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7. Entrance Gate to Makkah (Saudi Arabia)

Owner: Municipality of Makkah
Engineer: Khalid Al-Amoudi, Jeddah
Contractor: Mohd. Binladin Organization, Jeddah
Post-tensioning: VSL International Ltd., Jeddah
Construction time: Autumn 1985 – Spring 1988

This is the first of several new checkpoints planned around Islam's holiest city. The Big Door, situated 20 km outside Makkah and spanning the eight-lane highway to Jeddah, is a combination of a ceremonial arch and security checkpoint, beyond which only Moslems will be allowed.

The arch has a centre span of 92 m. Its sides consist of two box-shaped main girders, spaced apart 40 m at the tie-back walls and approx. 15 m in the centre. The girders, which are of conical external form, are connected by a grid of small skylight beams which allow sunlight to filter through the structure. The central part of the arch is a suspended span. The form of the arch symbolizes the two crossed swords from the Saudi arms.

The main girders were constructed in three pours (bottom slab, webs, top slab) on formwork supported on the ground. The formwork for the suspended span was also supported from the ground.

While the main girders are tied down by bar tendons, their post-tensioning consists of VSL tendons type EC/EC 5-19 arranged in the three webs and top slab. In the suspended span the tendons are in the webs only. They have dead-end anchorages type ECP at the lower end. All cables were installed by the VSL Push-through Method.

(H. U. Aeberhard)

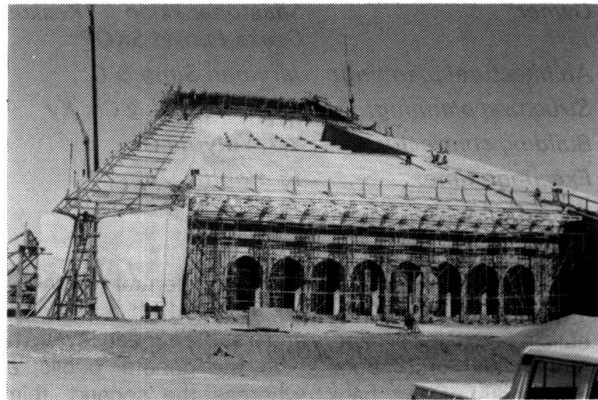


Fig. 2 Lateral view of the structure

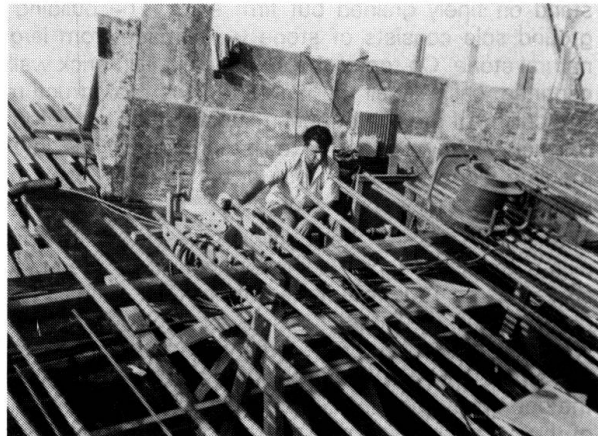


Fig. 3 Installation of cables by the VSL Push-through Method

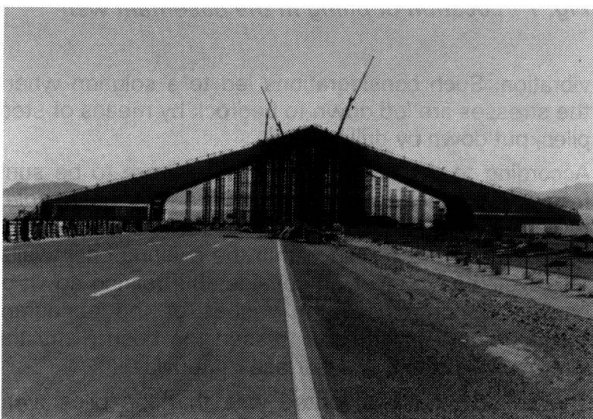


Fig. 1 View of the gate taking shape



Fig. 4 Concreting of a part of the suspended span