A TECHNICAL REPORT ON STUDENT INDUSTRIAL TRAINING WORK EXPERIENCE SCHEME [SIWES]

UNDERTAKEN AT:

GAB GEOMATIC AND CONSULT LTD is located at:

NO.82,OPPOSITE ROYAL EATRY,UPPER TAIWO ROAD,

ILORIN,KWARA STATE.

PRESENTED

AYEKOLU FAITH IYANUOLUWA

ND/23/SGI/FT/0087

SUBMITTED TO THE DEPARTMENT OF SURVEYING AND GEO- INFORMATICS

FACULTY OF ENVIRONMENTAL STUDIES, KWARA STATE POLYTECHNIC, ILORIN KWARA STATE.

IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF ORDINARY

NATIONAL DIPLOMA (OND) IN SURVEYING AND GEO- INFORMATICS.

MARCH, 2025

CERTIFICATION

I, **AYEKOLU FAITH IYANUOLUWA** with Matric number **ND/23/SGI/FT/0087** hereby certify that the information contained in this SIWES report were obtained as a result of my experiences during my 4 month SIWES programme at **GAB GEOMATIC AND CONSULT LTD** in accordance with survey rule and regulations and departmental instructions. I therefore submit the report as a partial fulfillment of the requirements for the student work experience scheme requirements for KWARA STATE POLYTECHNIC ILORIN , KWARA STATE, student work experience scheme.

_____ _____

DATE

(SIWES SUPERVISOR)

_____ _____

DATE

(SIWES COORDINATOR)

_____ _____

DATE

(HEAD OF DEPARTMENT)

_____

_____

Dr. OKENIYI O.M. **DATE**

DIRECTOR, DIRECTORATE OF

INDUSTRIAL LIAISONS PLACEMENT

DEDICATION

This Siwes report is dedicated **GOD** and to my lovely parent

Mr & Mrs AYEKOLU

ACKNOWLEDGEMENT

Praises and thanks to the Almighty GOD for his showers of blessing throughout my Industrial Training period and for a successful completion. I would like to express my deepest and sincere gratitude to my training supervisor and management of GAB GEOMATIC AND CONSULT LTD and other sectional heads in person of Surv. B. A. Jimoh. He has given me the opportunity to carry out this Industrial training; providing invaluable guidance throughout the training period. His supervision, vision, sincerity and motivation was deeply inspired me. I am extremely grateful for what he has offered me. I would also like to thank him for his friendship, empathy and great sense of humor.

Also to thank my sectional head, head of field and Carto- section in Person of Surv. Babatunde Kabir, for all his trust, support and advice during my SIWES programme at the Company words cannot express all the knowledge he impacted in me. May God Almighty Allah bless you and your home.

Nevertheless, my profound acknowledgement will extend to my Head of Department of Surveying and Geo- informatics,KWARA STATE POLYTECHNIC ILORIN and all other departmental lecturers for the advice, support and correction made to me while in the classroom, during practical and every time I need their assistance. I pray you all continuous to leave in good health and more promotion on your field sir and ma.

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CHAPTER ONE

1.0 INTRODUCTION

This report presents my experiences and achievements during my six-month industrial attachment at GAB GEOMATIC AND CONSULT LIMITED. The report provides an overview of the organization, its objectives, and the activities I was involved in during my attachment.

It also highlights the skills and knowledge I acquired during the period, including practical experience with surveying equipment, geospatial software, and project management techniques.

1.1 INCEPTION OF STUDENT INDUSTRIAL WORK EXPERIENCE SCHEME

The Students Industrial Work Experience Scheme (SIWES) is a program that was established in Nigeria to bridge the gap between theoretical knowledge acquired in the classroom and practical skills required in the workplace. SIWES was initiated in Nigeria in 1973 by the federal government as a response to the need for practical exposure of students in higher institutions to real work environments. Its relevance in the education system cannot be over emphasized as it develops the student to become skilled and experience professionalism in the various disciplines. It enables students to appreciate the basic concept involved in their field of study. SIWES, which involves the university authorities and the industrial sector, runs for 24 weeks for students in the fourth academic year in the universities. The scheme was organized by the federal Government and jointly coordinated by the Industrial Training Fund (ITF) and the Nigerian Universities Commission (NUC). The importance of the training scheme is justified as it is a research field, which enables students to be totally in- depth in finding the working culture, practice and tools in their various areas of specialization.

1.2 OBJECTIVES

The Students' Industrial Work Experience Scheme (SIWES) was created with the goal of fostering and supporting the development of skills in business and industry in order to create a pool of qualified native workers sufficient to meet the demands of the economy. Any industrial organization's most valuable resource depends on the technical proficiency of its workforce to operate and maintain its non- human assets and resources, which is why SIWES is required. According to the program's operational norms and guidelines, students are assigned to a structured environment (private or public), whose operations are related to their course of study. The purpose of this training time is to help students at different levels connect the theory they learn in class to real- world applications. According to the government's education policy,

CHAPTER TWO

2.0 DESCRIPTION OF THE ESTABLISHMENT OF ATTACHMENT

GAB GEOMATIC AND CONSULT LTD is a private surveying and geospatial services company located in [City, State]. The company was established in 2021 with the aim of providing innovative and cutting-edge solutions in surveying, mapping, and geospatial consulting.

The company has a flat organizational structure, with a managing director at the helm. The managing director is supported by a team of experienced surveyors, geospatial analysts, and administrative staff.

Facilities and Equipment

GAB GEOMATIC AND CONSULT LTD has a well-equipped office with state-of-the-art surveying and geospatial equipment, including:

- **Total stations**
- **GPS receivers**
- **GIS software (ArcGIS, QGIS)**
- **Surveying software (Autodesk, Carlson)**
- **Computers and laptops**

Services Offered

The company offers a range of services, including:

- **Topographic surveys**
- **Boundary surveys**
- **GIS mapping**
- **Geospatial consulting**
- **Project management**

2.1 LOCATION AND BRIEF HISTORY OF ESTABLISHMENT

GAB GEOMATIC AND CONSULT LTD is located at:

NO 82, OPPOSITE ROYAL EATRY, UPPER TAIWO ROAD,

ILORIN, KWARA STATE

Brief History Of Establishment

GAB GEOMATIC AND CONSULT LTD was established in 2021 by Surv. BABATUNDE KABIR a seasoned surveyor with eleven years of experience in the industry.

The company started as a small surveying firm providing services to local clients but has since grown to become a leading provider of surveying and geospatial services in [Region/State]. Over the years, the company has built a reputation for delivering high-quality services and has worked on numerous high-profile projects in Industry

GAB GEOMATIC AND CONSULT LTD is a private Survey firm. The company was established and legal registered under C.A.C corporate commission in the year 2021, the firm name has been in existences since seven year back. And the firm has fully involved in both government and privates survey job both in the state and outside the Kwara State.

The mandate of the ministry is primarily to formulate and implement the policies, programmes and projects of the Federal Government of Nigeria (FGN) with respect to road transport, highway construction and rehabilitation; highways planning and design monitoring and maintenance of federal roads and bridges nationwide.

2.2 OBJECTIVES OF ESTABLISHMENT

The primary objective of establishing GAB GEOMATIC AND CONSULT LTD is to provide innovative and cutting-edge surveying and geospatial services to clients in various industries, including:

Infrastructure Development : To support the development of infrastructure projects, such as roads, bridges, and buildings, by providing accurate and reliable surveying and mapping services.

Land Administration: To assist in the management and administration of land resources by providing services such as land surveying, mapping, and GIS analysis.

3. *Environmental Monitoring*: To support environmental monitoring and management efforts by providing services such as GPS tracking, GIS analysis, and remote sensing.

4. *Professional Development To provide training and development opportunities for surveying and geospatial professionals, promoting capacity building and skills development in the industry.

aims to become a leading provider of surveying and geospatial services in the region, known for its excellence, innovation, and commitment to delivering high-quality services.

Topographic Surveying

Geographic Information System Analysis

Digital Mapping and Street Guide Mapping

Drone Mapping and Analysis

Hydrographic Surveying

2.3 Departments and Units in the Firm

The following departments/section were operated and function well, they are:-

ii. Managing Director

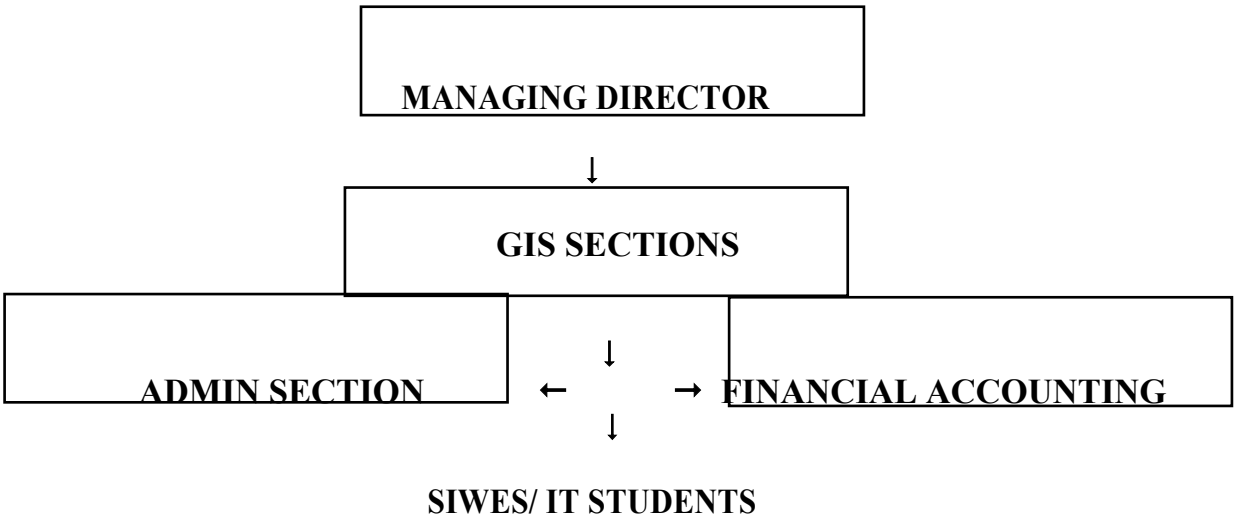
iii. GIS Section

iv. Admin. Section

v. Finance and Accounting Section

vi. SIWES/IT Student Section

2.4 ORGANIZATION STRUCTURE



CHAPTER THREE

INTRODUCTION TO LEVELING

3.5 DEFINITION OF LEVELING

WHAT IS LEVELING?

Leveling is the process of measuring the difference in height between points on the surface of the earth.

3.2 AIMS OF LEVELING

The main aims of Leveling are to determine the relatives height of points on the ground and to establish a horizontal reference line.

3.3 OBJECTIVES

1. **TO ESTABLISH A REFERENCE DATUM;** That is to create a bench mark or a reference point that will serve as a basis for measuring the height of other points.
2. **TO PROVIDE ACCURATE MEASUREMENT FOR CONSTRUCTION;** This is to ensure tyat buildings, roads, and other infrastructure are constructed on a level surface.
3. **TO CREATE TOPOGRAPHIC MAPS;** to gather data for the creation of topographic maps
4. **TO SUPPORT G.I.S;** To provide accurate and reliable data for geographic information system (G.I.S).

3.4 SCOPES OF LEVELING

1. **CONSTRUCTION:** Leveling is used to ensure that buildings, roads and other infrastructure are constructed on a level surface and to provide accurate measurements for the engineering design
2. **ENGINEERING;** Leveling is used to determine the height of points for engineering project such as Bridges, tunnels, dams, E.T.C
3. **LAND SURVEYING;** Leveling is used to determine the boundaries of properties and to provide accurate measurement for land surveying.
4. **GEOGRAPHY;** Leveling is used to create a topographic map, which are used to represent the earth's surface features including Contours, Elevation, And Land forms.

3.5 INSTRUMENT USED FOR LEVELING

1. Total Station
2. Tripod
3. Leveling Staff
4. Field Book
5. Pen

3.6 METHODOLOGY USED IN LEVELING

1. **SETTING-UP THE INSTRUMENT;** The Leveling instrument is set up on a stable Tripod and

Adjusted to ensure it is perfectly level.

2. **MEASURING THE HEIGHT DIFFERENCE :**The instrument is used to measure the height difference between two points .
3. **RECORDING THE READING :**The height difference is recorded and the process will be repeated for multiple purpose .
4. **CALCULATING THE REDUCE LEVEL:** The recorded reading are used to calculate the reduce levels which are the height of the point relative to the bench marks.
5. **ADJUSTING THE LEVELING:** The reduce levels are adjusted to ensure that they are accurate and reliable.

3.6 COMPUTATION OF LEVELING

The major method used for computing leveling are :

1. Height of instrument .
2. Rise and Fall method.

Computation of leveling using height of instrument:

B.S	I.S	F.S	H.I	R.L	B.M	Rmk
0.11			**100.11**	**100.00**		
	0.30			**99.81**	**0+000**	
	0.37			**99.74**	**0+010**	
	0.50			**99.61**	**0+020**	
	0.61			**99.50**	**0+030**	
	0.75			**99.36**	**0+040**	
	0.98			**99.13**	**0+050**	
	1.09			**99.02**	**0+060**	

	1.135			98.975	0+070	
		1.22		98.89	0+080	

METHOD USED FOR CALCULATING HEIGHT OF INSTRUMENT

1ST STAGE: B.S + R.L = H.I
H.I - I.S = R.L

2ND STAGE: H.I - F.S = The answer you get + B.S
It will give us the next H.I
THEN ; H.I - I.S = R.L

SO THEREFORE ; B.S means BACK SIGHT
F.S means FORE SIGHT
H.I means HEIGHT OF INSTRUMENT
I S means INTERMEDIATE SIGHT
R.L means REDUCE LEVEL

3.8 COMPUTATION OF LEVELING USING RISE (+) AND FALL (-)

B.S	I.S	F.S	RISE (+)	FALL (-)	R.L	B.M	Rmk
0.11					100.00		
	0.30			0.19	99.81	0+000	
	0.37			0.07	99.74	0+010	
	0.50			0.13	99.61	0+020	
	0.61			0.11	99.50	0+030	
	0.75			0.14	98.36	0+040	

	0.98			**0.23**	**99.13**	**0+050**	
	1.09			**0.11**	**99.02**	**0+060**	
	1.135			**0.045**	**98.975**	**0+070**	
		1.22		**0.085**	**98.89**	**0+080**	

METHOD FOR CALCULATING RISE AND FALL:

- **B.S - I.S = RISE (+) OR FALL (-)**
- **R.L - RISE (+) OR FALL (-)**

SO THEREFORE:

- **B.S means BACK SIGHT**
- **I.S means INTERMEDIATE SIGHT**
- **F.S means FORE SIGHT**
- **(+) Means RISE**
- **(-) Means FALL**
- **R.L means REDUCE LEVEL.**

- **Plotting was done on the data acquired then data processing on the data acquired at site was done on the computer system**

3.7 EXPERIENCE GAINED.

- **I was introduced to leveling, how to carry out leveling surveying using instrument with its accessories.**
- **I also learned how to maintain the instrument to avoid damages**
- **Practical on how to carry out leveling surveying on a road of 500m.**
- **Aloe learn on how to compute leveling using two methods which are:**
  - **A. Height of instrument**
  - **B. Rise and fall method**

3.8 PROBLEM ENCOUNTER.

- **Stress passing through when setting the instrument**
- **Weather condition**

CHAPTER FOUR:

1 – Introduction to AutoCAD

The term CAD (Computer Aided Design) applies to a wide range of programs that allow th user to created drawings, plans, and designs electronically. AutoCAD is one such program and it main claim to fame is that it is relatively easy to use, it is very comprehensive in its ability to create 2D and some 3D drawings, and it is very popular. Seventy percent of the CAD users in the world use AutoCAD.

I Starting AutoCAD

You can start AutoCAD by either double clicking on the program Icon on the desktop or by clicking on the program name in the Start menu.
The program will start and after a minute or so should display a screen similar to the one shown below. The dialog box in the middle will aid you in getting started at either creating a new drawing or continuing your work on a drawing that is not finished.

If you are continuing work on a drawing, click on the "A" icon in the extreme upper left corner of the window and Open->Drawing. A "Select File" dialog box will open allowing you to select the drawing file you want to open.

II The Initial Screen

AutoCAD has a very versatile user interface that allows you to control the program in several different ways. At the top of the window is a row of menus. Clicking on the Home, Insert, or Annotate causes another selection of menus to appear. This new selection of commands is frequently called a Ribbon or a

Dashboard. You can operate the program by clicking on the icons in these menus.
Another method of using the program is typing in the command names. This is frequently faster than using drop down menus for frequently used commands because you do not have to search for the correct menu or icon. You just type in the command name. For the most part, we will use this approach in this series of

tutorials. The commands that you type will appear at the bottom of the of the AutoCAD window.

III The LINE Command

Now that you have started AutoCAD and configured tool bars you want, you are ready to start learning to use the program. We will start with relatively simple commands and eventually, in later lessons, look at some of the more complex things that AutoCAD can do. The first command we will look at drawing straight lines. At the keyboard, type:
line
and press the ENTER key. You can use either upper or lower case when you type in AutoCAD commands.
The program will respond with:
Specify First Point:
Each line has a beginning and ending point and the program wants you to specify the beginning point of the line. You enter the beginning point by either typing the point coordinates at the keyboard or by clicking the mouse on a location of the screen where you want the line to begin. It is certainly much simpler to click with the mouse than it is to type in coordinates but engineering drawings are drawn precisely to scale and for the most part we will have to enter coordinates from the keyboard.
When you type a coordinate, enter the X or horizontal coordinate first followed by a comma and the Y or vertical coordinate. You cannot enter a space between the two coordinates. AutoCAD interprets a space as the ENTER key and assumes that you have finished entering the coordinates.
For Example, you could type:
Specify First Point: 3.5,6
The 3.5 coordinate is the X or horizontal coordinate and the 6 is the vertical coordinate.
After you enter the coordinates, press the enter key. The enter key tells the program that you have entered the first coordinate and are ready to enter the coordinates for the next which will be the end of the
line. The program responds by displaying:
To Point:
If you want a horizontal line that is 5 units long, @5,0 which is shown below.
To Point: @5,0

The @ sign tells the program this coordinate is measured from the last coordinate entered. In other

words, it says place the end if the line 5 units horizontally from the beginning point and 0 units vertically. The line drawn is shown above.
Using the @ sign to specify relative coordinates is easier than specifying absolute coordinates without the @ sign. The first point we drew had an absolute coordinate of 3.5,6 and the second point had an absolute coordinate of 8.5,6 since it is displaced 5 units horizontally from the first point.

We will continue with this to create the object shown on the right. It has lines, an arc, and a circle. We have drawn the first and we will continue drawing the rest of the lines.
As a shortcut, you can start the LINE command by typing L instead of the entire word LINE. Many AutoCAD commands can be abbreviated to just the first letter of the command.

IV Continue Drawing the Object

We can continue drawing the object shown on the right by adding more lines. If the line command is still operating, press ENTER to end it. We will start it again to draw the remaining lines.
You can draw the remaining lines by typing:
line
Specify First Point:
To Point:
To Point
To Point
To point

When you have finished entering all of the coordinates, you should have the object shown on the right.

V Erasing Objects

AutoCAD calls lines, circles, arcs and other things that you draw objects. You can erase any of these objects by typing the command:
ERASE
The program will respond with:

Select Objects:
You select the objects (lines, arcs, circles, etc.) in several different ways. The easiest way is to click on the object you want to erase. When you do, the object is redrawn as a dashed line. This shows the object has been selected for deletion. Click on all of the objects that you want to erase then press the ENTER key to terminate the command and erase the objects.
AutoCAD commands frequently have command modifiers that change the way the command works. For the ERASE command, you can type:
ERASE ALL
and AutoCAD selects all of the objects in the drawing for erasure. The word ALL modifies the way command works.
Another option is:
ERASE W
The W stands for window which allows you to select the objects by drawing a box around them. First click above and to the right of the objects that you want to erase. When you do, the mouse pointer changes to an elastic box with one corner fixed at the place where you clicked. Move the mouse until the box completely covers the information you want selected and click the mouse button again. All of the objects inside the box will be selected for erasure. Press the ENTER key to erase the objects.

You can type E to start the ERASE command.

VI Oops

If you make a mistake and erase something that you did not want to erase, type:
OOPS
to undo the last erasure. OOPS always undoes the last erasure even though you have continued with other commands since the objects were erased.

VII Canceling a Command

If you start a command and do not want to complete it, you can press the Esc key to cancel the command. For some commands, you may have to press the key more than once. Keep pressing the Esc key until you see the Command: prompt at the bottom of the screen.

VIII Drawing Arcs

The ARC command is used to draw arcs. We can use this command to draw the semicircle on the left side of the object. Enter:

{The end point of the last line we drew} {Enter C to tell the program we want to enter the center point instead of the end point of the arc}
{The center of the arc is 2 units below the start point} {The end of the arc is 2 units below the center}

2.0

4.0

2.0

8.5,6

CIRCLE
at the command prompt and AutoCAD will respond with:

3P/2P/TTR/<Center point>:
There are several different ways you can define a circle. In the computer response above, the words Center point are surrounded by angle brackets and this shows you the program is expecting you to enter the coordinates of the center of the circle. You can either type the coordinates or click with the mouse. The quantity in angle brackets is always the default selection for a command. The letters 3P/2P/TTR/are options you can use to modify the input required to create a circle. These options are:

3P Define the circle with 3 non-collinear points.
2P Define the circle with points on either end of the circle diameter. TTR Define the circle by specifying two other objects that are tangent to
the circle and the radius of the circle.

We can complete the drawing by drawing a circle. The center of the circle is two units vertically above the beginning point where we started the drawing. The coordinates for the center of the circle are 3.5,8. The circle has a diameter of 2.0.

center point for circle or [3P/2P/Ttr]:
radius of circle or [Diameter]:
diameter of circle:

The completed object is shown in the figure on the right.
Circle

3.5,8

3.5,6

X Program Help

If you need more information on the various options for drawing an arc, park the mouse over the icon and after a few seconds, a help message will pop up. The help message will stay on the screen for as long as the mouse is parked over the icon. If you want more help, you can press the F1 key and