

# Sunbury Dry Dock Mitre Lock Gate Replacement



## ECS Engineering

<b>Location</b>	River Thames, Upper Halliford, Surrey, UK
<b>Description</b>	Sunbury Dry Dock is located adjacent to the navigable River Thames, with the mitred lock gates a critical part of the facility. It is used by the Environment Agency to maintain its vessels. The gates at Sunbury Dry Dock are the first ever set of moulded fibre reinforced polymer lock gates to be installed in the UK.
<b>Client</b>	Environment Agency
<b>The challenge</b>	The gates retain a large volume of water upstream, with personnel often working in the dry dock area behind the gates. Environment Agency surveys determined that the existing timber gates had reached the end of their service life and needed to be replaced to maintain safe usage of the dry dock facility.
<b>The solution</b>	ECS designed, supplied and installed two replacement FRP lock gates to greatly improve the service life and reduce the maintenance requirements of the dry dock. Superior to timber and steel alternatives, the FRP panels have a design life of at least 100 years and almost completely eliminate maintenance.
<b>Material used</b>	Infusion Moulded FRP panels from FiberCore Europe was utilised in a design with stainless and galvanised steel interfaces manufactured by ECS. The fit out of the gate with bearing blocks, seals, walkways and hinge metalwork was undertaken by ECS at their Sutton in Ashfield Factory. The door slabs are produced via a specialised 'InfraCore® Inside' manufacturing process in the Netherlands. While the FRP door slab features conventional glass-fibre-reinforced polymers and thermosetting resin, the manufacturing process is highly optimised to create a structure designed to deliver exceptional durability, strength and serviceability.
<b>Specific design details</b>	Each of the two replacement FRP gates measures 4m high x 4.5m wide and has a mass of approximately 10 tonnes. Future designs should be able to iterate the design of the structure where weight can be less than any conventional timber or steel gate design.
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• Design Life exceeds other solutions by several magnitudes and offers significantly reduced whole life costs.</li> <li>• Greatly reduced maintenance requirements compared to timber or steel lock gates.</li> <li>• Near elimination of SHEQ risks of future maintenance in comparison to steel/timber.</li> <li>• Lightweight structure, reduces operating forces and energy usage in operation and reduces bearing wear.</li> <li>• Lower overall CO2 footprint due to inherent material sustainability and through elimination of significant ongoing interventions (such as repainting steel alternatives, or recladding timber alternatives).</li> </ul>
<b>Measurable outcomes</b>	<ul style="list-style-type: none"> <li>• Timber Lock gates need significant structural maintenance within 10-15 years with recladding necessary, and degradation of the timber gives an expected life of around 30-40 years. Sustainable hardwood is becoming harder to source.</li> <li>• Steel Lock gates require full repainting every 15-20 years and this introduces significant temporary works to undertake in situ and microplastic pollution risks as the paint degrades.</li> <li>• The FRP lock gates are expected to have a design life of in excess of 100 years and are almost maintenance-free throughout their life.</li> </ul>
<b>Further details</b>	<a href="http://www.ecseng.co.uk">www.ecseng.co.uk</a>