半無限弾性地盤上の構造物の振動

小　堀　鐸　二

VIBRATION RESPONSE OF STRUCTURE RESTING ON AN ELASTIC HALF-SPACE

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Synopsis

In this paper, the vibration response of the structure on the infinite elastic soil medium was investigated by using the ground compliance of the rectangular foundation. And so it is assumed that the cross-sectional area of the structure is rectangular and the structure is excited by the propagation of the progressive shear and dilatation waves. The vibration responses of the structure in the following cases, are studied here.

1. Forced vibration of the rectangular rigid foundation.
2. Vertical vibration of the rigid foundation.
3. Horizontal and rocking vibration of the rigid foundation.
4. Horizontal and rocking vibration of the multi-story structure.
5. Shear and rocking vibration of the elastic contineous structure.
6. Bending and rocking vibration of the elastic contineous structure.

As the results, it is generally pointed out that the magnification factor and phase difference in the displacement responses between the top and bottom of the structure are expressed as the same formula for a specific vibration mode of the structure excited by the propagation of the pure dilatation and shear waves. Accordingly the numerical results of the horizontal vibration response of the elastic structure show the same property within the considerable frequency range of the shear wave.