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Evaluating the Maximum Allowable Drift in a Shear Wall with Variable Stiffness

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Abstract: - In a reinforced concrete building, it is a common knowledge that the estimation of the drift used by seismic codes as well as investigators in the field of wind analysis and earthquake engineering is based on experience and logic. None of the drift formulas used by seismic codes take into consideration the actual structural stiffness and concrete/steel properties. Maximum allowable drift ranges from $h/50$ in some codes to $h/2000$ in others, where h is the height of a building. One of the main attempts to quantify maximum allowable drift was done by the author who suggested a formula that established grounds to start from in the estimation of the drift; it uses a constant lateral stiffness from the bottom to the top of a building. Shear walls however are usually designed with variable stiffness where the stiffer sections are at the bottom and the less stiff ones are as we go up the building. This paper analyses the building as a shear building, and uses a variable lateral stiffness between the stories for the lateral load resisting elements, and makes use of the finite element method along with structural dynamics and reinforced concrete design to generate a formula that can be used by a designer to estimate the allowable drift for a variable stiffness shear wall within elastic limits taking into consideration the effect of a cracked section suggested by UBC and ACI. In comparing results with other seismic codes, the suggested formula tends to be relatively conservative and close to the French code (PS92) and the Lebanese code.

Keywords: seismic codes, Finite Element Method, shear building, variable stiffness

Acoustical Silencers (Mufflers)

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Abstract: - This paper concerns acoustical silencers mounted on the pipe lines used for the evacuation in the atmosphere of the gas from noise producing equipment: engines, turbines, tanks, air-conditioning and ventilation equipment. Two types of passive silencers, with reaction and dissipative, will be presented. The principal constructive forms and the corresponding calculus formulas are given.

Keywords: - silencer, acoustic, reaction, dissipation

Methods of Simulation for Dynamic Systems with Friction

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Abstract: - In this paper the contact/impact between two bodies is accentuated by simulations using the ANSYS code. In the present study has been selected the ANSYS/LS-DYNA code because it is used in the simulation of contact/impact. This computer code performs nonlinear transient dynamic analysis of three-dimensional structures.

Keywords: - friction, contact/impact

Diminution Noise and Vibration for Industrial Equipments Designated to Gearbox Testing

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Abstract: - The paper refers to a complex algorithm of design test stands for gearboxes. The algorithm pursues the optimization of the complex assembly embodied by the stand. The optimization criteria point to minimizing power supply, to insuring energetic balance at reversed rotation motion and to establishing the correct relationship between torque and angular velocity signs. The former aspect is significantly important for the vibration and noise regime.

Keywords: - gear box testing, optimization, diminution of noise and vibration

Large Structures Motion Analysis by Image Processing

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Abstract: Vibration measurement of the large structures of which modal components are located in the very low frequency range 0.3 to 3 Hz it is a difficult task. Using a seismic accelerometer, piezoresistive or capacitive type, is difficult to separate the two motion components, translation and rotation, presented in the recorded signal. The laser measurement requires special expensive instrumentation which are not justified for sporadic need. The paper presents a simple method which allows ease to obtain the absolute low motions of a structure using a digital image processing technology. On the structure is placed a panel with a grid of points and with a customary cheap camcorder placed in a fixed position is recorded the motion of the focalized grid. Then by image processing frame by frame it is obtained the frame (absolute) position of the grid points and actual lows of the structure in the area focused. Using more one camcorder it can be obtain the real motion of all machinery structure. The method was successful verified in the laboratory on wind turbine blade and in the field on a surface mining huge structure machinery.

Keywords: excavator, structure vibration, image processing

The Application of Electrical Strain Gages at a Sgns Type Wagon

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Abstract: - The Sgns type wagons are flat cars which are used for carrying 20', 30' and 40' containers. It is one of the longest freight wagons (the length of the chassis is 18500 mm). According to the loading limits, the wagon allow loads distribution by the disposal of container supports according to UIC 571-4 leaflet.

Keywords: flat wagon, stress analysis, Catman, Hottinger, MGCplus, strain gages

Consideration Upon an Oscillating Mechanical System

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Abstract: - The paper studies the behavior of a classical dynamical system – Pohl’s wheel - for various constructive solutions, study assumptions and initial conditions. The behavior of the system is highlighted using time variation diagrams and phase plane representations, obtained by using a specialized program package. For certain values of the studied parameters, the evolution of the system may lead to deterministic chaotic behavior.

Keywords: - Pohl’s wheel, phase plane representation, deterministic chaotic behavior

Construction Equipment Noise Level Decreasing Coefficient – ΔL - Evaluation

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Abstract: The task of this work is the acoustic absorption coefficient variation study of sound absorbing structures and materials. Three construction equipments have been considered according to their different cabin design. Different sound frequencies and different layers of diverse sound absorbing treatment lead to different absorption average coefficient values.

Keywords: noise level, acoustic absorbing coefficient

The Influence of Linear Dissipation in the Hunting Motion Stability of Wheel Set with Elastic Joints System

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Abstract: - The hunting motions it's a lateral movement of the railway vehicles is a consequence of the reversed conic shape of the rolling surfaces. The stability is an important dynamic problem for vehicle system that determines the maximum operating speed of railway vehicle. To increase the stability performances of the wheel set it can be used elastic joints and linear dissipation devices, to bogies. Depends to the horizontal dissipation forces, the critical speed can be increased but the lateral forces can grow a lot and goes to derailment. In this paper is studied the influence of the linear dissipation into the hunting motion stability for a wheelset with elastic joints.

Keywords: - Hunting motion, damping, linear dissipation, railway

Noise Attenuation by Using Special Shape Robber Panel

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Abstract: - Within the last few years, concern about the protection of the environment has grown rapidly as it has become generally recognized that the steady rise in pollution of all kinds cannot be allowed to continue indefinitely. The aim of this paper is to give a good solution for reducing the noise level. Environmental impact studies, design of noise mitigation to reduce environmental impact are done. The experimental measurements are compared with predetermined criteria in order to judge its acceptability.

Keywords: - Noise attenuation, panel, environment protection

Noise Prediction for a Natural Gas Compression Station Using Custom Sound Barriers

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Abstract: - This paper will assess the noise impact of a natural gas compression station in the vicinity of residential areas, where Community law in the field of noise protection is applying. This paper presents acoustic and vibration measurements performed at a natural gas compression station, the noise map for the entire area and 3 different scenarios to reduce noise in the propagation path. The originality of the paper is given by one scenario designed with custom sound absorbent structures in order to reduce noise for a specific noise source. Conclusions and further work will be offered at the end of the article.

Keywords: - sound absorbent structures, prediction, gas station.

Dynamic Hydraulic Dampers for Earthquake Isolated Structural Systems

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Abstract: - This paper presents some solutions on hydraulic devices such as linear motors with direct and reverse reaction with the stabilizing role of building movement under the earthquake action. It emphasizes the possibilities of modelling, analysis and serviceable realization of hydraulic dampers with two main functions: dissipation of the transmitted energy to a building, on the one hand, and providing a relatively constant speed with sufficiently low values, on the other hand.

Keywords: - Hydraulic, Damper, Earthquake, Isolation, Building, Energy

The Linear Viscoelastic Behavior of the Asphalt Mixture to the Haversine Impulsive Dynamic Actions Specific in Road Traffic

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Abstract: - In this work is analyzed the behavior of the asphalt mixture under the action of dynamic traffic, and the contact between wheel and track is modeled as a dynamic excitation function of haversine type.

Keywords: - Asphalt mixture, Haversine, Impulsive actions, Dynamic behaviour, Road traffic