

1 Introduction

1.1 The rate of residential development has increased by over 50% in the last decade¹ but planning requirements for proper soils management for gardens and landscaping are rarely in place. The result is that many new build houses have gardens that are not fit for purpose. Poor garden drainage can be caused by one or a combination of factors. Common causes include high groundwater tables, heavy soils and soil compaction. Whilst there is not much that can be done about a high groundwater table, there are some commonplace errors and easy solutions for cases of heavy soils and compaction issues.

2 The Causes

2.1 There is no universal requirement for the inclusion of and adherence to Soil Resources Management Plans (SRMPs) in planning applications for housing developments. The result is that, due to programming and time constraints, developers and contractors pay no attention to the timing of works when it comes to soil handling. Soils are commonly handled in inappropriate conditions, whether when initially being stripped and stored or when being replaced, or in some circumstances, during both of these phases.

2.2 The very nature of the planning system results in a disproportionate amount of development on land with heavy, clayey soils, and/or land in floodplains, as this is the land that is more likely to fall outside the designation of “best and most versatile” (BMV) quality agricultural land. BMV land is afforded some protection from development in the National Planning Policy Framework² (NPPF) and is more likely to include light or medium loamy soils that are less susceptible to damage when being handled.

2.3 When clay is moistened, it becomes a cohesive and plastic material. It is in this state that any structures that have formed within the soils are most vulnerable to damage. Clay soils can be excavated and moved successfully whilst retaining structures, but only when in a dry state. If not dry, smearing and compaction by machinery occur on excavation, following which the soils are then stockpiled while still wet.

¹ ONS statistics 2013-2019.

<https://www.ons.gov.uk/businessindustryandtrade/constructionindustry/articles/housinginconstructionoutputstatisticsgreatbritain/2010to2019>

² Ministry of Housing, Communities & Local Government (2019)

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/810197/NPPF_Feb_2019_revised.pdf

- 2.4 Structure is important in soils for facilitating the movement of air and water. Once the soils are smeared and the structure is lost, the soil is stored when wet and the stockpiles smoothed off with an excavator bucket, there is nowhere for the enclosed water to go and no means for air to get in. The result is the development of anaerobic conditions which cause the soils within stockpiles to become malodorous and inhospitable for plant roots.
- 2.5 The soils will remain in store for the duration of the housing construction period. Once the gardens and landscaping progress, the contractors will take what will be still-wet, structureless clay soils out of store and use machinery to place the soils in the garden and greenspace areas. Layers may be levelled off with heavy machinery causing additional compaction.
- 2.6 Once topsoil is placed above compacted clay layers, it can seem faultless initially, and depending on the season, it is possible to achieve vegetation growth, including turf and garden shrubs. Drainage problems become apparent when precipitation exceeds evapotranspiration i.e. when rainfall increases and temperatures and daylight hours decrease. Rainfall accumulates in the soil which would have been rendered largely impermeable at very shallow depth by the various handling errors described above which are disappointingly common on new build estates.

3 Guidance

- 3.1 Guidance given by the National House Building Council³ (NHBC) states in Section 10.2.7 that “*Topsoil and sub soil should be of a quality that will not present a hazard to users of the garden area*”.
- 3.2 Section 10.2.8 indicates that there should be no waterlogging within 3m of the habitable parts of the home, and that waterlogging “*should be prevented by appropriate soil selection and management, and if necessary, by drainage or other suitable means*”.
- 3.3 Section 10.2.9 states that for the remainder of the garden area within 20m of the habitable parts of the home, appropriate actions should be undertaken “*to restore physical condition (e.g. soil structure) and drainage characteristics of the topsoil and subsoil that has been compacted during construction. This should include subsoil*”.

³ NHBC (2021). <https://www.nhbc.co.uk/builders/products-and-services/techzone/nhbc-standards/standards-2021>

decompaction, such as rotavating, to a minimum depth of 300mm and topsoil cultivation to the full depth of compaction”.

- 3.4 Finally, it notes that topsoil should be of a minimum thickness of 100mm.
- 3.5 This guidance is only that, guidance, and the inclusion of “should” rather than “shall”, “will” or “must” allows for schemes to be compliant with the standards whilst not fully delivering them. The standards are also only applicable to housing schemes that are built by contractors or developers that have registered with the NHBC. There is no obligation otherwise.
- 3.6 Even adhering to the NHBC guidance is not a failsafe route to garden drainage success. Laying a 3m depth of patio can overcome the requirement for no waterlogging to be within 3m of a home’s habitable area, yet would add to a developing problem at 3.1m.
- 3.7 Although turf can grow on very thin soils, a topsoil depth of 100mm cannot be considered adequate, with standard “target” profiles across landscape and restoration schemes usually falling between 250mm and 350mm.
- 3.8 Restoring the physical condition and drainage characteristics of a soil that has been damaged is not a rapid process. Large clumps and blocks can be broken up mechanically, but re-establishing true structure is a process that takes years.
- 3.9 Rotavating a compacted subsoil layer to a depth of 300mm could easily, if undertaken in suboptimal conditions, cause more damage than has already been inflicted on the soil. Assuming the conditions are appropriate, with the addition of 100mm of topsoil, the profile would still be permeable only to a depth of 400mm. In addition to the rain falling directly onto the garden or landscape surface, the rainfall burden is exacerbated by the much larger surface area of impermeable materials within a development, including rooftops, patios and driveways.
- 3.10 It is possible that issues with waterlogged gardens are being under reported. The NHBC issues questionnaires to the first residents of new build properties to ascertain their level of satisfaction with the property and the process of buying and occupying it. The survey is routinely undertaken at eight weeks; it may be months before issues with gardens become apparent. The survey also does not address garden quality directly, only asking for a response on satisfaction with the “external layout of the new home” and the “external design of the new home”. It is down to

individual interpretation whether this would include the layout and design of the garden as forming an external part of the house.

- 3.11 Gardens are not generally covered by new build warranties and therefore the cost of any remediation is likely to fall on the homeowner. As well as cost, adding drainage creates more disturbance in the garden, there can be difficulties and liabilities if there is a possibility that water could be directed off the property, and there can be a risk of surrounding waterlogged land and gardens inadvertently also draining into the retrospective drainage system.

4 The Solution

- 4.1 If councils were to insist on the implementation of a SRMP and secure the document as a condition of development, garden drainage issues could be solved before a single ped of soil has been moved.
- 4.2 The purpose of a SRMP is to record the soil types that are present on a site, set out what conditions are appropriate for their handling and storage, record the volumes and the locations of resource stockpiles, and set out a methodology for their successful reinstatement.
- 4.3 Soil movement operations should be overseen by a soils practitioner who can guide contractors as to when and where soil handling is or is not appropriate.
- 4.4 Simply by ensuring the soil conditions and machinery used are appropriate, future issues can be reduced significantly or avoided altogether. The operations are time-dependent, which will not necessarily fit with the construction programme, however the prevention of significant problems down the line that effectively render residential gardens unfit for purpose, as well as the associated effects on residents' wellbeing (and company reputation) should be motivation enough to take some care over the soil resources.