

INTEGRITANK[®] HF system overcomes harsh weather conditions

Croydon Cable Tunnel project protected with cold, spray-applied waterproofing



Project	Croydon Cable Tunnel, UK
Client	National Grid PLC
Contractor & Consultant	Morgan Est
Authorized Contractor (Waterproofing Applicator)	Stirling Lloyd Construction Ltd
GCP Solutions	INTEGRITANK [®] HF system

Project

Tunnel brings power to South East England

To facilitate high voltage power distribution in the South East of England, Morgan Est needed to build a 3.05m diameter cable tunnel to house the required heavy duty power cables. They decided to form the tunnel by boring, using the TBM method. This would necessitate the tunnel lining of the front and back shunts, which were to be 3.9m in diameter, being formed by a primary and secondary sprayed concrete lining with an effective waterproofing membrane sandwiched between two layers.

Challenge

Stringent waterproofing requirements for concrete lining

The chosen waterproofing system needed to be capable of forming a tenacious bond to both layers of sprayed concrete as well as being tough enough to withstand the application of the second concrete lining.

The waterproofing system of choice required the ability to tolerate difficult site and weather conditions due to the application being done in February when the temperature was between 0°C and 4°C – temperatures. These cold temperatures would have precluded the application of many systems based on other resins. The use of a liquid, sprayed system that easily followed contours of the tunnel meant that no time consuming, costly scaffolding or detailing associated with sheet membranes was necessary.



Solution



Seamless waterproofing membrane proves highly effective

The waterproofing system that met the requirements of the project was the **INTEGRITANK[®] HF** system from Stirling Lloyd (now GCP Applied Technologies). Based on unique **ESSELAC[®]** technology, this seamless, cold, spray-applied membrane holds an unparalleled track record of success. **INTEGRITANK[®] HF** provides an excellent bond to sprayed concrete and easily withstands the forces exerted by spraying concrete.

The application itself consisted of a primer to enhance the membranes bond to the substrate, followed by two color coded coats of the **INTEGRITANK[®] HF** system. Ensuring quality control for the project was straightforward. The two color-coded coats of waterproofing enabled fast visual inspection. In addition, wet film thickness testing ensured thickness levels and electronic 'holiday' testing was used to confirm the integrity of the waterproofing.

Pull off tests confirmed that the bond achieved by **INTEGRITANK[®] HF** exceeded the specified value of $0.3\text{N}/\text{mm}^2$. By using the **INTEGRITANK[®] HF** spray-applied system, Morgan Est produced a tunnel with not only effective, long-term protection for the valuable payload contained within, but produced it in a very cost-effective manner that decreased build time and costs.

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