

INSPIRED **BY YOU**

A COLLECTION OF INTERIOR ACOUSTIC DESIGN



Can employees finally
fall in love with
OPEN-PLAN OFFICES?

INDOOR CLIMATE

an interview with IAQ expert Geo Clausen

TREND WATCH

where office design is heading

CHANGING OFFICES

Project: SEB Bank & Pension, Copenhagen DK
Architect: Lundgaard & Tranberg Arkitekter
Ceiling: Mono Acoustic
Photo: Adam Mørk

The way we work and interact is constantly changing and evolving. This affects the way we design and build interior spaces. Recent heightened attention to sustainability and environmental certifications brings additional challenges and is forcing manufacturers of building materials to innovate. We all benefit, and sometimes the right combination can even inspire. *INSPIRED BY YOU* is a collection of inspirational interior spaces seen – and heard – from an acoustic comfort perspective. The images and articles focus on current solutions and future trends within the office environment. We invite you to explore here and online: www.rockfon.co.uk/office



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FRONT COVER

Project: Middelfart Sparkasse, Middelfart DK
Architect: 3XN
Ceiling: Fusion

TREND WATCH:

WHERE OFFICE DESIGN IS HEADING

Changing work patterns, environmental awareness and the worldwide economic situation are shaping the office of tomorrow. *INSPIRED BY YOU* identifies six key trends to keep an eye on.

Project: Viborg City Hall, Viborg DK
Architect: Henning Larsen
Ceiling: Mono Acoustic + Sonar X



Project: Marcapo, Coburg DE
Architect: Kessel-Innenarchitektur
Ceiling: Rockfon Eclipse

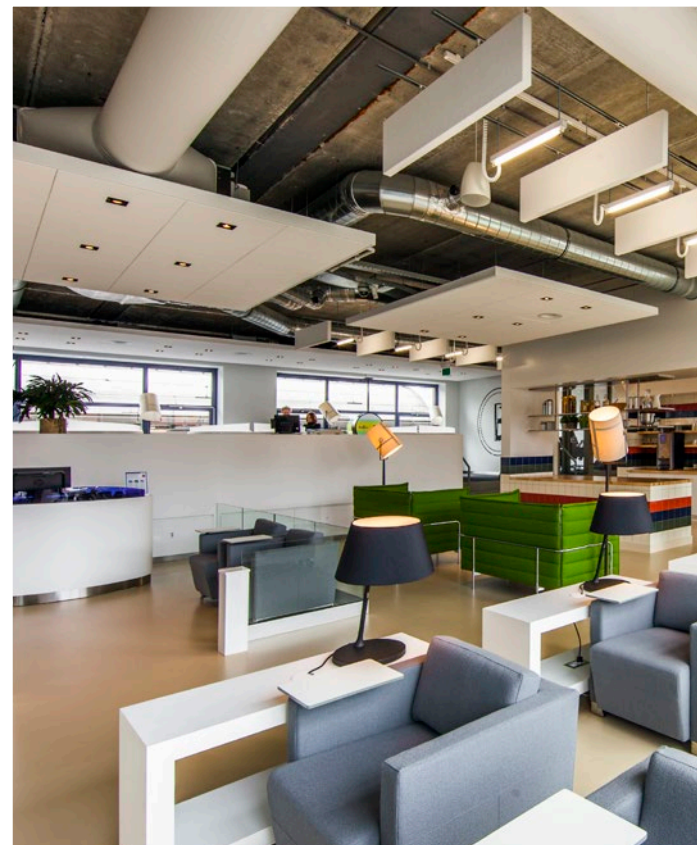
MOBILITY

Enabled by wireless devices, social networking and video conferencing tools, today's employees can work from anywhere, anytime. On any given day, in any typical office space, many workers are off-site leaving their workstations unoccupied. Consequently, hot-desking has become the norm in many buildings. This has enabled companies to increase the number of people working in the office without having to set aside more space for workstations. But what are organisations doing with the rest of the space?

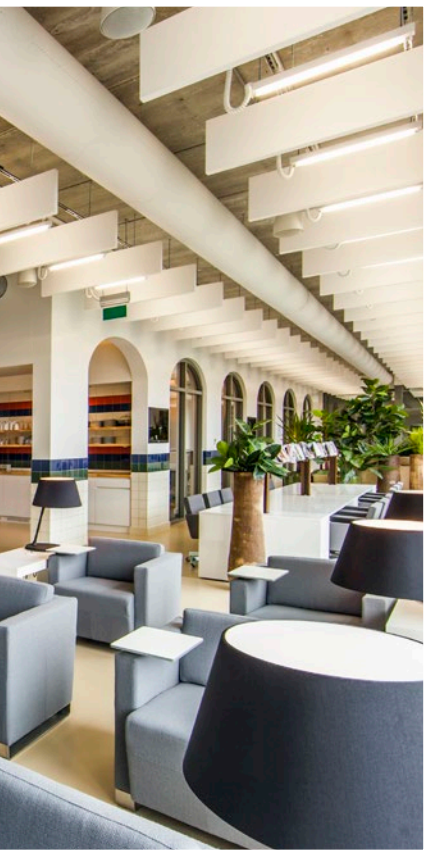


INTERACTION

Employers are transforming spaces into areas of informal meeting and interaction. According to modern management theories, employees are more productive and happier when they can interact freely with each other in a creative, inspiring setting. Beyond traditional formal meeting rooms, today's offices now include informal communal spaces like coffee bars or lounges dedicated to impromptu get-togethers and atriums that encourage chance encounters and casual interaction. In smaller nooks and hallways, comfortable furnishings for informal meetings and quiet reflection are increasingly popular. High dividing walls are being replaced by lower partitions – or removed completely. But one person's conversation is another person's disturbance. Greater interaction raises problems with confidentiality and concentration.



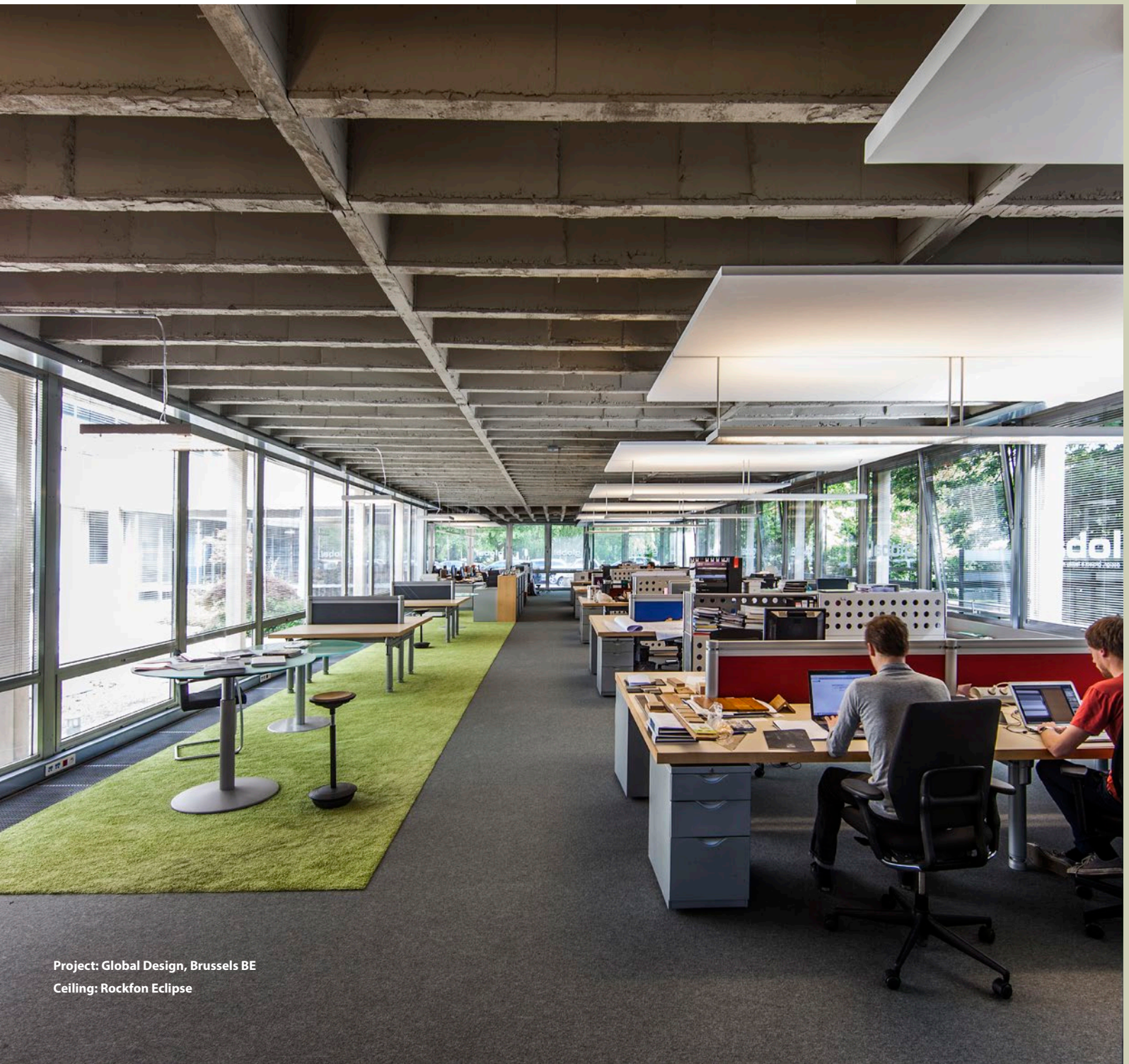
Project: station2station, Amersfoort NL
Architect: Abrahams Crielaers
Ceiling: Alaska D + Rockfon Contour



FLEXIBILITY

The freedom to roam and collaborate generates a greater need for flexible layouts. So does the pace of change in business today. Organisations need to be able to adjust workspaces accordingly. Sometimes referred to as “agile interiors”, these spaces can be reconfigured relatively quickly and easily. However, any change in floor plan requires a change in ceiling plan to ensure the space’s acoustic performance keeps pace with the changing needs of its occupants. Not to mention easy access to services and wiring housed in the ceiling void.

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Project: Fiberline, Middelfart DK
 Architect: Jan Søndergaard
 Ceiling: Fusion + Mono Acoustic



Project: Mikado House, Copenhagen DK
 Architect: Arkitema
 Ceiling: Alaska E

OPENNESS

The heightened interaction and flexibility of the 21st century workplace is also reflected in the increased use of glass, expansive spaces, integrated lighting and monolithic ceilings. Designers are trying to create inspiring spaces that reflect the energy and openness of the organisation. Some architects are taking the notion of openness to the extreme by showcasing formerly hidden areas, such as production areas and meeting rooms, in aquarium-like fashion. In fact, many companies see their office space as a way of promoting their brand and values to visiting clients and prospective employees.

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But the large windows and hard materials typically found in such buildings raise serious acoustic issues, while the growing use of thermal mass requires designers to rethink the way they design sound absorbing solutions, such as ceilings.

Project: Park 20|20 Fox, Hoofddorp NL
 Design Architect: William McDonough + Partners
 Architect of Record: KOW
 Interior Architect: Jos Bogaarts
 Size: 3,678 m²
 Ceiling: Rockfon Eclipse + Sonar X

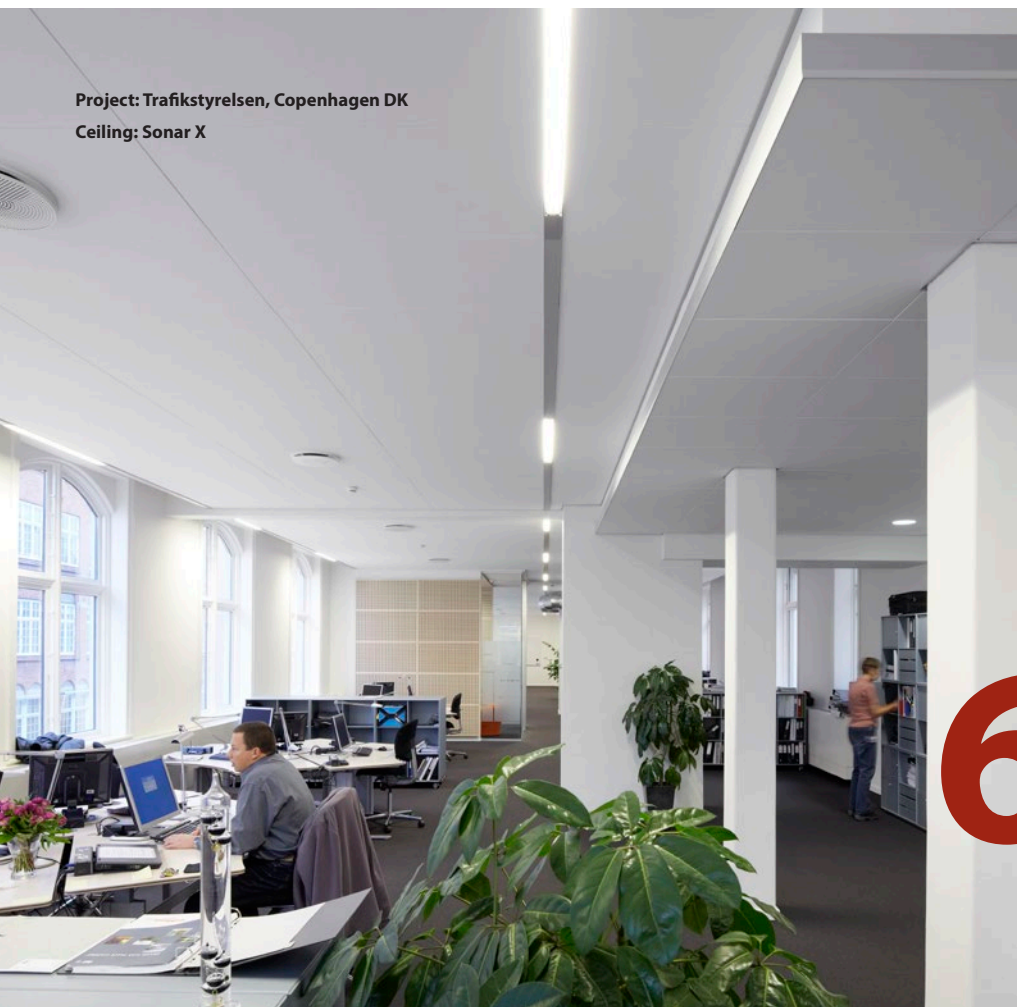


SUSTAINABILITY

Thermal mass is just one facet of a deeper trend towards sustainability and lower environmental impact. As awareness of building standards and rating systems such as BREEAM, SKA and LEED have entered the mainstream, some developers and architects have been pushing green building beyond just energy performance. An increasing number of designers now look at the full environmental impact of a building over its entire lifecycle, and this includes the indoor environment.

Studies show that acoustically-friendly spaces with comfortable lighting and optimum temperatures increase employee wellbeing, productivity and satisfaction – which in turn reduces absenteeism and staff turnover. But it is not always easy to balance the acoustic needs of a space with the heating, cooling and energy efficiency requirements.

Project: Trafikstyrelsen, Copenhagen DK
 Ceiling: Sonar X



UPGRADEABILITY

The trends outlined above are not reserved solely for new-builds. For example, by refurbishing and improving their current office layouts, companies can accommodate more staff comfortably without having to move into larger premises. This helps keep costs down, increase operational flexibility and meet employee expectations.

In a down economy, building owners are also keen to renovate their existing properties. It is a way of maintaining the competitiveness of their asset – of countering falling rental values and rising vacancy rates. In addition to preferring more modern, better quality spaces, today's tenants are very sensitive to the operating costs of offices. A refurbished space that offers lower energy costs thanks to improved use of thermal mass will be more attractive in the marketplace. ▶



INTERVIEW: GRY KJÆR, 3XN

MAKE ROOM FOR THE FUTURE



Project: KPMG, Frederiksberg DK

Architect: 3XN

Ceiling: Mono Acoustic + Sonar X with Fagerhult lighting

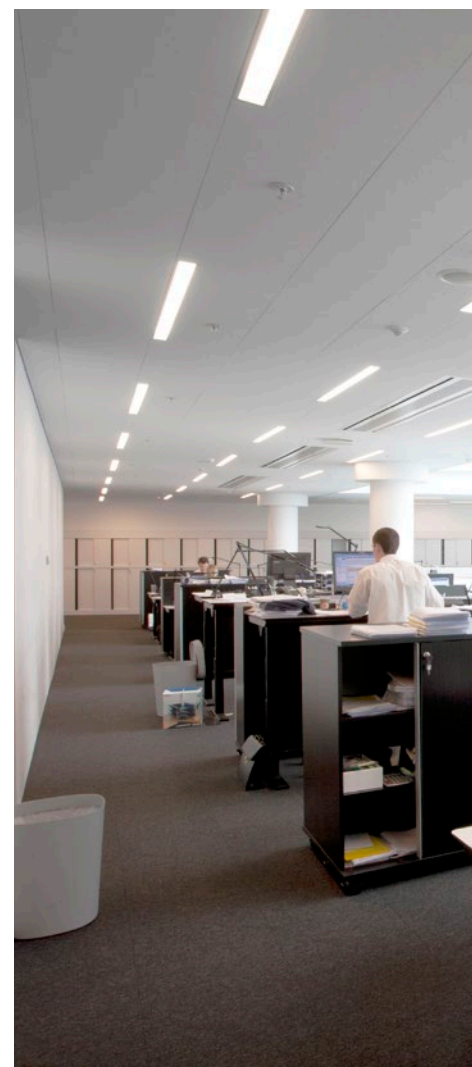
KPMG, one of the largest professional services networks in the world, has recently moved their Copenhagen offices into new headquarters designed by architects at 3XN. Shaped like a 3-leaf clover, the leaves sprout out from a connecting central atrium. The idea behind the building is to equip KPMG for tomorrow's requirements with collaboration, knowledge sharing and sustainability. The office must also be practical, providing room for 1,700 employees and spaces for conferences, training and seminars. With very low energy consumption and strict requirements for reducing environmental impact, the new building supports KPMG's Corporate Social Responsibility targets for reduced CO₂ emissions and is included in the European Green Building Program, whose goal is to improve the business efficiency of buildings. We spoke to **Gry Kjær**, one of the 3XN architects involved, about the project:

WHAT ARE THE MAIN CHALLENGES WHEN DESIGNING AN OFFICE BUILDING FROM SCRATCH?

"The main challenge is to analyse the client in terms of working procedures, structure, corporate values and culture while also paying close attention to their business and organisational goals. KPMG wanted new headquarters that would enhance the collaboration between different departments and strengthen the perception of KPMG as a modern and attractive workplace."

WHAT ARE THE TRENDS IN MODERN OFFICE ARCHITECTURE?

"Clients are becoming more and more aware of the positive impact architecture can have on the strategic goals of their organisations. It's not just about having an impressive building; it's now more about creating a building that assists in achieving corporate goals while protecting the positive elements of corporate culture."



HOW AND WHEN DO ACOUSTIC CONSIDERATIONS ENTER THE DESIGN PROCESS?

"When designing open-plan offices for employees that are used to single-office spaces, the acoustic climate is a main concern and major focal point right from the start. The very first draft specifies appropriate construction materials and acoustic solutions. When designing we focus on employees and their use of the building, so acoustics are important throughout all design stages."

WHAT MUST BE DONE TO ENSURE A GOOD INDOOR CLIMATE IN A BUILDING THAT IS PRIMARILY COMPOSED OF OPEN-PLAN OFFICES AND LARGE OPEN SPACES?

"It is important to create defined spaces for working and defined spaces for talking. These zones shape the behaviour of the user; staying quiet in the working zones should just come naturally. It's important to make good use of acoustic materials on the ceiling and, if needed, on the floor along with a ventilation system that provides fresh, clean air throughout the building."

GRY KJÆR



“WHEN DESIGNING WE FOCUS ON EMPLOYEES AND THEIR USE OF THE BUILDING, SO ACOUSTICS ARE IMPORTANT THROUGHOUT ALL DESIGN STAGES.”





Project: UN City, Copenhagen DK
Client: By & Havn A/S
Architect: 3XN
Engineer: Orbicon + Leif Hansen A/S
Landscape Architect: Schønherr Landskab
Area: 28,000 m² + 5,000 m² basement
Ceiling: Sonar X with Fagerhult lighting



SUSTAINABILITY AT WORK

Whether you are sailing into the Copenhagen harbour, taking the northern coastal train or visiting a mermaid at Langelinie, you cannot miss it. The Danish capital will soon have a new landmark: the UN City offices, being built in the Marmormøllen district north of the city centre, are due to be commissioned in 2013.



Project: UN City, Copenhagen DK
 Client: By & Havn A/S
 Architect: 3XN
 Engineer: Orbicon + Leif Hansen A/S
 Landscape Architect: Schönherr Landskab
 Area: 28,000 m² + 5,000 m² basement
 Ceiling: Sonar X with Fagerhult lighting

WALKING THE TALK

Following the United Nations (UN) Millennium Summit in 2000, the Danish government began to investigate the possibility of moving six Copenhagen-based UN agencies into one single location. The goal was to reduce operating costs, share resources and encourage greater cooperation between the agencies. But the project, which soon became known as **UN CITY**, had a fourth objective: environmental sustainability.

FROM AMBITION TO REALITY

Responsibility for translating the desire for greater environmental sustainability into a functioning workplace was given to the Danish firm of architects 3XN. Their star-shaped design

responded to the UN's desire for an iconic building. It also reflected the fact that the building houses separate agencies that share a mutual core set of values.

The design balances the need for openness with stringent security requirements. Daily life is centred around a light-filled atrium that offers visual and physical connections across floors and units. All the office floors have an open and flexible layout permitting knowledge sharing and interaction as well as spaces for individual concentration and private meetings. Workstations benefit from plenty of daylight and a good indoor climate.

SUSTAINABLE FROM THE START

The building features green recreational areas and several sustainable initiatives. *"The UN has great ambitions when it comes to sustainability in their buildings. Therefore, from the very beginning, integration of sustainable solutions was a key part of the design process,"* says **Gry Kjær**, associate at 3XN and project leader on UN City. *"Solar panels, seawater cooling, water re-use and automated BMS (Building Management Systems) are among the many solutions used on the project."*

“FROM THE VERY BEGINNING, INTEGRATION OF SUSTAINABLE SOLUTIONS WAS A KEY PART OF THE DESIGN PROCESS.”

Particular attention was paid to the indoor climate, because as Kjær puts it, *“sustainability isn’t just about energy consumption; it’s also about creating a healthy work environment.”* 3XN therefore recommended using certified building materials that offered the highest level of sustainability. *“For example, the building features approximately 35,000m² of ROCKFON Sonar® concealed X-edge ceiling with integrated lighting.”* Choosing the right materials from the beginning helps create a good indoor climate; excellent acoustics, ventilation and materials that support the use of less energy all play a significant part in the building.

In terms of sustainability, the UN City is expected to be one of Denmark’s most energy efficient buildings with an annual energy consumption of less than 50 kWh per m² (Danish Energy Class 1). The UN City is registered with the LEED® sustainability ratings system with a certification goal of minimum LEED Gold. It was awarded the prestigious GreenBuilding Award 2012 by the European Commission.

SHAPE OF THINGS TO COME

The design of UN City is not a one-off project, says Kjær. *“We definitely see a trend towards more sustainable buildings within the office sector as well as other sectors,”* she explains. *“Clients are becoming increasingly aware of the fact that sustainable building can offer high performance, contribute to a healthy working environment and hold competitive market value.”*

GXN, the innovation unit of 3XN, is currently involved with several projects where the development of a more sustainable building sector is in key focus. *“It is definitely an area of expertise that we find great demand for,”* concludes Kjær. ■



“SUSTAINABILITY ISN’T JUST ABOUT ENERGY CONSUMPTION; IT’S ALSO ABOUT CREATING A HEALTHY WORK ENVIRONMENT.”





NEW BEST FRIENDS: THERMAL MASS AND ACOUSTICS

Thermal mass is a hot topic among architects and contractors. It describes the ability of building material to absorb energy, store it and, at a later time, release it. In doing so, thermal mass can help

reduce the cooling and heating demands of a building, making it more energy efficient.



Project: Park 20|20 Fox, Hoofddorp NL
Design Architect: William McDonough + Partners
Architect of Record: KOW
Interior Architect: Jos Bogaarts
Size: 3,678 m²
Ceiling: Rockfon Eclipse + Sonar X



There are two main types of thermal mass. One is regular thermal mass, in which a thick concrete soffit is used to store thermal energy to heat and cool the building. The other is called TABS (Thermo-Active Building System). TABS is a water-based surface heating and cooling system where pipes are embedded in the concrete soffits of a building. This turns the soffits into giant heat exchangers.

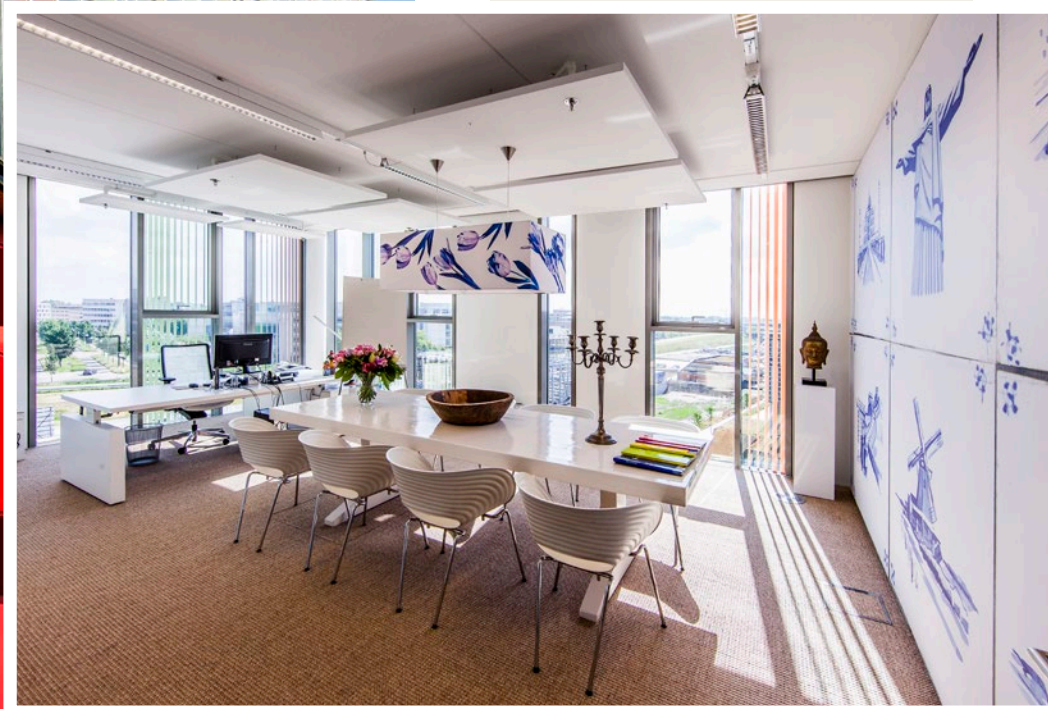
COOLING VERSUS ACOUSTICS

According to conventional wisdom, thermal mass and open-plan offices were thought to be incompatible. The problem was acoustics. Ceiling tiles are the main way designers ensure acoustic comfort in open spaces, but covering the soffit with a suspended ceiling prevents radiant heat and convection transfer between the room and the concrete soffit. As a result, when creating an open-plan office in a thermal mass building, designers had to make a tough choice: better cooling or better acoustics. ▶



Project: Park 20|20 Fox, Hoofddorp NL
Design Architect: William McDonough + Partners
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Interior Architect: Jos Bogaarts
Size: 3 678 m²
Ceiling: Rockfon Eclipse + Sonar X

“ ACCORDING TO CONVENTIONAL WISDOM, **THERMAL MASS AND OPEN-PLAN OFFICES** WERE THOUGHT TO BE INCOMPATIBLE. ”





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THINKING BEYOND THE CEILING

Research⁽¹⁾ into TABS thermal mass construction has shown that it is possible to use suspended ceilings to control acoustics and preserve the performance of thermal mass. How? Simply by not covering the entire soffit.

Researchers conducted tests where they covered the soffit of a TABS building with varying percentages of mineral fibre ceiling tiles. They also hung vertical baffles. They concluded that covering up to 50% of the ceiling area had no significant effect on the cooling capacity of the thermal mass. With 80% covered, the cooling coefficient was still around 70%. The baffles also had zero or barely any effect on cooling.

BUT WHAT ABOUT ACOUSTICS?

Not surprisingly, covering the soffit from wall to wall with ceiling tiles provided the best sound absorption. But 50-80% coverage performed nearly as well, especially when combined with wall panels. By combining ceiling tiles with other acoustics solutions, such as islands, baffles and wall panels, designers can provide an optimum level of acoustic comfort while letting the air flow freely in the room.

⁽¹⁾The cooling capacity of the thermo active building system combined with acoustic ceiling – Weitzmann, Peter; Pittarello, E.; Olesen, Bjarne W. – Nordic Symposium on Building Physics, 2008, Technical University of Denmark

CAR PARKS IN THE LIMELIGHT

Car parks rarely receive any respect. More often than not, they are the most neglected, least glamorous part of any building. Paradoxically, they are also one of the most visible. They are often the first part of a building that visitors experience. Acoustic ceilings can play an important role in making this experience a positive one – and in contributing to the building's energy efficiency and fire protection.

Project: The Squire, Frankfurt DE
Ceiling: Facett Brilliant C





Project: The Squire, Frankfurt DE
Ceiling: Facett Brilliant C

When Frankfurt-based JSK architects were designing a parking structure for **THE SQUIRE** complex near Frankfurt Airport, they paid close attention to the car park's ceilings. The Squire is an architectural masterpiece and feat of engineering. It is the first building of this magnitude to be erected above an ICE high-speed railway station, between two motorways, and on 86 columns. The Squire is a commercial district under one roof, with 140,000m² of offices, conference facilities, hotels, restaurants and stores – all located at one of the largest transport hubs in Europe.

The Squire's car park houses 600 spaces for tenants. Designed as an integral part of The Squire, the parking garage had to meet strict thermal insulation and fire protection standards, while also providing pleasant acoustics and complementing The Squire's bright and airy design.

JSK architects selected a ROCKFON **Facett Brilliant** acoustic ceiling. With a thickness of 80mm and a thermal conductivity value of 0.035 W/mK, it meets the project's thermal and acoustic requirements. The superior light reflection of Facett Brilliant enhances the bright interior lighting of the garage, while the high dimensional stability ensures it withstands the demanding indoor conditions found in an unheated garage. ■





Project: Diemerplein, Diemen NL
Ceiling: Facett B

OPEN-PLAN OFFICES:

TAKING THE OFFICE OUT OF OFFICE SPACE





Project: Zetel Spoorwegen, Zetel CH
Ceiling: Fibral baffles + Framed islands

Today's office workers may find it hard to believe, but open-plan offices are not a recent invention. In the early 20th century, architects such as Frank Lloyd Wright saw the spaciousness and flexibility of an open-plan area as a way of liberating office workers from the confines of walled boxes. The typical open-plan office of the first half of the 20th century contained long rows of desks. Cubicles were introduced later in an attempt to provide more privacy, and the rows were broken into pods and islands.

FOR AND AGAINST

Open-plan offices have their supporters and detractors. It is generally agreed that open plans can help foster productivity, communication and teamwork. Studies show that workspaces designed to foster group work and collaboration have a positive impact on business processes and costs.

But open space is not a panacea: simply moving employees into an open space without proper training or organisational changes does not necessarily produce performance gains. For example, the current practice of placing more experienced and higher-ranking staff in private offices reduces learning opportunities for younger employees.

THE PSYCHOLOGY OF SPACE

A considerable body of research also shows that open-plan offices may have a negative impact on employee health and can increase staff turnover. **Søren Peter Lund**, a senior researcher at the Danish National Research Centre for the Working Environment, explains: *“The lack of privacy in an open office makes workers feel like they are constantly being watched, and the noises around them might be perceived as a threat and an intrusion. This lack of privacy may also be directly related to noise levels, or vice versa. Especially when people are talking around you it becomes*

Project: Middelfart Sparkasse, Middelfart DK

Architect: 3XN

Ceiling: Fusion



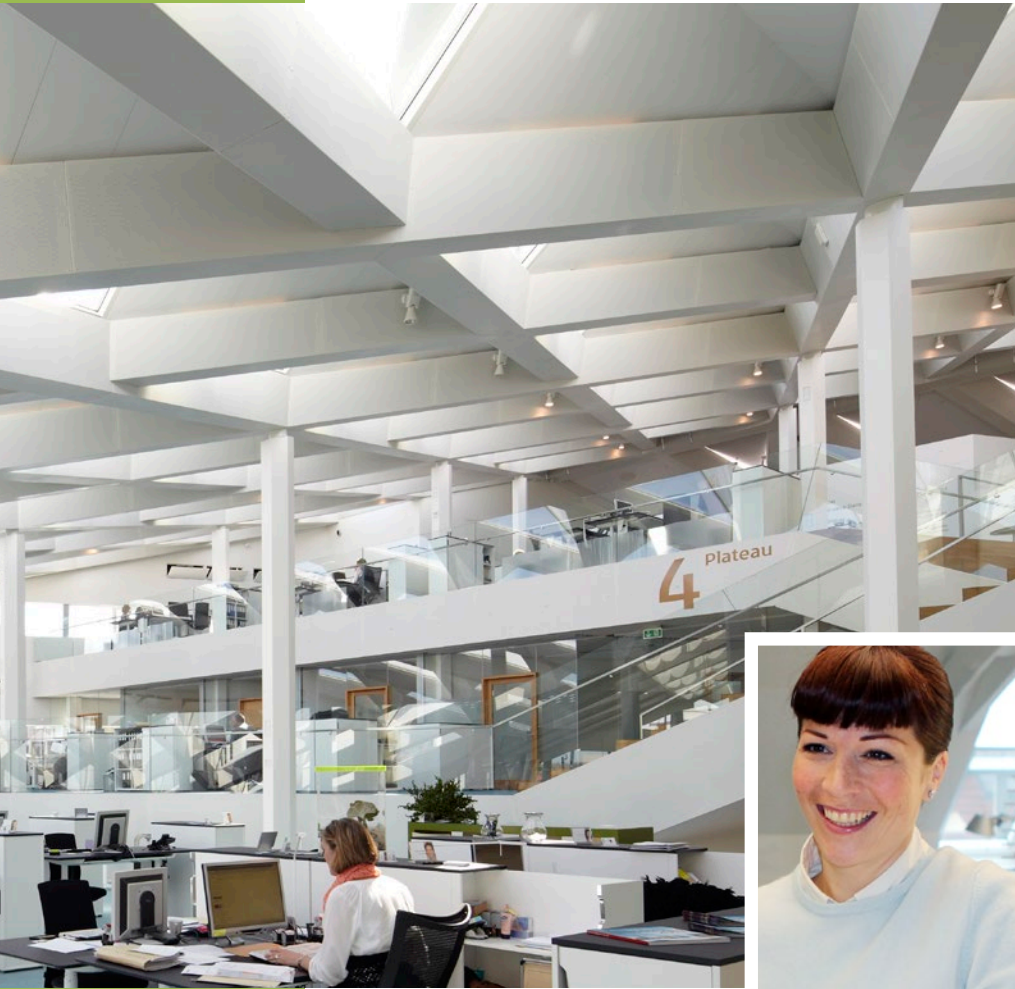
“THE NOISES

AROUND THEM MIGHT BE PERCEIVED
AS A THREAT AND AN INTRUSION.

”

Project: Bristol City Council, Bristol UK

Ceiling: Hygienic A + Koral A



MILLE SYLVEST

very difficult to concentrate. The acoustic quality of a room is one of the main factors to take into account when designing spaces that are used for both communicative and cognitive tasks."

In fact, it appears that the acoustics of an open-plan office not only affect how well employees accomplish their tasks, but also modify their behaviour. Behavioral Specialist **Mille Sylvest**, in cooperation with Roskilde University and architectural firm 3XN's Innovation Unit, GXN, is conducting PhD research into the relationship between architecture and social behaviour in office environments.

According to Sylvest, noise isn't just a disturbance that makes it difficult to concentrate. *"A person's well-being is closely linked to their level of satisfaction with their own status in the organisation. The quality of the workspace is a proxy marker of that status. So a noisy environment is a low-status one, which negatively affects personal well-being and changes a person's behaviour. People shut themselves off from others in noisy environments. They become reclusive and withdrawn."* It appears therefore, that a lack of privacy and poor acoustics can impair the motivation for greater productivity and collaboration – the very goals that drive organisations to create open-plan offices in the first place.



Project: Mikado House, Copenhagen DK

Architect: Arkitema

Ceiling: Alaska E

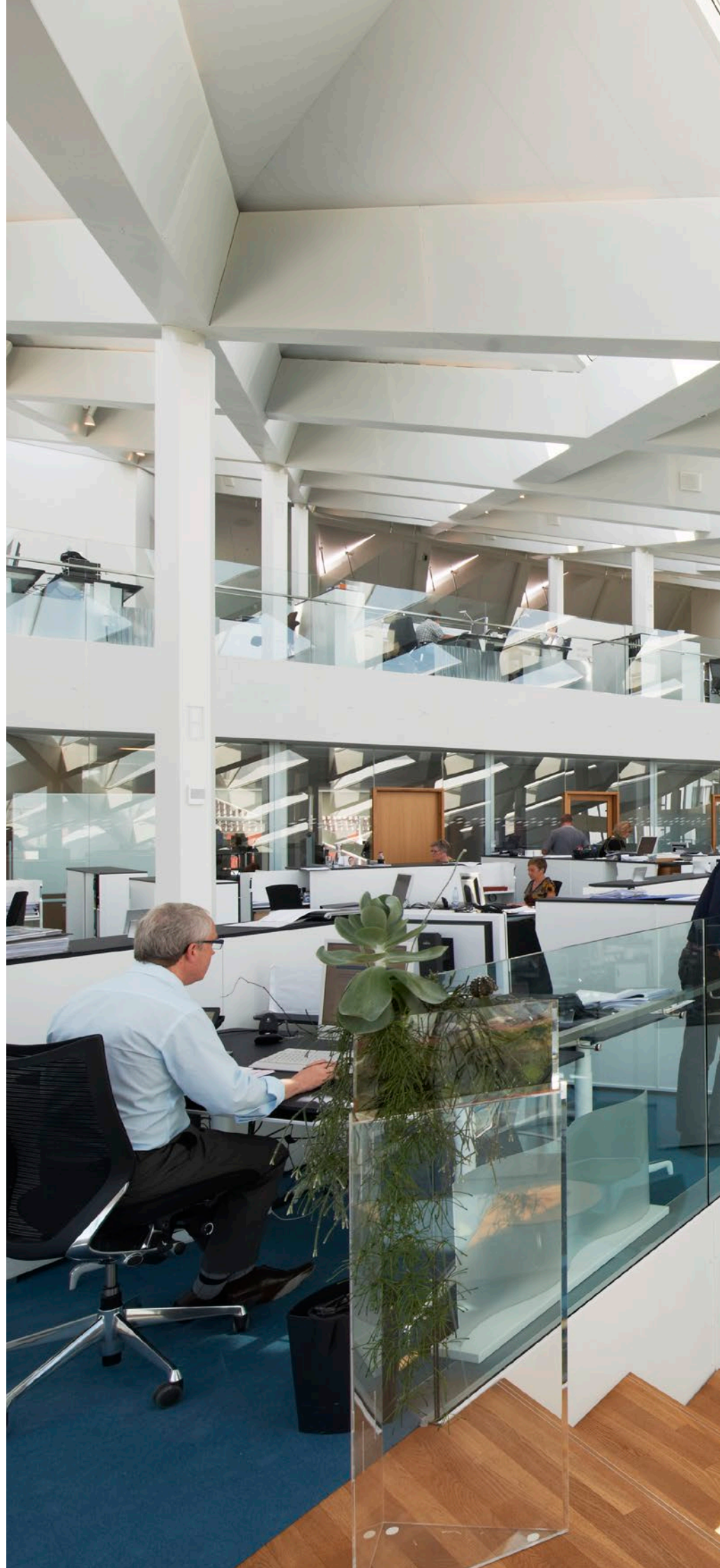
SOUND SOLUTIONS

Knowing the impact of noise on the well-being of workers is encouraging designers and specifiers to work with acousticians on improving office spaces. Designing the offices of tomorrow requires designing for human interaction, both physical and virtual, and supporting planned and unplanned encounters. As **Lennart Nilsson**, one of Sweden's foremost acousticians, puts it: *"In offices, the need for good sound absorption is especially high when working in open-plan offices and for team work that requires cross-functional conversations. For single offices, the need is not the same, of course, but again: good sound absorption contributes to increased comfort."* To achieve their requirements, acousticians are using all the tools at their disposal, including ceilings, islands, baffles and wall panels. They provide the flexibility required to tailor the acoustics of each space to the needs of the occupants. *"A good acoustic environment is vital, so employees can maintain concentration,"* concludes Nilsson.

OPEN IN THE FUTURE

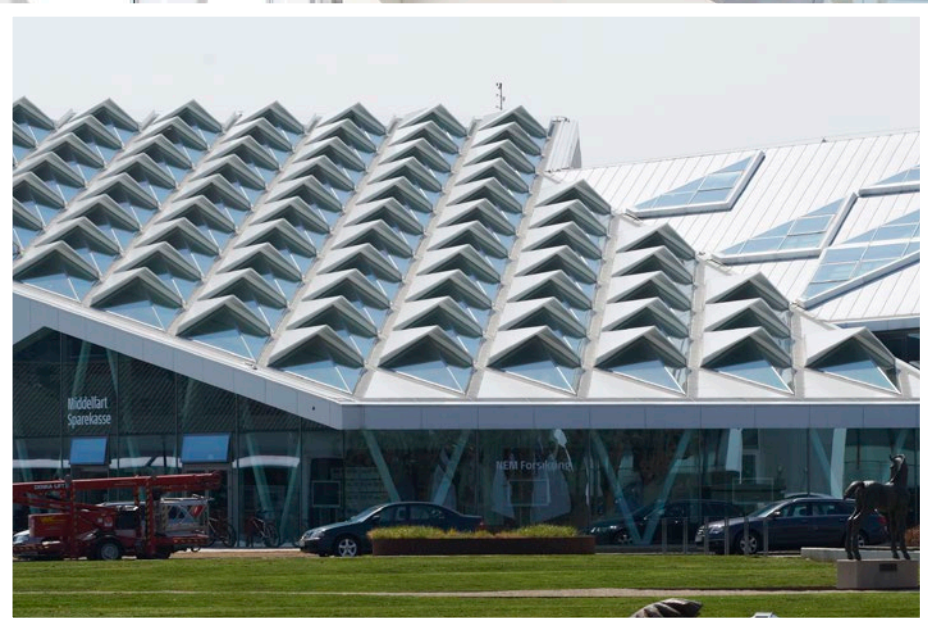
Designing offices, therefore, should no longer be thought of as a tug of war between cellular spaces and open spaces. As part of the current 'de-location' of people, processes and places, workplaces are going from being symbols of power and control to being places of culture and community.

In this context, the open-plan office will need to adapt. It will need to offer a balance between shared and private, between production and communication, between planned and unplanned, between individuals and communities, between flexibility and stability. ▶



“ A GOOD ACOUSTIC ENVIRONMENT
IS VITAL
SO EMPLOYEES CAN
MAINTAIN CONCENTRATION. ”







1 Plateau

erhverv

Project: Middelfart Sparkasse, Middelfart DK
Architect: 3XN
Ceiling: Fusion

CASE STUDY: SEB BANK & PENSION

BANKING ON INNOVATION



Project: SEB Bank & Pension, Copenhagen DK
Architect: Lundgaard & Tranberg Arkitekter
Ceiling: Mono Acoustic
Photos: Adam Mørk



When **SEB BANK & PENSION** wanted to bring the company's four business areas together under one roof, it went looking for a unique location in central Copenhagen. SEB chose to collaborate with Lundgaard & Tranberg Architects.

Once the location was selected, the design called for two nearly-identical buildings with a very organic shape. The award-winning offices feature storey-high windows, wooden floors, an open atrium and curved walls. All these elements leave visitors wondering: What's around the corner?

It was important to the architects that the ceiling should add to the aesthetics of the building and become an integrated part of the overall expression they wanted to achieve. But there was also a functional constraint: most of the employees work in open-plan spaces with a multitude of hard surfaces. Lundgaard & Tranberg Architects chose to work with ROCKFON and chose **Mono Acoustic®** for its Class A sound absorption and seamless surface, which easily fits within the organic shapes that characterise the SEB buildings. Special round hatches hidden in the ceiling provide access to concealed services.

Despite all the open volumes and hard surfaces, the acoustics are excellent, which **Peter Mering**, Project Manager from SEB, attributes to "the acoustic properties of the beautiful ROCKFON Mono Acoustic ceiling."



ILLUSIO is a small advertising agency that had a big problem. As the firm had grown, office acoustics had become unbearable. The open-plan office was occupied by 15 employees, and the hard surfaces – such as floor-to-ceiling windows, bare concrete and laminate floors – made it difficult to control the acoustics.

As agency director **Steve Abrassart** remarks, *“My desk was located at the back of the room, and I could repeat every word that the person at the other end of the room was saying.”*

He was keen to transform this noisy space into an enjoyable workplace while keeping the original spirit and design of the building. The goal was to use 50% of the ceiling area toward reducing the reverberation and intelligibility problems. Illusio installed **Rockfon Eclipse**® islands which, according to Abrassart, provided the ideal bridge between design and acoustics. *“With these islands, the noise in the room has been significantly suppressed while respecting the existing design features of the room.”* ▶

CASE STUDY: ILLUSIO

SOFTENING
THE EDGE OF HARD
SURFACES

INTERVIEW: CÉCILE VANBRABANT, IPG GROUP

DIALLING DOWN THE DECIBELS

Call centres are one of the toughest acoustic challenges that exist. **IPG GROUP** is a leader in the field of telemarketing, teleservices and call centres, with three locations in Belgium. It employs around 1,000 call centre agents. **Cécile Vanbrabant**, Facilities Manager at IPG, talked to us about what led her to install **Rockfon Eclipse®** ceiling islands.

WHAT WERE THE ACOUSTICS IN YOUR OFFICES LIKE BEFORE YOU INSTALLED THE ISLANDS?

"Our production floors are all open-office spaces. The noise level was acceptable but could be improved. So the best idea was to install islands beneath our existing metal ceiling in order to create a better work environment."

WHY WAS IT IMPORTANT TO IMPROVE THE QUALITY OF THE ACOUSTICS?

"The result of reducing the noise level has shown multiple advantages. An improved work environment gives more satisfaction to our employees and reduces the stress they experience. It's easier to work in a calmer environment, and both employee productivity and morale benefit from a better work environment, of course."



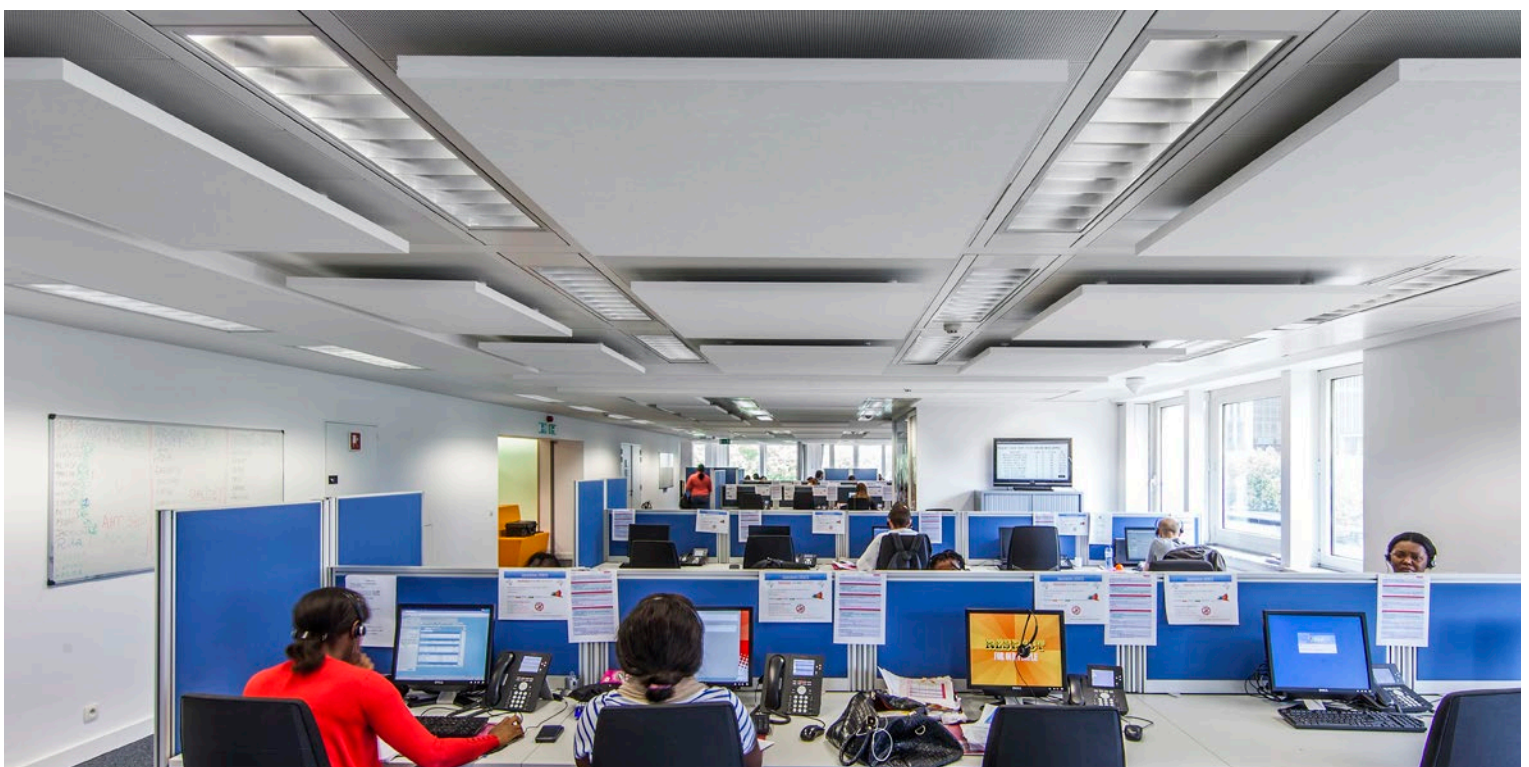
CÉCILE VANBRABANT

“THE BEST IDEA WAS TO INSTALL ISLANDS IN ORDER TO CREATE A BETTER WORK ENVIRONMENT.”

HOW WOULD YOU DESCRIBE THE ACOUSTIC SITUATION TODAY?

"The noise level has gone down, so much so, that employees are now happier to come to work and perform better since they feel better."

Project: IPG Group, Brussels BE
Ceiling: Rockfon Eclipse





THE SECRETS OF ROOM-TO-ROOM CONFIDENTIALITY

Much attention has been paid to reducing ambient noise levels within open-plan offices in order to improve employee concentration. But room-to-room confidentiality is an equally-important facet of office acoustics – one that sometimes gets overlooked and therefore overheard.



Some designers think that if a conversation is held in a room behind closed doors that it will be private. This is not always true. Sound travels from one space to another through doors, walls, floors and ceiling plenums. This leakage reduces workplace confidentiality and creates disturbance. According to **Lennart Nilsson**, one of Sweden's foremost acousticians, being able to hear noise coming from adjoining rooms is stressful because *"in addition to creating irritation, it also makes the employee wonder whether it is possible to have a confidential conversation."*

Project: Trafikstyrelsen, Copenhagen DK

Ceiling: Sonar X

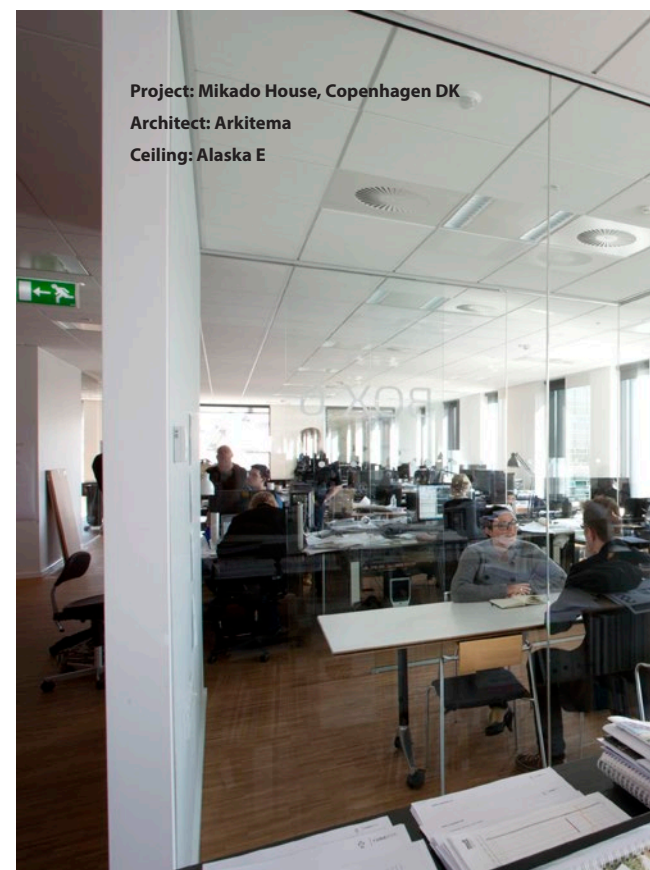


SOLUTIONS

There are two main ways of increasing confidentiality in a given space.

Insulation: High-insulating products can be used to prevent sound from leaking from one space to another. Full-height walls – from floor to plenum – are a very effective way to ensure great sound insulation, but a more flexible solution is to build the wall up to the suspended ceiling and use high-insulating ceilings like the ROCKFON dB range of products which can help achieve high levels of confidentiality and privacy. In extreme cases, these ceilings can also be combined with sound barriers installed directly above partition walls, which maintains the advantage of having such easily-movable walls.

Absorption: Applying acoustic treatments to the surfaces within a space will absorb sounds from people and equipment. Absorption reduces reverberation time, noise and sound pressure level in general. This creates a double effect since when the sound pressure level is low, people talk more quietly and their speech is intelligible. As a result less noise is transferred to the adjacent rooms. The two main contributors to sound absorption are high-quality acoustic ceilings and wall absorbers.



Project: Mikado House, Copenhagen DK

Architect: Arkitema

Ceiling: Alaska E

BETTER TOGETHER

Sound absorption and room-to-room insulation should not be thought of separately; there is a direct link between the two. Using a high-absorbing ceiling in the source room not only reduces the sound pressure in that room but also in any receiving rooms. That is why the dB range of products from ROCKFON combines both sound insulation and sound absorption in one tile. The front side absorbs sound from the source room while the back panel absorbs sound coming from services in the plenum, from adjacent rooms as well as excess sound that passes through the front side of the absorbing ceiling tile. Sandwiched between the two sides is an air-tight membrane that further reduces sound from leaking to adjacent spaces.

The Danish acoustician **Trøjgård Per Andersen** points out that it is important to find the right combination of sound insulation and absorption. According to Andersen, many types of ceilings – such as plaster – insulate well, but they reverberate sound, leading to poor acoustics. *“It is therefore a challenge to find the combination that meets both conditions. It is about avoiding sound that becomes noise, with the result that we become irritated and stressed.”*



IT IS ABOUT
**AVOIDING
SOUND THAT
BECOMES NOISE,**
WITH THE RESULT THAT
WE BECOME IRRITATED
AND STRESSED.



Project: Jacob Större, Stockholm SE

Architect: White Arkitekter

Ceiling: Alaska dB 40 E + Alaska dB 44 E



CASE STUDY: TYCO ELECTRONICS

SOUND CURVE MEETS LEARNING CURVE



Project: Tyco Electronics, Leuven BE
Ceiling: Sonar dB 35 A + Sonar dB 40 A



When **TYCO ELECTRONICS** decided to build a learning centre at its facilities in Leuven, Belgium, **Jos Devan** was confronted with the challenge of confidentiality. Devan was not, however, trying to keep conversations secret; he needed to control noise leakage.

The 500-person learning centre comprises several classrooms, break areas and dining space. Because Tyco selected tile floors and hard wall coverings, reverberation was going to be an issue. *"We built double walls between the classrooms with extra sound insulation, but we knew that sound could go over the walls through the ceiling space,"* explained Devan. He also knew that the ceiling tiles currently used in the offices would not be adequate to absorb and block the increased sound.

So Devan selected **Sonar dB 35** from ROCKFON for the break and dining area ceilings because *"what we need most there is absorption."* But in the classrooms, **Sonar dB 40** was installed to provide both absorption and insulation.

Devan is pleased with the results. *"The learning centre has been open for several months, and we have received positive feedback from the users in surveys we've conducted after their training. No one has ever complained about excessive sound or noise levels."*

IAQ EXPERT GEO CLAUSEN EXPLAINS THE RISKS OF IGNORING

INDOOR ENVIRONMENT

Project: Park 20|20 Fox, Hoofddorp NL

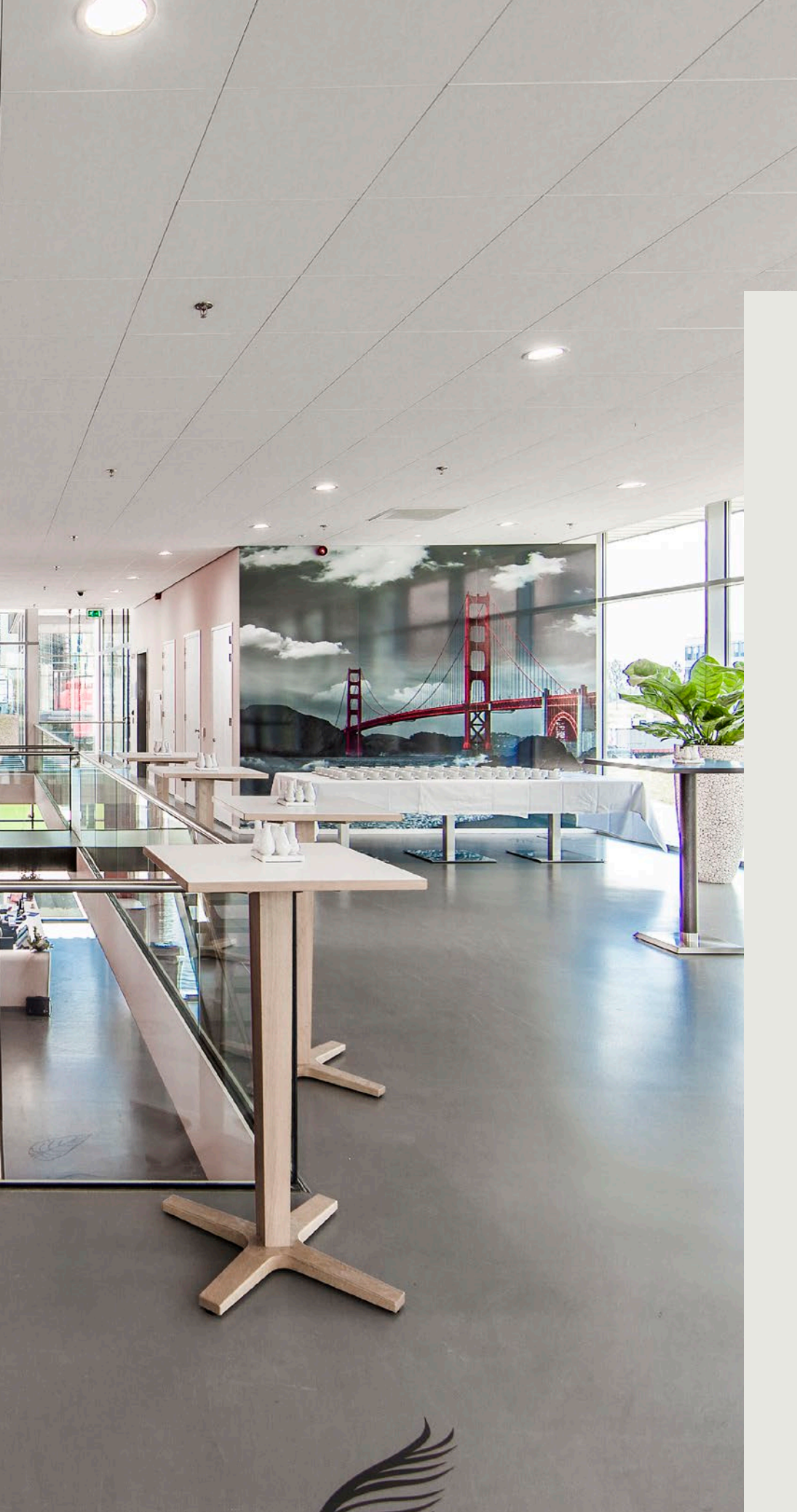
Design Architect: William McDonough + Partners

Architect of Record: KOW

Interior Architect: Jos Bogaarts

Size: 3,678 m²

Ceiling: Rockfon Eclipse + Sonar X



Geo Clausen is a leading international expert in the field of indoor air quality (IAQ). He is an associate professor at the International Centre for Indoor Environment and Energy (ICIEE) at the Technical University of Denmark. He has published several comparative studies on discomfort caused by indoor air pollution, thermal conditions and noise. He talks to *INSPIRED BY YOU* about the role of indoor environments in designing office spaces.



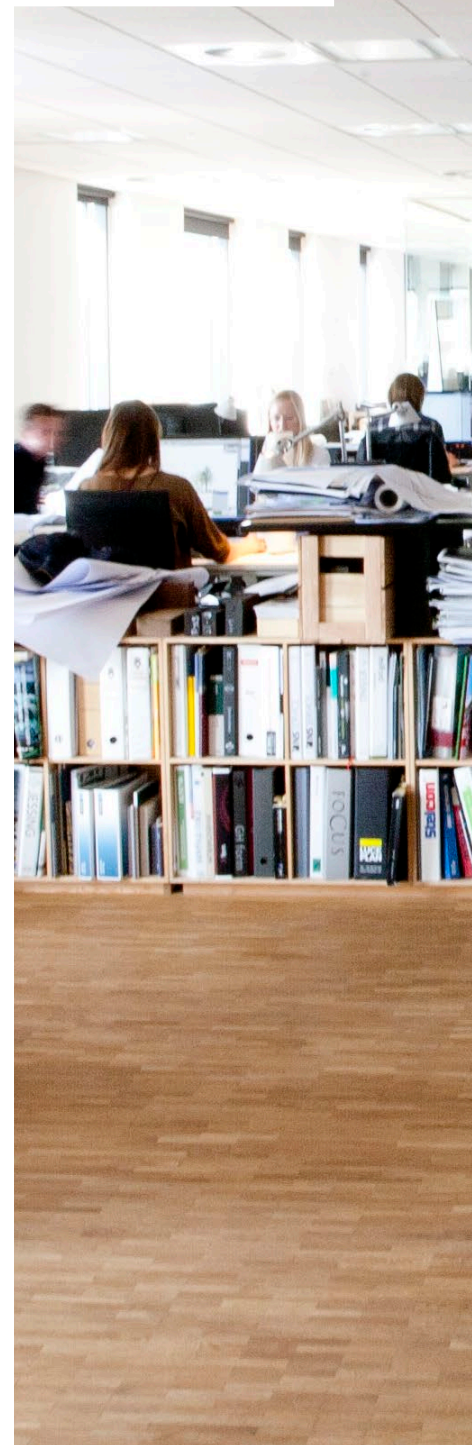
WHEN DID PEOPLE START PAYING ATTENTION TO INDOOR ENVIRONMENTS?

Although research into indoor environments has existed since the 1930s, it didn't really become an issue until the energy crisis in the 1970s when we started trying to reduce energy consumption related to HVAC (heating, ventilation and air conditioning). In the US, for example, the mid-70s crisis saw ventilation of office buildings reduced by two thirds. That's when we really started seeing complaints about poor indoor environments, and research has steadily increased since then.

Traditionally, there are four main parameters of indoor environments. First, there is **air quality**, which looks at what's in the air. There is **thermal quality**, which focuses on temperatures and drafts. Then there is **acoustics and noise**, and finally: **lighting**. We study the impact of these parameters on building occupants. There are three main families of effects. The first is perception: how does the person 'feel' about the environment; is it too hot, too cold, too bright, too dark, too noisy, too quiet, etc. Then there are real physical symptoms like dry eyes, runny noses, tiredness or headaches. At the far end of the spectrum comes illness. We focus mainly on the first two – perceptions and symptoms.

WHERE HAS THIS RESEARCH LED YOU?

In the past few years we've begun looking closely at productivity, and the research is very interesting. In one study, we asked volunteers to come and work for three days in offices that we have here on campus. We had them work in different indoor environments, in which we changed the temperature, the acoustics, the air quality and so on. We recorded their performance on various tasks. What we saw was a 5-10% drop in performance in a poor indoor working environment. When you compare this loss of productivity to what it costs to create a good indoor environment, you don't have to be genius to figure out that you should do all you can to create a good indoor environment from the outset. Thanks to this research, we're beginning to get more traction among architects and builders. They're sitting up and taking notice.



Project: Mikado House, Copenhagen DK

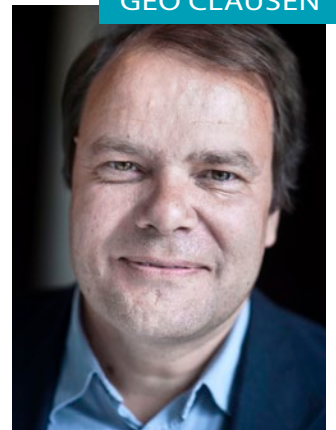
Architect: Arkitema

Ceiling: Alaska E

WHAT SHOULD BUILDING OWNERS PAY THE MOST ATTENTION TO?

First: building materials. You don't want to have indoor sources of pollution. This could be anything from smelly carpets to photocopiers that produce ozone. Next, you want to have sufficient ventilation and maintain a comfortable thermal environment; we see lots of problems arise here. Then pay attention to acoustics. Not all materials that are good for controlling acoustics are good for the other parameters; you need to look at controlling acoustics with materials that don't add to indoor pollution and that preserve the thermal environment. Like I said earlier, you have to have balance between the three. ▶

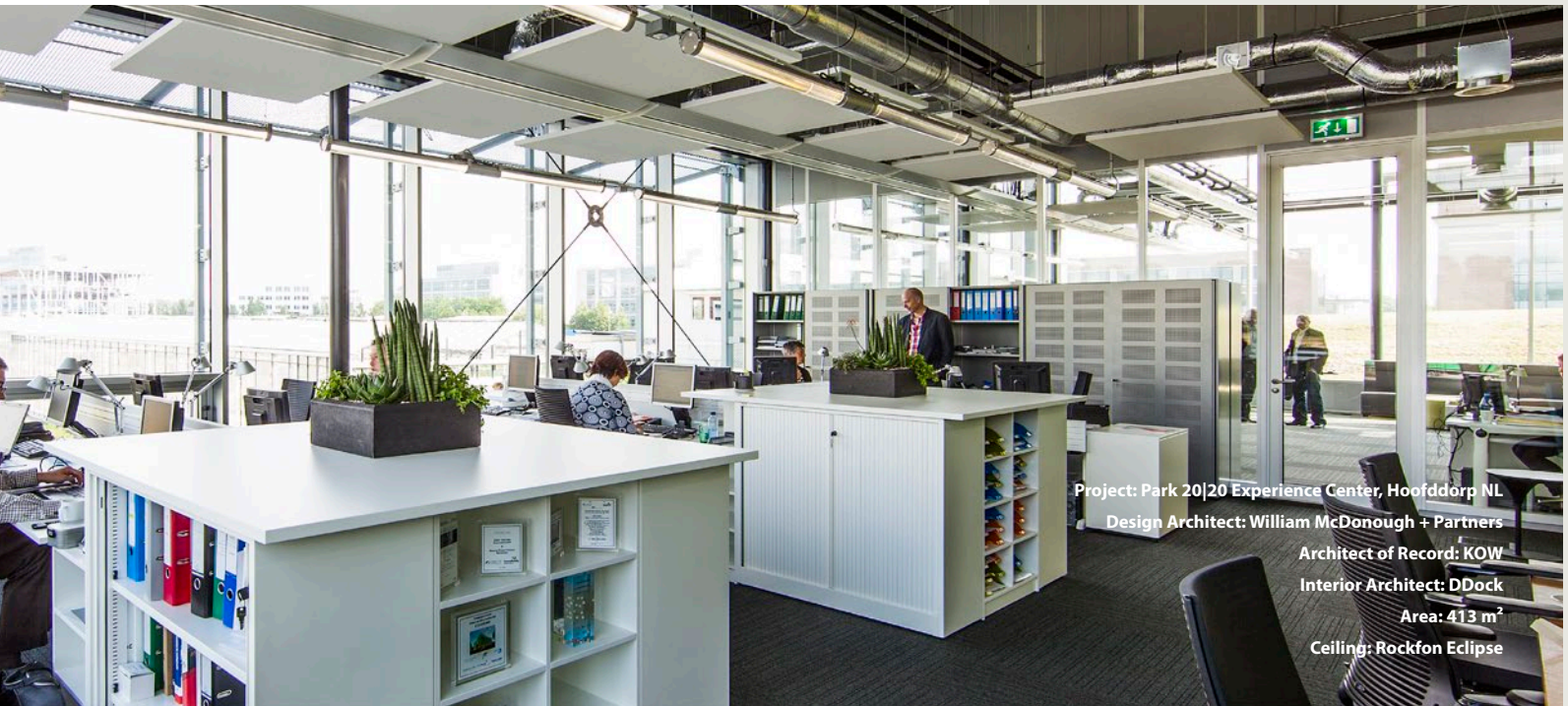
GEO CLAUSEN



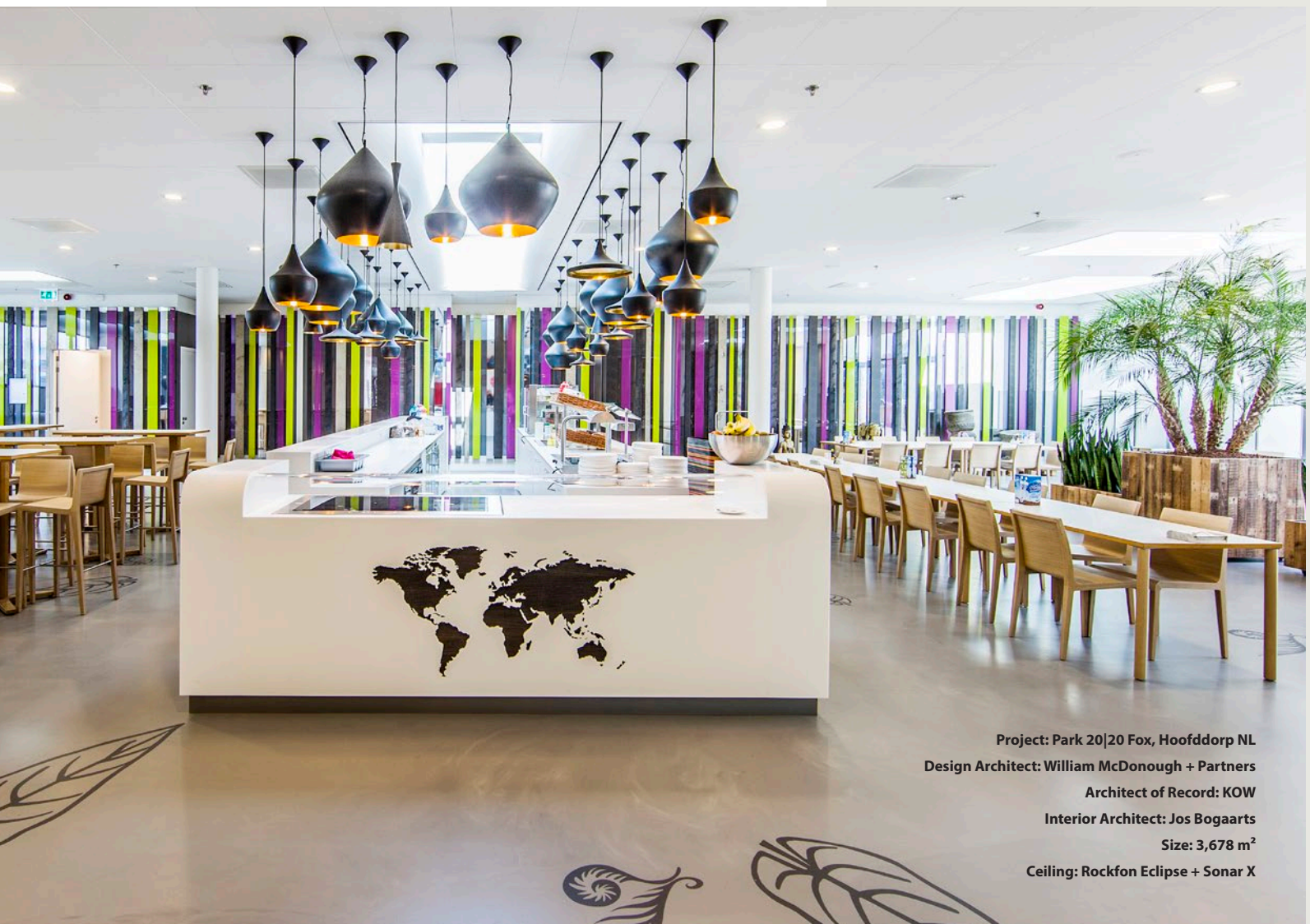
“OUR EXPECTATIONS OF THE CARS WE DRIVE AND THE COMPUTERS WE USE HAVE CHANGED, SO WHY SHOULD IT BE ANY DIFFERENT FOR OFFICES?”



Project: Novo Nordisk, Copenhagen DK
Ceiling: Fusion



Project: Park 20|20 Experience Center, Hoofddorp NL
 Design Architect: William McDonough + Partners
 Architect of Record: KOW
 Interior Architect: DDock
 Area: 413 m²
 Ceiling: Rockfon Eclipse



Project: Park 20|20 Fox, Hoofddorp NL
 Design Architect: William McDonough + Partners
 Architect of Record: KOW
 Interior Architect: Jos Bogaarts
 Size: 3,678 m²
 Ceiling: Rockfon Eclipse + Sonar X





Project: Offices IDATERM S.A., Madrid ES
 Architect: Manuel Q. Mula
 Ceiling: Rockfon Color-all Mercury D/AEX

IN YOUR RESEARCH, WHAT ARE OCCUPANTS TELLING YOU?

Employees expect more and more from the offices they work in. Our expectations of the cars we drive and the computers we use have changed, so why should it be any different for offices? People are less and less willing to tolerate a poor work environment, which is important to recognise if you want to hold on to good employees. No one would want to work for a company where employees got sick if they ate the canteen's lunch. So who would want to work in a building that makes them sick or tired?

We see over and over again lots of complaints about open-space offices. People complain about the temperature, the acoustics, just about everything. Maybe the problems are real, or maybe occupants are projecting their dissatisfaction with open-plan office in general on one aspect of the environment. But whatever the reason, they care about their indoor environment.

IT SOUNDS LIKE INDOOR ENVIRONMENT SHOULD PLAY A BIGGER ROLE IN BUILDING DESIGN.

I like to think of building design like a bar stool. It needs three legs to be stable. One leg is **energy consumption**: Many countries have strict regulations about energy efficiency, and the engineers know them by heart. The second leg is **workplace organisation**: It's why open plan offices are so popular, because they encourage knowledge sharing and let companies use the space in the most efficient way possible. The final leg, the one that often gets ignored, is **indoor environment**.

That's why I spend a lot of my time being the devil's advocate. I'm fond of saying, 'you don't build an office building to save energy, you build it to create a good indoor environment.' Sure, it's important to save energy and encourage knowledge sharing, but there's a price to pay for creating a poor indoor environment. It could be lower worker morale, lower productivity, absenteeism or even worse, real health problems. When you build an office you have to balance all three things: energy, organisation and indoor environment. ■

“ YOU DON'T BUILD AN OFFICE BUILDING TO SAVE ENERGY, YOU BUILD IT TO CREATE A GOOD INDOOR ENVIRONMENT. ”

THE RENAISSANCE OF RENOVATION

Project: Weston-super-Mare Town Hall,
Architect: Alec French Partnership
Ceiling: Rockfon Eclipse



In some ways, a renovation project can be more challenging than a new-build. This is due primarily to the fact that a retrofit never starts with a totally clean slate. The limitations of the existing building must be taken into account when upgrading the space for current and future uses – and regulations. And the market for renovation is growing. In the UK alone, refurbishments represent more than half of all new office projects. Increased office vacancy rates in countries like the Netherlands are also driving demand for renovations. In this context, therefore, it is vital to choose ceiling solutions that can help optimise the layout of a renovated space.

Refurbishment is nearly always driven by a need for greater efficiency. First there is **economic efficiency**. In a typical office building, more than half of the total energy use is attributed to lighting, heating and cooling. Making an old building more energy efficient will, therefore, reduce operating costs and offer a more comfortable climate – both of which are incentives for occupants.

Then there is **operational efficiency**. Very often, older office spaces do not provide the level of HVAC (heating, ventilation and air conditioning), electrical and IT services required by today's modern users. Moreover, some offices spaces were not designed to be offices in the first place. Old industrial buildings and heritage properties are often converted into office space. Meeting current acoustic, fire, safety and air quality regulations while respecting the original architecture can be a real headache for developers.

Finally, there is **organisational efficiency**. The way buildings are used evolves over time, and this is particularly true of office spaces. To improve the value of their assets, property developers are keen to upgrade existing, out-dated, individual cellular office spaces to more commercially attractive open plans. Even in offices with open-plan landscapes, the layout may no longer match the organisational requirements.

THE HEIGHT CHALLENGE

Whatever the reason behind a renovation project, developers often face a new crop of challenges all related to ceiling height. This is because in older buildings, the distance from floor to ceiling is typically shorter than in modern construction. The height challenge takes many forms:

HOW CAN I ACHIEVE ACOUSTIC COMFORT WHEN THE ORIGINAL ROOM HEIGHT IS TOO LOW FOR A TRADITIONAL SUSPENDED CEILING?

This is one of the biggest and most frequent challenges in renovation projects. ROCKFON provide demountable ceiling solutions with a very low installation height of just 31mm and others that are even less when fixed directly to the soffit yet can still achieve good sound absorption levels.


HOW DO I MAKE ROOM FOR SERVICES LIKE CABLING AND DUCTS WITHOUT MAKING THE CEILING TOO LOW?

A popular solution is to install services in the plenum above corridors to preserve ceiling height in office spaces. However, concentrating services above the hallway leaves little room for traditional ceiling hangers and increases the noise level generated by services. ROCKFON have corridor ceiling solutions that can be suspended from the wall – even across large spans – that absorb hallway noise thus reducing sound transfer from the plenum to adjacent rooms.

HOW CAN I PRESERVE DETAILS OF THE ORIGINAL ARCHITECTURE LIKE HIGH WINDOWS, BEAMS AND PILLARS WHILE STILL DELIVERING GOOD ACOUSTICS AND AN ATTRACTIVE DESIGN?

Ceiling islands, baffles and wall absorbers along with ceilings with height-shifts are versatile solutions as they can be installed around structural obstacles and blend into existing room designs.

HOW DO I ENSURE ACCESS TO SERVICES ONCE THEY'VE BEEN HIDDEN BEHIND THE CEILING?

One of the main reasons for renovating a space is to upgrade the HVAC, electrical and IT services. However, hiding them in the ceiling plenum is only half the story. It is important to provide quick access when maintenance is required. ROCKFON ceiling solutions are designed to be easily demountable, while innovative corridor solutions and hatches provide easy access to services. 

Project: Trafikstyrelsen, Copenhagen DK

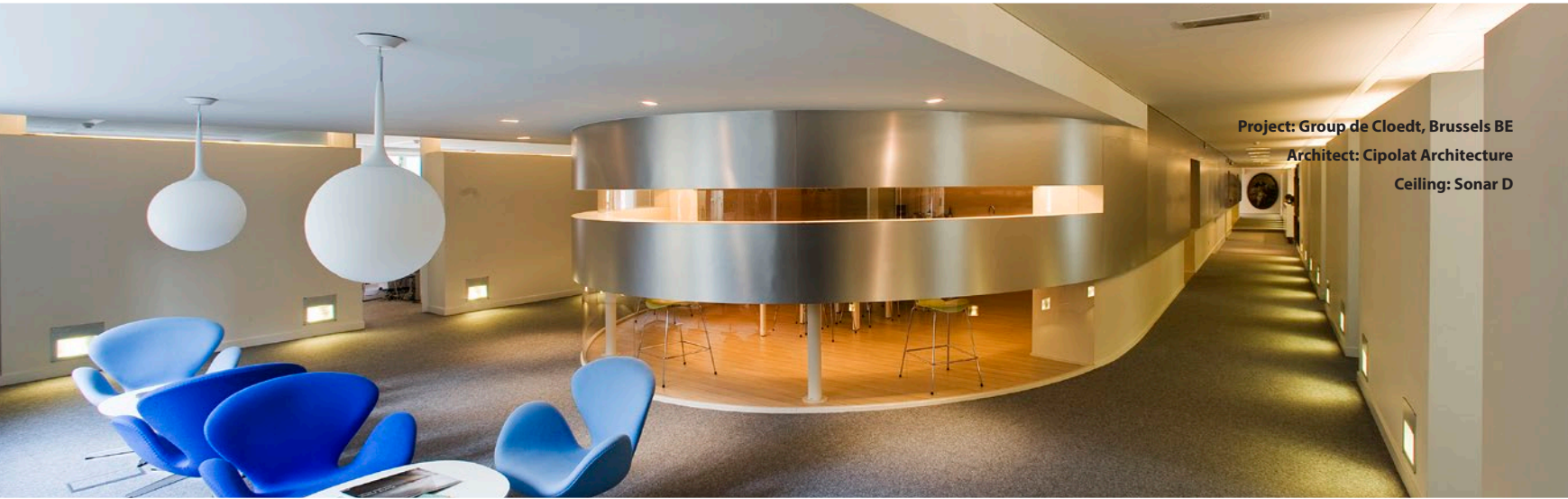
Ceiling: Sonar X



Project: Group de Cloedt, Brussels BE

Architect: Cipolat Architecture

Ceiling: Sonar D



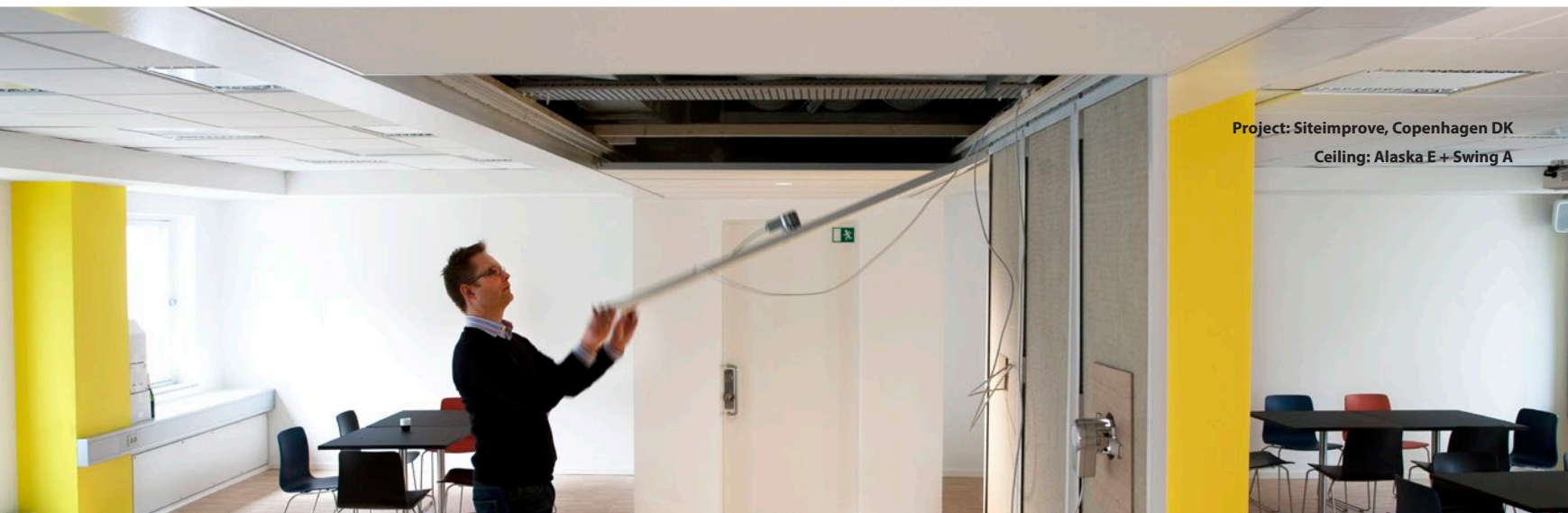
Project: Berclé College of Music, Valencia ES

Ceiling: Rockfon Eclipse



Project: Siteimprove, Copenhagen DK

Ceiling: Alaska E + Swing A

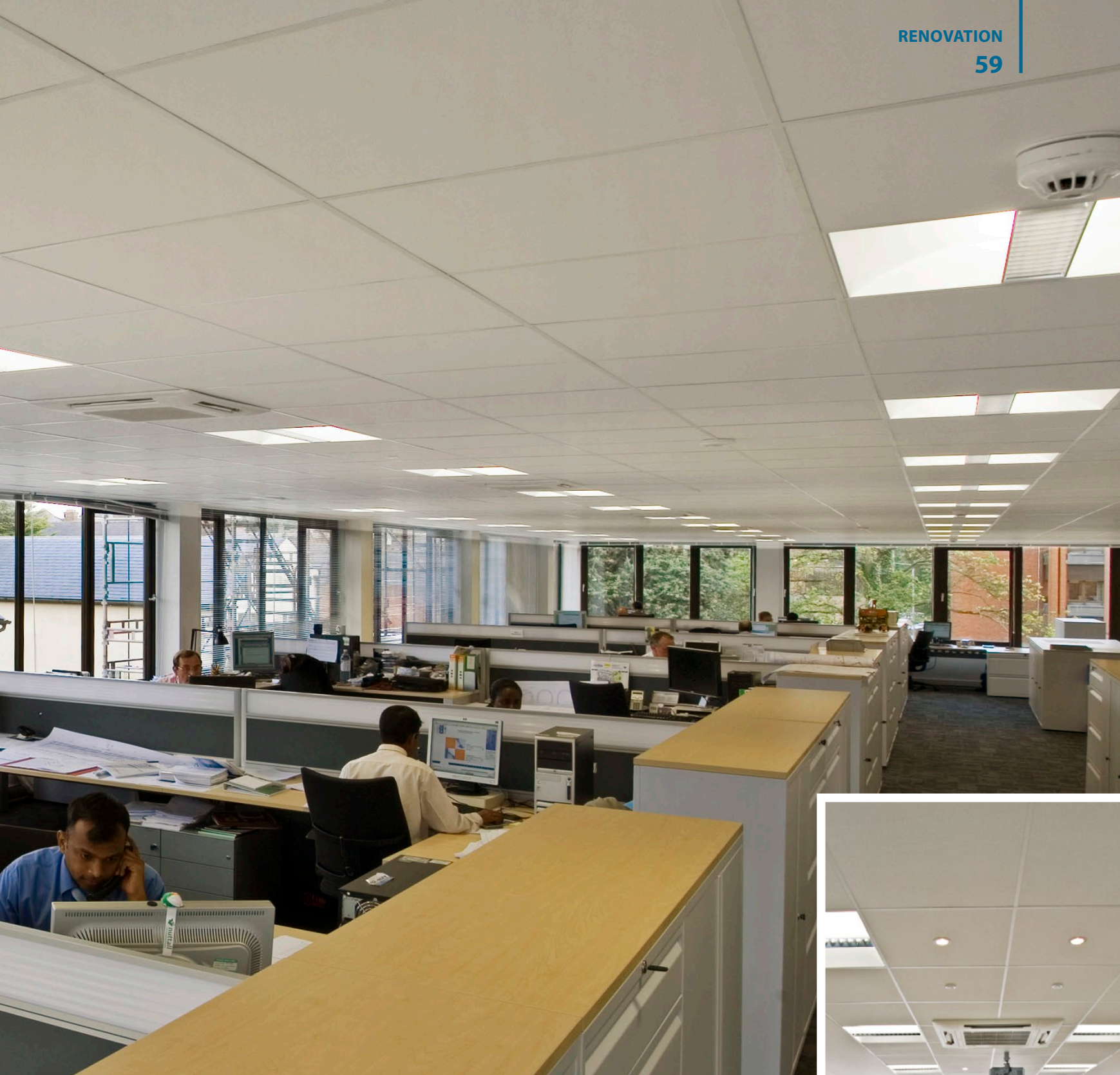


CASE STUDY: BAM NUTTALL LTD.

CLEARING THE CONGESTION



BAM NUTTALL LTD. is one of the UK's leading civil engineering companies. It decided to refurbish its head office in Camberley, Surrey. "Buildings tend to mutate over time," explained **Leighton Mills**, Project Manager for BAM Nuttall. "You end up with congested areas where pieces have been added with no thought to creating that open, homogenous space you need in an office these days."



To minimise business disruption, all the staff, furniture and IT equipment of each floor were temporarily relocated to leased space in another office building. One after the other, entire floors were then stripped out to allow new mechanical and electrical installations, ceilings, glazed and solid partitions, floor finishes, decorations, kitchen and toilet fitouts. The refurbishment was carried out over 36 weeks with each 700m² floor being completed in a 9-week period.

ROCKFON ceiling tiles were specified: **Koral** for the open-plan areas and **Hygienic** for the kitchen, break room and toilet areas.

"The renovation allowed us to create nice, flowing open spaces in which the ceiling is seen from wherever you are sitting. This means the finish had to be immaculate and the grid perfectly straight. ROCKFON tiles provided a very clean and attractive ceiling," says Mills. ■



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Rockfon

ROCKWOOL Limited T/A Rockfon
14th Floor, Chiswick Tower, 389 Chiswick High Road,
London W4 4AL
Tel: +44 (0) 208 222 7457
Fax: +44 (0)20 8222 7458
www.rockfon.co.uk