



Civil Engineering Practice

David Beadman

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***Civil Engineering Practice* focuses on practice-oriented papers written by practitioners, regulators and academics, and largely reports projects and research associated with the Boston area. There is the occasional paper dealing with an international project, when design or research for the project has been carried out by an organisation based in the Boston area. About 20% of the papers are concerned directly with geotechnics, and many other papers include aspects of geotechnics. The following papers relate to geotechnics from the 2001 Spring and Fall editions of the journal.**

Vibration damage claims: ingredients for a successful investigation

Paul L. Kelley, Steven J. Dellorusso and Charles J. Russo
Civil Engineering Practice, 2001, 16, No. 1, 41–52

Many construction activities such as blasting, pile driving, soil compaction and heavy equipment operation create ground vibrations. When the work is close to buildings, occupants may experience vibration levels in excess of typical ambient conditions, which often leads to an expectation of property damage and resulting insurance claims. It is almost always very difficult to determine the causal relationship of the construction activity to the alleged damage. The paper presents some guidelines for the assessment of the vibration damage, discusses the prediction of the magnitude of the vibrations, and presents some charts to help predict the degree of attenuation of the vibration with the distance from the source of the vibration. Damage categories are discussed, and some suggested limiting vibration values are given for the various damage categories for different types of building. Vibrations due to blasting and the repetitive vibrations from construction equipment are compared and contrasted.

Measures to minimise the effects of a deep excavation on two adjacent office buildings: the abutter's perspective

Lewis Edgers, Richard Henige, Thomas L. Weinmann and

Kenneth B. Wiesner

Civil Engineering Practice, 2001, 16, No. 1, 53–66

The main feature of Section C11A1 of the Boston Central Artery/Third Harbour tunnel project consists of a 630 m long, three to five lane cut-and-cover tunnel. The excavation reaches a maximum depth of 34 m to pass beneath the Massachusetts Bay Transit Authority Red Line, a subway line. The tunnel passes close to two office blocks, the 33-storey Federal Reserve Bank of Boston and the 46-storey One Financial Centre. The paper discusses the assessment of the ground movement damage due to the excavation. The relationships between the tower owners' engineers and the project engineers are discussed, together with the work done to model the towers and the effects of the excavation. Initial assessments of the likely damage were made using traditional simplified methods, but these were not considered to be applicable to such towers, and two-dimensional and three-dimensional structural models of the towers were created to model the effects of the predicted deflections. Finally the monitoring and the measurements made during construction are reported.

Observational evidence for amplification of earthquake ground motions in Boston and vicinity

John E. Ebel and Kathleen A. Hart

Civil Engineering Practice, 2001, 16, No. 2, 5–16

Microtremor measurements to obtain resonant frequencies and ground shaking amplification for soil sites in Boston

Kristin E. Hayles, John E. Ebel and Alfredo Urzua

Civil Engineering Practice, 2001, 16, No. 2, 17–36

Two linked papers discuss the amplification of earthquake tremors in the Boston area, which is described as an area of moderate seismic hazard. The first paper collates newspaper reports from the earlier half of the twentieth century to assess the magnitude of the tremors felt in various areas of Boston. Several landfilled areas record higher than average intensity of ground shaking, with no evidence found of amplification of ground shaking on drumlins or on bedrock areas.

The second paper investigates the same relationship between landfilled areas and amplification of ground shaking by means of microtremor monitoring. Ambient noise microtremors are low-amplitude motions of the ground caused by man-made,

oceanic and atmospheric disturbances. The paper includes some detailed analysis of seismographs placed at sites around Boston to try to show some correlation between the fundamental soil periods and the amplification of ground shaking.

Landfill gas: an asset and a liability

Michael J. Rossini

Civil Engineering Practice, 2001, 16, No. 2, 41–50

Landfill gas is used in many ways, and there are many approaches to regulating its release into the atmosphere. As

with most alternative energy sources, landfill gas presents many technical and environmental challenges to be overcome before its potential as a long-term renewable energy source can be fully realised. The process of decomposition is described, together with the hazards associated with the constituents of the landfill gas. The current regulatory framework in the United States is outlined, which requires the landfill owner to restrict the pollution from his site. The paper then discusses the limitations and the potential to use the landfill gas to produce energy, with some examples given of successful schemes.