



**FEDERAL REPUBLIC OF NIGERIA**

**FEDERAL MINISTRY OF NIGER DELTA AFFAIRS**

**DEPARTMENT OF INFRASTRUCTURAL DEVELOPMENT**

**LECTURE ON THE**  
**ROLE OF CONSULTANTS IN PROJECT SUPERVISION**

**TRAINING FOR NEWLY RECRUITED ENGINEERS/TECHNICAL OFFICERS**

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## 1.0 INTRODUCTION

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The role of the consultant on a construction project is often not fully understood by the other parties involved on the project, including the consultant's client, the owner. Consequently, the consultant may find himself under-utilized. There are also instances where the consultant himself is not fully aware of his roles (duties and obligations) to the owner and others, thereby exposing himself to potential liability claims.



During construction, the role of a consultant is to administer the contract as described in the Contract Documents. However, the contract documents do not make reference of the agreement between the owner and the consultant which outlines the professional services to be provided to the project. Nevertheless, the impact of the services provided by the consultant can be significant. The contractor should make themselves aware of the arrangement in place between the owner and the consultant and understand the scope of that arrangement at the outset of the project.



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With increased awareness and understanding, all parties can benefit from the advantages of having a consultant involved in the construction process. With a clearer understanding of their obligations, the consultant can better carry out their obligations to the owner and others.

The purpose of this paper is to highlight the main role of the consultant in the construction of a project.



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The role devolving on the consulting engineers arises from two relevant agreements which are:

1. The Consultancy Services Agreement between the Consultant and the Employer.
2. The Contract Agreement between the Employer and the Contractor



## 2.0 ROLE OF CONSULTANT ENGINEER

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Generally, the role as far as the Contract with the Client is concerned is that the consultant should supervise the works described in the contract in accordance with the conditions of contract, the specification and other documents.

Clause 13 of the "Standard Conditions of Contract" re-edited July 1999 states – 'unless it is legally or physically impossible, the contractor shall complete and maintain the works in strict accordance with the contract to the



satisfaction of the Engineer and shall comply with and adhere strictly to Engineer's instructions and directions on any matter (whether mentioned in the contract or not) touching or concerning the works. The contractor shall take instructions and directions only from the Engineer or (subject to the limitations referred to in clause 2 hereof) from the Engineer's Representative.



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The Engineer referred to in the clause above could either be the Consultant or the Client's engineer e.g Director of Highways. When the Client takes the position of Engineer, the Consultant should automatically become the Engineer's Representative.





Though not tidy, in some instances the Client also assumes the position of the Engineer's Representative where the Client has a reservoir of experienced engineers that are idle. Whereas when dispute arises between the Contractor and the Employer (owner) which they are unable to resolve, the first stage in the dispute resolution process is for both parties to involve the Consultant whose role is to act as an '*Impartial Adjudicator*'. The Consultant's decisions must be dictated by his or her best judgement of the most efficient and effective way to carry out the contract.



A Client's own engineer cannot be an impartial adjudicator in dispute concerning him. Clause 66 of the "Standard Conditions of Contract" re-edited July 1999 states that 'If any dispute or difference of any kind whatsoever shall arise between the Employer or the Engineer and the Contractor in connection with or arising out of the Contract or the carrying out of the Works (whether during the progress of the Works or after their completion and whether before or after the determination, abandonment or breach of the Contract) it shall be referred to and settled by the Engineer who shall state his decision in writing and give notice of the



same to the Employer and the Contractor. Such decision in respect of every matter so referred shall be final and binding upon the Employer and the Contractor until the completion of the Work and shall forthwith be given effect or by the Contractor who shall proceed with the works with all due diligence whether notice of dissatisfaction is given by him or by the Employer as hereinafter provided or not, .....



From the foregoing, the duties of the Consultant which are derived from the Contract and from which the powers of the Resident Engineer flow are legions and widely ramified. Some of these duties are explicit while others are implicit and may be deduced from the fundamental principles viewing his appointment as that of a fair umpire for the construction project.

The primary objective of site supervision upon the award of a contract is to ensure at all times that the works are free from defective materials and workmanship and they meet the requirements of the drawings and specifications.



The Consulting engineer is engaged by the Employer (Client) to perform the direct supervision of the construction works impartially within the terms of the contract. The Consultant and the Contractor share a unique responsibility in ensuring good supervision on site. Whereas the Consultant is engaged by the Employer because of his expertise to ensure that the job on hand is executed to specification, the Contractor also has an obligation to complete the works to specification within a certain time limit.



### 3.0 TYPES OF SUPERVISION

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To the consultant who designed the project, two types of supervision may be recognised – Normal Supervision and Resident Supervision.



### 3.1 Normal Supervision

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In Normal Supervision, the Consulting Engineer pays a regular visit to the site during the period of construction. A monthly site visit is normal though higher frequencies are not uncommon during certain stages of the works. Normal Supervision is usually adopted when the work is not very complex and the employer has dependable and competent staff who are deployed for resident supervision.



## 3.2 Resident Supervision

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In Resident Supervision, the Consulting Engineer provides resident staff and the number of staff deployed for the supervision depends on the nature and involvement of the works. The remuneration also depend on the years of experience of the various staff.





## 4.0 SUPERVISION OF CONSTRUCTION WORKS

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The main role of the Consultant Engineer are all site supervision of construction and administration of the contract with respect to:

- a. Supervision
- b. Testing
- c. Examination of materials and workmanship
- d. Measurement of work done

In carrying out the work and to ensure the proper construction of the works in accordance and in compliance with the requirements of the tender documents, construction drawings and the specifications, the Consulting Engineer shall provide suitable qualified supervisory and office staff.



## 5.0 DUTIES OF THE CONSULTANT ENGINEER

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The Consultant Engineer's duties include, but not necessarily limited to:

- i. Discharging the consultant engineer's duties and responsibilities relating to the site supervision and the administration of the contract in accordance with the powers delegated to the consultant in respect of the Condition of Contract, the drawings and all other parts of the Contract Document.



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- ii. Co-ordinating the work of various contractors; to agree on detailed programme of work; to check that all necessary instructions have been given to contractors and authorization obtained.
  
  - iii. Checking that materials including sampling and testing (where required) of all materials and workmanship are satisfactory and as specified; issuing instructions for remedying faults therein.



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iv. Checking lines, layout, level etc. of the works to ensure conformity with the drawings:

- Issuing further instructions, drawings and clarifications of detail as are necessary to ensure satisfactory construction of the works.
- To measure the amount of work done for the purpose of payment and to calculate such payments
- Undertaking all tests required and keep records thereof.
- Recording progress in detail, keeping a check on the estimated final total cost of the project.



- Keeping detailed records of the contractor's construction equipment, labour deployment and material usage on a day-to-day basis.
- To inform the contractor any changes in the design or specifications which may prove necessary or desirable during the course of the contract or to study any changes proposed by the contractor.
- Examining all claims from the contractor, preparing data relevant to such claims, sending to the contractor an initial response to every such claims. Recording progress in detail, keeping a check on the estimated final total cost of the project.



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- Reviewing day works sheets, increase of prices and all other matters requiring accountancy checking.
- v. When the work is completed, to perform a final inspection of entire project preliminary to its acceptance by the owner and the final payment to the contractor



## 6.0 SITE SUPERVISION TEAM

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The setup of the Consultant Site Supervision Team consists of:

1. Chief Resident Engineer
2. Principal Resident Engineers/Engineer
3. Resident Engineers and Technicians
4. Clerk/Typist

And the duties of the personnel are as follows:



## 6.1 Chief Resident Engineer

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He shall act as the Project Coordinator of the whole construction works, and will bear the overall responsibility for ensuring that the contract is administered as planned and the objective of the project are satisfied. His roles and responsibilities shall be:

- a. Act as a site representative of the Consultant.
- b. Liaise with the Consultant's Head office, Principal Resident Engineer/Engineer and Contractor in their works.
- c. Manage and control all site staffs assigned to the project such as staff time-keeping, overtime, leave, salaries, claims etc.





## 6.1 Chief Resident Engineer

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- d. Prepare monthly report on the progress of works
- e. Monitor the performance of site management and supervisory staff in their respective works
- f. Liaise with the Project Manager of the contractor.
- g. Certify interim progress payments submitted by the contractor for approval.



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- h. Monitor on all safety measures
  - i. Responsible for work measurement, progress payment recommendation, engineering instructions etc.
  - j. Responsible for preparation and completion of final measurement and as-built drawings.



## 6.2. Principal Resident Engineer/Engineer (PRE)

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The duties are as follows:

1. To be responsible to the Chief Resident Engineer (CRE) in reporting the work progress and other developing matters.
2. Responsible for the management of all site supervisory activities and interacting with the Contractor's site set up to ensure the construction works are properly carried out.
3. Exercise sound engineering judgement in examining and approving the Contractors temporary works and method of construction.
4. Closely monitor activities within the site and carry out frequent inspections and works supervision.
5. Ensure adequate site documentation of work progress/completion/changes and deal with all relevant correspondences with various parties involved.



6. To attend all site meeting.
7. To liaise with Contractor's Agent.
8. To organise and supervise his team to cover all aspect of supervision work and other relevant works.
9. To instruct his staff on the method of construction to be adopted for all aspect of work and recording works.
10. To assist the CRE in the measurement of all works and keep all necessary record.
11. To implement the QA/QC measures on site.



## 6.3 Resident Engineers and Technicians

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Their duties are as follows:

1. To be responsible to the CRE and PRE
2. Ensure the contractor's work is properly supervised at all times and it is carried out in accordance with the drawings and specification.
3. Contact the CRE and PRE when faulty works occur or where a variation is required.
4. Agree day work records with the Contractor, keep daily site diaries and complete daily reports and ensure that the records for plant and labour are kept accurately.



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5. Assist the CRE and PRE in taking measurement, levels and other details as may be necessary for progress payment, variation order, changes etc.
  
  6. Assist the CRE and PRE in testing and inspection of materials and workmanship



## 6.4. Clerk/Typist

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Assisting the CRE in the following:

1. Office administrative work, preparation of monthly reports.
2. Typing miscellaneous correspondence, report, memo, minutes of meeting and filing system.
3. In charge of incoming request for inspection form and checklist for quality plan.
4. In charge of filing system, update annual leave and medical records, time sheet, overtime and other staff related matters.
5. Prepare and update for laboratory test record.



## 7.0 CHECKLIST AS GUIDE DURING SITE SUPERVISION AND INSPECTION

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In general, the inspection personnel must ensure that each of the following items is strictly adhered to:

- a. That all material and workmanship are in accordance with the specifications and acceptable good practice.
- b. That the quality control testing of material is at an acceptable level of workmanship.
- c. That all works are to be in accordance with the level, alignment and cross-sections as specified in construction drawings and specifications.

In carrying out the supervision and inspection of certain aspects of a typical civil engineering works, the following checklist can be useful.





## 8.0 GENERAL

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The drawings and specifications must be checked to ensure that executed works comply with the contract provisions.



## 8.1 Initial Preliminary Works

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- Siting of the site office, workers canteen and recreation facilities if provided in the works
- Removal of topsoil and spoil heaps location
- Protective perimeter fencing
- Reconciliation of bench marks or level pegs
- Agree on the setting out of works



## 8.2 Stripping of Topsoil

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- Prior to stripping of topsoil, joint survey for spot level shall be carried out. Topsoil may be stockpiled for future use or disposed off at contractor's disposal site.



## 8.3 Excavation and Foundation Works

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- Width and depth of trenches
- Similarities or agreements of the ground with trial hole data
- Remove all unsuitable material
- Carry out compaction test
- Stability of slopes and timbering of excavation
- Depth of water table and hence pumping preparation
- Arrangement made to ensure safety of passers-by on the construction site.



- Arrangement made to ensure safety of passers-by on the construction site.
- Quality of concrete mixture and thickness of beds
- Damp proof course
- Correct placing of reinforcement and correct type (size, quality). Bending and spacing of bars to be checked.
- Consolidation of backfilling with special reference to material used.
- Check pile depths and driving mechanism



## 8.4 Drainage

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- Gradient of fall
- Depth of inverts at various chainages
- Timbering of trenches
- Concrete bed thickness and reinforcement
- Thickness and reinforcement of slabs, where necessary
- Nature of inlet into manhole
- Testing of drains and precast



## 8.5 In situ and Precast Concrete

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- Setting out and stability of shuttering
- Nature of shuttering
- Setting out reinforcement, fixing, holes and water bars
- Check mix and take test cubes at correct intervals
- Check and allow adequate curing
- For precast concrete, check size and shape of members
- Check position of fixing, hole etc.
- Check damage during movement and erection



## 9.0 DILEMMAS FOR CONSULTANTS ON CONSTRUCTION SUPERVISION

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Consultants on construction supervision are frequently presented with dilemmas, some of which occur repeatedly with the Client, Consultants experience concerns in terms of the role they play for the Client. Ultimately, the client is the main benefactor of work of the Consultant, but they are usually one step removed from the supervisory relationship. Supervising Consultants struggle at times to make the Client to be aware of their engagement. On the one hand, the Consultant need a certain level of detachment to work well but, on the other, the consultant need good cooperation and understanding from the Client.





One very frustrating dilemma is when bad workmanship and unsuitable methods are being used. It is the duty of the resident engineer to see that the work is rectified and the unsuitable methods stopped. This is easier said than done in practice. Contractors ignore instructions from consultants with impunity. In most cases when assistance is sort from the Client, it does not come. This could be emanating from the legal or contractual position of the resident engineer which is considered with the role he is asked to play in connection with a contract for construction.



The resident engineer is, in law, only the agent for the Engineer, who is responsible for the supervision of the construction of the work, and all the resident engineer's right and duties are as a servant to the Engineer. The legal standing of the Resident Engineer may be almost worthless, his existence but casually mentioned in the Standard Conditions of Contract, and yet he is without a doubt one of the most important persons on a contract.



## 10. CONCLUSION

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The Consultant have a wide variety of roles to play during the construction process. It is important to fully understand the Consultant's role and authority because they play multifaceted part in the construction project. Doing so ensures that the services of the Consultant can be fully maximised on construction project. Integrity placed above maximization of profit is of paramount importance to achieve the noble goal for the benefit of all.



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