Lucky 7, New Highway Eases Travel Between Hong Kong and Shenzhen

Project	Liantang Highway
Contractor	Chun Wo Construction Holdings Company Ltd
GCP Solutions	ELIMINATOR® bridge deck waterproofing

Project Profile

The Liantang/Heung Yuen Wai Boundary Control Point, also known as the Liantang Highway, will be the seventh land crossing between Shenzhen and Hong Kong. The new highway is designed to provide a direct transport link and expedite travel between the northeast New Territories and Shenzhen East on Mainland China. Liantang Highway is also expected to alleviate traffic and congestion at the two existing boundary control points at Man Kam To and Sha Tau Kok, on the eastern side of the New Territories. The new boundary crossing is expected to handle approximately 30,000 passenger trips and 17,850 vehicular trips daily, according to the Hong Kong government.

Covering 57 acres, the Liantang Highway project includes construction of an 11-km two-lane concrete road bridge linking the new highway with Fanling Highway; border patrol buildings and associated facilities; improving about 4.5 km of Shenzhen River between Ping Yuen River and Pak Fu Shan and re-provisioning Chuk Yuen Village.

"We can use ELIMINATOR® to do about 1,000 m2 a day in good weather condition and apply in relative humidity up to 98%. It's a fantastic material,"

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Jimmy Lo, managing director, Advance Specialist Treatment Engineering Ltd.

Key challenges for the project included finding a way to effectively prevent water ingress on the concrete road bridge deck, reduce the risk of waterborne contaminants and prevent the onset of early corrosion. The contractor needed a waterproofing system that was compatible with the structure's design-life requirement; engineered to provide sufficient bond and movement with the substrate and asphalt paving; tough and suitable for fast-tracking application, particularly during Hong Kong's wet and humid seasons. The bridge deck waterproofing solution also needed to have a track record of meeting strict construction and technical compliance, plus stringent lab testing.

"The ELIMINATOR® waterproofing membrane doesn't have overcoating time limits, allowing flexibility in scheduling. Plus, the liquid waterproofing solution was easy to apply, helping us to stay on project schedule,"

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Yeung Man Chun, site engineer, Chun Wo Construction Holdings.

The main contractor, Chun Wo Construction Holdings Company Ltd., selected the ELIMINATOR®bridge deck waterproofing system to protect the concrete road bridge section of Liantang Highway. When it comes to waterproofing in high humidity areas, the chemistry of the membrane is critical — many are susceptible to adverse moisture effects such as curing, de-bonding, bubbling, blistering and pin holes. The ELIMINATOR®waterproofing membrane's formulation, which is based on unique ESSELAC®technology, allows for application in high humidity while providing rapid full cure and early trafficability.

The ELIMINATOR®system is cold-applied using readily available airless-spray machines, providing an edge over membrane materials that require expensive, computerized, heated pumps. In addition, the cold-spray application provides further advantages of speed and cost. On the Liantang Highway project, two coats of ELIMINATOR® waterproofing membrane were applied to the concrete road bridge. The first coat was a distinctive yellow, followed by a second coat that is white, enabling superior quality control over one-coat membranes. The system is fast, effective and able to seal complex, critical details and penetrations with ease.

The ELIMINATOR®system forms a tough, flexible and seamless membrane with no vulnerable joints, allowing it to perform throughout the design life of a structure while simultaneously reducing maintenance costs. Its installation causes minimal disruption, and it is capable of supporting traffic just an hour after application. The system allows for wet film thickness gauge checks to ensure the specified film thickness is achieved across the area before curing.

GCP's unique, cold-spray-applied ELIMINATOR®system ensured ample tensile and shear bond between the asphalt paving and membrane. In addition, the ELIMINATOR®system also provided Chun Wo Construction with significant speed and efficiency advantage over traditional hot melt-type bond coats, without compromising quality and performance. Plus, the use of airless pumps made it fast and easy to apply and maintain. The ELIMINATOR®membrane is also less sensitive to moisture, so it can be applied in a wide temperature range to enable faster project completion.

Using cold-applied waterproofing alleviates the fire safety risks of using hot works.

In addition, the ELIMINATOR®waterproofing membrane allows for easy, on-the-spot quality control. With many other waterproofing membranes, there's no ability to gauge the effectiveness of the system until the project is complete.

"The ELIMINATOR® bridge deck waterproofing range is extremely robust and is designed to provide permanent protection against water and chloride ingress yet allow for periodic maintenance and replacement of the asphalt paving. Our experience, know-how, technical support, systems for quality assurance and licensed applicators are just as much a part of the product and specification, Our global record in ELIMINATOR® waterproofing membranes includes Hong Kong's most iconic bridges, spanning over 40 years. Our customers specify these membranes with confidence."

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Carl Pearse, Asia Pacific regional manager, GCP Applied Technologies.

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