

# Silicone Enables Equitecture on a Colossal Scale



Case Study: The Kelpies, Falkirk, Scotland



Photo courtesy of SH Structures and The Helix Trust

## The Project

Officially inaugurated on the 17<sup>th</sup> and 18<sup>th</sup> April 2014, The Kelpies are located in The Helix; a new 350 hectare park in Falkirk. They are modelled on heavy horses which were once the powerhouse of the Falkirk/Grangemouth area, working in the foundries, the fields, the farms and the canals. They exemplify the industrial history of Scotland.

Standing at 30 metres in height and one of the largest equine sculptures in the world, each component is formed from steel – a material from Scotland’s former industrial heartland, which allows each of the horses heads to exude a mechanized aesthetic.

The full structures are illuminated inside and out creating a stunning spectacle during the hours of darkness, which elevate Falkirk and Grangemouth to national and international prominence.

The £43 million project was made possible by a £25 million award from Big Lottery’s ‘Living Landmarks’ fund and a partnership between Falkirk Council, Scottish Canals and Central Scotland’s Forest Trust.

DOWSIL™ 896 PanelFix was specified for bonding the stainless steel skin plates which were used to clad the horses manes on each of the sculptures.

## PROJECT SNAPSHOT

**City:** Falkirk  
**Country:** Scotland

**Products\***  
DOWSIL™ 896 PanelFix

**Sculptor and Designer**  
Andy Scott

**Principal Contractor**  
S H Structures Limited

**Dow Technical Distributor**  
Sherwin-Williams Diversified Brands Ltd

\*Prior to February 2018, products listed were branded as Dow Corning

## The Challenge

Following its original inception in 2007 by the sculptor, Andy Scott, the design and erection of The Kelpies required a dedicated team of leading consultants and specialists to bring this new Scottish landmark to fruition. The project was several years in the making during which time a significant effort was devoted to detailed design, planning and creating a bespoke engineering solution, whilst preserving the artist's vision for the sculptures. Of the many technical issues this project presented, the fastening of the external stainless steel skin plates to the primary steel support structure was particularly challenging, due to the different shaped cladding panels and meeting the performance specification as prescribed by the project team.

## The Solution

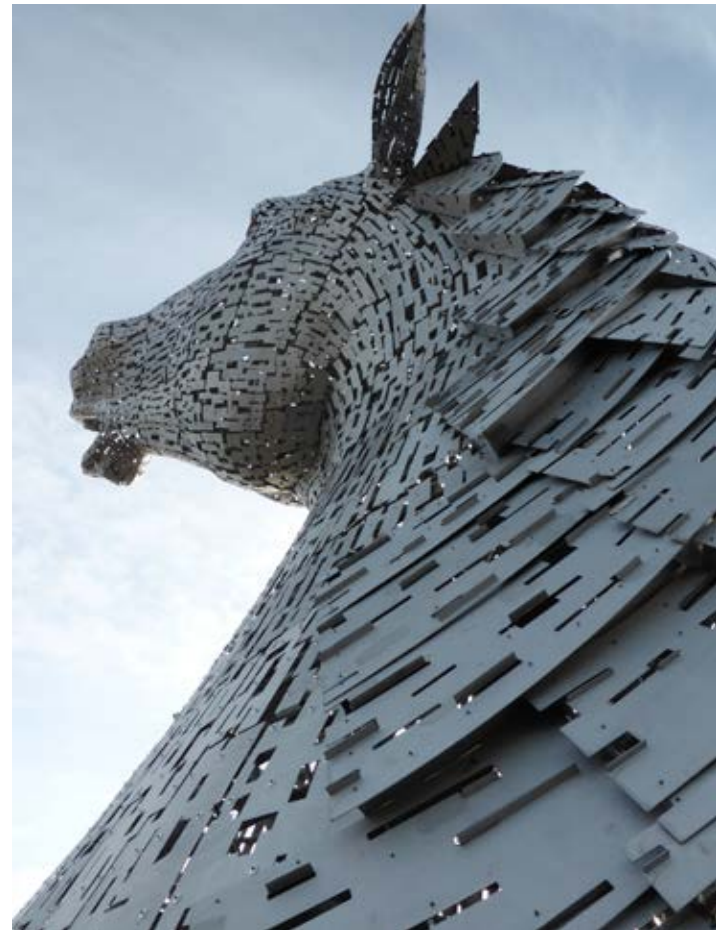
Specialist Steel Fabricator and Principal Contractor for The Kelpies, S H Structures Ltd, contacted Sherwin Williams and Dow to identify an appropriate system for fixation of the 0.9 mm thick external skin plates, which were comprised of over 100 different shapes and dimensions to replicate the original design aspects

of manes of the sculptured horses' heads. Dow proposed the use of silicone bonding with high strength DOWSIL™ 896 PanelFix in combination with the mechanical fixation. This allowed each of the 316 plates to be quickly and securely fastened, preventing vibration and accommodating dynamic wind loads which can give rise to vertical motion, creating oscillations in any direction. The use of DOWSIL™ 896 PanelFix also enabled the curved sections of the panels to be securely fixed to the sub structure.

The panels were installed and bonded by S H Structures using a specific joint detail which was specified by Dow, who conducted a series of calculations prior to recommending a universal design for the adhesive application.

## DOWSIL™ 896 PanelFix

A one part, neutral curing silicone sealant for structurally bonding together common panel bonding materials such as mineral substrates, metals (anodized aluminium, stainless steel, etc). It is highly durable, has immediate green strength directly after application and is able to withstand dynamic and permanent loads once cured.



Photos courtesy of SH Structures and The Helix Trust





“Our co-operation with [Dow] was vital, not only in enabling the security and safety of each panel but in providing a solution to address long term weather resistance in such an exposed location. This is of the utmost importance which will help realise the 100 year design life of this landmark structure”

David Perry, Contracts Manager at S H Structures



Photos courtesy of SH Structures and The Helix Trust

## Learn More

Dow high performance building solutions include proven materials for structural and protective glazing, weatherproofing, insulating glass, window and door fabrication, and building materials protection, as well as innovations for high-efficiency insulation, such as the DOWSIL™ Building Insulation Blanket.

To learn more about Dow high performance building solutions, visit us at [consumer.dow.com/construction](http://consumer.dow.com/construction) and [consumer.dow.com/PanelFix](http://consumer.dow.com/PanelFix).

## Learn More

Dow has sales offices, manufacturing sites, and science and technology laboratories around the globe. Find local contact information at [consumer.dow.com/ContactUs](http://consumer.dow.com/ContactUs).

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