

Hong Kong - Shenzhen Western Corridor/ Deep Bay Link Viaduct Construction

Upon completion, the Deep Bay Link (DBL) will be a 5.4km dual-3 carriageway which connects the fourth vehicular boundary crossing, Hong Kong-Shenzhen Western Corridor (HKSWC), to the existing road network by way of a new interchange at Lam Tei, Tuen Mun. The Deep Bay Link consists of mainly viaducts. The construction method of precast segmental launching construction is adopted for most of the viaduct erection.

The new boundary crossing is urgently required to relieve the already congested vehicular boundary crossings at Lok Ma Chau, Man Kam To and Sha Tau Kok. The construction period allowed for the HKSWC and DBL projects is less than 30 months which is very tight. Precast segmental launching construction is an effective fast-track construction method. For both projects, there are totally about 6,500 precast segments to be constructed and launched.

The precast segments are manufactured at dedicated casting yards off-site (in Guangdong) where the production rate and quality can be well controlled. In the design of the works, sizes of the precast segments are maximized to the full width of a span to limit the total number of segments. This will in turn reduce the time for the critical segment handling and launching activities to enable these major contracts to be completed in a relatively short construction period.

The launching of segments in these projects uses the span-by-span launching method. All precast segments of a span (average about 14) are hoisted by the launching gantry and rotated into alignment. They are then adjusted to fit the designed level and super-elevation, glued together to seal up joints between segments and prestressed temporarily to form a span girder. The girder is then aligned with the top of the piers at both ends and “stitched” to the piers using in-situ concrete. The launching gantry can move to the next position after application of tension to prestressing tendons.

For the projects, six launching gantries will be used. The largest two weigh about 800 tonnes each and can handle a span of the largest segments which are of average weight of 60 tonnes each.

深港西部通道 / 后海灣幹線 橋樑建造工程

后海灣幹線完工後，將會是一條5.4公里長的雙程六線分隔行車道。一端連接一條新的行車跨界通道，即深港西部通道，另一端則由位於屯門藍地的一個新交匯處連接香港現有的道路網。后海灣幹線主要由高架橋樑組成。橋樑工程採用分段構件曳進法建造。

爲了紓緩現在位於落馬州，文錦道和沙頭角的跨界設施的繁忙交通，需要儘快完成一條新的跨界通道。這條由深港西部通道和后海灣幹線所組成的通道的施工期非常緊迫，只有約30個月時間。使用分段構件曳進法有助於加快工程進度。兩個工程項目共需預制及安裝約六千五百件組件。

預制組件在廣東數個特設的預制場制造。這些特設工場提供有效的制造速率及品質控制。預制組件的設計是將組件的闊度增大至橋面闊度，從而減少組件數量。並藉此減省組件運送及安裝時間，使工程合約可於較短時間內完成。

工程採用的分段構件曳進法是一次過安裝一跨段的組件（平均約14件）。吊樑機將每段組件逐一吊起並轉動至路線方向。再依設計調較每件組件的水平及斜度。組件之間用接着膠封合接口之後再用預應力初步將全段組件組合成一條大樑。吊樑機將大樑的位置對準兩端的橋墩頂部後，大樑便靠混凝土跟橋墩接合成一跨段。在再次拉定預應力筋後，吊樑機便可移到下一位置重覆運作。

在兩個項目的工程高峯期，將會同時使用六部吊樑機。最大的兩部每部重八百公噸，足夠應付整跨段每件平均重達60公噸的大型組件。



Precast segments are hoisted by the launching gantry
吊樑機將大型組件吊起