Design of Replacement Rising Mains

Securing long term operational performance and preventing pollution

Kinmel Bay and Saltney

Client

Dŵr Cymru Welsh Water

Services Provided

- Design carried out in accordance with Sewers for Adoption Volume 7 Design guide and British Standard and EuroCode design codes
- Bill of quantities and cost estimates produced
- Whole life cost assessed based on requirement of a 60 year design life
- Advice on CDM matters was provided
- Statutory consultation and consents with key stakeholders undertaken
- Use of FileMaker to implement regular project outputs, ensuring that the project remained on track and within budget
- External risk and value audit undertaken to confirm the proposed options were the optimal solution taking account of whole life costs
- Preparation of work packages suitable to tender allowing DCWW to appoint a single contractor to deliver both schemes so realising cost and operational savings

Scheme Details

The Saltney rising main transfers sewage from the Chester Street SPS at Saltney to a gravity sewer leading to Chester WwTW. The Kinmel Bay rising main transfers sewage from Marine Lake SPS, Rhyl to Kinmel Bay WwTW. As a result of several bursts, mainly in GRP pipe, and performance issues in recent years on two major sewage rising mains in North Wales at Saltney and Kinmel Bay, Dŵr Cymru Welsh Water (DCWW) commissioned Waterco to produce System Assessment and Replacement Feasibility Study reports which led to replacement mains being installed immediately afterwards.

Following the submission of these reports, Waterco was commissioned by DCWW to undertake the detailed design for replacement of both rising mains. These designs were largely a development of the options recommended in the feasibility reports, extended to a point where competitive tenders could be obtained from a select list of framework contractors.

It was agreed that directional drill should be the method of installation under the main rivers of the River Dee (Saltney) and the River Clwyd (Kinmel Bay) to minimise the potential environmental and ecological impacts. This also meant that flood embankments could be left undisturbed. Polyethylene (PE) pipe was identified as providing the most cost effective solution based on whole life value and constructability.

Ground contamination was a concern on both projects due mainly to the proposed route passing through or very close to former tip sites. However ground investigation works did not identify any contamination issues of concern at Saltney or Kinmel Bay and ongoing monitoring during construction confirmed the decision not to specify any protection to the pipe, other than a clean imported bed and surround.

Some of the challenges presented by the project included:

- environmental and ecological assessment and management
- archaeological constraints
- a lack of storage at the sewage pumping stations requiring creative solutions around over pumping, planned shut downs and co-ordination of standby tankers
- liaison with Network Rail for pipe jacking under the Chester to Holyhead railway line through Rhyl for the Kinmel Bay scheme

Outcomes

Monitoring and survey of construction works continued following detailed design and both projects were delivered on time and within budget.