KWARA STATE POLYTECHNIC ILORIN

DEPARTMENT OF CIVIL ENGINEERING INSITITUTE OF TECHNOLOGY

A REPORT ON STUDENT INDUSTRIAL WORK EXPERIENCE SCHEME

(SIWES)

AT

` **KWARA STATE MINISTRY OF WORKS AND TRANSPORT, ILORIN**

BY

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SUBMITTED TO
THE DEPARTMENT OF CIVIL ENGINEERING,INSTITUTE OF APPLIED SCIENCE (IOT)KWARA STATE POLYTECHNIC, ILORIN

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DEDICATION

This report is dedicated to almighty God the lord of universe for his blessing, mercy and protection on me throughout my SIWES and for making my SIWES a prosperous completion.

ACKNOWLEDGEMENTS

All thanks, praise and admiration belong to almighty God, the Lord of universe. Which of his favour would I deny?Absolutely none. Words cannot express my gratitude for the gift of life, knowledge, wisdom, strength and the peace of mind bestowed on me. I shall forever glorify his name.

My special thanks also go to my families for their support, both morally and financially, before and during my SIWES program, I shall forever be grateful. May you live long enough to reap the fruit of your labour. Amen.

I also wish to acknowledge the polytechnic for giving me the opportunity to participate in the Student Industrial Work Experience Scheme (SIWES)

Finally, I would like to acknowledge my supervisor for his guidance and support throughout my training period.

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CHAPTER ONE

1.0 INTRODUCTION

The programme (SIWES) came into existence with the establishment of the Industrial Training Fund (ITF) under decree 47 of 1971 in a bid to boost professionalism in the construction industry. The fund in its policy statement No 1 published in 1973 inserted a clause dealing with the issue of practical skills. The fund will seek to work out cooperative machinery with industry, where students in institution of higher learning may require industrial training or mid-career attachment by contributions to the allowance payable to the student.

SIWES is therefore a skill training programmed designed to expose and prepare students of higher educational learning to practical work onsite; this scheme is for student studying practical and professional jobs.

In view of this the National University Commission took up the financial responsibility of the programmed for engineering and technology students of Nigerian Universities, while the National Bodies for Technical Education (NBTE) assume financial responsibility for the programmed in polytechnics and colleges of education.

The administration of the programmed was still a Herculean task and was not without a myriad of operational problems so the Federal Government agreed on National Council for Colleges of Education (NCCE).

Student industrial work experience scheme (SIWES) has been considered as the accepted skill training program. It forms part of the approved minimum academic standard in various degree programmers in all Nigerian universities. It is an effort to bridge the gap existing between theory and practice of various professions whereby at the end, the main quest of such scheme is achieved "has he bridged the gap between theory and practice".

The SIWES is a program involving students, the university and the labor industry. It is founded by the federal government of Nigeria and jointly coordinated by the industrial training fund (ITF) and the national universities commission (NUC).

SIWES has basically aimed at exposing students to machinery, professional work methods, ways of safe guarding the wok areas, workers in the industries and organizations.

1.1 AIM AND OBJECTIVES OF SIWES

1.1.1 AIMS:

The aim of SIWES is primarily to bridge the gap existing between theory and practice of engineering and technology, science, agriculture, medical management and other professional courses in Nigerian universities. Expose students to various plants and machineries in their field of study. It provides an avenue for student to apply the skills they acquired at school into practice. Enhance and strengthen employer's involvement in the entire educational process and provides an opportunity for jobs in the industrial sector.

To expose students to skills acquisition and ability to learn managerial services.To boost student interest in their area of discipline.

1.1.2 OBJECTIVES:

1. To provide an avenue for students in Nigerian universities to acquire industrial skills and experience in their courses of study.
2. To prepare students for the work situation they are likely to meet after graduation.
3. To expose students to work methods and to acquire techniques in handling equipment and machinery that may not be available in the universities.
4. To make the transition from university to the world of work easier and enhance student contacts for later job placement.
5. To provide students with an opportunity to apply their knowledge in real work situation thereby bridging the gap between university work and actual practice.
6. To enlist and strengthen employers' involvement in the entire educational process of preparing university graduates for employment in the industry.

1.2 SPECIFICATIONS FOR CIVIL ENGINEERING STUDENTS ON SIWES SCHEME

The trainee familiarizes himself with the offices and working environment including organizational structure, rules and regulation, codes and conduct as well as objectives of the company.

Development of new structures, materials procurement, and accessibility of building components and materials, the knowledge of building surveying, maintenance, technology and maintenance are very vital to the trainee. These items are not complete without the knowledge of the project management, construction management, building material procurement and strategies, management of construction, plant design and building system, maintenance and management of direct labor project, estimation and billing among others.

1.3 CONTRIBUTION OF THE SCHEME

The scheme makes a vital impact on the National economy and technological development and human resources, it includes;

- The improvement of technical communication for student.
- It improves the quality of skilled manpower in Nigeria and the professional world at large.
- Establishment of the various ties between institutions and industries.
- Opportunity of employment for students.

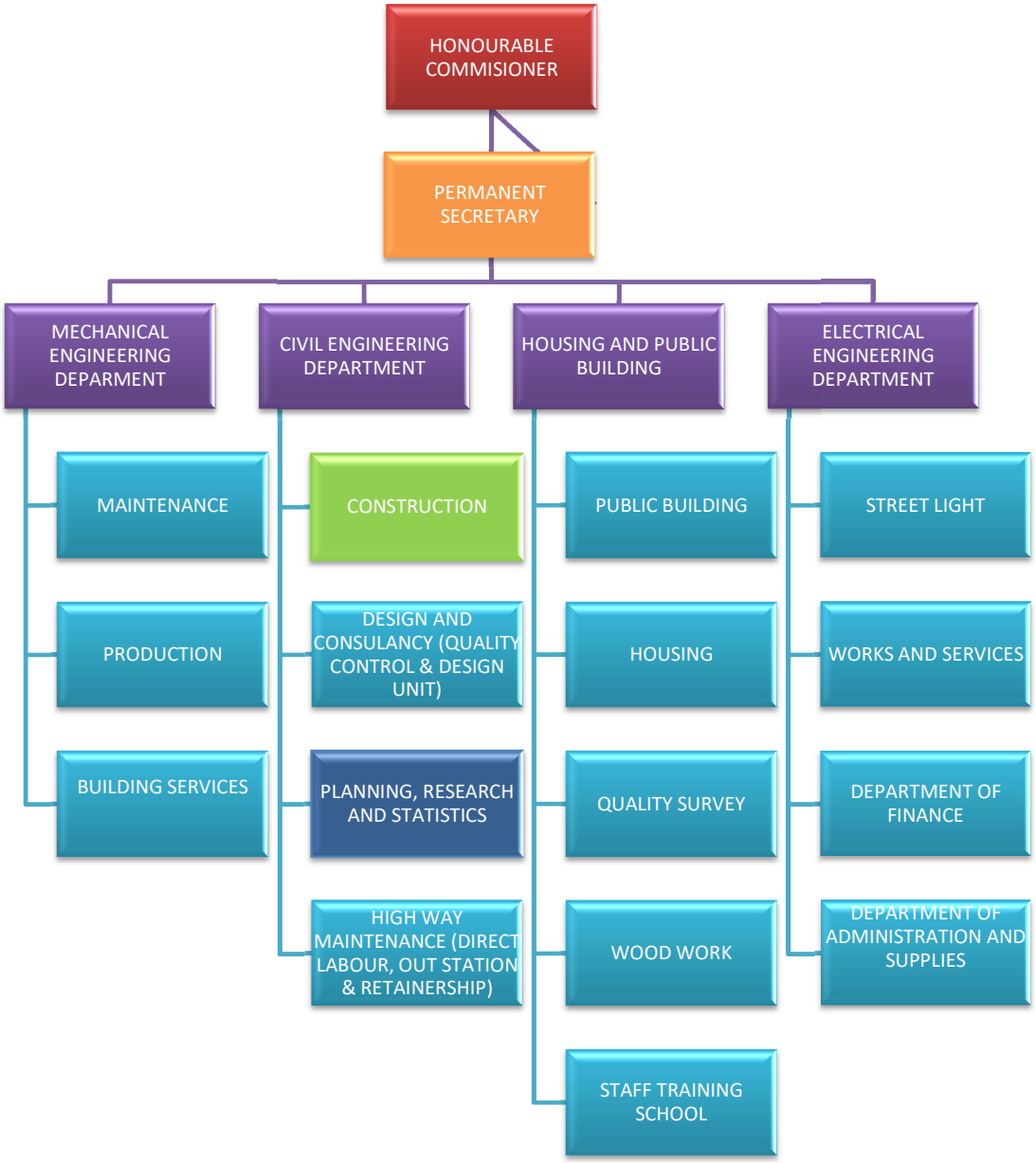
1.4 HISTORICAL BACKGROUND OF ORGANIZATION

Historical background of Kwara State ministry of works & transport is situated along Ahmadu Bello Way, Ilorin. It was set up by the State Government to control some specific activities like Rural and Urban areas development in terms of routes and other external work in the state. The organization as First known as Public works cooperation since creation of Kwara State in 1967, Until some years back when it was changes to Ministry of works and Transport with the headquarter at Ilorin the state Capital. Kwara State Ministry of Works & Transport was meant for carrying out works on road such as Maintenance, developments of new route and construction of roads network.

1.5 MAJOR ACTIVITIES OF THE ORGANIZATION

Civil engineering department is as old as the Ministry itself. It overseas and supervises road projects, Structure and quality control for the Government. It has training Section which provides adequate technical knowledge for Students of Tertiary institutions. It also comes out for direct labour such as rehabilitation of road i.e. Road maintenance, Construction of Culverts pavement etc.

1.6 THE ORGANOGRAM OF THE MINISTRY OF WORKS



CHAPTER TWO

2.1 CIVIL ENGINEERING

Civil engineering is a professional engineering discipline that deals with the design, construction, and maintenance of the physical and naturally built environment, including works like roads, bridges, canals, dams, and buildings. Civil engineering is the second-oldest engineering discipline after military engineering, and it is defined to distinguish non-military engineering from military engineering. It is traditionally broken into several sub-disciplines including architectural engineering, environmental engineering, engineering, control,structural engineering, earthquake engineering, transportation engineering, construction surveying, and construction engineering, etc. Civil engineering takes place in the public sector from municipal through to national governments, and in the private sector from individual homeowners through to international companies**.**

2.2 COMPONENTS OF ROAD STRUCTURE:

Road Structure Cross Section is composed of the following components:

1. Crown
2. Camber
3. Surface/Wearing Course
4. Kerbs 5. Shoulder
6. Drainage
7. Base Course
8. Sub-base
9. Formation level
10. Sub Grade

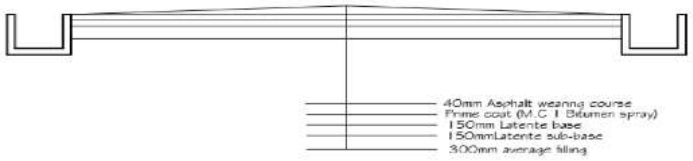


Plate 1.0: Road cross section

2.3 ROAD AND WATER

The greatest threat to an asphalt road is water.When a road is laid down, it flexes and moves slightly to accommodate changes in temperature and load. All this flexing eventually leads to cracking. Water penetrates those cracks and through processes like freezing, causes damage to the roadway. Crack sealing cleans debris from these cracks then fills them with an asphalt based polymer that adheres to the sides and bottom of the cracks, preventing the water from getting in.

Depending on the climate, the materials used, the pavement conditions and the technique used, crack sealing will last three to eight years. Crack sealing has two primary purposes:

1. To prevent the intrusion of water through the crack into the underlying pavement structure.

2. To prevent extraneous materials from entering the crack and causing further deterioration as the pavement expands and contracts with temperature changes.

2.4 CRACK SEALING PROCEDURES

For crack sealing, the most important aspect of the procedure is the preparation of the crack for treatment. Also, the season when the crack sealing is done will affect its performance. If the cracks need to be routed or sawed to remove extraneous material, it should be done before cleaning the cracks. The routing or sawing is best accomplished using a vertical-spindle router, rotary- impact router, or a random-crack saw.

After doing the routing or sawing, clean the cracks using high-pressure air, sandblasting, wire brushing, hot air blasting or high-pressure water. Cleaning the cracks is an essential step to ensure that the sealant will adhere to the sides of the crack. After cleaning, check the cracks for depth.

A backer rod should be placed in large deep cracks to conserve sealant. The backer rod should be a compressible, non-shrinking, non-absorbent material with a melting point higher than the temperature of the sealant.

The backer rod should be about 25 percent wider than the crack, to prevent slipping or floating out after placing the sealant. After the cracks are prepared, they are sealed with liquid asphalt. Equipment used for crack sealing or filling varies from truckmounted pressure applicators with hand wands to pour pots. No matter what type of equipment is used, the crack should be filled with sealant material from the bottom to the top of the crack to prevent air bubbles from forming bubbles create weak spots in the sealant. Pour only the amount of material that will fill the crack. Don't try to completely fill the crack because it is a waste of filler. Coat the vertical surfaces of the crack with a small excess of filler deposited in the bottom of the crack.

To prevent tracking, the filler should be 1⁄8 to 1⁄4 inch below the top of the crack. If necessary, use a squeegee to remove excess sealant on the pavement surface, and then blot with sand or limestone dust

2.5 ROADWAY EXCAVATION The work consist of all the required excavation within the limits of the right of way unless covered by other Sections of these Specifications. This shall include excavation of side ditches, where required, the removal, hauling and proper utilisation or disposal of all excavated materials and shaping of excavation and preparation of exposed surfaces of excavation on the entire length of the roadway, in accordance with these Specifications and to the lines, levels, grades, dimensions and cross sections shown on the Drawings or as required by the Engineer. The works specified shall also include operations in part widths and small areas of roadway where directed by the Engineer without any extra cost to the Employer. Roadway excavation shall include the following:

a) All excavation indicated on the Drawings within the limits of the cross sections and excavation of all materials for side roads and intersections.

b) The removal of existing pavement, sidewalks, kerbs and gutters within the limits of construction.

c) Excavation for stream and channel changes where not covered under Section 2.4, Channel Excavation.

d) Excavation required in cuts under embankments below the lowest normal limit of excavation indicated on the Drawings or below ground line and for the removal of unsuitable material. Materials from roadway excavations shall be classified as suitable or unsuitable as fill material, or as road pavement material, by the Engineer.

To be suitable as fill material, soil must not contain roots, sods or other deleterious materials.

Plate 2.2: Roadway Excavation

2.6 **FILLING AND GRADING** Laterite is filled into the cut portion of the road and compacted using sheep foot roller and smooth wheel roller. Laterite is a deep brown soil of cellular structure, easy to excavate, but gets hardened on exposure to air owing to the formation of hydrated iron oxides. The CBR (California Bearing ration) ratio of the laterite on our site is 85%. The laterite is brought form the

borrow pit, the borrow pit is a hole dug to a certain depth where laterite of good CBR ratio can be obtained. There are three borrow pits where the laterite is been brought

Road grading **laterite compaction**

2.7 **SPRAYING OF WATER** Water is sprayed on the laterite to give it the required moisture just enough to allow maximum compaction. Also water is sprayed after compaction of laterite when there will be another layer of laterite to be laid on the current layer to create bond between the two layers. This was done the water bauxer

spraying of water by the water bauxer

2.8 FIELD COMPACTION

Most of the compaction in the field is done with the aid of compaction equipment such as rollers. The four most common types of rollers are: a. Smooth-wheel rollers: they are suitable for proof rolling sub-grades and for finishing operation of fills with sandy and clayey soils. These rollers provide 100% courage under the wheels, with the ground contact pressure as high as 310 to 380 KN/m2. They are not suitable for producing high nit weights of compaction when used on the thicker layer. b. Pneumatic rubber tyre rollers: they are heavily loaded with several rows of tyres. The contact pressure under the tyre ranges from 600 to 700 KN/m2, and they produce up to 70 to 80% courage. Pneumatic rollers can be used for sandy and clayey soil compaction. c. Sheep foot rollers: these are drums with large number of projections. The area of each projection ranges from 25 to 85 cm2. These rollers are most effective in compacting clayey soils. The contact pressure under the projection ranges from 1400 to 7000 KN/m2. These projections help in creating bond between the current layer of soil and the next layer of soil to be laid. d. Vibratory Rollers: they are extremely efficient in compacting granular soils. Vibrator con be attached to smooth-wheel, pneumatic robber type, or sheep foot rollers to provide vibratory effects to the soil. Factors affecting field compaction I. Soil type and moisture content II. Thickness of the layer of the soil III. The intensity of pressure applied by the compacting equipment IV. The area over which the pressure is applied

Pneumatic rubber tyre roller

Drum wheel roller

2.9 PRIMING

This is the spraying of MC1 (Medium curing) on the surface of the prepared base course material e.g. laterite or stone base. After spraying the MC1, it should be allowed for about 1-hourto allow it penetrate into the base course material. It is recommended to spray 0.9 l/m2, 1.o l/m2 or 1.1l/m2. MC1 is one of the amongst the product of cutback bitumen. After applying MC1, it should be allowed to cure for a minimum of 48 to 72 hours before asphalt is placed, with no rain in the forecast. The temperature of MC1 during the application process should not be less than 1500C.The main purpose of priming is to; a. To coat and bond loose material particles on the surface of the base, b. To harden or toughen the base surface to provide a work platform for construction equipment, c. To plug capillary voids in the base course surface to prevent migration of moisture, d. To provide adhesion between the base course and the succeeding asphalt course. For the prime coat to be successful, it must be able to penetrate into the base course at least ½ inches.

Bitumen Boiler

2.3.1 BLINDING

After application of MC1 (prime coat) to the base and the asphalt is not readily available from the Marini, blinding is done. This is the application of river sand OR Quarry dust after priming to; a. Remove the air voids in the MC1, b. To allow vehicles to use the roads immediately after priming and blinding, c. To prevent the

MC1 from sticking to the tyres of vehicles thereby cleaning it away from the applied surface. blinding of the primed surface using quarry dust

2.3.2 ASPHALT OVERLAYING

An asphalt overlaying is simply the process of installing a new layer of hot mix asphalt directly over the existing asphalt on roads. The main aim of overlay is to add structural support to the existing pavement. Overlaying existing asphalt is a good solution when the existing road is still in decent shape and the existing elevations will allow proper drainage without milling of the entire surface. To maximize the overlays useful life, failed sections of the existing pavement were cut, excavated and replaced. If the percentage of bitumen in the asphalt mix is high, it will result in folding of the road surface and if the percentage of the aggregates is higher in the mix, it will result in excessive cracking of the road. This not only results in poor surface, but it result in a surface that retains water, thereby reducing the life span of the road by accelerating the ravelling process.

Hot mixed asphalt is manufactured at temperatures between 270oF and 325oF, depending on the environmental conditions and the distance from the hot mix plant to the site, hot mixed asphalt can lose between 5oF and 25oF.After overlaying the hot asphalt, it is left for the temperature to cool to a temperature below 80oc before compaction is started. The measurement of temperature at our site is done by the use of thermometer. If the compaction process is started at a temperature above 80oc, it leads to development hairy crack which enlarges as time passes. In the overlay process, if the hot mix asphalt pavement cools too quickly, the entire surface will ravel living a rough, rocky surface in a short period of time.

For the compaction of the newly over-laid asphalt, smooth wheel and pneumatic rubber tyre rollers are used. The smooth wheel roller compacts it first, water is sprayed to the wheel so that the asphalt does not stick to the wheel during the compaction process.

CHAPTER THREE

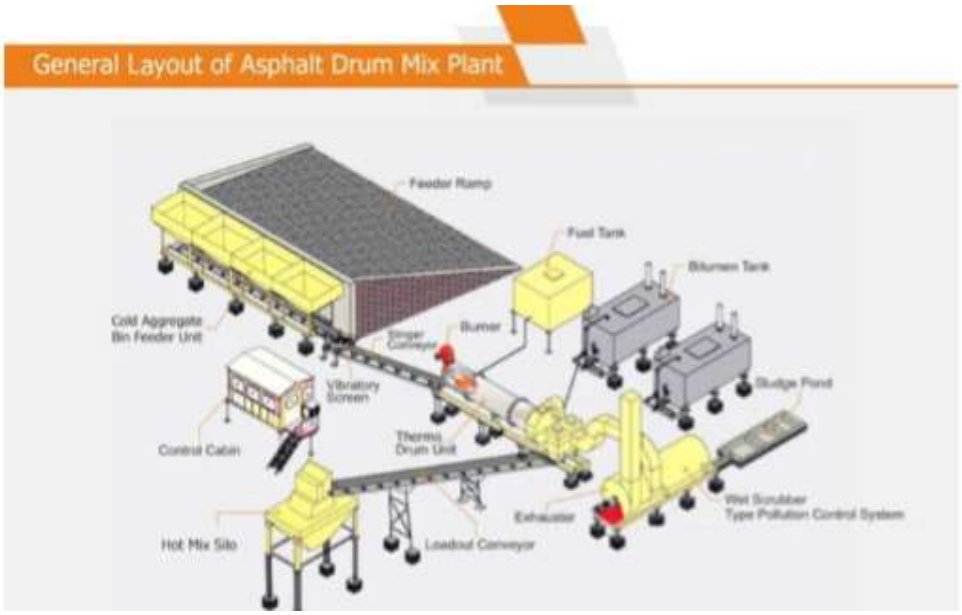
3.1 ASPHALT PLANT

This chapter discussed our visit to the drum mixing asphalt plant located along challenge unity road. The main purpose of the asphalt plant is to produce Asphalt. We were shown the machines involved in the production of asphalt and the procedure involved was thoroughly explained to us. Some of the equipment used was: a. Hopper: there are about four hoppers at the Marini namely: hopper 1, hopper 2, hopper 3 and hopper 4. The hopper has a conveyor belt used for transporting the aggregates to another section of the production process. The aggregates fall onto the conveyor by gravity. b. Dryer: used to dry moist aggregate that enters it. Its temperature ranges between 1500c and 1700c. c. Bunner fan/Air Blower: this helps in pumping air into the dryer. It also sprays diesel to the dryer and flames it to create fire. d. Hot Elevator: this collects the hot aggregates and passes it to the mixer. e. Mixers: this is used to mixes the aggregates with bitumen by the use of Paddles. The mixture is then dumped into a bucket. f. Bitumen Storage Tank: this is used for heating the bitumen

3.2 EXPERIENCED GAINED

- I was able to gain a first- hand practical experience in civil engineering. I leant that good team work is important for fast and good quality job delivery. I also gained knowledge on how to manage personnel on a site.
- I understood that proper field survey and inventory are pertinent to good quality desk study/work. I also learnt that good supervision produces good quality outcome of work.
- I learnt that proper project supervision is essential to produce good quality job. I also learnt that good technical, communication and project management skills are important to ensure completion of a project within budget and stipulated time period.
- I learnt that proper planning and execution are paramount to the success of a project. Also, good environmental consideration should be taken.

I gained full experience and attract full knowledge of achievement relating to the drainage construction, earthwork and construction of flexible road pavement.



General layout of Asphalt drum mix plant

3.3 MATERIALS

a. Aggregates: the main aggregates used in mixing asphalt at the Marini are ½ inch, 3/8 inch, ¾ inch, Quarry dust, river sand and Bitumen.

b. Bitumen: Production of Bitumen: Bitumen is the residue or by-product when the crude petroleum is refined. A wide variety of refinery processes, such as the straight distillation process, solvent extraction process etc. may be used to produce bitumen of different consistency and other desirable properties. Depending on the sources and characteristics of the crude oils and on the properties of bitumen required, more than one processing method may be employed.

3.4 FORMS OF BITUMEN

Cutback bitumen

Normal practice is to heat bitumen to reduce its viscosity. In some situations preference is given to use liquid binders such as cutback bitumen. In cutback bitumen suitable solvent is used to lower the viscosity of the bitumen. From the

environmental point of view also cutback bitumen is preferred. The solvent from the bituminous material will evaporate and the bitumen will bind the aggregate. Cutback bitumen is used for cold weather bituminous road construction and maintenance. The distillates used for preparation of cutback bitumen are naphtha, kerosene, diesel oil, and furnace oil. There are different types of cutback bitumen: rapid curing (RC), medium curing (MC), and slow curing (SC). RC is recommended for surface dressing and patchwork. MC is recommended for premix with less quantity of fine aggregates. SC is used for premix with appreciable quantity of fine aggregates. Other forms of bitumen include Bitumen emulsion, Bitumen Primers, and Modified Bitumen.

3.3 TYPES OF BITUMEN

I. 60/70

2 80/100

3.MCI

4. S125

The most preferred type of bitumen required for asphalting are: and . 60/70 and 80/ 100 while the most preferred type of bitumen required for priming is S125 and Mc1.

c. Asphalt:

This is the product gotten from the mixture of aggregates, river sand and bitumen. The mixture is done in percentage based on the required quality of asphalt needed. E.g. 33% of ½ inch, 33% of 3/8 inch, 36% of ¾ inch, 30% of river sand and 4.0% of bitumen.

Basically, when the entire aggregate particles (including the large aggregate particles) are coated with asphalt, the mix is said to be properly mixed.

d. Oil: This is used together with the heater to heat the bitumen and it also helps in preventing the bitumen from flaming during the heating process.

PICTURES OF SOME PART OF THE PLANT

Hopper or cold bin feed

Bitumen boiler supplying bitumen

Arrangement of the mix plant

3.4 DRAINAGE SYSTEM

One of the most important aspects of the design of a road is the provision made for protecting the road from surface water or ground water. If water is allowed to enter the structure of the road, the pavement will be weakened and it will be much more susceptible to damage by traffic.

Water can enter the road as a result of rain penetrating the surface or as a result of the infiltration of ground water.

The road surface must be constructed with a sufficient camber or crossfall to shed rainwater quickly and the formation of the road must be raised above the level of the local water table to prevent it being affected by ground water.

Water can also have a harmful effect on shoulders, slopes, ditches and other features. High water velocities can cause erosion which, when severe, can lead to the road being cut. Alternatively, low velocities in drainage facilities can lead to silt being deposited which, in turn, can lead to a blockage. Blockages often result in further erosion.

A good road drainage system, which is properly maintained, is vital to the successful operation of a road. It has four main functions:

1. To convey rainwater from the surface of the carriageway to outfalls
2. To control the level of the water table in the subgrade beneath the carriageway
3. To intercept ground and surface water flowing towards the road
4. To convey water across the line of the road in a controlled fashion. The first three functions are performed by side drains and the fourth by culverts, drifts and bridges.

SIDE DRAINS

The cost of side drains will normally be calculated as part of the cost of earthworks Side drains should be flat-bottomed if they are to be maintained by hand or 'v'-shaped if they are to be maintained by machine. Wide flat drains, known as 'meadow drains', can be used with advantage if there is room. The longitudinal gradient offside drains should always exceed 0.5 per cent to reduce the possibility of silting up. In hilly terrain, providing side drains with the same gradient as the road may result in water velocities that are too high. It may therefore be necessary to reduce the maximum gradient to an acceptable level by the provision of shallow dams or scour checks. These are often constructed of masonry, but can also be constructed in concrete or even timber. Wide drains are preferred to reduce the velocity and so minimise erosion. The provision of turnouts or cut-off drains should also be considered to

CHAPTER FOUR

1.0 EQUIPMENT AND MACHINE USED AND THEIR FUNCTIONS

4.1 CONCRETE MIXER

Concrete mixer is a machine used in construction to mix cement, aggregates (fine or course), and water to form concrete. It typically consists of rotating drum that efficiently combines these materials to produce a consistent and uniform mixture, which is essential for various construction projects such as building foundations, roads, and structures.

Figure 4.1: Concrete Mixer

4.2 EXCAVATOR

Excavators are popular earthmoving vehicles that feature a bucket, arm, rotating cab, and movable tracks. These components provide superior digging power and mobility, allowing this heavy equipment to perform a variety of

functions from digging trenches and breaking holes to lifting away waste trenches and breaking holes to lifting away waste and excavating mines.

Figure 4.2: Excavator.

4.3 ROAD ROLLER

A Road Roller is a compactor-type engineering vehicle used to compact soil, gravel, concrete or asphalt in the construction of roads and foundations. It also used at landfills or in agriculture. Road rollers are frequently referred to as steamrollers, regardless of their methods of propulsion

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Figure 4.3: Road Roller.

4.4 BULLDOZER

A bulldozer is a heavy construction machine which is primarily used for earthmoving and grading tasks on construction sites, road building, and land clearing.

Figure 4.4: Bulldozer

4.5 COMPRESSIVE TESTING MACHINE

This is a machine used to access the strength of cubic concrete sample. These tests help to ensure that the concrete specification used for the drainage can withstand the expected loads and environmental conditions, contribution to the durability and longetivity of the road infrastructure.

Figure 4.5: Compressive testing machine and crushed Cubic Concrete Sample.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATION

5.1 CONCLUSION

In road construction, the preliminary stage must involve a reconnaissance survey, the desk study, oral interview for the people around the proposed road.

A detailed survey of the proposed road site must be carried out for a good vertical and horizontal alignments.

The geotechnical and physio technical investigations of the proposed road site must be given full consideration in the road design and in the preparation of the Bill of Engineering Measurement and Evaluation (BEME). The Bill of Engineering Measurement and Evaluation must contain all necessary items of work in the right quantities.

Civil Engineering, thought very wide, is an interesting field of Engineering. Civil Engineering practices are easy in as much the technical know-how is acquired. Every task in life possesses some challenges. So, one must be ever ready to face and solve the problems encountered in any tasks for the benefits of mankind and oneself.

The program is of great importance to student. In under no circumstance should the program be eradicated, because it is indeed a great program that enhance student not only academically but also intellectually.

5.2 RECOMMENDATION

Since the program was introduced to institution and many governmental colleges, its major objective is to exposed and train students to actual working experience in their relevant field of study, thus, it will be of great important if the organizational bodies of the program will consider the following:

- The employer should ensure proper training of students.
- All parties involved in this SIWES training should duly observed periodic checks to students.
- Employer should involve in handling student's welfare in terms of feeding and transportation allowance to enable them complete the SIWES successfully.

5.3 PROBLEMS AFFECTING THE SCHEME

Recently problems are identified the management of the SIWES scheme which has depressingly affected the growth and development of the scheme, some of the problems include;

1. Inadequate funding of the scheme.
2. Negligence arising from the institution coordinators of the scheme.
3. Lack of cooperation from employees/trainees.
4. Insufficient professionals in the scheme.

5.4 PROBLEMS ENCOUNTERED

1. Due to the heavy rainfall, there were days whereby petite activities took place, thus limiting work progress on site.

2. The presence of water pipe within the drainage construction area leading to proper planning, coordination, and transferring of the water pipe in small length away from the drain line, leading to delays in the work progress on site.

3. During my first few weeks, I had difficulties understanding a lot of the terms and terminologies that was used at the office because a lot of them were very new to me. This made it hard for me to follow the procedures.

Figure 5.1: Heavy rainfall caused surface erosion and drainage blockage.

Figure 5.2: Transferring of water pipe in small length away from the drain line.

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