BERRYS

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# AGRICULTURAL LAND CLASSIFICATION

LAND AT SALPH END, RENHOLD, BEDS

**ISSUED BY**

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RTPI mediation of space - making of place

RICS

# Contents



**APPENDICES**

## SUMMARY

The Agricultural Land Classification of c. 19.56ha of land at Salph End, Renhold in Bedfordshire has been determined as 19% grade 2 and 80% subgrade 3a in accordance with the procedures set out in 'Revised guidelines and criteria for grading the quality of agricultural land' (MAFF, October 1988). There was a small area (<1%) of non agricultural (garden) land included in the red line boundary.

## 1. Introduction

1.1. Agricultural land is classified using the guidelines set out in the publication "Agricultural Land Classification of England and Wales" (MAFF,1988). This provides a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. Land may be classified land into one of five grades; Grade 1 land being of excellent quality and Grade 5 land of very poor quality. Grade 3, which constitutes about half of the agricultural land in England and Wales, is divided into two subgrades designated 3a and 3b. Grade is determined by the most limiting factor. The grades are described in more detail at **Appendix 4**.

1.2. The principal physical factors influencing agricultural production are:

- Climate
- Site
- Soil

1.3. Berrys have been instructed by Manor Oak Homes Limited to carry out an assessment of the Agricultural Land Classification (ALC) of approximately 20ha of land to the west of Ravensden Road, due North of Bedford, as outlined in red on the plan at **Appendix 1,** for the purposes of planning.

1.4. Under the Provisional Agricultural Land Classification for England and Wales (MAFF 1986) the area of the site is shown as grade 3, being part of a narrow band of grade 3 land following the Ravensden Brook. The wider area to the North and East is primarily (provisional) Grade 2, whilst the immediate south and west are built up areas. The Provisional Land Classification was only ever intended for strategic use, not being sufficiently accurate for the assessment of individual fields or sites, therefore this report aims to confirm the site specific land grades present. Nearby post 1988 classification (1398A/Cambridge) identified mostly Grade 3a land with small areas of 3b.

1.5. At inspection, on 16th and 21st July 2020, the site was cropped with spring barley.

## 2. Assessment Methodology

2.1. A site visit was undertaken to make a visual assessment of the land and to inspect the soils in order to support desk based study. In order to verify the soil type shown by the Soil Survey of England and Wales and National Soil Research Institute 14 soil cores were taken on a 100m grid pattern to 1m depth (as shown at **Appendix 2**) and 4 soil pits were dug to 1 – 1.2m depth.

2.2. The desk based study was completed using a number of different sources of information, including:

- Published data from MAFF (DEFRA) Agricultural Land Classification
- Published information and dataset queries from the National Soil Research Institute
- Data from the Meteorological Office
- Published geological survey data
- Environment agency flood risk maps
- Existing plans and aerial photographs (Google Earth)
- Munsell Soil Colour Charts

2.3. The land has been classified using the guidelines set out in the Agricultural Land Classification of England and Wales (MAFF,1988). This system provides a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. The limitations can operate in one or more of four principle ways: they may affect the range of crops that can be grown, the level of yield, the consistency of yield and the cost involved in obtaining that yield. The classification gives considerable weight to flexibility of cropping, whether actual or potential, but the ability of some land to produce consistently high yields of a somewhat narrower range of crops is also taken into account.

2.4. The grade or subgrade of land is determined by the most limiting factor present. When classifying land the overall climate and site limitations should be considered first as these can have an overriding influence on the grade.

## 3. Grade according to Climate Factors

3.1. The main parameters used in the assessment of an overall climatic limitation are average annual rainfall (AAR), as a measure of overall wetness, and the accumulated temperature above 0 degrees (AT0), taken between January and June, as a measure of the relative warmth of the locality. Climatic data is provided by the National Soil Research Institute, interpolated from a 5km Grid Square to site specific results.

| | |
|---|---|
| Grid Reference | TL07505290 |
| Altitude | 31 m |
| AAR (1941-70) | 577 mm |
| AT0 | $1445^{0}$ |

Climate is not limiting to production and the resultant grade is 1.

3.2. Aspect, gradient and elevation are limiting for example if solar radiation is significantly reduced, there is increased exposure or if frost pockets form.

Local climate is not thought to be limiting to production and the resultant grade is 1.

## 4. Grade according to Site Factors

4.1. The site slopes very gently to the southwest and has a small watercourse dividing the two field parcels, but the gradients are gentle and less than 7%. The ALC grading system gives gradient limits for grades and subgrade of land based on type of machinery that can be operated, with the principal thresholds in this instance being 7% for grade 1, 2 & 3a and 11% for grade 3b. Therefore gradient is a not a limitation on the site

4.2. The site is not recorded on Enviroment Agency records as being prone to flooding.

## 5. Grade according to Soil Factors

5.1. Soil texture and structure

5.1.1. The topsoils on the site were found to be clay loams analogous with the Evesham Series of the Evesham association as identified in the Soil Classification in the Soil Survey of England and Wales (Avery, B.W. 1973), but not an exact fit.

5.1.2. The subsoils on the site were consistent, being olive brown clays turning to grey clay at depth, mostly stoneless although slightly stoney in places towards the bottom of the olive brown layer. The lower subsoils were occasionally calcareous at the limit of borehole depth (1.2m).

5.1.3. Soil texture on its own is not limiting to production at this site but is taken into account in the wetness and droughtiness assessment.

5.1.4. The site is not restored nor saline, therefore shows no structural limitation to production.

5.2. Soil Depth

5.2.1. Soil depth (to consolidated or fragmented rock) affects grade by restricting range and type of cultivations, nutrient uptake, root growth and root anchorage.

5.2.2. Soils across the site were deep and all well in excess of 60cm, therefore offering no limitation to production.

5.3. Stoniness

5.3.1. High stone content affects production costs, crop establishment and nutrition, crop quality and can cause physical impediment to agricultural operations.

5.3.2. Stoniness levels in the samples were generally very low, although a scattering of siliceous stones were present within some profiles. Stoniness is not a limitation to production but is taken into account in the droughtiness calculations.

## 5.4. Chemical Limitations

5.4.1. Soil chemical properties can induce physical limitations in terms of soil structural stability.

5.4.2. Chemical limitations are not limiting to production in this instance.

## 5.5. Soil Wetness

5.5.1. Soil wetness may affect seed germination and survival, soil temperature, anaerobism and plant growth. The severity of limitation relates to the amount and frequency of rain in relation to evapotranspiration, the duration of waterlogging and soil texture.

5.5.2. The rainfall/evapotranspiration from NSRI held data:
Median Field Capacity Days = 99

5.5.3. Assessment of soil wetness requires inspection of soil core samples and profile pits to establish the texture of the top 25cm and relating this to the structure and colours of the subsoil to establish the presence of gleying and /or a slowly permeable layer. This information gives a wetness class which in turn is related to published data on 'Field Capacity Days' to give grading.

5.5.4. The samples inspected were mostly gleyed at 35cm depth with a slowly permeable layer generally starting at the same depth, reflecting the slowly permeable nature of the clay subsoils. However the climatic data gives a site with lower incoming rainfall and greater evapotranspiration and hence a relatively low Field Capacity Days number of 99. Therefore the wetness class is III which coupled with a medium clay loam topsoil gives a grading of 3a. On the bores where the slowly permeable layer was deeper (below 54cm) the Wetness class is II and the resultant grade is 2.

## 5.6. Droughtiness

5.6.1. Droughtiness may affect a crops ability to achieve full yield due to a limitation of soil moisture in relation to transpiration rates. Different crops will fair differently in a similar droughtiness regime due to different rooting levels and hence volume of soil moisture reserves available.

5.6.2. The ALC droughtiness assessment is based on the moisture balance for wheat and potatoes as reference crops. Moisture balance is calculated as the Available Water Capacity (AP) minus the Moisture Deficit (MD). Available Water depends on the soil texture and structure at different layers of top soil and sub soil, and is calculated for wheat crops to 120cm and potatoes to 70cm based on rooting depth. Moisture deficit is a crop related meterological variable based on the balance of rainfall and a potential evapotranspiration for the relevant reference crop.

5.6.3. MD data is calculated for the relevant soil series by NSRI and AP is calculated from the soil horizons and stoniness found on site. The resultant moisture balance can be calculated and attributed to the sample sites. Despite being slowly permeable and prone to waterlogging, the low porosity of clay soils also creates a lack of available water in comparison to crop needs and across the sample the drought grade was found to be limiting to grade 3a in most places (and grade 2 in others).

## 5.7. Erosion

5.7.1. Propensity to soil erosion limits grade when crops are destroyed, machinery operations hindered or crops subjected to abrasion.

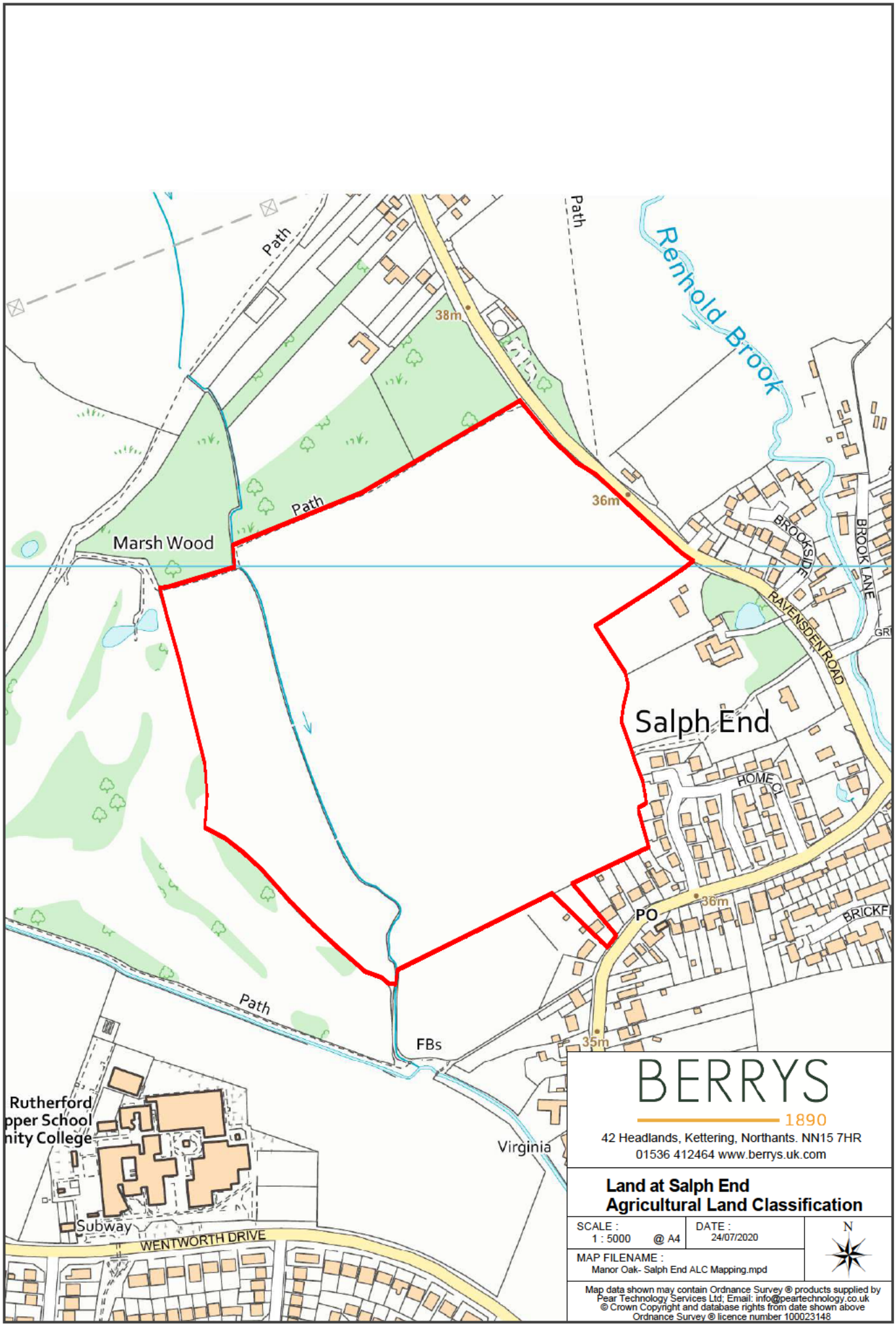
5.7.2. The clay loam topsoil textures present at the site are of not a kind that would be susceptible water erosion, especially with the gentle slopes present. Likewise wind erosion is also thought unlikely to be a factor.

## 6. Agricultural Land Classification

6.1. The site inspected known as land at Land at Salph End, Renhold, Bedfordshire, was found to comprise:

| Grade | Area (ha) | Proportion | Notes |
|---|---|---|---|
| Grade 2 | 3.82 | 19% | On account of wetness & droughtiness |
| Sub grade 3a | 15.60 | 80% | On account of wetness & droughtiness |
| Sub grade 3b | - | - | |
| Grade 4 | - | - | |
| Non Agricultural | 0.14 | 1% | Residential garden |
| Total | 19.56 | | |

6.2. The distribution of the soil grades is shown on the plan at **Appendix 2**.

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**Land at Salph End**
**Agricultural Land Classification**

| SCALE : 1 : 5000 @ A4 | DATE : 24/07/2020 | N |
|---|---|---|
| MAP FILENAME : Manor Oak- Salph End ALC Mapping.mpd | | |


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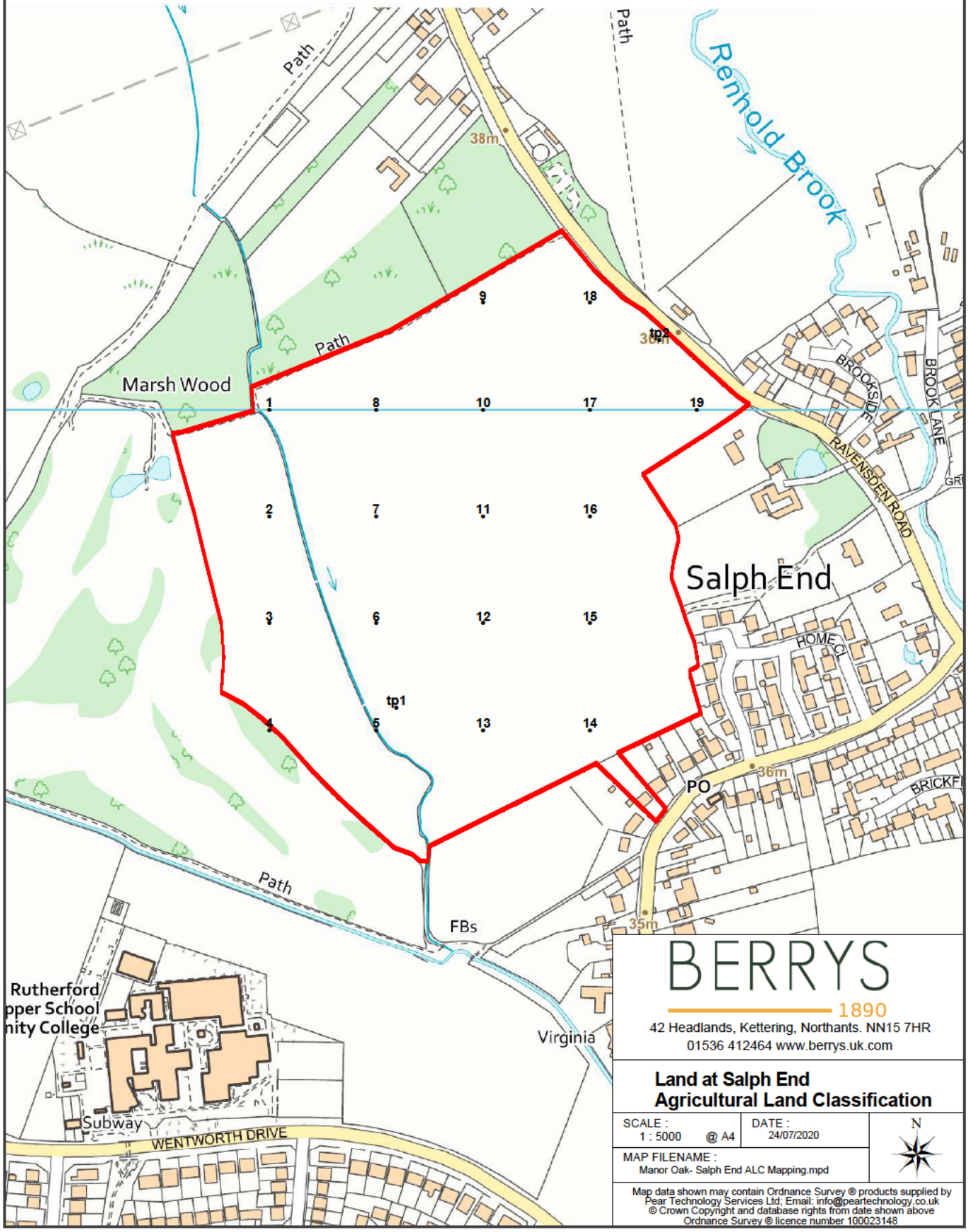


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| | |
|---|---|
| Grade 1 – Excellent quality agricultural land | Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can usually be grown and commonly include top fruit, soft fruit, 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 will 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 inflexibility 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 cultivations, 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. |
| Sub grade 3a | 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. |
| Sub grade 3b | Land capable of producing moderate 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. |