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Workington bridge push reconnects flooded town

3 December 2009 | By Alexandra Wynne

A team of Royal Engineers was this week racing to build a vital footbridge that will re-establish a connection through Workington in Cumbria which was ripped apart in last month's severe flood.

Soldiers were due to start assembling the new structure in as NCE went to press. Work is expected to take three to five days.

The bridge is likely to remain the town's only pedestrian or road link for at least six months while Allerdale Borough Council engineers rebuild one of three bridges damaged beyond repair in the floods.

But the Royal Engineers has designed the bridge so that it could remain in place for longer if foundations were bolstered at a later date.

"The council just didn't have the capacity to come up with a short sharp solution."

Royal Engineer senior engineer Major Grant Kerr

"I've done this as a temporary design," said Royal Engineer lead designer for the bridge Captain Caroline Graham-Brown. "But it's really just the foundations that are temporary."

The bridge will play a vital part in Allerdale's efforts to clean up the town after torrential rain left parts submerged by flood water and devastated its infrastructure, including three bridges.

Of the three, a steel footbridge with masonry abutments and a masonry road bridge were swept away. The third – the Grade II listed masonry Calva Bridge – is in dire condition and is likely to be demolished (News last week).

Since starting on site last week, the Royal Engineers team has carried out trial pit investigations, surveys, site selection work, bridge design and foundations installation for the temporary bridge – including flood protection for the bridge's southern abutment.

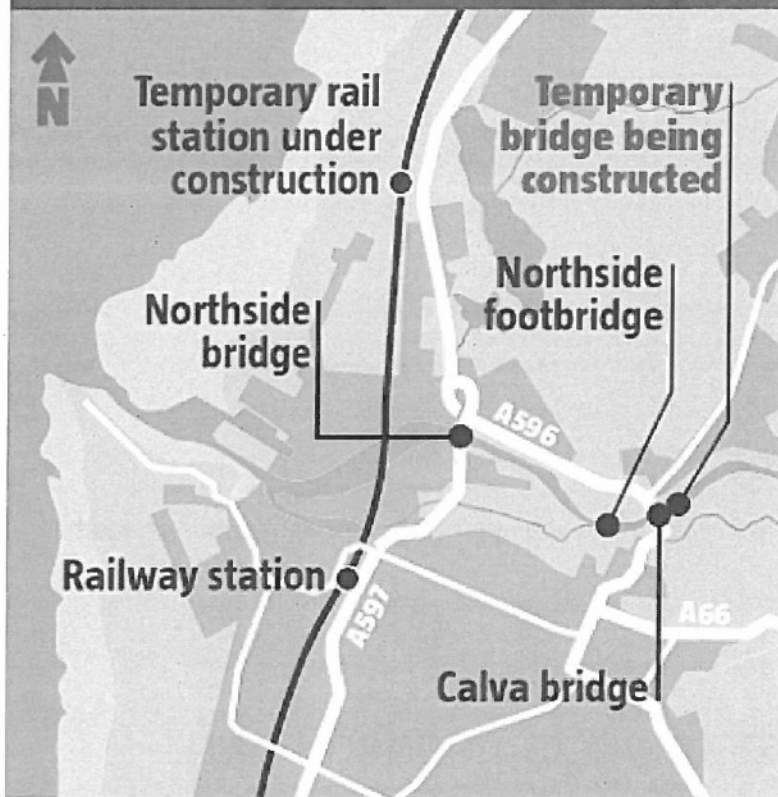
The Royal Engineers first contacted Allerdale Borough Council through its engineering design group 170 (Infrastructure Support) 64 Works Group last Tuesday to offer its help with restoring the town's infrastructure.

"Although the council has been great in coping with what's happened, it just didn't have the capacity to come up with a short sharp solution," said Royal Engineer senior engineer Major Grant Kerr.

"This bit is frustrating but I'm hoping that bridge panels will be on site tonight to start the launch tomorrow [Tuesday]."

Royal Engineers principal contractor Major

WORKINGTON



Nigel Hindmarsh

The team began at dawn last Wednesday, surveying possible site locations and later that day alerted its contractor – 3 Armoured Engineer Squadron 22 Engineer Regiment – that it was considering helping to install a bridge.

By the evening, the preferred site option had been selected about 200m upstream of the Calva Bridge over a 41m wide section of the River Derwent just outside the main town centre.

Even though the north bank of the river is 1.52m higher than the south, the team confirmed its choice of site last Thursday. Designs were rushed to the contractor so that it could start work as quickly as possible and work began last Friday.

Most of the Royal Engineers' bridge kit is currently in use in Afghanistan, so it has scrambled together its only available parts from two bridges that will eventually form a single lane, 51m long, steel truss bridge. The structure is a Mabey Bridge Compact 200 panel bridge – typically used as a military logistics support bridge.



Wrapped up: Rip rap will provide extra flood protection for the bridge

The team intends to assemble the bridge on rollers and push it across the river from the south side. It will use 17 pairs of 3m long prefabricated steel truss panels which are braced together. The main bridge section will be guided at the front by 12 lightweight truss sections acting as a "nose". A counterweight will be fitted to the back section of the structure during the push to prevent it from dipping. The trusses are linked by transverse steel transom beams which carry a proprietary Mabey Bridge decking system.

Preparing the bridge foundations has been an intensive operation. The lower, south bank comprises soft river gravels over clay, which needed strengthening. This was done by laying up to 1.2m of Grade 1 stone interspersed with layers of Tensar Triax geogrid for reinforcement.

Much of the foundation was in place when NCE visited the site at the weekend. The bridge was originally scheduled to be launched on Monday, but demanding aggregate compaction tolerances slowed work, delaying the launch until Tuesday.

"It is taking a bit more time at this stage because there is only 20mm tolerance on top," said Royal Engineers principal contractor Major Nigel Hindmarsh. "This bit is frustrating but I'm hoping that bridge panels will be on site tonight to start the launch tomorrow [Tuesday]."

"[This bridge] is designed to take military tanks – it's not designed well for the disabled, or to include lighting or hand rails."

Royal Engineer senior engineer Major Grant Kerr

Even though the bridge is temporary it has still been designed to withstand a 1 in 100 year flood event. "I spoke to the Environment Agency for their flooding model and they said 'you should definitely consider [the risk] even if it is just for six months,'" said Graham-Brown.

Protection to the south abutment is provided by rip rap. "We're using the rip rap to contain the foundation," said commanding officer and project manager Lieutenant Colonel Rob Blackstock. "Without it, [the foundations] would rapidly deteriorate if there's another flood anything like this one."

The Royal Engineers is working closely with Allerdale Borough Council on soft engineering solutions in tandem with construction work. "[This bridge] is designed to take military tanks – it's not designed well for the disabled, or to include lighting or hand rails," said Kerr.

Much of the team has been working around the clock to complete design and construction work and hopes are that the bridge will open in time for work and school runs from Monday.

"It is vital for Workington," said Kerr. "People who live in the north, work, go to school and shop in the south. Without a crossing it's an 18km round trip. "We have provided this military crossing for civilians and provided it immediately."

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