

Inform Practice Note #22b

September 2010
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cidb Infrastructure Gateway System
– Stages

cidb's Inform Practice notes provide guidance and clarity in achieving client objectives in construction procurement and delivery. Practice notes inform clients and practitioners on how to embrace best practice and how to deal with issues that may arise. They are aligned with, but do not replace regulation.

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Synopsis:

The delivery and maintenance of infrastructure needs to be managed and controlled in a logical, methodical and auditable manner. This practice note outlines the cidb Infrastructure Gateway System which provides a number of control points (gates) in the infrastructure life cycle where a decision is required before proceeding from one stage to another. Such decisions need to be based on information that is provided and if correctly done, provides assurance that a project involving the design and construction, refurbishment or alteration of infrastructure, the rehabilitation of infrastructure, or the performance of preventative, corrective, scheduled or routine maintenance remains within agreed mandates, aligns with the purpose for which it was conceived and can progress successfully from one stage to the next.

Inform practice note 22 – cidb Infrastructure Gateway System comprises three parts:

- a) An overview
- b) Stages
- c) Reviews

Extracts from the revised Green Paper: National strategic planning (January 2010) The Presidency, Republic of South Africa

Why do we need a vision and a longterm strategic plan?

- **The mobilisation of society** around a commonly agreed set of long-term goals is a key aspect of a successful developmental state.
- **Greater coherence in government's work between departments and across spheres** can only be achieved if there is a common understanding in enough detail of the long-term objectives and direction of our society.
- **Longer term planning provides longer term certainty, improving the quality of decision making** for all parts of government – from national to local – and for the private sector – from big businesses to small. A national vision that is widely understood and agreed on will encourage a longer term view from all key institutions, allowing them to invest with greater confidence in buildings, equipment and their employees.
- **Providing a basis for trade-offs between competing objectives** and facilitating sensible sequencing of major decisions.

1. Introduction

The starting point in the development of any infrastructure gateway system is to identify the information which needs to be developed and accepted at a particular point to enable a project to be advanced. The stages in the delivery and maintenance of infrastructure can then be defined as the activities that need to take place between such points.

The stages need to take account of planning, implementation and maintenance and operation activities.

2. Current public sector planning requirements

Public sector planning processes which seek to translate policies into long, medium and short term objectives, prioritising the objectives and sequencing them, are evolving. The recent establishment of a National Planning Commission is the embodiment of government's efforts to improve long term planning and to rally the nation around a common set of objectives and priorities to drive development over the longer term.

Chapter 5 (Strategic planning) of the Regulations issued in terms of the Public Finance Management Act of 1999 requires the accounting officer of an institution to prepare a strategic plan that is consistent with the period covered by the Medium Term Expenditure Framework. The regulations require strategic plans, amongst other things to cover at least three years and be consistent with the institution's published medium term expenditure estimates and to include details of proposed acquisitions of fixed or movable capital assets, planned capital investments and rehabilitation and maintenance of physical assets.

The Municipal Systems Act of 2000 (Act 32 of 2000) establishes the Integrated Development Plans (IDP) of a municipality as the principal strategic planning instrument that guides and informs all planning and development, and all decisions with regard to the planning, management and development in the municipality. It links, integrates, and coordinates all municipal plans into a single strategic plan for the development of the municipality. It provides a basis for determining the level and extent of municipal resources and capacity required, and for formulating budgets.

Sections 78 and 79 of this Act address aspects of infrastructure investment planning. These sections require that the cost of ownership must be known and the appropriate delivery mechanism identified ahead of implementation.

Accordingly, the starting point in the cidb Infrastructure Gateway System is an infrastructure plan which identifies long term needs and links prioritised needs to a forecasted budget over at least the medium term expenditure framework

Terminology

The **Project Management Institute** defines:

- **Portfolio:** A collection of projects or programmes and other work that are grouped together to facilitate effective management of that work to meet strategic business objectives. The projects or programmes of the portfolio may not necessarily be interdependent or directly related
- **Programme:** A group of related projects managed in a coordinated way to obtain benefits and control not available from managing them individually. Programmes include an element of ongoing work and may include elements or related work outside the scope of discrete projects in the programme
- **Project:** A temporary endeavour undertaken to create a unique product, service, or result
- The **International Organisation for Standardisation (ISO)** defines in ISO 10845-1:
- **Procurement strategy:** selected packaging, contracting, pricing and targeting strategy, and procurement procedure for a particular procurement
- **Packaging strategy:** organisation of work packages into contracts.
- **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.
- A **package** may be defined as works which have been grouped together for delivery under a single contract or a package order.

3. A strategic approach to procurement

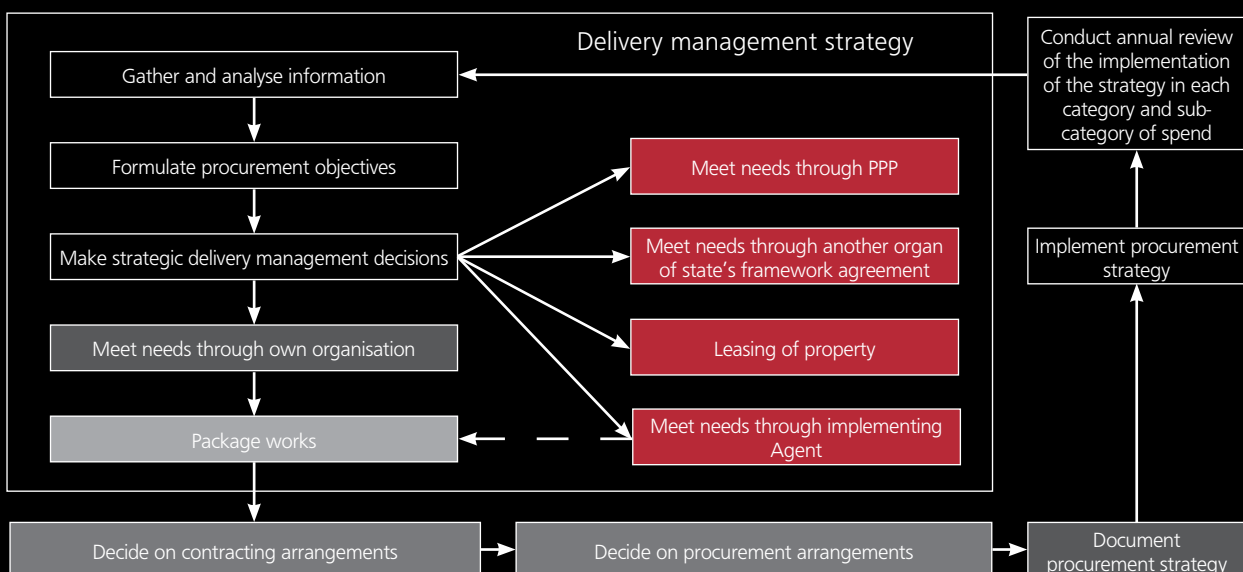
A strategic approach to procurement can be undertaken should a construction procurement strategy be developed for a portfolio of projects. (See cidb Practice Note #23, Construction Procurement Strategy).

Construction procurement strategy is the selection of a combination of the delivery management strategy and associated contracting and procurement arrangements. It necessitates that a number of choices be made from the available options.

A construction procurement strategy can be developed for a single project, a programme of projects or a portfolio of projects to identify the best way of achieving objectives and value for money, whilst taking into account risks and constraints.

A construction procurement strategy can be used to translate a portfolio of projects identified in an infrastructure plan into a series of packages for delivery under a single contract or a package order issued in terms of a framework agreement. Such strategy documents the choices made in the development of a delivery management strategy and the determination of the contracting and procurement arrangements.

Annual cycle for the development of procurement strategies for categories of spend

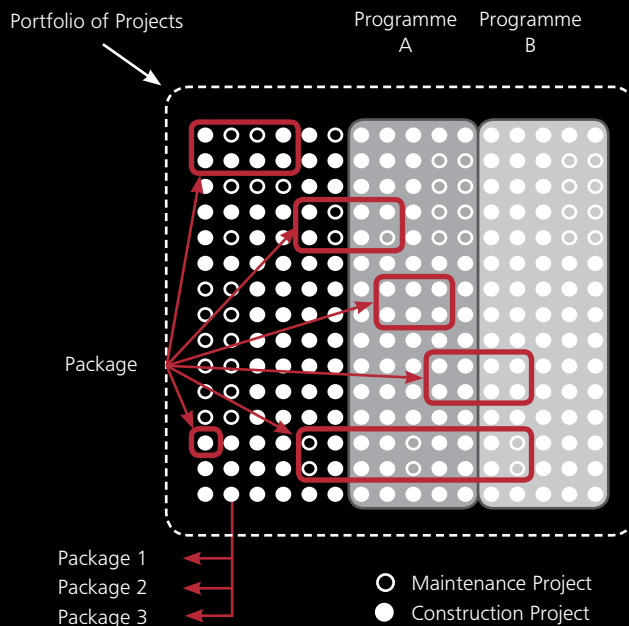


4. The work flow associated with a package

The work flow associated with a package for works involving construction, refurbishment, rehabilitation, extension or alteration is as follows:

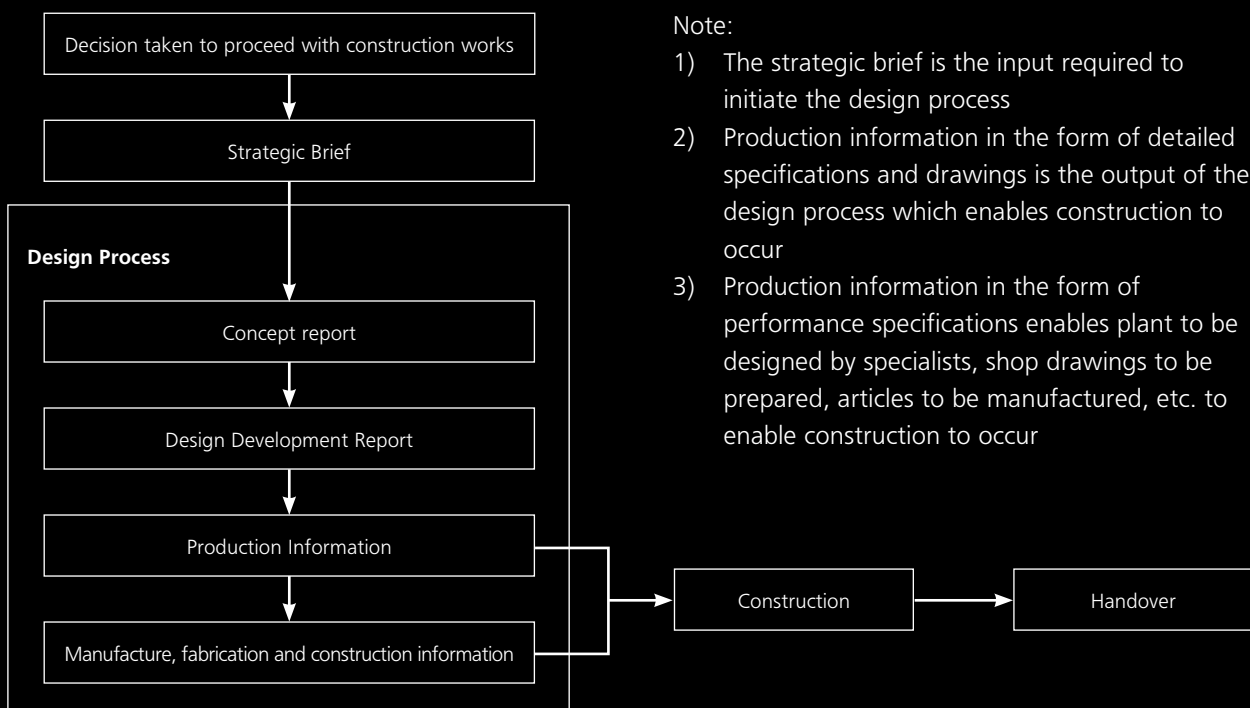
- The client establishes a strategic brief for a package setting out the package information;
 - Professionals develop a concept report which sets out the integrated concept for a package acceptance by the client based on the strategic brief;
 - Professionals design the works, based on the integrated concept for the works and present the design for acceptance by the client;
 - Professionals, employed by either the client or the contractor, convert the client accepted design into information enabling construction, manufacture or fabrication to take place;
 - A contractor proceeds with the works;
 - The works associated with a package are complete to the extent that the works may be used or others may do their work;
 - The works are taken over by the end user and the operational and maintenance staff; and
- All defects are rectified and all outstanding contractual payments have been made.

The concept of packages



Projects are grouped together or divided into packages for delivery under a single contract or a package order issued in terms of a framework agreement.

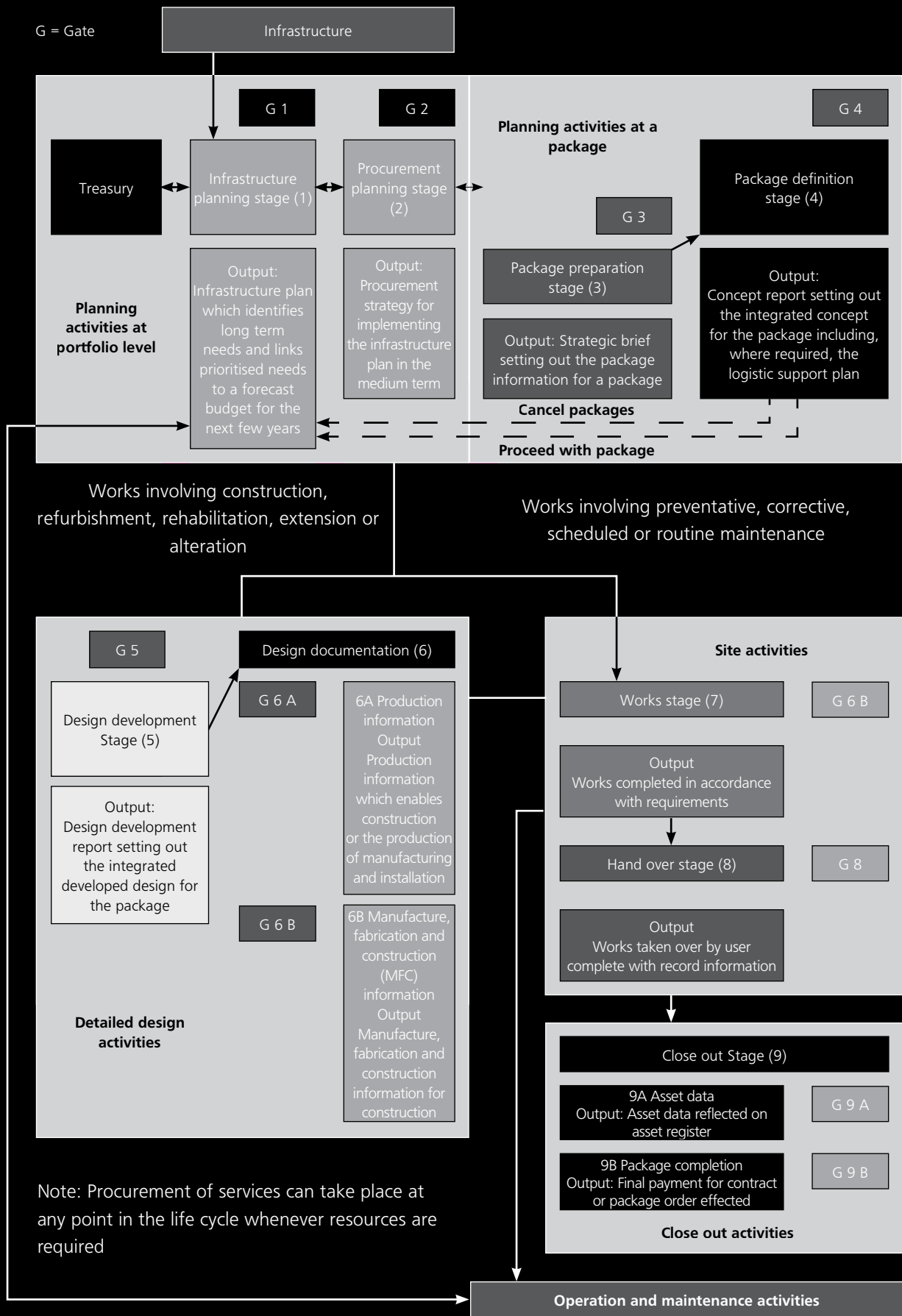
The work flow associated with the delivery of construction works



Note:

- 1) The strategic brief is the input required to initiate the design process
- 2) Production information in the form of detailed specifications and drawings is the output of the design process which enables construction to occur
- 3) Production information in the form of performance specifications enables plant to be designed by specialists, shop drawings to be prepared, articles to be manufactured, etc. to enable construction to occur

cidb Infrastructure Gateway System



The work flow is not necessarily linear. For example, construction activities can commence before the manufacturing and fabrication information is finalised and construction can commence before all the

construction information has been finalised. There are also variations in the work that needs to be done. For example, works involving heating and cooling systems (HVAC) and structural steelwork require manufacturing or fabrication information prior to being incorporated into the works. The construction of a road, on the other hand, may not require such information.

The workflow for works involving preventative, corrective, scheduled or routine maintenance is similar except that the information in the concept report is sufficient for the works to proceed.

A shortcoming in the aforementioned work flow is the logistical information necessary to plan for the operation and maintenance of works involving construction, refurbishment, rehabilitation, extension or alteration. What is also missing is the updating of the asset register. These activities need to be incorporated into the organisational processes.

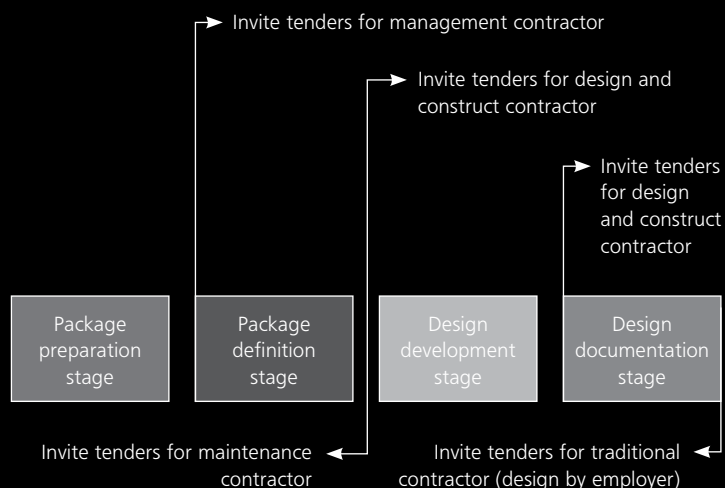
Package information

A brief is a working document which specifies at any point in time the relevant needs and aims, resources of the client and user, the context of the package and any appropriate design requirements within which all subsequent briefing (when needed) and designing (where necessary) can take place. Accordingly, a package is defined at any point in time in the project cycle by the package information that is available i.e. the:

- Brief which is progressively developed from time to time;
- Design;
- Package programme which identifies key dates and time periods for the performance of the works and services associated with the package; and
- Package cost.

The package information is developed following the identification of a package and is updated thereafter whenever revised information is obtained.

Alignment of cidb infrastructure delivery stages with various contracting strategies



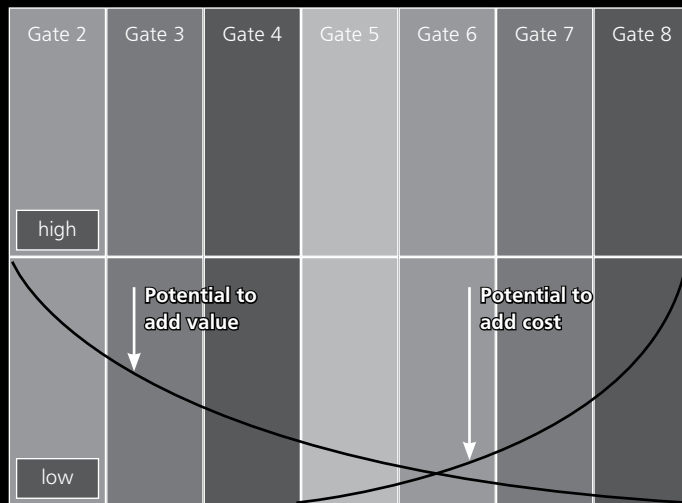
Note: The output of a stage becomes the scope of work for a package

Design by employer: contract under which a contractor undertakes only construction on the basis of full designs issued by the employer.	Develop and construct: contract based on a scheme design prepared by the client under which a contractor produces drawings and constructs it.
Design and construct: contract in which a contractor designs a project based on a brief provided by the client and constructs it.	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.

5. The cidb Infrastructure Gateway

The cidb Infrastructure Gateway System is linked to the outputs of the planning and implementation activities. The first two gates deal with portfolio planning activities at a strategic level whereas the last two planning gates deal with planning at a package (contract specific) level. Planning activities end when what is to be delivered in terms of a package has been decided upon i.e. at the end of the package definition stage. Gate 4 in the gateway process requires a decision to be made as to whether or not to proceed with a package. Organ of state have a duty to plan and should generally only procure services from the market when there is certainty that the package will proceed. Where there is insufficient capacity or capability to perform the planning activities such skills should be insourced. Outsourcing, except in the case of a management contractor should only occur after gate 4.

Trends in the potential to add value or cost



Different decision makers are required at different gates to accept the outputs of each stage before proceeding to the next. Senior managers are accountable for the outputs during the early planning stages and built environment professionals for outputs at the later stages. Middle management could be made accountable for the middle stages.

No procurement stages, apart from procurement planning at a portfolio level, are included in the infrastructure management cycle. Procurement gates governing procurement processes can occur whenever resources are procured.

Professional service providers are generally required only after gate 4 to progress the works to gate 9. The specific services that are required at each stage vary depending upon the contracting strategy that is adopted. For example, a full service is required in stage 5 and 6 where the design by employer contracting strategy is adopted, whereas in a design and construct contracting strategy, the professional service provider will confirm that the design is proceeding in accordance with the concept report and the design and documentation prepared by the contractor.

Gateway processes can be used to review projects (see cidb Inform Practice Note 22c). However, the application described in this inform practice note focuses on the putting in place of processes and procedures to ensure that the outputs of each stage in the delivery and maintenance of infrastructure are achieved and accepted before proceeding to the next stage. This enables works to be managed and controlled in a logical, methodical and auditable manner.

6. Key deliverables and principal actions associated with each stage

The key deliverables and the principal actions associated with each deliverable in respect of each stage in the cidb Infrastructure Gateway System are as follows:

Stage		Key deliverable at end of Stage	Principal actions associated with the key deliverable
No	Description		
Planning activities at a portfolio level			
1	Infrastructure planning	Approved infrastructure plan which identifies long term needs and links prioritised needs to a forecasted budget for the next few years	<ul style="list-style-type: none"> Identify the policy drivers, strategies and long term objectives of national, provincial and local government which impact upon the institution's infrastructure mandate; Formulate objective decision making criteria relating to the selection and prioritisation of projects; Produce a portfolio infrastructure plan for the long term acquisition, refurbishment, rehabilitation and maintenance of infrastructure which provides a projected list of work items described by category, location, type, economic classification and function needs and links prioritised needs to a forecasted budget for the next three to five years; and Remove projects associated with packages from the portfolio infrastructure plan which are not to be carried forward past stages 3 or stage 4 and update annually.
2	Procurement planning	Accepted procurement strategy for implementing the infrastructure plan in the medium term	<ul style="list-style-type: none"> Analyse the medium term expenditure infrastructure plan and identifying spatially located work items in the infrastructure plan grouped into categories of spend with common attributes; Perform an organisational and market analysis; Formulate primary and secondary procurement objectives; Make certain strategic management decisions; Package the works; Allocate risks and decide on a suitable pricing strategy for each package; Establish requirements for outsourced professional services and the manner in which such resources are to be contracted; Decide on the high level procurement arrangements; and Document the choices made in relation to the delivery management strategy, the contracting strategy and the procurement arrangements in each category and subcategory of spend.
Planning activities at a package level			
Insource professional resources to assist with the package planning activities, if necessary			
3	Package preparation	Client accepted strategic brief setting out the package information	<ul style="list-style-type: none"> Define the package objectives, business need, acceptance criteria and client priorities and aspirations; Confirm the scope of the package and identify any constraints; 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; 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; Identify procedures, organisational 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; Identify risks that need to be mitigated; Establish the control budget for the package, ownership costs and schedule for the package; and Develop and finalise the strategic brief.

Stage		Key deliverable at end of Stage	Principal actions associated with the key deliverable
No	Description		
Procure the services of a contractor on a "management contract" basis and professional service providers in accordance with documented procurement strategy, if relevant			
4	Package definition	Client accepted concept report setting out the integrated concept for the package	<ul style="list-style-type: none"> • Obtain site studies and specialist advice, as necessary; • Establish the feasibility of satisfying the strategic brief for the package within the control budget with or without modification; • Determine the initial design criteria and design options to construct, refurbish, rehabilitate, alter or extend infrastructure or the repair methods and procedures required to maintain the condition of infrastructure for the package; • Investigate alternative solutions and recommend the preferred solution; • Establish the detailed brief, scope, scale, form and cost plan for the package; • Develop an indicative schedule for documentation and construction or maintenance services associated with the package; • Produce 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; • Undertake where necessary, studies to determine whole life costs and to forecast revenue over the lifetime of the infrastructure associated with the project to confirm the financial sustainability of the project; • 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; • Produce a logistic support plan where required; and • Develop and finalise the concept report.
Procure the services of a contractor on a "design and construct" basis and professional service providers in accordance with documented procurement strategy, if relevant			
Detailed design activities			
5	Design development	Client accepted design development report setting out the integrated developed design for the package	<ul style="list-style-type: none"> • Develop in detail the accepted concept to finalise the design and definition criteria; • 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; • Confirm or revise the cost plan included in the concept report; and • Develop and finalise the design development report.
Procure the services of a contractor on a "develop and construct" basis and professional service providers in accordance with documented procurement strategy, if relevant			
6a	Design documentation (Production information)	Completed and client accepted production information	<ul style="list-style-type: none"> • 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
Procure the services of a contractor on a "design by employer" basis and professional service providers in accordance with documented procurement strategy, if relevant			
6b	Design documentation (Manufacture, fabrication and construction information)	Client accepted manufacture, fabrication and construction information	<ul style="list-style-type: none"> • 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. • Contractor - produce the manufacture, fabrication and construction information based on the production information.

Stage		Key deliverable at end of Stage	Principal actions associated with the key deliverable
No	Description		
Site Activities			
7	Works	Completed works which are capable of being occupied or used and accepted by the client.	<ul style="list-style-type: none"> • Provide temporary works; • Provide permanent works in accordance with the contract; • Manage risks associated with health, safety and the environment on the site; • Confirm that design intent is met; and • Correct notified defects which prevented the client or end user from using the works and others from doing their work.
8	Hand over	Works which have been taken over by the user complete with record information	<ul style="list-style-type: none"> • Finalise and assemble record information which accurately reflects the infrastructure that is acquired, rehabilitated, refurbished or maintained; • Hand over the works and record information to the user and, if necessary, train end user staff in the operation of the works.
Close out activities			
9a	Close out (Asset data)	Archived record information and updated asset register	<ul style="list-style-type: none"> • Archive record information; • Update the portfolio asset register.
9b	Close out (Package completion)	Completed contract or package order	<ul style="list-style-type: none"> • Correct all defects that are detected during the defects liability period; • 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; • Evaluate package outcomes; • 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.

Each stage has a clear start and an end point and a defined level of detail. Each ends with a specified deliverable. The package information is successively developed as the project progresses. The package information is the strategic brief at the end of Stage 1, the concept report at the end of Stage 2 and the design development report at the end of Stage 3.

The Stages do not include a procurement stage as procurement as the procurement arrangements may vary from project to project, depending upon the contracting strategy that is adopted. Defining what is to be constructed does not end with the completion of the production information. Stage 2b recognises that additional information may have to be prepared by the contractor and his team (subcontractors, suppliers and specialists).

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