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CHAPTER ONE

1.0 INTRODUCTION

Student industrial work experience scheme (SIWES) programmed, was established in year 1973 by federal Government of Nigeria through the industrial Training Fund (ITF) under the NBTE (National Board for Technical Examination). It has its headquarter in Jos, Plateau State. The major reason behind the establishment of SIWES programmed and the importance of the student to display their talents and also learn the practical aspects of their fields of study. After their graduation, they will have something valuable to contribute to the society. They will also be able to face future challenges in their respective field of study.

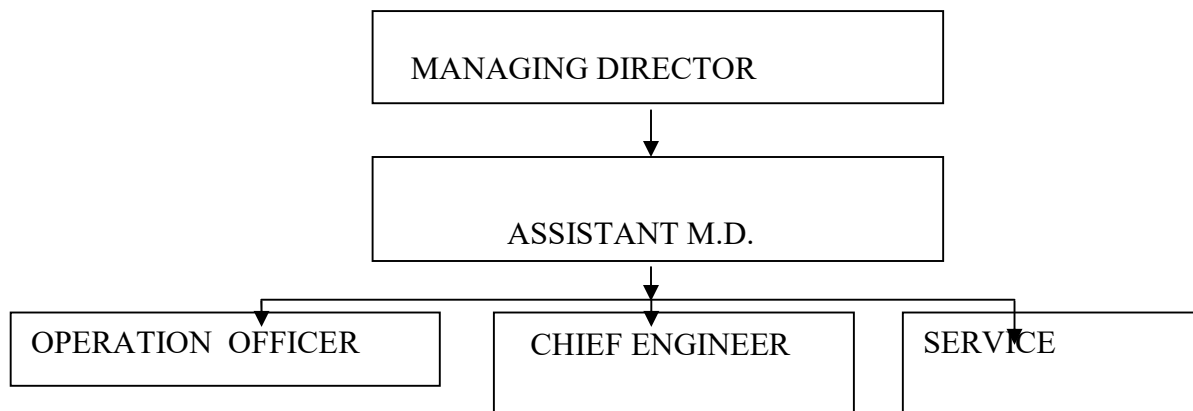
In accomplishment of my compulsory four months training program, I did my SIWES at Ace Bricks Construction

I was involved in several operations on site and experience in relation to my career of study (BUILDING TECHNOLOGY).

1.1 AIM AND OBJECTIVES OF SIWES

- ❖ To enhance the knowledge of students (theory) of what they have been taught in school by backing it with enough practicals.
- ❖ To provide students the opportunity to apply their theoretical knowledge in real work situation, bridging the gap between university work and actual site work.
- ❖ To provide an avenue for students to acquire industrial skill and experience in their course study.
- ❖ To enable students to develop more affection for their chosen profession.
- ❖ To expose students to working method and technique in handling equipment and machineries that may not be available to them in school.

1.2 ORGANIZATION CHART



CHAPTER TWO

2.0 SECTION / UNIT OF THE ORGANIZATION

ACEBRICKS CONSTRUCTION was divided into four section / unit they are as follows.

- Planning Approval Department
- Construction Management Department
- Building / Structural Department
- Administration Section

2.1 SPECIFIC FUNCTION OF THE ORGANIZATION

- **PLANNING APPROVAL DEPARTMENT**

This unit deals with planning approval of a proposal to use or develop land against the rules in planning scheme. The planning process is mainly concerned with the impacts of a proposed use or development upon neighboring land.

- **CONSTRUCTION DEPARTMENT**

This department provides construction management services on a project such as building, highway and other BUILDING TECHNOLOGY projects.

- **BUILDING TECHNOLOGY DEPARTMENT**

The department is made up of Civil & Structural engineering with wide range of experience in design detailing and supervision of structure.

- **ADMINISTRATION SECTION**

This section ensure the smooth running of the organization .The section make sure that the administration setup by the organization is in good order.

2.2 CONSTRUCTION

Construction is defined as the act of process of building something, but in BUILDING TECHNOLOGY construction is the process of designing of structure (ie construction of building) for dam, railway, dam water way and bridge.

2.3 TYPE OF CONSTRUCTION IN TEAR OF BUILDING TECHNOLOGY

- Building construction / Structural
- High way /road construction
- Construction of dam

Building construction: this aspect of construction is involved In building and erecting of structure examples are office, house, churches, mosques etc

High /road construction: this is the process of constructing bridges, road, highways or idealization of road.

Dam construction: this kind of construction is based on the construction of dam.

2.4 MAJOR BUILDING COMPONENTS

A building has two basics parts

- i. Substructure or foundations, and
- ii. Super structure



SUB- STRUCTURE OR FOUNDATION : is the lower portion of the building, usually located below the ground level, which transmits the loads of the superstructure to the supporting soils. A foundation is therefore that part of the structure which is in direct contact with the ground to which the loads are transmitted .

SUPER – STRUCTURE : Is the part of the structure which is above the ground level and which serves the purpose of its intended use. A part of the super-structure, located between the ground level and the floor level is known as plinth. plinth is therefore defined as the portion of the structure between the surface of the floor, immediately above the ground. The level of the floor is usually known as the plinth level. The components of a building can be broadly summarized as follows

- Foundation
- Columns
- Floors
- Walls
- Doors
- Windows and ventilation
- Roofs
- Stairs



SITE INVESTIGATION

This is a process of ascertaining the suitability of a particular chosen site for building construction purpose.

The type and nature of sub soil, geological condition and behavior, the depth of the water table the load bearing capacity, the difficulties that may arise construction and the change or occurrence that may arise after construction.

SITE PREPARATION

Site preparation includes everything you need to do to get the ready to build on. that include clearing of tree, rock , underbrush, anything that may be in the way of your foundation .this must be removed from site clearance in an initial major work to be carried out. this extend of work require labour plant and equipment depend on factor line size of site nature constituent to be removed from site, ground condition of the site distance debris to be remove from site in some cases or instant site clearance could involves large or small scale demonation of existing structures.

2.8 PRELIMINARY WORK

This involve all the activities before the building can be setting out for construction his include site investigation and consideration of site suitability.

2.9 SETTING OUT

The method of setting out is the reverse of surveying process. the process includes the position and level of the building lines and road alignment shown on the construction plans to be established on the grounds by various techniques and instrument. it is necessary to have a good knowledge of geometry in order to ensure accurate work. the first task in setting out in building is to established base line from which the whole of the building can be set out. The position of this line must be mark on site so that it can be re-established at anytime. the building line is frequently deterring by the highway authority and from the back of the public foot path. If other building have been erected at the area the building line can be determine from this existing building.

2.9.1 EXCAVATION

Excavation is done to received the foundation that will be constructed for a building. This is done after the setting out and marking out.

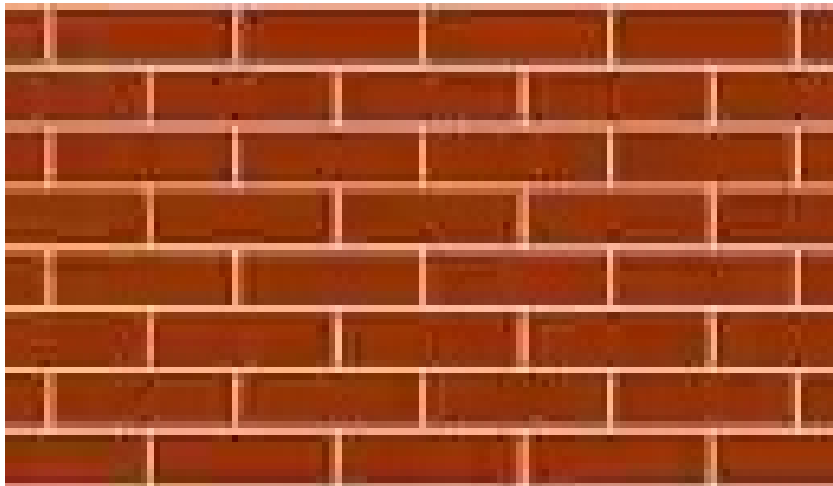
2.9.2 METHOD OF EXCAVATION

- Manual method
- Mechanical method

The choice of method of excavation is depend on the size work in small construction, it is more economic to used the manual method, whole large works will be economic to be executed using the mechanical method of excavation but the one that was fully involve is manual method, which labourer were digging the ground to specific depth and the width which was specified by engineer on site.

4.6 FORMING

This is the major part of the building that deals with the settings or arrangement of blocks, and the method used is Stretcher Bond.



Stretcher bond

CONSTRUCTION

Construction is defined as the act of process of building something, but in BUILDING TECHNOLOGY construction is the process of making or creating or creation a structure (ie construction of building) for movement purpose.

2.4 TYPE OF CONSTRUCTION IN TEAR OF BUILDING TECHNOLOGY

- Building construction
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CHAPTER THREE

3.0 BLOCKS

Blocks are manufactured in a variety of materials clay and concrete being the most usual. They can be hollow and joggle jointed. Blocks work is treated in the same way for brick work. A block is a solid material that is commonly square in shape and usually has flat shape.

Block is a mixture of cement, sand and water which is usually form of different shape and size, depending on the mauling used.

Block has different size such as:

9x9x18 inches (225x225x450)mm.

6x9x18 inches (150x225x450)mm.

Ratio used for molding in my site was 1:2:4 which normally gives 45 pieces of 9x9x18 inches block and 60 pieces of 6x9x18 inches block.

Ratio 1:2:4

Cement (1)

Fine aggregate (2)

Coarse aggregate (3)

3.1 BLOCK SETTING

Block setting is the process of laying blocks or joining blocks together by using mortar in order to form to a regular shape wall of the building.

INSTRUMENT USED

☐ SHOVEL



□ HAND TROWEL



To provide stability to a wall under construction it must be fixed together by means of mortar, which is mixture of cement, sand, lime and water. Mortar should fulfill the following requirements:

- i. Provide adequate strength but not greater than the required for the purpose of the wall
- ii. It must provide good workability and plasticity to enable the bricks to be bedded and adjusted to the required line and level
- iii. Provide a good bond with the bricks, block or stones being used to construct the wall
- iv. Provide water penetration through the joint when hardened
- v. The materials used should be readily available and economic

3.2.1 TYPE OF BONDS

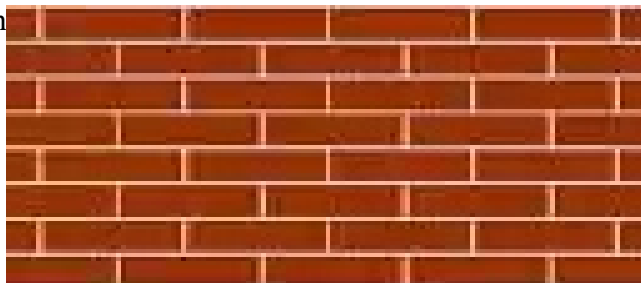
- Stretcher bond
- Flemish bond
- Header bond

Stretcher bond: is the commonest bond used today and the least interesting in appearance.

Stretcher bond wall

Stretcher bond wall with piers

Stretcher bond



STRETCHER BOND

English bond: consist of alternating courses of headers and stretcher with the alternative headers centred over and under the vertical joint of the stretcher.

Flemish bond: consist of alternating headers and stretcher along each course with the header centre on the stretchers above and below.

3.3 WALLS

Walls are any continuous vertical member whose length and height are both much large than the thickness, walls are provided to enclose or divide the floor space in desired pattern. In addition walls provide privacy, security and give protection against sun, rain, cold and other adverse effects of weather. Walls are constructed by used building units like bricks, stone, construced by used building units like bricks, stone, concrete blocks (hollow or solid)

3.3.1 CLASSIFICATION OF WALL

Walls can be classified into following

LOAD BEARING WALLS: Are walls that support it own weight as well as the super-imposed loads transferred to it though floors/roofs. E.g external wall

NON-LOAD- BEARING WALLS: Are walls on the other hand that carries its own weight and is not designed to carry and superimposed load from the structure.

They are normally provided as partition walls.

3.3.2 FUNCTION OF WALLS

- It provides necessary resistance to rain penetration
- It is capable of resisting both positive and negative wind pressure
- It give required degree of thermal insulation

1. ROOFING

2. Roof is the uppermost covering of the building which is for protecting and installation against atmospheric precipitation, temperature action and other environmental agent.

3. Component of roof

- 4. • King post
- 5. • Rafter
- 6. • Puling
- 7. • Tan beams
- 8. • Ceiling joint
- 9. • Wall plate

10. INSTRUMENT USED FOR ROOFING

- 11. • Hammer: It is used for nailing
- 12. • Saw :It is used in cutting the plank
- 13. • Line: It is used as leveling
- 14. • Measuring tape :is used for measurement
- 15. • Bar :is used to removed nails

ROOF SKELETAL SYSTEM (ROOF CARCASS)

Roof carcass is the wooden part of the building which is constructed so the roofing sheet can be laid on it to form the roof.

MATERIALS USED TO CONSTRUCT THE ROOF CARCASS

- 1. Planks (2 by 2, 2 by 3, 2 by 4 and 2 by 6)
- 2. Nails.
- 3. Hammer.E.T.C.

SECTIONS OF THE ROOF CARCASS

- 1. Wall plate.
- 2. Ridge board.
- 3. King post.
- 4. Rafter.

2.3 ROOF COVERING

Roof covering is any material attached to the roof carcass to protect the building against weather element (e.g. rainfall, heat and wind etc.) And also beautify the building.

4.4.1 SECTIONS OF THE ROOF COVERING

- I. Cladding
- II. Dash board
- III. Ridge
- IV. Eve angle
- V. Gutter
- VI. Roofing sheet

3.4.2 TYPES OF ROOFING SHEETS

- 16. Zinc sheets.
- 17. Aluminium sheets.
 - a) Box profile
 - b) Step tile.
- 18. Gerald roofing sheets.



CHAPTER FOUR

4.0 RELEVANCE OF EXPERIENCE GAIN AT THE FIELD OF STUDY

In BUILDING TECHNOLOGY, casting means the mixture of granite / gravel, sharp sand and cement with a certain volume of water.

4.1 CONCRETE WORK

Concrete works can be defined as the mixture of fine aggregate, coarse aggregate, cement and water and when mixed at its fluid state it forms paste and consistency that can be moulded to any shapes and sizes and on drying it forms a very hard and soil materials in form of rocks. There are two major classification of concrete (a) pre-cast concrete (b) cast-in-situ.

Concrete works done on site are as follows:-

- **BEAM:** these are horizontal members which support and distribute the weight of upper floor and roofs (usually of timber, steel, or reinforced concrete).
- **LINTELS:-** These are small beams placed over door and window openings and support the load of the wall over these openings.
- **COLUMNS:-** They are built with steel or reinforced concrete. They are usually isolated vertical members which carry the weight of beams, floors and roofs in framed buildings. The walls of framed buildings are non-load bearing.

4.2 DRAINAGE

Drainage system usually provided in the design of highway for the protection of the investment made in highway structure and for safety of the users in rural areas. Some portion of highway that provides for the surface drainage.

4.3 IMPORTANCE OF DRAINAGE

Drainage and culvert are important parts of highway and the reason why it cannot just be left out of the designing stage of highway are as follows:

- i. Water retained or logged on highway surface could cause fatal accidents for moving vehicles especially those on high speed.

- ii. Where drainage facilities are not provided, the sides of the roadway are normally subjected to erosion.
- iii. See page of water it pavement and sub-grade will cause a structure failure of the road.
- iv. The absence of the destruction of pipe culvert course hindrance to traffic flows.

In view of the above reasons, various types of drainage and culverts facilities are used to protect the highway against surface and sub-grade water. This is designed to convey water under, across along or away from the highway in the most economical, efficient and practical manner without damaging the highway or adjacent property.



CHAPTER FIVE

5.0 CONCLUSION

I was highly impressed on the ways the company carried out their activities.

They work with me time to time and skill acquisition is of great import. I learnt a lot from the company.

5.1 SUGGESTION AND RECOMMENDATION TO THE ORGANIZATION AND POLYTECHNIC CONCERNING THE SIWES PROGRAM

SIWES coordinator and the polytechnic authority should try to stop the habit of rejecting student for SIWES program by the industry. The institution supervisor should make it a priority to visit their designated student in the various organizations to update the student's log book.

Finally, they should resist the habit of staying in school and wait for their wards to finish the SIWES program only for them to sign their training log book and award them grade of the choices without checking the performance of the student in the field.