KWARA STATE POLYTECHNIC, ILORIN

INSTITUTE OF ENVIRONMENTAL STUDIES

DEPARTMENT OF SURVEYING AND GEO-INFORMATICS

A PROJECT REPORT ON :

CADASTRAL LAYOUT SURVEY

OF

OLD INSTITUTE OF ENVIRONMENTAL STUDIES (IES) AND VILLAGE, KWARA STATE POLYTECHNIC ILORIN ALONG OLD JEBBA ROAD, MORO LOCAL GOVERNMENT AREA, KWARA STATE.

SUBMITTED BY: AMUPITAN DUPE BLESSING

MATRICULATION: ND/23/SGI/FT/0085

SUPERVISOR IN CHARGE: SURV. R. O. ASONIBARE & MRS. S. O. ADEOTI

INSTITUTION: INSTITUTE OF ENVIRONMENTAL STUDIES

DATE: JULY, 2025

CERTIFICATE

I, AMUPITAN DUPE BLESSING with Matric Number ND/23/SGI/FT/0085 hereby certify that the information contained in this project report were obtained as a result of observations and movements taken by me and the Topographical Survey was done in accordance to Surveying rules and regulations and Departmental instructions.

Signature of student: _____

Name of student: _____

Date of completion: _____

Matric Number: ND/23/SGI/FT/0085

CERTIFICATION

This is to certify that AMUPITAN DUPE BLESSING with Matric number ND/23/SGI/FT/0085 carried out this project and has been approved as meeting the requirement for the award of National Diploma (ND) in Surveying and Geo-informatics in the Department of Surveying and Geo-informatics of the Institute of Environmental Studies, Kwara state polytechnic, Ilorin.

MRS. S. O. ADEOTI ……

Project supervisor DATE AND SIGN

SURV. ASONIBARE …….

Project supervisor DATE AND SIGN

SURV. R.S AWOLEYE ……..

Project Coordinator DATE AND SIGN

SURV. AMBIMBOLA ISAU …….

Head of Department DATE AND SIGN

External Moderator …….....

DATE AND SIGN

DEDICATION

This project is dedicated to Almighty God, the creator of heaven and earth, ancient of days, and it is Also dedicated to my Love parents MR & MRS AMUPITAN

ACKNOWLEDGMENT

I will like to express my profound appreciation to almighty God who in his infinite mercy, that gave me the ability to complete my program in peace and God health, if not for God, where will I be today?.All things are possible because of him and through him for the knowledge, wisdom and understanding, protection and provision on me through my ND programme. I thank Him for the great things he has done, most especially for the success of this project, God be the glory.

My appreciation goes to my lovely parent in person of MR & MRS AMUPITAN for their support and their prayer, throughout this journey thank for all the beautiful star and end through my ND program. I know I can't repay you back but I have special prayer to offer you both, wishing you both long life and prosperity in good health and wealth, more success, blessing and happiness along with a lot of luck (Amen).

And I also appreciate my supervisors MRS ADEOTI and SURV. ASONIBARE for their support on this project. And my appreciation also goes to all my lecturers Surv. Ayuba, Surv. Awoleye, Surv. Kazeem, Surv. Diran, Surv. Banji. Surv. Kazeem, may Almighty Allah continue to bless you all and help you.

ABSTRACT

The overall intent of this project report is to show the Layout Survey of part of unilorin cooperative sociaety at Ajia Baako village area, Moro local government area, Kwara State. A total station was used in acquiring data (x,y,) coordinates within the study area, with ground survey method. The data acquired were processed. The use of some software like AUTOCAD, Microsoft excel, notepad, and Microsoft. The end result was the production of the location plan of different kinds of plan and maps all at suitable scale both in soft and hardcopy formats. Finally, a project report was written.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Since time of creation, man has been known to have sense of living in a comfortable environment, it Is imperative that form part of human existence, meanwhile the need to manage the land is vital that is why human struggle is to acquire certain portion of land to support their existence, hence, the issue of ownership land tenure arose. In doing this, the concept of estate surveying cannot be overemphasized,

Surveying is a geographical mathematical aspect of science and profession, which is use to determine and delineate the jurisdiction and the portion of features on, above or beneath the surface of the earth. Survey also controls major construction work such as bridge, railways and road. Hence surveying can be defined as an act, science and technology of making measurement of relatives positions of point above or beneath the earth surface and plotting of these measurement to some suitable scale to form map of plan (Dorsett, 2007). Maity, S. K. (2021) opined that surveying as an act to determine the relative position of point on, above or beneath the survey of the earth, with respect to each other, by measurement of horizontal and vertical distances, angles and direction. Surveying is defined as the measurement of dimensional relationship, as a horizontal distance, direction, and angles on the earth especially for use in locating property boundaries, construction layout, and map making (Houlton, 2012)

Surveying is a means of taking general view by observation and measurement to determine the boundary, size, position, quality, conditional value of land, estates, building, farm, mines and plotting of all these measurements to some suitable scale to form a map or plan. (Wilson ,2001).

The American Congress on Surveying and Mapping (ACSM) define surveying as the science and art the of making all essential measurements to determine the relevance position of points, physical and cultural details, above, on, or beneath the earth surface and depict them in a visible form, or to establish the positions of points or details.

Surveying consists of different operations and techniques but the following basic principles provide unity and disciplines to the subject.

(a)Working from whole to parts: -This means that for any particular survey operations, whether it is for an entire country or an area of small extent. st must be connected to the main frame works of higher accuracy that could be made once the frames work has been established.

(b) Choosing the method of surveying: - This is adopted in order to meet the desired and required accuracy which the more refined techniques and instrument employed, the greater the accuracy that will be obtained.

(c) Provision of adequate check: - This is an important aspect of surveying exercise as it will show the possibility of detecting error and how it will be handle. Therefore, survey as well as estate survey involves stages such as planning, data acquisition processing, and information

presentation.

Survey can be divided into two main types.

(a)Plane surveying: - This is referred to as surveying dealing with an area of limited extent of country land and it is always assured that the earth surface is planes, hence neglecting the earth curvature.

(b) Geodetic surveying: - This is defined as the science of determining the size, shape of the earth and its gravity fields. For this observation to be of any value, it must be of

the highest accuracy by putting the earth curvature into consideration. Furthermore, surveying can be subdivided into some other branches which include:

1. Topographic surveying
2. Hydrographic surveying
3. Engineering surveying
4. Aerial photograph and remote sensing.
5. Mining surveying
6. Cadastral surveying
7. Photogrammetric surveying

TOPOGRAPHICAL SURVEYING: - This IS the surveying made for the production of the topographical maps that show natural and man-made features that are presents on a pieces of land and it, shows both the contour lines to illustrate the height or the terrain of the land.

HYDROGRAPHICAL SURVEYING: - These are surveys of water

bodies particularly the sea, made for the purpose of showing depth of water, points, the nature of the bottom, amounts, of store homes where edge of water merges with dry land nor earth light and house beacons. ENGINEERING SURVEYING: - It involves the preparation of a topographical map generally on it is large scale and such maps from the basis for the design of engineering works such as roads, dams, factories, it is also coming out with the special object of supplying particular information for engineering projects usually at large scale than that used for the normal topographic map.

AERIAL AND REMOTE SENSING SURVEYING: - It is defined as the

science and art of obtaining information about object area or phenomenon through the analysis of data acquired by a device that is not in contact with the object, area or phenomenon under investigation.

MINING SURVEYING: - This consists of the specialized techniques required determine the position of underground resources.

CADASTRAL SURVEYING: - This is the survey made for the purpose of producing plan showing property boundaries or plan on which area necessary for assessment of property or land taxes may av be computed. PHOTOGRAMMETRY SURVEYING: - This is the art, science and

technology of obtaining reliable information about physical object and environment through the process of recording, representation of energy pattern derived from non-contact sensor systems.

For The purpose of the project assignment cadastral layout survey will be treated as a subject in this project given

Cadastral layout survey is the actual survey operation carried out in marking on ground and marking all necessary measurement to obtain coordinate of layout plots and all details in a layout plan. In other word it could seen as the setting out of layout plan.

Therefore, cadastral layout surveying can be defined as an aspect of proportion survey carried out on a large area of land owned by an individual, authority or cooperated bodies for the purpose of utilizing it for a specific purpose (Chandra, 2006).

cadastral survey plan showing landed property and boundary together with details in it, accurately defined by a survey points permanently marked on the ground. In this case the survey has a legal force. (Basal,

2005).

1.2 STATEMENT OF PROBLEM

The landed property is always a subject of dispute. For this reason, government, individuals, firms, association or corporate bodies need to know the extent of their property. This brought about this project which is the cadastral layout survey which could be served as base map for the future planning and development of the site.

1.3 STUDY AREA

The project site is located at Kwara State Polytechnic (Old IES institute, village), Ilorin Kwara State of Nigeria having a latitude of N 8° 28'

55.4196" and Longitude of E 4° 31' 34.4208".

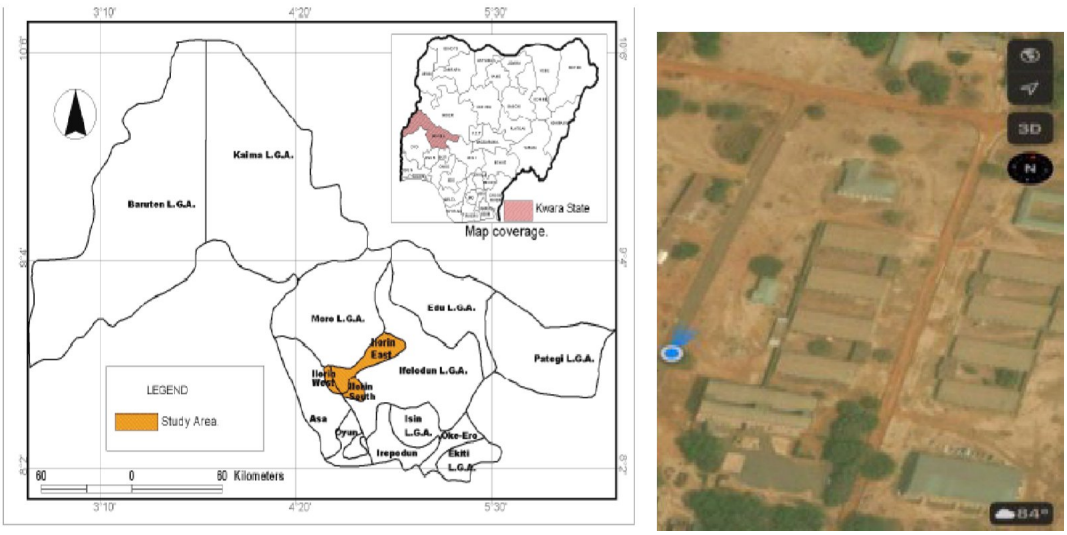


fig 1. Image showing study area

1.4 AIM AND OBJECTIVES

1.4.1 AIM

The project is aimed at carrying out cadastral layout survey of part of the

Kwara polytechnic, (Village area) ilorin, Kwara state.

1.4.2 OBJECTIVES OF THE STUDY

These are the step-by-step activities carried out in order to achieve the aim. The objectives of the project exercise include

1. Third order total station traverse
2. Perimeter leveling
3. Computation
4. Plan production
5. Report writing

1.5 SIGNIFICANCE OF THE STUDY

Cadastral survey provides a foundation for effective land management and administration, ensuring accurate property boundaries, facilitating land transactions, and resolving ownership disputes. It clarifies ownership rights, improves land use planning, and enables the creation of a reliable land information system

1.5 SCOPE OF THE PROJECT

The scope or the project assignment covered the following

• Reconnaissance

2. Control check
3. Test of instrument
4. Selection of station
5. Third order survey
6. Detailing by chain survey
7. Data processing or computation
8. Data presentation
9. Subdivision of plot

1.6 PERSONNEL

The under listed names are the member of the group who participate immensely in project given

NAME	MATRIC NUMBER
AMUPITAN DUPE BLESSING	ND/23/SGI/FT/0085
YUSUF RUKAYAT OLAJUMOKE	ND/23/SGI/FT/0084
ATEKOLU FAITH IYANUOLUWA	ND/23/SGI/FT/0087
IBRAHIMADENIKE JANET	ND/23/SGI/FT/0083
ALATISE YUSUF OLATUNJI	ND/23/SGI/FT/0082
ABDUL-RAHMAN ABDUL-QUYUM OLAMIDE	ND/22/SGI/FT/0038
AFOLAYAN CHRISTIANAADENIKE	ND/23/SGI/FT/0079

CHAPTER TWO

LITERATURE VIEW

Surveying is as old as civilization. It began in this world long ago, to say Egypt in particular. The Egyptians used stones to mark boundaries of

their farmland, along the NILE valley, but the boundary stone were often shifted away later. This led to proper demarcation of boundaries by surveying method(Jame,1967).

Surveying, being as old as man, may defined as the science of determining the position in three dimensions of natural and man-made features on or beneath the surface of the earth. These features may be represented in the analogue form as a contoured map, plan or chart, or in digital form such as a digital ground model (DGM). (Schofield, 2007).

Surveying is defined as the science and art of making measurements of relative positions of points above, on or beneath the earth surface and plotting of these measurements to a suitable scale to form map, plan or chart (Ramsay, 2000). Furthermore surveying can also be referred as the art of determining the relative position of distinctive features on the earth's surface or beneath the surface of the earth by means of measurement of distances, directions and the plotting of the measurement to a suitable scale to form a plan and map or section (Agor 2002). Today the importance of measuring and monitoring our environment is becoming increasingly

o o
critical as our p pulati n expands, land values appreciate, our natural resources dwindle, and human activities continue to stress the quality of our land, water, and air. Using modern ground, aerial and satellite technologies, and computers for data processing, contemporary surveyors are now able to measure and monitor the Earth and its natural resources on literally a global basis. Land is a solid part of the earth's surface. It is the foundation of all forms of human meaningful developmental activities. It is man's most valuable resource without which man could never exist and on which his continued existence and progress depends upon (Adeoye, 1998). Surveying, which is also interchangeably called geomatics, has traditionally been defined as the science, art, and technology of determining the relative positions of points above, on, or beneath the Earth's surface, or of establishing such points. In a more general sense, however, surveying (geomatics) can be regarded as that discipline which encompasses all methods for measuring and collecting information about the physical earth and our environment, processing that information, and disseminating a variety of resulting products to a wide range of clients. Cadastral Layout Survey , is the process of interpreting construction plans and marking the location of proposed new structures such as roads or buildings. Cadastral layout survey is the actual survey operation carried out in marking on the ground and marking all necessary measurements to obtain coordin te of layout plots and all details in layout plan. In other w rd it c uld b s e e n as the setting out of a layout lan.

2.1 OBJECTIVE OF CADASTRAL LAYOUT SURVEY

The followings are the aims or purpose of cadastral layout:

(a) To make out design plans on the use of available lands

(b) To ease administration of land in such ways

(I) It enables proper allocation of land to citizens or cooperate body for development

o o e

(ii) To enable government collect taxes from land owners

(iii) To Enables government control land development.

2.2 PREPARATION FOR CADASTRAL LAYOUT

Basic procedures: The following steps are normally taken in carrying out if a cadastral layout surveys.

(a) Planning: This is the act of knowing what exactly the survey to be carried out involves. The surveyor ascertain the provision of initial controls for orientation, getting adequate equipments to be used and the costing of the entire job.

(b) Reconnaissance: The surveyor visits the site, I.e the land marked for development in order to have a good picture of the site. As he/she goes over the land, he/she mark out points on ground in the perimeter of the land, that would enafieldroper survey of the area. Other points that would later serve as c ntrol c uld b established and traversed.

(c) Fieldwork: A tertiary theodolite is run over established perimeter points. Other selected points are traversed to make the area sufficiently provided with controls for the setting out. In addition details found on ground are survey as well.

(d) Computations and plotting: After the fieldwork, all necessary reduction of field data and computations are done in the office. Therefore a plan of the area is drawn up showing all necessary details like scale, north point and existing access routes. Its the drawn up plan that is used for layout design needed to develop the area.

2.3 BASIC EQUIPMENT FOR CADASTRAL LAYOUT SURVEY

They are:

o o e

(I) Theodolite and its tripod

(ii) compass and it's tripod

(iii) Tapes

(iv) Ranging poles

(v) Cutlass

(vi) field books and writing pen

(vii) wooden pegs

Note: Field assistances are needed to work with the surveyor.

2.4 LAYOUT DESIGN

Layout design of a surveyed are normally called a base map form the

basis for layout design. Befor embarking on layout design,the su veyor needs to work with a town planner. The design is aimed at providing space for roads,building plots, social space,market,religion centres, schools and industrial area on the base map. In doing this, a working knowledge of the following is necessary:

(1) Width specification for roads

(2) Minimum or maximum size specification of building plots including provision for building line regulation in low,medium and high density

areas.

(3) Maximum and minimum distance to social center.

CHAPTER THREE

3.0. METHODOLOGY

These are the methods and techniques that we employed in the execution of the survey project in relation to the survey rules and regulations.

3.1 RECONNAISSANCE

This is the initial operation or preliminary investigation undertaken by my survey crew in order to have a general overview of the physical features and terrain of the project site before the commencement of the real survey. Reconnaissance connotes one's description to ensure successful execution of the project. It is carried out in two stages namely

(a) Office planning

(b) Field reconnaissance

3.1.1 FIELD RECONNAISSANCE

This is the first visitation to our project site in order to have an overview of our project site. We walked round the site in order to have a general view of both the physical features and also the terrain of our project site. We also drew our recce diagram, and we selected the suitable number of station points that will be required for the project in such a way that they will be inter visible to each other. We use a differential GPS to pick the coordinates of all our station points and we search for existing monument around our project site. After se rching for this monuments, we write down th numbers on them, finally recce diagram was drawn no to scale.

3.1.2 OFFICE PLANNING

The relevant maps in the department were checked in order to get information's about the site. The coordinates of the nearby control points were also obtained from the Ministry of lands and survey Department.

These are the information of the controls within the project site. Table 3.1 shows the coordinates of the existing monuments that was found around our project site

PILLAR NO	EASTERN	NORTHERN
Pillar 1	678924.506	946917.784
Pillar 2	679052.529	946908.475
Pillar 3	679030.412	946759.687
Pillar 4	678902.389	946768.996

3.2 INSTRUMENTATION

This deals with the selection of the suitable instrument which will be required in carrying out the survey project. The instruments that were used are of two components:

- Hardware components
- Software components

3.2.1 HARDWARE COMPONENTS

The hardware components that was used when carrying out the survey project include the following:

e

equipm nt used in the execution of the project is listed below

- Total station with its tripod
- Reflector
- Target with their Tripods
- Plumb Bob
- Linen Tape (100m)
- Nails, with Bottle Corks and pegs
- Field book and pen

3.2.2 SOFTWARE COMPONENTS

The software components that were used when carrying out the survey project include the following:

- Ms word/ excel 2013
- AutoCAD 2007
- Notepad
- Ts link

3.3 INSTRUMENT TEST

All instrument used in carrying out the project were tested before the field operation was carried out in order to obtain a desired result that will comply with the planning so as to obtain the required accuracy.

3.4 COLLIMINATION TEST

The following test was carried out to test the workability of the equipment before the data capturing process. The tests are of two types which ar

i. Temporary Adjustment ii.

Permanent Adjustment

TEMPORARY ADJUSTMENTS: These are the ones that are carried out on every station before observation. They are;

i. Centering of instrument ii.

Removal of parallax

PERMANENT ADJUSTMENTS: The permanent adjustment are the following

1. Collimation adjustment
2. Vertical Index adjustment

3.5 PROCEDURE FOR COLLIMATION AND VERTICAL INDEX ADJUSTMENT

The instrument was set up on station which is pillar 1 and all necessary temporary adjustments were done. A target was set up at Pillar 1 to the line of site. It was aimed and bisected. The instrument was switch on and program which is on-board of the instrument was switch to the collimation program. Then, horizontal collimation and vertical index were in sequence recorded and stored in the memory of the instrument. The telescope was transited and the same target bisected. Both the new vertical index and collimation were recorded and stored accordingly. It was transited to the same target with both horizontal and vertical readings recorded to check the instrument's accuracy.

3.6 DATAACQUISITION

Data acquisition is the next stage after reconnaissance. This was done on the site and it includes the determination of bearing and distance between two points (i.e. linear measurement) and the coordinating of each station using total station.

3.7 CONTROL CHECK

Control check has to be carried out in order to know and also to ascertain if the pillars that we want to use for orientation is still in their original position. Before embarking on angular measurement, control check and observation was carried out on the control pillars. The total station was set on PILLAR 2 and all the necessary temporary station adjustment were carried out. Targets were also set up on PILLAR 1 and PILLAR 3

respectively.

Target on PILLAR 1 was back sight to obtain the horizontal circle reading on face left and reading were recorded, the theodolite was transited to face right and the horizontal circle reading was obtained. Also, target on PILLAR 3 was focused and bisected on foresight, the same process is repeated, but in this case the horizontal and vertical circle reading was taken both on face left and face right. All readings taken were booked in the field book

Table 3.2 observed controls

PILLAR NO	NORTHING (m)	EASTERN (m)
Pillar 1	946917.784	678924.506
Pillar 2	946808.475	679052.529
Pillar 3	946759.687	679030.412

3.3 show the results of our control check

PILLAR NO	REMARK	NORTHING	EASTING
Pillar 1.	Given	946917.784	678924.506
	Observed	946917.782	678924.502
	Difference	0.002	0.004
Pillar 2	Given	946808.475	679052.529
	Observed	946808.471	679052.527
	Difference	0.004	0.002
Pillar 3	Given	946759.687	679030.412
	Observed	946759.685	679030.410
	Different	0.002	0.001

3.6. FIELD OBSERVATION

This are the measurement and observation made on site. These include the following

1. Angular measurement
2. Linear measurement

3.6.1ANGULAR MEASUREMENTS (PERIMETER TRAVERSING)

This is to establish a boundary points on the surface of the earth by taking the bearing or angles between successive lines and their distances so as to detine the points with coordinates value on a plane form. The angles were observed on two zeros as this was the specification for a third order traverse. Having set the theodolite on and targets were set on as back station and PEG as fore station. All temporary adjustments were carried out i.e. (centering, leveling, and focusing). The back station was observed on a face left and the horizontal circle was read and recorded, the instrument was rotated clock wisely to fore station on face left, the horizontal circle and vertical circle was read and recorded. The instrument base was changed by locking the horizontal screw and turned it 90 degree and unlocked the horizontal circle reading screw, the base was been changed on every station in order to make the readings independent of each other.

The instrument was then transited to face right and bisected the fore station where both the horizontal and vertical circle readings were taken and recorded. It was tumed clock wisely to the back station, and the horizontal circle reading was read and recorded, this gave a complete set of r adings and observation. The process was repeated on other stations until it got to the last of the boundary line and close back on one of the

controls.

3.6.2 LINEAR MEASUREMENT

The linear measurement was carried out with use of ranging poles placed in between the theodolite and the target station (ie travers line) at the tape length and those poles was properly aligned with the instrument in order to have perfect straight line before taken the measurement with the steel tape. These direct measurement was taken and recorded in the filed book. The process continued at every instrument station until the

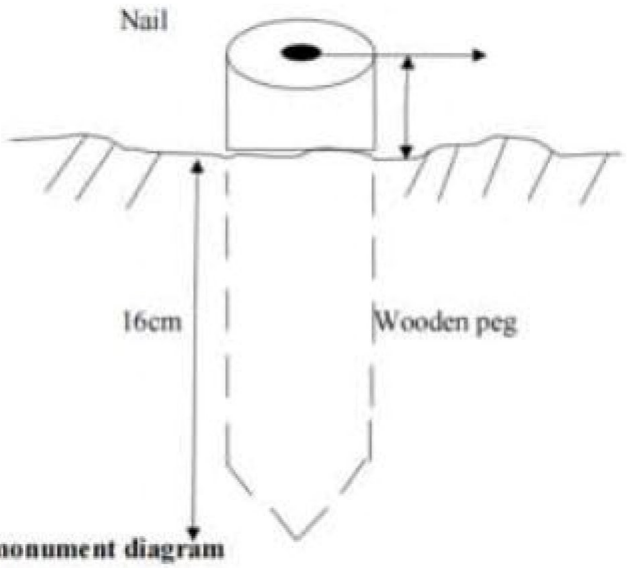


Fig 3.2 typical monument diagram

last travers line was measured. Hence, all the measurement recorded were later corrected with the slope correction to obtain the horizontal distance.

3.7 MONUMENTATION

This is the production of pillars for the selected points before being coordinated and this was carried out along the boundary of the area to be surveyed for precise demarcation. Monumentation is the art of defining any elected station of spot with structure like pillaring stone or pegging during the execution of any survey work or project. The dimension and length driven into the ground are shown below

3.8 TRAVERSING

Total station was set up on the control, switched on and all temporary adjustments were carried out. Then, “Job” was set in the instrument, height of instrument and reflectors were measured with steel tape and stored in the instrument’s memory, and coordinates of the control stations were recalled from the instruments’ memory, it was bisected for orientation, and Total station was instructed to compute the bearing between the two stations which was confirmed with a prismatic compass. One of the reflectors was taken to pillar, the reflector’s cross hair was bisected with that of the telescope eye piece of the total station and “All” key was pressed so as to measure and

record observation in the memory of the instrument. The above stated processes were carried out to coordinate the entire boundary points in X, Y, Z. The above process was rep ated for other blocks shown on the plan including subsidiary traverses.

3.9 LAYOUT DESIGN

After we have carried out the perimeter traverse of the boundary pillars, we plotted the coordinates gotten from site on AutoCAD. After plotting it on

AutoCAD, we use this perimeter to design a Layout plan.

The following factors are the steps followed when designing the layout plan:

1. Plot the coordinates of the perimeter on AutoCAD
2. Draw a line from boundary Pillar one to boundary Pillar two using the line or poly line tool.
3. Use the offset tool to offset a distance of 30.50 to define one line of the boundary of a plot.
4. Draw another line from boundary pillar six to boundary pillar one using the line or poly line tool.
5. Use the offset tool to offset a distance of 30.5 meter to define the other boundary line.

The same procedure was followed until the layout plan was designed

successfully.

3.10 SETTING OUT

After the layout plan has been designed, we went back to site to set out each plots and blocks using the coordinate that we got from our layout design soft copy on AutoCAD drawing, with the use of a Total Station.

The corner piece of each plots and blocks was pegged using bottle corks and nails.

3.11 DATA DOWNLOADING, EDITING AND PROCESSING

This explains the method in downloading, retrieving, sorting and analyzing of the acquired data (field data). Here, the data is being downloaded from the total station to a computer system and processed into information using the appropriate method and software.

The following software was used in the downloading, editing and processing of the data acquired from site:

- TS Link: This software was used in downloading the acquired data unto a personal computer.
- Microsoft Excel: This software was used in the editing of the downloaded data.
- Notepad: This software was used in the rearrangement of the edited data.
- Auto Cad: This software was used in the plotting and processing of the edited data.

3.12 DATA DOWNLOADING AND EDITING

This is the process of copying the data acquired from site unto a computer system. The acquired data was copied from the internal memory of the total station unto a memory card and then transferred unto a computer syst m via a card reader.

3.12.1 STEPS TO FOLLOW WHEN DOWNLOADING THE DATA

- Insert a memory card into the total station and copy the job file into the memory card.
- Install the downloading software on the computer system, I.e TS Link
- Insert the memory card into the computer system via a card reader
- Launch TS Link
- Go to import
- Save the file with a desired name in the XLS format (I.e Group2)
- Close TS link
- Launch Microsoft excel
- Press control O to open (an open file dialogue box will display)
- Search and click on your file with the name that you use to save it.
- Click on open
- Rearrange and edit your data by putting each data in the right column and row.

3.13 DATA PROCESSING

The data was processed with AutoCAD using the following processes:

- Launch your AutoCAD
- Go to format
- Select unit (set unit dialogue box will display)
- Set the unit according to the specifications of the job

3.14 COMPUTATIONS

Computation can be said to be calculations of one kind or another from a large part of the work of surveying and the ability to compute with speed and accuracy is an important qualification for the surveyor

Computation comes up after field work and is very important in survey work because it serves as the final information shown on plan.

The various computation procedures carried out in this project are analyzed as follows.

- Back computation
- Area computation

3.15.1 BACKWARD COMPUTATION

This was carried out by making use of the final adjusted coordinates and deducting them accordingly in order to obtain the delta northing (ΔN) and delta easting (ΔE).

The ΔN and ΔE were then computed to get the final bearing and distance of the station point thus;

Bearing of line = $\tan^{-1}(\Delta E/\Delta N)$

Distance (L) = $\sqrt{(\Delta E^2 + \Delta N^2)}$

The back computation was done in order to have final bearing and distance of the boundary lines. The below formulae was used

ΔN is difference in northing (m)
ΔE is difference in easing (m)

ΔN = N2-N1, N3-N2 etc.

ΔE = E2-E1, E3-E2 etc.

Tab: 3.4: Back computation of the control used

STATION FROM	BEARING	DISTANCE	ΔN	ΔE	NORTHING	EASTING	STATION TO
					946917.784	678924.506	Pil.1
Pil.1	170°22°48	127.08	-9.309	128.023	946908.475	679052.529	Pil.2
Pil. 2	00°35°14	150.42	-148.788	-22.117	946759.687	679030.412	Pil.3
Pil.3	170°22°43	128.36	9.309	-128.023	946768.996	678902.389	Pil.4
Pil. 4	04°03°66O	150.42	148.788	22.117	946917.784	678924.506	Pil.1

3.15AREA COMPUTATION

Area computation using double latitude and departure:

128.023

128.023. X -9.309. =.

-1191.766107

_____

256.046

-22.117

_____

233.929

-22.117. X. -148.788. =.

13290.7444196

_____

211.812

-128.023

_____

83.789

-128.023. X. 9.309. =.

-1191.766107

_____

-44.234

22.117

_____

-22.117

22.117. X. 148.788. = 3290.7444196

_____

0.00

Sum of (+) - Sum of (-) ÷. 2

6581.488392 - 2383.532214 ——————————————————. =. 4197.936178 ÷ 2

2

2098.97809

——————. =. 4.5127 hectares

465.165

LINEAR ACCURACY

The linear accuracy was computed using:

Starting Northing = 946321.8072

Closing Northing = 946321.8070

Misclosure in Northing = 0.002

Starting Easting = 679689.6697

Closing Easting = 679689.6696

Misclosure in Easting = 0.001

Total distance =556.280m

Linear Accuracy = 1

$$\frac{1}{\frac{\sqrt{\Delta E^2 + \Delta N^2}}{\text{Total distance}}}$$

Linear Accuracy = $1 \div \sqrt{(0.002^2 + 0.001^2)} \div (556.280)$

Linear Accuracy = $1 \div \sqrt{0.000004 \times 0.000001} \div 556.280$

Linear Accuracy = 1 x 556.280/0.00224

Linear Accuracy = 1: 248,348

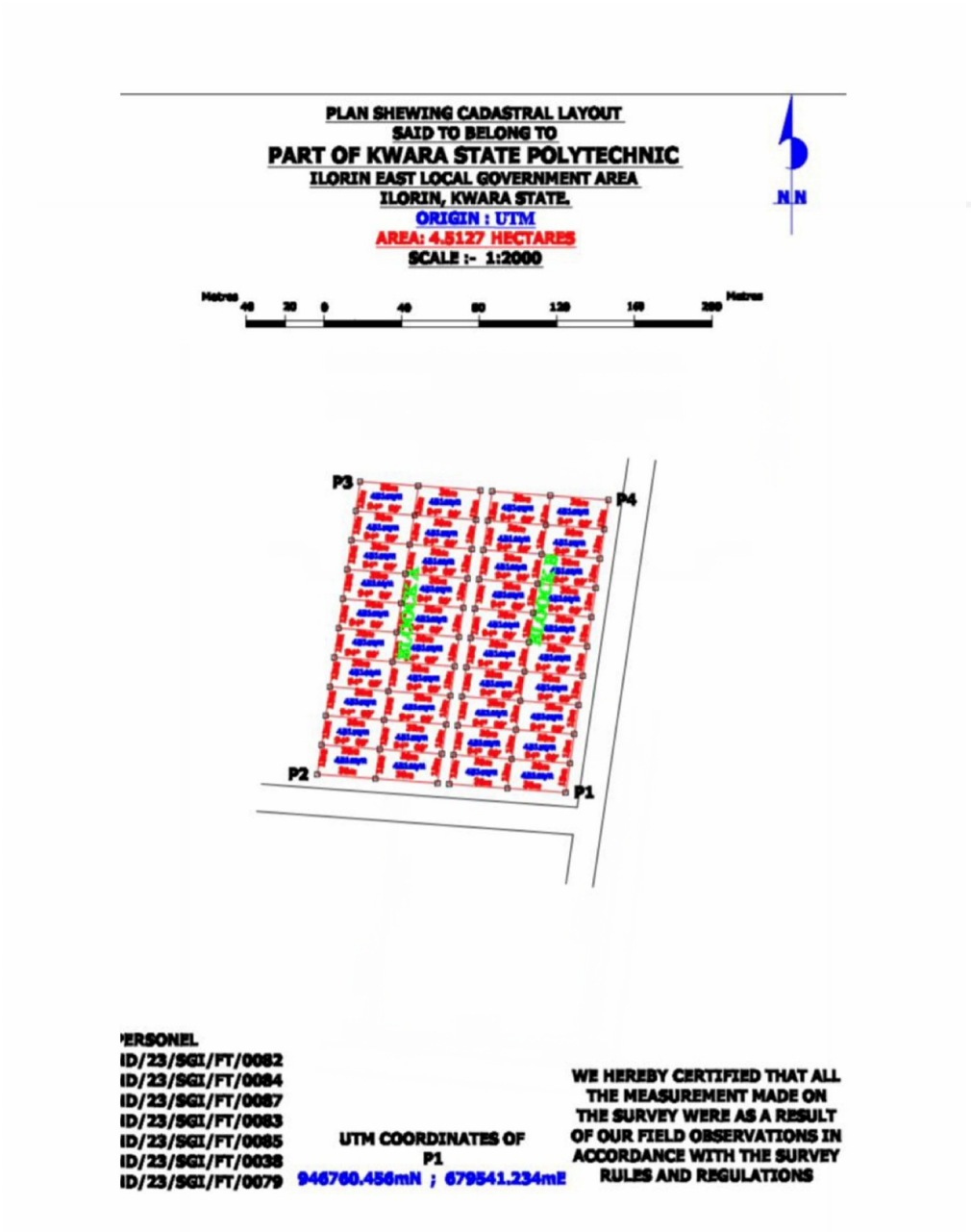
CHAPTER FOUR

4.0 INFORMATION PRESENTATION AND RESULT ANALYSIS

This is the presentation of the acquired data graphically to produce a map or plan i.e. representation of the data acquired on site a paper. The plotting was done using AutoCAD software and using a suitable scale in order to minimize error. The following plans were produced for this project:

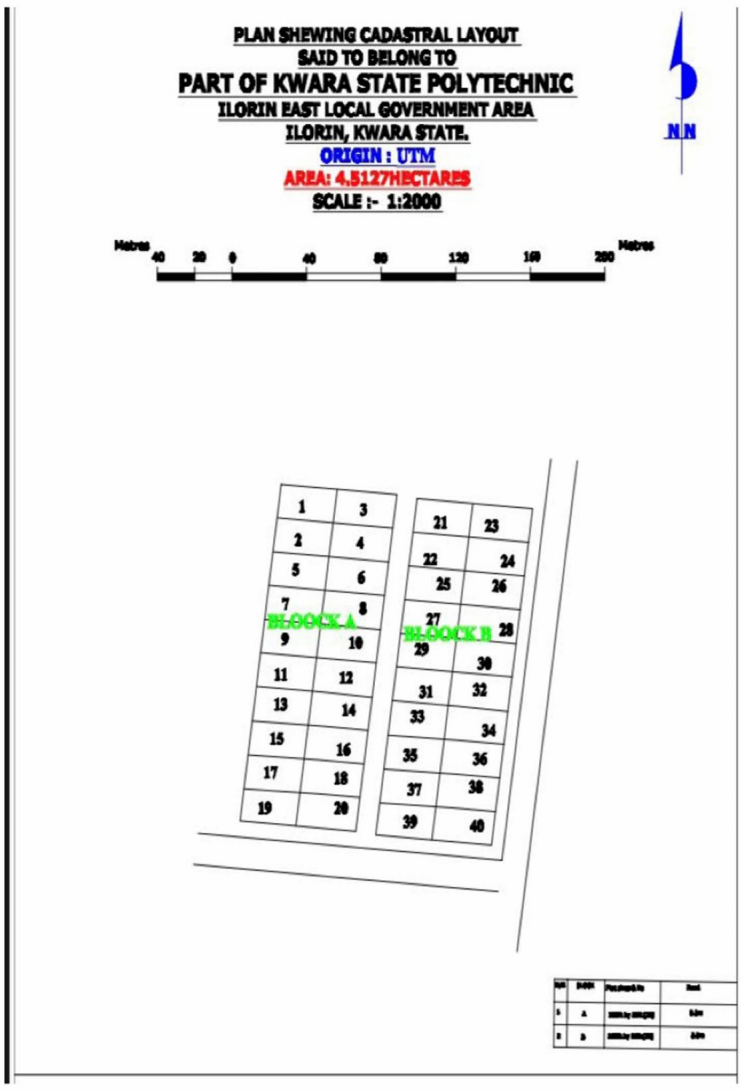
- **Perimeter plan**

Design layout plan



PERSONEL
ND/23/SGI/FT/0082
ND/23/SGI/FT/0084
ND/23/SGI/FT/0087
ND/23/SGI/FT/0083
ND/23/SGI/FT/0085
ND/23/SGI/FT/0038
ND/23/SGI/FT/0079
UTM COORDINATES OF
P1
946760.456mN ; 679541.234mE
WE HEREBY CERTIFIED THAT ALL THE MEASUREMENT MADE ON THE SURVEY WERE AS A RESULT OF OUR FIELD OBSERVATIONS IN ACCORDANCE WITH THE SURVEY RULES AND REGULATIONS

Design layout plan Perimeter Plan Layout Plan



4 .4ANALYSIS OF RESULT

After the completion of the project, the following were discovered The length of the longest Traverse line was found to be

30.000meters.

- The length of the longest boundary line is 189.580 meters
- The length of the shortest boundary line was found to be 128.360 meters
- The total boundary line is 468.350meters There are 40 plots in the layout design.
- There are 2 blocks in the layout design.

S/N	BLOCK	PLOT NO.	DIMENSION	USES
1	A	20	30 by 15	RESIDENTIAL
2	B	20	30 by 15	RESIDENTIAL

4.5 APPLICATION OF THE PROJECT

1. It can be used to provide information for cadastral information system (CIS)
2. It can be used in the designing and management of an estate
3. It can be used in the planning and positioning of public utilities

CHAPTER FIVE

5.0 SUMMARY, RECOMMENDATIONS AND CONCLUSION

5.1 SUMMARY

The overall intent of this project was to carry out layout survey of. It was carried out in five phases which includes; Decision making, field work and data acquisition, computing and data processing, mapping or data presentation and staking.

In the decision making stage, we carried out reconnaissance (i.e. office and field recce), Instrument selection and monumentation which involves the burying of boundary beacons.

In the second phase which is the field work and data acquisition stage; we carried out control check to check the Accuracy of our control beacons, perimeter traverse of the boundary to know the bearing and distance between two boundary pillars and also know the area of our

land.

During computing and Data processing, we plotted the coordinate of our boundary pillars on AutoCAD and use this to design a layout plan. We also carried out a back computation of the coordinate of our boundary pillars to determine the bearing and distances between each boundary

pillars.

In the mapping and data presentation phase a perimeter plan as well as a layout plan of the project site was drawn to scale and produced in a graphical form on the screen of the desktop (soft copy) and on paper

(hard copy).

5.2 CONCLUSION

After the completion of the survey project, in which I was able to know the importance of surveying; I hereby conclude that surveying is truly the bedrock of any meaningful and physical development.

5.3 RECOMMENDATION

I suggest that this project layout survey should be recommended at various level of education across all institutions of the Federation because it covers a wide aspect of surveying.

5.4 PROBLEM ENCOUNTERED

The following are the problems that we encountered during the course of carrying out the survey project:

i. The Project area was very busy due to students passing which make it difficult to carry out chaining and ranging.

ii. Battery problems iii. Weather condition

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APPENDIX

S/N	Name	EASTINGS	NORTHINGS	Elevation
1	BOUNDARY	679689.6697	946321.8072	344.737
2	BOUNDARY	679867.2706	946332.5084	338.481
3	BOUNDARY	679836.9161	946009.5247	328.57
4	BOUNDARY	679753.4595	946013.8892	325.71
5	BOUNDARY	679689.6696	946321.8070	344.737
6	building 1	679758.3199	946239.6285	339.655
7	building 1	679754.0584	946248.2372	340.917
8	building 1	679751.6044	946257.1406	341.958
9	building 1	679751.0111	946266.071	342.848
10	building 1	679751.84	946272.5484	343.452
11	building 1	679752.5504	946279.2649	344.084
12	building 1	679756.373	946287.4998	344.24
13	building 1	679758.5809	946289.9115	344.164
14	building 1	679769.1982	946282.3176	343.997
15	building 1	679772.7535	946286.0644	343.954
16	building 1	679777.6371	946290.1331	343.867
17	building 1	679771.5497	946302.257	343.803
18	building 1	679777.5857	946306.1653	343.609
19	building 1	679783.3999	946308.012	343.418
20	building 1	679789.1446	946309.2807	343.223

21	building 1	679794.4269	946309.9525	342.998
22	building 1	679799.0885	946309.6896	342.702
23	building 1	679803.3413	946308.4945	342.464
24	building 1	679808.4187	946307.1695	342.176
25	building 1	679813.4171	946305.1017	341.918
26	building 1	679819.012	946302.1356	341.65
27	building 1	679812.4001	946291.0014	342.447
28	building 1	679816.421	946286.8691	342.32
29	building 1	679820.6745	946281.3827	342.135
30	building 1	679831.8642	946290.2621	340.809
31	building 1	679835.5142	946282.6738	340.455
32	building 1	679838.069	946272.3183	339.173
33	building 1	679838.2668	946259.0286	337.856
34	building 1	679836.4814	946250.6885	337.259
35	building 1	679833.8305	946244.6108	336.735
36	building 1	679831.1605	946239.5733	336.202
37	building 1	679816.6965	946247.999	338.847
38	building 1	679820.0339	946254.9496	339.603
39	building 1	679820.8171	946254.7962	339.536
40	building 1	679822.0947	946262.2651	340.18
41	building 1	679820.5884	946270.8698	341.117
42	building 1	679817.4956	946269.2894	341.166

43	building 1	679815.8686	946272.5317	341.589
44	building 1	679819.1249	946273.6813	341.487
45	building 1	679816.5874	946278.4029	342.113
46	building 1	679817.5342	946279.2441	342.133
47	building 1	679814.3391	946283.5737	342.564
48	building 1	679810.4911	946287.4991	342.686
49	building 1	679809.6176	946286.5275	342.775
50	building 1	679803.9264	946289.199	343.059
51	building 1	679802.2451	946285.8992	343.277
52	building 1	679800.9507	946287.0649	343.323
53	building 1	679799.8563	946283.9055	343.498
54	building 1	679788.7321	946284.0438	343.941
55	building 1	679788.6766	946287.2623	343.852
56	building 1	679786.7179	946286.5174	343.882
57	building 1	679786.239	946288.5162	343.833
58	building 1	679780.4642	946286.8041	343.906
59	building 1	679775.0716	946283.2198	343.982
60	building 1	679772.591	946278.6304	343.685
61	building 1	679769.8845	946273.4195	343.178
62	building 1	679767.2588	946267.1929	342.571
63	building 1	679767.0885	946261.7676	342.041
64	building 1	679768.529	946257.1642	341.591

65	building 1	679772.4921	946248.9724	340.697
66	building 1	679758.3199	946239.6285	339.655
67	Building 2	679809.2008	946159.8356	331.519
68	Buiding 2	679836.2177	946156.6682	332.814
69	Building 3	679834.493	946148.1748	332.786
70	Buiding 3	679822.4431	946149.1084	331.939
71	Building 4	679820.1202	946136.1967	331.861
72	Buiding 4	679818.7907	946136.3144	331.818
73	Building 5	679817.7585	946127.5583	331.736
74	Buiding 5	679804.8213	946130.1726	331.36
75	Building 6	679806.5455	946142.7069	331.418
76	Buiding 6	679808.3784	946142.4018	331.478
77	Building 7	679810.2956	946152.2459	331.542
78	Buiding 7	679808.6372	946152.6542	331.488
79	Building 8	679809.2008	946159.8356	331.519
80	Building 3	679802.8657	946114.6229	329.899
81	Building 3	679829.3391	946111.5289	331.927
82	Building 3	679827.8265	946102.9828	331.497
83	Building 3	679814.9486	946103.2833	330.103
84	Building 3	679813.5298	946091.3448	329.427
85	Building 3	679811.8001	946082.8932	329.048
86	Building 3	679798.9538	946084.1242	327.577

87	Building 3	679800.7379	946097.3062	327.887
88	Building 3	679802.3153	946097.0327	328.09
89	Building 3	679803.1671	946105.8429	329.036
90	Building 3	679801.6358	946106.0694	328.9
91	Building 3	679802.8657	946114.6229	329.899
92	Building 3	679807.8708	946063.5886	328.243
93	Building 3	679820.3459	946063.1333	329.45
94	Building 3	679818.552	946038.8352	328.473
95	Building 3	679815.6336	946038.9352	328.191
96	Building 3	679815.333	946035.6134	328.058
97	Building 3	679806.5148	946036.0432	327.206
98	Building 3	679807.8708	946063.5886	328.243
99	ROAD	679946.873	946416.9322	344.395
100	ROAD	679942.5288	946319.3159	338.936
101	ROAD	679942.9514	946306.0933	338.841
102	ROAD	679939.9772	946261.4289	338
103	ROAD	679939.2729	946250.2778	337.988
104	ROAD	679936.4643	946162.2438	332.14
105	ROAD	679933.2067	946068.2955	329.053
106	ROAD	679931.1386	946058.0657	328.547
107	ROAD	679922.4327	946047.3285	328.218
108	ROAD	679904.9415	946031.8502	328.127

109	ROAD	679888.859	946016.142	328.181
110	ROAD	679876.7743	946005.5703	328.304
111	ROAD	679864.2774	946003.9128	328.713
112	ROAD	679851.6946	946005.1916	328.874
113	ROAD	679879.7872	946219.6083	335.648
114	ROAD	679866.284	946219.3512	334.765
115	ROAD	679840.2961	946006.1511	328.528
116	ROAD	679750.7762	946010.0987	325.648
117	ROAD	679710.6536	946010.4876	326.351
118	ROAD	679698.1536	946010.084	326.546
119	ROAD	679699.9083	946000.5936	326.019
120	ROAD	679751.6689	945999.8135	325.255
121	ROAD	679812.7895	945996.5089	327.145
122	ROAD	679833.2029	945995.9048	328.039
123	ROAD	679860.5739	945992.6894	328.836
124	ROAD	679870.738	945990.6243	328.504
125	ROAD	679882.5648	945986.1462	328.117
126	ROAD	679890.1578	945977.8901	327.504
127	ROAD	679901.2523	945966.683	326.031
128	ROAD	679907.4198	945957.4686	325.455
129	ROAD	679915.1517	945949.2585	324.977
130	ROAD	679921.6559	945936.8281	325.29

131	ROAD	679919.7576	945920.1658	325.864
132	ROAD	679914.5098	945895.4415	325.898
133	ROAD	679929.1779	945894.5894	326.147
134	ROAD	679930.9026	945930.2429	325.679
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136	ROAD	679926.0888	945949.4934	324.791
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140	ROAD	679941.8332	945931.0376	325.802
141	ROAD	679941.644	945924.3538	326.192
142	ROAD	679940.3207	945894.4703	326.279
143	ROAD	679954.3368	945894.2681	326.359
144	ROAD	679960.1085	945935.9088	326.16
145	ROAD	679963.8932	945942.3845	326.143
146	ROAD	679982.0775	945963.5863	327.03
147	ROAD	679993.1461	945977.7689	327.569
148	ROAD	680019.278	945985.8966	328.45
149	ROAD	680019.5192	945985.8926	328.452
150	ROAD	680049.2592	945985.3466	329.851
151	ROAD	680052.7984	945994.9155	330.765
152	ROAD	680035.8983	945995.2747	329.206

153	ROAD	680021.1428	945998.93	329.071
154	ROAD	680014.553	946000.8285	328.984
155	ROAD	679998.9224	946013.2946	328.691
156	ROAD	679979.8714	946033.5673	328.071
157	ROAD	679965.4018	946049.4666	328.419
158	ROAD	679958.6616	946062.734	329.066
159	ROAD	679959.5686	946094.9526	331.567
160	ROAD	679960.8124	946132.8956	332.923
161	ROAD	679962.2135	946229.3587	338.138
162	ROAD	679966.6673	946409.1306	342.532
163	ROAD	679931.9204	946045.2297	327.91
164	ROAD	679938.595	946053.831	328.233
165	ROAD	679942.537	946052.9746	328.123
166	ROAD	679948.3344	946044.4573	327.538
167	ROAD	679940.406	946045.6251	327.73
168	ROAD	679931.9204	946045.2297	327.91