Interference of Surface Footings in Sands*

by

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Author's Reply

The authors thank the writers for showing interest in their paper. Point wise reply of the querries raised by the discussers is given below:

1. Authors agree to the point made by Sri B. Siva Ram that there may same effect of confinement on the results of bearing capacity and settlement due to smaller size of the tank with respect to footing size. But here we will like to clarify.

   > "It was assured by conducting same pilot tests that the tank size is adequate for the footing size and spacings taken in this study. The reason being that due to the concentration of stresses on the footing sides, the effective load on the footing becomes eccentric. As indicated by the study of Saran (1969), the extent of rupture surface on the side other than eccentricity decreases fastly with eccentricity. The tank size was selected keeping this point in view".

2. Regarding the second point about inadequacy of transparent perpex model, we will like to say that perpex sheets were properly stiffened with steel channels. It was noted very carefully that there was no bulging of the perpex sheet. Regarding the lower experimental values of N compared to Stuart (1962) results, this observation is parallel to the observation of Stuart (1962) himself.

3. In the present paper only a part of the study has been reported. Study on the restraint footings is under progress and the results will be reported soon.

4. Authors do not agree with the point of Sri B. Siva Ram that the conclusions made in this study are in complete contradiction with the study of Alam Singh (1973). We found that the results show the similar trend.

5. We agree to the point of Sri M.D. Desai and Shri Venu Gopal that the conclusion about the bearing capacity decreases fastly upto the spacing 4.5, B needs to be further verified by the test data on more footings on different soils.

6. Regarding the point Venu Gopal about the extent of Rupture Surface, we will like to clarify that the extent of rupture surface

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reported in the paper is the maximum extent of the rupture surface which can occur on either side of the footing. A typical observed rupture surface is shown in Figure 1. More detailed information is available elsewhere (Agarwal 1970).

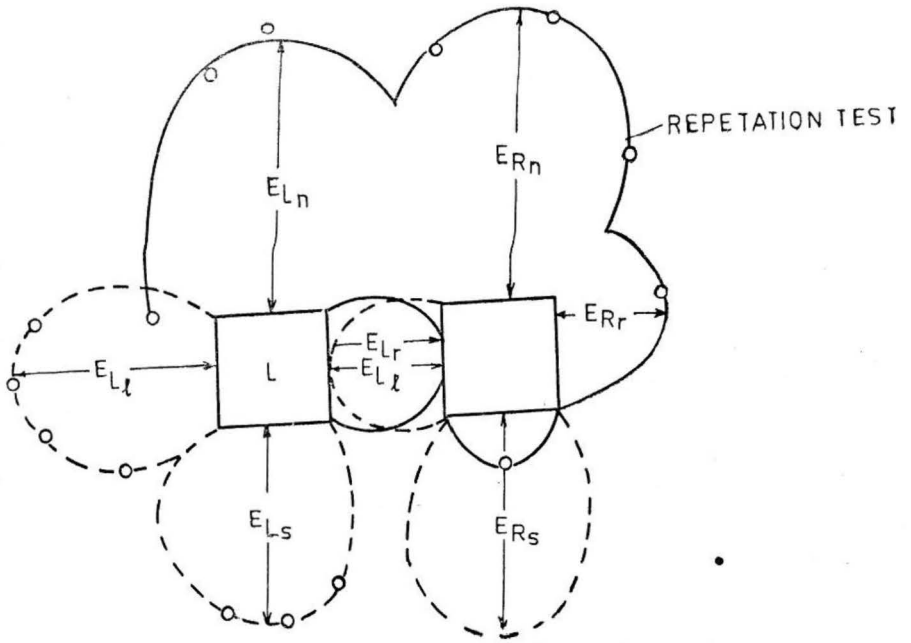

FIGURE 1. Extent of failure surface (Size 10 cms × 10 cms S/B = 21)

7. Pressure-settlement characteristics of footings both in two dimensional and three Dimensional tests were found of the same nature. The failure load in the two cases were determined by the procedure illustrated in figure 6 of this paper. Comparison of the observed results with Stuart Results is already given in the paper (Figure 8 of the paper).

8. Model footings used in this study were made of mild steel. In order to simulate the roughness of the actual footing, the bottom of the model footings were knurled.

9. The tilt of the footings were measured. A typical data for 10 × 10 cm footing is given below. It contains the observation of tilt at failure.

$\frac{S}{B}$	Tilt (radian)
5	2.15
4	1.4
3.5	1.83
3.0	2.2
2.5	2.45
2.0	2,96

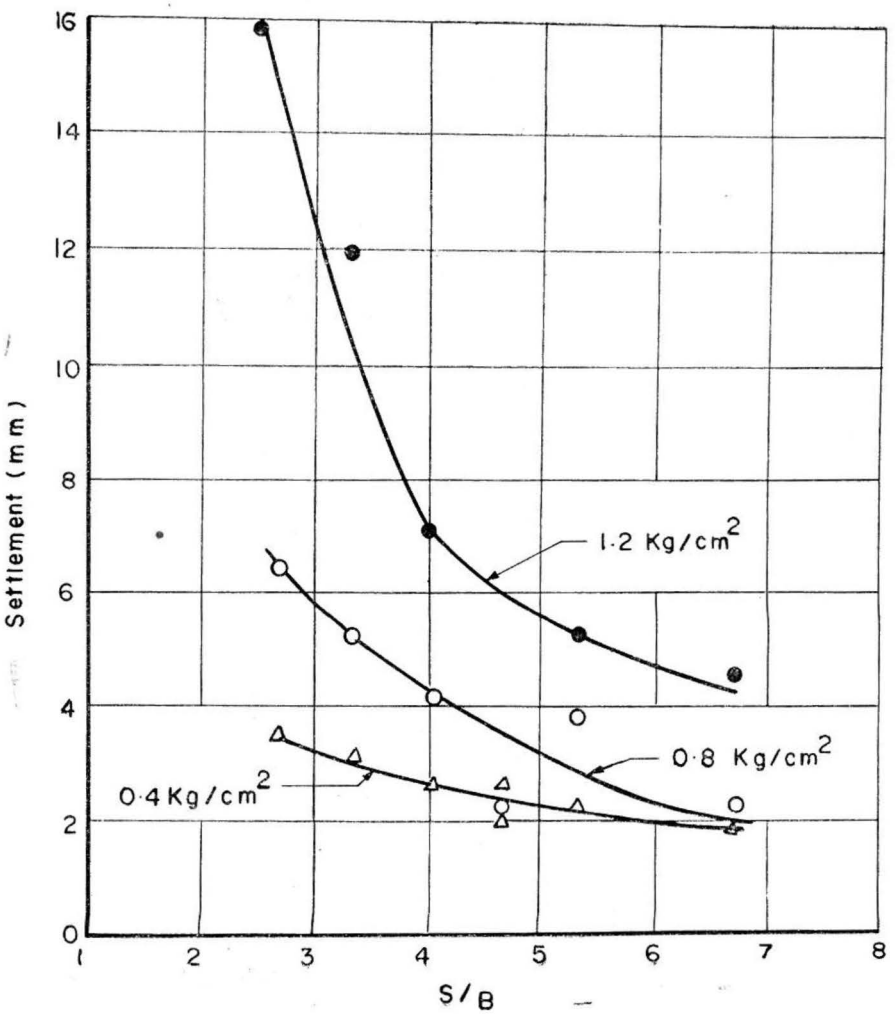

FIGURE 2. Settlement Versus S/B

This table indicates that the footing gets tilted due to interference effect. In other words the effective load on the footing becomes eccentric. As a definite trend could not be observed in tilt, the results were not reported in this paper. However, the details are available elsewhere (Agarwal 1970).

10. As wanted by Mr. Desai, the curves for settlement for different stress levels for one footing 7.5×10 cm size are shown in Figure 2. Similar curves were obtained in the case of other footings.

References

AGARWALA, V.C. (1970), "Interference of footings in Cohesionless soils" *M.E. Thesis* University of Roorkee, Roorkee.

SARAN, S. (1969), "Bearing Capacity of footings subjected to moments" *Ph.D. Thesis*, University of Roorkee, Roorkee.

Errata

1. The Equation (3) on page 219, No. 3, Vol. 5, July 1975 should read as

$$q_a = 0.554\ I\ (N-3)\ w' \left(\frac{B+30}{2B}\right)^2$$

2. The last Equation on page 259, No. 4, Vol. 5, October 1975 should read as

$$C_{uf} = C_{up} \left(\frac{B_f+1}{2B_f}\right)^2$$