50'000 m³ floating roof tank, made by a roll forming method

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Design Institute: TSNIIproektstalkonstructsiya
Dimensions:
Height: 17.95 m
Diameter: 60.70 m
Material:
Steel grade for the main structures: C60/45; C46/33
Mass:
Metal structures: 701 t
High-strength steels: 230 t
Steel consumption per 1 m3 of the tank effective capacity: 14.7 kg/m3

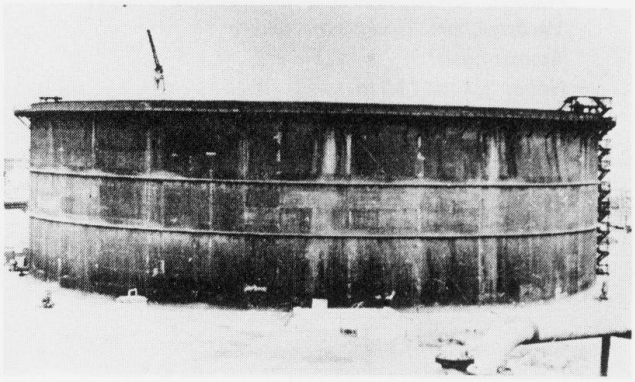

Fig. 1 General View of the Tank

50'000 m3 floating roof tank is designed for oil and oil products storage.
The tank height is 17.95 m, the diameter is 60.7 m, the floating roof diameter is 60.3 m.
The tank effective capacity is 47'600 m3.
For the first time the shell for the tank of the given capacity was fabricated of roll billets.
The floating roof tank is explosion-proof, provides the maximum operation economy, gives advantages concerning fire-resistance and its maintenance is easy comparing to other types of tanks.
The floating roof cuts down by 98 o/o the open surface of the stored products and decreases the losses caused by evaporation.
A seal is placed between the floating roof and the tank shell; the seal structure depends on the product to be stored as well as on clymatic conditions.
The tank shell is made of a high-strength steel of C 60/45 grade and of 16Г2АФ–12 mark instead of previously used higher strength steel of C 46/33 grade and of 09Г2С–12 mark for the tank with a by-plate assemblage of the shell, which was erected in Grozny.
As the high-strength steel was used the maximum shell thickness does not exceed the maximum permissible thickness of rolling – (roll forming) – 17 mm.
To provide stability of the shell leaves in the course of erection the stiffening rings are placed in the 5-th and 8-th shell courses as an addition to the upper stiffening ring which is used as a passage platform.
The tank bottom is designed as a roll-formed structure (made of rolls) with segment border plates.
The floating roof has a circular pontoon. The central part of the floating roof is made of rolls.
The guides and supporting posts of the floating roof are made of pipes.
The institute "Grozgypronephtechym" worked out a special water outlet device to remove storm waters from the floating roof surface.
The outside shaft stairs and the inside movable stairs are provided.
The mass of steel structures is equal to 701 t.
Saving of steel is 144 t in decreasing of budget allowances by 33'600 roubles comparing to the tank with a by-plate assembled shell which was erected in Grozny.
Two 50'000 m3 tanks with a roll-formed shell were constructed for the Moscow Oil Processing Plant.
The steel structures were fabricated at the Novokuznetsky tank steelwork plant.

(Z. Yu. Vyshegorodskaya, B. V. Popovsky)

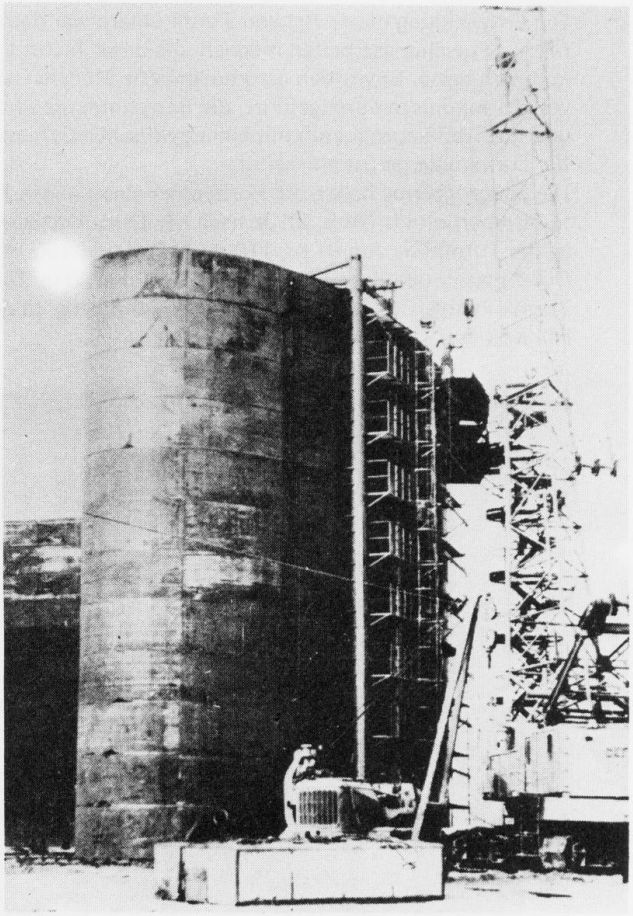

Fig. 2 Erection made by a Roll Forming Method