

Withdrawal of SANS 1200 and SANS 10120 as a South African National Standard

INTRODUCTION

The Standards Act of 2008 requires the South African Bureau of Standards to develop, issue, promote, maintain, amend or withdraw South African National Standards serving the standardisation needs of the South African community. South African National Standards, as is the case for International Standards, are reviewed every five years to ensure continued market relevance.

The South African Institution of Civil Engineering (SAICE) developed the SANS 1200 (Standardised Specification for Civil Engineering Construction) and associated SANS 0120 (Code of Practice for use with Standardised Specifications for Civil Engineering and Contract Documents) series in the late 1970s and early 1980s, with the support of the South African Federation (now Forum) of Civil Engineering Contractors (SAFCEC) and the South African Association of Consulting Engineers (SAACE, now Consulting Engineers South Africa (CESA)), and handed it over to the South African Bureau of Standards (SABS) to publish and maintain. These series of standards, however, stagnated in that they were not further developed and most of the parts were not amended to reflect changes in technologies, practices, procedures, materials and methods since their publication.

The withdrawal of SANS 1200 and replacement with SANS 2001 has been on the standards development agenda for many years. TC 1098 has, in terms of SANS 1-1, agreed to the withdrawal of SANS 1200 and SANS 10120 during April 2016, despite the fact that not all the SANS 1200 standards had been converted to the SANS 2001 series. Although SANS 1200 documents will no longer enjoy South African national standard status, these standards may nevertheless continue to be purchased from the SABS Sales Office.

SANS 2001 CONSTRUCTION STANDARDS

An overview of SANS 2001

The different parts of SANS 2001 each address a specific component of construction works. The prime purpose in the



Dr Ron Watermeyer
Chairman of SABS TC 1098
(Buildings and Civil Engineering Works)
watermeyer@ioptions.co.za

production of these standards is to create a set of standards which are generally applicable to construction works, and which can be readily modified to make them applicable to particular works. Accordingly, the SANS 2001 family of standards provides technical descriptions of the standard of materials and workmanship that will be used in the works. These standards do not make reference to the actions of those responsible for executing the works or the parties to a contract, i.e. to the constraints relating to the manner in which contract work is to be performed. Neither do they deal with the commercial arrangements of such contracts.

Parts of SANS 2001 are commonly applied in three different contexts.

Application of SANS 2001 in contracts

Contract documents for engineering and construction works need to be developed in accordance with the provisions of SANS 10845-2 (*Construction procurement – 2: Formatting and compilation of procurement documents*) which replaces SANS 10403 (*Formatting and compilation of procurement documents*).

Procurement documents developed in accordance with this standard comprise a number of component documents dealing with different topics grouped together in a logical sequence. The content of each component document should be such that, as far as possible, each subject matter is addressed only once in the procurement document and in its logical location. The component document “scope of work” is defined as the “document that specifies and describes the goods, services, or engineering and construction works which are to be provided, and any other

Table 1: Direct and indirect references to SANS 2001 in SANS 10400

Part of SANS 2001	Comments
BE1 – Earthworks (general)	Referenced in SANS 2001-CM2.
BS1 – Site clearance	Referenced as a “where necessary” requirement in SANS 2001-CM2.
CC1 – Concrete works (structural)*	Referenced as an alternative to SANS 2001-CC2 to enable concrete components and elements which are designed by the rules provided in SANS 10400 to be constructed. Typically used where concrete on a site is required for structures designed by competent persons and structures which are designed using the rules provided in SANS 10400.
CC2 – Concrete works (minor works)	This part of SANS 2001 provides construction rules for concrete work designed in accordance with the design rules contained in: <ul style="list-style-type: none"> ▪ SANS 10400-H (foundations) – lightly loaded surface beds ▪ SANS 10400-J (floors) – water-resistant floors of concrete construction and plain concrete impervious floors of limited size ▪ SANS 10400-M (stairways) – stairways ▪ SANS 10400-P (drainage) – conservancy and septic tanks ▪ SANS 10400-Q (non-water means of sanitary disposal) – ventilated improved pit toilets. SANS 2001-CC2 also provides rules for in-fill concrete in masonry walls. This part of SANS 2001 provides only for rough finishes to the concrete. SANS 2001-CC1 is used where a different finish is required.
CG1 – Installation of glazing in window and door frames*	The design rules for glazing contained in SANS 10400-CG1 (glazing) require that glazing either be installed in accordance with the requirements of SANS 10400-CG1 or in accordance with a suitable method described in SANS 10137.
CM1 – Masonry walling*	This part of SANS 2001 provides construction rules for masonry designed in accordance with the design rules contained in: <ul style="list-style-type: none"> ▪ SANS 10400-H (foundations) – foundation walls ▪ SANS 10400-K – walls ▪ SANS 10400-P (drainage) – conservancy and septic tanks ▪ SANS 10400-Q (non-water means of sanitary disposal) – ventilated improved pit toilets. This part of SANS 2001 requires: <ul style="list-style-type: none"> ▪ in-filling concrete to comply with the requirements of SANS 2001-CC2 ▪ joints in plaster provided at the interface between a soffit and wall to be in accordance with SANS 2001-EM1. The design rules for masonry walls contained in SANS 10400-K (walls) require that in-fill concrete be in accordance with SANS 2001-CM1.
CM2 – Strip footings, pad footings and slab-on-the-ground foundations for masonry walling*	This part of SANS 2001 provides construction rules for foundations supporting masonry walls and surface beds / slab on the ground designed in accordance with the design rules contained in SANS 10400-H (foundations). This part of SANS 2001 references Part BE1, BS1, CC1, CC2 and CM1. <ul style="list-style-type: none"> ▪ Material placed beneath foundations is required to comply with the requirements of SANS 2001-BE1. ▪ Where specified by the user clearing is required to be carried out as specified in SANS 2001-BS1. ▪ All concrete work in foundations and surface beds is required to comply with the provisions of SANS 2001-CC1 or SANS 2001-CC2. ▪ All masonry work in foundations is required to comply with the provisions of SANS 2001-CM1.
CS1 – Structural steelwork*	This part of SANS 2001 does not cover roof and side cladding, or the detailed aspects of sundry items such as handrails, ladders, steel flooring and the like, neither does it cover protection of steel-work against corrosion or fire.
CT1 – Structural timberwork (flooring)*	This part of SANS provides construction rules for suspended timber floors designed in accordance with the design rules contained in SANS 10400-J (floors).
CT2 – Structural timberwork (roofing)	This part of SANS 2001 provides construction rules for soft-wood roofing and ceiling assemblies designed in accordance with the design rules contained in SANS 10400-L (roofs).
DP2 – Medium pressure pipelines	SANS 10400-W (fire installations) requires that all fire installation pipework be constructed in accordance with the relevant requirements of SANS 2001-DP2 or DP4.
DP6 – Below groundwater installations	Fire installation pipework installed above ground or within the structure of a building is required to be metallic pipes and fittings complying with the relevant requirements of SANS 2001-DP2 and SANS 2001-DP6.
EM1 – Cement plaster	This part of SANS 2001 provides construction rules for the plastering of masonry walls designed in accordance with the design rules contained in: <ul style="list-style-type: none"> ▪ SANS 10400-H (foundations) – foundation walls ▪ SANS 10400-K – walls ▪ SANS 10400-P (drainage) – conservancy and septic tanks ▪ SANS 10400-Q (non-water means of sanitary disposal) – ventilated improved pit toilets. The fire resistance of plaster quoted in SANS 10400-T (fire protection) assumes that the plaster is in accordance with the provisions of SANS 2001-EM1.

* SANS 10400-B (structural design) states that Parts CC1, CG1, CM1, CM2, CS1 and CT1 of SANS 2001 may be used by competent persons to specify construction requirements for rational designs to satisfy requirements.

requirements and constraints relating to the manner in which the contract work is to be performed.”

Different families of SANS standards are used to compile the scope of works:

- SANS 2001 establishes generic specifications of the construction works for earthworks, site clearance, concrete works, glazing, masonry walling and strip footings, structural steelwork, structural timberwork, pipe bedding, pressure pipelines, cable ducts, sewers, stormwater drainage and pipe jacking, and
- SANS 1921 establishes generic requirements and constraints relating to the manner in which the works are constructed.

Both are modified for a specific purpose under a contract by specification data in the scope of work.

Application of SANS 2001 in National Building Regulations

Sub-regulation A14(1)(a) (Construction) of the National Building Regulations requires that the construction of any building or element be such that “the building or element as constructed does not compromise the design intent of any design solution that satisfies the requirements of a functional regulation.” This sub-regulation is deemed to be satisfied if such construction satisfies the requirements of the relevant part of SANS 10400. SANS 10400 establishes construction rules by reference to parts of SANS 2001 for use in conjunction with design rules. The default requirements of SANS 2001, or the prescribed parameters contained in parts of SANS 10400, are adequate for solutions which are arrived at by applying these design rules.

The parts of SANS 2001 which are currently directly and indirectly referenced in SANS 10400 are indicated in Table 1.

Application of SANS 2001 in the NHBRC (National Home Builders Registration Council) warranty scheme

The recently revised NHBRC’s *Home Building Manual 2015* establishes the means by which compliance with its technical requirements relating to its warranty scheme (5-year major structural defects and 12-month roof leakage warranty) can be demonstrated. Two methods for demonstrating compliance are provided, namely compliance methods and performance-based methods. The compliance methods are framed around a set of design and construction rules which must be adhered to. The performance-based methods require certification by a listed competent person, a certification body or Agrément South Africa.

Currently, the following parts of SANS 2001 are recognised by the NHBRC as compliance methods to satisfy construction requirements where design rules are applied:

- SANS 2001-CC1 Concrete works structural
- SANS 2001-CC2 Concrete works (minor works)
- SANS 2001-CG1 Installation of glazing in window and door frames
- SANS 2001-CM1 Masonry walling
- SANS 2001-CM2 Strip footings, pad footings and slab-on-the ground foundations for masonry walling
- SANS 2001-CT1 Structural timberwork (flooring)
- SANS 2001-CT2 Structural timberwork (roofing)
- SANS 2001-DP6 Below groundwater installations
- SANS 2001-DP7 Sewers for buildings
- SANS 2001-EM1 Cement plaster

METHODS OF MEASUREMENT

Each part of SANS 1200 was drafted around the standard set of headings contained in SANS 0120-1. Part 8 of each part within SANS 1200 covered measurement and payment. SANS 1200-A (*General*), or SANS 1200-AA (*General (Small Works)*), were developed as supporting specifications for all other parts of SANS 1200. These parts of SANS 1200 establish the following general principles which apply to all parts:

- “The rate or price tendered by the Contractor for a scheduled item shall be **deemed to cover the Contractor’s profit plus cost to him of all labour, materials, plant, equipment and facilities required by him to carry out the operations or activities** stated in the relevant sub-clause of Clause 8 of the applicable standardised specification, in addition to the cost to the Contractor of carrying out such ancillary and associated activities as the Contractor deems necessary for the completion of the Works in accordance with the said specification, the conditions of contract and the drawings.”
- “The Contractor’s charges for completing an item scheduled in the preliminary and general section of the schedule shall be interpreted to be his rate or price to cover his direct cost plus overheads and to include his profit and all costs and expenses that he requires for the item specified and for all general risks, liabilities and obligations set forth or implied in the documents on which the tender is based.”
- “Except where otherwise specified in Clause 8.1 of a standard specification or in the project specifications or in the preamble, all items in the schedule **shall be measured and shall cover the operations as recommended in the standard system of measurement of civil engineering quantities** for South Africa and South West Africa under the title Civil Engineering Quantities as approved and recommended for general use by the South African Institution of Civil Engineering

Civil Engineering Quantities 1973 (CEQ73), the document referred to in SANS 1200-A and SANS 1200-AA, makes it clear that the “Schedule of Quantities should be prepared on the understanding that, in the absence of specific directions to the contrary, the rates and prices that will be inserted will be considered as being the full inclusive rates and prices for the **finished work** described under the respective items as covering, not only all labour, materials, temporary work, plant, on-cost items and other overhead charges and profit, but also the general liabilities, obligations and risk arising out of the conditions of contract and specification.”

In 1990, SAICE published *Civil Engineering Quantities 1990* as a successor to the *Standard System of Measurement of Civil Engineering Construction Contracts*. The need for revising CEQ73 became necessary as Chapter VII (Units and Methods of Measurement) had been adopted and incorporated into SANS 1200 Standardised Specifications, thus making much of CEQ73 redundant.

ICE-SA, a joint division of SAICE and the Institution of Civil Engineers (ICE), UK, in 2011 published the *Southern African Edition of the Civil Engineering Standard Method of Measurement* (third edition). The Southern African edition of CESMM3-SA is a customisation of CESMM3 which has been used in the UK and many parts of the world since 1991, and was finalised with South African industry inputs and public comments. CESMM3 is based on the philosophy that “a Bill

of Quantities is no more than a price list **for the permanent works**. Items should be described in sufficient detail for it to be possible to distinguish between the different types of work and between work of the same nature carried out in different locations or in any other circumstances which may give rise to different pricing considerations. At the same time, all work that is required should be covered in the Bill of Quantities.” CESMM3-SA provides all the information relating to the measurement of items on two A4 pages which face each other – the three divisions for breaking items down are shown on the left-hand page while the measurement rules, definition rules, coverage rules and additional description rules are located on the right-hand page.

Standard systems of measurement such as those embedded in Clause 8 of the SANS 1200 standards or CESMM3 can be used with any specifications for the works. Such systems are independent from specifications, as they describe the finished or permanent works. The method of measurement should be called up in the pricing assumptions associated with a procurement document. The SANS 1200 system of measurement can be called up, for example, by inserting the following clause:

- “The method of measurement is the system of measurement set out in Clause 8 of the identified parts of SANS 1200 (Civil Engineering Construction) read in conjunction with the provisions of SANS 1200-A (General) subject to the following amendments”

MOVING FORWARD

Standard forms of contract have, since the publication of SANS 1200, been shifting away from the traditional master-servant relationship between the parties. This change in approach requires that the scope of work be objective in its formulation, particularly as defects are being defined as work not in accordance with the provisions of the scope of work or an instruction. The SANS 1200 specifications assign duties to the engineer using terms such as “in the opinion of the engineer”, “as the engineer may direct”, “approved by the engineer”, “the engineer considers”, “obtain specific instructions from the engineer before proceeding”, “the engineer allows to be incorporated”, “the engineer is satisfied”, “ordered by the engineer”, and “to the satisfaction of the engineer.” These terms introduce subjectivity and uncertainty as to what the actual requirements are. For example, how can a contractor price for something for which he is at the mercy of the engineer? What precisely is a defect in terms of the contract?

The withdrawal of the SANS 1200 standards presents those responsible for compiling bills of quantities and the scope of work associated with a contract to modernise their approach and to be more exacting in what they specify.

NOTE

Further insights and information can be obtained from:

Watermeyer, R B 2008. The adoption of CESMM3 as a standard method of measurement of civil engineering quantities in South Africa. *Civil Engineering*, 16(1): 18–19 and 56.

Watermeyer, R, Lomas, M, Macdonald, H, Jacquet, A, Griffiths, A, Baird, P & Cullen, M 2012. The changing landscape for civil engineering contracts: moving on from SABS 1200. *Civil Engineering*, 20(1): 20–25. ■