ARCHITECTS EDITION

ISSUE 1 / MARCH 2017

VISUAL

ASH & LACY

THE THEORY OF MESH

1. Light and Shade

Light & Shade = Free Area

The Art of Light Manipulation

Anotation here...

When using any type of mesh product as a decorative feature you are dealing with light and shade. In this issue of 'The Theory of Mesh' we explore the key factors to be considered and suggest ways to manipulate and combine these elements to obtain the best visual impact for your project.

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WHAT IS FREE AREA?

Light and shade can be created by changing the free area of a mesh. Free area is the amount of perforations/ holes in a given area and is often conveyed as a percentage. Free area influences the visual appearance of a pattern/mesh and also its physical performance.

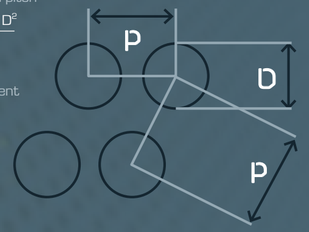
Calculating the free area of a mesh is relatively simple, some examples are shown below. For more information or assistance, please contact our technical department.

1 Round holes, staggered pitch

Round holes, staggered pitch

Free area = $\frac{90.7 \times D^2}{P^2}$

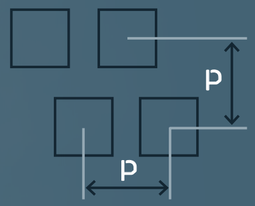
60° Pattern Arrangement



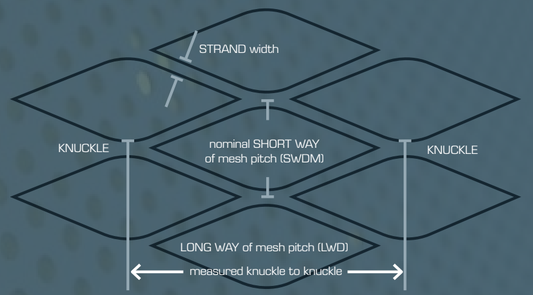
2 Square holes, staggered and square pitch

Round holes, staggered pitch

Free area = $\frac{100 \times D^2}{P^2}$



3 Expanded metal free area



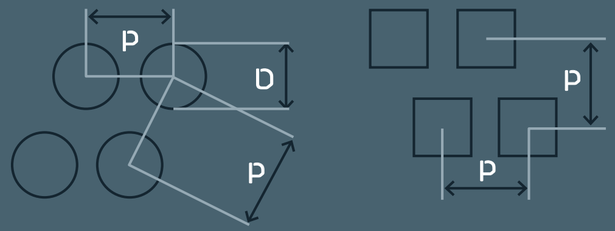
Expanded metal nominal visual free area (as viewed from the front)

(1-(1/SWM x strand width x 2)) x 100

WHAT DO I NEED TO CONSIDER?

The Pitch

The pitching of a pattern describes the distance from hole to hole usually measured from centre to centre of the aperture, and is denoted by 'P' on diagrams.



Choosing the right free area.

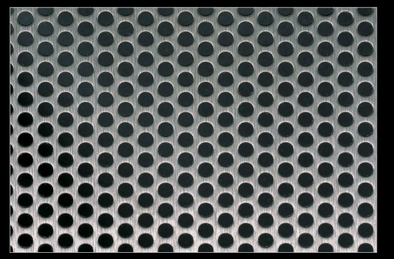
The higher the percentage free area the more you will see through. In very general terms once the free area gets to 30-40 % you start to see through it and at the higher levels becomes almost transparent?

Standard patterns

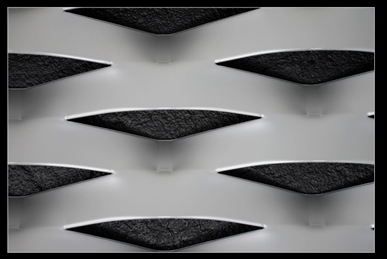
The Vision Range ...selection of sizes and shapes of mesh with range of free areas ...samples on request.

Full range can be seen on page 18

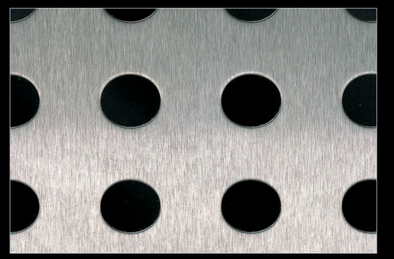
Vision 20



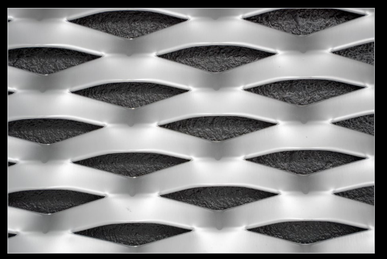
Vision Webb 22% & 87%



Vision 40



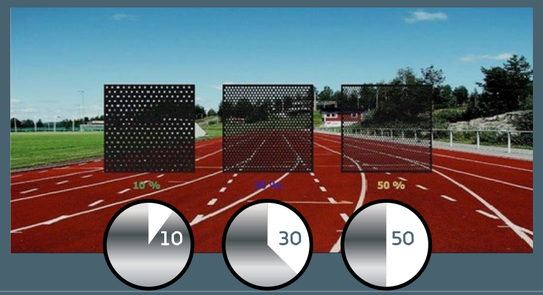
Vision Trafford 28% & 81%

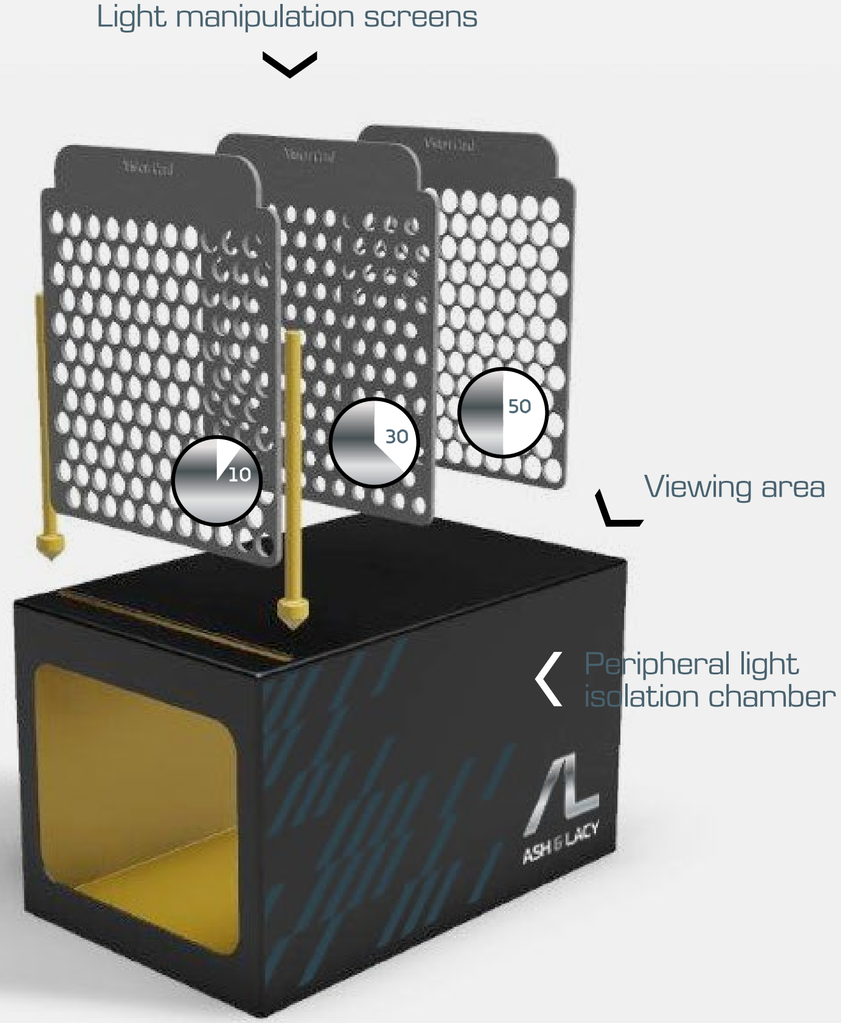


WHAT DO I NEED TO CONSIDER?

The Visionarium

The Visionarium is a practical device so you can see the impact changes in free area first hand.





Apply for your Visionarium here.

WHAT DO I NEED TO CONSIDER?

Tailoring patterns to alter the free area.

Perforated Patterns

The free area can be altered in perforated patterns by increasing or decreasing the hole size on a given pitch.

Expanded patterns

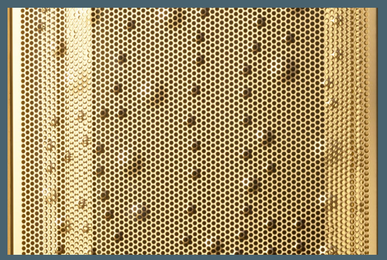
The free area of an expanded mesh can be altered by increasing or decreasing the strand or altering the short way. In-house tooling manufacturing means tooling can be designed to obtain specific free areas and mesh shapes.

In the field...

Project below required a low % free area to reduce light breakout from the car parking behind the panels but a specific level of ventilation.

Problems solved...

The example here has a 60% free area to allow maximum light and airflow into the room.



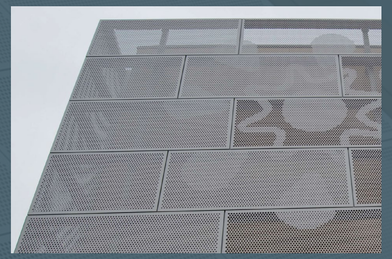
HOW DOES FREE AREA IMPACT MY DESIGN?

Contrast

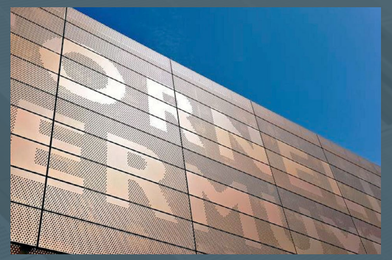
Contrast between perforated free areas enable us to create light and dark areas on a project.

In this example the same hole size was used with two different pitches . A higher 60% free area over the windows and a 30% for the rest of the screen.

Multiple hole sizes on the same pitching to create pattern by altering the free area.

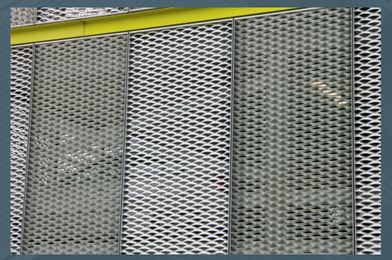


Unpunched areas create bold contrast and can be used to create designs, images or lettering.



Contrast can be achieved on an expanded metal mesh by simply rotating the mesh upside down.

In this example the mesh was all anodised the same colour but the rotation changes the light transition through the mesh making one appear much darker than the other.



HOW DOES FREE AREA IMPACT MY DESIGN?

Contrast - Positive & Negative

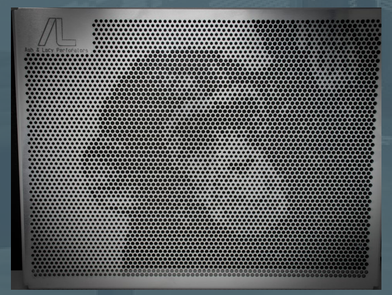
Deciding on whether you want a positive or negative image all hinges around the background to your perforated project. If the background is dark or in shade the higher percentage areas will appear darker.

If these areas are backlit or don't have a background the higher percentage free areas will appear light and the lower free areas darker/ solid.

Dark Background

H High % Free Area = Dark

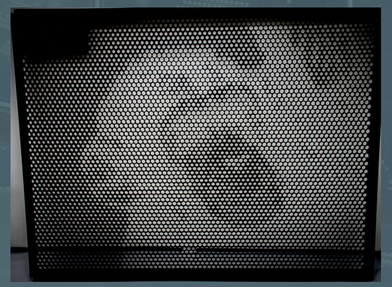
L Low % Free Area = Light



Light Background

H High % Free Area = Light

L Low % Free Area = Dark



ARE THERE ANY LIMITATIONS WITH FREE AREA?

Material thickness & free area

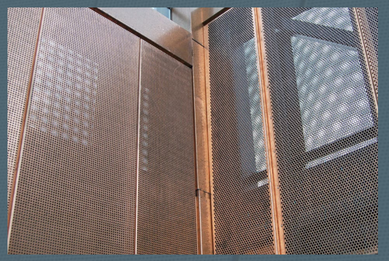
In general, the width of material between the holes or bridge, should be no smaller that the hole diameter. Using this principal means a wider range of materials and thickness will be available. However on some of the more complex designs or where a specific material thickness must be maintained to make a design work, we go below this principal.

Effects on free area with material type

Harder materials such as Stainless Steel distort whilst punching and this distortion increases as the percentage free area increases. Specialised levelling equipment and dedicated tooling can help to rectify this.

Samples

We can provide samples with specific free area using our Vision range which targets specific free areas with tried and tested patterns for the architectural specifier. Alternatively we can supply our Visionarium for a practical guide to the manipulation of light.



THE VISION RANGE

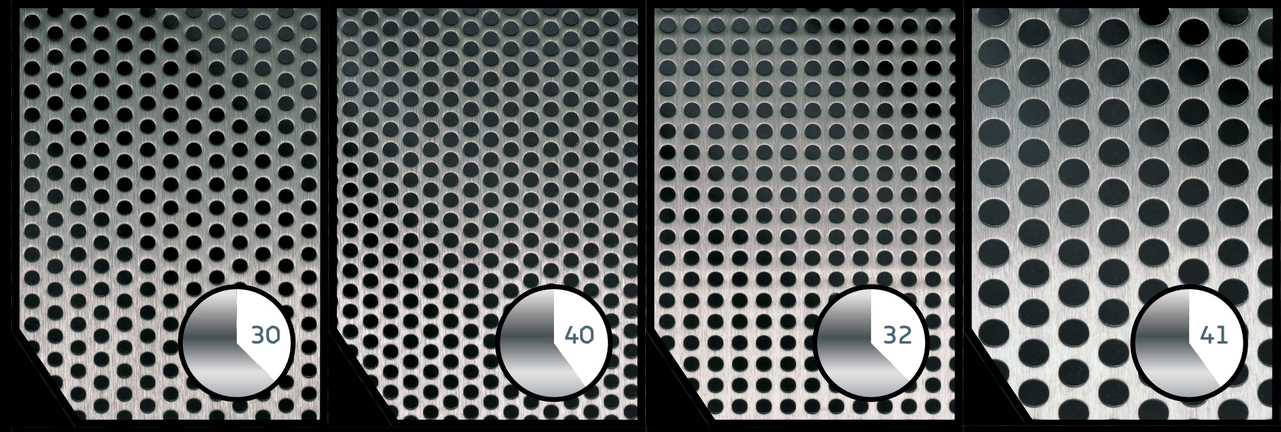
Vision is a unique collection of patterns, chosen to inspire the architectural specifier; a range of materials, patterns and finishes which allow designs for the real world to come to life.

The next issue of VisuAL explores 'Scale & Distance' and will be available in April 2017.

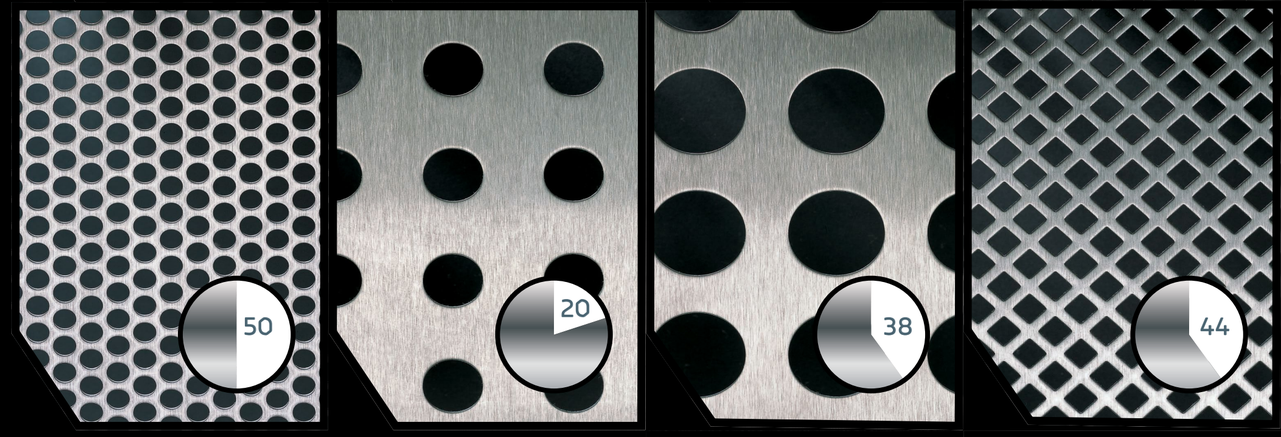
Sign up to register for your e-copy here.

Left to right:

Vision 30 ›
Vision 40 ›
Vision 32 ›
Vision 41 ›

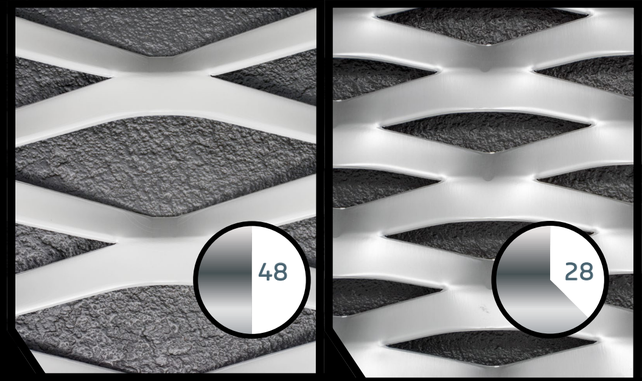


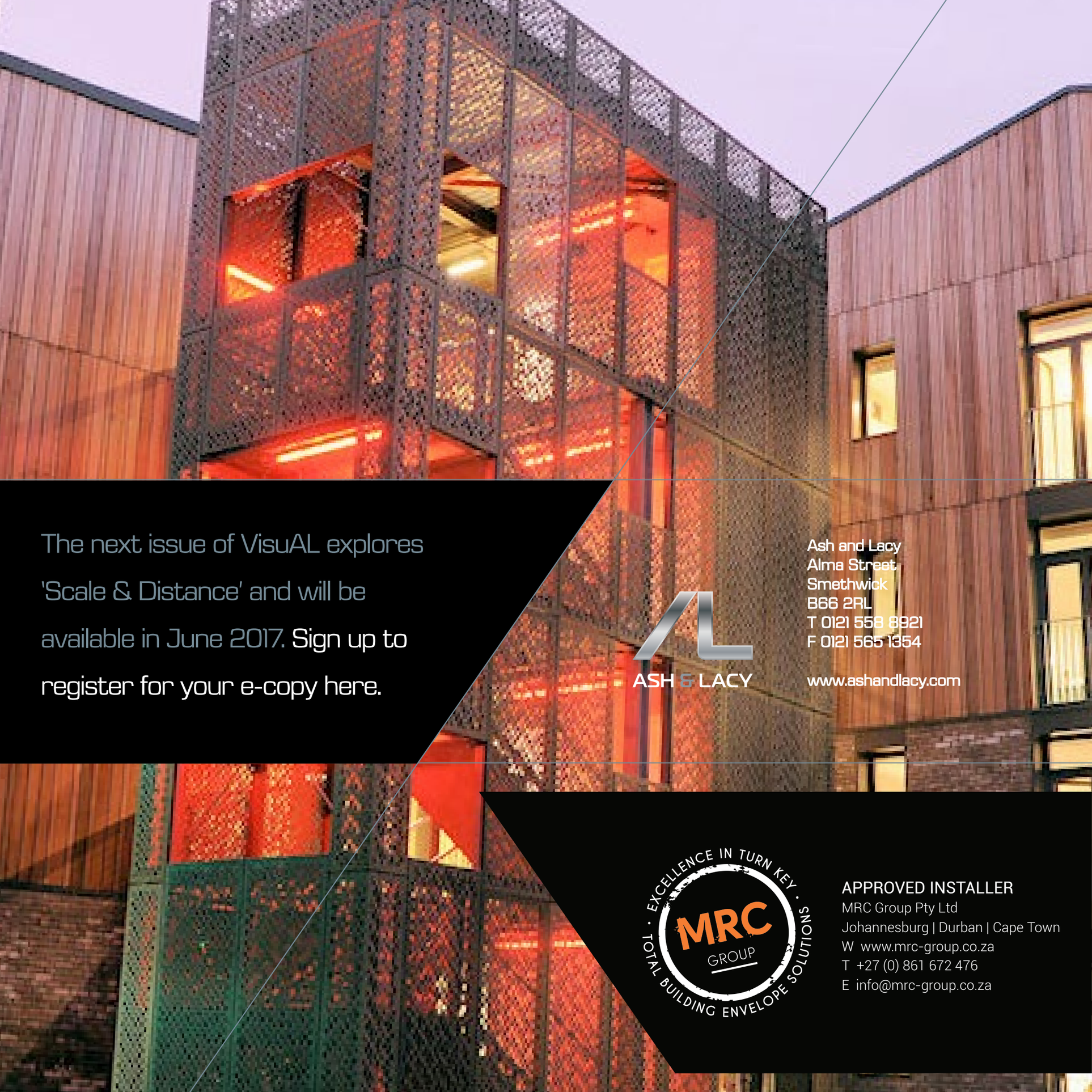
Vision 50 ›
Vision 20 ›
Vision 38 ›
Vision 44 ›



Left to right:

Vision Neutra ›
Vision Trafford ›





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