

AGRICULTURAL LAND CLASSIFICATION
HARFORD FARM, IPSWICH ROAD, NORWICH

1.0 BACKGROUND

1.1 Land on this 50 ha site was inspected on the 9th and 10th January 1992, in connection with proposals for a light industrial development. A total of 41 auger borings were made mainly on a 100 metre grid basis, supplemented by additional auger borings as necessary. This information was supplemented by data collected from 3 soil profile pits. At the time of survey the land was under winter barley, but had until relatively recently been under an intensive irrigated potato cropping regime. Approximately 10 hectares were in non agricultural or urban use.

2.0 PHYSICAL FACTORS AFFECTING LAND QUALITY

Altitude and Relief

2.1 The site occupies level and sloping ground on the north facing valley sides of the River Yare. From a maximum altitude of approximately 36 m AOD on the relatively level ground close to Hill Cottage, the land falls over moderately steep to steep gradients (measured at 6° to 17°) to a minimum altitude of approximately 5 m AOD on the river valley floodplain, in the northwest of the site.

2.2 Gradient constitutes a limitation to land quality where it exceeds 7° and effectively limits quality to subgrade 3b. This occurs on sloping ground to the north and south west of the farm building, and to the south of the Depot. On the west facing slopes north of Marshall Farm Road, gradients were measured at 6° or occasionally 7° and did not constitute a limitation to land quality. Some particularly steeply sloping agricultural land immediately east-north-east of the farm buildings was measured at 11° which represents the maximum gradients permissible in 3b.

2.3 Areas of land with gradients in excess of 11° occur immediately south west of Chapel Hill Wood and are currently uncultivated and under scrub vegetation.

Surface Stoniness

2.4 Estimates of total stoniness and surface stones in excess of 2 cm were made at each auger location across the site, and riddling undertaken where necessary to confirm quantities critical to individual ALC grades. The descriptions which follow relate to stones in excess of 2 cm:

2.5 Over much of the gently sloping land south of, and adjoining the River Yare, surface stone was typically between 5-10% of soil volume, although patches in excess of 10% were found to occur locally, thus limiting this area to grade 3a.

2.6 South of Marshall Farm Road surface stoniness increased from 5% in the vicinity of the road to just in excess of 15% in the southwest corner of the site where it effectively restricts land quality to 3b.

- 2.7 Over much of the intervening land surface stoniness was estimated at 3-6% of soil volume, with patches of up to 10% occurring rarely. Much land is therefore eligible for grades 1 or 2 on stoniness grounds.
- 2.8 Exceptions occur on the level upper slopes east of the farm buildings and to the south of Chapel Hill Wood and the adjoining scrub where patches of between 10% and 22% of soil volume occur commonly, restricting much of this area to 3b on stoniness grounds.

Topsoil Texture

- 2.9 This only constitutes a limitation to land quality on the level upper slopes southwest and west of Hill Cottage where medium sand top soils predominate.

Climate

- 2.10 The site is eligible climatically for grade 1. The relevant climate parameters are as follows:

Average Annual Rainfall	597 mm
Accumulated Temperature	1408°C
Field Capacity Days	114
Moisture Deficit (Wheat)	120 mm
Moisture Deficit (Potatoes)	115 mm

Geology

- 2.11 The solid geology of the site is Upper Chalk, although this is only mapped as being exposed in relatively small areas of gently sloping ground adjoining the River Yare. Elsewhere the Chalk is obscured by spreads of glacial sands and gravels, or in small areas immediately adjoining the river, by first terrace river gravels. Alluvium is mapped as occurring on the lowlying marshland to the north of the site and in a narrow tongue along the valley floor extending southwards from the Depot.

Soils

Two main soil types occur on the agricultural land on site and these are related closely to relief.

- 2.12 On the gently sloping land adjoining the River Yare soils are moderately well bodied, slightly stony and comprise sandy loam or sandy clay loam textures overlying chalk marl (silty clay loam in texture) below 50 cm depth. Wetness class is assessed as predominantly II, occasionally I.
- 2.13 Elsewhere soils mainly comprise free draining (wetness class I) light textured loamy sands, sands and sandy loam topsoils overlying progressively higher textured subsoils. The stone content of these profiles is variable ranging from very slightly stony to moderately stony in some locations (see paragraphs 2.4 to 2.8). Due to their light texture these soils are particularly prone to surface water erosion, which may be severe in areas of sloping ground.

2.14 In small areas to the west of the site, heavier soils outcrop on the shoulders of some slopes. Profiles in these areas are typically stony and comprise sandy loam or sandy clay loam textures overlying stiff clay at shallow depth, which may in turn overlie gravel or hoggin. Wetness class is assessed predominantly as III.

3.0 AGRICULTURAL LAND CLASSIFICATION

3.1 A reliable and adequate source of irrigation water is available on site and has been taken into account in grading the land. It should be noted however that upgrading has only occurred in one relatively small area of gently sloping or level land with reduced risk of surface water erosion and no over riding gradient, or stoniness or topsoil texture constraints.

3.2 The site is graded 3a and 3b. A breakdown of ALC grades in hectares and percentage terms is provided below.

ALC	Ha	%
3a	11.5	22.8
3b	28.4	56.2
Non agricultural	8.2	16.2
Urban	<u>2.4</u>	<u>4.8</u>
Totals	50.5	100.0

Subgrade 3a

3.3 This occurs on the gently sloping land immediately south of the River Yare. The soils in this area are more fully described in paragraph 2.11 and the land is limited predominantly by droughtiness constraints. Although irrigation water could partially offset this droughtiness limitation, the occurrence of stonier areas (in excess of 10% topsoil volume) effectively excludes this area from a higher grade.

Subgrade 3b

3.4 This is mapped over the rest of the site where light textured soils predominate (see paragraphs 2.12 and 2.13). The majority of this area is limited by gradient and droughtiness constraints although the less stony, level upper slopes west and southwest of Hill Cottage are restricted to 3b by their medium sand topsoils. Many areas of sloping ground are also affected by surface water erosion which was evident on site at the time of survey. These individual constraints collectively constitute a pattern limitation which significantly reduces the beneficial effects of available irrigation, since large areas remain restricted to 3b by gradient, surface stoniness and topsoil texture constraints. This land is therefore assessed in an unirrigated state as 3b.

3.5 Small areas of particularly steeply sloping ground east-north-east of the farm buildings on approach grade 4 (see paragraph 2.2). These areas remain in continued arable cultivation producing cereals and until recently, potatoes, and are therefore included in 3b.

- 3.6 An exception to the above findings occurs on the relatively level upper slopes east of the farm buildings and south of Chapel Hill Wood where soils graded 4 on droughtiness (due to the high profile stone contents described in paragraph 2.8) are upgraded to 3b with irrigation.

Non Agricultural Land

- 3.7 This is mapped on the lowlying marshland to the north west of the site which lies wet for much of the year and is under rough vegetation. It also occurs in a small area to the east of the Depot on the site of an old marling pit, to the north of the farm buildings in an area of new planting on disturbed ground, in Chapel Hill Wood, and the scrubland adjoining it to the south west.

Urban

- 3.8 The farm buildings, yard and adjacent cottage are included in this category.

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