

**Zeitschrift:** IABSE structures = Constructions AIPC = IVBH Bauwerke  
**Band:** 6 (1982)  
**Heft:** C-22: Water towers  
  
**Artikel:** Water tank with structural form of a space satellite (India)  
**Autor:** Viswanath, H.R. / Swamy, H.K. Nanjunda  
**DOI:** <https://doi.org/10.5169/seals-17591>

### **Nutzungsbedingungen**

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften auf E-Periodica. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. Das Veröffentlichen von Bildern in Print- und Online-Publikationen sowie auf Social Media-Kanälen oder Webseiten ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. [Mehr erfahren](#)

### **Conditions d'utilisation**

L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. La reproduction d'images dans des publications imprimées ou en ligne ainsi que sur des canaux de médias sociaux ou des sites web n'est autorisée qu'avec l'accord préalable des détenteurs des droits. [En savoir plus](#)

### **Terms of use**

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. Publishing images in print and online publications, as well as on social media channels or websites, is only permitted with the prior consent of the rights holders. [Find out more](#)

**Download PDF:** 06.08.2025

**ETH-Bibliothek Zürich, E-Periodica, <https://www.e-periodica.ch>**



## 2. Water Tank with Structural Form of a Space Satellite (India)

**Owner:** Indian Space Research Organisation (ISRO), Bangalore

**Architect:** ISRO, Bangalore

**Consulting engineers:** GERAME, Bangalore

**Contractors:** The Designers and Builders, Bangalore

**Work's duration:** 6 months

**Service date:** 1982

### Introduction

An RCC overhead water tower with a capacity of 70 m<sup>3</sup> over a staging of 20 m was proposed to supply drinking water to the residents in the housing colony of ISRO at Hassan, Karnataka. A platform inside the shaft at a height of 15 m was provided for sighting antenna as per the requirements of Indian Space Research Organisation (ISRO). The container is a prismoidal folded plate structural form resembling a space satellite and is supported on a star shaped hollow concrete shaft. The Contractors were awarded the work on contractors own designs, keeping the structural form proposed by ISRO, which was found to be lower by over 20% in cost compared to Departmental Designs.

### Design

The sixteen sided star shaped reinforced concrete tower shaft (Fig. 1) was supported on RC raft foundation. The container with a prismoidal folded plate member was designed as such with a diaphragm to resist hoop tension in between the lower prism and vertical portion of the container (Fig. 2 and Fig. 4).

### Construction

The sixteen vertical lines (at the intersection of sixteen vertical plates) continuing as the intersecting lines of the prismoidal folded plate members of the container had to lie exactly on eight symmetrical vertical planes. This necessitated the formwork to be designed in such a way that no corner should be pushed out of position due to vibration. This concept was achieved in the shaft (Fig. 3) by preparing form boards with joint at the centre of the alternate folds. The plywood boards were connected by bolts and at every lift it was checked with reference to vertical plane passing through a heavy plum bob at the centre of the shaft and the opposite intersecting lines with a tolerance of plus or minus 3 mm.

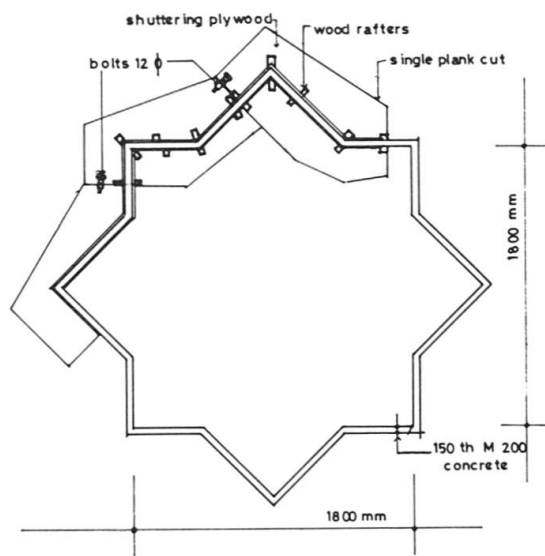


Fig. 1. Plan, shuttering details of shaft

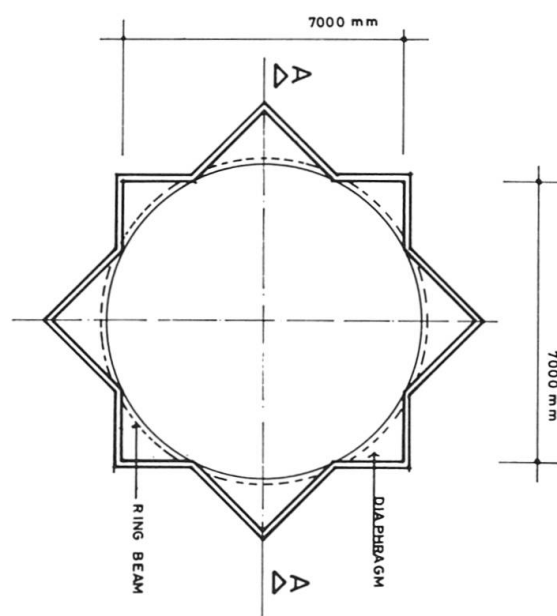


Fig. 2. Plan, above diaphragm

For the shaft inside form board was fixed for a height of 2.5 m and outside form board was two of 1.25 m height, casting lower 1.25 m height (0.15 m thick concrete) before fixing the 2nd outside board of 1.25 m height. Climbing form-work method was used.

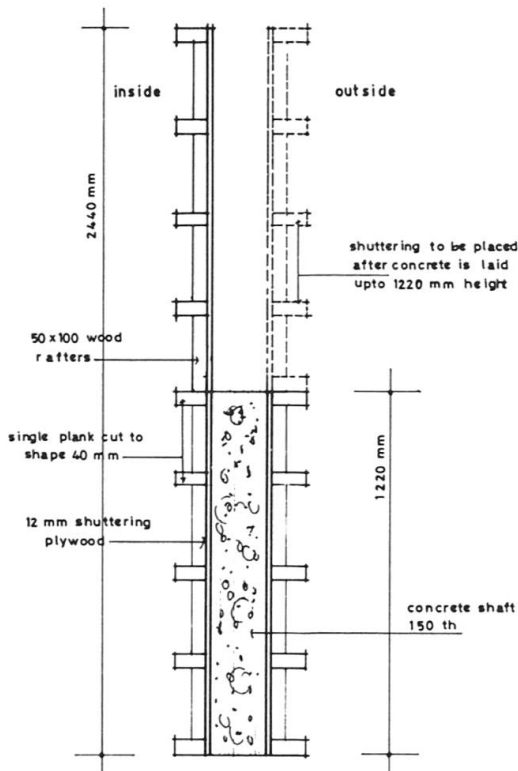


Fig. 3. Section, details of climbing formwork

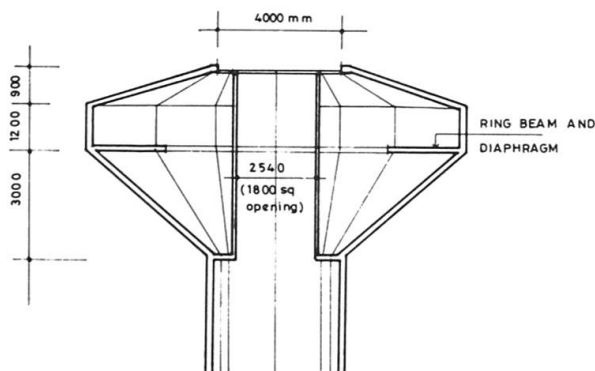


Fig. 4. Section A-A

As the vertical angle of the top and bottom portion of the prismoidal folded plate did not exceed 40 degree, no top formwork was found necessary.

Pipe scaffolding was used for the tower with an electrical hoist to lift materials. Structural concrete was of M 200 and 415 grade steel rods were used.

Only interior of the container is plastered in cement mortar with water proofing compound and all other surfaces were of exposed formwork.

(H. R. Viswanath. H. K. Nanjunda Swamy.)

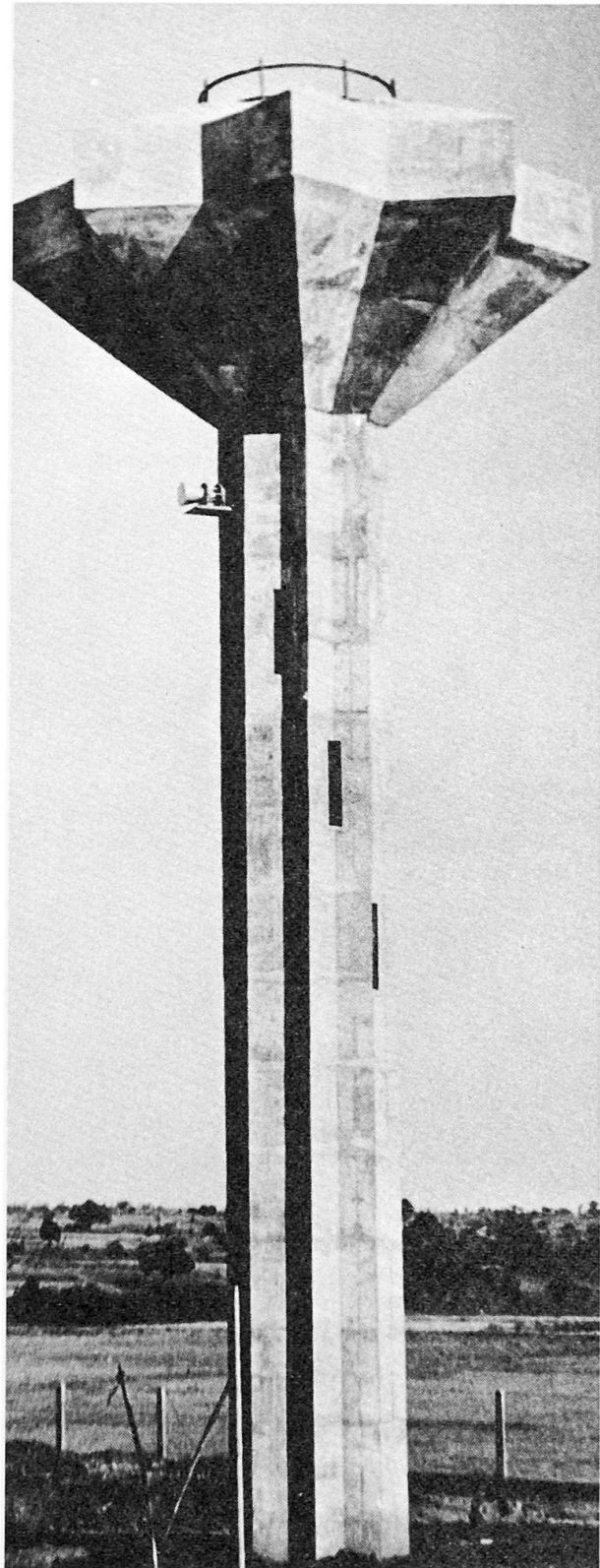


Fig. 5. Water tank with structural form of a space satellite