

**IMPACT OF ROAD CONTRACTOR CLASSIFICATION ON
ROAD MAINTENANCE DELIVERY IN GHANA**

BY

YEBOAH JOSEPH KWAME
B. Eng. (HONS) CIVIL ENGINEERING

**A THESIS SUBMITTED TO THE DEPARTMENT OF CIVIL
ENGINEERING,
KWAME NKRUMAH UNIVERSITY OF
SCIENCE AND TECHNOLOGY**

**IN PARTIAL FULFILLMENT OF THE REQUIREMENT
FOR THE DEGREE**

OF

**MASTER OF SCIENCE
FACULTY OF CIVIL AND GEOMATIC ENGINEERING,
COLLEGE OF ENGINEERING**

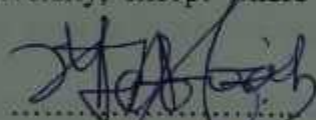
MAY 2008

LIBRARY
KWAME NKRUMAH UNIVERSITY OF
SCIENCE AND TECHNOLOGY
KUMASI-GHANA

DECLARATION

I hereby declare that this submission is my own work towards the MSc programme. And that, to the best of my knowledge, it contains neither material previously published by another person nor material which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text.

Yeboah Joseph Kwame
(PG 94347-06)


.....
Signature

31-07-08
.....
Date

Certified by:
Mr. Charles A. Adams
(Supervisor)

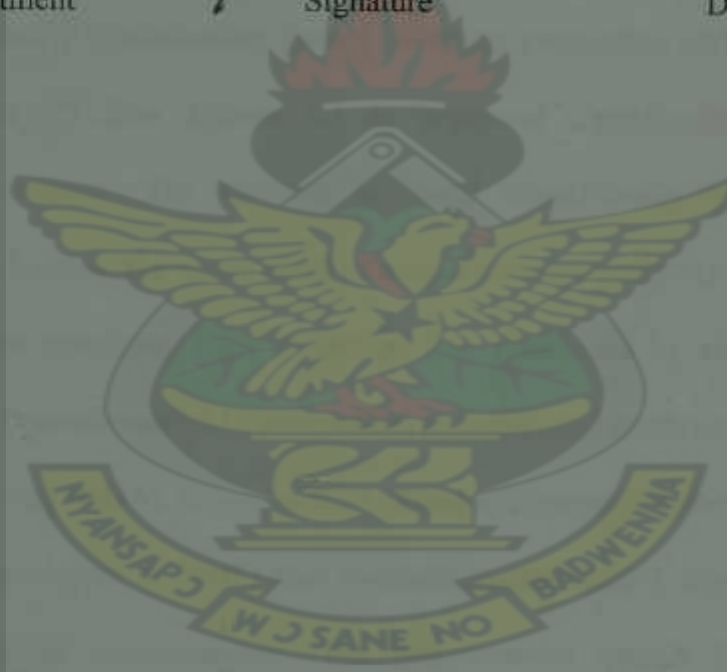

.....
Signature

31/07/08
.....
Date

Certified by:
Dr.S.I.K. Ampadu
Head of Department


.....
Signature

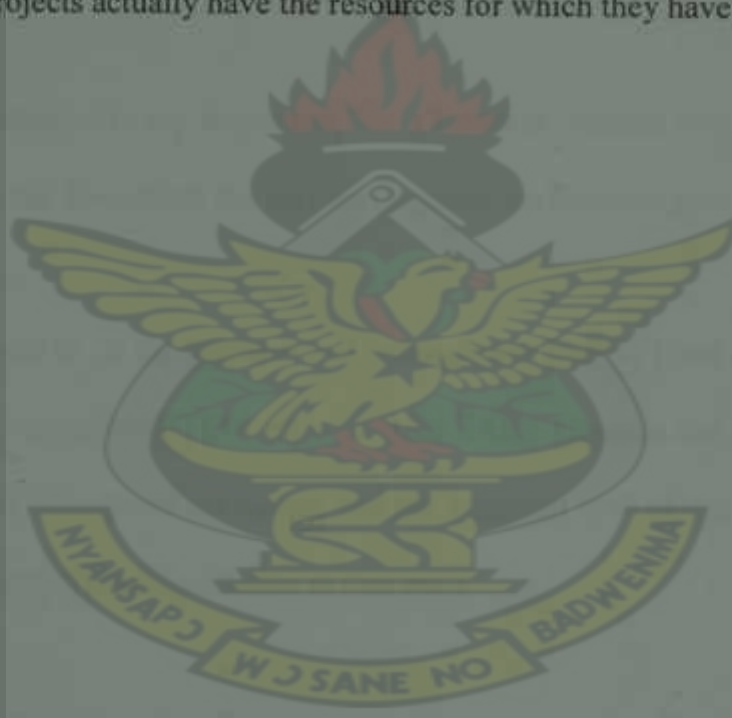
31/07/2008
.....
Date



ABSTRACT

In recent times the issue of inadequate local contracting capacity for the execution of road construction and maintenance projects seems to be assuming a disturbing national concern. Ineffective system of classifying road contractors, lack of road agency supervisory and monitoring capacity, difficulty in obtaining credit and delayed payment for certified work done, have been mentioned as factors affecting road maintenance delivery. This research seeks to assess the impact of the road contractor classification system; road contractor screening, selection and licensing for road works and in particular road maintenance services. The objectives of the study was: (1) to make a critical assessment of the procedures, requirements and features of the system, (2) Identify classification factors affecting performing and non performing contractors and (3) draw lessons for an improved classification and tendering evaluation procedures. The research reviewed classification systems of some countries to understand the frame work of a road contractor classification system and to learn of best practices. Data collection was conducted by administering four different survey questionnaires to contractors, regional road agency staff of the Ghana Highway Authority (GHA), in two regions. Road maintenance managers of GHA and Ministry of Transportation (MoT) road contractor classification committee members also responded to questionnaires. The questionnaire sought to establish the procedures, criteria, method of evaluation of contractors' application information by the classification committee members. Based on 15 performing and 15 non performing previously selected contractors, road managers evaluated contractor classification factors that influenced the success or otherwise of completed or ongoing projects in the period 2002- 2007. The results show that lack of a proper legal status / structure of the road contractor classification system, weak verification and

ineffective evaluation of contractor information results in an adhoc contractor registration and management, inadequate regulation and monitoring. Although the registration system in Ghana has achieved some modest gains in eliminating unsuitable and quack contractors, there is the need to create a separate department, council or board with legal status with a well resourced professional secretariat to be in charge of contractor grading, registration, monitoring and enforcement of contractor classification criteria. Verification and inspection of contractor facilities would then be intensified. In addition the adoption of a point system of evaluating contractors' information at classification would ensure that contractors tendering for road agency projects actually have the resources for which they have been classified.



LIBRARY
KWAME NKRUMAH UNIVERSITY OF
SCIENCE AND TECHNOLOGY
KUMASI-GHANA

ACKNOWLEDGEMENTS

I am grateful to the Kwame Nkrumah University of Science and Technology, the College of Engineering, especially the Ministry of Transportation and the Ghana Highway Authority for sponsoring me for the programme.

I am ever grateful to God who gave me this topic to work on in order to join many other senior colleagues who have been contributing to the challenges in the use and practice of the Road Contractor Classification system in Ghana and its intended contribution to the grading of contractors for road maintenance services delivery.

I am highly indebted to my supervisor Mr. Charles A. Adams who dedicated all his efforts guiding me throughout the various stages of the thesis project.

I am also grateful to all the lecturers and management staff of Road & Transportation Engineering Programme (RTEP) especially Dr S.I.K. Ampadu and Dr M. Salifu for their inspiration throughout the course and the Regional staff of the Ghana Highway authority for most of the consultation in this work.

My sincere thanks go to my wife, Madam Florence and my children, Emmanuela, Mary and Elizabeth Yeboah and my congregation members for their prayer support during this Masters Programme.

TABLE OF CONTENT

ABSTRACT	II
ACKNOWLEDGEMENTS	IV
LIST OF TABLES.....	VIII
LIST OF FIGURES.....	IX
1. INTRODUCTION	1
1.1 Background	1
1.1.1 Road Maintenance Delivery Before 1983	1
1.1.2 Institutional and Policy Reforms	2
1.1.3 The Road Contractor Classification Scheme	3
1.2 Problem Statement	4
1.3 Justification for the Research.....	5
1.4 Objective.....	5
1.5 Scope of Study.....	6
1.6 Thesis Structure	6
2. ROAD CONTRACTOR CLASSIFICATION SYSTEMS	7
2.1 Contractor Development Module.....	7
2.1.1 Contractor Registration and Regulation	7
2.1.2 Contractors can be regulated through a registration system.....	7
2.1.3 Training and mentoring	8
2.1.4 Continuous contractor assessment and grading	8
2.2 Role of Contractors	9
2.2.1 Creation and operation of contractors associations	9
2.3 Frame work of the Road Contractor Classification Systems.....	10
2.3.1 Structure and Legal Framework	10
2.3.2 Contractor Classification Categories	11
2.3.3 Procedures for road contractor classification	11
2.4 Criteria	13
2.4.1 Staff Requirement.....	13
2.4.2 Offices /Workshop Conditions Requirements.....	13
2.4.3 Experience Requirement.....	13
2.4.4 Financial Capacity	14
2.4.5 Occupational Health & Safety	14
2.4.6 Equipment.....	15

2.5	International experience	15
2.5.1	State of Tasmania (Australia)	15
2.5.2	Tanzania Contractor Registration System	17
2.5.3	South Africa Construction Industry Development Board	18
2.5.4	Singapore	19
2.6	Road Contractor Development in Ghana.....	19
2.6.1	Registered Contractors	19
2.6.2	Ghanaian Owned Firms	21
2.6.3	Development of the Ghanaian Construction Capacity in Ghana.....	22
2.6.4	Changes in Business Practices.....	22
2.7	Organisational Models.....	23
2.7.1	In – house Works Unit (Direct Labour).....	23
2.7.2	Conventional Contractor Model	23
2.7.3	Performance based contracts	24
2.8	Works Procurement	24
2.8.1	Procurement Method	25
2.8.2	Packaging of Maintenance Works and Contractors' Workload	25
2.8.3	Contractors Workload.....	26
2.9	Road Contractor Classification System as it Operates in Ghana	26
2.9.1	Contractor Classification Categories	27
2.9.2	Classification Requirements	28
2.9.3	System Procedures.....	29
2.9.4	Verifications/Evaluation	30
2.9.5	Monitoring	31
2.10	Factors affecting road maintenance contractor performance.....	31
2.10.1	Financial	31
2.10.2	Delay Payment of Interim Certificate.....	32
2.10.3	Financial Management and Lack of access to plant and equipment	32
2.10.4	Technological/Managerial Factors	33
3.	METHODOLOGY	34
3.1	Qualitative Method.....	34
3.2	Quantitative Method	34
3.2.1	Questionnaire to Contractors	35
3.2.2	Questionnaire to GHIA	36
3.2.3	Questionnaire to Road contractor classification committee.....	37
3.2.4	Scope of Works	37
3.3	Data Analysis.....	37
4.	RESULTS AND DISCUSSIONS.....	38
4.1	Road Contractor Registration System in Ghana.....	38
4.1.1	Existence of a Road Contractor Registration Board.....	40

4.1.2	New Registration/Upgrading and Renewals.....	41
4.1.3	Data Verification/Evaluation.....	44
4.1.4	Requirements for Classification	46
4.1.4.1	Financial Requirement.....	49
4.1.5	Monitoring and Enforcement.....	49
4.2	Results of Questionnaire Survey	51
4.2.1	Contractor and Office location	52
4.2.2	Characteristics of Contractors Responding to Questionnaire.....	53
4.3	Maintenance Workload of Classified Road Contractors.....	53
4.4	Equipment and Classified Road Contractors	57
4.4.1	Equipment Ownership Status	59
4.5	Effect of Contractor Full Time Technical Staff.....	61
4.6	Contractor Financial Capability.....	65
4.6.1	Access to Advance Mobilisation Loan/credit and Performance	66
4.7	Appreciation of Effectiveness and Quality of the Road Contractor Classification from Contractors point of view	68
4.8	Assessment of Contractor Classification System Impact from Supervisors Point of view	69
4.9	Summary of Findings.....	70
5	CONCLUSIONS AND RECOMMENDATIONS	73
5.1	Conclusions.....	73
5.2	Recommendations.....	74
	BIBLIOGRAPHY.....	76
	APPENDICES.....	78

LIST OF TABLES

Table 2.1: Detailed Financial Requirements for the Road Works Category in Tanzania. (Figs. in T.Shs.Million).....	11
Table 2.2: Experience Requirement	14
Table 2.3: Financial Requirements.....	14
Table 2.4: Tanzania Contractor Registration criteria and weightings	18
Table 2.5: Contractor's Annual Turnover requirement for the last five years	28
Table 2.6: Contractor's Rating Capital.....	29
Table 4.1: Zambia Road contractor registration criteria and weightings.	42
Table 4.2: Criteria and Verification Procedures adopted in the Contractor Registration System in Ghana.....	45
Table 4.3: Structural Indicators for Road Contractor Classification Systems in Various Countries.....	51
Table 4.3: Contractors and their Location	52
Table 4.4: Distribution of the Evaluated Performing and Non performing contractors	52
Table 4.5: Distribution of Maintenance work among Classified Road Contractors ...	54
Table 4.6: Performing and Non Performing contractors for various activities	55
Table 4.7: Trend of contractors and Performing and Non performing projects.....	56
Table 4.8: Compliance and shortfalls of equipment holding.....	58
Table 4.9: Equipment ownership among contractors.....	59
Table 4.10: Compliance to equipment requirement on site A1B1 and A2B2 Contractors.....	60
Table 4.11: Compliance to equipment requirement on site A3B3 and A4B4 contractors	60
Table 4.12: Effect of lack of Equipment on Performance.....	61
Table 4.13: Employment of Engineers	62
Table 4.14: Employment of Quantity Surveyors.....	62
Table 4.15: Employment of Land Surveyors.....	62
Table 4.16: Employment of Material/Soil Technician	63
Table 4.17: Distribution of inadequate full time technical Personnel	65
Table 4.18: Contractor source of funding.....	65
Table 4.19: Access to Advance Mobilisation Loan/credit and Performance	67
Table 4.20: Contractors Assessment of Achievements of the Road Contractor Classification System	68
Table 4.21: Road Managers Assessment of workings of the Road Contractor Classification System	69
Table 4.22: Problems/Concerns of Road Contractors	70

LIST OF FIGURES

Figure 2.1: Registered contractors, by category and class as at the end of December 2007.	20
Figure 2.2: Distribution of contractors by dominant combined size A1B1-A4B4.....	21
Figure 4.1: Flowchart of Activities and Procedure of the Road Contractor Classification in Ghana.....	39
Figure 4.2: Ranking of classification factors (Committee)	46
Figure 4.3: Ranking of classification factors by contractors	47
Figure 4.4: Distribution of Contractor class and performance on projects.	57



CHAPTER 1

1. INTRODUCTION

1.1 Background

Most African governments especially in sub Saharan Africa including Ghana has taken the bold step to respond to the Road Maintenance Initiative (RMI) project of the Sub Saharan African Transport Policy Programme to halt the decline of road deterioration. The evidence is seen in the heavy capital investment on road development and maintenance over the years. From 2000-2005 according to Ministry of Transportation (MoT Statistics, 2000-2005) the government of Ghana's spending on road infrastructure development amounted to \$135.90m compared to \$398.20m spent on road maintenance during the same period. Most of which were undertaken by local private road contractors.

The RMI document made the point clear that developing countries have lost and are still losing precious infrastructure worth billions of dollars through neglect of road networks built previously at great expense (The World Bank, 1988).

1.1.1 Road Maintenance Delivery Before 1983

Prior to 1983 the management of Ghana's road network was under the sole mandate of the Ghana Highway Authority (GHA) which had the responsibility to plan, implement and maintain all trunk, urban and feeder roads in Ghana (Kwakye, 2002).

GHA concentrated mostly on trunk and urban roads to the neglect of feeder roads.

There were also inadequate force account personnel to meet construction and maintenance needs of the road network, budget allocation meant for works were used to maintain the large fleet of construction equipment and staff, there was also no clear

distinction between the client and contractor roles since GHA had the mandate to act in all those capacities.

1.1.2 Institutional and Policy Reforms

In 1983 Ghana embarked upon institutional and policy reforms within the roads sub sector under its Economic Recovery Programme (ERP) with support from the World Bank aimed at reversing decades of the worsening condition of most of its road network.

Government created a new sector Ministry of Roads and Highways (MRH) now Ministry of Transportation to highlight its political commitment to road sector reforms. Two new agencies were later created namely the Department of Feeder Roads in charge of feeder roads network and the Department of Urban Roads in charge of Trunk Roads.

To arrest the decline in road infrastructure and to clear the backlog of road maintenance there was a shift in policy from force account maintenance to private sector maintenance services delivery with the purpose of streamlining the separate roles of client and provider of maintenance services and to ensure efficiency in maintenance operations and delivery (Kwakye, 2002).

One of the underpinning strategies for private sector participation was the development of a local contracting capacity.

In the process, a road contractor selection scheme was embarked upon in Ghana for the selection and registration of local contractors for use in the field of road

construction, rehabilitation and maintenance which was the sole preserve of foreign contractors (Rausch, 1994).

1.1.3 The Road Contractor Classification Scheme

Ghana developed a system of road contractor registration in 1985 operated by the then Ministry of Roads and Highways (Bentall et al, 1999). This enables contracts to be classified for bridge and road works by value and complexity. Contractors are registered within the appropriate category based on:

- Years of Relevant Experience
- Financial Capabilities
- Equipment Holding
- Human Resource capacity

The scheme aims at the proper grading of road contractors into their respective categories (Roads, Bridges and culverts, Steel works, Labour works, Bituminous surfacing works, Traffic signs and miscellaneous) and financial classes 1, 2, 3 and 4. To achieve this, a system consisting of procedures and requirements to be fulfilled by prospective contractors lead to their classification into an appropriate class, placing them into a register of contractors of good standing. The classification into an appropriate category and classes are required before a contractor can bid for government projects (MoT, guidelines for the Classification of Contractors for Road and Bridge Works). In general the road contractor classification system seeks to:

- Pre-qualify contractors and create a basket of competent contractors of various capabilities from which government can access to undertake road works of all categories
- Issue a road contractor license that enables individual contractors to be eligible to bid for public works in the road sector and,

- And thereby helping to develop emerging contractors and to regulate the road construction industry which leads to access creation, employment and development.

1.2 Problem Statement

The road contractor classification system has been practiced in Ghana for over two decades. The Draft National Road Transport Policy 2006 reveals that Ghana's local construction industry is not well managed and the system of classifying road contractors is not effective.

It put a demand on the government to improve how it classifies contractors, programs work, awards contracts, pays for work and recommends that a better system for classifying road contractors, awarding contracts, programming works and timely payments for work done in the short term be implemented.

Also in recent times the Ministry of Finance and Economic Planning has planned to tighten its knots on consultants and contractors in order to address national concerns over road contractors poor performance, abandoning of projects, inability to meet deadlines and poor work quality which has often led to contract termination, repackaging and re-award at a great cost to the tax payer therefore defeating the very objective of private sector participation.

The above unfortunate situation has resulted in the sinking image of local road contractors and thereby questioning the integrity of the procedures, requirements and enforcements within the road contractor classification system which is deemed to provide a register of contractors of high calibre and competence which are factors that contribute to achieving good quality works and thus value for money.

Also from the Road Sector Development Programme (RSDP) annual review reports, issues such as lack of contractor capacity, over classification of contractors are among many of the reasons of poor performance being recorded on the on-going RSDP contracts.

Other perceived problems plaguing the road construction industry are being attributed to the fact that a significant proportion of today's contractors are in a profession they have little knowledge of (Ofori, 1991).

1.3 Justification for the Research

The research results will provide the necessary knowledge and basis for the improvement of road contractor classification and award of contracts. It would also contribute to addressing contractor poor performance, abandoning of projects and inability to meet deadlines as well as strengthening the integrity of the procedures, requirements and enforcements in the classification of contractors for the procurement of road works and thereby contributing to the streamlining of the contracting business.

1.4 Objective

The specific research objectives are to:

1. Undertake a critical assessment of the contractor classification system as it operates in Ghana.
2. Determine the effect of road contractor classification factors on performing and non performing road contractors in the last 5 years.
3. Draw lessons for an improved classification and tendering evaluation procedures.

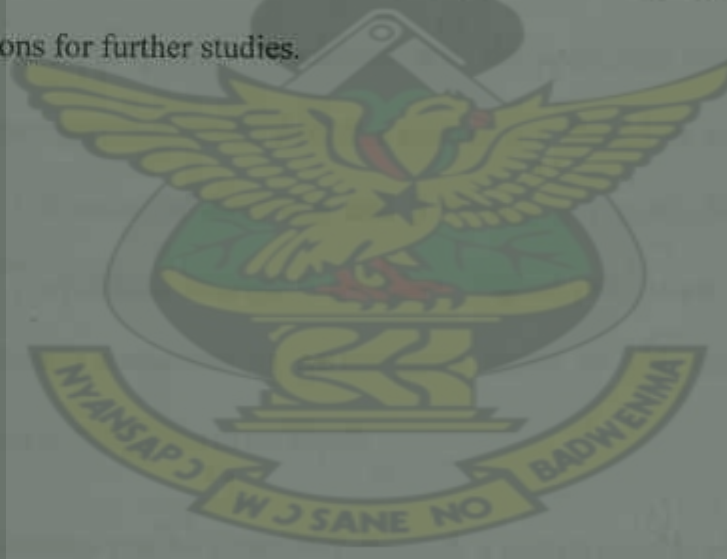
1.5 Scope of Study

The research used a sample of classified road contractors operating in Ashanti and Greater Accra Regions in the period 2002-2007. The targeted contractor categories were A1, B1 to A4, B4. Much of the material was based on interview and data retrieved from the Ministry of Transportation (MoT) and its agencies.

1.6 Thesis Structure

For the rest of the document, chapter 2 gives an account on international experience on Road Contractor Classification System, structure and legal framework, procedures, requirements, monitoring and enforcement.

The methodologies employed for the data collection are outlined in Chapter 3. Chapter 4 discusses the results obtained. Chapter 5 covers the conclusions and recommendations for further studies.



CHAPTER 2

2. ROAD CONTRACTOR CLASSIFICATION SYSTEMS

2.1 Contractor Development Module

Due to a significant socio-economic role of construction industries in developing countries, Dlungwana and Rwelamila (2002) argues for increased effort in the programmes that promotes the implementation of well-structured contractor development models and supportive procurement programmes in order to improve technical and managerial skills, knowledge and competitiveness of contractors. Some contractor development models are outlined below.

2.1.1 Contractor Registration and Regulation

Since development resources are limited, it is important that only contractors which show good potential to succeed be selected. It is also important that they be selected in a fair and transparent manner. Selected contractors should be properly registered and categorized in terms of their size and performance capabilities with a view to assisting their progression through subsequent higher categories. Some contractor registration schemes make use of performance scores to rate the performance of contracting firms (Dlungwana et al, 2002).

2.1.2 Contractors can be regulated through a registration system

Many countries have set up a national system that classifies contractors according to financial and technical capability. Andreski (1997) observes that care needs to be taken that such systems do not become rent-seeking exercises where contractors just pay for the classification they want, so inspection and verification of contractors' resources is essential. Registration systems may be more effective at provincial or

zonal level where the logistics of verification are much easier. Contractors are upgraded or down graded depending on performance.

Contractor registration systems are a means of pre-qualifying contractors for small sized works such as routine and periodic maintenance works of shorter lengths and duration as is currently practiced in Ghana. As a pre-qualification instrument for small works it ensures the removal of questions about contractor capability to undertake government advertised jobs when the criteria, verifications, inspections and monitoring systems are well implemented (Robinson et al, 1998).

2.1.3 Training and mentoring

Training and mentorship needs are identified, based on the results of the assessment exercise, and an appropriate training and mentorship intervention is developed. Training and mentorship revolves around the contractor's business management skills and knowledge, such as tendering and marketing, thus affording contractors an opportunity to gain basic capability or a competitive edge in comparison to their counterparts (Dlungwana et al, 2002).

2.1.4 Continuous contractor assessment and grading

Another fundamental process in developing contractors includes a continuous cycle of contractor's performance assessment and improvement. This process serves as feedback mechanism to monitor the development process on a continuous basis to validate the changing status of contractors as performance improves or deteriorates.

The implementation of development models requires serious commitment, planning and resource allocation by the managers of government agencies, to enable confident entrepreneurs to grow their businesses and create sustainable employment (Dlungwana et al, 2002).

2.2 Role of Contractors

The role of contractors is essential for the training of workers, employees and managers. It constitutes a preferential way of transferring and adapting to technologies and know-how (Rausch, 1994).

- Contractors are subject to taxes
- Contracting out work creates a frame work for successful cooperation between public services and the private sector.
- The employment of contractors makes possible a better control of the disbursement of public funds.

But there are inherent disadvantages to this method:

- Contracting out of works usually necessitates precise studies and of accurate tender documents.
- Some types of works cannot be defined with accuracy through unit prices prior to their realization.
- The framework imposed by a contract leaves little room in which to adapt the works programme to the local conditions, which is an important feature when carrying out routine and periodic maintenance on roads.

2.2.1 Creation and operation of contractors associations.

These associations enable contractors to promote and defend their interests as a group and this has much more weight than individuals. They can agree contract conditions, payment procedures and regulations with Government or other major clients. They can provide advice, training, financial support and improved access to banking, insurance, materials and equipment to their members. Larcher and Miles (2000) identified four issues that must be addressed when planning a contractors association:

- 1) It must be accepted by Government as representing their group, 2) Funding must be

available through membership fees or grants, 3) There must be a good number of members and 4) Like any other organization, it must have a good leadership and management.

2.3 Frame work of the Road Contractor Classification Systems

The following features are identified in a road contractor classification system:

- Structure and Legal framework
- Categories
- Procedures
- Requirements
- Monitoring and enforcement

These features if in place provides a fair and transparent registration criteria, which would provide an opportunity for contractors to access jobs in a fair and transparent manner, facilitates growth, provide a regulatory and development framework and enhance performance. An efficient classification scheme is also aimed to support risk management in tendering process and reduce tendering cost to both clients and contractors (Uriyo et al, 2004).

2.3.1 Structure and Legal Framework

A good number of countries operate contractor registration schemes under the mandate of statutory bodies established by adequately framed Acts of Parliament such as in South Africa, Botswana, Tanzania, Egypt and Singapore and Tasmania - Australia (Uriyo et al 2004). These bodies may be independent institutions or separate government departments or secretariats that are solely responsible for registration, regulation and promotion of contractors. The departments may be headed by a registrar of contractors.

2.3.2 Contractor Classification Categories

Categorization consists of main categories based on construction activities according to the different discipline and sub categories which allow for specialization. The categorization encompasses the various activities involved in the various engineering disciplines (civil, mechanical, electrical etc) or may be limited to only aspects of civil engineering construction and maintenance such as roads and bridge works. Categories are further divided into wider class limits ranging from 1-6 based on level of experience, qualifications of staff, turnover, capital, equipment and plant possession. Table 2.1 provides an example of the financial requirements for the Road Works Category in Tanzania.

Table 2.1: Detailed Financial Requirements for the Road Works Category in Tanzania. (Figs. in T.Shs.Million)

Criteria	CLASS						
	1	2	3	4	5	6	7
Limit for any single tender	Unlimited	4,500	1500	750	450	200	100
Average Turnover	900	450	150	75	45	14	N/A
Liquidity	300	150	50	10	6	2	N/A
Fixed Assets	1200	200	200	50	30	10	N/A

(Source: Tanzania Construction Registration Board, 2005)

2.3.3 Procedures for road contractor classification

2.3.3.1 Application

Application should be submitted on prescribed application form issued by the appropriate authority upon payment of an application fee. The duly filled application form should include information shown in the checklist in the form (Uriyo et al 2004). An application shall be considered complete, ready for evaluation and submitted to the classification authority, only if the application has been properly filled, and all necessary information and attachments submitted.

2.3.3.2 Data Verification

Data verification involves obtaining independent comments and recommendations from the referees, clients and consultants.

2.3.3.3 Inspection of Applicant's Premises/ Facilities and Resources

This is an important step in the registration process, where a team from the contractor registration outfit or secretariat or its appointed agents inspects the contractor's offices, equipments and other facilities and confirms application data.

2.3.3.4 Data Evaluation and Approvals

The secretariat upon inspection of offices, establishment and projects evaluate the data collected and compare it against the criteria set in the classification system. The council or committee responsible for registration considers the recommendations made by the secretariat for registration of any contractor and makes decision as appropriate (Uriyo et al, 2004).

2.3.3.5 Recommendations

In the determination of an appropriate class for registration as a contractor, it is recommended to establish an objective system of awarding points to the various criteria as shown below:

Qualification of staff	20%	Work experience	10%
Vehicles and Plant	15%	Location of office	5%
Working capital	15%	Experience with labour	5%
Landed property	15%	other specific considerations	5%

(Bentall et al, 1999)

An applicant must obtain a minimum score of 50% under each particular requirement and a minimum overall score of 60% for an applicant to qualify for registration.

2.4 Criteria

To facilitate a fair and transparent registration process there is the need to put in place detailed registration criteria such as staff requirement, offices/workshop conditions, experience, financial, occupational health and safety and equipment.

2.4.1 Staff Requirement

The competency and qualifications of staff is essential to any contracting firm. In order to instill professionalism into the contracting firms, a requirement for Technical Director is made a principal registration requirement. The Technical Director is a share holder or partner who can influence important decisions as regards the technical aspects which cannot otherwise be instilled by an employee.

2.4.2 Offices/Workshop Conditions Requirements

A contractor, be it big or small, is obliged to have an established office from which to operate from. This facilitates contact with the client institution, and is a basic step in establishing a business.

2.4.3 Experience Requirement

The track record of a firm is an important tool for assessing the competency of the firm. Applicants are expected generally to have executed construction works similar to the grades for which they wish to be registered.

The experience of firms applying for upgrading and renewals other than new entrants should be assessed in terms of years of practice in the field of application, average size of at least three projects and a maximum size of any single project. New entrants are not assessed based on the need to allow entry and the fact that risk is low. An example of a detailed experience requirement for each class is shown in Table 2.2.

Table 2.2: Experience Requirement

	Experience	Minimum Requirement
1	Years of practice in the field of application	Class 1 10 years Class 2 7 years Class 3 5 years Class 4 3 years
2	Average size of at least 3 projects executed in the years of practice or since last upgrading	At least 30% for classes 1-2 ,20 % for Class 3 and 15% for classes 4 of present class limit
3	Maximum size of any project executed in the years of practice or since last upgrading	

(Source: National Council for Construction, Zambia 2004)

2.4.4 Financial Capacity

Financial resources are very crucial in the construction process, as a contractor is usually required to meet several financial commitments in the process of preparing and implementing a project. Applicants are to show that they have sufficient resources to meet the financial commitments which would normally arise. Financial requirement are also set in terms of annual turnover, liquidity and asset value for upgrading and first registration and related to the single limit of contract allowed by a contractor in each class as shown in Table 2.3.

Table 2.3: Financial Requirements

	Class 1-2	Class3-4
Av. Annual Turnover	15% of Class Limit	15% of Class Limit
Liquidity	15% of Class Limit	2% of Class Limit
Assets	20% of Class Limit	2% of Class Limit

(Source: National Construction Council, Zambia 2004)

2.4.5 Occupational Health & Safety

The health and safety of workmen and general public in the work place is one of the most important responsibilities of any contractor. At the time of registration contractors submit a safety policy committing them to adherence of best safety practices.

2.4.6 Equipment

Equipment requirement enables contractors to own equipment. Equipment holding requirement is essential in terms of contractor performance (Bentall et al, 1999). Contractors are required to produce the document of proof of ownership.

2.5 International experience

International experience involving the study of other countries contractor classification systems were chosen to provide practical examples of a range of countries , conditions and experiences with particular reference to critically assessing the Ghana Road Classification scheme and to provide a base line comparison of best practices.

2.5.1 State of Tasmania (Australia)

In Tasmania all Contractors who wish to offer services to the Tasmanian Government for road works contracts must be pre-qualified with the Department of Infrastructure, Energy and Resources (DIER).

The aim of pre-qualification is to classify contractors according to their expertise and capabilities in specific work categories. The classification categories are as follows:

- Road works
- Bridge works
- Road and Bridge maintenance works

DIER maintains a register of pre-qualified contractors. The register provides a record of Contractors' expertise; experience; capacity to perform and a history of their performance on government projects.

Qualification into an appropriate category is based on an assessment of all the criteria set out below:

- Business information
- Registration categories
- Quality assurance
- Company organization
- Personnel
- Project experience and performance
- Financial information
- Occupational health and safety information and
- Environment.

To ensure transparency contractors are advised of the assessment results in writing as being pre-qualified for a particular category(s), pre-qualified but with restrictions applied or unsuitable for registration in a particular category.

The limit for registration in all categories is for two years and contractors are advised, in writing, when registration is due for renewal. Renewal or Upgrading are approved based on the assessment of the initial registration criteria and additional criteria such as past performance on those projects, time management, Quality assurance, Occupational Health & Safety and Environment systems, management, supervisory and construction personnel, capability for the co-ordination of subcontractors, affiliation and subcontractor arrangements, commitment to best practice and duration of operation as a contractor.

A Tasmania Code of Conduct of Practice for the Construction Industry has been instituted and lodgment of an application constitutes the contractor's agreement to comply with the code, failure of which may result in a formal warning, a partial exclusion from tendering opportunities or preclusion from all contracts for a specific period.

Other aspects of the Tasmania contractor registration system include maintenance of a database by the Tasmanian Treasury of information on all registered contractors that is password protected and intended solely for use by agency officers engaged in project procurement.

DIER requires that contractors, seeking registration maintain a Third Party quality system that has procedures that satisfy the key system elements of AS/NZS ISO 9001:2000. In addition financial information such as audited accounts, balance sheet/profit and loss statements and annual turnover must be reviewed by reputable third party financial services professionals such as Klyn Peat Marwick Goerdeler (KPMG). (Reference: Tasmania Guidelines for Registration as a pre-qualified contractor for civil works contracts, Department of Infrastructure, Energy and Resources).

2.5.2 Tanzania Contractor Registration System

Tanzania has a Contractor Registration Board (CRB). The Act of Establishment of 1997 has mandated the CRB the functions of over sighting and regulating contractors' activities in Tanzania. The Tanzania Contractor Registration Board is responsible for registration, regulation and promotion of contractors in Tanzania. It categorizes contractors into seven classes depending on level of experience, qualification of staff, turnover, capital, equipment and plant possession. It conducts annual evaluation of the performance of contractors. The TCRB uses a point system in classifying and grading contractors as shown in Table 2.4 (source: www.crbtz.org/documents/ACMProc2005).

The requirements are that each class applied for by the applicant must obtain a minimum score of 50% under each particular requirement, and a minimum overall score of 60% for an applicant to qualify for registration (Bentall et al, 1999).

Table 2.4: Tanzania Contractor Registration criteria and weightings

Vehicles and Plant	20%	Work experience	10%
Landed Property	15%	Office and Service facility	5%
Qualification of staff	25%	Experience with labour	5%
Working capital	15%	Other specific considerations	5%

(Source: Contractor Registration Board Tanzania 2005)

The Tanzania registration criteria lay more emphasis on qualification of key technical staff, vehicle and plant, working capital and landed property in descending order. It keeps a project register. Application forms used for new applicants and those for upgrading are differentiated. Registration procedures and requirements for Technical Directors and skilled personnel are strict.

2.5.3 South Africa Construction Industry Development Board

South Africa has promulgated an Act of Parliament establishing an independent Construction Industry Development Board in recognition of the indispensable role played by the construction industry in South Africa. The act has established a public sector register of contractors to support risk management in tendering process, reduce administrative burden associated with the award of contracts; reduce tendering cost to both clients and contractors, assess the performance of contractors in the execution of contracts and thus provide performance record of contractors.

The board stores data on the size, distribution of contractors operating within the industry, volume, nature, and performance of contractors as well as a register of projects. (South Africa Construction Industry Development Board Act [No. 38 of 2000])

2.5.4 Singapore

Singapore has a Contractor Registry administered under the Building and Construction Authority (BCA) to serve the procurement needs of government departments. The scope of registration consists of 6 main categories sub divided into 6-7 financial classes. Its experience requirement is measured by the last three years of completed projects whose total value must at least be equal to the tendering capacity of the grade applied, the paid up capital net worth must meet the tendering limit of the financial grade applied. Applicant's key personnel must be full time. Application submitted must be accompanied by educational certificates and licenses for verification (Source: www.bca.gov.sg/ContractorsRegistry)

2.6 Road Contractor Development in Ghana

The structure of the road construction industry in Ghana is characterized by a multiplicity of small firms. A list of registered contractors from the Ministry of Transportation (MoT) exists only from July 2007 onwards. Previous data is not available. The list of registered contractors show a total of 2171 road construction firms spread over the country, 54 % of this figure falls within financial class A3B3 and A4B4 which for the purposes of this study are emerging contractors with low capacity.

2.6.1 Registered Contractors

As of November 2007 the road industry had 2171 contractors registered with the Contractor Classification Committee as depicted in Table 1 Appendix B. There is generally an average registration of 338 contractors per month between July-November 2007 with the number of A2B2 contractors increasing from an average of

50 contractors to 760 in one month alone between October and November 2007 as seen in Figure 2.1.

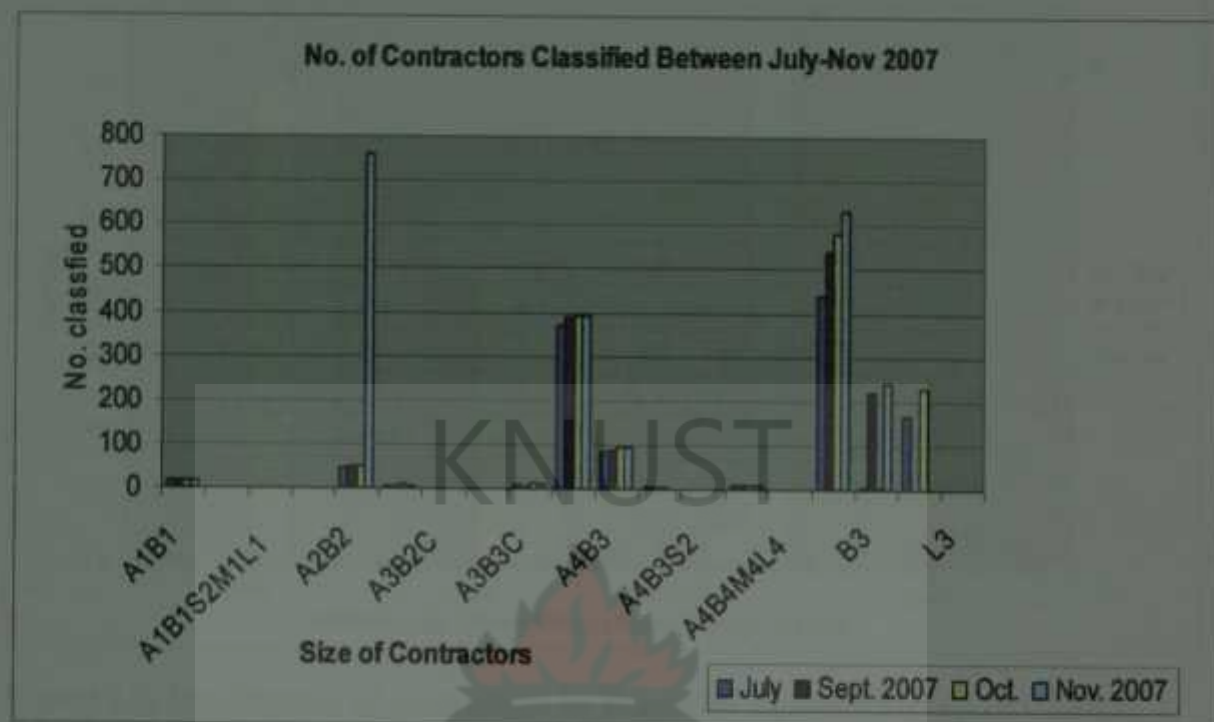


Figure 2.1: Registered contractors, by category and class as at the end of December 2007.

It is doubtful if thorough inspections and verifications would have been conducted in the case of new registrations, upgrading or renewals in this instance.

The majority of contractors amounting to 64% are small contractors in the lower classes, class A3B3-L3. Large contractors, class A1B1 amount to 1.0% of all registered contractors, of these 0.25.0% are local but foreign owned contractors either permanently registered in Ghana or are in the country on a temporary registration while medium contractors, class A2B2 represents 35%.

The work categorization and financial class based on limit of works to be tendered are discussed in section 2.8.1 and shown in Table 3 Appendix B. Work category M and L are for Miscellaneous routine maintenance works and Road line markings/ Traffic signs respectively which do not form part of the study.

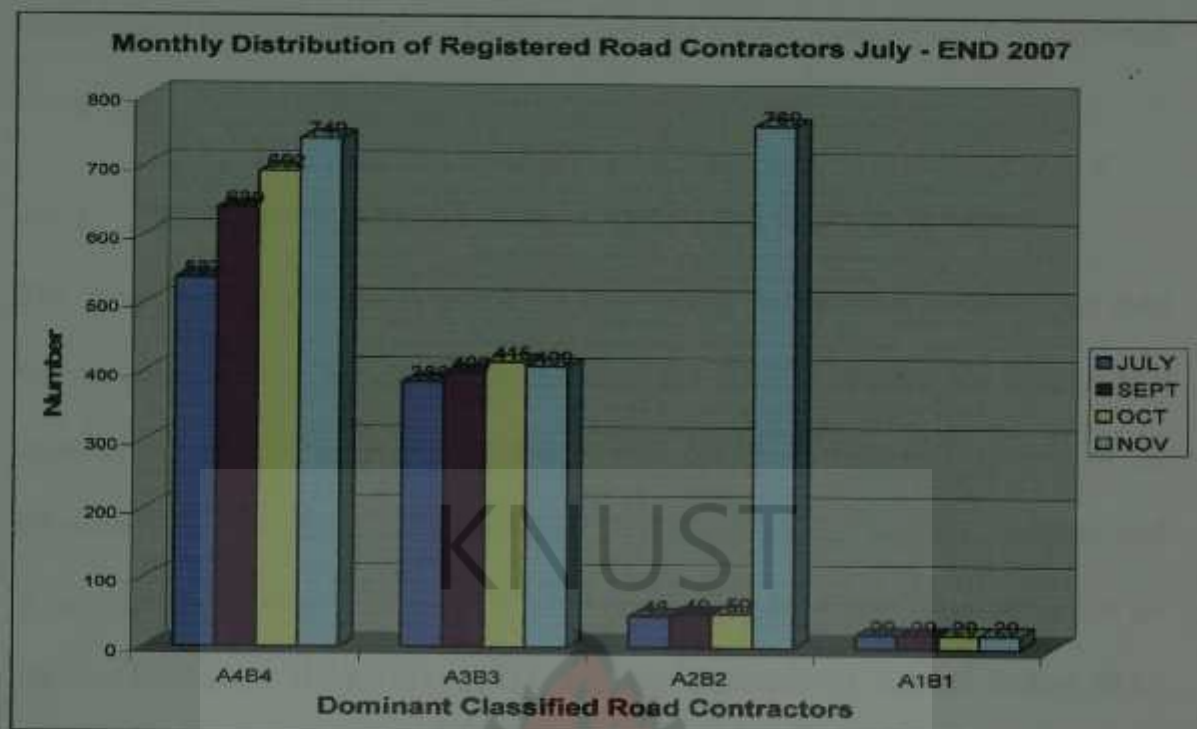


Figure 2.2: Distribution of contractors by dominant combined size A1B1-A4B4

The scenario depicted in Fig 2.2 above reflects an industry that is serviced predominantly by contractors with low capacity A4B4 and A3B3 contractors.

2.6.2 Ghanaian Owned Firms

The Ghanaian owned firms are headed by proprietors who have little or no knowledge in the construction industry (Ofori, 1991). The proprietors also refuse to employ personnel with the requisite technical know how to manage their firms towards sustainable growth programme. Management of the firms' resources- labour, finances, materials and plant and equipment is carried out haphazardly and therefore does not promote growth which is a performance indicator of the firms.

The poor performance records of the Ghanaian owned construction firms are evidenced by the fact that the nation's major road construction projects are awarded to the very large firms which are mostly foreign owned companies (Ofori, 1991). Thus

funds needed to recapitalize the Ghanaian firms to enhance their construction capacity development are considerably reduced through the interventions by the foreign owned companies.

2.6.3 Development of the Ghanaian Construction Capacity in Ghana.

The threat of and challenges posed by the foreign construction firms in the road construction industry are good indications of the need to develop the construction capacity in Ghana. The pursuit of this is vital for the growth and survival of the Ghanaian owned firms who already feel threatened. Various international development agencies, such as the World Bank (1984), the United Nations Centre for Human Settlement (UNCHS) (1981), and the International Labour Office (ILO) (1987), have shown considerable interest and have made significant contributions towards the development of the domestic contractors in Ghana.

Despite these positive contributions from such agencies, the Ghanaian contractors have not managed their firms effectively so as to be competitive even within the local construction environment. According to Davis (2006) one of the key lessons learnt from the Ghana Highway Sector Improvement Programme (HSIP) 1998-2002 was lack of capacity both in the public and private sector to link available resources with government priorities.

2.6.4 Changes in Business Practices

The construction industry, like all other economic sectors, is experiencing profound changes in business practices as a result of the development of new technologies, the growing sophistication of customers and increasing competition between product and service suppliers. The changes are increasingly evident in the operation and organization of construction companies. Designs, materials and components have

become more complex and the construction firms must develop the expected capacities to meet these emerging trends in the industry (Ofori, 1991).

These emerging trends in the construction business practices therefore pose a great challenge to Ghanaian contractors and will even be more pronounced in future where trends in the industry are most likely to be geared towards sophistication in almost all spheres of the construction industry.

2.7 Organisational Models

A number of Organisational models exist for delivering road maintenance. The different models are adopted to reflect the different political requirements for service delivery (Parkman et al, 2001). The two main models adopted in an order which represents in general the evolution of road maintenance delivery in Ghana are as follows:

2.7.1 In-house Works Unit (Direct Labour)

This is the earliest form of road maintenance delivery in Ghana which accounts for only a total of less than 5% of both routine and periodic works executed by the Mobile Maintenance Units, Road area crews and the Single man contractors (SMC's).

2.7.2 Conventional Contractor Model

In this model the agencies takes the manager role and lets development and periodic maintenance works out to external contractors (Parkman et al, 2001). This model, accounts for more than 95% of all maintenance works being executed, under the current Road Sector Development Programme (RSDP, 2002-2008).

2.7.3 Performance based contracts

This model is to be planned as a pilot project in Ghana. It defines minimum conditions of road, bridge, and traffic assets that have to be met by the contractor, as well as other services such as the collection and management of asset inventory data. Payments are based on how well the contractor manages to comply with the performance standards defined in the contracts, and not on the amount of works and services executed. Therefore work selection, design and delivery are all his responsibility. This allocates a higher risk to the contractor compared to the traditional contract arrangements but reduces the amount of supervision by the client (Zietlow, 2007)

2.8 Works Procurement

Procurement of maintenance works is by national competitive bidding open only to domestic suppliers or contractors who may submit bids in accordance with the National Procurement Act, 2003 and recommendation with the World Bank. Needs of the agencies are collated into a procurement plan which then stipulates the procurement method. The procurement plan describes the Procurement number of the project, description of the works; date estimate was prepared, dates of approval of estimates, tender launching, tender submission, opening of bids, dates of evaluation and submission of evaluation reports, approval of evaluated reports, contract award, signing of contract, commencement of projects and date of completion of project.

The plan would have been completed 3 months before the end of year and attached to a budget proposal to the Ministry of Finance and Economic Planning (MOFEP) through the MoT. The MOFEP checks estimates and provides ceiling to Ministries, Departments and Agencies (MDA's). MDA's reviews draft procurement plan to fit into the budgetary ceiling of MOFEP.

If procurement plan is working well then all these activities are wrapped up according to plan so that the date of advertisement of projects are adhered to but almost always the procurement stage is characterized by late award and commencement of projects. Also at evaluation stage, the evaluation team is not well resourced to do physical checks and even if they are resourced the time given them is very short.

2.8.1 Procurement Method

The procurement method depends on the threshold indicated in schedule 3 of the Procurement Act. Contract value up to Ghana cedis 50,000.00 is by Price Quotation. More than GHC 50,000 up to GHC1,500,000.00 is by National competitive bidding (NCB) using open or selective tendering while above GHC1,500,000.00 International competitive bidding (ICB) is used mainly for development projects (Public Procurement Act 663, 2003). Maintenance works under the RSDP are procured through the NCB. The forms of contract used are the lump sum, unit price, cost reimbursable and target cost. Tenders are open to eligible contractors who are duly registered with the MoT. Most maintenance contracts including, upgrading and rehabilitations are now open to all contractors from the lower class A3, B3; to the higher class A1B1 thereby exposing low equipped class of contractors to execute higher scope of works which leads to non performance.

2.8.2 Packaging of Maintenance Works and Contractors' Workload

Ghana's road maintenance works are packaged in small lots awarded to different contractors working on the same segment of road and holding different road projects in different regions and with different road agencies with average lengths 2.5km (resurfacing to upgrading works, MoT 2006 Review Report). Sam and Opoku (2005) indicate that packaging of works in Ghana is not in relation to cost of capitalization

and mobilisation. Small multiple contracts with wide area coverage of works for a single contractor undermine contractor effectiveness and also leads to higher overhead cost. This arrangement makes contractors to split resources among the contracts, leading to delays in completion.

2.8.3 Contractors Workload

The net effect is delay in delivery. The public sector's investment in construction is cyclic, being varied to suit prevailing requirement in the management of the economy (at the time of the research, projects for 2006 are now being awarded in 2007) this creates fluctuations in contractor work load (Ofori, 1991) and lack of continuity of work.

There are also a large number of contractors who are without government jobs. Available data from the Summary of Individual Contractor Workload-MoT, 2008), shows that of the 2171 contractors registered as at the end of 2007, 938 contractors representing 43% of the total contracting work force were engaged on projects in the road sector. This implies more than half of registered contractors are without jobs for the past 5 years in the road sub sector.

2.9 Road Contractor Classification System as it Operates in Ghana

The road contractor registration system has been introduced in Ghana since 1986. No proper records exist on annual numbers of contractors registered. Published figures of contractors of good standing began in July 2007. Monthly figures available as at the end of December 2007 are shown in (Appendix B Table 1). The current contractor registration is run on a committee basis without an independent secretariat with members drawn from the ministries, departments and agencies and is constrained by time and resources to carry out extensive verifications and inspections.

The system consists of procedures, requirements and enforcements and is centralized at the headquarters of the Ministry of Transportation. Two committees namely a Sub committee and a Main committee are involved in the running of the classification system (MoT, 2006 Review report).

2.9.1 Contractor Classification Categories

Contractors are categorized as roads, airport and related structures (Category A), Bridges, culverts and other structures (Category B), labour based road works (Category C) and Steel bridges and structures (Category S), (MoT, 2007 Guidelines for the Classification of Contractors for Road and Bridge Works, Appendix B Table 1). A contractor can be placed in more than one category. Within each category, contractors are classified within four financial classes 1 to 4 namely A1, A2, A3 and A4 and B1, B2, B3, and B4 in category A and B respectively, C1, C2, C3 and C4 for Category C and S1, S2, S3 and S4 for Category S. A contractor in a given class is not allowed to tender for any single contract, or have work on hand in excess of a stated threshold (Parkman et al, 2001). A contractor is also allowed to register in more than one category as A1, B1; or A2, B2. The study limits itself to Categories A and B which are the dominant categories in Ghana. For a contractor to be rated in a given class, requirement must be met in key areas in terms of staff, equipment, experience and participation in training courses run by the MoT and the Road Contractors Association.

2.9.2 Classification Requirements

2.9.2.1 Staff / Equipment Requirement

All contractors within each financial class are to provide details of name, position, nationality, address and technical training of owners and managers of the companies. In addition the name, educational background including institution attended, qualification and practical training of staff are provided. Minimum equipment holding of companies is also listed with relevant documentation and proof of ownership shown in (Appendix B Table 6 and 6A). Verifications by the committee is mostly by relying on documents submitted by the applicants.

2.9.2.2 Experience/Turnover

Experience / turnover requirement is determined from major road and related civil engineering contracts including building works executed in the last five years. Turnover requirement is shown in Table 2.5. Details on projects including award letters, contract sums, and completion certificates certified by the supervising engineer are attached for assessing contractors experience and turnover required mostly done by relying on documents submitted.

Table 2.5: Contractor's Annual Turnover requirement for the last five years

Financial Class	Category A Gh¢	Category B Gh¢
1	Over 60,000	Over 30,000
2	40,000-60,000	20,000-30,000
3	20,000-60,000	10,000-20,000
4	Up to 20,000	10,000

2.9.2.3 Capital

Applicant's capital rating is computed from details provided on immovable assets (lands, buildings less mortgages), depreciated value of movable property (equipment,

plant), current value of liquid assets owned by the company and shareholders to arrive at the total net value of capital required for classification (see Table 2.6 below) to be certified by a bank.

Table 2.6: Contractor's Rating Capital

Financial Class	Category A Gh¢	Category B Gh¢
1	100,000	50,000
2	50,000	20,000
3	20,000	10,000
4	10,000	5,000

2.9.2.4 Participation in Training Courses

New entrants are exempt from this requirement which is meant for renewals and upgrading of contractors in class A3, B3 and above, who must show evidence of participation of training courses organized by the Ministry of Transportation and other contractor associations such as the Association of Road Contractors of Ghana (ASROC). Unfortunately the Road Contractor Association has not been on its feet as expected and majority of members are now dissatisfied with its operations thereby forming a splinter group, the Progressive Road Contractors Association (PROCA)

2.9.3 System Procedures

The following procedures can be identified:

- Applicant buys the application form and guidelines for a non refundable fee of two hundred Ghana cedis from, Room B3 at the Ministry of Transportation. The amount is meant to cover production and administrative cost. This amount might be judged to be on the higher side considering the harsh economic realities of the time.

- The completed application form with necessary supporting documents is submitted to the office of the Chief Director where it is received and registered by the Secretary.
- Depending on his work schedule the form is minuted on and sent to the office of the Director of Procurement who is also the chairman of the Classification Committee for his comments and compilation.
- The Document is transferred to the sub committee who conducts the initial screening of documents to check for proper filling and attachments of relevant documents and submits report to the main committee at the appropriate meeting.
- Main committee meets once a month and deliberates on sub committees comments, evaluates data and approves or disapproves application based on discussions and consensus.
- The results are communicated to the applicant for the payment of the necessary fees for processing certificate.
- The certificate is processed latest 2 weeks after payment of the road contractor license
- Information on contractor's business name, class, postal/contact address, date issued and expiry date are entered into a register and published on the Ministry of Transportation's website.

2.9.4 Verifications/Evaluation

Verifications and inspections of contractor's resources used to be an integral process of the whole registration process. An inspection team which used to be a subset of the Technical subcommittee went round the three zones of the country and brought their

report for the deliberation of the sub committee is not functioning perhaps due to logistics constraints hence extensive inspections and verifications are not adequately carried out on some of the applicant's submissions. Evaluation is by discussions and consensus.

2.9.5 Monitoring

The contractor classification committee does not carry out direct monitoring of contractors operations. Monitoring of projects is considered not a direct responsibility of the committee and as such is deemed a responsibility of the road agencies. The agency supervision team report mainly on works progress through the use of routine report format such as the Board Format and Contract Key Data provided from head office and is silent on detailed information on contractor's resources such as personnel and equipment etc provided on Development projects through the use of the Site Operations Manual (SOM). Similarly the MoT, monitoring and evaluation reports are primarily concerned with quality and quantum of works executed and irregularity in work certification than details on contractor resources for work. In the end there is little or no documentation of how contractors complied with classification requirement. This leaves a big question about the importance of the contractor grading system.

2.10 Factors affecting road maintenance contractor performance

Factors affecting road maintenance contractors performance are varied these include financial, technological/ managerial and governmental (client).

2.10.1 Financial

The primary sources of the Ghanaian contractor are bank loan, trading, and family sources including investment from relatives. The main source is from the banking

sector. However the contractors' access to bank financing is reduced by weak cash flow, lack of collateral, high bank interest rates and high certificate discounting rate (DMJM et al, 1994).

2.10.2 Delay Payment of Interim Certificate

The Ghanaian contractor's working capital problems are compounded by the long and interminable delays in honouring payment certificates. Payment especially on government projects is unduly delayed. Delays in payment affect cash-flow and productivity with its attendant cost over-runs. Delay occurs due to government's inability to honour bills of executed works due to its own budgetary constraints (some contractors are owed more than a year's interim payment certificate as at the time of the research and does not know when the next payment would be made). Payments are also made not on first come first paid basis making it difficult for effective planning by the contractor, over-award of contracts and thirdly delay due to unnecessarily passing of certificates through many hands (sometimes about 45 officers) before it is finally honoured (National Committee, 1997).

2.10.3 Financial Management and Lack of access to plant and equipment

Most Ghanaian construction firms lack effective financial management personnel to administer the firm's financial resources. Monies, including mobilization loans accruing from projects are used haphazardly without due considerations for the purpose for which it was intended (De Heer Graham, 1994).

Lack of operable equipment on site is one of the major problems affecting the performance of Ghanaian contractors, especially those in the A3 and A4 classifications who rely basically on equipment hiring mechanism which are not efficient to execute their projects

2.10.4 Technological/Managerial Factors

Most of the road contracting firms in the country lack technical expertise. They employ casual labour instead of qualified personnel for reasons of reducing overhead costs to make up for funds they have either misapplied or misused (National Committee, 1997). As a result, projects are managed with heavy reliance on road agency staff for survey work, material testing and work measurement which invariably causes delay in project execution, mistrust and sometimes perceived collusion between the contractor and the client's staff who are seen to endorse certificates of contractors who undertake shoddy jobs (Daily Graphic page 48, April 26, 2008).

The contracting companies have moved from enterprises to limited liability companies on paper but are more or less managed as sole entrepreneurs without expertise in construction and with interest in many other fields (Ofori, 1991), mostly trading along the Dubai and China route. Again most road contractors have the habit of just purchasing bidding documents and finding a quantity surveyor to price it without any information regarding the method of executing the project and the prevailing site conditions in order to arrive at a reasonable estimate for the works in question thus leading to a serious consequence on the part of the contractor.

CHAPTER 3

3. METHODOLOGY

The methodology for this research highlighted primarily on desk study of road contractor classification systems with the view to meeting the study objectives. In addition, field surveys were conducted to help identify the compliance or non compliance of road contractor classification factors by performing and non performing road contractors working in Ashanti and Greater Accra Regions.

3.1 Qualitative Method

The qualitative method involved a series of interviews and consultations with stakeholders including serving and non serving road agency staff, contractors and consultants.

- (i) Literature review of existing classification systems in other countries.
- (ii) Desk study of published reports and papers on contractor development strategies
- (iii) Retrieval and analysis of road maintenance data on trunk road maintenance, summary of road contractor workload and MoT annual review and statistical reports.

3.2 Quantitative Method

The quantitative method involved questionnaires designed and delivered by hand. This was done to ensure fast delivery and response to the questionnaires. In administering the questionnaire the purposive sampling technique (non- probability sampling) technique was adopted for the purpose of reaching to the contractors whose projects were being reported in the Monthly Progress reports of Ashanti and Greater

Accra regions on Periodic and Routine Maintenance of Trunk Roads as at the end of December 2007. Four sets of questionnaire were sent to the following:

- Contractors
- GHA Regional road agency staff
- Regional Road maintenance managers
- Road contractor classification committee members

This multiple approach to data collection was adopted to reduce bias and increase accuracy (Mckillip, 1987). Also Hernes (1998) recommended that in identifying contractor training needs, information should be obtained from contractors themselves and from construction professionals who work closely with contractors. Hernes thought that the professionals would be more objective in judging contractors performance.

3.2.1 Questionnaire to Contractors

The target groups were contractors working in Ashanti and Greater Accra regions on trunk road periodic maintenance projects. The general objective was to establish:

- The background of the contractors and current registration status
- Contractor profiles: plant and equipment, technical staff
- Current registration/renewal procedures, requirements
- Contractors assessment of impact of the contractor registration system and
- Contractors ranking of the criteria for registration.

Based on a limited time for execution of the study, a total of 32 questionnaires were circulated to contractors actively engaged on maintenance projects in the two regions. However, only 11 respondents amounting to 34% of the sampled contractors returned the questionnaire. The low rate of response compares to a response rate of 39% in a similar study on contractors conducted in Zambia (Uriyo, 2004). However, extensive

use was made of interviews and documentations from the road agencies as well as supplementary questionnaire to road maintenance supervisors to capture data that was not available. This formed a good basis for the report.

3.2.2 Questionnaire to GHA

3.2.2.1 Questionnaire to GHA Regional road agency staff

The Target group was the three top management engineering staff of the Ghana Highway Authority regional offices in Ashanti and Greater Accra regions. These were the Regional Highway Director, Regional Maintenance Manager and the Regional Quantity Surveyors. The minimum years of experience for these officers ranged from 5 -30 years in the road and building industry. The objective of this survey was to obtain Road Supervisors view point of the quality and effectiveness of the operations of the Road Contractor Classification System.

3.2.2.2 Questionnaire to GHA Regional road maintenance managers

The objective of this survey was to evaluate contractors' on road contractor classification factors that influenced the success or otherwise of completed or ongoing projects listed in the Monthly progress reports using the road engineers who are the supervisors of the 30 selected projects in their jurisdictions. The 30 projects were grouped as performing if successfully completed and non- performing if progress is very slow, at stand still and is behind schedule by more than 20% of contract duration as at December 2007 (Sam and Opoku, 2005).

3.2.3 Questionnaire to Road contractor classification committee.

The target group was the road contractor classification committee members. The objective of the survey was to capture data on the structure of the committee, resources, data verifications, assessments and effectiveness of the committee.

3.2.4 Scope of Study

The research studied the compliance or otherwise of the road contractor classification factors by classified road contractors involved in trunk road maintenance delivery in Greater Accra and Ashanti regions from 2002-2007. The targeted contractor categories were from A1, B1 to A4, B4.

3.3 Data Analysis

Data from the questionnaires has been analysed using Microsoft Excel Pivot Table to draw out generalizations and trends. The analysis involved coding and data entry into Excel Software rearranging, combining factors, drawing tables/graphs and finding relationships between performing and non performing classified road contractors and compliance to key road contractor classification criteria such as:

- (i) Contractor financial capabilities
- (ii) Contractor equipment holding
- (iii) Contractor full time technical

Information from other countries registration schemes has been studied and compared with the implementation of existing road contractor classification system to identify any lapses in the criteria, implementation and monitoring systems.

CHAPTER 4

4. RESULTS AND DISCUSSIONS

This section presents a comparative analysis of the desk study of contractor classification systems of other countries and the Ghana Road Contractor Classification System. An attempt is made to discuss any similarities and deviations from best practices to see if there are shortfalls or otherwise that might influence the grading of contractors and thus contribute to performance or non performance of the Ghanaian local contractors in road maintenance delivery.

4.1 Road Contractor Registration System in Ghana

The road contractor classification criteria provide the platform for pre-qualifying contractors in Ghana for all maintenance works. There after all instructions to bid for any trunk road periodic maintenance work specify that bidders hold an MoT road contractor classification license making the contractor registration the basis for any meaningful procurement objective. Any lapses or weakness in the system of classifying road contractors could contribute to the objectives of road programmes not being achieved (RSDP Review report 2002-2006). Figure 4.1 illustrates the flow chart of procedures and processes involved in the Ghana Road Contractor Classification.

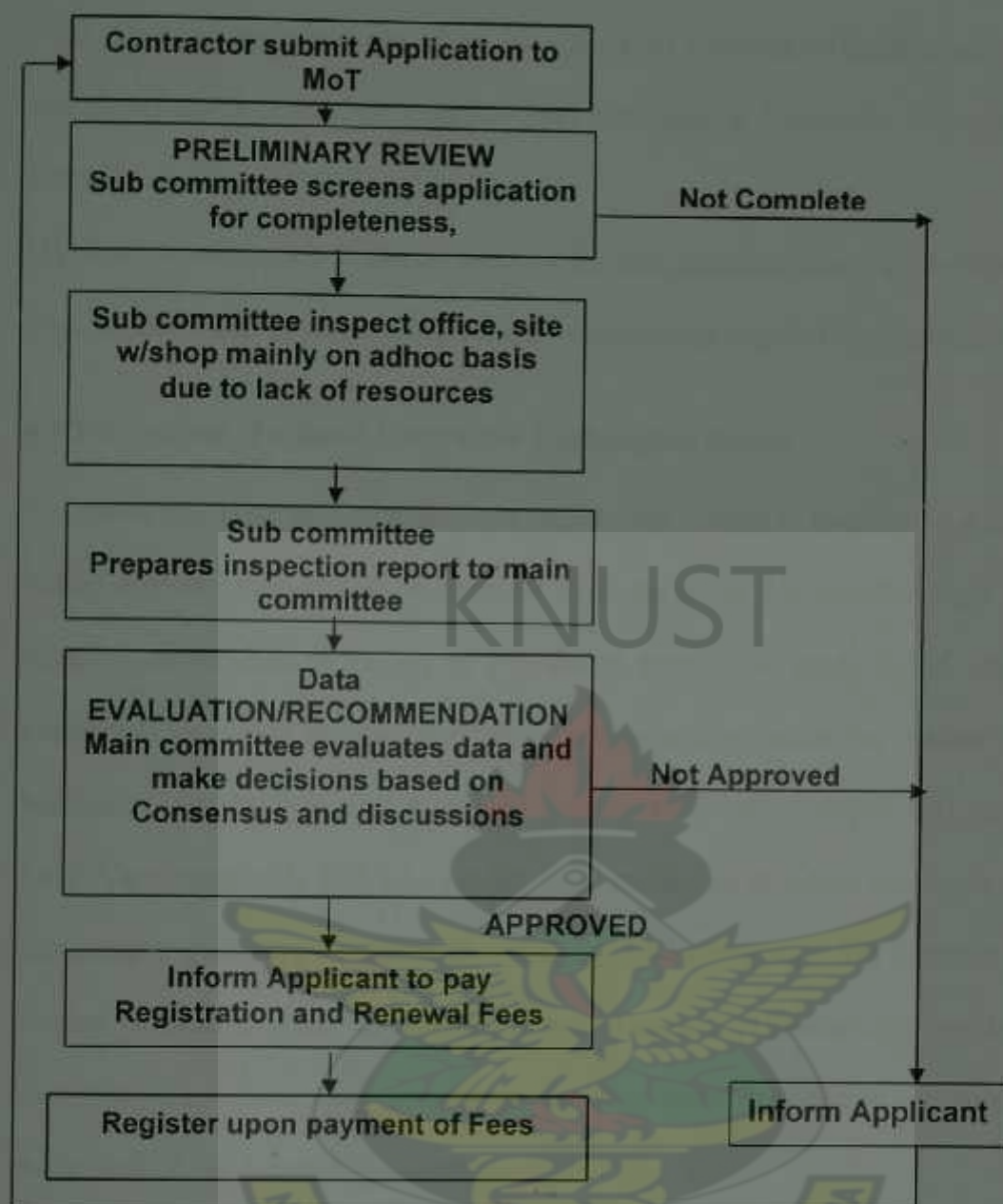


Figure 4.1: Flowchart of Activities and Procedure of the Road Contractor Classification in Ghana

In order to provide a systematic, careful and critical analysis of the system as it operates in Ghana and compare with best practices elsewhere, the following sections have been organized into subtitles as follows:

- Existence of Contractor Registration Board
- New Registration Categories/Upgrading and Renewals
- Verifications/ Evaluations/Monitoring and Enforcement.

Also some perceptions of the Ghanaian system by a section of contractors, engineers and classification committee members have been used to discuss the findings from the literature survey.

Much of the analysis is based on some of the best practices observed in literature and how the Ghanaian system could be improved adopting some of the reported systems.

4.1.1 Existence of a Road Contractor Registration Board

In Ghana, the existing road contractor registration system is handled by a committee within the structure of the Ministry of Transportation. No specific legal entity or structure established by an act of Parliament exists. The study found out that the committee functions only as part of an administrative procedure within the MoT administrative structure and is not an independent well equipped and empowered body. The supposedly lack of a proper legal status and structure results in an adhoc contractor registration management, regulation and monitoring. For instance in South Africa, Tanzania, Zambia, Singapore and Tasmania (Australia) there is legally established structures and secretariat for contractor registration, promotion and regulation of the contracting industry.

The advantage in having a legal entity and structure no matter how small could be: regulatory, contractor development, advisory to government and information dissemination and budgetary allocation.

Where as in Ghana, the committee members are selected and work on an adhoc basis, several issues relating to regulation, work load monitoring, establishment of an effective database, inspections and verifications cannot be done on a consistent and regular basis. The current road contractor registration scheme places a limit not only on the value of a single contract that can be awarded to a contractor in a particular class but also on the total workload for each class at any given time. This aims to

regulate workload of contractors and minimize the adverse effect of too much workload on the performance of contractors. However in Ghana contractor workload is a major cause of project delays as agencies failed to determine bidder's commitments and his performance in the other road agencies. (RSDP Review reports, 2004). Also the contractor registration board with a mandate to register projects would monitor that contractors adhere to limits. In addition the regulatory function is not effective as the road agencies have found it difficult to effectively regulate the contractors, while acting as both the client and regulator. This is particularly so because there is no database of contractor commitments, capacities, staff strengths etc for monitoring and regulating purposes. It is possible that contractors blacklisted in one region find their way to other regions where they are awarded jobs.

According to the survey of committee members all the three members of the subcommittee are staff of the MoT. These people have their normal assignment and schedules but also do initial screening of applicant's documents, vet and carry out inspections at sub committee level. Considering the huge monthly contractor applications, this lean staff who do not work full time on contractor classification issues cannot deliver thorough screening, verifications etc. Since no independent verifications exist, they can be very subjective in their recommendations.

4.1.2 New Registration/Upgrading and Renewals

In most systems surveyed e.g. Tasmania, Zambia and Tanzania etc. New Registration procedures are similar to those that pertain in Ghana. However it is the requirements that are different. Where as in Ghana, registration requirements such as company quality assurance, occupational health and safety information and company's concern for the environment and contractor's capability for the coordination of sub contractors are not considered or stated in the requirement, these form an integral part of the

system in Tasmania (Australia), Singapore and Zambia. During the questionnaire administration the study noted for example that even though all the companies are now registered as limited liability companies at the insistence of the MoT, their mode of operation is still that of sole proprietorship, official telephone numbers did not respond, a good number did not have company offices but operated from their houses. The responses from the Road Managers also reported that one project did not perform because when the Managing Director was not on site nothing moves. This indicates that though companies have been asked to register as corporate entities they are still operating as sole enterprises. Also other systems provide a point system whereby various requirements are given marks to show the relative importance to the classification process. Although the points assigned for any requirement may vary from one country to another depending on the environment, availability of credit and other resources, number of registrations etc, it is clear that contractors need to know the relative importance of satisfying all the requirements and how the non compliance of any can jeopardize one's registration effort.

An example of a detailed point system as shown earlier in Table 2.4 and that for Zambia in Table 4.1 is shown below:

Table 4.1: Zambia Road contractor registration criteria and weightings.

S/No	Requirement	Points
1	Staff Qualifications	25
2	Plant and Equipment	20
3	Office & Service facilities	10
4	Health & Safety Practices	5
5	Financial Status	20
6	Experience of the firm	20
	Total	100

(Source: National Construction of Zambia, 2004)

An applicant who scores an aggregate of 60 points and above, but not less than half of the points in any criteria above qualifies for registration. The points system provides an objective way of contractor registration and grading which eliminates subjectiveness and errors from the committee members or evaluators. In the case of Ghana even though the basic criteria is dependent only on contractor's staff and competence, equipment holding, financial capability and experience no such point system exists. From the survey of the Contractor classification committee, 100% (6) of the respondents revealed that recommendations for approving applications are based on discussions and consensus. Out of the 6 respondents to the questionnaire 67% stated that the classification requirement does not change from time to time, 16.5% stated that classification requirement do change from time to time and 16.5% did not commit themselves to any answer. This indicates that perhaps there is no uniform method of awarding points, and this situation may allow bogus and what is termed as "briefcase" contractors to enter the contracting business and which could adversely affect road maintenance delivery.

For upgrading in Tanzania, as in other places the application form is differentiated. This is not so in Ghana where the same application form is used for new applications and those for upgrading. The current application form catering for new application and upgrading can be confusing and is difficult in terms of time spent to differentiate between the number and type of contractors' previous information and resources. Considering application process rate of over 100 per month, the lack of consistent verifications, double counting of contractor's resources could arise (RSDP Review report, 2007). This could result in poor grading of local contractors and if these contractors are selected for projects, it could possibly contribute to their poor maintenance delivery on the works.

Also where as a contractor asking for an upgrading in Australia has to fulfill the basic initial classification criteria, the criteria for the new class, additional requirement such as third party certified quality assurance, time management etc must be satisfied. In Ghana the grading process is based on the same four criteria as for the new registration.

In Ghana it was noted that only a four tier classification exist 1-4 with class 1 being the highest and class 4 the lowest according to perceived capacities of contractors, this the study found did not augur well for real growth within the classes. Presently it is easy to progress straight for example from A4B4 to A3B3 in just about 2 or three years by adding a few more equipment. This has the tendency of providing a lot more contractors in the A3B3 group as earlier shown in figure 2.1 and 2.2 but who may not be technically competent but may succeed in passing through the tendering process and secure a maintenance job and would not be able to perform as has been identified by the study especially for A3B3 and some A2B2 contractors.

4.1.3 Data Verification/Evaluation

Most contractor registration systems reviewed have as part of its integral functions the data verification and evaluation procedures. In Singapore for instance the Contractors Registry sends officers to applicants' head offices local or overseas for further verification. The cost of such verifications is borne by the applicant.

In Ghana it does not appear this is the case even though the desire for thorough verification is there. Table 4.2 shows that in almost 100% of the cases the contractor classification committee relies only on documents submitted by contractors to verify and validate data of contractors' application for grading. 100% of respondents agreed that there are no more zonal sittings where previously an inspection team visited the regions to verify and inspect contractors' resources.

Table 4.2: Criteria and Verification Procedures adopted in the Contractor Registration System in Ghana

S/No	Issues	Response
1	Employees SSNIT/IRS/ Labour cards payment receipt	100% of cases by relying on documents
2	Certificates / testimonials of employees, Curriculum vitae of Works Manager, Engineers, Quantity Surveyors etc.	100% of cases by relying on documents
3	Details of immovable property	100% by relying on documents
4	Movable property i.e. road construction equipment proof of ownership	DVLA representative relies on individual vehicle registration information on hard copy files. Information not computerised and not centralized thus difficult to verify
5	Liquid assets and financial records of contractor	100% by relying on documents
7	Minimum required numbers of personnel and equipment	50% by relying on documents and 50% by site inspection
8	Inspection team	100 % of the 6 respondents agreed the Sub committee also acts as inspection team, but weaker compared to previously, conducts inspections in some cases
9	Zonal sittings for carrying out inspections and verification	100% of respondents agreed no zonal sittings are conducted as compared to the past.
10	Experience of contractor	100% by relying on same agency staff for endorsement of contractors submissions.

Perhaps this is the reason why contractors have resorted to the filling of forms but fails to provide the required technical staff and equipment on projects they are executing as revealed by technical audit reports in the Road Sector Development Programme Review reports since 2003 to date. This development leads to non compliance of contractors to road contractor classification factors for personnel,

equipment, financial capacity and experience as identified in the study to be contributing to contractors' inability to perform.

4.1.4 Requirements for Classification

In the systems of other countries reviewed such as Tanzania and Zambia priority in terms of relative importance is given to Qualification of contractors' key personnel followed by Plant and equipment, finance/capital in the second spot followed by the other factors.

In order to realize which factors of classification in Ghana was the most important resource of the local contractor, contributing to performance in road execution, views of classification committee members and the sampled road contractors were sought. Figure 4.2 shows the ranking of order of importance of classification factors by the MoT contractor classification committee members. 100% of the committee members stated that equipment holding is the number one requirement to be satisfied by the contractor to be classified. 50% each of respondents ranked capital and key personnel at the same level of importance at the second spot.

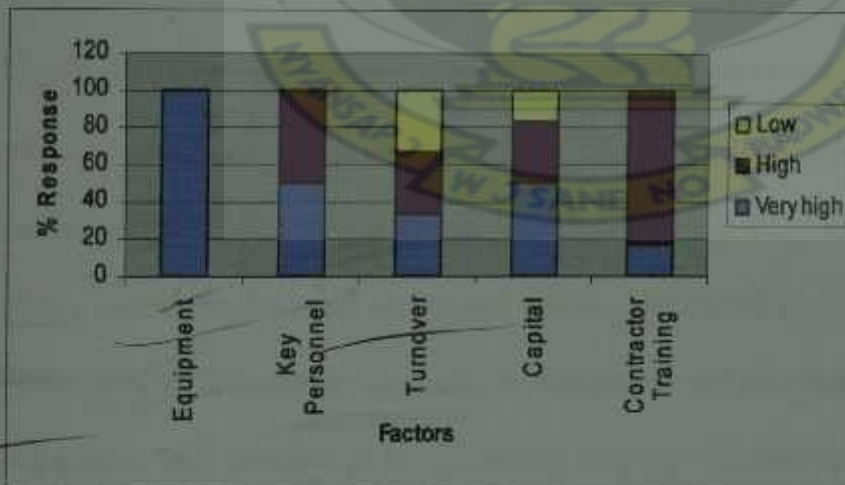


Figure 4.2: Ranking of classification factors (Committee)

A similar assessment was made by the contractors. From the contractor point of view (Figure 4.3) 73% of respondents placed the acquisition of equipment and increased turnover as number one above contractor key personnel. Surprisingly capital was the least ranked very high, even below contractor training by the contractors. This may explain why most contractors in Ghana go at length both to invest in equipment (though the study shows that they may be far from meeting the MoT criteria and appear old and unreliable) and to win more contracts to increase their turnover sometimes resulting in overload to the detriment of acquiring key personnel and capital to ensure a successful management of their projects.

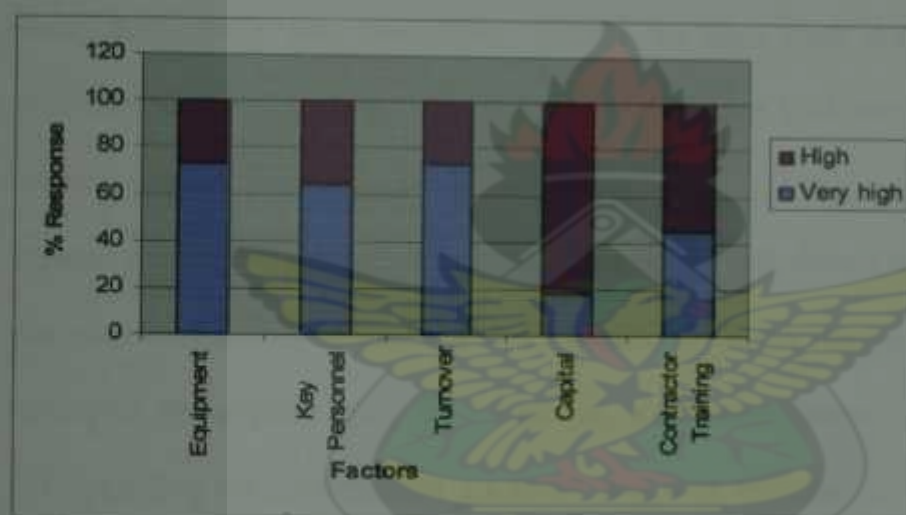


Figure 4.3: Ranking of classification factors by contractors

The review of best practices show that while emphasis is placed on contractor key personnel and capital for contract execution, the situation in Ghana is not so but places undue emphasis on equipment holding which the study shows is not attained by contractors. The undue emphasis on equipment and contractor turnover rather than acquisition and retention of key personnel may be contributing to the lack of success in maintenance delivery due to poor planning, poor contractor workmanship.

In the specific details of requirement for experience, country studies showed that for example in Zambia, a detailed experience requirement for each class is specified and

documented as shown earlier in Table 2.2. This enables each class of contractors to be adequately equipped with the knowledge to fulfilling the minimum requirement for each class. In Ghana, however the contractor classification system assesses all category and classes of contractors experience by the number of projects executed in the last five years. This criterion is too broad and not specific in terms of requirement to be specified for different classes A1, B1; A2, B2; A3, B3 and A4, B4.

The size of the project, complexity of the work is not requested. The system requests the contractor to provide evidence of these contracts but does not ask for definite references to aid verifications. Contractors need to be given adequate time to develop skills, competence and managerial abilities for their class and therefore a time requirement for upgrading from one class to another will restrict movement and increase competition within a class.

Perhaps this explains why most contracts are open to all classes except A4, B4. This can increase the cost of tender and the possibility of the choice of an incompetent contractor. Since, there is too much variation in the competences of the contractors.

For upgrading the classification guideline does only mention "a marked change" in personnel and/or equipment holding which will substantially modify his performance. Since several factors go to ensure that a contractor can satisfactorily execute projects, to upgrade a contractor based on improvement in one area without regard to his project management, compliance to best practices etc is unacceptable.

Also the classification system does indicate as long as a contractor submits information that meets the requirements the committee will continue to confirm his status (MoT, 2007). This is unfortunate, because a contractor can falsify documents, equipment fleet can be obsolete and yet he may submit what he thinks can enable him to be confirmed.

4.1.4.1 Financial Requirement

From the review of other countries, financial requirement is outlined in detail in terms of value of liquid and fixed assets and annual turnover as a percentage of the class limit of tender to ensure that the contractor have sufficient resources to meet financial commitments which normally arises (see Table 2.3). However in Ghana the financial requirements is not specifically or expressly tied as a percentage to the class limit of tender but as a fixed sum which is not adjustable and appears to be on the lower side, this has the tendency of registering contractors who do not have the financial wherewithal and rely mostly on interim contract payment and advance mobilisation loan to finance maintenance works. This could result in a financially weak contracting capacity that would not be able to deliver as expected.

Also, the classification requirement for upgrading does not mention any change or improvement in the contractor's financial performance or capabilities.

4.1.5 Monitoring and Enforcement

Again the review of some country contractor registration systems has shown that registration of contractors is one step towards regulating the contracting industry. However, in order to ensure that there is fair play, transparency, honesty and respect among contractors and that the conduct of contractors is ethical, it is necessary to enforce, monitor and regulate the contracting industry. In Tanzania, Singapore and Tasmania the Contractor Registration Board/Councils keep a database to:

- constantly update contractors records, level or volume of construction activities
- assess performance of contractors
- undertake site visits to identify common shortfalls on construction sites
- sample contractors without work.

In Ghana, although some of the above activities are performed, there seems a lack of coordination among departments and between agencies, the following are examples:

- The current database of contractors is not comprehensive enough and does not capture contractors' resources.
- Contractors' information submitted during classification is not accessible to contract awarding entities to enhance evaluation process.
- Agency supervisory staff, monitoring and evaluation exercises by agency and ministry staff normally does not report on contractors' resources as happens on development projects. Monthly progress reports from the regions are routine and provides only status and percent progress and provides no information on causes of delay, termination or warning letters that relates to classification requirement.

Also from the questionnaire to road contractor classification committee members 67% of respondents revealed that the committee does not monitor road works. The reasons given were that monitoring was not the committee's main function, it was the work of the agencies and it used to be done but now not. Lack of a central enforcement and monitoring department/authority with a clear mandate to sanction contractors may lead to inefficiency in the system which could impact negatively on contractor delivery.

A summary of the structural indicators for the road contractor classification systems of other countries assessed and discussed in the study are presented in Table 4.3. This includes the strength of their legal basis, year established, the duties and powers attributed to their systems and the provisions to ensure the effectiveness and efficiency of their contractor classification systems.

Table 4.3: Structural Indicators for Road Contractor Classification Systems in Various Countries

Description	Singapore	Tasmania	Tanzania	South Africa	Ghana
Year established	-	-	1997	2000	1986
Statutory basis	Law	Law	Act of Parliament	Act of Parliament	Admin. Procedure
Administrative Structure	Authority	Department	Board	Board	Adhoc Committee
Semi/Independent agencies	Yes	Yes	Yes	Yes	No
Contractor Registrar	Yes	Contract Services Manager	Yes	Yes	MoT
Project Register	Yes	Yes	Yes	Yes	No
Construction Code of Ethics	Yes	Yes	Yes	Yes	No
Criteria strict, specific and well defined	Yes	Yes	Yes	Yes	No
Financial class range	1-6	1-7	1-7	-	1-4
Data Evaluation/ Recommendation Based on	Point System	Point System	Point System	Point System	Discussions and consensus
Database	Yes	Yes	Yes	Yes	Limited database
Enforcements/Regulation	Yes	No	Yes	Yes	No
Monitoring / Feedback	Yes	Yes	Yes	Yes	Not properly Coordinated

4.2 Results of Questionnaire Survey

This section presents the analysis of questionnaires responded to by the 11 contractors, the questionnaire evaluating the operations of the contractors on the 30 selected projects, the questionnaires to the Road contractor classification committee and the Regional road agency staff.

4.2.1 Contractor and Office location

Table 4.3 presents the location of the surveyed contractors in the two regional capitals. 4 contractors are located in Accra while 7 contractors are located in Kumasi.

Table 4.3: Contractors and their Location

Class of Contractor	OFFICE Location		
	Accra	Kumasi	Total
A1B1	3	2	5
A2B2	0	3	3
A3B3	1	2	3
Total	4	7	11

In addition the distribution of 30 performing and non performing contractors and projects in Ashanti and Greater Accra regions evaluated by the road maintenance managers on factors that affected the performance or non performance of the projects are shown in Table 4.4.

Table 4.4: Distribution of the Evaluated Performing and Non performing contractors

Class of Contractor	Non Performing	Performing	Total
A1B1	4	1	5
A2B2	2	6	8
A3B3	7	4	11
A4B4	2	4	6
Total	15	15	30

15 projects executed by the selected contractors performed while 15 did not perform. Out of the 15 non performing projects 50% of the non performing projects were handled by low class A3B3 contractors while 27% of the non performing projects were handled by high class A1B1 contractors. The rest shared among A2B2 and A4B4.

4.2.2 Characteristics of Contractors Responding to Questionnaire.

64% of respondents were owner-managers of their respective firms which were predominantly limited liability companies although most are operating as sole proprietorship by Ghanaian standards. The rest of the respondents were senior officials of the companies ranging from General/Site Manager to Project Quantity Surveyor and Technical Director who could take informed decisions on behalf of their companies. Of the respondent, 82% had their Ministry of Transportation road contractor registration during 1983-1990 while 18% of respondents had their registration during 2003-2007. A lot of the respondents are conversant with operations of road contractor classification systems. Further analysis showed that 18% of respondents who are owner – managers had secondary education while 9% of respondents who are owner-managers had basic education and the rest 73% of respondent's owner- managers had tertiary education.

4.3 Maintenance Workload of Classified Road Contractors

The road contractor maintenance workload for the period 2002-2007 was retrieved for two jurisdictions; Ashanti and Greater Accra regions. The supervising Road Managers were made to assess 30 projects selected from the list grouped into two classes: performing or non performing projects. The maintenance projects were also categorized into Routine and Periodic projects. The analysis sought to establish any trends existing between contractor classification requirements such as workload, equipment holding, financial issues, technical staff and their performance on various maintenance projects. Generally as you move from A1B1 to A4B4, the classification requirements reduce from high to low. Also the categories and sizes of projects to be executed, financial requirement and employment of full time staff reduce. Out of the 30 projects, 73% were periodic projects made up of upgrading, rehabilitation,

resealing and resurfacing activities which require high equipment input, high technical expertise, and high financial inputs and generally more qualified contractor capacity. 27% of the projects were various routine activities that required comparatively less equipment input or less contractor capacity to execute

Table 4.5: Distribution of Maintenance work among Classified Road Contractors

CCLASS	Maintenance work Category				Grand Total
	periodic Upgrading/rehab	periodic reseal/ Surfacing	Routine shoulder Blading	Spot Improvement Drainage Construction	
A1B1	4	1			5
A2B2	5	3			8
A3B3	6	2	1	2	11
A4B4	1		1	4	6
Grand Total	16	6	2	6	30

Table 4.5 shows that of the periodic works, A1B1 and A2B2 contractors were involved in 43% of the selected projects while A3B3 and A4B4 contractors executed 30%. The rest of the projects 27% consisting of routine activities were also executed by A3B3 and A4B4 contractors.

Out of the 22 periodic maintenance works, 5 (27%) projects were executed by A1B1, 8 (36%) projects by A2B2, 8 (36%) projects by A3B3 and 1 (4.5%) project by A4B4. For rehabilitation and upgrading works which are at the higher end of the maintenance categories, A3B3 contractors executed 38%, A2B2 31%, and A1B1 and A4B4 executed 25% and 6% respectively.

Also 50% of the projects selected for assessment were non-performing and executed by contractors classified as none performing. The same is true of the performing projects.

From Table 4.6, out of 30 projects assessed, 7 executed by A3B3, 2 by A4B4, and 6 by A1B1 and A2B2 did not perform. More than 50% of projects by A3B3 and A1B1

did not perform. A2B2 contractors had a comparatively lower rate of non performance.

Table 4.6: Performing and Non Performing contractors for various activities

	Project Type	Class of Contractor				Grand Total
		A1B1	A2B2	A3B3	A4B4	
Non Performing	Drainage Structures			2	2	4
	REHAB			1		1
	Resurfacing	1	1	2		4
	Upgrading	3	1	2		6
subtotal		4	2	7	2	15
Performing	Culvert Construction				2	2
	Drainage Structures				1	1
	Shoulder Blading			1	1	2
	REHAB		2	1		3
	Resurfacing		1			1
	Resealing		1			1
	Upgrading	1	2	2		5
subtotal		1	6	4	4	15
Grand Total		5	8	11	6	30

The break down of projects indicates that A3B3 had the most projects (37%), A2B2 (27%) followed by A4B4 20%, the least projects were for the A1B1 contractors who did only 17% of all available projects. The distribution of the workload according to classes indicates that most contracts amounting to 64% (in number) go to contractors from class 3- 4 who also form the bulk of the contracting capacity in the country.

The workload among contractors evaluated by the engineers shown in Table 4.6 indicates that the projects executed by both A1B1 and A2B2 constitute about 40% of the 30 projects out of which 46% did not perform. A3B3 and A4B4 contractors executed nearly 60% of the entire workload in the two regions, out of which 53% did not perform. Of the non performing projects executed by these low capacity contractors (A3B3 and A4B4) 56% were upgrading, resurfacing and rehabilitation

works which includes some improvement in alignment, earthworks and heavy bituminous works which require higher class or calibre contractor such as A2B2 and A1B1.

Out of 11 non performing projects in rehabilitation, resurfacing and resealing and upgrading, 5 (46 %) were executed by A3B3, 36% by A1B1 and 18% by A2B2.

Concerning performing projects, there were 10 projects in rehabilitation, upgrading, resealing or resurfacing as shown in Table 4.6, 10% were completed by A1B1, 60% by A2B2 and 30% by A3B3.

Table 4.7: Trend of contractors and Performing and Non performing projects

	A1B1	A2B2	A3B3	A4B4
Performing	1(20%)	6(75%)	4(36%)	4(67%)
Non Performing	4(80%)	2(25%)	7(64%)	2(33%)
Total	5(100%)	8(100%)	11(100%)	6(100%)

Table 4.7 and Figure 4.4 indicate the trend of projects executed by various contractor classes. 80% of A1B1 projects, 64% of A3B3 projects did not perform. A2B2 and A4B4 had at least 70% of their projects performing. A4B4 projects are mostly routine projects, between A2B2 and A3B3, A3B3 performed poorly on projects most of which are periodic projects.

A1B1 contractors generally did not perform on almost all projects. A3B3 defaulted in many projects which may be above their class ability.

It is expected that the higher the class of contractor, his performance should be higher for the same kinds of projects. A4B4 contractors executing mostly routine maintenance works are performing because these works require minimal equipment input. However the success rate for the execution of rehabilitation, upgrading resurfacing and resealing works for A1B1, A2B2 and A3B3 are 20%, 75% and 40% respectively.

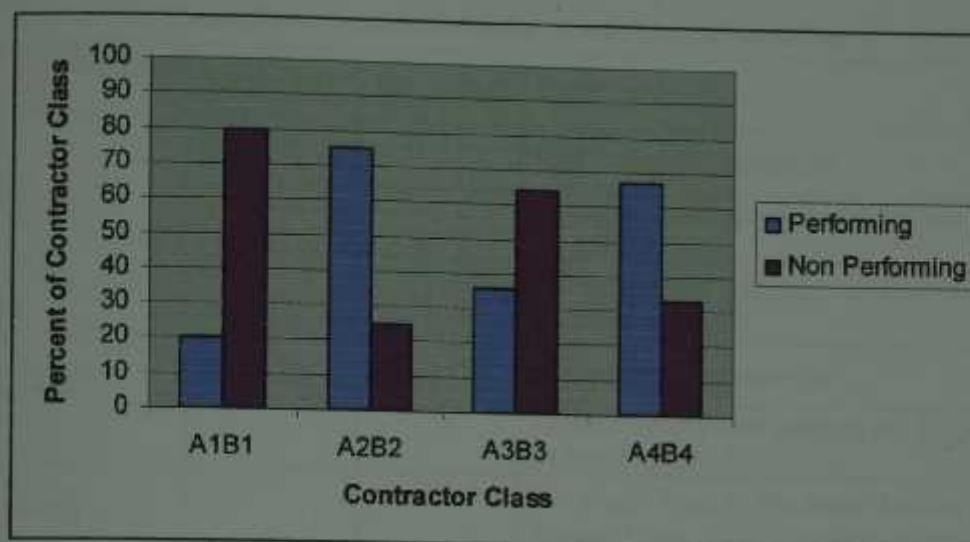


Figure 4.4: Distribution of Contractor class and performance on projects.

4.4 Equipment and Classified Road Contractors

Equipment holding of contractors is vital for a successful completion of road projects. Road contractor classification criteria specifies the minimum required equipment holding a competent construction company should possess in order to be classified as a road contractor in accordance with the Ministry of Transportation Road contractor classification system (Appendix B, Table 6A and 6B).

The questionnaire to the 11 contractors sought to ascertain their equipment holding and availability at site. Analysis made on equipment held by contractors, based on the responses from the 11 contractors surveyed is presented in Table 4.8. The assessment of projects by the Road maintenance engineers on whether contractors satisfied equipment requirement on site was also used to determine contractor compliance of the equipment requirement. The eleven contractors who responded to the contractor survey questionnaire were among the 30 contractors who were evaluated by the Road engineers unknowingly. The 11 contractors surveyed had equipment information which was confirmed by the Road maintenance managers.

Table 4.8: Compliance and shortfalls of equipment holding

Contractor class	No passed	No. Failed	Comments
A1B1	3		Had required equipment
	1		Partly satisfied requirement for low loader and Vibratory roller
		1	No static roller, no Bitumen Distributor and no chipping spreader
A2B2	2		Had required equipment
		1	Did not satisfy requirement for Tipper Trucks and Water Tanker
A3B3		1	No Water Tanker, No Static Roller, Only 1No Tipper Truck, No Chippings spreader
A3B3		1	No Dozer , No Water Tanker, No Static roller, only 2 No tipper truck, No chippings spreader
A3B3		1	No Dozer ,No static roller ,only 2 No Tipper trucks, No chippings spreader
Total	6	5	

The detailed equipment capacity of the eleven contractors and the road contractor classification equipment requirement is shown in Appendix B. The trend of equipment compliance by the contractors shows that about 60% of the A1B1 contractors surveyed satisfied road contractor classification minimum equipment holdings. About 70% of A2B2 contractors satisfied the minimum equipment holding; however none of the A3B3 respondent contractors met the minimum classification requirement for equipment holding. The survey also showed that the condition of the equipments ranged between good, fair and poor. Contractors who did not satisfy the minimum equipment requirement resorted to hiring to execute their projects.

An evaluation of the ~~data on~~ equipment capacity and the trend of contractor compliance to minimum equipment holding reveal that the bulk of equipment is in the A1B1 class. A1B1 has average 4 dozers per contractor, class A3B3 (3 dozers per contractor) and A3B3 having 0.7 dozers per contractor. It was expected that A1B1 and A2B2 contractors who met road contractor classification equipment requirement

and owned most equipment would have executed most projects but the reverse was the case even with the 11 contractors surveyed.

4.4.1 Equipment Ownership Status

Equipments submitted for classification purposes are expected to be available for the execution of projects. This is to avoid over reliance on hiring of equipment for the execution of projects. Table 4.9 presents the equipment ownership status of the 11 classified roads contractors. The table shows that contractor classes A1B1 and A2B2 owns most of their equipment while contractor class A3B3 owns less equipment and depends on equipment rentals for the execution of road maintenance projects.

Table 4.9: Equipment ownership among contractors

	DOZER		GRADER	WHEEL LOADER		VIB ROLLER	
CUCCLASS	OWNED	RENTED	OWNED	OWNED	RENTED	OWNED	RENTED
A1B1	5		5	5		5	
A2B2	3		3	3		3	
A3B3	1	2	3	1	2		3
Grand Total	9	2	11	9	2	8	3
	PNEUMATIC ROLLER		BIT DISTRIBUTOR		CHIP SPREADER		
CUCCLASS	OWNED	RENTED	NA	OWNED	RENTED	OWNED	RENTED
A1B1	5			4	1	4	1
A2B2	2	1		3		3	
A3B3		3	2		1		3
Grand Total	7	4	2	7	2	7	1

The compliance of contractors to equipment requirement on site for performing and non performing projects is also illustrated in Table 4.10 and 4.11 from data obtained from the evaluation of the 30 road projects being managed by the road engineers. The road supervisors were asked to state which contractors' satisfied equipment and which contractors did not and to what extent did lack of equipment affect the project.

Table 4.10: Compliance to equipment requirement on site A1B1 and A2B2 Contractors

	did not satisfy equipment requirement		satisfied equipment requirements		Grand Total
	A1B1	A2B2	A1B1	A2B2	
Project Type					
REHAB				2	2
Resealing		1			1
Resurfacing	1			2	3
Upgrading			4	3	7
Grand Total	1	1	4	7	13

Table 4.11: Compliance to equipment requirement on site A3B3 and A4B4 contractors

	did not satisfy equipment requirement		satisfied equipment requirements		Grand Total
	A3B3	A4B4	A3B3	A4B4	
Project Type					
Culvert Construction				2	2
Drainage Structures		1	2	2	5
REHAB			2		2
Resurfacing	2				2
Shoulder Blading			1	1	2
Upgrading	2		2		4
Grand Total	4	1	7	5	17

From Table 4.10 out of 13 projects handled by A1B1 and A2B2 contractors 11 projects did satisfy equipment requirement. Table 4.11 shows that 4 out of 11 A3B3 and 1 A4B4 contractors did not satisfied equipment requirement on 17 projects handled by A3B3 and A4B4 contractors.

The effect of lack of equipment on site can result in delays and generally non performance of contractors, Table 4.12 presents the effect of lack of equipment on 30 projects as evaluated by the road managers. The distribution shows that 20% of all projects executed by A1B1, 12.5% of projects handled by A2B2 and 37% of all A3B3 projects suffered lack of equipment that had severe consequences on the projects

execution. Also of the 15 non performing projects reported 9 did not have equipment but the lack of equipment on those projects had no effect on the execution of those projects. 6 of the non performing projects that suffered lack of equipment was reported had severe effect of which 4 were A3B3 contractors. The lack of equipment was severe where low class contractor was executing periodic maintenance works which required high equipment input.

Table 4.12: Effect of lack of Equipment on Performance

Performance	Effect of Lack of equipment on project	Contractor Classification				Grand Total
		A1B1	A2B2	A3B3	A4B4	
Non Performing	No Effect	3	2	3	1	9
	Severe	1		4	1	6
Total		4	2	7	2	15
Performing	No Effect	1	5	4	4	13
	Severe		1			1
Total		1	6	4	4	15
Grand Total		5	8	11	6	30

4.5 Effect of Contractor Full Time Technical Staff

Lack of full time personnel on Projects is a major obstacle to prompt project execution. Technical audit reports on the on-going Road Sector Development Programme continue to cite contractor full time personnel as none existent or woefully inadequate (RSDP 2004-2006, 2007 Review reports). Contractor personnel including full time technical staff ensures quality work is delivered however most road contractors indulge in filling of tender documents and contractors classification application forms with names and curriculum vitae of engineers and other professionals but fail to deploy them at site and because there is no verification system on the ground they always tend to go scot free thereby leaving behind substandard job.

Table 4.13: Employment of Engineers

Performance	Contractor Class	Engineer Employment		
		Full Time	Part Time	Total
Non Performing	A1B1	4		4
	A3B3		1	1
Performing	A1B1	1		1
	A2B2	2	1	3
	A3B3	1	1	2
Total		8	3	11

Analyses of Technical staff manpower of the 11 contractors surveyed are shown in Tables 4.13, 4.14, 4.15 and 4.16. The tables show that on the average of the 11 contractors, 8 had full time Civil Engineers, 7 full time Quantity Surveyors, 7 full time land surveyors and only 4 contractors had soil technicians. This manpower data for the 11 contractors were also validated by the road engineers but again the situation was different for the 19 contractors.

Table 4.14: Employment of Quantity Surveyors

Performance	Contractor Class	Quantity Surveyor Employment				
		FT	N/A	PT	Nil	Total
Non Performing	A1B1	2			2	4
	A3B3			1		1
Performing	A1B1	1				1
	A2B2	2		1		3
	A3B3	2				2
Total		7		1	2	11

Table 4.15: Employment of Land Surveyors

Performance	Contractor Class	Land Surveyor Employment		
		Full Time	Part Time	Total
Non Performing	A1B1	4		4
	A3B3		1	1
Performing	A1B1	1		1
	A2B2	2	1	3
	A3B3	1	1	2
Total		8	3	11

Table 4.16: Employment of Material / Soil Technician

Performance	Contractor Class	Soil Technician				Total
		N/A	FT	PT	Nil	
Non Performing	A1B1		1		3	4
	A3B3	1				1
Performing	A1B1		1			1
	A2B2		2	1		3
	A3B3	2				2
Total		3	4	1	3	11

A comparison of the personnel requirement (see Appendix B Table 5A- 5B) shows that although class A3B3 and to some extent A4B4 contractors are engaged in major periodic maintenance works such as rehabilitation and upgrading, the classification requirement does not categorically require especially A3B3 to employ experienced and competent technical staff such as Quantity /Land surveyors, Civil Engineers and Soil Technicians. Inadequate full time personnel cut across all the contractor size.

Table 4.17 shows the distribution of inadequate full time technical personnel on the 30 evaluated projects. Among the 15 non- performing contractors 47%, nearly half the number were A3B3 contractors who did not have adequate full time personnel.

Among contractors who did not have adequate full time personnel but performed, 50% were A2B2 contractors and 25% each of A3B3 and A4B4. This could be explained partly by the reliance of nearly all contractors on agency regional staff.

Many local contractors are unable to employ high calibre personnel and resort to low grade technical personnel and family members and at the end rely on agency personnel for site supervision and material quality control under such circumstances they may be pushed to compromise some standards.

Technical audit reports (RSDP 2004, 2005-2006, 2007 Review Reports) and public concerns reveals that many of the maintenance works are poorly executed yet the Laboratory results supporting the payment of certificates however indicate otherwise.

In order to ascertain whether the contractors executing maintenance jobs had the requisite technical staff requirement documented on paper on the ground, the respondent engineers reported on which projects availability of technical staff was most prevalent as depicted in Table 4.17. Inadequate full time personnel were reported on 12 non performing projects and 8 performing projects. Of the 12 non performing projects with inadequate staff 7 projects executed by A3B3 lacked adequate full time personnel, 5 of these projects were periodic while 2 were drainage structures contracts. The five remaining non performing contracts had two each without adequate full time technical staffs among the A1B1 and A4B4 and 1 project an A3B3 contractor. The table also shows that all the non performing upgrading projects did not have adequate full time technical staff while o two periodic projects executed by A1B1 contractors did not perform even with adequate full time personnel, this might be due to other factors mainly financial. The Table also shows projects with full time adequate technical staff on 10 projects.

Only 30% of these projects were non-performing while 70% of the projects with adequate full time personnel performed. This indicates that generally classified road contractors with the requisite technical personnel may successfully complete their projects. Again most upgrading works performed with adequate full time technical personnel. The Table also shows that generally all contractors whose projects performed had full time technical personnel to carry out supervision.

Table 4.17: Distribution of inadequate full time technical Personnel

Class of Contractor	Project Type	inadequate full time technical staff on site		adequate full time technical staff on site		Grand Total
		Non Performing	Performing	Non Performing	Performing	
A1B1	Resurfacing			1		1
	Upgrading	2		1	1	4
A2B2	REHAB		2			2
	Resealing		1			1
	Resurfacing		1	1		2
	Upgrading	1			2	3
A3B3	Drainage Structures	2				2
	REHAB	1	1			2
	Resurfacing	2				2
	Shoulder Blading				1	1
	Upgrading	2	1		1	4
A4B4	Culvert Construction		2			2
	Drainage Structures	2			1	3
	Shoulder Blading				1	1
Grand Total		12	8	3	7	30

4.6 Contractor Financial Capability

Contractor financial capacity was assessed based on the following assumptions that:

- contractors with adequate financial capacity would easily attract credit and this will contribute to his performance
- that the release of advance mobilization has an impact on contractor performance especially if he has sound financial status

- Assumption (a) is a requirement for classification.

Table 4.18: Contractor source of funding

Contractor Sources of Capital	Contractor Class			
	A1B1	A2B2	A3B3	Total
Bank Loan	3	1	2	6
Bank Loan/Payment from Contract	2	2		4
Payment from Contract			1	1
Total	5	3	3	11

From Table 4.18, respondents from the questionnaire to the 11 contractors shows that 55% of all the contractors depend solely on bank loan for their contract financing, 36% on bank loan and payment from contract including advance mobilization loan and only 9% rely solely on payment from contract.

Again in order to ascertain the financial capacities of the 30 contractors evaluated and how project financing affected projects execution in terms of severity, analysis using Excel Pivot Table cross tabulation showed that 93% of contractors who did not perform had severe financial constraints with A3B3 contractors forming 50% followed by A2B2- 29%, A1B1-14% and the rest 7% being A4B4. A3B3 with low turnover and therefore low equipment holding performed poorly.

4.6.1 Access to Advance Mobilisation Loan / credit and Performance

Figure 4.19 below shows the trend of the evaluation of contractors who received Advance mobilization loan and had access to credit and performance as indicated by the engineers. A cross tabulation of the two factors was done on the performing and non performing contractors. The scenario shows that of the 30 contractors only 7% did not rely on any form of access to credit or advance mobilization loan facility and did not perform. 10% of all contractors relied only on paid advance mobilization but all did not perform. (This is explained perhaps typical of the Ghanaian contractor by investing in equipment new and second hand to fill in equipment gap and spending on sometimes flashy cars to the detriment of the project).

Table 4.19: Access to Advance Mobilisation Loan / credit and Performance

		No Credit/ No Mobilization	No Credit/ Mobilization	Credit/ No Mobilization	Mobilization/ Credit	Grand Total
Performance	CCLASS	NCNM	NCM	CNM	CM	
Non Perf	A1B1	1	1		2	4
	A2B2	1			1	2
	A3B3		2	1	4	7
	A4B4				2	2
Sub total		2	3	1	9	15
Perf	A1B1				1	1
	A2B2			2	4	6
	A3B3			1	3	4
	A4B4			2	2	4
Subtotal				5	10	15
Total		2	3	6	19	30

20% of all contractors relied only on credit out of which 83% performed. Also 63% of all contractors relied on both mobilization and credit out of which 47% did not perform and 53% performed. The trend is that majority of contractors are executing projects by taking advantage of both advance mobilization and credit facilities, this shows that finance has some significant influence on the performance of contractors and they suffer immensely from undue delay in payment. The table also reveals that 60% of A3B3 and 67% of A1B1 who had access to both credit and advance mobilization did not perform. However 80% of A2B2 contractors who rely on both access to credit and mobilization performed. For the A4B4 contractors half of those who relied on both access to credit and advance mobilization did not perform. Thus A1B1 and A3B3 contractors are the most vulnerable in terms of application of project financing.

4.7 Appreciation of Effectiveness and Quality of the Road Contractor Classification from Contractors point of view

The survey to contractors also sought the views of contractors on the use and practice of the road contractor classification system over the years. They were asked to assess procedures, requirements, evaluations and verification processes of the road contractor classification system in Ghana. The assessment of the 11 contractors surveyed is presented in Table 4.20. The trend shows that generally less than half (46%) of the contractors surveyed appreciated the effectiveness and quality of the system, fairness of the grading, openness of the procedure, criteria application. Interestingly the table reveals that 54-82 % of the contractors surveyed believe the scheme has achieved poor results in industry related issues such as growth of small and medium contractors, employment and retention of contractors' staff, equipment availability and competency of contractors.

Table 4.20: Contractors Assessment of Achievements of the Road Contractor Classification System

No	Issues	% Responses	
		Good	Poor
1	How will you rate the effectiveness and quality of the system?	45	55
2	Fairness of the Grading of Contractors	46	54
3	Openness of the procedure	46	54
4	Does the application of the criteria for classification promoted growth of the industry	46	54
5	Employment and retention of staff	46	54
6	Availability of contractors with requisite competence	46	54
7	Availability of Contractors with requisite equipment	36	63
8	Growth of Small & medium contractors	18	82

4.8 Assessment of Contractor Classification System Impact from Supervisors

Point of view

Table 4.21 gives an overview of the major achievements and drawbacks of the contractor classification system from the point of view of GHA Road agency staff over the years of implementation of the Road Contractor Classification.

Table 4.21: Road Managers Assessment of workings of the Road Contractor Classification System

	Issues	% Responses	
		Good	Poor
1	How will you rate the effectiveness and quality of the system?	67	37
2	Fairness of the Grading of Contractors	50	50
3	Openness of the classification Procedures	33	67
4	Classification requirements has promoted growth of the industry	67	33
5	Employment and retention of qualified staff	67	33
6	Availability of Contractors adequately equipped	33	67
7	Growth of Small & medium local contractors	67	33
8	Availability of contractors with requisite competence	50	50

From Table 4.21, the road engineers gave a generally good assessment of the system in contrast to the contractors in the area of effectiveness and quality of the system, fairness of the grading of contractors, growth of small & medium local contractors and the construction industry as a whole. 80-100% of the road engineers also noted the following drawbacks in the systems:

Lack of openness in the classification procedures, weakness in the classification system, lack of availability of financially sound contractors and over classification of contractors.

Further analysis of the responses to the questionnaire to the road managers and contractors also revealed a general improvement in road maintenance by the operation of the

contractor classification system over the years especially during the years under review 2002 – 2007 compared to the past. Table 4.22 also shows the trend of problems and concerns of local road contractors.

Table 4.22: Problems /Concerns of Road Contractors

	Problem Areas	Type of Problem	% Respondents
1	Delays in Payments from Clients	<3months	18
		3-6months	27
		6-8months	27
		>8months	27
2	Equipment	Frequent breakdown	45
		Not frequent breakdown	55
3	Enough Road maintenance jobs	Enough	90
		Not enough	10
4	Contract price merit tendering	Sometimes	73
		Most of the time	27
5	Contract packaging	Attractive	45
		Very Attractive	10
		Not Attractive	45
6	Adequate frequency of Training	Adequate	45
		Not Adequate	55
7	Road maintenance delivery	Improved	90
		Not Improved	10

The problem areas include excessive delayed payments of certified works, mostly between 6-12 months, barely attractive contract packaging and sometimes contract do not merit tendering, inadequate contractor training programmes and frequent equipment breakdowns.

4.9 Summary of Findings

From the foregoing analysis the basis for the road contractor classification system in Ghana has been elaborated, this has been compared with best practices in other countries to identify perceived shortfalls. Further discussions has centered on the effect of classification factors and their compliance or otherwise by performing and

non performing classified local contractors executing road maintenance works. The principal issues are:

- Mandate of the existing classification system is now centered from an all encompassing contractor registration management ,regulation and monitoring to only grading of contractors
- That lack of a proper legal status and structure of the road contractor classification system results in an adhoc contractor registration management, regulation and monitoring.
- For lack of centralised project register and a more comprehensive database the registration system is not able to track records of performing and non performing contractors thus under achieving contractors are taking advantage of the weakness in tendering evaluation procedures to win contracts which they are not able to perform.
- Classification factors is limited to the basic four criteria putting more emphasis on equipment holding, it does not take into account company and organisational culture thus contractors are still operating as sole enterprises making them inefficient in maintenance delivery.
- Non use of a point system of evaluation introduces subjectiveness in the grading of contractors gave way to under resourced contractors who are not able to deliver the anticipated maintenance works.
- Categories and classes are limited to only a four tier classes 1-4, some A4,B4 contractors soon gets to A2,B2 and A3,B3 by the addition of two or three pieces of equipment and execution of a few projects without the needed company competence and growth required for achieving success in construction activities.

- Lower class contractor such as A4, B4 and A3, B3 contractors are securing most periodic maintenance works which are higher in scope than their class and are having difficulty in executing the works.
- Lack of equipment was severe where low class contractor mostly A3B3 was executing periodic maintenance works which required high equipment input and relied mostly on equipment rentals but did not perform on their projects possibly due to weak and poor condition of rented equipments.
- A1, B1 Contractors mostly satisfied equipment requirements but did not complete project on schedule due perhaps to financial difficulties and the technical difficulties or general company incompetence.
- A3B3 and to some extent A4B4 contractors are engaged in major periodic maintenance works such as rehabilitation and upgrading, the classification requirement does not categorically require especially, A3B3 to employ experienced and competent technical staff such as Quantity /Land surveyors, Civil Engineers and Soil Technicians The technical personnel gap may be contributing to weak supervision and the poor quality work.
- Mostly contractors claimed availability of key personnel but relied on regional road agency staff for leveling, measurements and supervision, this potentially brought delays to project execution as the agency staff themselves had their own daily routine assignments to attend.

CHAPTER 5

5 CONCLUSIONS AND RECOMMENDATIONS

This chapter attempts to draw conclusions of the research study and makes recommendations to help improve upon the classification system and tendering evaluation process.

5.1 Conclusions

The road contractor classification system has been operated for over 20 years as a committee system within the Ministry of Transportation administrative structure. The study could not categorically conclude that contractor classification factors alone were responsible for contractor performance or non performance. However a critical assessment of the system as it operates in Ghana compared to international experience reveals some weaknesses in the procedures, requirements and implementation of the classification system which have resulted in some contractors falling below their classified standards. These include:

- Classification committee operations are adhoc, need decentralization and are not adequately resourced. Absence of a separate secretariat or department or an independent board with full time personnel makes it difficult to carry out verifications of contractor's resources submitted during classification. Contractor registration information is therefore based on papers submitted which have not been adequately verified.
- Contractor grading is based on unstructured discussions and consensus building among members. This introduces subjectiveness in the evaluation process as members usually vouch for contractors which are not acceptable

- Also existing criteria lays more emphasis on equipment than on contractor key personnel, time management, experience on projects and capital. These results in low quality of staff and experience among construction firms which stifles quality and efficiency.
- Legal basis for the classification system need to be strengthened to enforce contractor compliance at sites.
- There seems to be a dual role of road agency supervisory staff i.e. on both the contractor team and as supervisor to monitor and enforce compliance. This has impacted negatively on contractor performance and compliance.
- Some procurement issues such as long delayed payment, lack of comprehensive database of contractor resources and performance record have contributed to poor tender evaluation and verification process which possibly allowed unqualified contractors to win projects for which their capacity is inadequate.

5.2 Recommendations

Following the above analysis of constraints in the current classification system, workload and contractor capacities the following strategies and interventions are recommended for the improvement of the contractor classification system, maintenance works procurement and execution.

1. Need to create separate department, council or board with legal entity with a well resourced secretariat to be in charge of project registration, contractor classification, monitoring enforcement of contractor classification criteria and able to apply sanctions to erring contractors.
2. Appoint an independent registrar of contracts for the council.

3. Allocate adequate resources for verifications of all declarations by contractors, reintroduce and revitalize the inspection teams and zonal sittings.
4. Registration criteria should be synchronized with project specific tendering requirements from agency tender entities so that registered contractors in the appropriate class should be able to meet the tender conditions required for the class and complexity of a given project to reduce tendering cost both to clients and contractor.
5. There should be a review of the current Road Contractor Classification document to ensure procedure for registration, renewals/ upgrading and requirements for all classes are tightened. A proposed procedure is shown in Appendix A.
6. Additional criteria such as quality assurance certified by third party, occupational health and safety, environment, capability for co-ordination of subcontractors, company organisational structure including Technical Director Criteria should be taken on board.
7. Introduce and adopt a more transparent system of evaluations and approvals such as the point system for the main classification criteria with a minimum overall score of (e.g. 70%) for an applicant to qualify for registration.

BIBLIOGRAPHY

Africa Transport Technical Notes: Sub Saharan Africa Transport Policy Program (SSATP) Road Management Initiative (RMI) UNECA and the World Bank Note No 8 (1997)

Andreski A (1997). Roads Investment for Sustainability of Network and Domestic Contractors. www.ittransport.co.uk Assessed 2008, April 13

Bentall P., Beusch A., Van de J., (1999) Employment Intensive Infrastructure Programmes: Capacity Building for Contracting in the Construction Sector ILO publication

Best Practice Guidelines for Contracting Out Government Services. Puma Policy Briefs No. 2 Public Management Services (1997) OECD

Brushett S., and Seth S.(2005) Construction Industry Development and the Road Sector - Effectiveness of National Construction Councils, World Bank, Sub Saharan Transport Policy Program No 8 ,www.roadfundtz.org Assessed April 13, 2008

Construction Industry Development Board Act No. 38 of 2000
Republic of South Africa Cape Town .www.info.gov.za/gazette/acts/2000;Assesed 15 APRIL 2008

Contractors Registration Board - Tanzania. Annual Consultative Meeting 2005
Proceedings: Capacity Building for a Sustainable Contracting Industry: challenge to all Stakeholders

Davis D., (2006) The Transport Sector: A laboratory for Good Practices in Capacity Development? Capacity Development Briefs World Bank Institute (2006) No 18

De Heer Graham J. (1994) Paper Presented on Problems confronting Small – Scale Contractors in Ghana .4th Management Improvement Training for Small Scale Construction in Ghana.

Dlungwana W., Rwelamila D., Contractor Development Models That Meets The Challenges of Globalisation- A Case for Developing Management Capability of Local Contractors(2002)

DMJM International, et al (1994) Local Construction Industry Capacity; Assessment and Development Study MRH, DFR

Guidelines for the classification of contractors for road and bridge works.
Ministry of Transportation (MoT) Ghana (2007)

Hernes T., (1998) Training contractors for results: A Guide for Trainers and Training Managers. ILO GENEVA

Kwakye E. (2002) Private Sector Participation in Road Development in Ghana, Workshop on Promoting Private Participation in Roads AND Highways Addis Ababa 2002 www.worldbank.org/transport Assessed April 3, 2008

Lantran J.M., (1991) Contracts for Road Maintenance Works Agreements For Works by Direct Labour (Contracting out of Road Maintenance Activities: Vol II) The World Bank & The Economic Commission for Africa Sub-Saharan Africa Transport Program

Larcher, P. and Miles, D (2000) Roads and realities: How to promote road contracting in developing countries. Institute of Development Engineering, Loughborough University, UK

Mckillip, J. (1987) Need Analysis: Tools for the Human Services and Education. Sage, Newbury Park

Ofori, G. (1991) Programmes for improving the performance of contracting firms in developing countries: A review of approaches and appropriate options. Construction Management and Economics (1991)9 pp.19-38

Parkmann, C., Madelin, K., Robinson, R., Toole, T., (2001) Developing Appropriate Management & Procurement Approaches for Road Maintenance

Public Procurement Act, 2003 (Act 663) Ghana Publishing Corporation (Assembly Press) Accra-Ghana

Rausch, E. (1994) Road Contractor Promotion and Employment Generation in Africa

Road Sector Development Programme Annual Review Report 2006, 2002, 2004-2005, 2007, Ministry of Transportation Ghana

Robinson, R., Danielson, U., Snaith, M.(1998). Road Maintenance Management: Concepts and Systems. Basingstoke and London: Macmillan Press, 1st Edition

Sam, K. A. and Opoku, G. (2005). Action plan for improving the local construction industry in Ghana.

Tasmania Guidelines for Registration as a pre-qualified Contractor for Civil Works Contracts. Department of Infrastructure, Energy and Resources (DIER). <http://147.109.254.181/domino/wgh.nsf>. Assessed 6 April 2008

Uriyo A., Mwila J., Jensen L., (2004) National Council for Construction Zambia, Development of Contractor Registration Scheme with a Focus on Small Scale Civil Works Contractors Final Report

Zietlow G. Restructuring Road Management: Cutting Cost and Improving Quality through Performance Based Road Management and Maintenance Contracts. University of Birmingham (UK) Senior Road Executive Programme

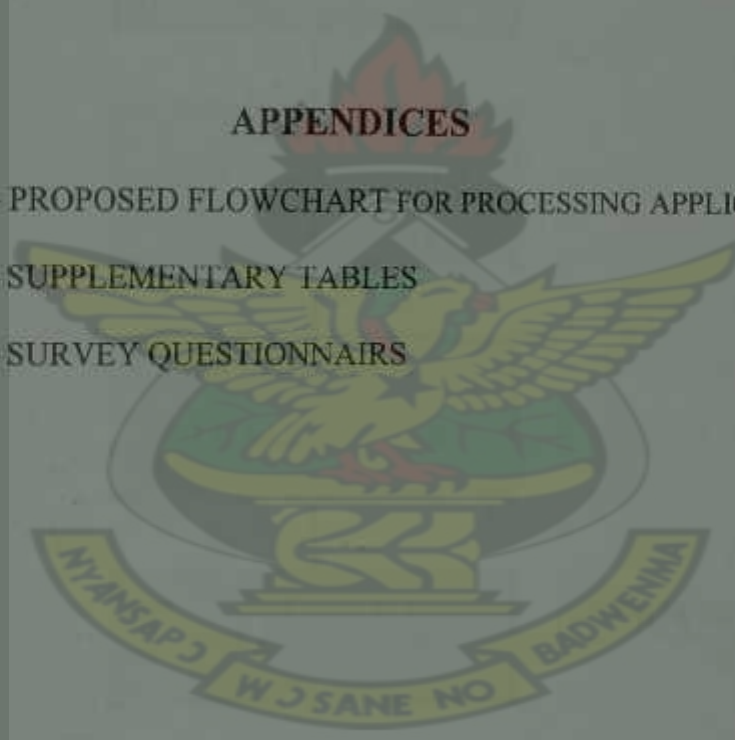
KNUST

APPENDICES

APPENDIX A – PROPOSED FLOWCHART FOR PROCESSING APPLICATIONS

APPENDIX B – SUPPLEMENTARY TABLES

APPENDIX C – SURVEY QUESTIONNAIRS



APPEENDIX A: PROPOSED FLOWCHART FOR PROCESSING APPLICATIONS

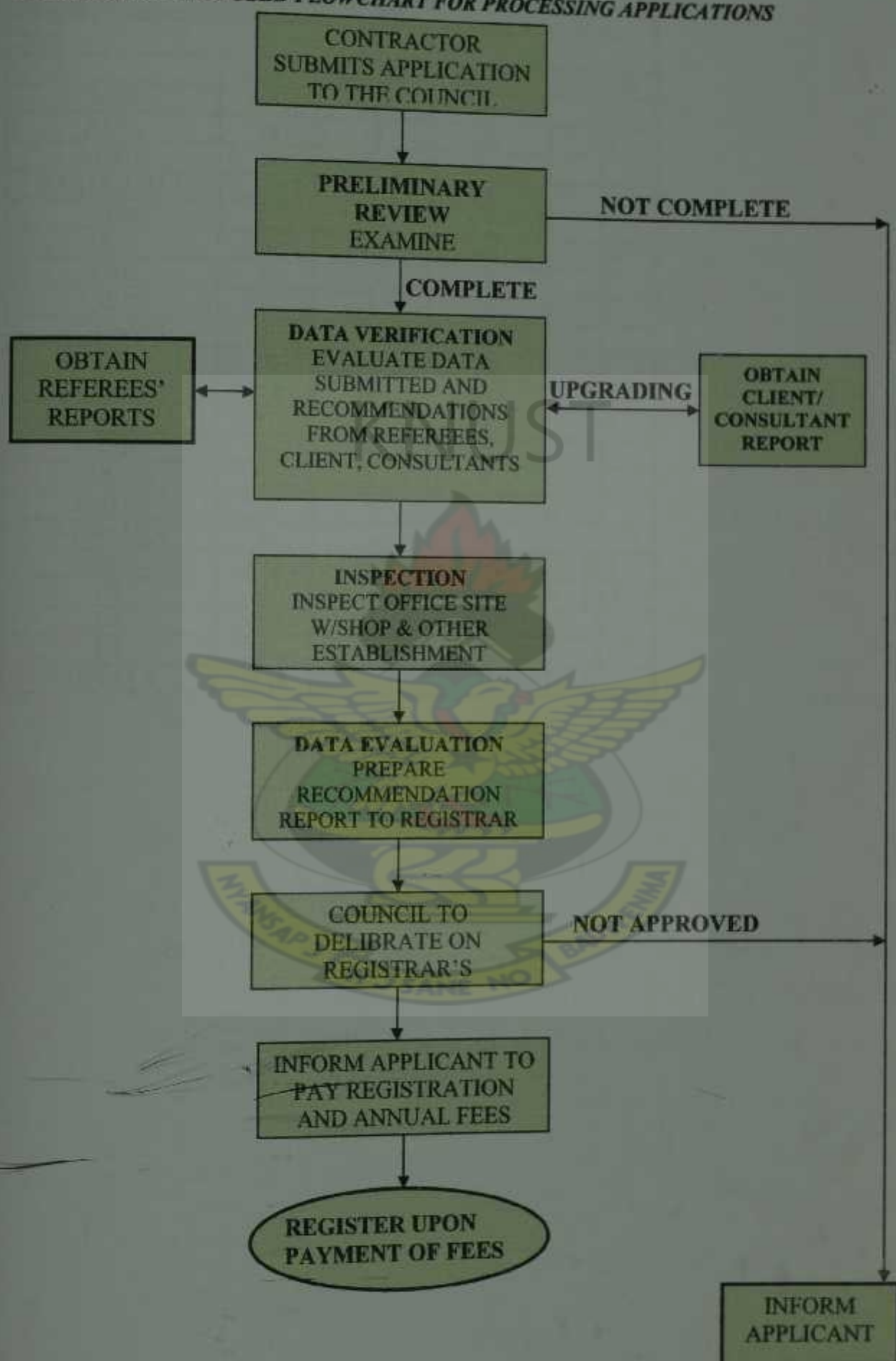
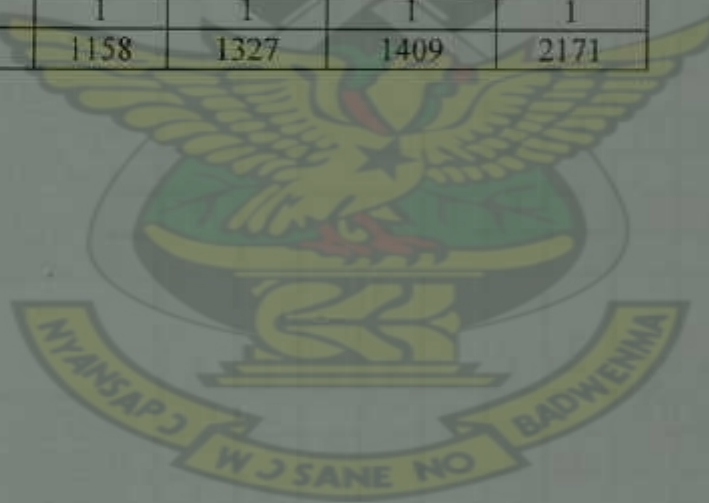


Table 1: Monthly Contractor Classification by Class July- Dec. 2007
Monthly Contractor Classification by Class between July- Nov. 2007

	Jul-07	Sept.07	OCT. 07	Nov-07
CLASS	No.	No.	No.	No.
A1B1	18	18	18	18
A1B1C	1	1	1	1
A1B1S2M1L1	1	1	1	1
A2B2C	0	1	1	1
A2B2	46	48	49	759
A3B2	6	6	7	6
A3B2C	1	1	1	1
A3B3S3L3	1	1	1	1
A3B3C	10	4	12	7
A3B3	368	388	394	394
A4B3	83	87	96	96
A4B3C	5	4	4	2
A4B3S2	1	1	1	1
A4B4C	7	9	9	9
A4B4M4L4	1	1	1	1
A4B4	440	537	581	631
B3	4	218	5	240
B4	164	0	226	1
L3	1	1	1	1
TOTALS	1158	1327	1409	2171



APPENDIX B: Table 2 Contractor Equipment Capacity

CONTRATOR CLASS	STATUS	DOZER	GRADER	LOW LOADER	TIPPER TRUCKS	STATIC ROLLER	VIBRATORY ROLLER	PNEUMATIC ROLLER	WATER TANKER	WHEEL LOADER	BITUMEN DISTRIBUTOR	CHIPPING SPREADER	Remarks
A1B1	OWNED	2	4	2	25	0	4	3	3	5	2	3	OK
	RENTED												
A1B1	OWNED	5	6	4	40	1	5	2	4	4	3	3	OK
	RENTED												
A1B1	OWNED	5	6	2	20	*	7	3	5	3	2	2	OK
	RENTED												
A1B1	OWNED	3	3	1*	9	2	1*	1	2	3	2	1	Partly OK
	RENTED												
A1B1	OWNED	4	5	1*	8*	0	2	1	2*	4	0*	0*	NOT OK
	RENTED												
A1B1 Classification Requirement		3	4	2	15	4	2	1	3	1	1	3	
A2B2	OWNED	4	4	2	8	2	2	3	3	3	2	3	OK
	RENTED												
A2B2	OWNED	2	4	1	7*	1	1	1	1*	2	1	1	OK
	RENTED												
A2B2	OWNED	2	3	1	9	2	1	1	2	3	2	1	OK
	RENTED												
A2B2 Classification Requirement		2	4	2	8		1	1*	2	1	1	2	
A3B3	OWNED	1	2		1*	0			0			0	Not Ok
	RENTED			1	7	1	1	1	1	1	1	1	
A3B3	OWNED	0	1		2*	0						0	NOT OK
	RENTED						1			1			
A3B3	OWNED	0	1		2*	0			1	1		0	Not OK
	RENTED	1		1	2	1	1						
A3B3 Classification Requirement		1** *	1		4	1			1			1	
A4B4 Classification Requirement			1		2	1							

*Partly satisfy Equipment requirement

** Classification Requirement - Either a pneumatic Roller or Static Roller

*** Classification Requirement - Either a Dozer or traxcavator

TABLE 3: CLASSIFICATION TABLE FOR ROAD CONTRACTORS BY CATEGORY AND CLASS

	CATEGORY A	CATEGORY B	CATEGORY C	CATEGORY S
CLASS	ROADS AIRPORTS & RELATED STRUCTURES	BRIDGES, CULVERTS & OTHER STRUCTURES	LABOUR BASED ROADWORKS	STEEL BRIGES AND STRUCTURES: CONSTRUCTION REHABILITATION AND MAINTENANCE
4	Spot improvement and reshaping, 80km and regravelling, 20km a. Tender figure up to cedis equivalent of US \$250,000 b. Total value of work on hand up to cedi equivalent of US \$ 400,000	Pipe culverts up to 1.2m diameters and non-reinforced a. Tender figure up to cedi equivalent US \$ 100,000 b. Total value of work on hand up to cedi equivalent of US \$ 150,000		This Class not Applicable
3	Work in class 4 plus rescaling up to 20km and resurfacing up to 10km a. Tender figure up to cedis equivalent of US \$650,000 b. Total value of work on hand up to cedi equivalent of US \$ 1,000,000	Work in class 4 plus single box culverts and other minor reinforced concrete structures including short retaining walls a. Tender figure up to cedis equivalent of US \$250,000 b. Total value of work on hand up to cedi equivalent of US \$ 400,000	ROAD CONSTRUCTION MAINTENANCE AND SPOT IMPROVEMENT USING LABOUR BASED METHODS AS TRAINED BY THE DEPARTMENT OF FEEDER ROADS	Sand blasting, cleaning, jacking, changing of members and parts, tightening of bolts and nuts, other repairs including painting a. Tender figure up to cedis equivalent of US \$250,000 b. Total value of work on hand up to cedi equivalent of US \$ 400,000
2	Work in Class 3 plus improvements, rehabilitation and minor construction works a. Tender figure up to cedi equivalent of US \$1,250,000 b. Total value of work on hand up to cedi equivalent of US \$2,000,00	Work in Class 3 plus major box culverts on bridges and reinforced concrete, steel or composite reinforced a. Tender figure up to cedi equivalent of US \$500,000structures b. Total value of work on hand up to cedi US\$750,000		Work in Class 3 plus minor construction a. Tender figure up to cedi equivalent of US \$500,000 b. Total value of work on hand up to cedi equivalent of US \$750,000
1	Work in class 2 plus major construction of roads and airports No limit on tender.	Work in Class 2 plus bridges and other major structure No limit on tender.		Work in Class 2 plus major steel construction No limit on tender

TABLE 4A
FULL TIME PERSONNEL REQUIREMENTS FOR CLASSIFICATION
"A" ROADS, AIRPORTS AND RELATED STRUCTURES

FINANCIAL CLASS	ITEM	DESCRIPTION	NO. REQUIRED	QUALIFICATION
(1)	1	Works Manager	2	Either BSc. Degree in either, Civil Engineering, Building Technology or Land/Quantity Surveying with a minimum of 10 years experience. Or Diploma in either Civil Engineering, Building Technology or Land/ Quantity Surveying with a minimum of 15 years experience.
	2	Engineer	2	Either BSc. Degree in either Civil Engineering, Building Technology or Land/Quantity Surveying with a minimum of 5 years experience Or Diploma in Civil engineering, Building Technology or minimum of 10 years experience.
	3	Accounts Officer	1	ACA Part 1 or 15 years approved accounting experience
	4	Works Superintendent	3	15 years Road Construction experience with Middle School Leaving Certificate or equivalent
	5	Mechanical Superintendent	2	10 years Road Construction experience with Middle School Certificate or equivalent
	6	Soils Technician	1	Equivalent of a Senior Technical Officer (Materials
	7	Works Foreman Earthworks	2	5 years experience in road works
	8	Works Foreman Pavement	1	5 years experience in road works
(CONTD)				

TABLE 4B
FULL TIME PERSONNEL REQUIREMENTS FOR CLASSIFICATION
"A" ROADS, AIRPORTS AND RELATED STRUCTURES

FINANCIAL CLASS	ITEM	DESCRIPTION	NO. REQUIRED	QUALIFICATION
(1)	9	Works Foreman, concrete	1	5 years experience in road works
	10	Works Foreman, Re-Steel	1	5 years experience in reinforced Concrete works
	11	Surveyor	1	Equivalent of a Senior Technical Officer
	12	Mechanic	10	With experience on road construction equipment
	13	Purchasing Officer	1	10 years purchasing experience
(2)	1	Works Manager	1	Either BSc. Degree in either Civil Engineering, Building Technology or Land/ Quantity Surveying with a minimum of 5 years experience. Or Diploma in either Civil Engineering, Building Technology or Land/Quantity Surveying with a minimum of 10 years experience
	2	Engineer	1	Either BSc. Degree in either Civil Engineering, Building Technology or Land/ Quantity Surveying. Or Diploma in either Civil Engineering Building Technology or Land/Quantity Surveying with a minimum of 5 years experience.
CONTD.				

TABLE 4C
FULL TIME PERSONNEL REQUIREMENTS FOR CLASSIFICATION
"A" ROADS, AIRPORTS AND RELATED STRUCTURES

FINANCIAL CLASS	ITEM	DESCRIPTION	NO. REQUIRED	QUALIFICATION
(2)	3	Accounts Officer	1	ACA Part 1 or 15 years Approved Accounting Experience
	4	Works Superintendent	2	10 years Road Construction experience with Middle School Leaving certificate
	5	Mechanical Superintendent	1	10 years Road Construction experience with Middle School Leaving certificate
	6	Soils Technician	1	Equivalent of a Senior Technical Officer (Materials)
	7	Works Foreman-Earthworks	1	5 years Road Construction Experience
	8	Works Foreman Concrete	1	5 years Road construction
	9	Works Foreman Concrete	1	5 years Road construction Experience
	10	Surveyor	1	Equivalent of a Senior Technical Officer
	11	Mechanics	5	With Experience on road construction equipment
	12	Purchasing Officer	1	5 years Purchasing Experience



TABLE 4D
FULL TIME PERSONNEL REQUIREMENTS FOR CLASSIFICATION
"A" ROADS, AIRPORTS AND RELATED STRUCTURES

FINANCIAL CLASS	ITEM	DESCRIPTION	NO. REQUIRED	QUALIFICATION
(3)	1	Works Superintendent	1	7 years Road Construction Experience
	2	Bookkeeper	1	
	3	Works Foreman Earth works	1	5 years Road Construction
	4	Works Foremen Pavement	1	5 years Road Construction Experience
	5	Mechanics	2	
(4)	1	Bookkeeper	1	
	2	Works Foreman Earthworks	1	
	3	Mechanics	1	



LIBRARY
KWAME NKURUMAH UNIVERSITY OF
SCIENCE AND TECHNOLOGY
KUMASI-GHANA

TABLE 5A
FULL TIME PERSONNEL REQUIREMENTS FOR CLASSIFICATION
"B" ROADS, AIRPORTS AND RELATED STRUCTURES

FINANCIAL CLASS	ITEM	DESCRIPTION	NO. REQUIRED	QUALIFICATION
1 (CONT'D)	1	Works Manager	1	Either BSc. Degree in Civil/ Structural Engineering, with either 10 year experience or 7 years experience in Bridge Works Or Diploma in Civil/ Structural Engineering with either 15 years experience in Road works or 5 years experience in Bridge Works or 10 years experience in Bridge Works.
	2	Engineer	1	Either BSc. Degree in Civil/ structural Engineering, with 5 years experience in Road Works or 3 years experience in Bridge Works. Or Diploma in Civil/structural Engineering, with 10 years experience in Road works or 5 years experience in Bridge Works.
	3	Accounts Officer	1	ACA Part 1 or 15 years of approved accounting experience
	4	Works Superintendent	1	Polytechnic Certificate with 5 years related experience.
	5	Mechanical Superintendent	1	5 years of Road Construction experience with Middle School Leaving Certificate
	6	Soils Technician/	1	Equivalent of a Senior Technical Officer (Material)
	7	Works Foreman, Earthworks		5 years road construction experience with Middle School Leaving Certificate
	8	Works Foreman, Concrete	1	Polytechnic Certificate

TABLE 5B
FULL TIME PERSONNEL REQUIREMENTS FOR CLASSIFICATION
"B" ROADS, AIRPORTS AND RELATED STRUCTURES

FINANCIAL CLASS	ITEM	DESCRIPTION	NO. REQUIRED	QUALIFICATION
(1)	8	Works Foreman, Concrete	1	Polytechnic Certificate
	9	Works Foreman, Piling	1	5 years experience with Bridge Construction Firm
	10	Works Foreman, Re-Steel	1	5 years experience in reinforced concrete works
	11	Mechanics	5	With experience in road and ridge construction works
(2)	1	Works manager	1	Either BSc. Degree in Civil/Structural Engineering, with 5 years experience in Road works or 3 years in Bridge Works. Or Diploma in Civil/Structural Engineering, with 10 years experience in Road works or 5 years in Bridge works.
	2	Accounts Officer	1	ACA Part 1 or 10 years Approved Accounting Experience
	3	Works Superintendent	1	Polytechnic Certificate with 5 years of related experience
	4	Works Foreman Concrete	1	Polytechnic Certificate
	5	Works Foreman - Re- Steel	1	5 years experience in reinforced concrete works
	6	Mechanics	1	With experience on road and bridge construction equipment

TABLE 5C
FULL TIME PERSONNEL REQUIREMENTS FOR CLASSIFICATION
"B" ROADS, AIRPORTS AND RELATED STRUCTURES

FINANCIAL CLASS	ITEM	DESCRIPTION	NO. REQUIRED	QUALIFICATION
(3)	1	Works Foreman Concrete	1	5 years related experience
	2	Bookkeeper	1	
(4)	3	Works Foreman	1	5 years related experience
"C" LABOUR BASED ROADWORKS				
	1	Works Foreman Earthwork	1	5 years related experience



TABLE 6A
CONTRACTORS MINIMUM EQUIPMENT HOLDING FOR CLASSIFICATION

ITEM	EQUIPMENT	A ROAD, AIRPORTS AND RELATED TRANSPORT INFRASTRUCTURE				B BRIDGES CULVERTS AND OTHER STRUCTURES				C LABOUR INTENSIVE ROAD CONSTRUCTION & MAINTENANCE
		I	II	III	IV	I	II	III	IV	
1	Dozer 150 KW (D7)	1	1							
2	Dozer 150KW (D6)	2	1	*1		1				
3	Grader 105	2	1							
4	Grader 105	2	1	1	1					
5	Traxcavator 1.9m3	1								
6	Traxcavator 1.1m3	1								
7	Wheeled Loader 1.1m3	1	1							
8	Excavator 1m3	1				1				
9	Static Roller -10Tonne	3	1	1	1	1				
10	Static Roller -6Tonne	1	*1							
11	Vibratory Roller-8 Tonne	2	1							
12	Pneumatic Roller	1	*1							
13	Plat/Pedestrian Roller	2	1			2	1	1		2
14	WATER TRANKER TRURCK-MIN.5000L	3	2			2	1			
15	Towed water Tanker- 1500L									1
16	LOW LOADER TRUCK	2	1							
17	Flat bed truck	2	1				1	1		
18	Tipper Truck-5m3	15	8	4	2	2	1			1
19	Dump Truck - 15M3	2								

TABLE 6B
CONTRACTORS MINIMUM EQUIPMENT HOLDING FOR CLASSIFICATION

ITEM	EQUIPMENT	A ROAD, AIRPORTS AND RELATED TRANSPORT INFRASTRUCTURE				B BRIDGES CULVERTS AND OTHER STRUCTURES				C LABOUR INTENSIVE ROAD CONSTRUCTION & MAINTENANCE
		I	II	III	IV	I	II	III	IV	
20	Pickup Truck	6	3	1	3	1				1
21	Bitumen Distributor	1	1							
22	Farm Tractor									3
23	Concrete Mixer 0.5m ³ /batch	2	1		2	1				
24	Concrete Mixer 0.25m ³ /batch					2	1	1		
25	Concrete Vibrator	2	1			3	2	1		
26	Air Compressor – 0.3m ³ /S	1	1			1				
27	Air Track 65mm Diameter	1				1				
28	Water Pump – 90,000 L/Hour	1				2	1			
29	Water Pump- 45,000L/Hour	1	1			1	1	1		1
30	Chippings Distributor (attachment)	3	2	1						
31	Crane					1				
32	Dragline Boom & Bucket					1				
33	Piling Hammer-1 Tonne					1				
34	Pile Driving Leads					1				
35	Bar Bender & Cutting	1				2	1			
36	Theodolite	2	1			1				
37	Engineer's level	2	1	1		1	1			

APPENDIX C

I. SURVEY QUESTIONNAIRE FORM

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

COLLEGE OF ENGINEERING

DEPARTMENT OF CIVIL ENGINEERING

Please answer all questions using the choices provided. Additional comments may be added in the space provided at the end of the questionnaire.

Any information provided will be treated as highly confidential and will be used for academic purposes only.

Questionnaire for Classification Committee

1. Organization

Position.....

2. Please when did you join the classification committee?

3. State the sub committees existing within the classification committee.....

4. Which of the branches do you belong? State

5. What is the numerical membership of the classification committee group you belong to? State.....

6. What is the function of the classification committee group that you belong to? State.....

7. What is your role on the committee group you belong to?

8. Since you joined the committee how many times has it been reconstituted? Please state the reason for reconstitution.

9. Has the workings of the committee changed in any way? [] YES [] NO

10. If yes which aspect can you comment on?

11. Has the change brought effectiveness and efficiency that you know?

State.....

12. Does the committee have an inspection team? [] YES [] NO

13. Does the committee have zonal sittings in the course of its work? [] YES [] NO

14. Does the committee have enough time to thoroughly verify and process registration applications? ☐ Yes ☐ No
- 15.0 Is the committee restrained by resources for classification purposes?
☐ Yes ☐ No
- 16.0 How does the com
- 17.0 Does the committee undertake independent verifications? ☐ Yes ☐ No
- 18.0 How does the committee verify the following requirements?
- 18.1 Employees SSNIT payment receipts
☐ By contacting ☐ Site inspection ☐ Rely on documents submitted
- 18.2 IRS tax receipts
☐ By contacting ☐ Site inspection ☐ Rely on documents submitted
- 18.3 Labour cards for employees
☐ By contacting ☐ Site inspection ☐ Rely on documents submitted
- 18.4 Certificates and testimonials of employees
☐ By contacting ☐ Site inspection ☐ Rely on documents submitted
- 18.5 Curriculum vitae of Works Manager, Engineer, Quantity Surveyor etc
☐ By contacting ☐ Site inspection ☐ Rely on documents submitted
- 18.6 Details of immovable property
☐ By contacting ☐ Site inspection ☐ Rely on documents submitted
- 18.7 Movable property i.e. road construction equipment proof of ownership
☐ Manual counting ☐ Site inspection ☐ Rely on documents submitted
- 18.8 Liquid assets as stated by the contractor
☐ Manual counting ☐ Site inspection ☐ Rely on documents submitted
- 18.9 How does the committee able to verify minimum required numbers of personnel and equipment ☐ by contacting ☐ Site inspection ☐ Rely on documents submitted
- 18.10 How does the committee verify the contractors work experience summary for the last five years?
☐ Rely on documents submitted ☐ Receives feed back from Client's Project Manager ☐ Inspection of Project records

18.11 How does the committee verify the contractors' financial records such as audited accounts, Profit and Loss Statement/ Balance sheet, Turnover declarations for registration or renewals or upgrading?

☐ Rely on documents submitted ☐ Accounts are certified by third party chartered Accounting institutions

19.0 Does the contractor classification committee maintain or have access to a computerized database that contains information on all contractors

☐ Yes ☐ No

20.0 Does contractor performance affect application for upgrading?

☐ Yes ☐ No

21.0 How is this assessed?

State.....

22.0 Does the committee assess contractor's record of performance on projects for renewals or upgrading for classification with regard to time, cost and quality?

☐ Yes ☐ No

23.0 How objective is the assessment?

☐ Based on points ☐ Discussions/Consensus

24.0 Does the criteria for classification change from time to time?

☐ Yes ☐ No

25.0 Is there a limit of the number of classified contractors?

☐ Yes ☐ No

26.0 Are contractors always advised of the application results in writing?

☐ Yes ☐ No

27.0 Does committee rejects application?

☐ Yes ☐ No

28.0 How many were rejected in the last one year?

State.....

29.0 Are applicants allowed to seek an appeal or review of any assessment decision by writing? ☐ Yes ☐ No

30.0 As a member of the committee does a good number of the contractors registered have capacity required for their class to deliver maintenance services?

[] Yes [] No

31.0 If no what has accounted for this draw back?

.....

32.0 Does the MRT have a national code of Practice for the construction Industry in Ghana which all road contractors must comply? [] Yes [] No

33.0 Has the legal basis of the classification ever been challenged? [] Yes [] No

34.0 Has the contractor classification system achieved any impact on the construction industry? [] Yes [] No

35.0 As a member of the committee what impact has the system achieved?

State.....

36.0 In which areas has the system not done enough?

State.....

36.0	Rank the following factors according to their influence they should have on classification			
	Factors	Rank		
		Very high	High	Low
36.1	Equipment			
36.2	Personnel			
36.3	Turnover			
36.4	Capital			
36.5	Experience			

II. QUESTIONNAIRE FOR ROAD CONTRACTORS

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
COLLEGE OF ENGINEERING

DEPARTMENT OF CIVIL ENGINEERING

Any information provided will be treated as highly confidential and will be used for academic purposes only.

Write the answer next to the question – or tick the correct answer if a choice is given

- 1.0 Position or Status in the company.....
- 2.0 City and Office location.....
- 3.0 Indicate level or terminal formal education ☐ Nil ☐ Basic
☐ Secondary ☐ Tertiary
- 4.0 What is the type of company?
☐ not registered ☐ limited liability by share ☐ partnership ☐ sole proprietor
- 5.0 When did you first register as a contractor? Tick the year ☐ before 1983
☐ 1983-1992 ☐ 1993-2000 ☐ 2001-2008
- 6.0 Did you start as a road contractor? ☐ Yes ☐ No
- 7.0 If No which area did you start as a contractor e.g.
☐ MWRWH, ☐ E.C.G., ☐ Construction material supplier ☐ other
- 8.0 When did you register with the MRT? State.....
- 9.0 Which other business activity does the firm undertake currently?
☐ Construction materials supplies & retailing ☐ Building works
☐ Consultancy ☐ Trading in goods other than construction materials
☐ Other
- 10.0 Do you support your other business activity with funds from contracting business and vice versa? ☐ Yes ☐ No
- 11.0 What is your current road contractor classification class?
State.....
- 12.0 What was your previous road contractor classification class?
- 13.0 Have ever applied for renewal? ☐ Yes ☐ No

- 14.0 How many times have you applied for renewals? State.....
- 15.0 How you been refused a renewal? ☐ Yes ☐ No
- 16.0 If yes what was the reason for refusal? State.....
.....
- 17.0 Have you ever been down graded? ☐ Yes ☐ No
- 18.0 What did you do to merit the downgrading? State.....
.....
- 19.0 Have you ever been upgraded? ☐ Yes ☐ NO
- 20.0 What did you do to merit the upgrading? State.....
.....
- 21.0 How long did the registration process take? State.....
- 22.0 Do you want the registration process to be decentralized? ☐ Yes ☐ No
- 23.0 Do you have adequate personnel for project execution? ☐ YES ☐ NO
- 24.0. How long does it take to receive payment for work certified?
- | | | | | |
|---------------|--|-------------------------------------|-------------------------------------|------------------------------------|
| Routine mtce | <input type="checkbox"/> less than 1 mth | <input type="checkbox"/> 1-2 mths | <input type="checkbox"/> 2-4 mths | <input type="checkbox"/> 4-6 mths |
| | <input type="checkbox"/> 6-8 mths | <input type="checkbox"/> >8 mths | | |
| Periodic mtce | <input type="checkbox"/> less than 1 mth | <input type="checkbox"/> 1-2 mths | <input type="checkbox"/> 2-4 mths | <input type="checkbox"/> 4-6 mths |
| | <input type="checkbox"/> 6-8 mths | <input type="checkbox"/> > 8 mths | | |
| Donor | <input type="checkbox"/> less than 1 mth | <input type="checkbox"/> 1-2 mths | <input type="checkbox"/> 2-4 mths | <input type="checkbox"/> 4-6 mths |
| | | <input type="checkbox"/> 6-8 mths | <input type="checkbox"/> > 8 mths | |
| Road Fund | <input type="checkbox"/> less than 1 mth | <input type="checkbox"/> 1 - 2 mths | <input type="checkbox"/> 2 - 4 mths | <input type="checkbox"/> 4- 6 mths |
| | <input type="checkbox"/> 6 - 8 mths | <input type="checkbox"/> > 8 mths | | |
- 25.0. Are there enough road maintenance jobs for the market? ☐ YES ☐ NO
- 26.0. Do you encounter frequent equipment breakdown? ☐ YES ☐ NO

27.0	The following key personnel are provided. Tick the ones you have employed full time and their qualification									
	Employment	No	Qualification			Status of Employ		Experience (yrs)		
< Sec. Sch			Sec Sch.	Tertiary	Full time	Part Time	<5	5-10	>10	
27.1	Owner /Manager									
27.2	Engineer									
27.3	Accounts Officer									
27.4	Quantity Surveyor									
27.5	Land Surveyor									
27.6	Soils Technician									
27.7	Works Supt									
27.8	Works Foreman									
27.9	Foreman Pavement									
27.10	Foreman Re-Steel									
27.11	Foreman Concrete									
27.12	Mechanic									
27.13	Purchasing Officer									
28.0	Please indicate the number, status and condition of your equipment holding									
	Equipment	No	Status		Condition					
			Owned	Rented	Good	Fair	Poor			
28.1	Dozer (D7)									
28.2	Dozer(D6)									
28.3	Grader									
28.4	Wheel loader									
28.5	Roller(static)									
28.6	Roller(Vibratory)									
28.7	Roller(Pneumatic)									
28.8	Water Tanker									
28.9	Low Loader Truck									
28.10	Tipper Truck									
28.11	Bitumen Distributor									
28.12	Chippings Spreader									

29.0 What is the main source of financing your contracting business? Tick appropriately.

☐ Bank Loan ☐ Payment for contract ☐ Trading ☐ Family sources

30.0 Does delay in payment affect works delivery? ☐ YES ☐ NO

31.0 How does it affect works delivery?

32.0 Are contract prices high enough to merit tendering? ☐ Sometimes ☐ Most of the time

33.0 Is contract packaging attractive enough to help in acquiring new equipment or for enhancing existing fleet? ☐ Attractive ☐ Very Attractive ☐ Not Attractive

34.0 Have you been to any training programme since becoming a contractor ☐ Yes ☐ No

35.0 Which Agency organized the training? ☐ DUR ☐ GHA ☐ DFR ☐ PROCA ☐ ASROC/GTZ

36.0 How many personnel and supervisors have attended contractor training programmes in the last 5 yrs? State

37.0 Is the frequency of training adequate? ☐ Yes ☐ No

38.0 How will you rate the effectiveness and quality of the classification system? ☐ Good ☐ Poor

39.0 Fairness of the grading of contractors ☐ Good ☐ Poor

40.0 Openness of the procedure ☐ Good ☐ Poor

41.0 Has the application of the criteria promoted growth of the industry? ☐ Good ☐ Poor

42.0 Employment and retention of staff ☐ Good ☐ Poor

43.0 Availability of contractors with requisite equipment ☐ Good ☐ Poor

44.0 Growth of small and medium contractors ☐ Good ☐ Poor

45.0 Availability of contractors with requisite equipment ☐ Good ☐ Poor

46.0 Has the contractor classification helped to improve road maintenance ☐ Yes ☐ No

47.0	Rank the following factors according to their influence they should have on classification			
	Factors	Rank		
		Very high	High	Low
47.1	Equipment			
47.2	Personnel			
47.3	Turnover			
47.4	Capital			
47.5	Experience			



III. QUESTIONNAIRE FOR ROAD MAINTENANCE MANAGERS IN GHANA (GREATER ACCRA AND ASHANTI REGIONS)

Please answer all questions using the choices provided. Additional comments may be added in the space provided at the end of the questionnaire. Any information provided will be treated as highly confidential and will be used for academic purposes only.

1. Project Name/No.....
2. Project Type.....
3. Contractor class.....
4. Did the contractor satisfy the equipment requirement? ☐ Yes ☐ No
5. How much did lack of equipment affect project? ☐ Severe ☐ Less severe
☐ No effect
6. Which of the following equipment was most frequently affected (was a problem to the contractor).
 - 6.1 Bitumen Distributor ☐ High ☐ Medium ☐ Low
 - 6.2 Pneumatic Roller ☐ High ☐ Medium ☐ Low
 - 6.3 Excavator ☐ High ☐ Medium ☐ Low
 - 6.4 Wheel loader ☐ High ☐ Medium ☐ Low
 - 6.5 Grader ☐ High ☐ Medium ☐ Low
 - 6.6 Dozer ☐ High ☐ Medium ☐ Low
 - 6.7 Water Tanker ☐ High ☐ Medium ☐ Low
 - 6.8 Chippings Spreader ☐ High ☐ Medium ☐ Low
- 7.0 Did contractor have adequate full time technical staff for the works?
☐ Yes ☐ No
- 8.0 Did contractors rely on regional staff for measurements and materials testing?
☐ Yes ☐ No
- 8.10 If yes to what extent did this affect the project? State
- 9.0 Tick which of the following staff the contractor did not have and state what the impact on the works was?
 - 9.1 W/ Manager ☐ State.....
 - 9.2 Civil engineer / Technician ☐ State.....

9.3 Q/Surveyor [] State.....

9.4 Soil Technician [] State.....

9.5 L/Surveyor [] State.....

9.6 Mechanics [] State.....

9.7 Foreman [] State.....

10.0 How did project finance affect the progress of work? [] Severe [] Less severe [] No Effect

11.0 How was the payment situation for the following project funding classes		Donor assisted		Road fund		
11.1	Prompt Payment	Y	N	Y	N	
11.2	Delayed Payment	Y	N	Y	N	
11.3	No Mobilisation			Y	N	
11.4	Access to credit	Y	N	Y	N	

12.0 Did the contractors' workload affect the project? [] Yes [] No

13.0 How did it affect the project? State.....

14.0 Did the contractor's lack of Management capacity affect the project?

15.0 How did it affect the project? State.....



IV. QUESTIONNAIRE FOR REGIONAL MANAGEMENT STAFF GHANA

Please answer all questions using the choices provided. Additional comments may be added in the space provided at the end of the questionnaire. Any information provided will be treated as highly confidential and will be used for academic purposes only.

1. Position.....
2. How many maintenance projects have you supervised in your organization within the last 5 years?

3.0	Rank the following achievements of the Contractor classification system in Ghana. Tick the appropriate response.		
	Achievements	Good	Poor
3.1	Fairness of the Grading of contractors		
3.2	Transparency of the classification Procedures		
3.3	Classification requirements has promoted growth of the industry		
3.4	Employment and retention of qualified staff		
3.5	Weakness in the classification system		
3.6	Availability of Contractors adequately equipped		
3.7	Availability of Financially sound Contractors		
3.8	Growth of Small & medium local contractors		
3.9	Database of performing and non performing contractors		
3.10	Improvement in the quality of maintenance works		
3.11	Elimination of persistently incompetent contractors		
3.12	Over classification of Contractors		
3.14	Issuance of Provisional Certificate		