ACET Newsletter

Association of Consulting Engineers Tanzania

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From left Eng. ?adve. Menye Manga the ERB board chairman, Eng. Benard Kavishe, the ERB register and Eng. Chedi Masambaji, the ACET President, singing the national anthem before official opening of te world engineering day at Karimjee Hall.

Engineering innovation for a more resilient world

By a Reporter

ENGINEERS countrywide have been urged to brainstorm on how they can join hands locally and internationally to increase the number or engineers as they were badly required in various development projects.

According to UNESCO, the number of engineers in Sub-Saharan Africa is lower then any other region of the world.

This was said during the World Engineering Day (WED) celebrated on March 4th 2023 in Dar es Salaam whereby stakeholders from different countries attended. This year's celebrations were marked globally in Madrid Spain.

Several participants expressed their satisfaction at the way the Day was organized. The theme for this year was: "Engineering Innovation for a more resilient world". In Tanzania it was organized by the Association of Consulting Engineers (ACET), Institution of Engineers Tanzania (IET) and the Engineers Registration Board (ERB).

On her welcoming remarks the IET President, Dr. Eng. Gema Modu pointed out that one of the objective of such a gathering with about 200 participants was to seriously evaluate the engineering field on how it contributed to sustainable national development.

ERB CEO Eng. Bernard Kavishe (speaking on behalf of the Board Chairman Eng. Adv. Menye Manga) revealed uneven ratio between male and female engineers, saying there were only 4,000 female engineers in Tanzania compared to 35,000 male engineers.

ACET President, Eng. Chedi Masambaji urged the local engineers that apart from being innovative as the Day's theme suggested, they must work diligently to increase collaboration, commitment and good project end result.

The event which was officiated by the then TANROADS CEO, Eng. Rogatius Mativila was held at Karimjee Hall. Eng. Mativila appreciated good preparations made by ACET, IET and ERB, saying in future a strategic approach was required to induce female students opt for engineering subjects of an effort in of increasing the number of female engineers in the country.

Vision, Mission Statement and Core Values

Our Vision

To be the leading professional business association that promotes excellence and professionalism in consulting engineering services in Africa

Our Mision

To promote the practice of consulting engineering in Tanzania consistent with professional ethical principles and business integrity.

Core Values

- Professionalism and excellence in engineering
- Practice
- Integrity and ethical conduct
- Public safety
- Customer satisfaction
- Accountability

STRATEGIC OBJECTIVES

Main objects of the Association of Consulting Engineers Tanzania ACE are:-

- Setting professional, business and economic standards thus enabling its members to provide better engineering consulting services in the interest of their clients and the general public.
- Safeguarding ethical standards of the engineering profession and ensuring that ethical standards are maintained by consulting engineers when offering their professional services.
- Providing a ready medium through which members can consult with each other on all matters of professional interest and affords a means by which the procedure of the consulting professional may be conducted.
- Formulating policies and guidelines upon which the practice of professional engineering services shall be performed.
- Protecting and serving the public welfare and establishing a standard for the competence and conduct of consulting engineers in Tanzania.
- Supporting and assisting in the advancement of the profession of consulting engineers in Tanzania.
- Promoting harmony, cooperation and mutual consultation amongst members of the association on matters pertaining to professional engineering services.
- Acting as a clearinghouse and information centre among its members and providing corporate services for their common purpose and benefit.
- Cooperating with public bodies and other organizations in matters of common interest.

WELCOMING REMARKS

ACET NEWSLETTER - FIRST EDITION

Dear Engineers, Stakeholders and Readers,

On behalf of the Editorial Team, I am deeply honoured to present to you the First Issue of the Association of Consulting Engineers Tanzania Newsletter in 2023. This newsletter will be published on a quarterly basis and circulated to various stakeholders online. We shall by all mean include its availability on our website as well.

ACET Newsletter is a platform where we can share information on best practices, innovations, articles, ongoing infrastructures, innovations, engineering news and technologies.

Among others, one major role of ACET Newsletter will be to inform, disseminate and share information with stakeholders in the industry. We aim to convey important information and reports on technology and related activities that are being carried out within the country.

Articles with high quality and educative subjects on consulting engineering industry will be featured in the Newsletter in order to subjectively influence and contribute towards improvement of the industry in the country. To this, I will sincerely request articles from our profound engineers as we unlock our own potential and usher a new era of innovation, sustainability and productivity.

Lastly, I wish to urge all stakeholders to support our endeavour and work towards the Next Level Engineering in the consultancy industry in our Country.

Once again on behalf of the Editorial Team, I welcome you to this Newsletter and the subsequent issues with a hope that together we shall work towards making the Newsletter a desired objective and a truly influential publication. Comments, suggestions and special issues or proposals will always be welcome for improvement.

Eng. Chedi Masambaji
ACET PRESIDENT

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EDITORIAL BOARD

THE 2022 - 2024 ACET COUNCIL MEMBERS

Eng Chedi Masambaji - ACET President

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Eng. Paul F Basondole - the ACET Honorary Treasurer

Eng. Fadhili Ilala - Council member

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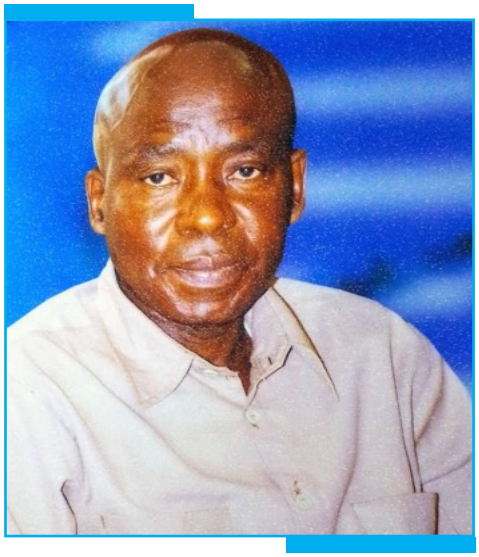

Eng Dr Richard Mwaipungu - Council member

Eng David Martin - Council Member

Eng Dereck Mbanzendole - Council Member

MEMBERS URGED TO SUPPORT FULLY VARIOUS FIDIC PROGRAMMES

FIDIC members all over the continent have been urged to participate fully and support FIDIC programmes wherever they are being held.

This was said by the FIDIC Africa President Mr Abe Thela who is also the President of CESA when opening the 29th FIDIC Infrastructure Conference held at Victoria Falls Resort, Livingstone in Zambia between 21st to 24th May, 2023.

The President also mentioned that the number of defaulters is increasing and challenged the associations to handle their duties diligently and meticulously.

FIDIC International CEO , Dr. Nelson Ogunshakin announced that the Global Infrastructure conference 2023 would be held in Singapore from September 10 to 12. He reminded members association to actively engage in FIDIC activities because they are the owners, emphasizing on intensive FIDIC trainings and less involvement in political related activities.

16 papers were presented on 22nd and 23rd May and each session was moderated to allow the delegates to open their minds and give relevant ideas.

To facilitate networking the delegate attended various receptions at Livingstone and Blue Hotels, the events included local dances and eating local foods. Participants from Tanzania, Kenya and Uganda joined hands in making a special performance, it was amazing.

ACET will be the host of the next conference in 2024. A well prepared video was played to inspire the delegates to come to Tanzania next year.

ACET Ag Executive Director Alex Alphonse sharing a light moment with Eng James Mwangi, the FIDIC Board member.

The organizers arranged a pleasure trip to Kazungula Bridge on 24th May. This is 923 in bridge crossing Zambezi river, linking Botswana and Zambia.

The ACET delegates included Dr. Exaud Mushi, Engineer Rizwan Quadri and CPA Alex Alphonce.

Young Engineers attending future leaders posting during the 29th FIDIC Africa Infrastructure meeting held in Living stone Zambia between 21th - 24th May 2023

Embracing green infrastructure for the future

The 29Th FIDIC Africa Infrastructure Conference was conducted in Livingstone Zambia from 21st – 24th May 2023. More than 31 Countries from Africa and beyond, were represented. The Outgoing FIDIC President and the FIDIC President elect, attended the conference. The theme for the conference was 'Green Infrastructure for the Future'. This was an opportunity given to the stakeholders to discuss various ways of embracing green infrastructure in their professional dealings.

Panel discussion during the Africa Infrastructure Conference (29th FIDIC Africa)

Creating a truly sustainable future for the Globe means not only identifying the interconnected natural landscapes that remain but also actively preserving them. This unique green infrastructure promotes healthier living by ensuring clean water and air and providing access to the natural world while enhancing economic growth across communities.

Engineers need to critically evaluate community policies on land development, benchmarking the area against other communities, including a green infrastructure element in the community's comprehensive land-use plan, using GIS analysis and tools to ensure that the community stays on track to preserve its green infrastructure

There is a persuasive need to ensure that the world's valuable landscapes are not sacrificed as a result of haphazard or poorly conceived development. Unlike the gray infrastructure of bridges, roads, and dams, this green infrastructure is precious and cannot be rebuilt once it is lost.

This also means addressing green infrastructure proactively at the beginning of the planning process, rather than reactively at the end. A green infrastructure approach to development identifies critical landscapes of ecological, attractive, and cultural value and preserves them. Ecologically valuable landscapes contain features such as watersheds, surface water, wildlife habitats, and coastal areas that benefit all living organisms in an area, not just people. Scenic and culturally valuable landscapes are characterized by recreational areas, view sheds, and similar features that increase property values and promote tourism.

The objective of the Green Infrastructure Initiative is to create a systematic, information-based method for transforming communities in the Globe into sustainable centers by identifying and preserving an interconnected system of landscapes at regional, local, and urban scales. Maintaining the connectivity of open spaces, habitats, and parks is important at each of these scales because connectivity lends the components of these landscapes the resilience they need to survive challenges, such as climate change, better than isolated areas can.

In early days, environmental trepidations were set aside in favor of economic necessity based on the belief that these were competing rather than complementary aspects of a truly sustainable future. But green infrastructure makes solid economic contributions. For example, preserving watersheds protects water supplies and safeguards the health of human populations, wildlife, and vegetation that depend on that water. Keeping coastal areas intact mitigates the effects of storm events and limits damage to buildings and other structures. And unmarred scenic views enhance property values.

Although green infrastructure has proven benefits such as green jobs, health related benefits, recreation spaces, habitat improvement, climate resiliency etc, the some challenges have been noted. These include high initial investment costs, getting the right materials, prolonged implementation time, uncontrollable air temperature and limited expertise.

By Alex Alphonce
ACET Acting Executive Director

Delegates to the FIDIC Africa Conference during the lunch break at the hotel.

Dilemma being faced during engineering supervision of building projects of local clients in Tanzania

By Richard Robert Mwaipungu

One of the prominent delegates in the FIDIC Infrastructure Conference emphasizing strongly on diligent supervision of engineering projects.

The heading may be a bit confusing to the reader and might want to know what type of dilemma the author is or was facing in first place. According to Longman dictionary, dilemma is a situation in which it is very difficult to decide what to do, because all the choices seem equally good or equally bad.

Yeah, it is true the author is and has been now and then found himself in situations which are somehow difficult to decide what to do, as choices are equally good or equally bad professionally and economically. And that is what prompt the author to write this article in first place. Normally this situation can be faced only in building works under the domain of local clients in the private sector. This is so because for government building and civil works, there is clear procedure of tendering, where all stake holders in engineering fields are involved namely contractors and consulting firms

Governments and Public Institutions Civil and Building Works Procurement Procedure

To real grasp the dilemma let start from the basic. It is a known fact that a big chunk of the civil and building works under government domain are being funded by tax payers' money, hence they are being governed by a well-established system from tendering process, selection of the winner, awarding the contract, signing contract, and the supervision of construction work. The process is done and supervised by a tender board, under the secretariat of procurement unit or department. It should further be noted that, most civil works are being supervised by engineering firms as leading consultant while most of building works are being supervised by architectural firms as leading consultant. The architectural firms during the bidding stage for the tender of building works, also select the engineering firms which shall do the structural design and drawings works, together with the quantity surveyor who shall prepare the bills of quantities (BoQ). It their bid win the tender, then the BoQ prepared by quantity surveyor shall be used by clients during tendering process to select a contractor to do the actual building works.

In the above-mentioned scenario, the architecture and engineering consultant firms are supervising the contractor who won the tender for the building works in question. The contractor in most case has a good team at site for the work he undertakes. He has architecture who will be drawing as built drawings, quantity surveyor who will measure the actual works done during preparation of certificate, and site engineer who will be responsible with structural works. All works are done through instructions where necessary, and no work is covered before inspection. Materials for building works are checked and approved before being incorporated in the ongoing building works. Shoddy works are demolished at the cost of contractor. The contract is governed by laws which protect all stakeholders.

Private Sector

In the private sector, most clients of building works, for a long period went through the process of erecting their residential or commercial building by using individual who are artisan by learning or experience in masonry, carpentry, painting, and electrical installation. No second- or third-part supervision of quality and workmanship is being carried out during construction work. It is a one man show.

In rural areas, most of the times, the building works proceed without building permit.

In urban areas, communities are aware of seeking building permit from town councils or municipalities before starting constructing their one storey residential building. The architectural drawings have to pass through the registered architecture who has to stamp it. Also, the structural engineer is involved in designing and preparing the structural drawings and stamping them, before one is being issued building permit. For one storey building, as one is made to believe, no registration of the project is required from Engineers Registration Board (ERB), Architecture and Quantity Surveyor Registration Board (AQRB) and Contractors Registration Board (CRB).

Of late the farmers and business community in Tanzania urban and rural areas have seen the need of erecting multi storey building structures for residential and also for commercial purposes. It is mandated that, for multi storey building structures apart from getting building permit from local councils, also one has to register the building with the authorized boards (ERB, AQRB, and CRB) before proceeding with the erection of the structure. For the structure to be registered by authorized civil and building works boards, one has to use the firms registered by the very boards for the designing, and drawing of the building structures and for registering process.

After preliminary works of designing, drawing, and seeking the building permit and project registration form respective boards, these good local clients are further required by law to engage the registered firms to do the construction and supervision works. They can be the same firms which did the registration of the building works or new firms, as the client wishes.

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Contd

It is sometimes not well understood in normal situations when a plot within the municipality has no title deed, and still the municipal in question issue building permit for a multi storey structure

The selection of contractor and supervising team for the multi storey building works in private sector is not uniform. It varies with the experience of the clients. The clients may be an individual local people, a private company or institutions who have or does not have a knowledge of the mechanisms governing building works industry, and is or does not abide by the system of auditing on how he/it spends his/they money. The selection of who to do building works depends mainly on the experience of his close associates or the building committee in the case of private institutions. As the chance may dictate, an individual from engineering firm may be selected to do all works, which imply, to find architecture, quantity surveyor, service engineer, contractor and sub-contractor. In this scenario, he will select a friendly architectural firm or an architecture or an artisan to do architectural works, while he does the work he knows best, that is of designing structural works and detailing reinforcement bars, and vice versa. The worse scenario is when a client hand-picked person does not fear God. It is worse because in most cases you will be left in the dark if you are not smart enough.

Fearing the imaginary cost from the engineering firms, local clients go to those selected firms which he will just pay them for using their names only on the notification board.

In most of these building erected by local clients the presence of service engineers is minimal.

Dilemma

The dilemma starts when you find yourself as consulting engineer, without contractor presence on site. The contractor 'name appears only on the construction site board, but is not physically on the ground. In other sites you are everything, contractor, architect, quantity surveyor and project engineer. So, you play both role as a project engineer and at the same time as site engineer. You may succeed convincing the client to employ the site engineer. In some sites he can be employed to the end of project, but in other sites he will be there for a month or two, and the client will fire him by claiming that he can't have somebody, who just sit to receive instructions from consulting engineer and do not do actual work of construction, while he has an artisan who is also supervising the construction works.

The dilemma also came into play when the work has proceeded against engineer instruction, and the structural location

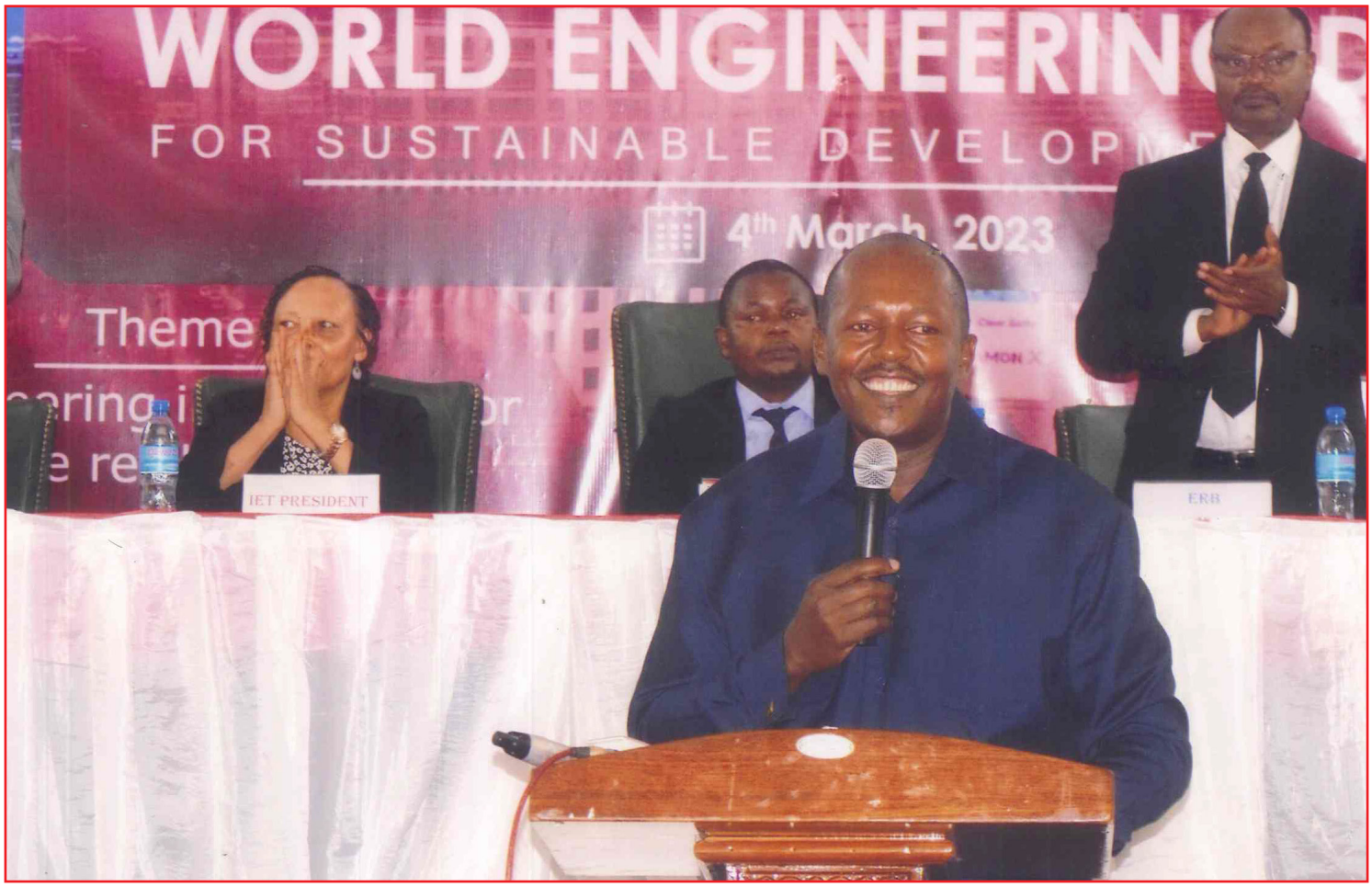
Contruction of Flyover at Waiyaki – Nairobi Kenya

in question has already been covered, and the client do not show any sign of cooperating with you, as the demolition of the shoddy work will eat his pocket financial resources. For that case he just proceeds with the construction against your advice. In one scenario, the stopping order was written to stop the work from proceeding due to inferior material. The client called the meeting where all stake holders of that project were present and it took reasons to convince the clients to do away with the sub standards materials from the site

The way forward

- There is a need of mass education on the importance of proper construction and supervision methods of building works regardless of its number of floors or coverage area. The quality of material and workmanship has to be taken on board by the presence of supervisors.
- ACET has to task itself with the preparation of a manual of procurement for local clients. The procurement manual should cover the area which is expected from local clients. Furthermore it should be easy to read, understand, and implement.
- Individuals who task themselves with erecting building structures as contractors, he must have on site the required team of experts. May be artisan or registered professional, from graduate engineer or architectural to professional engineer or architecture. This individual will be tasked to see to it that buildings built are according to the national standard existing.
- The issuance of building permit for private building structures within council or municipality has to be tied with the assurance of the name of a local registered contractor (whether by CRB or Municipal) and supervising team, architectural, service engineer and structural engineer. This exercise will not only ensure that the good principles of erecting building structures are being followed, but also will create job opportunities.
- The process of preparation and issuing title deeds for all lands in Tanzania should be privatizes at large and speeded up, particular in urban areas. This will enable local people to access loans from commercial banks for development purpose of their lands.
- It is high time now, soil bearing capacity of each local councils are known for an accurate design of building sub structure. It is an area which ACET can venture, starting with areas designated for residential and industrial buildings.
- Service engineer's presence is not noticeable in local building structures. Form designing to supervision. With ERA electrifying most rural and urban areas and new water projects are undertaken in rural and urban areas, the presence of service engineers has to be noted by local councils

NEWS IN PICTURES



ACET President Eng. Chedi Masambaji introducing retired ACET President Eng. Adv. Menye Manga, the ERB Board Eng. Bernard Kavishe and Eng. Rizwan Quadri, the FIDIC Africa President Elect at the World Engineering Day.

sitting from left; Tanroads Board Chairman, IET President Eng Dr Gema Modu, The Acting ACET Executive Director Alex Alphonse, ACET President Eng Chedi Masambaji, the Chief Guest Amb. Eng Aisha amour , the Permanent Secretary Ministry of Works and Transport, ERB Board Chairman Eng Adv Menye Manga, the ERB Registrar Eng Bernard Kavishe, ACET Vice President Eng Farida Mawenya and the PPRA CEO Mr Maswi, during the 37th ACET AGM at Serena Hotel Dar es Salaam

Force account: definition, applications and its challenges

By Eng. Paul F. Basondole, FIET, CE(T)

Force Account (FA) is a project delivery arrangement such that materials, labour and equipment are provided by or within public or semi-public entity. Regulation 167(2) of the Public Procurement Regulations, 2013 (PPR 2013) (as amended in 2016) defines force account as a construction by the procuring entity (PE) itself or use of public or semi-public agencies or departments concerned, where PE or the public or semi-public agency uses its own personnel and equipment or hired labour.

In accordance with Regulation 167(1) of PPR 2013 (as amended in 2016), the use of force account or direct labour may be justified if it meets any of the following conditions:

(a) the required works are scattered or are in remote locations for which qualified construction firms are unlikely to tender at reasonable prices;
(b) work is required to be carried out without disrupting ongoing operations;
(c) risks of unavoidable work interruption are better borne by a procuring entity or public authority than by a contractor;
(d) there are emergencies which require a prompt attention;
(e) the procuring entity has qualified personnel to carry out and supervise the required works; or
(f) the maintenance or construction is part of the routine activity of the procuring entity.

On 22 May 2020, the Public Procurement Regulatory Authority (PPRA) issued guidelines on application of Force Account. These guidelines are cited as Guidelines for Carrying out Works using Force Account by Procuring Entities in Tanzania and they came into force on 22 May 2020. These Guidelines modified the definition of FA by inclusion of private sector; a phrase 'or private sector' was added at the end of the definition of FA under Regulation 167(2) of PPR 2013 (as amended in 2016). In accordance with Clause 5.2 (a) of the FA Guidelines, the specific purpose of the Guidelines is to set procedure for procurement of labour and construction materials in implementation of FA.

Having defined force account and articulated its application requirements, let us ask few questions. One question that pops up immediately is whether or not the conditions for using FA, as stipulated under Regulation 167(1) (a) – (f) of PPR 2013 (as amended in 2016) are followed. Clause 6.2 of the FA Guideline also makes mandatory to obtain approval of tender board prior to using force account method and that the submission for request for approval must be accompanied with sufficient justification for use of the method.

The other question to ask is whether the private sector is really involved and to what extent. The advantages of involving the private sector in the use of FA include, but not limited to, the following: revenues to the government in terms of taxes; reduction of unemployment problem because private sector generates employment, more so the construction industry; quality compliance is guaranteed as there is mechanisms in the contract to safeguard the Client; losses of construction materials due to negligence, storage and handling, theft and negligence

ACET President Eng Chedi Masambaji giving a welcoming remark at the 37Th ACET AGM held on 28th July 2023 at Serena Hotel Dar es salaam. On his left, is the Permanent Secretary Ministry of Works and Transportation (Works), Amb. Eng Aisha Amour.

ERB Board Chairman Eng Adv Menye Manga addressing members during the 37th ACET AGM

are minimized; and risks associated with poor work and workmanship are mitigated as management of defects liability period, quality assurance and durability are built in the contract when the private sector is involved. One of the disadvantages of using FA is that it is difficult to correctly account for, and estimate, the costs involved because the public personnel uses resources (finances, time, equipment) which are not taken into account when cost works executed using FA.

A project is a temporary endeavour which is undertaken to accomplish a unique purpose which requires resources, has a sponsor (financier) and /or customer, and involves uncertainty or risk. As every project has three characteristics namely scope, schedule and budget, which in other circles are known as quality, time and cost respectively, projects executed using FA must consider these constraints. The uniqueness and risks on a project demand that project initiation must be properly administered. As a result, two project initiation documents must be prepared.

The first document is the Project Requirements Definition Document (or Statement of the Work) which shows what the project is expected to deliver. This is in line with Clause 11.3 of the FA Guidelines which requires the User Department shall, in consultation with technical personnel, prepare and submit scope of work and schedule of materials to the Procurement Management Unit for procurement of such materials. These requirements cover the quality (scope) and budget (cost) aspects on FA projects. The scope under FA is therefore to be determined as per Clause 11 of the FA Guidelines. The time (schedule) aspect is dealt with under Clause 9.4 (a) of the FA Guideline which requires the Project Manager or supervisor to approve the Work Plan. We need to ask here, are these requirements met?

The second document at initiation phase of a project, including FA projects, is the Project Management Plan which shows how the project is to be delivered, including procurement methods to be used in procurement of construction materials in accordance with Clause 11.4 of the FA Guideline which stipulates that procurement of materials shall be carried out using procedures specified in the Regulations. Every project also requires preparing three supporting documents namely the Quality Management Plan, Risk Management Plan and Contract Management Plan. In accordance with Clause 17.4 of the FA Guidelines, the Project Implementation Team, is required to monitor closely all risks associated with cost, time and quality and take corrective actions as appropriate, and any variations arising during execution of works shall obtain prior written approval of the tender board.

In conclusion, force account a project delivery method which is legally acceptable and conditions for its application are clearly stated in the Procurement Law of Tanzania. However, its current application leaves a lot to be desired. The Procuring Entities using FA must ensure that its application is in compliance with the Law and the Guideline issued by the PPRA. The other myth on force account is that it is "cheap" but there is no study to confirm that the method is 'cheap' because not all the expenses and costs involved are not accounted for. The right question therefore is whether or not force account is cost-effective, as the word 'cheap' may have a negative connotation.

Challenge to tall ambitions

By TAK Mathews

Man has always had tall ambitions, The 146.7m high Pyramid of Khufu (Giza), Egypt completed in 2570 BC (Source: Wikipedia) stand testimony to man's tall ambitions from prehistoric times. These structures, without exception were built to meet religious or political compulsions. They were not for human (live) continuous habitation.

Pyramid of Khufu in the background of the Sphinx

The oldest documented reference to a tall building for habitable purposes can be found in the bible. "... Then they said, Come let us build ourselves a city, with a tower that reaches to the heavens, so that we may make a name for ourselves;..... .."(Source: Genesis 11: 4, NIV). References to this tall ambition can also be found in other sources like the Book of Jubilees, the Quran and the Book of Mormon. (Source Wikipedia)

Interestingly even then, as is the case today, the main objective for tall was "making a name".

Researchers like the late Professor J E Gordon (Structures: Or Why Things Don't Fall Down) have estimated that this building could probably have reached a height of 2 kilometres, which is much higher than the current tall ambitions.

The biblical reference goes to elaborate that the building did not get completed as God intervened ".... Come, let us go down and confuse their language, so that they will not understand each other..... and they stopped building the city" (Source: Genesis 11: 7-8, NIV).

However in all likelihood the disruption would not have required God's intervention.

In reality, till the middle of the 19th century, the tallest buildings for human habitation was limited to 6 floors as climbing so many stairs was just not practical (reference Wikipedia). Elisha Graves Otis' "All Safe Gentlemen" demonstration of a safe elevator at the New York World's Fair at the New York Crystal Palace in 1853 changed all that. This one invention single handedly provided the impetus to the realistic tall ambitions that continue to alter the skylines of the cities of the world.

There is no doubt that hoisting processes and mechanisms have existed from prehistoric times. For instance the hoisting of the huge blocks for the pyramids would definitely have required some lifting mechanism powered through a combination of human and animal power. The rising platforms in the colosseums of the Roman times too had lifting mechanisms. Subsequently industrial units too would have required some sort of hoisting mechanism for efficient material (and labour?) movement. All these were principally for freight / material and very less for human transportation. With numerous cases of the hoisting medium failing, the hoisting mechanisms were generally considered unsafe for human use. This changed with Otis's dramatic demonstration in 1853.

Even then the limitations of driving mechanisms restricted any major height increase. Around the early part of the 19th century, steam powered hoisting mechanisms became prevalent, With its obvious inefficiency, it went out of favour soon after.

William Armstrong invented the hydraulic lift in 1870. While hydraulic elevators are still prevalent, these elevator systems have speed and travel limitations.

The invention of the electric lift in 1880 by Werner von Siemens (www.thoughtco.com), laid the foundation for the gradually removal of the technical speed limitations for elevators. In many ways speed limitations are now governed more by the frailties of the human body.

Today, the fastest elevator as confirmed by the Guinness World Records is by Hitachi and runs at 21m/s (75.6 kms/h) installed and commissioned at the Guangzhou Finance Centre. For perspective, the fastest elevators at Burj Khalifa are at 10m/s, while the fastest elevators at 101, Taipei by Toshiba are at 16.8m/s. These high speeds are achieved only in the up direction and is reduced to 10m/s in the down direction, again considering human frailties.

It would be logical that with speeds of 21m/s, a single elevator could be installed and commissioned to travel over a kilometer. At this point when speeds limits are going up, material limitations come into play. For instance, the steel ropes on which the elevator cars are suspended with its weight is a major limitation. Elevator companies are striving to address this and Kone has already tested and introduced the carbon fiber based Ultrarope. Other companies are also exploring rope less travel. Complexities of maintenance or a breakdown also contribute to the issue.

Even then the tallest building constructed to date, that is the Burj Khalifa (828m) or the under-construction Jeddah Tower (1008m) do not have a single elevator serving the full height.

Conclusion

Even after over 5000 years, the modern man's tall ambitions are yet to even reach the half way mark of the audacious Tower of Babel plan. After the structure, for which the know-how and material have existed from ancient days, what made a tall building a sustainable reality is the invention of the safe elevator. Elevators continue to be the only real challenge to man's tall ambition.

Nevertheless, not to be written off as the laggards holding down tall ambitions, elevator experts are striving to eliminate this challenge and are working on concepts for a space elevator. If this succeeds, we can finally consider achieving the Tower of Babel ambition.

The Diversity of Engineering Discipline

By R. R. Mwaipungu

Some engineers attend training courses to enhance their disciplines and operational capacity.

Introduction

The engineering discipline is one of the profound professions which touches the whole aspect of human being life. As the earth, unceasingly, continue to rotate along its orbit, to create sustainable living condition on the earth, so is the engineering discipline in its endeavor to provide solutions to engineering challenges. The discipline is currently on the frontline to protect and improve the world environment for all living creatures.

Life standard as we know it today has been achieved through the application of engineering know how aided with its diverse nature.

The article on the diversity of engineering profession is attempting to explain the function of five major branches of engineering profession. Furthermore, it touches also on the branches of engineering interdisciplinary, which coexist together with the five major ones. To aid in understanding the complex nature of engineering networking, the paper also touches on those who practice engineering

Again, engineers are who made the world as it stands today, and are still working hard to make it a better place for human beings to live in their quest for another best world.

Main branches of engineering

Engineering is a broad discipline that is often broken down into several sub-disciplines. Although an engineer will usually be trained in a specific discipline, he or she may become multi-disciplined through experience. Engineering is often characterized as having five main branches: bioengineering, chemical engineering, civil engineering, electrical engineering, and mechanical engineering.

Bioengineering

Bioengineering is the engineering of biological systems for a useful purpose. Examples of bioengineering research include bacteria engineered to produce chemicals, new medical imaging technology, portable and rapid disease diagnostic devices, prosthetics, biopharmaceuticals, and tissue-engineered organs.

Chemical engineering

Chemical engineering is the application of physics, chemistry, biology, and engineering principles in order to carry out chemical processes on a commercial scale, such as the manufacture of commodity chemicals, specialty chemicals, petroleum refining, microfabrication, fermentation, and biomolecule production.

Civil engineering

Civil engineering is the design and construction of public and private works, such as infrastructure (airports, roads, railways, water supply, and treatment etc.), bridges, tunnels, dams, and buildings. Civil engineering is traditionally broken into a number of sub-disciplines, including structural engineering, environmental engineering, and surveying. It is traditionally considered to be separate from military engineering.

Electrical engineering

Electrical engineering is the design, study, and manufacture of various electrical and electronic systems, such as broadcast engineering, electrical circuits, generators, motors, electromagnetic/electromechanical devices, electronic devices, electronic circuits, optical fibers, optoelectronic devices, computer systems, telecommunications, instrumentation, control systems, and electronics.

Mechanical engineering

Mechanical engineering is the design and manufacture of physical or mechanical systems, such as power and energy systems, aerospace/aircraft products, weapon systems, transportation products, engines, compressors, powertrains, kinematic chains, vacuum technology, vibration isolation equipment, manufacturing, robotics, turbines, audio equipment, and mechatronics.

Interdisciplinary Engineering

Interdisciplinary engineering draws from more than one of the principle branches of the practice. Historically, naval engineering and mining engineering were major branches. Other engineering fields are manufacturing engineering, acoustical engineering, corrosion engineering, instrumentation and control, aerospace, automotive, computer, electronic, information engineering, petroleum, environmental, systems, audio, software, architectural, agricultural, biosystems, biomedical, geological, textile, industrial, materials, and nuclear engineering.

New specialties sometimes combine with the traditional fields and form new branches – for example, Earth systems engineering and management involves a wide range of subject areas including engineering studies, environmental science, engineering ethics and philosophy of engineering.

Other Branches of Engineering

Aerospace engineering

Aerospace engineering covers the design, development, manufacture and operational behaviour of aircraft, satellites and rockets.

Marine engineering

Marine engineering covers the design, development, manufacture and operational behaviour of watercraft and stationary structures like oil platforms and ports.

Computer engineering

Computer engineering (CE) is a branch of engineering that integrates several fields of computer science and electronic engineering required to develop computer hardware and software. Computer engineers usually have training in electronic engineering (or electrical engineering), software design, and hardware-software integration instead of only software engineering or electronic engineering.

Geological engineering

Geological engineering is associated with anything constructed on or within the Earth. This discipline applies geological sciences and engineering principles to direct or support the work of other disciplines such as civil engineering, environmental engineering, and mining engineering. Geological engineers are involved with impact studies for facilities and operations that affect surface and subsurface environments, such as rock excavations (e.g. tunnels), building foundation consolidation, slope and fill stabilization, landslide risk assessment, groundwater monitoring, groundwater remediation, mining excavations, and natural resource exploration.

Practice

One who practices engineering is called an engineer, and those licensed to do so may have more formal designations such as Professional Engineer, Consulting Engineer, Incorporated Engineer, , or Designated Engineering Representative.

The pulse of Public Private Partnership (PPP) in road infrastructure projects in Tanzania

Tanzania Roads network is reported to be 181,190.06 Km long (36,760.29 Km are National Roads – Trunk (12,223.04 Km) and Regional (24,537.25 Km) and 144,429.77 Km are District Roads, out this 14,148.3 Km or 7.8% are paved roads, which means there is still a huge need to upgrade the remaining 92.2%. At the moment there are various efforts planned by the Government to accomplish this objective which in turn requires enormous resources to design, build, operate and finance. Thus, the need to involve the private sector has been observed to be indispensable. To effectively involve the private sector Public Private Partnership (PPP) delivery model is now being considered to be used in road infrastructure projects in Tanzania.

The concept of PPP in Tanzania is not a new phenomenon, one such classic example is PPP in Telecommunication sector in which since in 1990's the private sector started investing in Telecommunication infrastructure including taking over the responsibility to design, manufacture, construct, operate, maintain, and charge users for the services offered to recover their capital expenses and operating expenses. However, the road sector has to a large extent fallen behind in the use of PPP in road infrastructure delivery system, with the exception of Kigamboni Bridge which is the first recognized PPP road infrastructure project in Tanzania.

From 19th December 2022 to 20th December 2022 the Ministry of Works through Tanzania National Roads Agency (TANROADS) conducted a seminar in Arusha on road projects execution through PPP projects delivery system. The PPP model was explained to be a long term contract between a private party and a Government entity for providing a public asset or service in which the private party bears a significant risk and management responsibility and remuneration is linked to performance.

Currently, with TANROADS as implementing agency, the following roads upgrading projects have been selected to be delivered through PPP model, and these roads are as follows;

- Kibaha – Mlandizi – Chalinze – Morogoro Toll Expressway (205 Km long), and
- Igawa – Uyole – Songwe – Tunduma including Mbeya Bypass Toll Road (218 km long)

Kibaha – Mlandizi – Chalinze – Morogoro Toll Expressway

The expressway will entail design, construct, finance and operation of a new road infrastructure that is more or less parallel to the existing TANZAM Highway. The Expressway will be designed and constructed as a dual carriageway with a design speed of 120Km/h. The infrastructure will also be provided with auxiliary amenities such as modern rest areas, Free Interchanges, Toll Plaza, and e-tolling system.

Once completed, the expressway will help to significantly alleviate the heavy traffic problem that is now observed from Kibaha to Morogoro and as a result significantly reduce travelling time. The project will commence from Kibaha since already the road from Dar es Salaam to Kibaha compliments with an already widened eight lanes highway.

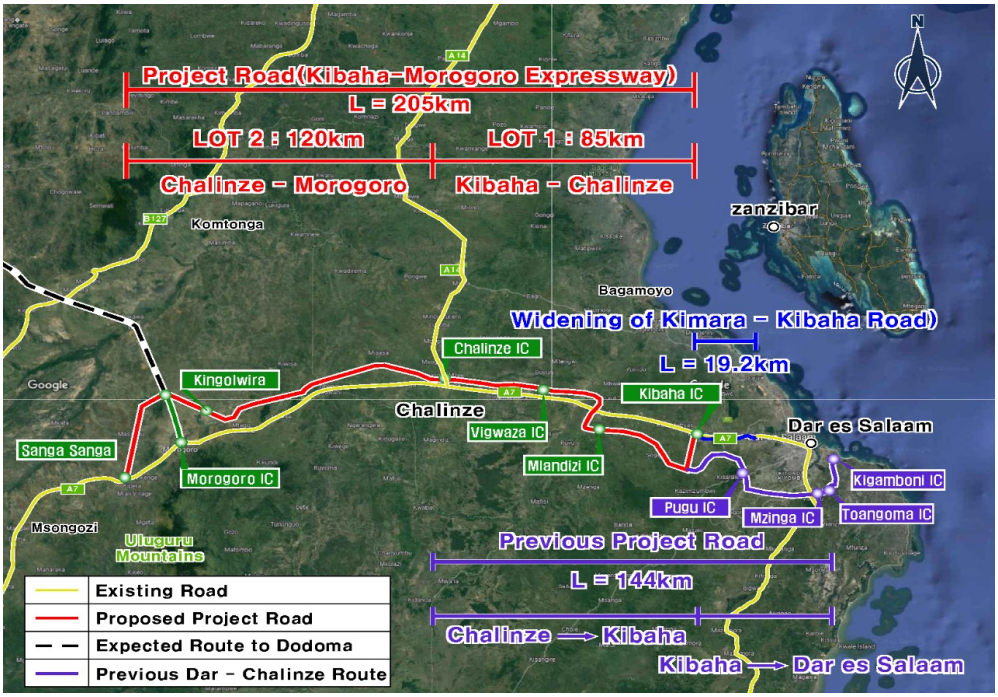
The implementation of the Kibaha to Morogoro expressway will be done in two Lots, with Lot 1 will be from Kibaha – Mlandizi – Chalinze, and Lot 2 from Chalinze – Morogoro. There is also a possibility of both Lots being implemented simultaneously.

Igawa – Uyole – Songwe – Tunduma Toll Road

The expressway will be designed and constructed as a two-lane carriageway with a design speed of 100 Km/h. This too shall also be provided with auxiliary amenities such as modern rest areas, Free Interchanges, Toll Plaza, and e-tolling system. Once completed, the expressway shall operate in parallel with the existing TANZAM highway.

It is thus obvious that the emergence of PPP road infrastructure projects in Tanzania offers new opportunities to consulting Engineers, including getting involved from the early stages of pre-feasibility, through technical and financial or financing proposals preparations, studies, designs, and construction.

In this respect, skills development and upskilling should be considered through continuous training in related fields to practitioners including Professional Engineers, Consulting Engineers, Architects, Quantity Surveyors, Procurement Officials, Planners, Accountants, Lawyers, etc. The Association of Consulting Engineers Tanzania (ACET) offers numerous opportunities that includes essential trainings through scheduled courses as well as customized arrangements, with a fervent belief of developing our local capability and capacity.



Prepared by: Chedi Masambaji (Ministry of Works PPP Seminar Attendee 19th to 20th December 2022)

Structures have to deal with a common enemy: corrosion

Construction companies all over the world spend fortunes trying to prevent the effects of corrosion on bridges and other structure. The problem may sound simple but its solution has proved complicated and elusive.

The steel used to reinforce concrete may rust when exposed to the elements.

Unprotected metal structures are they drilling platforms, houses or pipelines may corrode over time. One of the methods to prevent corrosion is called |"cathode protection" simply CP.

A prominent chemical engineer says corrosion is an incredibly complex process" it's an electro-chemical process, but when it comes to structures you need to include competences from many fields".

CP involves using an anode mounted on or into the structure that leads electric current to the concrete's metal reinforce bars which hence act as the cathode. This current prevents the metal from rusting.

Even though CP has become a standard method for preventing corrosion in many places around the world, some engineers do not see it as a silver bullet.

There is a need to study different possible solutions to tackle corrosion before deciding which method is the best. What is the best technical solution and most cost efficient?

One of the biggest challenges facing corrosion is to prevent corrosion caused by the phenomenon known as stray current.

Found primarily in towns, stray currents refer to electrical currents from metros, light rails and other electrical installations. Preventing corrosion due to stray currents is a complicated process and can be accomplished by electrical insulation, equipotential bonding and CP.

With the enormous need to protect steel and concrete structures from corrosion, the field has become one of world's biggest industries rendering engineers plenty of projects while working with all kinds of structures.

For instance, in developed countries where there are underground electric trains, corrosion monitoring system is crucial to predict when the tunnel's primary reinforcement would be at a risk of rusting or corroding. The bridges are also monitored to increase their level of safety.

{For more information contact COWI Protection Specialist}.

THE PROFESSION AND PRACTICE OF ENGINEERING CONSULTANCY

WHO is a consulting engineer?

A Consulting Engineer is defined as a person who possesses the necessary qualification and has been registered by the Engineers Registration Board in the category of consulting engineer and performs one or more of the disciplines of engineering and devotes himself to designing and inspecting the construction or installation of engineering works on a free basis and also advices his clients on engineering matters. For carrying out this profession the consulting engineer maintains his office either society or in conjunction with one or more engineers and usually employs his own staff.

ROLES OF A CONSULTING ENGINEER

The duty of a consulting engineer is to safeguard the interests of both the clients and society while devising sound engineering solutions for minimum whole life costs of the project. Services of consulting engineers cover

Preliminary Investigation:

This involves evaluation of client's needs, analysis of problems involved, making cost estimates make an Informed decision.

Detail engineering design. This covers:

Detail plans, design calculations and specifications. Also contract documents for tendering, calling for Tenders and Tender evaluation, Contract Supervision, Contract Administration and Project Management.

Special Services:

These include:

- Site investigation
- Surveys
- Adjudicate on disputes or claims
- Advice on suitability of contractors
- Inspect plant and equipment during
- manufacture
- Advice on payments
- Initial operation of plant and training of
- staff

WHY USE A CONSULTING ENGINEER

Advantages of using the services of a consulting engineer include:

- A consulting engineer accept professional responsibility for the work he undertakes
- A consulting ha no commercial interests with manufacturers, suppliers or contractors
- A consulting engineer selects materials and equipment suitable for the project without bias
- A consulting engineer is familiar with most modern techniques because of the daily practice of his profession

Selection of a consulting engineer

Selection of a consulting engineer needs careful thought. This directory is thus intended to facilitate the selection of consultants by clients. The ACET Secretariat will also be glad to assist clients in the establishment of a suitable shortlist of consultants to meet clients individual needs. The firms on the shortlist can then be contacted for details. In this way clients will save a lot of time and avoid unnecessary advertising costs.

When selecting/appointing a consulting engineer a client would normally consider qualifications and experience of a number of firms that appear capable of meeting requirements of the project.

About FIDIC

FIDIC stands for Fédération Internationale des Ingénieurs – Conseils, which means International Federation of Consulting Engineers. The organization was founded in 1913 by France, Belgium and Switzerland, and the UK joined in 1949. FIDIC currently has its headquarters in Switzerland. FIDIC is the global representative body for national associations of consulting engineers and represents over one million engineering professionals and 40,000 firms in more than 100 countries worldwide.

FIDIC promotes and implements the consulting engineering industry's strategic goals on behalf of its Member Associations. FIDIC publishes international standard forms of contracts for works and for, consultancy, sub-consultancy, joint ventures and representatives. FIDIC also publishes business practice documents such as policy statements, position papers, guidelines, training manuals and training resource kits in the areas of management systems (quality management, risk management, business integrity management, environment management, sustainability) and business processes (consultant selection, quality based selection, tendering, procurement, insurance, liability, technology transfer, capacity building).

2. Development of FIDIC Forms of Contract

2.1. Conditions of Contract for Construction for Work Designed by Employer - Red Book

In 1957, FIDIC published its first contract – the Form Contract for Works of Civil Engineering Construction. The organization has since become famous for its standard form contracts for the construction and engineering industry. The first FIDIC contract soon became known for the color of its cover – the Red Book. It has since become tradition that FIDIC contracts are known by the color of their covers. In response to comments and needs of the industry FIDIC continued to develop new editions the latest being the 2017 Edition.

2.2. Selected titles of FIDIC Forms of Contract / Agreement

Without going into details of definitions of words 'contract' and 'agreement', FIDIC has adopted the title Contract for Works Forms of Contract and Agreement for Service Forms of Contract. This list is given to provide readers with information on immense knowledge that is readily available for use in the industry. For instance, institutions that do dredging are encouraged to use the Form of Contract for Dredging and Reclamation Works 2006 (Blue Book) next time they are procuring dredging works. Others involved in Tunneling and Underground Works are encouraged to use Conditions of Contract for Underground Works 2019 (Emerald Book).

These and other documents are listed below.

2.1.1. Forms of Contract for Works

i. Condition for Contract for Construction for Building and Engineering Work Designed by the Employer 2017 (also 1999) – Red Book
ii. Conditions of Contract for Plant and Design Build for Electrical and Mechanical Plant, and for Building and Engineering Works, Designed by the Contractor 2017 (also 1999) – Yellow Book
iii. Conditions of Contract for EPC / Turnkey Projects 2017 (also 1999) – Silver Book
iv. Short Form of Contract 2021(also 1999) - Green Book
v. Conditions of Contract for Design, Build and Operate Project 2008 – Gold Book
vi. Conditions of Contract for Underground Works 2019 – Blue Book
vii. Form of Contract for Dredging and Reclamation Works 2006 – Emerald Book

Red, Yellow, Silver and Green Books are popularly known as rainbow suites. Other colors have been added to the rainbow as seen for Gold, Blue and Emerald. The 1999 edition of the rainbow suite continue to be used in various projects though use of the latest edition is gaining pace.

Conditions of Contract for Construction for Work Designed by the Employer (2006 and 2010) for Multilateral Development Banks is one of Forms of Contract worth mentioning here. The form is popularly known as the MDB Harmonized Edition - Pink Book. This form of Contract is a modified edition of the 1999 Red Book. It came as a result of request to FIDIC (by nine Multilateral Development Banks - World Bank, African Development Bank, Asian Development Bank and six others) to make changes in the 1999 Red Book include specific needs of the Banks in the wording of conditions of contract. Two editions were drafted namely the 2006 and 2010 but there has not been an edition based on the 2017 Edition of the Red Book. FIDIC is in discussion with some MDB to secure a license for the new MDB Harmonized edition.

2.2.2. Forms of Sub - contract for Works

i. Conditions for Subcontract for Construction for Building and Engineering Work Designed by the Employer 2011
ii. Conditions of Subcontract for Plant and Design Build for Electrical and Mechanical Plant, and for Building and Engineering Works, Designed by the Contractor 2019

2.2.3. Agreement Forms

i. Client Consultant Model Services Agreement 2017 (also 2006) – White Book
ii. Model Joint Venture (Consortium) Agreement Between Consultants 2017
iii. Sub-consultancy Agreement 2017
iv. Model Representative Agreement 2004

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3. Agreements with Multilateral Development Banks - MDBs

FIDIC has entered into agreements with MDBs to cause various forms of contract to be used for projects financed by the Banks. The Banks and forms of contract / agreement involved is as follows: -

Bank	FIDIC Documents
World Bank	Rainbow Suite 2017, White 2017, Gold 2008, Green 99 & Emerald 2019
IADB	Rainbow Suite 2017, White 2017, Gold 2008, Green 99
Caribbean Development Bank	Rainbow Suite 1999 and 2017, White 2017, Gold 2008 and Green 1999
EBRD	Rainbow Suite 1999 and 2017, White 2017, Gold 2008 and Green 1999
Asian Infrastructure Investment Bank	Rainbow Suite 1999 and 2017, White 2017, Gold 2008 and Green 1999
AfDB	Rainbow Suite 2017, White 2017, Gold 2008, Green 99, Red 99
Islamic Development bank	Rainbow Suite, 2017, White, 2017, Gold 2008, Green 99, Emerald 2019
IFAD	Rainbow Suite 2017, White 2017, Gold 2008, Green 99

This initiative implies that professionals working in projects financed by the listed organizations have to have a correct grip and understanding on how the forms of contract operate in order to be able to procure and effectively supervise projects using the FIDIC forms of contract. A particular recommendation is made to the Public Procurement Regulatory Authority to ensure that staff in Ministries and other public organizations are properly trained to be able to handle projects using these forms of contract. Furthermore, ACET is encouraged to continue with the training of various professionals to be able to respond to need of these FIDIC forms of Contract. Arbitrators and Adjudicators should also take a note about this initiative.

4. Current developments

As noted above FIDIC has continued to being issuing new documents in response to feedback from the industry. Recently (December 2022) FIDIC released a reprint of the 2017 set of rainbow suit; only five years after their release. Besides this release, FIDIC has also embarked on the production of the Engineering Procuring and Construction Management (EPCM form of contract) to serve the growing needs due to various projects that require this type of form of contract.

EPCM contracts can vary in their scope and type, but the proposed FIDIC version is for a contract between an owner or project sponsor and a single EPCM contractor where the contractor provides the following services for the owner or the project sponsor: -

- Overall engineering and design for the project (but also providing for management, as agent of owner / sponsor, for some specialty engineering and design / EPC contractors for sub – element of the project).
- Procurement as an agent of the owner / sponsor, of the goods, materials, equipment and construction and related services for the project.
- Management of the construction trade contractors and construction related services providers as an agent of owner / sponsor through completion and commissioning of the project.

Already there are projects in Tanzania that are being implemented using this approach and therefore these demands vigilance by construction professionals to ensure that they go abreast with the development of this form of contract.

It is also expected that soon FIDIC will consider a form of Contract for Engineering Procurement, Construction and Financing (EPCF) where besides delivering a project the Contractor also arranges for Financing of the Project under a specific agreement with beneficiaries.

4.1. Other documents in the pipeline

FIDIC has now began drafting 2017 Suite of Contracts Guide, 2017 Suite of Agreements Guide, Guide to the 2019 Emerald Book, 2017 Suite Subcontracts, JV Agreement for Contractors, Handbook for practitioners, Public Private Partnership (PPP) contract, Offshore Windfarm form of Contract, Update of procurement guide; and others

Another development includes negotiating more agreements and memoranda of understanding with various other banks and organizations to ensure a wide use of FIDIC forms of Contracts. The list is long but key issue here is that the documents have gained a broad acceptance calling for all practitioners in the sector to ensure that they are not left behind because it is not very long before one encounters a situation where he / she needs to use a FIDIC document for a project implementation.

It is noted here, and those in practice in Tanzania can bear witness, that there are several large projects in infrastructure (Railways, Energy Sector, Roads, etc.) that are being implemented using both 1999 and 2017 FIDIC forms of contract.

5. FIDIC Credentialing Limited (https://fcl.fidic.org)

In order to ensure that users of FIDIC document are getting adequate and appropriate knowledge, FIDIC has established a subsidiary called FIDIC Credentialing Limited - FCL. FCL provides certification services to individuals working in the global infrastructure industry. FCL examines and certifies consulting engineers, contract managers, future leaders, FIDIC trainers and dispute adjudicators. For more details, please browse the website indicated above.

6. Conclusion and recommendation

A brief background of FIDIC has been described with development of FIDIC forms of contract explained. There are various documents that are useful for different types of projects and FIDIC is making effort to popularize the documents through agreements and memoranda of understanding with various institutions that sponsor or finance projects. It is also noted that FIDIC has established a subsidiary for training and certification of professionals working with or likely to work with the FIDIC documents.

It has been recommended that professionals working in construction industry do a deliberate effort to ensure that they are conversant with the documents because they will have to work with them in projects they develop. Arbitrators and Adjudicators have also been reminded to ensure that they are well conversant with the forms of contract to facilitate credible handling of matters that are brought before them. A certification with FCL will be an added advantage in the course of enhancing confidence in handling FIDIC matters.

PROFESSIONALS COMPLIANCE AND THEIR REGISTRATION BODIES IN TANZANIA

By Advocate Akida Majengo

With the increase of investment opportunities in Tanzania both local and foreign, entities are obliged to work with Professional personnel who can serve organization's goals and purposes in the specific aspect of their competence. Professionals in Tanzania are legally required to comply and be registered with their professional bodies for their recognition and qualification to work in certain aspect of field specialization. The following are categorizes of Professionals that are required to be registered in accordance of the enabling laws of the professional in Tanzania.

Engineers

The Engineers Registration Board is a statutory body established under the Engineers Registration Act No.15 of 1997. The Board has been given the responsibility of monitoring and regulating engineering activities and the conduct of the engineers and engineering consulting firms.

The Act restrict the employment of professional engineers if those engineers are not registered and it may attract the penalty of court fine, jail or both. The registration of both local and foreign professional Engineers is done through official website of Engineers Registration Body (https://erb.go.tz)

Architects and Quantity Surveyors

The Architects and Quantity Surveyors Registration Board was established by the Architects and Quantity Surveyors (Registration) Act No.4 of 2010 and among its activities is to register and regulate the conduct of Architects, Quantity Surveyors, Interior Designers, Landscape Architects, Furniture Architects, Building Surveyors and Construction Managers. The Act prohibits persons or firms to practice as Architects or Surveyors if not registered with the Board otherwise shall be liable for a fine or Jail. All locals and professional registration shall be done through online registration system (https://ors.aqrb.go.tz)

Medical Doctors

The Medical Council of Tanganyika is a statutory body established under Section 3 of the Medical Practitioners and Dentists Act, Cap. 152 (2002 RE) of the Laws of Tanzania. The Medical Council of Tanganyika is vested with legal powers to register, oversee medical and dental practice in Tanzania. In particular, the Council has been empowered to ensure safe and effective practice for Medical Doctors and Dentists. Generally, the Council has the duty to guide members of the profession and protect the public against undesirable practice.

The law provides that a person who willfully and falsely practices as Medical, Dental or allied health professional and practitioner knowing that he is not registered or qualified as such, commits an offence. The registration shall be done through the official council websites.

The ACET Vice President Eng. Farida Mawenya, clarifying one of the issue raised during 36th AGM at Serena Hotel Dar es Salaam, related to professional compliance.

Nurses and Midwives

Tanzania Nursing and Midwifery Council is a professional regulatory authority established under the Nursing and Midwifery Act, 2010 to ensure that services provided by nurses and midwives in Tanzania are of acceptable standard and safe to their clients. The law provides that Nurses and Midwives must be registered to be allowed to practice in Tanzania failure of which attracts penalty.

Procurement and Supplies Professional.

Procurement and Supplies Professionals and Technicians Board (PSPTB) is established by Parliamentary Act No. 23 of 2007 that among other thing is to register all procurement and supplier professional in accordance of the law. Section 46 of Procurement and Supplies Professionals and Technicians Board Act, 20007 prohibits the employment of persons who are not registered with the Board.

Valuers

Valuers Registration Board is a public body corporate established under Section 12 of the Valuation and Valuers Registration Act, Cap 138 of the Laws of Tanzania to regulate valuation undertakings in the country. The main functions of the Board include registration of Valuers after evaluating their academic and practical qualification, promotion of educational advancement of Valuers and

control valuation practice in Tanzania. The Act prohibits the practice of Valuer without being issued with a Certificate by the Board.

Environmental Health Practitioners

The Environmental Health Council is the statutory body established in accordance of Environmental Health Practitioners (Registration) Act, 2007 vested with powers of registration and licensing of Medical Radiology and Imaging Practitioners, Health Laboratory Practitioners, Environmental Health Practitioners, Optometry Practitioners and Traditional and Alternative Health Practitioners in Tanzania Mainland. Section 39 of the Act provides that any Environmental practitioner has to be registered otherwise shall be committing an offence.

Advocates

The Register of the High Court of Tanzania is the responsible body vested with powers of registering and licensing Advocates to practice in mainland Tanzania in accordance of section 6 of the Advocates Act, Chapter 341 of the laws of Tanzania. Section 39 of the same Act prohibits the practice of unregistered Advocates in professional capacity or in official courts system of mainland Tanzania.

One of the capacity bulding programs conducted by ACET

Accountants and Auditors

The National Board of Accountants and Auditors (NBAA) is a responsible statutory body responsible for the registration of professional Accountants and Auditors in Tanzania in accordance of the Auditors and Accountants (Registration) Act number 33 of 1972 and it operates under the Ministry of Finance. Any Accountants or Auditors must be registered for professional practice otherwise shall be liable under section 14 of Accountants and Auditors (Practicing) Regulation, 2017.

ACET members posing for a group photo during the 36th AGM at Serena Hotel, Dar es Salaam.

ASSOCIATION OF CONSULTING ENGINEERS TANZANIA

****ACET COURSE SERIES****

2023 TRAINING CALENDAR

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E-mail: info@acet.or.tz, Web: www.acet.or.tz

Member of FIDIC

FIDIC CONDITIONS OF CONTRACTS MODULES

CODE	DATE	TITLE	COURSE TUTOR	VENUE	FEE (TSHS)	PDUs
FC1	14th - 17th February, 2023	FIDIC Conditions of Contracts (Modules 3 & 4) with practical case studies	Eng. L. Leach	Morogoro	1,000,000/-	
FC2	20th - 23rd March, 2023	FIDIC Conditions of Contracts (Modules 1 & 2) with practical case studies	Eng. Dr. K. Salewi	Mwanza	1,000,000/-	
FC3	17th - 20th April, 2023	FIDIC Conditions of Contracts (Modules 3 & 4) with practical case studies	Eng. Dr. K. Salewi	Dar es Salaam	1,000,000/-	
FC4	22nd - 25th May, 2023	FIDIC Conditions of Contracts (Modules 1 & 2) with Q&A session	Eng. L. Leach	Dodoma	1,000,000/-	
FC5	21st - 23rd June, 2023	FIDIC Module 5: Practical Use of FIDIC EPC/Turnkey Projects (Silver Book) with practical case studies	Eng. E. Mushi	Zanzibar	900,000/-	
FC6	1st - 4th August, 2023	FIDIC Conditions of Contracts (Modules 3 & 4) with practical case studies	Eng. Dr. K. Salewi	Morogoro	1,000,000/-	
FC7	4th - 7th, September, 2023	FIDIC Conditions of Contracts (Modules 1 & 2) with practical case studies	Eng. E. Mushi	Dar es Salaam	1,000,000/-	
FC8	2nd - 5th October, 2023	FIDIC Conditions of Contracts (Modules 3 & 4) with practical case studies	Eng. L. Leach	Arusha	1,000,000/-	
FC9	31st Oct - 3rd November, 2023	FIDIC Conditions of Contracts (Modules 1 & 2) with practical case studies	Eng. Dr. K. Salewi	Morogoro	1,000,000/-	
FC10	27th - 30th November, 2023	FIDIC Conditions of Contracts (Modules 3 & 4) with practical case studies	Eng. L. Leach	Dodoma	1,000,000/-	
	LOCAL CPD TRAINING COURSES					
LC1	9th - 11th January, 2023	Behaviour of Soil as Load Bearing Material Emphasis on Characteristics of Soils	Eng. Dr. R. Mwaipungu	Morogoro	500,000/-	18PDUs
LC2	30th Jan - 1st February, 2023	Principles and Procedures for Technical and Value for Money Auditing	Eng. P.F. Basondole	Dodoma	500,000/-	16PDUs
LC3	21st - 24th February, 2023	Construction Project Management - A Practical Approach (with case studies)	Eng. Dr. L. Chamuriho	Arusha	700,000/-	

CODE	DATE	TITLE	COURSE TUTOR	VENUE	FEE (TSHS)	PDUs
LC5	27th - 29th March, 2023	Competitive Preparation of Bid Documents (with case studies)	Eng. J. Nicolao	Dodoma	600,000/-	
LC6	19th - 21st April, 2023	Project Planning, Monitoring and Evaluation (with case studies)	Eng. P.F. Basondole	Morogoro	600,000/-	
LC7	23rd - 26th May, 2023	Procurement of Goods, Works and Non-Consultancy Services	Eng. Dr. R. Mlinga	Arusha	600,000/-	
LC8	19th - 21st June, 2023	Project Management: A Hybrid Approach	Eng. Prof. N.M. Lema	Morogoro	700,000/-	
LC9	17th - 19th July, 2023	Contract Management: Emphasis on Claims	Eng. P.F. Basondole	Dodoma	600,000/-	
LC10	23rd - 25th August, 2023	FIDIC Contracts Claims Management (case studies and Q&A)	Eng. Dr. K. Salewi	Morogoro	600,000/-	
LC11	18th - 20th September, 2023	Principles and Procedures of Technical and Value for Money Auditing (with case studies)	Eng. P. F. Basondole	Dodoma	500,000/-	
LC12	18th - 20th October, 2023	Drafting and Administration of all the FIDIC forms of Contracts	Eng. K. Kanyaura	Dar es Salaam	500,000/-	
LC13	13th - 15th November, 2023	Effectiveness of Drainage Systems for Sustainability of Gravelling Material for Road Works	Eng. Dr. R. Mwaipungu	Dodoma	500,000/-	
LC14	22nd - 24th November, 2023	Alternatives Dispute Resolution in Construction: Disputes Avoidance, Dispute Adjudication and Arbitration (with practical case studies)	Eng. L. Leach	Morogoro	600,000/-	

IMPORTANT:

i) All CPD Courses are delivered by qualified, experienced and accredited trainers recognized by the Engineers Registered Board (ERB) of Tanzania and attracts PDUs for engineering professionals

ii) ACET will arrange In-House (tailor made) CPD Course upon receiving formal request from the client, based on specific areas

iii) All FIDIC Courses (Module 1 - 4) have been internationally accredited and carry the necessary qualifications for professional interested to pursue journey on field of Construction Contracts Management (Ref. 1999 & 2017 FIDIC Conditions of Contracts)

iv) All CPD Courses will be conducted with minimum registration of (20) fifteen confirmed delegates. ACET Members & SEAP cand. Qualify for discounted fee

v) To submit your interest and further clarification please forward your inquiry via : Association of Consulting Engineers Tanzania (ACET)

Telephone: (+255 22)2131137, 746 543545, 713 434795 or e-mail: info@acet.or.tz, training@acet.or.tz

HOW TO BUILD A POSITIVE TEAM CULTURE

TIP 1 – Discuss success always, and what does it mean, and how to reach there

TIP 2 – Set goals – work with the team to identify individual and team goals

TIP 3 – Discuss values – find from the team values of utmost importance

TIP 4 – Respect – build a culture where everyone is treated equally.

TIP 5 – Responsibility – players must accept their role and actions

TIP 6 – Commitment – players must be committed to training and team work

TIP 7 – Continuous development – build a positive team culture

TIP 8 – Praise – those who do a good job should be praised

TIP 9 – Support each other when things become difficult and hard to handle

TIP 10 – Work together especially when things become tough

TIP 11 – Team building is getting to know-each other opinions

Tip 12 – Lead by example and learn to listen to other opinions

TIP 13 – Identify clear expectations to the team

TIP 14 – Be patient and avoid anger and bossy attitude

TIP 15 – Communicate effectively with everyone on the team

LARGEST COUNTRIES BY SIZE IN THE WORLD

1. Russia
2. Canada
3. China
4. United States of America
5. Brazil
6. Australia
7. India
8. Argentina
9. Algeria
10. Democratic Republic of Congo
11. Saud Arabia
12. Mexico
13. Indonesia
14. Sudan
15. Libya

MOST SPOKEN LANGUAGES GLOBALLY

(Source: World of Statistics, 2023 May)

1. English – (over 1,132 million speakers)
2. Mandarin - (over 1,117 million speakers)
3. Hindi - (over 613 million speakers)
4. Spanish - (Espanol) (over 534 million speakers)
5. French - (Francais) (over 280 million speakers)
6. Arabic - (over 274 million speakers)
7. Bengali - (over 265 million speakers)
8. Russia - (over 258 million speakers)
9. Portuguese - (over 234 million speakers)
10. Indonesian - (over 199 million speakers)
11. Urdu - (over 170 million speakers)
12. German (Deutsch) - (over 132 million speakers)
13. Japanese - (over 128 million speakers)
14. Kiswahili - (over 98 million speakers)
15. Marathi - (over 95 million speakers)
16. Telugu – (over 93 million speakers)
17. Western Punjabi - (over 93 million speakers)
18. Chinese –(over 82 million speakers)

BUILDING THE FASTEST GROWING COMPANIES IN TANZANIA

BY A REPORTER

A recent survey carried out by a date research company STATISTA – and published by the London's Financial Times (FT) has disclosed a list of 100 companies in Africa with the highest company annual growth (CAGR) in revenues and productivity between 2018 and 2022.

Majority of the companies are from Nigeria, South Africa, Morocco, Namibia, Egypt, Mauritius and Kenya. Only one company SILVERLANDS Tanzania Ltd – dealing with agri-commodities is based in Tanzania.

The ten leading companies are Afex Commodities Exchange Ltd (Nigeria), Moniepoing Inc. (Nigeria), Soko Watch Ltd (Kenya), Altech (Mauritius), Deimos Pty Ltd (South Africa), Daystar Power Group (Mauritius), Sankore Ltd (Nigeria), Easy Solar Ltd (Sierra Leone) and Chari Ma (Morocco).

Despite COVID 19, many of the companies in the continent did extremely well in their compound annual growth rate revenue and profitability. Those which did the best belonged to the business sectors including, finance and banking, renewable energy healthcare, commodities and to a large extent the agricultural sector.

The former president of the African Development Bank, Mr. Donald Kaberuka admitted that "the idea which suggests that every problem in the world, Africa is the next victim is now a days not necessary so," showing for instance that six of the top 20 companies on the list are from Nigeria and they are involved in financial service, real estate and retail.

There are few lessons which Tanzania's companies must learn if they want to achieve a healthy performance and fast expansion in future, especially now when investment opportunities are greatly visible and available.

MIXED GRILL

Is this the right way to send building materials to the site?

JOKES

Electric Chair

Three guys go to Mexico one night, get very drunk and fight, they all wake up in jail. They find out that they are to be executed for their crimes but none of them can remember what mistake they have done (except being drunk)

The first one is strapped in the electric chair and is asked if he has any last words. He says: " I am a priest in one of the local church, I have already repented to God for over drinking. I believe that the almighty power of God will intervene on my behalf as I am innocent".

The soldiers switches on the plug and nothing happens. They figure out that God does not want this priest to die, and let him go.

The second one is strapped in and gives his last works. " I am an Attorney and I believe in the eternal power of justice to intervene on the part of the innocent". The soldiers switch on the plug, but nothing happens. Figuring that the law could be on the guy's side, they let him go.

The last one is strapped in and boasts: " I am an electrical engineer and I tell you right away that you are hopeless, you will never electrocute anybody if you don't connect those two wires over there".

The soldiers connect them. God rest his soul in eternal peace!