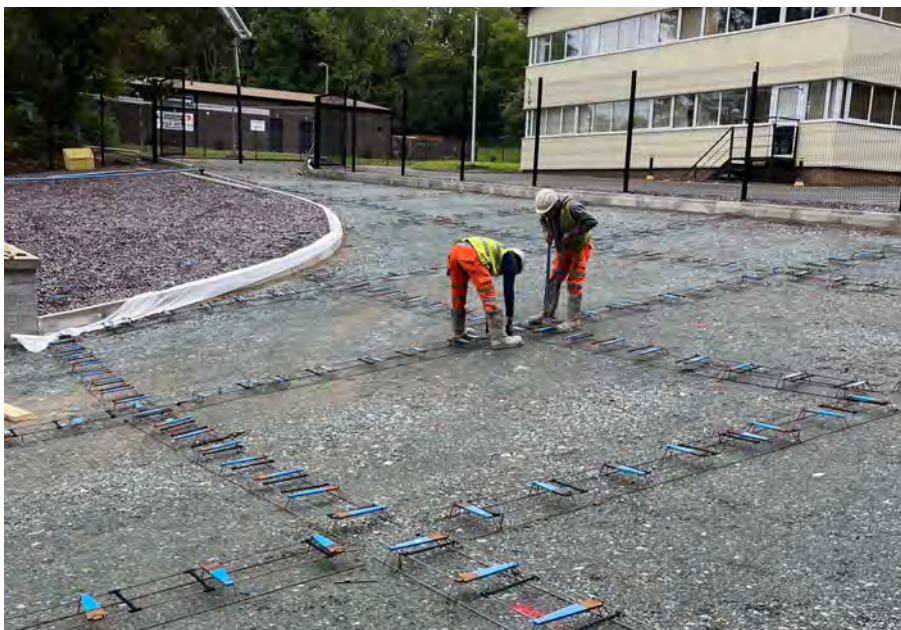


Llandygai Industrial Estate: A concrete hardstanding fit for the future

Industrial hardstandings and external service yards are essential components of industrial buildings and warehouses. When the owners of an industrial unit on Llandygai Industrial Estate, Bangor, upgraded the site in preparation for letting, the contractor opted for Danley's solution to ensure hardstanding longevity under heavy usage.



Multipurpose hardstanding design

As the largest city in Gwynedd, Bangor is a major transport hub for North Wales - boasting onward connections to the whole of Wales, the Port of Holyhead and, to the east, to Chester, Manchester and Merseyside. With easy access to the national motorway network, the city is an attractive proposition for businesses of all sizes. In particular, The Llandygai Industrial Estate is home to many companies, from construction and development, transportation and automotive, fashion and apparel, production and more.

When a unit on the industrial estate came up for rental, the location and size of the space meant that the site was sure to attract interest. Before putting it on the market, the owner invested in substantial refurbishment, ensuring that the 10,245 Sq Ft industrial unit, and extensive concrete service yard, were finished to a high standard. Working with Glyn Jones Ltd as the main contractor, Paul Dunn of WCD Industrial Flooring recommended Danley's Strategic Reinforcement Design for the concrete hardstanding.

Improved joint stability

Paul Dunn of WCD Industrial Flooring explains, "With the site not yet being under offer, the owner needed to ensure that the external concrete hardstanding would meet a range of different uses. If rented by a transportation or construction company, the hardstanding would need to withstand frequent heavy vehicles. If used for warehousing or logistics, it would need to perform well under dynamic loads from materials handling equipment such as forklift trucks or hand trucks. Danley's Strategic Reinforcement™ Design strategically controls load transfer issues, including spalling and out-of-joint panel cracks that are common in concrete hardstandings. By using a tapered plate dowel and sleeve system, it is possible to achieve more consistent joint performance and long-lasting joint stability."

Project information

- Client: Watkin Property Ventures
- Project: Unit 22, Llandygai Industrial Estate
- Location: Bangor
- Concrete Hardstanding Area: 1700m²
- Main Contractor: Glyn Jones Ltd
- Design Slab Engineer: Adept Consulting Ltd
- Concrete Contractor: WCD Industrial Flooring
- Completion Date: August 2023

Danley's Services

- Technical design support to the engineer
- On-site installation training and guidance on best practices for quality assurance
- Danley® design warranty

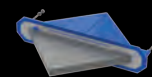


Project Details:

- 165mm PAV2 C32/40 Concrete Slab
- No steel mesh reinforcement
- PD3® Dowel Cradles at contraction joints
- Danley® Dowels at construction joints
- Joints spaced at 4m x 4m



PD3 Cradle™



Danley™ Dowel





Avoiding restraint using tapered plate dowels

Most concrete slab deterioration happens at the joints. Danley's Strategic Reinforcement Design optimises load transfer and control cracks by removing the steel from the mid-panel, and placing the support - in the form of specially designed dowels - at the joints instead. The primary purpose of any dowel is to help transmit the weight of the load from one slab to its neighbouring slab without causing damage or deflection. Rather than using traditional round dowels, which have inherent issues with stress and cracking, the Danley solution uses tapered plate dowels which are specifically designed to ensure that the concrete can shrink freely in both the lateral and longitudinal horizontal plane, without inducing restraint that leads to out-of-joint cracking.

Paul continues, "By supporting the most vulnerable areas of the slab, cracks and spalling are controlled and load transfer is optimised. As well as extending the life of the hardstanding, and making it less vulnerable to the pressure of both heavy vehicles and point loading, the design also reduces the volume of raw materials required and the time on site versus traditional methods of concrete reinforcement. In a site like the one at Llandygai Industrial Estate, opting for a solution that offers longevity over its life span will ensure that downtime is kept to a minimum and the hardstanding remains serviceable for years to come,"

Recommended by the concrete industry

Danley's tapered plate dowel solution minimises restraint and offers high load transfer across slabs (>90%) with exceptional long-term joint stability (<0.25 mm deflection possible). It also complies with TR34, TR66, Britpave Concrete Hardstanding Design Handbook, ACI 330.2R-17, and ACI 360R-10 specifications and/or design guidance.