



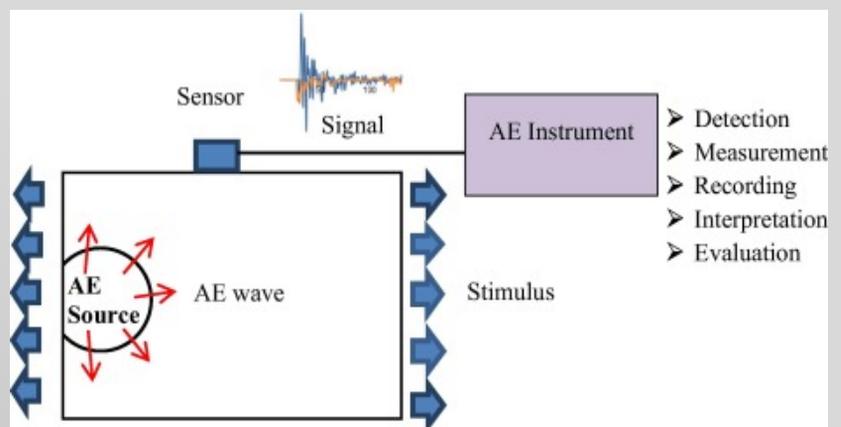
An overview on fatigue damage assessment of reinforced concrete structures with the aid of acoustic emission technique

Abstract

A comprehensive review on fatigue damage assessment of reinforced concrete (RC) structures with the aid of acoustic emission (AE) technique has been carried out. The reviews were performed on the background, principle, application, monitoring of RC structures, parameter and analysis using AE technique. Fatigue of RC structures, fatigue test configuration, effect of the fatigue amplitude of RC structures and correlation between AE technique and fatigue damage on RC structures have also been critically reviewed. From the review, two gaps were identified. Firstly, AE analyses such as AE parameter analysis, intensity analysis and average frequency versus RA value based on AE signal collected from located event is still limited. Secondly, fatigue test of RC structures based on increasing fatigue amplitude is still limited especially for RC beam specimen.

Keywords: Acoustic emission, Fatigue, Reinforced concrete, Fatigue damage

Fig. Principles of AE technique (Adaptation from Pollock)



Division	: Structure and Material
Author	: Dr. Noorsuhada binti Md. Nor
Name of book / Journal	: Construction and Building Materials
ISSN / ISBN	: 0950-0618
Publication Date	: Vol. 112, 2016, p. 424-439
Publisher / Organiser	: ELSEVIER

Selected Publications

Quantification of construction waste generated in residential housing projects via heap survey sampling with the method of visual estimation: A case study in Klang Valley and Pulau Pinang



Division : Construction Management

Author : [Raja Nor Husna Raja Mohd Noor](#)
[Amril Hadri Jamaludin](#)
 Siti Akmalina Rahmat
 Dr. Intan Rohani Endut
 Assoc. Prof. Dr. Ahmad Ruslan Mohd Redzuan
 Asmawati Che Hassan



Name of book / Journal : Engineering and Applied Sciences

ISSN / ISBN : 1816949X

Publication Date : Vol. 12, No. 4, 2017, p. 792-796.

Publisher / Organiser : Medwell

Abstract

Construction waste management is part of a growing movement towards a sustainable world. Throughout the years, the construction industry has made an important contribution in the lives of society in Malaysia. With the demands of major residential housing project developments, it shows that the construction sector is being expanded and developed. Moreover, it has been observed that the construction waste is one of the priority waste streams. Due to the increasing population that is actively involved in economic activities and the modernisation of the country, the types of construction wastes that is being produced is becoming more complex and has yet to be identified. Therefore, the established system to record quantitative data for the generation of construction waste has yet to be formally standardized and is still lacking across much of Asian and developing countries. To address this need, the study on the major types and composition of construction waste generated is carried out as a logical first step towards assisting the construction waste management through the categorization of construction waste in Klang Valley and Pulau Pinang. Throughout this study useful information concerning waste assessment data is necessary to achieve a better understanding of construction waste obtained. Case studies involving quantification and classification of construction waste for several on-going residential housing developments in Klang Valley, Selangor and Pulau Pinang have been presented. This study concludes with the identification of database information concerning the quantification of local construction waste which was developed for the current practices of construction waste management.

Keywords: Construction waste management, sustainable world, construction, priority waste stream, practice

Selected Publications

Teaching Forensic Engineering in Civil Engineering Undergraduate Course

Abstract

This paper describes the development of a course in forensic engineering at Universiti Teknologi MARA for civil engineering students at the bachelor degree level. The course is designed to give a broad introduction to the application of engineering and sciences on construction failures. The study of construction failures will offer students valuable insights into associated technical, ethical, and professional issues. Topics related to structural failures, geotechnical failures, and infrastructure failures are covered in this course. At the end of the course, students should be able to identify, evaluate, and provide solutions to real-life engineering problems. Particular reference is made to the implementation of the case-based method in teaching and learning. This method has been found effective in blending real-world problems and applying theoretical knowledge. Lessons learned from the case studies will help students avoid making the same mistakes and become better prepared to join the workforce.

Keywords: Forensic engineering; Civil engineering; Education; Case-based method; Failures.

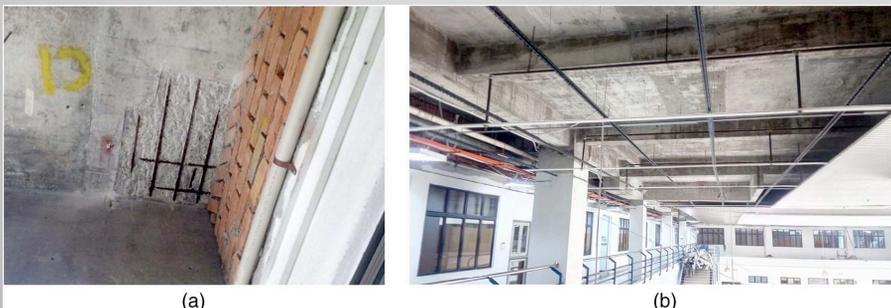


Fig. (a) Corrosion of rebar; (b) removal of ceiling

Division	: Geotechnical, Highway, Traffic and Transportation Engineering
Author	: <u>Dr. Ng Kok Shien</u> <u>Juhaizad Ahmad</u> <u>Ir. Mohamad Irwan Pandapotan Harapap</u>
Name of book / Journal	: Performance of Constructed Facilities
ISSN / ISBN	: 1943-5509
Publication Date	: Vol. 31, Issue 5 (October 2017)
Publisher / Organiser	: American Society of Civil Engineers (ASCE)

Selected Publications

Integration of HEC-RAS and geographical information system (GIS) in the hydrological study of peak flow response to deforestation on a small watershed in Malaysia

Abstract

Land use change is one of the most serious environmental and hydrological problems nowadays. It has become a global issue including Malaysia due to the greenhouse effect. Land use changes cause a significant adjustment of the hydrological balance of a watershed mainly by eliminating evapotranspiration, redistributing and modifying the amount of rainfall that reach the ground. A 20 years historical data were used to represent a geographical and hydrological data for a Kinta watershed, in the state of Perak. The geographical data were processed using geographical information system (GIS) to show the land use change in the study area. The hydrological data were analyzed through regression analysis, flow duration curve, and soil conservation service (SCS) method for analyzing runoff for land use change. The regression analyses have found significant increase of r^2 value from 3.1% between year 1990 to 1996, 7.5% between year 1997 to 2000, and 13.2% between the years of 2001 to 2006. The flow duration curve has selected streamflow data event on December 28 to 29, 1996 on the Kinta River at outlet of Kinta watershed result, which has shown volume of streamflow that was 2.209×10^6 m³. Meanwhile the direct runoff was 8.979 mm from volume divided by area of watershed 246 km². The ϕ index calculated was 28.144 mm/h and $\phi\Delta t$ was 28.144 mm. Land use analysis shown result for runoff depth and S, potential max retention followed by CN for each year. The result showed increase of runoff depth and decrease of S, potential maximum retention. These findings have proved that the changes in land use in terms of the increasing deforestation activities or increasing new development will give a crucial impact to the hydrology response.

Keywords: Land Use Change, Flow Duration Curve, Soil Conservation Service (SCS) Method, Runoff Depth, Geographical Information System (GIS)



Author : **Assoc. Prof. Dr. Mohd Fozi Ali**
Ahmad Fahmy Kamarudin
Kamarul Ariffin Khalid
Nor Faiza Abd Rahman

Name of book / Journal : International Journal of Water Resources and Environmental Engineering

ISSN / ISBN : 2141-6613

Publication Date : Vol. 5(3), 2013, p. 146-151.

Publisher / Organiser : Academic Journals

Selected Publications

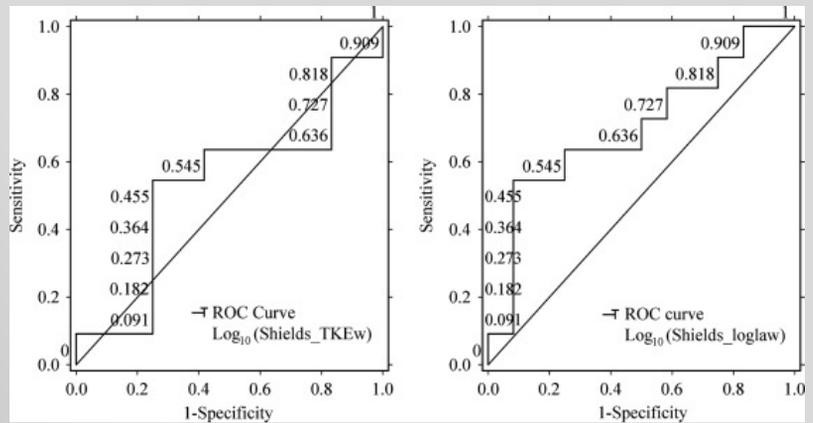
Occurrence of bed load transport in the presence of stable clast

Abstract

It is well-versed that transport occurrence is vital for in stream rehabilitation, river restoration and installment of sediment sampler on river beds. Current practice emulates the use of continuous prediction using reach-averaged approach. However, prediction of transport occurrence entails the use of binary model through the execution of logistic curve regression analysis. Bed load and turbulence data were physically measured at mountainous region with divergent surface bedform in its presence. The parameterization and statistical approaches are treated in the similar fashion with multiple regression except for the test for model fit and model selection criterion. The parameters on near-bed turbulence characteristics at the entrainment threshold were assigned as independent variables containing 15 predictors. Almost 80 models were generated by selecting the best possible combination in accordance with the statistical precaution of alleviating multicollinearity issue. It is postulated that the model containing shields stress in the form of turbulent kinetic energy (TKE) at vertical direction and fractional time for second quadrant provides better estimation of potential location for greatest sediment-entrainment; hence a high possibility for transport occurrence.

Keywords: Logistic regression analysis, Transport occurrence, Bed load, Entrainment, Local bed shear

Fig. ROC curve for selected predictor.



Author : Mohd Sofiyan Sulaiman
Assoc. Prof. Dr. Shanker Kumar Sinnakaudan
 Set Foong Ng
 Kyle Strom

Name of book / Journal : International Journal of Sediment Research

ISSN / ISBN : 1001-6279

Publication Date : Vol. 32, Issue 2, 2017, p. 195-209.

Publisher / Organiser : ELSEVIER

RNC Technical Lecture Series

Forensic Engineering: Problem, Challenges, and Opportunities (14 June 2017)

A technical talk was held intendedly for student and staff exposure on forensic and investigation in concrete and structure damages. Initial by introducing the importance of forensic engineering in civil and structural engineering practice, the content of the seminar emphasized on technique and methods for structural defect identification especially on fault and failure in reinforced concrete (RC) structures. From more than 27 years of experience, the speaker was highlighted the procedures in conducting the investigations and distinguished several structural failure evaluations systems. The crucial part in this forensic assessment was recognized which is to understand the root cause of failure or damage. Lastly, the standard element on report writing and documentation of typical structural failure forensic study was presented to the audience as an outcome in an investigation.



www.rnc.com.my

- ✓ **Why forensic engineering ?**
- ✓ **Identifying defects, faults and failures in R.C structures**
- ✓ **Conducting site investigations**
- ✓ **Evaluating structural failures**
- ✓ **Understanding causes of structural failures**
- ✓ **Report writing and documentation of structural failures**

Speaker:

Mr. Parnam Singh B.E (Hons), MSc (Civil) U.K, MCSM, MACI (Malaysia Chapter) graduated from the Queen's University of Belfast (U.K) in 1989. He is a registered Civil Engineer with the Board of Engineers Malaysia and the Institution of Engineers Malaysia.

Recent Research Grants

2015 - 2017			
Division	Project Leader	Project Title	Name of Research Grant
Geotechnical, Highway, Traffic and Transportation Engineering	Mohd Khairul Azhar Ismail	Micro and Macro Mechanical Properties Analysis of Tropical Weathered Rock Depending on the Weathering Degree.	Research Acculturation Grant Scheme (RAGS)
	Nor Hafizah Hanis Abdullah	Determination of Soil Water Content for Unsaturated Soil Using Time Domain Reflectometer	Research Acculturation Grant Scheme (RAGS)
	Roziah Keria	Pozzolan Effect on the Mechanical Properties of Scba And Scsa	Research Acculturation Grant Scheme (RAGS)
	Khairul Afinawati Hashim	Soil Erodibility Assessment for Stream Bank Erosion and Stability	Research Acculturation Grant Scheme (RAGS)
	Mohd Mustaqim Mohd Nordin	Shear Strength Empirical Model of Jointed Rock	Research Acculturation Grant Scheme (RAGS)
	Aniza Albar	Membrane Penetration Effect in Consolidated Drained Test	Research Acculturation Grant Scheme (RAGS)
	Nor Izzah Zainuddin	Model Development for Service Quality Indicator in Enhancing Urban Bus Operation in Malaysia	Research Acculturation Grant Scheme (RAGS)
Structure and Material	Mohd Ikmal Fazlan Rozli@Rosli	Formulation of Soil Structure Interaction of Prestressed Concrete Sleeper (Ssi-PCS)	Fundamental Research Grant Scheme (FRGS)
	Yee Hooi Min (Assoc.Prof.) (Ir)(Dr)	Sustainable Development of Green Technology Tensioned Fabric Structures	Research Acculturation Grant Scheme (RAGS)
	Mohd Asha'ari Masrom	Response of Interior Wall-slab Joints Subjected to out-of-plane Loading using Ductility Theory	Research Acculturation Grant Scheme (RAGS)

Recent Research Grants

2015 - 2017			
Division	Project Leader	Project Title	Name of Research Grant
Structure and Material	Nur Ashikin Marzuki	Fundamental Study of Retrofitted Reinforced Concrete Beam at Elevated High Temperature	Research Acculturation Grant Scheme (RAGS)
	Afifudin Habulat	Permeability and Strength of Fibre Reinforced Polymer Modified Pervious Concrete	Research Acculturation Grant Scheme (RAGS)
	Aimi Munirah Jalilluddin	Acoustic Emission Mechanisms of Reinforced Concrete Beam-column Joint	Research Acculturation Grant Scheme (RAGS)
	Noor Syafeekha Mohamad Sakdun	A Novel Acoustic Emission Mechanisms of Steel Fibre Reinforced Concrete Strengthened with Carbon Fibre Sheet	Research Acculturation Grant Scheme (RAGS)
	Hafizah Muhamad Azlan	Strength and Interface Adhesion Mechanism of In-plane Shear Loaded Thick Adhesive Joints	Research Acculturation Grant Scheme (RAGS)
Waste Water, Hydrology and Environmental Engineering	Muhamad Faizal Pakir Mohamed Latiff (Dr.)	Agricultural Based Activated Carbon Via Microwave Irradiated Process For Wastewater Treatment	Research Acculturation Grant Scheme (RAGS)
	Nuraini Tuttur	Phenomenology Of Incineration Temperature Of Sewage Sludge Ash(ssa)on Mortar	Research Acculturation Grant Scheme (RAGS)
	Shanker Kumar A/L Sinnakaudan (Assoc. Prof.)(Dr.)	Engagement Of Research Collaborator For Sediment Monitoring At Selected Rivers, Cameron Highlands Pahang	Research Acculturation Grant Scheme (RAGS)
	Nurhidayati Mat Daud	Assessment And Prediction Of Streambank Erosion Rates In The Erosion Susceptible Area	Research Acculturation Grant Scheme (RAGS)

Recent Research Grants

2015 - 2017			
Division	Project Leader	Project Title	Name of Research Grant
Construction Management	Nurol Huda Dahalan	Development of an Optimum Parking Demand Model	Research Acculturation Grant Scheme (RAGS)
	Amril Hadri Jamaludin	Waste Management Best Practice Model for Malaysia Construction Waste Management	Research Acculturation Grant Scheme (RAGS)
	Juzailah Nur Yunus	Logistics and Supply Chain Integration System Of IBS in Malaysian Construction Industry	Research Acculturation Grant Scheme (RAGS)
	Raja Nor Husna Raja Mohd Noor	Development of Supply Chain Framework for Improving Construction Waste Management Process in Malaysia	Research Acculturation Grant Scheme (RAGS)
	Nor Janna Tammy	Development of Modelling to Investigate the Probability of Project Successfulness	Research Acculturation Grant Scheme (RAGS)