

BEHAVIOR INVESTIGATION SKEW BRIDGES WITH BASE ISOLATION SYSTEM AGAINST VERTICAL AND HORIZONTAL EARTHQUAKES

Alireza MIRZAGOLTABAR ROSHAN

*Assistant Professor of Civil Engineering, Babol Noshirvani University of Technology, Babol, Iran
alirezagoltabar@gmail.com*

Afshin RAZAVIFAR

*Master Student of Civil Engineering, Babol Noshirvani University of Technology, Babol, Iran
afshinrazavifar@gmail.com*

Mohamad Sadegh SAM

*Master Student of Civil Engineering, Babol Noshirvani University of Technology, Babol, Iran
mohamadsam0055@yahoo.com*

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Bridges are one of the lifelines of society and their existence and usability whether before and after earthquake and other natural catastrophe such as flood is inevitable. Bridges face with horizontal and vertical loads, earthquake and other natural catastrophe needing realistic analysis and design.

This paper aims to compare seismic response of skew bridges having isolator and without isolator. Also in this research, these skew bridges were under two conditions of bilateral excitation with 2 horizontal components and bilateral excitation with 3 components (2 horizontal components and vertical components) and compared their seismic response.

In this article studied all states above about one of the real designed bridges in order to determine the parameters variability.

Some of the results are shown in below Figures.

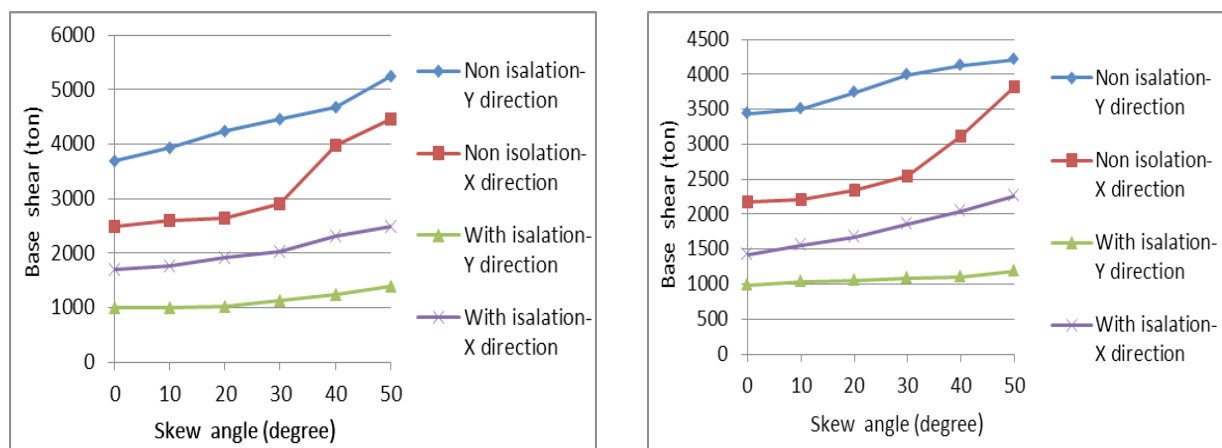


Figure 1. Comparing base shear under 3 components excitation (left side) and 2 components excitation (right side), Manjil earthquake

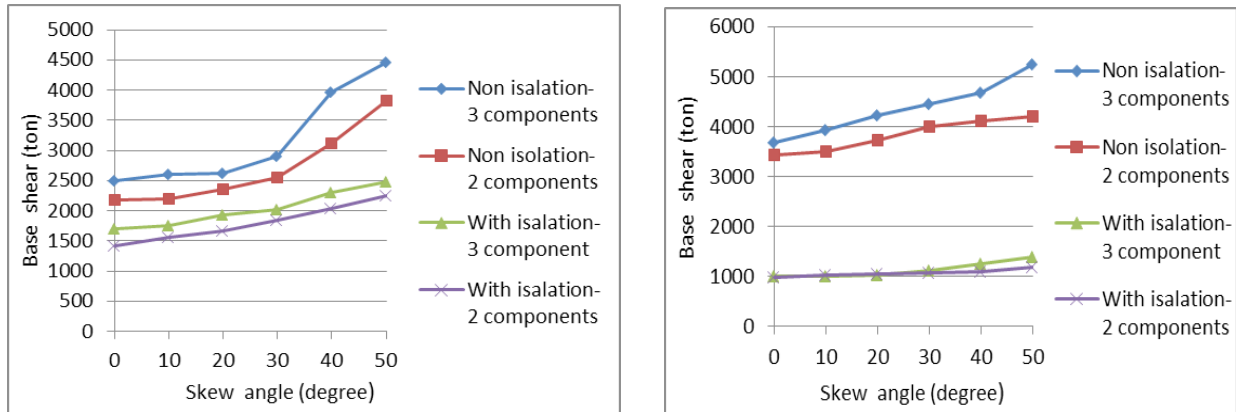


Figure 2. Comparing base shear in 2 condition of 2 components excitation and 3 components excitation (right side: latitude direction of bridge and left side: longitudinal direction of bridge), Manjil earthquake

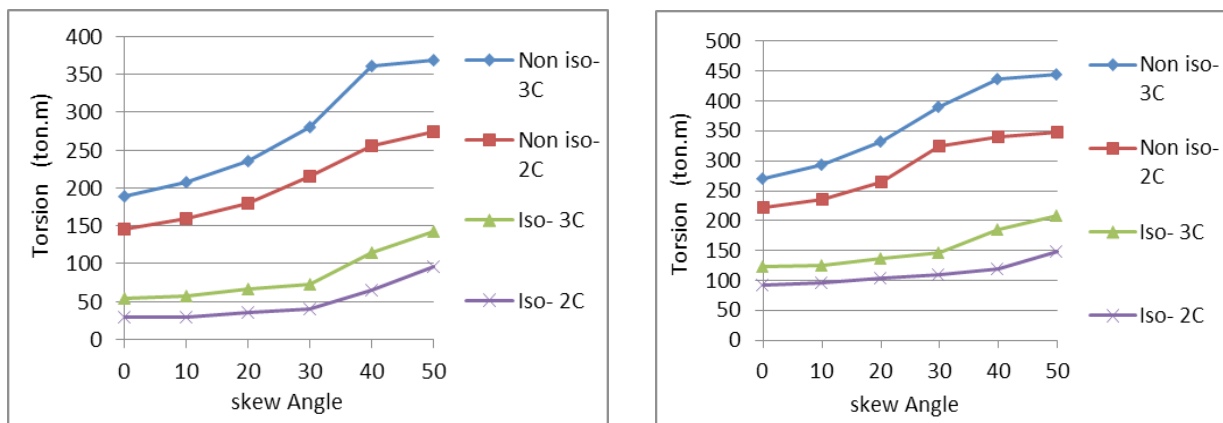


Figure 3. Comparing maximum torsion of column in 2 conditions of 2 components and 3 components excitation (right side: Tabas earthquake, left side: El Centro earthquake)

Conclusions are as follows:

1. The obtained result of the analysis shows that increasing skewness of bridges will increase seismic response of skew bridges (with or without isolator).
2. The results show that using seismic isolator in skew bridges can decrease adverse effect of skew feature of bridge.
3. The results show that effect of vertical component on skew bridge without having isolator can be significant that its role and effect on increasing seismic response of skew bridges without having isolator is more than seismic response of skew bridges being isolated.

REFERENCES

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