Republic of South Africa

EDICT OF GOVERNMENT

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SANS 10400-G (2011) (English): The application of the National Building Regulations Part G: Excavations

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Edition 3

SOUTH AFRICAN NATIONAL STANDARD

The application of the National Building Regulations

Part G: Excavations

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SANS 10400-G:2011
Edition 3

Table of changes

Change No.	Date	Scope

Acknowledgement

The SABS Standards Division wishes to acknowledge the work of the South African Institution of Civil Engineering in updating this document.

Foreword

This South African standard was approved by National Committee SABS TC 59, *Construction standards*, in accordance with procedures of the SABS Standards Division, in compliance with annex 3 of the WTO/TBT agreement.

This document was published in January 2011.

This document supersedes the corresponding parts of SABS 0400:1990 (first revision).

Compliance with the requirements of this document will be deemed to be compliance with the requirements of part G of the National Building Regulations, issued in terms of the National Building Regulations and Building Standards Act, 1977 (Act No. 103 of 1977).

SANS 10400 consists of the following parts, under the general title *The application of the National Building Regulations:*

Part A: General principles and requirements.

Part B: Structural design.

Part C: Dimensions.

Part D: Public safety.

Part F: Site operations.

Part G: Excavations.

Part H: Foundations.

Part J: Floors.

Part K: Walls.

Part L: Roofs.

Part M: Stairways.

Part N: Glazing.

Part O: Lighting and ventilation.

Foreword (*concluded*)

Part P: Drainage.

Part Q: Non-water-borne means of sanitary disposal.

Part R: Stormwater disposal.

Part S: Facilities for persons with disabilities.

Part T: Fire protection.

Part V: Space heating.

Part W: Fire installation.

This document should be read in conjunction with SANS 10400-A.

Annex A forms an integral part of this document.

Contents

The application of the National Building Regulations

Part G:
Excavations

1 Scope

This part of SANS 10400 provides deemed-to-satisfy requirements for compliance with part G (Excavations) of the National Building Regulations.

NOTE Part G of the National Building Regulations, issued in terms of the National Building Regulations and Building Standards Act, 1977 (Act No. 103 of 1977), is reproduced in annex A.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies. Information on currently valid national and international standards can be obtained from the SABS Standards Division.

SANS 10400-A, *The application of the National Building Regulations – Part A: General principles and requirements.*

SANS 10400-H (SABS 0400-H), *The application of the National Building Regulations – Part H: Foundations.*

3 Definitions

For the purposes of this document, the definitions given in SANS 10400-A (some of which are repeated for convenience) and the following apply.

3.1
competent person (civil engineering)
person who

a) is registered in terms of the Engineering Profession Act, 2000 (Act No. 46 of 2000), as either a Professional Engineer or a Professional Engineering Technologist,

b) has a tertiary qualification (degree or diploma) in civil engineering, and

c) is generally recognized as having the necessary experience and training to undertake rational assessments or rational designs in the field of civil engineering

3.2
competent person (engineering geology)
person who is registered as a Professional Natural Scientist in terms of the Natural Scientific Professions Act, 2003 (Act No. 27 of 2003), and has a BSc (Hons) degree or higher qualification in engineering geology

3.3
deemed-to-satisfy requirement
non-mandatory requirement, the compliance with which ensures compliance with a functional regulation

3.4
foundation
that part of a building which is in direct contact with, and is intended to transmit loads to, the ground

3.5
functional regulation
regulation that sets out in qualitative terms what is required of a building or building element or building component in respect of a particular characteristic, without specifying the method of construction, dimensions or materials to be used

3.6
rational assessment
assessment by a competent person of the adequacy of the performance of a solution in relation to requirements including as necessary, a process of reasoning, calculation and consideration of accepted analytical principles, based on a combination of deductions from available information, research and data, appropriate testing and service experience

3.7
rational design
design by a competent person involving a process of reasoning and calculation and which may include a design based on the use of a standard or other suitable document

4 Requirements

4.1 General

The functional regulation **G1(1)** contained in part G of the National Building Regulations (see annex A) shall be deemed to be satisfied where the excavation relating to a building

a) is less than 3,0 m deep and complies with the requirements of 4.2, or

b) is the subject of a rational design or a rational assessment (or both) prepared by a competent person (civil engineering) or competent person (engineering geology).

NOTE 1 No excavation can be made without causing some movements. Any method of construction that involves vibration, such as blasting, piling or compaction, might cause damage to adjacent buildings either directly from the vibrations themselves or their effect on the underlying soils.

NOTE 2 In rock excavation, stability is governed more often by the properties of the joints rather than the rock material.

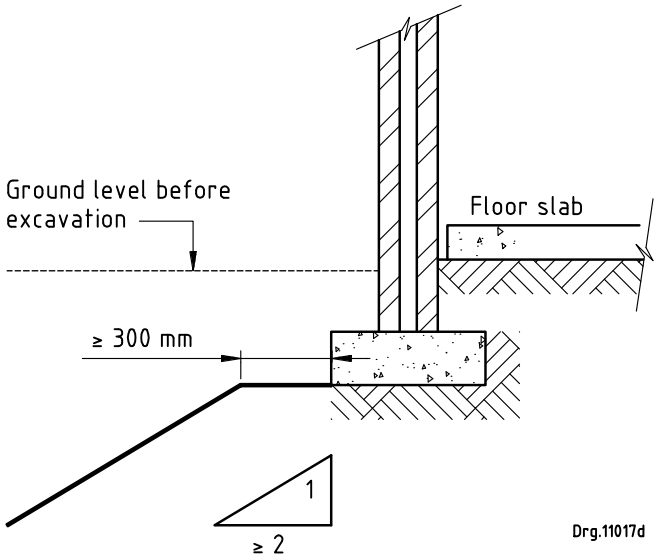
NOTE 3 The South African Institution of Civil Engineering's (Geotechnical Division) *Code of practice for lateral support in surface excavations* provides practical guidance to enable a competent person (civil engineering) or competent person (engineering geology) to comply with the requirements of 4.1(b).

NOTE 4 Part G of the National Building Regulations is concerned with the safety or stability of any property or service. The Construction Regulations issued in terms of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) are concerned with the safety of workers during the construction period. Part G is therefore concerned with the location and geometry of the excavation while the Construction Regulations are concerned with the actual construction of the excavation.

4.2 Excavations

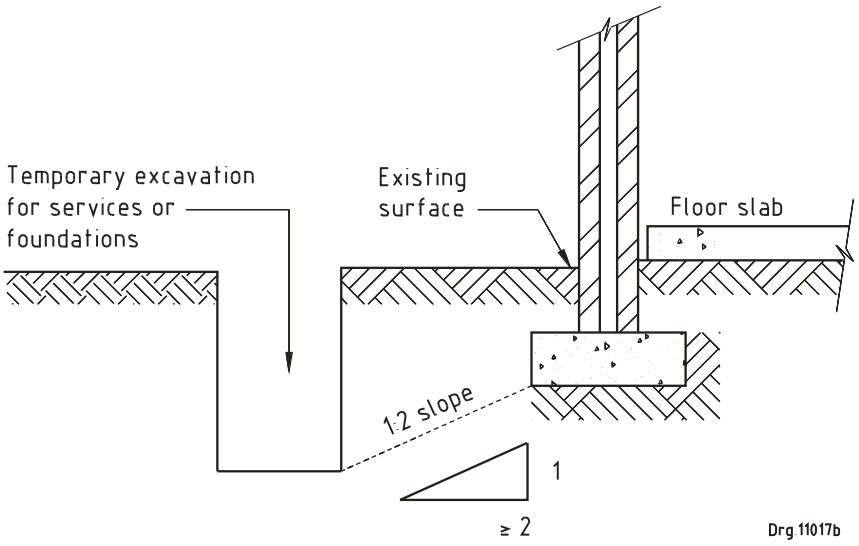
4.2.1 Temporary excavations

Temporary excavations shall not extend below the line shown in figure 1 drawn from the bottom edge of the foundation of a building.



Surface water shall be diverted away and prevented from running down the cut and causing erosion.

a) Temporary excavation exposing existing foundations



The sides of the excavation shall comply with the requirements of the Construction Regulations issued in terms of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993).

b) Temporary excavation in close proximity to building

Figure 1 —Temporary excavations

4.2.2 Permanent excavations

4.2.2.1 The slope of cuttings in permanent excavations shall not be steeper than 1:2 (see figure 2), except in the case of sound, intact rock, where the slope of the cutting may be vertical.

4.2.2.2 The excavation shall be sloped so that no water ponds within 3 m of the toe of the cutting.

4.2.2.3 Surface water shall be diverted away and prevented from running down the cut and causing erosion.

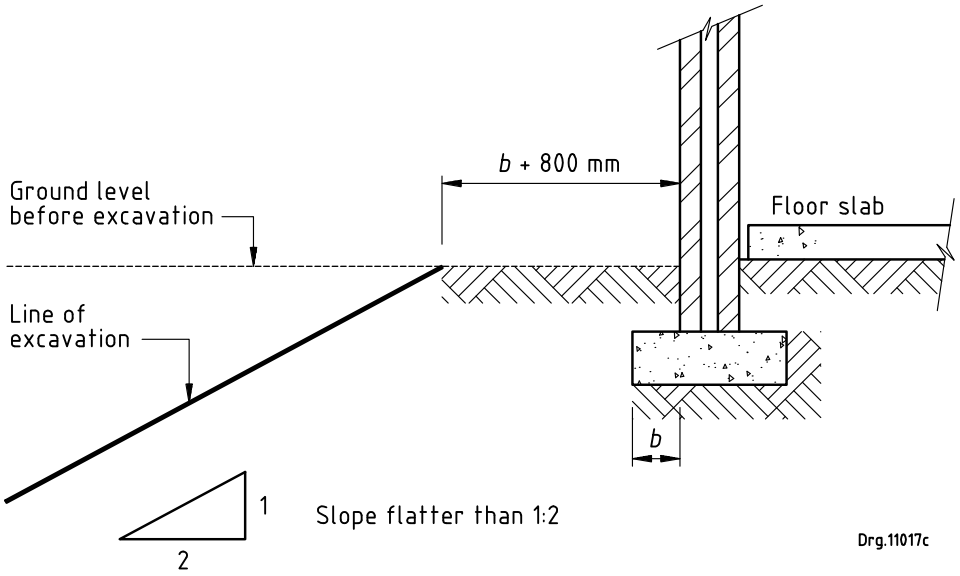


Figure 2 — Permanent excavations

4.2.3 Blasting

4.2.3.1 The distance from a blast hole to the closest point of a building, other than a historical monument or buildings with a foundation system that does not comply with the requirements of SANS 10400-H, shall be not less than that given in table 1

4.2.3.2 Detonating relays shall have at least a 20 millisecond delay interval.

Table 1 — Minimum distances of blast holes from buildings

1	2
Minimum distance from the nearest blast hole to a building	**Maximum charge mass per relay for commercial explosives**
m	kg
10	0,19
20	0,76
30	1,7
40	3,0
50	4,7
60	6,8
70	9,3
80	12,1
90	15,3
100	18,9
NOTE The maximum charge levels should keep the peak particle velocity at buildings below 50 mm/s.	

Annex A
(normative)

National Building Regulations
Part G: Excavations

Definitions

adequate
adequate

a) in the opinion of any local authority, or

b) in relation to any document issued by the council, in the opinion of the council

site
any erf, lot, plot, stand or other piece of land on which a building has been, is being or is to be erected

Regulations

G1 General Stability Requirement

(1) Where any excavation related to a building is carried out or is to be carried out on any site and such excavation may impair the safety or stability of any property or service, the owner of such site shall take adequate precautionary measures to ensure that the safety and stability of such property or service is maintained.

(2) While any such excavation remains open, and during the placing of any foundation within it, such excavation shall be maintained in a safe condition by the owner or person carrying out such excavation.

(3) Where the safety or stability of any property or service is likely to be impaired by such excavation, or where the depth, at any point, of such excavation is likely to be more than 3 m, the owner of the site shall –

(a) obtain the prior written authorization of the local authority for such excavation; and

(b) take the precautionary measures specified by the local authority or an approved competent person in such authorization.

(4) The owner of any site shall, at least seven days prior to the commencement of any excavation contemplated in subregulation **(1)**, notify the local authority in writing of his intention to excavate.

(5) Any owner or person who fails to comply with any requirement of this regulation, shall be guilty of an offence.

G2 Deemed-To-Satisfy Requirements

The requirements of Regulation **G1(1)** shall be deemed to be satisfied where the excavation complies with SANS 10400-G.

Bibliography

Standards

SANS 10400-B (SABS 0400-B), *The application of the National Building Regulations – Part B: Structural design.*

Other publications

South African Institution of Civil Engineering. *Code of practice for lateral support in surface excavations.* 1989. <http://www.saice.org.za>.

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South African National Standards are updated by amendment or revision. Users of South African National Standards should ensure that they possess the latest amendments or editions.

The SABS continuously strives to improve the quality of its products and services and would therefore be grateful if anyone finding an inaccuracy or ambiguity while using this standard would inform the secretary of the technical committee responsible, the identity of which can be found in the foreword.
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