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1.

Authors: Ahmed El-Desouky, Gamal El-Sheaky

Paper Title: New Concept for the Design of Flexible Pavement at Critical Highway Sections

Abstract: The design procedure of flexible pavement to be completely rational in nature, consideration should be given to all forces acting on pavement through the vehicle's tire. Although the horizontal forces (HF) on the pavements are of significant values, all pavement design methods do not take the actions of these forces on the pavement system into consideration. This may appear to be unrealistic load condition. Previous studies concluded that horizontal forces have significant effect on the response of flexible pavements. The main objective of this research is to recommend/quantify solutions to eliminate the effect of these forces on the response of flexible pavements. To achieve this objective theoretical analysis, using finite element technique, was performed to investigate the response of different flexible pavement sections under various wheel loads. Linear analysis was conducted using the computer program ANSYS 12.1. The basic measuring parameters of flexible pavement in this study were; the maximum surface deflection (SD), the maximum horizontal tensile strain at the bottom of asphalt concrete layer (ε_t) and the maximum compressive strain at the top of subgrade (ε_c). A total of 643 cases were studied to investigate the effect of HF on the behavior of asphalt pavements. Based on the response of asphalt pavement under HF, recommended pavement sections were adopted to eliminate the effect of HF. Reduction of the effect of HF on the flexible pavement response may achieved by increasing the AC layer thickness (h_1) followed by the asphalt concrete layer modulus (E_1) or by increasing the base layer modulus (E_2).

Keywords: Flexible Pavement, Horizontal Forces, Design, Critical Sections.

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2.

Authors: Yugandhara S. Sontakke, V. G. Sayagavi, P. J. Salunke, N. G. Gore

Paper Title: Seismic Analysis of Multistorey Building on Sloping Ground

Abstract: In most of the northern earthquake prone hilly part of the India, due to local topography constraint engineered construction is resulting in the adoption of either a step back or step back & set back configuration as a structural form for buildings. The adopted form is generally irregular, torsionally coupled & hence, susceptible to serve damage when affected by earthquake ground motion. Such buildings have mass & stiffness varying along the vertical & horizontal planes, resulting the centre of mass & centre of rigidity do not coincide on various floors, hence they demand torsional analysis, in addition to lateral forces under the action of earthquakes. In this paper seismic analysis performed on 48 RC buildings with three different configurations like, Step back building, Step back Set back building and Set back building are presented. 3 –D response spectrum analysis including torsional effect has been carried out by considering the dynamic response properties i.e. fundamental time period, top storey displacement and, the base shear action induced in columns with reference to the suitability of a building configuration on sloping ground. It is observed that Step back Set back buildings are found to be more suitable on sloping ground.

Keywords: Building, Etab, Response Spectrum Analysis, Seismic, Sloping ground.

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2. "Seismic Analysis of Buildings Resting on Sloping Ground." by Birajdar, B G., and S. S. Nalawade.
3. "Earthquake Behaviour of Reinforced Concrete Framed Buildings On Hill Slopes." By Ajay Kumar Sreerama & Pradeep Kumar Ramancharla.
4. "Seismic Behaviour of Buildings Located on Slopes – An Analytical Study and Some Observations From Sikkim Earthquake of September 18, 2011" by Y. Singh & Phani Gade and D.H. Lang & E. Erduran.
5. "Seismic Analysis of Buildings Resting on Sloping Ground with Varying Number of Bays and Hill Slopes" by Dr. S. A. Halkude, Mr. M. G. Kalyanshetti,.
6. "Effect of Sloping Ground on Step- Back and Setback Configurations of R.C.C. Frame Building" by Chaitrali Arvind

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Deshpande & Prof. P. M. Mohite.
7. "A Review on Seismic Analysis Of a Building on sloping ground" by Sanjaya Kumar Patro, Susanta Banerjee, Debasnana Jena, Sourav Kumar Das.
8. "Seismic performance of buildings resting on sloping ground-A review" by Hemal Dr. R. B. Khadiranaikar and Arif Masali.
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3.

Authors: **A. Hussain, M. A. Matin, M. F. Islam**

Paper Title: **Fabrication and Characterization of Dielectric Properties of $BaTiO_3/Ni_{0.6}Zn_{0.4}Fe_2O_4$ Multiphase Multiferroic**

Abstract: Multiphase multiferroic ceramics based on xBaTiO3 (BTO)/(1-x)Ni0.6Zn0.4Fe2O4 (NZFO) system were fabricated employing solid–state synthesis route. The composition of BTO was varied with x= 0.7-0.9 and sintered at 1275ºC or 1275ºC. Employing field emission scanning electron microscopy (FESEM) an improved microstructure has been found for samples sintered at 1275ºC. X-ray diffraction study confirmed the crystalline tetragonal perovskite structure of BTO phase and cubic spinel structure of NZFO phase in fabricated samples at all sintering temperatures. With increasing NZFO content dielectric constant was found to be decreased at the studied frequency range of 100 Hz to 2 MHz at room temperature. Curie temperature has shown to increase significantly with increasing composition of NZFO and broadened.

Keywords: Multiferroic composites, dielectric constant, Microstructure, BTO/NZFO.

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4.

Authors: **Badr A. El-sayed, Ibrahim A. Ibrahim, Walied A. A. Mohamed, Mahmoud A. M. Ahmed**

Paper Title: **Synthesis and Characterization of Crystalline Nano TiO_2 and ZnO and their Effects on the Photodegradation of Indigo Carmine Dye**

Abstract: TiO_2 and ZnO as nanoparticles have been synthesized and characterized using powder X-Ray Diffraction (XRD) and Scanning Electron Microscope (SEM). The study of photocatalytic Activity using the synthesized TiO_2 and ZnO in commercial and nano forms on the photodegradation of indigo carmine dye under UV irradiation has been carried out. The photodegradation was monitored by measuring the change of dye concentration as a function of irradiation time with power of UV lambs (254, 312 and 354 nm). The optimum of indigo carmine concentration was initially determined; the effects of different pH's on the photodegradation of IC have been studied in the range of (3 - 13.5) under UV irradiation. Also pK_a of the dye was determined by two methods. The photocatalytic effects of different amounts of the synthesized nano particles of TiO_2 (28 nm) and ZnO (34 nm) on the photodegradation rates were of the first- order reaction, and mechanism of photodegradation of the dye was discussed. It is observed that the rate of photodegradation process increasing with the nano particles of the synthesized oxides TiO_2 (28 nm) and ZnO (34 nm) comparable to their commercial oxides.

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Keywords: Indigo carmine (IC), nano oxides, pKa and photocatalytic degradation.

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5.

Authors: **Fani Samara, Stavros Sakellariou, Stergios Tampekis, Olga Christopoulou, Athanasios Sfougaris**

Paper Title: **Comparison of the land uses on the Island of Skiathos, Greece**

Abstract: The island of Skiathos has a total area of 50 sq. Km, accounting for 1.6% of the area of the prefecture of Magnesia and 0.28% of the Region of Thessaly, Greece. The land is hilly and attributed to farmland, meadows, woodlands, on land covered by water and land occupied by settlements and roads. Also, a large part occupied by burnt areas resulted from the fire of 2007. The aim of this paper is to present the progress of the existing land uses at the Island of Skiathos for the last decades. With the contribution of Geographic Information Systems (GIS) and the orthophotomaps, the spatial planning of the land uses can be evaluated for all these years and the total area can also be calculated. Our results are important for understanding the impacts of land uses on ecosystems in the frame of sustainable development. In the past there wasn't other research about the land uses of Skiathos Island and also is the first digitization of the area.

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Keywords: GIS, land uses, area, Island, thematic maps.

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