

1 Introduction

Brookbanks Consulting Limited (BCL) is commissioned by Carlyle Land Ltd and Commercial Estates Group to provide technical advice on viability and delivery on a proposed mixed-use development at Aadastral Park, Martlesham Heath, Suffolk.

An outline planning application has been submitted which, amongst other things, contains a Land Stability Report. This document provides technical evidence to the general ground conditions and earthworks requirements to deliver proposed development platforms.

The purpose of this note is to provide a non-technical explanation of how the existing ground will be manipulated, placed and compacted to form the proposed development platforms.

2 Earth Moving Non-Technical Summary

CUTTING AND FILLING

The existing ground profile within the site extents will be either 'cut into' or 'filled on top of' in order to change the profile to that proposed for development platforming. There is a requirement for earth cut and fill to ensure that the ground levels for development aren't too flat, or too steep. This is needed for the purposes of drainage, road alignments, housing foundations and many other technical reasons.

OBJECTIVE

The purpose of the Land Stability Report is to define the procedures to ensure that the proposed materials and workmanship to be used at the site are complying with the condition / requirements as stipulated in the Earthworks Specification, contained within the Appendix of that report.

EQUIPMENT

It would be proposed that the following machinery would be required for the earth works process:

- Excavator
- Dump Truck
- Service Vehicle for General Workers
- Roller
- Grader
- Bulldozer
- Compactors

MANPOWER

The following hierarchy of trained staff would be required to carry out the earth works process:

- Supervising Engineer
- Supervisor / Foremen
- Operator
- Driver

- Skilled Workers
- Surveyor
- Geotechnical Engineers

SETTING OUT

Prior to any commencement of any physical works, a professional land surveyor shall be appointed to carry out demarcation works and establish bench marks on site. Upon obtaining all the necessary survey data, a joint survey to check existing ground levels shall be carried out with the consulting engineers.

PREPARATION OF SITE

When any material is disposed outside the site, the disposed material shall be graded to a neat appearance and shall not obstruct natural drainage or cause damage to highways or property. All precautions shall be taken to prevent any erosion of the soil on the affected areas.

All unsuitable material and surplus suitable material shall be run to spoil in tips approved by the Engineer.

EXCAVATION OF CUT MATERIAL

The excavation of cutting shall be carried out in accordance with the relevant approved drawings and to the levels, widths and heights shown thereon. These drawings will form part of the detailed phased Reserved Matters applications.

Hauling of material from cuttings or the importation of fill material to the embankment or other areas of fill shall proceed only when sufficient compaction plant is operating at the place of deposition to ensure compliance with the specification requirements.

There will be significant volumes of cutting material generated from the existing land bunds generated by sub soil excavated as part of the Brett Aggregate activities. These volumes will be used to fill in areas of the site where proposed levels need to be higher than existing.

FILL MATERIAL

Filling low-level areas shall be to the level of sub grade as designated. After completion of clearing and grubbing, the Contractor shall carry out the necessary leveling in order to control the thickness of the layers of fill.

The existing natural ground shall be scarified in place to a minimum depth of 75mm for the full width of the embankment. The scarified material shall be leveled and compacted to a minimum of 95% maximum dry density.

Each fill thickness shall not exceed 250mm. The areas of fill will be compacted to ensure a good quality ground strength, to which roads, drainage and structures can be placed. Methods of compaction are described below.

PLACING & COMPACTION OF FILL MATERIAL

Earth fill on the ground shall be spread so as to produce uniform distribution and gradation of the earth fill throughout.

A specific example would be for earth placement near to Ipswich Road to the south of the site. Earth will be placed in bulk volumes to accord with the Earthworks Strategy Plan (10391-EW-01, provided within the 'Land Stability Report'). The northern edge of Ipswich Road would remain as per existing levels, but the site land adjacent with fluctuate in levels from this position, increasing north into the site to suit the proposed contours. This placement would be laid in layers and compacted via one of three methods which are described below.

The Earthworks Strategy Plan as described above has been designed so that all outer edges of the site remain as per existing levels. The proposed levels inside the site alter the onsite ground, but do tie in with out extents without the need for groundworks offsite.

Cluster of rock, which would interfere with proper compaction, will not be permitted. The earth fill shall be placed in continuous, approximately horizontal layers over the length being constructed for the full width of development platform.

There are three method of compaction that can be adopted at the site:

- Ramming
- Vibration
- Static Rollers

RAMMING

A pneumatic rammer exerts intermittent force directly down onto the fill material and breaks down the particles, pushing them closer together, and forces air out of any remaining voids.



VIBRATION

A vibro compactor literally 'vibrates' the fill material particles, setting them in motion, which rearranges them into a denser packing configuration.



STATIC ROLLERS

A heavy-set metal rolling wheel is driven slowly over the fill material, which forces air out of any voids and rearranges them into a denser packing configuration.



Material which has been compacted to a dry density less than required or at a moisture content outside the tolerable range shall be removed or reworked and re-compacted until the required properties are achieved.

Finally, geotechnical engineers will sample and test in a laboratory the ground strengths generated by the compaction method. If sufficient ground strengths have been achieved, then construction of both structure and infrastructure can commence.

3 Limitations

The benefits of this report are provided to Carlyle Land Ltd and Commercial Estates Group and the statutory consultees for the proposed development on Land South and East of Adastral Park.

Brookbanks Consulting Ltd excludes third party rights for the information contained in the report.