CADASTRAL LAYOUT SURVEY OF PART OF DE-GOLDEN SISTER RESIDENTIAL LAYOUT AT ALUFA AGUNBIADE VILLAGE, SENTU COMMUNITY, OFF OKE-OSE - LAJIKI ROAD, ILORIN EAST LOCAL GOVERNMENT AREA, KWARA STATE, NIGERIA.

PRESENTED BY

OLOYEDE FAVOUR ENIOLA

ND/23/SGI/FT/0001

SUBMITTED TO THE DEPARTMENT OF SURVEYING AND GEOINFORMATICS,

KWARA STATE POLYTECHNIC, ILORIN, KWARA STATE.

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE

AWARD OF NATIONAL DIPLOMA IN SURVEYING AND GEOINFORMATICS.

JUNE, 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.

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OLOYEDE FAVOUR ENIOLA DATE AND SIGNATURE

ND/23/SGI/FT/0001

CERTIFICATION

This is to certify that Oloyede Favour Eniola Matric no: ND/23/SGI/FT/0001 has satisfactorily carried out his project under my instructions and direct supervision. I hereby declare that he has conducted himself with diligence, honesty and sobriety on the project.

…………………………	………………………………
Surv. I. I. Abimbola (Project Supervisor)	Sign and Date
……………………………	…………………………………
Surv. Babatunde kabir (Project Supervisor)	Date and Sign
………………………………	…………………………………
Surv. R. S. Awoleye Project Coordinator	Sign and Date
…………………………	……………………………………
Surv. I. I. Abimbola Head of the Department	Sign and Date
…………………………	…………………………………
External Examiner	Sign and Date

DEDICATION

I dedicate this project report to the most beloved creator, the Almighty Allah.

ACKNOWLEDEMENT

plete this project. Thank you. I would like to express my heartfelt gratitude to my project supervisor, Surv. Babatunde Kabir, Surv. I.I Abimbola, for their invaluable guidance, support, and expertise throughout this project. Their constructive feedback, patience, and encouragement helped me navigate the challenges of this research and produce a quality output.

I appreciate the opportunity to work under their supervision and benefit from their vast knowledge and experience in cadastral layout survey. Their insightful comments and suggestions significantly improved the quality of this project, and I am grateful for their dedication and commitment to my academic success.

My immense appreciation goes to head of department in person of Surv. Abimbola Isau and departmental staff Surv. Banji, Surv. Babatunde Kabir Surv. Felix Diran, Surv. Kazeem, Mr.Benard, Surv. R.S Awoleye and others for their support and advice during the project period. I also acknowledge my project coordinator Surv R.S Awoleye. I can't forget all my colleagues for their cooperation, believe and understanding towards the successful completion of this project. I wish all of us success.

I would also like to thank my family, friends, and peers for their support, encouragement, and understanding throughout this project. Their contributions, whether big or small, are gratefully acknowledged.

Finally, I acknowledge Kwara State Polytechnic for providing the resources and facilities that enabled me

ABSTRACT

This project is the layout survey of the property of De-golden sisters at Sentu village, off Oke-ose to Lajiki road, Ilorin East Local Government Area, Kwara State. The components of the project include: Perimeter survey, setting out of points, beaconing of demarcated points, and coordination of 56 plots of land and production of layout plan at a suitable scale. The survey was tied to three existing control within the vicinity and the survey data was computed and AutoCAD Software was used for plotting of the final layout plan. Kolida (Model: SET 02) Total Station with its accessories were used for the setting out and final survey exercises. A total number of 80 points were monumented and surveyed. The total area covered is 2.7383 hectares. The average area of the plots is within 960Sqm. Being a third order job, an accuracy of 1:20,000 was achieved.

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CHAPTER ONE

1.0 INTRODUCTION

Cadastral layout surveying is a fundamental aspect of land administration and management, playing a crucial role in defining and documenting land ownership, boundaries, and subdivisions. As the world continues to urbanize and the demand for land increases, the need for precise, reliable, and legally recognized land surveys becomes more important than ever. This type of survey forms the backbone of property rights, land registration systems, and urban planning, ensuring that land parcels are clearly delineated and recorded for various uses such as residential, commercial, agricultural, and industrial development. At its core, a cadastral layout survey involves the systematic measurement and mapping of land parcels to establish their exact boundaries and dimensions.

This process is not merely a technical task; it carries significant legal, social, and economic implications. Accurate cadastral surveys protect landowners' rights by preventing boundary disputes, enabling secure land transactions, and providing a basis for taxation and land valuation. Moreover, cadastral data supports government agencies and planners in making informed decisions about land use, infrastructure development, and environmental conservation. Historically, cadastral surveys have evolved alongside the development of societies, reflecting the need to organize land ownership and use as populations grew and economies diversified. In many countries, cadastral systems are the foundation of land tenure security, contributing to social stability and economic growth. Without a reliable cadastral framework, land conflicts can escalate, investment in property can be discouraged, and sustainable development can be hindered.

The cadastral layout survey process typically begins with the acquisition of existing land records and maps, followed by detailed fieldwork to verify and update boundary information. Surveyors employ a range of modern technologies, including Global Positioning Systems (GPS), total stations, and Geographic Information Systems (GIS), to achieve high levels of accuracy and efficiency. These tools enable the creation of detailed cadastral maps that not only show property boundaries but also incorporate topographical features, infrastructure, and other relevant data. In addition to its technical components, cadastral surveying requires a deep understanding of legal frameworks, land policies, and community dynamics. Surveyors must navigate complex issues such as overlapping claims, customary land rights, and regulatory requirements. This multidisciplinary nature makes cadastral layout surveying a challenging yet rewarding field, essential for ensuring that land resources are managed fairly and sustainably. The importance of cadastral layout surveys extends beyond individual landowners to encompass broader societal benefits. Well-executed cadastral surveys facilitate urban planning by providing planners with accurate land parcel data necessary for zoning, infrastructure development, and environmental management. They also support economic development by enabling secure property markets, attracting investment, and promoting efficient land use. Furthermore, cadastral systems contribute to social equity by clarifying land ownership and reducing conflicts, which is particularly important in regions where land tenure is a source of tension.

In summary, cadastral layout surveying is a vital discipline that integrates technical expertise, legal knowledge, and social considerations to define and manage land ownership and use. It underpins land administration systems worldwide and is indispensable for sustainable development, economic growth, and social stability. This project aims to explore the principles, methods, and applications of cadastral layout surveys, highlighting their significance in contemporary land management and planning. By understanding and applying cadastral surveying techniques, stakeholders can ensure that land resources are allocated and utilized in an orderly, transparent, and equitable manner.

1.1 STATEMENT OF PROBLEM

Inaccurate or incomplete data can lead to boundary disputes, property ownership conflicts and difficulties in land transactions. In many cases, the lack of reliable cadastral information can hinder economic development, leading to social unrest and create challenges for land administration authorities. Therefore, conducting a thorough cadastral survey is essential to gather accurate data and mitigate these risks land dispute among the land owner and other unrest issue in a smart community. This call for the layout of landed property said to belong to the De-Golden sister at Sentu Village.

1.2 AIM OF THE PROJECT

The aim of this project is to carry out Cadastral Layout Survey of plots of land belongs to De-Golden Sister at Sentu Village to accurate delineate the plots and produced a reliable data on land parcels within the designated area, This data will serve as a foundation for land administration, property registration, and urban planning.

1.3 OBJECTIVES OF THE PROJECT

The objectives of this project are:

i. To determine the boundaries and ownership of land parcel within the designated area (perimeter plan).
ii. To provide accurate data on property values and land use (computation sheet).
iii. To produce area computation sheet.
iv. To produce standard layout plan

1.4 SCOPES OF THE PROJECT

i. Planning
ii. Reconnaissance
iii. Monumentation
iv. Perimeter Travers
v. Layout Design
vi. Setting-out and Traversing
vii. Data Processing
viii. Information Presentation

1.5 PROJECT SPECIFICATIONS

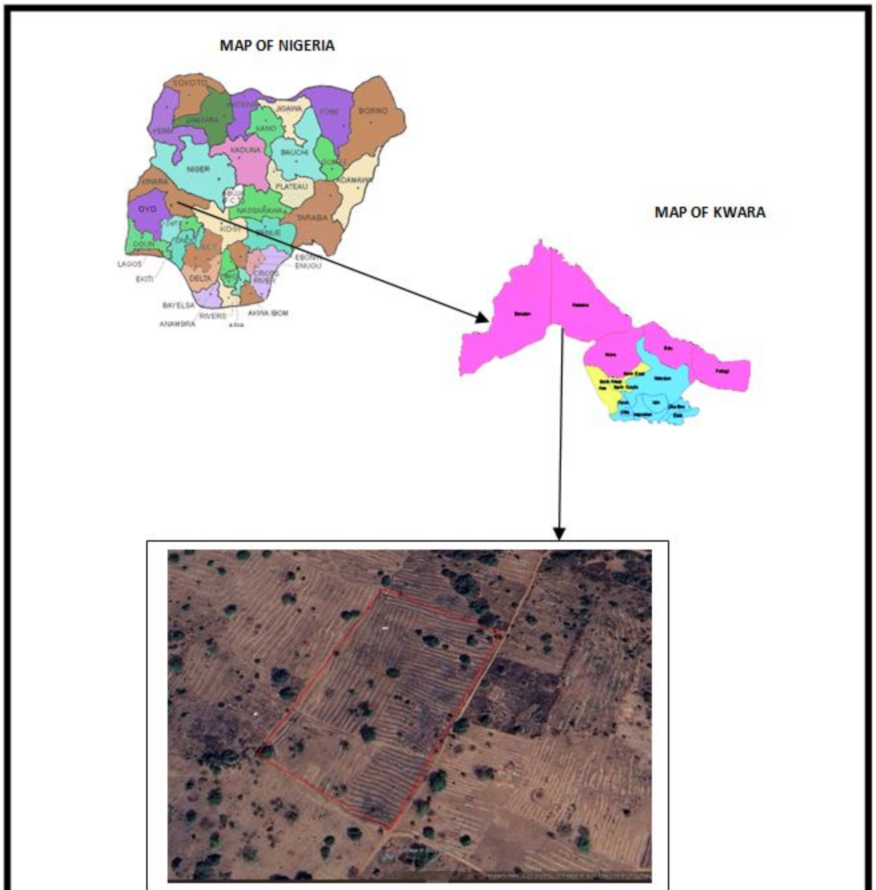
Project is based on the procedures used to execute a project in terms of how the measurements are taken. Specifications mean the requirements necessary to be met when carrying out the survey job of any order (cadastral layout survey). The following specifications are followed:

- Establishment of traverse points with property beacons (monumentations).

- Traverse commenced on three existing control points and closed on the same set of controls to check if the traverse is precise and accurate. The accuracy of the control points was found undisturbed before using them for orientation.
- The sub-division of the project area was done with the dimension of 15.25m x 30.50m for each plots and turning right angle.
- The residential plots should be regular and standard plots 50ft by 100ft.
- Property beacons should be emplaced at all plots.
- Each plot must have access road.
- The accuracy of the job should be third order. (less than1:3,000).
- There mustn't be cross or plus junction without a roundabout within the layout.
- Avoid sharp turning.

1.6 PROJECT LOCATION

The project site is situated in Alufa Agunbiade village area, Sentu community, off Oke-Ose - Lakiji Road, Ilorin East L.G.A, Kwara State which has an area of 2.747 hectares and it fall on geographical coordinate of 8°30'59.96"N ; 4°41'11.16"E to 8°31'9.67"N ; 4°41'10.73"E. The figure below shows the maps of the study area.



Google Earth imagery of The Study Area

1.7 PERSONNEL MEMBERS OF THE GROUP

The following students contributed greatly to the success of the field practical and they are;

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1.	Oloyede Favour Eniola	ND/23/SGI/FT/0001	Author
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CHAPTER TWO

2.0 LITERATURE REVIEW

Cadastral layout surveys constitute a critical component of land administration systems globally. They provide the foundational spatial and legal framework necessary for defining, recording, and managing land parcels. Accurate cadastral surveys underpin secure land tenure, facilitate property transactions, support urban and rural planning, and enable effective land taxation and governance. As urbanization accelerates and land demand intensifies, the importance of reliable cadastral layout surveys becomes more pronounced. This literature review synthesizes research findings, methodologies, technological advancements, challenges, and performance evaluation frameworks related to cadastral layout surveys. It draws on a wide range of sources, including international standards, case studies, and recent innovations, to provide a comprehensive understanding of the subject. The review also highlights institutional and operational challenges faced by cadastral agencies, particularly in developing countries, and explores future directions for enhancing cadastral survey systems.

Concept and Importance A cadastral survey is defined as the process of establishing and delineating the boundaries of land parcels for legal and administrative purposes. According to the International Federation of Surveyors (FIG), cadastral surveys are “surveys that establish or re-establish boundaries of land parcels and record them in a cadastre or land registry” (FIG, 1995). The cadastral layout survey specifically refers to the subdivision and arrangement of land into plots or parcels, often as part of land development, registration, or redistribution schemes. The cadastral layout survey serves multiple critical functions:

- Legal Certainty: It provides legally recognized boundaries that define ownership and rights.
- Land Administration: Supports land registration, taxation, and dispute resolution.
- Planning and Development: Facilitates urban planning, infrastructure development, and land use management.
- Economic Transactions: Enables secure property sales, leases, and mortgages.

Components of Cadastral Layout Survey A cadastral layout survey typically involves: Reconnaissance and Data Collection: Gathering existing maps, documents, and,

- stakeholder input. Field Surveying: Measuring land parcel boundaries using surveying instruments.
- Boundary Demarcation: Marking boundaries on the ground with physical monuments or
- markers. Mapping and Documentation: Creating detailed cadastral maps and records.
- Registration: Recording the surveyed parcels in official land registries.

Historical Context Historically, cadastral surveys have evolved from rudimentary boundary markings to sophisticated spatial data systems. Early cadastral systems relied on manual measurements and physical markers, often resulting in disputes due to inaccuracies. The advent of modern surveying instruments and digital mapping has transformed cadastral layout surveys into precise, reliable processes essential for contemporary land governance.

Methodologies in Cadastral Layout Survey Cadastral layout survey follows a systematic methodology involving several key steps and modern techniques: Review and Preparation Collect and study all relevant legal documents such as deeds, previous survey records, and• municipal plans to understand existing boundaries and ownership details. Physically visit the site with the landowner to verify and demarcate boundaries before• detailed surveying. Field Surveying Use specialized instruments like total stations, GPS (single or differential), and electronic theodolites to measure and locate property corners and boundaries accurately. Mark boundary points on the ground with permanent monuments such as iron rods, concrete pillars, or stakes. 3. Survey Techniques Common methods include: Traversing: Measuring a series of connected lines and angles to determine coordinates of boundary points. Triangulation: Using triangles and angle measurements to establish control points. Trilateration: Measuring all sides of triangles to fix coordinates. Photogrammetry: Extracting coordinates from aerial photographs or satellite imagery. Plane Table Surveying:

Drawing the map directly in the field by graphical plotting. 4. Data Processing and Plotting Process field measurements to compute coordinates and generate cadastral plans. Plot parcels either onsite or in the office using survey software, ensuring proper coding and joining of points to form parcel boundaries. 5. Verification and Connection to Existing Surveys Connect new survey data to existing cadastral control points or neighboring surveys to maintain continuity and accuracy. Resolve discrepancies by further measurements if significant differences arise between• new and existing data.

Final Documentation Prepare clear, unambiguous descriptions of parcels including coordinates, boundary directions, and ownership details. Submit cadastral maps and records for legal registration and archival. Modern Approaches Hybrid methods combine ground surveys with aerial photography or high-resolution, satellite imagery supported by ground truthing to improve accuracy and efficiency, especially in difficult terrain or urban areas. This methodology ensures accurate, legally defensible cadastral layouts that support land administration, ownership clarity, and development planning.

Traditional Surveying Techniques Traditional cadastral layout surveys rely on ground-based measurement techniques using instruments such as theodolites, total stations, and tape measures. The methodology involves: Reconnaissance: Surveyors review existing records, maps, and consult landowners or local authorities to understand the land parcel configuration. Establishing Control Points: Reference points are set using triangulation or traverse methods to provide a framework for measurements. Measurement: Distances and angles are measured between boundary points. Boundary Marking: Physical markers (concrete posts, iron rods, stones) are placed at parcel corners. Data Recording: Measurements are documented in field books and later processed for mapping. This approach, while reliable, is labor-intensive and time-consuming, especially for large or difficult terrain.

Modern Surveying Instruments The introduction of electronic distance measurement (EDM) devices, total stations, and Global Positioning System (GPS) technology has enhanced the accuracy and efficiency of cadastral surveys. Total Stations: Combine electronic theodolites and EDM to measure angles and distances quickly and accurately. GPS Surveying: Allows for rapid positioning using satellite signals, useful for establishing, control points and mapping boundaries. Digital Data

Collection: Field data is directly input into digital devices, reducing, transcription errors. 2.7 Integration with Geographic Information Systems (GIS) GIS technology enables the integration, analysis, and visualization of spatial cadastral data. Survey data is digitized and stored in GIS databases, facilitating: Layered Mapping: Combining cadastral data with topography, land use, and infrastructure, layers. Spatial Analysis: Identifying overlaps, gaps, and inconsistencies in land parcels. Data Sharing: Providing accessible cadastral information to stakeholders and the public.

Survey Procedures and Standards International standards, such as those from FIG and ISO, guide cadastral survey procedures to ensure consistency and legal validity. These include: Accuracy Requirements: Defining acceptable error margins for boundary measurements. Monumentation Standards: Specifications for physical boundary markers. Documentation: Requirements for survey plans, reports, and registration. Adherence to these standards is crucial for the legal acceptance of cadastral surveys. Technological Advances in Cadastral Layout Survey Recent advances have significantly transformed cadastral layout surveys, enhancing accuracy, efficiency, and data richness: Drones (UAVs) with LiDAR and High-Resolution Cameras: Drones equipped with LiDAR sensors and high-res cameras enable rapid, detailed aerial mapping and data collection, producing precise 3D point clouds of surveyed areas much faster than traditional methods. GNSS/GPS Systems with RTK and Multi-Frequency Receivers: Modern Global Navigation Satellite Systems provide real-time, centimeter-level positioning accuracy, crucial for establishing exact control points. Innovations like Real Time Kinematic (RTK) positioning reduce post-processing time and improve survey precision. 3D Laser Scanning: Laser scanners emit laser beams to capture millions of data points, creating highly detailed 3D models of terrain and structures. This technology is essential for complex urban environments and infrastructure projects. Mobile Mapping Systems (MMS): Integrated platforms combining LiDAR, cameras, and GNSS on vehicles or handheld devices allow fast, large-scale data collection for urban planning and road surveys. Artificial Intelligence (AI) and Automation:• AI algorithms assist in analyzing large datasets, detecting anomalies, optimizing workflows, and automating routine tasks, thereby reducing human error and increasing efficiency in cadastral data processing. Robotic Total Stations:• These automated instruments improve productivity and data accuracy by allowing single operator use, reducing labor costs in boundary and construction surveys. Digitalization and Data Integration: Transition from manual to digital data collection and sharing enables seamless integration of cadastral data in GIS and BIM systems, facilitating better land administration and real estate transactions. Institutional GNSS High Accuracy Services: Solutions like Sogei's GNSS service for cadastral surveying offer centralized management of GNSS receivers, improving accuracy, safety, and cost-efficiency for land administration agencies. These technologies collectively revolutionize cadastral layout surveys by providing faster data acquisition, higher precision, 3D spatial modeling, and enhanced data management capabilities, supporting modern land administration needs.

Remote Sensing and Aerial Surveying Remote sensing technologies, including satellite imagery and aerial photography, provide valuable data for cadastral mapping: High-Resolution Imagery: Enables identification of land parcel boundaries, especially in inaccessible areas. Orthophotos: Geometrically corrected aerial images used as base maps. LiDAR (Light Detection and Ranging): Offers detailed elevation data to support topographic mapping. Unmanned Aerial Vehicles (UAVs) / Drones Drones have revolutionized cadastral surveys by offering: Rapid Data Acquisition: Covering large areas quickly. High Accuracy: Capturing detailed imagery and 3D models. Cost-Effectiveness: Reducing manpower and equipment costs. Several studies highlight successful drone applications in cadastral surveys, especially in rural and difficult terrain.

Integration with Building Information Modeling (BIM) BIM integrates cadastral data with detailed building and infrastructure models, supporting: Urban Planning: Coordinated land and building management. Infrastructure Development: Accurate spatial referencing for construction projects. The integration of cadastral and BIM data is an emerging trend enhancing land administration capabilities. Automated and AI-Driven Surveying Artificial Intelligence (AI) and machine learning algorithms are being developed to: Automate Boundary Detection: Using image recognition on aerial or satellite data. Predict Land Use Changes: Supporting dynamic cadastral updates. Optimize Survey Planning: Enhancing resource allocation. While still in early stages, these technologies promise to transform cadastral surveying. Institutional and Implementation Challenges Institutional Challenges Fragmented Professional Roles: Different land-related professions (surveyors, planners, valuers) often work in isolation, causing duplicated efforts, data redundancy, and frustration for landowners who must consult multiple agencies. Poor Integration between Mapping and Registration: The traditional separation of cadastral maps and land registers leads to inefficiencies. Even where departments are under the same ministry, better cooperation is needed for seamless integration of cadastral data and land records. Organizational Structure Issues: Decisions on whether cadastral surveying and land registration should be combined or separate, centralized or decentralized, affect efficiency and data consistency. Close coordination between departments is essential. Lack of National Standards and Coordination: Many countries face challenges in standardizing survey methods and data models, leading to inconsistent cadastral information across regions. Limited Institutional Capacity: There is often insufficient investment in research, training, and development of local expertise to manage cadastral reforms effectively. Implementation Challenges Shortage of Skilled Manpower: Many areas suffer from a lack of trained cadastral surveyors and technical staff, compounded by inadequate inclusion of cadastral data modeling in academic curricula. Financial Constraints: Low government funding limits the ability to update cadastral maps, maintain control points, and adopt modern technologies, affecting the quality and timeliness of surveys. Weak Stakeholder Coordination: Poor collaboration between cadastral teams, urban planners, and development experts leads to inconsistencies in control point establishment and survey accuracy. Technical and Infrastructure Gaps: Inadequate ICT infrastructure and lack of integration with national spatial data infrastructures hinder efficient data sharing and cadastral system modernization. Data Integrity and Accessibility Issues: Problems with maintaining up-to-date, accurate cadastral data and limited public access reduce trust and usability of cadastral systems.

CHAPTER THREE

3.0 PROJECT PLANING

This is the preliminary stages of the project were the schedule and all other logistic will be decided and this planning is done in office in two was below.

3.1 RECONNAISSANCE

Reconnaissance is a very important aspect of any project work in surveying field; it generally consists of two methods.

1. Field reconnaissance

2. Office planning.

3.2 FIELD RECONNAISSANCE (RECCE)

In the process of obtaining field reconnaissance, the site was visited, drawing of the Recce diagram was carried out in order to decide on how best to do the job of the approved layout, the map covering the project site which was prepared by Ministry of Lands and Survey as a guide. The existing control points were located and the values were collected from the survey that did the part of the control to be use lather checking will be done for the in-situ.

3.3 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 2.1 Coordinates of Controls

Pillar No	Northing(m)	Easting(m)
SC/KW B10991R	941701.318	685715.747
SC/KW B10992R	941756.109	685609.382
SC/KW B10993R	941788.423	685544.026

Source: Private Practicing Surveyor

3.4 INSTRUMENT TEST

The Total Station was found to be in good working condition after checking for Collimation error, the Circular plate bubble and Plate level.

3.5 TEST OF TOTAL STATION 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 are

i. Temporary Adjustment
ii. Permanent Adjustment

The temporary adjustments are the ones that are carried out on every station before observation. They are;

i. Centering of instrument
ii. Removal of parallax

The permanent adjustments carried out are

1. Collimation adjustment
2. Vertical Index adjustment

2.5.1 PROCEDURE FOR COLLIMATION AND VERTICAL INDEX ADJUSTMENT

The instrument was set up on station SC/KW B10991R and all necessary temporary adjustments were performed. A target was set up at SC/KW B10991R to the line of site. It was aimed at 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. The readings obtained are as follows:

Table 2.2 Test of Total Station

	Old Reading	New Reading
Horizontal collimation error	$+00^0 00' 14''$	$+00^0 00' 09''$
Vertical index	$+00^0 00' 20''$	$+00^0 00' 04''$
		$+00^0 00' 09''$

Source: Author 2024

From the above reading, it is shown that the new value have higher precision than the previous. Therefore, the new value is set in the instrument for corrections applicable on any of the two axes.

3.5. IN-SITU CHECK OF CONTROLS USED

The following pillars SC/KW B10991R, SC/KW B10992R and SC/KW B10993R were among the ones found on the ground and checks were carried out on them to determine their true position and reliability.

Checks carried out on these pillars show that:

Observed Included angle = 180° 21' 12''

Computed Included angle = 180° 21' 18''

Difference: 00° 00'06''

Observed distance: = 120.305m (SC/KW B10992R - SC/KW B10991R)

Computed distance: = 120.315m (SC/KW B10992R - SC/KW B10993R)

Difference: = 0.010m

Remarks: The difference in both the angular and distance observations was within acceptable limit; hence the Pillars were in-situ.

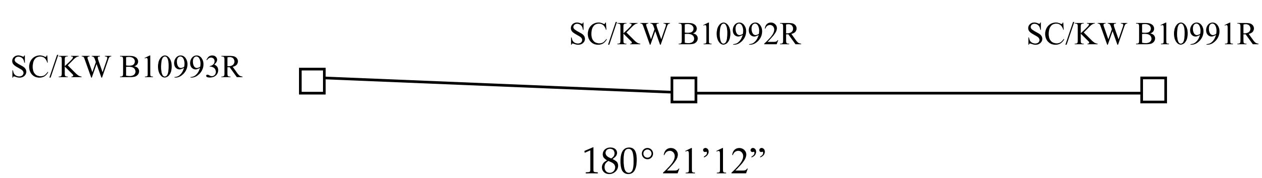


Fig 2.1 In-situ check for control

3.6 SCHEDULE OF FIELD WORK

Having completed the reconnaissance, the schedule of field work was designed as follows:

- Perimeter traverse
- Setting out of boundary beacons
- Layout design
- Pillar Numbering
- Traversing
- Report writing

3.7 DATA ACQUISITION

Layout is the sub-division of parcel of land into blocks and subsequently plots. The surveying process of defining the positions of various beacons that make up a layout on the ground by a surveyor using approved layout design made by the town planner is known as setting out. In the execution of this project the principle of "working from whole to parts" was adhered to as the perimeter beacons that formed the framework for the setting out of the blocks and the blocks formed the framework for the setting out of the plots.

The traditional or classical methods of surveying were decided upon for the execution of this project. The methods are:

- Setting out of the entire perimeter.
- Traverse method for acquisition of the entire perimeter.
- Stake out method for block by block and plot by plot setting out.

- Traverse method and interpolation for acquisition of the entire block and plot data.

3.8 SETTING OUT OF POINTS

Sokkia green label (Model: SET 02) Total Station was set up on SC/KW B10992R and oriented to SC/KW B10991R and coordinates of the stations were keyed into the instrument. Total station computed the bearing between the two stations for orientation. Then coordinates of points to be set out were entered into the total station and the setting out program of the instrument was used to get the angle to turn in order to face the direction of the point after orientation, the instrument was rotated until horizontal angle read 0◦00’00”, reflector was held along the direction and distance between the instrument and the reflector was measured.

The instrument displayed the remaining distance as either positive or negative. Positive distance means that the reflector should move away from the instrument by that amount while negative distance means that the reflector should move towards the instrument. When the horizontal angle read 0◦00’ 00” and measured distance displayed 0.000m this marked the exact position to be set out. The point was pegged and point number was written with permanent marker. All other points were set out in similar manner. Observations were carried out on the set out points and stored in the instrument memory. Also, the measurements made were found out to be permissible since the incurred error is within allowable. The principle of working from whole to part was observed while setting out the points as the boundary of the layout and some selected points within the boundary of the layout were first observed to server as subsidiary points (minor control points). Subsequent points were set-out from them.

3.9 MONUMENTATION

All the points set out were beaconed with a property beacon in compliance with cadastral survey regulations. The property Beacons were of dimension 18cm x 18cm x 75cm and made of concrete mixture of ratio 3:2:1in (3 parts of sand to 2 part of gravels and 1 part of cement) respectively. These beacons were emplaced in such a way that 15cm of its total length was above the ground surface while the remaining length was buried under the ground.

The boundary pillars were numbered accordingly as they were in the working diagram and where they fell during their setting out. However, the pillars were prefixed with identification mark SCKW. Because SURCON private numbers were obtained from the Office of State Surveyor General

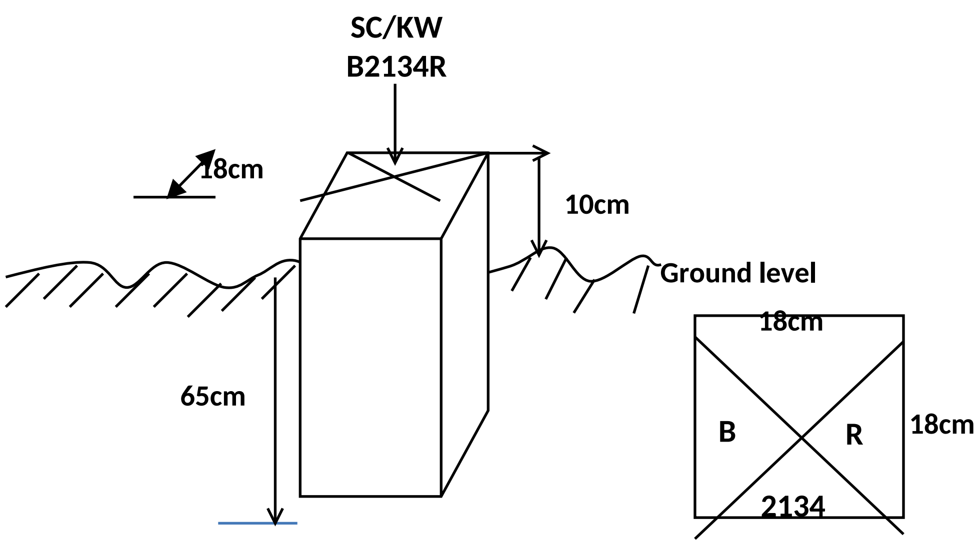


Fig 2.3 Description of pillar used showing portions above and below the ground

3.10 TRAVERSING

Total station was set up on SC/KW B10992R, 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 SC/KW B10991R, 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 SC/KW B10993R, 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 instrument was switched off and moved to SC/KW B10993R, and the above stated processes were carried out to coordinate the entire boundary points in X, Y, Z. The above process was repeated for other blocks shown on the plan including subsidiary traverses.

CHAPTER FOUR

4.0 DATA DOWNLOADING AND PROCESSING

The coordinates of the observed boundary were downloaded into the computer and were compiled in Microsoft excel for further processing. A script file of boundary points of individual plot was prepared in note pad using Polyline command. These script file was run in AutoCAD and the area information of each plots as well the bearing and distances of each consecutive lines were obtained.

4.1 DATA PROCESSING & ANALYSIS

The acquired field data was downloaded to the computer in the office. This was done using a NTS software. The following procedure was followed:

i. Connecting the SET and host computer, using communication cable.
ii. Selecting "JOB" in Memory Mode.
iii. Selecting "**comms**" output to display the JOB list.
iv. Pressing OK.
v. Selecting the output formation
vi. At the end of the downloading, the data was displaced in the following format, Point No., Easting and Northing.

The data was then copied to other software such as Microsoft Excel for further processing. Here, the data was arranged and stored as formatted Text (space delimited), ready for plotting. The observed data were reduced and corrected, Master Survey programmer software was used to process the data.

4.2 PLOTTING AND PLAN PRODUCTION

Auto-CAD2007 software was used for plotting all the set out pillars. The plotting procedure was as follows,

i. Launch Auto-CAD 2007.
ii. Select Format on the menu tool bar and set all necessary units such as meter, Decimal places, Directions etc.
iii. Select tool from the menu bar and highlight run script.
iv. Open the saved formatted Text from Microsoft Excel.
v. Zoom extents, by pressing Z enter and E enter.

All the coordinated points are plotted and displayed on the screen and with the help of the Recce diagram; all the boundary points were joined for individual plots to produce the boundary lines and the existing features such as Roads.

The final Layout plan was plotted at scale of 1: 2,500

4.3 PROJECT STATISTICS

1.	Total Number of residential plots	56 plots
2.	Total number of boundary beacons	4
3.	Coordinate Properties	UTM

4.4 COMPUTATIONS

The backward and area computation were done to the coordinates of the boundary pillar as show in the tables below;

Tab: 4.1: the table shows the back computation of the perimeter survey

Station form	Bearing	Distance (m)	ΔN	ΔE	Northing (m)	Easting (m)	To Station
					942244.886	684890.452	SC/KW J5920BK
SC/KW J5920BK	117° 13' 45’’	126.709	-57.976	112.668	942186.910	685003.119	SC/KW J7719BK
SC/KW J7719BK	206° 44' 54"	222.330	-198.539	-100.065	941988.371	684903.055	SC/KW B10990R
SC/KW B10990R	297° 14' 20"	119.643	54.761	-106.375	942043.132	684796.679	SC/KW B10991R
SC/KW B10991R	024° 55' 42"	222.481	201.754	93.772	942244.886	684890.452	SC/KW J5920BK

Tab: 4.2: the area computation by double latitude and single departure.

ΔE	ΔN	PRODUCT
112.668	X -57.976	= -6532.039968
112.668		
225.336		
-100.065		
125.271	X -198.539	= -24871.179069
-100.065		
25.206		
-106.375		
-81.169	X 54.761	= -4444.895609
-106.375		
-187.544		
93.772		
-93.772	X 201.754	= -18918.876088
93.772		

0.000		

= -6532.039968 -24871.179069 -4444.895609 -18918.876088

= -54766.990734\2

=27,383.495m²\10000

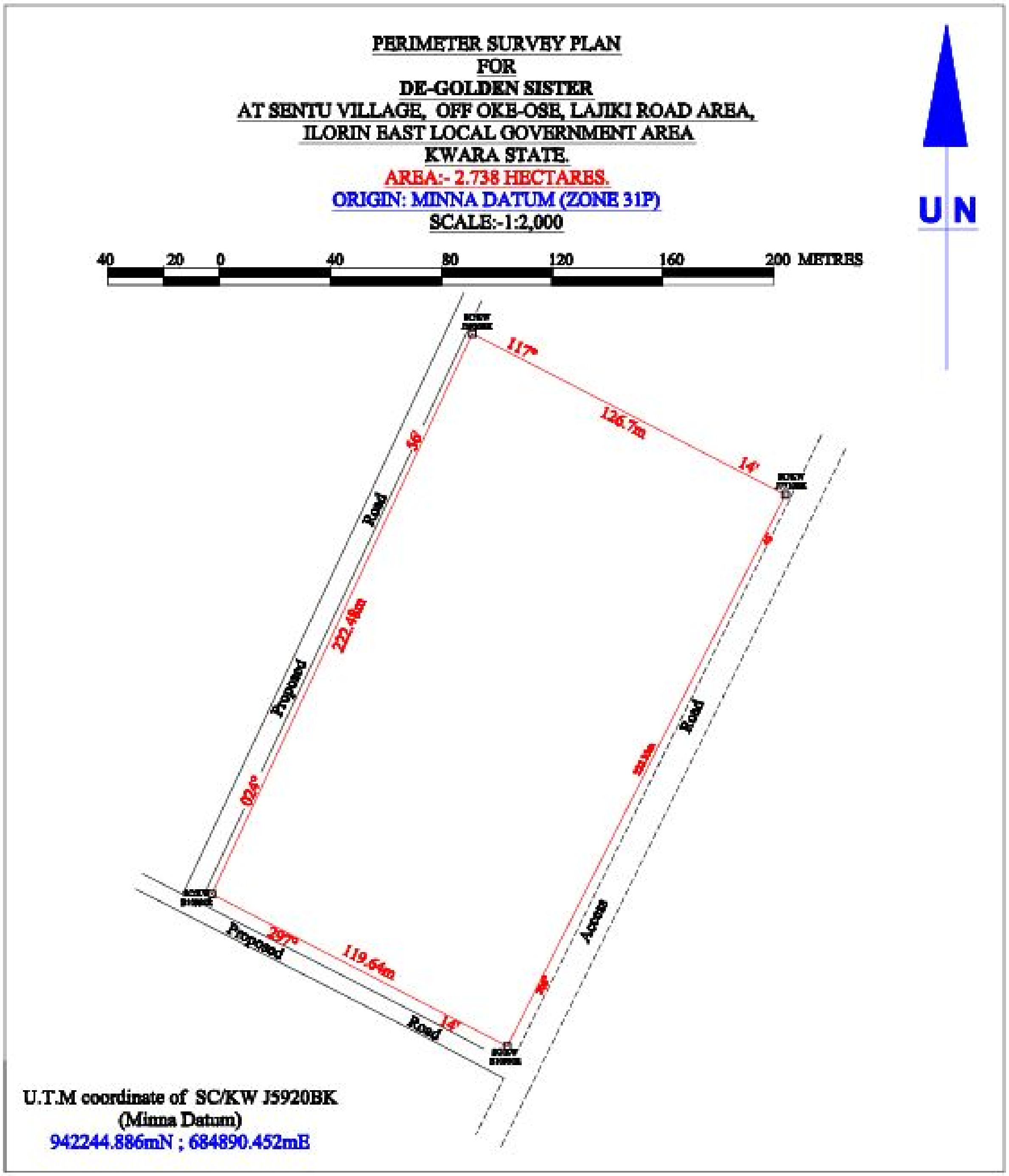
=2.7383 Hectares

4.5 DISCUSSION OF THE RESULT

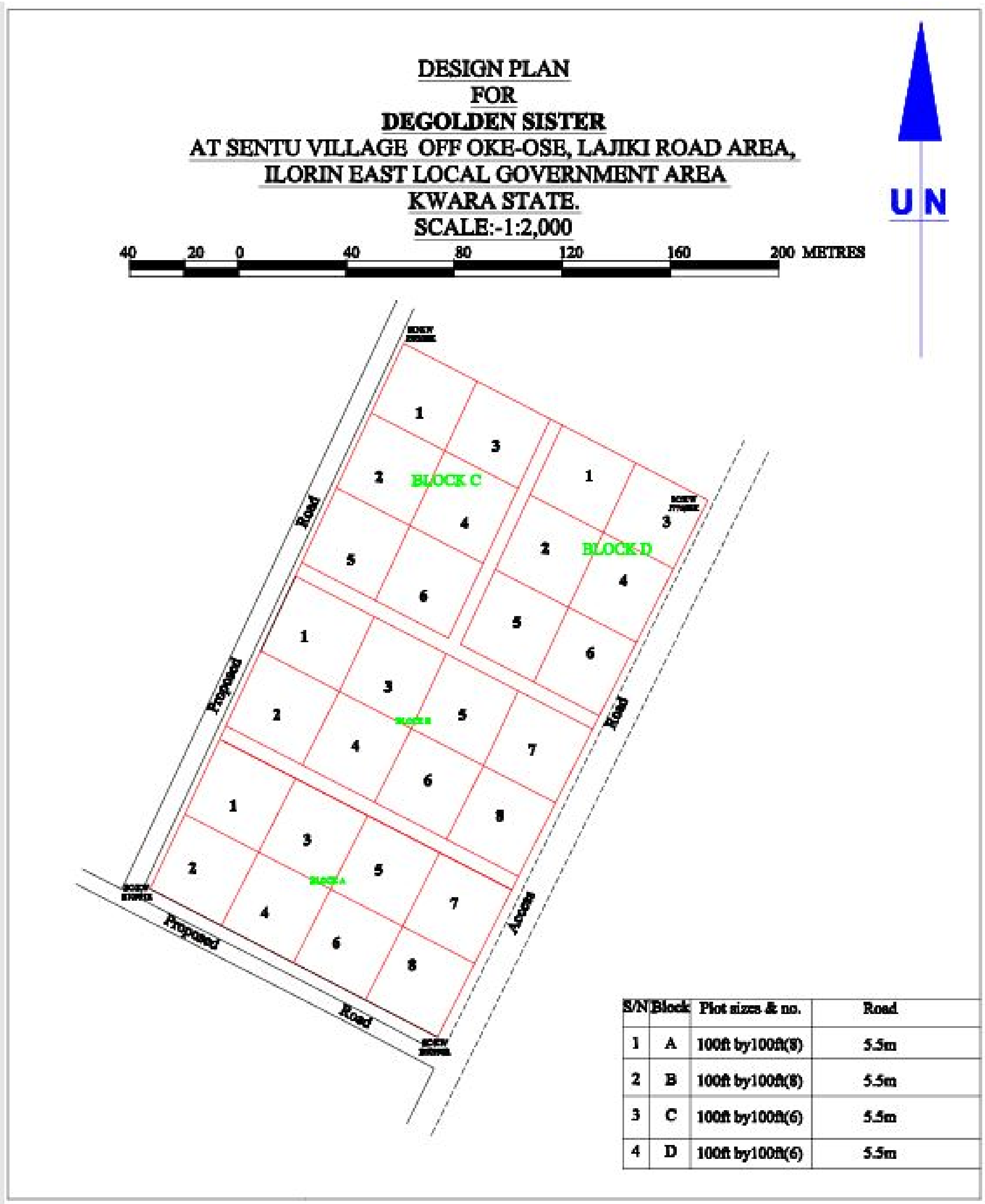
The following were the results obtained at the end of the project exercise, they are:

- Perimeter Survey plan.
- Design plan
- Layout plan

4.5.1 PERIMETER SURVEY PLAN

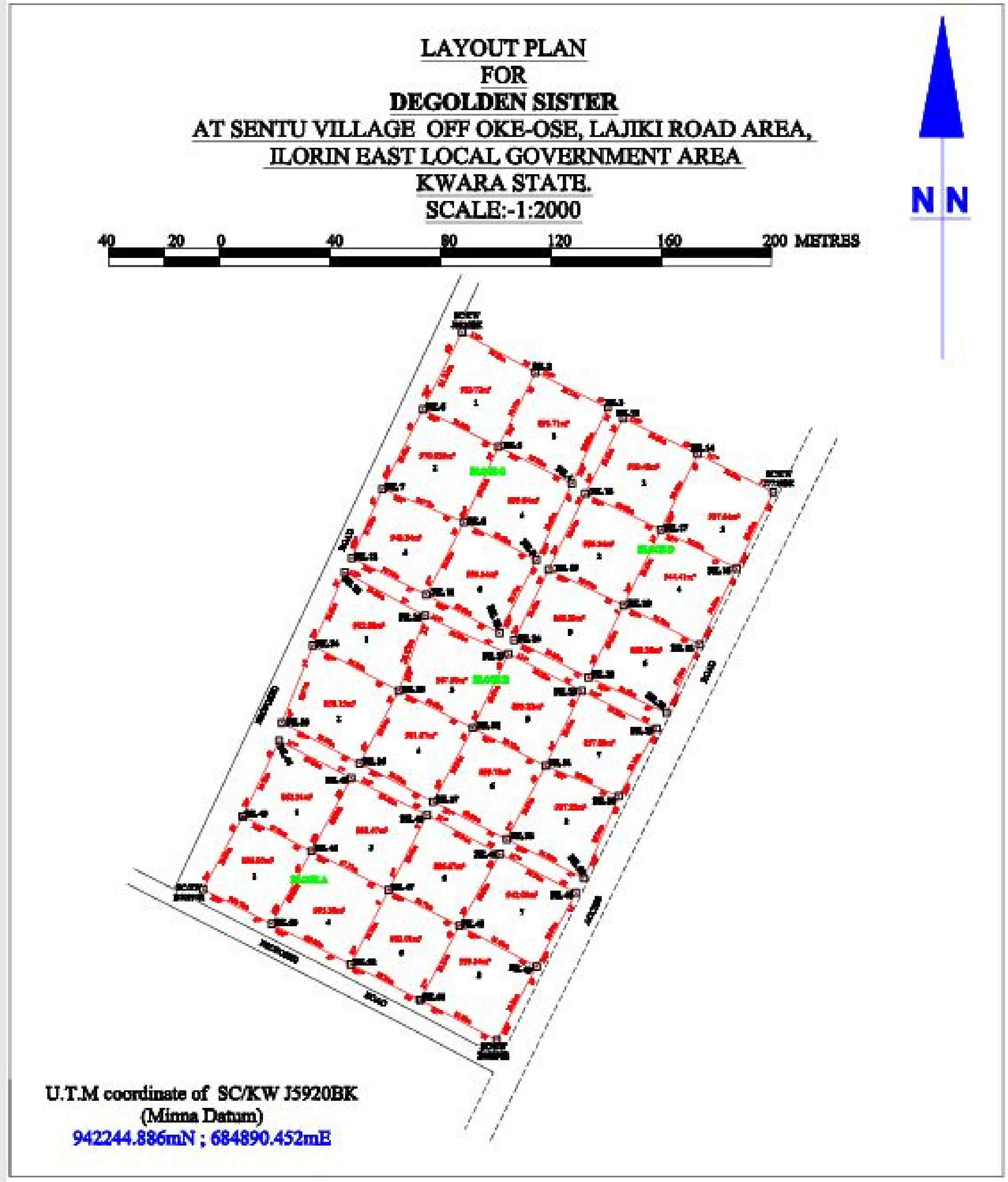


4.5.2 DESIGN PLAN



S/N	Block	Plot sizes & no.	Road
1	A	100ft by100ft(8)	5.5m
2	B	100ft by100ft(8)	5.5m
3	C	100ft by100ft(6)	5.5m
4	D	100ft by100ft(6)	5.5m

4.5.3 LAYOUT PLAN



CHAPTER FIVE

5.0 SUMMARY, CONCLUSION PROBLEMS ENCOUNTERED AND RECOMMENDATION.

5.1 SUMMARY

The project area covered a total area 2.738 hectares with total number of 4 pillars used for the Perimeter Survey. Whereas the total number of beacons used for the layout was 54, making a total number of 54 pillars emplaced. The total numbers of plots are 28 at 100ft x 100ft. The project cut across the following; reconnaissance, Monumentation and traversing and setting out. Kolida Total Station was used for the geometric data acquisition and its software was used in downloading and transforming the acquired data.

The final adjusted coordinates were used for the production of Perimeter Survey plan and the Layout Survey plan using AutoCAD 2007. The final plan was drawn at a scale of 1:2,000

5.2 CONCLUSION

In every aspect of the project, the results obtained were all within the limits of permissible accuracies. The principle of whole to path was adhering to and all the observations and measurements that were made in total conformity with survey rules and regulations. The final plan was presented to them in hard and soft copies. The hard copy was plotted on **A3** paper size.

However, based on the results obtained in the project, it is obvious that the aim of the project has been achieved. Conclusively, I hereby submit the Final Layout Survey Plan of De-Golden sister cooperative Land, which was successfully carried out.

5.3 PROBLEMS ENCOUNTERED

The only problem encountered was from the youths from the area who demanding some money for public relation. This was later settled by the Family representatives.

5.4 RECOMMENDATION

We hereby urge the department to exposed the students to more practical works in and outside the school. This project work show most of us the setting methods and exposed us to the uses of the survey instruments.

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Chrisman and Yandell (1988) A methodology to identify errors using a simple statistical model.

Elalichi and semlali (2001) the multipurpose concept of cadastral information system

Elekeset all (2008) explains cadastral maps and accuracy of the city Nug napolka in Romania.

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RAW DATA

PL	685715.372	941701.43	378.762
RD	685712.862	941697.33	378.756
PL2	685687.678	941716.11	379.535
PL3	685662.456	941729.037	380.403
B10992R	685609.007	941756.221	381.96
PL5	685623.378	941782.638	382.269
PL6	685676.16	941755.88	380.721
PL7	685701.779	941742.941	379.918
PL8	685729.781	941728.182	379.197
PL9	685716.533	941769.016	380.451
PL10	685744.061	941754.972	379.637
PL11	685746.929	941760.165	379.651
PL12	685718.942	941774.294	380.431
PL13	685690.1	941783.065	381.239
PL14	685692.255	941787.928	381.343
PL15	685662.604	941796.453	381.709
PL16	685665.695	941801.784	382.098
G7065KP	685636.516	941809.908	382.586
PL18	685648.743	941844.451	383.092
PL19	685679.925	941828.131	382.466
PL20	685706.604	941814.556	381.644
PL21	685732.978	941800.893	380.756
PL22	685759.615	941789.914	380.405
I7720BK	685776.835	941820.074	380.555
PL24	685759.721	941821.191	380.853
PL25	685748.544	941832.933	381.25
PL26	685746.205	941828.009	381.176
PL27	685719.623	941841.467	381.902
PL28	685721.682	941846.436	381.831
PL29	685716.38	941849.007	382.014
PL30	685702.871	941848.943	382.391
PL31	685686.689	941856.609	382.611
PL32	685689.859	941862.847	382.662
J5924BK	685662.878	941876.172	383.422

PL34	685660.297	941871.011	383.473
J5920BK	685702.779	941957.975	383.13
PL36	685729.38	941943.477	382.642
PL37	685755.528	941930.597	382.315
PL38	685761.105	941926.821	381.93
PL39	685788.187	941913.917	381.554
PL40	685815.447	941899.999	381.103
PL41	685802.232	941872.409	380.764
PL42	685774.836	941886.5	381.446
PL43	685747.487	941899.504	381.831
PL44	685742.594	941903.187	382.27
PL45	685715.892	941916.485	382.829
PL46	685788.895	941844.863	380.654
PL47	685761.351	941859.132	381.119
PL48	685734.181	941872.012	381.875
PL49	685729.669	941875.413	382.035
PL50	685703.469	941889.197	382.652
PL51	685702.677	941887.507	382.665
PL52	685669.388	941903.005	383.426