Module 003: Construction Contract Management and Administration

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Aim and purpose

This module will trace the contractual process from pre-tender stage to taking over, where the standard contract management and administration process is followed. An overview of various general conditions of contract will be discussed as well as the pre-award issues. Delegates will therefore gain an understanding of the entire process of contract management and administration, from the initiation of the project to its completion and taking over. Checklists of documents required, time charts and other tools of contracting will be discussed.

Learning outcomes

On completion of this module a learner should:
1. Know the basic contract management process
2. Be able to administer the contract from post contract to completion stage.
3. Be able to generate a record of documents required for project contract administration and project file.
4. Understand the cycle of contract management relative to construction projects.
5. Understand the use of contract documentations.
Module Overview

Contract Management and administration involves making decisions and the timely flow of information and decisions to enable completion of the project as required by the contract documents including review and observation of the construction project. This is important to the client, contractor and Consultant not only to determine that the work is proceeding in conformity with the contract documents, but also because it allows a final opportunity to detect any inaccuracies, ambiguities or inconsistencies in the design.

The objective of this module is to improve construction contract administration by providing education related to the administration and enforcement of contract requirements during the construction phase of the project.

This module will take the individual beyond the “business as usual” approach followed in the construction industry. Although some of the same topics may overlap with other modules, the depth of understanding and explanation as applicable to each module will provided needed skills to enhance improved construction performance.

This basic course includes, Construction Industry participants, Bidding Requirements and Process, alternatives and Substitutions, standards and Regulatory Influences, Site Activities, Execution of the Work, Certificate of Payment, Changes in the Work, Dispute Resolution, Construction Insurance, Construction Surety Bonds, Guaranties and Warranties, Project Submittal, Contract Close-Out, Commissioning, Definitions and Resources.

**Designed for:** The course is designed for those individuals involved in construction administration, including contractors, site engineers, General foremen, Contract Administrators, Property Managers, Architects, Engineers, Quantity surveyors, bonding and Insurance Agencies
INTRODUCTION TO CONTRACTION MANAGEMENT AND ADMINISTRATION

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1.0 A CONTRACT

A construction contract is a legally binding agreement between two parties on the details and cost of a construction project. This type of contract covers very expensive, complex projects and simple renovations. There are two types of clients that use construction contracts: residential and commercial. Each client has different requirements that determine what is included in the contract.

A residential construction contract includes three basic elements: project scope, schedule of work and payment details. The project scope is a statement of exactly what construction work is included in the contract. Both parties must agree that this section provides an exact representation of the required work.

The payment details section includes the total project cost and payment dates. All construction projects are paid on a percentage of completion basis. A deposit of no more than five percent of the total costs is provided at the start of the project. The next payment is made when the predefined section of work is completed.

Contract life Cycle

1.1 WHAT IS CONTRACT MANAGEMENT?
Contract Management could be defined as a multi-stage process that goes on through the entire duration of the contract and ensures that the parties meet their contractual obligations in order to deliver the specific objectives provided in the contract.
The main purpose of contract management is to make sure that the objectives of the contract (supply of goods, delivery of services or execution of works) are met in a timely fashion and value for money is achieved. In practice this means optimizing the efficiency of the processes, balancing costs and risks against returns and ideally aiming for a continuous improvement in performance over the life of the contract.

Therefore, the ultimate objectives of contract management are:

→ **Effectiveness**

The first and foremost condition of successful contract management is *getting the job done*. This translates in the fact that the ultimate scope/objective of the contract is accomplished, i.e.:

(i) Goods are delivered/installed;
(ii) Services are performed;
(iii) Civil works are completed.

→ **Efficiency**

Just getting the job done is not enough for a successful contract management. We should also be concerned about *how* the job is getting done. The aim should always be to get the job done in the best possible way. This means that the scope/objective of the contract is accomplished within the agreed:

(i) Costs (budget);
(ii) Time (duration);
(iii) Quality (functional parameters).

(Note: Achieving efficiency should not be mistaken for an unrealistic chase for cost savings, or unreasonable pressure to squeeze more output from the contractors for less money or less time. These practices frequently backfire and may result in more time and resources being misdirected towards a false objective).

1.2 **Management of Civil Works Contracts**

The civil works contracts are among the most complex contracts generally throughout the business world. They are therefore the most challenging in terms of contract management.

To begin with, there is a very large variety of types of civil works with various degrees of complexity and risks and even more various types of expertise required for their management.

Type of civil works – large infrastructure projects (highways, bridges, roads, irrigation systems, dams etc.), smaller scale municipal infrastructure projects (rehabilitation of buildings, roads, sewage, water or power utilities), environmental rehabilitation projects (earthworks, planting, seeding, water management etc.).

In the form of an equation with a multitude of variables this would translate as:
1.3 DIFFERENT TYPES OF CONSTRUCTION CONTRACTS

Some of the most common types of construction contracts used in the construction industry are the following:

1. Lump Sum/Fixed Price Contracts;
2. Cost Plus Contracts;
3. Unit Price Contracts; and
4. Time and Material Contracts.

The choice of which construction contract to use oftentimes comes down to the owner’s risk tolerance.

1.3.1 Lump Sum or Fixed Price Contract

Under a Lump Sum or Fixed Price Contract, the contractor agrees to perform the work specified and described in the contract for a fixed price. The price of a fixed contract can only be changed upon the execution of a change order, under which the owner and the contractor either (1) agree for the contractor to perform additional work that falls outside the scope of the original work for an agreed upon extra compensation or (2) agree to remove certain work from the original scope of work and reduce the price of the contract in proportion to the work that the contractor no longer has to perform. These types of contracts are appropriate when a clear scope and a defined schedule have been reviewed and agreed upon.

The benefit of using Lump Sum or Fixed Price Contracts is that the owner’s construction costs are more predictable. The owner’s cost will be capped by the contract price, so long as no change orders are issued and no disputes arise on the project.

There are not many drawbacks with the use of the Lump Sum or Fixed Price Contract. To ensure that the Lump Sum or Fixed Price Contract fulfills this function, i.e., provides a predictable and accurate cost of construction for the owner, it is very important for the scope of work under the contract to be clearly defined. This will eliminate the owner’s risk of the contractor attempting to increase the contract price through the issuance of change orders for the performance of additional work that is arguably not part of the original scope of work but should be. Additionally, the schedule should clearly define the work and the deadlines that must be met. This could perhaps be a drawback to the use of the Lump Sum or Fixed Price Contract because it would require additional time and money to clearly define the scope of work and create a detailed schedule (though this is something that should be done on every construction project to protect the owner).
In addition, other types of contracts, such as Cost Plus Fee or Time and Materials Contracts, could arguably be cheaper if the actual cost of construction were less than the contractor’s estimated cost of construction on which the fixed price is based. But these types of construction contracts could also be more expensive if the actual cost of construction were to exceed the contractor’s estimated costs.

Therefore, the Lump Sum or Fixed Price Contract is a relatively safe and predictable contract type that could be used on a construction project.
1.3.2 Cost Plus Contracts

The Cost Plus Contract is a type of a construction contract under which the owner agrees to pay the complete cost of the materials and labor needed to build the project along with a fee for the contractor’s overhead and profit. This contract type is favored where the scope of work is highly uncertain or indeterminate and the type of labor, material, and equipment needed to build the project is also uncertain in nature.

This type of contract involves payment of the actual costs, purchases or other expenses generated directly from the construction activity. Under this arrangement, complete records of all time and materials spent by the contractor on the work must be maintained. Cost Plus Contracts must contain specific information about certain pre-negotiated amount (some percentage of the material and labor cost) covering contractor’s overhead and profit. Costs must be detailed and should be classified as direct or indirect costs.

There are multiple variations for Cost plus contracts, and the most common are:

1. Cost plus Fixed Percentage Contract – Compensation is based on a percentage of the cost;
2. Cost plus Fixed Fee Contract – Compensation is based on a fixed sum independent the final project cost. The owner agrees to reimburse the contractor’s actual costs, regardless of amount, and in addition pay a negotiated fee independent of the amount of the actual costs;
3. Cost plus Fixed Fee with Guaranteed Maximum Price Contract – Compensation is based on a fixed sum of money. The total project cost will not exceed an agreed upper limit;
4. Cost plus Fixed Fee with Bonus Contract – Compensation is based on a fixed sum of money. A bonus is given if the project is finished below budget, ahead of schedule, etc.;
5. Cost plus Fixed Fee with Guaranteed Maximum Price with Bonus Contract – Compensation is based on a fixed sum of money. The total project cost will not exceed an agreed upper limit and a bonus is given if the project is finished below budget, ahead of schedule, etc.; and
6. Cost plus Fixed Fee with Arrangement for Sharing Any Cost Savings Contract – Compensation is based on a fixed sum of money. Any cost savings are shared with the buyer and the contractor.

The Cost Plus Fixed Fee construction contract is more predictable than Cost Plus Fixed Fee Percentage Construction Contract because the contractor’s fee for overhead and profit is, as its name suggests, predetermined. Regardless of what the cost of construction ultimately amounts to, the contractor’s fee remains the same. Conversely, the Cost Plus Fixed Percentage Construction Contract provides more variability with respect to the amount of the contractor’s fee because it is directly linked to the cost of construction, which in these types of arrangements is inherently unpredictable. In fact, the Cost Plus Fixed Percentage Construction Contract arguably incentivizes the contractor to not keep the costs low because its fee increases with the cost of construction.
The Cost Plus with Guaranteed Maximum Price Contract seeks to eliminate some of the risks associated with Cost Plus Contracts in that it caps the owner’s overall financial exposure. Thus, while the contract price is to be determined based on the cost of construction and the contractor’s fee, owner’s costs are capped at a certain amount.

These types of Cost Plus Construction Contracts are oftentimes grouped with bonus contracts, built-in contingencies, or cost savings contracts which incentivize the contractor to complete the project with agreed targets regarding schedule, quality, and budget in exchange for additional compensation on the project.

1.3.3 Unit Price Contracts

Unit Price Contracts are based on anticipated quantities of items which are counted in the project in addition to their unit prices. The final price of the project depends upon the quantities required to carry out the work. Generally, these types of contracts are suitable only for construction and supplier projects which involve accurate identification of different types of items, but not their numbers, in the contract documents. These types of contracts are oftentimes used on excavation projects.

1.3.4 Time and Material Contracts

Time and Material Contracts are usually preferred if the project scope is not clear, or has not been defined. The owner and the contractor must establish an agreed hourly or daily rate, including additional expenses that could arise in the construction process. The costs must be classified as direct, indirect, mark-up, and overhead. Sometimes the owner might want to establish a cap or specific project duration to the contractor that must be met, in order to have the owner’s risk minimized.

1.4 CONSTRUCTION CONDITION OF CONTRACTS

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. Contract conditions determine the allocation of risk and consequently, price. 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. manner in which the works are to be assessed and certified, time for payment and interest on overdue amounts.
e) Variations and claims, e.g. the manner in which 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 standardized 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 public sector generally uses one of the following standard forms of contract when engaging main contractors for construction works contracts:

a) FIDIC (French initials for International Federation of Consulting Engineers) (1999) (Short contract and Red, Yellow and Silver Books).
b) General Conditions of Contract for Construction Works (GCC).
c) JBCC Series 2000 (Principal Building Agreement and Minor Works Agreement).

1.4.1 Communications

The construction sector has a wide range of standard forms of contract which are intended to balance the risk of the parties but more importantly, through extensive and repeated use, give rise to a certainty of meaning. 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 2004) 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 period.
b) The employer to pay the contractor within a specified time 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 period.
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.

1.5 MANAGING TIME
1.5.1 Programme

Construction works are unique in that each activity needs to be sequenced in order 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.

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.

1.5.2 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.

Some forms of contract require that the contractor submit a claim for an extension of time to the employer within a specified time 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.

1.5.3 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.

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 is able to 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.

1.5.4 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.

1.5.5 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 have to 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 actually completed and the time according to the contract when they were supposed to be completed.

1.5.6 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 assesses 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.

1.6. CONSTRUCTION PROCESS

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:

a) Proof of the insurances that the contractor is required to have.

b) Provision of a performance bond.

c) Provision of the preliminary contractual programme.

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.

1.6.1 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 in order to ensure that the manner in which 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 allowable can help the contractor to plan the work more efficiently and make the most of cutting costs of production and thereby maximizing 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.

The difference between the estimates and the allowable is that the allowable are calculated backwards from the tendered rates submitted in the tender. The cost allowable 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:

- a) Labour
- b) Equipment
- c) Materials
- d) Transport

1.6.2 Resourcing the project

The drawback of not planning is that FAILURE comes as a complete surprise without the worry and stress that normally precedes it.

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 also 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).

Resource planning stems from two main elements of a contract:
  a) The programme of works.
  b) 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 in order 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 has to be done, the contractor can work more efficiently with equipment, personnel and tools and are informed at the start of the project more or less 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.

2.0 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 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.

Good contract administration is required to manage design specification, contractual agreement, competitive tendering, evaluation, cost control, variations, final accounts, claims and even disputes, this will eventually help to reduce construction costs.

A building project, has to undergo three specific stages namely, design, tender and construction. In all three stages, good contract administration is required to manage design specification, contractual agreement, competitive tendering, evaluation, cost control, variations, final accounts, claims and even disputes. Poor management in any of these aspects would lead to unnecessary claims and disputes and eventually higher construction costs.

Consultants can be reluctant to produce information release schedules because of concerns about being held to the dates on the schedule (even where the progress of construction does not require information when the information release schedule proposes it). Failure to keep to the dates set out in the information release schedule may then be a matter for which the contractor can claim an extension of time and loss and/or expense.

A schedule of tender adjustments or clarifications negotiated and agreed after the receipt of tenders and prior to the signing of the contract should be included into the pack of documents.

The requirement for the contractor to provide a performance bond and to obtain collateral warranties from any specialist sub-contractors or suppliers should form part of the conditions of contracts.

Both client and contractor should engross the contract by witnessed signatures prior to commencement of work. In practice the administrative effort of collating all necessary paperwork can be overtaken by the desire to begin construction. In such circumstances it becomes harder to sort out any disputes as to the content. There have been cases where the courts have had to interpret an implied contract when the contract has remained unsigned at the time of the dispute.
2.1 RECORD KEEPING

2.1.1 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.

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.

2.1.2 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.

2.1.3 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.
2.1.4 **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 similar to 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.

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 similar to 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.

2.1.5 **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 as long as there is a clear way of finding a particular picture when needed.
2.2 **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.**

Conditions of contract must be read in conjunction with specification documents, drawings bills of quantities, activity schedules and special conditions. Standard form contracts often comprise suites of contracts with ‘back to back’ subcontracts, consultant appointments and collateral warranties. The use of core conditions with option schedules or supplemental provisions is also now common (see NEC contract)

2.2.1 **Understanding the Contract Documents**

A prerequisite to executing the work is a basic understanding of the documents used in construction. Construction documents are defined as the written and graphic documents prepared or assembled by the designers for communicating the project design for construction and administering the construction contract.

2.2.2 **Various documents constitute the contract documents that are the basis of the contract.**

Other documents are for reference, such as geotechnical data and surveys, and others are generated to carry out the requirements, such as shop drawings and test reports. Certain requirements used in the procurement of the construction contract may no longer apply once the agreement is signed and the contract is formed. These documents include procurement solicitations, instructions for procurement, bid security, and procurement forms. Understanding how they are prepared will provide a greater understanding of how to benefit from their use. The following is an abbreviated description of typical documents used in construction.
On a traditional, fully-designed project, the contract documents may include:

- **Articles of agreement and conditions of contract**, for completing as a simple contract (or as a deed) – commonly referred to as General Conditions of Contracts
- **Contract drawings**.
- **Bills of quantities**.
- **Project Specifications**
- **Specifications**.
- **Schedules of work**.

On design and build projects, the contract documents may comprise:

- **The articles of agreement and conditions of contract**.
- **The employer's requirements**.
- **The contractor's proposals**.
- **The contract sum analysis**.
- **Possibly bills of quantities (for some or all of the design)**.

### 2.2.3 Construction Contract Documents

Construction contract documents are listed and enumerated in the agreement and referred to in the conditions of the contract for the work to be performed. They are the documents that are a legal part of the contract and describe the work. The contract documents describe the proposed construction (referred to as the *Work*) that results from performing services, furnishing labor, and supplying and incorporating materials and equipment into the construction.

Contract documents consist of both written and graphic elements and typically include the following:

#### a) Contracting Requirements

These include contracting forms (agreement) and conditions of the contract (general and supplementary conditions, or client furnished general or special conditions) as well as various named attachments and forms. Revisions, clarifications, and modifications are changes applicable to the contract documents such as addenda issued during the procurement process or change orders issued during the course of the work.

#### b) Specifications

These include specific written requirements for the work. Specifications define the quality requirements for products, materials, and workmanship upon which the contract is based and establish requirements for administration and performance of the project. They are generally written for each work result as sections and organized by divisions using Contract Drawings. These include large graphic illustrations of the physical form of the work to be performed. The drawings are graphic representations of the work upon which the contract is based. As the graphic documents usually contain more than plan views, the preferred term is *drawings* rather than *plans*. 
They show the quantitative extent and relationships of elements to one another. The contractor signing the agreement with the client has the responsibility of accomplishing the work in accordance with the contract documents. Therefore, the contract documents are addressed only to the contractor; however, client and designers responsibilities are also included within these “contract documents.” Contracting requirements and specifications are usually bound into the project manual. Contract drawings are generally bound separately because of their larger size.

There are several types of drawings, reports, and specifications that may be utilized during construction but may not be included with the contract documents. These may include surveys, hazardous material reports, assessments, and geotechnical data.

c) Drawings

Various drawings represent information about the work to be performed. They illustrate relationships between elements as well as quantities, locations, dimensions, sizes, shapes, and forms of the elements and assemblies in the project. Paper drawings are two-dimensional by their very nature. Certain types of specialized views can show elements in isometric or perspective views, but one cannot see every view possible. The current limitations of single views leave many portions of the work unseen. Communicating the information accurately may require multiple views. Understanding how drawings are prepared and the types of information shown is a major aspect of interpreting the information.

Plan views are drawings that show the horizontal layout, as if one is looking down on the subject. This view does not usually convey information about the vertical dimensions.

Other views such as elevations, sections, and profiles give a view looking perpendicular to the horizontal plane. These basic types of views require the user to mentally compare the two views to understand what is happening in the three dimensions of space. It is somewhat difficult to understand how far an element extends if it does not appear at the plane in which the view is drawn.

Fitting the various views together is like doing a jigsaw puzzle. To further explain various conditions, details are drawn as if the element were sliced or viewed at a particular location. These details indicate more specific information and may be considered representative of unique conditions or typical of most conditions.

Understanding what exists in the space indicated by the drawings leads to a consideration of the sequence necessary to carry out the work. The means, methods, and techniques are in the contractor’s control and the efficiency is a result of ingenuity and timing of each activity. Various types of views and drawings prepared by various professional disciplines are associated with stages of the facility life cycle.

d) Resource Drawings

These are the drawings furnished during the procurement stage that generally show existing conditions such as roads, buildings, and current construction circumstances. These may be drawings that were prepared for the construction of existing facilities. Drawings of this nature rarely show exact as-built conditions and may be record drawings from the previous contractor. Resource drawings are generally furnished for reference only and are not
contract documents. Resource drawings may also include items such as client furnished and -installed equipment that requires utility rough-in locations or attachment requirements.

e) Contract Drawings

Contract drawings are those named in the agreement and can be supplemented by various forms of interpretations and modifications including small-size sketches. These drawings document the work to be performed. They may show work to be removed and work to be constructed. They help to establish the extent of the work and are complementary with the specifications. The contract documents are interrelated and they provide different types of information required to carry out the work.

f) Shop Drawings

These are drawings that are prepared by manufacturers, suppliers, subcontractors, and contractors to illustrate a portion of the work. Only shop drawings required by the specifications are normally reviewed and acted on by the designers. These drawings usually illustrate proposed details and techniques to show compliance with the contract documents. Shop drawings may include dimensions obtained at the project site showing how the specialized work will be incorporated into the project. Shop drawings, regardless of approvals, are not contract documents and do not waive requirements of the contract documents.

g) Coordination Drawings

Information provided by various subcontractors and the contractor are brought together to coordinate utilization of limited space. Information on the contract drawings may be diagrammatic, with single lines indicating general locations. Coordination drawings are drawn with actual (scale) dimensions of the elements. These drawings help determine how elements will actually fit in the space available. Without coordination drawings, the installation of each element may require that the next element fit in the remaining space. Frequently, this creates a problem that is extremely difficult to rectify requiring elements to be repositioned. Coordination drawings, regardless of submission or approval by the designers, are not contract documents.

h) Record Drawings

The contract documents may require record drawings. Often the contractor marks up the contract drawings to indicate changes and field conditions. The contract documents indicate the type of information required to be included on the record drawings. Concealed conditions and utility locations are the most common information required. These record drawings are submitted through the designers to the client as a permanent record of the actual conditions of the completed work.

i) Electronic Models

As technology continues to evolve, some traditional locations of facility information are changing. Building Information Modeling (BIM) uses computer programs to document facility design, to simulate construction, and to simulate facility operation. BIM is more than 3D modeling of facilities and components with the traditional information typically found in contract drawings. A BIM database can be an intelligence-rich model that allows extraction
of graphical and data information. BIM is beginning to incorporate some traditional specification and product-specific information into the model. For example, a BIM database may contain information on doors at the specific door location. The door may be identified by size, type (metal, wood, aluminum, and glass), fire rating, finish, and hardware set.

BIM allows design and construction team members to collaboratively embed intelligence into the model in order for personnel to concentrate on design and problem-solving tasks while allowing the computer to perform tasks such as quantity take-offs for cost estimating or product ordering, clash detection, scheduling, and quality assurance.

\[ j \] **Specifications**

Specifications, in general, can include various types of data; however, the specifications included as a part of the contract documents are the written description of the work to be performed by the contractor and are prepared by the designers. The specifications may be simple notes on a drawing or more detailed descriptions bound in the project manual. The specifications are typically organized in accordance with the Standard Construction Specifications which establishes the organizational structure for the documents and sections within a project manual, each with its unique number and title. A section is further divided into the three parts defined and organized into divisions. A good understanding of the structure of specifications and the individual sections greatly aids in administrating the work.

Other types of specifications and standards, not bound in the project manual, may include those of organizations such as American Association of State Highway and Transportation Officials (AASHTO). Specifications and standards by such organizations may be contract documents if they are incorporated into the contract specifications by reference to specific standards.

Manufacturers develop data sheets that give specifics about their products. These product data sheets may be required as a submittal to provide evidence of the kind and quality of products being furnished by the contractor. These data sheets are like shop drawings and are not contract documents. Manufacturers may also develop guide specifications specifically for their products to assist the designers in preparing project specifications.

Record specifications are similar to record drawings in that they utilize contract documents, which are then marked by the contractor to indicate actual conditions such as the products provided during the construction stage.

\[ k \] **Revisions, Clarifications, and Modifications**

Pre-contract revisions include revisions made prior to signing the agreement. Addenda are written or graphic information issued to clarify, revise, add to, or delete information in the original procurement documents or in previous addenda. Typically, an addendum is issued prior to the receipt of bids or proposals. Other revisions may include bid or proposal revisions when permitted. Addenda items affecting the contract documents are contract document revisions and should be enforced during the administration of the contract.

Clarifications and proposals include documents initiating changes or clarifications that have not been incorporated into the contract by formal contract modifications. These documents include requests and proposals.
Contract modifications include modifications after the construction agreement has been signed and may include additions to, deletions from, or modifications of the work to be done. These are accomplished by change orders, change directives, and minor changes. These can be issued at any time during the contract period.

Issues that require attention by the Construction contract administrator are:

- Handling of project instructions and variations (change) management
  Variations - Changes in quantities of works occur in virtually any civil works contracts for a variety of reasons (quantities could not be accurately measured at the time of design, modifications of the conditions on site etc.).

  Variations are therefore not only normal in a civil works contract, but also necessary to correct shortcomings in the design, to improve the proposed technologies, to allow for the use of newer or better materials etc. As long as they are carefully analyzed and duly justified from a technical and economical perspective, variations should not be regarded as attempts of the Contractor to get money in dubious ways.

  The Engineer is again the most important player in this equation because it’s the Engineer’s duty to make sure that the variations requested by the Contractor are (i) necessary; and (ii) make technical and economical sense. The next step would be to evaluate the financial impact of the respective variations and duly inform the Employer about it. Depending on the limits of Engineer’s authority established in the Particular Conditions, the Employer should approve the variations that exceed the respective threshold.

- Re-measurement of works
  - Has notice been given by Engineer to Contractor about intention to carry out measurement?
  - Has Contractor sent qualified personnel to assist Engineer?
  - Have all particulars requested by Engineer been provided by Contractor?
  - Are certified laboratories/testing institutions hired for the tests?

- Health and Safety

- Schedule of works - A schedule of work should indicate the start date, milestones, and project completion date. Review this section in detail to ensure that all the primary requirements from the project scope are included. The process for inspection and quality assurance should be provided here.

- Managing Cash-flow projects

**Advance payment / Contractor’s mobilization**

It goes without saying that no payment should be made to the Contractor until valid and duly verified performance security and advance payment guarantee have been submitted. Then the Engineer should issue the appropriate Interim Payment Certificate certifying that all conditions for the advance payment have been met.

The Employer should supervise Contractor’s mobilization on site and use of the advance payment, because usually this is a fairly good indication on Contractor’s later performance. Any delays or deviations in site mobilization (in quantity but also in quantity – e.g. unacceptable accommodation or sanitary facilities) should be promptly notified to and remedied by the Contractor.
Contractor’s mobilization should be seen as comprising at least the following key aspects:

(i) financial resources - if advance has been paid, than the Contractor should be able to timely complete the appropriate mobilization arrangements;
(ii) manpower - both in terms of Contractor’s key staff and sufficient labor to ensure proper and timely execution of the works;
(iii) plant, equipment, materials;
(iv) site facilities – check the contractual requirements

There may be cases where the Contractor receives the advance payment but fails to mobilize up to the value of the advance payment or according to its own Mobilization Schedule (which should have been part of its bid). If it is obvious that the Contractor does not have the intention of making the adequate start up arrangements or uses the advance payment for other purposes than the mobilization costs, than the Employer would be entitled and should not hesitate to forfeit the advance payment guarantee, after due consultation with the Engineer, who should be in the best position to determine Contractor’s capacity or intentions.

Site visits by the Employer
Whenever visiting the Site, Employer’s staff should bear in mind the following minimum aspects that relate to visual or physical inspection:
- Progress of works against planned (how much of the work has been done, compared to the planned progress?);
- Quality of works (do all works comply with the quality requirements in the technical specifications?);
- Deployment of staff / labor (is the number of people actually working on site sufficient to have the works completed on time?);
- Contractor’s mobilization of materials and equipment (does the Contractor have all necessary equipment and construction materials to complete the works according to the specifications and on time?);
- Health and safety with regard not only to the Contractor’s personnel, but also to the public safety (have all necessary health and safety measures been implemented?);
- Environmental issues (is the Environmental Management Plan being enforced appropriately?).

Another important aspect would be the desk control of Engineer’s documents. The Engineer should maintain very accurate records of everything that happens on the Site. The following documents should be the minimum required:
- Measurement logs
- Activity reports – daily, weekly, monthly; showing in tabular format quantities of work done, number of staff and equipment involved, consumption of materials, testing and samples etc. The reports should also mention any specific events, incidents, weather conditions etc.
- Issues Log – a record of all issues that occurred during the execution of works, with appropriate description and indication of the date, cause, remedial measures to be taken, responsible party, status of remediation etc.
- Variation Orders – critical documents that justify changes in quantities, prices and time for completion.
- Requests to Contractor.
- Correspondence with the Contractor and third parties (Government agencies, local authorities, controlling bodies, end users, beneficiaries etc.)
Inspection and Control Logbook – a record of all inspections, audits and controls performed by any party starting with the Employer, but also any third party (environmental agency, financial control, local authorities etc.)

Payment
Payment of the Interim Payment Certificates issued by the Engineer based on Contractor’s monthly statements is one of Employer’s key responsibilities and also the moment with the maximum involvement of its technical, procurement and financial staff.

Remedies against non-performing contractors:
- Deny approval or acceptance of non-compliant goods, defective work, or sub-standard materials;
- Rejection of non-performing staff;
- Penalties for failure to meet functional guarantees;
- Actions against the Performance Security;
- Termination of Contract.

Acceptance / Taking Over Certificate
- Check if all the functional guarantees are met and all tests on completion have been successfully passed;
- Succession planning (who takes over the works; do they have funding for the proper care and maintenance; do they know what to do in case of defects etc.).

Warranty / Defects Liability Period
- Ensure that Performance Security/Retention Money Bank Guarantee and insurance policies (where applicable) are still valid and enforceable for the duration of the Defects Liability Period;
- Ensure that the Contractor is promptly notified about any defect and duly remedies the defects in due time.

Final Acceptance / Performance Certificate
- Check how the Contractor fulfilled its duties during the warranty period;
- Ensure the Contractor has no outstanding obligations, duties or debts;
- Release Performance Security/ Retention Money Bank Guarantee;
- Final Payment (if applicable).

Termination of Contract
- Check the exact provisions of the Contract with regard to the Termination by the Employer;
- Assess Contractor’s claims and remedies;
- Ensure that all Contractor’s reasonable claims have been properly addressed and all due amounts have been paid;
- Contingency planning.

Claims and settlement of disputes
- Check the exact provisions of the Contract with regard to the settlement of disputes and costs incurred (in terms of time, money and resources);
Check if the contract management team has consistently and correctly enforced the conditions of contract;
Duly document any deviations from the specifications and conditions of contract.

✓ Site Daily diary
✓ Site minutes & Files
✓ Instruction Books
✓ Contract close-out.

3.0 ESSENTIALS QUALITY CONTROL

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 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 old adage 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.

3.1 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:
  o setting out;
  o site establishment;
  o site administration;
  o health and safety;
  o human resources;
  o financial controls and payment certificates;
  o production in respect of each construction activity, e.g. excavations, brickwork, painting, etc;
  o quality monitoring and testing;
  o liaison with the employer and the professional team;
  o temporary works design; and
  o 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.

3.2 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:

3.2.1 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.

3.2.2 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.

3.2.3 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 end 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 in order 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 their 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.

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.

3.2.4 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.

3.2.5 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. Non-conformances result in rework. 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.
## SAMPLE SITE FORMS AND REPORTS (CIVIL WORKS CONTRACTS)

### DAILY REPORT SHEET

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<th>Weather condition</th>
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**Description of work**

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**Engineer’s Signature**

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**CHECKLIST – COMPLIANCE WITH FIDIC CONDITIONS OF CONTRACT**

This checklist can assist in the audit of the Contractor and the Engineer, as well as with regard to the interaction between contract parties

**Name of Project:**
**Date of audit:**
**Name of audited party:**

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<th>Clause #</th>
<th>Issues</th>
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<td>Communication</td>
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<tr>
<td>4.1</td>
<td>Contractor's general obligations</td>
<td>If Contractor has designed part of the Permanent Works: Have the designs been submitted to the Engineer? Have they been checked by Engineer for accordance with Specs and Drawings? Have all equipment, material and services their origin in the eligible source countries?</td>
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<tr>
<td>4.3</td>
<td>Contractor's representative</td>
<td>Has Contractor submitted the Contractor's Representative to the Engineer for approval? (Unless named in the contract) Has a deputy been named by Contractor and approved by Engineer?</td>
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<tr>
<td>4.4</td>
<td>Subcontractors</td>
<td>Are there subcontractors unnamed in Contract? Has the Engineer given his consent? Has the Engineer been notified 28 days prior to work commencement of the subcontractor?</td>
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<tr>
<td>4.7</td>
<td>Setting out</td>
<td>Is there a clear set of reference points, lines and levels notified by Engineer? Has the Contractor duly checked these?</td>
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<tr>
<td>4.9</td>
<td>Quality Assurance</td>
<td>Has the Contractor a QA system? Has the Engineer audited the QA system? Although not stated in Red Book, it is good practice that Engineer first develops QA Manual and Contractor then adapts it to his need. Does Engineer have appropriate QA system? Has Engineer's QA Manual been approved by Employer? Are all documents issued by Contractor to Engineer duly signed/approved by Contractor?</td>
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<tr>
<td>4.12</td>
<td>Unforeseeable Physical Conditions</td>
<td>In case of unforeseeable physical conditions: Has Contractor given notice to Engineer? Has the Engineer handled Sub-clauses 3.5 (Determination) or 20 (Variation) appropriately? (Fair balance between extensions and savings at different sites?)</td>
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<tr>
<td>Clause #</td>
<td>Issues</td>
<td>N/ A</td>
<td>Yes</td>
<td>No</td>
<td>Comments, Corrective measures by (date)</td>
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<td>----------------------------------------</td>
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<tr>
<td>8 Commencement, delays and suspension</td>
<td></td>
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<tr>
<td>8.1 Commencement of works</td>
<td>Check commencement date: ........................... Has the Contractor started works within reasonable time after Commencement Date?</td>
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<tr>
<td>8.3 Programme</td>
<td>Has the Contractor submitted a detailed and plausible Programme for the works to the Engineer within 28 days of being given notice of the Commencement? Does the content of the Programme comply with bullets (a) - (d)? Has the Engineer replied within 21 days? Is Programme continuously updated after changes?</td>
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<td>9 Tests on completion</td>
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<tr>
<td>9.1 Contractor's obligations</td>
<td>Have proper and adequate testing criteria been defined and agreed between Engineer and Contractor? (see Clauses 7.4 and 4.1) Has the Contractor informed Engineer at least 21 days before earliest Test date? Have tests been carried out no later than 14 days after this date? Has a certified testing report been submitted by Contractor to Engineer?</td>
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<tr>
<td>9.2 Delayed tests</td>
<td>In case there have been delays of the tests: have these been handled appropriately?</td>
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<tr>
<td>10 Employer's taking over</td>
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<tr>
<td>10.1 Taking over of the Works and Sections</td>
<td>Has the Contractor notified the Engineer within 14 days about readiness for taking over? Has the Engineer issued a TO Certificate properly filled in (TO date, whole Work or which Sections) with a complete list of any minor outstanding work? Has Engineer issued TO Certificate within 28 days after Contractor's application? Tentative structure of TO Certificate: Cover page with • clear statement of Taking Over • clear nomination of Sections, Lots • completion of works according to design Annex with list of outstanding works</td>
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<tr>
<td>10.4 Surfaces requiring Reinstatement</td>
<td>Have affected surfaces orderly been reinstated after completion of Works?</td>
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<tr>
<td>12 Measurement and Evaluation</td>
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<tr>
<td>12.1 Works to be measured</td>
<td>Has notice been given by Engineer to Contractor about intention to carry out measurement? Has Contractor sent qualified personnel to assist Engineer? Have all particulars requested by Engineer been provided by Contractor? Are certified laboratories/testing institutions hired for the tests?</td>
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</tr>
<tr>
<td>Clause #</td>
<td>Issues</td>
<td>N/A</td>
<td>Yes</td>
<td>No</td>
<td>Comments, Corrective measures by (date)</td>
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<td>13</td>
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<tr>
<td>Variations and Adjustment</td>
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<td>13.3</td>
<td>Variation procedure</td>
<td>In case there are any variations: Has the procedure outlined in 13.3 been observed?</td>
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<tr>
<td>14</td>
<td>Contract price and payment</td>
<td>Are records kept orderly by Contractor? Is this checked by the Engineer? Daily work reports, signed and dated by Contractor and submitted to Engineer, are very recommendable. Content (structures along sections and/or lots): • Personnel employed and hours worked • Qualitative and quantitative description of works carried out that day • Equipment used • Special occurrences</td>
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<td>20</td>
<td>Claims, Disputes and Arbitration</td>
<td>Has Contractor notified Engineer less than 28 days after he became aware of such circumstances? (Have claims been recognised anyway?) Has Engineer checked Contractor's record-keeping? In case Engineer has issued proper instructions for extended record-keeping: Have record-keeping requirements been met by Contractor? Has Contractor sent a fully justified, detailed claim to Engineer within 42 days after first becoming aware of circumstances? Has Engineer responded within 42 days with approval or rejection? Has Engineer taken all measures to defend Employer from Claims (e.g., defer Claims to Force Majeure)?</td>
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</tbody>
</table>

Auditor

Contractor / Engineer Date: Location: