FINAL YEAR PROJECT REPORT

ON

PERIMETER AND DETAILING SURVEY

OF

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

BY

FAGBOHUN ISAAC OLAMIDE

ND/23/SGI/FT/014

BEING A PROJECT SUBMITTED TO THE DEPARTMENT OF SURVEYING AND GEOINFORMATICS, INSTITUTE OF ENVIRONMENTAL STUDIES. KWARA STATE POLYTECHNIC, ILORIN. KWARA STATE

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF NATIONAL DIPLOMA IN (ND) SURVEYING AND GEOINFORMATICS

JUNE ,2025

CERTIFICATE

I hereby certify that the field work and information given in this project were obtained as a result of my observation and measurement and were carried out in accordance with survey laws and departmental instruction

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FAGBOHUN ISAAC OLAMIDE Date

ND/23/SGI/FT/014

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CERTIFICATION

This is to certify that **FAGBOHUN ISAAC OLAMIDE** with matric number **ND/23/SGI/FT/014** from Department of Surveying and Geoinformatics, Institute of Environmental Studies carried out a practical field work which formed basic of the project in accordance with survey rules and regulation and departmental instruction

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SURV ABDULSALAM AYUBA AND Date

SURV. OGUNTAYO BERNARD

Project Supervisors

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SURV. AWOLEYE RAPHAEL .S. Date

Project Co-Ordinator

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SURV. A. ISAU Date

Head Of Department

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External Examiner

SURV. J.O OPALEYE

Date

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DEDICATION

This project is dedicated to Almighty God and my loving guidance **MR and MRS KOLEOSHO** who saw me through the programme.

ACKNOWLEDGEMENT

I also give thanks to my project supervisors in the person of **Surv. Abdulsalam Ayuba And Suvr. Benard Oguntayo** for their strictly and through supervision. I will like to thank all lecturers of this noble department starting from H.O.**D Surv. Abinbola isau, Surv. A. Ayube, Mr. Bello Felix Diran, Surv. Williams Kzeem, Surv. A.O. Akinyede,** and also the Director of Special Duty
Surv. A.G. Aremu and other supportive staff of the department of Surveying and Geo-informatics, Kwara State Polytechnic, Ilorin.

To my group **I** appreciate all members of the starting from **Oyeniyi moshood Akinola, Awoyemi Mariam Deborah, Niniola Mutiat Omowumi, Musa Oladimeji Zulu, Raheem Rokibat Anike, Abdulrosheed Olayinka, Sheu Rokibat Ayoka**, I pray all our effort shall not be in vain and we shall all meet in our dreamlands (Amen).

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ABSTRACT

This project report focused on various method used in execution of perimeter and detailing survey of old institute of environmental studies (ies) and village, kwara state polytechnic ilorin along old jebba road,moro local government area, kwara state. the product was carried out using the basic survey operation include reconnaissance which involves field and library reconnaissance survey followed by data acquisition which involves their order theodolite traversing total station for detailing, but we use total station. All the data acquired from the field we deduced computed and adjusted accordingly to specification and result were analysed and found to be within the expected accuracy. Finally computed data were presented in graphical form in digital using civil CAD software and comprehensive report on how the whole operation was carried out was finally written.

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CHAPTER ONE

1.1 INTRODUCTION

A perimeter and detailing survey is a vital aspect of land surveying that plays a multifaceted role in the effective management and utilization of land. At its foundation, this type of survey is designed to accurately delineate the boundaries of a specific parcel of land, offering a precise and definitive description of ownership. The establishment of clear property lines is crucial not only for property owners seeking to assert their rights but also for various stakeholders, including governmental and regulatory bodies responsible for overseeing land use and management. By clearly defining property boundaries, perimeter and detailing surveys contribute significantly to preventing disputes related to land ownership and usage, fostering a more harmonious relationship among neighboring properties.

Beyond simply delineating boundaries, perimeter and detailing surveys involve the comprehensive documentation of significant features within the surveyed area. These features can include natural elements, such as trees, hills, and water bodies, as well as man-made structures like buildings, fences, roads, and utilities. The collection of this extensive data provides stakeholders—including property developers, planners, and municipal authorities—with crucial insights into the land's characteristics. Such information is instrumental in facilitating informed decisions about land use, development, and resource management.

The execution of perimeter and detailing surveys requires adherence to established guidelines and best practices, as precise surveying techniques are essential for capturing accurate data. Qualified surveyors employ a variety of tools and technologies to ensure that surveys are conducted meticulously. This careful approach not only enhances the precision of boundary definitions but also ensures that the survey provides a reliable account of the significant features present on the land.

A perimeter survey establishes the outer limits of a property through meticulous measurements, clarifying property lines and their relationship with adjacent parcels. This type of survey is crucial for determining property limits, preventing disputes, and ensuring that development projects are executed within legal boundaries. In contrast, detailing surveys take a step further by identifying and documenting a comprehensive range of features on the land. These features encompass natural elements, such as various forms of vegetation, rocks, and trees, as well as man-made structures, including buildings, walls, driveways, and utilities.

Together, perimeter and detailing surveys are integral to construction and land development projects. They equip stakeholders, including developers, architects, and planners, with accurate data regarding property boundaries and existing features while providing detailed specifications necessary for informed project planning and execution. By revealing potential risks—such as environmental hazards or conflicts with neighboring properties—these surveys enable developers to proactively address issues, mitigating risks and avoiding financial disputes. Additionally, they offer valuable insights for property transactions, be it sales, purchases, or leasing agreements.

The historical roots of perimeter and detailing surveys span several centuries, showcasing the evolution of surveying from rudimentary manual methods to sophisticated technological applications. Surveying has long been a critical practice in shaping human settlements and facilitating the development of infrastructure. In ancient times, the profession required precision and skill, with early surveyors relying on basic tools like measuring rods, ropes, and astronomical observations to delineate property boundaries and natural features. Civilizations such as the Egyptians, Greeks, and Romans recognized the importance of surveying and employed skilled professionals to measure and mark land, irrigation systems, and major construction endeavors. Their accuracy ensured that land was allocated fairly and structures were built according to established plans.

As societies grew and land became increasingly valuable, the demand for reliable and precise survey data intensified. The Middle Ages heralded improvements in surveying techniques with the introduction of new tools such as the Gunter's chain and the circumferentor. These innovations enhanced the ability of surveyors to map and divide land more accurately, particularly throughout Europe and Asia, thereby facilitating urbanization and trade. The ability to calculate distances, angles, and areas with greater precision laid the groundwork for the growth of cities and the advancement of commerce.

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In the modern era, surveying technology underwent significant transformations with the development of instruments such as the theodolite and transit, which allowed surveyors to measure angles and distances with improved accuracy. This advancement helped facilitate complex infrastructure projects, including roads, bridges, and canals. The introduction of electronic innovations in the 20th century, notably Electronic Distance Measurement (EDM) technology, enabled swift and precise distance assessments, leading to reduced errors and enhanced productivity. Furthermore, the rise of aerial photography and photogrammetry revolutionized mapping, allowing surveyors to efficiently cover extensive areas, which greatly benefited urban planning and environmental management.

Recently, the integration of cutting-edge technologies such as GPS, drones, LiDAR, and artificial intelligence has dramatically transformed the field of perimeter and detailing surveys. These advancements enable surveyors to collect and process vast amounts of data rapidly and accurately, supporting informed decision-making and improving overall productivity. By utilizing these technologies, surveyors can not only enhance the quality of their work but also reduce costs, thereby improving efficiency in the field.

In contemporary land development, perimeter and detailing surveys serve as essential components that deliver crucial information about property boundaries, existing features, and potential issues. They facilitate efficient project execution while ensuring compliance with regulatory standards. The primary advantage of these surveys lies in their enhanced accuracy, which significantly reduces the risk of errors and conflicts. By conclusively establishing property boundaries and proactively addressing potential concerns, developers are better equipped to navigate the complexities of the project landscape.

The applications of perimeter and detailing surveys are widespread and diverse, impacting various sectors including urban planning, infrastructure development, and environmental management. In urban planning, these surveys are critical for aligning new projects with municipal regulations and land-use policies. For infrastructure development, they provide essential insights regarding existing utilities and topographic features that must be considered throughout the construction process. Furthermore, perimeter and detailing surveys play a pivotal role in identifying environmental

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features and constraints, guiding sustainable development practices aimed at minimizing ecological impact.

PERIMETER SURVEY

The perimeter survey focuses primarily on defining the outer limits of a parcel of land. It involves careful measurements and mapping of the property boundaries to confirm ownership and establish any easements that may exist. During this surveying process, a minimum width of 15 feet is typically employed for mapping the perimeter, which requires a thorough assessment of the entire boundary of the property. The primary objectives of a perimeter survey include:

1. Boundary Definition: The survey provides accurate positioning of property lines, critical for resolving conflicts related to land ownership and ensuring compliance with legal obligations.

2. Identification of Existing Monuments: Perimeter surveys confirm the locations of existing boundary monuments—historical markers that help define property limits—and can assist in the establishment of new markers if necessary.

3. Documentation of Proximal Features: While a perimeter survey captures features that fall within the specified 15-foot width around the boundary, it generally does not include improvements or structures located further within the property, such as sheds, underground utilities, driveways, and pools. Instead, it emphasizes boundary-related elements, such as fences, hedges, and walls.

The result of a perimeter survey offers clarity regarding the extent of the property, enabling stakeholders to understand land use limits and addressing potential encroachments. This survey type is also instrumental in providing accurate data needed for land registration and formal acknowledgment under Nigerian land laws and guidelines.

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DETAILING SURVEY

In contrast, a detailing survey conveys a comprehensive picture of a parcel of land, focusing on all significant natural and man-made features within it. This survey extends beyond the mere identification of boundaries to encompass various on-site elements, making it crucial for the design, planning, and construction efforts. Key objectives of a detailing survey include:

1. Feature Documentation: The detailing survey provides a detailed inventory of all existing features, including buildings, roads, pathways, utilities, vegetation, and other structural elements on the property. This thorough documentation is essential for architects, engineers, and urban planners tasked with developing projects on the land.

2. Facilitating Land Development: The data obtained from detailing surveys supports informed decision-making in relation to land use, zoning compliance, and development approvals. This is particularly important in Nigeria, where adherence to local zoning regulations is critical.

3. Informing Site Design: By recording the types and locations of features on-site, detailing surveys provide designers and developers with critical insights needed for creating functional and efficient site layouts. Understanding these features is vital for ensuring that new developments harmonize with existing conditions and community needs.

PROCESS OF CONDUCTING SURVEYS

The execution of perimeter and detailing surveys requires specialized instruments and a systematic approach to data gathering. Typically, surveyors utilize Total Stations and theodolites to capture precise measurements. After collecting data, the survey results are analyzed and compiled into detailed plans that can be used by architects, engineers, and other stakeholders involved in the development process. It is imperative that these surveys are conducted by qualified land surveyors who are well-versed in the regulatory requirements and best practices established in Nigeria.

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WHEN IS A DETAILING SURVEY NECESSARY?

Detailing surveys may be required under several circumstances, including but not limited to:

1. Construction Planning: When preparing for the construction or extension of buildings on a property, a detailing survey ensures comprehensive documentation of existing features that may impact the design and execution of new structures.

2. Feature Recording: Whenever there is a need to locate and register all features and structures present on the property for planning or regulatory purposes.

3. Land Valuation: When preparing information related to land for valuation, a detailing survey provides the necessary details that substantiates the assessment process.

Features Typically Included in a Detailing Survey

The features recorded in a detailing survey may include:

- Building Outlines: Clear delineation of all buildings and structures on the property.

- Utility

locations: Documentation of all utilities, including water, electricity, sewer lines, and gas connections, which is crucial for both planning and construction purposes.

- Roadways and Pathways: Detailed mapping of existing roadways, paths, and access routes within the parcel, which inform traffic flow and accessibility considerations.

- Natural Features: Identification of natural elements such as trees, bodies of water, and significant geological formations that may influence land use and development.

- Other Structural Features: This may encompass fences, retaining walls, parking areas, drainage systems, and any other constructed features that exist within the boundaries of the site.

In Nigeria, both perimeter and detailing surveys must comply with the Land Use Act and other relevant legislation that governs land ownership and management. Surveyors are required to adhere to the guidelines set forth by the Office of the Surveyor General of the Federation and any additional local regulations to ensure that surveys are conducted in accordance with national standards. Proper documentation and certification of survey results are also necessary for land registration, property transactions, and conflict resolution.

Furthermore, engaging a registered surveyor is essential for guaranteeing the accuracy and legitimacy of the survey process. Registered surveyors are trained professionals equipped to navigate the complexities of land surveying in Nigeria, ensuring that all surveying practices align with legal expectations and professional ethics.

1.2 STATEMENT OF THE PROBLEM

The Village Area of Kwara State Polytechnic, particularly the corridor along the Old Institute of Environmental Studies, suffers from uncoordinated land development and ambiguous boundary definitions. Without an accurate and up-to-date perimeter and detailing survey, management decisions related to construction, expansion, and maintenance are compromised. Staff, students, and visitors often face navigation difficulties, while development projects are hindered by the absence of spatial data on drainage systems, roads, and infrastructure.

Inadequate mapping has also led to inefficiencies in land allocation, overlapping land usage, and potential encroachments. These problems hinder effective campus planning and pose long-term threats to institutional

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development. A thorough perimeter and detailing survey is required to support data-driven decisions and improve land administration within the polytechnic.

1.3 AIM OF THE PROJECT

Aim of a perimeter and detailing survey include accurately identifying property boundaries, analyzing existing site conditions, supporting development planning, ensuring compliance with regulations, providing construction guidance, serving as documentation for approvals, resolving conflicts regarding property lines, and creating a detailed record for future development reference.

1. Boundary Identification: To accurately determine and map property boundaries, ensuring that all features are within the legal limits and properly delineated.

2. Site Analysis: To provide a comprehensive understanding of the existing conditions on the site, including the layout of structures, landscaping, and other relevant features.

3. Development Planning: To support architects and planners in designing new structures or modifications by providing key information on existing parameters and constraints.

4. Compliance Assurance: To ensure that the development adheres to local regulations and zoning laws by accurately capturing the existing site details.

By achieving these aims, a perimeter and detailing survey plays a crucial role in the successful planning, design, and execution of construction projects.

1.4 OBJECTIVES

These are the objectives used in accordance to accomplish the project listed below

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1. **RECCONNAISSANCE**: This is site visitation to be more families to the site and to know the type of equipment and material to be used to carry out the project
2. **PLANNING**: This is to plan on how to execute the project successfully
3. **PERIMETER TRAVERSING**: This is to know the total area of land to be detailed or site teatimes in the site
4. **FIXING THE DETAILS**: Detailing of the structures on both natural and artificial features on the site.

1.5 PROJECT SPECIFICATION

Project specification returns to the requirements to be satisfies while carrying out surveying operation of any order. The specification that was put into consideration for this project are:

- The linear accuracy must not be less than1:500
- The project fall into 3 order categories of survey job. Hence, misclosure must not be greater than 30^0 where n refers to the members of static
- The linear measurement should be taken by steel tape and detail with the total station
- The length of each traverse line must not met lines than 250m.

1.6 SCOPE OF THE PROJECT

The scope of the project used is as follows:

Reconnaissance

Office Reconnaissance

Field Reconnaissance

Perimeter Traversing of the project

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

Data Analysis

Data processing

Plan or map presentation.

1.7 PERSONNEL INVOLVED

The underlined students of surveying and geo-information NDII 2023/2024 session are those who participated in the execution of this project they are:

S/N	NAMES	MATRIC NO	ROLE
1	FAGBOHUN ISAAC OLAMIDE	ND/23/SGI/FT/014	AUTHOR
2	MUSA ZULU OLADIMEJI	ND/23/SGI/FT/017	MEMBER
3	OYENIYI MASHOOD AKINOLA	ND/23/SGI/FT/019	MEMBER
4	SHEU ROKIBAT AYOKA	ND/23/SGI/FT/020	MEMBER
5	OJO SERAH ADESOLA	ND/23/SGI/FT/021	MEMBER
6	NINIOLA MUTIAT OMOWUNMI	ND/23/SGI/FT/024	MEMBER
7	AWOYEMI MARIAM DEBORAH	ND/23/SGI/FT/025	MEMBER
8	RAHEEM ROKIBAT ANIKE	ND/23/SGI/FT/026	MEMBER
9	ISHOLA ABDULROSHEED .O	ND/22/SGI/FT/028	MEMBER

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

MAP OF THE STUDY AREA.

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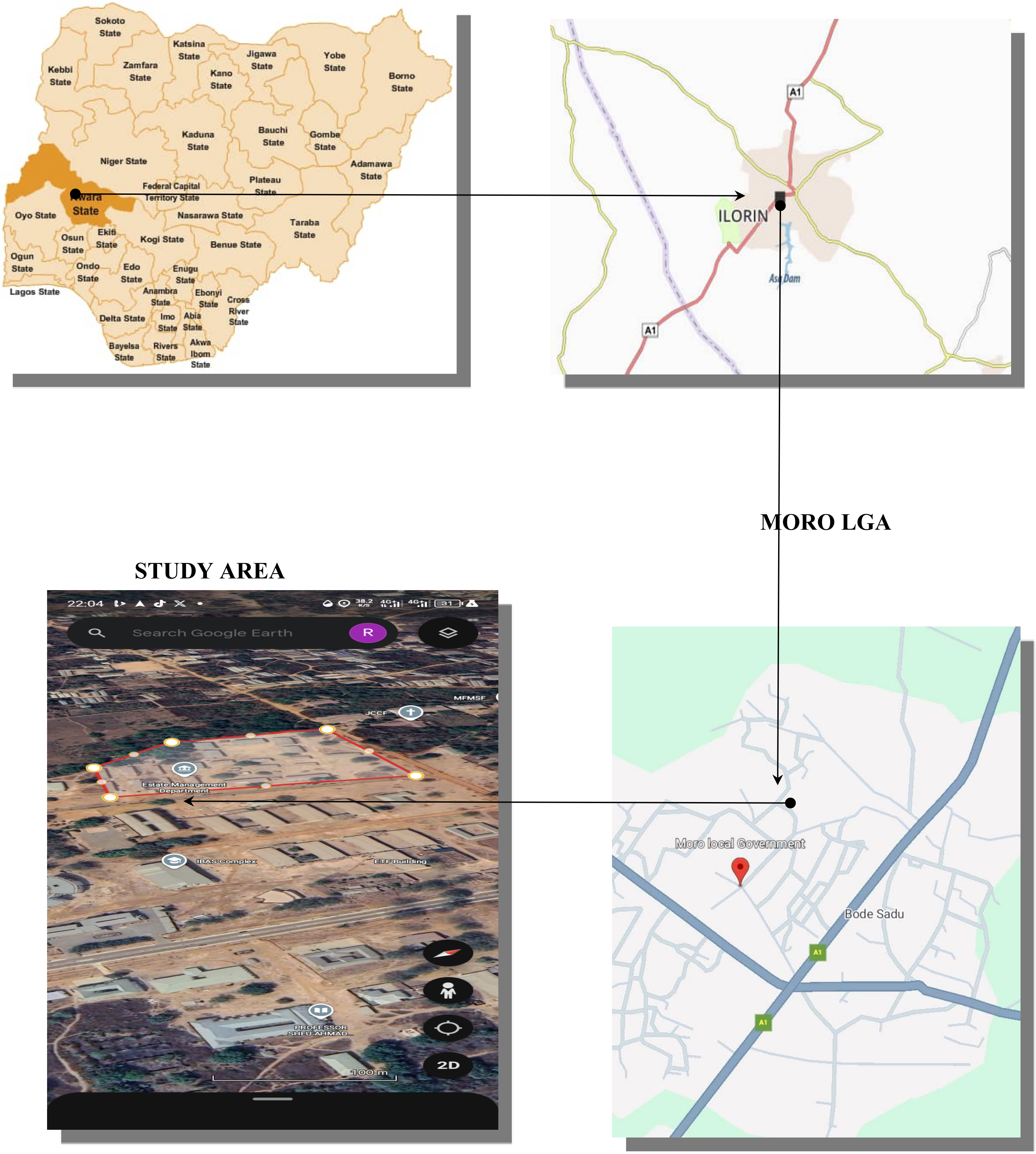

Sokoto State
Kebbi State
Zamfara State
Katsina State
Kano State
Jigawa State
Yobe State
Borno State
Kaduna State
Bauchi State
Gombe State
Niger State
Adamawa State
Federal Capital Territory State
Plateau State
Kwara State
Oyo State
Nasarawa State
Taraba State
Osun State
Ekiti State
Kogi State
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Bayelsa State
Rivers State
Akwa Ibom State
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CHAPTER TWO

LITERATURE REVIEW

Perimeter and detailing surveys are integral components within the realms of architecture, construction, and land surveying. These surveys serve to provide vital data concerning the dimensions, boundaries, and features of both properties and structures, enabling informed decision-making during critical phases of design, construction, and maintenance. In an era characterized by rapid globalization and urban growth, the necessity for precise surveying techniques has become increasingly pronounced.

The historical trajectory of surveying reveals a significant evolution from simple tools and methods to highly sophisticated technologies. The application of geometric principles can be traced back to ancient civilizations, where it served the dual purposes of property delineation and construction planning. The emergence of tools such as the theodolite in the 16th and 17th centuries represented a marked turning point, enabling precise measurement of angles and distances. The integration of electronic total stations and Global Positioning Systems (GPS) later transformed surveying practices, facilitating extensive data collection capabilities while minimizing human error.

Perimeter surveys specifically involve the delineation of property boundaries, employing several methodologies that can be categorized into conventional, digital, and integrated approaches. Conventional techniques often rely on physical measurement tools such as tape, chains, and theodolites. While these methods have been standard for many years, they tend to be resource-intensive and heavily dependent on the experience and expertise of the surveyor. Comparatively, digital surveying tools, including electronic total stations, markedly improve the speed and accuracy of perimeter surveys by employing advanced measurement technologies that reduce human error. The prevalence of GPS and Global Navigation Satellite Systems (GNSS) in perimeter surveying enhances the precision with which surveyors capture coordinates, further improving overall data integrity. Moreover, the advent of Light Detection and Ranging (LiDAR) technology adds another dimension to perimeter surveys, capturing intricate three-dimensional

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STAGES OF OPERATION IN PERIMETER AND DETAIL SURVEY.

Perimeter and detail surveys involves the following operation.

- ❖ Reconnaissance both in the office and field.
- ❖ Total station for detailing fixing/contouring
- ❖ Computation
- ❖ Plan production

2.2 EESENCES OF A PERIMETER AND DETAIL SURVEY

Perimeter and detail survey produced to provide the following.

- ❖ To determine the extents of an individual holding to avoid conflict over land
- ❖ To provide vital information which must be preserved for future management, maintainance, Mortification and monitoring of both natural and artificial features.
- ❖ To locate portion of land on the physical surface of earth together with detail on it by means of survey beacon and showing that survey on a plan.
- ❖ To determine the extent, size, value, ownership and transfer of land.
- ❖ To define the boundaries of a particular area of land showing them on a plan for further development of the area.

2.3 APPILCATION OF PERIMETER AND DETAIL SURVEY

Perimeter and detail survey are applicable in the following ways

- ❖ The survey plan can be used to supply information for the assessing and developing the construction work in the survey area
- ❖ They can be used for updating existing plan of an area.

Operation to this effect an expert surveyor must carry out recce diagram.

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Detailing could be referred to as the man made (artificial) and natural features on the ground within the project site which are determined and obtained with the use of the total station and are finally represented with a suitable scale on plan. The procedure chosen for a particular job depends on the personnel and instruction given by the project supervisor and also based on the availability of equipment applicable for task and hand survey and electronics to speed the processing and recording of survey data of the earth for control purpose that is for aligning land for and construction dimension. Land boundaries are set or measured for proper description the topography of land forms and natural or artificial objects are depicted on maps and major construction and civil engineering works such as dams, bridges, rail roads and highways are controlled by surveying methods.

The measurement of a survey are linear and angular and principles of geometry and trigonometry are usually applied.

Accompanying the actual measurement of surveying are mathematical calculation. Distance angle direction locations, elevation, area and volume are thus determined from data of the survey.

Also much of the information of the survey is portrayed graphically by the construction of maps, profile, cross section and diagram. The equipment available and methods application for measurement and calculation have changed tremendously in the past decade. Aerial photogrammetic, satellite observation remote sensing, innertial surveying electronic distance measurement and laser techniques are example of modern system utilized to collect data reliable in the surveying processing system. The duties of the surveyor have expanded beyond the traditional task of the field work of taking measurement and office work of computing and digital system.

Perimeter and detail survey plan aids cadastral surveyors in relocation existing property by relating them to existing detail on the ground.

Also a perimeter and detail survey is useful in the field of agriculture for the study of soil type and aids in soil conservation.

2.4 WAYS OF IMPROVING PERIMETER AND DETAIL SURVEY

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With today technology is possible to generate personal map and plan on a own computer. Digital techniques will continue to influence map making, enable more rapid production of accurate and current map.

Indeed, perimeter and detail survey is greatly hampered by non availability of good horizontal controls. In view of this perimeter and detail survey can be improved upon by establishing basic horizontal control network by first order geodetic triangulation, precise traverse or global positioning system [G.P.S]

information by emitting laser beams and analyzing reflections, making it particularly valuable in complex terrains and densely vegetated areas.

Detailing surveys provide crucial supplementary information regarding the features of landscapes and structures. These surveys assess topographical features, gathering data on grades, slopes, elevations, and existing infrastructure such as trees, buildings, roads, and utilities. Understanding these elements allows architects and engineers to design solutions that are adaptable and sensitive to the given landscape. The integration of detailing surveys with advanced 3D modeling techniques has revolutionized design practices, enabling the use of Building Information Modeling (BIM) in conjunction with survey data for improved visualization, coordination, and conflict detection.

In urban planning contexts, accurate perimeter and detailing surveys are indispensable. They offer critical input for zoning regulations, property delineation, environmental assessments, and overall spatial planning of urban areas. A wealth of research has underscored the necessity of integrating survey data into Geographic Information Systems (GIS), enhancing urban management capabilities. Advanced data visualization techniques enabled by GIS allow urban planners to simulate development scenarios and effectively assess potential project impacts on communities and their environments.

Despite technological advancements, challenges persist in perimeter and detailing surveys. Environmental factors can substantially affect measurement accuracy, as weather conditions and terrain obstructions, such as dense vegetation, pose significant challenges for data collection techniques. While GPS and GNSS technologies provide high levels of precision, their efficacy can be hampered by signal obstructions or adverse atmospheric conditions. Furthermore, integrating various surveying technologies necessitates comprehensive training and expertise, raising concerns over the availability of adequately skilled personnel. Surveyors must also navigate a complex regulatory landscape, as local regulations and standards can vary significantly, making compliance critical for legal recognition of survey results and impacting project timelines and costs.

As sustainability gains prominence across various sectors, the role of perimeter and detailing surveys in environmental management becomes increasingly essential. Accurate survey data aids responsible land use planning, ensuring that developments conform to environmental guidelines and policies. Research highlights that incorporating environmental assessments within surveying methodologies can effectively mitigate the ecological impacts of construction projects. Data from these surveys assists in developing sustainable urban infrastructures by informing vital decisions related to stormwater management, green space allocation, and urban heat island mitigation strategies.

Effective stakeholder engagement is crucial for successful perimeter and detailing surveys. Involving local communities in the surveying process enhances project outcomes by aligning them with the needs and concerns of residents. Research demonstrates that community involvement fosters more inclusive planning, increasing public buy-in and reducing resistance to proposed developments. Transparency in sharing survey data fosters trust and collaboration, leading to a holistic and equitable approach to urban development.

The integration of automation and artificial intelligence (AI) into the surveying field is reshaping traditional practices and methodologies. Machine learning algorithms analyze the vast datasets generated from perimeter and detailing surveys to identify patterns and anomalies, ultimately streamlining decision-making processes. Automated systems facilitate the integration of survey data into Geographic Information Systems (GIS), offering real-time analytics that support project management and urban planning initiatives. The application of AI in processing LiDAR data exemplifies how technological innovations can expedite the analysis of complex datasets, leading to accurate topographic maps and automated feature extraction that previously required extensive manual labor.

In light of the continuous evolution of the surveying profession, educational programs must adapt to equip future professionals with the essential skills required in today's technology-driven environment. Curricula increasingly emphasize new surveying methodologies, including GIS, LiDAR, and drone operation. Educational institutions focus on hands-on training to ensure that graduates attain proficiency in the advanced tools and techniques that characterize modern surveying. Furthermore, professional development initiatives emphasize interdisciplinary collaboration among surveyors, planners, and environmental scientists, fostering a broader, integrated approach to urban development. Addressing ethical considerations in surveying practices—encompassing environmental stewardship and community engagement—is also gaining importance in contemporary engineering and architecture programs.

Ultimately, the importance of perimeter and detailing surveys extends far beyond simple metric measurements; they are foundational for informed decision-making, sustainable practices, and effective management of urban environments. As technology evolves and societal needs shift, the field of surveying must continue to adapt, embracing innovations while addressing emerging challenges. Future research endeavors should focus on exploring the intersection of emerging survey technologies with interdisciplinary applications encompassing environmental science, urban planning, and data analytics. Striking a balance between technological progress and robust community engagement will be pivotal in maintaining public trust and ensuring that developmental initiatives align with both social values and environmental priorities.

In conclusion, proactive engagement in research surrounding the implications of AI and automation in the surveying field will be crucial for stakeholders to grasp both the advantages and potential limitations of these technologies. Professional organizations and academic institutions must take an active role in adapting curricula and training frameworks to prepare the next generation of surveyors for the diverse and dynamic demands of the future. By fostering collaboration across various disciplines and prioritizing a sustainable approach, the surveying profession can significantly contribute to the creation of resilient, thriving communities capable of addressing the

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challenges presented by an ever-evolving world. The ongoing dialogue in both scholarly literature and practical applications concerning perimeter and detailing surveys is essential for the advancement of the industry and the enhancement of urban living standards globally. This body of work underscores the relevance of surveying in contemporary contexts and highlights the potential for innovative solutions that can drive sustainable development and improve quality of life in urban settings. By continuously refining methodologies and embracing technological trends, the surveying profession can lead the way in creating informed, equitable, and sustainable urban futures, ultimately benefiting society as a whole.

Perimeter and detailing surveys are essential processes within architecture, construction, and land surveying, providing crucial information about dimensions, boundaries, and features of properties and structures. These surveys facilitate informed decision-making throughout the key stages of design, construction, and maintenance. The contemporary context, marked by rapid globalization and urbanization, highlights an increasing necessity for precision in surveying techniques. This expansive discussion reflects on the evolution, methodologies, advancements, and implications of perimeter and detailing surveys in today's practice.

Surveying has come a long way since its rudimentary beginnings, evolving from basic tools and methods to advanced technologies. The origins of geometric principles can be traced to ancient civilizations, which adeptly managed property delineation and construction planning. The introduction of the theodolite in the 16th and 17th centuries signaled a transformative step forward, providing the capability for accurate angle and distance measurements—foundations upon which modern surveying is built (Lawson, 2005). The later incorporation of electronic total stations and Global Positioning Systems (GPS) further transformed the field, enabling efficient data collection with reduced opportunities for human error (Heun, 2010).

When it comes to perimeter surveys, the primary focus lies in defining property boundaries. A range of methodologies, spanning from conventional to digital and integrated techniques, is utilized. Conventional methods tend to rely on traditional measuring tools like tape and chains, which can be labor-intensive and dependent on the surveyor's expertise (Smith & Pickard, 2017). In contrast, digital surveying instruments, especially electronic total stations, have dramatically enhanced the speed and accuracy of these surveys, facilitating the rapid gathering of substantial data (Jones &

Smith, 2016). Additionally, the widespread adoption of GPS and Global Navigation Satellite Systems (GNSS) improves the precision of geographical data capture, ensuring better integrity (Fowler, 2018).

The advent of Light Detection and Ranging (LiDAR) technology has further augmented perimeter surveys, allowing for the detailed capture of three-dimensional surface information by utilizing laser beams. LiDAR is particularly effective in complex terrains and areas with dense vegetation, where traditional surveying methods may struggle (Sullivan, 2020). This capability is increasingly relevant as urban expansion intrudes upon natural landscapes, demanding sophisticated survey techniques that accurately reflect environmental complexities.

Detailing surveys complement perimeter surveys by supplying important supplementary data regarding landscape features and structures. This includes comprehensive assessments of topography, with essential information on elevations, gradients, and preexisting infrastructures (Bennett, 2019). Such data informs adaptable design solutions that respond to environmental contexts. Furthermore, the fusion of detailing surveys with advanced 3D modeling technologies, notably through Building Information Modeling (BIM), has yielded significant improvements in visualization, coordination, and early-stage conflict detection (Williams & Johnson, 2021).

In urban planning projects, the integration of perimeter and detailing surveys is vital, providing essential inputs for zoning regulations, environmental assessments, and overall land use planning. Numerous studies emphasize integrating survey data into Geographic Information Systems (GIS) to bolster urban management strategies (Parker & Emmerson, 2022). The incorporation of GIS allows for advanced visualization and scenario simulation, enabling urban planners to assess the potential impacts of projects more effectively.

Nonetheless, challenges remain in the realm of perimeter and detailing surveys. Environmental factors can greatly influence measurement accuracy, with weather conditions and terrain obstructions presenting notable difficulties (Li, 2019). Although GPS and GNSS technologies offer high precision, their effectiveness may diminish due to signal interference or poor atmospheric conditions. Moreover, the effective integration of diverse surveying technologies necessitates considerable training, presenting concerns about the availability of adequately skilled professionals in the industry (Nguyen, 2021). Local regulatory standards also add complexity, as they can vary across jurisdictions, necessitating careful navigation to ensure compliance and legal recognition of survey findings (Harrison & Green, 2022).

As sustainability increasingly dominates discussions across various sectors, the role of perimeter and detailing surveys in environmental management becomes critical. Accurate survey data fosters responsible land-use planning, ensuring compliance with environmental guidelines and policies. Research reinforces that integrating environmental assessments within surveying methodologies can lessen the ecological repercussions of construction projects (Thompson & Larsen, 2022). This process involves identifying sensitive ecological zones, which in turn guides development planning toward minimizing disruptions.

The data derived from perimeter and detailing surveys also plays a pivotal role in developing sustainable urban infrastructures. These surveys provide essential insights into stormwater management, green space allocation, and strategies to mitigate urban heat islands (O'Brien & Talbot, 2021). In a time when climate change poses significant challenges to urban areas, such considerations are vital for fostering resilience and enhancing overall quality of life within communities.

Stakeholder engagement emerges as a crucial aspect of successful perimeter and detailing surveys. Involving local communities in the survey process strengthens project outcomes by aligning development efforts with the needs and aspirations of residents. Studies have shown that community participation during the surveying phase results in more inclusive planning practices, thereby increasing public support and decreasing opposition to new developments (Evans & Phillips, 2020). Promoting transparency in the dissemination of survey data fosters trust and collaboration, ensuring that urban projects are equitable and sensitive to diverse community concerns.

The increasing incorporation of automation and artificial intelligence (AI) within the surveying sector is also reshaping traditional methodologies and practices. Employing machine learning algorithms allows surveyors to process large datasets generated from perimeter and detailing

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surveys, identifying relevant patterns and anomalies that inform planning decisions (Wang et al., 2023). Furthermore, automated systems enhance the integration of survey data into Geographic Information Systems (GIS), providing real-time analytics to support project management and urban planning efforts. For instance, the application of AI in processing LiDAR data demonstrates how technology can streamline data analysis, resulting in rapid generation of accurate topographical maps and automated feature extraction that may have previously required manual intervention (Chen & Zhao, 2022).

With the ongoing evolution of the surveying profession, educational institutions must adapt to prepare the next generation of professionals effectively. Curricula are increasingly focusing on technology-driven practices such as GIS, LiDAR, and drone operations, while also emphasizing hands-on training to ensure familiarity with the advanced tools that define modern surveying (Stevenson et al., 2023). Moreover, professional development initiatives emphasize the importance of interdisciplinary collaboration, integrating the expertise of surveyors, urban planners, and environmental scientists, fostering a comprehensive approach to urban development. Ethical considerations concerning environmental responsibility and community engagement are becoming pivotal in both engineering and architecture education (Bradley & Fenton, 2021).

In summary, the implications of perimeter and detailing surveys extend well beyond basic measurements; they form the backbone of informed decision-making, sustainable practices, and the effective management of urban spaces. As technology continues to progress and societal needs evolve, the surveying profession must remain adaptable—embracing innovation while tackling emerging challenges head-on. Future research should focus on exploring the intersection of new survey technologies with interdisciplinary applications, encompassing fields such as environmental science, urban planning, and data analytics. Balancing technological advancements with genuine community engagement will be essential for maintaining public trust and ensuring that development initiatives reflect social and environmental values.

Ultimately, as the surveying profession advances, it is crucial for stakeholders to engage actively with the implications of automation and AI. Understanding both the benefits and limitations of these technologies will empower surveyors and urban planners to utilize innovations effectively. Professional organizations and academic institutions must take proactive steps to evolve curricula
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and training programs that meet the diverse demands of the future workforce. By fostering collaboration across numerous disciplines and prioritizing sustainable practices, the surveying field can contribute significantly to creating resilient communities capable of navigating the ongoing challenges of a rapidly changing world. The informed dialogue surrounding perimeter and detailing surveys in both academic literature and practical applications remains vital for advancing the industry and enhancing urban living standards on a global scale. This ongoing examination underscores the enduring relevance of surveying in contemporary contexts and suggests prospective avenues for innovative solutions aimed at sustainable development and improved quality of life in urban settings. Through continuous refinement of methodologies and the embrace of technological advancements, the surveying profession is positioned to lead in crafting informed, equitable, and sustainable urban futures, ultimately benefiting society as a whole while fostering a harmonious interplay between development and the environment.

CHAPTER THREE

3.0 METHODOLOGY

The methodology employed in a project is a structured system or set of principles that guides the problem-solving process. This includes various specific components such as tasks, methods, techniques, and tools that are integral to achieving the project's aims and objectives. In this project, the selected methodology was carefully designed to adhere to fundamental surveying principles, which shaped the overall execution and outcomes of the work. These principles included:

Working from Whole to Part: This principle emphasizes an overarching understanding of the entire survey area before delving into individual components. It ensures that attention is given to the broader context, allowing for a cohesive and comprehensive survey approach that enhances the accuracy of the final results.

Choosing the Appropriate Survey Method: Selecting the most suitable method of survey is critical in obtaining the desired results. This involves analyzing the specific requirements of the project, the characteristics of the survey area, and the resources available. The right method can significantly influence both the efficiency and effectiveness of the surveying process.

Provision of Adequate Checks: Integrating adequate checks within the survey process is essential for achieving the required accuracy. This involves careful planning and implementation of verification measures throughout the surveying stages, ensuring that any potential errors are identified and rectified promptly.

3.1.1 RECONNAISSANCE

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Reconnaissance is recognized as the initial and vital stage of any survey work. It serves as the preliminary investigation that enables surveyors to develop a comprehensive understanding of the site before the actual surveying begins. This phase, often referred to colloquially as "recce", is crucial in laying the groundwork for successful survey execution and involves thorough preparation and exploration. For this project, reconnaissance was conducted via two primary methods: field reconnaissance and office reconnaissance.

3.**1.2 FIELD RECONNAISSANCE**

Field reconnaissance involves a physical visit to the site prior to commencing survey operations. This crucial step allows the team to gather first-hand knowledge and insights, ensuring that the information previously collected during the office planning phase is accurate and trustworthy. On-site visits provide an opportunity to assess the physical terrain, the layout of the area, and any potential challenges that may arise during the survey process.

During the site visit, the project team meticulously marked the boundaries with wooden pegs driven securely into the ground to prevent disturbance or removal. This step is critical in maintaining the integrity of the markers and ensuring that they remain in place throughout the survey phases. The team also considered several essential factors during this stage:

Inter-Visibility of Selected Traverse Stations: It was important to ensure that the selected traverse stations could be clearly seen from one another, facilitating accurate angular observations and reducing potential measurement errors.

Safety of Selected Stations for Future Reference: The safety of the locations selected for survey stations is paramount, as these points will be referenced in the future. The team assessed the risks associated with each chosen location, ensuring that they were secure and free from disturbances that could compromise the survey.

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Accessibility of the Stations: Ease of access to the traverse stations was another key consideration. The team evaluated the logistical aspects of reaching each station, determining whether they could be accessed safely and efficiently during the survey operations.

3.1.3 OFFICE RECONNAISSANCE

Office reconnaissance complements field reconnaissance by focusing on gathering necessary information regarding the type of instruments to be used, the primary objectives of the survey, and the accuracy levels that would be required. This initial preparatory work is critical and involves extensive background research to ensure the success of field operations.

In this phase, the project team collected relevant data from various sources, including insights and directives from the project supervisor. These discussions were instrumental in shaping the survey approach and clarifying expectations concerning project goals. Additionally, the team obtained specifications, instructions, and coordinates for the control stations from the Department of Surveying and Geo-Informatics at Kwara State Polytechnic. This information is vital for aligning survey methodologies with institutional standards and established best practices within the industry, ensuring that the survey is carried out with the highest level of professionalism and technical rigor.

By carefully synthesizing data from both field and office reconnaissance, the project team was equipped with the comprehensive understanding required to proceed with the survey confidently. This thorough groundwork laid the foundation for the subsequent stages of the project, fostering an efficient workflow and minimizing risks of complications that may arise from inadequate preparation.

Table 3.1.3 **Co-ordinates of control used.**

STATION	EASTINGS	NORTHINGS(M)

	(M)	
KW/PT/2001	679647.447	946677.273
SC/KW/FRS/4404	679449.408	946699.489

3.2 INSTRUMENT TEST

HORIZONTAL COLLIMATION TEST

The aim of this test was to be sure that the line of sight is perpendicular to the trunion axis.

PROCEDURE:

The Total Station instrument was set over a point and all necessary temporary adjustments (centering, leveling and focusing) performed. Then the configuration menu of the total station was accessed by pressing down the menu key for about two seconds and the calibration sub-menu and consequently the horizontal collimation test was chosen. This test was done by sighting and bisecting a well-defined vertical target about 100m away and taking the horizontal readings on face left and face right. From the analysis of the results, the total station was in good adjustment.

VERTICAL INDEX ERROR TEST

This adjustment ensures that the vertical circle reading is exactly 90° when the line of sight is horizontal. Any deviation from this figure is termed vertical index error.

PROCEDURE:

The instrument was set over a point and necessary temporary adjustments (centering, leveling and focusing) performed. The vertical index error test was carried out by sighting a target at a distance of about 120m on face left. The vertical circle reading was recorded and on face right the target was sighted and bisected again and the vertical circle reading recorded.

3.2.1 IN-SITU CHECK FOR CONTROL

***In**-situ checks, including both angular and linear observations, were conducted to verify the* integrity of the existing control points. The following observational procedures were implemented:

The instrument was positioned at KW3001PT, and angular measurements were captured from this location to the targets on SC/KW/FRS/4404, which served as the back station.

The results of these observations, as detailed below, confirm that the control points remain in their original positions, thereby affirming their suitability for use.

TABLE 3.2.1 IN-SITU CHECK DATA ANALYSIS(control pillars).

STATION	**COORDINATE (m)**	**KNOWN VALUES (m)**	**MEASURED VALUES (m)**	**DIFFERENCE (m)**
SC/KW/FRS/4404	**NORTHING** **EASTING**	946677.273 679467.447	946699.489 679449.408	0 0 0
KW/PT/2001	**NORTHING** **EASTING**	946677.273 679467.447	946699.489 679449.408	-0.005m +0.004m

KW/PT/2001  **SC/KW/FRS/4404**

FIGURE 3.2.1 *Diagram Showing Control Used*

3.2.2 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.

3.2.3 Geometric Data Acquisition.

These are positional data, that is, they are data having the [x, y, and z] coordinates which is possible to locate their position on the surface of the earth.

3.2.4 Attribute Data Acquisition.

These data are acquired by social survey, these are data used for defining the purpose of features located on the earth surface.

3.2.5 EQUIPMENT USED/SYSTEM SELECTION AND SOFTWARE

This comprises of two components, namely: the hardware components and software components.

HARDWARE COMPONENT: These are the physical equipment used for the execution of the project and they are:

1. Total station (Sokkia)and its accessories
2. Nails and bottle corks
3. Field book and pen
4. Personal computer
5. pegs

SOFTWARE USED FOR DATA PROCESSING

1. AutoCAD 2017 for plotting the boundary and detailing
2. Note Pad, and Microsoft Excel (for Script preparation, editing and restructuring of data and report writing).

3.2.6 SETTING OUT OF PERIMETER BOUNDARY

The process of setting out the perimeter boundary was meticulously planned and executed based on thorough office planning in conjunction with field reconnaissance that had previously been completed. This groundwork was crucial for ensuring that the subsequent operations would be both efficient and accurate. The very first step in this procedure involved the careful placement of the surveying instrument onto Control Pillar KW3001PT, recognized as the nearest control point along the perimeter boundaries.

Before any measurements could take place, it was essential to perform a series of preliminary checks and adjustments on the instrument to ensure its accuracy and reliability. All temporary adjustments were conducted meticulously, confirming that the instrument was correctly calibrated for the task at hand. The coordinates for Control Point KW3001PT were subsequently input into the instrument, which served as the reference point for all subsequent measurements.

To establish the orientation of the instrument properly, KW3002PT was selected as the backsight reference. This involved sighting the control point through the instrument to ensure a stable reference for angular measurements. The coordinates for KW3002PT were then entered into the total station using its keyboard interface. This action allowed the instrument to compute the precise bearing between the two control points—KW3001PT and KW3002PT—ensuring that the instrument was adequately oriented for the upcoming setting out procedures.

With the orientation confirmed through the calculated bearing, the next phase necessitated the input of the coordinates for the specific points that would be set out along the perimeter. The total station's setting out program was activated at this stage, which proved invaluable in determining the angle required to turn the instrument in order to face the target point accurately. To achieve this, the instrument was rotated gradually until the horizontal angle displayed a reading of 0° 00' 00".

Once the instrument was correctly oriented, a reflector was strategically held along the identified direction of the point. At this juncture, it became essential to measure the distance between the instrument and the reflector accurately. The total station then processed this information and provided a reading of the remaining distance to the point that required fixing. The instrument displayed this distance using two distinct indicators: positive and negative values.

A positive distance indicated that the reflector must be moved away from the instrument by the displayed amount, allowing the surveyor to adjust the reflector's position accordingly. Conversely, a negative distance signified that the reflector needed to be moved toward the instrument, facilitating a more accurate alignment.

The process culminated when the horizontal angle again read 0° 00' 00" and the measured distance indicated 0.000m. This dual confirmation marked a critical milestone, as it signified that the exact position for the point to be set out had been successfully identified. Upon achieving this, the perimeter boundary was effectively established, paving the way for further stages of the surveying project. This methodical approach ensured the accuracy and reliability needed in perimeter surveys, which is essential for subsequent construction and planning phases.

3.3 MONUMENTATION

The beacons measuring 18cm by 18cm by 75 cm were molded in-situ with a mixture of 1:2:3 of cement, sand and gravel respectively. A 12mm diameter Iron rod defines the center of the beacon was placed. The perimeter boundary line was cleared to ensure inter-visibility between the beacons. The numbering of the beacons was carried out after molding in a clockwise pattern with an arrow pointing to the succeeding station. Also, numbering as carried out accordingly as they were in the Title Deed Plan (TDP).However, the beacons were prefixed with identification mark KP2001 where KP represents Kwara State Polytechnic.

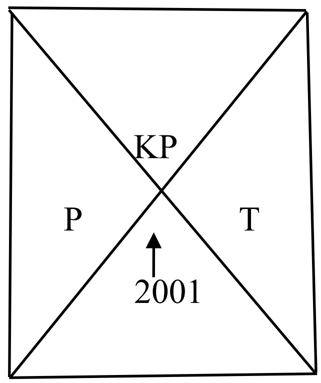

FIGURE 3.2.2: PLAN VIEW

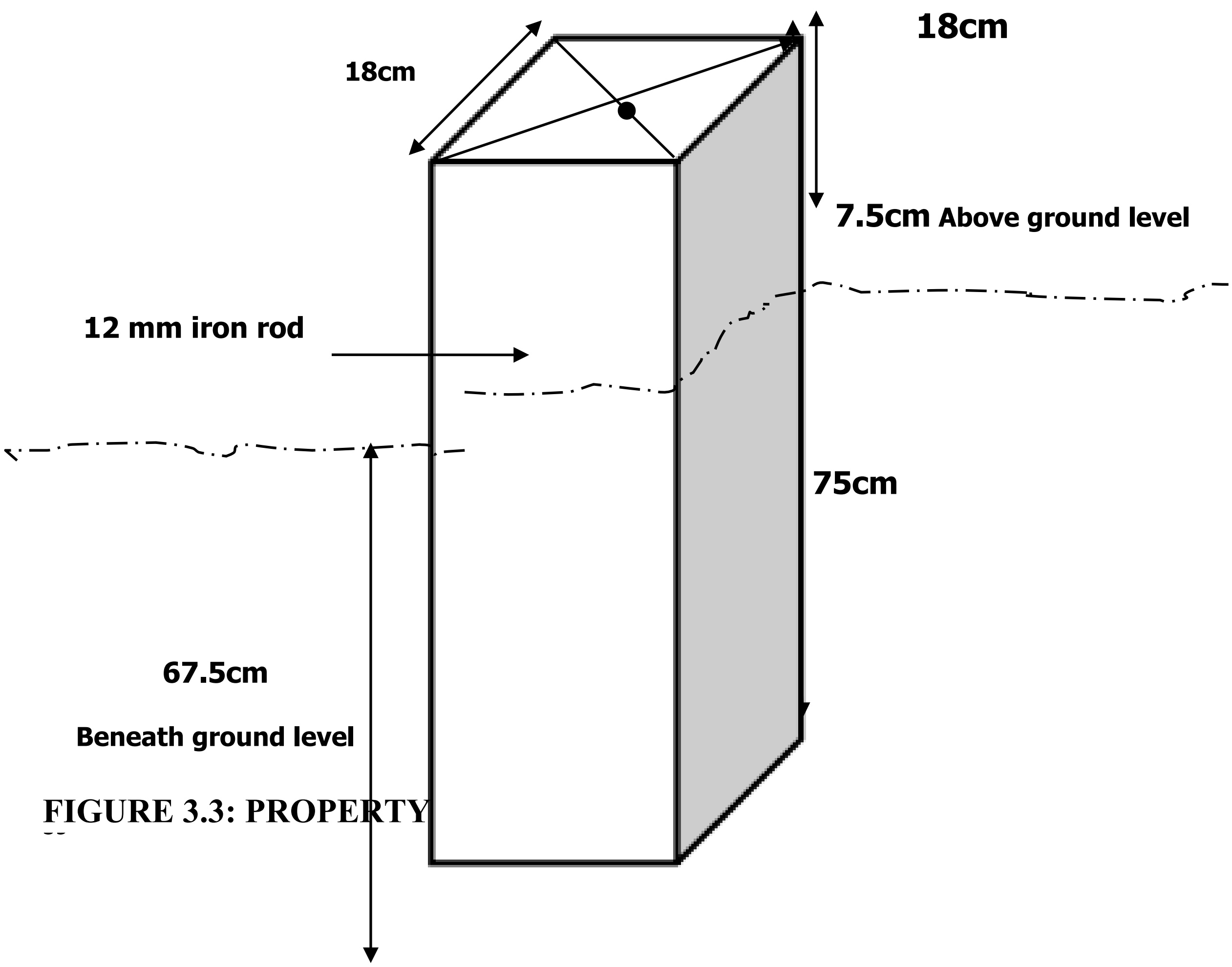

FIGURE 3.3: PROPERTY

3.4 PERIMETER TRAVERSING

To determine the total area of land to be detailed or site tested, the initial steps involved the demarcation, capping, and numbering of the beacons. Following this preparatory work, the actual data acquisition utilizing the Total Station MATO TC1010 commenced. The survey traverse originated from the control point KW3001PT, utilizing KW3002PT as the reference point for measurements.

The Total Station was strategically positioned over control KW3001PT, ensuring precise centering, leveling, and focusing of the telescope to minimize parallax errors. Subsequently, key parameters related to the instrument station were entered into the system, including the station name, height of the instrument above the station mark, and the XYZ coordinates for KW3001PT. After this setup, the reference control point KW3002PT was bisected, and its associated details—namely the station name, height of the target above the station mark, and the XYZ coordinates—were recorded accordingly.

In coordinate mode, the Total Station effectively measured and logged horizontal readings, vertical readings, and distances automatically into its internal memory. This functionality enabled accurate data collection on both faces of the instrument, ensuring reliable results.

The boundary points utilized in this survey included the following coordinates:

- PL1: 679582.728, 946429.840

- PL2: 679448.029, 946465.672

- PL3: 679434.376, 946560.036

- PL4: 679449.408, 946699.489

- PL5: 679647.447, 946677.273

The collection of these boundary points is critical for establishing accurate property boundaries and facilitating effective land management strategies. By integrating this data into the survey process, it lays the groundwork for comprehensive analysis and detailed reporting in subsequent phases of the project.

- 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.

This include the following with formula

- Linear measurement : the difference between the coordinates were first derived using ($\Delta E=E2-E1, E3-E2$) etc. and the distance of end traverse leg was obtained using the formula: distance $=\sqrt{(\Delta E)^2 +(\Delta N)^2}$
- Angular measurement: to calculated the bearing after the difference in coordinates has been derived, the formula is Bearing=$\tan^{-1} \Delta E/\Delta N$.

3.4.1. COORDINATES OF THE BOUNDARY

The coordinates are as follows

S/n	Easting	Northing

1	679582.728	946429.840
2	679448.029	946465.672
3	679434.376	946560.036
4	679449.408	946699.489
5	679647.447	946677.273

3.5 DETAIL SURVEY

The detail survey involved a comprehensive documentation of all features within the site, both natural and man-made, utilizing advanced surveying techniques with precise instruments.

The survey commenced with the set-up of the Total Station at Station PT2001. Once the equipment was powered on, necessary adjustments were made to ensure optimal performance. The instrument's settings for the "Job" and "Station Name" were configured, allowing for easy retrieval of the boundary point coordinates stored in the instrument's memory.

To ensure accuracy, the heights of the instrument above the survey station and the heights of the reflectors were meticulously measured using a steel tape measure. These measurements were then recorded in the Total Station's memory. A reflector placed on beacon SCKWFRS4404 was bisected to facilitate proper orientation.

Subsequently, the Total Station was programmed to compute the bearing between the two designated stations, following the input of the orientation station name SCKWFRS4404. As part of the detailed surveying process, one of the site assistants positioned a reflector at the edge of a building. The crosshairs of the reflector were aligned with those of the Total Station's telescope, and the "DIST" key was activated to obtain the measurement, which was then displayed and recorded within the instrument.

In parallel, the width of a specific area, such as the building's façade, was accurately measured using a 50-meter steel tape. The procedure was consistently applied during the detailed survey of the expressway, where the Total Station was set up on another boundary beacon, PT2001. In this instance, all edges of the carriageway and certain buildings were thoroughly measured and documented.

This methodical approach ensured that every relevant feature within the surveyed site was captured accurately, providing a comprehensive dataset for subsequent analysis and project planning.

CHAPTER FOUR

4.0 DATA PROCESSING

Following the completion of data acquisition at the site, the next step involved processing the collected data to ensure its accuracy and utility. This process began by utilizing Microsoft Excel 2007 Software to input the final coordinates of all surveyed points. During this phase, careful attention was paid to exclude any extraneous data, such as temporary control points that were not relevant to the final analysis. These unwanted data segments were systematically filtered out and subsequently transferred to Notepad before being exported to AutoCAD software 2017 for further manipulation and visualization.

The use of Microsoft Excel allowed for efficient organization and formatting of the data, ensuring that the essential coordinate information was easily accessible and well-structured. This step is crucial in facilitating subsequent analysis and ensuring that the data aligns with project requirements and standards.

4.1 RESULT ANALYSIS

Once the data had been processed, a thorough analysis was conducted to assess its compliance with departmental standards and expectations. The primary results stemming from the traverse performed in the field were extracted for evaluation. This analysis was systematic and detailed, with an emphasis on verifying the accuracy and reliability of the observations recorded during the fieldwork.

The results were organized in accordance with the original field observations, providing a clear and coherent representation of the data. Following this structured arrangement, the results were validated against established benchmarks and project specifications to confirm their adequacy for further application. The key findings are presented as follows, detailing the outcomes of the traverse and reinforcing the integrity of the survey conducted.

In essence, the data processing and analysis phases are critical components of the overall surveying workflow, ensuring that the captured information is not only accurate but also effectively prepared for subsequent use in project development and decision-making processes.

DE DN

From Station	**Observerd Bearing**	**Horizontal Distance(m)**	**- (E)**	**- (E)**	**Sum**	**- (N)**	**+ (N)**	**Sum**	**Easting**	**Northing**	**To Station**
									679582.728	946429.840	A
A	284°45'	139.380		134.699	134	35.832		35	679448.029	946465.672	B
B	351°1646'	95.450		13.653	147	94.364		129	679434.376	946560.036	C
C	06°09'	140.260	15.032		162	139.453		268	679449.408	946699.489	D
D	96°24'	199.280	198.039		360		22.216	290	679647.447	946677.273	E
E	194°39	255.760		64.719	424		247.433	537	679602.388	946505.003	F

4.3 COMPUTE FOR TOTAL AREA USING DOUBLE LATITUDE AND DEPARTURE

∆E	∆N	Easting	Northing
+134.699	-35.832	679582.728	946429.840
+ 13.653	-94.364	679448.029	946465.672
-15.032	-139.453	679434.376	946560.036
-198.039	+22.216	679449.408	946699.489
+64.719	+247.433	679647.447	946677.273

Source: Writer, 2025

+134.699

+134.699 × -35.832 = -4826.535

+269.398

+013.653

+283.051

+013.653 × -94.364= ⍰ 1288.352

+296.704

- 015.032

+281.672

-015.032 × ⍰ 139.453= +2096.257

+266.640

-198.039

+068.601

-198.039+068.601

-198.039 × **+22.216 =-4399.634**

-129.438

+ 064.719

-064.719

+ 0.64.719 × **+247.433 = +16013.616**

0.00

SUM OF POSITIVE (+) - SUM OF NEGATIVE (-)

$$= \frac{7595.352 - 10514.521}{2}$$

AREA = 4.265 square meters

4.3 GRAPHIC PLOTTING

This section pertains to the graphical representation, specifically the process of plotting the survey plan. The plotting was accomplished utilizing AutoCAD software along with additional programs on a computer system, ensuring a high degree of accuracy and detail in the final output. A suitable scale was employed to create a hard copy format of the plan, enabling clear visualization of the surveyed area. The information presented in the plan encompasses intricate boundary details as well as the necessary annotations. Moreover, conventional signs and symbols were incorporated throughout the plan to enhance clarity and ensure standardized communication of the survey data.

The digital plan was meticulously developed through a systematic approach utilizing AutoCAD software. Below is a detailed outline of the procedures followed to generate the plan:

- 1. System Preparation: The first step involved powering on the computer and allowing the system to boot up fully. This ensures that all required software and drivers are initialized correctly.

- 2. Notepad Preparation: Upon reaching the desktop environment, Notepad was opened to begin structuring the script file. In this stage, the coordinates for the polyline—specifically, the easting and northing values—were inputted systematically into the Notepad document. This careful structuring is essential for ensuring accurate representation of the plotted data.

- 3. File Saving: After inputting the necessary coordinate data, the file was saved with the appropriate file extension, specifically `.SCR`, which allows it to be recognized by AutoCAD for future processing.

- 4. Launching AutoCAD: The next step involved launching the AutoCAD software, providing access to all necessary tools for drafting and plotting.

- 5. Setting Units: Within AutoCAD, the format settings were accessed, allowing for selection of units suitable to the project's requirements. After adjusting these settings, the changes were confirmed by clicking "OK," ensuring that all measurements align with the expected standards.

- 6. Running the Script: Subsequently, the "Tool" menu was selected, where the option to "Run Script" was chosen. The saved script file was then picked up, allowing AutoCAD to process the coordinates outlined in the previously created file.

- 7. Displaying the Image: After initiating the script, the "Escape" key was pressed to exit any active commands. To visualize the plotted data, the "Zoom" command was utilized, specifically selecting "Extents." This action adjusted the view to fit the entire plotted outline within the workspace, projecting the survey image on the screen.

- 8. Editing the Boundary Lines: Once the data appeared, the boundary lines within the plot were modified. For the purpose of visibility and clarity, the lines were changed to a red color. Additionally, any necessary edits or adjustments to the plotted design were made at this stage to ensure the final output accurately reflects the intended survey details.

Through this methodical approach, the accurate graphical representation of the survey plan was achieved, allowing for effective communication of boundary details and assisting stakeholders in visualizing the land surveyed. This thorough plotting process underscores the importance of utilizing reliable software like AutoCAD in producing high-quality, professional survey documentation.

CHAPTER FIVE

5.0 **SUMMARY, CONCLUSION, AND RECOMMENDATIONS**

5.1 SUMMARY

This chapter presents a comprehensive overview of the perimeter and detailing survey project conducted at the Kwara State Polytechnic, specifically within the formal Institute of Environmental Studies. The survey adhered to specified third-order standards, ensuring precision and compliance throughout the process. An initial reconnaissance survey was meticulously performed, which included both field and office work, aimed at thorough planning for the survey operations. This reconnaissance phase allowed for the establishment of initial control points within the project site, thereby ensuring optimal orientation and setup for the surveying instruments.

Critical considerations included the selection of appropriate survey stations, ensuring the inter-visibility of these points was feasible to enhance the accuracy of the measurements to be taken. Subsequently, detailed diagrams of the targeted survey area were drawn up, providing a visual reference for the anticipated work.

The field operations incorporated both traversing and detailing activities, which are essential components of effective surveying. Following the completion of these operations, data processing was undertaken to analyze the collected information. Ultimately, plans were produced in both manual and digital formats, illustrating the perimeter and details of the entire project area. This dual format of presentation is useful for a broad audience and aids in the clear communication of the survey results.

5.2 CONCLUSION

Upon reflecting on the various stages of this project, it is appropriate to conclude that the endeavor was not only engaging but also educational, particularly during the planning and execution phases. The field procedures, while significantly demanding in terms of both time and effort, yielded a successful outcome. Adequate data were collected and processed, which is represented in the final plans generated. All necessary computations were performed in strict adherence to the specifications provided, ensuring the integrity of the work.

Throughout the course of this project, I have been exposed to critical procedures associated with cadastral surveys, including perimeter and detailing surveys. This exposure has not only enhanced my understanding but has also contributed significantly to my self-confidence and practical skills in executing such surveys. Despite my lack of prior experience in this specific type of project, I succeeded in achieving the outlined objectives and aims.

5.3 RECOMMENDATIONS

Drawing from the insights and experiences garnered during the execution of this project, I hereby recommend that similar surveying projects should be conducted continuously within the academic framework. Such initiatives would greatly enhance students' understanding and practical knowledge in the field of surveying, bridging the gap between theoretical learning and real-world application.

Furthermore, I recommend that adequate time be allocated within the semester for practical assignments related to this project. Additionally, timely distribution of surveying instruments is essential to avoid delays in project execution, ensuring that students can complete their assignments without unnecessary interruptions.

It is also imperative for the school to invest in modern surveying technology by acquiring additional digital stations and Electronic Distance Measuring (EDM) devices, alongside maintaining a supply of traditional analogue instruments. These resources are crucial for students seeking to perform accurate field surveys in both their practical exercises and project work. Providing such tools will significantly enhance the quality of data collected and ultimately lead to better educational outcomes in the discipline of surveying.

By implementing these recommendations, the institution can foster an enriching learning environment where students are better equipped to face the challenges of the surveying profession upon graduation.

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APPENDIX

ID	EASTING	NORTHING
PL1	679582.728	946429.840
PL2	679448.029	946465.672
PL3	679434.376	946560.036
PL4	679449.408	946699.489
PL5	679647.447	946677.273
BLD1	679549.274	946642.233
BLD1	679541.227	946644.456
BLD1	679549.407	946673.891
BLD1	679557.454	946671.668
BLD2	679606.155	946611.461
BLD2	679615.524	946608.893
BLD2	679605.691	946573.081
BLD2	679596.322	946575.649
BLD3	679564.348	946602.906
BLD3	679557.622	946604.990
BLD3	679563.626	946623.263
BLD3	679570.352	946621.179
BLD4	679541.131	946609.275
BLD4	679533.505	946611.284
BLD4	679538.580	946629.766
BLD4	679546.206	946627.757
BLD5	679498.379	946640.771
BLD5	679523.756	946633.877
BLD5	679520.271	946620.744
BLD5	679494.894	946627.638
BLD6	679463.996	946650.142
BLD6	679489.373	946643.248
BLD6	679485.888	946630.115
BLD6	679460.511	946637.009
BLD7	679457.544	946625.842
BLD7	679472.023	946621.924
BLD7	679465.087	946596.289
BLD7	679450.608	946600.207
BLD8	679529.818	946596.942
BLD8	679537.413	946594.907

BLD8	679531.409	946576.634
BLD8	679523.814	946578.669
BLD9	679554.668	946590.470
BLD9	679561.394	946588.386
BLD9	679555.390	946570.113
BLD9	679548.664	946572.197
BLD10	679592.068	946560.674
BLD10	679599.873	946559.664
BLD10	679593.075	946538.68
BLD10	679585.270	946539.689
BLD11	679519.000	946565.197
BLD11	679528.569	946563.532
BLD11	679525.179	946544.786
BLD11	679515.610	946546.451
BLD12	679478.939	946569.537
BLD12	679504.880	946562.819
BLD12	679501.237	946549.083
BLD12	679475.296	946555.801
BLD13	679444.388	946578.416
BLD13	679470.160	946571.719
BLD13	679465.756	946554.842
BLD13	679439.984	946561.539
BLD14	679510.302	946527.118
BLD14	679514.054	946537.943
BLD14	679534.343	946533.641
BLD14	679531.147	946521.705
BLD14	679521.697	946523.093
BLD14	679522.114	946524.897
BLD15	679509.302	946524.064
BLD15	679541.890	946519.170
BLD15	679539.930	946509.505
BLD15	679506.975	946515.133
BLD16	679553.651	946516.785
BLD16	679586.238	946511.89
BLD16	679584.278	946502.226
BLD16	679551.323	946507.854
BLD17	679504.954	946503.304
BLD17	679537.91	946497.676
BLD17	679536.226	946487.819
BLD17	679503.271	946493.447
BLD18	679549.303	946496.025
BLD18	679582.258	946490.397
BLD18	679580.575	946480.54

BLD18	679547.619	946486.168
BLD19	679545.936	946476.31
BLD19	679578.891	946470.682
BLD19	679577.208	946460.825
BLD19	679544.253	946466.453
BLD20	679501.588	946483.590
BLD20	679534.543	946477.961
BLD20	679532.859	946468.104
BLD20	679499.904	946473.732
BLD21	679498.221	946463.875
BLD21	679531.176	946458.24
BLD21	679529.493	946448.390
BLD21	679496.537	946454.018
BLD22	679542.569	946456.596
BLD22	679575.524	946450.968
BLD22	679573.841	946441.111
BLD22	679540.886	946446.739
MSQ	679496.29	946502.143
MSQ	679496.168	946499.145
MSQ	679477.014	946499.605
MSQ	679477.641	946514.971
MSQ	679496.779	946514.133
MSQ	679496.657	946511.135
MSQ	679499.882	946506.709
TOI1	679447.828	946594.614
TOI1	679452.651	946593.297
TOI1	679450.521	946585.496
TOI1	679445.698	946586.813
TOI2	679593.536	946572.708
TOI2	679598.359	946571.391
TOI2	679596.229	946563.590
TOI2	679591.406	946564.907
E.P	679492.26	946690.694
E.P	679562.54	946684.428
E.P	679610.758	946683.743
E.P	679445.846	946617.55
E.P	679483.807	946478.219
E.P	679549.084	946628.813
RD	679445.277	946712.177
RD	679643.316	946689.961
RD	679652.008	946683.482
RD	679579.403	946403.808
RD	679698.787	946684.724

RD	679671.309	946687.806
RD	679662.698	946681.966
RD	679659.235	946674.342
RD	679588.012	946402.041
RD	679446.392	946722.115
RD	679700.67	946694.575