

6 June 1994

**Works Branch Technical Circular No. 9/94**

**Restrictions on the Use of Hand-dug Caissons  
for Foundations and Geotechnical Works**

**Introduction**

Works Branch Technical Circular No. 26/93 introduced a general ban on the use of hand-dug caissons in July 1993 and provided guidelines for the special circumstances where they might be used. This Circular supersedes Works Branch Technical Circular No. 26/93, which is hereby cancelled.

**Background**

2. Hand-dug caissons have been used extensively in both foundation and other geotechnical works for many years. There are technical and financial benefits associated with this method of construction compared with other methods. However, the disturbingly high accident rate in hand-dug caisson operations and health hazards such as noise, dust, poisonous gas, collapse of caisson linings posed to workers, as reflected in findings by the Labour Department, have given cause for considerable concern.

**Present Situation**

3. The practicability of a total ban on hand-dug caissons is being considered by the Government. Works Branch will be in close liaison with the Labour Department and the construction industry concerning this issue. The mitigating measures for safety and health hazards, particularly in respect of improvement in air quality within a hand-dug caisson, are also being reviewed. Whilst a total ban on hand-dug caissons is deemed impracticable at this stage, works departments are urged to give the matter extremely careful consideration before hand-dug caisson construction is permitted (see Appendix A).

**Policy**

4. Works departments are permitted to include the use of hand-dug caissons in future contracts only where :

- (a) the use of hand-dug caissons is the only practicable solution or there is no safe engineered alternative, and

- (b) all necessary precautionary measures are taken to safeguard workers against accidents and health hazards.

5. Before opting for hand-dug caissons, an assessment should be carried out covering general safety, the cost of damage arising from dewatering and the possibility of unforeseen ground conditions. The design of caisson linings must also be examined for suitability as for any other structural temporary works.

6. In cases where hand-dug caissons are used, the minimum clear working space inside each caisson (i.e. excluding the lining) shall be 1.8 metres in diameter.

7. Any use of hand-dug caissons must receive the prior approval of the Head of Department, who may consult the Labour Department in respect of paragraph 4(b) above before giving consent.

### **Engagement of Suitable Staff**

8. One of the most important elements in the prevention of accidents in hand-dug caisson works is the engagement of suitably qualified and experienced professionals in the assessment and investigation of the site to identify potentially unfavourable conditions that may give rise to engineering problems, and to implement the necessary precautionary and preventive measures. Likewise, the employment of suitably trained and experienced construction workers, supervised by a sufficient number of competent supervisors to ensure strict adherence to stringent safety and health requirements, is also a pre-requisite.

### **Hand-dug Caisson Reporting**

9. Works departments shall keep Works Branch (attention PAS/CCC) informed in January and June of each year of the total number of hand-dug caissons sanctioned for construction, appropriately categorised into 'difficult' or 'straightforward' sites.

( LEE Shing-see )  
Deputy Secretary (Works Policy)