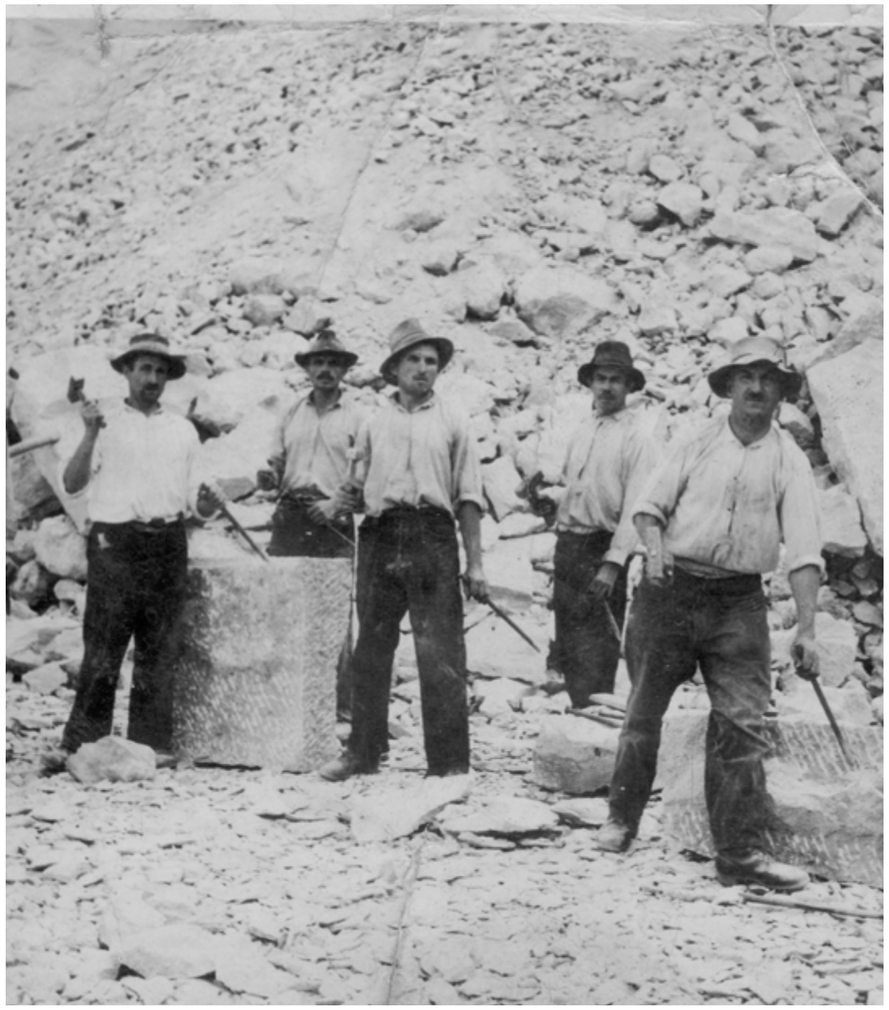
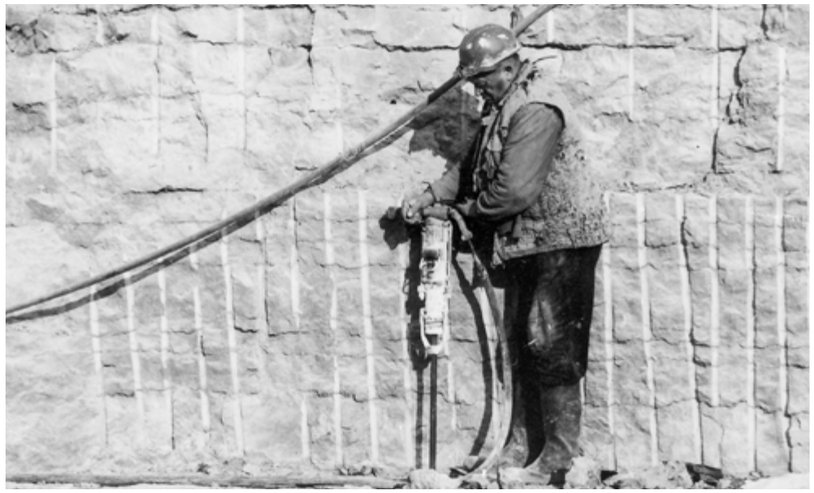
# High-End Limestone

from Reneszánsz Ltd.

Reneszánsz Ltd.

Hungarian Limestone





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# The Reneszánsz Quarry

## OUR OWN QUARRY

In the heart of Europe, near the village of Süttő, a settlement located next to the foothills of Gerecse mountain in Northern Hungary, the Reneszánsz Limestone Quarries were already used by our ancestors almost 2000 years ago. Limestone from here was also used in the ancient Roman Empire, the famous Roman forts and roads along the Danube were built from this high-quality limestone. The limestone stock found in our quarries will serve the architecture of the future as well for a long time, as the 100-hectare quarry area cultivated by Reneszánsz Zrt. has enough decorative stone asset for 400-500 years.

In our quarry, we only use diamond wire sawing technology, and we treat and reuse the water used to cut the stone. The limestone asset found here has physical properties suitable for manufacturing almost all the products required by the decorative and high-tech construction industry.

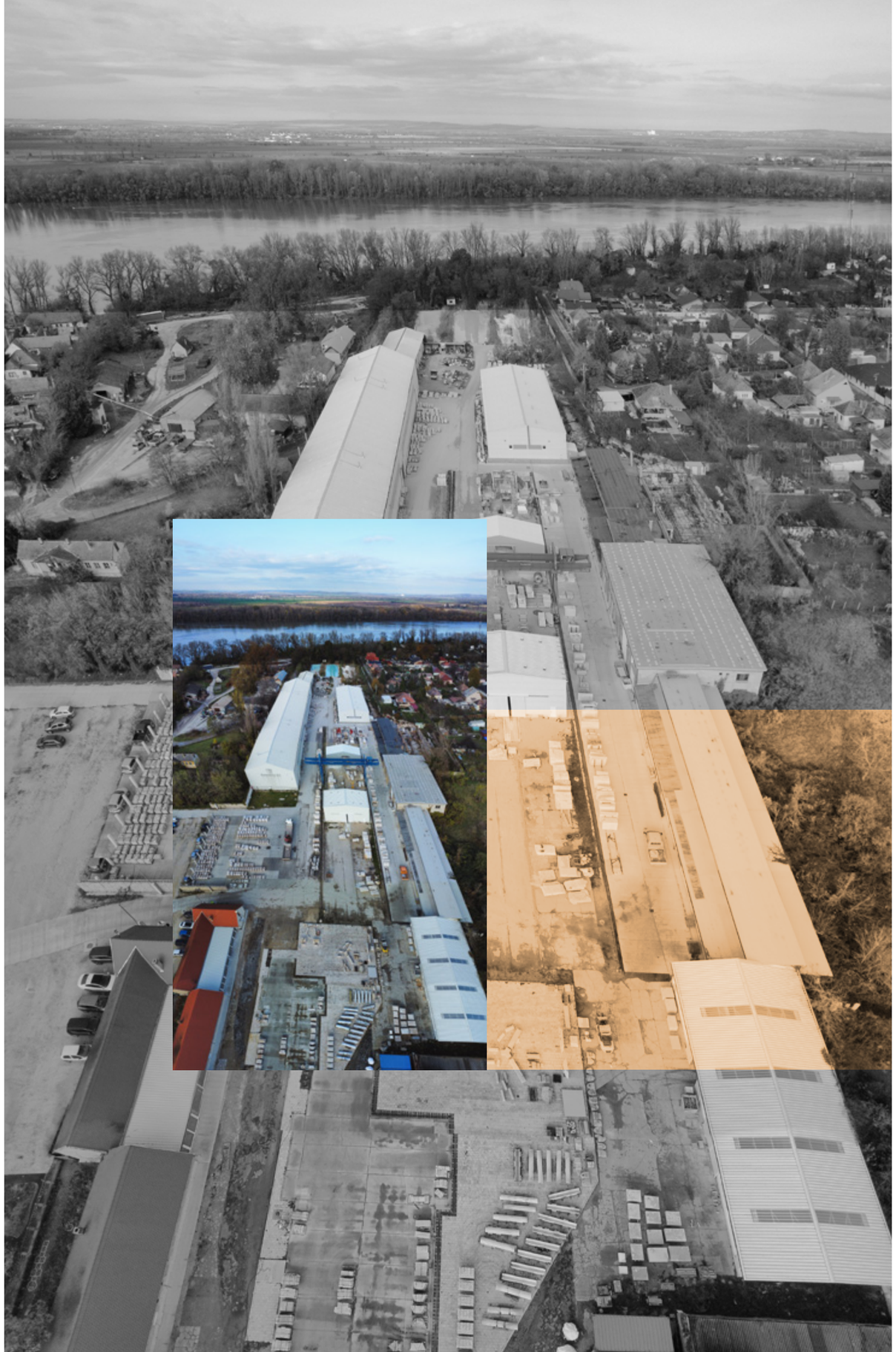
Due to its frost resistance and extreme salt resistance, it is ideal for use in climates with extreme weather conditions, and due to its hardness, it is well polishable. With its excellent workability, it can also be used as a raw material for sculptures and carved ornamental stone elements. Its processing is guaranteed by our 200 experienced colleagues and the 75-year history of our company.

*A wonderful limestone quarry in the heart of Europe: this is the home of Reneszánsz Limestone.*


DAZZINI
WB 97S

# The Reneszánsz Plant

02



*Having our own processing plant enables full control over the quality of the claddings. Every step of manufacture can be monitored and regulated to ensure a high quality result.*

## OUR OWN PROCESSING PLANT

The extracted stone blocks are processed in our plants equipped with modern and heavy-duty machines, two of which operate in Süttő, one in Üröm and one in Zalaegerszeg. A total of 11,000 square metres of industrial halls and 7 hectares of industrial areas provide a suitable background for our stone processing, as well as our commercial and logistics activities.

In our processing plants, high-performance gangsaws, Breton polishing lines, and cutting machines of 600-2500 are operated. In addition to our line of thin panel production machines representing a significant industrial volume, the innovative technology of the 21st century is represented by cutting machines and digital CNC-controlled stone carving robots also used in sculpture. With the full-scale digital survey and 3D scanning of buildings, statues or other spatial elements, almost no challenge is impossible for our specialists.

## DIGITAL STONE CARVING

In addition to the large scale mass production, our main activity is the customised, project-based manufacture and installation. These products may have unconventional dimensions, unique surface finishes or patterns, and can be installed both indoors and outdoors. They can be cladding panels or spatial elements, carved decorative or functional objects. We can manufacture these products from sketches, technical drawings, or even computer models. If necessary, our engineers and designers are available for participation even from the design phase.

In case of architectural works, we can prepare test foundations, test and sample walls depending on the project size, and the stones are also available for visual inspection directly in the quarry in their raw cut state.

Our production technology is designed for the creation of unique products for custom projects, as well as for small series and mass production.

*Digital control allows better accuracy and precision in stone carving, which can be particularly important in the case of complex patterns or detailed decorations.*


CMS
CD13-2

# The Reneszánsz Custom Manufacture

03

## MANUAL STONE CARVING

Throughout its more than 75 years of existence, our company's main objective has always been to maintain and pass on the tradition of stone carving and stone sculpting to the new generations.

In addition to large-scale industrial stone processing, we also have considerable expertise and capacity in the manufacture of ornamental stones and sculptures that require a high degree of expertise and craftsmanship. Our stone sculptors and stone carvers are the holders of many international professional awards. The work of their hands is preserved in masterfully manufactured ornamental stones of numerous domestic and foreign buildings, as well as in many façade and public sculptures made with artistic care.

Based on our unique expertise in contemporary architecture and traditional ornamental stonework, our specialised engineers are able to carry out architectural and reconstruction design projects for historical monuments, and our specialised construction team has the know-how to carry out the related erection and installation works as necessary.

*Manual stone carving and sculpting phases grant a unique, precise work.*

## HIGH-TECH MECHANICAL STONE CARVING

Today, remarkable buildings, urban spaces and street furniture are being created from limestone all over the world, the construction of which requires the most up-to-date technologies.

That is why it was essential to equip our plants with a robotised 3D wire cutting machine, 8 CNC cutting machines, water jet cutting machines, and sand blasters. In addition to all this, a manual stone carving know-how that goes back more than 75 years is also at our disposal.

Using the 3D scanner and our 3D design software, we can create a digital copy of a damaged carved stone elements of a historical monument, we can correct the defects of the stone using the software, and then, based on the digital file, we can manufacture a corrected specimen of the original stone element using our stone processing machines.

*The latest, most up-to-date technologies and equipment are essential parts of our everyday life. The unity of expertise and technology – this is Reneszánsz Limestone.*

# The Reneszánsz Limestone

04

*The Reneszánsz Limestone was formed in a lake fed by spring water, in which there was active aquatic life even during the formation.*



## THE FORMATION IS THE TEXTURE

The Reneszánsz Limestone is hard limestone of freshwater origin. It was formed from the sediment layer of springs and lakes of low-temperature thermal water around 400-600 thousand years ago.

Particularly, this is the origin of its unique texture, thus, the living aquatic world of past ages is clearly visible in the stone: the imprints of living creatures, plants, snails, and reeds.

These imprints, shapes or the resulting cavities are therefore hundreds of thousands of years old.

*The total formation time is about 1.5 million years, during which many processes took place, thus, within one block, the events of many, many years appear. This gives it its uniqueness, curiosity and the greatest value. This results in its truly unique type of limestone in the world.*

## CHARACTERISTICS OF THE RENESZÁNSZ LIMESTONE

The open pores that characterise the freshwater limestones give a unique appearance to the building materials made from them. The pores were formed by the water flowing through the limestone sediment and shaped by the reeds disappearing from the sediment, and thanks to its unique characteristics, it became a favourite building material for centuries. Open pores are not a cause for concern, they do not affect the durability or frost resistance of the stone.

*Open pores can be:*

*pores formed during sedimentation*

*left behind by plants, such as the hollow structure of reeds*

*cavities dissolved by subsurface water*



*Over the thousands of years, the different minerals have coloured the stone with special, unique colours, which is varied in pattern, but all elements are in harmony with each other.*

## COLOUR

No two Reneszánsz Limestone blocks are alike, almost every block has some special colour difference, due to the processes taking place – in space and time – during their formation.

In space, as different processes were taking place in different parts of the lake at the same time. There were places where springs emerging from the deep fed the lake, and other places characterised by calmer standing water areas. In the places where the sources emerged, the primary colour of the stone is lighter and the various dissolved minerals make it more colourful: blackish or even reddish. Where the source was located further away and the water stood still, typically towards the lakeshores, a brownish primary colour is more typical.

The change over time can be observed very well even within a single block. The climate was constantly changing, sometimes it was wetter, sometimes drier, and the various points of the lake, the calmer parts and the springs were also relocated many times. The imprints of these changes remain all there in the stone.

## PHYSICAL PROPERTIES OF THE RENESZÁNSZ LIMESTONE

Reneszánsz Limestone is considered one of the world's highest quality limestones with excellent properties.

**ABRASION RESISTANT**
<=20 $cm^3/50cm^2$

**BULK DENSITY**
2400–2600 $kg/m^3$

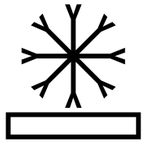

**SALT RESISTANT**
fully resistant to all types of salt

**WATER ABSORPTION**
< 3% by weight

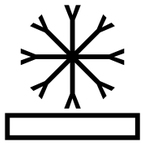
**BENDING STRENGTH**
>=9 $N/mm^2$

**COMPRESSIVE STRENGTH**
>= 80 $N/mm^2$

**FROST RESISTANT**
Tested for 98 freezing cycles



## FROST RESISTANT



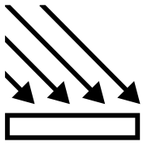
Thanks to its excellent resistance to abrasion and frost, it is perfectly suitable not only for indoor, but especially for outdoor use, whether installed on horizontal or vertical surfaces. It is a perfectly salt-resistant cladding material. Maximally resistant to repeated extreme temperature fluctuations within 24 hours.

Certain types of Reneszánsz Limestones tested for 98 freezing cycles are completely frost-resistant.

In the Reneszánsz Limestones, the pores are located separately. In these pores, water has enough space to expand and contract under the effect of the various heat transfers (freezing, melting, heating, etc.). The water can do this inside the pores, it does not burst the stone itself. As a result, the limestone is frost-resistant.



## HEAT-ISLAND EFFECT



Heat islands are mostly formed in urban areas, where the surfaces are made of synthetic materials (roofs, sidewalks, roads, etc.). These absorb a lot of heat energy from the sun, i.e.

- their heat absorption capacity is high,
- and their ability to reflect solar radiation is low.

The reflection of the absorbed heat to the air causes an increase in temperature, but also facilitates smog formation. The effect of heat islands is of particular concern when the ambient temperature is high, there are no clouds, no wind and the solar radiation reaches the earth's surface at a steep angle. The heat absorbed by the buildings determines the energy demand of the building's cooling system. Thus, high heat absorption means increasing energy consumption, energy demand and an additional emission of pollutants. Therefore, when reducing the ecological footprint of buildings, it is our duty to make designs that minimise heat islands.

Some natural stones, such as light-coloured limestone, are building materials:

- the heat absorption capacity of which is lower and
- the solar radiation reflection capacity is high

Therefore, light-coloured limestones, such as the Reneszánsz Limestone, significantly contribute to preventing the formation of urban heat islands.

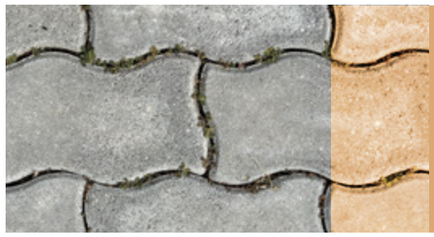
**Air temperature at the time of sampling the surfaces: 34 °C**

**Stairs made of limestone of Süttő**

**44 °C**

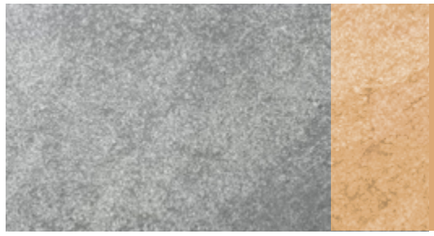
**Basalt cube**

**44 °C**



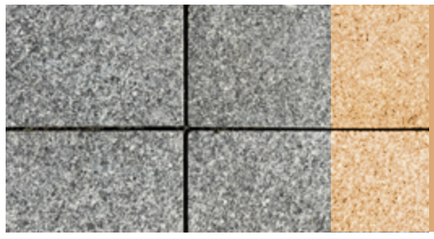
**Paving stone**

**47 °C**



**Asphalt**

**51 °C**



**Andesite**

**54 °C**

**Bench with wooden covering**

**63 °C**


## TREND

The eco-conscious trends of our time are determined by two key values: sustainability and carbon neutrality. Nowadays, when designing a building, it is increasingly important to take into account the environmental protection indicators of the materials to be incorporated, the ecological footprint created during the production and transportation of the building materials, as well as the expected energy demand of the building operation, and the analysis of its impact on the environment and its life cycle. In addition, after an eventual demolition, the stone material and the unused limestone can be returned to nature by recultivation, where new soil and vegetation will form on it.

It is not surprising that precisely for this reason, the focus of contemporary architecture is drastically shifting towards natural materials. The trends are clear. The focus of market attention is on natural stones, including hard, light-coloured limestones that offer integrated advantages, such as those represented by the unique Renaissance stone treasure.

It is carbon neutral, as nature itself took care of its production, it is durable and reusable. Its use does not produce hazardous waste, and it can be cleaned without chemicals.

Buildings built with Reneszánsz Limestone can be maintained for a long time, over several generations, easily and at low cost. Its unique resistance to salt, frost and abrasion makes it suitable for use on any horizontal or vertical surface, both indoors and outdoors.

# Portfolio Products

05

## STANDARD PRODUCTS

**Tiles**
» 1 cm thick
» 2 cm thick
» 3 cm thick

**Pavement**
» 2 cm thick
» 3 cm thick
» 4–8 cm thick

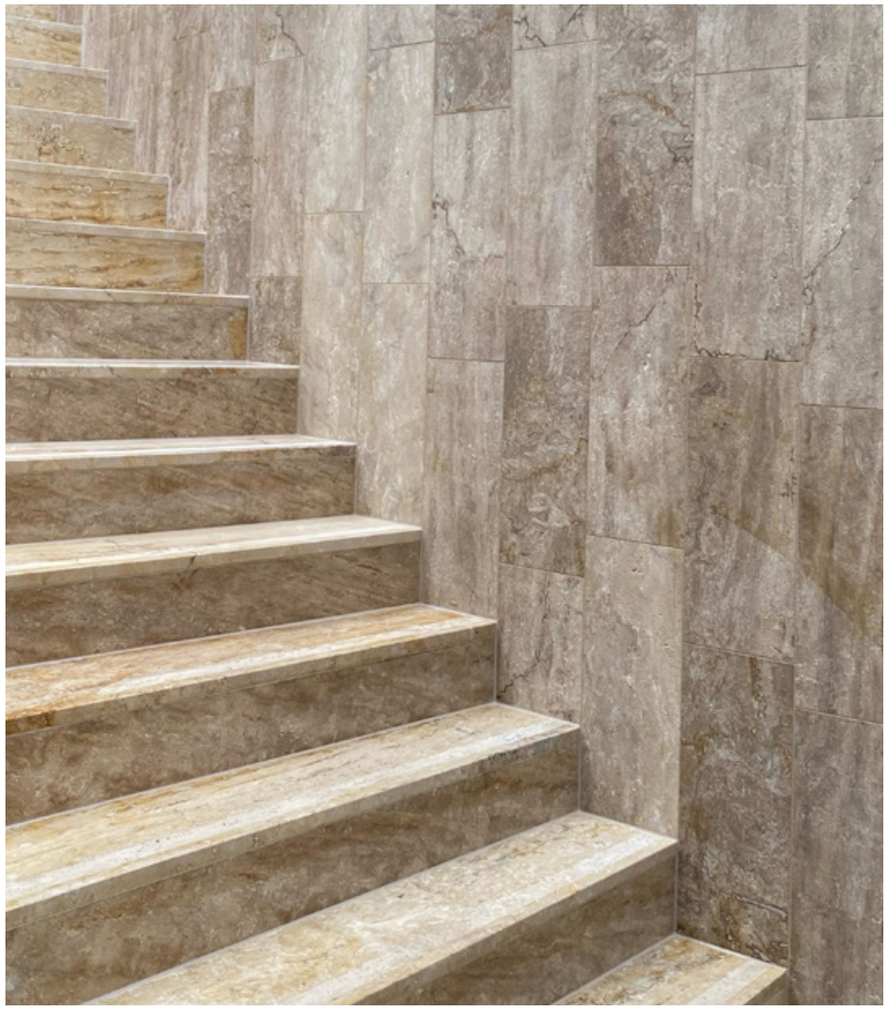
**Plinth border**
» 8 cm × 1 cm thick

**Stairs**
» 2 cm thick
» 3 cm thick

**Window sill**
» 2 cm thick
» 3 cm thick

**Panel**
» 2–10 cm thick

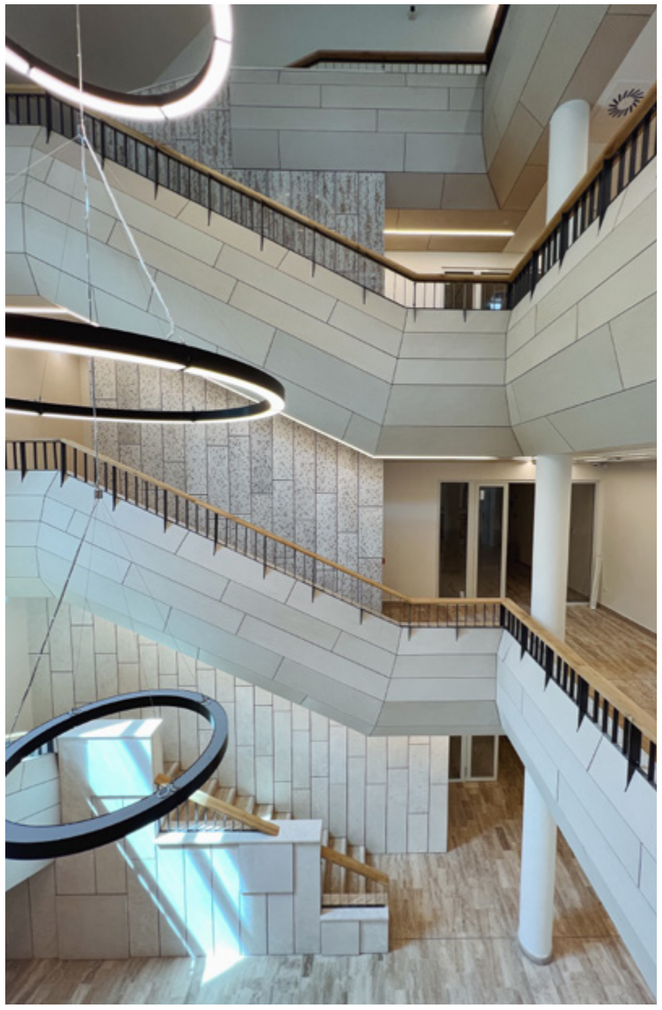
**Surfaces**
» cut
» diamond brushed
» sandblasted
» honed
» filled honed
» polished
» filled polished



## sandblasted

## polished, glossy





**Archiving Warehouse of the National Széchényi Library, Piliscsaba**

The building of the National Széchényi Library in Piliscsaba has a gross floor area of 11,000 square metres. The façade itself of the building is also unconventional: it is inspired by a book, leaf veins, and a pattern evoking digitisation. The pattern is formed by the difference between the sandblasted and polishead surface finish.

Any vector graphics or other type of graphics can be displayed in this way on the surface of the limestone panels. The unique patterned limestone claddings formed in this way have the same physical properties as the traditional Reneszánsz Limestone, both installed on vertical surfaces outdoors and on vertical and horizontal surfaces indoors.

polished

polished



**Bem Hotel and Office Building, reception desk, Budapest**

At the reception of BEM Center Building, functioning as both a hotel and an office building, a counter had to be implemented based on the visualisation plans, and it was a special challenge as, due to the limited load-bearing capacity of the floor, the monumental limestone counter had to be maximally lightened.

The carving of the counter was carried out with five-axis digitally controlled CNC stone carving machines.

## cut



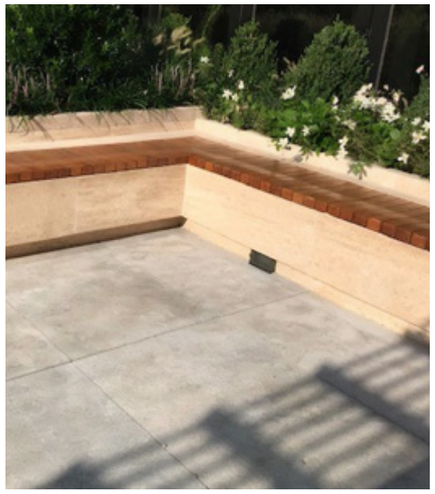
**BEM Hotel and Office Building, Budapest**

The BEM Center Hotel and Office Complex is located in the heart of Budapest. The modern, new building wings are covered with Reneszánsz Limestone. The designers display the stone in various forms, as design elements, in the prominent central interior spaces as well. The three-dimensional map showing the city from a bird's eye view is also made of limestone. This exceptional map is made of four pieces, manufactured with 5-axis CNC machines. It appears in rough cut surface design, the river is symbolised by a polishead surface finish.

## sealed, polished

## cut



**Penn One, New York**

In New York, One Penni Plaza is a roof terrace with a unique design - every element is made with sustainability in mind. The climate- and environment-friendly architecture appears also in the building materials used. The designers chose Reneszánsz Limestone because it is extremely frost-resistant and does not form an urban heat island. It can be maintained in an environmentally friendly way, it can be cleaned with high-pressure water only.


FINALLY,
A GOOD
EXCUSE
FINALLY,
A GOOD
EXCUSE

## honed



**Bank headquarter building, Budapest**

UniCredit Bank Building is located in the heart of Budapest. The façade has a classic limestone cladding made of Reneszánsz Limestone, the objective of its selection was to create a timeless cladding.

## cut

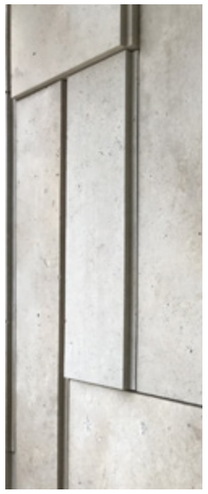


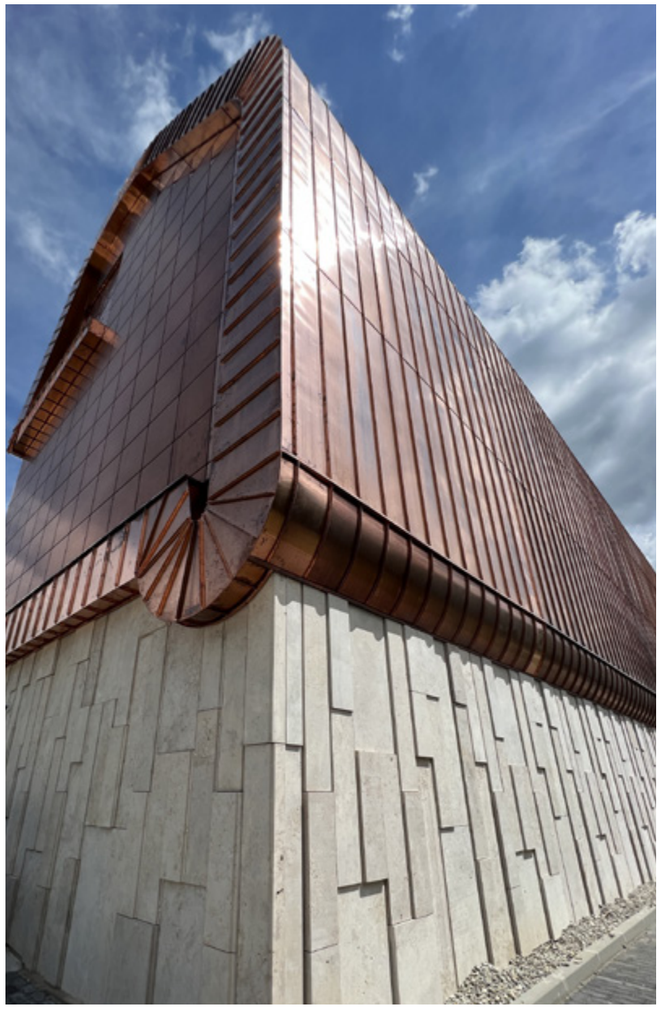

**Atrinova Office Building, Budapest**

Atrinova is a unique, contemporary building. Its covering is made of large, flat Reneszánsz Limestone with cut surface. For the exposed plinth parts, the designer selected Reneszánsz Limestone because of its excellent salt-resistance.

## cut

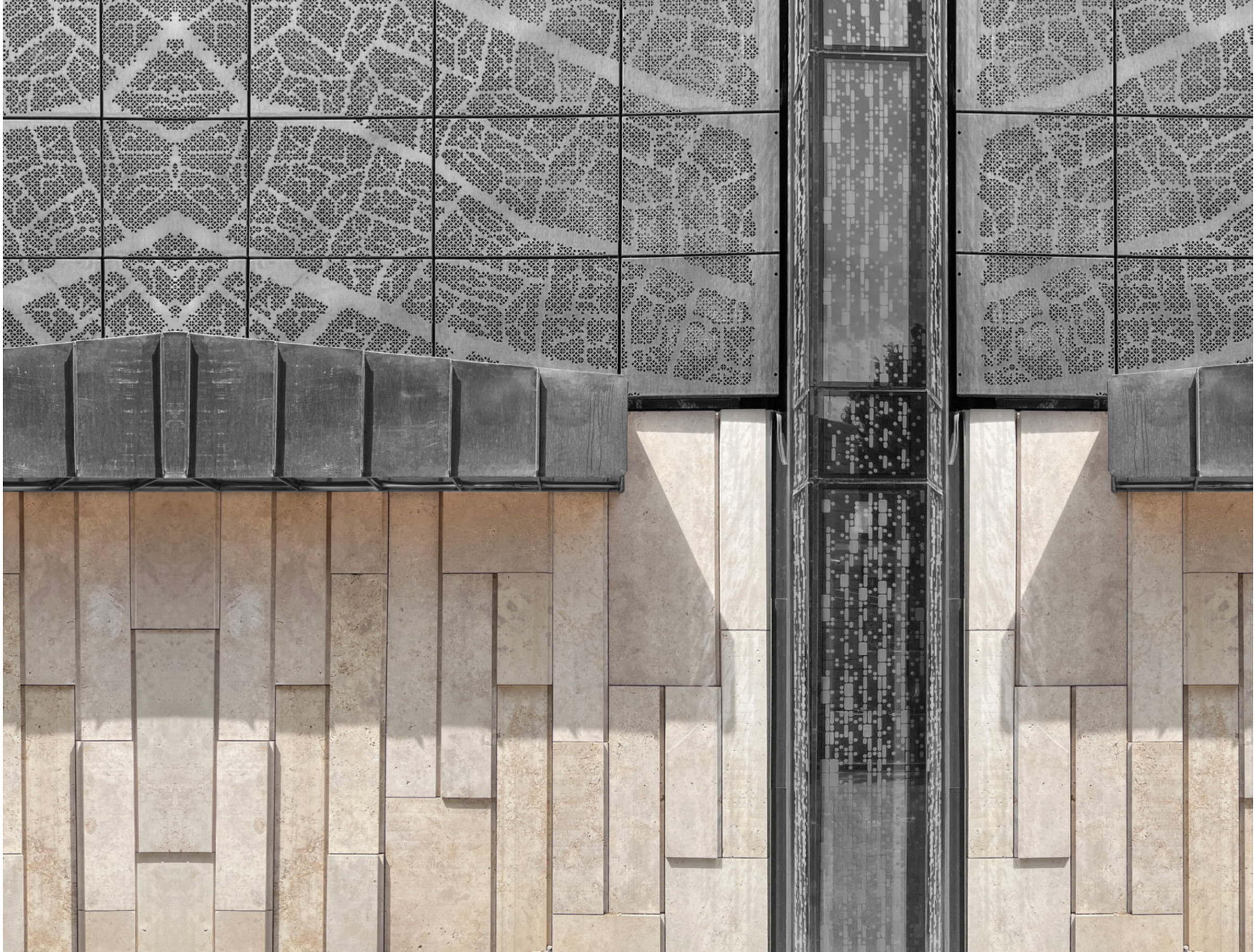






**Archiving Warehouse of the National Széchényi Library, Piliscsaba**

The library building has a gross floor area of 11,000 square metres. The façade itself of the building is also unconventional: it is inspired by a book. The masonry covering of different thicknesses provides its unique appearance.



## honed

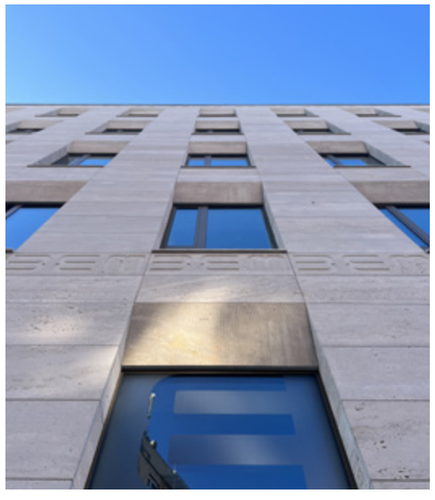



**Ritz Carlton Hotel, Budapest**

This majestic building is covered with limestone, which, with its conservativeness, provides cool elegance to this graceful downtown building.

## cut



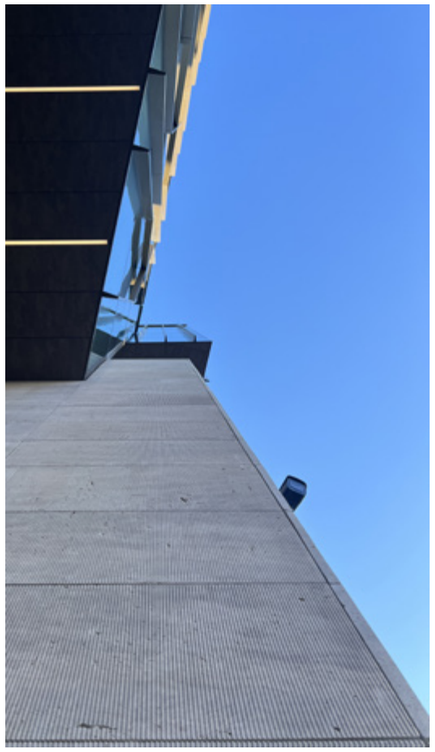


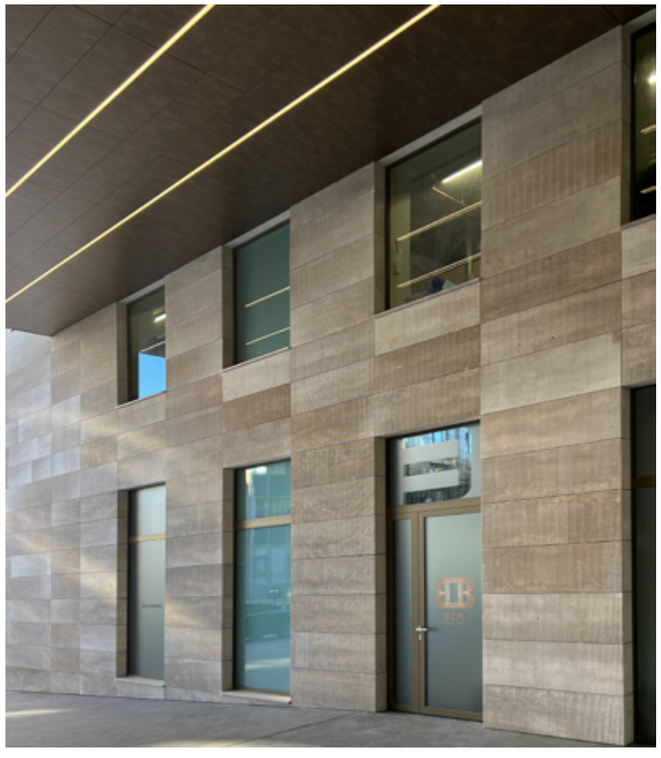
**BEM Hotel and Office Building, Budapest**

This building is covered with Reneszánsz Limestone for both functional and aesthetic reasons. The façade dynamics is ensured by the elements supporting the cut, unsealed 3D inscription and the elements with planed surface finish. The use of stone in its natural, raw form allows the new building to fit into the historical downtown environment.

## planed







**BEM Hotel and Office Building, Budapest**

The character of the façade of this office building is given by the striped, ribbed pattern created by the planed surface design.

## sandblasted



**Mansion, Pécs**

This house won the House of the Year award in 2012. Future-proofness and nature-friendliness were key considerations in the design of the building complex.

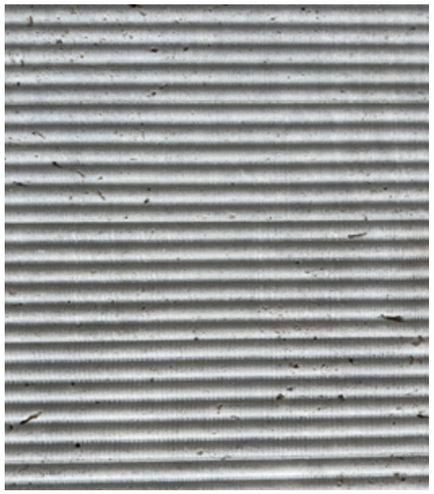
## honed

## cut



**Weekend House in Balatonvilágos**

The building gets very little natural shade, thus, it was particularly important to select a covering that resists the heat island effect as much as possible. It is essential that the walking surfaces, constantly exposed to the blazing sun, can be walked barefooted freely, even in the hottest summer weather.



## cut and planed



**Bartók Béla út Office Building, Budapest**

Reneszánsz Limestone appears in a raw, cut and planed surface finish on the façade. The limestone panels are attached to a railed steel structure on the unique style façade of this contemporary building.

## filled polished

## cut



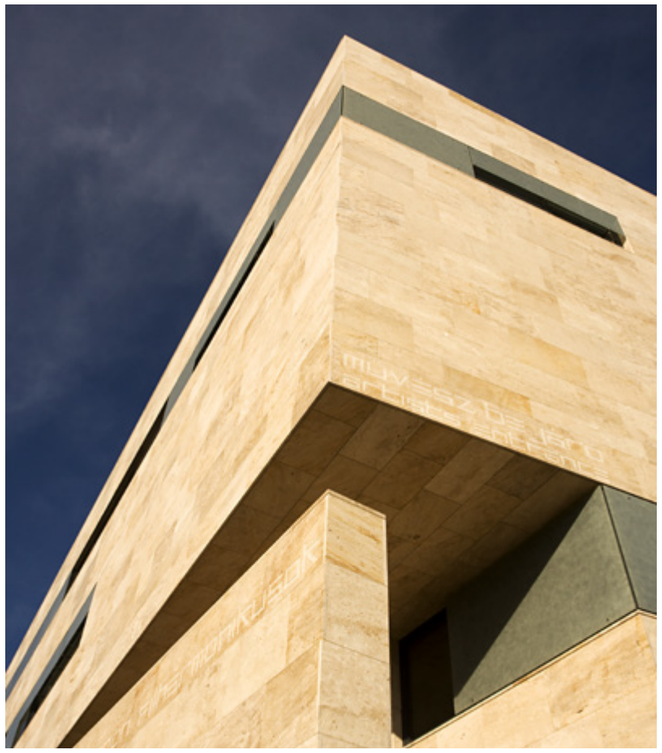
**MÜPA, Budapest**

MÜPA (Palace of Arts) is Hungary's leading cultural institution. The institution brings together different arts in a unique way. The objective was to reflect this kind of diversity also in the natural stone cladding of the exterior. The building won the FIABCI Prix d'Excellence 2006, considered the Oscar of architecture and real estate development, and the FIABCI Audience Award in 2007.

Reneszánsz Ltd. carried out the bill of quantities, manufacture and creation of this unique façade, thus, the entire process of implementation. The unconventional façade of the building was constructed from 3-4 types of Reneszánsz Limestone, using more than 1,000 pieces of stone.

## cut





**Kodály Centre, Pécs**

The building mass and external appearance of this concert and conference centre is completely dominated by limestone on its 11,144 square metres. The inclined side walls and roof planes are covered with Reneszánsz Limestone tiles that create an imposing, sculpture-like effect even from a bird's eye view.

The pavement, the ceiling, the walls and even the roofs are covered with limestone. The main challenge during the construction of this building was the stone roof. Our engineering team developed a custom stone attachment system for its installation. With a special clamping attachment, the covering is fastened to the roof on rails.

## filled polished



### Boston Public Library

For its multiple functions, the design team dreamed up a special, unconventionally coloured limestone.

One of the most wonderful features of the Reneszánsz Limestone lies in its varied colours. This, in addition to its many outstanding properties, makes it one of the most extraordinary limestones in the world.

## sawn



### Holiday House

The objective was to ensure sustainability and maximum compliance with the climate-friendly architectural aspects. It is not surprising that the designer chose limestone cladding both for the façade and for the interior cladding. The building's uniqueness comes from the type of stone itself.
The three centimetres thick large-panel limestone cladding, of a size of more than one metre by one metre, runs along the façade of the building as the dominant architectural element.

## cut




**CEU Budapest**

Thanks to its energy-efficient and sustainable solutions, the building was the first in the region to earn the BREEAM certificate.

The lower elements of the 8 cm thick masonry façade made of block stones are 2 metres high. There is glazing behind the tracery part of the limestone façade, which is why we used tightened stone joining here.

## cut



**Melea The Health Concept, Sárvár**

Limestone can best show its natural appearance in its unsealed cut finish. The architect fell in love with this naturalness, and that is why Reneszánsz Limestone was used in its raw beauty on the façade of this building.

## cut



**Melea The Health Concept, Sárvár**

In the hotel, naturalness played a dominant role in the design of the interior spaces. As a result, limestone covering with its unique raw surface has gained a dominant role.

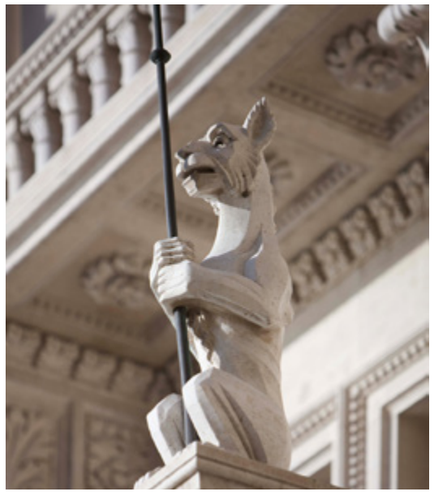
## honed



### Parliament, Budapest

The building of the Hungarian Parliament was completed in 1904 and limestone from Sóskút was used. Due to the increased air pollution in the 20th century, this limestone began to deteriorate quickly, and the cladding had to be replaced with harder, more resistant Reneszánsz Limestone.

Carved stone is eternal beauty. Man embraced it, mined it, and added value by carving colourful, varied shapes in it. Elements formed with hand tools, using technology matured by centuries of experience, mixed with large-scale preparation with modern 3-dimensional machines, from the quarry of Reneszánsz Ltd.



## cut



**Buda Castle - Riding Hall, Budapest**

Reborn as a multifunctional event space, the Riding Hall were originally built in 1901. Not only the façade of the newly completed building has been restored to a historically correct condition, but also its interior spaces. The façade is covered with wonderful Reneszánsz Limestone.

## honed



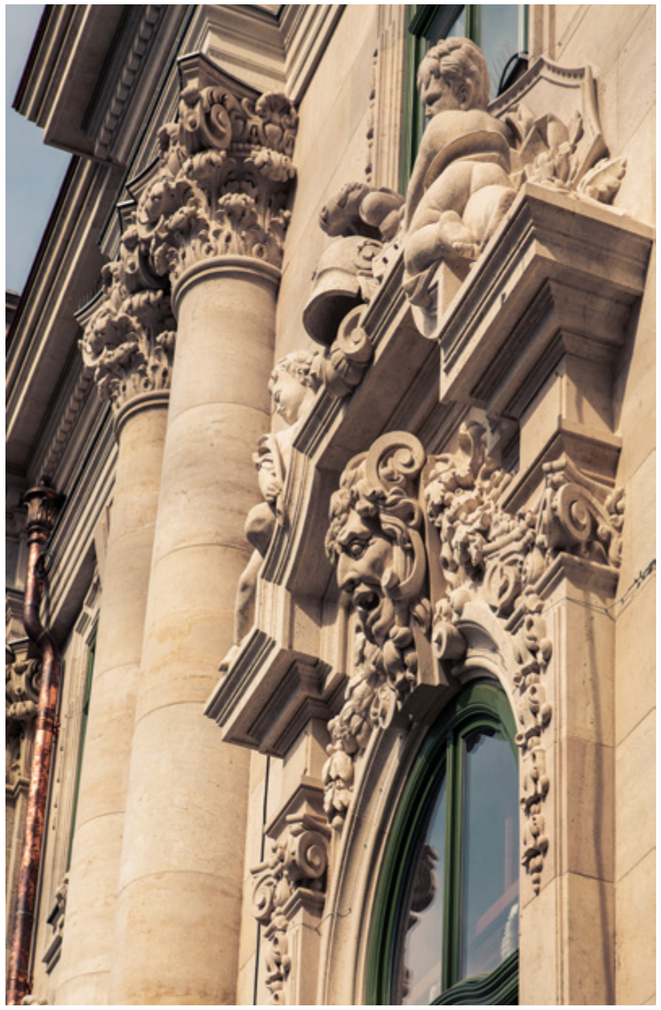
**Buda Castle - Royal Guard, Budapest**

The Royal Guard building, demolished in the 70s, was rebuilt on the basis of the original plans, photos, art history and architectural documents. Its huge Ionic columns, its façade decorated with beautiful sculptures, military symbols and weapons, were carved from Reneszánsz Limestone in the Reneszánsz workshops.

Our specialists participated both in the construction and in the installation.

## cut





**The Southern Connecting Wing, Buda Castel**

The renovation of the southern connecting wing was an extremely complex and highly specialized task.The first step was to carve out the basis, of the statues with sculpting machines, followed by meticulous manual stone carving, which required great care. Both work phases lasted many months. After they were finished, a tower crane lifted the individual elements, the puttos, the grotesque mask, the helmet or the lion's head into place. The weight of a putto and its ledge alone exceeded three tons.

## sandblasted

## honed

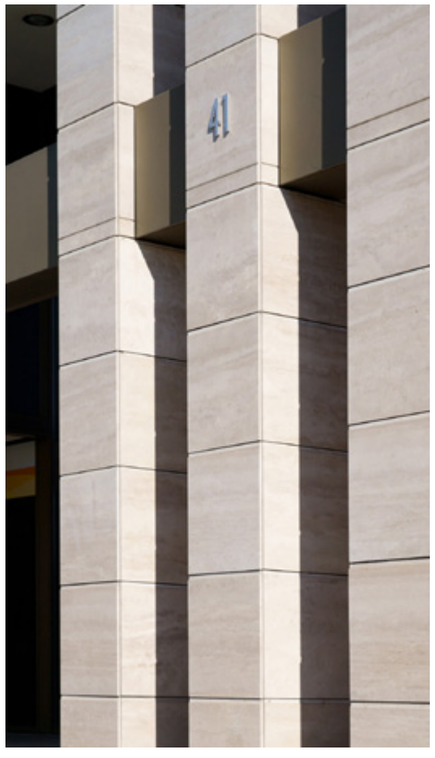


**Szabad György Parliament Office Building, Budapest**

The Szabad György Office Building was built on the main square of Budapest, the construction of which was a special challenge from several aspects. On the one hand, a historicised façade had to be built in front of a modern office building, and a special approach was needed during the design and execution, since the structure of the building is supported by a metro station. Thus, the building had to be integrated into the hall of the Kossuth tér metro station in an unconventional way. Fantastic lightened stone elements were created thanks to the special manufacturing and engineering innovation results.

## polished






**Office buildings, Csörsz utca**

13,000 square metres of environmentally friendly limestone cladding were installed on the façades of this buildings. Compared to other cladding types, natural stone is an environmentally conscious choice, appreciated by the BREEAM, DGNB and LEED systems. Compared to stone, glazed façades have a 60-360% higher negative impact on the environment* The 3 cm thick Reneszánsz Limestone cladding was installed on stainless steel anchor attached to the wall structure. Natural air-conditioning is ensured by the thermal insulation, the air gap, and the highly heat-reflective and heat-storing limestone cladding.

* Based on the study on the sustainability of façade claddings of Deutsche Naturstein Verband

## cut



**Kossuth statue, Budapest**

The group of sculptures is of a primary importance, and a dominant element of the square in front of the Parliament. Our stone carving team, 21 persons of whom worked on the sculptures, played an important role in its creation. The preparation was carried out with six robotised CNC machines in our plant. The amount of pedestal stone is 165 m³, and the statue group is made of 84 m³ of stone.

## bush-hammered



**The Sun building**

It is a limestone house, with not only its coverings but also some of its load-bearing elements made of Reneszánsz Limestone, valorising the stone's high load-bearing capacity and compressive strength of 80 N/mm². The floors are interconnected by solid block stairs, and the lintels above the doors and windows are made of tightly joined limestone beams. The roof of the building is covered with limestone tiles, which do not heat up above 40 degrees even during the greatest summer heat. Unlike other roofing - which can be heated up to 50-90 degrees by the summer sunshine - much less energy is needed to cool the building.

Thanks to the technology used to attach the stone elements of the roof, the solar panels could be fully integrated into the stone roof panels. In this way, the solar panels could become an integral part of the building in an unconventional way.

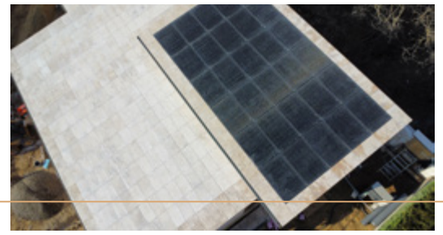
06



# Developments
# Design & Innovation

## Limestone street furniture

In addition to architecture and landscaping, natural materials, including limestone, are playing an increasingly important role in other areas of design as well. The heat island effect, an increasingly significant problem especially in cities, made limestone street furniture the focus of interest in addition to limestone pavements.



## Built-in photovoltaic limestone roof

The limestone roof surface does not heat up, it will be maximum 3 degrees warmer than the temperature outside, so the climate of the building remains excellent. The solar panels, flushed into the plane of the limestone roof, do not modify the image of the building façade.

## Architrave made of limestone

Man has used rocks as building materials since ancient times. Due to its excellent physical properties, limestone is particularly suitable for fulfilling structural and load-bearing functions. In the architecture of our days, environmental protection and sustainability aspects are of utmost importance, which is why limestone has once again come into focus. Compared to concrete beams, limestone is a more carbon-neutral and recyclable material, and with recultivation, the stone part of the beam can be returned to nature without polluting the environment. Our engineering team developed a tensile structure from limestone, which also stands its ground as an architrave, significantly accelerating and simplifying the construction.

## Limestone masonry elements

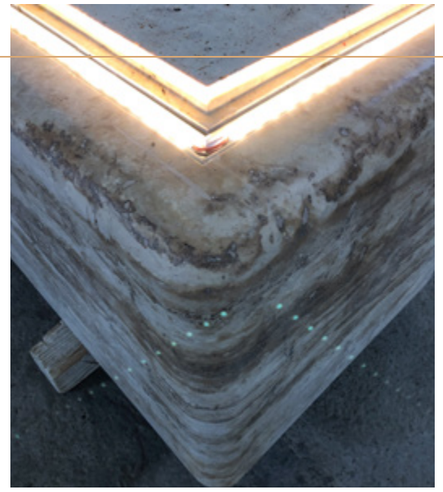
This unconventional masonry block is made using a special casting process.
The Reneszánsz Limestone element is a masonry block made with a cast artificial stone mixture, lightened with expanded ceramic balls. Thanks to this technology, natural limestone cladding can be used in sizes and in places where it was not previously suitable, mainly due to its weight. The complex blocks ensure a significantly accelerated and simplified construction process.

## Talking cylinders

These special cylindrical limestone street furniture stand in front of a puppet theatre. These special cylindrical limestone street furniture stand in front of a puppet theatre. Through the QR codes integrated into the seats, the children waiting there can listen to or even watch a story or performance from the puppet theatre's archives

## Heated street furniture

Man has been using rocks since ancient times. Gaia is one of the members of the Reneszánsz Limestone street furniture collection. Thanks to a special project, a version of Gaia, in which heated water is circulated, can be found in Budapest. Because limestone is hard to heat up, but also hard to give off the heat it absorbs, it is perfectly suited for warming up and to be used as a cuddly street furniture in cold weather.



## Demete

Demeter is a member of the Reneszánsz limestone street furniture collection. An advanced version, completed with lighting, was manufactured to be installed in a wonderful harbour. The light shining downwards gives the furniture an effect of floating, while also being conscious about the phenomenon of light pollution.

**Reneszánsz Ltd.**

**reneszansz.hu/en**