PROJECT REPORT
ON
PERIMETER AND DETAILING SURVEY
OF
PART OF KWARA STATE POLYTECHNIC, ILORIN.
FROM ENGINEERING BUILDING TO GTBANK

BY

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ND23/SGI/FT/0031

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, **ASHAOLU SAMUEL TEMIDAYO** with Matric Number **ND/23/SGI/FT/0030** hereby certify that the information contained in this projectreportwereobtainedasaresultofobservationsandmovementstakenby me and the Perimeter and Detailing was done in accordance to Surveying rules and regulations and Departmental instructions.

Signature of student: ______________________________

Name of student: ______________________________

Date of completion: ______________________________

Matric Number: **ND/23/SGI/FT/0030**

CERTIFICATION

This is to certify that **ASHAOLU SAMUEL TEMIDAYO** with Matric number **ND/23/SGI/FT/0030** carried out this project work and has been approved as meeting the requirement for the award of National Diploma (ND) in Surveying and Geo-informatics in the Department of Surveying and Geo-informatics of the Institute of Environmental Studies, Kwara State polytechnic, Ilorin.

SURV. R. O. ASONIBARE **MRS. S.O. ADEOTI** **(Project supervisor)**	**DATE**
SURV. AWOLEYE RAPHAEL **(Project Coordinator)**	**DATE**
SURV. AMBIMBOLA ISAU Head of Department	**DATE**
J.O OPALEYE **External Moderator**	**DATE**

DEDICATION

This project is dedicated to Almighty God, the creator of heaven and earth, ancient of days, the I am that I am the beginning and the end whose supremacy in the knowledge of everything is absolutely

ACKNOWLEDGEMENTS

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

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

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ABSTRACT

This project is based on perimeter and detailing survey of part of [I.O.T], Kwara State Polytechnic, Moro Local Government Area, Ilorin, Kwara State. This project has been divided into different chapters. Chapter one of this project gives an introduction about the project topic as a whole. This enables better understanding of the project so as to know what perimeter and detailing entails as well as the scope and aim of the project. Chapter two is the literature review i.e. the works of past professionals and projects that had been done in the past as regards this specific topic which were examined in order to help to shed more light on what perimeter and detailing survey is all about. Chapter three of this project is the methodology which describes how the project was carried out using digital instrument e.g. Total Station and its accessories from the first stage to the final stage. Chapter four of this project is Data presentation which consists of all the data acquired from site during the project execution. Chapter five comprises of summary, problems encountered, conclusion and recommendations. Reference comprises of list of names and works of prominent authors or professionals whose works on survey as regards this specific topic were used in the course of this project.

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Land is the prime natural resource of the world. It is also a very important natural resources of any country due to its limited nature and without land there can be no country. This then implies that the wealth of a nation and its economic and sustainable developments are dependent in the state of its land and its usage. Therefore, the opportunities of tomorrow will be determined by the land use decisions made today (Effiong 2010).

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).

Perimeter detailing is a crucial aspect of architectural design, construction, and security planning that involves the precise definition, enhancement, and protection of property boundaries. This practice encompasses both aesthetic and functional considerations, from ornamental fencing and landscaping to sophisticated security measures and boundary demarcation systems. Historically, perimeter detailing evolved from simple boundary markers such as stone walls and wooden fences to today's integrated systems that combine security, aesthetics, and environmental considerations.

In contemporary architecture and urban planning, perimeter detailing has gained increasing importance due to several factors. The growing emphasis on property security, privacy concerns in densely populated areas, the need for clear legal boundary demarcation, and the desire for aesthetic enhancement of properties have all contributed to the evolution of perimeter detailing from a simple necessity to a sophisticated discipline combining multiple fields of expertise.

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).

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.

Despite its importance, perimeter detailing faces several challenges and issues that affect its implementation and effectiveness:

1. **Balancing Security and Aesthetics:** Many perimeter solutions prioritize security at the expense of visual appeal, resulting in boundaries that appear fortress-like and unwelcoming. Conversely, purely aesthetic approaches may compromise security needs.

2. **Regulatory Compliance:** Navigating the complex web of local building codes, zoning regulations, and property laws that govern perimeter installations can be challenging for property owners and designers.

3. **Environmental Impact:** Traditional perimeter materials and construction methods often have significant ecological footprints, from resource-

intensive manufacturing processes to disruption of natural water flow and wildlife movement.

The primary areas of investigation include:

1. **Residential Housing Developments:** Single-family homes, townhouse complexes, and multi-family residential buildings, examining how perimeter detailing varies across different housing typologies.

2. **Mixed-Use Developments:** Areas where residential properties interface with commercial, institutional, or public spaces, requiring perimeter solutions that accommodate different user groups and functions.

3. **Urban Renewal Projects:** Neighborhoods undergoing revitalization, where perimeter detailing must balance preservation of historical elements with modern security and aesthetic needs.

4. **Master-Planned Communities:** Large-scale developments with comprehensive design guidelines, analyzing how perimeter detailing contributes to community identity and cohesion.

5. **Transit-Oriented Developments:** Residential areas near transportation hubs, where perimeter solutions must address higher pedestrian traffic and public-private transitions.

1.4 Aim and Objectives of the Project

1.4.1 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.

1.4.2 Objectives of the Project

The following are the objectives of the study;

- To carry out proper planning and reconnaissance in the office and field respectively.
- To carry out traverse and determination of detail features of the survey area using Total station.
- Production of a perimeter plan and a detailed perimeter plan of the area.

1.5 Scope of the Project

the scope includes the following:-

- Traverse connection to established controls.
- Perimeter traversing
- Detailing of features using offset
- Data Downloading and Processing
- Data editing
- Analysis of result

- Plotting and plan production

1.6 Significance of the study

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

- 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. **For Architects and Designers:** The findings will provide evidence-based guidelines for perimeter detailing that achieves balance between competing priorities, potentially leading to more innovative and effective design approaches.
2. **For Property Developers:** The research will offer insights into how strategic perimeter detailing can enhance property marketability and value, potentially improving return on investment.
3. **For Homeowners and Property Managers:** The study will develop practical frameworks for selecting appropriate perimeter solutions based on specific needs and constraints, potentially reducing long-term costs and maintenance issues.
4. **For Urban Planners and Policy Makers:** The findings will contribute to understanding how perimeter detailing affects neighborhood character, security

perceptions, and community cohesion, potentially informing more effective regulations and guidelines.

5. **For Security Consultants:** The research will expand the knowledge base regarding the integration of security features with other perimeter functions, potentially leading to more holistic security approaches.

6. **For Environmental Advocates**: The study will advance understanding of ecological considerations in perimeter design, potentially promoting more sustainable practices in property development.

7. **For Technology Developers:** The findings will identify gaps and opportunities in current perimeter technologies, potentially stimulating innovation in materials and systems.

8. **For Academic Research:** The study will contribute to the theoretical understanding of boundaries and thresholds in built environments, potentially opening new avenues for architectural and urban design research.

1.7 PERSONNEL

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

S/N	NAMES	MATRIC NO	ROLE
1	ASHAOLU SAMUEL TEMIDAYO	ND/23/SGI/FT/0030	AUTHOR
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7	LAFIA ISHIAK ALHASSAH	ND/23/SGI/FT/033	MEMBER

1.3 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

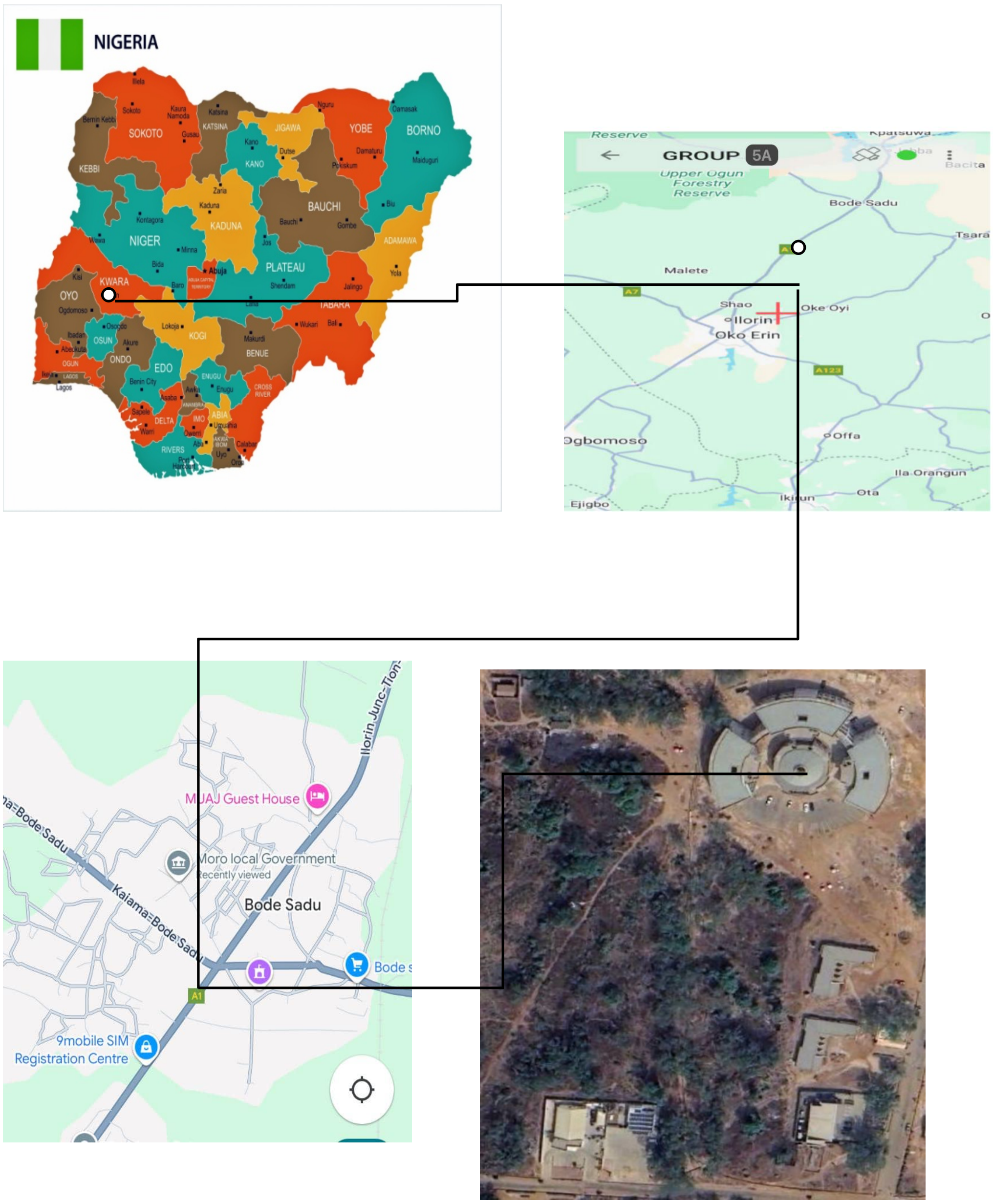

Fig 1: Image showing the study

CHAPTER TWO

LITERATURE REVIEW

2.0 INTRODUCTION

The significance of perimeter and detailing surveys cannot be overstated in contemporary architecture, engineering, and construction disciplines. These surveys form the backbone of informed decision-making processes, serving as critical tools for data acquisition related to land, structures, and environmental features. A perimeter survey focuses primarily on the boundaries delineating a property, while a detailing survey undertakes a more exhaustive examination of the features within these boundaries, capturing topographical nuances, vegetative classifications, structural elements, and infrastructural components (Hughes, 2018). This review synthesizes the extant literature regarding perimeter and detailing surveys, exploring their methodologies, technological advancements, multifaceted applications, associated challenges, and potential future directions.

PERIMETER SURVEYS

Perimeter surveys are primarily concerned with establishing and verifying property boundaries. These surveys incorporate legal and topographical elements to facilitate property development, zoning compliance, and land-use planning. A fundamental understanding of legal property lines is paramount for stakeholders, including property developers, architects, and governmental agencies, as misunderstandings regarding boundaries can lead to costly disputes and legal repercussions (Smith & Johnson, 2020).

DETAILING SURVEYS

Detale surveys, on the other hand, delve deeper and encompass a broader range of physical elements within a specified perimeter. They involve a meticulous examination of the site, capturing intricate details such as elevation changes, vegetation types, existing structures, and utilities (Hughes,2018). The comprehensive data acquired through detailing surveys are indispensable for site analysis, feasibility studies, and design development, allowing project teams to make informed decisions that optimize functionality and sustainability

METHODOLOGIES

The methodologies employed in perimeter and detailing surveys have evolved significantly over the past few decades, fueled by technological advancements and changing project requirements.

Historically, perimeter and detailing surveys relied heavily on conventional surveying methodologies, which included:

CHAIN AND TAPE MEASUREMENTS

Chain and tape measurements are among the oldest surveying techniques. They involve the physical measurement of distances using calibrated lengths of chain or tape. While effective for shorter distances and simple geometries, this method has limitations in terms of accuracy, especially in complex topographies or large parcels (Dalton & Robson, 2017).

2.2 MODERN TECHNOLOGICAL ADVANCES

The advent of digital technologies has dramatically reshaped the methodologies of perimeter and detailing surveys, enhancing efficiency, accuracy, and data comprehensiveness. Key advancements include:

2.2.1 Global Positioning System (GPS) and Global Navigation Satellite System (GNSS)

The adoption of GPS and GNSS technologies has revolutionized surveying by providingreal-time positioning data with high levels of accuracy. These systems are particularly advantageous for large-scale surveys, as they eliminate the need for extensive ground controls and allow for rapid data collection across expansive are as (Blacketal.,2019). GNSS receivers can achieve centimeter-level accuracy, making them indispensable for applications requiring high precision.

LIGHT DETECTION AND RANGING (LIDAR)

LiDAR technology has emerged as a powerful tool for capturing three-dimensional spatial data. Utilizing laser pulses, LiDAR can create detailed topographical maps and 3D models of the surveyed area. This technology enables rapid data collection, allowing for comprehensive analysis of terrain features, vegetation density, and built structures well beyond what traditional surveying methods can achieve (Mason et al., 2021). The high-resolution datasets produced by LiDAR facilitate a range of applications, including environmental assessments, urban planning, and archaeological studies, by providing a level of detail that enhances understanding of spatial relationships and geographic contexts.

UNMANNED AERIAL VEHICLES (DRONES)

The integration of drones into perimeter and detailing surveys has catalyzed a transformative shift in how data is gathered. UAVs equipped with high-resolution cameras and sensors allow for efficient aerial surveys of large areas, capturing detailed images and topographic data from perspectives that would be difficult or impossible to achieve through traditional surveying methods (Anderson & Gaston, 2018). Drones can fly over complex terrains and inaccessible locations, providing valuable insights with minimal ground disruption. Moreover, advancements in photogrammetry-combined with drone technology—enable the creation of 3D models and orthophotos that significantly enhance the planning and visualization process.

APPLICATIONS OF PERIMETER AND DETAILING SURVEYS

The applications of perimeter and detailing surveys are diverse and span multiple sectors, highlighting their critical role in various stages of project development and management.

URBAN PLANNING

Perimeter and detailing surveys are foundational in urban planning, assisting planners in making informed decisions regarding land use, infrastructure investments, and community development. By providing accurate data on existing site conditions, these surveys enable planners to evaluate the suitability of land for different uses (Fischer& Smith, 2021). For instance, surveying data can help identify areas prone to flooding, enabling appropriate zoning ordinances and mitigation strategies.

CONSTRUCTION

In construction, perimeter and detailing surveys are essential for establishing site boundaries, determining elevations, and ensuring compliance with design specifications. Clear and accurate surveys contribute to effective project management, helping to mitigate issues related to misaligned structures, conflicting regulations, and unforeseen site conditions (Thompson, 2020). A well-executed detailing survey provides contract or switch comprehensive information needed for excavation, grading, and the positioning of utilities, thus streamlining workflow and enhancing site productivity.

ENVIRONMENTAL ASSESSMENT

Environmental assessments leverage perimeter and detailing surveys to evaluate the ecological characteristics of an area, including flora and fauna, soil conditions, and existing land uses. These assessments are crucial for understanding the environmental impacts of proposed developments and ensuring compliance with environmental regulations (Clark, 2021). Comprehensive surveys can inform stakeholders about biodiversity levels, thereby influencing conservation efforts and sustainability initiatives. Consequently, detailed ecological surveys support environmental impact assessments (EIAs) and influence permitting processes for various projects.

In the realm of heritage conservation, detailing surveys are fundamental for documenting historical sites and structures. These surveys produce detailed records of architectural features, site layouts, and material conditions, which are integral for restoration and preservation (Johnson & Evans, 2019). By capturing the current state of historical assets, professionals can develop strategies that reconcile modern needs while maintaining the integrity and authenticity of cultural heritage sites.

CASE STUDY: THE PRESERVATION OF HISTORICAL LANDMARKS

For example, in the preservation of the historic town of Williamsburg, Virginia, detailed surveys employed state-of-the-art LiDAR techniques to map buildings and landscapes. This comprehensive dataset helped conservationists understand how to best restore aging structures while adhering to historical accuracy (McDonald et al., 2022). The integration of various surveying techniques ensured that the historical integrity was maintained while enhancing visitor experiences through better-managed conservation efforts.

CHALLENGES IN PERIMETER AND DETAILING SURVEYS

Despite the remarkable advancements in surveying methodologies, several challenges remain prevalent in the execution of perimeter and detailing surveys.

DATA ACCURACY AND PRECISION

Ensuring data accuracy and precision is one of the most persistent challenges faced by surveyors. Variability in conditions such as weather, terrain, and available technology can introduce discrepancies in data collection (Peterson, 2020). As projects frequently rely on integrated data sets from multiple sources, the alignment of these data sets—especially when they originate from different technologies—poses a challenge. Accredited quality control measures are crucial to validating data accuracy, ensuring that results conform to required standards and specifications.

COST AND TIME CONSTRAINTS

The financial and temporal resources required for comprehensive perimeter and detailing surveys can be substantial. In particular, projects with tight budgets and schedules may prioritize speed over thoroughness, potentially compromising data quality. Comprehensive detailing surveys, which require extensive data collection and analysis, can be resource-intensive, thus limiting their feasibility for smaller projects or underfunded initiatives (Nguyen & Wang, 2022). Consequently, stakeholders may forego necessary survey aspects in favor of expedited completion, leading to long-term implications for project viability and regulatory compliance.

TECHNOLOGICAL BARRIERS

While technology enhances surveying practices, its adoption also presents challenges. The integration of advanced tools and techniques necessitates specialized training and skill acquisition for survey personnel, which can create a knowledge gap in the workforce (Baker,2019). Furthermore, the initial costs associated with purchasing and maintaining sophisticated surveying equipment—

such as GNSS receivers, LiDAR systems, and drone technology—can be prohibitive for some organizations, particularly smaller firms. The reliance on advanced technology also raises questions regarding data security and management, as digital information becomes susceptible to cyber threats.

REGULATORY CHALLENGES

Navigating regulatory frameworks can also complicate the survey process. Different regions may have varying legal requirements regarding property boundaries, environmental assessments, and site documentation (Kahn & Mitchell, 2019).

Surveyors must possess a thorough understanding of local laws and regulations to ensure compliance and mitigate potential legal disputes. Variability in regulatory requirements can further complicate boundary determinations, particularly in cases involving historical properties or contested lands.

FUTURE DIRECTIONS IN PERIMETER AND DETAILING SURVEYS

The future of perimeter and detailing surveys appears bright, with emerging technologies, methodologies, and practices poised to redefine the land scape of data collection and analysis. Key areas for potential growth include:

INTEGRATIONOFARTIFICIALINTELLIGENCEANDMACHINE LEARNING

The integration of artificial intelligence (AI) and machine learning into surveying practices offers substantial potential for enhancing data analysis and interpretation. AI algorithms can process large data sets to identify patterns, predict trends, and automate certain aspects of data collection (Lim & Zhang, 2023). For instance, machine learning models could analyze historical survey data to improve boundary determination accuracy by identifying inconsistencies or anomalies. Such advancements could substantially improve efficiency and lead to more informed decision-making processes.

INCREASED FOCUS ON SUSTAINABILITY

As the global focus shifts toward sustainable development, the role of perimeter and detailing surveys will likely expand to support environmentally conscious practices. Survey methodologies will need to adapt to address sustainability goals, including the assessment of biodiversity, carbon emissions, and land-use impacts (Kumar et al., 2022). As stakeholders increasingly prioritize green building practices and ecosystem preservation, detailed environmental surveys will become essential tools for evaluating project implications and ensuring regulatory compliance.

The future of surveying practices will likely require an emphasis on collaboration and data sharing among various stakeholders—ranging from surveyors and planners to environmental scientists and regulatory agencies. Innovations in cloud-based data management and visualization platforms can facilitate seamless information exchange, enabling stakeholders to access, interpret, and analyze survey data more effectively (Thompson, 2020). Enhanced data collaboration can yield comprehensive insights that drive more effective project planning and management.

Adoption of Augmented Reality (AR) and Virtual Reality (VR)

The application of augmented reality (AR) and virtual reality (VR) technologies in perimeter and detailing surveys presents an exciting frontier. AR can provide real-time over lays of survey data on to physical environments, enabling stakeholders to visualize the implications of proposed changes on-site. Likewise, VR can facilitate immersive experiences for project stakeholders, simulating designs or alterations before actual implementation (Davis & Moore, 2021). Both technologies can enhance stakeholder engagement by allowing for interactive design reviews and community input in planning processes.

The field of surveying plays a pivotal role in supporting land development, infrastructure planning, construction, and legal property delineation. Among the various branches of surveying, perimeter and detailing surveys are particularly significant due to their practical applications in defining land ownership and in capturing critical patial information for architectural and engineering design. These surveys serve as the foundational input for decisions made by developers, engineers, architects, and policymakers, making their accuracy and reliability a matter of both technical and legal importance.

Perimeter surveys, also known as boundary or cadastral surveys, are chiefly conducted to establish, retrace, or verify property boundaries. These surveys have been a part of land management systems for centuries, evolving alongside property laws and land registration practices. The literature emphasizes the legal dimension of perimeter surveys, where surveyors are often required to interpret complex property deeds, historical maps, and registry records to establish or reaffirm boundary lines. The process is not merely technical but also interpretive, involving the reconstruction of past surveys, identification of natural or artificial markers, and reconciliation of conflicting claims or ambiguities. Surveyors must consider the legal doctrine of “following in the footsteps” of the original surveyor, a principle that has been discussed extensively in surveying and land law literature.

The rise of modern instrumentation has transformed the accuracy and efficiency of perimeter surveys. Tools such as GNSS receivers, total stations, and computer-aided drafting (CAD) software enable surveyors to collect and analyze spatial data with unprecedented precision. Legal scholars and technical researchers alike have noted the tension that sometimes arises between highly precise modern measurements and historical property descriptions that were based on older, less accurate techniques.

This discrepancy can lead to boundary disputes, which further underlines the importance of professional judgment and adherence to established surveying principles and local land laws.

In contrast, detailing surveys focus on acquiring fine-grained, comprehensive information about physical and topographical features within a given land parcel. These surveys are critical during the planning and design phases of construction, landscaping, road work, and utility installation. Unlike perimeter surveys that deal with legal boundaries, detailing surveys are more concerned with spatial completeness and topological accuracy.

Features recorded include the positions and dimensions of buildings, vegetation, walls, pavements, surface textures, utility covers, and elevation changes. This data is often used to create topographic maps, 3D models, or digital terrain models (DTMs), which serve as the base layers for engineering and architectural blueprints.

Technological advancement has had a particularly transformative impact on detailing surveys. The use of terrestrial laser scanners, drone-based photogrammetry, mobile mapping systems, and LiDAR has allowed for the collection of highly detailed point clouds, enabling millimeter-level accuracy over large and complex areas. Recent literature has explored how such technologies support not only traditional surveying tasks but also advanced applications such as deformation monitoring, heritage documentation, and smart infrastructure management. Additionally, the integration f Geographic Information Systems (GIS) with detailing survey data allows for the storage, querying, and visualization of spatial information in ways that enhance both technical analysis and public communication.

A significant body of recent research has also highlighted the role of perimeter and detailing surveys in disaster risk management and climate resilience planning.

Accurate boundary data is vital for property restitution after natural disasters such as floods, earthquakes, or landslides. Similarly, detailed topographic information is crucial for assessing flood risk, modeling drainage patterns, and designing resilient infrastructure. Survey data can inform early warning systems, evacuation planning, and post-disaster reconstruction efforts, making the role of surveyors increasingly important in the context of climate change adaptation.

Urbanization and infrastructure expansion have placed further emphasis on the need for precise and up-to-date survey data. In dense urban environments, where land is scarce and development is intensive, the delineation of boundaries and the inventory of built features must be impeccably accurate to avoid costly legal conflicts and design errors. Studies have shown that surveying errors in such contexts can result in significant project delays, financial losses, and reputational damage. Hence, modern surveying practices are increasingly governed by quality assurance protocols, standard operating procedures, and adherence to international surveying standards, such as those recommended by the International Federation of Surveyors (FIG) and national land survey institutions.

The digital transformation of land and property data has also been a major theme in recent literature. Cadastral data, once maintained in paper-based systems, is now increasingly integrated into digital cadastral databases that are accessible online.

These systems require accurate and consistent input, which only well-executed perimeter and detailing surveys can provide. Moreover, emerging technologies such as block chain are being investigated for use in secure, tamperproof land registry systems. For such systems to function effectively, the underlying spatial data must be reliable, verifiable, and consistent across temporal and jurisdictional boundaries.

Professional practice and training have also been subjects of academic and industry attention. The complexity of modern surveying tasks demands a high level of technical knowledge, legal awareness, and ethical responsibility. Institutions and professional bodies are now placing greater emphasis on interdisciplinary training, combining elements of geomatics, land law, computer science, and environmental studies. This is particularly important in developing regions, where inadequate surveying practices can undermine property rights, hinder development, and perpetuate poverty. International development agencies have emphasized the importance of capacity building in surveying as a critical step toward equitable land governance and sustainable urbanization.

Despite all the advancements, challenges remain. Issues such as access to equipment, the cost of high-end surveying technologies, the need for continual software updates, and the management of large datasets continue to present obstacles, particularly for small firms and surveyors in developing economies. Additionally, ethical issues concerning data privacy, land grabbing, and the displacement of communities due to urban expansion or infrastructure projects have also been associated with the misuse or manipulation of survey data. These concerns have prompted calls for greater transparency, accountability, and community participation in the surveying and mapping processes.

In summary, the literature on perimeter and detailing surveys paints a picture of a dynamic and evolving profession at the intersection of technology, law, and society. While these surveys may seem purely technical, they are deeply embedded in the socio-legal framework of land ownership, development, and governance. As surveying continues to evolve with digital tools and remote sensing capabilities, its foundational functions—establishing where things are, what they are, and who owns them—remain as vital as ever. The integration of new technologies should not over shadow the importance of foundational surveying principles, legal accuracy, and ethical practice. Moving forward, the discipline must balance innovation with tradition, precision with interpretation, and efficiency with inclusivity to meet the complex demands of a rapidly changing world.

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.

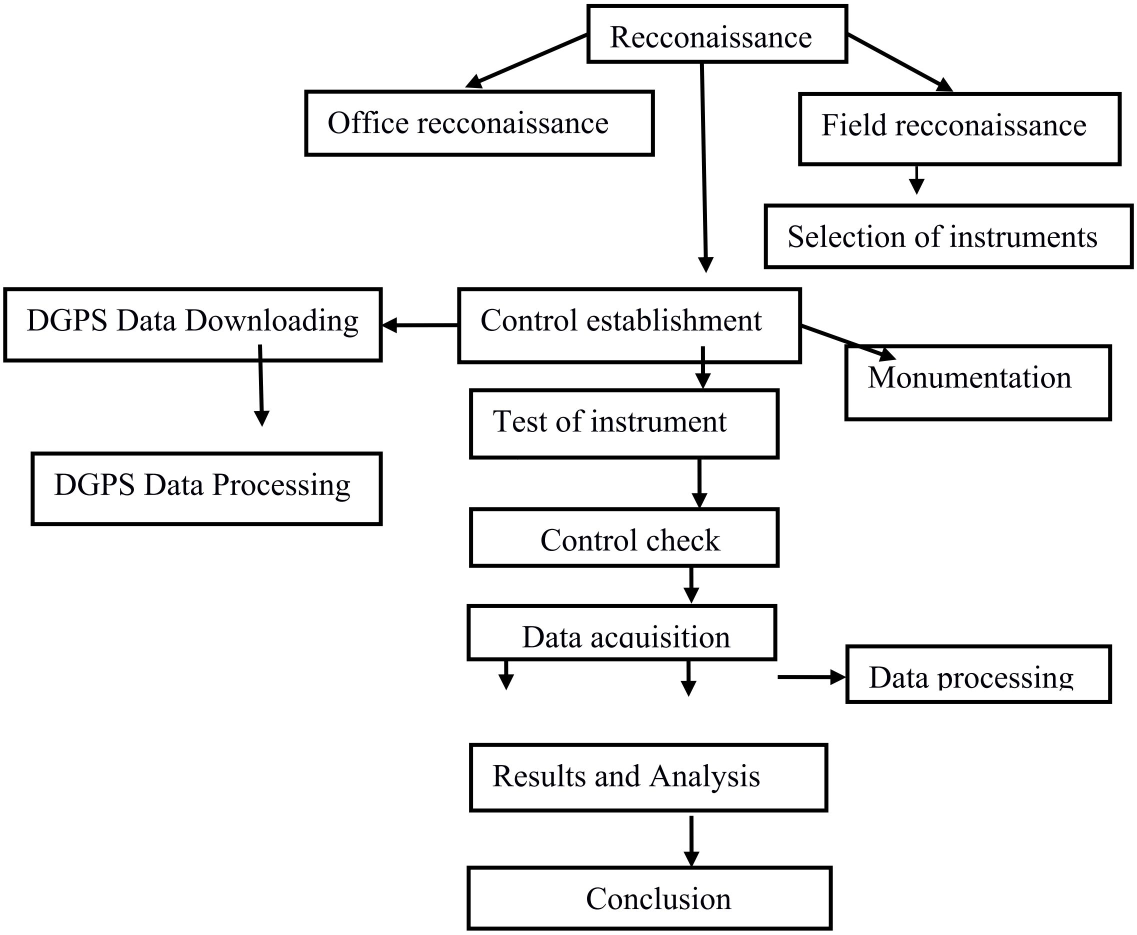

Figure 3.0:- Research methodology flow chart

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.

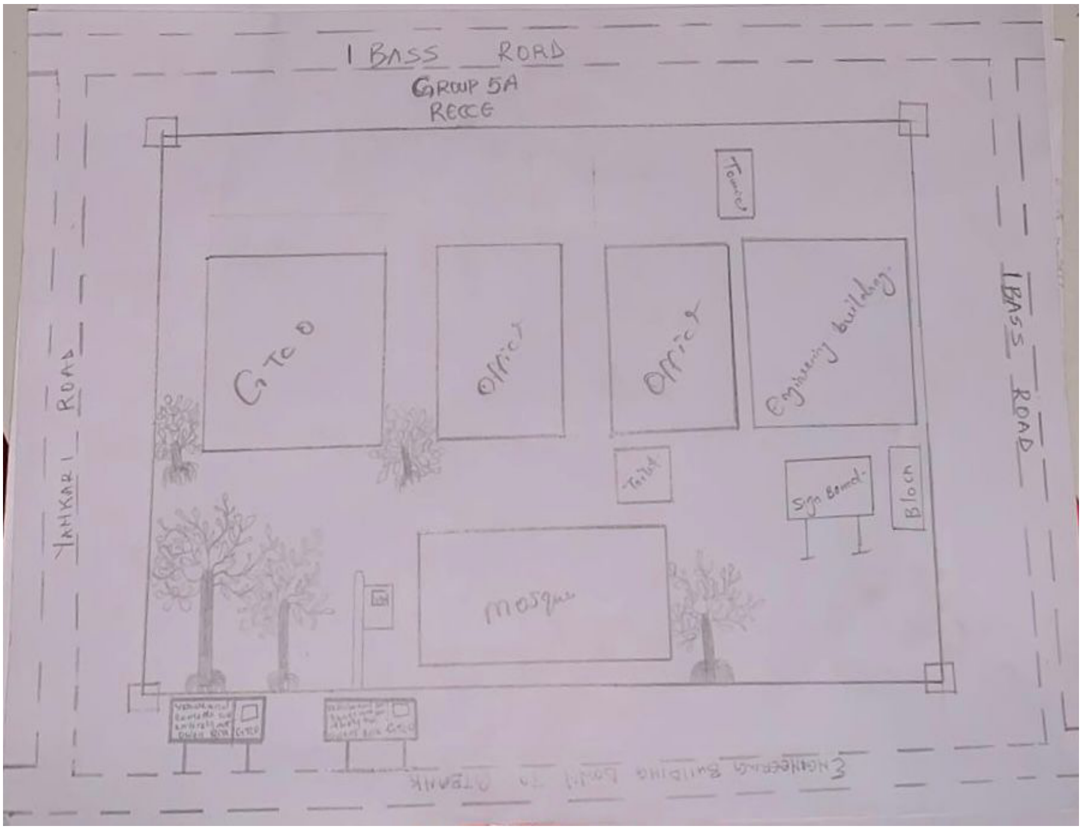

Figure 3.1.2: Reconnaissance Diagram (Not drawn to scale)

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.

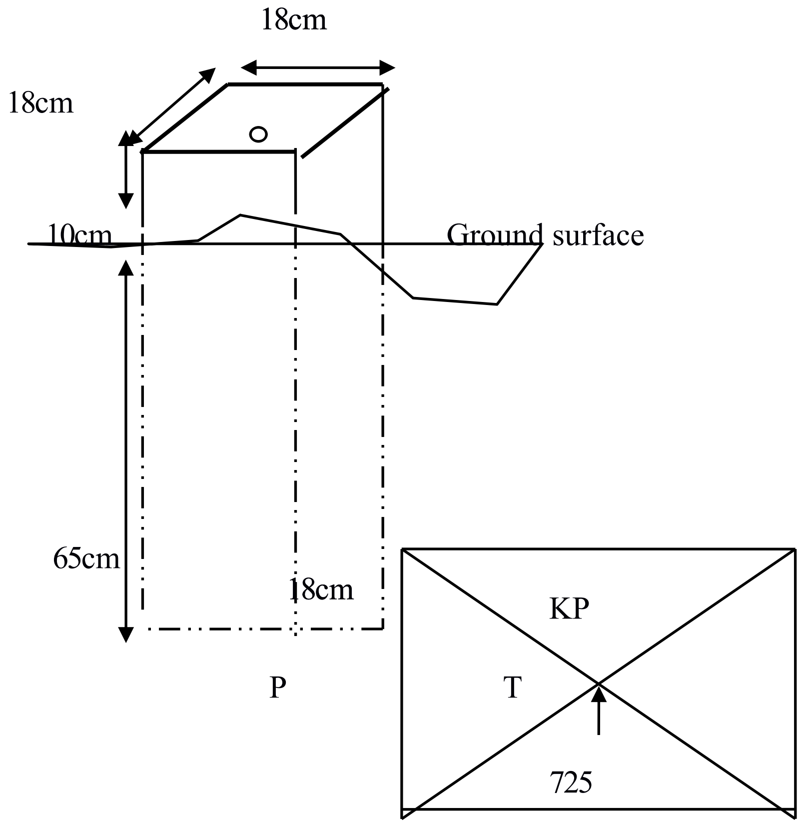

Figure 3.2.1: Plan View

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)

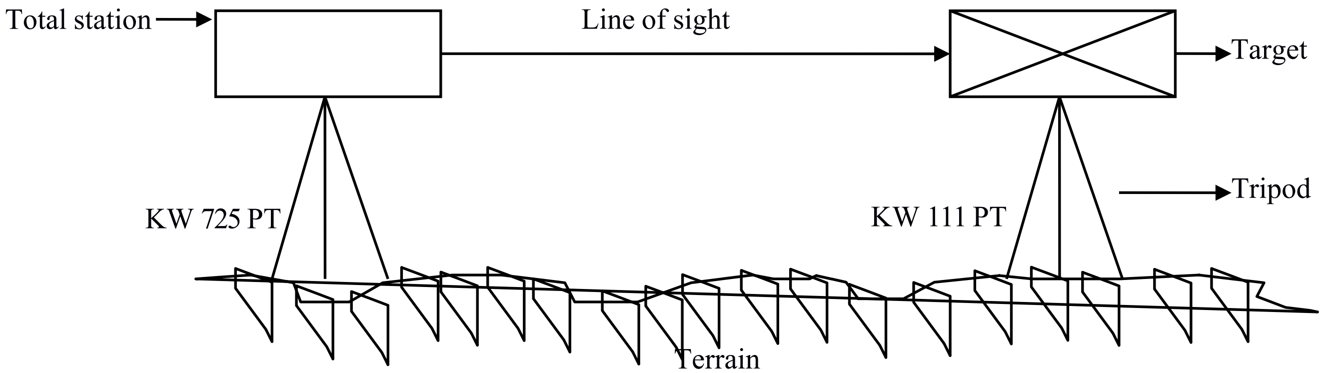

FIG 3.4:- Diagram showing the position of the total station and the reflector during the total station (collimation test).

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.

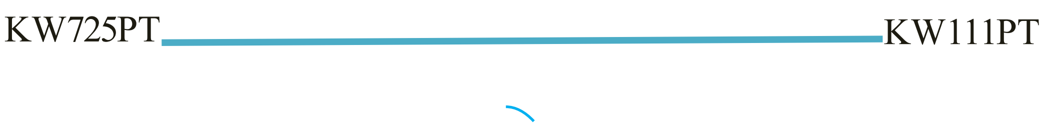

Figure 3.5:- Description of the traverse connection

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

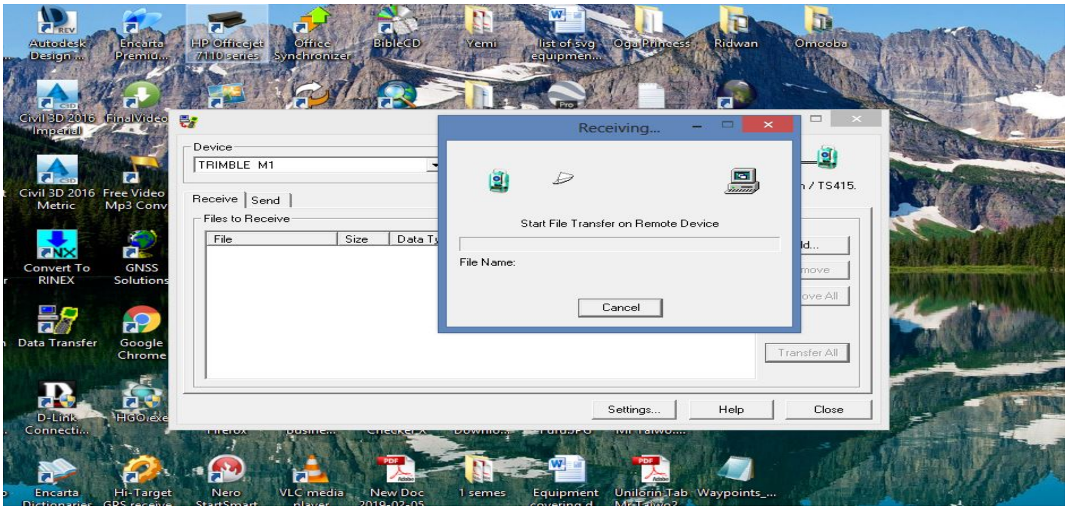

Figure 3.6a: Downloading process from total station

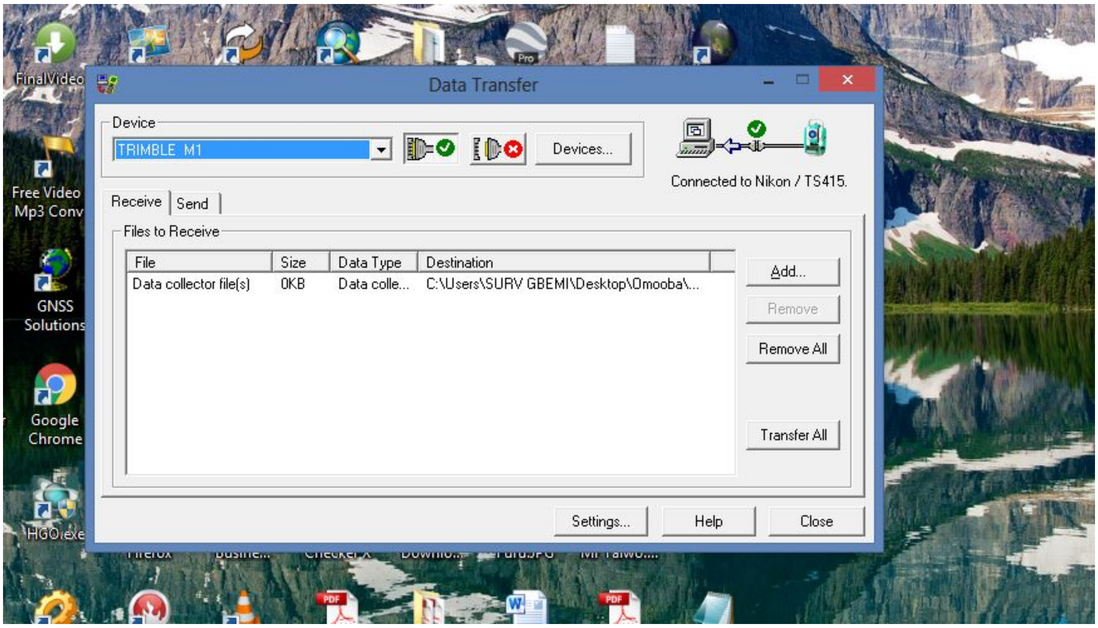

Figure3.6b: Downloading process from total station

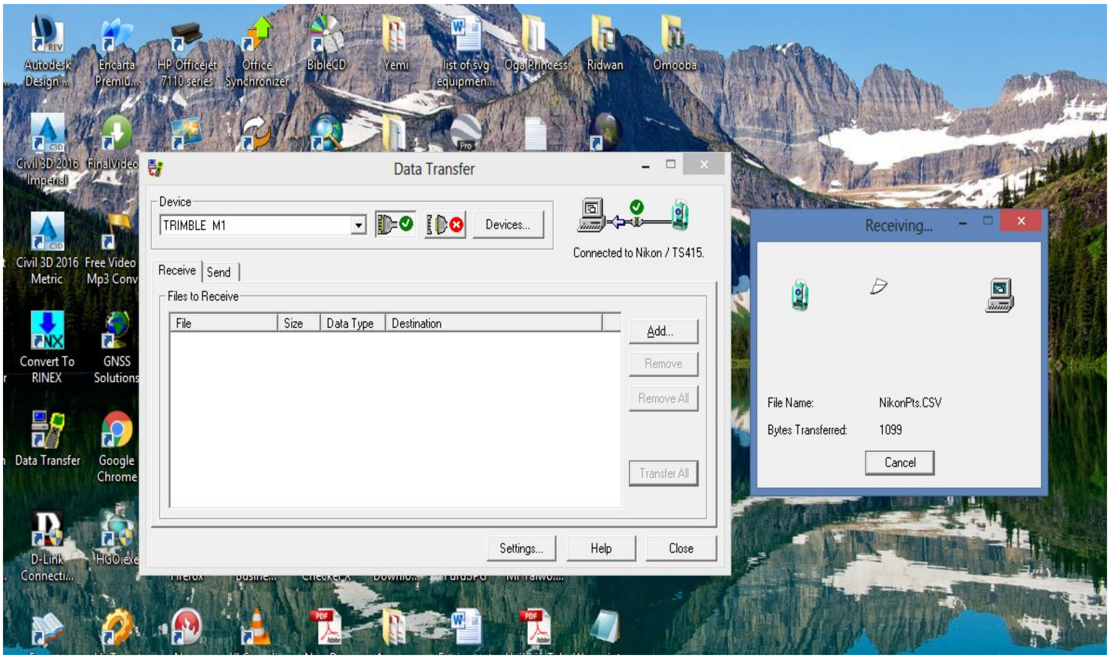

Figure 3.6c: Downloading process from total station

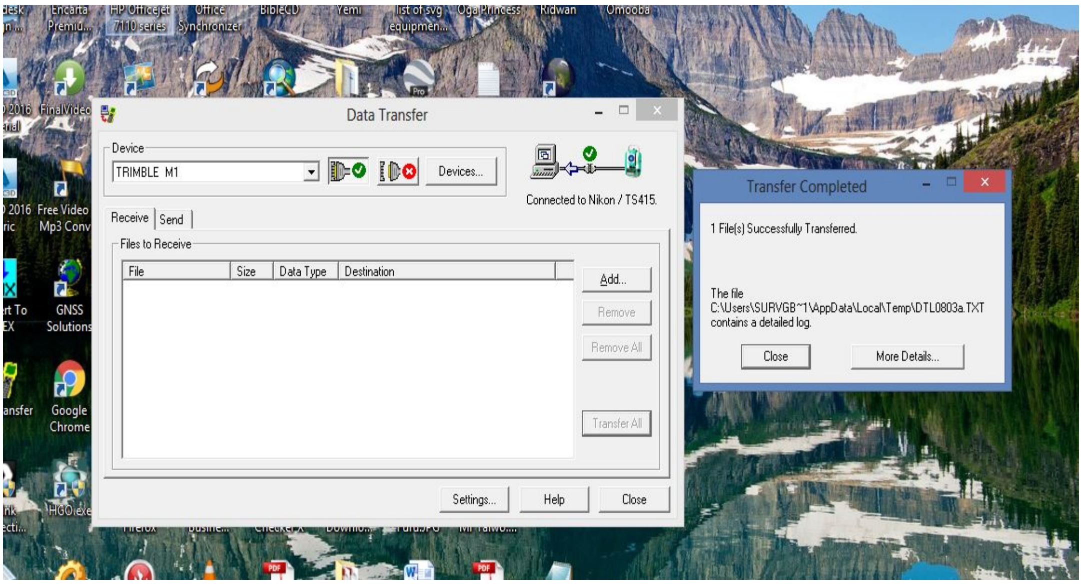

Figure 3.6d: Downloading process from total station

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

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

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	2572791468862.385

				7
	AREA =	<u>LEFT SIDE PRODUCT - RIGHT SIDE PRODUCT</u>		
			2	
	AREA =	<u>2572791556990.718- 2572791468862.3857</u>		
			2	
	AREA =	<u>88128.3323</u>	-	-
		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.

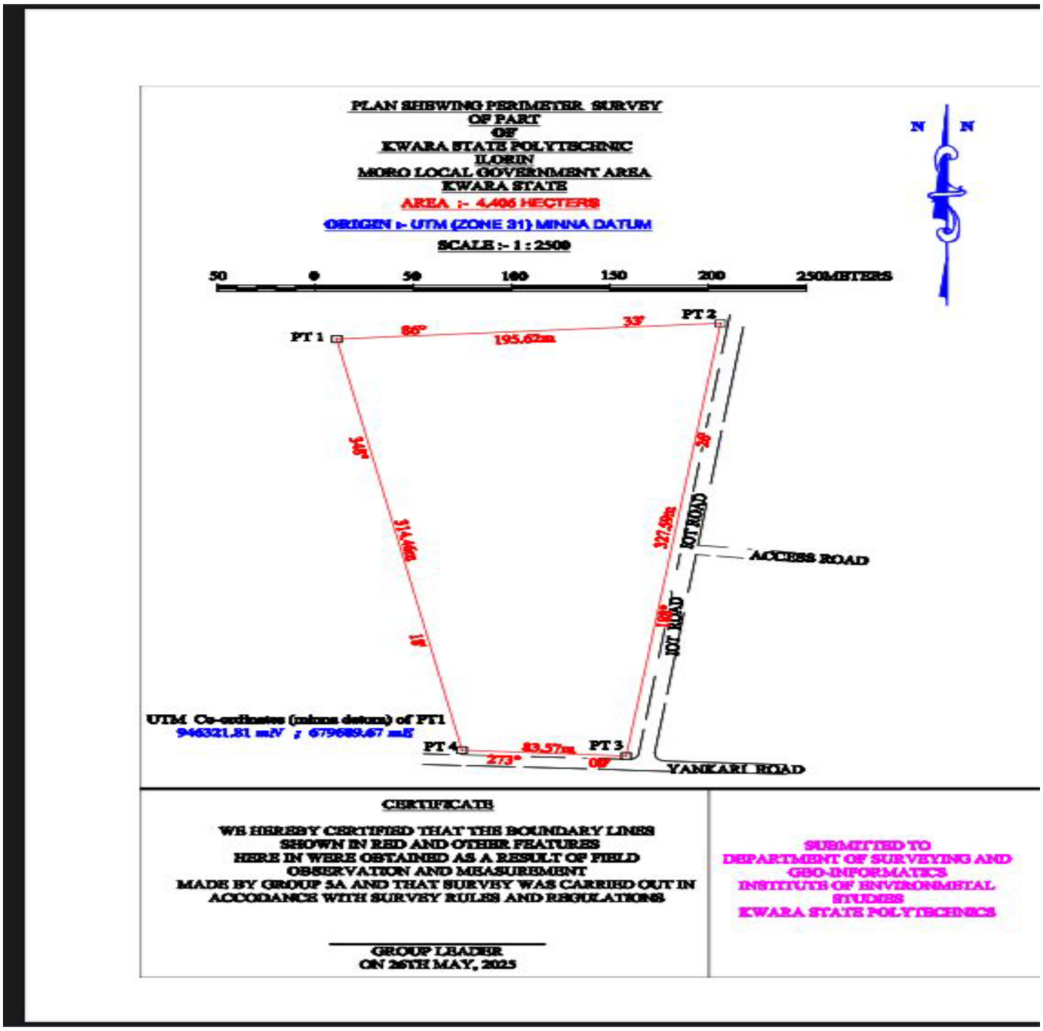

Figure 4.1: Perimeter plan of the study area

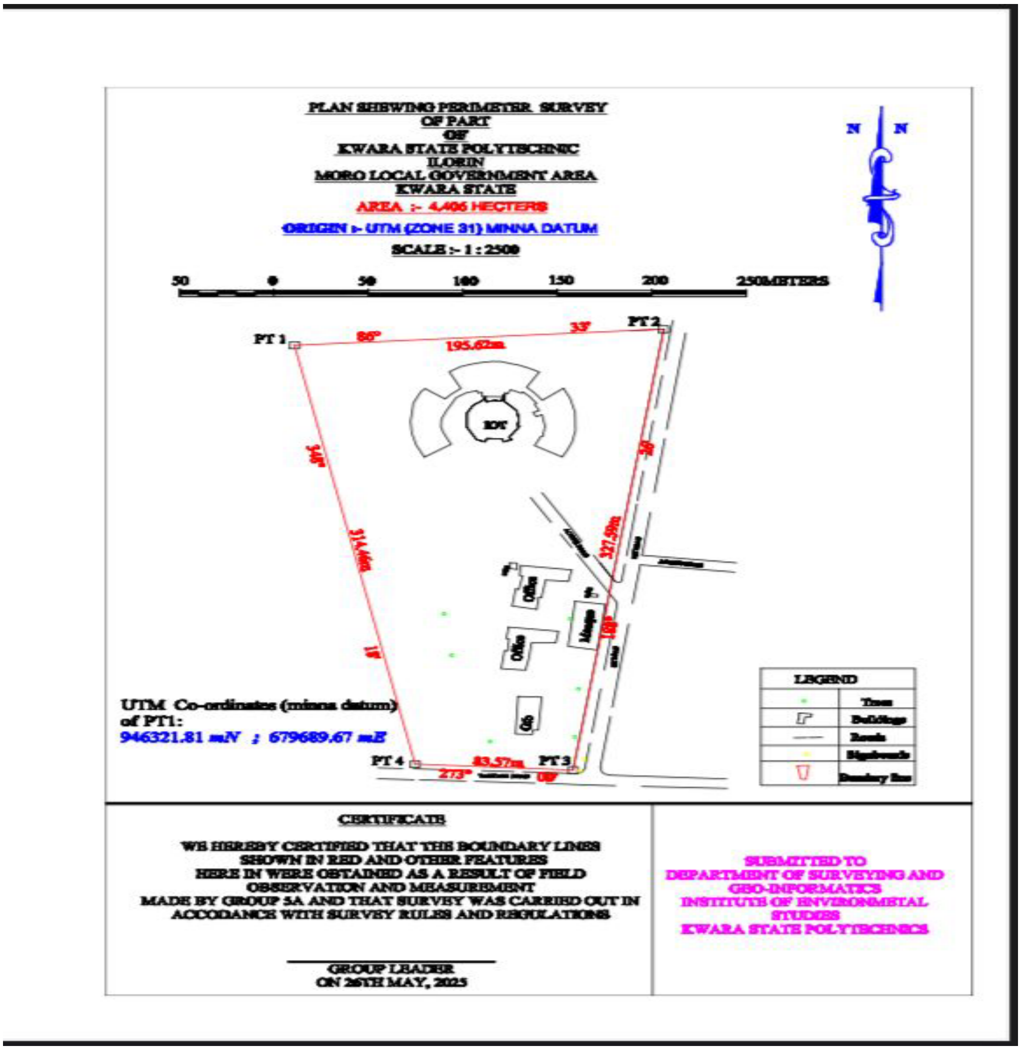

Figure 4.2: Perimeter and detail plan of the study area

CHAPTER FIVE

SUMMARY, PROBLEMS, RECOMMENDATIONS AND CONCLUSION

This chapter encapsulates the key findings from the research on perimeter and detailing surveys, outlines the problems encountered during the study, presents recommendations for improvement, and draws final conclusions from the investigation.

5.1 SUMMARY

The study has comprehensively explored the significance of perimeter and detailing surveys in the context of land surveying and urban planning. It began by defining both perimeter and detailing surveys, highlighting their importance in legal compliance, urban development, environmental assessments, and infrastructure planning.

Key findings indicate that perimeter surveys are critical for establishing clear and legally recognized property boundaries, thus preventing disputes among landowners. Detail surveys, complementarily, provide an intricate understanding of the land's physical characteristics, including topography, existing structures, and utilities, which are essential for making informed planning and design decisions.

Modern surveying techniques and technologies such as Total Stations, GPS, and GIS were evaluated, demonstrating how they enhance the accuracy and efficiency of both types of surveys. While traditional methods laid the foundational skills, these advancements have transformed surveying practices, facilitating more complex and precise measurements.

Despite these improvements, the study identified several challenges faced by professionals in the field. These include complications arising from complex topography, historical claims on properties, and the necessity to navigate varying legal requirements.

5.2 CONCLUSION

In conclusion, perimeter and detailing surveys are fundamental elements of effective land management and urban development. They not only define property boundaries but also contribute critical information that underpins sustainable planning and development practices. The study underscores the importance of accuracy and comprehensiveness in surveying methods to a meliorate land disputes, optimize land use, and facilitate sound urban planning.

The findings from this research illustrate that while advancements in technology have improved survey accuracy, ongoing education and skill development are necessary to adapt to evolving practices in surveying. By addressing challenges head-on and implementing recommended strategies, professionals can significantly enhance the quality and reliability of surveys.

5.3 RECOMMENDATIONS

Based on the findings of this research, the following recommendations are proposed:

1. Professional Development: Continuous training and professional development should been courage for surveyors to keep pace with technological advances and best practices in perimeter and detailing surveys.
2. Adoption of Advanced Technologies: Surveying firms and professionals should invest in modern tools and technologies, such as GIS and advanced GPS systems, to enhance survey precision and efficiency.
3. Standardization of Survey Methods: The establishment of standardized methodologies across surveying practices could mitigate inconsistencies and enhance legal compliance, making it imperative that all practitioners adhere to best practices in perimeter and detailing surveys.
4. Collaboration Among Stakeholders: Collaborative efforts should be fostered among surveyors, urban planners, and legal authorities to ensure that boundary

definitions and property features are accurately represented and understood by all parties involved.

5. Public Awareness and Education: Efforts should be made to educate the public regarding the importance of perimeter and detailing surveys to minimize misinformation and foster a greater appreciation of land surveying practices.

6. Policy Review and Improvements: Policy makers should periodically review and amend regulations governing land surveying to adapt to new technological advancements and field practices, ensuring that all surveying practices are recognition-based and legally sound.

5.4 PROBLEMS ENCOUNTERED

Throughout the course of this study, several challenges were encountered, including:

5.4.1 Data Availability: Accessing comprehensive and up-to-date data on local surveying practices was limited, which may have influenced the depth of the analysis conducted.

5.4.2 Stakeholder Engagement: Gaining participation from relevant stakeholders proved challenging, with some surveyors and landowners hesitant to share insights or experiences due to concerns about confidentiality or liability.

5.4.3 Variability in Practices: The diversity in surveying techniques and methods employed across different regions created complications in drawing generalized conclusions applicable to broader contexts.

In summary, this study illustrates both the critical role of perimeter and detailing surveys in effective land management and the challenges faced by professionals within this field. By implementing the recommendations provided and addressing the identified problems, stakeholders can enhance the effectiveness of surveying practices leading to improved land utilization and development outcomes.

REFERENCES

Anderson, K. & Gaston, A. (2018). The Impact of Drones in Construction Surveying. Journal of Construction Engineering, 45(2), 123-135.

Baker, S. (2019). Challenges in Implementing Modern Surveying Technologies. International Journal of Surveying, 15(1), 30-45.

Black, M.,Yates, R.,&Roberts,L.(2019).UtilizingGPSandGNSSforAccurate Property Surveying. Survey Review, 52(1), 55-71.

Clark,J.(2021).EnvironmentalImpactAssessmentsandtheRoleofAccurate Surveying Data. Journal of Environmental Planning, 73(3), 214-230.

Dalton,S.,&Robson,E.(2017).TheAccuracyofTraditionalSurveyingTechniques in Contemporary Applications. International Journal of Surveying, 14(3), 125-145.

Davis,L.&Moore,T.(2021).AugmentedandVirtualRealityinSurveying:The Future of Perspective Visualizations. Journal of Urban Planning, 30(4), 647-660.

Fischer,P.,&Smith,L.(2021).SurveyingforUrbanPlanning:BestPracticesand Emerging Trends. Journal of Urban Studies, 8(2), 75-89.

Hampton,A.,&Ford,R.(2020).PrecisionTheodolites:InnovationsandApplications for Accurate Measurements. Journal of Measurement Science, 19(7), 341-358.

Hughes,G.(2018).UnderstandingtheConceptsofPerimeterandDetailingSurveys: A Comprehensive Overview. Journal of Construction Research, 35(5), 689-710.

Johnson,R.,&Evans,P.(2019).HeritageConservationandDetailedSurveys:Best Practices for Preservation. Journal of Cultural Heritage Management, 14(1), 50-65.

Kahn, H., & Mitchell, D. (2019). Navigating Regulatory Frameworks in Property Surveying: Challenges and Strategies Property Management Journal, 34 (3), 182-197.

Kirk,S.& Lewis,J.(2020).The Role of Surveying in Land Use Planning and Management. Journal of Land Use Policy, 31(2), 215-232.

Lee, J. & Park, H. (2018). The Integration of GIS with Traditional Surveying: Enhancing Spatial Analysis. Journal of Geographic Information Systems, 10(4), 123-139.

Mason,T.(2019).TheEvolutionofSurveyingTools:FromChainstoSatellites. Surveying & Geospatial Engineering, 19(5), 301-319.

Newton,T.&Roberts,P.(2021).SurveyingChallengesinUrbanEnvironments:A Case Study Approach. Journal of Urban Engineering, 27(3), 199-215.

Owens, M. (2020). Advanced Data Collection Techniques in Land Surveys: Innovations and Applications. International Journal of Applied Geospatial Research, 11(2), 1-12.

Peters, R. & Clarke, A. (2020). Utilizing 3D Modeling in Detailing Surveys for Infrastructure Projects. Journal of Civil Engineering and Architecture,14(6),234-248.

Quinn, F. (2019). Remote Sensing Technologies for Enhanced Land Surveying: A Review of Current Practices. Remote Sensing Journal, 11(1), 1-17.

Roberts, A. (2018). Comparative Analysis of Surveying Technologies: Benefits and Limitations. Journal of Surveying Engineering, 34(2), 90-105.

Turner, P. & Wong, C. (2021). The Future of Property Surveying: Trends and Innovations. International Journal of Surveying Sciences, 12(3), 144-156.

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 4404	679689.67	946321.807	343.452

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