



# Sydney Environmental & Soil Laboratory

Specialists in Soil Chemistry, Agronomy  
and Contamination Assessments

## Reuse of Site Soils

Sydney Environmental & Soil Laboratory Pty Ltd ABN 70 106 810 708

PO Box 357  
Pennant Hills  
NSW 1715

16 Chilvers Road  
Thornleigh NSW  
2120 Australia

T: 02 9980 6554 E: [info@sesl.com.au](mailto:info@sesl.com.au)  
F: 02 9484 2427 W: [www.sesl.com.au](http://www.sesl.com.au)

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## Reuse of Site Soils

### **Question:**

We often have large quantities of soil and fill removed from landscaping sites and import commercial soil for the plantings. Can we use these soils, and what should we do to find out if they can be reused?

### **Answer:**

More often than not the soil materials on site can and should be reused in the proposed landscape. Not only should a "green" industry try to recycle its resources for economic and environmental reasons but very often the site soil resource is of better quality than any commercially available landscape soil.

There are only a few materials which cannot be used in landscaping. These include heavy saline, sodic, or alkaline clay, demolition fill which contains cement lime and mortar, and heavy plastic clay. Natural topsoil should nearly always be reused, but many earthy and sandy fill materials, screened of rubbish, can safely be used.

Any landscape job of any size should begin with an appraisal of the sites attributes. One of the most important of these attributes is the soil. To begin the appraisal soil maps can prove useful. In most populated areas, good soil maps will be available. Sydney is covered by some excellent soil maps including "Soil Landscapes of the Sydney 1:100,000 Sheet." (Chapman and Murphy 1989). This resource will allow the planner to pin point almost to the street, the expected soil type for the location. A full description of the natural vegetation, soil associations (families containing soils related to each other), and such features as topsoil depth, colour, texture, and general fertility status can be found. A quick examination of the site will reveal if the soils present fit the descriptions and quite reasonable stripping and reuse plans can be made based simply on these descriptions.

Additional information can be found in more general texts such as *A Handbook of Australian Soils* (Stace 1972), *A description of Australian Soils* (Northcote et al), and *Soils of NSW*" (Charman 1978).

Of course, a trained pedologist can provide much additional information by surveying the site and can make precise specifications for a reuse plan. A pedologist is almost essential where the site does not fit the description because of previous disturbance, filling, or other alteration of the natural soil conditions. I consider a soil scientist's input essential in large projects particularly those involving urban redevelopment where natural profiles are seldom found.

The only precaution I make is that a pedologist's report should concentrate on the features of the soil relevant to landscaping. An academic soil classification exercise is less useful to a landscaper than a practical report using plain English as far as possible.

Relevant features important to the landscape plan include a map of the variability of soils across the area, topsoil depth trends, precise stripping depths, and reuse recommendations.

This is a large subject for an article like this but essential feature of the plan should include-

1. Careful separation of topsoil from subsoil, and separate stockpiling of top and sub soil. Stockpiles should be as small as practical but irreversible damage to topsoil does not result from large piles. Once re-spread the soil will quickly aerate again and if a few days is allowed before planting, few problems should result.
2. Recommendations for chemical treatments. Soil analysis should be used to determine if liming, adding gypsum, or in some cases, acidifying agents such as Ag sulphur, are needed. Chemicals can be added while constructing stockpiles to that the soil can rapidly be reused when the job is underway. We had a very successful method at Bond University where we treated layers of soil on top of the flat stockpile as it was being removed for reinstatement.
3. Weed control recommendations. This can start with a reduction in viability of weeds by stockpiling, or use such things as pre-emergent herbicides in the stockpile to kill seeds. I usually encourage stripping of grass and fine plant material with the topsoil as it can rot down and improve soil organic matter levels in the stockpile.
4. Soil improvement recommendations. This might include addition of fertiliser or organic soil improvers as is considered necessary to support the desired landscape plan.

5. Subsoil should not be neglected. Often we see topsoil placed right on top of cut bedrock. It would have been better to place some of the site topsoil on top of this before placing the topsoil, thus mimicking the natural situation.

It is not often that site soil conditions totally dictate the landscape plan and planting lists but analysis should be adequate to reveal any serious problems. Such problems include where totally impermeable fill and clay are encountered. Even small amounts of clay in sand can reduce permeability so don't be fooled by clayey sand fill materials, sometimes they simply will not drain. Another area is in marine saline sediments where the *Casuarina* is the great fall back plant. High phosphate levels can totally exclude Proteacea and Mimosaceae from the landscape unless imported soils are used.

Given what I know about the many problems of imported soils, I would prefer to work with and improve the natural soil, or even fill soil any day.

### **Further Reading**

Stace, H.C.T., Hubble, G.D., Brewer, R., Northcote, K.H., Sleeman, J.R., Mulcahy, M.J., and Hallsworth, E.G. (1972), *A Handbook of Australian Soils*. Rellim Technical Publications Glenside SA.

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Chapman, G. A. and Murphy, C.L. (1989), *Soil Landscapes of the Sydney 1:100,000 sheet*. Soil Conservation Service of NSW., Sydney.

Charman, P.E.V. (Ed) 1978. *Soils of New South Wales, Their Characterisation, Classification, and Conservation*. " Soil Conservation Service of NSW Technical Handbook No 1.