

SINGAPORE STANDARD

# Code of practice for foundations

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**Code of practice for foundations**

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## Foreword

This Singapore Standard was prepared by the Technical Committee for Code of Practice for Foundations under the direction of the then Building and Construction Industry Standards Committee. It is a revision of CP 4 : 1976.

The major changes in the revised edition of CP 4 : 2003 are as follows:

*As amended  
Aug 03*

- (a) Clause 2.2 Design considerations in CP 4 : 1976 has been completely revised to address the local soil/rock conditions in Singapore.
- (b) Section 8 in CP 4 : 1976 was replaced by the relevant clauses of Section 9 of BS 8004 : 1986.
- (c) Inclusion of a section on durability of timber, metal and concrete structures, which was taken from BS 8004 : 1986 but modified to suit local needs.
- (d) Introduction of a separate section on Safety Precaution which was taken from BS 8004 : 1986 but modified to suit conditions in Singapore.

This code is an adoption of British Standard BS 8004 : 1986 and was implemented with permission of the British Standards Institution. Acknowledgement is made for the use of Figure 19 of BS 5930 : 1999 which is reproduced as Figure 2.1 in this standard.

Figures 7.6, 7.7, 7.10, 7.12, 7.13 and 7.14 published in this code are adapted with permission from "ASTM D3689-90 (1995) Standard Test Method for Individual Piles Under Static Axial Tensile Load" and "ASTM D3966-90 (1995) Standard Test Method for Piles Under Lateral Loads" respectively, copyright ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428."

Figures 7.2, 7.3 and 7.4 and Figure 7.11 published in this code are similar to Figures 11.8, 11.9, 11.17 and 11.19 respectively of the publication, "Pile Design and Construction Practice" Fourth Edition, by M.J. Tomlinson and are reproduced with the permission of Taylor & Francis Books Ltd.

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## Code of practice for foundations

### Section One – General

#### 1.1 Scope

This Code of Practice provides recommendations for the design and construction of foundations for the normal range of buildings and engineering structures. It serves as a guideline for achieving a technically sound, safe, and economical solution in the design and construction of these foundations.

In principle, one should consider site geological and subsurface conditions, nature of buildings or structures to be supported, availability of construction materials, and construction methods and details in the design of foundations for buildings and structures.

#### 1.2 Definitions

For the purpose of this Singapore Standard, the following definitions apply.

##### 1.2.1 Allowable pile load

The load that may be safely applied to a pile after taking into account its ultimate bearing capacity, negative friction, pile spacing, overall bearing capacity of the ground below the piles and allowable settlement.

##### 1.2.2 Allowable net bearing pressure

The maximum allowable net loading intensity at the base of the foundation, taking into account the ultimate bearing capacity, the amount and kind of settlement expected and the ability of the structure to accommodate this settlement. It is a combined function both of the site conditions, including all construction in the vicinity, and the characteristics of the proposed structure.

##### 1.2.3 Anvil

The part of a power-operated hammer which receives the blow of the ram and transmits it to the pile.

##### 1.2.4 Barrettes

A system of piling involving the excavation of large rectangular panels under bentonite. The techniques used in their construction are very similar to those used for diaphragm walling.

##### 1.2.5 Bentonite suspension/slurry

A mixture of bentonite and water.

##### 1.2.6 Boiling or quick condition

A phenomenon involving soil particles suspended in water when a cohesionless soil mass is subjected to an upward seepage force under a hydraulic gradient exceeding the critical gradient of the soil. This phenomenon should not be confused with blow-in or uplift that is associated with a cohesive soil stratum subject to an excessive upward water pressure from an underlying water-bearing stratum or aquifer beneath the bottom of an excavation.