2011 Annual Report

CSIR-BRRI
BUILDING AND ROAD RESEARCH INSTITUTE
Foreword by Director

The CSIR-Building and Road Research Institute (BRRI) was set up in 1952 as the West African Building Research Institute (WABRI) in Accra to test imported building materials. In 1960, WABRI was renamed Building Research Institute, under the then Ghana Academy of Sciences. In 1963, the Institute was moved to the campus of the Kwame Nkrumah University of Science and Technology (KNUST). The Institute’s mandate was expanded to include road research in 1964.

Through researchers from a wide professional spectrum, the Institute has successfully carried out its research activities in the built environment, as well as in the area of road safety management to support the socio-economic development of Ghana.

The Institute’s research activities are undertaken by five technical and three non-technical divisions. The technical divisions are: Building Materials Development, Construction, Geotechnical Engineering; Structures, Planning and Design; and Traffic and Transportation. The three non-technical divisions are: Administration, Commercialisation and Information and lastly, Finance.

Among the major technical activities of the institute are: geotechnical and geological investigations, slope stability studies, best construction practices and technologies, road crash studies, boundary demarcation and land administration, architectural design of buildings and development of building materials from local resources.

The Institute’s research accomplishments include the development of pozzolana cement, design and construction of 7 metre timber bridge across River Subin at Kaase-Kumasi and construction supervision of 104 kilometer Kumasi City Roads Rehabilitation Project. Other outstanding achievements are the establishment of a National Accident Database from 1991 to date, rehabilitation of 325 Primary Schools in Northern Ghana and design and construction of 650 No. Ashongman housing project with a cost saving of 30 percent. The rest are design and construction supervision of Tailings Storage Facility for mining companies in Ghana, Burkina Faso and Mali. Other outstanding feats had been accomplished in civil, geotechnical and environmental engineering.

Vision of BRRI

A centre of excellence that offers a one stop service in the conduct of research, training and technology transfer in the construction and transportation sectors.
Mission Statement of BRRI

- To promote the conduct of demand-driven and problem-based research, provide training and technology transfer that links effectively to the socio-economic development of Ghana, particularly, the building, road and transport industries.

Mandate of BRRI

- To undertake research into all aspects of building and road with respect to planning, design, construction and maintenance to assist the construction industry perform efficiently, safely and cost-effectively.
- To develop construction materials from local materials to reduce construction cost and make housing affordable.

Members of Management Board -2011

Ing. W.E.O. Apatu  
Chairman

Dr.(Mrs) Rose-Emma Enstua Mensah  
Member  
Deputy Director-General, CSIR

Mr. Eugene Atiemo  
Member  
Director, CSIR-BRRI

Mr. Bernard Abeiku Arthur  
Member  
Representative of Ministry of Transport

Dr. Gyawu Boakye  
Member  
Ag. Director, CSIR-WRI

Mr. Kwame Afreh  
Member  
Representative of Association of Building & Civil Contractors of Ghana

Mr. H.D. Adomako-Mensah  
Secretary  
Administrative Officer, CSIR-BRRI

Co-opted Members:

Mr. Francis K. Afukaar  
Deputy Director, CSIR-BRRI

Mr. M.B. Braimah  
Accountant, CSIR-BRRI
Members of Internal Management Committee - 2011

Mr. Eugene Atiemo, Director - Chairman
Mr. Francis Afukaar, Deputy Director - Member
Dr. J. K. Boadi, Head, Building Materials Development Division - Member
Mrs. Bettie Solomon-Ayeh, Head, Structures, D & P Division - Member
Mr. Ernest Osei-Tutu, Head, Construction Division - Member
Mr. J.B. Ofiri-Atuahene, Head, CID/Marketing Officer - Member
Mr. M. B. Braimah, Head, Finance Division - Member
Mr. William Agyemang, Head, T&T Division - Member
Mr. Seth Owusu Nyako, Head, Geotechnical Eng. Division - Member
Mr. Richard Quaynor, Rep. BRRI-RSA - Member
Mr. A. Amponsah-Fordjour, Rep. BRRI-SSA - Member
Mr. Santos Beyogley, Rep. PSWU/TUC - Member
Mr. H. D. Adomako-Mensah, Head, Admin. Division - Member
Mrs. Phyllis Nketia, Administrative Officer - Member/Sec
Mr. Isaac Kofi Yankson, Scientific Secretary - In Attendance
1.0 Research and Development Activities

1.1 The Impact of Drivers’ Personal Characteristics on their Understanding of Road Signs in Ghana

Objectives

1. To determine how drivers’ understanding of road signs affects their performance on the road
2. To assess the relationship between knowledge of road signs and performance on the road
3. To measure how personal characteristics, such as knowledge and understanding of road signs correlate with road traffic crashes

Methodology

The study relied on a small-scale survey, based on stratified choice-based random sampling technique. To allow for homogeneity in the sample, only commercial vehicles drivers were considered for the survey.

Sampling was done in two different stages; stage one focused on the selection of cities or towns. Stage two was used to select drivers or respondents for the study.

*Stage one (selection of Urban Areas)*

To achieve a national dimension, the study divided Ghana into three zones; the Southern Zone (made up of five regions; Greater Accra, Central, Western, Eastern Regions and Volta Regions), the Middle Zone (made up of two regions; Ashanti and Brong Ahafo) and the Northern Zone (made up of three regions; Northern, Upper East and Upper West Regions). These zones helped to identify the environmental effect on the driver characteristics in each zone.

*Stage Two (selection of Vehicles)*

The selection of respondents (drivers) in each zone relied on small-scale survey based on stratified choice-based random sampling technique. The mode of public transport used for the stratification was in three categories: mini-buses (including ‘trotro’ and 207), taxis and High Occupancy Buses (including the Metro Mass Transit Buses). A total of 1,200 respondents (basically drivers) was selected for the study.
Results

The study revealed the following:

- Drivers were more knowledgeable (60.4%) in the road signs than they understand their applications (54.2%). These average scores for both knowledge and understanding fall short of the 70% pass mark required when sitting for DVLA examinations.

- Drivers from the southern zone (with average corresponding scores of 63.1% and 54.2%) as well as the middle zone drivers (65.9% and 56.6%) performed better in both knowledge and understanding than the northern zone drivers (42.4% and 40.2%). Generally, drivers who had attained post secondary or tertiary education had very high mean score in both knowledge and understanding irrespective of age, gender, zone, experience, marital status and how the driver was trained.

- It was established that there exists a significant difference between the mean score of drivers’ who had no formal education (38.0%) and those with primary education (59.3%).

- Drivers who went through driving school seem to comprehend and understand road signs better (75.1%) than drivers who learnt to drive as mechanic apprentice/driver’s mate (56.3%), or through family/friends (65.5%) or on their own (65.4%). This reinforces the fact that, well established driving schools help their trainees to know and understand the use of the road signs through both theoretical and practical approaches before they pass out as drivers.

- Drivers knowledge and understanding of road signs generally improves with driving experience (from 55.0% when experience is not more than 5 years to 66.0% when experience is over 25 years). However, drivers’ knowledge and understanding of road signs seem to increase at a slower rate as drivers exceed 15 years of driving.

- Female drivers performed better (69.8%) than male drivers (60.2%) It was generally found that drivers’ knowledge and understanding of road signs increases with drivers’ age ( i.e. from 53.0% when drivers are between 18 and 25 years to 67.7% when drivers are between 46 and 55 years).
Way Forward

To ameliorate drivers’ performance, knowledge and understanding in road signs:

- potential drivers should be encouraged to attend certified driving schools before they obtain driving license. More of such training schools should be set up, particularly in the northern zone and other parts of the country.
- Driver license should be issued to potential drivers only when such drivers have at least, basic primary level of education.
- Female drivers should also be encouraged to take up commercial driving, as it is believed that, such a move would improve driving behaviour and reduce road traffic crashes involving commercial vehicles in the country.
- Regular refresher training courses for drivers are recommended.

1.2 Study to Determine the Magnitude of Driving under the Influence of Alcohol and its Impact on Road Safety in Ghana

Alcohol impairment is and established risk factor for the incidence and severity of road traffic crashes. Whereas the developed countries have dedicated resources to combating this menace, drunk-driving research and preventive programmes are at rudimentary stages in developing countries. The objective of this study was to establish baseline prevalence of drunk-driving in Ghana.

Methodology

Systematic roadside random sampling was used to determine the prevalence of drunk-driving in the country. Alco-sensor v breathalyzers were used for screening drivers to determine whether they have ingested any alcohol before driving vehicles. If alcohol was detected, a second test involving administration of disposable mouthpieces to establish the actual volume of alcohol in their breaths was conducted. The data collected was analysed using STATA 12, a scientific data analytical application software.
Results

- A total of 2,736 drivers were randomly stopped and their BrAC measured with the breathalyzers.
- In all, 8.7% had detectable alcohol in their breaths with 5.5% exceeding the legal limit of 0.08%.
- BrAC measurements were converted to BAC using the BrAC:BAC ratio of 2,300:1 for easy understanding in Ghana.
- A stratified analysis shows that 64% of the drivers who tested positive for alcohol recorded BAC exceeding the legal limit.
- Nineteen percent had BAC between 0.05 and 0.08%, whilst the remainder 17% had ingested alcohol ranging between 0.001 to 0.05.
- Drunk-driving prevalence in Ghana is therefore very high compared with many industrialised countries.

Way Forward

It is, therefore, recommended that enhanced enforcement, driver education and stricter laws such as reduced alcohol limits for young and novice drivers are encouraged to combat the incidence of drunk-driving and the associated traffic injuries in Ghana.

1.3 Optimizing the Engineering Properties of Natural Gravel for Road Sub-base and Base Construction Using Pozzolana and Lime.

Study Objectives

- To determine quantitatively, the improvement of engineering properties of clayey and sandy gravels with the addition of clay-pozzolana and/or lime and compare with established roadwork requirements in Ghana.
- To optimise the best mix ratio for the stabilization.
Methodology

- Collection of existing data on geotechnical investigations
- Digitisation of the existing data
- Taking of coordinates of the various sites of investigations using handheld GPS.
- Development of database in a GIS environment.
- Produce a map showing the locations included in the database.

Lime, Pozzolana, natural gravel and stabilization procedures were also used.

Stage Reached

Ninety percent of laboratory work completed. Analysis of results on-going.

Way Forward

More sample locations had been identified and would be included in the study.


Objectives

To determine the association between speed calming devices and:

i) the trends of vehicle speeds and
ii) pedestrian injuries in built-up areas in Ghana.

Methodology

A matched case-control study design was used to examine the association between speed calming measures (speed humps, traffic circles, rumble strips and speed tables), vehicle speed and pedestrian injuries in settlement areas in Ghana. Vehicle speeds were measured by radar gun in 38 selected settlements comprising 19 “with” and 19 “without” speed calming measures. Geocoded road injury fatalities were recorded in the Building & Road Research Institute database. Regression analysis compared case and control locations using logistic regression.
Major Findings

- Mean vehicle speeds and the proportion of vehicles exceeding the 50 km/hr speed limit were lower in settlements with traffic calming measures, relative to settlements without traffic calming measures.
- There were 30% fewer speed violations in settlements with speed calming devices and 60% speed violations in towns, without any speed calming measures.
- Over 80% of drivers observed driving through settlement areas were “through traffic” and do not stop. The risk of pedestrian fatality was significantly higher (adjusted OR=1.78; 95% CI=1.09 to 4.43) for residents without speed calming devices when compared to towns with calming devices.
- Among traffic schemes with calming devices, the protective effects were notably higher when the scheme contained speed tables than when there are no speed tables.

Expected Beneficiaries/Potential Impact

This study will inform engineers, safety practitioners, government officials, etc. to formulate informed policy on road safety.
1.5 Financing Rural Housing

Location
Juaben, Ejisu – Juaben Municipality

Study objectives:

Major Findings

- The payment for the system is worked in bags of cement. A bag of cement or its equivalent in Ghana cedis at the time of payment is paid every month by beneficiaries. The terms are very flexible and takes care of any unperceived changes in inflation as well as, insulating the financers.
- The minimum wage in Ghana now is 3.73 Ghana cedis which translate into about 110 Ghana cedis a month, so when a beneficiary spends about GH¢17.00 on housing (current price of a bag of cement), which is less than the 30%, an average Ghanaian spends on accommodation per month. Since most of the beneficiaries are peasant farmers who are not salary earners, such a system is very flexible and affordable to them.
- Lands for construction by Habitat for Humanity Ghana (HFGH) are all acquired as gifts from chiefs and elders of communities. This drastically reduces the cost of building houses. In a country, where the price of land increases monthly and is sometimes quoted in foreign currency, such a factor is key to the success of any rural or even urban housing scheme.
- Any policy and/or programme that aims at reducing the cost of land which forms about 35% of the cost of housing construction is welcome and in the right direction.
- The type of houses built are usually a two bedroom detached house with a hall, toilet, kitchen and bath. This helps beneficiaries to get access to some of the basic housing facilities thereby helping to solve some of the numerous problems associated with poor housing. This is good for a community with average household sizes less than 3. However, room sizes of 8ft*8ft are smaller than the standard room sizes of 12ft*12ft.
- About 35% of the occupants are tenants which show that most homeowners are people who may not be in serious need of places to lay their heads but see the habitat package as an opportunity to invest or own a house. This deviates from Habitat’s core mandate of providing housing for the rural poor who are in dire need of places to lay their heads. This does not also help in providing decent and affordable accommodation for the poor since most of the beneficiaries of programmes and packages like this are usually the rich who already have good places to lay their heads but see programmes like this as a way of investing.
- The Juaben affiliate and other Habitat communities in the country are developed in unserviced areas thus the Juaben Habitat community lacks the necessary facilities and amenities needed to make a town functional. Providing all these services and facilities is very expensive and therefore cannot be provided by Habitat and its beneficiaries.
• Government must therefore help in providing these services and facilities to create the enabling environment for NGOs and other private agencies to provide affordable and decent housing for the low income rural dweller.

**Expected Beneficiaries/Potential Impact**

1. Mortgage Operators
2. Rural Communities
3. Housing Experts

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1.6 The Effects of Overburden Pressure on the Results of Standard Penetration Tests (SPT) on Tropical Residual Soils – Case Study of Sunyani

**Study Objective**

To investigate the effect of overburden pressure on the SPT results.

**Methodology**

- Performance of SPT at a specified depth
- Excavation of the over burden
- Repeating the SPT
- Comparing the results

**Progress Made**

Data collection had been completed.

**Way Forward**

Analysis yet to commence.

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1.7 The Study of the Distribution of Chemical Quality of Groundwater Supplies Over some Aquifer Rock Types in Ashanti Region, Ghana

**Study Objectives**

- To determine how geology affects the distribution of chemical constituents in groundwater supplies over the major rock types of Ashanti Region.
• To assess the conformity of groundwater in Ashanti Region to local and international guidelines for potable water.

• To develop database of aquifer characteristics in Ashanti Region.

Methodology

• Sampling of groundwater from boreholes drilled as part of the ‘Promoting Partnership with Traditional Authority Project (PPTAP)’ which covered all the then 17 districts of Ashanti Region. The samples were obtained by installing an electrical submersible pump and collecting the clean water at the end of the pumping test in 1.5ml in clean and sterilized plastic bottles

• GPS co-ordinates were obtained for each sampling position and plotted on a map

• Laboratory analysis of samples at the KNUST for chemical elements in accordance with standard testing procedures for potable water.

• Correlation of the chemical results with the aquifer types.

Activity/Progress Made Since Previous Report
Preliminary Maps had been developed.

Way Forward

Some more data have to be acquired from the College of Engineering, KNUST. The ultimate target of this study is to develop a geochemical groundwater quality map for urban planning of Ashanti region.

1.8 Investigations into Mortars Containing Higher Volumes of Ghanaian Clay

Pozzolana as Cement Replacement Material.

Study objectives:

Location
Kumasi

Major Findings:
• The setting times, both the initial and final of the blended CP paste containing CP content between 30% and 50% generally occurred at an extended time when compared with the control paste.

• The blended CP paste between 30% and 50% labelled as CP30, CP35, CP40, CP45 and CP50 showed an increase in water demand as compared with the control cement paste (CP0).

• The compressive strength results of the blended pozzolana mortar mixture were found to be lower than the unblended cement mortar. However there exist a possibility to formulate masonry mortar between 30% and 50% cement replacement with pozzolana.

Expected Beneficiaries
Architects, Civil Engineers, Building Contractors, Government Institutions

Publications from Project
• A paper is being written for Journal publication.

1.9 Participation of Real Estate Developers in Mortgage financing: Push and Pull Factors

Location
Accra and Kumasi

Collaborating Institution(s)
Nil

Major Findings
• No GREDA member is into mortgage housing finance.
• The total elimination of the banks in mortgage housing finance is not possible since by so doing, only the high income earners will be able to afford a home.
• Inability to easily access information makes it difficult for real estate developers to track down their clients.
• Long term repayment period is the main limitation why GREDA is not into mortgage housing financing.

Successful mortgage market will depend highly on the efficiency of land title system. Mortgages must be attractive investments - interest rates must be market determined and provide investors with a positive, real, risk-adjusted rate of return.
If Government implements the proposed measures, it will go a long way to create an enabling environment for a vibrant mortgage market. The result will be sustainable flow of funds to the housing sector, thus, making it possible for many Ghanaians to afford their own homes. This will be a major step in our bid to create a property owning democratic society.

Expected Beneficiaries
1.10  Socio – Economic Impact of Sand Mining in Kwabre East District

Location
Wadie Adumakese and Adumanafo Communities in the Kwabre East District, Ashanti Region

Major Findings

- Sand mining activities as identified by the study in the two communities had been institutionalised. It was revealed by the study that all sand mining sites had been given by the chiefs who had assessed the land and found them not to be suitable for crop production. This practice had approval from the district assembly as the investors paid tolls to the assembly. The question, however, still remains on how these sites were assessed by the chiefs to be unsuitable for crop production since they did not have the technical competence for such assessment.
- The sand mining activities were seen to be the major source of livelihood for majority of the youth in the Wadie Adumakese and Adumanafo communities.
- Sand mining activities resulted in the destruction of farm lands which consequently affected crop yield.
- Other impacts of the activity included erosion, pollution, destruction of roads and the creation of pits in the community which eventually become breeding places for mosquitoes.
Most sand mining sites in the communities had not been reclaimed after mining, hence, leading to the destruction of lands, creating ecological imbalance.

**Expected Beneficiaries**
Environmental Protection Agency (EPA), The District Assembly and other environment-oriented organisations

### 2.0 CONSULTANCY AND TECHNICAL SERVICES

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### 3.0 GENERAL NEWS

#### 3.1 SCIENCE RESEARCH CLINIC

The Management of CSIR-BRRI in conjunction with the local Research Staff Association (RSA) organised a two-day Science Research Clinic for both Research and Technical Staff of the Institute on 28-29 July, 2011. The clinic was instructed by Prof. A. Alemna, University of Ghana and Mr. C. Entsua-mensah, Librarian, University of Cape Coast and former Director, CSIR-INSTI.

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Topics treated included:

- Structure of Scientific Paper
Fundamentals of Journal Publishing
• Quality Assurance in Journal Publishing
• Ethics of Research and Publishing
• Conversion of Technical Reports into Journal Papers
• Proposal Writing, among others.

The two-day event was well patronised and Staff commended CSIR-BRRI Management, RSA and the Resource Persons for good work done.

3.2 SEISMIC CODE BOOK LAUNCH

The CSIR-BRRI launched an updated version of the Seismic Code authored by Dr. Kwamena Amonoo-Neizer, a retired Chief Research Scientist and former Acting Director of CSIR-BRRI, at the Golden Tulip Hotel, Accra on Monday, February 21, 2011.

The event, which was chaired by Prof. E.H. Amonoo-Neizer, CSIR Council Chairman and younger brother of the Author, attracted many engineers, contractors and consultants. The Keynote address was given by Hon. Dr. Omane Boamah, Deputy Minister, Ministry of Environment, Science and Technology while the welcome address was delivered by Dr. A.B. Salifu, Director-General, CSIR. The formal book launch and auction was performed by Ing. J.N.K. Okyere, former Head, Traffic and Transportation Division, CSIR-BRRI and now Director of Comptran Ltd., Accra.
In attendance were the Deputy Director-General of CSIR, Dr. R.E.M. Entsua-Mensah, Prof. Aba Andam, GAEC; Ing. W.E.O. Apatu, Board Chairman of CSIR-BRRI; Dr. Pearl Adu Amankwah, Ag. Director, CSIR-CCID; and Directors of CSIR Institutes.

3.3 REFRESHER WORKSHOP FOR BRRI ADMINISTRATIVE ASSISTANTS

A 2-day Intensive Training Workshop was organized for all secretarial and administrative staff to help improve their administrative skills and also be abreast with changing trends in technology from 24 to 25 October, 2011. The facilitator was Mrs. Juliana Serwaa Andoh, School Secretary, School of Medical Sciences (SMS), KNUST.

The topics treated included:

- The Role of the Secretary in Office Management
- Office Practice and Management
- Filing and Records Keeping
- Communication
- Customer Care

There were hands-on practical assignments and group discussions.

Participants were unanimously agreed that more of such training workshops be organised, at least, once a year for them to be abreast with changing trends in technological advancement.
3.4 Outreach Programme on Bricks and Pozzolana

The Scientific Secretary, Mr. I. Kofi Yankson made an initial presentation on “Burnt Brick and Pozzolana as Alternative Building Materials for Property Owners” to Officers at the Kumasi Central Prisons on Friday, January 20, 2011. This was part of his Institutional outreach for the year, 2011. Following the Regional Commander of Prisons’ appreciation of the presentation, the officer arranged for Mr. Yankson to make another one to Officers at the Manhyia Prisons, Kumasi, on Friday, January 27, 2011. Below are photographs which were taken at the two places.

4.0 HIGH PROFILE VISITS TO CSIR-BRRI

4.1 EXECUTIVE DIRECTOR OF COMSATS VISITS GHANA

The Executive Director of Commission on Science and Technology for the Sustainable Development of the South (COMSATS), Dr. Imtinan Elahi Qureshi, undertook a four-day working visit to Ghana from
October 26-29, 2011. During his stay in Ghana, he had meetings with the Director of CSIR-BRRI, Deputy Director-General and Director-General of CSIR as well as the Honourable Minister of Environment, Science and Technology (MEST).

He informed the Hon. Minister that Ghanaian Scientists were welcome to join three operational groups in the areas of Climate, Medicinal Plants and ICTs. Touching upon the issues of financial support for Science and Technology, Dr. Qureshi stressed that all developing countries were direly in need of greater funding for R&D. Organizations like COMSATS, which depended on voluntary contributions of Member States, also needed to be financially supported in order to enhance their ability to execute projects directly contributing to the socio-economic upliftment of developing countries. Dr. Qureshi invited the Hon. Minister to personally represent Ghana in the forthcoming Commission Meeting of COMSATS. The Minister assured Dr. Qureshi that his suggestions would be discussed at the appropriate level.

Dr. Qureshi also delivered a personal letter of the Minister for Science and Technology, Government of Pakistan, H. E. Mr. Changez Khan Jamali, addressed to Hon. Ayittey, in which it was desired that Ghana may consider enhancement of scientific cooperation with Pakistan on bilateral level, as well as through the platform of COMSATS.

The Hon. Sherry Ayittey, reaffirmed the support of her Ministry towards COMSATS’ programmes and desired to expand cooperation in areas of Environment, Agriculture and Biotechnology. The Minister again expressed keen interest in educational opportunities available for Ghanaian students at COMSATS Institute of Information Technology (CIIT).

While receiving COMSATS’ shield from the Executive Director, the Minister appreciated his visit to Ghana and exploring possibilities of strengthening COMSATS’ role in the development of science and technology in Ghana.

Dr. Qureshi subsequently met with the Director General and Deputy Director-General of CSIR at the Head Office. Dr. Qureshi stated that COMSATS was a friendly Institution and at its meetings, each centre of excellence reported on institutional activities. He particularly mentioned a presentation by Ing. Atiemo on pozzolana research and production, which was applauded by members. Dr. Qureshi indicated the intention to transform the COMSATS Institute of Information Technology (CIIT) to a University He said, the necessary documents had been sent to Parliament of Pakistan for consideration, while 80 Student Scientists had already benefitted from the CIIT’s training in Internet Security. He again, stated that the CIIT currently had 16,000 Students who had enrolled with about 300 PhD Students and 1,700 Faculty Members.

The Director –General Dr A. B. Salifu, welcomed the idea of COMSATS and mentioned that the CSIR-CRI was being transformed into a Regional Centre of Excellence, with sponsorship by the West African
Agricultural Productivity Programme (WAAPP). He mentioned the setting up of an Artisan Training Centre at the CSIR-BRRI in collaboration with the Ministry of Environment, Science and Technology. Dr A. B. Salifu said the CSIR-INSTI was already working with another body on ‘e-solutions’ while the CSIR-CRI was seriously involved in ‘Agricultural Biotechnology’. On Medicinal Plants Research, the D-G informed Dr. Qureshi that CSIR-IIR and CSIR-FORIG were already involved. The Director, CSIR-BRRI informed the D-G that one person from the Institute had recently benefited from the CTWF-COMSATS joint International Training Workshop on 'Regional Climate Change and its Impact Assessment' held in China.

Dr. Qureshi met with Ing. Atiemo, Director of CSIR-BRRI at the CSIR Head Office, and later briefed him about the activities of CSIR and the International Centre of Materials Science and Technology (ICMST). He explained that originally, the ICMST consisted of the CSIR-BRRI and Institute of Mining and Mineral Engineering (IMME), KNUST with the centre at CSIR-BRRI but currently, the IMME was inactive. Dr. Qureshi then proposed that the entire CSIR would be considered for a Centre of Excellence to enable other Institutes apart from BRRI to be members.

Dr. Qureshi met with the Staff of CSIR-BRRI in Kumasi after which he was conducted round the Pozzolana Factory.

4.2 SOUTHERN SUDAN ROAD SAFETY COMMITTEE

A 23-member delegation from Southern Sudan visited CSIR-BRRI on Thursday, March 31, 2011 to learn about the National Road Crash Data Gathering Processes, Coding, Analysis and Reporting. As a new Nation, the delegation was in the country to learn about best practices in road safety management.
The leadership was received and welcomed by the Director in his office after which two presentations were made by Ing. Eugene Atiemo, Director, and Ing. Francis K. Afukaar, Deputy Director at the Conference Room. The delegation later visited BRRI National Accident Data Centre. They were impressed by what they heard and saw and promised to follow up in future.

4.3 Nigerian Building and Road Research Institute (NBRRI)

The four-man NBRRI delegation visited CSIR-BRRI in 7th August, 2011 to discuss mutual research interests led by Prof. Danladi S. Matawal (D-G/CEO, NBRRI-Abuja), included Engr. Y. S. Mohammed (Director, Technology Acquisition and Adaptation, Federal Ministry of Science and Technology, Abuja), Engr. George N. Omange (Director, Planning and IT, NBRRI-Abuja) and Engr. R. B. Lawal (Chief Research Officer, NBRRI-Ota).

A short opening ceremony took place in the BRRI Conference Room after which five presentations were made. The Presenters were:

- Ing. Eugene Atiemo (Overview of CSIR-BRRI)
- Ing. Francis K. Afukaar (Research and Consultancy Activities of the Traffic and Transportation Division)
- Surv. Ernest Osei-Tutu (Research and Consultancy Activities of the Construction Division)
- Mr. Seth Owusu Nyako (Research and Consultancy Activities of the Geotechnical Engineering Division)
- Prof. D. S. Matawal (Overview of NBRRI).
At the end of the presentations, official discussions to review the Action Plan on existing NBRRI/CSIR-BRRI MOU/Working Document to ensure its effective implementation took place.

Other discussions revolved around:

- How to strengthen Staff Exchange Programmes between NBRRI and CSIR-BRRI;
- Setting up a Pilot Pozzolana Plant at NBRRI;
- Logistics and funding strategies for Joint International Conferences;
- Exploration of the possibility of setting up BRRIs in Sierra Leone, Liberia, Senegal, Côte D’ivoire;
- Collaboration with some Universities; Prof. Matawal informed members that such moves should take off slowly before they are regularized later;
- Training: NBRRI indicated that they would be interested in curriculum for:
  - Training of artisans in brick making and laying
  - Training of MTTU and Highway Engineers in Road Safety Policy and intervention
- Establishment of West African Journal of Building and Road Research (WAJBRR):
  - Dr. Charles Chuka Osadebe (Engineering Geologist) – Editor-in-Chief
  - Dr. Bettie Solomon-Ayeh (Development Planner) – Assistant Editor-in-Chief
- Editorial Board:
  - Prof. D. Matawal, Director-General, NBRRI – Nigeria
  - Prof. M.E. Ibrahim, NBRRI
  - Mr. George O mange, NBRRI
  - Dr. (Mrs) R.E.M. Entsua-Mensah, Deputy Director-General, CSIR – Ghana
  - Ing. Eugene Atiemo, Director, CSIR-BRRI – Ghana
  - Ing. Francis Afukaar, Deputy Director, CSIR-BRRI – Ghana
  - Members for Liberia, Sierra Leone & Gambia would be sought for later on.
- Revival of existing Standing Committees
4.4 STX & KNUST

On Friday, February 4, 2011, the management of STX-Ghana and a team from the College of Architecture and Planning KNUST paid a working visit to CSIR-BRRI. The team was taken to the CSIR-BRRI Exhibition Hall where the Director, Ing. Eugene Atiemo, briefed them on the activities of the Institute. The visit followed a presentation the Director made at the STXGhana offices in Accra on Thursday, September 9, 2010.

The team visited the Institute to learn more about Pozzolana and how they could incorporate the product in the STX-GOG mass housing project. The visiting team had a very interactive encounter with the CSIR-BRRI team, which included: Ing. Francis K. Afukaar, Deputy Director, Mr. Kofi Obeng, Coordinator-Pozzolana Project, Mr. Kofi Yankson, Scientific Secretary and Mr.
4.5 Gary & Douglas Visit the Pozzolana Factory

4.6 TECHNOLOGY TRANSFER PROGRAMME FOR CENTRAL AFRICAN REPUBLICAN DELEGATES

In November 2011, three (3) government officials from road related agencies in the Central Africa Republic visited the CSIR-Building and Road Research Institute, on a two week technology transfer programme to learn more about the production and subsequent use of burnt clay bricks, especially for surfacing roads and other pavements. The visitors were Mr. Augustin Phonze (DirecteurGénéral des...
PistesRurales/Chief Executive Officer of the Rural Roads), Mr. Aimé Koradjim Kossoumadji (Directeur chargé des Etudes et de la Planification des pistesrurales /Manager in charge of Studies of the rural roads) and Mr. Richard Dondy (Directeur technique du Fondsoutier/Technical Director of the Road Fund).

The Visitors and BRRI Staff at the Brick factory  

This development was as a result of an earlier presentation made by Ing. Edmund Kwasi Debrah in October 2010 at the 2nd International Convention on Rural Roads, which was organized by the International Road Federation (IRF) in collaboration with the Global Transport Knowledge Partnership (gTKP), and hosted by the government of China.

The technology transfer programme took the form of training of trainers. The delegates were taken through a series of technical presentations that detailed the various activities involved in the stages of production of the engineered burnt clay bricks. In addition, the delegates undertook field visits to clay winning sites, processing and production sites, including the CSIR-BRRI brick factory at Fumesua and VICALEX brick factory at Mfensi, Ashanti Region. Finally, the delegates had hands-on training sessions at the CSIR-BRRI brick factory in the production processes. Mr. Rexford Brobbey of the Building Materials Development Division was the focal person for these exercises.

Details of the use of the engineered burnt clay bricks for surfacing pavements were discussed with the delegates. Field observations of the practical applications of the engineered burnt clay bricks were taken on the road network at CSIR-BRRI and the premises of Silicon Hotel and Conference Centre, Kentikrono-Kumasi.

Mrs. Linda Boamah, of CSIR-Crops Research Institute, interpreted all technical and field sessions into French which was the official language of the visitors. The visitors commended the training sessions highly successful and pledged to put the knowledge acquired into good use when they got back to their home country.
5.0 EXHIBITIONS

The CSIR-BRRI exhibited her services and clay products like: Pozzolana Cement, Burnt Bricks, Mosquito Control Soak-Away Fired Clay Stones, Portland Pozzolana Cement Blocks, Erosion Control Fired Clay Pegs, Paving Bricks, Fired Clay Slices (Facing Tiles) for Cladding and Floor Tiles at the following events:

- AGI-INDUTECH 2011 at the Prempeh Assembly Hall, KUMASI from April 13-20, 2011.
- First Ghana Science Congress at the Accra International Conference Centre from August 2-5, 2011.
- 14th ILO Regional Seminar, Accra-Ghana from September 5-9, 2011.

INTERNAL SEMINARS

<table>
<thead>
<tr>
<th>Name of Presenter(s)</th>
<th>Topic</th>
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<tbody>
<tr>
<td>Mr. Eugene Atiemo</td>
<td>Status Report on CSIR-BRRI in 2010 and Projections for 2011</td>
</tr>
<tr>
<td>Mr. Francis Afukaar</td>
<td>Evaluation of Speed Humps on Pedestrian Injuries in Ghana</td>
</tr>
<tr>
<td>Mr. James Damsere-Derry</td>
<td>Epidemiological Appraisal of Pedestrian Injury Pattern in Ghana</td>
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<tr>
<td>Dr. Bettie Solomon-Ayeh</td>
<td>Social Perceptions of high-Rise Residential Buildings in Ghana</td>
</tr>
<tr>
<td>Mr. Ackaah Williams</td>
<td>Road Traffic Crashes in Ashanti Region; factors Relating to Road Geometric Design and Traffic Characteristics</td>
</tr>
<tr>
<td>Name</td>
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<tr>
<td>Dr. Yaw Poku-Gyamfi</td>
<td>The Use of an Improved Processing Technique to Mitigate Ionospheric Error for GPS Signals.</td>
</tr>
<tr>
<td>Dr. C.F.A. Akayuli</td>
<td>Evaluation of Impacts of Blasting on buildings in Mining Communities: The need for a blasting Standard for Ghana</td>
</tr>
<tr>
<td>Mr. Joseph Adjei Danquah</td>
<td>Effects of Design on Maintenance of Public Housing in Ghana - Case Study Of CSIR-BRRI</td>
</tr>
<tr>
<td>Dr. Nsiah Achampong</td>
<td>Social Impact Assessment of the Ejisu-Tech Road Roundabouts</td>
</tr>
<tr>
<td>Mr. William Agyemang</td>
<td>Measurement of Service Quality of “TROTRO” as public transportation in Ghana – a case study of Kumasi Metropolis</td>
</tr>
<tr>
<td>Mr. Isaac Kofi Yankson</td>
<td>Road Use Behaviour of Primary School Children: The Case Study of Ablekuma Sub-Metro District of AMA</td>
</tr>
<tr>
<td>Mr. Bawa Shaibu</td>
<td>A Survey of Motor Vehicle Tyres and Related aspects in Kumasi</td>
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<tr>
<td>Mr. Richard Oduro Asamoah</td>
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<tr>
<td>Mrs. Ama Trinity Tagbor</td>
<td>The Termite Controlling Capabilities of Extracts of Thevetia peruviana</td>
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<tr>
<td>Mr. Ernest Osei-Tutu</td>
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<tr>
<td>Mr. Kingsley Joe Mensah</td>
<td>Scholarly Journal Publishing in Ghana: Review of the State and Patronage</td>
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<tr>
<td>Mr. K. Owusu Tawiah</td>
<td>Termite Infestation and Control in Buildings – Cost Implications</td>
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<tr>
<td>Mr. Frederick Wireko-Manu</td>
<td>Improving the Durability of Rural Housing Stock in Flood-Prone Areas</td>
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<tr>
<td>Mr. Seth Owusu Nyako</td>
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<tr>
<td>Mr. J.B. Ofiri -Atuahene</td>
<td>Website as an Effective Marketing Tool in Research Commercialisation</td>
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<tr>
<td>Mr. P. D. Baiden Amisah</td>
<td>An Evaluation of the Delivery Performance of the VRA-TTPS Fencing Project, Aboadze</td>
</tr>
<tr>
<td>Mr. Bernard Ofosu</td>
<td>Mapping the Depth to Ground Water Table: The GIS Approach</td>
</tr>
<tr>
<td>Mr. Richard Gvimah</td>
<td>Estimating the Demand Function for Public Transport</td>
</tr>
<tr>
<td>Mr. Kwame Baffour Awuah</td>
<td>The Need for Transportation Planning in Ghana</td>
</tr>
<tr>
<td>Mr. Edmund K. Debrah</td>
<td>Low-Cost Rural Road Surfacing: The Use of Burnt Clay Bricks</td>
</tr>
<tr>
<td>Mr. Prince Abrokwa Ofori</td>
<td>Promotion of Organised Self-help Housing by an Organised Union in Ghana: A Step-by-Step Manual for a Possible Pilot Scheme for University</td>
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</tbody>
</table>
PUBLICATIONS FOR 2011

Journal:

1. Osei-Tutu E, Sarfo Mensah and Collins Ameyaw; The Level of compliance with the Public Procurement Act (Act 663) in Ghana; International Journal of Project Planning and Finance vol.2 Issue 1, August, 2011, ISSN:2026-5190, Pp 20-40

2. Ref. CSIR/BRRI/RJP/EOT/2011/3


B.


Edited Conference papers:

1. Bediako, M., Adjaottor A.A. and Gawu, S.K.Y (2011), Selected Mechanical properties of mortar used for masonry incorporating artificial pozzolana, In proceedings, Modern Methods and Advances in Structural Engineering and Construction ISEC, Switzerland, Zurich


**Unedited Conference papers:**

<table>
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<tr>
<th>1. Name(s) of Author(s)</th>
<th>- Manu, F. W., Danquah J.A.</th>
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<tr>
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<tr>
<td>Title of Article/Paper/Work</td>
<td>Conference Paper</td>
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<tr>
<td>Name(s) of Author(s)</td>
<td>- Manu, F. W., Baiden-Amissah P. D</td>
</tr>
<tr>
<td>Year of Publication</td>
<td>- 2011</td>
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<tr>
<td>Title of Article/Paper/Work</td>
<td>Locally developed building materials for sustainable housing- CSIR-BRRRI’S options</td>
</tr>
<tr>
<td>Name of Conference</td>
<td>- Architects Sans Frontier International Workshop</td>
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<th>2. Name(s) of Author(s)</th>
<th>- Manu, F. W., Baiden-Amissah P. D</th>
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<tr>
<td>Year of Publication</td>
<td>- 2011</td>
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<tr>
<td>Title of Article/Paper/Work</td>
<td>‘Improving the durability of rural housing stock in flood prone areas’ presented in CSIR-BRRRI Seminar in 2011</td>
</tr>
<tr>
<td>Name of Conference</td>
<td>- CSIR-BRRRI Seminars</td>
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## NAMES OF STAFF WHO ATTENDED CONFERENCES AND SEMINARS IN 2011

### OVERSEAS

<table>
<thead>
<tr>
<th>NAME</th>
<th>TYPE OF TRAINING</th>
<th>ORGANISERS</th>
<th>DURATION</th>
<th>PLACE</th>
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<tbody>
<tr>
<td>1. Mr. Eugene Atiemo</td>
<td>31&lt;sup&gt;st&lt;/sup&gt; Annual Conference on Cement and Concrete Science</td>
<td>Imperial College, UK</td>
<td>11&lt;sup&gt;th&lt;/sup&gt; – 14&lt;sup&gt;th&lt;/sup&gt; September, 2011</td>
<td>London; UK</td>
</tr>
<tr>
<td>2. Mr. Augustine Osei-Frimpong</td>
<td>CTWF-COMSATS Joint International Training Workshop on Regional Climate Change and its Impact Assessment</td>
<td>International Centre for Climate and Environmental Sciences</td>
<td>26&lt;sup&gt;th&lt;/sup&gt; – 29&lt;sup&gt;th&lt;/sup&gt; September, 2011</td>
<td>Beijing, China</td>
</tr>
<tr>
<td>3. Dr. C.F.A. Akayuli</td>
<td>15&lt;sup&gt;th&lt;/sup&gt; African Regional Conference on Soil Mechanics and Geotechnical Engineering</td>
<td>International Society for Soil Mechanics and Geotechnical Engineering</td>
<td>18&lt;sup&gt;th&lt;/sup&gt; – 21&lt;sup&gt;st&lt;/sup&gt; July, 2011</td>
<td>Maputo; Mozambique</td>
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<td>4. Mr. Mark Bediako</td>
<td>Selected Mechanical Properties of Mortar Used for Masonry Incorporation Artificial Pozzolana</td>
<td>International Structural Engineering and Construction</td>
<td>21&lt;sup&gt;st&lt;/sup&gt; – 28&lt;sup&gt;th&lt;/sup&gt; June, 2011</td>
<td>Zurich; Switzerland</td>
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<tr>
<td>5. Mr. Ernest Osei-Tutu</td>
<td>MISBE 2011 CONFERENCE</td>
<td>D and G Partners</td>
<td>20&lt;sup&gt;th&lt;/sup&gt; – 23&lt;sup&gt;rd&lt;/sup&gt; May, 2011</td>
<td>Amsterdam, Netherlands</td>
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### LOCAL

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<tr>
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<tr>
<td>2. Dr. N.K. Nsiah Achampong</td>
<td>Workshop on Online Publishing (Ghanjol)</td>
<td>PKP</td>
<td>16&lt;sup&gt;th&lt;/sup&gt; – 18&lt;sup&gt;th&lt;/sup&gt; November, 2011</td>
<td>CSIR-INSTITI, Accra</td>
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<tr>
<td>3. Messrs I. Nyan; G. Agyapong &amp; U. Umar-Farouk; and Miss B. Adjololo &amp; MS. D. H. Bansah</td>
<td>VAT &amp; NHIL Applications to the Construction Industry in Ghana</td>
<td>Ghana Institution of Surveyors and Ghana Revenue Authority</td>
<td>16&lt;sup&gt;th&lt;/sup&gt; 18&lt;sup&gt;th&lt;/sup&gt; June, 2011</td>
<td>True Vine Hotel, Kumasi</td>
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<tr>
<td>8. Messrs D. Adobor; R. O. Asamoah; O. Osei and E. K. Debrah</td>
<td>14&lt;sup&gt;th&lt;/sup&gt; ILO Regional Seminar for Labour-Based Practitioners</td>
<td>Ministry of Roads and Highways (MoRH)</td>
<td>5&lt;sup&gt;th&lt;/sup&gt; – 9&lt;sup&gt;th&lt;/sup&gt; September, 2011</td>
<td>Accra International Conference Centre</td>
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# SENIOR MEMBERS AND JUNIOR STAFF APPOINTMENT

## NEW RECRUITMENT - 2011

### RESEARCH

<table>
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<tr>
<th>NAME</th>
<th>DESIGNATION</th>
<th>DIVISION</th>
<th>EFFECTIVE DATE</th>
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<tbody>
<tr>
<td>1. Benjamin Opoku</td>
<td>Research Scientist</td>
<td>Geotechnical Eng.</td>
<td>1\textsuperscript{st} February, 2011</td>
</tr>
<tr>
<td>2. Richard Amo Gyimah</td>
<td>Research Scientist</td>
<td>Traffic Eng.</td>
<td>1\textsuperscript{st} February, 2011</td>
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<tr>
<td>3. K. Twumasi Ampofo</td>
<td>Research Scientist</td>
<td>Structures</td>
<td>1\textsuperscript{st} May, 2011</td>
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<tr>
<td>4. Kwame Baffour Awuah</td>
<td>Research Scientist</td>
<td>Traffic Eng.</td>
<td>1\textsuperscript{st} June, 2011</td>
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### SENIOR STAFF

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<tbody>
<tr>
<td>Theresa Osei</td>
<td>Prin. Tech. Officer</td>
<td>Materials</td>
<td>1\textsuperscript{st} May, 2011</td>
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### JUNIOR STAFF

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<tbody>
<tr>
<td>1. Ann Frema Bonsu</td>
<td>Senior Clerk</td>
<td>Construction</td>
<td>1\textsuperscript{st} May, 2011</td>
</tr>
<tr>
<td>2. Daniel Mensah</td>
<td>Driver Grade II</td>
<td>Administration</td>
<td>1\textsuperscript{st} October, 2011</td>
</tr>
<tr>
<td>3. Samuel Kyei Baffour</td>
<td>Driver Grade II</td>
<td>Administration</td>
<td>1\textsuperscript{st} October, 2011</td>
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<tr>
<td>4. Emmanuel Asamoah</td>
<td>Driver Grade II</td>
<td>Administration</td>
<td>1\textsuperscript{st} October, 2011</td>
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<tr>
<td>5. Samuel Asamoah</td>
<td>Driver Grade II</td>
<td>Administration</td>
<td>1\textsuperscript{st} October, 2011</td>
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### PROMOTIONS

#### SENIOR STAFF

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<tbody>
<tr>
<td>1. Mercy Asunsung</td>
<td>Senior Technical Officer</td>
<td>Principal Technical Officer</td>
<td>1\textsuperscript{st} January, 2011</td>
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<tr>
<td>2. Samuel Berko</td>
<td>Principal Technical Officer</td>
<td>Chief Technical Officer</td>
<td>1\textsuperscript{st} January, 2011</td>
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<tr>
<td>3. Joseph Donkor</td>
<td>Senior Technical Officer</td>
<td>Principal Technical Officer</td>
<td>1\textsuperscript{st} January, 2011</td>
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<tr>
<td>4. Abubakari Sulemana</td>
<td>Accountant Officer</td>
<td>Senior Accounting Asst.</td>
<td>1\textsuperscript{st} January, 2011</td>
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<tr>
<td>5. Kongyir Wuleka Albanu</td>
<td>Technical Officer</td>
<td>Senior Technical Officer</td>
<td>1\textsuperscript{st} January, 2011</td>
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<tr>
<td><strong>6. Philip Bannor</strong></td>
<td>Technical Officer</td>
<td>Senior Technical Officer</td>
<td>1st January, 11</td>
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**JUNIOR STAFF**

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<tr>
<td><strong>1. Sevirous Yuoneyel</strong></td>
<td>Tradesman Grad 1</td>
<td>Artisan</td>
<td>1st January, 11</td>
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<tr>
<td><strong>2. Stephen Adu Nontwiri</strong></td>
<td>Senior Technical Asst.</td>
<td>Technical Officer</td>
<td>1st January, 11</td>
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<tr>
<td><strong>3. S.D. Salia</strong></td>
<td>Traffic Supervisor</td>
<td>Asst. Transport Officer</td>
<td>1st January, 11</td>
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<tr>
<td><strong>4. James Opoku</strong></td>
<td>Artisan</td>
<td>Junior Foreman</td>
<td>1st January, 11</td>
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<tr>
<td><strong>5. Emelia Boakye (Mrs.)</strong></td>
<td>Typist Grade 1</td>
<td>Senior Typist</td>
<td>1st January, 11</td>
</tr>
<tr>
<td><strong>6. Philip Akoto</strong></td>
<td>Labourer</td>
<td>Supervisor Grade 1</td>
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**RESIGNATION**

**SENIOR STAFF**

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<tr>
<td>1. Richard William Quaynor</td>
<td>Research Scientist</td>
<td>Construction</td>
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<tr>
<td>2. Benjamin Opoku</td>
<td>Research Scientist</td>
<td>Geotechnical Eng.</td>
</tr>
<tr>
<td>3. Eric Opoku Amankwa</td>
<td>Asst. Research Scientist</td>
<td>Construction</td>
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**RETIEMENT**

**JUNIOR STAFF**

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<tr>
<td>Emmanuel Opuni Frimpong</td>
<td>Traffic Supervisor</td>
<td>Administration</td>
<td>Driving</td>
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**SENIOR STAFF**

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<tbody>
<tr>
<td>1. Boakye Osei-Tutu</td>
<td>Chief Draughtsman</td>
<td>SDPD</td>
<td>Draughtsman</td>
</tr>
<tr>
<td>2. Thomas Boakye</td>
<td>Asst. Transport Officer</td>
<td>Administration</td>
<td>Driving</td>
</tr>
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STAFF LIST