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Effect of Soil-Structure Interaction on Performance of Sliding Low-Cost Base Isolators

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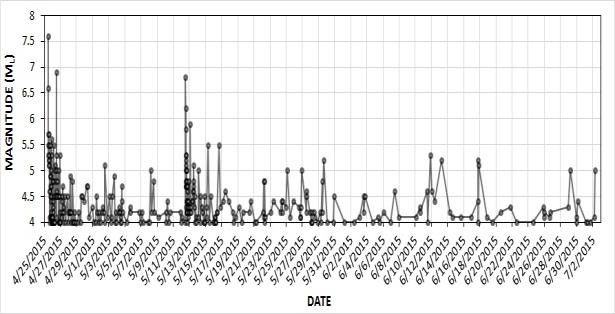
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# Introduction

Base isolation has developed as an effective solution to minimize structural damage under severe seismic excitations. Elastomeric isolators, in particular, have been studied extensively in the past. However, their high cost and bulkiness make them unsuitable for rural masonry buildings. Sliding base isolators of the pure-friction (PF) type have emerged as a viable alternative since they adopt a cheap light-weight sliding interface between the superstructure and foundation. They have also been shown to perform well over a wide range of earthquake frequencies and provide a high degree of acceleration isolation.

Soil-structure interaction (SSI), the interaction between dynamic ground motion and structural motion, generally increases the period of the structure and hence are often ignored in structural analysis. However, it is well-documented that SSI could have significant effects on low-rise buildings on soft soils. Since PF base isolation is mostly geared towards low-rise rural buildings, there is a need for a detailed study of SSI on PF base isolation. Moreover, most studies on SSI involve finite element analyses of massive grids, so they are too computationally involved to carry out a detailed parametric study. Hence, in this paper, we aim to present a simple, continuous, analytical model and conduct a parametric study of the effect of SSI on PF isolators over a wide range of near-fault and far-fault records.

Following Introduction, any heading title that authors prefer can be used using the same heading style Heading: 6 point before, 6 point after, 14 point Times New Roman, Lower case, Bold. Subheadings should indicate hierarchy levels (such as 1, 1.1, 1.1.1) with 6 point before, 6 point after, 12 point Times New Roman, Lower case, Bold.

be centred and attention should be paid that the Figure is aligned “In line with text” using Format Object Toolbar, Layout tag. Figures should be numbered consecutively in the order in which reference is made to them in the text, and Figure Captions should be given in 10 point Times in Roman font, centred beneath each figure with 6 point space above. Reference should be mentioned if figure is cited from any other publication. In Line Graph Axis should be clearly defined; usage of only symbols should be avoided. Units should be given on the axis. Legend and axis descriptions should be readable easily with at least 8 point font. One blank line space should be used before the figure and after the figure caption. All figures need to be cited in the text as Fig. 1.

**Table 1.** Number of death toll due to 2015 Gorkha Earthquake in Kathmandu Valley (Shakya & Kawan, 2016).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| District | Death | | | | Injured |
| Male | Female | Unknown | Total |
| Kathmandu | 622 | 600 | 1 | 1223 | 7950 |
| Bhaktapur | 119 | 214 | 0 | 333 | 2101 |
| Lalitpur | 69 | 108 | 0 | 177 | 3052 |
| Total | 810 | 922 | 1 | 1733 | 13103 |

**Fig. 1.** Sequence of 2015 Gorkha Earthquake Aftershocks ≥ ML 4

All the Tables, Figures and Equations used within the text should be numbered in sequence. Please pay attention to the quality of the Figures. All the Figures copied from Excel or any other applications should be pasted as “Picture” using Paste Special from Edit Toolbar. Figures should

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Table numbers should be mentioned within the text as Table 1. Table captions should be placed above each table, and one blank line should be used between caption and the previous paragraph. Characters used in tables must be Times New Roman font of 10 point. Tables should be centred and should not exceed page margins. One blank line should be used beneath Table. Reference should be mentioned if table is cited from any other publication.

Equations used in the main text should be centred and numbered consecutively. Equation numbers should be placed at the right end of the equation line between parentheses. Numbers of

equations given as a group or in sequence should be placed in line with the equation at the bottom of the group. Equation Editor should be used to create Equations using 11 point Symbols and Cambria Math Font. All equations need to be cited in the text as Eq. (1).

 (1)

International system of units (SI) should be used. If other units are used, equivalents should be given in parenthesis.

References should be given at the end. References should be written in text up to 2 authors as Clough & Penzien (1993), for more than two authors as Shakya *et al.* (2015). Reference at the end of the sentence, using the previous criteria, should be given in parentheses (Shakya *et al*., 2014). For a variety of references, some examples are given in the following References section.

References should be sorted in alphabetical order with respect to surnames. References should be in English. If several works by the same author are cited, entries should be in chronological order, with the latest one given first. References should be written using 10 point Times New Roman font, first line is indented as hanging 0.5cm with respect to following lines. Point and comma should not be used following names and surnames, only authors of the same publications should be separated by a comma. Conference, book, report and journal titles should be written in italic.

# Conclusions

It is suggested that the extended abstract end with a conclusion section summarising what has been done and what has been observed**.**

**Abstract should not exceed TWO pages length including figures, tables, endnotes and references.**

# References

Clough, R. W., & Penzien, J. (1993). *Dynamics of Structures* (2nd ed.). New York, NY: McGraw-Hill Book Company.

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