Creative piling solution used to replace retaining wall at Brickendon Lane

Collaboration, prompt decision making and mobilisation controlled the programme impact.

PROJECT	025316 – Brickendon Lane Retaining Wall
CUSTOMER	Hertfordshire County Council
LOCATION	Brickendon Lane, Hertfordshire
CONTRACT	NEC-D (Framework)
VALUE	£570K

Issue

Located just south of Hertford the 50m long retaining wall was constructed in 1983 to support Brickendon Lane road next to a local stream.

Following 2012 inspections, cracks on the adjacent carriageway indicated the wall was failing and needed replacement.

With the retaining wall hard up against the road edge and immediately adjacent to the watercourse a creative piling solution was required to prevent failure of the road during construction.

Solution

After consultation with the customer, designer and contractor on the options and their associated risks, it was agreed that installing sheet piles behind the existing structure would be the most feasible solution; providing support to the road before safely demolishing the old wall.

Selection of the right method of piling would prove to be critical due to the limited working space, environmental risks, ground conditions and the poor condition of the existing retaining wall.

Initially the Movax and leader rig was proposed, but further site analysis revealed there was still a significant risk of clash with the existing wall foundations. To overcome this constraint the 'F301 Giken' Silent Piler in super crush mode was selected as it could pile through the mass concrete obstructions.

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The Silent Piler uses a 'press in' method which had significant advantages in this situation. By using the adjacent piles as 'reaction piles' the rig simply pushed each new steel sheet pile into the ground. The result was a dramatic reduction in vibration and minimal horizontal loading on the existing retaining wall which was critical for road stability. The 'supercrush' auger was used as required to overcome obstructions and thus ensure works could be completed.

The learning from this project was applied to the construction of a new retaining wall for installation of the £7m Apsley Road Bridge over the West Coast Mainline at Hemel Hempstead.

Environmental impacts on local wildlife and badger setts were minimised by the low vibration and noise levels. Contamination of the adjacent water course was prevented by a temporary diversion.

Due to the height of the sheet piled wall 24 grouted ground anchors were installed prior to demolition of the old redundant wall in challenging ground conditions (dense gravels) to satisfy the 120 year design life.

Outcome

The collaborative approach taken early in the project facilitated a solution that was safe to construct and which critically controlled the risk of highway instability.

The local highway is now safely retained for its users over the next 120 years.