Case Study: 032

ECS Water Control

As part of a £1.8 million investment in the refurbishment of a number of its assets along the River Thames, the Environment Agency (EA) has replaced the lock gates at Romney. This complex part of the project was delivered by ECS Engineering Services as a turnkey solution that involved considerable in-house design and steel fabrication work.

Romney Lock Gates:

Manufacture, project management and installation

Romney Lock was opened on the present site in 1797 and built of oak, but it was later rebuilt by the Thames Conservancy in 1869 and the weir was rebuilt further upstream at the beginning of the 20th century. The lock was rebuilt again in 1979/80 and currently this structure, along with most of the locks on the River Thames, continues to be maintained by the EA.

Case Study: 032

Romney Lock Gates: Manufacture, project management and installation

Gate framework close-up

Gate manufacture

Hot dip galvanising

The lock gates had been independently inspected and assessed for the EA, along with several other sites. On the whole, it was deemed that the best course of action was to continue with maintaining the lock gates, but it was considered more cost effective to replace the lock gates at Romney.

The replacement units were four in number steel gates (2 x Tail and 2 x Head Gates) and these have been have been fitted to replace the existing timber gates. Gates have been handed to reflect fitment on the left and right hand side and each gate comprises of 4 sluices, which are hydraulically operated. The gates were substantial pieces of engineering being 3.6 m wide and with 2 at 3.8m tall and 2 at 5.77m tall.

The steel lock gates have been provided with a duplex corrosion protection system of galvanizing and painting. The life to first maintenance of these coatings is 25 years. The gates are fitted with synthetic seals (neoprene 'P' seals) to the heel and mitre posts, and the bottom rails. The life to first maintenance of these seals is 15 years.

The heel, mitre posts and bottom rails are fitted with synthetic bearing blocks. Rubbing strips are attached to the downstream side and trash guards are fitted to the mitre posts.

Clearly, as steel fabricated product, these new lock gates would need to be manufactured according to BS EN 1090 and carry the CE certification, under legislation that came into force in July 2014. ECS has achieved the required accreditation which demands a comprehensive quality system and traceability of all the components within a structure as well as regular training of engineers. With annual reassessments this essential certification also serves as an excellent benchmark that must be met before the EA will award any fabrication contracts.

For specialist projects such as this the EA relies on experienced contractors, such as ECS, that have the skills and the facilities to deliver the complete project, from start to finish. In this case the EA had specified the new gates to be constructed from steel which, with the correct marine protection, would provide a strong and durable solution with a design life of 80 years. Under the current European standards, this installation was classed as EXC2, well within the abilities of the ECS engineers which have achieved certification up to the more rigorous EXC3, which includes buildings and bridges.

Measurements were taken from the original wooden gates and information from historical drawings was used to create the designs for the new steel gates. Of crucial importance were the hinge points and the mitre join between the gates that must be correct to ensure reliable operation and a watertight joint.

To achieve this, the work was carefully coordinated with ECS' design teams, on-site engineers and steel fabrication facility along with several third parties. ECS' experience in working on large water control structures has proven invaluable in assessing the complications and providing solutions, for this type of project - resulting in timely completion.

A set of head gates and a set of tail gates were manufactured for the site at ECS's Huthwaite steel fabrication centre before being galvanised. However this was no small task, with the Romney gates almost 6m high metres high and weighing in at almost 10 tonnes per leaf, there was only one galvanising plant in the UK capable of dealing with these sizeable structures.

The gates were hot-dip galvanised, which ensures that the gates were coated both inside and outside, providing long term protection against corrosion and an ideal base protection for equipment that will be underwater for long periods.

Under ECS supervision the completed lock gates were installed using barge mounted HIAB cranes with a dive team was on hand to assist with the positioning of the gates on the hinges. The final step was to check the seals between the gates and around the sluice doors which was again completed by the dive team, with underwater video used to prove that all was in order.

ECS coordinated and managed the entire process including specialist sub-contract requirements from initial design through to the final handover.

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ECS Engineering Services

Water Control Site Services
Environmental Fabrications