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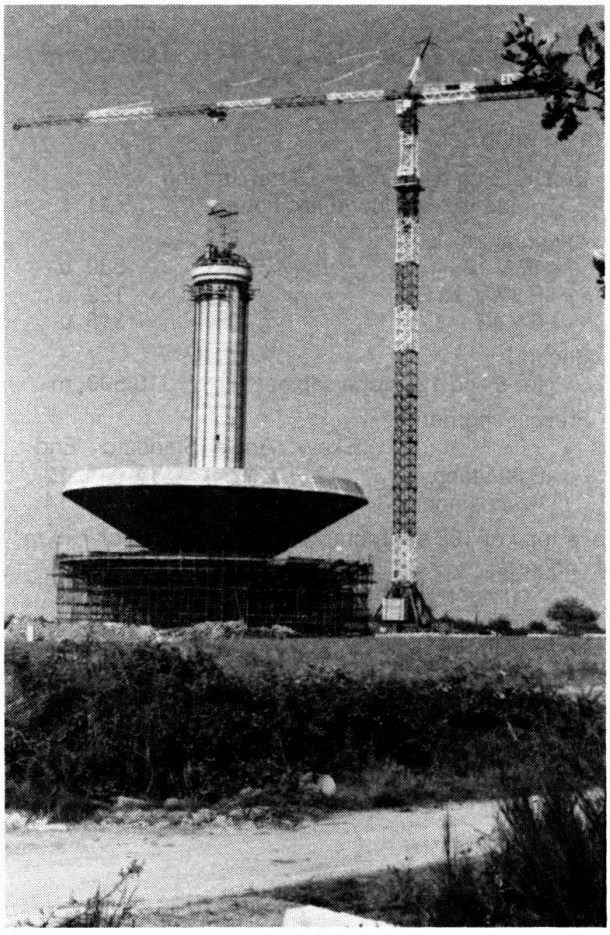
2. Water Tower, La Choltière, Vendée

Owner:	*Syndicat Intercommunal d'Alimentation en Eau Potable de la Région de Mareuil*
Designer:	*Departmental Management for Vendée Forest and Agriculture*
General Contractor:	*E.T.P.O. (Entreprise de Travaux Publics de l'Ouest), Nantes*
Structural Design:	*Europe Etudes GECTI, Rennes Branch*
Tank Hoisting:	*Freyssinet International (STUP), Nantes Branch*
Supervision:	*Socotec, Nantes Branch*

Introduction

In order to satisfy increasing demands for drinking water in the Vendée Department, it was decided to carry out certain modifications in the Marillet basin in the region of Mareuil sur Lay.

These modifications included, principally, the construction of two mass concrete gravity dams, one on the Marillet, the other on the Moinie river, thus retaining 7'000'000 m^3 of water.



These two dams are combined with a water treatment works – with an output of 20'000 m^3/day – which can be doubled in a later phase of the project – and a water supply tower with a capacity of 5'000 m^3 of drinking water.

The water tower

The structure consists of a tank, in the form of an inverted truncated cone, 10 m high, whose minimum diameter is 42 m, and which rests on top of a 50 m high tower 6.50 m in diameter.

The total height after completion is about 60 m.

The total weight of the structure is 4'000 t when empty – the tank alone weighing 2'400 t – and 9'000 t in service.

The tower is built of reinforced concrete and the concrete tank is prestressed with 12 K 13 Freyssinet tendons.

Because of the slenderness of the structure a model was first constructed and tested for wind effects by the E.N.S.M. at Nantes. An anti-swell device was then designed and installed.

The works

Though the casting of the concrete structures – tower and tank – was quite conventional, the construction method for the structure was rather original. In fact, the tank, weighing about 2'400 t, was cast at ground level by the general contractor, E.T.P.O., and then hoisted to its final level over 50 m above ground by means of fifteen 19 K 15 Dyform tendons, each having an ultimate strength of 570 tons.

The cables, anchored in the upper part of the tank, were pulled by means of fifteen SL 230 hydraulic devices activated by three groups of high pressure pumps.

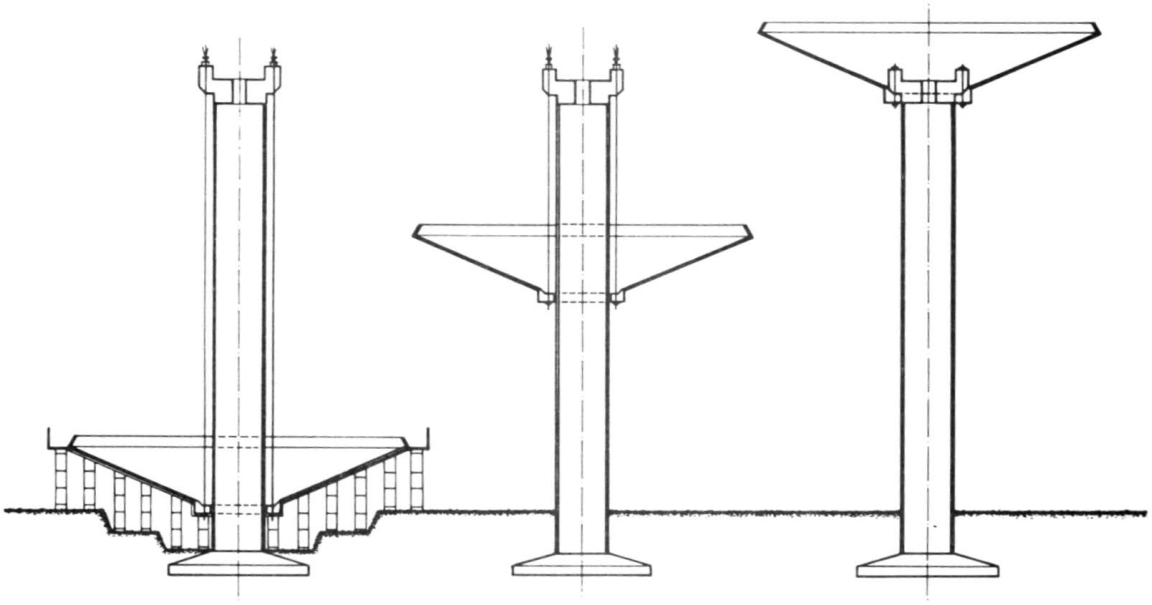
All operations were controlled from a central console, manned by a single operator who had at his disposal a series of video cameras, which allowed him to check, at any moment, the level and horizontality of the tank.

The hoisting operation, which took place in the Autumn of 1986, required less than three days at an average lifting speed of 2.50 m/hour.

Apart from the undoubted economy of this method, which avoided the use of costly scaffolding, the placing of the tank by means of hoisting reduced the total construction time of the structure by half.

Once the hoisting operation was completed, the tank was coupled to the tower by a cast-in-situ construction joint and the installation of 30 permanent prestressed ties formed of short Freyssinet 19 T 15 tendons using super grade strand.

(J. C. Bertel)



Scheme of hoisting operations