

Foundation piling—steel to replace concrete

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The author is to be congratulated on this thought-provoking paper. He is making the case that, because of their ease of removal and reusability, steel piles for supporting foundations will almost certainly be more economic than any other type if whole-life costing considerations are taken into account.

I should like to ask the author whether the reuse of existing piles for a new development, without removing them, would not be the better practical environmental and economic option? I have used existing piles as settlement reducers in a project in Wales, and I have encountered other projects in the literature where reuse of both concrete and steel piles was an integral part of design and construction.

Reuse, however, entails problems of its own. It may be that the new building's pile positions and capacities do not meet the requirements of the new building. In such a case, either the requirements can be reconfigured or additional piles can be installed. Design of new pile caps using a mix of new and old piles will have to consider the possibility of differential settlement due to different pile types and different stiffness responses of similar pile types, because the existing piles will have been preloaded by the old structure.

There are other matters that will have to be taken into account when considering reusability of existing piles. These include

- (a) As-built information about the existing piles and their reliability and adequacy. Where there is doubt, surveys, sampling and laboratory and field testing will have to be done for confirmation.
- (b) The attitude of project funders and building insurers to the reuse of old piles. Attitudes can be changed through clear presentation of facts, including whole-life costing that

includes all environmental impacts. Building insurers may have to come up with a new type of policy that perhaps treats superstructure separately from the foundation, a higher-risk item where existing piles have been used.

- (c) The load-carrying capacity of the piles. This may have increased with time and therefore may be different from the as-constructed records. This can be confirmed through the requisite testing.
- (d) The soundness of the existing piles, in that the materials have not significantly deteriorated to affect the future design life dictated by the new structure. This can be checked by sampling and testing.
- (e) Any damage to piles during demolition and while making them fit for reuse in the new development. The testing mentioned above will give a check on this.

Author's reply

Many thanks to I. S. Manhas for the comments on, and interest in, the above paper.

Taking one step back from the reuse of piled foundations, every effort should be made to reuse existing buildings if serviceable life remains. If that is no longer possible, and the superstructure has to be demolished owing to its unsuitability, then by all means reuse the piles of the old foundation.

However, if the original accommodation was redundant the chance of new accommodation fitting onto the old foundation is less probable.

If sites are redeveloped every 25–50 years the time will come, sooner or later, even after reuse, when the foundation piles will have to be removed or abandoned. Repeat abandonment leads eventually to sterile, unusable real estate in the centre of cities. Earlier savings in foundation costs then look very expensive.