AS-BUILT SURVEY OF KWARA STATE POLYTECHNIC,

(A CASE STUDY OF KWARA STATE POLYTECHNIC MINI CAMPUS)

OFF GENERAL HOSPITAL TO SAWMILL GARAGE ROAD, ILORIN WEST

LOCAL GOVERNMENT AREA, KWARA STATE.

PRESENTED BY

YAHYA RIDWAN
MATRIC NUMBER: ND/23/SGI/PT/0006

TO

THE DEPARTMENT OF SURVEY AND GEOINFORMATIC,

INSTITUTE OF ENVIROMENTAL STUDIES,

KWARA STATE POLYTECHNIC, ILORIN.

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR AWARD OF

NATIONAL DIPLOMA IN SURVEYING AND GEOINFORMATICS.

JUNE, 2025.

CERTIFICATE

I **Yahya Ridwan,** with the **Matriculation number ND/23/SGI/PT/0006** hereby certify that all the information given in this project work was carried out in accordance with the survey Laws, Regulations and departmental instructions. Submitted to the Department of Surveying and Geoinformatics, Institute of Environmental Sciences, Kwara State Polytechnic, Ilorin, Kwara State. In partial fulfilment of the requirements for award of National Diploma in Surveying and Geoinformatics.

Candidate's Name: **Yahya Ridwan**

Matric No: **ND/23/SGI/PT/0006**

Signature .... and Date:…………………………..

CERTIFICATION

CERTIFICATION This project titled “As-built Survey of kwara state polytechnic mini campus, off General Hospital – Sawmill road, Ilorin west local government area, Kwara state.” by **Yahya Ridwan,** with the **Matriculation number ND/23/SGI/PT/0006** meets the regulations governing the award of National Diploma (ND) of Kwara State Polytechnic, Ilorin and it is approved for its contribution to scientific knowledge and literary presentation.

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

DEDICATION

I wholeheartedly dedicate this work to my family, especially my parents, for their endless support and prayers, and to every student determined to achieve greatness through diligence and discipline.

ACKNOWLEDGEMENT

I thank Almighty Allah for seeing me through this project with strength, direction, and wisdom. I am especially grateful to my supervisors, Surv. Babatunde and Surv. A.I. Isau, for their professional guidance, motivation, and dedication towards the success of this project. I also appreciate the leadership and academic excellence provided by the Kwara State Polytechnic, Ilorin, especially the Department of Surveying and Geoinformatics. I extend my gratitude to my family and colleagues who stood by me throughout this academic pursuit

ABSTRACT

This project report on As-built survey of Kwara Polytechnic, Ilorin mini campus, the project was aimed at producing an As-built survey plan of the polytechnic, this aim and the objectives were achieved through the following scopes, recce survey, project planning, data acquisition, data processing and report writing. The methodology employed includes preliminary reconnaissance, checking of control points using Total station, data collection with a Total Station, and data processing was done using autoCAD2007 and the information presentation in both hard and soft copies. The acquired data were processed and analyzed to generate an as-built plan that aligns with planning standards and legal requirements for building and academic construction standard.

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CHAPTER ONE

1.0 INTRODUCTION

An As-Built Survey is an essential component of construction and infrastructure development that entails the precise documenting of a project as it stands upon completion. In contrast to design or construction drawings that depict the proposed structure, an as-built survey accurately represents the actual dimensions, conditions, and characteristics of the finished project. This survey method is essential for detecting discrepancies from initial plans, assuring adherence to regulations, and aiding in future maintenance or repairs. It functions as a conclusive documentation of the completed project, aiding engineers, architects, facility managers, and stakeholders in the long-term management of assets (Zlatanova et al., 2020).

As-built documentation has gained significance in contemporary construction owing to the evolving characteristics of building settings. Variations frequently arise during implementation, whether from site constraints, material substitutes, or alterations in client specifications. If not adequately documented, these inconsistencies can result in substantial errors in future planning or redevelopment initiatives. Consequently, as-built surveys function as instruments for quality assurance, project validation, and risk reduction. The Construction Industry Institute (CII) asserts that precise as-built data can save operational expenses, improve safety, and avert legal disputes stemming from inconsistencies between design intent and actual construction (CII, 2017).

The progression of digital surveying technologies has significantly altered the methodology of conducting as-built surveys. Conventional techniques, which depended significantly on manual measuring and draughting, are progressively being supplanted by high-precision technology such as terrestrial laser scanning, photogrammetry, drones, and Building Information Modelling (BIM). These technologies allow surveyors to acquire intricate geometries and spatial data with unparalleled speed and precision (Tang et al., 2010). For example, 3D laser scanning can provide millions of data points to construct a highly detailed digital twin of the built environment, whereas BIM platforms can assimilate this data for collaborative analysis and design enhancement.

The use of these technologies enhances the trustworthiness of as-built data and facilitates the digital transformation of the architecture, engineering, and construction (AEC) sector. Governments and business sector entities are acknowledging the significance of such data in long-term infrastructure development. The U.S. General Services Administration (GSA) mandates that as-built BIM models be utilised in federal construction projects to enhance asset management during the building's life cycle (GSA, 2021). This transition underscores the increasing strategic significance of as-built surveys in not just recording historical data but also influencing the future of construction and infrastructure development.

In modern construction and infrastructure development, a continual problem persists in aligning design purpose with real project implementation. Notwithstanding the presence of comprehensive architectural and engineering plans, inconsistencies can arise during construction owing to site-specific alterations, unforeseen technological challenges, or client-induced modifications. If unreported, these differences may lead to considerable inefficiencies, safety hazards, legal conflicts, and expensive mistakes in future maintenance, restoration, or expansion activities (Tang et al., 2010).

The conventional method of recording these deviations—via manual measurement and annotated drawings—has been insufficient in encapsulating the complexity and accuracy demanded by contemporary building projects. This deficiency has resulted in incorrect recordkeeping, disjointed data, and heightened reliance on anecdotal knowledge, hence compromising project sustainability and long-term asset management. Furthermore, without precise as-built data, stakeholders frequently must make pivotal decisions based on assumptions instead of verified facts, hence intensifying operational risks (Zlatanova et al., 2020).

1.1 STATEMENT OF PROBLEM

In many construction projects, discrepancies often arise between the original design and the actual construction. This can lead to future design challenges, legal issues, or costly alterations. Lack of accurate and up-to-date records of existing conditions can also hinder maintenance, expansion, or demolition works. Therefore, there is a need for a reliable method to capture and document existing structures precisely as they are built, especially for academic institutions like the project area.

1.2 AIM OF THE PROJECT

The aim of this project is to conduct an accurate as-built survey of an existing structure or infrastructure to provide detailed, verifiable documentation of its actual conditions upon completion, specifically for the project area.

1.3 OBJECTIVE OF THE PROJECT

i. To identify and record deviations from original design plans.

ii. To produce precise drawings that represents the existing physical state of the project.

iii. To produce a record surveying plan of the under-construction structure using the total station.

iv. To enhance understanding and application of geospatial techniques in post-construction documentation.

1.4 SCOPES OF THE PROJECT

This project focuses on conducting an as-built survey for a selected site, including the collection of field data, data processing, and generation of final as-built drawings. It covers planimetric and elevation features but excludes sub-surface or utility surveys Successful execution of this project involved the following scopes:

i. Project planning.
ii. Field reconnaissance.
iii. Data acquisition.
iv. Data processing.
v. Information presentation.
vi. Technical report writing

1.5 PROJECT SPECIFICATIONS

The specifications on this project involve the rules and regulations guiding the practice and processes of surveying, which are:

i. Connection of the survey to national framework (control pillars).

ii. A close traverse must be laid out for the perimeter survey to ensure checking on the final survey work.

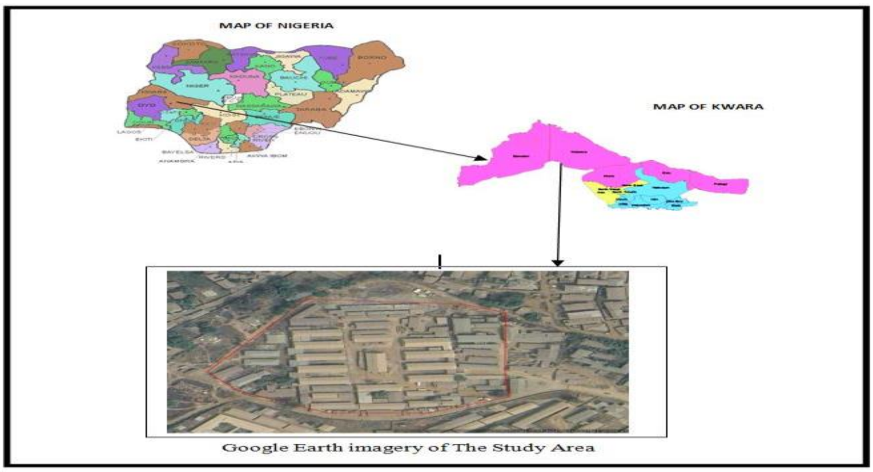
iii. Provision of the back computation sheet to show the list of the coordinates used for the perimeter survey.

iv. Linear accuracy of the survey work must be done accurately.

v. The plan to be produced must be a signed using standard as-built plan scales.

1.6 PROJECT LOCATION DESCRIPTION

The project site is located along Kwara state polytechnic Mini-Campus, inside university of Ilorin Mini-Campus, Off General Gari Alimi road, Ilorin-west local Government Area of Kwara State. Approximately the site is located on latitude 8°28'53.20"N ; longitude 4°31'37.75"E and 8°28'55.41"N; 4°31'30.28"E and the imagery below show the project area.



Google Earth imagery of The Study Area

1.7 PERSONNEL INVOLVED

The following are the members of the group that was involved in the as built survey project work, they are;

S/N	Names	Matric No	Role
1.	Yahya Ridwan	ND/22/SGI/PT/0006	Author
2.	Wasiu Abdulganiyu Bayonle	ND/23/SGI/PT/0001	Member
3.	Sakariyahu Abdulganiyu	ND/23/SGI/PT/0003	Member
4.	Bello Muhammad Abdullateef	ND/23/SGI/PT/0002	Member
5.	Ibrahim Aishat Khadijat	ND/23/SGI/PT/0007	Member
6.	Ilori Waris Opeyemi	ND/23/SGI/PT/0012	Member
7.	Betiku Funmilola Oyinkannsola	ND/23/SGI/PT/0005	Member
8.	Solayinka Mujeeb Olanrewaju	ND/23/SGI/PT/0004	Member

CHAPTER TWO

2.0 LITERATURE REVIEW

As-built surveys are critical in construction, engineering, and infrastructure management, providing accurate documentation of completed structures compared to their original design. These surveys have become increasingly significant due to the complexity of modern construction projects and the demand for precise post-construction documentation. They serve various stakeholders, including engineers, architects, project managers, and facility managers, ensuring that the built environment complies with design specifications, regulatory standards, and client expectations (Rüther et al., 2021).

An as-built survey refers to a comprehensive spatial and dimensional record of a structure or facility as it exists at the end of construction. Unlike design drawings, which represent the intended layout, as-built documentation captures actual conditions, including any deviations from the original plans due to field modifications, unforeseen site conditions, or construction errors. This record serves as a legal and technical reference for future renovations, maintenance, and facility management (Cousins, 2020).

As-built surveys employ a range of technologies, from traditional total stations to advanced 3D laser scanning and unmanned aerial vehicles (UAVs). Laser scanning, or LiDAR (Light Detection and Ranging), offers high precision and efficiency in capturing millions of data points, enabling the creation of detailed point clouds and Building Information Models (BIM). Photogrammetry is also widely used for generating 3D models from 2D photographs. The integration of Geographic Information Systems (GIS) and BIM technologies has enhanced the visualization and analysis capabilities of as-built data (Tang et al., 2010).

The application of modern as-built survey methods has led to significant improvements in project quality, error reduction, and post-construction documentation. Studies show that laser scanning can reduce surveying time by up to 60% while increasing measurement accuracy (Bosché et al., 2015). The integration with BIM allows for clash detection, structural analysis, and efficient maintenance planning. These outcomes underscore the role of as-built surveys in enhancing lifecycle management and minimizing operational risks.

As-built surveys are indispensable in modern construction and infrastructure projects, bridging the gap between design and reality. With evolving technologies such as LiDAR, UAVs, and BIM, the accuracy, efficiency, and utility of as-built documentation have greatly improved. Continued innovation and standardization in this field will further support data-driven decision-making across the construction lifecycle, ensuring structural integrity, compliance, and long-term value for stakeholders.

The increasing complexity of construction and infrastructure projects has elevated the importance of as-built surveys in documenting and verifying actual site conditions upon project completion. These surveys are not only vital for ensuring that construction conforms to design specifications but also for facilitating future renovations, risk management, and legal compliance. The growing adoption of digital tools and geospatial technologies has significantly enhanced the accuracy and efficiency of as-built data acquisition and usage (Sacks et al., 2018).

An as-built survey is a precise and comprehensive recording of the completed physical structure as it exists in the real world, including any changes that occurred during the construction process. It contrasts with "as-designed" plans by highlighting field-based modifications, structural shifts, or material substitutions. The resulting as-built drawings or digital models serve as the final authoritative documentation of the built asset (Wang et al., 2015).

Modern as-built surveys utilize a blend of traditional and advanced technologies. Traditional techniques involve total stations and GNSS (Global Navigation Satellite System) measurements, while contemporary practices often deploy terrestrial laser scanning (TLS), mobile mapping systems, UAV photogrammetry, and 3D modeling software. These tools produce detailed point clouds that can be transformed into digital twins and BIM-compatible formats, streamlining data integration and collaborative workflows (Kopsida et al., 2022).

The implementation of digital as-built surveying methods has demonstrated measurable benefits in terms of accuracy, documentation speed, and integration with project management systems. Research indicates that 3D laser scanning improves spatial accuracy by over 90% compared to manual methods, while significantly reducing the risk of rework due to design discrepancies (Volk et al., 2014). Furthermore, linking as-built data to BIM enhances facility management and lifecycle analysis, promoting sustainability and operational efficiency.

As-built surveys have evolved from manual documentation practices to sophisticated digital workflows powered by geospatial technologies. These advancements have transformed the post-construction phase, allowing for more reliable data capture, better project traceability, and enhanced stakeholder collaboration. Continued research and technological innovation will further elevate the strategic role of as-built surveys in construction quality assurance and infrastructure intelligence.

The global construction industry increasingly relies on accurate spatial data to manage quality assurance and asset documentation. As-built surveys play a fundamental role by providing verifiable records of completed structures, capturing actual site conditions as opposed to theoretical designs. Their importance has grown with the expansion of smart construction and digital twin technologies, particularly in reducing rework and ensuring design compliance (Olugboyega & Windapo, 2019).

An as-built survey is a detailed post-construction measurement and documentation process that records the exact dimensions, geometry, and location of structures as constructed. These surveys contrast with “as-planned” or “as-designed” documents, offering a factual representation of what was physically built, including any on-site variations. As-built data serves as a critical foundation for legal compliance, renovation, maintenance planning, and asset management (Zhao et al., 2016).

Modern as-built surveys utilize a hybrid of manual and digital techniques. Traditional methods involve the use of theodolites and total stations for linear measurements, while newer methods include terrestrial laser scanning, mobile LiDAR systems, drones, and photogrammetry. These techniques generate high-resolution point clouds that are processed into 3D BIM environments. Reality capture software and cloud-based collaboration tools are increasingly integrated to enhance accuracy and project delivery speed (Alizadehsalehi et al., 2020).

The integration of advanced technologies into as-built surveying has led to higher precision, improved documentation, and fewer project delays. Case studies reveal that laser scanning and UAV-based photogrammetry can detect discrepancies of as little as 2 mm, significantly improving structural alignment verification. Moreover, construction firms that adopt digital as-built processes report a 30–40% reduction in post-construction rework and greater cost control (Shin & Eastman, 2021).

As-built surveys have become a cornerstone of data-driven construction and infrastructure management. Their evolution from manual drawings to high-resolution digital models reflects the growing emphasis on accuracy, accountability, and long-term value in built environments. Continued investment in surveying technologies and skilled personnel will further solidify their role in achieving smarter, safer, and more sustainable construction outcomes.

CHAPTER THREE

3.0 METHODOLOGY

This aspect refers to a system of methods and principles, rules used in a field of study to achieve the aim and objectives of this project. The modality to successful execute this project was carried out based on the survey rules and regulation, supervisor advice and departmental instructions.

3.1 RECONNAISSANCE

Reconnaissance survey is a preliminary stage for exploratory investigations conducted to gather initial data concern the choice of Site area of Subject before more detailed research or filed work commenced. Reasons for reconnaissance survey of the project area are the following;

i. To know the location of the site.

ii. To determine the preliminary area/perimeter of the land.

iii. To know the survey method suitable for the field data acquisition and the instrument need for the it.

Reconnaissance in this project involved preliminary investigations to gather information about the survey area before conducting a detailed survey, reconnaissance of this project was carried out in two way namely as follows.

i. Office planning

ii. Field Reconnaissance

3.1.1 OFFICE PLANNING

It involved the process adopted in the collection of relevant data and specification about the as-built Surveying with the used of traversing survey method. During the office planning the given coordinate for control point HND2001, TBM0110, and HND2002, was obtained and computed as shown in the table 3.1 below. The choice of equipment to be use for project was obtained from the survey store in the department of surveying and Geoinformatic, Kwara State Polytechnic, Ilorin, and it was handled accordingly to the survey rules and regulations and departmental instruction.

TABLE 3.1 Showing the list of the coordinate of the control pillars used

Stations	Northing (m)	Easting (m)	Remark
HND2001	937892.5580	668076.4680	Given
TBM0110	937900.4120	668069.5750	Given
HND2002	937909.7109	668061.2683	Given

3.1.2 FIELD RECONNAISSANCE

Field recce and site visitation was conducted as preliminary survey for investigation of the basic information about a specified project area, location, or subject in the field. It allows the members of the groups to be familiar with the terrain, boundary lines, selection number of station required, Equipment that will be used for the job, pillars number HND2001, TBM0110, and HND2002 used as a control for the project and so on. The stations points selected was Inter-visible to one another and finally a reconnaissance diagram was produced which was attached to this project

3.2 INSTRUMENT SELECTION

The equipment used for this project was grouped into two categories;

i. Hardware

ii. Software

3.2.1 **Hardware used**

i. Total Station with its Accessories (KTS-442L)

ii. Reflector poles

iii. Field book

iv. Writing material (pen)

v. Survey beacons

vi. Steel Tape (5m)

vii. Tripod Stand

3.2.2 **Software used**

Below are the list of the software used during the project processing;

i. AutoCAD 2007

ii. Notepad

iii. Microsoft word

iv. Microsoft Excel

3.3 INSTRUMENT TEST

The instrument test was carried out before it used for angular observation. The purpose of testing the instrument before used is to know the assurance and maybe other instrument is in good Condition the instrument was set up over station A and it was pointed a Sighted to station B whore a pole Is hold, and the angle was recorded for face left the instrument was turn to farce right on the same point and it was sighted to station B, where a pole is held at the same position and the angle was recorded. The distance between station A and B 1s 10m. The steel tape was hold at 60m an point A and it was extend to point B. the results for the instrument test was shown i to figure 3.3 below and table 3:2 below.

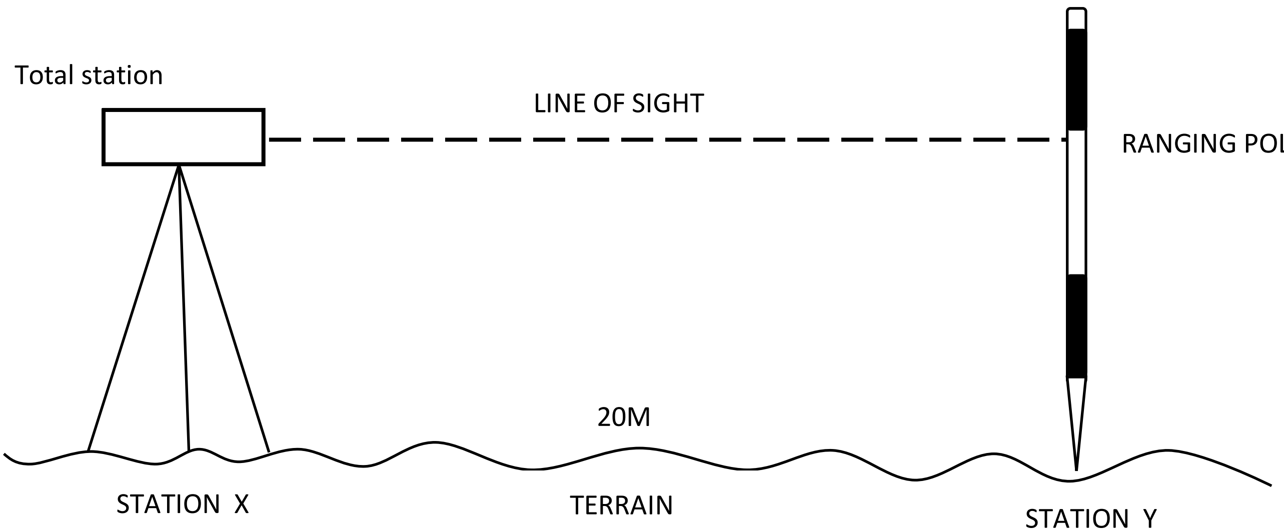


Figure 3.1 showing the instrument set up for collimation test

Table 3.2 showing the test of instrument result

STATION	SIGHT	FACE	HORIZONTAL READING	DEDUCED ANGLE
A	B	L	180° 00’ 03”	
	B	R	00°00’ 00”	180° 00’ 03”

Different in horizontal circle reading: 180° 00’ 03’’

Horizontal collimation error

= 180° 00’ 03’’

= 000° 00 03’’

Collimation error = $\frac{00°\,00'03''}{2}$

Horizontal collimation error = 00° 00’ 01”

Because the collimation error falls within the allowable 01”. The instrument was in good condition.

3.4 MONUMENTATION

This is the process in which the beacon is being buried in to ground. On the project site there are same existing beacons on the boundary lines m, nail with cap (bottle cork) was used as the station pegs.

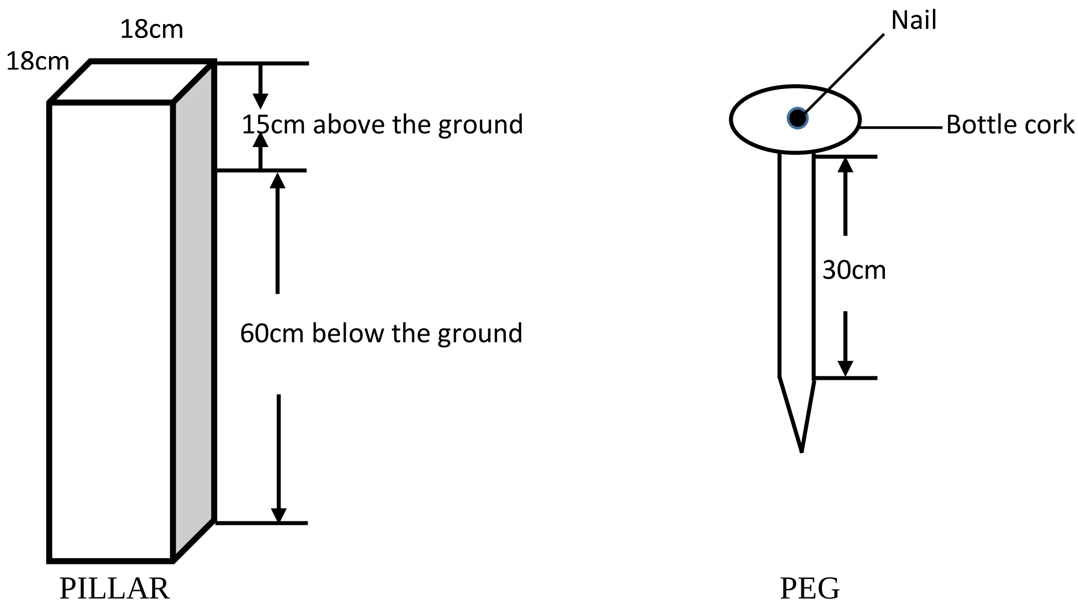


FIGURE 3.4 Diagram and Dimension of Pillars buried

3.5 CONTROL CHECK

The Control check was carried out to know the control point HND2001, TBM0110, and HND2002 are still in their positions. The instrument was set on Control FP01107 and the temporary adjustment was carried out i.e centring, levelling, and focusing. Back site was taken to control HND2001 and it was recorded.

The fore sight was served to PEG1 and it was recorded Steel tape was used to measure the distance between TBM0110 and PEGI and it was recorded. The data observed was computed for given coordinate and Observed Coordinate, as shown in the table 3.2 below.

TABLE 3.2 The Given Coordinate Of The Control Points

Stations	Northing (m)	Easting (m)	Remark
HND2001	937892.558	668076.468	Given
TBM0110	937900.412	668069.575	Given
HND2002	937909.711	668061.268	Given

TABLE 3.3 The Backward Computation for the Given Controls pillars

From station	**Bearing**	**Distance**	**ΔN**	**ΔE**	**Northing (m)**	**Easting (m)**	**To station**
					937892.558	668076.468	HND2001
HND2001	318° 43' 42’’	10.472	7.854	-6.893	937900.412	668069.575	TBM0110
TBM0110	318° 13' 33’’	12.469	9.299	-8.307	937909.711	668061.268	HND2002

TBM0110 to HND2002 BEARING = 318° 13' 33’’ DISTANCE = 12.469m

HND2002 to TBM0110 BEARING = 138° 43' 42’’ DISTANCE = 10.472m

TABLE 3.4 Show the Observed Coordinate of the Controls Pillars

Stations	Northing (m)	Easting (m)	Remark
HND2001	937892.550	668076.460	Observed
TBM0110	937900.412	668069.575	Observed
HND2002	937909.715	668061.271	Observed

TABLE 3.5 Show the Backward Computation for the Observed Control Pillars

From station	Bearing	Distanc	ΔN	ΔE	Northing (m)	Easting (m)	To station
					937892.550	668076.460	HND2001
HND2001	318° 43' 25''	10.451	7.862	-6.885	937900.412	668069.575	TBM0110
TBM0110	318° 14' 51''	12.470	9.303	-8.304	937909.715	668061.271	HND2002

TBM0110 to HND2002 BEARING = 318° 13' 51' DISTANCE = 12.470m

HND2002 to TBM0110 BEARING = 138° 43' 25'' DISTANCE = 10.451m

Therefore the difference between the given and observer bearing was 00° 00' 19" and 00° 00' 17" and the difference between the given and the observer linear distance was 0.003m and 0.021m the results obtained fall within the allowable accuracy for both angular and linear observation.

It was concluded the instrument was in good condition and fit to be used for the project.

3.6 DATA AQUISITION

This was carried out on the field using Total station with its accessories (KTS-442L) was used for coordinating the entire site for both the perimeter and details of the site. The Total station was set on the control Pillar TBM0110, and the temporary adjustment was carried out centering, leveling and focusing. The coordinates of the occupied station was input after that the coordinates of the backsight HND2001 was record as well and the observation was done to backsight pillar and the coordinates was take and check against the given. Having check and found accurate then the perimeter survey commenced for the entire project site.

3.6.1 DETAILING SURVEY

The detailing survey was done immediately after completely carried out the perimeter traverse to determine the position of the features on the Site was fixed using radiation survey method. During this several stations was established to pick the coordinates of the details and the coordinates was stored on the total station as its observed. This was later downloaded. The details that was picked during the detailing survey was coded in different ways like Building edges as ‘BLD’, Electric Poles ‘EP’, Drainage ‘DR’, Roads Line ‘RD’, Spot Height ‘SP’ and so on.

CHAPTER FOUR

4.0 DATA PROCESSING

This involved several step to ensure accurate and reliable result. It explains the method used in capturing; processing, downloading, and analyzing the data acquired Data reduction in surveying involves various methods to simplify and summarize the collected data for analysis. These are some common methods of data reduction that involves

- Combining multiple values into a single value. The average value is calculated by summing up all the values and dividing by the number of values.
- Least Square Adjustment (LSA) is a method of data reduction that involves minimizing the sum of the squared errors between observed and calculated values.
- Interpolation is a method of data reduction that involves estimating values between observed data points.
- Spatial data reduction refers to the process of simplifying and reducing the complexity of spatial data, such as geographic information system (GIS) data, while preserving its essential characteristics.

4.1 DATA EDITING

- Open excel
- Click on the desire file
- Set to delimited
- Click on next

- Mack space and comma
- Click
- On next
- Then click on finish

4.3 DATA PROCESSING USING AUTOCAD

The plan produced digitally with AutoCAD software. The following are the procedure used:

STEP 1: Open Notepad

Open Notepad on your computer. You can find it in the start menu (Window)

STEP 2: Create a New File

Click on "file" "New" to create a new file

STEP3: Enter Coordinates

Enter your coordinates in the following format:

X. Y. Data

STEP 4: Save the Fil

Click on "File" > "Save as" and choose a location to save your file. "ALADA Coordinate" txt, and select "All files" as the file type.

Importing the Coordinate File Into 2007 AutoCAD

STEP 1: Double click AutoCAD

Go under format

Click on format after that pick your unit

Drawing unit

Type.... Decimal

Precision... 0.000

Angle type Degree/Min/See

Precision Od00

Clockwise.... 노

Unit to scale Meters

Direction control North 270d0

Press "OK"

STEP 2: Create a new drawing

Click on "File" > "Name" to create a new drawing

STEP 3: Import the coordinate file

Click on "Tools" >"Reference" > "Import" and select "ALADA coordinate (.txt)" as the file type. Navigate to the location where you saved your coordinate file ("ALADA coordinate .txt") and select it.

STEP 4: Configure Import Setting. In the import select "Point" as the object type and choose the correct coordinate format (eg. X and Y) click "OK" to import the coordinates.

4.4 DATA EXTRACTION

The data recorded in the field book was picked to compute for the bearing and distance. Forward computation and backward computation after all necessary correction have been applied. Correction like slope correction, tension correction and standardization correction.

4.3 BACK COMPUTATION

The result get for forward computation was used for Back computation.

The following program was required for back computation

i. Input N2-N1 to get ΔN

ii. Input E2-E1 to get ΔE

iii.Input $\sqrt{(\Delta N^2 + \Delta E^2}$ to get distance

iv.Input shift tan $\frac{\Delta E}{\Delta N}$to get the corrected bearing when there us more station repeat step ¡¡¡ and ii.

Table 4.1 Showing Boundary Coordinates

Station	Northing (m)	Easting(m)	Remark
PIL1	937720.924	668157.605	Observed
PIL2	937720.560	668042.167	Observed
PIL3	937748.847	667988.759	Observed
PIL4	937788.194	667965.709	Observed
PIL5	937930.248	668056.923	Observed

PIL6	937924.001	668159.813	Observed

Table 4.1.1 Showing back computation for the boundary coordinate

Station form	Bearing	Distance	ΔN	ΔE	Northing	Easting	Station to
					937720.924	668157.605	PIL 1
PIL1	89° 49’ 09’’	115.484	0.364	115.438	937720.560	668042.167	PIL 2
PIL 2	117° 54’26’’	45.302	-28.287	53.408	937748.847	667988.759	PIL 3
PIL 3	149° 38’ 15”	31.887	-39.347	23.05	937788.194	667965.709	PIL 4
PIL 4	180° 35’ 31”	108.901	-142.054	-91.214	937930.248	668056.923	PIL 5
PIL 5	253° 31’ 46”	102.700	6.247	-102.89	937924.001	668159.813	PIL 6
PIL 6	360° 00’ 39”	203.082	203.077	2.208	937720.924	668157.605	PIL 1

4.4 AREA COMPUTATION

TABLE 4.1.2 showing area computation for the boundary coordination using double latitude

ΔE	ΔN	PRODUCT
115.438	X 0.364	= 42.019432
115.438		
230.876		
53.408		
284.284	X -28.287	=-8041.541508
53.408		
337.692		
23.05		
360.742	X -39.347	=-14194.11547
23.05		
283.792		
-91.214		
292.578	X -142.054	= -41561.87521
-91.214		
201.364		
-102.89		
98.474	X 6.247	= 615.167078
-102.89		
-4.416		
2.208		
-2.208	X 2203.077	= -448.394016
2.208		
0.000		

= 42.01943 – 8041.541508 – 14194.11547- 41561.87521+ 615.167078 – 448.394016 = -63588.73969\2

= 31794.36985m²\10,000.

= 3.1794 HECTRES

4.5 PLAN PRODUCTION

All the plan were produces in both soft copies and hard copies, the hard copies were shown on the appendix page attached with the project.

CHAPTER FIVE

5.0 SUMMARY, PROBLEMS ENCOUNTERED, CONCLUSION, RECOMMENDATION

5.1 SUMMARY

In order to determine the shape, size and location of the Kwara state Polytehnic Mini Campus, reconnaissance was carried out which helps in taking further decisions. Beacons were coordinated using total station with the help of existing control points very close to the project site. Data were downloaded and processed using appropriate AutoCAD 2007 software and the final adjusted coordinates of the perimeter were used to plot the boundary and other details . The resulting plan was printed in scale 1: 2,500. A comprehensive Technical report was prepared and printed.

5.2 PROBLEM ENCOUNTERED

i. Too much of rainfall which does not allowed site

ii. Unavailable of the group members due to dean's cup football tournament

iii. While taking observing there are some object obstructing the view when taking the observation e.g electric pole, building, tree etc.

5.3 RECOMMENDATION

The department should considered the season and time that the students should be given the terminal project.

5.4 CONCLUSION

At the end the aim and objective of this project was achieved. It was carried out using third order surveying method this project was carried out in accordance with survey rules and regulation and departmental instruction.

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RAW DATA

Name	Code	E	N	h		PT260	SH	668115.4	937791.5	317.946
PT1	ST17	668069.6	937900.4	324.137		PT261	SH	668118	937790.7	318.041
PT2	CV	668071.1	937900.4	324.553		PT262	SH	668117.7	937795.6	317.967
PT3	CV	668072	937900.3	324.541		PT263	SH	668113.5	937797.2	317.656
PT4	BLD	668072.6	937900.6	324.383		PT264	SH	668110.1	937800.8	317.647
PT5	BLD	668066.5	937905.8	323.724		PT265	SH	668110.4	937806.9	317.571
PT6	SH	668069.7	937897.9	324		PT266	SH	668114.1	937808.4	317.326
PT7	SH	668072.6	937896.1	324.671		PT267	SH	668117.8	937810	317.601
PT8	SH	668072.2	937891.5	324.604		PT268	SH	668117.6	937814.7	317.532
PT9	SH	668076.5	937892.6	324.821		PT269	SH	668113.8	937816	317.212
PT10	SH	668083.2	937892.3	324.831		PT270	SH	668109	937815.1	317.485
PT11	SH	668085.6	937889.4	324.87		PT271	SH	668104.5	937814.4	317.27
PT12	BLD	668085.4	937886.8	324.848		PT272	SH	668104.8	937819.5	317.197
PT13	SH	668088.7	937888.5	324.887		PT273	SH	668109.7	937818.5	317.278
PT14	SH	668090.4	937893.3	324.882		PT274	SH	668113.6	937819	317.192
PT15	SH	668095.3	937895.1	324.957		PT275	SH	668117.7	937821.2	317.334
PT16	SH	668095.6	937891.4	324.958		PT276	SH	668114.1	937823.2	317.152
PT17	BLD	668139.4	937901.3	324.586		PT277	SH	668109	937824.1	317.181
PT18	CV	668139.1	937901.2	316.047		PT278	SH	668104.9	937822.2	317.161
PT19	CV	668139.5	937900.4	316.104		PT279	SH	668105	937825.4	317.107
PT20	CV	668137.3	937899	317.048		PT280	SH	668103.5	937827.1	317.276
PT21	SH	668133.7	937894.7	316.106		PT281	SH	668108.1	937827.2	317.179
PT22	SH	668136.7	937894.8	316.021		PT282	SH	668112	937827.1	317.097
PT23	BLD	668137	937893.5	316.015		PT283	SH	668116.6	937827.5	317.116
PT24	SH	668141.1	937890.4	315.886		PT284	SH	668117.8	937831.4	317.048
PT25	SH	668145.9	937889.2	315.599		PT285	SH	668112.9	937833.2	317.012
PT26	SH	668147.8	937891.6	315.619		PT286	SH	668108.8	937832.7	317.058
PT27	GT	668148.7	937893.4	315.804		PT287	SH	668106.3	937831.7	317.095
PT28	GT	668147.9	937894	315.765		PT288	SH	668120.4	937780	318.343
PT29	BLD	668148.9	937893.2	315.928		PT289	SH	668125.9	937783	318.036
PT30	SH	668148.1	937886.3	315.852		PT290	SH	668122.6	937785.4	318.043
PT31	SH	668144.4	937882.9	315.942		PT291	SH	668120.9	937789.4	318.013
PT32	SH	668140.3	937879.1	316.287		PT292	BLD	668120.6	937791.6	317.908
PT33	SH	668144.4	937877.2	316.236		PT293	SH	668125	937790.3	317.853
PT34	SH	668147.4	937877.9	316.065		PT294	SH	668128.5	937785.7	317.944
PT35	BLD	668149.4	937879.9	315.956		PT295	SH	668133	937781.5	317.952

PT36	BLD	668156.1	937879.6	315.966		PT296	SH	668132.9	937786.5	317.857
PT37	BLD	668156	937874.1	315.966		PT297	SH	668132.2	937790.7	317.807
PT38	EP	668150.9	937875.2	316.093		PT298	SH	668137	937790.8	317.772
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PT40	BLD	668146.3	937874.1	316.297		PT300	SH	668140	937781.4	318.046
PT41	SH	668132	937896.8	316.129		PT301	SH	668144.3	937781.2	318.023
PT42	BLD	668128.4	937894.7	316.378		PT302	SH	668145.5	937786.4	317.727
PT43	SH	668124.8	937894.3	316.451		PT303	SH	668146	937791.2	317.717
PT44	SH	668121.3	937892	316.499		PT304	SH	668149.5	937790.8	317.75
PT45	SH	668118.3	937894.3	316.594		PT305	SH	668149.7	937786.7	317.692
PT46	SH	668115.7	937888.6	316.573		PT306	SH	668148.9	937781.3	317.842
PT47	BLD	668113.6	937886.9	316.529		PT307	BLD	668150.4	937781.4	317.8
PT48	SH	668110.4	937889.4	316.736		PT308	BLD	668150	937791.5	317.803
PT49	SH	668108.3	937891.8	316.596		PT309	SH	668113.7	937768.9	318.789
PT50	SH	668104.4	937892.2	316.593		PT310	SH	668113.6	937766	318.901
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PT53	SH	668119.7	937883.9	316.541		PT313	SH	668117.5	937764.3	318.911
PT54	SH	668117.1	937883.2	316.562		PT314	SH	668122.4	937765.5	318.977
PT55	SH	668114.2	937882.6	316.592		PT315	SH	668124.5	937762.3	318.933
PT56	BLD	668113.5	937874.4	316.659		PT316	SH	668122.4	937758.6	318.969
PT57	SH	668115.5	937874	316.641		PT317	SH	668121.7	937753.2	319.012
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PT59	SH	668116.9	937866.3	316.759		PT319	BLD	668113	937752.1	319.283
PT60	SH	668114.9	937865.7	316.81		PT320	BLD	668113.1	937748.7	319.275
PT61	SH	668112.2	937865.8	317.066		PT321	BLD	668113.2	937730.1	319.819
PT62	BLD	668111.7	937870.2	316.664		PT322	BLD	668118.1	937726.7	320.172
PT63	SH	668124	937868.3	316.542		PT323	BLD	668118.2	937750.2	319.117
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PT65	SH	668128.1	937869.8	316.579		PT325	SH	668124.5	937754.3	318.972
PT66	SH	668127.9	937872.5	316.566		PT326	SH	668125.4	937757	318.942
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PT68	SH	668123.6	937877	316.822		PT328	SH	668127.7	937763.6	318.945
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PT70	SH	668121.7	937869.6	316.558		PT330	SH	668132.3	937766.4	319.052
PT71	SH	668121.5	937862	316.817		PT331	SH	668132.9	937763.9	319.098
PT72	SH	668123.1	937858.4	316.857		PT332	SH	668133.1	937760.8	318.995
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PT75	SH	668116.8	937852.9	316.833		PT335	SH	668134.5	937750.7	319.07
PT76	CV	668119	937855.1	316.791		PT336	BLD	668137.6	937750.4	319.035
PT77	CV	668118.5	937855.2	316.819		PT337	SH	668138.2	937752.8	319.024
PT78	SH	668111.8	937851.5	317.396		PT338	BLD	668140.6	937755.3	318.91
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PT80	SH	668118.3	937849	316.835		PT340	SH	668136	937762	319.013
PT81	SH	668118.1	937843.1	316.939		PT341	SH	668138.3	937764.7	319.044
PT82	SH	668113.8	937842.7	316.91		PT342	BLD	668139.4	937765.7	319.051
PT83	SH	668108.1	937843.3	317.4		PT343	SH	668141.4	937749.2	319.111
PT84	SH	668106.1	937847.2	317.641		PT344	SH	668143.4	937751	319.05
PT85	SH	668102.4	937849.2	317.563		PT345	SH	668144.9	937753.8	318.948
PT86	SH	668101.2	937843.6	317.586		PT346	SH	668147.2	937751.6	318.691
PT87	SH	668099.2	937840.3	317.489		PT347	SH	668146.9	937747.9	319.135
PT88	SH	668098.1	937836.4	317.051		PT348	SH	668144.5	937745.9	319.098
PT89	SH	668094.9	937829.9	317.405		PT349	SH	668143.8	937741.8	319.252
PT90	SH	668099	937830	317.366		PT350	BLD	668137.8	937739.5	319.454
PT91	SH	668102.2	937835.3	317		PT351	SH	668140	937740.1	319.295
PT92	SH	668093	937842.7	317.597		PT352	SH	668141.4	937742	319.263
PT93	SH	668090.5	937849.3	317.02		PT353	SH	668145.1	937740.6	319.475
PT94	SH	668088	937845.4	317.154		PT354	SH	668147.6	937743.1	319.297
PT95	CV	668089.1	937840.1	317.01		PT355	SH	668149.8	937746.8	319.15
PT96	CV	668089.5	937840.1	317.036		PT356	SH	668151.4	937750.4	319.144
PT97	CV	668089.7	937835.1	316.97		PT357	SH	668153.9	937753.9	319.13
PT98	CV	668089.1	937835.1	316.951		PT358	BLD	668156.8	937753.8	319.16
PT99	SH	668087.3	937837.4	317.032		PT359	BLD	668155	937750.1	319.175
PT100	SH	668084.9	937841.3	317.015		PT360	GT	668156.7	937750.4	319.189
PT101	SH	668081.1	937845.6	316.694		PT361	GT	668156.4	937744	319.379
PT102	BLD	668082.4	937849.5	316.774		PT362	BLD	668151.3	937744.1	319.293
PT103	SH	668079.2	937850.8	316.576		PT363	BLD	668157.6	937720.9	319.595
PT104	SH	668076.3	937851.1	316.606		PT364	BLD	668075.3	937717.9	320.555
PT105	SH	668076.4	937857.2	316.522		PT365	BLD	668042.2	937720.6	320.353
PT106	SH	668079.6	937859	316.481		PT366	BLD	668036	937729.4	320.261
PT107	SH	668082.3	937859.3	316.539		PT367	BLD	668035.2	937744.9	319.623
PT108	SH	668081.6	937865.3	316.444		PT368	BLD	668011	937744.6	320.389
PT109	SH	668078.7	937867	316.454		PT369	BLD	668000.4	937749.6	319.55
PT110	SH	668075.8	937866.3	316.351		PT370	BLD	667993.6	937757.8	318.942
PT111	SH	668074	937869.4	316.329		PT371	BLD	667980.6	937772.8	318.59

PT112	SH	668078.7	937870.4	316.547		PT372	BLD	667974.3	937782.4	318.279
PT113	SH	668081.1	937872.7	316.472		PT373	BLD	667968.1	937789.6	318.03
PT114	SH	668081.9	937877.2	316.469		PT374	RD	667966.1	937793.6	317.734
PT115	SH	668079	937877.3	316.472		PT375	CL	667964.4	937795.8	317.839
PT116	SH	668076.3	937876	316.604		PT376	RD	667962.9	937797.2	317.658
PT117	EP	668074.3	937876.1	316.594		PT377	SH	667967.3	937798.1	317.599
PT118	TM	668071.8	937879	316.342		PT378	SH	667972.1	937795.5	317.821
PT119	TM	668076.7	937878.8	316.445		PT379	SH	667976.9	937798.1	317.559
PT120	TM	668077.2	937885.8	316.536		PT380	SH	667975.5	937802	317.229
PT121	SH	668079.9	937885	316.362		PT381	SH	667973.8	937805.3	317.111
PT122	SH	668082.8	937883.4	316.48		PT382	SH	667974.4	937809.3	317.087
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PT124	SH	668064.8	937896.9	315.429		PT384	SH	667986.3	937808.3	317.055
PT125	BLD	668064.8	937885.4	315.743		PT385	SH	667989	937806.7	317.471
PT126	SH	668069.7	937888.7	315.93		PT386	SH	667991.4	937808.2	317.321
PT127	SH	668069.8	937882.8	315.817		PT387	BLD	667995.8	937809.1	317.181
PT128	EP	668066.9	937881.4	316.367		PT388	BLD	667996.6	937819.4	317.014
PT129	BLD	668073.2	937873.9	316.28		PT389	BLD	667997.1	937825.8	316.715
PT130	SH	668076.5	937842.5	316.803		PT390	BLD	667997.7	937836.1	316.436
PT131	SH	668080.9	937837.3	316.882		PT391	SH	667999.8	937837.9	316.489
PT132	SH	668076.4	937833.4	317.117		PT392	SH	668004.1	937837	316.697
PT133	SH	668079.1	937829.3	317.088		PT393	SH	668006.3	937835.7	316.836
PT134	SH	668084.6	937829.3	317.095		PT394	SH	668012.2	937839.5	317.101
PT135	SH	668084.6	937825.2	317.166		PT395	BLD	668024	937834.2	316.943
PT136	SH	668080.9	937824.4	317.192		PT396	EP	668028.4	937833.8	316.701
PT137	EP	668075.2	937830.8	317.409		PT397	SH	668027.3	937830.5	316.834
PT138	SH	668076.5	937824.8	317.309		PT398	SH	668024.8	937827.5	316.95
PT139	SH	668080.1	937820.9	317.285		PT399	SH	668027.4	937825.1	316.977
PT140	SH	668083.9	937818.9	317.208		PT400	SH	668025.7	937818	317.088
PT141	SH	668084.3	937814.6	317.38		PT401	BLD	668022.6	937817.1	317.238
PT142	SH	668080.3	937812.9	317.483		PT402	SH	668025.6	937813.3	317.258
PT143	SH	668077	937811.8	317.722		PT403	SH	668030.1	937809.1	317.516
PT144	EP	668075.5	937812.1	317.622		PT404	BLD	668031.1	937802.8	317.66
PT145	CV	668075.9	937810.5	317.869		PT405	SH	668027.5	937801.2	317.556
PT146	CV	668076.6	937810.4	317.877		PT406	SH	668031.4	937799.3	317.671
PT147	CV	668076.1	937808	317.884		PT407	BLD	668035	937801.7	318.075
PT148	CV	668076.5	937808	317.896		PT408	SH	668032	937800	317.586
PT149	BLD	668073.4	937815.4	317.468		PT409	SH	668031.4	937796	317.74

PT150	BLD	668073.5	937803.4	317.824		PT410	SH	668033.4	937793.9	317.725
PT151	SH	668077.3	937804.7	317.737		PT411	BLD	668035.2	937792.8	317.863
PT152	SH	668080.4	937805.5	317.546		PT412	BLD	668029.7	937792.2	318.048
PT153	SH	668083.8	937807.7	317.514		PT413	BLD	668029.5	937779.7	318.482
PT154	SH	668084	937803.1	317.576		PT414	BLD	668035.6	937839.2	316.76
PT155	SH	668080.5	937801.9	317.645		PT415	BLD	668030	937849.5	316.014
PT156	SH	668076.8	937799.4	318.005		PT416	BLD	668014.7	937849.8	315.771
PT157	SH	668080.5	937797	317.729		PT417	RD	668001.4	937850	315.553
PT158	SH	668084.2	937798.5	317.584		PT418	RD	667996.5	937852.3	315.646
PT159	SH	668086.6	937795.5	317.625		PT419	BLD	668015.4	937870.2	315.216
PT160	SH	668088.9	937794.7	317.784		PT420	RD	668022.4	937889	314.617
PT161	SH	668087.8	937791.7	318.04		PT421	RD	668020.3	937890.7	314.467
PT162	BLD	668090.2	937790.5	318.057		PT422	BLD	668035.6	937896.8	314.523
PT163	SH	668086	937790	318.019		PT423	CV	668032.5	937898.1	314.441
PT164	SH	668079.9	937790.6	317.829		PT424	CV	668032.1	937898.6	314.354
PT165	SH	668076.8	937791.1	317.997		PT425	EP	668026.8	937902.6	314.367
PT166	EP	668075.9	937791.5	318.028		PT426	EP	668042.4	937923.4	313.423
PT167	SH	668081.3	937788.3	317.911		PT427	EP	668045.7	937913.1	313.825
PT168	SH	668086.2	937787	318.037		PT428	CV	668045.7	937915.3	314.041
PT169	SH	668088.3	937782.1	318.256		PT429	CV	668045.2	937915.7	314.017
PT170	SH	668083.1	937782.1	318.113		PT430	RD	668050.4	937924.9	313.193
PT171	SH	668077.2	937783.1	318.448		PT431	RD	668048	937928.1	313.163
PT172	SH	668077.1	937779.4	318.482		PT432	CL	668049.6	937927.2	313.142
PT173	SH	668080.8	937779.2	318.382		PT433	BLD	668057.8	937924.9	313.443
PT174	SH	668086.1	937777	318.527		PT434	BLD	668139.5	937920.4	313.76
PT175	SH	668088.4	937774.7	318.351		PT435	BD	668156.3	937920.7	312.957
PT176	CV	668076.7	937775.7	318.733		PT436	BLD	668156.4	937893.6	315.143
PT177	CV	668076.4	937775.7	318.755		PT437	BLD	668120.5	937803.6	317.77
PT178	SH	668075.6	937773.1	318.598		PT438	SH	668121.8	937806.3	317.702
PT179	BLD	668073.5	937768.6	318.708		PT439	BLD	668120.3	937810	317.679
PT180	SH	668073.1	937767.9	318.686		PT440	SH	668124.2	937808.2	317.693
PT181	SH	668075.1	937765.4	318.807		PT441	SH	668124.2	937805.5	317.683
PT182	BLD	668076.2	937763	318.99		PT442	SH	668127.7	937808.3	317.623
PT183	SH	668077.8	937762.3	318.92		PT443	SH	668129.9	937805.3	317.555
PT184	SH	668079.4	937758.5	319.226		PT444	SH	668132.3	937808.2	317.557
PT185	SH	668076.9	937758.6	318.98		PT445	SH	668135.2	937805	317.569
PT186	SH	668079.6	937754.5	319.302		PT446	SH	668139.8	937808.7	317.523
PT187	SH	668077.8	937753.6	319.218		PT447	SH	668142.5	937806.5	317.477

PT188	SH	668078.5	937746.8	319.408		PT448	SH	668143.5	937805.6	317.641
PT189	SH	668076.3	937744	319.51		PT449	BLD	668152.8	937810.8	317.334
PT190	SH	668079.7	937740.7	319.611		PT450	BLD	668152.8	937803.9	317.388
PT191	SH	668080.3	937743.2	319.569		PT451	BLD	668120.4	937826.9	317.189
PT192	SH	668078.8	937739.9	319.631		PT452	SH	668123.3	937828	316.989
PT193	SH	668078.8	937737.1	319.719		PT453	SH	668126.8	937828.7	316.943
PT194	SH	668081	937736.3	319.732		PT454	SH	668126.3	937832	316.931
PT195	SH	668078.1	937736.2	319.726		PT455	SH	668123.9	937832.8	316.937
PT196	SH	668074.3	937736.5	319.73		PT456	SH	668121.8	937833.5	316.965
PT197	BLD	668076	937739.9	319.718		PT457	SH	668128	937833	316.904
PT198	SH	668070.5	937735	319.725		PT458	SH	668128.4	937836.4	316.889
PT199	SH	668067.7	937732.6	319.769		PT459	SH	668135.6	937832.3	316.921
PT200	SH	668065.8	937735.6	319.673		PT460	SH	668134.3	937834.4	316.926
PT201	SH	668064.2	937739.6	319.579		PT461	SH	668138.4	937829.2	316.911
PT202	SH	668061	937736.3	319.632		PT462	SH	668141.1	937835.5	316.628
PT203	SH	668060.3	937732.6	319.705		PT463	SH	668120.5	937838.7	317.002
PT204	SH	668057.4	937735.8	319.652		PT464	BLD	668073.3	937862.2	316.453
PT205	SH	668056.3	937739.5	319.449		PT465	SH	668072.4	937859	316.477
PT206	SH	668052.5	937736.1	319.664		PT466	SH	668069.5	937857	316.409
PT207	SH	668050.9	937732.6	319.757		PT467	SH	668065.8	937859.2	316.319
PT208	SH	668048.6	937736.2	319.724		PT468	SH	668064.3	937857.5	316.229
PT209	BLD	668043.3	937739.9	319.659		PT469	SH	668063.9	937853.2	316.483
PT210	BLD	668043.6	937731.8	319.686		PT470	SH	668055.7	937859.2	316.296
PT211	BLD	668075.8	937729.8	319.966		PT471	SH	668050.3	937854.7	316.365
PT212	BLD	668079.9	937728.9	320.175		PT472	BLD	668050.1	937852.9	316.654
PT213	BLD	668079.7	937763.4	318.77		PT473	SH	668056.8	937852.8	316.47
PT214	SH	668080.8	937767.6	318.711		PT474	SH	668063.8	937852.2	316.438
PT215	SH	668083.6	937771.3	318.618		PT475	SH	668067.5	937853.8	316.473
PT216	CV	668088.4	937773.9	318.388		PT476	BLD	668073.3	937851.7	316.674
PT217	CV	668088.4	937774.1	318.401		PT477	BLD	668073.4	937838.8	317.02
PT218	CV	668088.9	937774.3	318.362		PT478	SH	668071.2	937834.5	316.988
PT219	CV	668089.2	937774.2	318.355		PT479	SH	668071.7	937829.5	317.224
PT220	CV	668089.7	937774	318.348		PT480	BLD	668073.4	937827.2	317.205
PT221	CV	668089.7	937773.6	318.358		PT481	SH	668067.6	937828.1	317.111
PT222	SH	668092.5	937776.3	318.551		PT482	SH	668064.6	937832.8	317.034
PT223	SH	668090.5	937779.5	318.338		PT483	SH	668061.8	937837.4	316.978
PT224	SH	668092.9	937780.6	318.233		PT484	SH	668056.2	937836.7	316.98
PT225	SH	668091.7	937784.1	318.136		PT485	SH	668057.4	937831	317.048

PT226	SH	668090.5	937787.6	318.117		PT486	SH	668058.5	937827.6	317.15
PT227	SH	668095.2	937788.3	318.215		PT487	SH	668050.6	937828	316.962
PT228	SH	668098.3	937788.8	318.206		PT488	SH	668049.9	937833.6	316.97
PT229	SH	668098.2	937786.1	318.204		PT489	SH	668049	937837	316.957
PT230	SH	668097.9	937782.4	318.229		PT490	BLD	668043.9	937838	317.267
PT231	SH	668097.4	937777.8	318.321		PT491	BLD	668073.7	937792	318.073
PT232	SH	668097.1	937773.1	318.529		PT492	SH	668073.1	937784.7	318.318
PT233	SH	668100.9	937773.3	318.58		PT493	BD	668073.2	937780.3	318.439
PT234	SH	668102.2	937777.1	318.319		PT494	SH	668069.9	937784.4	318.355
PT235	SH	668101.1	937781.3	318.285		PT495	SH	668064.9	937790.3	318.076
PT236	SH	668100.2	937785.2	318.239		PT496	SH	668062.6	937784.4	318.262
PT237	SH	668102.1	937788.4	318.071		PT497	SH	668061.5	937781.1	318.253
PT238	BLD	668103.3	937790.4	317.873		PT498	SH	668054.5	937781.3	318.237
PT239	SH	668105.1	937786.6	318.137		PT499	SH	668053	937785.2	318.171
PT240	SH	668105.9	937783.1	318.189		PT500	SH	668051.4	937789.3	318.097
PT241	SH	668106.2	937778.4	318.236		PT501	SH	668045	937791.3	318.148
PT242	SH	668106.3	937774.5	318.368		PT502	SH	668044.7	937785.9	318.238
PT243	SH	668106.4	937771.7	318.607		PT503	BD	668043.5	937789.4	318.204
PT244	SH	668109.8	937771.4	318.611		PT504	BD	668046.8	937781.7	318.191
PT245	SH	668114.7	937770.8	318.727		PT505	SH	668050.5	937781.3	318.192
PT246	CV	668118.6	937769.6	318.768		PT506	BLD	668073.6	937768.4	318.52
PT247	CV	668118.6	937769.2	318.875		PT507	SH	668072.8	937765.9	318.772
PT248	BLD	668120.4	937768.5	318.906		PT508	SH	668068.1	937767.9	318.712
PT249	SH	668118	937771.4	318.745		PT509	SH	668064.3	937765.9	318.846
PT250	SH	668114.6	937774.6	318.45		PT510	SH	668061.8	937764.8	318.757
PT251	SH	668112.3	937778.2	318.273		PT511	SH	668059.2	937766.6	318.779
PT252	SH	668116.9	937781	318.219		PT512	SH	668056.8	937767.3	318.813
PT253	SH	668114.7	937784	318.086		PT513	SH	668055.6	937765.9	317.208
PT254	SH	668110.9	937786.4	318.028		PT514	SH	668054.7	937765.1	317.217
PT255	SH	668108.3	937788.8	318.063		PT515	SH	668050.4	937765	317.161
PT256	SH	668106.5	937792.3	317.922		PT516	SH	668048.2	937766.1	317.281
PT257	SH	668104.3	937794.3	317.593		PT517	SH	668047.6	937767.1	318.799
PT258	SH	668106.6	937796.8	317.885		PT518	BLD	668043.7	937764.7	322.083
PT259	SH	668110.6	937794.3	317.866						