INSPIRED BY YOU

A COLLECTION OF INTERIOR ACOUSTIC DESIGN

DESIGNING FOR TOMORROW

Elegant Acoustics

DESIGN FOR WELL-BEING
How design can help us be productive, creative and healthy

AWARD-WINNING ARCHITECTURE
Creative solutions for acoustic challenges

CREATING THE SCHOOLS OF TOMORROW
Innovative learning landscapes

Rockfon®

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FRONT PAGE / **Project:** Hotel Llaut Palace, Mallorca, Spain
Architect: Arantxa Guerrero, Seta Arqutectos
Ceiling: Rockfon® Mono® Acoustic

Project: Expoforum, St.Petersburg, Russia
Architects: Yevgeny Gerasimov & Partners Architectural Studio and Choban & Partners
Ceilings: Rockfon Tropic® / **Edge:** X-edge

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GUILDFORD RECREATION CENTRE / CANADA

The completed Centre was described by the City of Surrey's Anita Green as "a beautiful and serene space", and true to the project's theme of community focus, will continue to serve as a hub to Guildford for years to come.

p. 34

ASTRID-LINDGREN SCHOOL / GERMANY

The Astrid-Lindgren School was designed by architect Ralf Pohlmann. He believed that school design should play "a pioneering role and show structures that are still present when the students then enter the professional life" in reference to his work on a school in Clenze, Germany.

p. 46

MIKKELLER / CHINA

Mikkeller chose the acoustic island solution Rockfon Eclipse® for its flexible and easy installation.
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THE LLAUT PALACE HOTEL / SPAIN

The adaptability of Rockfon® Mono® Acoustic enabled Guerrero to achieve his elegant and clean design, exactly as he had originally proposed.
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THE MESSNER MOUNTAIN MUSEUM / ITALY

Designed by the world famous Zaha Hadid Architects and sitting 2,275m above sea level atop the summit plateau of Kronplatz in the Italian Dolomites, it is renowned for its tranquillity.
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THE WORD / UNITED KINGDOM

The National Centre for the Written Word project in South Shields in the North East of England was presented with the prestigious Public Sector Interiors Project of the Year award in the 2016 Mixology North Awards.
p. 28

SINT-LIEVENSPOORT SCHOOL / BELGIUM

The Schools of Tomorrow programme in Flanders, Belgium, is one of the largest PPP projects in Europe: 182 projects individually designed to suit school specifications for 133,000 children and the community at large.
p. 40

Project: NCC Gladsaxe Company House, Gladsaxe, Denmark / **Architect:** Vilhelm Lauritzen Arkitekter A/S
Ceiling: Rockfon Tropic® / Edge: E24-edge

FROM THE EDITOR

For this issue of INSPIRED BY YOU we showcase the build, design and acoustics of spaces - from restaurants and office buildings to museums carved into rock and award-winning aquatic centres. We were able to speak with architects, business owners and project managers from across the globe who worked on these incredible projects and shared their successes.

We spoke to Lara Muller from the Blue Building Institute about the psychological importance of the transition from winter to spring, from staying indoors to moving outdoors, and how to create the feeling of being outdoors in an indoor space (p. 11). She shared some fascinating insights on the impact of light and acoustics on productivity and well being, and how to create spaces with a human-centric design approach.

Meanwhile, monolithic architecture can create outstanding designs that avoid the separation of exterior and interior, seamlessly migrating the two surfaces into one singular expression. The resurgence of monolithic architecture to preserve an architectural heritage can create extraordinary spaces. In this issue we profile the design and build of the Messner Mountain Museum, an intriguing building designed by the world-famous Zaha Hadid Architects, carved into rock atop the summit plateau of Kronplatz in the Italian Dolomites.

We have also focused on innovative design solutions and how to integrate true artistic expression and freedom within interior design. We spoke to the architects and project managers who have used ceilings to push the envelope of interior design, and spoken with a design award judge and award-winning project designers on creating award-winning architecture.

The design of schools presents a fascinating design challenge, balancing the day-to-day use of schools with the specific educational and developmental needs of children as well as those of the community at large. Beyond the school and community needs, we also look at how architects are rethinking classroom design, and how this design prepares students for the expectations of the future - creative thinking, design skills, and collaboration.

We had the opportunity to speak with one of Belgium's largest school renovation projects, the PPP Schools of Tomorrow project, and hear about how 182 projects were carried out to improve the indoor environment, acoustics, and accessibility of future-ready schools around Flanders. We were particularly inspired by the restoration of a convent to foster a positive educational environment for students with hearing and learning difficulties, whilst embracing and preserving the heritage and unique beauty of the building (p. 39).

We invite you to explore here and online.
– INSPIRED BY YOU

Project: Sparkasse Paderborn-Detmold, Paderborn, Germany / **Architect:** BKP Kolde Kollegen GmbH
Ceiling: Rockfon Tropic® / **Edge:** A-edge / **Grid:** Chicago Metallic™ T15 Click 2790

#01
OPTIMAL SPACES

The design of buildings for well being using human-centric design, is an area of architecture that is receiving increasing attention. Whether we're at home, at the office, or out for a meal with friends or family, we spend a majority of our time indoors. This chapter covers the key elements for human-centric design that can contribute to our general health, well being and also our productivity. We share an interview with the CEO and co-founder of the Blue Building Institute, Lara Muller, who speaks about the impact of design on business and the value in terms of real estate for human-centric design.

The effect of buildings through acoustics and lighting on our ability to be productive, creative, and healthy offers a real opportunity for property owners and businesses alike to create real value for the knowledge-based economy.

Acoustic considerations also affect our ability to relax and connect outside of work. Noise in restaurants is a growing problem, made worse by today's design trend for hard surfaces and exposed ceilings. We speak to a popular bar in Taipei that has been able to create the ideal atmosphere for customers to relax and enjoy their award-winning beer with the help of acoustic solutions that fit with their design ethos.

Project: Media Evolution City, Malmö, Sweden / **Architect:** Juul & Frost Arkitekter / **Ceiling:** Rockfon Sonar®
Edge: X-edge

INTERVIEW

Lara Muller

CEO and co-founder of BBI

Lara Muller is the CEO and co-founder of the Blue Building Institute (BBI). Lara's mission is to further develop and futureproof the real estate value proposition by adding a social dimension to it. As CEO of the BBI, her focus lies on building a movement together with the BBI's partners to advance human sustainability through the built environment.

TELL ME ABOUT THE BLUE BUILDING INSTITUTE.

The Blue Building Institute is a not-for-profit social enterprise that aims to start and capitalise on a movement that places human well being and health at the centre of the design and management of the built environment.

WHAT LED YOU TO CREATE THE BLUE BUILDING INSTITUTE?

We wanted to support the industry by sharing knowledge from all disciplines to really understand what it means and change design, construction, and real estate management practices to support a human-centric real estate management model. We believe that the sustainability agenda shouldn't only be focused on the green, environmental aspects of sustainability. To be future-ready, we need to integrate people holistically into the real estate business model to truly make it a "people, planet and profit" value proposition.

WHY IS THIS IMPORTANT?

The knowledge in this space is scarce. We are doing practical research to help prove that there is a business case for a human-centric real estate management strategy. Buildings that have a minimum footprint on environment and contribute to the health and well being of inhabitants are proven to perform better, have a fuller rental capacity, and better continuation of leasing contracts.

WHAT ROLE DOES ACOUSTICS PLAY IN CREATING A PRODUCTIVE ENVIRONMENT?

Distracting noise can result in a 66% drop in performance. Given that 92% of a company's cost is personnel, it's clear that acoustic considerations can have a huge impact.

WHAT SHOULD A VISITOR FEEL OR SENSE WHEN THEY WALK INTO A BUILDING WITH A HUMAN-CENTRIC PHILOSOPHY?

Ultimately, it should be a space in which visitors feel they want to stay. The building should be designed and furnished in such a way that you feel either the same or, ideally, better when you leave the building than when you came in.

Design and Productivity

The impact of human-centric design on well being and productivity

For many years, most of the focus of green buildings has been directed at reducing our global carbon footprint. However, in the mid-90s, the World Health Organization (WHO) released a Declaration on Occupational Health For All, which also addressed the need for planning and designing healthy work environments. Since its publication, occupational health has grown to become a more important conversation among health professionals, architects and building owners alike.

Whether at home or at the office, we spend the vast majority of our time indoors. As such, our buildings are increasingly being considered as contributors not only to our well being and quality of life, but also to our productivity.

As many companies now build their competitive advantage through human capital, human-centric real estate strategies create value for tenants and lead to bigger returns on investment for building owners. We spoke with Lara Muller, the CEO and co-founder of the Blue Building Institute, about the importance of human-centric real estate, which places human well being and health at the centre of the design and management of the built environment.

The indoor environment and productivity

The Blue Building Institute estimates that 92% of a company's expenses are linked to personnel costs. With a knowledge-based economy, the damaging effects of a bad indoor environment on productivity are compounded.

A good indoor environment is designed and furnished to provide an atmosphere in which the user is both comfortable and motivated. Through excellent air quality, daylight, and the right levels of heat and sound, a good indoor environment creates an atmosphere in which people can thrive.

To turn buildings into a positive agent for human well being, Lara Muller notes that there are seven key elements to consider that relate to both the design and management of spaces – air quality, light, comfort, access to water, nourishment, mind and fitness. These elements are essential to ensuring the health, vitality, and productivity of occupants.

> NOISE LEVELS ARE RANKED SECOND IN IMPORTANCE WHEN ASSESSING THE PHYSICAL FEATURES OF A BUILDING AND MEASURING HOW THEY CONTRIBUTE TO EFFICIENCY

The effects of acoustics

Acoustic considerations are one of the most important design factors in the work place and living environment. Electronics, HVAC systems, mechanical equipment and other noise-emitting office devices, as well as the people working, can be major sources of indoor noise. Another statistic that the Blue Building Institute shares is the impact of distracting noise on work - distracting noise can result in a 66% drop in performance.

According to a report by Leesman, a world leader in measuring the effectiveness of corporate workplaces, noise levels are ranked second in importance when assessing the physical features of a building and measuring how they contribute to efficiency – something not easily adjusted post-construction. What's more, Leesman found that high noise levels resulted in the lowest overall satisfaction within office spaces, with only 29% being happy with their current office acoustics.

> DISTRACTING NOISE CAN RESULT IN A 66% DROP IN PERFORMANCE

The importance of quality indoor lighting

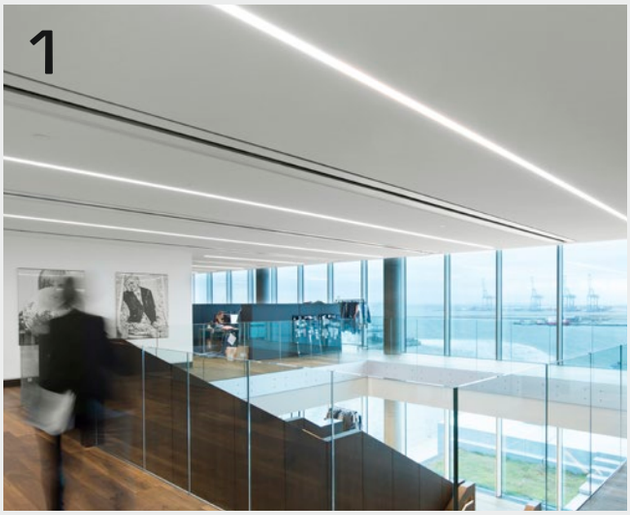
Quality of lighting is another element of indoor environment that can affect everything that we do. Beyond aiding vision, light has a direct effect on the area of our brain which acts as a stimulant to keep us alert and able to perform better cognitively. One study from the University of Oregon found that employees in offices with better daylight and views took 6.5% fewer sick days.

Given the expensive investment of real estate, many property companies are beginning to include sustainable strategies into the development of their buildings, seeking to stabilise the value and lifecycle of the building.

Building for customers

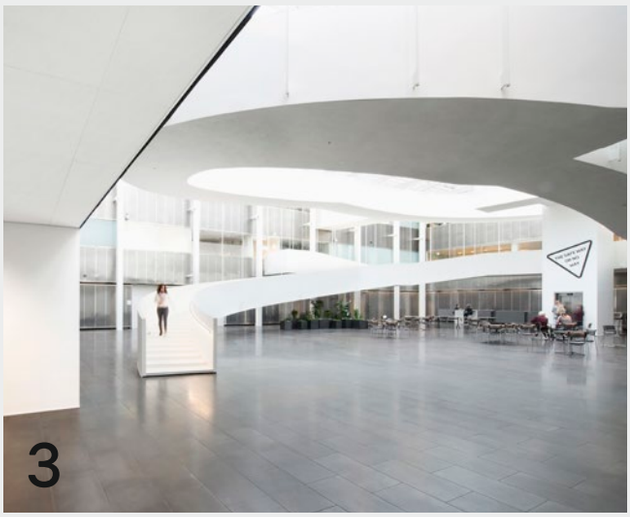
Companies are important customers for real-estate developers, and buildings play a crucial role in providing the right environment for customers to thrive. By creating a distraction-free, productive and comfortable indoor environment, you can support companies and their people in their performance, productivity, wellbeing and health.

The top 4 workplace design trends to watch out for



1 DESIGNING FOR WELL BEING

In recent years, indoor environment and well being has been thriving amongst interior designers and real-estate owners alike. With the increased momentum of the WELL Building Standard, the first certification to focus on enhancing the health and well being of occupants, designing for well being will continue to be a trending topic.



3 DATA-DRIVEN DESIGN

Moving away from assumptions, gut instinct and the contemporary office trend, workplace design is looking to science to help crunch data to better understand how users interact with their environment.

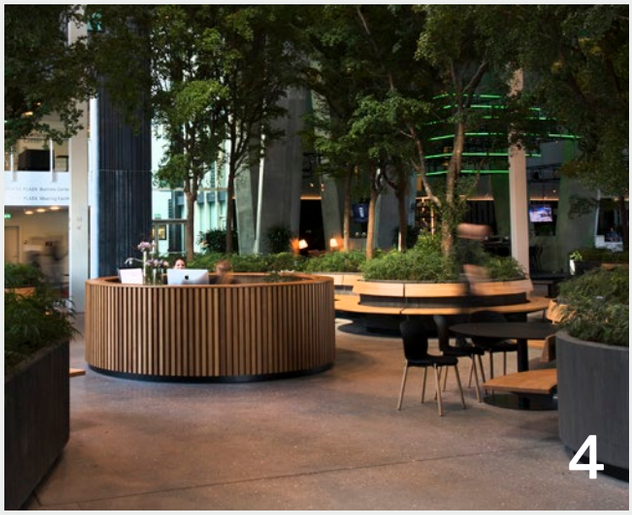
2 ACTIVITY-BASED DESIGN

Promoting collaboration among employees while respecting the need for privacy asks workplace design to group areas into work-styles, merging the benefits of open office cooperation and the need for quiet and concentrated workspaces.

4 BIOPHILIC DESIGN

Inspired by Edward O. Wilson's hypothesis that humans have an inherent need of nature, Biophilic design seeks to enhance our connection with the natural environment.

Biophilic design incorporates natural elements into workplace design, which include: access to natural light, natural colours, patterns and textures.



Brightening up telecommunications

When Swedish architects BAU were selected to design the new headquarters of a major telecoms company in Stockholm, they wanted the offices to be a natural, seamless extension of the building's signature atrium. But they also wanted a sustainable design that would embrace natural light and acoustics to enrich the space for the duration of the building's life.

To positively influence the building's lifecycle and create a comfortable environment for tenants, special focus was placed on the products used throughout the project.

Open plan working

Along with the office spaces, meeting rooms and open plan areas, the building is centred on a large atrium that extends from the ground floor, and features a seating gallery, to the top of the 10th floor.

In addition to providing light and a visual tie with the environment, the substantial atrium provides a vibrant centrepiece for the building. It functions simultaneously as the reception area, a casual meeting space and a venue for events, providing an appealing ambient environment for a range of uses.

Ceilings are golden

BAU architects faced the difficult task of translating the light and airy atmosphere created in the atrium throughout the rest of the office's modular office space, without compromising on appearance or acoustics. Creating a seamless and elegant extension of the vast atrium of the office relied heavily on the quality of the ceiling. As BAU architect Kristin Gausdal explains, "Ceilings can be frustrating. They make the difference between a nice space and a great space."

Gausdal wanted a ceiling that would create a beautifully smooth extension of the atrium's bright atmosphere. With the Rockfon Blanka® ceiling, Gausdal described how "the surface is smoother than on traditional stone wool tiles and is pattern-free." Improving access to natural light in the modular offices is important not only from a design perspective, but from a human perspective – with a study showing how 68% of employees complained about the lighting situation in their offices. Appropriate lighting can improve well being for those working in the building.

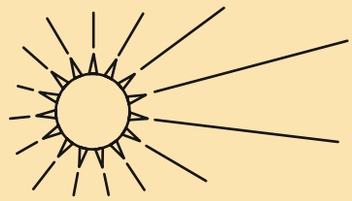
Rockfon Blanka

— If only everything white was this bright

The positive effects of light on the indoor environment and visual comfort should not be overlooked. With the proper use of materials it is possible to draw light further into a building, creating bright comfortable spaces for the users.

Rockfon Blanka is the pinnacle of interior design. Their whitest ceiling tile to date, it has a smooth, deep matt surface with high light reflection and light diffusion that will contribute to energy savings , reducing the need for artificial light by up to 11%, by capitalising upon the most economical source of light: the sun.

Brightening up offices, hospital rooms, retail environments and classrooms, Rockfon Blanka makes occupants feel like they have just walked into a special place. Its surface is non-directional keeping ceiling maintenance and installation easy and its great acoustic properties ensure a comfortable indoor environment.



Among Building Owners, Architects, Interior Designers, and Contractors:

77% identified improved indoor lighting conditions and daylight as the number 1 important feature of healthier buildings.


" Rockfon Blanka reflects the light better and looks whiter from any direction
Project: Telecommunications Project, Stockholm, Sweden
Architect: BAU / **Ceilings:** Rockfon Blanka®

INTERVIEW

Charles Spence

Experimental Psychologist, Oxford University

Professor Charles Spence is the head of the Crossmodal Research Laboratory at the Department of Experimental Psychology, Oxford University. He is interested in how people perceive the world around them. In particular, how our brains manage to process the information from each of our different senses (such as smell, taste, sight, hearing, and touch) to form the extraordinarily rich multisensory experiences that fill our daily lives.

WHAT ROLE DOES AMBIENT OR BACKGROUND NOISE PLAY IN A DINING EXPERIENCE?

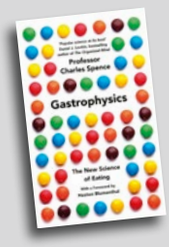
Ambient noise and music is crucial when we dine. If you have a lot of noise, it overwhelms your senses and distracts your attention. This means you have fewer resources to concentrate, and have fewer resources for taste processing.

WHAT NOISES OR SOUNDS CAN ENHANCE A DINING EXPERIENCE?

Playing classical music may enhance the perceived quality of wine and food. Loud background noise is shown to enhance umami taste, but it can also suppress sweet and salty tastes. High pitched notes can enhance the perceived sweetness of food, and base notes bring out bitter tastes.

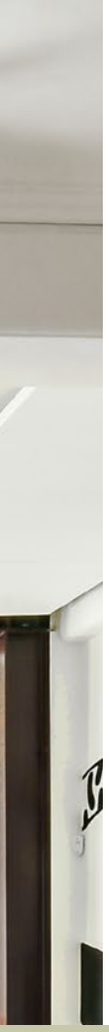
WHAT CAN RESTAURANTS DO TO REDUCE THE EFFECT OF NEGATIVE AMBIENT NOISE?

Today's design trend of exposed surfaces and high ceilings can create very distracting restaurant environments. To reduce this effect, restaurants can make simple changes such as adding absorbing materials, like curtains or cushions, and changing the type and volume of the music played. They can also install sound-absorbing materials that help to keep background noise to a minimum.



Explore Gastrophysics: The New Science of Eating by Charles Spence for more great insights about the influence of acoustics on taste, texture and the aroma of food.

Project: Mikkeller Taipei, Taiwan, China / **Architect:** Keng Yu Design Office
Construction: Rockfon Eclipse® / **Edge:** B-edge



Notes and Harmonies:

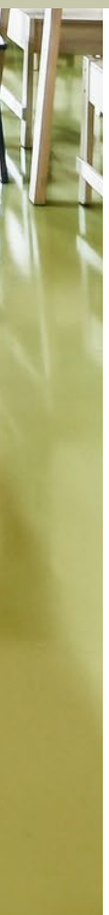
How acoustic performance can affect a restaurant experience

Does visiting a restaurant with heavy bass music leave a bitter taste in your mouth? Science may have an explanation for that. Scientists are discovering strong links between noise and taste meaning that, increasingly, dining out in restaurants is not just about the food.

The impact of sound on taste

The bitter taste from low notes is just one discovery that has been made that shows how sound can target and affect particular tastes, textures or flavour attributes we experience when we eat. The effects of background, ambient noise and other sounds on how we taste food is an area of research that has seen huge leaps in understanding in the past few years. Research has now found that there is a direct link between the ear and the nose, which may go some way toward explaining how and why noise affects what we taste.

> Nine out of 10 respondents said that background noise was the biggest problem they faced when eating out



Certain sounds can enhance tastes - for example, classical music may enhance the perceived quality of food and wine, and high pitched musical notes can enhance the perceived sweetness of food. However, sound can also detract, and loud background noise can negatively affect how we experience flavour and texture.

Noise can have a negative impact on health

Beyond affecting how we taste, and how we experience restaurants, research now shows that noise acts as a stressor and can also cause over-eating. Findings from a 4-year study by the Karolinska Institute in Sweden found that for every 10-dB increase in the road traffic noise levels, there was a 3cm increase in waist size for residents exposed to the noise. Furthermore, those exposed to loud airplane noise had a waist line that was, on average, 6cm larger.

Background noise is also a major and growing problem in restaurants, cafés and pubs. Nearly 80% of people have left a restaurant due to noise according to research by the charity Action for Hearing. Furthermore, the charity's research found that 91% of people said they wouldn't go back to a venue where noise levels were too high, and nine out of 10 respondents said that background noise was the biggest problem they faced when eating out. This can have a major impact on the businesses - 35% of those surveyed write reviews on websites like TripAdvisor after dining out - with half of these reviews mentioning high noise levels.

The acoustic challenges faced by restaurants

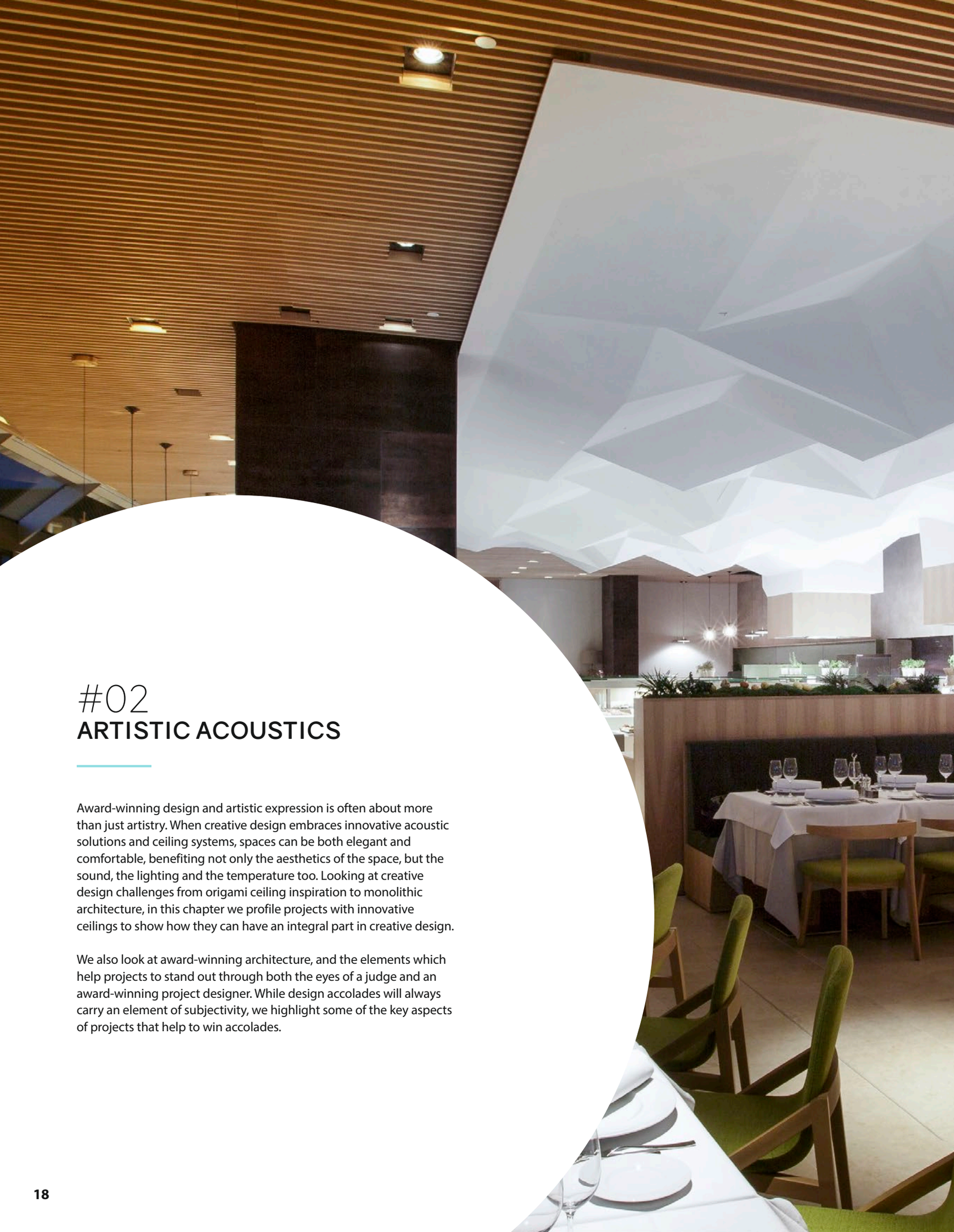
One restaurant that struggled with the impacts of noise is Mikkeller Taipei, a popular bar in the Dadaocheng neighbourhood of Taipei. Mikkeller was founded by two home brewers: Mikkel, a high school teacher, and Keller, a journalist. Both sought to introduce their home-brewed beer with creative beer names and cartoon character labels to the public, and to inspire people with new tastes.

The Mikkeller bar is bright, simple and, now, quiet. As a Danish brand, the interior design was built in a minimalistic Scandinavian style. Mikkeller sought to create an environment comfortable for everyone from single guests to groups to relax, drink good beer, and either read books or chat with friends.

However, the acoustic design process proved to be challenging. Mikkeller were unaware of the terrible acoustic environment until the soft launch, when guests could not hear the music, let alone each other. This was the exact opposite of the environment they sought to create. However they now faced a challenge of installing acoustic solutions to meet their needs. It had to fit with the overall Scandinavian simple, bright style, and it needed to provide a clean environment for the bar.

> Nearly 80% of people have left a restaurant due to noise according to research by the charity Action for Hearing

Guests who returned to the Mikkeller bar after the soft launch event were stunned by the improved effect the acoustic panels had and the bar's relaxed environment now attracts guests from around the world.



#02
ARTISTIC ACOUSTICS

Award-winning design and artistic expression is often about more than just artistry. When creative design embraces innovative acoustic solutions and ceiling systems, spaces can be both elegant and comfortable, benefiting not only the aesthetics of the space, but the sound, the lighting and the temperature too. Looking at creative design challenges from origami ceiling inspiration to monolithic architecture, in this chapter we profile projects with innovative ceilings to show how they can have an integral part in creative design.

We also look at award-winning architecture, and the elements which help projects to stand out through both the eyes of a judge and an award-winning project designer. While design accolades will always carry an element of subjectivity, we highlight some of the key aspects of projects that help to win accolades.

Project: Hotel Llaut Palace, Mallorca, Spain / **Architect:** Arantxa Guerrero, Seta Arqutectos
Ceiling: Rockfon® Mono® Acoustic

Project: Station Stockholm City , Stockholm, Sweden / **Architect:** Ahlqvist & Almqvist Arkitekter AB
Ceilings: Rockfon® Mono® Acoustic / **Grids:** Chicago Metallic™ Monolithic / **Photographer:** Mikael Ullén

The Art *of* Interior Design

Artistic design calls for a balance of style, comfort and top-grade finishing that functions for an interior layout, demanding the interior designer to have a wide-ranging and diverse skillset. With so many different factors and conditions, an artist should be able to influence the indoor environment with their work in limitless ways.

An artistic expression is the conscious application of an imagined vision, resulting in a phenomenon to be appreciated for its beauty. This creates an artistic representation in physical, acoustic or literary form.

Artistic interior design, when paired with great acoustic solutions and ceiling systems, can produce comfortable and elegant spaces that truly inspire.

Pleated monolithic acoustics drape the new Stockholm Central Station

The restoration of the Stockholm Central Station is a perfect example of a range of artistic designs becoming a feature of the landscape. Sweden has a long and illustrious tradition of introducing public art into metro station spaces, and its use in the new underground station by local artist Karin Lindh continues that trend.

Taking inspiration from the ornate design and elegance found in European cathedrals, Lindh wanted to play with daylight in a similar way as Bernini's sculpture, the Ecstasy of Saint Teresa, creating a beautiful indoor setting for the station. Yet her team was faced with the practical challenge of realising her artistic expression, a rippling pleated design draping the ceiling of the 200m^2 mezzanine, connecting the street level with the platforms, and creating a stunning centrepiece in the underground cathedral.

The flexibility of the Rockfon® Mono® Acoustic solution allowed this vision to come to fruition. The flexibility and durability of the ceiling infrastructure meant that Lindh and her team's design freedom was preserved, alongside architect Ahlqvist & Ahlmqvist, and the Stockholm Central Station could be transformed by Lindh's vision, while maintaining the acoustic precision and other innate requirements of the space.

Colour by Baffles

Another project with artistic expression at the forefront of its plans was the Meininger Hotel in Amsterdam designed by Christian Tschersich of LAVA (Laboratory for Visionary Architecture). A key aim of the Meininger Hotel Group when designing their hotels is to take inspiration from the city in which they are opening. In this instance, they borrowed from the ideas and style of Vincent Van Gogh with the plan featuring a 3D recreation of Van Gogh's famous Sunflowers canvas, offering a beautiful addition to the lobby environment. Its powerful characteristic style covered the new lobby bar and offered a unique atmosphere, emphasising the vibrant feel of the rooms at the hotel.

931 acoustic baffles were used throughout the design of this hotel lobby. The way in which the baffles are positioned greatly influences acoustic performance – installing the panels in a certain orientation can direct the noise and airflow, taking sound away from busy areas and improving the environment. At the same time, they can also provide colourful and vibrant aesthetics.

The way in which artists express their work can be broad and comprehensive, however irrespective of their design, they all rely heavily on quality products and partnerships in order for these projects and works of art to be realised. Whether it is a 200m^2 drape or a 3D recreation of Van Gogh's most famous work, it is the structural integrity of the infrastructure around them that has held these ideas together.

Project: Meininger Hotel, Amsterdam, Holland / **Architect:** Christian Sandor Tschersich, LAVA Architecture / **Ceilings:** Rockfon Contour® / **Edge:** Ac-Edge
Grid: Chicago Metallic™ T24 Hook 2850 / **Photographer:** Meininger Hotel, Amsterdam

Project: Hotel Llaut Palace, Mallorca, Spain / **Architect:** Arantxa Guerrero, Serta Arquitectos / **Ceiling:** Rockfon® Mono® Acoustic

Geometric Movement and Flexibility

Looking across Europe to Mallorca, Spain, the Llaut Palace Hotel, the new 5 star hotel also had to contend with some difficult circumstances when endeavouring to maintain a beautiful artistic design vision. One of the most challenging elements was creating a ceiling with an inverted pyramid design, inspired by origami and its geometry. This ceiling would create geometric ripples throughout the communal space of the hotel. "We wanted to transmit this sensation of lightness; the element of origami communicates movement and flexibility, expanding the space of the room," said architect Arantxa Guerrero.

Located in the dining room of the hotel, the architect's origami inspired artistry demanded a material which allowed for the construction of vertices and triangulations as well as having a high acoustic absorption, to counteract a highly trafficked space, and that didn't sacrifice on the aesthetic finish.

The flexibility of Rockfon® Mono® Acoustic enabled Guerrero to achieve his elegant and clean design, exactly as he had originally proposed.

An Architectural Heritage
Monolithic Architecture

From Petra in Jordan to Egyptian obelisks, monolithic architecture has historically been a sign of luxury and status due to its difficulty and technicality. Tracing its typography back to the Neolithic period, in recent years, it has seen a resurgence as an architectural trend. This technique can create outstanding constructions and designs that mould within and around the natural environment.

Tracing its etymologic root to Ancient Greece, meaning "single stone", monolithic avoids separating the exterior from the interior and seamlessly migrates the two surfaces into one singular expression. Designing a building from a single piece of rock is not without its challenges – one in particular being the infamously poor acoustics of the hard surfaces. The Messner Mountain Museum (MMM) Corones represents a good example of where this challenge was both addressed and perfectly solved. Designed by the world famous Zaha Hadid Architects and sitting 2,275m above sea level atop the summit plateau of Kronplatz in the Italian Dolomites, it is renowned for its tranquillity.

> *Monolithic architecture is the process of carving, casting or excavating buildings from a single piece of material, traditionally rock.*

HISTORY OF MONOLITHIC ARCHITECTURE

4200 BCE
POULNABRONE DOLMEN

2558 BCE
GREAT SPHINX OF GIZA

Project: Messner Mountain Museum Plan De Corones, Brunico, Italy
Architect: Zaha Hadid Architects
Ceiling: Rockfon® Mono® Acoustic

630 AD
MAHABALIPURAM
Photographer: Aravindreddyd

1930
MERCHANDISE MART
Photographer: Daniel X. O'Neil

2011
UC INNOVATION CENTER
Photographer: ELEMENTAL, Nico Saieh

2015
MESSNER MOUNTAIN MUSEUM

Reaching New Heights

Carved into the mountain, this extraordinary and elegant museum is devoted to mountaineering and alpine history, and offers unique views of the great mountain walls of the Dolomites and the Alps. According to architect Peter Irmscher, the design "remains true to its natural habitat, the rock, and seamlessly transitions into the mountain."

Reinold Messner, the eponymous founder of the museum, intended it as "a place of quiet where people can slow down and enjoy unforgettable views." Yet acoustics, as well as the tight construction schedule and remote setting, were among the key challenges for the construction of MMM Corones. And the now peaceful atmosphere has much to do with the endeavours of those who designed and constructed the building.

Addressing Alpine Acoustics

A specialist acoustic engineer was dedicated to the project from the very beginning, with auditory control high on the architect's agenda. They helped to demonstrate that monolithic design is possible without sacrificing top class acoustics. At first, Irmscher explained that they attempted to solve the noise problem with perforated plasterboard, but found that this approach was neither effective nor aesthetically pleasing.

The solution that addressed both of those needs was the unique monolithic solution of Rockfon® Mono® Acoustic. The museum design team realised that the lasting, durable and aesthetic product matched perfectly with the design vision to integrate the

Project: Messner Mountain Museum Plan De Corones, Brunico, Italy
Architect: Zaha Hadid Architects / **Ceiling:** Rockfon® Mono® Acoustic

exterior with the interior. In fact you hardly see the ceiling, as its colour and structure perfectly integrate into the concrete stone walls enhancing the true monolithic architectural experience. Irmscher described how the inspiration for the building came from the "dolomite stones". This acoustic precision matched with the beautiful appearance of the Rockfon Mono Acoustic surface and allowed Zaha Hadid Archiects to overcome the acoustic challenges of the project to create a tranquil environment within an extraordinary museum.

Bridging the gap between hard monolithic surfaces and inhabitable spaces could be the key to preserving an architectural heritage.

Rockfon Mono Acoustic

Refined, Undisturbed, Timeless Beauty

Interior design freedom asks for a combination of aesthetic choice and indoor comfort, enhancing the users experience while allowing for a signature design shaped to the spatial structure of the building. Flat or curved. White or custom colour. Ceilings or walls. Rockfon Mono Acoustic is more than a ceiling. It's a surface solution built to enrich the beauty of design while delivering a world of practical benefits.

The modern, smooth and refined surface creates a seamless design ideal that wraps quietly around ceilings and walls, bringing great acoustics to any space - big or small. With its Class A (α_w: 0.95-1.00) sound absorption, it enriches the interior surfaces for the benefit of the user.

Rockfon Mono Acoustic brings together, with amazing results, the undisturbed expressive potential of any design matched with the requirements of modern building specifications for good acoustics and indoor environment.

Project: The Word, South Shields, United Kingdom / **Architect:** FaulknerBrowns Architects
Ceiling: Rockfon® Mono® Acoustic / **Grid:** Chicago Metallic™ Monolithic

Creating Award-Winning Architecture

Awarding-winning architectural projects always push the boundaries of exterior and interior design, involving highly innovative plans and solutions. This inspiring work can lead to both elegant and practical results which translate into beautiful environments for those within them. The majority of architectural awards look to celebrate more than just the aesthetics of a building. What is becoming increasingly important is both influence and, crucially, the impact of the inside environment. Whether that is in terms of productivity, sustainability or community benefit – an award-winning design must be successful in all three.

Shape your world

The National Centre for the Written Word project in South Shields in the North East of England was presented with the prestigious Public Sector Interiors Project of the Year award in the 2016 Mixology North Awards. Designed to be a gateway to cultural, social and business knowledge, and playing to the industrial heritage of the region, the four-storey library and community centre "set the standard for design thinking in the UK" according to David Lindley, Executive Director at Designing Libraries.

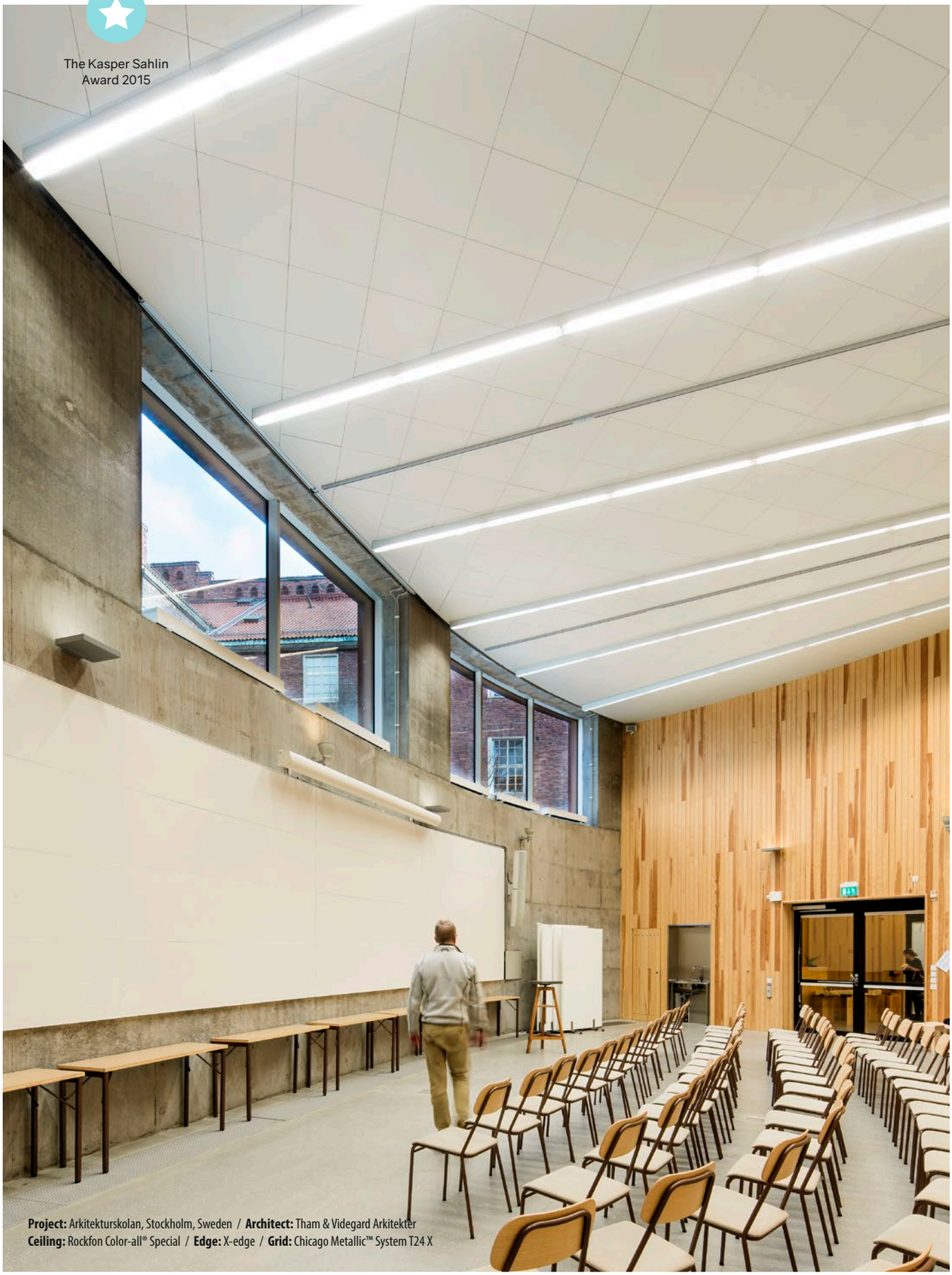
The award is judged on premium levels of quality, where it can be demonstrated that architecture and design contribute towards the delivery of first class public services in the community. This feeds into the importance of productivity and climate within an interior environment and how, when perfected, these can lead to award-winning architecture. In this, the award entry and the building itself was considerably boosted by the presence of a Rockfon® Mono® Acoustic seamless surface which "created a continuous ribbon around the circular atria of the building that enhances the atrium's stylish, contemporary interior design" according to Steve Dickson of FaulknerBrown Architects. John Osborne, Senior Project Manager at Bowmer & Kirkland described the results as sitting "so comfortably in the building and complements the surroundings, specifically how it curves around the central atrium space seamlessly, almost like a halo."

State-of-the-art Design

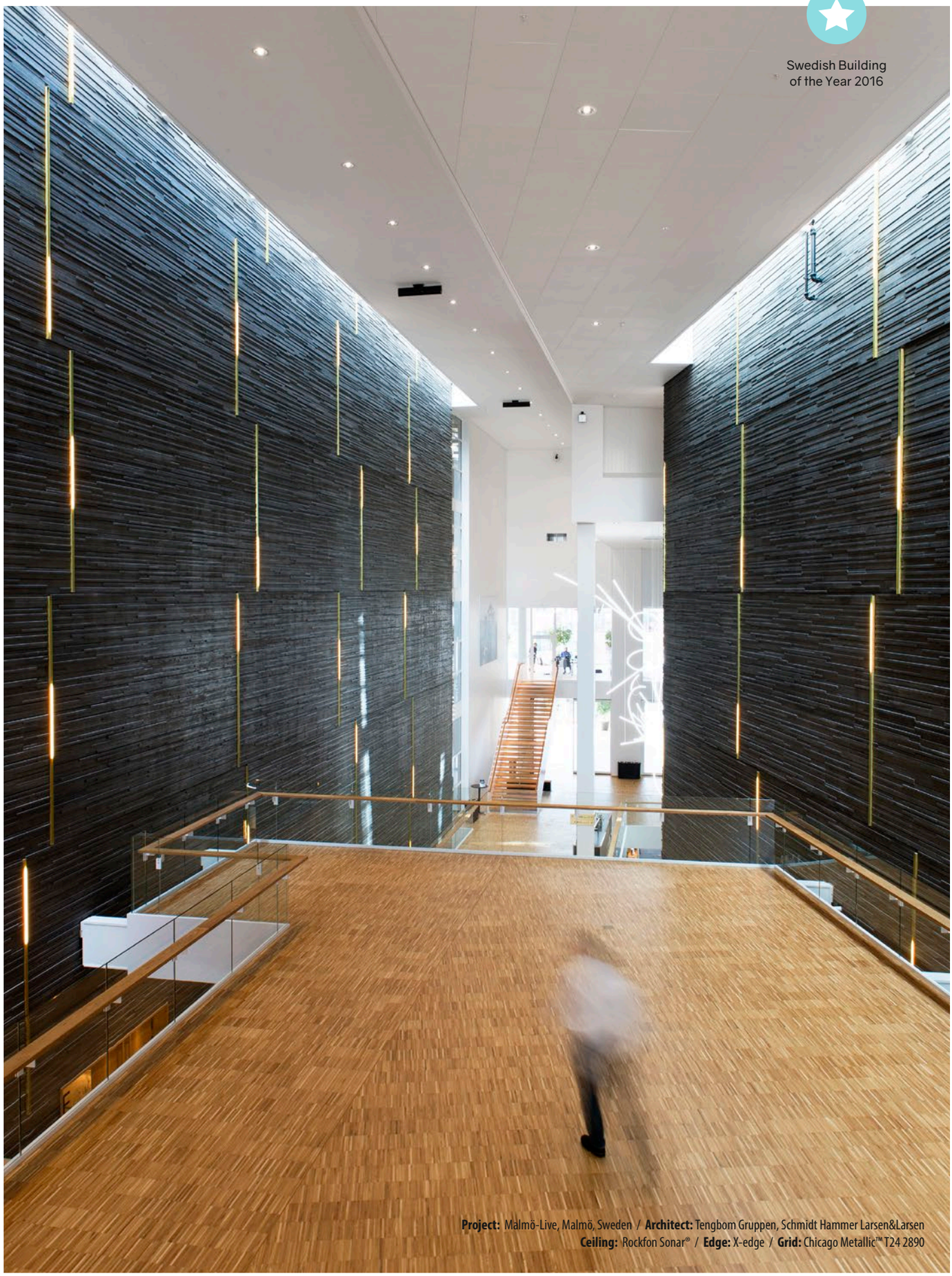
Innovation is key to award-winning design. Whether it is maximising comfort, productivity and efficiency in the workspace or developing a nurturing, educational and practical community. Innovative design and problem-solving qualities helped the Guildford Aquatic Centre showcase its design credentials; a sustainable strategy faced with complex challenges which was overcome through durable and pioneering solutions that included specialist acoustic panel design, impact resistance and humidity control. The centre was awarded first place in the Trade Award for 2015 by the Vancouver Regional Construction Association.

Winning awards can be of great importance to architects. While prizes can vary from financial benefits to unique opportunities, it is often the recognition of outstanding work that is the most powerful of accompaniments to award-winning designs. While the designation of architectural beauty will always carry an element of subjectivity, there are undoubtable aspects which are imperative when seeking to design a prize-worthy building. Creating a space which facilitates a unique and enjoyable indoor environment, while overcoming key innate challenges for the space, is essential to producing first-class architecture.

The Kasper Sahlin
Award 2015

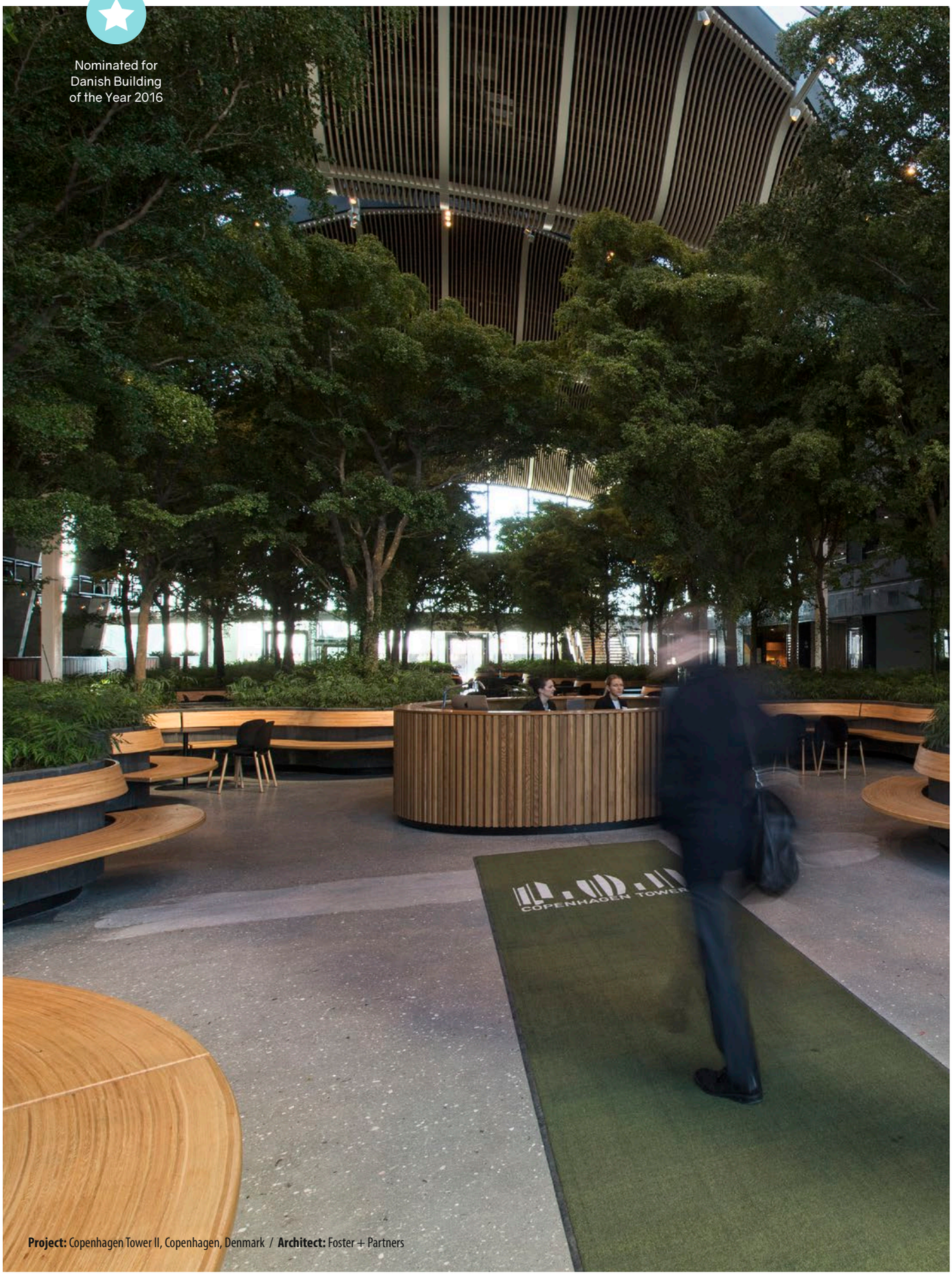


Project: Arkitekturskolan, Stockholm, Sweden / **Architect:** Tham & Videgard Arkitekter
Ceiling: Rockfon Color-all® Special / **Edge:** X-edge / **Grid:** Chicago Metallic™ System T24 X



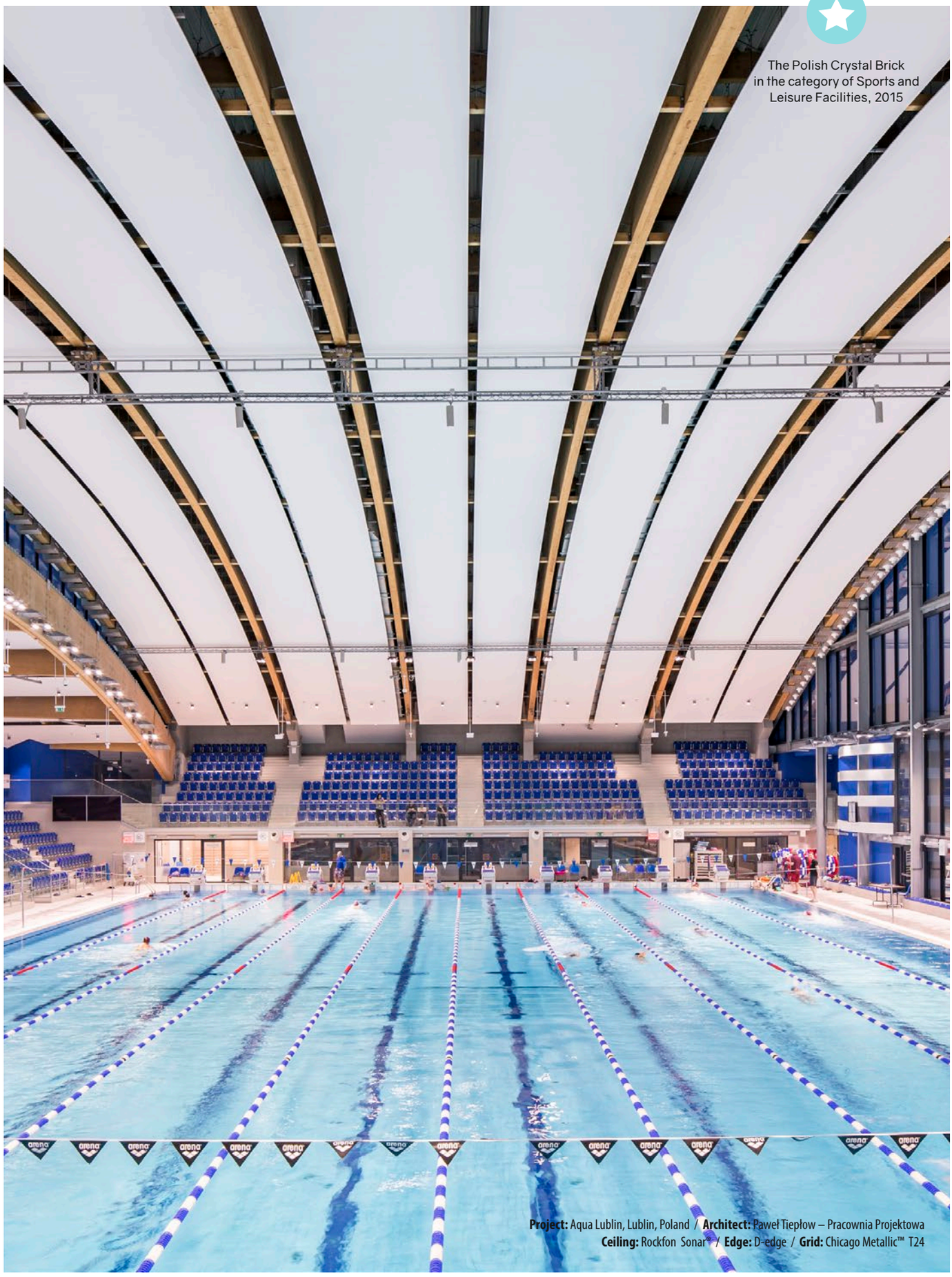
Swedish Building
of the Year 2016

Project: Malmö-Live, Malmö, Sweden / **Architect:** Tengbom Gruppen, Schmidt Hammer Larsen&Larsen
Ceiling: Rockfon Sonar® / **Edge:** X-edge / **Grid:** Chicago Metallic™ T24 2890



Nominated for
Danish Building
of the Year 2016

Project: Copenhagen Tower II, Copenhagen, Denmark / **Architect:** Foster + Partners



The Polish Crystal Brick
in the category of Sports and
Leisure Facilities, 2015

Project: Aqua Lublin, Lublin, Poland / **Architect:** Paweł Tiepłow – Pracownia Projektowa
Ceiling: Rockfon Sonar® / **Edge:** D-edge / **Grid:** Chicago Metallic™ T24

Award-Winning Technical Design

Pushing the envelope of architecture and design forces us to think critically and be sensitive to local project conditions. Award-winning design comes in many different shapes and sizes. While we have seen that artistic expression can result in beautiful and prize-worthy structures, sometimes it is the practical and durable solutions that overcome the biggest challenges which deserve the most praise.

Located outside of Vancouver, British Columbia, the Guildford Recreation Centre recently expanded to feature a new 10,000m^2 aquatic centre. The theme of this expansion was the use of water as a catalyst for regeneration in the local community.

Community-Minded Construction

The completed Centre was described by the City of Surrey's Anita Green as "a beautiful and serene space", and true to the project's theme of community-focus, will continue to serve as a hub for Guildford for years to come. The construction was awarded 1st place in the President's Trade Award for 2015 by the Vancouver Regional Construction Association.

This prize, awarded to StructureCraft, has a key emphasis on safety and sustainability considerations as well as recognising outstanding achievement when faced with demanding and challenging situations.

Overcoming Obstacles

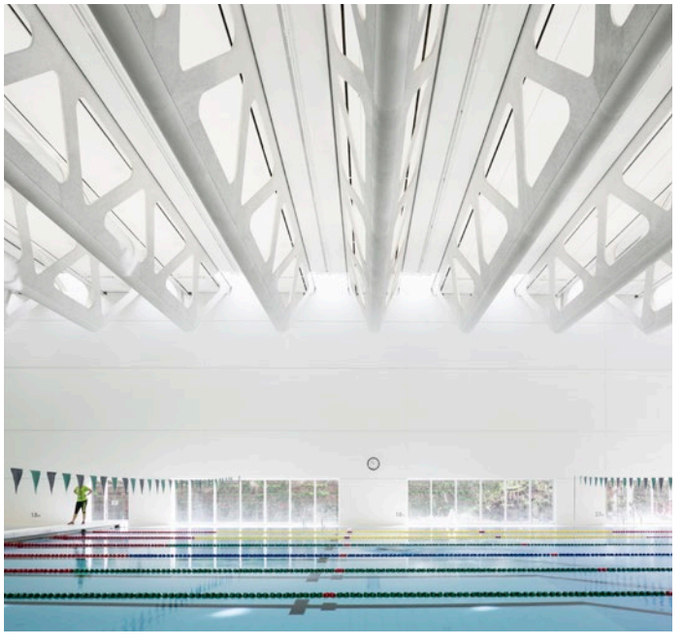
The $38.6 million project faced significant obstacles in the building process, with the requirement for the centre to remain open throughout the construction process and adhere to a tight building schedule. The challenges were further exacerbated by the need to manage acoustics, echo and reverberation in an environment "notorious for its noise" according to StructureCraft Builder's business development engineer, Brian Woudstra.

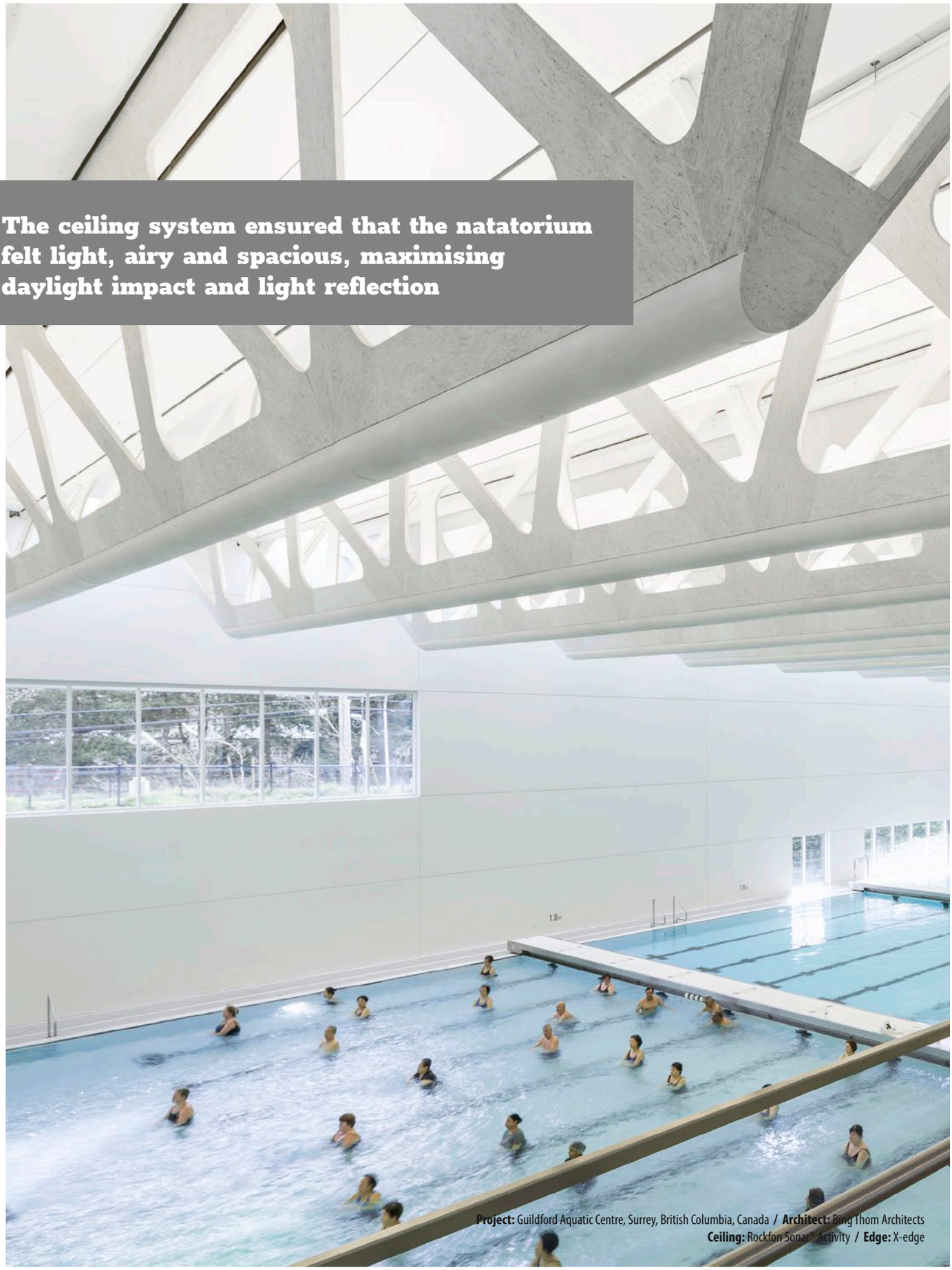
Innovative Solutions

These restrictions of both construction space and time were overcome by storing and completing over twenty 30m trusses off site, before assembling them by crane on location. Each truss was prefabricated with everything from mechanical ducts to ceiling panels. The trusses also enabled staff to carry out maintenance without having to close the pool for repairs, meaning that lights and fans could be serviced without hauling in lifts or draining the pool.

The construction partners' innovative solutions worked towards the project's performance goals of sustainability, aesthetics, time efficiency and budget. The ceiling system ensured that the natatorium felt light, airy and spacious, maximising daylight impact and light reflection. Especially on a bright day, the design allows for extensive sunlight to shine on the walls, from the skylights all the way down to the tiled flooring.

All of these factors and efforts culminated in what resulted in a hugely successful, efficient and prize-worthy endeavour, using interesting and innovative solutions to produce a technically complex design that benefitted both the community and the environment.





"The ceiling system ensured that the natatorium felt light, airy and spacious, maximising daylight impact and light reflection

Project: Guildford Aquatic Centre, Surrey, British Columbia, Canada **/ Architect:** Bing Thom Architects
Ceiling: Rockfon Sonar® Activity **/ Edge:** X-edge

Project: Frederiksbjerg School, Aarhus, Denmark / **Architects:** Henning Larsen Architects A/S, GPP Arkitekter, Møller & Grønborg, Kari Moseng
Ceilings: Rockfon Sonar® / **Edge:** M-edge / **Grids:** Chicago Metallic™ T24 Click 2890

#03
NEXT LEVEL LEARNING

This chapter goes back to school, featuring articles on innovation in school design. Comparing images of classrooms today with classrooms 50 or 100 years ago, it's sometimes hard to spot the difference - this is something that the schools we profile are working to change. We were able to speak with architect Ralf Pohlmann, who approached the design of an innovative school in Clenze, Germany with a pioneering role to both make students comfortable and to create consistency for when students enter their professional life – a future-forward approach. We profile the work of Henning Larsen Architects, who designed the award-winning Frederiksbjerg School with a focus on movement and play.

They looked to create relaxed, open spaces to allow students to learn skills like creative thinking, design, and the ability to cooperate and empathise. We spoke to the project manager and architect responsible for designing and managing the retrofit of the BuBaO Sint-Lievenspoort School in Flanders, Belgium, creating a school that honoured the past use of the building as a convent and looked to the future with innovative acoustic solutions and flexible designs to allow optimal use by both students and the community.

Project: BuBao Sint-Lievenspoort, Ghent, Belgium / **Architect:** EVR Architecten & Callebaut Architecten / **Photographer:** Stijn Bollaert

INTERVIEW

Philippe Monserez

PPP Schools of Tomorrow Programme Director

Philippe is the Programme Director of the Flemish Schools of Tomorrow programme. With its Design, Build, Finance, Maintenance (DBFM) approach, the Schools of Tomorrow partnership has taken the traditional approach to construction one step further, to cover the DBFM of school facilities for the first 30 years. Philippe has more than 25 years of experience managing ambitious corporate real estate projects and leading international and multi-disciplinary teams.

WHAT WERE THE CHALLENGES OF RETROFITTING EXISTING SCHOOL BUILDINGS?

The main challenge of retrofitting the existing school buildings was respecting the heritage of the buildings, whilst ensuring the retrofitted building met the same challenging technical requirements of climate, acoustics, accessibility, energy efficiency and fire safety as the new build schools.

HOW DID THE DESIGN, BUILD, FINANCE, AND MAINTENANCE APPROACH CHANGE HOW THE SCHOOL RENOVATIONS WERE CARRIED OUT?

The contractors were responsible for 30 years of maintenance of the schools. This meant that during the design and build, architects and contractors were pushed to use better materials and build with the 'total cost' in mind. During the construction, the contractor could come up with suggestions and optimisation based on maintenance considerations.

WHAT HAS BEEN THE REACTION TO THE SCHOOLS SO FAR?

We have heard that because the schools are more comfortable – acoustically and thermally – the students are quieter in their environment, and the teachers have fewer headaches!

CREATING SCHOOLS OF THE FUTURE

The Schools of Tomorrow programme in Flanders, Belgium, is one of the largest PPP projects in Europe: 182 projects individually designed to suit school specifications for 133,000 children and the community at large.

Schools with a more modern aspiration for their future education programmes were matched with architects that shared the same vision for the design of their school. The design challenges of creating a flexible, modern educational space were furthered by 20 of the projects that were retrofits of existing buildings. The retrofitted buildings needed to meet the same detailed outputs and specifications as newly built schools, such as high standards of indoor environment, acoustics, and accessibility, but they also needed to respect the often unique heritage of the school buildings.

The Schools of Tomorrow programme also took a more involved approach than the traditional approach to construction, through a Design, Build, Finance, Maintenance (DBFM) approach. The project contractor is responsible for maintaining the schools in the programme for the first 30 years, meaning that design and build decisions were taken with a long-term view. During the project build, the contractor was encouraged to suggest ideas for optimisation that would make it easier for building maintenance within that time span, increasing the focus on finding the most favourable products.

THE BUBAO SINT – LIEVENSPOORT SCHOOL, GENT, BELGIUM

One school that presented a particular challenge was the BuBaO Sint-Lievenspoort School in Gent, designed and executed by EVR-Architecten with Niels Baeck as project-architect.

The 140-year-old Sint-Lievenspoort Convent of the Sisters of Charity building is a former Convent that has been converted into a school. The architects and the contractor worked with the school administrators to renovate the building, embracing the existing character and quality of the building whilst factoring in the latest building regulations and guidelines such as the new acoustic requirements. For the BuBaO Sint-Lievenspoort School, this was of particular importance as it is a school for special elementary education, working with children who have hearing problems or who are on the autism spectrum.

Project: BuBao Sint-Lievenspoort, Ghent, Belgium
Architect: EVR Architecten & Callebaut Architecten
Ceiling: Rockfon® Krios® / **Grid:** Chicago Metallic™ Screenline® / **Photographer:** Stijn Bollaert

APPROACHING THE CHALLENGE

To approach this challenge, the architects began by looking at the different spaces within the school, and the specific requirements they each had as a result. Flexibility was key in the design, as the school was being used after-hours as a large meeting space and a centre for community events. With increased urbanisation, this is a growing trend for shared space usage in rural communities: as increasing numbers migrate to city centres the population decreases in rural areas, meaning architects need to renovate existing schools and other municipal buildings to ensure the same buildings can serve multiple purposes and cater to different target groups at different times. Also a challenge in densely populated urban areas, this sets higher demands for the architectural design.

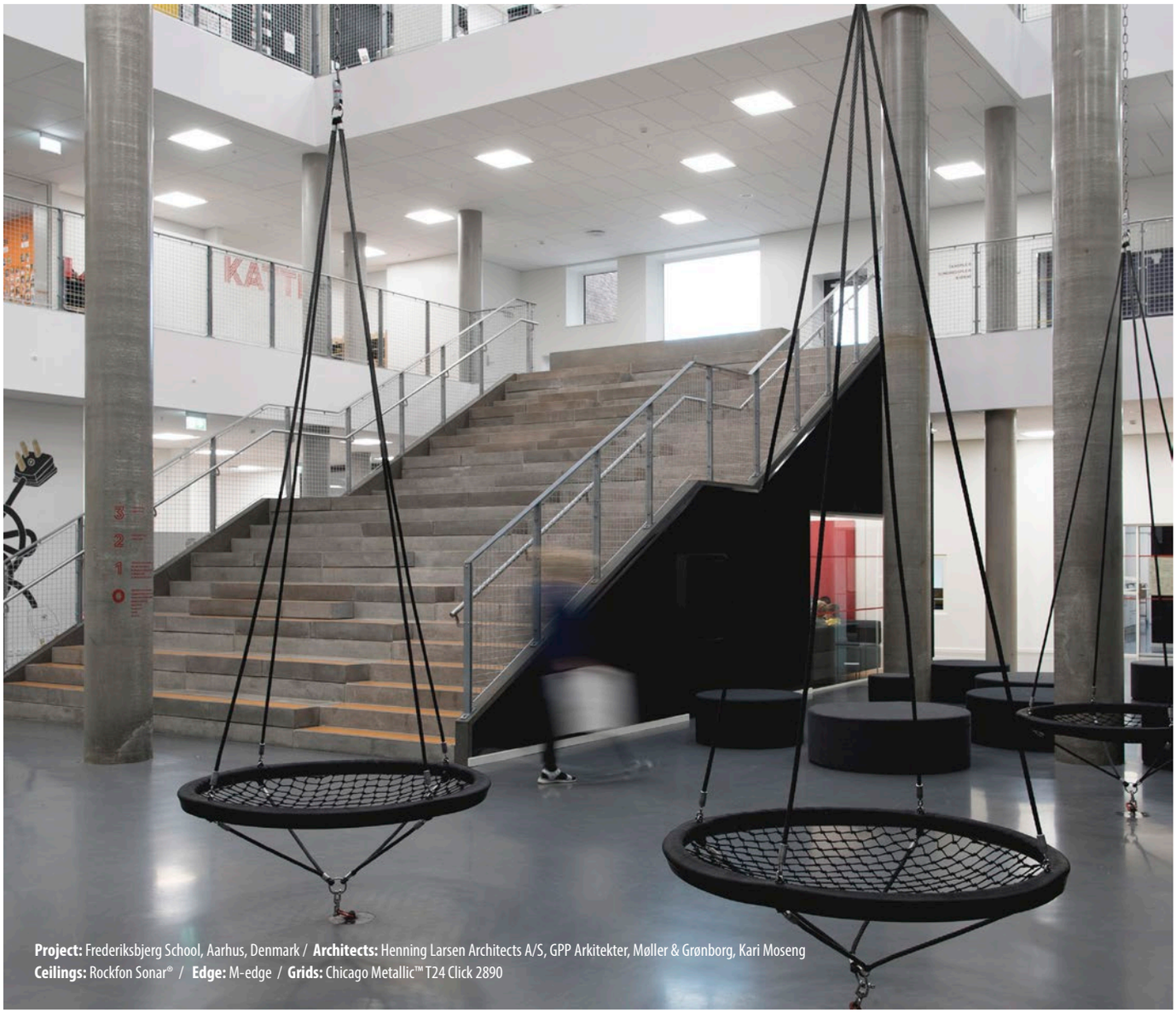
While the hallways had more room to showcase the historical elements of the building, the classrooms were treated as specialised studios with break vaulted Rockfon ceilings. A free hanging island solution was created with acoustic ceiling tiles. The ceilings were selected not only for their technical specifications relating to acoustics, but for the durability and fire safety that Rockfon products provide.

Another intriguing element of the renovation was the conversion of the existing chapel into a gymnasium. The chapel has an valuable interior with beautiful wooden vaulted ceilings and detailed heritage paintings. Acoustic improvements were made by introducing shortened walls on two sides, and an office was built in with acoustic materials to allow teachers a private space for work.

One aspect of the renovation that the architects embraced was working with the needs of their users, in this case, the school children. To make sure children could find their way easily through the school and quickly feel comfortable in their environment, every floor was given its own identity.

RESULTS

The BuBaO Sint-Lievenspoort School head teacher was one of the first in the overall project to benefit from the improved quality of the teaching environment once the renovation was complete. Like many of her students in the school, she too has hearing difficulties, and has found that the teaching environment is significantly better for both the teachers, who can hear the students better, and the students, who are quieter, more comfortable and more at ease in their new environment.



Project: Frederiksbjerg School, Aarhus, Denmark / **Architects:** Henning Larsen Architects A/S, GPP Arkitekter, Møller & Grønborg, Kari Moseng
Ceilings: Rockfon Sonar® / **Edge:** M-edge / **Grids:** Chicago Metallic™ T24 Click 2890

The School of the 21st Century

The purpose of the school is to create innovative learning spaces where teachers can share knowledge with students. If we are to compare the classroom of the 1950's to the classrooms of today, one struggles to see the fundamental changes made to the architecture of the room says CEO of [Language of Space], Kasper Stoltz.

While schools have embraced new technology in the classroom, there has been little change to how students function in the space itself.

When classrooms are designed to have a high-level of classification, the concept where each space is clearly focused on one certain subject, this is achieved by including relevant artefacts and tools for the lesson into the classroom, turning the teaching spaces into subject laboratories. This has been proven to help the students better adapt to their surrounding and thus positively influence their ability to concentrate and learn in a comfortable and enriching environment.

Like all architectural projects, understanding what the space will be used for and how it will impact the occupants is crucial.
If schools are to prepare students for the challenges of the future - creative thinking, design skills, collaboration – then we need to build schools where the architectural space facilitates students acquiring the skills needed for tomorrow.

INTERVIEW

Kasper Stoltz

CEO of [Language of Space]
and External Lecturer at the University of Aarhus

Kasper Stoltz is an External Lecturer on Material Culture at the University of Aarhus. He is also CEO of [Language of Space], a company working on a scientific basis, analysing and designing physical learning facilities, as well as advising architects, schools and politicians on school interiors and architecture. Kasper spoke with Rockfon about the importance of the school environment and classroom culture.

CHALLENGING SPACES

Too often, we still see the majority of classrooms where they're sitting in rows and all classes are conducted in the same space. The whole idea that eight completely different subjects are supposed to flourish within the same 50m^2 basically means that there's no space for anything else, just a book and a pen, and maybe a few pictures.

IMPORTANCE IN DESIGN

Skills like creative thinking, design thinking, the ability to cooperate and empathise; if you take those skills seriously then we really need to rethink how we teach, forcing us to re-evaluate how we design learning spaces. If we want to stay focused on testing while also encouraging personal development and growth, we aren't there at all. So when space is always determining what is possible, and the space is not designed to facilitate a specific activity, it won't happen. If you're sitting in an empty classroom with no tools, how can you work? Without the proper tools, it is very difficult to work with anything other than theoretical and abstract assignments. It doesn't facilitate physical activities that can foster creative thinking and entrepreneurship.

GROWING CREATIVITY

You could say that in education for the 21st century, there is a lot of creation and problem solving, both in the physical and digital worlds. So wouldn't it make sense that it was exhibited? That the building would also have a lot of galleries? Allowing the rest of the town into the school to view their artwork and creations benefits not just the school, but also the local community. The more authentic and great the audience is, the higher the motivation is for engaging in school work.

Construction Replaces Noise with Play

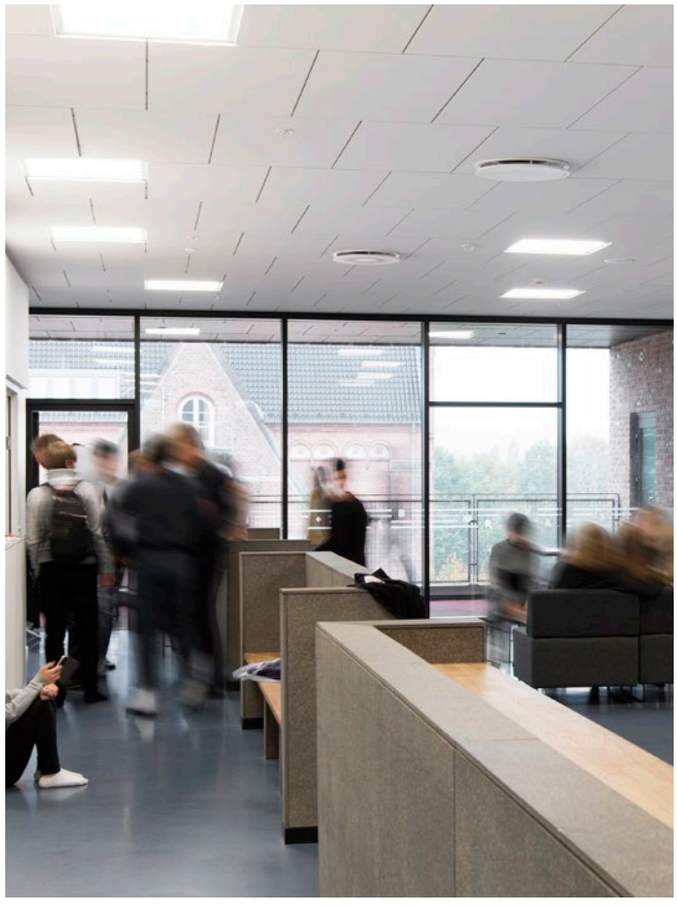
Designed by Henning Larsen Architects with Kasper Stoltz as an advisor on the project, the focus of the Frederiksbjerg School in Aarhus was on movement and play. The school was awarded the School Construction of the Year Award in 2016 for its innovative and optimised design at the School of the Future Conference.

The first school to be built in central Aarhus for 100 years, the school was constructed with 21st century principles in mind. The mood of the space was extremely important for the design of the school. To encourage the relaxed nature the school was seeking to foster, the architects installed a giant sloped climbing wall parallel to the main staircase, challenging the conventional means of getting around and providing innovative alternatives for the pupils, as well as three distinct areas for sports and games.

Movement and physical activity can produce a lot of noise. In order to do this, the ceilings in the school were installed with either Rockfon Sonar® M-edge or Rockfon Boxer® AEX ceiling tiles. Both sets of products have fantastic impact resistance making it ideal for use in schools.

Noise in primary schools is unavoidable, which was one of the most challenging issues when designing the building. By using acoustic absorber boxes to help reduce the noise, paired with the acoustic precision offered with the 13,600m^2 of ceiling solutions, the environment remained manageable and gentle. Acoustics is just one, albeit integral, component of designing a school. Innovative plans must be made to ensure educational spaces are focused on how students learn, and thus how schools take a constantly future-gazing approach to teaching.

It was this type of atmosphere that the Frederiksbjerg School was intending to replicate. With comprehensive control over the noise and acoustics of the space, the architects were able to construct an enriching and inspiring school in which the students could flourish.



> The architects made a distinct effort to create an acoustic environment to ensure 900 students could both work and play in an enriching space.”

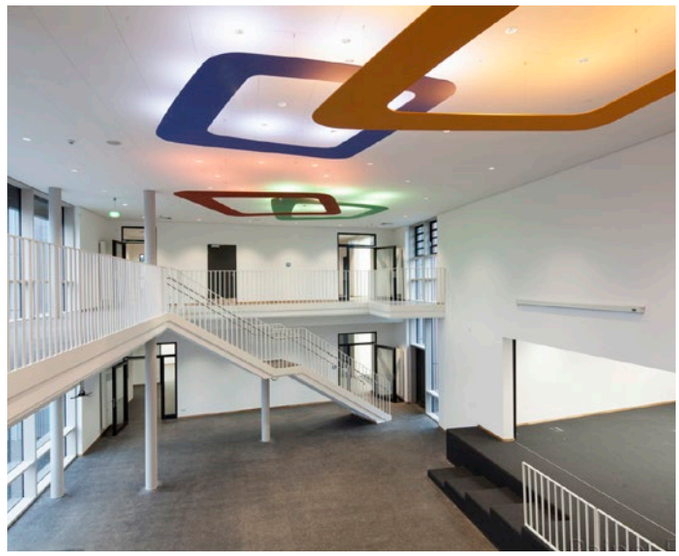
Project: Frederiksbjerg School, Aarhus, Denmark / **Architects:** Henning Larsen Architects A/S, GPP Arkitekter, Møller & Grønborg, Kari Moseng
Ceilings: Rockfon Boxer® / **Edge:** AEX-edge / **Grids:** Chicago Metallic™ T24 Click 2890 / **System:** Rockfon® System Olympia Plus A Impact 1A™

Inspiration starts at home

The Astrid-Lindgren School in Germany is another example of school design that looks towards the future. The architect behind the project, Ralf Pohlmann, believes that school design should play "a pioneering role and show structures that are still present when the students then enter their professional life". Pohlmann believes the most crucial aspect of the school experience is to "optimize it, and above all, to think about the future… [ensuring that] students feel comfortable there."

Pohlmann took stimulation from his bad experiences at school and those of his two daughters to develop design plans that make the student feel at home at school, removing any possible element of fear or negative feeling. With negative feeling comes poor productivity and a lack of focus, so keeping morale high in a school is key to establishing a flourishing environment.

Gone are the days of the drab and plain classrooms of decades gone by, when you enter a school of the 21st Century. All classrooms are specially designed for the lessons they are seeking to teach which is very much in line with what Kasper Stolz discussed when he referred to a clear classroom classification to en hance learning. In Astrid-Lindgren, there is a specialist central Music Hall, a workshop building, art classes and the future-proof design continues with WiFi throughout the buildings and school iPads.



A New School Day

The goal was to create a school where the children could feel safe and relaxed in a warm environment, to assist them in their capacity to learn and absorb information. Taking learnings from the Swiss school environment, the classroom set-up was rearranged so that, rather than individual desks, children work in small workgroups on a 'learning island' where they interact collaboratively. Two teachers also work in unison together, rather than a single teacher leading the lesson.

Since the shared 'learning island' environment means the classrooms can often be more noisy, the children are encouraged to talk and interact quietly with one another so they can be understood. So it was really important to the designers that the surroundings and room design mirror that.

After comparing diverse products, Pohlmann decided on Rockfon Tropic® ceiling tiles as the perfect solution, due to their high levels of sound absorption. In addition, he chose the X-edge for its smooth, clean finish, so that the ceiling would have a cohesive look and feel, with a seamless 'white blanket' appearance. Together with an integrated light solution the acoustic ceiling met the requirements of the school and classroom environment, at an appropriate price point for a state-run programme and budget.

A School of the 21st Century must offer a space that enables the students to act freely and individually while learning in a positive and focused environment. The Astrid-Lindgren School, followed these guidelines closely with technical success, as well as greatly benefiting the community.

Project: Astrid-Lindgren-Schule, Clenze, Germany / **Architect:** ralf pohlmann architekten, waddeweitz
Ceiling: Rockfon Tropic® / **Edge:** X-edge / **Grid:** Chicago Metallic™ T24 Click

THE ACOUSTICS INDEX

70% of Employees

report that their productivity would increase if their environment was less noisy.

48%

INCREASE IN EMPLOYEE FOCUS

in offices with good acoustics.

20 minutes

of concentrated work is lost due to small office distractions.

27% REDUCTION IN STRESS LEVELS

BECAUSE OF AN IMPROVED ACOUSTIC ENVIRONMENT IN OFFICES.

5-10%

REVENUE INCREASE

in retail shops where acoustics are optimized.

79%

OF PEOPLE HAVE LEFT A RESTAURANT EARLY BECAUSE IT WAS TOO NOISY.

50% of Teachers

have reported damage to their voice due to classroom noise.

91% OF PEOPLE

said they wouldn't go back to a restaurant where noise levels were too high.

66% DECREASE

in staff performance as a result of distracting noise

$52 Billion

The estimated cost of noise pollution in Europe per year.

3cm

LARGER WAIST LINE

for every 10-dB increase in road traffic noise levels.

Sources: Sound Business, 2007; Sykes, David M., PhD. Productivity: How Acoustics Affect Workers' Performance in Open Areas. 2004; Sykes, David M., PhD. Productivity: How Acoustics Affect Workers' Performance in Open Areas. 2004; Sykes, David M., PhD. Productivity: How Acoustics Affect Workers' Performance in Open Areas. 2004; Sound Business, 2007; Dixon, Luke, Speak Easy: How to improve the customer experience; Ray, Nelson et alt, Voice Disorders in Teachers and the General Population: Effects on Work Performance, Attendance, and Future Career Choices 2004; Dixon, Luke, Speak Easy: How to improve the customer experience; Building the Business Case: Health, Wellbeing and Productivity in Green Offices, Oct 2016; Building in Sound - BIAMP SYSTEMS Whitepaper; Spence, Charles, Noise and its impact on the perception of food and drink. 2014

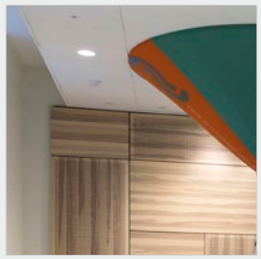


IMAGE GALLERY

Explore a collection of beautiful photographs from exceptional projects that paired brains with beauty, great indoor environment and eye-catching design.

Project: Cité de la Musique, Paris, France / **Installer:** SERTAC
Ceiling: Rockfon® Mono® Acoustic / **Photographer:** Laurent Blossier

Project: Media Evolution City, Malmö, Sweden / **Architect:** Juul & Frost Arkitekter
Ceilings: Rockfon Sonar® / **Edge:** X-edge

Project: Volvo Mobility Centre, Vlaardingen, The Netherlands / **Architect:** Peelen Interieur BV
Ceilings: Rockfon Blanka® / **Edge:** D-edge

Project: Roman Catholic Parish, Toruń, Poland
Installer: ProSystem Krzysztof Dziewulski **/ Ceiling:** Rockfon® Mono® Acoustic

Project: Tove Ditlevsens Skole, Copenhagen, Denmark
Ceilings: Rockfon Sonar® / **Edge:** X-edge

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