Pimpri Chinchwad Education Trust's
**Pimpri Chinchwad College of Engineering**

## Final Year B.Tech. Project- Abstract

**Department:**

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| **Project Title** | Effect of Xanthan Gum Biopolymer on laterite Soil in Settlement Analysis Using Plaxis-2D |
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| **Abstract** | **ABSTRACT**<br><br>Laterite soil is found in the Ratnagiri, Sindhudurg and Raigad regions of South Konkan, Kolhapur area in the Western Maharashtra and at the top of Sahyadri mountain locale. About 60 - 65% of Maharashtra's coastal region is surrounded by such red soil. Laterite being highly weathered material and rich in both iron and aluminium oxides, are often collapsible in behaviour. This behaviour can initiate cracks and fractures that reduces safety of structures. It may be possible to build ordinary structures (low rise) on suitably designed footings located a few feet below the ground surface; however, heavier structures may have to be based on firm layers, following thorough subsoil investigations. Since the engineering properties of soils in laterite-soil profiles vary considerably both vertically and horizontally , it is advisable to carefully evaluate each material on its own merits before deciding on the bearing pressure for a given foundation.<br><br>Xanthan gum is a polysaccharide commonly used as a food additive and rheology modifier. It has been used as a soil improvement material in the present study and experimental tests were performed. Xanthan gum–fine soil matrix acts as a cementation binder between coarse particles. To optimize the use of Xanthan gum and understand the mechanism behind the gain in strength, laboratory experiments were conducted on laterite soil, by replacing it with varying amounts of xanthum gum in terms of percentage of dry soil mass. The study revealed that the laterite's engineering properties (cohesion, angle of internal friction, permeability, OMC and MDD, etc) improved. The laterite's OMC and MDD was improved from 14.04 % and 1.41 gm/cc at 0 % to 12.06 % and 1.69 gm/cc at 4 % of Xanthum gum percentage. Further settlement analysis of the foundation using Plaxis software was done to check for the improvement in bearing capacity and reduction in settlement of soil. |
| **Remarks on IPR or Publication** | |
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