



NOVUM



# STRUCTURE + MEMBRANE + GLASS

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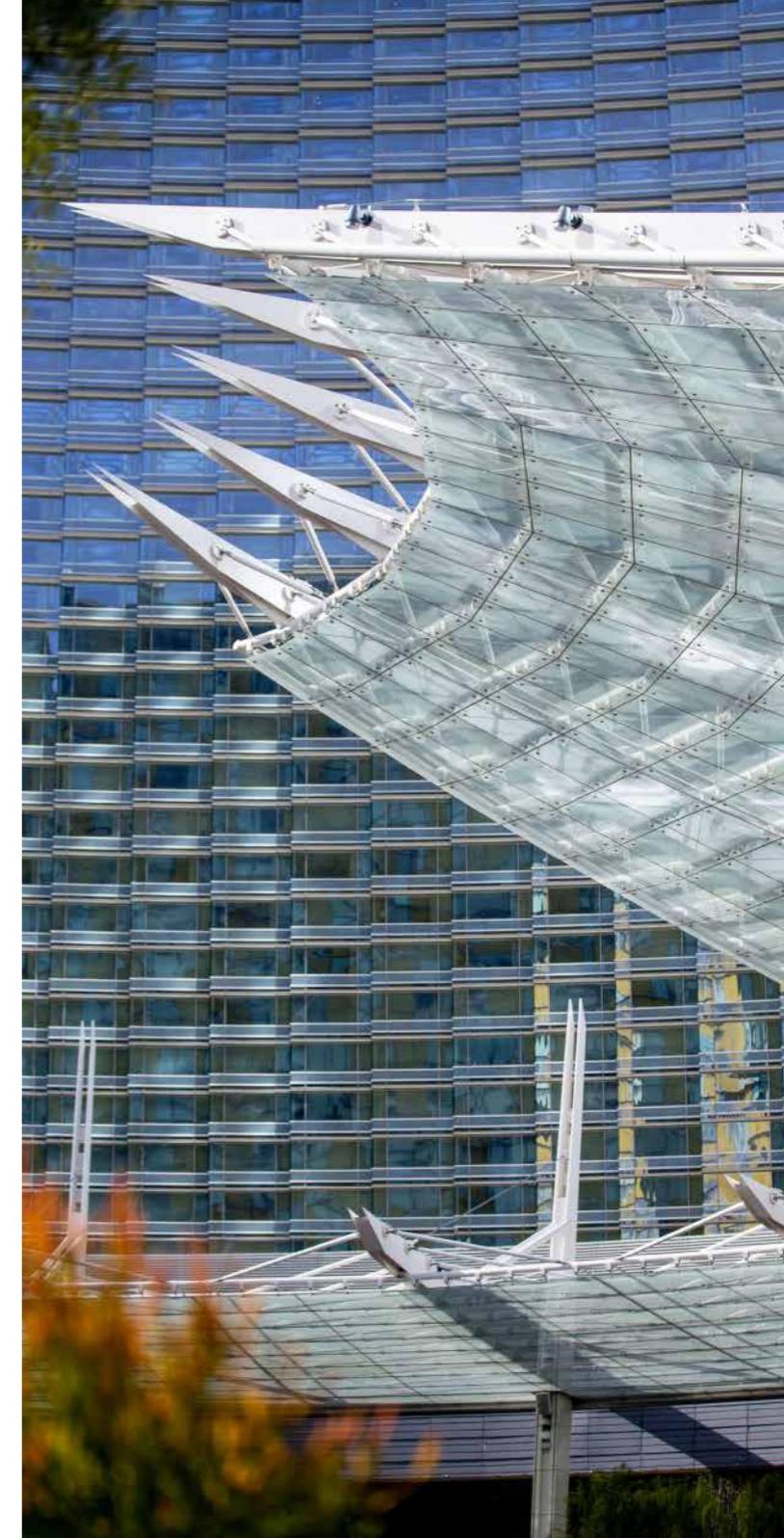
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## ABOUT US

Novum Structures is a single source contractor specialising in innovative architectural structures and integrated cladding. We offer bespoke engineering, fabrication, supply and installation services.

Client satisfaction is at the forefront of what we do. Our team of experts work closely with architects and contractors to find project specific solutions balanced by three principal drivers - design, time and price.

Our extensive project range showcases both versatility and quality; from the glazed free-form Enigma of the Dali Museum in Tampa Bay, to the Point Supported Glass structure of Sensor City, Liverpool; our iconic structures were made to stand out.

As an international market leader with offices across Europe, Asia and North America, we are able to offer global services and solutions at a local level. Employing a highly skilled set of experts across our offices, our company structure enables us to rapidly service and satisfy those markets where distinctive architectural structures and facades are being built.



## STRUCTURAL

- Architecturally Exposed Steel
  - Beam to Beam
  - Block Knoten
    - Free Form
  - Glass to Glass
  - Kugel Knoten

## STRUCTURAL COMPONENTS

- Disc Clamp
- Tension Cable
- Tension Rod

## MEMBRANE

- Air Filled Pillow
- Cable Tensioned Fabric
- Stressed Skin Membrane

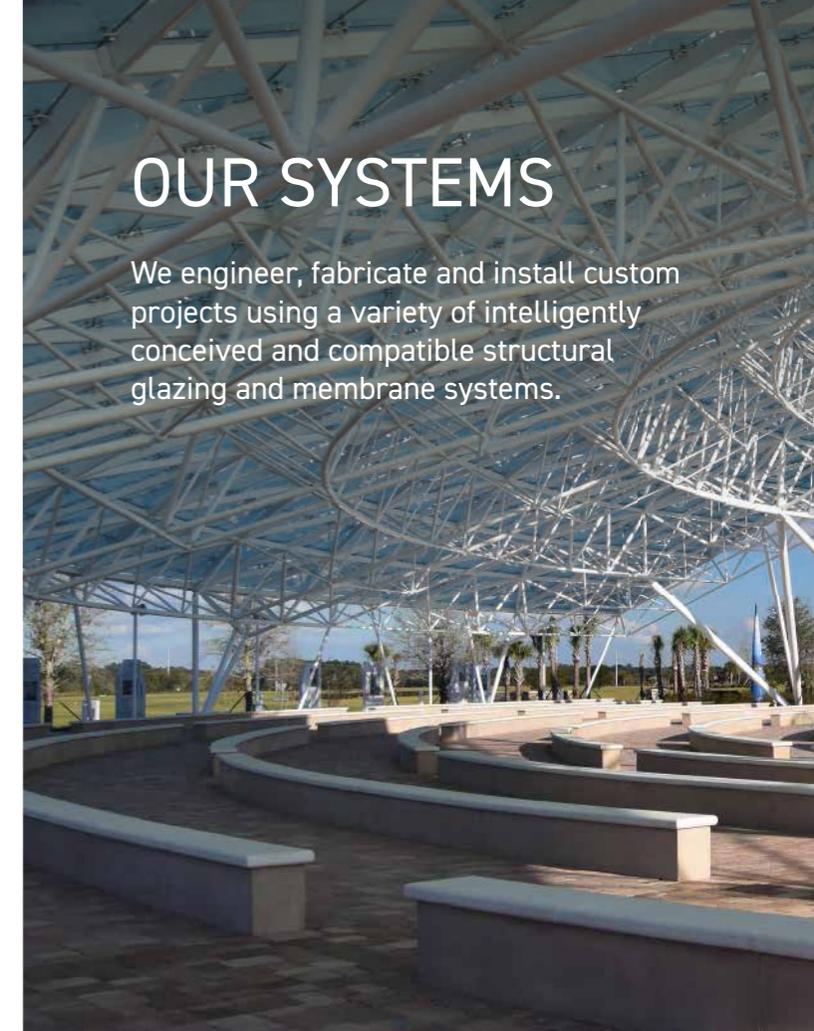
## GLAZING

- Aluminium Supported Glass
  - Corner Clamped Glass
  - Edge Clamped Glass
- Linear Supported Glass
- Point Supported Glass
- Walkway Surface Glass

## OUR SYSTEMS

We engineer, fabricate and install custom projects using a variety of intelligently conceived and compatible structural glazing and membrane systems.

Novum Structures offers a unique interchangeable system of products with the technical ability to customise for virtually any design.



# STRUCTURAL SYSTEMS

Novum Structures' six distinctive lightweight structural products were developed to solve demanding architectural challenges. The systems are typically fabricated in our own ISO certified factories, finished and then shipped compactly. Our structural systems fall into three categories:

## Architectural Steelwork: AES + BB

Our in-house-engineered architectural steelwork is factory fabricated, delivered and then mechanically fastened on-site with nominal welding. The Beam to Beam System features elegant mechanical framing methods.

## Nodal Spaceframes: BK + FF + KK

Semi-rigid nodal spaceframe systems (BK and FF) are comprised of solid or split nodes and bending capable members suitable for planar to free form surfaces and direct cladding. The timeless traditional spherical node pin jointed space truss system (KK) is fully optimised. All nodal components are designed to be interchangeable.

## All Glass: GG

Our Glass to Glass system extends the traditional role of glass as cladding to structural glazing with stiffening fins used as primary structure.



**AES - ARCHITECTURALLY EXPOSED STEEL**

Mechanically fastened custom precision steelwork of the finest quality. Minimal site use of welding and finishing.



**BB - BEAM TO BEAM**

A systemic approach for elegant mechanical connecting beams to form efficient 3-dimensional structures without nodes.



**BK - BLOCK KNOTEN**

A nodal system for single layer curved structures, which for longer spans can easily be transformed into a grid shell or double layer structure.



**FF - FREE FORM**

The unique bolted system for connecting beams that collectively form single layer, free surface geometries.



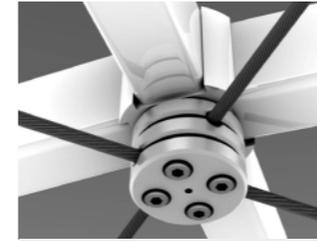
**KK - KUGEL KNOTEN**

The classic space frame system for double layer grids of free geometry and long spans with a very economical strength to weight ratio.



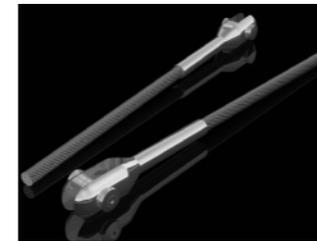
**GG - GLASS TO GLASS**

A structural system where glass is used as the primary structural element and also functions as the enclosure.



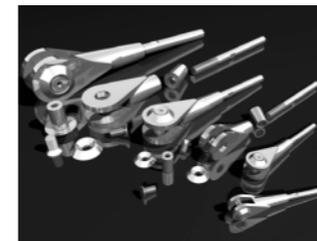
**DC - DISC CLAMP**

An accessory system or the very elegant and lightweight tension stiffening of grids comprised of other structural systems.



**TC - TENSION CABLE**

Fully engineered cables for architectural applications, in stainless or galvanised strand, complete with pre-stress methodology.



**TR - TENSION ROD**

Pre-engineered stainless steel tension rod system which has a variety of sizes, capabilities and finishes.

# STRUCTURAL COMPONENTS

The amount of pre-stress typically determines the type of tensile system required. Our architectural material of choice for tensile elements is typically corrosion-resistant stainless steel. The three systems are as follows:

## Cables: TC

Cables are used where high levels of pre-stress are required or where there is a need for very long elements.

## Disc Clamps: DC

Semi-rigid orthogonal grids using our nodal systems. They can be stiffened dramatically without the need for bulky diagonal members.

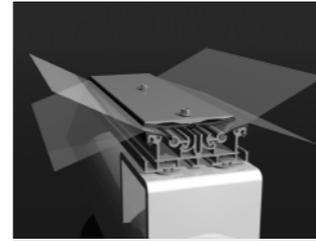
## Rods: TR

Where nominal pre-stress is needed, and design without load reversal or where components are short, tension rods are best. Tension rod applications are typically bracing or hanging elements as opposed to primary structure.



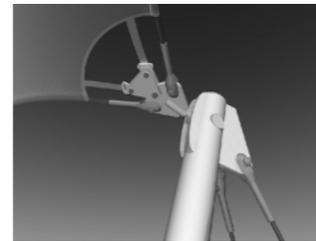
# MEMBRANE SYSTEMS

Novum has three distinctive system products ideally suited for the implementation of architectural membrane enclosures. In-house design and patterning are core skills of our company and we fabricate many different materials in our state-of-the-art German membrane production facility. The bulk of our projects use ETFE, but we also fabricate Tenara, PTFE and PVC materials. Each system has uniquely different aesthetics and uses a different approach to delivering the necessary surface tension.



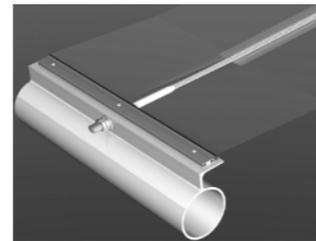
## AFP - AIR FILLED PILLOWS

Uniquely shaped air filled pillows, with a fully integrated perimeter, create a highly efficient and economical panel system



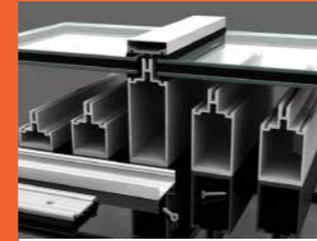
## CTF - CABLE TENSIONED FABRIC

Multiple materials are available to create free form surfaces by the biaxial tensioning of a single layer of fabric.



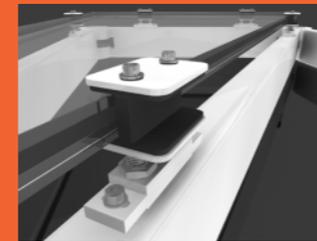
## SSM - STRESSED SKIN MEMBRANE

A single layer membrane is post tensioned and discreetly supported by thin, lightweight cables.



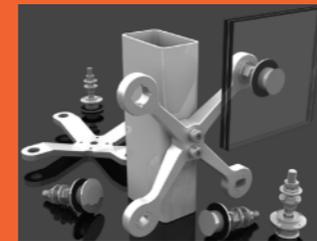
## ASG - ALUMINIUM SUPPORTED GLASS

A traditional aluminium framing system which economically captures all varieties of glass cladding with optimal capping.



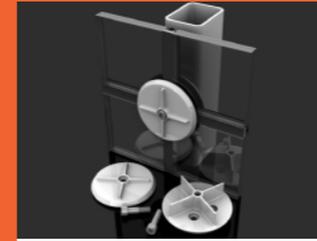
## ECG - EDGE CLAMPED GLASS

An economic system which supports glass panel edges and is ideally suited to glazing any surface geometry.



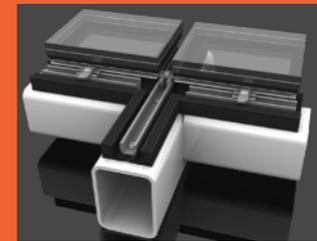
## PSG - POINT SUPPORTED GLASS

The ultimate structural glazing technology with a broad range of complementary and well engineered accessories.



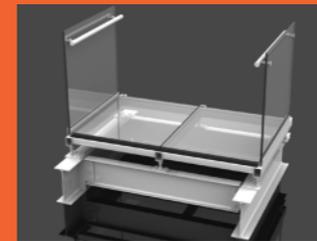
## CCG CORNER CLAMPED GLASS

Cast clamps capture structural glazing panels at the corners, allowing great transparency and expression.



## LSG - LINEAR SUPPORTED GLASS

A nominal depth glazing system developed to attach glass directly to high precision primary structures.



## WSG - WALKWAY SURFACE GLASS

A highly engineered glass system for walkway surfaces and stairs.

# GLAZING SYSTEMS

Novum Structures utilises six glazing systems to satisfy the varied aesthetics, complexities and functional demands of architectural glazing applications. Each system can be used with all glass types (monolithic, laminated and insulating) and are typically weather sealed using silicone and silicone gaskets. Our glazing systems fall into three categories:

## Structural Glazing: PSG + ECG + CCG

Benefits from discreet fixing points for a minimalist finish. Each uses mechanical fixing of the glass to the substructure via bolting or clamping. They work in both horizontal and vertical orientations with PSG being the most appropriate for suspended glazing.

## Conventional Glazing: ASG + LSG

Both systems function on the premise that at least two sides of the glass are supported. Our LSG system was developed to integrate directly to steel structural framing whereas our ASG system uses structural aluminium profiles in a more conventional manner, spanning between primary steel. Both can be flush glazed or capped.

## Walkable Glass: WSG

Designed to provide safety and translucency with minimal shadowing.

Swissotel Resort Bodrum Beach  
Location: Bodrum, Turkey  
Size: 4,305 sq ft / 400 m<sup>2</sup>  
Systems Used: GG, PSG, TR  
Architect: GAD Architecture



## SYSTEM - BENEFITS

At the early stages of design development, we recommend the appropriate solutions and product combinations to meet our client's key requirements, which are inevitably a balance of **design**, **time** and **price**.

Novum satisfies client demand for single source responsibility. We engineer, fabricate and then install custom projects using a variety of intelligently conceived and compatible structural, glazing and membrane systems.

Our comprehensive product range allows us to satisfy a broad spectrum of aesthetics whilst maintaining targeted price points.

Novum Structures manages and engineers all our projects and manufactures a significant portion of each project we build. This means budgets are meaningful, schedules are realistic, and quality is assured.



Location: Manchester, England  
Size: 62,000 sq ft / 5,800m<sup>2</sup>  
Systems used: ECG

General Contractor: VINCI Construction UK  
Architect: Leach Rhodes Walker

## NOVUM SYSTEMS

- Ability to custom
- Wide range and choice of aesthetics
- Cost schedule effectiveness
- Proven performance and reliability of systems
- Automation in design, details and production
- Design and engineering flexibility
- Key components are inventoried
- Lightweight - reduced transportation costs
- Fast delivery
- Mechanical fastening on site
- Quick assembly
- Reduced field testing
- Excellent quality and tolerance control
- Easy integration with purely custom elements and commodities.



## PROJECT EXAMPLE

# FRIARS WALK

### Shopping Centre

Novum worked closely with the client, design team and developer to ensure that the delivery of this 50 pillow canopy structure added a recognisable feature to the development with enhanced aesthetics. Several challenges were overcome, including a complete change from the original concept of a rectangular grid to a triangular grid as installed.

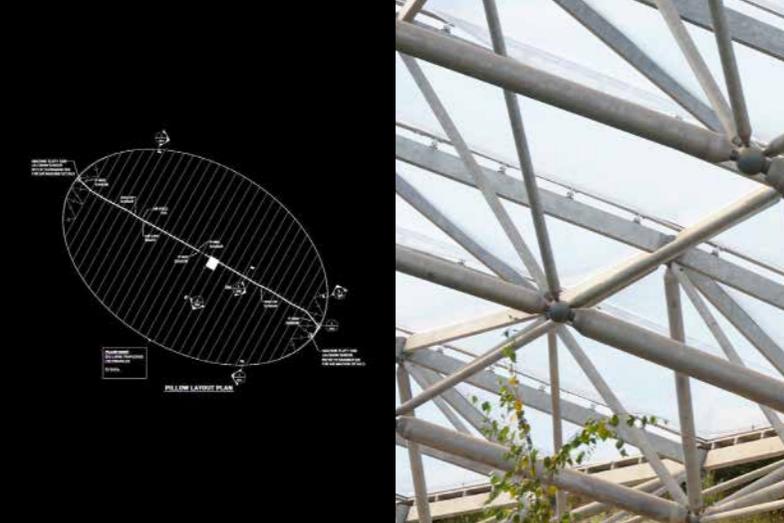
Location: Newport, Wales

Size: 2,420 m<sup>2</sup>

Systems used: AES + AFP

Architect: Leslie Jones Architecture





## PROJECT EXAMPLE BLUESTONE

### Serendome

Novum worked alongside Holder Mathias at Bluestone Resort in Wales on an adventure activity Serendome. The idea of the dome was to experience outdoor activities under a 'giant umbrella' so families could enjoy the thrill of the outdoors whatever the weather. The combination of the Novum KK and BK Systems create a large spaceframe structure with a transparent ETFE 2 layered AFP roof. Inside the dome features a hub of entertainment; from the 400 seat Amphitheatre to an impressive vertical adventure course.

Size: 8,000 m<sup>2</sup>

Architect: Holder Mathias

Systems used: AFP, KK, BK



## OUR SERVICES

Novum Structures provides local sales, project and field management services supported by a network of in-house international experts, strategic global supply and sound quality control.

Our team provides a comprehensive set of services designed to exceed client goals and expectations:

**Pre-construction Services:** By listening to our clients, we understand and prioritise their needs and identify possible solutions. Our industry leading pre-construction services create excellent client value by quickly determining the appropriate balance between design and price. Our clients can select which services suit their individual project from an extensive menu.

**Project Execution:** Transitioning from design to execution requires attention to detail. Novum Structures excels at delivering project management, planning, engineering, manufacturing, sourcing, logistics and site management which drives projects to completion on time, within budget. As we fabricate most of our systems at our own facilities, Novum Structures have excellent control over the product quality. Our experienced field engineers ensure that installations proceed according to plan and on schedule; with high standards and workplace safety at the forefront.

**Post-construction Services:** Our commitment to client satisfaction extends beyond project completion. Warranty support and optional maintenance agreements are an integral part of every project. They provide our clients with the security of knowing our care and expertise extend past project completion.



Novum Designer Assist is a value-added service that has become increasingly popular with architects, general contractors and developers. Our program consists of a collaborative process that achieves the design intent within well-defined cost parameters.

Novum works with the entire construction team in the development of technical solutions that preserve aesthetic and performance objectives, whilst being respectful of cost. As solutions are being developed, Novum provides real-time budgeting which enables the architectural team to investigate ideas for change with the added benefit of immediate feedback on pricing. As a single source specialty contractor, we are very well positioned to give you the most accurate pricing for the construction of your project.

A beautiful high-performance design is created and built while eliminating the need for value engineering later in the project life cycle.

## THE FOUR PHASES OF NOVUM DESIGNER ASSIST +STEPS TO FINAL EXECUTION

### Schematic Design Phase

1. Identify location on building for high value architecture
2. Create architectural form for specialty glazing elements
3. Establish a budget specifically for the specialty glazed elements

### Design Development

4. Create structural grid options on architectural form
5. Develop system solutions for the grid options
6. Provide pricing for design/supply/installation of the various system solutions
7. The preferred option is selected
8. Obtain full commitment of construction team for the option selected and pricing provided

### Construction Development

9. Develop preliminary engineering of glass/steel
10. Use visualization techniques to study key areas
11. Develop preliminary details
12. Develop specification for specialty glazed element
13. Provide final sum pricing for specialty element
14. Construction team then decides whether to enter into design/build agreement

### Contract Execution

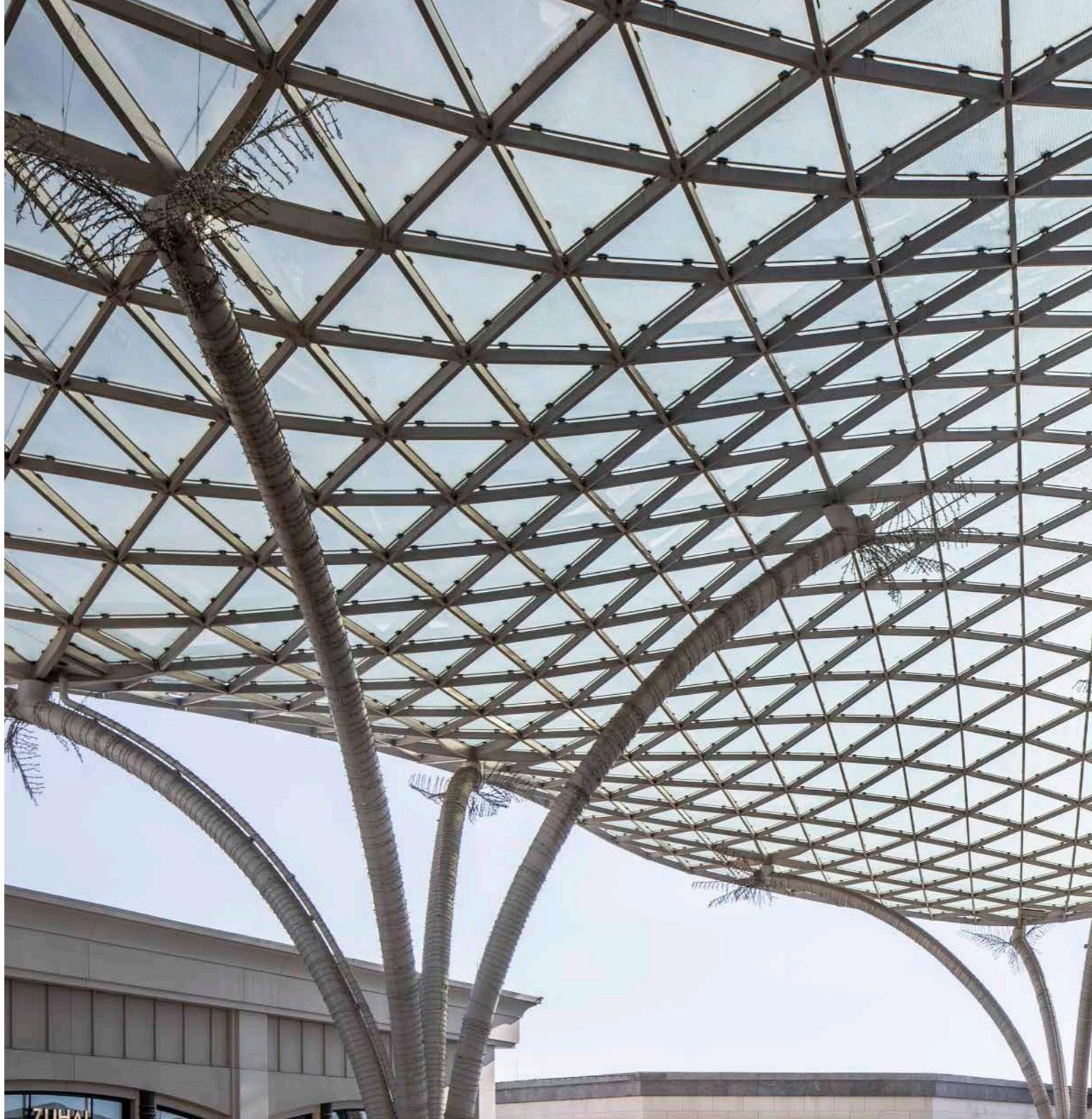
15. Final engineering
16. Fabrication drawings
17. Sourcing
18. Manufacturing
19. Installation



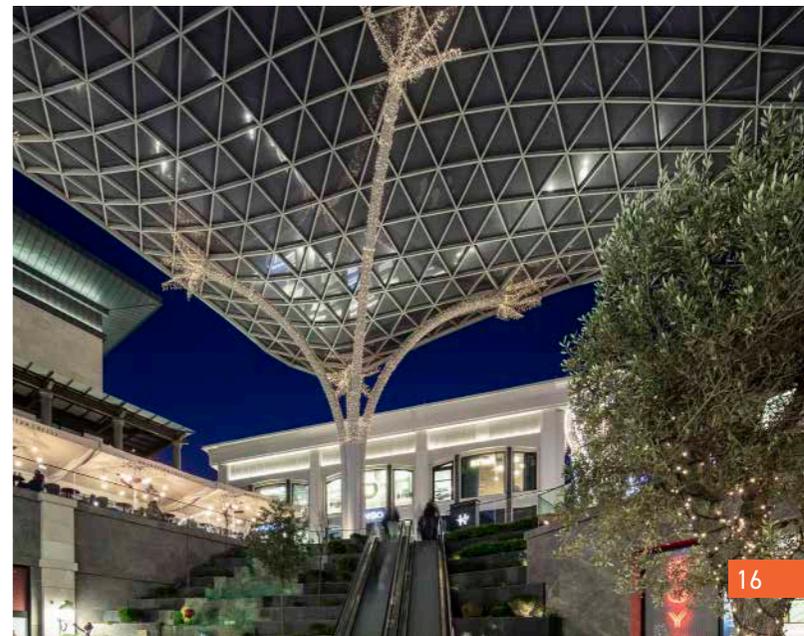
PROJECT EXAMPLE

# HILLTOWN MALL

This beautiful free form canopy stands tall at the heart of Hilltown Mall, Istanbul. The fully tempered glazed structure provides shelter from the elements whilst allowing natural daylight to shine through. The project was completed to the highest standard using our Architecturally Exposed Steel System on the imposing canopy columns. The columns themselves branch out like man-made trees and add a sense of tranquil outdoors to an otherwise concrete jungle. Our FF System was used alongside our ECG System to give this project its elegant and unique finish.



Location: Istanbul, Turkey  
Size: 1,973 m<sup>2</sup>  
Systems used: AES + FF + ECG  
Architect: Fehmi Kobal Design/  
Elkus Manfredi

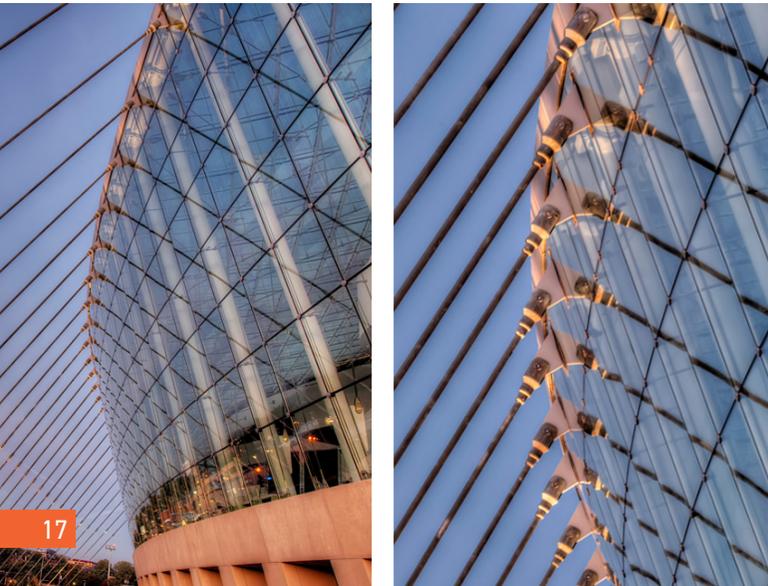
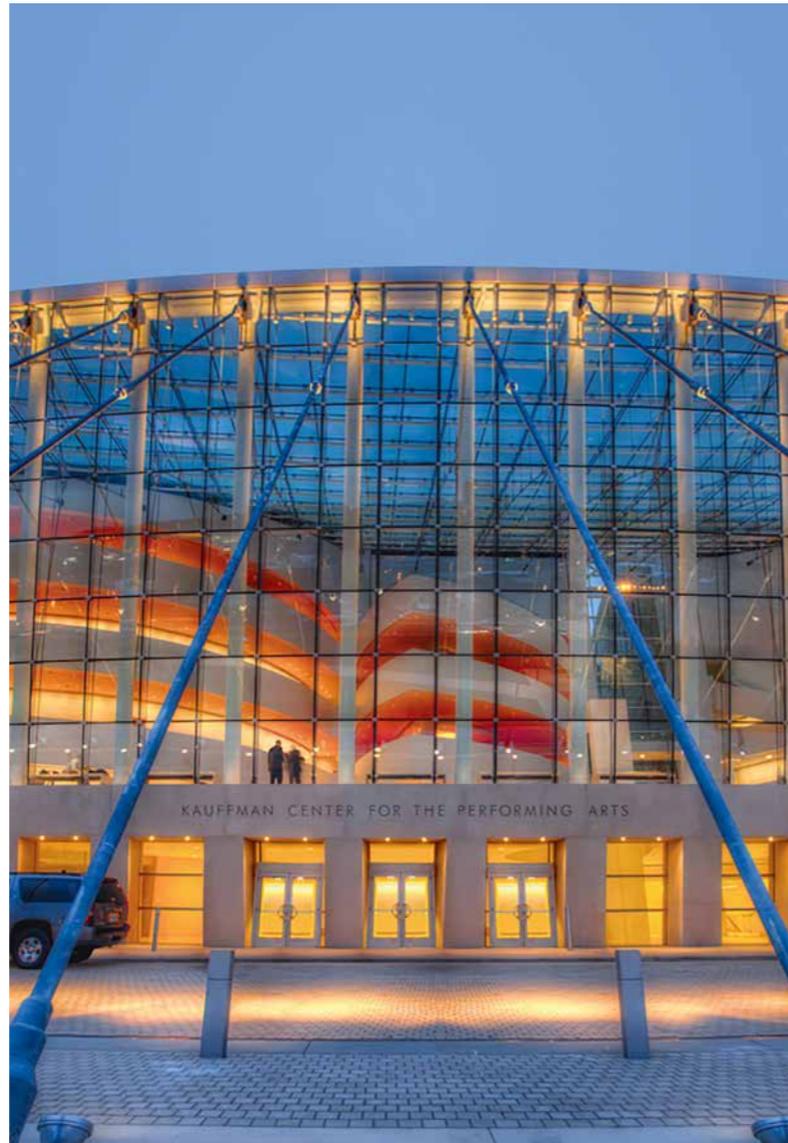


PROJECT EXAMPLE

# THE KAUFFMAN CENTER

The Kauffman Center features two large performance halls with massive steel substructures. A giant foyer is created by an elaborate glazed tension structure which anchors to the halls and then forms a tent tensioned over wall columns. The foyer structure features multiple Novum Systems – architectural steel, tension rods and cables. Similarly, the glazing uses edge, point and corner supported glass, showing the power of system integration. The incredible lightweight structure is one of the most complex in the United States.

Size: 5,130 m<sup>2</sup>  
Systems Used: AES, TR,  
TC, PSG, ECG, CCG  
Architect: Safdie Architects



Location: Keele, England  
Size: 1,075 m<sup>2</sup>  
Systems used: BK + ECG  
Architect: C4 Architecture



PROJECT EXAMPLE

# CAUDWELL INTERNATIONAL CHILDREN'S CENTRE

The exterior façade of the building is inclined outwards up to 22 degrees and curves around the building.

Novum offered several geometries of the glazing to maintain the curved aesthetic of the façade while achieving an efficient solution utilising Novum's BK + ECG Systems.



# NOVUM FACILITIES MANAGEMENT

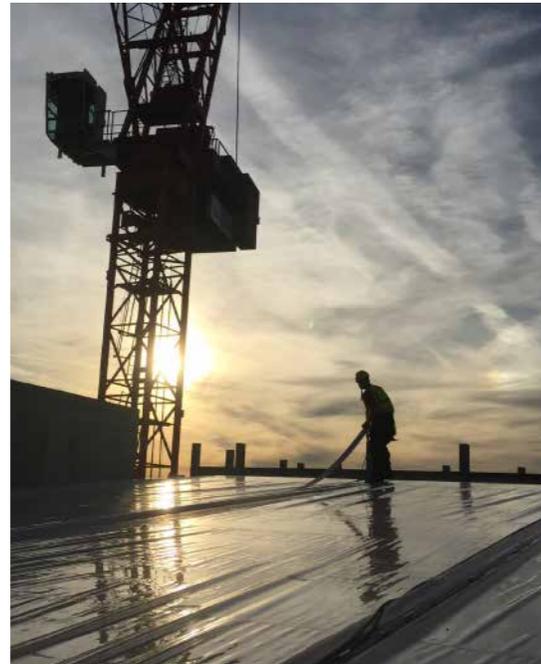
Novum Structures' has its own in-house team operating primarily in Europe who provide our facilities management service.

The Novum Facilities Management (NFM) team provide tailored maintenance and repair services to a diverse set of clients and building owners on their existing facilities.

Each project is carefully considered on a case-by-case basis by one of our expert technicians.

Our team understand that your business comes first and plan each project to ensure minimal interruption to your everyday operations.

Our bespoke services include but are not limited to; ETFE and membranes (repairs, surveys, replacements and cleaning) glass replacements and maintenance, silicon resealing on facades, roof areas and structures, painting, general cleaning, bird protection and more.



Please find below an outline of our services:

## Maintenance and Repair

At some point during its life cycle, it is inevitable that your building will require maintenance and repair, whether that be general wear and tear, neglect or climatic conditions. Our team offer a number of bespoke maintenance and repair services tailored to your individual needs:

- Rapid response and 24-hour service
- Membrane maintenance
- Membrane replacement
- Cleaning of ETFE, PTFE and PVC
- Flashing replacements
- Glass replacements
- Building repairs
- Window maintenance and cleaning
- Sealant replacement
- Gutter cleaning and repair
- Vegetation growth removal
- Service contracts

## Inspection

Novum Facilities Management is pleased to provide a comprehensive inspection service which can be tailored to suit individual project requirements and budgets.

- NDT, MPI sonic testing and corrosion inspection
- Paint inspection

## Industrial Rope Access

Our teams work at heights and in complex situations. Rope access is the modern approach for reaching difficult work areas and is internationally recognised as a valid and safe alternative to more traditional means. The method involves accessing areas with rope systems suspended from fixed structures. Novum has built an excellent reputation based on knowledge, quality, reliability, speed, and above all, safety.

- Our technique ensures minimal disruption
- Quick and cost-effective
- Environmentally friendly
- No power machinery or scaffolding is involved

- Limited points of contact reduces any possible damage

## Novum Bird Deterrent System

We know what an issue birds can be to your builds. That's why our team of specialists are able to offer the following disciplines depending on what would work best on your project:

- Bird spikes
- Bird netting
- Bird scarers/repeller
- Audible/acoustic deterrents
- Visual deterrents
- Laser deterrents
- Bird wires

## Novum Shading Systems

Our ETFE shading systems are designed using G-values which consider both solar glare and heat gain. We are world-leading providers of retrofit ETFE shading systems and also provide the following shading systems:

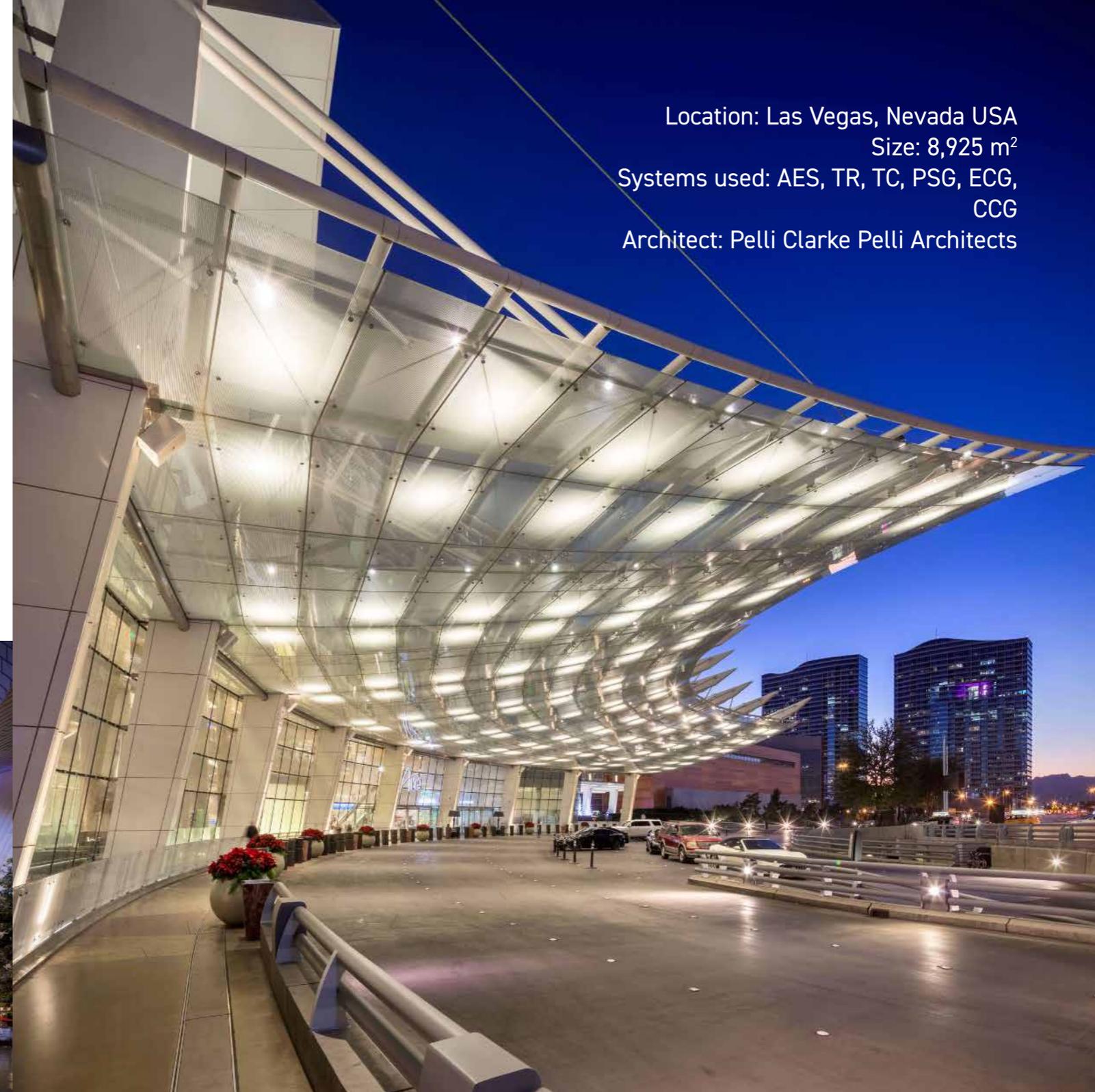
- Retrofit ETFE Shading
- Internal kites
- External kites
- Glass films
- Bespoke internal shades



PROJECT EXAMPLE

## ARIA RESORT & CASINO

Novum worked closely on various aspects of this project, including the grand entrance featuring a cantilevered suspended PSG canopy, low iron glass supported by a mix of painted mild and stainless steel secondary components of AES and TR Systems. The Harmon entry features a fully integrated PSG canopy which also braces a suspended machine steel fin wall with custom ECG. The fins suspend on stainless steel TR System rods.



Location: Las Vegas, Nevada USA

Size: 8,925 m<sup>2</sup>

Systems used: AES, TR, TC, PSG, ECG,

CCG

Architect: Pelli Clarke Pelli Architects



# CPD

## THE ACTION TO YOUR VISION

GAIN YOUR ARCHITECTURE CPD POINTS WITH NOVUM STRUCTURES' LUNCH + LEARN

EACH SESSION WILL COVER:

- Introduction to Novum Structures
- Services
  - Engineering and detailing
  - Fabrication and supply
  - Project management and installation
  - Facilities management and maintenance
- Pre-construction Support
  - Analysis
  - Product selection
  - Project development

- Applications
  - Facades
  - Canopies
  - Roofs
  - Atriums
  - Interiors
  - Free form
- 18 Interchangeable Elements
  - Structural systems
  - Tensile
  - Membrane
  - Glazing
- ETFE Specification
  - A deep dive into ETFE and it's comprehensive applications
- Projects
  - Global project examples

Please contact our CPD team for more information and to book your free session:  
[CPD@novumstructures.co.uk](mailto:CPD@novumstructures.co.uk)

# NOVUM CERTIFICATION BODIES

Acclaim Accreditation  
Registration number 146671



NQA  
Registration number 27743



Achilles-Building Confidence  
Registration number 490 0383



RISQS  
Registration number 3538



Builders Profile  
Registration number 24766



Alcumus - Safe Contractor  
Registration number QH5664



CHAS



Construction Line Gold  
Registration number 146671



SMAS  
Registration number 86818





## NOVUM STRUCTURES

International resources and a proven history of creating and building highly innovative projects.

Novum Structures has established an excellent reputation for delivering customer satisfaction on projects of all sizes to leading architects and contractors.

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