

# EFFECTS OF BLASTING VIBRATIONS ON UNCURED CONCRETE FOUNDATIONS

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## ABSTRACT

Construction of the \$200 million Riverchase Galleria Mall in Hoover, Alabama was started in early 1984. The construction area consists of about 70 acres. The extensive building complex requires heavy concrete foundations which have to be poured during the early stages of construction and on a nearly daily situation so that contractual agreements can be met on a timely basis.

The site is on the southeastern limb of the Birmingham anticline and is underlain by an alternating sequence of sandstone, shale, and conglomerate with associated coalbeds of the Pottsville formation of Pennsylvanian age - the coal measure sequences in Alabama. Geological and geotechnical investigations indicated a wide variation in the engineering properties of the foundation rocks. The rock types exhibit wide ranges in physical properties both in vertical and horizontal distances.

The need to blast for excavating the foundation so that they could be emplaced necessitated shooting at times before the normal curing time of the poured concrete. In addition, the site is within close proximity to numerous residential structures and a number of well established business complexes; therefore, it was necessary to ensure that air blasts and ground vibrations were well within acceptable limits to safeguard public safety and welfare.

This report explains and describes the control procedures used to ensure the public safety and welfare and the effects of blast generated ground vibrations imposed on the concrete foundations.