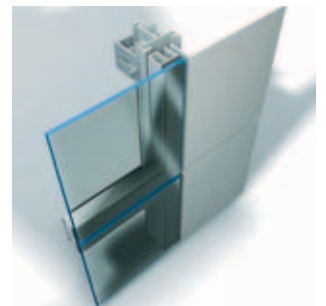


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# Urano Wall

## FREE STANDING CURTAIN WALL & ROOFING SYSTEM



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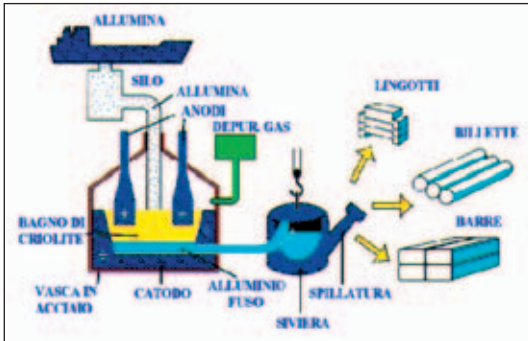
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## ALUMINIUM AND ECOLOGY

### • PRODUCTION OF PRIMARY ALUMINIUM



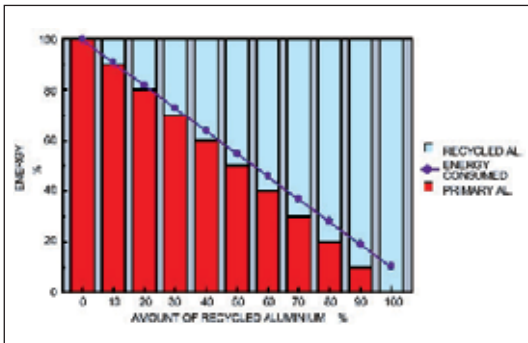
In nature the aluminium does not lie loose, but as a compound which makes up 8% of Earth crust.

The aluminium is the 3rd most widespread element in the World after oxygen and silicium.

The bauxite is mined from the Earth crust; from the bauxite, by electrolysis, the aluminium oxide (alumina) is obtained: it is the raw material necessary for the production of primary aluminium.

From 4 kg bauxite we obtain 2 kg alumina, from which we obtain 1 kg aluminium.

### • ENERGY SAVING IN RECYCLING



The quality of aluminium does not change when recycling.

The production scraps of the primary aluminium are directly recycled and re-utilised.

The re-melting of 1 kg aluminium requires only 5% of the energy employed for the production of the metal from the bauxite.

### • ENVIRONMENT



In the aluminium industry, the production of gases contributing to the greenhouse effect is due to the utilisation of fossil fuels and to the electrolysis process.

The emitted quantities of the above gases are very low and their influence on the total gases produced by the man are around 1% only.

However, the ever growing utilisation of aluminium in fields like the sector of transports, enables to reduce the weight of the vehicles, setting a limit to the emission of gases into the atmosphere; the utilisation of thermal break aluminium windows and doors enables a remarkable energy saving.

### • RECYCLING



The re-melting of aluminium requires a modest quantity of energy.

In the recycling process it is necessary to employ only 5% of the energy required at the origin to produce the primary metal with material losses lower than 3%.



## ALUMINIUM PROPERTIES

### • LIGHTNESS



The aluminium is an extremely light metal: its specific weight is 2.7 g/cm<sup>3</sup>, that means only one third of the specific weight of the steel.

### • RESISTANCE



The resistance of aluminium can be optimised with the addition of low quantities of other metals. Some particular alloys can make the resistance of aluminium similar to the steel.

### • RESISTANCE TO CORROSION



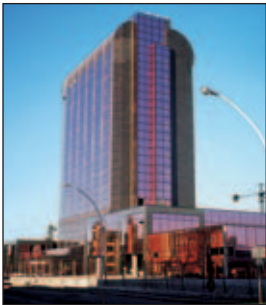
The spontaneous oxide coating protects the aluminium making it particularly resistant to corrosion. This feature can be improved by means of specific surface treatments.

### • MACHINABILITY



The aluminium can be used in the most various applications, thanks to the possibility to employ alloys which raise and complete its mechanical features.

### • INFLAMMABILITY AND FIRE RESISTANCE



Thanks to its refractoriness features, the aluminium can be employed in the buildings and in the transport sector as well.

## Cleaning and maintenance of aluminium windows



With the respect of cleaning and maintenance rules here given, the aluminium windows will keep their own performances of air-water tightness and beauty of surfaces. In order to keep these qualities, the exposed profiles and surfaces must be subject to regular cleaning and maintenance.

The frequency of intervention depends on the building surrounding and must be higher when located near the coast, in industrial and highly polluted areas. The cleaning of aluminium profiles is very simple: it's enough to pass carefully over them with a soft sponge moistened with the proper detergent. The detergent must not be abrasive, not with a basis of ammonia, not with a basis of chlorine (ex: bleach) or alkaline or acid products. The maintenance of the profiles for opening frames is often combined with the glass cleaning; we deeply recommend to clean the surfaces when they are not exposed to heat sources nor to the rays of the sun.



### IMPORTANT NOTES

The aluminium anodised and painted can not be in contact with damp mortar or chalk. Then, during the masonry work, we always recommend to protect the opening and sash frames in order to avoid any possible damaging.

### DO NOT USE

- Aggressive alkaline chemical products (ex. ammonia).
- Strong acids.
- Hypochlorites (ex. bleach).
- Oxiding products.
- Nitro-acetone solvents.

### WHAT TO USE

Water at max 30°C temperature and specific detergent for the cleaning of the aluminium parts of doors and windows anodised or painted.

## METRA suggested products:

### 1) Mu 0455 – Kit for cleaning and maintenance of painted frames

- including: Product for the regular cleaning of the painted aluminium  
Specific product for the EPDM gaskets  
Spray product for lubrication of the mechanisms

### 2) Mu 0456 – Kit for cleaning and maintenance of anodised frames

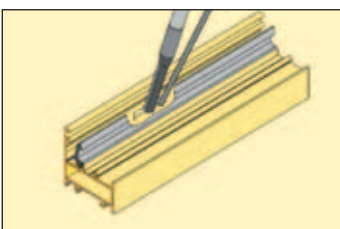
- including: Product for the regular cleaning of the anodised aluminium  
Specific product for the EPDM gaskets  
Spray product for lubrication of the mechanisms

## Cleaning of the window



### Cleaning inside the window

In order to guarantee a correct working, your window should be inspected at least once a year to check that no residue or extraneous body are in the grooves and in the slides of the frame itself. This operation prevents the eventual obstruction of the drainage holes, enabling the window to keep its performances.



### Cleaning of the drainage holes

Clear away the dust and dirt with a vacuum cleaner and, should the drainage holes be obstructed, remove the occlusion with the help of a tool similar to a rod.

## Maintenance of the accessories

Apart from cleaning the profiles, it is necessary to provide for the maintenance of the weather gaskets and of the accessories and repair, if necessary, the damaged parts. All opening frames and relevant lock points must be subject to maintenance, using a silicone or teflon spray, and any wearing level must be checked.

### 1) Spray for hardware

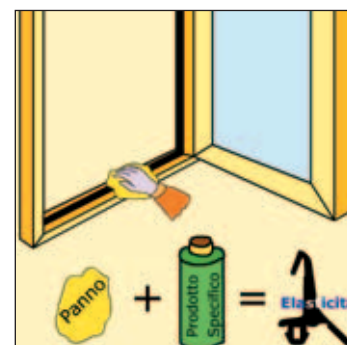
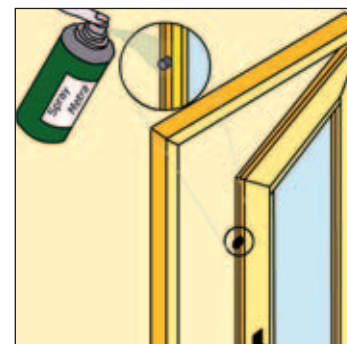
The opening parts and all lock points must be lubricated with oil or anti-acid grease. The spray leaves a protective film over the treated parts, improving the movement and attenuating any possible troublesome noise.

### 2) Product for gaskets

Cleaning the gaskets by a cloth damped with the indicated product at least twice a year, will enable the gaskets to keep their correct elasticity.

***In case of damages due to negligence or insufficient maintenance, any possibility to appeal to the guarantee is excluded.***

***The utilisation of a non recommended product releases METRA from the responsibility of any damage caused to the frames.***



## Ventilation of the windows

Your new windows Metra guarantee high performances of air and water tightness required by the specific Standards for the **energy saving**.

The lack of air exchange between indoor and outdoor can cause the increase of the relative humidity ratio of which, vice-versa, in order to limit the condensation, must be kept at a normal level, operating as per figures **A** and **B**.

Other possible sources of humidity in the houses could be:

Water boiling, food cooking, washing, shower, indoor plants, number of persons in the rooms, etc.

The humid air deposits itself on the windows and non-porous materials (ex: glass) in form of condensation and on the walls in form of eventual moulds and stagnation stains.

The condensation starts to form when the temperature of the walls in the room is lower than the temperature called "temperature of dew".

The temperature of dew is determined by the two following factors:

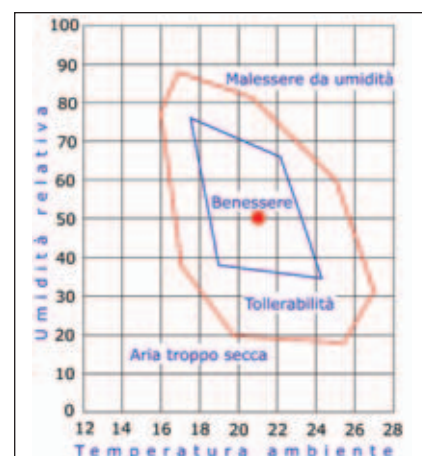
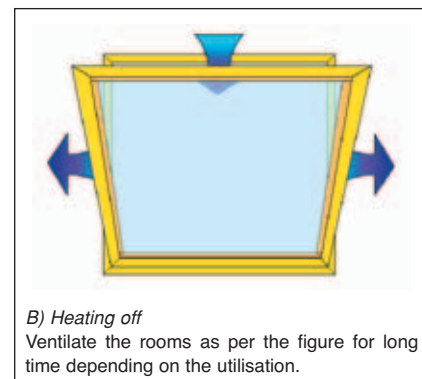
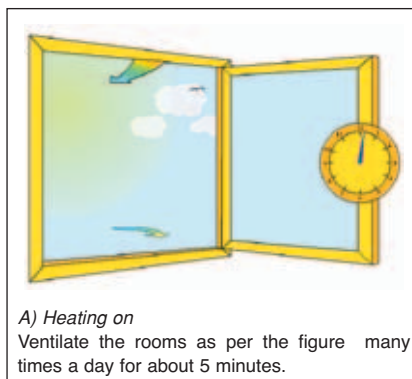
- Relative humidity ratio inside the rooms
- Temperature inside the rooms

**The ventilation of the rooms brings the air humidity to regular values.**

**By a short and repeated aeration, there is a low waste of energy and an efficient exchange of air is guaranteed.**

**The inhabiting wellbeing, as shown in the figure, is reached in function of the room temperature and of the relative humidity.**

Example: by a room temperature of 21°C and relative humidity of 50% we reach a condition of WELLBEING.



Wellbeing diagram



## METRA spa SALE GENERAL CONDITIONS

**Art. 1 Purpose and scope of application of these conditions** – These general conditions of sale govern all supply dealings between the parties apart from exceptions specifically agreed in writing. However, even in the case of exceptions agreed in writing, these conditions will continue to apply to all dealings not excepted.

**Art. 2 Drawing up of the contract** – The buyer's acceptance of Metra's offer or order, however communicated, will entail application of these general conditions to the sales contract; this will also be the case if acceptance is made through simple performance of the contract. Offers by agents, representatives and METRA sales assistants are not binding until they have been confirmed by METRA.

**Art. 3 Samples and modifications** – 3.1 – Information – Dimensions, manufacturing and assembly plans, prices, performance figures, colours and other types of data given in catalogues, leaflets, advertisements, illustrations, price lists or other METRA illustrative documents, and samples and models sent by METRA to the buyer, are to be considered approximate. These data are not binding unless expressly indicated, for example, in METRA's written offer or acceptance. 3.2 – Modifications to products – METRA reserves the right to make small technical changes to its products at any time that it feels may be dictated by production requirements, without being obliged to communicate the fact.

**Art. 4 Guarantee** – 4.1 – Conformity of products – METRA guarantees the conformity of its products within the terms of this article: the term 'conformity' is understood to mean correspondence of quality and type to what was stipulated in the contract and that the product is free from defects which might compromise the use for which it was meant. The buyer accepts METRA's tolerances regarding quantities of products. 4.2 – Extension of the guarantee – The guarantee that covers flaws is limited to those flaws that are due to material or construction faults that are imputable to METRA; the guarantee does not apply in cases in which the buyer installs or uses the product incorrectly. 4.3 – METRA will not accept liability for non-conformity defects deriving from damage caused to the products by transportation or handling. 4.4 – For details on construction or other industrial systems, consult the "General Notes" and "Performance and Safety Prescriptions" and anything else in the METRA catalogues and technical documentation that the buyer declares that he knows and accepts through placing the order and that must be considered an integral part of these general conditions. 4.5 – If METRA has made technical modifications to the products, as per art. 3.2, the modified products shall guarantee the same functionality and performance. METRA shall not be liable for non-conformity defects in the products that are due to normal wear of those parts that, by their nature, are subject to rapid and continuous wear. In general, METRA shall in no case be responsible for non-conformity defects caused after risks have been transferred to the buyer. 4.6 – Installation of products – The METRA guarantee does not cover defects resulting from improper installation. 4.7 – Complaints – The buyer is required to check the conformity of the product within eight days of receipt and in any case before additional work of any kind is undertaken on the product. The buyer shall report any visible defects in the product shortly after their discovery and in any case not more than six months after the date of delivery. Complaints shall be made via registered letter addressed to METRA and must give a detailed description of the defects or types of non-conformity that are the subject of the complaint. The buyer's right of guarantee shall be voided if he does not permit any reasonable check to be undertaken that METRA requires or if METRA requests the return of defective products, at METRA's own expense, and the buyer does not return the product within eight days of receiving the request. 4.8 – Redress – On receipt of a non-conformant product or defect reported by the buyer in compliance with article 4.7, METRA may at its sole discretion: a) within a reasonable period provide ex-works a product of the same type and in the same quantity as that/those recognised as being defective or non-conformant; b) credit the buyer a sum of money equal to the value to the product(s) recognised as

being defective or non-conformant. In these cases, METRA shall have the right to retain the defective product(s) which shall become its property. 4.9 – Limitation of METRA's responsibility – Any compensation paid to the buyer shall not exceed the invoiced price of the product(s). The guarantee described in this article supersedes all legal guarantees for defects and conformities and exempts METRA from any other responsibility for the supplied product(s); in particular, the buyer shall not be able to make further requests for compensation, price reductions or cancellation of the contract. In no case shall METRA be able to be held responsible for indirect or consequent damage.

**Art. 5 Technical standards and responsibilities of the manufacturer** – As the characteristics of METRA products comply with the legislation and technical standards in force in Italy, the buyer assumes the entire risk of possible lack of conformity between the Italian standards and the standards in force in the country of destination of the products, for which METRA shall not be held responsible. METRA only and exclusively guarantees the performance of the products of its own manufacture for the use, purpose, application, tolerances etc. that it expressly indicates. The buyer is not authorised to make use of the products supplied by METRA in a manner that does not conform to the contents of the previous point.

No exception to the contents of this article shall be considered valid unless expressly and specifically defined and accepted in writing between the parties.

**Art. 6 Delivery** – 6.1 Quotation of goods – Unless agreed otherwise, products are supplied ex-works; this is also the case when shipping is organised by METRA in which case METRA shall act as the on behalf of the buyer, it being understood that the product shall be transported at the cost and risk of the buyer. 6.2 – Transfer of risk – Risks relating to the supply shall, at the latest, be transferred to the buyer at the moment at which the product leaves METRA's factory if the commercial deadline or the regulations applicable do not permit an earlier transfer of risk. If the buyer does not take delivery of the product on the delivery date agreed for any reason not attributable to METRA, if the risk has not already been transferred as per the previous point, the risks shall in any case pass to the buyer on the agreed delivery date at the latest. METRA shall not in any case accept responsibility for deterioration of or damage to the product after risk has been transferred. In no case shall the buyer be freed from the obligation of paying the price of the goods if deterioration of or damage to the product occurs after transfer of risks. 6.3 – Delivery date – Even when the parties have agreed the delivery date, the delivery terms stated in the order confirmation shall not become valid unless the following conditions have been met: a) the buyer must make the required prepayment; b) the buyer must open the letter of credit agreed and stated in the contract. Unless otherwise agreed, ex-works delivery of product shall be made after the buyer has been notified in writing (including via telex or fax) that his product is available. 6.4 – Obligation of METRA to deliver the goods – The delivery terms are understood to be approximate and to give METRA the benefit of an appropriate period of grace. If goods are deemed to have been delivered late because METRA is at fault, the buyer shall be able to cancel only the goods not delivered, and in any case not before informing METRA of his intention via registered letter with notice of receipt, and having agreed a new delivery term of at least 30 days from receipt of the notification, within which time METRA shall be able to deliver all the goods specified in that notification that had not been already delivered. This shall also be valid for staggered deliveries and for which it is in particular agreed that in no case shall delay in making or failure to make one or more deliveries, or partial cancellation of the contract due to late delivery or failure to deliver, as specified in this article, give the buyer the right to cancel the contract relating to deliveries already made or future deliveries. METRA shall in any case be free of all responsibility for damage arising from total or partial early or late delivery whether total or partial. 6.5 – Force majeure – The delivery term shall be extended by a period equal to the duration of the act of force

majeure that is beyond the control of METRA or the buyer, should such an act occur after the contract has been signed and should it temporarily make delivery either impossible or excessively onerous. When METRA becomes aware of the act of force majeure, it shall inform the buyer of the situation within a reasonable period of time and, if the buyer is not affected by the act of force majeure, shall inform him of the probable effects on the obligation of delivery. Similarly, METRA shall inform the buyer as soon as the act of force majeure has been removed. Both METRA and the buyer shall have the right to cancel the contract via registered letter with notice of receipt, giving notice of one month, should the act of force majeure persist for a reasonable period after the agreed delivery date. In no case shall METRA or the buyer be able to demand compensation or damages of any nature for acts of force majeure.

**Art. 7 Payment** – 7.1 Prices and payments – The prices of the goods are always given ex-works. Payments and any other sums owed to METRA are deemed to be net prices received by METRA. Payments shall be made at the time of delivery to the bank stated by METRA unless otherwise agreed. Payments to agents, representatives or sales assistants shall not be considered as made until the moneys reach METRA. 7.2 – Delays in payments – Any delay or irregularity in payment shall give METRA the right to suspend supplies or cancel any current contracts even if they do not relate to the payments in question, as well as the right to compensation. METRA shall have the right, to automatically apply interest on arrears from the date on which payment fell due that is three percentage points above the current Italian discount rate. Delays in payments also give METRA the right to suspend the guarantee as per art. 4 for all of the period during which the delay in payment lasts. The buyer shall not be able to demand compensation for any non-fulfilment of contract by METRA if payments are not regularly made. The buyer is also obliged to make full payment even in cases of complaint or dispute. Payment of compensation to METRA through credits, however they may have arisen, is not permitted.

**Art. 8 Retention of title** – If payment either in whole or in part is to be made after delivery, the product delivered remains the property of METRA until complete payment has been made.

**Art. 9 Excessively onerous burdens** – If, for any reason that is unforeseeable to a business person in the industry with normal experience, it is excessively onerous for METRA's to perform its obligations—before they are performed – to the extent that the originally agreed value is altered by more than 20%, METRA shall be able to request a revision of the contractual conditions and, should the revision not be agreed, shall be able to cancel the contract.

**Art. 10 Interpretation; modifications; invalid clauses** – Any reference made to price lists, general conditions or other material from METRA or third parties is understood to refer to documents in force at the moment in which the reference is made, unless otherwise specified. Modifications or additions to contracts made by the parties to which these general conditions apply shall be made in writing or shall have no validity. Exceptions to one or more of these general conditions shall not be apply to other conditions in the contract, nor shall they imply the wish for the general conditions not to be applied as a whole. In the event of invalid or ineffectual contractual conditions, the contract as a whole shall be integrated and interpreted as though it contained all the clauses that allow the essential aim of the agreement, containing the clauses in question, to be achieved in compliance with the law.

**Art. 11 Place of jurisdiction** – All disputes arising from or connected with contracts to which these general conditions apply, shall be decided exclusively in the court of Brescia; METRA shall have the right to use the court of the buyer.

**Art. 12** – For everything is not included in the present sales conditions, please see the commercial price lists of Metra Building Systems and Metra Industrial Profiles.



## GENERAL NOTES

<b>Aluminium profiles</b>	Aluminium profiles are sold per meter.
<b>Dimensions of aluminium profiles</b>	Given dimensions are nominal and can change according to dimensional tolerances of extrusion (EN 12020-2). Also painting, by increasing thickness, contributes to the variation of the profiles' dimensions and, in particular, reduces the spaces of insertion seats for gaskets and accessories.
<b>Fabrication of the curtain wall</b>	During the first stages of the production, we suggest to produce a dimensional sample in order to check assembly features, waterproof performances and the mechanical characteristics of the accessories.
<b>Length of the bars</b>	The commercial length of the profile of this series is 6600 mm.
<b>Fixing to wall</b>	The description of some schemes for fixing frames to the wall does not have a restrictive value, it is only a suggestion, also for designers, of how to solve in a simple and practical way this particular and important problem of frames.

All sections, connections, assembly, machining and fittings given in the METRA drawings and catalogues correspond to the actual state of technics and have been defined with accuracy and competence.

They represent a free service that, without obligation, gives proposals and suggestions to the fabricator.

The fabricator must verify directly, at the moment of utilisation, if the proposals correspond to and if they are applicable to the case under examination, as the many-sided practical solutions can not be all illustrated in the catalogues.

- The profiles, the accessories and the gaskets in this catalogue have all been patented.
- All data given in the present catalogue are indicative and are not binding for METRA S.p.A.
- METRA S.p.A. reserves the right to bring, in every moment, all modifications it will consider suitable in order to improve its products.
- All materials illustrated in present catalogue are of exclusive property of METRA S.p.A. and, under law terms, in lack of expressed authorization, all rights are reserved, even partial.

The system has been studied in its totality of profiles, gaskets and accessories according to the fabricating and applicative technology indicated in the technical catalogue and according to the currently existing rules, prescriptions and recommendations in Italy, all this has determined also the dimensional limits here given.

On this base all laboratory tests have been executed and the given results have been achieved.

Then, it is absolutely essential to use original METRA profiles, gaskets and accessories and to perform the given fabricating and applicative processes, using "original METRA equipments".

The non-utilisation, also partial, of the original METRA products cuts out every possibility of recourse against METRA, who will recognise only the replacement of those products which should result to have a fabrication default.



**TECHNICAL DESCRIPTION OF THE URANO-WALL SYSTEM**

**Extruded aluminium profiles in alloy:** EN AW 6060 (EN 573-3 and EN 755-2)

**Temper designation:** EN 515

**Dimensional tolerances and thickness:** EN 12020-2

**Use:** This system, together with its aluminium profiles and “original” aluminium and stainless steel accessories, can be used to realize “ventilated curtain walls” covered, totally or partially, with aluminium panels.  
Besides new architectural constructions, ventilated covers of this type can be used also for restructuring existing buildings and, in particular, for those which need an architectural and energetic re-qualification.

**Main features:** “Ventilated curtain walls” made with the URANO system consist in a mat curtain wall, whose external cover is made up of aluminium pre-formed panels, dry-mounted through suspension devices and mechanical fixings; the structural part is hidden and separated from the wall front of the building behind (on which there is usually a thermo-insulating panel) to allow the circulation of air. The curtain so built protects naturally and efficiently the building against the combined actions of rain and wind: the so called pouring or downwind rain. The cover’s binding modality and the presence, behind the cover itself, of a ventilated hollow space neutralise the effects of rain whips and water sprinkles and the subsequent runoff water on the curtain wall and help to maintain both the thermal insulation and the internal counter-wall dry. This brings undoubted advantaged as for the life of the wall, its energetic efficacy during heating up period and the reduction, during summer, of the thermal load on the building through a partial reflection of sun rays by the covering and through the ventilation of the hollow space. Moreover, ventilated walls so built up can greatly improve the acoustic insulation of the shell which they cover.

## TECHNICAL DESCRIPTION OF SPECIFICATION

The “ventilated curtain wall” shall be realized using profiles from the METRA URANO system, in primary aluminium alloy EN AW- 6060, according to EN 573 standard, at a T5 temper designation according to EN 515 standard.

This system will make use of vertical profiles with variable depth (according to static requirements), whose shape shall be combinable with the supporting accessories of the external cover without any machining such as drilling or milling work.

This system will be composed of an external curtain wall made up of preformed aluminium sheet profiles, whose hidden aluminium support structure (vertical profiles) will be separated from the front of the wall behind, on which a waterproof, thermal-insulated, high-density not-combustible panel (class zero) is placed. In the alternative model with glazing panels, the curtain wall grid will be defined and completed through glass-supporting frames (semi-structural glazing) or glazed panels (structural glazing).

Externally, glass-supporting frames of the structural gluing type will not have metallic parts in view from the outside and the glazing surface will result perfectly coplanar with separation 8/16 mm fugues between slabs.

The profile on which the structural glue acts will be treated according to indications and specifications of the sealant furnisher, while the internal part will be treated according to the indications of the supervision of works.

The depth of the entire structure, starting from the part behind, shall be about 200 mm, including the external cover. The average profile thickness shall be compliant with the EN 755 standard.

Components shall fill requirements of UNI 3952 standard.

### ACCESSORIES

The vertical profile is connected to the wall by means of the following accessories:

- Wall fixing brackets (adjust  $\pm 25$ -30 mm according to the bracket).
- Supporting springs (stainless steel AISI 301) that permit the horizontal and vertical setting of the metal panel and that are self-blocking and complete with vibration-damping gasket.
- Supporting accessories for glazing panels (aluminium-stainless steel) that permit the horizontal and vertical setting of the metal panel and that are self-blocking and complete with vibration-damping gasket.
- Wall supporting springs of thermal-insulating panels, realized in tempered and relieved steel.

Accessories will be realized according to the following standards:

UNI 3054, UNI 3055, UNI 3056, UNI 3057, UNI 3058, UNI 3059.

Accessories shall be original METRA accessories, developed and produced for this system.

### DRAINAGE AND VENTILATION

The “ventilated curtain wall” system shall protect the wall behind against water sprinkles and rain whips and against the subsequent runoff water on the curtain wall surface, hence ensuring that the thermal insulator and the internal counter-wall are dry (thanks also to the ventilated hollow space between the external cover and the insulating) for better thermal-insulation and a longer life.

### GASKETS

Adhesive gaskets for covering the panels will be mounted on vertical mullions. PVC coextruded gaskets for glass will be mounted on glazing panels with structural glass.

Near the external perimeter of the frame or of the curtain wall, an elastomers (EPDM) water proof sheath will be glued as a junction between covering panels, so to avoid water leakage. In case aluminium panels are not used, but rather other material, at the contact points between frames or curtain wall, it will be necessary to interpose an insulating gasket to avoid galvanic phenomenon.

The features of the gaskets shall be compliant with UNI 9122 standard.

### DILATATIONS

Components will be realized in order to absorb expansions generated by the temperature variations and by tolerances and movements of the building structure without noise and deformation of the curtain wall. For this reason, profiles, accessories and gaskets shall be correctly used, following the indications of cutting and assembling tolerances indicated on the technical documentation for the manufacturing and the deployment of the system.

Particularly, expansions joints for mullions shall be realized using the appropriate plugs included among accessories and interposing between these joints and the fixing brackets a layer of anti-friction material (Teflon, nylon, etc...).



## **BUFFERING**

The “ventilated curtain wall” system shall permit the insertion of plain/glazed panels of different thickness, dry-mounted using supporting and fixing mechanical devices and with the possibility of being aligned even after their deployment. Between panels, there will be an EPDM spacer to ensure an 8/16 mm shutter.

## **GLAZING AND SEALANTS**

The curtain wall system shall permit the insertion of glazing made up of an external tempered glass of 6 mm minimum thickness (with a structural sealing joint between the glass and the aluminium frame) and with a max thickness of 8 mm.

Measuring of glass sheets shall be carried out according to the UNI 7143 standards.

Glazing will be realized according to the UNI 6534 standards and following the technical document UNCSAAL UX9, using dowels with appropriate hardness according to their supporting or spacing function.

External sheets will be supported by two nylon supports compatible with the structural sealant, glued to aluminium elements 50 mm long and fixed to the lower transom of the frame, so to avoid shearing force on the structural sealing produced by the weight of the sheet.

Structural sealing shall be carried out using silicone sealant for specific structural usages produced by Dow Corning.

Sealing cannot be realized at the building yard but at glassworks only, certified by the sealant producer. Sealing shall be carried out according to the producer’s indications.

The certificates of warranty of the sealant’s producer and of the glasswork which carried out the sealing shall be presented. Glazing shall be of prime quality, perfectly colourless and transparent, with coplanar flat surfaces and shall be compliant with UNI standards.

Using gaskets ensures that the pressure of the wind, by acting constantly on the entire perimeter of the sheets, avoids points of leakage.

For this reason, the external gasket will be more elastic than the internal one, so that it can deform in case of abnormal movements.

Security criteria: the choice of glazing shall be carried out according to the UNI 7687 standard.

## **PERFORMANCES**

The “ventilated curtain wall” system is naturally suitable to effectively protect the building against the combined actions of rain and wind.

During winter and summer periods, there will be advantages in term of acoustic and thermal insulation thanks to a partial reflection of sun rays by the external cover and, thanks to the natural ventilation in the hollow space, between this latter and the thermal insulation.

## **FIXING TO WALL**

The fixing to the wall shall be realized through anchoring brackets in aluminium alloy 6060TS according to the UNI 3952/66 standard; they shall be adjustable along the three orthogonal directions to permit an easy and correct positioning of profiles, and able to resist all the strain transmitted by the curtain wall (proper weight, pressure and depression of the wind, accidental loads).

## **CRITERIA FOR THE STATIC ESTIMATE**

Estimates shall be carried out applying weights of the buffering elements indicated by producers, loads and overloads according to the existing technical standards. Static estimates of structural elements shall be carried out keeping the value of the wind pressure as indicated in the Ministerial Decree dated 16th January 1996 updated by the Circular of the Ministry n°156 AA.GG/STC of 4th July 1996.

The maximal admissible tension for structural aluminium elements will be 850 kg/cm<sub>2</sub>.

Mullions and transoms shall be measured to avoid elastic deformations over 1/200 of the distance between two subsequent binding points of the building structure and in any case cannot exceed the threshold of 15 mm.

Double glazing shall be planned in any case; maximum deflection cannot exceed the maximum limit of 1/300 of the size of the sheet and shall be less than 8 mm in any case.

Glass sheets shall be measured according to the UNI 7143 standard.



### LIMIT OF USE

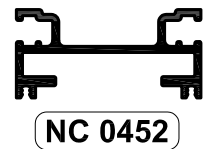
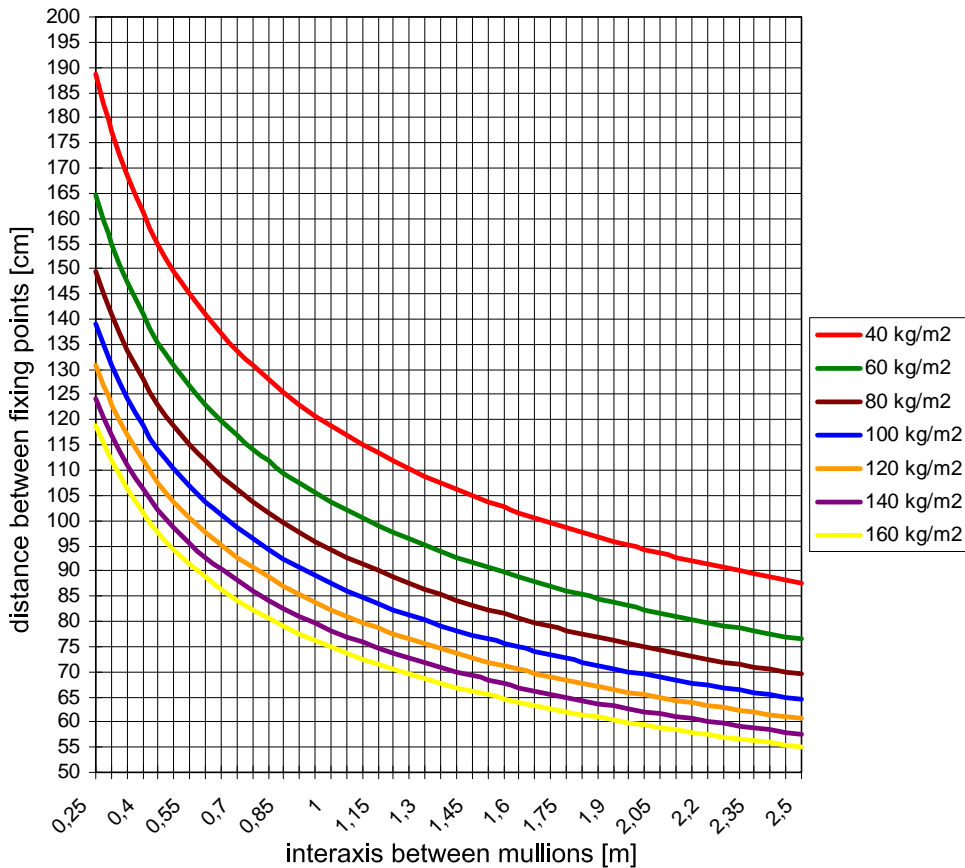
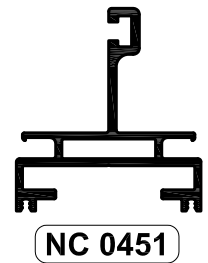
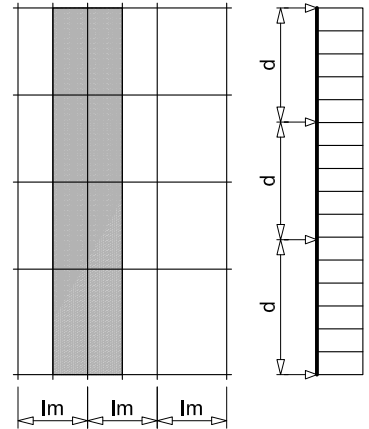
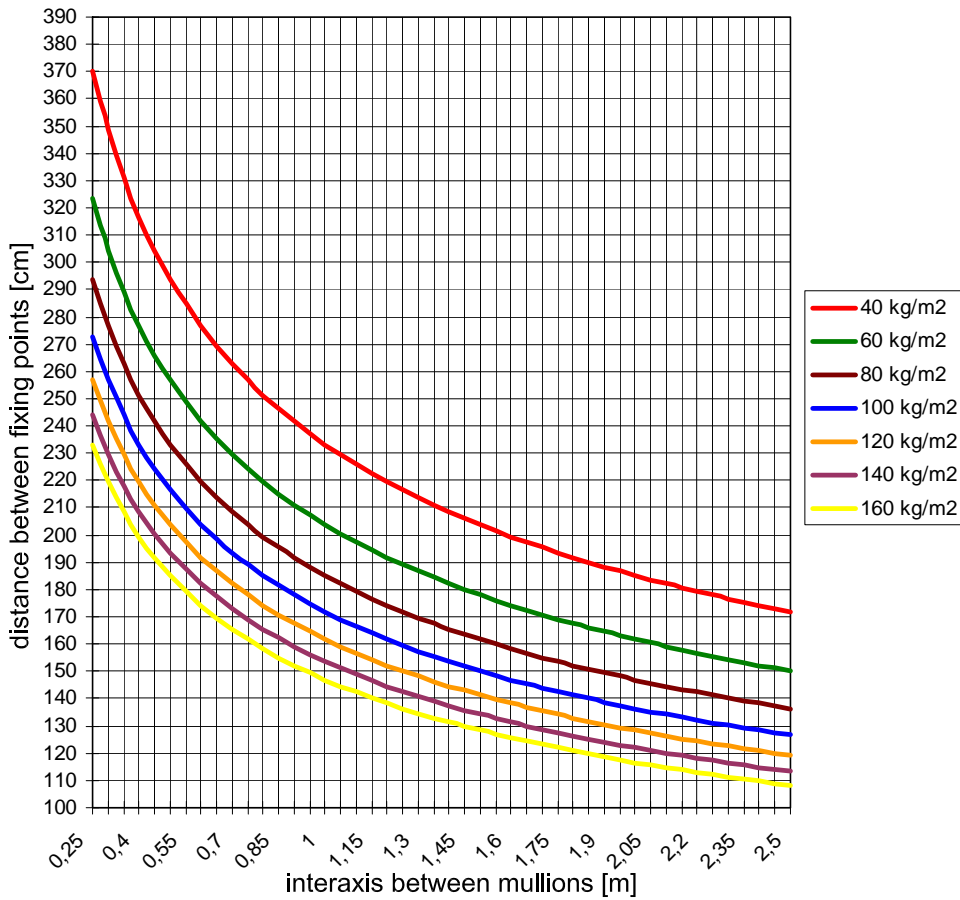
When determining maximal size of panels, the designer or the fabricator shall consider and evaluate dimensions and inertia movement of profiles, but also technical features of accessories and their meteorological and applied characteristics such as height from the ground, exposure to rain and speed of winds in the area.

### CONTROLS

With regard to quality of supplied materials, surface protection and performances, the supervision of works (the customer) is entitled to control and test according to the modalities and the criteria as in the UNI 3952 standard under the head "test by means of sampling".

At the completion of the work, a final technical test will be carried out.

Control of surface finishing can be carried out according to the brand directives QUALICOAT and QUALANOD.

**LOAD DIAGRAM OF THE MULLIONS**




# CERTIFICATO CERTIFICATE

## IGQ 9434

Si certifica che il sistema di gestione per la qualità di:  
*We hereby certify that the quality management system operated by:*

### Metra Spa

Rodengo Saiano

Via Provinciale Stacca, 1  
25050 Rodengo Saiano BS

è conforme alla norma:  
*is in compliance with the standard:*

## UNI EN ISO 9001:2000

per le seguenti attività:  
*for the following activities:*

EA: 17

Progettazione e fabbricazione di profilati di precisione estrusi in lega di alluminio e componentistica  
accessoria impiegati nei sistemi per l'edilizia e nelle applicazioni industriali

*Design and manufacture of aluminium alloy extruded sections and fittings employed in the  
construction industry and other industrial applications*

prima emissione: **1994-12-16**  
*first issued on:*  
emissione corrente: **2006-06-30**  
*last issued on:*  
data di scadenza: **2009-06-30**  
*valid until:*

Il Direttore  
Dario Agalbat  


[www.igq.it](http://www.igq.it) - [info@igq.it](mailto:info@igq.it)

CISQ is a member of



[www.igq-certification.com](http://www.igq-certification.com)

*IQNet, the association of the world's first  
class certification bodies, is the largest  
provider of management System  
Certification in the world.  
IQNet is composed of more than 30  
bodies and counts over 150 subsidiaries  
all over the globe.*

**SINCERT**

EUROPEAN UNION ISO 9001:2000

SGQ N° 001A  
SGA N° 015D  
PRD N° 001B

Membro degli Accordi di Mutuo Riconoscimento EA e IAF  
Signatory of EA and IAF Mutual Recognition Agreements



[www.cisq.com](http://www.cisq.com)

Novembre 2003



THE INTERNATIONAL CERTIFICATION NETWORK

# CERTIFICATE

IQNet and its partner  
CISQ/IGQ  
hereby certify that the organization

**Metra Spa**  
Rodengo Saiano

**Via Provinciale Stacca, 1**  
**25050 Rodengo Saiano BS**

has implemented and maintains a Quality Management System  
which fulfills the requirements of the standard

**ISO 9001:2000**

for the following activities:

**Design and manufacture of aluminium alloy extruded sections and fittings employed in the  
construction industry and other industrial applications**

issued on: **2006-06-30**

valid until: **2009-06-30**

CISQ/IGQ certified since: **1994-12-16**

*Registration Number:*

**IT- 0123 IGQ 9434**



*Fabio Roversi*  
President of IQNet



*Gianrenzo Prati*  
President of CISQ

**IQNet Partners\*:**

- AENOR Spain AFAQ France AIB -Vinçotte International Belgium ANCE Mexico APCER Portugal CISQ Italy CQC China CQM China  
 CSQ Czech Republic Cro Cert Croatia DQS Germany DS Denmark ELOT Greece FCAV Brazil FONDONORMA Venezuela  
 HKQAA Hong Kong ICONTEC Colombia IMNC Mexico IRAM Argentina JQA Japan KEMA Netherlands KFQ Korea MSZT Hungary  
 Nemko Certification Norway NSAI Ireland ÖQS Austria PCBC Poland PSB Certification Singapore QMI Canada RR Russia  
 SAI Global Australia SFS Finland SII Israel SIQ Slovenia SQS Switzerland SRAC Romania TEST St Petersburg Russia  
 YUQS Serbia and Montenegro

IQNet is represented in the USA by the Following partners: AFAQ, AIB - Vinçotte International, CISQ, DQS, KEMA, NSAI, QMI and SAI Global

\*The list of IQNet partners is valid at the time of issue of this certificate. Updated information is available under [www.iqnet-certification.com](http://www.iqnet-certification.com)

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## **ACCESSORIES AND GASKETS**





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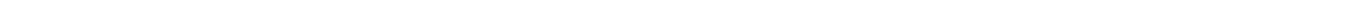


CODE	DRAWING	USE	CODE	DRAWING	USE
<b>Ma 3900</b>		Basic support bracket 80 mm to fix profile NC 0451 NC 0452  Material: Aluminium	<b>Ma 3911</b>		Check spring for fixed insulated panel max jutting-out from structure 135 mm  Material: Steel AISI 304
<b>Ma 3901</b>		Double support bracket 80 mm to fix profile NC 0451 NC 0452  Material: Aluminium	<b>Ma 3912</b>		Screw M6 x 20 + nut + washer + grover  Material: Stainless steel
<b>Ma 3902</b>		Basic support bracket 115 mm to fix profile NC 0451 NC 0452  Material: Aluminium	<b>Ma 3913</b>		Spacer thickness 8 mm for covering panels  Material: EPDM
<b>Ma 3903</b>		Double support bracket 115 mm to fix profile NC 0451 NC 0452  Material: Aluminium	<b>Ma 3914</b>		Accessory for support of panels with slot 19 x 45 mm in alternative to Ma 3907  Material: Aluminium Stainless steel
<b>Ma 3904</b>		Basic support bracket 150 mm to fix profile NC 0451 NC 0452  Material: Aluminium	<b>Ma 3915</b>		Corner cleat with pin or screw for side fixing for NC 0460 - NC 0462  Material: Aluminium
<b>Ma 3905</b>		Double support bracket 150 mm to fix profile NC 0451 NC 0452  Material: Aluminium	<b>Ma 3916</b>		Vibration-damping accessory for Ma 3914  Material: Polyamide 6 black
<b>Ma 3907</b>		Spring to support panels with slot 19 x 45 mm  Material: Stainless steel 8/10	<b>Ma 3917</b>		Blocking screw for corner cleat Ma 3915  Material: -
<b>Ma 3908</b>		Spring to support panels with slot 24 x 45 mm  Material: Stainless steel 8/10	<b>Ma 5571</b>		Pin 17 mm  Material: Zinc alloy
<b>Ma 3910</b>		Vibration-damping coupling for accessory Ma 3907-3908  Material: PVC	<b>Ma 0800</b>		Pliers for inserting panel support springs  Material: -



CODE	SECTION	USE	CODE	SECTION	USE
Mg 373D		Gasket for rabbet for mullion NC 0451 - NC 0452  Material: EPDM			
Mg 374P	 ALLEGIMENTO	Gasket for 6 mm glass  Material: coextruded P.V.C.			
Ma 570D		Adhesive gasket 30 x 2 for mullion NC 0451 - NC 0452  Material: -			
Mg 851P		Gasket for 8 mm glass  Material: coextruded P.V.C.			



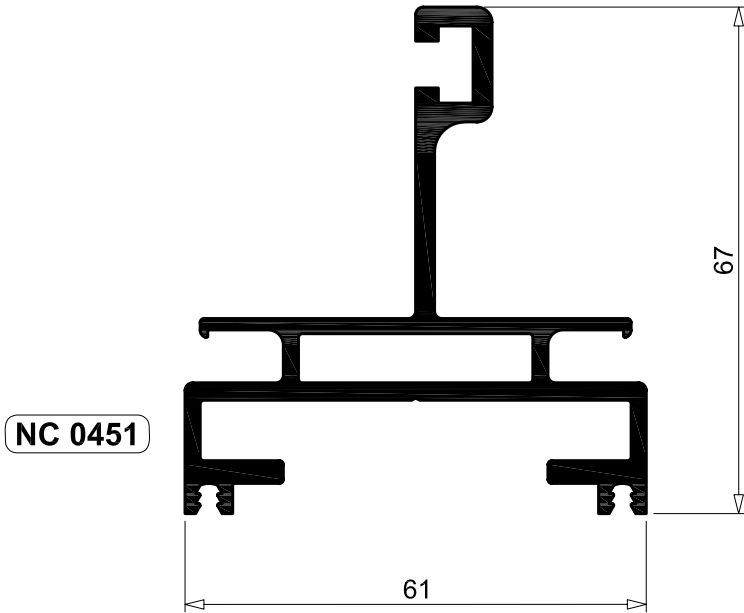


# PROFILES

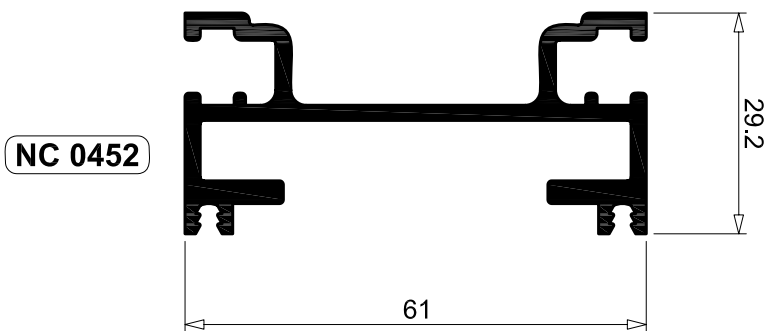
Groups A-B







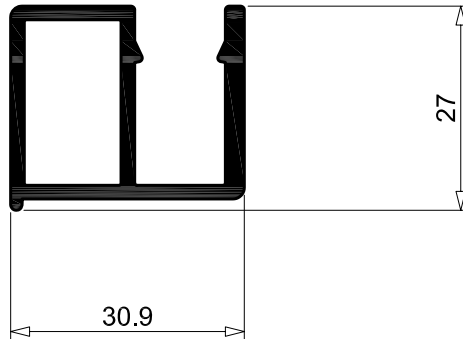
SECTION	CODE	$J_X$	$W_X$	USE
	WEIGHT kg/m	$J_Y$ cm <sup>4</sup>	$W_Y$ cm <sup>3</sup>	
	<b>NC 0451</b>	18.527	4.403	MULLION
	1.528	17.564	5.573	
		PERIMETER mm		PERIMETER IN VIEW mm
		424		---




SECTION	CODE	$J_X$	$W_X$	USE
	WEIGHT kg/m	$J_Y$ cm <sup>4</sup>	$W_Y$ cm <sup>3</sup>	
	<b>NC 0452</b>	2.445	1.645	MULLION
	1.01	19.217	6.301	
		PERIMETER mm		PERIMETER IN VIEW mm
		352		---

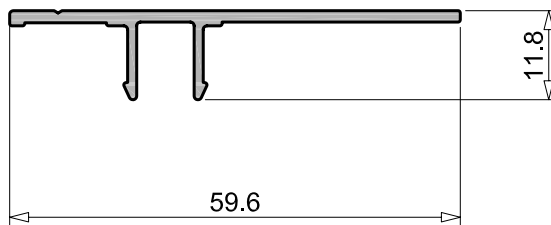



**NC 0460**



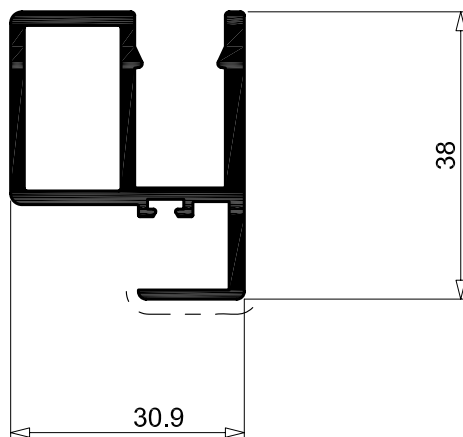
SECTION	CODE	$J_x$	$W_x$	USE
	WEIGHT kg/m	$J_y$ cm <sup>4</sup>	$W_y$ cm <sup>3</sup>	
	<b>NC 0460</b>	1.798	1.292	STRUCTURAL FRAME
	0.616	2.744	1.752	
PERIMETER mm		PERIMETER IN VIEW mm		
162		---		


**NC 0461**



SECTION	CODE	$J_x$	$W_x$	USE
	WEIGHT kg/m	$J_y$ cm <sup>4</sup>	$W_y$ cm <sup>3</sup>	
	<b>NC 0461</b>	0.092	0.094	COVER
	0.321	2.985	0.922	
PERIMETER mm		PERIMETER IN VIEW mm		
162		---		

**NC 0462**



SECTION	CODE	$J_x$	$W_x$	USE
	WEIGHT kg/m	$J_y$ cm <sup>4</sup>	$W_y$ cm <sup>3</sup>	
	<b>NC 0462</b>	3.191	1.513	SEMISTRUCTURAL FRAME
	0.729	3.207	1.822	
PERIMETER mm		PERIMETER IN VIEW mm		
219		--- 14		

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# SECTIONS

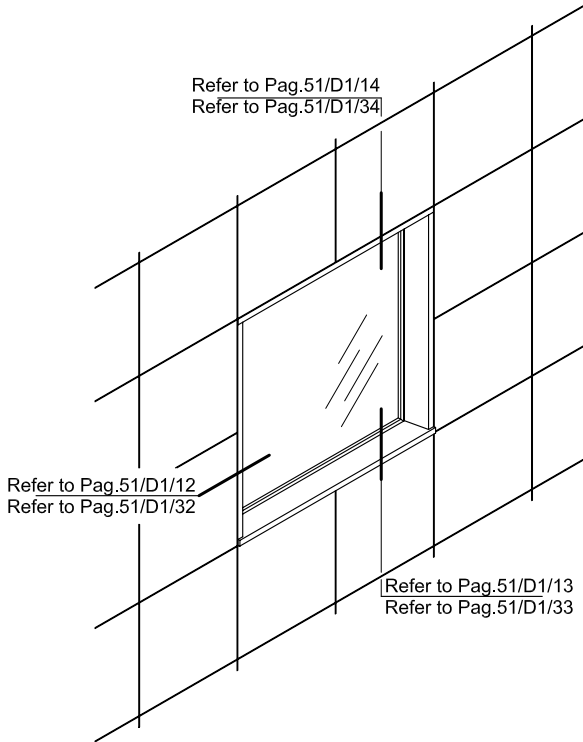
Groups D1 - D2

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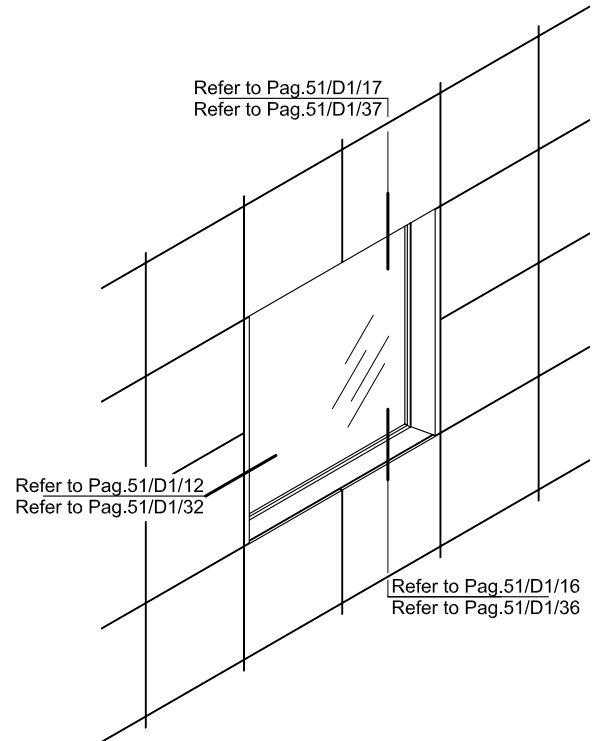


## Solutions for the insertion of glazed panel

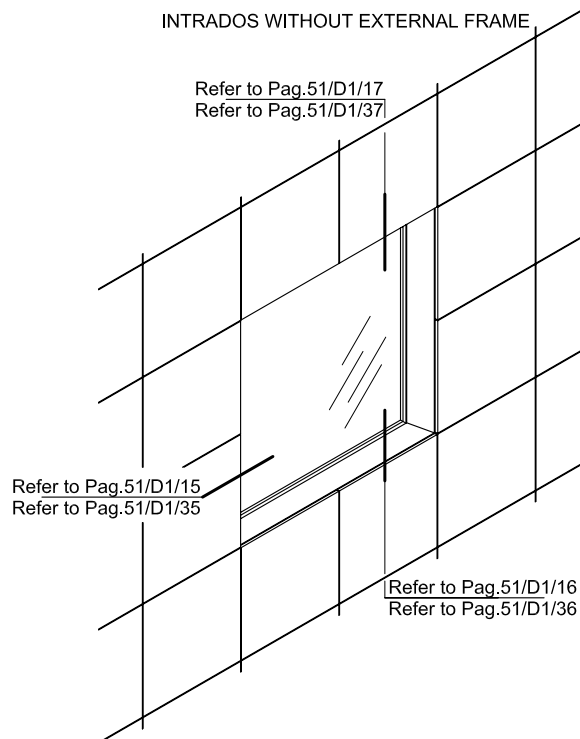
INTRADOS WITH WITH FRAME ON THE EXTERNAL PERIMETER AND WINDOW SILL



INTRADOS WITH EXTERNAL FRAME ONLY ON MULLIONS

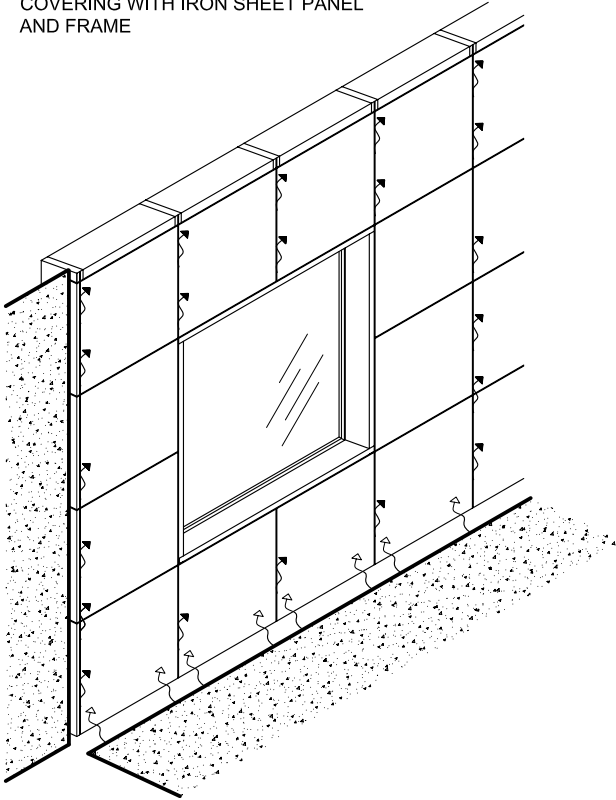


INTRADOS WITHOUT EXTERNAL FRAME

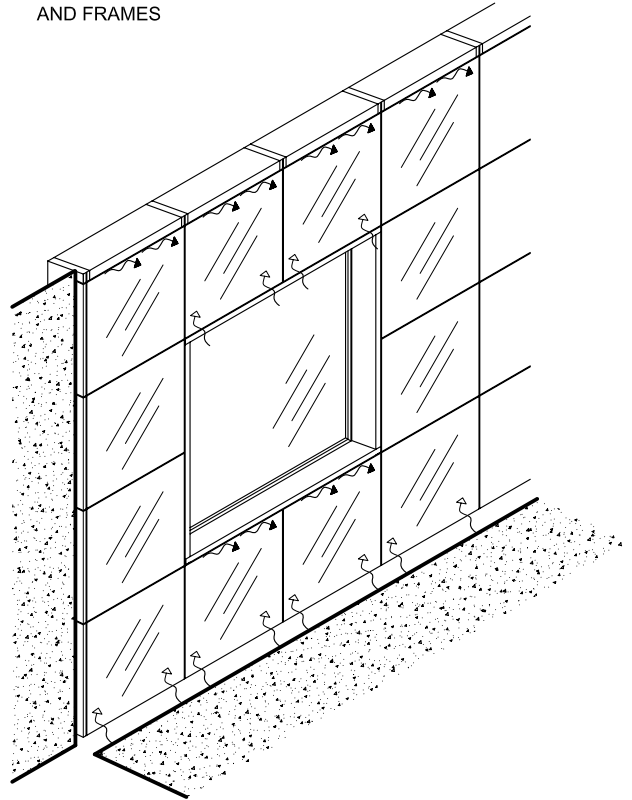


## NATURAL VENTILATION DIAGRAMS OF VENTILATED WALLS ACCORDING TO THE TYPE OF FRAME AND TO THE EXTERNAL COVERING

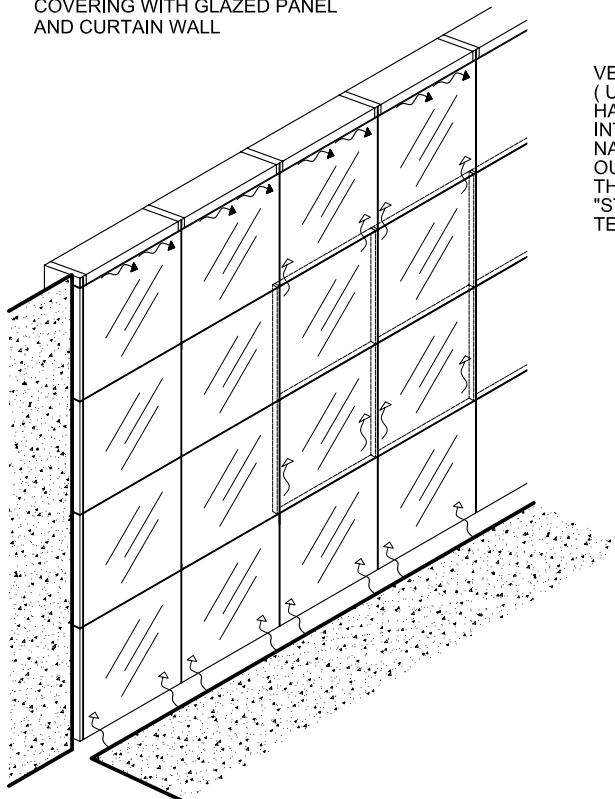
COVERING WITH IRON SHEET PANEL  
AND FRAME



COVERING WITH GLAZED PANEL  
AND FRAMES



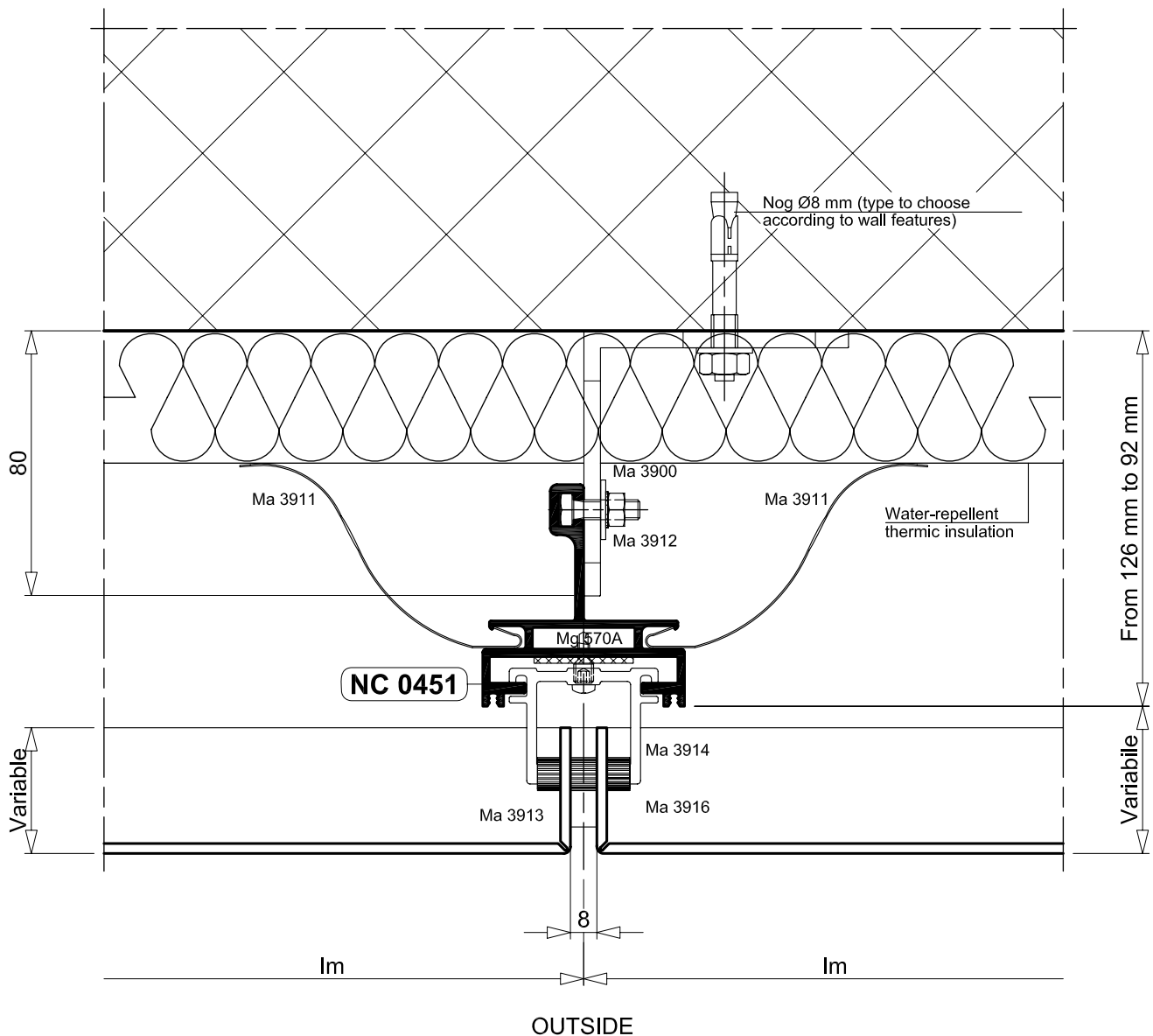
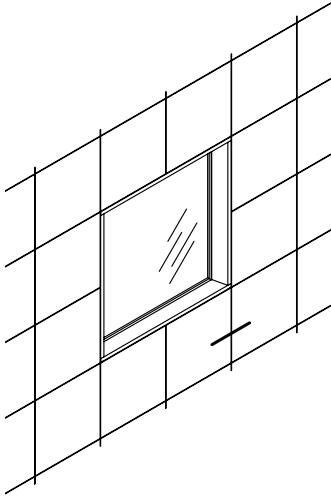
COVERING WITH GLAZED PANEL  
AND CURTAIN WALL



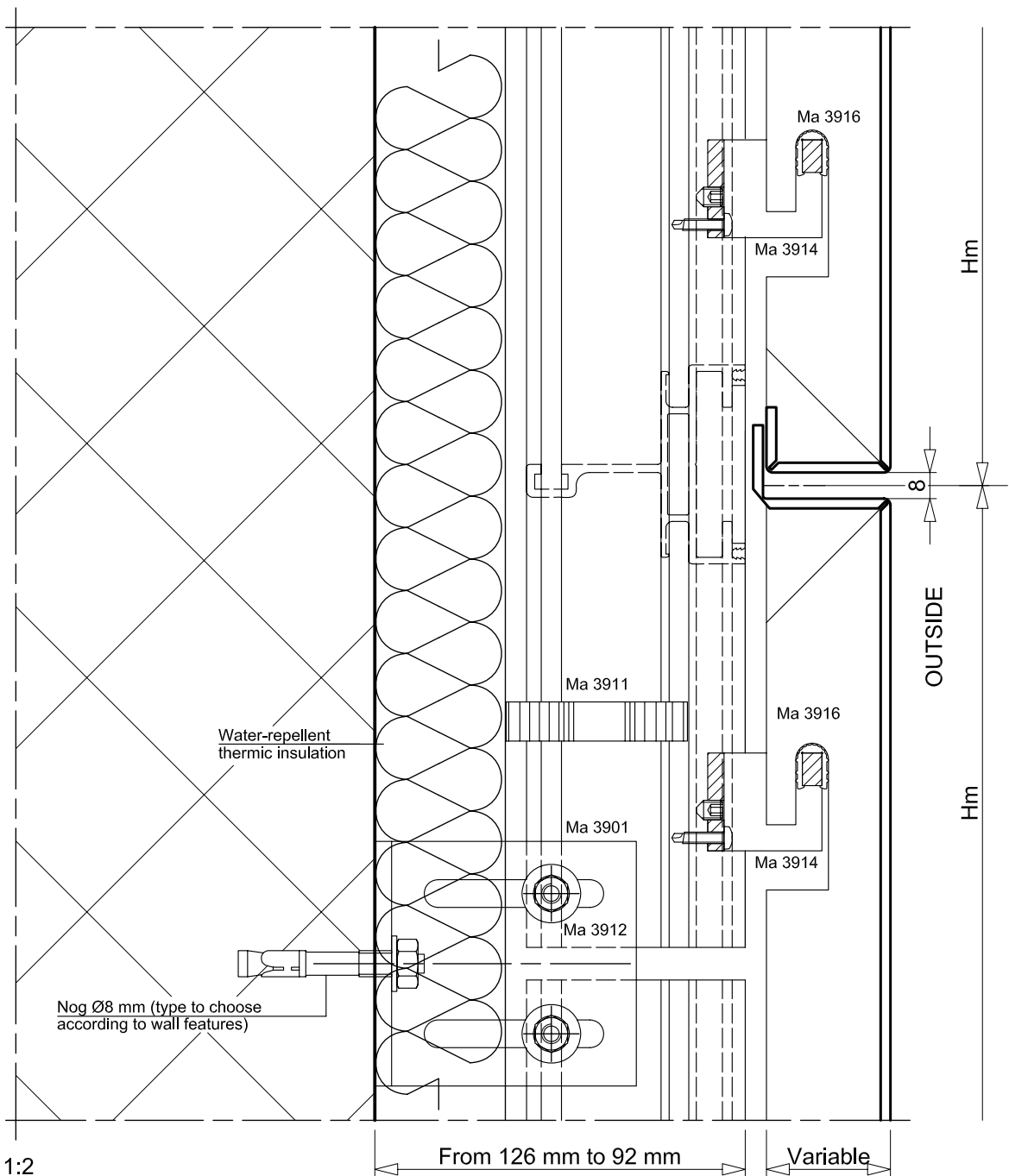
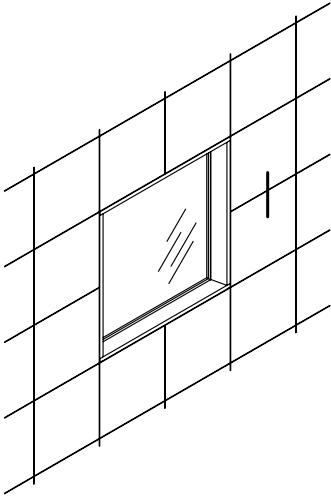
### VENTILATED WALL

VENTILATED WALL PRESENTS A LAMINAR WIND FLOW (UNIFORM AIR MOTION). THIS MEANS THAT AIR INSIDE HOLLOW SPACE SHAN'T COME IN CONTACT WITH THE INTERNAL ENVIRONMENT. NATURAL VENTILATION SHALL OCCOUR ONLY FROM THE OUTSIDE. THIS CAN BE REALIZED THANKS TO THE SO CALLED "STACK EFFECT": WARM AIR, LIGHTER THAN COLD AIR, TENDS TO RISE.

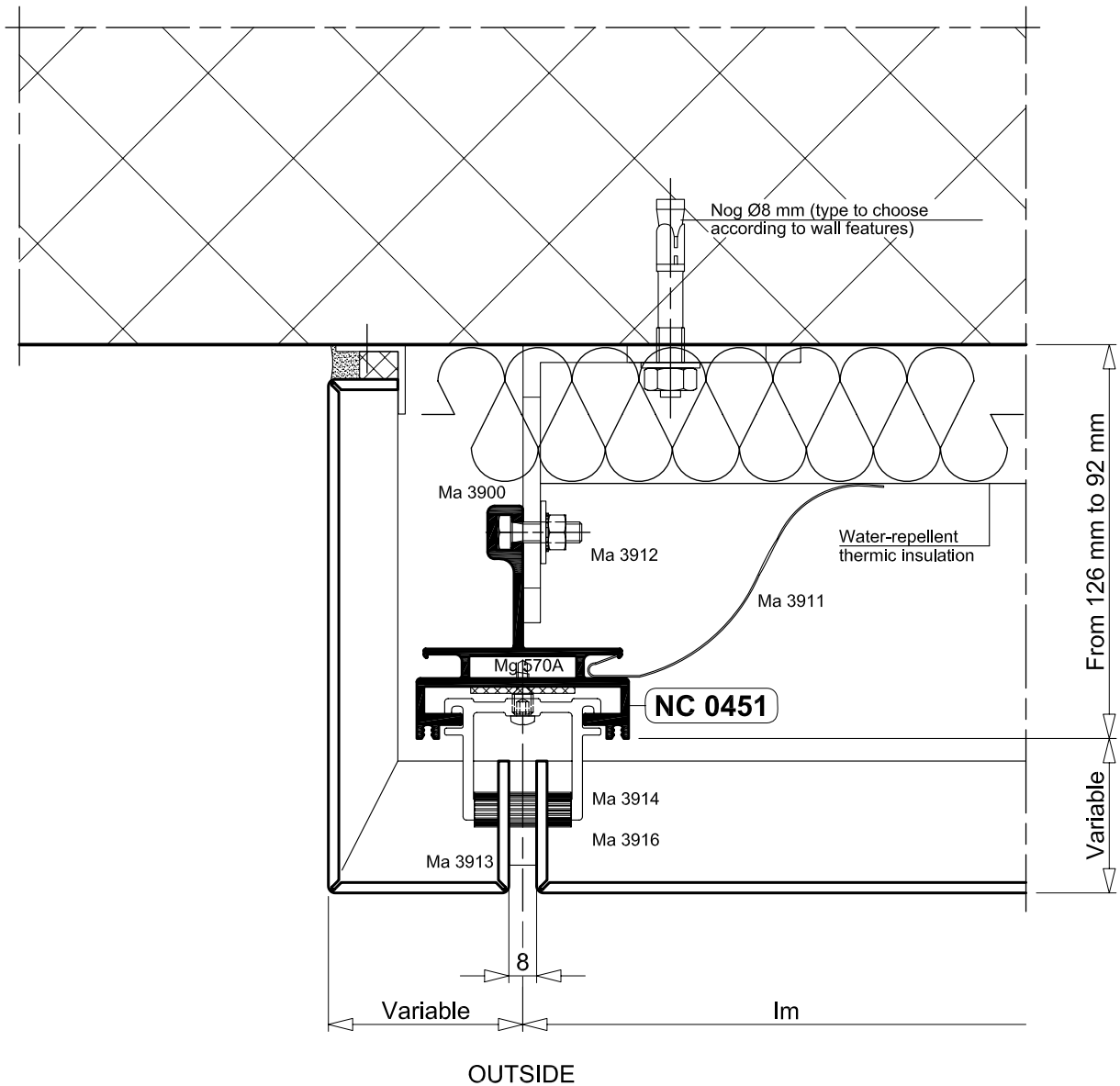
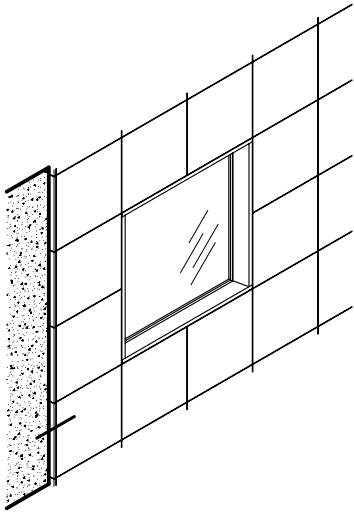
SECTIONS



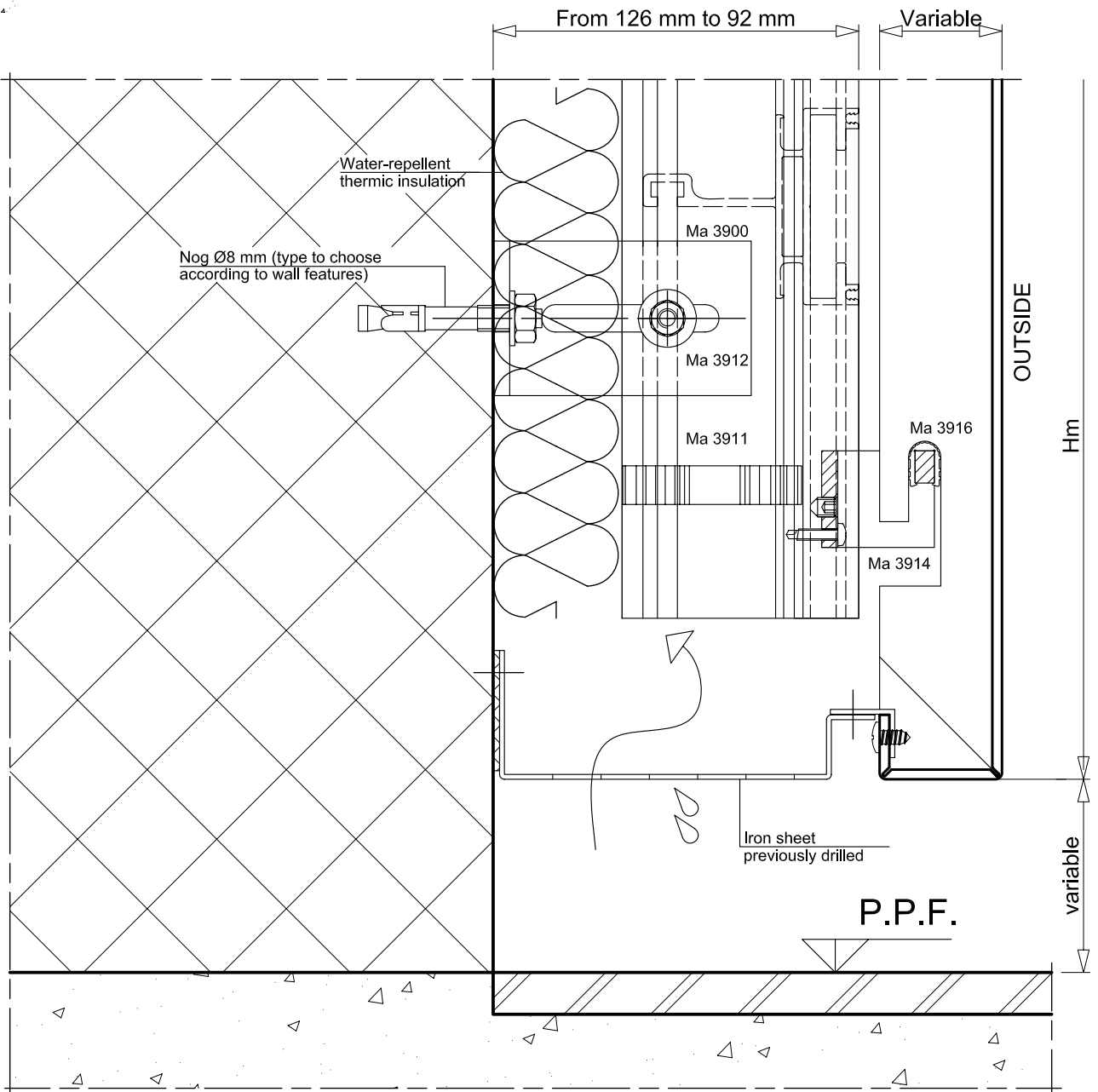
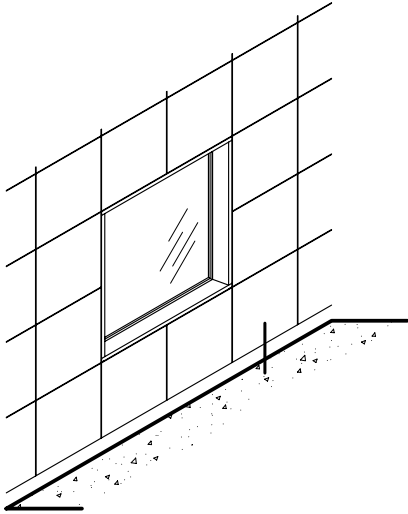
SCALE 1:2



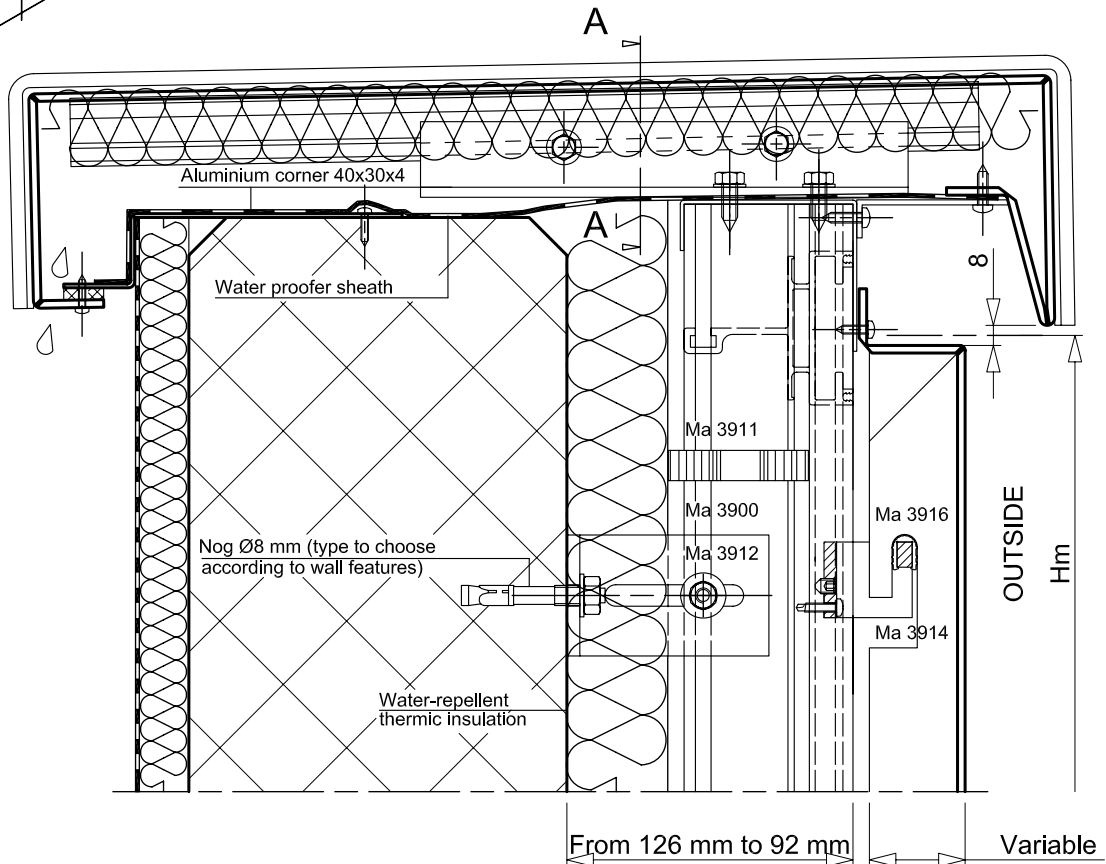
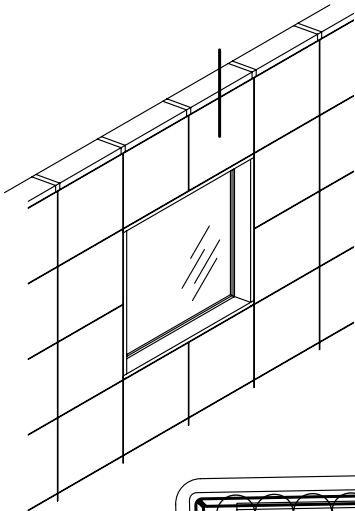
SECTIONS



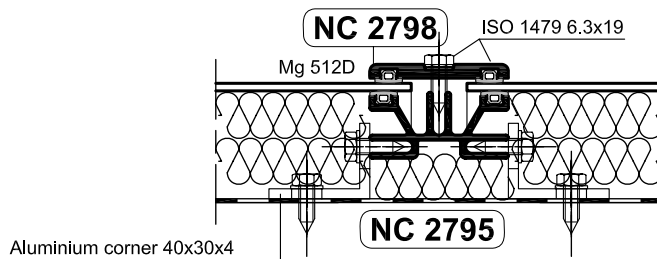
SCALE 1:2



SCALE 1:2



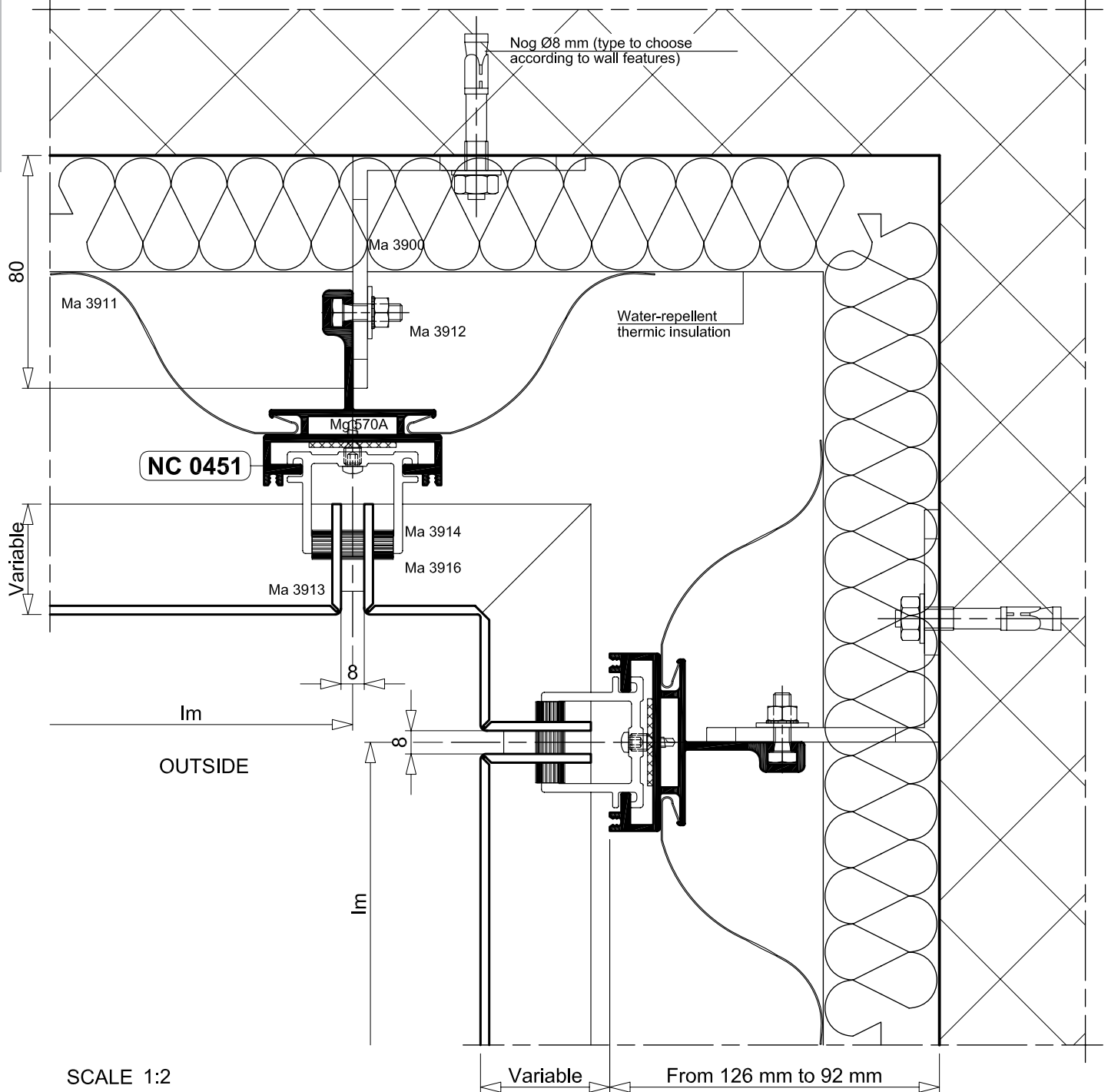
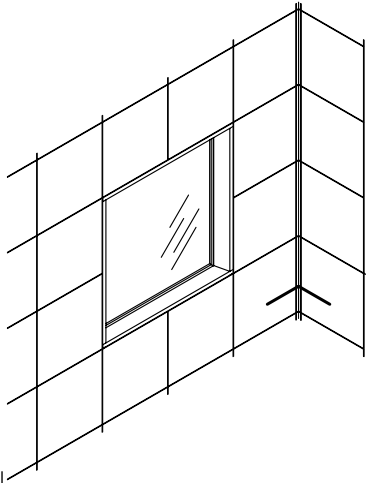
SECTION A-A

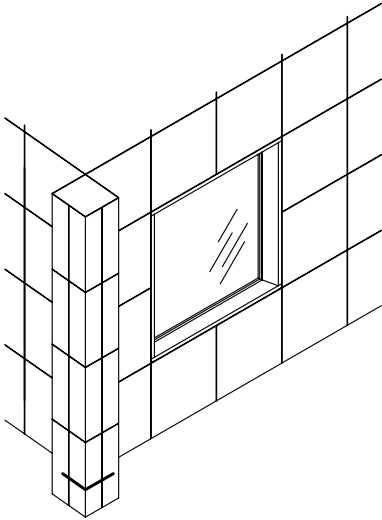


SCALE 1:3

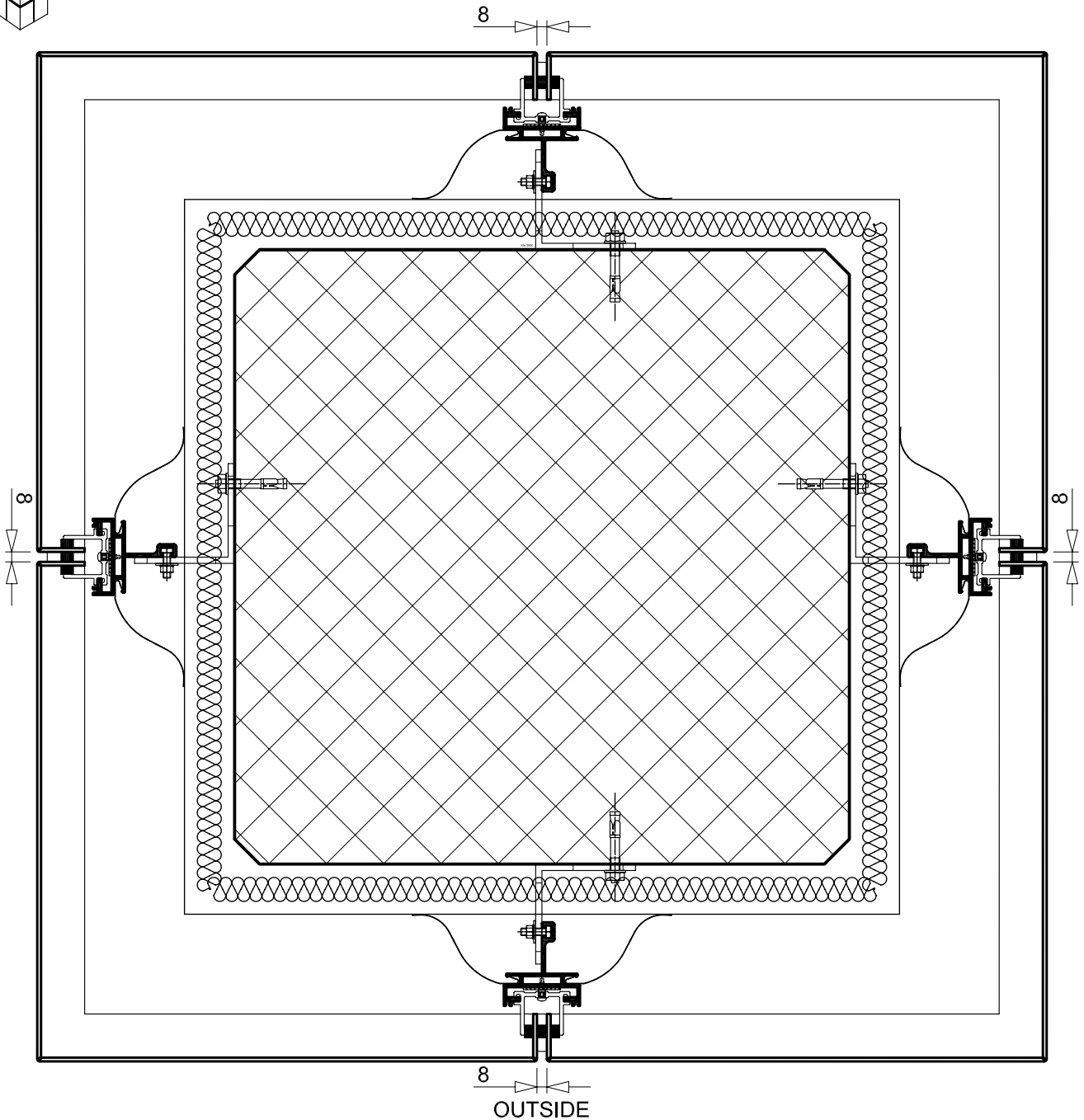




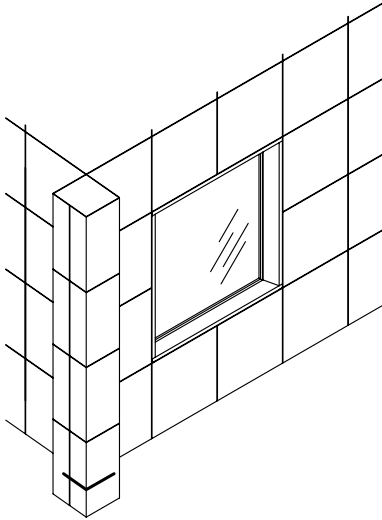




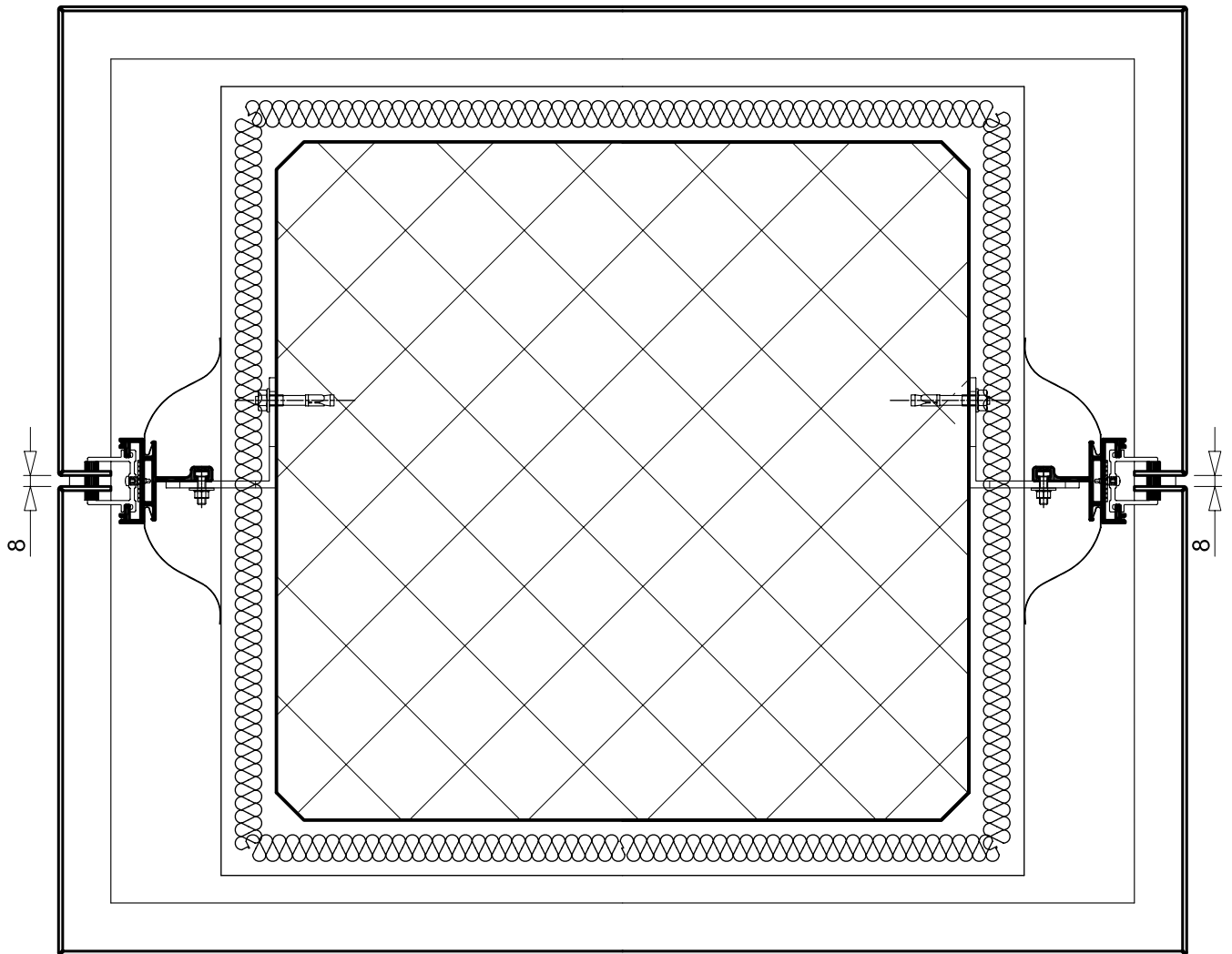
## INDICATIVE SOLUTION



SCALE 1:5

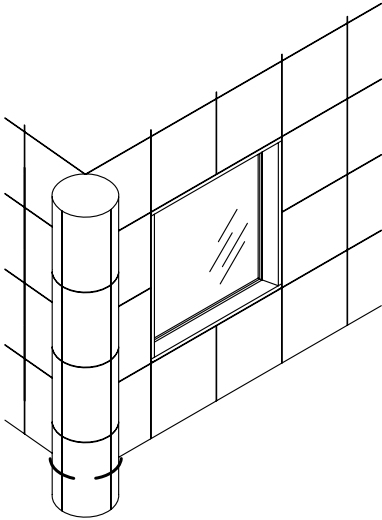


## INDICATIVE SOLUTION

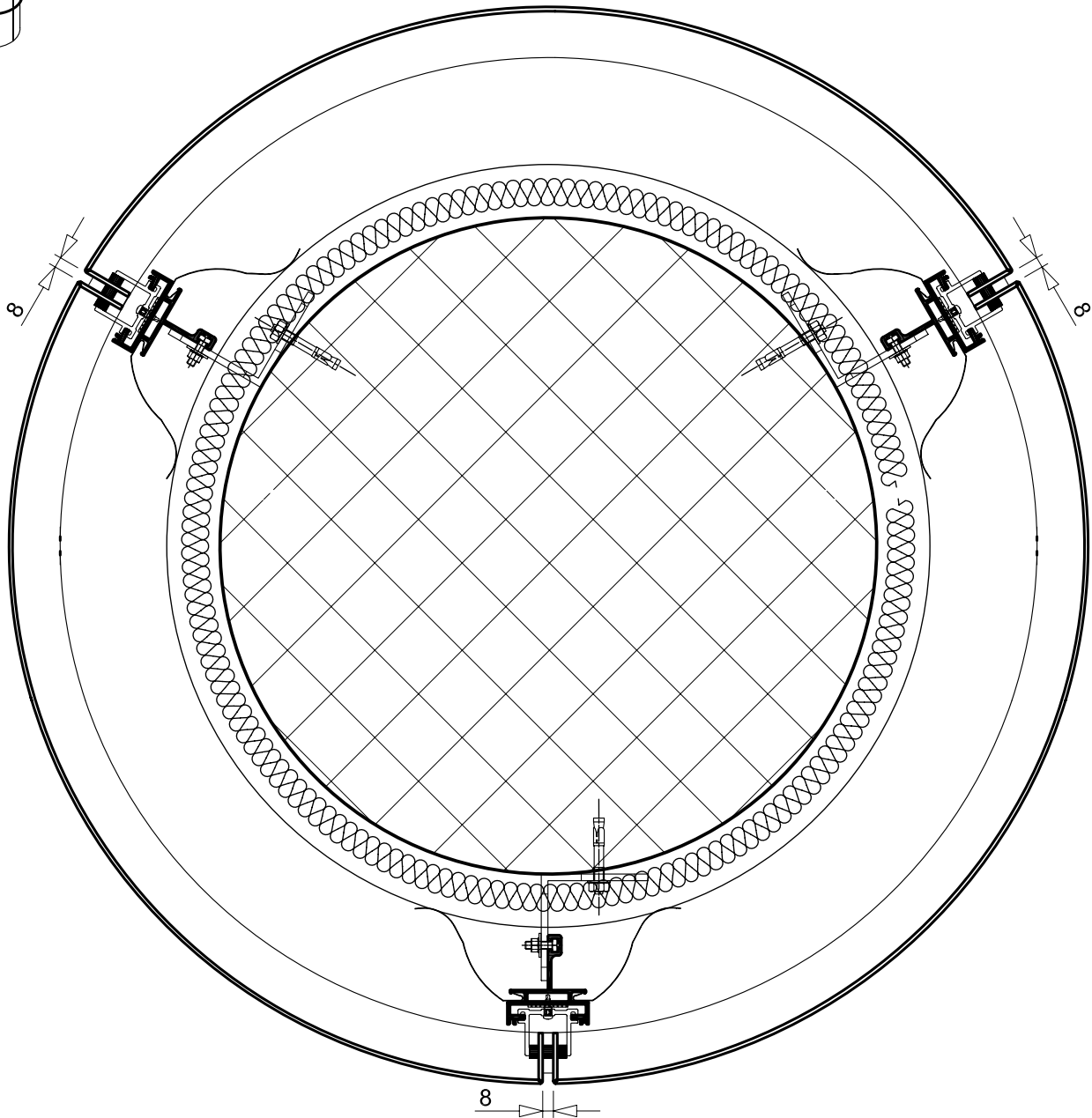


OUTSIDE

SCALE 1:5

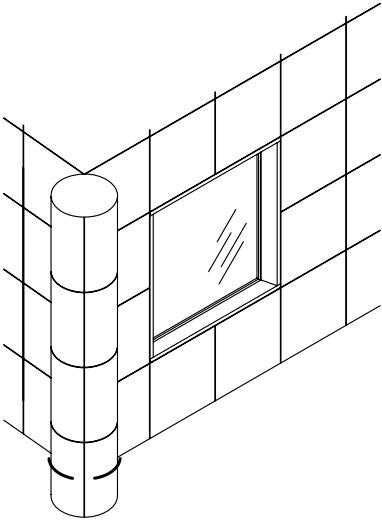


## INDICATIVE SOLUTION

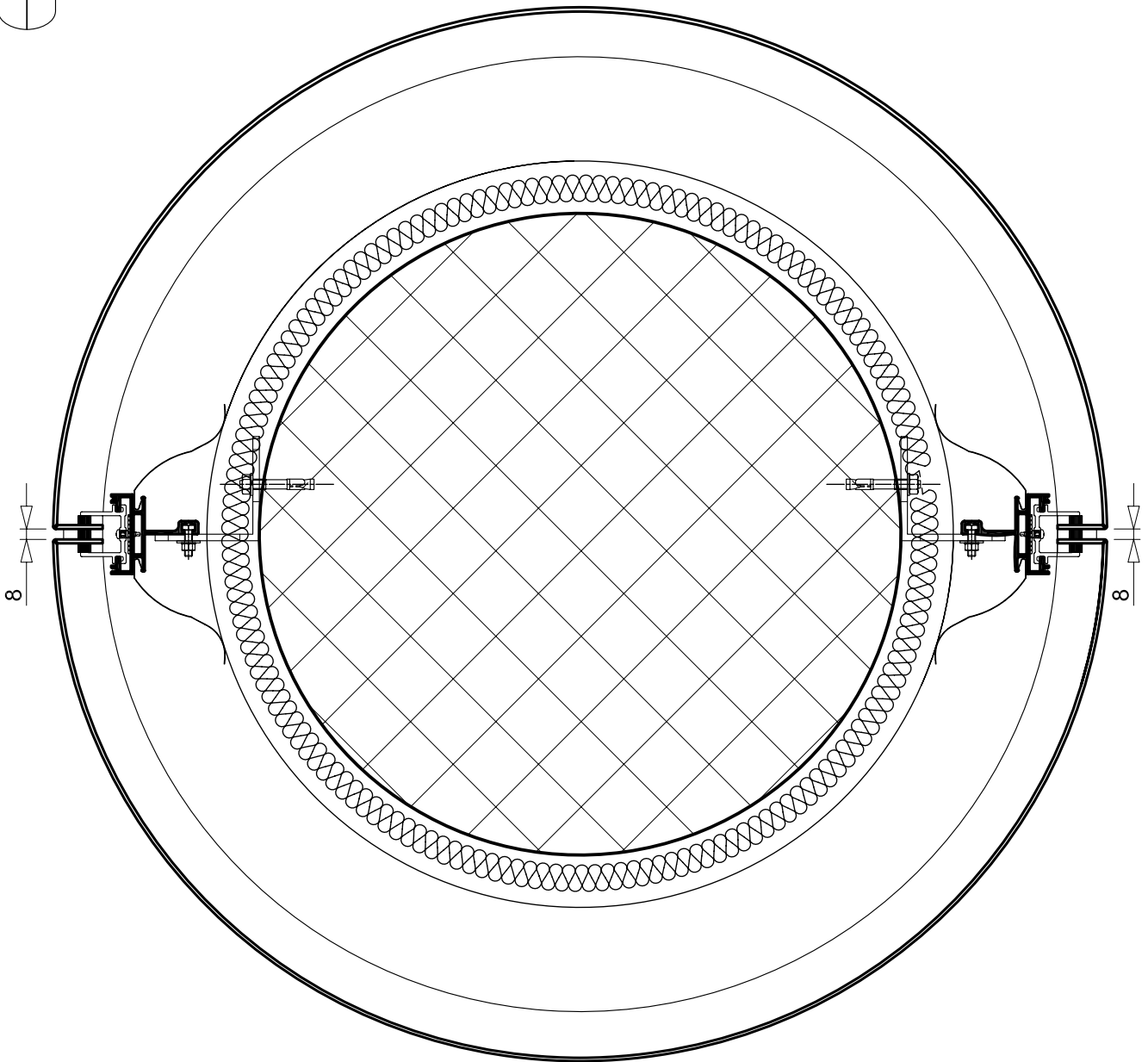


OUTSIDE

SCALE 1:5

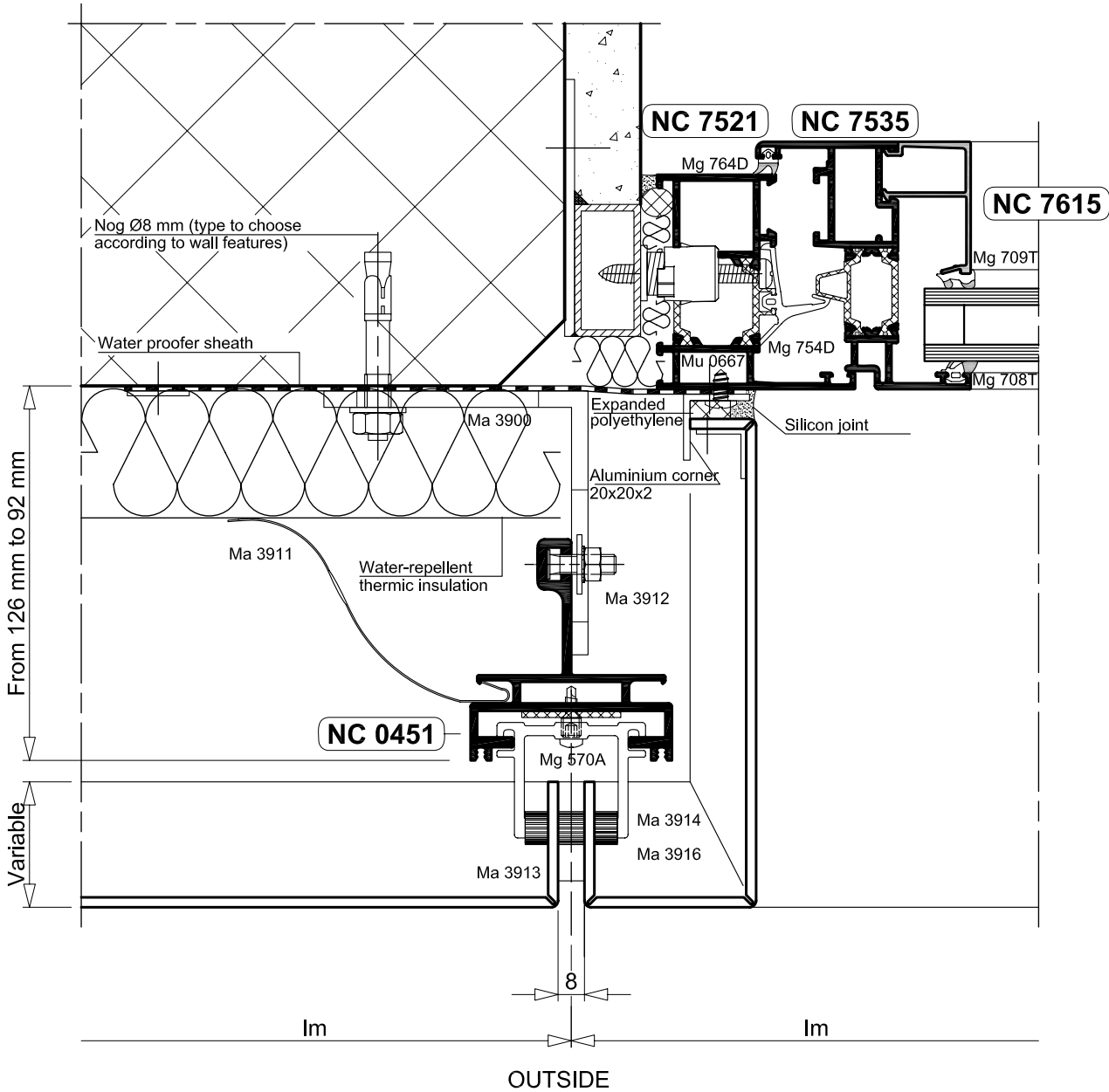
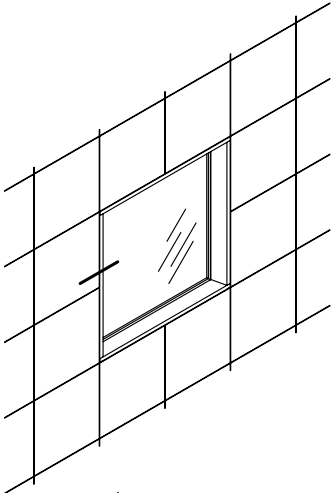


## INDICATIVE SOLUTION



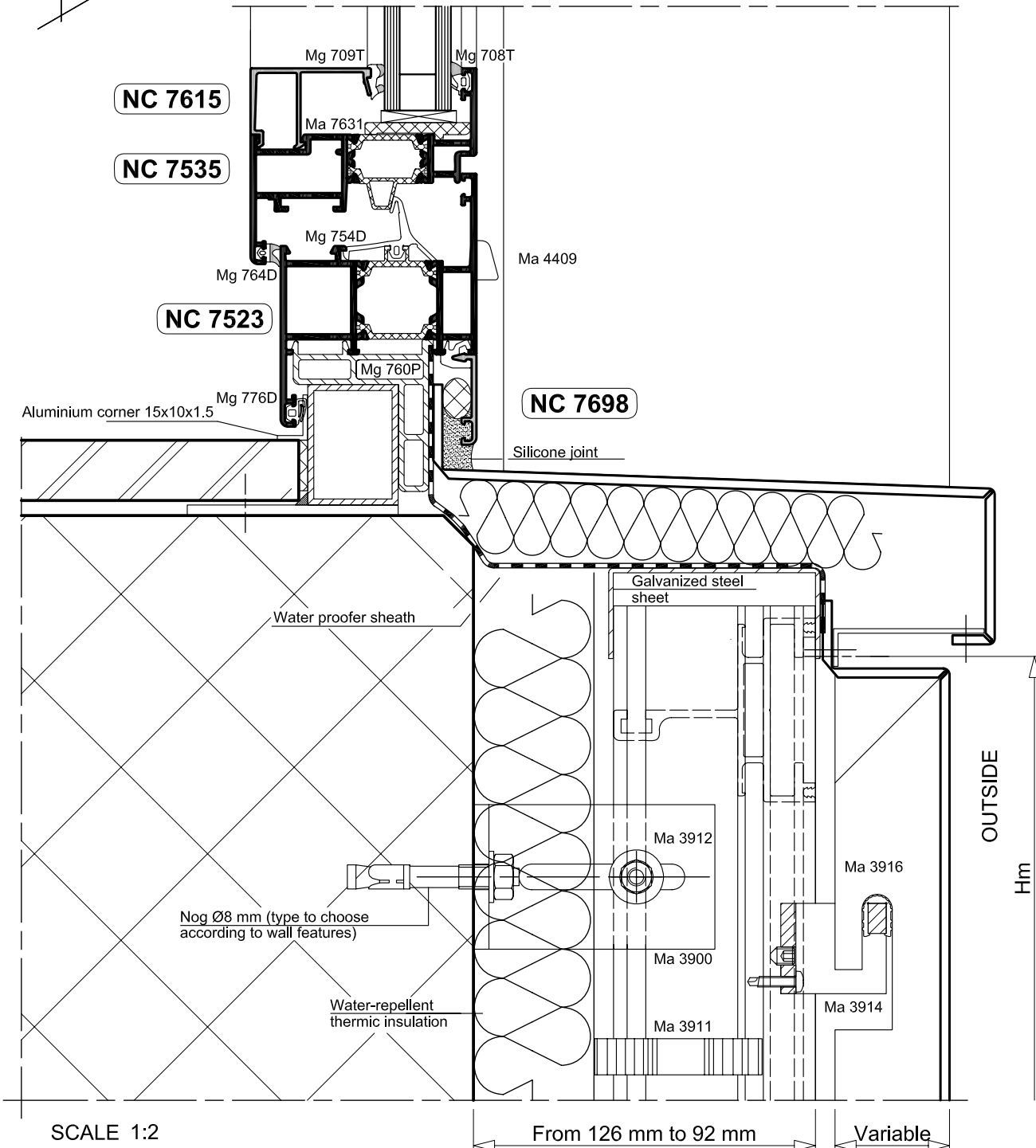
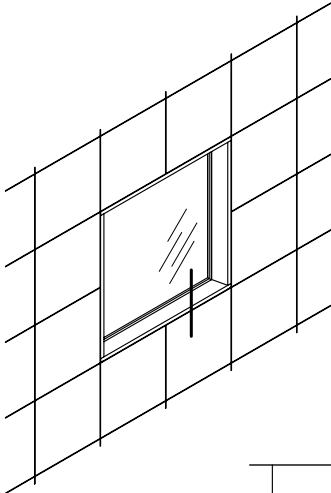
OUTSIDE

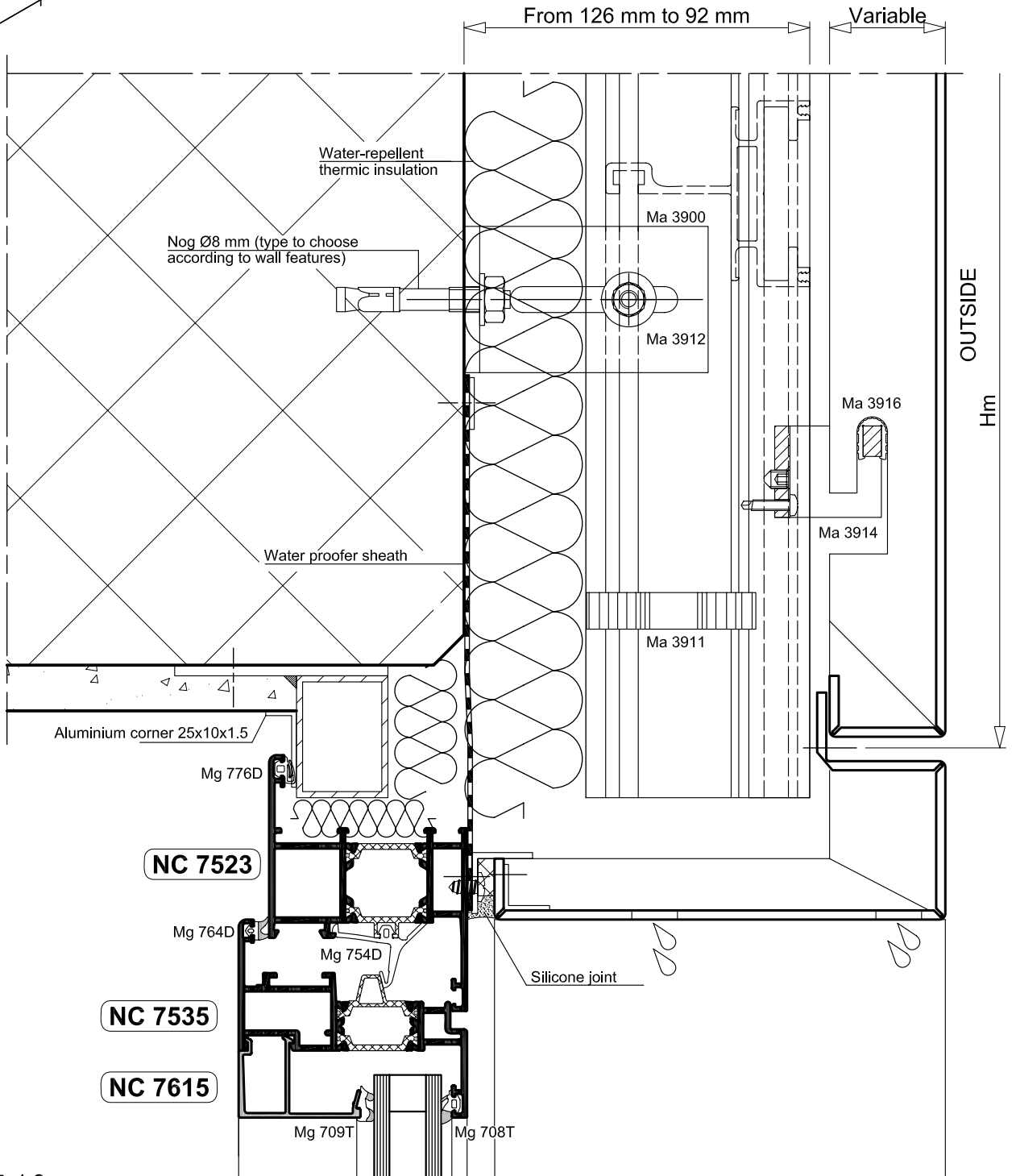
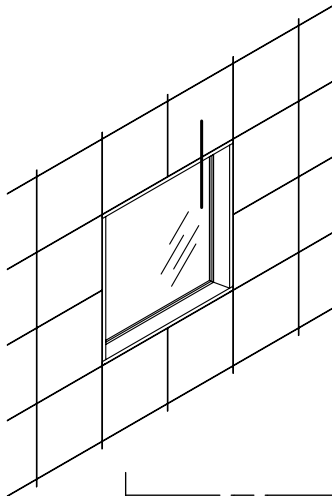
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SECTIONS

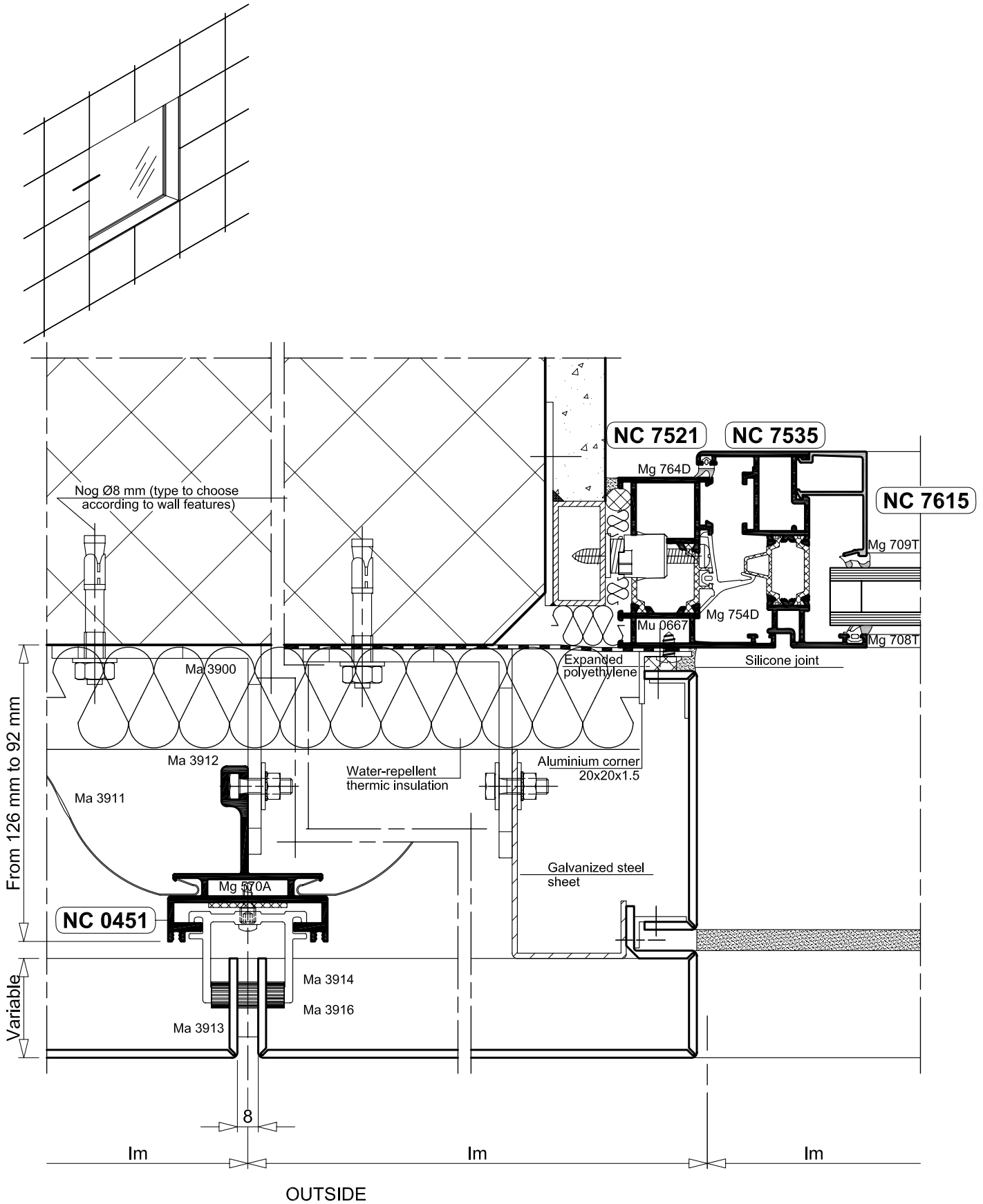
SCALE 1:2



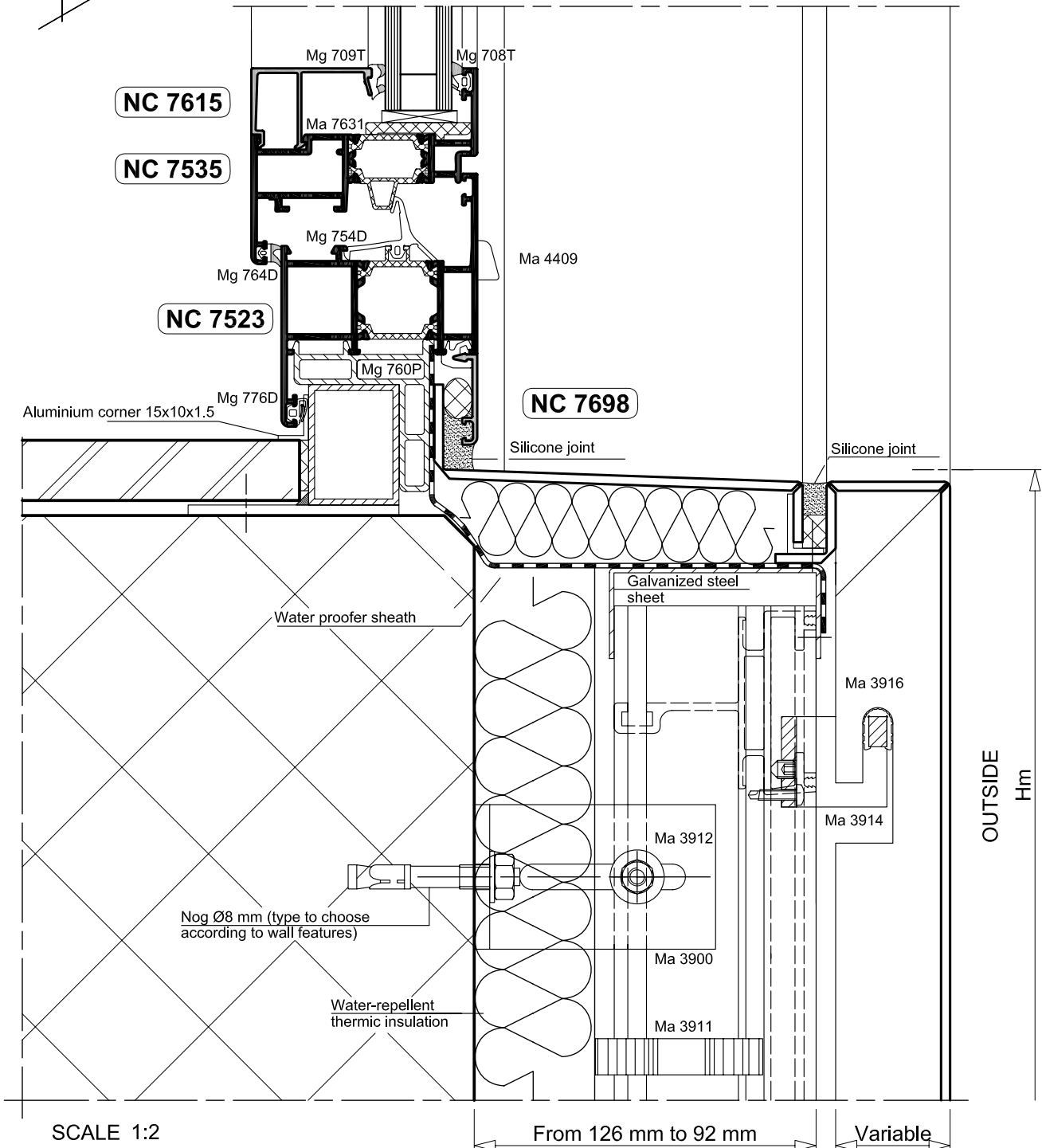
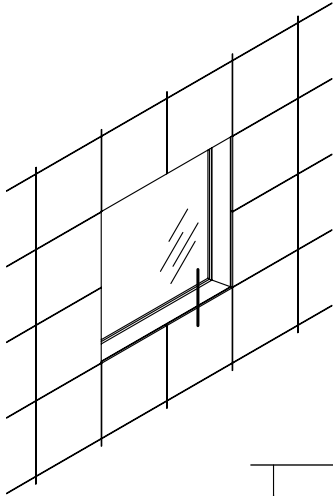


SCALE 1:2

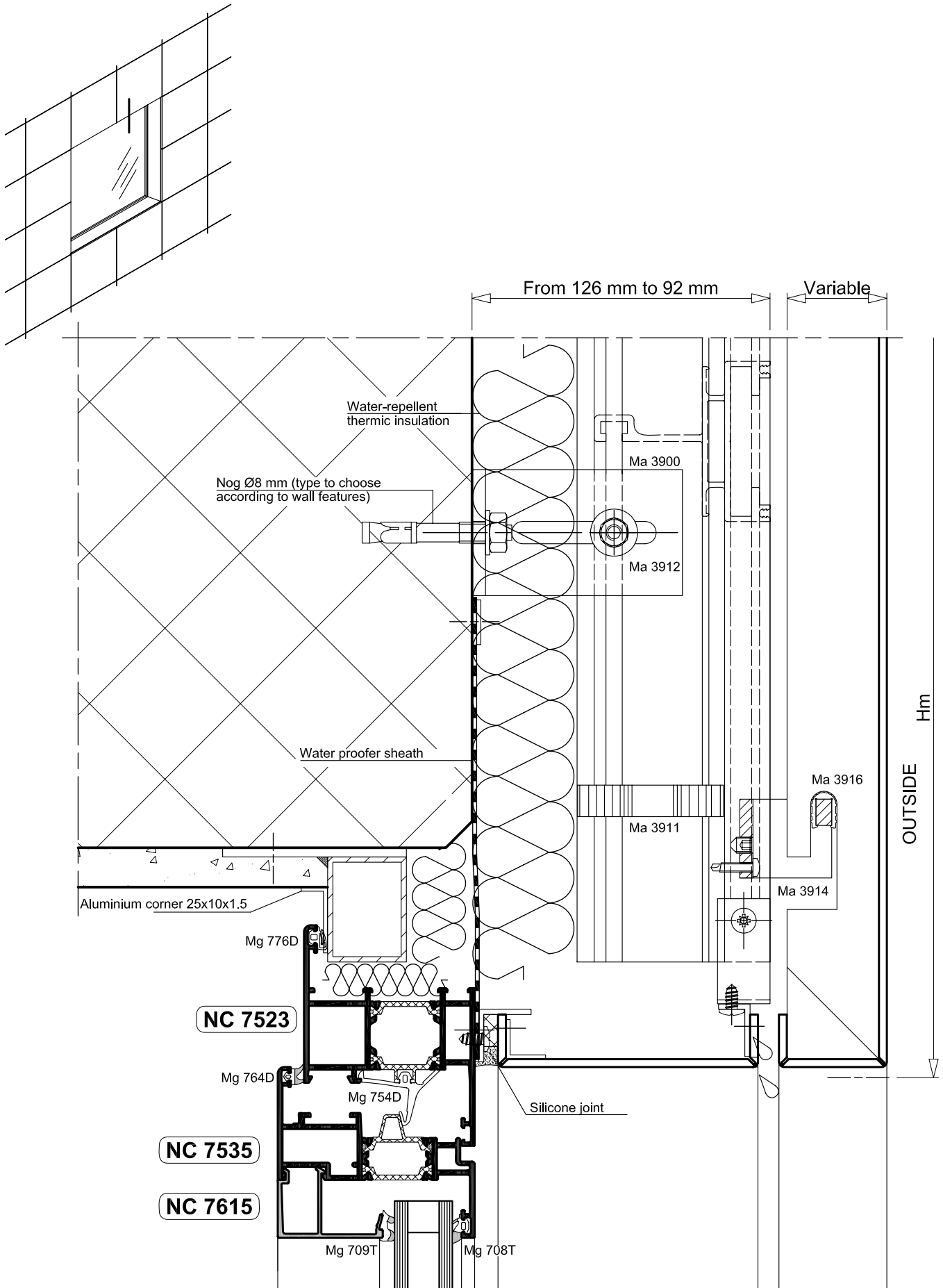


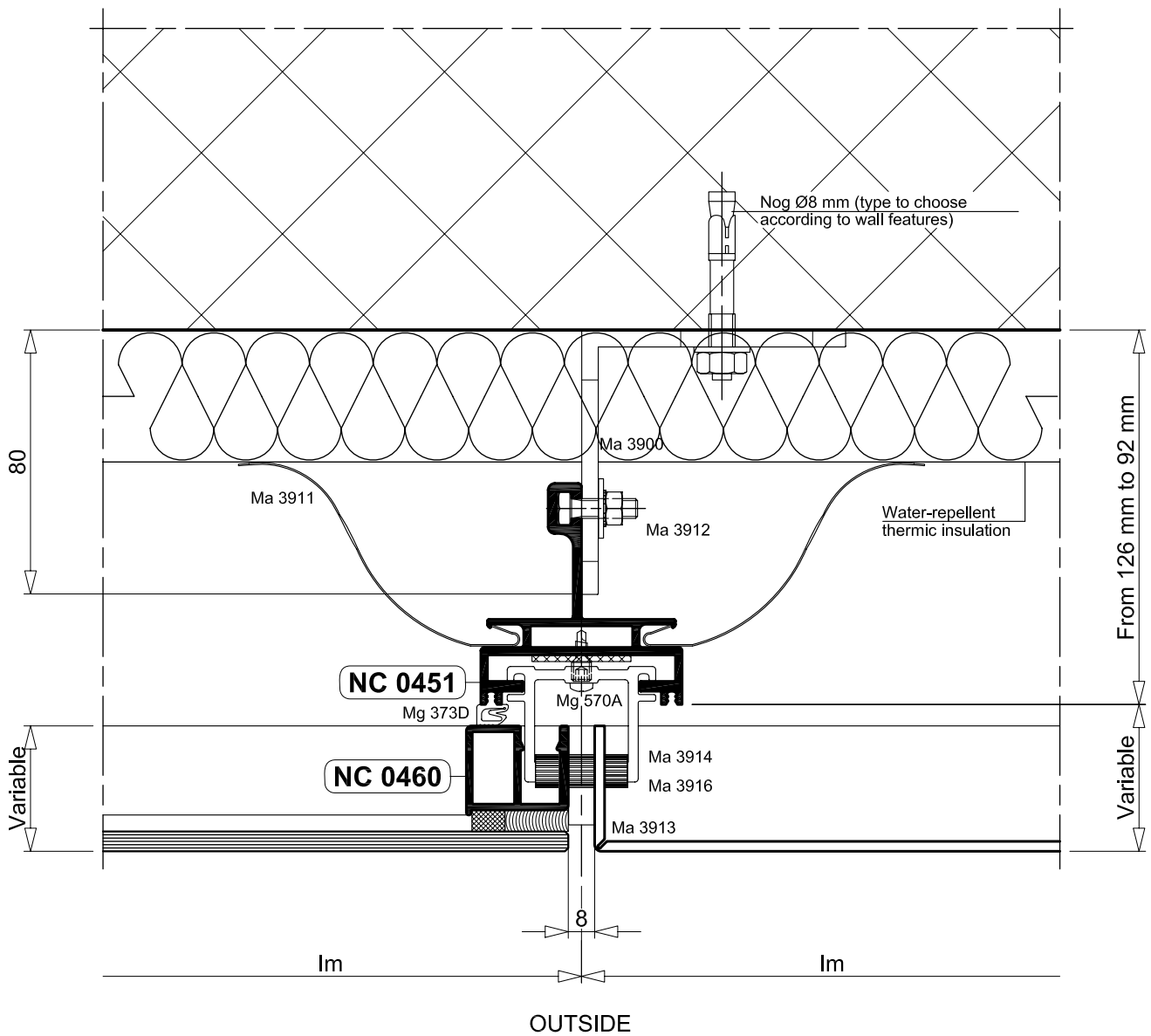
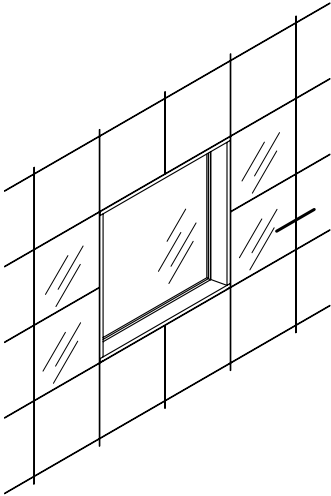


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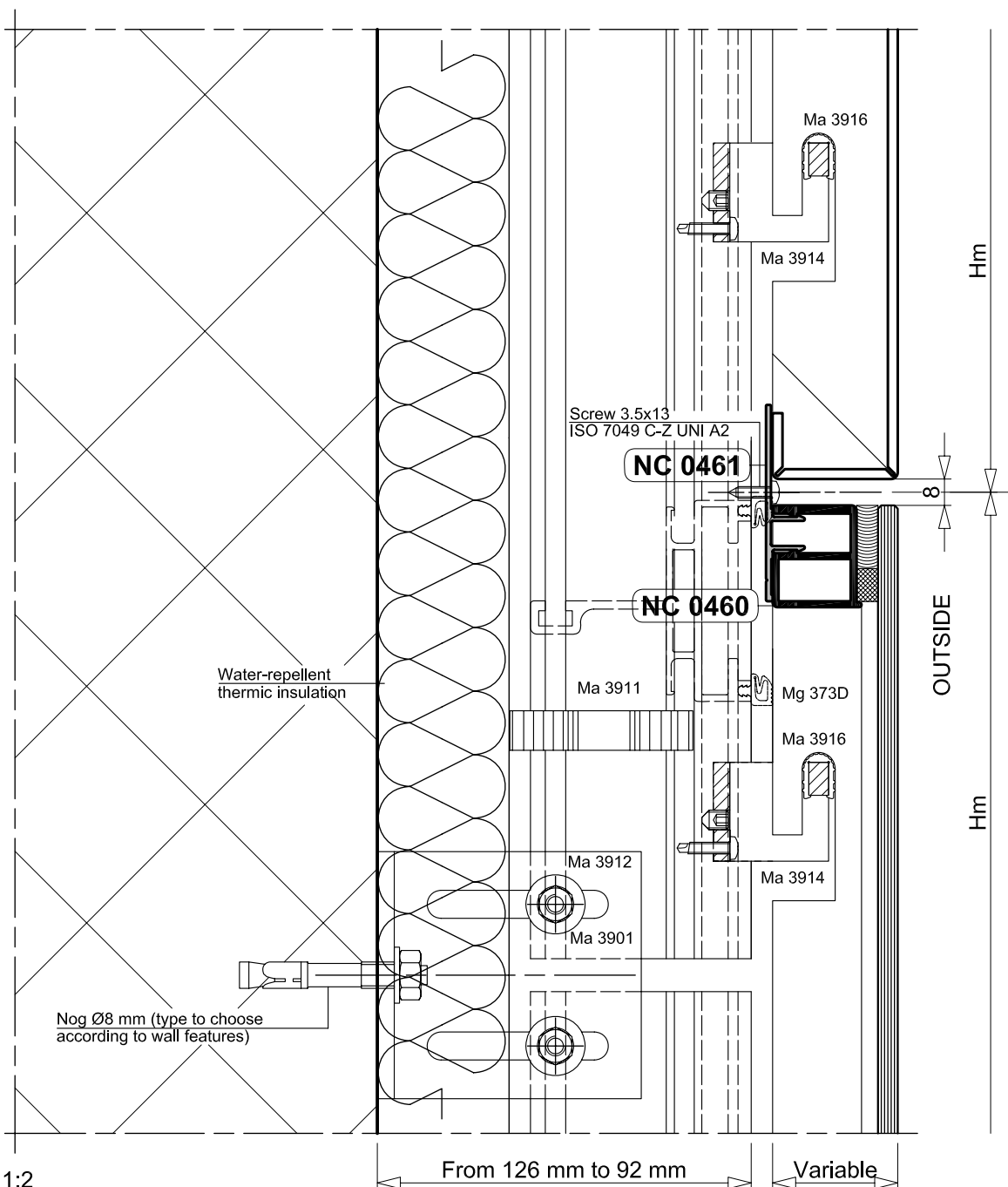
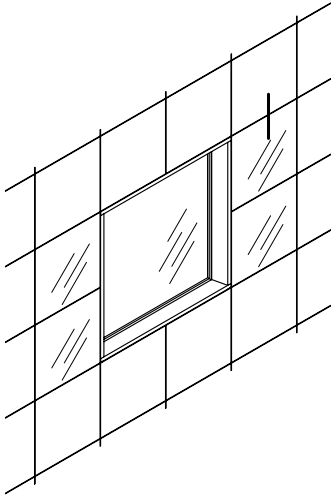


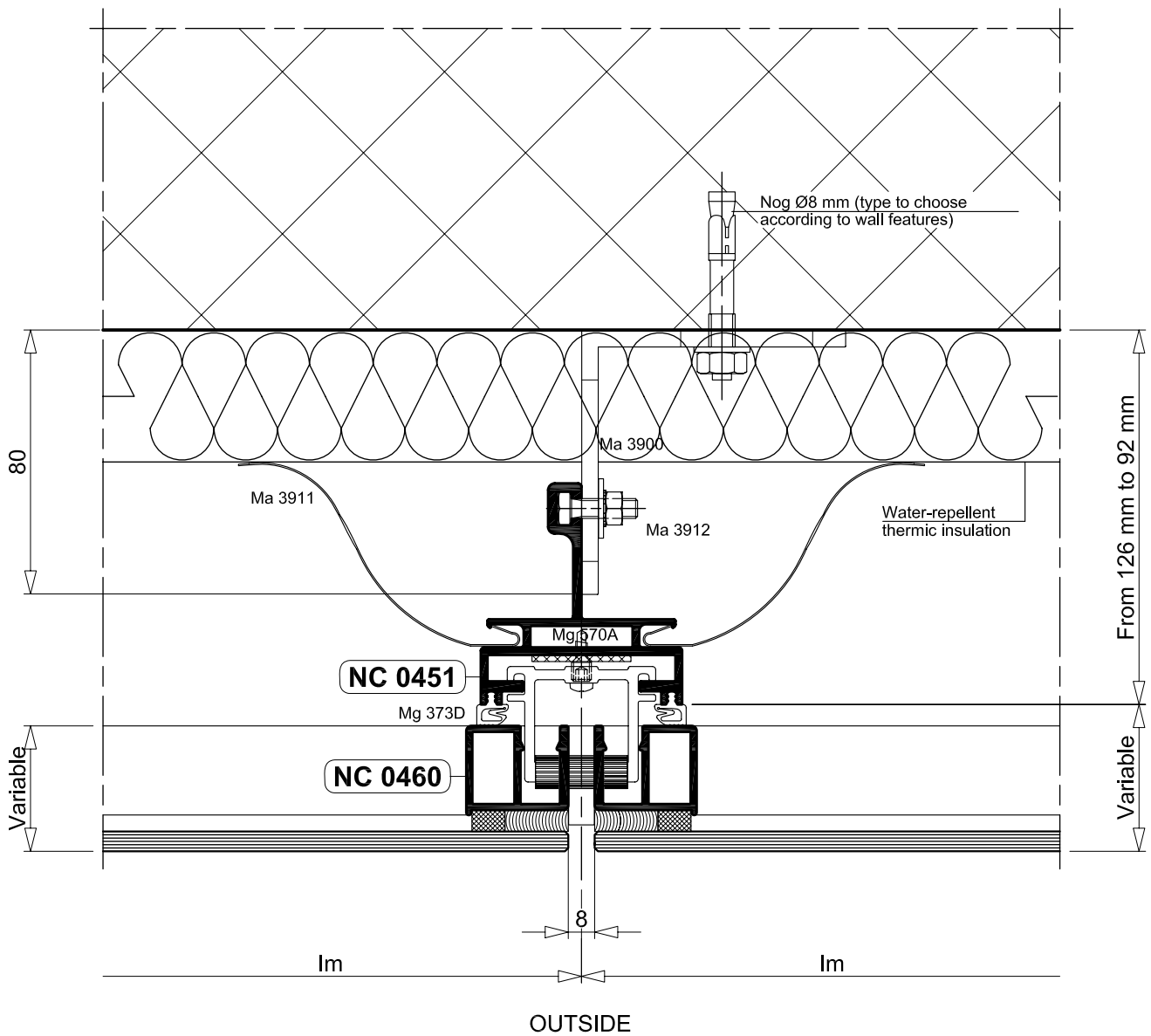
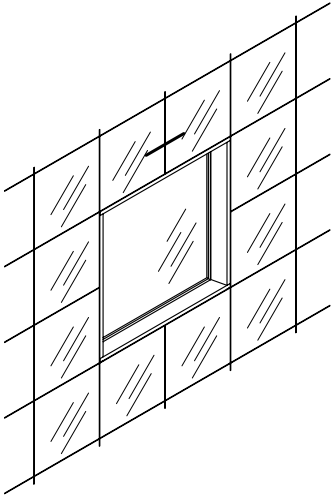
SECTIONS



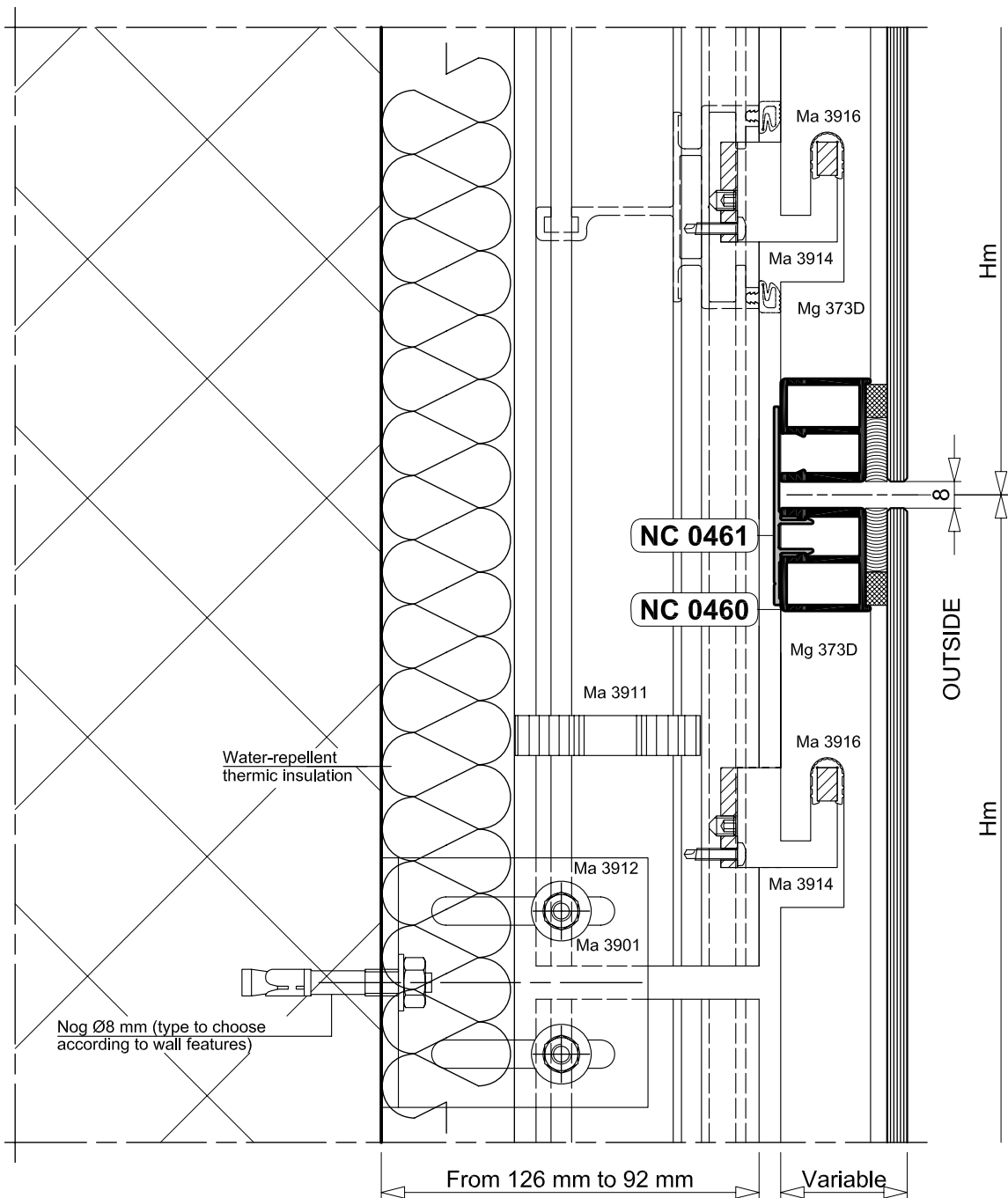
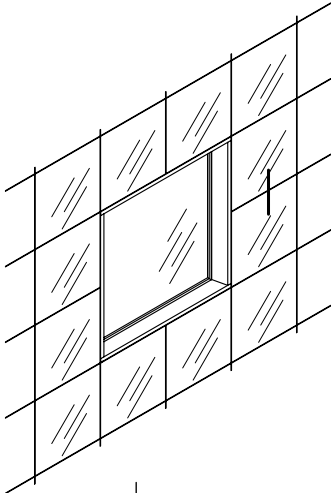


SCALE 1:2

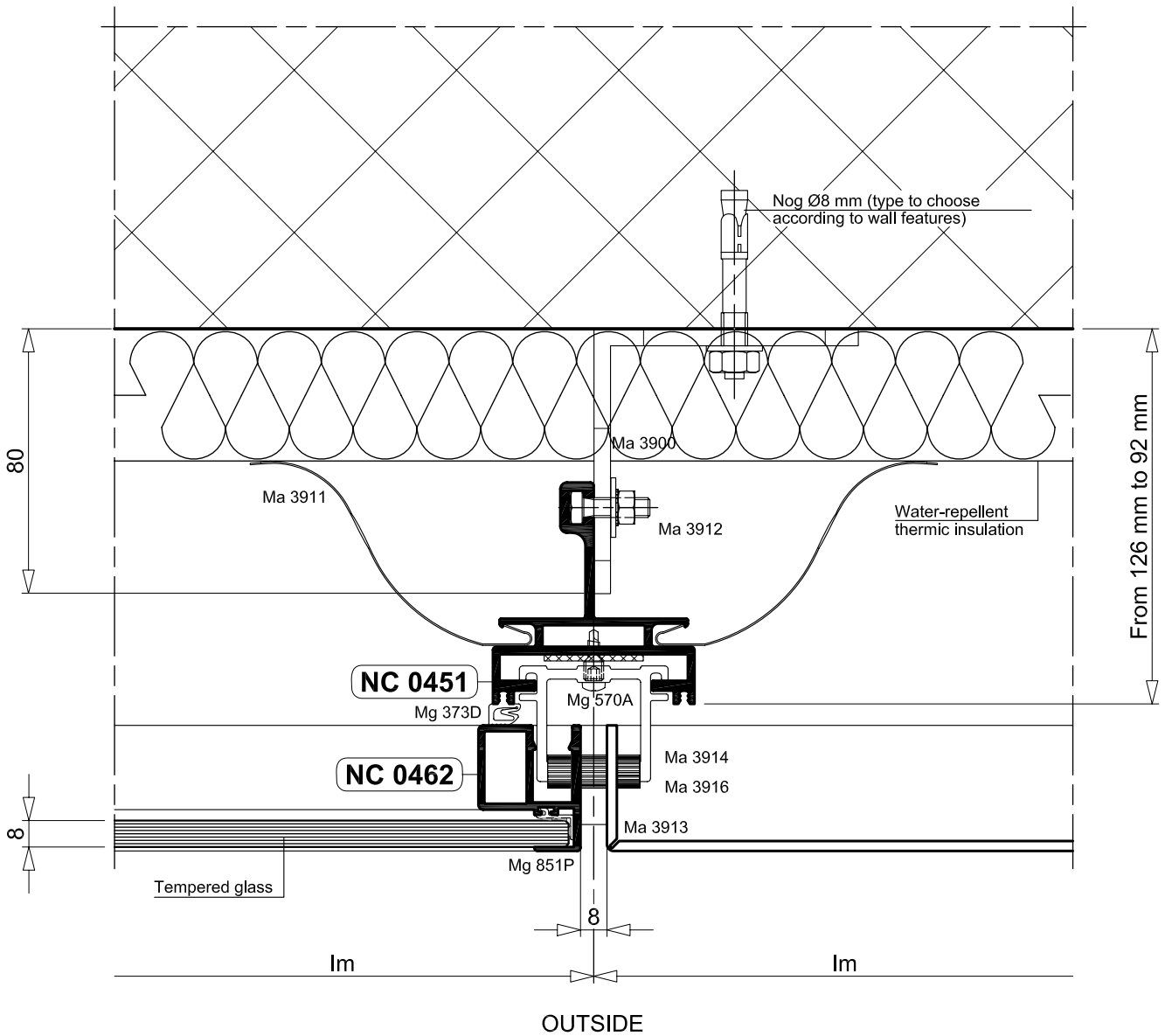
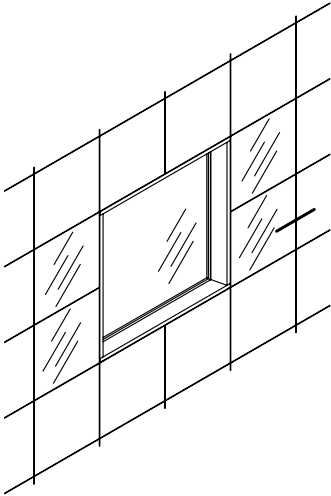




SCALE 1:2

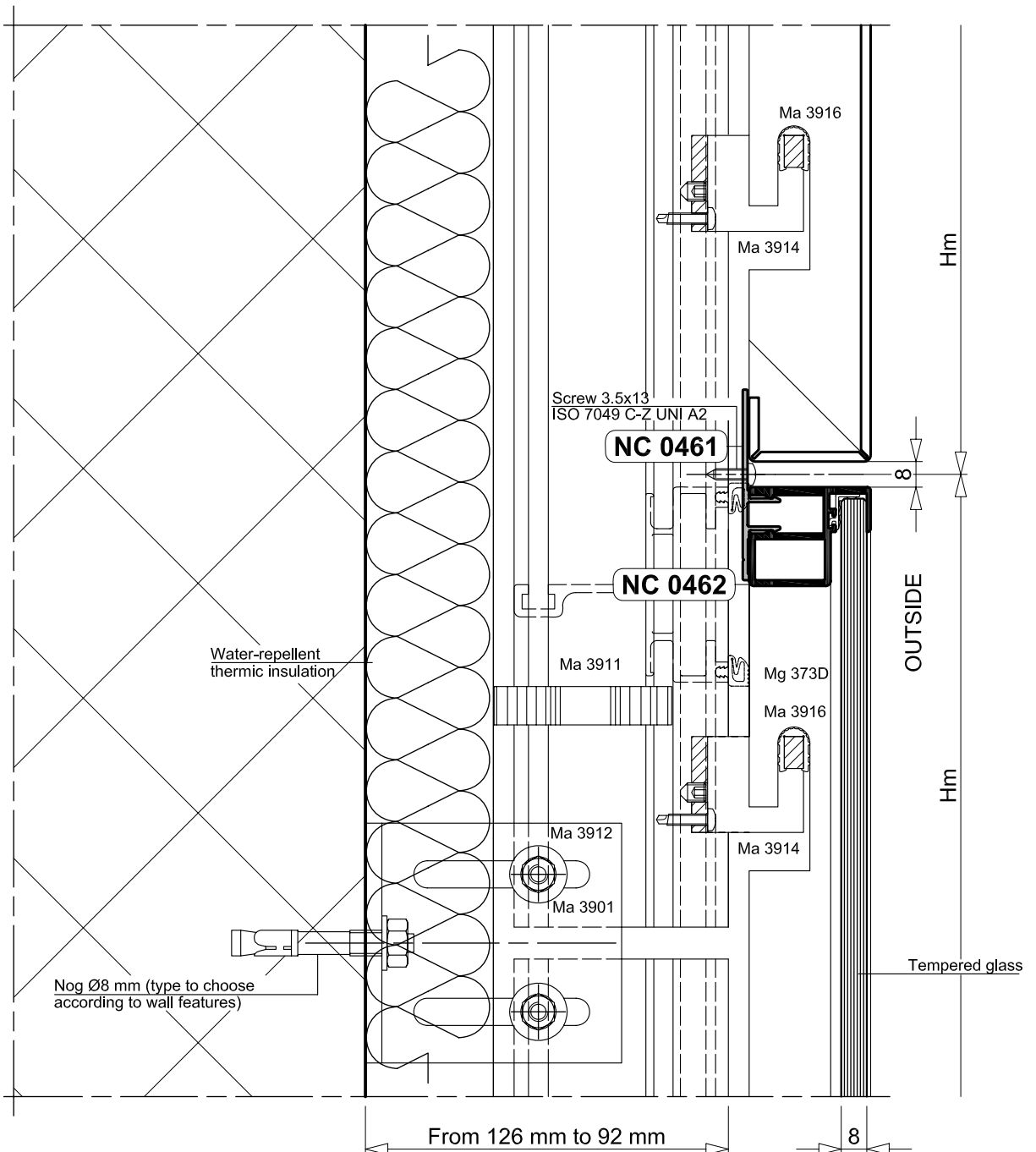
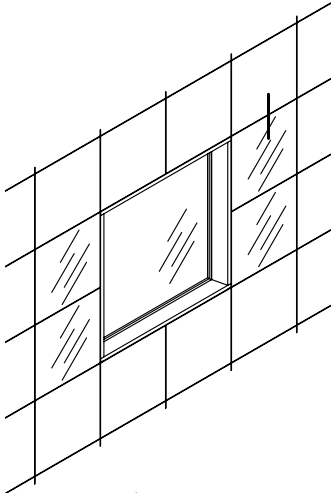


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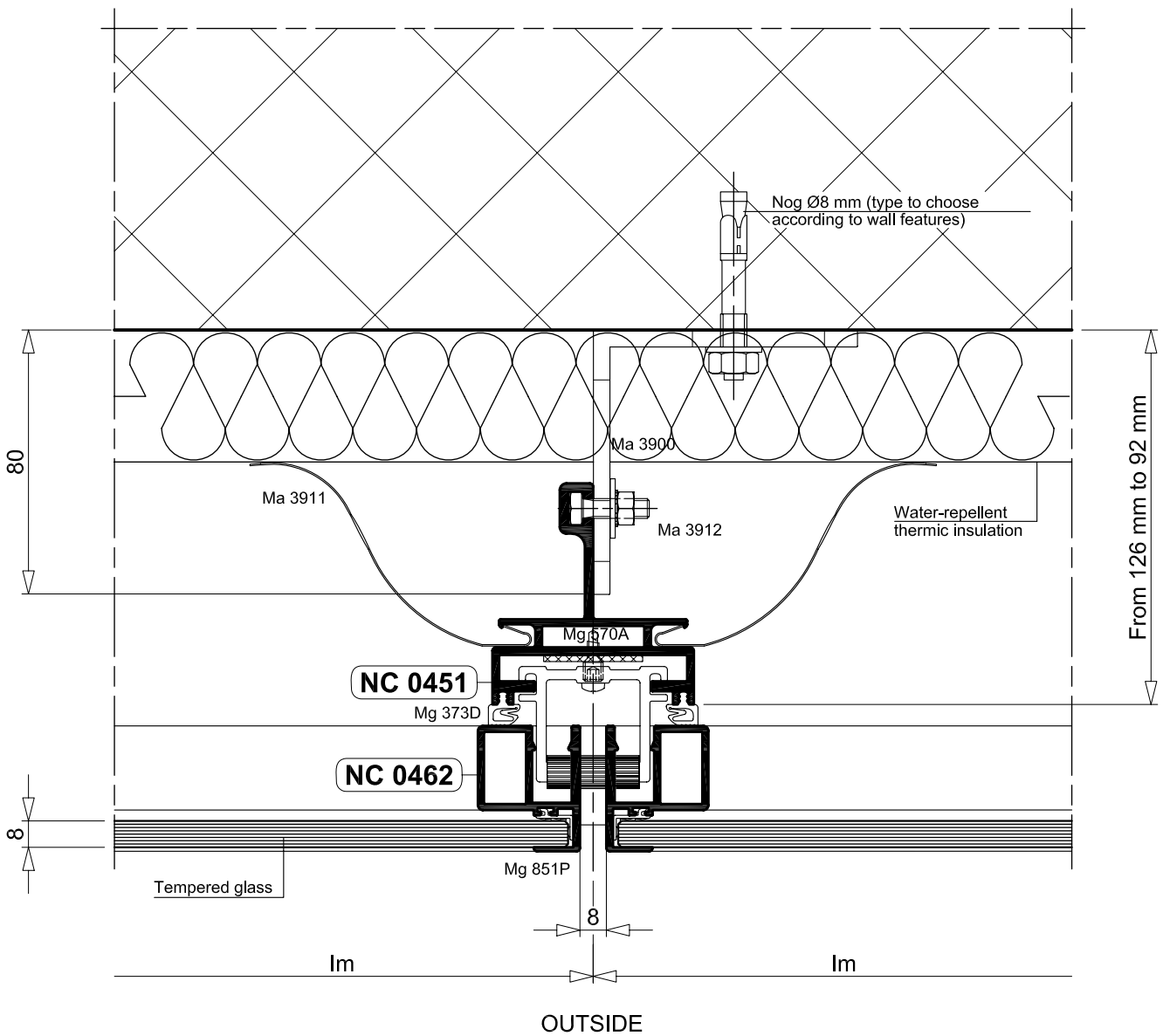
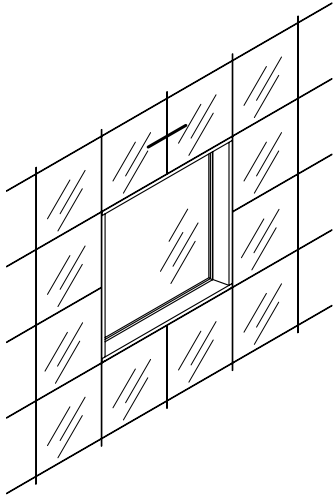


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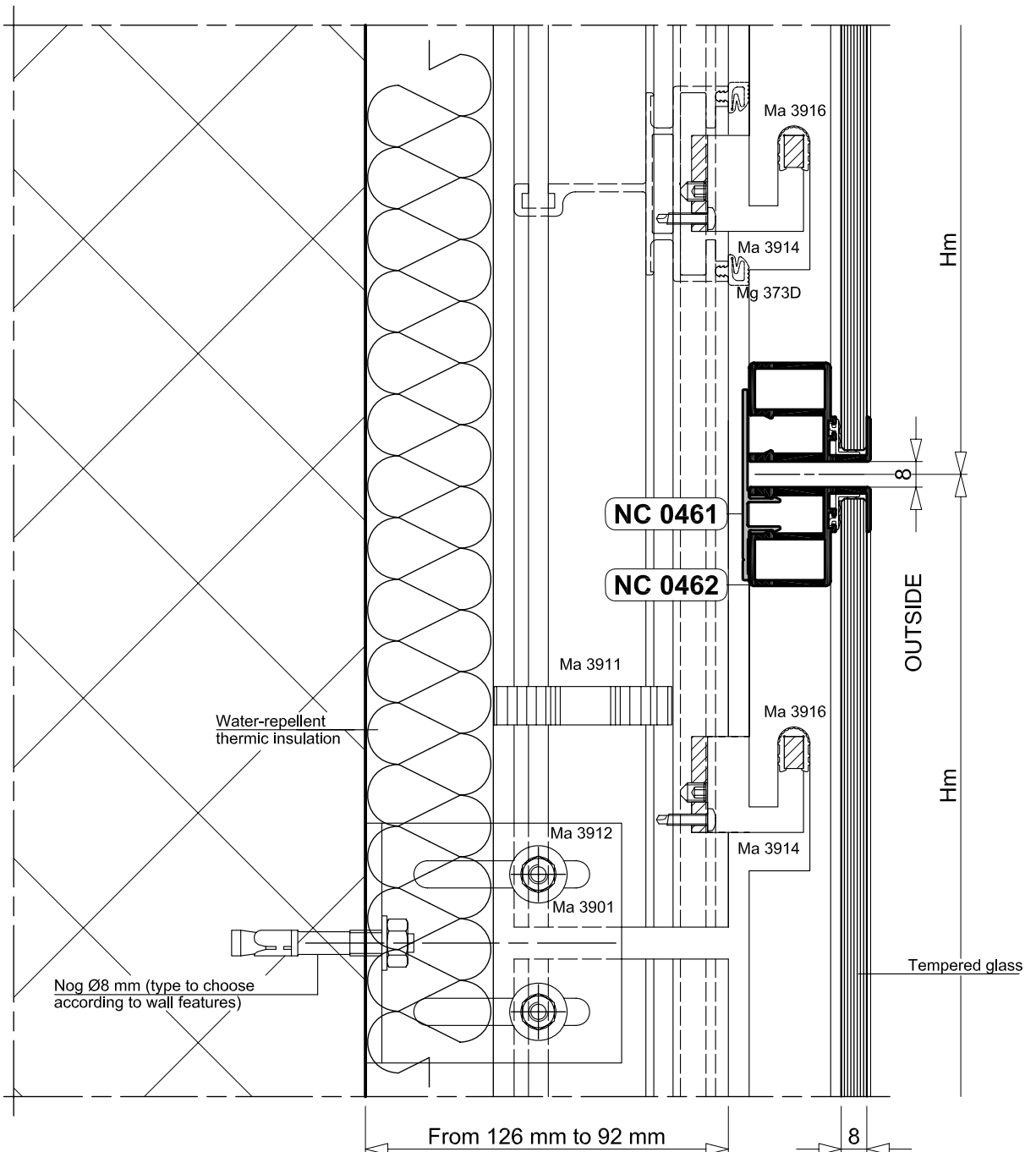
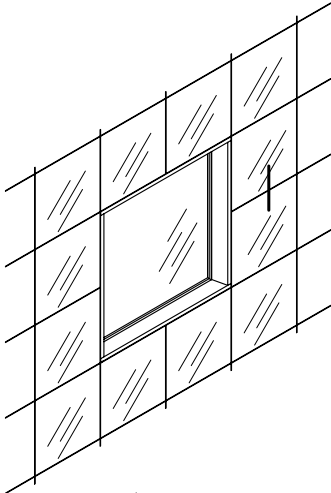


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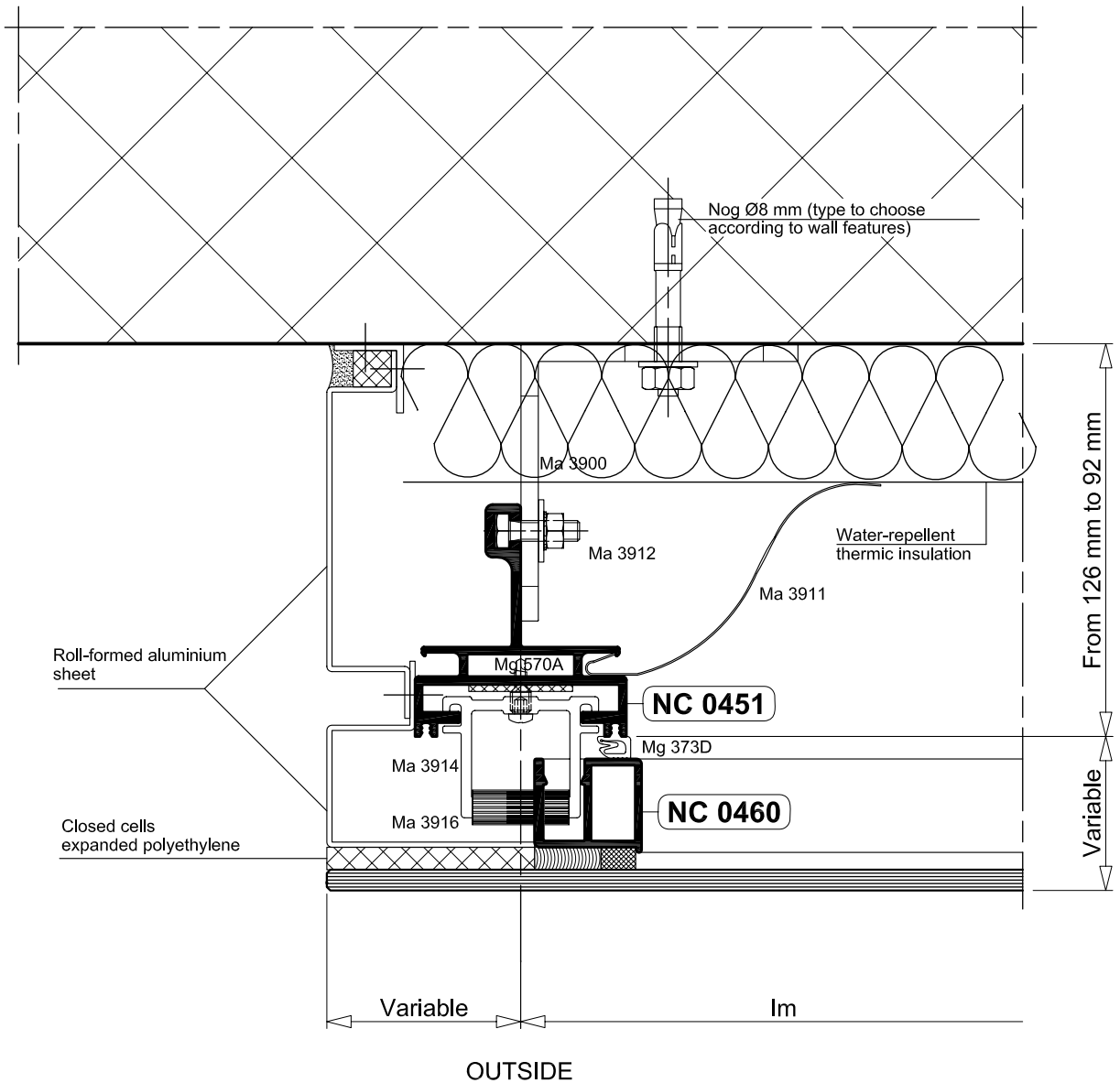
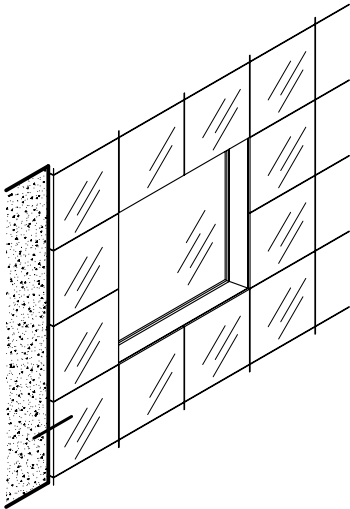


SECTIONS

SCALE 1:2

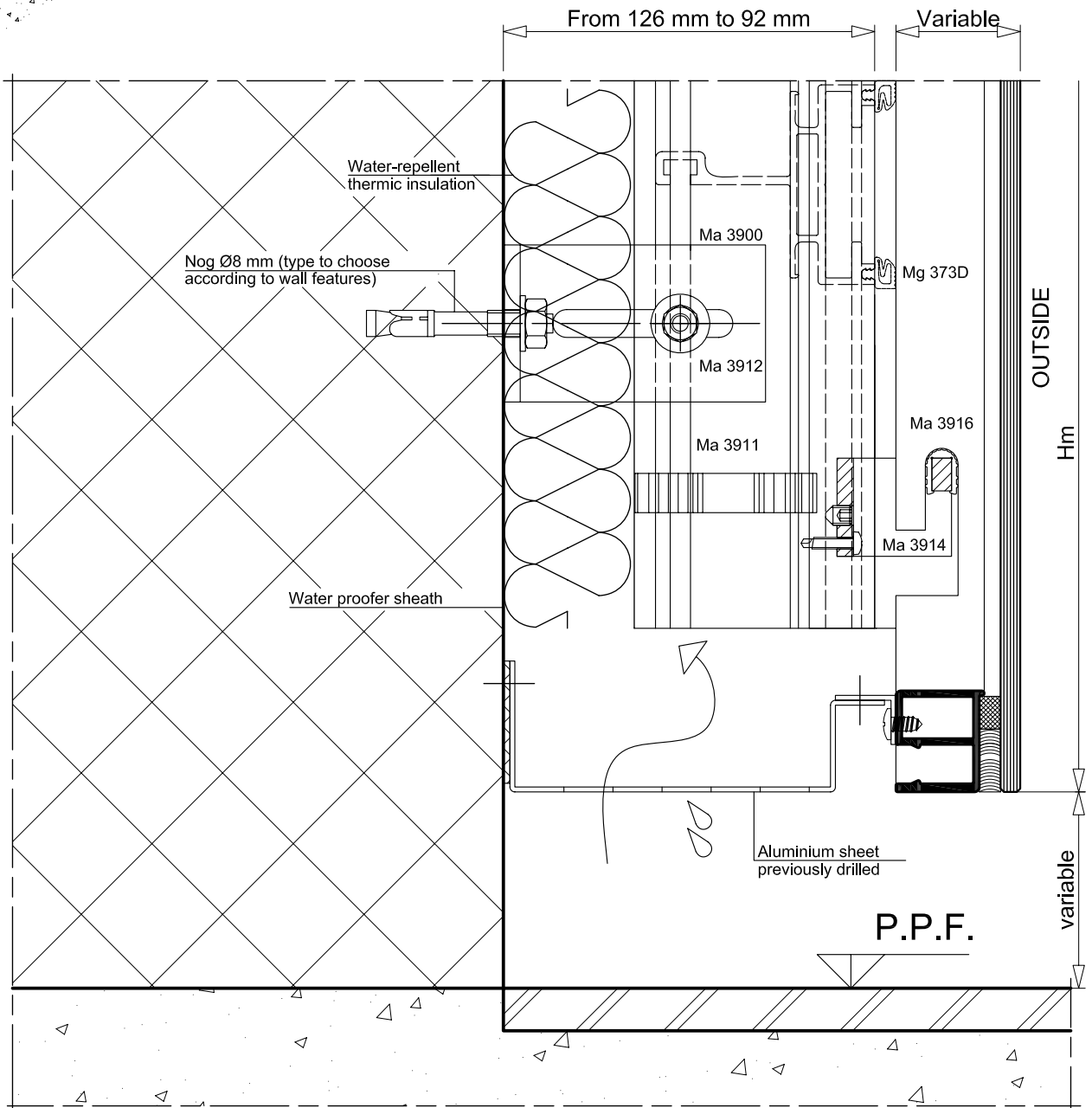
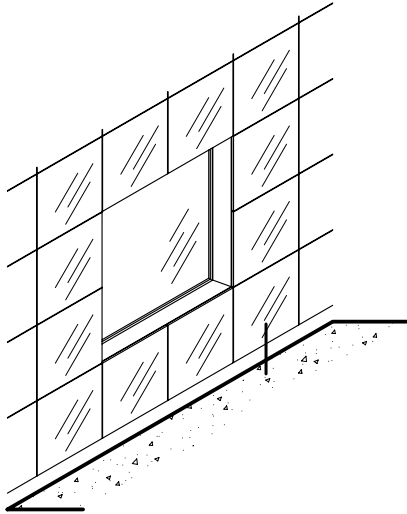


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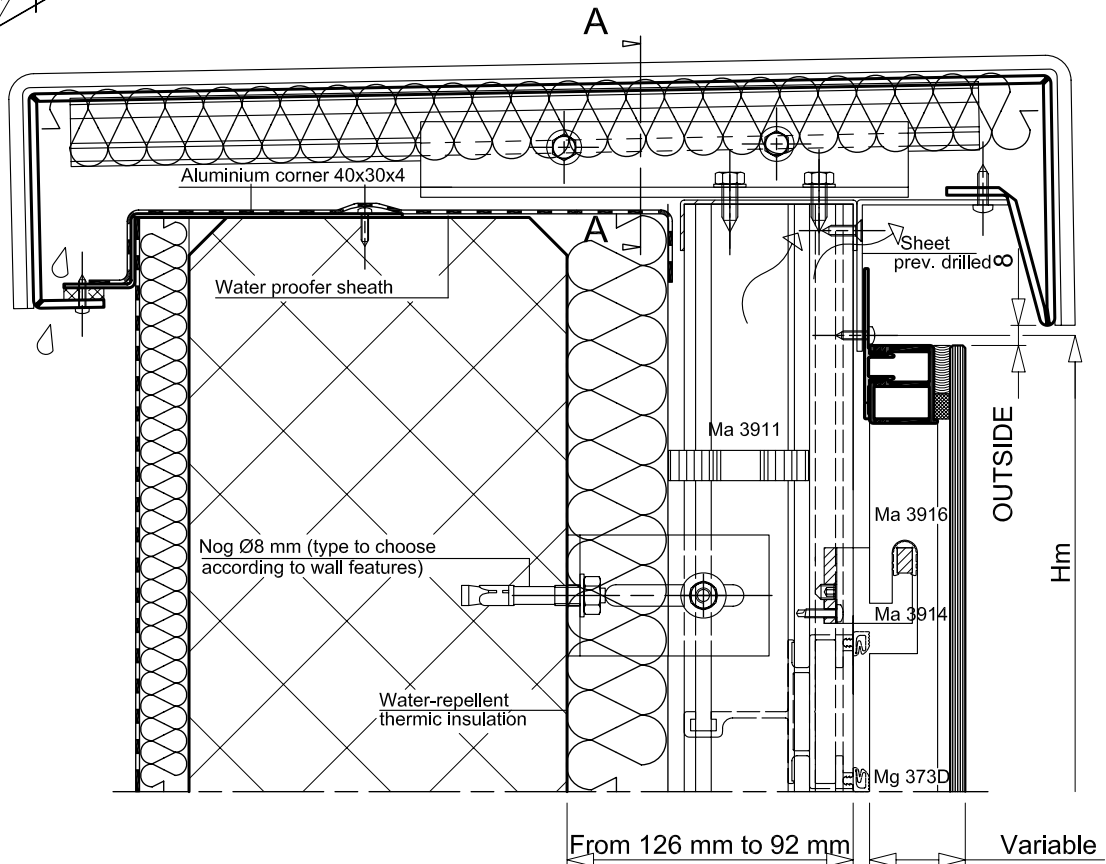
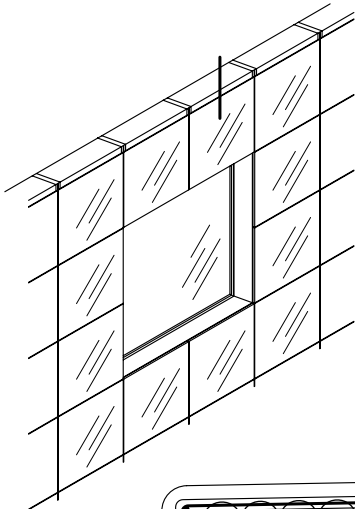


SECTIONS

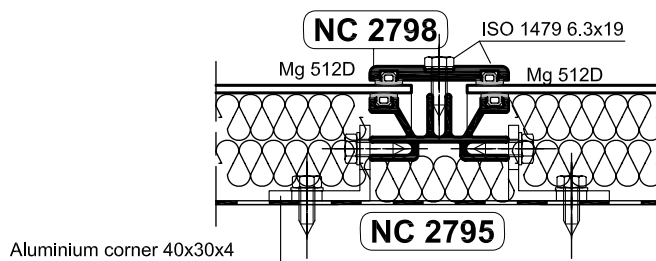
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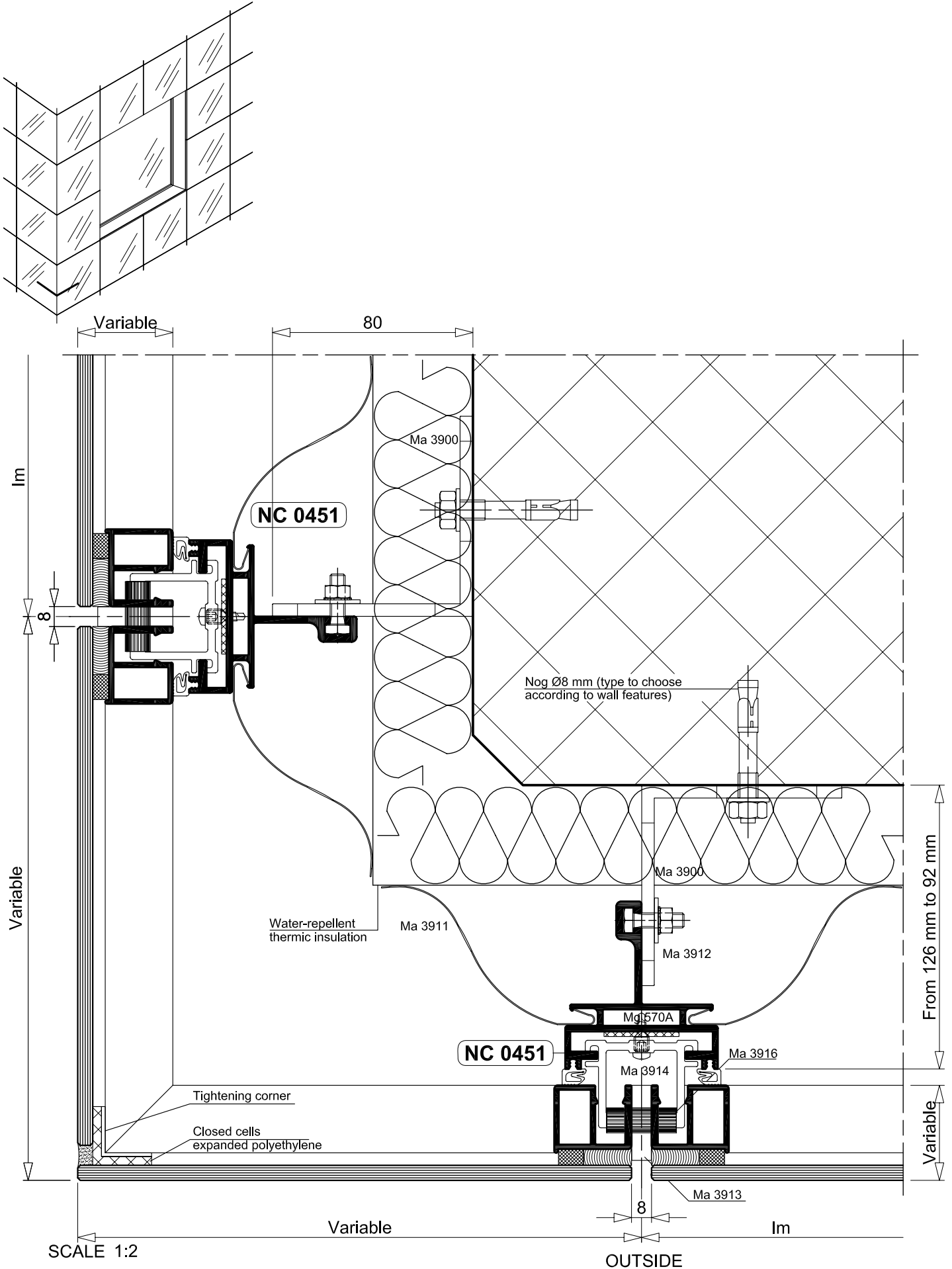
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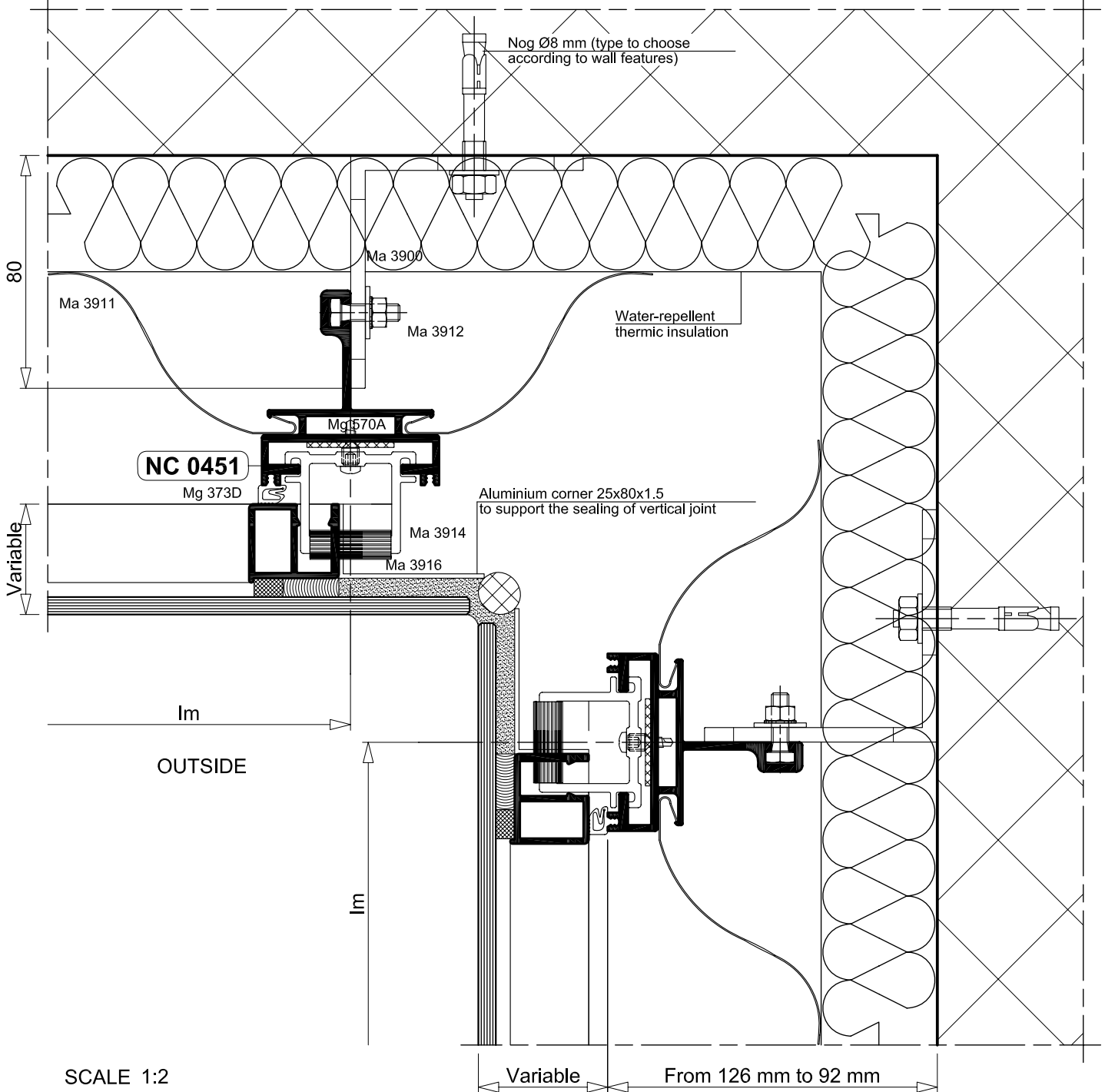
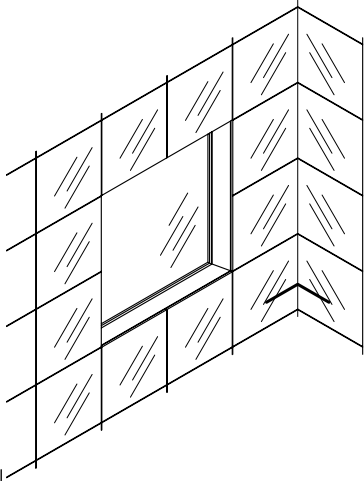


SECTION A-A



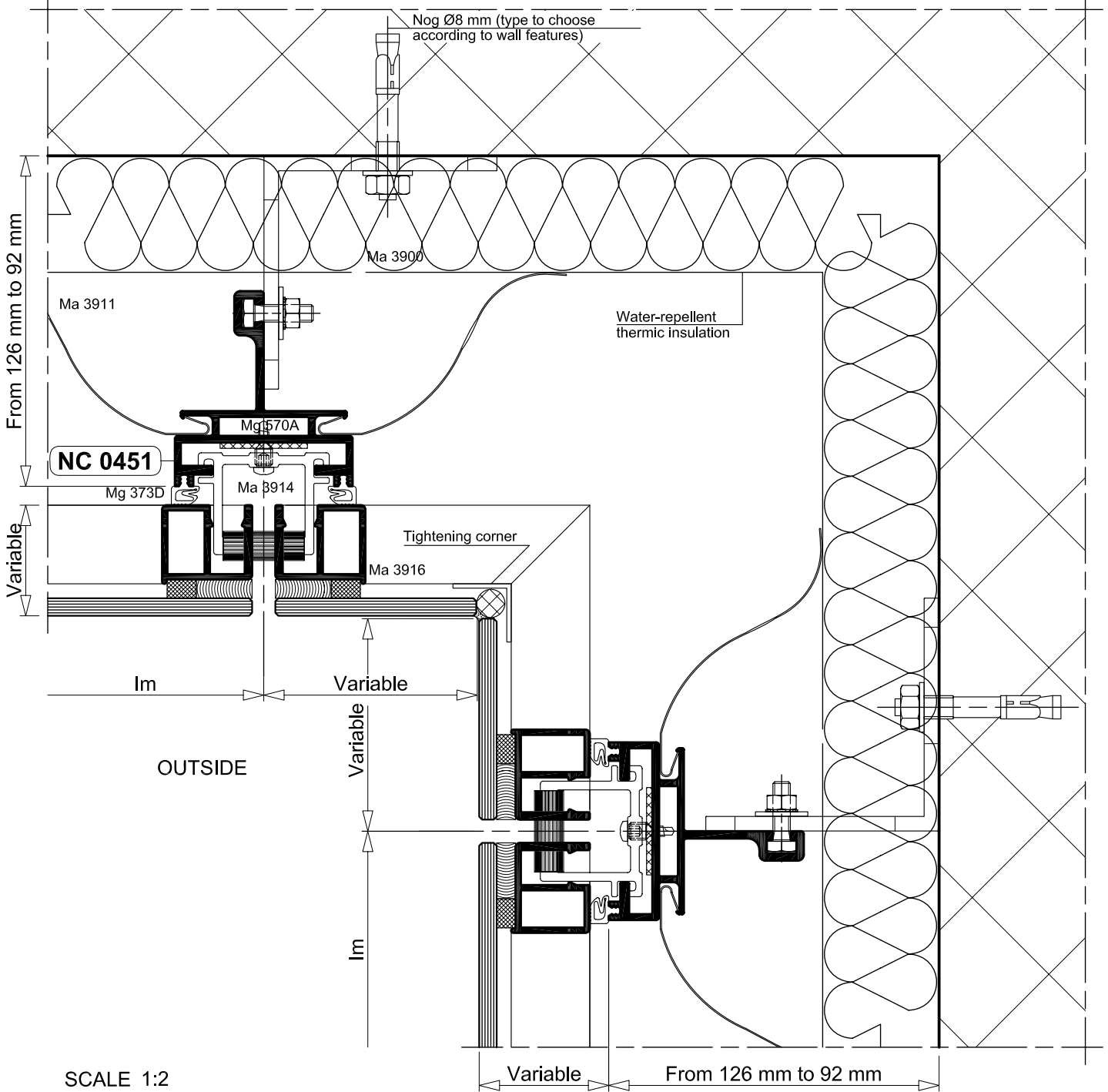
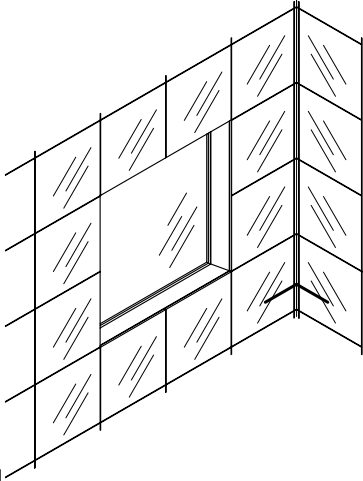
SECTIONS

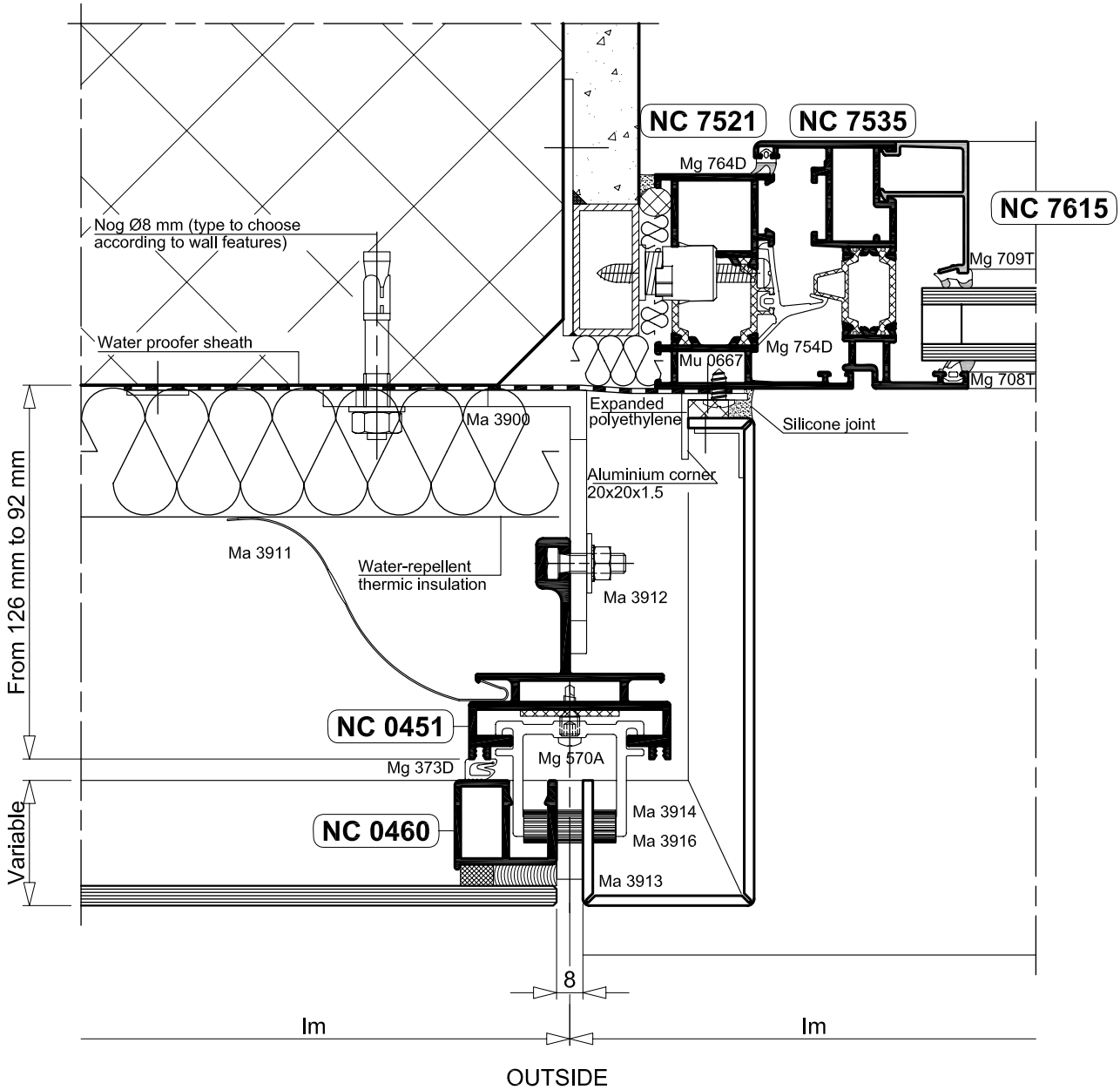
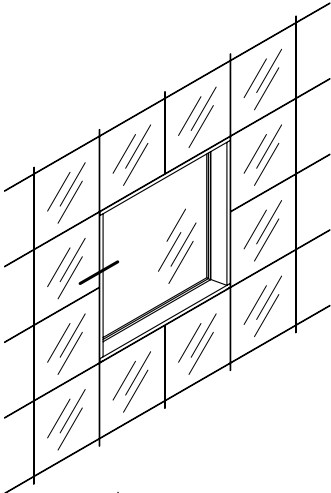




SECTIONS

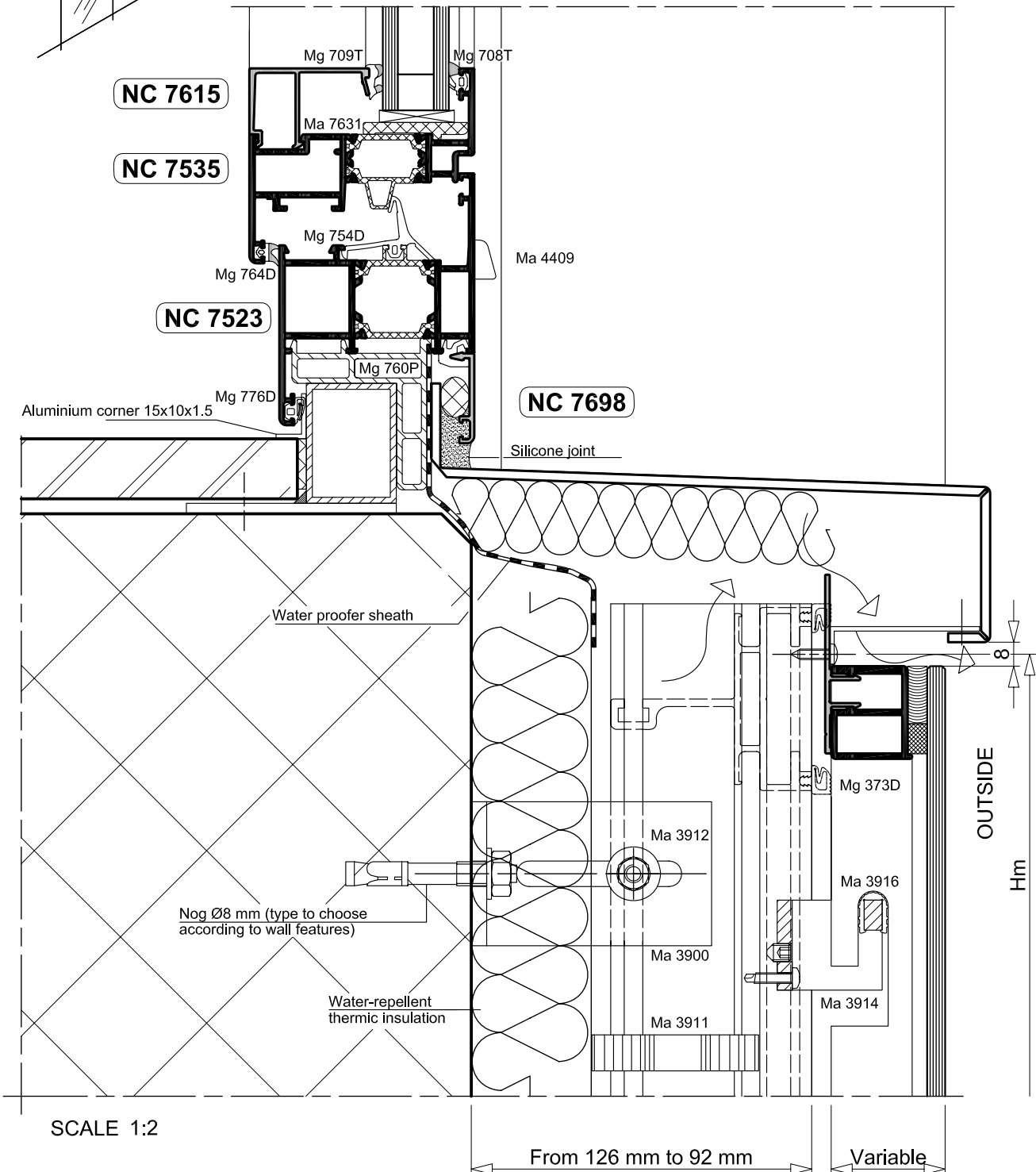
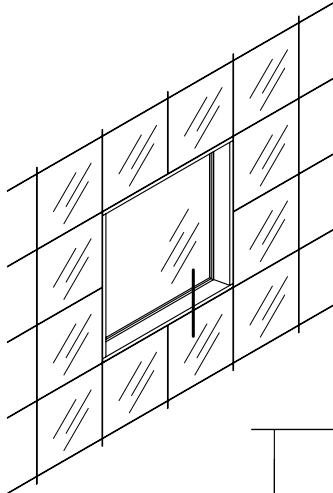


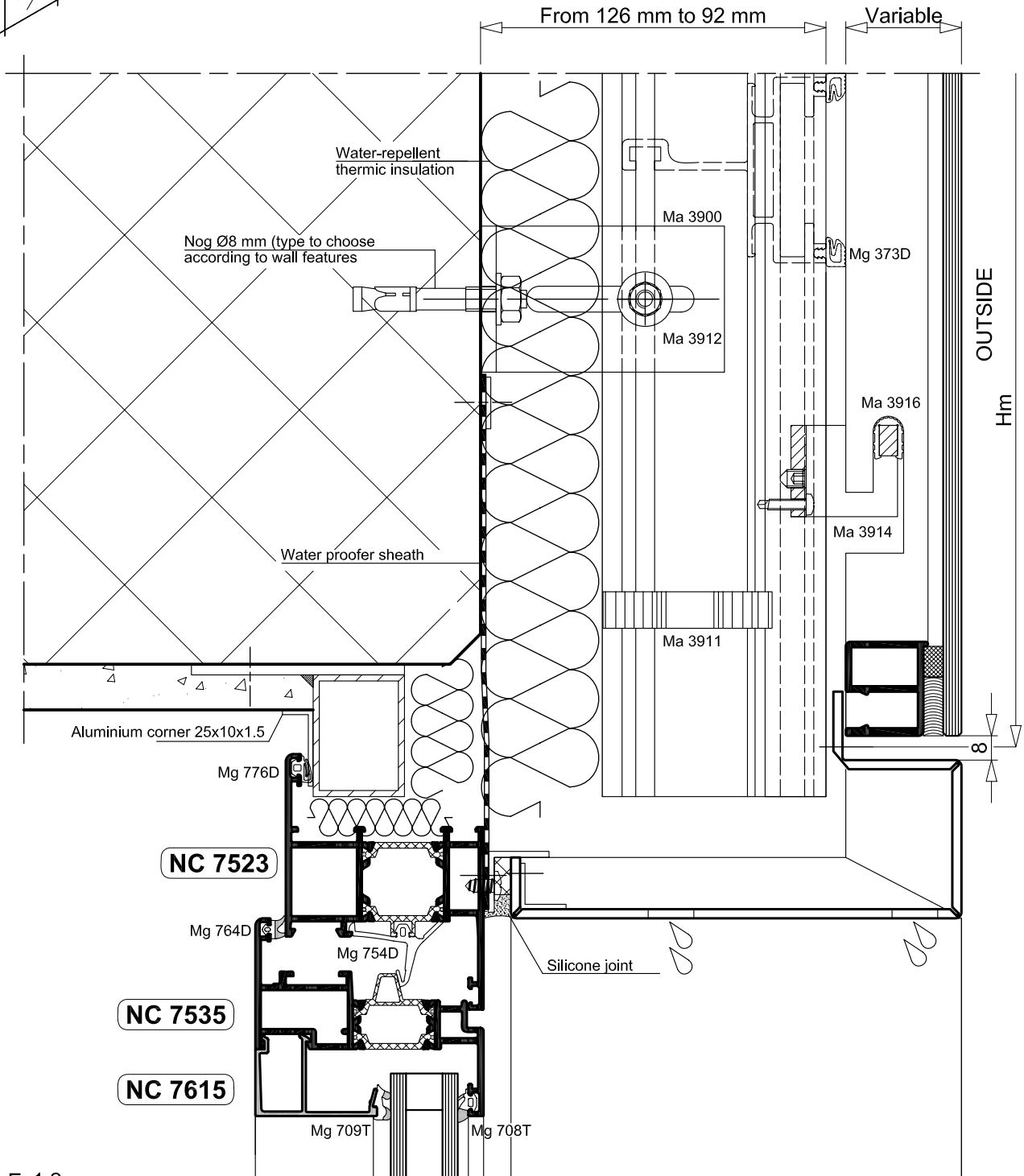
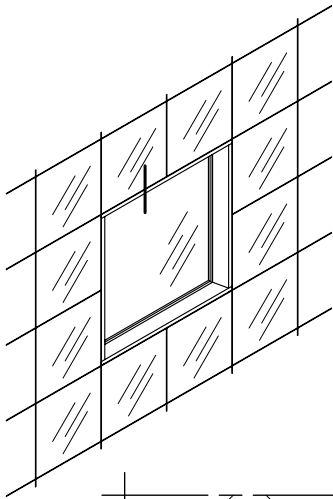




SECTIONS

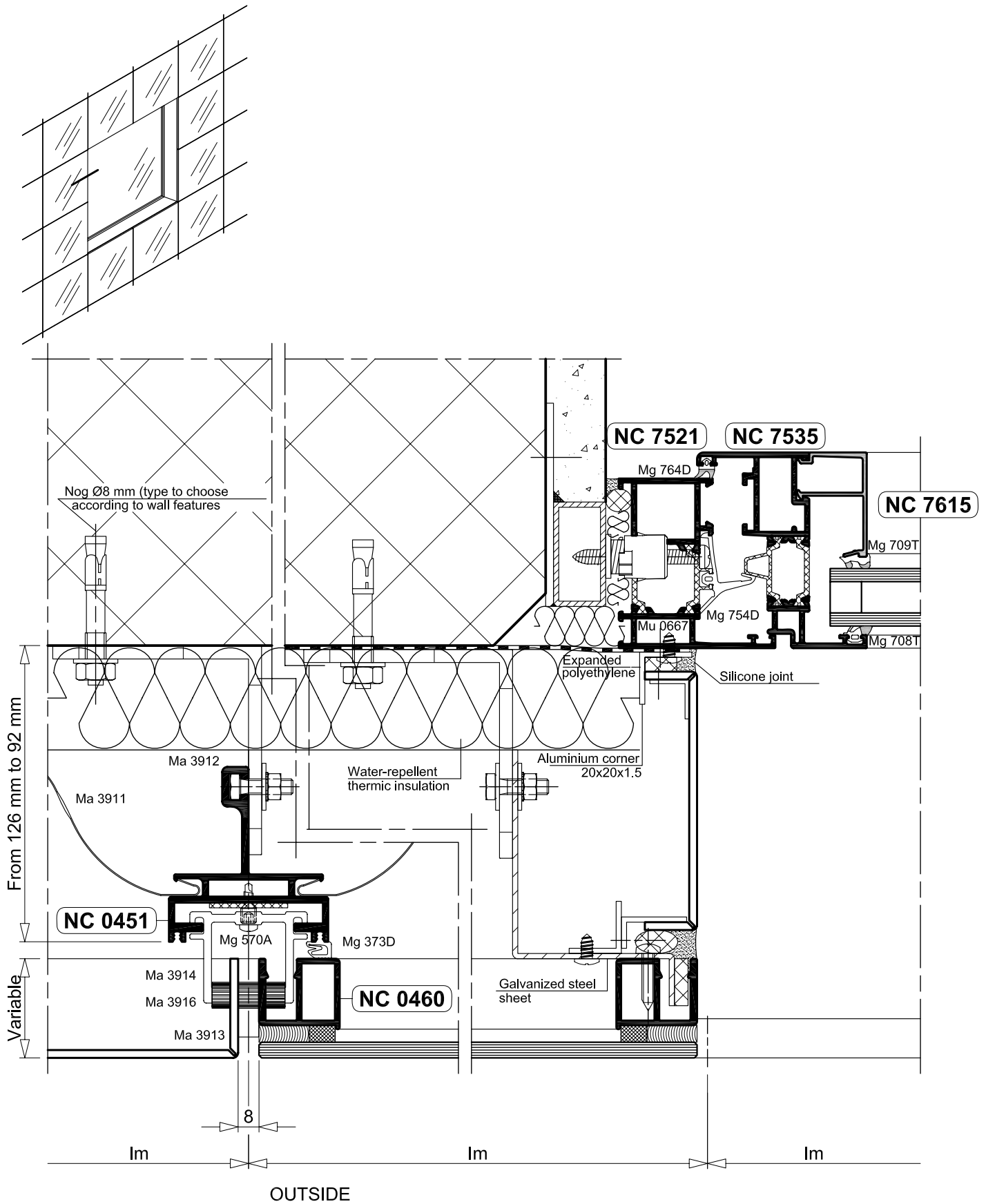
SCALE 1:2



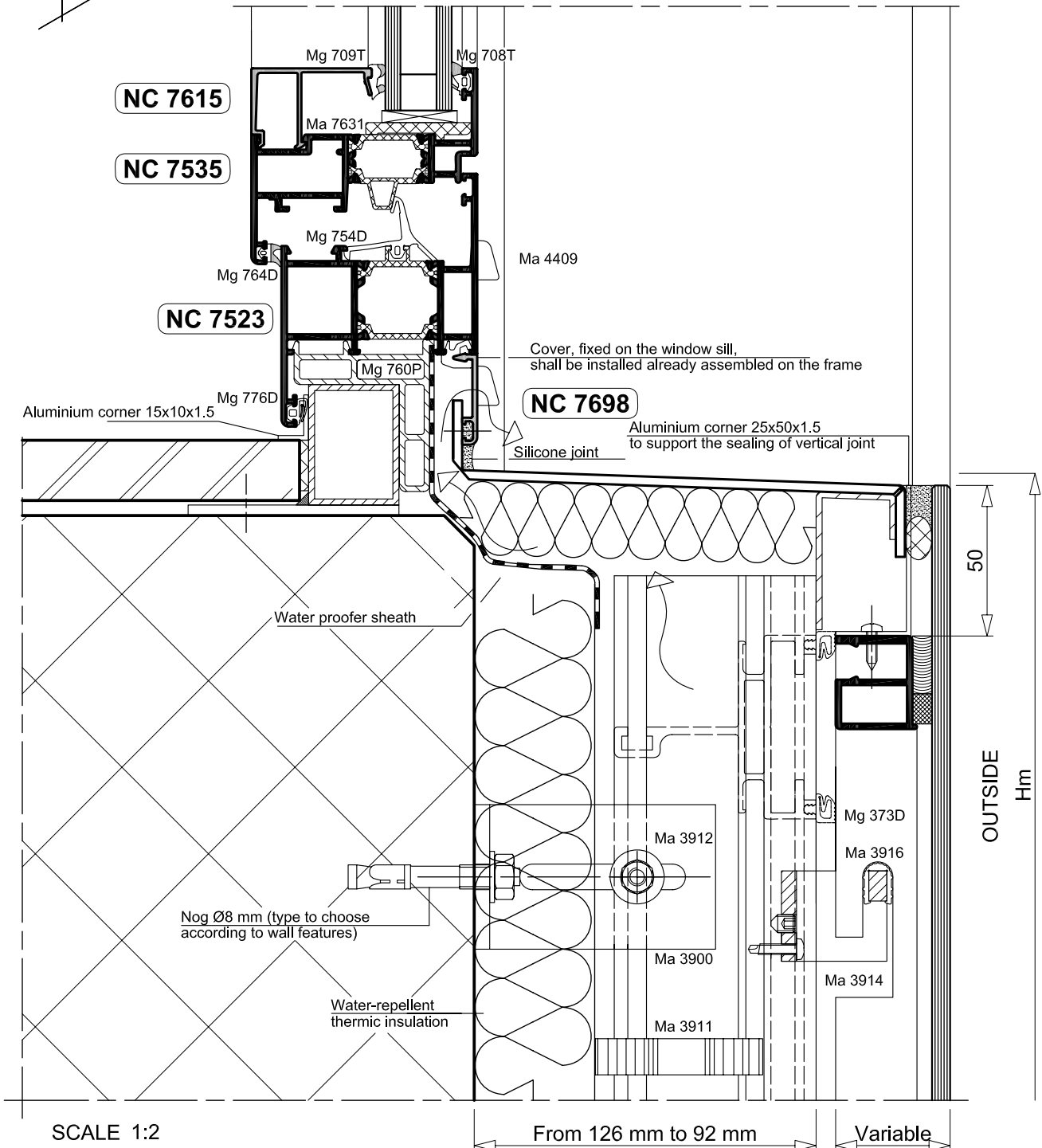
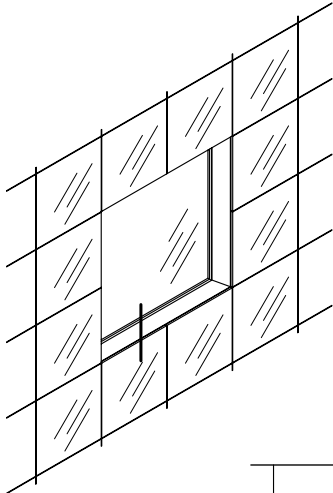


SECTIONS

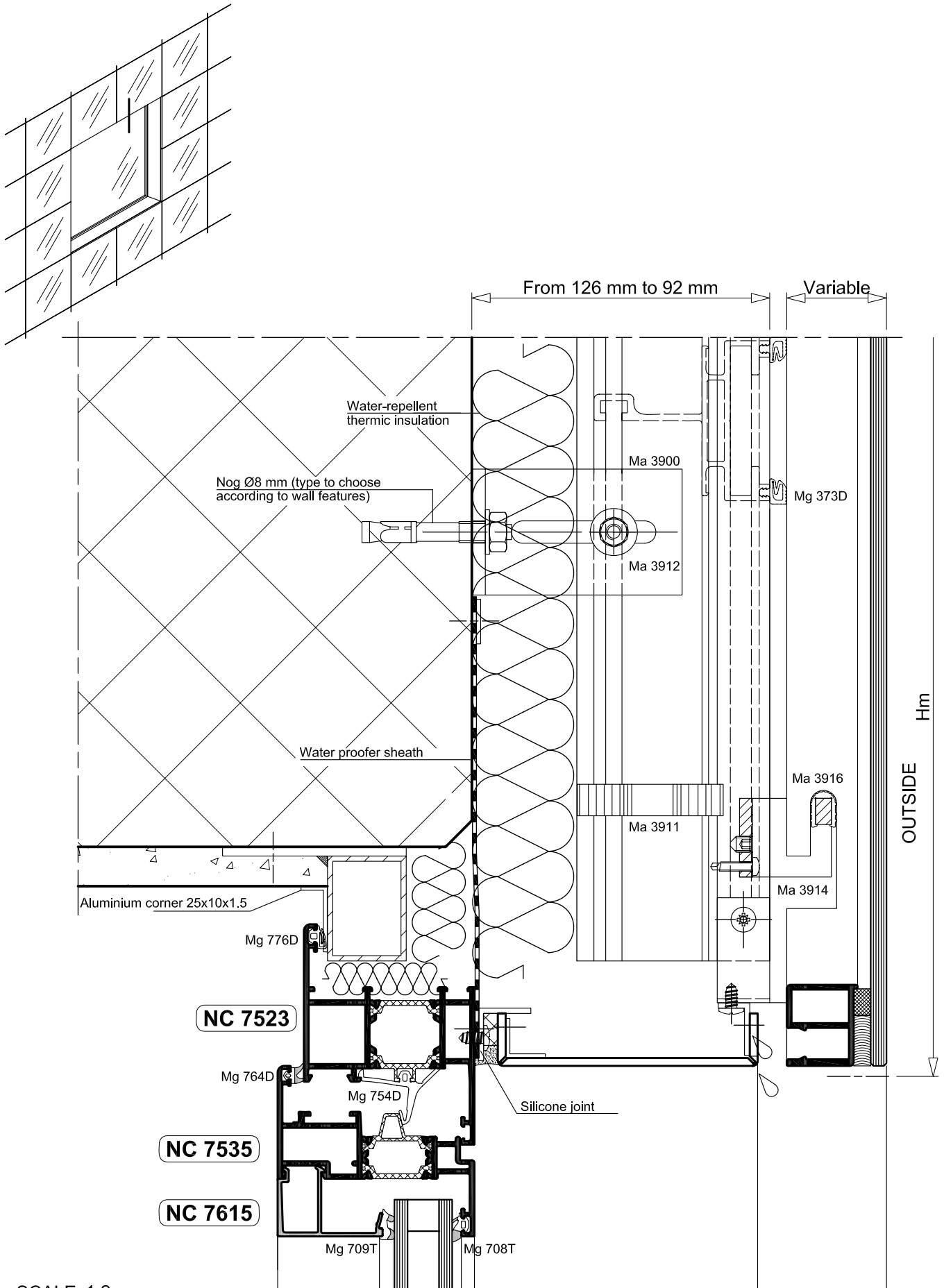
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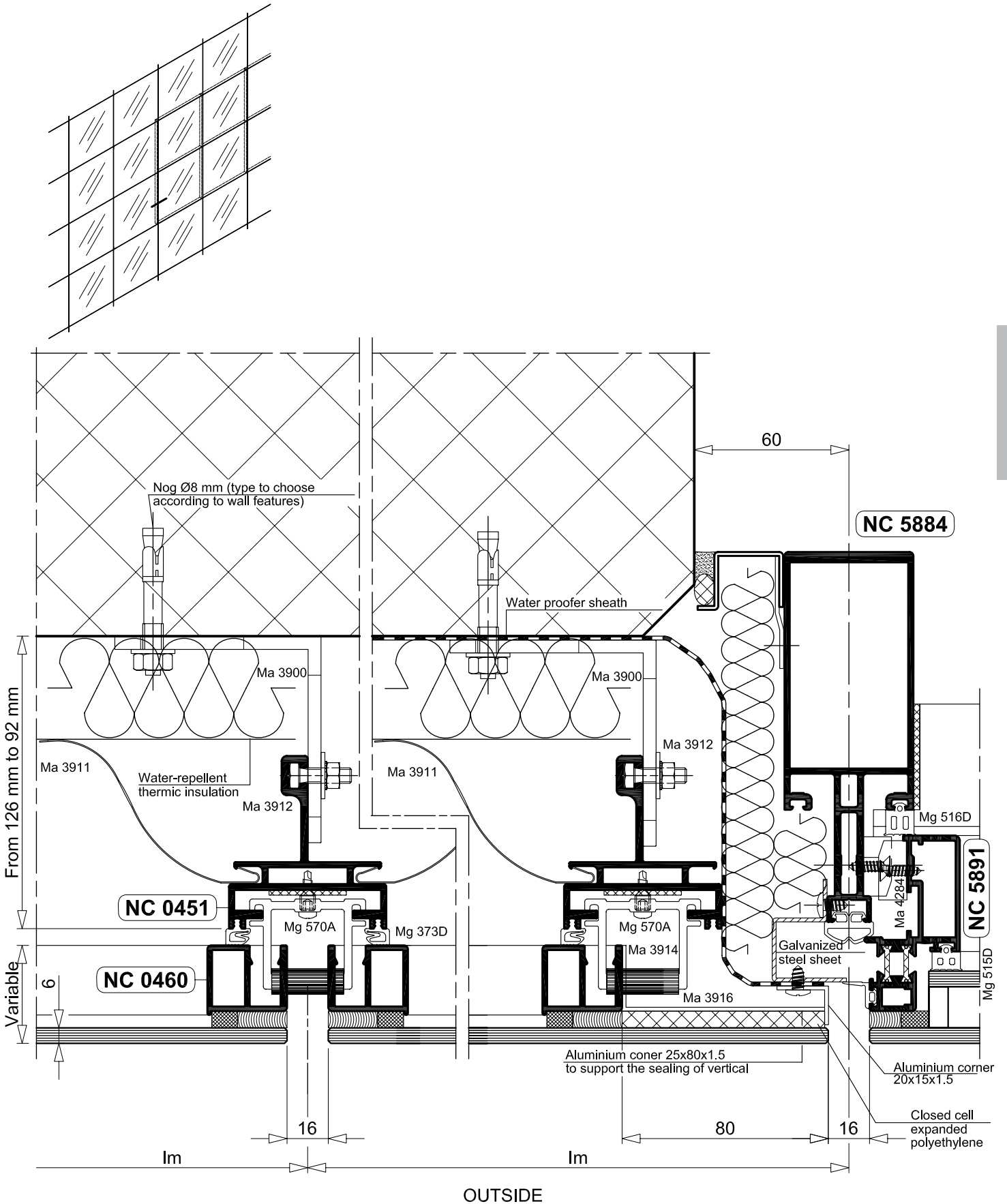
SCALE 1:2



SECTIONS

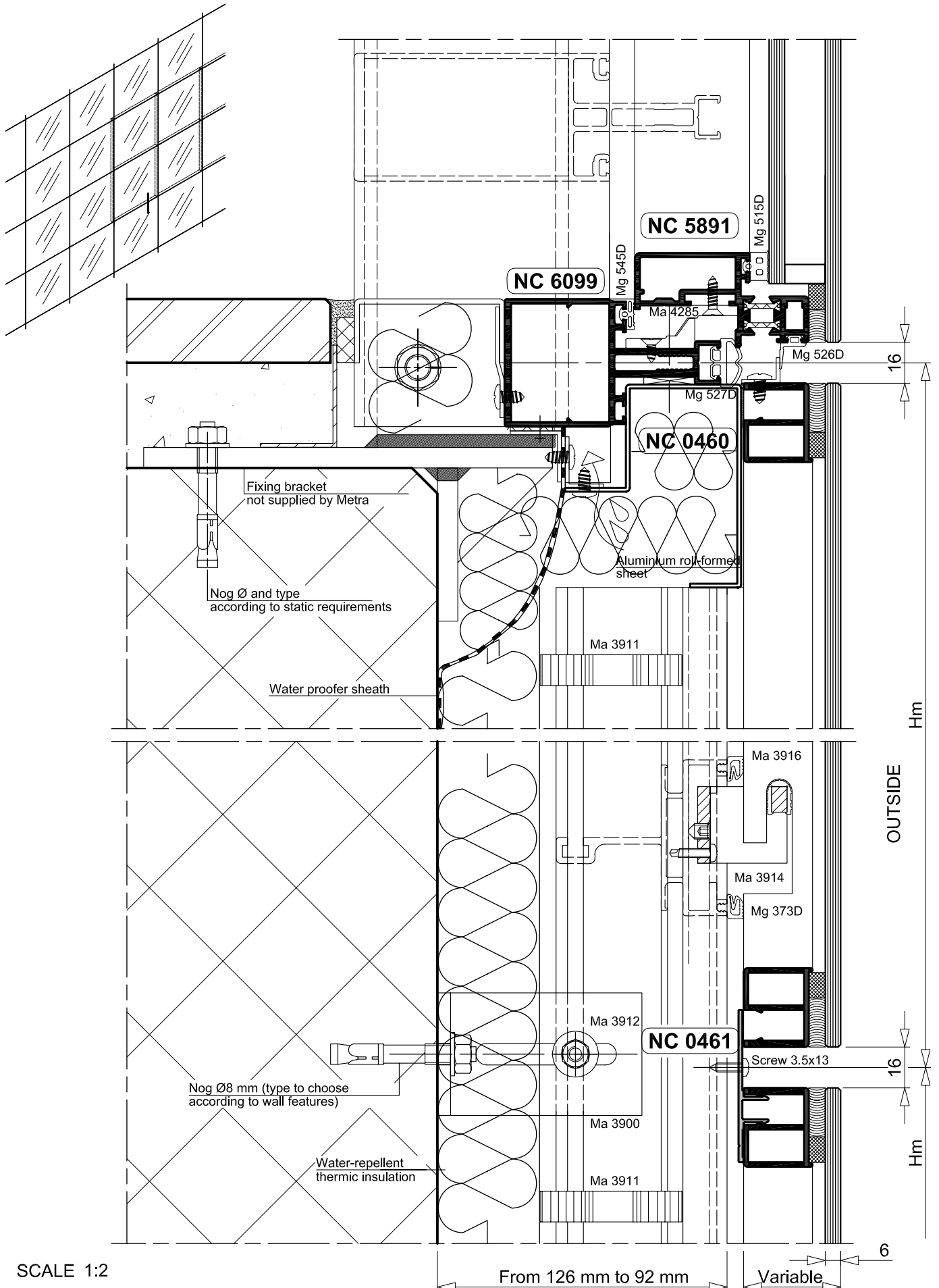


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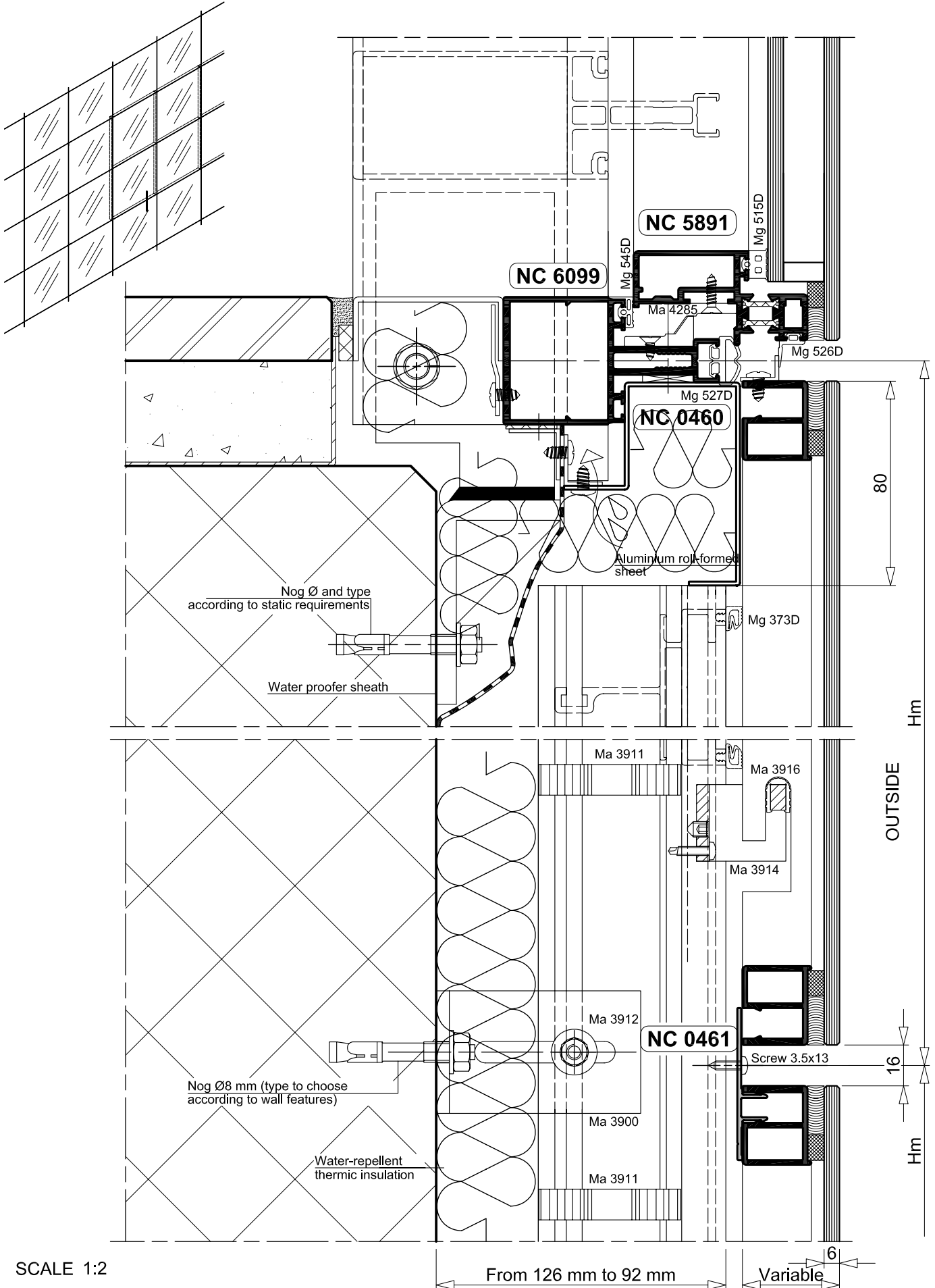


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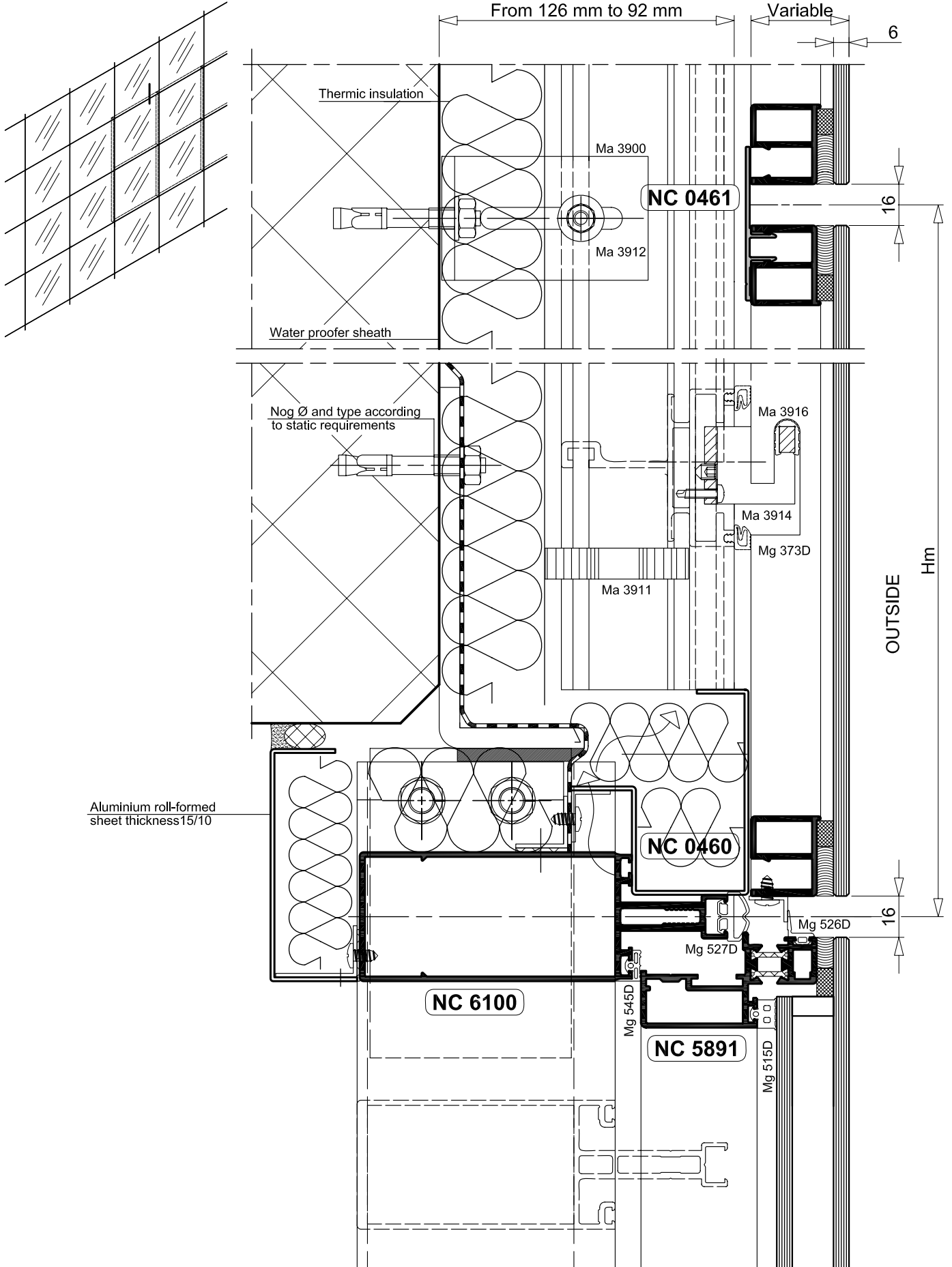


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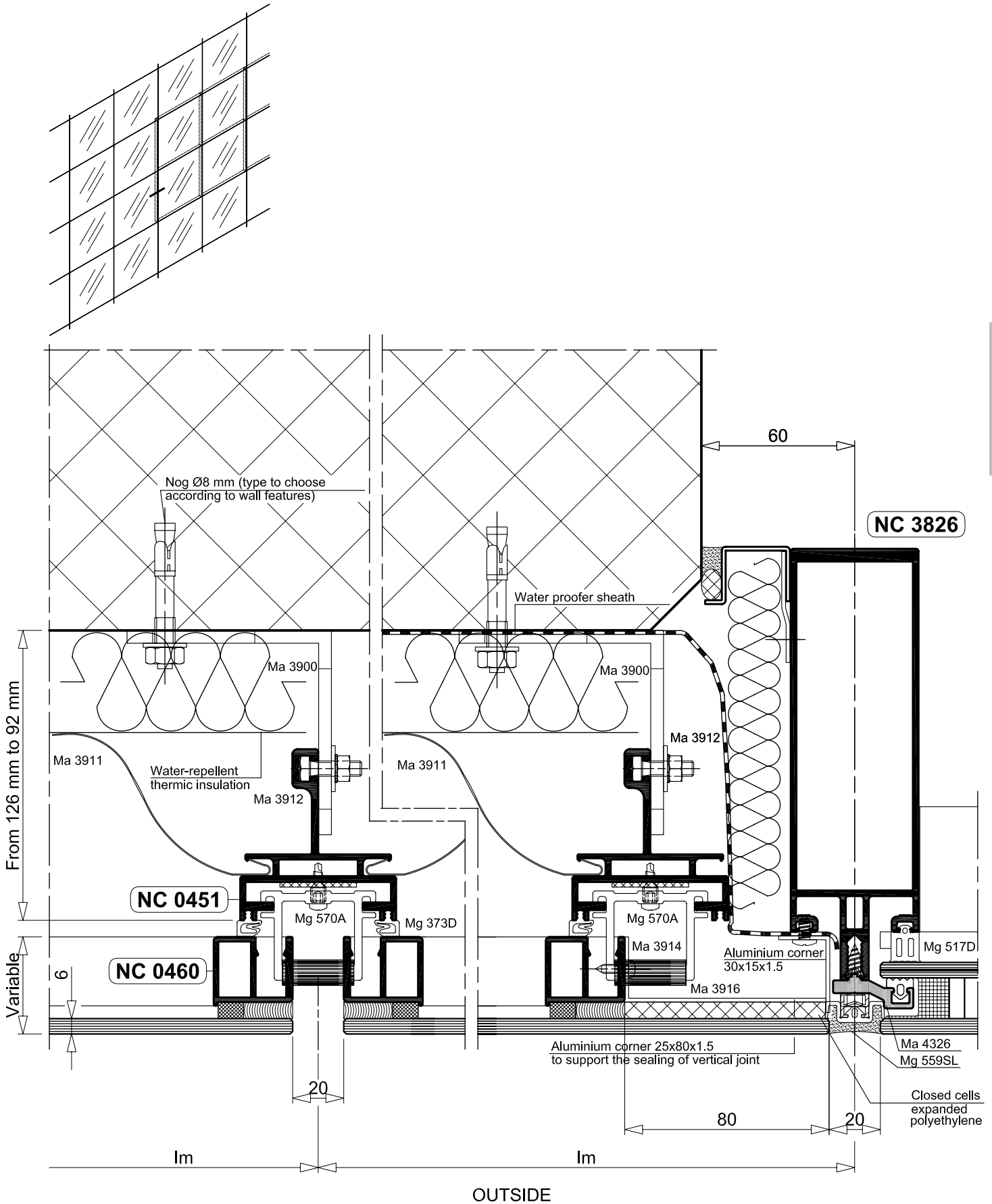


SECTIONS

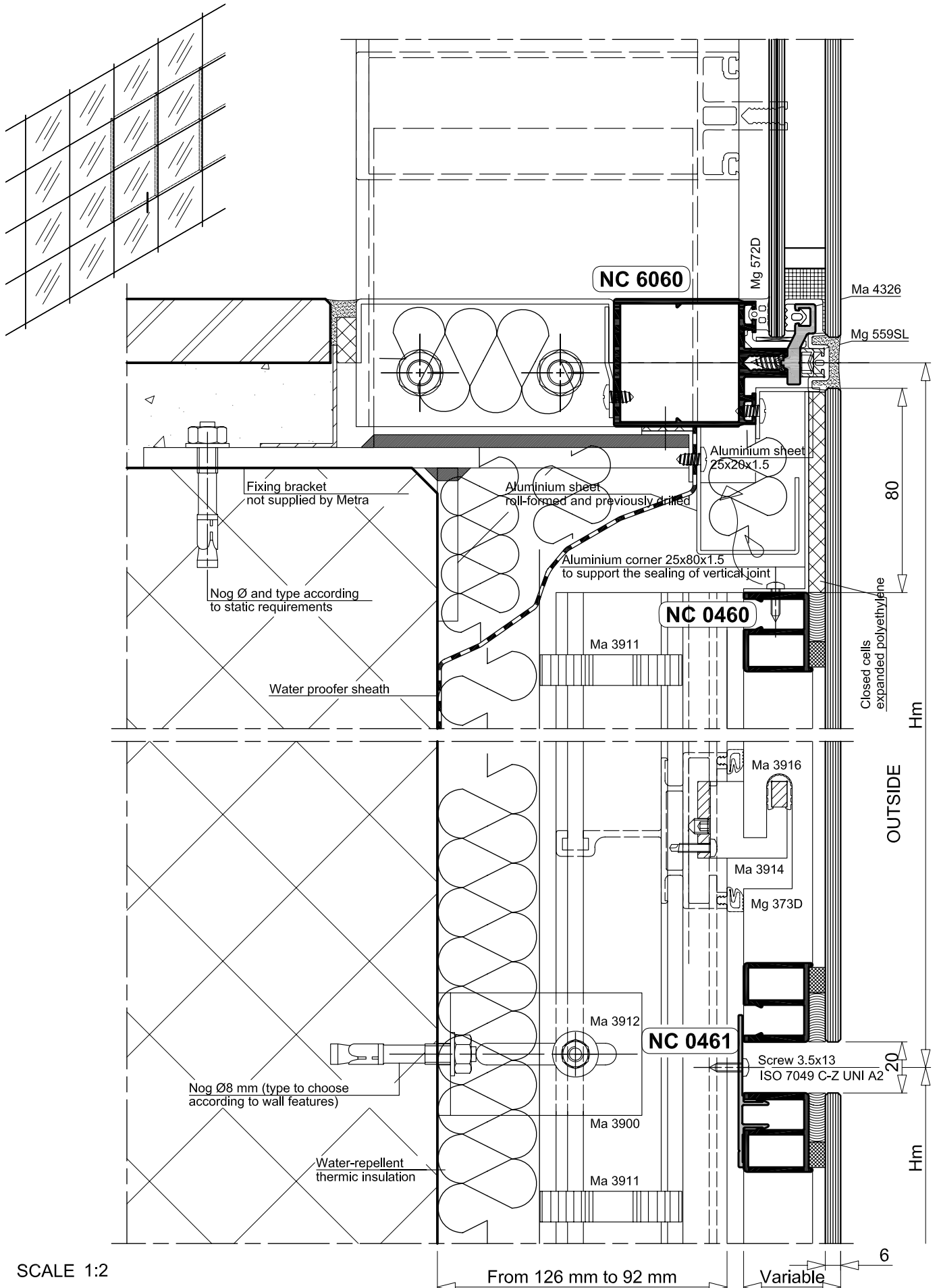
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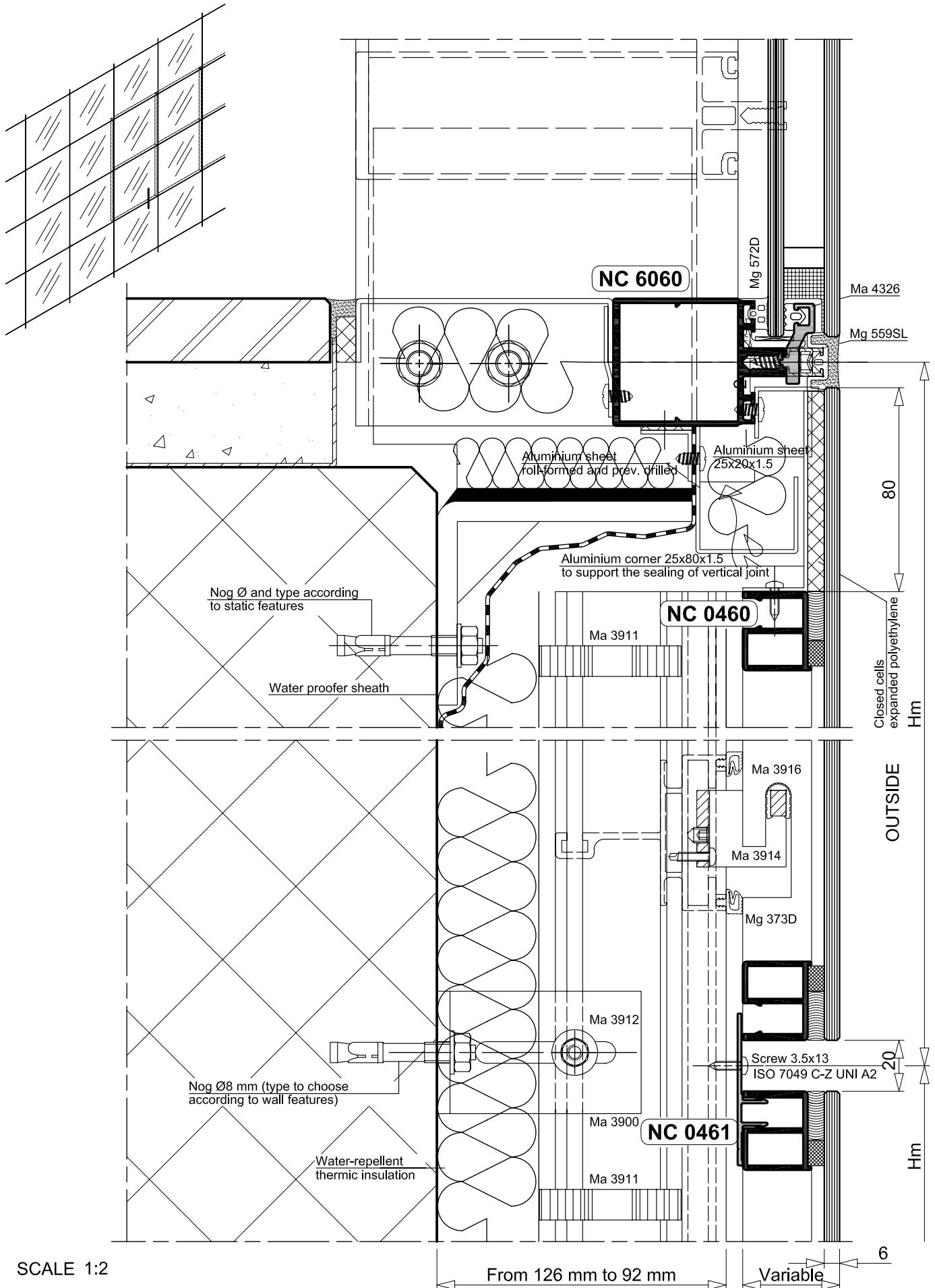
SCALE 1:2



SCALE 1:2

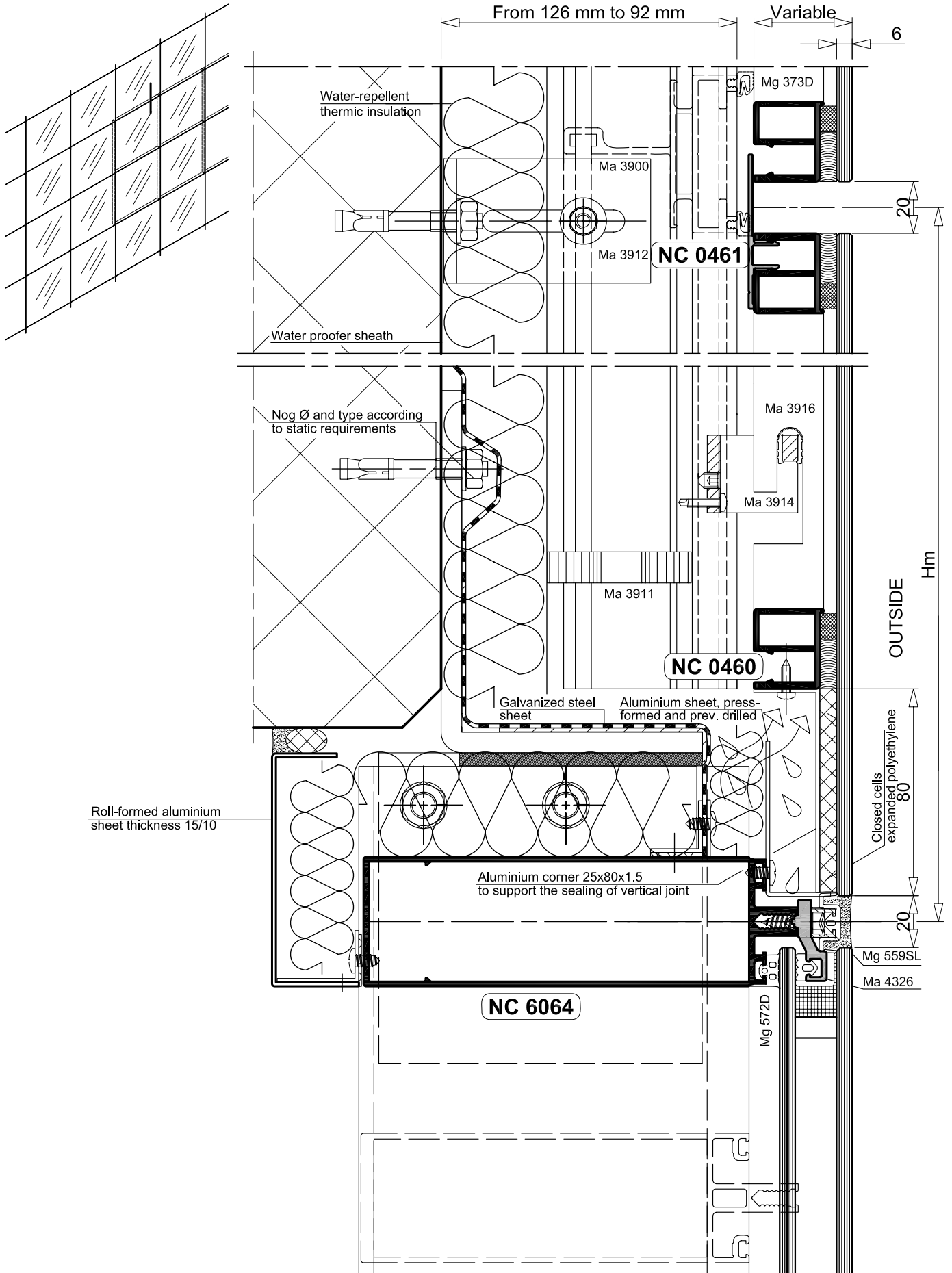


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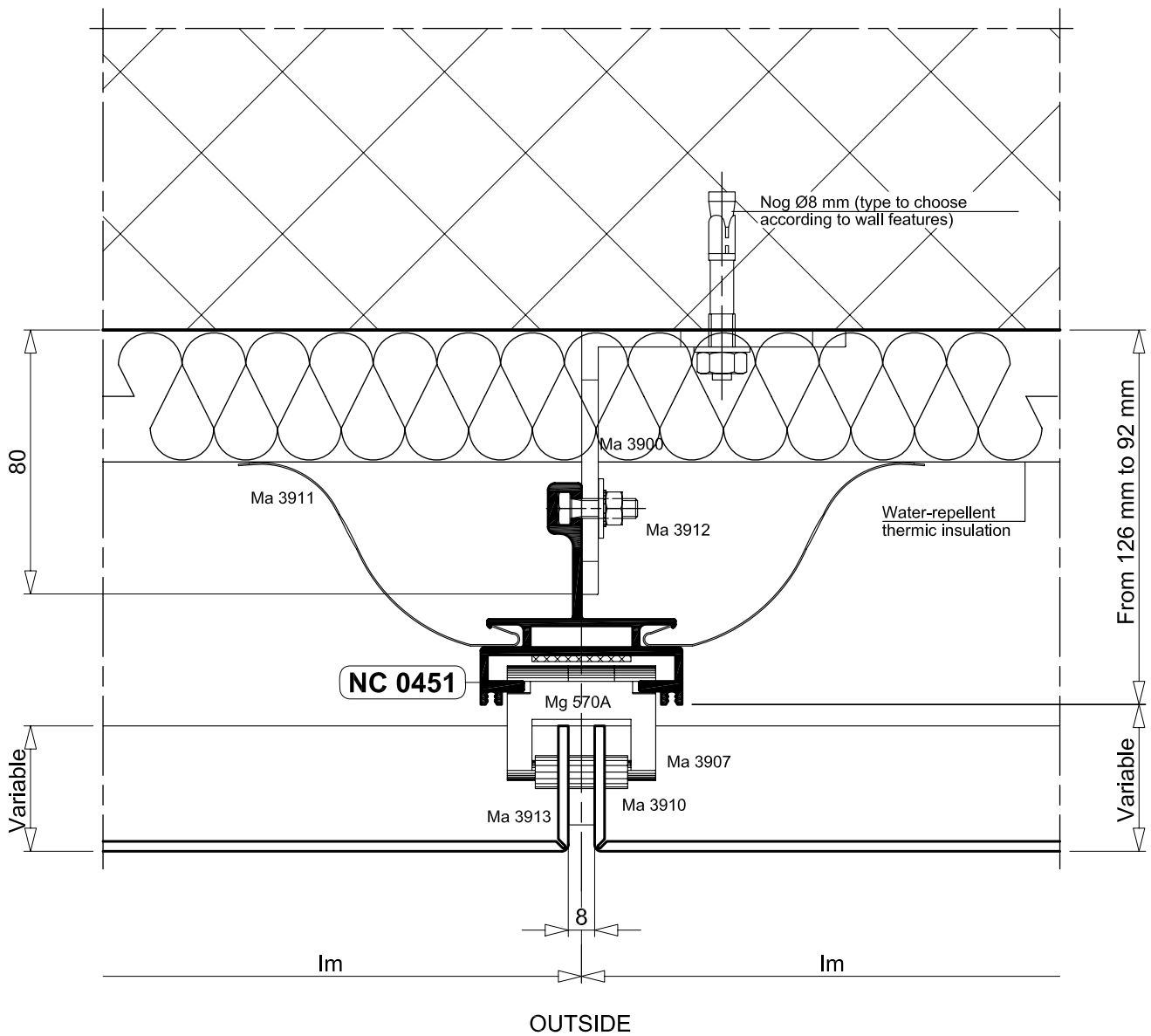
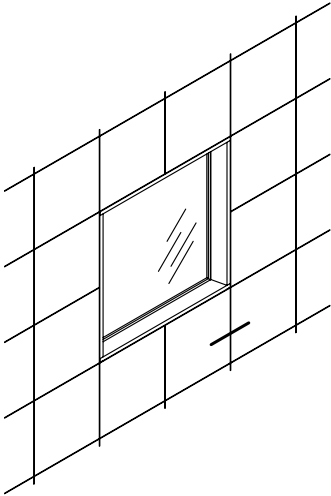


SECTIONS

SCALE 1:2

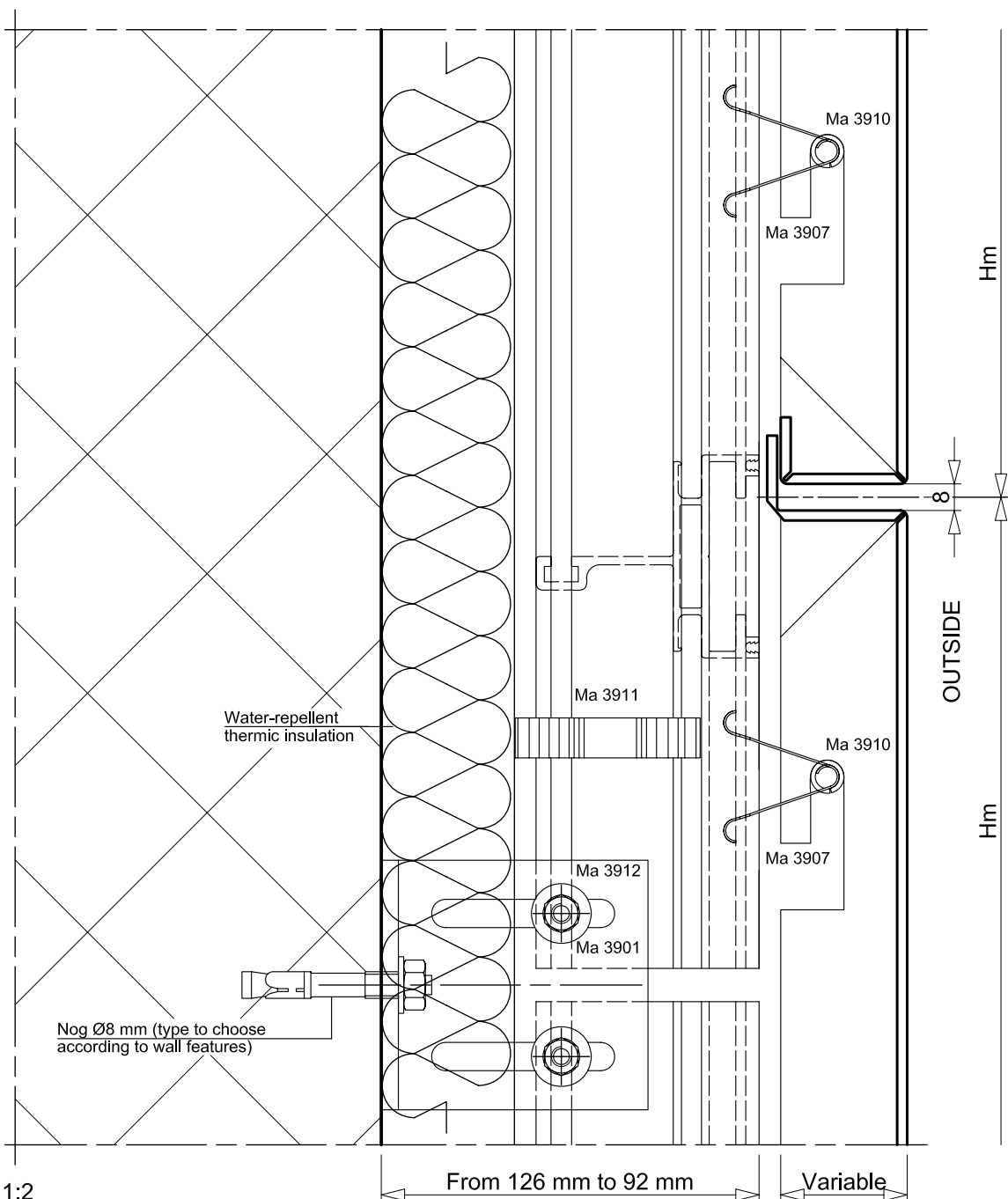
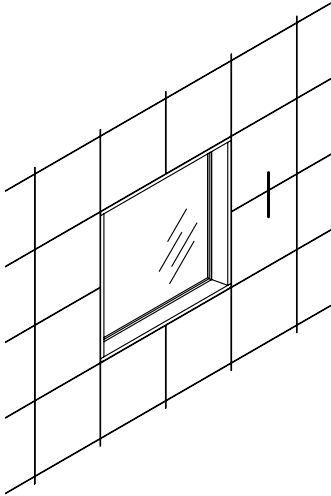


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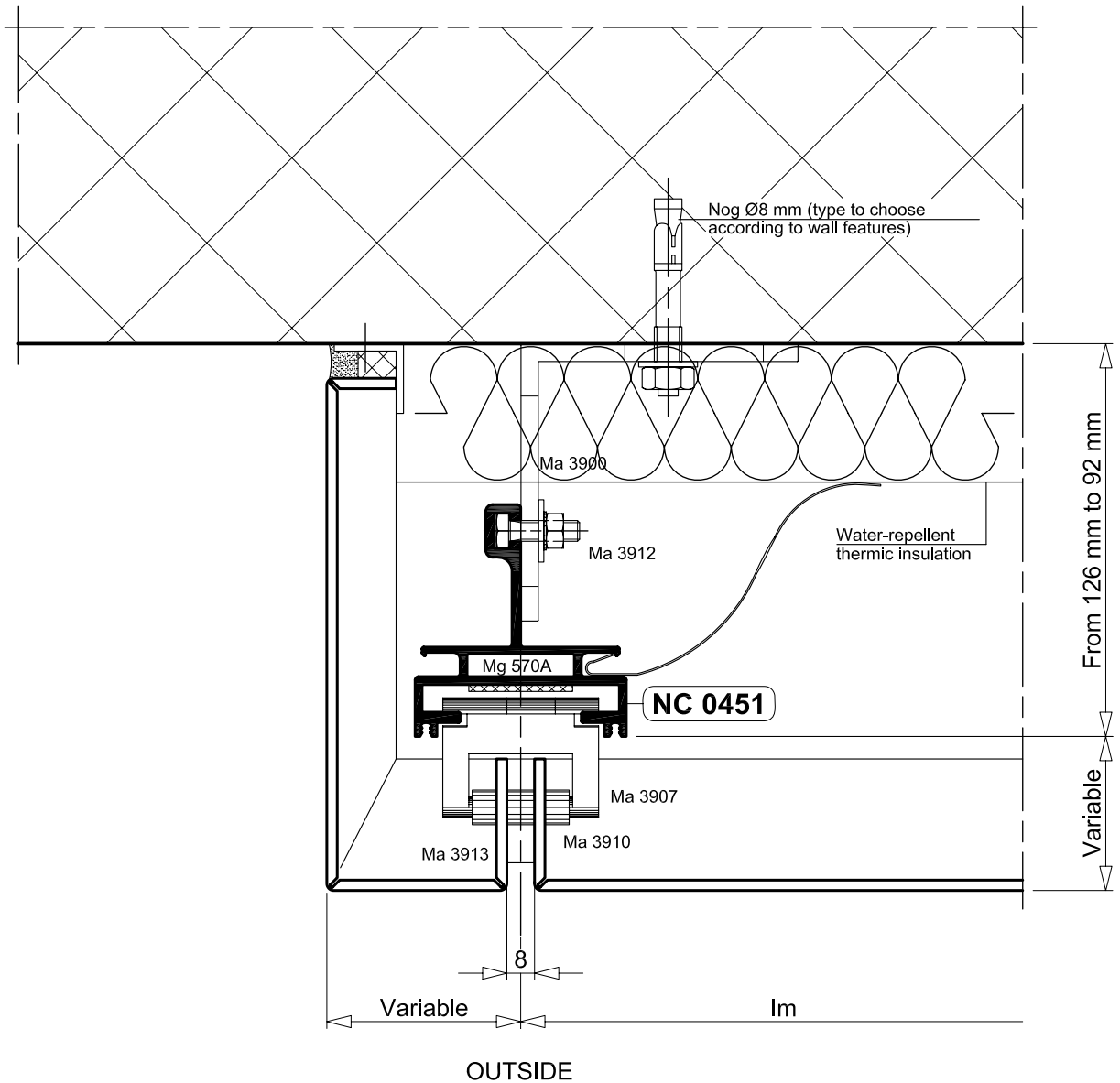
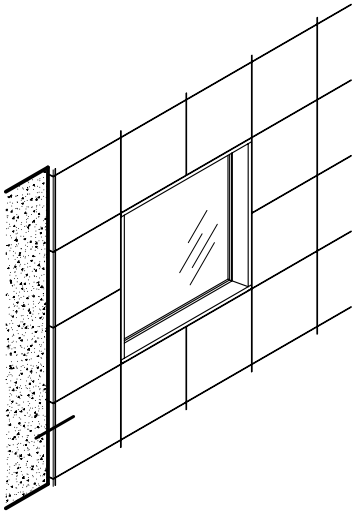


SCALE 1:2



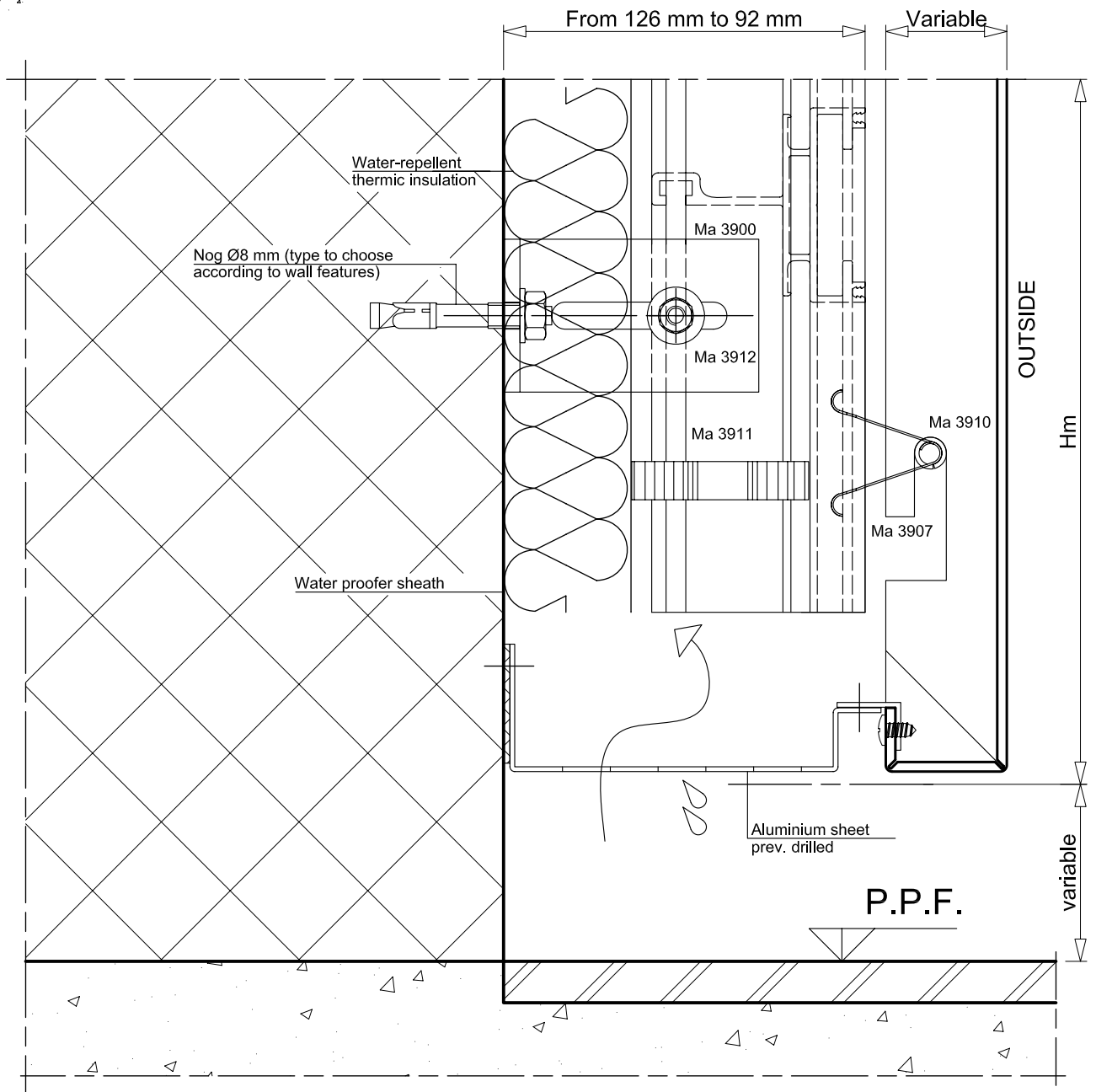
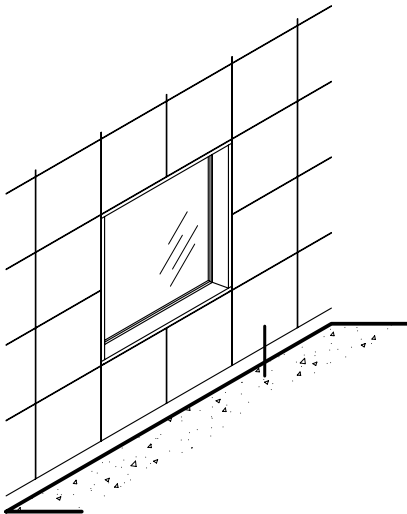


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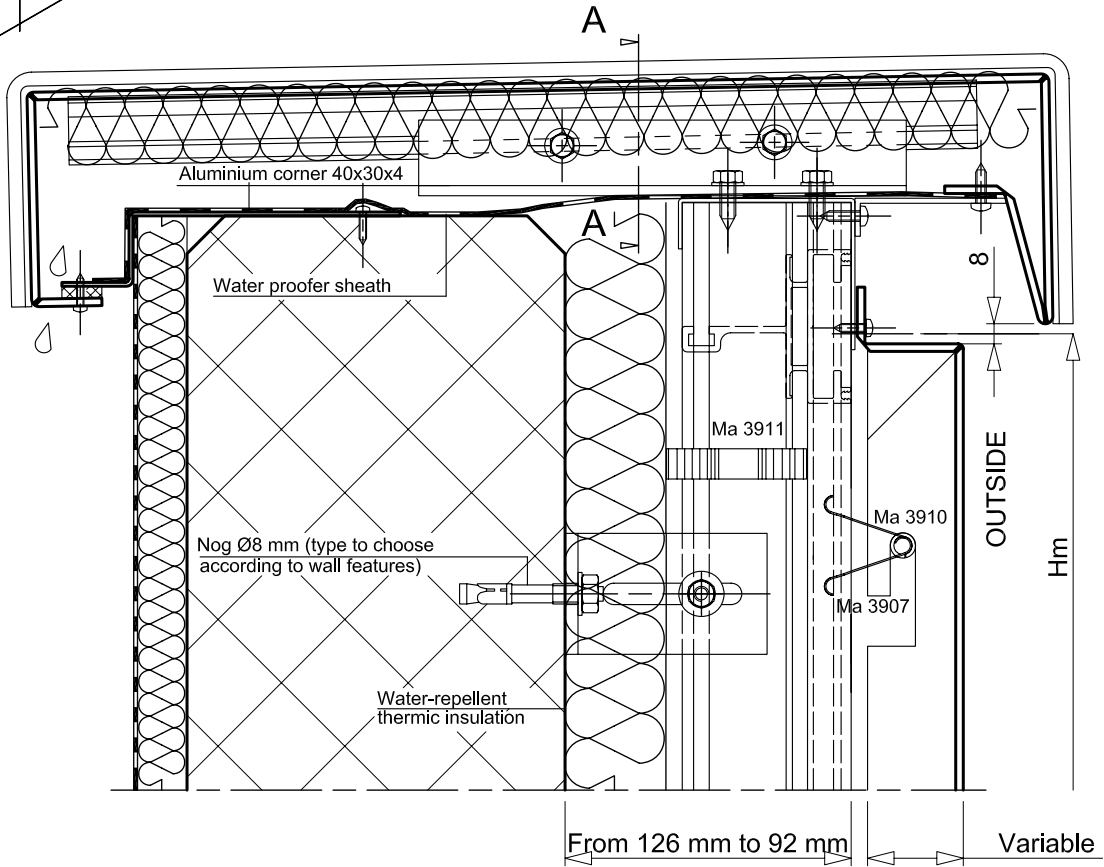
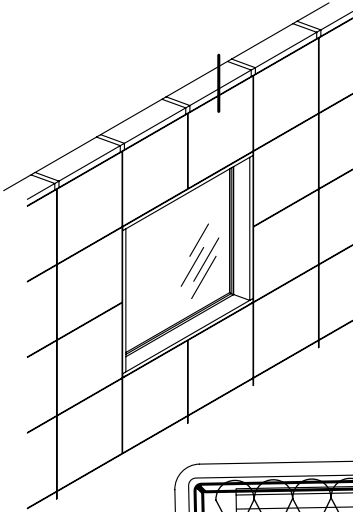


SECTIONS

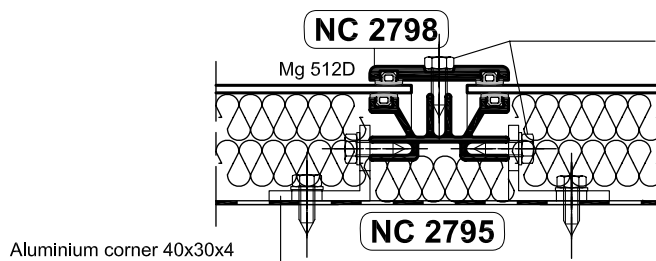
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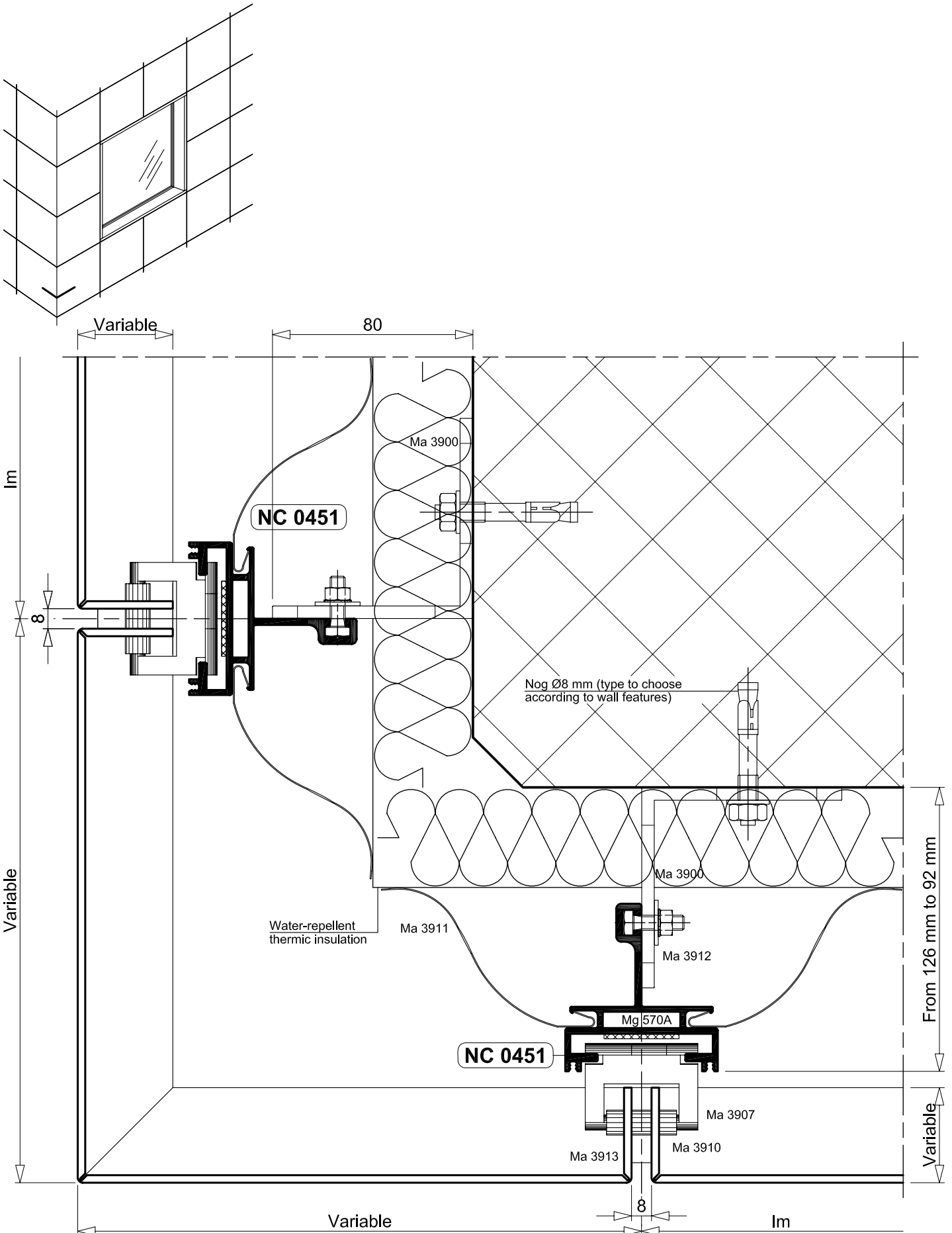
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### SECTION A-A

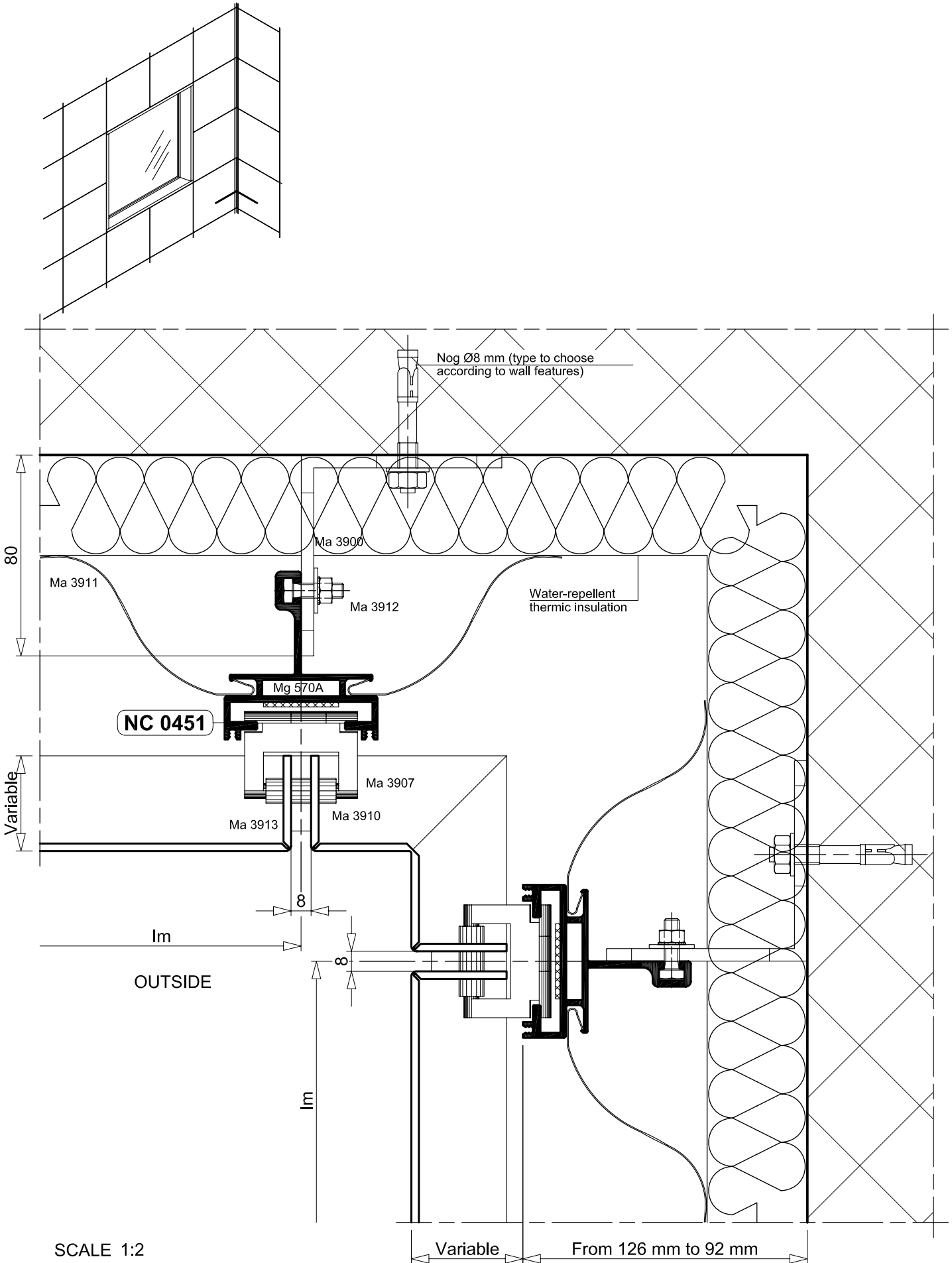


SCALE 1:3



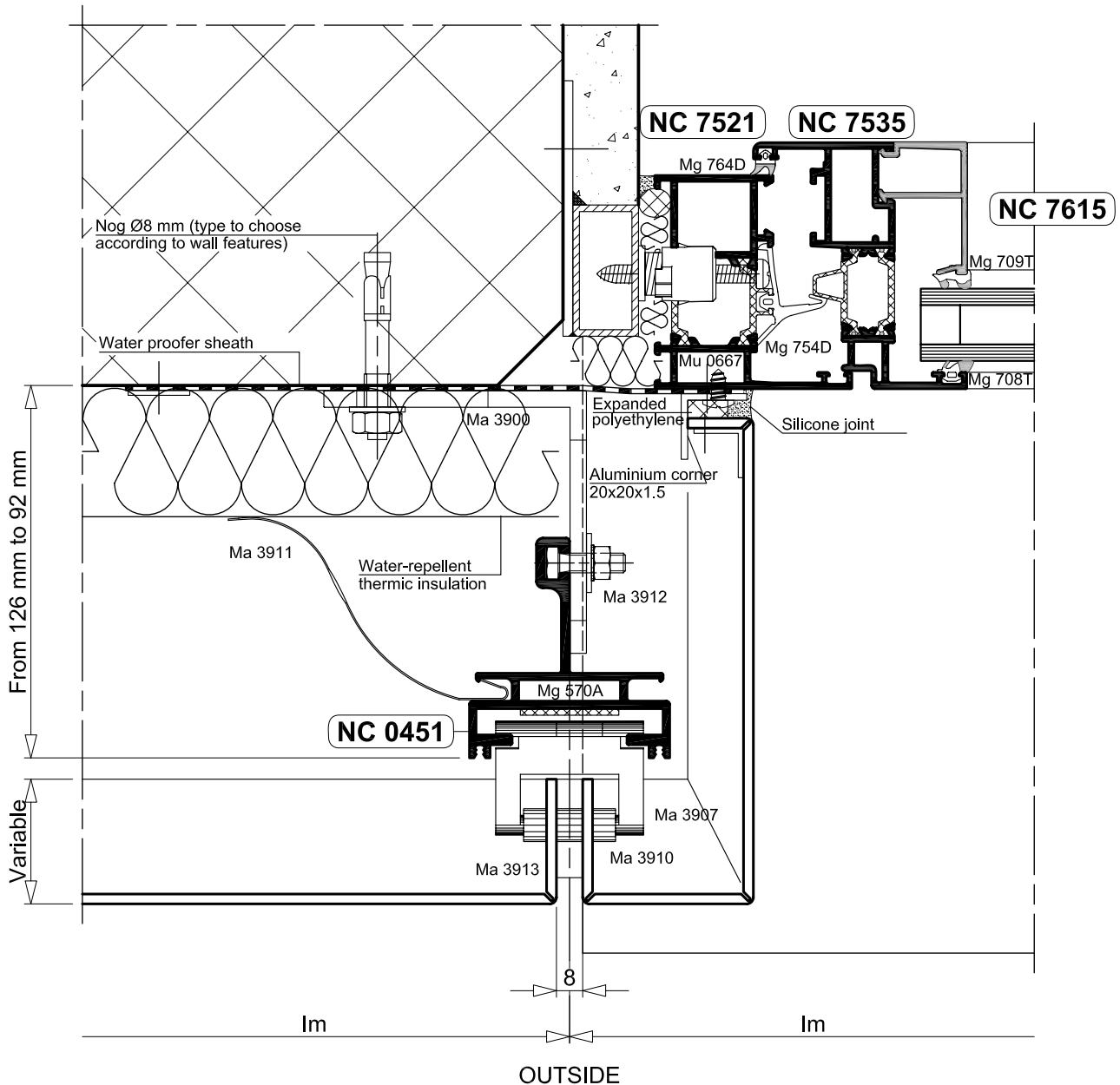
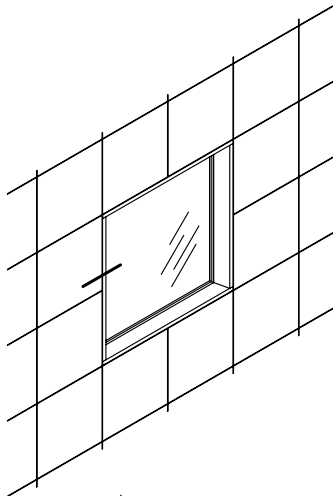
SCALE 1:2

OUTSIDE

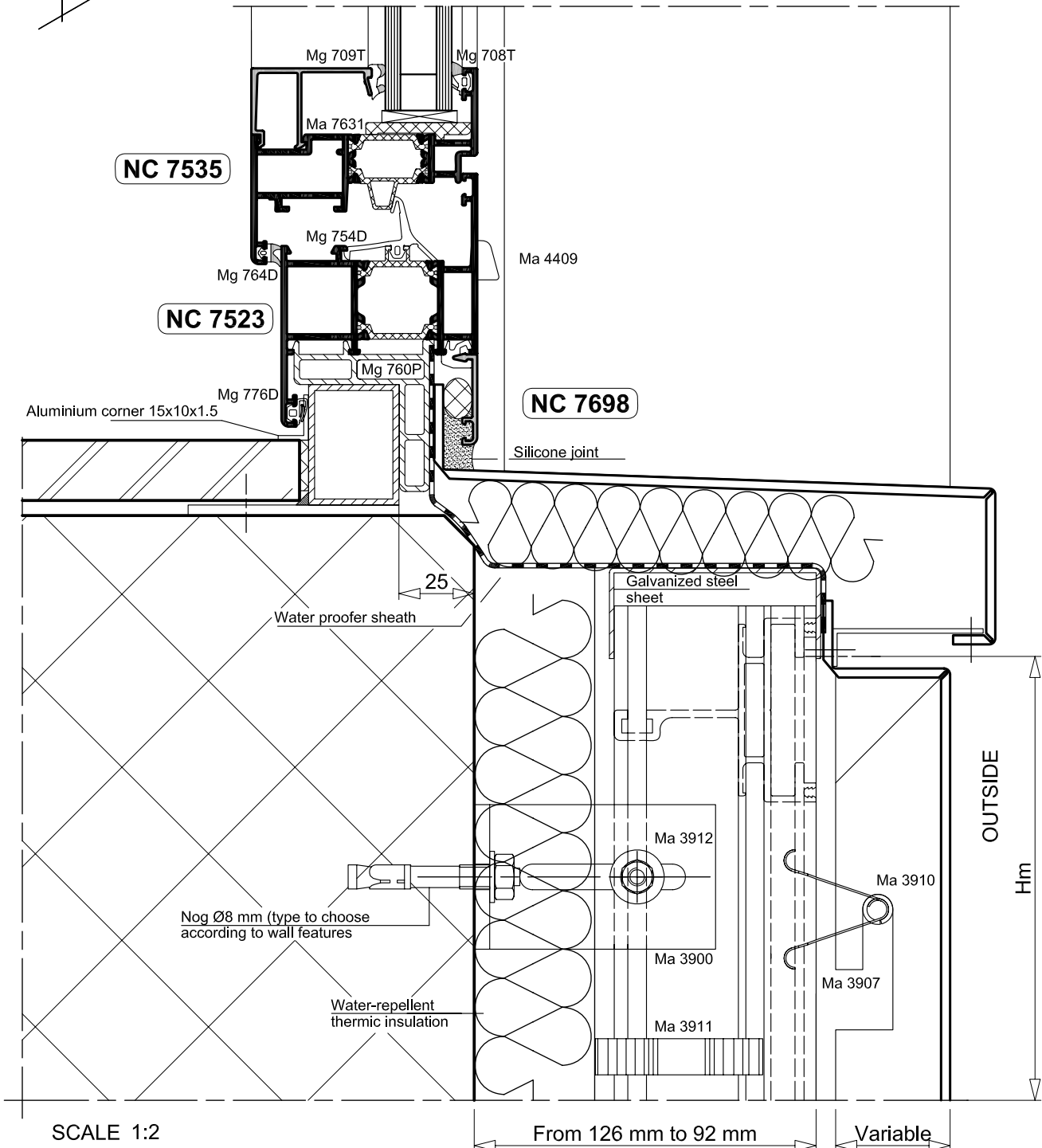
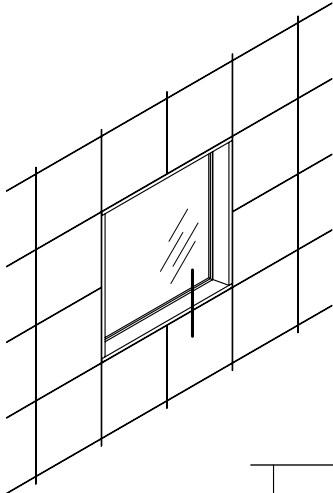


SECTIONS

SCALE 1:2



SCALE 1:2

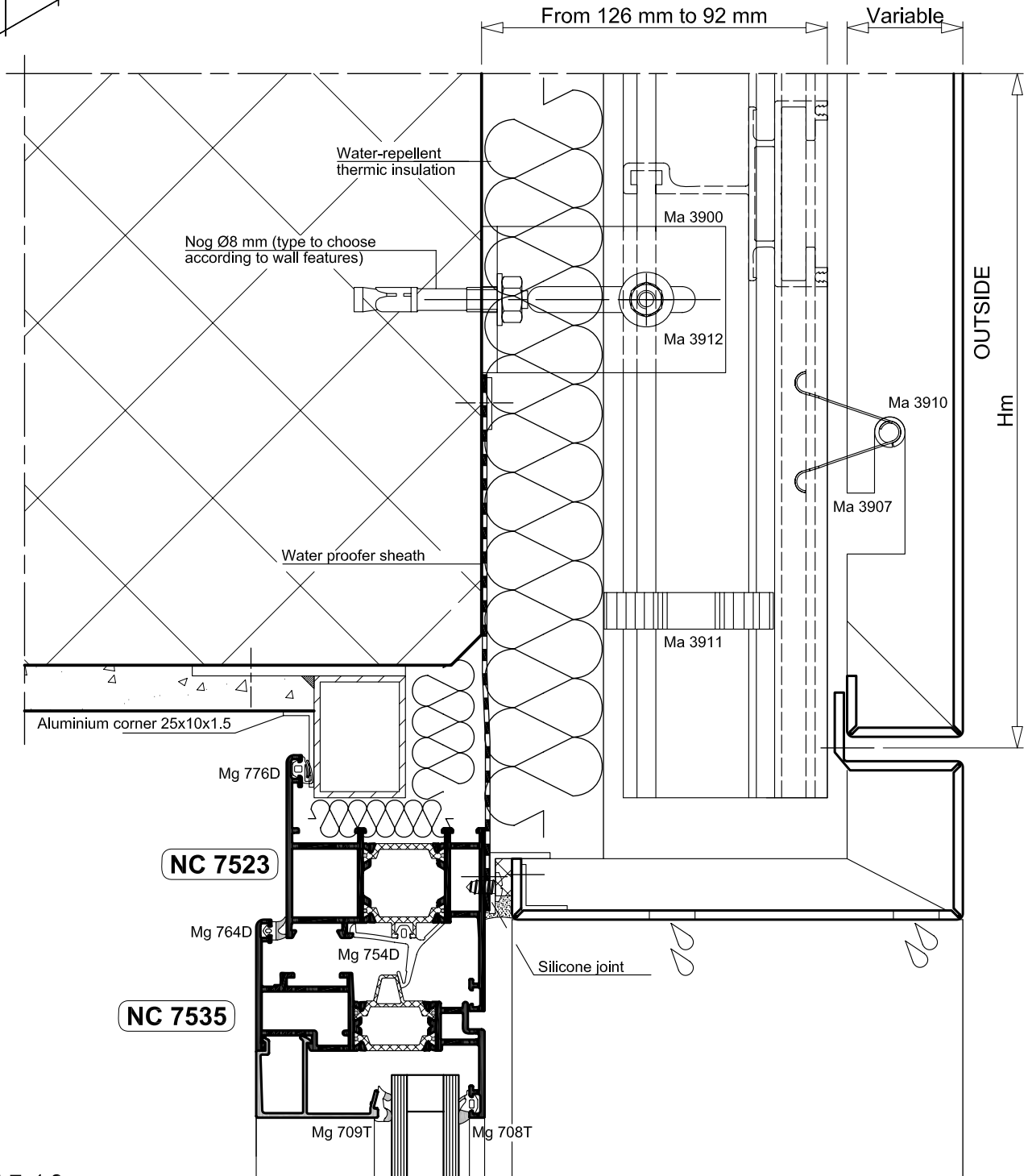
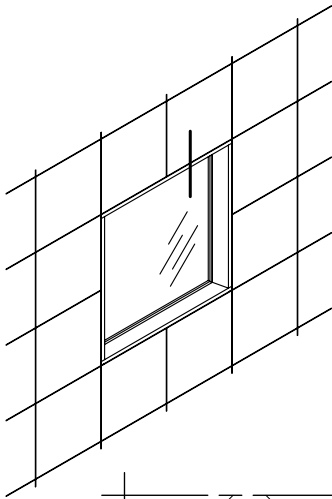


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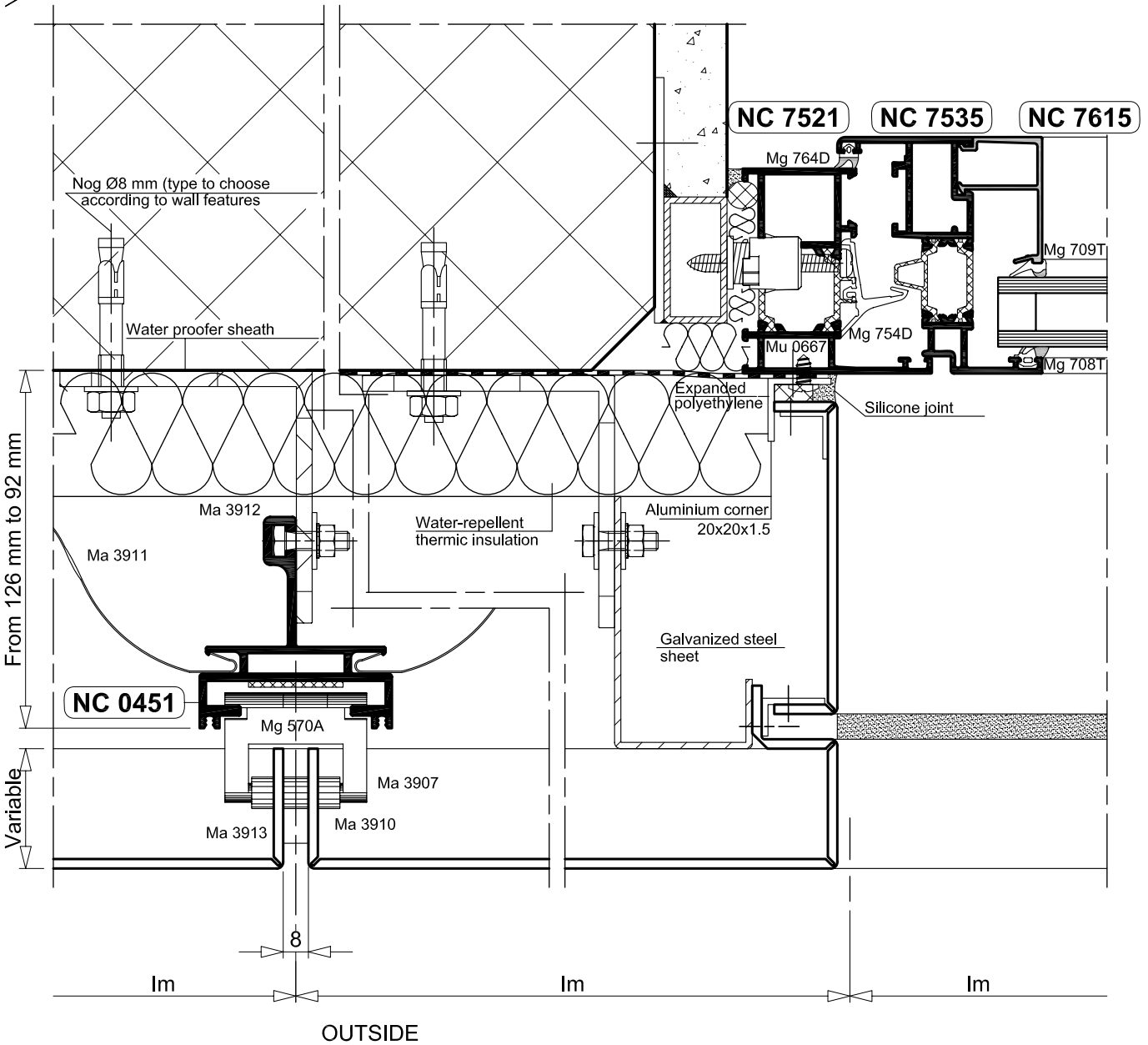
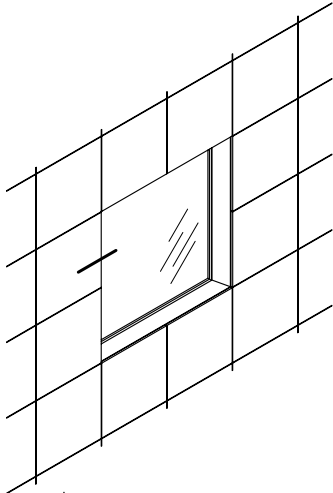
From 126 mm to 92 mm

Variable



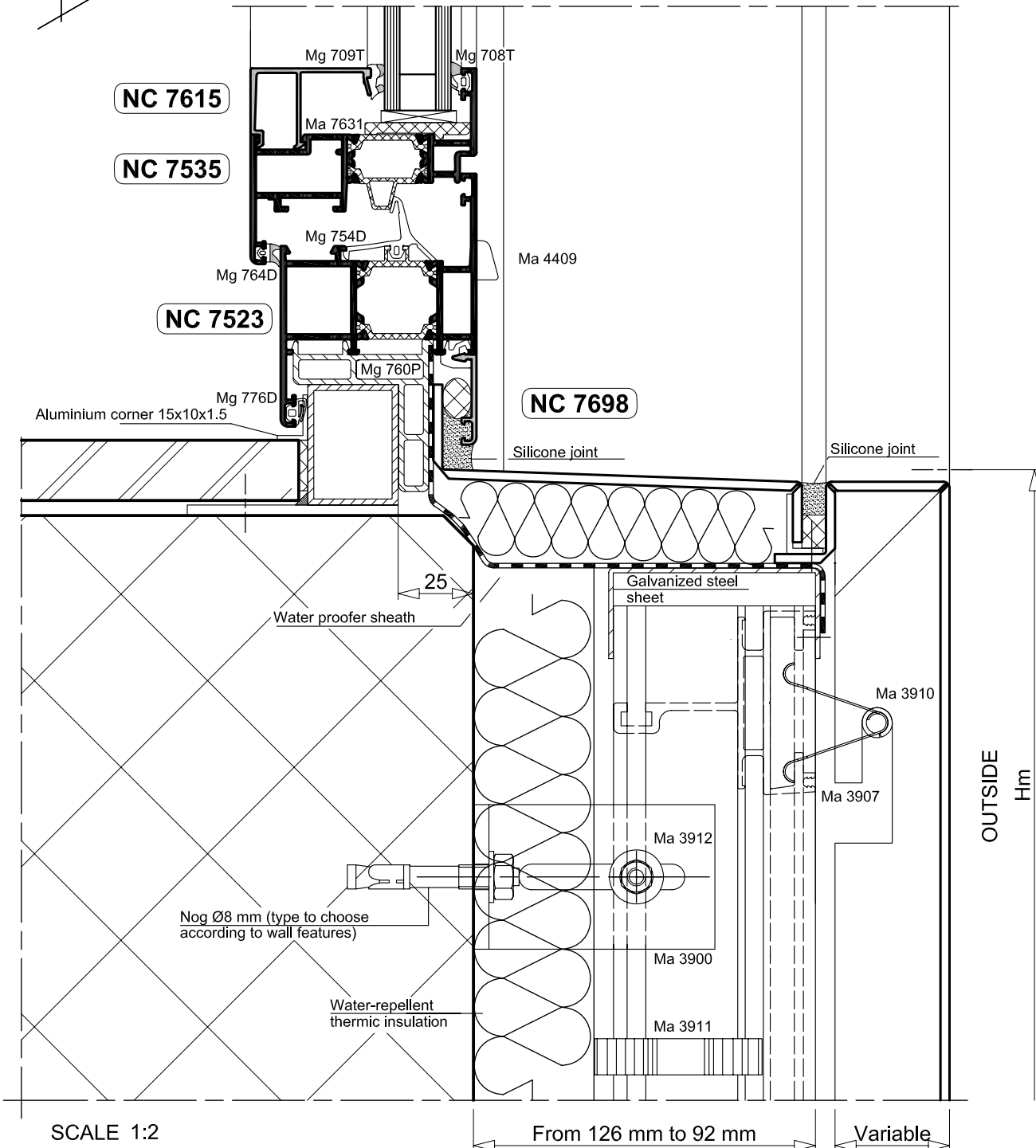
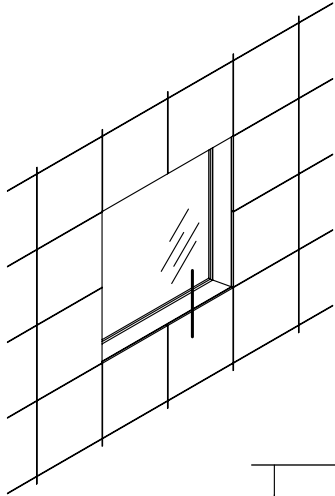


SCALE 1:2



SECTIONS

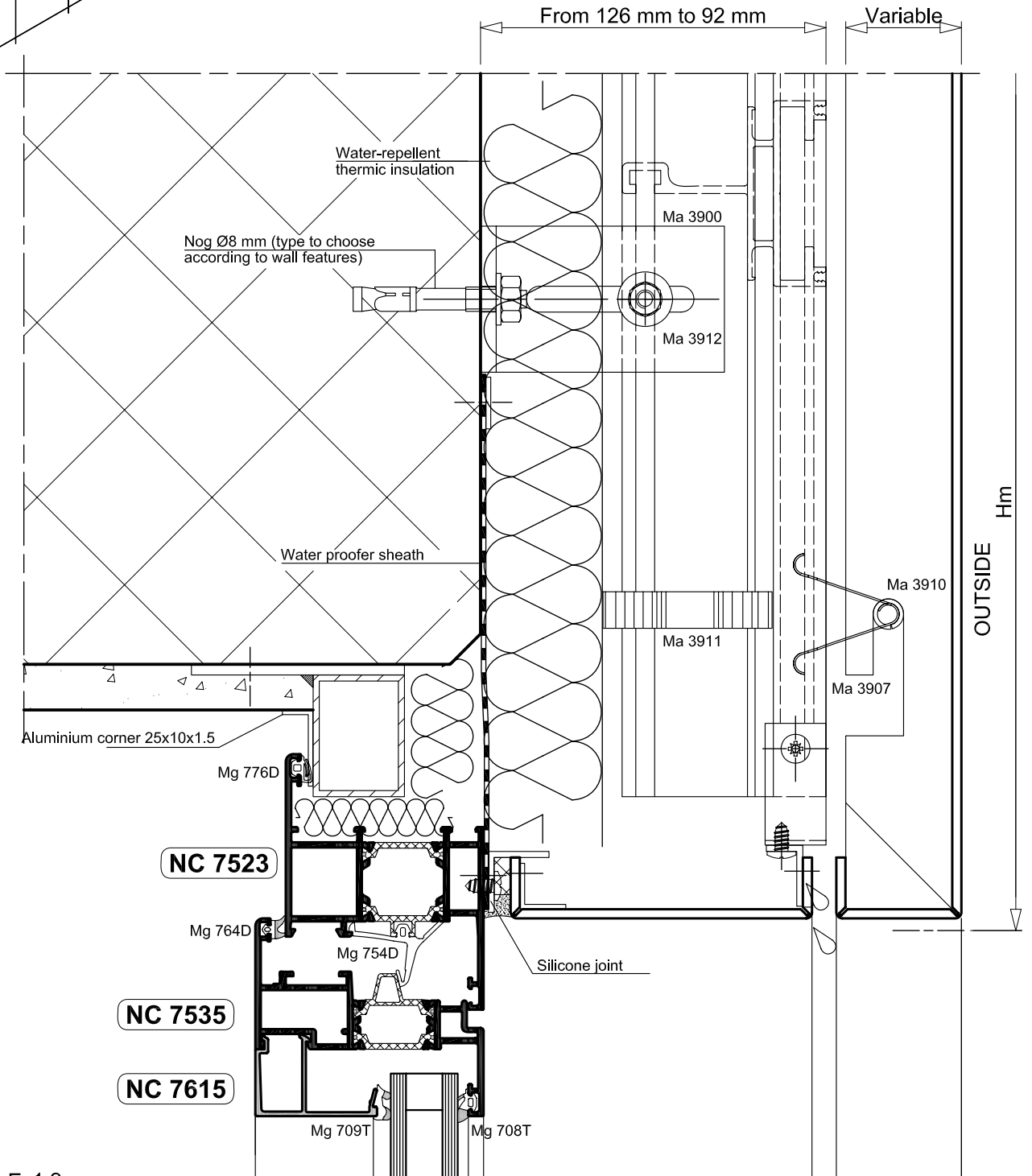
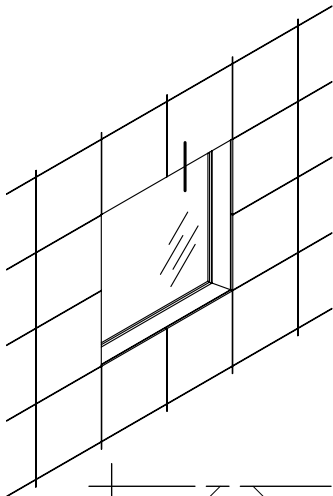
SCALE 1:2



SCALE 1:2

From 126 mm to 92 mm

Variable



SCALE 1:2

SECTIONS



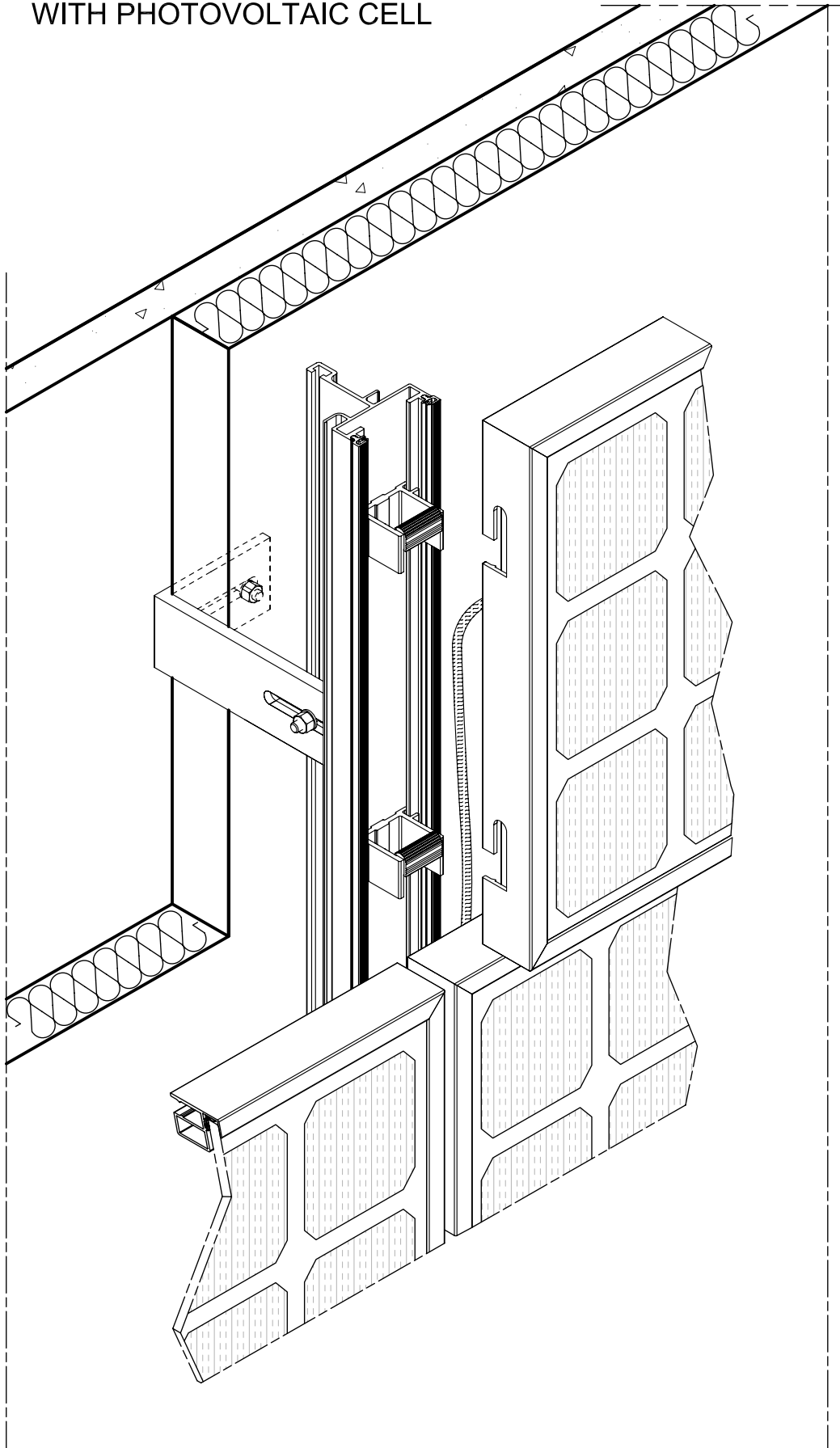
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# GLAZING

Group EV

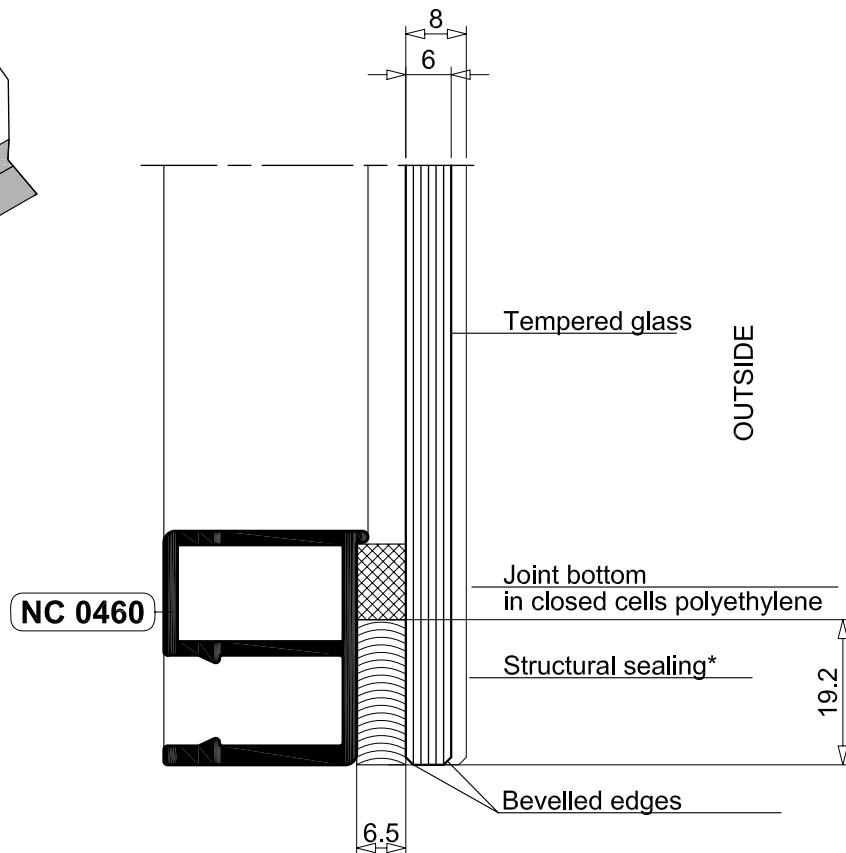
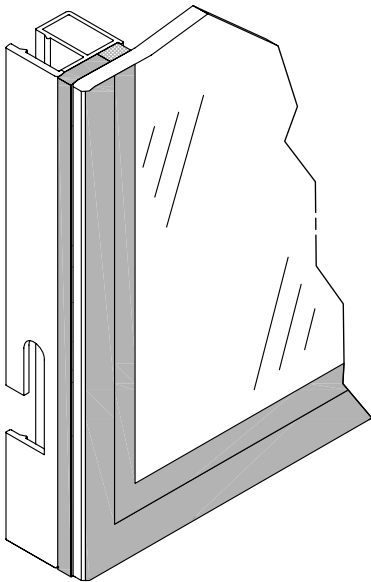
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FITTING OF THE EXTERNAL COVERING PANEL  
WITH PHOTOVOLTAIC CELL





## GLAZED MODULES WITH STRUCTURAL SEALING glass thickness from 6 mm to 8 mm - frame NC 0460



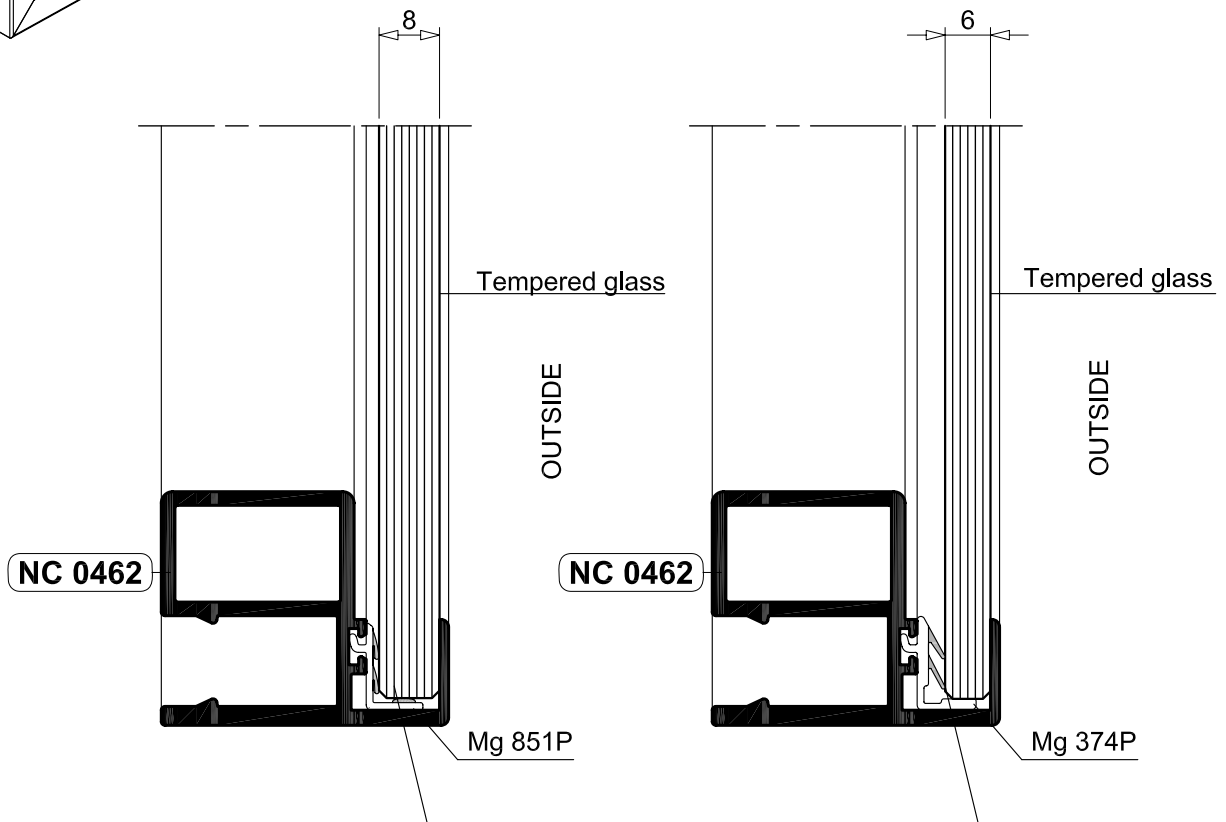
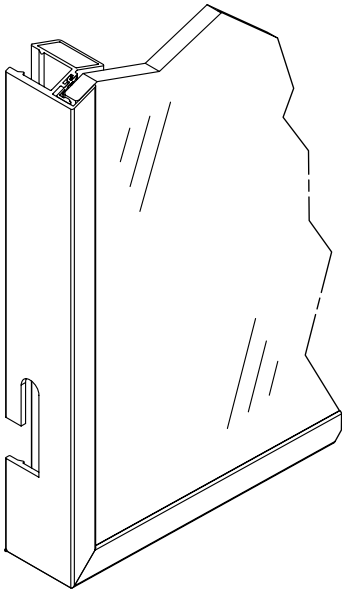
### \*Contour of the structural sealing and responsibilities

- The sealing of the structural contour is determined by the producer of the structural sealant and carried out only by authorized glassworks, according to the static load and the dimension of the modules.
- The glass fabricator shall ask for a written guarantee from the glasswork and the producer of the structural sealant.
- Drawings of glass sections shown on our catalogue have been agreed and approved by the structural sealant producer Dow Corning.
- To obtain the guarantee from the producers of structural sealant, glass fabricator and glasswork shall fill in the Project Check List, which shall be then send to the same producer, pointing out the location of the building site and the dimension (m<sup>2</sup>) of the sashes which can be inserted into the curtain wall.





## GLAZED MODULES WITH SEMISTRUCTURAL VENT glass thickness from 6 mm to 8 mm - frame NC 0462



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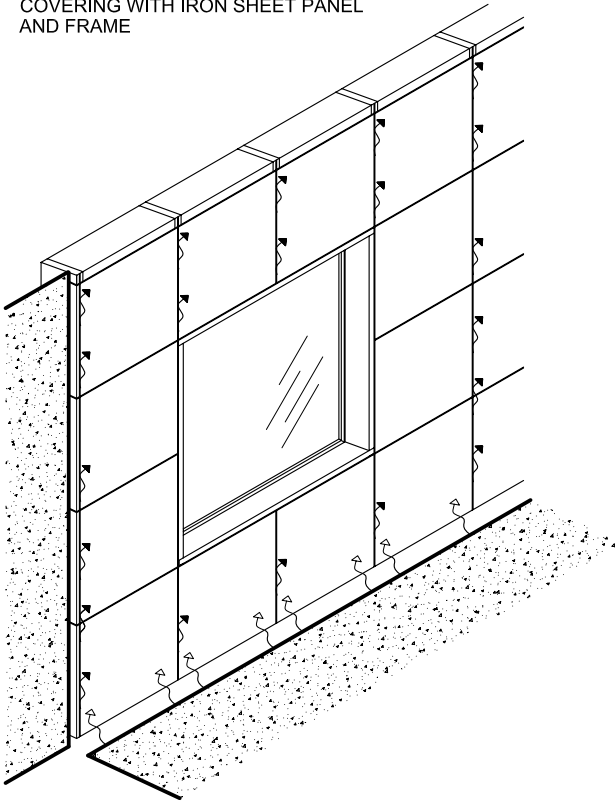
# MACHINING

Group E

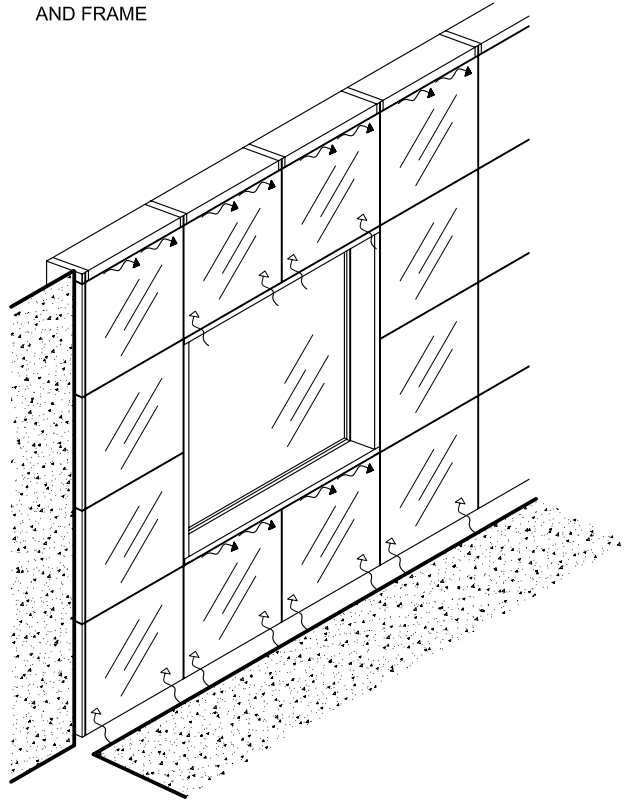
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## NATURAL VENTILATION DIAGRAMS OF VENTILATED WALLS ACCORDING TO THE TYPE OF FRAME AND TO THE EXTERNAL COVERING

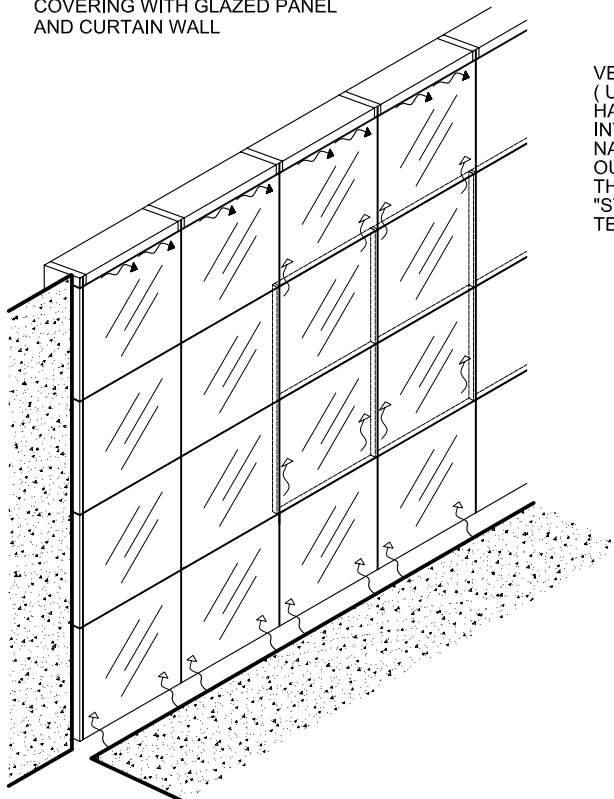
COVERING WITH IRON SHEET PANEL  
AND FRAME



COVERING WITH GLAZED PANEL  
AND FRAME



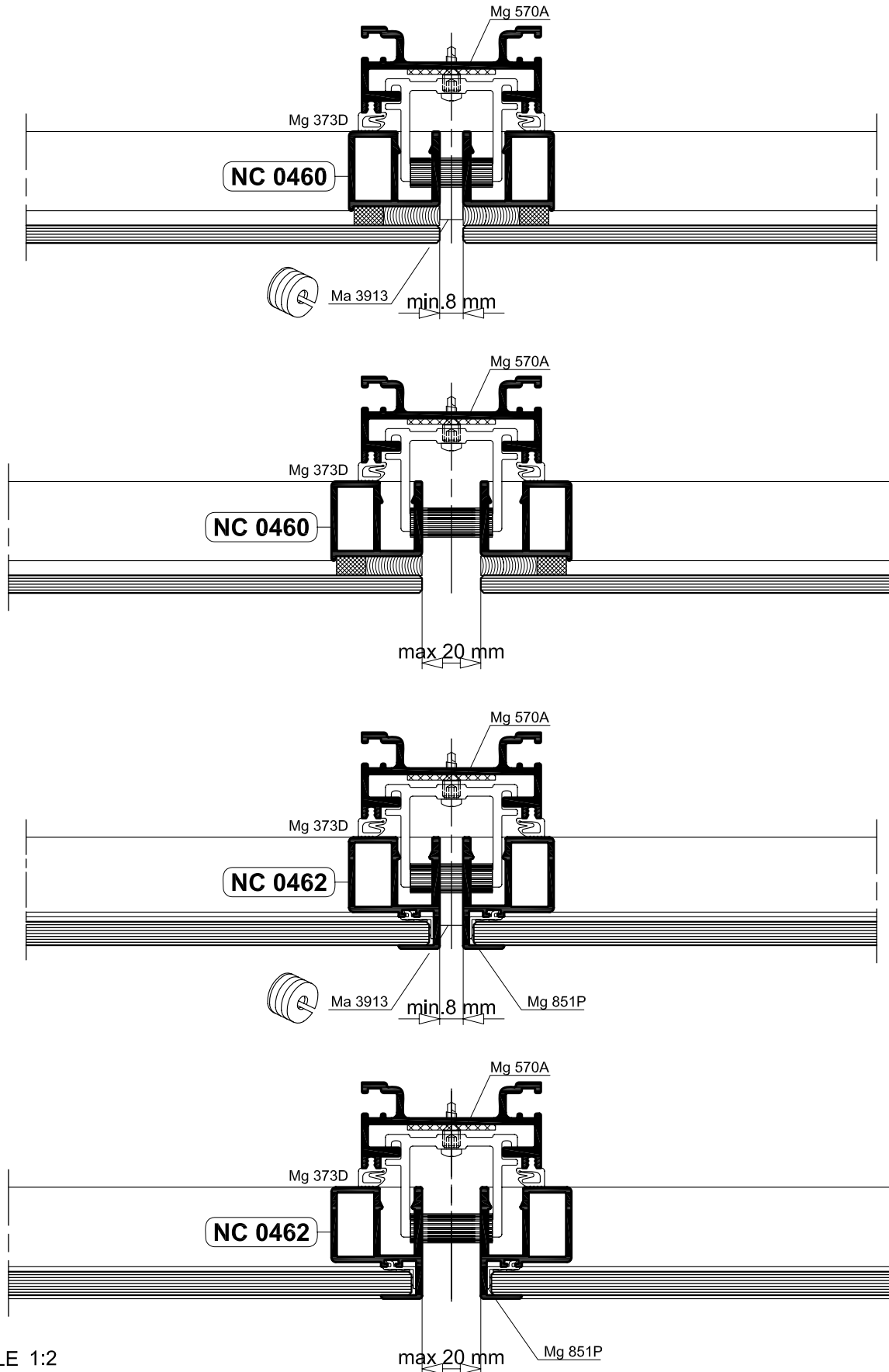
COVERING WITH GLAZED PANEL  
AND CURTAIN WALL



### VENTILATED WALL

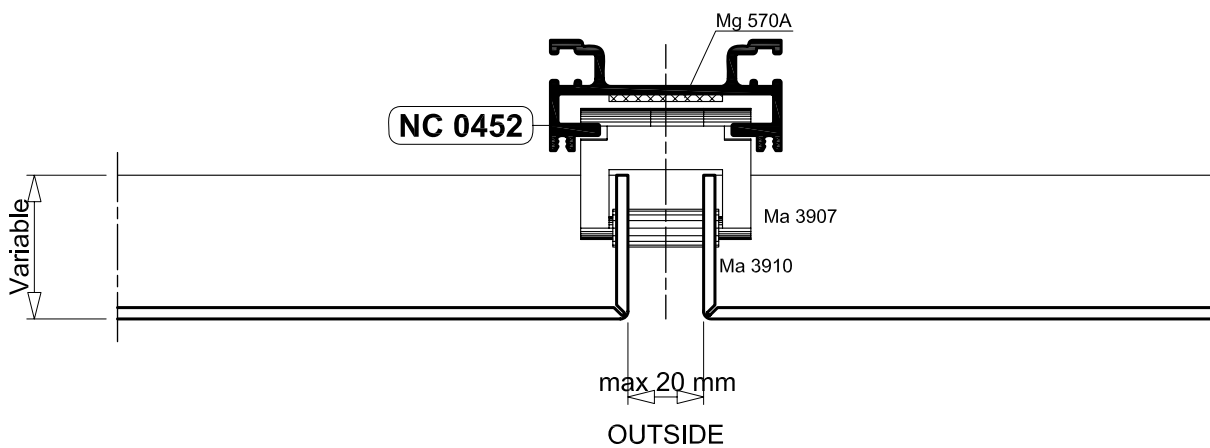
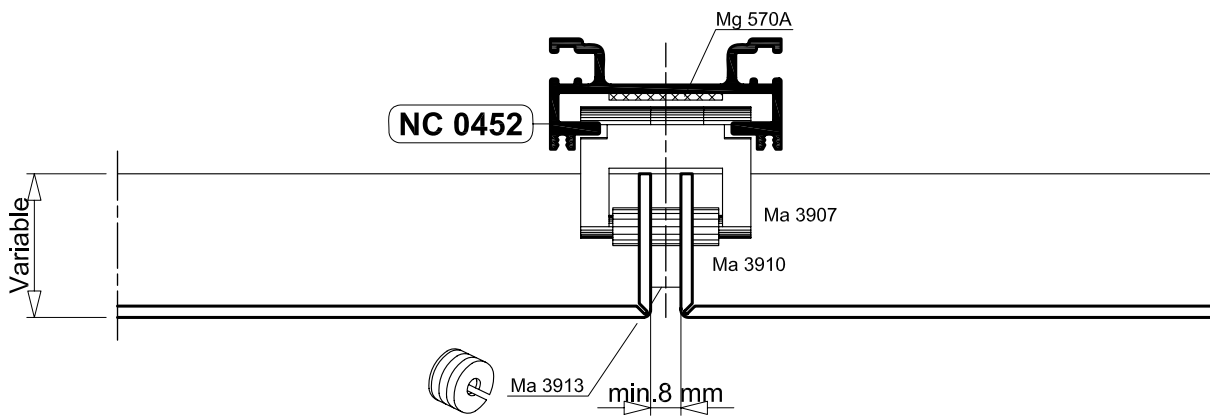
VENTILATED WALL PRESENTS A LAMINAR WIND FLOW ( UNIFORM AIR MOTION). THIS MEANS THAT AIR INSIDE HALLOW SPACE SHAN'T COME IN CONTACT WITH THE INTERNAL ENVIRONMENT.  
NATURAL VENTILATION SHALL OCCOUR ONLY FROM THE OUTSIDE.  
THIS CAN BE REALIZED THANKS TO THE SO CALLED "STACK EFFECT": WARM AIR, LIGHTER THAN COLD AIR, TENDS TO RISE.

## CHART FOR AVAILABLE GROOVE SOLUTIONS BETWEEN GLAZED PANELS from 8 mm ( with spacer Ma 3913) to 20 mm



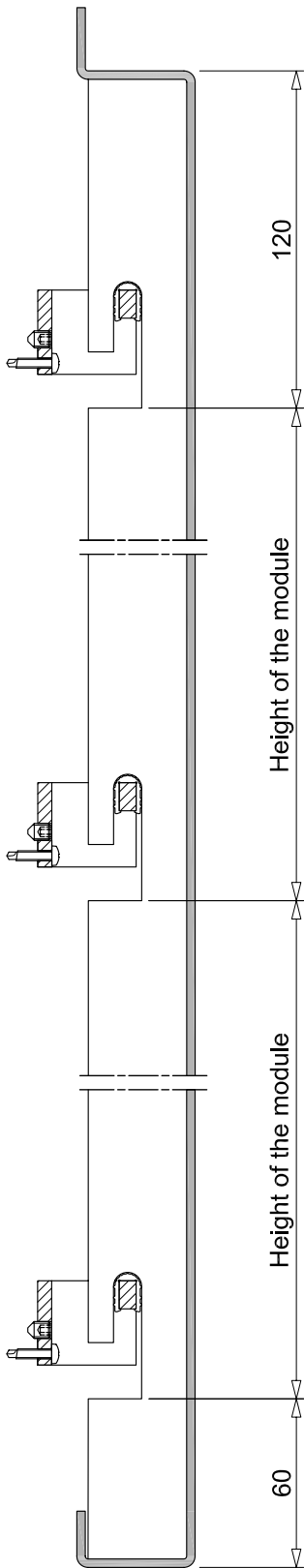
MACHINING

## CHART OF AVAILABLE GROOVE SOLUTIONS BETWEEN PANELS from 8 mm ( with spacer Ma 3913) to 20 mm

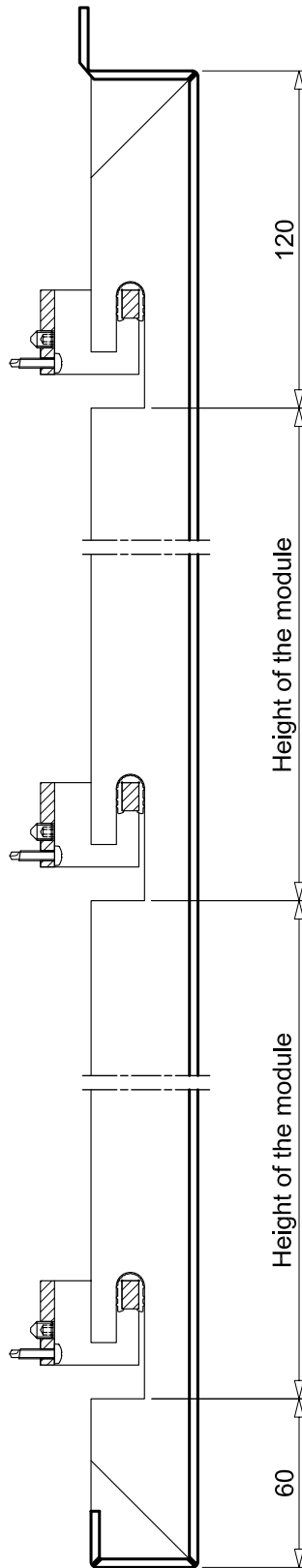


SCALE 1:2

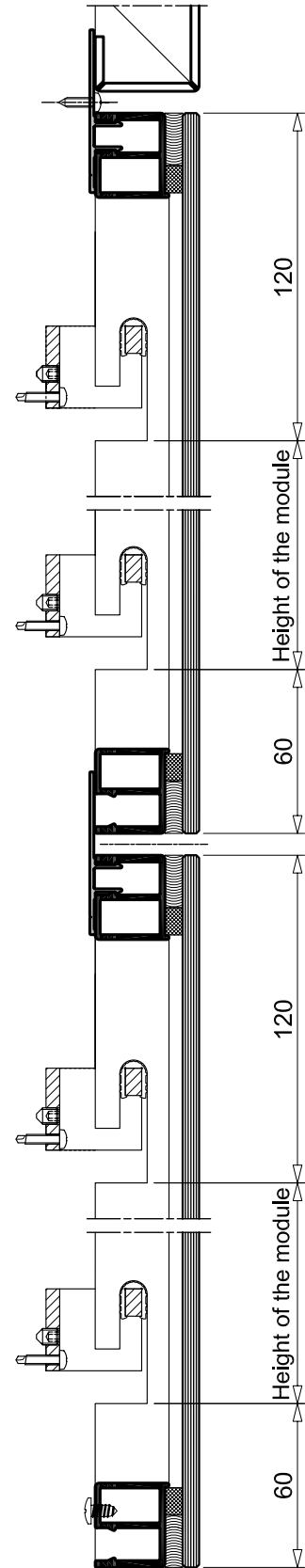
## FIXING OF THE PANELS



Aluminium sheet panel



Composite (Alucobond) panel



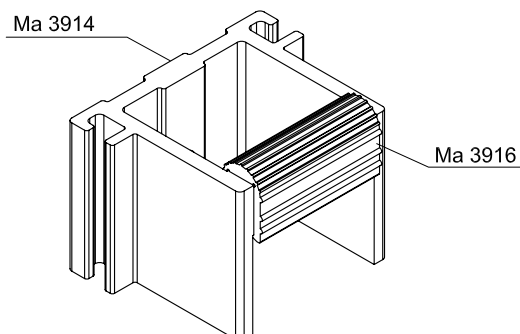
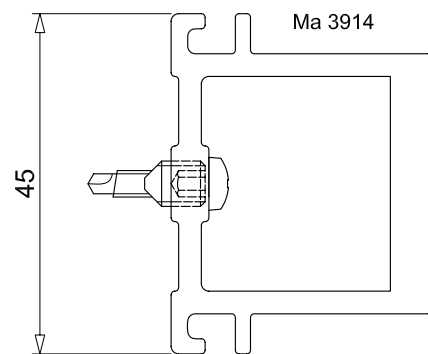
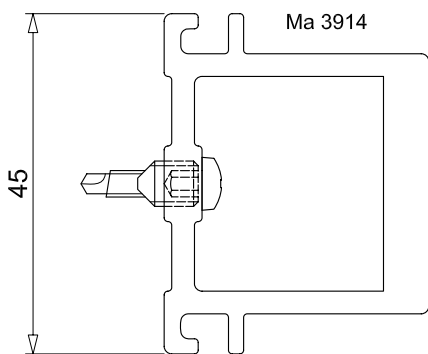
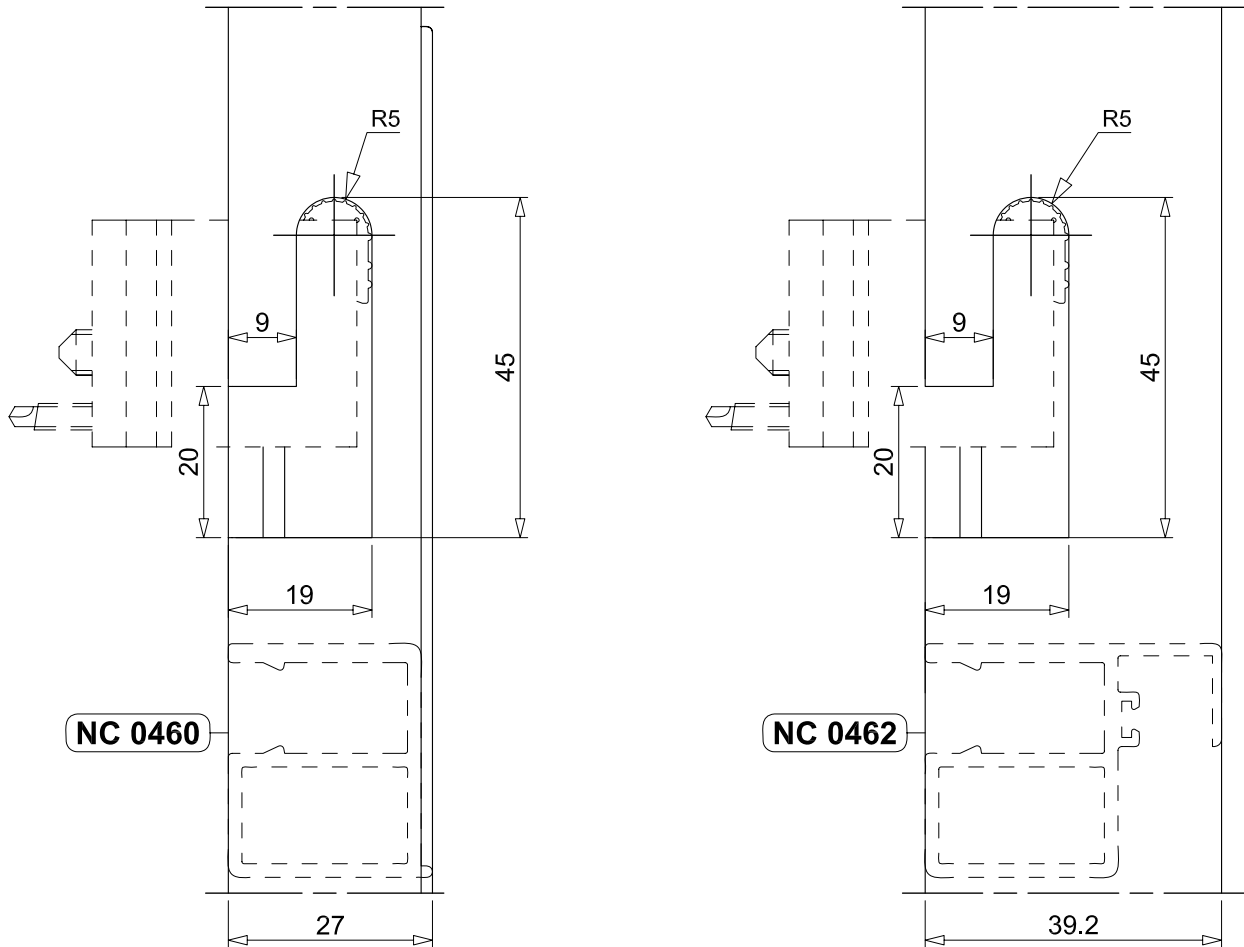
Panel with aluminium frame and structural glazing

N.B.

The above scheme for the fixing of panels must be considered as indicative. The number of fixing points is subject to the dimensions of the panel and to the kinetic load of the wind.

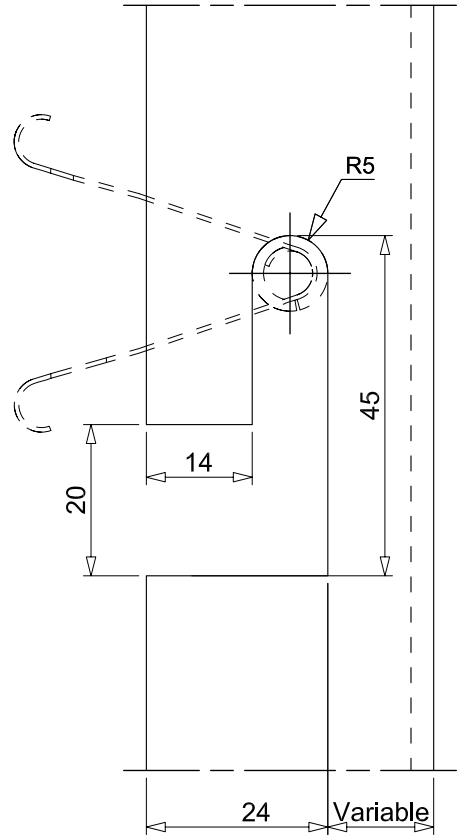
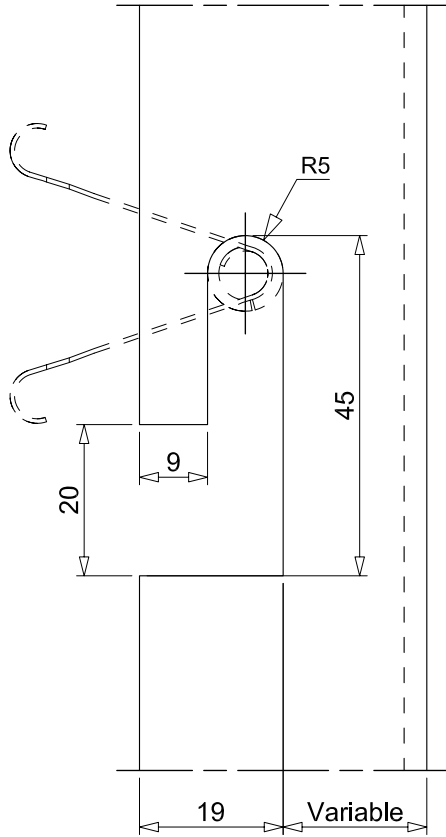
scale 1:3

CREATION OF SLOTS IN THE FRAMES WITH EXTERNAL GLAZING  
FOR THE ACCESSORIES MA 3914 AND MA 3916



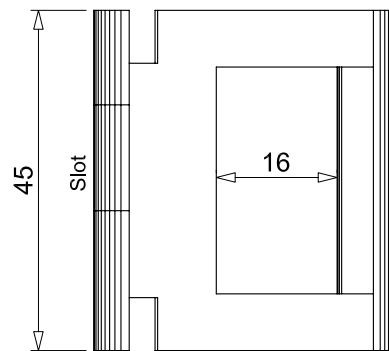
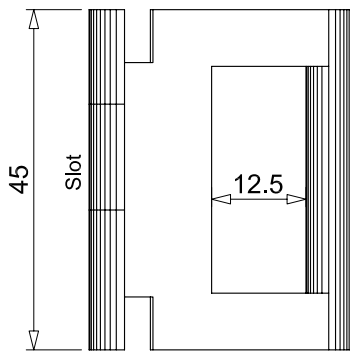


## CREATION OF SLOTS IN THE EXTERNAL PANELS FOR THE SPRINGS MA 3907 AND MA 3908



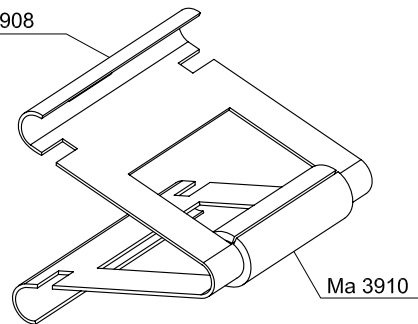
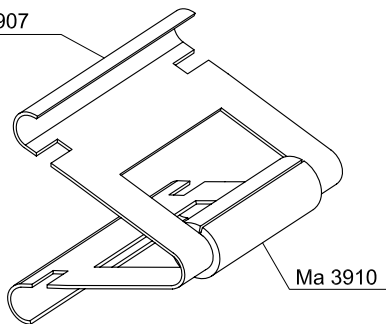
Spring Ma 3907

Spring Ma 3908



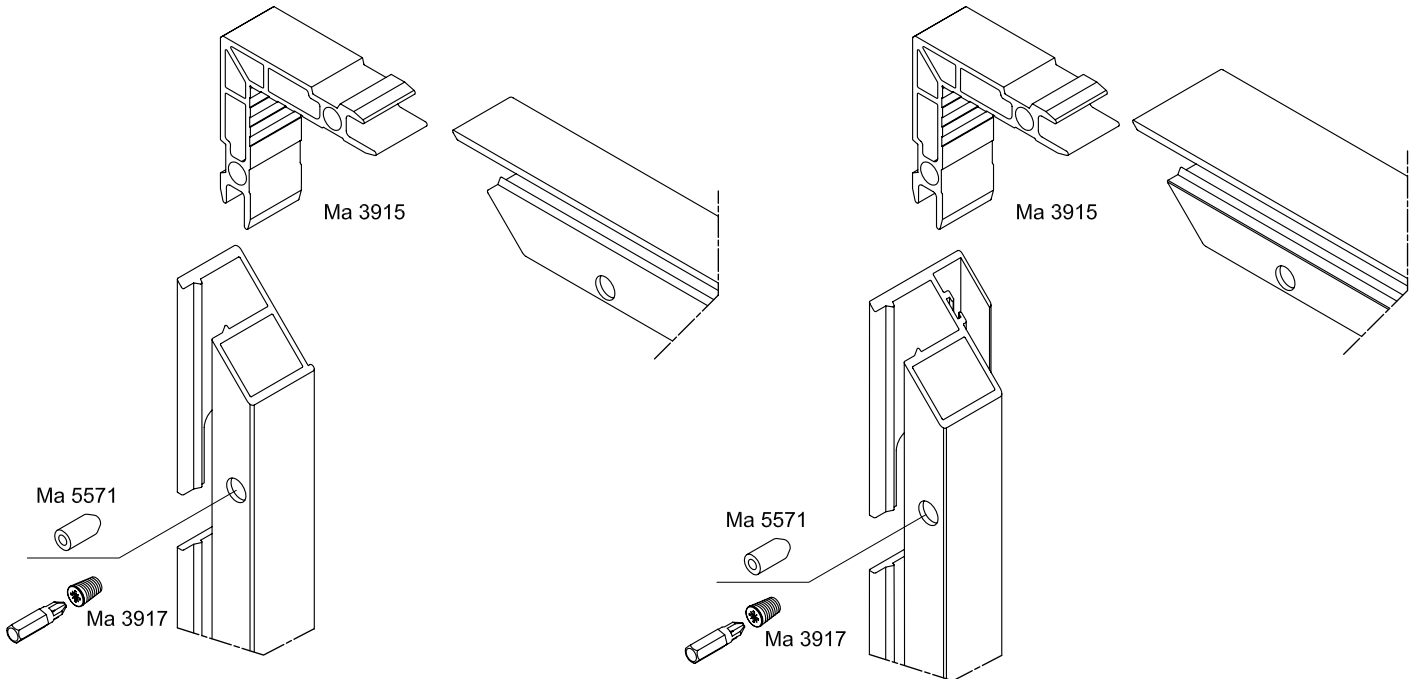
Ma 3907

Ma 3908





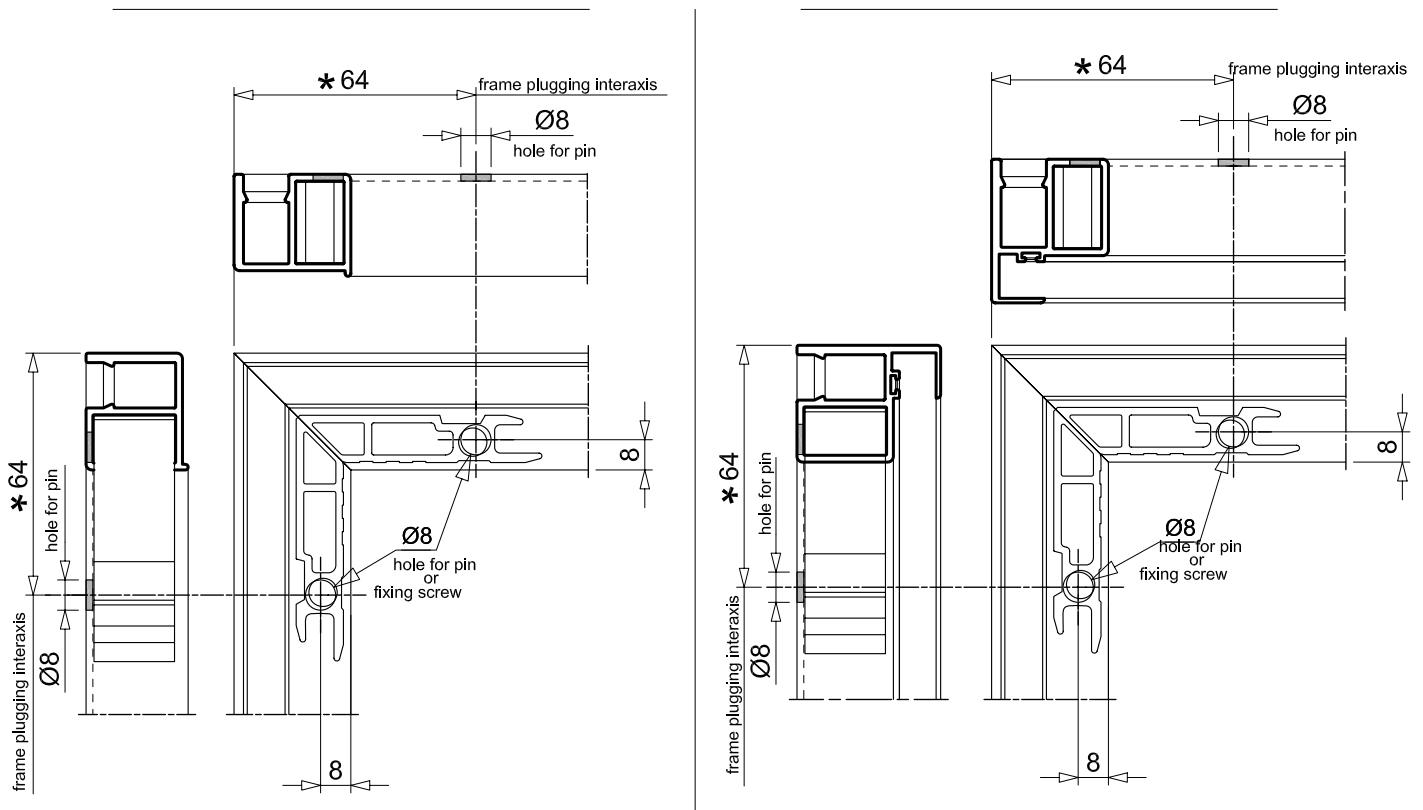
## CORNER CLEAT FIXING FOR ASSEMBLY OF CORNERS



Machining suitable for the following frames:  
NC 0460 - NC 0462



For tightening the screws Ma 3917 use the cross-insert POZIDRIV n°2



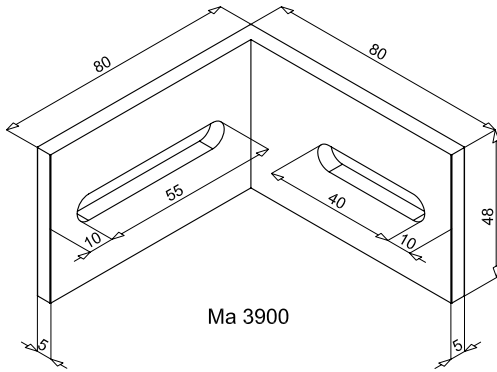
\* THEORETICAL DIMENSION, TO BE VERIFIED DURING ASSEMBLY



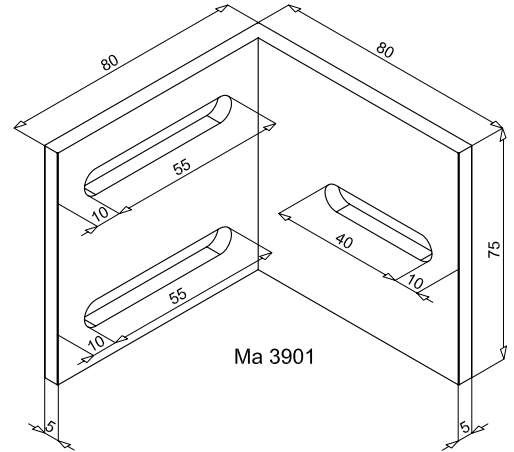
## BRACKETS

a) Brackets for anchorage to the mullions

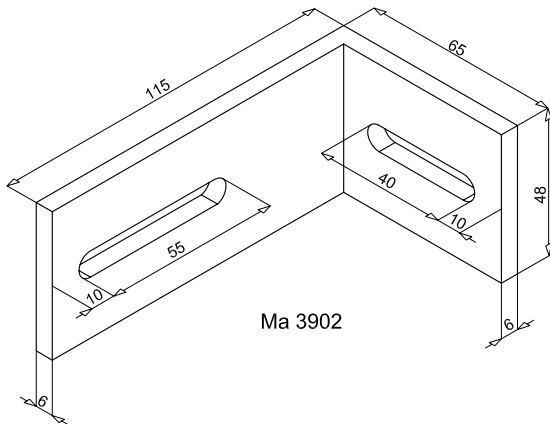
b) Brackets for anchorage to the mullions for the dilatation joint



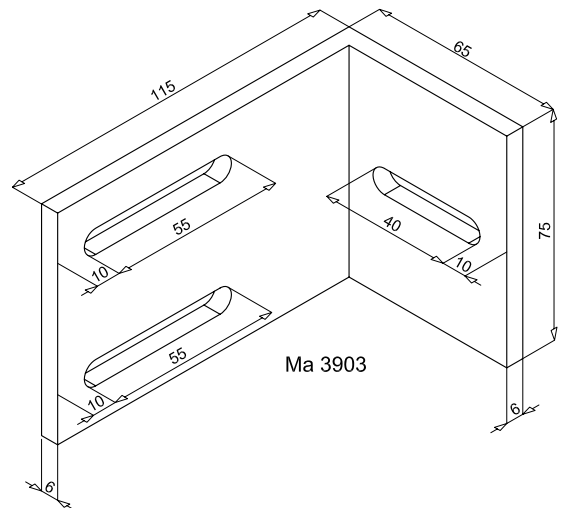
Ma 3900



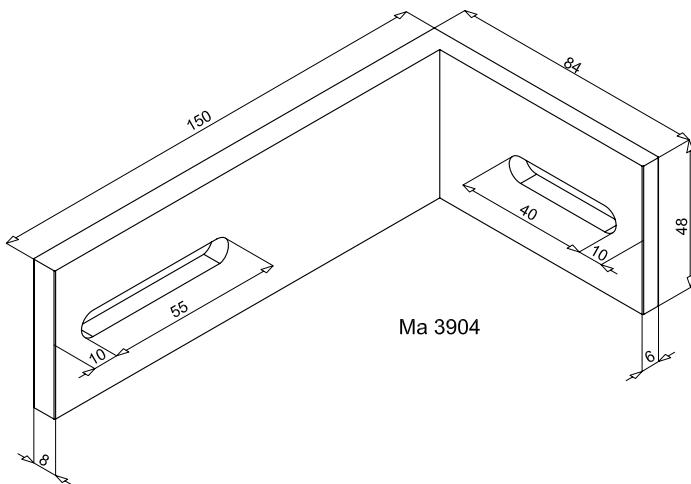
Ma 3901



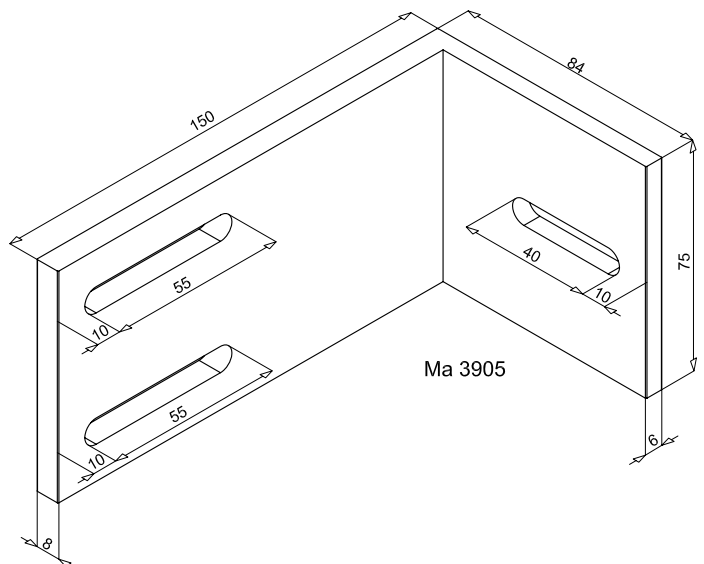
Ma 3902



Ma 3903

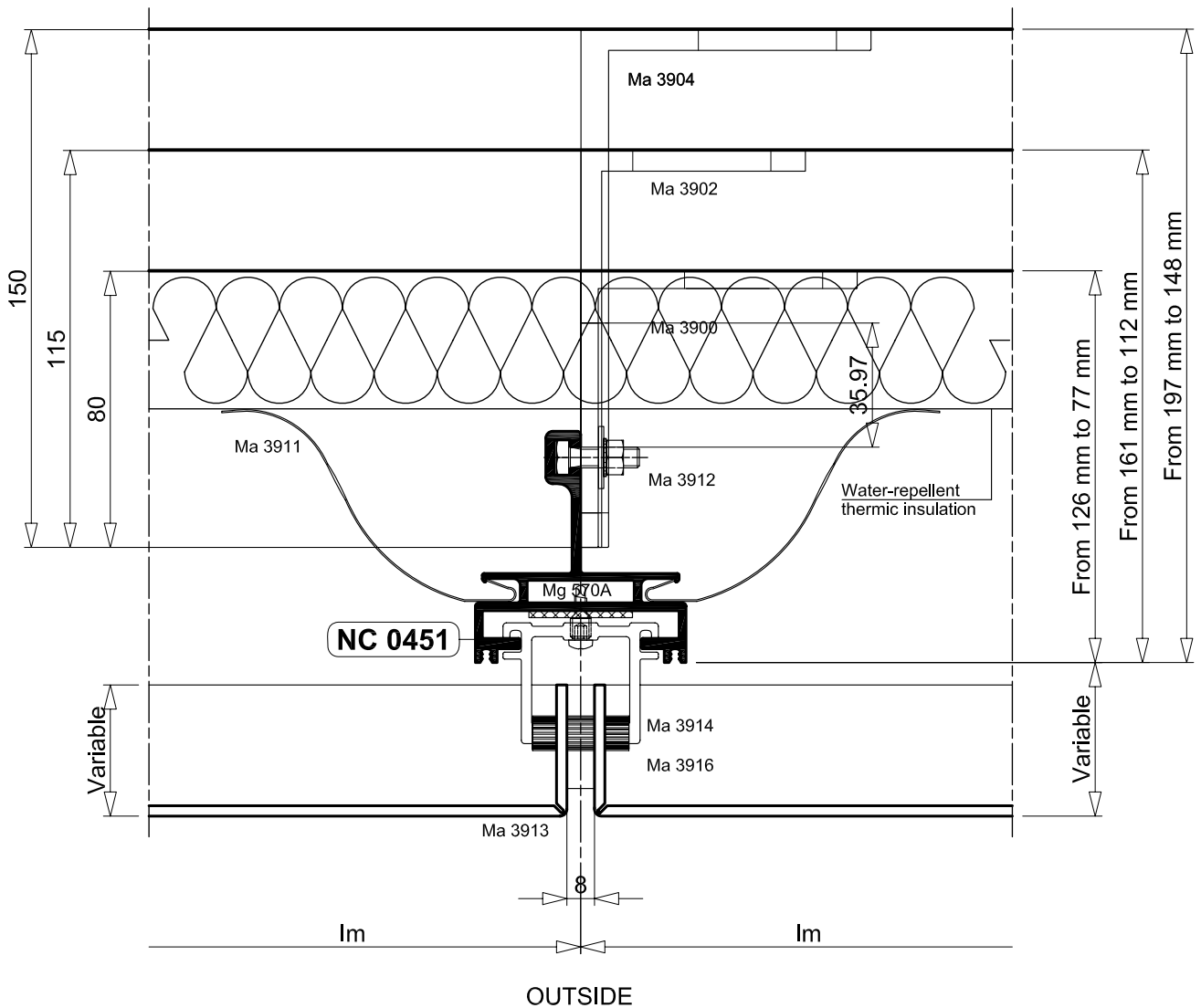
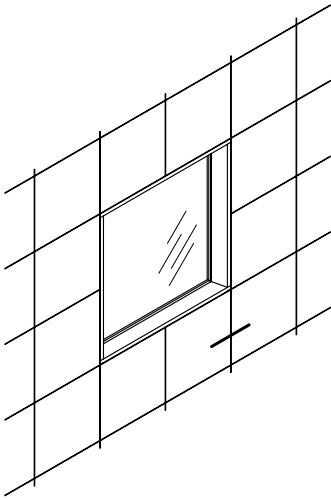


Ma 3904



Ma 3905

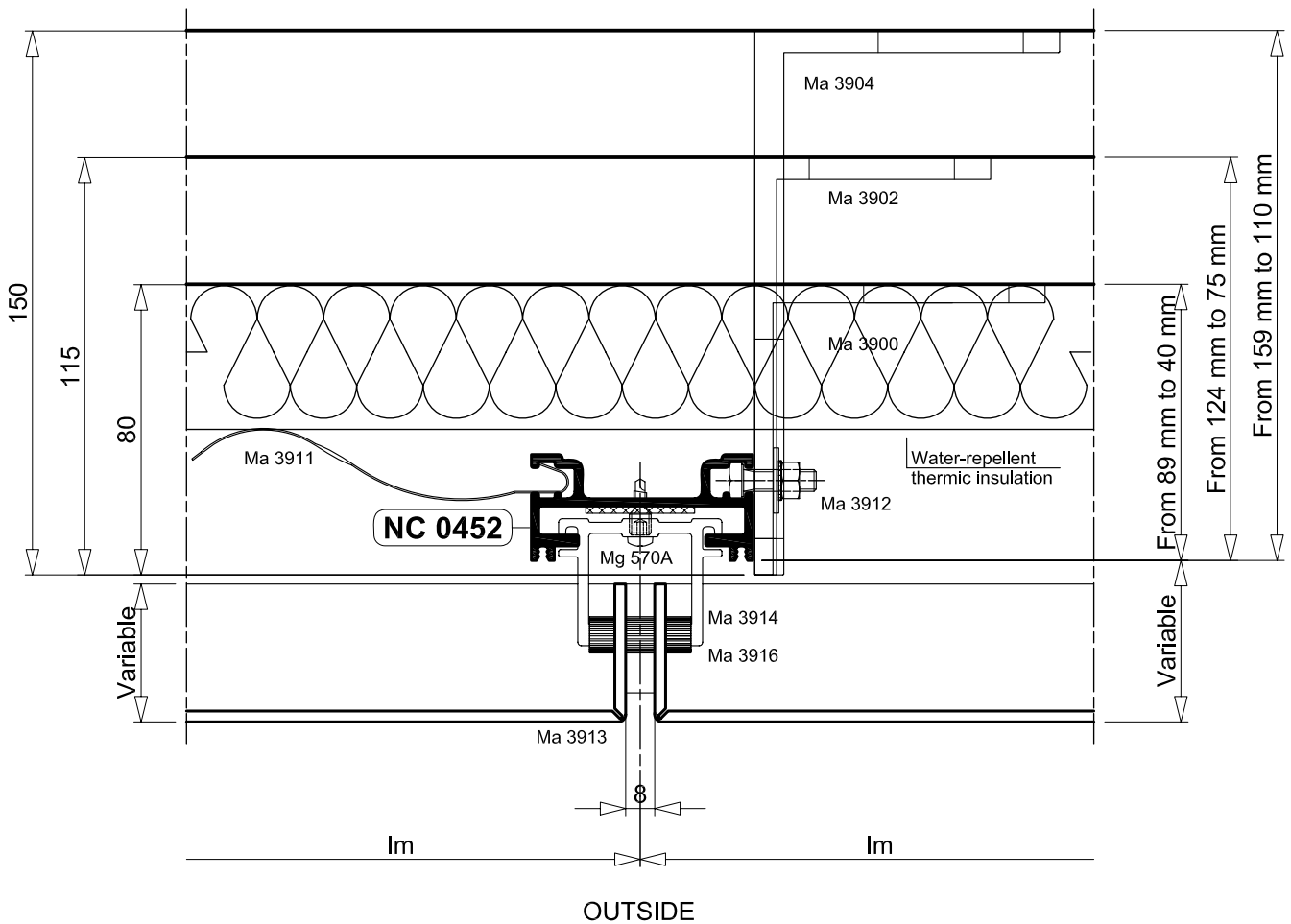
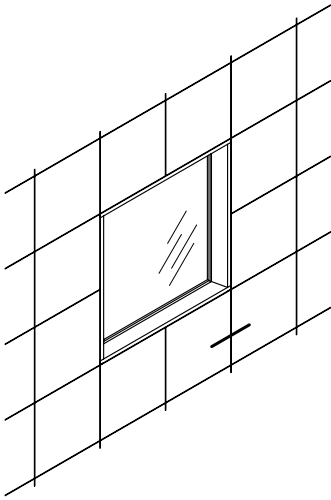
## CHART FOR VENTILATED WALL DEPTH VALUES with brackets Ma 3900 Ma 3902 Ma 3904 and profile Nc 0451



SCALE 1:2



## CHART FOR VENTILATED WALL DEPTH VALUES with brackets Ma 3900 Ma 3902 Ma 3904 and profile Nc 0452



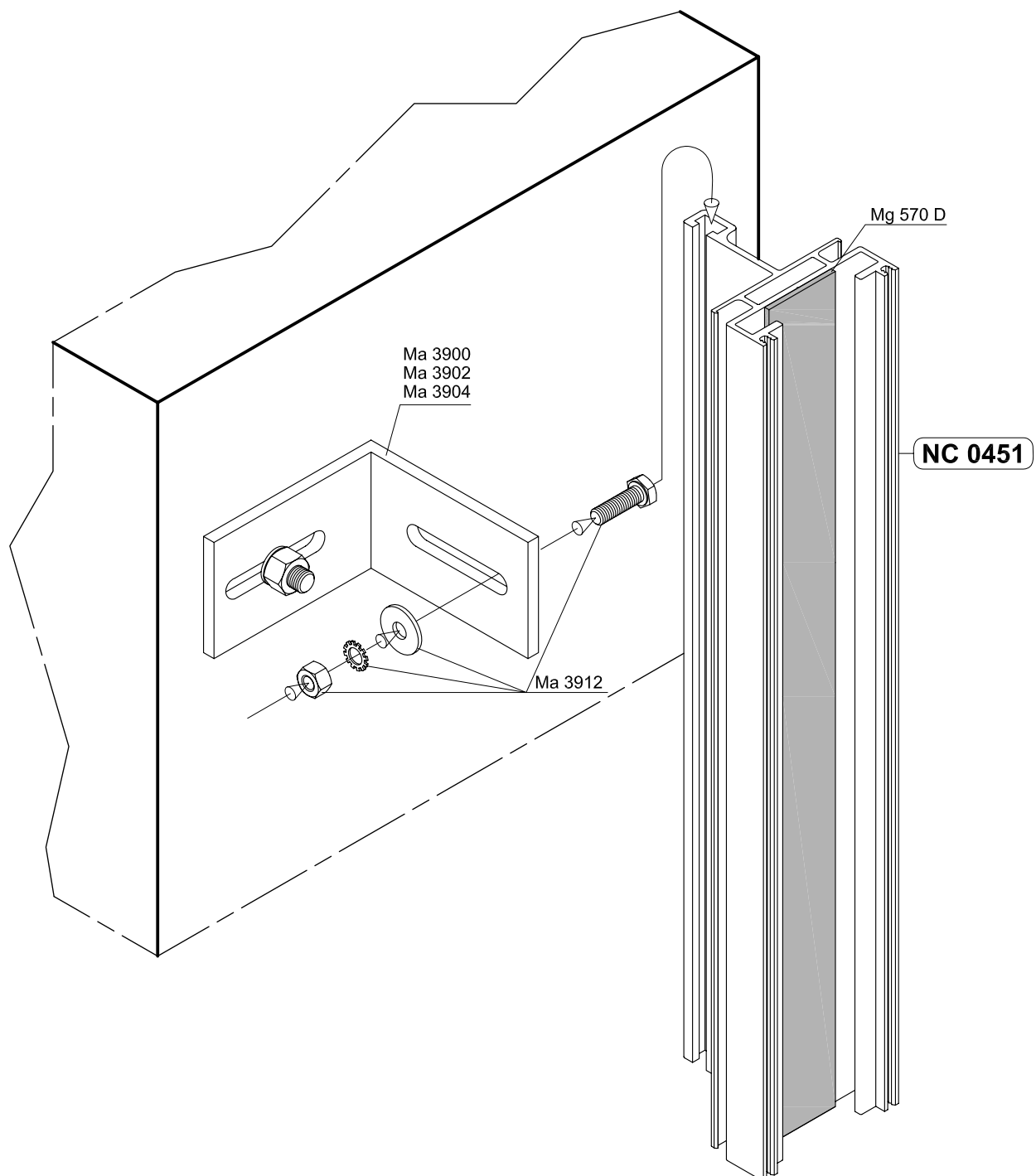
MACHINING

SCALE 1:2

## INSTALLATION OF WALL BRACKETS

Ma 3900 - Ma 3902 - Ma 3904

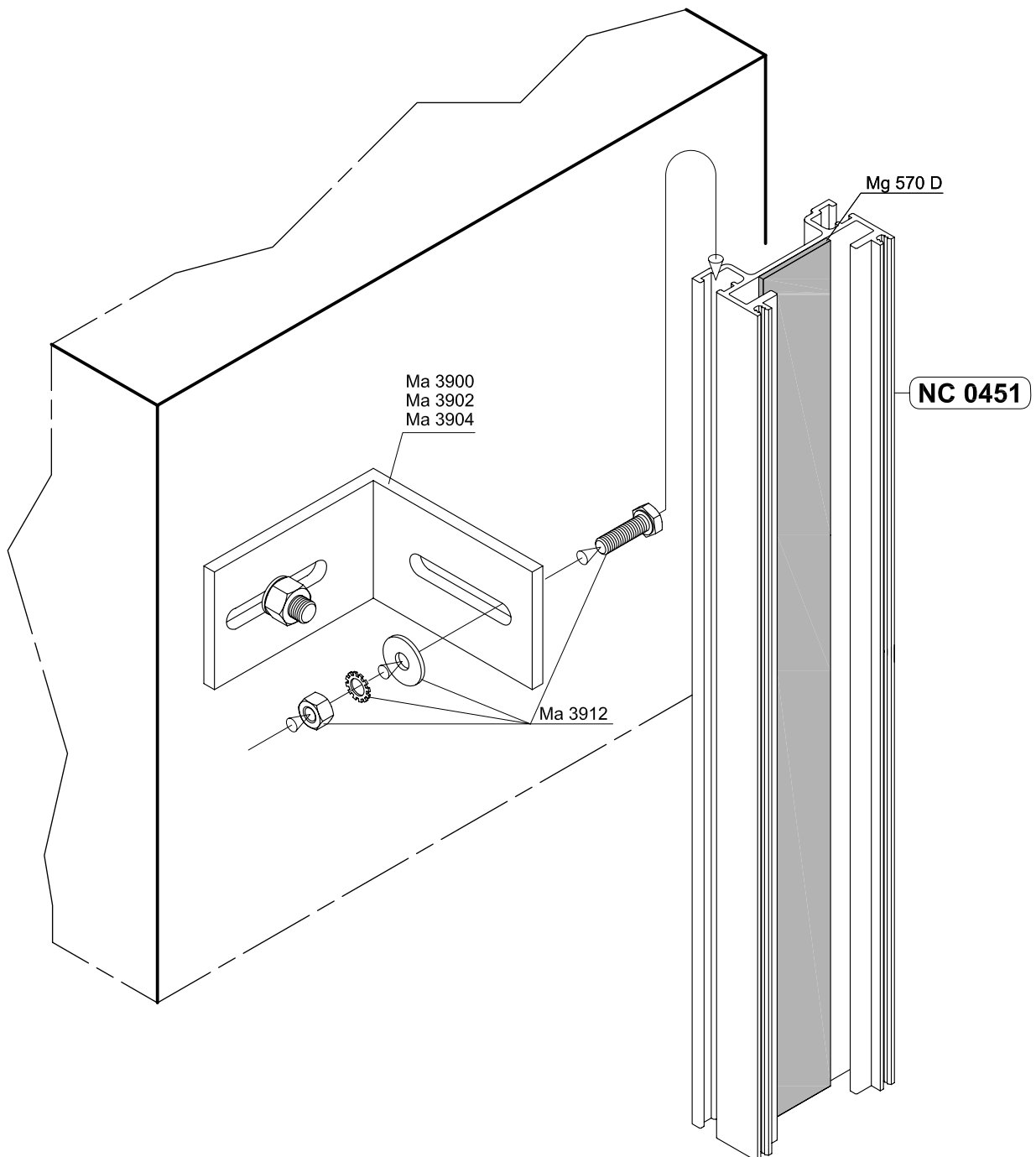
- Insert screws Ma 3912 into their proper slots and place them near their respective brackets.
- Fix the mullion to the support bracket, keeping the perpendicularity according to the prefixed jutting-out



## INSTALLATION OF WALL BRACKETS

Ma 3900 - Ma 3902 - Ma 3904

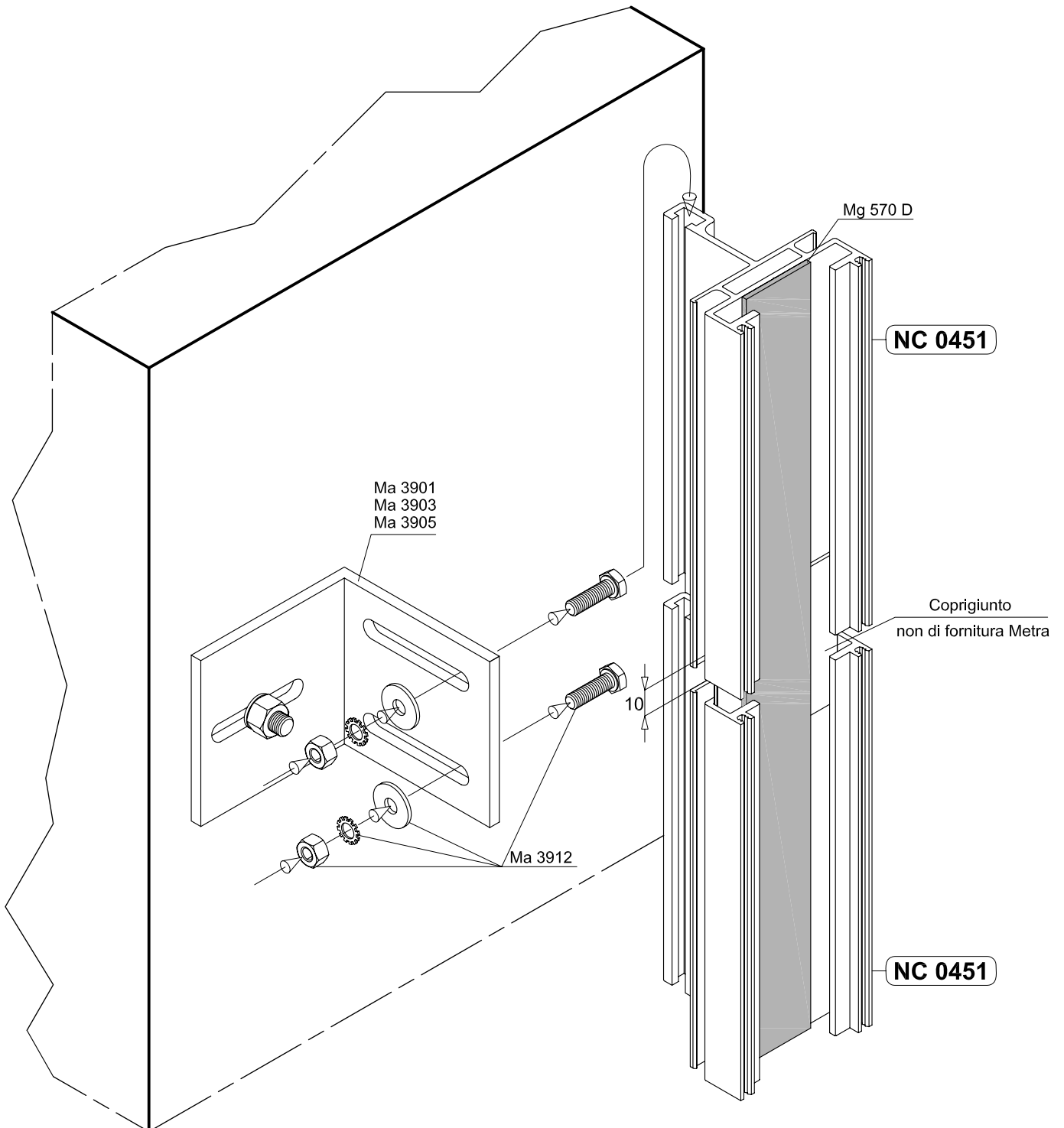
- Insert screws Ma 3912 into their proper slots and place them near their respective brackets.
- Fix the mullion to the support bracket, keeping the perpendicularity according to the prefixed jutting-out



## INSTALLATION OF WALL BRACKETS WITH DOUBLE SLOT

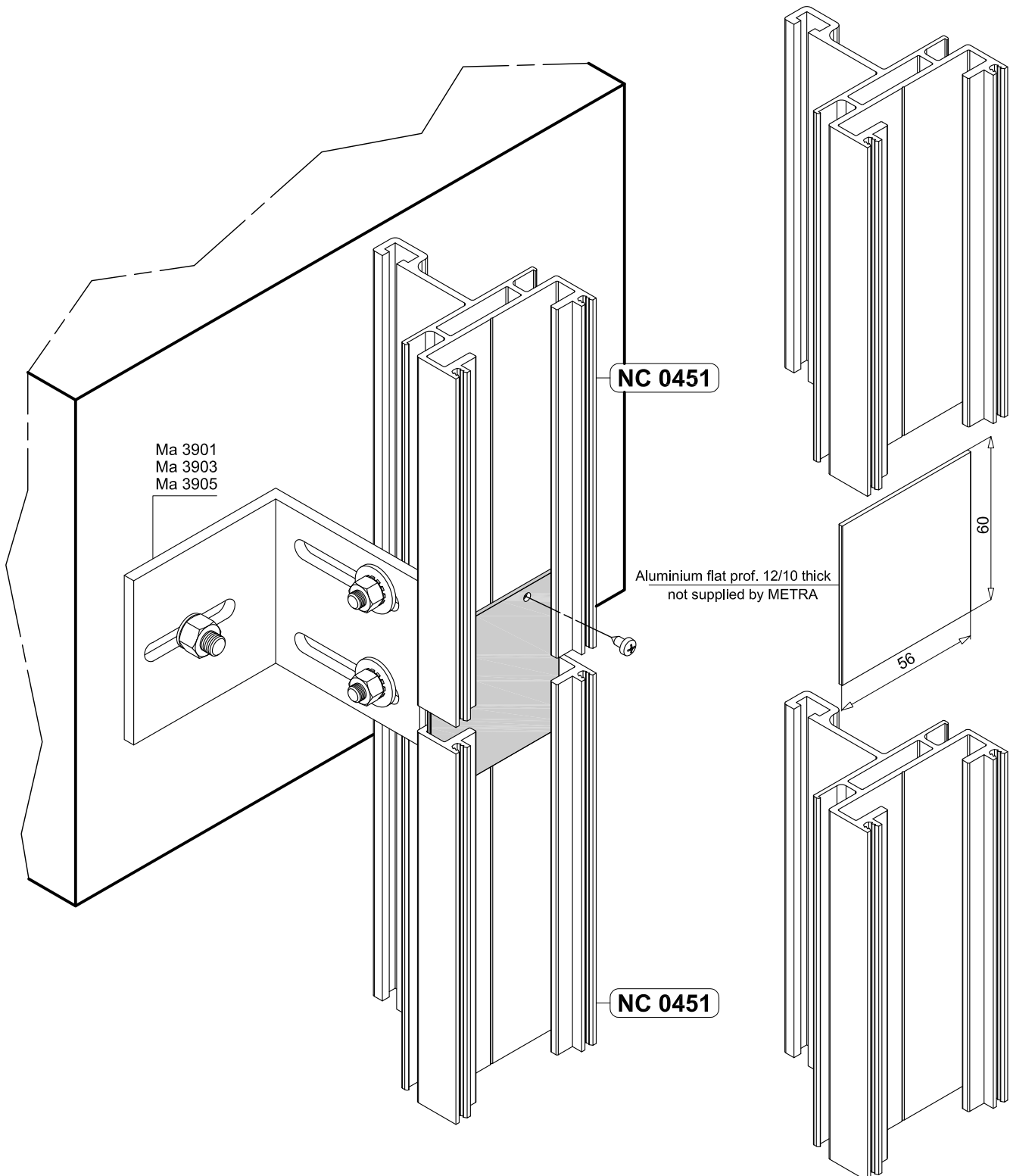
Ma 3901 - Ma 3903 - Ma 3905

- Fix wall brackets with the double slot near the mullions joint
- Insert screws Ma 3912 into their proper slots and place them near their respective brackets.
- Fix the mullion to the support bracket, keeping the perpendicularity according to the prefixed jutting-out



## FITTING OF JOINT-COVERS BETWEEN MULLIONS

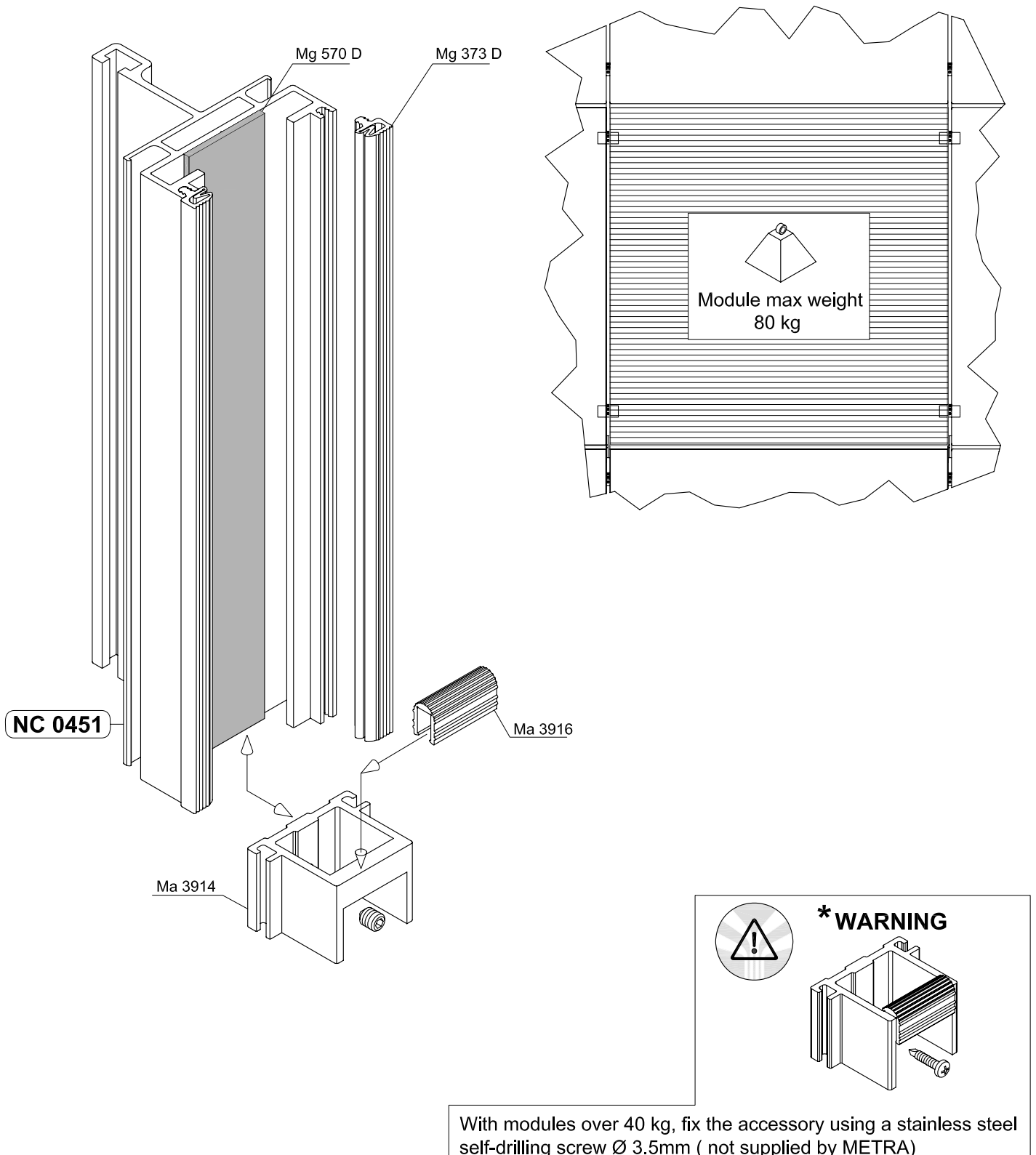
- Insert the aluminium flat profile 12/10 (not supplied by METRA) next to the dilatation joint of the mullions
- Fix the above by screws (not supplied by METRA) onto the upper mullion.





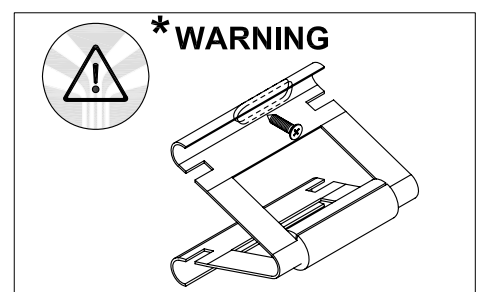
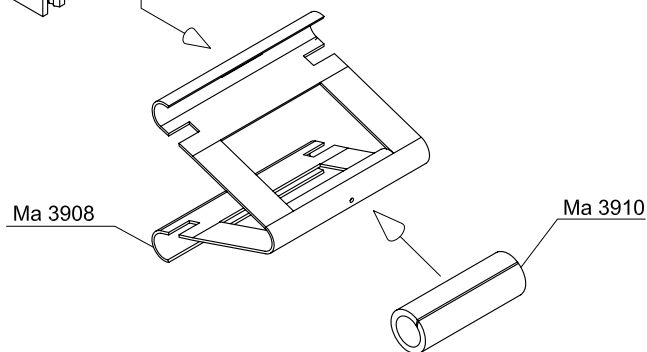
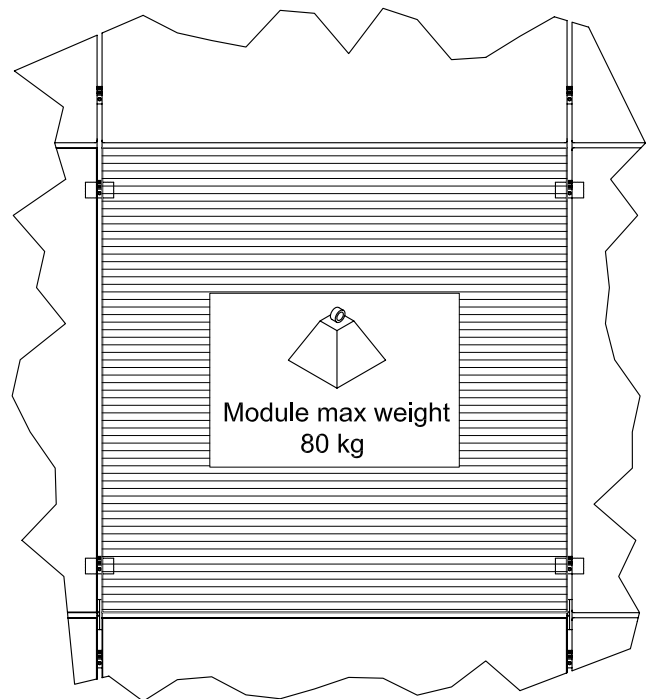
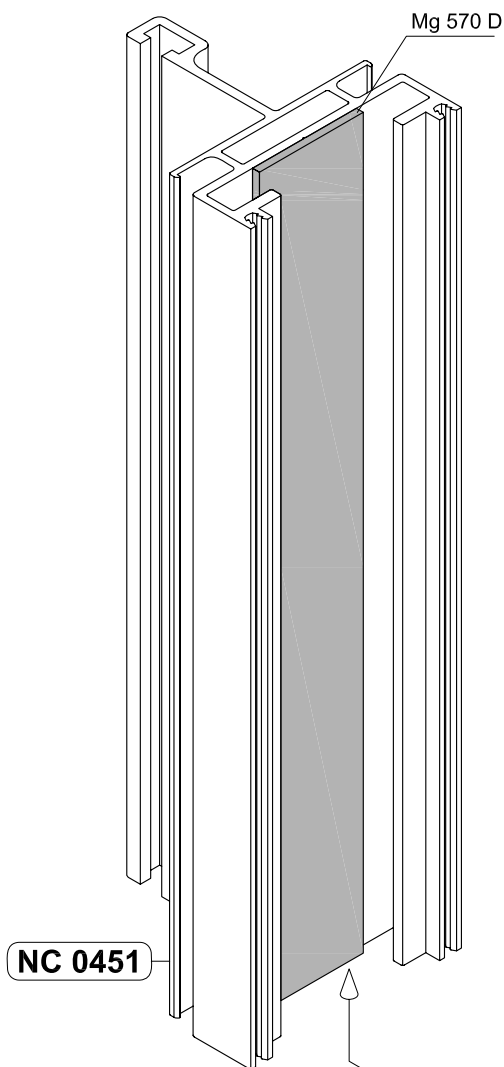
## INSTALLATION BY INSERTION OF ACCESSORY MA 3914 AND MA 3916

- Insert accessory Ma 3914 for panel support into the mullion before fixing the mullion on the brackets.
- Insert on each accessory Ma 3914 the vibration damper Ma 3916



## INSTALLATION BY INSERTION OF SPRINGS MA 3907 AND MA 3908

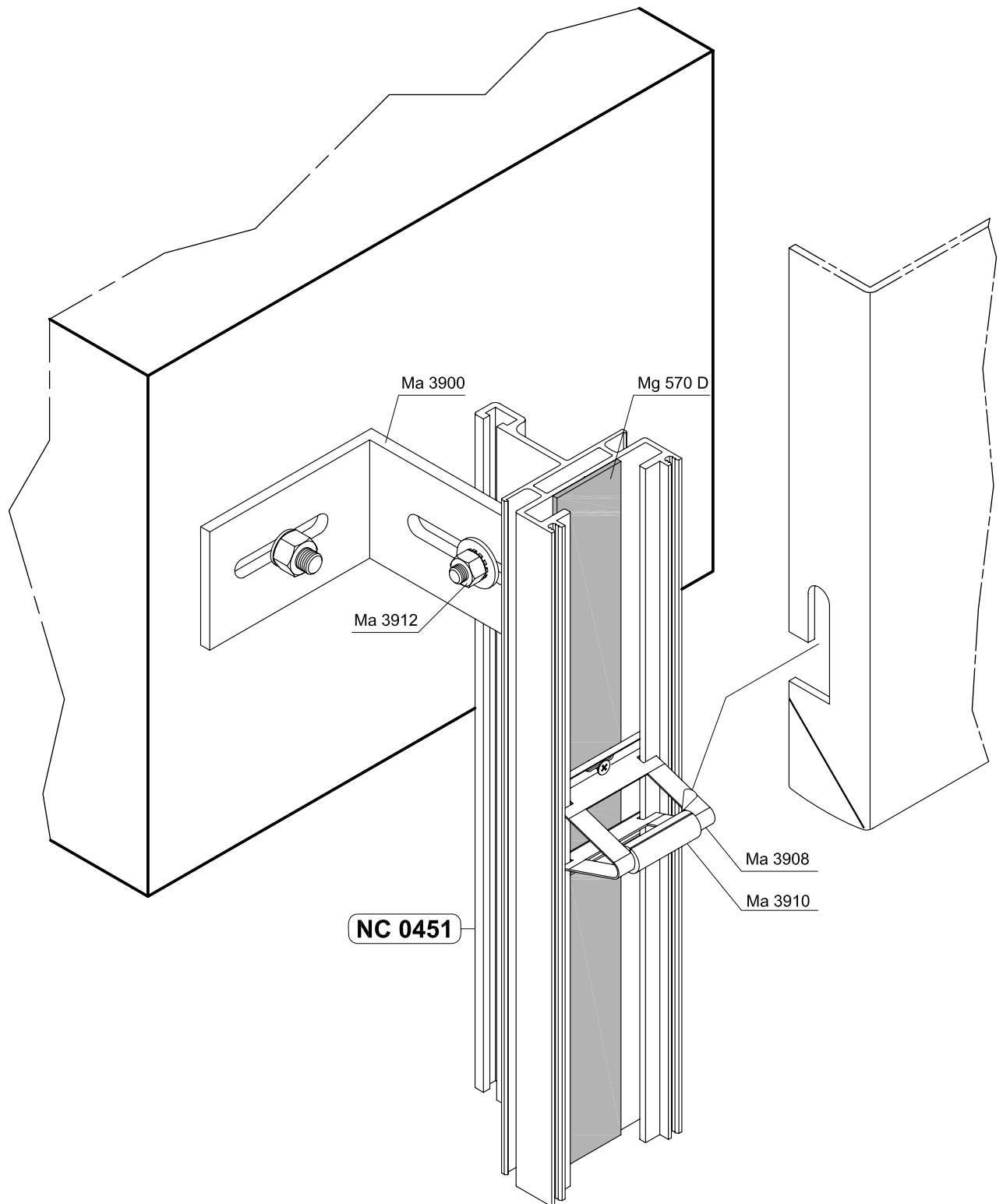
- a) Insert springs for panel support into the mullion before fixing the mullion on the brackets.
- b) Insert on each spring the vibration-damping coupling



On painted or anodised frames, fix spring using a stainless steel self-drilling screw diam. 4.2 mm ( not supplied by METRA)

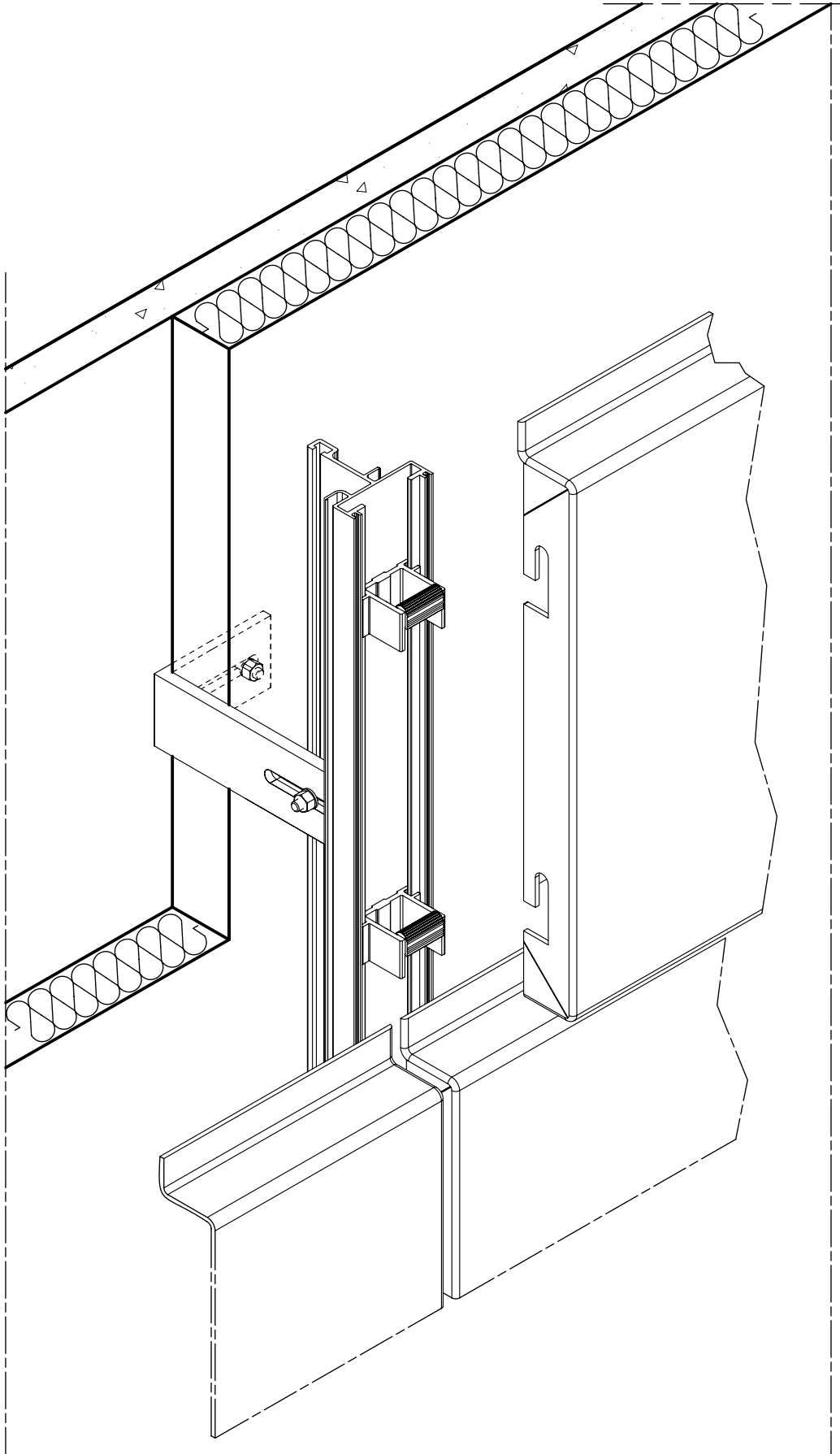
## INSTALLATION OF THE EXTERNAL COVERING PANEL

- Fix the external covering panel to the specific supporting spring.





## FITTING OF THE EXTERNAL COVERING PANEL

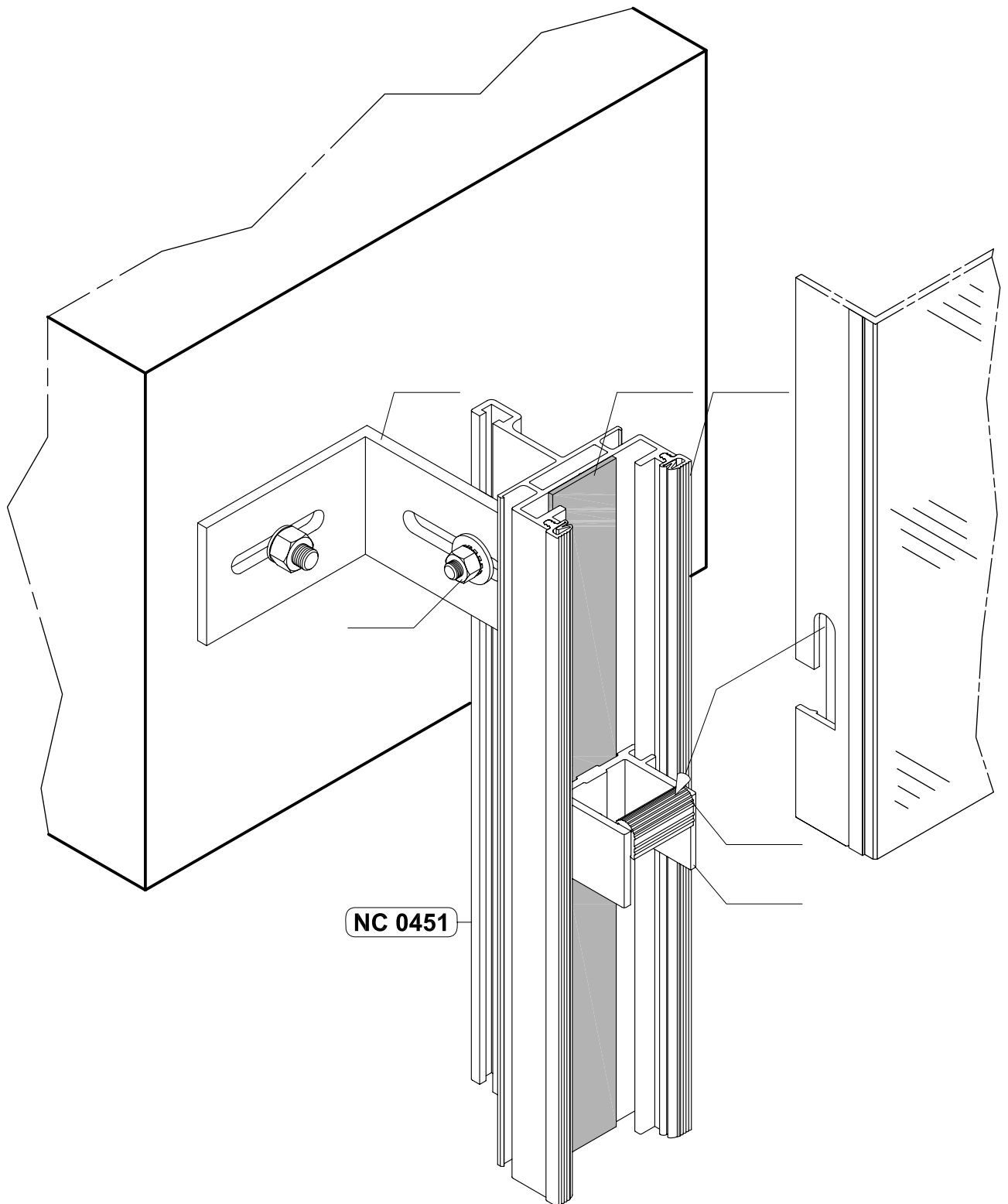


MACHINING



## INSTALLATION OF EXTERNAL GLAZED FRAME AND COVERING

- Fix the external covering glazed frame to the specific supporting accessory



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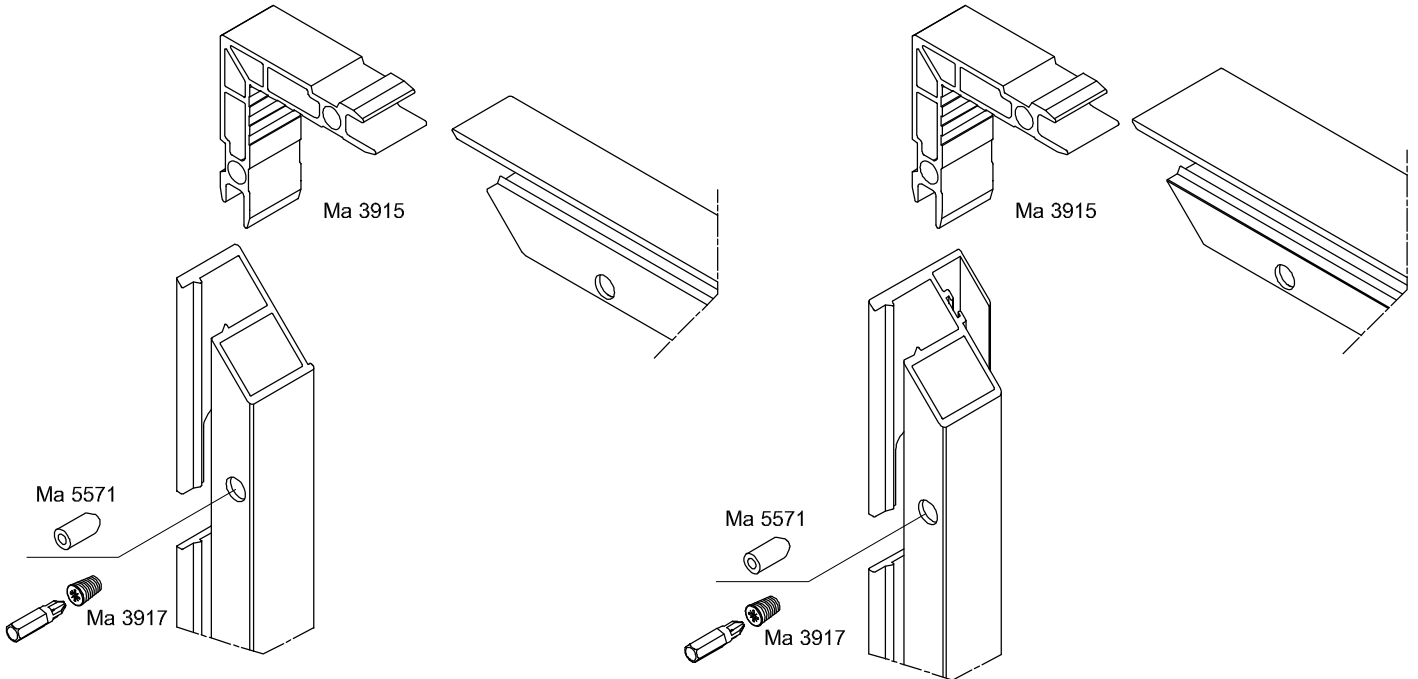
## UPDATES

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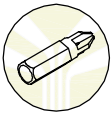


SUBJECT: Tightening of screw Ma 3917 with cross-insert POZIDRIV nr. 2

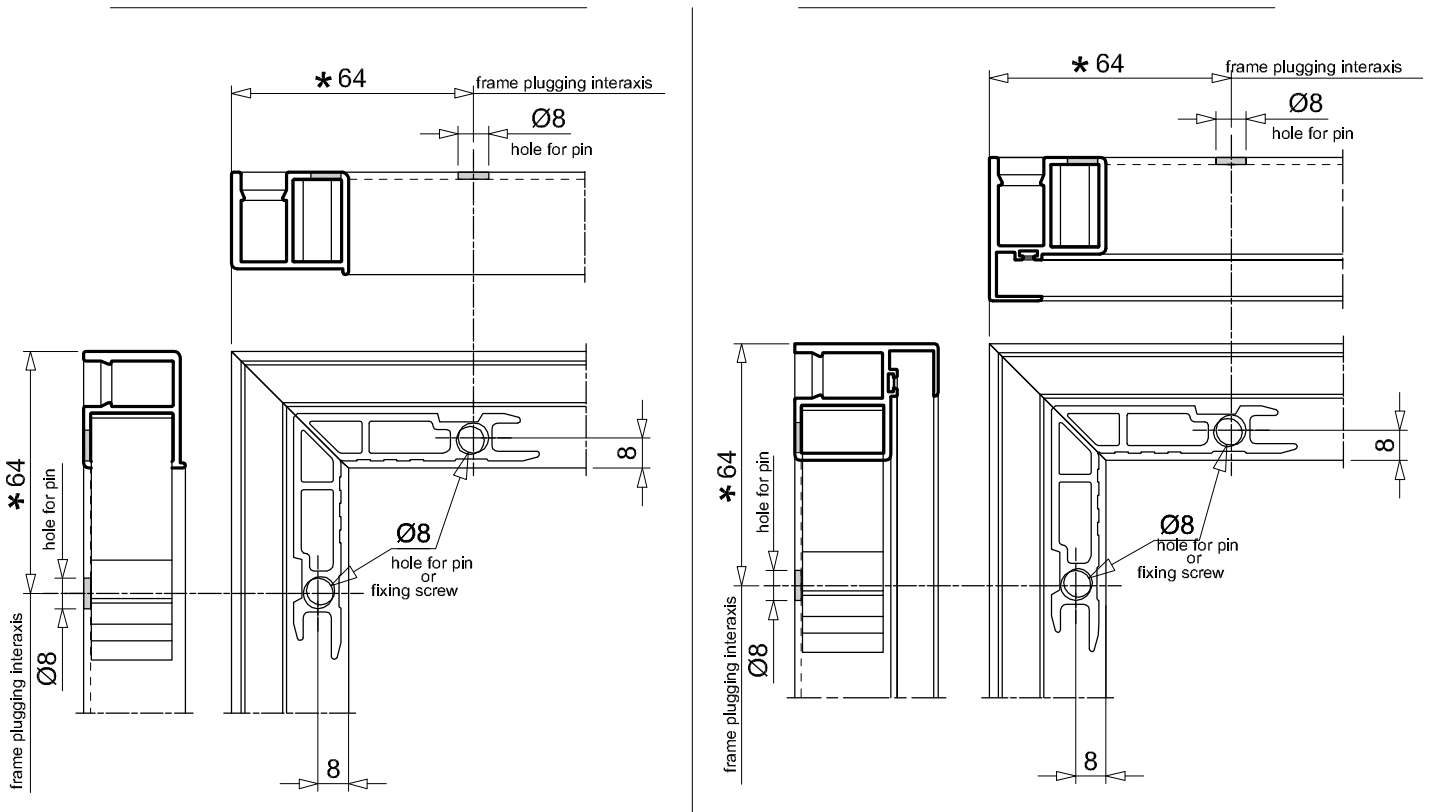
## CORNER CLEAT FIXING FOR ASSEMBLY OF CORNERS



Machining suitable for the following frames:  
NC 0460 - NC 0462



For tightening the screws Ma 3917 use the cross-insert POZIDRIV n°2



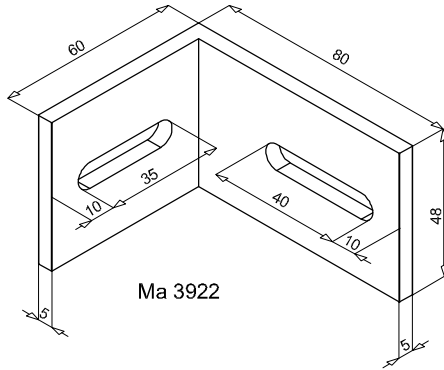
\* THEORICAL DIMENSION, TO BE VERIFIED DURING ASSEMBLY

NOTES: Replaces page 51 E 07 of 22/07/2008 of the catalogue



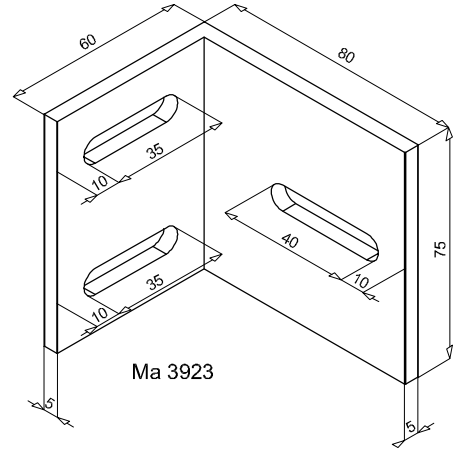
## BRACKETS

a) Brackets for anchorage to the mullions

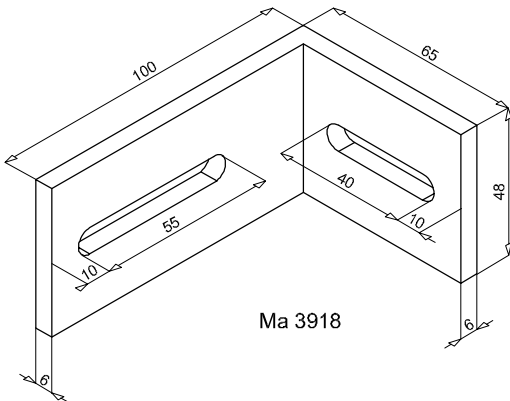


Ma 3922

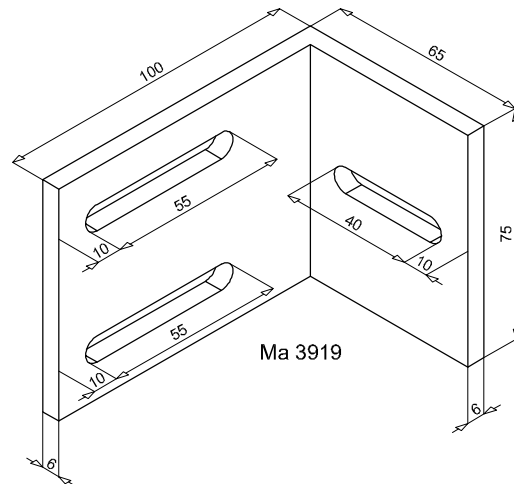
b) Brackets for anchorage to the mullions for dilatation joint



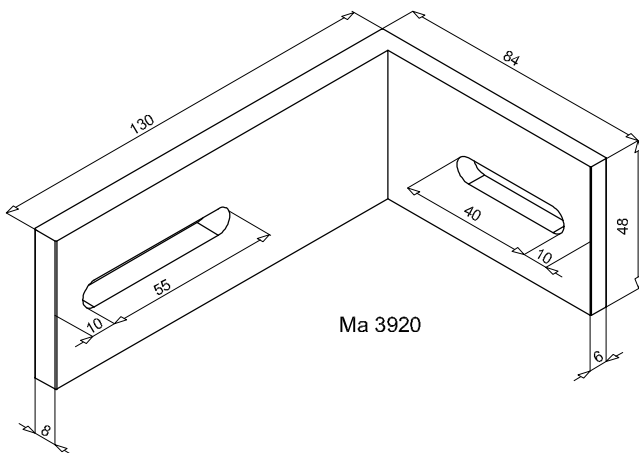
Ma 3923



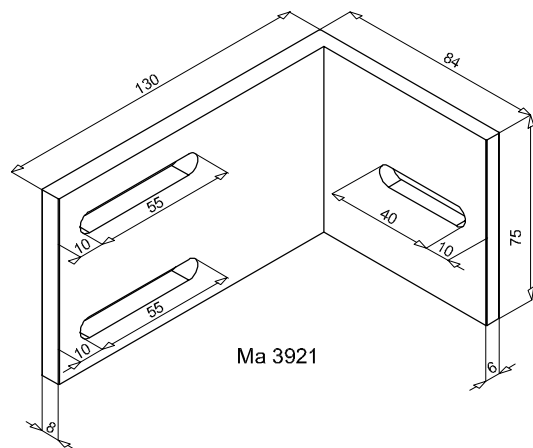
Ma 3918



Ma 3919



Ma 3920



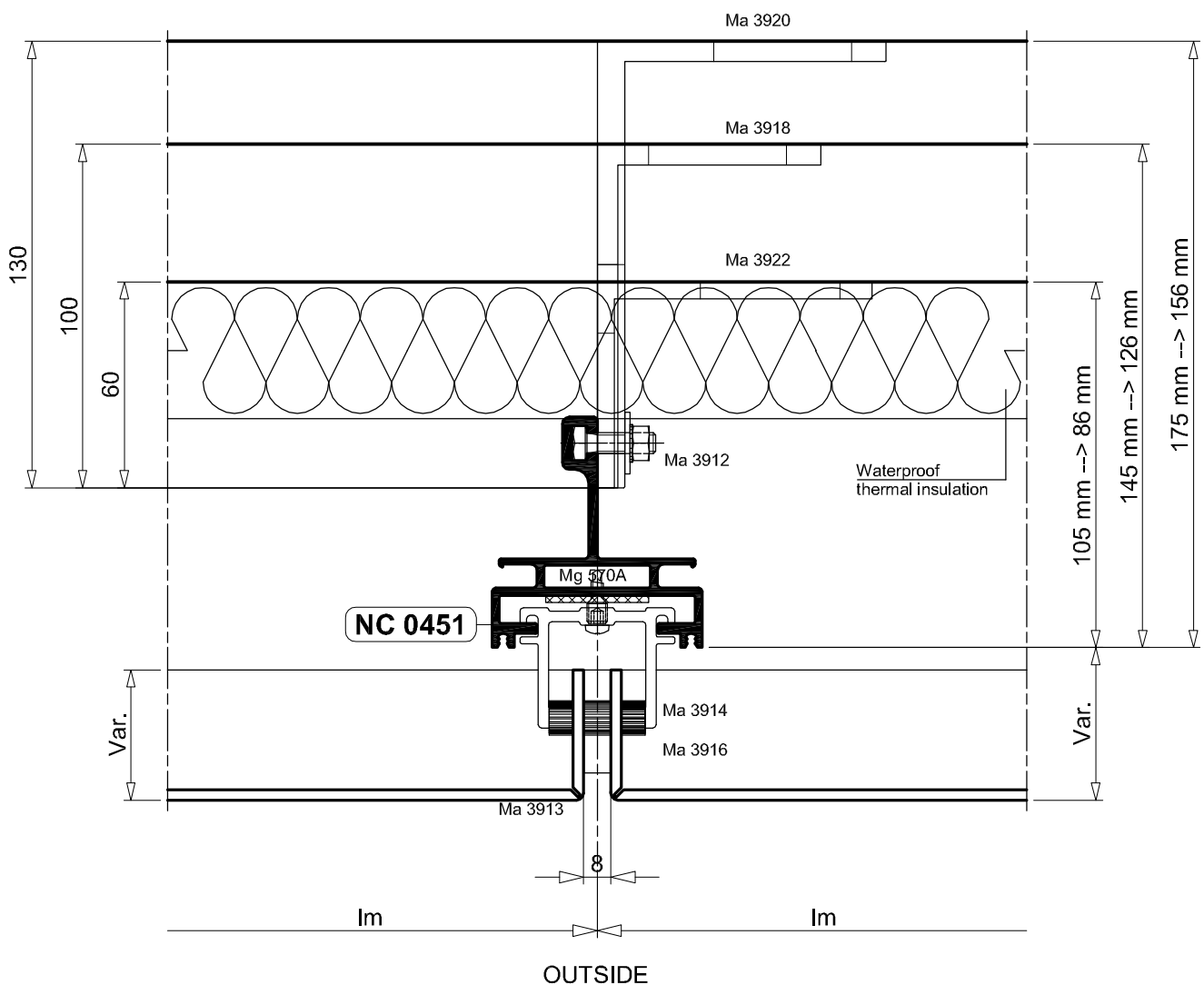
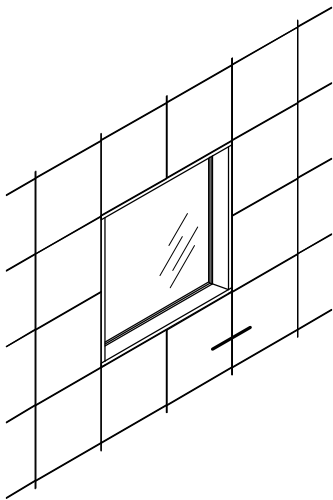
Ma 3921





SUBJECT: New bearing brackets 60 mm - 100 mm - 130 mm

## VALUES OF DEPTH OF THE VENTILATED CURTAIN WALL by use of the brackets Ma 3918, Ma 3920, Ma 3922 and profile NC 0451



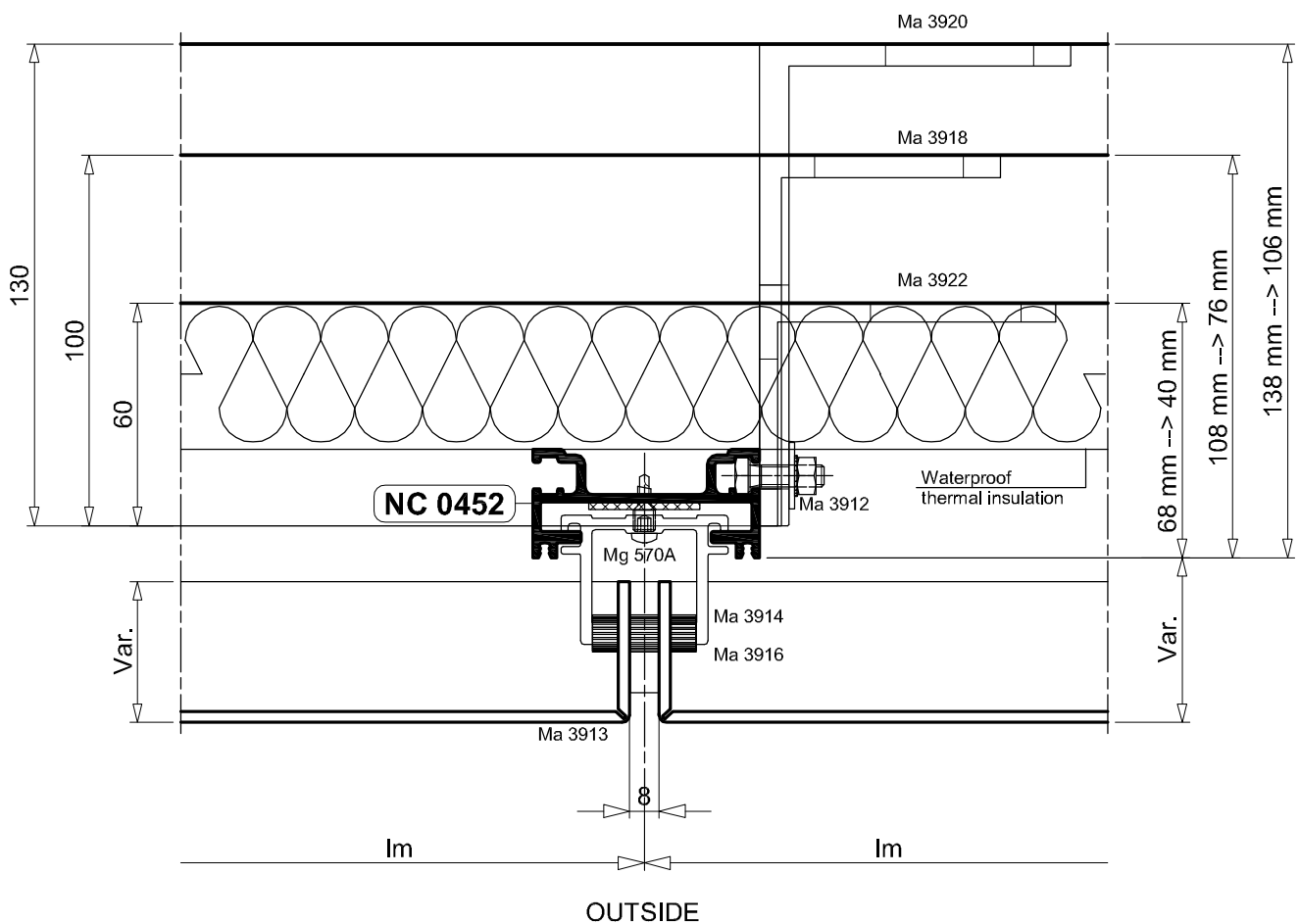
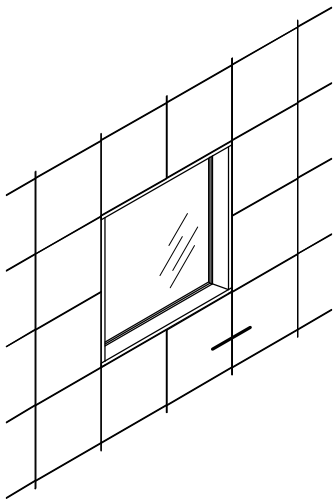
SCALE 1:2

NOTES:



SUBJECT: New bearing brackets 60 mm - 100 mm - 130 mm

## VALUES OF DEPTH OF THE VENTILATED CURTAIN WALL by use of the brackets Ma 3918, Ma 3920, Ma 3922 and profile NC 0452

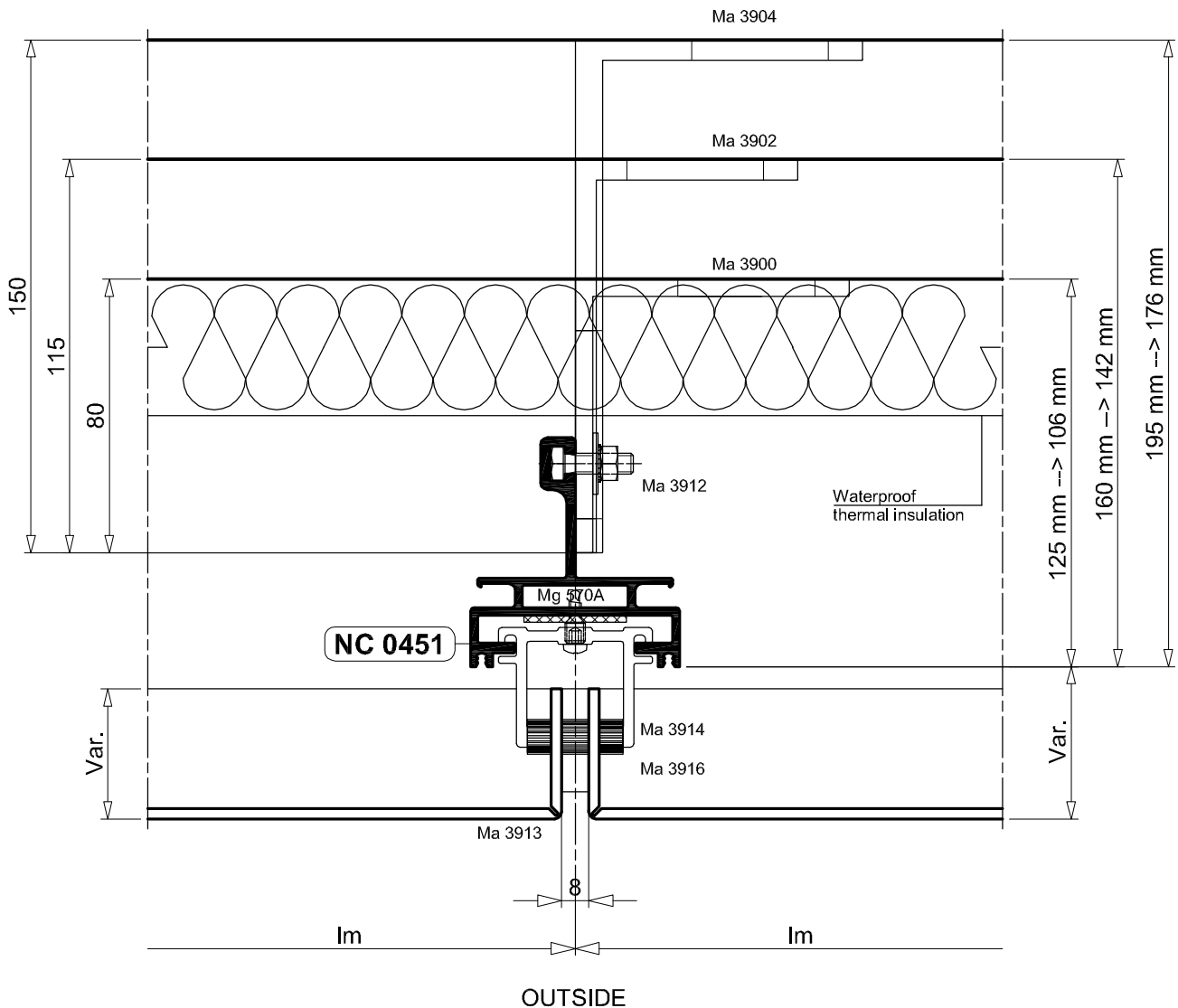
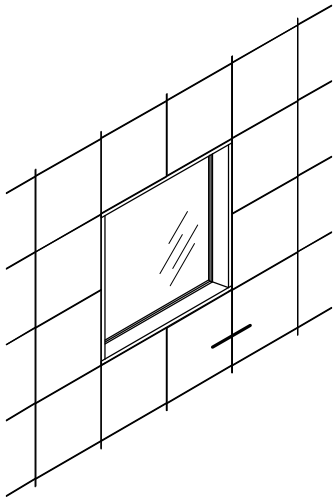


SCALE 1:2

NOTES:



## VALUES OF DEPTH OF THE VENTILATED CURTAIN WALL by use of the brackets Ma 3900, Ma 3902, Ma 3904 and profile NC 0451

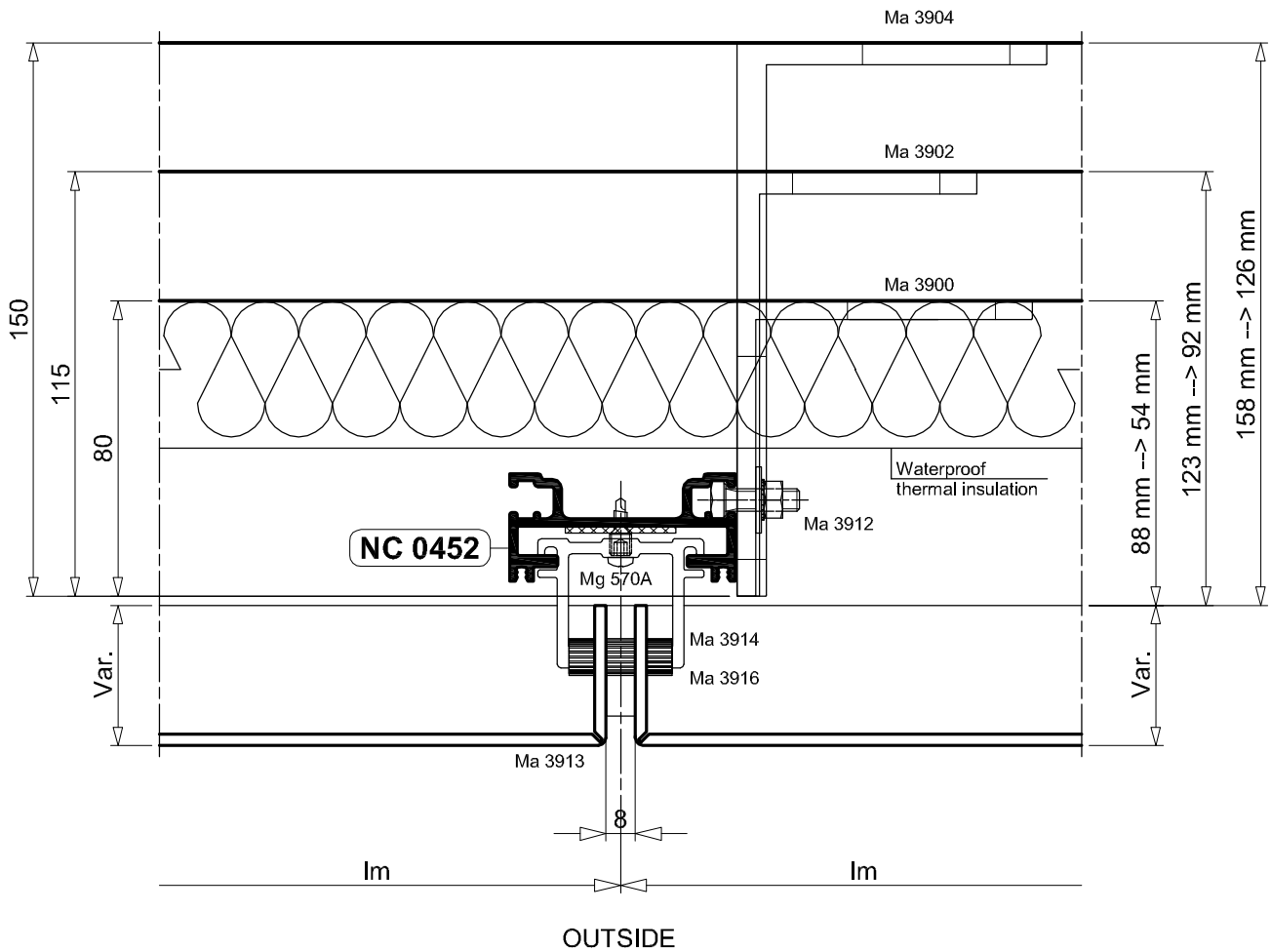
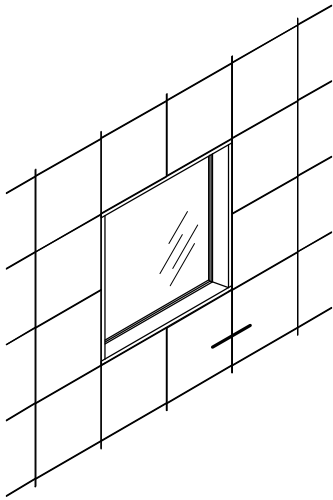


SCALE 1:2

NOTES: Replaces page 51 E 09 of 16/04/2008 of the catalogue



**VALUES OF DEPTH OF THE VENTILATED CURTAIN WALL  
by use of the brackets Ma 3900, Ma 3902, Ma 3904  
and profile NC 0452**



SCALE 1:2

NOTES: Replaces page 51 E 10 of 16/04/2008 of the catalogue

Since 1962 METRA is specialized in the extrusion of aluminium, a metal with exceptional qualities in terms of ductility, resistance, lightness and aesthetics, and easy to recycle. A continuously rising route with several evolution stages which involved not only the production, more and more aiming at realizing high technology and good-looking systems, but even with attention to the organisation in the Group.

With 14 Companies, 6 logistic poles and more than 20 dealers in most of European Countries, METRA has confirmed its position as a leader in Italy and great protagonist in the European and international market.

The capability in supplying solutions for the architecture and building, from the curtain wall to the window or door and to the accessories, studied in all details, makes METRA the Group with the best CE certifications concerning the energy saving and the acoustic insulation. All METRA systems are highly appreciated for the greatest care in the smallest details and make your house more and more beautiful, comfortable and secure.

From more than 40 years METRA is in the front-line in the research to ensure the highest level in quality, reliability and service, because for METRA the customer's satisfaction is always the highest priority.

## METRA Systems

### Curtain walls – Architectural shell

Poliedra-Sky (50, 50 I, 50 S, 50 CV), Poliedra-Sky 60, Poliedra-Sky 80 S, Poliedra-Sky 50 Photovoltaic, Poliedra-Sky Fast 80, Poliedra-Sky Glass 180/130, Urano Wall

**CD 1**

### Complementary systems to the architectural shell

Frangisole (Sunblades), NC 100 Doors and Partition Walls, METRA-FLEX Internal Doors

**CD 1A**

### Casement Systems

NC 50 I, NC 50 STH, NC 65 STH, NC 65 STH Entrance Doors, NC 72 STH, NC 75 STH

**CD 2**

### Composed and Special Systems

Aluminium-wood, Aluminium Bicolour, KORALL 80 STH, Théatron (Handrails)

**CD 3**

### Sliding Systems

NC-S 50 Roma, NC-S 50 STH Roma, NC-S 65 Tahiti, NC-S 65 Miami, NC-S 65 STH Miami, NC-S 120 STH Montreal, NC-S 150 STH Rodos

**CD 4**

### Shutters

Classica, Genova, Trieste, Provenzale, Scorrevole (Sliding), Scuretto, Scuretto Rustico (Blind shutters)

**CD 5**

### Accessories

**CD 6**



**METRA**

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