

Soil engineering: landscaping increases urban soil knowledge

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Abstract:

Landscaping must meet the expectations of the population and the elected members in terms of environmental and functional quality. For this purpose, developers, managers and designers intend to manage local resources to provide low cost investments in a sustainable development process.

Taking into account the pedological aspect of soil provides a common response to a variety of urban actors. Soil is the main criteria controlling the ecological quality of natural and urban environments, which represents a critical citizen issue. Landscape projects provide an opportunity for rehabilitation or preservation of soils in changing urban and suburban areas.

Soil engineering can transform or create a soil, optimizing its agro-pedological performance (fertility, hydrological dynamic). Control of plant strata introduced in a fertile soil may promote ecological quality of the city, by contributing to urban biodiversity, reducing temperature range or thus participating in carbon sequestration. Soil engineering can also meet other objectives in urban planning: soil may protect from contamination, enhance infiltration and rainwater recycling and bear different functional uses of the city (traffic, parking, leisure activities).

The methodology used in landscaping project consultancy work covers the following process:

- Characterization of pre-existing soils based on scientific data acquisition (soil profile description, sampling, laboratory analysis ...);
- Assessment of available resources: soils with an ecological value are preserved or used as resources to increase fertility of degraded soils;
- Assessment of the project requirements for plants and other uses, taking into account preliminary diagnosis;
- Quantitative and qualitative definition of the soil reconstruction process: production of fertile soils layout which encapsulates the different soil types to produce, whilst meeting needs and resources. Optimization of agronomic characteristics and application of operational constraints defined in the project as: permeability issues, levelling, rainwater recycling and contamination risks;
- Adaptation of vegetation types to fertile soil layout (and vice versa) ensuring the durability of landscaping and the development of its ecological value at low cost;
- Execution of earthwork and plantation on the basis of a fertile soil layout. Quality control of reconstituted soils (similar procedure than for the initial soil characterization)

The acquired experience through this process provides feedback to improve practices and awareness of urban actors. Moreover, soil data - funded via the urban planning process - should participate in the development of scientific knowledge (urban soils functioning, evolution overtime, distribution, etc.) at low cost. Numerous observations made during such operations may contribute to a cartography project of urban soils.

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