

Abstract

Reuse of Urban Soils as Earthworks Material: Geotechnical and Environmental Specifications †

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Abstract: In the context of urban extension, the depletion of natural resources for construction constitutes a crucial issue. Specifically, in the field of earthworks, the amounts of materials can be massive and pose the crucial problem of resource shortage. Therefore, the reuse of excavated urban soils from foundation layers as new earthwork construction materials appears to be a sustainable and promising solution. Two questions are thus asked: (1) Are urban soils relevant from a geotechnical point of view? (2) Are they relevant from an environmental point of view? To answer those issues, two urban soils from the suburb of Paris (France) have been studied. Geotechnical approach and environmental approach exhibit that both soils have common features. Specifically, they are bearer of several pollutant phases like metals, organic carbon and sulphates. Interestingly, those materials, when treated with few percent of hydraulic binders reach required mechanical performances for a use in road structure despite the occurrence of pollutants that are known to have deleterious effects on soil stabilization with lime and cements. However, even if permeability of materials is reduced when they are treated with cement, leaching tests under neutral pH (7) and alkaline pH (12) show, that treatment could have inhibitor effects or activating effects on pollutants release.

Keywords: urban soils; natural resources



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