Society Of Nepalese Engineers in UK

SONEUK Conference on the Innovative Technologies and Practices for the Development of Nepal

Saturday 21st April 2018

Aroma lounge, 96 Llanover Road, North Wembley, London

Programme

10:30 - 11:00: Registration and Refreshments

Inaugural session (11:00-11:25)

Session Chair: Ghanashyam Paudyal, President, SONEUK

11:00 - 10:05: Welcome
Shailendra Shrestha, General Secretary, SONEUK

11:05 - 11:15: Inauguration and Inaugural speech
Dr Durga Bahadur Subdedi, HE Nepalese Ambassador to the UK

11:15 - 11:20: Introduction to the Conference
Dr Birendra Shrestha, Coordinator, SONEUK Conference Organising Committee

11:20 - 11:25: Vote of thanks
Ghanashyam Paudyal, President - SONEUK

Technical session 1 (11:30 – 13:00)

Session Chair: Dr Birendra Shrestha, Coordinator, SONEUK Conference Organising Committee

11:30 - 12:00: Collaborative approach - an effective tool for project delivery: a case study of a railway project in London
- *Rajesh Pathak*

12:00 - 12:30: Tunnelling and the Underground Metro Rail in Kathmandu Soil
- *Dr Binod Lal Amatya*

12:30 – 13:00: Importance of a Robust Engineering Assurance Process and iELC for Railway Infrastructure Projects
- *Narad Bhandari*

13:00 - 14:00: Networking Lunch

Technical session 2 (14:00 – 15:30)

Session Chair: Dr Ramesh Marasini, Associate Professor, Southampton Solent University

14:00 - 14:30: Schematic Design of Dodhara Chandani Pedestrian Bridge
- *Krishna Kishor Shrestha*

14:30 – 15:00: Resolving through Structural Forms: Examples including Mayadevi Temple
- *Ghanashyam Poudyal and Kanhaiya Bhagat Koiri*

15:00 – 15:30: Innovative technologies and sustainable practices in the energy sector to overcome energy crisis of Nepal
- *Ramhari Poudyal*

15:30 - 16:00: Interactions

16:00 Conference closing

TECHNICAL PRESENTATIONS

Collaborative working: An experience from Crossrail project

Rajesh Pathak, MEng, Project Manager, Crossrail Southeast Section Project

Southeast section of Crossrail project known as Crossrail Kent is one of the most successful project in the United Kingdom. Despite the challenges of difficult ground condition, integrating multidisciplinary design, complex construction interface, involvement of large number of stakeholders, constraints of site condition and requirement to keep the existing railway operational for public use while carrying construction works, the project achieved all four Key Dates as scheduled and completed on budget. The project was finalist team under “Great Team Work” category for Network Rail infrastructure project award 2017. The project is also short listed under two categories of “collaborative working” and “effective construction planning” for UK Rail Industry Award (UKRIA) 2018. This paper discusses the project scope in brief; project interface and stakeholder management, major challenges faced by the project and collaborative working for successful delivery of the project.

Tunnelling and the Underground Metro Rail in Kathmandu Soil

Dr Binod L. Amatya, Consulting Civil Engineer, Arcadis, London

Kathmandu is an historic city with heritage areas everywhere. Modern Kathmandu has however evolved haphazardly without adequate urban infrastructure and planning. As a result, public spaces are limited, and the city is facing transport chaos and environmental disorder, especially air pollution. An underground metro railway system could provide a mass transit capability in the city, which could bring economic prosperity, improved quality of life and sustainable development in the region. However, when building a network of underground rail tunnels beneath the city, the complex ground conditions within the valley need to be properly considered.

In this context, this paper highlights the need for the underground metro rail development in the Kathmandu Valley and sets out the economic and technical opportunities for such development. This paper also highlights and discusses the challenges imposed by the nature of the subsurface soils and geology of the valley for such potential development and looks at how to build appropriate rail infrastructure in the local context.

Importance of a Robust Engineering Assurance Process and iELC for Railway Infrastructure Projects

Narad Bhandari, Lead Senior Project Engineer, Network Rail, London, UK

One of the major constituent of engineering failures is the quality of design production and construction activities lacking good engineering process in place. Through a robust engineering assurance process [EAP], a project can be developed and delivered effectively and efficiently in line with all relevant standards and governance. This reduces project and safety risks, ensures the requirements are met and optimises the balance between quality, time and cost. One such approach is Integrated Engineering Life Cycle (iELC) tool, which has recently been developed for conducting EAP for Network Rail infrastructure projects to improve quality of design and construction activities. This approach provides better relationship between Project Management and the Project Engineering activities as part of continuous improvement in managing engineering processes.

The design and construction of most of the major projects in Nepal are carried out primarily by donor/investor's own "Design and Build" contractors or selective consultants or contractors. Government agencies do not have full visibility of what Engineering Assurance activities are undertaken by them. This may lead to engineering failures if compromise in engineering design or construction activities. Complex projects like Railway System consist of very complex and multidisciplinary infrastructures with many constraints and limitations. Therefore, the structure of Engineering Assurance Team, Review and Acceptance process discussed in this paper illustrating how iELC-like tool can be implemented for any future Railway Infrastructure development as well as other infrastructure projects in Nepal to minimise risks during design, construction, operation and maintenance stages.

Schematic Design of Dodhara Chandani Pedestrian Bridge

Krishna Kishor Shrestha, Senior Highway Engineer, Jacobs, Kings Hill, Kent

Dodhara and Chandani are two village development committees (VDCs) connected to mainland Nepal only by a 1400m long pedestrian bridge over Mahakali River. Due to the length of the bridge, different structural spanning systems such as Cable Car system and Multi-span suspension bridge proposed initially were not up to the criteria of operation, maintenance and structural performance. Taking this challenge to find an appropriate solution for the unique pedestrian bridge, a review of various motorable bridges in the world was carried out. This led to the development of an innovative structural system by joining serial simple suspension bridges with mid anchorage piers to cover 1400m wide crossing. The exploration of various 'Non-standard Solutions' combined with creativity and innovation helped to choose the right choice of the schematic design of the pedestrian bridge. This paper describes background of the project and details the desktop study carried out to select serial suspension bridge as the design option.

Resolving through Structural Forms: Examples including Mayadevi Temple

Ghanashyam Paudyal, Principal Engineer, WFS Corps, London
Kanhaiya Bhagat Koiri, Senior Engineer, Axiom Structures, London

It is a common practice to conceptualise structures uniquely and off the traditional track for aesthetic reasons. In addition, site conditions, surrounding constraints and environmental challenges are increasing a push for a unique configuration. As these complexities are growing, structural engineering is facing challenges to conceptualise, analyse and design of such structures. Recent developments in analytical tools with computerised automation in analysis and design are assisting engineers to deal with such complex situations. Though the development of new and hybrid materials along with construction techniques are helping, choosing appropriate structural form has historically been one of the key challenges.

Decision on structural form in complex situations demands a perfect blend of the knowledge of theory, design tools and construction practices. This requires experience and sound understanding of structural knowledge and behaviour. In this context, this paper highlights the importance of structural forms, explains how choosing these appropriately helps to resolve difficult issues and provides some real project examples that had been applied in Nepalese context where both the design and construction techniques are far behind compared to the developed nations.

Innovative technologies and sustainable practices in the energy sector to overcome energy crisis of Nepal

Ramhari Poudyal, PhD Candidate, Swansea University, Swansea, Wales

Energy is a fundamental asset for enabling socio-economic development and poverty reduction of any nation. The future role of digital technologies for generating, handling and communicating data has taken centre stage in energy discussions. Despite the enormous renewable energy resources, Nepal is suffering from chaotic energy crisis for more than a decade. There is a big gap between supply and demand of electricity in one side, and another side there is huge system loss and electricity theft up to 34 percent in some year according to the World Bank data. Innovative technologies like smart grid and the microgrid could be utilised to generate electricity from various local renewable resources and reduce the system loss.

This paper presents the perspective of the energy crisis, supply demand scenarios of Nepal. It explores how massive system losses and inefficiency would be significantly measured and how innovative and sustainable practices such as smart grid and conservation practices could help save the energy. The lessons learned from the use of modern energy efficiency measures and preservation practices around the world are highlighted. Finally, it describes the importance of energy mix in the power system as Nepal is heavily dependent on Hydropower only.