



Case Study

Chilled Beam Longevity



Contents

1. <i>Chilled Beam Life Expectancy</i>	4
Outlining the life expectancy of standard Chilled Beam units.	
2. <i>Previous Frenger Projects</i>	6
A look back at our successful installations and innovative solutions.	
3. <i>Recent High-Profile Projects</i>	16
Highlighting our latest contributions to prestigious and complex developments	
4. <i>Chilled Beam Flexibility</i>	19
Exploring the adaptability of Frenger's Chilled Beam solutions for diverse applications	

Chilled Beams: The key to a long-lasting HVAC system

Over the decades, we have supplied our Chilled Beam solutions to many landmark buildings and prestigious commercial office projects worldwide. Many of these projects continue to utilise their original Frenger[®] Chilled Beams, a testament to their exceptional longevity and flexibility.

Showcasing their adaptability, many projects installed with our Chilled Beams have undergone refurbishments and redesigns while retaining the original Chilled Beam systems, highlighting the success of our Chilled Beam technology in supporting future cellularisation and different office décor.



Chilled Beam Life Expectancy

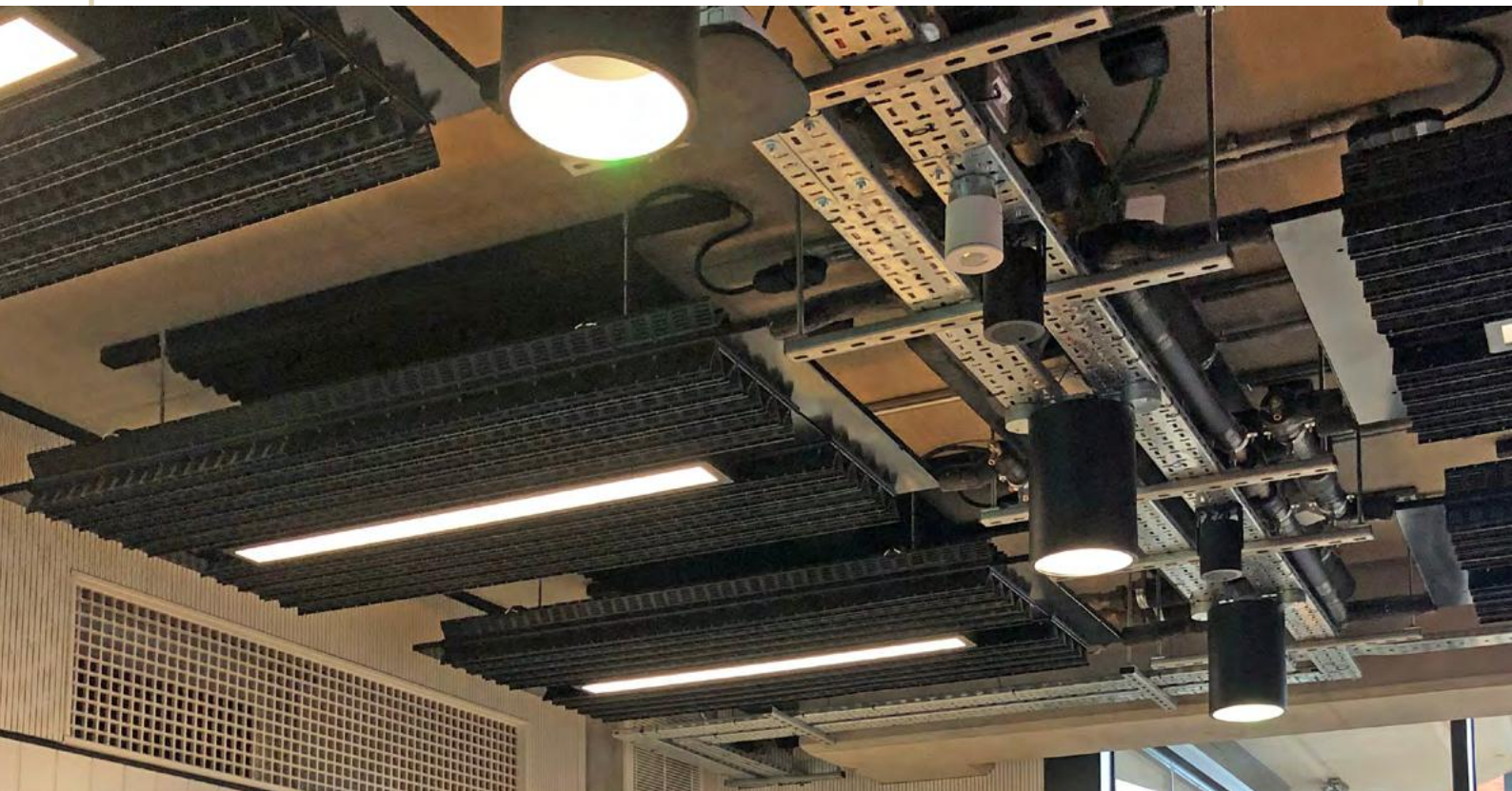
Standard Chilled Beam Technology contains no moving parts (i.e no fans & motors etc...) which helps to reduce product maintenance to periodic visual inspections every 4-5 years for a typical commercial office building, significantly less than other HVAC units. Product life expectancy of Chilled Beams can be well in excess of 25 yrs if regular water quality checks are undertaken.

When correctly assessing a Chilled Beam system over the full life cycle of the building if you take into account the initial capital costs as well as the operating costs, maintenance & replacement costs over a 25 year period then the overall life cycle costs make Chilled Beam systems a more cost effective solution in comparison to other HVAC systems.



Why do Chilled Beams have a long lifespan?

- **No moving parts** - Chilled Beams contain no moving parts or consumable items such as fans, motors, or filters. Not only does this ensure long life expectancy it also has the added benefit of keeping maintenance to a minimum, for example for typical commercial office applications chilled beams typically only require inspections every 4 to 5 years.
- **Corrosion-Resistant Materials and dry running** – Our X-Wing[®] ‘Radiant’ Passive Chilled Beam is constructed from only copper and aluminium which are not only 100% recyclable but are also resistant to corrosion when installed in a controlled environment. Active Chilled Beams are manufactured using the same copper and aluminium materials for the heat exchanger with painted Zintec steel casing construction providing a corrosion resistant external finish, all the materials of construction can be fully recycled at the end of the products life which reduces the embodied carbon associated with ‘disposal’. In addition to the materials of construction, Chilled Beam longevity is also enhanced as they function with a ‘dry’ non-condensing coil which not only save on maintenance as they have no drip trays to biocide and condensate pumps to replace, they also ensure long life expectancy as the casing and internal components are kept in a dry state and not subjected to any moisture or condensate.
- **Consistent Performance** – As Chilled Beam systems utilise water at temperatures closer to the room condition compared to other terminal systems, it not only provides the added benefit of excellent comfort levels, but it also means the control system will cycle less frequently, resulting in longer life expectancy of the system components such as control valves & actuators.



Previous Frenger Projects



500 Collins Street

Combining heritage and modern architecture, 500 Collins Street has a history of investing in sustainable technologies that not only benefit the environment but also benefit the wellbeing of building occupants.

The 48-year-old tower became the first existing building in Australia to achieve "WELL Certification" at the Platinum level and was Australia's first fully refurbished, multi-tenanted office building to achieve a 5 Green Star Office Design rating.

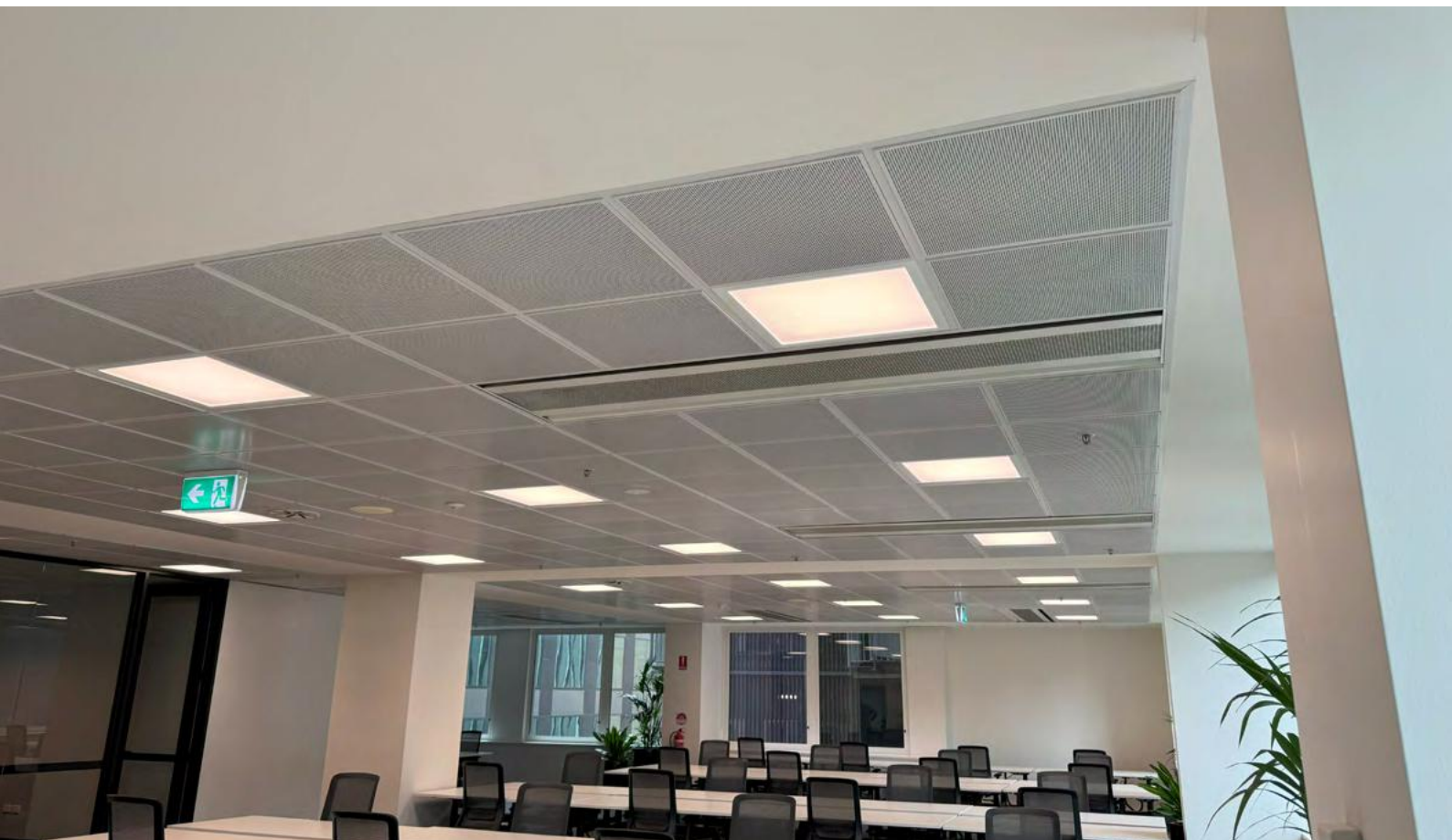
Located in Melbourne's Central Business District (CBD), Frenger first supplied the multi-award-winning building in 2005, with both Ceiling Integrated Chilled Beams (CICB) and Multi-Service Chilled Beams (MSCB), which are all still in operation nearly 20 years on since their original installation.

Chilled Beam technology provided all tenants with access to outside air ventilation rates at a level 50% greater than the minimum required by Australia standards.





500 Collins Street original installation - 2005



500 Collins Street photo - 2024



500 Collins Street is the first existing office building in Australia to achieve WELL Platinum Certification, it also went on to win multiple awards including:

- Finalist - Property Council of Australia Innovation & Excellence Awards 2022,
- Winner - Australia Property Institute Excellence in Property Awards 2007,
- Finalist Banksia Awards - Built Environment Award 2007,
- Finalist - Melbourne Awards 2007,
- Finalist - 2007 World Environment Day Awards,
- Finalist Property Council of Australia Innovation & Excellence Awards 2007,



Testament to the exceptional longevity and reliability of our Chilled Beams, two decades on from their original supply and installation to the 500 Collins Street project, they are still in operation today providing the high thermal comfort levels that can be expected from Frenger Chilled Beams. Compared to other HVAC systems which require frequent servicing and parts replacement our Chilled Beams have maintained their high levels of performance for two decades, reinforcing the value of Chilled Beams as a modern & efficient HVAC solution.

55 Baker Street

The iconic 55 Baker Street was completely refurbished and redeveloped in 2007, proving modern design principles can be applied well to existing buildings.

The myth that chilled beams cannot be flexible was disproved on the 55 Baker Street project, as demonstrated by the pre-planned MSCB joining infill locations, which allowed for the future cellularisation of the office space on 3 metre and 1.5 metre grid arrangement.

Frenger's order value was £7.6 million with 4,500 units in excess of 11 km being installed inside of 55 Baker Street making it the world's largest Active Multi-Service Chilled Beam project. Frenger were selected by Blyth & Blyth for the £160 million refurbishment of London & Regionals '55 Baker Street'.

Our Multi-Service Chilled Beams continue to operate efficiently 18 years after their initial installation, with areas of the building having undergone upgrades from Frenger replacing the T5 lamps with the more energy-efficient LED lighting, further reducing maintenance requirements and energy consumption. The end client remains highly satisfied with the system's low maintenance, long lifespan, and energy efficiency, all while delivering exceptional thermal comfort.





55 Baker Street original installation - 2007



Recent 55 Baker Street

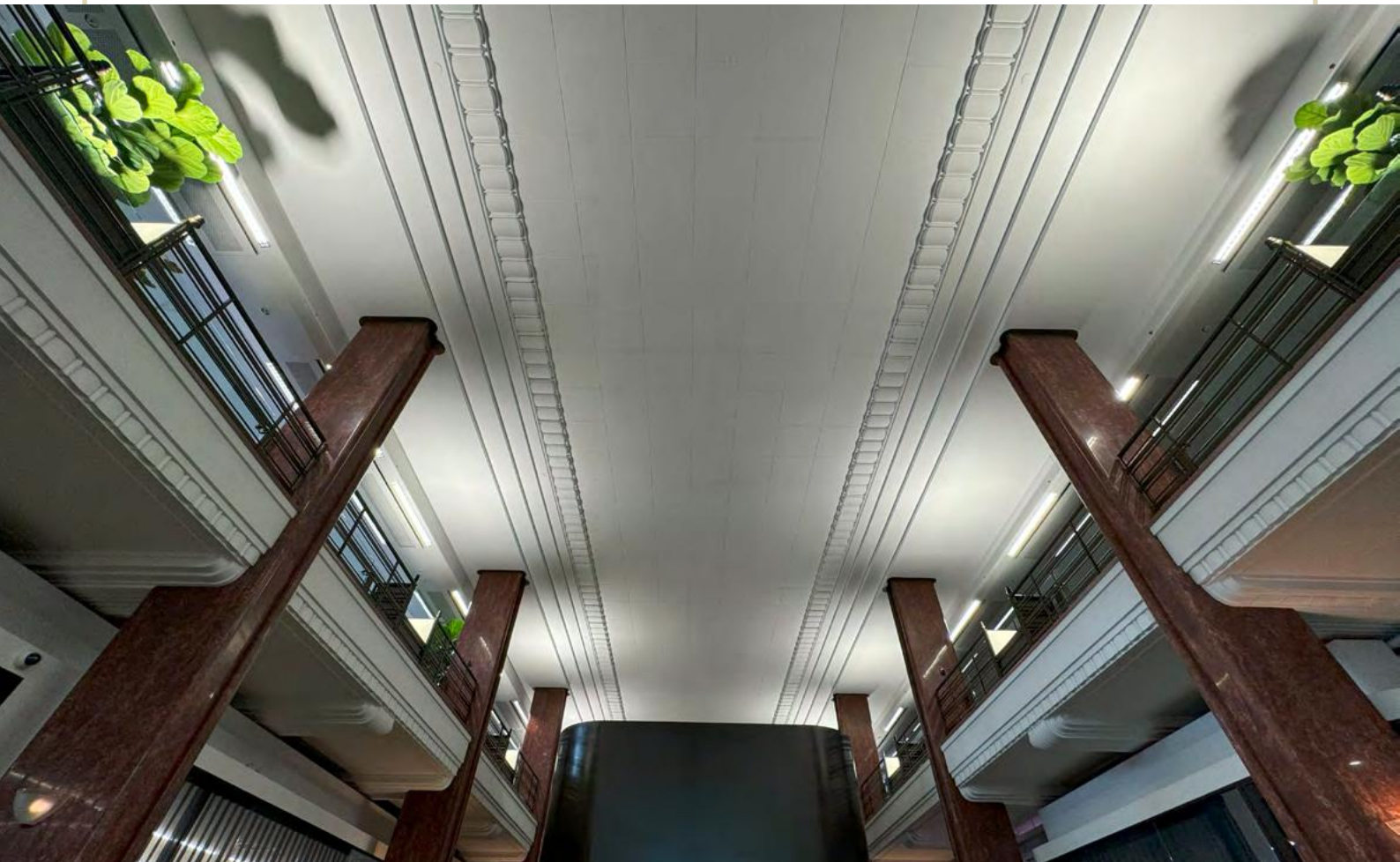


Transport House

In 2008, Frenger supplied Australia's first Multi-Service Chilled Beam project to Transport House, located in Sydney's central business district (CBD).

Over 240 MSCBs were shipped over to Sydney providing the highest quality thermal comfort to building occupants in the important heritage listed building.

Frenger's Multi-Service Chilled Beams continue to be used in Transport House to this day, showcasing the flexibility of Chilled Beam design and its ability to blend into continuously changing architectural aesthetics.





Transport House original installation - 2008



Transport House photo - 2024

65 Southwark Street

The extensive refurbishment of the Harlequin Building, 65 Southwark Street, back in 2012, was supplied by Frenger with our 'Slim Line' Active Multi-Service Chilled Beams (MSCBs) with seamless T5 lamps integrated within the extruded polycarbonate side pods.

In February 2024 the production of T5 lamps became prohibited in the UK, aiming to move towards a more sustainable and efficient lighting solution, LED lighting emerged as the superior solution against the no longer required fluorescent lamps.

As a result of these new regulations, Frenger upgraded the luminaires in the MSCBs that they had previously supplied to 65 Southwark Street from T5 Lamp Lighting to more energy-efficient and longer-lasting LED lighting.





65 Southwark Street original installation - 2012

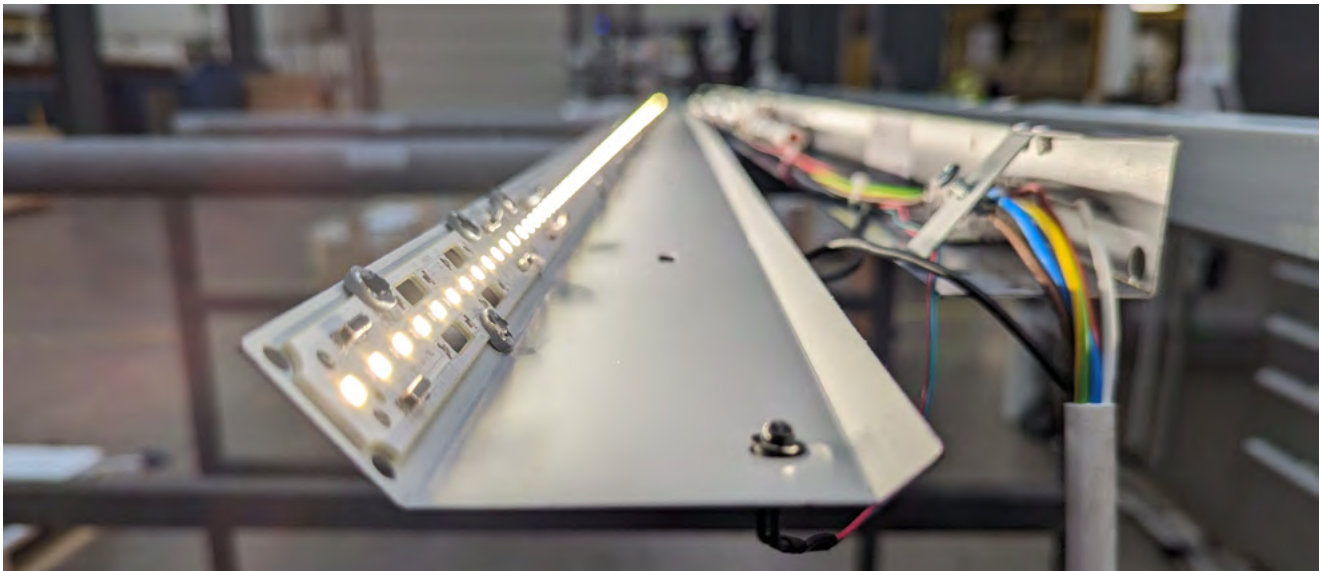


65 Southwark Street image - 2024

T5 Lamp to LED Lighting upgrade

In 2023 Frenger were contacted to upgrade the luminaires in the MSCB's that they previously supplied to the 65 Southwark Street from T5 Lamp lighting to more energy efficient and longer lasting LED lighting.

Frenger can upgrade their previously manufactured existing lighting profiles from T5 Lamps to the more efficient and sustainable LED lighting solution, allowing for the same lighting profile optic to be reused (in this case study extruded square edge polycarbonate), or if required Frenger can carry out a complete retrofit of the lighting profile on the Multi-Service Chilled Beam to one of their new lighting profile designs such as extruded bullnose polycarbonate or multi layered micro prismatic lighting profiles with extruded aluminium satin anodised frames.



As the 65 Southwark Street project was already fitted with extruded polycarbonate lighting side profiles it was decided that the new LED lighting would be integrated into the existing side profile of the MSCB.

The refurbishment process involved producing brand new replacement lighting internals (gear trays and LED reflector trays), which were bespoke manufactured and factory assembled in Frenger's UK Technical Facility using First Tier LED electronic components.

All purpose manufactured MSCB gear trays and LED reflector trays are fully wired, factory tested and certified in-house before packaging ready for on site 'Plug & Play' installation.

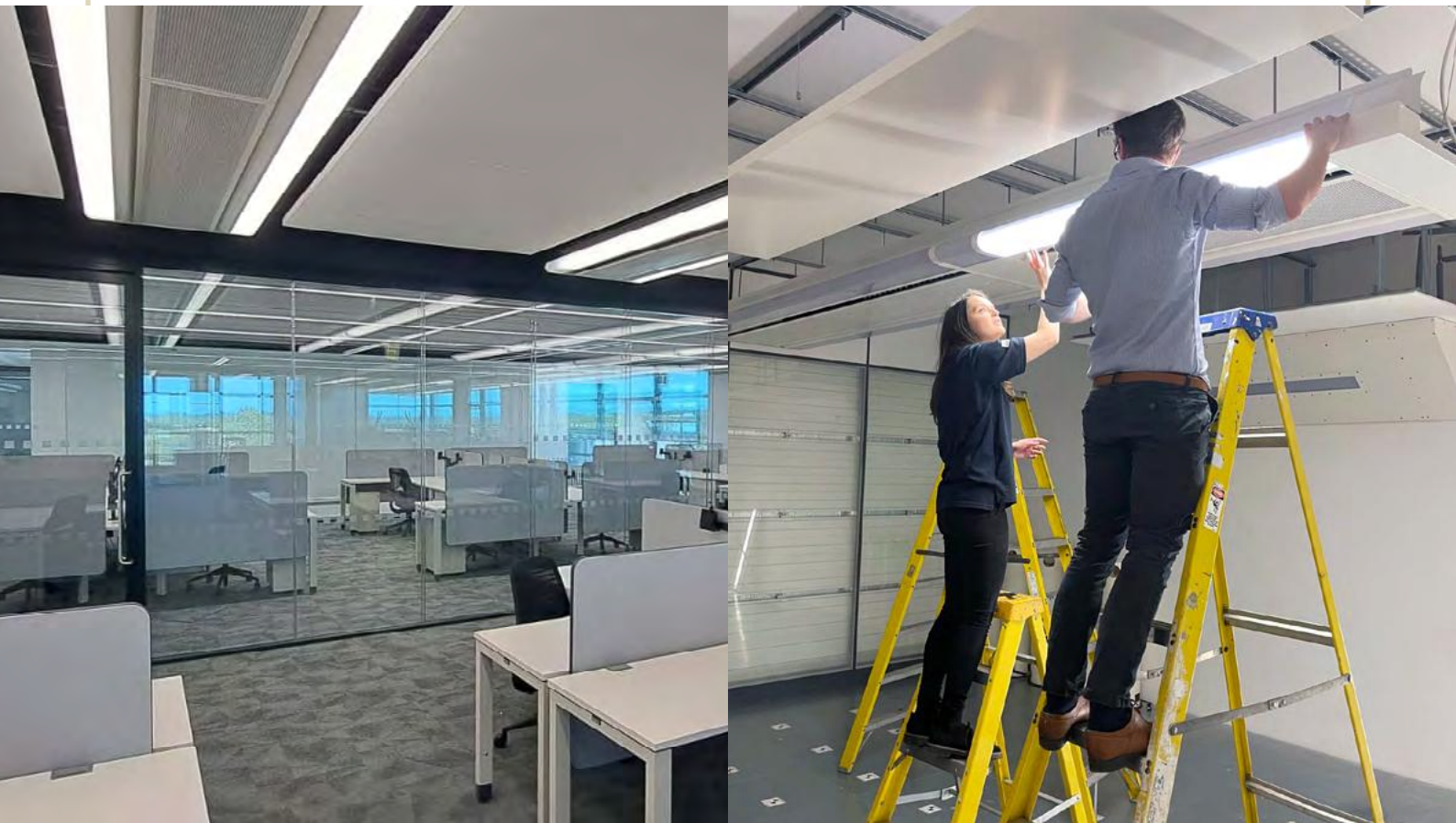
Recent High-Profile Projects

Aston Martin F1 Headquarters

Designed by Ridge and Partners LLP, Frenger® was selected as the specialist manufacturer for the space conditioning for the new Aston Martin F1 factory offices, with the layout designed to optimise communications for race car development.

The £200 million pound Aston Martin Formula One (AMF1) team factory, was supplied with our Compact Active Multi-Service Chilled Beams (MSCBs) with integrated LED lighting. Playing a crucial role in the design process, we hosted key partners at our UK Technical Facility, assuming a pivotal role in the lighting design to reduce uplighting.

The project consists of three stages, starting with the main factory (Phase 1), a new wind tunnel (Phase 2), and an employee experience and events space (Phase 3), standing in place of the current factory which is set to be demolished after the team moves to the newly constructed £200 Million (GBP) state-of-the-art facility in May 2024. This third phase will connect the buildings with a central street system linked by bridges.



Aston Martin F1 HQ image



20 Finsbury Circus

Frenger supplied the multi-million pound office refurbishment with our Active Multi-Service Chilled Beam units complete with continuous LED lighting and our Chilled Ceilings.

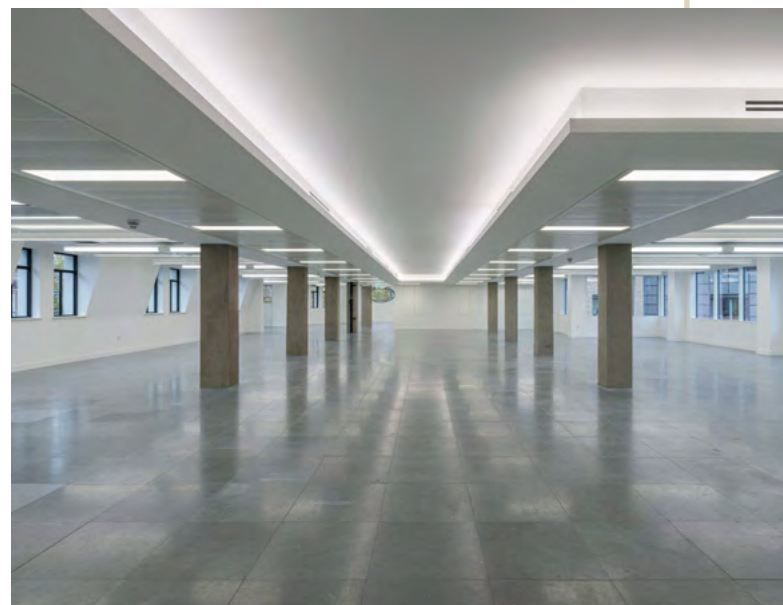
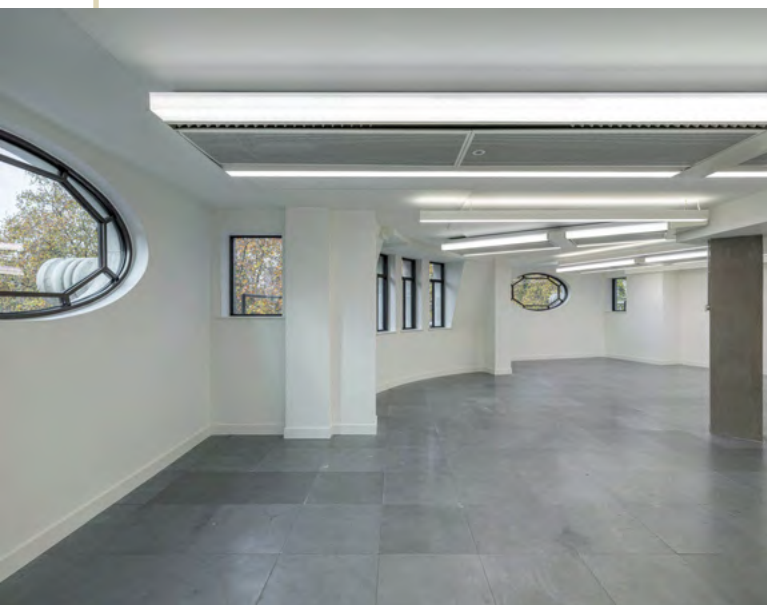
A key aspiration behind the refurbishment was to increase sustainability and reduce the environmental impact of the building, with the building going on to achieve a BREEAM 'Excellent' rating.



Frenger's Compact Active MSCB



Frenger's Chilled Ceiling Tile





Dogger Bank Windfarm O&M Base

Frenger supplied the multi-million pound Dogger Bank Windfarm Operations & Maintenance (O&M) base with our Slimline Compact Active Multi-Service Chilled Beam units, X-Wing 'Radiant' Passive Chilled Beams, and our Electric Radiant Heating Panels.

The recently opened base contains the infrastructure required to operate the windfarm including office, training, and welfare spaces for around 200 people and support the 277 offshore wind turbines.



Dogger Bank Windfarm image

Chilled Beam Flexibility



Future Cellularisation

Chilled Beams provide a long-life, minimal maintenance HVAC solution, which can be used for a range of industry applications. Due to the products containing no moving parts, product life expectancy can be well in excess of 25 years, continuing to provide high levels of thermal performance associated with all Frenger's HVAC products.

Both Frenger's range of Active and 'Radiant' Passive Chilled Beams can be designed to accommodate flexible workspace for future cellularization / partitioning. Our Chilled Beam units can be manufactured, sized and orientated to a pre-agreed planning grid, typically 3m x 3m or can be as little as 1.5m x 1.5m, although the smaller the planning grid for greater flexibility, the greater the cost. 3m x 3m is a typical and usually a most cost-effective planning grid for cellularization..

--- = Potential Partition Locations

