PERIMETER AND DETAILING SURVEY

OF

PART OF KWARA STATE POLYTECHNIC, ILORIN.

FROM ENGINEERING BUILDING TO GTBANK

BY

LAFIA ISHIAK ALHASSAN

ND23/SGI/FT/0033

SUBMITTED TO:

THE DEPARTMENT OF SURVEYING AND GEO INFORMATICS KWARA STATE POLYTECHNIC, ILORIN.

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF NATIONAL DIPLOMA IN SURVEYING AND GEO-INFORMATICS

JULY,2025

CERTIFICATE

I hereby certify that all the information given in this project was obtain as a result of the observation and measurements, carried out by me in accordance with survey rules, regulation and departmental instructions.

LAFIA ISHIAK ALHASSAN . ____________________

ND/23/SGI/FT/0033 **SIGN AND DATE**

CERTIFICATION

This is to certify that LAFIA ISHIAK ALHASSAN with matriculation number **ND23/SGI/FT/0033** has satisfactorily carried out the survey duties contained in his project under my instruction and direct supervision.

I hereby declare, that he has conducted himself with due diligence, honesty and sobriety on the project.

__________________________ __________________________

SURV. R.O ASONIBANIRE. **DATE**
MRS.S.O ADEOTI
(Project Supervisor)

__________________________ __________________________

SURV. AWOLEYE RAPHEALS **DATE**
(Project Coordinator)

__________________________ __________________________

SURV. AISAU **DATE**
(Head of Department)

__________________________ __________________________

SURV. OPALEYE J.O **DATE**
EXTERNAL EXAMINER

DEDICATION

I dedicate this project first and foremost to Almighty God who has been there right from the beginning to the very point. Special dedication also to my entire supportive parent for their relentless support and compassion toward me during the course of my National Diploma program.

This project is also dedicated to my family and friends may Almighty God be with you all. (Amen)

ACKNOWLEDGEMENTS

All glory, honor and adoration belong to God Almighty, the most high, the most glorious, and the ancient of days who has given me the opportunity to complete my OND program.

My appreciation goes to my amiable Supervisor Mrs. ADEOTI S. O. for his encouragement and motivation as regard the writing of this project, thank you so much ma. May God bless you and your family (Amen).

My appreciation also goes to all lecturers in the Department of Surveying and Geo Informatics, SURV. A. I. ISAU, SURV.BABATUNDE KABIR, SURV. A. O. AKINYEDE, SURV. F. D. BELLO, SURV. ABDUSALAM AYUBA, SURV. B. Y. OGUNTAYO, SURV. R. S. AWOLEYE, SURV. WILLIAMS KAZEEM, SURV. R. O. ASONIBARE, May God bless you all for the love you have shown toward me and to the department at large.

My deepest appreciation also goes to my wonderful and dynamic parent Mr. and Mrs. LAFIA for their support financially, morally, spiritually toward the completion of this program. I pray you shall be rewarded by my success in life (Amen). Also to my brothers and sisters, and the whole family of LAFIA God will reward you all.

Finally, my gratitude goes to all my amiable and dependable friends in surveying and geo-informatics that have stood by me and encourage me throughout my OND program, i pray we shall succeed in all our endeavours in life (Amen),

God bless you all. Thanks.

ABSTRACT

The use of Total station and Geomatic information system techniques especially with high spatial resolution satellite imagery has great capacities for detailing and map revision. These techniques have been used in various time and at different stages to study characteristics of earth's features, monitor natural and physical phenomena and also produce digital mapping of different places. The aim of this project is to produce perimeter and detail survey from total station with Arc GIS and Google Earth image of Maxar image with resolution of 0.6m and groundtruthing information were used to update and produce the digital mapping of Kwara state polytechnic, Ilorin. Data campus was made through Google Earth and digitizing of image by Arc GIS 10.2 while field work was carried out for the purpose of easy identification and collection of all necessary information. The spatial resolution of the image used is 0.6m. the acquired data was processed and analyzed using Arc GIS 10.2 during groundtruthing, identified street names were collected and place on the map with additional information obtained from the existing school guide and also from student for better interpretation of the imageries. The final results obtained were: Geo-database of the school queries of deferent phases and updated digital map of the school.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Surveying has traditionally been defined as the science, art and technology of determining the relative positive of points above, on, or beneath the earth's surface, or of establishing such point (Ghilani and wolf, 2008). In a broad sense, surveying can be regarded as that discipline which encompass 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.

Surveying is a profession with many definitions as applied to it over the years, changing even as the duties of the surveyor had been dynamic over the years. Some years back surveying was defined as the science and art of making reliable measurements of the relief position of features on, above or beneath the earth surface and plotting of these measurements to some suitable scale to form a map, plan or chart (Brinker 1977).

Surveying is the first step for the execution of a construction projects. With the change in time, there has been great development and improvement in the surveying techniques. From the vintage chain surveying to satellite surveying and the modern engineering projects, construction has reached a new modern era of engineering.

Surveying is the branch of engineering that deals with the art and science of determining the relative positions of distinctive features on or beneath the surface of the earth, by measurements of distances, directions and elevations (Agor 2008). There are different branches of surveying such as Geodetic survey, Topographic survey, Hydrographic survey, Mining survey, Photogrammetry and remote sensing, Engineering survey, Cadastral survey which include perimeter and detail survey. Cadastral surveying is the sub field of cadastre and surveying that specializes in the establishment and re-establishment of real property boundaries.

Cadastral survey is the branch of surveying which is concerned with the survey and demarcation of land for the purpose of defining parcels of land for registration in the land registry. It is concerned with land management and more specifically with issues of landownership, measurement delineation of property boundaries. It is survey that creates, mark, define or re-establish the boundaries and subdivision of public land and through this, ownership can be recorded in public register.

Perimeter surveying is a type of property survey that determines the particular boundaries of a parcel of land areas by setting corner markers or monuments, to determine coordinates of these corners, and to obtain boundary and area information required for record, deed descriptions and for plotting parcels of real property. These markers are desirable for public record and to ensure correct title for the rightful owner of the land. Cadastral surveys are usually performed for either re-establishment of existing property boundaries or for the creation of new property boundaries in land division process.

Detailing is a process whereby features on the ground are surveyed and represented by a suitable scale on a plan, regardless of their shape, all objects can be located by considering them as a composition of a series of connected straight lines, with each line being determined by two points.

Detail survey is a survey that a surveyor needs to record all the permanent features on the ground such as:- Buildings, land utilities, Drain, Culvert, Electric Pole, Road, Fence and all the permanent features on the ground for proper assessment of the existing development in the surveyed area or modification of it and usually confined to the boundaries of the parcel of land.

A surveyor is a professional person with the academic qualifications and technical expertise to determine, measure and represent land, three dimensional objects, points fields and trajectories; to assemble and interpret land and geographically related information, to use that information for planning and efficient administration of the land, the sea and any structure thereon.

A surveyor determines the relative positions of natural and manmade features on the earth's surface and records these in a graphical and usable form. He is also involved in the determination of the size, shape and gravity field of the earth using equipment and techniques which can sometimes be highly sophisticated (Fajemirokun1980).

HOW ARE THEY CARRIED OUT?

They are generally carried out using severally instrument such as Total station and theodolites. The data is carried out to the office for analysis and preparation of detail plan are usually useful for engineers and architect who use them in their design and plan. The survey should be carried out by qualified land surveyor who may be assisted by a chain man.

WHEN ARE DETAIL SURVEY NEEDED?

I. When you are planning to constant on extent of building in your land.

II. When you are to locate and record all features and structures.

III. When you want to present information about your land for purpose of a land valuation.

SOME OF THE FEATURES THAT ARE INCLUDING UDED IN A DETAIL SURVEY

• Building outline.

• Height at all major features including, but not limited to ridges height, gutter heights, natural surface and spot height, kerb, drive ways and paths

Information at the cadastral component of the projects,

• Heights and features at neighboring properties include window height or ridge levels and gutter levels it requires more measurement can he taken in relation to be finished Boar level and features

The amount of information required from a detail survey is dependent upon what the survey is being used for. If the detail survey is the complying development, then very minimal information is required. The designer of the extension or new structure may only require a tall development application is required to construct the new features then more information may be required. The amount of information dependent also relies on what the architect or designer may need is important to consult the surveyor prim to works to ensures that all works that are carried out contains the required information. Re-visit to site can be a costly exercise.

The height at all features is compared to Australian insect datum

(AHD), which is especially relevant in floor prone areas. Key stone survey uses the network of surveying marks in New South way to ascertain the relatives* value of all features within the detail survey. A bench mark isplaced either a eat in the kerb or a mail in the kerb which can then be used for construction phase.

It should be noted that which list detail survey provided may be accurate, it still necessary to have the new structure fully set out before construction takes place. The intension of a detail survey is not to locate boundaries corners. For this reason, it is important to engaged a registered surveyor to carry out the works of the survey has been completed. Key stone survey is able to comply with this as are employs a registered surveyor to oversee the detail process. Key stone as part of their wide range of services can provide quality detail surveys with a very test term around.

1.2 Statement of the Problem

There is no adequate up-to-date map of the part of Kwara State Polytechnic. To aid decision making by the management. It has been observed that people find it difficult getting to their destination with all the structure and roads on ground, thus the need for ease of movement for the thousands of people passing the route. A map can provide response to questions like: where a particular road is, where it leads to, the distance and the fastest route or shortest route between two points. This survey will be used for future planning regardless of the type of construction to be carried out. Some other project where the survey will be relevant includes in designing the drainage network, road and also new building. This will definitely affect proper planning and decision making for the management.

1.3 Aim and Objectives of the Project

1.3.1 Aim of the Project

The aim of this project is to carry out perimeter and detail survey of part of Kwara polytechnic Ilorin, The New engineering building to Guarantee trust bank.

1.3.2 **Objectives of the Project**

The following are the objectives of the study;

i. To carry out proper planning and reconnaissance in the office and field respectively.

ii. To carry out traverse and determination of detail features of the survey area using Total station.

iii. Production of a perimeter plan and a detailed perimeter plan of the area.

1.4 Scope of the Project

The scope includes the following:-

I. Reconnaissance

II. Office Reconnaissance

III. Field Reconnaissance

IV. Perimeter Traversing of the project

V. Fixing of the detailed structures (re detailing of the features).

VI. Data Analysis

VII. Data processing

VIII. Traverse connection to established controls.

IX. Perimeter traversing

X. Detailing of features using offset

XI. Data Downloading and Processing

XII. Data editing

XIII. Analysis of result

XIV. Plotting and plan production

1.5 Significance of the study

This study would be of high significance, as it can find applications in the following areas;

- The linear accuracy must not be less than1:500,
- The project fall into 3 order categories of survey job. Hence, disclosure must not be greater than 30° where n refers to the members of static
- The linear measurement should be taken by steel tape and detail with the total station
- The length of each traverse line must not met lines than 250m.
- As it will help to produce a well detailed survey plan
- Building location and facility planning could be well aided.

- Proper planning on the usage of the vacant land.
- Proper planning of drainage system within the case study.

1.6 PERSONNEL

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

S/N	NAMES	MATRIC NO	ROLE
1	LAFIA ISHIAK ALHASSAN	ND/23/SGI/FT/0033	AUTHOR
2	OLAJIDE HANNAH IBUKUNOLUWA	ND/23/SGI/FT/039	MEMBER
3	REMU OLUWASAYO AYOKUNLE	ND/23/SGI/FT/040	MEMBER
4	AREO JOSHUA OLUWASEUN	ND/23/SGI/FT/031	MEMBER
5	ASHAOLU SAMUEL TEMIDAYO	ND/23/SGI/FT/030	MEMBER
6	OGUNBIYI ADENIKE OMOWUMI	ND/23/SGI/FT/037	MEMBER
7	OROKUNLE IDOWU OLUWASUKUNMI	ND/23/SGI/FT/036	MEMBER

1.7 Study Area

The project site is located at Kwara State Polytechnic (The New engineering building to Guarantee trust bank.), Ilorin Kwara State of Nigeria having a latitude of N 8° 28' 55.4196" and Longitude of E 4° 31' 34.4208".

MAP OF STUDY AREA

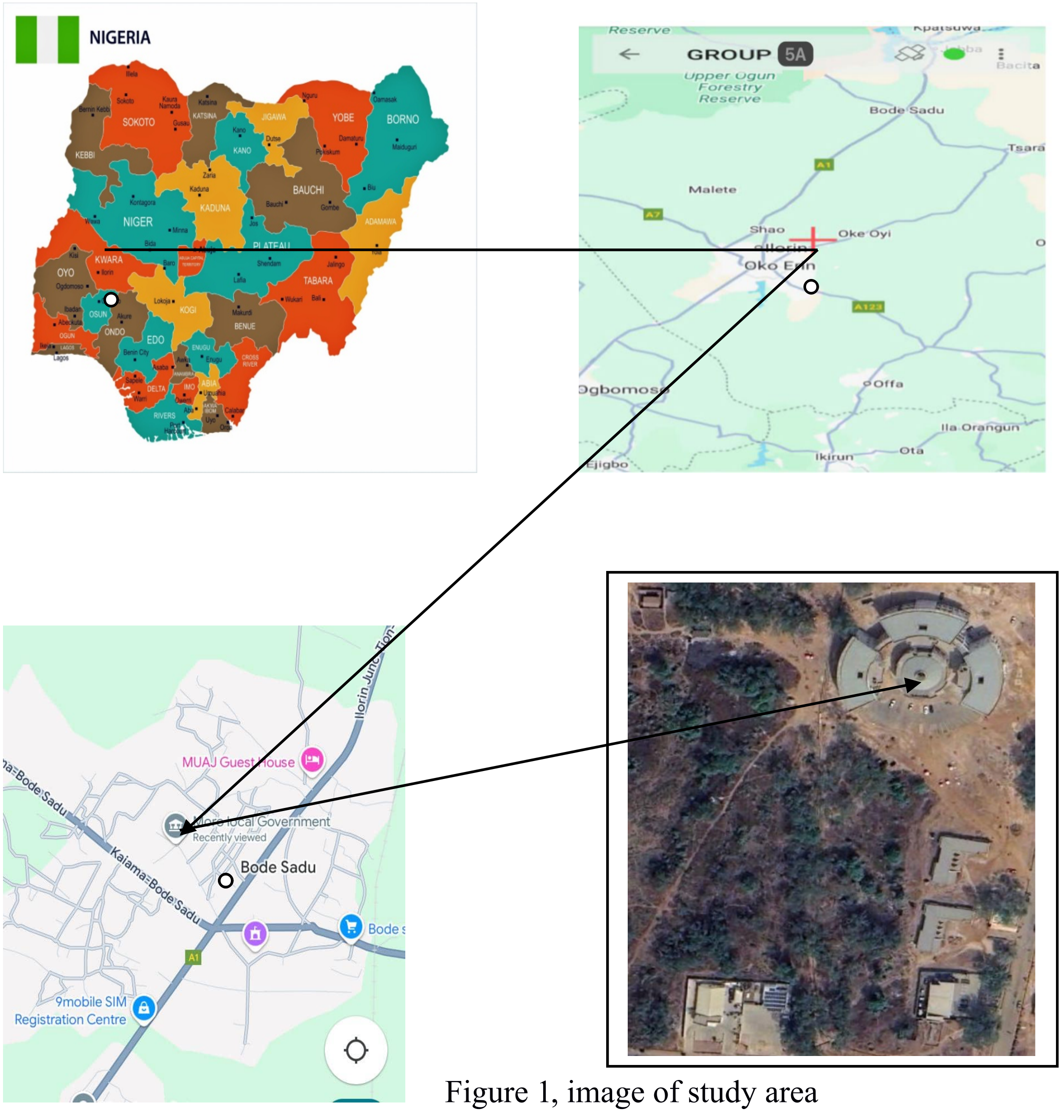

Figure 1, image of study area

CHAPTER TWO

LITERATURE REVIEW

2.1 Conceptual Framework

2.1.1 Definition of Perimeter Survey

A perimeter survey, also known as a boundary survey, involves determining and mapping the precise boundaries of a parcel of land using geodetic measurements (Anderson & Mikhail, 1998). It establishes coordinates of boundary points, calculates areas, and delineates property lines to support land management, planning, and legal documentation. In institutional settings like Kwara State Polytechnic, perimeter surveys are critical for resolving boundary disputes and optimizing land use.

2.1.2 Definition of Detailing Survey

A detailing survey captures the physical features of a site, including topographic elements (e.g., elevation, contours) and man-made structures (e.g., buildings, roads, utilities) (Kavanagh, 2014). These surveys provide detailed spatial data for engineering design, construction, and facility management. In the context of this study, detailing surveys are essential for mapping the infrastructure between the Engineering Building and GTBank, facilitating planning and maintenance.

2.1.3 Importance of Perimeter and Detailing Surveys

Perimeter and detailing surveys are foundational to surveying and geoinformatics, supporting applications in urban planning, civil engineering, and environmental management (Uren & Price, 2010). They ensure accurate spatial data for infrastructure development, reduce land conflicts, and enhance decision-making in institutional management. The integration of these surveys in academic-commercial zones, such as the study area, addresses the need for precise spatial data in high-traffic environments.

2.1.4 Historical Development of Surveying Techniques

Surveying has evolved from manual methods, such as chain and compass surveying, to modern geospatial technologies. Early surveys in Nigeria, as noted by Fajemirokun (2002), relied on rudimentary tools, leading to inaccuracies in boundary demarcation. The introduction of electronic distance measurement (EDM) in the 1970s and Total Stations in the 1990s revolutionized surveying by improving accuracy and efficiency (Schofield & Breach, 2007). The advent of Global Navigation Satellite Systems (GNSS) and Geographic Information Systems (GIS) in the 2000s further enhanced the ability to produce high-resolution maps and models, as evidenced in urban surveys in Ilorin (Oladapo, 2015).

In the context of Kwara State Polytechnic, historical surveys were primarily manual, resulting in outdated maps that fail to reflect current infrastructure. This study leverages modern tools like Total Stations and GNSS to address these limitations, aligning with global trends in surveying technology adoption.

2.1.5 Modern Surveying Technologies

2.1.5.1 Total Station

Total Stations combine electronic theodolites with EDM to measure angles and distances with high precision (Kavanagh, 2014). They are widely used in perimeter and detailing surveys for their accuracy (up to ±2mm) and efficiency. Studies by Adeyemi et al. (2018) in Ilorin demonstrated the effectiveness of Total Stations in institutional surveys, achieving angular misclosure within third-order traverse specifications ($30''\sqrt{n}$).

2.1.5.2 Global Navigation Satellite Systems (GNSS)

GNSS, including GPS, GLONASS, and Galileo, provides accurate positioning data for large-scale surveys (Hofmann-Wellenhof et al., 2008). In urban settings, GNSS is used to establish control points for perimeter surveys, as seen in a route survey of Oyun-Oloru Road near Ilorin (Samphina Academy, 2021). This study employs GNSS to determine boundary coordinates in the study area.

2.1.5.3 Geographic Information Systems (GIS) and Computer-Aided Design (CAD)

GIS and CAD software, such as ArcGIS and AutoCAD, are used for data processing, analysis, and map production (Longley et al., 2015). They enable the creation of digital models and high-resolution maps, which are critical for detailing surveys. A study by Oladapo (2015) in Kwara State highlighted the role of GIS in urban planning, emphasizing its applicability to institutional settings like the polytechnic.

2.1.6 Applications of Perimeter and Detailing Surveys in Institutional Settings

Perimeter and detailing surveys have been applied in various institutional contexts globally and locally. In Nigeria, a survey at the University of Lagos used Total Stations to map academic and commercial zones, improving land use planning (Ojo & Adeyemi, 2019). Similarly, a perimeter survey at Ahmadu Bello University, Zaria, resolved boundary disputes by providing accurate spatial data (Ibrahim, 2020). In Kwara State, a statistical survey at Kwara State Polytechnic by Sprojectng (n.d.) underscored the need for updated topographic data to support infrastructure development.

The study area, spanning the Engineering Building to GTBank, is a critical zone due to its academic and commercial activities. High pedestrian and vehicular traffic necessitates precise spatial data for planning pathways, parking, and utilities. The lack of recent surveys in this area highlights the need for this study to provide updated and detailed maps.

2.1.7 Challenges in Perimeter and Detailing Surveys

Several challenges affect the accuracy and efficiency of perimeter and detailing surveys:

1. **Outdated Data**: Many institutions, including Kwara State Polytechnic, rely on outdated maps, leading to planning errors (Oladapo, 2015).
2. **Environmental Factors**: Weather conditions, such as heavy rainfall in Ilorin, can disrupt fieldwork (Adeyemi et al., 2018).
3. **Equipment Limitations**: Limited access to high-precision tools can compromise survey quality (Fajemirokun, 2002).
4. **Human Factors**: High traffic in urban settings can delay data collection, as noted in a traffic sign study in Ilorin (ResearchGate, 2025).

This study addresses these challenges by using modern equipment and scheduling fieldwork to minimize disruptions.

2.1.8 Case Studies

2.1.8.1 Route Survey of Oyun-Oloru Road, Ilorin

A route survey conducted by Samphina Academy (2021) near Ilorin used Total Stations and GNSS to map a 5-km road. The study achieved high accuracy (linear misclosure of 1:10,000) and provided data for road construction, demonstrating the efficacy of modern tools in urban surveys.

2.1.8.2 Topographic Survey at the University of Ibadan

A topographic survey at the University of Ibadan by Ojo and Adeyemi (2019) used GIS and Total Stations to map academic facilities. The survey produced detailed maps for infrastructure planning, highlighting the relevance of detailing surveys in institutional settings.

2.1.8.3 Perimeter Survey at Federal Polytechnic, Bauchi

Ibrahim (2020) conducted a perimeter survey at Federal Polytechnic, Bauchi, using GNSS to establish boundary coordinates. The study resolved land disputes and supported campus expansion, providing a model for this research.

2.2 Theoretical Framework

This research is grounded in the **Geodetic Surveying Theory**, which emphasizes precise measurement of the Earth’s surface using angular and distance observations (Anderson & Mikhail, 1998). The theory supports the use of Total Stations and GNSS for accurate coordinate determination. Additionally, the **Spatial Data Infrastructure (SDI) Framework** by Longley et al. (2015) guides the integration of survey data into GIS for planning and decision-making. These frameworks provide a robust basis for achieving the study’s objectives.The literature review highlights the importance of perimeter and detailing surveys in institutional settings, supported by advancements in Total Stations, GNSS, and GIS. Historical and modern surveying techniques demonstrate progress in accuracy and efficiency, yet challenges like outdated data and environmental factors persist. Case studies from Nigeria and beyond underscore the applicability of these surveys, while gaps in context-specific research justify this study. The theoretical framework ensures methodological rigor, setting the stage for a comprehensive survey of the study area.

CHAPTER THREE

METHODOLOGY

3.0 Methodology

This refers to the method and the principles used to achieve the aim and objectives of this project work. The execution of this project was based on the following basic principles of surveying:

- Working from whole to part.
- The principle of choosing the method of survey most appropriate to meet the desired result.
- The principle of provision for adequate checks to meet the required accuracy. The method are traversing and detailing.

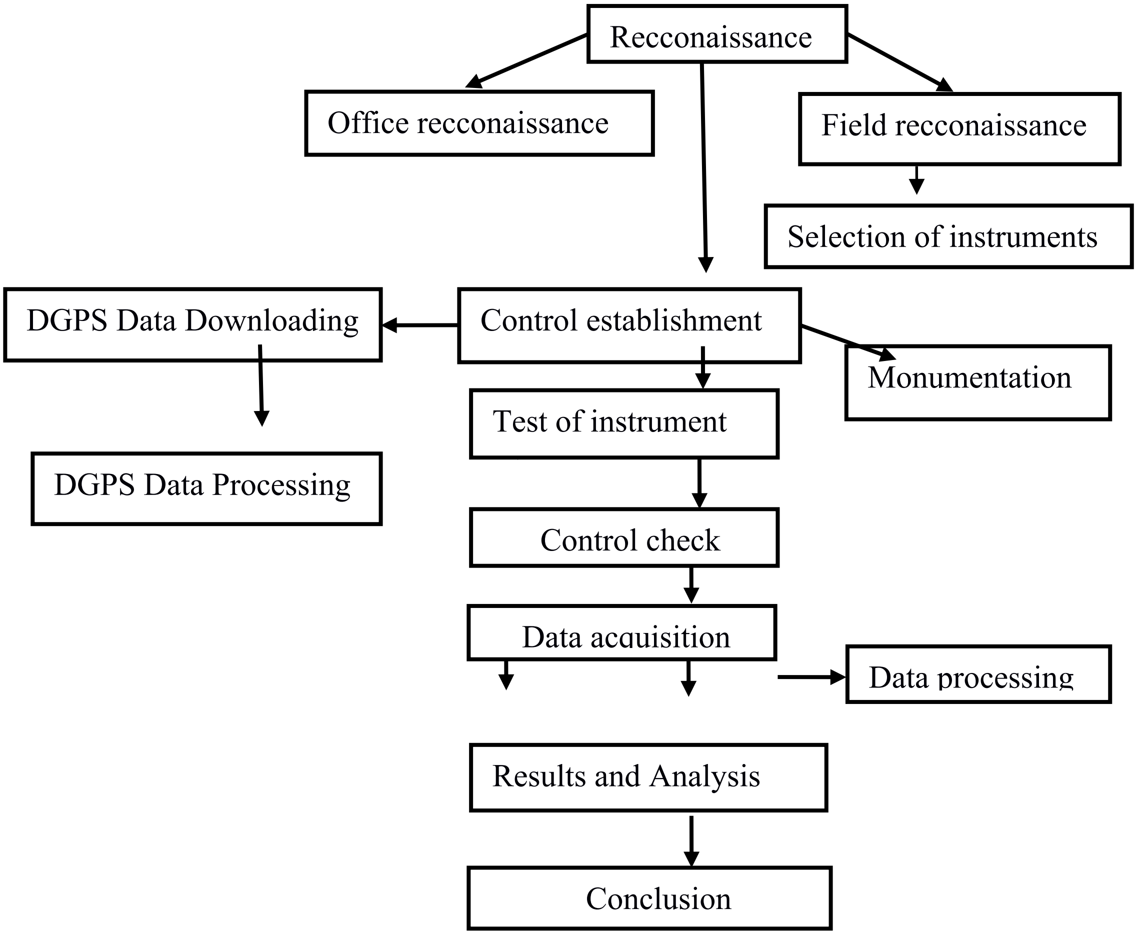

Figure 3.0:- Research methodology flow chart

3.1 Reconnaissance

Reconnaissance is a pre-requisite stage of any survey project to be carried out. It is the study of the subject matter as regard to a particular survey of an area of land. During reconnaissance, the purpose, specification and required accuracy of the survey were closely examined as these would affect the choice of the instruments and method of survey to be employed. The reconnaissance done comprise of office planning and field reconnaissance.

3.1.1 Office Reconnaissance

At this stage, decisions were made on the easiest approach to achieve the aim of the project using available sources of information about the study area and also the nature of survey. The imagery of the study area, personnel, initial control for orientation, choice of instrument and method to be employed were considered and determined at this stage. Also costing of the survey operation was done in the office.

3.1.2 Field Reconnaissance

The project site was visited to have the true picture of the site for better planning and execution and to locate the control pillars for necessary orientation of the study area. For proper selection of the boundary stations, the following factors were taken into consideration, the position and shape of the boundary, indivisibility of the consecutive stations selected. The boundaries were marked with wooden pegs driven into the ground to avoid disturbance or removal by any one and for the proper identification. The intervisibility of these selected stations were put into consideration.

Controls were not found around the study area which necessitated the transfer of control points to a reasonable distance within the study area. The end product of the field reconnaissance is the recce diagram which is shown in figure 3.2 below.

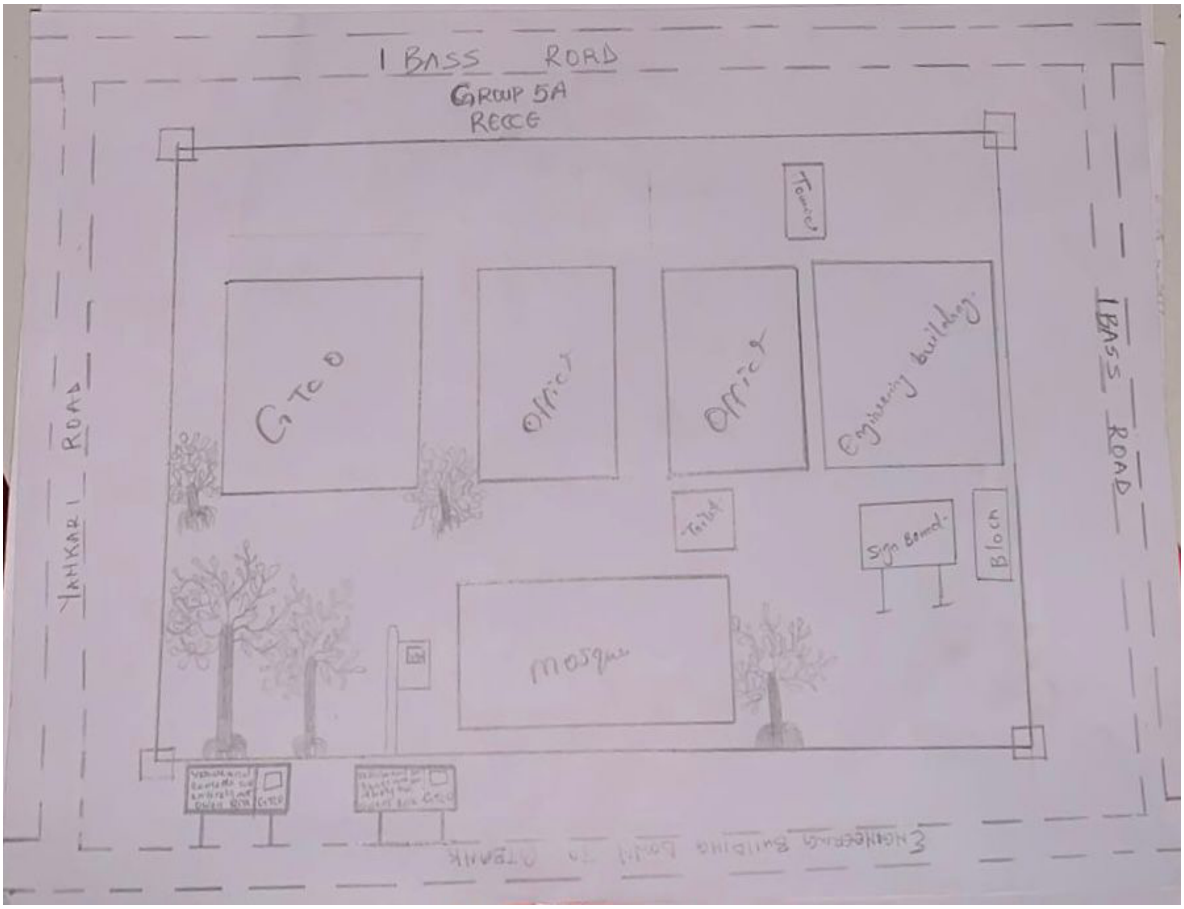

Figure 3.1.2: Reconnaissance Diagram (Not drawn to scale)

3.2 Monumentation

This is the selection of points at all change of directions and defining the points using pegs, beacons upon which centering can be made during field operation. This could be temporary or permanent, depending on the nature of the work. Specifically for this project, precast concrete beacons of dimension 18cm by 18cm by 65cm height were used. Each was buried vertically such that 10cm protruded above the ground surface.

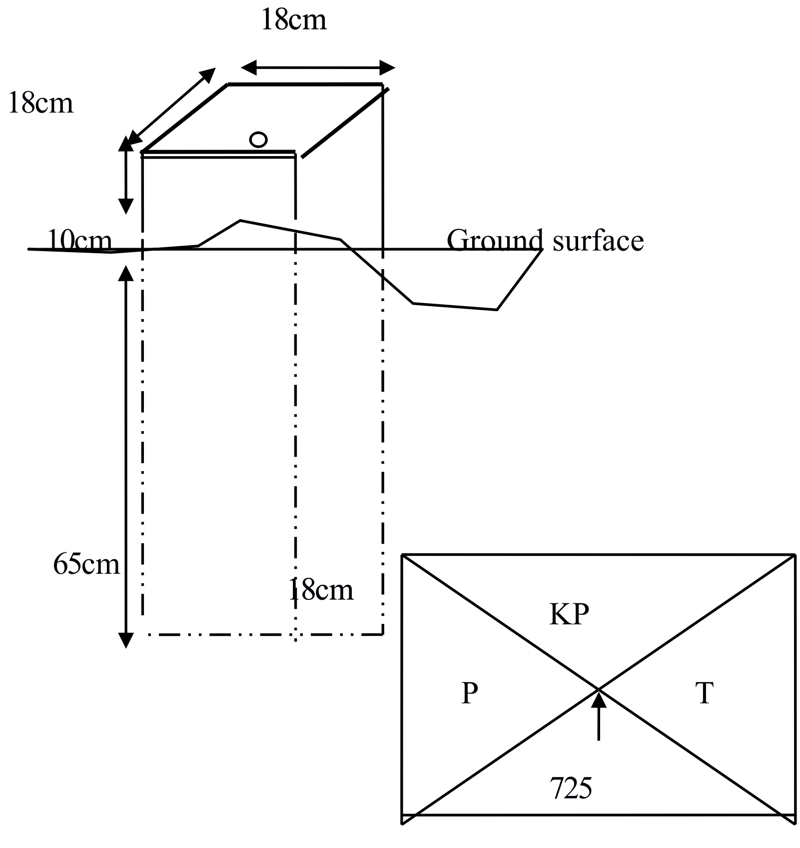

Figure 3.2.1: Plan View

Figure3.2.1:-Dimensional Representation Of Boundary Beacon

3.3 Equipment Used

The instrument used for the execution of the project are listed below

- Differential Global Positioning System (DGPS)
- Total station and its accessories (Trimble)
- Reflector stand and target
- Beacon
- pegs
- Tape (5m)
- Writing materials

Other Hardware and software used include:

(i.) Laptop

(ii.) GNSS solution

(iii.) Trimble software office

(iv.) Trimble Geo office downloading cable.

(v.) AutoCAD 2010

(vi.) Notepad and Microsoft Excel for editing and running of the script

(vii.) Microsoft word for report writing

3.3.1 Perimeter Survey and Detailing Observation

The perimeter and detail observation was carried out using the total station. This was done carefully in such a way to achieve the desire objective for the project. Before observation, test of instrument was carried out.

3.3.1.1 Test of Instrument

Test of instrument is very important in surveying operation. The accuracy of any work done depends on the quality of the instrument used, using faulty instrument will mar the output of the work.

In view of this, test of instrument was done in order to ascertain the working condition of the instrument acquired from the departmental store.

3.4. Collimation of Test For Total Station

The instrument total station (TRIMBLE PT1) was tested for both horizontal and vertical collimation errors. This was done by setting the instrument on a station and applying all necessary temporary adjustment such as centering, leveling and parallax elimination.

The coordinates of the known station (KW725PT) was inputted into the instrument. The target was also placed on another known station (KW111PT) and was carefully bisected and measured at the end the result supplied were compared with the available result (see table 3.4)

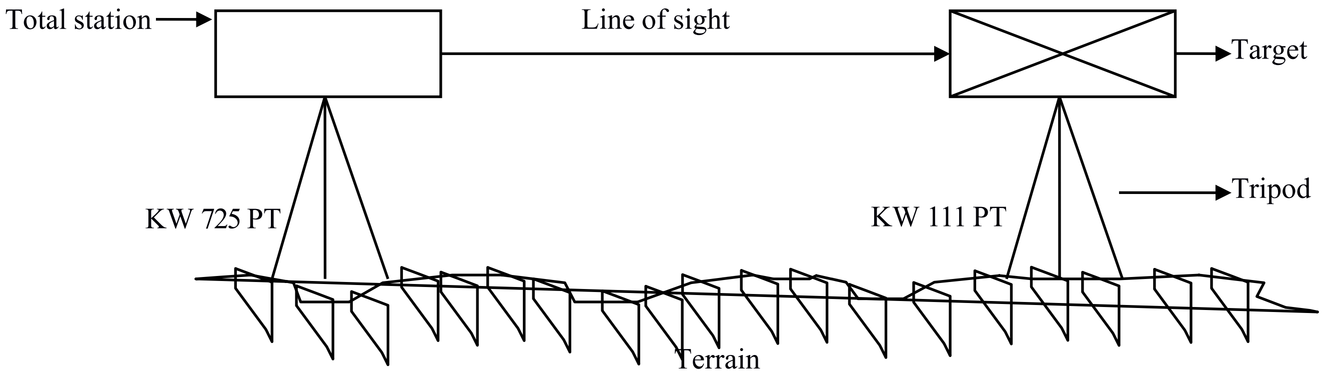

FIG 3.4:- Diagram showing the position of the total station and the reflector during the total station (collimation test).

3.5 Data Acquisition

This involves the processes in acquiring the data needed for the project. This involves the actual making of measurements and recording of observed data on the field. There are different methods of acquiring data in the site with different instrument such as Total station, Theodolite, Compass, Level Instrument etc.

3.5.1 Geometric Data Acquisition For Perimeter Traverse

Geometric data are positional data, that is, they are data having the X, Y, Z coordinates which makes it possible to locate their position on the surface of the earth. The total station (TRIMBLE PT1) was used for collection of geometric data.

The third order closed traverse was carried out using Trimble Total Station to determine the positions of all stations in the project area. For perimeter traverse, total station was set up on control pillar KW725PT and temporary adjustment performed. The coordinates of the instrument station, Backsight station the heights of instrument and that of the target were measured with tape and keyed-in into the memory of the total station for storage and the orientation was completed. After this, the target was moved to SC/KW F.RS 4404for observation. With the instrument on KW725PT, the target was focused and the cross-hair bisected msr1 was clicked on the total station. The instrument displayed the coordinates (E, N and H) of the station and the values were stored in the memory of the instrument which serves as field book. Then, the instrument was moved to KW111PT orientation was repeated and the same procedures were taken until we closed back on the control pillar KW725PT.

Figure 3.5:- Description of the traverse connection

3.5.2 Geometric Data Acquisition For Detailing

For the collection of details, the total station was set up on KW111PT and temporary adjustments were performed and back sighted KW725PT for station orientation. Then, various points of interest were coordinated by placing the reflector at such points and measure. The coordinates of such points taken were stored in the internal memory of the instrument and on the field book. For points which could not be visualized from KW111PT, other station points were selected to facilitate their coordination. Feature like buildings, electric poles, trees and water tank, road, security house and mosque were all detailed, after which the traverse was closed back on KW111PT. Having bisected these features, readings were taken and stored in the internal memory of the instrument.

3.6 Perimeter Traversing

After the demarcation, capping and numbering of the beacons, the actual data acquisition using the total station MATO TC1010 commenced. The traverse started from KW725PT with KW111PT as reference point. The total station was set up over control KW725PT, centered, leveled and telescope focused to eliminate parallax. The parameters of the instrument station i.e. station name, height of instrument over the station mark, and the XYZ coordinates of the station were keyed in. The reference control point was then bisected and the station name KW111PT, height of target over the station mark, and the XYZ coordinates of the station were key in. Though the total station was set in coordinate mode it actually measured and recorded horizontal readings, vertical readings and distances automatically into the internal memory of the instrument on both faces which it used to compute and display coordinates. At every set up of the total station, the temporary adjustment was carried out and the following parameters measured:

- Height of instrument
- Height of the back target
- Height of the fore target
- Distance to back and fore station

This is the determination of bearing and distance of series of connected lines from known coordinated point so as to obtain coordinate of the newly established station.

3.7 Data Downloading

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.

Steps To Follow When Downloading From Total Station

- The downloading software was already installed on the computer system (Trimble Total Station Software) and was launched.
- The total station was connected to the computer system via downloading cable
- The Total station was switched on and the following options were selected to download the file.

○ GOTO	Data Transfer
○ SELECT	Send data (by pressing F1)
○ SELECT/CLICK	Measure Data
○ SELECT	File Name (Hafiz)
○ CLICK	ENTER
○ SELECT	Yes (Option)

- It was ensured that the parameter on total station and the computer system were the same.
- A folder was created on the laptop to save the data from the software and the link selected on the software.
- Transfer was clicked on the total station software to download the file into a folder on the laptop.

- After the transfer was completed, click on transform coordinate on the total station software resident in the computer system. After converting the required data into dxf format.
- The coordinates were exported from the software environment to Microsoft excel for further processing

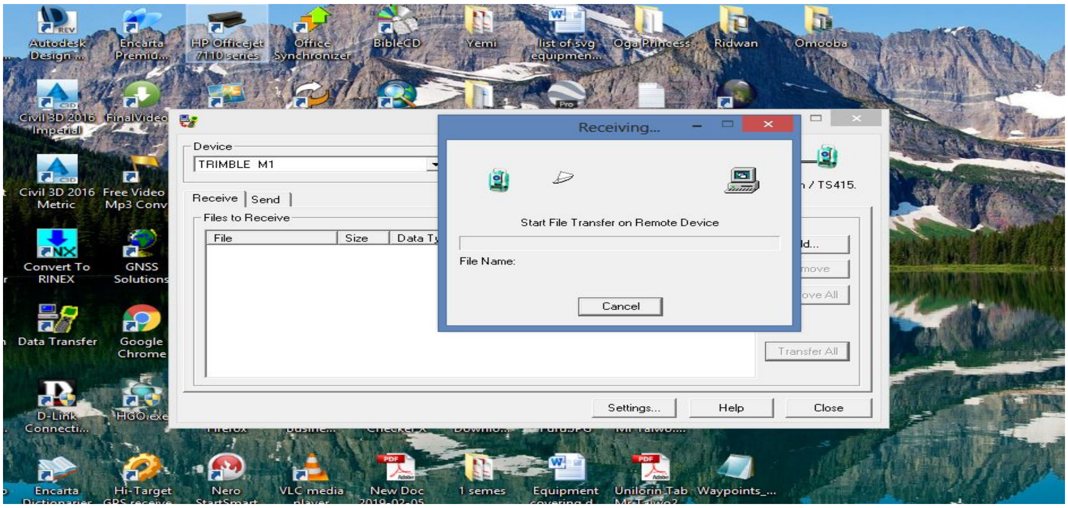

Figure 3.6a: Downloading process from total station

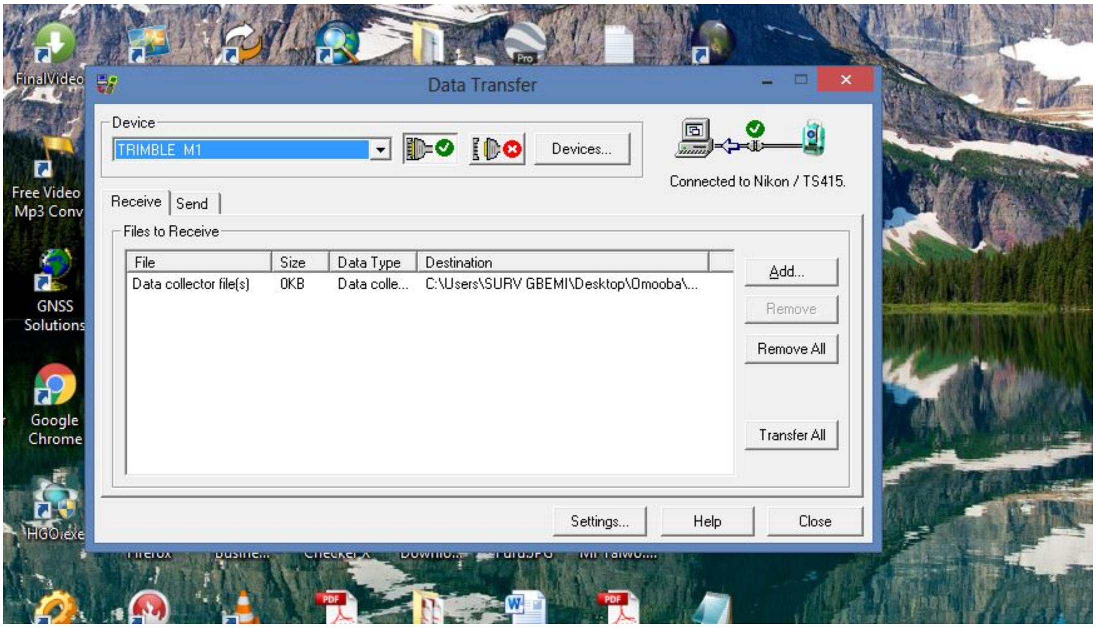

Figure3.6b: Downloading process from total station

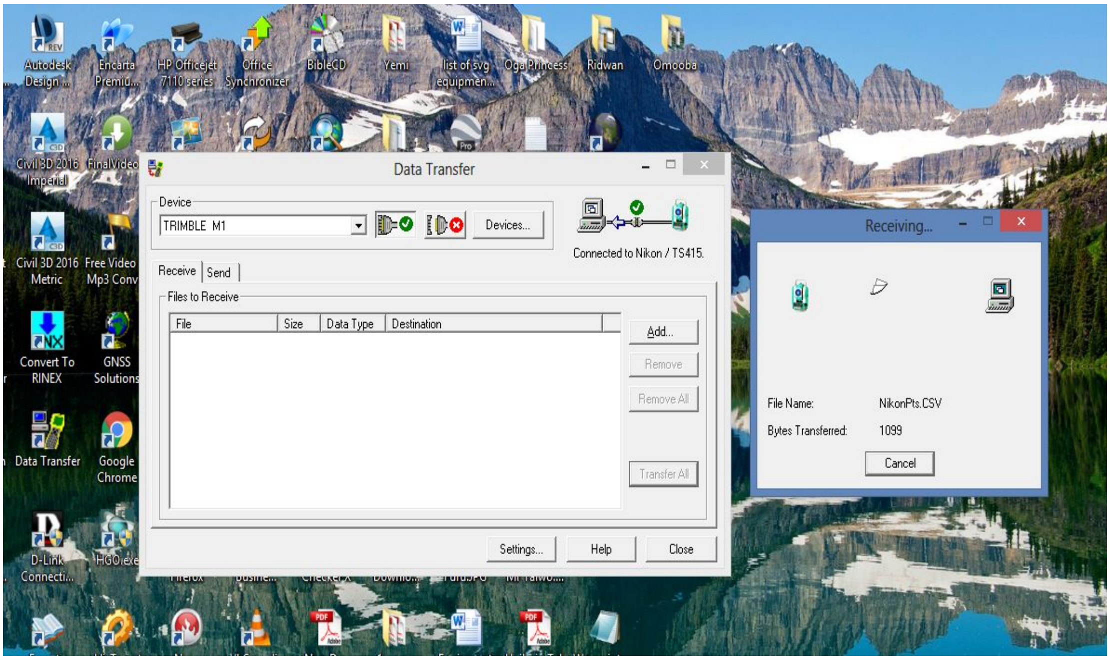

Figure 3.6c: Downloading process from total station

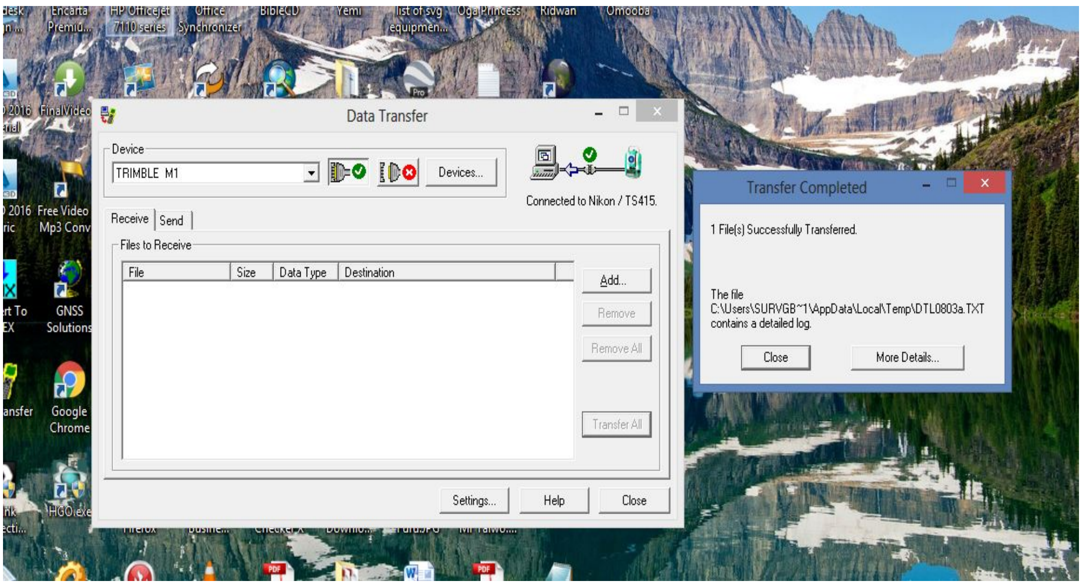

Figure 3.6d: Downloading process from total station

3.7.1.1 Data Processing

As the instrument downloading cable is faulty, Microsoft Excel 2007 Software was used to type the final coordinates of all points except the unwanted

3.7.1.2 Data Editing

The downloaded data were edited in the Microsoft Excel environment before the edited data were exported to Notepad. During the editing process, the irrelevant and redundant data were removed while edited data were saved in a plotable format of file.scr.

3.8 Computations

Computation can be said to be calculations of a 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.

Computations are made algebraically by the use of simple arithmetical procedures and trigonometric functions and graphically by accurate scaled drawing. Computation come up after field work and is very important in survey work because it serves as the final information shown on plan.

Computation is the operation carried out when the raw data obtain from the field has been processed to obtain final result from which plans were produced.

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

After the field book has been deduced the following computation were carried out

- Traverse backward computation.
- Area computation.
- Linear accuracy.

3.8.1 Traverse Backward Computation

The processed boundary data downloaded from the instrument and the already existing control information were used to determine the latitude, departure, bearings and distances of traverse lines as shown in the table below

Bearing of line =

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

The back computation was done in order o have final bearing and distance of the boundary lines.

The below formulae was used

$\Delta N = N_2 - N_1, N_3 - N_2$

$\Delta E = E_2 - E_1, E_3 - E_2$

Putting the sign they carried into consideration

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

Bearing = Tan-1 DE/DN

Where

ΔN is difference in northing (m)

ΔE is difference in easting (m)

3.9 Area Computation

Using cross coordinates method, area computation was done by a small program in an excel spread sheet. The results were as shown below:

NORTHING (A)	EASTING (A)
NORTHING (B)	EASTING (B)
NORTHING (C)	EASTING (C)
NORTHING (D)	EASTING (D)
NORTHING (A)	EASTING (A)

$$\text{AREA} = \frac{\text{LEFT SIDE PRODUCT - RIGHT SIDE PRODUCT}}{2}$$

3.9.1 Linear Accuracy

The linear accuracy was calculated according to the specifications by Surveyors Registration Council of Nigeria (SURCON). Since this is classified as third order job, the following formula was used:

Linear Accuracy =£d/e

CHAPTER FOUR

RESULTS AND DATA ANALYSIS

4.1 Results

This presents the results and explains how data obtained from field were analyzed, processed, plotted and presented.

4.1.1 Control Establishment Result

After processing of the data acquired during the control extension, the results of the controls established are as shown in table 4.1.

Table 4.1: Control Established

PL ID	Easting	Northing	Heights
KW TL02	679751.84	946272.55	343.452
KW725PT	679689.67	946321.81	344.737
KW111PT	679836.92	946009.53	328.57

4.1.2:- Test Of Instrument

The instrument in view is the total station used to carry out the perimeter survey observations.

Table 4.2:-Test Observation

Station	Readings	Northings(M)	Eastings (M)	Bearing	Dist(M)
Target Station	Initial Reading	946009.53	679836.92	141°57'10.6''	321.156
	Total Station Reading	946009.89	679836.46	141°57'10.6"	321.156
	Differences	-0.46	0.36	00°00'00''	0.001

Source: Field Observation

It is evident that the instrument is in good working condition.

4.3 Control check

The controls used were checked to determine if they were still in-situ, the results are given in table 4.3a and 4.3b

Table 4.3a Control Checks (Observed values)

Station From	Bearing (° ' ")	Distance (m)	Northings (m)	Eastings (m)	Station To
KW 725 PT	154° 45' 16.3"	345.278	946321.83	679689.66	KW 725 PT
KW 111 PT	141° 57' 10.6"	321.156	946009.53	679836.92	KW 111 PT

Source: Field Observation

Table 4.3bControl Check (Computed Values)

Station From	Bearing (° ' ")	Distance (m)	Northings (m)	Eastings (m)	Station To
KW 725 PT	154° 45'16.3"	345.278	946321.81	679689.67	KW 725 PT
KW 111 PT	141° 57'10.7"	321.156	928399.494	683747.738	KW 111 PT

4.4 Traverse Back Computation

Table 4.4:. Back computation of the traverse

Station from	Bearing	Dist (m)	ΔN	ΔE	Northing (m)	Easting (m)	Station To
					946321.81	679689.67	SC/KW F.RS 4404
SC/KW F.RS 4404	03°26'47.8"	195.61	11.76	195.26	946333.57	679884.93	SC/KW F.RS 4405
SC/KW F.RS 4405	81°34'20.37"	327.58	-324.04	-48.01	946009.53	679836.92	SC/KW F.RS 4406
SC/KW F.RS 4406	177°0'34.39"	83.57	4.36	-83.46	946013.89	679753.46	SC/KW F.RS 4407
SC/KW F.RS 4047	11°42'14.6"	314.36	30.92	-63.79	946321.81	679689.67	SC/KW F.RS 4404

4.5 Area Computation

Table 4.5: Results of Area Computation

	Coordinates			
	Final Northing	**Final Easting**	**Left Side Product**	**Right Side Product**
Stn. Id.	**(m)**	**(m)**	**(m^2)**	**(m^2)**
A	946321.81	679689.67		
B	946333.57	679884.93	6433899375749.3232	643213151903.2219
C	946009.53	679836.92	643352499521.4044	643177623083.3829
D	946013.89	679753.46	643053251210.4738	643135169254.8187
A	946321.81	679689.67	642995868709.5162	643265524620.9626
		SUM =	2572791556990.718	2572791468862.3857
	AREA =	LEFT SIDE PRODUCT - RIGHT SIDE PRODUCT		
			2	
	AREA =	2572791556990.718- 2572791468862.3857		
			2	
	AREA =	88128.3323	-	-
		2		
	AREA =	44064.166	Sqmtrs	
	AREA =	4.406	Hectares	

The total area was found to be 4.406**Hectares** and the perimeter was **1023.052m**.

4.6 Linear Accuracy

Linear Accuracy =

Table 4.6: Results for linear accuracy

Remarks	Eastings(M)	Northings(M)	Hts (M)	Stn
Starting Coord. (original)	679689.67	946321.81	344.737	KW725PT
Closing Coord. (observed)	679689.46	946321.89	344.71	KW725PT
Difference	-0.21	-0.08	+0.027	

Misclosure in northing (ΔN) = -0.08

Misclosure in easting (ΔE) = -0.21

Total distance = 1059.05

=

=

=

= 1: 8050.412145

The linear accuracy is **1:8050**which conforms with the Third order accuracy.

4.7 Data Analysis

Table 4.7 shows the perimeter survey boundary points seven (5) number of points defines the perimeter of the institute.

Table 4.7: The Perimeter Boundary Points

Station	Northings (M)	Eastings (M)	Height (M)
SC/KW F.RS 4404	946421.81	679689.67	344.737
SC/KW F.RS 4405	946333.57	679884.93	338.481
SC/KW F.RS 4406	946009.53	679836.92	328.57
SC/KW F.RS 4407	946013.89	679753.46	325.71
SC/KW F.RS 4404	946321.81	679689.67	344.737

The coordinates of the details such as buildings, GTB, trees, office, mosque, toilets, signboards and roads were also obtained and are as shown in appendix A

4.8 Information Presentation

The end product of this project exercise was the graphical representation of the processed field data of the survey area which was drawn to a suitable scale. The digital representation of the project area was done according to survey rules and regulations as well as departmental instructions.

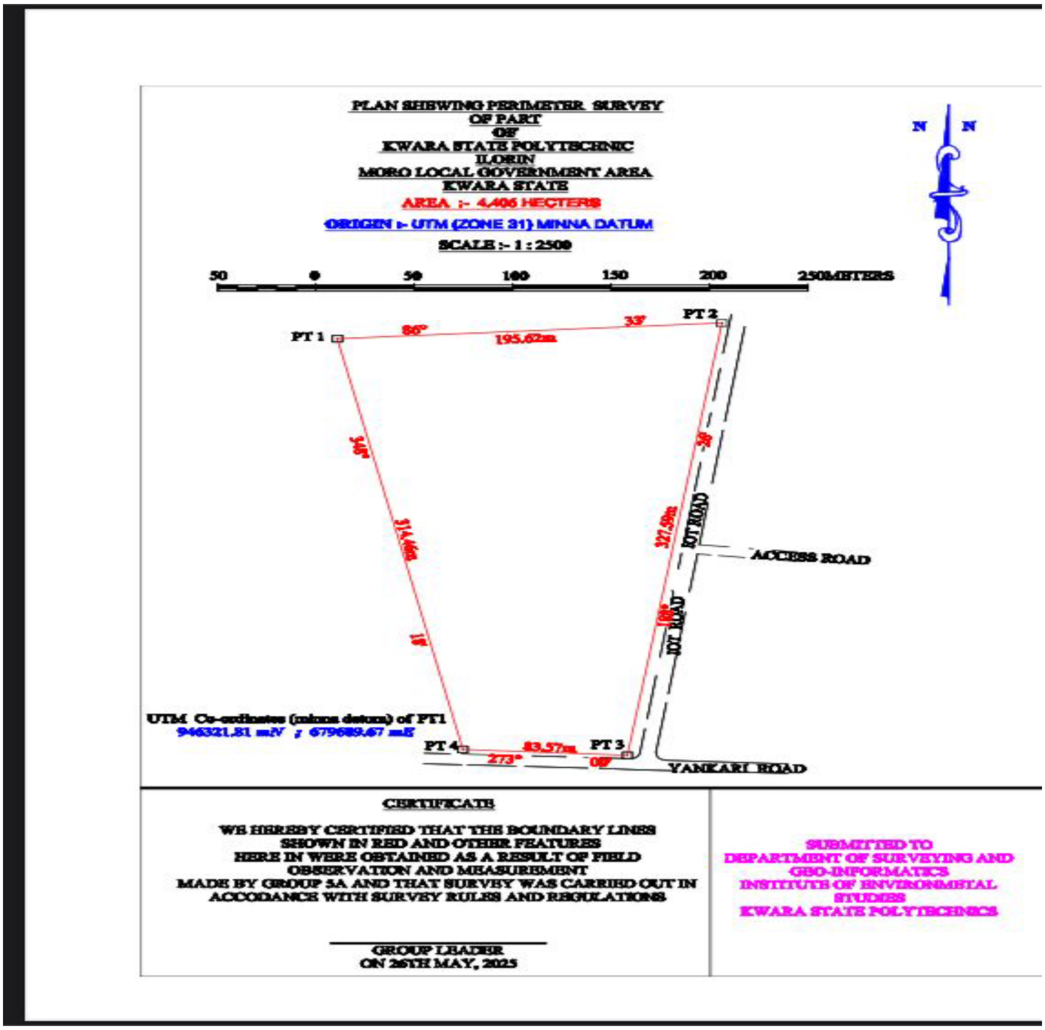

Figure 4.1: Perimeter plan of the study area

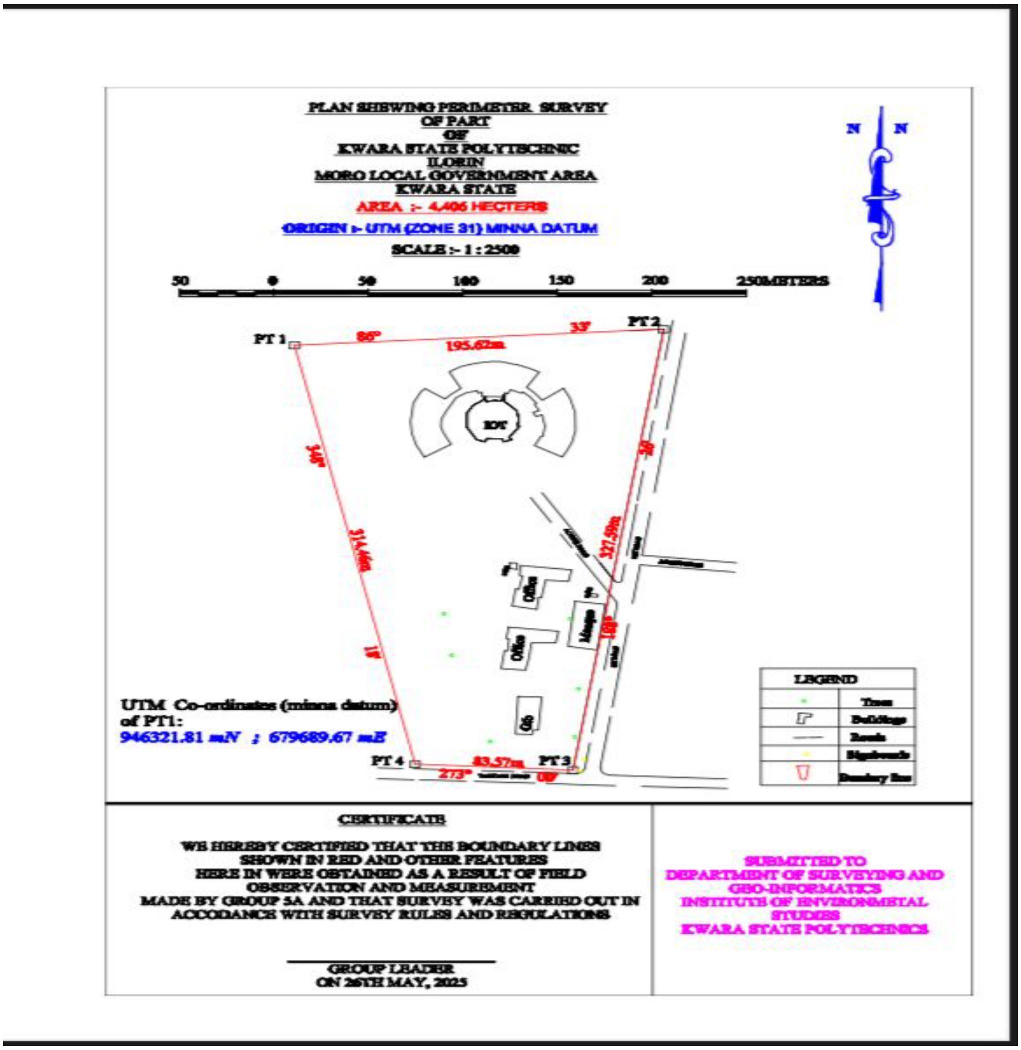

Figure 4.2: Perimeter and detail plan of the study area

CHAPTER FIVE

SUMMERY, CONCLUSION AND RECOMMENDATION

5.1 Summary

The project perimeter and detailing survey was carried out at Kwara State Polytechnic Part of engineering building down to GTBANK. The project is carried out in accordance with the two order specification. The reconnaissance survey was properly carried out and office, this was done for proper planning of the operation by cheating initial controls that is within the project site for the orientation, the instrument to be used, and selected station in which the indivisibility of the selected station were put into consideration and finally, drawing of selected diagram of the area to be surveyed.

The field operation includes (traversing and detailing). Therefore data processing was done and plan was produced in analysis (manual) and digital format tithe plan showing perimeter and detail of all project was executed

5.2 Problem Encounter

The problem encountered during the process of the execution of this project

1. Student passing by were obstructing the right of observer and causing disturbance.
2. The weather was not conducive and it was draining all days.

5.3 Conclusion

Have gone through all stages of this project, it is right to say the task is well interesting particularly at the planning and execution stage thought field procedure was very tedious and time consuming from all indications. The project has been successful executed and adequate data acquired processed represented in plans all necessary computations were carried out to meet specification is given finally, the following project has been exposed me to the procedure of cadastral survey and perimeter and detail survey also the task has given me a self confidence on it has improved my skills in carrying out perimeter and details survey. Despite the fact that I have not done this before but in still achieving aim and objective of the project. Plan of the study were produced, the survey was executed in the accordance and respect with survey rules and the departmental instruction in carrying out the project topics. And conclusively the report written was done on how the entire project was executed both field and office work.

5.4 Recommendations

As a result of the experience acquired during the course of executing this project, I hereby recommend that this kind of project should be a continuous one in order to boost the student's knowledge within and outside the citadel of learning. I also recommend that practical within the semester of the project should be given a time and instrument should be distributed on time so that practical assignment will not with the project.

I also recommend this particular project practical to be done often to update the infrastructural features and the society for the development of the particular area, also it should be carried out in school for the next development in the premises, moreover it is necessary for every Survey & Geo-Informatics Students to be able to carry out this particular practical.

Also that the school provide more new digital station, EDM and analogue instruments should be supply to the school store for student in carrying out both their practical and project in order to get accurate data from the field.

References

Surveyor R.S. Awoleye HOD, (2018): surveyor Bayi Akinyele (2018)Barrister A, surveyor

Abdulsalam Ayuba and Raymond (1990):London, pitha publishing limitedSurveying 4th edition

Bassak N.N (1994):surveying and leveling 7th edition Tata N.Ccram. Hill publicity company limited, new delhi paje city

Bonford. G (1984) Geodessy 4th edition, oxford university press city Brinker, R.C (1997). Elementary surveying 2nd edition, Barting the Madam Mahan Das, MM, Das Saikia put int 2010. Maitias walde muitan,19th century 1780.

Microsoft encata (2009). One Microsoft produced was 980326399 USA.

Oxford advance learning dictionary 2001 6th edition, oxford university Puri walter street.

Punmia, B.C (2003) surveying vol 1 and II 6th edition, laxmi india P.32

Ramsay, J. (1971): Land surveying 4th edition chances process limitedbungay lam

Raymond, S (11972):Elementary surveying 6th edition. Simeon(1989) panphlets specification for geodetic survey in Nigeria P,SI.54

Oliver J.G Clending (1978) Principles of Surveying Working Ham Berkshire, England ppl.

Appendices

APPENDIX A: SORTED ACQUIRED DATAS

APPENDIX B: PERIMETER AND DETAIL PLAN IN ENVELOPE

Appendix A

SORTED ACQUIRED DATAS

CONTROL USED

POINT ID	EASTING	NORTHING	HEIGHT
KW725PT	679689.671	946321.807	344.737
KW111PT	679836.916	946009.525	328.57

PERIMETER POINTS

POINT ID	EASTING	NORTHING	HEIGHT
SC/KW F.RS 4404	679689.671	946321.807	339.655
SC/KW F.RS 4405	679884.932	946333.571	340.917
SC/KW F.RS 4406	679836.916	946009.525	341.958
SC/KW F.RS 4407	679753.459	946013.889	342.848
SC/KW F.RS	679689.67	946321.807	343.452

4404

DETAIL POINTS

POINT ID	EASTING	NORTHING	HEIGHT
EG1	679758.321	946239.632	344.084
EG2	679754.063	946248.243	344.24
BL1	679751.63	946257.142	344.164
EG3	679751.011	946266.072	343.997
EG4	679751.841	946272.552	343.954
BL2	679752.551	946279.262	343.867
EG5	679756.371	946287.501	343.803
EG6	679758.576	946289.906	343.609
EG7	679769.145	946282.317	343.418

EG8	679772.746	946286.056	343.223
EG9	679777.631	946290.125	342.998
BL3	679771.545	946302.256	342.702
BL4	679777.585	946306.165	342.464
OFF1	679804.82	946130.166	342.176
OFF2	679806.553	946142.711	341.918
OFF3	679808.381	946142.4	341.65
BL5	679810.251	946152.25	342.447
OFF4	679808.639	946152.645	342.32
OFF	679809.212	946159.839	342.135
BL5	679836.221	946156.67	340.809
Wl1	679834.491	946148.172	340.455
EG10	679822.443	946149.114	339.173

CL1	679820.121	946136.201	337.856
OFF6	679818.791	946136.312	337.259
OFF7	679817.762	946127.563	336.735
OFF8	679804.823	946130.174	336.202
TL1	679803.381	946161.872	338.847
Tl 2	679807.183	946161.612	339.603
TL3	679807.433	946157.032	339.536
TL4	679803.541	946157.623	340.18
TL5	679803.382	946161.871	341.117
OFF9	679802.871	946114.623	341.166
OFF10	679829.342	946111.532	341.589
OFF11	679827.832	946102.981	341.487
OFF12	679814.952	946103.281	342.113

BL6	679813.531	946091.342	342.133
CL2	679811.82	946082.893	342.564
OFF13	679798.951	946084.122	342.686
OFF14	679800.742	946097.313	342.775
OFF15	679802.322	946097.031	343.059
OFF16	679803.172	946105.841	343.277
OFF7	679801.641	946106.072	343.323
OFF18	679802.872	946114.621	343.498
GTB1	679807.852	946063.82	343.941
GTB2	679807.871	946063.592	343.852
GTB3	679820.351	946063.132	343.882
GTB4	679818.551	946038.839	343.833
GTB5	679815.629	946038.938	343.906

GTB6	679815.327	946035.605	343.982
GTB7	679806.509	946036.039	343.685
GTB8	679807.865	946063.589	343.178
MQ1	679838.087	946133.585	342.571
MQ2	679853.92	946131.287	342.041
MQ3	679849.725	946097.686	341.591
MQ4	679834.275	946100.5	340.697
MQ5	679838.089	946133.579	339.655
TL6	679846.21	946139.201	331.519
TL7	679850.038	946138.648	332.814
TL8	679849.871	946136.692	332.786
TL9	679846.202	946136.941	331.939
TL10	679846.211	946139.201	331.861

TR1	679768.701	946124.21	331.818
TR2	679772.619	946093.729	331.736
TR3	679807.852	946063.82	343.941
TR4	679793.091	946030.537	331.36
TR5	679837.931	946033.652	331.418
TR6	679839.881	946069.127	331.478
SB1	679840.578	946009.091	331.542
SB2	679842.739	946017.61	331.488
RD1	679733.439	946003.161	331.519
RD2	679733.748	946011.162	329.899
RD3	679838.041	946006.852	331.927
RD4	679843.285	946011.141	331.497
RD5	679860.225	946131.321	330.103

RD6	679814.447	946209.941	329.427
RD7	679820.475	946213.501	329.048
RD8	679859.029	946148.369	327.577
RD9	679862.731	946149.111	327.887
RD10	679889.64	946340.005	328.09
RD11	679896.425	946330.871	329.036
RD12	679873.388	946167.387	328.9
RD13	679923.27	946161.85	329.899
RD14	680019.278	945985.8966	328.45
RD15	680019.5192	945985.8926	328.452
RD16	680049.2592	945985.3466	329.851
RD17	680052.7984	945994.9155	330.765
RD18	680035.8983	945995.2747	329.206

RD19	680021.1428	945998.93	329.071
RD20	680014.553	946000.8285	328.984
RD21	679998.9224	946013.2946	328.691
RD22	679979.8714	946033.5673	328.071
RD23	679965.4018	946049.4666	328.419
RD24	679958.6616	946062.734	329.066
RD25	679959.5686	946094.9526	331.567
RD26	679960.8124	946132.8956	332.923
RD27	679962.2135	946229.3587	338.138
RD28	679966.6673	946409.1306	342.532
RD29	679931.9204	946045.2297	327.91
RD30	679938.595	946053.831	328.233
RD31	679942.537	946052.9746	328.123

RD32	679948.3344	946044.4573	327.538
RD33	679940.406	946045.6251	327.73