

5 October 2011

Dear Colleagues

## The future of SABS 1200, SANS 2001, SANS 1921 and CESMM3

The SABS secretariat decided during January 2011 to conduct a straw poll without contextualizing the issues – “SABS is now proposing that we continue to support, develop and maintain the SANS 1200 series of Standards. These would be developed in parallel with the SANS 2001 docs, so that end users have a choice of which to use.”

The attached document “*The changing landscape for civil engineering contracts: moving on from SABS 1200*” provides a comprehensive background to the development of SABS 1200, SANS 2001, SANS 1921 and the Southern African edition of CESMM3. It contextualizes the issues at hand and is worth reading in order to better understand the merits of SABS’s conclusion.

In summary, SABS 1200 was developed in the late 1970s for use with Civil Engineering Quantities (CEQ73) and GCC 1982 for the design by employer contracting strategy. SABS 0120 code of practice provided guidance on the use of SABS 1200 and informed the way in which tenders were compiled and formatted. Most parts of SABS 1200 have not been modified since the mid 1980s and the last additions or minor amendments to the series were made in 1996. Significant changes in materials have occurred since then with respect to cements and pipe systems, amongst others

The SABS Technical Committee (TC 59) took the decision in 2000 to convert SABS 1200 into two families of standards, namely the SANS 1921, *Construction and management requirements for works contracts*, and SANS 2001, *Construction works*. All reference to the responsibilities of the Engineer and the Contractor were removed from the text and no measurement and payment items were included. This enables these standards to be used with any pricing or contracting strategy at main or subcontract level and with any conditions of contract in an objective manner. All parts of SANS 1921 were published in 2005. Most parts of SANS 2001 have now been published. All that remains is for the road works and piling parts to be published.

The SABS 1200 standards relating to concrete were withdrawn when SANS 2001-CC1 and SANS 2001-CC2 were published in 2007. This caused some confusion as the system of measurement was still embedded in SABS 1200 and until such time that an alternative system was in place, industry would have no access to these SABS standards. The Southern African edition of Civil Engineering Standard System of Measurement (CESMM3) has now been published and can be used with any specifications whether they be standardised or bespoke and with any of the forms of contract in use in South Africa. This has addressed the concerns that were raised.

What is agreed is that SABS 1200 is very outdated and is in need of a major overhaul. What is also clear is that there are well thought out modern alternatives to SABS 1200 which can be used. One has to question why SABS should invest in updating the SABS 1200 / SABS 0120 system when all that is outstanding is the completion of the piling and roadwork parts of SANS 2001 to modernize civil engineering construction practices. It is also not good practice to have two series of national standards covering substantially the same subject matter – it defeats the objective of standardization. Industry needs to move on from SABS 1200.

Kind regards



**Dr Ron Watermeyer**

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**Briefing**

## The changing landscape for civil engineering contracts: moving on from SABS 1200

### 1 Introduction

Dr Martin Barnes, the originator of the NEC Engineering and Construction Contract, in his Smeaton Lecture (1999), pointed out that virtually no civil engineering was carried out in the UK after the Romans left until the seventeenth century; the two notable major works being the Exeter Ship Canal (1567) and the drainage the Fens. This all changed between the 1760s and the 1850s. John Smeaton, who is often regarded as the founder of civil engineering and whose largest project was the Forth and Clyde Canal linking the East side of Scotland to the West, developed his approach to managing works. In 1768 he set down his management scheme for the construction phase with detailed tables of responsibility. His team comprised the engineer in chief, the resident engineer and the 'surveyors' for the various geographical sections working under him, and contractors (as opposed to direct labour). This "master – servant" model has remained in use for the majority of civil engineering projects for more than two hundred years and is still used on projects managed in the traditional way.

Sir Joseph Bazalgette, who was responsible for constructing the major sewer projects and the embankments on the Thames in London, developed a standard form of contract in the 1860s which was adopted by the Metropolitan Board of Works. This form of contract remained as the principal model for contracts for more than a hundred years and was the model for the first edition of the ICE contract published in 1945. The 1945 ICE form of contract in turn served as a model for forms of contract in many parts of the world including South Africa, entrenching the master servant relationship into civil engineering practice.

### 2 The 1970's approach to civil engineering contracts

#### 2.1 Overview

Civil engineering works were delivered during the 1970s using the traditional preplanned approach to delivery which required that the design and specifications be adequately developed and approved by clients before tenders were invited and contractors appointed.

The 1970 approach to civil engineering contracts is set out in a number of documents, all of which were published during the 1970s and early 1980s, namely:

- General Conditions of Contract for Use in Connection with Works of Civil Engineering Construction (Fifth edition) (GCC 1982).
- South African Association of Consulting Model Form 1 All Disciplines, Articles and Conditions of Agreement
- Civil Engineering Quantities (Third edition) (CEQ73)
- SABS 1200, *Standardised specification for civil engineering construction*

- SABS 0120, *Code of practice for use with standardised specifications for civil engineering and contract documents*

## 2.2 GCC 1982

This form of contract reflected the master – servant thinking of the day. For example, the general obligations of the Contractor were to *execute, complete and (where specified) maintain the Works in strict accordance with the Contract and to the **satisfaction of the Engineer** and shall comply with and adhere strictly to the **Engineer’s instructions and directions** on any matter (whether mentioned in the Contract or not)*. Another example of this philosophy may be found in the dispute resolution provisions which required disputes between the Employer or the Engineer and the Contractor to be referred to and settled in the first instance by the Engineer and thereafter through a mediator.

Monthly payment were based on the Engineer’s estimated value of the work measured in terms of the schedule of quantities. The works were measured in accordance with the procedures set forth in the Standard System of Measurement of Civil Engineering Quantities except where otherwise stated in the specifications or the detailed descriptions of the work items in the schedule of quantities.

## 2.2 SAACE Model Form 1

This Model Form of Agreement for engineering services established, amongst other things, the Consulting Engineer’s responsibilities to the client. This Model Form also reflected the thinking of the day - *the Consulting Engineer shall exercise two distinct and separate functions in terms of these Conditions. He is the Client’s agent employed to use his skill and knowledge to do what the Client himself chooses not to do, i.e. report on, design and to administer the construction of the Works. In terms of the Contract between the Client and the Contractor he is the Engineer who is to **act as an adjudicator** and the limitations of his power in this respect are defined by the terms of the contract. There is no contract between the Consulting Engineer and the Contractor. The Consulting Engineer is **obliged to “hold the scales” fairly** between the Client and the Contractor and to **act in accordance with the ethics and general practices of his profession**.*

## 2.3 CEQ73

CEQ73 states that *“The Schedule of Quantities is a list of items giving the estimated quantities and **brief** descriptions of the work to be performed and materials to be provided under the Contract, the quantities and the descriptions being derived from the drawings and specification and space being provided for the insertion of price rates against each item and the extension and totalling of the prices”*.

Schedule of Quantities prepared in accordance with the CEQ73 were expected to provide:

- tenderers with adequate information regarding the extent of the work required to enable them to accurately and confidently prepare tenders which could then be readily compared with other tenders; and
- a sound basis for the valuation of work carried out at any stage of a contract.

CEQ73 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.”*

CEQ73 established units and methods of measurement in Chapter VII under the headings scope, general principles, units of measurement, separate items, descriptions, unit rates and general remarks. The section “unit rates” itemised what should be included in the unit rates i.e. it gave guidance on what the tenderer should include in his tendered rates.

## 2.4 SABS 1200 Standardised specifications

The preface to SABS 1200 states that “*the prime purpose in the production of these standardized specifications was to arrive at a set of standard and unambiguous documents acceptable to employer, engineering, and contractor bodies, and thereby to save money through lower contract prices and to reduce the number of engineering hours spent in administering contracts by establishing, for all classes of civil engineering construction, practical standards of workmanship and administrative control that would be adequate but not excessive and with which all parties would in due course become familiar.*” Prior to the publication of SABS 1200, no standardised specifications for civil engineering works existed in South Africa. Each client or firm of consultants had their own bespoke set of specifications and applied their interpretation of the standard system of measurement for civil engineering quantities in the form of CEQ73.

Each part of SABS 1200 was drafted around the standard set of headings contained in SABS 0120-1. SABS 1200-A, *General*, or SABS 1200-AA, *General (Small Works)*, were developed as supporting specifications for all other parts of SABS 1200. These parts of SABS 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 subclause 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 Engineers .....*”

The clauses on Measurement and Payment are divided into Principles and Scheduled Items. The scheduled items create standard text which may be readily included in a schedule of quantities. What is covered in the rate or sum for a scheduled item **is specified in detail**. Accordingly, any change to what is usually included in a scheduled item needs to be stated in the Project Specifications. This introduced uncertainties in the application of the measurement system – does one provide everything that is necessary to achieve the finished (permanent) work or does one provide what is specified for the item in clause 8 of SABS 1200. It also requires the clause 8 of SABS 1200 to be read with the Project Specification.

SABS 1200 is based on the master - servant thinking of the day. The specifications assign duties to the Engineer and the Contractor. Terms such as the “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” are frequently encountered in the standards. This **introduces subjectivity and uncertainty** as to what the actual requirements are. How can a Contractor price something for which he is at the mercy of the Engineer?

SABS 1200 is also developed around the design by employer strategy i.e. a contracting strategy whereby a **contractor undertakes only construction on the basis of full designs issued by the employer**. The specifying of the responsibilities of the engineer and contractor not only locks the specifications into this contracting strategy but also makes subcontracting difficult as the Engineer is an agent of the Employer and not the Contractor.

## 2.5 SABS 0120 Code of Practice

SABS 0120 provides guidance on the compilation of contract documents where use of the SABS 1200 specification is made. This code of practice, which was first published in 1981, comprises 5 Parts viz:

- Part 1, *Format and contents*
- Part 2, *Project specification*
- Part 3, *Guidance for design*
- Part 4, *Typical schedule of quantities*
- Part 5, *Contract administration*

SABS 0120-1 covers the format and contents of project specifications, standardized specifications and particular specifications which, together with schedules of quantities, are required in the preparation of contract documents. It requires that the headings in a standardised or particular specification be provided in a specific sequence i.e. Scope, Interpretation, Materials, Plant, Construction, Tolerances, Testing and Measurement and Payment.

SABS 0120-1 also requires contract documents to be developed using the following sequence:

- Cover and introductory pages
- Conditions of tender
- Schedule of drawings
- General conditions of contract
- Special conditions of contract
- Specifications
- Schedule-of quantities
- Data sheets (details of certain materials which the contractor is to supply under the contract or of the types of plant which he proposes to employ).
- Tender
- Appendix to tender
- Bonds

SABS 0120-2 provides guidance on the preparation of the two portions of a project specification – Portion 1 which covers the description of the works and includes general matters affecting the project and Portion 2 which covers variations and additions to the standardised specifications which form part of a contract. SABS 0120-3 covers matters which should be dealt with by the project engineer or the senior design engineer i.e. aspects of design that were assumed in the framing of the relevant SABS 1200 specifications and aspects of the design which must be considered in the control of work executed in terms of a relevant SABS 1200 specification.

SABS 0120-4 covers typical schedules of quantities relating to the work covered by standardised specifications and provides a uniform framework within which a schedule of quantities may be developed. This part of SABS 0120 requires the following wording to be included in the preamble to a schedule of quantities:

*Descriptions in the schedule of quantities are abbreviated and the schedule has been drawn up generally in accordance with the latest issue of Civil Engineering Quantities. Should any requirement of the measurement and payment clause of the applicable standardised specification, or the project specifications, or the particular specification **conflict** with the terms of the schedule or, when relevant, Civil Engineering Quantities, **the requirements of the standardised, project or particular specification, as applicable shall prevail.***

SABS 0120-5 covers recommendations and suggestions intended to assist the engineer and the contractor in executing work covered by the standardised specifications.

## **3 The changes brought into civil engineering contracts during the 1990s**

### **3.1 GCC 1990**

The sixth edition of the General Conditions of Contract for Works of Civil Engineering Construction was published in 1990. GCC 1990 started to soften the master – servant relationship. The Engineer's function was described as being to *administer the contract as agent of the Employer in accordance with the provisions of the Contract. Whenever the Engineer intends, in terms of the Contract, to exercise any discretion, or make or issue any ruling, contract interpretation or price determination, he shall first allow the Contractor a reasonable opportunity of submitting to him representations relating to the matter concerned and he shall decide thereon as agent of the Employer but by the application of his own independent judgement and professional standards.* It also changed the obligation of the Contractor regarding the provision of the works from *"in strict accordance with the Contract and to the satisfaction of the Engineer"* to as *"specified in or reasonably inferred from the Contract"*

GCC 1990 made provision for the design of the permanent works by the Contractor, but retained monthly measurement by the Engineer based on a schedule of quantities. It required that the work be measured in accordance with the methods and procedures described in the contract or failing which in accordance with the standard systems of measurement laid down in the SABS 1200 Standardised Specifications.

### **3.2 Civil Engineering Quantities 1990**

Civil Engineering Quantities 1990, *A Guide for Determining and Using Quantities for Civil Engineering and Construction Contracts*, was published in 1990 as a companion to SABS 1200, SABS 0120-4 and GCC 1982. CEQ90 became necessary as the largest portion of CEQ73, namely chapter VI (units and methods of measurement), were incorporated into SABS 1200 and need to be removed. The bulk of CEQ90 was accordingly dedicated to the recommend method of booking dimensions from drawings, taking off quantities and listing the quantities in a formal schedule of quantities that quantifies the work to be done for a civil engineering works contract. Accordingly, CEQ 1990 is a companion document to the standard system of measurement embedded in chapter 8 of each part of SABS 1200 and cannot stand as a standard system of measurement in its own right.

### **3.3 Procurement reform**

The South African government embarked upon a procurement reform process during 1995. The *Green Paper on Public Sector Procurement Reform in South Africa* (1997) recognised that *"currently methods of measurement are incorporated in civil engineering construction standards and this presents a barrier to the standardisation of specifications."* It proposed that *"there should be complete separation in contract documentation between conditions of tender, conditions of contract specifications and terms of payment (including methods of measurement)."*

The *Recommendations on Refinements in Public Sector Procurement Policy, Practices and Procedures in the Construction Sector* made by Focus Group 6 (an industry group of interested parties) to the Inter-ministerial Task Team for Construction Industry Development confirmed this position in 2000 following an intense series of meetings with the teams' secretariat – *"There must be a complete separation in such documentation between conditions of tender, conditions of contract and specifications. Terms of payment must not be included in the specifications."*

### **3.4 New International forms of contract**

The New Engineering Contract (NEC) was launched by the Institution of Civil Engineers in 1995. This innovative form of contract was drafted on a relational contracting basis, based on the belief that collaborative working across the entire supply chain optimises the likely project outcomes when compared with a typically fragmented and non-integrated approach to designing and constructing projects. The NEC3 contracts are accordingly designed to encourage collaboration and teamwork rather than a confrontational approach to the management of a contract. This changed the master – servant relationship to a simple collaboration between two specialist contributors.

The International Federation of Consulting Engineers (FIDIC) brought out a new family of contract in 1999. The role of the Engineer in these forms of contract was confined to performing duties assigned to him in terms of the contract and duties were placed on the Contractor to promptly give notice to the Engineer of specific probable future events which may adversely affect the work, increase the contract price or delay completion. The FIDIC 1999 contracts also signalled a departure from the adversarial relationships embedded in the traditional master - servant relationship model.

Both of these families of contracts allowed the Contractor to assume design responsibilities for the permanent work. These forms of contract provided alternative pricing strategies to enable design and construct or develop and construct contracting strategies to be implemented as a bill of quantities is not suitable for use in such contracting arrangements.

### **3.5 Amendment to SABS 1200 and SABS 0120**

Very few amendments of a very minor nature were made to Parts D (earthworks), DA (earthworks – small works), H (structural steelwork) during 1990 whilst Parts DK (gabions and pitching), M (roads general), MFL (base light pavement structures) were either revised or published during 1996.

No amendments during the 1990s were made to the 1986 editions of the supporting specifications SABS 1200A and SABS 1200AA which apply to all the other parts, despite the publication of CEQ90. The master – servant relationship embedded in GCC 1982 remained in the SABS 1200 standards as well as the assigning of responsibilities to the Engineer and Contractor for a design by employer contracting strategy.

Very few revisions were made to parts of SABS 0120 during this period.

## **4 The changes brought into civil engineering contracts post 2000**

### **4.1 CIDB Standard for Uniformity in Construction Procurement**

The Construction Industry Development Board, drawing upon the work of the Inter-ministerial Task Team for Construction Industry Development, published the Standard for Uniformity in Construction Procurement during 2004. This standard confined the selection of a form of contract for construction works to GCC and the FIDIC, JBCC and NEC families of contracts. It also established a standard for the formatting and compiling of procurement documents which was more fully described in SANS 10403 (2003), *Formatting and compilation of construction procurement documents*. This standard required that component document be as follows:

- Tendering procedures (Tender Notice and Invitation to Tender and Tender Data)
- Returnable Documents (List of Tender Returnable Documents, Returnable Schedules)
- Contract (Agreements and Contract Data, Pricing Data, Scope of Work and Site Information)

The Pricing Data is broken down into Pricing Assumptions and Pricing Schedules / Activity Schedules / Bills of Quantities. The 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 requirements and constraints relating to the manner in which the contract work is to be performed*.

### **4.2 Next generation of South African National Standards**

The SANS 2001 and SANS 1921 families of standards were developed to replace SABS 1200. All reference to the responsibilities of the Engineer and the Contractor were removed from the text and no measurement and payment items were included. This enables these standards to be used with any pricing or contracting strategy at main or subcontract level and with any conditions of contract in an objective manner.

The SANS 2001 family of standards, parts of which were published from 2005 onwards, provides technical descriptions of the standard of materials and workmanship that will be used in the works that are executed or in the performance of the works when completed (or both). 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. All the standards relating to structural materials (masonry, timber, concrete and steel), site clearance, general earthworks and pipelines have been published. These standards incorporate the new standards that have been published since SABS 1200 was developed e.g. cement and pipe standards. All that remains is the conversion of the piling and roadworks specifications to the new format and to revision of these standards to reflect current standards and practices.

SANS 1921, all six parts of which were published in 2004, describe generic construction and management requirements for engineering and construction works i.e. the constraints to providing the works.

Annex D of SANS 10403 provides comprehensive guidance on the items which should be addressed in the scope of work. Parts of SANS 1921 and SANS 2001 enable a large portion of the scope of work to be developed by reference to these standards and the completion of specification data which make these generic specifications contract specific. Annex A of these standards provide comprehensive guidance on the preparation of specification data.

### **4.3 GCC 2004 and GCC 2010**

In 2004, SAICE published the General Conditions of Contract for Construction Works which removed all reference to SABS 1200 and simply stated that “*All the work shall be measured in accordance with the provisions of the Pricing Data.*” This approach has been retained in the 2010 edition of this document. The adjudicator role of the Engineer has been retained, but the scope of matters being referred to the Engineer for resolution further diminishing in the 2010 edition.

### **4.4 CESMM3**

Industry representatives met during 2008 to discuss the way forward regarding a standard system of measurement should SABS 1200 be withdrawn. The Civil Engineering Standard Method of Measurement published by the Institution of Civil Engineers (ICE) (London) (CESMM3) became a logical choice as a base document for the successor to the current system of measurement embedded in the SABS 1200 as it is a document founded on the same thinking and philosophy as the system that has evolved in South Africa and is widely used in Africa. There were, however, a number of issues relating to terminology, references to BS standards and regional earthworks practices (excavation of trenches and temporary earthworks) that needed to be addressed to make CESMM3 suitable for use in Southern Africa. ICE granted permission for the customisation of CESMM3.

Work on the CESMM3 was suspended due to delays in the publication of SANS 2001 as it was felt that there needed to be a critical mass of SANS 2001 standards available before launching CESMM3. A Southern African version of CESMM3 was launched in 2011 following its finalisation by industry. This edition of CESMM3 aligns with the terminology used in the CIDB Standard for Uniformity in Construction Procurement and may be used with any form of contract in use in South Africa.

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 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.

## 5 The future of SABS 1200

The conversion of SABS 1200 to SANS 2001 and SANS 1921 has been a long and frustrating process. All six parts to SANS 1921 were published well before the first part of SANS 2001 was published in 2007. Most of the pipeline standards were stable and ready for processing during the early half of 2008, but were only finally published at the end of 2010 with very minor adjustments.

The foreword to the SANS 2001-CC1 (2007), *Concrete works (structural)*, which was published in 2007, states that this standard replaced and cancelled SABS 1200G, GA, GB, GE and GF. This caused some confusion as the system of measurement was still embedded in SABS 1200 and until such time that an alternative system was in place, industry would have no access to these SABS standards. At the April 2009 meeting of the TC59 *it was agreed that the SANS 1200 standard that are withdrawn will be re-published as technical specifications so that they will still be available to the industry.*

Issues were again raised during 2010 at a TC 59 meeting. The TC59 agreed to meet and discuss these issues in detail. The SABS secretariat, however, decided not to convene a meeting with industry stakeholders and experts but to rather conducted a straw poll without consulting TC 59 on the matter or contextualizing the issues – *“SABS is now proposing that we continue to support, develop and maintain the SANS 1200 series of Standards. These would be developed in parallel with the SANS 2001 docs, so that end users have a choice of which to use.”* This was done without considering what the new look SANS 1200 would look like and answering basic questions such as *would it continue with the master – servant approach, would it be sufficiently flexible to accommodate any contracting and pricing strategy, would it be suitable for use in subcontracts, how will the ever increasing constraints imposed to delivering the works be handled, will measurement and payment clauses be separately published in another document, will supporting documentation be required etc?* What also needs to be considered is SABS’s capability and capacity to undertake this work. It is not a simple matter of updating a few clauses, modifying a few references to standards and changing SABS to SANS. A fundamental overhaul is required.

It is clear that SABS 1200 has served its purpose and run its course. One must move on. The question is ***will industry move on or resist change?***