

HEAVY LIFTING IN HONG KONG Tricky truss transfer



*Hong Kong Convention and Exhibition
Centre Expansion Project*

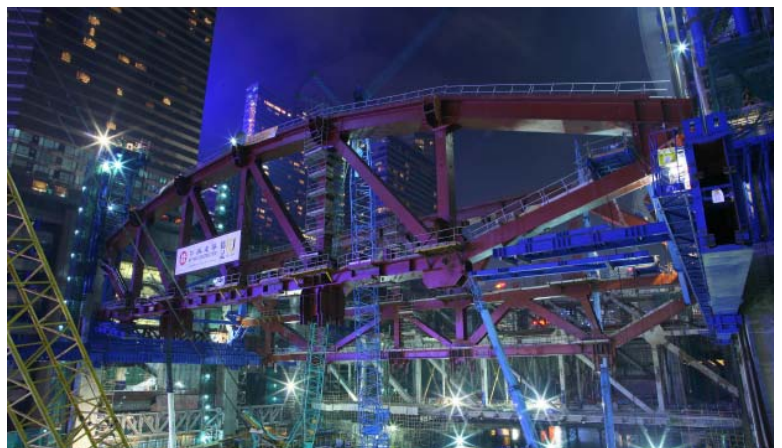
VSL HK has been awarded from Hip Hing – Ngo Kee JV the subcontract for the complex and challenging lifting and launching operation of the four main roof trusses for a bridging link needed as part of the expansion of the Hong Kong Convention and Exhibition Centre in Wanchai. The main roof trusses A, B, C and D weigh between 1290t and 1800t each and span approximately 90m across the harbour channel, spaced at 27m from one another. They are supported on bearings on top of permanent columns 41m and 57m above ground.

The existing Atrium Link Bridge between Phase I and II has to remain fully operational while these main trusses are being installed. Due to this requirement, the first two trusses, A and B, can only be assembled and lifted at the position of truss C and D respectively, and need to be launched sideways by 54m over the existing link bridge. Roof trusses A and B are lifted in pairs along with the sledges, north/south sliding beams and its supports.

After lifting trusses A and B, the sliding beam supports are installed, allowing the load transfer from the trusses to the supports. The sliding beams and the trusses are launched in alternate stages by strand jacking to the next grid, where the headroom at column C heavy lift bracket will allow lifting truss B further up to its final level. Subsequently, extension legs are installed on truss B down to the sliding beam, allowing launching trusses A and B to their final position. Trusses C and D are assembled and lifted independently at their respective column grids.

Temporary Structures

The lifting support structure is made of self-balancing lifting brackets mounted on temporary concrete corbels which in turn are stressed to the top of the permanent columns C and D on the north and south. The heavy lifting and sliding works require about 1650t of temporary steel to be fabricated specifically for this project. Apart from the design of all temporary works to enable the truss installation, VSL's scope included the stability checking of the permanent supporting structure as well as the temporary strengthening of the trusses for the lifting and sliding load cases.



Truss A and B lifted to truss A's final level



The self-balancing lifting bracket on column D/24

Lifting and sliding

The roof trusses are lifted using eight hydraulic jacks SLU330 for each roof truss, each jack having a capacity of 330 tons and their associated hydraulic pumps, all operated from a centralized control panel. These jacks are mounted on the self balancing lifting brackets that are installed on top of the permanent columns on grid C and D. For the lifting of roof trusses A and B, a total of 16 SLU330 were synchronised for the lift. The sliding of the roof trusses will be done using four hydraulic jacks SLU70 with two jacks being mounted at the end of each north and south sliding beams.

Trusses A and B together with the sledges and sliding beams weigh approximately 4000 tons and have been successfully lifted to the final height level of truss A. Trusses A and B are expected to be slid into their final positions by the end of February 2008. Trusses C and D are expected to be lifted into their final position by the end of March 2008.

Kai Tai Ng

Hong Kong Convention and Exhibition Centre Expansion

The Phase III extension of the Hong Kong Convention and Exhibition Centre follows the Atrium Link extension on which VSL is working and is expected to be completed in 2009. The Atrium Link extension, which links the Phase I and Phase II wings of the convention center, will add 19,400m² of exhibition space, an increase of 42%, for a total exhibition area of 66,000m². At the moment, the HKCEC offers 49,000m² of exhibition space spread between the Phase I and Phase II wings. The new Expansion spanning across the water channel between Phase I and Phase II of the HKCEC will accommodate three main levels of Exhibition Hall Extensions. The permanent supporting columns will be located on land at the north and south side of the water channel. There will be no permanent intermediate columns in the waterway. Plans call for construction to begin on the Phase III project in 2009. Work is expected to be completed by 2015.



The Hong Kong government has given the green light to the Phase III extension. The newly-enlarged HKCEC facilities will have an exhibition area comparable to the Venetian Macao, which has about 111,500m² of meeting, convention and exhibition space. "The Venetian attracts, [...] because of the huge space that is available [...]," said a Credit Suisse analyst. "In Hong Kong, the space is almost always full."

Source: <http://www.hkcecema.com>