

10 POINT GUIDE

to shading complex architectural glass structures

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Glass reflects humanity. No other material resonates with us so instantly. Its beauty, subtlety and flexibility inspire spectacular forms that make places memorable, and give them warmth, confidence, even soul.

But it has an uneasy relationship with the environment, leaving architects today with a responsibility to reconcile beauty with energy efficiency and wellbeing.

Here are ten useful pointers for designers striving to reach the optimum balance of light and shade.

“I am always searching
for more light and space”

Santiago Calatrava



1

How to approach large glass atria

Glazed atria create impact. They are meeting and gathering places, so the control of heat and light is essential to their success. Shading with semi-transparent fabric offers precise regulation and energy savings whilst preserving a connection with the outside world. Automated tension systems can be installed horizontally or on an angle to suit the structure, and can cover up to 100m² with a single system.

2

Glass façades: address heat gain and glare without compromising design

The most effective protection against excess heat gain is external fabric shading, which can reduce energy demand for cooling by over 70% and lighting by over 50% without losing the view to the outdoors. Tensioned façade blinds are retractable and can be integrated with the façade structure for a clean look, or set out from the façade using stainless steel cable guides to create the illusion of floating fabric.




3

Shading curved glass structures

Shading systems can be designed to follow the curvature of a façade or other glass structure both internally and externally using tensioned fabric and relieving rollers. Curved glass often means a delicate supporting structure, making load calculations and bespoke bracketry design key considerations.





4

Consideration of unusual shapes

The most advanced tensioned systems conceal a torsion spring and a motor within the fabric barrel, allowing the design of triangular and trapezoidal solutions which hold the fabric flat, even when installed at an angle. Early consideration of bracket location is important to achieve a fabric shape as close as possible to the glazing it will cover.



5

Planning shading for outdoor spaces

The sheer density of urban spaces makes rooftop, courtyard and surrounding outdoor spaces increasingly valuable. Planning shade in these areas is crucial in converting an architectural idea into a well-used space, but subtlety of shading mechanism is also important to ensure views are clear when sun protection is not needed. Tensioned fabric panel systems can operate on slim support cables, eliminating the need for bulky supporting structures and covering huge areas with a single piece of fabric.





6

Standing up to an adverse climate

External shading products must be able to handle environmental conditions ranging from extreme heat and sandstorms to high wind, rain and extreme cold. Established product manufacturers will provide CE marks detailing classifications of wind resistance and solar transmittance in line with European standards, as well as maintenance and servicing requirements. Tensioned fabric systems are inherently strong and have a long track record of internal and external use in locations with challenging climates such as the Middle East and northern Scandinavia.

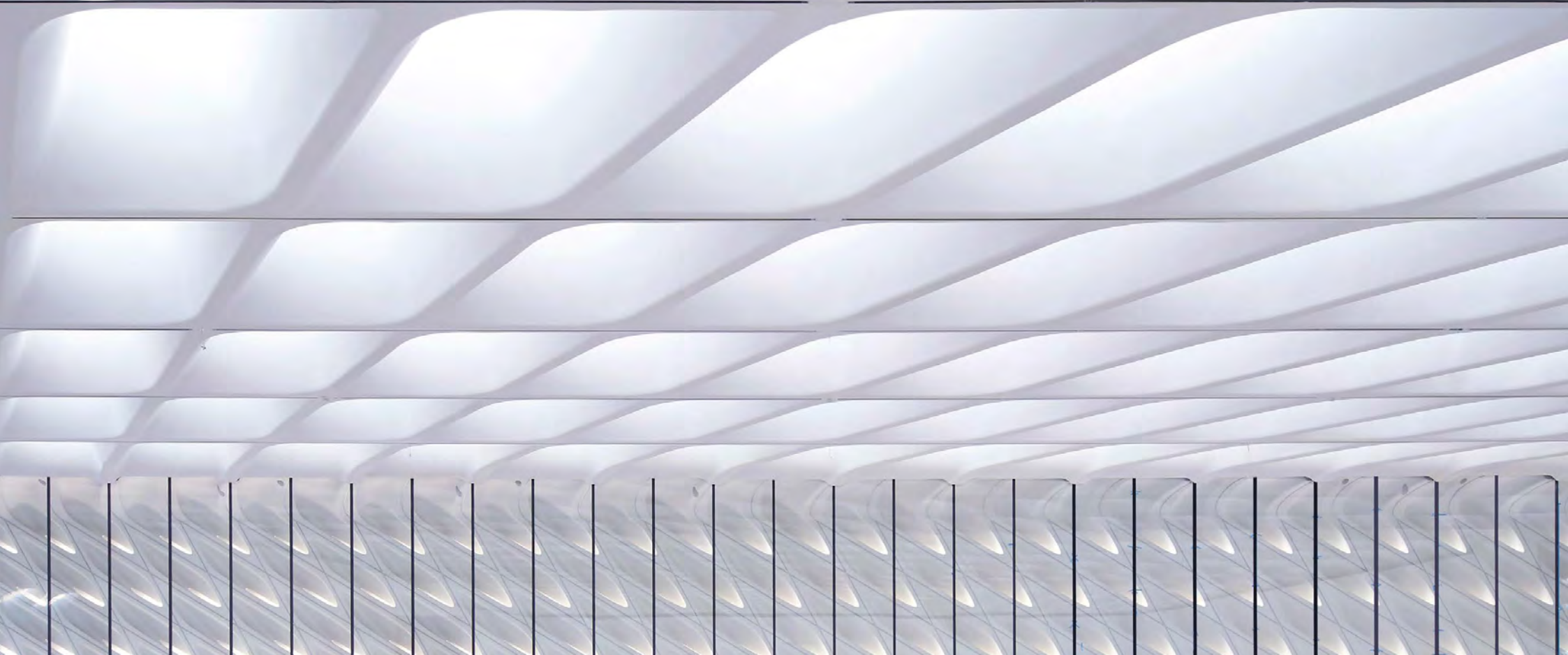





7

Regulate your environment with automatic control

The effect of solar energy on buildings is highly dynamic, yet a building must provide a stable indoor environment regardless of the hour, day or season. Motorised shading integrated with precise daylight tracking software and an appropriate BMS can constantly adapt to the external environment, keeping heat, glare and energy use manageable on the inside.

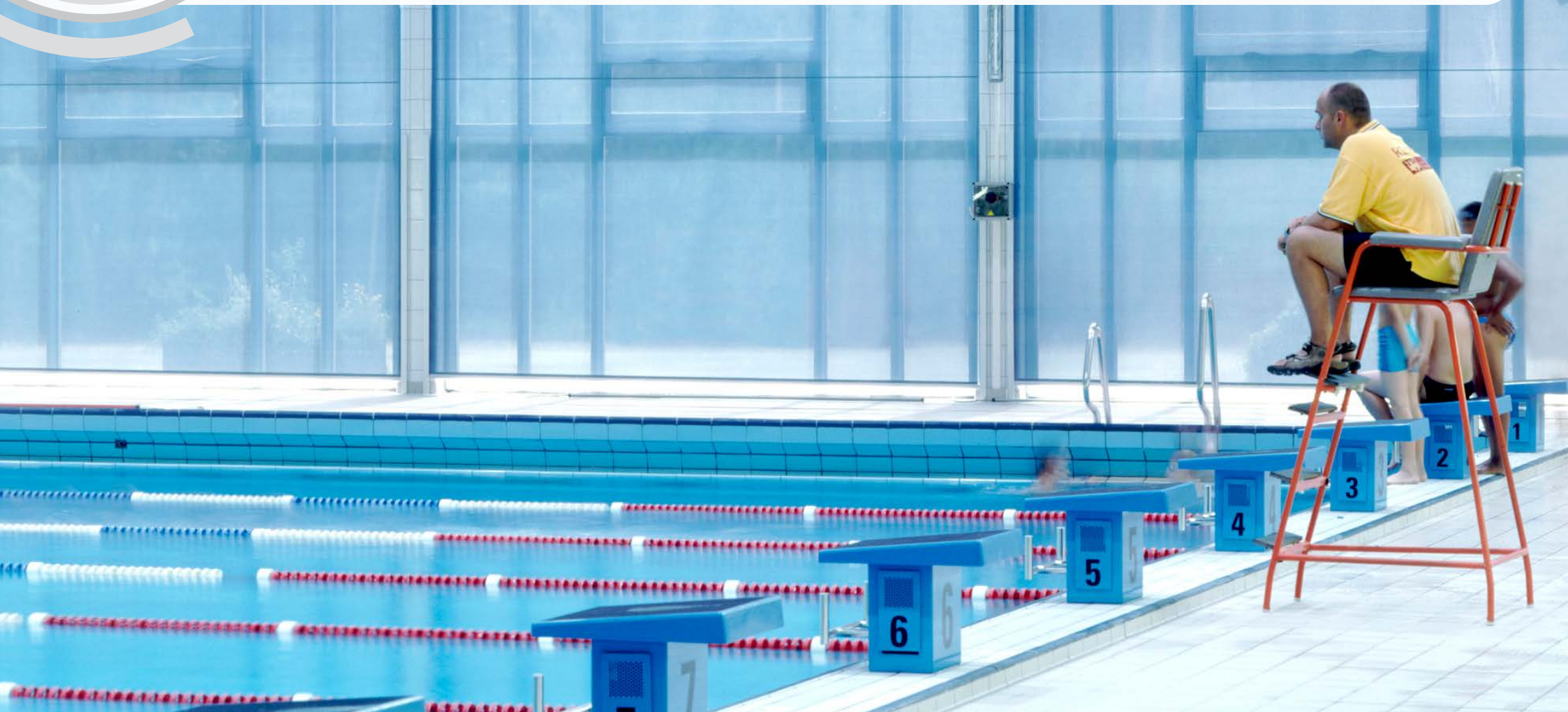




8

Choice of fabric

Complex glass structures require expertly engineered fabrics to achieve the correct balance of heat reflection, glare reduction, views to the outside, durability, safety, aesthetics and a low carbon footprint. A glass fibre core weave is often a good choice for strength and durability, but many other material choices may be appropriate depending on the nature of the space to be covered.



9

Expert advice at an early stage

Collaboration with engineers and product manufacturers early in the design process results in integrated shading systems that work seamlessly with their surroundings, harnessing the power of light and shade as positive architectural features, rather than restrictions or problems to be overcome later.





10

Resolving complexity with intelligent engineering

Sometimes great design is about what you can't see. Building physics modelling and specialist mechanical and electrical engineering create shading systems that work in tune with aesthetics and atmosphere, evolving together with the building design, and delivering both efficacy and elegance. Creative collaboration and meticulous testing lead to systems that don't just look good on paper, they perform exactly as they should.



Guthrie Douglas are a team of specialist engineers with the sole focus of creating technical shading systems for extraordinary spaces.

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