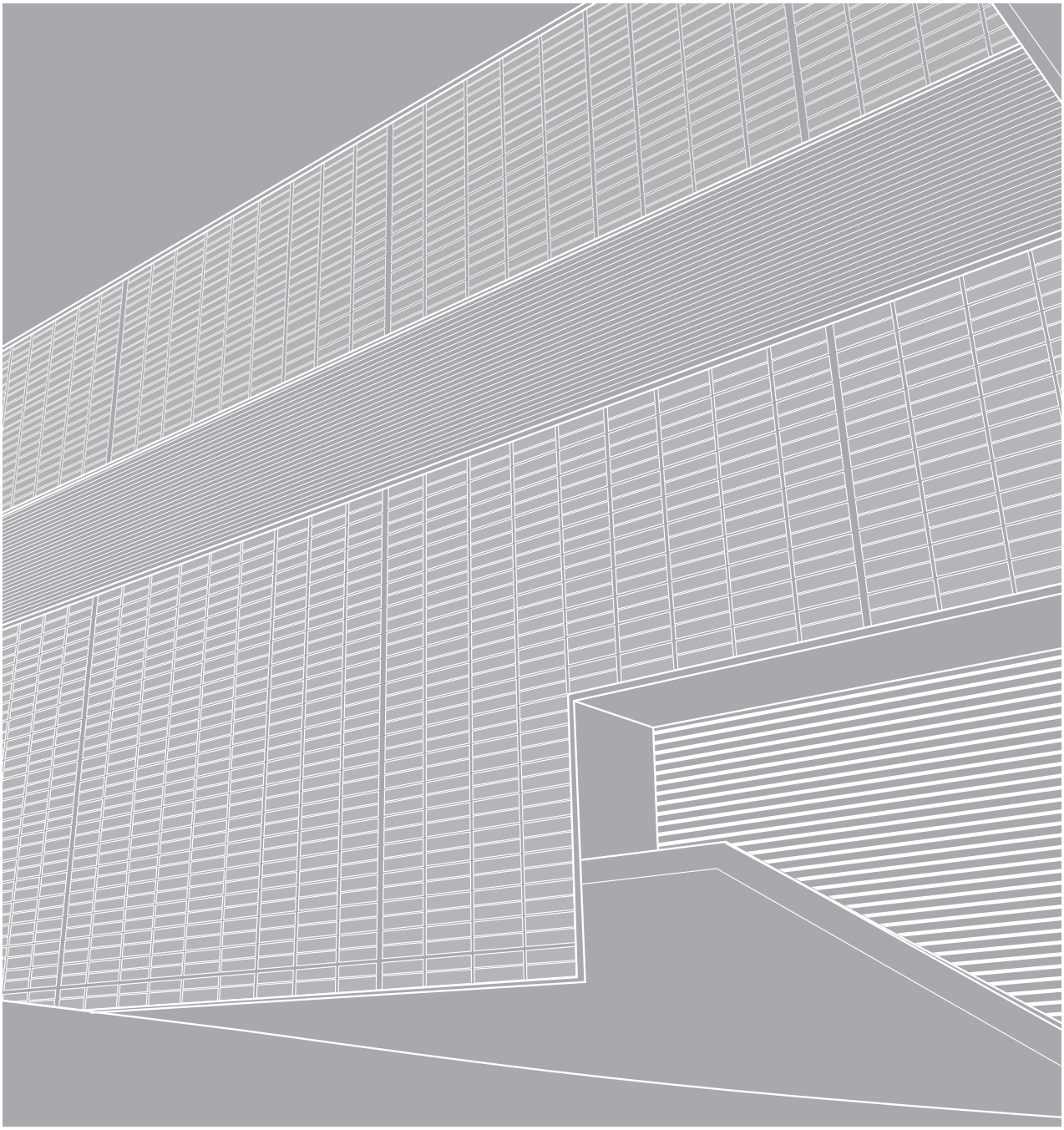
DOUBLE SPAN
TABLE B5: General Installation

Wind Region	Limiting Height (m)	Terrain Category 1	Terrain Category 1.5	Terrain Category 2	Terrain Category 2.5	Terrain Category 3	Terrain Category 4
A6	5	Span 2*	Span 2*	Span 1*	Span 1*	Span 1*	Span 1*
	10	Span 2*	Span 2*	Span 2*	Span 1*	Span 1*	Span 1*
	20	Span 3	Span 3	Span 2*	Span 2*	Span 2*	Span 1*
	50	Span 3	Span 3	Span 3	Span 2*	Span 2*	Span 1*
	75	Span 3	Span 3	Span 3	Span 3	Span 2*	Span 2*
	100	Span 3	Span 3	Span 3	Span 3	Span 3	Span 2*
A7	5	Span 2*	Span 2*	Span 1*	Span 1*	Span 1*	Span 1*
	10	Span 2*	Span 2*	Span 1*	Span 1*	Span 1*	Span 1*
	20	Span 3	Span 3	Span 2*	Span 2*	Span 2*	Span 1*
	50	Span 3	Span 3	Span 3	Span 2*	Span 2*	Span 1*
	75	Span 3	Span 3	Span 3	Span 3	Span 2*	Span 2*
	100	Span 3	Span 3	Span 3	Span 3	Span 3	Span 2*
W	5	Span 3	Span 2*	Span 2*	Span 2*	Span 2*	Span 1*
	10	Span 3	Span 3	Span 3	Span 2*	Span 2*	Span 1*
	20	Span 3	Span 3	Span 3	Span 3	Span 2*	Span 1*
	50	Span 4	Span 3	Span 3	Span 3	Span 3	Span 2*
	75	Span 4	Span 3	Span 3	Span 3	Span 3	Span 2*
	100	Span 4	Span 4	Span 3	Span 3	Span 3	Span 3

TABLE B6: Corner Installation for Tall Buildings (Aspect Ratio >1)

Wind Region	Limiting Height (m)	Terrain Category 1	Terrain Category 1.5	Terrain Category 2	Terrain Category 2.5	Terrain Category 3	Terrain Category 4
A6	10	Span 3	Span 3	Span 3	Span 2*	Span 2*	Span 1*
	15	Span 3	Span 3	Span 3	Span 3	Span 2*	Span 1*
	20	Span 4	Span 3	Span 3	Span 3	Span 2*	Span 1*
	50	Span 4	Span 4	Span 3	Span 3	Span 3	Span 2*
	75	Span 4	Span 4	Span 4	Span 3	Span 3	Span 3
	100	Span 4	Span 4	Span 4	Span 4	Span 3	Span 3
A7	10	Span 3	Span 3	Span 3	Span 2*	Span 2*	Span 1*
	15	Span 3	Span 3	Span 3	Span 3	Span 2*	Span 1*
	20	Span 4	Span 3	Span 3	Span 3	Span 2*	Span 1*
	50	Span 4	Span 4	Span 3	Span 3	Span 3	Span 2*
	75	Span 4	Span 4	Span 4	Span 3	Span 3	Span 3
	100	Span 4	Span 4	Span 4	Span 4	Span 3	Span 3
W	10	Span 4	Span 4	Span 3	Span 3	Span 2*	Span 2*
	15	Span 4	Span 4	Span 4	Span 3	Span 3	Span 2*
	20	Span 4	Span 4	Span 4	Span 3	Span 3	Span 2*
	50	Span 4	Span 4	Span 4	Span 4	Span 4	Span 3
	75	Span 4	Span 4	Span 4	Span 4	Span 4	Span 3
	100	Span 4	Span 4	Span 4	Span 4	Span 4	Span 3

SAFE WORKING INSTRUCTIONS



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SAFE WORKING INSTRUCTIONS:
SITE PREPARATION

REWORKING TILES

Silica dust can be liberated from the Terraçade XP tiles when they are reworked. Chronic inhalation of crystalline silica has been associated with impairment of lung function. Please refer to the SDS for Terraçade, which is available from the Terraçade website (www.terracade.com.au or www.terracade.co.nz) for further information. Care should be taken when reworking Terraçade XP tiles to maintain the exposure to crystalline silica below the Exposure Standard proscribed by Worksafe Australia (0.1 mg/m^3). Safe working procedures should include:

- Utilising a wet saw when cutting or reworking tiles. Contact the saw manufacturer for further details.
- Wear appropriate personal protective equipment, such as approved dust mask and safety goggles, when utilising power tools or abrasive hand tools on the tiles.
- Ensure that dust is disposed of during clean up and disposal appropriately, by either wetting or vacuuming.

USING BRICK/TILE SAWS OR POWER SAWS

- Ensure that adequate personal protective equipment, such as approved safety glasses, gloves, dust mask and hearing protection, is worn.
- Try and use a wet saw to cut tiles, or ensure that adequate ventilation or dust extraction equipment is available if dry cutting is used.

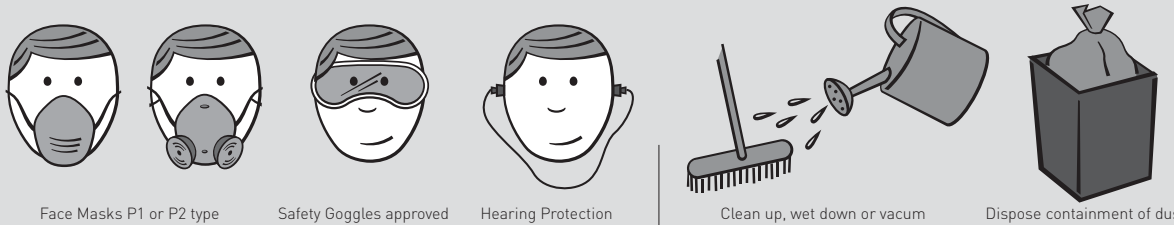
HANDLING

- Care should be taken when handling suspension rails and trims to avoid cuts and abrasions. The use of appropriate gloves may be of benefit. Extra care should be taken when handling cut pieces.
- It is recommended that packs of suspension rails should be broken up, so that they may be handled individually.
- Ensure clear passage when moving the suspension rails and trims due to their size. Also allow for adequate storage of the suspension rails and trims to avoid trip hazards.
- Take care when handling cut or broken tiles, to avoid cuts or abrasions from sharp surfaces.
- Consider manual handling issues when lifting tiles.
- Ensure that an adequate number of people are available to support the weight of the roll when rolling out the membrane.

STORAGE AND CLEANING OF SURROUNDING MATERIALS

- All materials should be stored to avoid damage. Particularly, ensure that the hangers on the suspension rails are protected from distortion and the edges and corners of the tiles are protected from chipping.
- Protect the tiles, rails and trims from exposure to rain, water or chemicals during storage.
- Ensure that pressure water jet cleaning of any surrounding surfaces is conducted prior to the installation of the tiles.
- Protect aluminium components during chemical cleaning of nearby materials, especially during acid cleaning of brick work.

RECOMMENDED SAFETY PROTECTION



Face Masks P1 or P2 type approved to the relevant Australian Standards.

Safety Goggles approved to the relevant Australian Standards.

Hearing Protection approved to the relevant Australian Standards.

Clean up, wet down or vacum

Dispose containment of dust

INSTALLATION

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Terraçade products and the latest version
of this manual, please refer to our website.
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INSTALLATION:
GENERAL INSTALLATION PROCEDURE

THE TERRAÇADE XP SYSTEM IS EASILY INSTALLED AS THE TILES ARE CAPTURED AND SUPPORTED BY PURPOSE DESIGNED HORIZONTAL RAILS.

The speed of installation of the tiles and the effectiveness of the panel support system is dependent on achieving close control of tolerances in the fixings of the vertical support system.

PREPARATION

01. Ensure that adequate structural members are available to fasten the horizontal rails to. Design documentation should accommodate these requirements.

02. Specify adequate waterproofing measures for the backup structural wall.

03. Determine the set-out of tiles, based upon the design requirements. The tiles could be set from the base, the top or from any important structural features.

04. Determine the quantities of the components required for a particular design. Contact an Brickworks Building Products representative if you require assistance.

05. Obtain the correct fasteners for the design.

06. Ensure that the installers are aware that irregularities of shape in backup wall must be packed out or accommodated for, to ensure that the horizontal rails are installed correctly.

EXAMINATION OF SUBSTRUCTURE

07. The maximum horizontal or vertical deviation of a surface from a plane surface (bow) in any 2m length;
- Structural Tolerance - 5mm
- Non - Structural Framework Tolerance- 3mm

08. Examine back-up wall for compliance with design requirements. Check for discrepancies with drawings, cracks and other possible air leakage sources and rectify before proceeding with the installation.

SET OUT AND COORDINATION

09. Establish and coordinate set-out lines, following design requirements for the set-out of the tiles. For example, the design may require that the tile module is spaced from an important feature or designed to reduce cut tiles around a window.

10. Ensure that adequate support structure is available to comply with the span configurations specified.

STANDARD INSTALLATION OF HORIZONTAL RAILS, FLASHINGS & TRIMS

The standard installation practice involves installing the Terraçade XP system onto secondary framing. Typical details are provided in the Standard Installation Details section.

(See below diagram 01)

11. Install any secondary framing necessary to support aluminium rails including any separation of dissimilar metals to prevent corrosion, line and level.

12. Install flashings to openings and corner flashings as required.

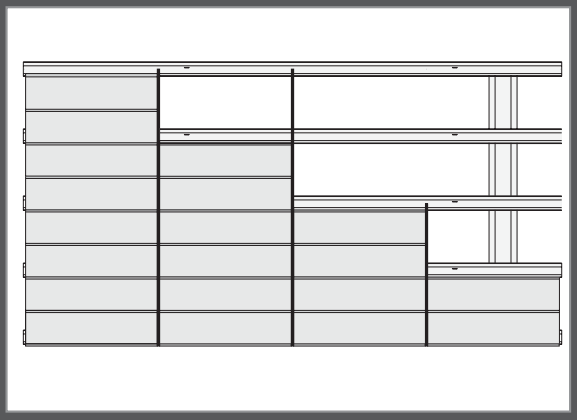
13. Cut horizontal rails and surrounds to size, if necessary. Drill drainage holes on surrounds as required.

14. Install horizontal aluminium rails and surrounds, ensuring that the rails are installed straight as per the design specifications (with particular reference to the specified span configuration and fasteners). Note: it is imperative that rails are installed to a vertical tolerance of ±2 mm). Ensure that the design specifications and advice of the Structural Engineer are followed.

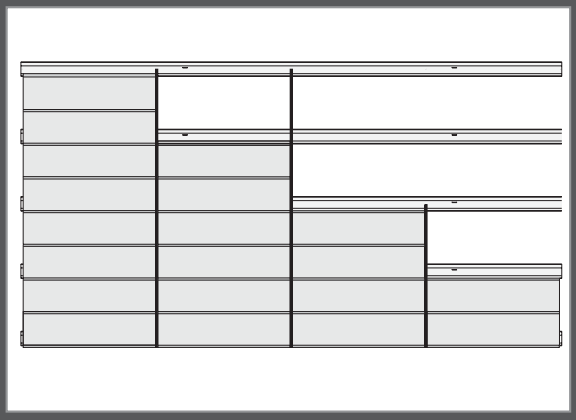
15. Install the fitment gasket onto the horizontal rails and surrounds where necessary. The gasket should be cut to 100 mm lengths and placed at approximately 600 mm centres along the horizontal rail. The gasket should be placed so that it supports adjacent tiles.

16. Check all flashings (corner flashing, horizontal flashing at each 2 storey location, and flashing around all openings etc) are continuous and complete

17. Install external decorative trims (refer to the trim installation procedure).



01.



02.

INSTALLATION:
GENERAL INSTALLATION PROCEDURE

ALTERNATE INSTALLATION OF HORIZONTAL RAILS, FLASHINGS AND TRIMS

The alternate installation practice involves installing the Terraçade XP system directly to the back up wall and not onto a secondary frame. Typical details are provided in the Alternate Installation Details section. Repeat the procedure above, but install the horizontal aluminium rails directly onto to the back up wall.

(See below left diagram 02)

INSTALLATION OF TILES

18. Commence installation of tiles starting from the base and working upwards, ensuring horizontal set out lines are maintained.

19. Install tiles onto the horizontal rail by initially placing the top of the tile into the receiving section of the upper horizontal rail. Lift the base of the tile and tilt inwards slightly to engage the bottom of the tile on the hanger of the lower horizontal rail. Check that the tile has been securely engaged visually and by physically moving the tile.

(See below diagram 03)

20. Insert vertical aluminium joining strips and fix them mechanically using blind rivets or screws at maximum 600mm centres. 3M VHB tape may be used to position the joining strips prior to mechanical fixing. **(See below diagram 04)**

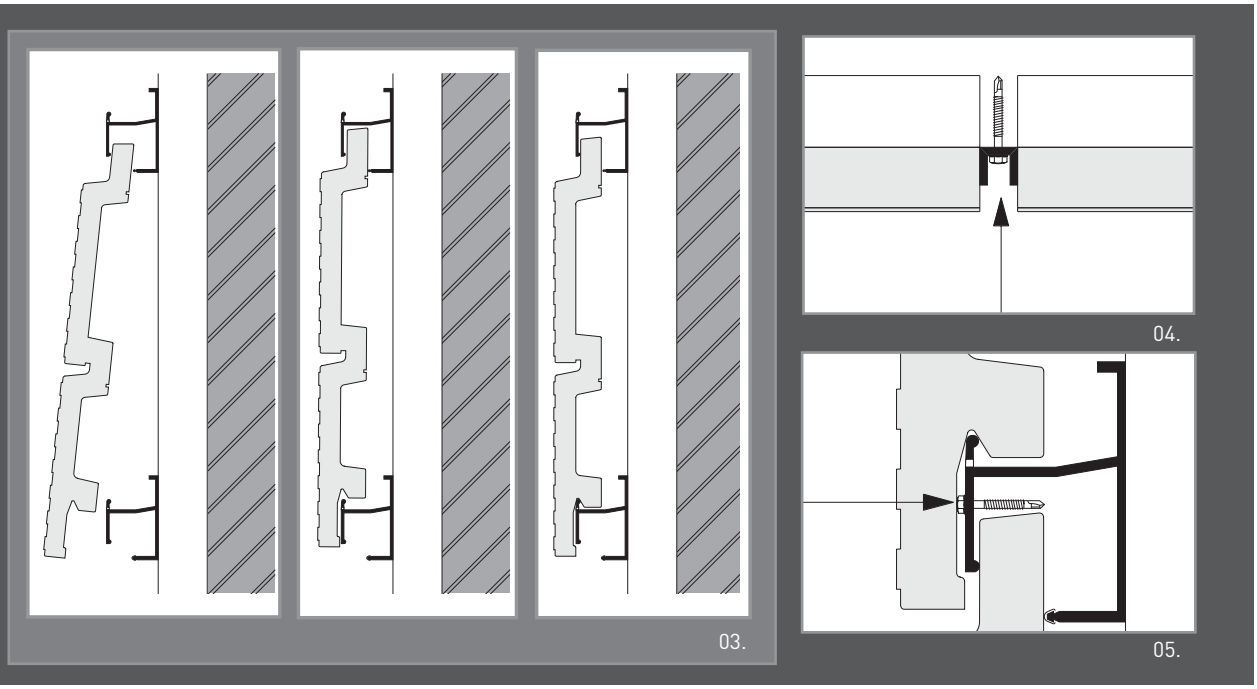
21. Brush down or sponge with a moist cloth on completion to remove loose material.

NOTES:

• It is possible to remove individual tiles from a wall however this may require 'shuffling' of immediately adjacent tiles. A mechanical fixing can be used to prevent the removal of tiles, as shown below. Once the tile is in position drill the screw into the horizontal rail. One screw at the centre of each tile is sufficient. The screw will then prevent the removal of the tile and will not be visible as the tile above will shield it. **(See below diagram 05)**

• Tiles can be cut to any length or height using a wet saw with appropriate continuous rim diamond blades. Surround trims are used to capture cut tiles.

• The thermal expansion of the aluminium rails, surrounds and jointing strips should be taken into account during design.



03.

04.

05.

INSTALLATION:
TRIM INSTALLATION PROCEDURE

STANDARD INSTALLATION OF THE SURROUND FOR PARAPET AND WINDOW SILL

01. Cut any secondary framing to a length that accommodates the back leg of the surround.

01. Fasten the surround (refer to fastener table) to the secondary frame.

02. For a whole tile, insert the top of the tile into the inner section of surround and lift the base of the tile so that it is hangs on the horizontal rail. Ensure that the tile is securely engaged visually and by physically moving the tile.

(See below diagram 06)

03. For a cut tile, insert the cut end of the tile into the outer section of surround and lift the base of the tile so that it is hangs on the horizontal rail as normal. Ensure that the tile is securely engaged visually and by physically moving the tile.

(See below diagram 07)

ALTERNATE INSTALLATION OF THE MODIFIED SURROUND FOR PARAPET AND WINDOW SILL

Repeat the procedure above, but fasten the modified surround (refer to fastener table) to the back up wall.

STANDARD INSTALLATION OF THE SURROUND FOR BASE AND WINDOW HEAD

01. Cut any secondary framing to a length that accommodates the back leg of the surround.

02. Fasten the surround (refer to fastener table) to the secondary frame.

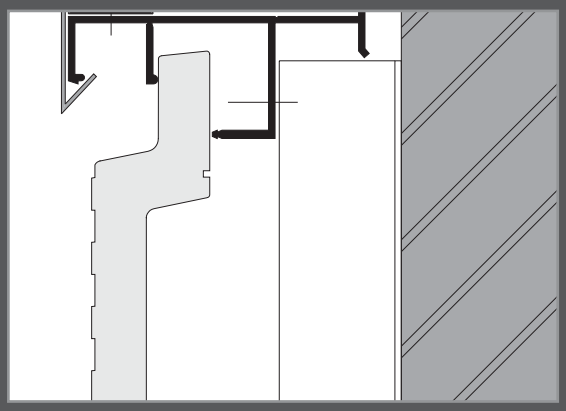
03. For a whole tile, insert the top of the tile into the receiving section of the horizontal rail and lift the base of the tile so that it is hangs on the base surround. Ensure that the tile is securely engaged visually and by physically moving the tile.

(See below diagram 08)

04. For a cut tile, insert the top of the tile as normal into the receiving section of the horizontal rail and lift the cut end of the tile into the outer section of the base surround. Ensure that the tile is securely engaged visually and by physically moving the tile.

a. Non-continuous neoprene packers will be necessary if a cut tile is not supported at the base by a hanger.

(See below diagram 09)



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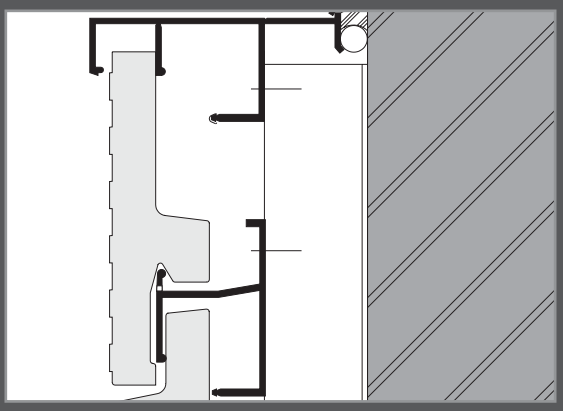

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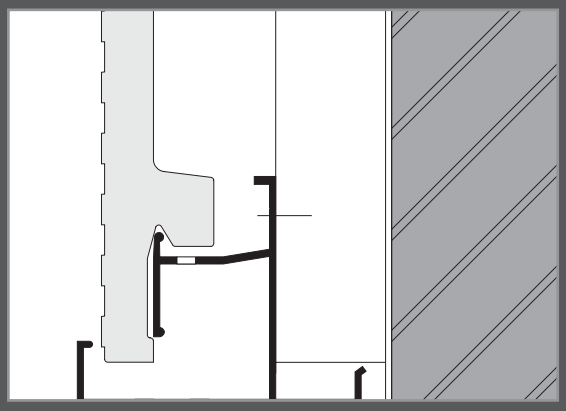

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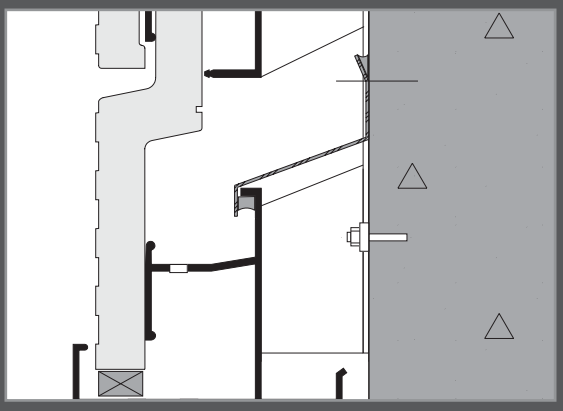


09.

INSTALLATION:
TRIM INSTALLATION PROCEDURE

ALTERNATE INSTALLATION OF THE MODIFIED SURROUND FOR BASE AND WINDOW HEAD

Repeat the procedure above, but fasten the modified base surround (refer to fastener table) to the back up wall.

STANDARD INSTALLATION OF SURROUND FOR SIDE AND WINDOW JAMB

01. Cut the horizontal rail and position any secondary framing to a length that accommodates the back leg of the surround.

02. Remove the middle leg of the surround by manipulating it with two sets of pliers along the length of the surround. Take care to wear appropriate safety gear (eg. safety goggles, gloves etc). Do not attempt to tear out the piece, rather manipulate it along the entire length.

03. Fasten the surround (refer to fastener table) to the secondary frame.

04. For whole and cut tiles, engage the tile in the normal manner, but slightly to the side of the surround. Slide the tile gently into the surround. Ensure that the tile is securely engaged visually and by physically moving the tile.

(See below diagram 010)

ALTERNATE INSTALLATION OF THE MODIFIED SURROUND FOR BASE AND WINDOW HEAD

Repeat the procedure above, but fasten the modified surround (refer to fastener table) to the back up wall.

INSTALLATION OF INTERNAL CORNER

01. Cut the horizontal rails to a length that accommodates the internal corner.

02. Fasten the internal corner (refer to fastener table) to the horizontal railing at a suitable dimension to form the internal corner.

03. For whole and cut tiles, engage the tiles in the normal manner. Ensure that the tile is securely engaged visually and by physically moving the tile.

(See below diagram 011)

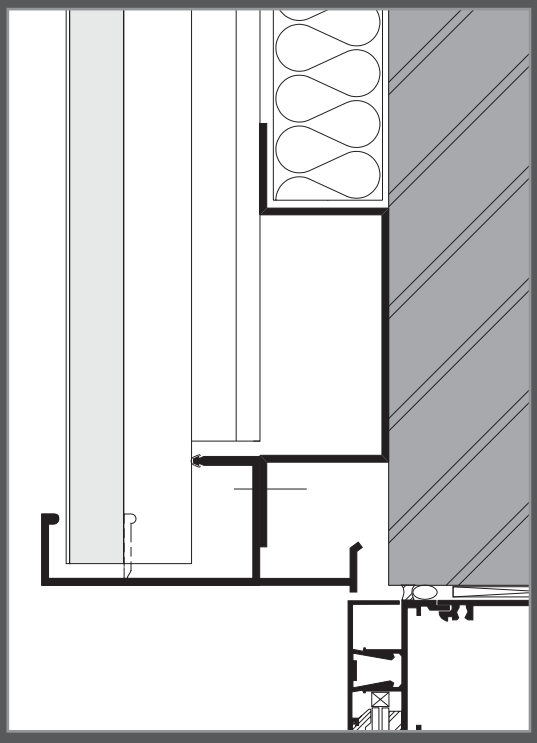
INSTALLATION OF EXTERNAL CORNER

01. Fasten the external corner (refer to fastener table) to the horizontal railing at a suitable dimension to form the external corner.

02. Fasten the second side of horizontal rails after the external corner has been attached.

03. For whole and cut tiles, engage the tiles in the normal manner. Ensure that the tile is securely engaged visually and by physically moving the tile.

(See below diagram 012)



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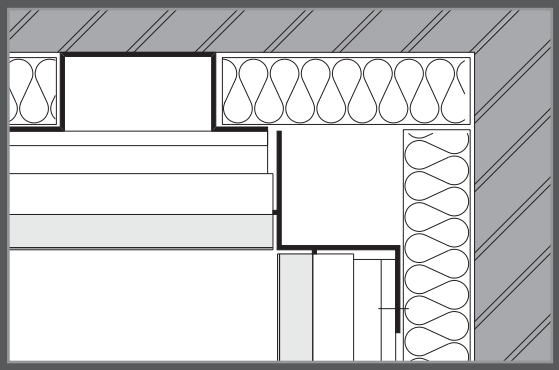
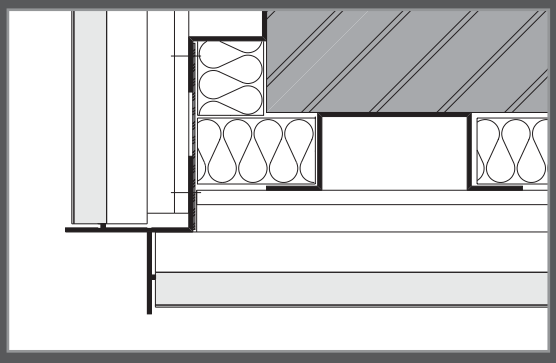
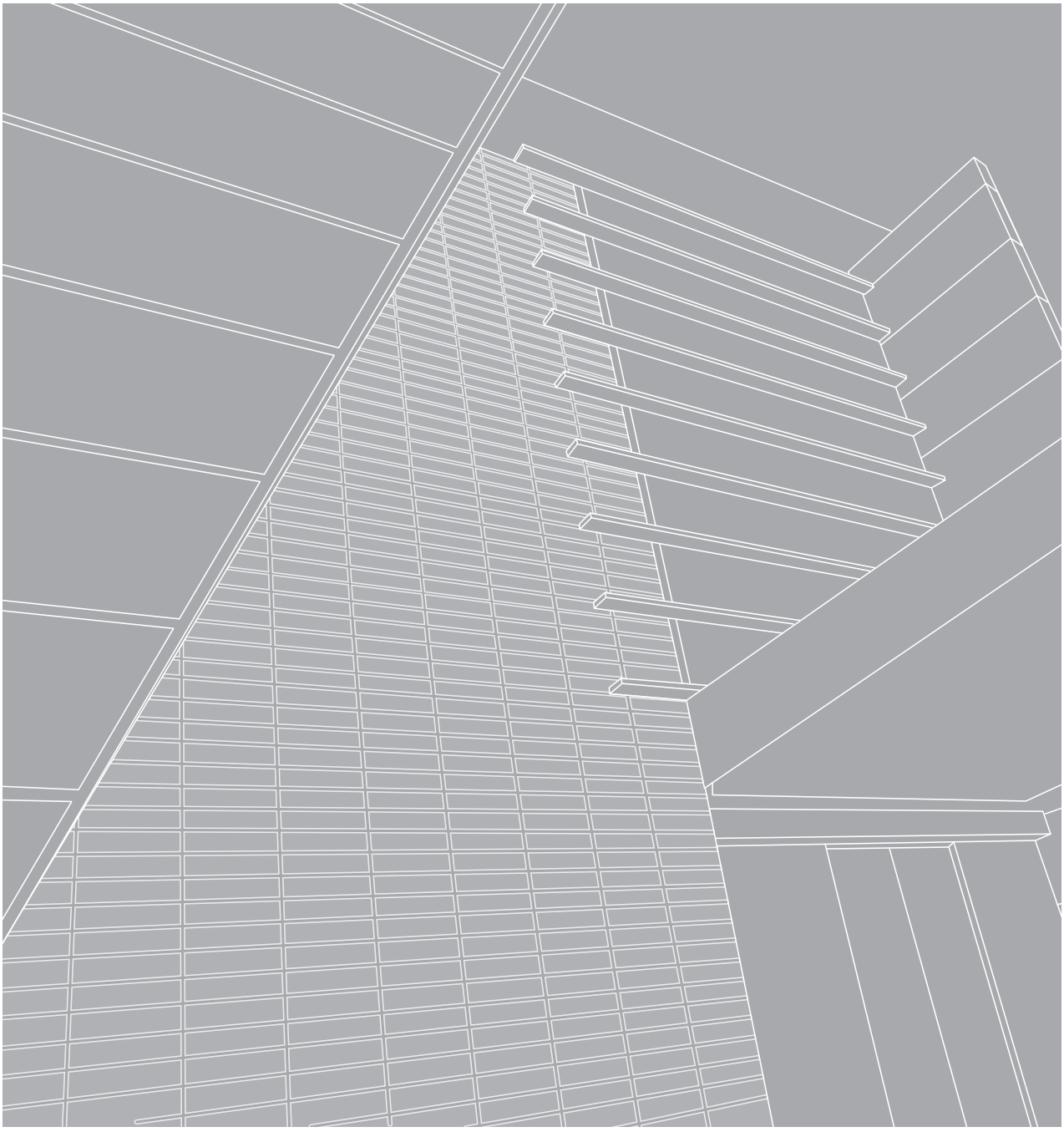


011.



012.

SYSTEM DESIGN



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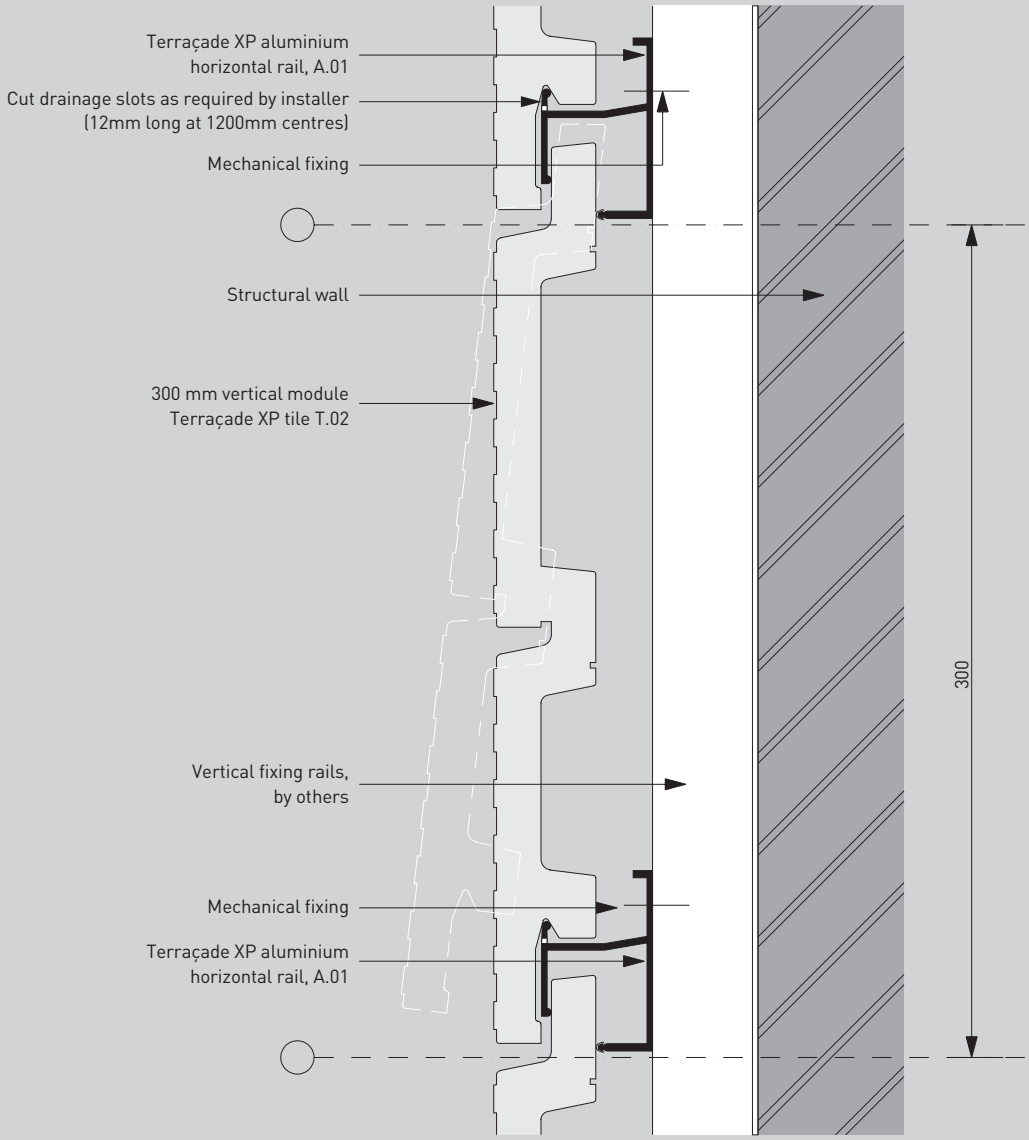
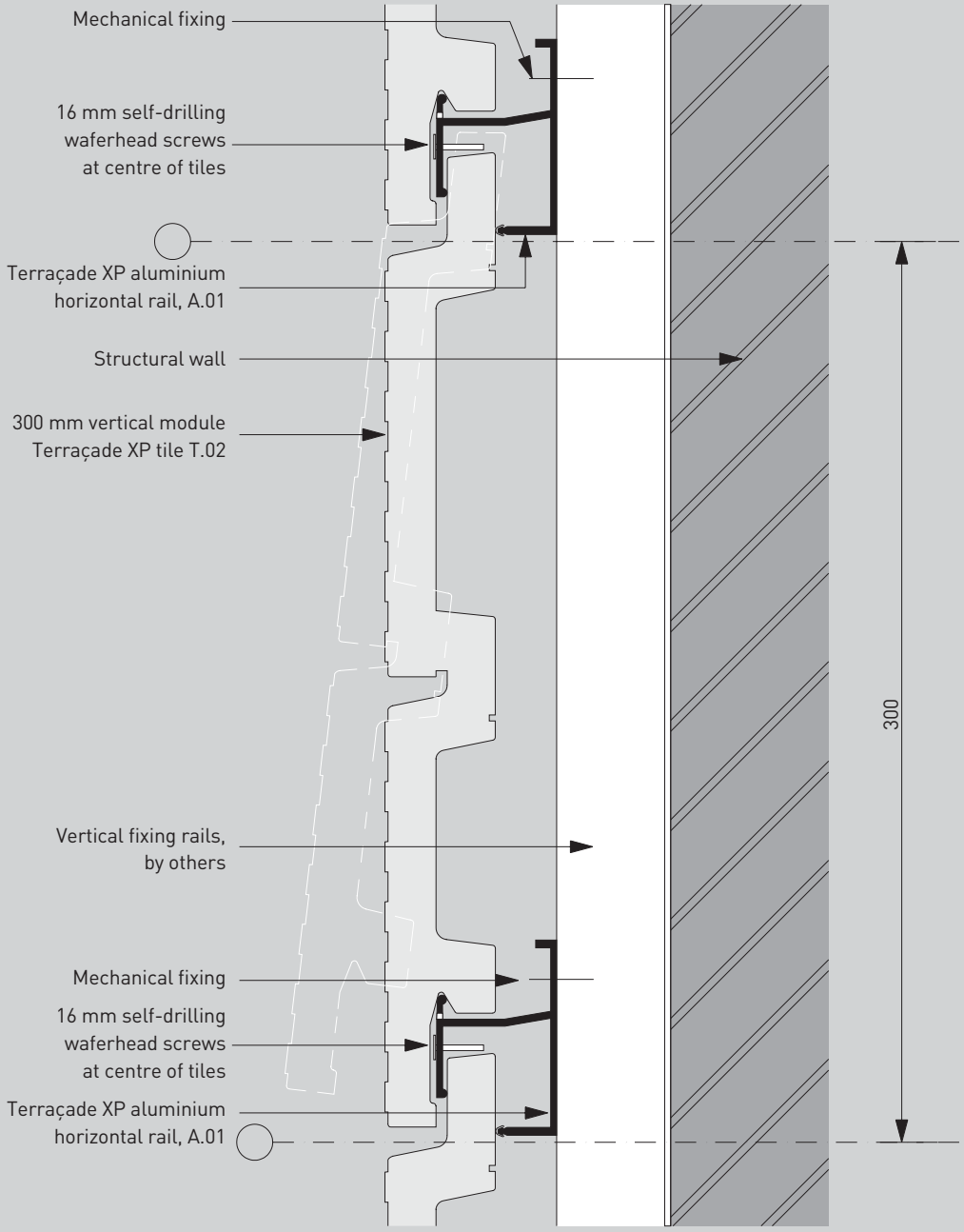
STANDARD INSTALLATION:
TYPICAL VERTICAL SECTION

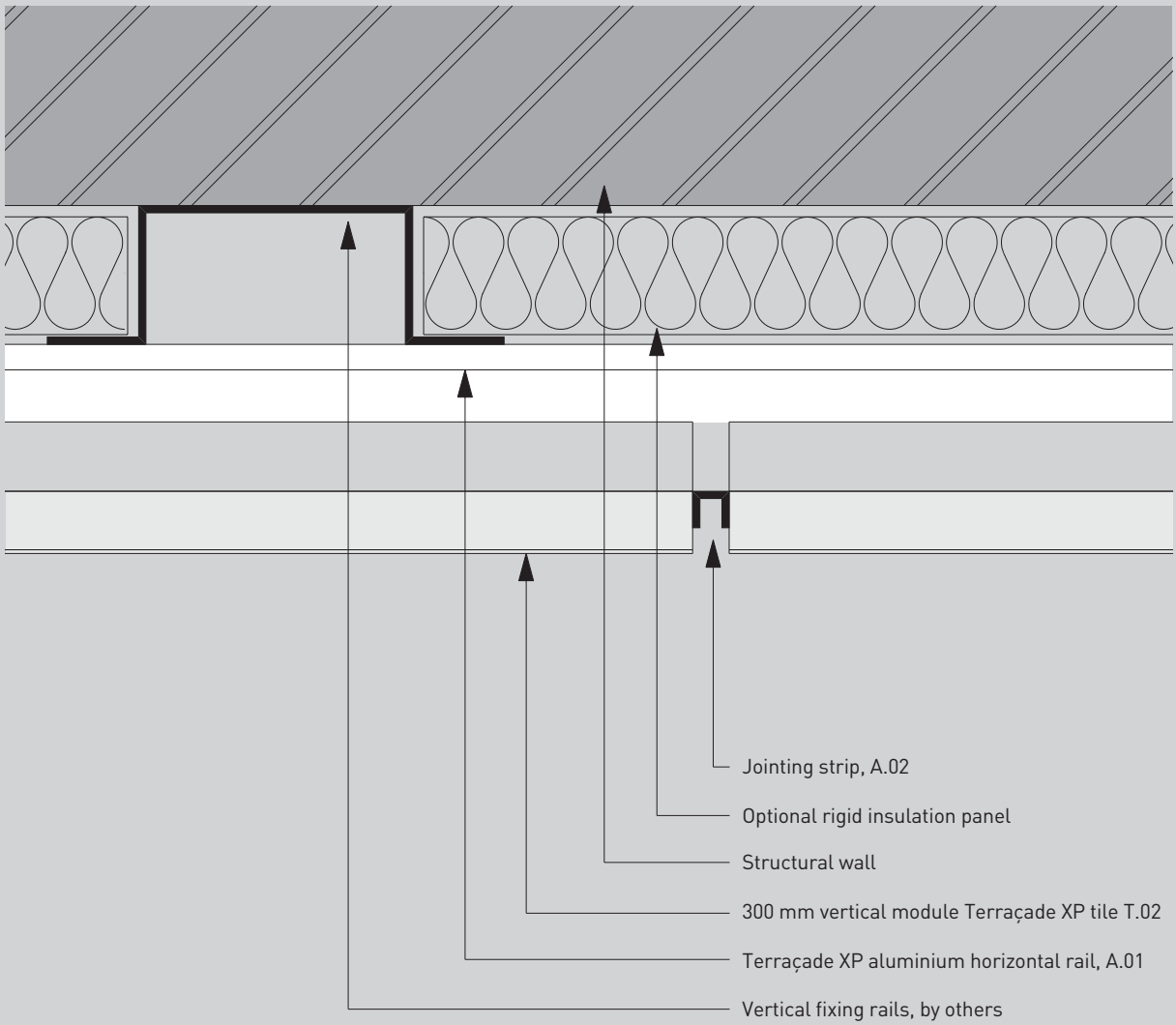


STANDARD INSTALLATION:
MECHANICAL FIXING

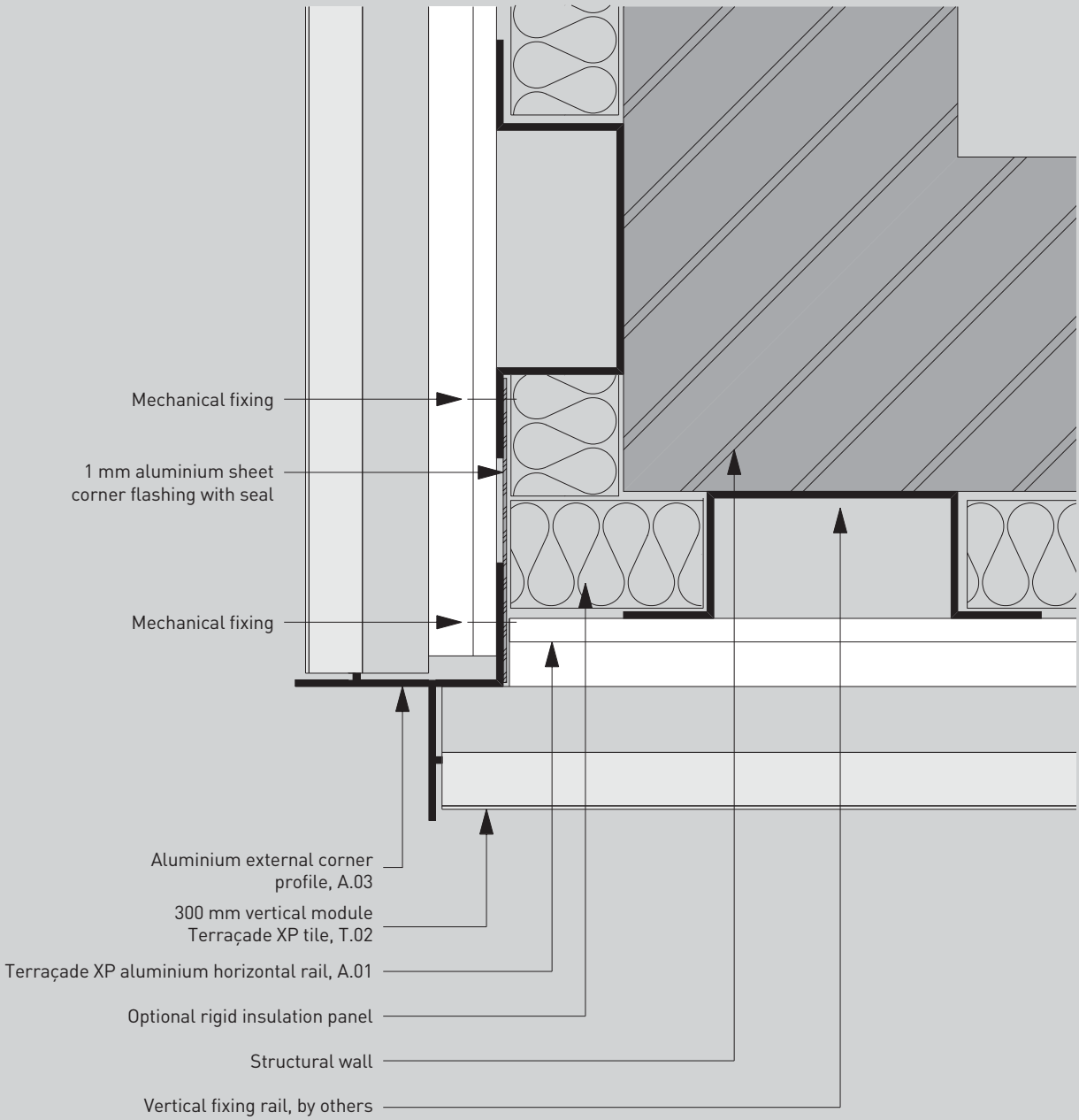


Note: This method demonstrates a mechanical fixing method to prevent the removal of tiles at ground level

STANDARD INSTALLATION:
TYPICAL HORIZONTAL SECTION



STANDARD INSTALLATION:
EXTERNAL CORNER DETAIL – HORIZONTAL SECTION



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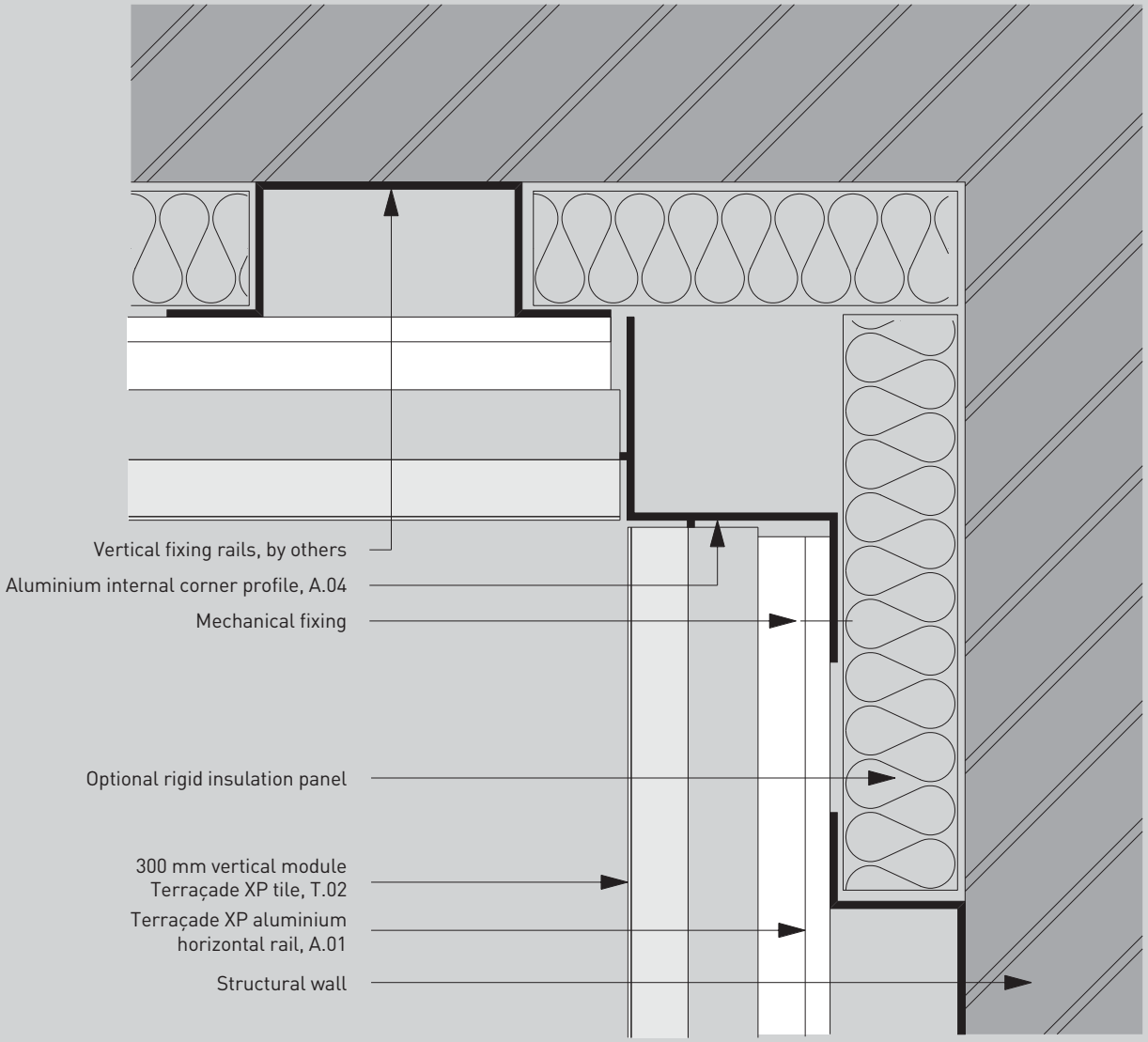
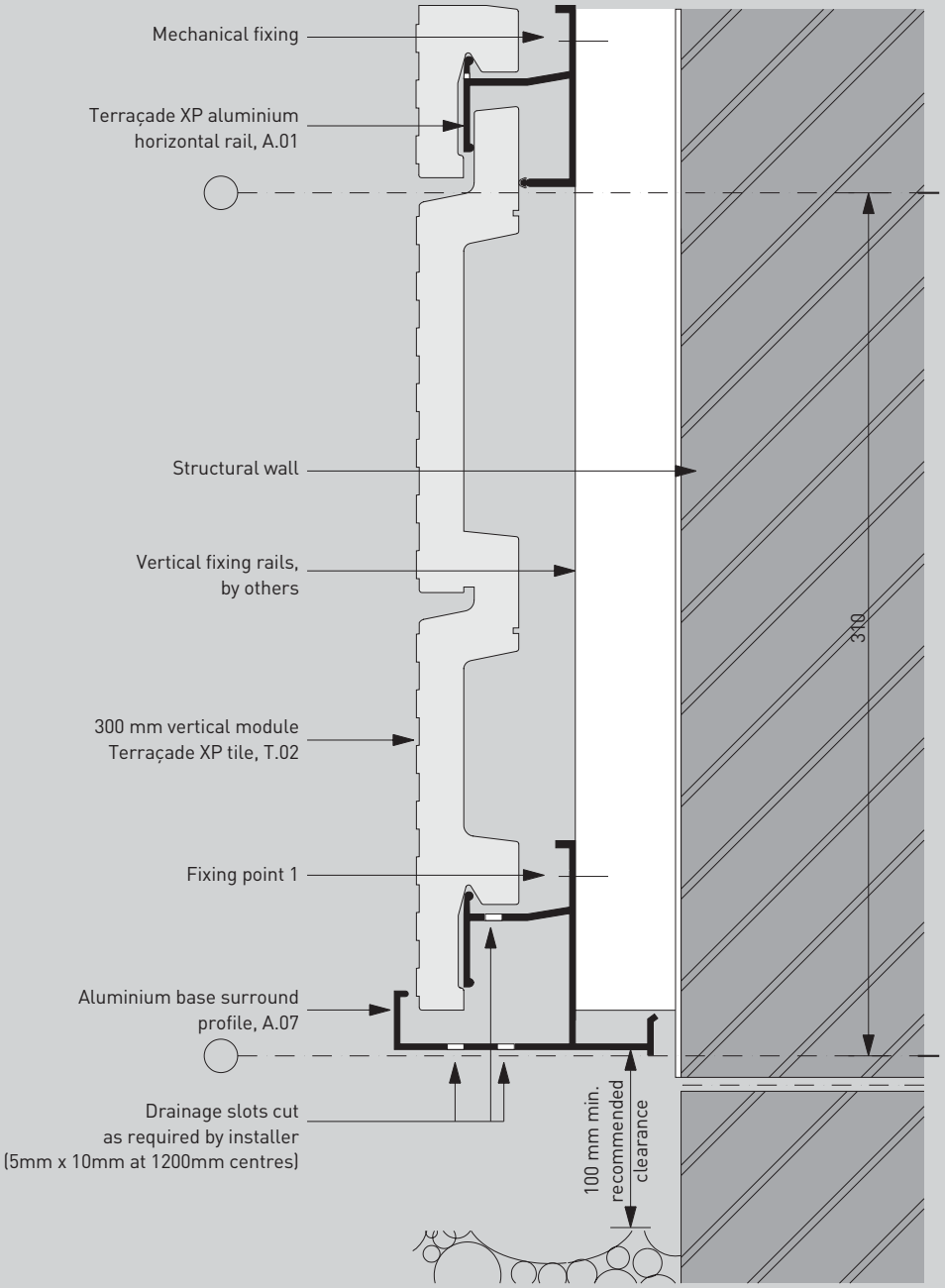
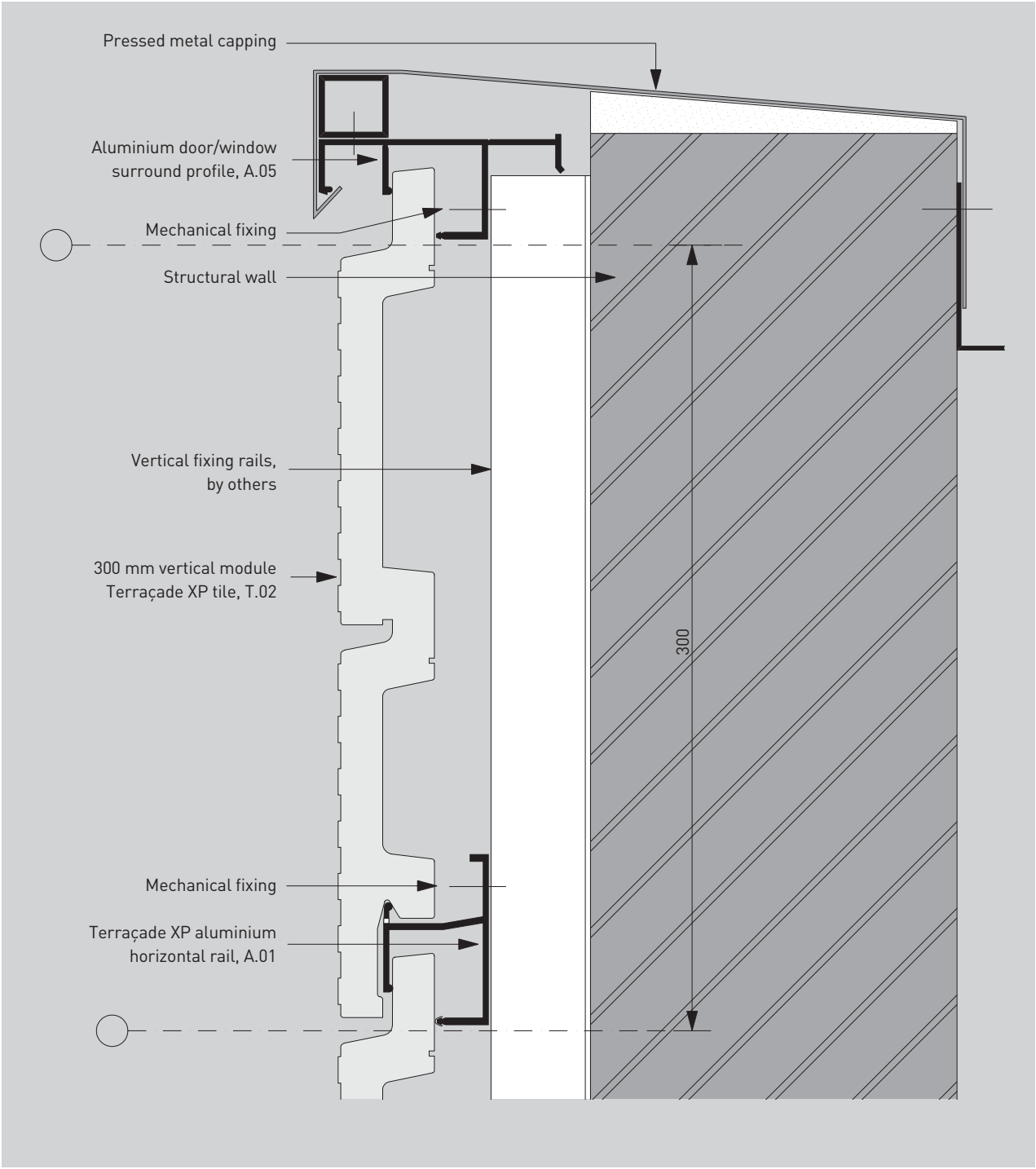
STANDARD INSTALLATION:
INTERNAL CORNER DETAIL – HORIZONTAL SECTION



STANDARD INSTALLATION:
BASE SURROUND PROFILE – VERTICAL SECTION



STANDARD INSTALLATION:
PARAPET DETAIL OPTION 1 – VERTICAL SECTION



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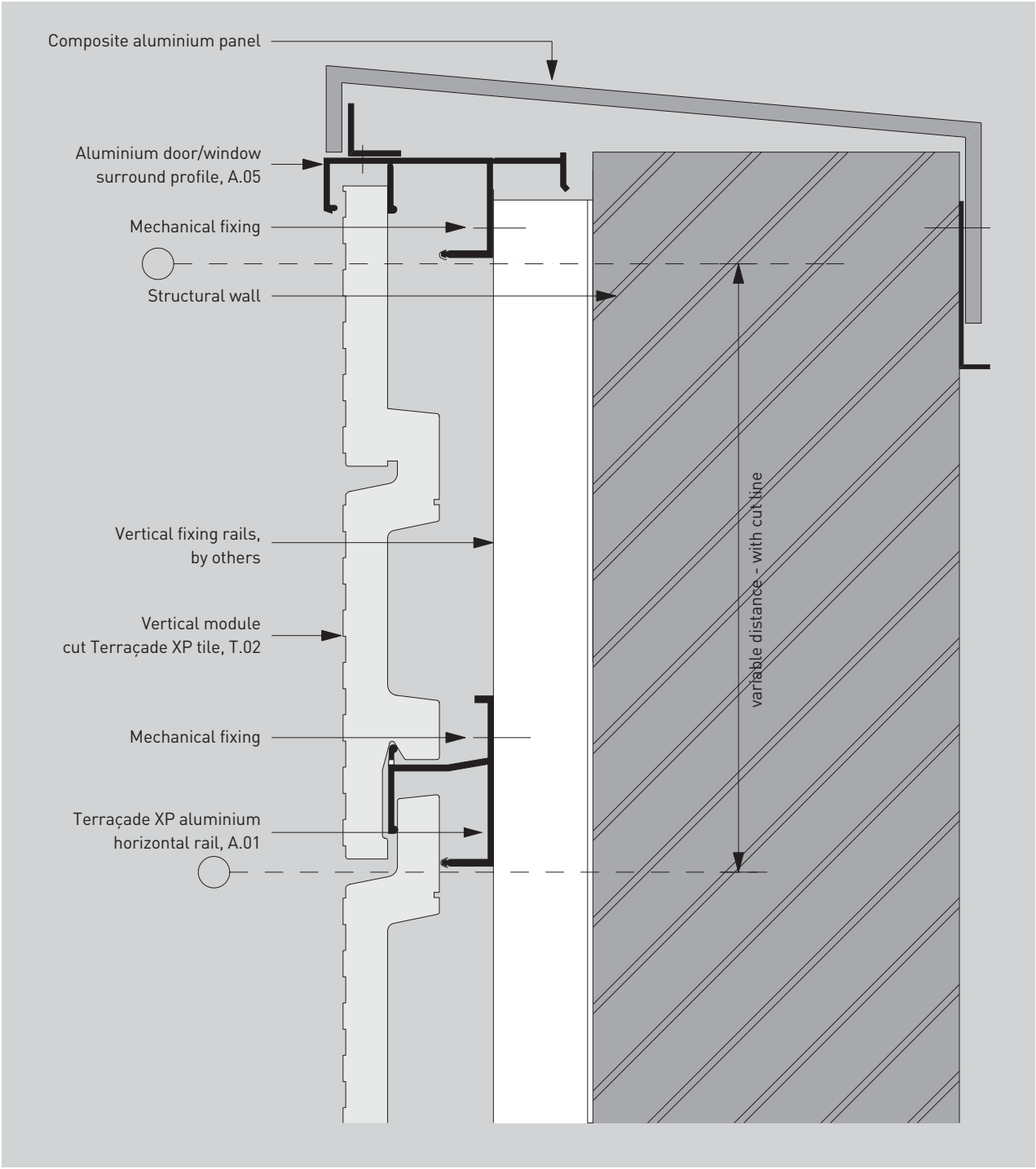
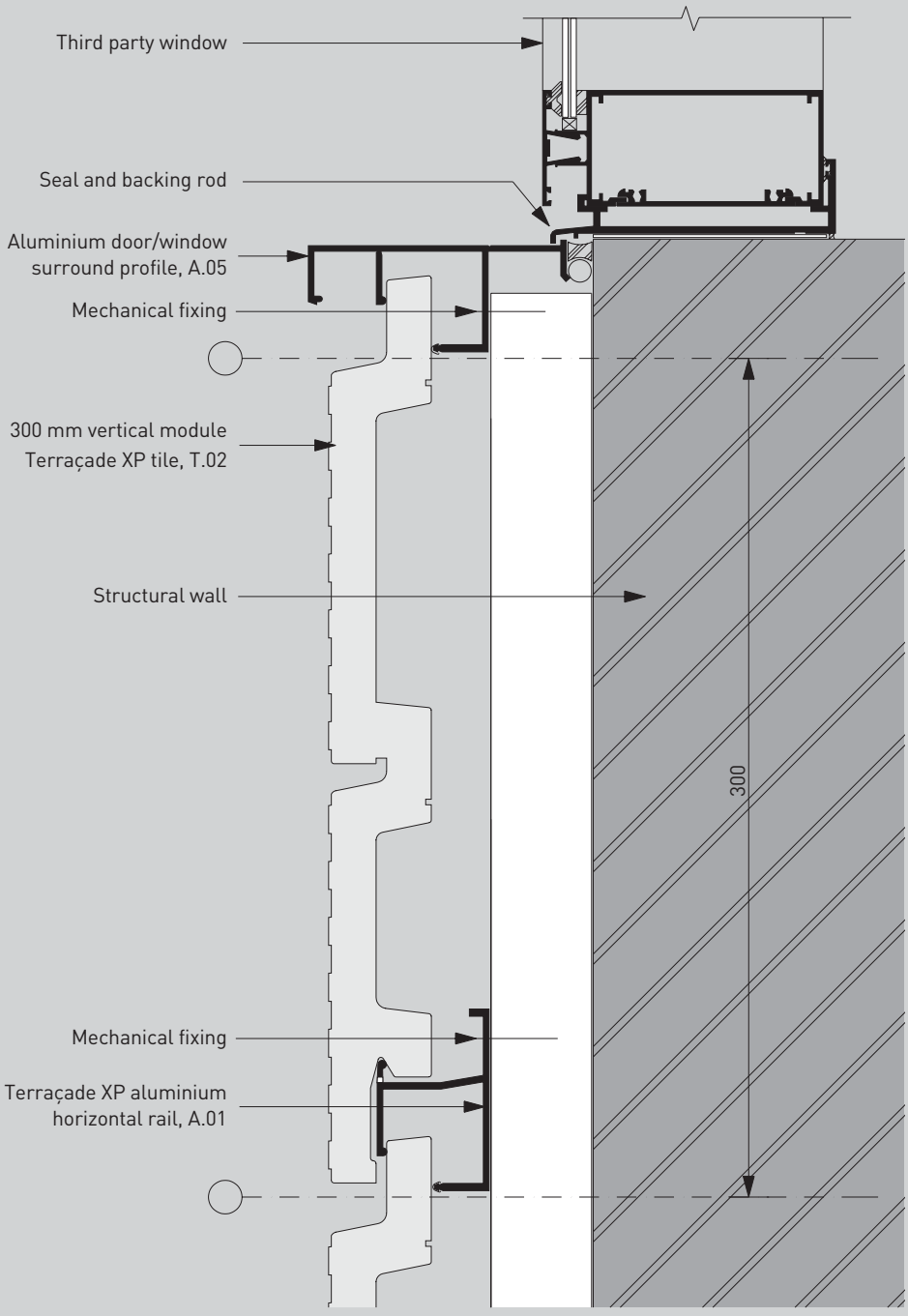
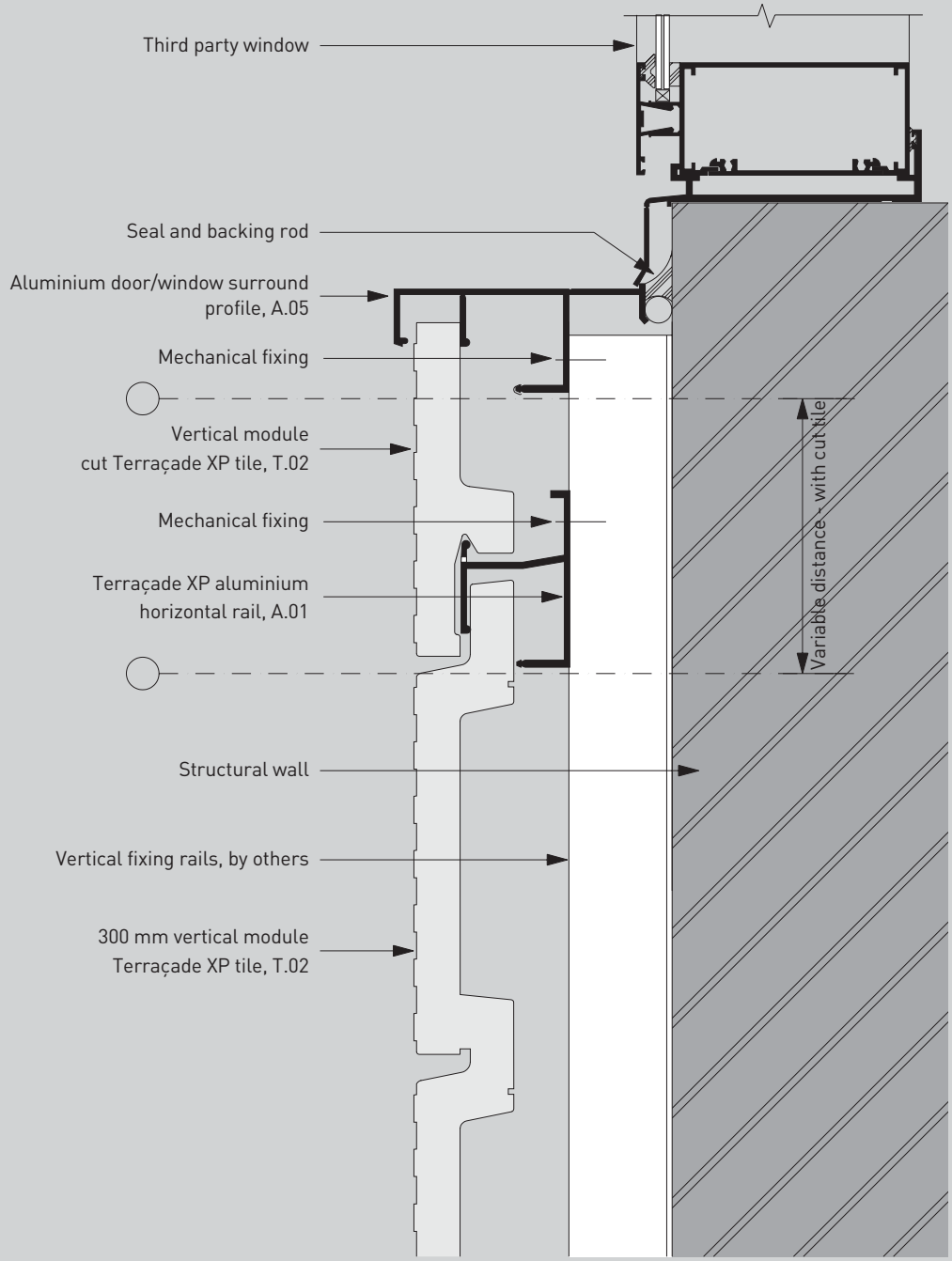
STANDARD INSTALLATION:
PARAPET DETAIL OPTION 2 – VERTICAL SECTION



STANDARD INSTALLATION:
WINDOW SILL OPTION 1 – VERTICAL SECTION



STANDARD INSTALLATION:
WINDOW SILL OPTION 2 – VERTICAL SECTION



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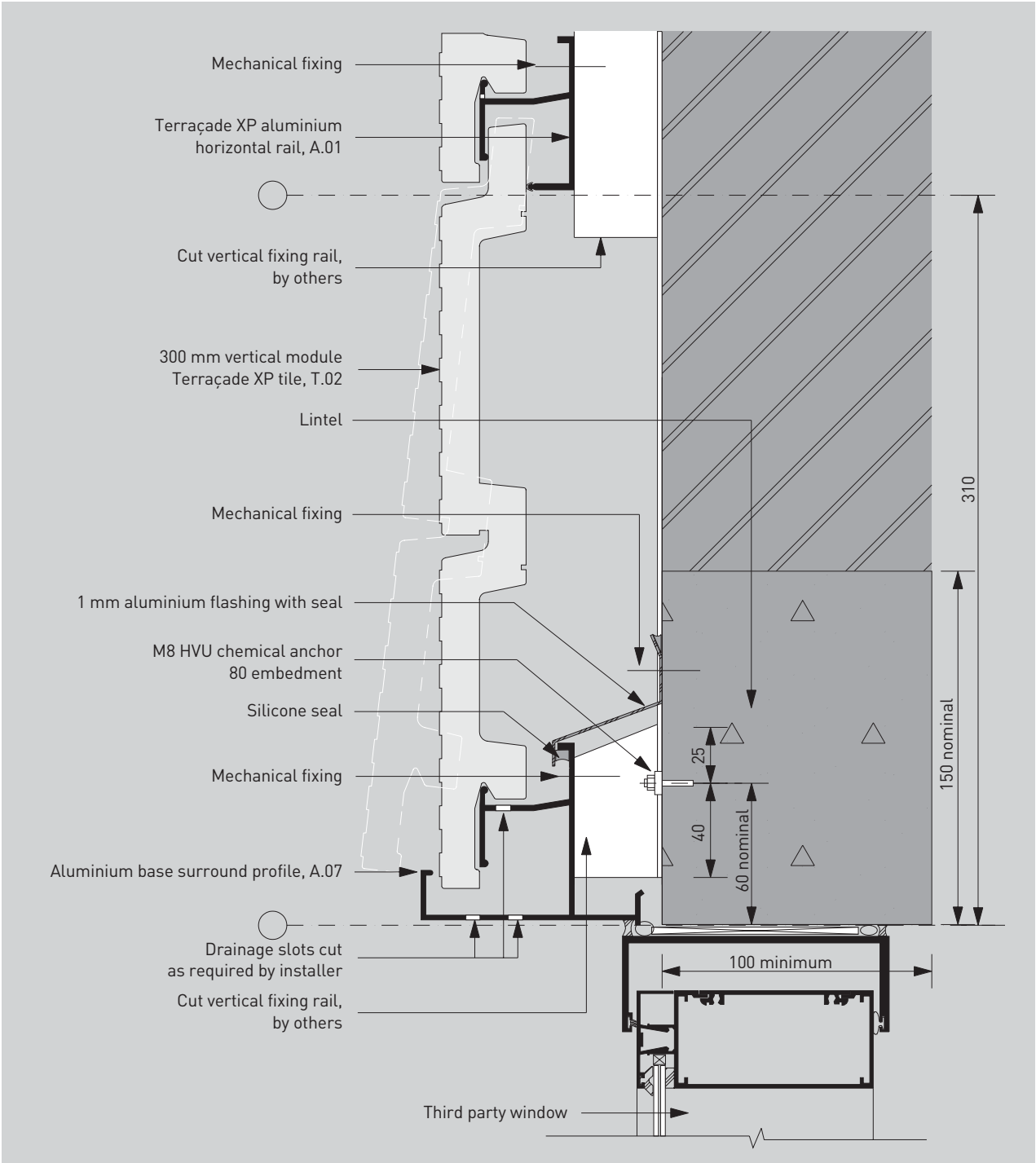
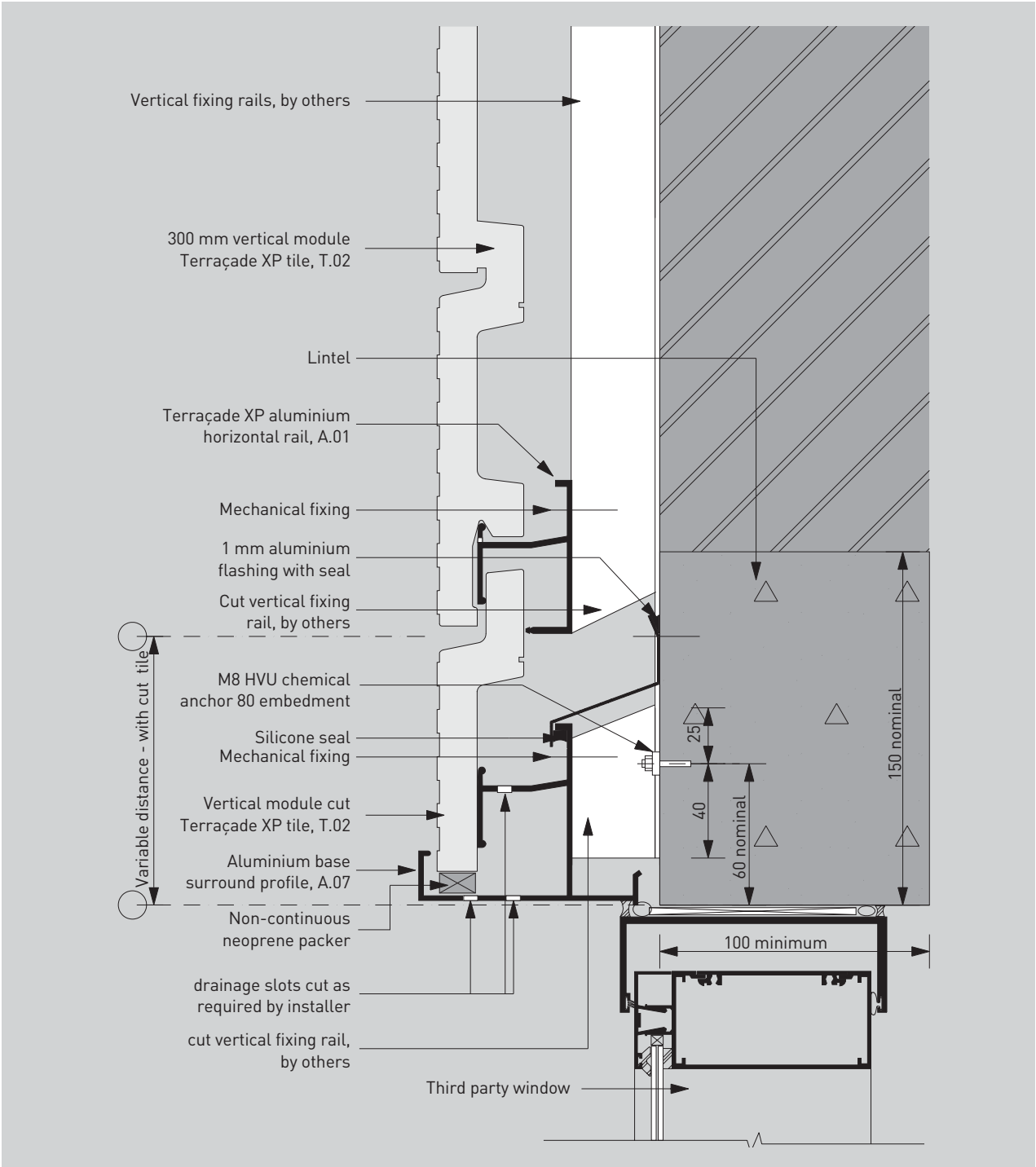
STANDARD INSTALLATION:
WINDOW HEAD OPTION 1 – VERTICAL SECTION

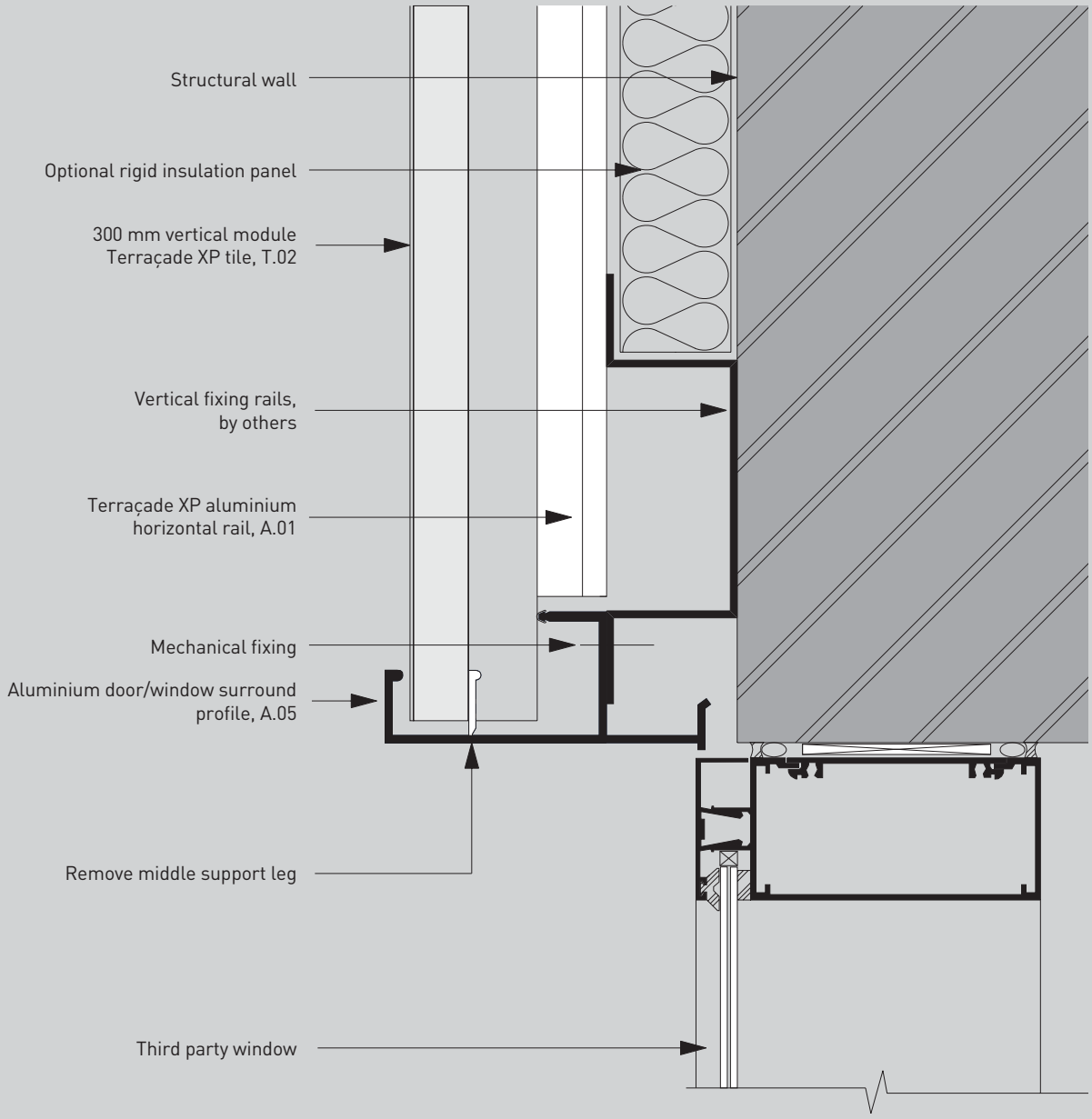


ISSUE D-0411

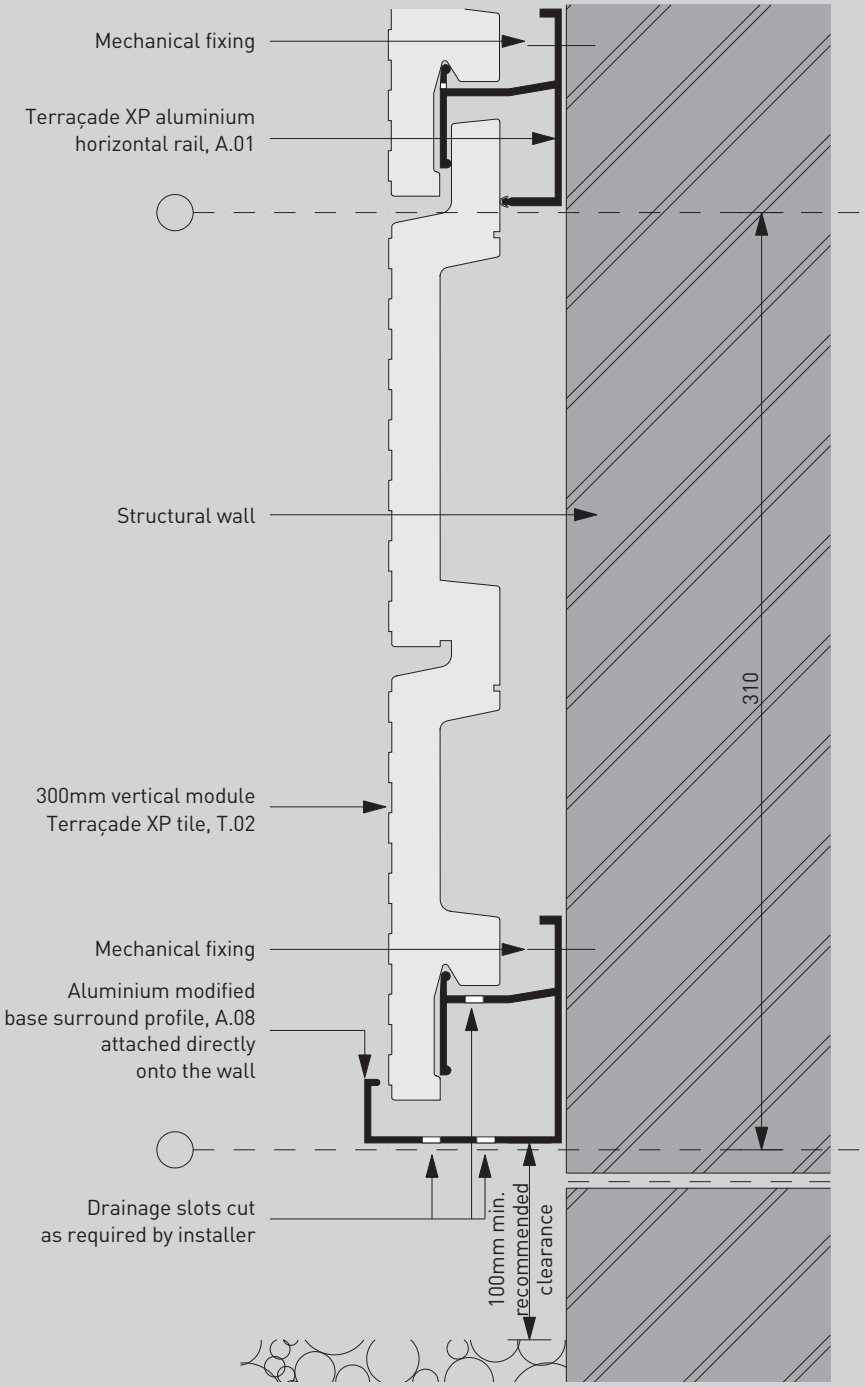
STANDARD INSTALLATION:
WINDOW HEAD OPTION 2 – VERTICAL SECTION



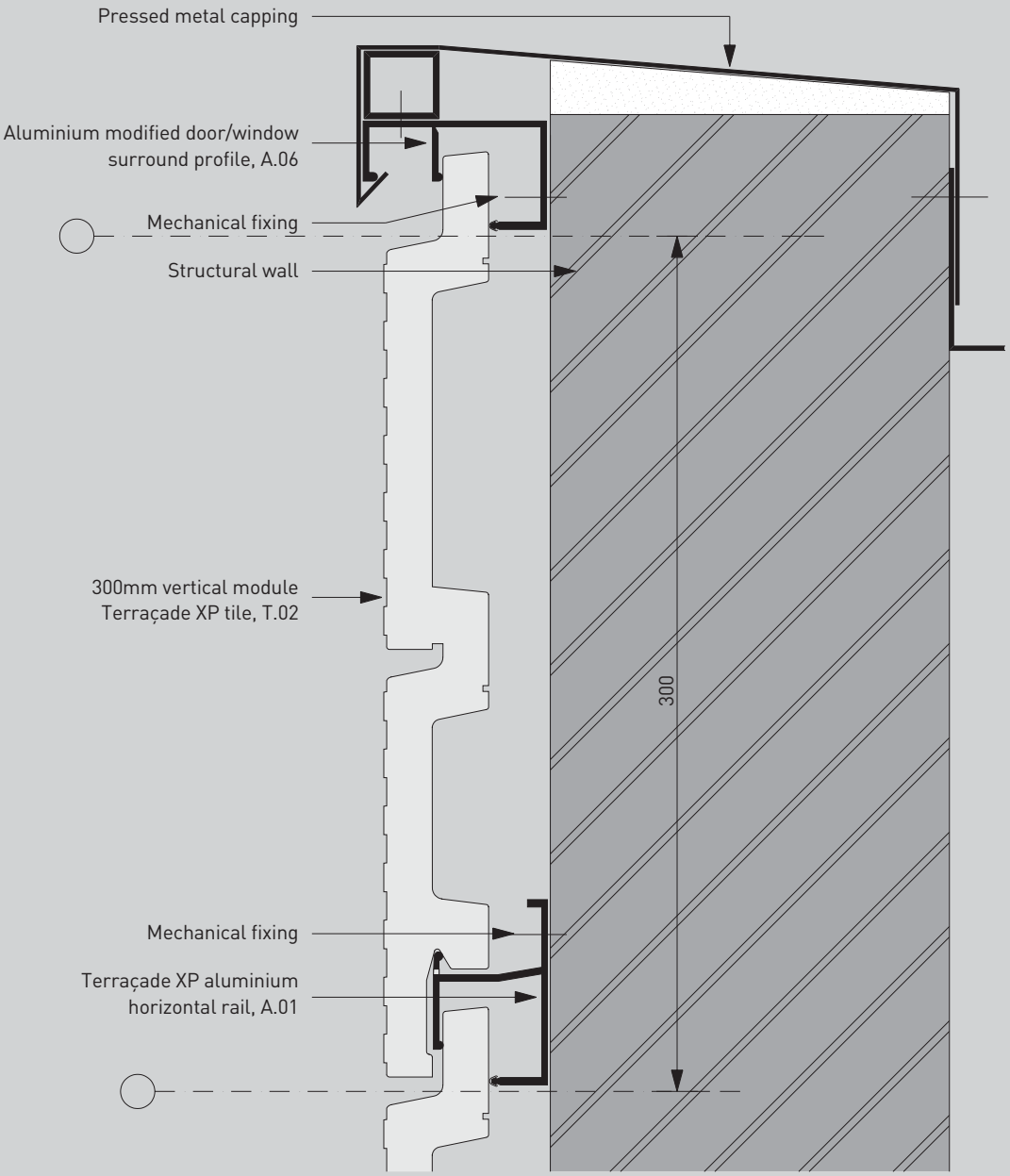
STANDARD INSTALLATION:
WINDOW JAMB – HORIZONTAL SECTION



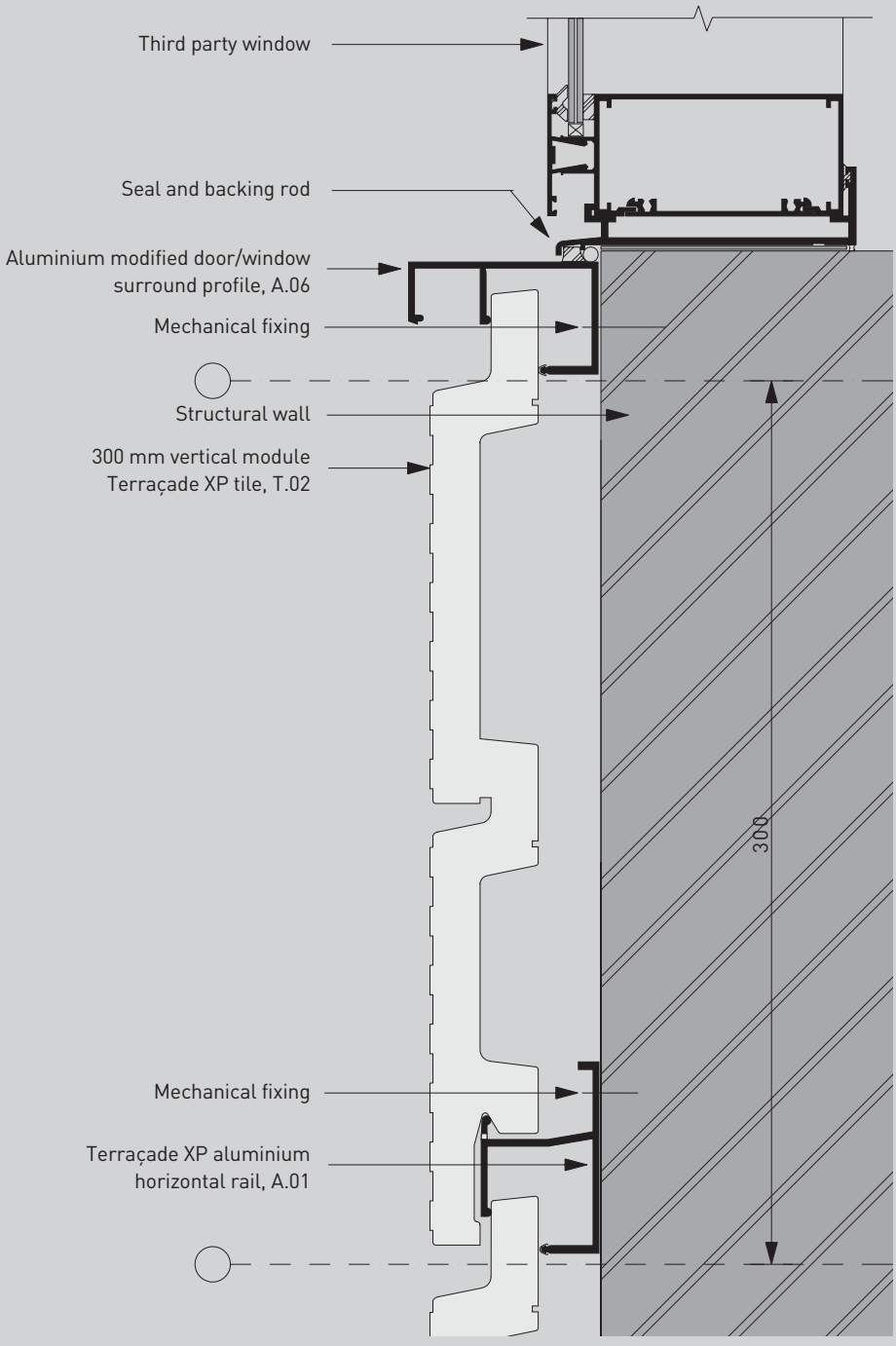
ALTERNATE INSTALLATION:
MODIFIED BASE SURROUND – VERTICAL SECTION



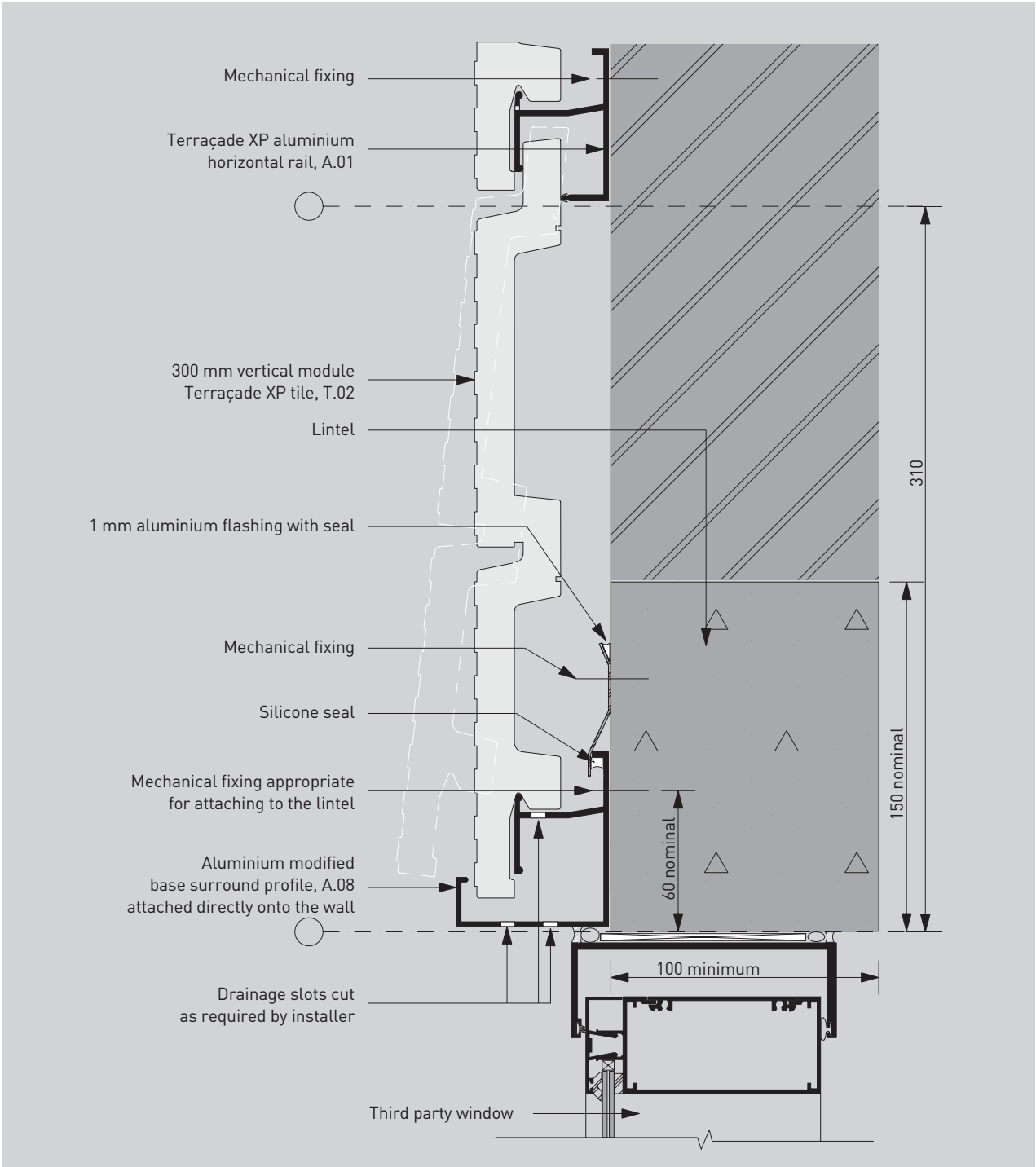
ALTERNATE INSTALLATION:
MODIFIED PARAPET DETAIL – VERTICAL SECTION



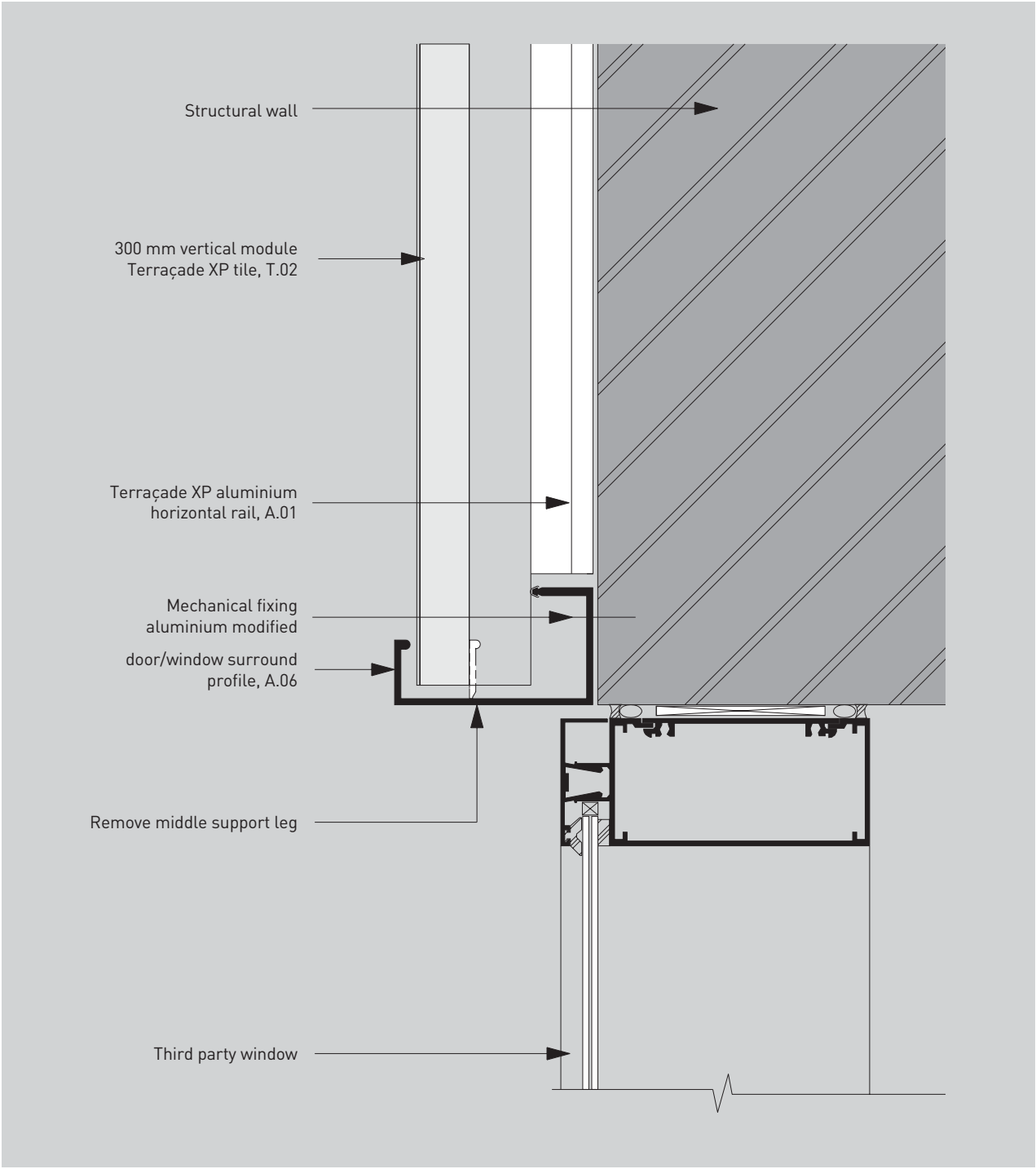
ALTERNATE INSTALLATION:
MODIFIED WINDOW SILL – VERTICAL SECTION



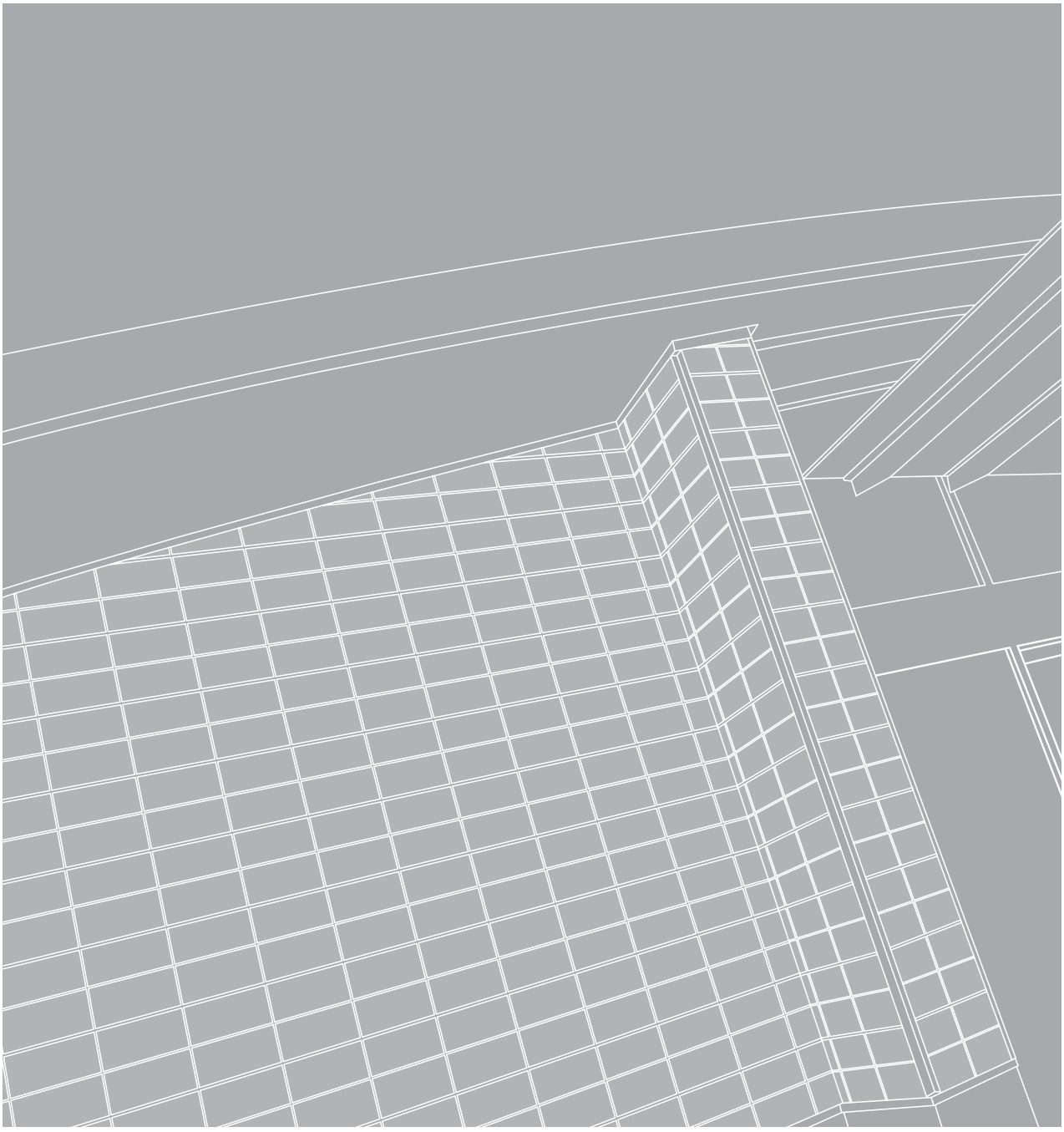
ALTERNATE INSTALLATION:
MODIFIED WINDOW HEAD – VERTICAL SECTION



ALTERNATE INSTALLATION:
MODIFIED WINDOW JAMB – VERTICAL SECTION



MAINTENANCE



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MAINTENANCE GUIDE:
FOR TERRAÇADE™ FAÇADE SYSTEM COMPONENTS

1. SYSTEM INSPECTION
It is recommended that the Terraçade Façade System be inspected at regular intervals to ensure the integrity of the system. The inspection interval will vary according to the sub-frame and trim components utilised in the system. Below is a summary of cleaning and maintenance information that can be accessed at the Terraçade website

2. CLEANING
Terraçade tiles are a natural terracotta product and are therefore virtually maintenance free. If you wish to remove any dirt or pollution grime that has built up over time, simply lightly hose or sponge down the tiles with water.

The tiles should be washed down during installation using a sponge with water and a neutral pH cleaner and then rinsed off with clean water. For ongoing maintenance the tiles may be hosed or sponged to remove dust and the build-up of dirt. Normally, cleaning the tiles will be as easy as letting the rain do the work for you.

3. ALUMINIUM TRIMS
a. Care & Maintenance Instructions
A simple regular clean will minimise the effects of weathering and will remove dirt, grime and other build-up detrimental to all powder coatings.

b. Recommended cleaning method
Just a gentle clean with a soft brush and mild detergent, followed by a fresh water rinse, will maintain the long-term performance of your powder coated products. In rural or normal urban environments cleaning should occur every 12 months. In areas of high pollution, such as industrial areas, geothermal areas or coastal environments, cleaning should occur every three months. In particularly hazardous locations, such as beachfronts, severe marine environments or areas of high industrial pollution, cleaning should be increased to monthly.

c. Recommended cleaning products
To protect the surface of your powder coated products, do not use strong solvents, abrasive cleaning products or those products that are recommended for thinning various types of paints. If you need to remove splashed paint, sealants or mastics from your powder coated products, you can use white spirits. When using white spirits, cleaning should be carried out in shade and during cooler temperatures using a soft cloth and gentle wiping only. It is also recommended that, prior to use, a small non-visible area of your powder coated products be tested to ensure that no visual colour change or damage will occur, particularly with bright and deep colours.

4. SEALING TILES
Terraçade tiles have a hard wearing surface that is resistant to most normal staining agents. In particularly difficult environments, for instance high traffic city areas, Terraçade may be exposed to graffiti vandalism or build up of carbon dirt from passing motor vehicle traffic. A high quality impregnating (penetrating) sealer can be used to make the surface easier to clean and prevent permanent staining as much as possible.

5. DRY TREAT STAIN-PROOF
Dry treat Stain-Proof is a permanent, visible, fully breathable impregnating sealer for protection against water ingress and salt attack. It has graffiti resistance and a 15 year performance warranty when sealing is performed by an Accredited Applicator (visit www.drytreat.com for more detail).

Stain-Proof has special molecules which bond permanently inside the terracotta. It is highly recommended for such surfaces for its 15 year plus durability and its ability to stand up to commercial cleaning techniques such as pressure hosing which are commonly used to clean vertical surfaces.

a. Maintenance after sealing
Due to superior bonding, Stain-Proof will not be harmed by strong alkaline cleaners or pressure hosing. Standard cleaning regimes (except for acid washing) can continue to be used on the treated surfaces, and the use of special proprietary cleaning chemicals or equipment is not required to uphold the performance warranty.

b. Pre-sealing preparation
Any surface to be sealed should be clean and looking just as you want it before it is sealed - it may be impossible to remove stains after sealing. Ensure the material is thoroughly dry before applying any Dry-Treat sealer

c. Test area
Always test any cleaning chemical or sealer on a small, inconspicuous area of the surface 24 hours before doing the project, to check that it will produce the desired result.

6. REPLACING INDIVIDUAL TILES
If a Terracade XP tile is damaged they can easily be replaced. Simply remove the damaged tile or broken pieces and insert a new tile. If tiles have been mechanically fixed (using the method described in the installation section) start removing tiles vertically adjacent to the damaged tile. Remove the tiles one by one by unscrewing the fasteners at each step until the damaged tile is removed. Insert the new tiles and replace the tiles and mechanical fixings working back up the wall until all the tiles have been replaced.

NOTES:

TERRAÇADE XP NOTES

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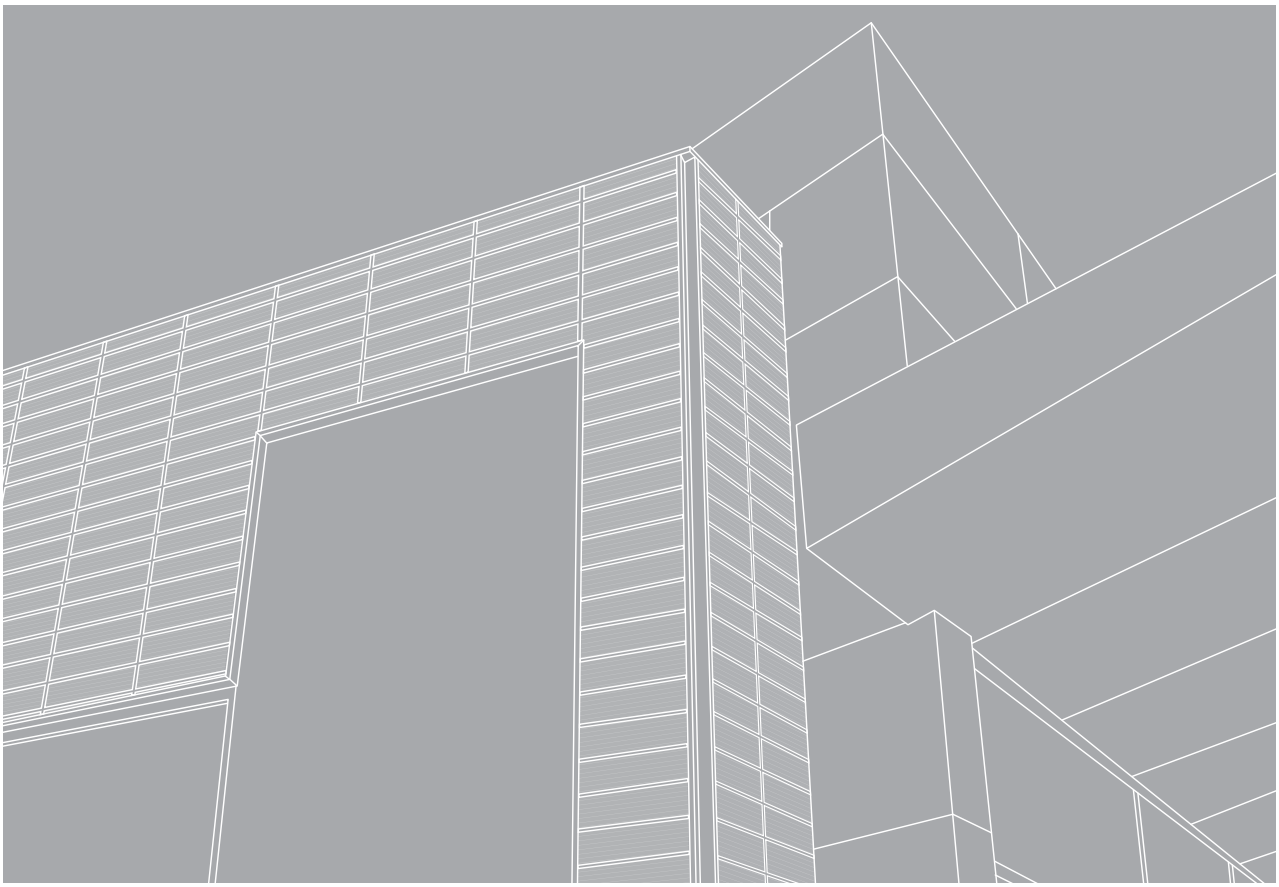

QUALITY GUARANTEE:

Brickworks Building Products continued commitment to quality and innovation ensures that Terraçade XP will remain the benchmark for excellence for many years to come.

Our tradition, experience and financial strength have made Brickworks Building Products the first choice for many architects, builders and designers.

Terraçade XP has a warranty of 15 years on the system and a lifetime warranty on colour fastness and durability, as per Brickworks Building Products Warranty for Terraçade.

Contact Brickworks Building Products to have an architectural consultant visit you with samples and technical information, or to discuss your next project.

15 YEAR WARRANTY ON THE SYSTEM

LIFETIME WARRANTY
COLOURFASTNESS & DURABILITY

Please note: Photographs should be considered indicative of colour and texture only. Variations in colour and shade are inherent in all clay fired products. All Terraçade tiles and accessories should be ordered at the same time to avoid the possibility of batch to batch variations. No responsibility will be accepted for colour selection, matching, blending and any other physical or colour related defects once the tiles have been incorporated into any construction. Terraçade™ and Terrcade XP™ are registered trademarks of the Brickworks Building Products or its wholly owned subsidiaries. ACN 119 059 513

Australian Patent Pending, New Zealand Patent, Australian and New Zealand Design Registrations.

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