national treasury

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REPUBLIC OF SOUTH AFRICA

Standard for an Infrastructure Delivery Management System

30th November 2012 (Final Draft)

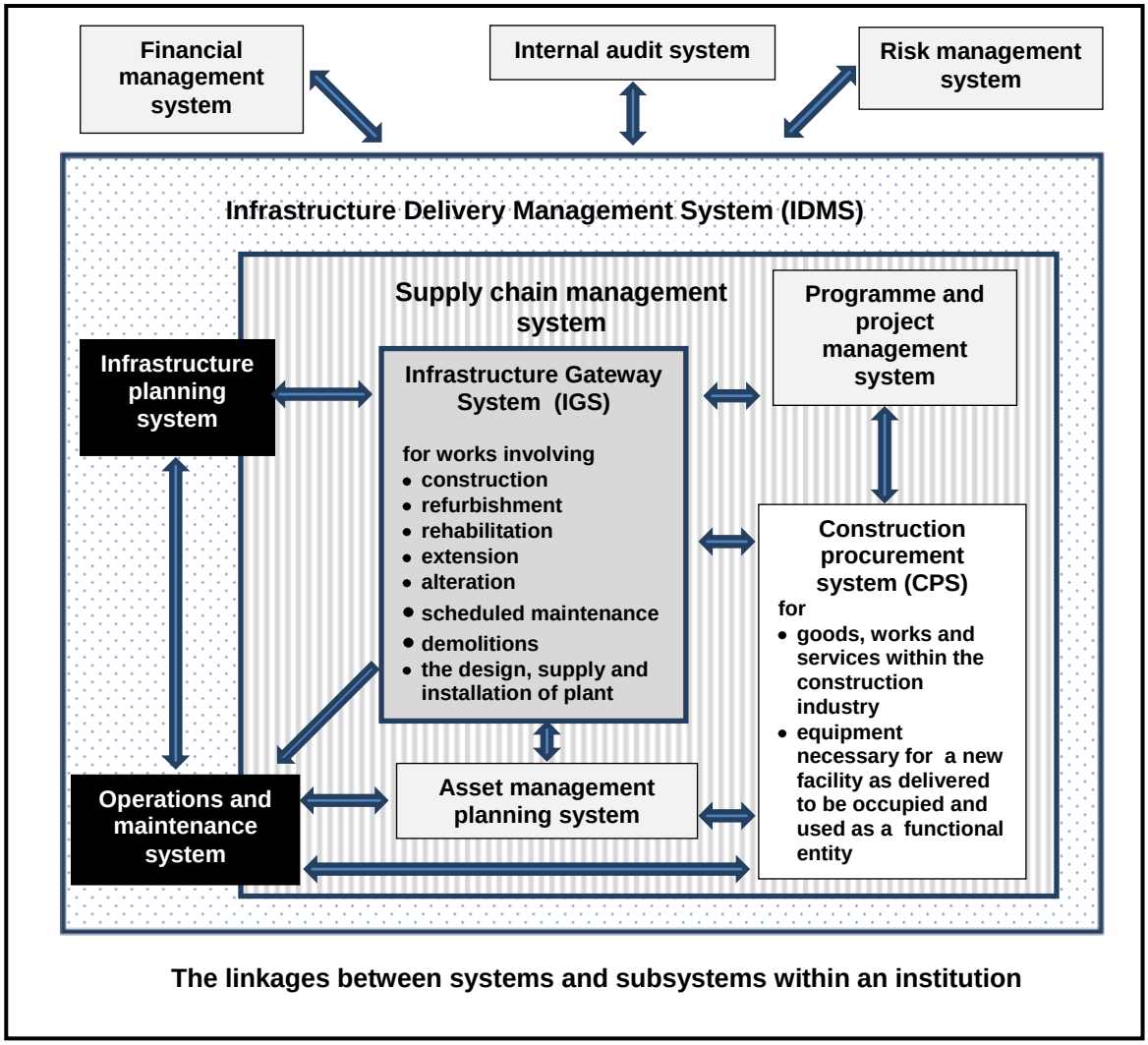
Comment on this standard may be submitted by 08 February 2013 to:

The Director-General
National Treasury
Private Bag X115
PRETORIA
0001

All comments must be marked for the attention of Mr Jayce Nair or to Ms Moipone Ramipone and may be either posted to the above address, transmitted by fax to 086 513 0008 or by email to TRComments@treasury.gov.za

Introduction

The Infrastructure Delivery Management System (IDMS) is a government management system for planning, budgeting, procurement, delivery, maintenance, operation, monitoring and evaluation of infrastructure. It comprises a set of interrelating or interacting elements that establish processes which transform inputs into outputs.



The linkages between systems and subsystems within an institution

The IDMS comprises the following systems:

a) an infrastructure planning system;

b) an infrastructure gateway systems (IGS);

c) a construction procurement system (CPS);

d) a programme and project management system;

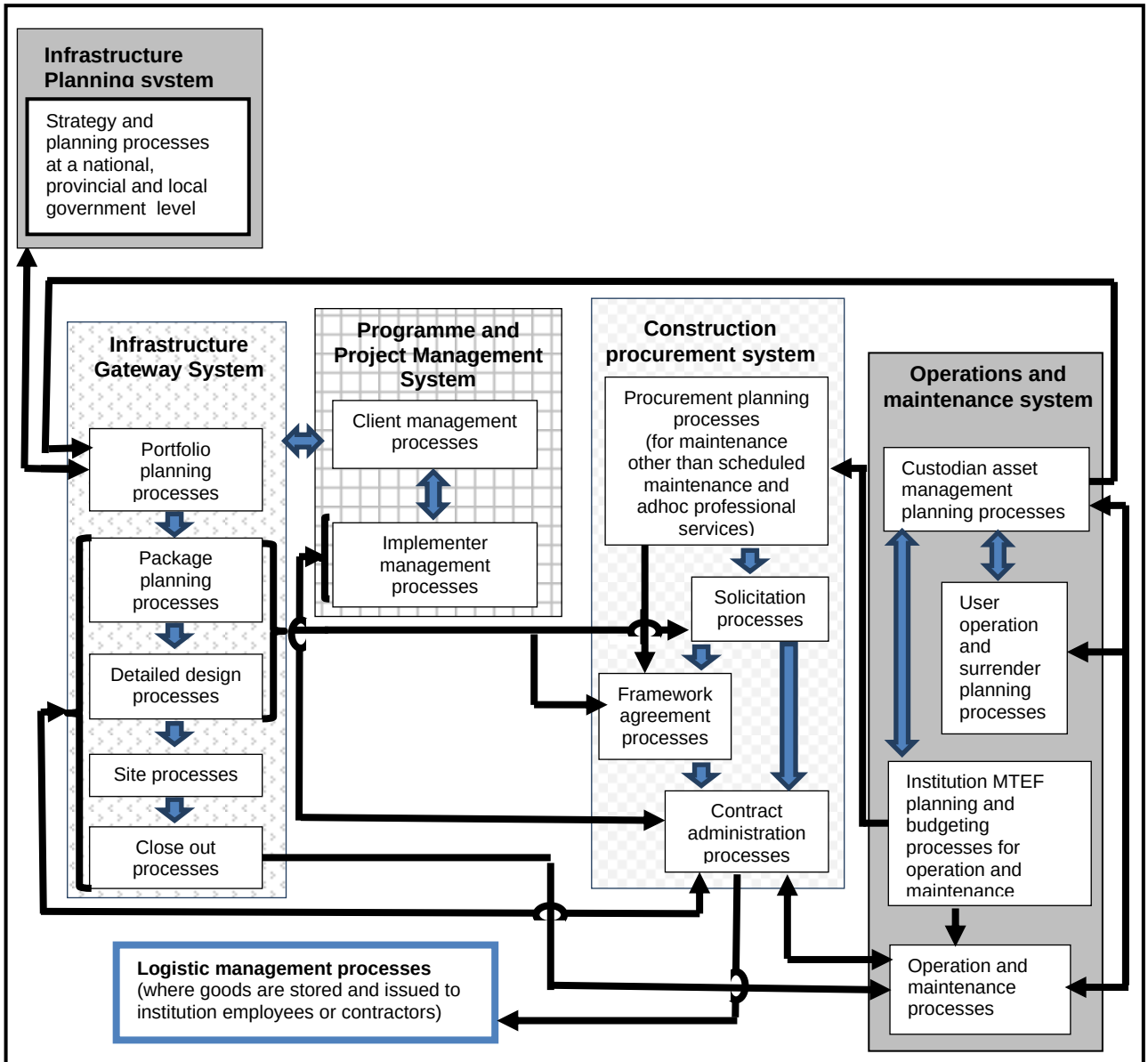
e) an operations and maintenance system

Risks are managed within each of these systems.

The IDMS is designed to be linked to the Medium Term Expenditure Framework (MTEF). It has a strong focus on outcomes, value for money and the effective and efficient functioning of the procurement and delivery management system in compliance with relevant legislation. It includes a supply chain

management system (SCM) and can be readily integrated into the various systems that accounting officers and accounting authorities are required to implement.

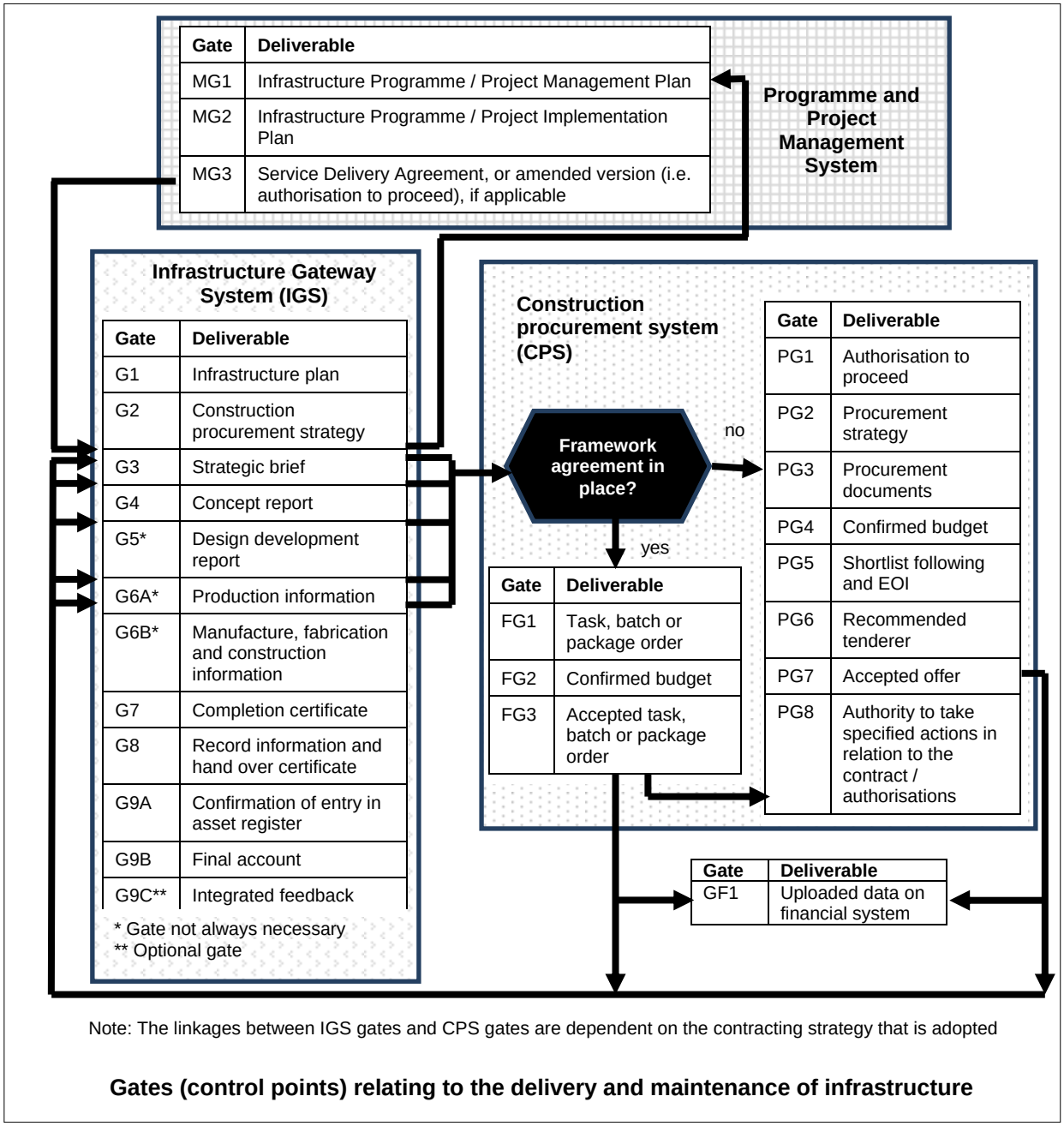
It should be noted in this regard that procurement is the process which creates, manages and fulfils contracts. SCM on the other hand is the design, planning, execution, control and monitoring of supply chain activities in the delivery of goods, services or works, with the objective of creating net value and providing oversight and co-ordination of information and finances within the supply chain. Accordingly, SCM is far broader than procurement.



Interacting systems and processes embedded within the IDMS

The IDMS contains a number of systems each comprising a set of processes which need to be managed. These systems are interrelated and contain interacting elements as shown in the above diagram. The planning of an institution's infrastructure projects at a portfolio level is not only influenced by the strategy and planning processes conducted at a national, provincial and local level but also by the asset management plans developed by custodians and users in the operation and maintenance of infrastructure. The infrastructure gateway system which provides the work flow for the delivery of projects involving the construction, refurbishment, rehabilitation, extension, alteration or scheduled maintenance of infrastructure cannot be implemented in isolation from the construction procurement system and programme and project management system. Likewise, the operations and maintenance system cannot be implemented in isolation

from the procurement system and certain outputs (record information and user manuals) of the infrastructure gateway system.



Gate	Deliverable
MG1	Infrastructure Programme / Project Management Plan
MG2	Infrastructure Programme / Project Implementation Plan
MG3	Service Delivery Agreement, or amended version (i.e. authorisation to proceed), if applicable

Gate	Deliverable
G1	Infrastructure plan
G2	Construction procurement strategy
G3	Strategic brief
G4	Concept report
G5*	Design development report
G6A*	Production information
G6B*	Manufacture, fabrication and construction information
G7	Completion certificate
G8	Record information and hand over certificate
G9A	Confirmation of entry in asset register
G9B	Final account
G9C**	Integrated feedback

Gate	Deliverable
FG1	Task, batch or package order
FG2	Confirmed budget
FG3	Accepted task, batch or package order

Gate	Deliverable
PG1	Authorisation to proceed
PG2	Procurement strategy
PG3	Procurement documents
PG4	Confirmed budget
PG5	Shortlist following and EOI
PG6	Recommended tenderer
PG7	Accepted offer
PG8	Authority to take specified actions in relation to the contract / authorisations

Gate	Deliverable
GF1	Uploaded data on financial system

Note: The linkages between IGS gates and CPS gates are dependent on the contracting strategy that is adopted

Gates (control points) relating to the delivery and maintenance of infrastructure

This standard establishes the manner in which projects involving the construction, refurbishment, rehabilitation, extension, alteration or day-to-day, routine, scheduled and emergency maintenance of infrastructure are conceived, budgeted for and delivered. It does so in such a manner that enables:

1) infrastructure that is delivered to have a fitness of purpose, provide value for money over its service life, be safe, reliable and efficient, be affordable taking into account life cycle costs and, as far as is possible, to be delivered within a control budget;

2) infrastructure to be maintained so that it remains fit for purpose in use;

3) an alignment of interest between those who design and construct a infrastructure and those who subsequently occupy, use or manage it.

4) decisions taken at gates (control points) to provide assurance that projects remains within agreed mandates and projects can progress successfully from one stage of the Infrastructure Gateway System to the next;

5) projects can be readily tracked and performance monitored;

6) responsibilities for performing activities and making decisions at control points within processes to be clearly allocated;

7) projects to satisfy client requirements;

8) risks to be proactively managed; and

9) processes to be audited

Standard for an Infrastructure Delivery Management System

CONTENTS

1 Scope

This standard establishes an infrastructure delivery management system comprising processes, procedures and methods within an institution for the delivery or maintenance of infrastructure in a staged, systematic, disciplined, uniform integrated and auditable manner. It covers the manner in which projects involving the construction, refurbishment, rehabilitation, extension, alteration or day-to-day, routine, scheduled and emergency maintenance of infrastructure are conceived, budgeted for and delivered.

2 Terms, definitions and abbreviations

2.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply:

alteration: changing or modifying the character or condition of a building, plant or civil engineering works

asset register: a record of asset information including inventory, historical, financial, condition, technical and financial information.

brief: a working document for an identified project or package which specifies at any point in time the relevant needs, objectives, acceptance criteria and priorities of the client, provides the context of the project or package and any appropriate design or maintenance requirements within which all subsequent briefing (when needed) and designing can take place

client: the institution or division within an institution which is ultimately responsible and accountable for the delivery of services requiring infrastructure

commissioning: a quality-oriented process for achieving, verifying, and documenting that the performance of facilities, systems, and assemblies meets defined objectives and criteria

contracting strategy
strategy that governs the nature of the relationship which the employer wishes to foster with the contractor, which in turn determines the risks and responsibilities between the parties to the contract and the methodology by which the contractor is to be paid

contractor: person or organisation contracted to construct, refurbish, rehabilitate, extend, alter, repair, maintain or demolish works or components thereof

contract manager: person appointed by the implementer to administer a package on behalf of the employer and, where relevant, to perform duties relating to the overall management of such contract from the implementer's point of view

concept report: the document containing the package information which sets out the integrated concept for the works, any statutory permissions and funding or utility approvals granted, a risk report and, where new infrastructure is created, a logistic support plan

control budget: the amount of money which is allocated or made available by the client to deliver or maintain infrastructure associated with a project or package including site costs, professional fees, all service and planning charges, applicable taxes, risk allowances and provision for price inflation which may be adjusted by the client from time to time

construction: everything that is constructed or results from construction operations

construction procurement strategy: the documented delivery management strategy and contracting and procurement arrangements for the delivery or maintenance of infrastructure

cost plan: the document progressively developed by estimating the total cost of the package including any construction, refurbishment, extension and professional service costs, service and planning charges and applicable taxes

custodian: the institution or division within an institution which acts as the caretaker of infrastructure throughout its lifecycle

NOTE The custodian is responsible for maintaining the value of the infrastructure, and, where appropriate, to allocate infrastructure to users and to support users in planning activities aimed at efficient use of infrastructure

day-to-day maintenance: maintenance that takes place on an *adhoc* basis including minor repairs, modifications and replacements

defects liability period: period from completion during which the contractor has an obligation to make good defects in the materials and workmanship covered by the contract that are indicated by the employer or his representative

delivery management strategy
strategy which is adopted to manage and resource the delivery and maintenance of infrastructure

design development report: the document containing the package information which sets out the integrated developed design of the works for a package and forms the basis for the development of the production information, any statutory permissions and utility approvals granted and a risk report

emergency maintenance: repairs which are unforeseen and require urgent attention due to the presence of, or the imminent risk of, an extreme or emergency situation arising from one or more of the following:

a) human injury or death;

b) human suffering or deprivation of human rights;

c) serious damage to property or financial loss;

d) livestock or animal injury, suffering or death;

e) serious environmental damage or degradation; or

f) interruption of essential services.

employer: institution intending to or entering into a contract with the contractor for the provision of goods, services, or engineering and construction works

extension: addition to an existing building

framework agreement: agreement between an institution and one or more contractors, the purpose of which is to establish the terms governing task, batch or package orders to be awarded during a given period, in particular with regard to price and, where appropriate, the quantity envisaged

NOTE: A framework agreement is a general term for contracts with contractors that set out terms and conditions under which specific procurements (call-offs) can be made throughout the term of the contract.

gate: a control point at the end of a process where a decision is required before proceeding to the next process or activity

NOTE A gate is a strategic decision making point.

gateway review: a review of the available information at a gate upon which a decision to proceed or not to the next process is based

independent project: a single package or series of packages involving the delivery and / or maintenance of infrastructure identified in a construction procurement strategy which do not form part of a programme or projects

infrastructure: fixed assets that are constructed or result from construction operations including:

a) buildings, structures and facilities;

b) water supply, sanitation, electricity supply, transportation and storm water drainage systems; and

c) the related permanent fixtures that cannot be readily or economically removed or reused

infrastructure plan: a plan which identifies long term needs and links prioritised needs to a forecasted budget for the next few years

information and communication technologies (ICT): diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information including computers, the Internet, broadcasting technologies (radio and television), and telephony

infrastructure Programme / Project Management Plan (IPMP): document prepared by the client which establishes the client's arrangements for the efficient and effective management of programmes of projects / independent projects over the MTEF period, aligns with the adopted construction procurement strategy and indicates the allocation of the MTEF budget to the projects to be implemented over the MTEF period

infrastructure Programme / Project Implementation Plan (IPIP): document prepared by an implementer in response to an IPMP which outlines in organisational terms how the implementer will deliver the packages and which is regularly updated to remain current

implementer: institution or division within an institution responsible for the physical delivery of infrastructure or maintenance projects

institution: an organ of state to which this standard applies

logistic support plan: a plan which establishes the organisational structure required for operation and maintenance of the asset resulting from the package over life span, and office, stores, furniture, equipment, ICT and staff training requirements to run operation and maintenance facilities as well as engineering infrastructure

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

maintenance: combination of all technical and associated administrative actions during an item's service life with the aim of retaining it in a state in which it can perform its required functions

maintenance plan: document outlining and scheduling the maintenance tasks and activities necessary to ensure that a facility or service remains operational in its original design condition complete with a detailed life-cycle budget

major capital project: a project or a series of related packages involving the construction, alteration, extensions, refurbishment or the rehabilitation of infrastructure on a single site having an estimated control budget exceeding a value determined by the relevant treasury

package: works which have been grouped together for delivery under a single contract or a package order

package execution plan (PEP): a summary of the accepted package information at each gate as such information is progressively developed and the persons identified to assume functional responsibility for taking aspects of the project forward

package information: information at a point in time, following the identification of a package which is contained in one or more of the following documents:

a) the brief which is progressively developed from time to time;

b) the design documentation including specifications, data schedules and drawings;

c) the schedule which identifies key dates and time periods for the performance of the works and services associated with the package, and

d) cost plan

order: the instruction to provide goods, services or works under a framework agreement

packaging strategy
organization of work packages into contracts

performance
ability to fulfil required functions under intended use conditions or behaviour when in use

portfolio
a collection of projects or programmes and other work that are grouped together to facilitate effective management of that work to meet strategic objectives

NOTE The projects or programmes of the portfolio may not necessarily be interdependent or directly related

pricing strategy
strategy which is adopted to secure financial offers and to remunerate contractors in terms of the contract

procurement
process which creates, manages and fulfils contracts relating to the provision of goods, services and engineering and construction works or disposals, or any combination thereof

procurement strategy
selected packaging, contracting, pricing and targeting strategy, and procurement procedure for a particular procurement

procurement procedure
selected procedure for a specific procurement

principal programme manager: official or PSP appointed by the implementer who is responsible for overseeing the implementation of a programme of projects involving the delivery and / or maintenance of infrastructure

principal project manager: official or PSP appointed by the implementer who is responsible for overseeing the implementation of an independent project involving the delivery and / or maintenance of infrastructure

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

professional service provider (PSP): persons whose primary business is to provide impartial and independent knowledge-based services to clients for a fee

programme
a group of related projects managed in a coordinated way to obtain benefits and control not available from managing them individually.

NOTE Programmes include an element of on-going work and may include elements of related work outside the scope of discrete projects in the programme

programme of projects: a group packages identified in a construction procurement strategy managed in a coordinated way to obtain benefits and control not available from managing them individually.

project: identified elements of work involving the construction, refurbishment, rehabilitation, extension, alteration, demolition or scheduled maintenance of infrastructure, the transfer of infrastructure to another institution or the leasing of infrastructure

quality plan: a document that specifies the procedures and resources that will be needed to carry out a project, perform a process or manage a contract, including who will do what and when

record information: information that

a) records the condition of the completed works associated with a package;

b) documents the works as constructed or competed;

c) contains advice on the care and servicing requirements for the works or a portion thereof;

d) contains advice on the use of plant and equipment;

e) confirms the performance requirements of the design development report and production information;

f) contains certificates confirming compliance with legislation, statutory permissions etc.; or

g) contains guarantees that extend beyond the defects liability period provided for in the package

NOTE Record information includes drawings, specifications, design and service life parameters and maintenance and operation manuals.

refurbishment: modification and improvements to an existing plant, building or civil engineering works in order to bring it up to an acceptable condition

review: activity undertaken to determine the suitability, adequacy and effectiveness of the subject matter to achieve established objectives

rehabilitation: extensive work to bring plant, building(s) or civil engineering works back to acceptable functional conditions, often involving improvements

risk: effect of uncertainty on objectives

risk management: coordinated activities to direct and control an organization with regard to risk

risk register: record of information about identified risks

risk report: communication intended to inform particular internal or external stakeholders by providing information regarding the current state of risk and its management

routine maintenance: regular on-going maintenance necessary to keep infrastructure operating safely and to prevent premature failure including repairs

scope of work: 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

schedule:

a) the planned dates for performing activities and the planned dates for achieving major milestone; or

b) a table of items of information

scheduled maintenance: maintenance projects flowing out of condition assessments or service life planning and which are included in a list in an infrastructure plan for implementation through the IGS

Service Delivery Agreement (SDA): an agreement between two or more organs of state setting out the terms and conditions, and roles and responsibilities with respect to the delivery or maintenance of infrastructure which promotes and facilitates inter-institutional relations and the principles of participation, co-operation and co-ordination

service life
period of time after construction during which infrastructure or its parts meet or exceed the performance demanded or expected to be fulfilled

stage: a collection of logically related activities in the infrastructure delivery cycle that culminates in the completion of a major deliverable

strategic brief: the document accepted at the end of stage 3 of the IGS which contains, the package information, risk report, the schedule of statutory permissions, funding requirements, and utility approvals, as relevant, that are to be obtained as the work proceeds and the procurement strategy for the package

statutory permissions
any relevant approval, consent or permission under any legislation required to implement a package

supervising agent: official or PSP appointed by the implementer to check that the works are proceeding in accordance with the provisions of the contract

targeting strategy
strategy that enables secondary procurement policy objectives to be promoted

treasury: the National Treasury or a provincial treasury, as may be appropriate in the circumstances

user requirements
statement of need to be fulfilled

user
an institution of a division within an institution which is responsible for operating the infrastructure which is allocated to it

utility
a company, municipality or municipal entity which provides services such as water or electricity

2.2 Abbreviations

For the purposes of this document, the following abbreviations apply

CIDB: Construction Industry Development Board

ICT: Information and Communication Technologies

IGS: Infrastructure Gateway System

IPIP: Infrastructure Programme / Project Implementation Plan

IPMP: Infrastructure Programme / Project Management Plan

MTEF: Medium Term Expenditure Framework

PEP: Package Execution Plan

PPP: Public Private Partnership

PSP: Professional Service Provider

SCM: Supply Chain Management

SDA: Service Delivery Agreement

3 Normative references

The following referenced documents are indispensable for the application of this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

National Treasury, *Standard for a Construction Procurement System*, National Treasury and Construction Industry Development Board

National Treasury, *Occupational Health and Safety Specification for Construction Works Contracts,* National Treasury and Construction Industry Development Board

4 Infrastructure Gateway System

4.1 Gates, stages and associated key deliverables

4.1.1 The stages, key deliverables and principal actions associated with the delivery and scheduled maintenance of infrastructure shall be as stated in Table 1 and outlined in Figure 1.

NOTE 1 The planning activities at a portfolio level (stages 1 and 2) and at a package level of the infrastructure gateway system are iterative activities (see Figure 1). Projects may be reprioritised or cancelled following the conclusion of stage 4. Also procurement planning should be undertaken on an annual basis. As a result, packages may change e.g. be grouped together or broken down.

NOTE 2 The infrastructure gateway system deals with the generic work flow associated with the delivery and maintenance of infrastructure and generate information which informs decisions at particular points. It is not aligned to any particular funding or procurement procedures.

4.1.2 An institution may add additional gates within a stage but may not remove or omit any stage except stages 5 and 6 subject to the package information available at the end of stage 4 being sufficient to proceed with stage 7 or stage 9C.

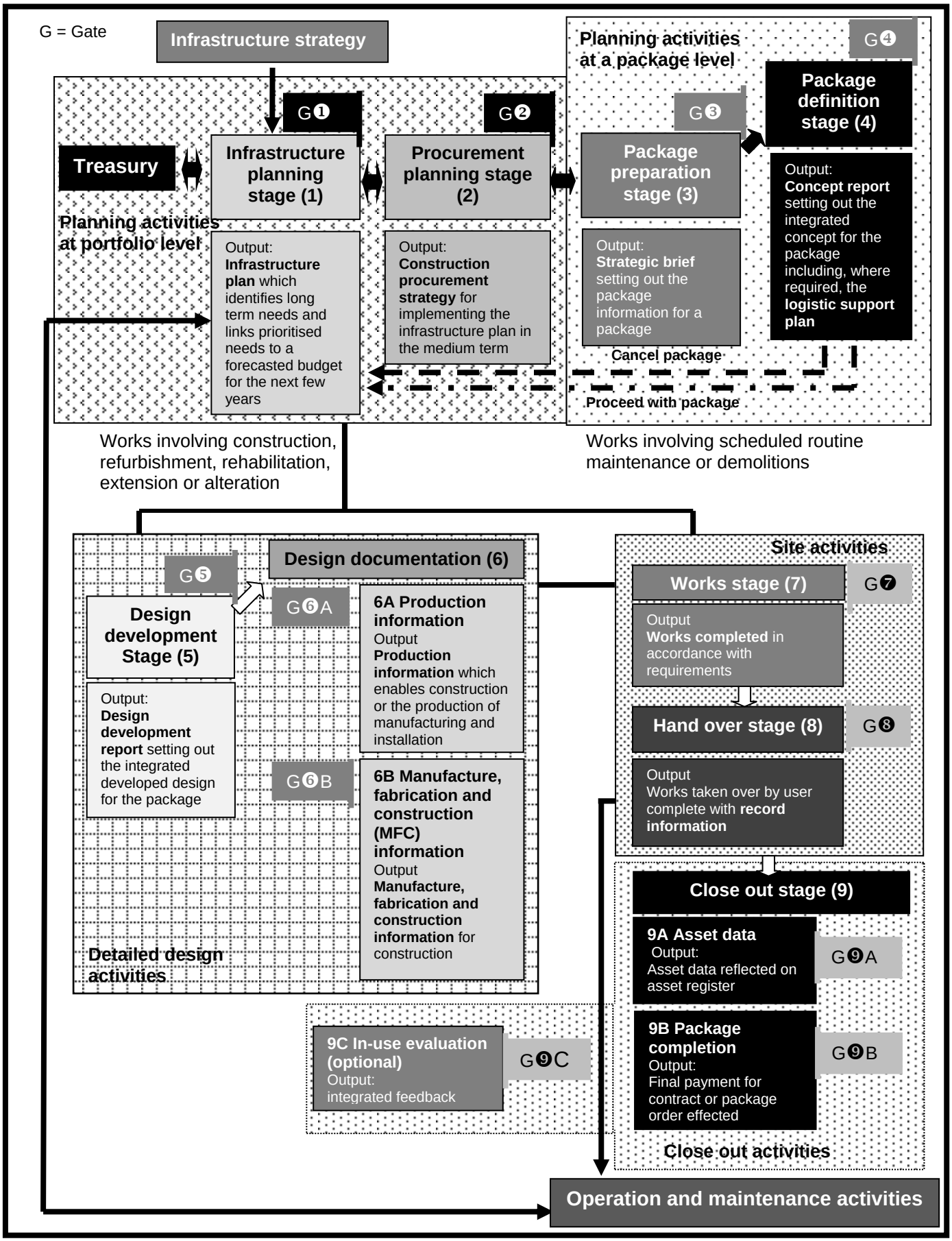


Figure 1 – The stages and gates of the Infrastructure Gateway System

Table 1 – Key deliverables and activities associated with the infrastructure gateway system

Activities	Stage		Key deliverable
	No	Description	
Planning at a portfolio level	1	Infrastructure planning	Client approved infrastructure plan
	2	Procurement planning	Client accepted construction procurement strategy for implementing the infrastructure plan in the medium term
Planning at a package level	3	Package preparation	Client accepted strategic brief
	4	Package definition	Client accepted concept report including where necessary, a logistic support plan
Detailed design	5	Design development	Client accepted design development report
	6a	Design documentation (Production information)	Completed and client accepted production information
	6b	Design documentation (Manufacture, fabrication and construction information)	Client accepted manufacture, fabrication and construction information
Site	7	Works	Completed works which are capable of being occupied or used and accepted by the client.
	8	Hand over	Works which have been taken over by the user complete with record information
Close out	9a	Asset data	Archived record information and updated asset register
	9b	Package completion	Completed contract or package order

4.1.3 A stage in the infrastructure gateway system (IGS) shall only be completed when the deliverable has been approved or accepted by the person or persons designated to do so. Activities associated with a stage may be undertaken in parallel or series, provided that each stage is completed in sequence.

4.1.4 The level of detail contained in a deliverable associated with the end of each stage shall be:

a) sufficient to enable informed decisions to be made to proceed to the next stage (see Figure 2); and

b) such that it can be used to form the basis of the scope of work for taking the package forward in terms of the selected contracting strategy (see Table 2).

NOTE The level of information increases with each successive stage. Different types of infrastructure, contracting strategies as well as the scale and location of projects present different risks. As a result, the level of detail at each stage necessary to make an informed decision at a gate is a matter of professional judgement and varies between different types of projects and contracting strategies.

4.1.5 The infrastructure plan and the construction procurement strategy shall be reviewed and updated at least once a year (see Annexure A).

NOTE The portfolio and package planning activities are iterative processes with improved information with each iteration (see Annexure A). Accordingly, portfolio and package planning (the first four stages of the IGS) being an iterative process can involve a number of MTEF years, depending upon how early planning activities commence and how long it takes to bring a project to a state of readiness for implementation.

Table 2 – Key deliverables associated with the scope of work of a contracting strategy

Contracting strategy		**Key deliverable which forms the basis of the scope of work associated with a contract**	
Strategy	**Description**	**Stage associated with the deliverable**	**Deliverable**
Management contractor*	Contract under which a contractor provides consultation during the design stage and is responsible for planning and managing all post-contract activities and for the performance of the whole of the contract	3 Package preparation	Client accepted strategic brief*
Design and construct	Contract in which a contractor designs a project based on a brief provided by the client and constructs it	4 Package definition	Client accepted concept report
Develop and construct	Contract based on a scheme design prepared by the client under which a contractor produces drawings and constructs it	5 Design development	Client accepted design development report
Design by employer	Contract under which a contractor undertakes only construction on the basis of full designs issued by the employer	6a Design documentation (Production information)	Completed and client accepted production information

* A management contractor can also be appointed after Stage 4, 5 or 6A in which case the client accepted concept report, design development report or production information, respectively, can serve as the basis of the scope of work.

4.2 Activities

4.2.1 Planning activities at a portfolio level

4.2.1.1 Stage 1: Infrastructure planning

4.2.1.1.1 The following activities shall as necessary be undertaken during stage 1 (infrastructure planning) to develop an infrastructure plan:

a) identify the policy drivers, strategies and long term objectives and spatial planning of national, provincial and local government which impact upon the client's service delivery mandate;

b) examine the relationship between previous outputs of infrastructure plans and outcomes achieved and consider implications for future planning;

c) articulate desired outcomes for infrastructure in support of service delivery at a portfolio level including depth versus width of impact, financial and environmental sustainability and socio-economic impacts which are aligned with a);

d) assess current performance of infrastructure against desired outcomes and perform a needs analysis informed by factors such as desired outcomes, policies, norms and standards, condition assessments, functional performance or nature of existing infrastructure, demographic trends, current and forecasted utilisation trends, service levels and desired outcomes which results in:

   1) a documented and credible forecast of current and projected net demand for services (i.e. demand for services minus the existing supply plus inputs needed to maintain existing and projected supply for services) over a range of time horizons including the 3-year MTEF and a period of not less than 10 years; and

   2) a broad description of what additional (over and above existing supply) infrastructure outputs need to be provided to support services for each of the time horizons.

e) at a strategic level:

   1) identify and document a range of feasible options in the form of broad strategic interventions for achieving the desired outcomes after considering amongst other things:

— non-infrastructure options such as operational or managerial reorganisation;

— infrastructure options such as alterations, extensions, refurbishment, rehabilitation, repairs or scheduled maintenance of existing infrastructure, the construction of new infrastructure or the leasing of infrastructure taking cognisance of asset management plans; and

— where appropriate, off-budget financing to achieve desired outcomes (e.g. .mobilising additional finance via PPPs or via the sale of underutilized land and facilities)

2) recommend a preferred mix of non-infrastructure and infrastructure options and provide an objective motivation for such a mix;

f) identify for each of the recommended intervention options the broad scope and cost estimate for individual projects within the available funding envelopes while allowing for possible strategic budget shifts implied by the strategic shifts

g) for each of the identified projects

1) prepare a time schedule;

2) identify encumbrances such as land availability, land ownership, zoning rights, availability of bulk or ICT infrastructure and records of decisions regarding environmental issues; and

3) provide realistic time frames for removing such encumbrances;

h) produce an infrastructure plan at a portfolio level for the forecasted long term acquisition, refurbishment, rehabilitation and scheduled maintenance of infrastructure which provides a prioritised list of projects against a forecasted budget for at least the next three years described by:

1) the intervention options and the rationale for the selected intervention;

2) the independent project or programme of projects to which each project is allocated during the development of a construction procurement strategy (see Table 3 and annexure A), if any or if known,

3) the category in which the project falls;

4) the broad scope of work;

5) the time schedule;

6) the estimated total project cost and annual cash flows;

7) the geographical location; and

8) any known encumbrances such as land availability, land ownership and zoning rights including the current status and estimated timeframes for removing these encumbrances; and

9) records of decision regarding environmental issues.

i) undertake specific activities:

1) prescribed by law; and

2) linked to funding requirements including the making of applications for funds; and

j) obtain infrastructure plan approval and secure the budget to initiate further planning or implementation for the next MTEF period.

NOTE 1 Infrastructure planning described in 4.2.1.1.1 is designed to diagnose the problem, articulate goals against which plans will be tested, forecast the planning requirements, create alternatives (scenarios) to satisfy forecasted requirements and the goals, plan test to evaluate the degree to which each alternative fulfils the goals and to select a preferred option or options and to evaluate the proposed projects prior to their prioritisation and inclusion in an infrastructure plan (See Figure 2)

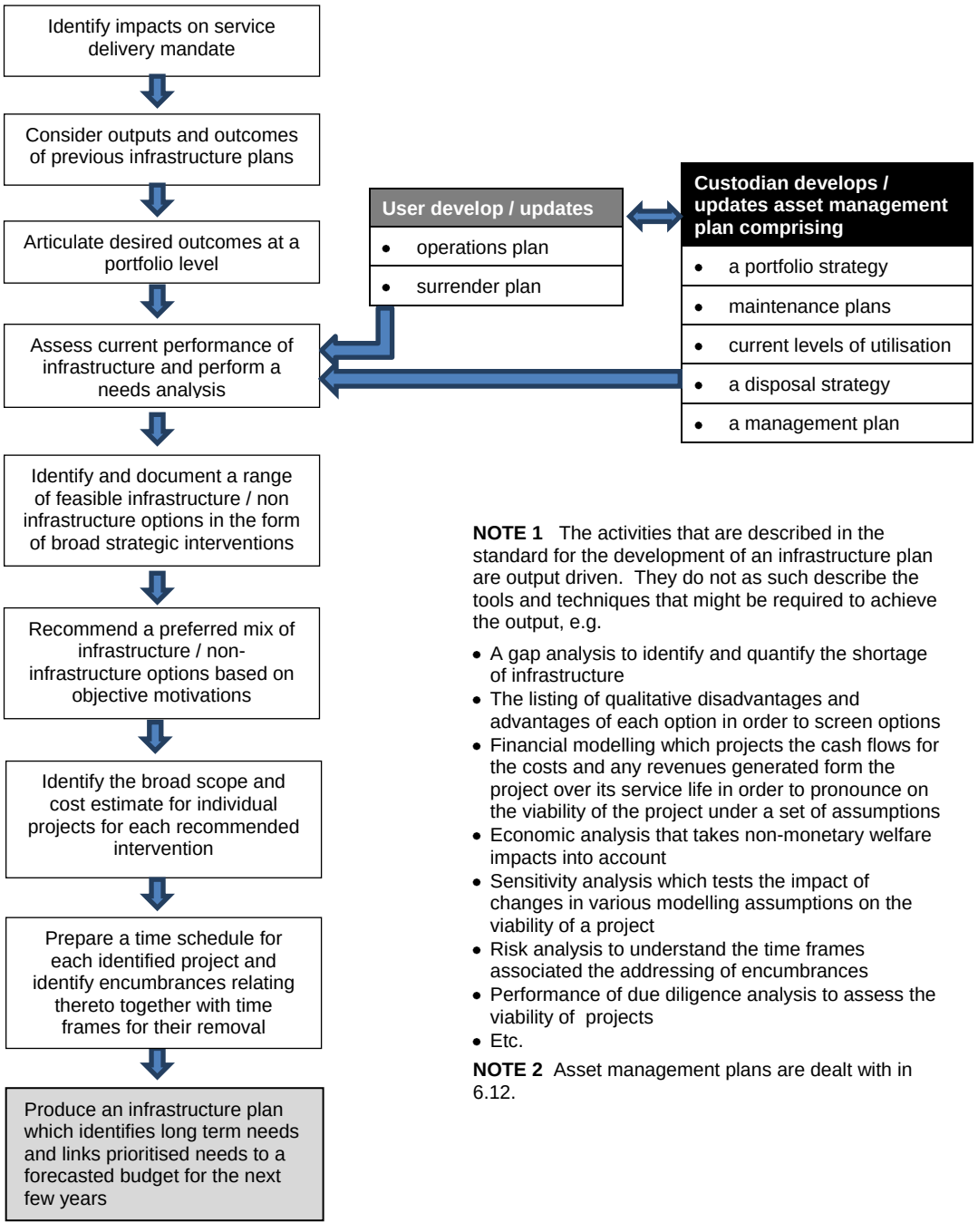


Figure 2 - Activities which need to be performed in the development of an infrastructure plan

NOTE 2 Infrastructure planning is a continuum and not an event. It is a highly iterative process involving the rationalisation of demand against available resources while maintaining required service levels. It is not a step by step process where the analyses are independent of each other and can be performed in sequence. Information needs to flow between the different analyses and constant feedback mechanisms need to be put in place to ensure coherence.

NOTE 3 Infrastructure planning can be supply driven (i.e. by addressing the difference or gap between a desired state and a current state) or demand driven (i.e. by adopting approaches which change the perceptions and hence requirement as to what should be supplied). It is therefore important to consider what drives infrastructure prior to performing a needs analysis and during the options analysis.

NOTE 4 Infrastructure planning requires interactions between the different internal and external role players including that between the client and the custodian.

NOTE 5 Initiation of the entire preferred mix of options to achieve desired outcomes described in 4.2.1.1.1e) might not be possible in the first year or two of an MTEF due to prior and current project commitments. However, budget shifts resulting from changes in strategies and priorities can and should be affected over time, with at least the outer year of the MTEF clearly reflecting such strategic shifts. In infrastructure planning:

a) the first order of business is to decide on the required shifts in budget allocations to achieve strategic objectives over a specified time frame which should be at least 10 years;

b) the second order of business is the identification of sub-categories of intervention options which are part of the preferred mix (e.g. improved maintenance may be the main intervention option in order to achieve the desired outcome of greater width of impact and may be further broken down into sub-categories such as scheduled, routine maintenance and day to day maintenance).

NOTE 6 Objective motivations for an option typically revolve around value for money considerations i.e. the most economical solution after consideration of the project criteria in terms of the service life cost. They may also include cost benefit analysis, cost effectiveness analysis, impact assessments, comparisons of the qualitative advantages and disadvantages of each option or the balancing of trade-offs. Outputs of engineering, environmental, financial, socio-economic and risk analyses and organisational considerations can also contribute to the objective motivation for the selection of an option. In some instances, it might be necessary to take into account the anticipated revenue stream generated over its service life or to undertake a sensitivity analysis to test the assumptions made in various modelling exercises.

NOTE 7. The selection of a site for a project can be influenced by a number of factors such as environmental conditions, availability of utilities, costs to provide services (e.g. water, sewerage, stormwater drainage, road access, electricity and ICT infrastructure), heritage issues, alignment with Integrated Development Plans, ownership of land, geotechnical conditions, space and slope constraints, zoning restrictions etc.

NOTE 8 The information available to screen and ultimately select options, depending upon the nature of the projects, is usually refined over time. When a project first appears on a list, a decision might be only to release funding to develop the brief for the package (stage 3) and possibly the concept report (stage 4) (see Annexure A) during an MTEF year. The project information that becomes available during these stages should be looped back into stage 1 for use in annual budgeting and updating of the infrastructure plan. . It is therefore important to indicate in infrastructure plans if a project has gone through to stage 4 and what has changed with respect to projects included in previous infrastructure plans.

NOTE 9 The resources spent on appraising proposals, options and projects should be proportional to the likely project cost bearing in mind its nature and complexity.

NOTE 10 Every infrastructure project in principle requires a separate appraisal. It is, however, possible to group similar projects together and appraise them collectively.

NOTE 11 The prioritisation and scheduling of infrastructure projects over the 3-year MTEF (and at least into the beginning of the next MTEF) should, as a general rule, be such that land acquisition and detailed project planning (i.e. up to and including stage 4) does not happen in the same financial year as project implementation, but should instead be completed in the prior year/s. This will significantly reduce the risk of project implementation having to be put on hold and rescheduled due to unresolved land and planning related issues (see Annexure A).

NOTE12 Land acquisition planning should begin well in advance of implementation. It is therefore desirable to have planning timeframes longer than the MTEF.

NOTE 13 Detailed guidance on the development of aspects of infrastructure plans may be found in various publications such as:

- Association of local Government Engineering NZ and National Asset Management Steering (NAMS) Group. International Infrastructure Management Manual – South African Edition 2006. ISBN No 0-473-10685-X
- IDM Toolkit. Delivery Management Guidelines: Delivery Process 1 - Portfolio Management. www.cidb.org.za/_layouts/toolkit/index.html
- Department Co-operative Government and Traditional Affairs. Municipal Infrastructure - An Industry Guide to Infrastructure Service Delivery Levels and Unit Costs. January 2010
- Department: Provincial and Local Government: The Municipal Infrastructure Grant: Basic Level of Service and Unit Costs: A Guide for Municipalities. June 2010.
- Department: Local and Provincial Government. Guidelines for Infrastructure Asset Management in Local Government 2006 – 2009. /www.dplg.gov.za/subwebsites/mig/docs/7.pdf
- National Department of Public Works. Guidelines for Users - User Asset Management Plans (U-AMPs).www.cidb.org.za/_layouts/toolkit/data/ai_docs/DP2-S10%20Guideline%20for%20U-AMP%20(2008-10-20)%20Version%201.pdf

NOTE 14 The economic analysis that is performed should take into account life cycle costs – see ISO 15686-5, Buildings and constructed assets — Service life planning — Part 5: Life cycle costing.

NOTE 15 Where projects are linked to programmes of projects or an independent project, the basis or rationale for the identification of such linkage should be stated as well as the scope of the programme of projects / independent project and associated budgets and sub-budgets.

NOTE 16 Risk considerations should be taken into account when prioritising projects for planning and implementation.

NOTE 17 The planning, identification, prioritisation and budgeting of scheduled maintenance projects should be informed by the condition assessments and maintenance plans developed by the custodian in accordance with 6.12.1.

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4.2.1.1.2 Approved infrastructure plans shall:

a) provide infrastructure which has a fitness of purpose and provides value for money over its service life;

b) provide infrastructure in the right quantity and quality, in the right places, at the right time, and in accordance with constitutional and legislative mandates, strategic priorities, accepted norms and standards (planning guidelines) and which is affordable in terms of current and future budgetary projections;

c) ensure that optimal utilisation is made of existing infrastructure as demand patterns shift over time; and

d) enable infrastructure to be maintained so that it remains fit for purpose in use.

NOTE The processes within stage 1 should enable the infrastructure plans which are developed to:

a) be aligned and integrated with the long term objectives and the spatial planning of the different spheres of government which impact upon the institution's mandate;
b) contain projects which have been selected and prioritised on the basis of institutionalized prioritisation processes which *inter alia* incorporate consideration of key organizational strategic emphases, participation by key stakeholders and documented objective decision making criteria (such as condition assessments , demographic patterns/population trends, utilisation levels, norms and standards, life cycle planning/costing etc.),
c) satisfy all legislative requirements, organisational requirements and any conditions or requirements associated with grant funding;
d) be linked to budgets for preferably five years (three year MTEF period and two outer years) but at least three financial years in the MTEF period; and
e) organise projects into categories such as new construction, alteration, extension, rehabilitation, refurbishment and scheduled maintenance..

4.2.1.1.3 Work on a project associated with stages subsequent to stage 1 may not be undertaken before a project is on the approved infrastructure plan and appropriately budgeted for in the MTEF.

4.2.1.2 Stage 2: Procurement planning

4.2.1.2.1 The activities identified in Table 3 shall be undertaken to produce a construction procurement strategy at a portfolio level for implementing projects in the infrastructure plan over at least the MTEF period.

4.2.1.2.2 The Public Private Partnership procedures established by National Treasury shall be followed for those categorises of spend which are identified in the construction procurement strategy as being delivered through a PPP.

NOTE 1 The Construction Industry Development Board / National Treasury, Practice Guide #2: Construction Procurement Strategy provides detailed guidance on the development of a construction procurement strategy.

NOTE 2 The headings contained in Table 5 enable the outcomes of each activity in the step by step procedure provided in Table 4 to be documented in a logical and systematic manner. The documenting of the reasons for making each decision under these headings enables the reader to understand the thinking behind the decisions that were taken.

4.2.2 Planning activities at a package level

4.2.2.1 Stage 3: Package preparation

The following activities shall be undertaken during stage 3 (package preparation) to develop a strategic brief:

a) define the package objectives, business need, user requirements, acceptance criteria and client priorities and aspirations, as relevant;

b) confirm the scope of the package and identify any constraints;

c) establish the project criteria including as, relevant, the performance and reliability requirements, design life, service life of components, function, maintenance and replacement requirements, mix of uses, scale, location, quality, value, time, safety, health, environment and sustainability;

d) where necessary, conduct preliminary investigations, stakeholder consultations, site visits or desk top studies to obtain data or to interrogate outstanding risks relating to matters such as the site, bulk services, the environment, heritage, safety, planning;

e) identify procedures, organizational structure, key constraints, statutory permissions (e.g. environmental, heritage, social, planning, building control), and utility approvals, policies (e.g. environmental, developmental, social, maintenance or facilities management) and strategies to take the package forward;

f) identify risks that need to be mitigated;

g) establish the control budget for the package, ownership costs and schedule for the package; and

h) develop, finalise and obtain acceptance of the strategic brief.

NOTE The preliminary investigations, depending upon the nature of the project and the work undertaken in stage 1, are characterised by site visits and assessments including site suitability from a legal, land, bulk service, geotechnical, topographical, environmental, heritage, social etc. perspectives and stakeholder support. The level of detail is usually insufficient for detailed design purposes i.e. it is indicative. More comprehensive investigations are performed in stage 4. The preliminary investigations allow a project to be further probed beyond the stage 1 assessment before significant resources are committed to prepare the project for implementation.

Table 3: Activities, sub-activities, steps and outputs associated with a construction procurement strategy

Activity		Sub- activity		Step		Output
#	Description	#	Description	#	Description	
1	Develop a delivery management strategy	1.1	Gather and analyse information	1	Conduct a spend analysis	Spatially located work items in the infrastructure plan grouped into categories of spend with common attributes.
				2	Conduct an organisational analysis	Descriptions of client organisational characteristics
				3	Conduct a market analysis	Descriptions of market characteristics
		1.2	Formulate procurement objectives	1	Formulate primary procurement objectives	Identified primary procurement objectives
				2	Formulate secondary procurement objectives	Documented and prioritised secondary procurement objectives
		1.3	Make strategic delivery management decisions	-	Decide on how needs are to be met	A delivery management plan which indicates how each categories of spend or portions thereof are to be delivered. i.e. through a Public Private Partnership, Implementing Agent, another organ of state's framework agreement, leasing of property, outsourcing or own resources
		1.4	Decide on delivery mode (project or programme)	-	Decide on programme of projects or series of independent projects	Categories of spend or portions thereof delivered as a programme of projects or a series of independent projects
		1.5	Package works	1	Identify opportunities for framework agreements	Categories of spend or portions thereof to be implemented through own framework agreements.
				2	Identify packages	A package plan for construction and maintenance projects or a combination thereof which states the mode of delivery for and identifies each package
2	Decide on contracting arrangements	2.1	Allocate risks for packages	1	Decide service requirements and / or contracting strategy	Service requirements and risk allocations for each package i.e. allocation of responsibilities, pricing strategy and standard form of contract
				2	Decide on pricing strategy	
				3	Decide on form of contract	
		2.2	Establish requirements for outsourced professional services		Identify services areas that are required	Identified professional services which need to be procured
		2.3	Package professional service contracts	1	Decide on contracting strategy	Requirements for outsourced professional services categorized as single discipline or multidisciplinary
				2	Decide on the type of contract	Requirements for outsourced professional services linked to a specific package or a programme or a number of undefined packages or programmes
		2.4	Allocate risks for professional service contracts	1	Decide on pricing strategy	Identified pricing strategy for required professional services
				2	Decide on form of contract	Identified standard form of contract for a professional service contract

Activity		Sub- activity		Step		Output
#	Description	#	Description	#	Description	
3	Decide on procurement arrangements	3.1	Decide on quality strategy	-	-	Suitable quality strategies
		3.2	Decide on procurement procedure	-	-	A suitable procurement procedure
		3.3	Decide on targeted procurement strategy	-	-	Suitable targeted procurement procedures
		3.4	Decide on tender evaluation procedure	-	-	A suitable tender evaluation strategy
4	Document the construction procurement strategy	-	Document the identified construction procurement strategy using the recommended headings provided in Table 5	-	-	A documented construction procurement strategy that documents the logic behind the choices that are made at each step
5	Acceptance of construction procurement strategy	-	Accept construction procurement strategy	-	-	An accepted construction procurement strategy

Table 5 – Recommended headings in a construction procurement strategy

#	Heading	Subheadings
1	Background / introduction	
2	Delivery management strategy	2.1 Nature and spatial arrangement of projects and clusters 2.2 Client organisation characteristics 2.3 Market characteristics 2.4 Primary procurement objectives 2.5 Secondary procurement objectives 2.6 Delivery management plan 2.7 Delivery mode 2.8 Packaging strategy
3	Contracting arrangements	3.1 Risk allocations for packages 3.1.1 Contracting and pricing strategies 3.1.2 Forms of contract 3.2 Professional services contracts 3.2.1 Requirements for outsourced services 3.2.2 Packaging for professional service contracts 3.2.3 Allocation of risks for professional service contracts
4	Procurement arrangements	4.1 Quality strategy 4.2 Procurement procedure 4.3 Targeted procurement procedure 4.4 Tender evaluation procedure
5	Satisfying primary and secondary objectives	5.1 Construction procurement strategy 5.2 Issues to be dealt with in contracts which are not addressed elsewhere

4.2.2.2 Stage 4: Package definition

4.2.2.2.1 The following activities shall be undertaken during stage 4 (package definition) to develop a concept report setting out the integrated concept for the package:

a) obtain site studies and specialist advice, as necessary;

b) establish the feasibility of satisfying the strategic brief for the package within the control budget with or without modification;

c) determine the initial design criteria and design options to construct, refurbish, rehabilitate, alter or extend infrastructure or the methods and procedures required to maintain the condition of infrastructure for the package;

d) investigate alternative solutions and recommend the preferred solution;

e) establish the detailed brief, scope, scale, form and cost plan for the package;

f) develop an indicative schedule for documentation and construction or maintenance services associated with the package;

g) produce as necessary a site development plan or other suitable schematic layouts of the works and obtain the necessary statutory permissions, funding approvals or utility approvals to proceed with the works associated with the package;

h) undertake where necessary, studies to determine service life costs and to forecast revenue over the lifetime of the infrastructure associated with the project to confirm the financial sustainability of the project;

i) produce a risk report which incorporates the need for further surveys, tests, other investigations and consents and approvals, if any, during subsequent stages and identified health, safety and environmental risk;

j) produce a logistic support plan in accordance with the provisions of 4.2.2.2.2 if new infrastructure is created; and

j) develop, finalise and obtain the clients acceptance of the concept report.

NOTE 1 The package preparation stage is the last stage of the planning activities. It brings to a close the information required to make informed decisions concerning the implementation of the project. This stage as such needs to resolve any outstanding project related risks and gather sufficient information to enable such decisions to be made.

NOTE 2 Site studies can include site evaluations, topographical surveys, surveys of existing structures, geotechnical investigations and environmental, social or heritage assessments.

NOTE 3 Resolution of details that do not impact upon the key elements are generally left to stage 5.

NOTE 4 Stage 4 is where sufficient design concepts or solutions are developed for the client to establish the feasibility of the works associated with the package or to select a particular conceptual approach to pursue.

NOTE 5 The design or solution at the end of stage 4 is "frozen". The concept report as such in the case of

a) construction, refurbishment, rehabilitation, alteration or extensions of infrastructure contains as relevant, the preliminary analysis, key assumptions, the evaluation of alternatives, preliminary sizes of primary or key elements, a description or outline of secondary elements, the preliminary review of the utility supply capacity, indicative specifications or schedules of finishes and preliminary layout drawings.
b) maintenance contains the specifications for the maintenance and repair procedures.

4.2.2.2.2 The following activities shall, where required, be undertaken to produce the logistic support plan:

a) **Client:** identify additional organisational structure required for operation and maintenance over life span, and office, stores, furniture, equipment, information technology and staff training requirements to run operation and maintenance facilities as well as engineering infrastructure

b) **Professional:** i) establish logistic requirements in respect of facilities and/or engineering infrastructure;

ii) specify requirements, if any, for the contractor to provide a servicing and maintenance plan for all facilities and engineering infrastructure

NOTE Logistic requirements typically relate:

a) in engineering infrastructure to the strategic management of the operation and maintenance of water supply, sanitation, telecommunication, electricity supply, electronic, transportation, and stormwater drainage systems, taking full cognizance of their design or forecasted behaviour under specific operating conditions in a manner that does not compromise their intended functioning or the health and safety of workers and users or harm property or the environment
b) in buildings and related site works to facilities management i.e., an interdisciplinary field primarily devoted to the day to day operations, maintenance and care of buildings e.g. the care of air conditioning, electric power, plumbing and lighting systems, cleaning, decoration, grounds keeping and security.

4.2.3 Detailed design activities

4.2.3.1 Stage 5: Design development

The following activities shall be undertaken during stage 5 (design development) to develop the design development report:

a) develop in detail the accepted concept to finalise the design and definition criteria;

b) establish the detailed form, character, function and cost plan, defining all components in terms of overall size, typical detail, performance and outline specification, as relevant;

c) confirm or revise the cost plan included in the concept report; and

d) develop and finalise and obtain the clients acceptance of the design development report.

NOTE 1 Detailed design includes the selection of materials and components. At this stage there will frequently be an iterative process of proposing a component, checking its predicted performance against the brief, and amending selections if required.

NOTE 2 The design development report translates the concept report into a document which paints a picture of what is to be delivered in terms of the package. The report needs as such to describe how structures, services or buildings and related site works, systems, subsystems, assemblies and components are to function, how they are to be safely constructed, how they are to be maintained and, if relevant, how they are to be commissioned.

NOTE 3 Outline specifications should be in sufficient detail to enable a view to be taken on the operation and maintenance implications of the design and the compatibility with existing plant and equipment to be established. Reference to applicable specifications and key data associated therewith may be sufficient e.g. reference to applicable SANS 2001 *Construction standards* and critical specification data.

NOTE 4 As part of service life planning, components should be assessed for compliance with performance requirements. Performance will deteriorate at a rate depending on the local environment, including the reactions at interfaces between materials and/or components, the design of the works, the component and installation detailing, the materials, the skill and quality of site work, maintenance and usage.

NOTE 5 The design should reflect the constraints of the budget for the overall project. To meet the brief, adjustment of either the budget or the service life requirements may be necessary. Where a specification is adjusted to meet cost constraints, the maintenance implications should also be considered.

NOTE 6 Commissioning is often misinterpreted to focus solely on testing during the end of the construction phase. Commissioning is actually a collaborative process for planning, delivering, and operating works that function as intended. ASHRAE (The American Society of Heating, Refrigeration and Air-Conditioning Engineers) defines commissioning as *"…the process of ensuring that systems are designed, installed, functionally tested, and capable of being operated and maintained to perform in conformity with the design intent… Commissioning begins with planning and includes design, construction, start-up, acceptance and training, and can be applied throughout the life of the building.*" This definition accurately depicts commissioning as a holistic process that spans from pre-design planning to post-construction operation and can be thought of as a checks-and-balances system.

4.2.3.2 Stage 6: Design documentation

4.2.3.2.1 Stage 6A: Production information

The following activities shall be undertaken during stage 6A (production information) to produce the production information:

a) produce the final 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; and

b) obtain the clients acceptance of the production information.

NOTE 1 The scope of work for a package specifies not only the works that are left behind but also the constraints in performing the works. It should accordingly include certain constraints relating to the temporary works, sequencing of the works and times between operations.

NOTE 2 Quality in contracts is frequently considered to be "conformance to stated requirements." Defects on the other hand are parts of the works which are not in accordance with stated requirements. This necessitates that requirements are objectively and comprehensively expressed in the scope of work in such a manner that compliance is capable of objective assessment i.e. the contractor can verify compliance without reference to the designer or representative of the employer.

NOTE 3 Those responsible for drafting or providing inputs to the scope of work need to:
a) consider the inclusion of requirements for a quality management system or a quality management plan;
b) state, as necessary, the nature of the tests and inspections that are to be conducted, the timing of specified tests/ inspections, where and when the tests are to be performed, who is responsible for performing the tests, requirements for witnessing of tests, who is responsible for providing materials, facilities and samples for tests/inspections, the objectives of the tests/inspections, the testing procedures to be applied and the standards to be satisfied; and
c) express quality standards in such a manner that compliance is capable of being objectively assessed.

NOTE 4 This stage includes selecting appropriate component specifications and installation details, and may extend into selecting the optimum specifications, using techniques such as value engineering or life cycle costing.

NOTE 5 Commissioning procedures need to be scheduled in relation to other services or construction activities. Since the commissioning process is dependent on the progress of systems, structures and building fabric, the scheduling of commissioning activities needs to be carefully planned in relation to those activities. Accordingly, the interdependency problems need to be identified and considered as early in the project as possible as they need to be included in the designer's specification.

4.2.3.2.2 Stage 6B: Manufacture, fabrication and construction information

The following activities shall be undertaken during stage 6B (manufacture, fabrication and construction) to produce the manufacture, fabrication and construction information:

a) **contractor:** produce the manufacture, fabrication and construction information based on the production information.

b) **client's representative:** review the manufacture, fabrication and construction information prepared by others, based on the production information for design intent and conformance with scope of work.

NOTE Standard forms of contract contain generic requirements which facilitate the acceptance of manufacture, fabrication and construction information. Contract specific requirements may be included in the scope of work.

4.2.4 Site activities

4.2.4.1 Stage 7: Works stage

The following activities shall be undertaken during stage 7 (works) in relation to the works:

a) provide temporary works

b) provide permanent works in accordance with the contract

c) manage risks associated with health, safety and the environment on the site,

d) confirm that design intent is met; and

e) correct notified defects which prevented the client or end user from using the works and others from doing their work

NOTE 1 Contract data in a contract identifies the applicable conditions of contract which contain terms that collectively describe the rights and obligations of contracting parties and the agreed procedures for the administration of their contract.

NOTE 2 Most of the standard forms of contract prescribed in the CIDB Standard for Uniformity in Construction Procurement for use by the public sector contain standard provisions for the delegation of employer responsibilities to an employer's representative. The standard arrangements are as follows:

a) the Principal Agent in the JBCC Series 2000 contracts;
b) the Project Manager in the NEC3 Engineering and Construction Works Contract;
c) the Service Manager in the NEC3 Term Service Contract;
d) the Supply Manager in the NEC3 Supply Contract; and
e) the Engineer in GCC and the FIDIC contracts other than the FIDIC Short Form of Contract.

NOTE 3 High level procedures relating to the completion and correction of defects are contained in the conditions of contract. A well formulated contract should contain, where relevant, comprehensive commissioning requirements in the scope of work.

4.2.4.2 Stage 8: Handover stage

The following activities shall be undertaken during stage 8 (handover):

a) finalise and assemble record information which accurately reflects the infrastructure that is acquired, rehabilitated, refurbished or maintained; and

b) hand over the works and record information to the user and, if necessary, train end user staff in the operation of the works.

NOTE 1 There is a difference between achieving completion of the works in accordance with the provisions of the contract and the handing over of the works to the owner, end user or those responsible for the operation and maintenance of the works. A well formulated contract should contain, where relevant, testing and commissioning requirements ahead of completion to facilitate a smooth hand over.

NOTE 2 A handover needs to be planned. Prior warning of the expected handover dates needs to be given to those who are going to use, operate or maintain works. The successful completion of packages which incorporate plant (machinery and heavy equipment installed for the operation of a servicer) is usually dependent on there being a properly conducted commissioning procedure prior to or integrated with the hand over.

NOTE 3 The primary objective of the record information is to provide those tasked with the operation and maintenance of a building and associated site works with the necessary information to:

a) understand how the designers intended the works, systems, subsystems, assemblies and components to function;
b) effectively operate, care for and maintain the works, systems, subsystems, assemblies and components to function
c) check, test or replace systems, subsystems, assemblies or components to ensure the satisfactory performance of works, systems, subsystems, assemblies and components over time;
d) develop routine and scheduled maintenance plans;
e) determine stock levels for components and assemblies that need to be regularly replaced; and
f) budget for the operation and maintenance of the works, systems, subsystems and components over time

The secondary objective of the record information is to provide information pertaining to the planning and design of a works to inform refurbishments, alterations, modifications, renovations and additions that may be required from time to time.

4.2.5 Close out stage

4.2.5.1 Stage 9A: Asset Data

The following activities shall be undertaken where necessary during stage 9A (asset data) in relation to the works:

a) archive record information

b) update portfolio asset register

NOTE This stage involves the obtaining of the required information for the asset register, the validation of the information and the entering of the information into the asset register.

4.2.5.2 Stage 9B: Package completion

The following activities shall be undertaken where necessary during stage 9B (package completion) in relation to the works:

a) correct all defects that are detected during the defects liability period;

b) complete the contract by finalising all outstanding contractual obligations including the finalisation and payment of amounts due after the expiry of the defects correction period

c) evaluate package outcomes; and

d) compile a completion report for the package outlining what was achieved in terms of key performance indicators and suggestions for improvements on future packages of a similar nature

NOTE The standard forms of contract that form the basis of the contract between the client and a contractor establish requirements for bringing a contract to conclusion.

4.2.5.3 Stage 9C: In-use evaluation

The following activities should be undertaken where desirable approximately one year after hand over during stage 9C (in-use evaluation) on new, modified refurbished or rehabilitated infrastructure:

a) observe infrastructure in use; and

b) produce a report which provides integrated feedback aimed at continuous improvement of delivered infrastructure.

NOTE: Stage 9C is not an obligatory stage. Depending upon the nature of the infrastructure that is delivered, it can provide valuable feedback to those engaged on future projects of a similar nature.

5 The framework for the delivery and maintenance of assets

5.1 General

5.1.1 Works involving the construction, refurbishment, rehabilitation, extension or alteration of infrastructure, goods or services necessary for a new facility as delivered to be occupied and used as a functional entity, temporary facilities and the routine and scheduled maintenance of existing infrastructure shall be implemented in accordance with:

a) the National Treasury *Standard for a Construction Procurement System*;

b) the approved IPMPs developed by **clients**;

c) the approved IPIPs developed by **implementers**;

d) where applicable, agreed SDA;

e) applicable forms of contract used by the institution; and

f) the provisions of this standard including the controls shown in Figure 3.

NOTE Goods and services necessary for a new facility can include furniture, equipment and ICT. Temporary facilities can include mobile classrooms and accommodation.

5.1.2 All goods and services relating to routine, day-to-day and emergency maintenance undertaken by contractors shall be procured in accordance with the National Treasury *Standard for a Construction Procurement System* and, where required, in terms of the procurement controls shown in Figure 3.

NOTE 1 The left hand side of Figure 3 outlines the gates associated with the IGS while the right hand side and central portion of Figure 3 outlines the gates associated with the Construction Procurement System including those associated with framework agreements. Figure 3 also indicates the linkages with IPMPs, IPIPS and PEPs as well as those with a relevant treasury, PPP processes, the CIDB's i-tender system and the institution's financial management system. It also provides the navigation paths between the various parts of the Infrastructure Gateway System and the Construction Procurement System for different types of contracts.

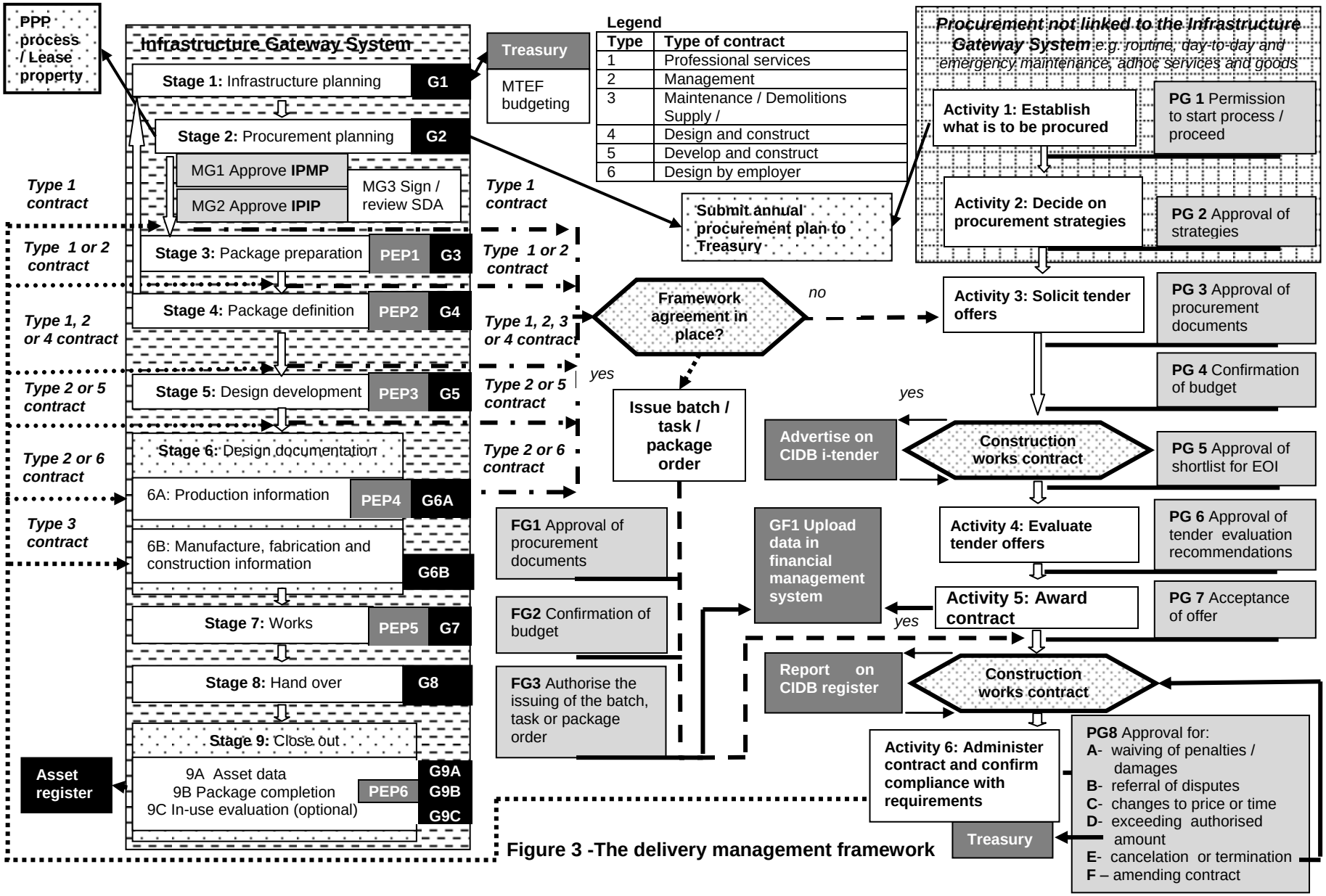

Figure 3 -The delivery management framework

NOTE 2 Contracts unrelated to an infrastructure plan are initiated in the first principal procurement activity (Establish what is to be procured) and pass through PG1 as indicated on the right hand side of Figure 3. Contracts associated with the IGS including professional services are initiated through the infrastructure planning stage (stage 1 of the IGS) on the left hand side of Figure 3. Infrastructure plans inform expenditure in the MTEF period, hence the link with treasury. Projects are allocated to contracts and package orders during stage 2 of the IGS. This completes the planning activities at a portfolio level. Package planning activities can then commence (stages 3 and 4 of the IGS). Should the packages prove not to be viable in their current form (e.g. insufficient budget, unacceptable risk profile, geotechnical / environmental / community constraints, poor return on investment etc.), the infrastructure plan is updated and the process repeated through stages 2 to 4 of the IGS. The acceptance of the procurement plan enables the IPMPs and the IPIPs to be developed and approved. This authorizes the procurement of goods, services and works associated with the projects in the infrastructure plan.

NOTE 3 Goods, services and works can be procured either through framework agreements that are already in place or through the construction procurement system. The Package Execution Plans (PEPs) are updated whenever stages 3, 4, 5, 6A, 7 and 9B of the IGS are completed. This enables progress to be monitored and reported on. The time, cost and scope of a package can be tracked by viewing the latest PEP for a Package and comparing the latest data with data contained in previous versions of these plans.

NOTE 4 The budgets are confirmed whenever the IPIP is updated or a procurement transaction is proceeded with. The award of a contract or a task, batch or task order provides a linkage with the institution's financial system. Progress reports via the PEP and payment certificates can inform the financial management system as to the progress of projects and project milestones. The passing through gates can also trigger events e.g. the release of retention amounts, the release of performance bonds etc.

NOTE 5 Portfolio and package planning is an iterative process which can involve a number of MTEF years, depending upon how early planning activities commence (see Annexure A). As a result, the information in the infrastructure plan can contain information obtained from PEP 1 and PEP 2 which have been extracted from the strategic brief and concept report developed during stages 3 and 4 of the IGS. Where such information is not available when the infrastructure plan is prepared, assumptions will need to be made regarding such information.

5.1.3 The control documents that inform decisions made at the control points or confirm that a milestone in the process as shown in Figure 3 has been reached are identified in Table 5. Such documents shall be retained for auditing purposes. Audits and quality assurance processes shall focus on the contents of these documents.

Table 5: Control documents provided at control points

Control point	Control documents	Comments
Infrastructure Gateway System		
G1	Accepted infrastructure plan and MTEF Budget	Developed by client
G2	Accepted construction procurement strategy	Developed by client in collaboration with the implementer
MG1	Approved IPMP	Developed and approved by client and accepted by implementer
MG2	Approved IPIP	Developed and approved by implementer and accepted by client
MG3	SDA	Developed and signed off by client and implementer
G3	Accepted strategic brief	Developed and approved by client and accepted by implementer PEP1 developed using package information contained in the accepted strategic brief
G4	Accepted concept report	Developed by implementer / contractor but accepted by client PEP2 developed using package information contained in the accepted concept report

Control point	Control documents	Comments
G5	Accepted design development report	Developed by implementer / contractor but accepted by client PEP3 developed using package information contained in accepted design development report
G6A	Accepted production information	Developed by implementer / contractor. Key documents accepted by client remainder accepted by implementer / contract manager PEP4 developed using package information extracted from priced or forecast of price in terms of contract or package order after production information is sufficiently developed
G6B	Accepted Manufacture, fabrication and construction information for construction	Prepared by contractor and accepted by contract manager
G7	FIDIC Short form of Contract / Silver Book / Red book / Yellow Book - Taking over Notice	Certified and issued by contract manager PEP5 developed using package information available immediately after certification
	FIDIC Gold Book - Commissioning certificate	
	GCC 2010 - Certificate of Practical Completion and Certificate of Completion	
	JBCC PBA - Certificate of Practical Completion and Certificate of Works Completion	
	JBCC MWA - Certificate of Practical Completion	
	NEC3 Engineering and Construction Contract - Completion Certificate	
	NEC3 Engineering and Construction Short Contract - Completion Certificate	
G8	Accepted record information complete with compliance certificates	Record information developed by implementer / contractor but accepted by client (Compliance certificates are issued by professionally qualified persons)
	Hand over certificate	Certificate issued by implementer and countersigned by client
G9A	Confirmation of entry of data into asset register	Issued by custodian
G9B	FIDIC Silver Book / Red book / Yellow Book - Performance Certificate	Issued by contract manager PEP6 developed using package information available immediately after certification
	FIDIC Gold Book - Contract completion certificate	
	GCC 2010 - Final Approval Certificate	
	JBCC PBA and MWA - Certificate of Final Completion	
	NEC3 Engineering and Construction Contract and NEC3 Engineering and Construction Short Contract - Defects Certificate	
	Final account	
	Accepted close out reports	Developed by implementer and accepted by client
G9C	Post completion evaluation report	Developed by client in collaboration with implementer

Control point	Control documents	Comments
Procurement gates (see National Treasury *Standard for Construction Procurement System*)		
PG1	Approved broad scope of work, estimated financial value and timing	Developed by a procurement leader and approved by Designated Person
PG2	Approved contract procurement strategy	Developed by a procurement leader and approved by Designated Person
PG3	Approved procurement document	Developed by procurement leader and approved by Documentation Review Team
	Documentation Review Team Report	Prepared by Documentation Review Team
PG4	Confirmation of budget	Procurement leader advises. Budget office confirms
PG5	Evaluation report	Prepared by Evaluation Panel
	Approval of shortlist for Expression of Interest	Designated person approves
PG6	Evaluation report	Prepared by Evaluation Panel
	Approval to award contract	Designated person approves
PG7	Authority to award	Delegated Authority authorises.
	Final contract document	Procurement leader provides.
PG8A	Authority to waive penalties / damages	Designated person issues.
PG8B	Authority for referral of dispute	Designated person issues
PG8C	Authority to increase contract value / contract period	Designated person issues
PG8D	Authority to exceed authorized amount	Designated person issues
PG8E	Authority to cancel or terminate contract	Designated person issues
Framework agreement gates		
FG1	Approved procurement document	Developed by procurement leader and approved by Documentation Review Team
	Documentation Review Team Report	Documentation Review Team
FG2	Confirmation of budget	Procurement leader advises. Budget office confirms
FG3	Evaluation report where competition is re-opened amongst framework contractors	Evaluation Panel
	Authority to issue batch, task or package order	Delegated authority authorises.
	Issued batch, task or package order	Contract manager issues the batch, task or package order

NOTE The terms procurement leader and contract manager refer to persons performing functions and not the designation of posts within an institution. Such persons may be officials or employees of professional service providers.

5.1.4 All progress reporting shall be framed around the completion of activities associated with a control point.

5.1.5 Institutions may implement projects relating to the delivery and scheduled maintenance of infrastructure only after stage 4 of the IGS has been completed i.e. a concept report has been developed and accepted by the **client** (see Figure 1).

5.1.6 The **custodian** should commence with land acquisition processes during stage 1 of the IGS. Such processes may not be finalised until such time that the concept report is well advanced and it is clear that the project is viable and is required.

NOTE The custodian should commence with the land acquisition process well in advance of implementation as a package with encumbered land may not proceed beyond stage 4 (see 6.1.10).

5.2 Financial arrangements

5.2.1 Where an institution functions as a **client** but does not function as an **implemente**r, the **client** shall state in the SDA entered into what the financial arrangements are to pay professional service providers and contractors in terms of their contracts. Such arrangements shall make provision for release of retention monies.

5.2.2 An appropriate allowance shall be made in budgets for an MTEF year to enable the **implementer** to proceed with the development of concept reports associated with stage 4 (package planning) of the IGS for packages associated with subsequent MTEF years.

5.3 Service Delivery Agreement

5.3.1 A **client** shall enter into a Service Delivery Agreement (SDA) with **implementers** only where different institutions assume responsibilities relating to the **client** and **implementer**. Such agreement shall record agreements reached in respect of the IPMP and the IPIP and shall be annually reviewed and amended if necessary by the respective heads of the institutions as soon as possible after the finalisation of the IPIP for an MTEF year but not later than the end of the financial year. The signing off of new or amended SDA between two institutions shall be deemed to be authorisation to proceed with the implementation of the projects contained therein for a MTEF year.

NOTE SDA's can be drafted in such a manner that it is possible to amend them every year by substituting one annexure for another e.g. the IPMPs and IPIPs can be located in annexures and replaced with the new one ahead of a MTEF year.

5.3.2 A SDA should amongst other things cover the following:

a) overall aims, objectives and priorities;

b) parties to the Agreement;

c) roles and responsibilities;

d) plans to be implemented through the SDA including the IPMP and IPIPs;

e) contributing resources (i.e. financial and non-financial resources and agreement on what each party will contribute);

f) institutional mechanisms including agreement on governance structures, decision making procedures, processes and operating procedures to be followed;

g) dispute resolution procedures;

h) financial arrangements including the paying of professional service providers and contractors and the release of retention monies; and

i) commencement, duration and amendments to the agreement.

NOTE The SDA should relate to the full IDMS i.e. not only to programme and project management and the client-implementer relationship, but should also include matters relating to infrastructure planning, operations and maintenance, and property management.

6 Implementation

6.1 General requirements

6.1.1 The delivery and maintenance of infrastructure shall be in accordance with all legislative requirements.

NOTE The legislation that commonly impacts on activities relating to the design and delivery of infrastructure is identified in the CIDB's compendium of legislation (see www.cidb.org.za/legislation/default.aspx).

6.1.2 Institutions shall assign suitably qualified officials or require suitably qualified persons in the employ of a PSP or a contractor to perform the activities associated with a stage of the IGS as stated in Table 6. Officials shall oversee the development of IPMPs and IPIPs, preferably with inputs from suitably qualified professionals in the employ of their institutions.

6.1.3 Professionals in the employ of an institution, PSP or contractor who provide services associated with the IGS for a project or package shall do so in accordance with the relevant provisions of 4. Such professionals shall, in the case of stages 3 to 9 of the IGS be assigned responsibility to function as one of more of the functionaries identified in Table 7.

NOTE On complex independent projects, it might be necessary to appoint different professionals to function as a project leader, lead designer, designer and cost consultant, particularly where a design by employer contracting strategy is adopted. On simple projects involving a single disciple, e.g. a road, a single PSP or an individual can be appointed to function as a project leader, lead designer, designer and cost consultant.

Table 6: Allocation of functional responsibilities

Stage		Activity	Responsible person(s)
1	Infrastructure planning	Develop, finalise and obtain acceptance of infrastructure plan	Official(s) in the employ of the client and, where relevant, official(s) in the employ of the custodian
		Accept infrastructure plans	
2	Procurement planning	Develop construction procurement strategy	Official(s) in the employ of the client and implementer with inputs as necessary by professionals in their employ or a PSPs
-	-	Develop an IPMP and revise annually	Official(s) in the employ of the client with inputs as necessary by professionals in the employ of the client or a PSP
		Approval of IPMP	Official in the employ of the client
		Develop an IPIP and revise annually	Officials in the employ of the implementer with inputs as necessary by professionals in the employ of the implementer or a PSP
		Approval of IPIP	Official(s) in the employ of the client
		Enter into a SDA and review / revise annually	An official in the employ of the client and an official in the employ of the implementer
3	Package planning	Develop, finalise and obtain acceptance of the strategic brief	Official(s) in the employ of the client supported as necessary by professionals in the employ of the client or a PSP
		Approve strategic brief	Official in the employ of the client
		Accept strategic brief	Official in the employ of the implementer (e.g. principal programme / project manager)
-	-	Develop version 1 of PEP	Official in the employ of the implementer or a PSP
4	Package definition	Develop, finalise and obtain the clients acceptance of the concept report	Professionals in the employ of the implementer, PSP or management contractor
		Accept concept report	Official in the employ of the client
-	-	Develop version 2 of PEP	Official in the employ of the implementer or a PSP

Stage		Activity	Responsible person(s)
5	Design development	Develop, finalise and obtain acceptance of design development report	Professionals in the employ of the implementer, PSP, management contractor or design and construct contractor
		Accept design development report	Official in the employ of the client
-	-	Develop version 3 of PEP	Official in the employ of the implementer or a PSP
6A	Design documentation (Production information)	Develop, finalise and obtain acceptance of production information	Professionals in the employ of the implementer, a PSP, management contractor, design and construct contractor or develop and construct contractor
		Accept production information	Official in the employ of the client for some parts and professionals in the employ of the implementer or a PSP for the remaining parts
-	-	Develop version 4 of PEP	Official in the employ of the implementer or a PSP
6B	Design documentation (Manufacture, fabrication and construction information)	Develop, finalise and obtain acceptance of manufacture, fabrication and construction information	Professionals in the employ of the contractor
		Accept manufacture, fabrication and construction information	Professionals in the employ of the implementer or a PSP
7	Works	Provide the temporary and permanent works	Professionals in the employ of the contractor
		Accept works completed in accordance with the contract	Professionals in the employ of the implementer or a PSP
-	-	Develop version 5 of PEP	Official in the employ of the implementer or a PSP
8	Handover	Finalise and assemble record information	Professionals in the employ of the implementer, a PSP or contractor
		Hand over the works and record information to the user	Official(s) in the employ of the client supported as necessary by professionals in the employ of the client or a PSP
9A	Close out	Archive record information and update portfolio asset register	Official in the employ of the custodian
9B		Finalise the contract	Professional in the employ of the implementer or a PSP
		Compile close out report	Professional in the employ of the implementer or a PSP
-		Develop version 6 of PEP	Official in the employ of the implementer or a PSP
9C		Conduct in-use evaluation	Official(s) in the employ of the client and the employ or the Implementer

6.1.4 Implementers shall appoint suitably qualified persons in their employ or in the employ of a PSP to act as (see Annexure D):

a) **principal programme managers** in relation to each programme of projects and **principal project managers** in relation to each independent project;

b) **procurement leaders** to take responsibility for the management of the procurement processes in accordance with the provisions of the National Treasury *Standard for a Construction Procurement System* associated with a procurement package up until such package is awarded; and .

c) **contract managers** and **supervising agents** in the administration of contracts in accordance with the provisions of the contract.

NOTE The terms principal programme manager, principal project manager, procurement leader, contract manager and supervising agent refer to persons performing functions and not the designation of posts within an institution (see Annexure D).

Table 7 Professional responsibilities associated with implementing certain stages of the IGS

Designation	Overview of responsibilities
project leader	Provide a non-design role to lead and 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	Set design standards for and co-ordinate and integrate the design of designers and co-ordinate advice on design related issues by designers and provide design advice
designer	Provide design services relating to the delivery of infrastructure or undertake conditional assessment services relating to scheduled maintenance
cost consultant	Provide independent and impartial estimation and control of the cost of constructing, rehabilitating and refurbishing infrastructure by means of one of more of the following: a) accurate measurement of the works, b) comprehensive knowledge of various financing methods, construction systems, forms of contract 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.

6.1.5 Unless otherwise stated in an applicable SDA, all communications in writing between the client and the implementer or their respective representatives, including requests to accept an end of IGS stage deliverable shall be replied to within 7 working days.

6.1.6 Unless otherwise stated in an applicable SDA, the client shall provide written reasons for not accepting or approving an end of IGS stage deliverable. The implementer shall take account of these reasons when resubmitting such deliverables for acceptance or approval.

6.1.7 The **client** shall manage the interface between the end-user and interface with community structures up to the end of IGS stage 4 (package definition) activities. The **client** shall after the conclusion of stage 4, introduce the **implementer's principal programme / project manager** to the community structures. The **implementer** shall thereafter be responsible for implementing any requirements stipulated by the **client** regarding social facilitation and establish the necessary project steering committees, appoint the community liaison officers, recruit and select local labour, manage community related risks, deal with issues related to labour unrest or disputes during the execution of the works, etc.

6.1.8 Acceptance of an end of an IGS stage deliverable shall be deemed to be the formal authorisation to proceed with the next stage.

6.1.9 Infrastructure projects should, as far as is feasible, be based on standard designs, drawings and technical specifications as well as on space planning norms and standards.

NOTE Standard designs, drawings and specifications reduce the need for both conceptual development of a design and also the need for detailed design work and thereby substantially reduce the cost of professional fees and schedule for delivery. Clients in collaboration with the implementer need to develop and regularly maintain and update space planning norms and standards, standard drawings and technical specifications, design guidelines and cost norms.

6.1.10 No work beyond stage 4 (package definition) of the IGS shall take place on infrastructure located on encumbered land or where agreements have not been put in place for the provision of bulk services or ICT infrastructure.

NOTE Land encumbrances include land availability, land ownership, zoning rights and records of decision regarding environmental issues.

6.1.11 Activities associated with stages 5 to 9 of the IGS of a package may be undertaken in parallel or series, provided that:

a) each stage is completed in sequence; and

b) the total of prices, exclusive of price adjustment for inflation, for a contract or package order does not increase from the total of prices upon award of the contract or issue of the package order to the extent that it requires prior written approval of the relevant treasury to proceed (see National Treasury *Standard for a Construction Procurement System).*

6.2 Conduct of those engaged in the IDMS

The conduct of all personnel and agents applying this standard shall comply with the applicable requirements for conduct established in the National Treasury *Standard for a Construction Procurement System.*

NOTE The IDMS incorporates a SCM system. As a result, the applicable requirements for conduct contained in the Construction Procurement System also apply.

6.3 Portfolio planning

6.3.1 Stage 1 (Infrastructure planning)

The **client** shall, as part of the annual budget process, annually produce a suitable infrastructure plan which satisfies all legislative, institutional and relevant national and provincial requirements for the current planning year and the subsequent two years in line with MTEF requirements. Such plans shall furthermore comply with any conditions or requirements associated with grant funding.

6.3.2 Stage 2 (Procurement planning)

The **client** shall in collaboration with the **implementer** develop and document a construction procurement strategy every year.

6.3.3 Portfolio management plans

6.3.3.1 The **client** shall develop IPMPs annually for the portfolio of projects contained in the infrastructure plan, which is aligned with the adopted construction procurement strategy. Such a plan should as necessary:

a) identify the objectives of each programme or projects or independent projects;

b) identify the scope, budget and schedule for projects / packages, or where available the PEPs (see 6.7.3) for packages included in a programme of projects or an independent project;

c) provide details of the projects budgeted for implementation in the Medium Term Expenditure Framework(MTEF) period (3 year planning horizon);

d) outline the construction procurement strategy ;

e) identify and describe the **client** and community structures, if any, which need to be consulted with or who need to participate in aspects of the delivery cycle;

f) provide a time management plan for the programme i.e. the baseline against which progress towards the attainment of milestone target dates can be measured;

g) provide the projected budget and cash flows (cost plan for the programme) which will enable planned and actual expenditure to be compared in different categories of spend and revisions to

the budget to be approved and multiple project budgets to be managed and rolled up to infrastructure programme level;

h) document the key success factors and the key performance indicators which need to be measured, monitored and evaluated;

i) identify the major risks and how such risks are to be mitigated / managed (risk assessment and management plan);

j) indicate how **client** quality requirements and expectations are to be met;

k) document a communication plan which determines the lines of communication and includes as necessary, the following key activities:

1) Communications Planning - determining the information and communications needs of the stakeholders: who needs what information, when will they need it, and how will it be given to them

2) Information Distribution - making needed information available to project stakeholders in a timely manner

3) Performance Reporting - collecting and disseminating performance information. This includes status reporting, progress measurement, and forecasting

4) Administrative Closure - generating, gathering, and disseminating information to formalise phase or project completion; and

l) quality management requirements.

NOTE 1 The IPMP indicates the allocation of the MTEF budget to the projects to be implemented over the MTEF period. As such it creates an alignment between planning and budgeting. This enables an MTEF project list to be generated so that the planning and design processes can start timeously to ensure expenditure in the financial year budget projections.

NOTE 2 The level of detail in an IPMP depends upon the information that is available (see Annexure A). Where programmes involve repetitive buildings, it is possible to provide much of the strategic brief in the IPMP.

6.3.3.2 The **implementer** shall review the **client's** IPMPs which relate to the **implementer's** IPIP with a view to establishing that such plans:

a) are comprehensive and addresses all the critical issues including expenditure and project progress issues; and

b) clearly and unambiguously expresses the **client's** expectations and requirements for the programme or project.

6.3.3.3 The **implementer** who reviews the **client's** IPMP shall either accept such plan or propose revisions and engage with the **client** with a view to amending or modifying such plans to satisfy the requirements of 5.3.3.2. The client shall issue a revised IPMP should the proposed revisions be acceptable.

6.3.3.4 The **implementer** shall develop an IPIP in response to an IPMP which should as necessary:

a) provides for each package whose concept report developed during stage 4 of the IGS has been accepted by the **client**:

1) a high level summary of the most recent PEPs;

2) the assigned internal and external resources for implementation and responsibilities;

3) the current cash flow forecast;

4) the milestone dates (key deliverables) for implementation of each project;

5) key performance indicators, targets and the means of quantification / measurement; and

6) the controls and measure which will address health, safety, environmental and other project risks.

b) outlines requirements for projects and packages that have not progressed beyond stage 4 of the IGS.

c) enables a financial report to be generated which:

1) lists the packages associated with a programme or project which have been finalised during the last two years preceding the MTEF period together with actual expenditure; and

2) shows the following for packages being implemented during each year of the full MTEF period:

— budget for the year;
— actual expenditure to date;
— remaining budget for the year;
— forecast expenditure for the remainder of the year; and
— forecast over/under expenditure for the year;.

3) expenditure in relation to projects and packages which have not progressed beyond stage 4 of the IGS; and

4) enables “Actual versus Planned” expenditure and time lines to compared at a package or programme / project level.

NOTE The focuses of the IPIP is on managing package scope, time and cost.

6.3.3.5 The **client** shall approve the IPIP developed by the **implementer,** if satisfied that the IPIP is likely to enable the client’s objectives to be satisfied.

6.3.3.6 Where the **client** and the i**mplementer** are the same institution or where the infrastructure funds reside with the **implementer**, the **implementer** shall develop IPIPs annually and include relevant aspects of 6.3.3.1 in the IPIPs.

6.4 Package planning, design and delivery activities and responsibilities

6.4.1 General

6.4.1.1 The **implementer** shall obtain from the **client** a list of persons who are delegated to make inputs into a deliverable and to accept the end of stage deliverable in respect of each stage, if such information is not included in the IPMP or the SDA.

6.4.1.2 The person functioning as a **project leader** (see Table 7) or a **management / design and construct / develop and construct contractor** shall obtain the **client’s** inputs into the development and finalisation of the concept report, design development report, production information, record information and close out report and the acceptance thereof through the appropriate **principal programme manager** / **principal project manager** and **contract manager,** respectively.

6.4.1.3 The **principal programme manager** or **principal project manager** shall:

a) obtain the **client's** requirements for commissioning and handover, if any, and ensure that such requirements are forwarded to those responsible for compiling procurement documents for professional services and the provision of construction works; and

b) communicate to the **client** the contractual provisions for the taking over of the works from the contractor responsible for providing the works and make the necessary arrangements with the **client** to ensure that the **implementer** is not liable for securing the site prior to hand over to the **client**.

NOTE The responsibility for the works passes to the Employer once the contractor achieves completion in terms of the contract or soon thereafter.

6.4.2 Stage 3 (Package preparation)

6.4.2.1 A person designated by the **client** shall develop a strategic brief for a package, and once approved, submit it to the **implementer** for review and acceptance.

NOTE In programmes involving repetitive works it is possible to have a single strategic brief for a programme of projects with tabulated variables for each specific package. It is also possible where planning has been undertaken in advance of implementation to have the strategic brief included in the IPMP as an annexure.

6.4.2.2 A person designated by the **principal programme manager** or **principal project manager** shall review a strategic brief for a package, which is developed and approved by the **client** prior to being issued for implementation in terms of a SDA or this standard, with a view to establishing that the document:

a) is comprehensive and fulfils the requirements for a strategic brief established in 4.2.2.1; and

b) clearly and unambiguously expresses the **client's** expectations and is capable of being implemented.

6.4.2.3 The designated person who reviews the **client** approved strategic brief in terms of 6.4.2.2, shall either accept the strategic brief or propose revisions and engage with the **client** through the **principal programme manager** or **principal project manager** with a view to amending or modifying such brief to satisfy the requirements of 6.4.2.1. The designated person shall obtain the **client's** approval for any revised brief in writing.

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6.4.3 Stage 4 (Package definition)

6.4.3.1 The **project leader** assigned by the **principal programme manager** / **principal project manager** or a **management contractor** shall either convert or oversee the conversion of the strategic brief for the package into a workable and viable concept for the implementation of the package or, should a viable solution not be found, produce a report recommending the cancellation of the package.

6.4.3.2 The **project leader** or a **management contractor** shall obtain the **client's** acceptance of the concept report as well as inputs into the logistics support plan through the **principal programme manager** / **principal project manager** or **contract manager,** respectively. Proof of the **client's** acceptance of the concept report shall be kept for record and auditing purposes.

6.4.3.3 No work associated with the implementation stages, obtaining planning permissions or commencing a procurement process for infrastructure associated with a package may be undertaken before the **client's** acceptance of the concept report is obtained unless written instructions to the contrary are obtained from the **client.**

6.4.4 Stage 5 (Design development)

The design of infrastructure, if applicable (see Figure 1), shall be developed in such a manner that the **client** accepts a design development report prior to the commencement of construction, fabrication or manufacturing activities. Proof of the **client's** acceptance of the design development report shall be kept for record and auditing purposes.

6.4.5 Stage 6 (Design documentation)

6.4.5.1 Stage 6A (Production information)

The **principal programme manager** or **principal project manager** shall in consultation with the client identify which parts of the production information, if applicable (see Figure 1) shall be accepted by the **client** or his delegate before being issued to a contractor. The remaining parts shall be accepted by either the **project leader** or the **contract manager,** depending upon the contracting strategy that is adopted.

6.4.5.2 Stage 6B ((Manufacture, fabrication and construction information)

The **contract manager** shall accept the manufacture, fabrication and construction information in accordance with the provisions of the contract.

6.4.6 Stage 7 (Works)

6.4.6.1 The **principal programme manager** or **principal project manager** shall brief the **contract manager** of the **client's** monitoring and reporting requirements for stage 7 (Works). The **contract manager** shall ensure that these monitoring and reporting requirements are adhered to.

6.4.6.2 The **contract manager** shall provide the **principal programme manager** or **principal project manager** with adequate notice of the anticipated date of completion for a part or whole of the works in accordance with the provisions of the contract so that the necessary hand over arrangements with the **client** may be made.

NOTE The responsibility for the works passes to the Employer once the contractor achieves completion in terms of the contract. The Employer may have to secure the works if there is a delay in handover to the client. It is therefore important for the contract manager to ascertain what the minimum notice period should be.

6.4.7 Stage 8 (Hand over)

6.4.7.1 The **principal programme manager** or **principal project manager** shall arrange for the handover of a part or the whole of the works to the person(s) nominated by the **client** and assign a person(s) to do so. Proof of the **client's** acceptance of the works shall be kept for record and auditing purposes.

6.4.7.2 The **project leader** or **contractor**, depending upon the contracting strategy that is adopted, shall ensure that all applicable certificates are completed and the record information is assembled and accepted within one week of the certification of completion in accordance with the provisions of the contract which triggers the transfer of the care of the works back to the **client** and / or **custodian**. Such information shall be handed over to the person(s) who hands over a part or the whole of the works to the person(s) nominated by the **client**. Proof of acceptance of the record information shall be kept for record and auditing purposes.

6.4.7.3 Those responsible for developing the record information shall update the information in the design development report, if provided, so that when the works are completed, the record information is available.

6.4.7.4 Requirements for the development and the timing for the delivery of record information shall be incorporated in the scope of work of the relevant contracts for PSP and contractors. Payment items shall be linked to the provision of such information.

NOTE The design development report documents what is to be delivered. Record information documents what has been delivered.

6.4.7.5 Where required in terms of a SDA, the **project leader** or **contractor** shall attach to the record information a maintenance plan.

6.4.8 Stage 9 (Close out)

6.4.8.1 Stage 9A (Asset data)

The **custodian** shall capture all asset related data (financial and non-financial) onto the asset register to serve as inputs in future infrastructure planning processes.

NOTE The client should similarly update their records.

6.4.8.2 Stage 9B (Package completion activities)

The **contract manager** shall prepare a close out report in accordance with requirements established by the **principal programme manager** or **principal project manager**, as relevant**.** Such report shall be submitted to the **principal programme manager** or **principal project manager** not later than one year after completion or within 30 days of the end of the defects liability period, whichever is the earlier.

NOTE The defects liability period is typically between three and twelve months where the design by employer contracting strategy is adopted. This peiod can in the case of design and construct and develop and construct contracts extend for three to five years, hence the need for closure not later than one year after completion.

6.4.8.3 Stage 9C (In-use evaluation)

Post completion evaluation reports which provide integrated feedback aimed at continuous improvement of built environments, infrastructure delivery and procurement methods shall be undertaken in accordance with the provisions of a SDA. Alternatively they should be undertaken on a sample basis on projects or packages identified by the **client** approximately one year after handover. Such an evaluation shall be undertaken in terms of a procedure developed or adopted by the **client** and accepted by the **principal programme manager** or **principal project manager**.

6.5 Monitoring and reporting on progress

6.5.1 Each time that a deliverable associated with a stage in the IGS is accepted or approved, data relating to the scope, timing and cost of the package, and where relevant, parameters associated with key performance indicators, shall be captured in a standard format in the PEP (see 6.7.3) on a management system put in place by the **implementer** by the responsible **project leader** or **contract manager.**

6.5.2 The management system shall be capable of producing dashboard reports on a regular basis using the information contained in the PEP.

6.6 Gateway reviews

6.6.1 General

6.6.1.1 Gateway reviews may be undertaken by a gateway review team of the deliverables associated with any of the gates in the IGS. Such reviews should, however, preferably take place at gates 4, 5 or 8 of the IGS. Gateway reviews at gate 4 of the IGS shall be undertaken on all projects which are categorised by a relevant treasury as being major capital projects. The implementer shall notify the relevant treasury of all major capital projects whenever such projects are identified.

6.6.1.2 A gateway review team shall comprise not less than three persons appointed by the **implementer** in consultation with the **client** who are not involved in the programme or the project within which the package falls and who are familiar with the subject matter of the deliverable at the end of the stage under review. In the case of major capital projects, the relevant treasury may nominate an additional person to serve on the gateway review team.

6.6.1.3 The **project leader** or, if assigned to do so, **contract manager** responsible for a package which requires a gateway review at a particular stage (see 6.6.2 and 6.6.3) shall ensure that the gateway review team is:

a) issued at least one week prior to the date set for the review with the end of stage deliverable which is to be reviewed as well as other earlier which may be relevant, e.g.

   1) review of Stage 4 (Package Definitions): provide the strategic brief

   2) review of Stage 5 (Design Development): provide the strategic brief and concept report

   3) review of Stage 8 (Handover): provide the design development report;

b) afforded access to the key staff members and, where relevant, stakeholders.

6.6.1.4 The gateway review team shall:

a) review the end of stage deliverables for compliance with the requirements of this document;

b) establish the quality of the documentation through the interviewing of key staff members and stakeholders.

c) base its findings primarily on:

   1) the information contained in the end of stage deliverables;

   2) supplementary documentation, if any, provided by key staff obtained during the interview process; and

   3) interviews with key staff and stakeholders.

d) issue a report at the conclusion of a gateway review which indicates the team's assessment of the information at the end of a stage and provides findings or recommendations on areas where further work may be undertaken to improve such information.

6.6.1.5 Aspects in the report should be flagged as being:

a) Code **red**: Team considers the aspect to pose a significant risk to the project / package.

b) Code **amber**: Team considers the aspects which indicate a minor risk to the project / package.

c) Code **green**: Team considers the aspect to have been given adequate consideration to the extent that it is unlikely to jeopardise the success of progressing to the next stage.

NOTE 1 An IGS review is not an audit or about 'passing' or 'failing' gates, but about improving the chances of the successful identification and formulation of projects and the delivery of packages. It is a partnership between the review and project teams and provides everyone with an opportunity to learn lessons from the experience.

NOTE 2 The level of detailed content in a review reports needs to be in line with the importance and impact of the recommendations. Such a report should aim to produce candid and practical recommendations, based on best practice. A spirit of openness and a willingness to work together is essential to the achievement of a useful gateway review report.

6.6.2 Review of major capital projects

All major capital projects shall have a gateway review prior to the acceptance of the end of stage 4. The focus of such a review shall in the first instance be on the quality of the documentation and thereafter on:

a) **deliverability:** the extent to which a project is deemed likely to delivery the expected benefits within the declared cost / time / performance envelope

b) **affordability:** the extent to which the level of expenditure and financial risk involved in a project can be taken up on, given the organisation's overall financial position, both singly and in the light of its other current and projected commitments

c) **value for money:** the optimum combination of service life costs and quality (or fitness of purpose) to meet the user's requirements.

NOTE This gateway review satisfies the requirements of Section 38(1)(a)(iv) of the Public Finance Management Act of 1999 which requires that all major capital projects be properly evaluated prior to a final decision being taken on the project.

6.6.3 Packages selected for review on a random sample basis

The **implementer** shall identify a random sample of packages and require that a gateway review be undertaken on any of the stages of the IGS but preferably on 4, 5 or 8. The focus of such a review, which shall take place after the end of stage deliverable has been accepted, shall be on the quality of the documents.

NOTE Annexure B provides typical questions that a review team could ask at the end of stages 4, 5 and 85 of IGS.

6.7 Programme and project management arrangements

6.7.1 Procurement plans

6.7.1.1 The **implementer** shall on an annual basis collate information from the IPMPs and IPIPs and prepare a procurement plan for all proposed tenders for the next financial year which contains the following information in a tabular form, where the proposed procurement is estimated to exceed R 500 000 including VAT:

a) a description of the goods, services or works;

b) the estimated value of such goods, services or works including all applicable taxes;

c) the envisaged date of advertisement;

d) envisaged closing date for tenders;

e) envisaged date of award; and

f) the responsible office / regional office.

6.7.1.2 The **implementer** shall submit such a plan to the Head of the SCM Unit within 15 calendar days of the financial year end of each year, who in turn shall submit to the relevant treasury within 30 calendar days of the financial year end of each year.

6.7.1.3 The relevant principal programme manager or principal project manager shall notify the Head of the SCM unit of any cancellation of proposed tenderers or the addition of any tenders whenever such cancellation or addition occurs.

6.7.2 Responsibilities of principal programme and project managers

Principal programme managers and **principal project managers** appointed by the **implementer** shall:

a) manage the planning and implementation of packages in terms of this standard in a manner that enables both the **implementer** and its **clients** to achieve their objectives and in such a manner that:

   1) all projects are developed and managed in terms of a common procedural and programmatic approach and integrated with the **client's** administrative processes and are institutionalised;

2) the various elements of the projects are properly co-ordinated;

3) the projects include all the work required, and only the work required, to complete the project successfully;

4) the timely completion of the projects is facilitated;

5) projects are completed as far as is reasonably possible, within the budget that is agreed from time to time with the **client**;

6) the project satisfies the needs for which it was undertaken;

7) effective use of the people involved with projects is made;

8) timely and appropriate generation, collection, dissemination, storage, and ultimate disposition of project and package information occurs; and

9) the systematic identification, analysis, and response to project risk occurs.

b) manage assigned **project leader**s, **procurement leader**s and **contract managers;**

c) regularly review and update the approved IPIP and provide the **client** with copies of each revision of the IPIP.

6.7.3 PEPs and capturing of data

6.7.3.1 The **principal programme manager** or **principal project manager** or a person designated by the **client** shall at the commencement of a financial year ensure that information that is available concerning the packages that are planned to be worked on and which are not already on the financial system is captured on the system. All professional service contracts shall be linked to these packages so that all expenditure incurred can be linked to such packages.

6.7.3.2 The PEP shall contain from stage 3 onwards:

a) the package profile (see Table 8);

b) a summary of the package information at each stage of the delivery management cycle as well as the dates of acceptance of the end of stage deliverables;

c) the names of the persons who are appointed as the project leader, the lead designer, the designer, the cost consultant, the procurement leader, the contract manager, health and safety agent, supervising agent and contractor as relevant and as applicable to the stage to which the version of the PEP relates (see Annexure D);

d) particulars of the individual projects that are linked to the package so that reporting at a project level can take place as necessary; and

e) details and dates of those persons who accepted an end of stage deliverable.

NOTE 1 A PEP provides a history of the package information as it is progressively developed and enables the changes in the budget and timing for the work to be readily understood. It also contains a record of appointment made to assume functional responsibilities.

NOTE 2 The package profile is the front end of the PEP.

Table 8: Package profile

<table>
<tr><td>Client</td><td colspan="5">Insert client department's name</td></tr>
<tr><td>Reference number</td><td colspan="5">Insert contract number and if relevant package order number</td></tr>
<tr><td>Title</td><td colspan="5">Insert title of package</td></tr>
<tr><td>Location</td><td colspan="5">Insert the location of the site and provide GPS co-ordinates for each project within a package</td></tr>
<tr><td>Overview of works</td><td colspan="5">Provide a short description of the works, their purpose, etc.</td></tr>
<tr><td rowspan="2">Type of works</td><td colspan="5">One or a combination of:</td></tr>
<tr><td colspan="5">☐ New construction
☐ Demolition
☐ Supply and install plant
☐ Alteration
☐ Extension
☐ Rehabilitation
☐ Refurbishment
☐ Routine maintenance
☐ Scheduled maintenance</td></tr>
<tr><td>Socio-objectives</td><td colspan="5">☐ B-BBEE
☐ CIDB registered contractors grades 4 to 7
☐ CIDB registered contractors grades 1 to 3
☐ black owned consulting firms
☐ work opportunities to temporary workers
☐ development of nationally accredited skills
☐ other (state)</td></tr>
<tr><td rowspan="9">Procurement strategy</td><td colspan="5">Delivery mode: ☐ programme ☐ independent project
Insert name of programme/ project</td></tr>
<tr><td colspan="5">Service requirement</td></tr>
<tr><td>Maintenance only</td><td colspan="3">Pricing strategy
☐ Priced contract with a priced list
☐ Cost reimbursable contract
☐ Target contract</td><td>Form of contract
☐ NEC TSC
☐ NEC TSSC</td></tr>
<tr><td>Construction only</td><td colspan="2">Pricing strategy
☐ Price based –lump sum /activity schedule / price list
☐ Price based - bill of quantities
☐ Target cost contract – activity schedule
☐ Cost reimbursable contract
☐ Management contract</td><td>Contracting strategy
☐ Design by employer
☐ Develop and construct
☐ Design and construct
☐ Construction management
☐ Management contractor</td><td>Form of contract
☐ FIDIC RB
☐ FIDIC SB
☐ FIDIC YB
☐ FIDIC SF
☐ GCC 2010
☐ JBCC PBA
☐ JBCC MWA
☐ NEC ECC
☐ NEC ECSC</td></tr>
<tr><td>Construction and maintenance service</td><td colspan="2">Pricing strategy as per construction and maintenance service</td><td>Contracting strategy as per construction service</td><td>Form of contract
☐ NEC ECC
☐ NEC ECC with NEC TSC</td></tr>
<tr><td>Construction, maintenance and operation</td><td colspan="2">Pricing strategy</td><td>Contracting strategy as per construction service</td><td>Form of contract
☐ FIDIC GB
☐ NEC ECC plus NEC TSC</td></tr>
<tr><td>Supply and install</td><td colspan="4">Form of contract
☐ NEC SC ☐ NEC SSC</td></tr>
<tr><td>Procurement arrangements</td><td colspan="2">Procurement procedure
☐ Open
☐ Qualified
☐ Proposal
☐ Negotiation
☐ Competitive negotiations (open)
☐ Competitive negotiations (restricted)</td><td>Targeting strategies
☐ Preferences
☐ Incentives for KPIs
☐ Mandatory subcontracting
☐ Contractual obligations</td><td>Evaluation method
☐ Method 2
☐ Method 4</td></tr>
</table>

Tender process	**Calls for expressions of interest** Date of advertisement Closing date for submissions Number of submissions received *(insert data)* Number of respondents invited to submit tenders *(insert data)*	**Tenders** Date or advertisement / sending of invitations following an EOI Closing date for submissions Number of tenders received *(insert data)* Number of responsive tenders *(insert data)* Date of award of contract

NOTE The full titles of these standard forms of contract can be found in the National Treasury *Standard for a Construction Procurement System*. The following abbreviations are applied in this table to identify specific forms of contract in families of contracts:

ECSC – Engineering and Construction Short Contract
ECC - Engineering and construction Contract
SC – Supply Contract
SSC – Short Supply Contract
TSC - Term Service Contract
TSSC –Term Service Short Contract
PBA – Principal Building Agreement
MWA –Minor Works Agreement
GB – Gold Book
RB – Red Book.
SB – Silver Book.
SF – Short Form (Green Book)
YB – Yellow Book

6.7.3.3 The **project leader** or, if assigned to do so, the **contract manager,** shall develop and or update the PEP when required to do so and develop and maintain the following documents between stages for each package for which they are responsible for:

a) a risk register

b) a communications plan which is aligned to the IPMP, SDA and IPIP, as relevant; and

c) a quality plan.

NOTE A contract manager is only appointed when a package is awarded. This can take place between the end of stage 3 (package planning) and when most of the production information (design documentation) is completed, depending upon the contracting strategy that is adopted. The role of the project leader also diminishes where the contractor takes on management and design responsibilities.

6.8 Contract administration

6.8.1 The **contract manager** assigned to administer a specific contract or task, batch, or package order shall:

a) capture on the system the following data within two weeks of the award of a contract or task, batch or package order at least the following information:

1) his or her name and contract particulars;

2) the programme or project number, as relevant

3) the contractual dates associated with the contract and where relevant, a task, batch or package order (see Table 9)

4) the assessment dates associated with the contract or task, batch or package order, as relevant (see Table 9);

5) except in the case of very low value goods or services contracts, provide a cash flow forecast against each assessment date;

6) the total of prices or forecasted total of prices, if not already captured;

7) where relevant, whether or not provision is made for price adjustment for inflation, delay damages, company guarantee, performance bond and retention and if so, what is the quantum or estimated quantum of such provisions, where applicable;

Table 9: Responsibilities and basic parameters associated with a contract

Contract	Identity of contract manager in terms of the contract	Person responsible for assessing the amount due	Assessment date	Contractual dates	Total of Prices	
					Pricing strategy	Basis for calculation
FIDIC SF	Employer's representative	Contractor	Monthly up until end of period for notifying defects	Commencement Works are complete End of period for notifying defects	Lump sum Lump sum with schedule of rates Cost reimbursable Lump sum with bill of quantities Remeasurement with bill of quantities Cost reimbursable	As set out in the contract data
FIDIC GB	Engineer	Contractor	Monthly up until the taking over certificate and thereafter after the end of the period for notifying defects	Commencement Commissioning Contract completion	Lump sum	Instalments as set out in a schedule in Schedule of Payments for the Design-Build Period and Operation Service Period
FIDIC RB	Engineer	Contractor	Monthly up until the taking over certificate and thereafter after the end of the period for notifying defects	Commencement Works are compete Contract completion	Bill of quantities Lump sum	Sum of quantities times rates plus prices for items which have no quantities As per schedule of payments
FIDIC SB FIDIC YB	Engineer	Contractor	Monthly up until the taking over certificate and thereafter after the end of the period for notifying defects	Commencement Works are complete Contract completion	Lump sum	As per schedule of payments
GCC 2010	Engineer	Contractor	Monthly up until Certificate of Completion and thereafter only after the Final Approval Certificate has been issued	Commencement Due Completion Expiry of Defects Liability Period	Bill of quantities Fixed price	Sum of quantities times rates plus prices for items which have no quantities Lump sums in agreed breakdown
JBCC PBA	Principal agent	Principal agent	Monthly up until final payment certificate	Possession of the site Practical completion End of latent defects liability period	Bill of quantities	Sum of quantities times rates plus prices for items which have no quantities Lump sums representing estimated value of completed work

Contract	Identity of contract manager in terms of the contract	Person responsible for assessing the amount due	Assessment date	Contractual dates	Total of Prices	
					Pricing strategy	Basis for calculation
JBCC MWA	Principal agent	Principal Agent	Monthly up until final payment certificate	Possession of the site Practical completion End of latent defects liability period	Bill of quantities	Sum of quantities times rates plus prices for items which have no quantities
NEC3 Supply Contract (SC)	Supply Manager	Supply Manager	Monthly assessment date Final assessment (4 weeks after the last defects date)	Starting date Delivery date Defects date	Priced contract with Price Schedule	Sum of quantities times rates plus prices for items which have no quantities
NEC3 Supply Short Contract (SSC)	Purchaser's representative	Purchaser	Monthly assessment date Final assessment (4 weeks after the last defects date)	Starting date Delivery date Defects date Start date for batch* Delivery date for batch* Defects date for a batch*	Priced contract with Price Schedule	Sum of quantities times rates plus prices for items which have no quantities
NEC3 Term Service Contract	Service Manager	Service Manager	Monthly assessment date Final assessment (four weeks after the end of the service / the latest date for completion of a task)	Starting date Service period Starting date for task* Task Completion Date*	A: Priced contract with Price List	Sum of quantities times rates plus prices for items which have no quantities
					C: Target contract with Price List	Sum of quantities times rates plus prices for items which have no quantities
					F: Cost reimbursable contract	Forecast of Defined Cost
NEC3 Term Service Short Contract	Employer's representative	Contractor	Monthly assessment date Final assessment (one month after the end of the service / the latest date for completion of a task)	Starting date Service period Starting date for task* Task completion date*	Priced contract with a Price List	Sum of quantities times rates plus prices for items which have no quantities
NEC3 Professional Services Contract	Employer's representative	Consultant	Monthly assessment date Final assessment (8 weeks after the last defects date) Completion of the whole of the services or the latest date for the completion of a task	Starting date Completion date for whole of the services Sectional completion dates Defects date Starting date for task* Task completion date*	A: Priced contract with activity schedule	Sum of prices for activities in activity schedule
					C: Target contract	Sum of prices for activities
					E: Time based	Forecast of the total Time Charge
					G: Term contract	Forecast of the total Time Charge plus sum of lump sum process in Task Schedule

Contract	Identity of contract manager in terms of the contract	Person responsible for assessing the amount due	Assessment date	Contractual dates	Total of Prices	
					Pricing strategy	**Basis for calculation**
NEC3 Engineering and Construction Contract	Project Manager	Project Manager	Monthly assessment date Final assessment (4 weeks after issue of Defects Certificate) Completion of the whole of the services or the latest date for the completion of a task	Starting date Completion date Sectional completion dates Defects date Starting date for a package* Completion date for a package* Defects date for a package*	A: Priced contract with Activity Schedule	Sum of prices for activities in activity schedule
					B: Priced contract with Bill of quantities	Sum of quantities times rates plus prices for items which have no quantities
					C: Target contract with Activity Schedule	Sum of prices for activities in activity schedule
					E: Cost reimbursable contract	Forecast of Defined Cost
					F: Management contract	Forecast of Defined Cost
NEC3 Engineering and Construction Short Contract	Employer's representative	Contractor	Monthly assessment date Final assessment (4 weeks after the issue of the Defects Certificate)	Starting date Completion date Defects date Starting date for a package* Completion date for a package* Defects date for a package*	Priced contract with a Price List	Sum of quantities times rates plus prices for items which have no quantities

*Applicable where package, task or batch orders are issued in terms of a framework agreement

b) administer such contract or task, batch or package order in accordance with the provisions of the contract and the National Treasury *Standard for a Construction Procurement System*, using the **implementer's** standard templates for communications;

c) make, where required in terms of the contract (see Table 9) an assessment of the amount due on or before the 1st of the month where monthly assessments are required and certify such payment on or before the 8th of each month and forward such certification to the **principal programme manager** or the **principal project manager** on or before the 9th of each month;

d) encourage the contractor to make an assessment of the amount due and submit an invoice on or before a specified day in a month where monthly assessments are required and accept the amount due or adjust the amount giving reasons to the contractor within 5 working days of such date and forward the documentation for the amount due to the **principal programme manager** or the **principal project manager** on or before a day in each month specified by such manager;

e) revise the estimates for price adjustment for inflation where provided for, prepare an updated cash flow for the remainder of the contract based on the contractor's programme and capture these amounts together with the amounts due to the contractor and the retention amounts, if relevant, on a monthly basis;

f) capture the revised total of the prices for the contract or package order within one week of a contractor revising a forecast of the total of prices or an event being implemented which in terms of the contract increase the total of prices;

g) capture the revised completion date, delivery date or completion date for a task, as relevant, for the contract or package order within one week of an event being implemented which in terms of the contract causes the contract completion date to be changed and amend as necessary the associated assessment dates;

h) capture on the system the date when the certificates identified in Table 10 were issued within one week of them being issued;

Table 10: Certificates issued in terms of the contract

Form of contract	Certificate
GCC 2010	Certificate of Practical Completion Completion Certificate Final Approval Certificate
JBCC PBA	Certificate of Final Completion Certificate of Practical Completion Certificate of Works Completion
JBCC MWA	Certificate of Final Completion Certificate of Practical Completion
NEC3 Professional Services Contract	Completion Certificate
NEC3 Engineering and Construction Contract	Completion Certificate Defects Certificate
NEC3 Engineering and Construction Short Contract	Completion Certificate Defects Certificate

i) capture on the system the date when the following documents, as relevant, have been accepted in terms of the contract within one week of them being accepted;

1) polices and certificates of all insurances;

2) parent company guarantees;

3) performance bonds

j) maintain records in accordance with the requirements of the **implementer's** records management policy and any specific requirements contained in the SDA;

k) provide a monthly report on events which in terms of the contract cause the total of prices to increase or the contract completion date to be changed, which as a minimum contains:

1) the date when such an event was notified together with a brief description of the event, a brief reason for the event being notified and whether or not the event has happened or is expected to happen;

2) whether or not quotations have been instructed;

3) the response to contractor's submissions;

4) approvals granted for the event in terms of the National Treasury *Standard for a Construction Procurement System;*

5) the status of all such events and the forecasted accumulative effect of all notified events on the time and price parameters associated with a contract or batch, task or package order.

l) consult with the **principal programme manager** or **principal project manager** before:

1) accepting any proposal to change the scope of work to accept a defect;

2) issuing an instruction to stop or not start work after the starting date; or

3) an instruction for acceleration;

m) report to the **principal programme manager** or **principal project manager** all insurance claims made within one week of the claim being lodged;

n) report to the **principal programme manager** or **principal project manager** any dispute for referral to an adjudicator that is notified by a contractor; and

o) prepare a motivation setting out any dissatisfaction with an adjudicator's decision for consideration by the **principal programme manager** or **principal project manager** for referral to a tribunal.

NOTE The basic data associated with an award of a contract (i.e. title, number, form of contract used and option, award date and where applicable, total of prices is captured in accordance with the National Treasury *Standard for a Construction Procurement System*.

6.8.2 The **contract manager** shall in terms of a target contract adjust the total of prices for inflation in accordance with the requirements of the contract at the specified intervals and submit a monthly report to the **principal programme manager** or **principal project manager** which contains the following information:

a) the contractor's latest forecast of total defined cost / time charge together with an explanation of any changes made since the last forecast;

b) the amount due before the deduction of any retention monies;

c) the total of prices with and without any adjustments for inflation, if relevant;

d) the forecasted total adjustment to total of prices for inflation;

e) in the case of an engineering and construction works contract

1) the total forecasted defined cost plus the fees for the payment due;

2) the actual defined cost plus the fees covering the previous payment certificate;

3) interest due to the contractor or employer for corrections between forecasted and actual defined cost plus fee for the previous month

4) the contractor's planned value, based on the estimated amount that should have been earned at the assessment date in terms of the programme for completed and partially completed activities, where the prices in the activity schedule for partially completed activities are calculated on a pro rata basis; and

5) the contractor's earned value based on the estimated amount that would have been earned at the assessment date for completed and partially completed activities, where the prices in the activity schedule for partially completed activities are calculated on a pro rata basis.

6.8.3 The **supervising agent** shall issue a warning to the **contract manager** regarding any non-conformance on the part of a contractor to requirements (defects) prior to completion or any other matter which is likely to significantly increase costs, delay completion or impair the performance of the works in use.

NOTE The NEC3 ECC, the JBCC PBA and JBCC MWA forms of contract make provision for persons independent from the person appointed to administer the contract to attend to the technical aspects of the contractor's works. This clause ensures that they advise on aspects that impact upon time and cost and contribute to the management of risks at a package level.

6.9 Occupational Health and Safety

6.9.1 The **implementer** shall include a clause in all its contracts for services, goods and engineering and construction works which in terms of terms of Section 37(2) of the Occupational Health and Safety Act of 1993 (Act 85 of 1993) relieves the **implementer** of any and all of its liabilities in terms of Section 37(1) of this Act in respect of any acts or omissions of the contractor and his employees to the extent permitted by this Act.

6.9.2 The **implementer** shall appoint a **health and safety agent** (i.e. an official in their employ or a service provider) in accordance with the provisions of Regulation 4(5) of the Construction Regulations 2003 issued in terms of the Occupational Health and Safety Act of 1993 (Act 85 of 1993) to assume the responsibilities imposed upon the **implementer** as a "client" in terms of the regulations in respect of each and every package.

6.9.3 All contractors shall be required in terms of their respective contracts to execute construction works in accordance with the provisions of the National Treasury *Occupational Health and Safety Specification for Engineering and Construction Works Contracts* or a suitable specification developed by the implementer. The **health and safety agent** shall in terms of such specification issue Improvement Notifications, Contravention Notices and Prohibition Notices, as relevant and applicable, to the contractor concerned and forwarded copies to the **contract manager**. Such notices shall require corrective remedial action by the contractor. In the event that a "life threatening" situation develops on the site, due to negligence, or the lack of preparations, the activity will be terminated immediately. The **contract manager** shall notify the **principal programme manager** or **principal project manager** upon receipt of a Prohibition Notice.

6.9.4 The appointed **health and safety agent** shall in respect of the packages for which he is assigned:

a) conduct initial site safety inductions for each professional service provider contracted by the **implementer** to provide construction related services for a package and each principal contractor appointed to execute a package.

NOTE Following the initial induction, it will be the responsibility of the principal contractor to conduct all other on-site inductions.

b) perform the statutory duties imposed by the Construction Regulations (Regulation 4(5)) issued in terms of the Occupational Health and Safety Act in relation to a package;

c) act as the **contract manager's** or **supervising agent's** representative, depending upon the standard form of contact that is used, in terms of works contracts falling within the scope of the Construction Regulations;

d) act as the Employer's health and safety agent in accordance with the provisions of the National Treasury *Occupational health and safety specification for construction works contracts* or other suitable specification;

e) submit the Notification of Construction Work to the Department of Labour, if not already done so by the principal contractor (Regulation 3(1)a);

f) handover to the **contract manager** upon completion of a package the principal contractor's health and safety file together with a brief report on the health and safety performance of the contractor;

g) attend site meetings when specifically requested to do so by the **contract manager**; and

h) appoint a suitably qualified safety practitioner to visit the sites at regular intervals specified by the **principal programme manager** or **principal project manager** to conduct site inspections for compliance with the requirements of the National Treasury *Occupational health and safety specification for construction works contracts* or other suitable specification and submit management reports, detailing inspection results and any remedial action required by the principal and / or subcontractors.

6.9.5 The **principal programme manager** or the **principal project manager** shall notify the **health and safety agent** of the award of a contract by the **implementer** to a professional service provider who provides construction related services for a package and each principal contractor appointed to execute a package as soon as possible after the award of the contract or package order.

6.9.6 The **contract manager** or **supervising agent** and their delegates, as relevant shall record in a book, which shall be kept on site in the same place as the health and safety file required in terms of the National Treasury *Occupational Health and Safety Specification for Construction Works Contracts* or other suitable specification, all site visits and any notifications or instructions to the contractor regarding defects and the rectification thereof which occur prior to completion of the works.

6.9.7 Designers of construction works or parts thereof shall, when called upon to do so by a **project manager**, provide the necessary inputs into the scope of work of a contract using the standard template contained in Annexure C.

6.10 Key performance indicators relating to construction activities

6.10.1 The following key performance indicators relating to construction and maintenance activities shall be reported by the **contract manager** on a monthly basis in respect of each programme of projects and independent project;

a) the number of people employed on the site including those employed by subcontractors;

b) the amount of work subcontracted to registered contractors in each contractor grading designation;

c) the number of improvement, contravention and prohibition notices issued;

d) incidents reportable in terms of the Construction Regulations issued in terms of the Occupational Health and Safety Act, briefly indicating the nature of the incident;

e) specific key performance indicators required by a client in terms of an IPMP or SDA or targeting strategy.

6.10.2 Key performance indicators relating to the engagement of enterprises, joint venture partners, local resources and local labour shall be measured and quantified in accordance with the relevant requirements of ISO 10845 Construction Procurement or an equivalent South Africa national standard.

6.10.3 Key performance indicators relating to cost norms shall be compiled by the **contract manager** in terms of requirements established by the **principal programme manager** or **principal project manager** in consultation with the **client** and included in the close out report.

NOTE Key performance indicators such as the cost of a road per km or a certain type of building per square metre can provide useful planning information and enable comparisons with other projects of a similar nature to be made.

6.11 Risk management

6.11.1 Risk registers shall be established by both the **client** and **implementer** at a portfolio, programme / project and contract level and maintained by those responsible for managing activities at such levels. Such registers shall as a minimum contain:

a) the entry date;

b) a description of the risk i.e. risk event, cause and possible outcome;

c) the action to avoid or reduce risk i.e. a description of the action, responsibility for action and time table for implementation;

d) action status i.e. actioned / take no action / monitor and review / to be auctioned.

6.11.2 Those responsible for establishing and maintaining risk registers shall issue risk reports when called upon to do so.

6.12 Asset management plans

6.12.1 Custodians shall prepare and update annually an asset management plan covering all infrastructure allocated to their custodianship. Such a plan as a minimum shall comprise:

a) a portfolio strategy which addresses the projected use and surrender of infrastructure and undeveloped land;

b) maintenance plans for at least a 15 year horizon or service life of infrastructure based on documented condition assessments which are not more than 5 years old;

c) performance assessments;

d) current levels of utilisation; and

d) a disposal strategy and management plan.

NOTE 1 Condition data is used to determine the need and timing for some routine maintenance and remedial action to prevent loss of service or economic loss. Performance assessments compare actual performance with service standards or design criteria, and are used to determine the need for alterations, extensions, refurbishments etc.

NOTE 2 The asset management plan described in 6.12.1 satisfies the minimum requirements for a custodian immoveable asset management plan described in section 7 of the Government Immoveable Asset Management Act of 2007 (Act 7 of 2007)

6.12.2 The institution responsible for the planning and budgeting of day-to-day, routine and emergency maintenance shall, taking cognisance of the maintenance plans contained in the asset management plan developed in accordance with 6.12.1, develop a maintenance plan for an MTEF period, obtain approval for such a plan, undertake activities prescribed by law and secure the budget to undertake the required maintenance for the next MTEF period.

6.12.3 Users shall annually prepare and document:

a) an operations plan relating to the effective functioning of all infrastructure and land under its control; and

b) a surrender plan which identifies infrastructure surplus to requirements and submit such a plan to the custodian for reallocation or disposal.

NOTE The minimum requirements for a user immoveable asset management plan described in section 8 of the Government Immoveable Asset Management Act of 2007 (Act 7 of 2007) can be satisfied through the development of an infrastructure plan in accordance with 4.2.1.1.1 and an operations plan and surrender plan in accordance with 6.12.3.

6.12.3 The custodian and user shall consult each other in finalising the documents referred to in 6.12.1 and 6.12.2.

6.12.4 The annual asset management plan, following its approval, shall be submitted to the relevant treasury and copied to the client.

NOTE Detailed guidance on the development of aspects of asset management plans may be found in various publications such as:

- Association of local Government Engineering NZ and National Asset Management Steering (NAMS) Group. International Infrastructure Management Manual – South African Edition 2006. ISBN No 0-473-10685-X
- IDM Toolkit. Delivery Management Guidelines: Delivery Process 3 –Operations and Maintenance www.cidb.org.za/_layouts/toolkit/index.html
- Department Co-operative Government and Traditional Affairs. Municipal Infrastructure - An Industry Guide to Infrastructure Service Delivery Levels and Unit Costs. January 2010
- Department: Local and Provincial Government. Guidelines for Infrastructure Asset Management in Local Government 2006 – 2009. www.dplg.gov.za/subwebsites/mig/docs/7.pdf
- National Department of Public Works. Guidelines for Users - User Asset Management Plans (U-AMPs).www.cidb.org.za/_layouts/toolkit/data/ai_docs/DP2-S10%20Guideline%20for%20U-AMP%20(2008-10-20)%20Version%201.pdf

Annexure A: The annual planning and budgeting cycle

A1 An overview of the portfolio and package planning stages

A1.1 The infrastructure planning system deals with all aspects of infrastructure planning at a portfolio level and feeds into stage 1 of the IGS. The output of stage 1 (see Figure A1) is an infrastructure plan. This plan forms the input to stage 2. Decisions regarding the grouping of projects for delivery (as a programme of projects or as an independent project) and the allocation of projects to contracts and package orders issued in terms of framework contracts (packages) are made during stage 2. Package planning activities can then commence i.e. stage 3 followed by stage 4. Should the packages at the end of the end of stage 4 prove not to be viable in their current form (e.g. insufficient budget, unacceptable risk profile, geotechnical / environmental / community constraints, poor return on investment etc.), the project is either modified before proceeding to implementation by repeating if necessary Stages 3 and 4 or terminated. Depending upon the budget allocations for an MTEF year, projects that have completed stage 4 may be either implemented or held over for implementation for a subsequent financial year, particularly where infrastructure is located on encumbered land or where agreements for the provision of bulk services or ICT infrastructure are not in place.

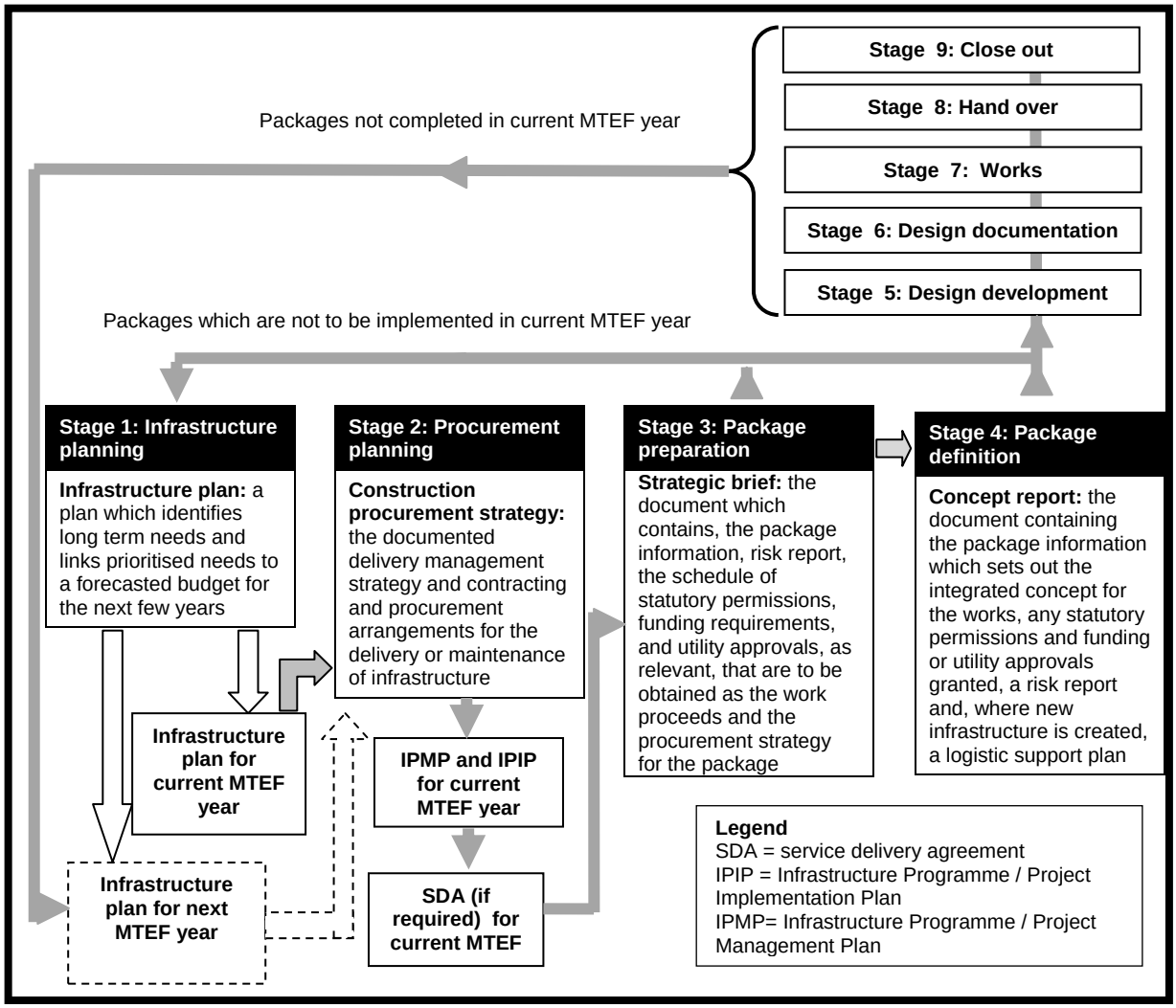


Figure A1: The annual cycle for portfolio and package planning cycle in the IDMS

A1.2 Stages 1 to 4 needs to answer the questions raised in Table A1. Major capital projects, comprising a project or a series of related packages involving works on a single site, having an estimated control budget exceeding a threshold, need to be subjected to an independent gateway review before proceeding beyond Stage 4.

Table A1: Questions which requires answers in stages 1 to 4

Stage		Questions
1	Infrastructure planning	Questions at a **portfolio level**: 1) What are the projected medium and long term financial requirements? 2) Which projects should be prioritised for implementation? 3) What is the estimated budget for each project? 4) Should funding be released to develop the brief for the package and the concept report? Alternatively should the project be implemented i.e. proceed beyond stage 4?
2	Procurement planning	Questions at a **portfolio level**: 1) How are projects to be delivered? 2) How is work to be packaged i.e. what is to be delivered through a single contract or package order within a framework agreement? 3) What are the contracting arrangements for a package? 4) 4 What are the procurement arrangements for a package?
3	Package preparation	Questions at a **package level**: 1) What is the brief for the project team tasked to finalise the planning for the package? 2) Should funding be released to finalise the package planning i.e. proceed to stage 4? 3) What are the main risks in taking the project forward that require mitigation?
4	Package definition	Questions at a **package level**: 1) Is the project feasible? 2) What is the brief for implementing the package? 3) What is the concept i.e. the viable solution? 4) What are the maintenance and operation implications for the proposed works?

A1.3 Information obtained from stages 1 to 4 informs and refines the budget allocations, procurement plans, infrastructure plans etc. and enables such documents to be populated and various types of plans that are required in terms of various pieces of legislation to be developed.

A2 Cyclic nature of planning

A2.1 The infrastructure plan is annually updated in order to secure the necessary budget for the MTEF period. This can result in the reprioritization of projects including those that have reached stage 4 but have not proceeded to implementation. Accordingly, the infrastructure plan can contain information with varying degrees of certainty. For example, the scope, time schedule and cost can be based at one end of the spectrum on preliminary assessments and indicative costs, and at the other end of the spectrum on a concept report based on feasibility reports and viable solutions. Accordingly, the portfolio and package planning (the first four stages of the IGS) can span a number of MTEF years, depending upon how early planning activities commence, and can in some instances involve the repeating of stages 3 and 4. As a result, the information in the infrastructure plan can contain information obtained from stages 2, 3 and 4 of the IGS. Where such information is not available for projects when the infrastructure plan is prepared, assumptions should be made regarding such information.

A2.2 The cyclic nature of portfolio planning and the budgeting processes means that there is a feedback loop between the IGS and the infrastructure planning system regarding projects which do not proceed beyond stage 4 to implementation (see Figure A1).

A2.3 The work flow associated with MTEF periods is as illustrated in Figure A2. Typically, infrastructure plans (stage 1) for the next MTEF year need to be developed during the first half of the year. This allows construction procurement strategies to be developed during the third quarter and the budget allocations to be made. These strategies in turn inform, as relevant, the finalisation of the Infrastructure Programme / Project Management Plans (IPMPs), Infrastructure Programme / Project Implementation Plans (IPIPs) and Service Delivery Agreements (SDAs) during the last quarter of Year 0 when the

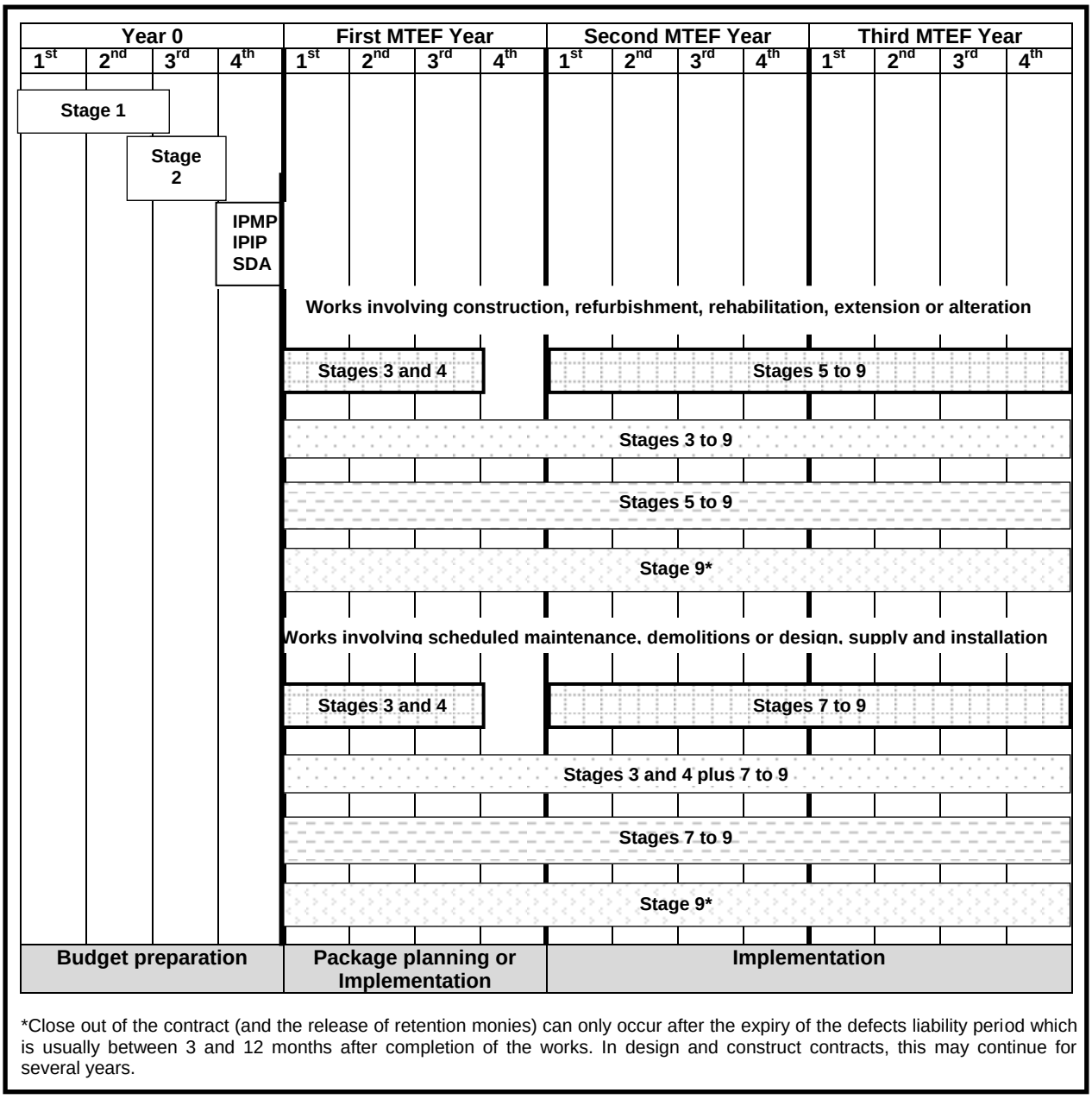
available budget for the MTEF period becomes known. The work flow for projects in the first MTEF year (see Figure A2) will typically involve:

1) Package planning (IGS stages 3 and 4) for projects which will be implemented in the second and third MTEF years.

2) The implementation of projects (design development and documentation (IGS stages 5 and 6), if required) which may, with reasonable certainty, be completed in one of the MTEF years.

3) The implementation of projects for which the package planning (IGS stages 3 and 4) was completed in Year 0 or before.

4) The close out of projects that were finished in Year 0 or before (IGS stage 9).



*Close out of the contract (and the release of retention monies) can only occur after the expiry of the defects liability period which is usually between 3 and 12 months after completion of the works. In design and construct contracts, this may continue for several years.

Figure A2: Aligning IGS stages for a typical portfolio of projects across an MTEF period

Annexure B: Questions which could be asked at the end of stages 4, 5 and 8 of a gateway review

Examples of questions which could be asked by gateway review teams include:

Stage 4: Package definition

- Is the concept clear and unambiguous?
- Have a wide enough range of design options that will satisfy the brief been examined?
- Is there a clear “best option” or would several design options satisfy the brief?
- Have the risks for each of the design options been fully assessed?
- Does the programme take into account any lead times associated with statutory permissions and critical dependencies that are required?
- Does the proposed solution satisfy the strategic brief?
- Have all the major risks that arose during this stage been resolved?
- If there are unresolved issues, what are the risks of implementing rather than delaying?
- Have all the stakeholder issues been addressed?
- Is there continuing stakeholder support for the project?
- Is the decision on the construction procurement strategy likely to deliver what is need on time and within budget, and will it provide value for money?
- Has service life costs been adequately considered?
- Is the package ready for implementation / detailed design?
- Will the proposed works, on completion, achieve the service objectives and fulfil the identified need(s), which are consistent with government policy and the organisation’s strategic objectives?
- Have the social, economic and environmental impacts of the project been identified and dealt with?

Stage 5: Design development

- Have all the technical implications, such as “buildability” for construction been addressed?
- Does the design present whole-life value?
- Does the design adequately deal with health, safety, environmental and maintenance issues?
- Is the end product clear and unambiguous?
- Is the proposed design an expansion of the concept report and if not, why not?
- Have all the major risks that arose during this stage been resolved?
- If there are unresolved issues, what are the risks of implementing rather than delaying?
- Have all the stakeholder issues been addressed?

- Has service life costs been adequately considered?

- Is the package ready for implementation?

- Have the social, economic and environmental impacts of the project been dealt with?

Stage 8: Handover

- Does the record information provide those tasked with the operation and maintenance of works with the necessary information to:

    - understand how the designers intended buildings and their related site works, systems, subsystems, assemblies and components or works to function?

    - effectively operate, care for and maintain works, systems, subsystems, assemblies and components?

    - check, test or replace systems, subsystems, assemblies or components to ensure the satisfactory performance of works, systems, subsystems, assemblies and components over time?

- Does the record information provide information pertaining to the planning and design of works to inform additions, extensions, refurbishments, modifications and scheduled maintenance that may be required from time to time?.

- Does the record information provide the custodian or user with the assurance that the works as handed over satisfies all occupational health and safety requirements?.

- Does the record information contain information to enable safe and efficient operation and maintenance?

- What is the clarity, quality, and ease of locating information?

Annexure C: Occupational Health and Safety information

Project No:	**Document no:**
Description of works:	
To the Project Leader	
Address:	
Tel:	**Fax:**
Attention:	**Email:**

Service area	**Major hazards identified by the designer***	**Special construction procedures and sequences of construction****
Architectural design		
Civil engineering		
Electrical engineering		
Fire safety		
Landscape architectural design		
Mechanical engineering		
Structural engineering		
Wet services		

* Insert none if there are none
** Highlight with possible references to drawings

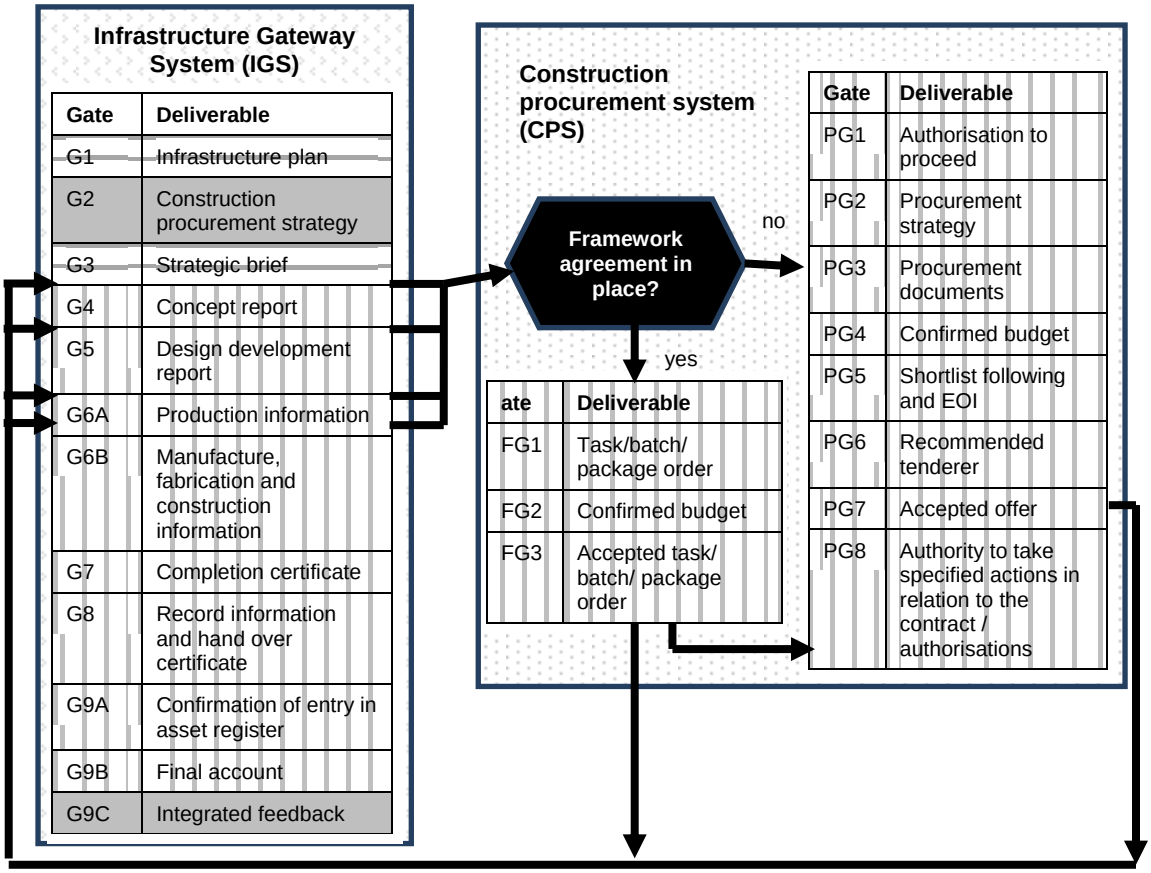
Notified by Designer		
Signature	Name: Company:	Date:

Annexure D: Functional roles and responsibilities

D1 Overview of roles and responsibilities

D1.1 This standard:

a) assigns functional roles and responsibilities to clients and implementers in the delivery and scheduled maintenance of infrastructure as indicated in Table 6 and illustrated in Figure D1;



Note:

- The linkages between IGS gates and CPS gates are dependent on the contracting strategy that is adopted
- Gates 5, 6A and 6B are not always necessary
- Gate 9C is optional

Legend

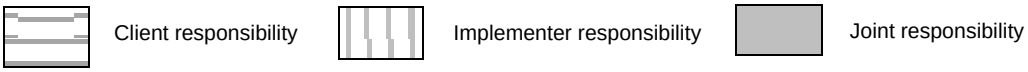


Figure D1: Assigned client and implementer responsibilities

b) describes the roles and responsibilities of the following suitably qualified professionals appointed by the implementer:

1) principal programme managers who oversee the implementation of programmes of projects;

2) principal project managers who oversee the implementation of independent projects;

3) contract managers who administer a contract or package order and perform duties relating to the overall management of the contract;

4) health and safety agent who 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 Ac, 1993;

5) supervising agent who checks that the works are proceeding in accordance with the provisions of the contract;

c) refers to roles and responsibilities assigned to persons as the:

1) procurement leader who is tasked to perform or oversee certain procurement functions in the National Treasury *Standard for a Construction Procurement System*; and

2) project leader who leads and directs the project team which perform design and cost consulting functions;

3) lead designer who co-ordinates and integrates the design,

4) designer who provides design services; and

5) cost consultant who provides cost advice and controls cost.

NOTE 1 The terms that are used in this standard are not related to posts within an institution or necessarily linked to any of the built environment professions. The term “principal” is used in font of programme manager and project manager to identify the person who carries within an institution overall professional responsibility for the implementation of a programme of projects or an independent project, respectively. It is understood that depending upon the size, nature and complexity of a programme or independent project, programme and project managers may work under such persons. The responsibilities of such managers are not described in this standard as the “principal” will be required to assign responsibilities to them and supervise their work.

NOTE 2 The term “programme manager” and “project manager” does not appear in the text without being proceeded by “principal”. This is to avoid confusion as these terms are frequently loosely used. The terms “procurement leader” and “project leader” are used. The term “procurement leader” is used to identify the built environment professional who is responsible for overseeing or performing technical activities relating to the procurement process. The term “project leader” is used to identify the built environment professional responsible for leading and directing the project team tasked to develop IGS deliverables.

NOTE 3 Although the focus in the standard is on the implementer making the appointments, it is possible for a client who is not an implementer to appoint a project leader, lead designer, designer and cost consultant to provide stage 3 services. The client is, however, free to approach the implementer for inputs into this stage to obviate the need for such appointments.

NOTE 4 In some programmes of projects or independent projects, the client and the implementer are the same institutions, while in others this is not the case.

D1.2 The basic lines of reporting for each package within a programme of projects or an independent project are set out in Figure D2. There are many options available to an implementer in assigning functional responsibilities to particular persons (officials or PSPs). This ensures flexibility. For example, in some programmes of projects different individuals will be assigned functional responsibilities for each of the identified roles. In other programmes it may be desirable to combine functional roles and responsibilities e.g. the project leader can also be the procurement leader and the same person can be appointed to function as project leader, lead designer, designer and cost consultant or the contract manager and supervising agent.

D2 Outline of assigned functional responsibilities

D2.1 Principal programme / project manager

D2.1.1 The implementer needs to appoint principal programme managers to oversee the implementation of each programme of projects and principal project managers to oversee the implementation of each independent project (see 6.1.4). Such persons, who provide a single point of

responsibility for a programme of projects or an independent project, should be made responsible for the preparation of an IPIP and, where relevant, the acceptance of a strategic brief prepared by the client.

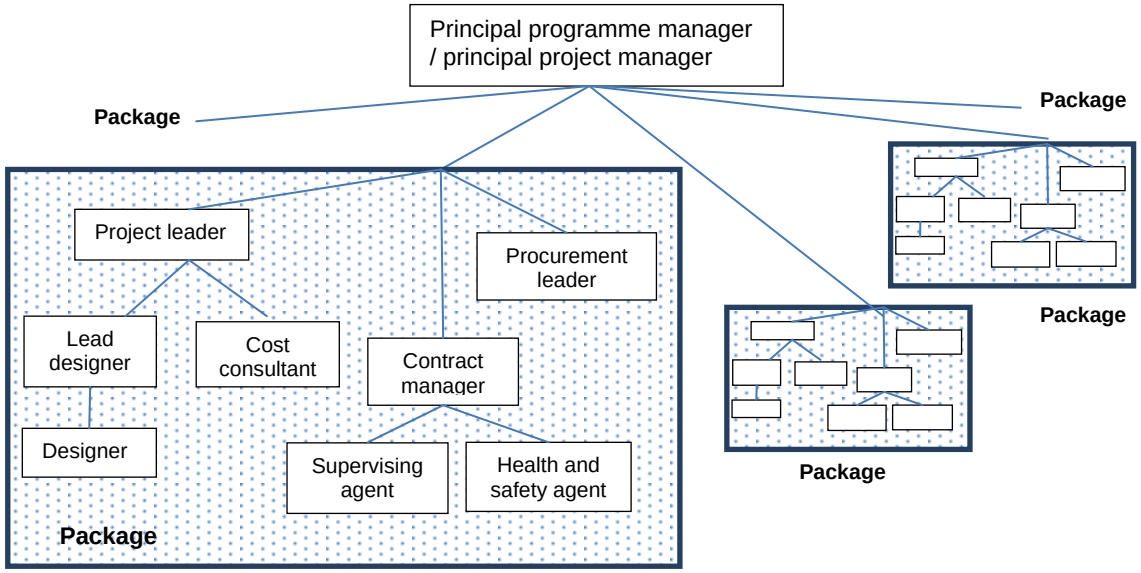


Figure D2: Basic lines of reporting for assigned functional responsibilities for each package

D2.1.2 This standard establishes general and specific duties for principal programme managers and principal project managers to (see 6.7.2.1) to:

a) manage programmes and projects in accordance with normal professional management standards so that both the implementer and client achieve their respective objectives;

b) manage and receive communications from assigned contract managers (see also 6.8); and

c) regularly review and update the approved IPIP and provide the client with copies of each revision of the IPIP.

D2.1.3 Principal programme / project managers need in terms of this standard to amongst other things:

a) designate persons to accept strategic briefs provided by clients (6.4.2.3);

b) assign responsibilities for taking packages beyond stage 3 to project leaders (see 6.4.3.1) and interface with and facilitate the client's inputs into the development and finalisation of end of stage deliverables and the acceptance thereof (see 6.4.3.2, 6.4.5.1 and 6.4.1.2);

c) obtain the client's requirements for commissioning and handover, if any, and communicate them to those responsible for compiling procurement documents (see 6.4.1.3a));

d) implement any requirements regarding social facilitation and establish the necessary project steering committees, appoint the community liaison officers, recruit and select local labour, manage community related risks, deal with issues related to labour unrest or disputes during the execution of the works, etc. (see 6.1.7);

e) brief the contract manager of the client's monitoring and reporting requirements for stage 7 (Works) (see 6.4.6.1);

f) communicate to the client the contractual provisions for the taking over of the works and make the necessary hand over arrangements (see 6.4.1.3a, 6.4.6.2 and 6.4.7.1);

h) establish requirements for close out reports, communicate such requirements to contract managers and receive reports (see 6.4.8.2);

i) accept the procedures for post completion evaluations prepared by the client (see 6.4.8.3);

j) receive Prohibition Notices issued in terms of the occupational health and safety specification (see 6.9.3);

k) determine the frequency of site visits by a qualified safety practitioner to conduct site inspections for compliance with the health and safety requirements (see 6.9.4i));

l) notify the **health and safety agent** of the award of a contract to a PSP who provides construction related services for a package and each principal contractor appointed to execute a package (see 6.9.5); and

m) establish and maintain risk registers at a programme of projects or an independent project level (see 6.11.1) and issue risk reports (see 6.11.2);

D2.1.4 The principal programme managers and principal project managers may be supported in the carrying out of their duties by programme and project managers. They may also delegate responsibilities to such persons.

D2.1.5 The principal programme manager or principal project manager can be delegated in terms of the National Treasury Standard for a Construction Procurement System to appoint a Documentation Review Team and an Evaluation Panel and to make decisions at certain gates e.g. approve certain increases in the total of prices or the time for completion which don't exceed a specified margin.

D2.2 Contract managers

The implementer needs to appoint suitably qualified persons to function as contract managers in respect of each package. The primary function of a contract manager is to administer the contract in terms of the provisions of the contract (see second column of Table 10 for term assigned to contract manager in the standard forms of contract that may be used). The contract manager in addition needs to:

a) manage the interface between the contractor and the project leader in obtaining client inputs where a management, design and construct or develop and construct contracting strategy is utilised (see 6.4.1.2); and

b) if required to do so, update the PEP, and develop and maintain a risk register, a communications plan and a quality plan (see 6.7.3);

c) ensure that the client's requirements for monitoring and reporting are adhered to (see 6.4.6.1);

d) provide the principal programme manager or principal project manager with adequate notice of the anticipated date of completion of a part or the whole of the works so that the necessary handover arrangements with the client may be made (see 6.4.6.2);

e) prepare the close out report in accordance with requirements (see 6.4.8.2);

f) if assigned to do so, provide the gateway review team with the documentation that they require to undertake a gateway review (see 6.6.1.2);

g) report to the principal programme manager or principal project manager, as relevant, see 6.7.2.1b)

.

NOTE The second column of Table 10 indicates the identity of the contract manager in terms of the various standard forms of contract. i.e. engineer. employer's representative. project manager, purchaser's representative, service manager or supply manager.

D2.3 Health and safety agents

D2.3.1 The health and safety agent assumes the responsibilities of the implementer as a "client" in terms of the Construction Regulations 2003 issued in terms of the Occupational Health and Safety Act of 1993 in respect of each and every package. The specific duties of a health and safety agent are set out in the National Treasury *Occupational Health and Safety Specification for Engineering and Construction Works Contracts* (see 6.9). The **health and safety agent** may in terms of this specification issue Improvement Notifications, Contravention Notices and Prohibition Notices, as relevant and applicable, to the contractor concerned and forwarded copies to the **contract manager**. Such notices shall require corrective remedial action by the contractor. In the event that a "life threatening" situation develops on the site, due to negligence, or the lack of preparations, the activity will be terminated immediately. The **contract manager** shall notify the **principal programme manager** or **principal project manager** upon receipt of a Prohibition Notice.

D2.3.2 The health and safety agent acts as the **contract manager's** or **supervising agent's** representative, depending upon the standard form of contact that is used, in terms of works contracts falling within the scope of the Construction Regulations

D2.4 Supervising agents

D2.4.1 All the standard forms of contract allow the contract manager or employer to delegate their administrative duties to others. Some forms of contract make standard provision for the separation of administrative duties relating to time and cost from those relating to compliance with the scope of work. The NEC Engineering and Construction Contract (ECC) makes provision for a project manager and a supervisor while the JBCC forms of contract make provision for a principal agent and agents. These provisions don't permit the supervisor and agents to issue instructions relating to time and cost. Their role is of a technical nature relating primarily to the quality of the works.

D2.4.2 It is possible in forms of contract which don't make provision for the separation of duties to delegate duties to supervising agents e,g. the engineer in GCC 2010 and the FIDIC family of contracts can delegate duties to a supervising agent.

D2.4.3 There are advantages in complex works, particularly where there are different professions and engineering disciplines involved in the design of a package to separate the roles of the contract manager from the supervising agent. On single discipline and relatively straightforward work, the roles should be combined. .

D2.4.4 The supervising agent needs in support of the risk management system to issue warnings to the contract manager regarding any non-conformance on the part of a contractor to requirements (defects) prior to completion or any other matter which is likely to significantly increase the costs, delay completion or impair the performance of the works in use (see 6.8.3)

D2.4.5 The supervising agent needs to record in a book which shall be kept on site in the same place as the health and safety file required in terms of the National Treasury *Occupational Health and Safety Specification for Construction Works Contracts*, all site visits and any notifications or instructions to the contractor regarding defects and the rectification thereof which occur prior to completion of the works (see 6.9.6).

D2.5 Project leaders, lead designers, designers and cost consultants

D2.5.1 The professional services of project leaders, lead designers, designers and cost consultants (see Table 7) are required as inputs into most of the activities associated with an IGS stage in order to produce a deliverable.

D2.5.2 Professionals providing services relating to project leader, lead designer, designer and cost consultant can be called upon to provide two types of services (see Table D1), depending upon the allocation of design responsibilities in the contracting strategy that is adopted, namely:

a) definition services which develop the deliverable associated with an end of a stage; and

b) review services which review the definition service of a stage undertaken by others for general conformity with the scope of work selected for a particular contracting strategy.

Table D1: Allocation of responsibilities for services in the different contracting strategies

Contracting strategy	IGS Stage (see Figure 1)	Implementer responsibilities	Contractor's responsibilities
Management contractor*	4, 5 and 6A	Review services	Definition services
Design and construct	4	Definition services	None
	5 and 6A	Review services	Definition services
Develop and construct	4 and 5	Definition services	None
	6A	Review services	Definition services
Design by employer	4, 5 and 6A	Definition services	None

* A management contractor can also be appointed after Stage 4, 5 or 6A, in which case, the management contractor will assume the responsibilities for the contractor associated with that stage.

D2.5.3 Services relating to stages 3 to 6 may be provided by suitably qualified employees, contracted individuals or professional service providers appointed by either the implementer or a contractor depending upon the contracting strategy that is adopted as indicated in Table D2.

NOTE The nature of the services required of a cost consultant in each stage is dependent upon the pricing and contracting strategy that is adopted. The cost consultant is usually required to prepare bills of quantities where the design by employer contracting strategy is required and to forecast and monitor contractor's costs in cost reimbursable contracts and target cost contracts. (The contractor is usually responsible for developing an activity schedule in the case of a design and construct or develop and construct pricing strategy.

D**2.5.4** The services of the project leader, lead designer, designer and cost consultant tail off during stages 7 and 8. Their only deliverables is the record information. Their services relate to dealing with outstanding issues and answering questions raised by users. They may, however, be called upon to contribute to the close out report or to provide inputs to a post occupancy evaluation.

NOTE The cost consultant may be required to assist the contract manager with the controlling of costs associated with the contract, the evaluation of changes in costs arising from the occurrence of the employer's risk events or changes in the scope of work and the certifying of payment due to contractors. The designer may also be appointed as a supervising agent. These are additional services.

D2.5.5 Designers may be appointed to perform a discipline specific service (e.g. in accordance with those described in Table D3 for building works) in which case, the designer shall provide the service in relation to the identified discipline. Designers are, however, required in terms of the Construction Regulations issued in terms of the Occupational Health and Safety Act of 1993 to carry out sufficient inspections to ensure compliance with the requirements of the design and keep a record of such inspections on site. They may likewise also be required to conduct such inspections in terms of the National Building Regulations issued in terms of the National Building Regulations and Standards Act of 1977. For this reason, it is advisable to appoint the designer as the supervising agent.

D2.5.6 The project leader is required in terms of this standard to:

a) accept in the case of a design by employer contracting strategy certain parts of the production information (6.4.5.1);

b) oversee the development of a maintenance plan if required (6.4.7.5);

c) update the PEP whenever a deliverable is accepted and develop and maintain a risk register, a communications plan and a quality plan (6.5.1 and 6.7.3); and

d) provide the gateway review team with the documentation that they require to undertake a gateway review (see 6.6.1.2).

Table D2: Person responsible for appointing project leader, lead designer, designer and cost consultant during stages 3 to 6

<table>
<tr><th colspan="5">Infrastructure Gateway System (workflow)</th></tr>
<tr><th colspan="2" rowspan="2">Stage</th><th rowspan="2">Activity</th><th colspan="3">Responsibilities</th></tr>
<tr><th>Design by employer</th><th>Develop and construct</th><th>Design and construct</th></tr>
<tr><td>3</td><td>Package planning</td><td>Develop, finalise and obtain acceptance of the strategic brief</td><td colspan="3">Client</td></tr>
<tr><td colspan="5">Procure the services of a contractor on a “management contract” basis and professional service providers in accordance with documented procurement strategy</td></tr>
<tr><td>4</td><td>Package definition</td><td>Develop, finalise and obtain the clients acceptance of the concept report</td><td colspan="3">Implementer or management contractor</td></tr>
<tr><td colspan="5">Procure the services of a contractor on a “design and construct” basis and professional service providers in accordance with documented procurement strategy</td></tr>
<tr><td>5</td><td>Design development</td><td>Develop, finalise and obtain acceptance of design development report</td><td colspan="2">Implementer or management contractor</td><td>Design and construct contractor for full service
Implementer or management contractor for review service</td></tr>
<tr><td colspan="5">Procure the services of a contractor on a “develop and construct” basis and professional service providers in accordance with documented procurement strategy</td></tr>
<tr><td>6A</td><td>Design documentation (Production information)</td><td>Develop, finalise and obtain acceptance of production information</td><td>Implementer or management contractor</td><td colspan="2">Design and construct / develop and construct contractor for full service
Implementer or management contractor for review service</td></tr>
<tr><td colspan="5">Procure the services of a contractor on a “design by employer” basis and professional service providers in accordance with documented procurement strategy</td></tr>
<tr><td>6B</td><td>Design documentation (Manufacture, fabrication and construction information)</td><td>Develop, finalise and obtain acceptance of manufacture, fabrication and construction information</td><td colspan="3">Contractor for full service
Implementer or management contractor for review services (lead design and designer only)</td></tr>
</table>

D2.6 Procurement leader

D2.6.1 Procurement forms part of the body of knowledge associated with the architectural, construction management, construction project management, engineering and landscape architect professions. It is imperative that professional skills residing in these professions are made use of in the procurement process. The procurement leader needs to 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.

D2.6.2 In many projects, it may make sense to make appoint the procurement leader as the project leader, particularly in the smaller and less complex projects.

Table D3: Design services relating to buildings

Service	Principal activities
Architectural design	Plan, design and review the construction, extension or refurbishment of buildings, spaces, structures and associated site works for the use of people by the creative organization of materials and components with consideration to mass, space, form, volume, texture, structure, light, shadow, materials and the project brief.
Acoustic design	Plan, design and review the construction of buildings and building components to achieve acoustical outcomes
Civil engineering	Plan, design and review the construction of site works comprising a structure such as a road, pipeline or sewerage system or the results of operations such as earthworks or geotechnical processes.
Electrical engineering	Plan, design and review the installation of the electrical and electronic systems for and in a building or structure
Facade engineering	Plan, design and review the installation of structures to enclose spaces in buildings and spaces
Fire safety	Plan, design and review the fire protection system to protect people and their environments from the destructive effects of fire and smoke.
Landscape architectural design	Plan, design and review the construction of outdoor and public spaces to achieve environmental, socio-behavioural, or aesthetic outcomes or any combination thereof
Mechanical engineering	Plan, design and review the construction, as relevant, of the gas installation, compressed air installations, thermal and environmental control systems, materials handling systems or mechanical equipment for and in a building
Structural engineering	Plan, design and review the construction of buildings and structures or any component thereof to ensure structural safety and structural serviceability performance during their working life in the environment in which they are located when subject to their intended use in terms of one or more of the following: i) external and internal environmental agents; ii) maintenance schedule and specified component design life; or iii) changes in form or properties
Wet services	Plan, design and review the construction, within buildings or from a point of drainage installations intended for the reception, conveyance, storage or treatment of sewage and water installations or water installation which conveys water for the purpose of fire-fighting or consumption within a building.