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Seismic survey, Macquarie Plains railway viaduct.

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The piers of the railway viaduct at Macquarie Plains [DN928720] have been severely undercut by the Derwent River in recent years. Before a long term treatment of the problem could be attempted it was necessary to obtain some information about the river bed and founding materials. Due to difficult drilling conditions it was preferable to use geophysical methods to obtain such information.

The seismic survey was undertaken by suspending the cable from the rail bridge and immersing hydrophones at approximately 7.5-8.0 m intervals. The spread was 90 m in length and extended from bank to bank. Shots were fired in the river bank beneath the bridge. Some signal noise was introduced in the resulting records by the passage of water past the hydrophones.

The survey showed the seismic velocity of the river bed materials to be 1500-1600 m/s to a depth in excess of 15-35 m. A range is given for the depth to any significant refractor since none was revealed during the survey and the actual depth would depend on the velocity of the refractor. In any event it is established that no significantly better founding material occurs within at least 15 m and possibly much deeper.

The velocities recorded are typical for saturated river gravels and clays and the dark carbonaceous clay recovered from the river during concreting about the piers would therefore be typical.

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