

Ian Bennie & Associates

Test Report No. 2019-056-S5

Brickworks Terracade TN - Cavity wall

Specimen tests by the methods of AS/NZS4284

**To the requirements of NCC 2019 verification methods
FV1 & V2.2.1**

For

Brickworks Building Products

April 2022



Accredited Laboratory No. 2371
Accredited for compliance with ISO/IEC 17025 - Testing



TEST REPORT NUMBER 2019-056-S5

Test Client: Brickworks Building Products
738-780 Wallgrove Road, Horsley Park, NSW, 2175

Specimen identification:

A Brickworks Terracade TN test specimen measuring 2100 mm in height x 3000 mm in width was installed on a timber stud wall by the client. The sample consisted of Terracade tiles on vertical joining channels with a brickworks branded Frameshield 100 flexible wall wrap. The sample included a 300 mm return, window, wall junctions, control joints. Full details of the cladding system were provided by the Client and relevant details are included in Appendix C. Drawings provided 20th June 2019

Construction:

For the purposes of the NCC the specimen was deemed to be a Cavity Wall utilising appropriate breather wrap to prevent water ingress to the stud framing. For the purposes of observations during the test, acrylic sheets were used as the internal lining on the stud frame. Holes were introduced through the internal lining to create an air infiltration of 1.6 L/s.m² at 150 Pa of pressure on the sample, being the highest allowable infiltration rate specified in AS/NZS 4284.

Test Method:

NCC-2019 Weatherproofing Verification Methods V2.2.1 and FV1 with test procedures in accordance with Australian Standard AS/NZS 4284:2008, Testing of building facades.

Nominated Serviceability limit state pressures: +1500 Pa and -1500 Pa

Test Location: Ian Bennie & Associates, Dandenong South, Victoria

Test Date: 19th July 2019

Sample received:

12th July 2019

Requirement:

The compliance requirements of the NCC-2019 Weatherproofing Verification Methods FV1 & V2.2.1 are given in Appendix B

Conclusions:

The Brickworks Terracade TN passed all the compliance requirements of the NCC-2019 Weatherproofing Verification Methods FV1 & V2.2.1 at the nominated test parameters. Complete detail of all tests conducted are given in the body of this report

Disclaimer:

Sample information including material properties and detailing was supplied by the client and no verification of actual construction details or sampling of production stock could be performed. The test results contained herein apply to the sample as tested. Ian Bennie & associates accept no liability for claims of losses, expenses, damages and costs arising as a result of the use of product(s) referred to in this report.

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Brickworks Building Products

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Ian Bennie 22nd April 2022

Authorised Signatory

Water Penetration Test 1; 19th July 2019

Nominated Serviceability limit state pressures: +1500 Pa /1500 Pa

Static pressure water test: 450 Pa

No leakage through the cladding system was observed during the test.

Cyclic pressure water test: 450 Pa - 900 Pa

No leakage through the cladding system was observed during the test.

Static pressure water test with 6mm penetrations in cladding: 450 Pa

No leakage through the cladding system was observed during the test.

Cyclic pressure water test with 6mm penetrations in cladding: 450 Pa - 900 Pa

No leakage through the cladding system was observed during the test.

Static pressure water test with internal lining removed: 50 Pa

No leakage through the cladding system was observed during the test. After the test the building wrap was cut away and there was evidence of water having penetrated cladding boards however there was no pooling of water on horizontal surfaces.

APPENDIX A TEST PROCEDURES & METHODS FOR AS/NZS:4284-
2008
& NCC-2019 FV2.2.1

Test Sequence

NCC- 2019 Weatherproofing test procedures were conducted in accordance with Australian Standard AS/NZS 4284:2008, Testing of building facades, as detailed in Appendix A in the following sequence:

Static pressure Pre loading.

Positive and negative serviceability limit state pressures were applied to the external face of the specimen for periods of 1 minute each.

Static pressure water test.

A water penetration test was then carried out in accordance with Clause 8.5 of AS/NZS 4284:2008 at a static pressure of 30% of W_s for a period of 15 minutes.

Cyclic pressure water test.

A water penetration test was then carried out in accordance with Clause 8.6 of AS/NZS 4284:2008 at the cyclic pressures of: 30% -60% of W_s for 5 minutes.

Cyclic pressure water test with 6mm penetrations in cladding.

6mm diameter holes were inserted in the external face of the specimen at the following locations:

- Wall/window joint at 3/4 height of the window
- Immediately above the window
- Through the external sealing of the vertical and horizontal control joints
- Above the meter box and the downpipe penetrations.

Water penetration tests were then carried out in accordance with Clause 8.6 of AS/NZS 4284:2008 at the Static and Cyclic pressures as detailed above.

Static pressure water test with internal lining removed.

The internal acrylic lining of the sample was removed and a static water penetration test was then carried out in accordance with Clause 8.5 of AS/NZS 4284:2008 at a static pressure of 50 Pa for a period of 15 minutes.

Test Equipment

Water was applied via sprays located 300 mm away from the outdoor face of the test specimen. Water flow rate to the sprays was measured with a calibrated pressure gauge to an accuracy of 2% and was maintained at a level of 0.05 l/s.m² over the test area throughout the test. Water application was maintained continuously and water was

observed to evenly cover the exterior face of the test specimen. All pressure transducers are calibrated against NATA certified manometers and may be taken to have a measurement accuracy of 1%.

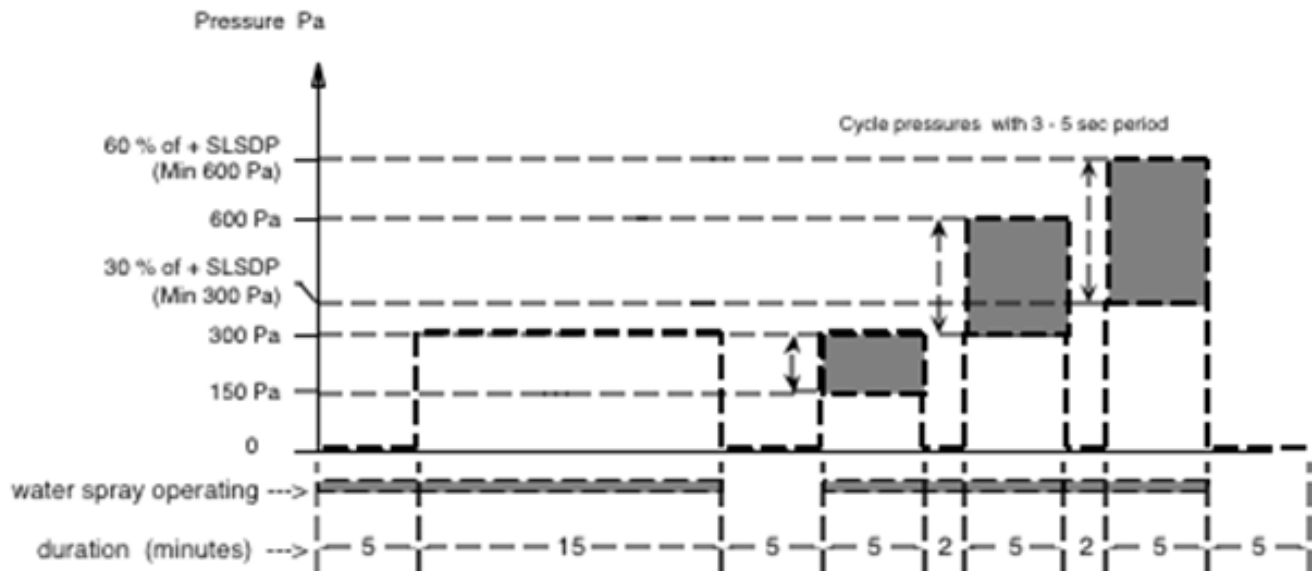
Water Penetration Test Parameters as stated in AS/NZS:2484-2008

Test pressures:

Static 30% of W_s (at least 300 Pa) duration = 15 minutes
Cyclic 15% - 30% of W_s duration = 5 minutes
 20% - 40% of W_s duration = 5 minutes
 30% - 60% of W_s duration = 5 minutes

Water application rate: 0.05 L/m².s

Water penetration test sequence



Test Requirement:

As per the Compliance requirements of NCC-2019 Weatherproofing Verification Methods V2.2.1 and FV1 that are given in Appendix B.

APPENDIX B – COMPLIANCE REQUIREMENTS

Applicability to be verified with specifier

These results are applicable for the weather proofing of an *external wall* that;

- i.) Has a risk score of 20 or less (tables FV1 & V2.2.1 a)
- ii.) Is not subjected to a ULS of more than 2.5kPa
- iii.) Includes only windows that comply with 2047

Compliance requirements:

- (i) A direct fix cladding wall and unique wall are verified for compliance with FP1.4 if there is no presence of water on the inside surface of the facade.
- (ii) A cavity wall is verified for compliance with FP1.4 if there is no presence of water on the removed surface of the cavity, except that during the simulation of the failure of the primary weather-defense or sealing, water may—
 - (A) transfer to the removed surface of the cavity due to the introduced defects (6 mm holes); and
 - (B) contact, but not pool on, battens and other cavity surfaces.

APPENDIX C – DETAILS OF THE TEST SPECIMEN

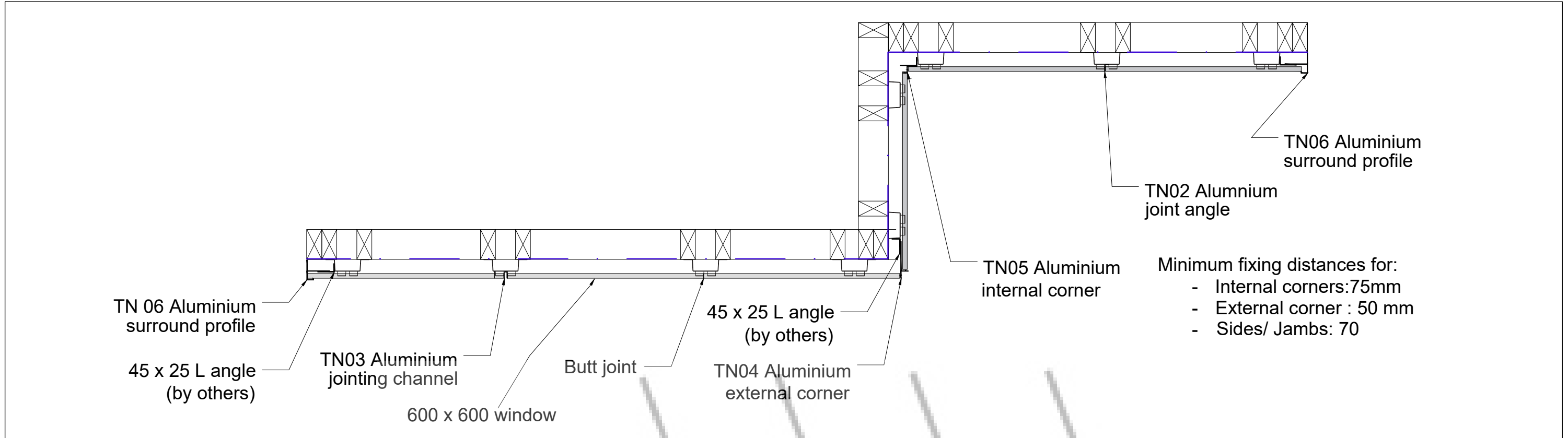
Air barrier used - Brickworks terracade membrane

Terraçade Membrane Properties

C6: Membrane Properties

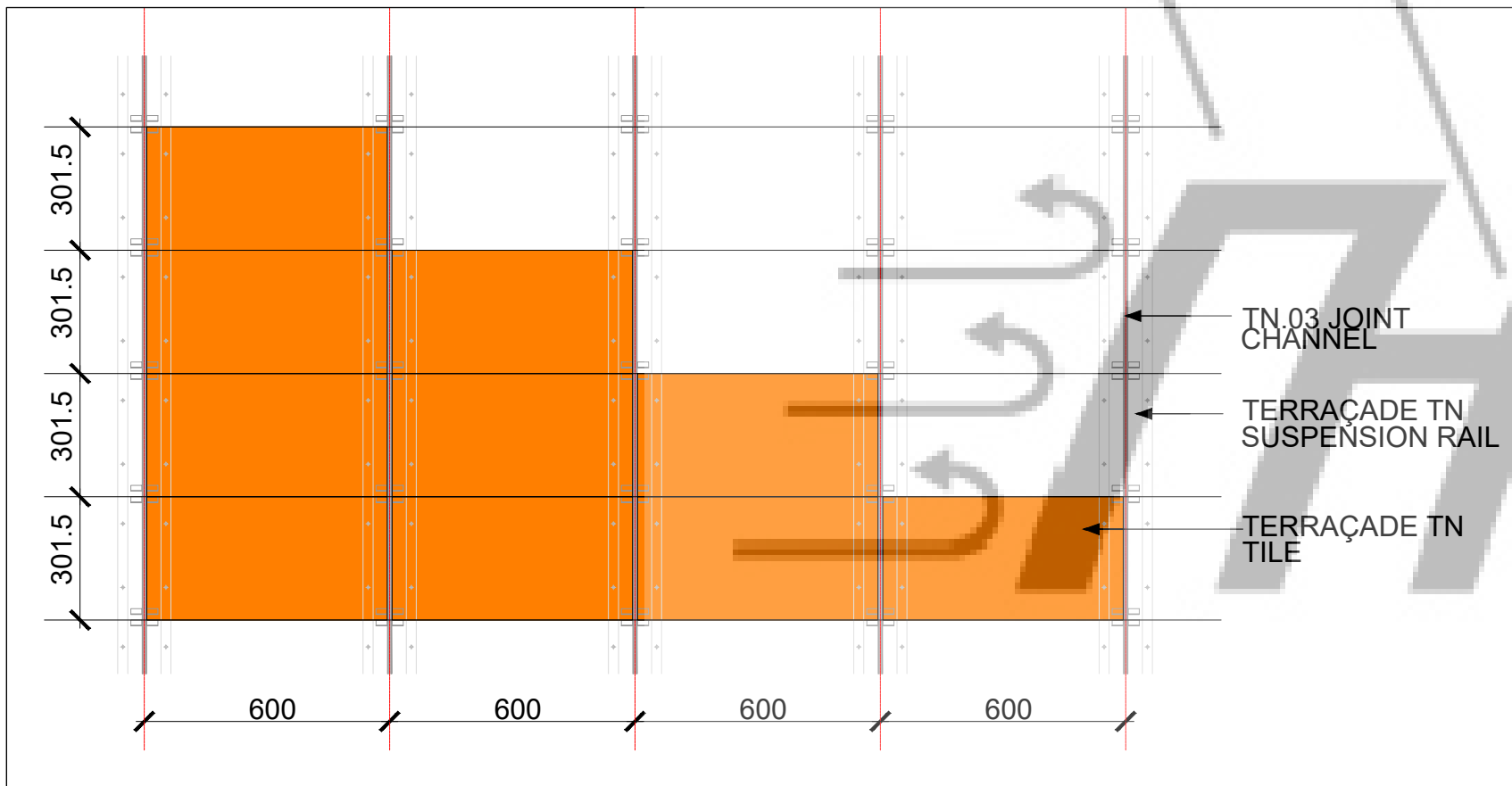
Roll Dimensions	1.5m x 50m	
Weight of complete Roll	~7.5kg	
Thickness	0.5mm	
Weight	100 g/m ²	
Resistance to Water Penetration	Pass	
Water Vapour Permeability	7.5 µg/Ns	
Vapour Resistance	0.13 MNs/g	
Burst Strength, Wet Dry	294N	
Duty	Light	
Flammability Index	Low (<5)	
Air Permeability/ Air Tightness	Air Permeable	
Allowable UV exposure prior to installation of cladding	2 months	
Tensile Strength	MD 3.8 kN/m	CD 3.1 kN/m

BUILD DETAILS

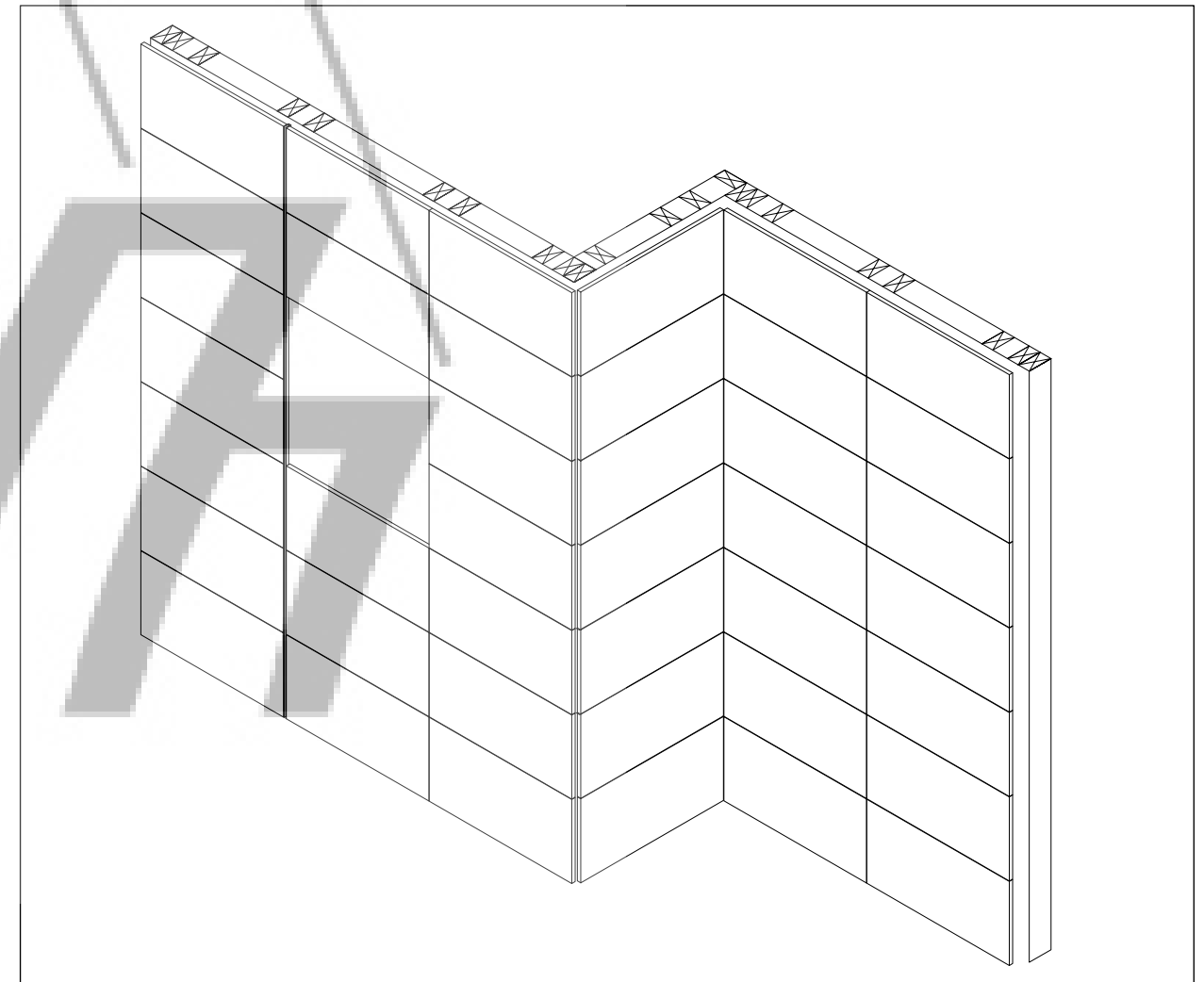


1. FRAMING AND DETAIL LOCATIONS

PLAN: SCALE 1:20

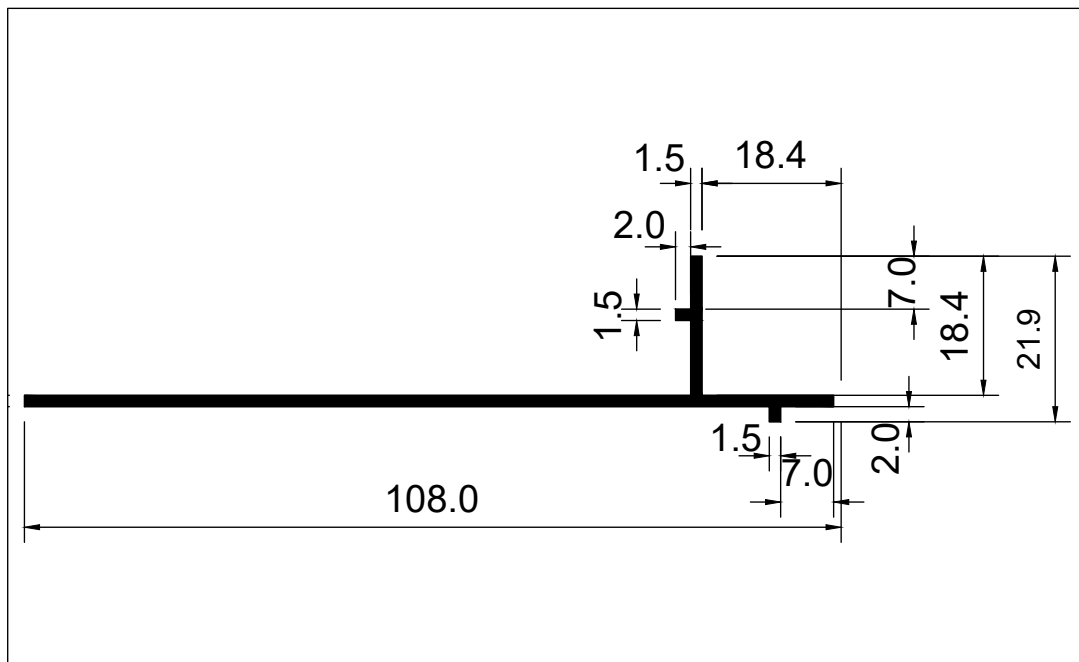


2. ELEVATION DETAIL



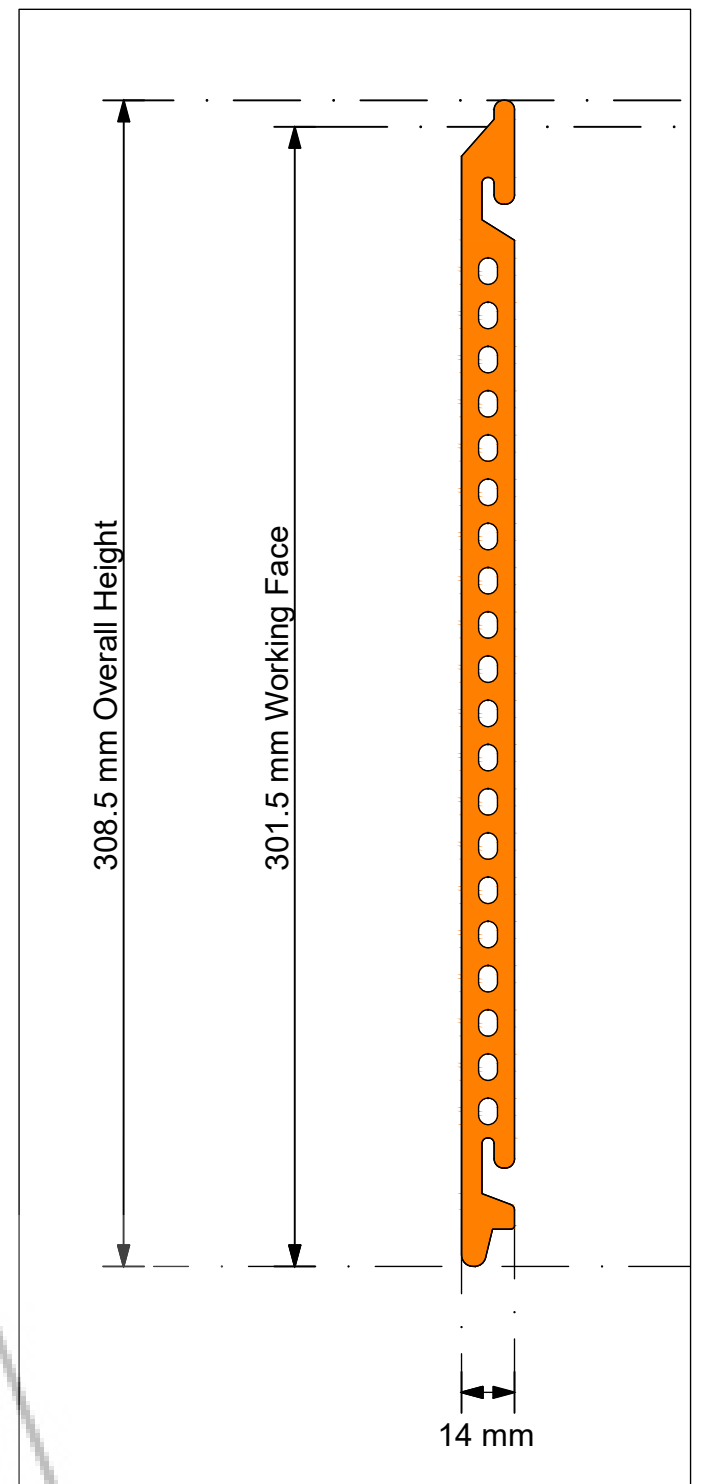
3. ISOMETRIC VIEW

COMPONENTS



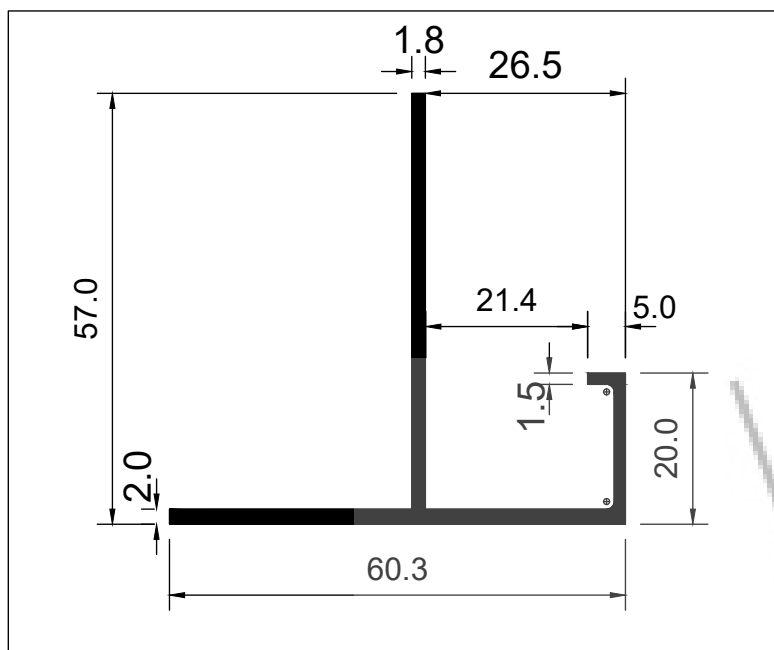
TN.04 EXTERNAL CORNER

SECTION - SCALE 1:1



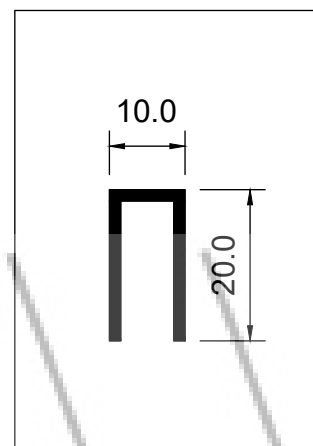
TN TILE

SECTION - SCALE 1:2



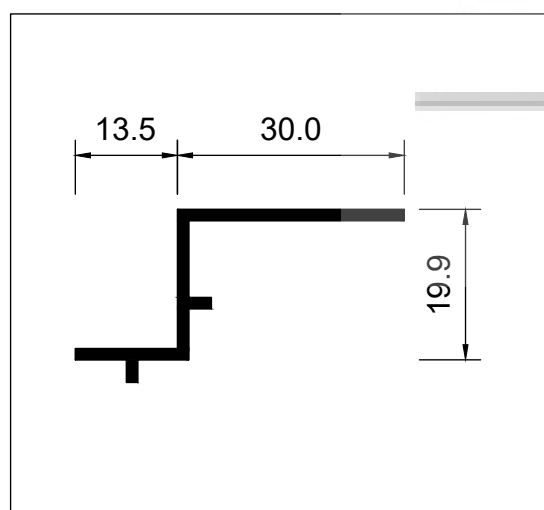
TN.06 ALUMINIUM SURROUND

SECTION - SCALE 1:1



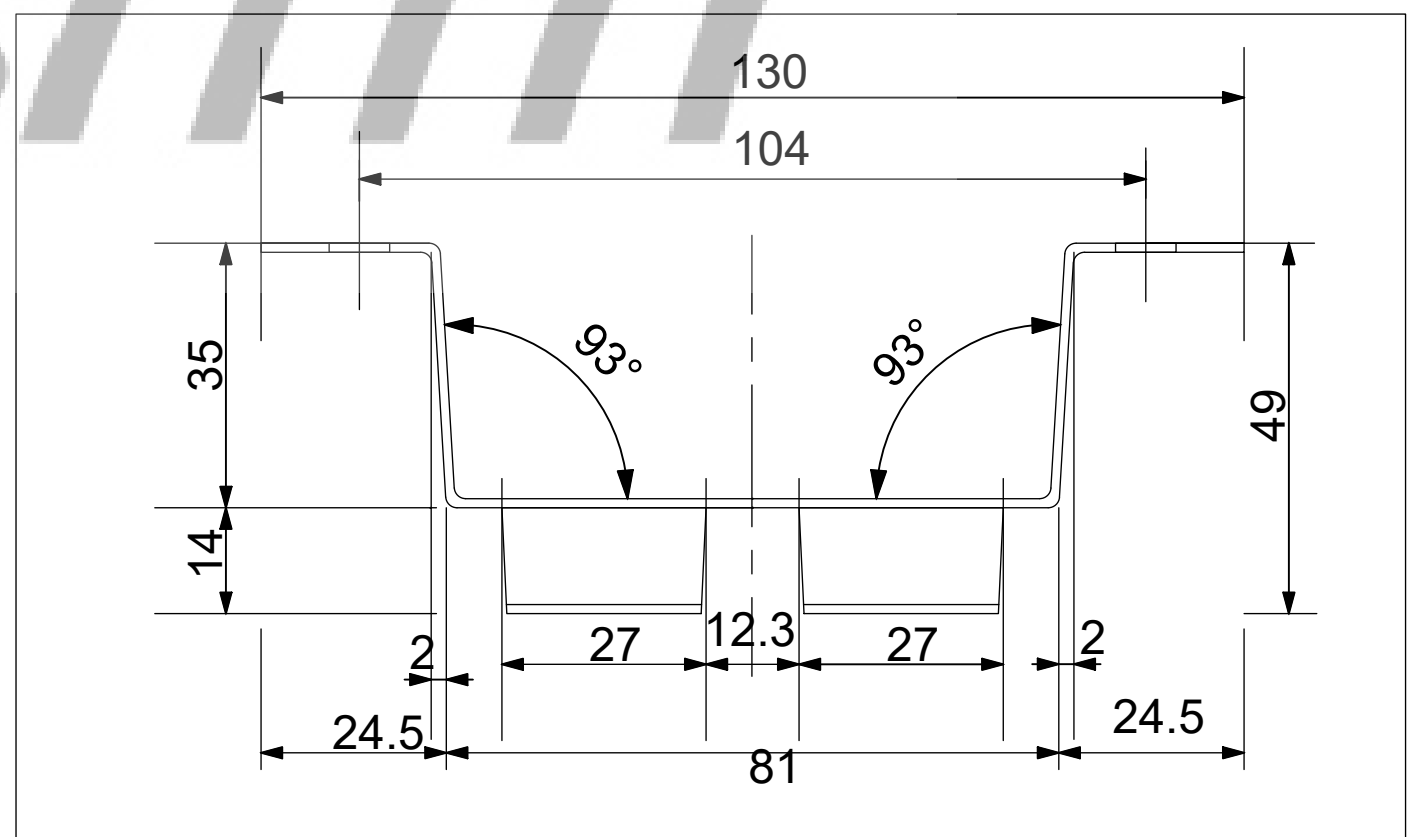
TN.03 JOINT CHANNEL

SECTION - SCALE 1:1



TN.04 INTERNAL CORNER

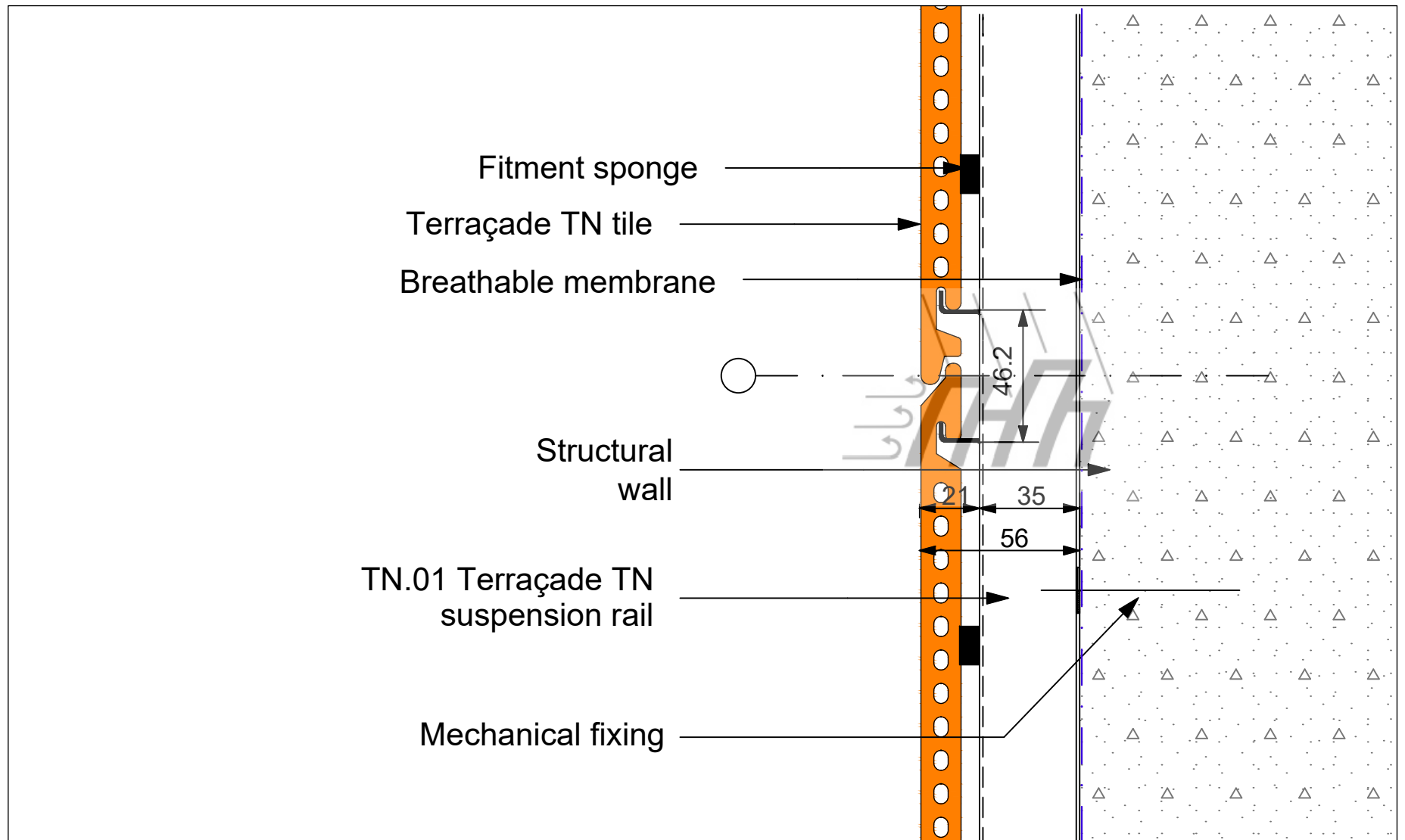
SECTION - SCALE 1:1



TN.01 SUSPENSION RAIL

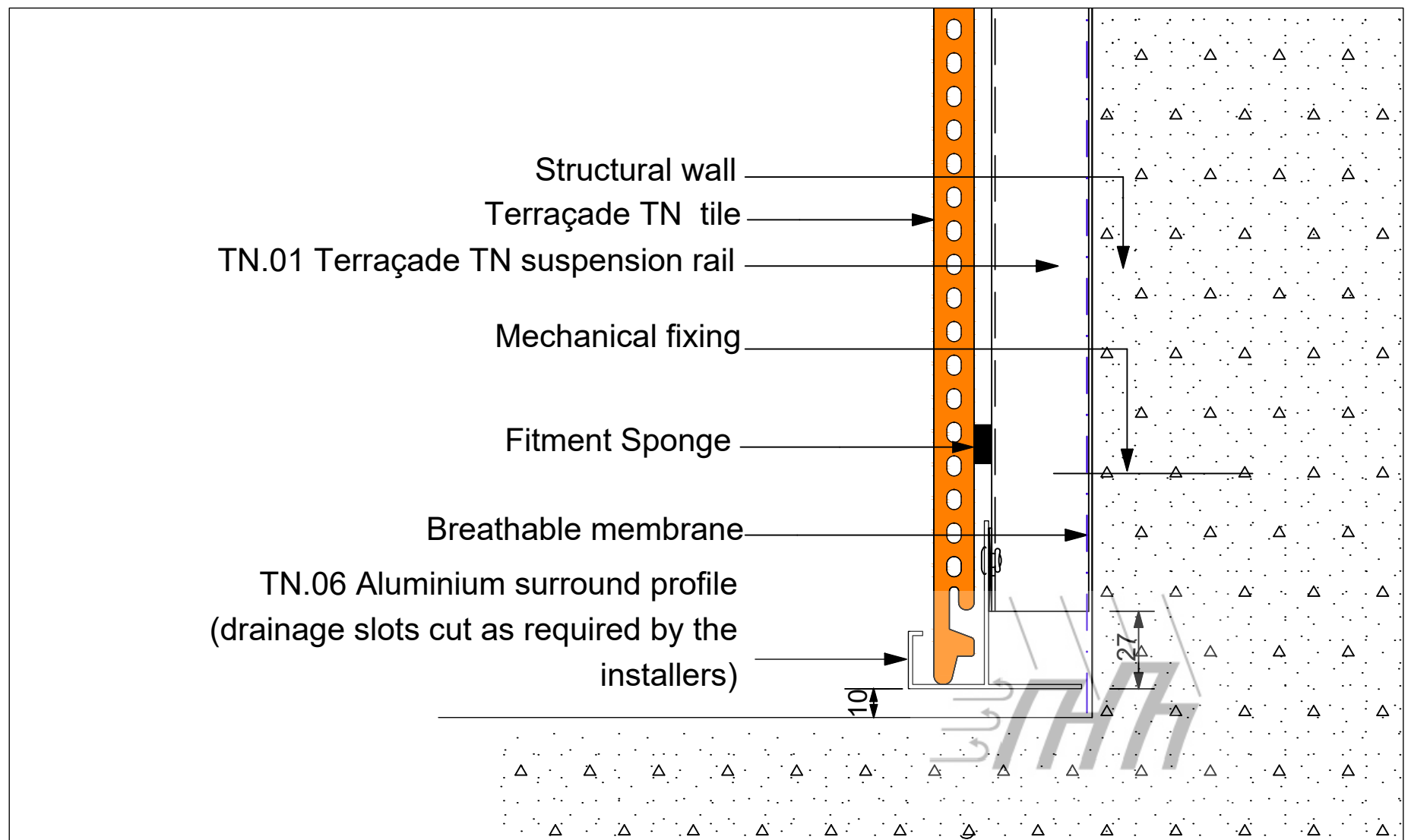
PLAN - SCALE 1:1

BASE SD-06 AND SIDE DETAIL SD-02



1. SIDE DETAIL

SECTION: SCALE 1:2

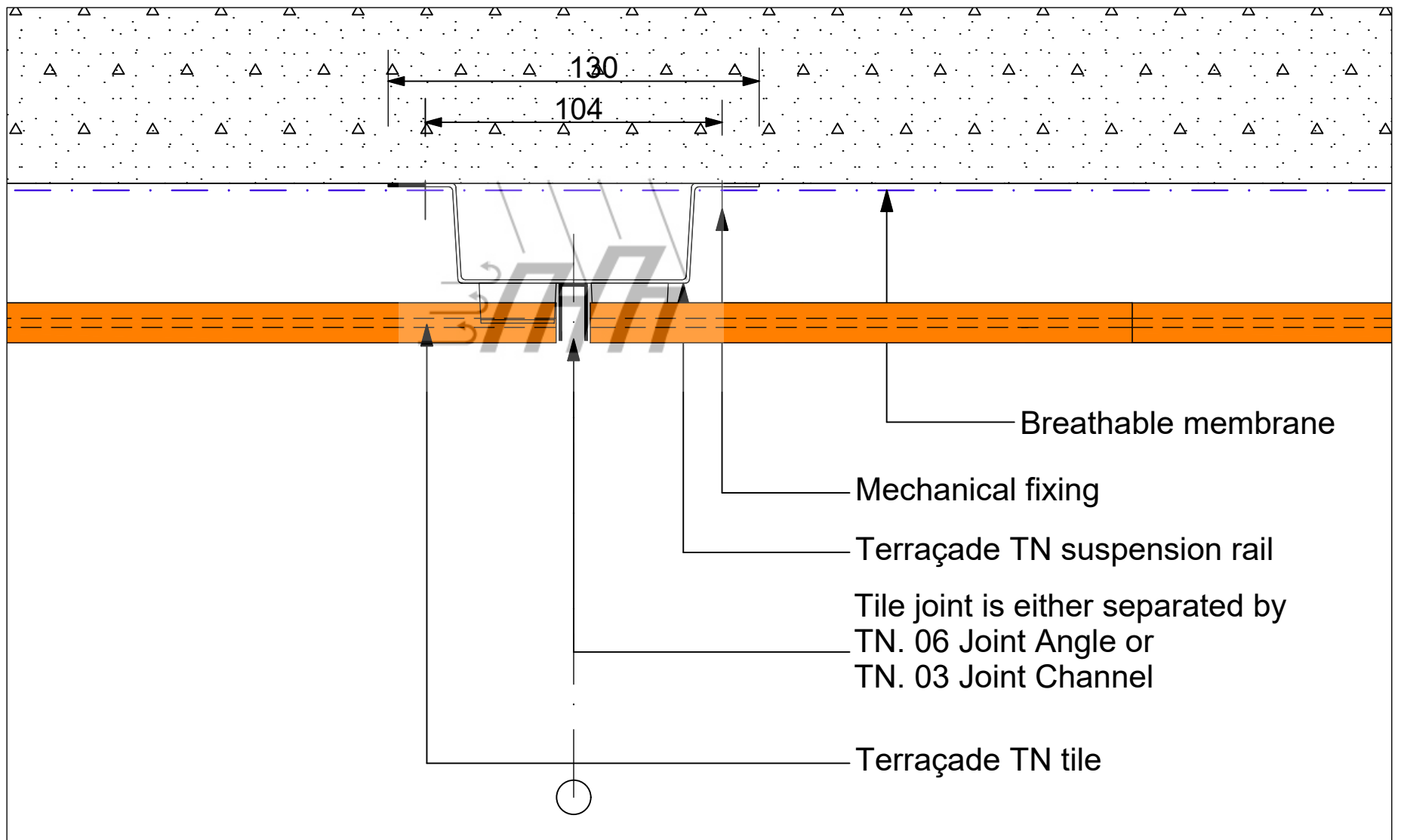


2. SIDE DETAIL

PLAN - SCALE 1:2

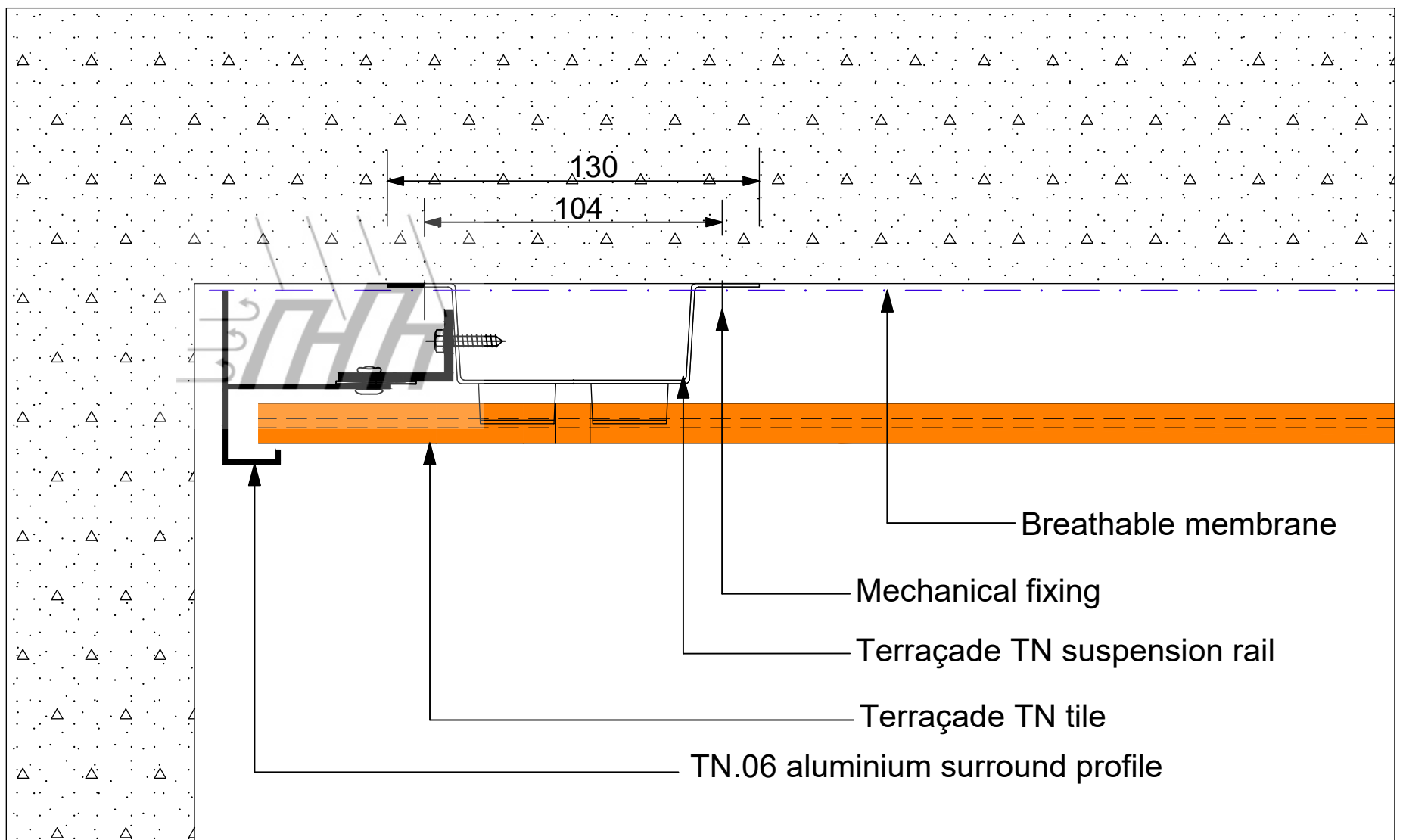
TERRAÇADE TN

HORIZONTAL - SD 03



1. HORIZONTAL DETAIL

PLAN: SCALE 1:2

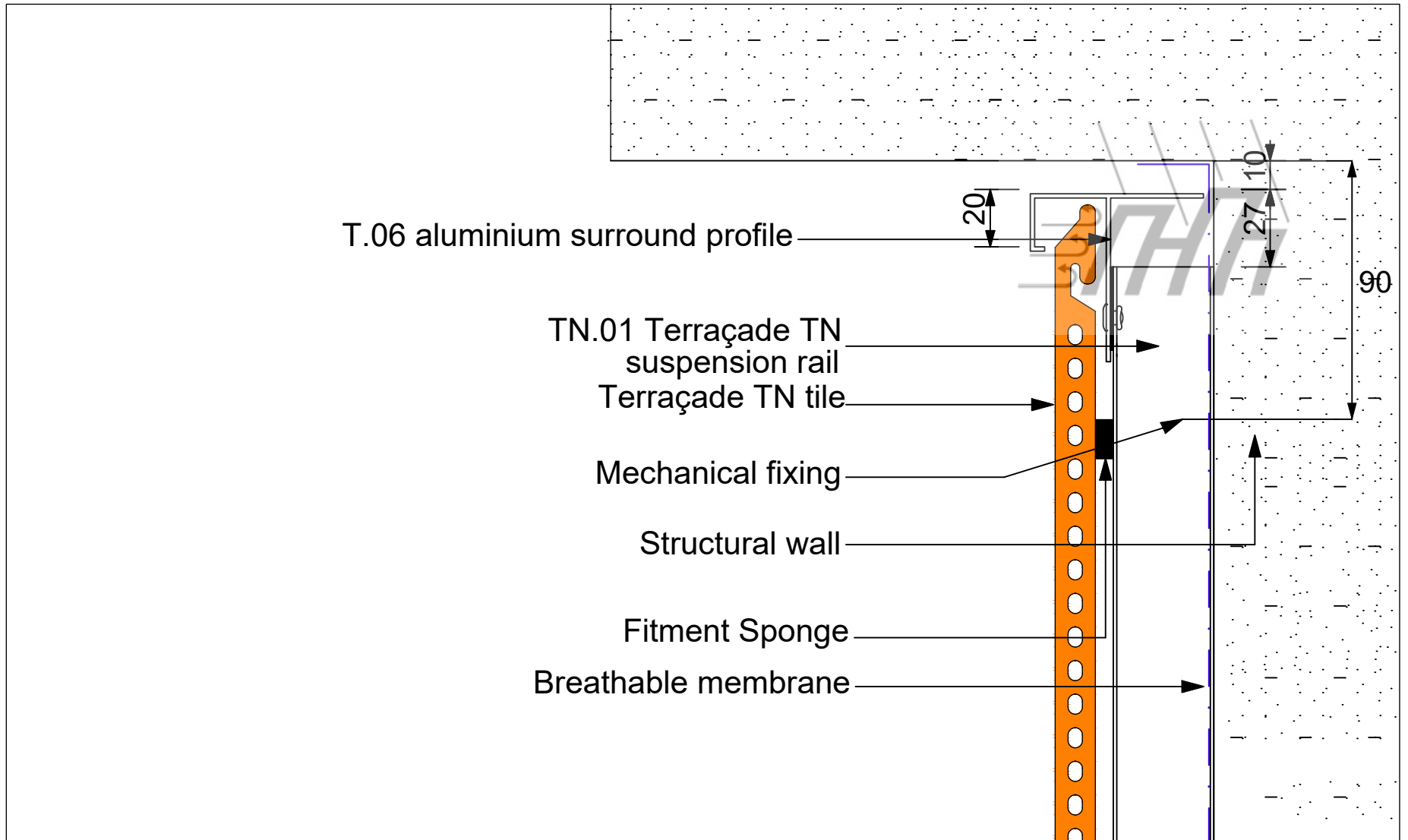


2. SIDE DETAIL

PLAN - SCALE 1:2

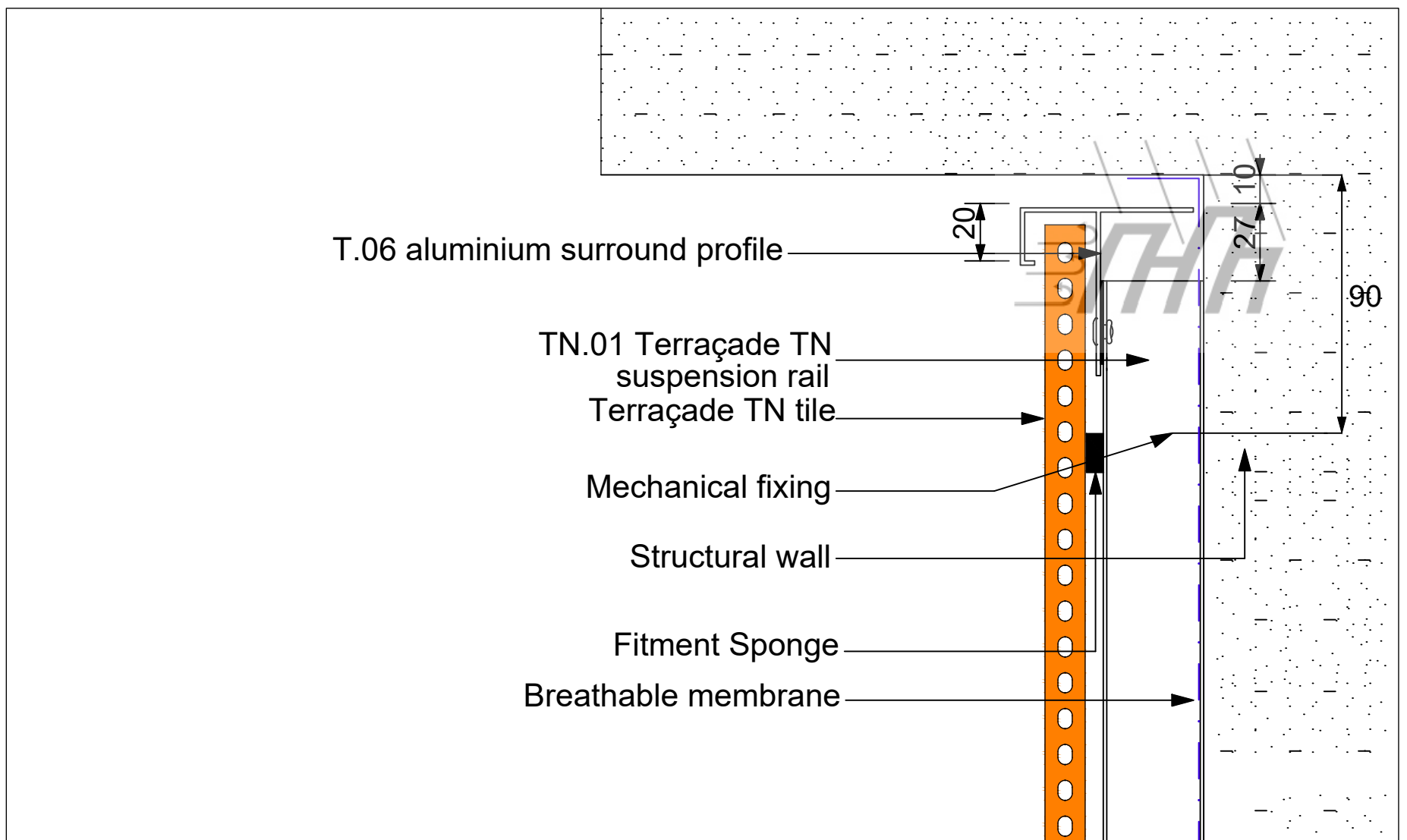
TERRAÇADE TN

PARAPET/EAVE - SD 07



1. PARAPET/EAVE DETAIL WHOLE TILE

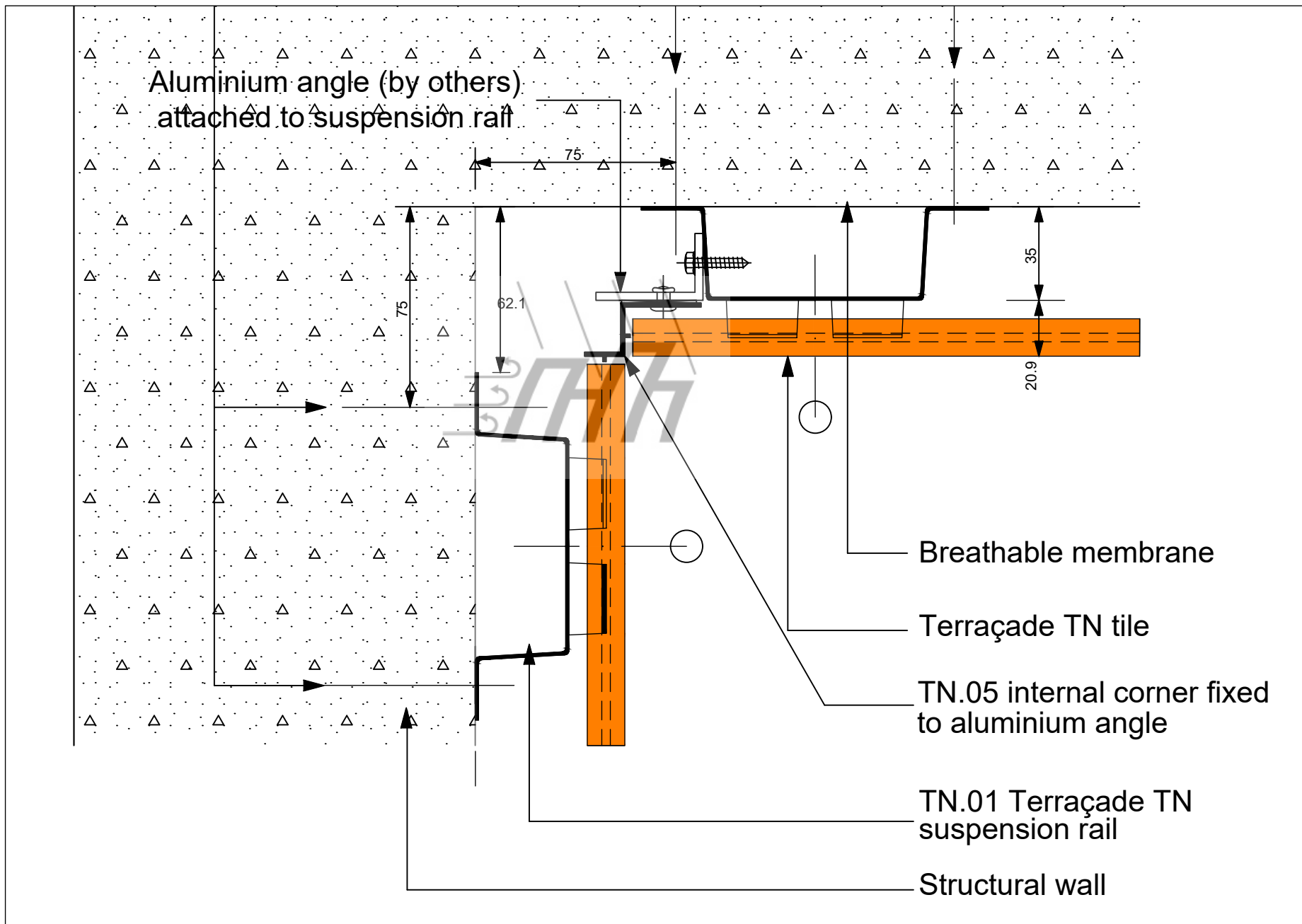
SECTION - SCALE 1:2



2. PARAPET/EAVE CUT TILE

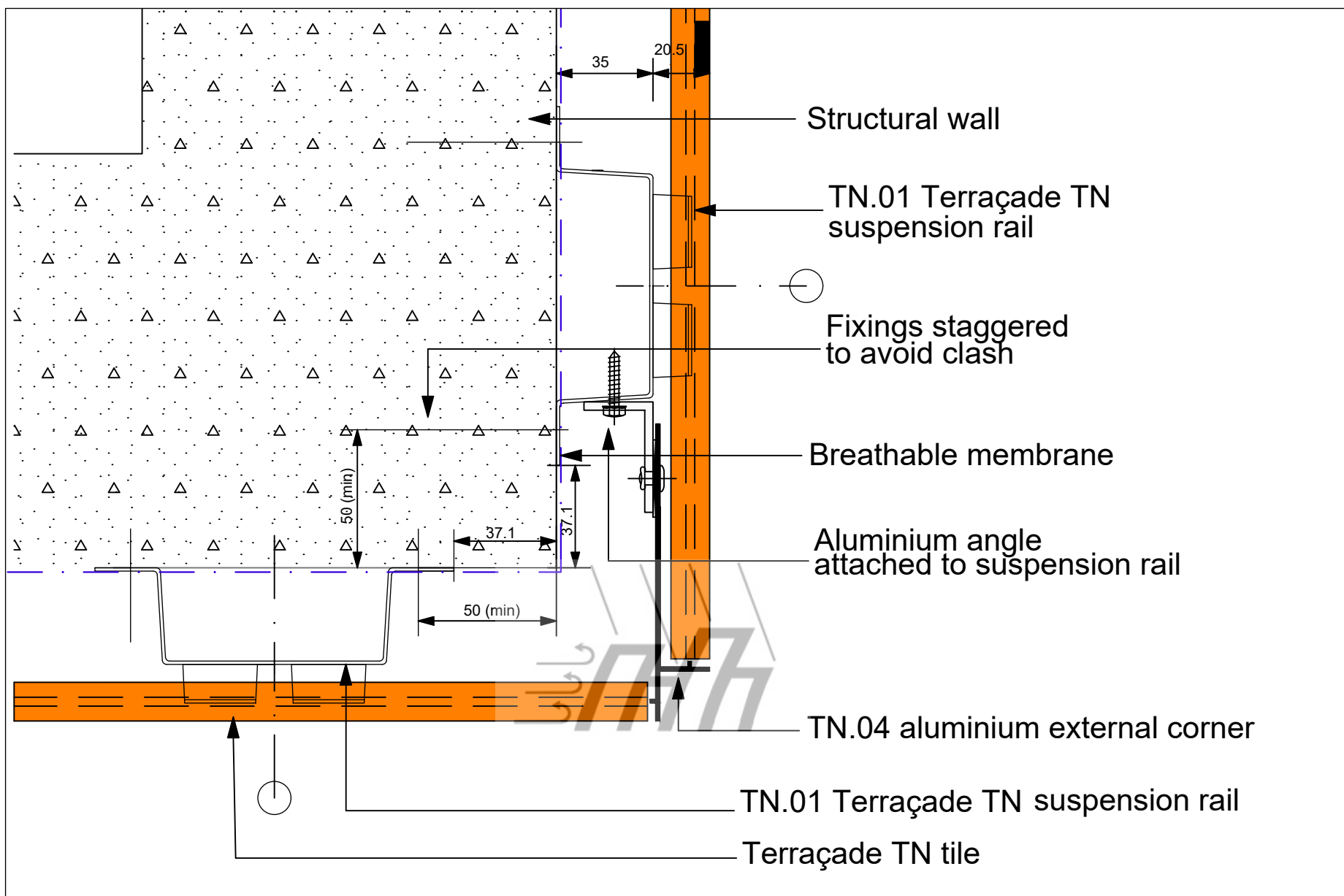
SECTION - SCALE 1:2

INTERNAL CORNER SD 05 AND EXTERNAL CORNER SD 04



1. INTERNAL CORNER

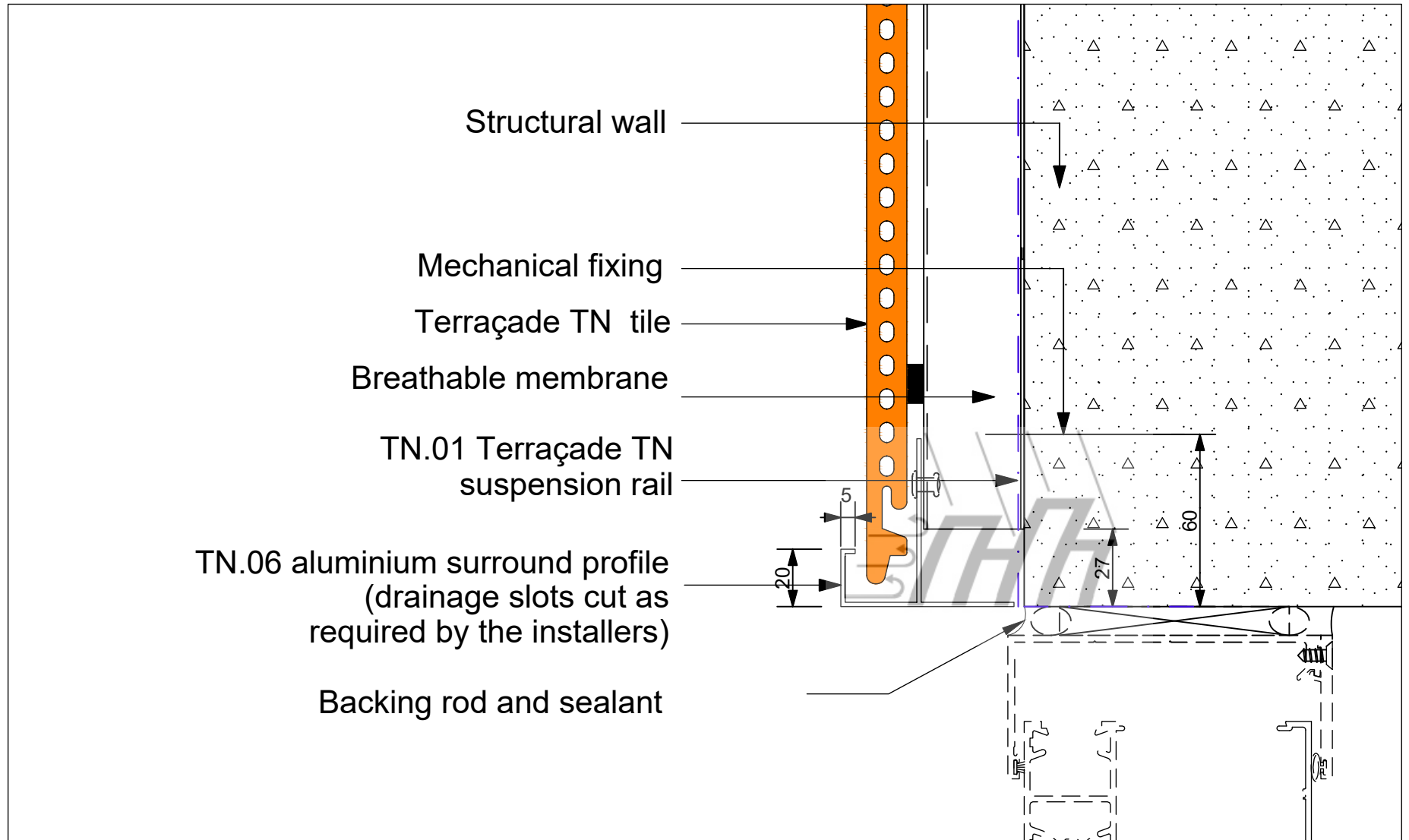
PLAN - SCALE 1:2



2. EXTERNAL CORNER

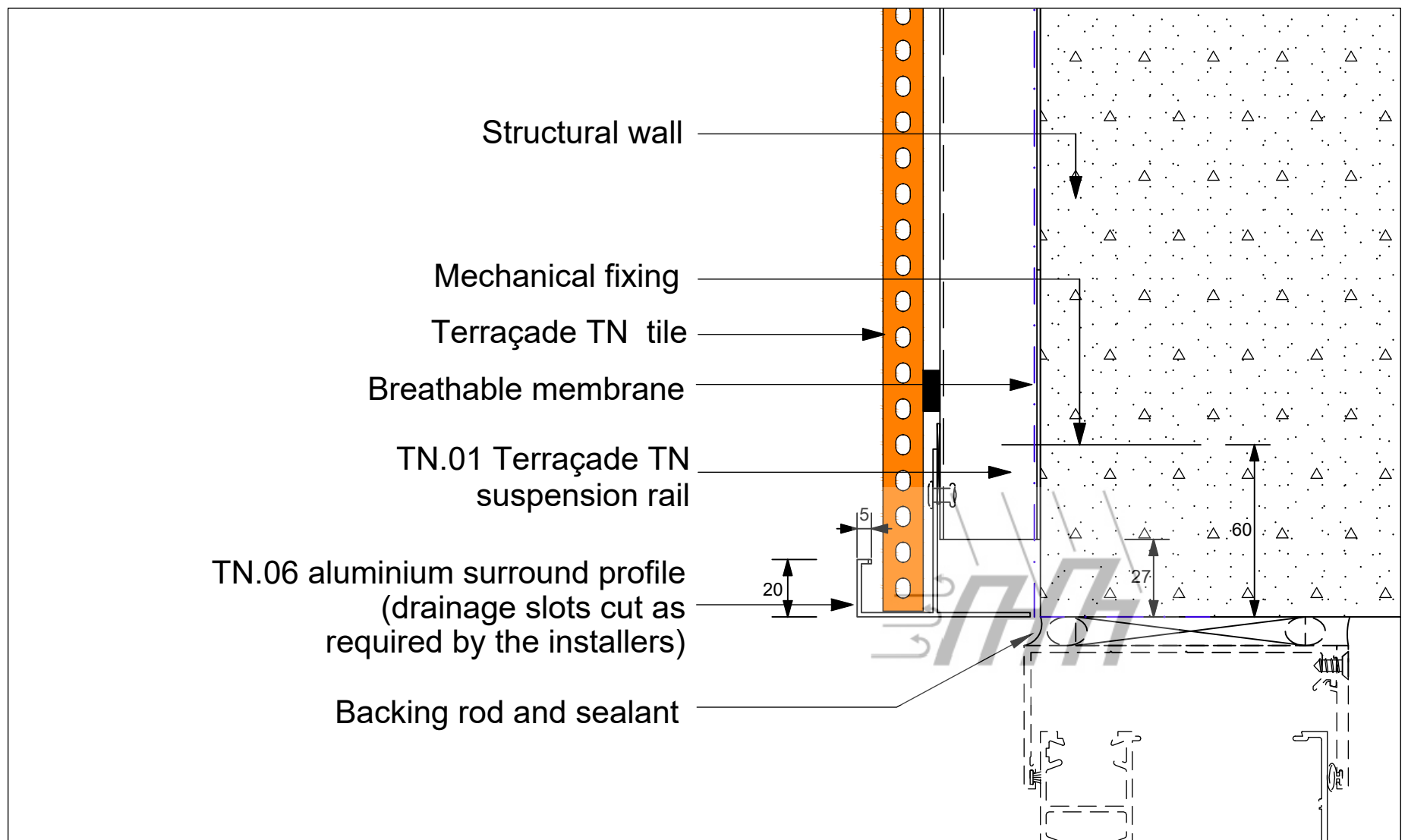
PLAN - SCALE 1:2

WINDOW HEAD - SD 09



1. WINDOW HEAD WHOLE TILE

SECTION - SCALE 1:2

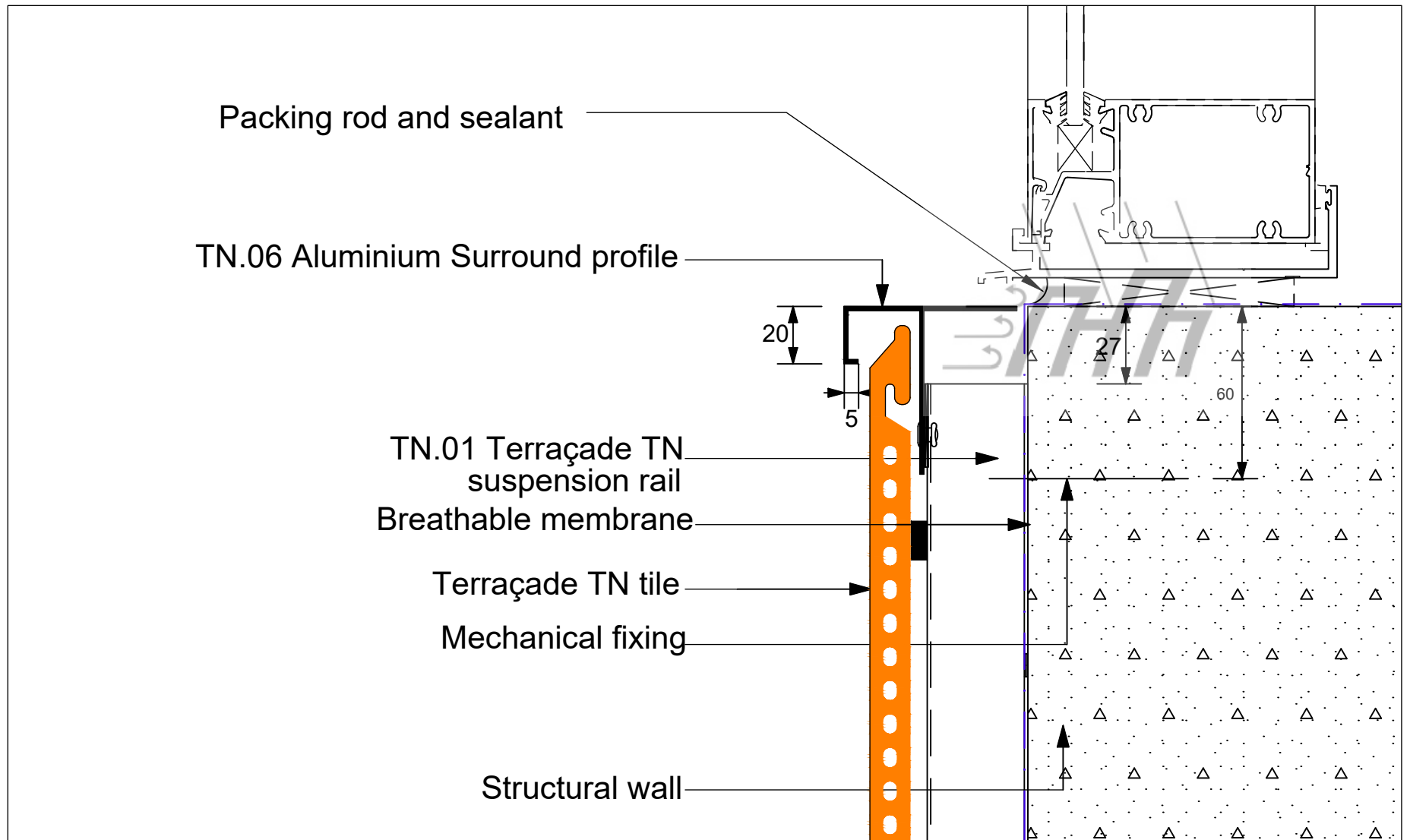


2. WINDOW HEAD CUT TILE

SECTION - SCALE 1:2

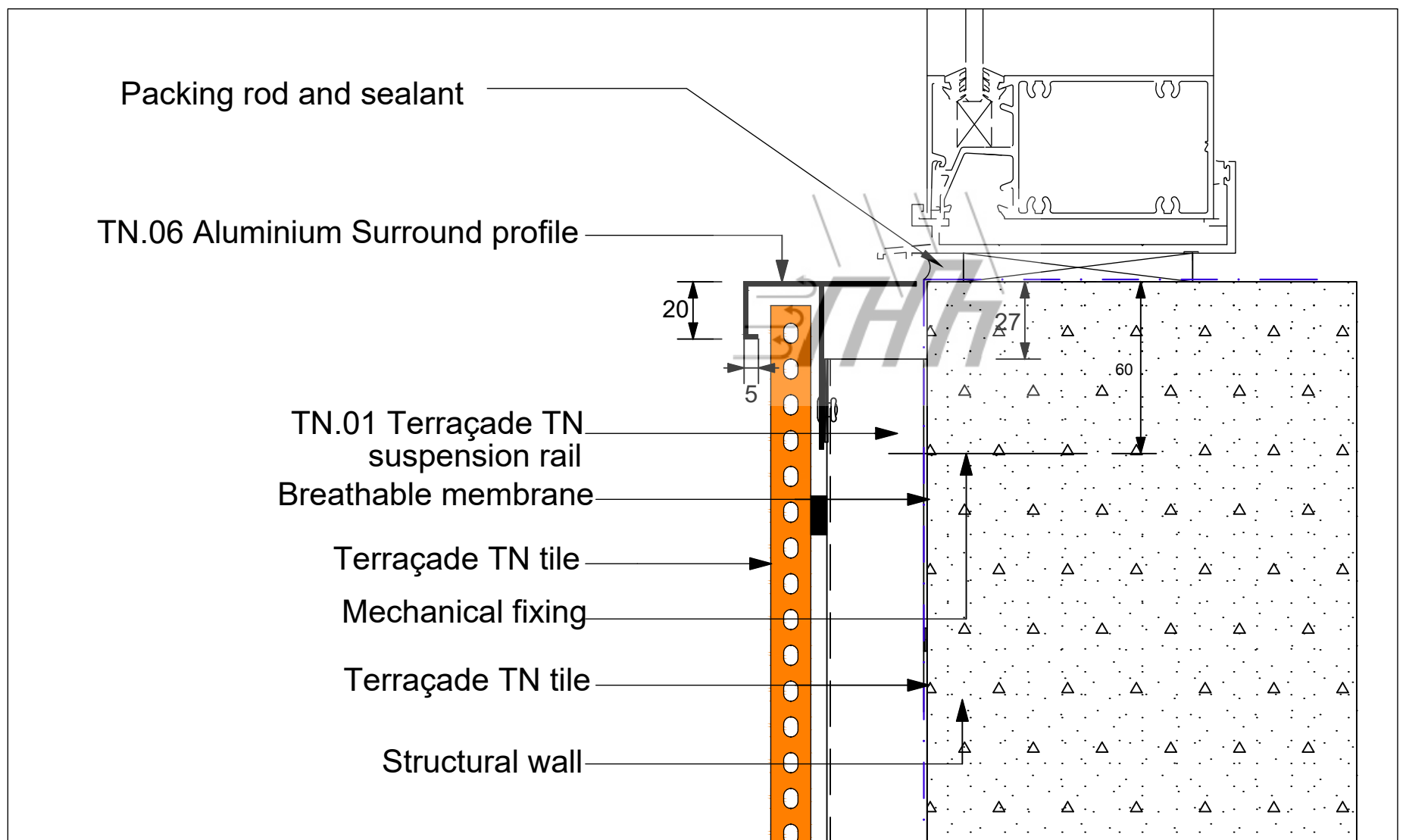
TERRAÇADE TN

WINDOW SILL - SD 08



1. WINDOW SILL WHOLE TILE

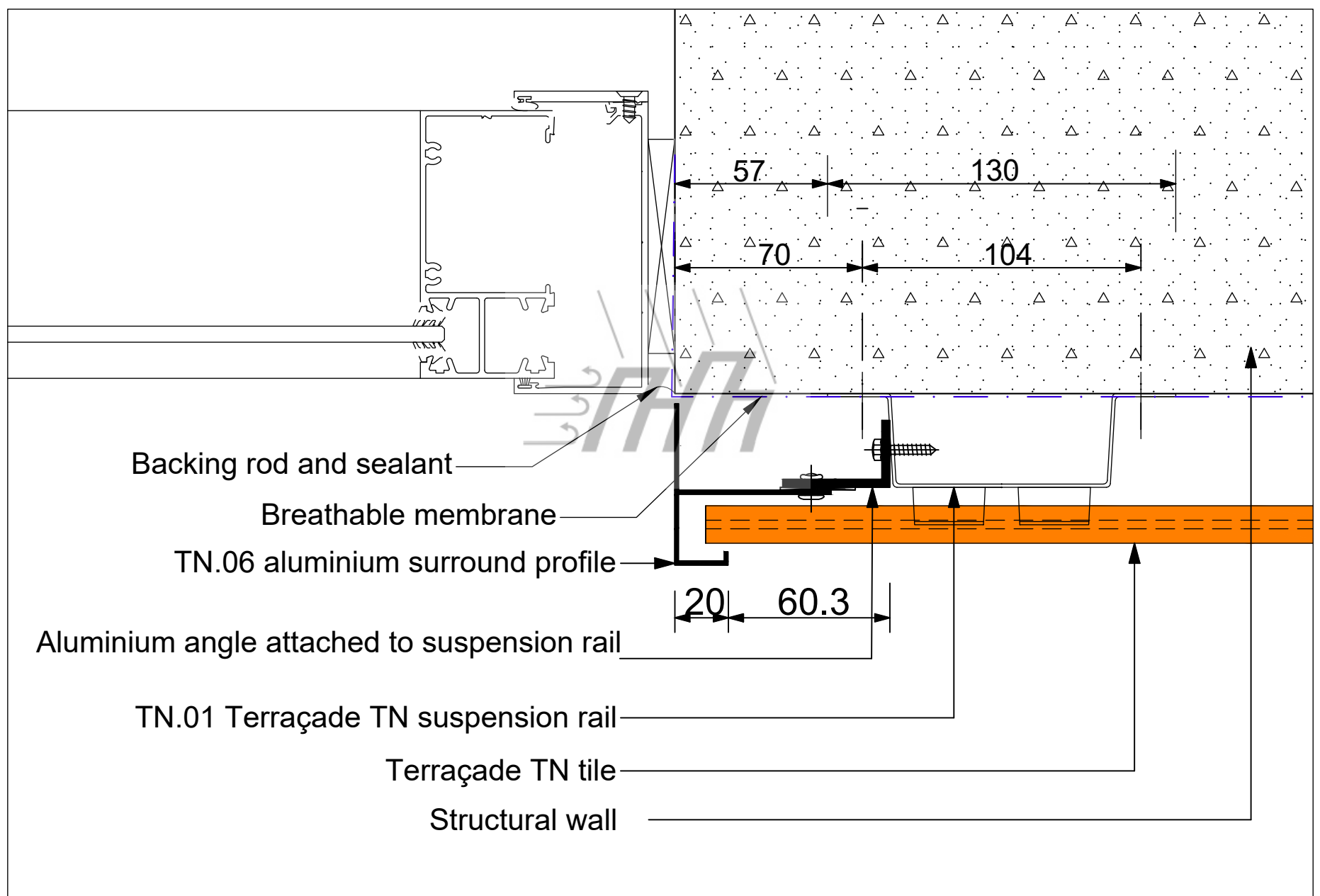
SECTION - SCALE 1:2



2. WINDOW SILL CUT TILE

SECTION - SCALE 1:2

WINDOW JAMB - SD 10



1. WINDOW JAMB

PLAN - SCALE 1:2

TERRAÇADE TN