national treasury

Department:
National Treasury
REPUBLIC OF SOUTH AFRICA

OFFICE OF THE CHIEF PROCUREMENT OFFICER COST MODEL FOR THE ESTABLISHMENT OF CONTROL BUDGETS FOR PRIMARY AND SECONDARY SCHOOLS

This document was developed in consultation with the Department of Basic Education

8 June 2015

Contents

COST MODEL FOR THE ESTABLISHMENT OF CONTROL BUDGETS FOR PRIMARY AND SECONDARY SCHOOLS

1 Background to the cost model

The National Policy for an Equitable Provision of an Enabling School Physical Teaching and Learning Environment was gazetted on 11 June 2010 to guide the provision of suitable enabling environments for all learners in South Africa. The Department of Basic Education (DBE), following a consultative and participative process in response to this policy, published:

1) a menu of prototype designs of small, medium and large primary and secondary schools, with and without waterborne sanitation, to meet the required typology of schools;

2) a cost model based on elemental costs associated with the menu of prototype designs which enabled the estimated costs to be established in any of the 9 provinces; and

3) a design manual to assist all role-players involved in the planning, budgeting, design, procurement and implementation of schools infrastructure.

The menu of prototype designs for schools is classified into primary (schools which offer grades R to 7 or grades within this range) and secondary schools (schools which offer grades 8 to 12 or grades within this range). Both these classifications are further broken down into three types of schools small, medium and large, based on the number of learners.

Schools, based on the prototype designs, are furthermore classified in terms of their sanitation systems as follows:

- "Wet" schools which are provided with conventional flush toilets with a permanent water supply and sewage connection into a municipal main, septic tank or conservancy tank; and

- "Dry" schools which are provided with Ventilated Improved Pit Toilet (VIP) or any other type of alternative dry sanitation system and drinking water from tanks.

The menu of prototype drawings provides drawings for each of the individual buildings which make up a school as stand-alone buildings as well as a typical site layout for each type of new school. This enables different combinations and configurations to be provided on a wide range of sites. It also enables a new school as a whole to be constructed or one or more new buildings within an existing school to be constructed.

The Minister of Basic Education gazetted Minimum Uniform Norms and Standards for Public School Infrastructure in terms of the South African Schools Act of 1996 (Act No. 84 of 1996) on 29 November 2013. These norms establish requirements for universal access, the siting and identification of schools, categories of school areas and their sizes, class rooms, electricity, water, sanitation, library, laboratories for science, technology and life sciences, sports and recreational facilities, electronic connectivity, perimeter security and school safety and design considerations for all educational facilities. These regulations also require that the planning and design of all new schools and additions, alterations, and improvements to schools comply with all relevant laws including the National Building Regulations and the Occupational Health and Safety Act.

These gazetted Norms and Standards in addition to providing norms and standards for public schools establish timeframes within which school infrastructure backlogs must be eradicated as indicated in Table 1. Minimum requirements for education, education support and administrative areas, parking bays, toilets and sports facilities are indicated in Table 2.

Table 1: Infrastructure backlogs and timeframes for addressing such backlogs

<table>
<tr><th>Priority</th><th>Description</th><th>By when</th><th>Norms and standard</th></tr>
<tr><td>1a</td><td>Replacement of all schools built entirely from mud or other inappropriate materials</td><td>November 2016</td><td>See Table 2 for packages of educational areas</td></tr>
<tr><td>1b</td><td>All those schools that do not have access to any form of power supply, water supply or sanitation</td><td>November 2016</td><td>Forms of power supply include one or more of the following:
(a) grid electrical reticulation;
(b) generators;
(c) solar powered energy; or
(d) wind powered energy sources.
Sources of water supply include one or more of the following:
(a) a municipal reticulation network;
(b) rain water harvesting and, when so required, tanker supply from municipalities;
(c) mobile tankers;
(d) boreholes and, when so required, tanker supply from municipalities; or
(e) local reservoirs and dams.
Sanitation facilities(see Tables 3 and 4) include one or more of the following:
(a) waterborne sanitation;
(b) small bore sewer reticulation;
(c) septic or conservancy tank systems;
(d) ventilated improved pit latrines; or
(e) composting toilets</td></tr>
<tr><td>2</td><td>Norms and standards relating to the availability of classrooms, electricity, water, sanitation, electronic connectivity and perimeter security</td><td>November 2020</td><td>Class rooms to have a minimum area and number of learners as follows:
<table>
<tr><th rowspan="2">Type</th><th colspan="2">Square metres per</th><th rowspan="2">Max learners</th></tr>
<tr><th>Learner</th><th>Educator</th></tr>
<tr><td>Grade -R</td><td>1,6</td><td>7,0</td><td>30</td></tr>
<tr><td>Grade 1-12</td><td>1,0</td><td>7,0</td><td>40</td></tr>
<tr><td>Learners with disabilities</td><td>2,0</td><td>-</td><td>-</td></tr>
</table>
See priority 1a for electricity, water and sanitation norms and standards.
The following electronic connectivity facilities must be provided:
(a) telephone facilities;
(b) fax facilities;
(c) internet facilities; and
(d) an intercom or public address system.
Every school site, which includes all school outbuildings and sporting and recreational facilities, must be surrounded by appropriate fencinq to a minimum height of at least 1,8 meters
School buildings must have at least one form of safety and security measure, such as the following:
(a) burglar proofing to all opening window sections on all ground floor buildings that are accessed by learners and educators;
(b) a security guard arrangement; or
(c) an alarm system linked to a rapid armed response, where available.</td></tr>
</table>

3	Libraries and laboratories for science, technology and life sciences	November 2026	All schools must have a school library or a multimedia centre All schools that offer science subjects must have a laboratory
4	All other norms and standards	December 2030	See Table 2

Table 2: Minimum package of educational areas for each type of school

Description		Minimum unit size norm (useable area) (m^2)	Primary (Grade 1 to 7)						Secondary (Grade 8 to 12)		
			Micro (<135)			Small (135 – 310)	Medium (311 – 620)	Large* (621-930)	Small (200 – 400)	Medium (401 – 600)	Large* (600 – 1000)
			Small	Medium	Large						
Education areas	Grade R class room	60 + 12	1	1	1	As per enrolment					
	Classrooms plus storage area	48 + 12**	1-2	2-4	4-6	4 - 8	8 - 16	16- 24	5-13	10 -15	15 -25
	Multimedia centre plus storage area	80 +12				1	1				
	Science laboratory plus storage area	60 +12				1	1	1	1	1	1
	Multipurpose classroom plus storage area	60 +12	1	1	1	1	1	1	1	1	1
	Computer room plus storage area	60 +12						1	1	1	1
	Library	60 +12						1	1	1	1
Education support areas	Nutrition centre (kitchen + food storage + dining room)	15 + 12 +100	1 off where National Schools Nutrition Programme is implemented								
	Counseling room	15						1			1
	Sick room	15				1	1	1	1	1	2
Administrative areas	Principal's office	20	1	1	1	1	1	1	1	1	1
	Deputy principal office	15					1	1		1	2
	Admin office	20	1	1	1	1	1	1	1	1	1
	Reception areas	15						1			1
	Storage areas for administrative purposes	15						1		1	1
	Strong room	10	1	1	1	1	1	1	1	1	1
	Staff room	60		1	1	1	1	1	1	1	1
	Staff kitchenette	12	1	1	1	1	1	1	1	1	1
	HODs office	15				1	2	3	1	2	4
	Printing room	15				1	1	1	1	1	1
Other	Covered dining area	none	1	1	1						

*mega schools have more classrooms than large schools
** classrooms with specific curricula choices may require larger areas (see Table 6)

Table 2 (concluded)

Description	**Minimum unit size norm** (useable area) **(m^2)**	**Primary (Grade R plus 1 to 7)**						**Secondary (Grade 8 to 12)**		
		Micro (<135)			**Small (135 – 310)**	**Medium (311 – 620)**	**Large* (621-930)**	**Small (200 – 400)**	**Medium (401 – 600)**	**Large* (600 – 1000)**
		Small	**Medium**	**Large**						
Parking bays	not applicable	Parking bays as per post establishment								
Toilets	not applicable	See Tables 3 and 4								
Areas for physical education, sport and recreation	not applicable	Areas where physical education, sporting and recreational activities can take place								

Table 3: Sanitation requirements for primary schools

Enrolment range	Enrolment per gender	Girls toilet	Girls' basin	Boys' toilets	Boys' urinals	Boys' basins	Unisex grade R toilets	Grade R basins	Unisex disabled toilets & basins	Female staff toilets	Female staff basins	Male staff toilets	Male staff urinals	Male staff basins	Total toilets (toilets plus urinal)
0-25	0-13	2	1	1	1	1	0	0	1	0	0	1	0	0	6
26-65	13-33	2	1	1	1	1	0	0	1	0	0	1	0	0	6
66-134	33-67	3	2	1	2	1	2	1	1	1	1	1	0	0	11
135-310	68-155	6	4	2	4	2	3	2	1	2	1	1	1	1	20
311-620	156-310	8	6	4	4	2	4	3	1	2	1	1	1	1	25
621-930	311-465	10	6	4	6	3	5	3	2	3	2	1	2	2	33
931-1240	466-620	12	8	6	6	4	5	3	2	3	2	1	2	2	37

Table 4: Sanitation requirements for secondary schools

Enrolment range	Enrolment per gender	Girls toilet	Girls' basin	Boys' toilets	Boys' urinals	Boys' basins	Unisex disabled toilets & basins	Female staff toilets	Female staff basins	Male staff toilets	Male staff urinals	Male staff basins	Total toilets (toilets plus urinal)
0-100	0-50	2	1	1	1	1	1	0	0	1	0	0	6
101-200	51-100	4	2	2	2	2	1	1	1	1	0	1	11
201-400	101-200	6	4	2	4	2	1	2	1	1	1	1	17
401-600	201-300	8	6	4	4	3	1	2	1	1	1	1	21
601-800	301-400	10	6	4	6	3	1	2	1	1	1	1	25
800-1000	401-501	12	8	4	6	3	2	3	2	1	2	2	30
1000-1200	501-600	14	8	6	6	4	2	3	2	1	2	2	34

COST MODEL FOR THE ESTABLISHMENT OF CONTROL BUDGETS FOR PRIMARY AND SECONDARY SCHOOLS

An announcement following consultation with the Minister of Basic Education was made during the Minister of Finance's 2015 budget speech that "*with effect from May this year, all school building plans will be standardised and the cost of construction will be controlled by the Office of the Chief Procurement Officer. Too often, and for too long, we have paid too much for school building projects.*"

As a result of this announcement the office of the Chief Procurement Officer (OCPO) was required to investigate and develop cost control measures which will enable the state to realise value for money in the delivery of new schools and the provision of additional buildings at existing schools.

The office of the Chief Procurement Officer (OCPO) has in consultation with the Department of Basic Education (DBE) developed a cost model which establishes a control budget for the provision of new schools (small, medium and large primary and secondary) and additional buildings on existing schools. This cost model is based on the menu of prototype designs and the cost model developed by the DBE during 2011 and is aligned with the Minimum Uniform Norms and Standards for Public School Infrastructure published in terms of the South African Schools Act, 1996. It takes into account a number of common variables, namely differences in costs associated with building construction in different provinces, different sanitation options, site constraints, founding conditions and price inflation.

2 Overview and implications of the National Treasury Instruction for controlling costs

The purpose of Treasury Instruction No 02 of 2015/2016: *Cost Control Measures for the Construction of New Primary and Secondary Schools and the Provision of Additional Buildings at Existing Schools* Cost is to establish the manner in which the costs associated with the delivery of new schools and the provision of additional buildings at existing schools may be controlled in terms of the subsections 6(1)(g) and 6(2)(a) of the Public Finance Management Act of 1999 (Act No1 of 1999).

The requirements of the National Treasury Instruction are as follows:

"3.1 Those responsible for the planning, designing and procuring of a new school or additional school buildings for an existing school must:

(a) comply with the provisions of the Minimum Uniform Norms and Standards for Public School Infrastructure published in terms of the South African Schools Act, 1996, (Act No. 84 of 1996) Government Gazette No 37081 of 29 November 2013; and

(b) provide a suitable enabling environment for learners within the control budget generated by the National Treasury cost model.

3.2 The organ of state or the school governing body established in terms of section 16 of the South African Schools Act, 1996 (Act No. 84 of 1996), responsible for procuring and delivering new schools or additional buildings within existing schools must:

(a) proactively manage the progressive development of a project against the control budget generated by the National Treasury cost model by means of the package planning, detailed design and site processes and take the necessary action to keep the project costs within such budget;

(b) use the cost model as a benchmark prior to going to the market;

(c) must reserve the right to reject bids or negotiate with bidders where the costs are excessive and beyond the estimated control budget;

(d) continuously monitor the project expenditure against the control budget during project execution; and

(e) within 4 months after the project was brought to completion (i.e. reaching a state of readiness for the occupation of the whole of the works although some minor work may be outstanding):

i) calculate the final cost for the project (total cost of new school or total cost of additional buildings provided for an existing school within the scope of the cost model) using the latest version of the National Treasury cost model for schools and applying the price adjustment for inflation indices during the month that completion was achieved;

ii) obtain the cost of the works, professional fees and implementing agent services, if any, including VAT, covered by the control budget, certified by a professional quantity surveyor registered in terms of the Quantity Surveying Professions Act, 2000 (Act No. 49 of 2000);

iii) compare the certified cost against the control budget; and

iv) where the final cost exceeds the control budget, submit a report prepared by a professional quantity surveyor registered in terms of the Quantity Surveying Professions Act, 2000 (Act No. 49 of 2000) in the prescribed format (Annexure A) to the National Treasury or relevant Treasury. This report must substantiate and motivate the reasons for exceeding the control budget and accounts for such overrun.

3.3 Such reports provide National Treasury the opportunity to interrogate cost overruns on individual projects, track trends, effect any necessary changes to the cost model and, where appropriate, take corrective action to ensure that future projects delivered by an implementer provide value for money."

The purpose of a control budget for the development of new schools and the upgrading of existing schools is to introduce into the funding allocations and briefing of those responsible for planning, designing and procuring schools the concept of value for money i.e. the optimal use of resources to achieve intended outcomes. Value for money will be achieved should the total cost (costs of implementing agent services, professional fees and construction costs) for the development of new schools and the upgrading of existing schools not exceed the control budget established by the model. Projects which exceed the control budget for reasons which are acceptable to the OCPO or relevant treasury also deliver value for money.

The cost control measures will change the current delivery culture from a "*pay for what is designed*" to "*deliver infrastructure within an agreed budget*". This is a significant culture shift within government and its service providers. It will require implementers to exercise continuous budget control from the inception of a project through to its completion in order to achieve value for money outcomes. The Infrastructure Delivery Management Systems (IDMS) illustrated in Figure 1 provides a control framework for the planning, design and execution of infrastructure projects, the tracking of projects and the monitoring of performance. Package information (the brief, the documentation, the schedule and the cost plan) needs to be consciously confirmed or adjusted at the control points (end of stage) associated with the package planning and design development stages. This provides education departments with a tool to manage the final cost of projects within the control budget established for a specific project.

3 Basis of cost norms

The standard book of prototype designs provides a number of standard elemental designs for various types of buildings which make up a school with waterborne (“wet”) or non-waterborne (“dry”) means of sanitary disposal including:

- standard classrooms;
- grade R classrooms (where relevant);
- multimedia centres;
- science laboratories;
- multipurpose classrooms;
- computer rooms; and
- libraries.

The aforementioned elemental designs are integrated with storage areas, ablutions facilities in schools which are provided with a waterborne means of sanitary disposal and offices for heads of department.

Standard elemental designs are also provided for:

- nutrition centres;
- groupings of administrative areas such as principal and deputy principal offices, administrative offices and reception areas, strong rooms, printing rooms etc. and educational support areas such as sick rooms and counselling rooms;
- tuck shop areas and change rooms and
- caretaker rooms and security rooms.

The typical site layouts provide illustrative examples of how these various types of buildings may be arranged on an ideal site (rectangular with an aspect ratio of around 1,5) of 2,8 ha and 4,8 ha for primary and secondary schools respectively. They also provide information regarding possible sports facilities, parking areas and paved surfaces between buildings.

This book of prototype designs, with some adjustments to the usable areas and number of toilets and groupings of administrative areas, is considered to be a reasonably efficient and pragmatic application of the Minimum Uniform Norms and Standards for Public School Infrastructure in the planning and design of an enabling environment for the different new school types. As such it serves as the basis for establishing the control budget for the development of new schools and the upgrading of existing schools.

Portfolio planning processes

Stage 1	Infrastructure planning
End of stage deliverable	**Infrastructure plan** – a plan which identifies long term needs and links prioritised needs to a forecasted budget for the next few years
Gate 1	Approved infrastructure plan

Stage 2	Strategic resourcing
End of stage deliverable	**Delivery and / or procurement strategy** - a document which contains in respect of each project or package the delivery strategy for a portfolio of projects and, where needs are met through own procurement system, the selected packaging, contracting, pricing and targeting strategy, and procurement procedure
Gate 2	Approved delivery and / or procurement strategy

Package planning processes

Stage 3	Preparation and briefing
End of stage deliverable	**Strategic brief** - a document defining project objectives, needs, acceptance criteria and client priorities and aspirations and which sets out the basis for the development of the concept report for one or more packages
Gate 3	Accepted strategic brief

Stage 4	Concept and viability
End of stage deliverable	**Concept report** – a document which establishes the detailed brief, scope, scale, form and control budget and sets out the integrated concept for one or more packages
Gate 4	Accepted concept report

Project terminated

Implementation

Works requiring detailed design processes

Implementation authorised

Works with sufficient information to proceed to site processes

Detailed design processes

Stage 5	Design development
End of stage deliverable	**design development report -** a document which develops in detail the approved concept to finalise the design and definition criteria, sets out the integrated developed design and contains the cost plan and schedule for one or more packages
Gate 5	Accepted design development report

Stage 6 Design documentation

Stage 6A	Production information
End of stage deliverable	**production information: -** the detailing, performance definition, specification, sizing and positioning of all systems and components enabling either construction (where the contractor is able to build directly from the information prepared) or the production of manufacturing and installation information for construction
Gate 6A	Completed and accepted production information for the works
Stage 6B	**Manufacture, fabrication and construction information**
End of stage deliverable	**manufacture, fabrication and construction information: -** information produced by or on behalf of the contractor, based on the production information provided for a package which enables manufacture, fabrication or construction to take place
Gate 6B	Manufacture, fabrication and construction information accepted as being in accordance with the production information

Site processes

Stage 7	Works
End of stage deliverable	Completed works which are capable of being occupied or used.
Gate 7	Completion certificate

Stage 8	Hand over
End of stage deliverable	Works which have been taken over by the user complete with record information
Gate 8	Record information Take over certificate

Close out

Stage 9	Package completion
End of stage deliverable	Works with notified defects corrected Outstanding monies settled
Gate 9	Defects certificate, final payment certificate and close out report

Note: a package is works which have been grouped together for delivery under a single contract or a package order issued in terms of a framework contract

Figure 1: Stages and gates within the delivery management process embedded in the IDMS

4 The model

4.1 Scope of model

The cost model provides a control budget for:

1) new schools; and

2) the upgrading of existing schools in respect of the:

   a) minimum education areas (the minimum teaching and learning areas in a school);

   b) education support areas (areas in a school that are required to create a healthy, safe and conducive school environment and to support the teaching and learning functions at a school); and

   c) administration areas (areas in a school that are used by the school management and staff for administration and management purposes and for the day to day running of a school).

The model does not cover micro primary schools with or without a waterborne means of sanitary disposal and excludes:

1) the furnishings of the spaces or the equipment other than toilets required to enable the facility to be utilised:

2) the provision of facilities at existing schools which are not listed in Table 2 or Table 6.

Table 6: Optional education spaces subject to curriculum choice

Type of classroom to suite curriculum choice	Minimum unit size norm for each type of classroom plus storage area allowance for new construction (m^2)
Arts and culture classroom; technology classroom and engineering graphics and design room.	60 + 12
Dance studies room; design room; dramatic arts room; music room; hospitality studies room; visual arts room; social sciences room and agricultural sciences room	80 + 12
Agricultural technology workshop; civil technology workshop; electrical technology workshop and mechanical technology workshop;	180 + 12

No allowance has been made in the model for:

1) facilities for learners with special education needs which comply with requirements related to the nature of the specialised support programme offered at a school and the level of support required at such school;

2) precautionary measures for schools located on class P sites (see Table A.2 of Annexure A) including those underlain by dolomite land (see Annexure B);

3) the decanting of learners and educators in existing schools during construction where

educational areas are replaced;

4) the demolition of inappropriate buildings which are no longer required;

5) the distance of the school from a regional centre and the condition of the roads serving such schools which can significantly increase the cost of transporting materials, equipment and people to the site, require accommodation for staff, etc.

The increase in costs above the control budget due to facilities for learners with special education needs, precautionary measures for schools located on class P sites or underlain by dolomite land, decanting and demolition and any other abnormally high cost needs to be reported to the OCPO on a case by case basis should the control budget be exceeded when construction has been completed.

4.2 Adjustments to the control budget permitted in terms of the model

Provision is made in the cost model to make adjustment in respect of the following:

1) Differences in costs associated with building construction in different provinces based on the reports issued by the Bureau for Economic Research and Medium Term Forecasting Associates which takes into account factors such as:

- materials costs (.e.g. transport costs from Gauteng manufacturers of construction materials and the existence of oligopolies or regional monopolies in the supplies of sand, stone, steel, cement, etc.);
- labour costs;
- composition of labour;
- building methods (e.g. cavity wall construction, corrosion protection of window and door frames etc. in certain coastal regions);
- market competitiveness (e.g. differences in workloads); and
- productivity (e.g. that caused by adverse weather conditions).

2) The nature of the land parcel available for a new school as certain sites may require double storey classroom construction.

3) Sites which have a waterborne sanitation means of sanitary disposal where the sewer does not connect to an existing municipal sewer require additional structures such as septic or conservancy tanks.

4) Site class designations other than C, S, H and R (see A2.2 of Annexure A) which will require additional precautionary measures of foundation designs to accommodate differential movement.

5) The average slope of the site exceeds 1:10 (see A.3 of Annexure A) which will require terracing.

4.3 Establishment of requirements

The starting point for the establishment of requirements is to identify:

1) the type of school i.e. primary or secondary;

2) the number of learners at the school enrolled as relevant in:

a) Grade R and Grades 1 to 7 (primary school only); and

b) Grades 8 to 12 (secondary school only).

3) the type of sanitation system i.e. waterborne means of sanitary disposal or non-waterborne means of sanitary disposal.

This information may then be used to classify the school as being small, medium or large primary school or secondary school (see Table 2 for number of learners in each school category), to calculate the number of Grade R classrooms, if any, that may be required, and to determine the sanitation requirements (see Tables 3 and 4).

The required education, education support and administrative areas can then be determined as follows:

1) Establish the number of classrooms that are required by dividing the number of learners (enrolment number) by:

   a) 40 in the case of Grade 1 to 12 classrooms; and

   b) 30 in the case of Grade R classrooms; and

   round the number of classrooms upwards.

2) Identify the number and type of minimum education areas which are required per school category as indicated in Table 2.

3) Identify the minimum number and type of toilets that are required, based on the school type (primary or secondary) and the number of learners from either Table 3 or Table 4, as relevant.

4) Establish whether or not a nutrition centre is required to implement the National Schools Nutrition Programme.

5) Identify the required optional education spaces (classrooms) linked to subject curriculum choices, if any.

Identify the areas of adjustment to the control budget to accommodate site specific circumstances (see 4.2).

The Excel spreadsheet calculator enables the control budget for a new school or the provision of additional buildings for an existing school to be readily calculated should the aforementioned variables be captured in the spreadsheet.

4.4 Professional fees and costs for implementing agent services

The control budget includes:

a) professional fees (i.e. the fees that are charged for built environment services which are performed by persons registered in terms of a statutory council which govern professions e.g. the Engineering Council of South Africa, the South African Council for the Architectural Profession, the South African Council for the Quantity Surveying Profession and the South African Council for the Project and Construction Management Professions); and

b) costs for implementing agency services, if applicable.

Annexure D provides an overview of these services.

4.5 Price adjustment for inflation

The following formula is used to calculate price adjustment for inflation:

Price adjustment for inflation (PAF):

$$= p_1 \frac{(L_{PEOP} - B_{PEOP})}{B_{PEOP}} + p_2 \frac{(L_{EQUIP} - B_{EQUIP})}{B_{EQUIP}} + p_3 \frac{(L_{P\&M} - B_{P\&M})}{B_{P\&M}} - p_4 \frac{(L_{FUEL} - B_{FUEL})}{B_{FUEL}}$$

where:

L = latest index

B = base index

and the proportions and indices used to calculate the Price Adjustment Factor are as indicated in Table 7.

Table 7: Indices used in the calculation of Price Adjustment

Proportion		***Index***		
variable	***value***	***identification***	***linked to index for***	***index prepared by***
p_1	*0.3*	PEOP	*People*	*"Consumer Price Index: index numbers and year on year rates " for index as published in the Statistical Release, P0141 Table B of Statistics South Africa*
p_2	*0,07*	EQUIP	*Equipment*	*Contract Price Adjustment Provisions (CPAP) Work Groups and Selected Materials Indices) for Construction machinery (excluding trucks) as published in the Statistical Release P0151 Table 4 of Statistics South Africa*
p_3	*0,45*	P&M	*Plant and materials*	*"Contract Price Adjustment Provisions (CPAP) Work Groups and Selected Materials Indices for buildings and construction (building industries) as published in the Statistical Release P0151 Table 3 of Statistics South Africa*
p_4	*0,03*	FUEL	*Fuel (Diesel)*	*"Contract Price Adjustment Provisions (CPAP) Work Groups and Selected Materials Indices for diesel at wholesale level (Witwatersrand) as published in the Statistical Release P0151 Table 4 of Statistics South Africa*
-	*0,15* *1.00*	***-***	***non-adjustable***	

The value of the latest indices can be obtained from Statistics South Africa. The base date indices are the February 2015 indices i.e.

B_{PEOP} = 111.5

B_{EQUIP} = 106.3

$B_{P\&M} = 115.4$

$B_{FUEL} = 85.2$

Annexure A: Extraordinary development conditions for schools

A.1 Introduction

Single and double storey buildings having concrete foundations and floors, masonry walls and timber roof trusses are the most commonly encountered form of buildings in South Africa. The design and construction of these types of buildings are standardised across South Africa. Standard regional adjustments are however necessary to accommodate different environmental conditions to provide suitable indoor climates in different climatic zones. In addition, site specific adjustments may need to be made to the standard technologies and construction methods which are used in the provision of infrastructure which supports schools or the erection of a building to accommodate extraordinary development conditions to ensure satisfactory performance. Accordingly, extraordinary development conditions refer to site characteristics which necessitate that some measures over and above the “norm” are required to ensure satisfactory building outcomes. Although the benchmark or “norm” is set by regulators for single storey buildings of masonry construction, extraordinary development conditions frequently necessitate that changes in the design and construction techniques in other building technologies are required to ensure the satisfactory performance of a building over its lifetime.

Extraordinary development conditions relate to climatic, topographic (natural ground slope of the site) and geotechnical (inherent geology) conditions. Certain geographic areas fall within the Southern Cape Coastal Condensation Areas (see Annexure C) where condensation can occur on the underside of metal roofing sheets, at ceiling level, window panes and walls or interstitially (e.g. in spaces and gaps between components).

A.2 Extraordinary geotechnical conditions

A.2.1 Dolomite land

Extraordinary development requirements relating to schools constructed on dolomite land is explained in Annexure B.

A.2.2 Site class designations

A.2.2.1 Introduction

Masonry is a brittle material with limited tensile strength which is susceptible to cracking arising from movements (small dimensional changes) which cannot be prevented but can be accommodated. Movements in masonry usually arise from one or more of the following:

- changes in temperature;
- changes in moisture content of near surface soil horizons which results in irreversible expansion in clay masonry units and drying shrinkage in concrete masonry units;
- absorption of water vapour which results in small reversible movements;
- deflection under loads; and
- ground movements and differential settlement.

Movements arising from changes in temperature and moisture content and the absorption of water vapour can be accommodated by providing movement joints in walls. Suitably positioned joints relieve the build-up of stresses and avoid cracking. Masonry members can be designed to limit deflections within tolerable limits.

Foundation movements are normally associated with changes in moisture content. Expansive soils undergo changes in volume due to changes in moisture content which manifests as swelling (heave) when the moisture content increases and shrinks when the moisture content decreases. Saturated compressible soils when loaded settle rapidly if the soil is free-draining, and gradually if it is not free-draining. Collapsible soils are stiff when dry but lose their ability to support loads when wet leading to sudden or collapse settlement.

Uniform ground movements generally do not cause damage to buildings, but may detrimentally affect service (water and sewer) pipe entries at the perimeter of structures. Non-uniform movements in soil tend to cause a “doming” profile or a “dishing” profile underneath a building as illustrated in Figure A.1 or loss of support at a corner or along a perimeter of a building.

Ground movements induce separations in masonry walls at damp proof courses with doming (hogging) and dishing (sagging) ground movements as shown in Figure A.1. Masonry will span, or in the case of sagging (dishing) movements tend to arch, across the separation if it has adequate strength to resist the induced tensile stresses. If not, it will crack and form a movement joint.

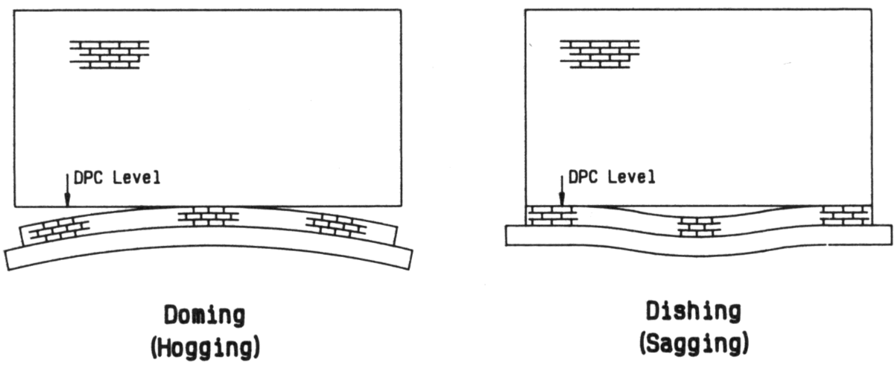


Figure A.1 – Behaviour of masonry wall subjected to doming and dishing movements

Damage caused by heave or shrinkage movements differs from that due to collapse or consolidation settlements. Generally, if no precautions are taken to reduce differential movements or to prevent conditions promoting potential movement from occurring in buildings of masonry construction, foundation movements will tend to result in:

1) on expansive soils
   - damage occurring throughout the building, the severity of the damage being greatest in the external walls or internally in the central portions of the building, depending on the moisture content of the soil preceding construction; and
   - cracks alternately opening and closing as a result of seasonal and climatic changes in the water content of the founding material.

2) on compressible soils
   - damage manifesting itself in a particular portion of the building, e.g. along a line traversing the building; and
   - cracks opening in time as subsequent settlement occurs.

3) on collapsible soils
- damage is localised in portions of the building as and when collapse settlement occurs, e.g. beneath foundations adjacent to leaking water pipes or adjacent to areas of poor drainage where surface ponding of rainwater occurs.

In the case of expansive soils, differential movements can also lead to the sticking or jamming of doors and windows.

A.2.2.2 Measures to accommodate ground movements

In normal construction, all walls can be founded on strip footings. Alternatively, some or all of the internal walls can be founded on thickened footings and external walls on edge beams.

Normal construction can only tolerate a small amount of differential ground movement without the masonry walls cracking or doors and windows jamming. On sites where expansive, compressible and collapsible soils occur or where buildings are founded partly on rock, precautionary measures need to be taken to avoid such damage. There are two types of precautionary measures which may be used in isolation or in conjunction with each other, namely geotechnical solutions or structural solutions.

Geotechnical solutions generally eliminate or reduce the total soil movements to an acceptable level by means of one of the following:

1) the removal of the soil horizons giving rise to unacceptable differential movements and the replacement of these horizons with inert material suitably compacted or the re-use of the excavated material as founding material in a compacted form (soil raft);

2) founding of the wall footings at a deeper level than is commonly associated with normal construction, i.e. on a competent horizon founding horizon below the problem horizon; and

3) the densification of the soil horizons giving rise to unacceptable differential movement by means of surface compaction.

Structural solutions, on the other hand, depending upon the nature and magnitude of the differential movements, are aimed at:

1) allowing movement within masonry walls to take place through the provision of vertical joints

2) lightly reinforcing masonry walls, particularly at the top and bottom of wall panels and above and below openings

3) reinforcing strip foundations to withstand tensile forces;

4) creating a stiffened footing by reinforcing not only the strip foundation but also the masonry above the footing to slab or window height (see stiffened strip footing and split construction sketches in Table A.1);

5) providing foundations which are:

    a) sufficiently stiff to limit any cracking of the masonry walls they support to within tolerable limits (see cellular raft and stiffened raft foundations shown in Table A.1); or

b) restrained from moving vertically in response to ground movements (see pier and piled foundations in Table A.1).

ANNEXURE A

Table A.1: Different types of foundation systems for single storey buildings of masonry construction

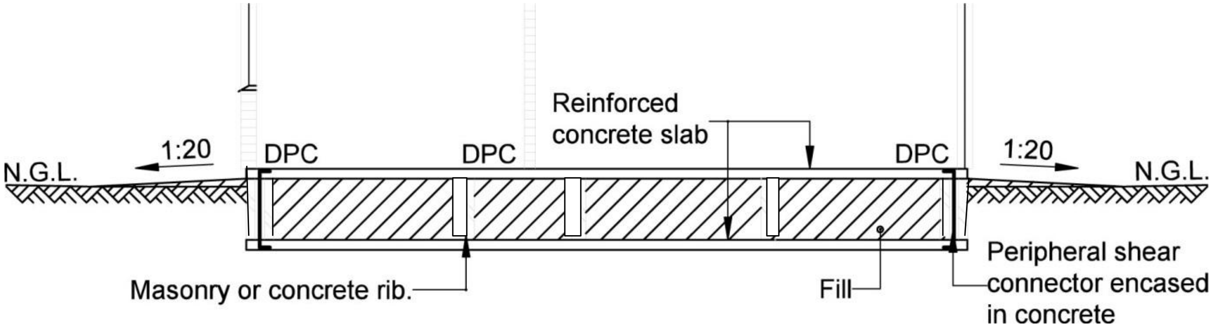
Construction type	Description	Sketch and / or comments
Cellular raft:	A foundation system which comprises two horizontal reinforced concrete slabs interconnected by a series of web beams that by virtue of its stiffness: a) enables a building to tolerate differential movements or localized loss of support (soft spots); or b) reduces the differential heave movements to a level that can be tolerated by the superstructure without significant damage occurring.	
Deep strip foundation	Normal construction where the foundations are founded at a greater depth than normal, on a competent horizon below the soil horizon which exhibits compressible or collapsible characteristics.	Same as strip footing foundation with a deeper founding level and more foundation brickwork
Modified normal construction	Normal construction with precautions, articulation joints at doors and openings, light reinforcement in masonry and reinforcement in concrete strip footings.	Typical details are shown in SANS 10400-H
Pier foundation	Masonry, reinforced concrete or mass concrete column with or without a pad footing, designed to transfer structural loads to a suitable founding horizon.	See pile foundation - ground beams on compressible and collapsible soils. A pier with or without a pad is constructed in place of a pile

Table A.1 (continued)

Construction	Description	Sketch and / or comments

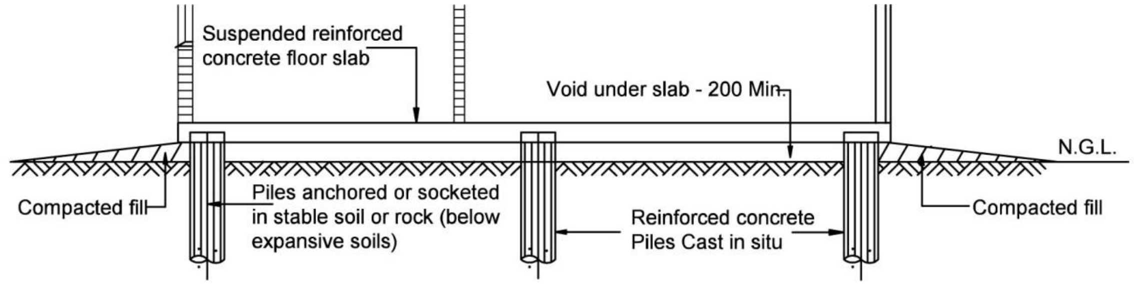
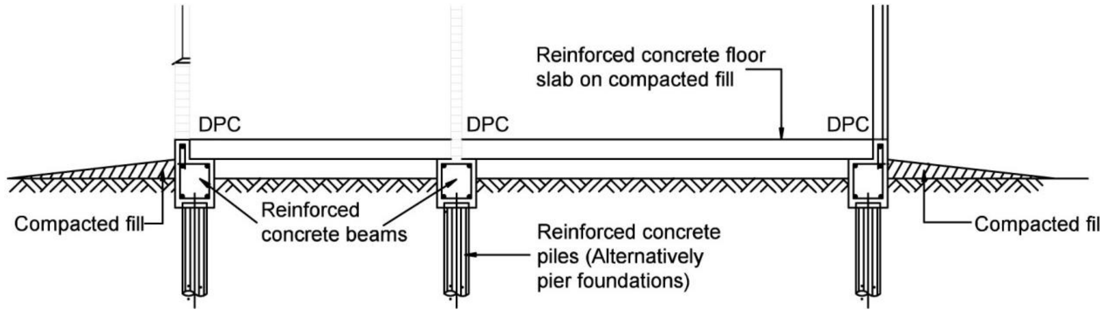
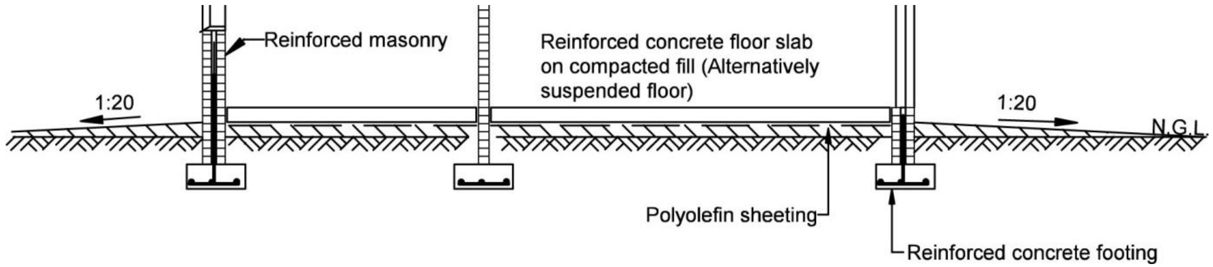
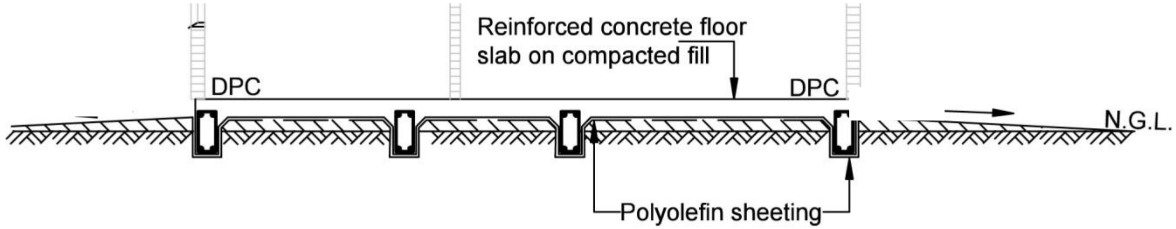
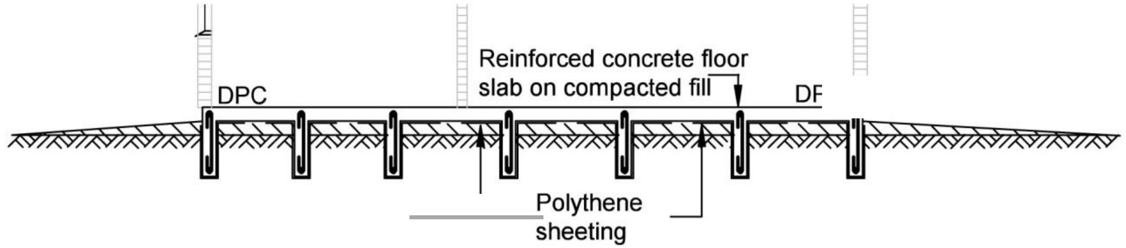
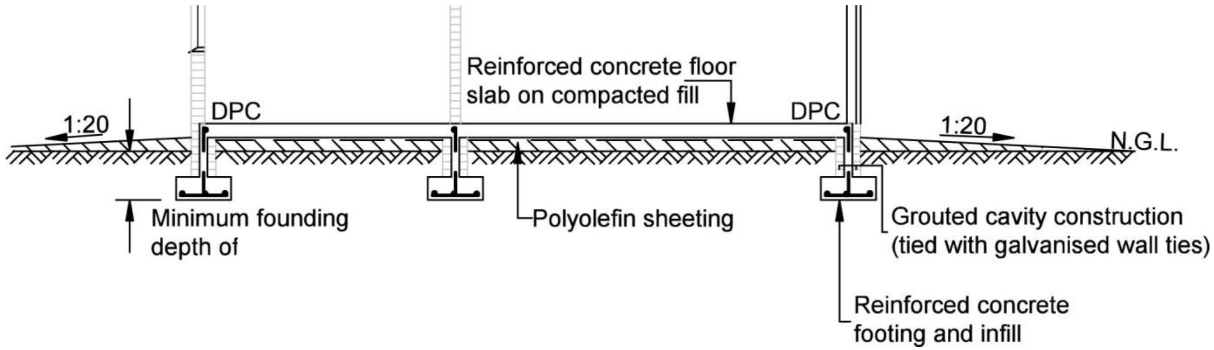
type		
Pile	A reinforced concrete or steel column-shaped member designed to transfer structural loads to a suitable founding horizon	 **Piled foundations – slab on expansive soils** (Note: The void underneath the suspended slab and the anchoring of the piles prevent movements in the soil being reflected in the floor slab and the masonry walls)  **Piled foundations – ground beams on compressible and collapsible soils**
Split construction	A construction technique, in which the structure of the building is provided with sufficient flexibility to accommodate the differential movements of the founding horizon, by means of a combination of full movement joints, reinforced masonry, stiffened strip-footings and floating / suspended floors, without significant damage occurring.	 Note: Full movement joints are articulation joints designed to accommodate movements both in and out of the plane of the wall

Table A.1 (concluded)

Construction type	Description	Sketch and / or comments

<table>
<tr>
<td>Stiffened raft</td>
<td>A foundation system that comprises a grid of reinforced/post tensioned concrete beams cast integrally with the floor slab, which by virtue of its stiffness:
a) enables a building to tolerate differential movements or localized loss of support (soft spots), or
b) reduces the differential heave movements to a level that can be tolerated by the superstructure
without significant damage occurring</td>
<td>

Stiffened raft - widely spaced beams


Stiffened raft – closely spaced beams</td>
</tr>
<tr>
<td>Stiffened strip footings</td>
<td>A foundation system which, by means of reinforced stiffening beam elements, enables a building to tolerate differential movements or localized loss of foundation support (soft spots) without significant damage occurring.</td>
<td>
</td>
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</table>

The provision of articulation joints and the lightly reinforcing of masonry is frequently used in conjunction with cellular and stiffened raft and pier and piled construction to make the foundations more economical.

Rules are provided in the deemed-to-satisfy provision of the National Building Regulations (see SANS 10400-H, *The application of National Building Regulations – Part H: Foundations)* for normal construction and modified normal construction. Suitably qualified persons are required to take responsibility for the design and implementation of geotechnical solutions and other types of structural solutions.

A.2.2.3 Appropriate foundation solutions for particular sites

Expansive clays and collapsible soils are spread across South Africa as indicated in Figure A2. Horizons with potentially collapsible fabrics are commonly encountered across Gauteng and the North West Province, in the Bloemfontein and Durban environs and in a corridor in the Free State north of Bloemfontein stretching to the Vaal River. Expansive soils, on the other hand, are more widely distributed across South Africa and have been reported to occur in most parts of the country with the exception of the Little Karoo, the extreme Northern Cape, the northern portion of the Limpopo Province and the extreme eastern regions of the Mpumalanga Province. The areas most affected by expansive soils include the Free State gold fields, the North West Province and the Pretoria Witwatersrand Vereeniging complex, which are some of the most densely populated areas in South Africa.

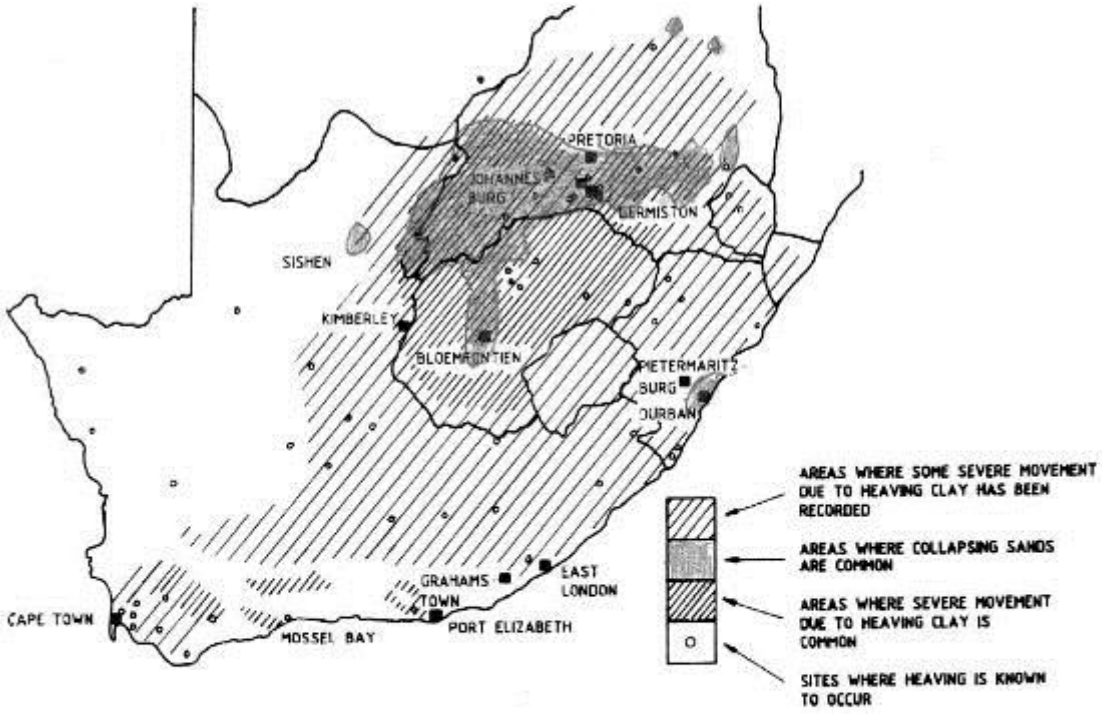


Figure A.2– Distribution of expansive clays and collapsing sands

The founding soil horizons on a site can be described as stable, expansive, compressible or potentially collapsible in character. Sites can further be designated in terms of the magnitude of the predicted differential soil movements experienced by single storey buildings. Site class designations which link the aforementioned descriptors to a range of predicted differential movements can then be linked to appropriate geotechnical and structural foundation solutions which limit cracking in masonry walls and floors to within tolerable limits (see Table A.2). Site class designations enable the risks of structural defects in buildings arising from differential movements in founding horizons to be mitigated.

Table A.2: Site classification designations linked to construction types

Site class designations	Typical founding material	Character of founding material	Single storey masonry building construction type
R	Rocks	Stable	Normal
H	Clays, silty clays, clayey silts and sandy clays.	Expansive soils	Normal
H1			Modified normal / soil raft
H2			Stiffened or cellular raft / piled or split construction / soil raft
H3			Stiffened or cellular raft / piled construction / soil raft.
C	Silty sands, sands, sandy and gravely soils	Compressible and potentially collapsible soils	Normal
C1			Modified normal / compaction of in-situ soils below individual footings / deep strip foundations / soil raft.
C2			Stiffened strip footings, stiffened or cellular raft / deep strip foundations / compaction of in-situ soils below individual footings / piled or pier foundations / soil raft.
P	Contaminated soils, controlled fill, dolomitic areas, landslip, landfill, marshy areas, mine waste fill, mining subsidence, reclaimed areas, uncontrolled fill, very soft silts / silty clays.	Variable	Variable
S	Clayey silts, clayey sands of low plasticity, sands, sandy and gravely soils	Compressible soils	Normal
S1			Modified normal / compaction of in-situ soil below individual footings / deep strip foundations / soil raft.
S2			Stiffened strip footings, stiffenend or cellular raft / deep strip foundations / compaction of in-situ soils below individual footings / piled or pier foundations / soil raft.

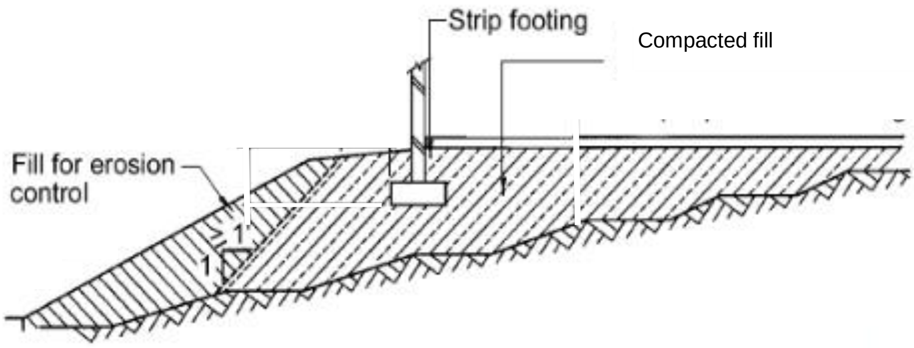


Figure A.3 – Fill and foundations for low side of sloped sites on engineered fill

A.3 Topography of the site

The topography affects the construction of buildings and sports fields. It may be necessary to construct terraces to provide a level platform for buildings. Where cut to fill operations are required to provide these platforms, foundations may be founded within the fills as indicated in Figure A.3. Such fills need to be engineered to limit differential settlements in foundations.

A.4 Southern Cape Coastal Condensation Areas

Condensation is caused when water vapour comes into contact with cold surfaces and condenses to form dampness or water droplets. Air can contain varying amounts of water vapour; warm air can hold more water vapour than cold air. When warm air comes into contact with a colder surface, it cools down and can't retain the same amount of water vapour. The excess water vapour is released and forms condensation.

Normal daily (human) activities produce warm air containing a large amount of water vapour. If the warm air can't escape through an open window or air vent, it builds up and moves towards a cold surface where it cools and forms condensation.

Under severe climatic conditions, such as that which occurs in the Southern Coastal Condensation Problem Area (see Figure 1 and Table 8), where external and internal surfaces of the building envelope are cooled to below the dew point then condensation will occur in building cavities such as in roof spaces, which can over a prolonged period, be detrimental to the structural system and as a result of mould growth compromise internal air quality unless appropriate preventative measures are taken.

Preventative measures that can be taken include:

a) improving the thermal performance of the building by, for example, by providing insulation in ceilings and thicker masonry walls or walls of cavity construction; and

b) the provision of effective vapour barriers in appropriate positions so as to prevent rotting of timber studs or timber roof truss components, or corrosion of steel studs and wall ties.

Annexure B: Dolomite land

B.1 Introduction

A sinkhole is a feature in the landscape that occurs suddenly and manifests itself as a hole in the ground and can occur with little warning. A subsidence, on the other hand, is a slow forming shallow enclosed depression. Sinkholes and subsidence in South Africa occur in ground underlain by dolomites, a type of carbonate rock. Sinkholes are generally circular, up to 125 m in diameter, steep sided and deep (up to 50m). Subsidence can range from metres to kilometres in surface expression and centimetres to metres in depth.

Rain water takes up carbon dioxide in the atmosphere and soil to form a weak carbonic acid. The weakly-acidic groundwater circulating along tension fractures, faults and joints in the dolomitic succession causes leaching of the carbonate minerals. The carbonates are removed in the form of bicarbonates by groundwater. This leaching is most pronounced in the first few tens of metres within bedrock or below the water table. This ultimately results in the formation of cavities in the bedrock as illustrated in Figure B1.

Sediments in the overburden (soil above the bedrock) spall into the cavity as indicated in Figure B1. The soil forms an arch over the cavity in the bedrock. Given sufficient time and the correct triggering mechanisms, instability and the eventual breaching of the ground surface may occur naturally. Human activities, particularly that relating to urban development, can greatly accelerate the formation of sinkholes as such activity disturbs the meta-stable conditions in the dolomite environment.

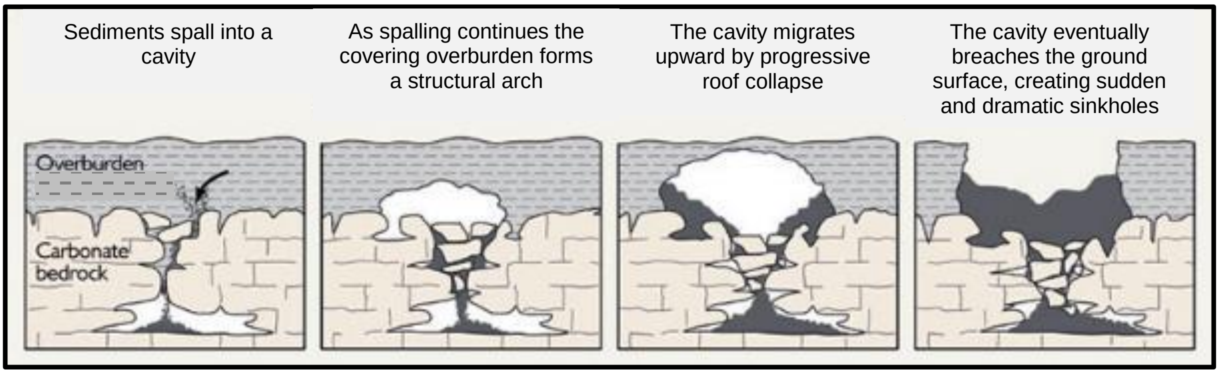


Figure B1 – The formation of sinkholes within carbonate rocks

Topography and drainage, the thickness, erodibility and strength of the transported soils and residuum, the nature and topography of the underlying strata, the depth and expected fluctuations of the water table, and the presence of structural features such as faults, fractures and dykes are all factors which influence the susceptibility of sinkhole and subsidence formation taking place.

B.2 Triggering mechanisms

The primary trigger mechanisms for sinkhole and subsidence formation include:

1) ingress of water from leaking water-bearing services,

2) poorly managed surface water drainage; and

3) groundwater level drawdown.

A major study on state land south of Pretoria examined 650 sinkhole events over the 20-year period prior to the implementation of a risk management strategy. 643 (99%) of these sinkholes were found to be directly attributable to leaking services or humans' negative influence. The introduction of a comprehensive risk management strategy reduced the annual incidence of sinkhole formation by approximately 90%.

B.3 Risk management strategies

The risk of sinkhole formation may be managed on dolomite land by:

1) placing restrictions on land use;

2) ensuring appropriate development;

3) establishing requirements for:

   a) the installation of below ground infrastructure, particularly water bearing services;
   b) the construction of above ground water bearing structures;
   c) the management and control of surface water; and
   d) design requirements for buildings and structures to allow the safe evacuation of occupants in the event of a hazard occurring.

4) establishing requirements for:

   a) the management and monitoring of surface drainage and dewatering;

   b) the maintenance of water-bearing structures and services; and

5) developing risk management systems to mitigate the hazards associated with the developments on such land that are implemented by local authorities and owners of buildings and infrastructure.

Dolomite land (land underlain by dolomites or limestone residuum or bedrock, typically at depths of no more than 60 m in areas where no de-watering has taken place and 100 m in areas where de-watering has taken place) is classified in terms of its susceptibility of a sinkhole of a certain size occurring i.e. its inherent hazard class. Dolomite land can also be categorised in terms of precautionary measures relating to the installation of water bearing services, the management and control of stormwater and the safe evacuation of occupants in the event of a hazard occurring as indicated in Table B1.

It may be possible in some instances to develop sites having a dolomite area designation of D4 should the state be prepared to pay a premium for the development of such sites and extraordinary measures which are supported by independent reviewers are taken to mitigate risks.

B.4 Affected areas

The areas underlain by dolomites which are known to be susceptible to sinkhole formation and which require that risk mitigation measures be undertaken fall within the Malmani Subgroup and Campbell Rand Subgroup (see B2).

ANNEXURE B

Table B1: Dolomite area designations

Dolomite area designation	Description
D1	No precautionary measures are required.
D2	Precautionary measures and dolomite risk management are required to maintain a tolerable hazard rating.
D3	Precaution measures and dolomite risk management in addition to that described for dolomite area designation D2 are required to achieve a tolerable hazard rating.
D4	Precaution measures and dolomite risk management in addition to that described for D3 rarely enables a tolerable hazard rating to be achieved.

Table B2: Areas underlain by dolomites which are known to be susceptible to sinkhole formation

Common name	New name	Common name	New name
Barberton	Umjindi	Lebowakgomo	Lepelle-nkumpi
Barkley west	Thusanang municipality	Lichtenbrug	Lichtenburg local municipality
Belfast	Highlands	Mafikeng	Mafikeng local municipality
Benede	Benede	Marble hall	Greater marble hall municipality
Bo karoo	Bo karoo	Meyerton	Midvaal local municipality
Brits	Nw372 local council	Mogwase	Mankwe-madikwe local municipality
Bronkhorstspruit	Kungwini local municipality	Nelspruit	Mbombela
Brugersfort/ ohrigstad/eastern tubatse	Greater tubatse municipality	Nylstroom	Modimolle
Bushbuckridge	Bushbuckridge municipality	Parys	Ngwathe local municipality
Carltonville	Merafong city local municipality	Pietersburg	Polokwane
Danielskuil	Dan-lime municipality	Pomfret	Molopo local municipality
Delmas	Delmas	Postmasburg	Re a ipela municipality
Diamondfields	Diamondfields	Potchefstroom	Potchefstroom local municipality
Dma lowveld	Dma lowveld	Potgietersrus	Mogalakwena
East Rand	Ekhurleni Metroplitan Municipality	Pretoria	Tshwane metroplitan municipality
Ellisras	Lephalale	Prieska	Priemanday municipality
Elukwatini/carolina	Albert luthuli	Randfontein	Randfontein local municipality
Ganyesa	Kagisano local municipality	Reivilo	Greater taung local municipality

ANNEXURE B

Common name	New name	Common name	New name
Griekwastad	Siyancuma municipality	Rustenburg	Rustenburg local municipality
Groblersdal	Greater groblersdal municipality	Sabie	Thaba chweu
Heidelberg	Lesedi local municipality	Sasolburg	Metsimaholo local municipality
Hoedspruit	Drankensberg municipality	Schuinsdraai nature reserve	Schuinsdraai nature reserve
Hopetown	Oranje-karoo municipality	Sterkfontein	Sterkfontein
Johannesburg	City of johannesburg	Thabazimbi	Thabazimbi
Kalahari cbdc	Kalahari cbdc	Tzaneen	Greater tzaneen municipality
Kathu	Gammagara municipality	Ventersdorp	Ventersdorp local municipality
Kgalagadi	Segonyana municipality	Vereeniging	Emfuleni local municipality
Klerksdorp	Klerksdorp local municipality	Vryburg	Naledi local municipality
Koster	Nw374 local municipality	Warmbath	Bela bela
Kroonstad	Moohaka local municipality	Westonaria	Westonaria local municipality
Krugersdorp	Mogale city local municipality	Zeerust	Zeerust local municipality
Kuruman	Kuraman-mothibistad municipality		

Annexure C: Energy usage

The gazetted Minimum Uniform Norms and Standards for Public School Infrastructure in terms of the South African Schools Act, 1996, on 29 November 2013 requires that "passive solar design principles should be employed in the design of all education areas to address energy saving and natural cooling*"* and that a *"* school design must comply with all relevant laws, including the National Building Regulations*".*

Part XA of the National Building Regulations establishes requirements for Energy Usage. These regulations require that:

1) new building and extensions to buildings are designed and constructed so as to use energy efficiently in order to reduce Greenhouse Gas emissions; and

2) not more than 50% of the annual domestic hot water requirement may be supplied by means of electrical resistance heating.

Compliance with the design and construction requirements can be demonstrated by means of one of three methods, namely:

1) adopting the orientation, shading, services and building envelope provided in the rules contained in SANS 10400 Part XA;

2) demonstrating by means of a rational design that the energy usage of such building is equivalent to or better than that which would have been achieved by adopting the rules provided in SANS 10400 XA, or

3) determining using certified software that the theoretical energy usage performance is less than or equal to that of a reference building in accordance with the provisions of SANS 10400 Part XA.

Most schools are likely to satisfy the requirements of Part XA of the National Building Regulations using the first of the aforementioned methods. This method requires that:

- The orientation of the major windows of any school building should be facing north in order to take advantage of winter solar gain. This orientation is, however, not mandatory, and may not make sense in all climatic regions and locations. Shading only becomes mandatory where the fenestration area (glazing and framing elements that are fixed or moveable) to the net floor areas exceeds 15%. This is not the case in the prototype designs for schools.

- SANS 10400-XA does establish fenestration air infiltration requirements which need to be assessed in accordance with the provisions of SANS 613. Opening windows will typically be required to be fitted with flexible gaskets to satisfy these requirements.

- The external walls of schools are required to be built of masonry or alternatively to be thermally insulated to the level stipulated for low mass construction methods. Cavity walls should, however, be provided in the Southern Cape Condensation Problem Area to address both condensation and rain penetration through walls (see Figure C1 and Table C1).

- The roof and ceiling assemblies of all buildings are required to achieve a specified thermal resistance in each climatic zone shown in Figure C2. The impact of this requirement on schools will be that all classrooms will typically need to have ceilings which are insulated, with fibreglass insulation (or products of equivalent performance) to a thickness ranging between 100mm and 140mm as well as an under-roof reflective foil roof-liner or possibly both.

ANNEXURE C

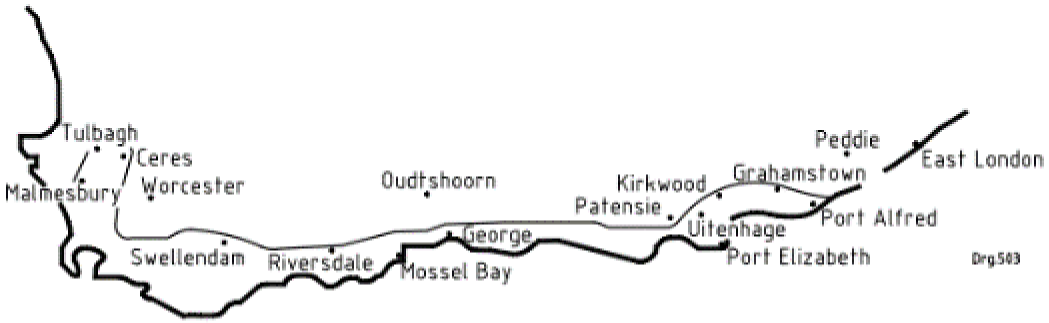
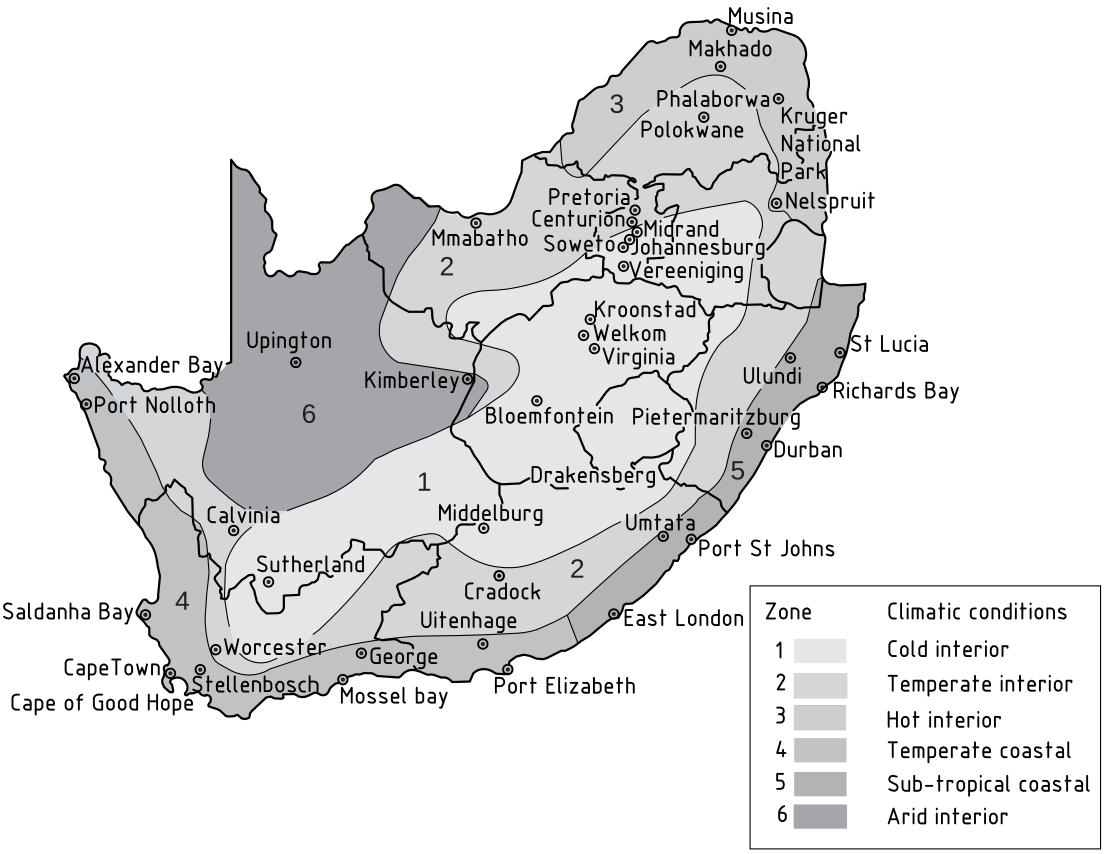


Figure C1 — The Southern Coastal Condensation Problem (SCCP) area

Table C1: Towns that fall within the Southern Coastal Condensation Problem area

Town	Town	Town	Town	Town
Addo	Dana Bay	Kalbaskraal	Papiesvlei	Stellenbosch
Alexandria	Despatch	Kareedouw	Paradise Beach	St Francis Bay
Amsterdamhoek	Droë Vlakte	Kariega	Paterson	Still Bay
Askraal	Elgin	Kasuka	Pearly Beach	Storms River
Aston Bay	Elim	Kenton on Sea	Philadelphia	Strand
Atlantis	Fairfield	Kleinmond	Plettenberg Bay	Struis Bay
Baardskeerdersbos	Firgrove	Klipdale	Pniel	Sunland
Bellevue	Fish Hoek	Knysna	Port Beaufort	Swartkops
Bethelsdorp	Gans Bay	Kommetjie	Port Elizabeth	The Crags
Betty’s Bay	George	Kruisfontein	Protem	Vermaaklikheid
Bloubergstrand	Gordon’s Bay	Kuilsrivier	Riethuiskraal	Viljoenskroon
Bluecliff	Gouritsmond	Kylemore	Rietpoel	Vlees Bay
Boesmansrivier-	Grabouw	Loerie	Rondevlei	Waenhuiskrans
mond	Groot Brakrivier	Malgas	Salem	Wilderness
Boknesstrand	Groot	Melkbosstrand	Scarborough	Windmill
Botrivier	Jongensfontein	Milnerton	Sea View	Witsand
Brandwag	Hartenbos	Mossel Bay	Sedgefield	Wittedrif
Bredasdorp	Hawston	Muizenberg	Simon’s Town	Witteklip
Caledon	Hermanus	Napier	Sinksabrug	Woodlands
Cape Town	Hermon	Noanaha	Skipskop	Wydgeleë
Clarkson	Herold’s Bay	Onrus	Slangrivier	
Coega	Hout Bay	Oukraal	Somerset West	
Coerney	Humansdorp	Oyster Bay	Southwell	
Colchester	Jeffreys Bay	Pacaltsdorp	Stanford	

ANNEXURE C



Zone	Description	Major centre
1	Cold interior	Johannesburg, Bloemfontein
2	Temperate interior	Pretoria, Polokwane
3	Hot interior	Makhado, Nelspruit
4	Temperate coastal	Cape Town, Port Elizabeth
5	Sub-tropical coastal	East London, Durban, Richards Bay
6	Arid interior	Upington, Kimberley

Figure C.2 — Climatic zone map

Annexure D: Professional fees and costs for implementing agent services

D1 Professional fees

The following generic built enviornment services are required to typically required to deliver schools:

- programme / project manager
- procurement leader
- project leader
- contract manager
- lead designer
- designer
- cost consultant / quantity surveyor
- supervising agent
- health and safety agent

The basic lines of reporting and assigned responsibilities for each of these functional roles for each package within a programme of projects or an independent project are indicated in Figure D1. The services of additional specialists such as engineering geologists, geotechnical engineers and land surveyors may also be required.

D2 Implementing agency considerations

Section 238 of the Constitution of the Republic of South Africa (Act No 106 of 1996) deals with agency and delegations. This section of the Constitution permits an organ of state to exercise any power or perform any function for an executive organ of state on an agency basis.

In the context of infrastructure, the role of the implementing agent is to:

1) Plan, manage and roll out the design and delivery of school infrastructure in accordance with the Department of Basic Education's briefing, priorities, MTEF budget provisions, mandate, norms and standards and policies.

2) Plan and manage the effective procurement within the legislative framework of the required built environment professionals, contractors and suppliers to delivery projects.

3) Provide informed "client" direction to the appointed project managers and design team in the planning, design and implementation of projects.

4) Oversee the commissioning, fine tuning and hand over of completed infrastructure to the custodian.

5) Identify stakeholder base and expectation and manage project risks.

6) Manage socio-economic risks.

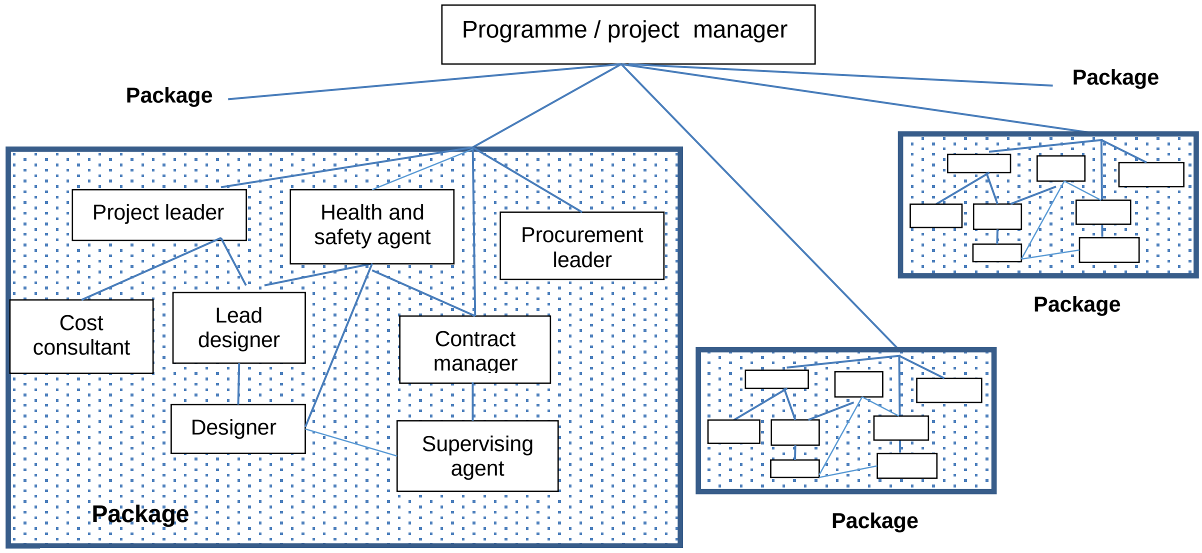
7) Oversee the financial management and budgeting requirements for projects.

8) Make the necessary payments to contractors, suppliers and consultants.

The implementing agent in effect provides the centralised management of one or more portfolios of education projects which includes identifying, prioritising, authorising, managing and controlling projects, programmes and other related work to achieve the specific infrastructure related service delivery objectives of the Department of Basic Education in consultation with the DBE. Such an agent is as such tasked with ensuring that projects and programmes are reviewed to prioritise resource allocations, the management of the portfolio is consistent and aligned to the client institution's expectations, the co-ordinated alignment of the interfaces between stakeholders, the management of unrealistic expectations and political pressure and the monitoring of changes in the broad environment.

An implementing agent needs to have staff to provide the agency service including administrative and financial support staff. The implementing agent may have internal programme and project managers to attend to the detailed planning and implementation of projects i.e. to provide certain normal built environment services. Alternatively, they may outsource the entire programme and project management function or a portion thereof.

ANNEXURE D



Designation	Overview of responsibilities
Programme / Project manager	Manage the implementation of a programme of projects / an independent project involving the delivery and / or planned maintenance of infrastructure in a manner that: a) enables both the implementer and its client to achieve their objectives; and b) all projects are developed and managed in terms of a common procedural approach and integrated with the implementer's administrative processes and are institutionalised
Project leader	Direct the project team including: a) the establishment of the overall strategy for the development and delivery of the deliverable; b) the monitoring and integration of the activities of the project team; c) the development and maintenance of a schedule and the monitoring of progress towards the attainment of the deliverable; and d) the briefing of, the reporting to and the obtaining of decisions and acceptance of a deliverable
Lead designer	Establish and refine the design approach or solution to achieve the required quality, health and safety and other required standards and is co-ordinated within the project team Co-ordinate the advice and input of designers and cost consultants
Designer	Provide design or conditional assessment services relating to the provision or maintenance of infrastructure
Cost consultant	Provide independent and impartial estimation and control of the cost of constructing, rehabilitating and refurbishing infrastructure by means of one or more of the following: a) accurate measurement of the works, b) comprehensive knowledge of various construction systems and the costs of alternative design proposals, construction methods and materials, or c) the application of expert knowledge of costs and prices of work, labour, materials, plant and equipment required
Procurement leader	Oversee the development of the procurement documents and manage the procurement process from the advertisement of tenders to the award of the contract as a single point of responsibility including the conducting of clarification meetings
Contract manager	Administer a package on behalf of the employer and perform duties relating to the overall management of such contract from the implementer's point of view
Supervising agent	Confirm that the works are proceeding in accordance with the provisions of the scope of work associated with a package and notify the contract manager of any non-conformance on the part of a contractor to requirements
Health and safety agent	Assume the responsibilities imposed upon the implementer as a "client" in terms of the Construction Regulations issued in terms of the Occupational Health and Safety Act, 1993, perform specific duties in terms of established procedures and lead health and safety risk management compliance processes

Figure D1: Basic lines of reporting and assigned responsibilities for each functional roles of built environment professionals associated with a package