

Design of foundation engineering

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Since the ground condition has firm clay, therefore there is a need to consider the depth of foundations. Clay exhibits the property to shrink or contract depending on the moisture content present in it (Kenneth, 1993: 25). At the same time, if the surrounding area has trees, there is a possibility that the trees would absorb the moisture from the clay, and hence, the foundation may experience settlement to a significant level. In this case, it is essential to consider the depth of the foundation. A trench fill foundation is thus ideal for this type of site condition. Research suggests that “ trench fill foundations are quicker to prepare than deep strip foundations. This means that there is less disruption once the building work starts and not as much labor time will be needed. It is less likely that subsidence will occur in cases where there may be changes in the soils substrata” (Mosley & Bungey, 2000, 48).

FOUNDATION FOR UNEVEN GROUND CONDITIONS

The site has different ground conditions and has different soils. Thus, it has a weak bearing capacity. For this purpose, the ideal foundation would be a strip, grid, or mat foundation. In this case, the suggested foundation is the mat foundation. Because of varying ground conditions, the majority of the isolated footings would have large areas and thus, it would become uneconomical (Terzaghi et. al, 2006, 256)l. According to the British Code, “ Where the subsoil is very weak the load needs to be spread over a greater area. This is achieved by casting a slab of concrete over the whole ground area and thickening the slab where walls are to be placed”(Perry & Perry, 2009, 118).

The design of any reinforced concrete structure aims at a suitable and economical design and for this purpose, mat foundation is ideal. A mat

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foundation is often used by designers when isolated footings may overlap with one another (Fleming et. al, 2005: 198). A mat foundation is considered to be that type of foundation, which is placed over the entire area. It comprises of reinforced concrete slab, which would be laid over the uneven ground, and thus, it would bear the load of the entire structure. Mat foundation is also ideal for this type of ground condition because of differential settlement. The aim of the mat foundation is to minimize differential settlement (Coduto, 2001, 289). The massive loading of the structure can cause the soil to compress and thus, the structure may experience settlement. For this purpose, the mat is used as an option in order to distribute the entire loads of the buildings and to remove differential settlement.