

## Kopu Bridge Replacement



This aerial photo shows progress to June 2010.

Piling and pier construction is now under way in earnest and the project is on track for completion in mid-2012.

This project includes construction of the new bridge, 2.5km of approach roads, a new link road to State Highway 26 east of the bridge and a new two-lane roundabout at the junction of SH25 and SH26.

### Progress to date

Fifteen concrete piers will support the new bridge. Seven piers are currently under construction from the temporary working platform extending from the west bank of the Waihou River.

Each pier consists of 6-8 piles, a pile cap, a pier column and a pier cap. Steel girders will be laid between the piers to support the concrete bridge deck.

The piles extend up to 55m into the bed of the Waihou River. Soils in this area are soft silts laid down by the river over thousands of years, so long piles are needed to support the weight of the bridge.

The piling process begins when 12m steel cylinders are placed on rollers on site and welded together to form 24m and 36m pile casings. Circular metal plates are welded onto what will become the bottom end of the 36m casing to make it watertight.

The 36m pile casing is then transported onto the temporary working platform, lifted into place and driven into the river bed using a hydraulic hammer hung off a crane. Then, if needed, another 24m of casing is welded onto the 36m casing and driven to final depth.

Each pile is then filled with a 'pile cage' made from reinforcing steel and lowered into the pile casing, which is then pumped full of concrete.

When each pile is complete, a reinforced concrete pile cap binds the tops of the piles together. On top of this, the pier column and pier head are then constructed.

As at 30 June, pier and pile construction progress was as follows (piers are numbered from the west bank):

- pier 1: complete
- pier 2: complete
- pier 3: pile cap complete
- pier 4: piling complete
- pier 5: piling yet to start
- pier 6: piling yet to start
- pier 7: complete
- pier 8: pile cap and column complete
- pier 9: piling complete
- pier 10: piling begun.

Concrete kerb and channelling and installation of underground services between the new roundabout and the Kopu Tavern have been completed.

At the D&H Steel Construction factory in Auckland, the first bridge girders are being manufactured.

Monitoring continues on the embankments that have been placed along the bridge approach roads either side of the bridge. The embankments are needed to compress the soft soils underneath prior to final road construction and have to be built up slowly. Because the subsoils under the embankments are wet and soft, there are limits to the weight they can bear. Too much weight imposed all at once can cause the subsoils to fail. To prevent this, subsoil pressures under the embankments are regularly monitored, and extra embankment fill is only added when subsoil pressures allow. The next top-up is likely to be in August or September this year.

Another year of settlement time is expected to be required for the new approach roads. Recently, repairs were carried out on sections of the state highway adjacent to the settlement embankments as adjacent settlement caused cracks to appear in the state highway. This was expected to occur and it's likely more repairs will be needed as time goes on.

## In the near future

Construction work will continue on piers 3-10.

Monitoring at the new roundabout site will end soon because the results are showing that settlement will be complete in August. This is good news as it is seven weeks earlier than expected.

Construction may begin soon on the roundabout but only if this suits the contractor's work programme.

Pre-assembly of the first girders is expected to begin around the middle of July and, if everything goes smoothly, then soon after the girders will be erected permanently between piers 7 and 8. Some girders will be pre-assembled on the ground for later installation.



Pile casings measuring 24m and 36m are constructed on site.



A 36m pile casing has been driven beneath the river. A 24m casing will be welded on top.



Reinforcing steel protruding from each pile is further reinforced and concrete poured to form a pile cap that will become the foundation for a bridge pier.



**For more information**

For more information, go to:  
[www.nzta.govt.nz/kopubridge](http://www.nzta.govt.nz/kopubridge).