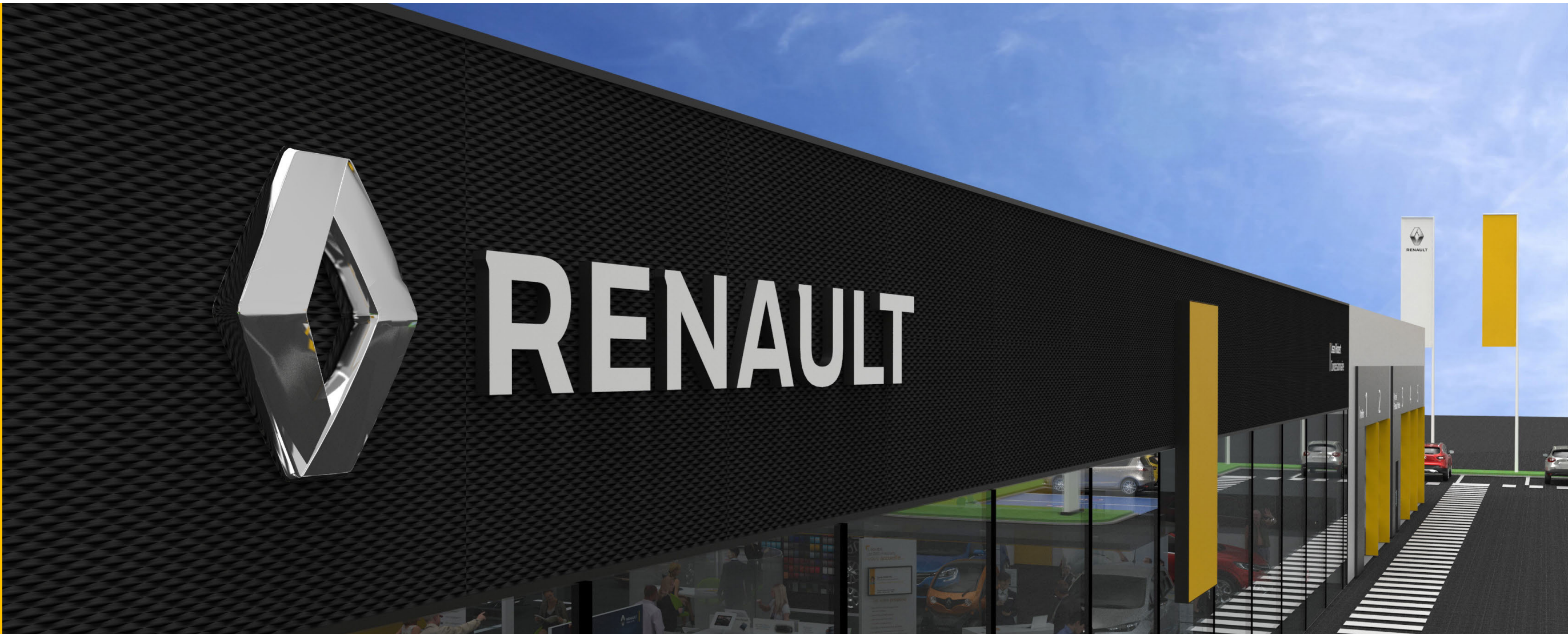


Renault Store - Technical specifications



RENAULT
Passion for life

The woven-metal façade



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1

Technical requirements

General technical requirements

1.1 Preamble

RENAULT expects all those involved in the "Renault Store" programme to meet their obligations in terms of results as per the requirements of the Technical Specifications. The general rules and specificities set out below are to be considered as the minimum necessary that has to be done to achieve the expected result.

1.2. Safety of persons and property

The supplier shall be able to provide proof that it has analysed the risks related to the services it is to provide and that its personnel and any sub-contractors have undergone sufficient training. Strict compliance with legislation in terms of safety and protection of workers is required.

1.3. Respect for the environment

Materials and methods which make it possible to reduce harm to the environment shall be used wherever possible (recyclable materials, energy-saving technologies, toxicity of materials and products used, etc.).

The supplier shall be able to provide proof that it has the various administrative permits (operating permit, environmental permit) necessary to manufacture the various items of equipment and that it complies with the operating conditions required by the legislation in force or by the specific operating conditions in the countries concerned.

A global approach such as the ISO 14001 standard is recommended. e.

1.4. Quality

The supplier shall be able to provide proof that it works in accordance with ISO 9000 quality assurance standards, formal certification being particularly recommended in this regard. The signwriter shall attach a specific Quality Plan to its offer to assure RENAULT of its capacity to supply finished products and spare parts that are compliant with the contractual requirements, within the set time periods. It shall request its sub-contractors to do likewise.

The procedures applied must make it possible to:

- Be sure that the parts and products purchased, manufactured and supplied shall neither be used nor delivered before they have been checked and be recognized as compliant.
- Procedures shall be set out for identifying causes of non-compliance, which make it possible to provide sustainable solutions that can be applied more widely to resolve the non-compliance and prevent it reoccurring.

These operations shall be recorded in the appropriate documents and be approved by RENAULT prior to being applied more widely.

- Track changes in the quality of products and assembly and removal services using inspection and audit indicators (incidents, complaints, etc.).

This tracking shall result in preventive or corrective actions; they shall be approved by RENAULT before being applied.

General technical requirements

1.5. Compliance of messages and colours

Visuals must comply with the official images contained in this document.

All shades have a 40% satin finish unless specified otherwise. Particular attention should be paid to complying with the colour code.

Compliance with the tolerances for the L.a.b. is required.

2.1. General technical standards

The reference base to be followed for design and manufacturing shall, at the very least, be that required by Eurocode standards.

The regulations relating to the dimensioning of structures in force in each of the countries concerned shall be complied with taking climatic conditions into account.

The following obligations in terms of results must be met:

- Supported under their own weight, the equipment must appear perfectly horizontal and vertical.
- The parallel alignment of separate elements must be observed.
- Under normal wind conditions (Cf. NV65 and NF EN1991-1-4 (Eurocode 1)), the permissible bend between the fastening and the point most distant from the fastening (dimension "d") shall not exceed $d/100$.

2.1.1. CLIMATIC CONDITIONS

Wind loads to be considered for the design of structures shall be taken from the Eurocode 1 rules (EN 1991-1-3): zones 4 (28 m/s), roughness IIIb, force coefficient equal to 1.80. Any structure situated in an unfavorable geographical area with regard to this load case shall be subject to a special design basis in order to meet the applicable standards.

2.1.2. DESIGN RULES

2.1.2.1 Aluminium structures

Design rules for aluminium structures - most recent edition of DTU rules (currently, July 1976).

Applicable standard for the execution of structures: NF EN 1090-2 and Eurocode 9.

2.1.2.2 Steel structures

Design rules for steel structures CM 66 » - most recent edition.

Applicable standard for the execution of structures: EN 1093 and Eurocode 3.

2.1.2.3 Concrete blocks

Concrete blocks shall be of "weight" type with minimum reinforcement.

The concrete to be used shall have an ordinary Portland cement (OPC) content of 400 kg/m³ (s' 28=300 bars - s28=25 bars).

General technical requirements

2.1.2.4 Design calculations for plastic elements

Adapt the CM 66 rules using a safety coefficient of 2 for the stresses.

2.1.3. MATERIALS

2.1.3.1 General remarks

The materials used shall all be first-choice materials suitable for their envisaged use and they shall be used in accordance with the rules of best industry practice for the profession and in compliance with the standards and regulations in force in France and in the Countries in which they are intended to be used.

The materials used shall not have any defect that is likely to compromise the durability of the structures. The equipment shall be easy to clean, maintain and service.

The materials shall be capable of withstanding harsh climatic conditions such as rain, snow, hail, condensation, dust and salt spray.

Operation must be guaranteed between - 20 and + 80 ° C.

2.1.3.2 Steels

Steels shall be either "hot finished" as per NF EN 10210 or "cold finished" as per NF EN 10219-1 and 2. The quality of the steels shall be stated on the production drawings and it goes without saying that the mechanical properties of the different types of steels must be taken into account for stability calculations.

All elements shall be manufactured in a covered, sheltered location.

After machining, welding, drilling, notching, etc. the elements shall be prepared prior to anti-corrosion treatment: brushing of welds, careful deburring, cleaning, shot peening and sand blasting.

The anti-corrosion treatment shall be performed by hot galvanization of a minimum of 80 µm and shall provide fault-free protection for at least the period of the ten-year guarantee.

No machining may be carried out once the parts have undergone anti-corrosion treatment.

All fasteners and hardware (including hinges) shall be made of 18/10 stainless steel (NFE 25.033).

2.1.3.3. Aluminium

The reference standard is NF EN 573-1. Parts used in a supporting structure shall be chosen from the "6000" series. For parts which are not used in a supporting structure, the "1000" series shall be acceptable.

The alloys are to be weldable.

The parts shall be carefully deburred and the welds shall be brushed before any protective treatment.

The visible parts of equipment shall be treated by the application of paintwork performed according to a "Qualicoat"-type procedure.

General technical requirements

2.1.3.4. PMMA

The PMMA shall meet at least the following characteristics:

	Flat parts machined "cast" PMMA	Flat parts unmachined "extruded" PMMA
• Opal white (values for a test piece of 3mm thick)		
• Tensile strength	> 75 MPa	> 70 MPa
• Bending strength	> 130 MPa	> 120 MPa
• Bending modulus	> 3,250 MPa	> 3,000 MPa
• Unnotched CHARPY impact test strength	> 12 MPa	>10 MPa
• Expansion	< 1 mm / 1 m / 10°C	<1 mm / 1 m / 10°C
• Light transmittance	> 50 %	>33 %

The thermoformed panels shall be made of white, light diffusing, extruded PMMA in compliance with the sheet manufacturer's heating parameters.

Where parts made of PMMA are more than 100 cm high, they shall be hung from the top by an adhesive PMMA cleat.

The thickness of the sheets shall be calculated in compliance with the tensile strength standards set out above.

2.1.3.5. Polycarbonate

The polycarbonate sheet shall meet at least the following characteristics:

- Uncoloured appearance
- Density > 1.2 g/cm³
- Tensile strength: 60 Mpa
- Expansion < 0.7 mm / 1 m / 10°C
- Light transmittance > 90%

2.1.3.6. Expanded foam

These following characteristics must be met:

- Material 9010 white PVC
- Density > 50 g/cm³
- UV-stabilized: 14 MPa
- Shore hardness D > 75
- Expansion < 1 mm / 1 m / 10°C

2.1.3.7. Paint

Painted parts must have an even appearance across their entire surface.

Defects such as pores, fissures, grains of dust, runs or waves of paint shall not be tolerated.

General technical requirements

Samples of painted rough parts shall be tested and accepted by RENAULT, after having undergone the following tests performed by a certified body:

- Colour based on a LAB test with a MINOLTA 508 D colorimeter with D65 illuminant and the observer at 10° and specular component included (the tolerances in the CIELAB colour space are L +/- 1, a +/-1.5, b +/- 1.5).
- Gloss at 40 °: based on a test according to NF T 30064 standard.
- Gloss at 60 °: based on a test according to NF T 30064 standard
- Adhesion: resistance to peeling based on grid test.
Class 1, as per P UW 150 1. NF T 30038 standard
- Colourfastness:
QUV as per NF T 30036 after 200 hours of exposure.

Samples of each of the elements shall be supplied, upon request, to RENAULT for inspection.

2.1.4. ELECTRICAL EQUIPMENT

Assemblies with electrical equipment shall comply with the essential safety requirements of the European Union. Within this framework, the supplier shall obtain a certificate (for each type of equipment) which must clearly state the compliance of the assemblies, and thus of the components, with:

- requirements relating to the safety and protection of users and all other persons (directive 73/23/EEC without any lower voltage threshold)
- requirements relating to electromagnetic compatibility (directive 89/336/EEC).

The rating plate on each item of equipment shall display the CE mark indicating compliance with these requirements.

The regulations relating to low-voltage signage in force in each of the countries concerned shall be complied with taking climatic conditions into account.

In addition, the following requirements shall be met:

Electrical equipment shall be compliant with the standards in force from the series NFC 15-100, NFC 20-010 and NFC 20-030, NFC 71, NFC 32 for France and the IEC 60364 international standard.

This concerns the following in particular:

- Category one electrical installations and low-voltage illuminated signage installations.
- The fire behaviour of electrical equipment and the degree of protection of enclosures,
- Flexible and rigid low-voltage cables.

In addition, the equipment shall comply regulations relating to the suppression of interference in inhabited areas and shall thus be delivered with interference suppression.

General technical requirements

2.1.4.1 IP rating

All the electrical equipment shall have a protection rating of at least IP 44-D.

2.1.4.2 Protection against electric shock

All equipment shall be "class 1".

2.1.4.3 Fasteners

The converters shall be placed in areas not subject to standing water.

The cables and sheaths shall be fastened to structures at 50 cm intervals.

2.1.4.4 Cable routing

Every cable or sheath passing through a metal part shall be routed through a cable gland.

Connection boxes.

An IP 44 sealed plastic connection box shall be provided at the inlet to each assembly. This box shall be equipped with a 5-input connection pin for 4 mm wiring.

All the connection boxes shall have the markings P1+P2+P3+T+N.

2.1.4.5 LEDs

The white LEDs used shall have the following characteristics:

- Lifetime: 50,000 hours for a loss of initial luminous flux of 50 % at the end of the period
- 5 year guarantee for operation 10 hours per day with a maximum loss of luminous flux of 20 %
- Operating temperature of LEDs: between - 20° C and +50 °C.
- Minimum protection index: IP 67
- The LEDs used must comply with the following international standards: IEC 62504 TS Ed. 1, IEC 61231, IEC 62560 Ed 1, IEC 62031 LED module safety, IEC 61347-2-13 LED control gear.

2.1.4.6 Converters

The power supply converters for the LEDs shall have the following characteristics:

- Wide power supply voltage range (100 to 300 volts)
- Reversible protection against increase in temperature and overload
- Protection against short-circuits with automatic restart
- Minimum protection index: IP 67
- Operation compliant with: EN 55015, EN 61000-3-2, EN 61547, EN 61558-2-17

General technical requirements

2.1.5. FASTENERS AND HARDWARE

All fasteners and hardware used shall be made of stainless steel (non-magnetizable).

Aluminium "pop" rivets are accepted as long as the steel rods are systematically removed.

For welding, the wires and electrodes are to be compliant with NF 81.830.

2.1.6. ANCHORING SYSTEMS AND FASTENINGS

The plinths for all equipments shall be completely removable without having to remove another element of the assembly. The plinths shall cover the attachment plates or fastenings. The attachment plates shall be easily accessible once the plinths have been removed.

For each of the assemblies which require a foundation block or fastening to a separate structure, the signwriter shall provide the elements necessary, as well as the conditions to be used to make design calculations for these elements (wind conditions and design calculation methods).

2.1.7. IDENTIFICATION PLATE

Each finished product shall be marked with a metal identification plate on the structure which shall show at least the following information:

- Name of the signwriter
- Product code and batch
- Month and year of manufacturing
- The CE Marking if it is illuminated.

2.1.8. STORAGE

The finished products shall be stored in a dry and well-ventilated location.

RENAULT inspectors shall be able to have access to them at any time.

2.2. Guarantees

The suppliers undertake to offer the guarantee conditions below for their products:

- 2 year guarantee on the installation against defects and faulty workmanship,
- 5 year guarantee on the electrical equipment including the LEDs and converters,
- 5 year guarantee on the adhesive elements,
- 5 year guarantee on digital printing (anti UV treatment),
- 5 year guarantee on workshop-lacquered sheet metal,
- 5 year guarantee on the chrome-plated diamonds,
- 7 year guarantee on sheet metal and profiles pre-lacquered by the aluminium manufacturer,
- 10 year guarantee on the internal structures,
- 10 year guarantee on the PMMA acrylic panels.

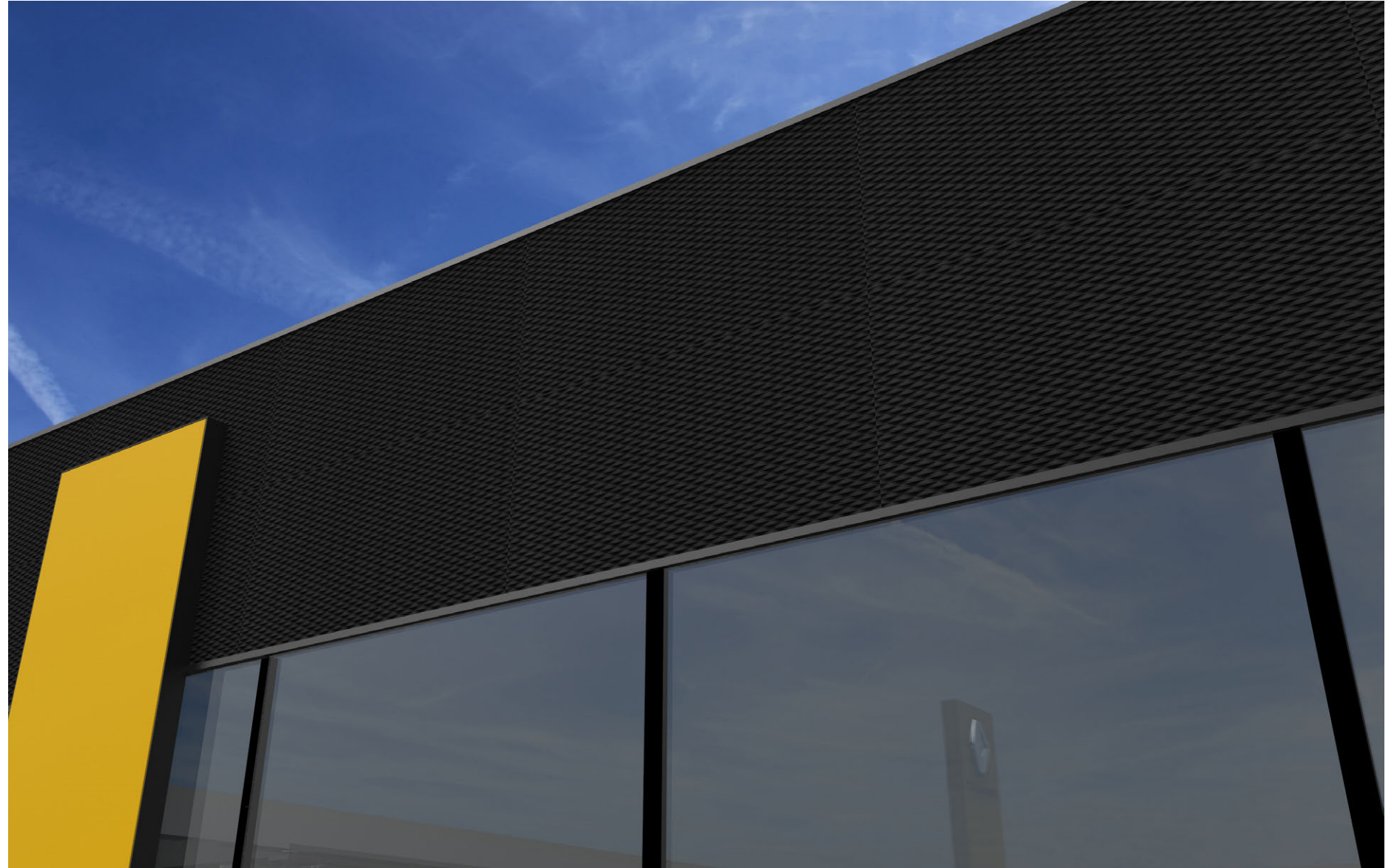
2

General remarks

Overview

Description

The woven-metal façade is used to clad the upper part of both the main and secondary showroom façades.



Colours and materials



Metallic dark grey

- Post-lacquered aluminium sheeting, 20/10 mm thick
- Satin finish with 30% gloss
- Metallic finish
- Ref. AXALTA - Alesta IP Anthracite Grey X930500089



RAL 9005 matt black

- Pre-lacquered aluminium sheeting, 15/10 mm thick
- Matt finish with 2% gloss

3

Technical principles

General presentation

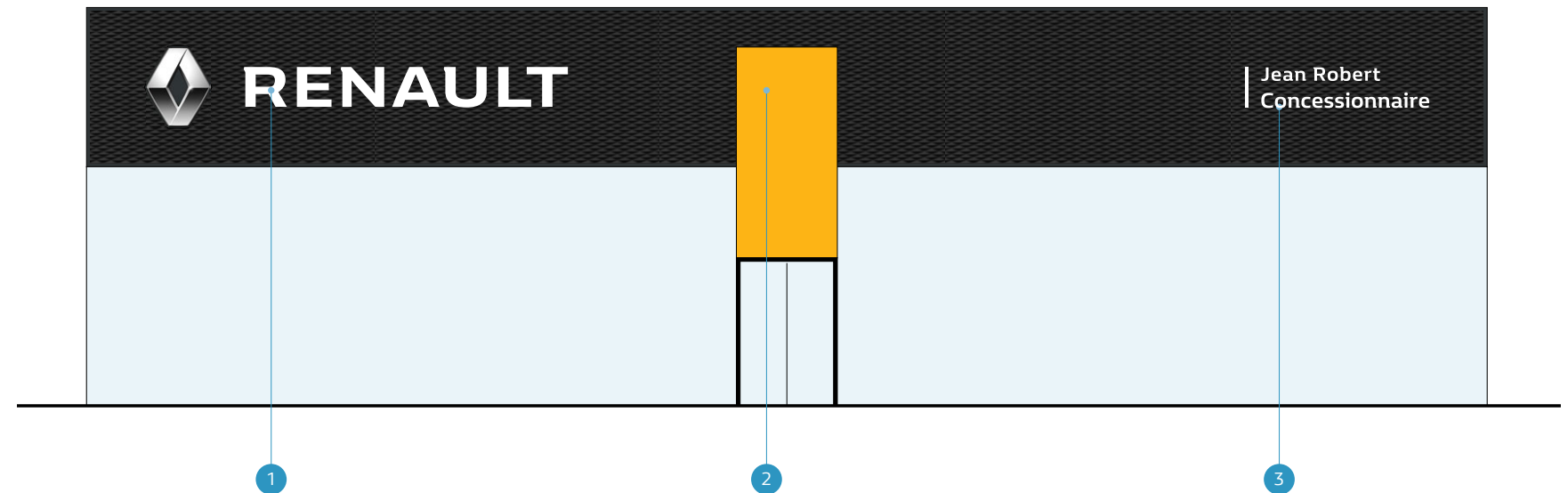
Principle

The woven-metal façade is used to clad the upper part of the showroom. On the main façade, it accommodates:

- the Renault signature and site name,
- the overhead panel.

Key

- 1 Renault signature (3D diamond and Renault word)
- 2 Overhead panel
- 3 Site name



Description de la résille

Principle

The woven-metal mesh is made of expanded aluminum sheet, 20/10th mm thick:

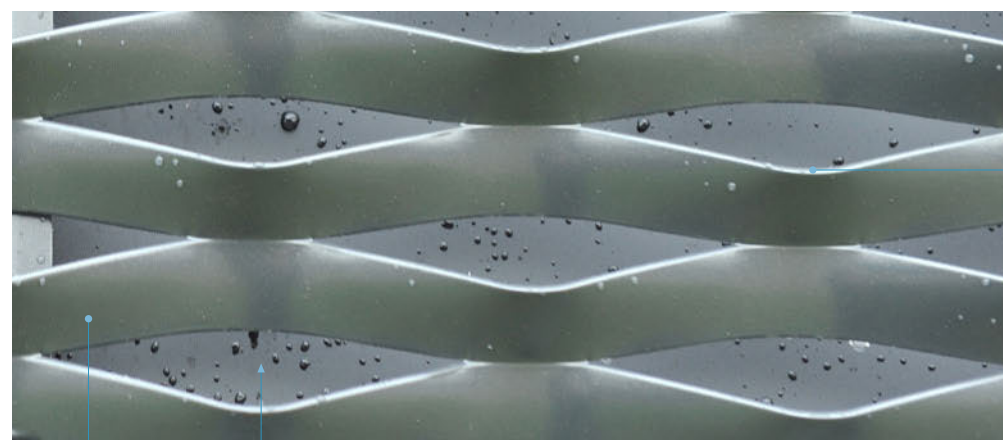
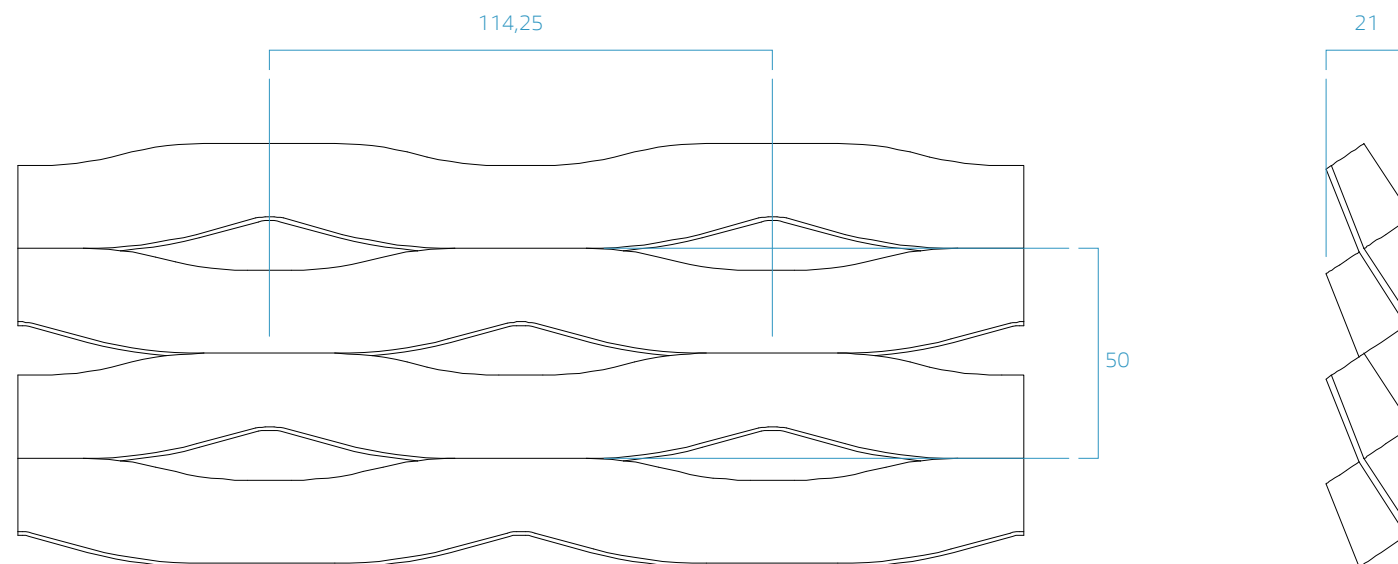
- initial format of sheet: 2,500 x 2,000 mm,
- format of finished module: 2,380 x 1,940 mm,
- mesh size, L. 114.25 x Thk. 21 x H. 25 mm,
- painting: post-lacquered in dark grey metallic satin.

Approximate weight: 12 kg/m²

Behind the woven-metal mesh modules, set back by about 60 mm, a matt black aluminum panel provides a contrast to highlight the light effects on the woven-metal.

Key

- 1 Woven-metal in dark grey metallic satin
- 2 Rear panel in pre-lacquered RAL 9005 matt black aluminium sheet, 15/10th mm thick



Direction of opening of expanded metal

The painting of woven-metal is being color matching and will be available from AKZO-NOBEL and DUPONT for application in powder coating. Please connect on Brand Stores website **by MAY 30, 2016** for an update of this document.

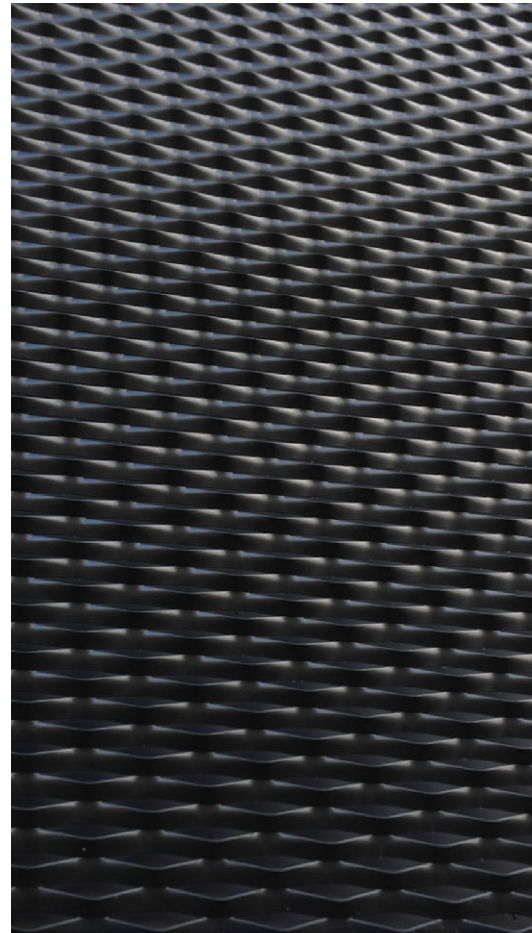
Expected result

Constraints

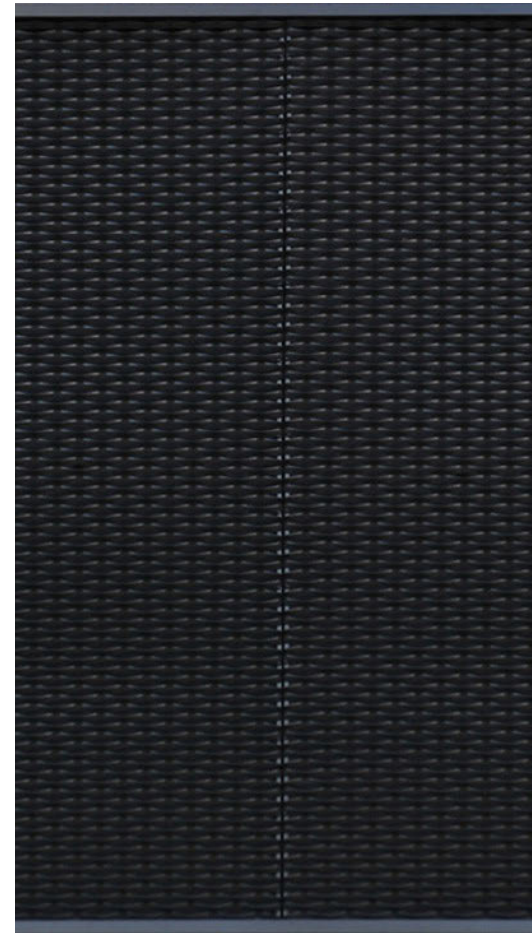
- It is important to comply with the colour, metallization and gloss of the paint in order to achieve the required visual effect.
- The opening of the metal mesh is always directed upward.
- The junctions between mesh modules must be carefully executed and regular.
- The woven-metal mesh modules must be sufficiently flat and dimensionally uniform in the implementation of the mesh in order to provide good visual continuity, especially at connections.

Key

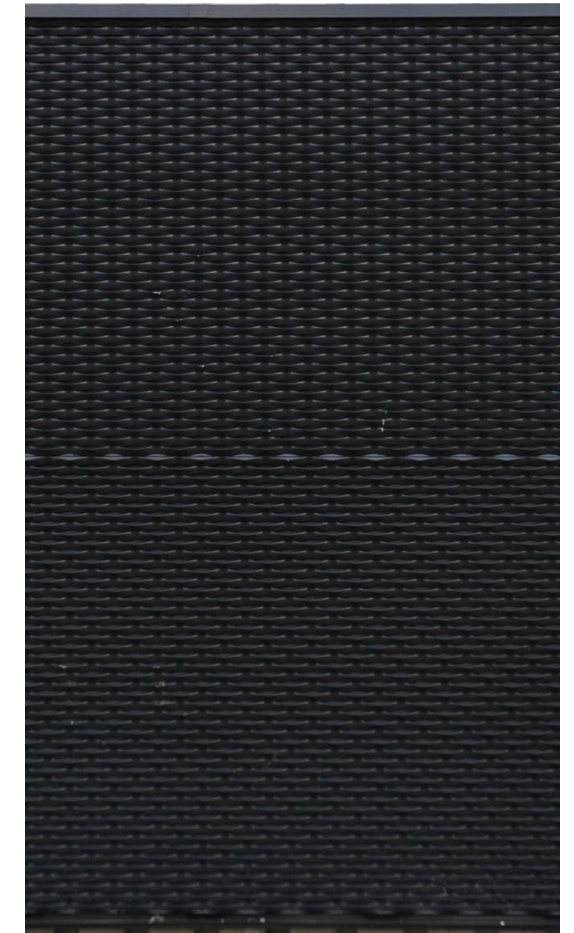
- 1 General appearance of a mesh module
- 2 Vertical junction between two mesh modules
- 3 Horizontal junction between two mesh modules



1



2



3

Implementation for heights < 2,400 mm

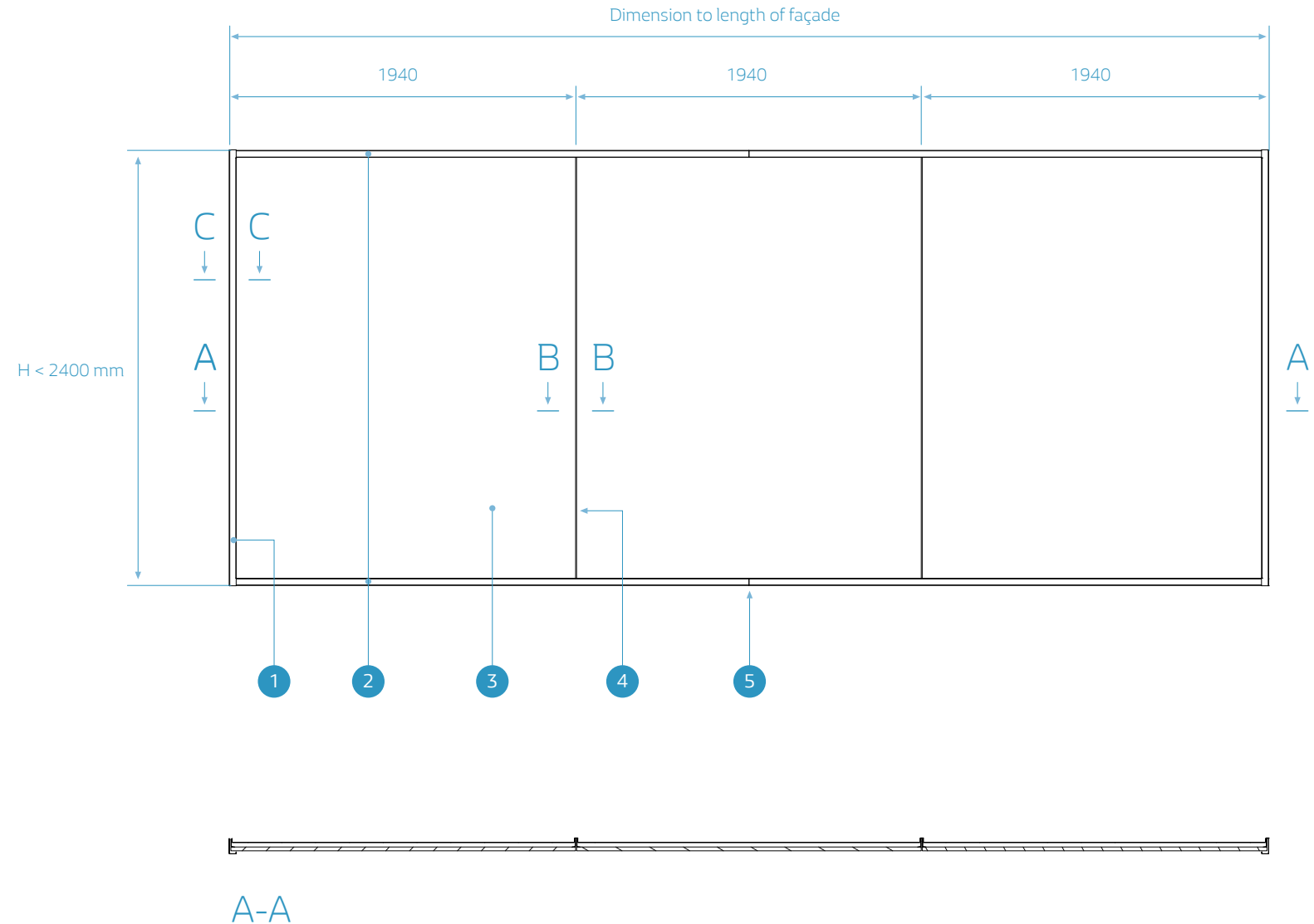
Principle

If the height of the façade is less than 2.40 m, the cladding shall comprise a homogenous surface with a peripheral frame and woven-metal mesh modules approximately of h. 2,380 x w. 1,940 mm in format, with vertical joints between modules.

Particular care shall be taken to ensure the flatness of the mesh modules, which may require recutting of edges to release stresses generated by the forming of the expanded metal.

Key

- 1 Peripheral frame upright in aluminum sheet 20/10th thick, post-lacquered with dark grey metallic paint
- 2 Peripheral frame top rail in aluminum sheet 20/10th thick, post-lacquered with dark grey metallic paint
- 3 Woven-metal mesh module, h. 2,380 x 1,940 mm
- 4 Vertical junction between two mesh panels
- 5 Edge-to-edge joint centred on rail with alignment bar



Cladding details and assemblies for façades < 2,400 mm

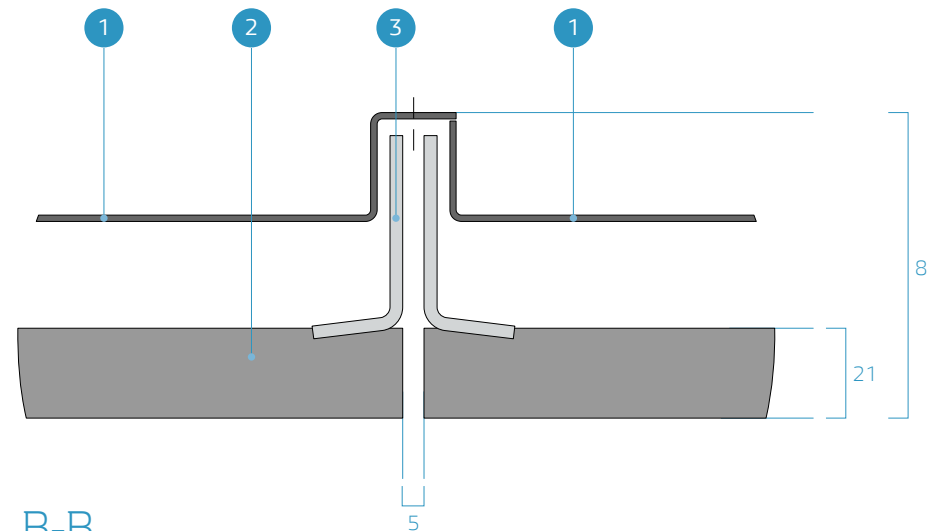
Principle

These details concern the claddings of façade less than 2.40 m in height.

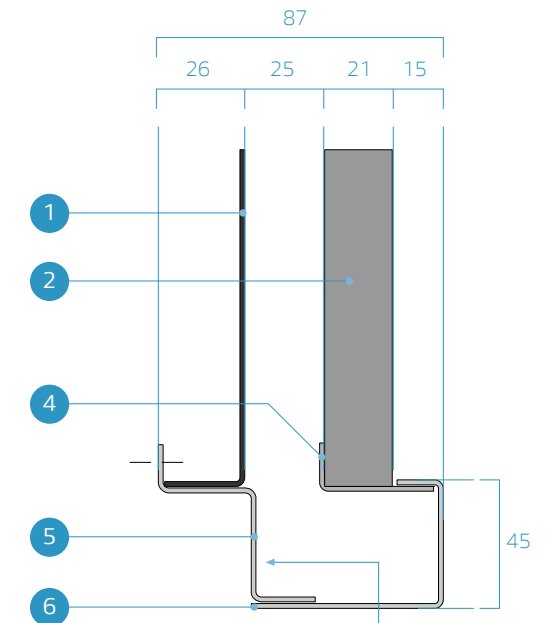
Note that the vertical joint between two mesh panels always comprises a recessed joint with a maximum width of 5 mm.

Key

- ① Rear panel in pre-lacquered RAL 9005 matt black aluminium sheet, 15/10th mm thick
- ② Woven-metal mesh module, maximum dimensions of h. 2,380 x w 1,940 mm
- ③ Perforated vertical angle in 3 mm aluminum, welded to back of mesh for stiffening
- ④ Aluminium alignment bracket post-lacquered with dark grey metallic paint
- ⑤ Rear element of peripheral frame for wall mounting, made of aluminum sheet 20/10th thick, post-lacquered with dark grey metallic paint
- ⑥ Peripheral frame upright in aluminum sheet 20/10th thick, post-lacquered with dark grey metallic paint



B-B
Vertical junction
between modules



C-C
Cross-section
of peripheral frame

NOTE
This part, 50 mm in width, is located arranged at intervals of 400 mm to facilitate the evacuation of leaves or other material liable to pass through the mesh

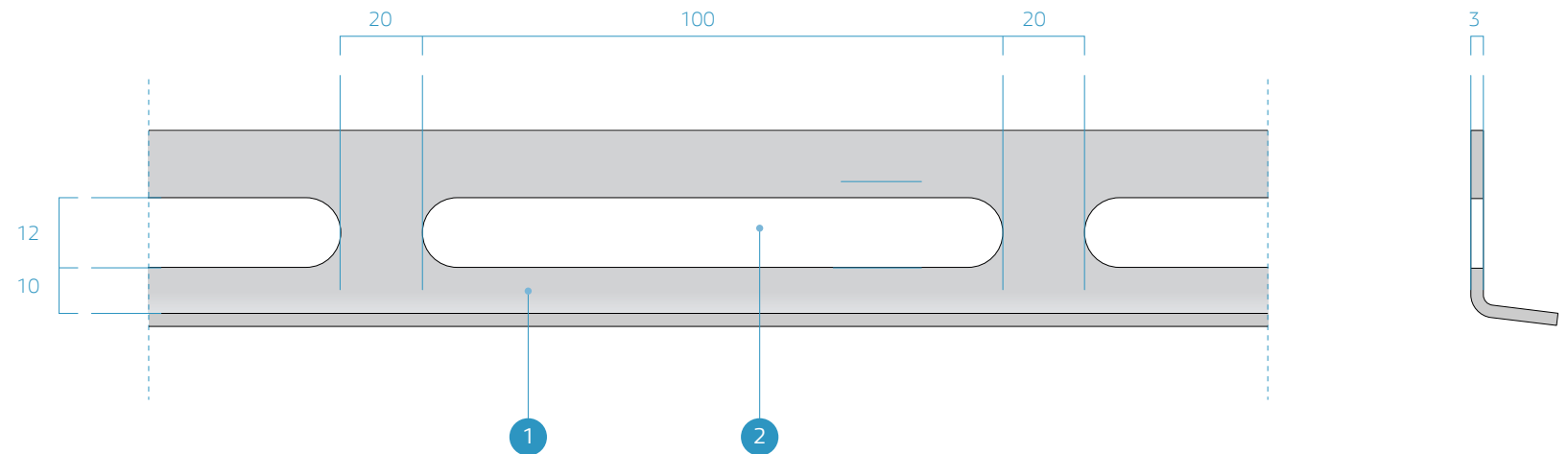
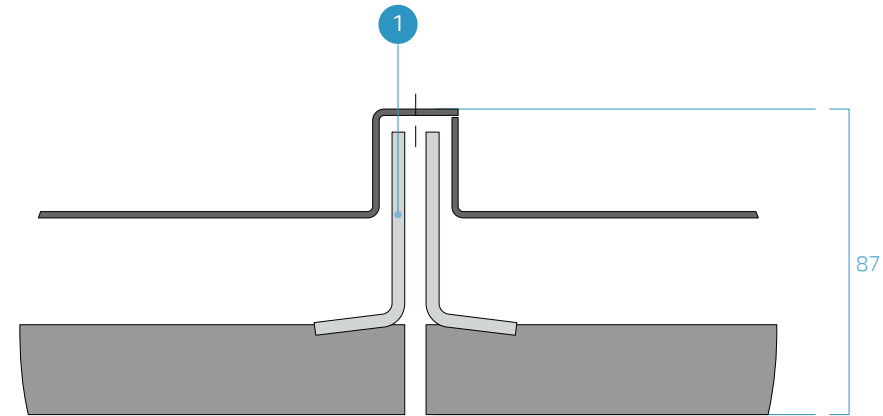
Perforation of vertical pieces

Principle

The vertical angles used to stiffen the mesh modules are perforated at regular intervals to reduce visible shadows cast on the black background.

Key

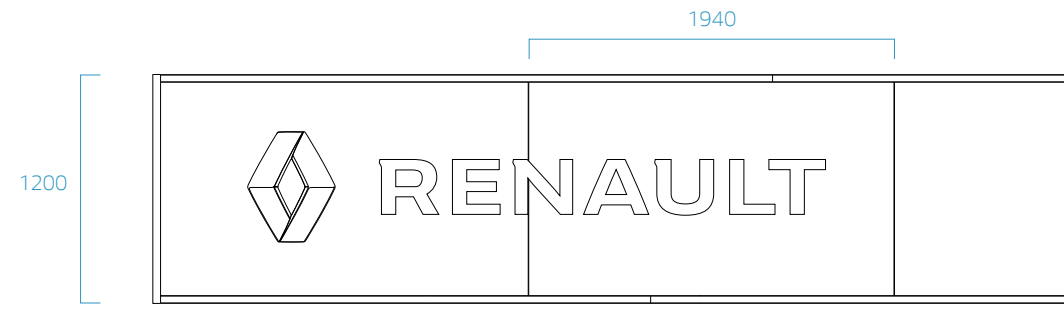
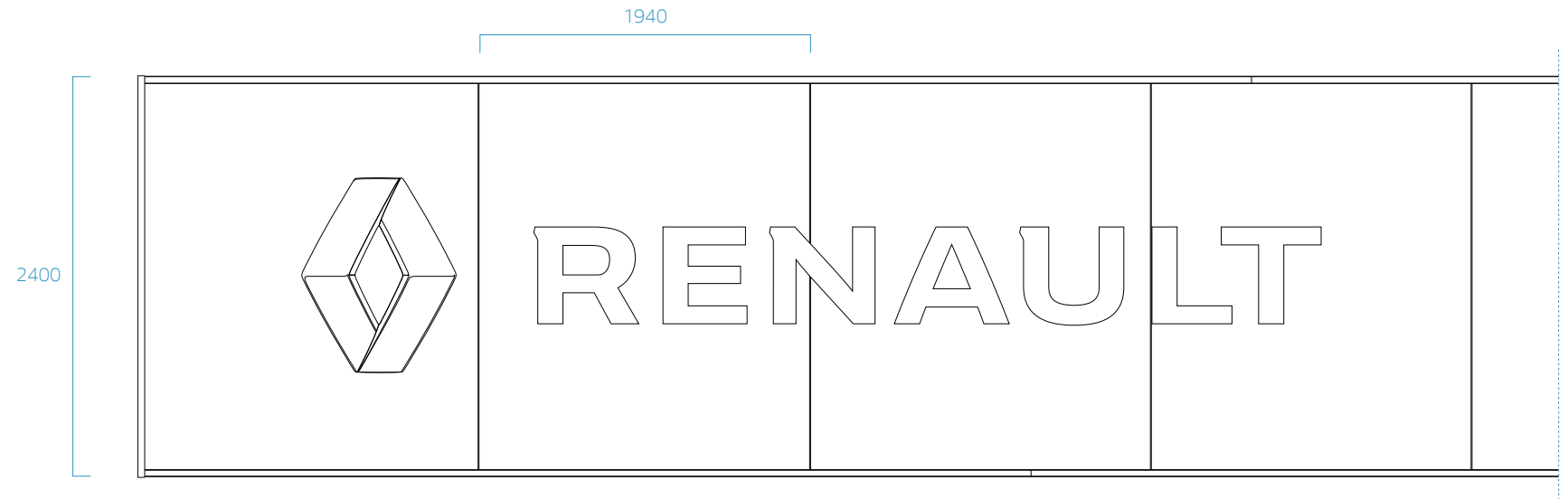
- 1 Vertical angle piece in 3 mm aluminum, welded to back of mesh for stiffening
- 2 Oblong hole 100 x 12 mm



Examples of layout plans for façades < 2,400 mm

Principles

- The mesh modules have maximum dimensions of: 2,380 x 1,940 mm.
- When the height of façade to be clad is less than 2,400 mm, the modules are arranged side by side, without the need for horizontal joins.
- The opening of the metal mesh is always directed upward.
- The Renault signature is laid out on the mesh with seeking to align the text according to the joints.
- The peripheral frame has a fixed thickness of 45 mm, irrespective of the total height of the cladding.



Implementation for heights > 2,400 mm

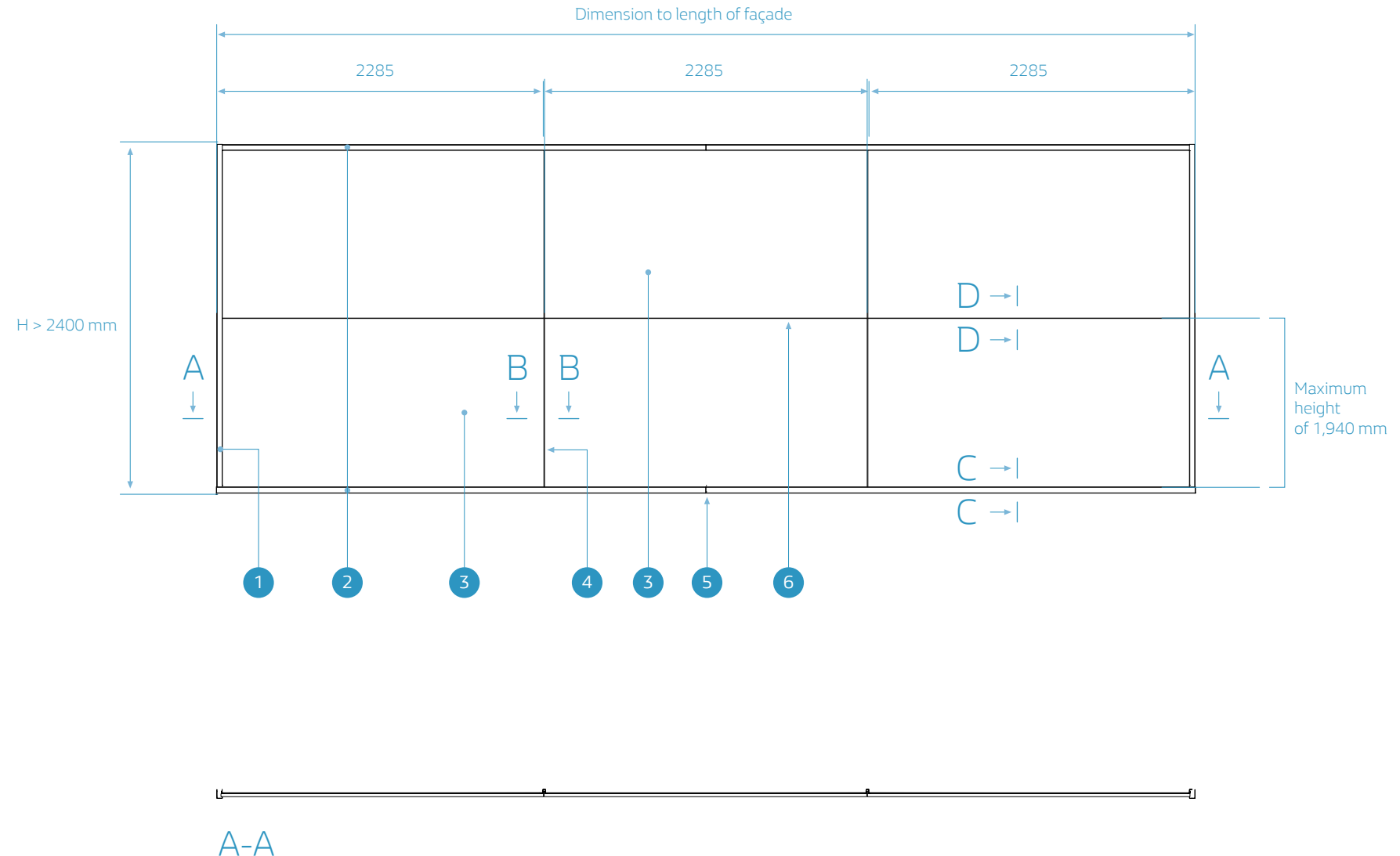
Principle

If the height of the façade is greater than 2.40 m, the cladding shall comprise a homogenous surface with a peripheral frame and horizontal woven-metal mesh modules of approximately h. 1,940 x w. 2,380 mm, joined in the vertical and horizontal planes.

Particular care shall be taken to ensure the flatness of the mesh modules, which **may require recutting of edges to release stresses** generated by the forming of the expanded metal.

Key

- 1 Peripheral frame upright in aluminum sheet 20/10th thick, post-lacquered with dark grey metallic paint
- 2 Peripheral frame top rail in aluminum sheet 20/10th thick, post-lacquered with dark grey metallic paint
- 3 Woven-metal mesh module, maximum dimensions of h. 1,940 x w. 2,380 mm
- 4 Vertical junction between two mesh panels
- 5 Edge-to-edge joint centred on rail
- 6 Edge-to-edge joint centred between 2 modules



Cladding details and assemblies for façade heights > 2,400 mm

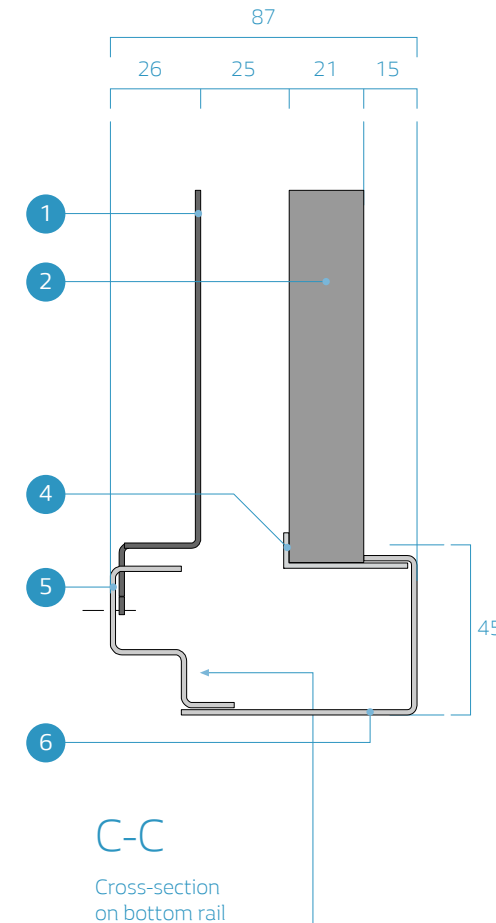
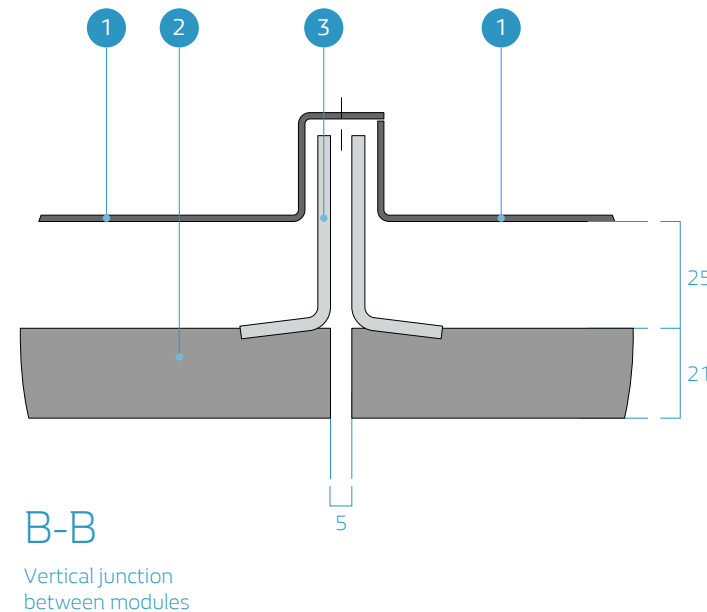
Principle

These details concern the façade claddings

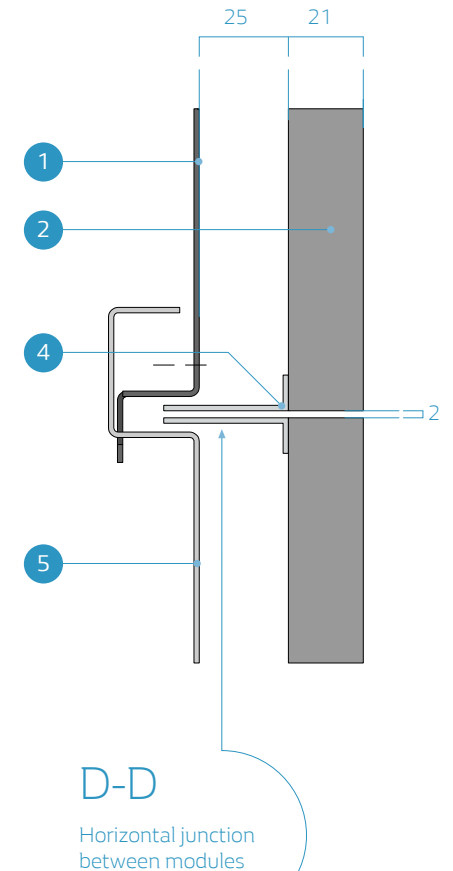
Note that the vertical joint between two mesh panels always comprises a recessed joint with a maximum width of 5 mm, while the horizontal joint is made with an edge-to-edge joint with a maximum height of 2 mm.

Key

- 1 Rear panel in pre-lacquered RAL 9005 matt black aluminium sheet, 15/10th mm thick
- 2 Woven-metal mesh module, maximum dimensions of h. 1,940 x w. 2,380 mm
- 3 Perforated vertical angle in 3 mm aluminum, welded to back of mesh for stiffening
- 4 Aluminium alignment bracket post-lacquered with dark grey metallic paint
- 5 Rear element of peripheral frame for wall mounting, made of aluminum sheet 20/10th thick, post-lacquered with dark grey metallic paint
- 6 Peripheral frame, in aluminum sheet 20/10th thick, post-lacquered with dark grey metallic paint



NOTE
This part, 50 mm in width, is located arranged at intervals of 400 mm to facilitate the evacuation of leaves or other material liable to pass through the mesh



NOTE
This part, 50 mm in width, is located arranged at intervals of 400 mm to facilitate the evacuation of leaves or other material liable to pass through the mesh

Examples of layout plans for façade heights > 2,400 mm

Principles

- The mesh modules have maximum dimensions of: h. 1,940 x w. 2,380 mm.
- Between 2,400 mm and 3,880 mm in height, two horizontal rows of modules are required, arranged with a central joint.
- For heights in excess of 3,880 mm, three horizontal rows of modules are required, arranged with two horizontal joints.
- The opening of the metal mesh is always directed upward.
- The Renault signature is laid out on the mesh with seeking to align the text according to the joints.
- The peripheral frame has a fixed thickness of 45 mm, irrespective of the total height of the cladding.

NOTE. The examples opposite show the greatest standard signature height associating the 1,800 mm diamond with a 900 mm Renault word.

