

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY,

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DESIGN THESIS:

REDEVELOPMENT OF SUAME MAGAZINE, *AUTOMATICS TRAINING  
CENTER*

KUMASI

AUTHOR:

NYAME -TAWIAH DAVID

(Master of Architecture)

A DESIGN THESIS REPORT SUBMITTED TO THE DEPARTMENT OF ARCHITECTURE OF  
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IN ARCHITECTURE.

June 2009

## DECLARATION

I hereby declare that this thesis report has been undertaken solely by me and is an original and not a duplicate or plagiarised work. It has resulted from thorough research and logical analysis and synthesis under department staff supervision.

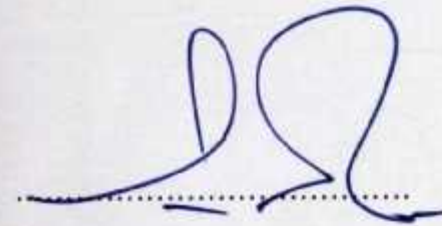


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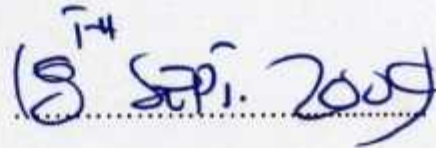
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I hereby declare that this work is an original research undertaken by my student and has been done under my supervision



Mr Charles Essel

*Supervisor*



Date

Professor G.W.K. Instiful

*Head of Department*

Date

## DEDICATION

This design thesis is dedicated to my wonderful parents-Mr & Mrs Nyame-Twaiah for their support, inspiration and prayers throughout my educational life.

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I express my sincerest gratitude first and foremost to the Almighty God for seeing me through these six years of study at the university.

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## ABSTRACT

Suame Magazine, an industrial village housing about 20,000 artisans dealing in metal scraps, vehicular repairs and spare parts. The Suame Magazine, the largest informal sector village in the country is also a major centre for vehicle repairs attracting vehicles not only from Ghana but also from neighbouring countries in the West Africa sub region. About 80% of the cars on our roads are serviced by local artisans and the rest 20% serviced by specialised service centres like Vodi, Toyota, Nissan but to mention a few. It has a work force popularly referred to as 'Fitters' and are finding it difficult to cope with new auto models as a result of their lack of formal education.

The days of grease monkey mechanics at our local garages like Suame Magazine are far long gone in the advanced and developed countries. this is gradually passing away in our part of the world. Today cars are seen as complex machines run by sophisticated computer systems and people who fix them are no longer called mechanics or "fitters" but highly skilled automotive technicians who are well vest in troubleshooting problems using the latest programmes and software to diagnose, service are repair modern cars.

Launching a project at Suame Magazine on 9<sup>th</sup> January, 2009 under the theme, 'Harnessing the potential of artisanal engineering for Ghana's industrialization', the Vice President said there was the urgent need to focus attention on harnessing our resources for the establishment of an institute to save the Suame Magazine from total collapse precipitated by modern technological innovations and sophistication in the automobile industry.

In view of this, looking at the great potentials and technological innovations with the little knowledge the artisans have in formal engineering, the role it plays in our economy and the rest of West Africa, there is the need to equip our artisans with modern trouble shooting techniques to diagnose and service modern computerized cars to meet the demand of tomorrow.

## **CHAPTER ONE**

### **INTRODUCTION**

Chapter one is Introduction to the study and It deals with the Background of the Study, the Statement of the Problem under study, Objectives, Research Questions, Scope, Limitation Methodology, Importance of the study and Organization of the rest of the text.

#### **1.0 Background to the study**

Suame is a major suburb in Kumasi, the second largest city in Ghana and the regional capital of Ashanti region. "Suame Magazine" (SM) is a huge sprawl somewhat plastered centrally across a huge wrap of Kumasi's middle. As far as Ghanaians can remember, SM has been an amazing labyrinth of garages, workshops, tool shacks, machine mini-marts, outdoor laboratories, greasy foundries, and assorted furnaces-on-wheels. It is a place awash with urban myth, and steeped in a changeless flux of activity. What that means is that the hum may never stop, yet regardless how long one stays away, on return SM always feels and looks the same. It serves as one stop market for drivers and car owners from the northern part of Ghana, countries across the border and even the southern part of the country.

Some 200,000 artisans, salespeople, technicians, and garage operators – the four main classes of inhabitant - supply the ceaseless buzz, and sustain SM's formidable reputation as the Shop that never lacks. Regardless your mechanical woe, particularly if it is auto-related, rest assured that cure is lurking somewhere in the nooks and crannies of Suame Magazine.

Left to fend for itself by successive governments and municipal administrations, Suame Magazine has enjoyed a steady, if unspectacular, growth over the years. Guilds, corresponding to the aforesaid classes, have emerged to champion the self-interest of members, and evolve efficient and interesting governance systems to preserve the general harmony.

The 'hierarchical system' is anchored around the age-old practice of the 'master craftsman' and

his 'apprentices'. The choice of pronoun was deliberate: the gender balance is overwhelmingly tilted to the male of the species. <sup>(1)</sup>

The role of technical education in a country's industry drives is very paramount. Nations that have not placed emphasis on technology have sluggish in the development .

with modern term of development in the automobile industry, car engines are basically electronics and the approach of detecting faults are complicated. In modern way, the car is analysed by a software through the computer and all problems indicated on the screen of the computer. The mechanic become aware of the exact problem and find the best solution to it.

With the little formal education of our artisans at the Suame Magazine, yet they are able to perform wonderfully and about 80% of our cars on our roads are serviced by them.

As a result of their role in our economy today, there is the need to upgrade them with modern technology of car troubleshooting to enable them meet the modern challenges of the world or else ,they will be out of business in the near future.

### **1.1 Problem statement**

There have been many attempts by the government to improve the skills of the youth through the establishment of vocational technical institutes throughout the whole nation.

All this attempt has failed to address the challenges of today due to the following:

The lack of adequate facilities such as modern and well stocked workshops and laboratories, ICT centers to equip students with modern technology. There has been attempt by the present and past governments to establish technical and vocational institutes to equip school drop outs with skills to make them self employed. This attempt have failed because of the emptiness of the programmes and the resources such as

equipments and personnel to drive the vision.

The big gap between the technicians and our engineers as a result of our educational system. The nature of our educational systems have created a big gap between the artisans at the bottom and the engineers at the top. As a result of this, there have not been understanding and link between them. This leads to Findings of research works by engineers not been implemented at the bottom (artisans) to improve standards of life.

The inability of technicians to detect faults of modern electronic cars. In the world today, technology is far advanced and cars are seen as a complex machines. Today, it becomes impossible for troubleshooting without the use of modern techniques and troubleshooting softwares. Our artisans will soon be thrown out of market if care is not taken to arrest the situation.

The neglecting of our artisans in our educational system making them in effective and unable to meet modern demands. The nature of our educational system neglect artisans who are not able to claim the educational ladder from Junior High School to the Universty. School levers who learn trade and become artisans are neglected as there is no proper formal training for them. This makes them insufficient to meet challenges of today and tomorrow.

## **1.2 Research Questions**

Research Questions have been used in the research methodology instead of hypothesis because of the nature of the research which is more of Qualitative. As sited in SOCIAL RESEARCH METHODS by Bryman Alan, Qualitative research is more open ended than qualitative research and therefore Research Questions will provide a focus that will<sup>(2)</sup> ; guide my literature search, guide the kind

of data to collect, the analysis of the data, the writing up of the data and stop me from going off in unnecessary direction and tangents.

The following are the Research Questions developed for the research.

1. What Technical education will be required by the artisans at the bottom of the formal education?
2. What kind of facilities will be needed by the ordinary artisans to improve their skills?
3. How can the artisans acquire the needed skills through the teaching of basic theory and more practicals?
4. How can employment be provided through the upgrade of skills?

### **1.3 Objectives**

The following consist of the objectives outlined for the research;

1. To introduce a kind of technological education that will be practical centered so that artisans who are at the bottom of the formal education will not be left out.
2. To provide the kind of facilities that will enable the artisans get the required skills to meet the challenges of tomorrow.
3. To provide an automobile recourses center that will give basic theory and more practical's to Apprentice who have graduated from their masters.
4. Arrest the possible unemployment for mechanics popularly called fitters in the near future through the upgrade of technology.

### **1.3 Scopes**

The research is limited to the fitting area of Suame Magazine. The fitting area compresses of Mechanics, Car electricians and Fabricators. For the purpose of this research, the search will be limited to the Mechanics and Electricians at the fitting area. The aim of this research is to target the ordinary artisans who has just the basic education .

### **1.4 limitations**

The research is limited to only the fitting area of Suame Magazine due to time and financial constraints. The researcher encountered some problems with the collection of the questionnaire in some of the workstations sampled for the study. The researcher was made to go and call at another date for the questionnaire, some apprentices kept repeatedly asking for further explanation, the researcher encountered a lot of difficulties in answering the questions as most of them could not read and write. On the whole, the exercise was successful.

### **1.5 Methodology**

This deals with the methods and the instruments used for the study. The researcher employed instruments such as Internet, University libraries, news papers, magazines and journals for both primary and secondary data. Questionnaires were administered to both apprentices and masters for information.

### **1.6 Importance of the study**

At the end of the research, Artisans at the Suame Magazine will benefit from the following;

1. A kind of technological education that will be practical centered so that artisans who are at the bottom of the formal education will not be left out.
2. The kind of facilities that will enable the ordinary artisans get the required skills to meet the challenges of tomorrow.

3 An automobile recourses center that will give a bit of theory and more practical's to

Apprentice who have graduated from their masters.

4. Arrest the possible unemployment for mechanics in the near future through the upgrade of technology.

### **1.7 Organization of the rest of the text**

The project is in five chapters .Chapter One is Introduction to the study .It deals with the Background of the Study, the Statement of the Problem under study, Research Questions, Objectives, scope, Limitations, methodology and Importance of the Study.

Chapter Two focuses on review of related literature. Chapter Three comprises the methodology the researcher employed for the collecting of the information for the study .

Chapter Four concerns findings and discussions of the study and Chapter five has recommendations and conclusions.

## **CHAPTER TWO**

### **REVIEW OF RELATED LITERATURE**

#### **2.0 Overview**

The purpose of this chapter is to provide a review of literature related to the topic. The review will briefly examine the following;

1. Background to the New Education Reform of 1987
2. Vocational education
3. Technical and vocational education in Ghana: NVTI (National Vocational Training Institute)
4. History of Suame Magazine
  - Suame Magazine Industrial Development Organisation (SMIDO)
  - The industrial Breakthrough of Suame magazine
5. Case study ;Kumasi Technical Trianing Institute
6. Parameter of Auto workshop design

#### **2.1 Background to the New Education Reform of 1987**

Years after independence Ghana's formal education system, particularly at the basic and the secondary levels, continued to reflect the elitist and academic type bequeathed to us by our colonial masters. Despite various attempts to increase access by opening more schools and to improve quality through the training of more qualified teachers, the education system generally did not undergo any major

structural or curricular changes to enable majority of both elementary and secondary school leavers to either proceed to the next stage of education or become economically viable in the society.

Annoh (2001) indicates that between 1970 and 1973, only 14% of the 64% age cohort who benefited from primary and middle school education could proceed further to second cycle institution, only 0.8% entered tertiary institutions annually. <sup>(3)</sup>

This naturally had created a scenario of ever-swelling corps of unemployed elementary and secondary school leavers who socially and politically, were becoming dangerous to the society.

To address this trend, the 1974 New Structure and Content of Education which introduced the Experimental Junior Secondary School was involved to diversify the structure and content of elementary and secondary education to make them more cost-effective and to provide a mixture of academic and practical course in order to maximize the impact of those levels of education.

However, in spite of its laudable intentions, the 1974 New Structure and Content of Education (NSCE) could not have any sustaining impact on the general education system in the country. This was due, among other factors to lack of coordinated governmental support and parental anxiety about the future prospect of the programme. Thus by the beginning of 1980, only Experimental Junior Secondary Schools were functioning throughout the country. By 1986, the ratio of school enrolment at all levels was as follows; primary 73 percent of age cohort; secondary 7 percent of age cohort; and tertiary 0.8 percent of age cohort. It was this structural and organizational inadequacy which continued to plague the nation's educational system that necessitated the introduction of the 1987 Education Reforms.

### 2.11 Nature and Characteristics of the New Education Reforms (NER).

In term of scope, direction and implementation, the NER had been the most revolutionary educational initiative ever to be pursued in post independence Ghana.

Annoh (2001) talks of the PNDC government which initiated the programme and gave the following as the underlying philosophies and intentions.

- To reduce the duration of pre-university education from seventeen (17) to twelve (12) years.
- To provide increased access to education at the basic and secondary levels by making the former available to junior secondary school leavers.
- To provide the quality, efficient and relevance of pre-university education by expanding the curriculum of both the primary and secondary schools.
- To increase the cost-effectiveness and cost recovery within the educational system and to ensure that funds allocated for education are solely for the purpose. This strategy involves reducing the number of non-teaching staff.
- Phasing out all residential and feeding subsidies at all secondary and tertiary levels, and increasing book-user fees at both secondary and tertiary levels.
- To increase the involvement of parents and the community in the educational process.

The programme took off in September, 1987 after initial preparations as regards the provision of the necessary inputs such as materials and textbooks, construction of additional classrooms and workshops as well as the production of manuscripts and reading materials in the various subject areas. <sup>(4)</sup>

## 2.12 Achievements

Annoh (2001) stated the following as what the NER has achieved so far.

- ❖ The opening of more schools both at the primary and secondary levels has somehow made pre-university education accessible to many children of school going age.
- ❖ Community interest and enthusiasm in education, which were largely lacking before the introduction of the NER, have been tremendously whipped up. This has changed the character of school life and school administration.
- ❖ Supply of education inputs – building, equipment, etc, has improved considerably in many schools.
- ❖ Encouragement has also been given to local personnel particularly teachers to produce reading materials for schools. There has been effective supervision at the district level with the appointment of circuit officers.<sup>(5)</sup>

## 2.13 Prospects

- The expansion of the curriculum at both JSS and SSS levels is likely to provide a broad-based education to the youth.
  - 12 years means that all other things being equal, most of the students who continue to pursue university and other tertiary education (as stipulated by the reforms) may be able to enter the job world at a relatively prime age and have a long working period.
- The rationalization of higher education is expected to lead to the provision of courses which are more relevant to national manpower requirements.
- The proposed introduction of B.ED through Distance Education may provide teachers with the opportunity to upgrade them professionally and academically

## 2.14 Problems of the New Education Reforms (NER)

Among other problems cited by Annoh (2001) were;

- Lack of facilities and equipment in many schools.
- Poor quality of facilities and equipment.
- Inappropriate location of some SSS schools
- Inability of SSS to absorb all the JSS graduates.

Amofa, (1999) also identified among the following as the problems facing the New Education Reform of 1987; He stated that;

- Many schools do not have full set of teaching staff, especially for handling technical / vocational subjects. The rural schools are worse off in this respect.
- The supply of teacher / student support materials has been inadequate and irregular.
- Workshops are lacking in many schools, for technical / vocational subjects.
- Schools, especially, in the rural areas are without some essential infrastructure like electricity to operate some workshop.

In July 14, 1994, an Education Reform Committee was inaugurated to

address the following terms of reference. Among the issues to be addressed include;

- Courses should be so arranged that there are linkages from Primary to JSS level to SSS level.
- The number of optional subjects at SSS level should be determined.

- The contents of the curriculum, syllabus and their accompanying textbooks and other instructional materials with regard to their suitability, adequacy and availability should be examined.

By October 15, 1994, the Committee presented its report and all the terms of reference were considered in order to ensure a better continuity and linkage between Pre-Vocational Skills and SSS Visual Arts programmes.

The president's committee on Review of Education Reforms in Ghana, (2002) chaired by Professor Anamoah-Mensah, dubbed "Meeting the Challenges of Education in the Twenty First Century " confirmed that there are a number of weakness in the current JSS system.

The major ones include;

- Poor academic preparation in the various subject areas, especially in the technical and vocational subjects.
- Inadequate facilities such as workshops, laboratories and libraries.
- Absence of counseling and special needs services.
- Absence of performance standards to guide teaching and learning.
- To the Committee, one significant observation about the JSS is that about 60% of pupils fail to gain admission into SSS and have limited alternative avenues for further development and progression especially into Technical /Vocational Education and Training institutions.

With reference to the Senior Secondary School the Committee came out with the following findings;

- Lack of adequate teaching/learning facilities.
- Poor infrastructural facilities.
- Lack of well-motivated and committed teachers;

- Absence of proper guidance and counseling services.

To the relevance of the study, a survey of the problems identified touched on lack of tools and materials, lack of qualified teachers for Vocational education, lack of facilities and equipment in many schools and absence of linkage between the JSS Pre-Vocational Skills and SSS Visual Arts Programmes.

It is therefore important to improve the linkage between the JSS Pre-Vocational Skills and the SSS Visual Arts Programmes. <sup>(6)</sup>

## 2.15 Vocational Education

Lincoln Library (as cited in Adipah, 2000p.29) defines vocational education as “the course which prepares for commercial or industrial pursuits”. <sup>(7)</sup>

This definition is however, considered limited in scope because preparation for professions is also in every sense vocational education.

He further stated that, all education can be regarded as vocational. For example, every college, technical school and university has the basic objective of training young men and women to take up the duties of adult life.

Giachina (as cited in Adipah 2000p.30) defines vocational education as “all the experience an individual needs to prepare for some useful occupations”. <sup>(8)</sup>

MESW and MOE (as cited in Adipah 2000p.31) defines the concept of Vocational Education in Ghana as,

That type of education designed to prepare skilled personnel at lower levels of qualification for one or a group of occupation's grades or jobs. Vocational education includes general education, practical training for the development of skills, required by chosen occupations and related theory. Vocational education for SSS under the New Education Reform is designed to build on the foundation of the Pre-vocational at the JSS and continued at the SSS. <sup>(9)</sup>

The aim of Vocational Education by UNESCO in 1996 is to "enlarge Vocational horizons by serving as an introduction to the world of work and the world of technology".

## **2.2 National Vocational Training Institute (NVTI)**

### **2.21 Establishment of the institute.**

In 1967, a tripartite National Manpower Board comprising representative of the government, employer(industry) and workers(labour) was established in order to plan effective development and utilization of human resource in accordance with the expected socio-economic development of the country. After a comprehensive study of the country's manpower needs and existing facilities for skill training, the board requested for assistance from the United Nations Development programme Special Fund(UNDP/SP) in establishing a national vocational training programme. The first phase of the project which was of four years duration was approved in June 1968 with a total UNDP input of seven hundred and five thousand, four hundred dollars (705,400) and Ghana government counterpart contribution of three hundred and seventy-four thousand cedis (374,000). The UNDP input provided for 240 man-month of expertise in expertise in addition to equipment and fellowships.

The plan of operation was signed on 23<sup>rd</sup> October, 1968 and commencement of operations was authorized on 25<sup>th</sup> October, 1968, with the International Labour Organisation (ILO) as the executing agency and the

Ministry of Labour, Social Welfare and Co-operative now Ministry of Manpower, Youth and Employment as the co-operating agency. An Act of Parliament 351 of 12 th January 1970 was passed to legalize the establishment of the Institute.<sup>(10)</sup>

## **2.22 Functions of NVTI**

1. To organize apprenticeship, in –plant training and training programme for industrial and clerical workers and train instructors Training officers required for the purpose.
2. To provide for vocational guidance and career development in the industry.
3. To develop training standards and evolve effective trade testing and certification policies and programmes.
4. To initiate a continuing study of the country's manpower requirement at the skilled worker level.
5. To establish and maintain technical and cultural relations with international organizations and other foreign institutions engaged in activities connected with vocational training.
6. subject to the provision of this Act, do all such things as are conducive to the attainment of the objectives of the Institute.<sup>(11)</sup>

Mr S.B. Amponsah, director of NVTI (as cited in "IN PERSPECTIVE"p2) indicated that, the concept of vocational training and apprenticeship should engage our attention as a nation now than before. In an era where nations like Korea, China, Japan, India, etc.have made giant strides through small and Medium Enterprise (SMEs), Ghana can follow this trend and turn its numerous youth who are unemployed but are available and not ready for immediate academic pursuit into strategic national skills bank for national development and quality skills export.

To actualize this dream it will be necessary to deepen our understanding of the school based and workshop apprenticeship. For example 2007, out of about 312,000 JHS graduates only 51% were placed in various Senior High School (SHS). Again, in 2008 out of about 248,000 JHS graduates, about 73% were placed in the SHS. It is therefore time to turn the energies of these huge numbers of youth into strategic national asset as the nation Marshall all resources for development. Of course, the government has taken the right step of deepening its commitment and interest in the TVET sub-sector by passing Act 718 (the COTVET Act) but a lot more is required.

Among other things needed to ensure that the right skills (in quality and quantity) are these teaming youth, are the quality of infrastructure and facilitation in this sub sector that should be of serious concern. NVTI in its bid to tackle his problem headlong has restructured itself with the vision" To provide the best system of TVET employable skills".<sup>(12)</sup>

### **2.3 Origin of suame magazine**

The term 'magazine' is a historical reference to military armories (or magazines) that were located in the area during colonial times. suame magazine originally emerged in the 1930s and experienced significant population growth in the 1950s and 1960s as a result of the removal of businesses from the city centre of Kumasi. Growth of the magazine was spurned again in the mid-1970s when restrictions were imposed on importation of new vehicles and parts. While some large enterprises suffered, the small enterprises of suame magazine filled the gap that the policy created by crafting spare parts that were originally imported.<sup>(13)</sup>

#### **2.31 The transition**

In 1983, under the guidance of the world bank and international monetary fund, the government of Ghana launched the economic recovery programme as an effort to reduce Ghana's debt and improve trading practices. As part of this initiative, the restriction on importation of vehicles and parts were removed. Some large enterprises were able to re-establish themselves but now competed against the small enterprises in Suame magazine which had developed expertise.<sup>(14)</sup>

#### **2.32 Suame magazine today**

Today, Suame magazine has a working population of over 20,000 and approximately 12,000 shop-owning. Suame magazine is an artisanal engineering cluster spanning 20 square miles located in Kumasi, Ghana.

### **2.33 Suame Magazine Industrial Development Organisation (SMIDO)**

#### **2.34 Origin of SMIDO**

The Suame Magazine Industrial Development Organization (SMIDO) was formed in 2006 as an umbrella non-governmental organization and development institution for Suame Magazine. Historically, a major challenge for development in the Magazine has been the lack of a single organization that has broad support from various associations and individuals in the community that can act as an entry point for policy interventions and take ownership for ongoing development initiatives. SMIDO has overcome this

challenge by unifying the following 12

associations to support SMIDO as their umbrella organization:

- Dynamic Spare Parts Dealer's Association
- Mechanical Association, Ashanti Region
- Ghana Haulage Transport Owner's Association, Ashanti Region
- Kumasi Scraps Dealer's Association
- Condemn Car Dealer's Association, Magazine Region
- Onuado Association
- Fuel Injection Pump Mechanical Association
- Electrical Welders and Fabricator's Association of Ghana
- Big Friend's Mechanical Association
- Suame Magazine Women's Association
- Asafo Mechanical Association, Asafo
- SofoLine Mechanical Association, Kwadaso

The formation of SMIDO was an outcome of an advocacy program organized by the Dynamic Spare Parts Dealers Association (DSPDA) and funded by BUSAC. BUSAC is the acronym for "Business Sector Advocacy Challenge Fund". It is a project funded by DANIDA, DFID and USAID as part of their support to Ghana. BUSAC's goal is "to facilitate the development and growth of a competitive

and vibrant private sector by improving the environment in which businesses operate.”

With broad based support from the associations within Suame Magazine and hundreds of artisans registered as members, SMIDO is a grass roots organization symbolizing the desire of the community to develop Suame Magazine. <sup>(15)</sup>

### **2.35 Mission, Goals and Objectives**

The mission statement of SMIDO is: “To ensure effective and efficient management of the Suame Industrial Estate for appropriate technological innovations, partnership, marketing, employment creation and enhanced investment opportunities to establish the state as the main industrial hub of Ghana and West Africa” <sup>(16)</sup>

### **2.36 The goals & objectives of SMIDO**

- 1.To bring all stakeholders of Suame Magazine Industrial Estate together for the pursuit of a  
Common development agenda
- 2.Strengthen member associations to play an effective support role to SMIDO
- 3.To co-ordinate and manage the activities of the various mechanical workshops and stores in the  
industrial estate
- 4.To introduce quality control administrative systems into the mechanical workshops and stores in  
the industrial estate
- 5.To establish partnership with technical institutions both within and outside Ghana for training and  
technical exchange programmes
- 6.To conduct research and document innovative indigenous technology for institutional training and  
dissemination
- 7.Develop and market the technological products and activities of the industrial estate both within

and outside Ghana

8. To be the frontline advocates for the development of artisanal engineering in Ghana
9. To ensure security (job and property), safety precautions and long-term welfare needs of the working population of the industrial estate
10. To streamline procedures for revenue mobilization for the mutual benefit of government and Suame Magazine industrial estate
11. To streamline procedures for youth development to make Suame the core centre for youth training, industrial attachment and employment centre in Ghana and West Africa
12. To ensure a more appropriate infrastructural development of the industrial estate<sup>(17)</sup>

### **2.37 Policy Advocacy**

SMIDO's policy advocacy activities include research, publication and promotion of policy, engagement with media on current events and consultation with the government and development agencies on issues related to Suame Magazine. It includes:

1. 1st National Industrial Conference on Suame Magazine in November 2006
2. Guest participant in a Ministry of Finance & Economic Planning sponsored workshop on cluster-based industrial development held February 2007. The purpose of the workshop was to present research findings on the studies on cluster-based industrial development in Africa and East Asia and to propose policy options for pro-poor industrial development in Africa.
3. Artisanal engineering representatives and presentation of paper at the National Development Planning Commission (NDPC) consensus building workshop for Ghana's 10 year development Plan in 2007

3. Two TV documentaries of Suame Magazine - TV3 and Metro TV
4. 2007 SMIDO Industrial Policy Blueprint publication and launching in Kumasi by her honorary SMIDO Patron, Miss Joyce Aryee
5. Guests' participants in the Ghana Chamber of Mines expanded Council Meeting in February, 2008. SMIDO presented a paper on collaboration between SMIDO and Mining industry.
6. Partnership trip to the Great KOSA industrial estate of Apostle Kwadwo Safo of Kristo Asafo Fame
7. Official invitation extended to SMIDO by the Trade and Industry Ministry to explore common grounds of cooperation in December 2007
8. Profiling of SMIDO under the Millennium Cities Initiative Kumasi Investment Guide to promote foreign and domestic investment engagement with SMIDO by UNIDO
9. Advocacy of pro-Suame Magazine Incorporation into political parties manifestoes during 2008 Presidential Elections. The objective is to court multi-party support base for Suame Magazine
10. Advocacy for financial support for the establishment of Suame Technical Automatics Engineering Institute Project, a collaborative project with Ghana-Indian Kofi Annan Centre of Excellence in ICT. <sup>(18)</sup>

## 2.4 The industrial Breakthrough of Suame Magazine

As cited on (myjoyonline.com, Thursday 7<sup>th</sup> August 2008, 7:10 GMT) The Suame Magazine Industrial Development Organisation (SMIDO), the development unit of Suame Magazine, has led mechanics at Suame to manufacture chain links to service the mining industry. The chain links, hitherto imported by the mining companies form a key component of the machinery used in the transport of raw materials. The Daily Graphic says when it visited the workshop; the artisans were busily working on orders from the Ghana Bauxite Company (GBC) at Awaso in the Western Region.

SMIDO has established a workshop at Suame Magazine, which it intends to turn into a major chain link manufacturing factory.

Mr Kwabena Boateng, Manager of the SMIOO Chain Link Workshop said the mining companies he had approached so far had expressed satisfaction with their innovative products in terms of quality and time of delivery.

He said their activities were not limited to the chain links but they hope to expand their capacity to manufacture as many types of equipment that were currently imported to service the mining industry.

Speaking with the Daily Graphic, Mr Nyaaba-Aweeba Azongo, the consultant to SMIDO, indicated that the chain link project was part of the planning process towards the integration of Suame Magazine into the major economic sectors of the country.

He noted that the prospects of building a modern industrial village for Suame Magazine would remain a tourist exercise, if it were not consciously planned to service the needs of the industrial sectors of the country.

According to him, the best social corporate responsibility role the mining companies could play in the country would be to support the development of the largest informal sector of Suame Magazine, which serves as a source of livelihood for many young people in the informal sector.

He said the current initiative to build a modern Industrial Village for Suame Magazine would be given a

significant boost if the mining companies showed interest in Suame Magazine's products to generate income to support the project. <sup>(19)</sup>

## **2.5 Technical institute for Suame artisans**

Vice President, John Dramani Mahama on Thursday launched a multi-million Ghana cedi talent hunt project and a technical institute in Kumasi.

The project is to give Information Communication Technology (ICT) in artisanal training to Suame Magazine artisans in Kumasi.

Amidst heavy police presence at the Suame Magazine, an industrial village housing about 20,000 artisans dealing in metal scraps, vehicular repairs and spare parts, the Vice President was given a rousing welcome by residents and NDC youth supporters most of whom shouted 'Obama', 'Obama' amidst drumming and dancing.

The project, a joint collaboration between the technology consultancy centre of the Kwame Nkrumah University of Science and Technology (KNUST), Kumasi and the Kofi Annan ICT centre in Accra, is to help give skill training and capacity building to the artisans in that informal industrial sector to help them meet modern challenges in the global automobile industry.

The capacity training which has three components covering basic artisanal engineering and designing through ICT, Auto diagnostics and business management through ICT, is being funded by DANIDA, USAID, PFID and the Business sector Advocacy Challenge (BUSAC) and Suame Magazine Industrial Development Organisation (SMIDO).

Launching the project under the theme, 'Harnessing the potential of artisanal engineering for

Ghana's industrialization', the Vice President said there was the urgent need to focus attention on harnessing our resources for the establishment of an institute to save the Suame Magazine from total collapse precipitated by modern technological innovations and sophistication in the automobile industry.

He said, the Suame Magazine, the largest informal sector village in the country is also a major centre for vehicle repairs attracting vehicles not only from Ghana but also from neighbouring countries in the west Africa sub region, has a work force popularly referred to as 'Fitters' and are finding it difficult to cope with new auto models as a result of their lack of formal education.

"This is so because there is no existing institutional training centre to provide the requisite knowledge and skills for them to keep pace with the ever changing global auto technology and vehicular repair to enable them remain competitive".

Mr Mahama said there was the urgent need for the retraining and retooling of this pool of talents to make them productive and remain in business in order to stem the imminent danger of aggravating unemployment, poverty and increase crime if their businesses collapse.

Mr Aweda Azongo Consultant for the project, said the Suame Magazine which has existed for 80 years, keeps growing on its own without any planned intervention by the government, a situation which can lead to its total collapse.

He explained that the industrial hub has five clusters, all of which revolve around one principal sub cluster, which is the vehicular repair cluster, adding that if particular attention is not given to institutional training to boost this area; its collapse can affect the other

revolving sub clusters.

Mr Dil Rachmeler, Fund Manager for BUSAC thanked SMIDO and the other collaborators for the project, saying that, the project was the most successful grants out of the 362 grants BUSAC has executed in Ghana.

He expressed the hope that Suame Magazine would be the best industrial hub in the whole of West Africa.

Miss Dorothy Gordon of the Kofi Annan ICT centre pledged the centre's readiness to demystify ICT training to make it attractive to the artisans most of whom feel they can not receive the training owing to their low educational background. <sup>(20)</sup>

Source: GNA

**2.6 Case study ;Kumasi Technical Trianing Institute**

Reason for selection.

- KTI is one of the well established technical institute in the country
- It offers automobile training

**2.61 Planning**

The institute has been zoned into four distinct areas.

- Workshops
- Teaching and Administration
- Dormitories
- Social center ;auditorium

In the rezoning of the workshop area, was based on similar activities eg. Workshop for small cars and bigger cars. Courtyard also features most in the planning. <sup>(21)</sup>

**2.62 Architecture**

The international style runs through the building on the campus. Rectilinear forms dominate the Architecture due to the activities being carried in the workshops.

**2.63 Structure**

The design of the workshops adopts the post and beam method. The corrugated aluminium barrel roof enables large spans of over 18m to be roofed without intermediate supports. This is because there are no roof structural members. This reduces the amount of dead load on the structure. The roofing system improves the day lighting and natural ventilation values in the workshop spaces. It also increases the room height. Room heights are 2-3 volumes high.

## **2.64 Circulation**

The institution is entered through three different routes servicing the workshops, administration and the staff residence at the southern part of the campus. Internally the various facilities are linked by 1m wide walkways.

## **2.65 Waste management**

Liquid waste in the form oil are collected in container in the service pit and deposited in barrels to be used for other purpose.

## **2.66 Fire prevention and fighting**

All workshops are installed with extinguishers as an interim measure to prevent fire spreading. On the large scale, fire hydrants are located at strategic point to fight fire during an outbreak. Again all workshops and facilities like classrooms are planned with fire safety in mind. Fire escape doors are fixed with panic locks for easy exit. The inscription 'No smoking' has also been placed at all facilities to prevent fire out breaks.

## **2.67 Observations**

- The ever increasing student population has created congestion in the facilities.
- All workshop have been provided with at least a store and an office

## **2.7 Parameters of auto workshop design**

### **2.71 Site ,Function and organisation**

According to Architects' data, Third edition by Ernest and Peter Neufert,p381-384: ratio of built area to unbuilt area of auto workshop should be approximately 1:3:5.In so doing the characteristics of sit such as size, vehicle access, road design must be taken into consideration.

Basic rules for repair auto workstation design.

1. Stie built area 1/3 to 2/3 unbuilt areas. There should be possibility for extension in future.
2. Allowable space for big workshops is about 200m<sup>2</sup> per workshop employee. Supporting facilities such as customers waiting area, social rooms should be provided. For big workshops towing vehicles, fork lift, a four column car lift frame and wheel balancing equipment and nearby spare parts store is a must.
3. Vehicle repair centres should be structured on performance production principle. This is so because, cars are driven into workshops and remain at designated repair bay until the work is finished.
4. Service ducts should be laid overhead.
5. ideally ,the site dept or width should be greater than 80m but for light repair shops for light commercial vehicles are possible on sites with little dept.(minimum is 40m)
6. Usually single storey of light steel construction or prefabricated elements with single span without columns is preferred.(approximate module is preferred to allow for extension)
7. Workshop floors should be sealed against grease and oil. Petrol and oil traps are essential.

8. Installation for ducts for electricity, compressed air, used oil and water is recommended. <sup>(22)</sup>

## **2.72 Safety in the auto workshop**

According to **worksafe Victoria guide (automotive workshop safety)** published in April 2004, Manual handling injuries are the most common type of injury occurring in motor vehicle workshops. The injuries occur from handling heavy or awkward objects, heavy lifting, and prolonged or sustained work in awkward postures. This injury trend occurs across all types of vehicle repair, maintenance or installation work, and on all types of vehicles. These body stressing injuries make up 47% of all reported injuries.

The next most common category of injury is slips, trips and falls, usually from floors in substandard condition. This is 14% of all claims and is solved by good layout/design and good housekeeping.

Compared to other industries the rate of injuries due to bullying is high at 2% of all claims. These injuries are easily preventable. Owners and workshop managers are directed to WorkSafe's guidance material on preventing bullying and violence in the workplace.

Fatal accidents are devastating and while the young and inexperienced are most at risk, experienced workers, and in some cases employers, have been the victims. In almost every instance a chain of events is put into place that ultimately leads to tragic consequences. Breaking this chain at an early stage will prevent this outcome.

Some examples of fatal accidents that have occurred in recent years are

- vehicle hoist failed, car fell on mechanic (multiple occurrence)
- truck was supported on wooden blocks at front with drive wheels in contact with ground engine was started with gearbox in gear while mechanic was underneath
- tyre fitter was struck by split rim assembly while inflating tyre
- business owner working under an unsupported tipper truck tray was crushed when the hydraulic controls were activated

• mechanic carrying out roadside repairs was struck by a passing vehicle. <sup>(24)</sup>

**2.73 Precautionary measures for workers in the workshops**

1. Do not rely on safe behavior as the main means of preventing injury. Safety solutions that rely on Administrative controls such as training, supervision, and procedures, require constant vigilance and effort to maintain. Physical changes such as improved workplace layout do not require the same level of effort and are more effective and a sustainable means of injury prevention.

2. Use mechanical devices to reduce heavy lifting, awkward postures, sustained postures and other body stressing. Many mechanical devices are already in use, such as tools powered by compressed air, hoists, cranes and lifting hooks, bead breakers, and body undersides to get under vehicles. Some devices are widely known but used less often, such as vacuum lifters for windscreen insertion, using hoists when detailing, hip-height roller conveyor and ramps to load and move tyres, order picking ladders with load tables for stock access, pads and body tables for comfortable work in foot wells and under dashes and castors on heavy toolboxes. A few workplaces apply innovative ideas such as tyre underside and using overhead-mounted body support harnesses for work over the engine bay. If the equipment exists to reduce the risk of body stressing then it should be purchased and used.

3. Search widely for solutions and challenge ‘that’s the way it has always been done’  
Because people do not expect to go home injured or maimed from work, what people accept as ‘the normal way of doing things’ has changed. Managers, owners and employees need to recognize this. For example, for working safely with axle stands and jacks the Australian Standards are the reasonable best starting point, however some automotive workshops do not apply the safety standards in these documents. <sup>(25)</sup>

## **2.74 Activities in the auto workshop and the possible hazards they cause.**

### **2.741 Working around vehicles-The workshop**

Hazards include:

Moving vehicles that may cause injury to employees and members of public.

These control measures are applicable to all vehicles. Additional controls are given for specific types of vehicles.

#### *Managing traffic at the workplace*

When there is no traffic management plan for work in the workshop, car parks or footpaths. Traffic management in these situations is ad hoc, for example No exclusion zones marked or barriers provided. Customers drive their own vehicle within workshop. This is often dangerous and cause unexpected accident in workshops.

#### *Work areas*

For workshops to function well, there should be clear definition of spaces. A situation where such definitions does not exist; work is done inside or outside workshop, eg on footpaths or road. <sup>(26)</sup>.

#### *Driving vehicles*

Employees and others drive outside of their licence conditions or level of competence, eg

- Road testing of vehicles by unlicensed drivers
- People drive within their licence requirements but with unfamiliar vehicles without induction, training or supervision

#### *Preventing slips and trips*

Long leads required to reach from power outlets. Leads strewn across workshop. Spills/wet patches not cleaned up. Absorbent material not available. Floor surface slippery when wet, or uneven with

cracks and holes. <sup>(26)</sup>

## **2.742 Lifting equipments**

Hazards include:

Failure of lifting equipment causing crushing injuries and fatalities. These control measures are applicable to all lifting equipment and vehicles.

### *Vehicle hoists*

A situation where there is no hoist inspection and maintenance regime in place, no operating or maintenance instructions located on hoist and no Safe Working Load displayed on hoist. The moving part of the hoist or its load is located closer than 600mm to any fixed structure or other equipment that moves so that a person Could be trapped. Electrical wiring or equipment damaged. Hoist-operator controls damaged, poorly positioned or not clearly marked for safe operation. No dropper bar (safety prop) fitted to in-ground Hydraulic ram type hoist. No training provided on safe use of hoists.

### *Hydraulic jacks and trolley jacks*

On occasions where there is no hydraulic jack and trolley jack inspection regime in place, no operating or maintenance Instructions located on trolley jack. No vehicle stands used when vehicle raised by hydraulic jack or Trolley jack, accidents can occur.

### *Vehicle ramps and stands*

Vehicle ramps and stands have no rated capacity marked and the Safe Working Load is unknown. Vehicles on ramps not secured in such a way as to prevent movement. This can cause accident when the vehicle is not secured on the ramp.

## 2.743 Storage and racking of parts

Hazards include:

High force and awkward postures from lifting, lowering, and handling tyre/wheel assemblies. Falls from heights (eg ladders and mezzanine floors). Falls on level surfaces with tripping hazards.

### *Forklifts and lifting equipment*

If there is no traffic management plan in place for forklift work. Tyres and parts loaded and unloaded by person standing on fork-arms of forklift. No mechanical lifting devices to lift tyres/parts up to and down from mezzanine storage areas and racking above shoulder height. Tyres/parts either thrown onto mezzanine storage or carried up stairs. 'Order-picked' tyres dropped from storage or racking. If care not taken, accident can occur in such a situation. <sup>(27)</sup>

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.1 Overview**

This deals with the methodology and the instruments used for the study. The chapter is organized under such topics as research design, library research, and population, sampling techniques and sample instrumentation, validity, reliability, administration of questionnaire, primary and secondary sources of data, data collecting procedures and data analysis plan.

#### **3.2 Research Design**

Best J.W. (1981) examines Qualitative Descriptive Research as a method, which uses quantitative methods to describe the data. It is also used in describing, recording,

analyzing and interpreting conditions that exist .It involves some types of comparison or contrast and attempts to discover relationship between existing non manipulated variables. Quantitative Data analysis was used to describe the results of the study.<sup>(28)</sup>

The descriptive research allowed the researcher in the collection of data and the analysis of the data using quantitative data analysis. The method enabled the researcher to produce a descriptive and analytical report that can be interpreted and put into good use. This Qualitative Descriptive Research was used to design the questionnaire in a structured and semi-structured questionnaire to collect data .

#### **3.3 University and departmental libraries**

The Researcher will visit the following Libraries to find information on the study; The KNUST Main Library, The College of Architecture Library, The Department of Architecture Library, (KNUST), Department of Planning library and Institute of housing and settlement studies library will be visited for

the research.

In all the libraries, great efforts will be made to collect the secondary data. The information will help me review the related literature.

**3.4 Population**

The target population for the study comprises all technicians in the fitting area of the Suame Magazine.

Out of the many technicians, those at the fitting area will be selected for the study.

(A) Master technician in the auto repair industry at the Suame Magazine.

(B) Apprentice technician in the auto repair industry.

1. Category A	-	Master technicians in the repair industry.....	(200)
2. Category B	-	Apprentices technician .....	(1000)
Total		=	1200 Respondents

The total population for this research will therefore be One hundred (1200) respondents.

**3.5 Sample and Sampling Technique**

The sample of the study would be collected from auto fitting area , out of a target population of about two thousand (2000) people, thousand two hundred (1200) would be selected for the study.

The reason for the targeted thousand two hundred is that, out of the two hundred(200) workshops that will be visited, ten(10) technicians averagely in each workshop will be selected and averagely one master technician in each workshop that will be visited.

The sampling techniques used will be simple random and stratified random sampling to select participants for the study. On the selection of technicians, papers on which “yes” were written to the

required number with a few “no” would be folded and put in a basket. This would be well shuffled for technicians to pick.

At the end, five apprentice’s technicians would be selected from each workshop and one master apprentice making it a total of six for each workshop. On the whole, six technicians, multiplied by the total number of workshops that would be visited will amount to the total sampling size.

### **3.6 Instrumentation**

The set of questionnaire would be designed by the researcher to collect data from auto repair sector.

The questionnaire designed for the auto repairs will seek information concerning their educational level, the difficulties they encounter in servicing modern electronic cars and their interest to upgrade their skills.

### **3.7 Validation**

The items chosen would be vetted by the supervisor and those found to be irrelevant would be rejected and others modified. The items in each questionnaire would be carefully chosen to establish both face and content validity. After screening and vetting by mates and other people concerned, the supervisor would finally approve the instrument.

### **3.8 Internet sourcing**

I will employ the use of internet to get some of the primary data .I will use search engines such as Google.com and others.

### **Pilot Study**

After the validation of the questionnaires was established, copies were printed and administered to six (40) apprentice technician and (5) master technician at Ahinsan Bonsum fitting area. The objective of the pilot study was to find out how the technician would understand the items and respond to them. Items that were poorly responded to were considered ambiguous and therefore reframed.

## **Administration of Questionnaire**

For maximum response rate and effective collection of the questionnaire, it was administered personally. The researcher obtained an introductory letter from the Head of Department: Architecture, to be sent to the fitting area of magazine, a date was set for the administration. On the fixed date, copies of the questionnaire were administered. In order to obtain appropriate responses from the respondents, the instructions were explained to them. They were allowed sometime to respond to the questionnaire. The researcher collected all the copies of questionnaire distributed from the technician.

## **Primary and Secondary Sources of Data**

The primary data was solicited from apprentice technician and master technician. This consists of sixty (1000) technician apprentice and (200) master technician. The secondary data was collected mostly from documentary sources (books, publications, periodicals and unpublished thesis). In all the places visited, great efforts were made to collect the necessary data. Data collected from the field and libraries was assembled, synthesized, critically evaluated (analyzed), translated and conclusions drawn from them. The information was described and presented in descriptive form, tables, figures and charts in the thesis.

## **Data Collection Procedure**

For this work, both primary and secondary data were used. Copies of the questionnaire were administered to one hundred (1200) technicians

## **Data Analysis Plan**

The data collected was coded and entered into the computer. They were analyzed by the researcher who converted the response entered into frequency counts, charts and percentages for analysis.



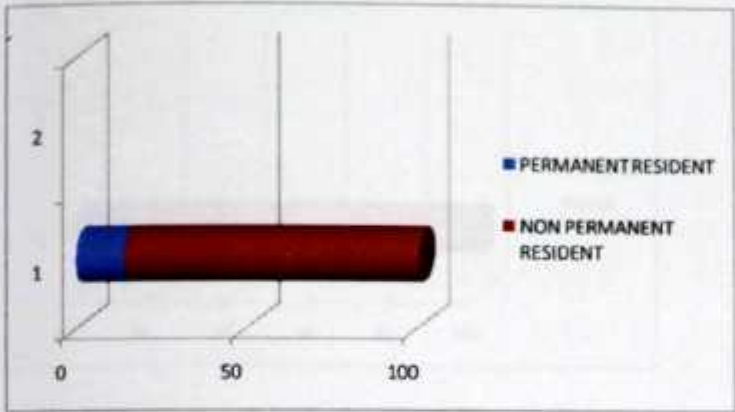


Chart 2, Chart showing the population of permanent to non permanent population at Suame magazine

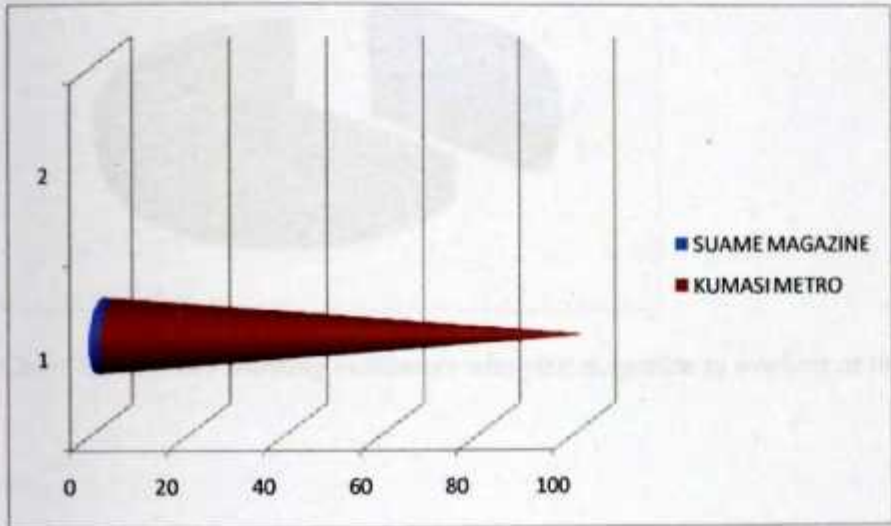


Chart 3, Chart showing population of Kumasi metro to population of Suame magazine

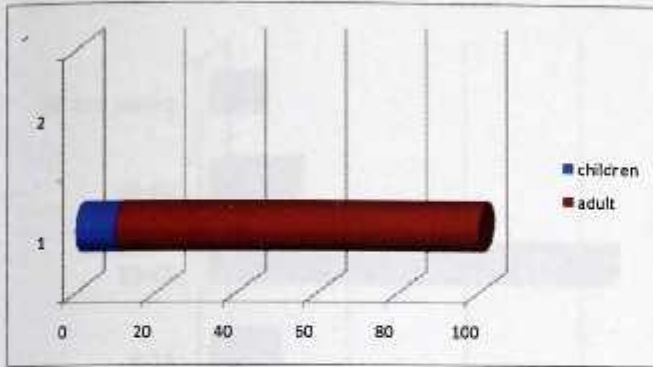


Chart 6, Chart showing children to adult of Suame magazine's population

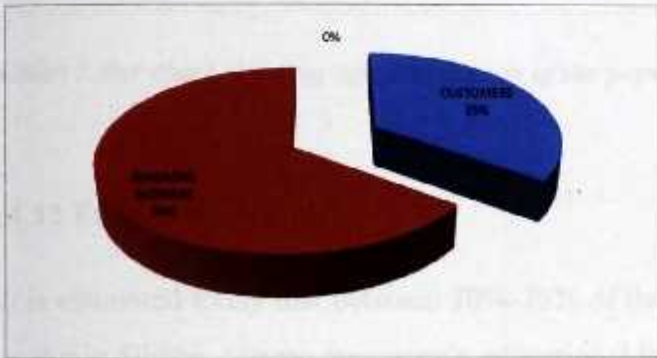


Chart 7, Pie chart showing customers who visit magazine to workers at the magazine

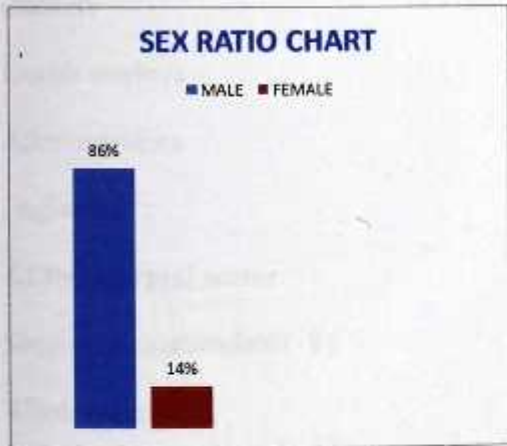


Chart 4, Chart depicts male to female at Suame magazine

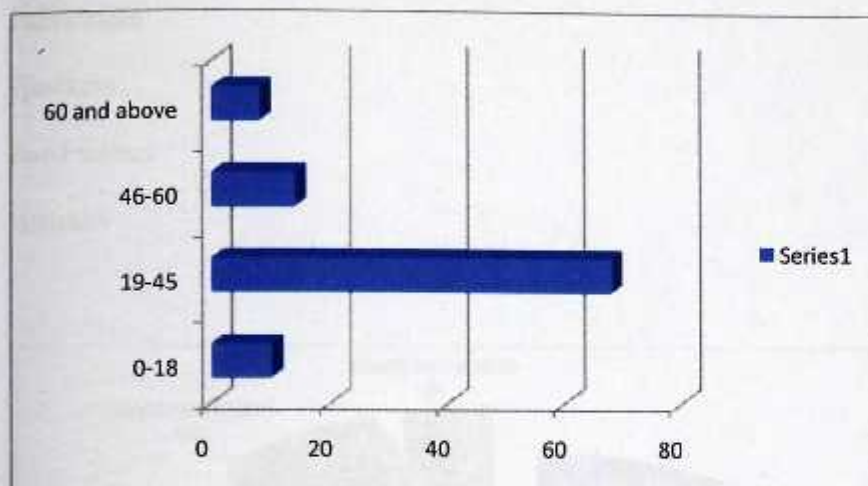


Chart 5, Bar chart showing age distribution of the population at Suame Magazine

### 4.12 Educational levels

It is estimated today that between 70%-75% of the labour force are employed in the informal sector in Ghana .Suame magazine’s educational level is not defferent.

### 4.13 Categories of labour force

#### 4.13a Formal sector

- Bankers
- Health workers
- Administrators
- Engineers

#### 4.13b Informal sector

- Shop owners attendants
- Whole sellers
- Petty traders
- Spare parts dealers
- Mechanics

Fabricators  
Hawkers  
Food sellers  
Artisans

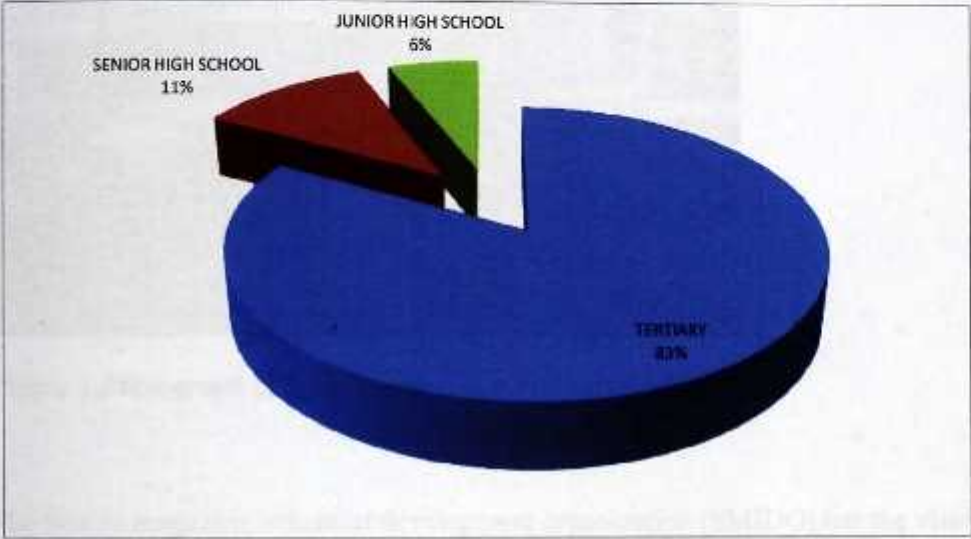


Chart 8, Pie chart showing educational levels in the formal sector

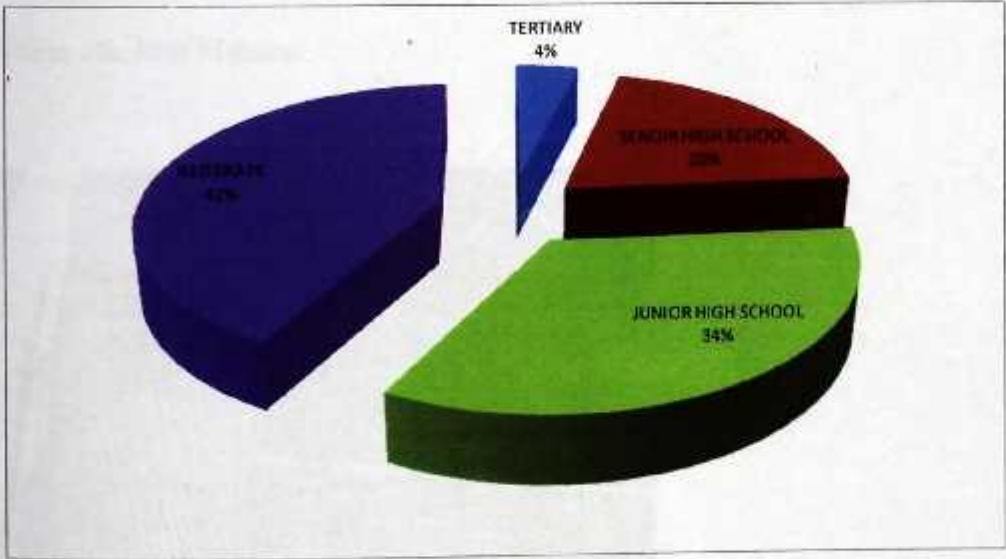


Chart 9, Pie chart showing educational levels in the informal sector



*Figure 1, Photograph of both the formal and informal sector*

The Suame magazine industrial development organization (SMIDO) has the vision of moving the magazine

from the ancient way to the modern way of repairs. This vision led them to the establishment of a training school called Suame magazine automatics training center. It was recently opened by the vice president of Ghana, HE John Mahama.



*Figure 2, photograph of SMIDO automatics training center*

#### 4.14a Religion

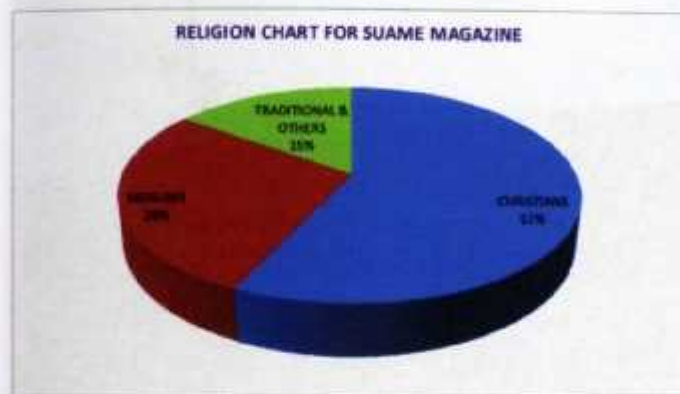


Chart 10, Chart showing religion distribution



Figure 3, photograph showing Methodist church-Suame

The Methodist church occupies their own land and therefore have been able to develop it to suit their purpose.



Figure 4, photograph showing Love chapel-Suame

The Love chapel which is a charismatic church is on a rented apartment on the 2nd floor of a mixed use building of which the first two floors are shops.

#### 4. Social control and administration

The Kumasi metropolitan assembly is the central core of administration with supporting government departments. Subin sub-metro which is one of the sub-metros controls the suame magazine.

There are also several committees for specific functions under the Subin sub-metro.



Chart 11, Chart showing social control and administration

## 4.2 Economic activities of Suame Magazine

### 4.21 Introduction

The major control to the growth of a nation, is its economy. Kumasi Suame magazine being the biggest of its kind in the country and West Africa as a whole facilitate this activity. The Ashanti regional capital which houses the Suame magazine lies in the middle of the country and support and link both the southern and northern sectors of the country. The main activities that goes on at Suame magazine are categorizes under the following:

- Retail/wholesale
- Fabrication
- Auto mechanics
- Services



*Figure 5, Photograph showing retail/wholesale*



*Figure 6, Photograph showing fabrication*



Figure 7, Photograph showing auto mechanics



Figure 8, Photograph showing services

#### 4.22 Percentages of economic activities

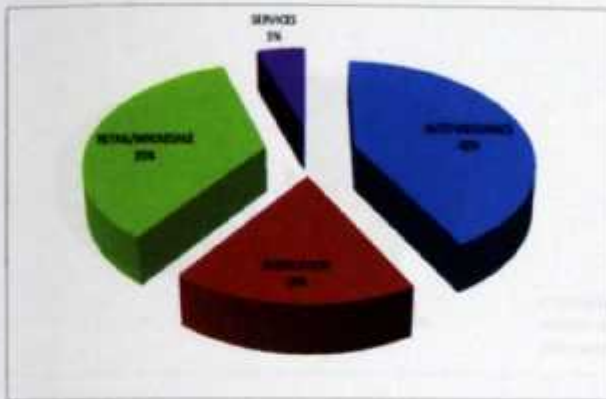


Chart 12, retail/wholesale

#### 4.221 Retail/Wholesale activities include:

1. Car spare parts. eg doors,finders,absorbers etc
2. Car decoration.eg 4x4 front guards, sit covers etc
- 3.Car accessories .eg engine oil, brake oil,grase,electrical parts etc.

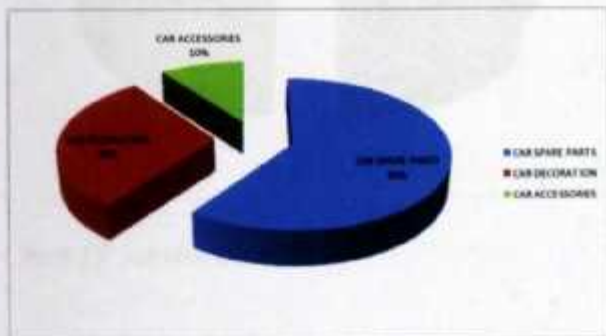


Chart 13,Retail/Wholesale activities

#### 4.222 Retail/Wholesale activities include:

1. Car electrical parts. eg car lights, control boards, ignition etc
2. Car aircondition.eg detecting faults,aircon gas filling etc
- 3Car engine/under parts .eg repairing of engine

#### 4.223 Auto mechanics activities

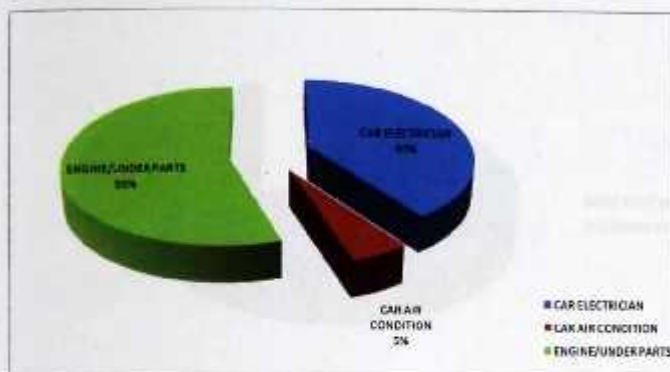


Chart 14, auto mechanics activities

#### 4.224 Services activities

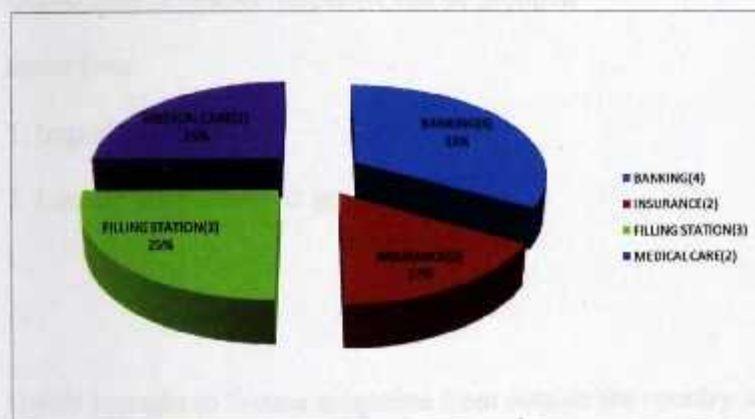


Chart 15, service activities

#### 4.225 Fabrication activities

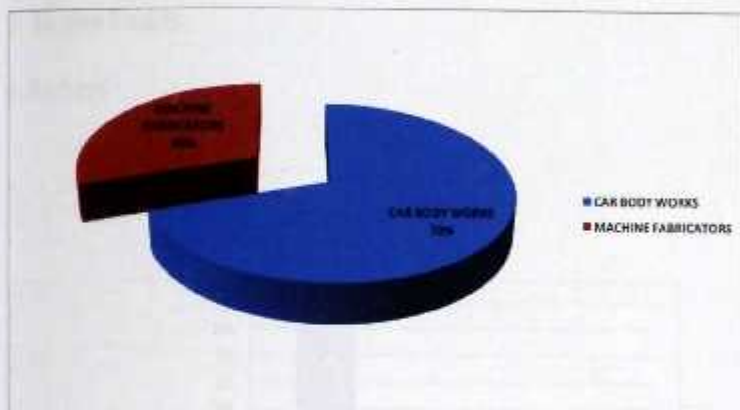


Chart 16, fabrication activities

#### 4.226 Sources of goods

Goods sold at Suame magazine can be grouped under two.

1. Imported goods
2. Locally manufactured goods

Goods brought to Suame magazine from outside the country amount to 95% of total goods. They normally come from Korea, United Kingdom, China, Dubai, France, Germany, Spain. Goods imported includes:

1. Car parts
2. Engines
3. Brand new cars
4. Used cars
5. Car tyres

Locally manufactured goods amount to 5% of the total goods. They include

1. Bolt and nuts

2. Engine oil
3. Brake bands
4. Rubbers

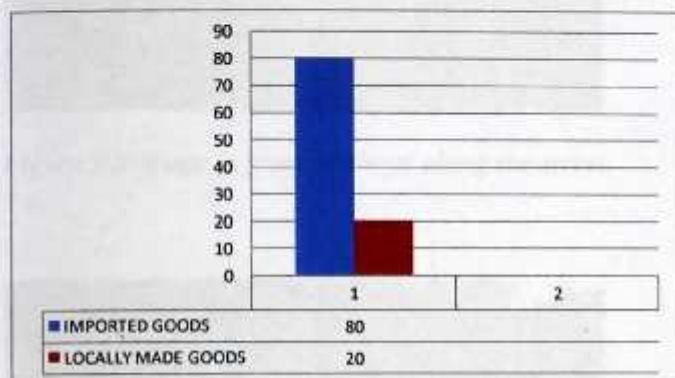


Chart 17, Chart showing percentage of imported goods to locally manufactured goods



Chart 18, From the above chart, 88% of the market is inter-regional and 12% is international. The international market includes Mali, Burkina-faso, Togo etc.

#### 4.23 Storage of goods

Large quantities of goods are brought to the Suame magazine and therefore the need for storage spaces. Under the study area, it was found out that, two types of storage exist.

1. Storage within shops
2. Storage in front of shops along the street.



Figure 9,Storage in front of shops along the street.



Figure 10,Storage within shops

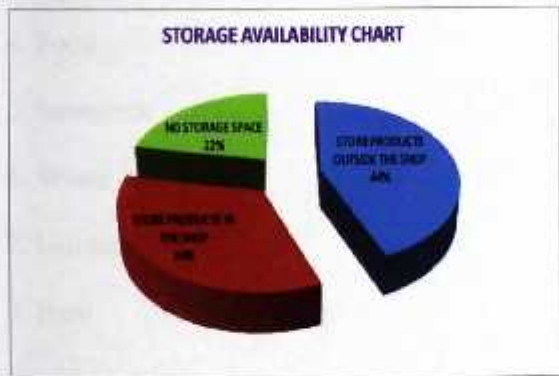


Chart 19,The chart above depicts about 24%of shops without storage spaces

Some of the shop owners own storage spaces in their Homes. They transport them into the shops when

the need arises by the use of pickups, trucks. With some of the spare parts dealers, they order for wares when customers need them.

#### 4.24 Security

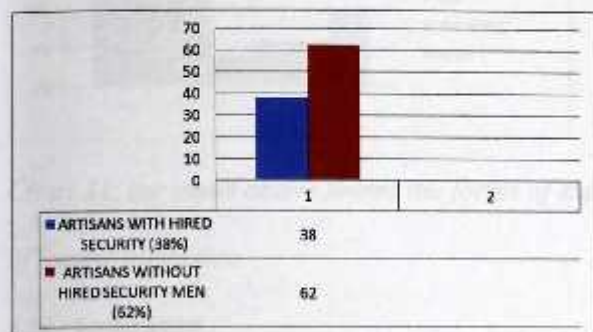


Chart 20, The chart above shows the number of shops with hired security to those Without security.

#### 4.25 Expenditure

There are several expenses that are incurred in the daily running of businesses. The businesses in the study area make expenses on the following:

1. Transportation
2. Taxes
3. Communication
4. Food
5. Insurance
6. Waste
7. Utilities
8. Rent

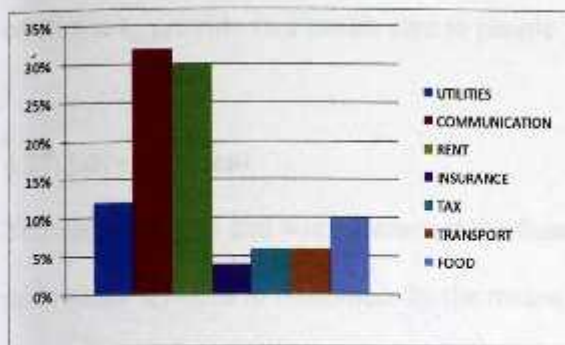


Chart 21, the chart above shows the forms of expenditure of the people of Suame magazine.

#### 4.26 Insurance

A number of insurance companies representatives exist at the Suame Magazine to provide a diverse insurance policies. This include

1. Life policy insurance
2. Motor insurance
3. Burglary
4. Child education
5. Retirement policies
6. Funeral policy
7. General business
8. National health insurance



Chart 22, From the chart, the percentage of people covered with any form of insurance, for which the health insurance scheme is the biggest to those uncovered by any form of insurance.

The national health insurance scheme is a scheme introduced by the government

of Ghana to provide free health care to people.

#### **4.27. Advertisement**

The various shops and workstations at the Suame magazine employs various means to sell their products and render services to customers by the means of the following

1. Media: radio stations, news papers, television stations  
the internet etc

2. Bill boards and sign boards

3. Banners

##### **4.27.1 Types of billboards and sign boards**

1. Signage mounted directly on buildings
2. Sign boards mounted from metal supports
3. Adverts painted on walls of buildings
4. Banners tied to supports
5. Sign boards mounted on poles



*Figure 11, Signboards mounted on poles*



Figure 12, Adverts on walls



Figure 13, Adverts mounted in front of shops

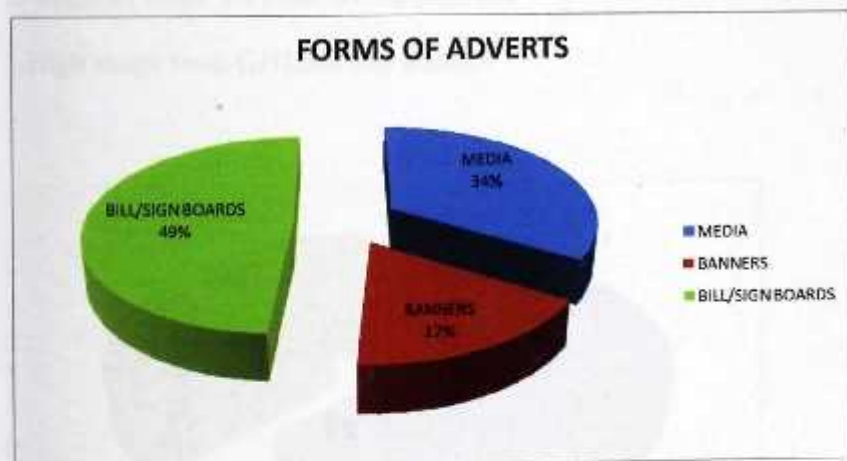


Chart 23, The chart above shows the percentages of various forms of adverts at the Suame magazine.

### FORMS OF ADVERTS

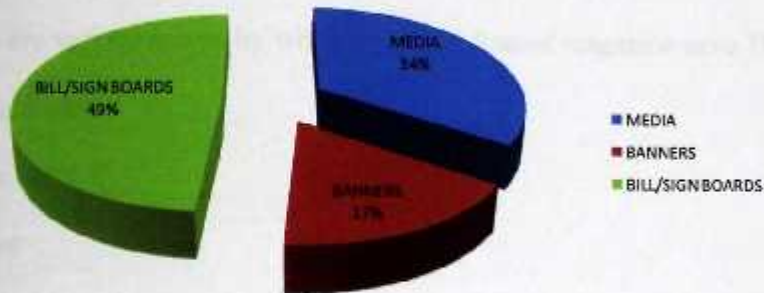


Chart 23, The chart above shows the percentages of various forms of adverts at the Suame magazine.

### 4.28 Daily and monthly sales

Business in the Suame magazine records various sale during the hours of work.

Sales made can be categorized into

1. Low range between 0-GH50
2. Medium range between GH50-GH1000
3. High range from GH1000 and above.

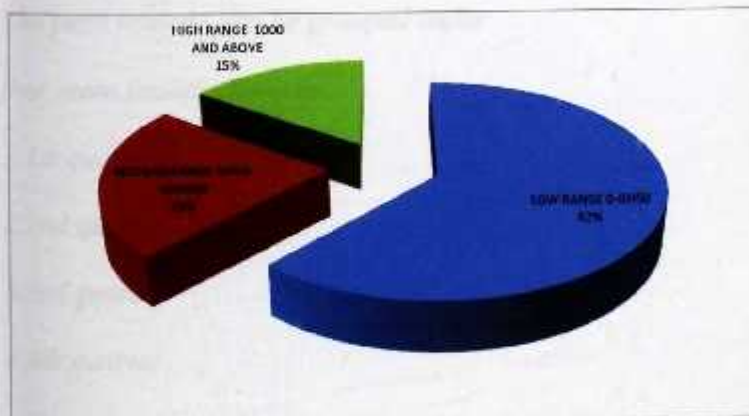


Chart 24, The chart above shows the monthly sales of three categories of sellers.

#### 4.281 Savings pattern

There are various means by which people at Suame magazine save. The following are the main ways.

1. The bank
2. Susu
3. Susu and bank
4. No savings

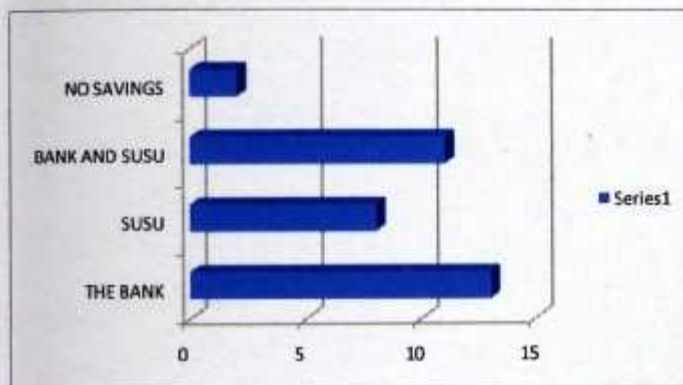


Chart 25, The bar chart above shows the savings pattern at Suame magazine.

#### 4.29 Peak seasons

The peak seasons can be grouped under four main groups. Namely

1. 1st quarter
2. 2nd quarter
3. 3rd quarter
4. 4th quarter

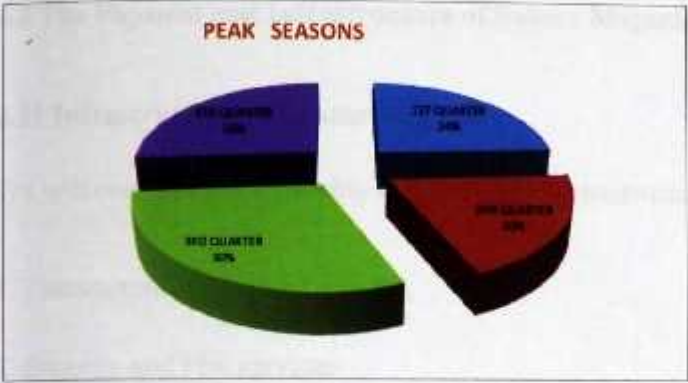


Chart 26, peak seasons

PEAK SEASONS	
1st Quarter	20%
2nd Quarter	30%
3rd Quarter	20%
4th Quarter	30%

## 4.3 The Physical and Infrastructure of Suame Magazine

### 4.31 Infrastructure of Suame Magazine

We will consider the following element under infrastructure:

1. Transportation
2. Security and Fire services
3. Water supply
4. Electricity supply
5. Waste management
6. Communication.

### 4.32 Transportation

Types of roads

<b>1. PRIMARY ROADS:</b> -Most frequently used -Major roads -Number of vehicles per hour-778 -Road length about 750m to 1000m -Road width ranges between 9.4m to 17m. -2 to 4lanes	<b>2. PRIMARY ROADS:</b> -More used -Minor roads -Number of vehicles per hour-563 -Road width between 6m to 9.5m -2 lanes	<b>3. TERTIARY ROADS:</b> -less used -Distributor roads -Number of vehicles per hour-269 -Road width between 5m to 9m
--	--	---

Table 1, Types of roads

# MAP OF SUAME MAGAZINE



Map 1, Suame map



Figure 14, offinso road

Figure 18, Tafo road

86% of the artisans at Suame Magazine stay outside the working environment and 70% of them come to work with public transport. 22% with their private cars and 8% by foot.

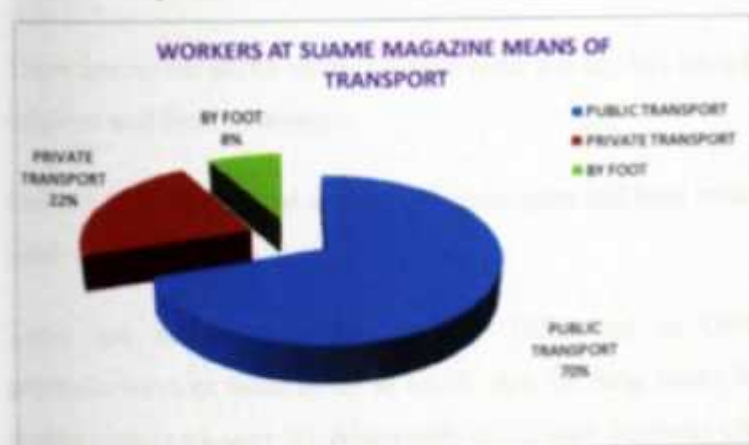


Chart 27, Means of transport

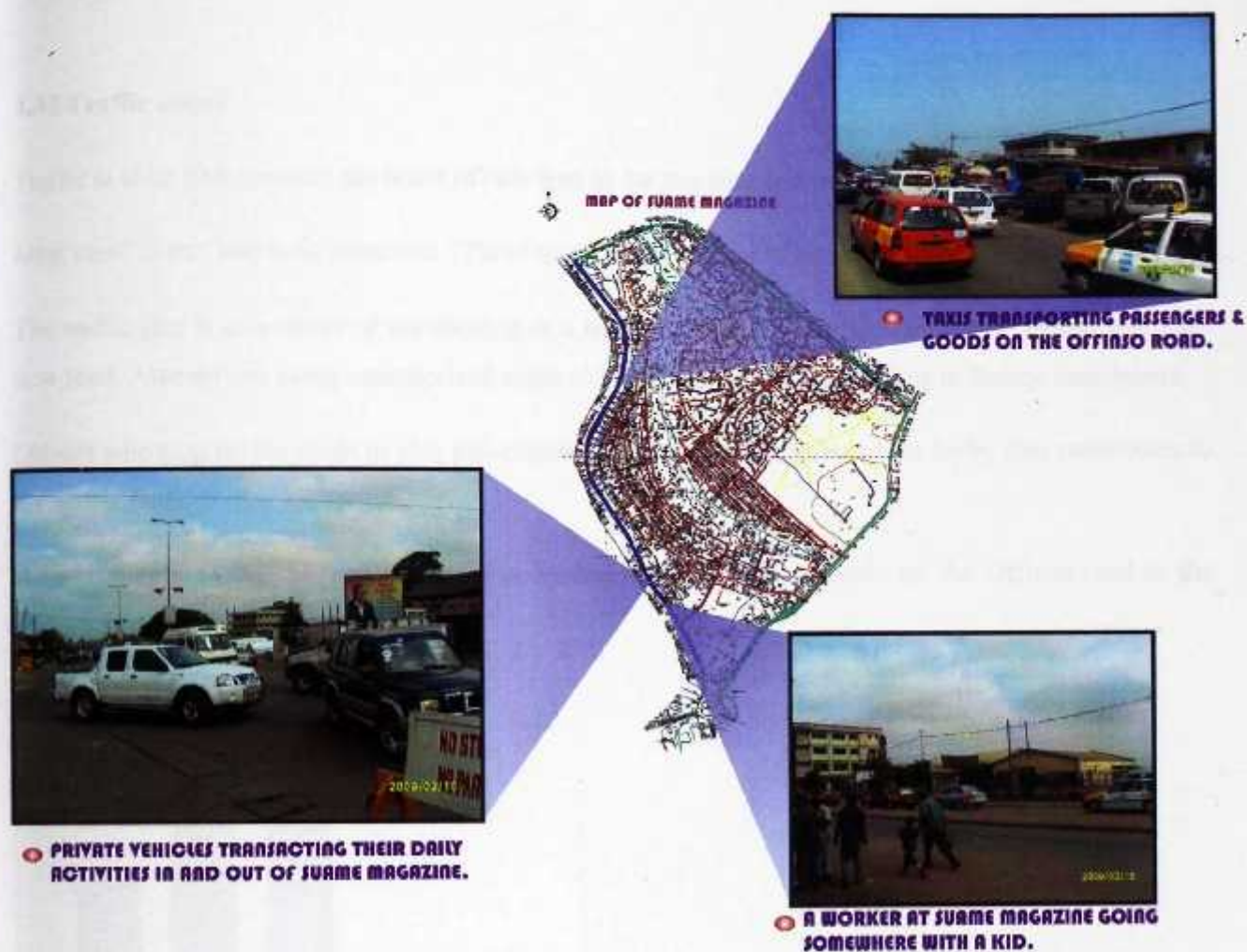


Figure 15, everyday activity at Suame Magazine

There are no car parks on the Offinso road; the lay-bys have therefore been turned into parking spaces for retailers and their customers.

Drivers stop on the road to drop off passengers and load which result in a lot of traffic congestion on the road.

There are no thoroughfares linking Tafo road to Offinso road so customers looking for any products/services have to be in traffic jam for long hours before finding what they're looking for. This makes customers very uncomfortable to transact business effectively at the Suame Magazine.

Trucks load up spare parts from the harbours and transport them Suame magazine where they are off-loaded into shops and in front of shops where they are stored.

4.33 Traffic count

Traffic is at its pick between the hours of 7am-9pm in the morning and from 5pm-7pm in the evening.

Mini vans”trotro” and taxis constitute 72% of the vehicles on the Offinso road.

The traffic jam is as a result of the absence of a traffic light at the intersection of the Offinso and Tafo new road. Also drivers using unauthorized roads to join the Offinso road, heading to Suame roundabout.

Drivers who stop on the roads to pick passengers due to the inefficiencies of the layby also contributes to the traffic jams.

Approximately 14,000 of the artisans of at Suame road pick. Cars mostly on the Offinso road to the various homes.

12TH FEBRUARY, 2009. (7:45am - 8:45am)

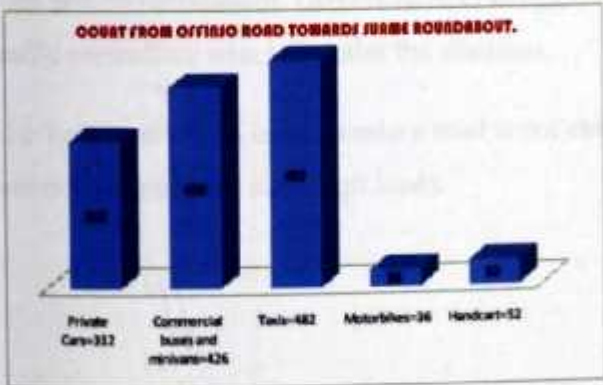
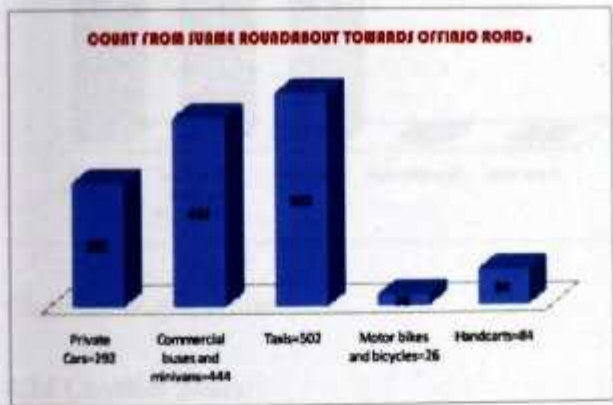


Chart 28, traffic count

**19TH FEBRUARY, 2009. (5:00am - 6:00pm)**

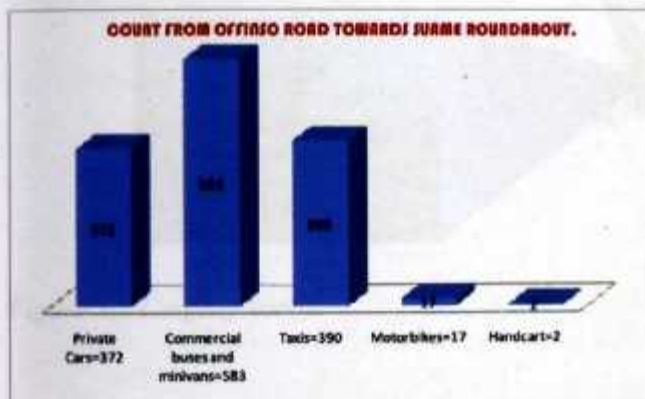
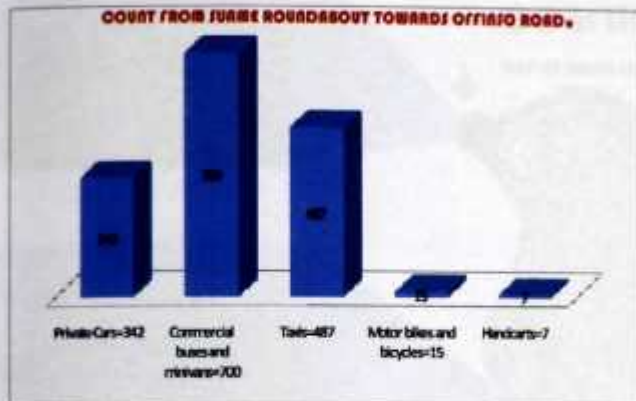


Chart 29, traffic count

#### 4.34 Conflict zones

The loads on Offinso and new Tafo road create a serious conflict at their intersection. There is no traffic light and no roundabout. Drivers have to struggle their own way to pass through. Occasionally, there are traffic controllers who help calm the situation.

The Tafo road which is a secondary road is not able to handle the current load of vehicles on it because it was not designed for such high loads.

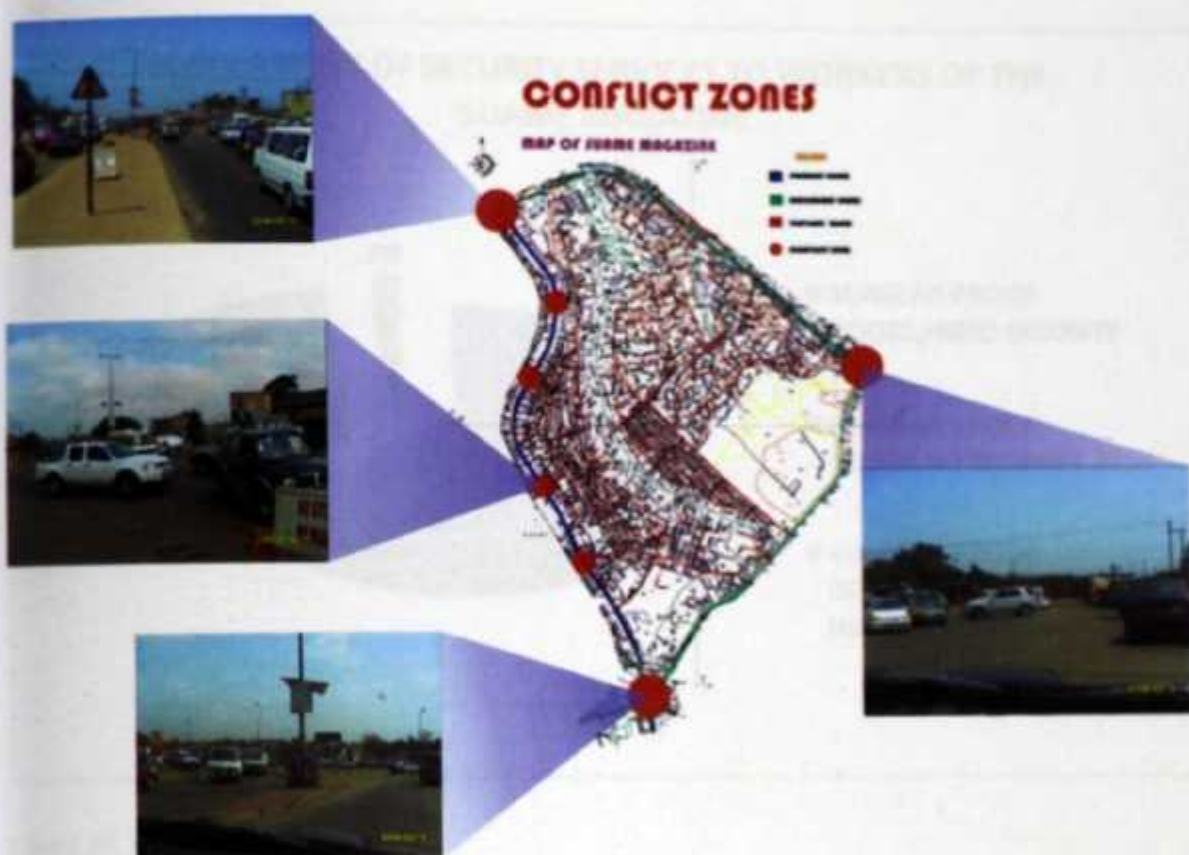


Figure 16, Conflict zones

#### 4.35 Security and fire services

62% of the hired security men at Suame magazine are untrained. This has made the combat of crime cases very difficult. There is no coordination between them and the police service in the area.

70% of the streets are not well illuminated and this creates the conducive environment for criminals to perpetuate their activities.

There is a police station at Suame but their presence in helping to combating crime is not felt by the artisans.

Poor road network and planning of the structures in Suame has made it difficult to apprehend criminals if they're seen since its easy for them to hide anywhere.

36% of the retailers use burglar proof doors with at least two padlocks as a means of securing their products.

### AVAILABILITY OF SECURITY SERVICES TO WORKERS OF THE SUAME MAGAZINE

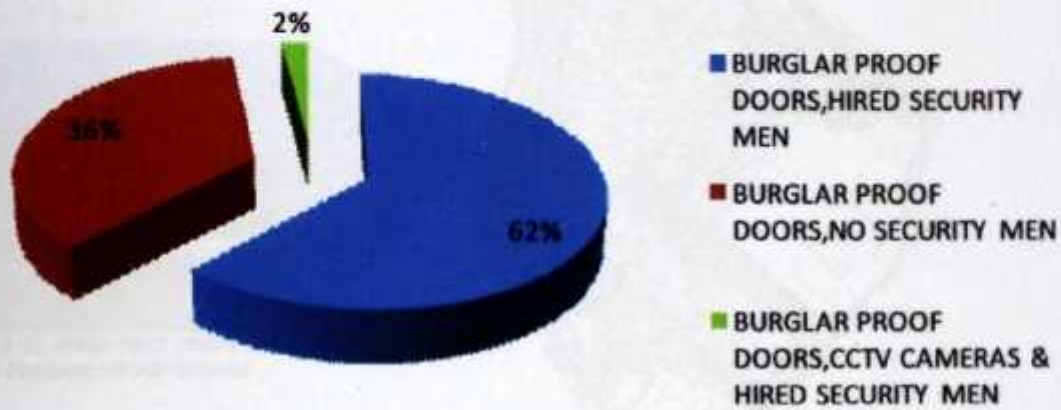


Chart 30, security services

### CRIME WAVE CHART.-07/08-KUMASI

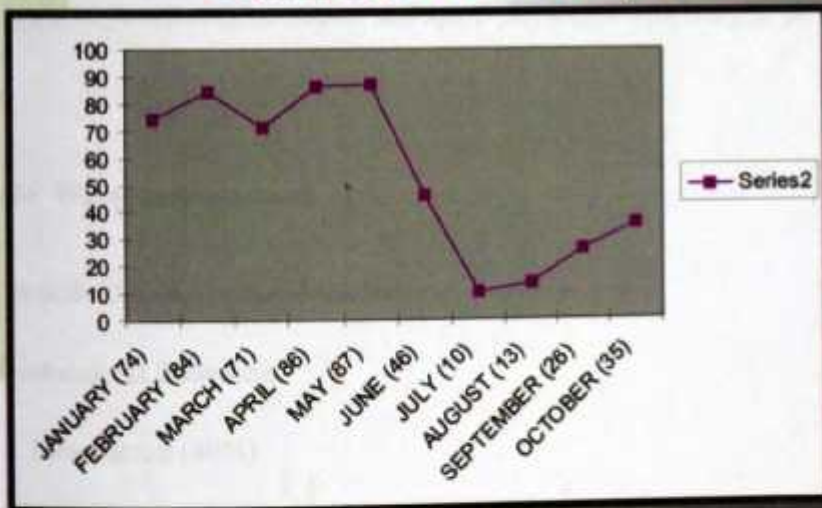


Chart 31, crime wave

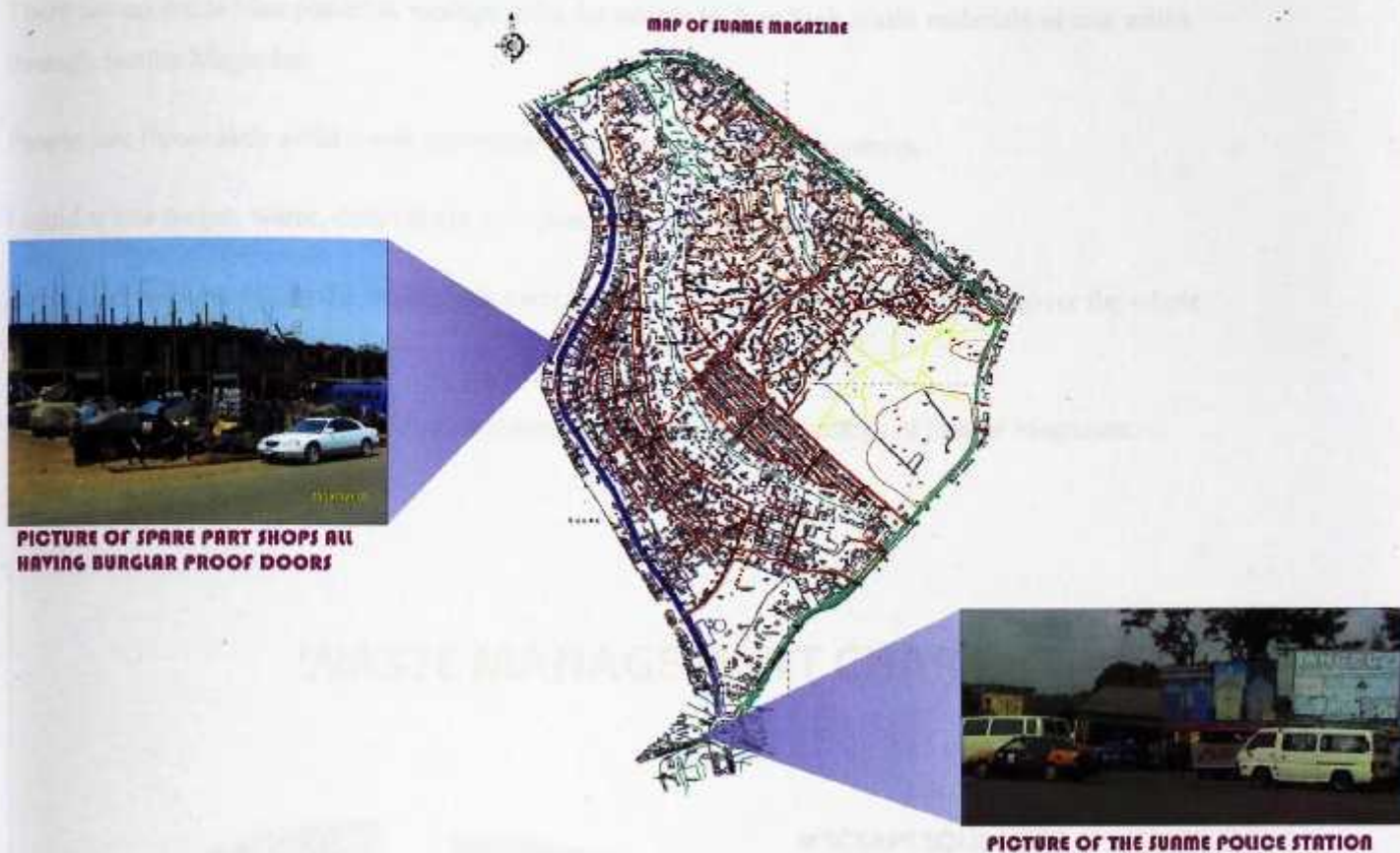


Figure 17, Suame Police station and spare part shops with Burglar proof.

#### 4.36 Waste management

The activities of Suame Magazine

Produces the following

1. Metal scrap (40%)
2. Degradable &  
Non-degradable (46%)
3. Dirty oil (14%)

There are no waste bins placed at vantage point for people to drop their waste materials as one walks through Suame Magazine.

People just throw their solid waste anywhere on the ground and in the gutters.

Liquid waste (urine, water, dirty oil.etc.) are poured in gutters to drain away.

Zoom lion workers sweep the main roads early in the morning but they're not able to cover the whole area before the business day starts.

When it rains, it drains into river Bunkonfuom running through the valleys of Suame Magazine.

### WASTE MANAGEMENT CHART

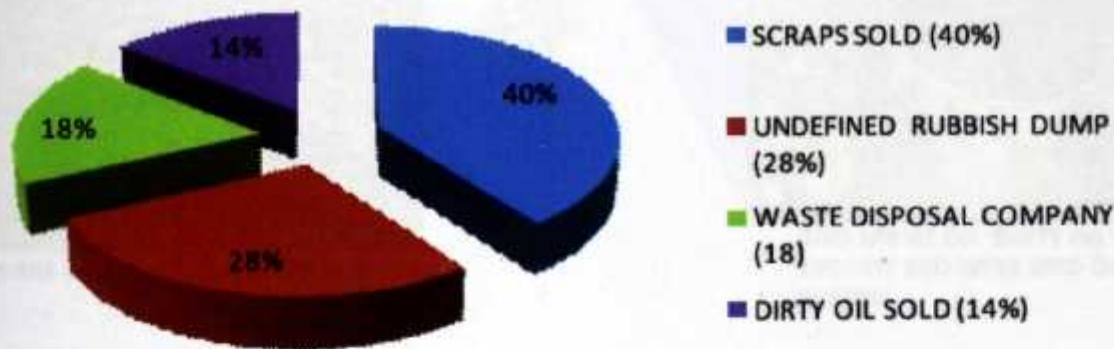


Chart 32, waste manage



Figure 18, waste management

#### 4.37 Electricity supply

18% of the workers at Suame Magazine use electricity to directly facilitate their day to day activities whilst the remaining 82% do their businesses without electricity.

There are six (6) 500kva transformers located at Suame Magazine which is use to distribute electricity power to the artisans.

There is a primary sub-station e located at the Suame Magazine.

The capacities of the five transformers does not meet the need of the growing number of artisans the magazine.

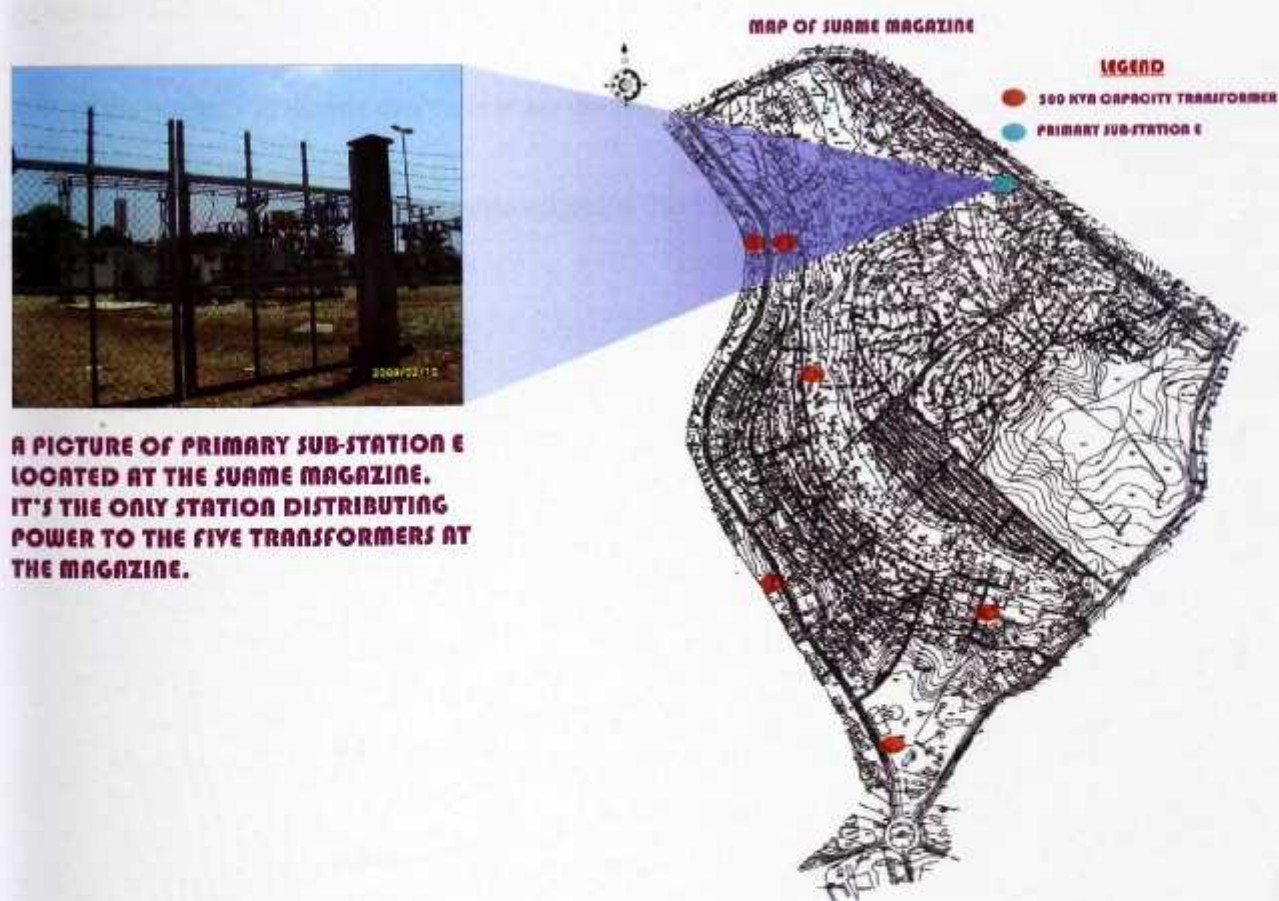


Figure 19, Sub station at Suame Magazine

#### **4.38 Water supply**

Water for day to day activities at the workshop is fetched from taps being supplied by Ghana Water Company Limited (GWCL) and other fetch from river Bunkonfuom.

GWCL supplies water to 13,000 consumers at the Suame district.

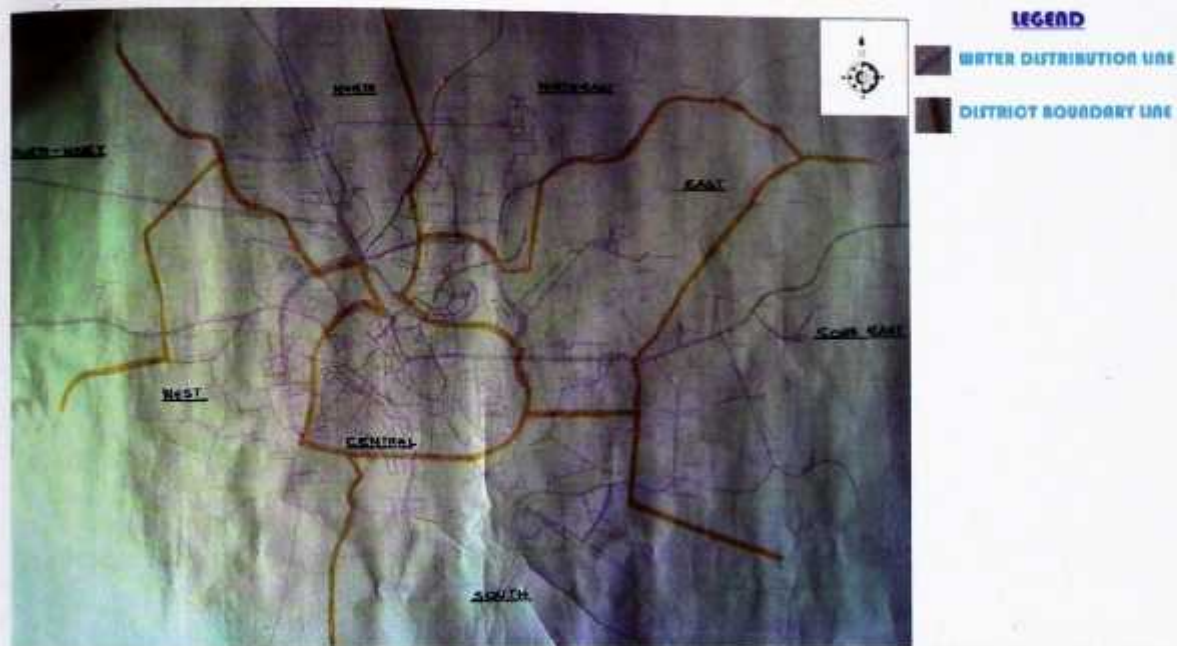
There are fire hydrants located at the Suame Magazine but cannot be identified on the maps. Workshops have been constructed over some of them and are impossible to locate some of them. Food vendors cooking at the Suame magazine buy clean water outside the magazine and use it to cook their food.

Other artisans have dug wells where people fetch and bath with it at the end of the day's work before they go home.

95% of the workers at Suame don't use water directly in their line of work.

95% of retailers and workshops at Suame magazine don't have any fire extinguishers.

## MAP SHOWING WATER DISTRIBUTION LINES IN KUMASI



Map 2, water distribution lines in Kumasi

## MAP SHOWING WATER DISTRIBUTION LINES AT SUAME DISTRICT(NORTH) - KUMASI



Map 2, water distribution lines in Suame Magazine

## 4.4 Physical environment

### 4.41 Site boundaries

The Suame Magazine site is bounded by the following:

1. THE OFFINSO ROAD
2. THE TAFO ROAD
3. THE NEW TAFO ROAD

The Suame Magazine site covers an area of 2,371,899 m<sup>2</sup> (585.85 acres).

The site slopes from the east towards the west at a drop of 2m at a distance of 10m and vice versa from west to east to form a valley at the middle of the site.

The Bunkonfuom River runs through the valleys on the site with marshy areas around it.

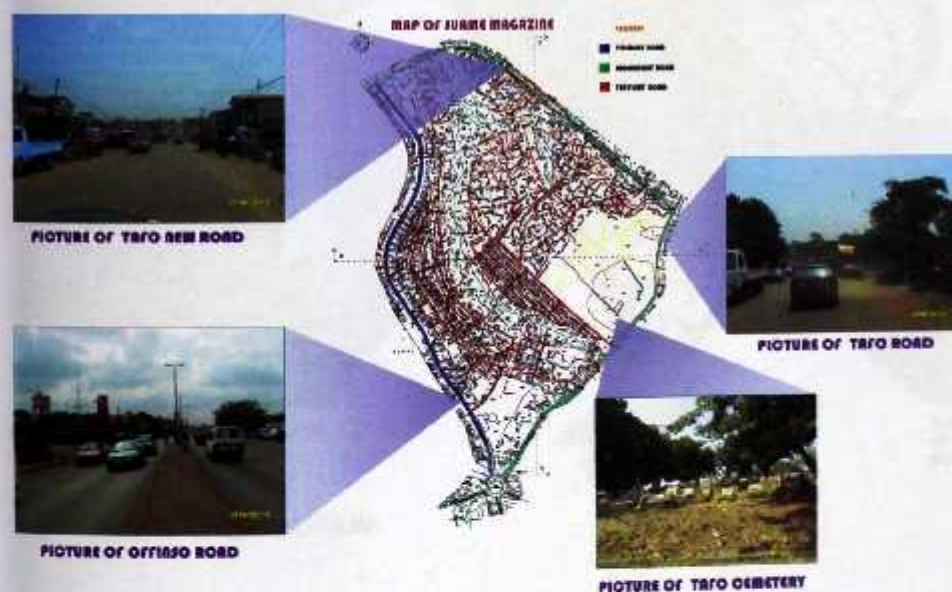


Figure 20, major roads at Suame Magazine

4.42 Building conditions

Structures are classified based on their performance using the following criteria;

- 1. Super structure
- 2. Infrastructure & services

They are grouped into; good, fair or poor.

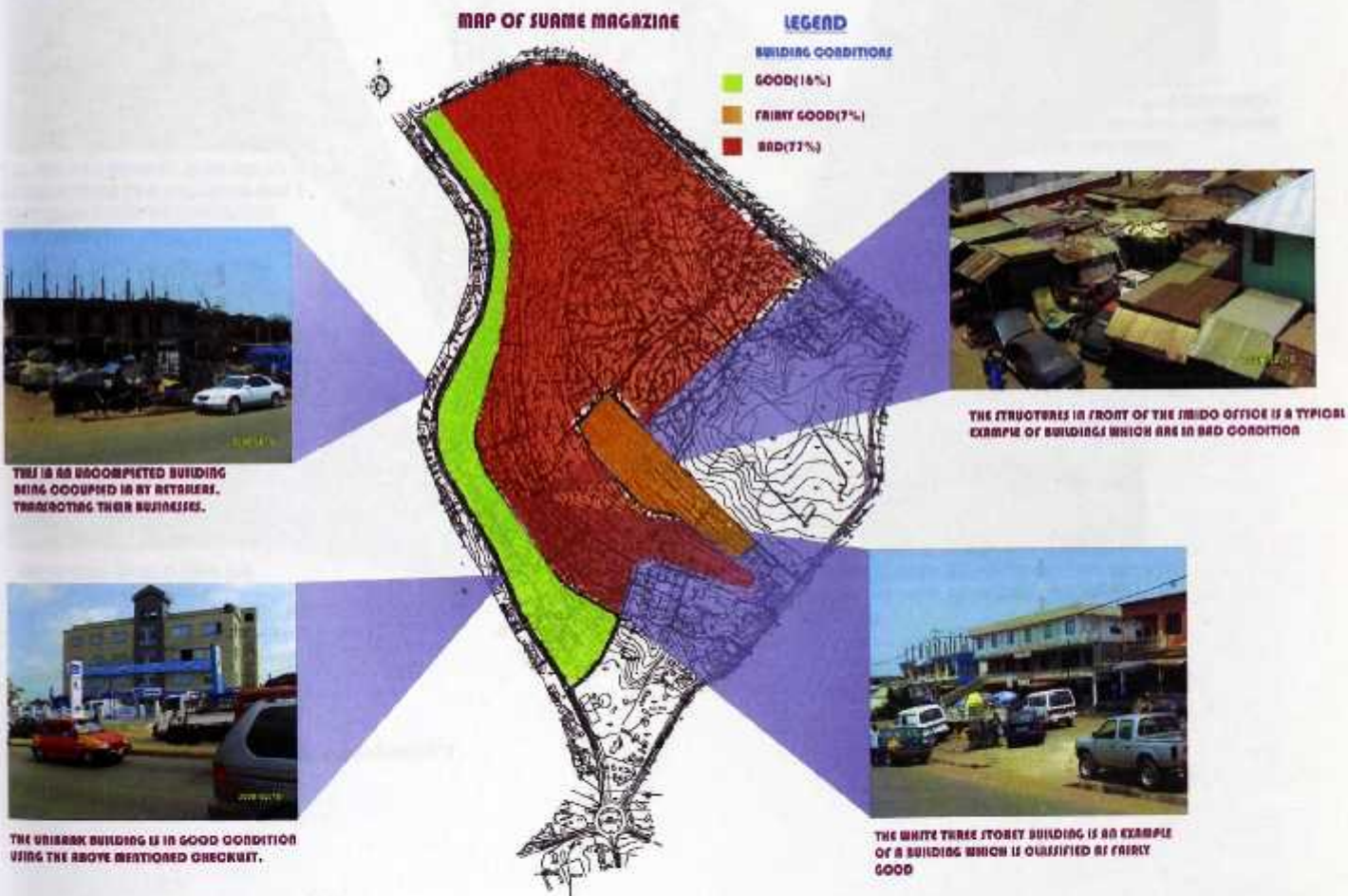


Figure 21, Building conditions

#### 4.43 Landmarks,vistas,edges and nodes

These features are used as reference points for orientation and direction, inter-woven with the zone's streetscape gives its character.

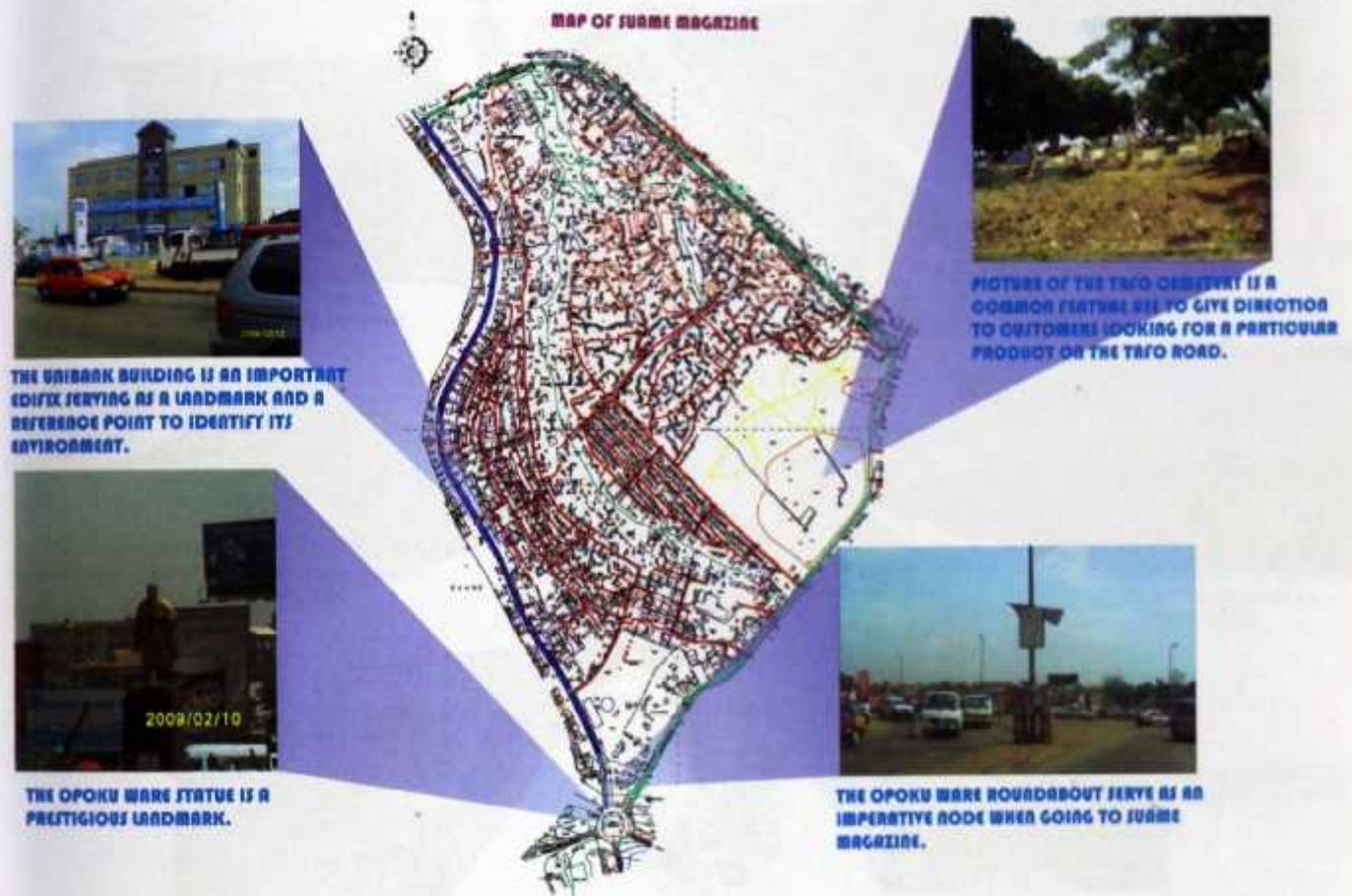


Figure 22, Landmark, vistas and nodes

##### 4.43a Streetscape and Skyline

90% of the buildings along the main roads were residential structures which were later renovated and used for shops, banks and other commercials purposes.

There are different architectural styles seen at Suame including international and modern style.

Building height ranges from 5 storeys to single storey. This creates an inter-play of heights in the streetscape show the massing.

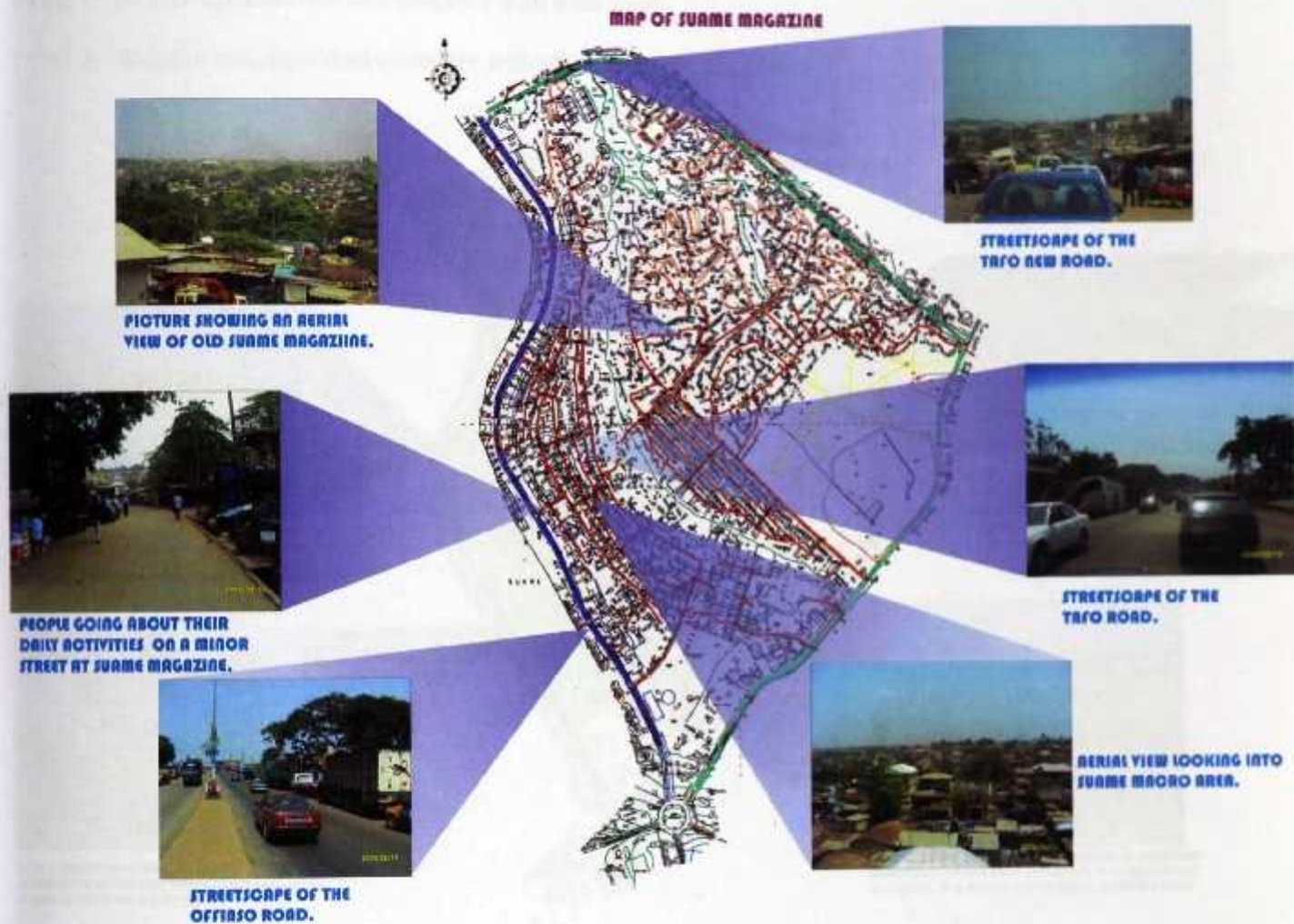


Figure 23, streetscape and skyline



Street facade of the Offinso road

Figure 24, street facade

#### 4.44 Building materials and finishes

Buildings are grouped based on the following classification;

TYPE 1; Blockwork/concrete and windows with steel doors.

TYPE 2; Wooden structure/steel container with aluminium roofing sheet.

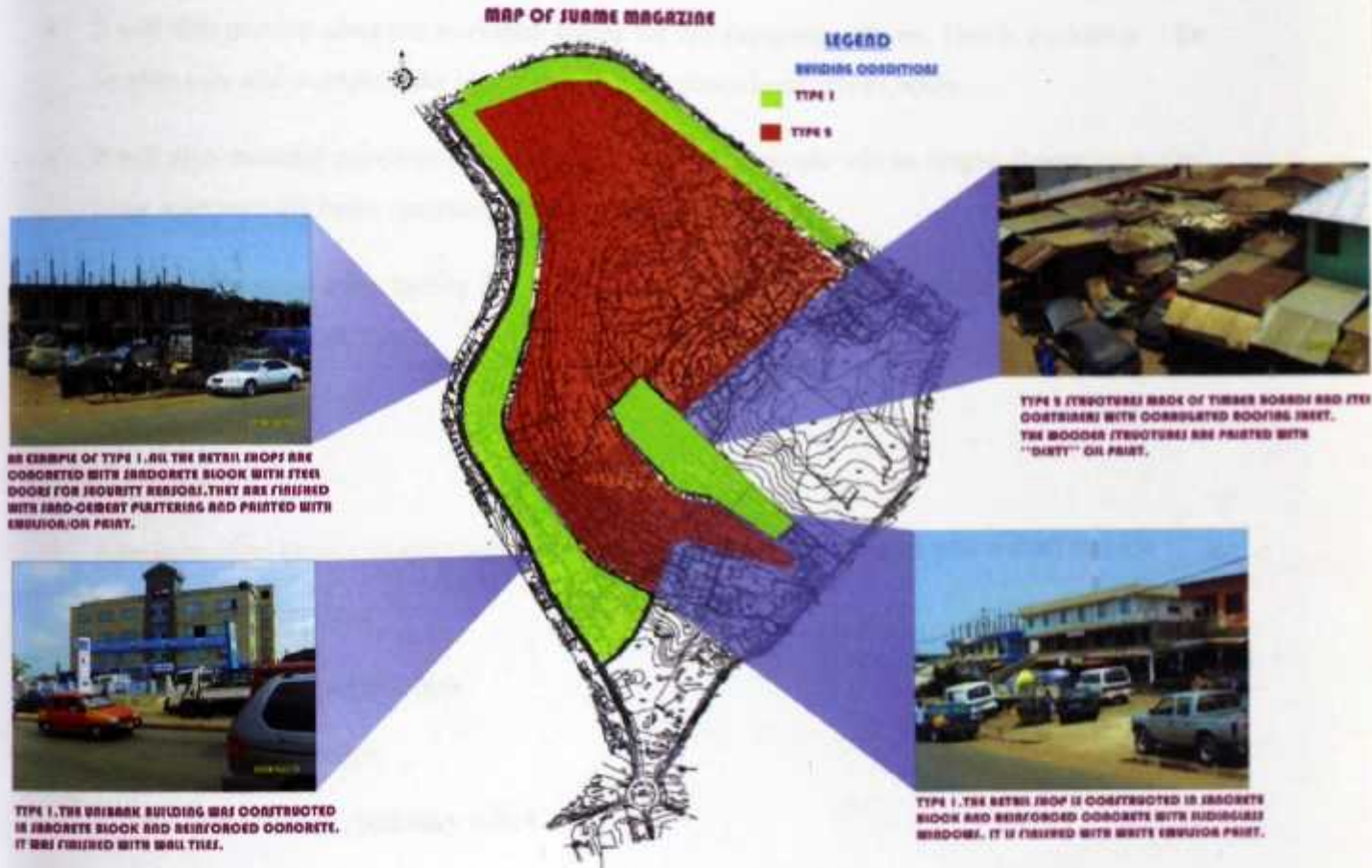


Figure 25, Material usage

## 4.5 PROPOSED EDUCATIONAL FACILITY UNDER PHASE ONE

### 4.51 Scope

- The designed will consider the position of adminstration block
- It will also provide adequate workshop spaces for two categories of cars. That is,workshop for smaller cars and workshop for bigger cars like aticulator head, tracks,buses.
- It will also consider provision of class room block where people will be taught theory course in basic management,basic communication skills, ICT and others.
- There will be supporting facility like auditorium of about five hundred capacity that will generate income for the school.

### 4.52 Clients brief

1. Administration block (all spaces shall be installed with internet services which shall include
  - Principal office
  - Deputy principal office
  - Accounts office
  - Receptionist /Secretary office
  - Staff common room
  - Infirmary
  - Bookshop
  - Four seminar rooms
  - Two computer laboratory
2. Five hundred capacity auditorium with supporting facilities
3. Two workshop for smaller cars with modern automobile laboratory

4. One workshop for bigger cars with modern automobile laboratory
5. Fifty capacity canteen
6. Twelve classrooms with projectors
7. A basket ball pitch
8. Two security post
9. Two inceptors
10. Fifty capacity packing spaces
11. Soft and hard landscape

#### 4.53 Accommodation schedule

NAME OF SPACE	QUANTITY	SPACE REQUIRED sq m
<b>Administration</b>		
Office for principal	1	25
Deputy principal	1	25
Accounts office	1	25
Staff common room	1	100
Reception	1	16
Computer laboratory	2	196
Seminar room	2	196
<b>Workshops</b>		
Workshop for small car	2	648
Workshop for big cars	1	
<b>Lecture rooms</b>		
classroom	12	1664

<b>Auditorium</b>	1	2000
<b>Basket ball pitch</b>	1	800
<b>Security post</b>	2	18
<b>Receptor</b>	2	24

*Table 2, Accommodation schedule*

#### **4.54 Site Analysis**

##### **4.541 Site justification**

1. position of site centrally located  
in relationship to the proposed land use
2. close to the proposed automobile  
light industrial area to enable students have  
access to practicals
3. Views to and from the site
4. Site located on a hill for easy drainage
5. Available access to the site. All sides is  
bounded by access roads.

##### **4.542 Site location**

The site is centrally located to the east of  
light industrial automobile and to the south of  
proposed scarp industry.

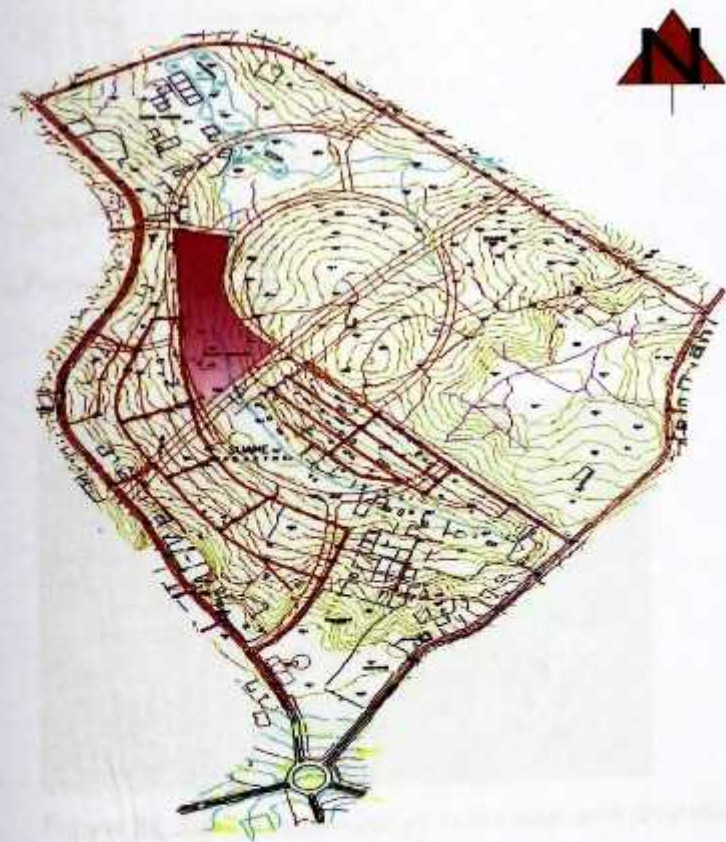
##### **4.543 Site boundaries**

The site shares boundaries with the proposed automobile light

Industry to the east and to the west of commercial area  
along the suame magazine high street



Map4, Kumasi map



Map1, Suame magazine



*Map 5, Proposed site for educational facility*



*Figure 26, Site shares boundary to the west with proposed commercial facility.*



*Figure 27, Site shares boundary to the east*

#### **4.55 SWOT Analysis**

##### **4.551 Strength**

1. Deep slop for drainage and basement
2. Firm soil for foundation
3. Sizable land for intended purpose
4. Centrally located in relation to other land uses.

##### **4.552 Opportunity**

1. Site bounded by four access roads
2. Good views from all direction
3. Small stream at the base of site for drainage

##### **4.553 Weakness**

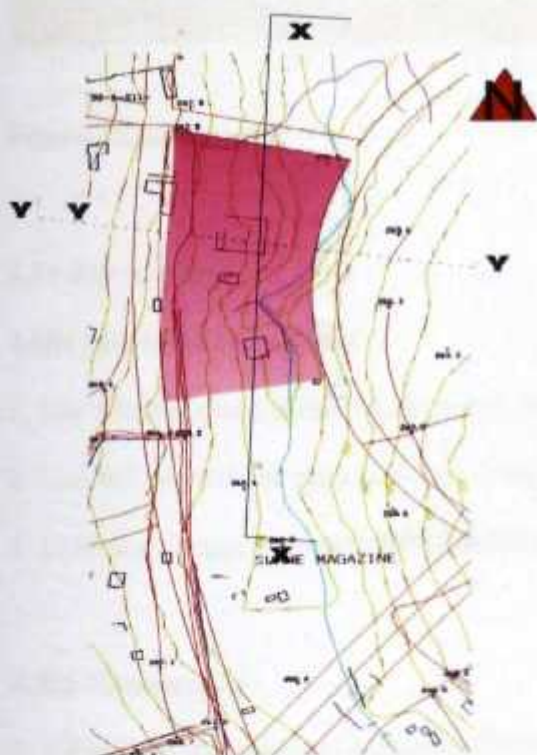
1. Sloping nature of site will involve capital expenditure
2. Frequent erosion due to nature of site
3. Lack an adequate waste disposal site



Figure 28, Picture of stream acts as waste dumping ground for machines oil

#### 4.554 Threat

1. Vehicular noise
2. Vehicular traffic on magazine high street



Map5, proposed site



*Figure 29, The gradient of the slope is 0.005. Section Y-Y*

This gradient above and below provides an ideal place for the development under studies. Site development will therefore not be high.



*Figure 30, Section X-X*

#### **4.56 Site Survey**

##### **4.561 Site location and size**

1. Site situated close to the old magazine (refer to map)
2. Located close to the proposed high street (refer to map )
3. Land size is approximately **69000meter square**

##### **4.562 Topography**

1. Slops from the proposed commercial area  
to the light industrial area
2. It has slope drop of about 3.1 to 3.6 meters
3. Direction of slope aids drainage

#### **4.563 Access to site**

1. Bounded on all four sides by road
2. Very good access to site as a result

#### **4.564 Problems**

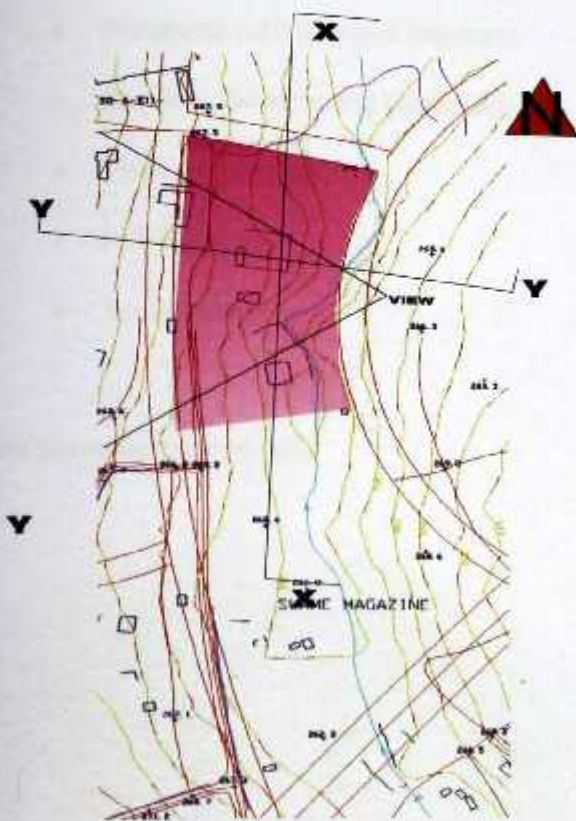
1. Noise pollution from the cars using the road
2. Noise from the light industrial area
3. The greasy and oily site

#### **4.565 Services**

1. Site has supply of both water and electricity from the mains
2. Storm drains available at the base of slop

#### **4.566 Views to and from site**

Positioning of site affords is good views to and from the site



Map 5, Proposed site

#### 4.57 Philosophy

The philosophy behind the design is Changing Suame Magazine into a modern industrial city. This is so because Suame Magazine contribute a lot to the economic development of the Transportation industry. Therefore there is the need to change Suame Magazine to function as expected.

#### 4.58 Conceptual site planning

Three alternatives conceptual site planning processes were considered. These were done with reference to certain factors like;

- The land use pattern of the proposal
- The topography of the site

- Peripheral activities and structures
- Services and servicing the facilities
- Noise and pollution
- Fire fighting
- Socialization

#### 4.581 Site planning (*option one*)

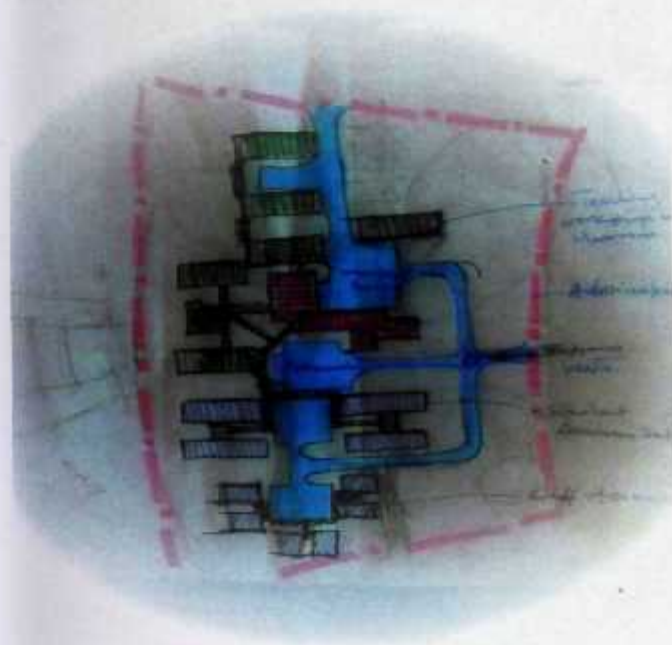
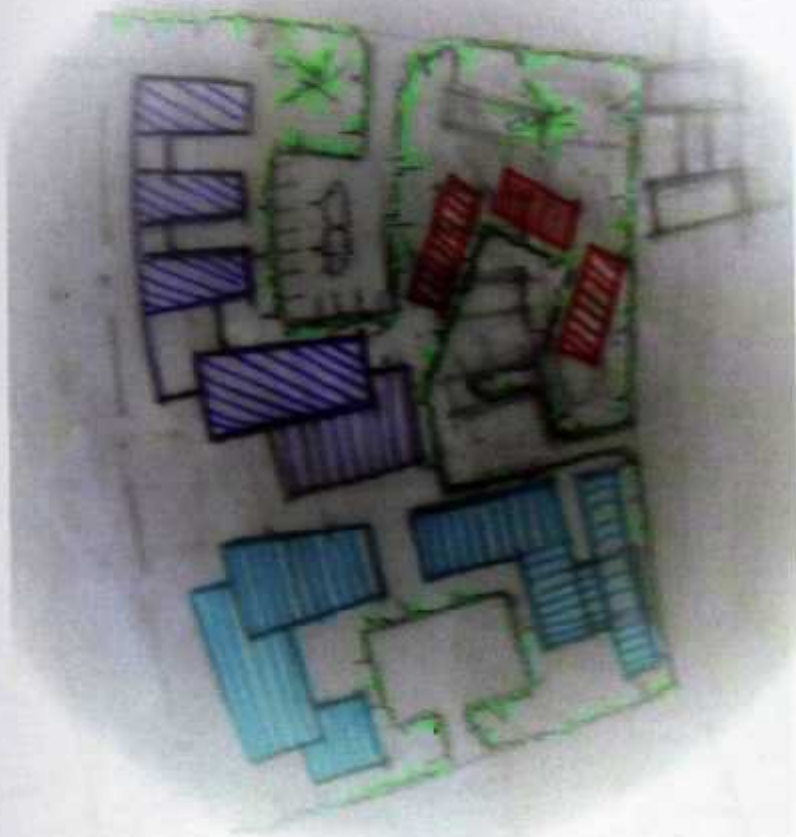


Figure 31, *option 1*

With this option ,the site is zoned into three different zones. That is ,a teaching area, workshop area and accommodation area. The teaching area comprises of lecture rooms, administration and auditorium. The workshop area comprises of a workshop for small cars and those for big cars. The parking spaces is located centrally to the administration. The accommodation area also has a car parking space .The workshop has different entering point for services.

#### 4.582 Site planning (*option two*)



*Figure 32, Option 2*

Option two is basically zoned into workshops and teaching area. The workshop area comprises of three workshops of which two is for small cars and one for big cars. The teaching area is made up of the administration, lecture rooms and auditorium. Visistors and staff car park is located close to the administration whiles a big open area is located close to the workshops to allow practicals. There are two entry points of which the one to the north is the main entrances and the second entrance being for

the workshop area.

#### 4.583 Site planning (option three)

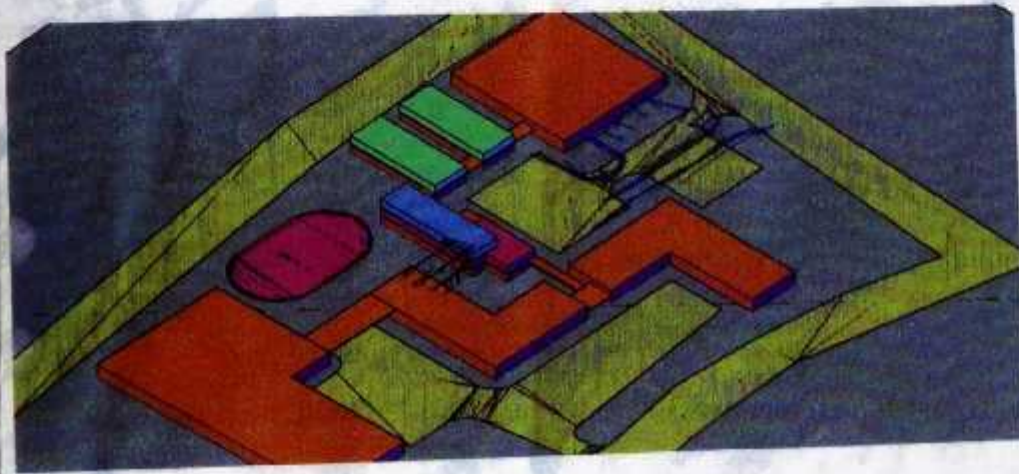


Figure 33, Option 3

This option is developed from the option two. The site is entered through the north because the road on the north is a minor road. The second entry is through the east which is for services. This option is zoned into teaching area which is made up of administration, classroom blocks and auditorium. The workshop area which is paramount in this option comprises of workshop for small cars (2) and for

bigger cars (1).the main parking is located close to the administration block and auditorium for easy access. The workshop area has big parking space for parking and practicals.

#### 4.584 Site planning (*chosen option*)



*Figure 34, chosen option*

The chosen conceptual site plan went through the above process to achieve this. The push and pull method and the idea of court yards were adopted for the purpose of arrangement. This was done for the purpose of the following:

- Ventilation and day lighting
- Orientation
- Services
- Overcrowding of building
- Building casting shadows on others.

This is done by perceiving it in 3-dimensional.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION AND RECOMMENDATIONS**

This chapter is devoted to the summary of the study, research findings, conclusions drawn from the findings and recommendations.

#### **5.0 Summary of the Study.**

The main concern of the research was to find out the reason why Technicians at the Suame Magazine find it difficult in troubleshooting of modern cars. To accomplish this, apprentice technicians and master technicians at the fitting area of Suame were targeted as the population for the study.

A sample size of thousand two hundred were selected from a population of two thousand technicians at the fitting area of Suame Magazine.

The main aim of the research was to find out why technicians are not able to troubleshoot modern cars and give the necessary solutions to the problem.

To elicit information for the study, copies of questionnaire were designed and administered to technicians at the fitting area of Suame Magazine.

#### **5.1 The recommended Design**

Based on the Architecture of the proposed school, the entire school has been zoned into two.

That is, Academic /Teaching area and a Practical area. This is done due to the following reasons:

- Accessibility to site
- Waste management
- Noise levels

- Pollution
- Material delivery
- Land use plan of Suame magazine
- Building height

For easy entry and exit to and from the site, two entrances have been provided which are separated and the main entrance celebrated to indicate its importance.

For the purpose of waste management, an entrance have been provided for services and collection of scrap. With reference to noise levels, the workshops have been sited at the back of the academic area. further used the workshops for small cars to serve as a buffer from the workshop for bigger engines as the noise levels and pollution is height.

Enough spaces have been left in-between buildings for the following reasons

- To prevent tall buildings casting shadows over small ones
- To create ventilated spaces
- To create access in times of services like fire out break
- To create court yards in times of socialization

Furthermore, hierarchy of events has been considered. In so doing ,administration,auditorium,classroom block are been placed closer to the central parking and workshops placed further.

### **5.11 The recommended block plan**

The block plan depicts the roof plan of all facilities on the site and their heights. It further indicates certain features like

- The form of the building
- Accesses

- Adjoining facilities/linkages
- How buildings cast shadows in relationship to heights of adjoining buildings.

#### **5.12 Access**

On the block plan, accesses in terms of roads and pedestrian walkways are clearly defined. Much emphasis is placed on pedestrian walkways. In so doing, all walkways within the school linking facilities have been covered and the ones close to the road are well paved and wide enough to allow four people to pass. The sides of the three access roads have been paved and though they are not covered, trees like cassia are planted along the road to provide shade.

#### **5.13 Entry/ Exit**

The site is bounded by access roads all round and therefore makes entry and exit easy.

#### **5.14 Service Yard**

Enough space have been provided at the workshop area to enable easily delivery of goods and Services and waste movement and management easy.

#### **5.15 Parking**

Fifty capacity car park have been provided for the auditorium and thirty capacity parking provided for the administration. Although the parking spaces are not shaded, shading trees will provided to shade the parking spaces.

#### **5.16 Orientation**

The site measures sixty nine square meter. All buildings have been oriented towards the north – south.

#### **5.17 Massing**

The school administration is three storey high. The auditorium and all the workshops are double volume to provide enough room for circulation of air. Also in the workshop the double volume is

provided because of the height of the vehicles that are worked on. The classroom block is one storey high with a court yard in the middle.

#### **5.18 Open spaces**

Court yards form integral part of the design. On the block plan a lot of court yard have been created by the form of arrangement.

#### **5.19 Peripheral Activities**

From the proposed land use map, the automobile repairs is situated to the east of the site, commercial activities occur at the west which is closer to the Suame magazine high street.

#### **5.2 The recommended Plans-Departmental definitions**

The departmental legends herein are the result of basic design considerations that have been carefully taken to ensure their optimum applicability to each of the projects under consideration. On the whole, six separate plans have been developed for the proposed school representing auditorium, administration ,classroom block, two workshop for small cars and one workshop for bigger cars.

#### **5.21 The auditorium**

It has area of two thousand and seventy four meter square. It has the following facilities at the ground floor.

- Five hundred seating capacity auditorium of a height of 7 meters
- Two changing rooms
- Front and back stage
- Two store rooms
- Projector and sound room

- One office
- Two wash rooms for both female and male
- Entrance foyer

## 5.22 Classroom block

It has an area of nine hundred and forty six square meters. It is repetition of a *ground floor* at the *first floor*. Facilities include:

- Twelve classrooms (installed with projector and ICT)
- Two wash rooms (six water closets each for male and female)

## 5.23 Administration

It is a three story building.

### *Ground floor*

It has an area of seven hundred and fifty seven square meters. The facilities include;

- Office for principal and vice principal
- Accounts office
- Store room
- Reception/secretary office
- Staff common room
- Infirmary
- Bookshop
- Entrance foyer

### *First floor*

It has an area of seven hundred and fifty seven square kilometer. The facilities include:

- Hundred capacity seating electronic library

- Two computer laboratory (forty capacity each)

#### *2<sup>nd</sup> and 3<sup>rd</sup> floor*

It has a square metre of seven hundred and twenty. Facilities include;

- Four seminar rooms installed with projectors. It has thirty capacities each seating.

#### **5.24 A. Recommended Workshops (small cars)**

It has a square meter of one thousand, three hundred and eleven. It has a room height of 6 meters.

The facilities include

- Automobile laboratory.
- Two offices
- Spare parts store
- Two demonstration area
- Two service pit and four hydraulic lift
- Two Changing rooms
- A compressor room

#### **5.25B. Recommended Workshops (small cars)**

It has a square meter of one thousand three hundred and eleven. It has a room height of 6 meters.

The facilities include:

- One office
- A store room
- Two changing rooms
- Two demonstration area
- Two service pit and four hydraulic lift
- One compressor room

### 5.26 Recommended Workshop for big cars

It has a square meter of six thousand, two hundred and twenty. It has a room height of 7 meters. It

has the following facilities:

- Two demonstration area
- Three service pit and two hydraulic lift
- Automobile laboratory
- Three office
- One common room
- One spare parts storage
- Two changing rooms
- 1 Scrap stores

### 5.27 Canteen

Facilities include:

- Five serving post
- One yard
- Hundred capacity eating area

### 5.3 Recommended Materials for the project

The design is made up of a variety of materials ranging from wood to metal. Among the selected materials that will be used for the construction of the structures are:

- Cement-sand mortar block: this will be used to lay the walls.
- Wood; well seasoned 20%mc Odum or Danta would be used for the doors, door frames as well as the window frames.
- Aluminum: this will be required for the balustrade of the exhibition hall, administration lecture theatre, restaurant, etc.
- Linoleum base floor tiles: this will be used for the floors of some of the laboratories and classrooms to allow for easy cleaning and noised attenuation.
- Porcelain tiles: due to its resistance to wear and its aesthetic nature, it will be used at the Auditorium, Library, and the Office.
- Concrete pavement blocks would be used at places like the car-parks, service yards and pedestrians walkways.
- Pre-rolled Aluminum roof covering in a barred shape would be used for the roofing of the workshops.
- A.05 mm thick Industrial Deep Trough roofing sheet in a long span length would be used for roofing the classroom blocks, lectures theatre, laboratory, administration etc.
- Large panes of glass are to be used for the panels of doors and some windows.
- Large panes of glass are to be used for the panel of door and some windows.
- NAACO louver frame and opaque graded glass would be used for the windows of most of the structure on the site. Majority of the wall surface will be cement-mortar plastered and then painted with a well selected emulsion paint of high quality to it, oil paints would not be suitable due to high temperature level.
- The roof structure (trusses) would be made of steel and the truss for the administration

entrance to be made of wood.

- The roof structure (trusses) would be made of mild steel/ This will afford easy construction and forming.

#### **5.4 The Recommended Services**

Services provided at the site are made up of the following:

- Fire prevention and fighting,
- Electrical,
- Sewage Plumbing
- Waste Disposal
- Circulation

##### **5.41 Fire prevention and fighting**

- In the design, fire prevention and fighting has been a priority due to the involvement of Workshops which put the design in a high fire risk category.

##### **5.42. Prevention**

The design of the workshops especially where exposure is high, care has been taken to chose the Right materials. The floors are made concrete, walls made of sandcrate blocks and fire resistance paint used for the doors and the walls.

##### **5.43. Fire Fighting**

- Fire alarms systems (smoke senor) are installed at all the blocks.
- Regularly update fire extintinguisher are provided at all places which are visible to every person.
- Hose reels, connected to dry rise inlet are mounted at vantage points.

- In the design of the spaces, escape door to all facilities are provided with panic locks, especially at the workshops.
- Quite a number of fire hydrants are clearly located at vantage points on the site.

#### **5.44 Waste Management**

Two main system of waste collection are to be adopted here in terms of solid waste management.

Waste will be collected in bins mounted at vantage points. Large volumes of waste that are generated from the workshop (car shop would be extracted with medium duty electronic extractors and then collected by vans.

Due to the use of oil in all the workshops, service pit will be provided and oil containers placed at the bottom to collect oil. A receptor will be constructed at the lower part of the site to collect all oils at the site when it rains to prevent pollution of water bodies nearby.

Due to the nature of the site, soil waste could best be managed by the central sewage system.

#### **5.45 Electricity**

The role of electricity and its installation in any facility is very important and it cannot be down play as far as this design is concerned. The safety in term of fire outbreak to some extent will depend on the safety and quality of electrical installation. Since this facility is both educational and industrial, the level of safety and protection must be high.

#### **5.46 Installation**

- Three phase system of power supply will be used to supply power to the site. It will then be zoned according to heavy and light equipments.
- Protection in two forms has been considered.

a) Against lightening

b) Against excess current flow

#### **5.47 Protection against lighting**

Both air termination and earth pods with grids will be provided on all buildings to forestall lightening perils.

#### **5.48 Protection against excess current flow**

Circuit breakers of two kinds will be adopted in this design

I.Re- wire cable fuse cartridge (coarse protection)

II.High breaking Capacity (hbc) cartridge fuse (close protection)

#### **5.49 System of wiring**

I.Trucking system

II. Conduit system

#### **5.491 Lighting**

- Daylight is going to be a major source of lighting as far as this design is concern.

The orientation of the building has made it possible to take advantage of the day lighting.

- Electric lighting, for that is going to serve as a supplementary source of illumination in some facilities.

- In choosing the right lighting gargets, the following were considered:

a. Heat generating level of equipments.

b. quantity of light

c.glare

- Fluorescent lamps will form the bulk of artificial illumination in this design
- Spot light would be used at the auditorium.
- Chandeliers are to be used at the eating areas.

### **5.5 Recommended Landscaping**

Landscape, apart from its beautification purpose, provides other functions without which the design is not complete. For example, it serves as a wind break, cut down sound movement and provides shade to mention a few.

Landscape is grouped into land landscape: hard surfaces lives pavements, asphalt and so on and soft

Landscape includes all plant materials ranging from turfs to avenue trees. Since both soft and hard landscape have a role to play in the implementation of the project, there is the need to blend the two to achieve the best results.

#### **5.51 Merits of Landscaping to the project**

- It provides a source of sound attenuation since the site is bounded by roads.
- It will help increase humidity at the site
- the blend of the plants and hard surfaces provide beautification

The hard landscape also plays a valuable role in the project. This will be used to pave the pedestrian walk ways , the parking areas, service yards etc.It is durable and hard to resist pressure.

80% of the total inbuilt areas in the project will be covered with soft landscaping to increase humidity and therefore reduce heating. Plants materials like Acacia,Pines,Rain trees and Royal palm will be used.

## 5.6 Recommended preliminary estimates for the proposed training school

<i>Name of facility</i>	<i>Area(sqm)</i>	<i>Rate</i>	<i>Total amount</i>	<i>Remarks</i>
<b>Auditorium</b>	2040	GH450	GH918000	It includes all Fixed assets
<b>Administration</b>	3016	GH450	GH1357200	It includes all Fixed assets
<b>Classroom block</b>	3036	GH450	GH1366200	It includes all Fixed assets
<b>Workshop(small cars)1</b>	1242	GH450	GH144900	It includes all Fixed assets
<b>Workshop(small cars )2</b>	1512	GH450	GH680400	It includes all Fixed assets
<b>Workshop(big cars)</b>	2240	GH450	GH1008000	It includes all Fixed assets
<b>Security</b>	9	GH450	GH4050	It includes all Fixed assets
<b>Parking</b>	3256	GH150	GH488400	It includes all Fixed assets
<b>Soft and hard landscaping</b>	62592	GH50	GH2641200	It includes all Fixed assets

Table 4, Priliminary cost of project

## 5.7 Phasing of the project

Due to the high cost of the proposed project, its execution will be carried out in 3 phases.

### Phase one:

- Administration
- Classroom block

### Phase two :

- Workshop for( small cars)
- Workshop for (big cars)

### Phase three:

- School Auditorium

Note: any of the above phases goes with it corresponding landscaping

## 5.8 Conclusion

It is my hope that capacity building which has three main components covering artisanal Engineering and design through ICT, Auto diagnostics and Business management will help upgrade our artisans in Suame and the country as a whole.

I am happy that this project if taken serious by the government and other stake holders, will help the artisans upgrade themselves to meet future challenges in the automobile industry as there is the urgent need to focus attention on harnessing our recourses to save the industry from total collapse precipitated by modern technological innovations and sophistication in the automobile industry as cited by the Vice President of Ghana; John Mahama Dramani.

## REFERENCE

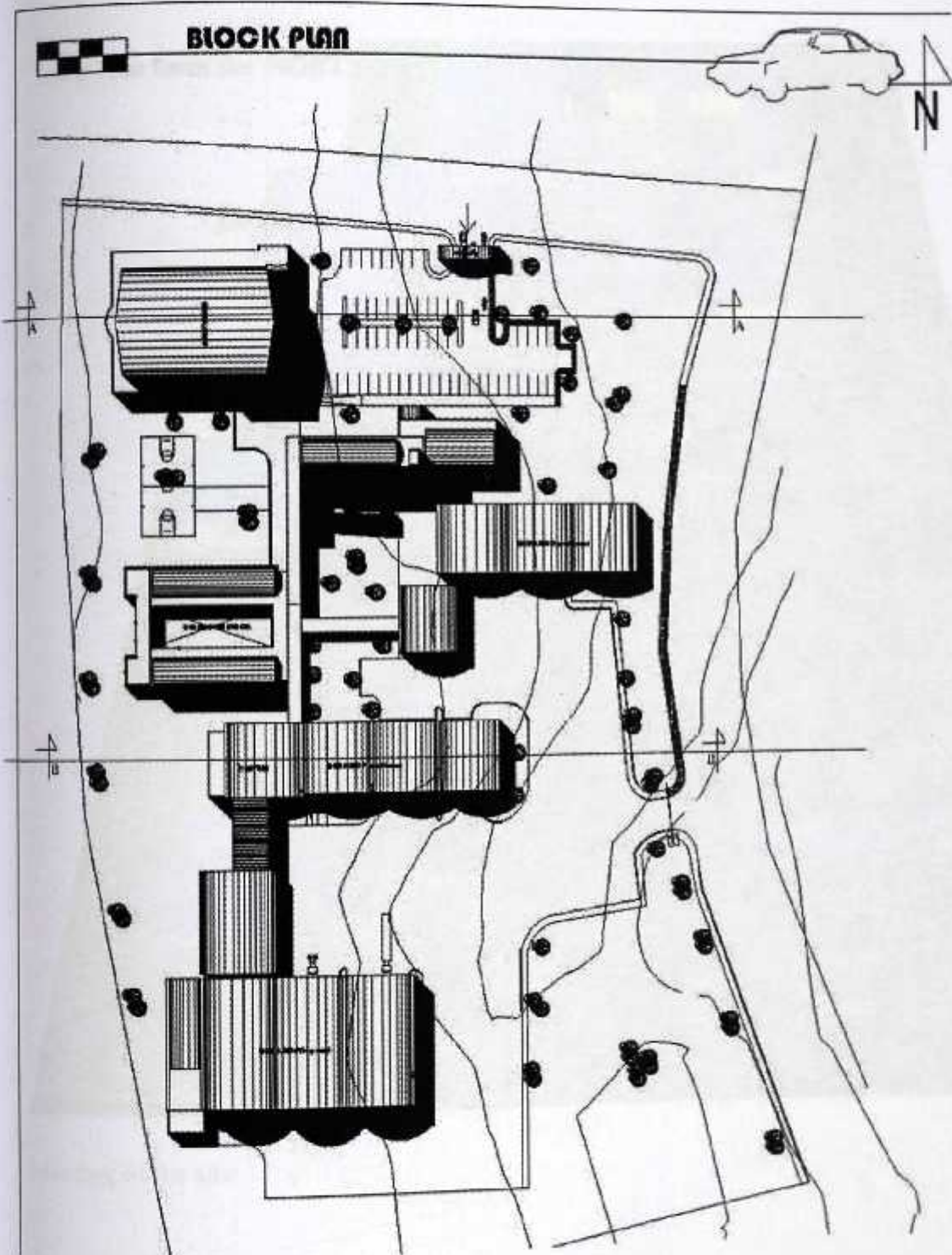
1. Simons .B. Bright, Monday August 25, 2008
2. Bryman Alan,Qualitative Research methods
3. Annoh (2001),Education,Kumasi,Cita printing press
4. Annoh (2001),Education,Kumasi,Cita printing press
5. Annoh (2001),Education,Kumasi,Cita printing press
6. Amofa(1999)Sociological foundation in education for student,Grandy publications, kumasi
7. Adipah(2000),Lincoln library,p29
8. Adipah(2000),Giachina,p39
9. Adipah(2000),MESW and MOE,p31
10. Puoru,Kudese,Addison,Yeboah,NVTI in Perspective.p5
11. Puoru,Kudese,Addison,Yeboah,NVTI in Perspective.p6
12. Amponsah S.B,NVTI in Perspective,p2
13. <http://www.answers.com/history>
14. <http://www.answers.com/history>
15. <http://wwwsmidoghana.org/origin.html>
16. <http://wwwsmidoghana.org/missions.html>

17. <http://wwwsmidoghana.org/goals.html>
18. <http://wwwsmidoghana.org/policy.html>
19. Myjoyonline, Thursday 7<sup>th</sup> August 2008, 10GMT
20. Ghana News Agency
21. Dwomoh. Abraham Kwabina, September 2007, Unpublish thesis report, p18-22
22. Ernest and Peter Neufert, Architects Data, p381-384
23. Workshop Victoria guide(2004), p3
24. Workshop Victoria guide(2004), p3
25. Workshop Victoria guide(2004), p3
26. Workshop Victoria guide(2004), p5-6
27. Workshop Victoria guide(2004), p12
28. Best J.W(1981). Research in education, 4<sup>th</sup> edition, Prentice Hall, Englewood Cliffs, NJ

## BIBIOGRAPHY

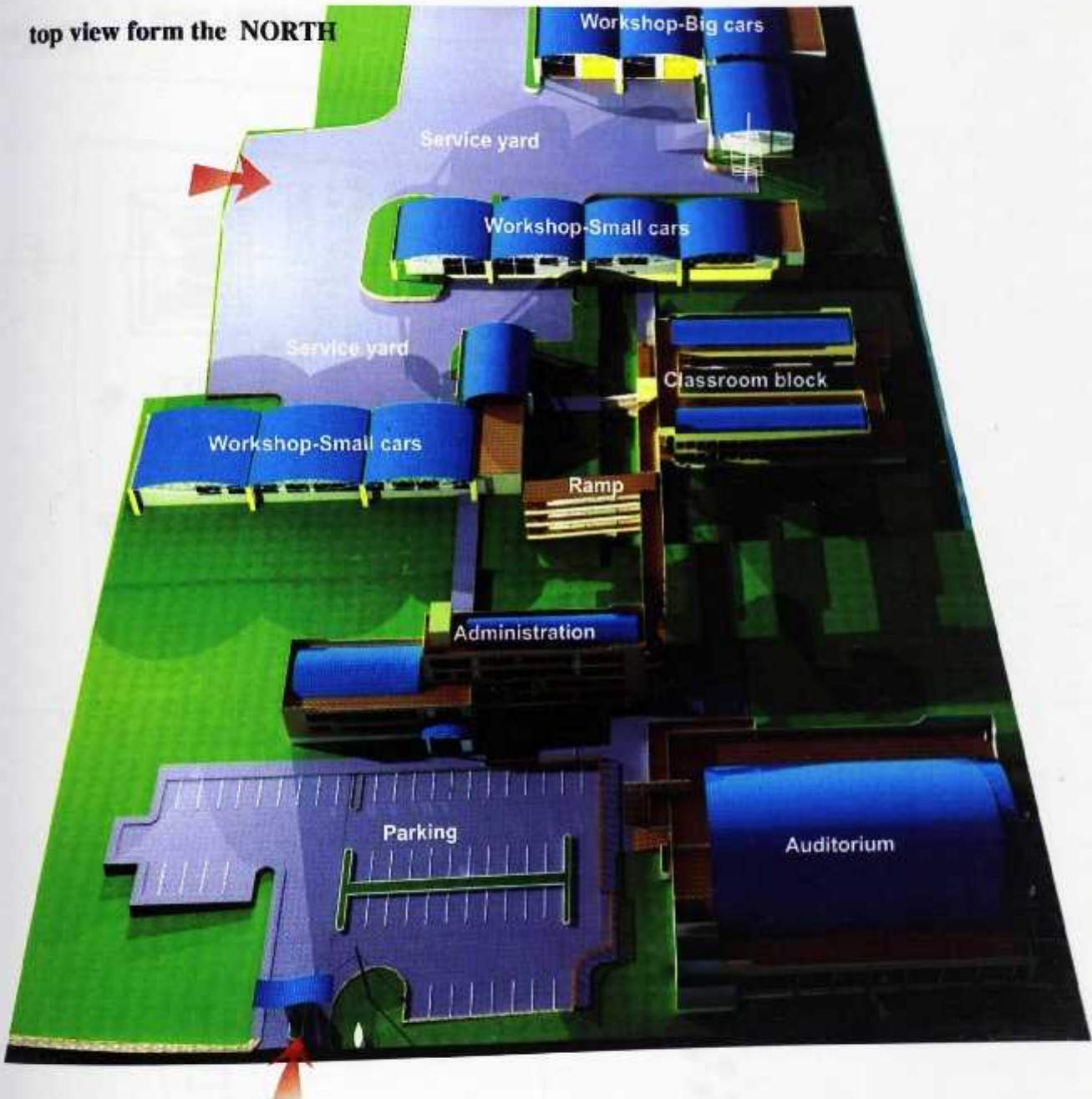
1. Adipah B. K. (2000) Developing Plan for a Competency – Based on Training in Visual Art Vocations for SSS Graduates.  
Unpublished Thesis.
2. Adipah B. K. (2000)
3. Adipah B. K (2000)
4. Adipah B. K. (2000)
5. Amofa A. K. (1999), Sociological Foundation in Education for Students, Kumasi; Grandy Publications, Kumasi Ghana.
6. Cambridge International Dictionary of English (1996) London, UK
7. Committee on Review of Education Reforms (2000). Meeting The Challenges of Education in the Twenty First Century, Accra, Adwinsa Publication Ltd.
8. Longman Dictionary of Contemporary English (2000) Longman Group Ltd.
9. Bryman Alan, Social research methods
10. myjoyonline.com, Thursday 7<sup>th</sup> August 2008, 7:10 GMT)
11. Remy Puoru, Kudese, Addison and H K Yeboah, NVTI in Perspective
12. Vice President, John Dramani Mahama, Mr Aweda Azongo Consultant for the project and Mr Dil Rachmeler, Fund Manager for BUSAC on Thursday launched a multi-million Ghana cedi talent hunt project and a technical institute in Kumasi.
13. Ernest and Peter Neufert, Architects Data.
14. Workshop Victoria guide (2004)
15. Best J. W (1981). Research in education, 4<sup>th</sup> edition, Prentice Hall, Englewood Cliffs, NJ

APPENDIX A-Block plan



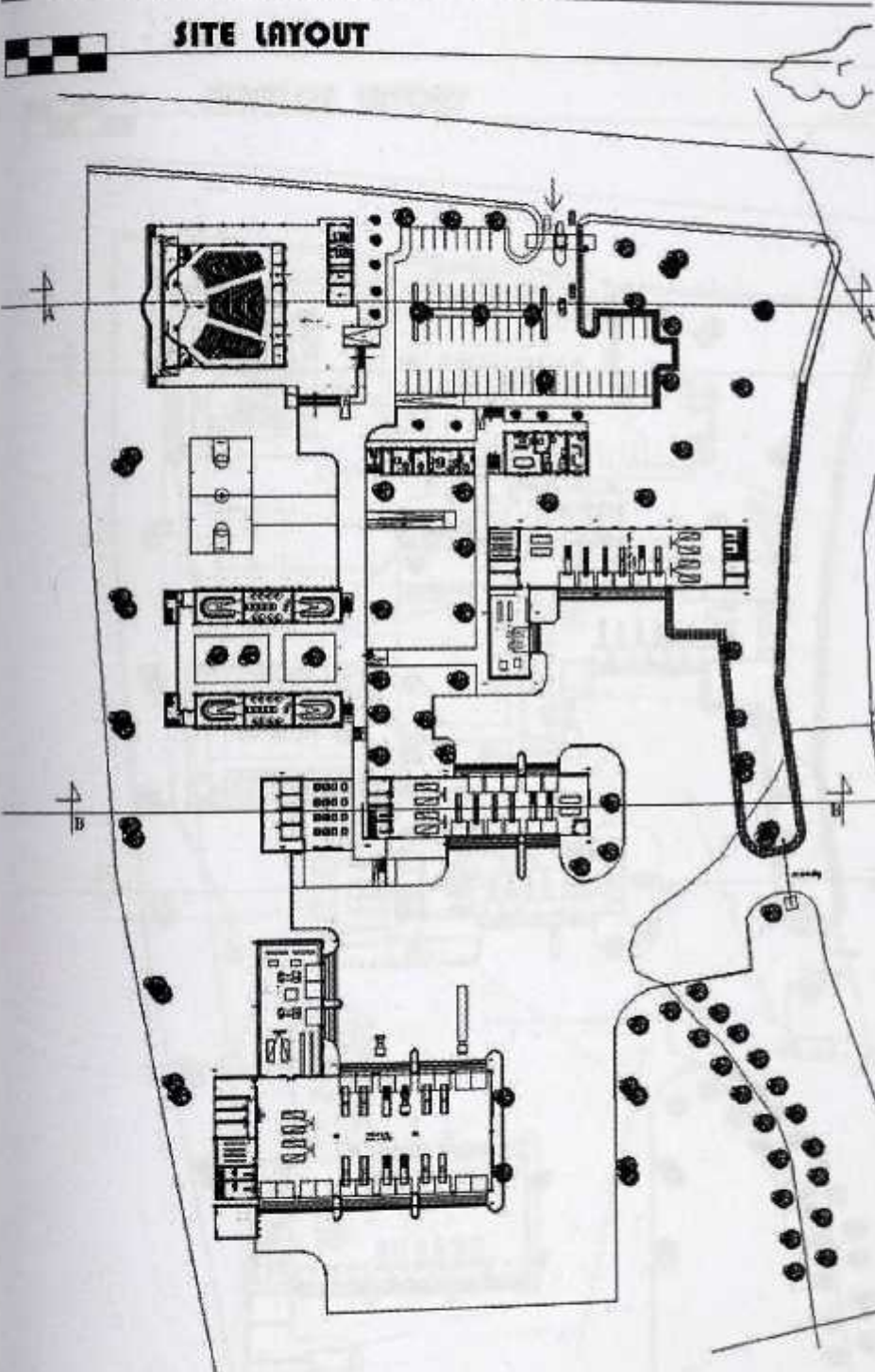
Block plan

APPENDIX B- Aerial view of school



Massing of the site

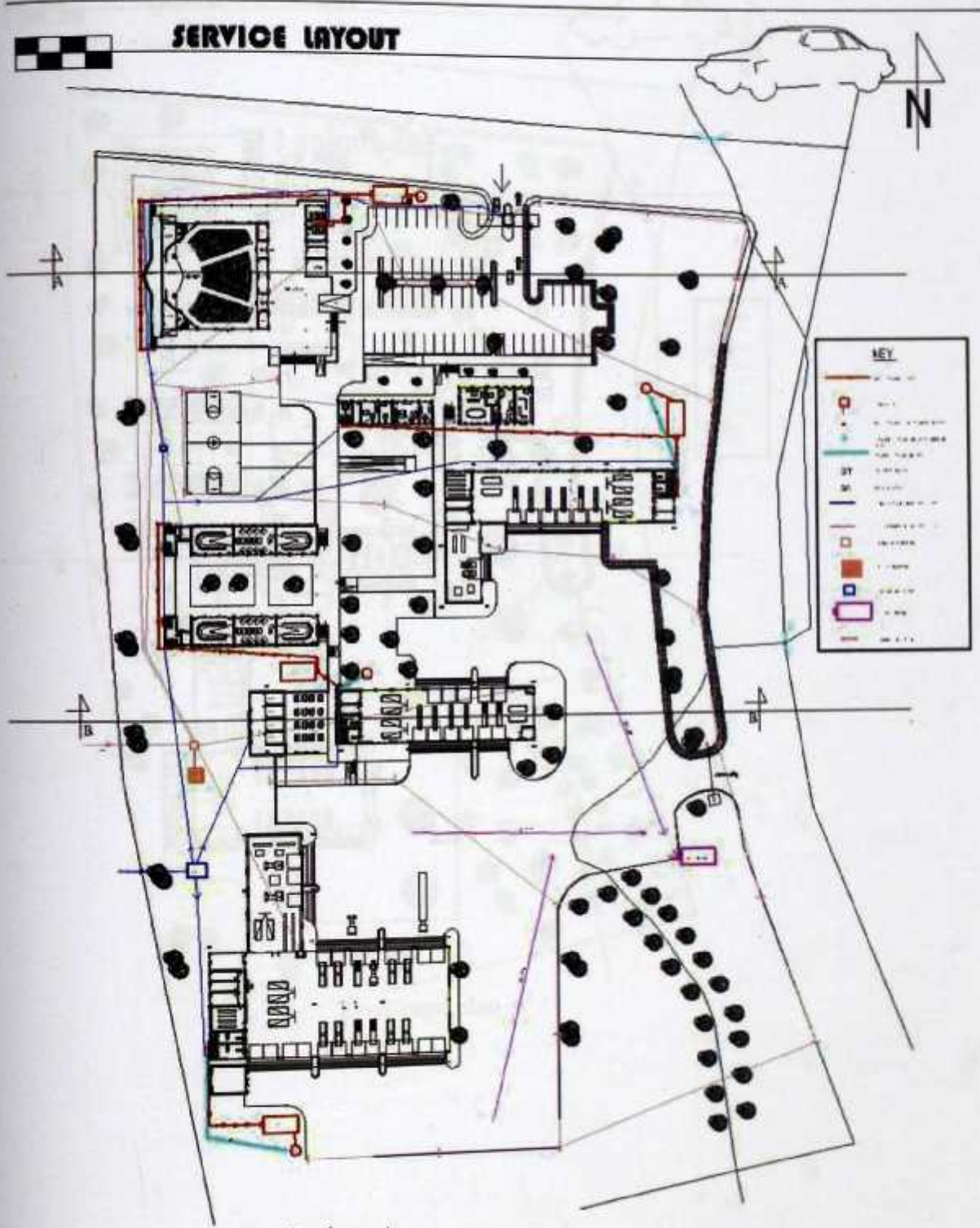
APPENDIX C- Site layout



Proposed site

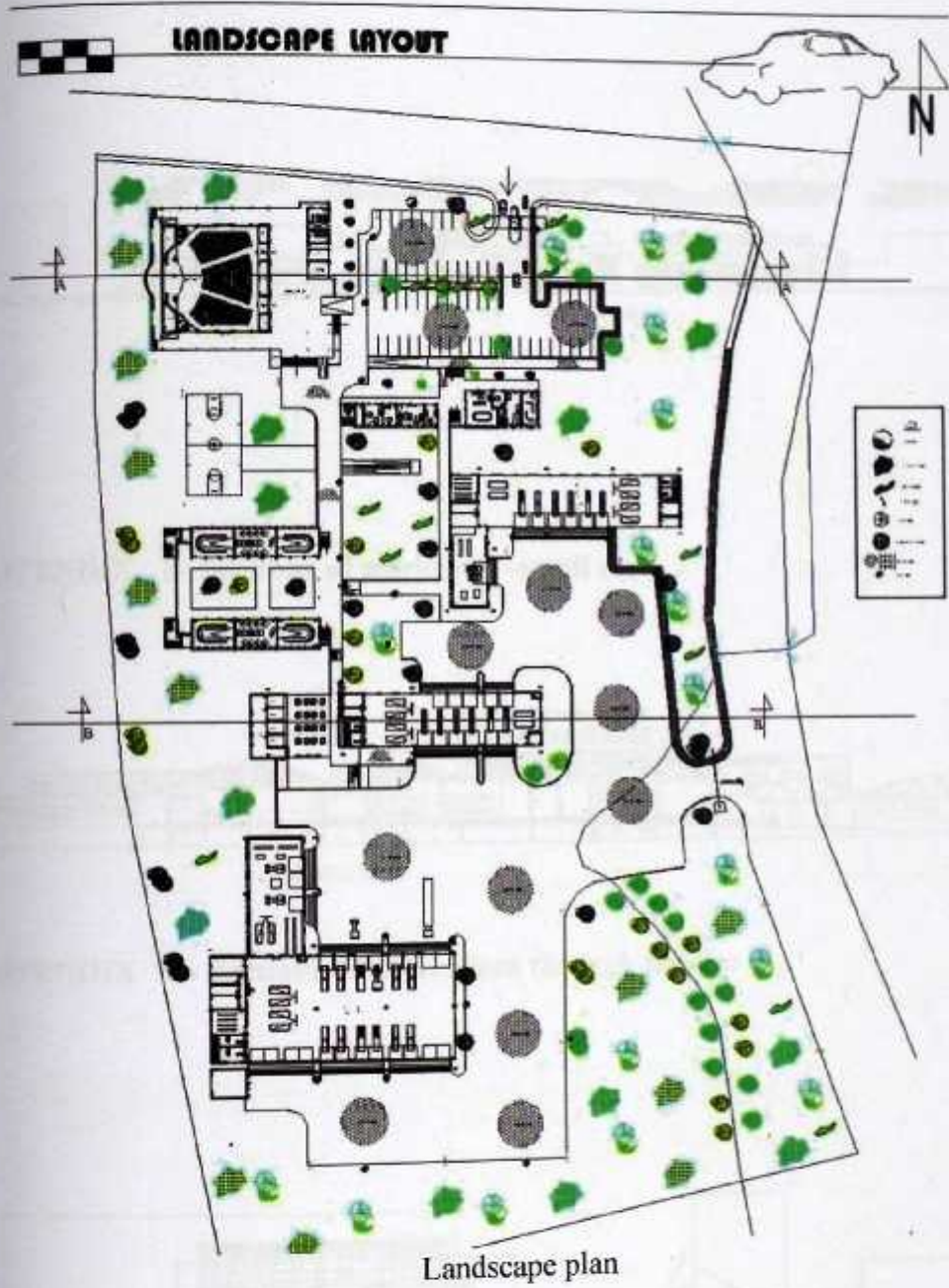
layout

APPENDIX D- Service layout

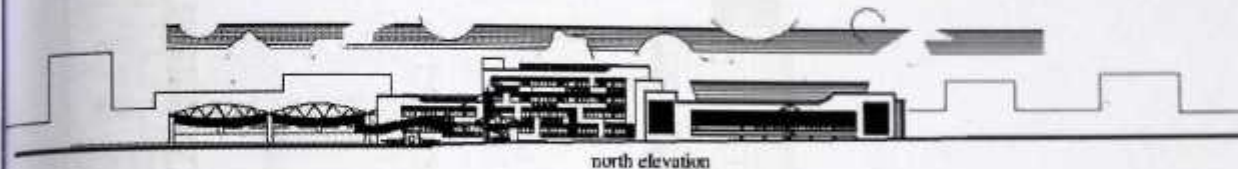


Service layout

APPENDIX D- Landscape layout

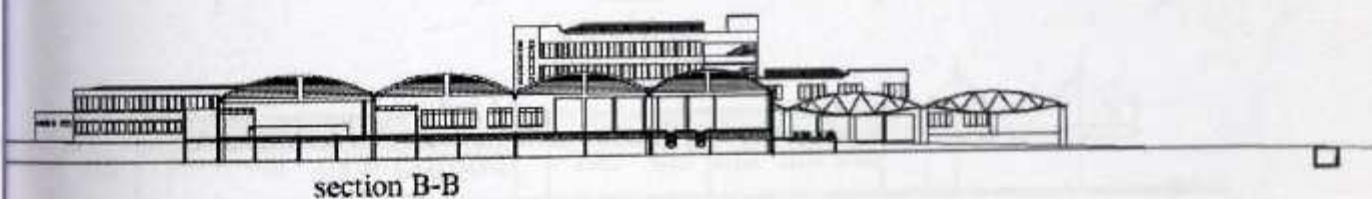


**APPENDIX E- Elevation of administration**



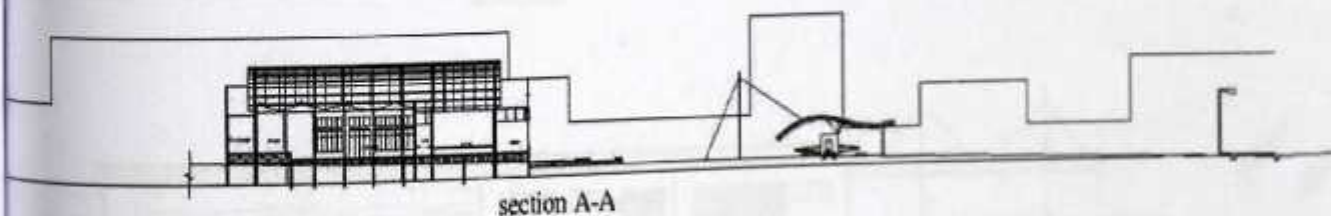
north elevation

**APPENDIX F- Sections of workshop—small cars**



section B-B

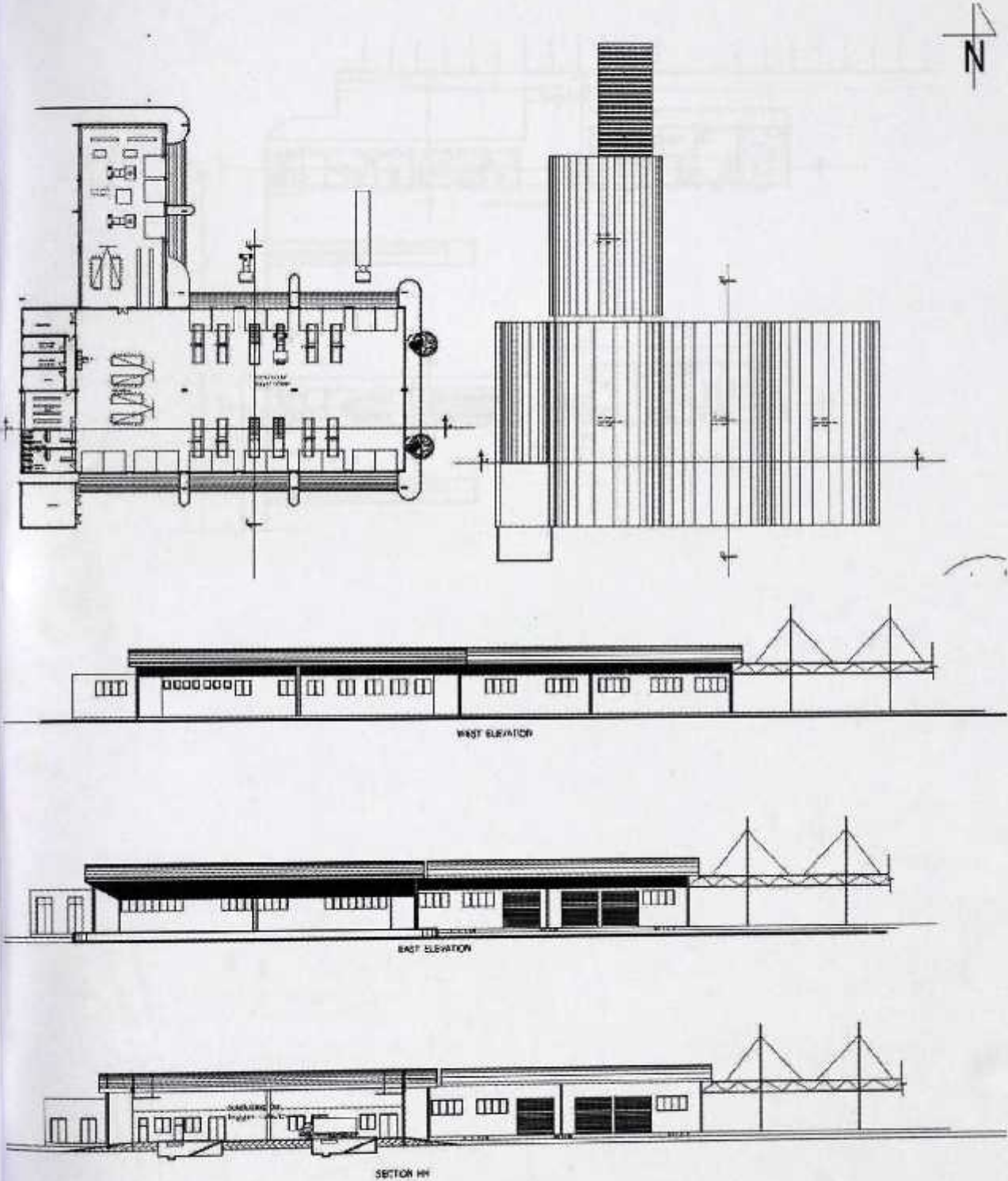
**APPENDIX G- Sections of auditorium through the site**



section A-A

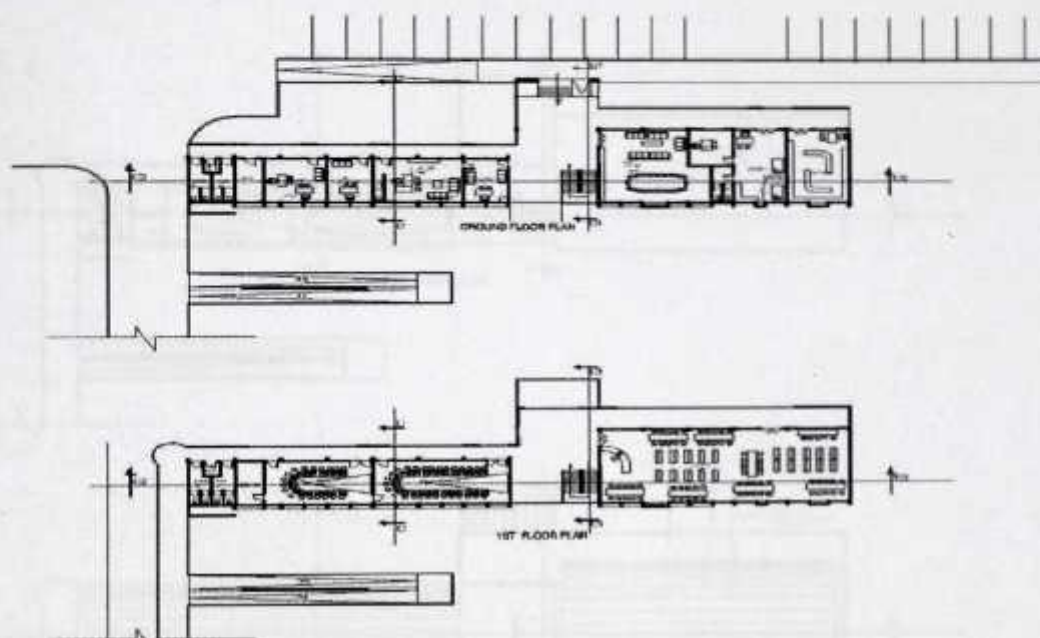
WORKSHOP-big cars

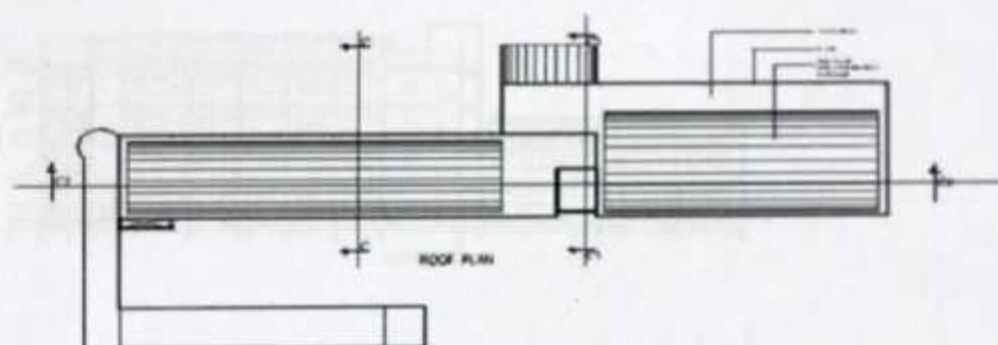
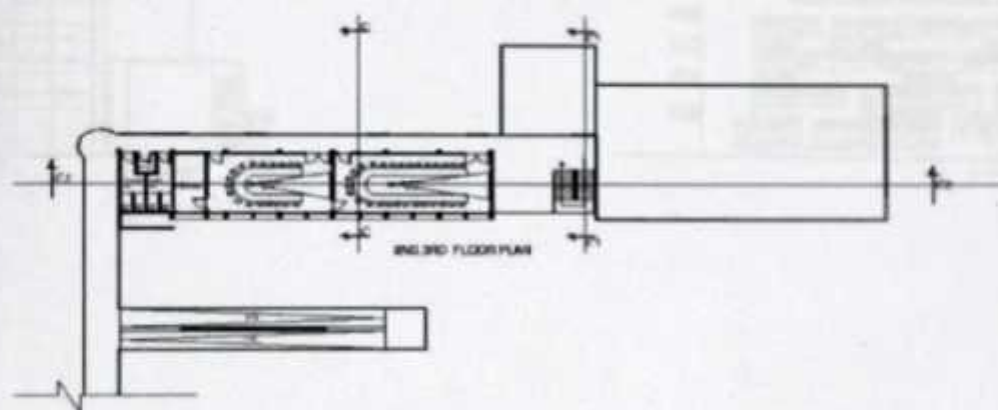
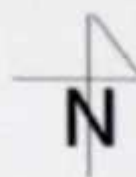
APPENDIX H- Plans and sections of workshop-Big cars



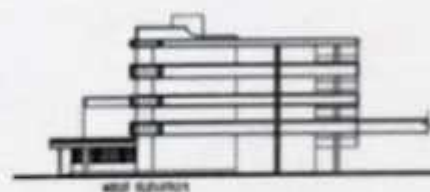
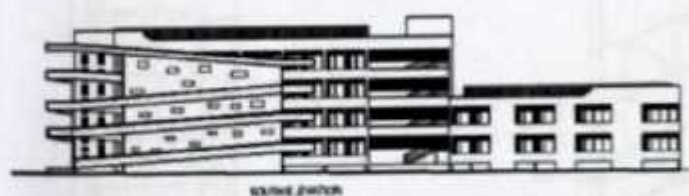
WORKSHOP-big cars

## APPENDIX I- Plans, elevation and sections of Administration





ADMINISTRATION



# APPENDIX 2- Plans, elevations and sections of Classroom Block



EAST ELEVATION

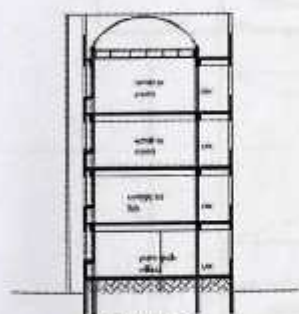


NORTH ELEVATION

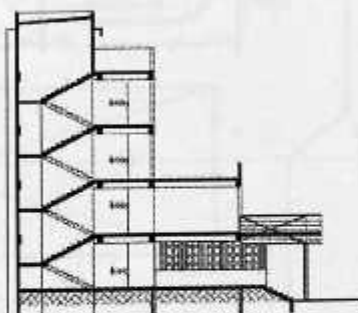


SECTION CC2

## ADMINISTRATION

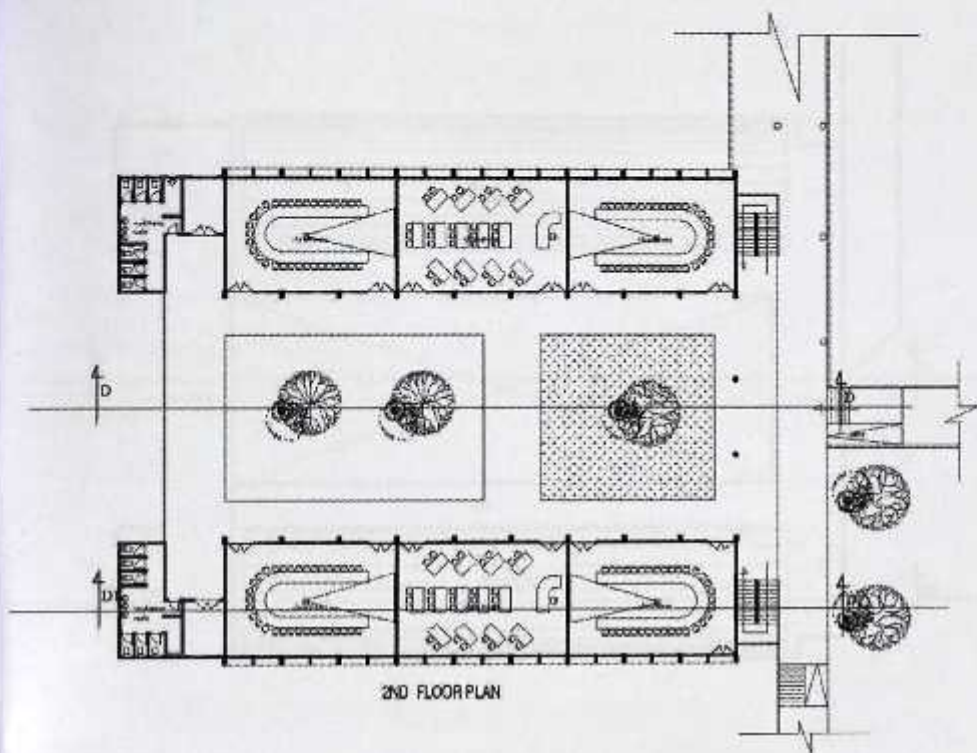


SECTION CC

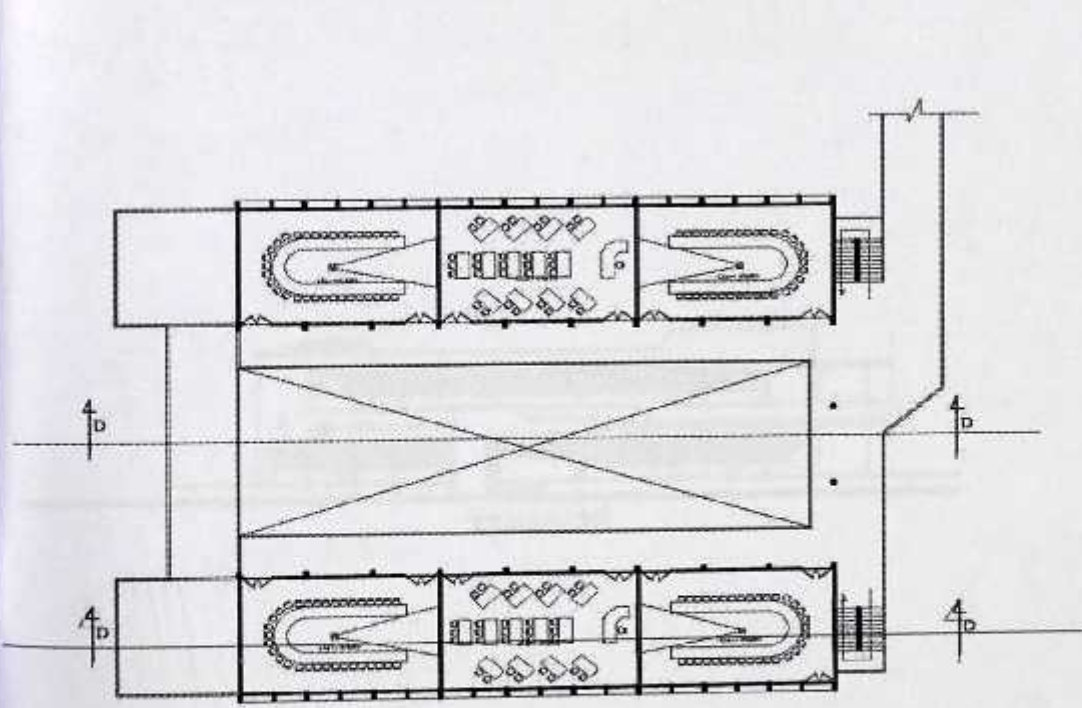


SECTION CC1

APPENDIX J- Plans, elevation and sections of Classroom block



2ND FLOOR PLAN

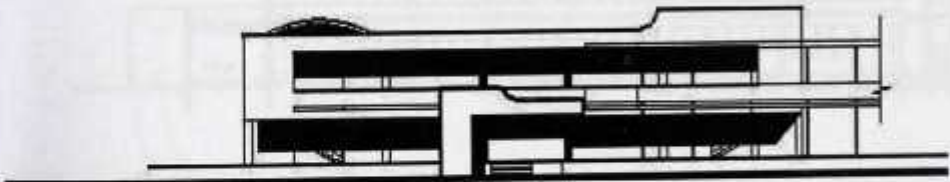
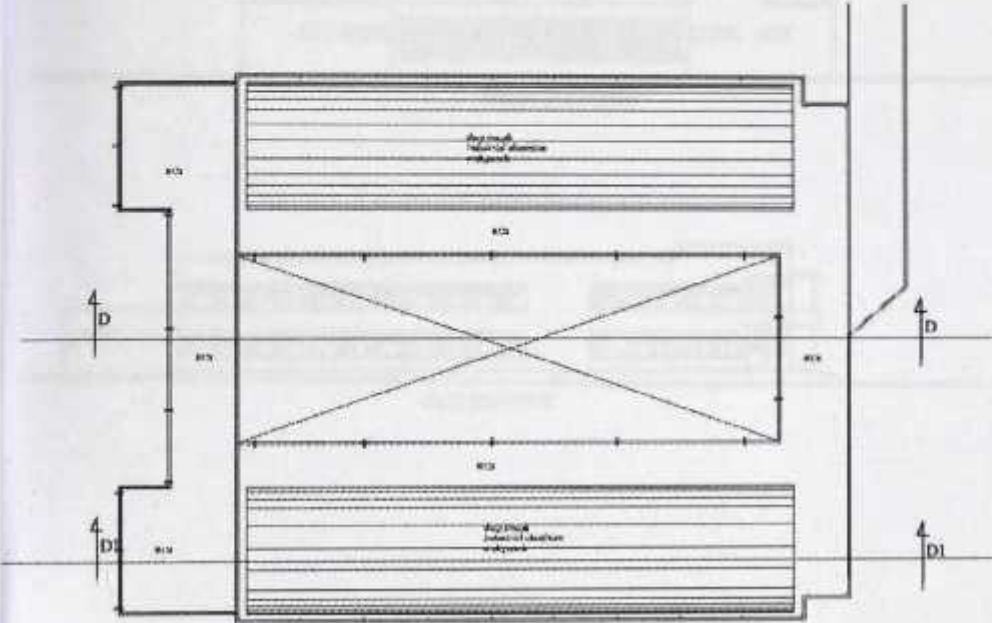


1ST FLOOR PLAN

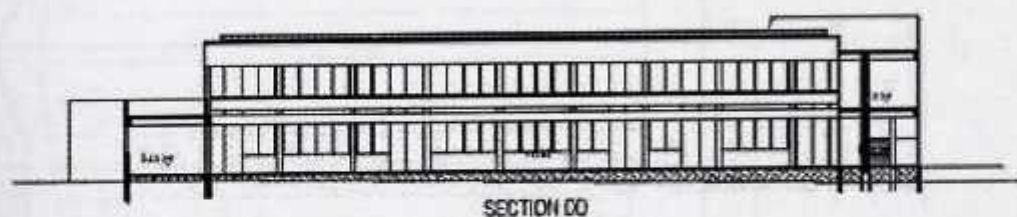
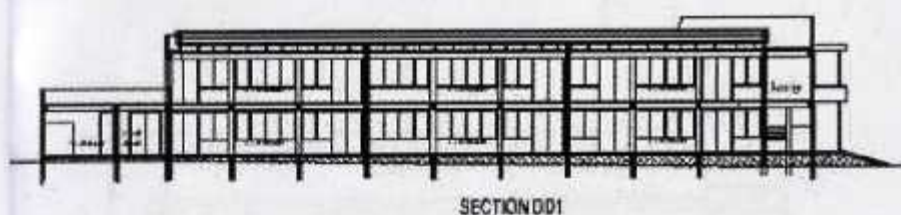
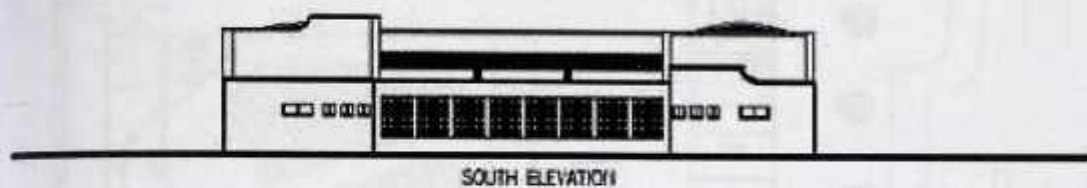


CLASSROOM BLOCK

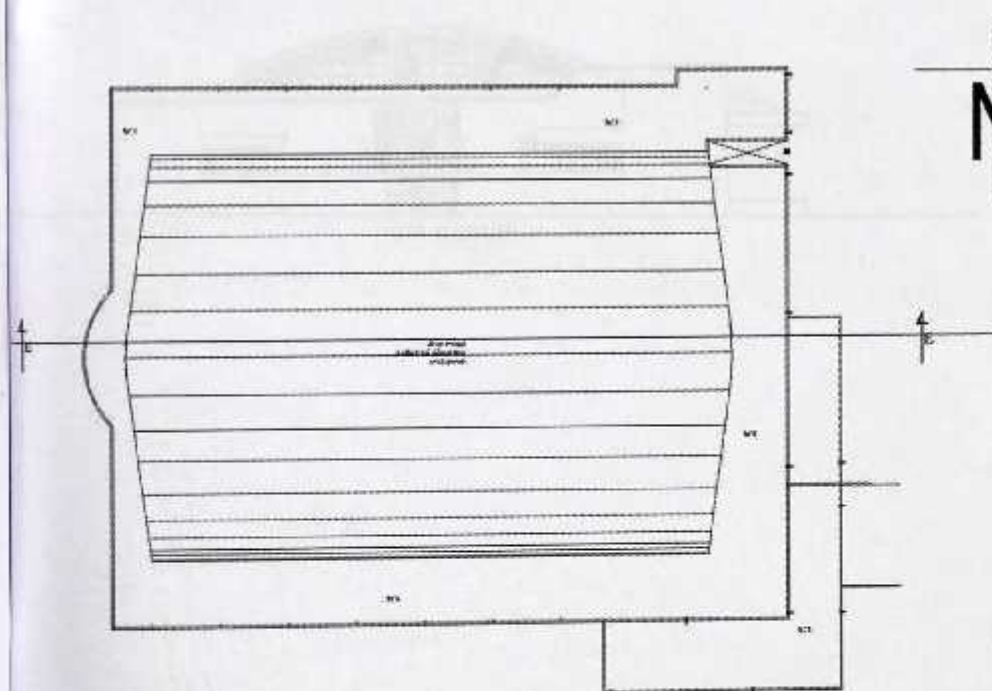
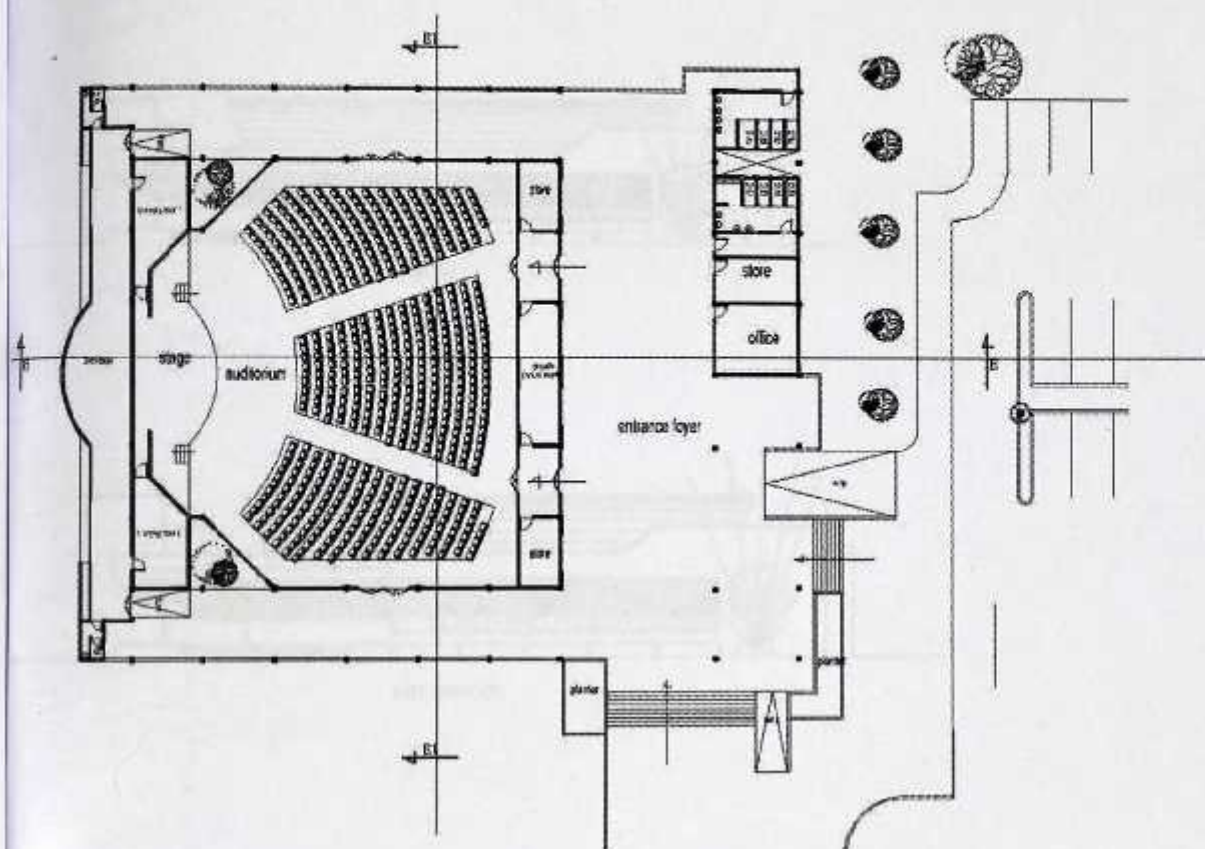
CLASSROOM BLOCK



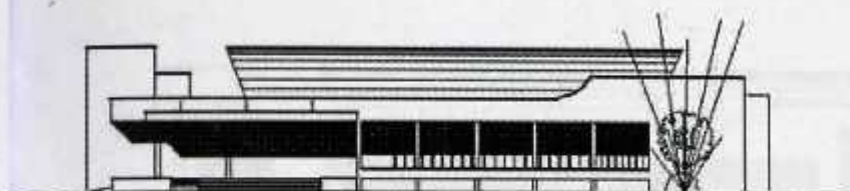
NORTH ELEVATION



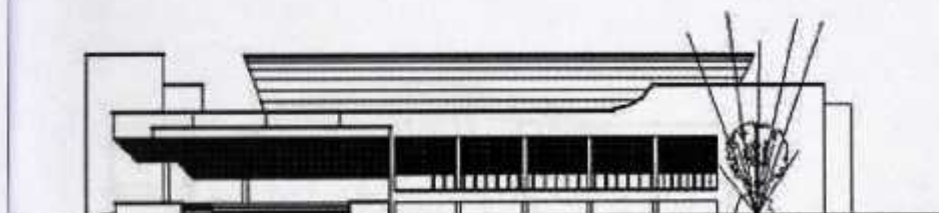
# **APPENDIX M- Plans, elevation and sections of Auditorium**



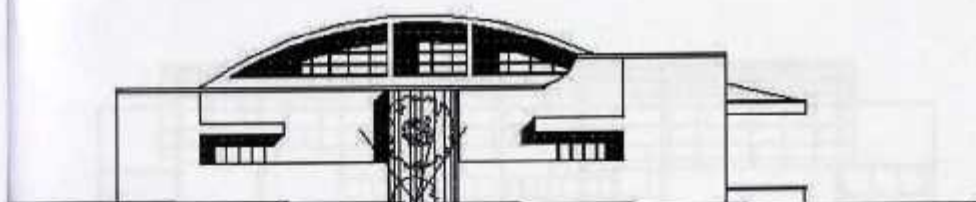
AUDITORIUM



EAST ELEVATION

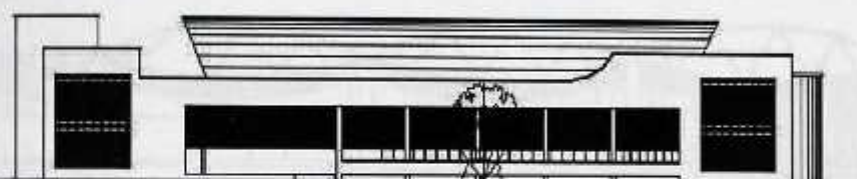


EAST ELEVATION

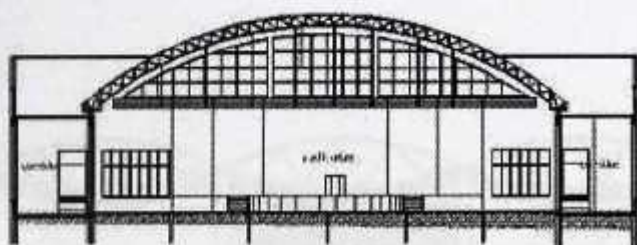


NORTH ELEVATION

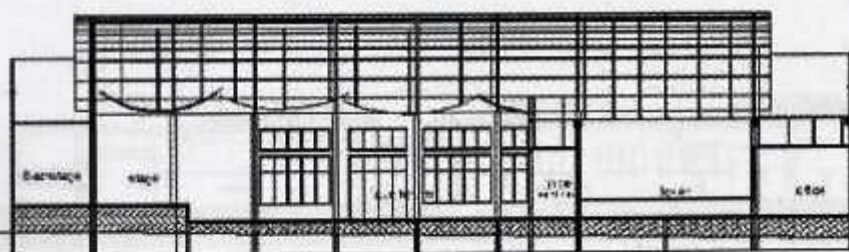
APPENDIX B: Plans, elevations and sections of Workshop (small) (part 2)



WEST ELEVATION

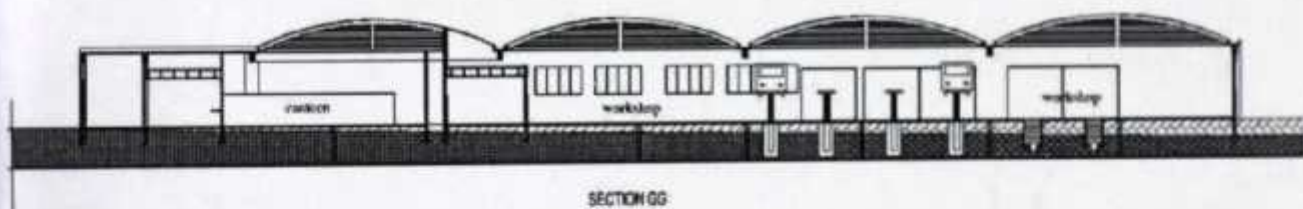
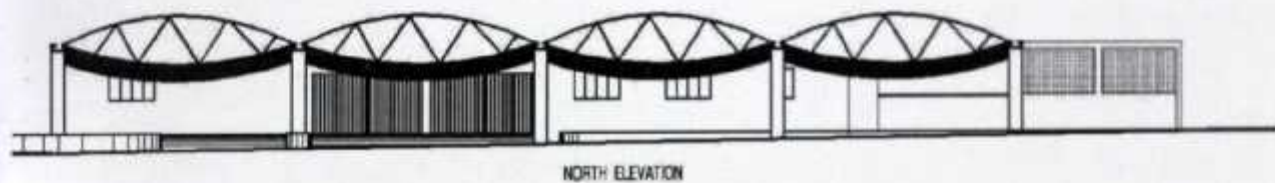


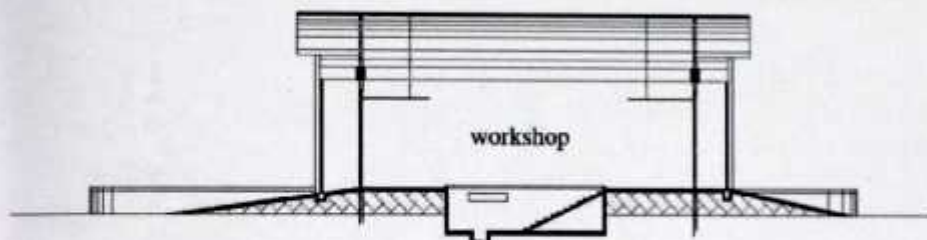
SECTION E1E1



SECTION EE

**APPENDIX N- Plans, elevation and sections of Workshop small cars-B**





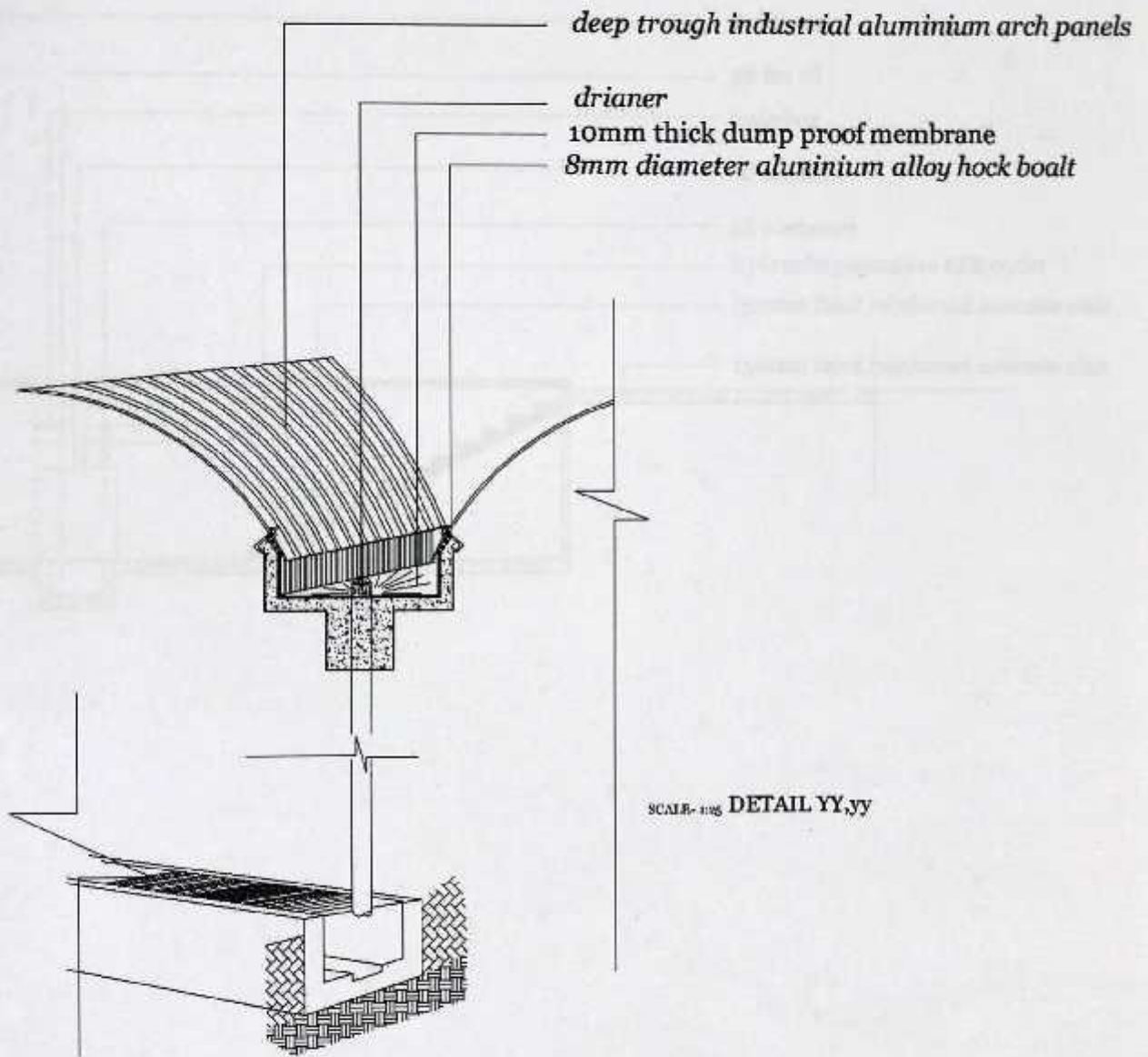
SECTION GG1

DETAIL GG SCALE 1/8" = 1'-0"

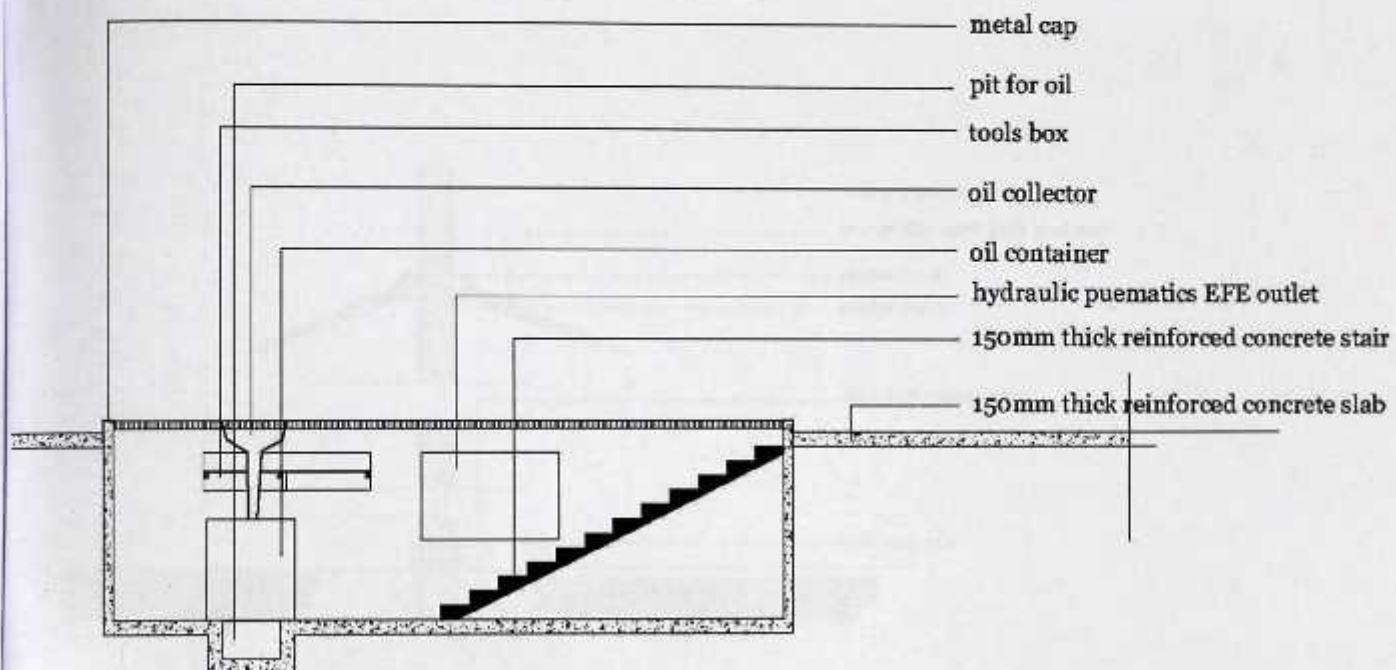
## APPENDIX O- Detail of roof of auditorium



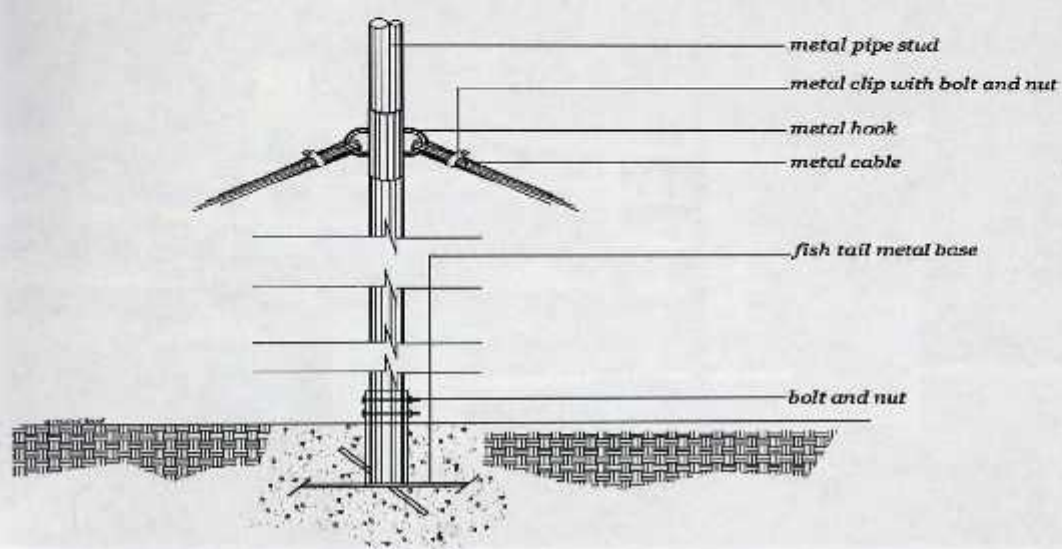
**APPENDIX O- Detail of barrel roof -workshop**



## APPENDIX P- Detail Service pit -workshop



**APPENDIX Q- Detail of metal support -workshop**



SCALE- 1:25 **DETAIL XX,xx**

## APPENDIX R- Eternal view of administration



Eternal view of administration

## APPENDIX S- Eternal view of Auditorium



View of auditorium

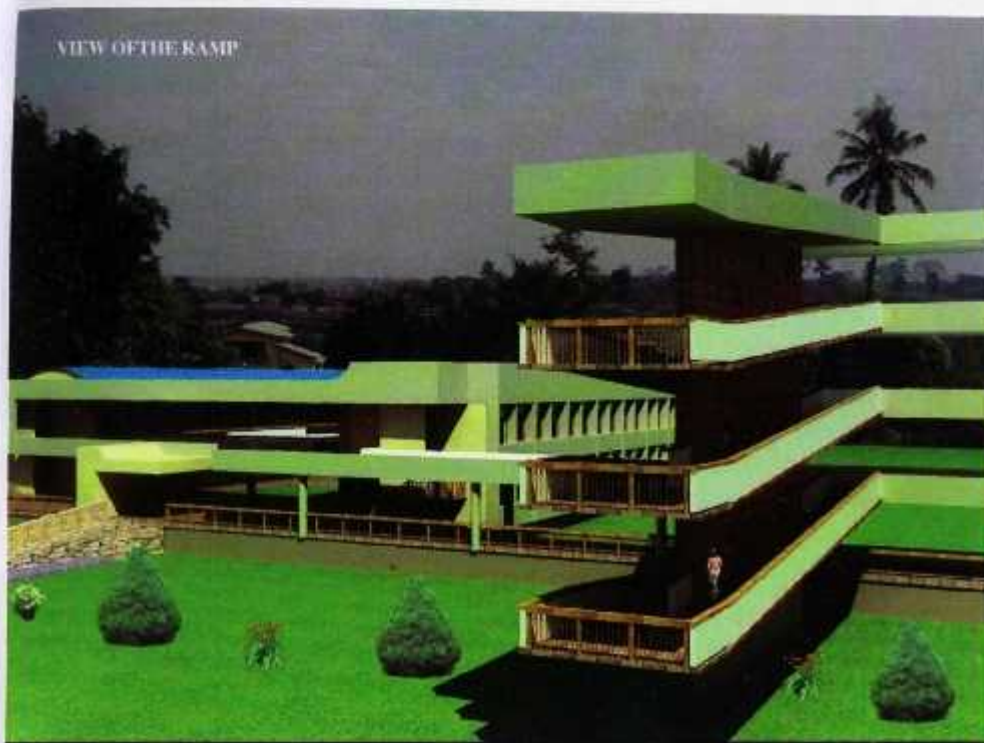
## APPENDIX T- External view of Classroom block

EXTERNAL PERSPECTIVE  
CLASSROOM BLOCK



View of classroom block

#### APPENDIX S- Eternal view of Ramp



View of the ramp

#### APPENDIX U- Eternal view Workshop –Small cars



## APPENDIX U- Eternal view Workshop –Big cars



Workshop –Big cars



**APPENDIX V**

**THESIS QUESTIONNAIRE**

**TOPIC: REDEVELOPMENT OF SUAME MAGAZINE**

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**MASTER OF ARCHITECTURE**

**JUNE 09**

**Name:**

**Sex: male [ ] female [ ]**

**Age:**

**Date:**

---

1. What is the area of your expertise? Do you have any other profession?

Ans:

2. Master or Apprentice? If Master, how many workers?

Ans:

3. How long have you been working here?

Ans:

4. What time do you come to work and from which area? What is the means of transport?

Ans:

5. What systems do you work in this area? Clusters (Precinct) or Disperse

Ans:

6. Which one do you prefer and why?

Ans:

7. How do you acquire space/land here to operate?

Ans:

8. How do customers come in, park and how are they attended to? How many customers do you normally service in a day?

Ans:

9. If cars are not service the same day, how are they secured to be operated on the following day.

Ans:

10. What are your major sources of market? Inter regional, international or both?

Ans:

11. How do you dispose of waste; dirty oil, scraps, etc?

Ans:

12. How do you bring in and store your products?

Ans:

13. Do you have any health facility at Suame magazine and if not, how far do you have to travel to get to the nearest one?

Ans:

14. Have you experienced fire outbreak in Suame Magazine before? How did it happen? Do you have safety measures to prevent fire?

Ans:

15. How often have you heard of theft cases in and around the Suame Magazine?

What security systems do you have in place? Individuals or collective security system? Ans:

16. What material do you use for building your work station and why? Cost of the material?

Ans:

17. Do you have adequate sanitary facilities? Did you build it or is being provided by the KMA or a private owner? How much does it cost to access one if you don't have it?

Ans:

18. What is the traffic situation in and around Suame Magazine? How do people maneuver their way through?

Ans:

19. Are you comfortable (noise, traffic, space) with your current workstation? If yes or no, why?

Ans:

20. What is the coordination between KMA and the workers of the Magazine? Do you pay any form of taxes and do you receive the necessary services and support of the KMA?

Ans:

21. Will you accept to have some form of formal training?

Ans:

24. Do you bring your children to work place?

Ans:

25. Do you have schools in and around Suame Magazine? If yes, do you send your children there and why?

Ans:

26. Where do you get food during break time (breakfast, lunch or supper)?

Ans:

27. Do you have banks in the area and do you save your money there? If yes or no, why?

Ans:

28. Do you have any workers associations and which one do you join? What kind of support do you receive from these associations?

Ans:

29. What is the accommodation situation for apprentices and masters? Do they sleep in the workshops or rent places in and around the suburbs?

Ans:

30. Is there any coordination between the workers of Suame and the Engineering Department of KNUST? If yes, what are the arrangements and if no why not?

31. How do you want the magazine to look like in the next 10 years? (Planning, technology and machinery)

Ans:

32. What happens when it rains? (Drainage, shelters for customers and workers, etc.)

32. Do you know the history of Suame? How it started and the various stages and transitions it has been through over the years?

Ans: