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STATEMENT OF PHYSICAL CHARACTERISTICS

BEECHBROOK FARM, STATION ROAD, WESTWELL, near ASHFORD, KENT



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1. BACKGROUND

- 1.1 The 9.3 ha area was surveyed on 23 May 1990 in connection with proposals for mineral extraction (sand). It lies to the north of Ashford, Kent and is bounded to the north by the M20 which is currently under construction and to the south by the Ashford to Maidstone mainline railway. To the northwest is Sunnybridge Farm whilst to the south east there is currently no obvious physical boundary.
- 1.2 The area was assessed using 110cm and 120cm Dutch soil augers, with samples being taken at approximately 100 m intervals. In addition two soil inspection pits were examined.
- 1.3 Land Use

At the time of survey most of the area was under winter barley.

2. PHYSICAL FACTORS AFFECTING LAND QUALITY

Relief

- 2.1 The altitude of the area varies between approximately 65m A.O.D and 70m A.O.D, with the highest land occurring towards the north and centre of the site, with gentle falls to the north west and south east.

Gradient is not a significant limitation in terms of land quality at this locality.

Climate

- 2.2 The average annual rainfall for this area occurs within the range 748mm to 750mm, (Met Office, 1989) which is moderate in a national context. The median accumulated temperature above 0°C, between January and June, a measure of the relative warmth of a locality, ranges between 1426 day degrees and 1432 day degrees, (Met Office, 1989) this being moderate for the south east of England. The site is at field capacity for around 156 days per annum, which provides a measure of the effect of climate on the soil water regime; Crop adjusted moisture deficits are within the range 114mm to 115mm for wheat, and 108mm and 109mm for potatoes.
- 2.3 Climatic factors per se place no limitation on agricultural land quality, but do affect interactive limitations between soil and climate, namely soil wetness and droughtness.

Geology and Soils

- 2.4 British Geological Survey, Sheet 289, Canterbury, (1978) shows the area to the north and west to be underlain by Cretaceous Folkestone Beds. To the south and east Recent Head Brickearth drift masks the Folkestone Beds.

Soil Survey of England and Wales, Sheet 6, Soils of South East England (1982) indicates one main soil association across the area, namely FYFIELD 2 of which the Barming, Bearsted and Hothfield are component soil series.

Detailed field examination of the soils indicates the presence of two broad soil groups across the site.

The first group of soils occurs in the north and west of the site where brickearth drift is absent or thin. These soils commonly comprise stoneless or slightly gritty sandy loam or sandy silt loam topsoil textures which are non calcareous. Similar textures can be found in the upper subsoil in addition to sandy clay loam and loamy sand, passing to sandy loam/loamy sand with depth. These commonly pass into medium sand textures associated with the Folkestone Beds. The soils are well drained (Wetness Class I) showing no evidence of drainage imperfections but are limited by droughtiness resulting from the high subsoil sand content.

The second group of soils occur in association with the Head Brickearth deposits found to the south and east of the site. Profiles typically comprise, sandy silt loam topsoils overlying similar textures in the upper subsoil (occasionally sandy clay loam), passing into similar or slightly heavier (mainly silty clay loam) textures at depth.

These may extend to depths in excess of 1.2m or pass into the underlying sandy Folkestone Beds where the drift is thinner. Profiles vary in drainage status from Wetness Class I to III depending upon the permeability characteristics of the underlying subsoils.

3. AGRICULTURAL LAND CLASSIFICATION

- 3.1 The ALC grading of the survey area is primarily determined by interactions between climate and soil factors, namely wetness and droughtiness. ALC grades 1, 2 and 3a have been mapped and a breakdown of these grades in terms of area and extent is given below.

Grade	ha	% of total agricultural land.
1	3.55	38
2	3.75	40
3a	2.00	22
Total area	9.30	100

- 3.2 Appendix 1 gives a generalised description of the grades and subgrades identified in this survey.

3.3 Grade 1

Land of this quality occupies approximately 38%, (3.55 ha) of the total agricultural land area and occurs towards the south eastern half of the site. Soil profiles typically comprise sandy silt loam, topsoil textures, which overlie similar textures in the upper subsoil. These may extend to 1.2m or more or pass to loamy sand and medium sand textures occurring in the lower subsoil (below 75 cm). These profiles are stoneless and noncalcareous showing only minor drainage imperfections (ie. gleyed at 100cm depth,). However, these soils are deep and well drained therefore warrant allocation to Wetness Class I and no significant limitation affects their agricultural use.

3.4 Grade 2

Grade 2 land occurs approximately 40%, (3.75 ha), of the total agricultural land on the site and occurs towards the north and west of the site.

Profiles typically comprise stoneless, non calcareous, sandy silt loam to sandy loam topsoils, overlying similar textures in the upper subsoil with occasional sandy clay loam textures. Lower subsoil textures are slightly heavier than those of the Grade 1 soils with heavy and medium silty clay loams, sandy clay loam sometimes passing to medium silty clays. Such soils are placed in grade 2, due to slight wetness limitations. Drainage imperfections in the lower subsoil, as indicated by ochreous mottling, are associated with the heavier soil textures, with gleying from 45-50cm and slowly permeable horizons from 50-65cm. These are therefore allocated to Wetness Class II or III.

3.5 Grade 3a

Land of this quality occupies approximately 2.00 ha of the site, (22% of the total agricultural land area), and occurs towards the north western half of the site, which was slightly higher than elsewhere. Soil profiles typically comprise sandy loam and sandy silt loam topsoils overlying similar textures in the upper subsoil including loamy sand which passes into medium sand at approximately 50cm. Profiles are deep stoneless and non calcareous. Occasional thin clay lenses occurred within the sand.

These soils are well drained and therefore placed in Wetness Class I but, are principally limited by droughtiness as a result of their sandy nature, which results in a moderate available water capacity.

4. SOIL RESOURCES

- 4.1 The soil type overlay illustrates the pattern of soil resources on the site. It should be emphasised that this is not a soil stripping plan but merely an illustration of the soil resources available for restoration of the site. When considering these details it is important to remember that soils were sampled to a maximum depth of 100-120cm during survey work. In some cases soil resources will extend below this depth.

Topsoil

- 4.2 One topsoil unit has been identified across the site which is common to all the soil types illustrated on the accompanying overlay. This typically comprises 25-30cm (mean 27.1cm) of dark greyish brown (10YR4/2) sandy silt loam to sandy loam topsoil. Topsoils are non calcareous and typically only stoneless to very slightly stony (1-2% volume or less) of small and medium sized flints.

Subsoil

- 4.3 Three subsoil units have been identified corresponding to the soil divisions (types 1i, 1ii and 2) on the accompanying overlay. Soil Type 1 has been divided into 2 separate units to reflect the differences in subsoil texture, particularly clay content.

Unit 1i

- 4.4 This unit corresponds to those soils developed in deep head brickearth drift (to 75-80cm+) having light to medium loamy subsoils of sandy silt loam or medium clay loam texture, with clay content tending to increase slightly with depth. Subsoil colour is a uniform brown (10YR4/3) becoming paler (10YR5/3) sometimes with faint ochreous mottling, towards the base of the profile. Where described this non calcareous subsoil is porous

(>0.5% biopores) with weakly developed coarse subangular blocky structures containing numerous worm channels.

- 4.5 The underlying material below 75-80cm+ is believed to be derived from the Folkestone Beds deposits and comprises a pale coloured (yellow (10YR7/4), yellowish brown (10YR5/4-5/8, or olive yellow (2.5Y 6/8)) loamy sand or sand with friable to loose, weakly developed medium to coarse blocky structures. Some harder discontinuous ferruginous bands containing a weakly cemented soft sandstone were also noted.

Unit 1ii

- 4.6 This unit occurs towards the upper eastern part of the site and represents soils similar to those described above developed in deep head brickearth but having medium loamy to clayey textures of medium silty clay loam and sandy clay loam becoming heavy silty clay loam, or medium clay/silty clay with depth. The underlying Folkestone Beds were not encountered within augering depth. Soil colours are typically yellowish brown (10YR 5/4) to brown (10YR 5/3) but may become paler brown (10YR 6/4) to light yellow brown (10YR 6/3) with depth. Gleying due to slow permeability was noted from about 45-50cm+.

Unit 2

- 4.7 This unit is mapped where head brickearth deposits are absent (or very thin) over non calcareous sandy Folkestone Beds. It comprises virtually stoneless sandy loam in the upper profile which may extend to 120cm+ or, more typically, becomes progressively lighter with depth passing through loamy sand or sand. Sandy loam or loamy sand horizons are commonly brown (10YR 4/3) or yellowish brown (10YR 5/6) with wider colour variations where a sand substratum is encountered. Where described, soils had friable consistence but becoming looser (single grain) with depth. Structures were moderately well developed coarse blocky in the upper profile becoming more weakly developed or apedal (single grain) towards the base of the profile.

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REFERENCES

BRITISH GEOLOGICAL SURVEY, (1982). Sheet 289, Canterbury.

MAFF, (1988) Agricultural Land Classification of England and Wales.
Revised guidelines and criteria for grading the quality of agricultural land.

SOIL SURVEY OF ENGLAND AND WALES (1983) Sheet 6 - Soils of South East England.

SOIL SURVEY OF ENGLAND AND WALES (1984) Bulletin 15 - Soils and their use
in South-East England.

DESCRIPTION OF THE GRADES AND SUBGRADES

The ALC grades and subgrades are described below in terms of the types of limitation which can occur, typical cropping range and the expected level and consistency of yield. In practice, the grades are defined by reference to physical characteristics and the grading guidance and cut-offs for limitation factors in Section 3 enable land to be ranked in accordance with these general descriptions. The most productive and flexible land falls into Grades 1 and 2 and Subgrade 3a and collectively comprises about one-third of the agricultural land in England and Wales. About half the land is of moderate quality in Subgrade 3b or poor quality in Grade 4. Although less significant on a national scale such land can be locally valuable to agriculture and the rural economy where poorer farmland predominates. The remainder is very poor quality land in Grade 5, which mostly occurs in the uplands.

Descriptions are also given of other land categories which may be used on ALC maps.

Grade 1 – excellent quality agricultural land

Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown and commonly includes top fruit, soft fruit, salad crops and winter harvested vegetables. Yields are high and less variable than on land of lower quality.

Grade 2 – very good quality agricultural land

Land with minor limitations which affect crop yield, cultivations or harvesting. A wide range of agricultural and horticultural crops can usually be grown but on some land in the grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable root crops. The level of yield is generally high but may be lower or more variable than Grade 1.

Grade 3 – good to moderate quality agricultural land

Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.

Subgrade 3a – good quality agricultural land

Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.

Subgrade 3b – moderate quality agricultural land

Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.

Grade 4 – poor quality agricultural land

Land with severe limitations which significantly restrict the range of crops and/or level of yields. It is mainly suited to grass with occasional arable crops (eg cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.

Grade 5 – very poor quality agricultural land

Land with very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

Descriptions of other land categories used on ALC maps

Urban

Built-up or 'hard' uses with relatively little potential for a return to agriculture including: housing, industry, commerce, education, transport, religious buildings, cemeteries. Also, hard-surfaced sports facilities, permanent caravan sites and vacant land; all types of derelict land, including mineral workings which are only likely to be reclaimed using derelict land grants.

Non-agricultural

'Soft' uses where most of the land could be returned relatively easily to agriculture, including: golf courses, private parkland, public open spaces, sports fields, allotments and soft-surfaced areas on airports/airfields. Also active mineral workings and refuse tips where restoration conditions to 'soft' after-uses may apply.

Woodland

Includes commercial and non-commercial woodland. A distinction may be made as necessary between farm and non-farm woodland.

Agricultural buildings

Includes the normal range of agricultural buildings as well as other relatively permanent structures such as glasshouses. Temporary structures (eg polythene tunnels erected for lambing) may be ignored.

Open water

Includes lakes, ponds and rivers as map scale permits.

Land not surveyed

Agricultural land which has not been surveyed.

Where the land use includes more than one of the above land cover types, eg buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will usually be shown.

APPENDIX

FIELD ASSESSMENT OF SOIL WETNESS CLASS

SOIL WETNESS CLASSIFICATION

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile. Six revised soil wetness classes (Hodgson, in preparation) are identified and are defined in Table 11.

Table 11 Definition of Soil Wetness Classes

Wetness Class	Duration of Waterlogging ¹
I	The soil profile is not wet within 70 cm depth for more than 30 days in most years ² .
II	The soil profile is wet within 70 cm depth for 31-90 days in most years <i>or</i> , if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 90 days, but not wet within 40 cm depth for more than 30 days in most years.
III	The soil profile is wet within 70 cm depth for 91-180 days in most years <i>or</i> , if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 180 days, but only wet within 40 cm depth for between 31 and 90 days in most years.
IV	The soil profile is wet within 70 cm depth for more than 180 days but not within 40 cm depth for more than 210 days in most years <i>or</i> , if there is no slowly permeable layer within 80 cm depth, it is wet within 40 cm depth for 91-210 days in most years.
V	The soil profile is wet within 40 cm depth for 211-335 days in most years.
VI	The soil profile is wet within 40 cm depth for more than 335 days in most years.

¹ The number of days specified is not necessarily a continuous period.

² 'In most years' is defined as more than 10 out of 20 years.

Soils can be allocated to a wetness class on the basis of quantitative data recorded over a period of many years or by the interpretation of soil profile characteristics, site and climatic factors. Adequate quantitative data will rarely be available for ALC surveys and therefore the interpretative method of field assessment is used to identify soil wetness class in the field. The method adopted here is common to ADAS and the SSLRC.