

## Editorial

In this Volume 45 Number 2, the Journal includes nine (9) research and technical articles. The relevance and usefulness of respective articles are summarised below.

**L.A. Ellis et al.**, “Investigating the use of Recycled Concrete Aggregates in the Construction of Structural Beams”, investigated the use of recycled concrete aggregates (RCA) produced from high strength concrete and its effects on the mechanical properties of concrete and structural members. The results showed that the compressive strength of RCA concrete was 5% greater than natural aggregates (NA) concrete. The influence of the properties of durability and crushing resistance of the RCA, which exceeded that of NA, contributed to the higher concrete strengths when compared to NA concrete. In addition, concrete with RCA and steel fibers had an increase of compressive strength by 16% to concrete without steel fibers. However, no significant increase in the deflection and strain of the beams under third point loading suggest that given the right conditions RCA can be used in place of NA.

In their article, “Port of Spain Commuter Patterns and Satisfaction Levels”, **M. Boneo** and **T. Townsend**, reported the first part of a two-stage process of developing a quantitative measure of the performance of the Port of Spain public transportation network. The key stakeholders in the transportation network were identified and classified in a stakeholder matrix on the basis of their interest and influence. A survey was undertaken to understand the public’s perception of the transport network and the travel patterns and characteristics. Survey participants were broadly dissatisfied with the transport system, indicating strong dissatisfaction with congestion, lack of accessibility and lack of information experienced in the capital city. The findings also highlighted how disadvantaged users of public transportation are with respect to ease of travel to and within the city.

**K. Jackson et al.**, “Production and Characterisation of a Novel Dasheen (*Colocasia esculenta*) Alcoholic Fermented Beverage”, investigated the quality characteristics of two types (i.e., A and B) of dasheen musts, each at three total soluble solids (TSS) levels (18, 22 and 25 °Brix). Results showed that fermentation caused pH, SG and TSS to decrease while simultaneously increased TA. Coliforms were not detected in any of the must and fermented beverage samples. The beverage made from batch A, 25 °Brix was consumer acceptable based on sensory and physicochemical analyses with a pH of 3.12, SG of 1.0053, TSS of 10.13 °Brix, TA (% citric acid) of 0.75% and an alcohol content of 14.00 and 12.52% using the hydrometer and gas chromatography methods respectively. The overall results indicate that this product can be beneficial to the Caribbean food and beverage industries.

Critical Infrastructures (CIs) are essential assets to maintain vital societal functions. The occurrence of faults or attacks in either Cyber domain or Physical domain of CIs could result in the disruption of services, causing negative impacts beyond the system itself. **A. Mohammed et al.**, “The Exigency for Resilient and Cyber-Secure Critical Infrastructure in the Caribbean”, reviewed past incidents from 2012-2022 taken place both regionally and internationally, with major emphasis on those occurring in the Caribbean region. The article discussed the importance of maintaining resilient and cyber secure CIs for the purpose of critical infrastructure protection (CIP) given the current situation. In responding to frequently occurring scenarios, recommendations on the way forward have been proposed.

In the fifth article, “Fluid Flow and Heat Transfer Characteristics of Clerestory-Shaped Attics Heated from Below”, **O. Kamiyo** and **A. Waheed** reported a finite volume analysis of the aerodynamics and heat transfer in attics of a clerestory roof design. It was found that the shape of the enclosure has strong influence on the structure of the flow and temperature fields. The reduction of the number and size of the counter-rotating cells and their formation within the enclosures provide an analogous reduction of the total heat transfer rate as the roof pitch angle increases. The velocity and temperature profiles across midheight and midlength of the enclosures enable the prediction of appropriate position in the attic. On the heat transfer, the relationship between the mean Nusselt number and the Rayleigh number is presented in form of a correlation. The results are of significance to building engineers engaged in the analysis and design of building attics and tropical agriculturalists for the control of produce drying rates.

**R.J. Murray**, “Energy, Emissions and Exergy Analyses of Ethanol-Biodiesel-Coconut Oil Ternary Fuel Blends and Comparative Assessment of Their Suitability for Compression Ignition Engines”, assessed the use of alcohol-biodiesel-vegetable oil blends in compression ignition (CI) engines. Three ethanol-biodiesel-vegetable oil blends were developed using 10%, 20% and 30% alcohol and their performances were compared to diesel and neat coconut oil. These blends were tested in a single cylinder diesel engine and their performances assessed using energy, emissions and exergy analyses. The results indicated that the blends had better brake thermal efficiency (BTE) values than diesel at high to medium loads. The blends were found to be comparable to diesel based on a First Law energy analysis. The Second Law analyses indicated that the blends made better use of their fuel energy potential. The ternary blends would be a viable candidate for future energy conversion via CI engines.

**L.P. Leon et al.**, “Dominating Factors of Road Failures: Perceptions of Key Stakeholders in the Small Island Developing State of Trinidad and Tobago”, investigated the reasons for frequent pavement failures and explored their impact on maintenance and economic development in Trinidad and Tobago. A questionnaire was completed by 120 contractors, consultants, and state agency experts specialising in road construction and maintenance. The Relative Importance Index (RII) of the assessment shows that utility cuts by the Water and Sewerage Authority were the most important (0.904), followed by maintenance culture (0.898), quality of work (workmanship) (0.888), poor drainage facilities, and overloaded vehicles (0.854). These would impact on high vehicle running costs, longer travel times, and higher prices for products and services. Recommendations are made to address the critical causes and reduce the adverse consequences of frequent pavement failure.

In the eighth article, “Investigation of Compressive Strength of Slag-based Geopolymer Concrete Incorporated with Palm Oil Fuel Ash”, **F.A. Olutoge** and **A.S. Kolade**, investigated the compressive strength of geopolymer concrete incorporated with palm oil fuel ash (POFA). The geopolymer mix entailed fine aggregates, with 100% replacement of portland cement with ground granulated blast furnace slag (GGBS) incorporated with palm oil fuel ash. An alkaline solution was used in place of water containing sodium hydroxide and sodium silicate. Through comparative analysis, it was determined that the most efficient geopolymer mix was mix 2 of GGBS: POFA ratio of 75:25 with 14M alkaline solution. Results showed that geopolymer concrete could achieve greater strength than portland cement concrete.

**G. Shrivastava**, “A Historical Note of the Department of Civil Engineering, UWI St. Augustine: 1972- 2001”, provided a review of the transformations in the Department of Civil Engineering at The University of the West Indies (UWI) at St. Augustine over three subsequent decades. This covered (a) beginning of graduate level research, (b) commencement of an MSc programme in Construction Engineering and Management, (c) change of name from Civil to ‘Civil and Environmental’, (d) relocation into a purpose built building, (e) construction of environmental engineering, engineering geology, highway engineering, soil mechanics and structural engineering laboratories, (f) expansion and modernization of fluid mechanics laboratory, and (g) introduction of semester system with its credit-based curriculum and assessment.

On behalf of the Editorial Office, we gratefully acknowledge all authors who have made this issue possible with their research work. We greatly appreciate the voluntary contributions and unfailing support that our reviewers give to the Journal. Our reviewer panel is composed of academia, and practicing engineers and professionals from industry and other organisations as listed below:

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