

# Stainless Steel in Architectural Applications





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## Introduction



**JOHN ROWE**  
Secretary-General

The ISSF is particularly proud to present the fifth edition of its Architectural Brochure. It is hard to believe that we have assembled sufficient examples to fill five Brochures dedicated to this continually growing market. A glimpse through our previous editions will show that the booklets have grown from 28 examples in 2015 to 61 in the current edition, and this is indicative of the ever growing attention which architects are giving to the strength, formability, corrosion resistance, sustainability and aesthetic properties of stainless steel. Going through the pages of this fascinating Brochure you will be struck (as I was), by the sheer size of Linda Bakke's sculpture of an Elk from Stor-Elvdal Municipality, not far from Oslo in Norway, as well as her sculpture of the skull and tusks of a mammoth that were recovered in a nearby melting glacier, dating back more than 50 000 years. There are so many examples of fine sculptures and street furniture which highlight the seemingly limitless imaginations of those who work with this truly remarkable material. Other stand-out examples from the following pages are the Dalton Cumbrian Facility, which

uses a most unusual 316 stainless steel which has been mirror-finished and coloured black. The effect is stunning. And the mis-shaped design of the Stadhaus Ballhausgasse, in Graz, Austria, which looks as though the photograph has been taken through a mis-shaped mirror. And another unusual design is the Music Theatre and Exhibition Hall in Tbilisi, Georgia. All of the examples shown in this Brochure are interesting in themselves, but one more which I would like to mention is the unusual sculpture outside the Tokyo Station, which has fresh plants growing from one side, emphasising the environmentally friendly nature of stainless steel. In my introduction to the 4th Edition, I mentioned that "For me, the milestone achievement over the years since the Millennium has been the amazing growth of the development of stainless steel as an "art meets function" tool in the architectural sector. Our Architectural Brochures series will reveal immediately how the architect, as artist, has used stainless steel creatively to design something which is more than a building, more than a sculpture or more than a structure. And the best thing is that whilst creating a thing of beauty, the designer is adding to the sustainability of our world, because the stainless steel he uses is capable of being 100% recycled when it comes to the end of its useful life, thus adding immeasurably to the value of life on earth."

I must once again express my appreciation to our Fellow from Nisshin, Naoki Yasuda, who has worked so hard to collect the contributions for this issue and to obtain permissions to reprint the material; to Jo Claes, our Administration and Communications Manager, who ensures that deadlines are met and is responsible for the superb design of these pages; to our members who worked so hard to find unusual and informative examples and to submit the details to us; and, finally, to the architects, designers and photographers, who so willingly gave their permissions for us to reproduce their work in these pages. Our goal is to provide inspiration to you and your customers to continue the excellent work that has already been done in the ABC sector and I will end by encouraging you all to continue to make a note everytime you see something unusual or especially beautiful and send us the location and as much information as you can. Wherever there is a shortfall in our available background stories we usually turn to Mr. Google for his help.

John Rowe  
Secretary-General  
International Stainless Steel Forum  
Brussels

## The Big Elk

### Atna, Norway

The Big Elk is the world's largest elk sculpture. It stands on Bjøråa picnic area in Stor-Elvdal municipality midway between Oslo and Trondheim along Highway 3. It was manufactured in China by Dry Art Limited and the size is 10.3 meters high and 11.5 meters long. The sculpture was given as a gift to Stor-Elvdal municipality from Sparebanken Hedmark's art fund. It was unveiled on October 15, 2015. The Big Elk is part of NPRA project "Trafikantens experiences".

The landmark in Eastern Valleys intends to function as:

- Mental attention turns to the road and road safety in the area
- Reference point between Oslo and Trondheim
- Ability to stop and see / experience, stretch your legs, and with this combat fatigue
- Setting focus on venison issues (Stor-Elvdal is the third largest elk municipality)
- Be an identity reinforcing symbol regionally
- Lockers enthusiasm locally, nationally and beyond borders
- Open for development and innovation in Eastern Valleys.

Sparebanken Hedmark art fund has provided 2 million NOK in a gift to produce the sculpture.

Environment:	park side
Material:	316 high-polished stainless steel
Manufacturer:	Dry Art Ltd.
Artist:	Linda Bakke
Photographs:	Linda Bakke
More information:	<a href="http://lindabakke.webs.com">lindabakke.webs.com</a>





## Mammoth

### Favang, Norway

“Mammoth” by Linda Bakke is an exact recreation of a mammoth skull, but double in size. Gudbrandsdalen is unique nationally in terms of mammoth finds, and Fåvang is the location in Norway with the most recorded examples of surviving remains. From the sculpture “Mammoth”, you can see straight across to the gravel pit in which the mammoth tusks were found. The gravel deposits were left by a river of glacier water that also brought the items dating 50,000 to 100,000 years back in time. “Dragon” in Ringebu and “Mammoth” in Fåvang are two sculptures that call attention to the link between the villages, and reflect the distinctive character and interconnection, and at the same time allude to the local identity and history, of the two communities. The sculpture is made of stainless steel, grade 316, and has been created using many small pieces that have been hammered, adapted, welded, brushed, and polished. Linda Bakke (born 1973) is from Stange, and works with sculptures and art in public-space projects that are location specific, visually striking, and often laden with mystical, historic, or mythical content.

Environment:	park side
Material:	316 high-polished stainless steel
Manufacturer:	Sino Sculpture
Artist:	Linda Bakke
Photographs:	Linda Bakke
More information:	<a href="http://lindabakke.webs.com">lindabakke.webs.com</a>





## Isabelle

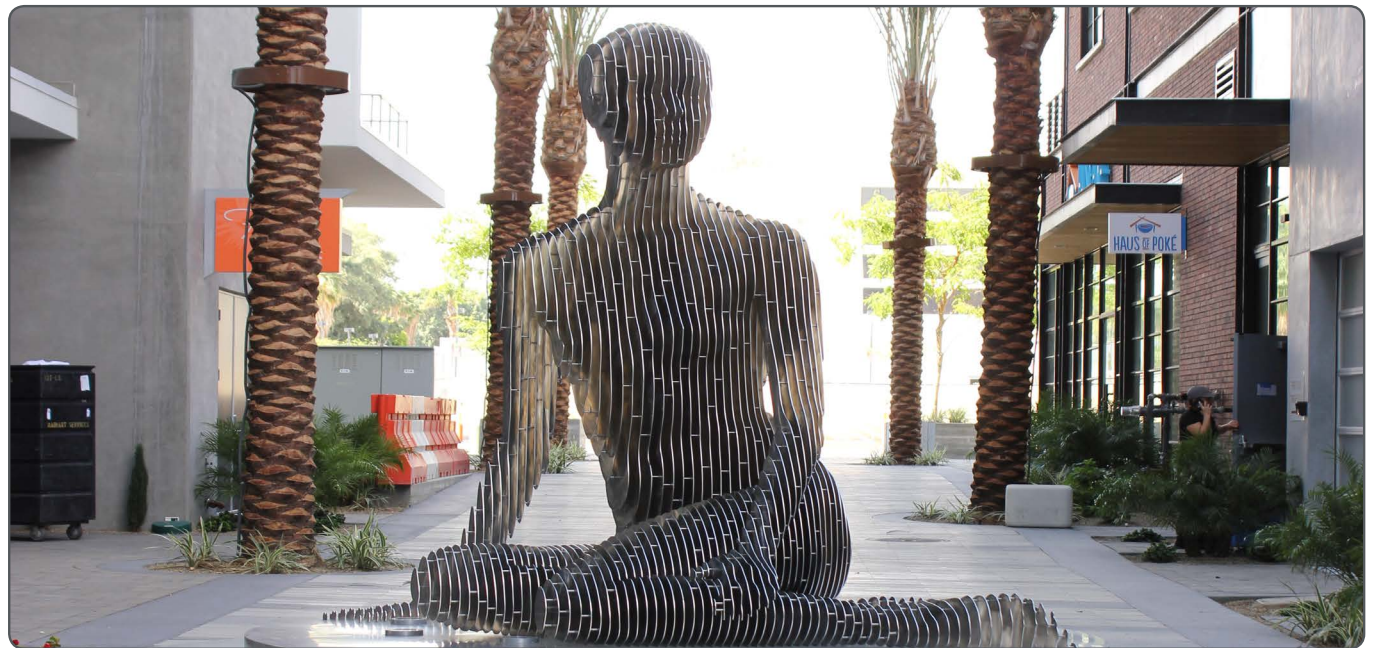
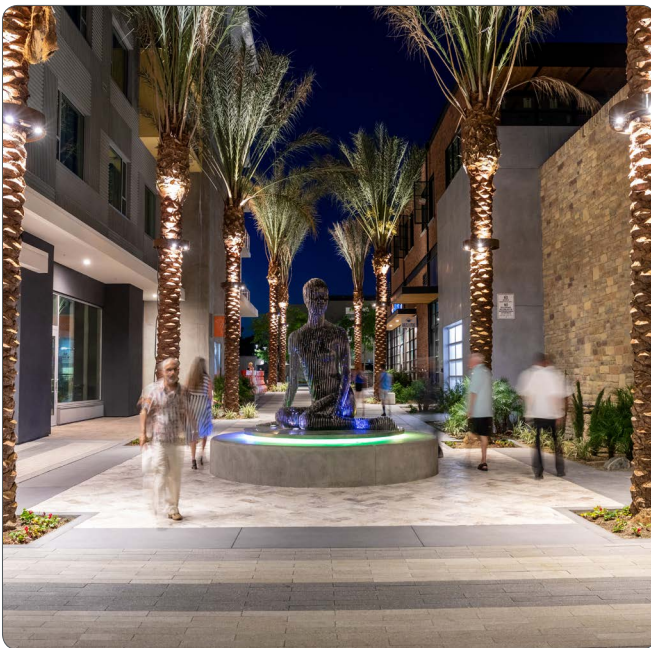
### Palm Springs, USA

Tourists and locals are gawking at the new public art installation in front of the Rowan Hotel in Palm Springs in California where a newly redeveloped downtown, now houses a stainless steel sculpture by German artist Julian Voss-Andreae, titled “Isabelle”.

The sculpture creates a visual illusion that is very much part of Andreae’s art aesthetic. Strips

of stainless steel are engineered to shape a silhouette of a woman posing on her side, but a glance on another angle, the statue disappears. Andreae mixes art with science, to create a piece of art that almost challenges the laws of physics, and Isabelle is not the exception. The Palm Springs city officials said there are more art installations on their way as part of their redeveloped downtown project.

Environment:	urban
Material:	304 stainless steel passivated to ASTM A-380 with a thickness 6.35 mm for the base and 2.67 mm for the slices
Artist:	Julian Voss-Andreae
Photographs:	Julian Voss-Andreae
More information:	<a href="http://julianvossandreae.com">julianvossandreae.com</a>







High Bar  
AT THE OUBAN

## Steel Stampede

### Aurora, USA

This wild stampede of thirteen horse silhouettes created by renowned sculptor, Douwe Blumberg, are individually created using stainless steel and cor-ten steel. Thus, creating a varying degree of color and pattern unique to each horse. The sculptures are fabricated using two identical silhouettes that are fitted together with an internal steel supporting structure. The sculpture is located galloping through the entrance of the Star K Ranch for the Morrison Nature Center in Aurora, Colorado.



Environment:	park side
Material:	stainless steel
Artist:	DOUWE Studio
Photographs:	DOUWE Studio
More information:	<a href="http://douwestudios.com">douwestudios.com</a>



## M+ Pavilion

### Hong Kong, China

M+ Pavilion is a two-storey exhibition and event space in the midst of the Hong Kong West Kowloon Cultural District. In September 2013, the Hong Kong West Kowloon Cultural District Authority launched an open competition for the design of the M+ Pavilion. The winning design went to the team of VPANG architects ltd + JET Architecture Inc + Lisa Cheung which stood out from among 100 international entries. The building was completed and opened to public in September 2016.

The architecture is represented as a Floating Art Platform. It is elevated on a berm, blending itself into the surroundings of the City Park by mirrored stainless steel external walls. In line with the overall City Park design concept of the West Kowloon Cultural District, the Floating Art Platform aims at offering a respite from hectic city life. It should be a simple, pure and clean space; a space situated away from city noise and pollution, a space that gives us a chance to open our hearts, relax our minds, and appreciate artwork amidst the backdrop of the cityscape. Mirrored stainless steel external walls are not only camouflaging, but also reverberating and witnessing the transformation of the surroundings and city in time. The elevated main exhibition space made the structure as if floating amongst trees and foliage

while the white walls filtered the environment noises. Art could be displayed, promoted, shared and embraced. It belongs to the city, near and dear to the heart of Hong Kong. Elevated walls are designed strategically with openings projecting the Pavilion to intertwine with its surroundings in a human scale:

1. A welcoming northeast conjunction to the Park linking the future M+ Museum
2. The northwest façade is close to main road for services access;
3. Southside waterfront facing connection in form of curved steps, which wrap around the central green berm, gradually bring the visitor from ground level of the park to the raised pavilion platform.

The VPANG design also explored the notion of ecology with the same smart simplistic approach as our overall concept, where the building, topographic landscape, wide spreading tree canopies works together forming a continuous whole. This extensive greenery addresses our emphasis on the incorporation of manmade and natural environment.

The main exhibition space has full length openable glazed doors to create connection between indoor and outdoor exhibition spaces to allow multiple disciplines and multiple exhibition or event formats.

Environment:	urban
Material:	3.0 mm thick stainless steel
Manufacturer:	Union Contractors Ltd.
Architect:	VPANG Architects and JET Architects and Lisa Cheung
Photographs:	VPANG Architects Ltd.
More information:	<a href="http://vpang.com">vpang.com</a>





## Dalton Cumbrian Facility

### Cumbria, United Kingdom

Mirror-black stainless steel Proteus HR panels clad a two-storey office/laboratory building that forms the major part of the £4.7million Dalton Cumbrian Facility (DCF), a joint venture between The University of Manchester's Dalton Nuclear Institute and National Decommissioning Authority (NDA).

Designed to accommodate around 50 postgraduate researchers, lecturers and operating personnel in a modern iconic environment, the facility comprises an ion-beam accelerator hall with analytical and inspection laboratories, computer modelling facilities, meeting and seminar rooms, and offices.

Its location was chosen by the university to take full advantage of the area's nuclear ties, with the National Nuclear Laboratory's extensive R&D and engineering facilities at the Central Laboratory on the Sellafield site and at Workington.

It is fostering strong links between academia and industry that will maximise the impact of academic nuclear research in the areas of radiation science, radiochemistry, nuclear engineering decommissioning, and the management of radioactive waste.

It is set to achieve global recognition as a trusted provider of fundamental and applied research in support of the civil nuclear energy programme

as well as being a major contributor in the training of existing and future nuclear experts and professionals. BREEAM rated "Very good", its architectural expression is strongly influenced by the colour and texture of the surrounding rugged countryside. The Proteus panels on the façade of the two-storey building are carried through to the soffit of a cantilever exaggerating the slope of the site. John Clarke, the NDA's executive director for business planning, and Britain's Energy Coast Board member, said: "The need for a world class nuclear research centre was a key part of the NDA's skills strategy."

Environment:	rural
Material:	316 mirror black polished stainless steel with a thickness of 0.8 mm
Manufacturer:	Rimex
Architects:	Wilson Mason and Partners Architects
Photographs:	PROTEUS
More information:	<a href="http://proteusfaçades.com">proteusfaçades.com</a>





## Porsche Pavilion

### Wolfsburg, Germany

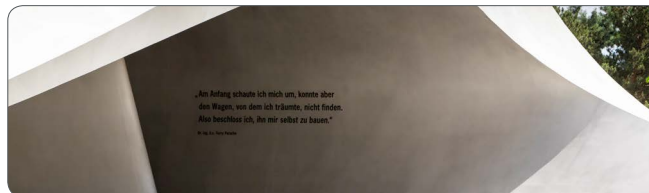
The organically shaped building is sitting – in mirrored location to the Volkswagen Pavilion- at the central axis of the theme park and offers 400m<sup>2</sup> of space for exhibitions and presentations. Its characteristic silhouette will become a distinctive icon amid the lagoon landscape of the Autostadt.

Curving lines and exciting bends make the Pavilion a dynamic yet reduced sculpture with its characteristics derived from the Porsche brand image. As designed by HENN, the structure captures the dynamic flow of driving with a seamless building skin. Its lines pick up speed and slow down just to plunge forward in large curves with ever-changing radii. A matte-finished stainless steel cladding forms the flush envelope of this vibrant structure, creating the impression of a homogeneous unity, whilst creating a continuously changing appearance depending on light and weather conditions. At the entrance the pavilion cantilevers 25m over the lagoon's water surface in front. Below the cantilever of the large asymmetrical roof, a sheltered external space opens up. This space is visually connected to the surrounding landscape, but forms its own acoustic enclosure, providing seating for a few hundred guests. Architecture and landscape, interior and exterior as well as roof and façade are brought

together by HENN in their architectural concept of a coherent, flowing continuum. The external area around the pavilion was designed by landscape architects WES and integrated into the overall concept of the theme park.

This is how the new piazzetta creates a connection between the Porsche Pavilion and the adjacent Volkswagen Commercial Vehicles Pavilion by means of water features and trees. By walking around the sculptural Porsche Pavilion, further highlights of the Autostadt can be discovered. Similar to the monocoque construction technology used for lightweight structures in the automotive and aerospace industries, the building envelope forms a spatial enclosure whilst at the same time acting as load-bearing structure. A total of 620 sheets of stainless steel cladding with welded ribs were prefabricated in a ship-yard in Stralsund and assembled on site.

Tradition and innovation, performance and day-to-day-practicality, design and functionality, exclusiveness and social acceptance: These four antagonistic terms characterise Porsche's values and philosophy.



Environment:	urban
Material:	304 matt finished stainless steel with a thickness of 10-30 mm plate
Architects:	HENN Architects
Photographs:	HENN Architects
More information:	<a href="http://henn.com">henn.com</a>





## PANEUM

### Asten, Austria

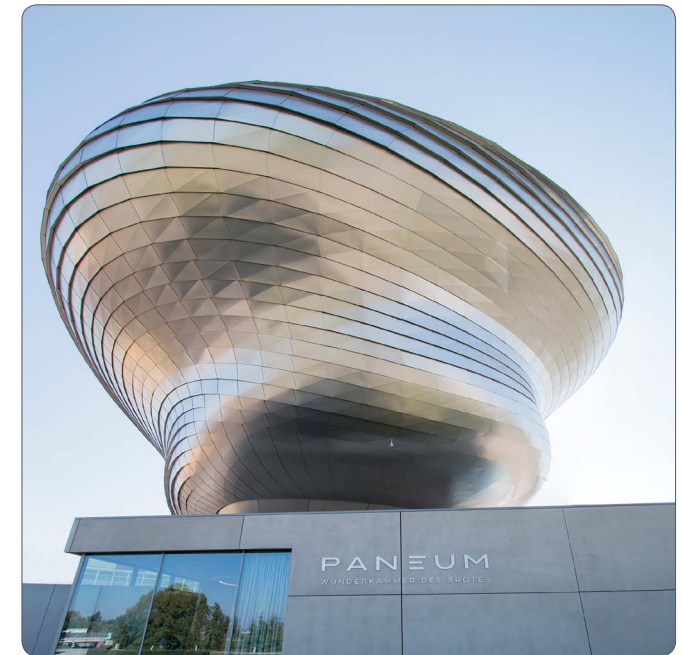
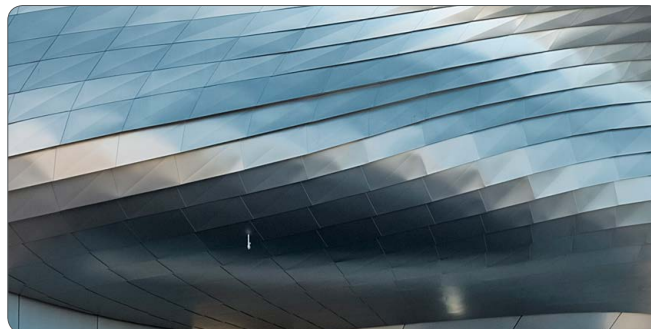
The Customer Information Centre and Event Forum PANEUM - Wunderkammer des Brotes - for the company Backaldrin in Asten consists of two elements: a box shaped plinth building with foyer and event rooms plus the "Wunderkammer des Brotes", a two storey freeform exhibition area floating on top. The chosen materials augment the contrast of these two elements: The square base building shows a cast-in-place concrete façade while the rounded wood structure of the museum is clad with stainless steel shingles.

The base building houses the event rooms and the adjoining rooms. This area can be used for a variety of events as presentations, receptions or workshops for up to 120 visitors.

The design of the exhibition area is based on the idea of a cabinet of curiosities, a concept for collections originating in the Baroque period. This concept is especially appropriate for the unusual and small-scale objects in the collection related to the topic "bread" which are presented in the exhibition area. For the exhibition concept and design Gruppe Gut from Bozen was responsible. The centre of the "Wunderkammer des Brotes" is formed by a circular atrium, in which selected items from the collection are individually suspended from the top, as in a differentiated crystal chandelier. The atrium is enclosed by

a spiral stair where visitors can look at the exhibited items from various perspectives. The stair provides access to the two exhibition levels, where the objects are presented with the help of walls, tables and cabinets that are integrated into the architecture. Additionally, all floors can be accessed by elevators. The atrium is naturally illuminated from above while the exhibition spaces have artificial light.

The self-supporting wood shell of the exhibition structure is visible in the interior. It is composed of layered circles of cross laminated timber. This method of construction enables the realization of the free form. The high degree of prefabrication with 3D CNC technology (Computerized Numerical Control) lead to a short building time. Leaving the precisely shaped wood timber exposed on the interior, with just a layer of paint, made additional interior finishes unnecessary.



Environment:	urban
Material:	316L (EN 1.4404) glass bead blasted stainless steel with a thickness of 1.0 mm and a total of 3680 panels
Manufacturers:	Aperam, Mirrorinox, Lummel GmbH & Co. KG
Architects:	Coop Himmelbl(L) AU
Photographs:	Markus Pillhofer
More information:	coop-himmelblau.at or aperam.com/uginox.com



PANEUM  
WUNDERKAMMER DES BRÖTES

## BMW Welt

### Munich, Germany

The realization of the technical building facilities for this Event Exhibition and Automobile Delivery Center led to a planning model with five thematic blocks: Hall, Car Delivery (Premiere), Forum, Gastronomy and Double Cone.

The main element of the building is a large, permeable Hall with a sculptural roof and a double cone figure which emerges in relation to the existing headquarters complex. The hall is a marketplace for differentiated and changing uses and an un-mistakable sign for the BMW Group. The interior topography creates differentiated spatial densities and fluid subspaces.

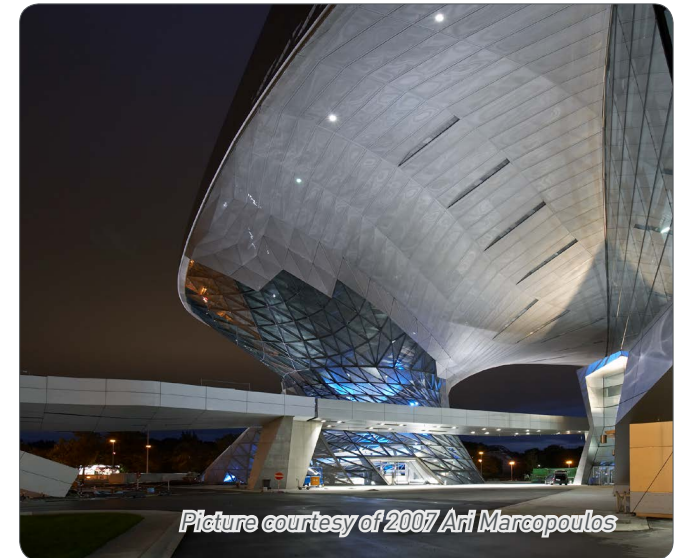
Sustainability is an essential aim of this concept. The entire building makes use of natural resources in its operation. Consequently, the building can operate with the lowest possible energy consumption and the natural resources are used directly and indirectly to meet all requirements.

Since the view onto the roof of BMW Welt as the fifth façade plays just as important a role in the communicative impact of the building's outer skin as the four walls, a traditional fan-like raised arrangement of solar cells facing south was out of the question.

In conventional systems the output of south-facing

cells in a reference year was about 16% higher than that of cells that were placed horizontally. However, the choice of special high-quality black glass-foil solar panels helped to almost balance out this difference. The installed solar power system has a nominal output of 810 kWp with 3,660 solar panels and an area of approx. 8,000 square meters. The solar panels were integrated flush with the surface of a stainless steel cover that fits over the actual roof drainage level. In this way, visible penetrations through the roof and visible exhaust structures were avoided. The interiors are a composition of monumental stairways, curved bridges and balconies that are held in the air. All spaces have protections of perforated stainless steel panels, which slow UV ingress.

Environment:	urban
Material:	316L (exterior) and 304 (interior) stainless steel, glass bead blasted and perforated with a thickness of 3.0 mm
Manufacturer:	Lummel GmbH & Co. KG
Architects:	Coop Himmelb(L) AU
Photographs:	2007 Ari Marcopoulos and Duccio Malagamba
More information:	coop-himmelblau.at



Picture courtesy of 2007 Ari Marcopoulos



Picture courtesy of Duccio Malagamba



*Picture courtesy of Duccio Malagamba*



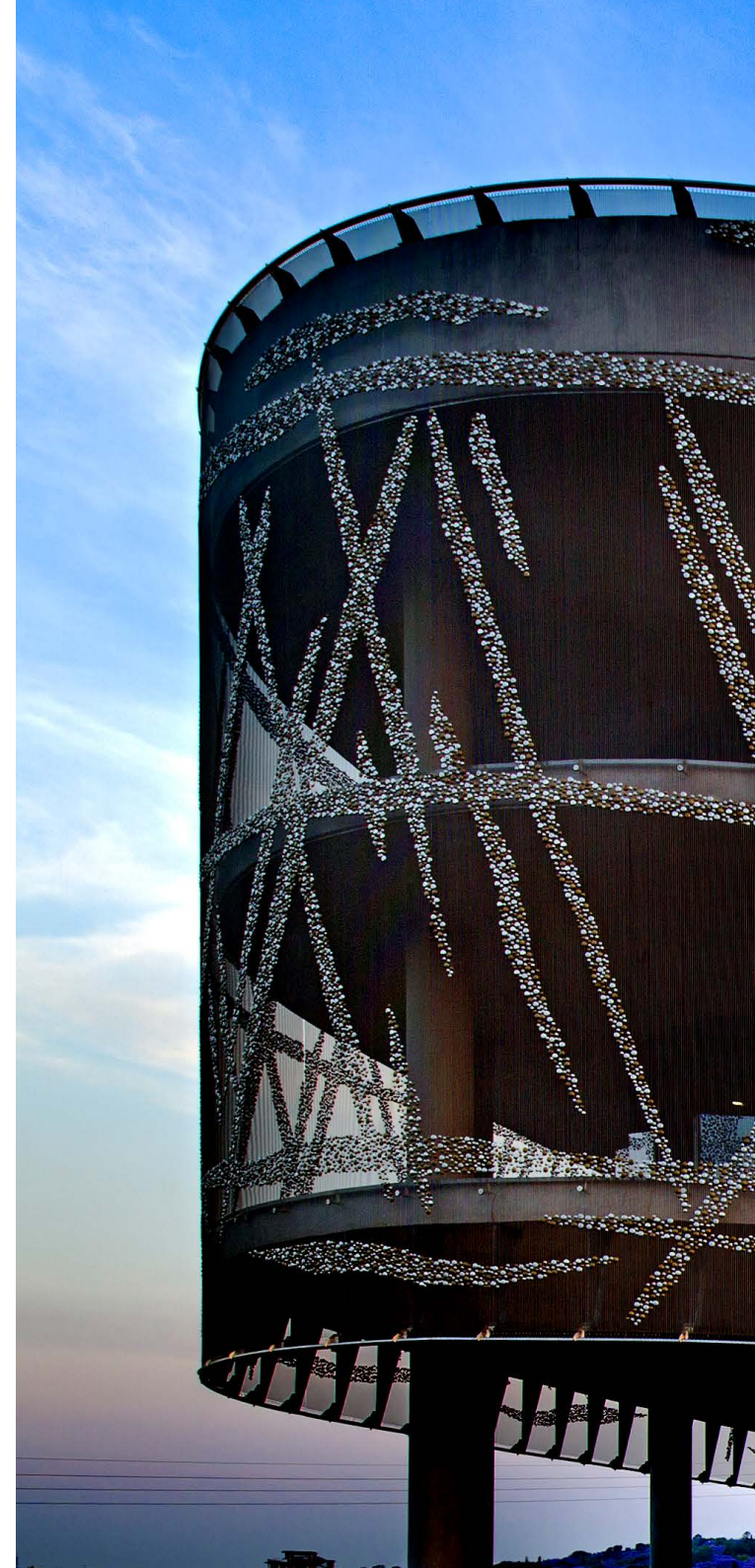
## Statistics South Africa Headquarter

### Pretoria, South Africa

Today, South Africa is one of the most important emerging economies. The national statistics authority, Statistics South Africa (Stats SA) in Pretoria, plays a key role when it comes to measuring the great progress. The South African architectural firms GLH and Terra Ether designed the building jointly and gave it an unmistakable face with a façade made of metal mesh from GKD. Adorned with more than half a million buttons, it conveys the authority's message in a visual and symbolic manner.

A total of 2,280 square meters of Omega mesh were used to create 41 panels with various widths and a height of 10.14 meters. When cladding the drum, the panels were bent and fixed in place using staples in such a way that they consistently follow the form of the building in parallel and on the same level. Terra Ether Architects not only chose the GKD mesh due to its special appearance and flexibility for the façades: on the drum the cladding also functions as effective solar protection as well as serving as a fall guard on the balconies. For its use in the office blocks, the proven solar protection function was decisive.

Environment:	urban
Material:	316 stainless steel
Manufacturer:	GKD-Omega
Architects:	GLH and Terra Ether / GKD
Photographs:	GLH-TE JV
More information:	<a href="http://gkd.de">gkd.de</a> or <a href="http://impetus-pr.de">impetus-pr.de</a>





## Le Monolith

### Lyon, France

The monolith is a real urban ensemble sited on the C island in the new Conference quarter to the south of the Lyon peninsula between the Saone and the Rhone. The project consists of constructing a 28,000 m<sup>2</sup> island in the Confluence area of Lyon, with an arrangement of housing, offices and commercial premises. It is part of the LyonIsland project designed to increase the housing quota in this part of the Lyon peninsula whilst at the same time trying to respect the social mix requirements and new environmental legislation. The monolith is part of the High Environmental Quality building

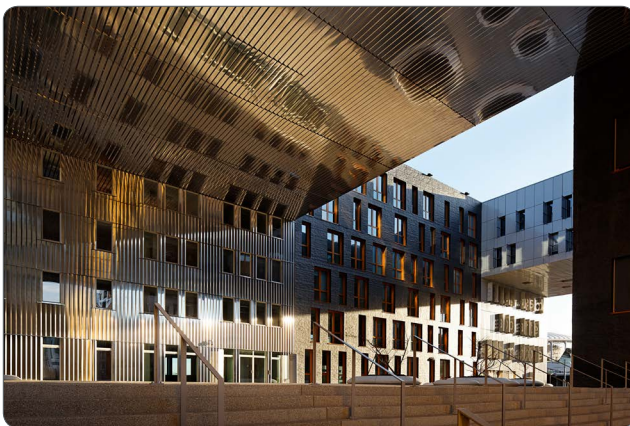
scheme for residential, office and commercial premises. Compact, and laid out around a central courtyard with access from three monumental doors, five architectural teams each shared a part of the project.

The façades and soffits of the bridge are in Uginox Bright stainless steel which reflected in the garden. The stainless elements are classic blade shapes which interlock one into the other. Industrially produced they are perfectly flat with easy fixing.

From this single volume, each architect found their inventive area and developed one of the parts from the common whole. Our part was essentially made up of offices, laid out in a

sculpted voluminous format to form a huge antagonism above the internal street which looked out onto the large central park as though to absorb it.

The façades are clad in Uginox bright mirror sheets. Most of which are crafted to form large helixes which sketch out the imaginary flowers, a reminder of the park on to which the Monolith opens out. The mirror finish allows the multiple reflections of the countryside opposite, lightening the antagonistic roof which fades into the reflections and creating a kaleidoscope area, somewhat imaginary in the middle of this architectural rigour.



Environment:	urban
Material:	304 Uginox Bright stainless steel with a thickness of 0.8 mm
Manufacturer:	Uginox / Aperam
Architects:	Manuelle Gautrand Architecture
Photographs:	Vincent Fillon
More information:	<a href="http://manuelle-gautrand.com">manuelle-gautrand.com</a> or <a href="http://aperam.com">aperam.com</a>







A LOUER  
Loyer commercial

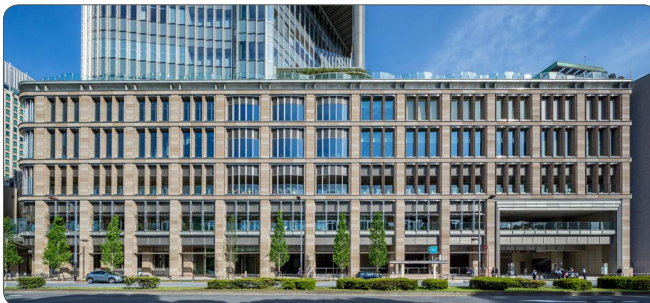
A LOUER  
Loyer commercial

## Tokyo Midtown Hibiya

### Tokyo, Japan

Tokyo Midtown Hibiya was built on a corner facing Hibiya Park, on the site of old business buildings named “Sanshin Building” and “Hibiya Mitsui Building”. The lower part of the new building follows the wall image of “Sanshin Building” which was highly evaluated as the Art Deco style, and its west side façade is facing to the Hibiya Park which is known as a green oasis in urban Tokyo. Thus it was needed to have harmony and continuity between the green of the park and the façade in west part of building. In the concept of Tokyo Midtown, the Tokyo Midtown Hibiya is

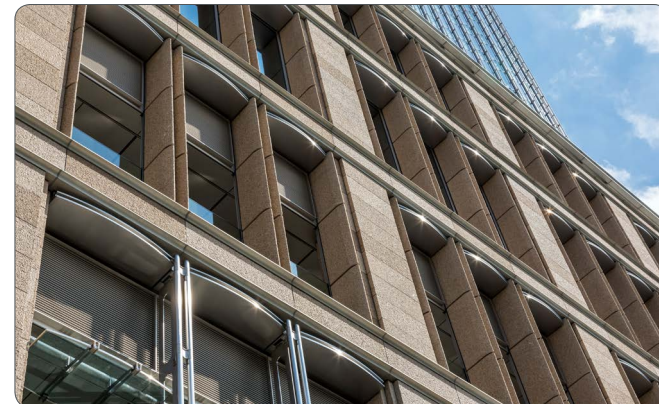
Environment:	urban
Material:	304 (NSS445M2) stainless steel
Finish:	304-HL (NSS445M2-HL+PHL) (vibration) with a thickness of 2.0 mm
Manufacturer:	Kikukawa Kogyo Co., Ltd. / Nisshin Steel Co., Ltd.
Architects:	Nikken Sekkei Ltd.
Photographs:	Kikukawa Kogyo Co., Ltd.
More information:	kikukawa.com or nisshin-steel.co.jp



the second project of a series of the Roppongi project. The main subject is “Getting better as times passes”. It is the opposite image from the aging. With the characteristics of each city, it is considered the realization of remarkable exterior design.

The stainless steel mullion, which extends over 11 spans to the second floor part on the west side façade (park side), is a combination of stainless steel pipes (dia. 76.3 mm) and stainless steel plates (thickness 12 mm). The frame of the glass handrail is stainless steel. The designer has given a lot of emphasis to materials including stainless steel products in detail since the master plan stage. In order to realize the design, the consideration has been repeated in the quality controls and technical proposals from an early stage.

Stainless steel plate with three large long holes is an element of the shaft joining each rod, glass frame, and glass handrail frame; its accuracy directly leads to the quality of the whole unit as



it is. In order to smartly connect the mullion and the rod while maintaining the accuracy, stainless steel lost wax casting was adopted for the joint member, and the mechanism inside the pipe was devised in order to bring out the street of the rod. As machining requires precision, Kikukawa Kogyo responded by making full use of the know-how of the latest equipment, such as using a 3D cutting laser cutter at the notch of the pipe. The low-rise section border, drainage and eaves are located in a difficult place to maintain, therefore NSS445M2, which is a ferritic stainless steel and is more corrosion-resistant than grade 316, was adopted for the material. Among them, the eaves border panel, like a glass canopy, has a round-shaped design in the horizontal direction, and a Hair Line finish is adopted, and in order to suppress the reflection of lighting, the PHL finish was adopted, so it was a product with high processing difficulty to ensure quality.



## Shanghai Bund Financial Centre

### Shanghai, China

The Bund has been Shanghai's most prestigious stretch of waterfront since the nineteenth century and the design of the Shanghai Bund Financial Center has been created as a symbolic connection between the old part of Shanghai and the new financial district. The master plan for the site was created by Heatherwick Studio and Foster & Partners and includes offices, a boutique hotel, luxury retail space and restaurants around a plaza. At the core of the scheme is an Arts and Cultural center. The development's construction began in 2010 and was completed in 2016.

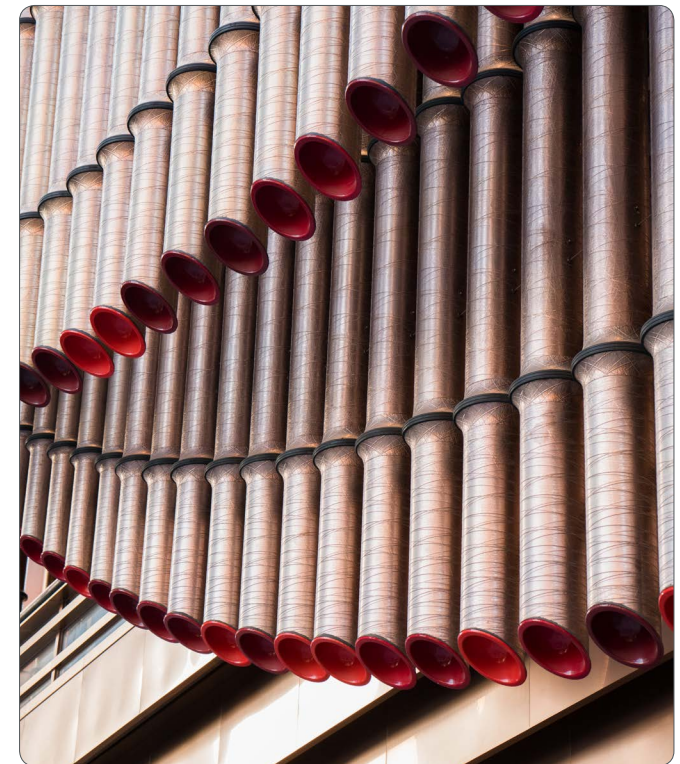
15,000 square meters of PVD stainless steel in Rose Gold were used across the development for façades, cladding, glazing bars, panelling and of course the extraordinary veil of bamboo tubes which drapes around the Arts and Cultural Centre. The 420,000 square meter site had been unoccupied for some years but now has become a fitting landmark representing the long-standing prosperity of the Bund.

The style of architecture within the Financial Centre is a departure from the "show off" architecture so often deployed in China's grand schemes – the often seen towers of glittering glass and with smooth, anodyne exteriors and a non-colour palette. The Bund's square buildings are stepped, tapered and layered to create not

an intimidating urban backdrop but one that embraces – despite the admittedly very tall anchoring pair of towers at the south end. This style creates an exciting and unusual architecture that has its own way of being impressive. It certainly provides an opportunity to showcase the materials used on this development - Rose Gold PVD stainless steel and bronze granite.

Windows have irregular criss-crossings of bars of the PVD stainless steel creating a grille reminiscent of a Chinese screen. In concordance with the motif of the tapering towers the gaps between the horizontal bars decrease as they advance upwards. Picking up on the emblem of the irregular rectilinear shapes some windows are "blacked out" completely with, instead, panels of PVD stainless steel in Rose Gold with square indentations. These panels appear almost as external works of abstract art. The buildings directed towards the embankment echo the proportions and spacing of the grand and prosperous nineteenth century buildings which are found along on the Bund. The Plaza is meant to be enjoyed at night and the buildings take on a golden glow as light is reflected from the Rose Gold PVD used extensively on the buildings' exteriors.

Environment:	urban
Material:	316 PVD-coloured (rose gold vibration) stainless steel
Manufacturer:	Double Stone Steel & John Desmond Ltd.
Architects:	Foster + Partner
Photographs:	John Desmond Ltd.
More information:	<a href="http://doublestonesteel.com">doublestonesteel.com</a>





## Magnocentro Plaza Building

### Mexico City, Mexico

In 1997 PES Group did some research, it turned out that at that time it was more economical to use stainless steel than granite or other stone, hence the idea of covering the building with a stainless steel façade. Construction was finished in 2000.

Stainless 316 was chosen in order to prevent a quick deterioration.

Lino pattern finish was used to avoid dazzling people when driving because of the reflection of the sun on the façade. This pattern also hides any imperfections due to its "flatness".

The builder considers that stainless represented several advantages:

- The first one is that it is a material that does not decay, does not deteriorate over time, it does not require the maintenance that stone requires like cleaning and sealing the stone steadily, with chemicals and sealants
- With minimal maintenance cost the façade always looks like brand new, which is an important factor in terms of costs
- it is a poor heat conductor, which significantly decreases the consumption of air conditioning as well as electricity.

A video about this façade is available on Youtube: [youtu.be/Gm\\_x\\_gjNnjo](https://youtu.be/Gm_x_gjNnjo)



Environment:	urban
Material:	316 lino pattern finished stainless steel
Architects:	MEXDESA
Photographs:	MEXDESA
More information:	<a href="http://mexdesa.com">mexdesa.com</a> or <a href="http://iminox.org">iminox.org</a>







## Middle East Airlines Training Center

### Beirut, Lebanon

As Lebanon's first flight simulator training center and part of the Middle East Aviation Academy, this new \$50-million facility features a range of training divisions, a library and administrative offices. But its defining feature is the center's 62-foot-tall (19 m) domed conference center that houses a 300-person auditorium, cafeteria, kitchen and reception hall - along with serving as the facility's main entrance. Made from reinforced concrete and clad with triangular stainless steel panels and LED light joints between panels, the dome covers an area of 475 m<sup>2</sup>.



Environment:	urban
Material:	Aperam 316L with Uginox Meca 8ND (mirror finished)
Manufacturer:	Aperam
Architects:	Khatib & Alami
Photographs:	by courtesy of Khatib & Alami
More information:	<a href="http://aperam.com">aperam.com</a> or <a href="http://uginox.com">uginox.com</a>







## University of Leeds

### Leeds, United Kingdom

The new purpose-built home of the M&S Company Archive at the University of Leeds features extensive use of Proteus Engineered Façades' HR rainscreen cladding system which combines all the benefits of a Modern Method of Construction with the beauty of "bronze".

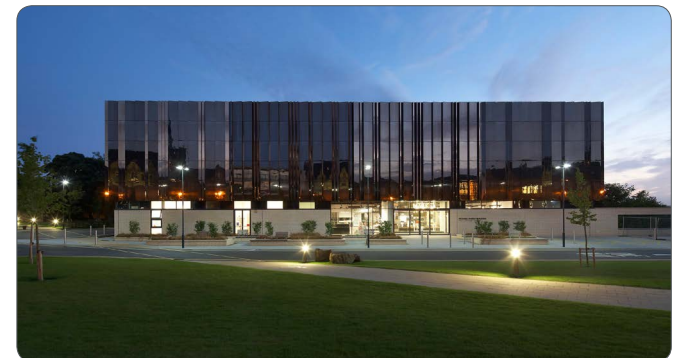
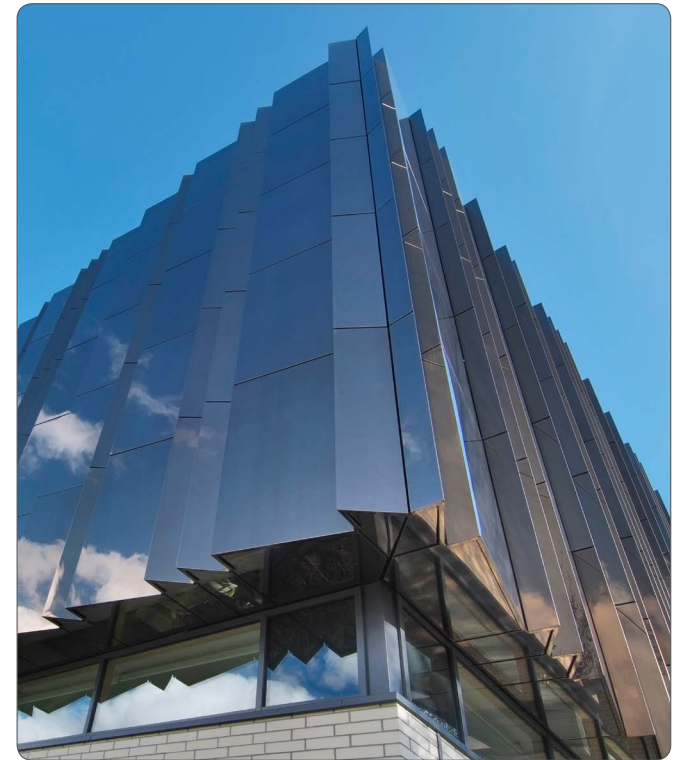
The £6million Michael Marks Building on the university's Western Campus follows the golden rule of architectural design "Form follows function", combining within the façade the high strength, low maintenance and excellent corrosion resistance of stainless steel with a visually contemporary finish.

The 3D façade was designed by the university's master planners Broadway Malyan Architects to represent the pages of a book or folds of a dress (some of the materials stored within) but although it appears highly complex, the brief response was to create a semi-unitised panel that could be installed onto a single-plane support system, reducing the complexity and time needed to install the façade.

Broadway Malyan were looking for an envelope system that would give the variety of panel sizes required for their design as well as flatness, a mirror finish and long-lasting aesthetics, with Proteus HR's lightweight aluminium honeycomb core providing a perfectly flat finish coupled with

very large panel sizes and recessed joints. Marks and Spencer "shadow" architects Darnton EGS said: "The project uses various innovative measures to achieve its BREEAM and sustainable status. However, the rainscreen façade system is a unique feature. The architects worked closely with Proteus Engineered Façades to develop a way of using the cladding systems in such a 3D manner. "The panels are very robust but lightweight, thanks to the aluminium honeycomb core structurally bonded to the lightweight metal skin. The façade consists mainly of two modular size panels, with dimensions carefully designed to suit metal sheet sizes."

Environment:	urban
Material:	316 stainless steel with a mirror bronze finish and a thickness of 0.8 mm
Manufacturer:	PROTEUS/Rimes Metal Group
Architect:	Broadway Malyan Architects
Photographs:	PROTEUS
More information:	<a href="http://proteusfaçades.com">proteusfaçades.com</a>





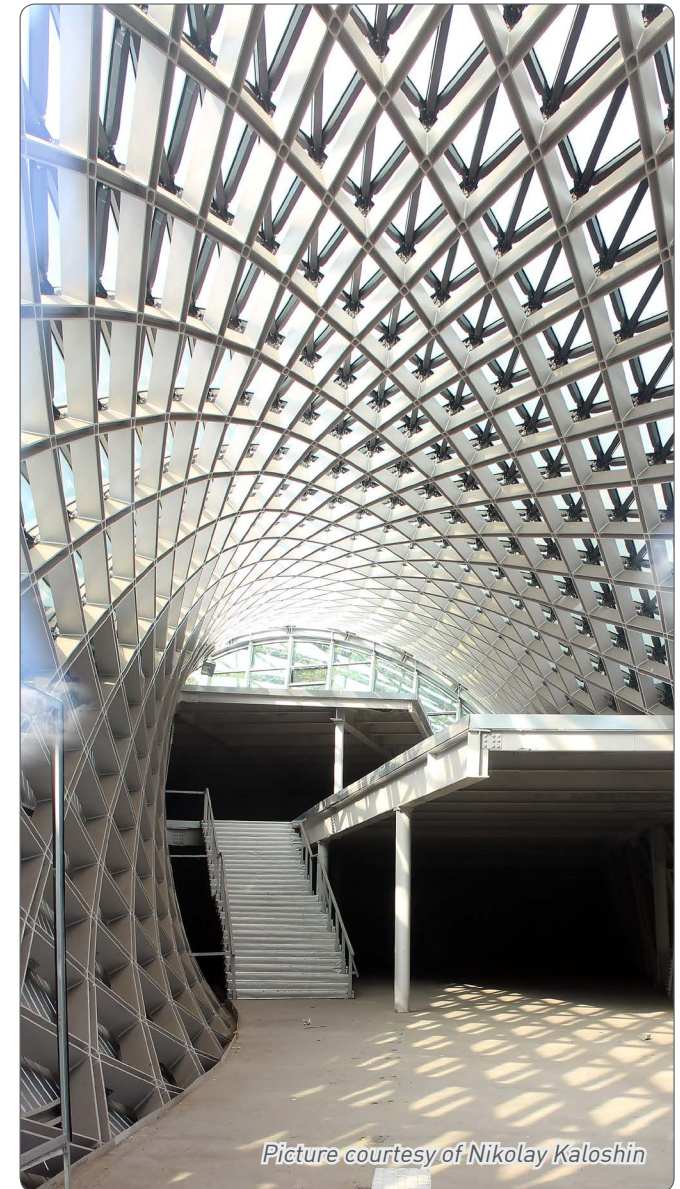
## Rhike Park - Music Theatre and Exhibition Hall

### Tbilisi, Georgia

The project site is located inside the green area called Rhike Park, in Tbilisi, Georgia. The building consists of two different soft shaped elements that are connected as a unique body at the retaining wall. Both structures are clad with stainless steel panels and inside the concrete and steel structure. Every element has his own function: The Musical Theatre and the Exhibition Hall. The north part of the building contains the

Musical Theatre Hall (566 seats), the foyer and several facilities, together with technical spaces for theatre machinery and various storages. The Exhibition Hall opens his great entrance with a ramp that brings visitors from the street level. The Music Theatre Hall, on the contrary, soars from the ground and allows the users staying in the foyer and in the cafeteria to have a view to the river and the skyline of the city. It is a periscope to the city and looks towards the river framing the historic core of the Old Tbilisi.

Environment:	urban
Material:	stainless steel
Architect:	Massimiliano and Doriana Fuksas
Photographs:	Joel Rookwood and Nikolay Kaloshin
More information:	<a href="http://fuksas.it">fuksas.it</a>





Picture courtesy of Joel Rookwood

# Elbphilharmonie

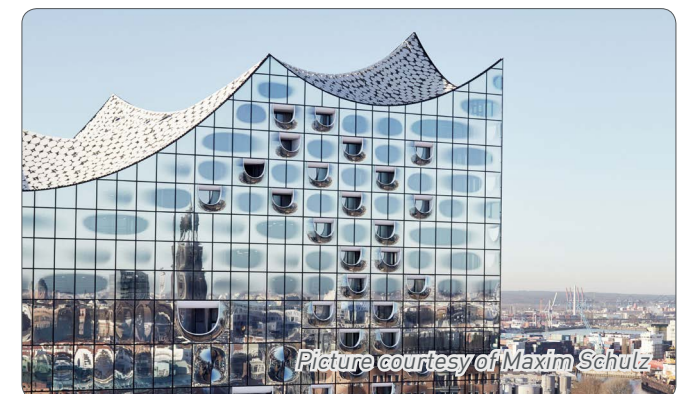
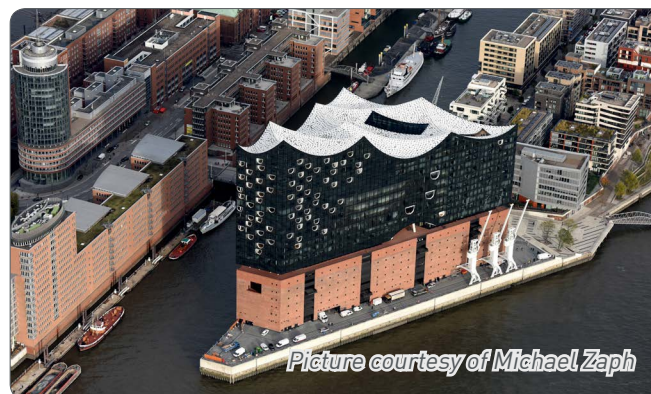
## Hamburg, Germany

The Elbphilharmonie is emerging directly on the Elbe at the peak of the harbour above the historical Kaispeicher A in which tea and cocoa sacks were stored right up until the 90s. The new building with its curved glass façades sweeps up above the gutted red clinker Kaispeicher and takes on the appearance of a huge glass ship. An 82 meter long escalator leads up to the public plaza on the roof of the old Kaispeicher at a height of 37 meters, where visitors are rewarded with a fascinating view of the harbour and city. The heart of the building is the large concert hall with 2,150 seats, which is set to become one of the best in the world. In addition, the building will also house a smaller concert hall with around 550 seats, a 5 star hotel with around 250 rooms, 45

apartments as well as restaurants and bars. The Elbphilharmonie is the cultural highlight of the new Hafencity area and is likely to become the centre of the city of music, Hamburg. Swiss architects Herzog & de Meuron defined extreme technical requirements for the single skin unitized glass façade. Both standard curtain wall units developed for the Elbphilharmonie comprise two modules each, 4.30 m wide, and 3.35 m high as well as 5.00 m wide and 3.35 m high. The vertical façade members of the spherically curved units in the Philharmonic area have been partly covered with a mirror polished high gloss sheeting made of stainless steel. The approximately 370 mirror polished, manually operated vertical tilt windows were also tailor-made for the Elbphilharmonie and serve the individual fresh air supply.

The horseshoe shaped cut out glass balconies in the residential areas resemble a tuning fork. The approx. 100 tuning forks made of glass fibre reinforced polymer (GRP) are outwardly curved and in addition have to support the loggia glazing. The pre-elements out of GRP comply with Fire Protection Classification B1 and were manufactured and coated brilliant white by the Chemnitz company Fiber-Tech Products GmbH. Gartner fitted these pre-elements with inner stainless steel reinforcements to support the structure as well as the three centimetre thick, double curved laminated triple glazing. The large loggia tuning forks were installed between the 12th and 17th floors of the Elbphilharmonie at a height of 55 to 75 meters.

Environment:	marine
Material:	304 and 316L mirror-polished stainless steel with a thickness of 1.0 to 3.0 mm
Architects:	Herzog & de Meuron
Photographs:	Iwan Baan, Maxim Schulz, and Michael Zaph
More information:	<a href="http://elbphilharmonie.de">elbphilharmonie.de</a>





Picture courtesy of Iwan Baan

## Kunsthalle Mannheim Museum

### Mannheim, Germany

The Kunsthalle Mannheim museum of modern and contemporary art was opened at the end of 2017 by Federal President Frank-Walter Steinmeier. As Germany's largest new museum building, it is a prime example of both civic commitment and architectural skill. The composition of roomforming cubes is visually connected by a sophisticated façade made of bronze-coloured stainless steel fabric from GKD – Gebr. Kufferath AG (GKD).

The atrium, which is covered by a glass roof and therefore flooded with light, grants fascinating views in all directions. The feeling of wide open space and cosmopolitanism stimulate a sense of curiosity among visitors to explore the other rooms.

This feeling is underlined by the stainless steel fabric façade cladding. The architects went with a significantly higher degree of transparency for the fabric in front of the large-format glazed surfaces than for that cladding the fiber cement panels in front of the cubes. This varying degree of transparency preserves the effect of the architectural concept, regardless of the viewing distance. Despite the colossal dimensions of the building's structure and façade, the woven skin loses nothing of its textile effect even from a distance.

The GKD wove stainless steel wires and tubes of two different diameters – 3 mm and 25 mm – into four-wire warp wire groups made of untreated stainless steel. The key here was to use weaving techniques to completely balance out the varying stress ratios in the fabric due to the differences in wire thickness, so that the façade would withstand the strict static requirements caused by wind and snow.

GKD's many years of experience with coating technologies and their effects on buildings proved invaluable here. For example, the wires were coated in a continuous process, while the tubes were painted together with the closures in a spraying process and all then interwoven with the untreated warp wire groups.

A total of 72 panels, each measuring around 20 meters in length and 3.26 meters in width, were used to create the sophisticated skin which lends the Kunsthalle its versatile face. With the discreet brilliance of the warm bronze tone, the finished fabric reflects the colour of the sandstone used in neighboring buildings. The large, stainless steel fabric façade measures over 4,600 square meters and changes its appearance throughout the day, in all weather conditions, from near or far.



Environment:	urban
Material:	316 bronze coloured stainless steel with a thickness of 3.0 mm for the wire and 25 mm for the pipes
Manufacturer:	GKD
Architects:	Von Gerkan, Marg and Partners
Photographs:	GKD/Constantin Meyer or Kunsthalle Manngem/ Rainer Diehl
More information:	gkd.de or impetus-pr.de







## La Sagrada Familia

### Barcelona, Spain

The Expiatory Temple of the Sagrada Familia began its construction in March of 1882. During the following years, until Gaudí's death in 1926, he collaborated with different architects, sculptors, draughtsmen and modellers, in new architectural solutions. After his death, the project went through different architects, always respecting the original idea, but economic problems and a fire during the civil war that destroyed scale models and plans created by Gaudí, forced to stop the works on several occasions. The incorporation of new technologies in the project brings it close to completion, scheduled for 2026, the year of the centenary of the great architect's death.

The use of stainless steel has been a constant during the project in recent years through a modular solution. In 2008, Roldan, S.A., the long product factory of the Acerinox group, began supplying duplex stainless steel reinforcing bars, that are significantly increasing its use from 2014 onwards. Durability is the main reason why stainless steel is being used in the construction of the upper levels of the towers. The difficulty of replacement and/or any future intervention, as a consequence of the corrosion of conventional rebar in a saline environment as is the case in Barcelona, would have a high cost. There is a large number of types of stainless

steel, however, the project team selected duplex 2205 (EN 1.4462) for its high resistance to pitting corrosion, characteristics to be taken into account in environments near the sea with presence of chlorides.

The assembly works of the different modules are carried out in the facilities that the Sagrada Familia has got in Galera, a small town eighty kilometres from Barcelona. At present, the panels with which central towers are taking height by means of the innovative process of tensioning the stone are being manufactured. This tensioning consists of stones with a specific shape and finish together with stainless steel structures (image 4). Thanks to this construction system, the towers can be raised more quickly and easily. For instance a level of the Tower of the Evangelists, which has a height slightly higher than 3 meters, can be assembled in the basilica in less than 6 hours.

Four to six tensors are used per panel, sewn with stainless steel rebars to join one piece with another. On each side of the panels there is a pillar made of stainless steel sheet and rebar, which connects each panel with the next one (images 1 and 2). When the assembly is too complex, as the Towers of the Evangelists in its final section, it is carried out entirely in Galera and finally concreted at the basilica.

In level 11 of the Tower "Mare de Deu", you

can see the circular metal structure which the different panels are assembled on. The wide area available allows to assemble simultaneously different levels of the paraboloid towers of the basilica.

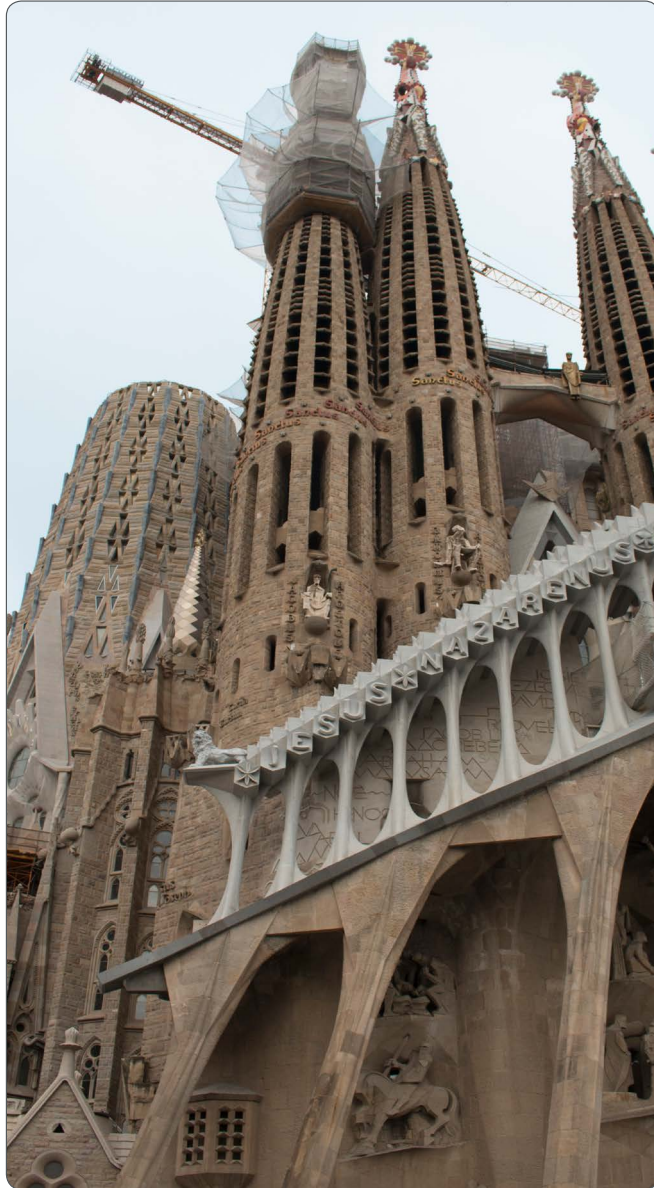
Once assembled and verified their correct fit, they are disassembled by pieces and packed in boxes for transport to Barcelona.

The Temple of the Sagrada Familia is a perfect example of how a current, versatile, machinable, transformable, durable and resistant material as stainless steel, can solve important problems in emblematic buildings, providing constructive solutions never seen before.

Environment:	urban
Material:	2205 (EN 1.4462) duplex stainless steel
Manufacturer:	Acerinox
Architects:	Antoni Gaudí
Photographs:	Acerinox
More information:	acerinox.com or cedinox.es



1.



3.



4.



2.



5.



## The Japanese Sword Museum

### Tokyo, Japan

The Japanese Sword Museum was relocated and re-opened in 2017. It conserves the Japanese swords, and to support the preservation and the development of sword forging and polishing techniques.

It was required to show the figure and shape like Japanese traditional sword pursuing functions and expressing eliminating all waste in the design of entrance and interior. Therefore stainless steel plate of the Silky Blast Finish was adopted for these parts because of their exquisite refracting appearance in the sunlight. Kikukawa's Silky Blast finish was chosen for its texture that realizes the concept, Japanese Sword.

Environment:	urban
Material:	304 stainless steel with a silky blast (shot blast) finish and a thickness of 3.0 to 4.0 mm
Manufacturer:	Kikukawa Kogyo Co., Ltd. / Nisshin Steel Co., Ltd.
Architects:	Maki and Associates
Photographs:	Kikukawa Kogyo Co., Ltd.
More information:	kikukawa.com or nisshin-steel.co.jp





刀剣博物館  
日本刀文化館

## Jeongok Prehistory Museum

### Yeoncheon, South Korea

Jeongok Prehistory Museum by France based-studio X-Tu architects is now complete. Located on a paleolithic site of major archeological significance in Jeongok, South Korea, the facility aims to provide a multi-sensory space that represents ranging environments and atmospheres from the prehistoric landscape. We wished to honour the riverside landscape which saw the birth of the first inhabitants of Korea, and acknowledge the beauty of the two hill curves echoing the river meanders.

How to enhance such a pre-existent form and its geological underground chasm?

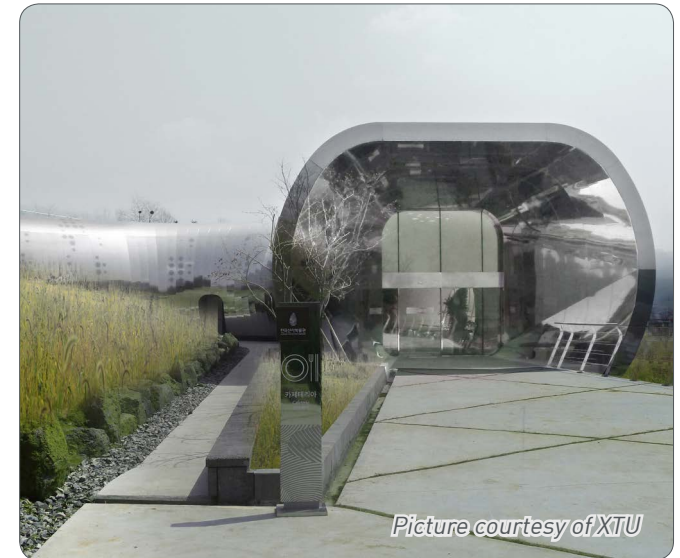
- by digging the chasm to let the Earth tell its history
- by alleviating the visual hold of the project in order to let the chasm express itself ;
- for this purpose, the building will be enched into the hill which has been hollowed out and the stockrooms will be located underground ;
- by curving the central part of the building so as to unveil the geological crack (and also the sun, from the edge of the crack) ;
- by clothing it in a « shimmering skin » which will reflect the precipice from underneath.

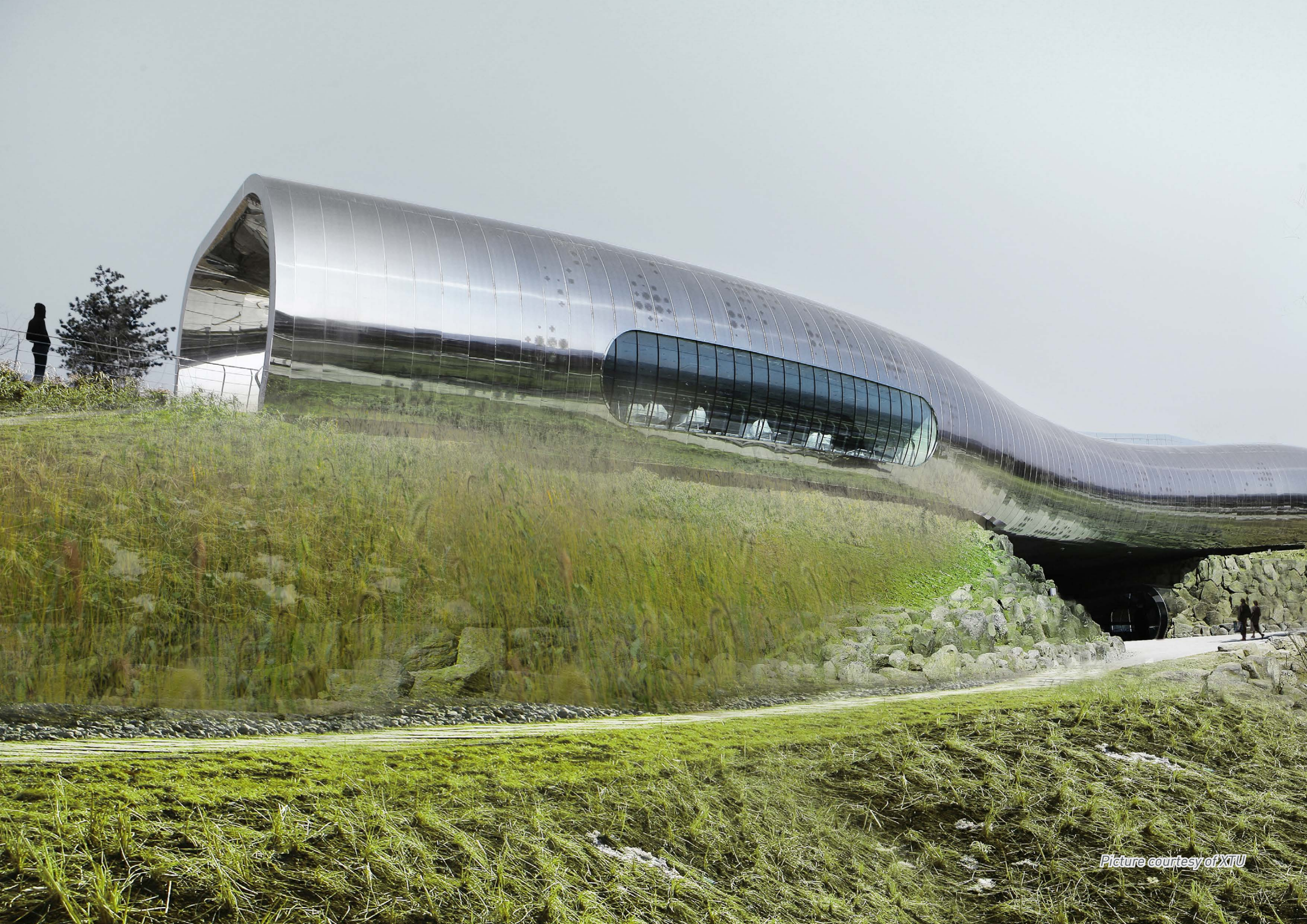
Thus set up, the project appears like a bridge stretched between two cliffs which can be seen from a long distance from the motorway.

A double metal envelope with various perforations, waving and soft, nearly organic, the front shimmers like a reptile skin; more or less glazed according to different places, changing with the light, it becomes a stainless steel mirror underneath which reflects the image of the chasm.

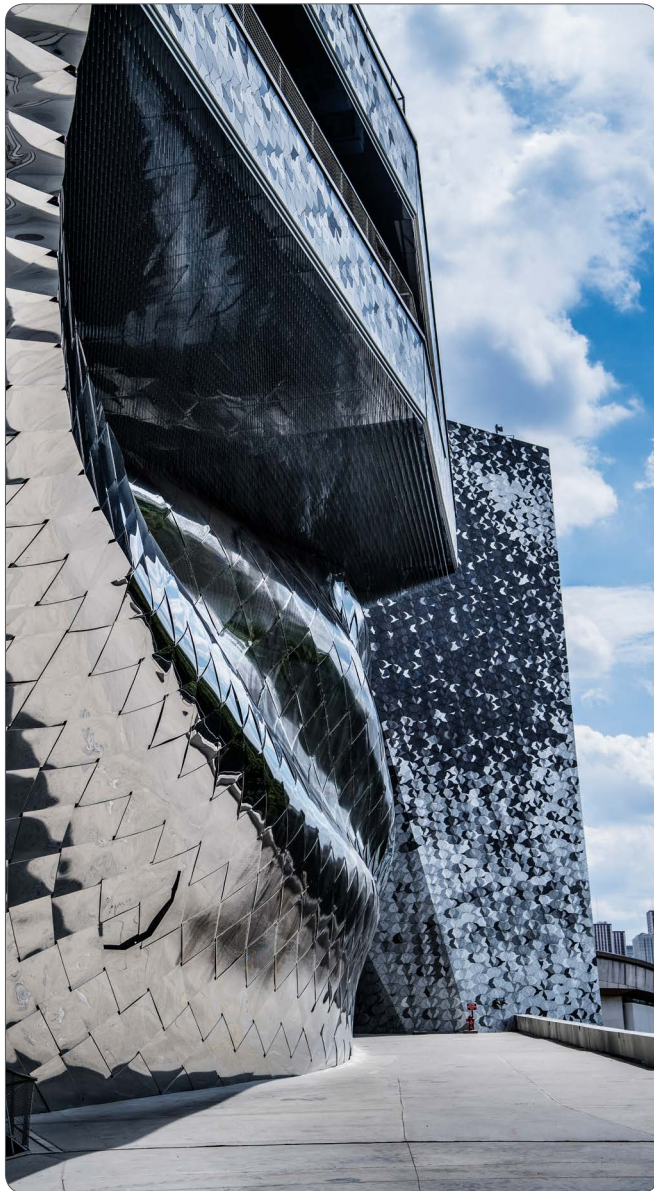
For the landscape from light and view, the envelope filters the light like a lattice. The double wall includes glazings and solar protections in perforated metal and makes it possible to have a perfect command of heat exchange of the building, in winter as in summer. The admission of natural light is adjustable according to the needs of scenographic effects. On the level of the cafeteria and the central space, panoramic windows open on the landscape.

Environment:	park side
Material:	mirror-finished stainless steel
Architects:	X-TU
Photographs:	XTU, Iwan Ban
More information:	<a href="http://xtuarchitects.com">xtuarchitects.com</a>





Picture courtesy of XJTU



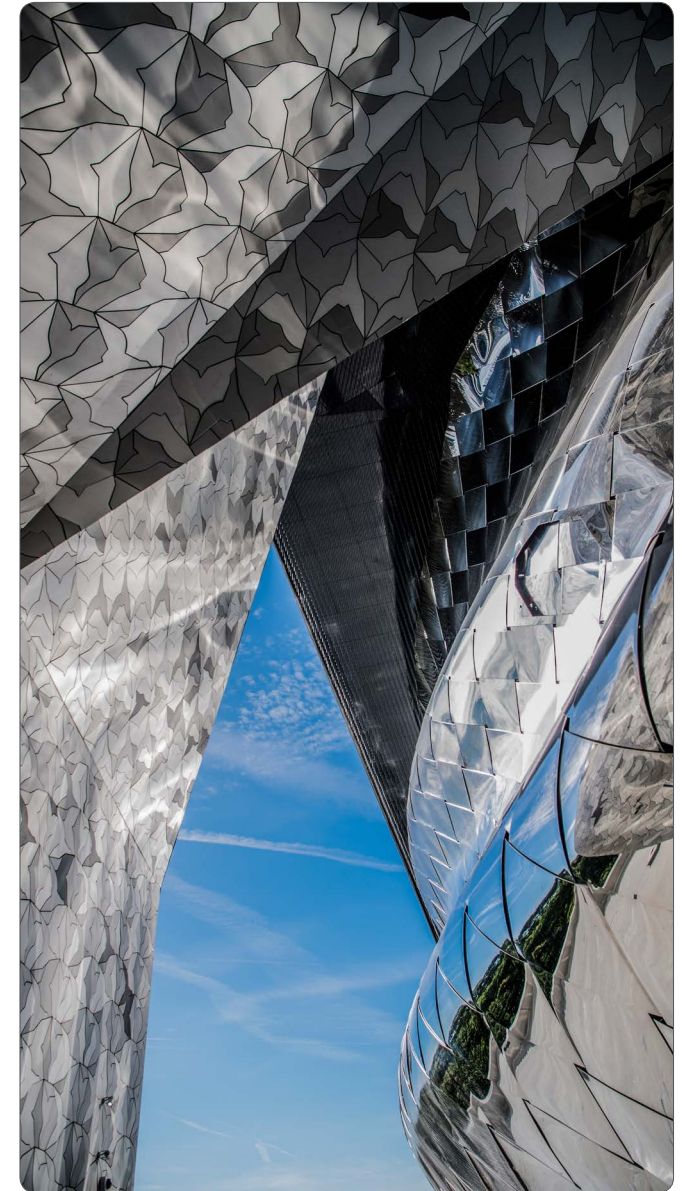
## Philharmonie de Paris

### Paris, France

The 3.600 capacity Philharmonie de Paris is an eye-catching landmark of the Greater Paris area. Its metallic cladding and angular shapes provide a unique, distorted reflection of the surrounding landscape, while its bird-inspired façade is a nod to the beauty being created inside. The highlight of the design is the bright, stainless steel plated Tourbillon, or whirlpool, that rises from the building's centre. In contrast to the matt outer layer, the shiny appearance of the stainless steel exaggerates the surrounding landscape.



Environment:	urban
Material:	Aperam 316L with Uginox Bright finish
Manufacturer:	Aperam
Architects:	Ateliers Jean Nouvel, Metra & Associés
Photographs:	William Beucardet
More information:	<a href="http://aperam.com">aperam.com</a> or <a href="http://uginox.com">uginox.com</a>





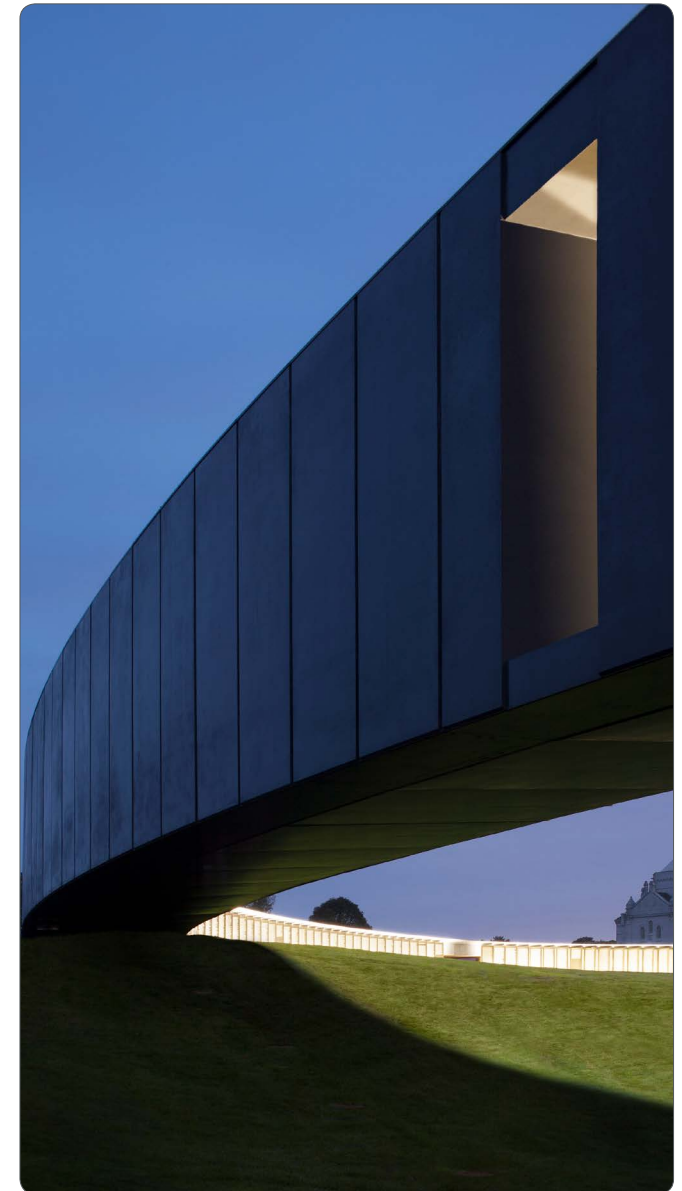


## International Memorial of Notre Dame de Lorette

### Ablain Saint Nazaire, France

In commemoration of the 100th anniversary of World War I, this monument is positioned on a hillside at Notre-Dame-de-Lorette and overlooking France's largest military cemetery. The focus of the monument is the Ring of Remembrance, a circular structure listing the names of the nearly 580.000 soldiers who lost their lives at the battles of Flanders and Artois. Thanks to its use of corrosion resistant coloured stainless steel, the names etched on to the ring's 500 panels will stand the test of time. Standing solemnly over the battlefield, the Ring of Remembrance is a work of art bridging the past to the present and spanning into the future.

Environment:	rural
Material:	Aperam 316L bronze coloured stainless steel
Manufacturer:	Aperam
Architects:	Philippe Prost Architecte / AAPP
Photographs:	adagp – 2014 Aitor Ortiz
More information:	aperam.com or uginox.com







Environment:	urban
Material:	Aperam 304 with Uginox Mat finish
Manufacturer:	Aperam
Architects:	de Alzua / ZigZag architecture
Photographs:	Sergio Grazia
More information:	<a href="http://aperam.com">aperam.com</a> or <a href="http://uginox.com">uginox.com</a>

## Archives Lille

### Lille, France

Lille's new Department of Archives not only serves as a striking addition to the surrounding landscape, it also plays an important role in preserving the trove of historic books and documents that call it home. The seven-story building is covered in perforated 304 grade

stainless steel mesh. Thanks to its matt appearance (Uginox Mat), the square building reflects the urban lights that surround it. By incorporating all existing facilities, the new building also adds a number of common areas, including interior patios that are bathed in warm natural light.



## Island Pavilion

### Wormsley, United Kingdom

The Island Pavilion and footbridge sit at the heart of a pastoral landscape just outside of Oxford, England. The project, which complements the nearby Wormsley House and Garsington Opera House, re-interprets the 18th century tradition for outdoor entertainment for 21st century performances. For example, its use of stainless steel not only recognises its invention in nearby Sheffield, it also provides the durability that a permanent, outdoor facility requires. The pavilion is designed to maximise views of the landscape and, in addition to hosting an array of summer operas, exhibitions and recitals, it is also home to Jeff Koon's stainless steel "Cracked Egg (Blue)" sculpture.

Environment:	park side
Material:	Aperam 316L with Uginox Top finish
Manufacturer:	Aperam
Architects:	Robin Snell and Partners
Photographs:	Graham Everitt - View Pictures Ltd.
More information:	<a href="http://aperam.com">aperam.com</a> or <a href="http://uginox.com">uginox.com</a>







## Congress and Music Hall

### Strasbourg, France

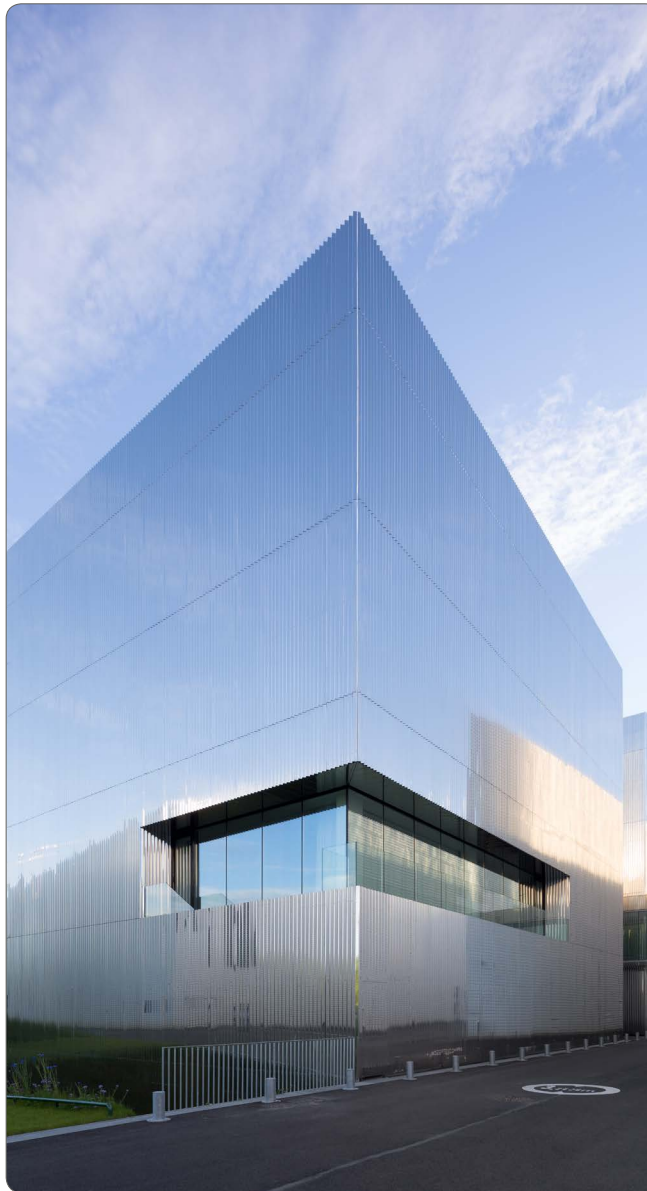
Thanks to a major renovation, Strasbourg's Palais de la Musique et des Congrès (PMC) has doubled its capacity and provided the Orchestre Philharmonique de Strasbourg (OPS), its resident symphony, with state-of-the-art facilities. The renovations optimize office space, add rehearsal rooms, improve acoustics and increase seating capacity. But it's not just the inside that benefits from these renovations, the outside facade has too. The 14 m stainless steel columns that encompass the site's three parts now stand as the PMC's architectural signature. The columns use a 304/1.4301 grade with a Uginox Mat appearance.

Environment:	urban
Material:	Aperam 304L with Uginox Bright finish and a thickness of 3 mm
Manufacturer:	Aperam
Architects:	Rey-Lucquet et associés Atelier d'Architecture / Dietrich I Untertrifaller Architekten
Photographs:	Bruno Klomfar
More information:	<a href="http://aperam.com">aperam.com</a> or <a href="http://uginox.com">uginox.com</a>









## CTLES Extension

### Bussy Saint Georges, France

Originally designed by Dominique Perrault, the Technical Centre for Books of Higher Education (CTLES) is responsible for preserving the documents of various French universities and research centers. A recent extension saw the addition of a pair of enormous mirrored-steel boxes connected to the original structure via a glazed bridge. Although designed to echo the style of Perrault's aluminum building, the extension is purposely detached so as not to distort the original building. The extension's use of ribbed panels of reflective stainless steel (Uginox Bright) reflects the sky and the greenery of the surrounding rural landscape while also offering a nice contrast the original building's matt appearance.

Environment:	urban
Material:	Aperam 304L with Uginox Bright finish
Manufacturer:	Aperam
Architects:	Antonini Darmon
Photographs:	Pierre L'Excellent
More information:	<a href="http://aperam.com">aperam.com</a> or <a href="http://uginox.com">uginox.com</a>



## McCormick Tribune Campus Center

### Chicago, USA

The McCormick Tribune Campus Center seeks to reinvigorate the urbanism inherent – but long since neglected – in Mies van der Rohe’s 1940 masterplan for the Illinois Institute of Technology. The large single-storey Campus Center provides a focal point for the previously sundered halves of the campus, and features a noise-absorbing steel tube wrapping the Elevated metro that runs directly over the building and, inside, a dense mosaic of programs including a bookstore, food court, café, auditorium, computer centre, and meeting spaces.

How to energize a campus that has half the population that animated it in the 1940s but now double its original footprint? To us, the conundrum implied a building that is able to re-urbanize the largest possible area using the least amount of built substance.

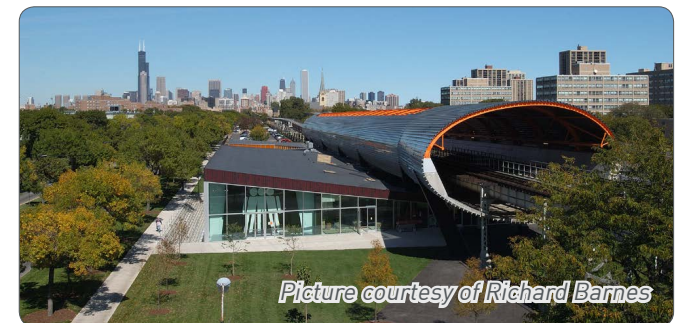
To create a new point of density for the campus, we located the building at the heart of IIT – a large rectangle between State and Wabash, 32nd and 33rd streets – and directly underneath the “L”, the artery that connects the campus to the rest of Chicago. By enclosing the tracks above the Campus Center in a muffling stainless steel cylinder, a formerly deafening no man’s land becomes a not only tolerable but a magnetic environment. The encircled track – known among

students spontaneously as the Tube – becomes a crucial part of the Campus Center’s, and IIT’s, image.

Rather than stacking activities in a multi-storey building, we opted to arrange each programmatic element of the Campus Center in a dense single plane that would foster an urban condition. To achieve this, in 1997 OMA carried out a study to map the “desire lines” of student foot traffic across the campus. These intersecting diagonal paths are maintained inside the Campus Center itself, linking the multiplicity of activities via a network of interior streets, plazas, and urban islands that form neighborhoods: 24-hour, commercial, entertainment, academic, recreation, and other urban elements in microcosm.

The unifying element of the Campus Center is the roof: a sloping concrete slab that protects against the noise of the L while encompassing the heterogenous programs below. Where the roof ducks beneath the “L”, the underside of the Tube juts through the concrete as a reminder of what’s above. The roof has a long overhang that embraces the adjacent Commons Hall, Mies’s original student centre, designed in 1953. The Commons has its original perimeter and interior wooden partitions preserved, and now functions as a food court.

Environment:	park side
Material:	stainless steel
Architects:	OMA
Photographs:	Philippe Ruault, Richard Barnes
More information:	oma.com





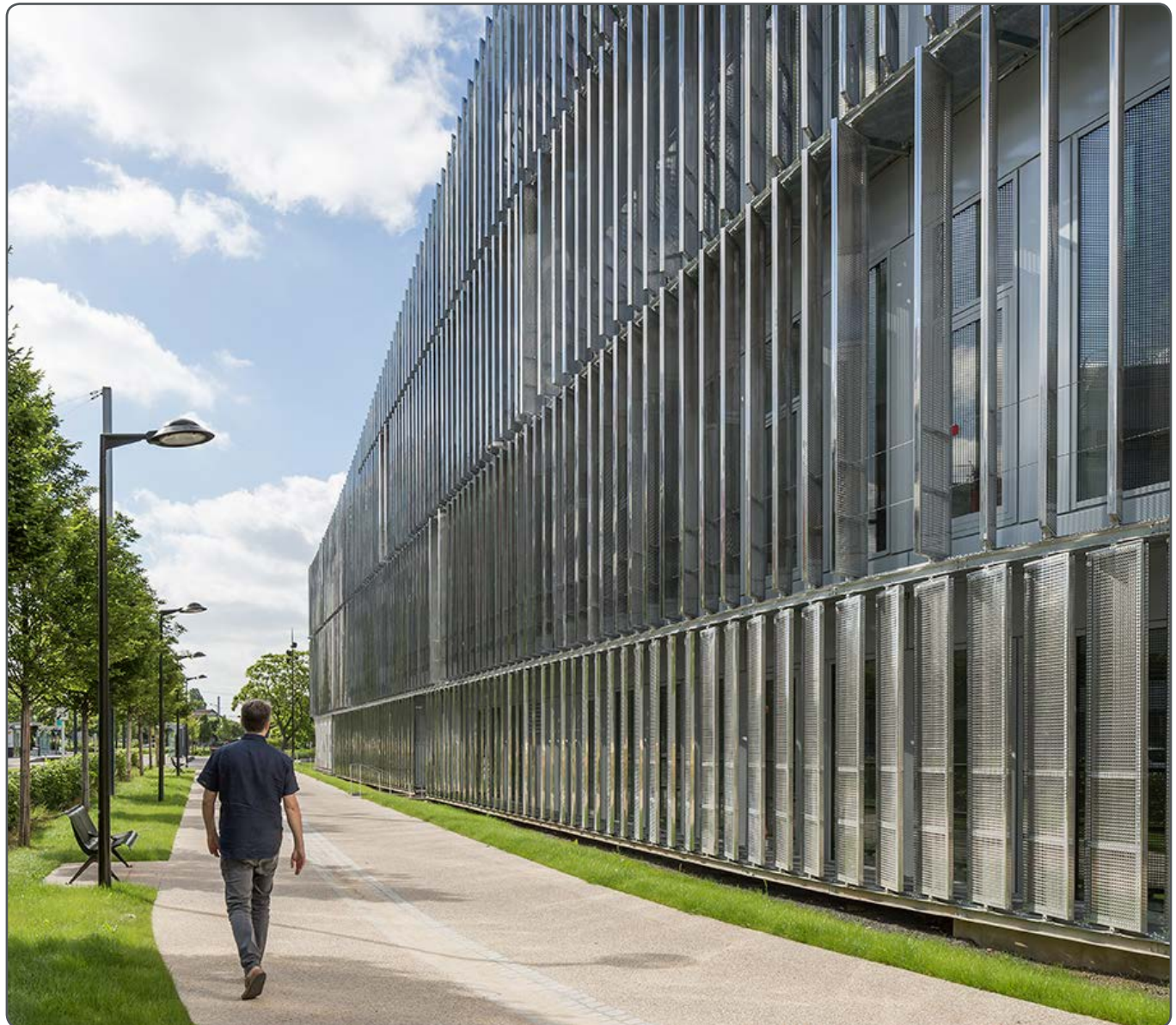
*Picture courtesy of Philippe Ruault*

# University Library of University Paris 13

## Villetaneuse, France

With a campus separated from the city center and comprised of conventional, two-story buildings, Villetaneuse University was suffering from an identity crisis. But with a new tramway connecting the campus with the city, the University saw an opportunity to boldly affirm its presence. The answer was the extension of the library which, sitting on the edge of town and along the tramline, serves as a gateway to the campus. The striking new triangular building's stainless steel cover (Uginox Bright) gives it a modern, industrial look, while its stainless steel shutters (grade 304) reflect the natural sunlight. Combined, these features give the library a subtle look of a bookshelf.

Environment:	urban
Material:	Aperam 304L with Uginox Bright finish
Manufacturer:	Aperam
Architects:	Bernard Ropa
Photographs:	Luc Boegly
More information:	<a href="http://aperam.com">aperam.com</a> or <a href="http://uginox.com">uginox.com</a>





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## Helix Bridge

### Singapore

The Helix Pedestrian Bridge spans the mouth of the Singapore River where it opens onto Marina Bay. It links the established Raffles Avenue district with the new Bay precinct that contains the Sands Resort and the Gardens By The Bay, and leads around to the CBD Financial District.

The project encompassed both the pedestrian bridge and a new vehicular bridge, the latter running straight across the river mouth. The pedestrian bridge is curved in plan to distance pedestrians from the traffic while also enabling pedestrians to connect from one bridge to the other at mid-span. The bridge is 285 metres long, made up of three 65 metre spans and two 45 metre end spans.

The source of inspiration for the structure was the DNA molecule. It provided a deceptively lightweight solution to a bridge that curves in plan and is tubular in section, this geometry being devised to integrate structure, deck and canopy within its overall 10.8 metre diameter.

The economy of material facilitated by the DNA-based structure prompted the Singapore Urban Development Authority to have the bridge fabricated in duplex stainless steel. The decision afforded opportunity to pare the members to minimal dimensions – the tubes are only 273 mm in diameter – and to craft the connections linking the spirals like tendons. Tiny LED spots are integrated into the tubes accentuating the delineation at night. The canopies alternate between fritted glass and steel mesh, creating

varied experience from their reflectivity and translucency.

These treatments caused us to consider the bridge as a ‘bracelet’ enfolding the mouth of the river at its opening to the bay. In order to facilitate views of boating events held on the bay, a series of oval viewing pods were added, appearing like studs along the bracelet.

The delicate tracery of the bridge’s double spiral has created a foil to the massive buildings that flank the shorelines, in particular the Marina Bay Sands Resort. The bridge acts as both a crossing and as a place of relief in this context, evidenced by the many Singaporeans and visitors that come to merely stroll and enjoy its experience.



Environment:	marine
Material:	duplex stainless steel piping
Size and volume:	273 diameter and 600 tonnes
Architects:	Cox Architecture
Photographs:	Christopher Fredrick Jones
More information:	<a href="http://coxarchitecture.com.au">coxarchitecture.com.au</a>







## Footbridge of Trumpf

### Ditzingen, Germany

The new footbridge over Gerlinger Strasse connects two production areas of the headquarters of Trumpf in Ditzingen and enables employees to cross the busy regional road safely. The bridge is a lightweight shell construction, which due to the high efficiency of the supporting structure is made of only 2 cm thin, double curved stainless steel sheets. The shell edge is reinforced by upstands which twist towards the four base points to form triangular bearing points. Further bracing in the shell surface were completely omitted. Pedestrians walk directly on the steel shell, which is coated on the walking area to prevent slipping. Holes corresponding to the flow of force were cut into the shell with Trumpf laser machines. The size and density of the apertures depend on the degree of utilisation of the supporting structure. In the area of the walking surface, the lasered apertures are replaced by approximately 14,300 smaller holes filled with glass plugs. The bridge was welded together on site from several individual parts and lifted into its final position by a heavy-duty crane. The lightness of the bridge is underlined by the very transparent and anti-reflective allglass railings. Barkow Leibinger (Berlin) supported us with architectural consultancy.



Environment:	rural
Material:	duplex (Forta DX 2201/ EN 1.4462) stainless steel
Manufacturer:	Outokumpu Oyj
Architects:	Schlaich Bergermann & Partner
More information:	sbp.de or outokumpu.com





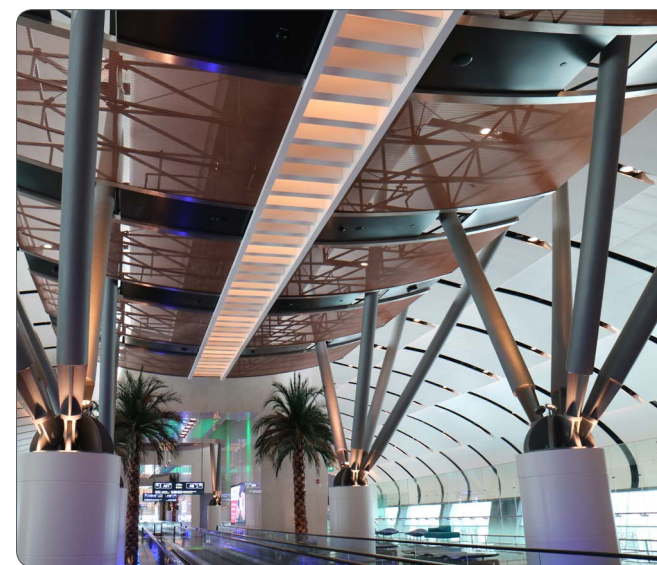
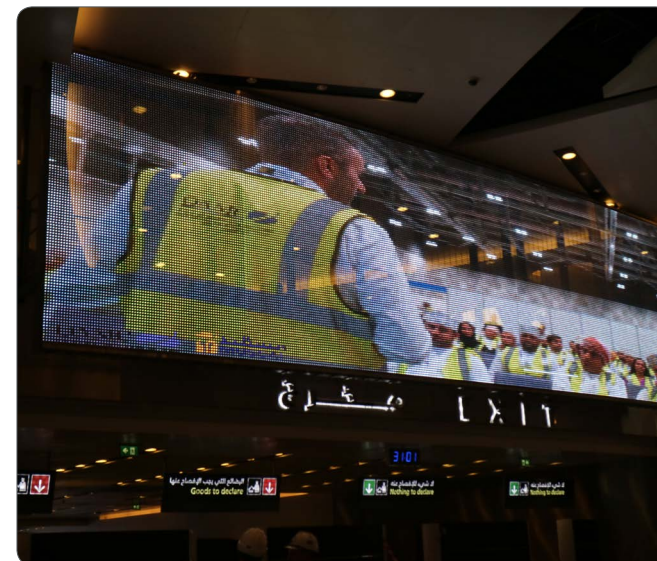
## Muscat International Airport

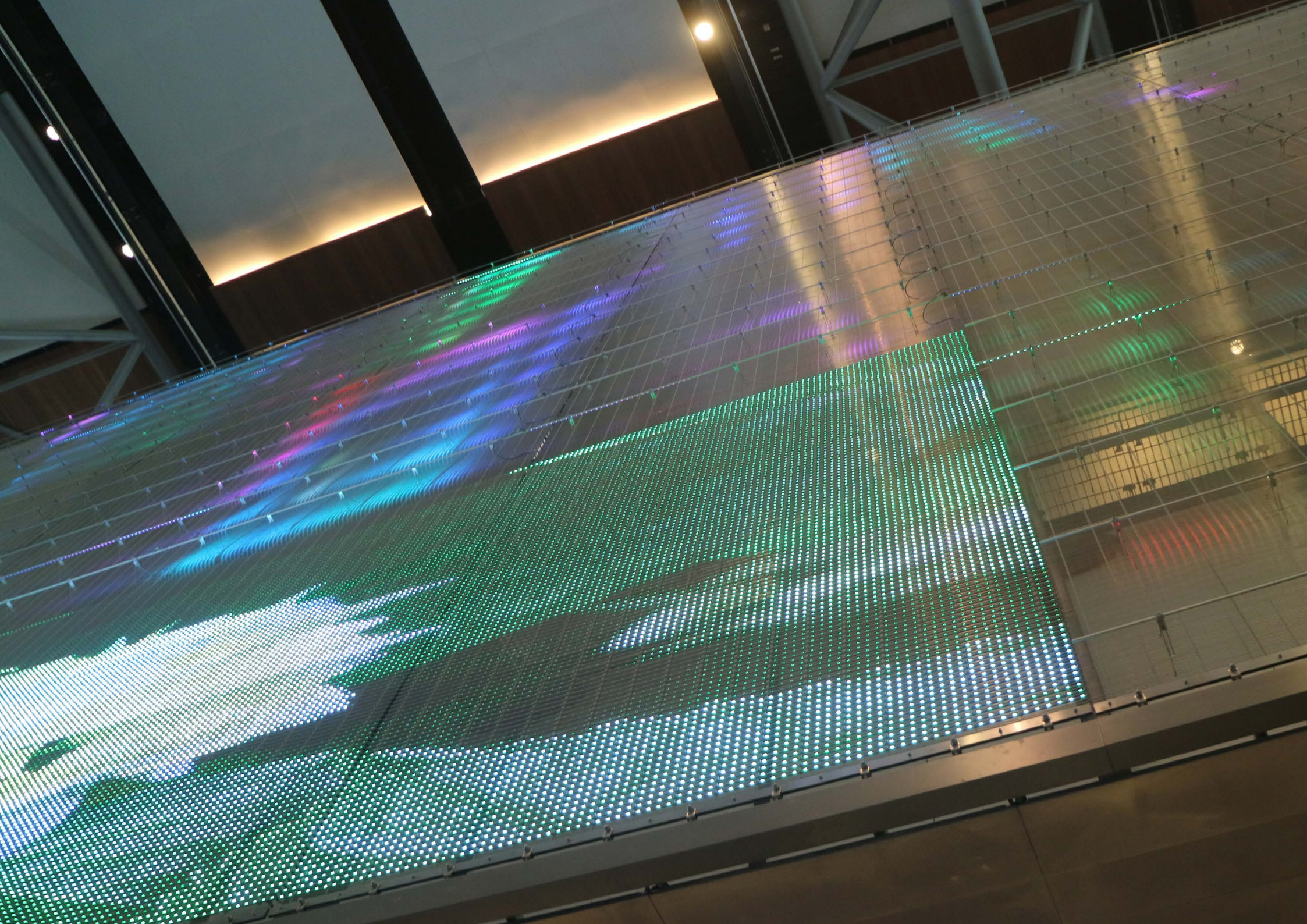
### Muscat, Oman

Today, the Sultanate in the south-east of the Arabian Peninsula is considered the safest country in the Middle East and, as such, is becoming an ever more attractive destination for business and leisure travel. In order to keep pace with the rapid growth that this has brought about, the Gulf State is investing billions in expanding its airport infrastructure. The largest and most significant project is the reconstruction of Muscat International Airport, designed by Danish architects COWI/LARSEN. In operation since 1972, it experienced the third-largest increase in passenger numbers worldwide in the period 2012 – 2016 according to figures from the International Air Transport Association (IATA). The reconstruction was performed to the latest technical standards and combines great convenience with high-class aesthetics. Metal fabric of stainless steel from GKD makes a considerable contribution to the understated elegance of the passenger terminal: it gives a virtuoso display of the full range of its design possibilities in twelve different applications. Fascinating ceiling and wall solutions, room dividers, and large-scale transparent media façades from the MEDIAMESH® family are setting new standards for contemporary airport design. Various ceiling solutions (suspended or as grid

constructions), wall hangings and room dividers made from Lamelle fabric, and three large, transparent media façades shape the feel of the space in all parts of the building. A total of 5,865 square meters of stainless steel fabric were used. After almost ten years of planning and construction for the airport, the result speaks for itself: in terms of design, passenger handling efficiency, and recreation quality, the new passenger terminal of Muscat International Airport is exemplary in many respects for pioneering airport architecture. The solutions made from GKD metal fabric that were used here provide virtually boundless inspiration for realizing such architecture – functional versatility at its best.

Environment:	interior
Material:	316 stainless steel
Manufacturer:	GKD Mediamesh and Lamelle
Photographs:	GKD
More information:	gkd.de or impetus-pr.de





## Ventilation Tower of Tokyo Station

### Tokyo, Japan

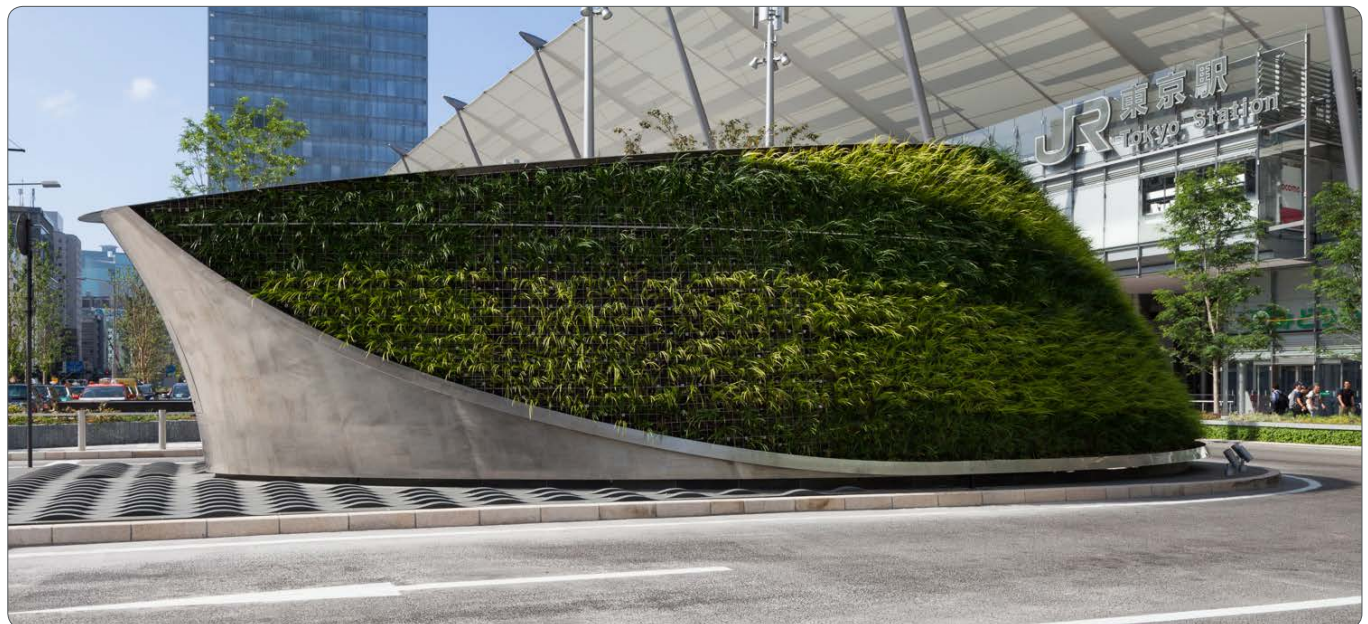
This is a monument that was installed during the redevelopment of Tokyo, Yaesu exit area. The ventilation tower provides a contrast between the sharp stately metal and the rich soft green plantation.

The 3D schematics were modeled with the 3D CAD, fabricated with 9 mm stainless steel in the Kikugawa factory, then welded and re-finished on-site for installation by expert craftsmen.

The material used, duplex stainless steel SUS329-J3L, was selected for its higher durability upon considering the location of the project that could induce stain and rust.

Panels were welded and finished on-site by hand to create one large independent shell-shaped structure panel without internal reinforcement steel frames.

Environment:	urban
Material:	duplex (SUS329J3L; 2205; EN 1.4462) stainless steel with a pearl vibration finish and a thickness of 9.0 mm
Manufacturer:	Kikukawa Kogyo Co., Ltd. / NSSC
Architects:	Tokyo-Station Yaesu-side Plaza Design JV
Photographs:	Kikukawa Kogyo Co., Ltd.
More information:	kikukawa.com or nssc.nssmc.com





## Bermondsey Bicycle Store

### London, United Kingdom

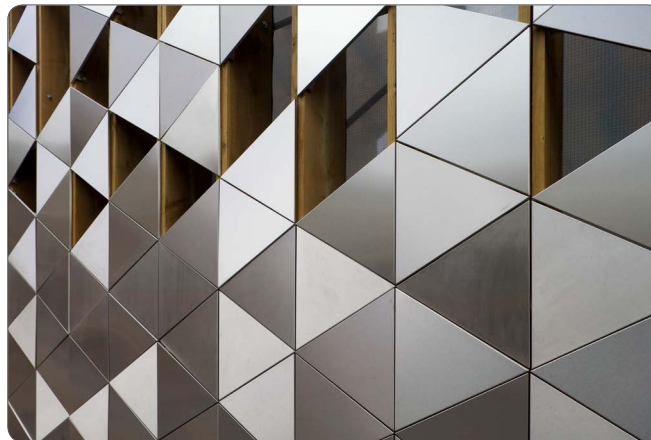
Bermondsey Bicycle Store forms a striking entrance to Bermondsey Square – a lively public space at the heart of an ambitious regeneration project in south-east London. Embedding green transport values within the local community, the store accommodates 76 bikes belonging to the square’s workers and residents. Using stainless steel panels in an original and exciting manner, the intervention adds sparkle to Igloo’s vision for inner city living.

The square is a Scheduled Ancient Monument and host to the historic Bermondsey Antiques Market. Beneath it lies the 11th century ruins of Bermondsey Abbey. Drawing on the narrative of

silver trinkets and treasures past, the landscaping is conceived as a textured carpet adorned with jewel-like street objects. Located at the southern entrance and visible from afar, the bicycle store is the ornamental highlight among the peppering of new bollards, benches and stands.

The building’s outer skin is a playful array of triangular stainless steel panels that refer to the square’s gem-like bollards. The surface fragments towards the roof revealing an underlying structure of laminated timber portal frames. A translucent inner skin provides a protected enclosure filled with diffused natural light. Sensor-integrated lighting maintains security and adds drama and prominence at night.

Environment:	urban
Material:	one way brushed stainless steel
Manufacturer:	Gallford Try
Architects:	Sarah Wiggles Architects
Photographs:	Mark Hadden
More information:	<a href="http://swarch.co.uk">swarch.co.uk</a>





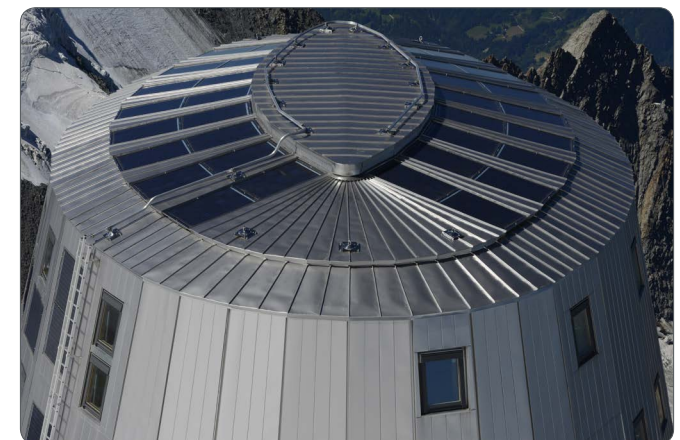
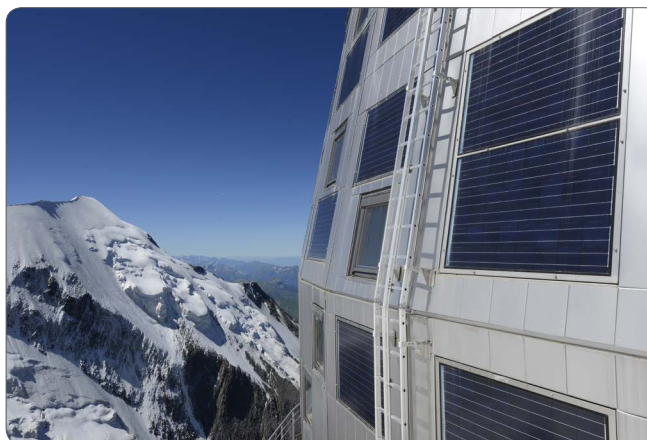


## Refuge du Goûter

### Saint Gervais, France

At 4.810 metres, for many, Mont-Blanc is the Holy Grail of alpine mountaineering. But before reaching the top, many must spend at least a night at the Refuge du Goûter shelter. Built in 1962, the shelter is the last stop before the final ascent. But at 3,835 metres, it has been subject to both intense usage and intense weather – not to mention being in the path of an advancing glacier. Thus, a new, stainless steel shelter has been built. The four-level building, which includes technical rooms, a common room and dormitories, was designed to withstand winds of up to 260 km/h, a load pressure of 400 kg/m<sup>2</sup> and a vacuum pressure of 600 kg/m<sup>2</sup>. To ensure the building is able to withstand the extreme mountain conditions while providing a comfortable and safe shelter for climbers, 304L grade austenitic stainless steel siding was used.

Environment:	alpine
Material:	Aperam 304 with Uginox Top surface finish
Manufacturer:	Aperam
Architects:	Groupe H & Déca-Laage
Photographs:	Pascal Tournaire
More information:	<a href="http://aperam.com">aperam.com</a> or <a href="http://uginox.com">uginox.com</a>







## No. 1 Hardmann Street

### Manchester, United Kingdom

No.1 Hardman Street is located at the heart of Spinningfields in Manchester City Centre. This recently completed building provides 5 floors of office space and is a piece of contemporary architecture which sits comfortably alongside both its historic neighbours and the large glazed buildings of this commercial area. Being one of the smaller buildings of the Spinningfields redevelopment, the design seeks to maximise its visual impact and optimise the site.

With work complete by Eric Wright Construction in July 2014, and cladding sub-contractor Cover Structure Ltd, the distinctive external materials provide a strong visual identity. The main building envelope consists of a simple black composite cladding panel with large window inserts, and a Proteus SC bespoke perforated aluminium white

screen to the front half of the building. Openings of various sizes in the Proteus SC perforated screen create a pattern across the elevation which animates the façade as well as providing shading and screening to the window openings behind. At night the façade is illuminated within the cavity giving the building a colourful evening identity. At ground floor and around the parapet of the building, the insulated panels have been finished with a Proteus HR honeycomb rainscreen panel with a Rimex Colourtex Blue Pippin Patterned Stainless Steel. This finish subtly changes with varying light conditions. In bright sunlight, the Stainless Steel Panels seem to mirror the blue skies above, while in darker conditions, the appearance is similar to that of the simple black panel on the rear elevation.

Environment:	urban
Material:	304 pippin colourtex finished stainless steel
Manufacturer:	Rimex
Architects:	Levitt Bernstein
Photographs:	PROTEUS
More information:	<a href="http://proteusfaçades.com">proteusfaçades.com</a>





## M6B2 Tower of Biodiversity

### Paris, France

The relationship between building height and sustainability is a subject that currently occupies the minds of many city planners. This is because the city cannot expand infinitely into the landscape. In France, however, “village” urbanism seems to be adamantly resisting the vertical city, without truly considering its potential. One of the objectives of this project is to quell these hesitations.

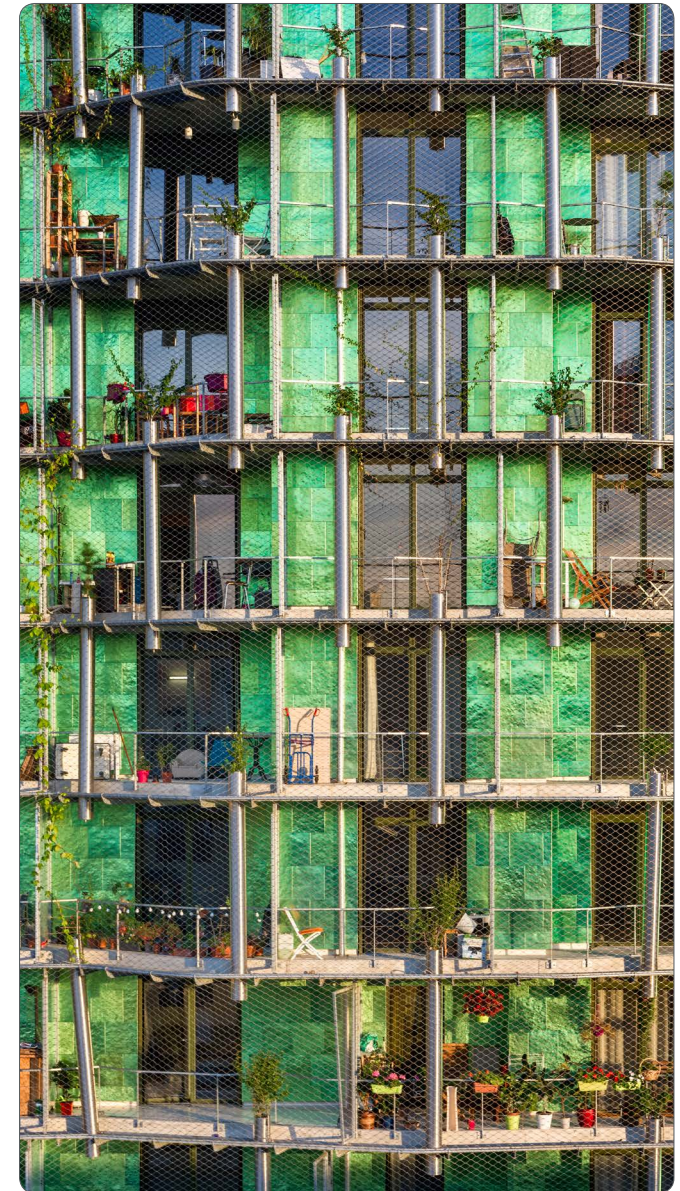
Benefitting from an exemption to the 37-metre height restriction in Paris, the team created a 50-metre-high building that towers above its neighbours at River Gauche, on the southern bank of the river Seine.

This tower has a façade with a double skin for the 16-storey tower. The outer layer is made up of stainless steel netting that acts as a climbing

frame for plants. Plants grow up the exterior of this green apartment tower spread seeds across the city. It allows the wind to spread class one purebred seeds into the urban environment. Its height is a key element for its capacity to regenerate urban biodiversity. The landscaping strategy unfolds in three stages: first with rapidly climbing vines, later with conifer trees that develop in five to ten years, and lastly with slow-growth trees like oaks that develop in twenty years or more.

The green vegetal façade of the tower extends over the center of the block to the surrounding buildings. They are placed at the corners of the block, allowing for the pedestrian to stroll through a calm, protected garden filled with low vegetation, as if outside of the city.

Environment:	urban
Material:	stainless steel nets
Architects:	Maison Edouard François
Photographs:	Pierre L'Excellent
More information:	<a href="http://edouardfrancois.com">edouardfrancois.com</a>





## MoyaMoya House

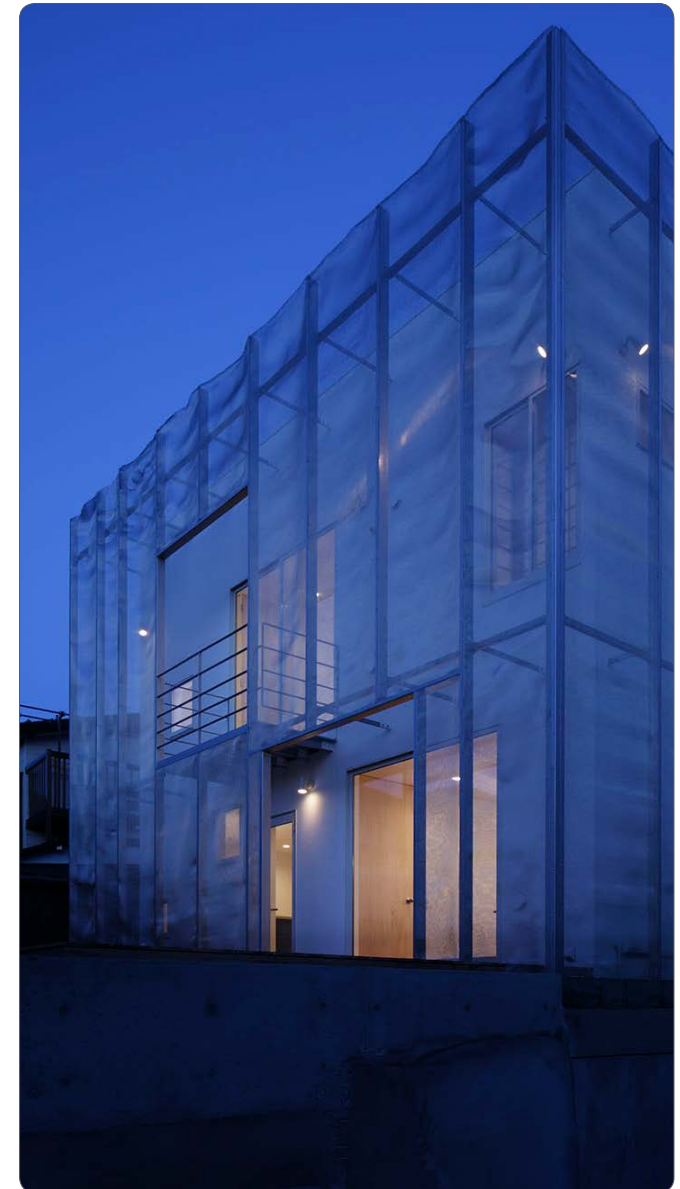
### Higashikurume, Japan

This is a residence in a commuter town in one of the suburbs of Tokyo. The studio was constructed so the client could study and dye kimonos, her chief hobby, as the center of the house; also, Studio Phenomenon tried to provide the place to communicate and interact, accepting foreign students after her kids leave the home. The shape of the building plot is a huge square (9100\*9100), and it slopes and spreads north and south. Because of the slating ground, a private space was settled in the northern part commanding a fine view. An open ceiling studio is connected to a kitchen, so that it allows the client to have a big party as she desires. Considering when she ages in the future, her bedroom, a study room, and other infrastructures are placed on the first floor. Other single rooms, a living room, and a Japanese style room are on the second floor; moreover, you can enjoy a fine prospect with Mt. Fuji from the living room. When looking at this project from a different perspective, the most significant characteristic of this construction is the stainless steel fence which surrounds the building. By creating the space which makes the border between the inside and the outside of the building vague, the inside thereof is difficult to see from the outside. In terms of security, significant effects can be also expected. A moire pattern is

generated since the stainless steel is doubled, and it makes people feel as if they are inside even if they are outside. Being swayed by the wind, the stainless steel fence shines and causes a great variety of the moire patterns. The angle and strength of the light are certainly changed by time – morning, afternoon, evening, and night. The change of the light creates not only gripping moire patterns, but also gives different and diverse impressions to the house. This is the place where people can closely enjoy the transitions of time, seasons, and climates through the house.

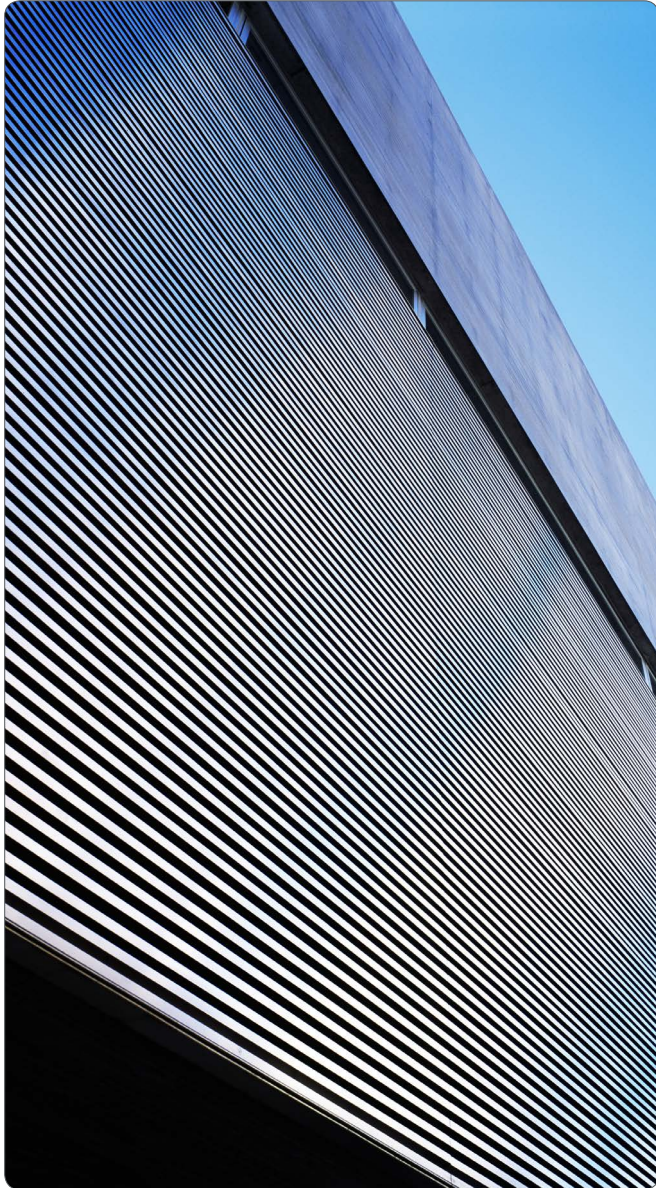


Environment:	rural
Material:	304 stainless steel mesh
Architects:	Studio PHENOMENON
Photographs:	Daisuke Shima / Nacasa&Partners Inc
More information:	<a href="http://umihikosano.jp">umihikosano.jp</a>







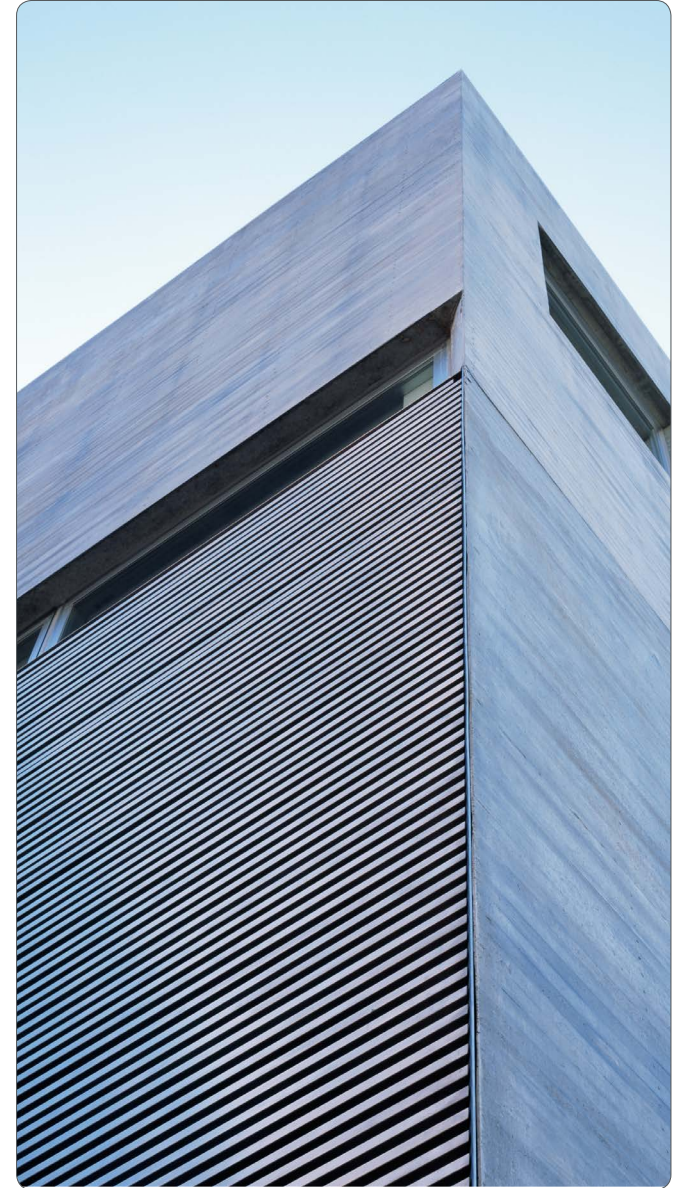


## Calm House

### Tokyo, Japan

Calm House is a minimalist house located in Tokyo, Japan, designed by APOLLO Architects and Associates. The residence is constructed of concrete and 40 mm-wide cedar. Stainless steel louvers cover the second-floor window to act as a screen, and serves as a unique characteristic for the neighbourhood. The first floor is used mainly for guests, and features a Japanese-styled room replete with tatami mats and translucent sliding doors. The second floor contains the main bedroom and children's room, which are located adjacent the courtyard. Each room has a private courtyard and individual or common bathroom attached.

Environment:	urban
Material:	stainless steel
Architects:	APOLLO Architects & Associates
Photographs:	APOLLO Architects & Associates
More information:	<a href="http://kurosakisatoshi.com">kurosakisatoshi.com</a>





## MahaNakhon

### Bangkok, Thailand

Temples and dream beaches with turquoise-blue water make Thailand a sought-after destination for tourists from all over the world. The capital Bangkok, with a population of some nine million, is a city of contrasts with irresistible magic. In contrast to many other Asian megacities, however, the city has few contemporary architectural highlights. The German architect Ole Scheeren created Bangkok's new landmark in the form of the 314-meter high MahaNakhon. The MahaNakhon is complemented by the seven-story shopping temple Cube and a fully automated parking garage. For the cladding of the parking garage, the architect chose PC-Sambesi metal mesh from GKD. Alongside the extraordinary aesthetics, its proven low-maintenance solar protection and reliable fall guard protection properties were crucial factors behind this decision.

In order to adapt the appearance of this structure to the luxurious overall ambience, the architect chose shimmering PC-Sambesi stainless steel mesh for the cladding. A total of 464 framed mesh panels, each 2.9 meters high and up to 1.8 meters wide, subtly take up the visual appearance of the louvered façade of the MahaNakhon.

Some 2,100 square meters of rigid mesh lend the parking garage an elegant look. In addition

to the high-quality appearance of the metallic skin, the architect was also convinced by the ease with which the cladding can be maintained. The attractive shell fulfills two functional roles: it serves as reliable fall guard protection on all floors, while also playing a key role in supporting the environmentally friendly overall concept of the MahaNakhon complex. In the tropical climate of Bangkok, the light- and airpermeable membrane proves its worth as an effective solar protection solution, which also enables natural climate control of the parking tower. Because daylight can enter the building freely, less electric lighting is required. In monsoon seasons the mesh also protects the parked vehicles from driving rain. The stainless steel, which is 100 percent recyclable at the end of its service life, also improves the ecological footprint of the building complex. The MahaNakhon was opened in August 2016 in the heart of Bangkok following an eight-year planning and construction phase. Today, the country's tallest building is constantly in dialog with the city and its people. As such, Bangkok's new landmark links opportunities for identification and participation with the role of an ambassador for a city on the rise.



Environment:	urban
Material:	316 stainless steel
Manufacturer:	GKD-PC Sambesi
Architects:	Ole Scheeren
Photographs:	GKD
More information:	gkd.de or impetus-pr.de



## Stadthaus Ballhausgasse

### Graz, Austria

The residential building 'Stadthaus Ballhausgasse' fills a long-time void on a street in the historic city centre of Graz, Austria. Developed by HoG architektur, the street elevation interprets the design principals of the late 19th century using a contemporary language. The plasticity created by a game of light and shadow on the cornices, protruding windows and surrounding frames, as well as their arrangement, is achieved by the absorption and continuation of these elements in the mirror-effect façade. A three-dimensional appearance, in the form of slightly inclined triangular planes, emerges and links the different ledge heights of the neighbouring buildings, thus making the reduced number of stories less recognizable within the context. The result is a differentiated interaction between exterior and window surfaces on several

levels, which reveal new details from different perspectives. As a representative view, the street façade complex design and higher expenditure on materials contrasts with the unadorned courtyard walls.

This void was the only vacant site in a continuous, homogeneous and unbroken row of houses. The structure explores a game of integration and mere imitation, using a new type of material in the form of mirror-finished, high-gloss polished stainless steel — a high-quality component that has a subtle life of its own, as it is not as perfectly smooth and hard as glass. Through its properties, the collection of panels reflects the nearby architecture, which appear refracted as in a kaleidoscope due to the slightly different inclination. The new building has the paradoxical effect of having both a strong presence and absence via dematerialization.

Environment:	urban
Material:	316L stainless steel, 3D polished, 3.0 mm thick
Manufacturer:	Bogner Edelstahl
Architect:	Hope of Glory
Photographs:	Paul Ott
More information:	<a href="http://hog-architektur.com">hog-architektur.com</a>



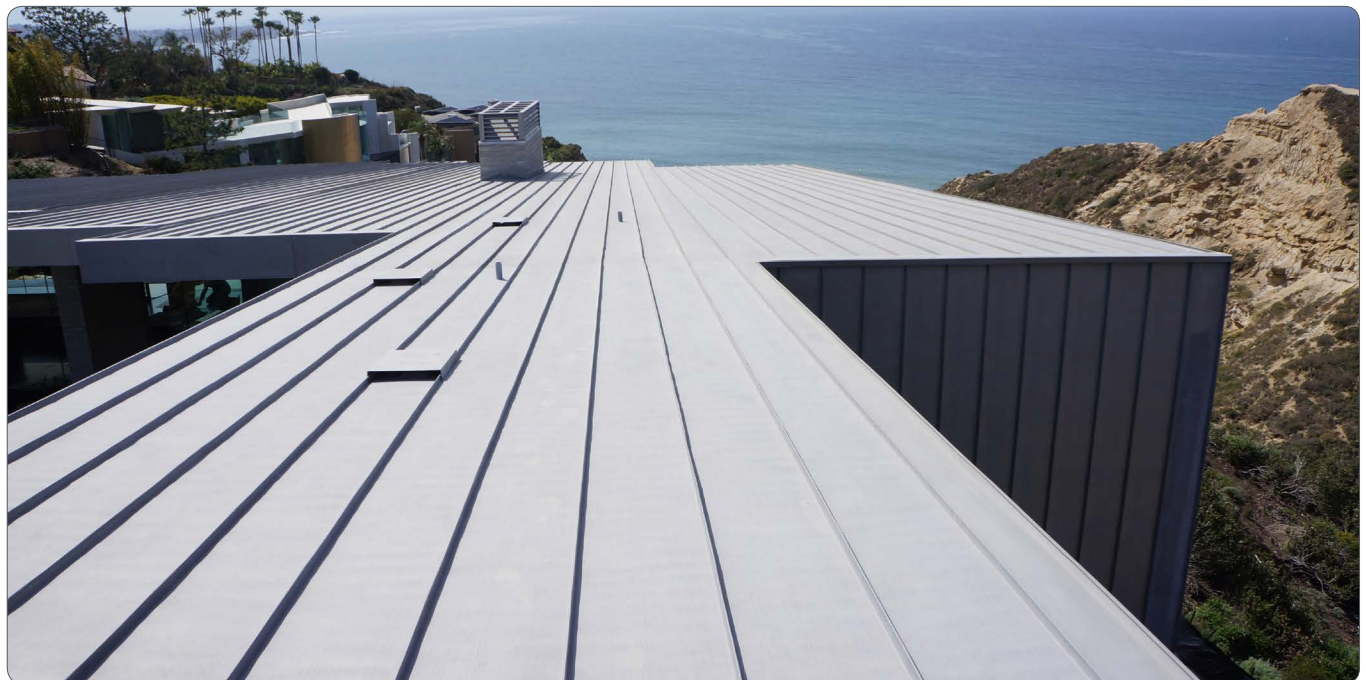


## La Jolla

### San Diego, USA

Terne coated stainless steel was utilized in this one-of-a-kind of residential project in La Jolla, California. What made this metal roof system particularly challenging was the building's geographical location. Sitting on an ocean-side cliff, the structure is constantly exposed to corrosive winds. Aperam's Uginox Patina K44 terne coated stainless steel was the perfect choice for the project, not only for its beautiful natural appearance, but also for its superb corrosion resistance in marine environments. Stainless steel's low expansion and contraction also made the roof's distinctive radial design possible.

Environment:	marine
Material:	Aperam K44 with Uginox Patina finish (EN 1.4521)
Manufacturer:	Aperam
Architects:	Daniel Schmidt
Photographs:	Enduringmetal
More information:	<a href="http://aperam.com">aperam.com</a> or <a href="http://uginox.com">uginox.com</a>







## Bogindhu Farmhouse

### Aberdeenshire, United Kingdom

This extension and refurbishment of Aberdeenshire's historic Bogindhu farmhouse required significant work on the existing structure, including the removal of the ground and first floors, the removal of all internal walls and a stripping back of the external walls to expose the original stone. A contemporary barn was added, giving the complex an 'L' formation as was called for in the original design plans. The barn includes a stainless steel band that serves as a cill for the cladding and, in places, as a gutter. Uginox Top's durable matt finish stainless steel was also used on the roof, due to its corrosive resistant properties and its ability to harmonise with the rest of the building's design.

Environment:	rural
Material:	Aperam 316L with Uginox Top surface finish
Manufacturer:	Aperam
Architects:	Room Architects
Photographs:	N. Rigden
More information:	<a href="http://aperam.com">aperam.com</a> or <a href="http://uginox.com">uginox.com</a>





## JDL Fetter Lane

### London, United Kingdom

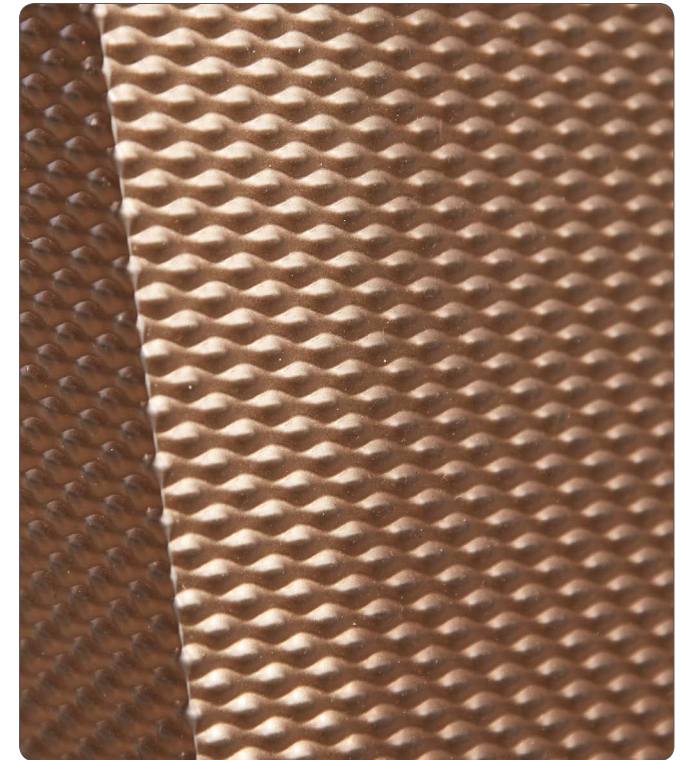
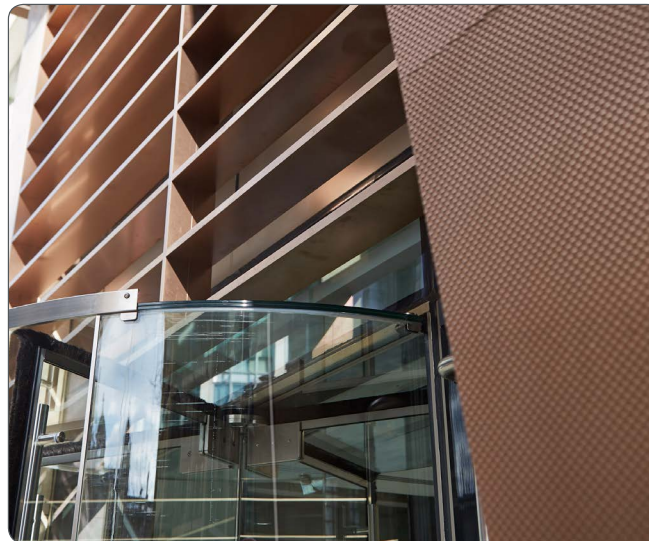
The original brief was to undertake renovations to dilapidations as the main tenant was moving out of the building. Then McBains were asked to provide architectural services to refresh all the internal common parts and a concept design for the external entrance. The existing entrance was low and dark and not very discernible from the main thoroughfare as the entrance was at the side of the building. The client wanted to create a clear entrance that was welcoming and that had more gravitas and appeal.

There were quite a few challenges on the project. They did not really know the structure of the façade of the building as there were no detailed records or drawings. Assumptions were made as to what would be found once the existing façade was stripped off.

Originally much brighter finishes were proposed i.e. a powder-coated polyester canopy but the planners were not in favour as there is a listed building opposite and the bright finish was deemed to be unsuitable to be in such close proximity. So a more traditional finish had to be considered. The team at McBains Cooper looked at a bronze-coloured material, Granex 6WL electro-plated and sandblasted stainless steel that had been used elsewhere to good effect and it had the really contemporary feel that was wanted.

However the real concern was that the electro-plated finish would be adversely affected by weather and a guarantee from the manufacturer could not be obtained.

When the PVD was proposed as an alternative this proved more than acceptable as it had both the aesthetic appeal of bronze and also had a twelve-year guarantee which gave the architect and the client much-needed reassurance. The V-Grooving and folding of the PVD stainless steel sheet meant the look of solid bronze would be achieved without the weight and this specification was approved by the planning council.



Environment:	urban
Material:	316L stainless steel PVD coloured in chocolate with embossed finish SB-H25
Manufacturer:	John Desmond Ltd.
Architects:	McBains Cooper
Photographs:	John Desmond Ltd.
More information:	<a href="http://johndesmond.com">johndesmond.com</a>

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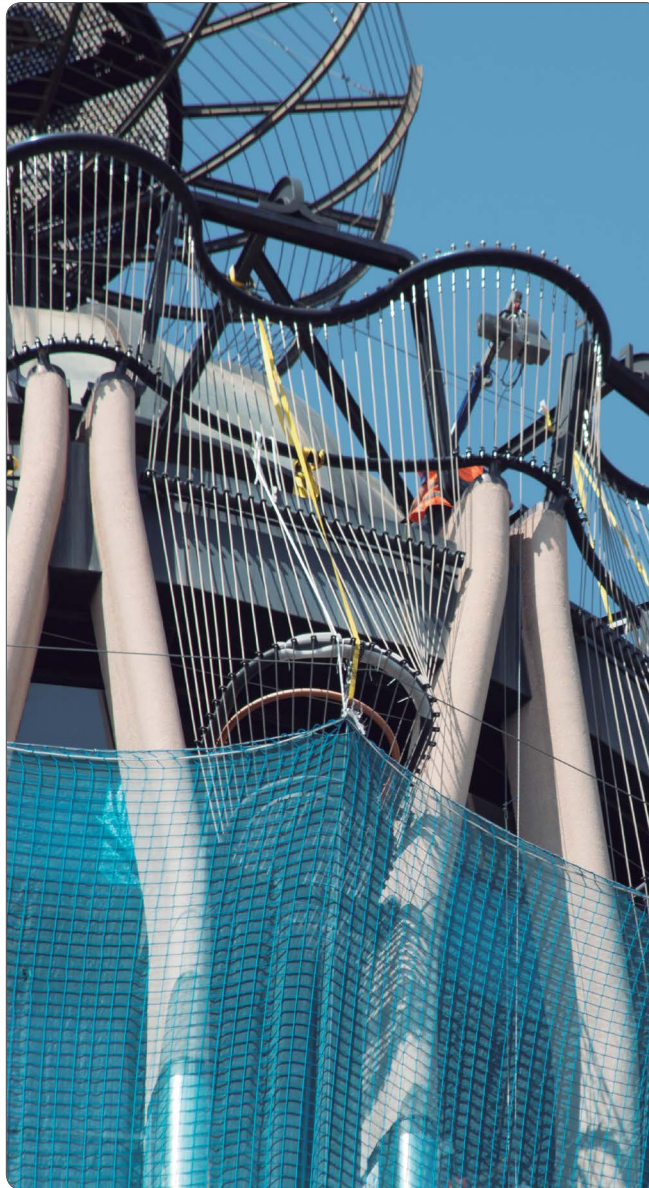
FETTER  
LANE



## Torre Europa

### Madrid, Spain

Originally constructed in 1985 in the heart of Madrid's business district and across from Santiago Bernabéu Stadium—home of the Real Madrid football team—the 121 meter high Torre Europa by the renowned architect Miguel de Oriol has been refurbished. The entrance has been reoriented and the lobby now provides for more light and transparency. A hanging canopy above the lobby wraps around the side of the building to connect the plaza to the main entrance. CallisonRTKL Architecture replaced the tower's exposed concrete façade with austenitic stainless steel AISI 304L, 1.4307, linen finish manufactured by Acerinox. ENAR, technology consulting façades pioneer in Madrid in the architectural envelopes is implementing the project together with INASUS, experts in the manufacture and installation of special façades on site. With this renovation, Grupo Infororsa specialist in the acquisition, construction and complete refurbishment of emblematic building for subsequent leasing and integral management, wants to respect the Architect's original and unique design of the building that nowadays requires certain improvements to meet this century's needs.



Environment:	urban
Material:	304L (EN 1.4307) stainless steel with a linen finish
Manufacturer:	Acerinox
Architects:	Miguel Oriol e Ybarra / CallisonRTKL Architecture
Photographs:	Acerinox
More information:	acerinox.com



## Edogawa Garage Club

### Tokyo, Japan

Ribbons of wave-like perforated steel form a mask, like an outer skin for this old warehouse. Colour variations highlighted by light changes produce unexpected chequered patterns as well as silver and gold toning at dawn and dusk, emphasising the façade's versatile nature. This is a design for the re-use of an old warehouse in Tokyo. The following issues were addressed when making the design.

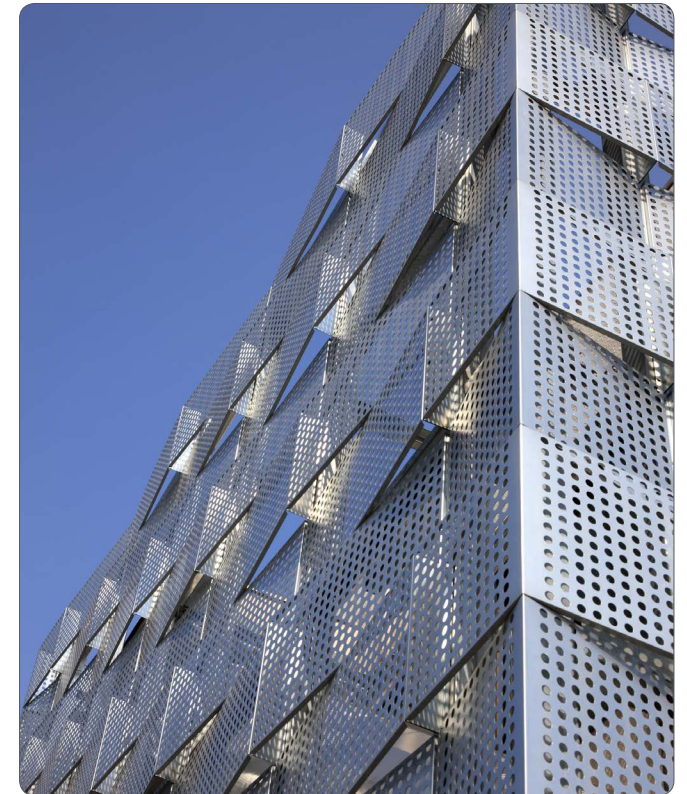
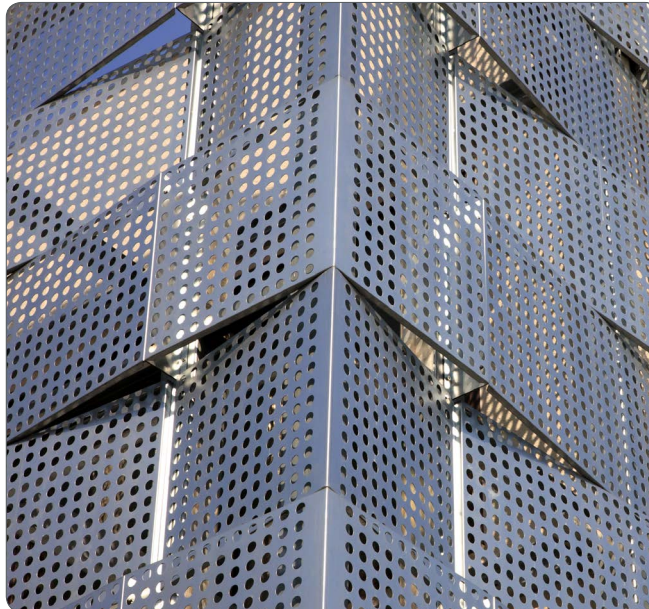
1. The environment: to avoid the CO<sub>2</sub> discharge that demolition and rebuilding would have caused, the existing structure was retained.
2. The character of the site: an attempt was made to create a design which would reflect and enhance the context which is a riverside site in Tokyo.

In order to protect the building from external damage caused by over-excited spectators and to ensure a reasonable internal light level from the existing windows, the entire exterior was clad with a skin of perforated stainless steel panels, with holes made using a special process. Structural strength is secured by slightly angling the panels, creating an overall undulating chequerboard effect. Moreover the undulations are staggered from course to course, to help prevent staining and

rain damage. Special corner panels bent at right angles provide added stability.

This design responds sensitively to the ever-changing features of the natural environment, such as the colour of the sky, the intensity of the light and the movement of clouds, which are reflected in its surface like the ripples on the water of the nearby river.

The aim is to create an architecture that catches the subtle changes in Nature which has been submerged by the city.



Environment:	urban
Material:	stainless steel
Manufacturer:	EROOF
Architects:	Jun'ichi Ito + Jun'ichi Ito Architect & Associates
Photographs:	Naomi Kurozumi
More information:	ito-jun.com





## CHUM University of Montreal Health Center

### Québec, Canada

Originally built in 1865 as Holy Trinity Anglican Church, this structure has changed hands and purposes a number of times before being integrated into the Montreal Mega Hospital (CHUM) project. Today, the old church's iconic steeple is a highlight of CHUM, one of North America's largest academic medical facilities. To ensure the reconstructed steeple captured the original's look and feel, while also being able to withstand harsh environmental conditions, it was built using Uginox Patina (K44). Being terne coated, the Uginox Patina weathered to achieve a dull grey aspect that mimics the slate colour of the original steeple.

Environment:	urban
Material:	Aperam K44 with Uginox Patina (EN 1.4521)
Manufacturer:	Aperam
Architects:	Neuf Architect(e)s + CannonDesign
Photographs:	courtesy of Aperam
More information:	<a href="http://aperam.com">aperam.com</a> or <a href="http://uginox.com">uginox.com</a>





## MyZeil Shopping Mall

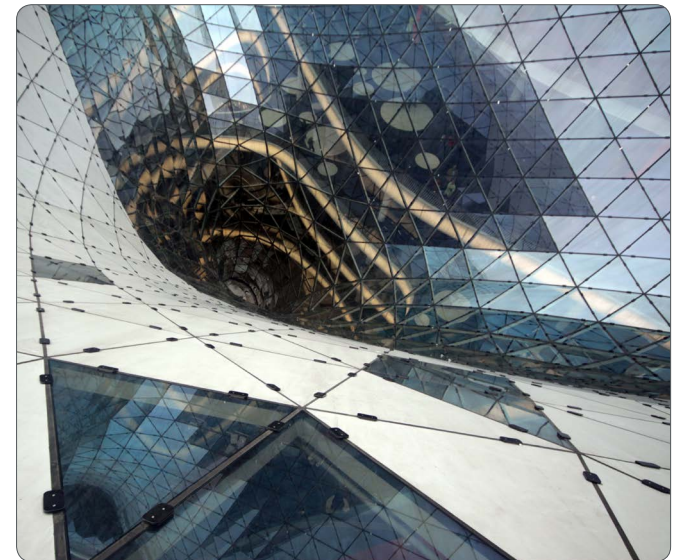
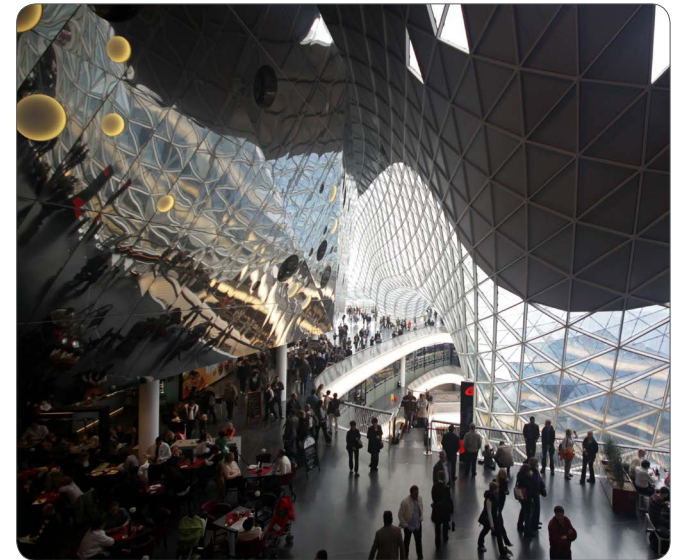
### Frankfurt, Germany

For a top address in Germany, check out “Zeil 106, 60313 Frankfurt am Main”. Zeil is one of Germany’s busiest shopping streets and number 106 is where one of Europe’s biggest inner-city development projects, with an investment volume of 960 million euros, is being built: The “PalaisQuartier”. Part of the development, the “MyZeil” shopping and leisure world, opened recently. Inside the building, the gleaming, reflective interior façade of the covered shopping center is made entirely of stainless steel elements supplied by the Krefeld and Dillenburg plants of ThyssenKrupp Nirosta.

With its unique roof, the shopping mall is an architectural tour de force extending over eight stories with a total gross area of 77,000 square meters. It was designed by the Italian architect Massimiliano Fuksas, who rose to international prominence among other things through his designs for the “Europapark” shopping mall in Salzburg (1997), the redevelopment of the “Place des Nations” in Geneva (1999) and the “Vienna Twin Towers” in Vienna (2001). In MyZeil, Massimiliano Fuksas placed particular emphasis on light and transparency. The building’s exterior façade, for instance, is almost completely transparent. To carry this effect through into the inside of the building, sections of the interior

façade were clad with reflective stainless steel. “Altogether we used 15 tons of Nirosta 4301 stainless steel with IIIId/ 2R finish to make polygonal wall elements for the wall paneling which we attached with invisible fasteners,” says Franz Hof, project manager at AMS GmbH, a company specializing in metal interior fittings with over 37 years’ experience, which was responsible for designing and fitting the MyZeil stainless steel paneling. “The stainless steel panels offer unbeatable quality, corrosion resistance and an attractive gleaming finish. They were used to decorate the walls of the interior façade which extends from the fourth to the seventh level of the new shopping complex.”

Environment:	urban
Material:	304 stainless steel with a 2R reflective finish
Manufacturer:	Outokumpu
Architects:	Massimiliano and Doriana Fuksas
Photographs:	Karsten Monnerjahn
More information:	fuksas.it





## Roberto Cavalli Caffè

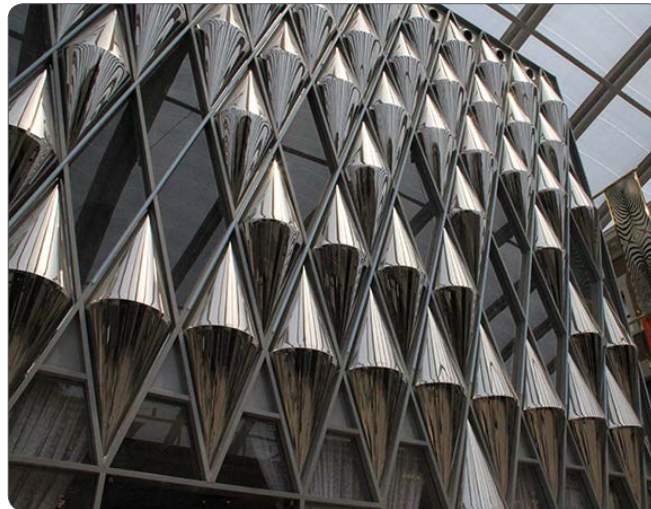
### Kuwait, Kuwait

Roberto Cavalli is an Italian fashion designer, born on 15 November 1940 in Florence, Italy. The design for The Avenues was inspired by the natural rock formations, sand and sky found in Kuwait. The glazed arched canopy roof gives the feeling of an outdoor space which is emphasised by The Grand Avenue being designed to look and feel like a Boulevard with the living palms lining the street. The walkways are paved with stone from around the world – China, Italy, Spain and Turkey – which underpins the international theme. The Cavalli Caffè is a significant presence within The Avenues. The Cavalli chain in the Middle East is operated by Pragma Group who are based in the Lebanon. The café, serving Italian food, accommodates 80 customers with both inside and outdoor seating.

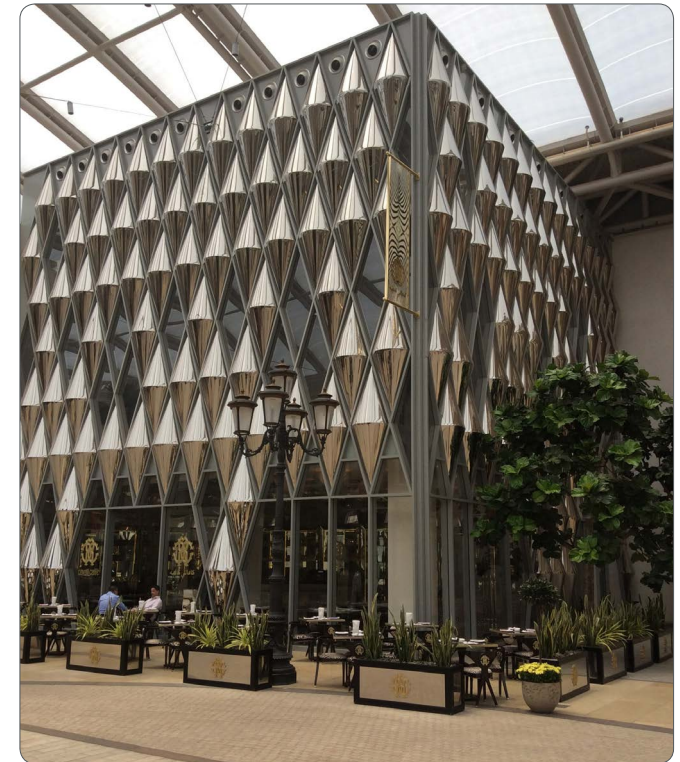
What is unexpected is the design of the exterior of the café which bears no resemblance to any other Cavalli stores or cafés. Double-ended polished stainless steel cones create elongated diamond footprints against the glass. There are twelve or thirteen cones wide on the façade and thirteen or fourteen deep with some being left unmounted which reveals the diamond shaped glazed aperture behind. There are LED purple lighting strips running along one edge of the aluminium diamonds which, when illuminated,

form striking diagonal lines of purple light. The effect is to create a mesmerising and unforgettable façade.

The cones were handmade from 2 mm 316 grade stainless steel in the Double Stone Steel factory. Fabrication included the forming, welding and polishing. Each section was hand-polished to a Super 8 finish. Stainless steel was chosen as it was found to be the best mirror effect that was required for Roberto Cavalli's design concept. Originally the material was to be GRP (Glass-Reinforced Plastic) with a chromed finish. This method of fabrication had to be abandoned as there were no tanks large enough in which to chrome the sections.



Environment:	urban
Material:	316 stainless steel, 2 mm thick and hand polished to super 8 finish
Manufacturer:	Double Stone Steel
Architects:	In-house Roberto Cavalli
Photographs:	Double Stone Steel
More information:	<a href="http://doublestonesteel.com">doublestonesteel.com</a>





## Eton Place

### Dalian, China

The port city of Dalian in northern China is a city of contrasts. A vibrant center of trade and industry, this rapidly growing metropolis plays an equally important role in the region as one of the country's most popular vacation destinations. In the city center of Dalian, the Beijing office of the NBBJ architectural firm designed the Eton Place Dalian tower complex as a superlative multifunctional development. Large MEDIAMESH® screens from GKD running around the corners of the building seize the attention of passers-by at both main entrances. The transparent displays made of filigree stainless steel mesh with integrated LED profiles function as an advertising platform for luxury goods from all over the world and underline the exclusivity of the building complex.

Environment: urban  
 Material: 316 stainless steel  
 Manufacturer: GKD-Mediamesh  
 Architects: NBBJ / GKD  
 Photographs: GKD  
 More information: [gkd.de](http://gkd.de) or [impetus-pr.de](http://impetus-pr.de)







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WHERE ARE YOU?



## Liverpool Interlomas

### Mexico City, Mexico

Understanding the new role shopping centers play in today's society, in which they have become a magnet for social and cultural encounters, Rojkind Arquitectos was commissioned to design a façade for the new 18,000 square meter department store as part of a new era in the company's pursuit to re-brand itself. Liverpool department stores, with a 164-year-old history, have for the most part always been one of the main anchor stores for large shopping centers in Mexico.

Located in the northern car-dependent suburb of Interlomas on the outskirts of Mexico City, this relatively new suburb is characterized by a lack of open public space and a myriad of roads on which pedestrians are not welcomed.

Environment:	urban
Material:	angel hair polished stainless steel
Manufacturer:	ZAHNER
Architects:	Rojkind Arquitectos
Photographs:	Paul Rivera
More information:	rojkindarquitectos.com

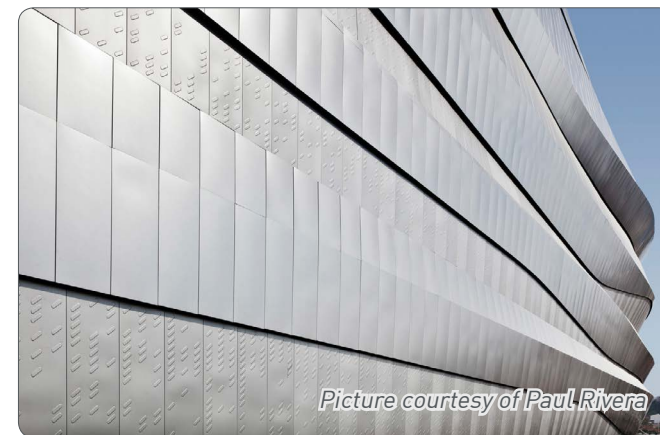


Picture courtesy of Paul Rivera

The new façade responds to the fast pace of everyday life in this isolated suburb, sitting in the middle of a very congested intersection of highways and overpasses, which give it a futuristic “Blade Runner-like” feel.

The double-layered façade shelters the store and its users from its chaotic environment. Its sleek stainless steel machine-like exterior is intended to evolve in a very fluid way as the intense sun bathes it throughout the day. It's a contradiction to the grit and chaos of its surroundings; a juxtaposition that becomes a new reference for this part of the city.

At night, the hollow cavity between the layers of the façade is engulfed in light that subtly escapes through the fine reliefs formed at the folds in the skin. The façade transforms at night from its solid monochromatic appearance during the day to a dynamic form accented by light.



Picture courtesy of Paul Rivera



*Picture courtesy of Paul Rivera*



## Harvey Nicholls Store

### Kuwait, Kuwait

The design of the store façade can probably best be described by saying that it looks like lots and lots of towering organ pipes. Convoluted rivulets of gold piping run from floor to ceiling on the main area of the façade and are echoed again on the first floor and in the interior. The façade is not only visible from the outside, it forms part of the backdrop for the Veranda restaurant on the first floor as seen in the image below. The store is located on The Grand Avenue and the feel is that of an outdoor avenue lined with palms and boutiques. Although the store is under cover from an arched glazed canopy the cladding is exactly as if the store were facing the outdoor elements. The clientele were analysed and clearly understood to demand a luxurious shopping experience as well as the opportunity to buy luxury goods. The pressure would be on to make this store stand out, in a shopping complex with this fanfare and levels of expectation. The UK's Harvey Nichols Edinburgh and Bristol stores restrained claddings of local stones and granites needed to be matched in gravitas and "wow" factor in Middle East terms of reference. The answer could only be gold. This is where the Double Stone Steel PVD coated coloured stainless steel could really be the only alternative to actual gold. The success is indubitable as in every marketing piece for The

Avenues, Harvey Nichols' store is firmly in the frame. The Arabic love of, or indeed reverence for, gold goes back centuries. The first Arabian gold was mined in 3000BC in what is known as "The Cradle of Gold", its real name being Mahd adh Dhahab, the leading mining area within the Arabian Peninsula. In this instance, the store front is not clad with actual gold (unlike the store designed by Rem Koolhaas, Fondazione Prada, Milan which is clad in 24 carat gold leaf). It gleams and has the rich depth of hue and allure of gold but is in fact PVD coated coloured stainless steel. PVD was specified for its durability and ease of handling during construction.

Environment:	urban
Material:	316 PVD coloured (gold) stainless steel
Manufacturer:	Double Stone Steel
Architects:	Gensler
Photographs:	Double Stone Steel
More information:	<a href="http://doublestonesteel.com">doublestonesteel.com</a>





## Tokyu Plaza Omotesandou Harajuku

Tokyo, Japan

This building, located at the intersection of Omotesando and Meiji-Dori, uses stainless steel panels to create an enormous kaleidoscope which was designed by Mr. Hiroshi Nakamura. He designed this kaleidoscope façade to direct to customers an exhilaration and bustling by giving specialized experience. There were two challenges for this design. First, the panel must be completely a mirror which can reflect visitors to each mirror panel again and again. The mirror panels therefore must have a high quality condition at their flatness. Second, each of the triangular panels that make up the kaleidoscope has a unique shape, and is positioned at angles mathematically determined. Thus it is required to have high designing and technical technology of construction. In order to implement these ends, they developed a very flexible basement design system and a fiber laser welding method which can reduce the heat effect for panels. The assembly system is atypical, with the peak points of the panels positioned using backing with conical tips, and the triangular panels attached by hinges to the ceiling joist, which connect to the peak.



Environment:	urban
Material:	304 mirror polished stainless steel with a thickness of 3.0mm
Manufacturer:	Kikukawa Kogyo Co., Ltd. / Nisshin Steel Co., Ltd.
Architects:	Hiroshi Nakamura & NAP + Takenaka Corporation
Photographs:	Kikukawa Kogyo Co., Ltd.
More information:	kikukawa.com or nisshin-steel.co.jp





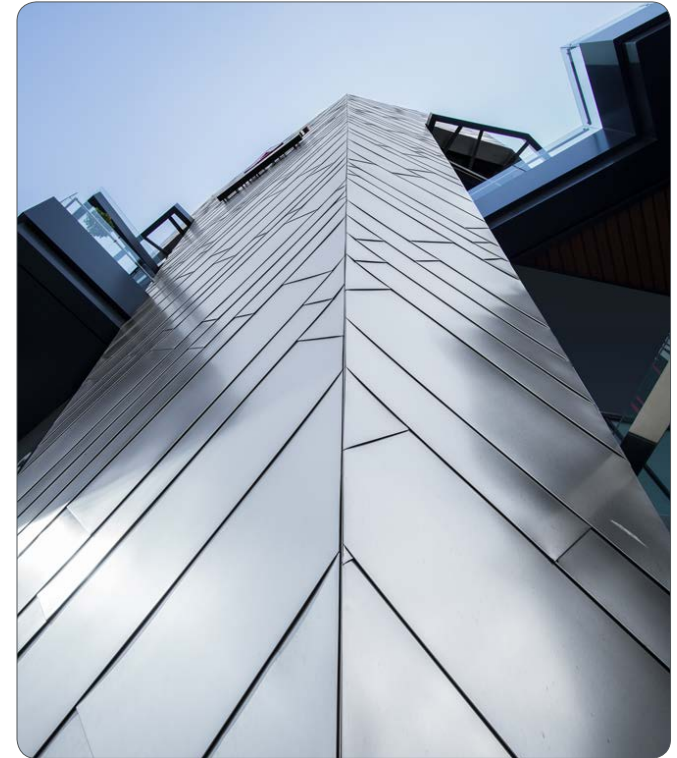
## Fashion Drive Mall

### Monterrey, Mexico

Fashion Drive Mall is located in Monterrey, Nuevo León, a city in the north of Mexico. The façade was designed and built by “Grupo Básica”, a Mexican company specialized in design, consultancy and installation of façades. The owner of the mall wanted the project to become an icon of the area, an attractive element that would enhance it. Different materials such as stone or phenolics were considered, but stainless steel convinced the designer for the shine that only stainless can offer, in addition to the economic advantages such as its durability and low maintenance. The façade consists of a set of rectangular stainless steel sheets placed in an overlap simulating the appearance of fish scales. 316L stainless steel was used. 24 gauge was chosen to facilitate the bending required by the mechanical union between the sheets. The surface finish is a nuanced finish with worm-like figures in order to reduce the brightness to avoid dazzling the drivers, but at the same time shine enough to attract people to get in to the mall. The construction lasted just over a year beginning in July 2016 and ending in September 2017. The mechanical union between the stainless scales was made by the flat lock system. On the edges of the sheets, were made four 180° bends, which allowed the hitch between one sheet and

another. In addition, each sheet was assembled mechanically to the OSB wood substrate of the structure by bolted stainless clips. This technic of mechanical union avoids the use of welding, adhesives, sealants or liquid elements that could fail and stain the façade by draining them. The mechanical assembly also helps to eliminate the possible effects in long term by dilation and contraction of a metallic material. The joints to be floating with each other, allow the material to expand and contract freely in the changes of temperature by cycles such as day and night, winter and summer, without this resulting in damage to the façade. The arrangement as fish scales makes the façade waterproof since it allows the water to flow freely over the surface without entering the building, guaranteeing the watertightness.

Stainless steel façades seem something complicated or expensive, but it should not be so. Stainless provides great benefits, with an adequate knowledge of the material, good cutting to avoid waste and a suitable installation system, stainless steel is a material competitive with others in the market. Once installed, it provides a guarantee for the investment. After one year, this façade has had an excellent performance, has not required maintenance and has undoubtedly enhanced the area by attracting the attention of people passing through the place.



Environment:	urban
Material:	316L stainless steel, nuance finish, with a thickness of 0.635 mm
Architects:	Grupo Basica
Photographs:	IMINOX, Grupo Basica
More information:	grupobasica.com or iminox.org





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## Nissan Stadium

### Yokohama, Japan

On June 30, 2002 while the Brazilian team captain Cafu holds the golden cup high up in the air and some 2.7 million paper cranes flew down from the sky, the 2002 FIFA World Cup™ “the Stage of a Dream” closed its curtain. At Nissan Stadium, which was called International Stadium Yokohama at that time, four games including the finals were held, and it was crowded with 260,000 spectators from Japan and abroad. We have received high praise for wonderfulness of a stadium with a seating capacity of 70,000.

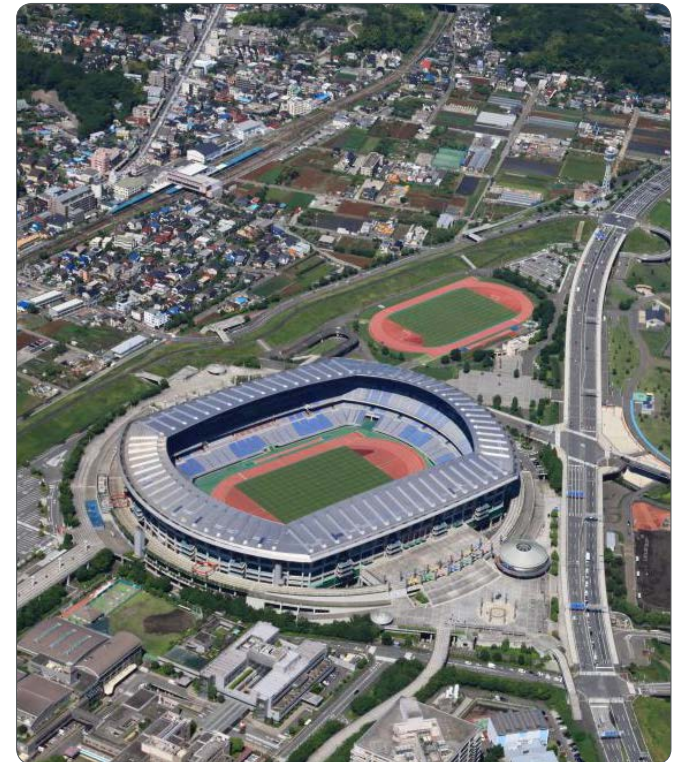
Having been recognized by the global community, Nissan Stadium will continue providing “the Stage of a Dream”, by hosting international sports events, live concerts of various artists, and by offering the guided stadium tour and its running track open for public.

With 72,327 seats, the stadium has the largest spectator capacity in Japan. All the seats are individually sectioned with 90 cm of space between rows, so spectators can sit back and enjoy the games in comfort. To ensure that spectators do not miss any of the drama, large screens are installed on both Side Stands for instant replays of outstanding plays and scores. Additionally, the sound coming from the 528 loudspeakers adds emotion and excitement to the game. Three quarters of the seating area is covered by a large

roof.

In this stadium, a roof by stainless steel vibration damping steel plate welding method was adopted. This roof is designed to emphasize the airiness of the roof using a gentle curved line that takes into consideration the surrounding environment, a landscape as a park facility, an image as a sports facility. Especially by adopting the welding method of stainless steel damped steel plate, in addition to preventing metal sounds caused by rain and wind, beautiful shape with more durability is further enhancing the sense of quality.

Environment:	urban
Material:	304 and 316 stainless steel
Weight:	146 tonnes
Manufacturer:	Nippon Metal Industry Co. Ltd.
Architect:	Takenaka Corporation a.o.
Pictures:	Yokohama Sports Association
More information:	<a href="http://nissan-stadium.jp">nissan-stadium.jp</a>





## Longchamp Hippodrome

### Paris, France

The origins of the Longchamp racecourse date back to the 19th century. However, numerous remodeling and extension projects have led to a rather non-transparent network of buildings and areas. Perrault therefore proposed tearing down the existing stands, as well as multiple buildings spread across the site, to create space for a new grandstand and pavilions that would secure the infrastructure required at a horse racing venue. Various historic buildings – including the administration building, stables and totalizator – were also renovated and extended in line with his concept.

The colours selected for the buildings – natural tones such as ochre and brown – as well as the wooden-clad spectator terraces help the huge building structure blend in with its environment. When designing the façades, Perrault once again put his faith in the various metallic fabrics offered by GKD.

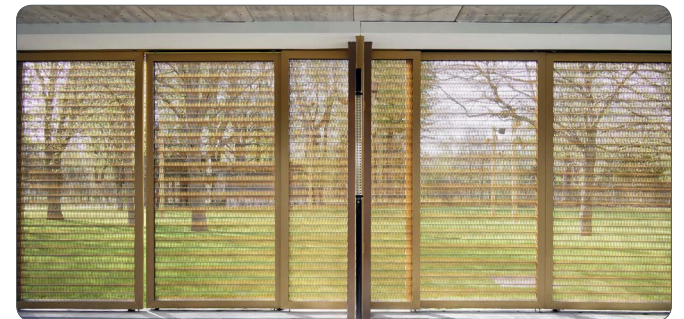
For the horizontally movable, full-height solar protection elements of the grandstand and pavilions that flank the representative stairway up to the main entrance of Paris Longchamp, he selected golden stainless steel fabric of the type ESCALE 7x1.5. It's spirals create interesting light effects throughout the seasons. When closed the panels, which measure more than

three meters in height and 1.70 meters in width, protect the stand from becoming uncomfortably hot, thereby supporting the building's sophisticated energy concept. The structure, like all of the hippodrome's other new buildings, complies with the HQE standard (Haute Qualité Environnementale).

At the same time, the open fabric structure gently filters daylight and allows it into the rooms, creating bright and pleasant spaces. Thanks to their unrestricted outward views, the solar protection panels also meet the explicit aim of transparency. At night, interior lighting grants views into the building from the outside through the metallic membrane. During daylight hours, the shimmering membrane engages in a delicate dialog with the natural environment and lends the stand a sense of Mediterranean lightness thanks to its warm shade of gold.

ParisLongchamp therefore breaks away the old pattern of classic racecourses and instead focuses on networking the poles of sports and events, nature and prestige, innovation and tradition to create a unique world of experiences that can more than hold its own in international comparisons.

Environment:	park side
Material:	gold coloured 316 stainless steel
Manufacturer:	GKD Escale 7*1.5
Architects:	Dominique Perrault
Photographs:	Dominique Perrault
More information:	<a href="http://gkd.de">gkd.de</a> or <a href="http://impetus-pr.de">impetus-pr.de</a>







## Yanuma Stadium

### New Delhi, India

The portfolio of famous sporting venues with metallic mesh reflects the virtually inexhaustible formal language and functionality of this industrial base material in stadium construction. The most recent example is the Yamuna Stadium in New Delhi, India, which was opened in the summer of 2010 for the largest sporting event in the city's history, the Commonwealth Games. With 272 competitions in 17 sporting disciplines, as well as over 7,000 athletes and officials from the Commonwealth states, this event enjoys reverence comparable with the Olympic Games among the countries that take part. The venue for the archery and table tennis events was the Yamuna

Sports Complex in the 16-million metropolis of New Delhi. With seating for 5,000 spectators, 10 practice areas and a multifunctional hall, the planners at Peddle Thorp Architects, Melbourne, developed a stadium that can hold its own against any other venue worldwide. The façades of the circular building employ 86 "Tigris" stainless steel mesh panels to create a visually seamless shell. With intelligent interplay of reflection and transparency, its woven skin transforms the sporting venue into a modern interpretation of coexistence. At the same time, the mesh provides effective sun protection for the subtropical climate in New Delhi with temperatures well in excess of 40°C.

Environment:	urban
Material:	316 stainless steel
Manufacturer:	GKD-Tigris
Architects:	Peddle Thorp
Photographs:	GKD/Badri Narayan
More information:	<a href="http://gkd.de">gkd.de</a> or <a href="http://impetus-pr.de">impetus-pr.de</a>





## Estadio Wanda Metropolitano

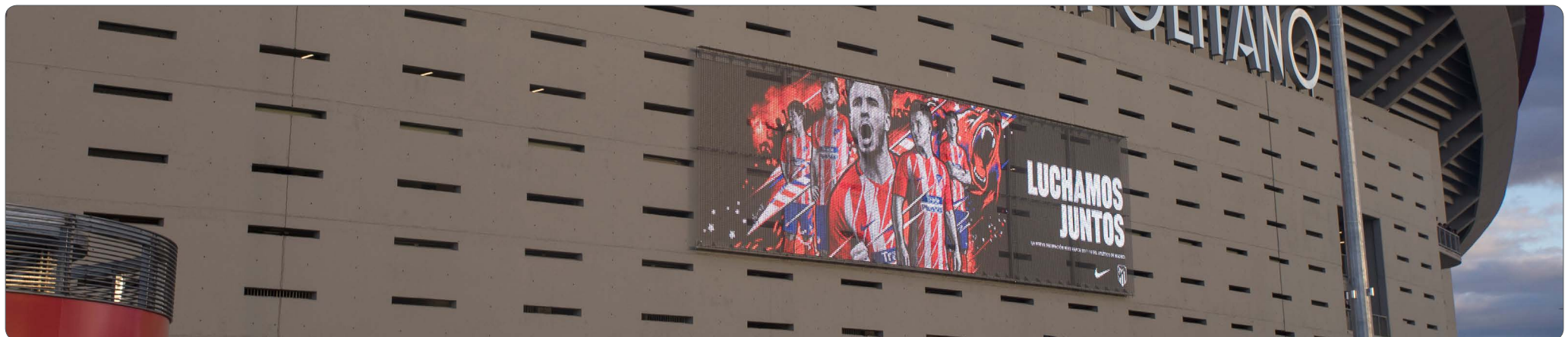
### Madrid, Spain

Bigger, more convenient, more spectacular: the new stadium of the top Spanish club Atlético Madrid is among the very elite of European soccer arenas. After six years in construction, the tradition-steeped club opened the doors of the Estadio Wanda Metropolitano in the north-east of the Spanish capital. A large screen on the western façade above the main entrance gets arriving fans in the mood for the match ahead with video sequences from previous games and emotional images. Yet the transparent MEDIAMESH® system from GKD nevertheless blends in perfectly with the puristic façade design. As a result, the spectacularly sweeping roof with integrated

LED bands, the bright, horizontally perforated façade and the MEDIAMESH® display all blend in together perfectly.

The stadium did not have to wait long to score its first major success: just a few days after it was opened, the European soccer governing body UEFA awarded the Champions League final to the Estadio Wanda Metropolitano. Atlético Madrid will therefore host the final of the continent's top club competition on June 1, 2019 – an event that last took place in Spain at the Santiago Bernabéu stadium of local rivals Real Madrid in 2010. The spectators at the Champions League final will then enjoy a fitting welcome from the imposing MEDIAMESH® screen from GKD.

Environment:	urban
Material:	316 stainless steel
Manufacturer:	GKD Mediamesh
Photographers:	GKD
More information:	<a href="http://gkd.de">gkd.de</a> or <a href="http://impetus-pr.de">impetus-pr.de</a>





# WANDA METROPOL



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## Optus Stadium Park

### Perth, Australia

Optus Stadium officially opened on 21 January 2018 and is the new home game venue of local Australian Football League teams Fremantle Football Club and the West Coast Eagles. The impressive Arbour stands 10 m tall and 20 m wide, and stretches 450 m around the south side of the Stadium. It connects a new six-platform railway station to the Swan River, over which the Matagarup Bridge is currently being constructed to provide pedestrian access to East Perth. Over a thousand stainless steel cables were installed on the 43 arches that make up the Arbour to create a tensile structure in the form of a canopy. Suspended on the structure using bespoke fittings are 3,076 bronzed artwork panels reflecting Whadjuk and Noongar stories. Stadium Park was constructed on wetlands with cultural heritage significance to the Indigenous community, and its rich Aboriginal history was

the inspiration behind the Arbour's design. More than 13 tonnes of grade 316 stainless steel was used, including in excess of 14 km of 16 mm and 8 mm hamma™ X 1x19 wire rope supplied by ASSDA Member Arcus Wire Group, 20,000 bespoke fittings and over 34,000 screws. Stainless steel was specified for the cable net canopy for its strength and durability to withstand the harsh Western Australian weather conditions, including powerful coastal winds driven from the Indian Ocean. The 16 mm edge cables on the structure were tensioned to forces up to 52kN, with the 8 mm longitudinal and transversal cables tensioned up to maximum of 11kN. In addition, the high quality and aesthetical value of stainless steel complemented the Arbour's design in creating an eye-catching structure for patrons. Structural Dynamics provided value engineering and practical advice to the project engineer Maffei Engineering and project architect Hassell on how to best integrate

stainless steel tensile systems into the design. Their in-house team of engineers used structural and finite element analysis as components of the detailed analysis and modelling on how the cable design would behave and interact within a tensile architecture installation. Structural Dynamics also worked with engineering firm Partridge to undertake the final design, review, slip testing of the bespoke cable clamps and final sign off for the project. Each of the eight different types of cable edge clamps were sent to the National Association of Testing Authorities' (NATA) accredited laboratory for slip testing under wet and dry conditions to ensure their strength and adequacy. The cable fittings were designed to the AS 1170 series: Structural Design Action, AS 4100: Steel Structures and AS 2759: Steel Wire Rope – Use, Operation and Maintenance.



Environment:	marine
Material:	316 stainless steel wire with a thickness of 8.16 mm
Manufacturer:	Arcus Wire Group
Architects:	Structural Dynamics / COX Architecture
Photographs:	Structural Dynamics / Makmax
More information:	strudyna.com.au or assda.asn.au





## New Bright Annealing Line of Aperam Gueugnon

### Gueugnon, France

Today's steel mills are moving away from the function-over-form of the past and embracing a more aesthetic approach. A case-in-point is Aperam's Gueugnon site, where the traditional skyline of tall chimneys spitting out multi-coloured fumes is being replaced by shining, futuristic towers. The new 68.30 m tower is covered with 0.8 mm thick bright annealed (Uginox Bright) stainless steel cladding – produced and annealed on-site. While inside the tower houses the furnace and the accumulator, outside it blends perfectly into the surrounding landscape and has become a point of pride for both Aperam and local residents alike.

Environment:	urban
Material:	Aperam 304 with Uginox Bright finish
Manufacturer:	Aperam
Photographs:	Aperam
More information:	<a href="http://aperam.com">aperam.com</a>







## Help

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## About ISSF

The International Stainless Steel Forum (ISSF) is a non-profit research and development organisation which was founded in 1996 and which serves as the focal point for the international stainless steel industry.

### Who are the members?

ISSF has two categories of membership: company members and affiliated members. Company members are producers of stainless steel (integrated mills and rerollers). The association has 56 members from all over the world and currently represents approximately 90% of the total production of stainless steel.

### More information

For more information about ISSF, please consult our website [worldstainless.org](http://worldstainless.org).

For more information about stainless steel and sustainability, please consult the [sustainablestainless.org](http://sustainablestainless.org) website.

## Contact us

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[worldstainless.org](http://worldstainless.org)