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Author's Replies

Multiple Authors

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AUTHOR'S REPLIES

Closure by Bosili, Gorelli and Muzzi.

Referring to the discussion of our paper "Local Site Behaviour in the 1976 Earthquake" by Thomas Aladut, we believe that no authors reply is needed except our appreciation for the positive comments and the correct understanding of the messages given in the paper.

Closure by R.K.M. Bhandari.

The author thanks Professor Romo for his keen interest in the paper. The limitation of using empirical relationship to predict the depth of improvement, when the soil was subjected to pounding, is well brought out in the paper. It is of course, true that if a theory incorporating various soil as well as hammer characteristics can be developed, it might be possible to make reliable predictions of depth.

Closure by Wang Zhong Qi.

The discussor gives an important hint on the assessment of the multiple effect of a disastrous earthquake like this in Tangshan 1976, and suggests that it could not be concluded in analyzing only a section outside of the whole complexity. The authors are willing to give further explanation to their standpoint that surface faultings like that in the paper are the resulting manifestation due to extremely strong shaking of ground surface and not the cause of the major endamaging motion. So, generally speaking such a surface faulting is often associated seemingly with the epicentral area and the damaging effects as a whole. While strictly and comparatively speaking, surface faulting of such kind is proved to be somewhat moderate and tolerable in certain sense, because of its decreasing effect to ground shaking. Furthermore, the authors wish to point out that there is no evidence to show any correlation between the damaging intensiveness and the distance to the faulting line within a limited epicentral area. Another field manifestation might help to illustrate further for all kinds of surface ruptures, no matter, what mechanism they have do show a decreasing damaging effect on their own location or on the very nearby housing. The damaging manners of the housing are seemingly as those due to statically uneven settlement rather than dynamic shaking.

Closure by M. Iyengar.

The discussor has raised two important points; one relating to destructive effects of pile driving operations on the soil structure and the other on the soil-pile-structure interaction effects.

It is well-known that pile driving operation or any other soil densification process is essentially a destructive process which alters the initial soil-structure. Any existing sand grain bonds are likely to be broken. However, in the present studies, any adverse effect on this account, would be reflected in the shake table test results which were conducted for liquefaction studies, since the tests were conducted on reconstituted samples. Thus, to all intents and purposes, such effects are automatically taken care of. Further, inevitably there is a time gap between instant of the pile installation and instant when it is loaded after completion of the structure. There is also a further time gap by the time an earthquake of the design magnitude is likely to visit the site. Thus, at least, a partial re-development of the sand grain bonds could be expected in this period, resulting in a further decrease in liquefaction potential.

Regarding the soil-pile-structure interaction effects, the author agrees that these should be considered. In fact, one of the reasons for avoiding use of raker piles for the project was to keep the system flexible and minimize dynamic interaction.