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Silverthorne Sheet Piling

Salix was commissioned to undertake the design and build for a sheet piled wall with a reinforced concrete capping beam. This was to replace a failed section of timber wall at the Silverthorne Lane, Bristol remediation Project.

During the development stage we designed a cantilever, sheet piled wall enabling removal of any potential footing or drainage clashes associated with the original anchor block design brief. Achieving a design life of 60 years.

The new wall section needed to tie into the existing stone wall which was failing in many places. During the design period the tie-in points to the existing stone canal wall were overgrown with dense vegetation, requiring us to set out and agree the final tie-in points on site. Due to protracted stakeholder approvals, Salix mobilised to site in July 2023.

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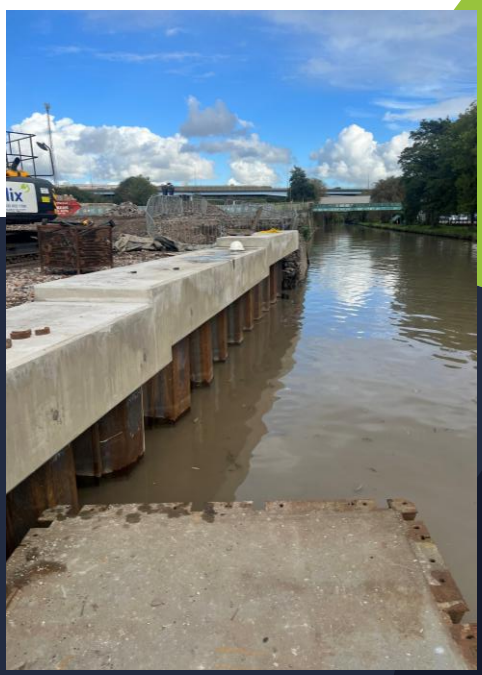
To temporarily support the existing wall, we installed timber frames and temporary Z piles. For the water side over the existing concrete inlet, where temporary piles could not be used, we installed Salix 2t Aqua Rock Bags®.

Under the supervision of a safety boat, we installed our interlocking Nato pontoons to provide a safe working platform for the water side of the works. Our skilled operatives also installed the safety line and signage in line with our rescue plan.

To protect the watercourse, we installed a silt curtain and oil booms around the rear of the Nato pontoons ensuring that we protected the working environment and were compliant with all relevant EA standards and our approvals.

Case
Study



The main contractor installed a reduced-level piling mat to create our working platform. With our JS220 long reach excavator we carefully removed the existing timber posts which had been driven into the bed along with the transverse timbers. This allowed us a clear line for the proposed sheet pile works.

After the timber sections were removed, we agreed the tie-in points with the client. Due to the poor condition of the existing wall structure this proved particularly challenging. We dug Trial holes to establish the depth of the existing wall foundations and identify if there was a batter on the rear of the wall as this affected the removal of the existing structures and the placement of the sheet piles.

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Case Study

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Once the tie-in points were established, small sections of the existing wall structure were carefully removed ensuring that debris did not enter the watercourse.
Once the alignment was set out, we mobilised a Movax SG-75 mounted on a 35t excavator with DX25 BSP piling hammer to install the 13m Larssen sheet piles. We faced additional challenges with the tie-ins, which led to us installing sacrificial 'Z' piles with an omega clutch at each tie-in point. This brought the sheet piled wall in behind the existing structure.

During the sheet pile installation, not anticipated based on the client-supplied ground investigation, some piles were driven to failure. We mobilised an impact hammer to back drive piles to depth, exercising extreme caution to avoid pile deformation. On completion of the back driving exercise, a small number of piles reached failure at depths from finish levels ranging from 350mm to 1100mm, which required an instruction from our client, to mobilise an oxy acetylene cutting team. We recorded details for each of the piles, noting sheet pile lengths, toe depths and noting depths for refusal.

We backfilled the sheet piles with a self-compacting gravel up to the underside of the formation level for the capping beam, leaving a gap for shuttering installation. Blinding concrete was installed landside to provide us with our level for the concrete capping beam shuttering. To ensure that the gap between the new and existing structures was fully sealed, we used mass pour concrete.

On the waterside, we utilised the Dawsons sheet pile capping beam system to create our platform. This was set at various levels to account for the 4 No. of level changes in the finished level of the capping beam, which was to be utilised for surface water runoff.

Following the fixing of the steel sections and tie-bars, we achieved client sign off. We undertook pre-concrete pour inspections, and a concrete pump was mobilised. The concrete was poured in one visit with vibrating pokers ensuring that there was a consistent finish to the concrete and any air bubbles removed. Cube samples were taken on days seven and twenty-eight, with crushing was commissioned to check strength compliance.

For further information, visit us at www.salixrw.com or contact:
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