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
NURUDEEN MUBARAK OPEYEMI
ND/23/SGI/FT/0023

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, **NURUDEEN MUBARAK OPEYEMI** with Matric number **ND/23/SGI/FT/0023** 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)

_____

_____

SURV. B. KABIR **DATE**

DIRECTOR, DIRECTORATE OF

INDUSTRIAL LIAISONS PLACEMENT

DEDICATION

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

Mr & Mrs NURUDEEN

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

MANAGING DIRECTOR

↓

GIS SECTIONS

↓

← →

↓

SIWES/ IT STUDENTS

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.**

CHAPTER FOUR:

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

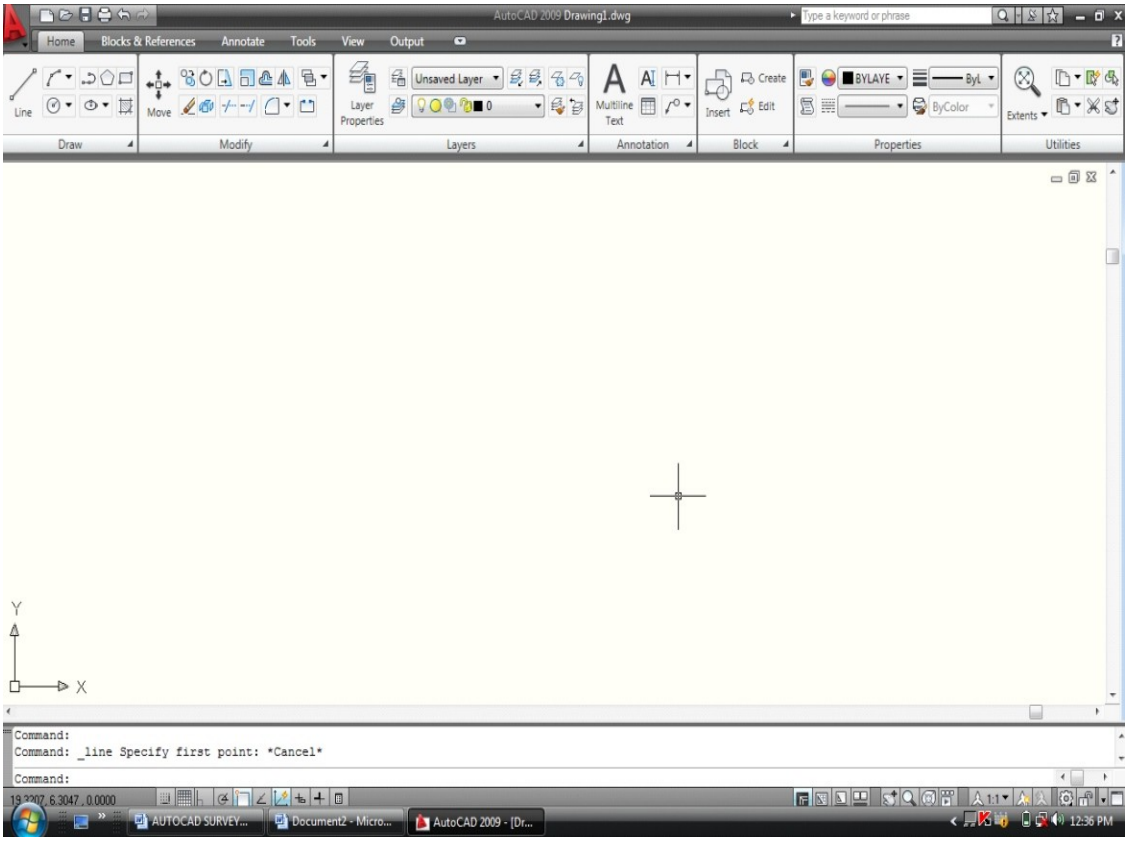
AutoCAD has a very versatile user interface that allows you to control the program in several different ways. At the top of the window is a row of menus. Clicking on the Home, Insert, or Annotate causes another selection of menus to appear. This new selection of commands is frequently called a Ribbon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

STEPS IN AUTO-CAD

STEP 1: OPEN AUTOCAD.
STEP 2: NAME THE PAGE BY, CLICKING ON SAVE
STEP 3 SET DRAWING UNITS
STEP 4: SET LAYERS
STEP 5 START PLOTTING
STEP 6: SET BEACON
STEP 7: WRITE BEACON NUMBER
STEP 8: PLOTTING BEARING AND DISTANCE C
STEP 9: PLOTTING ROAD
STEP 10 PLOTTING DETAIL
STEP 11: SET TITLE
STEP 12: SET LAYER TO SCALE
STEP 13: SET LAYER TO BORDER
STEP 14: COORDINATE LINES/NORTH DIRECTION
STEP 15: VERGE THE PLOT
STEP 16: PLOT

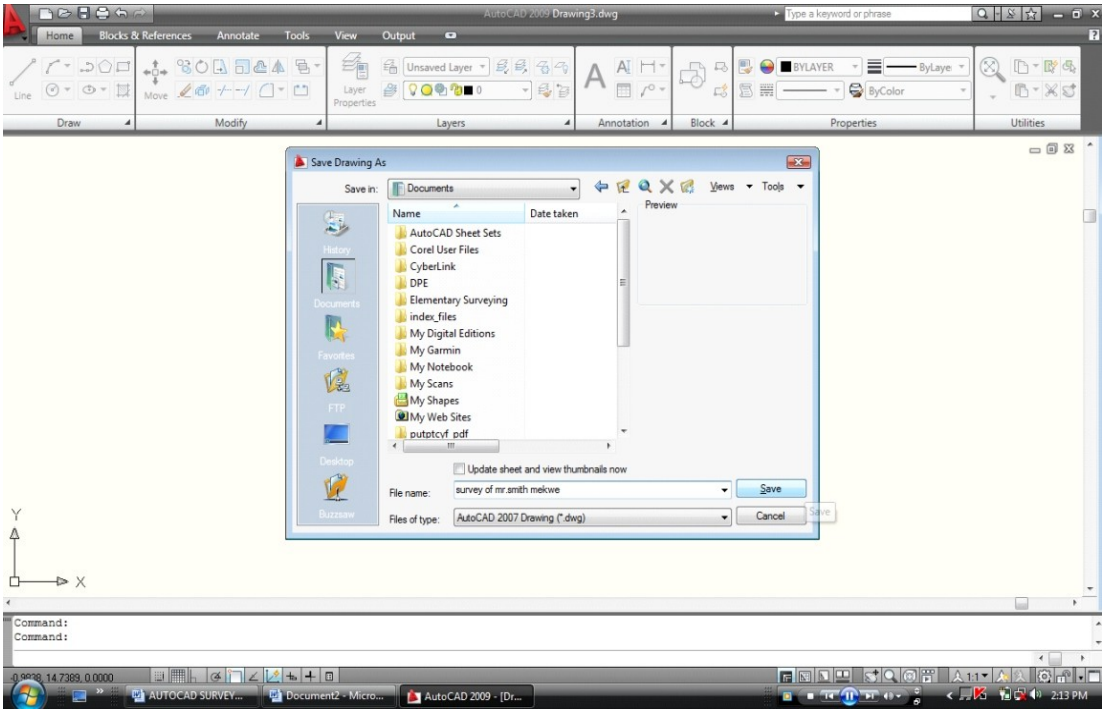
Step 1: Open **AutoCAD.**

Double click on AutoCADicon on the desktop, or
Click the AutoCADicon on the programs menu bar



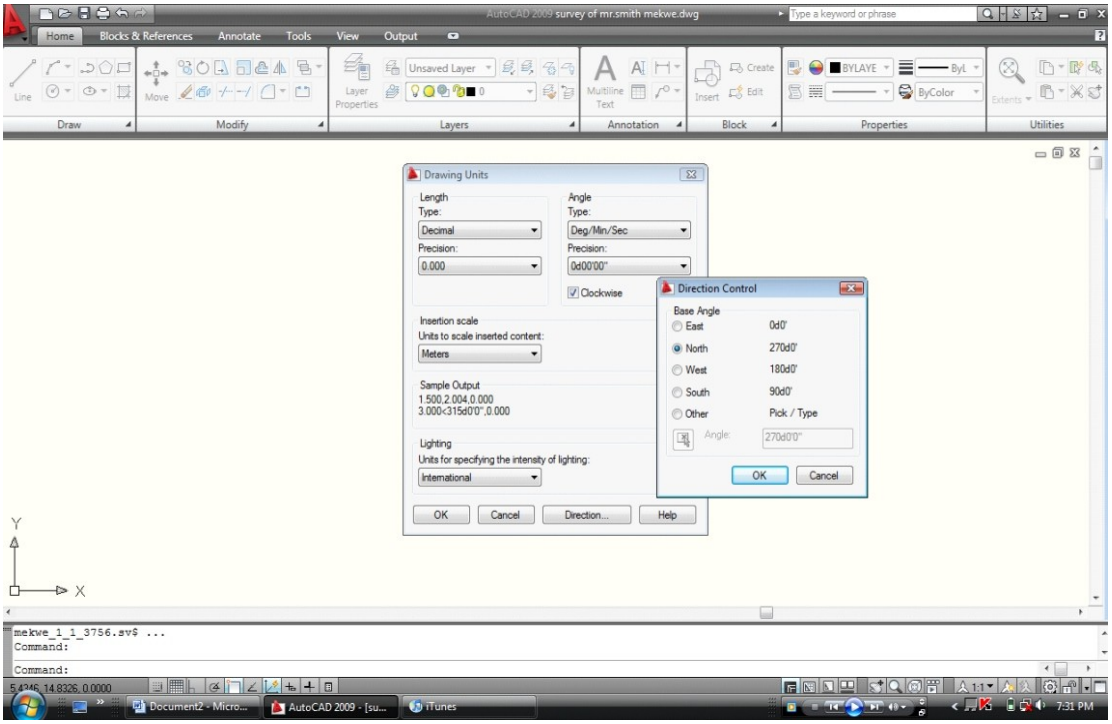
Step 2: Name the page by

- clicking on ***save***
- Type in the name e.g. survey of Mr. Smith Mekwe,
- Click on ***save***



Step 3 **SET DRAWING UNITS**

Command: ***units*** or click on ***format*** select units



Step 3i Length Angle

Set Type = ***Decimal*** Set Type = ***Deg/Min/Sec***

Set Precision = ***0.000*** Set precision = ***0d00'00''***

Insertion Scale click ***clockwise***

Set unit to scale inserted content = ***meters***

Click ***Direction***

Click ***North***

Click ***ok***

Step 3ii SET POINT STYLE

Click on format

Click on point style

Choose beacon type

Point size: 2.000 units

Set size in ***absolute units***

Ok

Step 4: **SET LAYERS**

Step 4i: Click on format, from the ***format*** menu click on ***layer***

Click on new layer

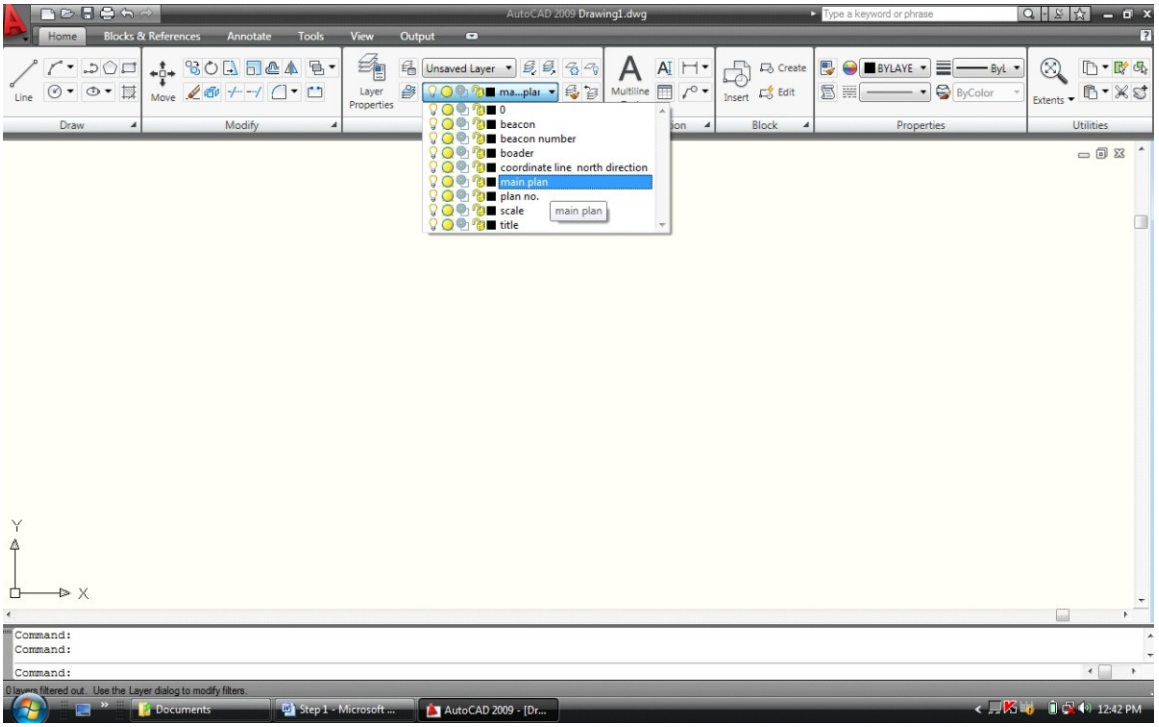
Right click (the name column) on the new layer created, type in the layer name.

LIST OF LAYER NAME FOR A PLAN

- main plan
- beacon
- beacon number
- bearing and distance
- road
- detail
- title
- scale
- border
- Coordinate lines/ north direction.

Step 5 Start **PLOTTING**

Click on the layer menu and select ***main plan***

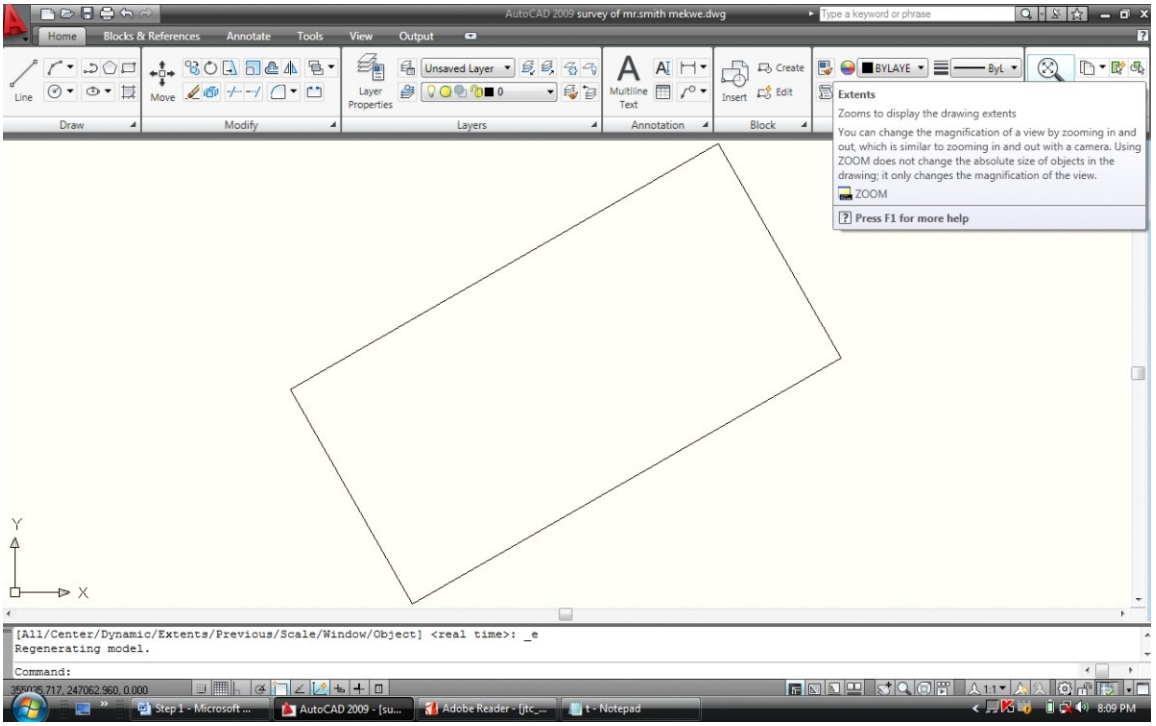


PLOTTING BY CARTESIAN OORDINATES

- Type ***line*** in the command box then press ***enter***. Or
- Click on the ***line*** symbol
- Type in the coordinate of points accordingly
- Specify first point: 355013.495,247063.130
- Specify next point or[Undo]:type 355028.614,247036.647
- Specify next point or[Close/Undo]:type 354975.701,247006.240
- Specify next point or[Close/Undo]:type 354960.612,247032.721
- Type ***close***
- Type ***zoom extent*** or click on ***zoom extent***

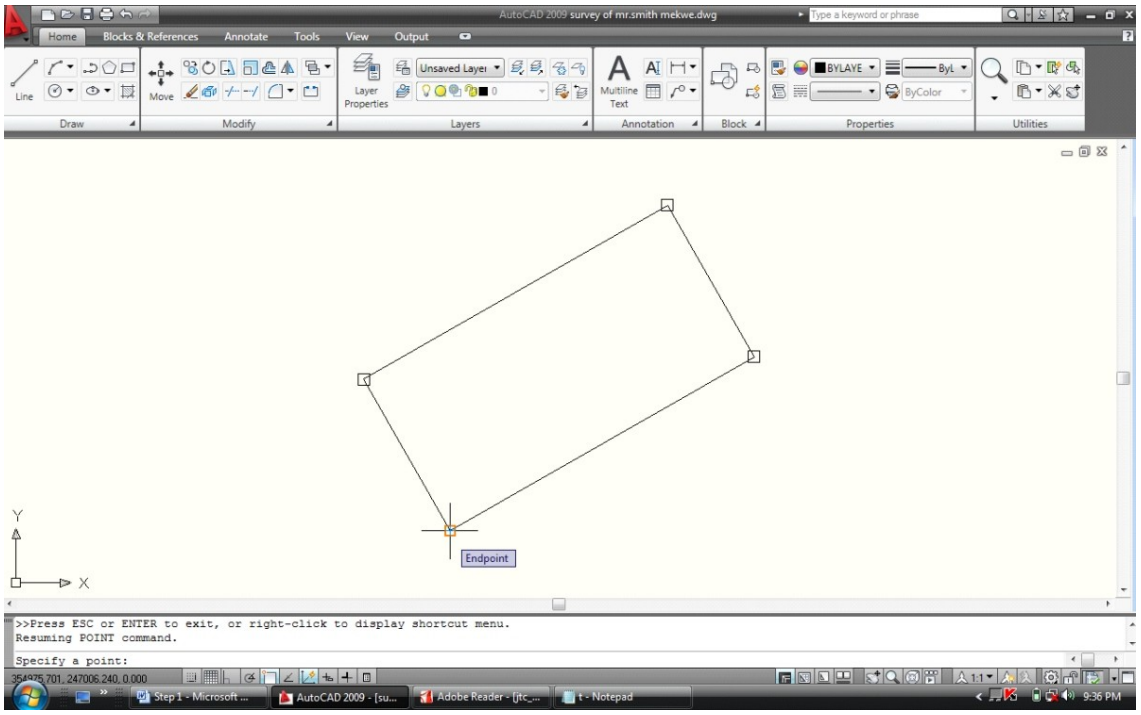
PLOTTING BY RECTANGULAR COORDINATES

- Type ***line*** in the command box then press ***enter***. Or
- Click on the ***line*** symbol
- Type in the rectangular coordinate for the reference point.
- Specify first point: 355013.495,247063.130
- Specify next point or[Undo]:type @30.50<150d17'
- Specify next point or[Close/Undo]:type @61.00<240d06'
- Specify next point or[Close/Undo]:type @30.50<330d17'
- Type ***close***
- Type ***zoom extent*** or click on ***zoom extent***



Step 6: **SET BEACON**

- Click on the layer menu and select ***beacon***
- Command: Type ***point*** then *enter* or
- Click on draw then click on ***multiple point***
- Take the mouse to the edges of the plot and click on each.
- ***Esc***



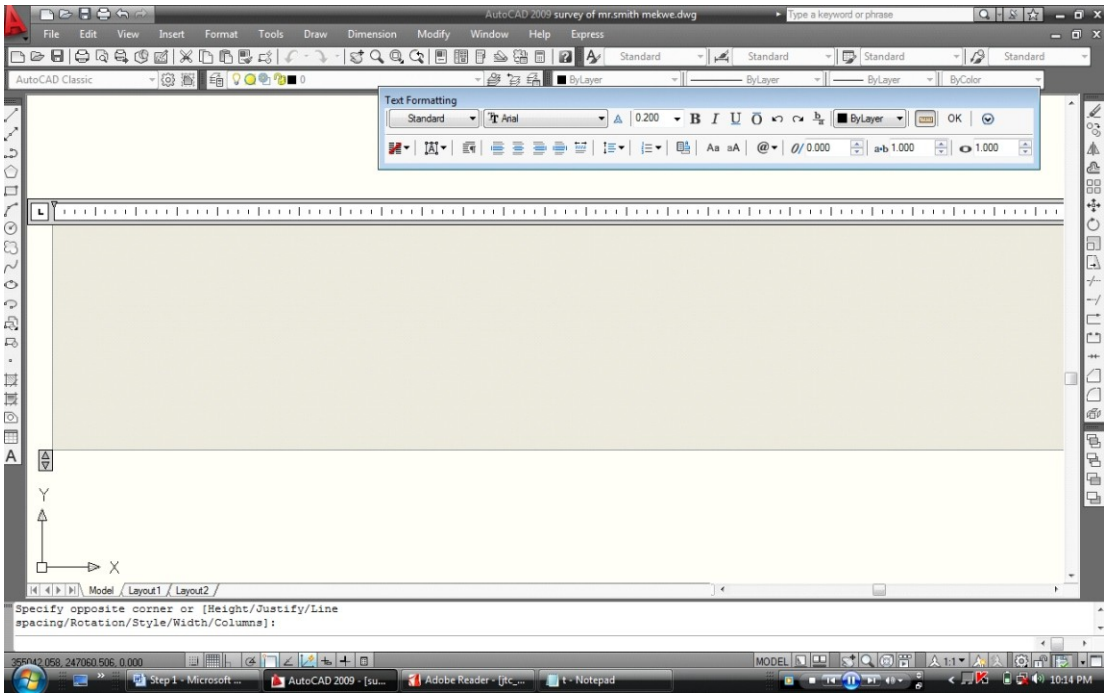
Step 7: **WRITE BEACON NUMBER**

- Clicks on the layer menu and select ***beacon number***

Command: multiline text or click **A**

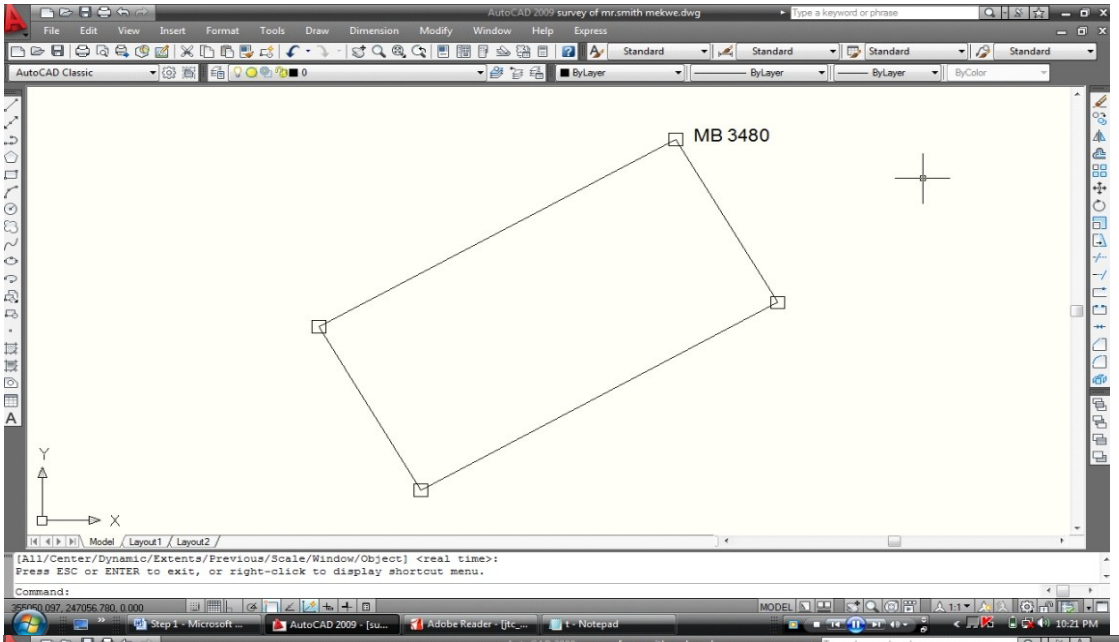
- Draw a rectangle and click

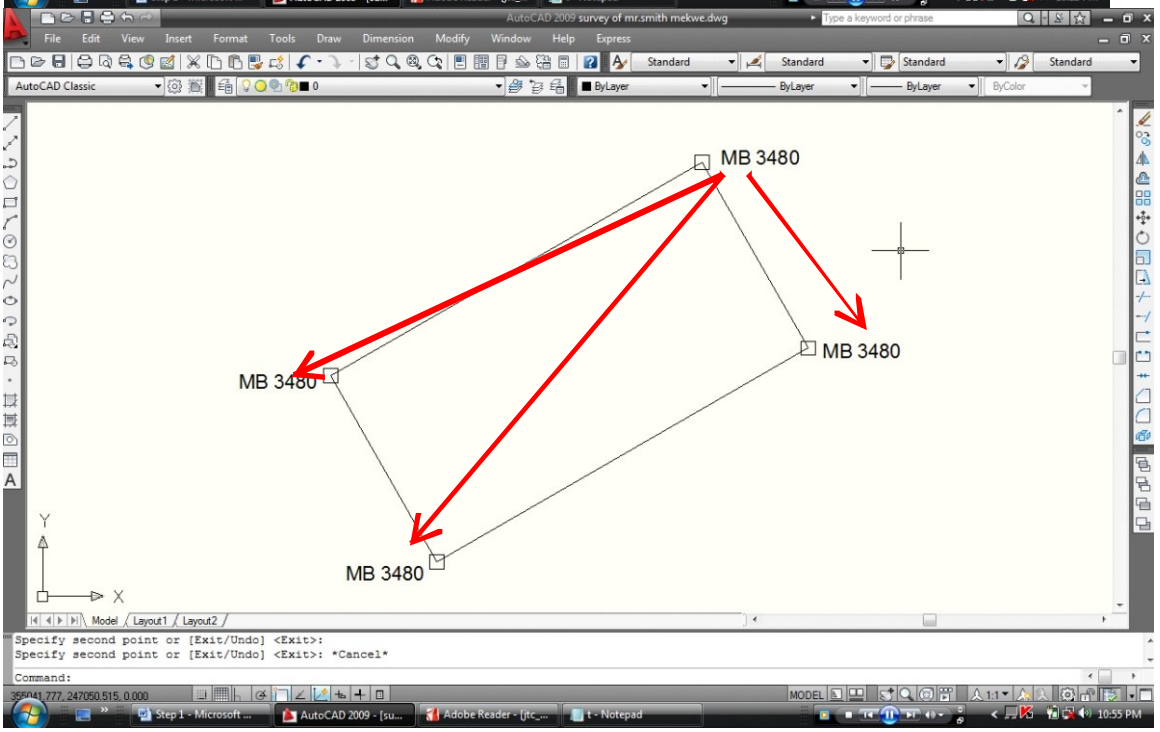
(*Note: the rectangle defines the writing area for the text.)*



- Set text height to 2.000
- Type MB 3480 (beacon number of first point).
- Click ***Ok***

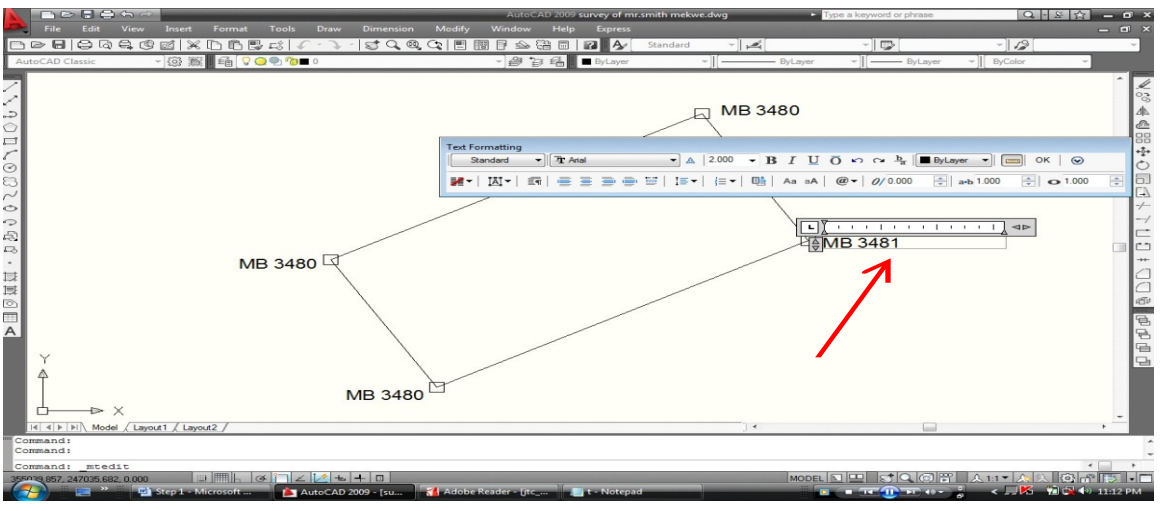
- Copy MB 3480 and
- paste on other corners of plot





Step 7i: Edit newly copied beacon numbers by double clicking on each,
Step 7ii correct the beacon number, MB 3481, MB 3482, MB 3483.

Ok.



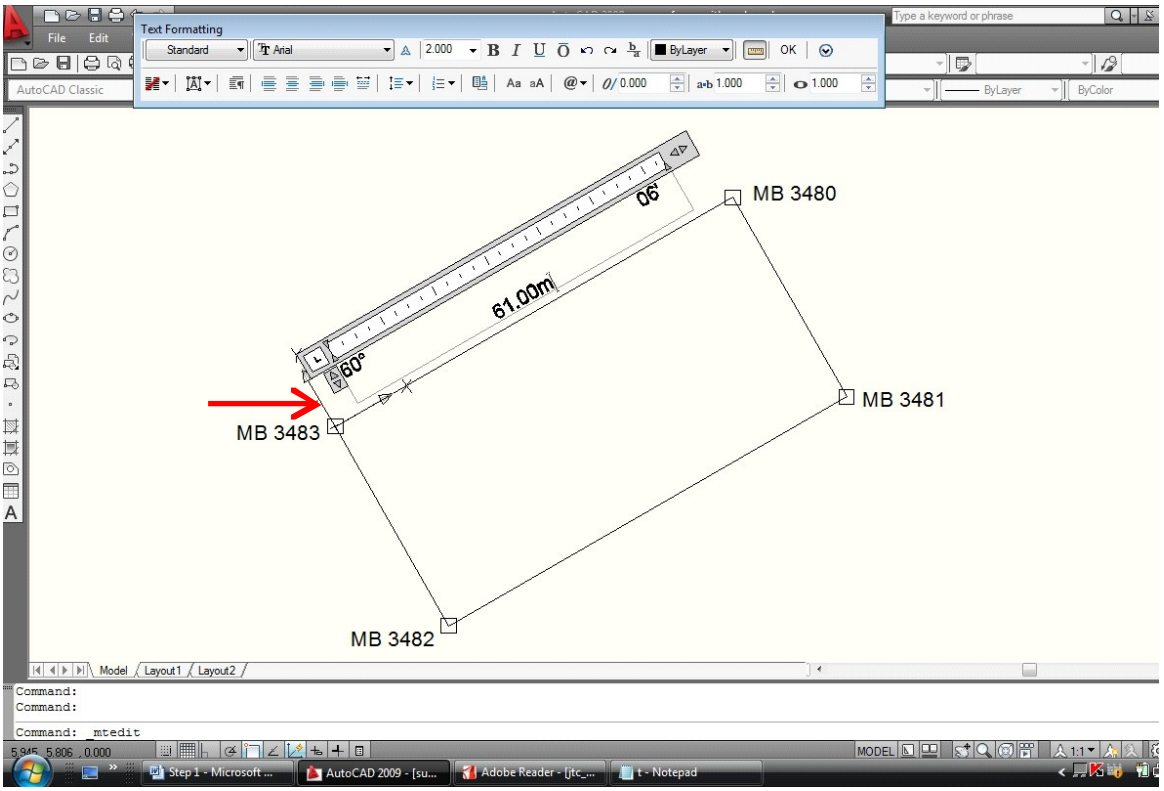
Step 8: Plotting **BEARING AND DISTANCE**

Set layer to ***bearing and distance***

- Set ***ucs****(user coordinate system).*
- From the menu bar click on ***tools***, ***new ucs, object***.
- The select line MB 3483- MB 3480

Step 8ii: Command: ***text*** *or* click **A.**

- Write 60%%d 06' *enter,* write 61.00m, ***ok***
- Write the bearing and distance and repeat process for other lines.

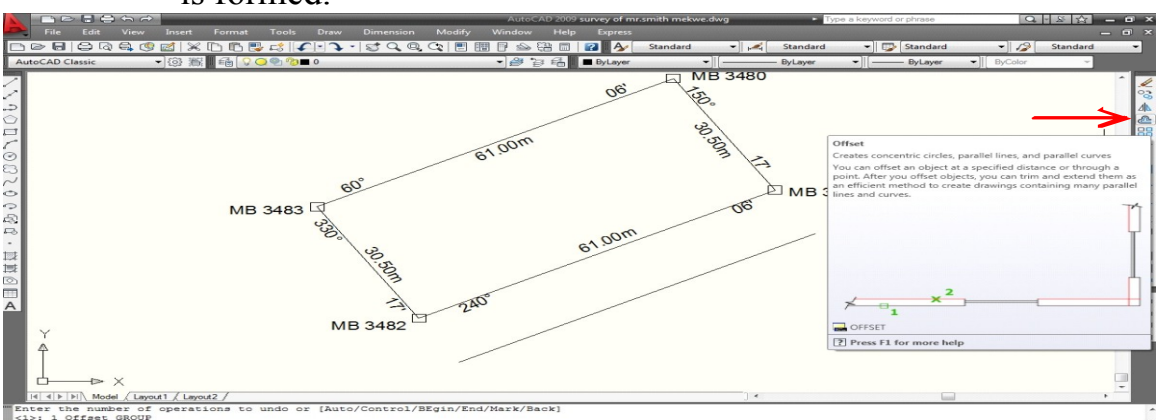


Step 9: plotting **ROAD**

set layer to ***road***

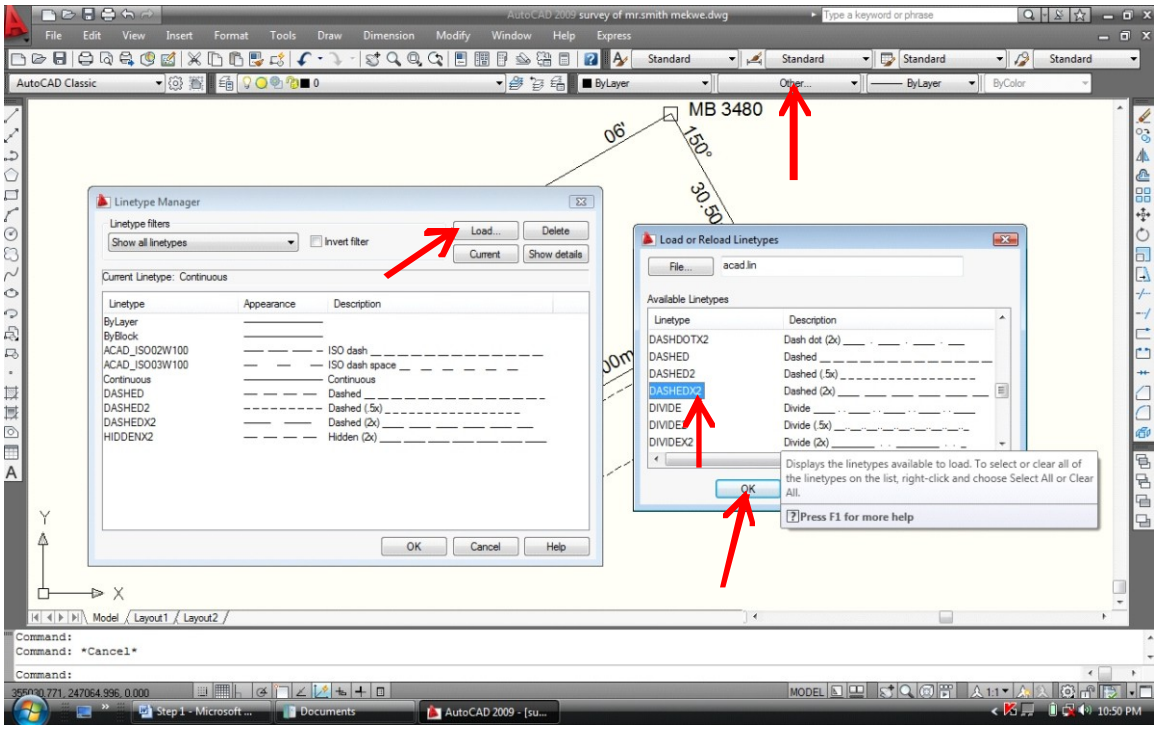
Command: ***offset*** or click ***offset***

- *Specify offset distance or [Through/Erase/Layer] <Through>:* 12(12m offset) *enter*. A little box is formed on the mouse cursor click the box on line MB3481 to MB3482
- Then click the empty space in the direction of the road on the sketch given.
- *Select object to offset or [Exit/Undo] <Exit>: enter*
- repeat offset process for 2.5m, the other side of the road is formed.



To peck the road.

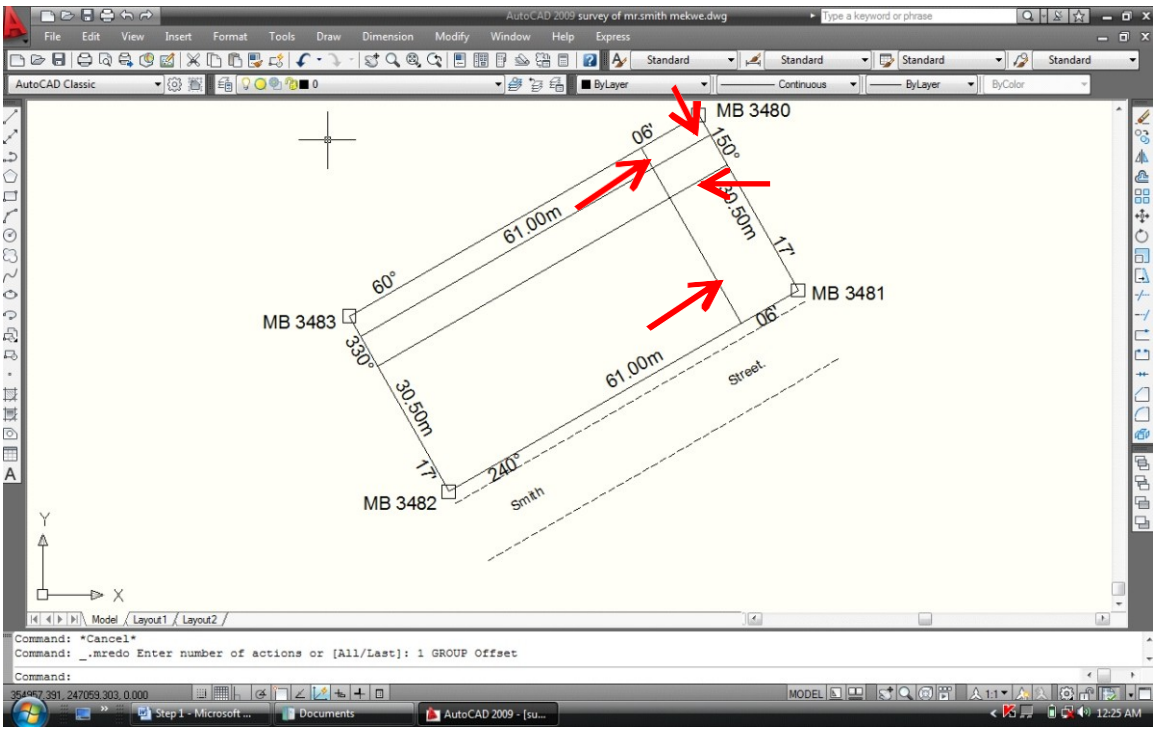
- click on line type on the menu bar,
- click on ***other,***
- click on ***load,***
- select ***DASHEDX2***



- ***ok***
- Highlight the two sides of the road by clicking on both.
- Click on the line type menu,
- Choose ***DASHEDX2***
- Esc (on keyboard)
-

Step 9iii WRITE THE STREET NAME

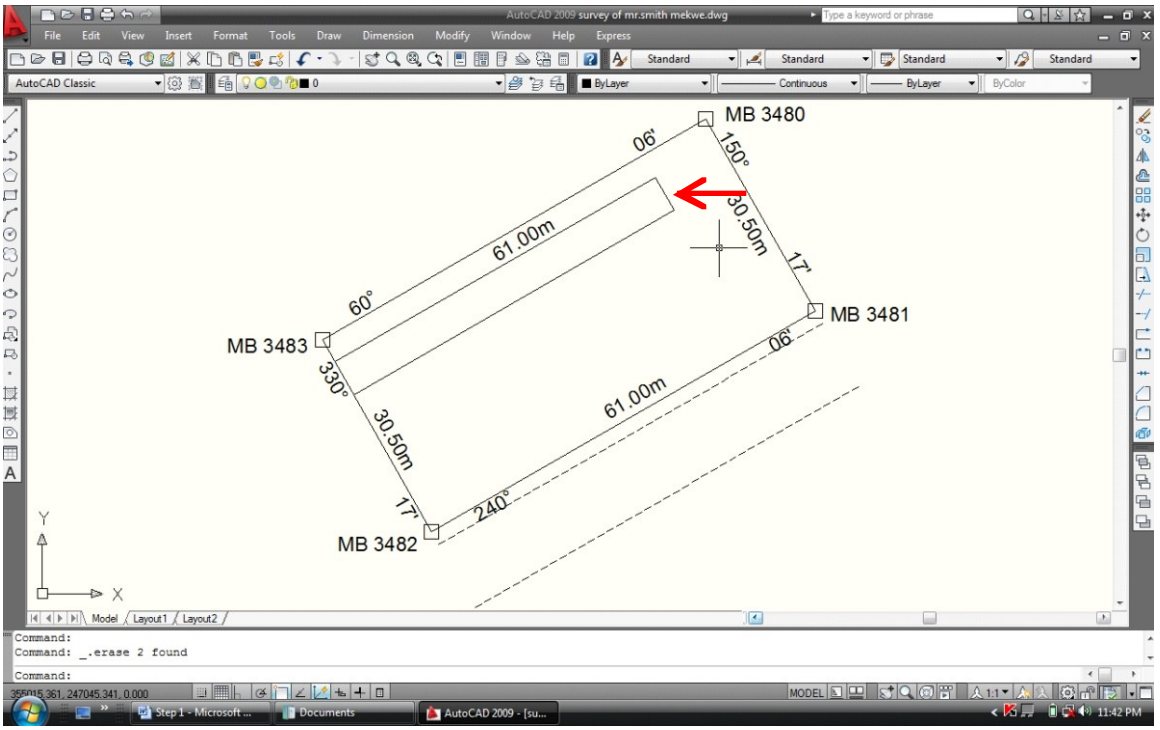
- orient the ***ucs*** along the road
- command : text write Smith Street
- Perfectly align using, command ***move*** *enter*
- Using the cursor right click on the write-up the left click to move.
- Esc.
- From the new offset line take offset of 5.2m



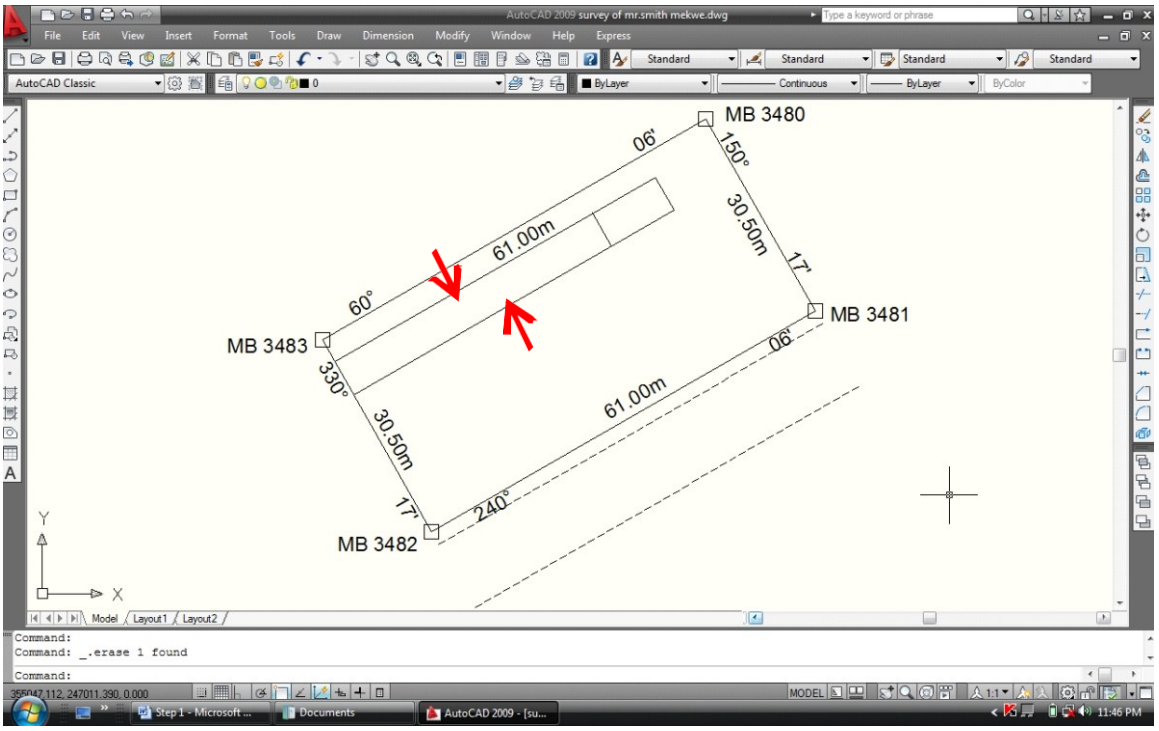
- trim the lines the arrows are pointed at,

Command: ***trim*** or click on the ***trim*** icon,

- Take the cursor to any line to be trimmed and right click on it, then left click on each line and it will be trimmed.



- Take an offset of 10m from line the arrow is pointed.



- Trim both lines and the detail is defined.

Step 10i HATCHING THE BUILDING

command : ***hatch*** *enter*

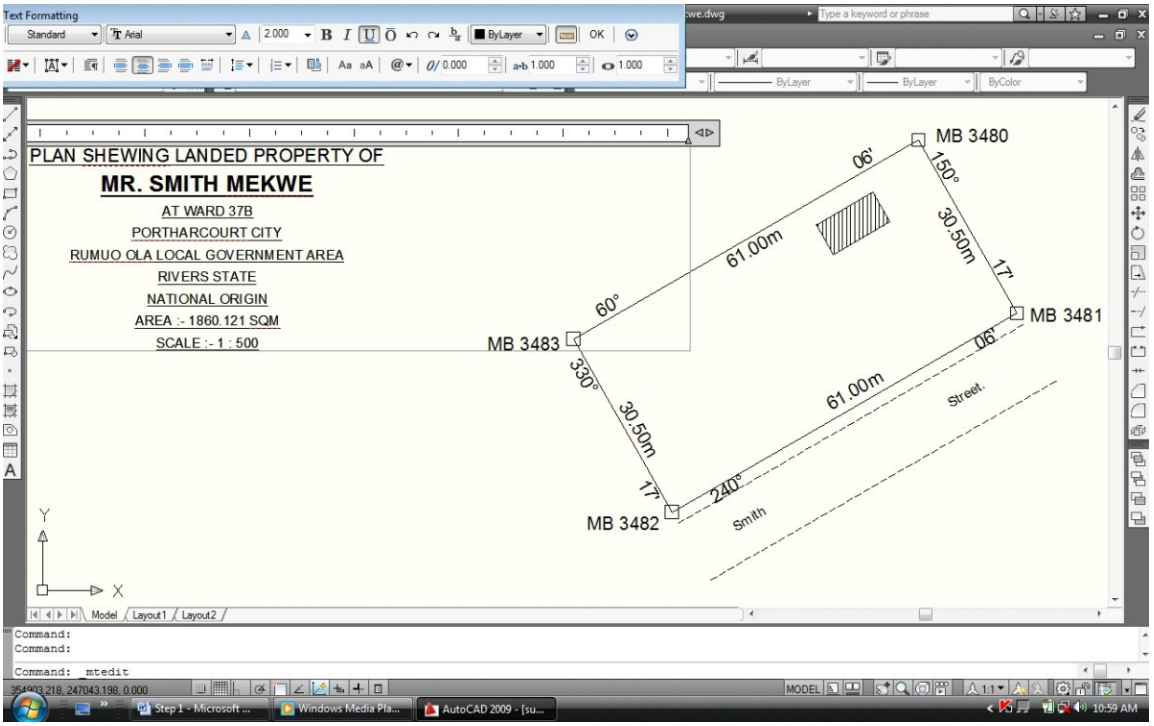
Step 11: Set **TITLE**

- select form the layer menu ***title***

Command: ***text*** or click **A**

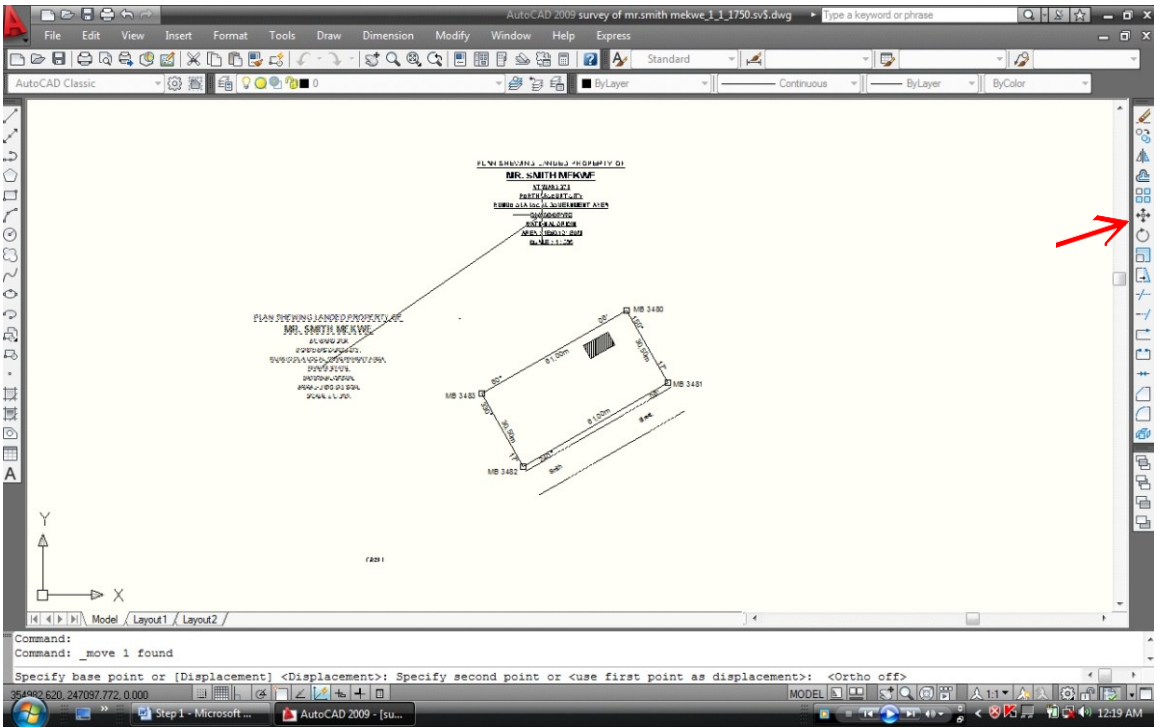
- Draw a rectangular box with the cursor.
- Set text size to 2m
- Type: PLAN SHEWING LANDED PROPERTY OF
- *Enter*
- Set text size to 2.5m, click on bold and underline
- Type : **MR. SMITH MEKWE**
- *Enter*
- Set text size to 1.5
- Type : AT WARD 37B
- *Enter*
- Type : PORTHARCOURTH CITY
- *Enter*
- Type : RUMUO OLA LOCAL GOVERNMENT AREA
- Enter
- Type : RIVER STATE
- *Enter*
- Type : NATIONAL ORIGIN
- *Enter*
- Type : AREA:-1860.121SQM
- *Enter*
- Type : SCALE:- 1:500

- *Ok*



Command: ***Zoom out*** (reduce the size of drawing)

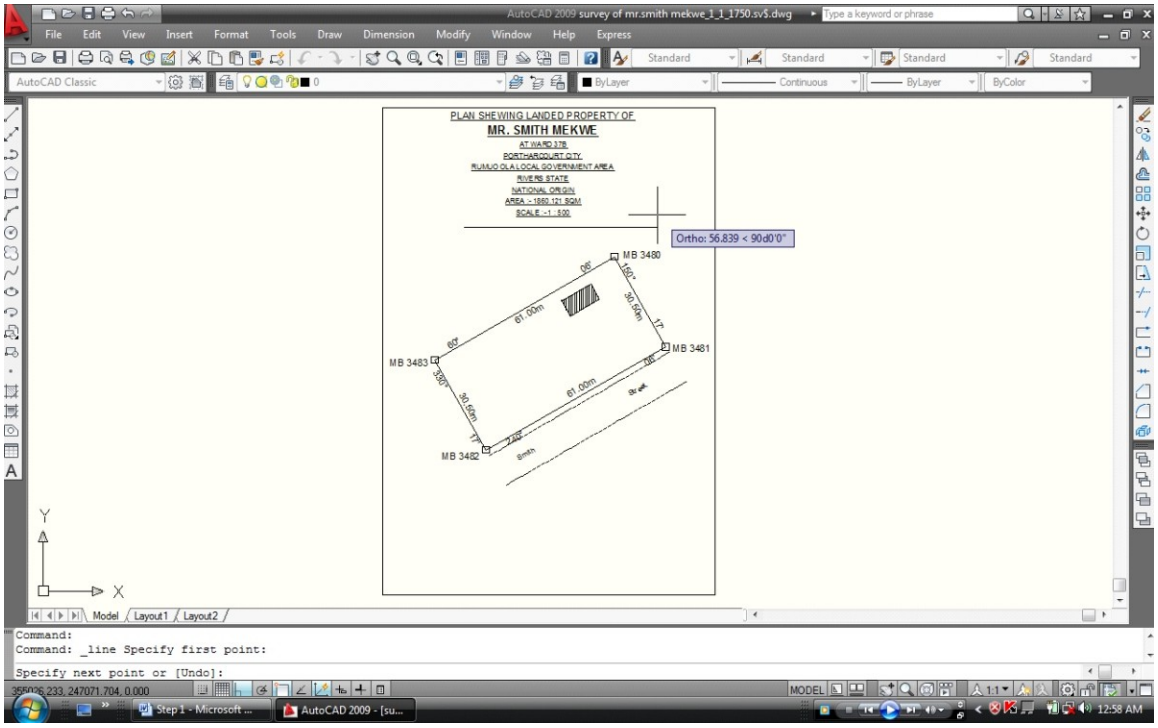
- Highlight the title by clicking on it
- Command: ***move***
- Click again to move.
- Move title to the top of the plot.



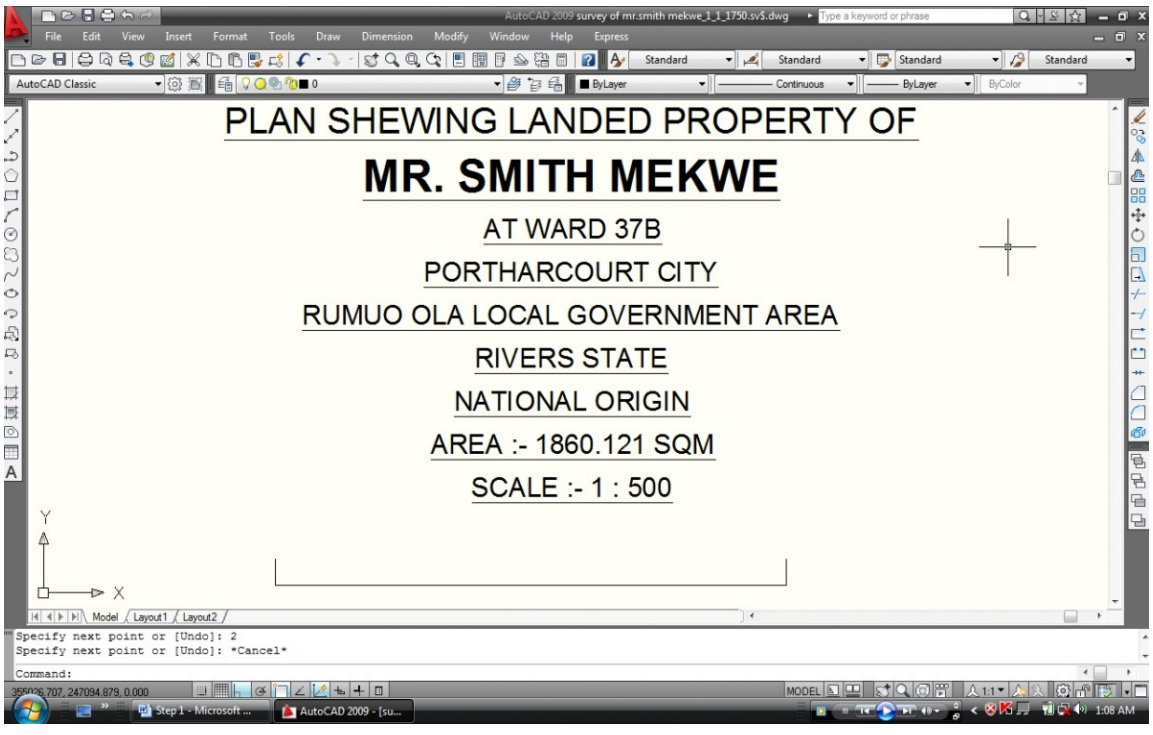
Step 12: Set layer to **SCALE**

- set to ortho mode, command: *ortho*
- Enter mode [ON/OFF] <OFF>: on

Command: ***line*** or click on line symbol.



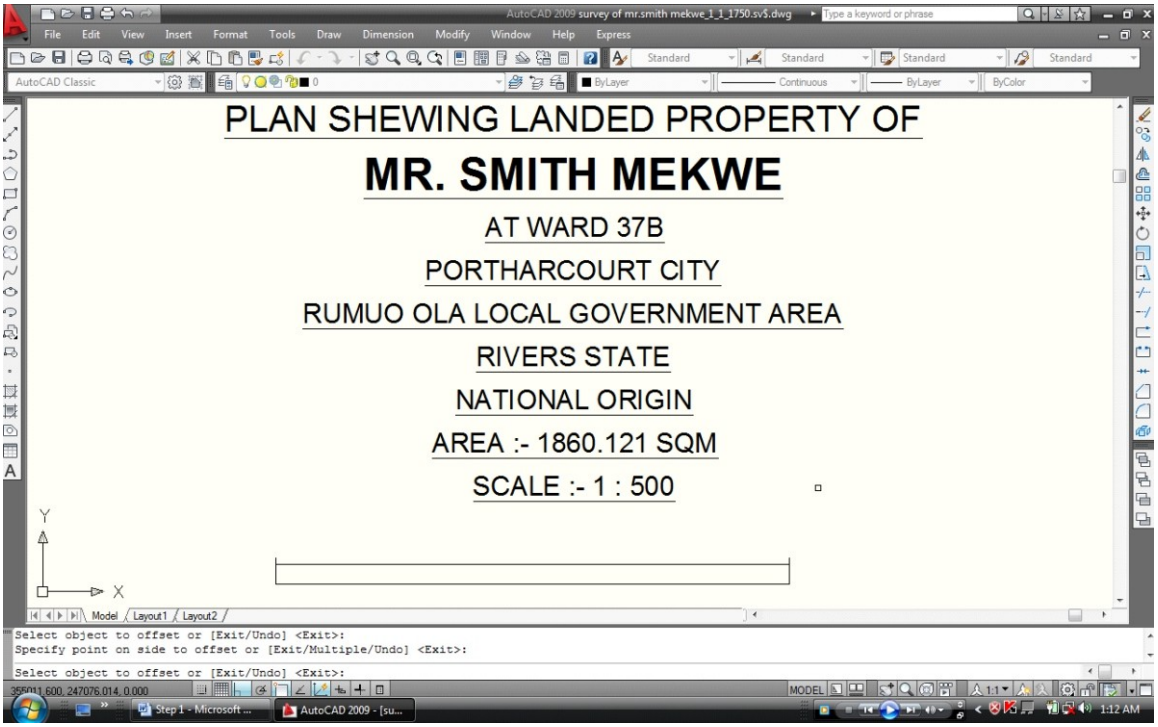
- Type 40.0<90d0’0’, and then *enter*
- Click on the left side of the line
- Type 2.00<0d0’0”
- Repeat on the right side of the line.



OFFSET LINES

Command: ***offset***

- Type in 1.5
- *Enter*
- Click just above the long horizontal scale line.
- *Esc*



Command: ***offset***

- Type 10, then *enter*
- From the left short vertical line, then click within the confines
- Repeat process based on the new lines established, dividing it into four (4) equal paths.

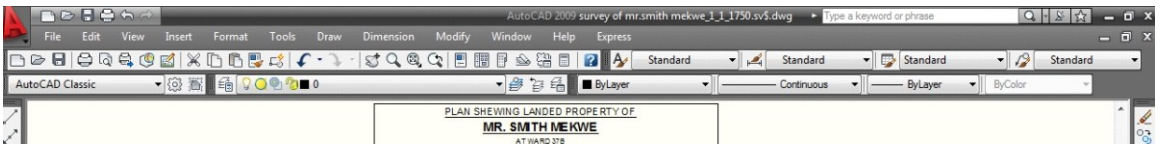
Command: ***offset***

- Type 5,then enter
- Click on the short vertical line on the left, and then click within the first column, its divided in two equal parts.
- *Esc*

Step 13: Set layer to **BORDER**

Command: ***rectang*** or click on the rectangle symbol

- With the cursor draw a rectangle as a border over the TITLLE and THE MAIN PLOT.



Step 13i: Highlight border by clicking on it,
Click on line weight control.
Select 0.60mm (to thicken the border).
Esc

Step 14 : **COORDINATE LINES / NORTH DIRECTION**

Command: *ortho*

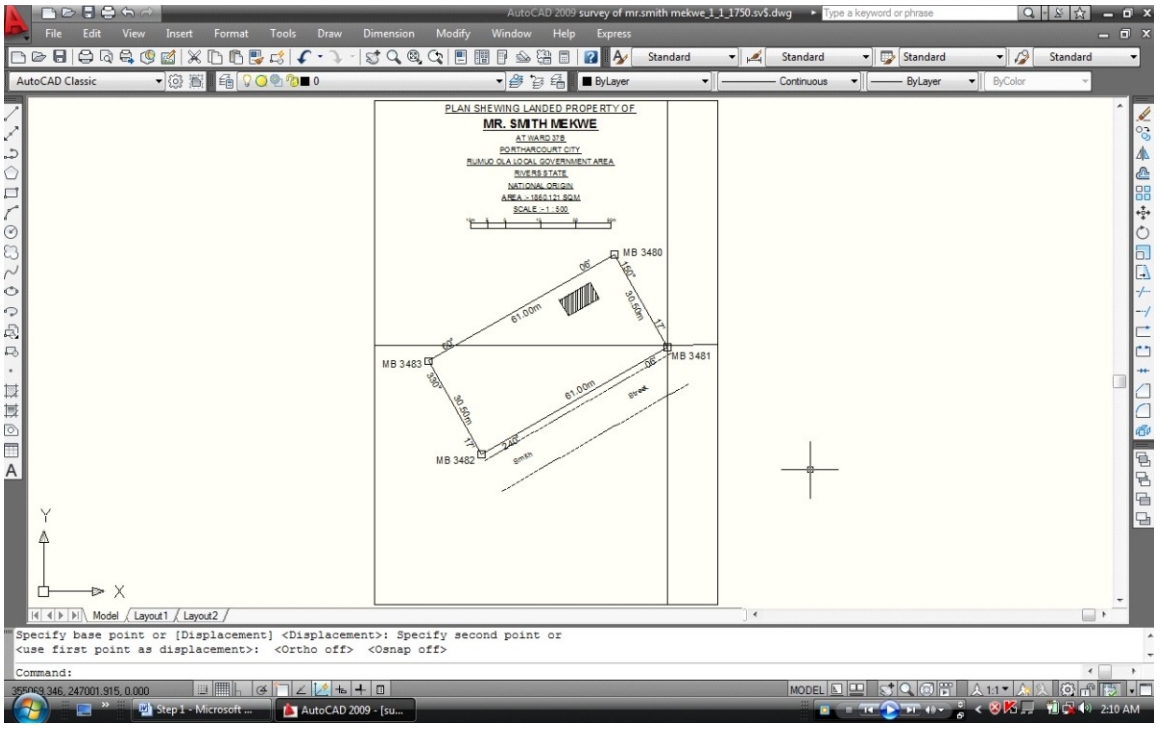
- Enter mode [ON/OFF] <OFF>: on

Command: *osnap*

- *Ok*

Command: *line*

- Take the cursor to point MB 3481; click the highlighted part of the box.
- Pull the line drawn vertically upward towards the border and end it at the border. (turn of osnap before the border)
- Do the same in the horizontal direction.



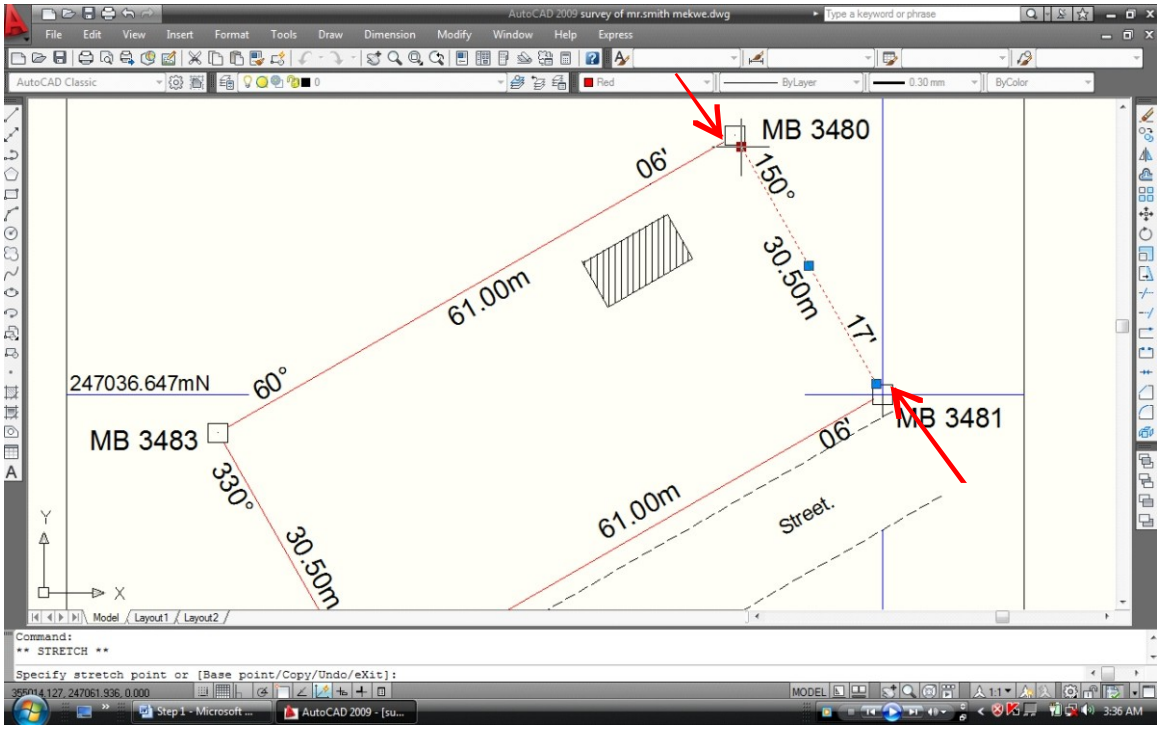
Command: ***trim***

- Trim line within the plot and road.

- Create a north symbol over the north line,
- By ***line*** and ***curve*** commands.
- By text command write the NN (National North)

Step 15: **VERGE THE PLOT**

- Select the four border of the plot
- Click ***color control (by layer)***
- Click on ***red***
- Click on ***line weight control***
- Select 0.30mm
- Esc
- Highlight the northing and easting lines
- Click on ***blue***
- Edith the title by double clicking on in,
- Highlight the area and select ***red***
- Click ***ok*** to exit
- Create a position for plan no.
- Highlight each line between the beacon
- From the end point gently pull out of the box(beacon symbol)
-



Repeat carefully for each line at both ends

Note: press esc after each line

Command: ***text***

- Set ***text height*** to 2.000
- Click on **B**(bold)
- Type (**.**)dot

Note: the area captured is the area to be printed.

- Click ***apply to layout***
- *Ok*

CHAPTER FIVE

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**