

## PARABOLOID SHELL AS FOOTING

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### ABSTRACT

A simplified method for the design of paraboloid shell footing base on the displacement of the shell's crown where the column axial load is transferred to the footing has been developed. A case study was presented to demonstrate the use of the proposed method and to illustrate its capabilities. The results of the proposed method confirm the ability of the shell model in determining accurate and practical results for the design of paraboloid shell footing. Base on the analytical results of this paper the paraboloid shell is more economical than the conventional flat footing on poor subsoil, and very competitive with other shell footings.

### INTRODUCTION

A shell is a thin – walled curved element in which the thickness is rather small compared to the lateral dimensions and radii of curvature. Fig.1 shows a shell as a solid continuum lying between two closely spaced curved surfaces. Thickness is the distance between the two boundary surfaces. If the thickness is large, the shell will be termed as thick, otherwise, it is thin, Bairagi,N.K. ( 1990 )

Apart from the purpose of roofing, shells have been used in a wide range of structures such as liquid containers, bunkers, silos, marine structures, etc. Therefore, there is no reason why shells should not be used in footings. Spread footings for columns, transmitting heavy loads to weak soils, tend to be massive. If mat foundations are provided they need to be excessively thick to be rigid enough to control the settlements within limits. A thin shell foundation, can provide the same rigidity as a much thicker mat foundation; for more details see Kurien ( 1977 ) .

Experience have shown that, shell foundation are economical over the conventional