cidb
Construction Industry Development Board

CONTRACTOR MANAGEMENT GUIDELINES

CMG 101

2026 EDITION

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MINISTERIAL FOREWORD

The construction industry remains one of the most dynamic and impactful sectors of our economy, shaping not only our infrastructure but also our national development trajectory. Yet entering this industry and sustaining a successful contracting business can be complex, especially for new entrepreneurs navigating its competitive and highly regulated environment. It is within this context that this document has been developed to serve as a practical guide for emerging contractors who aspire to build strong, compliant, and sustainable businesses.

This publication equips new entrants with the foundational knowledge required to understand the construction ecosystem and operate effectively within it. It outlines the critical steps needed to establish a contracting enterprise, including developing a sound business plan, identifying key stakeholders, and ensuring compliance with industry laws and standards. By familiarising themselves with the requirements of the Construction Industry Development Board (cidb) and other regulatory bodies, contractors can position themselves for credibility, growth, and access to new opportunities.

At the heart of this document lies our commitment to capacity building and professionalisation within the construction sector. Beyond regulatory compliance, success in this industry depends on cultivating the right skills, acquiring hands-on experience, and continuously improving business and technical competencies. The guideline therefore emphasises the importance of understanding the market, building partnerships, and investing in personal and organisational development to achieve long-term sustainability.

We also believe in making it easier for construction companies to grow and thrive to create jobs. That is why the Department of Public Works and Infrastructure (DPWI) and the cidb have produced this guide: to remove obstacles, unlock opportunity and support new firms so that South Africa (SA) can become what we have declared it will be: a construction site, with cranes, shovels, boots-on-the-ground and new contracts delivering work for communities across the country.

As the sector continues to evolve in response to technological advancements and new economic realities, it is essential that emerging contractors are well informed, agile, and resilient. I trust that this document will not only inform but also inspire new participants to contribute meaningfully to SA's infrastructure development and economic delivery. Together, we can build a construction industry that is competitive and sustainable, one that reflects the aspirations of a growing nation.

Dean Macpherson
Honourable Minister of Public Works and Infrastructure

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SECTION 1.1:
THE FUNDAMENTALS OF A CONSTRUCTION BUSINESS

Whatever a business does, it does so for a profit to grow the business and add value to its shareholders.

1.1.1 Introduction to the Business World

The business world comprises many enterprises that sell goods which people need (products) and/or doing something for other people (services). Construction businesses sell their services and products to a client through a contract that is either agreed verbally or is committed to in writing.

To be financially sustainable, any business must invoice or bill clients more than the total of all the monies that are expended while running the business. The amount invoiced, and subsequently paid, is known as income. The amount of money spent on expenses is known as expenditure.

To operate as a successful business in the construction industry, income per contract should always be greater than expenditure per contract.

1.1.2 What is the Construction Industry?

"Construction industry" means the broad conglomeration of industries and sectors which add value in the creation and maintenance of fixed assets within the built environment.

1.1.3 What is Meant by Construction Works?

"Construction Works" means the provision of a combination of goods and services arranged for the development, extension, installation, repair, maintenance, renewal, removal, renovation, alteration, dismantling or demolition of a fixed asset including building and engineering infrastructure.

Construction, in its broadest sense, is the process of building or creating something, often a structure like a **building, bridge, or infrastructure.** It encompasses activities from initial planning and design to the completion of a project, including repairs, maintenance, and eventual demolition or decommissioning.

The various stages of construction include:

Pre-construction

Planning and design: construction begins with detailed plans and designs, often created by architects and engineers, to ensure the structure meets its intended purpose and specifications.

Construction

It may take any of the following forms:

- ***Building and assembly:*** involves assembling different elements according to the plan and specifications to create a finished structure.
- ***Maintenance and repairs:*** ongoing activities to keep the structure in good condition and address any necessary repairs.
- ***Expansion and improvements:*** modifications to existing structures to enhance functionality or expand their capacity.
- ***Demolition and decommissioning:*** final stages of a project, including the removal of structures or equipment.

SECTION 1.2:
ROLE PLAYERS IN THE CONSTRUCTION INDUSTRY

1.2.1 The Client/employer

In the construction industry, a client/employer is the individual or organisation that initiates and funds a construction project by entering a contract to procure construction works. They are the ultimate decision-maker and are responsible for defining the project's scope, budget, and overall objectives.

Clients often do not possess the expertise or resources to design and construct construction works. They contract or employ other businesses to do so and are often referred to as "employers". The employer may undertake construction using various contracting strategies. These include:

- **"Design by employer":** The employer appoints consultants (design professionals) to design the works and a contractor to construct the works designed by the appointed consultants. The consultant is also required to confirm that the contractor constructs the works according to the requirements of the consultant's design.
- **"Design and build":** The client appoints a contractor to both design and build the works. The contractor usually appoints a consultant to design the works for him.
- **"Design and construct":** This type of contract is based on a scheme design prepared by the employer under which the contractor produces drawings and constructs.
- **"Management contractor or construction management":** This is a contract under which the contractor provides consultation during the design stage and is responsible for planning and managing all post-contract activities for (sub) contractors and the performance of the whole contract.

The client may also appoint a professional or a consultant to provide the contractor with the design or drawings and any instructions regarding how the works are to be constructed. This professional will also be required to verify the quality of work undertaken by a contractor and confirm any payment due to the contractor.

Figure 1.1: Design by Employer

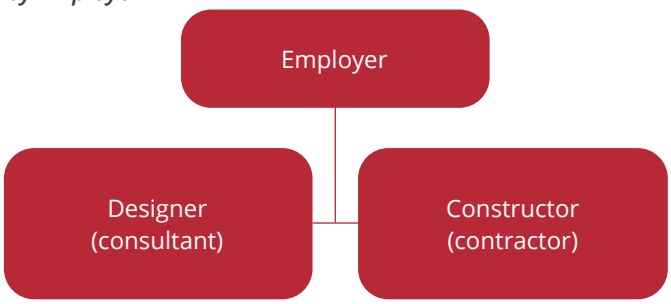
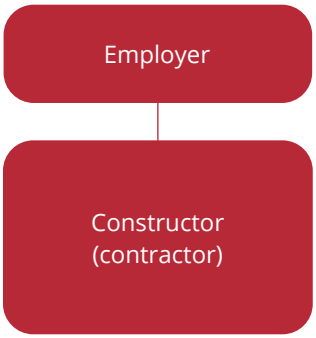


Figure 1.2: Design and Build



The size of the professional team depends on the size of the project. A house construction project may only have an architect, whereas a shopping centre construction project could have an architect, quantity surveyor, project manager, as well as civil, structural, mechanical, and electrical engineers.

Before starting a project, contractors should understand who is on the professional team and what their roles and responsibilities are in accordance with their contract.

It is in the contractor's best interest to develop a positive working relationship with each member of the professional team. This is not always easy, but wherever a contractor can, they should strive to do this.

1.2.2 The Professional Team

In a project, there will often be what is generally referred to as "the professional team". The professional team comprises one or more professionals called "consultants". The team is appointed by the client to perform various activities.

Architect

The architect is a person who is qualified to plan, design, and oversee the construction of buildings. He/she will know where the building lines are i.e. the cut off lines over which the building must not be built. The architect also knows what the building boundary lines are as per municipal regulations, as well the amount of parking that must be provided. For more information on the Architectural Profession, visit www.sacapsa.com.

Engineers

There are several types of engineers that a contractor may encounter. These most commonly include:

- Structural engineers
- Civil engineers
- Mechanical engineers
- Electrical engineers
- Resident engineers

Engineers are professionals who apply scientific, mathematical, and engineering principles to plan, design, develop and maintain systems, structures, and processes. For example, in a building designed by an architect there could be structural components incorporated in the structure, i.e., concrete slabs. The **structural engineer** will determine the suitable recommended thickness of the concrete slab and reinforcement required to support the concrete slab. Should the contractor not build the slab to the recommended thickness and fail to use the specified steel diameter and position, then the slab could fail.

A road is designed by a **civil engineer** who will determine the number and loads of the vehicles that will use a particular road over a required period. He will then design the foundation layers of the road to ensure the road will last its intended design life. A civil engineer will also be involved in projects involving the construction of municipal services such as water mains, sewer pipelines and stormwater systems. His responsibility will include calculation of the diameter of water and sewerage pipes and ensure that all the municipal regulations are complied with.

The **mechanical engineer's** function is to ensure that all the mechanical equipment that is built into a particular building will function satisfactorily, for example, the air-conditioning. The mechanical engineer will know how much air-conditioning is required to ensure comfort and air quality in a building by applying engineering principles to manage the indoor environment. He will thus design the air-conditioning plant and make recommendations on suitable air-conditioning units.

An **electrical engineer** will be required to design the lighting layouts and electricity requirements in a building and to make sure that all the mechanical equipment, apparatus, stoves, etc. have sufficient power for them to operate satisfactorily.

A **resident engineer** is a skilled professional who acts as the on-site representative for the client or owner, overseeing the construction project and ensuring it adheres to design plans, specifications, and contractual obligations. They are essentially the eyes and ears of the project on the ground and responsible for daily construction activities. For more information on the Engineering Profession, visit www.ecsa.co.za.

Quantity Surveyor

The quantity surveyor is also a qualified professional who is employed on building projects to "measure" the works. He will calculate the cost of a building by splitting the building up into various elements and trades which will include brickwork, plastering, carpeting, etc., and

will measure the work that is required in each of the trades. He will then produce a bill of quantities and the contract documents on which the contractors bid. The quantity surveyor may be involved in the adjudication of the tenders to ensure that all contractors comply with the terms and conditions of the contract. The quantity surveyor is employed on the project to measure the works on behalf of the client as the contractor progresses with the work and to produce the payment certificate which the client uses to pay the contractor.

The quantity surveyor is employed on building projects and is generally not involved on civil engineering projects where the quantities are measured by the civil engineer. For more information on the Quantity Surveying Profession, visit www.sacqsp.org.za.

Project Manager

The project manager is chosen by the client to successfully manage the completion of a project on time, within budget and to the required quality. It is possible that the project manager will not liaise directly with the contractor but will liaise with the professional team who are appointed to ensure that the works progress satisfactorily. The roles and responsibilities of a project manager could be very broad and may include the management of a whole project from its conceptual design stage to construction stage including handover and commissioning phases. For more information on the Project Management Profession, visit www.sacpcmp.org.za.

Health and Safety Agent

A health and safety agent is a competent person who acts as a representative for a client to manage and oversee the health and safety aspects of a project. They ensure compliance with regulations, develop and implement safety plans, and mentor other safety personnel. For more information on the Health and Safety Profession, visit www.sacpcmp.org.za.

Contractor

A “Contractor” means a person or body of persons who undertakes to execute and complete construction works.

The contractor may also appoint a person whom he refers to as “project or contracts manager” but he will not be a part of the professional team.

SECTION 1.3:
REGISTERING A BUSINESS

When setting up a business, the initial step should be to consider the most appropriate way the owner wishes to conduct his business.

In a sole proprietorship an individual trades under his personal name, although he may often add "Trading as ... " under another name.

Sole proprietorships and partnerships permit an individual to work independently, or with others in partnership. They do not necessarily cost anything to set up, but offer no protection to the owners in the case of claims and the owners are thus subjected to a high degree of risk.

1.3.1 Business Types

Contractors typically trade under one of the following business types:

- Sole Proprietor
- Partnership
- Proprietary Limited (Pty) Ltd

1.3.2 Sole Proprietorships

An individual may set up a business and work on contracts without registering a company. A sole proprietorship, by law, is regarded as an extension of an individual and offers no protection against business risk. If the company owes money, it is the same as owner of the company owing money. If there are claims against the business, the claims are against the owner in his personal capacity.

A sole proprietor is the easiest business type that a contractor may operate under. However, it is a very risky option as the owner is liable in his personal capacity for any debts of the business. It is for these reasons that other types and styles of business are recommended.

1.3.3 Partnerships

A partnership is formed when two or more people agree to come together and operate a business as partners.

Each person might bring something to the business such as their own skills, people, equipment, or money. As with a sole proprietorship, everything is at risk in the event of a collapse of the partnership as the law regards a partnership as a group of individuals who are co-owners of the assets and liabilities of the partnership.

If one of the partners becomes unable to pay his debts in his personal capacity, the liquidator may attach the assets of the partnership. If the value of the assets is not enough to cover the debt, the liquidator may then decide to attach the personal assets of the other partners.

1.3.4 Companies

There are two types of business companies. They are:

- A private company
- A public company

A private company may have a minimum of one director and one shareholder. There are no restrictions on the number of shareholders. A private company cannot be listed on the Johannesburg Stock Exchange (JSE) and no shares may be sold to the public.

A public company may have three directors and seven shareholders and may sell shares to the public through the Johannesburg Stock Exchange.

Under South Africa's Companies Act 71 of 2008, directors can be held personally liable for breaches of their duties, including fiduciary duties, and other misconduct, leading to financial losses for the company or third parties. This liability can be joint and several with other liable persons, meaning a single director can be held liable for the total damages.

Key Aspects of Personal Liability under the Companies Act:

a. **Fiduciary duty breaches**: Directors have a duty to act in the best interests of the company. A breach of this duty can result in personal liability.

b. **Negligence**: Directors can be held liable for negligence, including failing to act with the required care, skill, and diligence.

c. **Reckless trading**: Trading a company recklessly or with intent to defraud creditors can lead to personal liability for directors.

d. **Acting outside authority**: Directors can be held personally liable if they act outside their authority or appear to bind the company without proper authorisation.

e. **Financial statements**: Knowingly or recklessly signing or consenting to a false or misleading financial statement can lead to personal liability.

f. **Delinquent Directors**: Directors can be declared delinquent if they breach their fiduciary duties or commit certain other misconduct, which can lead to disqualification and personal liability.

g. **Reporting obligations**: Directors have an obligation to report financial distress and failure to do so may result in personal liability.

h. **Shareholder rights**: Shareholders can bring actions against directors for breaches of their duties.

i. **Removal of Directors**: Shareholders can remove directors by an ordinary resolution.

j. **Auditor rotation**: The same audit firm may not serve as the auditor of a company for more than five consecutive financial years.

The Role of an Accounting Officer in a Company

An Accounting Officer is responsible for ensuring that the company maintains sound financial management, complies with applicable legislation and governance standards, and safeguards its resources through effective internal controls and accountable leadership.

The accounting officer must be registered with one of the following institutions:

- The Institute of Administration and Commerce of Southern Africa.
- Accountants and auditors registered in terms of the Public Accountants' and Auditors' Act, 1951.
- The Chartered Institute of Management Accountants.
- The Southern African Institute of Chartered Accountants.
- The Southern African Institute of Chartered Secretaries and Administrators.
- The Chartered Association of Certified Accountants.
- The Southern African Institute of Business Accountants.
- The Institute of Commercial and Financial Accountants of Southern Africa.

A company is a legal person who has capacity and powers to act on its own.

The main reason to register a company is to separate the individual from the business in terms of the law, thereby safeguarding the individual, under most circumstances, from the loss of personal assets in the case of problems in the business.

In simple terms, a fiduciary is a person or organisation legally and ethically required to put your best interests ahead of their own.

The differences between a sole proprietor, partnership and a private company may be summarised as follows:

Table 1.1: Differences Between a Sole Proprietor, Partnership, and a Private Company

SOLE PROPRIETORSHIP	PARTNERSHIP	PRIVATE COMPANY
• One owner. • The owner is personally responsible for all debts and liabilities of the business. • The owner has sole control over all business decisions. • The owner retains all profits and bears all losses of the business. • The business is not taxed as a separate entity; the owner's personal income tax return includes the business's income or loss.	• Minimum of two members. • Each partner is generally responsible for their share of the business' debts and liabilities. • Partners typically share in the decision-making process. • Partners generally share unlimited liability for the business' debts. • Profits and losses are shared among the partners, usually in the proportions agreed upon in their partnership agreement.	• Minimum of one director. • No restrictions on the number of shareholders. • Comprise of directors and shareholders. • Has a memorandum of incorporation. • Compulsory annual return to be lodged. • Has an auditor. • Convenes an annual general meeting. • Members hold shares. • Can acquire its own shares under certain circumstances. • Directors are responsible for the day-to-day management. • Register of members. • Audited financial statements. • Not entirely prohibited from providing financial assistance for the acquisition of its own shares but subject to strict regulations and requirements.

SECTION 1.4:
COMPLIANCE WITH STATUTORY REQUIREMENTS

1.4.1 Operating a Construction Business

Laws are sets of rules and regulations (statutory requirements) established by a government. Law affects everyday life and society in several ways and they regulate the rights and actions of people and organisations. Failure to comply with statutory requirements may result in fines or penalties being imposed and in extreme cases the imposition of jail terms.

South African law is established by Acts of Parliament and Regulations issued by Ministers in terms of an Act of Parliament.

There are many laws that are applicable to the construction industry. The cidb has identified several laws that govern the construction industry in SA. While a precise number isn't explicitly stated, key legislation includes the Construction Industry Development Board Act 38 of 2000, the Occupational Health and Safety Act (OHSA), and related regulations.

The law prohibits a national government department, a provincial department, a local government, or a state-owned enterprise from entering into a contract with a construction business to undertake construction works if that business is not registered with the cidb, www.cidb.org.za.

Furthermore, construction businesses are not permitted by law to contract with any client if they:

- Are not in possession of a Tax Clearance Certificate of Good Standing issued by the South African Revenue Services (SARS), www.sars.gov.za.
- Are not in good standing with the Compensation Fund or with a licensed compensation insurer (Federated Employers Mutual Assurance (FEM) for the building industry), www.labour.gov.za.
- Cannot reasonably satisfy the client that they have the necessary competencies and resources to carry out the work safely.

The South African Revenue Service (SARS) will only issue a business with a Tax Clearance Certificate if a business has not contravened the provisions of the Income Tax Act (1962), Employees Tax (PAYE as contained in the Income Tax Act), or Unemployment Insurance Contributions Act (2002) as at the date of the certificate. Tax clearance certificates are valid for a period of one year, provided that no taxes, levies, or duties become due and outstanding during this period.

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South African Revenue Service

Ignorance of the law is no defence!

Failure to comply with certain statutory requirements can disqualify a construction business from contracting with clients.

1.4.2 Compensation for Occupational Injuries and Diseases

Government has established a fund to compensate casual and full-time workers who, because of a workplace accident or work-related disease, become ill, injured, disabled, or killed. Workers who are injured on duty can claim compensation for temporary or permanent disablement. If workers die because of an injury on duty, their dependants can claim compensation.

Occupational injuries are injuries sustained by workers in the workplace or while performing any activities related to the business of the employer.

An occupational disease is a disease caused by a worker's job.

Workers who are temporarily or partially disabled receive 75% of their pay from the date of the accident or disease diagnosis until their condition is stabilised or they are fit to go back to work. Employers must pay compensation for three months from the accident or diagnosis date and then claim these payments back from the Compensation Fund.

Compensation is payable for any impairment of function, loss of limb or any permanent defect because of the injury or disease. Depending on the degree of disablement, compensation may take the form of lump sum or monthly pension payments.

Employers are protected against civil claims if a worker is injured on duty. The Fund also covers the cost of transporting workers to a hospital or doctor and medical aid expenses for a period of up to two years, and in certain circumstances for longer periods.

The Fund does not cover workers who are totally or partially disabled for less than three days. It also does not cover any worker guilty of wilful misconduct, unless they are seriously disabled or killed.

Anyone who employs one or more workers must register with the Compensation Fund and pay annual assessment fees. A separate registration is necessary for each separate branch of a business, unless an arrangement for combined registration has been made.

Before 31 March annually, all employers (including contractors) must submit a statement of earnings paid to all their workers from the beginning of March the previous year to the end of February. The annual assessment fee is calculated on workers' earnings and an assessment tariff based on the risks associated with the type of work being done. Employers fall into one of over a hundred subclasses, each with its own assessment tariff.

Assessment fee = total workers' pay ÷ 100 x assessment tariff.

The assessment tariff varies between the different sectors and sub-sectors of industry; for example, the 2025 tariffs are as follows:

All building operations	2,65%
Any tunnelling, rock drilling and/or blasting	3,34%
Operations of civil engineers	2,65%

If the total of all workers' pay is R1 000 000,00 and an assessment tariff of 2,65% applies, then the amount due to the Compensation Fund is R26 500,00.

Workers, or someone on their behalf, must immediately report an accident and any injuries, verbally or in writing, to the employer. If a worker does not report an injury to his employer, the Commissioner or mutual association within 12 months of being injured, he will lose any right to benefits.

All employers must report any accidents that result in medical expenses and/or a worker's absence from work for longer than three days by submitting the required documents to the Compensation Fund within seven days.

Employers who delay in reporting an accident are guilty of a criminal offence and will have to pay a penalty.

A worker, or someone on his behalf, must report in writing to the employer as soon as possible after a doctor's diagnosis if he has contracted a disease. If a worker does not report a disease to his employer, the Commissioner or mutual association within 12 months of being diagnosed, he will lose any right to benefits. Employers must fill in the required forms and submit them to the Compensation Commissioner within 14 days.

What role does the Federated Employers' Mutual Assurance Company Limited Play in the Construction Industry?

- The Federated Employers' Mutual Assurance Company Limited (FEM) was established as a mutual insurer in 1936 and on the introduction of the Workmen's Compensation Act 1941 was granted a licence to continue to transact workmen's compensation insurance for the building industry.
- Its business operations are essentially confined to the insurance of employers against their liabilities under the Compensation for Occupational Injuries and Diseases Act 1993.
- FEM is a licensed compensation insurer. Instead of paying contributions to the Compensation Fund, construction businesses may take out insurance with FEM (Tel. 011-359-4300).
- The assessment rates are the same as those applied by the Compensation Commissioner. No-claim bonuses are paid out.
- FEM has regional offices in major centres.

1.4.3 Registration with the cidb

The Construction Industry Development Board Act of 2000 requires the cidb to establish a national register of contractors and prohibits the award of a construction works contract by a national or provincial government department, a municipality, or a state-owned enterprise to an unregistered contractor (see www.cidb.org.za). Only prime or main contractors must be registered with the cidb.

The following contractors are exempt from registration with the cidb:

Subcontractors

- ***Labour-only contractors*** – Contractors who are provided with the bulk of construction materials required for construction by the employer or an agent of the employer need not to register.
- ***Once-off joint ventures*** do not have to register, provided that each partner of the joint venture is separately registered with the cidb.
- ***Home builders*** – Contractors who are registered with the NHBRC as homebuilders are exempt from registering with the cidb unless they also wish to tender for other types of public sector construction work.

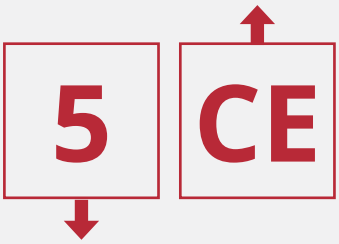
A contractor's grading designation is determined by the financial and works capability of the business. Financial capability relates to financial history (turnover), the highest value recently completed contracts and the amount of working capital that can be raised to sustain a contract.

Works capability is determined by the highest value of a contract recently completed in a class of construction works in the previous five years, the number of professionals employed, and the fulfilment of relevant statutory requirements.

Note: A subcontractor conducting construction works on public sector contracts awarded in terms of a competitive tender or quotation process, must be registered with the cidb.

Describing contractor grading designations

Two letters depicting the class of construction works (general building, civil engineering, electrical engineering, mechanical engineering or specialist category) in which the contractor is registered.



Single number representing a registered contractor's capability to undertake a contract in a particular class of construction works within a specified tender value range.

Table 1.2: Range of Tender Values by Grade

TENDER VALUE RANGE DESIGNATION	RANGE OF TENDER VALUES	
	GREATER THAN	LESS THAN OR EQUAL TO
1	-	R500 000
2	R500 000	R1 000 000
3	R1 000 000	R3 000 000
4	R3 000 000	R6 000 000
5	R6 000 000	R10 000 000
6	R10 000 000	R20 000 000
7	R20 000 000	R60 000 000
8	R60 000 000	R200 000 000
9	R200 000 000	No Limit

Newly established businesses are assessed on the amount of working capital that they can raise to sustain a contract. No financial or works capability requirements apply to the entry level, i.e., in contractor grading designation one.

The contractor's grading designation is used by government and provincial departments, municipalities, and state-owned enterprises to decide if a registered contracting business will be considered for a particular construction works contract.

For example, a contracting business registered as a 5CE, will be considered for a civil engineering works contracts having a value not exceeding R6,5 million.

Construction businesses may register for different classes of works. For example, a construction business may be registered as a 5CE and as an 8ME. This means that the business will also be considered for public sector mechanical engineering works contracts having a value not exceeding R200 million.

Construction businesses are required to abide by a code of conduct and are registered for a period of three years.

Contractors registered in Grades 2 to 9 will be required to confirm their particulars and pay the annual fees each year on the anniversary of their registration.

Grade 1 registration only requires a renewal after three years. An annual fee is not applicable for Grade 1 contractors.

Registration is valid for a period of three years. A registered contractor must apply for renewal three months before the existing registration expires.

Contractors' whose Grading has not been renewed on the date of expiry will be removed from the Register of Contrcators (RoC).

How contractor grading designations are determined

- Your contractor grading designation is determined by your financial capability and your works capability.
- Your financial capability relates to your financial history (turnover), and the amount of working capital you can raise to sustain a contract, i.e. available capital. Available capital is the sum of retained income, shareholders or members' loans and form of acceptable financial sponsorship.
- Your works capability is determined by the largest contract you have undertaken and completed in your class of construction works (completed during the five years immediately preceding the application).
- Your contractor grading designation will be used by Government (national, provincial, municipal and state-owned enterprises) to qualify your tender to be considered.

Table 1.3: Determining Works Capability

DESIGNATION	FINANCIAL AND WORKS REQUIREMENT
Grade 2	Must have completed a contract with the value of not less than R130 000,00.
Grade 3	Must have completed a contract with the value of not less than R450 000,00 and either have best turnover not less than R1 000 000,00 or have available capital not less than R100 000,00.
Grade 4	Must have completed a contract with the value of not less than R900 000,00 and either have best turnover not less than R2 000 000,00 or have available capital not less than R200 000,00.
Grade 5 and higher	Must have works and financial capability not less than that indicated on the table below, for the contractor grading designation applied for.

Table 1.4: Determining Financial Capability

DESIGNATION	UPPER LIMIT OF TENDER VALUE RANGE	BEST ANNUAL TURNOVER	LARGEST CONTRACT	AVAILABLE CAPITAL
2	R1 000 000	-	R130 000	-
3	R3 000 000	R1 000 000	R450 000	R100 000
4	R6 000 000	R2 000 000	R900 000	R200 000
5	R10 000 000	R3 250 000	R1 500 000	R650 000
6	R20 000 000	R6 500 000	R3 000 000	R1 300 000
7	R60 000 000	R20 000 000	R9 000 000	R4 000 000
8	R200 000 000	R65 000 000	R30 000 000	R13 000 000
9	No Limit	R200 000 000	R90 000 000	R40 000 000

Grading Designations and Classes of Construction Works

A contractor may apply for registration in multiple classes of works; however, within each class, the contractor may hold only one grading designation. In each class, registration will be granted at the highest grade for which the contractor applies and qualifies. As a result, a contractor may have different grading designations across different classes of works, but not more than one Grade within the same class.

Grading Designations reflect the value of the Works that a contractor applies to register for. There are nine tender value ranges, numbered 1 to 9.

Grading Classes reflect the types of works for which a contractor applies for registration.

Table 1.5: Grading Classes of Works

CLASS OF WORK	DESCRIPTION
General Building	GB
Civil Engineering	CE
Mechanical Engineering	ME
Electrical Engineering (Building)	EB
Electrical Engineering (Infrastructure)	EP
Specialist Works	Details on the categories of specialist works can be found on pages 18 - 19

The above classes of works are further explained in detail below:

Table 1.6: Classes of Construction Works

DEFINITION	BASIC WORKS TYPES	EXAMPLES
Civil Engineering (CE)		
Construction works primarily concerned with materials such as steel, concrete, earth and rock and their application in the development, extension, installation, maintenance, removal, renovation, alteration, or dismantling of building and engineering infrastructure.	Water, sewerage, roads, railways, harbours and transport, urban development, and municipal services.	• Structures such as cooling towers, bridges, culverts, dams, grandstands, roads, railways, reservoirs, runways, swimming pools, silos, or tunnels. • The results of operations such as dredging, earthworks and geotechnical processes. • Township services, water treatment and supply, sewerage works, sanitation, soil conservation works, irrigation works, storm-water and drainage works, coastal works, ports, harbours, airports and pipelines.

DEFINITION	BASIC WORKS TYPES	EXAMPLES
Electrical Engineering Works – Building (EB)		
Construction works that are primarily concerned with the installation, extension, modification, or repair of electrical installations in or on any premises used for the transmission of electricity from a point of control to a point of consumption, including any article forming part of such an installation.	All electrical equipment forming an integral and permanent part of buildings and/or structures, including any wiring, cable jointing and laying and electrical overhead line construction.	• Electrical installations in buildings. • Electrical reticulations within a plot of land (erf) or building site. • Standby plant and uninterrupted power supply. • Verification and certification of electrical installations on premises.
Electrical Engineering Works – Infrastructure (EP)		
Construction works that are primarily concerned with development, extension, installation, removal, renovation, alteration or dismantling of engineering infrastructure relating to the generation, transmission, and distribution of electricity; or which cannot be classified as EB.	Electrical power generation, transmission, control and distribution equipment and systems.	• Power generation • Street and area lighting • Substations and protection systems • Township reticulations • Transmission lines
General Building Works (GB)		
Construction works that are primarily concerned with the development, extension, installation, renewal, renovation, alteration, or dismantling of a permanent shelter for its occupants or contents; or cannot be categorised in terms of the definitions provided for civil engineering works, electrical engineering works, mechanical engineering works, or specialist works.	Building and ancillary works other than those categorised as: • Civil engineering works • Electrical engineering works • Mechanical engineering works • Specialist works	• Buildings for domestic, industrial, institutional, or commercial occupancies • Carports • Stores • Walls

DEFINITION	BASIC WORKS TYPES	EXAMPLES
Mechanical Engineering Works (ME)		
Construction works are primarily concerned with the development, extension, installation, removal, alteration, renewal of engineering infrastructure for gas transmission and distribution, solid waste disposal, heating, ventilation and cooling, chemical works, metallurgical works, manufacturing, food processing and materials handling.	• Machine systems including those relating to the environment of building interiors • Gas transmission and distribution systems • Pipelines • Materials handling, lifting machinery, heating, ventilation and cooling, pumps • Continuous process systems, chemical works, metallurgical works, manufacturing, food processing such as that in concentrator machinery and apparatus, oil and gas wells, smelters, cyanide plants, acid plants, metallurgical machinery, equipment, and apparatus, and works necessary for the beneficiation of metals, minerals, rocks, petroleum and organic substances or other chemical processes	• Air-conditioning and mechanical ventilation • Boiler installations and steam distribution • Central heating • Centralised hot water generation • Compressed air, gas and vacuum installations • Conveyor and materials handling installations • Continuous process systems involving chemical works, metallurgical works, oil and gas wells, acid plants, metallurgical machinery, equipment, and apparatus, and works necessary for the beneficiation of metals, minerals, rocks, petroleum and organic substance and other chemical processes • Dust and sawdust extraction • Kitchen equipment • Laundry equipment • Refrigeration and cold rooms • Waste handling systems (including compactors)

Table 1.7: Specialist Works Classifications

SB	The extension, installation, repair, maintenance or renewal, or removal of asphalt.	**SJ**	The development, installation, removal, or dismantling, as relevant, of piles and other specialised foundations for buildings and structures.
SC	The development, extension, installation, removal, and dismantling, as relevant, associated with building excavations, shaft sinking and lateral earth support.	**SK**	The installation, renewal, removal, alteration, or dismantling, as relevant, of road markings and signage.
SD	The development, extension, installation, repair, renewal, removal, or alteration of corrosion protection systems (cathodic, anodic and electrolytic).	**SL**	The development, extension, installation, renewal, removal, renovation, alteration or dismantling of structural steelwork and scaffolding.

SE	Demolition of buildings and engineering infrastructure and blasting.	**SM**	Timber buildings and structures.
SF	The development, extension, installation, renewal, removal, renovation, alteration or dismantling of fire prevention and protection infrastructure (drencher and sprinkler systems and fire installation).	**SN**	The extension, installation, repair, maintenance, renewal, removal, renovation, or alteration, as relevant, of the waterproofing of basements, roofs and walls using specialist systems.
SG	The development, extension, installation, renewal, removal, renovation, alteration or dismantling of glazing, curtain walls and shop fronts.	**SO**	The development, extension, installation, renewal, removal, alteration, or dismantling or demolition of water installations and soil and wastewater drainage associated with buildings (wet services and plumbing).
SH	The development, extension, installation, maintenance, renewal, removal, alteration, or dismantling, as relevant, of landscaping, irrigation, and horticultural works.	**SQ**	The development, extension, installation, repairs, dismantling of precast walls, installation of wire perimeter fencing, diamond perimeter fencing, palisade steel fencing with posts and stay at intervals.
SI	The development, extension, installation, repair, maintenance, renewal, removal, renovation, alteration or dismantling of lifts, escalators, travellators and hoisting machinery.		

Note: For the Electrical Engineering (EB) class of construction works, the applicant must submit an originally certified and signed electrical contractor's certificate issued in the name of the enterprise, by the Department of Labour.

SECTION 1.5:
FINDING WORK OPPORTUNITIES

Construction businesses can look for opportunities in the Government Tender Bulletin, newspapers, the cidb i-Tender service on the cidb website (www.cidb.org.za) or check their local municipality's tender notice board.

Look for work opportunities, as well as opportunities to promote the business for the future.

Construction businesses have many avenues to pursue to find work opportunities. If they decide to operate in the public sector, they can look for opportunities in the Government Tender Bulletin, newspapers, the cidb i-Tender service on the cidb website (www.cidb.org.za) or check their local municipality's tender notice board. Talking to other construction businesses is also good, since information on work that one construction business does not want to do can be very useful to another construction business. This also creates subcontracting possibilities.

1.5.1 Private and Public Sector Quotations

There are differences between the rules that govern the private and public (national and provincial governments, municipalities, public entities, state-owned enterprises, and municipal entities) sector in procuring goods, services and works.

The private sector is not required by law to follow any rules relating to procurement (buying) of goods, services or works. They generally choose the lowest price out of all the tenders they receive and will choose a higher price only if they do not feel confident that the company with the lowest price can do a proper job. They are also free to negotiate contracts or to invite a limited number of construction businesses to submit tenders or quotations based on whatever criteria they choose.

The public sector has many rules that govern the way in which they can procure goods, services or works. The constitution requires that any procurement by a public sector client must be fair, equitable, transparent, competitive, and cost effective.

The documentation used to invite quotations and tenders in the public sector is very similar, but the way they are advertised and awarded differs. Construction businesses are required to submit tender offers on the form of offer and acceptance whenever quotations or tenders are called for and written contracts are entered into with a public sector client.

The cidb promotes a uniform procurement system. Some private sector clients, particularly those that are publicly listed companies, follow some of the public sector rules. Most contractors will either negotiate subcontracts with subcontractors or invite the construction businesses that they consider able to deliver the required service to submit quotations.

Procedures in the private sector where the cidb Standard for Uniformity in Construction Procurement is not applied are much less formal with the differences between the calling for quotations and tenders being very different. Typically, tenders are invited in terms of a standard form of contract, scope of work, form of tender and stated conditions of tender and only a brief scope of work is provided where quotations are sought. Quotes are accepted verbally or in writing by issuing a letter of acceptance.

Construction businesses are advised to stipulate that their quotation is conditional upon the client entering into a written contract based on a specified standard form of contract. Construction businesses should stipulate on their quotations for how long the quotation is valid (e.g. one month), after which the business reserves the right to review the price.

To be successful, a construction business must know the procurement rules of their clients and prospective clients and abide by them for their tender submissions to be evaluated and to be awarded contracts.

1.5.2 What is the Request for Quotation Process?

A Request for Quotation (RFQ) is a formal procurement process where an organ of state (government body) invites potential suppliers to submit price quotations for specific goods or services. It's a way to solicit pricing information from multiple suppliers to facilitate a competitive and transparent procurement process.

RFQs are used when an organ of state has a clear need for a specific product or service and wants to compare prices from various suppliers to ensure fair and equitable procurement practices.

1.5.3 What is a Tender Process?

A tender is a formal offer or bid submitted in response to an invitation by a state organ for the provision of goods or services. It's a written offer that specifies the goods or services to be provided, the price, and other relevant conditions.

The tender process involves the government department inviting public offers for goods or services, and then evaluating the tenders based on price and other factors. Once accepted, a tender becomes a binding contract between the winning company and the government.

What is the difference between a request for quotation and a tender?

A quotation is a fixed price offer, which once accepted by the organ of state, cannot be modified, or changed. On the other hand, a tender is a response to the invitation to tender, which is used to find out the best value for money, from prospective suppliers. The RFQ is a lot like the Tender, however typically smaller in size and scope.

1.5.4 Obtaining Information on Tender Opportunities

The Notice and Invitation to Tender (first page of a tender document prepared in accordance with the requirements of the cidb Standard for Uniformity in Construction Procurement) should contain at least the following information:

a. A reference number
b. The name of the employer
c. The title of the proposed contract
d. A brief description of the supplies and services or engineering and construction works which are required
e. The closing date and time for the submission of tenders
f. The date, time, and place of the compulsory clarification meeting, if any
g. The time and place for collecting the procurement documents

This notice may also:

- Contain the name and contact particulars of a person to whom queries in relation to the tender may be directed
- Establish the cidb contractor grading requirements
- Briefly describe any eligibility criteria, deposits payable for procurement documentation and preferences, if any, that are offered

Tender advertisements in the media contain some or all the above information. This information enables prospective tenderers to make informed decisions regarding the tender opportunity. Construction businesses should not pursue tendering opportunities outside of their cidb contractor grading designations or where they don't satisfy any stated eligibility criteria. If they do so, the employer will not evaluate their tender. Estimates of these requirements are provided in the Tender Notice and Invitation to Tender.

Eligibility criteria are stated in Clause F.2.1 of the Tender Data where use is made of the cidb Standard Conditions of Tender.

Tender documents are normally available from the time they are advertised until the day the tenders are due. It is important to collect procurement documents as soon as possible to allow as much time as possible to prepare the tender offer.

An employer is not permitted in terms of the Construction Industry Development Regulations to award a public sector construction works contract to a construction business that does not satisfy the required cidb contractor grading requirements.

When collecting a tender document, it is important to sign and fill in the construction business' contact particulars in any register that the employer may have. This will allow the employer to inform the construction business if the closing date for the tender is extended or to issue addenda (changes to the tender document).

1.5.5 Analysing Tender Document Requirements

A construction business should read through the entire tender document as soon as possible after the documents have been collected from the client or the client's agents. Documents formatted and compiled in accordance with the requirements of the cidb Standard for Uniformity in Construction Procurement have a standard structure of component documents with standard contents and are divided into three basic components.

- Tendering procedures that contain only information that pertains to the submission and evaluation of the tender in terms of the cidb Standard Conditions of Tender.
- Returnable documents that the tenderer (construction business) is required to complete.
- The draft contract that sets out the terms and conditions of the contract that will ultimately be concluded with the successful tenderer.

The construction business should carefully read through the documents and make notes of deadlines for submission, documents that must be provided with the tender (tax clearance certificates, CVs, company profiles, etc.) and make sure that what the client wants is clearly understood.

The returnable documents include the pricing section, as well as forms that request certain specific information, such as those relating to preferences, resources to execute the contract and previous work experience.

The draft contract needs to be understood i.e. the rights, risks and obligations, as well as the way the contractor is to be paid.

The Construction Industry Development Board Act, 2000, prohibits the award of a public sector construction works contract to an unregistered contractor.

It is important to establish at the earliest possible stage which documents need to be submitted with a tender. Failure to do so may mean that the tender cannot be completed by the closing date for tender submissions.

1.5.6 Finding Work Opportunities Other Than Tendering

Joint Ventures

Contractors may form joint ventures for several reasons, including:

- The project is too large or complex for one company to undertake with its available resources.
- The project requires specialist skills or abilities which the company is unable to provide on its own.

Joint ventures are unincorporated bodies, regarded in law as partnerships in which the partners are jointly and severally liable for the acts, neglects and omissions of the partnership.

The successful operation of a joint venture requires a high degree of trust and cooperation between the members.

The following standard joint venture agreements are available:

- cidb Joint Venture Agreement.
- The South African Federation of Civil Engineering Contractors (SAFCEC) Joint Venture Agreement and Heads of Agreement

In developing countries, including SA, the skills and expertise of emerging firms can be developed through their association in joint ventures with well-established, experienced companies.

Joint ventures may operate in two distinctly different ways, but in practice most operate as a mix of the two broad alternatives which are:

- The members of the joint venture pool their resources and the contract is executed by the joint venture using the pooled resources.
- The work and obligations making up the contract are broken down into distinct elements or sections, usually based on locality, the nature of the work or the capabilities and resources required. Each element is assigned to a specific member of the joint venture who assumes full responsibility for its execution under the direction of the joint venture.

A joint venture agreement should:

a. Clearly and comprehensively set out the contributions to be made by each member towards the activities of the joint venture in securing and executing the contract and should allocate monetary values to such contributions.
b. Record the percentage participation by each member in all aspects of the fortunes of the joint venture, including risks, rewards, losses, and liabilities.
c. Provide for meaningful input by all members to the policy-making and management activities of the joint venture.
d. Provide for the establishment of a management body for the joint venture.
e. Should provide measures to limit, as far as possible, losses to the joint venture by the default of a member.
f. Promote consensus between the members whilst ensuring that the activities of the joint venture will not be unduly hindered by failure to achieve it.
g. Provide for rapid, cheap, and easy interim dispute resolution and for effective final dispute resolution, if required.
h. Be sufficiently flexible to allow for joint ventures which differ in nature, objectives, inputs by members, management systems, etc.

Subcontracting

The practice of subcontracting portions of a construction works contract to others is a well-established practice in SA and elsewhere in the world. The reasons for subcontracting vary between the different types of construction works contracts. In some contracts, there may be a need to acquire specialist capabilities to perform certain aspects of the work. In others, there may be a need to subcontract portions of the work to increase the contracting capacity of the contractor or to satisfy client requirements or expectations relating to the engagement of small and micro enterprises or local enterprises in a contract.

There are three types of subcontractors:

- A ***domestic subcontractor*** is a subcontractor appointed by the main contractor at his discretion in which case the contractor is free to negotiate the prices and terms for subcontracting.
- A ***nominated subcontractor*** is a subcontractor nominated by the employer/client which the main contractor is obliged to appoint as a subcontractor.
- A ***selected subcontractor*** is a subcontractor selected by the main contractor in consultation with the employer/client in terms of the requirements of the contract.

A contractor is free to negotiate prices and the terms of the contract with a domestic subcontractor.

The employer usually selects nominated subcontractors following a competitive tender process.

A selected subcontractor is usually appointed following a competitive tender process.

Table 1.8: The Differences Between Three Types of Subcontractors

DOMESTIC SUBCONTRACTOR	NOMINATED SUBCONTRACTOR	SELECTED SUBCONTRACTOR
The main contractor remains responsible for providing the portion of the works that was subcontracted to a domestic subcontractor, as if the work had not been subcontracted.	The main contractor has no control over the appointment of a nominated subcontractor and as such cannot be held responsible for any delays in appointing such a subcontractor. A contractor may on justifiable grounds refuse to contract a nominated subcontractor.	The main contractor has control over the appointment of selected subcontractors if he is made responsible for the procurement process. As a result, the employer is not liable for any expenses or costs associated with a delay in the appointment of the selected subcontractor, unless the employer or the employer's representative is responsible for developing the selected subcontractors' procurement documents or controlling the procurement process.

1.5.7 Contractor Development Opportunities

The objective of a Contractor Development Programme (CDP) is to increase the capacity, equity ownership, sustainability, quality, and performance of cidb registered contractor. This effectively raises the contribution of the construction industry to SA's accelerated and shared growth initiative.

To achieve this objective, participants within the CDP should commit to all or some of the following developmental outcomes:

- Improve the Grading status of contractors in targeted categories and grades
- Increase the number of black women, disabled, and youth-owned companies in targeted categories
- Create sustainable contracting enterprises by enabling continuous work through a competitive process
- Improve the performance of contractors in terms of quality, employment practices, skills development, safety, health, and the environment
- Improve the business management and technical skills of these contractors.

A CDP should be a well-planned operation that aims to exit and graduate contractors from the programme with measurable improvements (e.g. NQF level or improvement in contractor grading) and involves commitment of financial and human resources by both the client and the contractor. Clients that commit to contractor development must use an appropriate portion of their procurement of infrastructure budget to support the objectives of the CDP.

1.5.8 Methods of Delivering Contractor Development

Direct Targeting (Incubator)

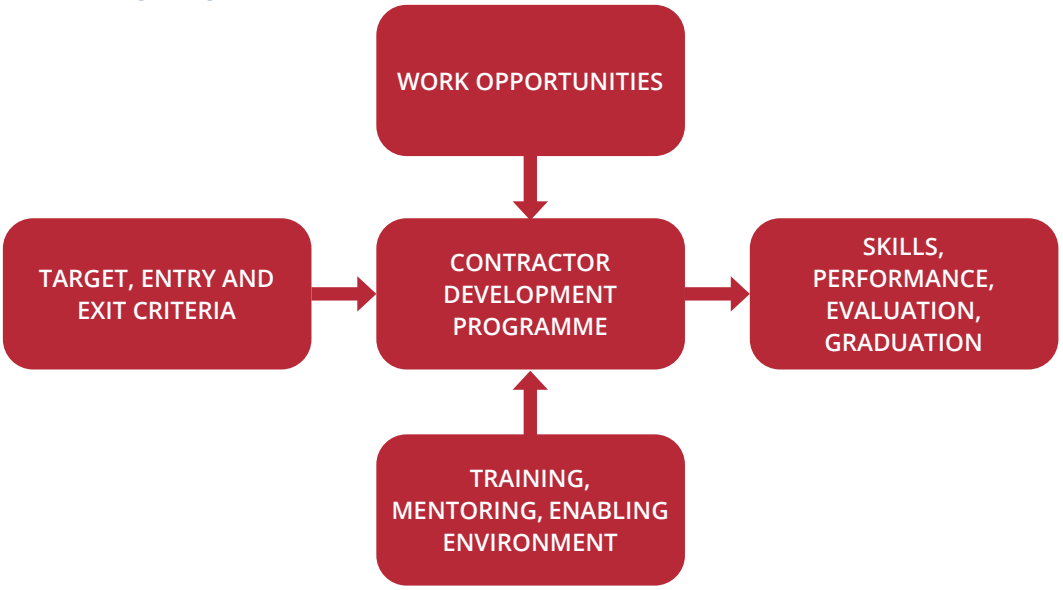
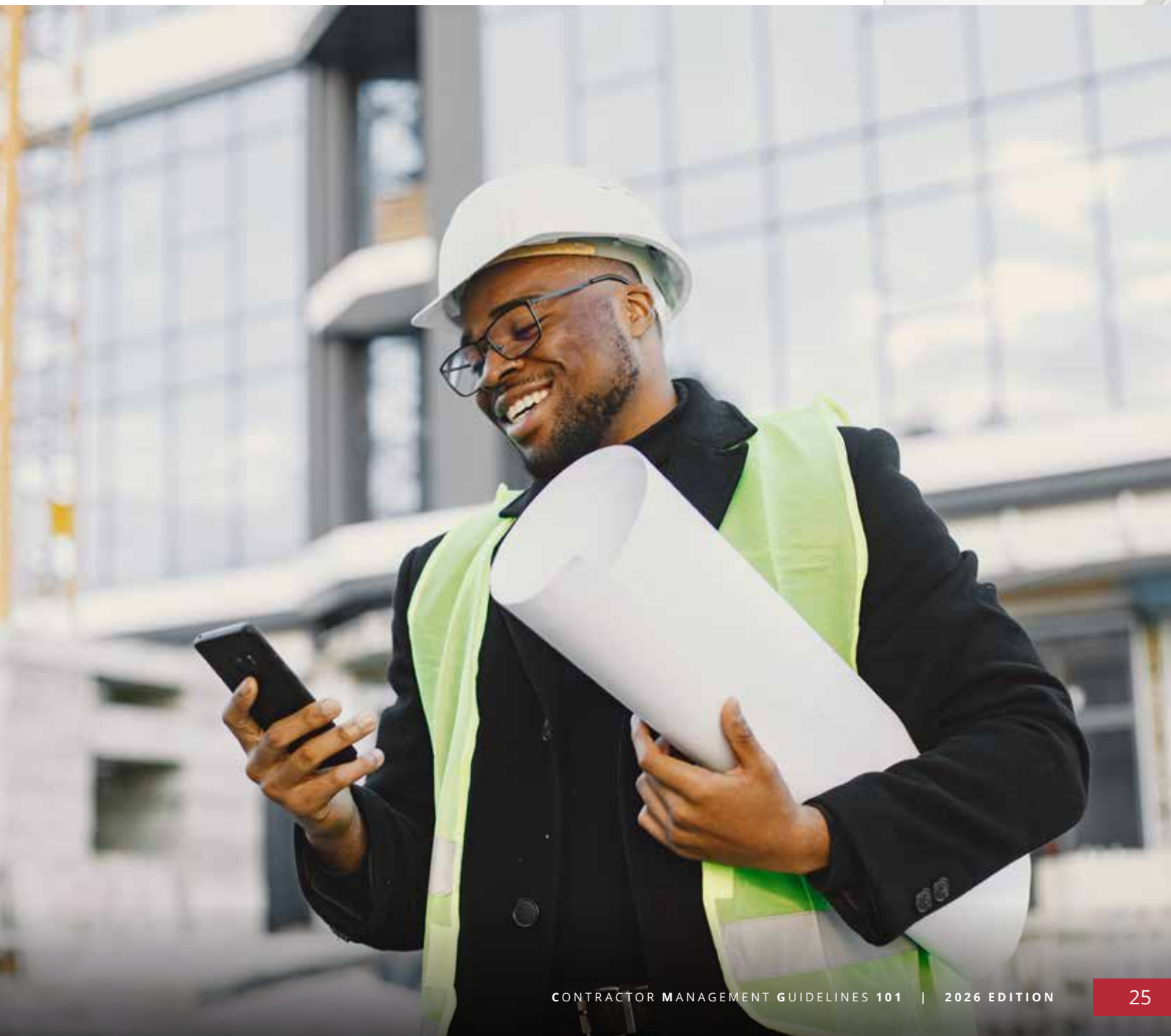


Figure 1.3: Contractor Development Incubator

Indirect Targeting
Structured JVs
Subcontracting
Construction Management
Unbundling
cidb Standard for Indirect Targeting for Enterprise



SECTION 1.6:
GROWING A CONSTRUCTION BUSINESS

1.6.1 The Benefits of Growing a Construction Business

Once a construction business has been established and is operating comfortably, the owner may decide that it is time to expand. A larger business can offer a wider range of services and can engage in more activities at the same time. If it is carefully controlled and managed, the larger turnover will also mean that there is a greater possibility of larger profits. However, the opposite is also true; a larger business that is poorly managed has a greater opportunity for making a loss.

Before a decision is made to grow the business, the reasons for needing to grow must be carefully understood, as well as the impact it may have on the opportunities that are currently available and may be available to the business in the future.

Larger businesses can leverage better prices and payment terms from suppliers as they have more buying power. This makes such businesses more competitive as they can offer lower prices. They also have more scope to make a bigger profit on existing projects since their costs are lower. Larger buyers can also demand faster delivery of goods.

When a contractor tenders for work, the client will always investigate the contractor's capability and capacity to do the work. Larger contractors have more options available to them, since they have a proven track record of successfully completing large projects. This is most visible in the contractor's grading designation on the cidb RoC.

With a larger business, there is a need to employ more staff, especially for administrative purposes. Once administrative systems have been established, then it is a good idea to employ other people to run and manage these systems. This will free up senior management to control and direct operations, giving better control of the business.

Larger businesses generally have:

- *More buying power*
- *More work opportunities*
- *More control*
- *Employ more people*
- *Enjoy more client confidence*

1.6.2 Grow a Business or Expand It?

Growing a business means getting more work in the area where it currently operates. This could be a geographical area or a type of work. Typically, construction businesses opt for obtaining more work in the same area that they currently operate and grow to undertake more than one project of a similar nature, often in the same geographical area. Often contractors take on more work to ensure that they have continuity of work ensuring that their workers are occupied.

Growing a business means a bigger business in the current field.

Continuity of work is essential to maintain a sustainable business and the more frequently work is performed, the better, quicker, and cheaper it can be done.

Expanding a business involves obtaining work in areas that are new to the business. This diversity of work is healthy and provides a range of skills within the business, making it more marketable to a variety of clients.

Expanding a business delves into new areas.

Experience is the key to determine which approach is most appropriate at a particular time. Many factors need to be considered when deciding to expand or grow, such as what the competition is doing and where the gaps are in the market. Experience forms the foundation from which a business can grow.

Make sure that the benefits in growing the business outweigh the risks that are to be taken.

Advantages of growing a business include:

- Better:
  - buying power from suppliers
  - leverage with the banks and financial service providers
  - bargaining power for credit
  - access to projects

"No pain, no gain."

  - sustainability of work for employees
  - stability of the workforce due to more sustainable work
- More opportunity to develop employee skills
- Increased value of the business

There are also disadvantages:

a. Bigger expenses when running a larger business
b. Increased administration costs can erode profitability
c. More pressure to obtain work to sustain a larger workforce
d. More difficult to manage cash-flow requirements
e. The owner is no longer able to oversee all the work and must hire people he can trust to do this for him
f. There are more suppliers to pay and more clients who might not pay (or not pay on time)
g. More financial support is needed
h. Banks will require more collateral for loans

1.6.3 When to Start Growing a Business

A contractor may feel confident when the business is running smoothly – there is steady work, operations are stable, and profits are healthy. However, the market is never static, and what seems sufficient today may not sustain the business five or ten years from now.

Clients' priorities shift, and construction budgets may be redirected to other areas, requiring the contractor to seek new opportunities. At the same time, experienced staff may leave for better remuneration or personal reasons, weakening operational capacity.

Without forward planning, these changes can leave an unprepared contractor vulnerable. In many cases, failure to anticipate and adapt to evolving circumstances can result in business closure, with owners forced back into the market as employees rather than employers.

1.6.4 Where to Find Opportunities for Growth

One of the most important areas to find growth opportunities is in speaking to other contractors. Each contractor goes through different learning experiences on each contract and by sharing these experiences with others, both parties can benefit.

Sometimes, it may even lead to a merger of two companies to the benefit of both companies.

A good place to meet other contractors is to become a member of a contractor's organisation. Smaller contractors are typically based within a small geographical area, and where there is a lot of work, there will often be many smaller contractors operating. Community contractor organisations are a good place to start investigating what other contractors are doing, how they can help each other, and what their problems are.

Often contractors find sub-contracting work through these types of organisations.

1.6.5 Targeting and Planning for Growth

A business does not grow by itself. To grow consistently, the company must have a target and a business plan outlining what needs to be done to achieve that target.

Setting a target is the starting point. Targets can be set in terms of the company's turnover, the number of projects that are undertaken, the size of contracts that are taken on, the number

Don't try to grow a business if the risks are high.

If the business is doing well, carry on, but plan for contingencies.

If a business needs to grow, but the risks are high, leave and find employment elsewhere.

GROWTH: NOT ALWAYS A GOOD THING!

If there is no target, it will not be hit!

A construction business always needs to plan or map out where it is going. This allows changes to be made according to circumstances without a loss of focus.

Monitor progress towards achieving the goals of the business plan. If the progress is not monitored the goals will not be achieved!

A successful construction business has:

- *A continuous work flow.*
- *Clients that are fully satisfied with the quality and timelines of its work.*

of jobs created, and lastly, but most importantly, the profit that the company makes in a year. Each of these targets can be difficult to achieve, but, by simply thinking of the targets and setting them, the first steps have been taken towards achieving them.

Drawing up a business plan to achieve growth is very similar to the process required when starting up a business. The difference between the two processes is that the start up business plan lacks the frame of reference present in the business plan used to achieve growth. Decision making becomes easier once the company's approach to the business details and philosophy has been established, and the work methods and administration procedures have been set up. These can then be used as the baseline for improving and streamlining the business.

1.6.6 Driving the Business Plan

The business plan will not grow the business by itself. Once the business plan has been established, it must be implemented, the progress monitored and the plan revised, as required. It is important to take a step back to check the progress towards those targets at least once a month.

The environment in which the business operates changes continuously, making it necessary to adapt the business plan according to those changes. It is more important though to stay focused on the eventual outcome.

1.6.7 Options for Growth

The business owner has several options that he can choose from. Each will make the business grow bigger, however, the different options have different outcomes. The business can grow by:

- Taking on progressively larger projects
- Taking on more of the same size or smaller projects
- Joining up with other contractors to undertake joint ventures
- Contracting directly with the client instead of acting as subcontractors
- Merging with other contractors to combine resources and capability immediately

Each of these options has advantages and disadvantages that need to be carefully considered before they are undertaken.

1.6.8 Attributes of a Successful Contractor

A successful construction business has:

a. A continuous workflow
b. Clients that are fully satisfied with the quality and timelines of its work
c. A motivated workforce that produces the correct quality of work in as short a time as possible (i.e., they have high levels of productivity)
d. Willingness to satisfy their customers' expectations
e. Cashflow to pay their suppliers on time to increase their credit rating and to obtain any discounts that are offered
f. The confidence of their bank manager
g. Financial resources to pay their taxes on time
h. Compliance with statutory requirements
i. Ability to identify opportunities and take maximum advantage of them
j. The respect of their clients, their customers, and their peers (colleagues and competitors)
k. Year-on-year profit

A successful contractor has, or can obtain, various management skills including those relating to:

a. Setting of appropriate targets (goals and objectives) for achievement and against which the business can measure itself
b. Marketing the business effectively
c. Pricing products and services correctly
d. The ability to buy and/or hire plant, equipment, and materials at competitive prices

e. Managing profits and losses and the business' cash flow
f. The ability to keep records of all business transactions
g. Managing the workforce
h. Planning ahead
i. Managing time effectively

In addition, a successful contractor must be able to:

- Interact effectively with clients and their professional teams
- Know what his rights are and, as importantly, when to "fight for his rights", when to negotiate and when not to fight

As with any businessperson, a contractor must be able to make decisions. These must be based on all the available information and then, once they are made, a successful contractor must stand by those decisions and do whatever is necessary to achieve the required outcomes relating to those decisions.

Some projects are more demanding than others and a successful contractor must be prepared to work long hours from time-to-time. However, a contractor must be able to manage his overtime to suit personal commitments outside of the business.

Above all, the contractor must observe the three "absolutes" of project/construction management, namely that a project must be completed **on time** to the required **quality** and **within budget**. The contractor must therefore be able to do the right things, right the first time, at the right time, to the right quality, at the right cost.

The success of a construction business depends on its understanding of how internal and external factors affect the business and how to deal with them.

The construction industry is not a place for the faint hearted. It is a ruthless world where it is the "survival of the fittest".

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FINANCIAL MANAGEMENT

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2.1.1 Financing a Construction Business

A successful contractor not only needs to have to have the necessary resources to perform construction works but should also have access to sufficient money to run its daily operations.

Money is needed to start up a business and more money is needed to run a business. The intention of any business should be to take the initial investment (capital) and use it effectively to bring in a return to the investor.

The business must ensure that the money invested is put to the best possible use to make as much profit as possible. To do this, a business plan is used to identify how much money is needed and when. Such a plan will enable the owner to predict with some certainty whether the business will make a profit or a loss.

Money is the lifeblood of a business. It must flow to keep the business alive.

Managing finances cannot be left to the contractor's appointed accountant. The decisions made by the owner(s) on how the construction business operates will have a financial implication for the business. The owners take the risk of losing that money if the construction business is badly managed and are compensated for this risk by their share of the profits that are made. If the business is sold, then they will want their share of the value of the business at the time it is sold.

2.1.2 Financing a Construction Business

Once the owner has identified how much money is required, he will have to make sure that he can provide it at the right time.

The value of a business grows with Retained Profits.

Usually, the owner does not have enough capital to cover the requirements, especially when starting out, and will have to find it. There are three basic sources of funds:

- ***Equity capital*** – the money the owner or other interested party puts into the business when it starts to get it going.
- ***Borrowed capital*** – money that the owner borrows to increase the business' ability to perform construction projects.
- ***Retained profits*** – money that the owner leaves in the business to grow its capacity to do construction projects.

The owners of a business always bear the first share of the risk. This is money that the owners invest in the business in return for a share in the profits that the business might make in the longer term. This **equity capital** is made up of money put in by the owners of the business, as well as money that other investors are prepared to put at risk in the belief that they will see a share of the profits of the successful business in the long term.

Operating a business is risky. There are many factors that impact on whether a business survives or not.

Borrowed capital normally comes in the form of a bank loan that is secured by the owners of the business. This comes at a cost and the amount of interest that is due should be factored in when the estimates of the amount of money required are done. Bank loans and overdrafts are normally short to medium-term loans that the bank reserves the right to ask for repayment of the entire amount with very little notice. Long-term loans are offered by some of the development institutions to support smaller businesses in speeding up their growth.

In all circumstances, there is a requirement for the borrowers (owners) to provide collateral for the amount that they borrow. This is often in the form of the owners' personal assets, such as a house or other property, which the bank will take ownership of and, if need be, sell to cover the amount of the loan that is not repaid. Borrowing money is expensive and it puts the collateral at risk.

To obtain funding for a new business in South Africa, contractors could explore options like government grants and loans from development finance institutions (DFIs) like SEFDA and the National Empowerment Fund (NEF) or use alternative methods such as bank loans.

Development Finance Institutions are specialised development banks or subsidiaries established to provide capital and support to emerging entrepreneurs. They provide funds mainly in the form of loans or equity that would otherwise not be able to access funds from commercial lenders. Contractors can access funding from the following DFIs:

a. Industrial Development Corporation (IDC) on www.idc.co.za
b. National Empowerment Fund (NEF) on www.nefcorp.co.za
c. Small Enterprise Development and Finance Agency on www.sedfa.org.za
d. Eastern Cape Development Corporation (ECDC) on www.ecdc.co.za
e. Gauteng Enterprise Propeller (GEP) on www.gep.co.za
f. Ithala on www.ithala.co.za
g. Mpumalanga Economic Growth Agency (MEGA) on www.mega.gov.za
h. Limpopo Economic Development Agency (LEDA) on www.lieda.co.za
i. North West Development Corporation (NWDC) on www.nwdc.co.za

Retained profits are the best way of growing a business. Instead of the owners taking out all the profits for their own personal use, by leaving some of the profits within the business they are investing more into the business, enabling the business to perform larger projects, and growing its capability.

Sometimes, clients will agree to advance payments for work that is to be performed on a project. These mobilisation advances are essentially a short-term loan from the client and in most cases require the contractor to obtain an advance payment bond from another institution such as a bank.

The advance payment is repaid out of the money that the contractor earns whilst doing the project, generally in monthly instalments. All the advance payments are paid back in this way before the end of the contract.

2.1.3 Keeping Records and Accounts

A business must keep track of where its money comes from and what it is used for. It is essential that a business implements a proper accounting system, since it will indicate very quickly whether the business is sound and in good health, and whether there is appropriate financial control over the business. When applying for loans this is the first thing that a bank will ask for.

It is not just the business that needs to account for the money. Each individual project should have its own financial system so that the construction business can keep control of costs, as well as the income that will be generated by the project. Each project's accounts are combined with the office overheads to produce the construction business' overall financial status. These financial control systems can be simple or complex but must provide the information required to keep expenditure to less than the income.

2.1.4 Fixed Assets and Working Capital

Fixed assets have a relatively long life and are permanent in nature. Fixed assets are items such as land and buildings, plant, and machinery. It is important not to tie up too much of the business' capital in fixed assets since there will not be enough available to perform the work.

Remember that a loan must be fully re-paid, along with the interest charged.

Advance payments can help ease cash-flow pressures, however, the contractor would save on interest costs that would otherwise have been incurred, and the client may expect a corresponding cost saving in return for providing the advance.

Record keeping and accounts is like feeling the business' pulse.

A construction business is made up of the sum of all the projects it has on its books plus the office overheads.

It is essential to keep a balance between requirements for working capital and investment in fixed assets.

Working capital is the money that flows through the business. This is money that is used to buy the materials and equipment, or to pay wages, salaries or subcontractors' invoices until such time as the client pays the contractor for the work that has been completed. This is the money that is used to run the business.

The business must have sufficient working capital to ensure that the work can continue until the client pays for the work that has been done. Very often a late payment by the client can cause the business to run out of money to pay wages, pay suppliers for materials and other commitments, and eventually stopping the work.

2.1.5 Income

The reason why businesses fail is that they do not generate enough income to cover their expenditure. It is therefore extremely important that income and cash received are concepts that are clearly understood.

The price quoted for a project should always exceed expenses. This is, however, not enough. Businesses could fail if monies owed are not received in time to pay expenses, for example, when a supplier of goods or services demands payment. Construction businesses can also fail if they have insufficient cash to pay for the plant, equipment, materials, and labour (resources) required to construct or maintain works.

The amount of money available at any one time to pay for resources, service providers or suppliers is known as the contractor's cash reserve. Cash reserves can be built up from borrowings (e.g., from a bank) or earnings (e.g., from projects). It is always better to try generate cash reserves from your earnings rather than your borrowings. Borrowing money costs money. Businesses must pay interest on borrowings.

A construction business needs to generate sufficient cash to pay for the equipment, plant, materials, and labour used to construct the works on time.

Businesses must only borrow money if they are sure that they will be able to repay the money. People in turn, should only go into business if they are sure that they can manage a business' cash flow.

Total income in a particular year is referred to as turnover.

2.1.6 Expenditure

Expenditure includes every single item that a business needs to pay money for e.g.:

- ***Once-off costs:*** these are the once-off costs of the business. Examples of the once-off costs are the cost of creating the company, office equipment such as computers, software and office furniture that are bought for the business.
- ***Recurrent costs:*** these are the day-to-day operating costs that are paid every month. Examples of recurrent costs are rent, hire of photocopiers, regular office staff costs, water and lights and insurances.
- ***Project costs:*** these are the costs specific to each particular contract or project. They include the site establishment, site overhead and supervision costs, materials, plant, equipment, and labour specific to the projects on which a contractor is working.
- ***Interest:*** borrowing money costs money. Interest on monies borrowed is therefore an expense.
- ***Taxes:*** these comprise company tax, employees' tax and VAT. Employees' tax is covered in the wage bill. VAT should neither be regarded as an income nor an expense. The government taxes profits. The South African Receiver of Revenue charges a percentage tax on a business' total income, minus their total expenditure, including any interest that was paid in the running of a business.

Without a sure income and sufficient cash reserves, a business will not be able to operate and will go out of business.

2.1.7 Profits and losses

Profit is the amount of money that remains after all expenses have been paid. Profit does not include salaries, wages, cost of hire of bakkies, rentals or any other cost that is included in expenditure. Note that the salary of a business owner is an expense and not a profit.

Phrases that are commonly encountered with respect to profit are:

- Profit Before Interest and Tax (PBIT)
- Profit Before Tax (PBT)
- Profit After Tax (PAT)

Loss is the shortfall between income and expenditure that needs to be funded by the business.

2.1.8 Resources

Resources refer to the various elements that a construction business uses to execute a contract. These resources comprise:

a. **Labour** which is used to construct or maintain works.

b. **Equipment,** which is required to construct or maintain works, e.g., machinery, power tools, scaffolding, vehicles, etc.

c. **Plant** which is installed into the works.

d. **Materials** which are incorporated into the works.

e. **Money** required to pay for the labour, equipment, plant, and materials.

A business needs to not only manage resources, but also to market resources.

In a construction business, the cost of these resources can be split into various sections with these being:

- Business operating costs/recurrent costs
- Once-off business costs
- Project overhead costs (preliminary and general items)
- Project work content/measured work

A contractor should match resources to each of the elements and then ensure that income includes sufficient money to pay for all the resources identified and to make a profit.

The safest way of expanding a business is out of retained profit. Profit should not be used to fund spending sprees. It should rather be invested in the business to ensure a more prosperous future.

Most people go into business to make money, that is, they want to take money out of the business. In order for money to be taken out of a business, there has to be money in the business that is not owed to anybody. The temptation to take money out of the business apart from your salary, while the business has debts, must be resisted.

Construction businesses should try to use their own money and save the interest and bank charges to remain competitive.

2.2.1 Money

The owners of a construction business (contractor) may use their own money (equity capital), borrow capital from the bank or other source to start a construction business (see section 2.1). This money/capital is used by the business to acquire resources, e.g., materials, labour, and plant. The business owners need to use this money/capital effectively to obtain a good return on their investment, otherwise they could invest their money/capital in other forms of investment products which will yield higher returns on their money.

Contractors need to:

- Ensure that they know exactly how much money is needed for a contract.
- Negotiate to get the best possible interest rate on borrowings.
- Know how the interest rate will be calculated (per month, etc.).
- Know what the bank charges will be.
- Make assumptions as to when a client is likely to pay.
- Calculate the cost of money before submitting a tender.

The profits made (retained profits) by the construction business should be ploughed back into the business to reduce the amount of money that needs to be borrowed from banks or other sources.

The most well-known lending institutions are banks, whose primary business is lending money to individuals and companies by charging interest on the loan amount. Borrowing money from banks is expensive. In addition to the interest charged, banks add service fees for each service that they provide. For example, on a transactional account, banks charge a minimum service fee per month and thereafter, levy a charge for each transaction i.e. a fee on a debit order or a money transfer.

A bank overdraft is a very useful source of income for the bank. Interest is calculated on the daily balance on the overdraft amount, i.e., the amount of money owed to the bank. If on one day R10 000,00 is owed and the overdraft rate is 20% the interest that will be charged on that day will be 10 000,00 x 20% x 1/365 = R5,48.

The banks add this interest charge to a construction business' account once a month. The interest is compounded every month. That is, the interest is added to the overdraft monthly and interest is then charged on the new total amount. In this way, interest is charged on interest.

For example, if R10 000,00 is borrowed at a flat rate of 20% interest on January 1st and is repaid on December 31st of the same year, the annual interest is R2 000,00. The same calculation if interest is charged on interest (compound interest) the interest charges will be R2 213,35.

Other aspects that impact a construction business' cash flow and overdraft limits are:

- Prompt payment from clients for work completed.
- Limiting spending to the absolute minimum and paying as late as payment conditions permit, e.g., payment to material suppliers and plant hiring companies.
- Optimising ordering of material, i.e., don't order materials too early and order only that which is required at that point in time.
- Building up of cash reserves by resisting the temptation to spend.

- Choosing not to tender for work where the contractor cannot be competitive due to the cost of money, e.g., where the client says in the tender "payment within 45 days" or "payment within 60 days" and the contractor has insufficient credit, such terms of payments could be extremely prohibitive.

Apart from the banks, there are other organisations such as Khula Enterprises Limited that can be approached for support. Contractors should be extremely careful of money lenders as they are permitted in terms of the law to charge a much higher interest rate than the banks.

The contractor needs to consider the advantages of credit, as a slightly higher price with credit facilities may be a better option when procuring resources. Even if the price from a supplier looks good initially it may not be the best deal.

Credit is not everything, but it is extremely important to have access to it provided the contractor can manage it correctly. Credit means that materials can be ordered and only paid for after a certain period following receipt of the materials.

2.2.2 Material Supplies

Contractors should procure materials of the right quality delivered on time at the cheapest price. A combination of these three requirements is extremely important. There is no point in getting materials at a low price if they are rejected once they are delivered to a site or built into the works. Materials not delivered on time may delay the works and prove to be very costly.

Contractors should accordingly resist procuring on price alone. It is imperative that the required quality, quantity, and time for delivery are established and understood before approaching a supplier. At the same time, these requirements need to be clearly communicated to the supplier when ordering materials or obtaining a quotation for tender purposes.

Late payments may attract interest charges. In addition, in the event of late payment, the supplier could refuse to give a contractor a credit reference or could give a negative one.

It should also be established whether the materials are to be delivered or collected and what storage capacity is available to receive the materials. It may also be necessary to establish if the supplier is a VAT vendor, and it is important to know whether VAT is included in the quoted price.

The most common credit period is 30 days. This normally means that payment is required 30 days from the date on the statement. Suppliers usually deliver materials on a particular day and will invoice immediately. Towards the end of that month the supplier sends out a statement with a summary of all the invoices sent and all monies received from the contractor during that month.

Thirty days credit means that a contractor has 30 days from the date of this statement to pay, failing which, they could be charged interest by the supplier and lose the right to claim any discounts.

Ideally, materials should be ordered so that they can be built into the project within a month of delivery. This will allow the cost of the materials to be included in the payment certificate that is presented to the client for payment. It is even possible that the client will pay the certificate before the contractor has to pay the suppliers of the materials.

Should this occur, the contractor will be able to buy materials without having to use or increase borrowings. In effect, the client's money may then be used as bridging finance to fund the business. Contractors should be aware that if they order materials that they are not able to build into the works within that month, then the payment from the client may not cover the cost of those materials, and they may have to pay the supplier or risk losing the credit facility from that supplier.

In addition to credit, suppliers should be asked for discounts. There are two main forms of discount: trade discount and settlement discount. Trade discounts are granted to the contractor and settlement discounts are granted if monies owed are paid on time.

Trade discount is taken off the price to begin with. The suppliers often have a “list price”, which is generally not confidential. What is confidential is the discount they give a contractor off the list price. The discount that suppliers will give depends on how the supplier rates the contractor as a client (i.e., what is the risk of non-payment), and how good the contractor is at negotiating. The supplier could allow a contractor a settlement discount, which is normally 2,5% for payment within 30 days. The discount is only allowed by the supplier if the contractor pays his account on time. The settlement discount is then deducted by the contractor from the amount shown on the statement, provided payment is made on time.

Positive credit references are needed to get more credit. Suppliers ask contractors for trade references when credit applications are made. These are companies from whom a contractor has purchased materials on credit in the past. It is a good idea to buy materials from different suppliers to build up a list of credible references.

2.2.3 Equipment

The leasing of equipment allows it to be bought over a period. At the end of the lease period, the ownership is usually transferred, sometimes for a lump sum (residual amount). The question of ownership and the payment of residual amounts need to be understood before entering into a lease agreement.

Equipment may be:

- Bought for cash, in which case the contractor owns, maintains and ensures the equipment and employs operators to use the equipment.
- Leased in accordance with an agreement whereby the contractor pays a certain amount, normally monthly, towards the purchase price of the equipment, maintains and ensures the equipment and employs operators to use the equipment (the contractor may own the equipment after the lease period is completed).
- Hiring/renting from a reputable equipment-hire company at an agreed hourly, daily, weekly, or monthly rate, with or without an operator. The responsibility for maintenance lies with the hire company.

The factors that determine how equipment is acquired depends on various factors including the cost (including maintenance and insurances), cash reserves, how long the equipment is to be used, the availability of the equipment, the frequency of use and what deal is offered.

When hiring equipment, it is important to establish the following:

a. The minimum number of hours that must be paid for per day where the hire is on an hourly basis.
b. Whether the hire rate includes the operator.
c. Whether the rate includes fuels and oils (this is referred to as “wet” if it does and “dry” if it doesn't).
d. What tools are regarded as part of the equipment to be hired and what must be hired or purchased in addition, e.g., when a compressor is hired, the attachments such as chipping hammers, clay spades, moil points, ground engaging tools (GET) and cutting edges must be hired or bought separately.
e. What will happen in the event of damage to the equipment, for example, damage to tyres, body damage, windscreen damage, etc.
f. What (if anything) is covered under the hirer's insurance.
g. What happens in the event of injury/death of the operator, injury/death caused by the operator, damage to property caused by the operator if the contractor provides the operator or if the hirer provides the operator.
h. Whether the minimum daily hire time is applicable on rainy days.
i. Whether the equipment can be booked off-hire for a period when it is not working on a site, or does the hire company offer standing-time rates lower than the normal working rates.
j. What will happen in the case of the breakdown of the equipment, e.g., how long will the hirer take to get it fixed or will the hirer supply replacement equipment.
k. How much is the cost of transport of the equipment to and from the site.
l. What the operator's overtime conditions are and whether accommodation and transport to the site is to be provided every day or when the operator does overtime or not at all.
m. The notification time of putting the equipment off hire.
n. What insurance should, or must, be taken out.

Equipment should always be hired from a reputable equipment-hire company, individual or organisation. A good equipment-hire company should be able to provide the following:

- A good service (as they often specialise in specific types of equipment).
- Well-maintained equipment in good condition.
- Advice on the equipment required for certain jobs, such as size of loader, TLB, etc. required, and whether they should be tracked, or rubber tyred.
- Excellent operators with experience, skill, and knowledge.

2.2.4 Formwork and Scaffolding Suppliers

Formwork and scaffolding suppliers are often able to assist a contractor with the preparation of tenders if approached to do so. They should:

- Determine the quantities of scaffolding that is required, and the weekly hire costs based on the drawings and the areas for which scaffolding is required.
- Assist with the planning of the work and provide a price for the most economical formwork solution for a project, based on the programme and drawings, including the time for re-use of the same formwork for different parts of the project.

When hiring scaffolding and formwork, the following is important:

a. Make sure that the formwork is checked on and off site as the contractor will be held liable if a piece of equipment, frame, etc. is damaged or lost; this is especially important for small items such as clips.
b. Consider asking your supplier to check that the formwork and scaffolding have been correctly assembled before casting concrete or putting a load onto it.
c. Check that the supplier will deliver and collect the scaffolding and formwork.
d. Make sure that allowance is made in tenders for overruns, damage, and the costly cleaning of the equipment, e.g., the shutter pans, props on which concrete has splashed, etc.
e. Make sure that the price includes the oiling of the boards and pans with shutter oil.
f. Use of the correct oils on the shutter as incorrect oils can spoil the surface finish or cause the concrete to stick to the shutter and require the surface to be plastered over.

Remember, the clock is always ticking. Keeping the formwork or scaffolding for an extra day costs money unless a deal has been made in advance with the supplier.

It is often better on projects with long durations to buy the items that can become consumables, such as formwork and wedges, as these often get lost and buying them can be more cost effective.

2.2.5 People

For small and micro enterprises, it may be possible to run an office from your home. In such a case, the owner/member of the business is often responsible for office management, administration, statutory and voluntary registrations, salaries and wages and a host of other activities associated with a head office. There is nothing wrong with a managing member or business owner engaging specialist individuals who are more technically, financially or administratively qualified than they are, conceivably even earning more money for a given period than the managing member themselves.

Labour on construction sites may be engaged either as temporary employees appointed on fixed-term contracts for a specific project, or as permanent staff who move between sites as required. In both cases, employees must be properly recruited, inducted, and trained to ensure efficiency, compliance and quality performance.

Appropriately qualified or competent technical and supervisory site staff needs to be employed or engaged for all projects. No compromise on the quality of these human resources can ever be accommodated, as the cost of re-work (including demolition and cartage, new materials and repeat labour, overall downtime, and extended time) is not provided for in any budget. The costs of rework erodes the profit that has been provided for in a contract.

Establishing good relationships with subcontractors is important!

2.2.6 Subcontractors

Subcontractors are an important resource and can provide a contractor with capabilities and capacities that it may not possess. Instead of hiring people specifically to do the work, it is sometimes easier to subcontract a company that specialises in that field to come and do the work for the contractor.

2.2.7 Cashflow

Cashflow is the term used to describe the amount of working capital that a business has at any point in time. This reflects the changing balance in the business' bank account. Contractors should evaluate a client's payment record and allow for any delays in payment in their calculations for working capital on a project.

Project cash flow is calculated from the project costs compared to the project income. The net cash flow is the difference between the two figures. The contractor's cash-flow requirement is simply the cash-flow requirements of all the different projects added together, plus the overhead costs for the office premises and support staff.

Cash flow is king! Without cash the business cannot survive.

By keeping this up to date, the contractor can forecast how much working capital will be needed to fund the operations, as well as the ability to repay loans or when they will be able to buy new equipment. A cash-flow analysis is essential to operating a construction business. Without cash to pay for wages, materials, equipment hire, etc. the contractor is out of business.

Table 2.1: Example of Cash Flow for a Typical Six-month Contract for R372 460

MONTH	ACTIVITY/ MILESTONE	PROJECT COST	PROJECT INCOME	COST HIGHER THAN INCOME	INCOME HIGHER THAN COST	NET CASH FLOW
		R	R	R	R	R
August	Establish site and start-up	27 250		27 250		-27 250
September		67 520		67 520		-94 770
October		68 760		68 760		-163 530
November	Receive first payment	69 980	32 640	37 340		-200 870
December	Substantially Complete	46 270	68 300		22 030	-178 840
January	Finish Snag List	36 220	71 420		35 200	-143 640
February			76 140		76 140	-67 500
March			74 840		74 840	7 340
April	Receive last payment		15 260		15 260	22 600
May						22 600
June	Receive 1st Retention Release		16 930		16 930	39 530
July						39 530
August						39 530
September						39 530
October						39 530
November						39 530
December	Receive final retention		16 930		16 930	56 460
Total		**316 000**	**372 460**		**56 460**	

This cash flow shows the following:

a. The client will pay between 30 and 60 days from date of invoice
b. The project will take six months to perform
c. Retention is 10%, with half of the retention being paid on occupation by the client and the other half at the end of the contract
d. The project will have a profit of R56 460 (or 18%)
e. The contractor will require a maximum of R200 870 working capital
f. The contractor will be out of pocket for seven months
g. The final profit will only be received 17 months after the project started
h. Cash-flow forecasts become even more important when more than one project is being worked on at any point in time

There are many factors that affect cash flow. One late payment can cause a construction business to go out of business.

Table 2.2: Example of Three Contracts Running Simultaneously (No Retention Amounts)

CONTRACT	PERIOD	VALUE	ANTICIPATED PROFIT
1	9 months	R1 000 000	R100 000
2	6 months	R80 000	R12 000
3	5 months	R75 000	R5 000

The projected cash flows for the projects are as follows:

Table 2.3: Project Cashflows: Contract 1

MONTH	1	2	3	4	5	6	7	8	9
Payments made by business	50 000	75 000	100 000	135 000	150 000	135 000	100 000	90 000	65 000
Income received	30 000	60 000	100 000	140 000	170 000	150 000	135 000	100 000	115 000
Net income per month	-20 000	-15 000	0	5 000	20 000	15 000	35 000	10 000	50 000
Net cash flow	**-20 000**	**-35 000**	**-35 000**	**-30 000**	**-10 000**	**5 000**	**40 000**	**50 000**	**100 000**

Table 2.4: Project Cashflows: Contract 2

MONTH	1	2	3	4	5	6
Payments made by business	12 000	12 000	12 000	12 000	12 000	8 000
Income received	5 000	15 000	15 000	15 000	15 000	15 000
Net income per month	-7 000	3 000	3 000	3 000	3 000	7 000
Net cash flow	**-7 000**	**-4 000**	**-1 000**	**2 000**	**5 000**	**12 000**

Table 2.5: Project Cashflows: Contract 3

MONTH	1	2	3	4	5
Payments made by business	15 000	20 000	20 000	10 000	5000
Income received	5 000	15 000	20 000	20 000	15 000
Net income per month	-10 000	-5 000	0	10 000	10 000
Net cash flow	**-10 000**	**-15 000**	**-15 000**	**-5 000**	**5 000**

This appears to be a healthy order book.

If Contract 1 starts in January, Contract 2 starts in February and Contract 3 starts in April, the net cash flow for the contractor will look like this:

Table 2.6: Net Cashflow Analysis Over 9 Months

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Contract 1	-20 000	-35 000	-35 000	-30 000	-10 000	5 000	40 000	50 000	100 000
Contract 2		-7 000	-4 000	-1 000	2 000	5 000	12 000		
Contract 3				-10 000	-15 000	-15 000	-5 000	5 000	
Net cash flow for the business	**-20 000**	**-42 000**	**-39 000**	**-41 000**	**-23 000**	**-5 000**	**47 000**	**55 000**	**100 000**

The contractor has a bank overdraft facility of R65 000,00 making the contractor's financial situation favourable. The client for Contract 2 does not pay the R5 000 in February, but arranges to pay R20 000 (R5 000 for February and R15 000 for March) in March, which the contractor accepts. The contractor's expenses for February will increase to R47 000.

This amount is still within the contractor's bank overdraft limit of R65 000.

At the end of March however, the client says that his mortgage bond has not yet come through and payment will be made in a few days. The amount of money that the contractor must borrow in March will now increase from R39 000 to R59 000 which is of concern as Contract 3 is scheduled to start.

When the Contract 2 client doesn't pay for the work in April, the contractor is in serious financial trouble. Costs have remained the same and the business has paid out R36 000. The Contract 2 client is still saying that the bond is going to be paid next week. The amount that the contractor must borrow has now risen to R76 000 i.e. exceeding the bank overdraft limit. This can cause a business to fold.

Whatever is said must be put into writing.

Failure to ensure a healthy cash flow is the most common cause of business failure. This occurs even if people are excellent at what they do. No money, no business.

Table 2.7: 4-month Cashflow Analysis

	JAN	FEB	MAR	APR
Contract 1	-20 000	-35 000	-35 000	-30 000
Contract 2		-12 000	-24 000	-36 000
Contract 3				-10 000
Total	**-20 000**	**-47 000**	**-59 000**	**-76 000**

The situation could have been managed had the contractor told his client that he would accept the R5 000 at the end of March along with the March payment and if the bond had still not come through, the work will stop until such time that the bond came through. Alternatively, the contractor could have advised the client that if he did not pay within 14 days the work will stop.

Had this been done, the cash flow would resemble the information as depicted in Table 2.8 below.

Table 2.8: Net Cashflow Analysis Over 9 Months

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Contract 1	-20 000	-35 000	-35 000	-30 000	-10 000	5 000	40 000	50 000	100 000
Contract 2		-12 000	-4 000	-4 000	-4 000	-4 000	-4 000	-4 000	-4 000
Contract 3				-10 000	-15 000	-15 000	-5 000	10 000	10 000
Total	**-20 000**	**-47 000**	**-39 000**	**-44 000**	**-29 000**	**-14 000**	**31 000**	**56 000**	**106 000**

A profit of R106 000 would have been made instead of R117 000. The business would have, however, survived.

Invoicing and Terms of Payment

Cash flow is the life blood of any business. It is therefore essential that all invoices are submitted promptly and the claim for payment is followed up with clients to ensure that the payment is received.

It is also important to understand and agree to the terms of payment, e.g., 7, 14 or 30 days from receipt of invoice before a contract is concluded. Where possible, quotations should include the terms of payment, e.g., within 14 days of invoice.

The terms of payment have a serious effect on a construction business' cash flow.

SECTION 2.3:
MARKETING

Marketing can make a difference to a contractor's profitability.

Marketing is often confused with selling and whilst they are related, numerous differences exist. Selling focuses on distributing the product or service that the business offers, whilst marketing focuses on knowing what the client needs and providing the product or service that is needed.

Always make sure that potential clients can contact you.

2.3.1 Marketing Concepts

Construction is both a service and a product. A contractor provides a service by satisfying the client's requirements and delivers a product on completion of a project. A contractor's reputation is dependent on clients being satisfied with both the service and the product. This is a team effort and requires every employee to play their part in promoting the capabilities of the contractor and the quality of its product.

The question "where are next year's profits coming from" should be far more important to a contractor than "what was last year's profit". The service rendered during a project and the quality of the product can be marketed to secure future work.

A client's decision to appoint a particular contractor, particularly a private-sector client (or a main contractor when appointing a subcontractor), is based on many factors. Price is not the only factor. Expertise, experience, and a track record of satisfied clients can sway a client's decision to award a contract.

Business strategy focuses on the understanding of the forces that shape the construction industry and winning contracts in a competitive environment. Marketing focuses on interpreting the environment in terms of client requirements and satisfying those requirements. Marketing is all about promoting a contractor to the extent that a client moves from being unaware of the contractor to contracting with the contractor on a regular basis.

If clients do not know that a contractor exists or what services it offers, they will never engage with them or contract them to deliver those services. It is essential for a contractor to let the market know that they are there and that they mean business. Marketing is a very varied topic that extends from glossy media adverts to word-of-mouth.

Marketing can take many forms, from word-of-mouth to door-to-door canvassing, printed flyers, construction signboards, radio or television adverts, sports sponsorships, billboards, and adverts on taxis or just a plain brochure and company profile.

2.3.2 Publicity

Publicity can take on many forms and there are many different media to use to get the message across. The important information that should be incorporated includes:

a. The name of the business
b. What the business does (and any specialties)
c. Where the business is located
d. How the business can be contacted
e. What the business has done in the past
f. What the business is currently busy with
g. Recommendations from previous clients reflecting that the business is the best at that work
h. Why the client should be contracting with this business rather than another one

2.3.3 Promoting a Construction Business

General Considerations

The marketing of a construction business is very different from the marketing of a supermarket or a product line. Contractors offer a specialised and complex service and therefore need to let their clients know that the service they can deliver is the best or at least better than their competitors.

This may take many forms, including photographs of completed projects, testimonials from satisfied clients, professionally produced brochures showcasing past work, or videos highlighting how the contractor successfully overcame challenges on complex projects.

The purpose of promotional activities is to seek out prospective clients and to convert them into actual clients. Advertising can move prospective clients through the stages from "unawareness" to "awareness" and "comprehension". Personal selling is usually required to move from "comprehension" to "conviction" and ultimately "action" and the signing of a contract.

Advertising and Corporate Identity

The intensity and nature of advertising activities are very dependent upon the following:

- The nature or type of business.
- The competitiveness of the market.
- The stage of the development of the business.

For example, a newly established contractor that supplies and installs roof trusses needs to advertise its services and products to a large potential client base that is unaware of the services and products on offer. Advertising for such a business needs to focus on competence and other competitive advantages to attract an initial set of clients in the form of enquiries. More established contractors would need to focus their advertising on the range of their services and products to maintain "top of mind" awareness.

Advertising costs money. From simple business cards to television adverts, each advert costs the contractor money. In each business' marketing plan there must be a budget set aside for marketing that can be used to determine what type and extent of marketing can be used. It is also important to identify what the benefit of a particular advertising campaign might be, and a benefit-cost ratio should be worked out for each form of advertising. It is pointless to spend money on advertising if it will not help bring in more work opportunities.

Image Building

Corporate image refers to how clients, stakeholders and the broader market perceive a construction business. It is shaped by the contractor's reputation for delivering quality work on time and within budget, as well as by professionalism in all interactions with clients, suppliers, and employees. Clear communication, transparent pricing and reliable performance build trust and credibility, while adherence to safety standards, regulatory compliance and ethical business practices reinforces long-term confidence.

A positive image is further strengthened by showcasing completed projects through photographs, case studies and client testimonials. Once the target market has been identified and a clear action plan is in place, the contractor should actively promote this image to increase visibility.

Visual presentation plays an important role - neatly dressed staff, professional conduct, and strong worker performance in terms of productivity, quality and health and safety all contribute to favourable perceptions. Conversely, accidents, late completion, environmental neglect, untidy sites, poor productivity, and rework can damage a contractor's image and negatively impact profitability.

Corporate Identity

Corporate identity is the visual and branding expression of the business and how it presents itself consistently to the market. It includes elements such as company colour schemes, logos and branding applied to letterheads, vehicles, promotional material, signboards, and site signage.

Remember, a client is only a contractor's client when the first payment is received.

Choose an advertising method and media that is appropriate and will reach the client effectively.

Increased market share invariably results when a contractor's reputation as a "quality" contractor spreads.

Image can be described as how clients and others perceive a construction business.

This form of image promotion increases exposure and helps establish brand recognition - a familiar name is more likely to secure work than one that is unknown.

Effective signage should be strategically positioned for maximum visibility, compliant with local by-laws, constructed from durable materials, and maintained so that it remains level and in good condition. A strong, consistent corporate identity supports and reinforces the contractor's corporate image by ensuring that the business is easily recognisable and always professionally represented.

Public Relations and Client Recommendations

The contractor's future depend on client satisfaction, which in turn is dependent upon how well the contract is managed and executed and if it is successfully completed on time and to the required quality.

Probably the most effective marketing tool is word-of-mouth. Once a contractor has successfully performed on a project, they can ask the client to refer them to other clients.

Where a new client is found, the contractor can provide references from their previous clients. It is also important to identify potential sources of work, and this is often done by talking to potential clients and seeking out new clients.

Other contractors are very often also future clients. Where a contractor secures work that they do not normally do, they subcontract to other contractors. This is a good source of future work and if the contractor performs well as a subcontractor, then the main contractor will call on them to do similar work in the future or refer them to others where similar work is required.

Client recommendations are one of the most powerful promotional tools available and need to be nurtured at all costs.

Good references are the most effective way of marketing a contractor.

Personal Selling

The owners, members or company directors need to market the construction business. They are in the best position to do so. They know the construction business' strengths and weaknesses, as well as the limitation in capability and what their likely capacity is for new work.

2.3.4 A Marketing Plan

A critical element of successful marketing is the preparation of a marketing plan.

When a contractor has determined the sector, they wish to operate in, and the clients they wish to provide services to, and what those clients' needs are, he can start planning how to become more visible, attractive and competitive. The marketing plan is like the business plan but focuses on how to portray the work, resources, skills, and successes of the contractor.

Learn from each campaign how to do better in the next one.

The marketing plan should contain at least:

a. The business' present situation
b. The resources available to the business
c. The business' problems and opportunities
d. The actions to be taken
e. The business' objectives
f. The budget for marketing

One way of doing this is by doing a SWOT analysis - identify the business' strengths, weaknesses, opportunities, and threats, and then determining what actions are best for improving the good points and removing or mitigating the poorer areas.

2.3.5 Effectiveness of Marketing Campaigns

The effectiveness of any marketing campaign must be measured. Work opportunities should be measured before and after the campaign has been implemented so that the benefit can be measured against the cost of the campaign.

SECTION 2.4:
TENDER CONSIDERATIONS

2.4.1 Identify the Market Segment

A construction business needs to first identify what market segment they want to operate in and which other construction businesses they will have to compete against. This will be dictated by the skills and resources that the construction business has at its disposal, its strengths, as well as an analysis of where the gaps in the market lie (geographic location, type of work and size of contract).

The business must also determine whether it will operate in the private sector, the public sector or in both. Any construction business is offered the opportunity to compete for public sector projects provided they are registered with the Construction Industry Development Board (cidb) in an appropriate contractor grading designation (see section 1.4).

Tenders are normally evaluated on a point scoring system in terms of which points are awarded for price and points are awarded for preference. Sometimes, points are also awarded for the quality (functionality) offered by the construction business. In the private sector, however, clients most often choose who they wish to invite to submit tenders or with whom they wish to negotiate subcontracts.

There is no point in spending enormous amounts of time, cost, and effort in setting up a business or in submitting a tender for work in a market where there is an oversupply of construction businesses competing for work or in a market where a client is likely to prefer to do business with a better-known construction business.

There may be barriers to operating in certain sectors that the construction business must overcome to be allowed to work. For example, the requirements for registration with the Electrical Contractors' Board of South Africa must be met to operate as an electrical contractor.

Public sector and private sector clients operate differently. Construction businesses should choose which sector they wish to operate in, (or both) and position themselves accordingly.

2.4.2 Identify Competitors

It is important for a construction business to understand who their competitors are, so that the business can offer better or different services and thereby secure work ahead of their competitors. If there is a gap in the market, where there are very few other construction businesses, there will be less competition and more opportunities for work.

Where there is a market in which there is plenty of work, a construction business may get a share despite the high levels of competition. A construction business should investigate this before contemplating starting up a new business.

Know your market means:

- *Know your client's needs*
- *Know what your competition offers*

2.4.3 Analysing the Opportunity for Profit

The construction business should confirm whether it is able to perform the work that is required by the client, and if so, easily or with difficulty. Experience in work of a similar nature should provide the answers to these critical questions.

However, work that is easy is not always profitable. The construction business also needs to evaluate if it will be more competitive than its competitors in performing the work while still making a reasonable profit after the contract is finished.

An accurate estimate of what the likely cost of the works might be needs to be made before a tender offer can be made (see section 2.8). Estimating is the process of predicting the costs of carrying out the work. Tendering is the subsequent commercial process of making an offer based upon these estimated costs, plus an element of profit and if necessary, risk.

The drawings and specifications provide estimators with how the job is to be built and what resources are required.

The estimate should account for the methods of building or construction to be used and all the circumstances that may affect the carrying out and completion of the work. A reliable estimate can only be achieved by analysis and categorising each operation into simple elements and estimating the cost methodically and accurately (see section 2.8).

On larger projects, it may be necessary or prudent to draw up a preliminary programme or bar chart to get a better understanding of the sequences and timing of operations.

The estimator must be aware of important project specific aspects as they may affect the estimates. These include:

a. Commencement and completion dates
b. Client requirements for phasing or staging completion
c. Other requirements regarding the sequencing of work
d. Work to be carried out by others
e. Work to be subcontracted
f. Site conditions
g. Key items or materials requiring firm delivery arrangements

The scope of work, which includes the specifications and drawings, will indicate the following:

a. The required quantity of work
b. The required quality of the finish and standard of workmanship
c. If operations are repetitive
d. If excessive or detailed setting out is required
e. The required degree of accuracy and tolerances
f. If the design is intricate or straightforward
g. If special skills will be needed
h. If any special construction sequence is necessary
i. If the operation:
– is within the experience of the existing employees
– requires special instruction or training
– will require the employment of additional trained personnel
j. The accessibility of the site
k. Height or depth of work
l. Any double handling of material
m. Restrictions in working, e.g., occupational health and safety requirements, requirements for subcontracting portions of the works, employment of local labour

The tender programme, if produced, will indicate the following:

- The time available for activities on the site
- If work will be continuous or intermittent
- The degree of interdependency of activities, trades, and operations
- The relative proportions of supervisory, skilled, and unskilled employees that are required and the size of work teams
- The timing and extent of equipment that needs to be sourced or provided

A visit to the site and its surroundings will provide an indication of:

- The travelling costs that are likely to be associated with the site
- Physical conditions and any restrictions likely to be encountered
- Site layout, storage and unloading facilities
- The likely skill, experience, and availability of local labour

Once the construction business is satisfied that it can provide the client with what is required, the risks associated with the contract need to be assessed, e.g., rain, heavy traffic, labour disputes, material suppliers not delivering, etc. Each of these risks needs to be evaluated to arrive at an informed decision as to whether to submit a tender (see section 2.8).

The construction business needs to consider all the above when estimating what the cost of the works is likely to be and what level of risk allowance should be made.

Construction businesses should not tender for work where the business is:

- Unlikely to make a profit.
- Not confident that it can perform the works.
- Unlikely to be competitive.

2.4.4 Clarification Meeting

Many clients provide a clarification meeting (site inspection or briefing session) before the closing of tenders. All tenderers are required to attend compulsory clarification meetings failing which their tender submission will not be evaluated by clients. The tender advertisements and tender documents provide details of the time and place where these meetings are to be held and indicate whether the meeting is compulsory.

Clarification meetings that take place on site (site inspections) allow prospective tenderers to familiarise themselves with the site conditions and gives the client or the clients representative the opportunity to inform tenderers of particular client requirements, site conditions, ground conditions, where waste may be dumped, materials may be borrowed or camps and offices may be established, as well as environmental issues, such as sensitive wetland areas or access to the site.

Site inspections provide the construction business with an opportunity to obtain answers to questions such as:

a. Where is the site?
b. What are the site conditions?
c. How can the site be accessed?
d. What are the soil conditions on the site?
e. What services (water, electricity, etc.) are available on the site?
f. Where can unwanted or surplus soil, rubble and rubbish be disposed of?
g. What are the arrangements for site security, if any?
h. What are the local conditions relating to labour and the supply of materials?

A briefing session will generally cover issues that do not necessarily have to be discussed on site or where the site is not accessible for some reason. These issues are normally discussed at the client's premises and give tenderers an opportunity to clarify any points that they are not completely comfortable with.

When the site inspection or briefing session is compulsory, it is essential that the construction business either records its presence on the register that the client passes around or gets the client's representative to sign the form provided for this purpose in the tender documents. Without this clear confirmation, a construction business' tender will become invalid, even if it did attend the meeting, since there is no way for the client to remember each person at the meeting. The onus lies on the construction business to provide the proof of attendance.

2.4.5 Making a Tender Submission

A construction business should carefully read the conditions of tender and observe the following when submitting a tender offer:

- Confirm that the eligibility criteria are complied with.
- Attend the clarification meeting, if any.
- Follow the instructions for: pricing the tender offer; submitting a tender offer; and submitting alternative offers.
- Ensure that the tender offer is received by the employer before the closing time for tenders.

Section 2.6 provides further information where the cidb Standard Conditions of Tender are used and the cidb Register of Contractors is applied in the procurement.

The construction business must complete and submit all documents requested by the employer. Where the documents have been prepared in accordance with the cidb's Standard for Uniformity in Construction Procurement, the schedule of returnable documents provides

A review of the scope of work, the tender programme and a visit to the site may indicate that the contract is unattractive to the construction business, in which case the contractor should decide not to submit a tender.

The purpose of a site visit is to find out as much as possible about the conditions on site and how they may affect the construction process. This allows the construction business to assess their risks and to make an informed risk allowance in the tender offer.

a comprehensive list of all forms and supporting information that must be completed or submitted. This schedule serves as an important checklist and construction businesses should review it carefully to ensure that all required documents are fully completed, correctly signed, and included in the tender submission.

The construction business should draw up its own checklist of documents that have to be completed where documents are not formatted and compiled in accordance with the cidb Standard for Uniformity in Construction Procurement.

Often the client will base his evaluation on a construction business' experience in performing work of a similar nature and will require descriptions of the work that a construction business has previously done, who the previous clients were, as well as contactable references that allow the client to confirm how the construction business performed.

This information may be used to demonstrate a construction business' capability of performing the work. Alternatively, it may be used in the scoring of tender submissions where quality forms part of the score. Construction businesses are advised to provide comprehensive submissions where the information is used to score tenderers as the evaluators can only score the information that is provided to them in tender submissions.

The construction business should also confirm how many copies of documents and which certificates need to be included in the tender submission. **These requirements may be found in the following clauses of the Tender Data where the cidb Standard Conditions of Tender are used:**

- Clause F.2.13.3 - number of copies.
- Clause F.2.20 - securities, bonds and guarantees.
- Clause F.2.23 - certificates.

Construction businesses, may in their tender offers, propose deviations to the client's requirements or exclude some of the client's requirements by qualifying their tender offers to remove unacceptable or onerous requirements. Such deviations and qualifications may, however, not be acceptable to the client. **The cidb Standard Conditions of Tender in Clause F.3.8.2 only permit deviations and qualifications which:**

- Don't detrimentally affect the scope, quality, or performance of the works.
- Significantly change the client's or construction business' risks and responsibilities under the contract.
- Affect the competitive position of tenderers complying with the client's requirements.

Construction businesses must be cautious when proposing deviations and qualifications in their tender offers.

Copies of the tender submission should be made so that any queries raised by the client or his agents during the evaluation of tenders may be answered.

2.4.6 Tender Checklist

One of the most important aids that a construction business (intending to contract either as a main contractor or subcontractor) can have at tender stage is a tender checklist. The purpose of such a list is to act as a reminder to tenderers of issues for consideration when preparing tenders.

1. **WORK: What is the nature and extent of the work that the tenderer is required to undertake?**
   - Is the tenderer responsible for any portion of the design of the work?
   - Is the location, start date and probable duration of the project known?
   - Can this contract be undertaken given the construction business' current and foreseeable contractual commitments, resources, and workload?

2. **FORM OF CONTRACT: Is the contract a standard form of contract or subcontract recommended by the cidb (see section 2.8) or are there any amendments or variations to the standard conditions of contract?**
   - What is the risk associated with signing an "unknown" form of contract or an extensively modified form of contract on issues such as payment terms, administrative procedures, procedures relating to practical and final completion, resolution of disputes, claims procedures, interest on overdue payments, the contractor's right to suspend the works for default on payment, claims for extension of time, recovery of costs due to client delay, etc.

3. **TENDER PERIOD: can the tenderer prepare and submit a tender in the time allowed?**

4. **CLIENT: is the client an acceptable credit risk? Is the client known to be slow in making payments?**

5. **SCOPE OF WORK: what are the works that are to be provided and any other requirements and constraints relating to the way the contract work is to be performed?**
   - Are the specifications clear and comprehensive?
   - What are the acceptance criteria, if any, for the works and components thereof?
   - Do the drawings that are provided clearly establish what is required?
   - How difficult is it to comply with the constraints relating to the way the works are to be performed, e.g., programme constraints, local resource requirements quality management systems, etc.?
   - Can the works be constructed in accordance with the drawings and specifications?
   - What is the quality of the information provided in the scope of work?
   - How complete is the information?

6. **PAYMENT TERMS AND PRICING STRATEGY:**
   - Are the pricing strategy or payment terms attractive?
   - Can the construction business finance the works within the required pricing strategy, payment terms and levels of retention monies at the various stages of the contract?
   - Is there sufficient compensation for late payment by the client?

7. **PERFORMANCE BONDS:** is a performance bond required? What is the amount of the performance bond?

8. **PRICE ESCALATION:** Is the contract price subject to adjustment to allow for price inflation? Is the formula for and the indices relating to price adjustment known?

9. **INSURANCE:** What are the requirements for insurance that will affect the tendered price?

10. **DISPUTE RESOLUTION:** If a dispute arises, what is the method of resolution? Mediation, adjudication, litigation, arbitration, etc?

11. **PENALTIES FOR LATE COMPLETION:** What are the penalties for late completion and are they excessively high?

SECTION 2.5:
PUBLIC CONSTRUCTION PROCUREMENT SYSTEM

2.5.1 cidb Standard for Uniformity in Construction Procurement

Public sector procurement is regulated through the Constitution of the Republic of South Africa (Act 106 of 1996), the Public Finance Management Act of 1996, the Municipal Finance Management Act of 2003, the Preferential Procurement Policy Framework Act of 2000, and several other pieces of legislation. The Constitution requires that any procurement by a public sector client (employer) must be fair, equitable, transparent, competitive, and cost-effective.

Public sector clients (national and provincial departments, municipalities, and state-owned enterprises) are required in terms of the Construction Industry Development Board Act 38 of 2000, to procure construction works in accordance with the cidb Standard for Uniformity in Construction Procurement.

Private sector clients are not required to procure construction works in accordance with the Standard for Uniformity in Construction Procurement. Many private sector clients, however, choose to do so.

This Standard for Uniformity in Construction Procurement establishes minimum requirements that:

- Promote cost efficiencies through the adoption of a uniform structure for construction procurement documents and standard component documents, as well as generic and uniform solicitation procedures.
- Provide transparent, fair, and equitable procurement methods and procedures in critical areas in the solicitation process.
- Ensure that the forms of contract that are used are fair and equitable to the parties to a contract.
- Enable risk, responsibilities, and obligations to be clearly identified.

There is a great difference between the rules that govern the private and public sector in procuring goods, services and works from the public.

The private sector is not required by law to follow any rules relating to procurement (buying) of goods, services or works other than the cidb Code of Conduct for the Parties engaged in Procurement. They generally choose the lowest price out of all the tenders they receive and will choose a higher price only if they do not feel confident that the company with the lowest price can do a proper job.

The public sector is, however, governed by many rules that govern the way in which they can procure goods, services or works.

cidb registered contractors, depending upon their grading designation, either get an SMS or e-mail notification of tenders invited in the contractor grading designations that they are registered in.

A searchable database of all tenders invited through the i-Tender system is available on the cidb website.

2.5.2 Procurement Procedures

The Standard for Uniformity in Construction Procurement establishes several standard procurement procedures that enable clients to engage with contractors. The procedures that are commonly encountered in construction works are:

- Open procedure.
- Qualified procedure.
- Quotation procedure.

Contractors may either download the Government Tender Bulletin from the web or receive it through the post at a nominal cost.

In the **open procedure** an employer advertises a tender using

In the **qualified procedure**, an employer advertises a call for expressions of interest using

cidb i-Tender service (see **www.cidb.org.za**)

If necessary, in the Government Tender Bulletin (**www.treasury.gov.za** or **www.info.gov.za/documents/tenders/index.htm**)

or

in other media such as newspapers.

Contractors who are registered with the cidb in the required contractor grading designation (see section 1.4.3 for information on the cidb contractor grading system) or are capable of being registered by the time that tenders are evaluated, may submit tenders in response to this invitation.

In the **qualified procedure**, the employer evaluates submissions in terms of the evaluation criteria stated in the submission data. Thereafter, only those that qualify or are shortlisted to submit tenders in terms of the stated evaluation criteria, are invited to submit tender offers.

Contractors are not required to submit financial offers where expressions of interest are called for. They are usually invited to submit their credentials so that they may be:

- Prequalified to submit a tender.
- Admitted to an electronic database which is used to nominate those who will be invited to submit tenders.

The **qualified procedure** is usually used in large and complex projects or on projects that require a high degree of specialised inputs or where skills and expertise are not readily available.

In the **quotation procedure**, tender offers are solicited from not less than three tenderers in any manner the organisation chooses, subject to the procedures being fair, equitable, transparent, competitive and cost-effective. The quotation procedure may only be used by national and provincial departments, municipalities and municipal entities where the value of the contract including VAT is estimated to be less than a value determined by National Treasury.

Quotations are usually advertised in local media. Alternatively, contractors that are registered on a database (prequalified listing) are invited to submit quotations.

Sometimes, a negotiated procedure is used to obtain a tender from a single tenderer. This usually occurs under the following circumstances:

- An emergency has arisen that is so extreme as to warrant the negotiated procedure being pursued.
- The service or works being procured are largely identical to works previously executed by that contractor and it is not in the public interest to solicit other tenders.
- Only one contractor is identified as possessing the necessary experience and qualifications or products to provide the required service or works.

Private sector clients frequently negotiate contracts with the contractor of their choice where long-term relationships exist. Alternatively, to obtain competitive prices, they make use of the open, qualified or quotation procedure that comprises:

1. Employer solicits tender offers
2. Tenderer compiles tender offer and submits it to the employer
3. Employer compiles contract after evaluating tender offers

Calls for expressions of interest when used to pre-qualify or shortlist tenderers, provide the market with an advance warning of a tendering opportunity and give respondents time to become compliant with any of the prequalification criteria. This procedure ensures that:

Tenders are only received from tenderers who potentially have the necessary capabilities and capacities to perform the contact.

A manageable number of respondents are invited to submit tender offers (usually not less than five).

The negotiated procedure may be used where the following are present or imminent:

- Human injury or death.
- Human suffering or deprivation of human rights.
- Serious damage to property or financial loss.
- Injury, suffering or death to livestock or other animals.
- Serious environmental damage or degradation or interruption of essential services.

2.5.3 Structure of Procurement Documents

Procurement documents are used to solicit tender offers and form the basis for a contract.

The Standard for Uniformity in Construction Procurement provides a series of standard headings of component documents based on an "offer" and "acceptance" process.

Procurement documents comprise several component documents dealing with different topics grouped together in a logical sequence. The first cluster of documents contains only those documents that are relevant to the tender stage:

CONTENTS	FUNCTION AND BROAD OUTLINE OF CONTENTS
Number/Heading	

Table 2.9: Tendering Procedures

PART T1: TENDERING PROCEDURES		
T1.1	Tender Notice and Invitation to Tender	Alerts tenderers to the nature of the supplies, services and engineering and construction works required by the employer and should contain sufficient information to enable them to respond appropriately.
T1.2	Tender Data	States what the applicable conditions of tender are and where they may be found. Tender data also provides the variables for standardised conditions of tender.

In this approach, the employer will compile the contract using some of the returnable documents and the draft contract.

Alternatively, the employer may structure the document as follows in a single document:

- *T1.1 Tender Notice and Invitation to Tender.*
- *T1.2 Tender Data.*
- *T2.1 List of Returnable Documents.*
- *T2.2 Returnable Schedules.*
- *C1.1 Form of Offer and Acceptance.*
- *C1.2 Contract Data.*
- *C1.3 Forms of Securities.*
- *C1.4 Forms for Adjudicators Appointment*
- *C2.1 Pricing Instructions.*
- *C2.2 Activity Schedule/ Bill of Quantities.*
- *C3 Scope of Work.*
- *C4 Site Information.*

The document that is issued for tender purposes becomes the contract once the employer completes the acceptance portion of the Form of Offer and Acceptance.

Table 2.10: Returnable Documents

PART T2: RETURNABLE DOCUMENTS		
T2.1	List of Returnable Documents	Ensures that everything the employer requires a tenderer to submit with his tender is included in, or returned with his tender submission.
T2.2	Returnable Schedules	Contains documents that the tenderer is required to complete for the purpose of evaluating tenders and other schedules which upon acceptance become part of the subsequent contract.

The second cluster includes those documents that relate to the contract that will be created upon the acceptance of the tender.

Table 2.11: Agreements and Contract Data

PART C1: AGREEMENTS AND CONTRACT DATA		
C1.1	Form of Offer and Acceptance	Formalises the legal process of offer and acceptance.
C1.2	Contracts Data	States the applicable conditions of contract and associated contract specific data that collectively describe the risks, liabilities and obligations of the contracting parties and the procedures for the administration of the contract.

Table 2.12: Pricing Data

PART C2: PRICING DATA		
C2.1	Pricing Instructions	Provides the criteria and assumptions that it will be assumed (in the contract) that the tenderer has considered when developing his prices or target in the case of target and cost reimbursable contracts.
C2.2	Activity Schedule/Bill of Quantities	Records the contractor's prices for providing supplies/ services/engineering and construction works that are described elsewhere in a specification within the Scope of Work section of the contract.

Table 2.13: Scope of Work

PART C3: SCOPE OF WORK		
C3	Scope of Work	Specifies and describes the supplies, services, or engineering and construction works that are to be provided and any other requirements and constraints relating to the manner in which the contract work is to be performed.

Table 2.14: Site Information

PART C4: SITE INFORMATION (ENGINEERING AND CONSTRUCTION WORKS CONTRACTS ONLY)		
C4	Site Information	Describes the site as at the time of tender to enable the tenderer to price his tender and to decide upon his method of working, programming and risks.

The Standard for Uniformity in Construction Procurement requires that these headings be used with procurement documents (tender and contract).

Procurement documents capture the choices made by the client when conducting the process of offer and acceptance in the **tender data.** They capture the allocation of risks, liabilities and obligations of the parties, the procedures for the administration of the contract and the way disputes may be resolved in the contract data. **They also provide the basis for the following:**

- Paying the contractor in the **pricing data.**
- Specifying any measurable, tangible, verifiable outcome, result, or item that must be produced or completed (deliverable) and the constraints in doing so in the **scope of work.**

In the case of construction works, communicating the outcomes of surveys to tenderers in the site information, e.g., soil and ground conditions, the location and state of buildings or facilities that contractors may be expected to use or may be affected by the contractor's activities, environmental conditions, the number, and location of people who may be affected by the works, availability of materials, etc.

Contractors who are familiar with the standardised procurement documents of an organisation will only need to read the project specific sections for a project to know what the organisation requires. On the other hand, contractors who are not familiar with an organisation's standardised documents can quickly locate information that they may require if they have a working knowledge of the framework for the formatting and compilation of procurement documents provided in the Standard for Uniformity in Construction Procurement.

The commonly encountered pricing strategies include:

- *Lump sum*
- *Activity schedules*
- *Bills of quantities*
- *Cost reimbursable*
- *Target cost*
- *Schedules of rates*

(See section 2.5.)

2.5.4 Standard Forms of Contract

The conditions of a contract establish the risks, liabilities and obligations of the contracting parties and the procedures for the administration of the contract. They can be either purpose written for a particular project (bespoke contract) or they can be standardised in such a manner that they can be applied to a wide range of projects through project-specific data (form of contract).

Standard forms of contract that are published by industry-based organisations were negotiated over several years between different stakeholders and are fair to both the parties who have signed the contract. The Standard for Uniformity in Construction Procurement limits the range of forms of contract in use in the public sector in South Africa to the following:

- FIDIC (French Initials for International Federation of Consulting Engineers) (1999) (Short contract and Red, Yellow and Silver Books).
- General Conditions of Contract for Construction Works (GCC).
- JBCC Series 2000 (Principal Building Agreement and Minor Works Agreement).
- New Engineering Contract (NEC3) (Engineering and Construction Contract and Engineering and Construction Short Contract).

Purpose written and other forms of contract are not permitted.

Standard forms of contract may be purchased from the following organisations:

JBCC:	
ASAQS	(011) 315 4140
MBSA	(011) 805 6611 and regional offices
SAIA	(011) 486 0684 and regional offices
CESA	(011) 463 2022
GCC2004:	
CESA	(011) 463 2022
SAICE	(011) 805-5947
SAFCEC	(011) 455-1700
FIDIC:	
CESA	(011) 463 2022
SAFCEC	(011) 455-1700
NEC:	
SAICE	(011) 805-5947
ECS	(011) 803 3008

2.5.5 Standard Conditions of Tender

The cidb Standard Conditions of Tender contained in the Standard for Uniformity in Construction Procurement standardise the procurement processes, methods, and procedures from the time that tenders are invited to the time that a contract is awarded. They are generic in nature and are made project specific through choices that are made by the employer in developing the Tender Data associated with a specific project.

Table 2.15: Example of Tender Data

CLAUSE NUMBER	
Number/Heading	The conditions of tender are the Standard Conditions of Tender as contained in Annexure C of the cidb Standard for Uniformity in Construction Procurement. The Standard Conditions of Tender for Procurement make several references to the tender data for details that apply specifically to this tender. The tender data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the standard conditions of tender. Each item of data given below is cross-referenced to the clause in the standard conditions of tender to which it mainly applies.
C.1.1	The employer is ...

These conditions of tender establish a tenderer's obligations in submitting a tender and the employer's undertakings in soliciting and evaluating tender offers. They establish the rules from the time a tender is advertised to the time that a contract is awarded and require employers to conduct the process of offer and acceptance in terms of a set of standard procedures.

The conditions of tender also do the following:

- Bind the employer and tenderer to behave in a particular manner.
- Establish what a tenderer must do to submit a compliant (responsive) tender.
- Make known to tenderers the criteria by which the tenderer will be evaluated.
- Establish the way the employer will conduct the process of offer and acceptance.
- Provide the necessary feedback to tenderers on the outcomes of the process.

2.5.6 Structure of Documents Associated with a Call for Expressions of Interest

The groups of documents where expressions of interest are called for should comprise documents that are relevant to the admission to an electronic database or those required to shortlist or pre-qualify (or both) tenderers so that they may be invited to submit tender offers in respect of a particular procurement.

CONTENTS	FUNCTION AND BROAD OUTLINE OF CONTENTS
Number/Heading	

Table 2.16: Expression of Interest Documents

PART E1: SUBMISSION PROCEDURES		
E1.1	Notice and invitation to submit an expression of interest	Alerts respondents to submit their credentials to be admitted to an electronic database or to be invited to submit tenders should they satisfy stated criteria. This document should contain sufficient information to enable them to respond appropriately.
E1.2	Submission data	States what the applicable conditions for the calling for expressions of interest are and where they may be found. Submission data also provides the variables for standardised conditions for the calling for expressions of interest.
PART E2: RETURNABLE DOCUMENTS		
E2.1	List of returnable documents	Ensures that everything the employer requires a respondent to include in his submission is included in or returned with the a submission.
E2.2	Submission schedules	Contains documents that the respondent is required to complete for the purpose of evaluating submissions.
PART E3: INDICATIVE SCOPE OF WORK (WHERE APPROPRIATE)		
E3	Indicative scope of work	Indicates to respondents what the contract is likely to entail so that they can make an informed decision as to whether they wish to respond and if so, to structure their submission around the likely demands of the project.

2.5.7 Standard Conditions for the Calling for Expressions of Interest

Standard Conditions for the Calling for Expressions of Interest are provided in Annexure H of the cidb Standard for Uniformity in Construction Procurement to standardise the procurement processes, methods, and procedures where calls for expressions of interest are made.

These conditions establish the rules from the time a call for an expression of interest is advertised to the time that any submission is evaluated. They are generic in nature and are made procurement specific through Submission Data in much the same way that the Standard Conditions of Tender are made tender specific through the Tender Data.

2.5.8 South African National Standards Identified in the Scope of Work

The scope of work specifies and describes the construction works which are to be provided and any other requirements and constraints relating to the way the contract work is to be performed. Many of these requirements can be standardised and are covered in South African National Standards. Procurement documents establish requirements for the construction and management of the works by simply referring to them, e.g., the masonry wall shall be constructed in accordance with the requirements of SANS 2001-CM1.

An expression of interest is a request for tenderers to register their interest in undertaking a specific contract or to participate in a project or programme and to submit their credentials so they may, in terms of the organisation's procurement procedures, be invited to submit a tender offer should they qualify or be selected to do so.

Copies of these national standards may be purchased from Standards South Africa's head office in Pretoria (Tel: 012 428 7911) or from their regional offices. Alternatively, they can be purchased and downloaded in electronic format from the SABS Standards Web store - see www.sabs.co.za.

SABS

2.5.9 cidb Code of Conduct for the Parties Engaged in Construction Procurement

The cidb Code of Conduct for the Parties engaged in Construction Procurement requires that the parties in any public or private construction-related procurement should comply in their dealings with each other as follows:

a Behave equitably, honestly, and transparently.

b Discharge duties and obligations timeously and with integrity.

c Comply with all applicable legislation and associated regulations.

d Satisfy all relevant requirements established in procurement documents.

e Avoid conflicts of interest.

f Not maliciously or recklessly injure or attempt to injure the reputation of another party.

The Board is empowered by the Construction Industry Development Board Act to enforce this code of conduct. The Board may fine those who breach the code of conduct in an amount not exceeding R100 000,00 or remove their names from the RoC for a period.

2.5.10 The Promotion of Administrative Justice Act

Decisions made in the public sector regarding actions taken in the evaluation and award of a contract is an administrative decision, and as such is subject to the Promotion of Administrative Justice Act, 2000 (Act 3 of 2000). The Act gives effect to the rights provided for the Bill of Rights in Section 33 of the Constitution (Act 108 of 1996), namely that everyone has the right to administrative action that is lawful, reasonable, and fair and must be furnished with written reasons where their rights have been adversely affected by administrative action. The Constitution also provides for the review of administrative action by a court, or where appropriate, an impartial tribunal, and imposes a duty on the state to give effect to the rights provided for.

The Act establishes fair administrative procedures, permits those affected by unfair administrative action to request written reasons for such administrative action within 90 days of, or when they became aware of, such actions and requires administrators to respond within 90 days of receipt of such requests. Administrative actions are presumed to be taken without good cause where an administrator fails to respond within the prescribed period.

The Act also provides for procedures for the judicial review of administrative actions and remedies in proceedings for judicial review including the prohibition of an administrator from acting in a particular manner, setting aside the administrative action, correcting the defective action and the ordering of the administrator to pay compensation.

Contractors, accordingly, have the right to challenge decisions made by officials and their agents regarding any aspects of procurement in terms of this Act should they have reason to believe that such a decision is biased, unfair, contrary to the conditions of tender or incorrect.

2.5.11 Promotion of Access to Information Act

The Promotion of Access to Information Act 2 of 2000 gives effect to the constitutional right of access to any information held by the State and any information that is held by another person and that is required for the exercise or protection of any rights.

2.5.12 Protection of Personal Information Act

The Protection of Personal Information Act 2013(PoPIA or the PoPI Act) is a piece of legislation which governs the law of data protection and privacy in South Africa. The act was passed to regulate the right to privacy, as enshrined by section 14 of the Constitution of South Africa, and would work in conjunction with the Promotion of Access to Information Act.

The PoPI Act sets out several core obligations. Some of the key requirements include:

1. Personal information can only be processed
   - with the consent of the data subject; or
   - if it is necessary for the conclusion or performance of a contract that a data subject is a party to; or
   - it is required by law; or
   - it protects a legitimate interest of a data subject; or
   - if processing is necessary for pursuing the legitimate interests of the responsible party or of a third party to whom the information is supplied.
2. Private and public entities must report data leaks to the affected people and the Information Regulator.
3. Organisations must appoint a responsible person who must ensure compliance to the PoPI Act.
4. Cross-border transfers of personal data are restricted.
5. Organisations that process personal information must ensure they satisfy minimum security obligations.
6. Direct marketing, the sale and use of electronic directories and automated decision making are also severely curtailed.
7. The act elevates the obligations placed on entities that process information regarding children, religious beliefs, race, ethnic origin, trade union membership, health, sex life, criminal behaviour and biometric information.

2.5.13 The Public Protector

The Public Protector Act (Act 23 of 1994) permits the public to raise issues and empowers the Public Protector, acting as an ombudsman, to investigate, report on and take the necessary remedial action on any conduct in state affairs or in the public administration, which is alleged or suspected, to be improper or to result in any impropriety or prejudice.

2.5.14 Prevention and Combating of Corrupt Activities Act

The Prevention and Combating of Corrupt Activities Act, 2004 (Act 12 of 2004), which is applicable to both the public and private sector, makes corruption and related activities an offence.

Corrupt activities giving rise to offences include the following:

- Improperly influencing in any way, the promotion, execution, procurement, or retention of any contract.
- The fixing of the price, consideration or other monies stipulated or otherwise provided for in any contract.
- Manipulating by any means the award of a tender.
- Manipulating by any means the outcome of an auction.
- Public officers having a private interest in a contract connected with the public body that employs them except where the interest is in a stock exchange listed company or their conditions of employment do not prohibit such involvement in a contract.

The direct or indirect offering or receiving of gratifications underlies the above-mentioned corrupt activities. Gratification in terms of the Act includes:

a. Money, whether in cash or otherwise.

b. Any donation, gift, loan, fee, reward, valuable security, property, or interest in property of any description, whether movable or immovable or any other similar advantage.

c. The avoidance of a loss, liability, penalty, forfeiture, punishment, or other disadvantage.

d. Any office, status, honour, employment, contract of employment or services, any agreement to give employment or render services in any capacity and residential or holiday accommodation.

e. Any payment, release, discharge or liquidation of any loan, obligation, or other liability whether in whole or in part.
f. Any forbearance to demand any money or money's worth or valuable thing.
g. Any other service or favour or advantage of any description, including protection from any penalty or disability incurred or apprehended or from any action or proceedings of a disciplinary, civil, or criminal nature, whether already instituted, and includes the exercise or the forbearance from the exercise of any right or any official power or duty.
h. Any right or privilege.
i. Any real or pretended aid, vote, consent, influence, or abstention from voting.
j. Any valuable consideration or benefit of any kind, including any discount, commission, rebate, bonus, deduction, or percentage.

The Act also makes it an offence to be an accessory to or after the above-mentioned offences as well as to attempt, conspire or induce another person to commit such offences.

Persons convicted of an offence may be fined or imprisoned. The Act also allows the courts to impose an additional fine equal to five times the value of the gratification, and in the case of offences in respect of corrupt activities relating to contracts and the procuring and withdrawal of tenders, to order that the particulars of the convicted person or firm be put on a Register of Tender Defaulters that will be open to the public.

In terms of the Act, National Treasury must determine the period of restriction (not less than five years and more than 10 years) and may in addition terminate any agreement with the person or enterprise concerned. Clients must disqualify and ignore all tenders received from such persons and enterprises.

The Act places a duty of care on accounting officers and accounting authorities to report known or suspected cases of corruption to a police officer, failing which, they are guilty of an offence.

2.5.15 Prevention of Organised Crime Act

The Prevention of Organised Crime Act (POCA) 121 of 1998 is a law designed:

a. To introduce measures to combat organised crime, money laundering and criminal gang activities.
b. To prohibit certain activities relating to racketeering activities.
c. To provide for the prohibition of money laundering and for an obligation to report certain information.
d. To criminalise certain activities associated with gangs.
e. To provide for the recovery of the proceeds of unlawful activity.
f. For the civil forfeiture of criminal assets that have been used to commit an offence or assets that are the proceeds of unlawful activity.
g. To provide for the establishment of a Criminal Assets Recovery Account.

SECTION 2.6:
TENDERING FOR PUBLIC SECTOR WORK

2.6.1 Requirements for Public Sector Construction Procurement

Public sector procurement is regulated through several pieces of legislation. Construction procurement in the public sector, apart from being regulated in terms of general legislation governing public procurement, is also regulated through the following cidb prescripts that have been issued in terms of the Construction Industry Development Board Act 38 of 2000:

- cidb Code of Conduct for the Parties engaged in Construction Procurement.
- cidb Standard for Uniformity in Construction Procurement.

These prescripts are applicable to all organs of state, i.e. all national and provincial departments, constitutional institutions, public entities, municipalities and municipal entities (see section 2.4).

2.6.2 Understanding the cidb Standard Conditions of Tender

The cidb Standard Conditions of Tender contained in the Standard for Uniformity in Construction Procurement standardise the procurement processes, methods, and procedures from the time that tenders are invited to the time that a contract is awarded. These conditions of tender establish a tenderer's obligations in submitting a tender and the employer's (client's) undertakings in soliciting and evaluating tender offers. As such, they establish the rules from the time a tender is advertised to the time that a contract is awarded and require employers to conduct the process of offer and acceptance in terms of a set of standard procedures (see section 2.4).

Remember that:

a. Contractors are bound to act in accordance with the cidb when preparing and submitting tenders and engaging with the employer during the tender process (see Clause C.1.1 of the cidb Standard Conditions of Tender).
b. The contractors may only communicate with the employer's agent who is named in the Tender Data during the tender process associated with a particular tender (see Clause C.1.4).
c. Communications between the contractor and the employer are to be in writing and in English (see Clause C.1.4).
d. The employer will usually not pay for any of the costs associated with the preparation of tenders (see Clause C.2.2).
e. It is the contractor's responsibility to check that the documents are complete. (The Tender Data entered against Clause C.1.2 will list the documents comprising the tender. Check that all the sections have been included in the tender document and each section has no missing pages).

The contractor is responsible for the following:

a. Making use of the latest versions of the conditions of contract, specifications and standards that are referenced in the tender documents when preparing a tender (see Clause C.2.5).
b. Acknowledging the receipt of any addenda (amendments) to the tender document issued by the employer (see Clause C.2.6).
c. Requesting clarifications from the employer regarding the intent and meaning of the tender documents (see Clause C.2.8).
d. Obtaining advice on the adequacy of any insurance cover provided by the employer (see Clause C.2.9).
e. Alterations made by the contractor to the tender to correct errors in completing the submission must be initialled by the person responsible for signing the offer portion of the Form of Offer and Acceptance (see Clause C.2.11).
f. The contractor must ensure that all the information or data that is requested is submitted in the form that is required (see Clause C.2.14).

cidb Code of Conduct for all Parties involved in Construction Procurement

a. Behave equitably, honestly and transparently.
b. Discharge duties and obligations timeously and with integrity.
c. Comply with all applicable legislation and associated regulations.
d. Satisfy all relevant requirements established in procurement documents.
e. Avoid conflicts of interest.
f. Not maliciously or recklessly injure or attempt to injure the reputation of another party.

Clause C.2.1 (eligibility) allows the employer to set criteria in the Tender Data relating to a tenderer's capacity and capability to perform the contract. Only those tenderers that satisfy such criteria are permitted to submit a tender offer.

g. The contractor must provide clarifications and other material that has a bearing on the tender offer in response to requests raised by the employer within the time frames stated by the employer (see Clauses C.2.17 and C.2.18).
h. The employer may negotiate the final terms of the tender with the contractor that is identified in terms of a competitive selection process (see Clause C.2.17).

2.6.3 Submitting a Compliant (Responsive) Tender Offer

The activities that are associated with the submission of a compliant (responsive) tender are:

1. **Confirm that the eligibility criteria are complied with (Clause C.2.1).**

   Contractors must satisfy the eligibility criteria that are stated in the Tender Data to have their tenders evaluated.

   Eligibility criteria are frequently highlighted in the Tender Notice and Invitation to Tender. Contractors are advised not to obtain tender documents if they are not able to satisfy eligibility criteria as there is no point in spending time and energy on preparing and submitting a tender if the business cannot satisfy the eligibility criteria.

   All public sector tenders for construction works require that only those contractors who are registered with the cidb in an appropriate contractor grading designation are eligible to have their tenders evaluated. The Tender Notice and Invitation to Tender gives an indication of the grading requirements while the Tender Data states the exact requirements.

   The Construction Industry Development Regulations disallows the evaluation of tender offers from registered contractors who tender above their designated tender value range (except where the margin by which the tender value range is exceeded is reasonable) and are not registered in the required class of construction works.

   What this regulation means is that a contractor must be registered in the class of construction works stipulated in the Tender Data. They should tender an amount inclusive of VAT within the limits of the tender value range associated with their contractor grading designation to ensure that their tender offer is evaluated. They may tender above their tender value range, but are not guaranteed that the employer will evaluate their tender offer unless the margin by which they exceed the limits is very low (say 5 to 10%).

   This regulation accordingly provides the employer with some discretion to evaluate tenders that are just above the threshold associated with a contractor grading designation and to award a contract to a contractor outside of its tender value range provided that the employer is satisfied that the contractor has the capabilities and capacity to perform the contract.

   The Construction Industry Development Regulations permit employers to evaluate tender offers received from unregistered contractors who are capable of being registered in the required contractor grading designation prior to the evaluation of tenders. What this means is that contractors must have made an application that is complete in all respects to the cidb for registration in a contractor grading designation by the time that employers start comparing tender offers. The contract will, however, not be awarded to a contractor unless it is registered.

   The regulations do allow a registered potentially emerging enterprise to be awarded a contract in one contractor grading designation higher than they are registered, provided that the employer:

   - Is satisfied that the contractor has the potential to develop into and qualify for registration in a higher grade.
   - Ensures that financial, management or other support is provided to that contractor to enable the contractor to successfully execute the contract.

   Employers must indicate whether this provision will be applied in the Tender Notice, Invitation to Tender and in the Tender Data.

Joint ventures need not be registered with the cidb if all the partners in a joint venture are registered with the cidb, and the lead partner is registered in the required class of construction works. The contractor grading designation of such a joint venture is calculated by using the calculator on the registers section of cidb's website www.cidb.org.za.

The "effective" contractor grading designation calculated by the calculator is the contractor grading designation of the joint venture. Alternatively, the table for deemed contractor grading designations for joint ventures may be used. Higher contractor grading designations may in some instances be obtained from the cidb calculator.

Table 2.17: Deemed Contractor Grading Designations in Joint Ventures

JOIN VENTURE DESIGNATION	DESIGNATION OF REGISTERED CONTRACTORS (PARTNERS) IN JOINT VENTURE
3	3 partners in designation 2
4	3 partners in designation 3
5	2 partners in designation 4 *or* 1 partner in designation 4 and 2 partners in designation 3
6	2 partners in designation 5 *or* 1 partner in designation 5 and 2 partners in designation 4
7	2 partners in designation 6 *or* 1 partner in designation 6 and 2 partners in designation 5
8	3 partners in designation 7
9	3 partners in designation 8

The contractor grading designations that are shown in the Tender Notice and Invitation to Tender provide an indication of what the likely requirements are. They are usually on the low side so that eligible contractors are not unfairly excluded due to estimates being inaccurate or where the estimated value is close to a tender value range threshold.

Note: Lead partner must be registered in required class of work.

2. Attend the clarification meeting (Clause C.2.7)

The employer may make the clarification (site) meeting compulsory for tenderers to attend. Failure to attend a compulsory clarification meeting will result in a tender not being considered. It is important for a contractor to attend any compulsory clarification meeting if it intends submitting a tender offer.

Details of the place and time of the clarification meetings are to be found in the Tender Notice and Invitation to Tender.

3. Follow the instructions for pricing the tender offer (Clause C.2.10)

The contractors must base their price on all duties, taxes (other than VAT) and any other levies payable as they were 14 days before the closing time for tenders. VAT must be shown separately. The prices must be fixed (not subject to price adjustment due to inflation or increases or decreases in the prices of certain commodities), unless the Contract Data makes provision for price adjustment.

The prices tendered must be in Rand unless otherwise specified in the Tender Data.

4. Follow instructions when submitting alternative offers (Clause C.2.12)

Unless otherwise stated in the Tender Data, an alternative tender offer may only be submitted if a fully compliant tender offer that satisfies the requirements of the procurement documents is also submitted. Accordingly, a contractor must be prepared to construct the works in accordance with the specifications provided in the procurement documents if it wants to submit an alternative tender.

The Tender Data may prohibit the submission of any alternative offer. Alternatively, the Tender Data may permit the submission of an alternative offer if it complies with specified criteria without having to submit a tender based on that specified in the scope of work of the procurement documents.

Clarification or site meetings provide tenderers with an opportunity to raise points of clarity with the employer. Such meetings enable employers to obtain the names and addresses of potential tenderers. It provides tenderers with an opportunity to see who they are likely to be tendering against.

A contractor should carefully study the Tender Data that deals with the submission of an alternative tender before considering the submission of an alternative tender.

The List of Returnable Documents that is found in Part 2 of the procurement documents indicates which documents are to be completed and which certificates are to be submitted as part of the tender submission.

5. Follow instructions in submitting a tender offer (Clause C.2.13) Contractors must ensure that they comply with the following:

a. Submit an offer for the whole of the works unless the Tender Data states that this is unnecessary.
b. Return all returnable documents after they have been completed in their entirety either electronically or in black ink.
c. Submit the number of copies stated in the Tender Data.
d. Sign the original and all copies of the tender offer.
e. State which of the signatories in a joint venture is the lead partner who may be held liable for the tender offer.
f. Seal the original and each copy in a package marked as "original" or "copy".
g. State their names and addresses, as well as any specific information stated in the Tender Data on each package that is submitted.
h. Seal the original tender and copy packages in an outer package that states the employer's address and identification details as stated in the Tender Data.

6. Ensure that the tender offer is received by the employer before the closing time for tenders (Clause C.2.15)

Tender Tips

- Tenders received after the closing time for tenders will be returned unopened even if they are one minute late!
- Employers may be requested to extend the closing time for tenders should they issue addenda to allow tenderers to consider any changes in requirements.
- Contractors should consider requesting an extension to the closing date should the employer issue addenda that significantly change requirements within one week of the closing date.
- Clarification or site meetings provide tenderers with an opportunity to raise points of clarity with the employer. Such meetings enable employers to obtain the names and addresses of potential tenderers. It provides tenderers with an opportunity to see who they are likely to be tendering against.
- A contractor should carefully study the Tender Data that deals with the submission of an alternative tender before considering the submission of an alternative tender.
- The List of Returnable Documents that is found in Part 2 of the procurement documents indicates which documents are to be completed and which certificates are to be submitted as part of the tender submission.

7. Consider extending the tender validity period (Clause C 2.16)

The conditions of tender hold tender offer valid for an acceptance period stated in the tender data (normally eight weeks and in exceptional circumstances up to 12 weeks). If the employer has not awarded a contract during this period, the employer may request tenderers to extend this period as it is unfair to hold a tenderer for lengthy periods without providing them with an opportunity to withdraw their tender.

Contractors are not obliged to extend the validity period and are permitted to make such extension subject to price escalation being provided for the extended validity period if such provisions are not already provided for (Most contracts use the month during which the tenders closed as the base month to calculate price escalation.) It must, however, be remembered that any price adjustment will be reflected in the evaluation of the competitiveness of their tender offer.

2.6.4 Basis Upon Which the Employer Will Evaluate Tenders

Employers will process and evaluate tenders in accordance with the conditions of tender. Employers will accordingly:

01

OPEN AND RECORD TENDER OFFERS RECEIVED:

Where a two-envelope system is not used

- Open tender offers immediately after the closing time for receipt of tender submissions in the presence of tenderers' agents and announce and record pertinent data, if (see Clauses C.3.4 and C.2.13):
  - submitted in sealed envelopes;
  - annotated with the required particulars; and
  - placed in the nominated tender box or delivered to the specified place for receipt of tender submissions.
- Make available name, price and preferences claimed to interested parties who request such information.

Where a two-envelope system is used

- Open the technical proposal in the presence of the tenders' agents and announce the name of each tenderer. Evaluate the quality of the technical proposals.
- Open the financial proposals of tenderers who score above the minimum number of points for quality stated in the Tender Data and announce the score in the presence of the tenderers' agents.
- Return unopened any financial proposals received from those tenderers who failed to achieve the minimum number of points for quality.
- Return unopened tenders that are (see Clauses C.3.3, and C.3.8):
  - received late;
  - by a method other than the prescribed method; or.
- Consider declaring as non-responsive tender offers not received in the form required i.e. tenders which are submitted in a format or on forms other than those prescribed in the tender documents (see Clause C.2.14).
- Reject all tender offers submitted by telegraph, telex, facsimile or e-mail, unless stated otherwise in the tender data (see Clause C.2.13).

02

Determine whether or not tender offers are complete

- Compare tender submission against list of returnable documents (document T2.1) contained in the procurement document and identify schedules and component documents that have not been returned or are incomplete (see Clauses C.3.8, C.2.13, C.2.14, C.2.18, C.2.6).
- Request tenderers to complete incomplete documents (only if such information does not change or effect the competitive position of a tenderer) within a reasonable period of time so that their tenders are capable of being evaluated.
- Record what is incomplete in each tender offer, i.e. what is incomplete regarding the financial offer, quality offered, and preference claimed.
- Confirm that tenderers took any addenda that were issued into account in their submission (see Clause C.2.6).

03

Determine whether or not tender offers are responsive

- Confirm compliance with all the requirements of the Standard Conditions of Tender, i.e. that:
  - Eligibility criteria are complied with (see Clause C.2.1).
  - The tenderer attended compulsory site/clarification meetings, if any (see Clause C.2.7).
  - The tenderer has observed pricing instructions (see Clause C.2.10).
  - Alterations, if any, comply with instructions (see Clause C.2.11).
  - Conditions attached to alternative tender offers where alternative tenders have been submitted, have been met (see Clause C.2.12).
  - The tender offer covers the scope of work contained in the procurement document and, where applicable, meets the performance or functional requirements of the specifications or is equivalent in performance to that specified.
  - The tenderer has signed the form of offer and acceptance (see Clause C.2.13).
  - Access to premises for inspections, tests and analysis as provided for in the tender data was provided (see Clause C.2.19).
  - The securities, bonds, guarantees, policies and certificates of insurance required have been submitted (see Clause C.2.20).
  - The required certificates have been submitted (see Clause C.2.23).
- Identify areas of non-compliance with the terms, conditions and scope of work, and determine if any deviation is material using the test for material deviation provided in Clause C.3.8.
- Review all qualifications made to the offer and determine if any of them are material using the test for material qualification provided in Clause C.3.8.
- Declare tender offers non-responsive and reject them as such should they (see F.3.8):
  - Fail to comply with the requirements of i) above.
  - Fail to provide additional information that is requested by the due date (see clause C.2.18).
  - Not have a signed and completed form of offer and acceptance.
  - Contain material deviations or qualifications.
- Record reasons for declaring a tender to be non-responsive.

04

Evaluate tender offers (see Clause C.3.11)

- Identify parameters included in the returnable documents that have a bearing on the financial offer, e.g. life cycle costs, contract period, requirement for price escalation, etc. and quantify their impact on the financial offer.
- Reduce all tender offers to a common base, i.e. to comparative offers.
- Judge the reasonableness of financial offers and reject all tender offers with unrealistic financial offers.
- Confirm that tenderers are eligible for the preferences claimed in the preference schedule or the reasonableness of any tendered contract participation goal (or both). (No preferences may be granted to incomplete claims for preferences.)
- Score the financial offer of all responsive tender offers received to two decimal points using the appropriate formulae. (Score incomplete quality submissions in so far as they may be scored.)
- Score quality for each of the categories stated in the tender data and calculate the total score for quality and record score.
- Eliminate tender offers that do not score the minimum number of points for quality stated in the tender data.
- Award tender evaluation points for the category of preference or in proportion to the tendered contract participation goal to each eligible tenderer (or both), in the manner described in the relevant Preferencing Schedule.
- Total tender evaluation points in accordance with requirements in the Tender Data and rank tenderers.

05

Determine if there are any grounds for disqualification (see Clause C.3.7)

Determine whether or not the highest ranked or scoring tenderer has been engaged in corrupt or fraudulent practices and if so, instantly disqualify the tenderer.

06

Determine acceptability of preferred tenderer

- Confirm that the highest-ranked or scoring tenderer (preferred tenderer):
  - Is not under any restrictions or has principals who are under any restrictions from participating in public procurement.
  - Can demonstrate that the tenderer possesses the necessary professional and technical qualifications, professional and technical competence, financial resources, equipment and other physical facilities, managerial capability, reliability, experience and reputation, and the personnel to perform the contract.
  - Has legal capacity to enter into a contract.
  - Is not insolvent, in receivership, bankrupt or being wound up, or has its affairs administered by a court or a judicial officer, has suspended its business activities, or is subject to legal procedures in respect of any of the foregoing.
  - Satisfies legal requirements.
  - Does not have conflicts of interest that may impact on the tenderer's ability to perform the contract in the best interests of the employer.
- Review bill of quantities or pricing schedules of the preferred tenderer and, if any, for arithmetical errors, omissions, and discrepancies in accordance with the provisions of clause C.3.9 and, if relevant, clarify if the tendered or corrected price is to apply.
- Perform a risk analysis on the preferred tenderer to ascertain if any of the following, as relevant, present an unacceptable commercial risk to the employer:
  - unduly high or unduly low tendered rates or amounts in the tender offer;
  - contract data provided by the employer; or
  - the contents of the tender returnables that are to be included in the contract.
- Approach tenderer to amend any part of the tender submission that presents an unacceptable commercial risk, if relevant (see also Annexure D).
- Clarify any matter that could give rise to ambiguity in a contract arising from the tender offer (see Clause C.3.10).
- Recommend the highest-ranked tenderer or tenderer with the most evaluation points for the award of the contract, or if found to be unsatisfactory, undertake an analysis on the next highest-ranked tenderer and so on until such time as a tenderer satisfies the risk assessment (see Clause C.3.11).

07

Prepare a tender evaluation report

Prepare a tender evaluation report, preferably using the following headings and appropriate forms:

- Section 1: Summary
- Section 2: An overview of the tender evaluation process
- Section 3: Tender evaluation forms
- Section 4: Reasons for the elimination of tenderers
- Section 5: Recommendations for the award of the tender

08

Confirm the recommendation contained in the tender evaluation report

Submit the tender evaluation report to the persons identified in the employer's procurement policy for their confirmation of the recommendation for the award of the contract.

SECTION 2.7:
PRICING STRATEGIES

2.7.1 Understanding the Pricing Strategy of the Tender

The pricing strategy is the method that an employer (client) uses to obtain a price for construction works and to pay the contractor for work completed. There are several different pricing strategies.

The employer or his professional team usually decides which pricing strategy to use for a particular project. The procurement documentation states what pricing strategy will be used.

The contract sets out what the employer's and the contractor's risks are. The contractor prices for all his risks and is entitled to claim costs associated with events that are the employer's risk.

2.7.2 Bills of Quantities

Bills of quantities are the most common form of pricing strategy used where the contractor undertakes construction on the basis of full designs issued by the employer. The employer arranges for the bills of quantities to be prepared, usually in accordance with a standard system of measurement. These bills of quantities break the work down into several items that the contractor is required to price. The contractor is paid an amount for work completed based on the rate in the bills of quantities multiplied by the quantity of work completed.

Different pricing strategies place varying levels of risk on the contractor, depending on how involved the client is in the management and execution of the project.

Table 2.18: Example of a Bill of Quantities

ITEM	REF.	DESCRIP.	UNIT	QTY	RATE %	PRICE

2.7.3 Schedules of Rates

Schedules of rates are used where employers are unsure of the exact quantities that will be required during the contract. Schedules of rates identify the items that will probably be constructed. The contractor is required to submit rates only for each item and is paid an amount for work completed based on the rate in the schedule of rates multiplied by the quantity of work completed.

Prices may be fixed or be subject to price adjustment to take account of fluctuations in the cost of labour, equipment, fuel, and materials.

2.7.4 Lump Sum Prices

Lump sum prices are used where the employer pays the contractor a lump sum upon the completion of the contract. (Interim payments are often provided for based on a reasonable estimate of the value of the work completed.)

2.7.5 Activity Schedules

Activity schedules are used where the employer or the contractor identifies activities that are to be performed during the contract, based on a construction programme and the scope of the work. These activities are captured in an activity schedule. The contractor submits a price for each activity and is paid the amount for an activity when the activity has been completed. (The total of the activity prices is the total price for the contract work.)

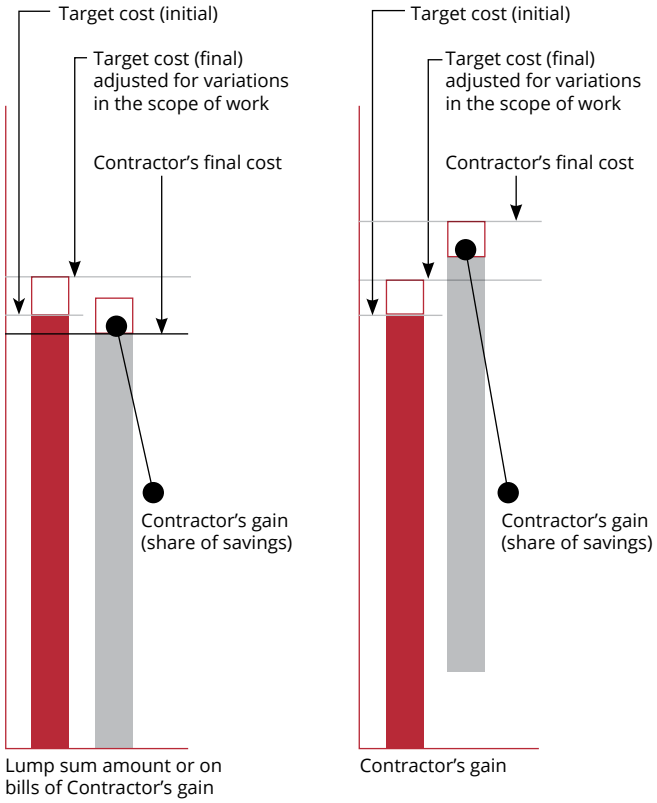
2.7.6 Cost Reimbursable Contract

In a cost reimbursable contract, the contractor is paid an agreed percentage fee to cover his overheads and profit and is reimbursed at market related rates for predefined cost items.

2.7.7 Target Cost Contract

In a target cost contract, the contractor is paid his costs as defined in the contract, based on his tendered cost parameters and at the end of the contract, the contractor is paid (or pays) his share of the difference between the agreed target cost and his cost according to an agreed formula. If the final cost is less than the target cost, the contractor is paid his share of the saving. If the final cost is greater than the target cost, the contractor pays his share of the difference. This motivates the contractor to control costs. The target price is usually agreed at the time that the contract is concluded.

Figure 2.1: Target Cost Concept



2.7.8 Standard Pricing Strategies for Main Contractors

The JBCC Principal Building Agreement (PBA) and JBCC Minor Works Agreement (MWA) allow tenders to be based on either a lump sum amount or on bills of quantities. Contractors are required to price the bills of quantities to arrive at a contract sum. The rates in the bills of quantities are used as the basis for paying for additional work that may be required.

Alternatively, contractors are required to provide a lump sum for the works and to complete a schedule of rates that provides a basis for paying for any additional work that may be required. Where work is not covered by these rates, new rates with a markup of 10% must be agreed or the actual cost plus 10% is paid.

The JBCC PBA makes provision for interim payments in lump sum contracts, based upon a reasonable estimate of the works completed and allows bills of quantities to include prime cost amounts (amount included in the contract sum for the delivery cost of materials and goods obtained from a supplier as instructed by the employer's principal agent) and budgetary

The JBCC PBA and MWA require that the rates in the bill of quantities be adjusted where additional work or work identified as being provisional is not of a similar character or executed under similar conditions.

GCC 2025 allows the general items (items in the bills of quantities that relate to general obligations, site services and facilities) to be adjusted if the final contract price before any adjustment for escalation exceeds the contract price when the contract was awarded, less any contingency amounts, by 15% or more.

allowances (sum of money included in the contracts for work intended for execution by the contractor, the extent of which is identified but not detailed). Contractors are required to price their overheads and profit on prime cost amounts but not for budgetary allowances as these items are treated as additional work.

The General Conditions of Contract for Construction Works (GCC) (2025) allow for any pricing strategy that is described in the pricing data. It does contain standard provisions for bills of quantities and the measurement of variations in a similar manner to the JBCC agreements. Where work is not covered by the rates, payment may be made in terms of day works rates and a percentage allowance for overheads and profit tendered and accepted by the contractor.

The FIDIC Conditions of Contract for Construction for Building and Engineering Works designed by the Employer (Red Book) contains standard provisions for bills of quantities and the measurement of variations in a similar manner to the JBCC agreements and GCC 2025.

These conditions, however, permit a new rate to be determined where items are not specified as "fixed rate items", e.g.:

- The measured quantity for an item is increased or decreased by more than 10%.
- This change in quantity multiplied by the rate for the item exceeds 0,01% of the Accepted Contract Value.
- This change in quantity directly changes the cost per unit quantity of the item by more than 1%.

The FIDIC Short Form of Contract, on the other hand, makes provision for payment to be made in terms of a lump sum, a lump sum price with schedule of rates, a lump sum with bill of quantities and remeasurement of the tender bill of quantities. Variations are, as appropriate, based on a lump sum agreed between the employer and contractor, at rates in the contract or based on rates in the contract, new agreed rates or at the day work rates provided for in the contract.

Variations are, as appropriate, based on a lump sum agreed between the employer and contractor, at rates in the contract or based on rates in the contract, new agreed rates or at the day work rates provided for in the contract.

The NEC3 Engineering and Construction Works Contract provides for the following options:

A: Priced contract with activity schedule.
B: Priced contract with bill of quantities.
C: Target contract with activity schedule.
D: Target contract with bill of quantities.
E: Cost reimbursable contract.
F: Management contract.

The NEC3 contract deals with all changes in the scope of work in terms of a compensation procedure. Compensation events are events that are at the employer's risk under the contract and entitle the contractor to an assessment of the effect the event has on the prices and the completion date. Contractors are required to submit a quotation for compensation events based on the contractor's forecast on their impact upon the cost in carrying out the works at the time the event is assessed.

Use is made of a cost component schedule with tendered fees and parameters to develop a quotation. In option A, the contractor takes the bulk of the financial risk while the employer carries some risk through the compensation event procedure. Option B transfers a little more of the risk to the employer who takes a risk of his quantity assessment being changed in final construction. (Any increase or decrease in the bills of quantities is a compensation event if it causes the cost per unit of quantity to change and the rates for the item multiplied by the final total quantity of work is more than 0,5% of the total of prices at the start of the contract.)

Options C and D allows for a spread of risk between the priced and cost reimbursable extremes. Adjusting the target share between the employer and contractor will vary the risk between one principally carried by the employer to one principally carried by the contractor, and to any stage in between those extremes. In option E the employer takes the bulk of the risk but has complete flexibility. The contractor does, however, carry some risk as he has to allow for the "disallowed costs". Option F is a cost reimbursable contract as the contractor is paid costs plus a percentage fee; the cost being the cost of works subcontracted to others and the fees for his management services.

The NEC3 Engineering and Construction Short Contract makes provision for activity schedules and bills of quantities. Quotations are submitted for compensation events, based on market-related costs and the percentages for overheads and profit tendered by the contractor.

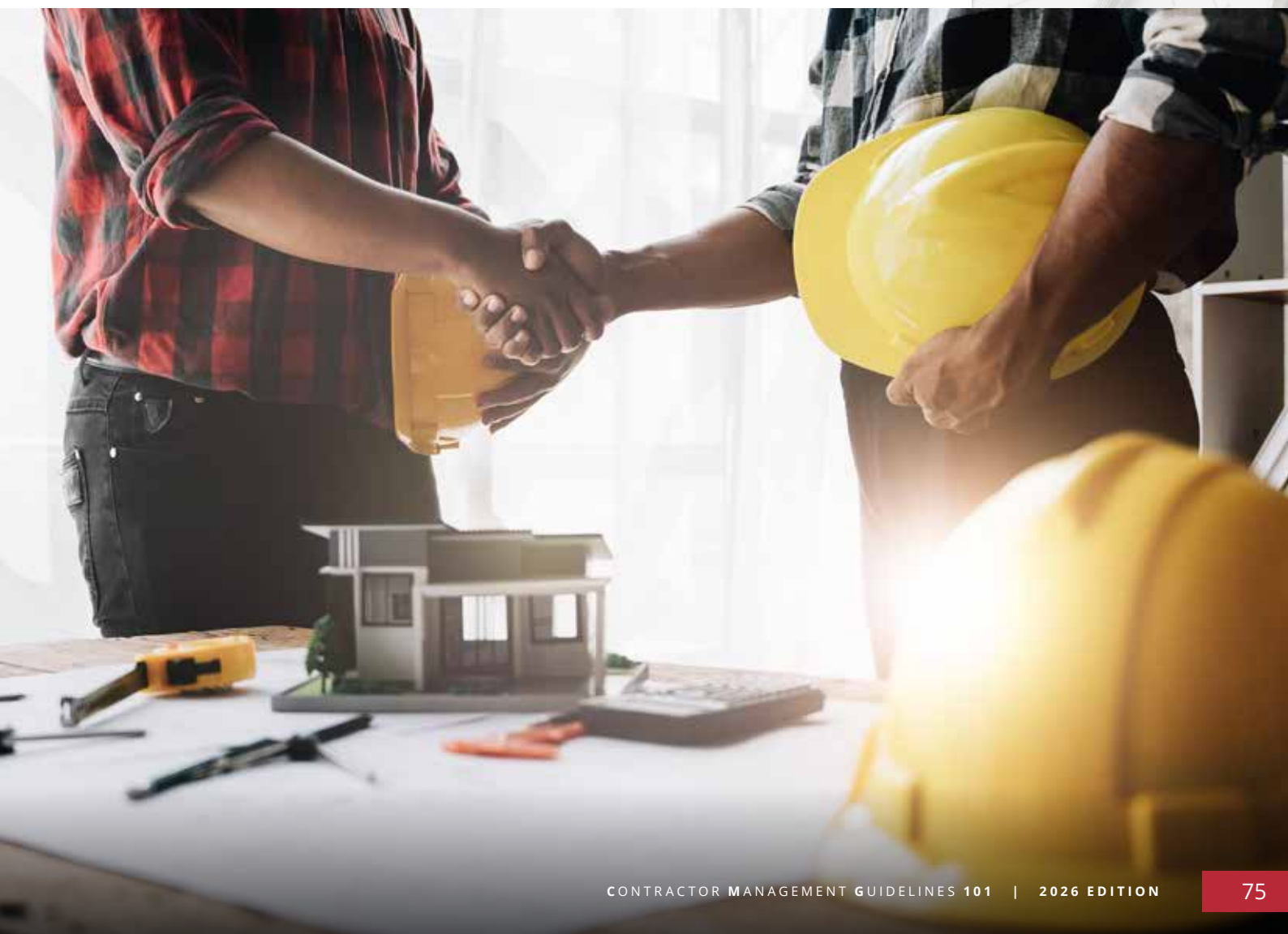
Table 2.19: Schedule of Cost Components

#	COMPONENT	AMOUNT (RANDS)
1	People	R
2	Equipment	R
3	Plant and materials	R
4	Charges	R
5	Manufacture and fabrication	R
6	Design	R
Cost of works not subcontracted		R

Cost of works not subcontracted x direct fee percentage = R ..... fee 1

Subcontracted amount x subcontracted fee percentage = R ..... fee 2

Amount due = defined cost + subcontracted amount + Fee 1 + Fee 2



SECTION 2.8:
PRICING A TENDER

2.8.1 Building up a Tender Price

Tender prices can be built up by considering several components including:

- **General items:** being the items to cover the charges for compliance with contractual obligations (i.e., insurance; performance guarantees; provision of accommodation, equipment and support for the employer's staff or agents; samples, shop drawings and testing of materials; temporary works; and supervision) and the provision, maintenance and removal of site facilities (accommodation and buildings, services, communications and equipment).
- **Construction (work) content:** being the price of all the items that are to be constructed or built.
- **Overheads:** being the operating (every day) expenses incurred in the upkeep of the business and its offices that are not attributable to individual contracts including total cost of office personnel (salaries, allowances, medical aid contributions, pension fund contributions, etc.), office costs (rentals or ownership expenses, building maintenance, telephone, photocopying, etc.), vehicles (ownership costs, hire costs, maintenance, fuel, licensing, etc.) and finance charges.
- **Risk allowance:** being an allowance (contingency) to cover the perceived risk associated with poor estimates of the cost of general items and construction content, inflationary increases in materials, plant, equipment, labour and fuel covered in the contract, bad weather, construction difficulties, community difficulties, delays in payment, poor workmanship, poor tender documentation, completeness of drawings and details, tolerances required, ground conditions, time allowed for completion, etc.
- **Profit:** being the amount of profit that is added on by a business that does not include any of the above.

The construction content can in turn be broken down into work performed using own resources and work using subcontractors. Prices may be fixed for a period or subject to price escalation, i.e., linked to inflation.

Contractors need to gather data from their previous projects, manufacturers of products and equipment, trade associations and technical publications to enable prices for construction activities to be developed.

Figure 2.2: Classification of Items

ITEM NO	DESCRIPTION	UNIT OF MEASURE	QUANTITY	RATE
General item or construction content - labour, materials, plant and equipment or Subcontracted work		Overheads	Risk Allowance	Profit

It is more important to get the total price for a project correct rather than the individual rates where bills of quantities are used. The rates in bills of quantities should, however, be a realistic estimate of the price for an item as any increase or decrease in quantities will affect the total amount paid by the employer, and depending upon the form of contract that is used, form the basis for assessing the variations to the contract price arising from any changes to the scope of work.

The pricing of a tender is dependent on the way in which a business is run and operated. A contractor may:

- *Do the work with own resources.*
- *Subcontract all the work.*
- *Buy materials, subcontract the labour and hire or purchase equipment.*
- *The type of project also plays a part in which method will be used.*

2.8.2 Estimating the Quantum of Work Involved

The establishment of the quantity of work involved in a contract is a critical activity. The starting point is to summarise all the similar types of work and to calculate from the drawings or obtain the quantity of work required from the bills of quantity, e.g., move 100 000,00 cubic metres, construct 10 000 square metres of office buildings, or construct 5,6 km of secondary water mains.

This gives a good idea of what the contract involves and how much work is required to complete the contract within the required contract period.

The next activity is to break these items down into the different materials, trades or types of work that are required to construct the item. Each of these items should be broken down into the following four main components:

- Labour needed to construct the works.
- Materials (bricks, concrete, pipes, etc.) and plant (machinery, generators, boilers, etc.) which needs to be incorporated into the works.
- Equipment (scaffolding, TLBs, graders, etc.) needed to construct the works.
- Work, if any, to be subcontracted to others.

The amount of labour and equipment for each of these items needs to be estimated and the required quantity of materials and plant quantified from the drawings, specifications and bill descriptions contained in the procurement documents.

Equipment manufacturers have information on the typical productivities of their equipment, e.g., see Caterpillar Performance Handbook. This information enables estimates of the working time required to be made. Estimates of the standing time need to be made from a programme for the activities that require the use of such equipment, based on the proposed method of work.

The establishment of realistic production rates is a major consideration. There is no substitute for comprehensive data and feedback from previous work of a similar nature to the work being priced. It is important to remember that the cost of output depends upon many variables. It is therefore important to consider the conditions that prevailed at the time that the recorded cost of output was noted as adjustments need to be made to accommodate the expected conditions that will apply to a site (see section 2.4).

When each item has been broken down into these elements, the contractor should consolidate all the materials into a summary, so that prices for materials and plant may be obtained. Thereafter, the costs of its own workforce and equipment need to be estimated, quotations for plant hire and subcontracted works obtained. Finally, the supervision, personnel, services such as electricity, water and telephones and facilities required to store the materials, secure the equipment when not in use, maintain the equipment in working condition and manage the works need to be identified and costed.

In most contracts less than 20% of the items account for more than 80% of the cost.

The contractor should try to visualise what will be required to do the work and how the works will be constructed. There is an art to estimating.

Great caution must be exercised when a particular type of work is being considered for the first time where reliance is placed on information obtained from sources external to the business.

Table 2.20: Resources Required by Activity

ACTIVITY	RESOURCE (EXCLUDES TOOLS)
Excavation (manual) in soft material	1 x General Worker
Excavation (mechanical) in soft intermediate material	Tractor/Loader/Bcktr (TLB)
Excavation (mechanical) in hard material (rock)	Excavator with Woodpecker
Carting away within 150 m	1 x General Worker
Loading on tipper	1 x General Worker
Clearing and grubbing including carting away	1 x General Worker
Gabions (fixing and packing)	1 x General Worker
Backfilling including manual compaction per 200 mm	1 x General Worker
Erect or dismantle scaffolding	1 x General Worker + 0,3 x semi-skilled
Ordinary single-skin (90 mm) brickwork, open runs	1 x Bricklayer + 1,5 x assistants
Ordinary 90 mm brickwork, with corners, rebates, reveals	1 x Bricklayer + 1,5 x assistants
90 mm brick facings with pointing	1 x Bricklayer + 1,5 x assistants
Timber formwork to beams, lintels and walls up to 3 m	1 x Carpenter + 1 x Carpenter's assistant
Decking formwork including propping and ramps	1 x Carpenter + 1 x Carpenter's assistant
Mass concrete batching, placement and tamping	1 x 0,10 - 0,20 m3 Mixer + Vibrator
	1 x Charge Hand + 8 x G/W s
Reinforced concrete batching, placement and vibration	1 x 0,10 - 0,20 m3 Mixer + Vibrator 1 x Charge Hand + 8 x G/W s
Steel reinforcement fixing to beams and columns	1 x Steel Fixer + 1 x Fixing assistant
Steel reinforcement fixing to floors and slabs	1 x Steel Fixer + 1 x Fixing assistant
Plaster/screeds	1 x Tradesman + 1,5 x assistants
Kerbing, including excavation, concrete haunching, backfill and compact	1 x Tradesman + 2 x assistants

Table 2.21: Number of Masonry Units and Volume of Mortar Required

MANUFACTURING DIMENSIONS		NUMBER OF UNITS PER SQUARE METRE OF SINGLE LEAF WALL AREA	MORTAR VOLUME (CUBIC METRE/SQUARE METRE WALL AREA) MANUFACTURING WIDTH OF THE UNIT (MM)			
LENGTH (MM)	HEIGHT (MM)		190	140	90	106
390	190	12,5	0,015	0,011	0,008	-
390	140	16,7	0,017	0,013	-	-
390	90	25	0,025	0,019	0,013	-
290	90	33,3	-	-	0,013	-
190	90	50	-	-	0,013	-
222	72	51	-	-	-	0,018

Notes:

- Wastage on masonry units depends on the nature of the exposed faces and the methods of handling. Generally, a figure of 10% is appropriate.

- The volume of mortar should be increased by a factor of 2,5 for brickwork and 1,75 for block work to allow for bulking, poor handling, storage, mortar droppings, etc.
- Approximately six 50 kg pockets of cement and 1,3 cubic metre of sand are required to produce 1 cubic metre of class II mortar.

2.8.3 Obtaining Prices from Material Suppliers

When getting prices from material suppliers, the contractor should also bear in mind the following factors that will influence the cost of materials:

a. Whether or not the materials will be delivered or will have to be collected.
b. Bulk discounts (combining similar materials from multiple contracts).
c. Payment terms (accounts that only need to be settled sometime after the materials are delivered).
d. Stock levels maintained at the suppliers.
e. Returns of unused materials.
f. Minimum order sizes and any cost premiums associated with the ordering of small quantities.
g. Trade discounts.
h. Delivery periods.
i. Existing relationships with material suppliers.

A successful track record with material suppliers is a great asset and allows the contractor to benefit from certain cash flow advantages relating to having accounts with the material suppliers and bulk and early settlement discounts that might be offered when accounts are settled on or before time. This relationship is based on the confidence that the supplier places in the contractor to settle bills in full and on time.

Should the contractor default on a single payment or be substantially late in paying bills to one supplier, it may become more difficult to obtain these advantages from other suppliers. In addition, other suppliers might decide to withdraw these privileges and require the upfront payment for materials.

Contractors that don't have a relationship with their supplier must have sufficient start-up capital to be able to pay for materials up front and continue the works until their payment certificate is settled by the client (see sections 2.1 and 2.2).

Larger material suppliers may provide contractors with better prices than smaller material suppliers since they are able to purchase the materials from the manufacturers in bulk. This bulk discount is often passed on to their customers. Larger material suppliers will also generally always have the required stock and are as such able to deliver immediately. They may also have specials on tools and equipment. Smaller material suppliers, on the other hand, are generally geared to providing a wide variety of materials and equipment. They are generally more expensive as their storage costs are higher due to a lower turnover in stock.

Very often, construction materials are only available directly from the manufacturer. Manufacturers provide materials in bulk to their customers and may not be prepared to offer smaller quantities that may be required for a particular tender. They are also not always geared for deliveries and often require that the materials be collected.

In many instances, there will be special items that have to be manufactured to be built into the works. This is where the contractor has to approach the manufacturers to ensure that these items have been correctly priced.

2.8.4 Establishing Equipment Requirements

The nature and quantities of equipment required for a project can only be identified and listed after the contractor has identified the methodology for doing the work. This is achieved by means of a method statement. Decisions must then be made regarding the hiring or purchasing of the required equipment (see section 2.2).

In many instances, the most obvious choice of a material supplier is not the cheapest or most effective for a contract.

There are many benefits to establishing a relationship with material suppliers. Contractors that do so may enjoy a competitive advantage over their competitors.

Contractors should first assess their current inventory of equipment to see what is suitable for the project. The following questions need to be asked:

a. Is it suited for the work?
b. Will it provide the productivity required to finish the work on time?
c. Will it break down and cause undue delay to the works?
d. What will it cost to repair it if it is not in perfect order?
e. How long will it last? For the duration of the contract? (If not, new equipment might have to be purchased or hired at greater cost part of the way through the contract.)
f. What will it cost to maintain or service? What facilities are required to service the equipment?
g. Has it been fully paid for? (If not, the repayments and depreciation costs need to be worked out.)

Hiring equipment eliminates the need for a large capital outlay. Hired equipment is immediately available and is often serviced and maintained by the hire company. Usually, the equipment is provided with operators (see section 2.2).

Choosing the hire company may be difficult and prices can vary considerably. It is always advisable to hire from reputable companies that have been established for a period , since they have a reputation to maintain, and will generally have a large inventory of items to choose from.

Purchasing equipment must be carefully considered before this option is followed. Where a job requires a specific item of equipment that can be used on many other projects, it may be a good idea to purchase equipment. The decision to purchase must not be taken lightly because it can become a large financial commitment if future projects are not secured or if there is no use for the item on other projects.

Where a special item of equipment is needed to complete the works and is not available for hire, the contractor may have to include the cost of purchasing it in the tender. The cost to the contract in this case will be the full cost of the equipment, less the expected selling price once the contract has been completed.

The contractor is advised when purchasing equipment on a once-off project basis to obtain quotes that are valid for the tender period and to ascertain the delivery times for such equipment. If this is not done, the equipment may be more expensive to purchase and, particularly when the equipment is made to order, might arrive too late.

Table 2.22: Weighing Up the Option 'to Hire' or 'to Buy'

CONSIDERATION	BETTER TO HIRE	BETTER TO BUY
Cannot afford to buy	✓	
Item will only be used occasionally	✓	
Item will be used often		✓
It will be possible to hire out the item when it is not being used		✓
An up-to-date model is needed	✓	
An older model will work just as well		✓
Maintenance and repairs are complicated or costly	✓	
The item is low maintenance		✓
A skilled operator is needed	✓	
Special equipment is needed to move it around (e.g. lowbed)	✓	

Although the hire costs may be slightly more expensive than purchase and ownership costs, the hiring of equipment allows the contractor to concentrate on other aspects of their works as the hire company is most often responsible for routine maintenance and the costs of repairs.

2.8.5 Pricing the Labour Required for a Tender

Labour costs can constitute a large proportion of the costs for performing the works.

Labour costs need to be accurately estimated in terms of the following:

a. The cost of the wages, salaries, and fringe benefits.
b. Payments for bonuses and incentives, overtime, working in special circumstances, special allowances, absence due to sickness and holidays and severance.

c. Payments made in relation to travel, subsistence and lodging, relocation, medical examinations, and protective clothing.
d. Payments for meeting the requirements of the law (e.g., Unemployment Insurance Fund contributions), pensions and life assurance, death benefit, occupational accident benefits, medical aid, vehicle, and safety training.
e. The number of persons involved in the task.
f. Production rates.
g. Redundancy of labour on critical tasks.
h. Sharing of labour between tasks that are not concurrent.
i. Training costs.
j. Supervision costs (these are normally priced separately in the contract under the general items).

A charge to cover overheads for staff working on the site should also be considered. Such a charge should include payments for the provision and use of equipment, supplies and services relating to catering, medical facilities and first aid, recreation, sanitation, security, copying, telephone, fax, radio, surveying and setting out, computing and hand tools not powered by compressed air.

It is often easier to draw up the way in which each task will be performed and to allocate categories of labour to perform the work and cost this on a team basis.

The cost of transporting labour to and from the site should be included in the costs for general items.

It is important when calculating the labour cost to consider annual and sick leave that will be due to full-time employees or higher rates for contract workers. It is also important to make allowance for overtime rates, the time that the labour is not engaged in productive work for whatever reason and for severance pay.

2.8.6 Pricing the Equipment Required for a Tender

Equipment costs need to be accurately estimated not only in terms of the items of equipment that are required but also in terms of materials, fuels and other consumables that may be required to operate or use the equipment.

Pricing the equipment required for a tender can be viewed in many ways, depending on whether it is owned, purchased for the project, or hired. In all circumstances, there will be mobilisation costs involved to bring the equipment onto site and to take it off again. There will also be standing time, when the construction business is engaged on critical tasks and cannot use the equipment, even though an equipment hire company may still be charging for its use.

Allowances may also need to be made for the following:

a. Delivery, erection, and removal charges, if applicable.
b. Fuel costs, if applicable.
c. Operator costs, if applicable, the effect and cost of maintaining the equipment in good working order.
d. Any special provisions for unloading and loading.
e. Any temporary access roads or temporary works associated with the use or operation of the equipment.
f. Any special insurances that may be needed.
g. Any supporting equipment needed to operate the equipment, e.g., hoses, breakers and bits associated with a compressor.
h. Safety measures that may be required.

Equipment comprises items provided by the construction business to provide the construction works. Such items are not incorporated into the construction works.

Plant and materials are items intended to be included in the works.

The estimator must decide if the equipment is to be allocated to unit rates or against equipment costs in the General Items in the Pricing Data. Equipment is usually allocated against unit rates where such equipment is specific to an activity, e.g., excavation. Equipment such as concrete mixers and hoists, which are used in several activities and for different trades, should be allocated to General Items.

2.8.7 Pricing the Plant and Material Required for a Tender

When pricing the work to be performed it is important to price plant and materials correctly.

One major component that is often misjudged is the issue of waste. A reasonable allowance for waste needs to be included in the price for materials as it is virtually impossible to perform certain types of construction works.

Equipment comprises items provided by the construction business to provide the construction works. Such items are not incorporated into the construction works.

Plant and materials are items intended to be included in the works without waste. Savings in the cost of construction can be made if the actual waste is below the allowance provided in the tender. The main causes of wastage are:

1. Off cuts
2. Demolition of work completed due to:
   a. Faulty workmanship or poor-quality control
   b. Setting out errors
   c. Not understanding quality requirements established in the scope of work.
   d. Not working within the specified tolerances
   e. Over excavation of excavations and trenches
   f. Construction inaccuracies
   g. Work methods
   h. Substandard materials
   i. Breakages in handling and offloading
   j. Incorrect storage of materials on site (damage by the weather)
   k. Malicious damage
   l. Pilfering and theft
   m. Poor control of stocks in stores

The price for plant and material should also include delivery to the site, providing and removal of packaging, as well as samples and tests. Costs relating to removal of materials surplus to requirements should be included in the costs for general items.

The allowances for waste should be based on experience gained in previous contracts. Data given in publications and information supplied by manufacturers should be used with caution.

2.8.8 Pricing for General Items

Site Establishment and De-Establishment

Both electricity and water are usually only provided at one connection point each on a site and it is the contractor's responsibility to lay cables and pipes to the points of use.

Site establishment is an important part of the tender. This cost is normally provided for within the bills of quantities or the activity schedules and constitutes the amount that the construction business requires to establish itself on site.

Examples of items that might be included in site establishment are:

a. Accommodation for own staff (offices, stores, storage yards, accommodation, etc.)
b. Accommodation for the client's principal agent's or project manager's or engineer's representative
c. Rooms for meetings
d. Notice boards
e. The cost of bringing personnel and equipment to site
f. The cost of providing adequate access roads to the site (if necessary)
g. Connections to electricity, water, sewers, and telephone lines
h. Ablution facilities (water closets and wash hand basins and possibly urinals and showers)
i. The provision of fencing or hoarding around the site

There is similarly a cost for de-establishment where all temporary accommodation, material and plant surplus to requirements are removed from site. Often tenders will contain two items, namely one for the establishment and one for the removal of items from site. However, if there is only one item, then both establishment and de-establishment need to be priced for under establishment.

Careful thought is required, since this is a direct cost to the contractor and can influence the overall tender price quite substantially if it is not properly calculated.

An aspect that is often overlooked in tenders is the cost of transport. All personnel, plant and equipment need to be brought to site and removed again when their function has been completed. Where the labour will be accommodated on site, transport will not be a significant cost factor. However, if the contractor is not going to provide accommodation, then a transport strategy needs to be developed to make sure the workforce is at work on time.

Contractors often price their tenders on the basis that they will provide their labour with transport to and from work between the site and a designated central place. Alternatively, the labour is provided with a transport allowance as part of their wages, and it is their responsibility to get to work on time and home again.

Contractual Requirements

Contractors need to price for the provision of a performance guarantee or bond and insurances in accordance with the requirements of the contract (see sections 2.4 and 2.9).

Health and Safety Requirements

Construction businesses need to factor in the price to do all things necessary to comply with the requirements of the Construction Regulations issued in terms of the Health and Safety Act (see section 3.3).

Time-Related (Recurring) Items

Time-related charges relate to the costs of running a construction site that are not included in the price for producing something. Items that need to be considered include:

a. The costs of cell phones, faxes, internet, and telephones
b. Electricity and water consumption
c. Site security
d. Cleaning and maintenance of facilities
e. Removal of rubbish
f. Consumables (groceries, fuel, photographs, cutting discs, etc.)
g. Site staff salaries and wages (site agent, foreman, surveyor, clerks, storemen, night watchmen, drivers, etc.)
h. Maintenance of survey and office equipment
i. Site vehicles
j. Access to temporary roads

Start-Up Capital

A critical task for any contractor is to maintain a positive cash flow position, i.e., the cash that flows in is more than the cash that flows out (see section 2.1). This is an ideal position that is seldom realised in the early part of a contract.

In almost every contract, the contractor is required to finance all costs until such time the first payment is received. This is the most difficult time for any contractor when resources are being mobilised. Most often, the costs will have to be carried through either an overdraft facility at the bank, extended credit periods from suppliers or from cash loans. In all of these cases, there will be interest charged to the contractor on the loaned amount or the overdraft. This is a cost that must be included in the price for a contract.

A contractor may reduce its risk exposure by carefully choosing its projects, clients, and staff.

Risk is the chance of something happening that could have a bad impact on the profit associated with a project.

High reward, high risk. Low reward, low risk.

2.8.9 Allowances

Allowances can be applied either differently to individual items or uniformly to all items. Often the profit mark-up is applied in a combination of these two approaches.

Risk

Risk is encountered in all aspects of construction (see section 3.10). A risk allowance enables a contractor to reduce its loss exposure should an event occur.

The contractor needs to identify whether there is an extraordinary risk attached to any activity that should be priced in the tender, and if so, what the likelihood is that this risk event will take place. If it is decided that this item is highly likely to occur and that there will be a cost attached to this, a risk allowance should be applied to that activity.

Contractors have been known to have won projects with anticipated high risk at good margins and have found that the risks were not as bad as anticipated and made good money. Conversely, many contractors have not won tenders because they have overestimated the risks involved.

There is always a risk on every project. The extent of the risk will depend on a variety of factors such as the stability of the workforce, dependability of supplies and closeness to your suppliers, ability of the client to pay, etc.

A contractor may reduce its risk exposure by carefully choosing its projects, clients, and staff. Risk is the chance of something happening that could have a bad impact on the profit associated with a project.

Mark-Up

Mark-up refers to the amount that a contractor will add on the cost of the measured works and preliminary and general items. A contractor needs to provide sufficient mark-up to cover the costs of business overheads (business operating costs and once-off business costs), profits, and an allowance for risks.

There is no magic formula for setting the profit margin. In bad times, contractors have priced at "cost" to remain in business whilst in good times, the percentage profit may well be in double figures.

One formula is the Haylett Escalation Formula where the contract is divided into "work groups". Each work group is assigned an index with the base index being the index applicable at the time that tenders closed. Each month these indices are updated, and a new index figure given. The increase in price is based on the ratio of the applicable monthly index and the base index.

Alternatively, the contract will provide coefficients for labour, equipment, materials, and fuel and specify an index that applies to each of these items. The increase in price is based on the ratio of the applicable monthly index and the base index multiplied by the relevant coefficient.

Overheads

Overall mark-ups to cover costs that cannot be attributed directly to a project are applied generally during the finalisation of the tender just before submission. These mark-ups can be done to allow for overhead costs imposed by the costs of running a head office or some other reason, e.g., costs relating to head office support staff such as company payroll administrators, bookkeepers, tendering staff and messengers and costs of computers and software that are common to all contracts.

These overall mark-ups need to be calculated from the experience that the contractor has built up over the past contracts.

Overheads can be estimated by considering what the contractor is going to be doing for the next year and what the likely turnover will be. If the same overheads are to be charged to each contract, the average overhead percentage will be proportional to the ratio of the contract divided by the likely turnover.

There is no certainty, particularly in a growing business that the estimate of the likely turnover will be reached. As a result, it may be advisable to consider a higher overhead than the estimated average. It must be kept in mind that the higher the percentage overheads, the less competitive the contractor is in being awarded contracts. Overheads need to be kept as low as possible.

Profit

Profit is profit. It should not include any costs or payments such as salary for the owners of a construction business. Once all costs and the risk allowance have been decided upon, the profit margin should be looked at, based on what price the contractor thinks that the market can sustain or what price the client will be prepared to pay. Too high a profit margin may result in the tender being awarded to another contractor.

Price Escalation

The Rand cost of labour, plant and materials all increase over time. An hour of labour is an hour of labour, but wages increase over time. Statistics South Africa reports on the inflation rate of a range of commodities every month and as a year-on-year figure.

These figures are important as a contractor is required to agree prices for plant, material, equipment and labour at the start of a contract. The actual costs to the contractor when these resources are required may be higher than those estimated at the time that the contract was concluded.

The contract may provide for price escalation, in which case, the contractor will be compensated for price inflation in terms of a formula that is stated in the contract. This compensation, particularly in boom periods, may not be sufficient to cover the increases. Where this is believed to be the case, an allowance for under recovery should be made in the risk mark-up.

In some contracts that are typically shorter than one year, the contract may require the contractor to tender a fixed price, i.e., the rates tendered by the contractor must factor in price escalation. Where this is the case, the contractor needs to estimate the effect of price inflation on costs based on the projected inflation rate.

2.8.10 Finalising the Tender Price

A decision as to what the tender price submitted to a client should only be undertaken when estimates of all costs, the risk allowance, the allowance for price escalation, if any, and profit has been established. The finalisation of a tender requires consideration of the following:

a. Knowledge of the marketplace.
b. The market prices for the type of project that is being tendered for and the costing that has been determined in the build-up of the tender price.
c. The risks involved in executing the tender.
d. Other commitments within the contractor's organisation.
e. Availability of resources.
f. How badly the work is needed to keep the workforce employed.

In the final analysis, the tender price that is submitted is a business decision that is based on knowledge of the market, knowledge of the contractor's likely competitors and what the effect of being awarded the contract will have on the business.

Alternatively, the contract will provide coefficients for labour, equipment, materials and fuel and specify an index that applies to each of these items. The increase in price is based on the ratio of the applicable monthly index and the base index multiplied by the relevant coefficient.

The importance of having the work must be balanced by the risk involved in getting the contract and being successful in completing the contract with a profit!

SECTION 2.9:
CONTRACTUAL CONSIDERATIONS

2.9.1 The Fundamentals of a Construction Works Contract

A contract is an agreement between two or more people that is enforceable by law. In construction, it is an agreement between an employer (client) and a contractor to construct, repair or renovate something, in an agreed time, for an agreed price and to agreed standards.

The contractor may undertake all the work himself or subcontract a portion of the work to others (see section 1.5). The agreement made between the contractor and a subcontractor is called a subcontract (the main or prime contract is between the contractor and the employer). In this case, the contractor promises to pay for the part of the work done by the subcontractor and the subcontractor promises to do that part of the work that is specified in the subcontract.

Sometimes there are others involved to assist the employer. These persons are not parties to the contract but are agents of the employer. Agents ensure that the contract is properly carried out and some may give instructions to the contractor.

In construction works contracts, an employer (client) enters a contract with a contractor. The contractor may in turn enter a contract with a supplier or service provider or elect to subcontract work to a subcontractor, in which case the contractor becomes the employer.

The employer is responsible for making payments to those entities that are contracted to provide supplies, services or works.

A right is an entitlement. The employer has a right to have the work done properly, for the agreed price and in the time promised. The contractor is entitled to be paid the agreed price for doing the work. A responsibility is a duty or an obligation. The employer has a responsibility to pay the contractor for doing the work. The contractor has a responsibility to do the work properly for the agreed price and in the time promised.

One parties right creates a responsibility for the other party. When a party does not comply with his responsibilities, it is said that he is in breach of contract. Rights and responsibilities in a contract are enforced by law. This may be either by the courts or by arbitration, depending, what is written in the contract.

Sometimes the parties wish to change their rights or responsibilities in the contract. This can only be done if both parties agree to the change and if the change is recorded in writing and signed by both. However, when the contract states that an agent can instruct the contractor to do additional work, leave out certain work or change what must be done, the contractor has to obey that instruction but will get paid extra and be given extra time to do so if the instruction causes him additional cost and delay, and if it was not issued because of the fault of the contractor.

2.9.2 Concluding a Contract

A contract may, in terms of South African law, be entered into in several ways. These include:

- Verbal offers.
- The signing of a formal contract.
- Exchange of letters.

For a contract to be legally valid certain conditions must be met:

- The parties must be legally able to make a contract.
- There must be consensus (a meeting of the minds), i.e., the offer by one party and an unambiguous and unconditional acceptance by the other.
- There can be no force or coercion on either party in making the contract as a contract may be set aside if acceptance has been induced by misrepresentation, mistake, duress, or undue influence.
- The object of the contract must be physically and legally possible.
- Each party is contributing something to the contract; the contractor through offering to do the work and the client in agreeing to pay for it.

A contract therefore comes into existence once an offer has been unconditionally accepted.

2.9.3 Concluding a Contract Using the cidb Procedures

The following steps typically lead to the formation of a contract between the employer and the contractor where the cidb procedures are followed:

a. The employer invites tenderers to submit tender offers using procurement documents compiled in accordance with the requirements of the cidb Standard for Uniformity in Construction Procurement and using a standard form of contract (see sections 2.5 and 2.6).

b. Tenderers complete and sign the offer portion of the Form of Offer and Acceptance and make a tender submission in accordance with the requirements of the Tender Data. Generally, the contractor is required to price for all the works described in the tender documents.

c. The employer or his agent opens the tenders and usually makes known the names of the tenderers who submitted tenders and tender prices to interested parties.

d. The employer or his agent evaluates the tender in accordance with the provisions of the Tender Data and confirms that tenderers have the capability and capacity to perform the contract (see section 2.6).

e. The employer or his agent clarifies any outstanding issues with the successful tenderer and compiles the contract. Any amendment agreed to in the process of offer and acceptance is included in the contract, typically in the schedule of deviations contained in the Form of Offer and Acceptance.

f. The employer completes and signs the Acceptance portion of the Form of Offer and Acceptance.

The employer's acceptance concludes the contract between the parties. The contract commences once the tenderer receives a signed copy of the Form of Offer and Acceptance.

Changes to the contract are only binding once it has come into effect, if made in writing and are agreed to by both parties. The Form of Offer and Acceptance expressly states that no amendments to the tender documents are valid unless they are included in the Schedule of Deviations attached to the Form of Offer and Acceptance. As a result, nothing that was discussed or agreed during clarifications, or the finalisation of the contract will be binding on the parties unless it is included in the Schedule of Deviations.

The manner in which a contract comes into existence depends on how the offer and acceptance is made. Sometimes the existence of a contract may well be “implied” by the actions of the parties. For example, a contractor may give a client a quotation for certain work to be done and then be given access to the site by the client. Even though the offer has not been formally accepted, the action of the client indicates the existence of a contract.

When a contractor signs any legal document it is bound by the terms and conditions of the document that has been signed. This applies even if the business has not read the terms. “Let him who signs take care .”

2.9.4 Standard Construction Works Contracts and Subcontracts

A construction works contract needs to record what the employer and contractor agree to. The contract needs to address issues such as:

a. The rights, risks, and responsibilities of the parties.
b. The administrative procedures relating to all aspects of the works.
c. The role and authority of any agent that is appointed by the employer.
d. A definition of the contract period when work will start and when it must be completed.
e. Progress payments, how often the payments will be made, who will do the assessment, as well as the terms of payment including such things as retention money, if any.
f. Whether or not the contractor will be paid for price escalation due to inflation.
g. How the contract price is to be adjusted in response to changes in the scope of work made after the contract has been concluded.
h. Conditions under which the contract may be terminated.
i. Conditions under which the completion date may be extended.
j. How disagreements are to be settled.

A construction contract should in its simplest form describe the following:

- *What will be done*
- *How long it will take to complete*
- *How much and when the employer will pay*
- *What will be done if there are changes and delays in the work*
- *What work methods and quality will apply*

These items can be recorded in a standard contract prepared by an industry association or professional body. The employer can then choose a standard form of contract that is suitable for the construction works that he wants to be constructed and has administrative procedures that fits in with the way he wishes the works to be managed and administered. The contractor can then tender with confidence if he is familiar with this form of contract. Each of the parties and any agent appointed by the employer all know what they must do.

The cidb requires that the public sector use one of the following standard forms of contract when contracting with main contractors:

- FIDIC (French Initials for International Federation of Consulting Engineers) (1999) (Short contract and Red, Yellow and Silver Books).
- General Conditions of Contract for Construction Works (GCC).
- JBCC Series 2000 (Principal Building Agreement and Minor Works Agreement).
- New Engineering Contract (NEC3) (Engineering and Construction Contract and Engineering and Construction Short Contract).

The cidb promotes the use of the following standard forms of subcontract:

a. BIFSA Non-Nominated Subcontract for use with the JBCC Series 2000 Principal Building Agreement.
b. BIFSA Standard Subcontract Agreement 1995 edition (Amended 2000), for use with Principal Building Agreements other than the JBCC Principal Building Agreement.
c. BIFSA Labour-only subcontract.
d. Construction Industry Development Board's Standard Subcontract (labour only).
e. The Joint Building Contracts Committee (JBCC Series 2000):
   - Nominated/selected Subcontract Agreement.
   - Engineering General Conditions.
f. New Engineering Contract (NEC3):
   - NEC Engineering and Construction Subcontract.
   - NEC Engineering and Construction Short Subcontract.
g. SAFCEC General Conditions of Subcontract (2003 edition).

Each of these forms of contract contain generic general conditions that are made project specific through contract data, i.e., a document that states what the variable and project specific information is and clauses which vary, amend, or add to the requirements of the general conditions of contract.

The forms of contract that are promoted by the cidb are fair and equitable in the assigning of rights and obligations to the parties. **Contractors need to carefully consider what are their risks, liabilities, and obligations before signing contracts that contain the following:**

- Purpose-written conditions of contract.
- Standard conditions of contract that have been developed by the client.
- Standard forms of contract that are not promoted by the cidb.
- Clauses in the contract data that substantially vary from the general conditions of contract in a standard form of contract.
- Additional conditions in the contract data.

A contractor should give particular attention to conditions of subcontract as the business may frequently be in a weaker position when working as a subcontractor than when working as a main or prime contractor.

2.9.5 Typical Features of Construction Works Contracts for Main Contractors

General

All standard forms of contract have clauses that deal with the following:

a. Definitions and interpretation
b. Time
c. Risk and insurance
d. The obligations of the employer
e. Testing and defects
f. The contractor's main responsibilities
g. Payment

The employer's main obligation is to pay the contractor and to provide the contractor with access to and with use or possession of the site. The employer is also obliged to answer any queries raised by the contractor. The employer may delegate obligations to an agent or employee. The employer may not, however, delegate the obligations to pay the contractor.

The contractor's main obligation is to complete the work in terms of the contract in accordance with the scope of work described in drawings, specifications, and the like. In a subcontract, the role of the "employer" is performed by the contractor and the role of the "contactor" is performed by the subcontractor.

Whether specified in the contract documents or not, it is the contractor's responsibility to provide the works in accordance with all laws, regulations, statutes, and by-laws (see Compendium of Legislation affecting construction stakeholders on www.cidb.co.za).

When one goes to a café and asks for a glass of Coca Cola with ice, the assumption is made that one will get a drink that is fizzy, that the glass will be clean before your drink was poured into it, and that the ice cubes will be made from water that was fit for drinking purposes. These assumptions are reasonable assumptions to make and are known as "implied terms". The same is true when a client procures construction works - it is implied that the contractor will execute the work in a workmanlike manner and that the materials incorporated into the works will be in accordance with the specifications, and where there are no specifications, of a reasonable quality and fit for purpose.

Breaches by either party to the contract may result in the contract being cancelled. For example, if the employer does not pay, the contractor is entitled to cancel the contract. On the other hand, should the contractor fail to provide the work in accordance with the provisions of the contract, the employer may cancel the contract.

Performance Guarantees

Performance guarantees are issued by financial institutions such as a bank and provide for payment of money by the financial institution to the employer should the contractor fail to complete the contract, e.g., should the contractor be in breach of contract and the contract is cancelled or the contractor becomes bankrupt. Most construction works contracts require performance guarantees that pay the employer when the contractor has been in breach of contract and the contract has been cancelled or the contractor has become bankrupt.

Interim (Monthly) Payments

A contractor must make regular payments for labour, materials, equipment and subcontractors during the construction period. To enable him to do this, a construction contract usually provides for "interim payments" to be made each month, based on the estimated amount of work done for that month and materials that the contractor may have bought and that have been delivered to site but not yet built in.

Conditions of contract for subcontracts differ widely. Ideally, the conditions of subcontract should be similar to that of the main contract. This is only possible where the NEC3 and JBCC forms of contract are used.

The conditions of contract should not be more onerous than that of the main or prime contract.

In a subcontract, the role of the "employer" is performed by the contractor and the role of the "contactor" is performed by the subcontractor.

The contractor, in some forms of contract, is required to provide information to the employer's agents to enable him to draw up an "Interim Payment Certificate" that shows the amount to be paid to the contractor by the employer for that month. The employer must pay the contractor the amount shown in the Interim Payment Certificate after the certificate has been issued.

If the employer does not pay the amount shown in time, he will be in breach of contract and will have to pay interest to the contractor.

If the employer still does not pay the contractor after the contractor has written to him demanding payment, the contractor may cancel the contract. This however should be done according to the cancellation clauses stipulated in the contract.

Variations and Payment Matters

The way payments are made arising from changes to the scope of work needs to be understood as this is fertile ground for disputes if not properly dealt with and can lead to a loss of money. On the other hand, an understanding of how compensation is made can improve the profitability of a project.

Most standard forms of contract permit the employer or the employer's representative to order increases or decreases in any portions of the work, changes to the details of the work or additional work of a similar nature. The empowerment to omit work cannot be used to take away items of work for which the contractor has tendered and then to be contracted to another contractor.

Most standard forms of contract prescribe how the contractor is to be compensated for changes in the scope of work. Some standard forms of contract require that the contractor tender fee percentages, labour rates and equipment hire rates to enable the changes in prices associated with changes in the scope of work be evaluated (see section 2.6).

Retention

Many contracts make provision for retention monies to be withheld from interim payments. Such money is held by the employer to offset costs which may arise from the contractor's failure to fully comply with the contract, including the making good of any defective work.

Typically, a percentage of the progress payment is retained up to a stated limit and the total sums retained are released in two stages. The first stage is when the contractor completes the works so that the employer may use the works as intended and the second when the defects liability period expires.

Risk and Insurance

Risk is the chance of something happening that will impact on the outcome of the contract. A contractor faces many risks in a construction works contract. However, by being aware of the risks, understanding the rights and responsibilities contained in the contract, proper planning and making sure the work is done properly the first time, the contractor will be successful and can make a profit.

Insurance is compensation that will be paid by an insurance company to the person or persons who have taken out the insurance if the risk event happens and causes loss. The consequences of a certain risk event happening will be the responsibility of either the employer or the contractor, depending on what the contract states.

It is important to remember that the person who takes out insurance is not always the person who is at risk. This means that, if the employer takes out works insurance, but the contract states that the contractor is responsible if a certain risk event happens, the contractor will have to pay for any loss or damage caused by the risk event that is not compensated for by the insurance pay-out.

Because of this, the contractor must satisfy himself that he has proper insurance to cover his risks if the contract states that he is to take out insurance and if the contract makes insurance

If the contractor contracts to provide the entire works for a lump sum, he is obliged to carry out any works which are indispensably necessary for completion, even if not specifically referred to in the contract documents.

the employer's responsibility, the employer has taken out sufficient insurance. If the insurance is not sufficient, the contractor must take out additional insurance to ensure that he will be properly covered. The contractor is in no position to “second guess" the additional insurance that could be required.

Completing a Contract

One of the important things that must be agreed in a contract is when the work has to be finished, so that although a few small things remain to be done, the employer can use the works as he intended. At this point the work is said to be “practically complete”. When this happens, the employer or his agent typically issues a certificate indicating that the works have reached this stage of completion and provides the contractor with a list of the few small things that still must be done.

The contract must specify when the work must be practically completed. Should the contractor not complete the contract by this due date, he will be in breach of contract and may have to pay penalties to the employer.

The contractor is required to provide a programme of the works at the start of the contract to the employer as part of the contract.

The programme is important for both the contractor and the employer, because the contractor uses it to plan his work so that he can be sure he will finish the work in time and the employer's agents use it to check the contractor's progress and to take action if the contractor falls behind so that the work is finished by the due date.

When the contractor has finished the work as stipulated in the contract, the works are complete. The contractor is then responsible for fixing any defects that are found for the period stated in the contract. At the end of this period, the contractor is paid all outstanding amounts that are due.

Resolving Disagreements

The contract will stipulate which form of dispute resolution mechanism will be used in the event of a disagreement/dispute between the parties, i.e., the employer and the contractor. The dispute resolution specified in the contract may be one of the following: mediation, arbitration, adjudication, or litigation.

When the contractor disagrees with the employer or an agent (or when they disagree with him), they try firstly to solve the problem themselves. If this fails, either a mediator or adjudicator is called in to settle the dispute. If no agreement is reached, the disagreement is settled by a court of law or by an arbitrator who acts in terms of the South African laws governing arbitration.

A mediator's job is to get the parties to settle their differences and reach agreement. He may use any means to do so and may meet separately with the parties or with both parties. He may help them understand what the problem is and may offer advice to the parties on a solution that may be acceptable to both parties. If agreement is reached, the parties record in writing what they have agreed. If no agreement is reached or it appears to the mediator that the parties cannot reach agreement, a court of law or an arbitrator is requested to settle the disagreement.

An adjudicator's job is to obtain information from both the parties, examine it in terms of what the contract says and make a ruling on it. The adjudicator is required to make the ruling within the time stated in the contract and follow the procedures described in the contract. The contractor and employer must do what the adjudicator says. If the adjudicator's ruling is that the employer must pay the contractor, then the employer must pay the contractor. If one of the parties does not accept the adjudicator's rulings, he may, after doing what the adjudicator tells him to do, ask a court of law or an arbitrator to finally settle the disagreement.

A lien can be a trump card when demanding payment.

The fundamental requirement to ensure that the lien can be exercised is to ensure that full possession of the site is maintained.

2.9.6 Contractor's Lien

When one takes a car to a garage to get it repaired, one hands over your keys to the garage. When the car has been repaired and you have paid your money for the repair, the garage gives you your keys back. The garage does not have to give you your keys back until you have paid for the repair in full. The garage has the right of retention, right to hold one's property (i.e. the car), which is also known as a lien, by law until it has been paid.

A lien, or right of retention, is a right conferred by law upon a person who has put money, or money's worth, into a property of another or retaining such property in his possession until he has been paid. In a construction works contract, the employer hands over the site to a contractor.

The contractor is obliged to restore possession of the site to the employer after the completion of the works. However, if the contractor has not been paid, the contractor may by virtue of a lien, remain in possession of the site until such time as the amount due has been paid in full. This only applies if the contractor has not waived his right of lien.

A subcontractor who has not been paid by the main contractor is, however, under normal circumstances not entitled to exercise a lien over the property. The subcontractor's only recourse is to claim payment from the main contractor.

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PROJECT AND CONTRACT MANAGEMENT

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3.1.1 Conditions of Contract

The conditions of contract are the terms that collectively describe the rights and obligations of contracting parties (i.e., the employer and the contractor) and the agreed procedures for the administration of their contract. Typically, these conditions address the following:

a. The parties' main responsibilities e.g., the employer provides the site and the right of access thereto while the contractor provides the works in accordance with the requirements established in the contract

b. The timing of the works, e.g., start date, time for completion, period for defects liability, etc.

c. Testing and remedying of defects

d. Payment, e.g., way the works are to be assessed and certified, time for payment and interest on overdue amounts

e. Variations and claims, e.g., the way variations to the contract are to be evaluated and paid for and how the costs which result from employer liabilities are assessed and paid for

f. Title (ownership) to objects, materials within the site, etc.

g. Risks and insurances, e.g., what are the employer's and contractor's risk and what insurances each party will take out

h. Termination, e.g., the reasons for termination, the procedures for termination and the payment to be made upon termination

i. The resolution of disputes, e.g., by adjudication, mediation, arbitration, litigation (court of law) or a combination thereof

Conditions of contract can be standardised so that the same conditions of contract can be used on different projects, in which case they are referred to as standard forms of contract.

The cidb requires that the public sector use one of the following standard forms of contract when engaging main contractors for construction works contracts:

- FIDIC (French initials for International Federation of Consulting Engineers) (1999) (Short contract and Red, Yellow and Silver Books)
- General Conditions of Contract for Construction Works (GCC)
- JBCC Series 2000 (Principal Building Agreement and Minor Works Agreement)
- New Engineering Contract (NEC3) (Engineering and Construction Contract and Engineering and Construction Short Contract)

Conditions of contract for subcontracts differ widely. Ideally, the conditions of subcontract should be like that of the main contract. This is only possible where the NEC3 and JBCC forms of contract are used.

The conditions of contract should not be more onerous than that of the main or prime contractor.

Section 2.9 covers the following:

- The fundamentals of a construction works contract
- Concluding a contract
- Concluding a contract using cidb procedures
- Standard construction works contracts and subcontracts
- Typical features of construction work contracts for main contractors
- Contractor's lien

3.1.2 Communications

The single most important task in administering a contract is to ensure effective communications with the employer and his representatives e.g., principal agent (JBCC Series 2000), engineer (FIDIC and GCC 2025) or project manager (NEC3). Each form of contract stipulates requirements for communications between the parties of the contract. These usually need to be communicated in a form which can be read, copied, and recorded. The contract data associated with a contract also state to whom communications are to be addressed and where certain communications are to be sent.

The various contracts require:

a. The contractor to provide a programme within a specified time.
b. The employer to pay the contractor within a specified period.
c. The employer's representative to provide a decision within a specified period.
d. The contractor to give notice of his intention to declare a matter as being a dispute within a specified time.
e. The contractor to submit timely request for inspections etc.

Each of these events requires different types of communications between the parties. Effective communications can mean the difference between a problematic contract and a smoothly run one. It is also important for a contractor to communicate effectively with its suppliers, service providers and subcontractors.

Each standard form of contract is very clear on what needs to be communicated, what the time frames for communications are and how communications are to be made.

Each standard form of contract is very clear on what needs to be communicated, what the time frames for communications are and how communications are to be made.

3.1.3 Managing Time

Programme

Construction works are unique in that each activity needs to be sequenced for the project to be completed. For example, it is not possible to erect the roof until the foundations and walls have been constructed. This type of logic is used to determine how long a project will take to complete. Efficient programming can mean significant time and cost savings to both the contractor and the employer.

At the start of each contract, the contractor is required to prepare a programme and have it agreed to by the employer or his representative. This programme indicates the duration and logic of the sequencing of activities for the project. The employer or his representative will evaluate whether the logic is sound and whether the estimated time frames for completion of the works are reasonable. (see section 3.6 for guidance on the preparation of bar charts).

The programme is an important tool for managing time to ensure that the works are completed in accordance with contractual requirements. It also allows the employer's representative to establish the reasonableness of any claims for an extension of time.

The programme shows which activities are on the critical path, or impact directly on the completion date of the contract if they are delayed.

This critical path programme is the essential tool in assessing the likelihood of claims should there be changes to the works, or the conditions under which the work is done.

Extensions of time

Where the contractor is instructed by the employer or his representative to add, change or remove activities from the project or to change the scope of work, there may be grounds for a change to the time for completion. If the change to the project causes the project to be completed later than planned, then there is reason to change the completion date. If it does not, there is no reason to do so.

Completion is a state of readiness for occupation of the whole works although some minor work may be outstanding.

Retention monies are monies retained for a certain period by the employer to offset costs which may arise from the contractor's liability for defects or failure to comply fully with the contract.

Performance bonds are submitted to the employer or placed in the hands of a third party to guarantee completion of the work and recovery of the sums which the contractor would be recognised as owing in terms of the contract.

Some forms of contract require that the contractor submit a claim for an extension of time to the employer within a specified period of becoming aware of an event that may give rise to such an extension, e.g., abnormal rainfall, failure by the employer to provide access to the site, etc. Failure to do so might result in the forfeiting of the right to an extension of time.

Completion

The contractor is responsible for the works from the date that possession of the site is given by the employer or his representative until such time that the works are completed or are capable of being used by the client. The different forms of contract have different processes for declaring a contract complete. Some require the employer's representative to issue a single completion certificate while others require a practical completion certificate and a completion certificate to be issued (see section 3.9).

At this point (depending on the form of contract) retention moneys are reduced, performance bonds are released and the defects liability period commences. This is a great financial relief for a contractor.

Where the contract allows for it, the contractor is entitled to or required to hand over sections of the project before the whole project is completed. Handing over these sections means that the employer can utilise that portion of the works before the whole project is completed and the contractor is thereafter not liable for that portion of the works.

The risk of damage to the works also passes to the employer upon completion. It is therefore important to manage and complete the work in such a manner that completion is achieved as soon as possible.

Early completion

If the contractor is very efficient, and there are no problems experienced on site, then the contractor will be free to start a new project much earlier. The contractor needs to ascertain that by completing a contract earlier does not cost him more. In some contracts, the employer may encourage early completion by offering a bonus for early completion.

Penalties for late completion

Provisions for penalties or delay damages (a monetary value representing the damage caused by the delay) are contained in most construction contracts. These are imposed where the employer has specific deadlines or other requirements and will experience a loss of revenue, loss of use of the premises if the project is delivered late or must pay additional supervision and administration costs relating to the late completion.

The contract document will specify the value of the penalties per day, per week or per month, or the extent of the penalties should specific requirements not be achieved.

Penalties are deducted from interim payment certificates as soon as they occur and can be objectively quantified. They are based on the difference between the time that the works were completed and the time according to the contract when they were supposed to be completed.

Changes to the prices for the works

Instructions given by the employer or his representative that change the scope of the work or the timing of the works (i.e., the construction programme), can impact on the cost of the works. Each of the different forms of contract assess the impact on the contract price differently.

The contractor is required to carry out any instruction received in writing to change the scope of work or the timing of the works unless it is impossible or illegal to do so.

Changes in the scope of work most often arise through changes in the details on the construction drawings or specifications, the employer increasing or decreasing the size of the work, and new information regarding the site becoming available which necessitates that the design be amended. The contractor should always check the changes that are made to the drawings and identify how the changes affect the programme, materials ordering and utilisation of resources.

Changes in the completion date for the works frequently arise from access being denied to the site or a portion thereof for whatever reasons, the employer requiring the contractor to stop the works, or an earlier completion being required.

The contract also identifies which risks are carried by the contractor and which are carried by the employer. Accordingly, should an event occur on the site and the contract states that it is the employer's risk, then the contractor is entitled to have the contract price adjusted to compensate for the additional costs incurred. An extension to the time for completion may also be due to the contractor.

The scope of work is the document that specifies and describes the works which are to be provided and any other requirements and constraints relating to the way the contract work is to be performed.

3.1.4 Certificates and Invoicing

Interim invoices

Most contracts make provision for monthly interim payments based on the value of the work executed and any amounts to be added or subtracted in terms of the contract. Each form of contract contains specific procedures for payment.

Table 3.1: Standard Provisions in the Forms of Contract Endorsed by the cidb

FORM OF CONTRACT	WHO INITIATES AN INTERIM PAYMENT CLAIM	PROCESSING OF INTERIM CLAIM	PERIOD WITHIN WHICH EMPLOYER PAYS
FIDIC 'Suite of contracts'	Contractor is required to make application for the Payment Certificate to the Engineer at the end of each month, setting out the amounts which the contractor believes that he is entitled to.	Engineer verifies statements and issues interim Payment Certificate within 28 days of receipt of the contractor's statement and supporting documents.	56 days after the engineer receives the contractor's statement and supporting documents.
GCC 2025	Contractor is required to deliver to the employer a monthly statement for payment of the amounts that he considers due to him.	Employer's agent verifies statements and issues interim payment certificate within 7 days to the employer.	28 days after the employer's agent issues the payment certificate to the employer.
JBCC Minor Works	Principal agent issues an interim payment certificate. Contractor cooperates and assists in the preparation of the valuation of the payment certificate.	Principal agent issues an interim payment certificate by not later than the day of the month as stated in the contract data, whether or not the contractor provided the information.	14 calendar days after principal agent issues payment certificate to contractor and employer.
JBCC Principal Agreement	Principal agent issues an interim monthly certificate. Contractor assists the principal agent in preparing the claim information and assessing the amounts completed.	Principal agent issues an interim payment certificate by not later than the day of the month stated in the contract date, based on a valuation.	14 calendar days after principal agent issues payment certificate to the contractor and employer.
NEC3 Engineering and Construction Contract	Project manager assesses the amount due at each assessment date and may consider an application for payment submitted by the contractor.	Project manager gives the contractor details of how the amount has been assessed and certifies the payment within one week of each assessment date.	Three weeks from the assessment date.

Final invoices

Final payment occurs only after the defect's liability period has lapsed. Each form of contract contains procedures for final payments.

Table 3.2: Standard Provisions in the Forms of Contract Endorsed by the cidb

FORM OF CONTRACT	WHO INITIATES A FINAL PAYMENT CLAIM?	PROCESSING OF CLAIM	PERIOD WITHIN WHICH EMPLOYER PAYS
FIDIC "Suite of Contracts"	Contractor provides engineer with draft final statement within 56 days of receiving the Performance Certificate.	Engineer verifies statement. Contractor issues final statement to and discharge within 28 days of the issue of the final statement Engineer issues employer final payment certificate within 56 days of receipt of draft final statement.	56 days after the employer receives the final payment certificate.
GCC 2025	Contractor delivers final statement to the employer's agent within 14 days of the issue of the final approval certificate.	Employer's agent verifies final statement and issues final payment certificate within 14 days of receipt of the contractor's final statement.	28 days after the employer's agent issues the final payment certificate to the employer.
JBCC Minor Works	Principal agent submits the final account to the contractor within 45 days of practical completion.	Contractor accepts or objects to the final account within 10 days. Thereafter, principal agent issues final payment certificate to contractor and employer.	14 calendar days after the date of the final payment certificate issued by the principal agent to the contractor and employer.
JBCC Principal Agreement	Principal agent issues the final account to the contractor within 60 working days of practical completion.	Contractor accepts or objects to the final account within 30 days of receipt. Thereafter, the principal agent issues final payment certificate within 7 days to contractor and employer.	14 calendar days after principal agent issues final payment certificate to contractor and employer.
NEC3 Engineering and Construction Contract	Project manager assesses the amount due within four weeks of the supervisor issuing the defects certificate and may consider an application for payment submitted by the contractor.	Project manager gives the contractor details of how the amount has been assessed and certifies the payment within one week of each assessment date.	3 weeks of the assessment date.

Tax invoices

Section 20(1) of the Value Added Tax Act of 1991, (Act 89 of 1991), requires that a supplier (person supplying goods or services) who is registered as a VAT vendor issues to the recipient a tax invoice within 21 days of the date of a supply whether requested or not.

Tax invoices for amounts more than R5 000,00 must include:

a. The words "tax invoice" in a prominent place.
b. The name, address, and VAT registration number of the supplier.
c. The name, address and where the recipient is a vendor, the recipient's VAT registration number.
d. The serial number and date of issue.
e. An accurate description of goods and/or services (indicating where applicable that the goods are second-hand goods).
f. Quantity or volume of goods or services supplied.
g. Price and VAT.

A tax invoice is a document which is provided for in the Value-Added Tax Act, 1991 ("the VAT Act") to enable the vendor to claim input tax.

The VAT Act prescribes that a tax invoice must contain certain details about the taxable supply as well as the parties to the transaction.

3.1.5 Disputes

A dispute can arise in the contract when both the contractor and the employer think that they are right, and they both think the other party is wrong. There are a variety of reasons for a dispute, but the most common reasons are regarding money or time for completion.

The contract specifies the way disputes will be resolved on the contract. The different forms of contract deal with disputes differently and typically include provisions for the initial resolution of a dispute by:

- **Mediation** – a third party is appointed to facilitate conciliation between the parties and agreement on the outcome of the dispute.
  or
- **Adjudication** – a third party is appointed to decide on the dispute, which is binding on the parties and is final unless it is reviewed by either arbitration or litigation.

Where a party to the contract is dissatisfied with the decision of an adjudicator or fails to settle the dispute through adjudication, the dispute is referred for final resolution to:

- **Arbitration** – one or more arbitrators are appointed to resolve the dispute in accordance with procedures laid down in the Arbitration Act 42 of 1965.
  or
- **Litigation** – one or more advocates are appointed by both parties. The advocates present their sides of the argument in a court of law to persuade the judge which party has the better legal case.

Mediation and adjudication (see section 2.8) are intended to provide an inexpensive means for resolving disputes without legal representation. Only if these procedures fail to resolve the dispute is the matter referred to arbitration or litigation for final resolution.

The procedure for the adjudication of disputes is intended to resolve disputes quickly. Most contracts have time periods for referring disputes for resolution by an adjudicator. Disputes that are notified outside of these time periods are automatically referred to arbitration or litigation.

Not all disputes end up being declared as such. Most disputes are sorted out on site between the contractor's representative and the employer's representative. The parties come to an agreement to settle the dispute in a friendly way, and all parties compromise on their position until they reach a common ground. This is the most effective way of sorting out differences.

The parties to a contract are always free to agree to settle a dispute amicably in any manner that the parties choose, no matter what the contract stipulates.

3.1.6 Termination of Contract

Each of the forms of contract endorsed by the cidb permits the parties to the contract to terminate the contract should the other party be in material breach of the contract, e.g., the employer has failed to pay the contractor, or the contractor is not performing the work in accordance with the provisions of the contract.

Table 3.3: Reasons for the Employer to Terminate Due to Default by the Contractor

FORM OF CONTRACT	REASONS FOR THE EMPLOYER TO TERMINATE DUE TO DEFAULT BY THE CONTRACTOR
JBCC Minor Works Agreement	Where the Contractor defaults by failing to: • Provide the security and the Employer elects to terminate. • Execute the works. • Comply within a reasonable period with a valid contract instruction issued • Provide evidence of insurance where responsible.
JBCC Principal Building Agreement FIDIC "Suite of Contracts"	Where the Contractor fails to comply with contractual obligations or refuses to comply with a contract instruction. Where the Contractor: • Fails to provide a performance security or comply with an instruction. • Abandons the works or plainly demonstrates the intention not to continue • performance of obligations. • Without reasonable excuse fails to proceed with the works. • Subcontracts the works or assigns the contract without the required agreement. • Becomes bankrupt or insolvent or carries on business under a receiver. • Gives or offers to give to any person any bribe, gift, gratuity, commission or other thing of value as an inducement or reward.
GCC 2025	Where the Contractor has: • Made application for sequestration of his estate. • Abandoned the contract. • Without reasonable cause failed to commence the works. • Failed to proceed with the works with due diligence or to execute the works in accordance with the contract. • Failed to remove materials from the site or to pull down and replace work condemned and rejected by the Engineer. • To the detriment of good workmanship or in defiance of the Engineer's instructions sublet any part of the contract. • Assigned the contract or any part thereof without consent. • Anyone in his pay or in his employ bribes a person in the employ of the Employer. • Furnished inaccurate information in his contract.
NEC3 Engineering and Construction Works Contract	Where the Contractor: • Becomes insolvent. • Has defaulted by substantially failing to comply with his obligations, not providing a bond or guarantee, appointing a subcontractor for a substantial portion of the works without acceptance by the Project Manager, hindered the Employer or broken a health or safety regulation.

Table 3.4: Reasons for the Contractor to Terminate Due to Default of the Employer

FORM OF CONTRACT	REASONS FOR THE CONTRACTOR TO TERMINATE DUE TO DEFAULT BY THE EMPLOYER
JBCC Minor Works Agreement	• The Employer fails to appoint a Principal Agent, give possession of the site or pay a certified amount. • The Principal Agent fails to issue a Payment Certificate or a completion certificate.
JBCC Principal Building Agreement	• The Employer fails to appoint a Principal Agent, effect special insurances, give possession of the site or pay a certified amount. • The Principal Agent fails to issue a Payment Certificate to the contractor by the due date
FIDIC "Suite of Contracts"	• The Employer fails to pay the Contractor in accordance with the contract. • In the event of a prolonged suspension which affects the whole of the works.
GCC 2025	• The Employer fails to pay the Contractor the amount due in terms of the contract.
NEC3 Engineering and Construction Works Contract	• The Employer has not paid a certified amount within 11 weeks of the certificate. • The Project Manager has instructed the Contractor to stop or not start the works for a reason which is not the fault of the Contractor and an instruction has not been given to re - start or start the works within thirteen weeks.

SECTION 3.2:
PREPARING TO START THE CONTRACT

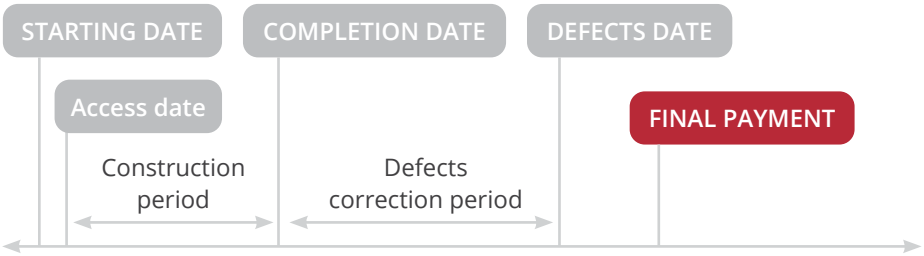
3.2.1 The Construction Process

Every construction works contract that is endorsed by the cidb makes provision for a start date, an access date, a completion date, and a defects date.

At the start of any contract, the contractor needs to deliver certain items that are required in terms of the contract. These items can include:

- Proof of the insurances that the contractor is required to have.
- Provision of a performance bond.
- Provision of the preliminary contractual programme.

Figure 3.1: Contractual Requirements According to Agreed Time Periods



These contractual requirements are needed by the employer to justify providing the contractor with access to the site. The contractor must comply with these requirements timeously; otherwise, he will be in breach of contract and may have the contract terminated due to lack of performance.

3.2.2 Allowable Rates

Before the work on site can start, the contractor should make certain preparations. These preparations include careful planning of resources and methods of work to ensure that the work is performed on site is in line with the thinking at tender stage.

This process is known as the pre-contract planning stage of the contract, and will result in a set of allowable rates or lump sum amounts for activities that have been calculated, in order to guide the productivity requirements on site. The contractor uses productivity rates from past projects of a similar nature to determine productivity hours.

"Allowable rates or lump sums" are the costs or time period that a contractor can allow for the task at hand, covering labour, equipment, transport, supervision and planned profit. These allowables can help the contractor to plan the work more efficiently and make the most of cutting costs of production and thereby maximising profits.

When putting the price together for the tender submission, the contractor was required to make certain assumptions regarding the manner in which the work would be done. This includes how many people of what category are to be used for the work, how long they will take to perform a task, and how much work they will be able to complete in a day (see section 2.9).

The difference between the estimates and the allowables is that the allowables are calculated backwards from the tendered rates submitted in the tender. The cost allowables are calculated by dividing the direct project cost for the item of work by the total quantity of work to be done on that item. Each item of work will contain at least one of the following components:

- Labour
- Equipment
- Materials
- Transport

Table 3.5: Allowable Rates Example

QUANTITIES TAKEN OFF DRAWINGS				DIRECT PROJECT COSTS					TENDERED RATE
ITEM	DESCRIPTION	UNIT	QUANTITY	LABOUR	EQUIPMENT	MATERIALS	TRANSPORT	TOTAL COST	
3.1	Concrete to Foundations	m^3	4	R448	R128	R1 648	R320	R2 544	R750

The direct project costs to mix and place 4.0 m3 of concrete to foundations:

- Labour = R448,00/ 4.0 m^3 = R112,00/m^3
- Equipment = R128,00/ 4.0 m^3 = R32,00/m^3
- Transport = R320,00/ 4.0 m^3 = R80,00/m^3

This leaves over a total of R412,00 per m3 for materials.

The total of the cost per m^3 is R636,00/ m^3. The difference between the tendered rate of R750,00/ m^3 and this figure represents the profit included in this item (18% profit) when the tender was calculated.

The benefit of doing this analysis before the work starts on the contract is that the contractor is immediately provided with a clear allowable amount for expenditure on each component of the work.

A contractor's profits are eroded whenever the cost of a task or activity exceeds the allowable.

In this example, the contractor will know that a price of R412,00 per m^3 plus a portion of the cost for labour and equipment for mixing the concrete cannot be exceeded if ready mixed concrete is purchased, or alternatively the equipment, sand, stone, cement, and labour needed to mix the concrete should equal or be less than this amount. It also indicates how much the contractor can spend on labour in the pouring and placing of the concrete in foundations.

3.2.3 Time Allowables

Another important aspect to be determined when considering allowable rates is the time that should be allowed to be taken to complete a task.

The four-person labour team planned to place the concrete at a wage rate of R28,00 per hour. Accordingly, the allowed time to complete the activity is R112,00 for four labourers at R28,00 per hour = one hour.

The time target for the labour team to work towards when they are casting four m3 concrete in a foundation is four hours.

Time allowable should then be tabulated against each item that will be costed, so that each activity can be measured against allowables. This provides the contractor a means of identifying immediately where areas are taking too long to construct and where there is scope for more profit.

The drawback of not planning is that FAILURE comes as a complete surprise without the worry and stress that normally precedes it.

3.2.4 Resourcing the Project

From the quantities identified in the contract or taken off the drawings, the contractor can identify the gross quantities of each type of material that will be required to construct the works, how many people will be required to finish the works in time, the plant required to carry out each activity and have a good idea of the profit that might be made on the project. This will provide good indicators as to how many people are required on site, and how much equipment is needed (e.g., does the contractor need to provide his own batching plant or can he make use of ready - mixed concrete) (see section 3.6).

Resource planning stems from two main elements of a contract (see section 3.6):

- The programme of works.
- The production rates that the contractor can manage to do the work.

Work programmes are essential for the efficient performance of any job. They are an essential tool for job planning and cost control and may be used to demonstrate claims for delays and extra payments.

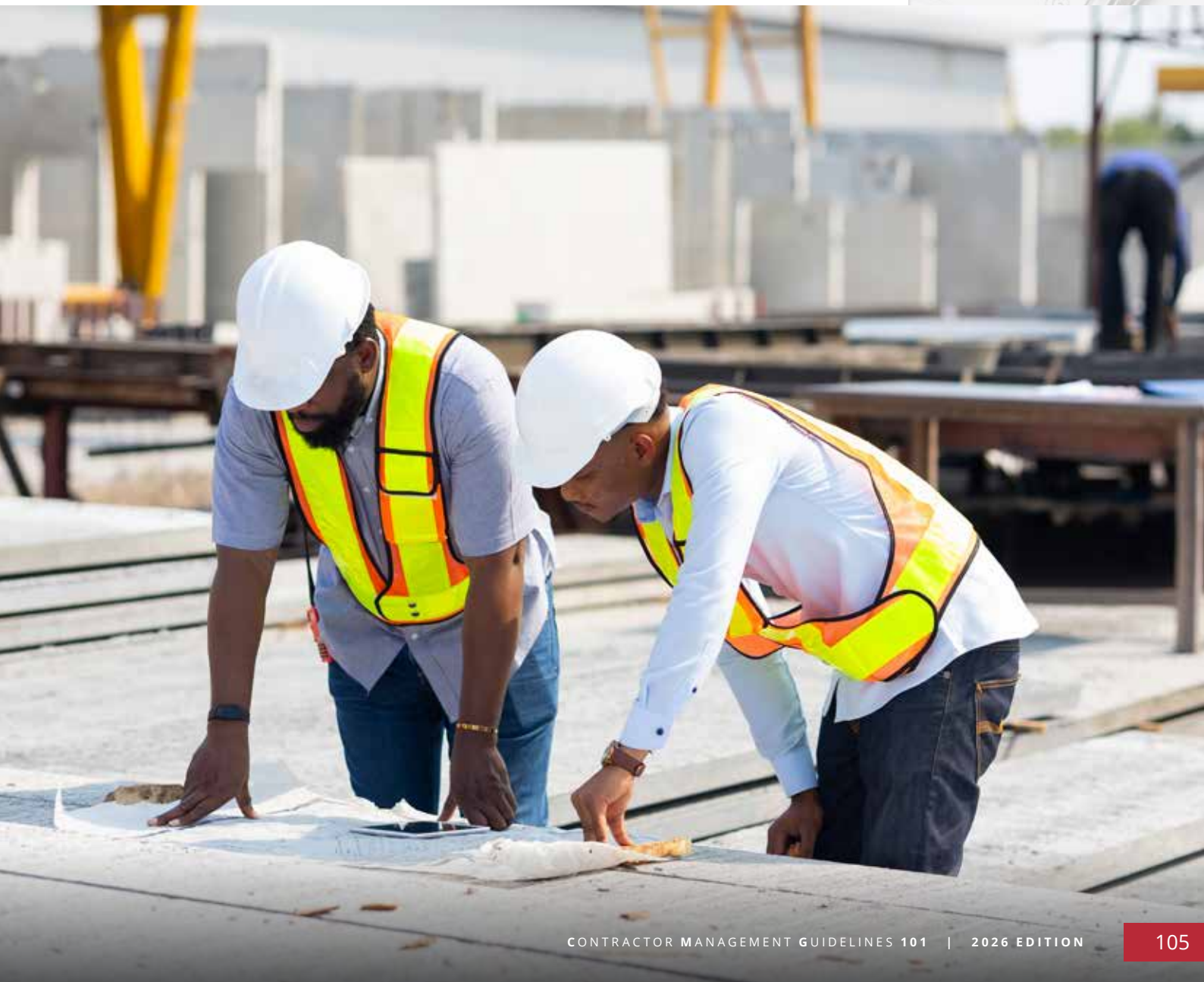
The programme is the tool that is used to determine the sequence in which the work needs to be done to be completed on time. In construction, there is a logical sequence to the activities. It is not possible to construct the roof until the walls have been built, and the walls cannot be built until the foundations have been constructed. This logical sequencing of activities is an essential tool for managing any construction project (see section 3.6).

By carefully sequencing the work that must be done, the contractor can work more efficiently with equipment, personnel and tools and are informed at the start of the project when the required materials need to be purchased. By moving activities around and carefully changing the sequence of the works, the contractor can optimise each resource's input and complete the works as soon as possible.

Different options can be explored and the one that will yield the greatest profit, or the least risk can be chosen. At tender stage the methodology for the works is prepared in a hurried and broad-brush manner. When the contract is awarded, the contractor owes it to himself to ensure that the most profitable and least risky options are chosen to maximise the profits for the shareholders.

3.2.5 Site Establishment

Site establishment, an essential part of preparation necessary to start a contract, is addressed in section 3.4.



Safety is a state in which the risk of harm (to persons) or damage is limited to an acceptable level. Safety on site is something that must be considered very carefully. It is not possible to determine the price of a life, or an eye, if it is lost through an accident.

The Occupational Health and Safety Act (Act 85 of 1993) Section 8(1): General duties of employers to their employees states:

Every employer shall provide and maintain, as far as is reasonably practicable, a working environment that is safe and without risk to the health of his employees.

Improving safety on site does not need to be an expensive task. It can entail careful induction training of all persons entering the site, ensuring that each person wears suitable personal protective equipment, and keeping a wary eye out for potential risk areas on site.

It is also important to remember workers' health is affected by the environment and conditions that they work in. Long - term health problems can be a more serious risk to workers than site accidents.

3.3.1 Workplace Accidents

A workplace accident is an unplanned event with undesirable outcomes typically relating to loss of production at one end of the spectrum and loss of life at the other. To avoid these undesirable outcomes, it is necessary to plan for possible risky situations and to avoid or eradicate the risk (see section 3.10).

The most common injuries on site are finger, hand, or foot injuries. These are mostly caused when workers must manually move and position materials and equipment as part of their daily tasks. More serious injuries, which also frequently occur, are eye and head injuries. Many injuries can easily be avoided by using suitable personal protective equipment such as gloves, boots with steel toe caps, goggles ,or a hard hat.

It is every contractor's statutory duty to ensure that workers are not exposed to unsafe working environments. Construction sites are by nature prone to accidents because of the many activities that take place at the same time. The owner of a construction business is liable for any injuries or fatalities that occur on site, and he needs to put suitable safety induction training in place, provide suitable personal protective equipment, and plan the works in such a way that workers are not exposed to undue risks.

3.3.2 Long-term Health Problems in the Workplace

The working environment on a construction site is nearly always noisy, dusty, and dirty. This can cause long-term health problems for workers who are exposed to loud noise for a long period, or end up breathing in fine particles of dust and other debris that is thrown into the air by construction operations.

People who are exposed to very noisy operations for a long time can suffer permanently impaired hearing or even total hearing loss. The contractor must provide suitable hearing protection in the form of ear plugs or earmuffs to workers in noisy areas and most importantly, ensure that these are used.

The same applies to dusty environments. Silicosis is one of the most common chest ailments experienced by mine workers and is caused by breathing in the very fine dust that is produced when drilling holes for blasting and whilst mucking out the blasted rock debris. Construction sites are also prone to dusty conditions, especially in South Africa, where haul roads are not surfaced, and very dry conditions result in the roads being pulverised to fine dust by the heavy trucks and high traffic during construction.

Frequent spraying of dirt roads with water can prevent them from drying out and causing dust. This also provides a better surface for the trucks to drive on, resulting in less breakdowns and better productivity. As dust cannot be eliminated, workers exposed to dust should be required to wear face mask dust filters. A wet handkerchief does not prevent the microscopically fine dust particles that cause silicosis from entering the lungs of a worker – only a purpose designed filter will do the job.

Another area where workers are subject to long-term health problems is where there is a lot of welding to be done. The very bright light produced during arc welding causes damage to the retina of the eye, something which cannot be reversed. Those artisans who are doing the welding must always be equipped with proper welding helmets, goggles, and protective clothing such as welding gloves, aprons, and sleeve protectors, which also prevent burns from weld spatter and grinding operations.

3.3.3 Legal Requirements for Health and Safety

Health and safety requirements are stipulated in the Occupational Health and Safety Act (Act 85 or 1993). These requirements are supplemented by several regulations issued in terms of this Act. Compensation for injury, disease or death of a worker is governed by the Compensation for Occupational Health and Diseases Act (Act 130 of 1993). Both laws are administered by the Department of Labour.

The Occupational Health and Safety Act is based on the principle that dangers in the workplace must be addressed by communication and cooperation between the worker and the employer. The worker and the employer must share the responsibility for health and safety in the workplace. Both parties must proactively identify dangers and develop control measures to make the workplace safe.

A contractor is required to provide and maintain, as far as is reasonably practicable, a working environment that is safe and without risk to the health of his employees. To do this, the contractor needs to (see section 3.10):

- Identify hazards (source of or exposure to danger) in relation to the work on site.
- Evaluate the associated risks (the probability that damage or injury will occur).
- Establish the steps that need to be taken to prevent exposure of employees to the identified hazard or where prevention is not practicable, minimise such exposure.

The contractor also needs to make every employee aware of the identified hazards and to train every employee in the steps that need to be followed to prevent or minimise exposure to the hazard. The contractor must not allow any worker to work on the site that has not been informed of and trained in the steps that need to be followed. The contractor must also be proactive and ensure that the steps are indeed followed and that workers are reminded of the hazards and the steps that are to be followed from time to time.

Government has established a fund to compensate casual and full-time workers who, as a result of a workplace accident or work-related disease, become ill, are injured, disabled or killed. Workers who are injured on duty can claim compensation for temporary or permanent disablement. If workers die because of an injury on duty, their dependants can claim compensation.

Contractors must register with the Compensation Fund and pay annual assessment fees (see section 1.4).

3.3.4 Health and Safety Representatives

Contractors who employ 20 or more workers must appoint health and safety representatives to monitor health and safety conditions. One such representative needs to be appointed for every 50 workers. Representatives must be full-time workers who are familiar with the workplace.

Representatives are required to:

- Review the effectiveness of health and safety measures
- Monitor, investigate and report on health and safety matters
- Accompany inspectors during inspections
- Make representations to the contractor regarding any complaints regarding health and safety matters

Contractors who have appointed two or more health and safety representatives must form health and safety committees. These committees should meet monthly. They may make recommendations to the contractor regarding any matter affecting the health or safety of

Regulations issued in terms of the Occupational Health and Safety Act (Act 85 of 1993) include:

- *General Administrative Regulations*
- *General Safety Regulations*
- *General Machinery Regulations*
- *Asbestos Regulations*
- *Construction Regulations*
- *Driven Machinery Regulations*
- *Electrical Machinery Regulations*
- *Electrical Installation Regulations*
- *Explosive Regulations*
- *Facilities Regulations*
- *Noise Induced Hearing Loss Regulations*
- *Regulations for Hazardous Chemical Substances*
- *Vessels Under Pressure Regulations*

An employee is entitled to benefits in the event of an injury on duty.

However, if an accident is attributable to "serious and wilful misconduct" by the employee, no compensation is payable unless the accident results in serious disablement or the employee dies, leaving dependants.

Sections 17 to 20 of the Occupational Health and Safety Act deal with matters relating to health and safety representatives and health and safety committees.

persons on the site and must discuss any incident on site which caused a person to become ill, be injured or to die.

Health and safety committees must make and keep records of recommendations to employers and inspectors.

Health and Safety Plans

Contractors shall prepare a documented health and safety (H&S) plan for each project to ensure a working environment for workers and the public that does not threaten their health and safety. The H&S plan shall address the significant and residual hazards and risks that a competent and resourced contractor would not have been expected to know relative to a specific project on a specific site. The H&S plan shall describe the work to be done, the hazards associated with that work and clearly describe the hazard control measures that will be implemented.

The H&S plan shall include, inter alia, a statement of responsibilities in terms of management of various aspects of H&S on site, H&S training, and incident management. Site H&S rules for each project will also be included that address, inter alia, induction/orientation and H&S training, personal protective equipment, access to the site, accident and emergency procedures, and safe work procedures. H&S method statements shall form part of the H&S plan. The contractor shall ensure that the H&S plan is implemented, reviewed, and regularly updated.

Construction Supervisors and Safety Officers

The Construction Regulations require the contractor to appoint a full-time competent employee to supervise the performance of construction work. This person must be appointed in writing as the construction supervisor.

The contractor may appoint additional people to assist the construction supervisor to perform certain of his functions, but this does not relieve the construction supervisor of his or her responsibilities under the regulations. If the contractor has not appointed additional people to assist the construction supervisor, and an inspector determines that the construction supervisor needs assistance, he can instruct the contractor to do so.

No construction supervisor may supervise construction work on more than one site unless there are sufficient additional competent people appointed to assist him.

A contractor must assess a project for size, degree of dangers that are likely to be encountered or the accumulation of hazards or risks on site, and if deemed necessary, appoint a full - time or part-time construction safety officer to assist in all safety related controls. This person must be appointed in writing.

Conducting of Risk Assessments

In terms of the Construction Regulations, the contractor must have a risk assessment (see section 3.10) performed by a competent person (who is appointed in writing) before any construction work starts as well as during the construction work. Such an assessment shall as a minimum:

- Identify the risks and hazards to which persons may be exposed to
- Analyse and evaluate the identified risks and hazards
- Document a plan of safe work procedures to mitigate, reduce or control the risks and hazards that have been identified
- Provide a monitoring plan
- Provide a review plan

This risk assessment must be available on site for inspection by an inspector, client, client's agent, contractor, employee, representative of a trade union, health and safety representative or any member of the health and safety committee.

The contractor must ensure that all subcontractors are aware of any hazards on the site before construction work commences and during the construction period.

Awareness of having to work safely is the first step towards improving the safety of workers on a construction site. By being aware of what could result in an injury, everyone can keep an eye out for potential risk areas and correct them before an injury occurs.

Regulation 8 of the Construction Regulations deals with the supervision of construction works.

Regulation 9 of the Construction Regulations deals with the risk assessments of construction works.

A contractor is required to:

- Provide a first aid box or boxes at or near the workplace where more than five employees are employed.
- Ensure that where there are more than 10 employees employed on the site that for every group of up to 50 employees at that workplace, at least one person is readily available during normal working hours, who is in possession of a valid certificate of competency in first aid.

Poor housekeeping occurs when equipment, materials and other items are left lying loosely around a construction site, particularly in areas where people are required to walk, pass through or carry out their work. These items present a significant safety risk and are a major cause of injuries. All materials must be properly arranged and securely stored, while rubble and redundant materials should be removed from site without delay.

There is a direct link between poor housekeeping and the number of injuries recorded on construction sites. Accidents frequently occur when incorrectly stacked items fall onto someone, loose cables become entangled with moving objects and strike workers or visitors, open electrical boxes short-circuit when exposed to moisture, or individuals suffer electric shock after touching a poorly earthed distribution board. Maintaining good housekeeping is therefore essential to ensuring a safe working environment.

Employees

Section 14 of the Occupational Health and Safety Act requires that every employee:

- Takes reasonable care at his place of work for his own health and safety and of other persons who may be affected by his acts or omissions.
- Cooperates with the contractor in complying with the requirements of the Act.
- Carries out lawful instructions and obeys the health and safety rules and procedures laid down by the contractor.
- Brings to the contractor's or the health and safety representative's attention any situation which is unsafe or unhealthy.
- Reports incidents which may affect his health, or which has caused an injury to himself, to the contractor or the health and safety representative as soon as practicable but not later than the end of the shift during which the incident occurred.

The General Safety Regulations require a contractor to prohibit an employee who is, or who appears to be, under the influence of intoxicating liquor or drugs to enter or remain at a workplace. Employees taking medicines may only be permitted to perform duties at the workplace if a side effect of their medication does not constitute a threat to the health or safety of the person concerned or other persons at the workplace.

The contractor is required by the Construction Regulations to ensure that all employees under their control are:

- Informed, instructed, and trained by a competent person regarding any hazard and the related work procedures before any work commences, and thereafter at such times as may be determined in the risk assessment.
- Issued with proof of health and safety induction training issued by a competent person and carry proof of such induction when working on site.

Visitors to the Construction Site

In terms of the Construction Regulations, visitors to the site must be informed of the hazards and be issued with the necessary personal protective equipment, unless they are merely visiting the site office and do not encounter construction activities.

A risk assessment is an important step in protecting workers, as well as complying with the law. It helps the contractor to focus on the risks that really matter in a particular workplace – the ones with the potential to cause real harm. Workers and others have a right to be protected from harm.

Specific requirements

General Safety Regulations establish specific requirements relating to:

a. Personal safety equipment and facilities
b. First aid, emergency equipment and procedures
c. Use and storage of flammable liquids
d. Work in confined spaces
e. Work in elevated positions
f. Working in danger of engulfment
g. Stacking of articles
h. Welding, flame cutting, soldering and similar operations
i. Ladders
j. Ramps

Construction Regulations establish specific requirements relating to:

a. Fall protection
b. Structures (buildings, structures other than buildings, formwork, false work, scaffold, or any fixed plant)
c. Formwork and support work
d. Excavation work
e. Demolition work
f. Tunnelling
g. Scaffolding
h. Suspended platforms
i. Boatswain's chairs
j. Material hoists
k. Batch plants
l. Explosive powered tools
m. Cranes
n. Construction vehicles and mobile plant
o. Electrical installations and machinery on construction sites
p. Use and temporary storage of flammable liquids on construction sites
q. Water environments
r. Housekeeping on construction sites
s. Stacking and storage on construction sites
t. Fire precautions on construction sites
u. Construction welfare facilities

The General Machinery Regulations establish specific requirements for the:

- Supervision of machinery
- Safeguarding of machinery
- Operation of machinery
- Working on moving or electrically alive machinery
- Devices to stop and start machinery

Diving Regulations establish specific requirements for diving operations.

Noise-Induced Hearing Loss Regulations establish specific requirements for exposure to noise, noise monitoring, control of noise exposure and hearing protective equipment. The Facilities Regulations establish requirements for facilities including sanitation, changing rooms, and drinking water.

Driven Machinery Regulations provide specific requirements for the operation of machinery such as revolving machinery, circular saws, band saws, wood planning machines, sanding machines, grinding machines, air compressors, refrigeration, and air conditioning installations, etc. The Lift, Escalator and Passenger Conveyor Regulations establish requirements for the design and construction of lifts, escalators, and passenger conveyors. The Vessels under Pressure Regulations establish requirements for the design, construction, and manufacture of pressure vessels (e.g., boilers, a pressurised system, etc.)

The Construction Regulations require a contractor to provide at or within reasonable access of every construction site, the following clean and maintained facilities:

- ***at least one shower facility for every 15 workers;***
- ***at least one sanitary facility for every 30 workers;***
- ***changing facilities for each sex; and***
- ***sheltered eating areas.***

Electrical Machinery Regulations establish specific requirements relating to:

a. Safety equipment
b. Work on disconnected electrical machinery
c. Switch and transformer premises
d. Switchboards
e. Electrical machinery in hazardous locations
f. Portable electrical tools and lights
g. Electric fences
h. Earthing
i. Clearance of power lines
j. Insulators and fittings
k. Overhead service connections and conductors

The **Electrical Installation Regulations** establish design and construction requirements for any machinery in or on any premises used for the transmission of energy from a point of control to a point of consumption anywhere on the premises. These regulations require that electrical contractors who perform electrical engineering work are registered to do so with the chief inspector or a person appointed by the chief inspector.

The **Asbestos Regulations** establish specific requirements relating to asbestos work, exposure to asbestos and the disposal and demolition of asbestos. The **Environmental Regulations for Workplaces** establish requirements for the environment within which workers are permitted to work. These regulations accordingly address issues such as noise, temperature, ventilation, and lighting precautions against flooding, etc. The **Explosive Regulations** deal with the handling and use of explosives.

The **Regulations for Hazardous Chemical Substances** deal with the handling and transportation of toxic, harmful, corrosive, irritant or asphyxiant substance.

Subcontractors

In terms of the Construction Regulations, a contractor may only subcontract work in terms of a written subcontract and shall only appoint a subcontractor should the contractor be reasonably satisfied that such a subcontractor has the necessary competencies and resources to perform the work falling within the scope of the subcontract safely.

The contractor is required to:

- Stop any subcontractor from executing construction work which is not in accordance with the contractor's or subcontractor's health and safety plan for the site or which poses a threat to the health and safety of persons.
- Ensure that every subcontractor is registered and in good standing with the compensation fund or with a licensed compensation insurer prior to work commencing on site; and potential subcontractors submitting tenders have made provision for the cost of health and safety measures during the construction process.

The Construction Industry Regulations make provision for an EB Class of Works which is defined as construction works that are primarily concerned with the installation, extension, modification or repair of electrical installations in or on any premises used for the transmission of electricity from a point of control to a point of consumption, including any article forming part of such an installation.

The EB class of construction works covers all electrical equipment forming an integral and permanent part of buildings and/or structures, including any wiring, cable jointing and laying and electrical overhead line construction.

The health and safety file should contain at least:

- *Notifications*
- *Letters of appointment*
- *Minutes of meetings*
- *Copies of subcontract agreements*
- *Health and safety plans*
- *Recommendations*
- *Reports*
- *Proof of registrations*
- *Risk assessments*
- *Details of induction training*
- *Certificates*
- *Names of first aiders on site*
- *Records of inspections etc*

Contractors who delay in reporting an accident may be fined.

Notification of construction work

The Construction Regulations require that the main contactor inform the provincial director of the Department of Labour before carrying out any work on site where the work:

- Involves the demolition of a structure exceeding a height of three meters, the use of explosives or the dismantling of fixed plant at a height greater than three meters.
- Exceeds 180 days or will involve more than 1800 person days of construction work and includes excavation work deeper than one meter; or working at a height greater than three meters above ground or a landing.

Health and safety file

The Construction Regulations require that a health and safety file, which includes all documentation required in terms of the provisions of the Act and Regulations, is opened, and kept on site and made available to an inspector, client, client's agent, or main contractor upon request.

Health and Safety Inspectors

Health and safety inspectors, appointed by the Minister of Labour may, in terms of the Occupational Health and Safety Act, enter any workplace at all reasonable times, without prior notice, and question any person. They are also empowered to request and examine documents and remove any evidence of a breach of the requirements of the Act and its associated Regulations. They may also prohibit a contractor from continuing any work which, in their opinion, threatens or is likely to threaten the health or safety of any person working on the site and may block off unsafe workplace areas.

An inspector may investigate the circumstances of any incident that has occurred, which has resulted, or in the opinion of the inspector could have resulted, in the injury, illness or death of any person. Such reports are submitted to the Attorney General who may deal with the incident in terms of the Criminal Procedures Act or the Inquests Act.

3.3.5 Penalties

Section 38 of the Occupational Health and Safety Act contemplates the following minimum penalties:

- Committing a reckless act in the workplace – a fine of R 50 000,00 and one -year imprisonment.
- Omissions by contractors which lead to a disabling injury – a fine of R 100 000,00 and a one-year imprisonment.
- Omission by a contractor that leads to one fatality – a fine of R 100 000,00 and a two-year prison sentence.

3.3.6 Reporting of Incidents

The Occupational Health and Safety Act requires that all incidents be reported within seven days to the provincial director of the Department of Labour. If a person who is injured dies after the Department is notified, the death of the worker must be immediately reported to the Department.

No one may disturb the site of an injury or death, unless such disturbance is required to prevent a further incident, to remove the injured or dead, or to rescue persons from danger.

3.3.7 Reporting Requirements for Occupational Injuries

All contractors must report any accidents that result in medical expenses and/or a worker's absence from work for longer than three days by submitting the required documents to the Compensation Fund within seven days. Employers must submit certain documents to the Compensation Commissioner within seven days of being notified.

Note: Employees may also obtain compensation for an occupational disease if the disease has arisen out of or in the course of his employment. If the occupational disease is aggravated by another disease, the employee may receive compensation for the treatment of the other disease as well. The employee must, within 12 months of being diagnosed with the disease bring it to the attention of the Commissioner, the contractor or Mutual Association concerned, failing which the claim will not be accepted and no compensation will be payable.

An incident is any event or occurrence that takes place in the workplace, or arises out of or in connection with work activities, including the use of plant or machinery, and which results in, or could result in:

- A major incident occurred (i.e., an occurrence of catastrophic proportions);
- Any person dies, becomes unconscious, suffers the loss of a limb or part of a limb or is otherwise injured or becomes ill to such a degree that he is likely either to die or to suffer a permanent physical defect or likely to be unable for a period of at least 14 days either to work or to continue with the activity for which he was employed or is usually employed; or
- The health or safety of any person was endangered and where:
  - a dangerous substance was spilled;
  - the uncontrolled release of any substance under pressure took place;
  - machinery or any part thereof fractured or failed resulting in flying, falling or uncontrolled moving objects; or
  - machinery ran out of control.

SECTION 3.4:
SITE ESTABLISHMENT AND ADMINISTRATION

Site establishment should be regarded as the setting up of a remote operations control centre. This exercise is often strategically and financially under - estimated.

Always read the contract, particularly the scope of work, to identify any specific requirements that the employer may require.

3.4.1 Introduction to Site Establishment

It is important for the contractor to mobilise and move onto site as soon as possible after the site is handed over by the employer. If the contractor does not do this, the employer might terminate the contract due to the contractor's breach.

Site establishment is a very important element in the performance of any contract. If the site establishment is well planned and executed, the contractor can greatly increase productivity and efficiency. A well-organised site which is neat, tidy, and clean will not only look professional but will also reduce waste, accidents, and lost time in searching for items that are needed.

The employer usually provides a portion of land for the contractor to use as a site camp, either within the construction site itself or in a nearby location. Site establishment should be regarded as the setting up of a remote operations control centre, as it forms the operational hub of the project. However, this critical exercise is often strategically and financially underestimated.

3.4.2 Site Layout Considerations

The arrangement of site accommodation such as offices, storage sheds, mechanical service yards, training areas and access routes is normally a first consideration when establishing a site. Other aspects such as the location of services such as water, electricity and telephones can also play an important part in the site layout.

When planning the layout of the site, it is important to also consider the owners or tenants of the areas next door to the site. Loud noise from a machine can disturb the neighbours if it will be running for long periods, and complaints will be received about this disturbance. In such a case, the machine should be shielded to reduce any possible disturbance to a minimum.

When planning the site layout, the contractor should consider at least the following:

a. Location of the site
b. Conditions on site
c. Access to the site
d. Drainage of the site
e. Ground conditions (wet weather conditions, marshy conditions, ground movements)
f. Services available (water, sewers, electricity, gas, telephones, etc.)
g. The type and quantities of material that is to be stored
h. The type of construction equipment that is to be used
i. Disposal sites for excess soil or rubbish
j. Security on site (access security, security of materials delivered, etc.)
k. Accommodation requirements for the employer and his representatives
l. Local suppliers
m. Local labour availability

3.4.3 Access

Access to the site and movement around the site must be well planned. This entails the planning for access by heavy trucks to deliver major plant, materials, and equipment, as well as by light vehicles to drop off personnel. There will also be pedestrian access points to consider since many people will come to site on foot or possibly by taxi. Parking space is also needed for site management, and for the employer and his representatives.

Access to the different parts of the site is also important as different types of equipment will be required in different areas. For example, tower cranes may be required at different points on the site. On some sites, underground access, or even access to services tunnels that have already been constructed, may have to be considered.

Where there is no easy access available, the contractor will have to construct temporary access. This can entail a simple timber walkway or the construction of an access road, depending on the location and nature of the site.

Site Facilities

General considerations

Different sites will require different types of site facilities. It is important to know what is to be accommodated on site when the contractor starts to plan the site establishment. The number of personnel, types and quantities of materials which will be required, equipment that will be used, and the security requirements for the site must all be carefully considered.

Administrative offices

The administrative offices will vary depending on the size of the project and the duration of the works. Site offices are often custom designed to be transportable and can be moved from one site to the next, saving on the expense of fitting them out for each new project. The number and quality of the office accommodation should be appropriate to the length of time that site staff will be using them and by the number of personnel that will be using them.

The site offices should be as far as possible watertight, dust and soundproof and of a solid construction. Suitable lighting and ventilation must be fitted either in the form of windows or lights, air conditioners and fans. Good internal and external finishes will enhance site staff's working environment and will promote pride in their work.

Facilities for workers

Huts and sheds should be provided for workers to shelter them from bad weather and changing into working clothes. On some sites accommodation and canteen areas are also needed if the project is on a remote site far away from existing settlements, and therefore the contractor must provide this for his workers in terms of the contract.

Ablution facilities

Toilets and bathrooms must be provided in sufficient quantity for all staff and workers including those employed by subcontractors. The number of these ablutions should be appropriate to the size of the site and should be well - kept. Clean water should be always provided for workers to drink and wash with.

Regulation F11 of the National Building Regulations prohibits the erection or demolition of a building unless approved sanitary facilities for all personnel employed on or in connection with such work have been provided or are available on the site or, with the permission of the local authority, at some other place.

SANS 10400 - F establishes minimum requirements to allow this Regulation F11 to be satisfied. Sanitary facilities should be provided at the rate of not less than one sanitary facility for 30 workers (or part of that number). Construction Regulations No 37305 of 7 February 2014 also stipulates requirements for construction welfare facilities.

Storage shed and areas

Depending on the size and nature of the project, other general sheds may also be needed. Sometimes the contractor will need to perform quality control testing on site and may establish a testing laboratory to do this himself, rather than to rely on external service providers. Soils or

A contractor shows that it values their inputs by providing good facilities for use by its workers. This can result in increased productivity, high morale in the workforce and reduced labour force turnover.

concrete testing labs take up a lot of space and need to be correctly set up in order to provide consistent and valid results.

Storage sheds are almost always needed to keep small tools, equipment and materials dry and secure when the contractor is not working. These need to be built to the required size, and with the appropriate amount of security for the site location and the nature of the items to be stored. Storage is often also to be provided for subcontractors.

When positioning storage sheds and areas, it is important to reduce the amount of handling that is required for those materials. The more materials are handled, the greater the possibility of damage or contamination and the more expensive and time consuming it becomes to work with them.

The type of materials or equipment to be stored needs to be considered as well. Fuels and explosives have very stringent storage requirements, and, in some instances, the contractor may have to obtain permits for these items. Plastic pipes may require shade from the sun in order not to be damaged whilst stored and electrical equipment will need to be stored in a dry place. Cement is normally stored either in silos or in weatherproof buildings or containers, on platforms or pallets off the floor.

3.4.5 Construction Equipment Areas

Certain projects require heavy machinery such as graders, bulldozers, excavators, and fleets of tipper trucks. These machines need an area in which they can be maintained and a location where they can be safely stored overnight.

Depending on the nature of the project, the machines may be stored next to where they happen to be working, well away from the main site offices. However, security must be provided for this situation.

Servicing of machines is normally done where they are working on a regular scheduled basis. Repairs are typically carried out wherever a machine breaks down; however, major servicing and more extensive repair work are usually undertaken in a central workshop. A workshops area would be required for this type of support work.

3.4.6 Work Areas

Work areas will include those parts of the site where the contractor will construct the works, as well as any areas that are used to assemble or produce elements for the works. These areas would include pre-casting yards, batching plants, areas where reinforcing cages are tied ready to be positioned and other areas where built-in elements are assembled prior to installation.

These work areas should be positioned carefully on the site to maximise efficiency in the construction process. Careful planning should be done over the duration and function of some items that will be used within these working areas, so that they do not need to be relocated during the project, causing delays to production. For example, the batching plant should be positioned where it can remain for the duration of the time that concrete will be needed on site, and in such a manner that delivery of aggregates and cement to the batch plant will not interfere with the operation of the batch plant itself or the delivery of concrete to the site.

The position of a tower crane is another good example. The tower crane may be required for almost the entire time, however, its position may need to be changed to reach sections of the building that are out of its initial reach and which will be constructed later. In such cases, the original location of the tower crane may well be built over when it is moved, using the same crane, simply relocated elsewhere.

3.4.7 Security

Site security is a critical part of the establishment. The perimeter of the site must be secured from a health and safety perspective to prevent unauthorised persons from gaining access to the site. The contractor is responsible for all persons who enter the site, and if a person were to wander onto the site and be injured or killed, this would have a serious impact on the delivery

of the project. Perimeter security is also required to prevent vandalism or damage to the works by unauthorised people entering the site.

Watchmen are usually posted at night or over weekends when the contractor is not at work to maintain this security. Suitable shelter needs to be provided for these watchmen.

Stores should be secured against theft and efficient systems put in place to ensure that materials are not stolen. Good systems will also reduce wastage of materials on site through proper and appropriate storage.

SECTION 3.5:
SITE ADMINISTRATION

Much of the paper received by a construction business has no long-term value but certain items are very important.

The challenge is to figure out which papers are needed, where to systematically store them, and how long to keep them.

The site diary can be used as a tool for planning, checking, and controlling site activities.

The records in a diary can be used in a court of law to prove what did or did not happen on a particular day. However, if the diary is incomplete or has gaps in it, then some doubt will exist as the authenticity of the diary. It is important to ensure that entries are accurate and comprehensive.

3.5.1 What is Administration?

Administration is the management of the affairs of a contractor's business. Site administration is the management of the contractor's affairs on a particular construction site.

Site administration and site management (see sections 3.1, 3.4 and 3.8) is often under-resourced and neglected in favour of production pressures. Site administration and site management is the 'nerve centre' of operations and if these functions are not functioning effectively, they will hamper production output and quality will suffer.

3.5.2 Record Keeping

General

Construction is a complex business to operate and there are many different activities that need to be managed at any one time. It is not possible to remember what happened at what time, and who did it, and why. Record keeping is essential to ensure that events can be recalled at a later stage.

There are several main types of records that need to be kept including:

1. Site diary
2. Drawing register
3. Written notices, correspondence, and site instructions
4. Site photographs
5. Contractual documents
6. Occupational health and safety documents (see section 3.3)
7. The site diary can be used as a tool for planning, checking, and controlling site activities

It is essential to also ensure that these records are properly filed so that they can be easily found when needed. By implementing a standard way of keeping and filing records, the contractor will save time and effort when starting new projects. It will also improve the contractor's ability to monitor and improve on production, quality, and cost controls.

Changes to the scope of work in the form of revised drawings or site instructions issued by the employer's representative can lead to adjustments being made to:

- The time for completing the works
- The price for performing the works

Most forms of contract require the contractor to motivate claims for adjustments within a specified time frame and to confirm all verbal communications in writing, failing which they are not recognised in terms of the contract. Failure to maintain adequate records and written confirmation can therefore result in significant financial loss.

Site diary

The site diary should be kept by the contractor's site agent or site manager responsible for the site. This site diary should keep specific information relating to the work that is done each day, what problems were encountered, what instructions were issued by the employer's representative (principal agent, project manager, supervisor, engineer), what drawings were received, and production and milestones achieved. Each project is different and the site diary for each contract will change depending on the type of work to be done.

There are standard records that need to be kept which are needed for contractual reasons. Information kept for all projects should include:

a. Day
b. Date
c. Rainfall measured
d. Personnel schedule
e. Equipment schedule
f. Record of any reportable accidents that occur
g. Production targets and achievements
h. Site instructions received
i. Drawings received
j. Issues that are causing delays
k. Work that is to be rectified
l. Site meetings held and the date for the next one

The contractor can decide how they wish to implement the site diary and there are different approaches that are commonly used. Some contractors produce a customised printed book with carbonated copies for use on site. This is useful for specific sites where the site agent will write in the diary what the records are for the day and issue a copy to the employer's representative.

Another approach is to develop a spreadsheet with the required information on it. Each day this spreadsheet is filled in and e - mailed to the employer's representative who can then store it electronically or print it out for their files or pass it on for information to the employer or other parties.

Drawing register

A drawing register must be kept and is essential in identifying changes and dates when these changes are notified. The drawing register must identify each drawing issued to the contractor for the contract with a revision number and the date it was received. This record is essential in determining when changes were implemented in the drawings and how it may have affected the works.

Changes to drawings may result in a variation if the work that is required for the change has already started. On the other hand, if the work has not yet started and materials have not been purchased for the original design the change may not result in a claim.

Written notices, correspondence, and site instructions

Correspondence is used to convey messages and confirm verbal discussions held between the parties on site. They place the discussion on record and expand on the circumstances or approach to be followed.

Written notices are like correspondence but differ in the fact that they are written in accordance with a specific requirement in terms of the general conditions of contract and usually make reference to a particular clause.

Changes to the scope of work in the form of revised drawings or site instructions issued by the employer's representative can lead to adjustments being made to:

- *the time for completing the works*
- *the price for performing the works*

Most forms of contract require that the contractor motivate claims for such adjustments within a specified time frame. Failure to maintain adequate records can result in financial loss.

Most forms of contract require that verbal communications be confirmed in writing, failing which such communications are not recognised in terms of the contract.

Site instructions are often given verbally on site in order not to delay the work. These must be confirmed in writing as soon as practically possible, so that they are placed on record and become binding in terms of the contract. Some contractors print standard site instruction booklets like the site diary, with carbonated pages which can be filled in by the employer's representative and handed to the contractor.

It is important to keep copies of outgoing mail as well as incoming mail. This should also be added to the filing system. Where there is a likelihood of a large quantity of mail to be processed, it would be a good idea to implement a document management system.

It is said that a picture paints a thousand words. Digital photography has dramatically reduced photographic costs. No contractor should be on site without a camera.

Site photographs

Site photographs are invaluable in recording conditions at a particular date and time. A picture tells the whole story; however, it is important to capture additional information about the picture as well. The additional information is needed to place the image in time and place so that it can be utilised.

Digital cameras now provide a means of recording actual events cheaply and effectively. The camera records the date and time of an image within the resulting image file.

Site photographs should have the following information:

a. Date and time
b. Location
c. Reason for taking the photograph
d. Name of photographer
e. The names of relevant people included in the photograph
f. The names of the subcontractors included in the photograph

The best "diary" of a project is a regular completed site diary coupled with a series of regularly taken photographs. These photographs do not have to be taken daily but could be taken on a weekly basis or at times when specific important occurrences take place.

It is important that the photographs are correctly coded and filed with the appropriate description relating to each photograph. Electronic storage is fine if there is a clear way of finding a particular picture when needed.

Contractual documents

The most important document for any construction project is the contract. This details all the rights, responsibilities, and obligations of the parties to the contract. There should always be a copy of this document available for site personnel to refer to.

Other contractual documents are also important and should be stored carefully. Documents that have contractual reference include:

a. The main contract
b. Subcontracts
c. Labour contracts
d. Plant-hire agreements
e. Delivery notes
f. Programmes and bar charts
g. Site-meeting minutes
h. Notifications for inspections
i. Correspondence with the employer/employer's representative
j. Payment certificates
k. Completion certificates
l. Daily labour sheets and materials and equipment usage where work is performed on a cost reimbursable basis
m. Health and safety file containing relevant health and safety documents

3.5.3 Filing

The key to keeping all documents is an efficient filing system. There are no fixed rules and filing systems vary from person to person. One person may file everything in date order and another by subject or document type. These personal preferences will make it extremely difficult for a contractor to find their documents, since each person will need to pull out documents that they have filed themselves.

A standardised system of filing is therefore essential. There are still no rules to how this should be done; however, there are different types of documents that will need to be kept for different purposes, by different people, in different places, in different ways.

For example, delivery notes are essential documents for the stores to keep. These will need to be reconciled each month against supplier's invoices by the accounts section. These will probably be kept in the stores, possibly in lever arch files and only stores personnel and accounts personnel will have access to these documents.

Contractual documents are sensitive and confidential and would possibly be kept in the site agent's office in a locked filing cabinet to keep prying eyes away. Payment certificates would be kept by the cost controller or the site agent, and a copy of the invoice will possibly also be made available to the accounts department so that they can reconcile them with the bank statements when the client pays.

Labour contracts should be kept by the human resources section or the wages clerks. It is important to keep these contracts at hand since personnel change often on a site and the contracts will be required when they arrive or depart.

The contractor must devise its own system for site filing but it is recommended that it includes a particular job number, followed by a file reference number which will be consistent on all jobs. For example, the 613.10 could be the "Wages and Labour" file for contract number 613; and 817.10 could be the "Wages and Labour" file for contract 817 and so on.

The file, or set of files, for a site could be arranged as follows:

File reference number 10 – Wages and Labour
11 – Time sheets and wage sheets
12 – Accident reports
13 – Labour programme

File reference number 20 – Materials Ordering
21 – Requisition to order forms
22 – Purchase order forms

File reference number 30 – Materials Delivered
31 – Goods receiving notes
32 – Suppliers delivery notes

File number 40 – Goods Issued
41 – Requisitions
42 – Site issue notes
43 – Goods returned vouchers

File reference number 50 – Assets
51 – Asset register
52 – Small tools register
53 – Stock cards stored in alphabetically

File number 60 – Correspondence

There should be several files, or one file split into sections for particular file reference i.e., "correspondence" is one such reference number. The correspondence can be split into various sub-sections as follows:

61 – Professional Team - This will relate to all correspondence between the construction business and the architect, engineer, client, etc.
62 – Subcontractors
63 – Meeting Minutes
64 – Internal Memos
65 – Drawing Schedules
66 – Site Instructions / Architect's Instructions / Variation Orders
67 – Tender Documentation, including all allowables for labour, plant, and materials.
68 – P&Gs, showing allowables that can be spent on the site camp, etc.
69 – Certificates

File number 70 – Photographs

71 – Photographs stored in date order.
72 – Short description of what was intended by taking the particular photograph.

3.5.4 Mail System

Whilst it is important to ensure that mail is controlled between the contractor and the employer's representative, this is not the only mail that needs to be attended to. There is correspondence between the site and the head office, with suppliers and subcontractors, with statutory bodies such as the Department of Labour, with the bank and many other stakeholders. In addition, there will also be correspondence between the site personnel, informing each other of required materials, delays, or other matters.

An efficient mail system needs to be introduced on site to ensure that the message gets to the correct person as soon as possible and with as much clarity as possible.

Incoming mail, which should always be date stamped, comes in different formats:

- Written letters
- E-mail
- Internal mail
- Fax

Each of the above communication modes should be processed differently since their means of "delivery" and receiving varies. Consideration should also be given to maintaining a duplicate set of records at head office.

There should be a standard procedure established on site for each type of mail so that the messages are properly transmitted. Careful consideration needs to be made to ensure that different people on site don't address the same item of correspondence. To avoid this, different people on site may need to be tasked to handle different types of correspondence.

3.5.5 Meetings

Meetings are essential communication tools to ensure that everyone on the team understands all aspects of the job and can perform effectively as a team. Issues can be very quickly straightened out and decisions can be taken on options available. It is essential that meetings are properly managed and controlled.

A carefully drafted agenda will assist in keeping meetings to the point and short in duration. The minutes of these meetings must be properly kept and promptly written up, as these also form part of the record of events and decisions for the contract. Minutes are also used by those attending to prompt them in the actions assigned to them.

When preparing for meetings the following points should be planned and organised:

- Predetermine all meeting dates and times
- Advise all parties in time, and remind, and confirm
- Ensure meetings start on time
- Always have an agenda
- Always set a time limit
- Stick to the agenda
- Stick to the point and don't get bogged down in irrelevant points
- Always allocate and delegate actions and get confirmed dates for the actions
- Follow - up on previous actions
- Always take and distribute minutes as quickly and as practically as possible

3.5.6 Stores

Typically, stores are controlled independently from the production teams to control waste, unnecessary expenditure and to ensure that each production team is provided with what it needs. The stores control system includes the locking of the materials in a secure area, maintaining good security over the materials and keeping an inventory control system that provides immediate information on the stock levels of all items that are kept in the stores.

Inventory controls are also integrated with the accounts sections who determine what amounts are to be paid to suppliers. Delivery notes need to be signed and kept as proof of delivery of materials in order that the accounts department can make payment only for goods that have been delivered. The inventory levels can also be set so that there is always a minimum level of stock available. This minimum level should be determined by both the demand for the item and the delivery time from the suppliers. It is a great expense to keep stock in the stores if it will never be used and will be thrown away or returned to the supplier for a reduced amount.

Records need to be kept of the inflow and outflow of materials. Accordingly, documents such as the following may need to be completed:

- Requisition notes
- Purchase orders
- Stores issue notes
- Goods returned vouchers
- Stock control cards which should include the code of the material, the supplier of the material and information such as:
  a. Sate of receipt of materials into the store
  b. The quantity of materials received on a particular date
  c. The date on which materials are issued to site personnel
  d. The site issue number
  e. The quantities of materials that are issued
  f. A running total of materials received less stock issued
  g. Minimum stock levels
  h. Stock re-order levels

3.5.7 Hired Equipment

Contractors should put a system in place to record the use of each item of hired equipment on site. A hire report can be generated by simply recording for each item of equipment its status on each day as working or standing and for what period. The operator and supervisor should sign off the records daily.

3.5.8 Time Cards

Labour is generally paid on an hourly basis. Time worked must be recorded daily on a timecard by the worker's supervisor. This constitutes the legal record of the time spent when it comes to the worker's wages for payment at the end of the month.

Standard time and over time are all calculated from the daily records of each person's timecard. These timecards need to be maintained by the supervisors, who will hand them in to the wages clerks daily for capture into the wages payment system. This also records if a worker is absent from work.

Bricks that are purchased are visible. Equipment hours are not. Without adequate records, equipment usage cannot be managed or controlled.

SECTION 3.6:
PRODUCTION PLANNING AND RESOURCING

3.6.1 The Importance of Planning and Resourcing

Poor planning leads to project surprises, staff frustration and unforeseen costs in resourcing (materials and production). This can have a negative impact on cash - flow and result in penalties being applied to the contract should the contract not be completed on time. All of this erodes a contractor's profitability.

Proper planning and resourcing improve project efficiency and profitability, avoids penalties, motivates staff, and demonstrates to the employer the competence of the contractor.

3.6.2 Activity List

The starting point in production planning and resourcing is to develop an activity list. The activity list describes what must be done on the project by splitting the entire project into easily described bits of work or activities. Each activity is generally a continuous activity of one group of workers.

An example of an activity list for constructing a house is as follows:

1. Set out foundations
2. Clear and grub site
3. Excavate footings
4. Cast footings
5. Sub-floor brickwork
6. Fill under floors
7. Cast surface bed
8. Superstructure brickwork
9. Roof timbers
10. Beam-fill
11. Roof covering
12. Plastering
13. Screeds
14. Plumber: first fix
15. Electrician: first fix
16. Glazing
17. Painting first coat
18. Painting finishing coat
19. Hang doors
20. Fix ironmongery
21. Floor finishes
22. Electrician: second fix
23. Plumber: second fix
24. Ceilings
25. Clean
26. Snag
27. Hand over

All of the above are construction activities which could include various actions as part of that activity. For example, "superstructure brickwork" includes the fixing of windows while "fill under floors" includes the forming of any thickenings to the surface beds that might be required.

Work programmes are essential for the efficient performance of any job. They are an essential tool for job planning and cost control and may be used to demonstrate claims for delays and extra payments

Some allowances for quality control points and milestones are necessary. These could include inspections of the:

- Foundation
- Plumbing
- Slab
- Electrical
- Wall-plate
- Completion of maintenance inspection

These quality control points and milestones must be added to the activity list. For example, if the architect, project manager or clerk of works requires a "wall-plate inspection", this must be done before the contractor puts on the roof trusses and this activity must be planned to take place immediately after the contractor has finished the superstructure brickwork. If the contractor needs to issue notice that inspection is required, this will need to be programmed accordingly.

3.6.3 Programming or Sequencing of Activities

Programming entails the arranging of the activity list in a logical construction sequence. There are three main aspects to consider when programming, namely:

- Physical considerations
- Methodology or approach
- Practicalities

Physical considerations consider the obvious. For example, the foundations can't be cast until their excavations are complete, and the roof can't be put on until the brickwork has been built.

Methodology or approach considers the reasons why various activities cannot be performed at the same time. For example, once the superstructure brickwork has been constructed, it is possible to put on the roof, plaster the walls and hang the doors, all at the same time. Physically there is no reason why these activities cannot take place when the brickwork is completed. However, it is a safety hazard for people to work underneath other people. Materials or equipment could easily fall from the hands of the carpenters working on the roof and injure the workmen below.

Furthermore, the internal doors should not be hung until such time as the roof is on to prevent damage to the doors from rain or sunlight. The external doors should be lockable before installing fittings such as lights, taps, etc., otherwise they could be stolen. The plastering should be completed, and one coat of paint should be put on the walls prior to the erection of the ceilings. This prevents the ceilings from being damaged by plastering operations and allows a good paint finish right up to the ceiling.

Practicalities consider the appropriateness of performing activities simultaneously. For example, one cannot screed the floor and plaster the walls at the same time, as the workmen will get in each other's way. One cannot paint the door frame at the same time as one is hanging the door.

Ideally, only one trade should be permitted to work in one area at any time. Apart from providing a safer environment for workers, it can improve quality and productivity as the workmen of one trade feel pressurised by the workmen of another trade to get finished, particularly if the site supervisor only permits a handover from one trade to the next when the first trade's quality has satisfied all requirements.

Security becomes a problem when more than one trade is working in an area at the same time. For example, the carpenters' tools could go missing when other subcontractors or trade

Decisions relating to the sequencing of activities should be based on security, safety, and quality considerations.

workers were working in the same unit at the same time. Furthermore, it is very easy to assign a single trade team the responsibility for cleaning up its mess and waste when it has finished its activities and to lock the building at the end of each day's work.

3.6.4 Developing a Bar Chart

A bar chart or construction programme is a list of activities that are planned to be completed by a particular time. The steps in developing a bar chart are as follows:

Typically the activities or tasks are listed vertically at the left of the page, with the time-scale in months, weeks or days horizontally along the top of the page and the "time now" line, advancing from left to right across the page indicating the current date (shown at week 3 on the chart). The actual progress made can be plotted underneath – see activities 1, 2 and 3.

Make an activity list and arrange it into a logical sequence of events at a level of detail that is practical and appropriate.

Assume a rate of production for each activity considering the available resources. This will determine the length of time required for each activity (see section 2.9).

Determine the logical sequence in which work is to be carried out. Include any dependencies that might exist, even if these are not at first considered to be critical.

Draw out the logical sequence on a bar chart. This provides a visual tool to identify what activity is to start, when it is to start, and what needs to be completed before it can start (see sample below).

Table 3.6: Project Plan

TIME IN WEEKS	1	2	3	4	5	6	7	8	9	10
Activity	■									
Establish site – set out		■								
Excavation			■							
Foundation concrete and brickwork				■	■	■				
Superstructure						■	■			
Roof										
Services (1st, 2nd, final)		■			■			■	■	
External works				■						
Finishing and cleaning									■	■
Hand over to client										■

3.6.5 Resourcing

The bar chart can be used to resource the project. The chart presents a logical breakdown and sequence of activities for the project and the timing for and duration of these activities. The resources associated with each activity now need to be identified – labour, materials, equipment, subcontractors, etc. The total resources required for each period can be worked out by simply adding the resources that are required for each activity that is executed simultaneously.

The bar chart can then be adjusted by moving activities back and forth in time to reduce the quantity of that resource required to complete all those tasks at the same time or to smooth out the requirements for that resource.

3.6.6 Material Ordering

The contractor can identify from the bar chart when materials are required for a project and order them when needed. The supplier's lead time and delivery time should be considered when the item is ordered so that it can be delivered at the right time. This reduces storage costs and minimises damage to the materials and possible loss due to shrinkage or spoiling.

3.6.7 Equipment Usage

The contractor can also identify from the bar chart when equipment must be available on the site and when it can be removed from the site. Allowance must be made for the time it takes to move the equipment from one site to the other site or for the hire company to deliver the equipment. It is important to return hired equipment that is no longer required as soon as an activity has been completed to save costs.

3.6.8 Subcontractors

The contractor can use the bar chart to identify when a subcontractor must start their work and when the subcontractor must finish their work. This information can help to schedule the work of the subcontractors and to manage them.

3.6.9 Contingencies and 'float'

Whilst it is important to draw up the programme to show the shortest possible time to complete a project not everything on site goes exactly as planned. There are unforeseen events such as rain or people that are absent due to sickness which will delay the work that has been scheduled for a particular day. The contractor should incorporate an appropriate amount of slack time or "float" to ensure that there is time allowed to deal with these contingencies. Sometimes the float is shown as a separate activity but more often it is included in the activities themselves, allowing slightly more time than anticipated to complete the work.

Many activities automatically have float built in due to the way that they were scheduled. There may be slack time for an activity if there is another activity which takes longer and which starts at the same time. Both activities can be started at the same time but the shorter one will finish earlier or can start later and finish at the same time. The shorter activity can then float between its earliest start date and its latest start date without affecting the critical path of the programme.

3.6.10 Critical Path

Once the programme has been optimised the contractor will be able to determine the critical path. All the activities that have no float are on the critical path. If any of these activities are delayed, the end date of the programme will be delayed.

The contractor must make sure that the programme is updated with current progress because the critical path can change from day to day should a non-critical item take longer to complete than anticipated and thereby changing the critical path of the whole job.

3.6.11 Overall Programme

It is important to remember all the activities that are required for the works. This includes the site establishment, mobilisation of plant to site, lead times for ordering of materials required for the works, disestablishment from site and the deadlines that are required along the way.

It is also essential to link all the dependencies, no matter if they are part of the critical path or not. As circumstances change on site, the start of different activities will change, and the critical path activities may also be changed depending on those other dependencies.

3.6.12 Fabrication Offsite

Some projects may allow for fabrication of elements off site to reduce the time for completion. For example, houses can be constructed quicker if the entire bathroom were prefabricated complete with bathroom fittings and plumbing. The walls could be built around a prefabricated element that is put in place. All that is needed is to connect the hot and cold-water pipes and the drains. This would reduce the time required to complete the entire house by several days or even weeks.

If there are elements that lend themselves to prefabrication offsite the contractor can take advantage of this in the programme. If there is a shorter period spent on site, the contractor will make more profit if the additional expense for prefabrication off site and transport of the element to site is less than the general overheads of being on site for a longer period using *in-situ* construction methods.

There is the possibility of better quality control and quality testing of elements if they are fabricated off site. Structural welds can be x-rayed where they are manufactured in a workshop much more easily than when they are at the top of a structure.

3.6.13 Precast Elements

Precast elements can assist greatly in the speed of construction and improve the quality of the works. There are several suppliers of precast concrete items, and it can be an advantage to purchase directly from these suppliers. Alternatively, the contractor could set up a precasting yard to manufacture elements prior to their being required in the works.

Typical precast elements include kerbs, kerb inlets, pipe markers, stormwater pipes, lintels, and culverts. There are also decorative items such as windowsill mouldings or architraves available from these suppliers. Specialised concrete items can be made by the contractor on site to facilitate the works such as concrete tunnel lining segments or specially shaped stormwater drain sections.

3.6.14 Prefabricated Elements

Not all prefabricated items are made of concrete. Entire warehouse building structures can be prefabricated in a workshop, disassembled and then re-assembled on site. Structural steel and wooden roof trusses are the most common sorts of prefabricated elements to be found on site. Ceiling cornice mouldings made from polystyrene are another example of saving time and expense by providing a finished product that is quick and easy to install compared to plastering the section.

The contractor can cut substantial time off the programme by using these prefabricated elements and reduce the resources that are needed to complete the works.

3.6.15 Specialist Manufacturing

Certain built-in plant is manufactured only by certain specialist suppliers. Items such as high voltage electrical transformers or switchgear cannot be purchased from the local hardware store and require special attention. The contractor must identify these “special” items early in the contract to ensure that they can programme the work around the delivery dates of these items which often have long lead times.

3.6.16 Leadtime

Specialist suppliers also typically supply items that are not very common. This means that each item may have to be specially made for the project and such items require a long lead time before delivery. The lead time for some items can be quite short whilst others can be months or even years.

3.6.17 Installation

Specialist suppliers are often the only ones who can install their special items. Hydraulic loading bays are another example of these specialised items, and the lead times can be several months for delivery. The installation of these is another problem that should be considered when programming the works. Not only does the surrounding work need to be completed before the loading bay equipment is installed, but the loading bay suppliers need to be warned well in advance to be available to come and install the item. This is a variable that the contractor needs to consider in the programme.

SECTION 3.7:
QUALITY

3.7.1 What is Quality?

Quality is defined as "conformance with requirements". In the case of the construction industry the requirements are the specifications and contract drawings. These two documents are used by the contractor during the construction phase to assist with the achievement of quality on a project. It is important not to confuse quality with luxury.

A house built with face bricks will have a different outcome to one built with stock bricks. The specifications for laying face bricks differ from that of laying stock bricks that will be plastered afterward. Stock bricks do not need to be laid to the high level of tolerances that face bricks are since they will anyway be covered with plaster. The bedding joints do not have to be as regular or as neatly executed as those for face bricks. When the walls have been built the result will be a quality job if they comply with the specifications, however, there is a difference in the look, maintenance and performance of the finished product.

Quality is not a programme; it is an approach to business. Results (performance and financial) are the natural consequence of effective quality management.

3.7.2 The Price of Non-conformance

The cost of all the corrective actions that had to take place due to the contractor's failure to comply with the specifications is known as the "Price of Non-conformance" (PONC).

The reason why a mistake is made is most often because of not checking a drawing to confirm the requirements or not reading the project specifications properly. It is essential to avoid re-doing work because this is a direct cost to the contractor. The cost of re-work extends to:

a. Demolition of the work done that does not conform to specification
b. Re-construction of the work done
c. Wasted materials resulting from the work that had to be demolished
d. Delay to work that was programmed to continue directly after completion of the work that had to be demolished
e. Overheads on site and at head office that are incurred due to the delay
f. Most importantly, the loss of confidence that the employer has that the contractor is competent to perform the work

It is far better to take slightly longer to do the job right the first time than to rush the work and must demolish and re-build. The saying "do it right first time" is accurate, but could be enhanced to "doing the right things right first time".

The cost of quality control is cheaper than the cost of non-compliance, defective work and re-works. It involves anticipating problem areas before they reveal themselves, double-checking specifications, providing incentives to staff members for carrying through the quality plan or undertaking spot quality checks on site, testing and seeking advice from people the contractor trusts.

3.7.3 Quality Control

Quality control is an essential part of the construction process. By proper planning and careful work any construction project can be completed correctly without having to re-do any of the work that is required. This control over the work to prevent making mistakes is known as quality control. The saying that "prevention is better than cure" is most definitely applicable in the construction industry.

By ensuring that quality work is being done from the start, the contractor ensures that when the work is complete, it complies with the specifications and there will be no call to re-do any of the sections he has completed.

3.7.4 Quality Plan

A quality plan is a document specifying the processes, procedures and associated resources which will be applied by whom and when to meet the requirements of a specific project or contract.

A quality plan should indicate how the required activities will be carried out e.g., in the case of excavations for a building to ensure that:

- The excavations have been done to the dimensions given on the drawings
- The sides of trenches are vertical and the bottom of the trenches level
- The inspections of footings by the local authority/building inspector/engineer (if reinforced) are carried out before the concrete is cast
- The quality plan should also identify the individuals who will be responsible for carrying out inspections

Accordingly, the quality plan should:

- Establish and document the quality control procedure which is to be implemented on site to deal with each main activity that may be undertaken, such as:
  - setting out
  - site establishment
  - site administration
  - health and safety
  - human resources
  - financial controls and payment certificates
  - production in respect of each construction activity, e.g. excavations, brickwork, painting, etc
  - quality monitoring and testing
  - liaison with the employer and the professional team
  - temporary works design
  - equipment maintenance and efficient operation
- Provide quality control sheets for each activity
- Assign responsibilities to people to carry out daily inspections and in preparation for any activities to be carried out
- Require that quality control sheets are signed off by a designated responsible person
- Require that copies of quality control sheets are kept on file for audit purposes

3.7.5 Quality Improvement Process

Quality Control (QC) in a construction business is the control of quality within the various projects that are being undertaken. The contractor should devise a way in which it can improve the quality of its work. The way in which quality is improved is known as a Quality Improvement Process (QIP).

The following steps can be taken to ensure the continual improvement of the quality of products and services offered by a contractor:

1. Management commitment

The contractor's senior management must be committed to improve the quality of the work that the contractor does, otherwise the employees will not believe that it is important to improve the quality of the work that they perform.

2. The quality improvement team

A team should be dedicated to run and monitor the quality improvement process. Without consistent monitoring the improvements in quality cannot be measured and where there is no visible outcome the quality improvement process will fail.

3. Consistency of work and standardisation

A contractor may have several sites with different personnel on each of these sites. It is important that the contractor is consistent in the work it produces. It is of little benefit to have one good foreman who always produces a good result and two other foremen who always battle to hand over projects. The contractor should set up systems and standard methods of approaching the work that they do to produce a consistent quality. To do this the contractor might get the "good foreman" to come in and discuss the systems that he uses to ensure that his work runs smoothly, document these systems, and then instruct the other foreman to comply with them.

If there is a standardised approach and systems in place, there is no excuse for anybody who works within the contractor's organisation to say that "I thought it was close (good) enough". Something is either right (conforms to the specifications), or it is wrong (does not conform). However, this does not mean to say that everything must be perfect. Good construction practice allows various tolerances, and the contractor should ensure that the work they perform is always within these tolerances. Conformance with specifications means constructing the works within the specified tolerances.

4. Measurement of the Price of Non-Conformance (PONC)

Measurement is the only way in which the contractor can assess how well it is doing in its quest for a quality product. Each time a mistake is made the contractor should keep a record of the cost of rectifying the works. It is more difficult to measure the loss of credibility with the employer or professional team.

The contractor would have made an allowance in the tender for time spent by the site agent with the client to go through the project quality checks and hand over of the works. The contractor should also have priced the cost of a finishing team in fixing up the snags as a result of the final inspections. This amounts to the costs that were allowed and what constitutes conformance to requirements. Any additional work done over this allowance is due to the contractor's non-conformance to the requirements.

All the re-work costs (PONC) must be added up on each project and the PONC for each project should be noted. The PONC of all projects could be displayed on the contractor's notice board, website, in a marketing brochure, or discussed at company meetings to make sure that everybody knows the seriousness of the pursuit for quality and that improvement from each employee is expected on each of their subsequent projects. Monitoring can be done on an ongoing basis and is not restricted to the end of a project.

5. Cost of quality

The cost of quality is constituted by the cost of conformance (COC) (the cost of doing things right) and the cost of non-conformance (CONC) (the cost of doing things wrong). The CONC is useful as it can be related to an organisation's monetary business volume and the percentage contribution thereto can be computed. The cost related to the achievement of quality is comprised of the cost of conformance and the cost of non-conformance.

Each person within the contractor's team needs to be made aware of the price of non-conformance associated with the poor habits that they have picked up. By ensuring that each person is aware of the cost that they are incurring to the contracting organisation and incentivising them to improve, they will try to reduce the PONC as much as possible.

6. Awareness

A Quality Improvement Process must be implemented throughout the contracting organisation. All employees must be made aware that there is a process underway to improve the quality of the work performed and thereby improve the profits and repeat business.

7. Corrective action

The contractor must learn by the mistakes made on current projects and set up systems to ensure that the same mistakes are not repeated. The contractor should make it standard practice to do a project close out analysis which can identify where there were mistakes made that could be avoided in future projects. These changes should be incorporated into the contractor's operations manual.

8. Zero defects planning

Strive for zero defects and determine what must be done within the contracting organisation to achieve zero defects. Each time a mistake is made, and work must be repeated the profitability of the contractor is affected.

Unless the contractor produces consistent quality work it will not be in business for very long.

There may be a quick profit on one job but there will be no repeat business if the quality of work is poor.

A tolerance is an allowance made for something to deviate in size from a standard or the limit within which it is allowed to deviate.

Non - conformances result in rework.

9. Employee training

The contractor should provide training to all employees to enable them to actively participate in the quality improvement process. This can be done by means of courses that are run by various external organisations or, depending on the size of the contracting organisation, even the foreman or a skilled artisan should take time to show the workers how to perform the specific tasks correctly.

10. Goal setting

Together with the measurement of the price of non-conformance comes the ability to set targets. The contractor should contemplate setting goals that are reasonable and achievable in the quest for zero defect.

11. Recognition

Active recognition and support to those staff members who actively try to improve the quality of their work must be encouraged. When the targets that were set have been achieved there must be some form of recognition in order to motivate others within the contracting organisation to put every effort into improved quality.

3.7.6 Successful Handover

Striving to improve the quality of work, ensuring that work complies with the specifications and good building practice will ensure that the successful handover of the contractor's project on completion is a happy and satisfactory one rather than one that ends up in a dispute.

Contractors that do not get their quality right and continually go into disputes with clients will soon go out of business because no one will want to use them on their projects.

SECTION 3.8:
MANAGING RESOURCES

3.8.1 Supervision

Resources are a core element of the contractor. These constitute materials, labour, plant, equipment and, of course, the management skills to be able to coordinate them all to produce a finished product.

Supervisors on site have the responsibility to ensure that the resources available on site are coordinated in an efficient manner so that production on site is optimised. It will not benefit the project if the single tower crane on site is being used to support a single shutter for oiling if the bricklayers have insufficient bricks available to lay on the sixth storey or they are out of mortar to lay them.

Supervisors, from the Contracts Manager through Site Agent, General Foreman, Charge Hand, and Gang Boss need to understand that they need to work together as a team to plan their resource requirements well ahead of time. Poor supervision can mean that the project makes a loss, and can even cause the contractor to go insolvent through penalties for not completing the work on time or to the required standard.

Supervision on site is the key to optimising the production on site. Supervisors are required to plan, and order materials required for the works well ahead of time to ensure that the work does not stop whilst waiting for delivery. They also need to ensure that workers know exactly what they are required to do and in what sequence. Supervisors must also be able to motivate their workers to improve their productivity and complete the work to the required standard in the available time.

3.8.2 Problem Solving

Every site will encounter problems. These come from unexpected events or conditions and a solution needs to be found to minimise the risk or to proceed with the works.

When problems arise, these tend to cause production to stop or at best slow down. It is best to try to anticipate problems and put measures in place to avoid them but not everything can be foreseen. When problems do arise there needs to be a standard procedure for notifying the responsible person of the problem and asking for guidance on how to address the problem. If there is a clear line of communication, then this process can be made very quick, easy, and simple. The line of communication will go up the ladder to the point where the person who is able to resolves the problem.

Problems can be solved by amending the work methodology, the timing or sequence, the tools to be used or by stopping work until the problem goes away (e.g., when it rains). It must be always remembered that the best interests of the project must be considered when deciding what solution to choose.

3.8.3 Work Methods

Different methods of working require different resources. As such, the work methods need to be matched with the resources available and the time that they are required to be completed in.

For example, excavation of a trench can be done in many ways, each of which is best suited to the conditions. For very deep, narrow trenches, an excavator with a narrow bucket may be the correct and most efficient answer but the project safety requirements need to be considered. For a shallow trench it might be quicker, cheaper and more cost effective to excavate by hand.

Labour intensive work is strongly promoted in the construction industry because there are many tasks that can be done by hand that are as efficient or cost effective as using heavy machinery.

Equipment comprises items that a contractor uses to construct the work.

Plant comprises apparatus, machinery and items which are incorporated into the works.

If labour and equipment are not managed correctly, a contractor will be paying more than they should for the value that they are getting. One can never get a "man hour" or an "equipment hour" back; it's like time, when it's gone, it's gone.

Different sequences can greatly enhance the time of delivery. For example, it might be easier to dig out the material if it is wet but to transport it means that water contained in the soil is also transported. This can lead to overloading of trucks and the consequential loss of productivity due to the truck being stopped at a weigh bridge.

Excavating the material dry and transporting it dry will take the load from the trucks and spread it more evenly, but it may place more pressure on the excavator that digs it out of the ground. This can be optimised to suit the capability of the excavator and the number of trucks that are available to produce the best productivity at the least cost per cubic metre.

3.8.4 Incentive Schemes

Motivation is a factor that can be easily influenced. There is always a cycle of motivation during a project. At the start, everyone is very excited about the new work, and they are normally highly productive and keen to get the job underway. As the project progresses, however, motivation can flag dramatically due to problems encountered that hinder the team from achieving the allowables or the productivity goals that are set.

Another factor that works against construction projects is the fact that they are always a temporary job. When the project nears completion, motivation is normally at a low point, since those people employed for the project see the end of the project approaching and with it their having to look for a new job. This prospect of a possible lack of income at the end of a project can be a major factor in trying to extend the duration of the job by slowing down the productivity rate.

One way of improving motivation is to implement an incentive scheme of some kind. Different kinds of incentives can be implemented, depending on what will motivate the part of the workforce the best. Incentives contain several elements:

- a target
- a timeframe
- a reward

The most common incentive is a financial bonus if a specific productivity target or completion date is achieved. This addresses to some extent the “end of job” syndrome but cannot eliminate it completely. Time off or a special treat such as a braai with the site team on a Friday afternoon can also help to get the team motivated. Another method is to set specific tasks for the day that are to be achieved.

If the target is set correctly, it will stretch the worker to finish in the time initially planned but it may be quite easily achieved once they have worked out a system to optimise the activity. Letting people go home for the day once they have finished their task is also a good incentive.

Incentive schemes are good motivators, but they can also destroy morale entirely if the goals are not set appropriately. If a goal is set so high that it may never be achieved, it will have the opposite effect and demotivate the workers dramatically. Likewise, if the target is so easily achieved that the bonus is always paid out it will be considered a “right” by the workers. If the reward is not immediately available, it can also lead to demotivation and angry workers.

Take the example of a labourer who is employed for 10 days and is paid for 10 days. If he worked only 50% efficiently, he will have been paid for 10 days and only produced 5 days value for the contractor. Increasing productivity will always be a cost saving to the contractor.

Financial incentive schemes may include:

- *Profit share (payments based on profit earned)*
- *Piecework (worker is paid a rate per unit of production)*
- *Task work (worker is paid for a task completed)*
- *Bonus for a team’s productivity*

Always communicate productivity targets to staff.

3.8.5 Maintenance of Equipment

Equipment needs to be maintained to ensure that they are in good working order. Breakdowns have a negative impact on productivity. Heavy machinery comes with a recommended schedule for servicing and maintenance which should be adhered to, to ensure the long life of the machine and the proper production rates it should be capable of. It is also important to remember that smaller equipment also requires maintenance and servicing and if neglected can also break down and cause delays.

Some items will require daily servicing. These services should be scheduled for times of the day when the machines are not in use so that the servicing does not impact on productivity. Typically, machines are serviced overnight or during a break when the operators have lunch. This means that the productive times of the day for the operator are as long as possible.

If a critical piece of machinery, such as a grader, is damaged and needs serious repairs it can have a major impact on the works, since other pieces of equipment, operators and labour will be at a standstill while waiting for the grader to be put back into operation. It would be better to stop the grader for an hour or two to do repairs than to push on to try and achieve the day's production, with the result that the grader is out of action for two or three days whilst a special part is sourced and delivered to the site.

Maintenance of concrete shutters is another example where good care can extend the productive life of the shutters. Timber shutters are normally used only two or three times, however, if they are properly cared for it could be extended by properly oiling the boards before casting and ensuring proper handling of the shutters when stripping. The result is significant savings on the costs, time and material for building and making of shutters. The overall costs can be drastically reduced by spending a little time on maintaining them and taking care in the handling and storage of the shutters.

Simple things like cleaning shovels after casting concrete can also save time and money. Cleaning the shovel immediately after use means that the concrete residue can be easily washed off, leaving the shovel smooth. If it is not cleaned and the concrete residue is left to stick to the shovel it will make it very difficult to use again and will probably be thrown away. A little maintenance can go a long way.

3.8.6 Storage of Materials

Some materials are regarded as consumables. For example, unlike bricks, cement in pockets or in silos can deteriorate over time and reach a point where it cannot be used. Careful management of these resources is therefore extremely important as materials that have deteriorated to an unacceptable state cannot be incorporated into the works and will have to be disposed of and replaced. Cement silos need to be in good condition before they can be used, and time taken to prepare them will be well spent. Using materials after their "expiry date" may mean to break down what has been constructed and start again.

When resources (like bricks) are completely "storable" they need little management other than ensuring that they have been stored correctly and that they are secure from theft or damage by falling over. Plant and labour (including security) cannot be stored and therefore need full time on-site supervision and careful management.

Goods that can deteriorate need special attention. Typically, these items have a shelf life and must be used within that time or will have to be thrown away. Once the expiry date has been reached the item will not perform as it should. An example of this is a chemical resin anchor that is used to set threaded studs into concrete or rock. These types of goods need to be managed on a first in, first out basis but will always have to be checked before use to see that the expiry date has not been reached.

Materials must not be temporarily stored adjacent to or within a structure or service in a manner which overloads the structure or service or any portion thereof.

When managing materials it is good to always consider the "storability" of materials.

Materials should be stored in accordance with the manufacturer's instructions and protected in such a manner that any deterioration, distortion, damage or contamination does not impair their performance when incorporated into the works.

SECTION 3.9:
FINISHING THE PROJECT

Failure to follow procedures provided for in the contract can lead to:

- *late payment*
- *delays in the release of retention and performance bonds*
- *the employer applying the financial penalties provided for in the contract for late completion*

3.9.1 What is Completion?

Completion of the works is usually followed by a defect's liability period during which the contractor is obligated to make good any shortcomings in the materials and workmanship covered by the contract that are indicated by the employer or his representative (engineer, principal agent ,or project manager). The completion of the contract cannot take place before the expiry of the defect's liability period.

Completion of the works triggers the release of performance bonds and the reduction in retention monies. The completion date for a contract is usually linked to the completion of the works. Failure to do so may result in penalties (or liquidated damages). Consequently, it is in the contractor's interests to complete the works as soon as possible.

Each of the forms of contract supported by the cidb has different administrative procedures in bringing the works and the contract to completion. It is very important that contractors familiarise themselves with the procedures that apply to their specific projects. The diagrams at the end of this guideline illustrate the procedures that are provided for. Clause references are provided for ease of location of the detailed requirements.

3.9.2 Defects or 'snag' lists

A defects or 'snag' list is typically issued by the employer's representative around the time that completion of the works is certified. Such a list, depending on the form of contract that is used, will typically indicate what needs to be completed prior to certification of completion or what needs to be corrected during the defect's liability or correction period.

Contractors will do well to prepare their own "snag" list prior to requesting the employer's representative to certify completion. This will minimise the risk of not obtaining a certificate as a result of defects found that prevent certification.

Each defect notified by the employer's representative during the defects liability or correction period should be added to the snag list. Defects that are rectified should be removed from the list.

A final walk through the works should be arranged for all the parties involved in the contract just prior to the end of the defects liability or correction period to confirm that all defects have been attended to.

The contractor should not accept the addition of defects to the list that have been caused by the employer's or client's use of the facility, and only accept defects relating to work not in accordance with the provisions of the contract.

3.9.3 Post Works Completion Checklist

A post works completion list should include all items that need to be finalised before the end of the defect's liability or correction period. Items to be checked include:

Site related issues:

- Ensure that the site is cleared properly with no rubble, equipment or unused materials left lying around
- Ensure that temporary water, electrical, sewerage and telephone connections are disconnected and that the paperwork for discontinuity of these services are completed
- Remove all contract - related signage

Site administration:

a. Ensure that all files and paperwork are completed and in order, since there could be supplier and subcontractor invoices outstanding, and the final accounts will not yet be completed for the project
b. Ensure that all documentation is properly filed in a safe place (It is advisable to keep all project information for a period of three years)
c. Check that all subcontractors have submitted their final accounts and been paid accordingly
d. Ensure that all hired equipment has been returned
e. Close insurance cover for the works
f. Close petty cash

Contractual

a. Complete all items on defects list (snag list)
b. Request the return of performance bonds and securities (if any)
c. Request return of retention guarantee (if any)
d. Return subcontractor guarantees
e. Obtain signed completion documentation as provided for in the contract

Financial

- Close financial accounts for the project for domestic subcontractors and nominated and selected subcontractors
- Recover deposits paid for temporary connections to services such as electricity, water, pavement deposits and pavement fees not used

Feedback to estimating section

Ensure that all information regarding costs on the project, particularly related to allowables, is provided to those people in the contractor's head office that are responsible for estimating and tendering for new work.

General

Double check that all files are completed with respect to:

a. Drawings
b. Site instructions
c. Scope changes
d. Confirmation of verbal instructions that have been obtained
e. Programme and programme updates
f. Budget and budget updates
g. Minutes of meetings etc.

3.9.4 Record Drawings and Manuals

In terms of the contract, the contractor is also required to provide as-built or record drawings, i.e., drawings that record construction works as completed. For example, where SANS 1921 - 1, Construction and management requirements for works contracts Part 1: General engineering and construction works, forms part of the scope of work, the contractor is required to provide within 40 working days of the works being completed, record drawings indicating all deviations from the construction drawings.

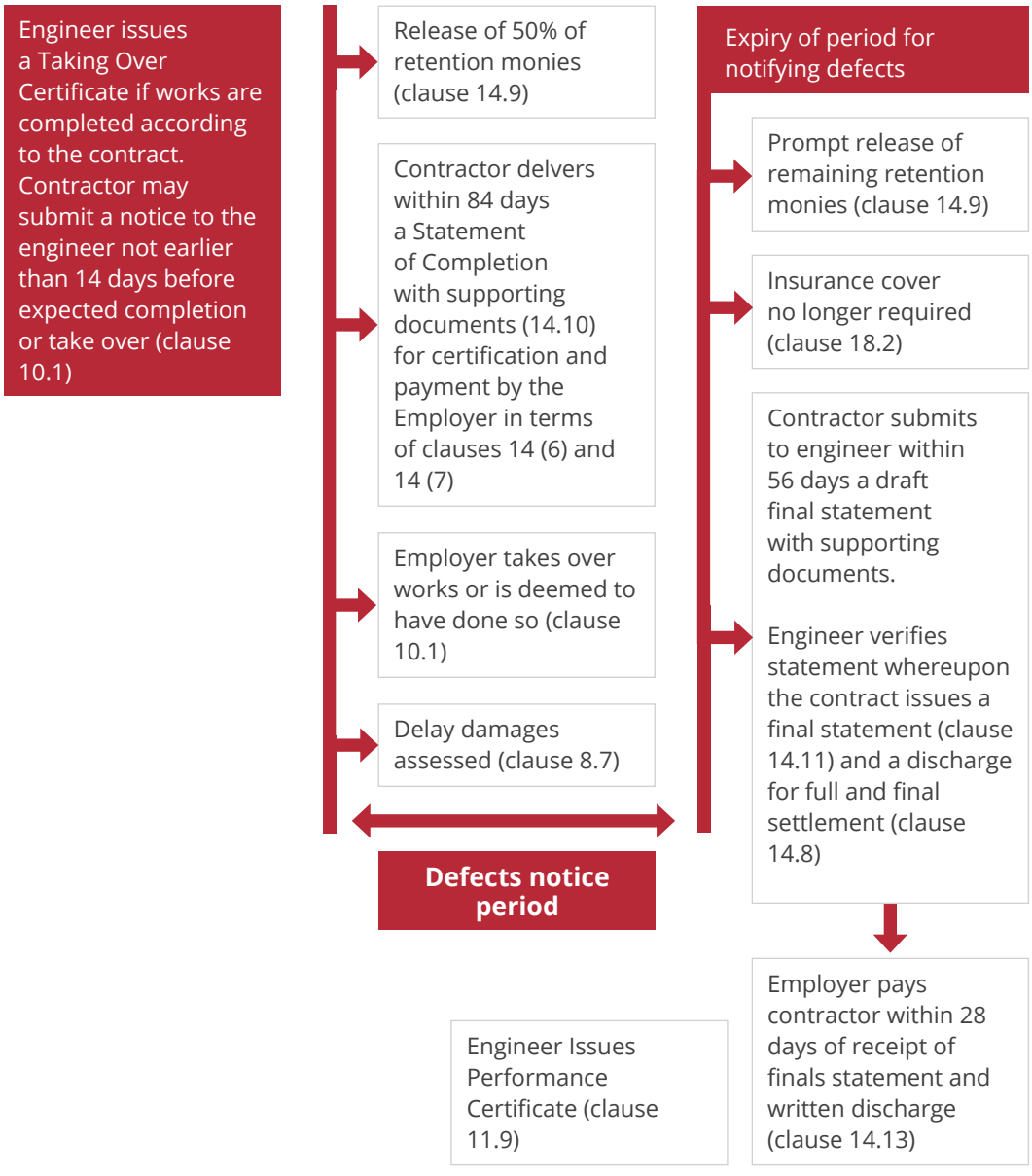
When work is planned and designed, many assumptions are made that may not be correct when it comes time to construct. As such the works may be constructed differently to what was originally designed. The employer must have these details correctly recorded for future maintenance and possible additions or alterations that may be needed later.

The contractor is often required to provide this as - built information and annotated drawings to the employer or the engineer so that the final configuration can be recorded. This information is often in the form of marked - up construction drawings; however, additional data is sometimes also required such as the GPS coordinates of valves and fire hydrants that have been installed.

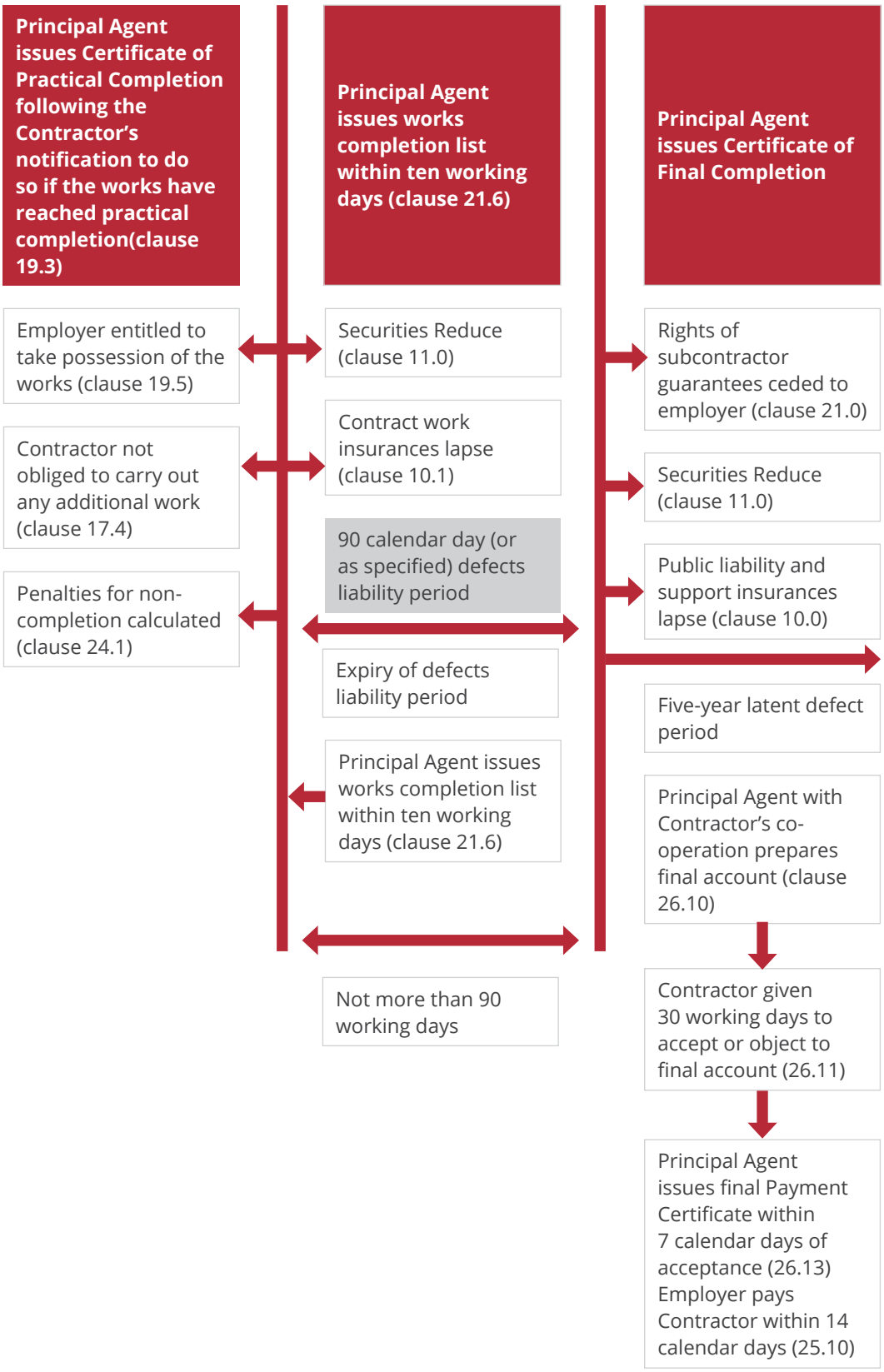
On some projects the contractor is required to hand over operation and maintenance manuals which enable the end user to operate the plant that is provided or to take care of and service such plant.

The contractor's work is not complete until he has provided all this information in the format that the client requires.

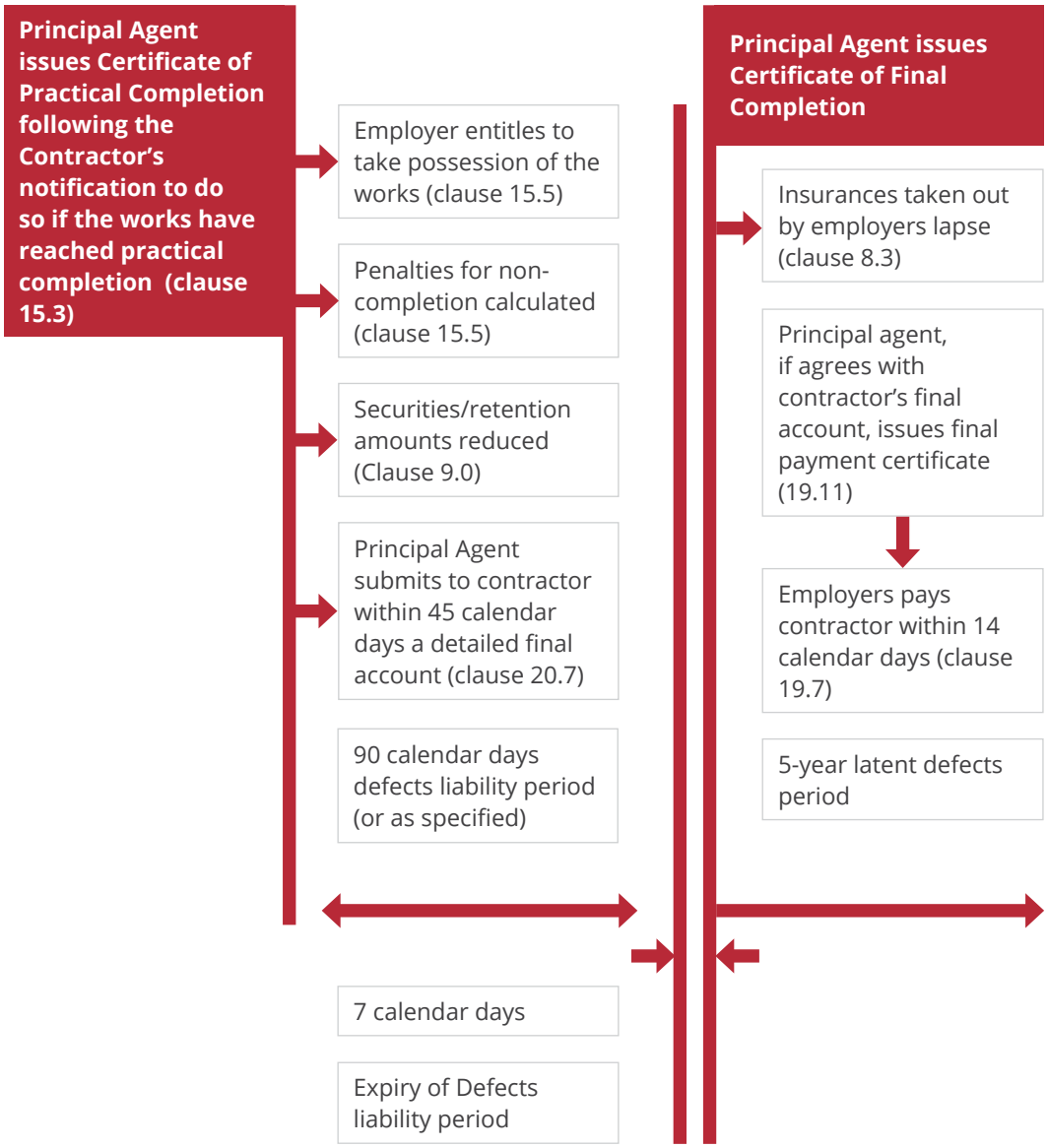
FIDIC CONDITIONS OF CONTRACT



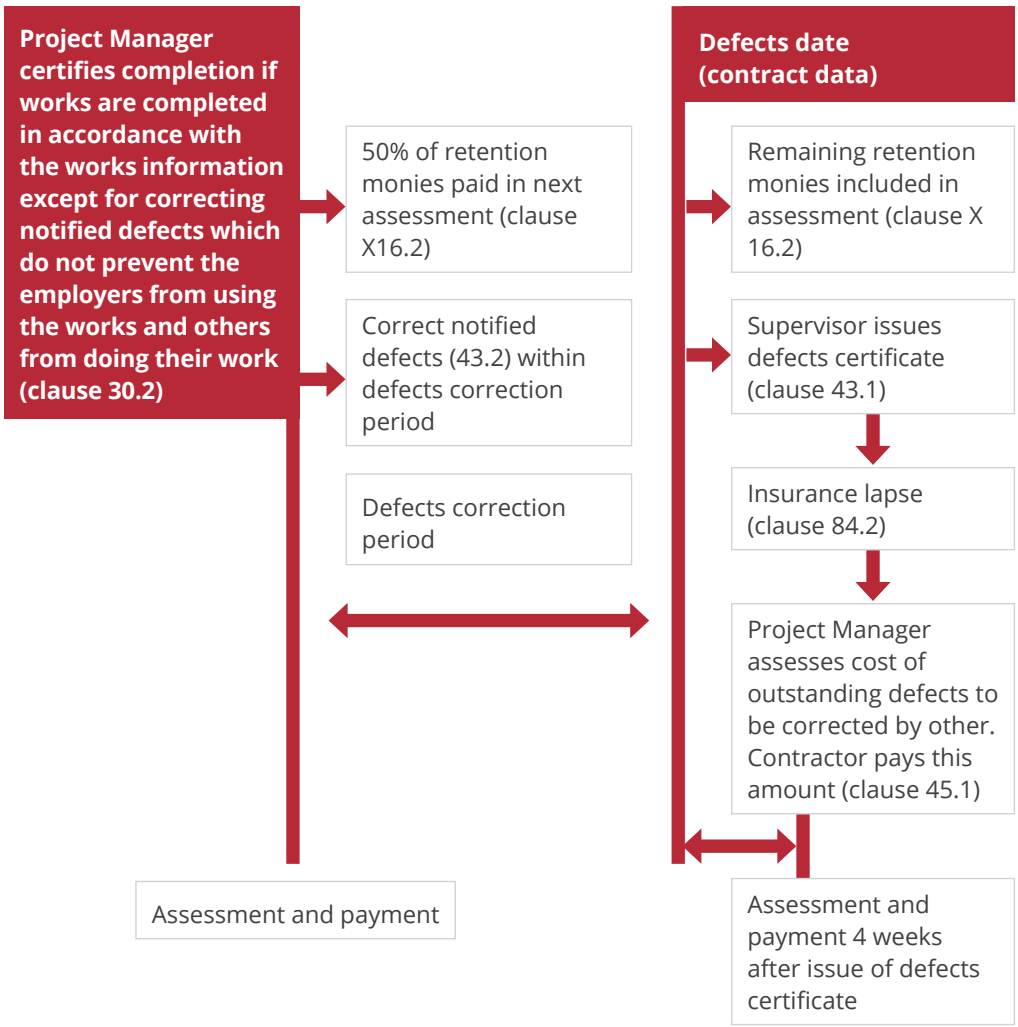
JBCC SERIES 2000 PRINCIPAL BUILDING AGREEMENT



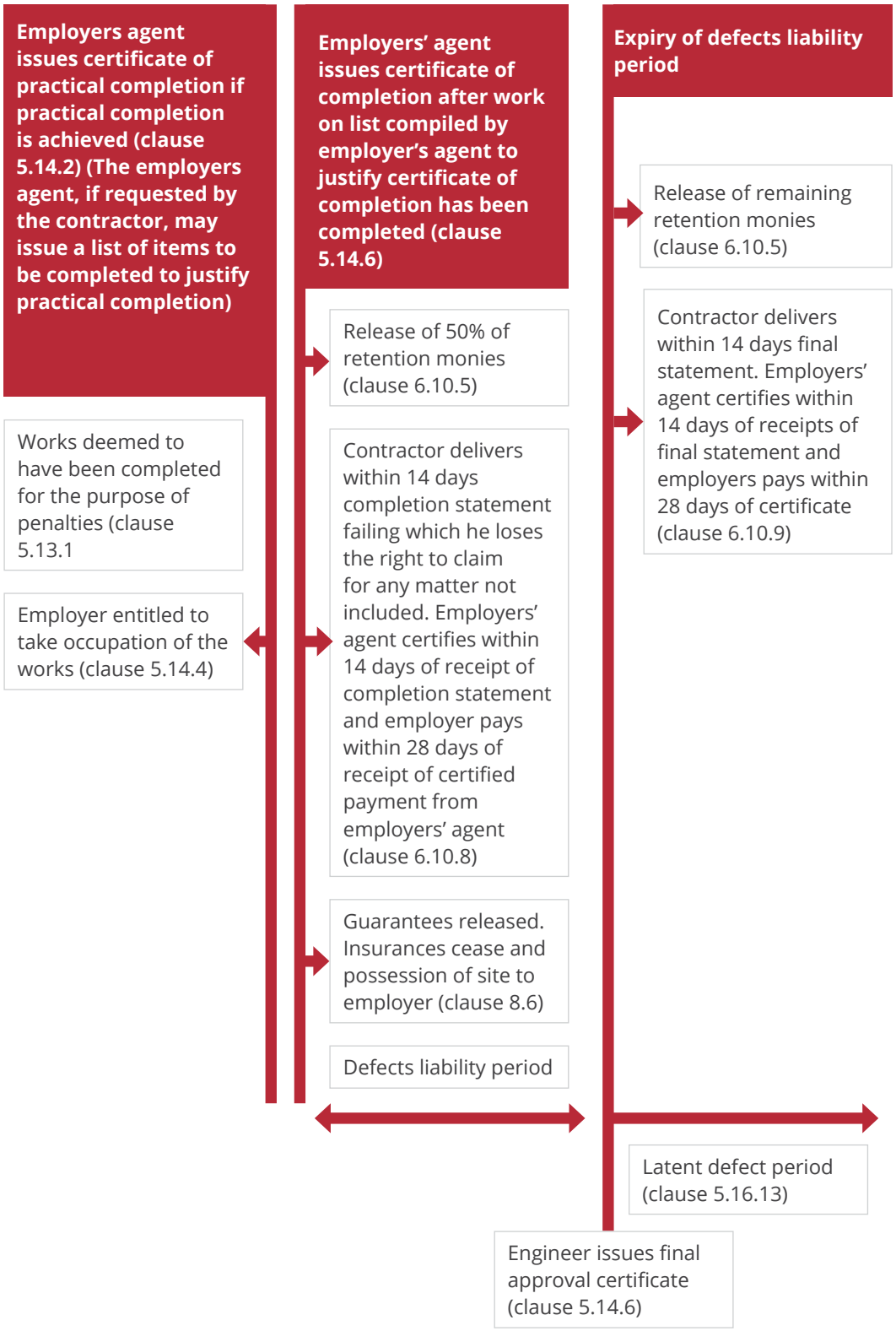
JBCC SERIES 2000 MINOR WORKS



NEC3 ENGINEERING AND CONSTRUCTION CONTRACT



GENERAL CONDITIONS OF CONTRACT FOR CONSTRUCTION WORKS (GCC 2025)



SECTION 3.10
CONTROLLING PROJECT RISK

3.10.1 What is Risk?

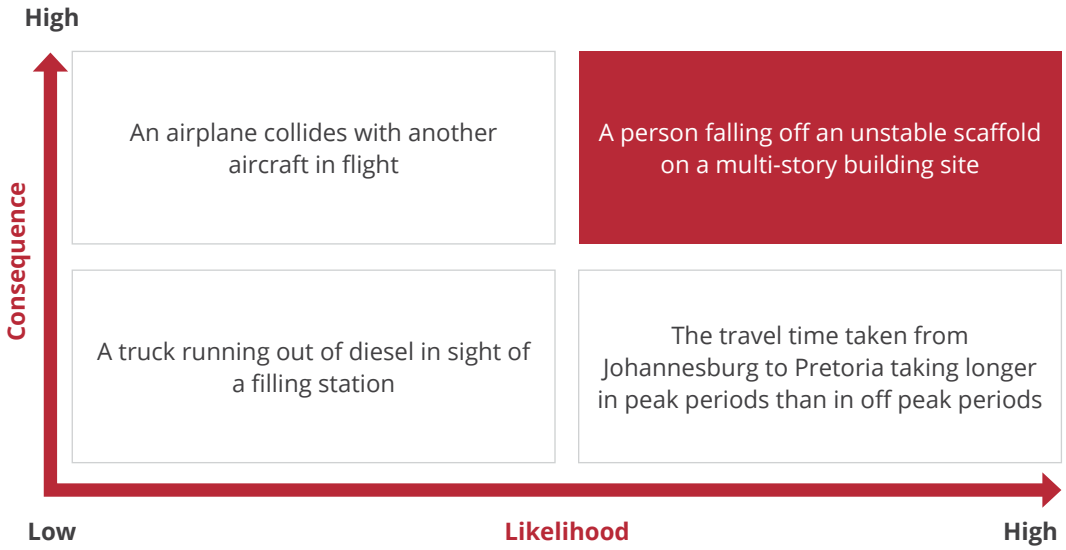
Risk is the chance of something happening that will have an impact upon a project's objectives.

Risk has two elements, namely:

- The likelihood of an unwanted event.
- The consequences when it happens.

The likelihood and consequence of an event are combined to indicate the severity of the risk.

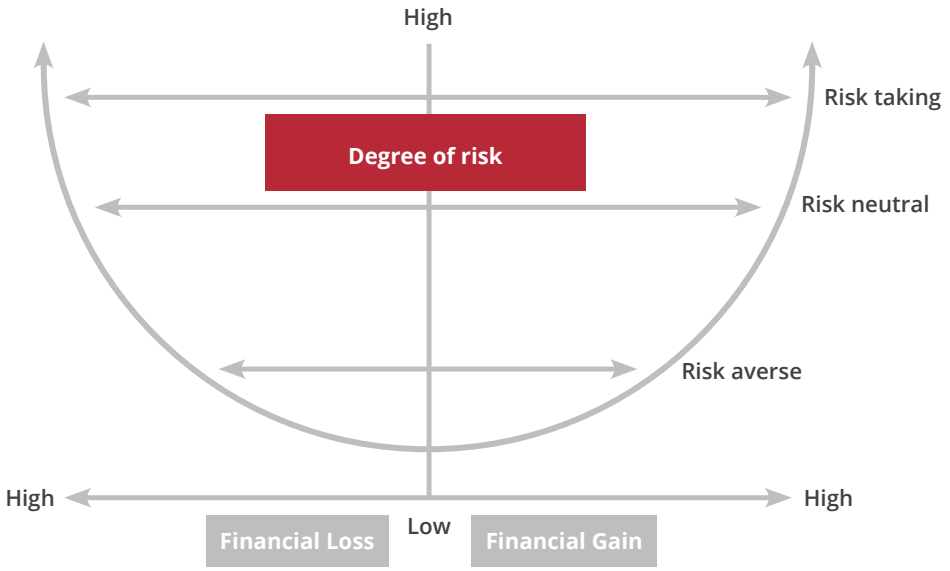
Figure 3.2: Likelihood and Consequence of Potential Risks



Risk and opportunity go hand in hand. A contractor may be described as

- **Risk taking** – high risks are taken that result in the reaping of higher-than-average rewards when things go well and huge loss of money when things go wrong.
- **Risk neutral** – only an average number of risks are taken that result in average financial rewards.
- **Risk averse** – risks are avoided that result in smaller but more consistent financial rewards.

Figure 3.3: Degrees of Risk



3.10.2 What are the Common Sources of Risk on a Construction Project?

There are many sources of risk on a construction project which may be categorised as follows:

Table 3.7: Three-point System to Assess Likelihood and Consequence of Risk

SOURCE	EXAMPLES OF RISK
Client	The client delays payment or does not pay for work done
Commercial	The tendered amount is insufficient to cover costs
Community	The community is opposed to the project
Construction	Heavy rains delay the construction programme
Contractual	The inflation adjustments provided for in the contract are insufficient to cover the real cost of inflation
Environmental	Raw sewerage spills into the water course
Financial	Bank won't provide sufficient bridging finance
Labour	Labour strikes during the project
Market	The tender is awarded to another contractor due to high levels of competition in the market
Natural	The site is susceptible to flooding
Occupational health and safety	A worker is killed during construction
Quality	Labour is insufficiently skilled to achieve required quality
Safety	Criminal acts and acts of vandalism occur
Transport	Vehicles cannot access the site in the raining season

Possible risks that a contractor faces are:

- The tender price may be too low or the costs on site may increase.
- The work may be more difficult than realised and take longer to complete, resulting in penalties.
- The employer may not pay in time or at all.
- Subcontractors may not do their work properly.
- The agent may make changes which cause extra costs or delays.
- There may be delays caused by bad weather or strikes, or suppliers not delivering materials.
- The work may be defective because it is not according to the contract drawings or the specification and may have to be redone.
- Work done may be damaged or destroyed by external forces.

3.10.3 Measuring Risk

Approximate scales may be used to measure the likelihood of a risk occurring based on judgment. The consequence may be measured in monetary terms, time delay and severity of accident or injury.

Alternatively, consequences may be measured on approximate scales.

The simplest scale is a three-point system where the likelihood and consequence of the risk are assessed as being low, medium, and high. The risks may be described as low, medium, or high based on the scales for consequence and likelihood as follows:

		Likelihood		
		Low	Medium	High
Consequence	Low	Low	Low	Medium
	Medium	Low	Medium	High
	High	Medium	High	High

If numerical values are assigned to both the consequence and the likelihood, the risk may be scored by multiplying the likelihood by the occurrence. For example, if low is assigned a value of 1, medium a value of 2 and high a value of 3, the risks may be assessed in terms of a number between 1 and 9. The scoring of risk allows risks to be ranked.

			Likelihood	
		Low (1)	Medium (2)	High (3)
Consequence	Low (1)	1	2	3
	Medium (2)	4	5	6
	High (3)	7	8	9

Risk management may assist a contractor to:

- Save money and improve profitability.
- Reduce accidents.
- Deliver project on time.
- Reduce the chances of disputes arising.
- Enhance the reputation of the business.
- Risk cannot be eradicated but can be managed. It is better to be proactive rather than reactive.
- Working together reduces risks.

3.10.4 Risk Management

Every person is involved in risk management daily. Decisions must be made whether or not to cross a road, overtake another car or to deposit money in a particular bank. The risk management that is applied in daily life is usually instinctive and is as such managed by judgment and experience.

Construction projects are full of uncertainties. Risk needs to be managed in a systematic manner to improve the likelihood of projects being completed on time and within the tendered price. The identification of a risk ensures that a contractor is not caught by surprise. Management of the risk ensures that the impact of the risk is reduced.

Risk management is all about making informed decisions, minimising potential damage or loss, and controlling uncertainties. Once a contractor is aware of the risks that a particular project or activity involves, informed decisions can be taken regarding different courses of action. It also focuses efforts and energies into dealing with the areas that might have the potential to cause time delays and cost overruns on a project. Consequently, risk management is also about opportunities for improving the way in which a contractor operates.

Figure 3.4: Main Elements of the Risk Management Process

Risk cannot be eradicated but can be managed. It is better to be proactive rather than reactive.

Working together reduces risks.

Risk management is an iterative process.

a. Identify the objectives of the risk assessment for the project, activity or group of activities and define the criteria against which risk will be evaluated, e.g. to return a particular profit level on a project, to complete a project ahead of time, to complete a project without any major accidents, etc.

b. Identify the hazards (sources of potential harm or a situation with a potential to cause loss) i.e., what can happen and why can it happen.

c. Determine the existing control measures and analyse risks in terms of consequence and likelihood in the context of those controls.

d. Evaluate risks by comparing against the pre-established criteria.

e. Rank risks to identify priorities.

f. Treat risks by developing and implementing a specific management plan or accept risks and monitor low priority risks.

The performance of the risk management system should be monitored and reviewed at regular intervals to ensure that it reflects any changes which might affect it. Risk management is a continuous process.

A risk management plan should be developed with inputs and discussions with the contractor's staff and where relevant the employer's staff and agents. This is essential to identify the hazards. Hazards can be identified through brainstorming with others, interviews of team members and reviews of similar projects.

- Always expect the unexpected.
- Risk assessment does not need to be precise to be useful.
- Plan ahead.
- Plan for emergencies.
- Lack of communication is usually one of the biggest hazards.
- People are usually the most unpredictable hazard.

3.10.5 Risk Registers

A risk management system needs to be documented. A risk register is a tool for documenting the findings of the risk management process that is followed. The register needs to record at least the source, nature, existing controls, consequences, likelihood and initial risk rating for each risk identified.

Table 3.8: Example of Health and Safety Risk Register

HEALTH AND SAFETY – OBJECTIVE IS TO COMPLETE A PROJECT WITHOUT ANY MAJOR ACCIDENTS								
What are the hazards?	**Who might be harmed and how?**	**What are the safe work procedures for the site?**	**What further action is necessary (monitoring and review)?**	**Action by whom**	**Action by when**	**Likelihood**	**Consequence**	**Risk Rating**
Collapse of scaffold	All operatives on scaffold may incur crush injuries or worse if the scaffold collapses on top of them	Bricklayer supervisor to check with the site manager that the correct scaffold is provided and inspected	Supervisor to keep a check to make sure that scaffold is not overloaded with materials	LG	Before bricklaying starts	Low	High	3

Table 3.9: Example of Constructive Objectives Register

CONSTRUCTION OBJECTIVE IS TO COMPLETE THE PROJECT ON TIME WITHIN ALLOWABLES										
								Control Measures		
Item no	**Area**	**Hazard**	**What can happen and why?**	**Consequences of the hazard happening**	**Likelihood**	**Consequence**	**Risk Rating**	**Strategy**	**Owner of strategy**	**In place (Y/N)?**
1	Plant and material	Availability of structural steel roof trusses	Demand exceeds supply leading to a shortage of materials	Roof cannot be completed, and building cannot be handed over to the client. Delay will lead to penalties payable of R40K per day	High	High	9	Order steel as soon as contract is awarded. Follow up order with fabricator on a fortnightly basis	Site Manager	Y

Notes

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