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A PROPOSED PRESTRESSED CONCRETE BRIDGE WITH ELECTROMAGNETIC INDUCTION AS THE ENERGY HARVESTING DEVICE

De Leon, John Nico M.
Dizon, Denlee D.
Gallego, John Nelson M.
Juico, Paolo
Mallari, Francis
Mallari, Rachille N.
Pangilinan, Joshwa S.
Supan, Raymart Y.

The study is about an energy harvesting bridge that is composed of prestressed concrete girder and reinforced concrete slab, coping beam, column, and footing. The bridge has a span of 77.6 meters and a width of 8 meters. The design computations are based on American Association of State Highways and Transportation Officials (AASHTO) LRFD 2012.

Truck loading is the governed live load, the designed dead loads were the weight of the super structure, superimposed loads and the wearing surface. The slab has a thickness of 225 mm; the girder is a Type III beam with 25 pieces of prestressing strands; the coping beam is in the form of an inverted T and has a dimension of 650 mm for Bsteam, 675 mm Bledge, 1843 mm for Heap, 700 mm for Dsteam and 200 mm Bf; the column has a circular shape and has a diameter of 1600 mm and a height of 4 m; and lastly the footing has a blank meters of drilled piles and a dimension of blank for the pile caps.

The device that was used was based on the electromagnetic induction. The device has a dimension of 3000 mm x 150 mm x 10 mm which could produce 20.238 volts in a day considering the Annual Average Daily Traffic on the site which is in Barangay Valdez, Froridablanca, Pampanga.

DESIGN OF EVACUATIN FACILITY USING LIGHTGAGE MATERIAL (LOAD AND RESISTANCE FACTOR DESIGN APPROACH)

Jonnel R. Gagui
Cherry R. Valdez
Carlo T. Mallo
Raymundo D. Mangalino Jr.
Jocelyn I. Morales
Princes Agustina P. Santos
Luisito M. Pangilinan

This study deals with the design of evacuation facility using light gage steel structure using the Load and Resistance Factor Design (LRFD) Approach. LRFD is considered a more rational way of designing streel structures than the conventional approach and therefore is deemed as the state of the art approach in steel design. A uniform reliability and a resulting uniform economic structure can be obtained for some load combinations and structural configurations. The American Iron and Steel Institute (AISI) provides the applicable specification for LRFD light gage steel design.

The problem of reducing the effects of typhoons characterized by strong wind in the most vulnerable communities in the Philippines is the core concern of the study. The proponents consider this study as significant as it aimed to design an evacuation facility for communities to function even ub the presence of the natural disasters.

Out of the data gathered by the proponents through research, interviews, and experimentation, it was found out that the efficiency of the conventional design of schools that are used as an alternative evacuation center can be improved.

In the process, the design criteria of the study were based on the provisions and specifications of the National Structural Code of the Philippines (NSCP) 2001 Edition and Association of Structural Engineers of the Philippines (ASEP) Steel Handbook Manual 2004, Design of Steel Structures, SK Duggal (2009, Third Edition) and Module 5: Cables and Arches, Version 2 CE IIT, Kharagpur. However, feasibility of the proposed project, as a school/evacuation center to prospect developer (governmental/ non-governmental) will depend upon the obtained findings of future studies.

DISASTER RESILIENT DOME HOUSE

Tala, Renzo L.
Garcia, Erwin P.
Macasieb, Kevin R.
Pineda, Jerome P.
Titco, Adrian Paul C.
Amarila, Rubie Anne G.
Cristobal, Ma. Fatima M.
Enriquez, Rachelle Anne S.

The study focused on developing a disaster resilient house from various engineering materials by analysing the different structural components of the aforementioned house. Disaster resilient house is a new concept in which it encourages and promotes best engineering practices by the used of concrete armour unit as protection from the scouring of the structure. Bataan is one of the qualified places here in the Philippines in which the disaster resilient house perfectly suited. The proponents analysed the mechanisms of the structure by the use of Staad.Pro (a computer software program). The proponents selected and design the components of the system based on the calculation and practically that us applicable to every component. The design presented by the researchers was able to develop effectively the appropriate edifices. The aim of this study is to protect the property of the homeowners from typhoon, abrupt rising of the flood, and to lessen casualties in floodplain areas. With this, the proponents recommend the use of the disaster resilient house design for the continuous growth and excellence of the selected locale for this study.

FERRO CEMENT: A GREEN BUILDING MATERIAL

Peña, Anne Jernie B.
Simon, Alyssa N.
Mondoñedo, Glenn Louie P.
Lumba, Jemar L.
Macapagal, Jobenson M.
Nacu, Sherwin Laurence S.
Parico, Tiejay D.
Razon, Rowel Niño M.
Yuzon, Edgar M.

Climate change and urbanization are two of the most important trends shaping the world, trends with profound implications for the cement industry. Cement is the key ingredient of concrete, the world's most widely used building material, but it is also the product of an energy-intensive process that accounts for about 6% global greenhouse gasses. These emissions threaten increase as developing countries urbanize and construct roads, buildings, and other infrastructure in decades ahead.

To pursue a low carbon growth path, the industry needs to adopt the most efficient technologies, develop innovative products and explore promising technologies for alternative cement.

Green building also known as green construction or sustainable building refers to both a structure and the using of process that are environmentally responsible and resource-efficient throughout a building's life-cycle. The Green Building practice expands and complements the classical building design concerns of economy, utility durability, and comfort.

Ferro-Cement requires less energy upon production. The proponents of this study sought to find alternative solutions to cement's environmental and price hike issues.

Three samples of mixture were introduced and compressive strength test was done. Sample 1 is composed of 70% steel dust, 10% fly ash, 9% limestone, 7% clay and 4% oxalic acid; Sample 2 consists of 60% steel dust, 20% fly ash, 9% limestone, 6% clay and 5% oxalic acid; and Sample 3 consists of 50% steel dust, 22% fly ash, 12% limestone, 8% clay and 8% oxalic acid. The best sample with accordance to its compressive strength was tested to its specific gravity, setting time, normal consistency, and autoclave expansion.

Test results revealed that the use of the said mixtures as complete substitute to Portland cement is feasible.

PROPOSED FACILITIES FOR IMPROVEMENT OF TRAFFIC MANAGEMENT IN PLAZA BURGOS, GUAGUA, PAMPANGA

Sarahlie B. Bansil
Maureen D. Macapinlac
Louis-Lane S. Manalili
John Daniel D. Mercado
Alvin M. Punzalan
Rejoice S. Serrano

The transition of rural to a more urban society gives a prospect for growth in economic, social, infrastructural development. The municipality of Guagua indicates an urban transition since it is a first class municipality. The growing economy of the municipality also indicates an increasing volume of vehicles entering Plaza Burgos, the seat of the development.

The researched method type used in the study of the mixed qualitative and quantitative approach.

This study assess the current situation of traffic volume in the study area by conducting manual counting to determine the Level of Service of the existing road networks. The researchers conducted a survey for drivers only to calculate economic loss due to traffic. The lack of common terminals and parking facility largely contribute to the rising traffic congestion in the study area. The researchers came up to a solution of proposing 3 common terminals and vertical parking space. This study includes the benefit cost analysis of the facilities in terms of comparing the estimated cost of materials to be used the facilities versus the amount of economic loss due to traffic. Also, it includes the projection of Level of Service of roads if the facilities are implemented/constructed.

This is a great opportunity for further studies that can contribute in improving the traffic management of Plaza Burgos, Guagua, Pampanga.