Jetty Repairs cope with time and tide

The repair of a concrete jetty on the estuary of the River Severn, where the tides are phenomenally high, presents a special type of challenge. **Jack Barfoot** talks with the contractors, Colebrand Contracting Limited.

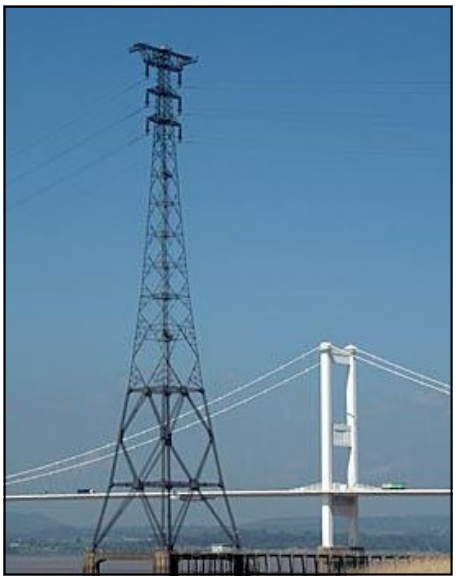
Built in the sixties, the trestle type reinforced precast concrete jetty supports and gives service access to a pylon standing away from the shore immediately downstream of the Severn Bridge at Aust in the County of Avon.

Work comprised patch repairs to the trestles, together with repairs to, and extending the cover of, the insitu concrete plinths at the base of the trestles.

Phil Stainton, who was in overall charge of the contract, and Chris Walton, Manager of the South Wales office and Contracts Manager on a major maintenance contract on the neighbouring Severn Bridge, described the contract and its relevant aspects to me. “The repairs themselves were fairly orthodox although the length of defective concrete repaired at any time on a trestle leg was confined to 2 metres, and on no more than 2 of the 4 arises, in order to minimise the reduction of the structural integrity of the trestle during the repair procedure. We used **Nufins Nupatch** proprietary fast setting mortar and concrete repair system, and the general procedure was that of traditionally cutting back any damage as far as the reinforcement, which was then grit-blasted to bright metal and primed with a Colebrand material, CXL 111. Then using a timber shutter, the repair material was poured in from the top, vibrated and left to set, which took about an hour to achieve”.

This simple-enough-sounding operation, however, was fraught with a number of difficulties, I learned. Programming, for example, already on a knife-edge of dependency upon tide times and levels, was further hindered by the limitations of working on a day-to-day basis. Because of the very nature of the repairs, the volume of repairs and quantities of materials required were not consistent. It was not possible to accurately forecast the precise amount of repair work which would be carried out in a given location. And of course, added to this was the ever-present factor of programming to suit changing tide tables and using the time available to the best advantage.

“On some days it was possible to achieve two working shifts, when, say, an ebb-tide took place six am and again at six pm or thereabouts. On another day only one shift of actual repair work would be possible. Another factor which could be crucial was the area where work on the jetty was actually taking place – at the far end, in deeper water, the maximum time for repair work could be down to one hour, but on the landward end of the jetty, four hours could be possible within the same tidal period. These times had to include that needed for setting of the concrete, of course. During neap tides work could only take place at the short end, and even there not much more than fifty per cent of the trestles were accessible.



"The plinths, or bases, to the trestle legs constituted the most difficult part of the work. Some of these had deteriorated quite badly, as might be expected from their situation. After digging away the surrounding mud, cutting out the defective concrete and affecting the normal repair procedure, we then recast and enlarged the affected plinths to give increased cover and protection to the reinforcement". This consisted generally of adding 150mm of concrete to all the one-metre-square faces and tops of the plinths, and included drilling and fixing resin-anchored dowels to assist in providing a bond between the old and new concrete.

"The plinths were submerged for most of the time" Phil Stainton recalled, "particularly at the far end of the jetty, where we could only work on them during spring tides when the water was at its lowest ebb level. Even then only a limited amount of time was available in which to place the material and allow to set. Once the initial set has taken place **Nufins Nupatch** is not affected by immersion". He added, "Which is why it was chosen for this job".

Scaffolding comprised a combination of lightweight alloy staging and conventional scaffolding. "We erected the scaffold at the beginning of the contract". Phil Stainton said, "And left it for a couple of tides to see how it withstood the effects of strong current. Erection was not easy, as the support for the scaffolding necessarily had to be the existing trestles, so we were dependent for support on the very structure which we were repairing. Approximately half of the fifty trestles were worked on and the whole repair including the plinths used ten cubic metres of material. The experimental immersion of the scaffolding, we found, was satisfactory, and we were able to leave it in position between shifts as we worked along the jetty".

In spite of all the difficulties, however, progress on the contract was good, although the repair work was a little more extensive than had been originally envisaged.

The client was CEGB, Bristol (CEGB Engineer, Mike Delderfield). Contractors were Colebrand Contracting Ltd (made up of Divisions devoted to concrete repair, painting, engineering and specialist resins) of Goodshawfold Road, Rossendale Lancs.

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